



**DC-DC Converters****DIN Rail 4****DC-DC Converters****Isolated - including bi-directional 23****POL (non isolated) 129**

CC-E	24	iAA/iAC	133	PAF500F	68
CC-P-E	27	iAD	136	PAF600F	71
CCG15-30	30	iAF	138	PAF700F	74
CE-1000	130	iAH	140	PAH300/450	77
CN-A	33	iBA/iBC	142	PH-A 280	80
CN-A 24Vdc	36	iBD	144	PH-F	84
DPX15W Series	5	iBF	146	PL5	158
DPX20W Series	8	iBH	148	PL10-20S	161
DPX30W Series	11	iCF	150	PL10-20SMS	164
DPX40W Series	14	iCG	152	PV	85
DPX40W Triple Output	17	iCH	154	PXA15	88
DPX60 Series	20	iEA	48	PXB15	91
EZA2.5kW	124	iEH	50	PXC05	94
EZA11kW	127	iFB	156	PXC-M03(W)	112
GQA120	39	iHG	52	PXC-M06(W)	116
HQA85	42	iQE	54	PXC-M10(W)	120
HQA120	45	iQG	56	PXD	97
i3A	167	iQL	58	PXD20W	100
i6A	169	iSA	60	PXD30W	103
i6A4W	172	PAE50/100	62	PXE	106
i6AN	175	PAF450F280 & PAF600F280	65	PXF	109



DPX15W Series	5
DPX20W Series	8
DPX30W Series	11
DPX40W Series	14
DPX40W Triple Output	17
DPX60 Series	20



## Applications DC/DC Converters

- Distributed Power Architecture with DC Bus
- Small subsystems with battery backup

## Features DC/DC Converters

- Galvanic isolation between input and output
- Power range from 1.5W to 700W
- Convection, baseplate conduction or forced air cooling
- Input voltage ranges 2:1 or 4:1
- Nominal input voltages 5V, 12V, 24V, 48V, 110V or 280V







## DPX15W Series

Single and Dual Output 15W Din Rail Mount  
DC-DC Converters

- Single and dual output
- Meet EN55022 Class B
- Input fuse protection
- Input reverse polarity protection
- Input in-rush current protection
- Overload and short circuit protection
- Over voltage protection
- Reliable snap-on for DIN rail TS-35/7.5 or TS-35/15
- I/O-isolation 1600 VDC
- Output DC-OK indicator

### Key Market Segments & Applications

Communication Systems, Industry Control Systems  
Factory Automation, Semiconductor Equipment

### DPX15W Features and Benefits

#### Features

- CE Approvals
- Wide Range Input

#### Benefits

- Easier System Approvals
- Less Parts to Inventory

#### Specifications

ITEMS	DPX15W	
Rated Input voltage range	24V nominal input 9.5-36VDC	48V nominal input 18-75VDC
Switching Frequency	400kHz, typ	
Maximum Input Current	See Table	
Input Fuse	24V input, 6A Fuse	48V input, 4A fuse
Max Output Power (W)	See Table	
Voltage Accuracy	Single/Dual $\pm 1.2\%$ / Single (3.3V) $\pm 2.0\%$	
Line Regulation (LL to HL at full load)	Single $\pm 0.2\%$ / Dual 0.5%	
Ripple and Noise	20MHz bandwidth	See table
Start up time (Nominal Vin and constant resistive load)	Power up 100mS, typ	
Remote on/off (option) (Note 2)	POSITIVE logic: ON: Open or 3-12V, OFF Short or <1.2V NEGATIVE logic: ON: Short or <1.2V, OFF Open or 3-12V	
Efficiency	See Table	
Over Current Protection, Factory Set	Maximum, 150% of full load	
Short Circuit Protection (Note 3)	Hiccup, auto recovery	
Overvoltage Protection	3.3V output 5V output 12V output 15 output	3.9V 6.2V 15V 18V
Operating Temperature	-40°C ~ 85°C (without derating) 85°C ~ 95°C (with derating - see curve)	
Storage Temperature	-40°C ~ 105°C	
Thermal Shock	MIL-STD-810F	
Relative Humidity (non condensing)	5% to 95% RH	
Transient Response (25% step load change)	250µS	
Isolation Voltage (Min)	1600Vdc	
Isolation Resistance	10 <sup>9</sup> Ω	
Isolation Capacitance (Max)	4000 pF	
MTBF BELLCORE TR-NWT-000332 (Note 1)	147,200 hrs	
Vibration	MIL-STD-810F	
Conducted and Radiated Emissions	EN55022, Class B	
Immunity	EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6 Perf. Criteria A	
Safety	CE	
Size (H x W x D)	57.6 x 24.5 x 125.0 mm	
Weight	147.5g	
Connector	Screw Terminal	
Cooling	Convection	
Front Panel LED	Output DC good	
Warranty yrs	3	



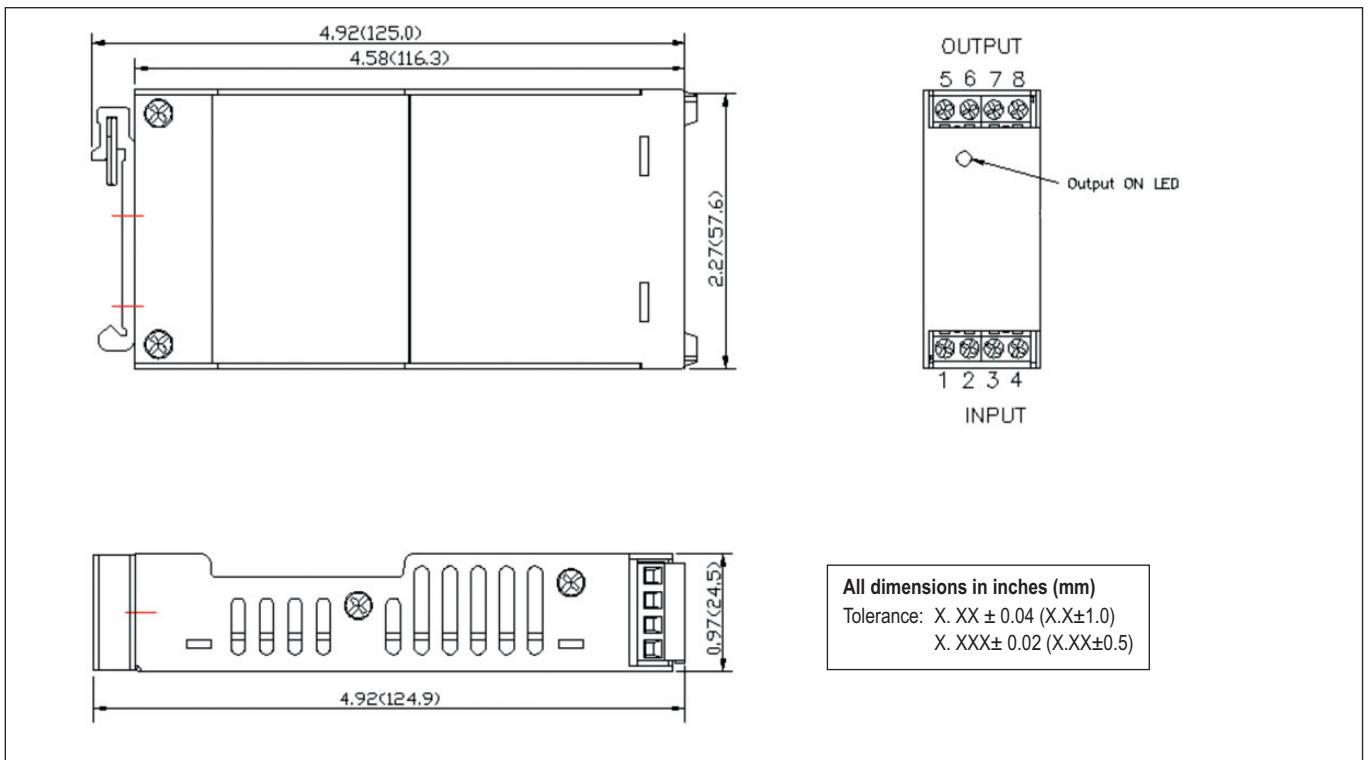
## Model Selector

Model	Input Range	Output Voltage	Output Current Min Load	Output Current Full Load	Output (3) Ripple & Noise	Input Current No Load (4)	Input Current Full Load (5)	Eff % (3)	Capacitor Load Max (6)
DPX15-24WS3P3	9.5 - 36 VDC	3.3 VDC	0mA	4500mA	50mVp-p	52mA	773mA	84	147000μF
DPX15-24WS05	9.5 - 36 VDC	5 VDC	0mA	3000mA	50mVp-p	67mA	772mA	85	7200μF
DPX15-24WS5P1	9.5 - 36 VDC	5.1 VDC	0mA	3000mA	50mVp-p	67mA	787mA	85	7200μF
DPX15-24WS12	9.5 - 36 VDC	12 VDC	0mA	1250mA	75mVp-p	26mA	772mA	85	1250μF
DPX15-24WS15	9.5 - 36 VDC	15 VDC	0mA	1000mA	75mVp-p	26mA	772mA	85	800μF
DPX15-24WD05	9.5 - 36 VDC	±5 VDC	0mA	±1500mA	75mVp-p	57mA	772mA	85	±3600μF
DPX15-24WD12	9.5 - 36 VDC	±12 VDC	0mA	±625mA	75mVp-p	35mA	762mA	86	±625μF
DPX15-24WD15	9.5 - 36 VDC	±15 VDC	0mA	±500mA	75mVp-p	35mA	762mA	86	±400μF
DPX15-48WS3P3	18 - 75 VDC	3.3 VDC	0mA	4500mA	50mVp-p	37mA	387mA	84	14700μF
DPX15-48WS05	18 - 75 VDC	5 VDC	0mA	3000mA	50mVp-p	38mA	381mA	86	7200μF
DPX15-48WS5P1	18 - 75 VDC	5.1 VDC	0mA	3000mA	50mVp-p	38mA	389mA	86	7200μF
DPX15-48WS12	18 - 75 VDC	12 VDC	0mA	1250mA	75mVp-p	18mA	386mA	85	1250μF
DPX15-48WS15	18 - 75 VDC	15 VDC	0mA	1000mA	75mVp-p	18mA	386mA	85	800μF
DPX15-48WD05	18 - 75 VDC	± 5 VDC	0mA	± 1500mA	75mVp-p	37mA	381mA	86	±3600μF
DPX15-48WD12	18 - 75 VDC	± 12VDC	0mA	± 625mA	75mVp-p	20mA	381mA	86	±625μF
DPX15-48WD15	18 - 75 VDC	± 15 VDC	0mA	± 500mA	75mVp-p	20mA	381mA	86	±400μF

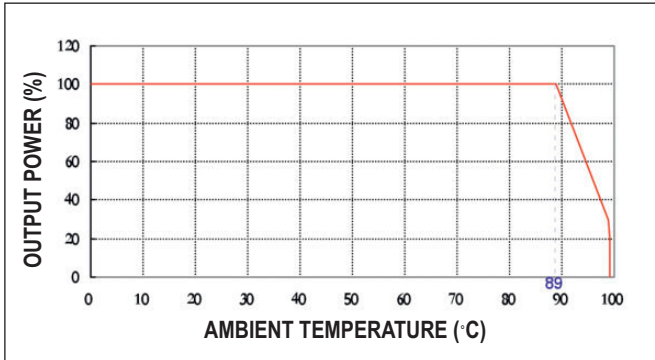
### Notes see above

- BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C. MIL-HDBK-217F Notice2 @Ta=25°C, Full load(Ground, Benign, controlled environment).
- The ON/OFF control pin voltage is referenced to -Vin. To order Negative logic ON/OFF control add the suffix -N (Ex:DPX15-48WS05-N), for Positive logic add suffix -P (Ex:DPX15-48NS05-P)
- Typical value at nominal input voltage and full load.
- Typical value at nominal input voltage and no load.
- Maximum value at nominal input voltage and full load.
- Test by minimum Vin and constant resistive load.

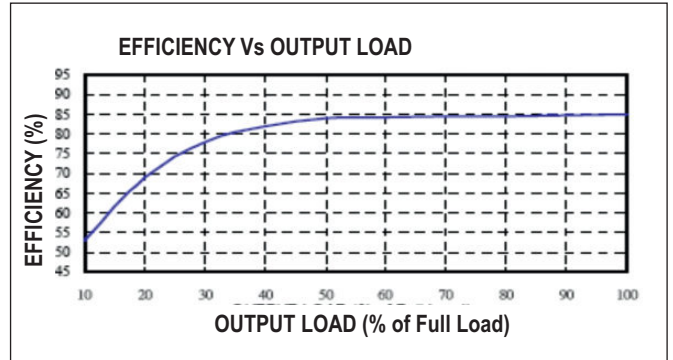
## Outline Drawing DPX15W Series



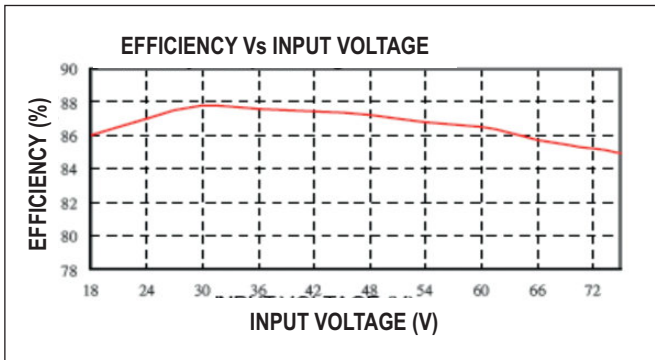
Derating Curve DPX15-48WS05



Efficiency / Load Curve DPX15-48WS05



Efficiency / Input Curve DPX15-48WS05



Pinout		
PIN	Single	Dual
1	CTRL	CTRL
2	- Input	- Input
3	- Input	- Input
4	+ Input	+ Input
5	NC	NC
6	- Output	- Output
7	+ Output	Common
8	NC	+ Output

NC: No connection

Screw terminals - wire range from 14 to 18 AWG

### Options

Option	Suffix
Negative Logic Remote ON/OFF	- N
Positive Logic Remote ON/OFF	- P





## DPX20W Series

Single and Dual Output 20W Din Rail Mount  
DC-DC Converters

- Single and dual output
- Meet EN55022 Class B
- Input fuse protection
- Input reverse polarity protection
- Input in-rush current protection
- Overload and short circuit protection
- Over voltage protection
- Reliable snap-on for DIN rail TS-35/7.5 or TS-35/15
- I/O-isolation 1600 VDC
- Output DC-OK indicator

### Key Market Segments & Applications

Communication Systems, Industry Control Systems  
Factory Automation, Semiconductor Equipment

### DPX20W Features and Benefits

#### Features

- CE Approval
- Wide Range Input

#### Benefits

- Easier System Approvals
- Less Parts to Inventory

#### Specifications

ITEMS	DPX20W	
Rated Input voltage range	24V nominal input 9.5-36VDC	48V nominal input 18-75VDC
Switching Frequency	400kHz, typ	
Maximum Input Current	See Table	
Input Fuse	24V input, 6A Fuse	48V input, 4A fuse
Max Output Power (W)	See Table	
Voltage Accuracy	Single/Dual $\pm 1.0\%$ / Single (3.3V) $\pm 1.5\%$	
Voltage Adjustment (Note 7)	Single output $\pm 10\%$	
Line Regulation (LL to HL at full load Single)	Single $\pm 0.2\%$ / Dual $\pm 0.5\%$	
Ripple and Noise	20MHz bandwidth See table	
Start up time (Nominal Vin and constant resistive load)	Power up 100mS, typ (remote On/Off 20mS, typ)	
Remote on/off (option) (Note 2)	POSITIVE Logic: ON: Open or 3-12V, OFF Short or <1.2V NEGATIVE Logic: ON: Short or <1.2V, OFF Open or 3-12V	
Efficiency	See Table	
Over Current Protection, Factory Set	Maximum, 150% of full load	
Short Circuit Protection (Note 3)	Hiccup, auto recovery	
Overvoltage Protection	3.3V output 5V output 12V output 15 output	3.9V 6.2V 15V 18V
Operating Temperature	-40°C ~ 78°C (without derating) 78°C ~ 91°C (with derating - see curve)	
Storage Temperature	-40°C ~ 105°C	
Thermal Shock	MIL-STD-810F	
Relative Humidity (non condensing)	5% to 95% RH	
Transient Response (25% step load change)	250µS	
Isolation Voltage (Min)	1600Vdc	
Isolation Resistance	10 <sup>9</sup> Ω	
Isolation Capacitance (Max)	4000 pF	
MTBF BELLCORE TR-NWT-000332 (Note 1)	139,300 hrs	
Vibration	MIL-STD-810F	
Conducted and Radiated Emissions	EN55022, Class B	
Immunity	EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6 Perf. Criteria A	
Safety	CE	
Size (H x W x D)	57.6 x 24.5 x 125.0 mm	
Weight	147.5g	
Connector	Screw Terminal	
Cooling	Convection	
Front Panel LED	Output DC good	
Warranty yrs	3	

Notes: See page 2

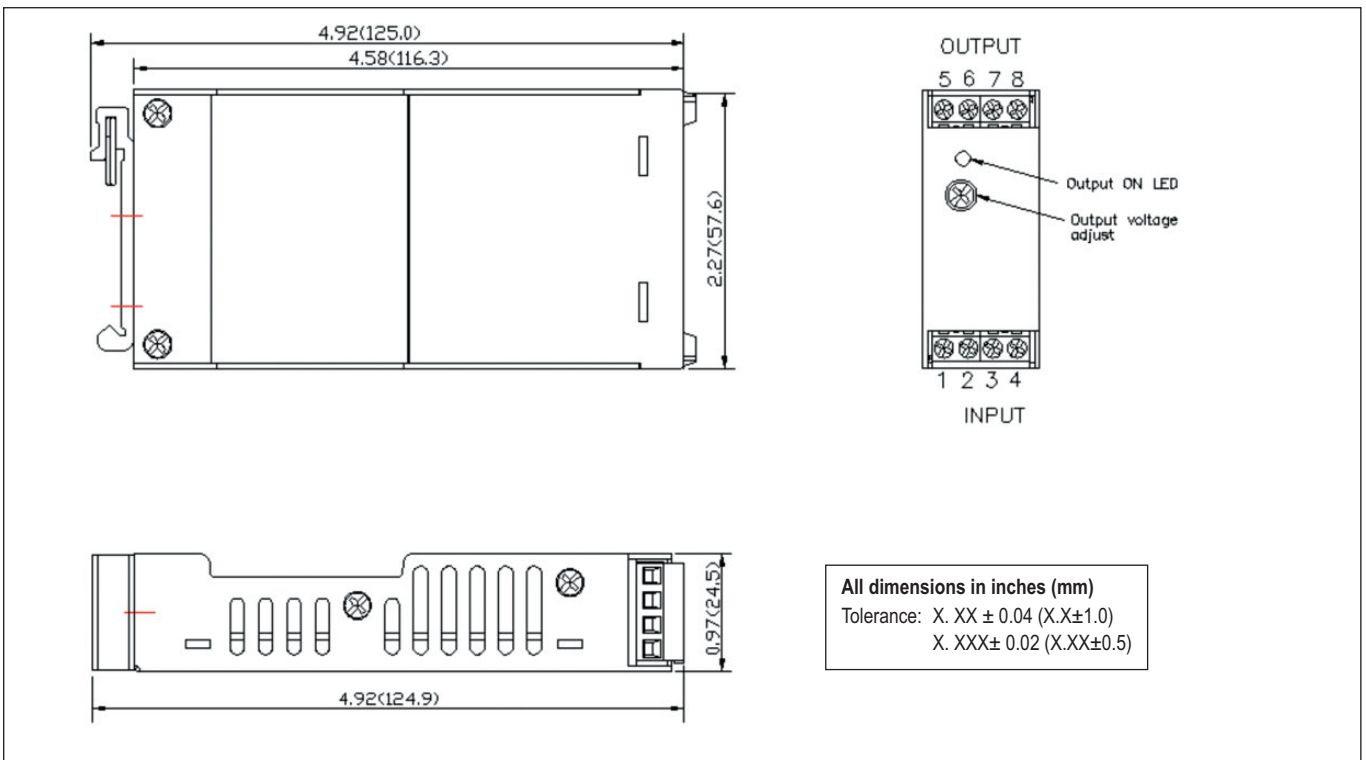


## Notes

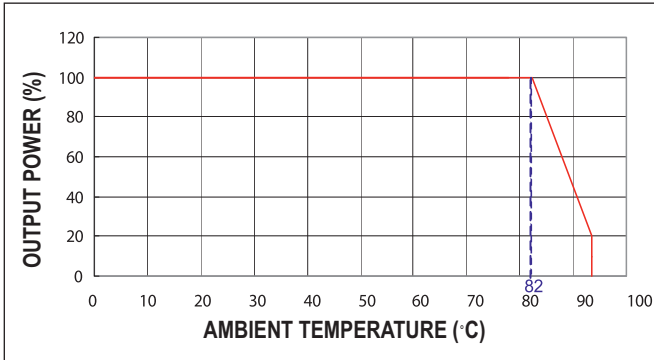
1. BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C. MIL-HDBK-217F Notice2 @Ta=25°C, Full load(Ground, Benign, controlled environment).
2. The ON/OFF control pin voltage is referenced to -Vin. To order Negative logic ON/OFF control add the suffix -N (Ex:DPX20-48WS05-N), for Positive logic add suffix -P (Ex:DPX20-48NS05-P)
3. Typical value at nominal input voltage and full load.
4. Typical value at nominal input voltage and no load.
5. Maximum value at nominal input voltage and full load.
6. Test by minimum Vin and constant resistive load.
7. Single outputs have a potentiometer to adjust the output voltage.

Model Selector									
Model	Input Range	Output Voltage	Output Current Min Load	Output Current Full Load	Output (3) Ripple & Noise	Input Current No Load (4)	Input Current Full Load 5	Eff % (3)	Capacitor Load Max (6)
DPX20-24WS3P3	9.5 - 36 VDC	3.3 VDC	0mA	5500mA	60mVp-p	52mA	957mA	83	18000µF
DPX20-24WS05	9.5 - 36 VDC	5 VDC	0mA	4000mA	75mVp-p	67mA	1016mA	86	9600µF
DPX20-24WS12	9.5 - 36 VDC	12 VDC	0mA	1670mA	75mVp-p	26mA	1043mA	84	1650µF
DPX20-24WS15	9.5 - 36 VDC	15 VDC	0mA	1330mA	75mVp-p	27mA	1039mA	84	1050µF
DPX20-24WD05	9.5 - 36 VDC	± 5 VDC	0mA	±2000mA	100mVp-p	59mA	1016mA	86	±2000µF
DPX20-24WD12	9.5 - 36 VDC	±12 VDC	0mA	±833mA	100mVp-p	34mA	1028mA	85	±825µF
DPX20-24WD15	9.5 - 36 VDC	±15 VDC	0mA	±667mA	100mVp-p	35mA	1029mA	85	±525µF
DPX20-48WS3P3	18 - 75 VDC	3.3 VDC	0mA	5500mA	60mVp-p	37mA	473mA	83	18000µF
DPX20-48WS05	18 - 75 VDC	5 VDC	0mA	4000mA	75mVp-p	37mA	508mA	86	9600µF
DPX20-48WS12	18 - 75 VDC	12 VDC	0mA	1670mA	75mVp-p	18mA	515mA	85	1650µF
DPX20-48WS15	18 - 75 VDC	15 VDC	0mA	1330mA	75mVp-p	18mA	513mA	85	1050µF
DPX20-48WD05	18 - 75 VDC	± 5 VDC	0mA	±2000mA	100mVp-p	37mA	502mA	87	±4800µF
DPX20-48WD12	18 - 75 VDC	± 12 VDC	0mA	±833mA	100mVp-p	20mA	508mA	86	±825µF
DPX20-48WD15	18 - 75 VDC	± 15 VDC	0mA	±667mA	100mVp-p	20mA	508mA	86	±525µF

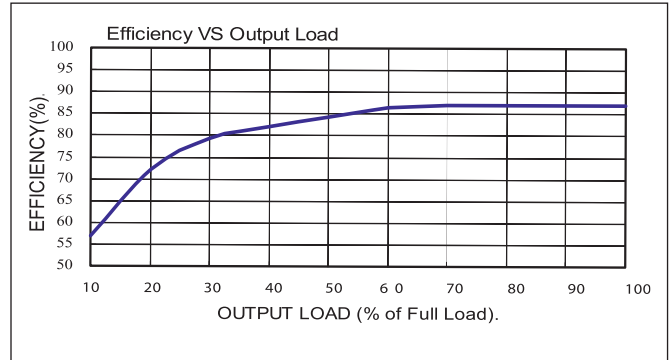
## Outline Drawing DPX20W Series



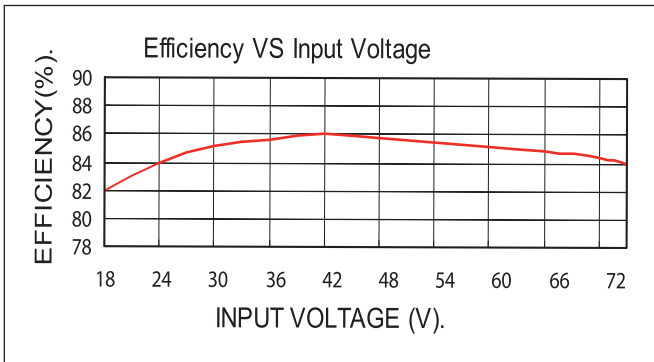
## Derating Curve DPX20-48WS05



## Efficiency / Load Curve DPX20-48WS05



## Efficiency / Input Voltage Curve DPX20-48WS05



Pinout		
PIN	Single	Dual
1	CTRL	CTRL
2	- Input	- Input
3	- Input	- Input
4	+ Input	+ Input
5	NC	NC
6	- Output	- Output
7	+ Output	Common
8	NC	+ Output

NC: No connection  
Screw terminals - wire range from 14 to 18 AWG

Options	
Option	Suffix
Negative Logic Remote ON/OFF	- N
Positive Logic Remote ON/OFF	- P





## DPX30W Series

Single and Dual Output 30W Din Rail Mount  
DC-DC Converters

- Single and dual output
- Meet EN55022 Class B
- Input fuse protection
- Input reverse polarity protection
- Input in-rush current protection
- Overload and short circuit protection
- Over voltage protection
- Reliable snap-on for DIN rail TS-35/7.5 or TS-35/15
- I/O-isolation 1600 VDC
- Output DC-OK indicator

### Key Market Segments & Applications

Communication Systems, Industry Control Systems  
Factory Automation, Semiconductor Equipment

### DPX30W Features and Benefits

#### Features

- CE Approval
- Wide Range Input

#### Benefits

- Easier System Approvals
- Less Parts to Inventory

#### Specifications

ITEMS	DPX30W	
	24V nominal input 10-40VDC	48V nominal input 18-75VDC
Rated Input voltage range	24V nominal input 10-40VDC	48V nominal input 18-75VDC
Switching Frequency	300kHz, typ	
Maximum Input Current	See Table	
Input Fuse	24V input, 6A Fuse	48V input, 4A fuse
Max Output Power (W)	See Table	
Voltage Accuracy	Single/Dual $\pm 1.0\%$ / Single (3.3V) $\pm 1.5\%$	
Voltage Adjustment (Note 7)	Single output $\pm 10\%$	
Minimum Load	N/A	
Line Regulation (LL to HL at full load)	Single $\pm 0.5\%$ / Dual $\pm 0.5\%$	
Ripple and Noise	20MHz bandwidth See table	
Start up time (Nominal Vin and constant resistive load)	Power up 100ms, typ	
Remote on/off (option) (Note 2)	POSITIVE Logic: ON: Open or 3-12V, OFF Short or <1.2V NEGATIVE Logic: ON: Short or <1.2V, OFF Open or 3-12V	
Efficiency	See Table	
Over Current Protection, Factory Set	Maximum, 150% of full load	
Short Circuit Protection (Note 3)	Hiccup, auto recovery	
Overvoltage Protection	3.3V output 5V output 12V output 15 output	3.9V 6.2V 15V 18V
Operating Temperature	-40°C ~ 67°C (without derating) 67°C ~ 90°C (with derating - see curve)	
Storage Temperature	-40°C ~ 105°C	
Thermal Shock	MIL-STD-810F	
Relative Humidity (non condensing)	5% to 95% RH	
Transient Response (25% step load change)	250µs	
Isolation Voltage (Min)	1600Vdc	
Isolation Resistance	$10^9 \Omega$	
Isolation Capacitance (Max)	4000 pF	
MTBF BELLCORE TR-NWT-000332 (Note 1)	112,400 hrs	
Vibration	MIL-STD-810F	
Conducted and Radiated Emissions	EN55022, Class B	
Immunity	EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6 Perf. Criteria A	
Safety	CE	
Size (H x W x D)	57.6 x 24.5 x 125.0 mm	
Weight	170g	
Connector	Screw Terminal	
Cooling	Convection	
Front Panel LED	Output DC good	
Warranty yrs	3	

Notes: See page 2



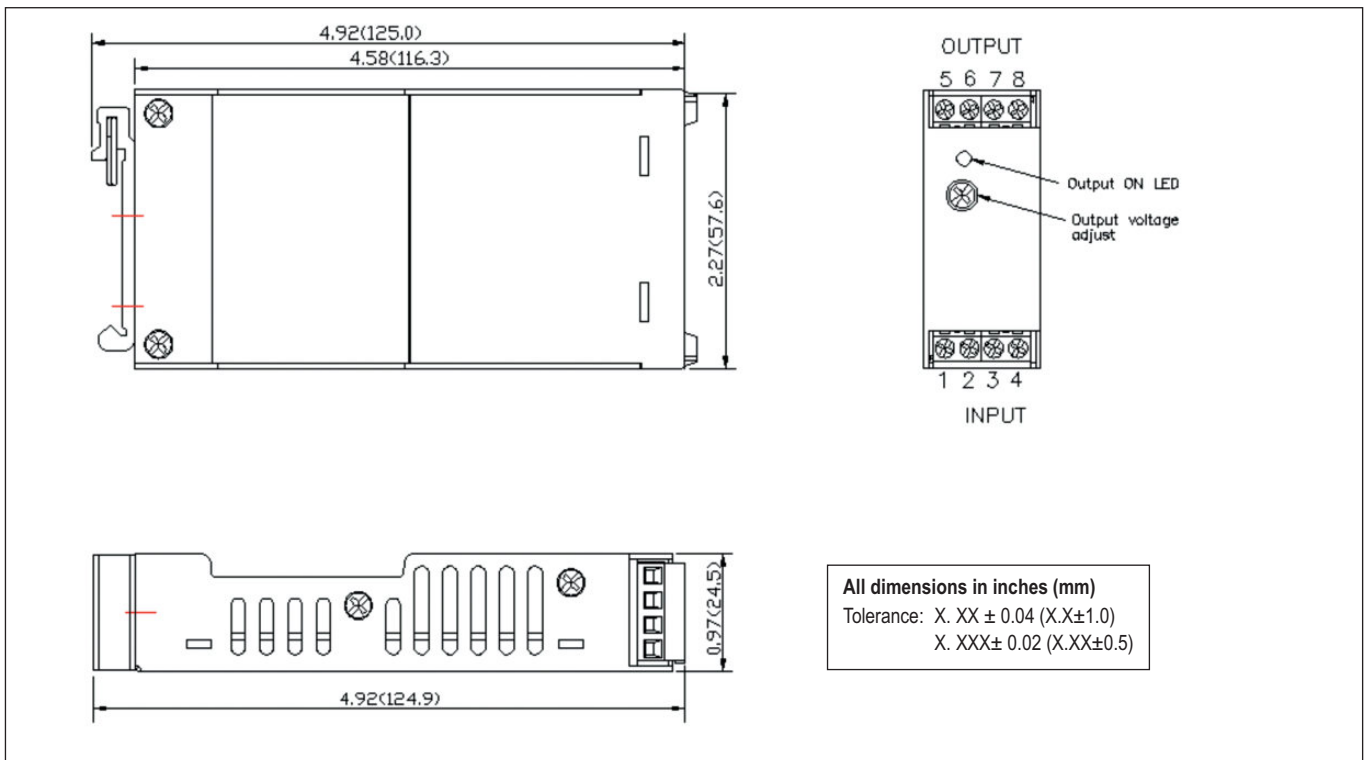


## Notes

1. BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C. MIL-HDBK-217F Notice2 @Ta=25°C, Full load(Ground, Benign, controlled environment).
2. The ON/OFF control pin voltage is referenced to -Vin. To order Negative logic ON/OFF control add the suffix -N (Ex:DPX30-48WS05-N), for Positive logic add suffix -P (Ex:DPX30-48NS05-P)
3. Typical value at nominal input voltage and full load.
4. Typical value at nominal input voltage and no load.
5. Maximum value at nominal input voltage and full load.
6. Test by minimum Vin and constant resistive load.
7. Single outputs have a potentiometer to adjust the output voltage.

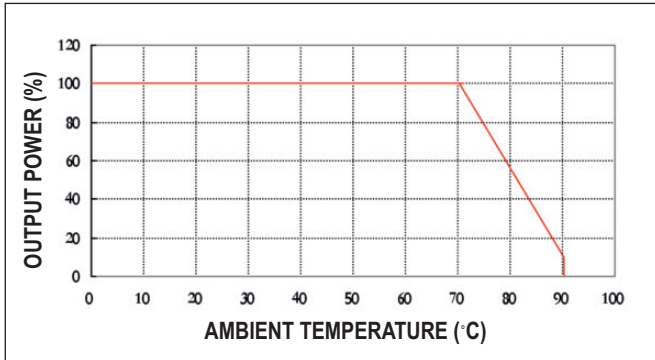
Model Selector									
Model	Input Range	Output Voltage	Output Current Min Load	Output Current Full Load	Output (3) Ripple & Noise	Input Current No Load (4)	Input Current Full Load (5)	Eff. % (3)	Capacitor Load Max (6)
DPX30-24WS3P3	10 - 40 VDC	3.3 VDC	0mA	6000mA	60mVp-p	52mA	1031mA	84	19500μF
DPX30-24WS05	9.5 - 36 VDC	5 VDC	0mA	6000mA	75mVp-p	67mA	1563mA	84	10200μF
DPX30-24WS12	10 - 40 VDC	12 VDC	0mA	2500mA	100mVp-p	69mA	1563mA	84	3300μF
DPX30-24WS15	10 - 40 VDC	15 VDC	0mA	2000mA	100mVp-p	75mA	1543mA	85	1100μF
DPX30-24WD12	10 - 40 VDC	± 12 VDC	0mA	± 1250mA	100mVp-p	34mA	1623mA	81	±1000μF
DPX30-24WD15	10 - 40 VDC	± 15 VDC	0mA	±1000mA	100mVp-p	40mA	1603mA	82	±680μF
DPX30-48WS3P3	18 - 75 VDC	3.3 VDC	0mA	6000mA	60mVp-p	32mA	509mA	85	19500μF
DPX30-48WS05	18 - 75 VDC	5 VDC	0mA	6000mA	75mVp-p	32mA	762mA	86	10200μF
DPX30-48WS12	18 - 75 VDC	12 VDC	0mA	2500mA	100mVp-p	38mA	772mA	85	3300μF
DPX30-48WS15	18 - 75 VDC	15 VDC	0mA	2000mA	100mVp-p	48mA	762mA	86	1100μF
DPX30-48WD12	18 - 75 VDC	± 12 VDC	0mA	±1250mA	100mVp-p	28mA	791mA	83	±1000μF
DPX30-48WD15	18 - 75 VDC	± 15 VDC	0mA	±1000mA	100mVp-p	28mA	781mA	84	±680μF

## Outline Drawing DPX30W Series

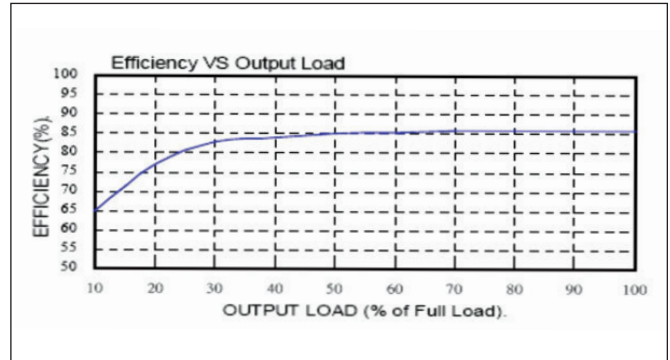




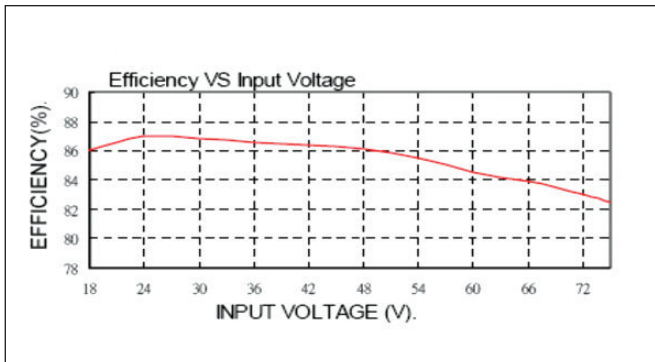
## Derating Curve DPX30-48WS05



## Efficiency / Load Curve DPX30-48WS05



## Efficiency / Input Curve DPX30-48WS05



Pinout		
PIN	Single	Dual
1	CTRL	CTRL
2	- Input	- Input
3	- Input	- Input
4	+ Input	+ Input
5	NC	NC
6	- Output	- Output
7	+ Output	Common
8	NC	+ Output

Options	
Option	Suffix
Negative Logic Remote ON/OFF	- N
Positive Logic Remote ON/OFF	- P

NC: No connection  
Screw terminals - wire range from 14 to 18 AWG





## DPX40W Series

Single and Dual Output 40W Din Rail Mount  
DC-DC Converters

- Single and dual output
- Meet EN55022 Class B
- Input fuse protection
- Input reverse polarity protection
- Input in-rush current protection
- Overload and short circuit protection
- Over voltage protection
- Reliable snap-on for DIN rail TS-35/7.5 or TS-35/15
- I/O-isolation 1600 VDC
- Output DC-OK indicator

### Key Market Segments & Applications

Communication Systems, Industry Control Systems  
Factory Automation, Semiconductor Equipment

### DPX40W Features and Benefits

#### Features

- CE Approvals
- Wide Range Input

#### Benefits

- Easier System Approvals
- Less Parts to Inventory

#### Specifications

ITEMS	DPX40W	
	24V nominal input 9.5-36VDC	48V nominal input 18-75VDC
Rated Input voltage range	24V nominal input 9.5-36VDC	48V nominal input 18-75VDC
Switching Frequency	300kHz, typ	
Maximum Input Current	See Table	
Max Output Power (W)	See Table	
Voltage Accuracy	Single/Dual $\pm 1.0\%$ / Single (3.3V) $\pm 1.5\%$	
Voltage Adjustment (Note 7)	Single output $\pm 10\%$	
Minimum Load	N/A	
Line Regulation (LL to HL at full load)	Single at $\pm 0.5\%$	
Ripple and Noise	20MHz bandwidth See table	
Start up time (Nominal Vin and constant resistive load)	Power up 100mS, typ (remote 20mS, typ)	
Remote on/off (option) (Note 2)	POSITIVE Logic: ON: Open or 3-12V, OFF Short or <1.2V NEGATIVE Logic: ON: Short or <1.2V, OFF Open or 3-12V	
Efficiency	See Table	
Over Current Protection, Factory Set	Maximum, 150% of full load	
Short Circuit Protection (Note 3)	Hiccup, auto recovery	
Overvoltage Protection	3.3V output 5V output 12V output 15 output	3.9V 6.2V 15V 18V
Operating Temperature	-40°C ~ 66°C (without derating) 66°C ~ 87°C (with derating - see curve)	
Storage Temperature	-40°C ~ 105°C	
Thermal Shock	MIL-STD-810F	
Relative Humidity (non condensing)	5% to 95% RH	
Transient Response (25% step load change)	250µS	
Isolation Voltage (Min)	1600Vdc	
Isolation Resistance	10 <sup>9</sup> Ω	
Isolation Capacitance (Max)	4000 pF	
MTBF BELLCORE TR-NWT-000332 (Note 1)	968,800 hrs	
Vibration	MIL-STD-810F	
Conducted and Radiated Emissions	EN55022, Class B	
Immunity	EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6 Perf. Criteria A	
Safety	CE	
Size (H x W x D)	57.6 x 24.5 x 125.0 mm	
Weight	182g	
Connector	Screw Terminal	
Cooling	Convection	
Front Panel LED	Output DC good	
Warranty yrs	3	

Notes: See page 2

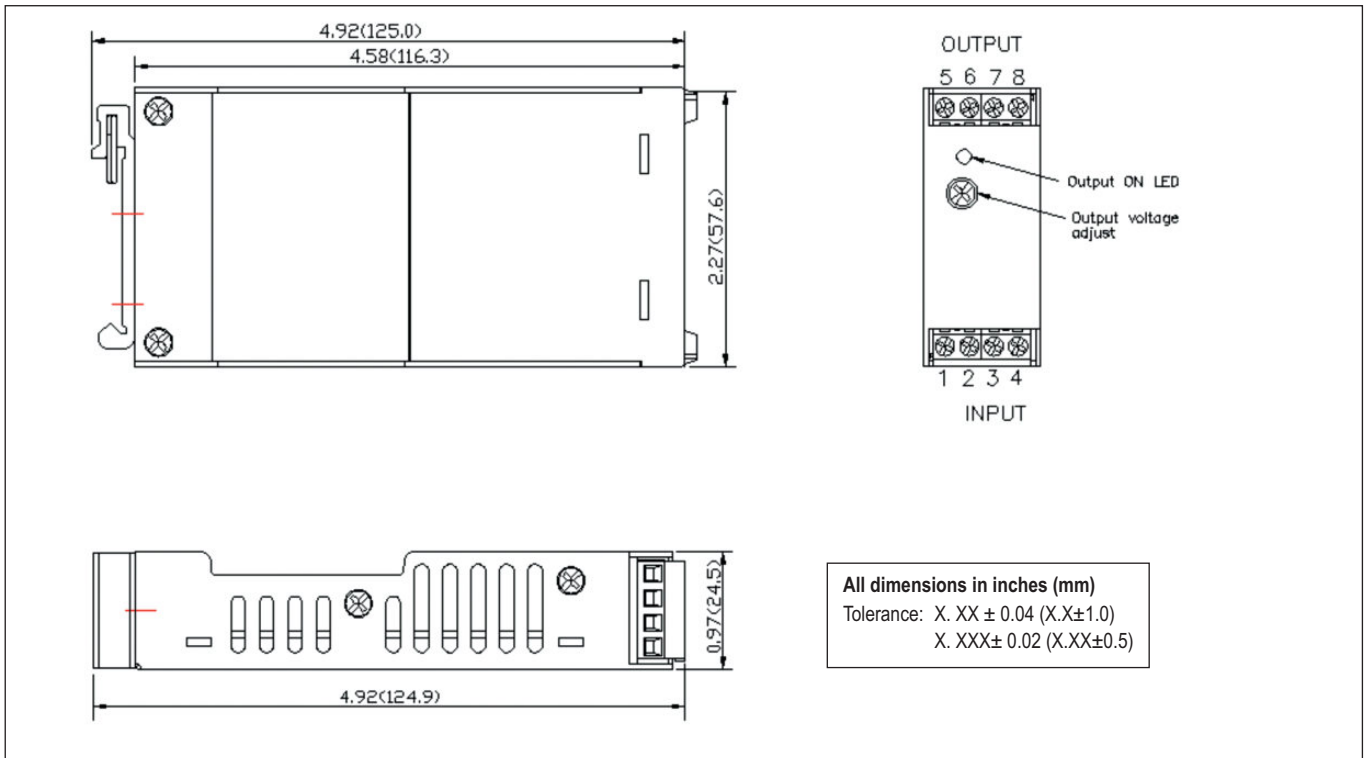


## Notes

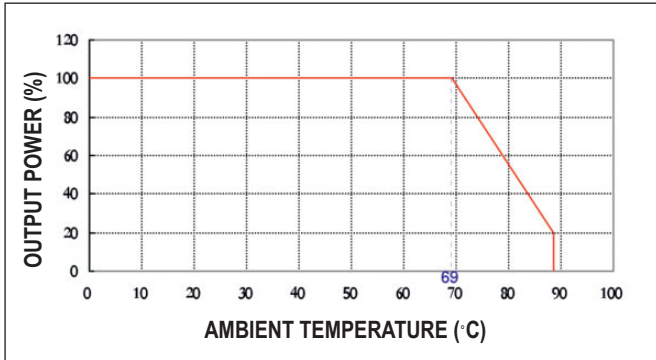
1. BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C. MIL-HDBK-217F Notice2 @Ta=25°C, Full load(Ground, Benign, controlled environment).
2. The ON/OFF control pin voltage is referenced to -Vin. To order Negative logic ON/OFF control add the suffix -N (Ex:DPX40-48WS05-N), for Positive logic add suffix -P (Ex:DPX40-48NS05-P)
3. Typical value at nominal input voltage and full load.
4. Typical value at nominal input voltage and no load.
5. Maximum value at nominal input voltage and full load.
6. Test by minimum Vin and constant resistive load.
7. Single outputs have a potentiometer to adjust the output voltage.

Model Selector									
Model	Input Range	Output Voltage	Output Current		Output (3)	Input Current		Eff. %	Capacitor
			Min Load	Full Load	Ripple & Noise	No Load (4)	Full Load (5)	(3)	Load Max (6)
DPX40-24WS3P3	9.5 - 36 VDC	3.3 VDC	0mA	10000mA	50mVp-p	83mA	1741mA	83	25750μF
DPX40-24WS05	9.5 - 36 VDC	5 VDC	0mA	8000mA	50mVp-p	103mA	2083mA	84	13600μF
DPX40-24WS12	9.5 - 36 VDC	12 VDC	50mA	3333mA	75mVp-p	55mA	2083mA	84	2360μF
DPX40-24WS15	9.5 - 36 VDC	15 VDC	50mA	2666mA	75mVp-p	56mA	2083mA	84	1510μF
DPX40-24WD12	9.5 - 36 VDC	± 12 VDC	±65mA	±1667 Ma	120mVp-p	65mA	2110mA	83	±1200μF
DPX40-24WD15	9.5 - 36 VDC	± 15 VDC	±50mA	±1333mA	150mVp-p	76mA	2110mA	83	±750μF
DPX40-48WS3P3	18 - 75 VDC	3.3 VDC	0mA	10000mA	50mVp-p	63mA	859mA	84	25750μF
DPX40-48WS05	18 - 75 VDC	5 VDC	0mA	8000mA	50mVp-p	68mA	1029mA	86	13600μF
DPX40-48WS12	18 - 75 VDC	12 VDC	50mA	3333mA	75mVp-p	34mA	1029mA	85	2360μF
DPX40-48WS15	18 - 75 VDC	15 VDC	50mA	2666mA	75mVp-p	34mA	1029mA	85	1510μF
DPX40-48WD12	18 - 75 VDC	± 12 VDC	±65mA	±1667mA	120mVp-p	34mA	1042mA	84	±1200μF
DPX40-48WD15	18 - 75 VDC	± 15 VDC	±60mA	±1333mA	150mVp-p	34mA	1042mA	84	±750μF

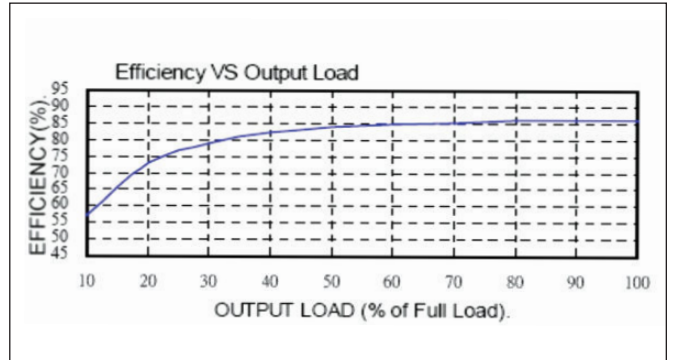
## Outline Drawing DPX40W Series



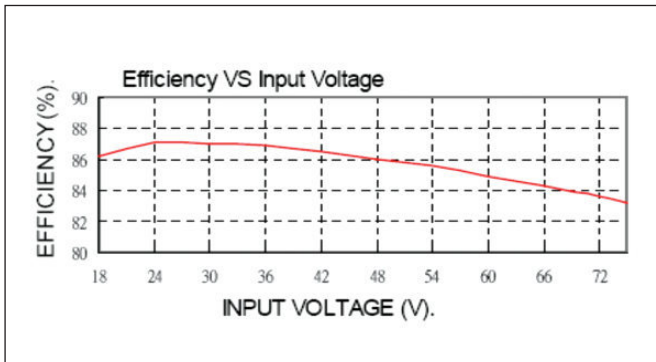
## Derating Curve DPX40-48WS05



## Efficiency / Load Curve DPX40-48WS05



## Efficiency / Input Curve DPX40-48WS05



Pinout		
PIN	Single	Dual
1	CTRL	CTRL
2	- Input	- Input
3	- Input	- Input
4	+ Input	+ Input
5	NC	NC
6	- Output	- Output
7	+ Output	Common
8	NC	+ Output

NC: No connection  
Screw terminals - wire range from 14 to 18 AWG

Options	
Option	Suffix
Negative Logic Remote ON/OFF	- N
Positive Logic Remote ON/OFF	- P





- Output DC-OK indicator Industry Control System
- Triple Output
- Meet EN55022 Class B Semiconductor Equipment
- Internal input fuse protection
- Internal input reverse polarity protection
- Internal input in-rush current limit circuit
- Overload and short circuit protection
- Over voltage protection
- Reliable snap-on for DIN rail TS-35/7.5 OR TS-35/15
- I/O-isolation 1600 VDC

## DPX40W Triple Output Series

40W Din Rail Mount DC-DC Converters

### Key Market Segments & Applications

Communication System, Factory Automation, Semiconductor Equipment

### DPX40W Triple Output Series Features and Benefits

#### Features

- CE Approvals
- Wide Range Input

#### Benefits

- Easier System Approvals
- Less Parts to Inventory

#### Specifications

ITEMS	DPX40W Triple Output
Rated Input voltage range	12V nominal input 9.5-18VDC 24V nominal input 18-36VDC 48V nominal input 36-75VDC
Frequency	300kHz, typ
Maximum Input Current	See Table
Max Output Power (W)	See Table
Voltage Accuracy	Main $\pm 2\%$ Auxillary $\pm 5\%$
Minimum Load (6)	See table
Voltage Adjustment	Factory set
Line Regulation	LL to HL at full load Main $\pm 1\%$ , LL to HL at full load Auxillary $\pm 5\%$
Load regulation (7)	LL to HL at full load Main $\pm 2.5\%$ , LL to HL at full load Auxillary $\pm 5\%$
Load (cross regulation) (8)	Main $\pm 2.5\%$
Ripple and Noise	20MHz bandwidth See table
Start up time (Nominal Vin and constant resistive load)	Power up 100mS, typ" "Remote 20mS, typ
Remote on/off (option) (2)	ON: Open or 3-12V, OFF Short or <1.2V
Efficiency	See Table
Over Current Protection, Factory Set	Maximum, 150% of full load
Short Circuit Protection	Hiccup, auto recovery
Overvoltage Protection	3.3V output 3.9V 5V output 6.2V 12V output 15V 15 output 18V
Operating Temperature	-40°C ~ 69°C (without derating) +69°C ~ +90°C (with derating - see curve)
Storage Temperature	-40°C ~ +105°C
Thermal Shock	MIL-STD-810F
Relative Humidity (non condensing)	5% to 95% RH
Transient Response (25% step load change)	250µS
MTBF BELLCORE TR-NWT-000332 (1)	1,184,000 hrs
MIL-HDBK-217F (1)	358,400 hrs
Vibration	MIL-STD-810F
Conducted and Radiated Emissions	EN55022
Immunity	EN61000-4-2, Perf. Criteria A", "EN61000-4-3, Perf. Criteria A", EN61000-4-4 Perf. Criteria A, EN61000-4-5 Perf. Criteria A, EN61000-4-6 Perf. Criteria ASafety CE
Size (H x W x D)	57.6 x 24.5 x 125.0 mm
Weight	182g
Connector	Screw Terminal
Cooling	Convection
Front Panel LED	Output DC good
Warranty	3 Years

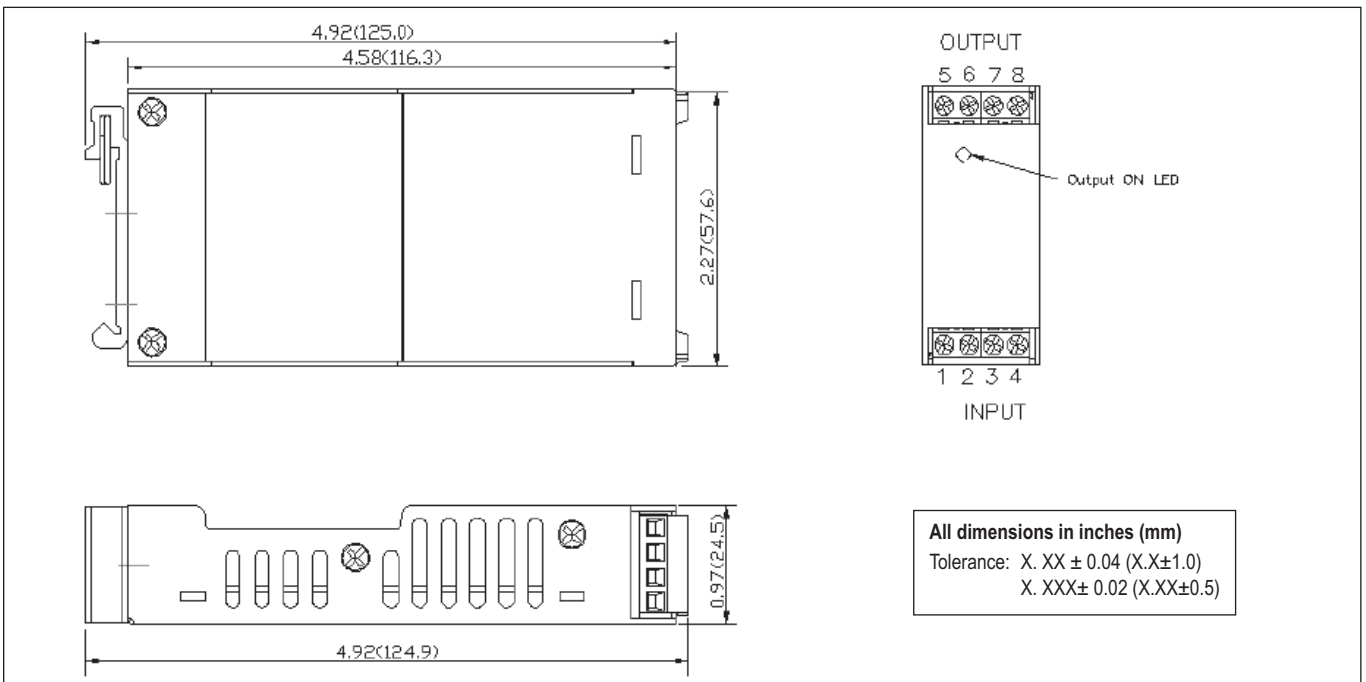


**Notes:**

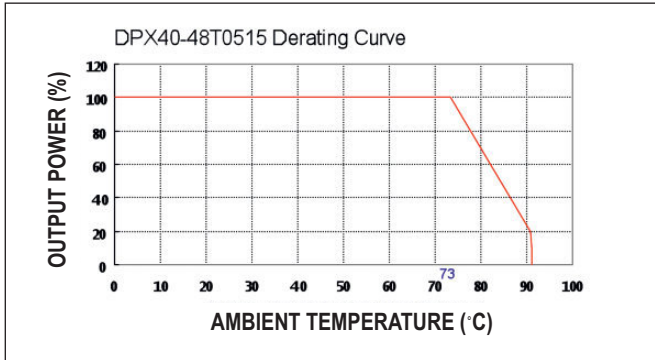
1. BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C MIL-HDBK-217F Notice2 @Ta=25 °C, Full load (Ground, Benign, controlled environment).
2. The ON/OFF control pin voltage is referenced to -Vin. To order Negative logic ON/OFF control add the suffix -N (Ex:DPX40-48T0512-N), for Positive logic add suffix -P (Ex:DPX40-48T0512-P)
3. Typical value at nominal input voltage and full load.
4. Typical value at nominal input voltage and no load.
5. Maximum value at nominal input voltage and full load.
6. The output requires a minimum load. **Note:** Under no load conditions the unit will not be damaged, however, not all specifications will be met.
7. Load regulation for triple output: Main output (V1): 10% to 100% with 10% to 100% balanced on auxiliaries. Auxiliary outputs (V2 and V3): 10% to 100% balanced on all outputs.
8. Cross regulation for triple outputs: Main output 100% load, auxiliary 100% , other auxiliary 25% to 100%. Auxiliary outputs (V2 and V3): Main output 100% load, auxiliary 100%, other auxiliary 25% to 100% or main output 25%, auxiliary output 25%, other auxiliary 25% to 100%.
9. Test by minimum Vin and constant resistive load.

Model Selector									
Model	Input Range	Output Voltage	Output Current Min Load	Output Current Full Load	Output (3) Ripple & Noise	Input Curr No Load (4)	Input Curr Full Load (5)	Eff. % (3)	Capacitor Load Max (9)
DPX40-12T3312	9.5 - 18VDC	3.3 / ±12VDC	600mA / ±40mA	6000mA / ±400mA	50m / 75Vp-p	222mA	3223mA	80	13000 / 330µF
DPX40-12T3315	9.5 - 18VDC	3.3 / ±15VDC	600mA / ±30mA	6000mA / ±300mA	50m / 75Vp-p	237mA	3158mA	80	13000 / 110µF
DPX40-12T0512	9.5 - 18VDC	5 / ±12VDC	600mA / ±40mA	6000mA / ±400mA	50m / 75Vp-p	287mA	4231mA	82	6800 / 330µF
DPX40-12T0515	9.5 - 18VDC	5 / ±15VDC	600mA / ±30mA	6000mA / ±300mA	50m / 75Vp-p	287mA	4167mA	82	6800 / 110µF
DPX40-24T3312	18 - 36VDC	3.3 / ±12VDC	600mA / ±40mA	6000mA / ±400mA	50m / 75Vp-p	67mA	1571mA	82	13000 / 330µF
DPX40-24T3315	18 - 36VDC	3.3 / ±15VDC	600mA / ±30mA	6000mA / ±300mA	50m / 75Vp-p	67mA	1538mA	82	13000 / 110µF
DPX40-24T0512	18 - 36VDC	5 / ±12VDC	600mA / ±40mA	6000mA / ±400mA	50m / 75Vp-p	67mA	2063mA	84	6800 / 330µF
DPX40-24T0515	18 - 36VDC	5 / ±15VDC	600mA / ±30mA	6000mA / ±300mA	50m / 75Vp-p	77mA	2031mA	84	6800 / 110µF
DPX40-48T3312	36 - 75VDC	3.3 / ±12VDC	600mA / ±40mA	6000mA / ±400mA	50m / 75Vp-p	42mA	766mA	84	13000 / 330µF
DPX40-48T3315	36 - 75VDC	3.3 / ±15VDC	600mA / ±30mA	6000mA / ±300mA	50m / 75Vp-p	42mA	750mA	84	13000 / 110µF
DPX40-48T0512	36 - 75VDC	5 / ±12VDC	600mA / ±40mA	6000mA / ±400mA	50m / 75Vp-p	42mA	1006mA	86	6800 / 330µF
DPX40-48T0515	36 - 75VDC	5 / ±15VDC	600mA / ±30mA	6000mA / ±300mA	50m / 75Vp-p	47mA	991mA	86	6800 / 110µF

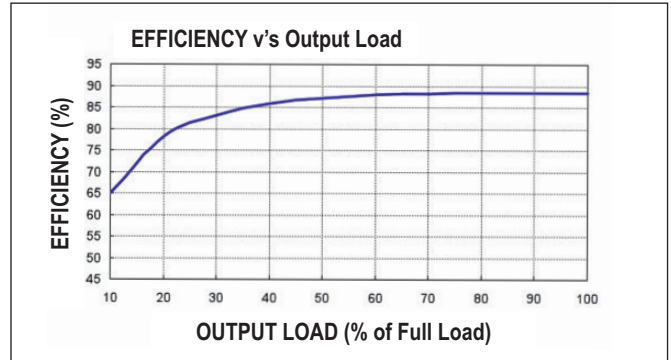
## Outline Drawing DPX40W Triple Output Series



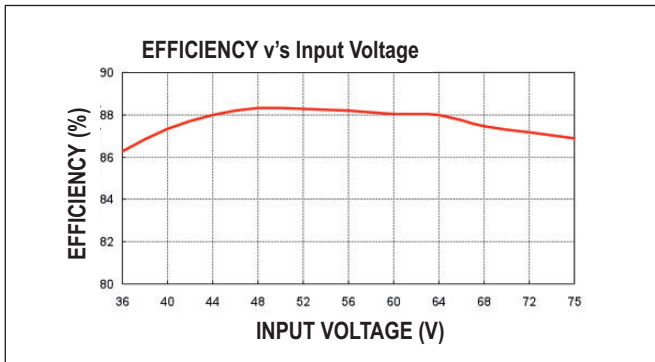
## Derating Curve DPX40-48T0515



## Efficiency / Load Curve DPX40-48T0515



## Efficiency / Input Curve DPX40-48T0515



Pinout	
PIN	Function
1	CTRL
2	- Input
3	- Input
4	+ Input
5	+ Auxiliary
6	Common
7	- Auxiliary
8	+ Output

Options	
Option	Suffix
Negative Logic Remote ON/OFF	- N
Positive Logic Remote ON/OFF	- P

Screw terminals - wire range from 14 to 18 AWG







- Meet EN55022 Class B
- Input fuse protection
- Input reverse polarity protection
- Input in-rush current protection
- Overload and short circuit protection
- Over voltage protection
- Reliable snap-on for DIN rail TS-35/7.5 or TS-35/15
- I/O-isolation 1600 VDC
- Output DC-OK indicator

## DPX60 Series

Single Output 60W Din Rail Mount  
DC-DC Converters

### Key Market Segments & Applications

Communication Systems, Industry Control Systems  
Factory Automation, Semiconductor Equipment

### DPX60 Features and Benefits

#### Features

- CE Approvals

#### Benefits

- Easier System Approvals
- Less Parts to Inventory

#### Specifications

ITEMS	DPX60	
	24V nominal input 18-36VDC	48V nominal input 36-75VDC
Rated Input voltage range	24V nominal input 18-36VDC	48V nominal input 36-75VDC
Switching Frequency	300kHz, typ	
Maximum Input Current	See Table	
Max Output Power (W)	See Table	
Voltage Accuracy	Single/Dual $\pm 1.0\%$ / Single (3.3V) $\pm 1.5\%$	
Voltage Adjustment (Note 7)	Single output $\pm 10\%$	
Minimum Load	N/A	
Line Regulation (LL to HL at full load)	Single at $\pm 0.5\%$	
Ripple and Noise	20MHz bandwidth See table	
Start up time (Nominal Vin and constant resistive load)	Power up 100mS, typ (remote 20mS, typ)	
Remote on/off (option) (Note 2)	POSITIVE Logic: ON: Open or 3-12V, OFF Short or <1.2V NEGATIVE Logic: ON: Short or <1.2V, OFF Open or 3-12V	
Efficiency	See Table	
Over Current Protection, Factory Set	Maximum, 150% of full load	
Short Circuit Protection (Note 3)	Hiccup, auto recovery	
Overvoltage Protection	3.3V output 5V output 12V output 15 output	3.7 VDC - 5.4VDC 5.6VDC - 7.0VDC 13.5VDC - 20.5VDC 16.8VDC - 20.5VDC
Operating Temperature	-40°C ~ 60°C (without derating) 60°C ~ 85°C (with derating - see curve)	
Storage Temperature	-40°C ~ 105°C	
Thermal Shock	MIL-STD-810F	
Relative Humidity (non condensing)	5% to 95% RH	
Transient Response (25% step load change)	250µS	
Isolation Voltage (Min)	1600Vdc	
Isolation Resistance	$10^9 \Omega$	
Isolation Capacitance (Max)	4000 pF	
MTBF BELLCORE TR-NWT-000332 (Note 1)	957,600 hrs	
Vibration	MIL-STD-810F	
Conducted and Radiated Emissions	EN55022, Class B	
Immunity	EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6 Perf. Criteria A	
Safety	CE	
Size (H x W x D)	57.6 x 24.5 x 125.0 mm	
Weight	182g	
Connector	Screw Terminal	
Cooling	Convection	
Front Panel LED	Output DC good	
Warranty yrs	3	

Notes: See page 2



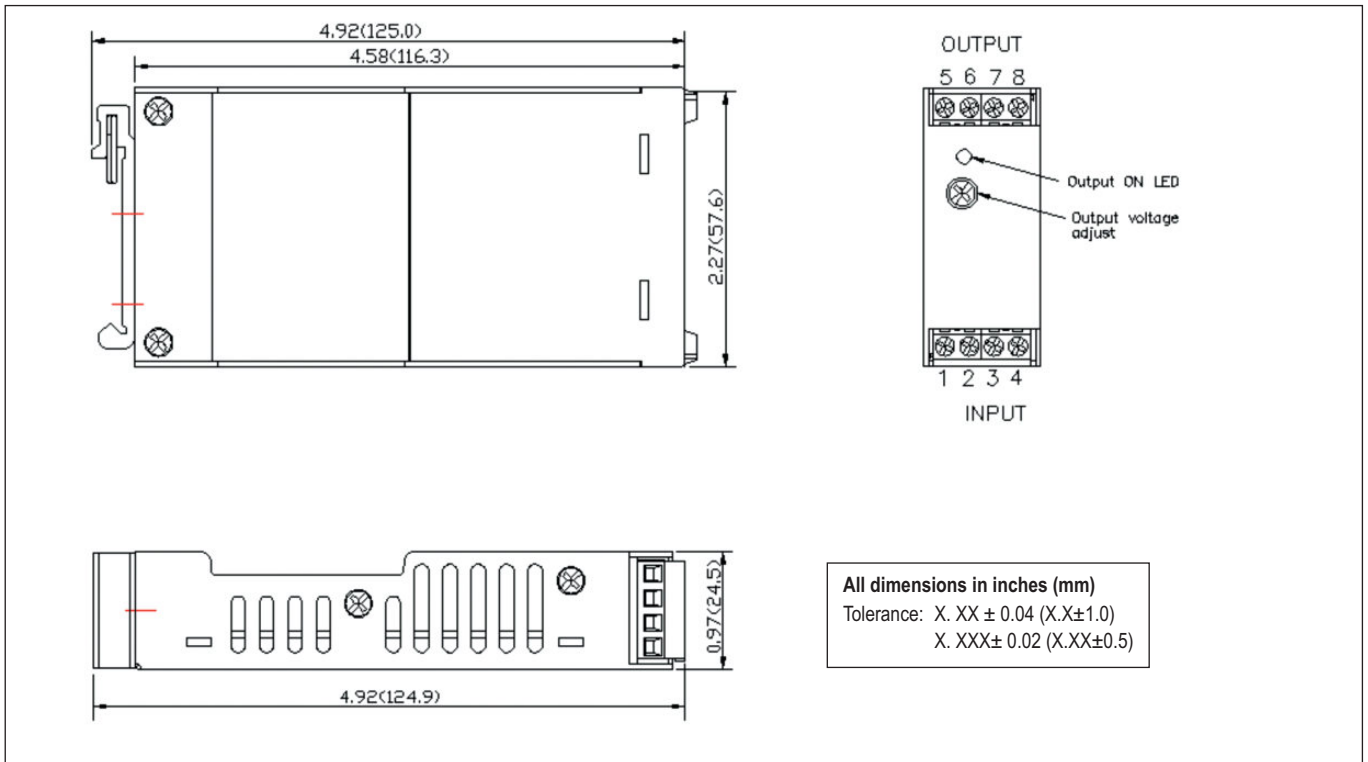


## Notes

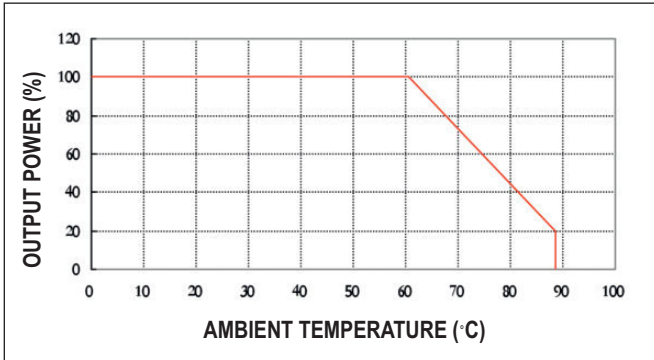
1. BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C. MIL-HDBK-217F Notice2 @Ta=25°C, Full load(Ground, Benign, controlled environment).
2. The ON/OFF control pin voltage is referenced to -Vin. Positive logic standard. To order Negative logic ON/OFF control add the suffix-N (Ex:DPX60-48S05-N)
3. Typical value at nominal input voltage and full load.
4. Typical value at nominal input voltage and no load.
5. Maximum value at nominal input voltage and full load.
6. Test by minimum Vin and constant resistive load.
7. Single outputs have a potentiometer to adjust the output voltage.

Model Selector									
Model	Input Range	Output Voltage	Output Current		Output (3) Ripple & Noise	Input Current		Eff. % (3)	Capacitor Load Max (6)
			Min Load	Full Load		No Load (4)	Full Load (5)		
DPX60-24S3P3	18 - 36 VDC	3.3 VDC	0mA	14000mA	75mVp-p	103mA	2376mA	85	36000µF
DPX60-24S05	18 - 36 VDC	5 VDC	0mA	12000mA	75mVp-p	155mA	3049mA	86	20400µF
DPX60-24S12	18 - 36 VDC	12 VDC	0mA	5000mA	100mVp-p	155mA	3049mA	86	3550µF
DPX60-24S15	18 - 36 VDC	15 VDC	0mA	4000mA	100mVp-p	155mA	3049mA	86	2300µF
DPX60-48S3P3	36 - 75 VDC	3.3 VDC	0mA	14000mA	75mVp-p	83mA	1188mA	85	36000µF
DPX60-48S05	36 - 75 VDC	5 VDC	0mA	12000mA	75mVp-p	104mA	1524mA	86	20400µF
DPX60-48S12	36 - 75 VDC	12 VDC	0mA	5000mA	100mVp-p	104mA	1524mA	86	3550µF
DPX60-48S15	36 - 75 VDC	15 VDC	0mA	4000mA	100mVp-p	104mA	1524mA	86	2300µF

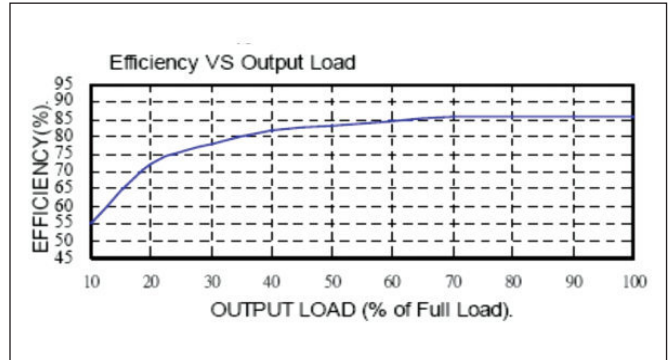
## Outline Drawing DPX60 Series



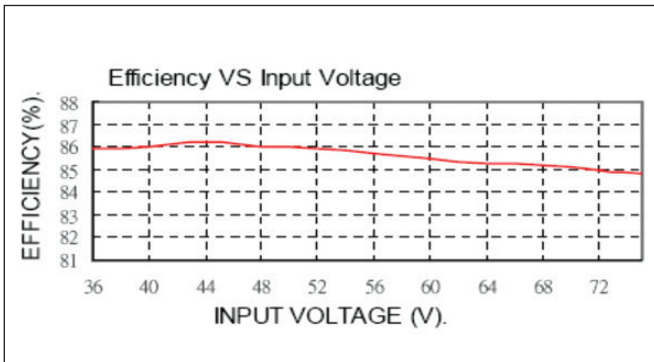
## Derating Curve DPX60-48S05



## Efficiency / Load Curve DPX60-48S05



## Efficiency / Input Curve DPX60-48S05



Pinout	
PIN	Single
1	CTRL
2	- Input
3	- Input
4	+ Input
5	NC
6	- Output
7	+ Output
8	NC

Options	
Option	Suffix
Negative Logic Remote ON/OFF	- N

NC: No connection  
Screw terminals - wire range from 14 to 18 AWG





# DC-DC Converters - Isolated

CC-E	24	PAF700F	74
CC-P-E	27	PAH300/450	77
CCG15-30	30	PH-A 280	80
CN-A	33	PH-F	84
CN-A 24Vdc	36	PV	85
GQA120	39	PXA15	88
HQA85	42	PXB15	91
HQA120	45	PXC05	94
iEA	48	PXD	97
iEH	50	PXD20W	100
iHG	52	PXD30W	103
iQE	54	PXE	106
iQG	56	PXF	109
iQL	58	PXC-M03(W)	112
iSA	60	PXC-M06(W)	116
PAE50/100	62	PXC-M10(W)	120
PAF450F280 & PAF600F280	65	EZA2.5kW	124
PAF500F	68	EZA11kW	127
PAF600F	71		



## Applications DC/DC Converters

- Distributed Power Architecture with DC Bus
- Small subsystems with battery backup

## Features DC/DC Converters

- Galvanic isolation between input and output
- Power range from 1.5W to 700W
- Convection, baseplate conduction or forced air cooling
- Input voltage ranges 2:1 or 4:1
- Nominal input voltages 5V, 12V, 24V, 48V, 110V or 280V





- Compact Footprint/Low Profile
- Through Hole or SMT Versions
- 5V, 12V, 24V & 48V Inputs
- 3.3 to 30V<sup>1</sup> Single,  $\pm 12$  to 15V Dual Outputs
- Output Voltage Adjustment
- Input - Output Isolation
- RoHS Compliant
- 5 Year Warranty

## CC-E Series

Ultra Compact, 1.5W to 25W Single & Dual DC-DC Converters

### Key Market Segments & Applications

Telecommunications  
Instrumentation  
Datacom

### CC-E Features and Benefits

Features	Benefits
<ul style="list-style-type: none"> <li>• Compact</li> <li>• Self Contained</li> <li>• Multiple Input Voltage configurations</li> <li>• Open Frame (no potting)</li> </ul>	<ul style="list-style-type: none"> <li>• Less PCB Area Used</li> <li>• Requires No External Components</li> <li>• Easier System Configuration</li> <li>• Lighter in Weight, Suitable for Surface Mount (R Version)</li> </ul>

Specifications		3.3V	5V	12/15V	$\pm 12/15$ (24/30) <sup>1</sup>
Nominal Output Voltage	V				
DC Input	V	5V: 4.5-9.0V, 12V: 9-18V, 24V: 18-36V, 48V: 36-76V			
Efficiency	%	71 to 90% model dependant			
Output Voltage Tolerance	%	1.5-10W: $\pm 3\%$ , 15-25W: $\pm 5\%$			
Output Adjustment (via trim pin)	V	3.15-3.6V <sup>(5)</sup>	4.75-6.0V	11.4-15V	22.8 - 30V
Line Regulation	mV	20 (40 CC15; 30 CC25)		40	80
Load Regulation	mV	40 (120 CC15; 200 CC25)		100	600 <sup>2</sup>
Temperature Coefficient	%	$\pm 0.02\%/^{\circ}\text{C}$			
Preload	-	No preload required			
Output Ripple (typ./max.BW 50MHz)	mV	40/120		30/120	
Overcurrent Protection	-	Output current limiting with automatic recovery, shutdown CC15, 25 type			
Overvoltage Protection	-	No			
Remote On/ Off	-	CC1R5, 3, 6, & 10: RC terminal open, output is OFF; RC terminal to -Vin (0-0.4V), output is ON CC15 & CC25: RC terminal open, output is ON; RC terminal to +Vin, output is OFF			
Operating Temp.- Convection	$^{\circ}\text{C}$	-40 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$ , derates linearly to 40% load from +50 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$			
Operating Temp.- Forced Air	$^{\circ}\text{C}$	-40 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$ with 1m/s air full load			
Storage Temperature	$^{\circ}\text{C}$	-40 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$			
Humidity (non Condensing)	-	95% RH max.(maximum wet-bulb temperature: +38 $^{\circ}\text{C}$ )			
Isolation Voltage	-	500VAC 1 min. Input to output, input to case, output to case			
Isolation Resistance	$\Omega$	Input to output, input to case, output to case: 50M $\Omega$ min. (500VDC)			
Shock	m/s <sup>2</sup>	980m/s <sup>2</sup> (100G) 6ms (6 directions, each 3 times)			
Vibration (non Operating)	-	10 to 55Hz (sweep for 15min) 1.52mm constant, 3 directions X, Y, Z each 2 hours			
Safety Agency Certifications	-	IEC/EN/UL/CSA60950-1, IEC/EN/UL/CSA62368-1 and CE Mark			
Weight	g	CC1R5: 3.2, CC3: 4.5, CC6: 5.8, CC10:10.0, CC15: 12.5, CC25: 20.0			
Size (L x W x H) (Through Hole & SMD package)	mm	CC1R5: 16.51 x 16.61 x 8.51; CC3: 22.86 x 16.61 x 8.51; CC6: 22.86 x 21.11 x 8.51 CC10: 35.56 x 22.61 x 8.51 CC15: 38.10 x 32.11 x 7.49; CC25: 43.21 x 44.91 x 7.49 CC3: SIP type 27.69 x 9.19 x 17.91			
Warranty	yrs	5			

#### Notes:

1. For 24V/30V output - connect across +Vout & -Vout and leave "common out" pin not connected.
2. Based upon equal load current from both outputs. 3. For 15V output connect trim to -Vout.
4. See Installation Manual for full specifications, test methods of parameters and application notes.
5. Not available on CC15 and CC25 models.



Model Selector						
Output Voltage (V)	Output Current (A)	Output Power (W)	5V Input	12V Input	24V Input	48V Input
<b>Single Outputs</b>						
3.3	0.4	1.5	CC1R5-0503SF-E	CC1R5-1203SF-E	CC1R5-2403SF-E	CC1R5-4803SF-E
3.3	0.8	3	CC3-0503SF-E	CC3-1203SF-E	CC3-2403SF-E	CC3-4803SF-E
3.3	1.2	6	CC6-0503SF-E	CC6-1203SF-E	CC6-2403SF-E	CC6-4803SF-E
3.3	2.5	10	CC10-0503SF-E	CC10-1203SF-E	CC10-2403SF-E	CC10-4803SF-E
3.3	4.5	15	-	-	CC15-2403SF-E	-
3.3	7.5	25	-	-	CC25-2403SF-E	-
5	0.3	1.5	CC1R5-0505SF-E	CC1R5-1205SF-E	CC1R5-2405SF-E	CC1R5-4805SF-E
5	0.6	3	CC3-0505SF-E	CC3-1205SF-E	CC3-2405SF-E	CC3-4805SF-E
5	1.0	5	CC6-0505SF-E	-	-	-
5	1.2	6	-	CC6-1205SF-E	CC6-2405SF-E	CC6-4805SF-E
5	2.0	10	CC10-0505SF-E	CC10-1205SF-E	CC10-2405SF-E	CC10-4805SF-E
5	3.0	15	-	-	CC15-2405SF-E	-
5	5.0	25	-	-	CC25-2405SF-E	-
12(15)	0.125(0.1)	1.5	CC1R5-0512SF-E	CC1R5-1212SF-E	CC1R5-2412SF-E	CC1R5-4812SF-E
12(15)	0.25(0.2)	3	CC3-0512SF-E	CC3-1212SF-E	CC3-2412SF-E	CC3-4812SF-E
12(15)	0.5(0.4)	6	CC6-0512SF-E	CC6-1212SF-E	CC6-2412SF-E	CC6-4812SF-E
12(15)	0.8(0.64)	10	CC10-0512SF-E	-	-	-
12(15)	1.0(0.8)	10	-	CC10-1212SF-E	CC10-2412SF-E	CC10-4812SF-E
<b>Dual Outputs</b>						
±12 (15) <sup>3</sup>	0.06(0.05)	1.5	CC1R5-0512DF-E	CC1R5-1212DF-E	CC1R5-2412DF-E	CC1R5-4812DF-E
±12 (15) <sup>3</sup>	0.125(0.1)	3	CC3-0512DF-E	CC3-1212DF-E	CC3-2412DF-E	CC3-4812DF-E
±12 (15) <sup>3</sup>	0.25(0.2)	6	CC6-0512DF-E	CC6-1212DF-E	CC6-2412DF-E	CC6-4812DF-E
±12 (15) <sup>3</sup>	0.4(0.32)	10	CC10-0512DF-E	-	-	-
±12 (15) <sup>3</sup>	0.45(0.36)	10	-	CC10-1212DF-E	CC10-2412DF-E	CC10-4812DF-E

Options	
Version	Description
F-E	Through hole mounting (DIP)
R-E	Surface mount (SMD)
S-E	Through hole mounting (SIP) (SIP option available for CC3 only)

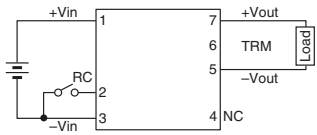
Pinout (CC1R5, 3, 6, and 10)		
Pin	Single	Dual
1	+Vin	+Vin
2	RC	RC
3	-Vin	-Vin
4	NC	-Vout
5	-Vout	Common out
6	TRM	TRM
7	+Vout	+Vout

For CC15 and 25 see Installation Manual online



## Pin Out Diagrams CC-E Series

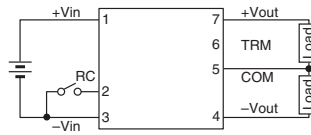
### CONNECTIONS CC1R5-□□□□S□-E



### TERMINAL PIN CONFIGURATION

No.1	+Vin
No.2	RC
No.3	-Vin
No.4	NC
No.5	-Vout
No.6	TRM
No.7	+Vout

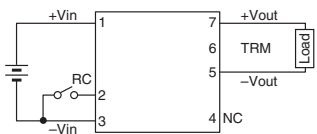
### CC1R5-□□□□□□-E



### TERMINAL PIN CONFIGURATION

No.1	+Vin
No.2	RC
No.3	-Vin
No.4	-Vout
No.5	Common out
No.6	TRM
No.7	+Vout

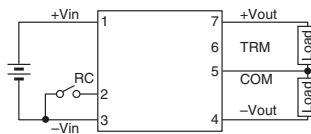
### CONNECTIONS CC3-□□□□□□-E



### TERMINAL PIN CONFIGURATION

No.1	+Vin
No.2	RC
No.3	-Vin
No.4	NC
No.5	-Vout
No.6	TRM
No.7	+Vout

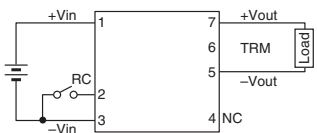
### CC3-□□□□□□□-E



### TERMINAL PIN CONFIGURATION

No.1	+Vin
No.2	RC
No.3	-Vin
No.4	-Vout
No.5	Common out
No.6	TRM
No.7	+Vout

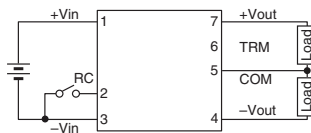
### CONNECTIONS CC6-□□□□□□-E



### TERMINAL PIN CONFIGURATION

No.1	+Vin
No.2	RC
No.3	-Vin
No.4	NC
No.5	-Vout
No.6	TRM
No.7	+Vout

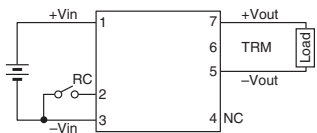
### CC6-□□□□□□□-E



### TERMINAL PIN CONFIGURATION

No.1	+Vin
No.2	RC
No.3	-Vin
No.4	-Vout
No.5	Common out
No.6	TRM
No.7	+Vout

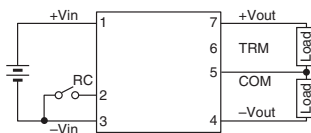
### CONNECTIONS CC10-□□□□□□-E



### TERMINAL PIN CONFIGURATION

No.1	+Vin
No.2	RC
No.3	-Vin
No.4	NC
No.5	-Vout
No.6	TRM
No.7	+Vout

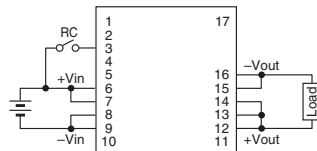
### CC10-□□□□□□□-E



### TERMINAL PIN CONFIGURATION

No.1	+Vin
No.2	RC
No.3	-Vin
No.4	-Vout
No.5	Common out
No.6	TRM
No.7	+Vout

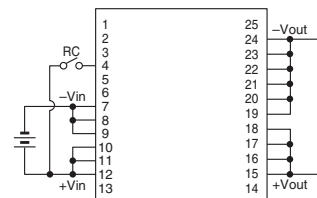
### CONNECTION CC15-xxxxSF-E (DIP TYPE)



### TERMINAL PIN CONFIGURATION

No.1	NC	No.10	NC
No.2	NC	No.11	NC
No.3	RC	No.12	+Vout
No.4	NC	No.13	+Vout
No.5	NC	No.14	+Vout
No.6	+Vin	No.15	-Vout
No.7	+Vin	No.16	-Vout
No.8	-Vin	No.17	NC
No.9	-Vin		

### CONNECTION CC25-xxxxSF-E (DIP TYPE)



### TERMINAL PIN CONFIGURATION

No.1	NC	No.10	+Vin	No.19	-Vout
No.2	NC	No.11	+Vin	No.20	-Vout
No.3	NC	No.12	+Vin	No.21	-Vout
No.4	RC	No.13	NC	No.22	-Vout
No.5	NC	No.14	NC	No.23	-Vout
No.6	NC	No.15	+Vout	No.24	-Vout
No.7	-Vin	No.16	+Vout	No.25	NC
No.8	-Vin	No.17	+Vout		
No.9	-Vin	No.18	+Vout		





- Compact Footprint / Low Profile
- 24V & 48V Inputs
- 3.3V to 15V Outputs
- Input - Output Isolation
- Through Hole or SMT Versions
- DC OK signal
- Sequencing pin
- 5 Year Warranty

## CC-P-E Series

Ultra Compact, 15W to 30W  
DC-DC Converters

### Key Market Segments & Applications

Process Control  
Instrumentation  
Datacom & Telecom

### CC-E Features and Benefits

#### Features

- Compact
- Five Sided Shielding (cased version)
- Parallel Operation

#### Benefits

- Less PCB Area Used
- Lower radiated EMI
- Provides additional power

#### Specifications

Nominal Output Voltage	V	3.3V	5V	12V	15V
DC Input	VDC	24V Nominal: 18-36V, 48V Nominal: 36-76V			
Efficiency	%	89 to 92% model dependant			
Initial set accuracy	%	±1%			
Total Regulation limits	%	+5%, -3%			
Output Adjustment	-	None			
Temperature Coefficient	%/°C	<0.02%/°C			
Preload	A	None			
Output Ripple	mV	50mV			150mV
Overcurrent Protection	-	> 103% of nominal rating			
Overvoltage protection	-	Operates at 115 - 145% of nominal voltage			
Remote On/Off (RC)	-	Logic high (pull high to shutdown), referenced to -Vin			
Alarm (ALM)	-	Low On Fail, referenced to -Vin. 20 units maximum			
Sequencing (PO)	-	Connecting PO terminals on multiple power supplies ensures all simulataneously start up (20 units maximum)			
Cooling	-	Convection			
Operating Temp. Range	°C	-40°C to +85°C			
Storage Temperature	°C	-40°C to +85°C			
Humidity (Non condensing)	%RH	5 - 95%RH			
Isolation Voltage (Cased version)	VDC	Input/Output 1000VDC, Input/Case 500VDC, Output/Case 500VDC, 100mA for 1 min			
Isolation Voltage (Uncased version)	VDC	Input/Output 1500VDC, 100mA for 1 min			
Isolation Resistance (Cased version)	Ω	>50MΩ at 25°C and 70% RH, 500VDC Input/Output, Input/Case, Output/Case			
Isolation Resistance (Uncased version)	Ω	>50MΩ at 25°C and 70% RH, 500VDC Input/Output			
Shock (Non operating)	-	980m/s <sup>2</sup> (100G), 6ms, 6 directions, 3 times			
Vibration (non operating)	-	10-55-10 Hz (sweep for 15 min.) 1.52mm amplitude, 2 hour X, Y, Z			
Safety Agency Certifications	-	IEC/EN/UL/CSA60950-1, IEC/EN/UL/CSA62368-1 and CE Mark			
Weight	g	With case: CC15 15g, CC30 20g. Without case: CC15 10g, CC30 15g			
Size (LxWxH) (Thru hole ver., w/ case)	mm	CC15: 38.4 x 6.8 x 29.6mm, CC30: 38.4 x 8.3 x 33.5mm			
Warranty	yrs	5			

Notes: See Installation Manual for full specifications, test methods of parameters and application notes.



Model Selector				
Output Voltage (V)	Output Current (A)	Max O/P Power (W)	24V Input	48V Input
3.3	4.5	15	CC15-2403SFP-E	CC15-4803SFP-E*
3.3	9	30	CC30-2403SFP-E	CC30-4803SFP-E*
5	3	15	CC15-2405SFP-E	CC15-4805SFP-E*
5	6	30	CC30-2405SFP-E	CC30-4805SFP-E*
12	1.25	15	CC15-2412SFP-E	CC15-4812SFP-E*
12	2.5	30	CC30-2412SFP-E	CC30-4812SFP-E*
15	1	15	CC15-2415SFP-E	CC15-4815SFP-E*
15	2	30	CC30-2415SFP-E	CC30-4815SFP-E*

\*CC15 & CC30 48Vin models - last time buy March 2019

Options		
Version	PIN	Case
CCxx-yyySFP-E*	Through hole	Yes
CCxx-yyySFH-E	Through hole	No
CCxx-yyySRP-E	SMT	Yes
CCxx-yyySRH-E	SMT	No

Where xx is output power & yyy is input and output voltage combination. \* denotes preferred model

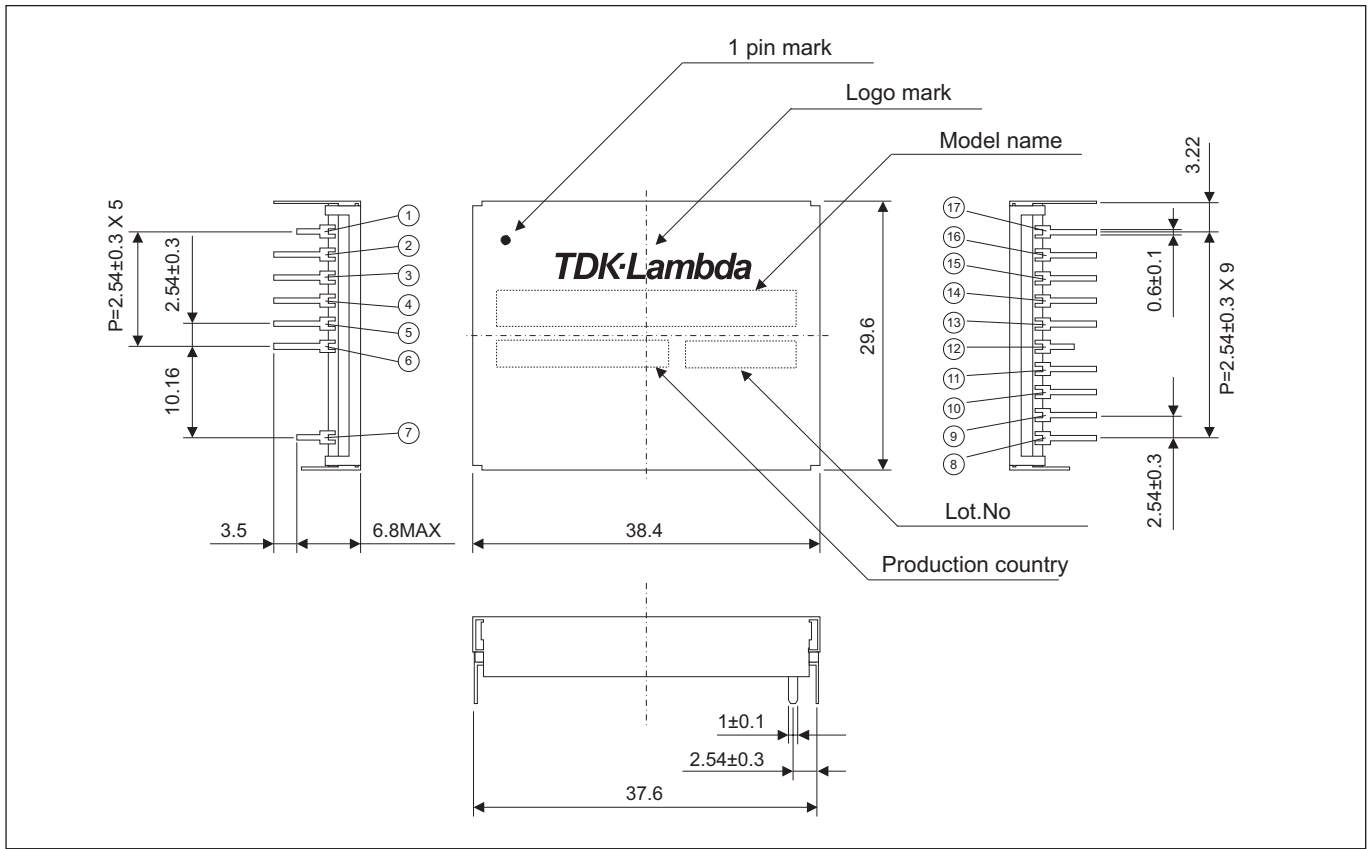
Pinout SFP-E Models		
Pin	Pin Name	Function
1	Stopper	Stopper
2	+Vout	+DC output
3	+Vout	+DC output
4	+Vout	+DC output
5	-Vout	-DC output
6	-Vout	-DC output
7	Stopper	Stopper
8	NC	Not connected
9	ALM	Alarm
10	RC	Remote control
11	PO	Start in / out
12	Stopper	Stopper
13	+Vin	+DC input
14	+Vin	+DC input
15	-Vin	-DC input
16	-Vin	-DC input
17	NC	Not connected

Pinout SRP-E Models		
Pin	Pin Name	Function
1	NC	Not connected
2	+Vout	+DC output
3	+Vout	+DC output
4	+Vout	+DC output
5	-Vout	-DC output
6	-Vout	-DC output
7	NC	Not connected
8	NC	Not connected
9	ALM	Alarm
10	RC	Remote control
11	PO	Start in / out
12	NC	Not connected
13	+Vin	+DC input
14	+Vin	+DC input
15	-Vin	-DC input
16	-Vin	-DC input
17	NC	Not connected

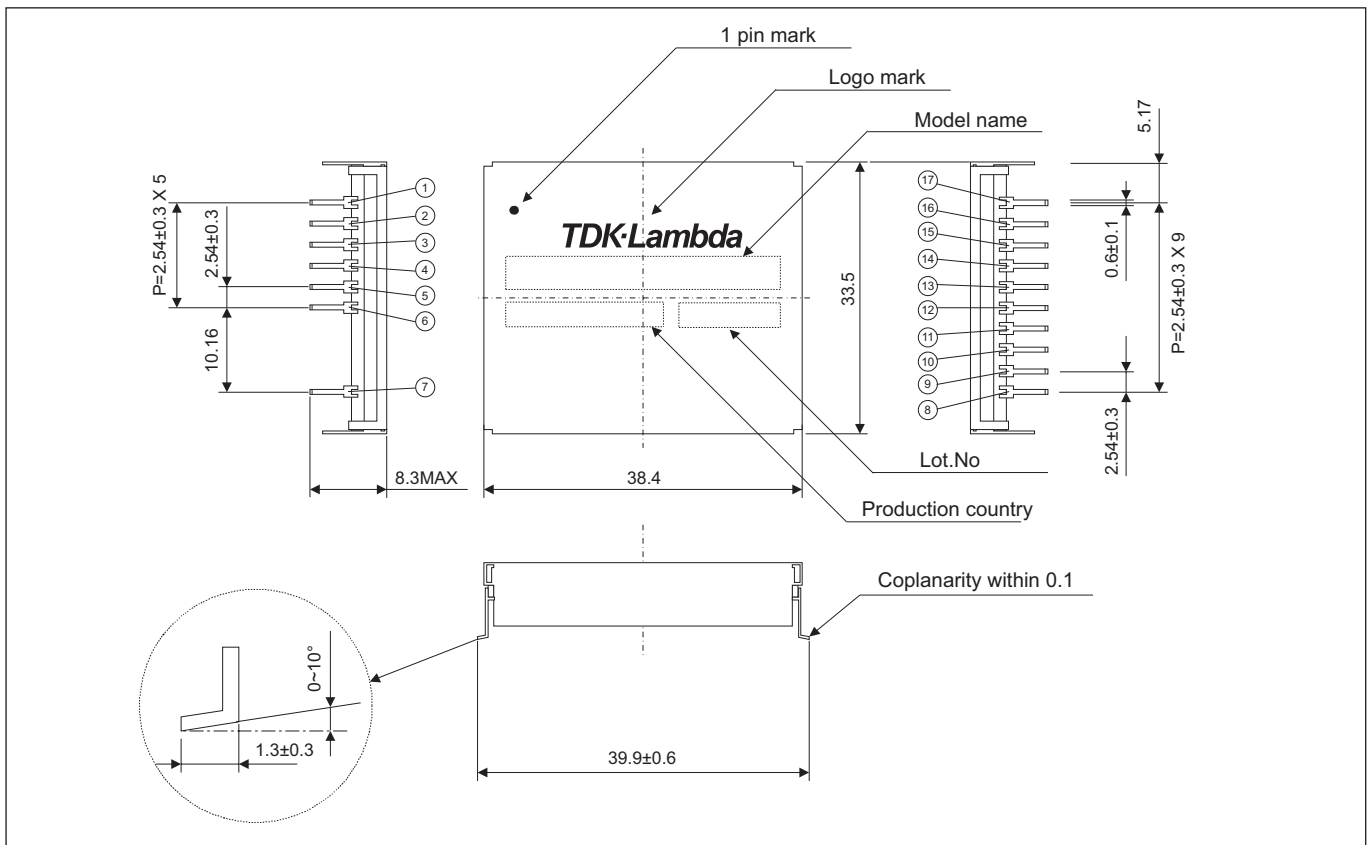




## Outline Drawing CC15-xxxxSFP-E Series



## Outline Drawing CC30-xxxxSRP-E Series





## 15 to 30W DC-DC Converters



Industrial



Test



Comm



Broadcast



Features	Benefits
• Industry Standard 1" x 1" Footprint	• Fits in place of 2 x 1" converters
• Wide Range DC Input 9 - 36 or 18 - 76V	• Less Parts to Inventory
• High Efficiency - Up to 92%	• Easier System Thermal Management
• Six Sided Shielding	• Reduced Radiated Noise

Specification		CCG15/CCG30							
Model		3.3V	5V	12V	15V	24V	30V	±12V	±15V
Nominal Output Voltage	VDC	3.3V	5V	12V	15V	24V	30V	±12V	±15V
Input Voltage Range	VDC	9 - 36V or 18 - 76VDC							
Input Current	A	See model selector							
Output Voltage Adjustment	VDC	2.97 - 3.63	4.5 - 5.5	10.8 - 13.2	13.5 - 16.5	None			
Output Voltage Accuracy	%	±2%				±5%			
Ripple & Noise (max) pk-pk	mV	70	70	95	95	190	190	95	95
Line Regulation (max)	mV	13.2	20	48	60	120	150	60	75
Load Regulation (max)	mV	13.2	20	48	60	240	300	120	150
Cross Regulation (1)	mV	Not applicable						480	600
Overcurrent Protection	%	>105% (Hiccup current style)							
Overvoltage Protection	%	-							
Remote On/Off		Standard: Low = ON, Open = OFF. Positive Logic (/P suffix): Open = ON, Low = OFF							
Operating Temperature	°C	-40°C to +110°C Case, -40°C to +85°C Ambient. See installation manual for operation above 60°C							
Storage Temperature	°C	-55°C to +125°C							
Temperature Coefficient	%/°C	0.02%/°C							
Humidity (non condensing)	%RH	5 - 95% RH Operating and Non Operating							
Cooling	-	Convection or forced air							
Withstand Voltage	VAC	Input to Case: 1kVDC; Input to Output 1.5kVDC; Output to Case: 1kVDC							
Isolation Resistance	MΩ	>100M at 25°C and 70%RH, Output to Case 500VDC							
Vibration	-	Non Operating, 10-55Hz (sweep for 3 min.) Amplitude 1.52mm constant (Max 90.8m/s <sup>2</sup> ) X,Y,Z 1 hour each							
Shock	-	490.3m/s <sup>2</sup>							
Safety Agency Certifications	-	IEC/EN/UL/CSA60950-1, IEC/EN/UL/CSA62368-1 and CE Mark							
Weight (Typ)	g	20							
Size (WxHxD)	mm	25.4 x 9.9 x 25.4							
Warranty	yrs	5							

**Note:** See Installation Manual for full details, test methods of parameters and application notes (1) Dual outputs only. One output at 100%, the other output at 20% load



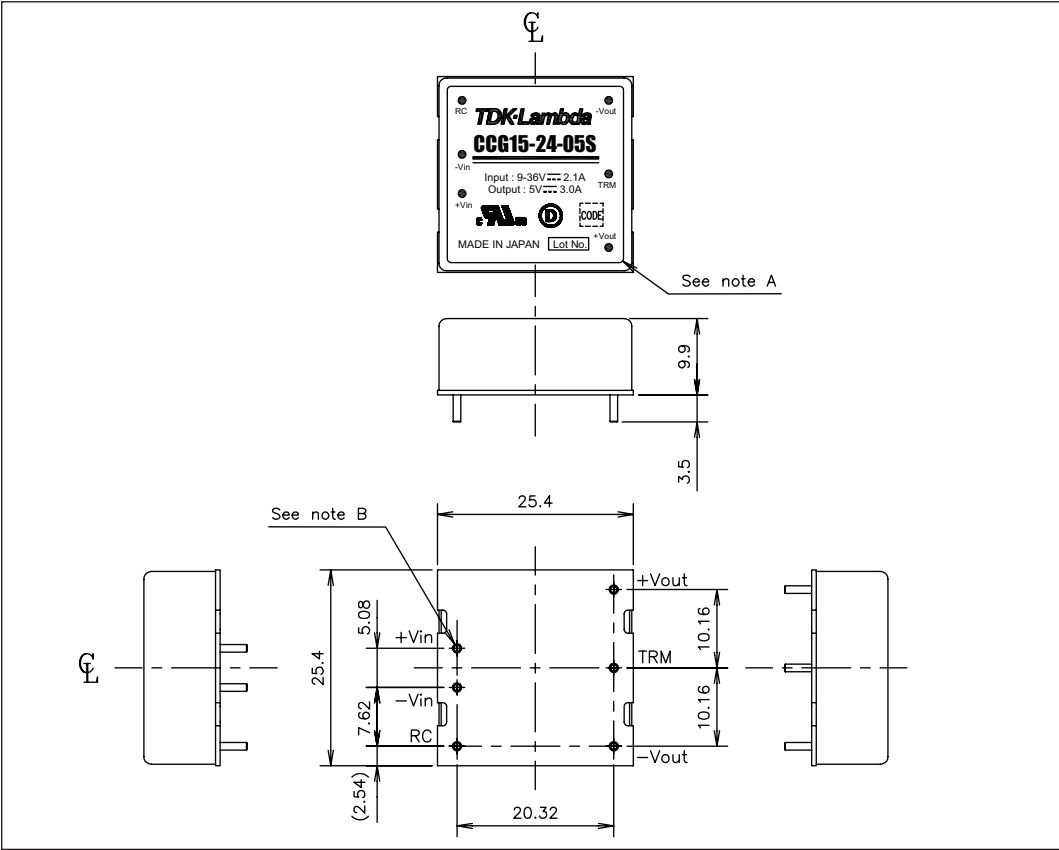
Model Selector Single Output						
Model	Output Voltage (V)	Output Current (A)	Input Voltage (V)	Maximum Power (W)	Input Current at Nominal Input (A)	Efficiency (%) (100% load, nominal input)
CCG15-24-03S	3.3	4	9 - 36	13.2	0.65	85
CCG30-24-03S	3.3	7	9 - 36	23.1	1.12	86
CCG15-24-05S	5	3	9 - 36	15.0	0.72	87
CCG30-24-05S	5	6	9 - 36	30.0	1.4	89
CCG15-24-12S	12	1.3	9 - 36	15.6	0.74	88
CCG30-24-12S	12	2.5	9 - 36	30.0	1.4	89
CCG15-24-15S	15	1	9 - 36	15.0	0.71	88
CCG30-24-15S	15	2	9 - 36	30.0	1.4	89
CCG15-24-12D (1)	24	0.65	9 - 36	15.6	0.73	89
CCG30-24-12D (1)	24	1.25	9 - 36	30.0	1.4	89
CCG15-24-15D (1)	30	0.5	9 - 36	15.0	0.7	90
CCG30-24-15D (1)	30	1	9 - 36	30.0	0.38	91
CCG15-24-12D	±12V	±0.65	9 - 36	15.6	0.73	89
CCG30-24-12D	±12V	±1.25	9 - 36	30.0	1.4	89
CCG15-24-15D	±15V	±0.5	9 - 36	15.0	0.7	90
CCG30-24-15D	±15V	±1.0	9 - 36	30.0	0.38	91
CCG15-48-03S	3.3	4	18 - 76	13.2	0.32	85
CCG30-48-03S	3.3	7	18 - 76	23.1	0.55	87
CCG15-48-05S	5	3	18 - 76	15.0	0.36	87
CCG30-48-05S	5	6	18 - 76	30.0	0.69	90
CCG15-48-12S	12	1.3	18 - 76	15.6	0.37	88
CCG30-48-12S	12	2.5	18 - 76	30.0	0.69	90
CCG15-48-15S	15	1	18 - 76	15.0	0.36	88
CCG30-48-15S	15	2	18 - 76	30.0	0.69	91
CCG15-48-12D (1)	24	0.65	18 - 76	15.6	0.37	89
CCG30-48-12D (1)	24	1.25	18 - 76	30.0	0.69	91
CCG15-48-15D (1)	30	0.5	18 - 76	15.0	0.35	90
CCG30-48-15D (1)	30	1	18 - 76	30.0	0.68	92
CCG15-48-12D	±12V	±0.65	18 - 76	15.6	0.37	89
CCG30-48-12D	±12V	±1.25	18 - 76	30.0	0.69	91
CCG15-48-15D	±15V	±0.5	18 - 76	15.0	0.35	90
CCG30-48-15D	±15V	±1.0	18 - 76	30.0	0.68	92

**Note (1):** CCG can be used as a single output connecting between +Vout and -Vout leaving the COM pin open

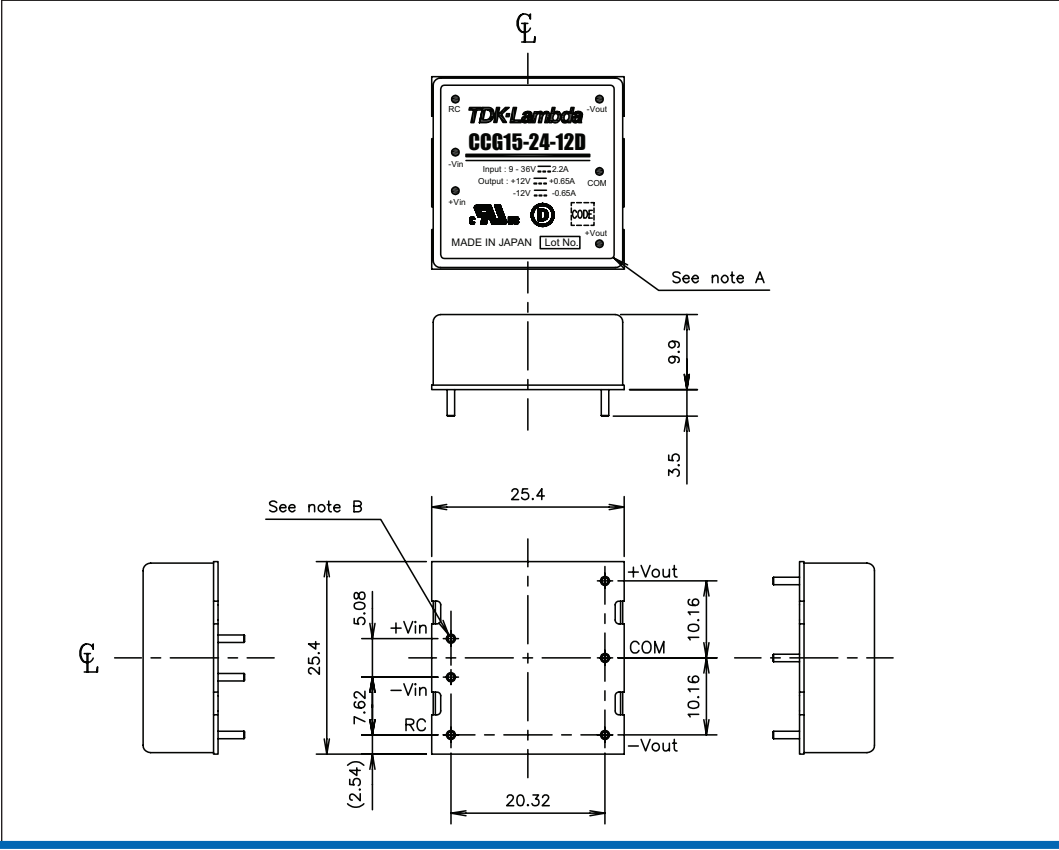
Options	
Suffix	Description
Blank	Negative Logic Remote On/Off
/P	Positive Logic Remote On/Off



## Outline Drawing CCG15-30 Series Single Output



## Outline Drawing CCG15-30 Series Dual Output





- 60 - 160VDC Input to EN50155/IEC60571
- EN/IEC 61373 Shock and Vibration
- Base plate Cooled
- Full Power at +100°C base plate
- Five Year Warranty

## Key Market Segments & Applications

Railway Applications  
 Suitable for battery powered railway systems  
 Power Plants

## CN-A Series

30W to 200W 110VDC Input  
 Quarter Brick & Half Brick Railway DC-DC Converters

### CN-A Features and Benefits

#### Features

- Small Size
- Quarter & Half Brick Footprint
- Full Power from -40°C to +100°C
- UVLO Function
- Coating Option

#### Benefits

- Less PCB space used
- Industry Standard size
- No Derating required - covers TX class for Railway
- Protects battery against deep discharges
- According to EN50155

### Specifications

ITEMS	MODELS	CN30A110, CN50A110, CN100A110, CN200A110			
		See model selector			
Nominal Output Voltage	VDC	5V	12V	15V	24V
Input Voltage Range (1)	VDC	60 - 160VDC			
Input Current	A	0.34 - 2.16A (model dependant)			
Output Voltage Adjustment	VDC	4.5 - 6	10.8 - 13.2	13.5 - 16.5	21.6 - 26.4
Ripple & Noise (max) pk-pk	mV	100	150	150	240
Line Regulation (max)	mV	20	48	60	96
Load Regulation (max)	mV	40	96	120	192
Overcurrent Protection	%	105 - 140%			
Overvoltage Protection	%	125 - 145% (Cycle input or remote on/off to reset)			
Remote Sense	-	Yes			
Remote On/Off	-	Yes; Low = ON, Open = OFF			
Parallel Operation	-	CN30,50 & 100 : No / CN200 : 5V : No; 12, 15, 24V : Yes			
Operating Temperature	°C	-40°C to +100°C Baseplate			
Storage Temperature	°C	-40°C to +100°C			
Temperature Coefficient	%/°C	0.02%/°C			
Humidity (non condensing)	%RH	5 - 95% RH Operating and Non Operating			
Conformal Coating (1)	-	Optional - /CO suffix			
Cooling	-	Conduction (See Installation Manual for heatsink selection)			
Withstand Voltage	VAC	Input to Baseplate: 1.5kVAC; Input to Output 3.0kVAC for 1 min.; Output to Baseplate: 500VAC for 1 min			
Isolation Resistance	Ω	>100MΩ at 25°C and 70%RH, Output to Base plate 500VDC			
Vibration (1)	-	Non Operating, 10-55Hz (sweep for 1 min.) Amplitude 0.825mm constant (Max 49 m/s <sup>2</sup> ) X,Y,Z 1 hour each IEC61373 - Category 1, Grade B			
Shock (1)	-	196.1m/s <sup>2</sup> , EN/IEC61373 - Category 1, Grade B			
Safety Agency Certifications	-	UL60950-1, CSA60950-1, EN60950-1, CE LVD			
Weight (Typ)	g	CN30-50 : 70 / CN200 : 100			
Size (WxHxD)	mm	CN30A - 100A : 36.8 x 12.7 x 57.9, CN200A : 61 x 12.7 x 57.9			
Warranty	yrs	5			

**Notes:** See Installation Manual for full details, test methods of parameters and application notes  
 (1) Compliance to EN50155 & IEC60571

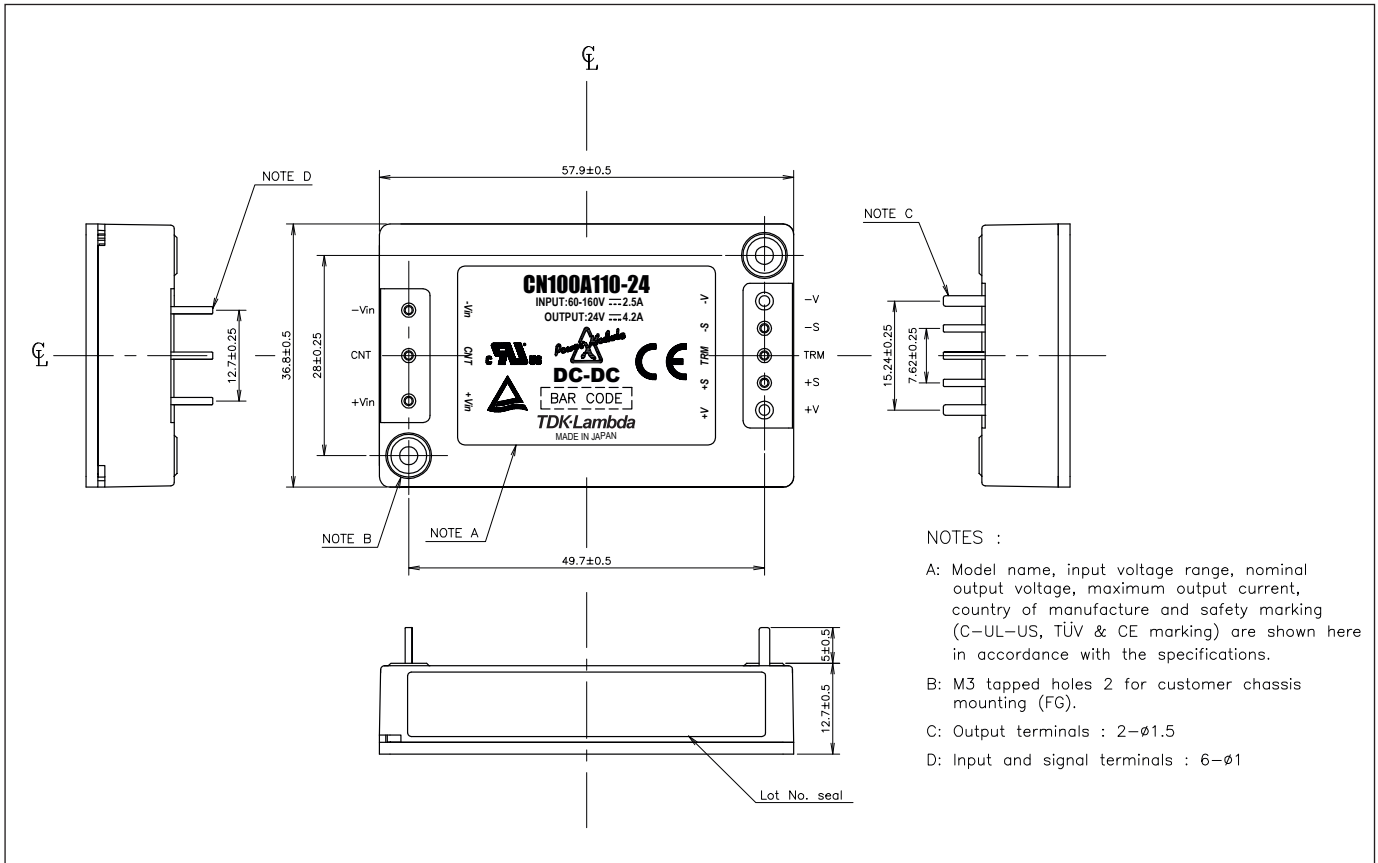


## Model Selector

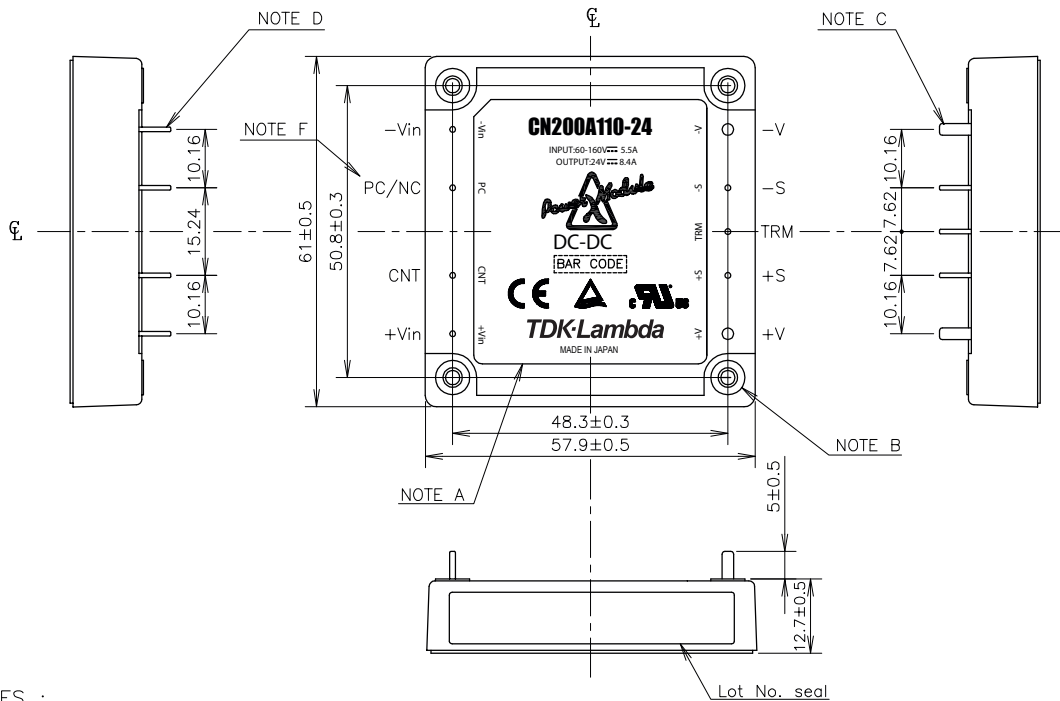
Model	Voltage (V)	Output Current (A)	Maximum Power (W)	Input Current (A)	Efficiency (%) (100% load, 110VDC In)
CN30A110-5	5	6.0	30.0	0.34	83
CN50A110-5	5	10.0	50.0	0.55	85
CN100A110-5	5	20.0	100.0	1.08	85
CN200A110-5	5	40.0	200.0	2.16	85
CN30A110-12	12	2.5	30.0	0.34	84
CN50A110-12	12	4.2	50.4	0.55	86
CN100A110-12	12	8.4	100.8	1.05	88
CN200A110-12	12	16.7	200.4	2.09	88
CN30A110-15	15	2.0	30.0	0.34	84
CN50A110-15	15	3.4	51.0	0.55	86
CN100A110-15	15	6.7	100.5	1.05	88
CN200A110-15	15	13.4	201	2.1	88
CN30A110-24	24	1.3	31.2	0.34	84
CN50A110-24	24	2.1	50.4	0.55	86
CN100A110-24	24	4.2	100.8	1.05	88
CN200A110-24	24	8.4	201.6	2.11	88

Option: Conformal coating for EN50155 & IEC60571 compliance: add /CO suffix to model name

## Outline Drawing CN30A-CN100A



## Outline Drawing CN200A



### NOTES :

- A: Model name, input voltage range, nominal output voltage, maximum output current, country of manufacture and safety marking (C-UL-US, TÜV & CE marking) are shown here in accordance with the specifications.
- B: M3 tapped holes 4 for customer chassis mounting (FG).
- C: Output terminals : 2- $\phi 2.0$
- D: Input and signal terminals : 7- $\phi 1$
- E: Unless otherwise specified dimensional tolerance :  $\pm 0.25$
- F: 5V output model : NC  
12V, 15V, 24V output models : PC





Industrial

Cots

Railroad

## 50W & 100W 24VDC Input Quarter Brick Railway DC-DC Converters



Features	Benefits
• Small Size	• Less PCB space used
• Quarter Brick Footprint	• Industry Standard size
• Full Power from -40°C to +100°C	• No Derating required - covers TX class for Railway
• UVLO Function	• Protects battery against deep discharges
• Coating Option	• According to EN50155

Specification		CN50A24-xx	CN100A24-xx
Input Voltage Range (5)	VDC	14.4 - 36VDC	
Input Voltage Transient	VDC	40V for 3s	
Input Current	A	2.5 to 4.91A (model dependant)	
Output Voltage Adjustment	VDC	5V models: -10/+20% ; 12 & 24V models: +/-10%	
Ripple & Noise (max) pk-pk	mV	see Model Selector	
Line Regulation (max)	mV	see Model Selector	
Load regulation (max)	mV	see Model Selector	
Output Voltage Accuracy (1)	%	+/- 1%	
Overcurrent Protection (2)	%	105 - 140%	
Overvoltage Protection (3)	%	125 - 145%	
Remote Sense (4)	-	Yes	
Remote On/Off (4)	-	Yes (short: On - Open: Off)	
Parallel Operation	-	No	
Series Operation (4)	-	Yes	
Operating temperature	°C	-40°C to +100°C Baseplate	
Storage Temperature	°C	-40°C to +100°C	
Temperature Coefficient	%/°C	0.02%/°C	
Humidity (non condensing)	%RH	5-95% RH, Operating and Non Operating	
Conformal Coating (5)	-	Optional - /CO suffix	
Cooling (4)	-	Conduction Cooled	
Withstand Voltage	VAC	Input to Baseplate: 2kVAC, Input to Output: 3kVAC for 1mn (20mA) Output to Baseplate: 500VAC for 1mn (20mA)	
Isolation Resistance	Ω	100MΩ at 25°C and 70%RH, Output to Baseplate 500VDC Non Operating, 10-55Hz (sweep for 1mn).	
Vibration (5)	-	Amplitude 0.825mm Constant (Maximum 49.9m/s <sup>2</sup> ) X,Y,Z 1 hour each EN/IEC 61373 - Category 1 - Grade B	
Shock (5)	-	196.1m/s <sup>2</sup> , EN/IEC 61373 - Category 1, Grade B	
EMC Compliance (5)	-	Refer to Application Notes	
Safety Agency Certifications	-	UL 60950-1, CSA 60950-1, EN 60950-1, CE LVD	
Weight (Typ)	g	70	
Size (WxHxD)	mm	36.8 x 12.7 x 57.9	
Warranty	yrs	5	

### Notes

- (1) At 24VDC input and maximum output current; baseplate temperature = +25°C.
- (2) 5V delay shutdown when left in OCP conditions, with output voltage less than LVP (Low Voltage Protection) level.  
12 & 24V : constant current limiting with automatic recovery LVP reset : Line off or Control off
- (3) OVP reset : Line off or Control off
- (4) Refer to Instruction Manual
- (5) Compliance to EN50155 & IEC60571





## Model Selector

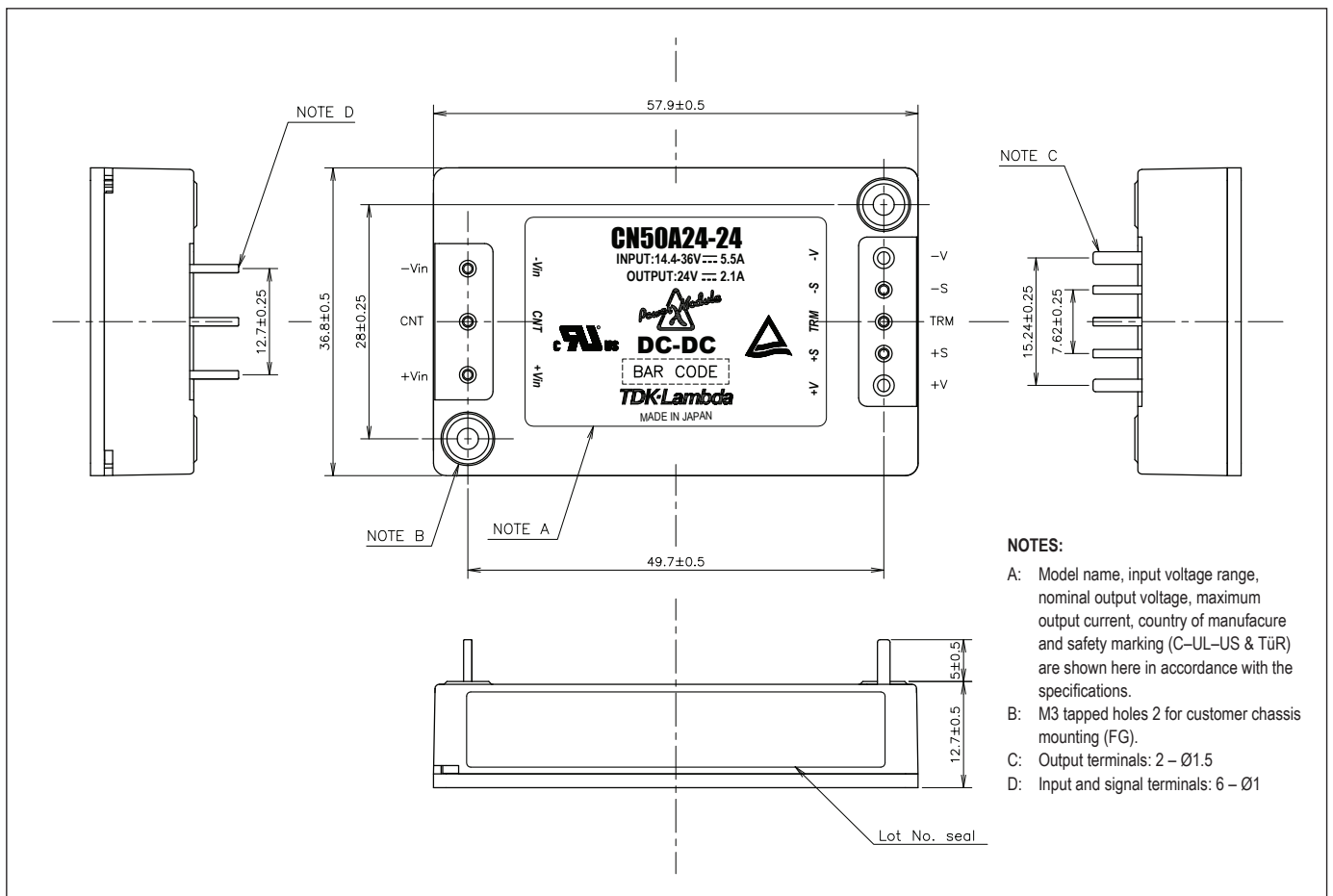
Model	Output Voltage (VDC)	Output Current (A)	Maximum Power (W)	Input <sup>(1)</sup> Current (A)	Efficiency <sup>(1)</sup> (%)	Output Voltage Adj (VDC)	Ripple & Noise (mV pk-pk) <sup>(4)</sup>	Line <sup>(2)</sup> Regulation (mV)	Load <sup>(3)</sup> Regulation (mV)
CN50A24-5	5	10	50	2.48	85	4.5-6	100	20	40
CN50A24-12	12	4.2	50.4	2.47	86	10.8-13.2	150	48	96
CN50A24-24	24	2.1	50.4	2.47	86	21.6-26.4	240	96	192
CN100A24-5	5	20	100	4.91	86	4.75-6	100	20	40
CN100A24-12	12	8.4	100.8	4.83	88	10.8-13.2	150	48	96
CN100A24-24	24	4.2	100.8	4.83	88	21.6-26.4	240	96	192

### Notes:

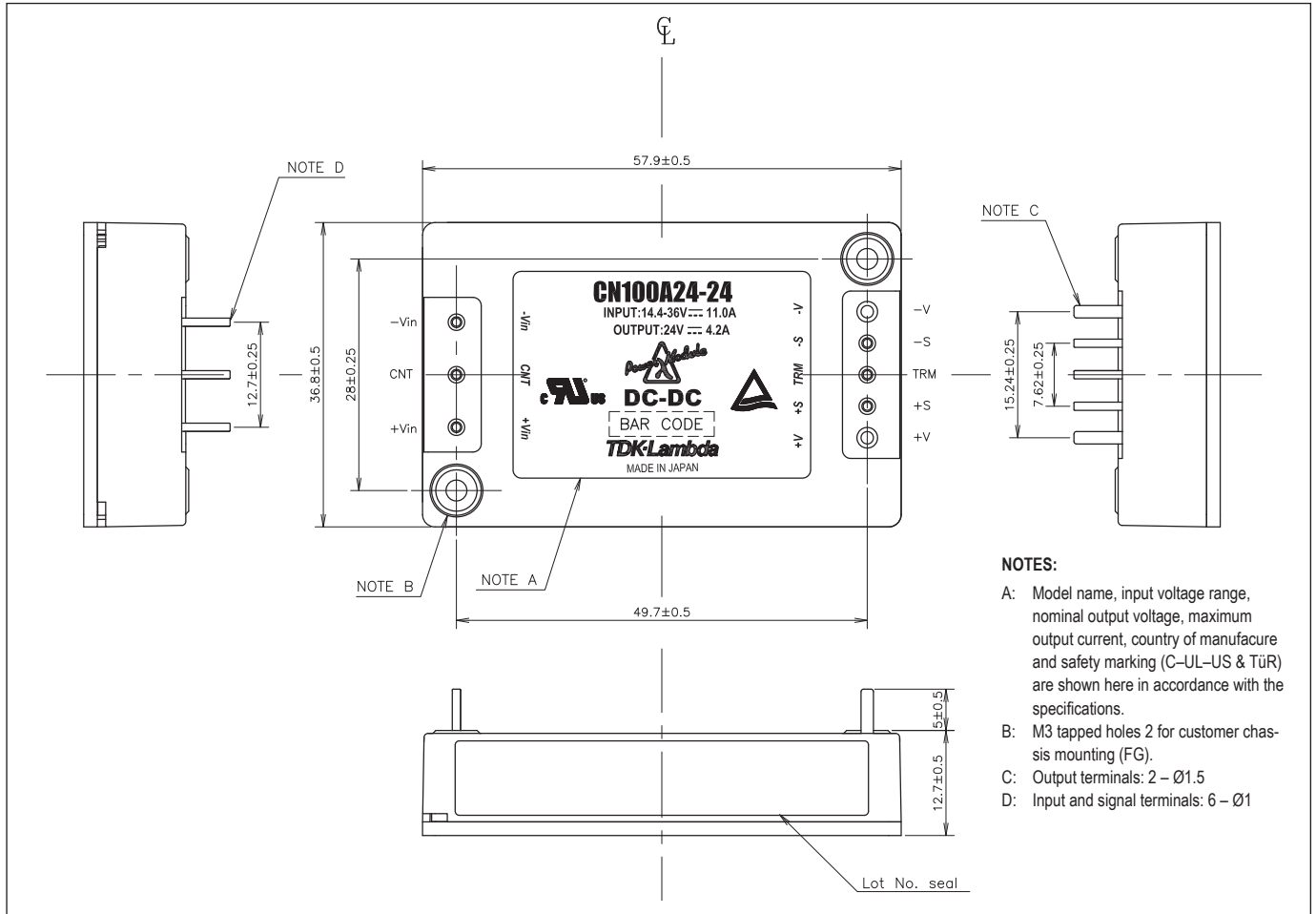
- (1) At 24VDC input and maximum output current; baseplate temperature = +25°C
- (2) 14.4 - 36VDC, constant load
- (3) No load - Full Load, constant input voltage
- (4) External components are necessary for operation; refer to Instruction Manual

**Option:** Conformal Coating for EN50155 & IEC60571 compliance: add /CO suffix to Model Name

## Outline Drawing CN50A24



## Outline Drawing CN100A24





## 120W Industrial Quarter Brick Converters



Features	Benefits
• Standard Quarter Brick Footprint	• Assists System Integration
• 9-36, 18-36VDC Inputs	• Designed for 28V DC Networks
• Up to 91.5% Efficiency	• Easier System Thermal Management
• Up to 105°C Baseplate Temperatures	• Suitable for Conduction Cooling
• 1,500VDC Isolation (2,250VDC or 3,000VDC option)	• For Rugged Environments

Specification								
Model		GQA120						
Nominal Output Voltage (1)	VDC	5V	12V	15V	24V	28V	48V	
Input Voltage Range	VDC	9 - 36V						18 - 36V
Input Current (Maximum)	A	17A						10A
Efficiency (100% load, 24V input)	%	90%	89%	89%	87%	89%	91.5%	
Output Voltage Adjustment	VDC	4.5 - 5.5V	10.8 - 13.2V	13.5 - 16.5V	21.6 - 26.4V	25.2 - 30.8V	45.6 - 52.8V	
Ripple & Noise (max) pk-pk	mV	150mV	180mV	200mV	250mV	250mV	300mV	
Line Regulation (typ)	%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	
Load Regulation (max)	%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	
Overcurrent Protection (typ)	A	37A	14.5A	12A	6.2A	5.1A	4A	
Overvoltage Protection (typ)	V	6.5V	15V	18V	32V	35V	54V	
Remote On/Off	-	Yes; Low = ON, Open = OFF						
Remote Sense	-	Yes				Not as standard		
Operating Temperature	°C	-40°C to +105°C						
Storage Temperature	°C	-55°C to +125°C						
Temperature regulation	%	0.5% across full temperature range						
Cooling	-	Conduction, convection or forced air						
Withstand Voltage	VDC	Input to Output 1,500VDC (-NP7 suffix: 2,250VDC, -OP7 suffix: 3,000VDC), Baseplate to Input or Output 1,500VDC. (-NP7 & -OP7 suffix: 2,250VDC)						
Isolation Resistance	MΩ	>10MΩ						
Safety Agency Certifications	-	UL60950-1, CSA60950-1, EN60950-1, CE Mark						
Weight (Typ)	g	85g (Flanged baseplate, open frame)						
Size (LxWxH)	mm	Flanged version: 60.6 x 49.5 x 12.7 Non-flanged version: 60.6 x 39.5 x 12.7						
Warranty	yrs	3						

Notes: See Installation Manual for full details, test methods of parameters and application notes

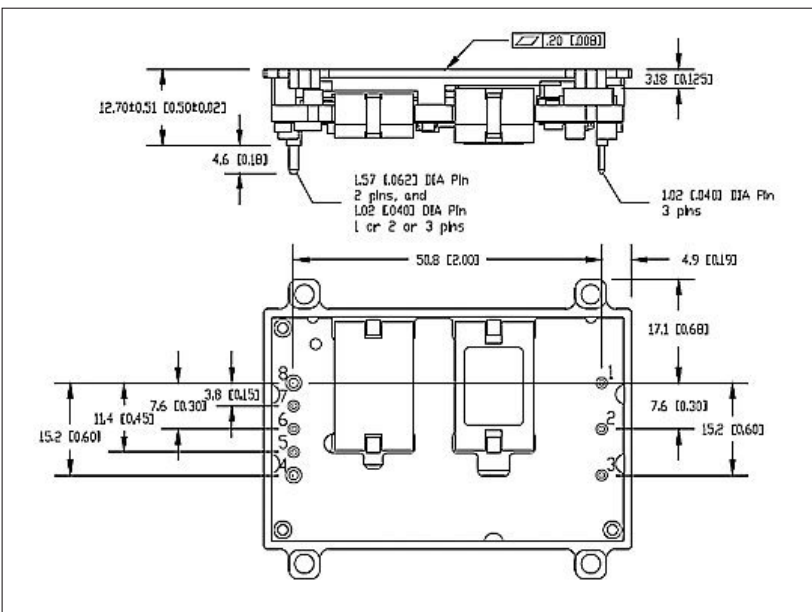
(1) Up to 50V input transient for 1 second



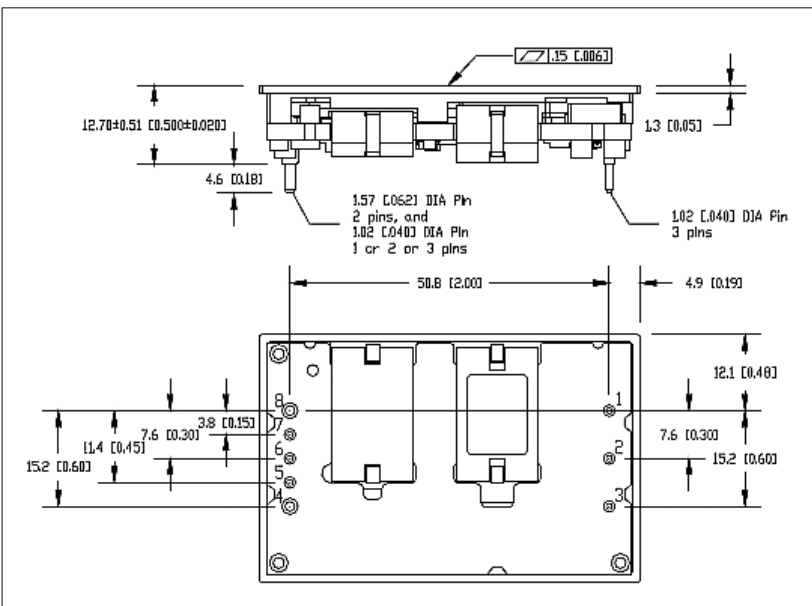
## Model Selector

Model	Input Voltage (V)	Output Voltage (V)	Maximum Current (A)	Maximum Power (W)
GQA2W024A050V-007-R	9 - 36	5	24	120
GQA2W010A120V-007-R	9 - 36	12	10	120
GQA2W008A150V-007-R	9 - 36	15	8	120
GQA2W005A240V-007-R	9 - 36	24	5	120
GQA2W004A280V-007-R	9 - 36	28	4.28	120
GQA24003A480V-007-R	18 - 36	48	2.5	120

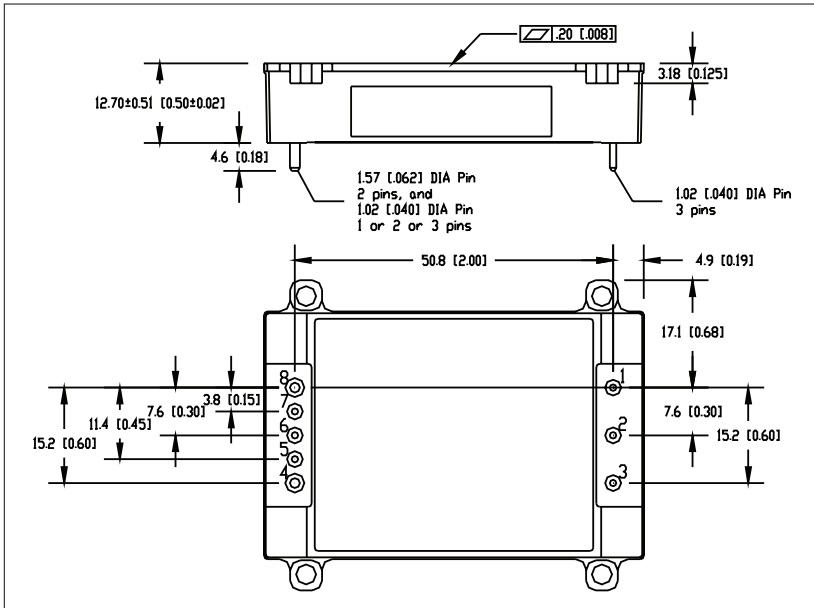
## Flange Baseplate, Open Frame GQA120 Series



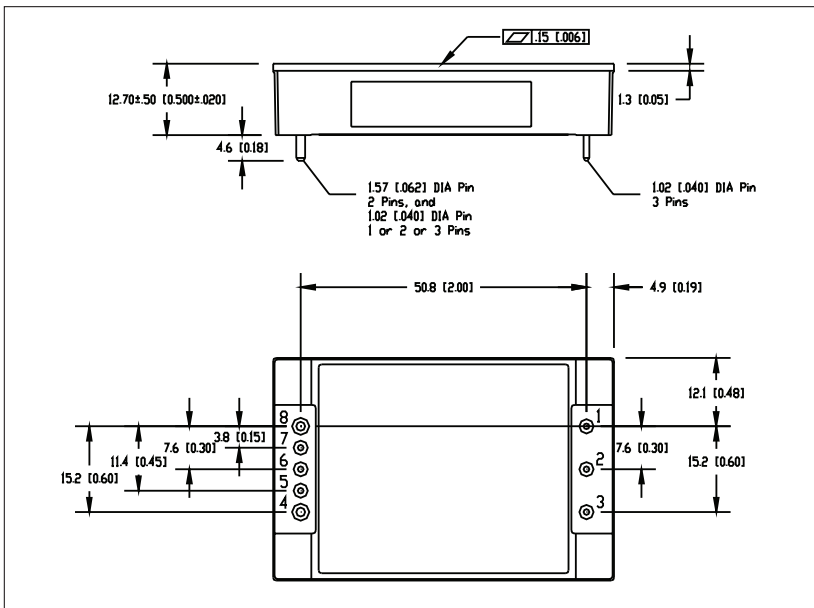
## Non-Flange Baseplate, Open Frame GQA120 Series



## With Flange, Potted GQA120 Series



## No Flange, Potted GQA120 Series



### Options

Suffix	Description
-007-R	Flanged Baseplate, Open Frame
-N07-R	Non-Flanged Baseplate, Open Frame
-0P7-R	Flanged Baseplate, Enclosed with Potting, 3kV Input to Output Isolation
-NP7-R	Non-Flanged Baseplate, Enclosed with Potting

Standard Model

Notes: \*Contact factory for other Voltages or option codes

### Pin Assignment

PIN	Function
1	Vin (+)
2	On / Off
3	Vin (-)
4	Vo (-)
5	Sense (-), select models
6	Trim
7	Sense (+), select models
8	Vo (+)





## 85W Harsh Environment Quarter Brick Converters

Features	Benefits
• Standard Quarter Brick Footprint	• Assists System Integration
• 9-40VDC Input	• Designed for 28V DC Networks
• Up to 92% Efficiency	• Easier System Thermal Management
• Up to 115°C Baseplate Temperatures	• Suitable for Conduction Cooling
• Rugged Package with Encapsulation	• For Rugged Environments
• No Optocouplers Used	• Allows High Temperature Operation



Specification		HQA				
Model		5V	12V	15V	24V	28V
Nominal Output Voltage	VDC	5V	12V	15V	24V	28V
Input Voltage Range	VDC	9 - 40V				
Input Current	A	13A Maximum				
Efficiency (100% load, 24V input)	%	91	90	92	87	88.5
Output Voltage Adjustment	VDC	4.5 - 5.5	10.8 - 13.2	13.5 - 16.5	21.6 - 26.4	25.2 - 30.8
Output Voltage Accuracy	%	±3%				
Ripple & Noise (max) pk-pk	mV	150	200	200	250	200
Line Regulation (typ)	%	0.05	0.05	0.05	0.05	0.05
Load Regulation (max)	%	0.03	0.03	0.03	0.03	0.03
Overcurrent Protection (typ)	A	27	11	8	5.2	4.2
Overvoltage Protection (typ)	V	6.5	15	18	32	35
Remote On/Off	-	Yes; Low = ON, Open = OFF				
Remote Sense	-	Yes		Not as standard		
Operating Temperature	°C	Standard screening: -40°C to +115°C				
Storage Temperature	°C	-65°C to +125°C				
Temperature regulation	%	0.5% across full temperature range				
Cooling	-	Conduction, convection or forced air				
Withstand Voltage	VDC	Input to baseplate, Input to Output 2250VDC				
Isolation Resistance	MΩ	>10MΩ				
Safety Agency Certifications	-	UL60950-1, CSA60950-1, EN60950-1, CE Mark				
Qualification Methods	-	Consistent with MIL-STD-883F and MIL-STD-202G				
Weight (Typ)	g	100 (Flanged version)				
Size (LxWxH)	mm	Flanged version: 60.6 x 55.9 x 12.7 Non-flanged version: 60.6 x 39 x 12.7				
Warranty	yrs	3				

**Notes:** See Installation Manual for full details, test methods of parameters and application notes



## Model Selector

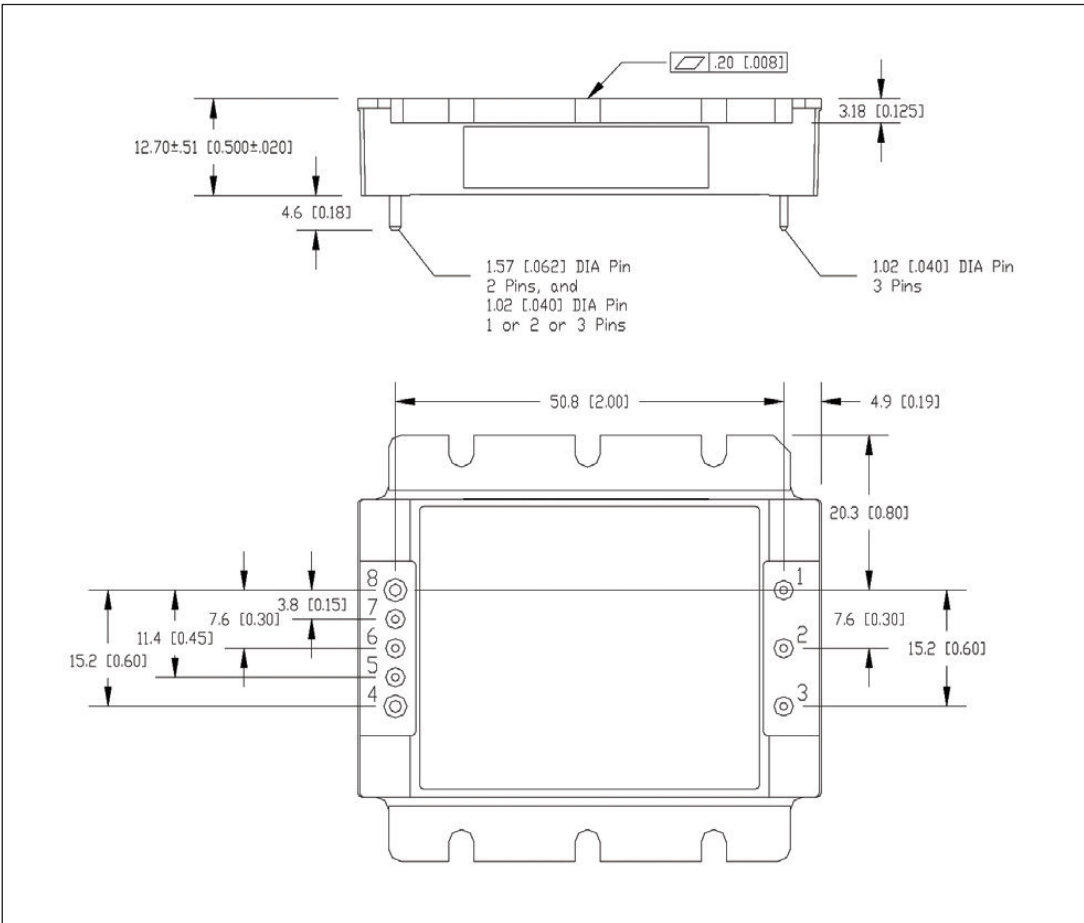
Model	Input Voltage (V)	Output Voltage (V)	Max Current (A)	Maximum Power (W)
HQA2W085W050V-007-S	9 - 40	5	17	85
HQA2W085W120V-007-S	9 - 40	12	7.1	85
HQA2W085W150V-007-S	9 - 40	15	5.7	85
HQA2W085W240V-007-S	9 - 40	24	3.5	85
HQA2W085W280V-007-S	9 - 40	28	3	85

## Options

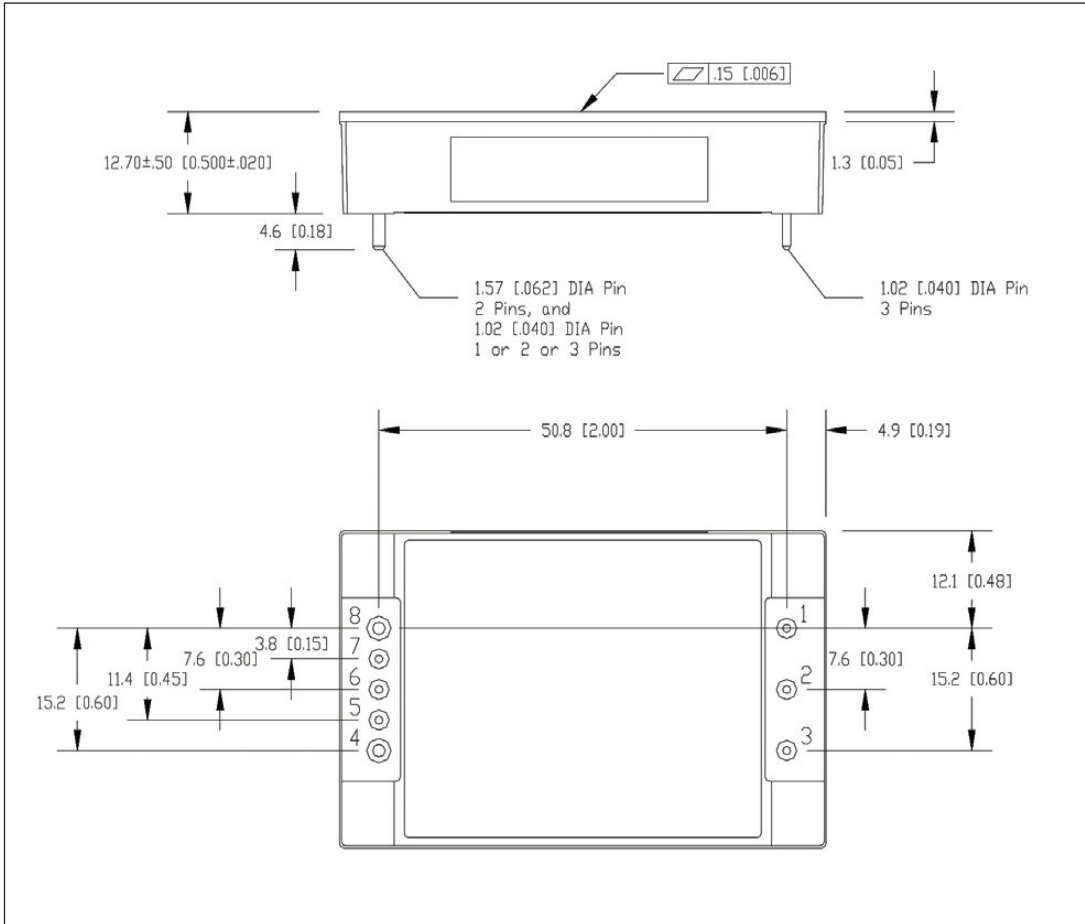
Suffix	Description
-007-S	Flanged Baseplate, Standard Screening
-N07-S	Non-Flanged Baseplate, Standard Screening

**Note:** Contact Sales Office for other voltages or option

## Outline Drawing HQA85 Series Flange version



## Outline Drawing HQA85 Series Non-Flange version



### Pin Assignment

PIN	Function	PIN	Function
1	Vin (+)	5	Sense (-) select models
2	On / Off	6	Trim
3	Vin (-)	7	Sense (+) select models
4	Vo (-)	8	Vo (+)

### Screening

Operation	S-Grade (Standard Screening)
Functional Test	Room and Hot Test
Burn in	Yes
Temperature Cycling	No
Hi-Pot	2250VDC







## 120W Harsh Environment Quarter Brick Converters



Features	Benefits
• Standard Quarter Brick Footprint	• Assists System Integration
• 9-40, 18-40VDC Inputs	• Designed for 28V DC Networks
• Up to 91.5% Efficiency	• Easier System Thermal Management
• Up to 115°C Baseplate Temperatures	• Suitable for Conduction Cooling
• Rugged Package with Encapsulation	• For Rugged Environments
• No Optocouplers Used	• Allows High Temperature Operation
• Enhanced Screening Option	• Suitable for High Reliability Applications

Specification		HQA						
Model		5V	12V	15V	24V	28V	48V	
Nominal Output Voltage	VDC	5V	12V	15V	24V	28V	48V	
Input Voltage Range	VDC	9 - 40V						18 - 40V
Input Current	A	16A Maximum						
Efficiency (100% load, 24V input)	%	90	90	89	87	89	91.5	
Output Voltage Adjustment	VDC	4.5 - 5.5	10.8 - 13.2	13.5 - 16.5	21.6 - 26.4	25.2 - 30.8	45.6 - 52.8	
Output Voltage Accuracy	%	±3%						
Ripple & Noise (max) pk-pk	mV	150	150	200	250	250	300	
Line Regulation (typ)	%	0.05	0.05	0.05	0.05	0.05	0.05	
Load Regulation (max)	%	0.03	0.03	0.03	0.03	0.03	0.03	
Overcurrent Protection (typ)	A	37	14.5	12	6.2	5.2	4.0	
Overvoltage Protection (typ)	V	6.5	15	18	32	35	54	
Remote On/Off	-	Yes; Low = ON, Open = OFF						
Remote Sense	-	Yes			Not as standard			
Operating Temperature	°C	Standard screening: -40°C to +115°C, Enhanced screening: -55°C to +115°C						
Storage Temperature	°C	-65°C to +125°C						
Temperature regulation	%	0.5% across full temperature range						
Humidity (non condensing)	%RH	MIL-STD 883 Method 1004.7						
Cooling	-	Conduction, convection or forced air						
Withstand Voltage	VDC	Input to baseplate, Input to Output 2250VDC						
Isolation Resistance	Ω	>10MΩ						
Vibration	-	MIL-STD-202G, Method 201A, Unpowered, sweep 1: 5 to 50 Hz at 0.5g, sweep 2: 50 to 500 Hz at 1.5g, three axis						
Shock	-	MIL-STD-202G, Method 213B, Table 213-1, Test Condition I, Unpowered, 50G half sine 6ms, three axis						
Safety Agency Certifications	-	UL60950-1, CSA60950-1, EN60950-1, CE Mark						
Qualification Methods	-	MIL-STD-883F and MIL-STD-202G						
Weight (Typ)	g	100g (Flanged version)						
Size (LxWxH)	mm	Flanged version: 60.6 x 55.9 x 12.7; Non-flanged version: 60.6 x 39 x 12.7						
Warranty	yrs	3						

**Notes:** See Installation Manual for full details, test methods of parameters and application notes



Model Selector				
Model	Input Voltage (V)	Output Voltage (V)	Maximum Current (A)	Maximum Power (W)
HQA2W120W050V-007-S	9 - 40	5	24	120
HQA2W120W120V-007-S	9 - 40	12	10	120
HQA2W120W150V-007-S	9 - 40	15	8	120
HQA2W120W240V-007-S	9 - 40	24	5	120
HQA2W120W280V-007-S	9 - 40	28	4.2	118
HQA24120W480V-007-S	18 - 40	48	2.5	120

Screening		
Operation	S-Grade	M-Grade
Functional Test	Room and Hot Test	Cold, Room, and Hot Test
Burn in	Yes	Extended, 96 hour
Temperature Cycling	No	10 Cycles
Hi-Pot	2250VDC	2250VDC
Visual Inspection	Yes	Yes

Options	
Suffix	Description
-007-S	Flanged Baseplate, Standard Screening
-N07-S	Non-Flanged Baseplate, Standard Screening
-007-M	Flanged Baseplate, Enhanced Screening
-N07-M	Non-Flanged Baseplate, Enhanced Screening

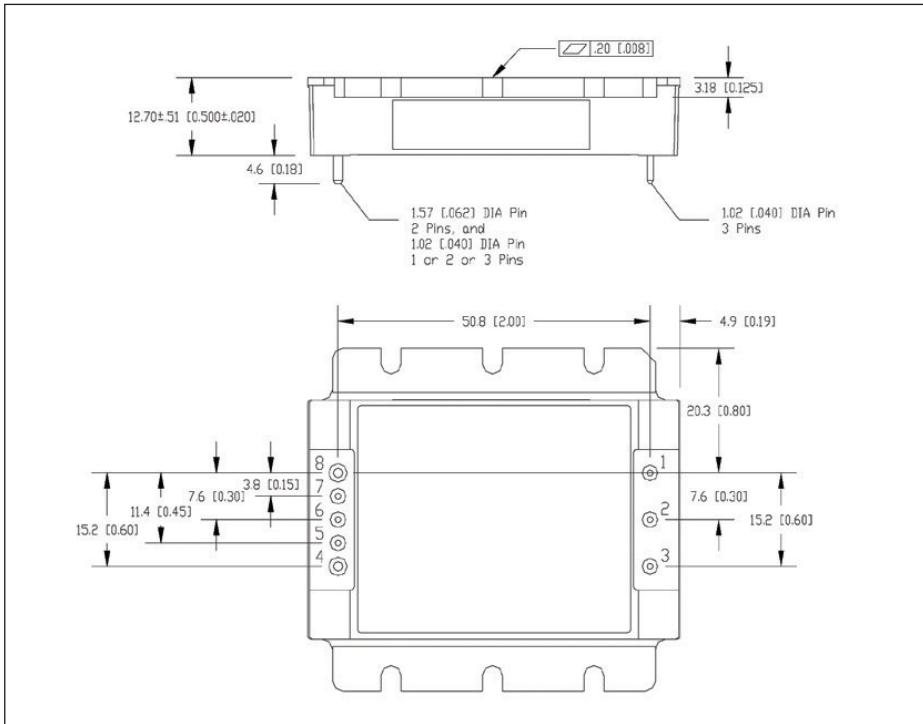
Standard Model

Contact Factory for Status

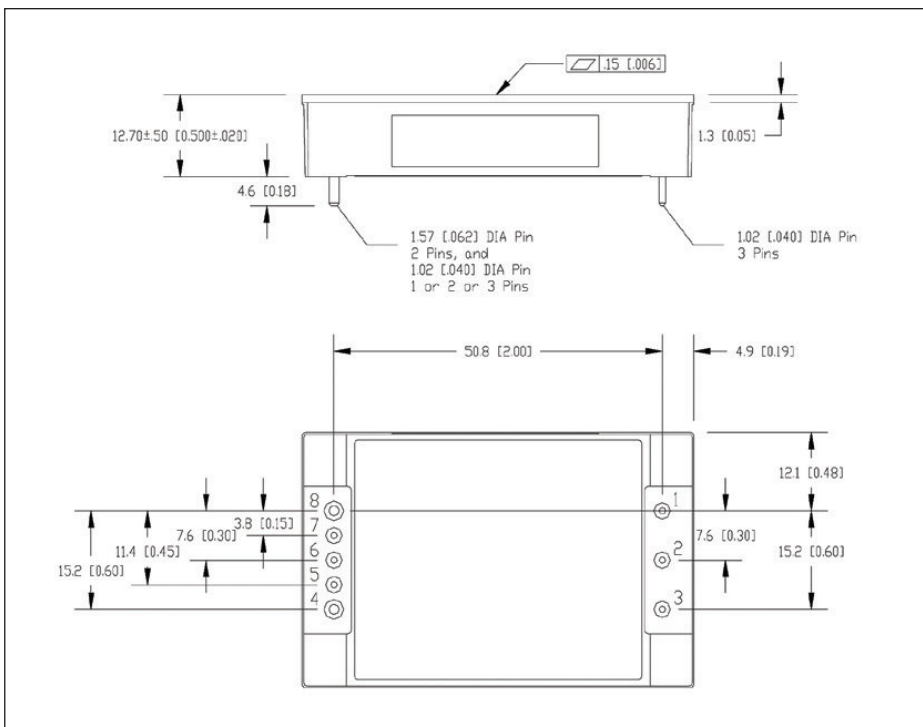
Notes: \*Contact factory for other Voltages or option codes



## Outline Drawing Flange Version HQA Series



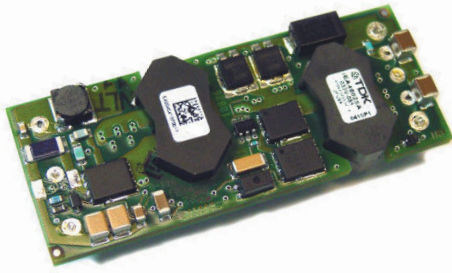
## Outline Drawing Non-Flange Version HQA Series



### Pin Assignment

PIN	Function
1	Vin (+)
2	On / Off
3	Vin (-)
4	Vo (-)
5	Sense (-), select models
6	Trim
7	Sense (+), select models
8	Vo (+)





- Standard Eighth Brick Footprint
- 24 or 48VDC Input
- 5V 15A - 28V 2.67A Nominal Output
- Through Hole Mounting
- Low 8.8mm Profile
- 1500VDC Basic Isolation

## iEA Series

67-78W

Eighth Brick DC-DC Converters

### iEA Features and Benefits

#### Features

- High operating efficiency (up to 91%)
- Constant switching frequency
- Open frame design

#### Benefits

- Reduced system heating
- Easier system filtering
- Better thermal performance

Specifications		iEA Series				
MODEL						
ITEMS		5	12	15	18	28
Nominal Output Voltage	VDC	5	12	15	18	28
Input Voltage Range	VDC	18 - 60 or 36 - 75 (see model selector)				
Input Current (max)	A	4.5				
Output Voltage Tolerance	VDC	4.85 - 5.15	11.58 - 12.42	14.47 - 15.52	17.28 - 18.72	26.88 - 29.12
Ripple & Noise (max) (pk-pk) (1)	mV	125	200	150	200	250
Line Regulation (max)	mV	10	24	35	45	70
Load Regulation (max)	mV	10	24	35	45	70
Overload Protection (typ)	A	20	8.5	6	4.4	4
Overvoltage Protection	VDC	5.7 - 6.7	13.6 - 15.7	16.8 - 22.0	20.0 - 26.0	32.0 - 38.0
Remote Sense	-	Yes				
Remote On / Off	-	Positive or Negative Logic, see Model Selector				
Temperature (operating)	°C	-40°C to +125°C				
Temperature (storage)	°C	-55°C to +125°C				
Humidity (operating)	-	20 - 95% RH Non condensing				
Humidity (storage)	-	10 - 95% RH Non condensing				
Cooling	-	Convection or forced air				
Isolation Voltage	VDC	1500				
Vibration (non operating)	-	5~50Hz@0.5g (4.9m/s <sup>2</sup> ), & 50~500Hz@1.5g (14.7m/s <sup>2</sup> ) per Bellcore TR-EOP-000063-5.4.4				
Shock	-	196.1m/s <sup>2</sup>				
Safety Agency Approvals	-	UL60950 (US and Canada), VDE0805 (IEC60950), CB scheme (IEC60950), CE Mark (LVD)				
Weight (max)	g	30.4				
Size	mm	58.4 x 22.9 x 8.8				
Warranty	yrs	3				

**Notes:** (1) Measured across one 0.1μF ceramic capacitor and one 10μF tantalum ceramic capacitor; BW = 20MHz



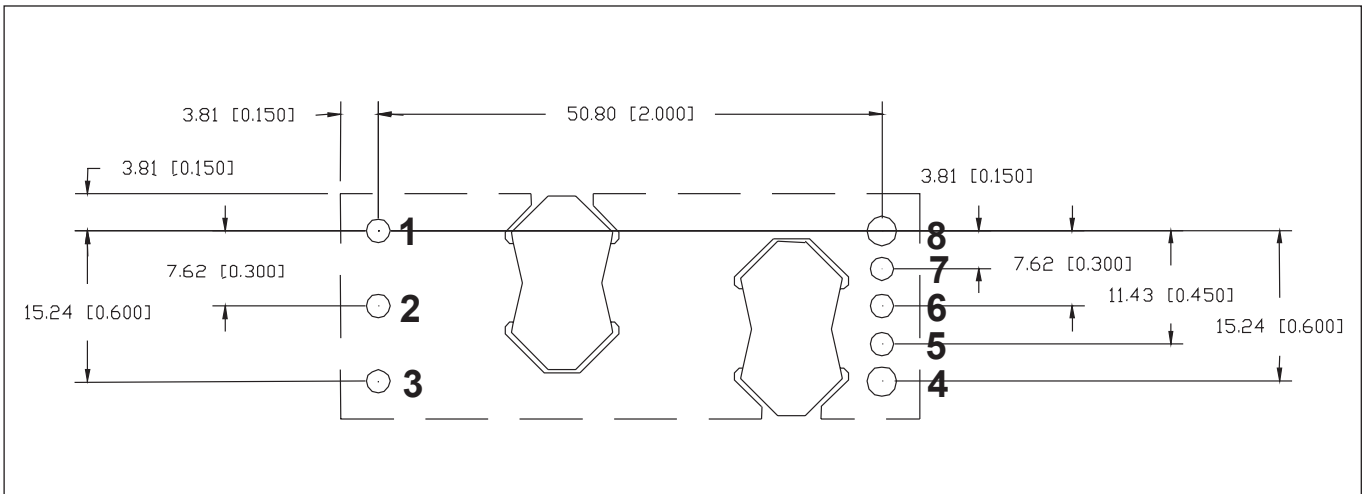
## Model Selector

Model	Voltage Output (V)	Voltage Adjust (V)	Output Curr. (A)	Max. Output Power (W)	Efficiency at Full Load (%)	Pos. Logic On/Off	Neg. Logic On/Off
iEA48015A050V-000-R	5	4.5 - 5.5	15	75	90	X	
iEA48015A050V-001-R	5	4.5 - 5.5	15	75	90		X
iEA4W004A120V-003-R <sup>(2)</sup>	12	-	4	48	91		X
iEA48007A120V-000-R	12	10.8 - 13.2	7	78	91	X	
iEA48007A120V-001-R	12	10.8 - 13.2	7	78	91		X
iEA48007A120V-005-R <sup>(3)</sup>	12	10.8 - 13.2	6.5	78	91		X
iEA48005A150V-001-R	15	13.5 - 16.5	4.5	67.5	90		X
iEA48004A180V-001-R	18	16.2 - 19.8	3.75	67.5	90.5		X
iEA48003A280V-001-R	28	19.6 - 30.8	2.67	75	90		X

Note: (2) 0.11" pin length, input voltage 18 - 60V, (3) 0.2" pin length

### Preferred

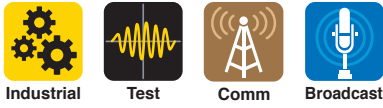
## Recommended Footprint (Top view)



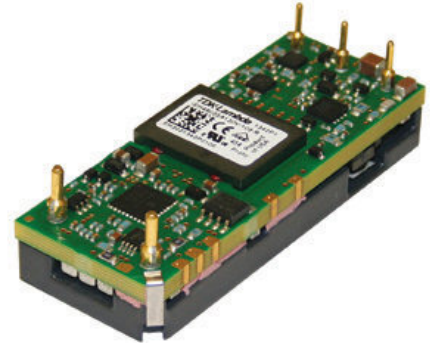
## Pinout

Pin#	Function
1	Vin (+)
2	On / Off
3	Vin (-)
4	Vout (-)
5	Sense (-)
6	Trim
7	Sense (+)
8	Vout (+)





## 300-317W Eighth Brick Converter



Features	Benefits
300W in Eighth Brick package	Saves space on application board
Digital adaptive Control	For fast transient response
Up to 95.5% efficiency	Reduces system heat
Constant switching frequency	Predictable EMI
Baseplate cooling	Better system thermal management

Specification		iEH	
Model			
Nominal Output Voltage	VDC	10.8	12
Input Voltage Range	VDC	36-75	36-75*
Ripple & Noise (max) (pk-pk) (1)	mV	150	120
Line Regulation (max)	mV	50	60
Load Regulation (max)	mV	100	60
Overload Protection Threshold (3)	A	36	29.5
Overvoltage Protection (Typ) (2)	VDC	13.1	14.8
Overtemperature Protection (3)	-	Yes	
Remote On / Off	-	Negative Logic	
Temperature (operating)	°C	-40°C to 124°C	-40°C to 130°C
Temperature (storage)	°C	-55°C to 125°C	-55°C to 125°C
Humidity (operating)	%RH	20-95% RH Non condensing	
Humidity (storage)	%RH	10-95% RH Non condensing	
Cooling	-	Conduction, convection or forced air (see detailed datasheet for derating)	
Isolation Voltage	VDC	2250VDC Input to Output, 1500VDC Input to Baseplate	
Vibration (non operating)	-	5-50Hz @ 0.5g (4.9m/s <sup>2</sup> ), and 50-500Hz @ 1.5g (14.7m/s <sup>2</sup> ) per Bellcore TR-EOP-000063-5.4.4	
Shock	-	196.1m/s <sup>2</sup>	
Safety Agency Approvals	-	UL60950 (US and Canada), CB scheme IEC 60950-1 (2nd edition) AM1, CE Mark EN 60950-1/A12	
Weight (max)	g	50	
Size	mm.	50.42 x 22.86 x 12.70	
Warranty	yrs	3	

### Notes

\*When operating below 40V input, the module will operate, but load regulation may be out of specification.

(1) See website for detailed specification and test methods.

(2) Latching

(3) Non-Latching

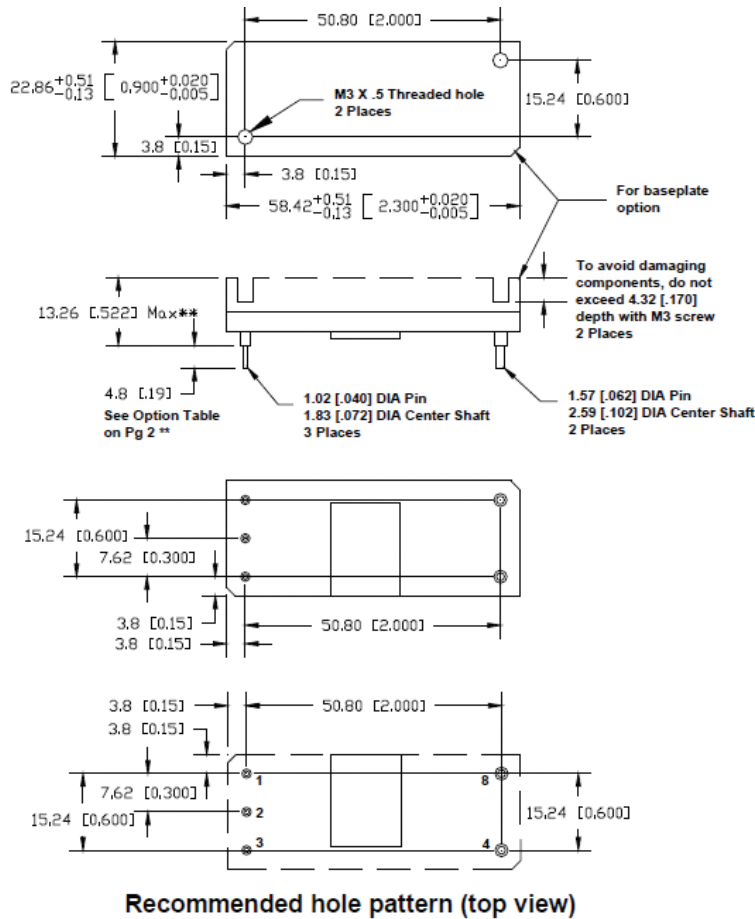


## Model Selector

Model	Input Voltage (V)	Output Voltage (V)	Drop Share	Max. Curr. (A)	Max. Output Power (W)	Base Plate	OVP	Efficiency at Full Load (%)	Pin Length (in)
iEH48028A108V-103-R	36-75	10.8	No	28	300	Yes	Non-Latch	94	0.145
iEH48028A108V-109-R	36-75	10.8	No	28	300	Yes	Latch	94	0.190
iEH48025A120V-003-R	36-75	12	No	25	300	No	Non-Latch	94.6	0.145
iEH48025A120V-103-R	36-75	12	No	25	300	Yes	Non-Latch	94.6	0.145
iEH48025A120V-107-R	36-75	12	No	25	300	Yes	Non-Latch	94.6	0.190
iEH48025A120V-109-R	36-75	12	No	25	300	Yes	Latch	94.6	0.190

PREFERRED MODEL

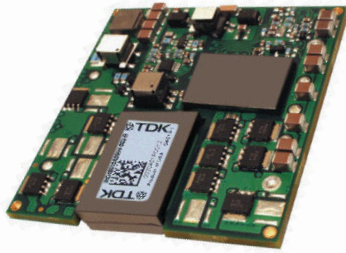
## Outline Drawing iEH Series



## Pin Assignment

PIN	Function	PIN	Function
1	Vin (+)	5	None
2	On / Off	6	None
3	Vin (-)	7	None
4	Vo (-)	8	Vo (+)





- Standard Half Brick Footprint (DOSA)
- 36 - 75VDC Input
- 12V Nominal Output
- Through Hole Mounting
- 1500VDC Basic Isolation

## iHG Series

300 - 456W, 48V Input  
Half Brick Converter

### iHG Features and Benefits

#### Features

- High operating efficiency (up to 92.5%)
- Constant switching frequency
- Low component count

#### Benefits

- Reduced system heating
- Easier system filtering
- Higher reliability

### Specifications

MODEL		iHG48025A120V-101-R	iHG48038A120V-109-R
ITEMS			
Nominal Output Voltage	VDC	12	12
Input Voltage Range	VDC	36 - 75	38 - 75
Efficiency	%	94	92.5
Ripple & Noise (max)(pk-pk) (1)	mV	250	280
Line Regulation (max)	mV	12	15
Load Regulation (max)	mV	10	15
Overload Protection Threshold (3)	A	30	45
Overvoltage Protection (2)	VDC	14.7	14.7
Overtemperature Protection (3)	-	Yes	
Remote Sense	-	yes	
Remote On-Off	-	Negative Logic	
Temperature (operating)	°C	-40°C to +116°C	
Temperature (storage)	°C	-55°C to +125°C	
Humidity (operating)	-	20 to 95% (non-condensing)	
Humidity (storage)	-	10 to 95% (non-condensing)	
Cooling	-	Convection or Forced Air	
Isolation Voltage	VDC	1500	
Vibration (non operating)	-	5 to 50Hz@0.5g (4.9m/s <sup>2</sup> ), and 50 to 500Hz@1.5g (14.7m/s <sup>2</sup> ) per Bellcore TR-EOP-000063-5.4.4	
Shock	-	50 G at 6ms pulse in three axes	
Safety Agency Approvals	-	UL60950 (US and Canada), VDE0805, CB scheme (IEC950), CE Mark (EN60950)	
Weight (max)	g	105	
Size	mm	59.94 x 56.90 x 13.21	
Warranty	yrs	3	

#### Notes:

- (1) Measured across one 10 $\mu$ f, one 0.47 $\mu$ f, one 0.1 $\mu$ f ceramic capacitors, and one 220 $\mu$ f electrolytic capacitor. BW = 20MHz.
- (2) Latching
- (3) Non-latching





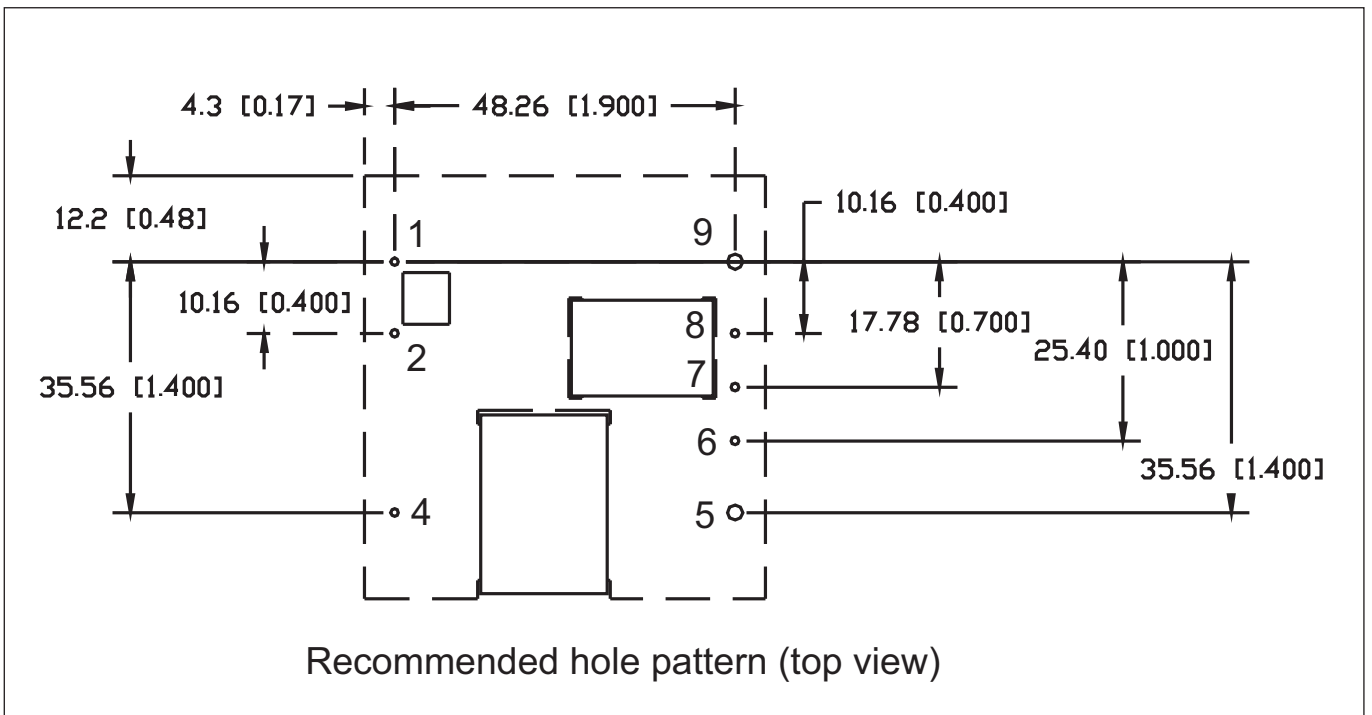
## Model Selector

Model	Input Volt. (V)	Output Volt. (V)	Adjust Range (V)	Output Current (A)	Max. Output Power (W)	On/Off Logic	Pin Length (in)
iHG48025A120V-101-R	36 - 75	12	6 - 13.2	25	300	Neg	0.145
IHG48038A120V-109-R	38 - 75	12	6 - 13.2	38	456	Neg	0.180

Preferred

NB other configurations on request

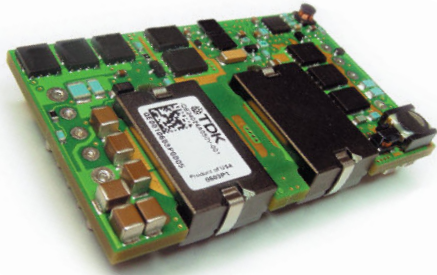
## Hole Pattern (Top View) iHG



## Pinout

PIN	Function	PIN	Function
1	Vin (+)	6	Sense (-)
2	On / Off	7	Trim
3	N / A	8	Sense (+)
4	Vin (-)	9	Vout (+)
5	Vout (-)		





- Standard Quarter Brick Footprint
- 36-75VDC & Wide Range 18-60V Inputs
- 5V 30A - 15V 10A Nominal Outputs
- Through Hole Mounting
- Low 10.41mm Profile
- 1500VDC Basic Isolation

## iQE Series

108 - 204W

Quarter Brick Converter

### iQE Features and Benefits

#### Features

- High operating efficiency (>90%)
- Constant switching frequency
- Low component count

#### Benefits

- Reduced system heating
- Easier system filtering
- Higher reliability

Specifications		iQE Series			
ITEMS	MODEL	3.3*	5	12	15
Nominal Output Voltage	VDC	3.3*	5	12	15
Input Voltage Range	VDC	See model Selector			
Input Current (max)	A	10			
Output Voltage Tolerance	VDC	3.2 - 3.4	4.85 - 5.15	11.58 - 12.42	14.48 - 15.52
Ripple & Noise (max) (pk to pk) (1)	mV	150	150	150	150
Line Regulation (max)	mV	10	15	30	30
Load Regulation (max)	mV	10	30	30	30
Overload Protection (typ)	%	Inception - 133-158% of rated output; Short circuit - auto recovery			
Overvoltage Protection	VDC	3.8 - 4.6	5.7 - 6.7	13.6 - 16.5	16.7 - 21
Remote Sense	-	Yes			
Remote On / Off	-	Positive or Negative Logic available, see Model Selector			
Temperature (operating)	°C	-40°C to +125°C			
Temperature (storage)	°C	-55°C to +125°C			
Humidity (operating)	-	20 - 95% RH Non condensing			
Humidity (storage)	-	10 - 95% RH Non condensing			
Cooling	-	Convection or forced air			
Isolation Voltage	VDC	1500			
Vibration (non operating)	-	5 to 50Hz @ 0.5g (4.9m/s <sup>2</sup> ), and 50 to 500Hz @ 1.5g (14.7m/s <sup>2</sup> ) per Bellcore TR-EOP-000063-5.4.4			
Shock	-	196.1m/s <sup>2</sup>			
Safety Agency Approvals	-	UL60950 (US and Canada), VDE0805 (IEC60950), CB scheme (IEC60950)			
Weight (max)	g	50			
Size	mm	57.9 x 36.8 x 10.41			
Warranty	yrs	3			

**Notes:** (1) Measured across one 22 $\mu$ F and one 0.1 $\mu$ F ceramic capacitor; BW = 20MHz \* Last time buy Sept 2017



Model Selector						
Model	Input Voltage (V)	Output Voltage (V)	Adjust Range (V)	Max. Current (A)	Max. Output Power (W)	Efficiency
IQE24009A120V-001-R*	18-36	12	10.8-13.2	9	108	88
IQE24024A050V-001-R*	18-36	5	4.5-5.5	24	120	90
IQE24030A033V-001-R*	18-36	3.3	2.97-3.63	30	99	90
IQE48010A150V-007-R	36-75	15	13.5-16.5	10	150	91
IQE48017A120V-001-R	36-75	12	10.8-13.2	17	204	93
IQE48030A050V-001-R	36-75	5	4.5-5.5	30	150	91
IQE4W011A120V-001-R	18-60	12	10.8-13.2	11	132	90

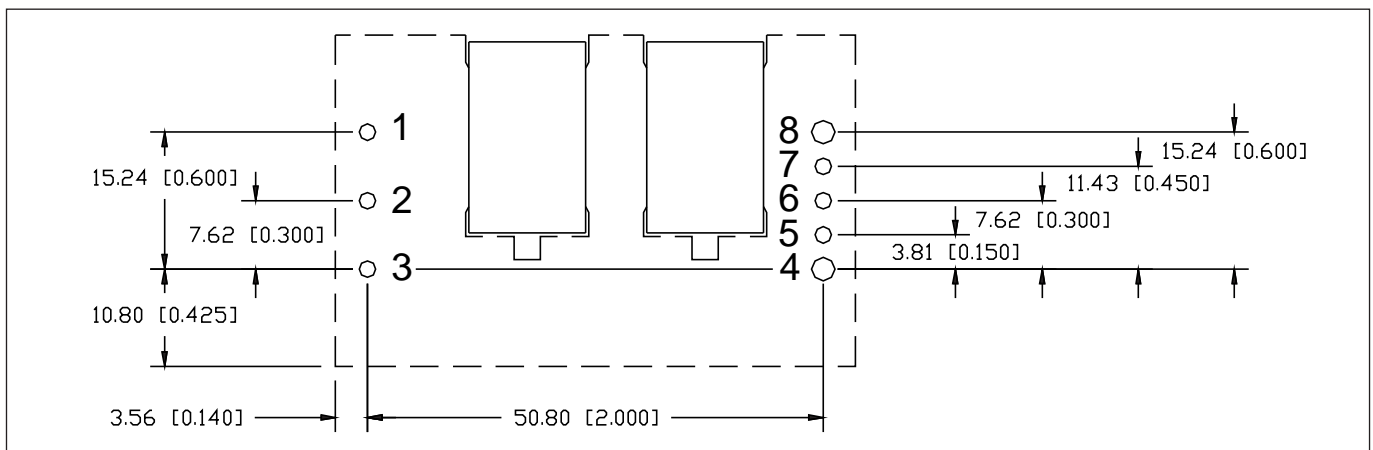
**Preferred**

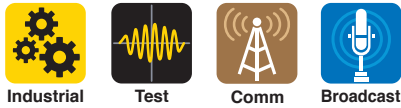
NB: other configurations on request \* Last time buy Sept 2017

Feature Set					
Feature Set	Positive Logic On / Off	Negative Logic On / Off	0.110" Pin Len.	0.180" Pin Len.	0.145" Pin Len.
01		X			X
07		X		X	

PIN Out	
PIN	Function
1	Vin (+)
2	On / Off
3	Vin (-)
4	Vout (-)
5	Sense (-)
6	Trim
7	Sense (+)
8	Vout (+)

### Recommended Hole Pattern (Top View)





## 300-504W Quarter Brick Converters



Features	Benefits
• High Operating Efficiency (up to 94.5%)	• Reduces Heat in System
• Constant Switching Frequency	• Predictable EMI
• Starts with Pre-biased Output	• Monotonic Start-up
• Baseplate Cooled	• Better System Thermal Management
• Parallel Operation (400W model)	• For High Power Systems

Specification		iQG48033A120V-000-109	iQG48033A120V-1D1 & 1D9	iQG48042A120V-109 & 1U9
Nominal Output Voltage	VDC	12V	12V	12V
Input Voltage Range	VDC	36 - 75VDC		39 - 75VDC
Input Current (max)	A	10.5A		15A
Efficiency (48V Input)	%	94.5%		
Output Voltage Tolerance	VDC	11.5 - 11.85	11.6 - 12.0	11.93 - 12.35
Output Voltage Adjustment	-	None		
Ripple & Noise (max) (pk - pk)	mV	125mV	150mV	175mV
Line Regulation (typical)	mV	20mV		12mV
Load Regulation (typical)	mV	35mV	n/a	35mV (-109 only)
Overload Protection (typ)	A	39A (non-latching)		52A (non-latching)
Overvoltage Protection	VDC	13.7 - 15.6 (latching)		
Remote Sense	-	No	Yes	No
Remote On / Off	-	Negative		
Current Share (Droop Mode)	-	No	Yes	(-1U9 only)
Current Share Accuracy	-	±10% (50-100% of total load)		
Temperature (operating)	°C	-40°C to 124°C (1)		-40°C to 125°C (1)
Temperature (storage)	°C	-55°C to 125°C		
Humidity (operating)	%RH	20-95% RH Non Condensing		
Humidity (storage)	%RH	10-95% RH Non Condensing		
Cooling	-	Conduction, convection, or forced air (See detailed datasheet for derating)		
Isolation Voltage	VDC	1500VDC Input to Output, Input to Baseplate		
Vibration (non operating)	-	5-50Hz @ 0.5g (4.9m/s <sup>2</sup> ) and 50-500Hz @ 1.5g (14.7m/s <sup>2</sup> ) per Bellcore TR-EOP-000063-5.4.4		
Shock	-	196.1m/s <sup>2</sup>		
Safety Agency Certifications	-	UL60950-1 (US and Canada), VDE0805 (IEC60950-1), CB scheme (IEC60950-1), CE Mark		
Weight	g	70g		88g
Size (LxWxH)	mm	57.91 x 36.83 x 13.21		57.91 x 36.83 x 13.97
Warranty	Yrs	3		

**Note:** See website for detailed specifications and test methods

**Note:** (1) See detailed datasheet for derating

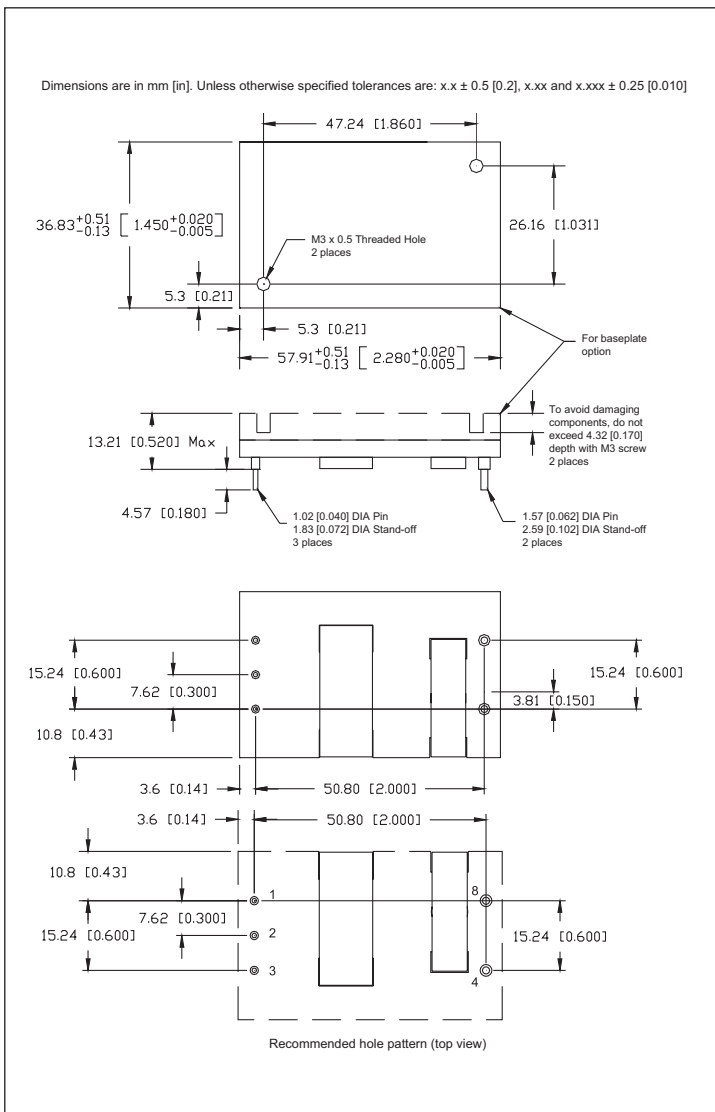


## Model Selector

Model	Input Voltage (V)	Output Voltage (V)	Max. Curr. (A)	Max. Output Power (W)	On/Off Polarity	Pin Length	Base Plate
iQG48047A096V-1D1-R	36 - 75	9.6	47	450	Neg	0.145"	Yes
iQG48025A120V-001-R	36 - 75	12	25	300	Neg	0.145"	No
iQG48025A120V-101-R	36 - 75	12	25	300	Neg	0.145"	Yes
iQG48025A120V-009-R	36 - 75	12	25	300	Neg	0.180"	No
iQG48025A120V-109-R	36 - 75	12	25	300	Neg	0.180"	Yes
iQG48033A120V-109-R	36 - 75	12	33	396	Neg	0.180"	Yes
iQG48033A120V-1D9-R	36 - 75	12	33	396	Neg	0.180"	Yes
iQG48033A120V-101-R	36 - 75	12	33	400	Neg	0.145"	Yes
iQG48033A120V-1D1-R	36 - 75	12	33	400	Neg	0.145"	Yes
iQG48033A120V-009-R	36 - 75	12	33	400	Neg	0.180"	No
iQG48042A120V-109-R	39 - 75	12	42	504	Neg	0.180"	Yes
iQG48042A120V-1U9-R	39 - 75	12	42	504	Neg	0.166"	Yes

## Preferred

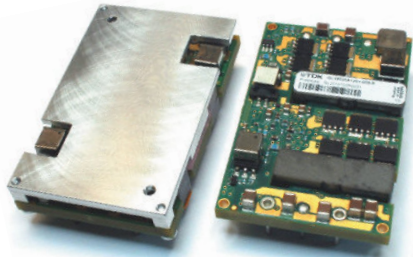
## Recommended Footprint (Top View) iQG Series



## Pin Assignment

PIN	Function	PIN	Function
1	Vin (+)	5	None
2	On / Off	6	None
3	Vin (-)	7	None
4	Vout (-)	8	Vout (+)





- Standard Quarter Brick Footprint
- 18-36 & 36-75VDC Inputs
- 2.5V to 28V Nominal Outputs
- Through Hole Mounting
- 1500VDC Basic Isolation
- Baseplate Cooling

## iQL Series

72-308W

Quarter Brick Converter

### iQL Features and Benefits

Features	Benefits
<ul style="list-style-type: none"> <li>• High operating efficiency (up to 94%)</li> <li>• Constant switching frequency</li> <li>• Baseplate</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced system heating</li> <li>• Easier system filtering</li> <li>• Conduction or heatsink cooling</li> </ul>

Specifications		iQL				
ITEMS	MODEL	2.5	3.3	5	12	28
Nominal Output Voltage	VDC	2.5	3.3	5	12	28
Input Voltage Range	VDC	See Model Selector				
Ripple & Noise (max)(pk-pk) (1) mV	30	70	80	100	120	500
Line Regulation (max)	mV	5	6.6	10	60	100
Load Regulation (max)	mV	5	15	10	60	100
Overload Protection Threshold (3)	A	69	70	50	27.5	12.4
Overvoltage Protection (Typ) (2)	VDC	3.1	4.1	6.1	14.7	33.6
Overtemperature Protection (3)	-	Yes				
Remote Sense	-	Yes except 8.3V models and above				
Remote On / Off	-	Negative Logic				
Temperature (operating)	°C	-40°C to +115°C		-40°C to +125°C	-40°C to +118°C	-40°C to +115°C
Temperature (storage)	°C	-55°C to +125°C				
Humidity (operating)	-	20 to 95% (non-condensing)				
Humidity (storage)	-	10 to 95% (non-condensing)				
Cooling	-	Conduction, convection, or forced air				
Isolation Voltage	VDC	1500 Input - Output, 1500 Input - Baseplate				
Vibration (non operating)	-	5 to 50Hz@0.5g (4.9m/s <sup>2</sup> ), and 50 to 500Hz@1.5g (14.7m/s <sup>2</sup> ) per Bellcore TR-EOP-000063-5.4.4				
Shock	-	50 G at 6 ms pulse in three axes				
Safety Agency Approvals	-	UL60950 (US and Canada), VDE0805, CB scheme IEC950), CE Mark (EN60950)				
Weight (max)	g	55g open-frame, 70g with the base-plate				
Size	mm	57.9 x 36.8 x 13.21				
Warranty	yrs	3				

**Notes:**

- (1) See Website for detailed specifications and test methods
- (2) Latching
- (3) Non-latching



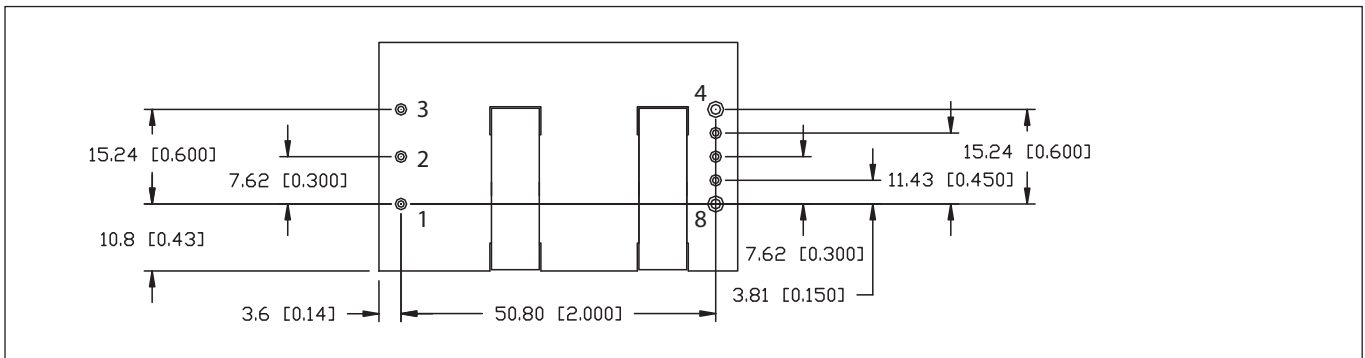
## Model Selector

Model	Input Voltage (V)	Output Voltage (V)	Adjust Range (V)	Max. Curr. (A)	Max. Output Power (W)	Base Plate	Efficiency at Full Load (%)	Pin Length (in)
iQL48060A025V-0B3-R (3)	36 - 75	2.5	2.0 - 2.75	60	150.0	No	89.0	0.145
iQL48060A025V-0B9-R	36 - 75	2.5	2.0 - 2.75	60	150.0	No	89.0	0.180
iQL24050A033V-009-R	18 - 36	3.3	2.64 - 3.63	50	165.0	Yes	90.5	0.180
iQL48060A033V-003-R (3)	36 - 75	3.3	2.64 - 3.63	60	198.0	Yes	91.0	0.145
iQL48060A033V-009-R	36 - 75	3.3	2.64 - 3.63	60	198.0	Yes	91.0	0.180
iQL48060A033V-0B9-R	36 - 75	3.3	2.64 - 3.63	60	198.0	No	91.0	0.180
iQL24040A050V-001-R (2)	18 - 36	5.0	4.0 - 5.5	40	200.0	Yes	91.0	0.145
iQL24040A050V-009-R	18 - 36	5.0	4.0 - 5.5	40	200.0	Yes	91.0	0.180
iQL48045A050V-001-R	36 - 75	5.0	4.0 - 5.5	45	225.0	Yes	91.0	0.145
iQL48045A050V-003-R (3)	36 - 75	5.0	4.0 - 5.5	45	225.0	Yes	91.0	0.145
iQL48045A050V-0B3-R (3)	36 - 75	5.0	4.0 - 5.5	45	225.0	No	91.0	0.145
iQL48045A050V-009-R	36 - 75	5.0	4.0 - 5.5	45	225.0	Yes	91.0	0.180
iQL48045A050V-0B9-R	36 - 75	5.0	4.0 - 5.5	45	225.0	No	91.0	0.180
iQL24021A120V-001-R (2)	20 - 36	12.0	9.6 - 13.2	21	252.0	Yes	92.0	0.145
iQL24021A120V-009-R	20 - 36	12.0	9.28 - 12.76	21	252.0	Yes	92.0	0.180
iQL48025A120V-009-R	36 - 75	12.0	9.6 - 13.2	25	300.0	Yes	93.5	0.180
iQL48025A120V-0B9-R	36 - 75	12.0	9.6 - 13.2	25	300.0	No	93.5	0.180
iQL48025A120V-001-R	36 - 75	12.0	9.6 - 13.2	25	300.0	Yes	94.0	0.145
iQL48011A280V-008-R	36 - 75	28.0	22.4 - 30.8	11	308.0	Yes	92.5	0.180
iQL48011A280V-009-R	36 - 75	28.0	22.4 - 30.8	11	308.0	Yes	92.5	0.180

### Preferred

Note: (2) Latching (3) Non-latching

## Recommended Footprint (Top View) iQL Series



### Feature Set

Feature Set	On / Off Logic	Trim Pin	Pin Length (inches)	Base Plate
00	Positive	Yes	0.145	Yes
01	Negative	Yes	0.145	Yes
08	Positive	Yes	0.180	Yes
<b>09*</b>	<b>Negative</b>	<b>Yes</b>	<b>0.180</b>	<b>Yes</b>
B8	Positive	Yes	0.180	No
<b>B9*</b>	<b>Negative</b>	<b>Yes</b>	<b>0.180</b>	<b>No</b>
L8	Positive	No	0.180	Yes
L9	Negative	No	0.180	Yes

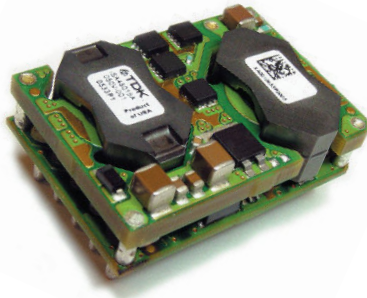
#### \* Preferred feature set

Model Number Example: iQL48030A096V-009-R

### Pinout

PIN	Function	PIN	Function
1	Vin (+)	5	Sense (-) (if applicable-not fitted on 8.3V or above)
2	On / Off	6	Trim
3	Vin (-)	7	Sense (+) (if applicable-not fitted on 8.3V or above)
4	Vo (-)	8	Vo (+)





- Standard Sixteenth Brick Footprint (DOSA)
- 36-75VDC Input
- 3.3V 25A - 12V 6.5A Nominal Outputs
- Through Hole Mounting
- Low 12.7mm Profile
- 1500VDC Basic Isolation

## iSA Series

75 - 82.5W

Sixteenth Brick Converter

### iSA Features and Benefits

#### Features

- High operating efficiency (up to 90%)
- Constant switching frequency
- 44% smaller than eighth brick

#### Benefits

- Reduced system heating
- Easier system filtering
- Optimization of board space

Specifications		iSA480		
ITEMS	MODEL			
Nominal Output Voltage	VDC	3.3	5	12
Input Voltage Range	VDC	36 to 75		
Input Current (max)	A	4		
Output Voltage Tolerance	VDC	3.20-3.40	4.85-5.15	11.58-12.42
Ripple & Noise (max) (pk to pk)	mV	100		200
Line Regulation (max)	mV	7	10	24
Load Regulation (max)	mV	8	10	24
Overload Protection	%	Inception- 130-147% of rated output; Short circuit auto recovery		
Overvoltage Protection	VDC	3.75-4.65	5.7-6.7	13.6-15.7
Remote Sense	-	Yes		
Remote On/Off	-	Negative Logic		
Temperature (operating)	°C	-40°C to +125°C		
Temperature (storage)	°C	-55°C to +125°C		
Humidity (operating)	-	20 - 95% RH Non condensing		
Humidity (storage)	-	10 - 95% RH Non condensing		
Cooling	-	Convection or forced air		
I/O Isolation Voltage	VDC	1500		
Vibration (non operating)	-	5 to 50Hz @ 0.5g (4.9m/s <sup>2</sup> ), and 50 to 500Hz @ 1.5g (14.7m/s <sup>2</sup> ) per Bellcore TR-EOP-000063-5.4.4		
Shock	-	196.1m/s <sup>2</sup>		
Safety Agency Approvals	-	UL60950 (US and Canada), VDE0805 (IEC60950), CB scheme (IEC60950), CE Mark (LVD)		
Weight (max)	g	30.4		
Size	mm	33 x 22.9 x 12.7		
Warranty	yrs	3		





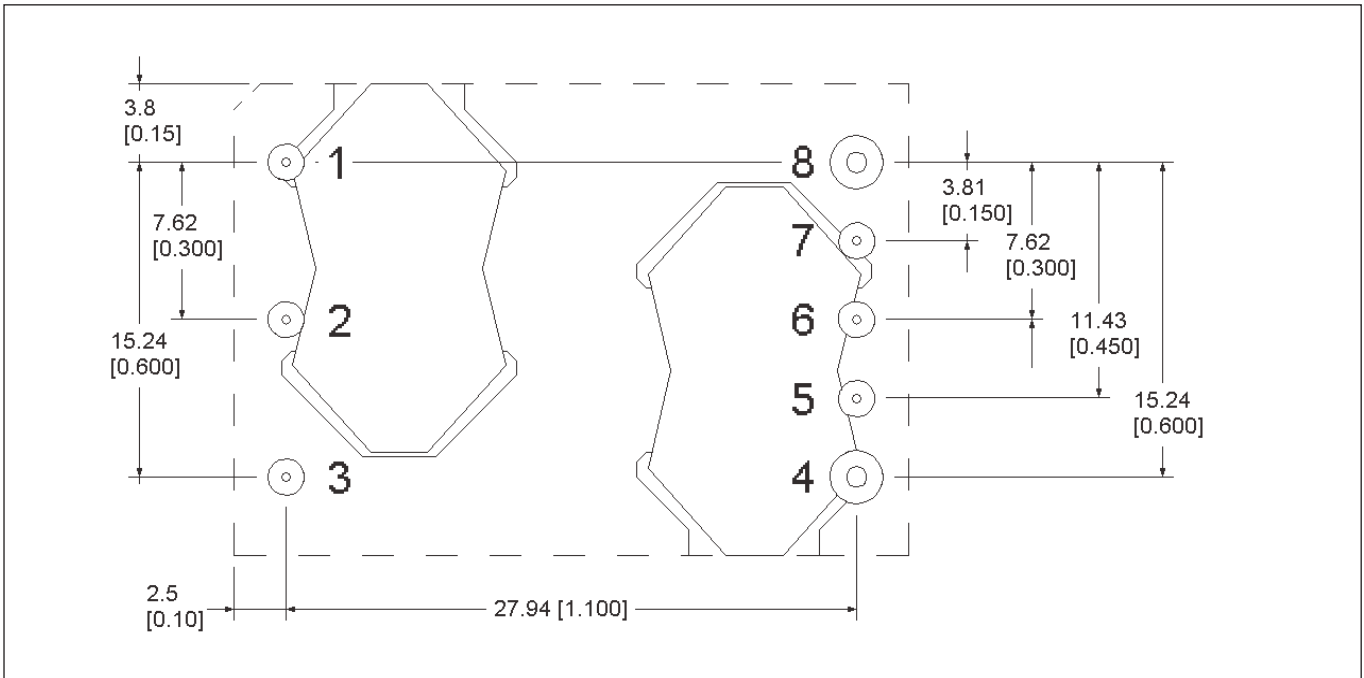
## Model Selector

Model	Voltage (V)	Adjust Range (V)	Max. Curr. (A)	Max. Output Power (W)	Efficiency at Full Load (%)
iSA48007A120V-001-R	12	10.8 - 13.2	6.5	78	90
iSA48015A050V-001-R	5	4.5 - 5.5	15	75	90
iSA48025A033V-001-R	3.3	2.97 - 3.63	25	82.5	88

**Preferred**

NB other configurations on request

## Recommended Hole Pattern



## Feature Set

Feature Set	Positive Logic On / Off	Negative Logic On / Off	0.110" Pin Len.	0.180" Pin Len.	0.145" Pin Len.	Latching OVP
01		X			X	

## PIN Assignments

Pin	Function
1	Vin (+)
2	On / Off
3	Vin (-)
4	Vout (-)
5	Sense (-)
6	Trim
7	Sense (+)
8	Vout (+)





## PAE50/100 Series

High Efficiency Eighth Brick  
DC-DC Converters

- Output currents up to 30A
- RoHS Compliant
- Industry Standard Package and Pinout
- 24V - 48V Input Models
- Output Voltage Adjustment
- Remote On/Off

### Key Market Segments & Applications

Telecommunications  
Data Communications  
Networking Equipment  
Test Equipment  
Industrial Electronics  
Distributed Power Architecture

### PAE50/100 Features and Benefits

#### Features

- High Efficiency
- Same Pinout as Quarter Bricks
- Meets Basic Isolation

#### Benefits

- Reduces System Heating
- Reduces PCB Area
- Assists Safety Approval

Specifications		MODELS	PAE50S24	PAE50S48 PAE100S48
ITEMS				
Input Voltage Range	VDC		18-36	36-76
Output Voltage Accuracy	%			±1
Max Ripple & Noise	mV			100
Max Line Regulation	mV			10
Max Load Regulation	mV			10
Overcurrent Protection (1)	-		PAE50 models 105% - 150%, PAE100 models 105% - 140%	
Overvoltage Protection (max) (2)	-		115% - 135% (120%-140% PAE50S48-5 + PAE100S48-5 only)	
Remote Sense	-			Yes
Remote On / Off	-		Yes (open = off; short to 0V = on)	
Operating Temperature	°C		-40 to +85	
Operating Humidity	-		5 - 95% RH (non-condensing)	
Storage Temperature	°C		-40 to +100	
Storage Humidity	-		5 - 95% RH (non-condensing)	
Cooling	-		Convection or Forced Air	
I/O Isolation Voltage	-		Input to Output 1500VDC	
Vibration (non operating)	-		10 - 55Hz (1 minute), Amplitude 0.825mm (49m/s <sup>2</sup> max) X, Y, Z 1 hour	
Shock	-		< 196.1 m/s <sup>2</sup>	
Safety Agency Approvals	-		IEC/EN/UL/CSA60950-1, IEC/EN/UL/CSA62368-1 and CE Mark	
Weight (Typ)	g		25	
Size (WxHxD)	mm		22.76 X 8.5 X 57.9 (See Outline Drawing)	
Warranty	-		2 Years	

**Notes:** (1) Converter shut down, auto restart. (2) Auto restart on /V models

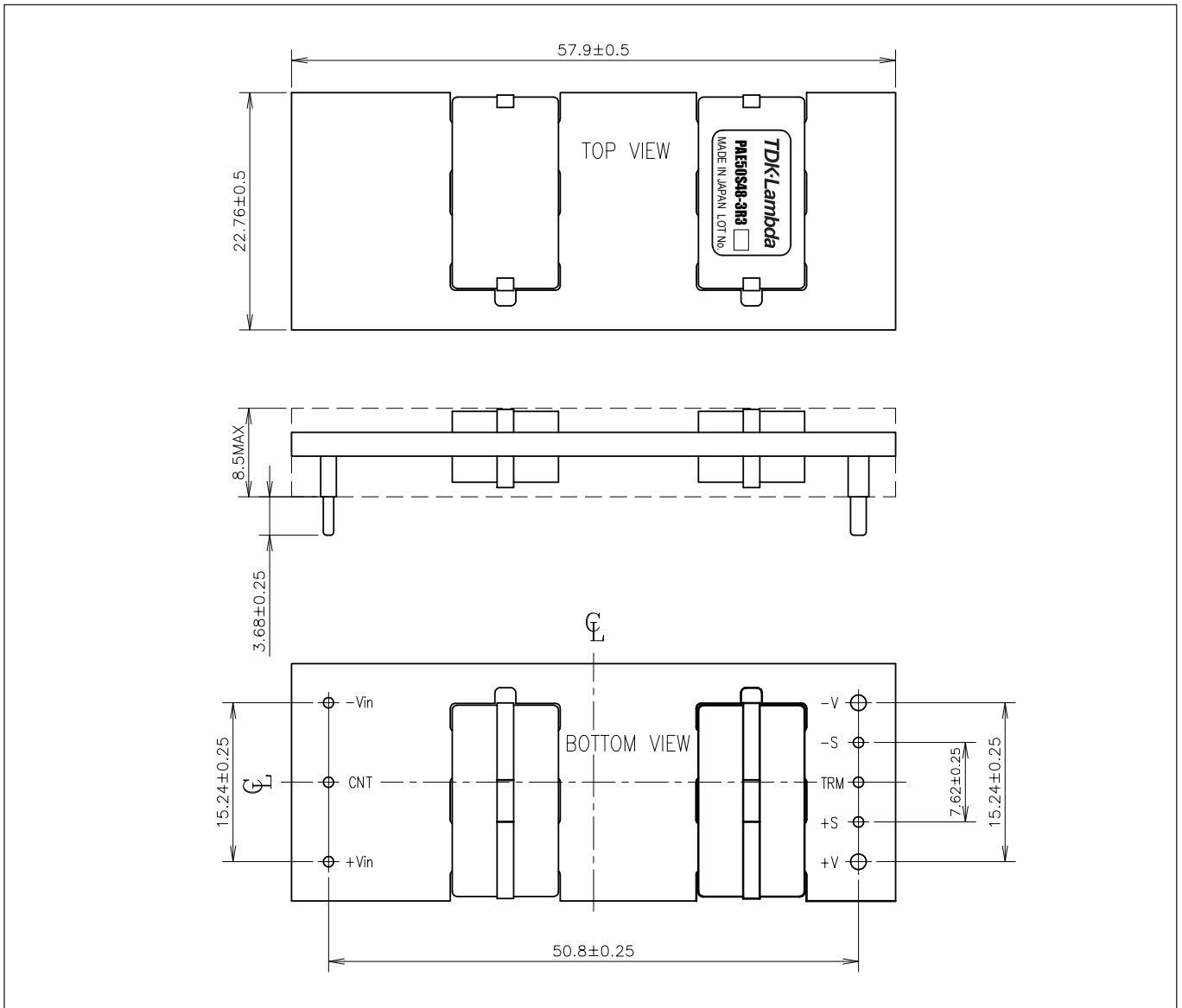


Model Selector						
Models	Voltage (V)	Adjust Range	Max. current (A)	Max. Output Power (W)	Efficiency at Full Load (%)	Input Current (A)
PAE50S48-1R8	1.8	1.44 - 1.98	20	36.0	87	0.87
PAE100S48-1R8	1.8	1.44 - 1.98	30	54.0	87	1.30
PAE50S48-2R5	2.5	2.00 - 2.75	18	45.0	89	1.06
PAE100S48-2R5	2.5	2.00 - 2.75	25	62.5	89	1.47
PAE50S48-3R3	3.3	2.64 - 3.63	16	52.8	91	1.21
PAE100S48-3R3	3.3	2.64 - 3.63	25	82.5	91	1.89
PAE50S48-5	5.0	4.25 - 5.75	10	50.0	91	1.15
PAE100S48-5	5.0	4.25 - 5.75	20	100.0	91	2.29
PAE50S24-5	5.0	4.00 - 5.50	10	50.0	91	2.29
PAE50S24-6	6.0	4.80 - 6.60	8.4	50.4	91	2.31
PAE100S48-3R3/H	3.3	2.64 - 3.63	30	99.0	90	2.30

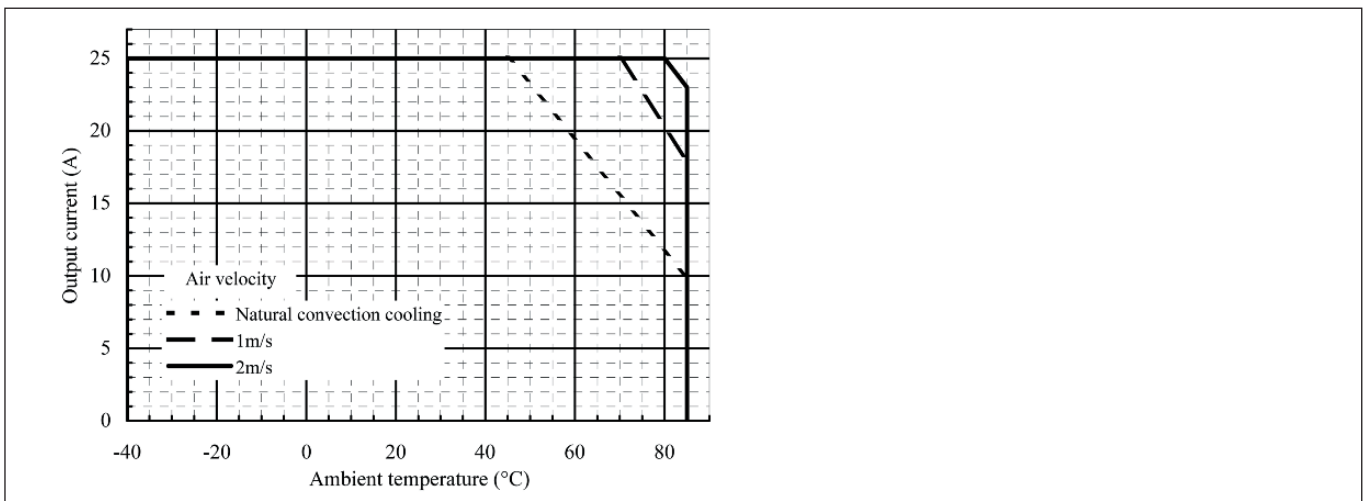
Remote On/Off Options	
Suffix	Function
Blank	Manual Reset
/V	Auto Reset (Preferred)



## Outline Drawing PAE50/100 Series



## Derating Curve PAE100S48-3R3





- Output Voltages from 7.2V to 57V
- Current Share
- Operation to +100°C Baseplate
- Wide Adjustable Output Range

## Key Market Segments & Applications

Servers & Rail Systems  
 High End Computers  
 Customer Power Supplies

## PAF450F280 & PAF600F280

200V to 400VDC Input Full Brick  
 DC-DC Converters

### PAF450F280 & PAF600F280 Features and Benefits

#### Features

- Wide adjustment range
- Parallel Pin
- High efficiency - up to 91%

#### Benefits

- Reduces need for custom modules
- Modules can be connected together for higher current
- Reduces Heat Loss

### Specifications

MODEL		PAF600F280-12 /PAF450F280-12	PAF600F280-24 /PAF450F280-24	PAF600F280-28 /PAF450F280-28	PAF600F280-48 /PAF450F280-48
ITEMS					
Nominal Output Voltage	VDC	12	24	28	48
Output Current (Max)	A	50/38	25/19	21.5/16.5	12.5/9.5
Max Output Power	W	600/456	600/456	602/462	600/456
Efficiency (Typ)	%	89/90	91	91	91
Input Voltage Range	VDC	200-400VDC			
Output Voltage Accuracy	%	±1			
Output Voltage Adjustment	VDC	7.2 - 14.4	14.4 - 28.8	16.8 - 33.6	28.8 - 57.6
Max Ripple & Noise	mV	120	240	280	480
Max Line Regulation	mV	48	56	56	96
Max Load Regulation	mV	48	56	56	96
Temperature Coefficient	°C	0.02%/°C			
Overcurrent Protection	%	105 - 140%			
Overvoltage Protection	%	125 - 145%			
Signals & Control	-	Remote sense, remote On/Off, Parallel Pin, Inverter Good, 10-14V Auxiliary voltage			
Baseplate Temperature	-	-40°C to +100°C Baseplate: (See derating chart)			
Humidity (non condensing)	-	5 - 95% RH Operating, 5 - 95% RH Non Operating			
Cooling	-	Conduction (See Installation Manual for heatsink selection)			
Isolation Voltage	-	Input to Baseplate: 2500VAC (20mA); Input to Output 3000VAC for 1 min.; Output to Baseplate: 500VDC for 1 min			
Shock	-	196.1m/s <sup>2</sup>			
Vibration	-	Non Operating, 10-55Hz (sweep for 1 min.) Amplitude 0.825mm constant (Max 49 m/s <sup>2</sup> ) X,Y,Z 1 hour each			
Safety Agency Approvals	-	UL60950-1, CSA60950-1, EN60950-1, CE LVD			
Weight (Typ)	g	200			
Size (WxHxD)	mm	61 x 12.7 x 116.8			
Warranty	yr	2			

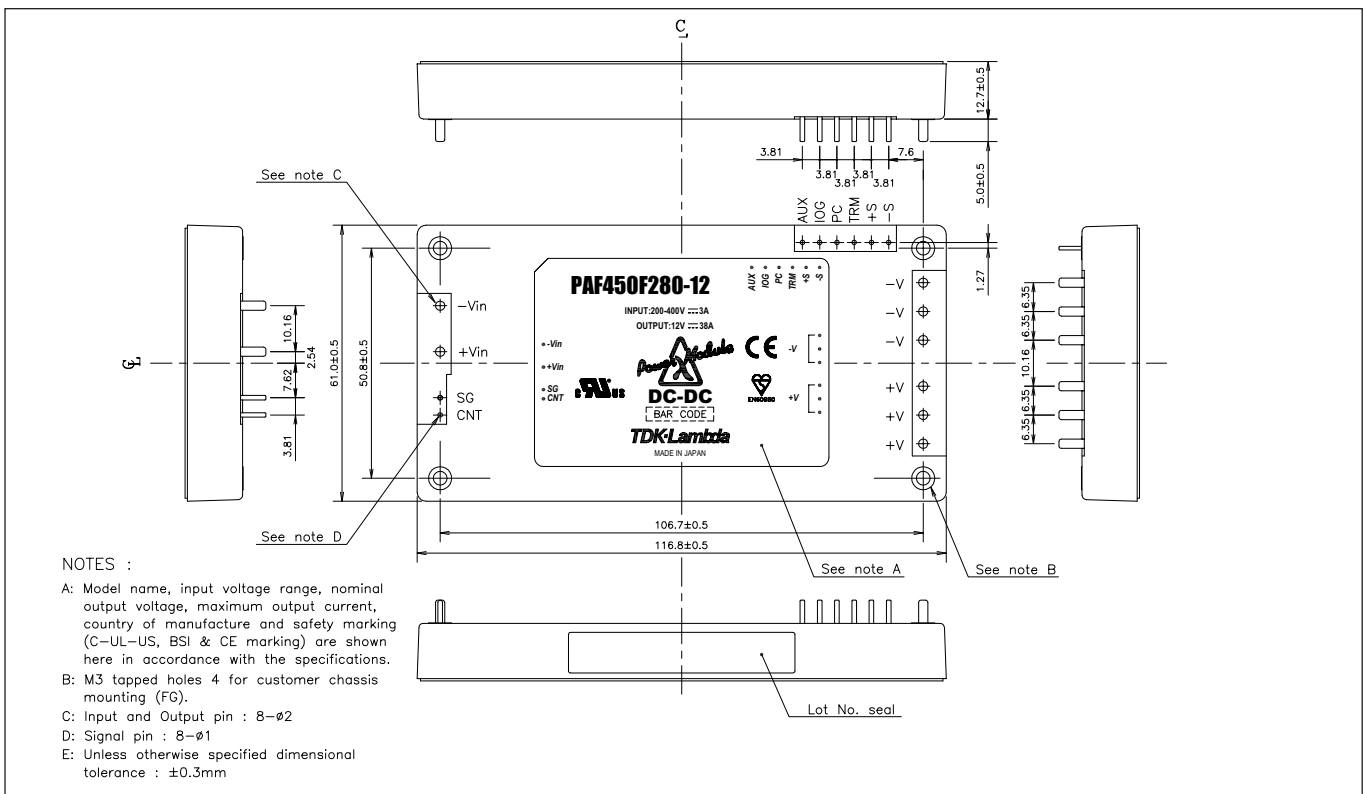
**Notes:** See Installation Manual for full details, test methods of parameters and application notes.



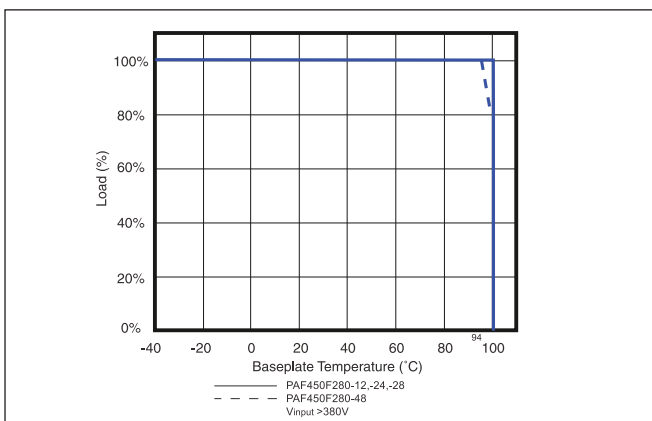
Pinout	
Pin Description	Function
-Vin	Negative Input Terminal
+Vin	Positive Input Terminal
CNT	Remote On/Off Negative Terminal
+V	Positive Output Terminal
-V	Negative Output Terminal
AUX	10-14V Aux Voltage
PC	Parallel Control Connection
TRIM	Output Adjustment Trim Pin
+S	Positive Remote Sense
-S	Negative Remote Sense
SG	Remote ON/OFF Return

Options	
Suffix	Description
Blank	M3 tapped mounting inserts (4)
/T	3.3mm non-threaded inserts (4)

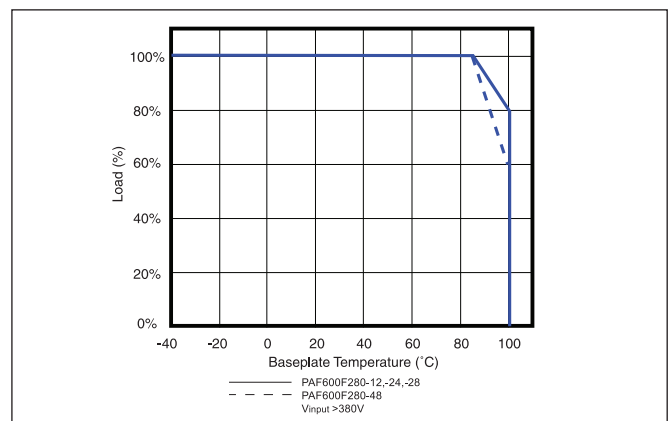
## Outline Drawing PAF450F280



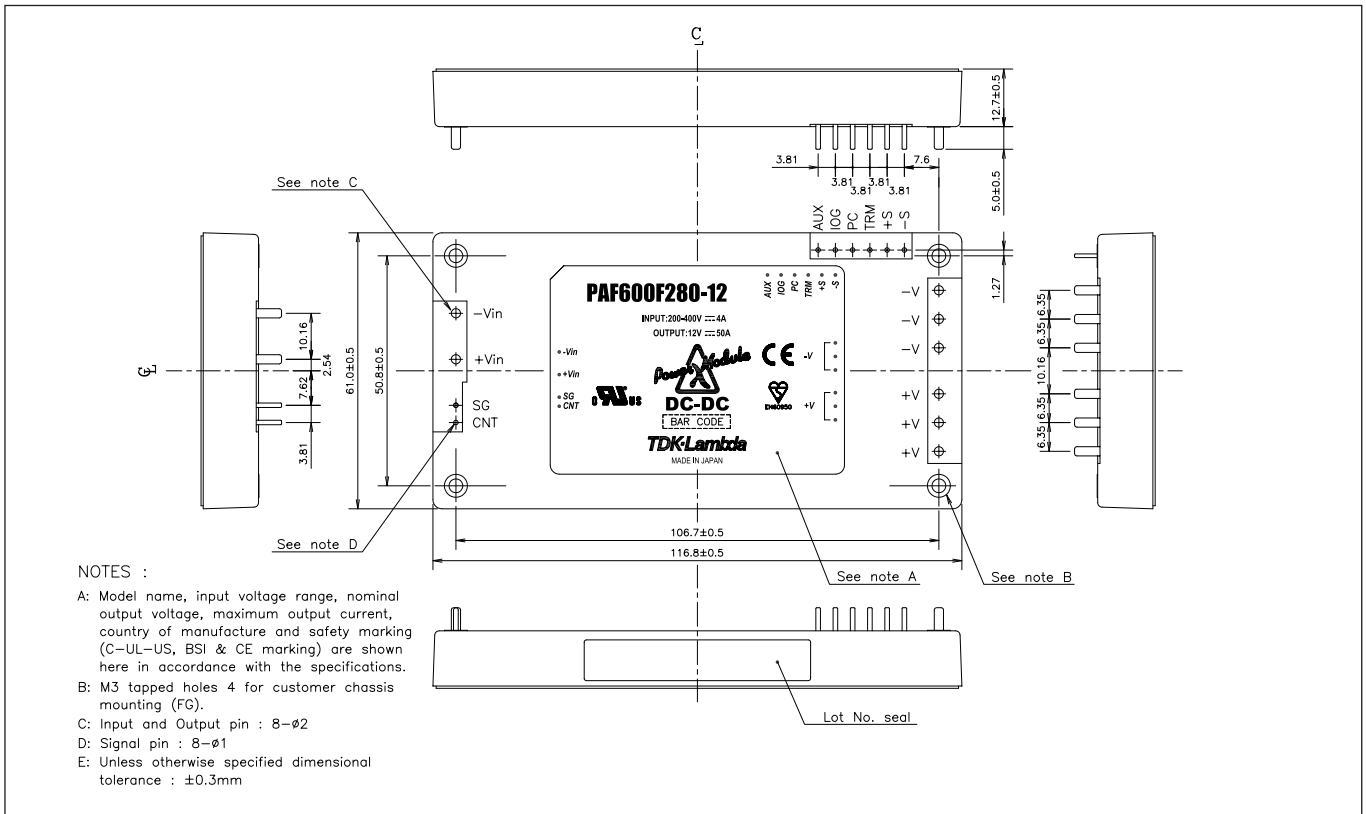
## Derating Curve PAF450F280



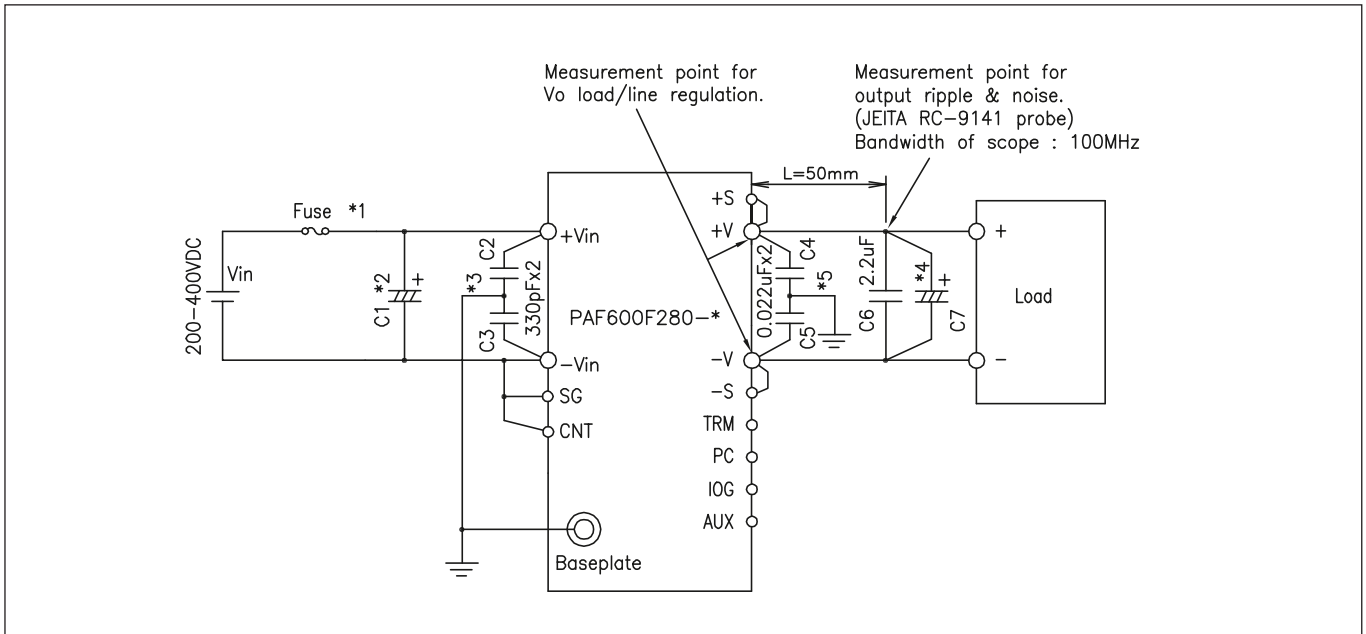
## Derating Curve PAF600F280



## Outline Drawing PAF600F280



## Connection Example





## PAF500F

24V & 48V Input Full Brick DC-DC Converters

- 12V output for driving non-isolated converters
- Safety Approved
- Up to 80A output current (48V models)
- Full power at 100°C baseplate
- Opto Isolated Remote On / Off
- Wide Adjustable Output Range

### Key Market Segments & Applications

Central Office:	ATM, Sonet, DSL, ISDN, Frame relay
Broadband:	Switching Equipment, Routers
Wireless/Cellular:	Micro Cells (larger in size/10 sq. mi.) Pico Cells (smaller in size/1 to 2 sq. mi.)
Remote Electronics:	Fixed Local Loop, Fiber Optic Transmission, Microwave Transmission, Wireless Local Loop
Customer Premise:	PBX, PABX, Datacomm, Voice Systems, Video Conferencing

### PAF500F Features and Benefits

#### Features

- Wide adjustment range
- Parallel Pin
- ASIC Design
- No potting materials

#### Benefits

- Reduces need for custom modules
- Modules can be connected together for higher current
- Reduced component count, increased MTBF
- Lower weight

### Specifications

MODEL		PAF500F48-3.3	PAF500F48-5	PAF500F24-12 PAF500F48-12	PAF500F24-28 PAF500F48-28
ITEMS					
Nominal Output Voltage	VDC	3.3	5	12	28
Output Current (Max)	A	80	80	42	18
Max Output Power	W	264	400	504	504
Efficiency (Typ)	%	78	83	89	90
Input Voltage range	VDC	36-76		19-36 or 36-76	18-36 or 36-76
Input Current (Typ) (24V/48V)	A	7.3	10.4	24 / 12.2	23.8 / 12.1
Output Voltage Accuracy	%	±1			
Output Voltage Adjustment	VDC	2 - 4	3 - 6	7.2 - 13.2	16.8 - 30.8
Max Ripple & Noise	mV	100	100	200	280
Max Line Regulation	mV	10	10	24	56
Max Load Regulation	mV	10	10	24	56
Overcurrent Protection	%	105 - 140%			
Overvoltage Protection	%	130-160	125-145	115-135	115-135
Signals & Control	-	Remote sense, remote On/Off, Parallel Pin, DC Good (12, 28V models), Adjustable OVP (3.3, 5V models), 7-10V Auxiliary voltage			
Operating Temperature	-	-40°C to +100°C baseplate			
Cooling	-	Conduction (See Installation Manual for heatsink selection)			
Isolation Voltage	VDC	Input - Baseplate 1500V, Input - Output 1500V, Output-Baseplate 500V			
Shock	-	196.1m/s <sup>2</sup>			
Vibration	-	Non Operating, 10-55Hz (sweep for 1 min.)			
Amplitude	-	0.825mm constant (Max 49m/s <sup>2</sup> ) X, Y, Z 1 hour each			
Safety Agency Approvals	-	UL60950-1, CSA60950-1, EN60950-1, CE LVD			
Weight (Typ)	g	250			
Size (WxHxD)	in(mm)	2.4x0.5x4.6 (61x12.7x116.8) See outline drawing			
Warranty	-	2 years			

**Notes:** See Installation Manual for full details, test methods of parameters and application notes.

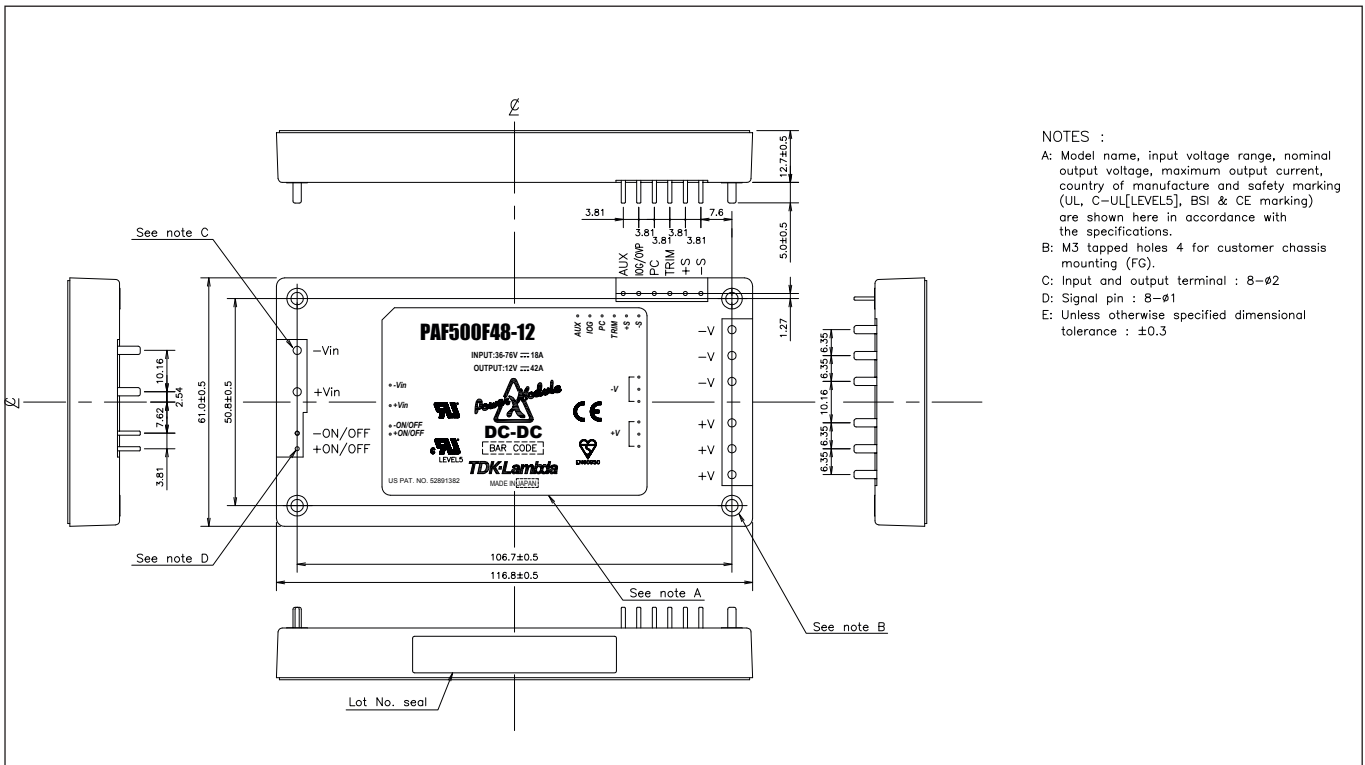




Pinout	
Pin Description	Function
-Vin	Negative Input Terminal
+Vin	Positive Input Terminal
- ON/OFF	Remote On/Off negative terminal
+ON/OFF	Remote On/Off positive terminal
+V	Positive Output Terminal
-V	Negative Output Terminal
AUX	7-10V Aux voltage
IOG/OVP	DC Good / OVP adjustment
PC	Parallel control connection
TRIM	Output adjustment Trim pin
+S	Positive Remote sense
-S	Negative Remote sense

Options	
Suffix	Description
Blank	
/T	No thread in mounting holes

## Outline Drawing PAF500F

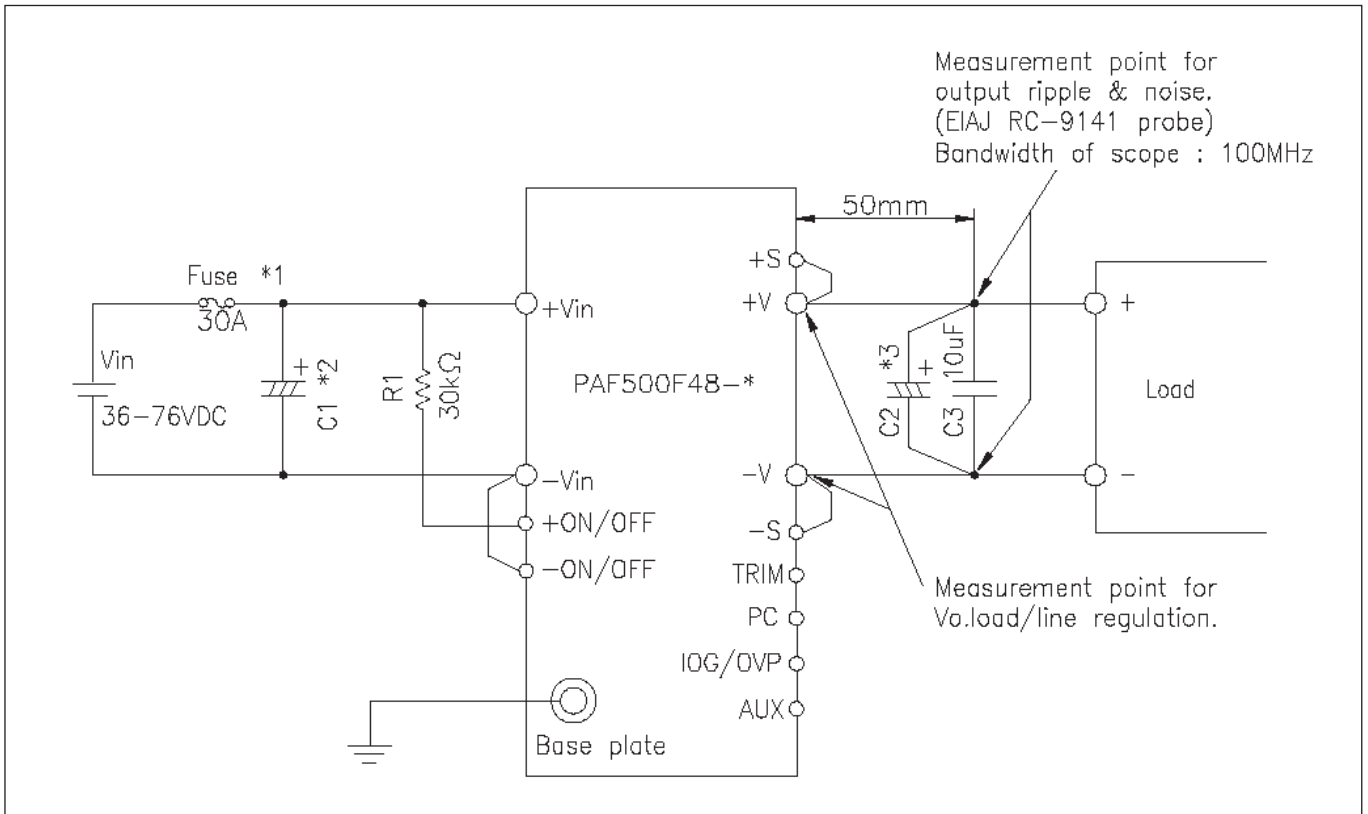


## Heatsink Table

Heatsink	Size (mm)	Thermal Resistance
HAF-10L	116.8 x 25.4 x 61	2.2°C/W
HAF-15L	116.8 x 38.1 x 61	1.9°C/W
HAF-15T	116.8 x 38.1 x 61	1.5°C/W



## Connection Example



For full data and drawings please visit  
[www.emea.tdk-lambda.com/www/paf](http://www.emea.tdk-lambda.com/www/paf)





## PAF600F

24V & 48V Input Full Brick DC-DC Converters

- 12V output for driving non-isolated converters
- Safety Approved
- Full power at 100°C baseplate
- Opto Isolated Remote On / Off
- Wide Adjustable Output Range

### Key Market Segments & Applications

Central Office:	ATM, Sonet, DSL, ISDN, Frame Relay
Broadband:	Switching Equipment, Routers
Wireless/Cellular:	Micro Cells (larger in size/10 sq. mi.) Pico Cells (smaller in size/1 to 2 sq. mi.)
Remote Electronics:	Fixed Local Loop, Fiber Optic Transmission, Microwave Transmission, Wireless Local Loop Base Station Power Amplifiers

### PAF600F Features and Benefits

#### Features

- Wide adjustment range
- Parallel Pin
- ASIC Design
- 24V & 48V Inputs

#### Benefits

- Reduces need for custom modules
- Modules can be connected together for higher current
- Reduced component count, increased MTBF
- Suitable for remote & central office applications

### Specifications

MODEL		PAF600F24-12 PAF600F48-12	PAF600F24-28 PAF600F48-28
ITEMS			
Nominal Output Voltage	VDC	12	28
Output Current (Max)	A	50	21.5
Output Power (Max)	W	600	602
Efficiency (Typ)	%	89 to 90%	
Input Voltage Range	VDC	20-36 / 36-76	19-36 / 36-76
Input Current (Typ) 24/48V input	A	28.9 / 14.2	28.9 / 14.1
Output Voltage Accuracy	%	±1	
Output Voltage Adjustment	VDC	7.2 - 13.2	16.8 - 30.8
Ripple & Noise (Max)	mV	200	280
Line Regulation (Max)	mV	24	56
Load Regulation (Max)	mV	24	56
Temperature Coefficient	-	0.02%/°C	
Overcurrent Protection	%	105 - 140%	
Overvoltage Protection	%	115-135%	
Signals & Control	-	Remote sense, remote On/Off, Parallel Pin, DC Good, 7-10V Auxiliary voltage	
Operating Temperature	-	-40°C to +100°C baseplate	
Humidity (operating)	-	30-95% RH Non condensing	
Humidity (storage)	-	10-95% RH Non condensing	
Cooling	-	Conduction (See Installation Manual for heatsink selection)	
Isolation Voltage	VDC	Input - Baseplate 1500V, Input - Output 1500V, Output-Baseplate 500V (for 1 min.)	
Shock	-	196.1m/s <sup>2</sup>	
Vibration	-	Non Operating, 10-55Hz (sweep for 1 min.) Amplitude 0.825mm constant (Max 49 m/s <sup>2</sup> ) X,Y,Z 1 hour each	
Safety Agency Approvals	-	UL60950-1, CSA60950-1, EN60950-1, CE LVD (48V model only)	
Weight (Typ)	g	250	
Size (WxHxD)	in(mm)	2.4 x 0.5 x 4.6 (61 x 12.7 x 116.8) See outline drawing	
Warranty	-	2 years	

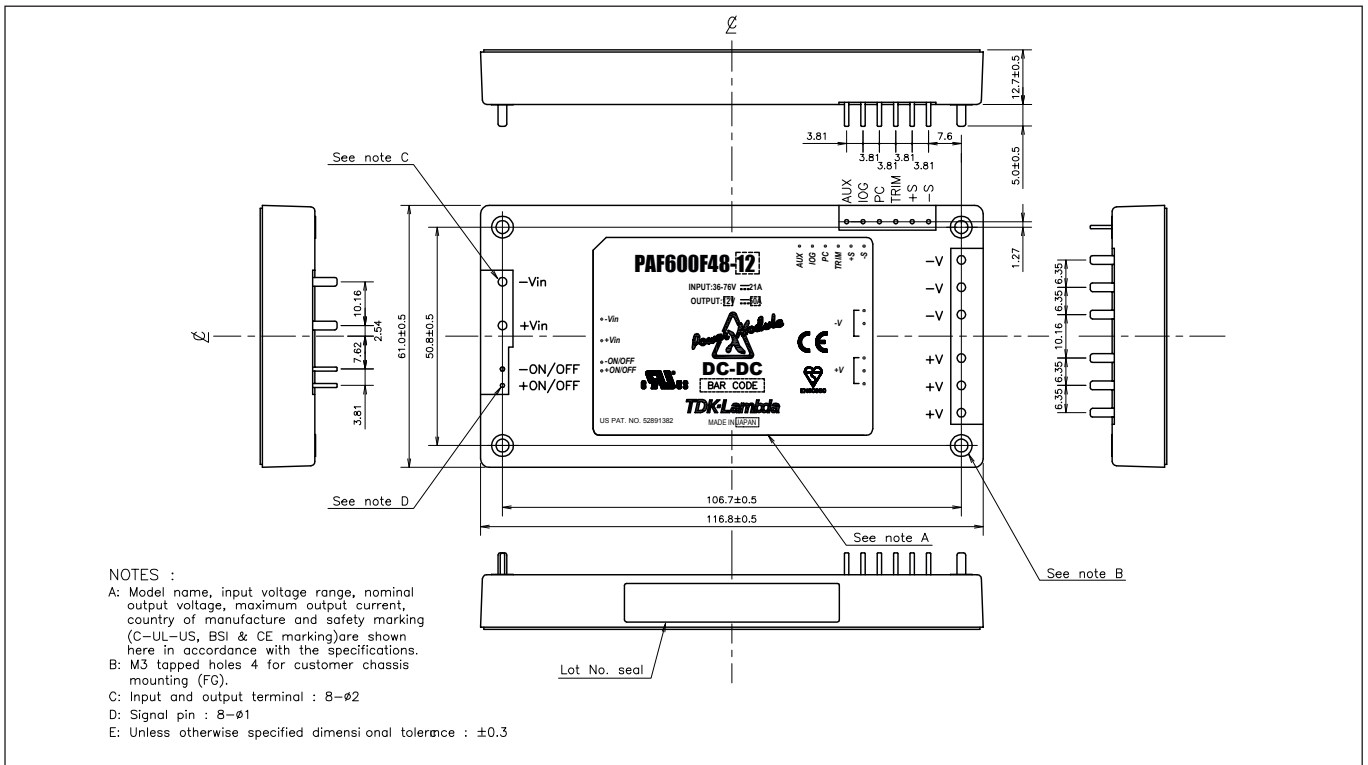
**Note:** See Installation Manual for full details, test methods of parameters and application notes.



Pinout	
Pin Description	Function
-Vin	Negative Input Terminal
+Vin	Positive Input Terminal
- ON/OFF	Remote On/Off Negative Terminal
+ON/OFF	Remote On/Off Positive Terminal
+V	Positive Output Terminal
-V	Negative Output Terminal
AUX	7-10V Aux Voltage
IOG	DC Good
PC	Parallel Control Connection
TRIM	Output Adjustment Trim Pin
+S	Positive Remote Sense
-S	Negative Remote Sense

Options	
Suffix	Description
Blank	
/T	No thread in mounting holes

## Outline Drawing PAF600F

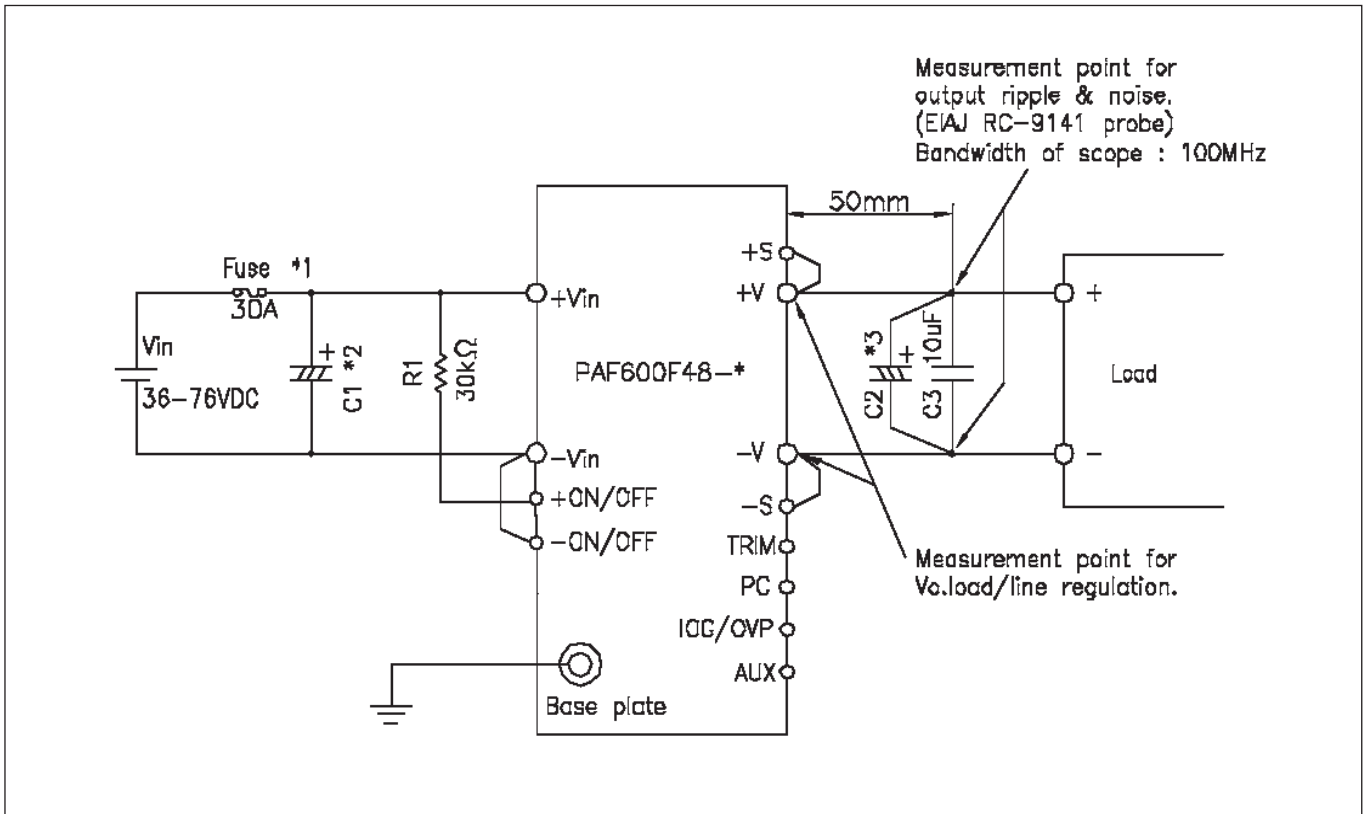


## Heatsink Table

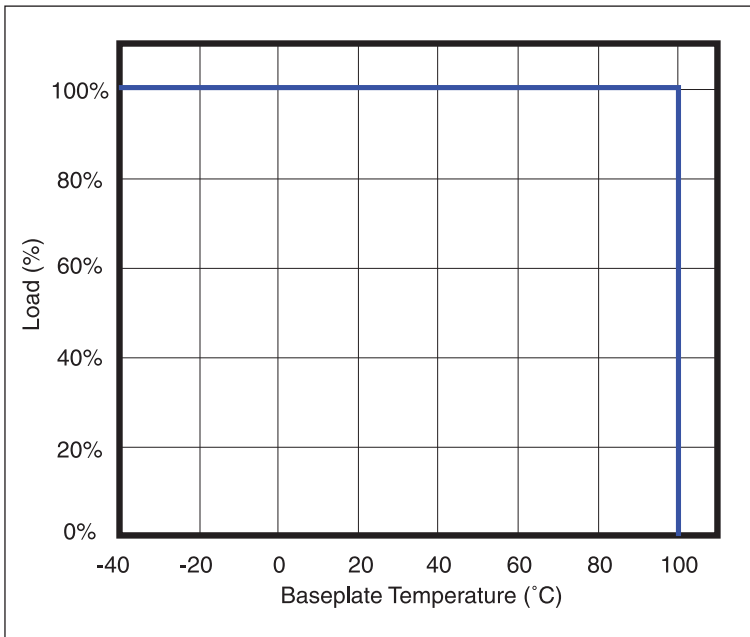
Heatsink	Size (mm)	Thermal Resistance
HAF-10L	116.8 x 25.4 x 61	2.2°C/W
HAF-15L	116.8 x 38.1 x 61	1.9°C/W
HAF-15T	116.8 x 38.1 x 61	1.5°C/W



## Connection Example

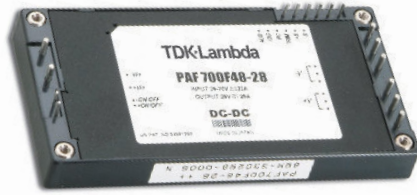


## Derating Curve PAF600F Series



For full data and drawings please visit  
[www.emea.tdk-lambda.com/www/paf](http://www.emea.tdk-lambda.com/www/paf)





## PAF700F Series

700W 48V Input  
Full Brick DC-DC Converters

- 12V output for driving non-isolated converters
- 12V, 28V output for BTS amps
- Full power at +85°C baseplate, operation to +100°C
- Opto Isolated Remote On / Off
- Wide Adjustable Output Range

### Key Market Segments & Applications

Central Office:	ATM, Sonet, DSL, ISDN, Frame Relay
Broadband:	Switching Equipment, Routers
Wireless/Cellular:	Micro Cells (larger in size/10 sq. mi.) Pico Cells (smaller in size/1 to 2 sq. mi.)
Remote Electronics:	Fixed Local Loop, Fibre Optic Transmission, Microwave Transmission, Wireless Local Loop
Base Station Power Amplifiers	
Intermediate Bus Architectures	

### PAF700F Features and Benefits

#### Features

- Wide adjustment range
- Parallel Pin
- ASIC Design

#### Benefits

- Reduces need for custom modules
- Modules can be connected together for higher current
- Reduced component count, increased MTBF

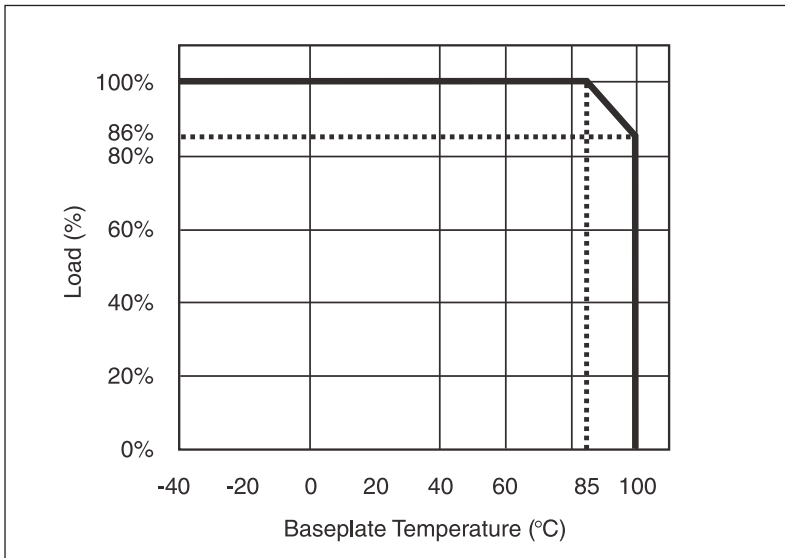
### Specifications

MODEL		PAF700F48-12	PAF700F48-28
ITEMS			
Nominal Output Voltage	VDC	12	28
Output Current (Max)	A	58.5	25
Output Power (Max)	W	702	700
Efficiency (Typ)	%	90%	91%
Input Voltage Range	VDC	36-76	
Input Current(Typ)	A	16.5	16.4
Output Voltage Accuracy	%	±1	
Output Voltage Adjustment	VDC	7.2 - 13.8	16.8 - 32.2
Ripple & Noise (Max)	mV	200	280
Line Regulation (Max)	mV	24	56
Load Regulation (Max)	mV	24	56
Temperature Coefficient	-	0.02%/°C	
Overcurrent Protection	%	105 - 140%	
Overvoltage Protection	%	120 - 135%	
Parallel Operation		Yes	
Series Operation		Yes	
Signals & Control	-	Remote sense, remote On/Off, Parallel Pin, DC Good, 7-10V Auxiliary voltage	
Operating Temperature	-	-40°C to +100°C baseplate	
Humidity (operating)	-	20 - 95% RH Non condensing	
Humidity (storage)	-	10 - 95% RH Non condensing	
Cooling	-	Conduction (See Installation Manual for heatsink selection)	
Isolation Voltage	VDC	Input - Baseplate 1500V, Input - Output 1500V, Output-Baseplate 500V (for 1 min.)	
Shock	-	196.1m/s <sup>2</sup>	
Vibration	-	Non Operating, 10-55Hz (sweep for 1 min.) Amplitude 0.825mm constant (Max 49 m/s <sup>2</sup> ) X,Y,Z 1 hour each	
Safety Agency Approvals	-	UL60950-1, CSAC22.2 No. 60950-1, EN60950, CE LVD	
Weight (Typ)	g	200	
Size (WxHxD)	mm (in)	61 x 12.7 x 116.8 (2.4 x 0.5 x 4.6) See outline drawing	
Warranty	yrs	2	

**Notes:** See Installation Manual for full details, test methods of parameters and application notes.



## Derating Curve



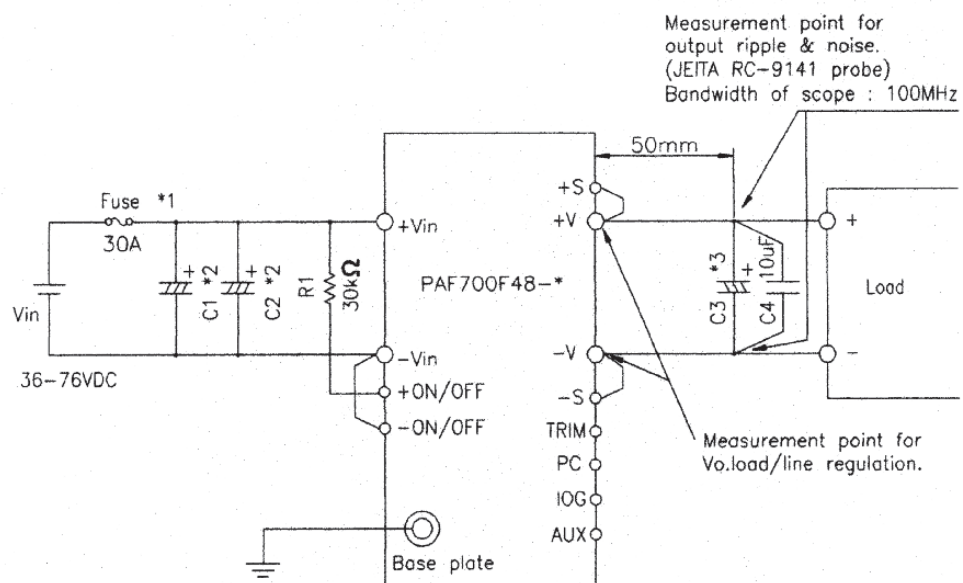
## Part Number Scheme

Full Brick	Max Power Watts	Full Function	Nominal Input Voltage	Output Voltage	Option Suffix
PAF	700	F	48	12 or 28	Blank = M3 Tapped inserts T = 3.3mm Non-threaded through hole

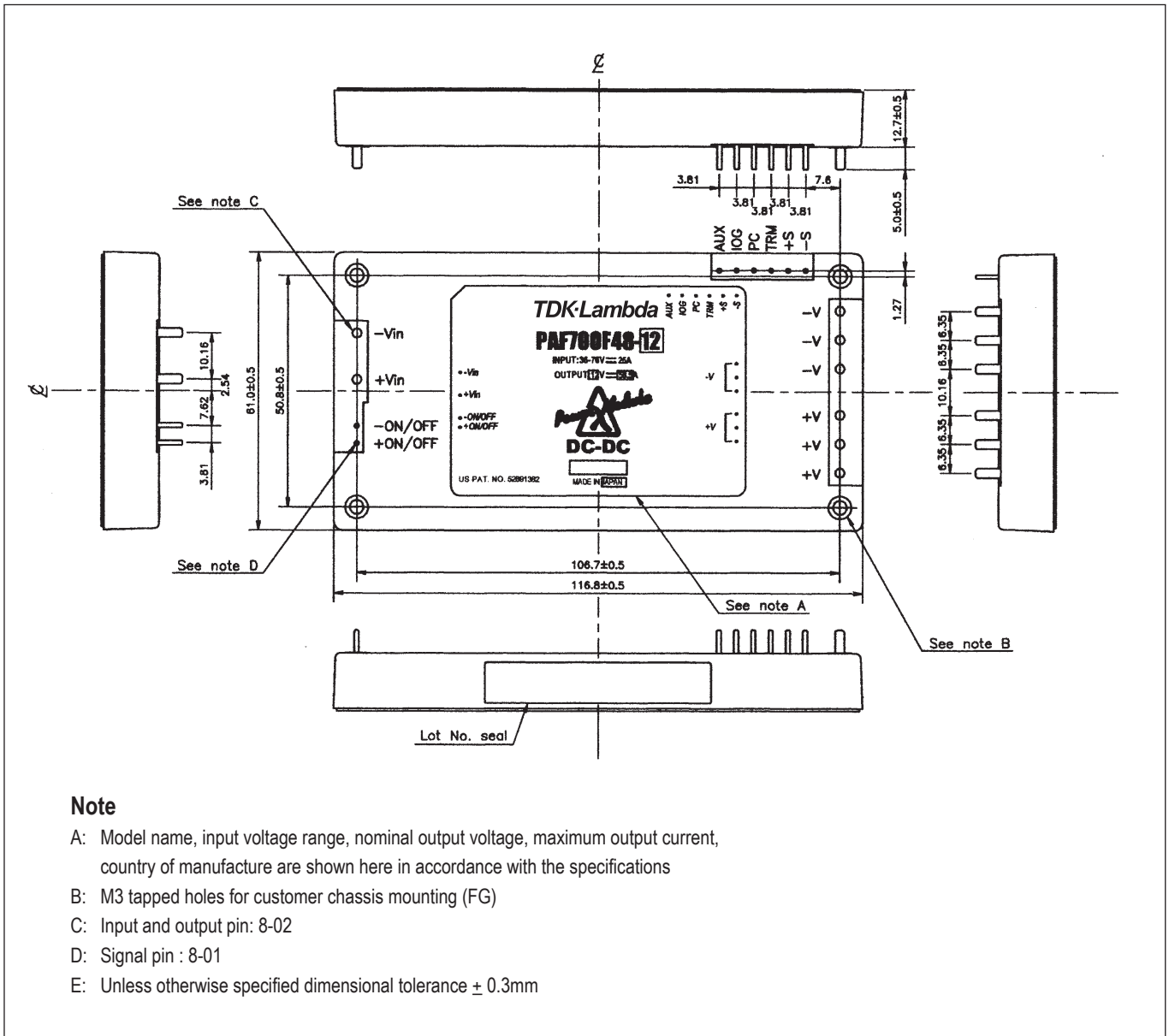
## Connection Example

### Note

- 1 Use external fuse of fast blow type, for each unit
- 2 Put input capacitor, C1 and C2, greater than 220uF for each. If the impedance of input line is high, C1 and C2 capacitance must be greater than above.
- 3 Put output capacitor, C3 (12v: more than 470uF, 28V: greater than 220uF). If the ambient temperature is less than -20C, use 4 pieces of the recommended capacitor above.
- 4 Refer to instruction manual for further details.



## Outline Drawing PAF700F



Pinout	
Pin Description	Function
-Vin	Negative Input Terminal
+Vin	Positive Input Terminal
- ON/OFF	Remote On/Off Negative Terminal
+ON/OFF	Remote On/Off Positive Terminal
+V	Positive Output Terminal
-V	Negative Output Terminal
AUX	7-10V Aux Voltage
IOG	DC Good
PC	Parallel Control Connection
TRIM	Output Adjustment Trim Pin
+S	Positive Remote Sense
-S	Negative Remote Sense







- 12V output for driving non-isolated converters
- Safety Approved
- Operation at +100°C baseplate
- Wide Adjustable Output Range
- Industry Standard Half Brick Package

## Key Market Segments & Applications

- Base Station Power Amplifiers
- Bus converters for Distributed Power Architectures

## PAH300/450 Series

300W to 450W 24V & 48V Input Half Brick DC-DC Converters

### PAH Features and Benefits

#### Features

- Wide adjustment range
- Compact size
- ASIC Design
- 24V & 48V inputs

#### Benefits

- Reduces need for custom modules
- Replaces 3/4 or Full Brick Power Modules
- Reduced component count, increased MTBF
- Suitable for remote & central office applications

### Specifications

ITEM	MODELS	PAH300S, 350S, 450S		
		12V	28V	48V
Nominal Output Voltage	VDC	12V	28V	48V
Input Voltage range	VDC	18-36 or 36-76		
Input Current (Max)	A	8.24-17.4A (model dependant)		
Output Voltage Adjustment	VDC	7.2 - 13.2	16.8 - 33	28.8 - 57.6(5)
Ripple & Noise (max) (pk to pk)	mV	200	280(1)	480
Line Regulation (max)	mV	24	56	96
Load Regulation (max)	mV	24	56	96
Overload Protection	%	105 - 140%, constant current with auto recovery		
Overvoltage Protection (3)	%	115-135%	125-140%(2)	125-145%(6)
Remote Sense	-	Yes		
Remote On/Off (See options)	-	Standard; Low = ON, Open = OFF /P option; Low = OFF, Open = ON		
Temperature (operating)	°C	-40°C to +100°C baseplate, full power(4)		
Temperature (storage)	°C	-40°C to +100°C		
Temperature Coefficient	-	0.02%/°C		
Humidity (operating)	-	5 - 95% RH Non condensing		
Humidity (storage)	-	5 - 95% RH Non condensing		
Cooling	-	Conduction (See Installation Manual for heatsink selection)		
Isolation Voltage	VDC	1500VDC Input to output & baseplate, 500VDC Output to baseplate		
Vibration	-	Non Operating, 10-55Hz (sweep for 1 min.)		
Amplitude	-	0.825mm constant (Max 49 m/s <sup>2</sup> ) X,Y,Z 1 hour each		
Shock	-	196.1m/s <sup>2</sup>		
Safety Agency Approvals	-	UL60950-1, CSA60950-1, EN60950-1, CE LVD (48V input models only)		
Weight (Typ)	g	90/100		
Size (WxHxD)	mm	61x12.7x57.9 See outline drawing		
Warranty	yrs	2		

**Note: See Installation Manual for full details, test methods of parameters and application notes**

- (1) 240mV for PAH300
- (2) 125-145% for PAH450S48-28
- (3) Manual reset

- (4) PAH350S24-28 & -48 derate linearly to 85% load from 90°C to 100°C
- (5) 28.8-52.8 PAH350S24-48
- (6) 115-140% PAH350S24-48



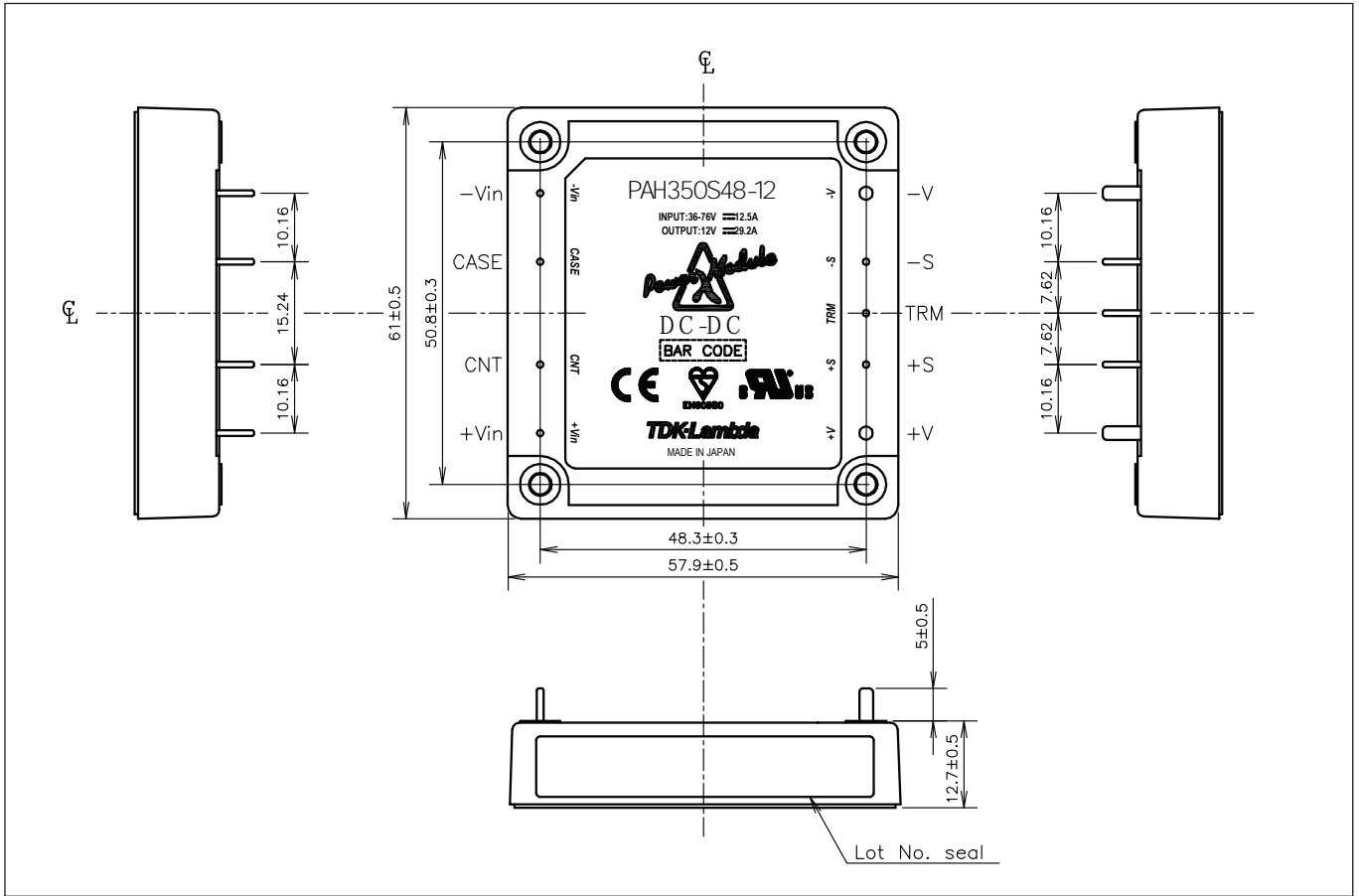
Model Selector					
Model	Input Voltage (V)	Output Voltage (V)	Max. Curr. (A)	Max. Output Power (W)	Efficiency Typ. (%)
PAH300S24-12	18 - 36	12	25	300	87
PAH300S48-12	36 - 76	12	25	300	90
PAH350S48-12	36 - 76	12	29.2	350	89
PAH300S24-28	18 - 36	28	11	308	88
PAH350S24-28	18 - 36	28	12.5	350	88
PAH350S24-48	18 - 36	48	7.3	350	87
PAH300S48-28	36 - 76	28	11	308	90
PAH350S48-28	36 - 76	28	12.5	350	89
PAH450S48-28	36 - 76	28	16	448	92
PAH450S48-48	36 - 76	48	9.4	451	92

Pinout	
Pin Description	Function
-Vin	Negative Input Terminal
+Vin	Positive Input Terminal
CNT	On / Off Control terminal
+V	Positive Output Terminal
-V	Negative Output Terminal
TRIM	Output adjustment Trim pin
+S	Positive Remote sense
-S	Negative Remote sense

Options	
Suffix	Description
-	M3 Tapped inserts for mounting
/T	M3 clearance inserts for mounting
/P	Positive logic remote On/Off (not on PAH450S)



## Outline Drawing PAH300/450 Series





## 50W to 300W DC-DC Converters, Single Output High Density Power Modules

Features	Benefits
• High Density	• Smaller Package Size
• Up to 425 Vdc Input	• Cover HVDC Telecom Requirements
• Fixed Operating Frequency	• Easier System Filtering
• High Efficiency	• Better System Thermal Management
• Certified to IEC/EN62477-1 OVC III	• No External Transformer Needed



Quarter brick shown

Specification		PH50A280	PH75A280	PH100A280	PH150A280	PH300A280
Model						
ITEMS						
Input Voltage range	-			200 - 425 VDC		
Input Current (1)	A			See Model selector		
Output Voltage Accuracy	%			+/-2		
Maximum Ripple and Noise (5)	mV	3.3 & 5V: 100mV, 12 & 15V: 150mV, 24V: 240mV, 28V: 280mV, 48V: 400mV (300W 480mV)				
Temperature Coefficient	-			<0.02°C / W		
Overvoltage protection (2) (4)	-			See model selector		
Overcurrent protection (6)	%			102-150		
Remote sense (2)	-			Yes		
Remote ON/OFF control (2)	-			yes - SHORT=ON OPEN=OFF		
Series Operation (2)	-			Yes		
Parallel Operation	-			No		
Operating Temperature (2)	°C	-40°C to +100°C (Baseplate), -40°C to +85°C (Ambient)				
Storage Temperature	°C	-40°C to +100°C				
Humidity (non condensing)	-	Operating: 5 - 95%RH, Storage: 5 - 95%RH				
Cooling	-	Conduction cooled				
Withstand Voltage (3)	-	I/P to Baseplate 2.5kVAC (20mA), I/P to O/P: 3kVAC (20mA), O/P to Baseplate: 500VAC (20mA) for 1min				
Isolation Resistance	MΩ	>100MΩ at 25°C & 70%RH, Output to Baseplate: 500VDC				
Vibration	-	10 - 55Hz (1 minute sweep), Amplitude 0.825mm Constant (Maximum 49.0m/s <sup>2</sup> ) X, Y, Z 1 hour each				
Shock	-	196.1 m/s <sup>2</sup>				
Safety Agency Approvals	-	IEC/EN/UL/CSA60950-1, IEC/EN/UL/CSA62368-1, EN62477-1 (OVC III, PH300A only) and CE Mark				
Weight (Typ)	g	50 - 150W: 55, 300W: 100				
Size (W x H x D) (7)	mm	Quarter Brick Format 37.2 x 12.7 x 58.3				Half Brick Format 61.0 x 12.7 x 57.9
Warranty	yrs	5				

**Notes:**

- (1) At 280 VDC input and maximum output current (baseplate temperature = 25°C)
- (2) Refer to detailed Specifications & Instruction Manual
- (3) This specification applies to the Power Module as a stand-alone item
- (4) OVP reset: Line OFF or Control OFF
- (5) 200 - 425 VDC input, Constant load
- (6) Constant current limitation - Automatic recovery
- (7) Refer to outline drawing

**Read Instruction Manual carefully before using the Power module unit**

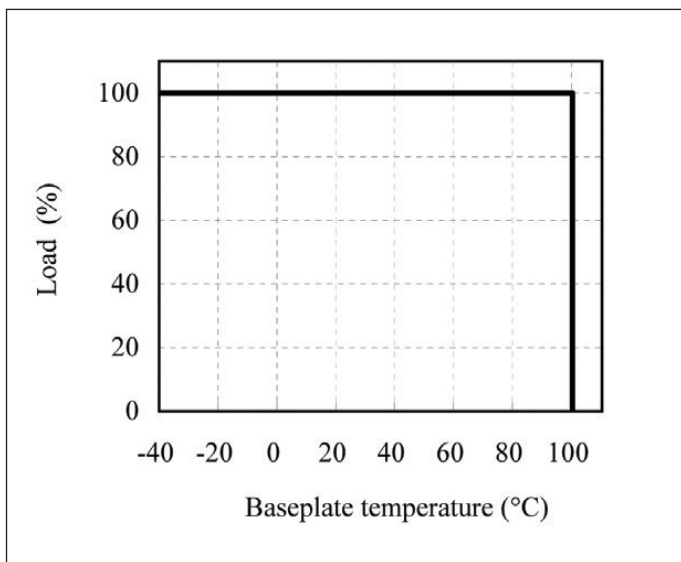


## Model Selector

Model	Output Voltage	Output Adjust Range (V)	Max Output Current (A)	Max Output Power (W)	Efficiency <sup>(3)</sup> (%)	Input Current (A)	Load Reg <sup>(1)</sup> (mV)	Line Reg <sup>(2)</sup> (mV)	OVP (V)
PH50A280-5	5V	4 - 6	10	50	86	0.21	10	10	6.25 - 7.5
PH50A280-12	12V	9.6 - 13.2	4.2	50.4	89	0.20	24	24	13.8 - 17.4
PH50A280-24	24V	19.2 - 26.4	2.1	50.4	89	0.20	48	48	27.6 - 34.8
PH50A280-48	48V	38.4 - 52.8	1.1	52.8	89	0.21	96	96	55.2 - 69.6
PH75A280-3.3	3.3V	2.97 - 3.96	15	49.5	83	0.22	10	10	4.3 - 6.6
PH75A280-5	5V	4 - 6	15	75	86	0.32	10	10	6.25 - 7.5
PH75A280-12	12V	9.6 - 13.2	6.3	75.6	89	0.31	24	24	13.8 - 17.4
PH75A280-15	15V	12.5 - 16.5	5	75	90	0.30	30	30	17.2 - 21.8
PH75A280-24	24V	19.2 - 26.4	3.2	76.8	90	0.31	48	48	27.6 - 34.8
PH75A280-28	28V	23.3 - 30.8	2.7	75.6	90	0.30	56	56	32.2 - 40.6
PH75A280-48	48V	38.4 - 52.8	1.6	76.8	90	0.31	96	96	55.2 - 69.6
PH100A280-3.3	3.3V	2.97 - 3.96	20	66	83	0.29	10	10	4.3 - 6.6
PH100A280-5	5V	4 - 6	20	100	86	0.42	10	10	6.25 - 7.5
PH100A280-12	12V	9.6 - 13.2	8.4	100.8	88	0.41	24	24	13.8 - 17.4
PH100A280-24	24V	19.2 - 26.4	4.2	100.8	89	0.41	48	48	27.6 - 34.8
PH100A280-48	48V	38.4 - 52.8	2.1	100.8	90	0.40	96	96	55.2 - 69.6
PH150A280-12	12V	9.6 - 13.2	12.5	150	88	0.62	24	24	13.8 - 17.4
PH150A280-15	15V	12.5 - 16.5	10	150	90	0.6	30	30	17.2 - 21.8
PH150A280-24	24V	19.2 - 26.4	6.3	151.2	89	0.61	48	48	27.6 - 34.8
PH150A280-28	28V	23.3 - 30.8	5.4	151.2	90	0.61	56	56	32.2 - 40.6
PH150A280-48	48V	38.4 - 52.8	3.2	153.6	90	0.60	96	96	55.2 - 69.6
PH300A280-5	5V	2.5 - 6	60	300	89	1.22	10	10	6.25 - 7.25
PH300A280-12	12V	7.2 - 14.4	25	300	89	1.22	24	24	15 - 17.4
PH300A280-24	24V	14.4 - 28.8	12.5	300	90.5	1.20	48	48	30 - 34.8
PH300A280-28	28V	16.8 - 33.6	10.8	302.4	91	1.20	56	56	35 - 40.6
PH300A280-48	48V	28.8 - 57.6	6.3	302.4	92	1.19	96	96	60 - 69.6

Notes: (1) No load - Full load, Constant input voltage (2) 200 - 425 VDC input, Constant load (3) At 280VDC input and maximum output current

## Derating Curve PH-A 280 Series



## Pin Assignments

Pin Description	Function
+Vin	Positive Input Terminal
-Vin	Negative Input Terminal
+S	Positive Remote Sense
-S	Negative Remote Sense
+V	Positive Output Terminal
-V	Negative Output Terminal
CNT	On/Off Control Terminal
TRM	Output Adjustment Trim Pin

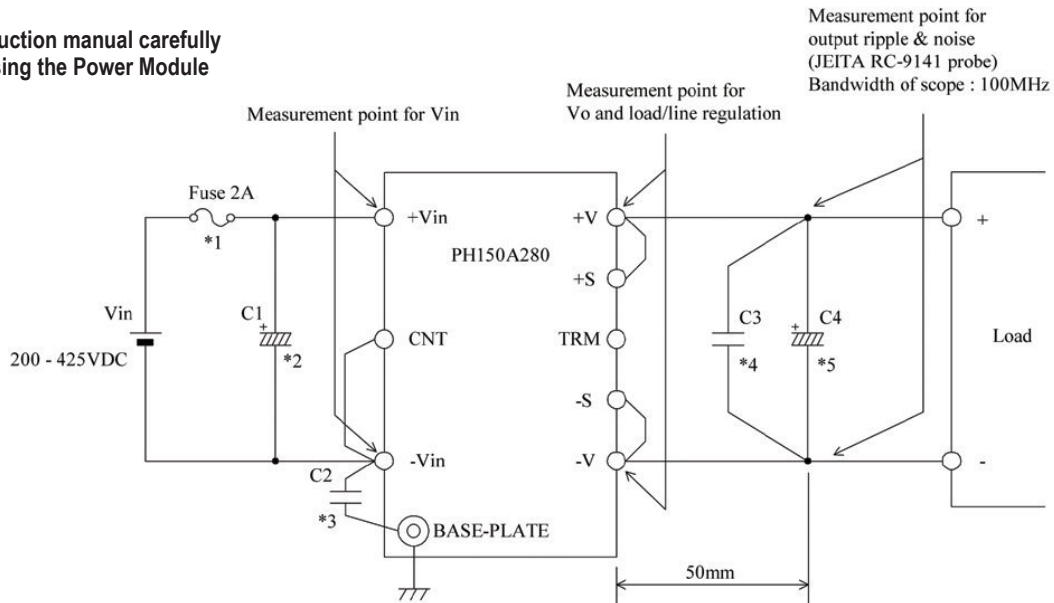
## Heat Sink Accessories

Model	Description
HAQ-10T	PH50A to 150A 25mm transverse fins
HAH-10T	PH300A 25mm transverse fins
HAH-15T	PH300A 38mm transverse fins
HAH-15L	PH300A 38mm longitudinal fins

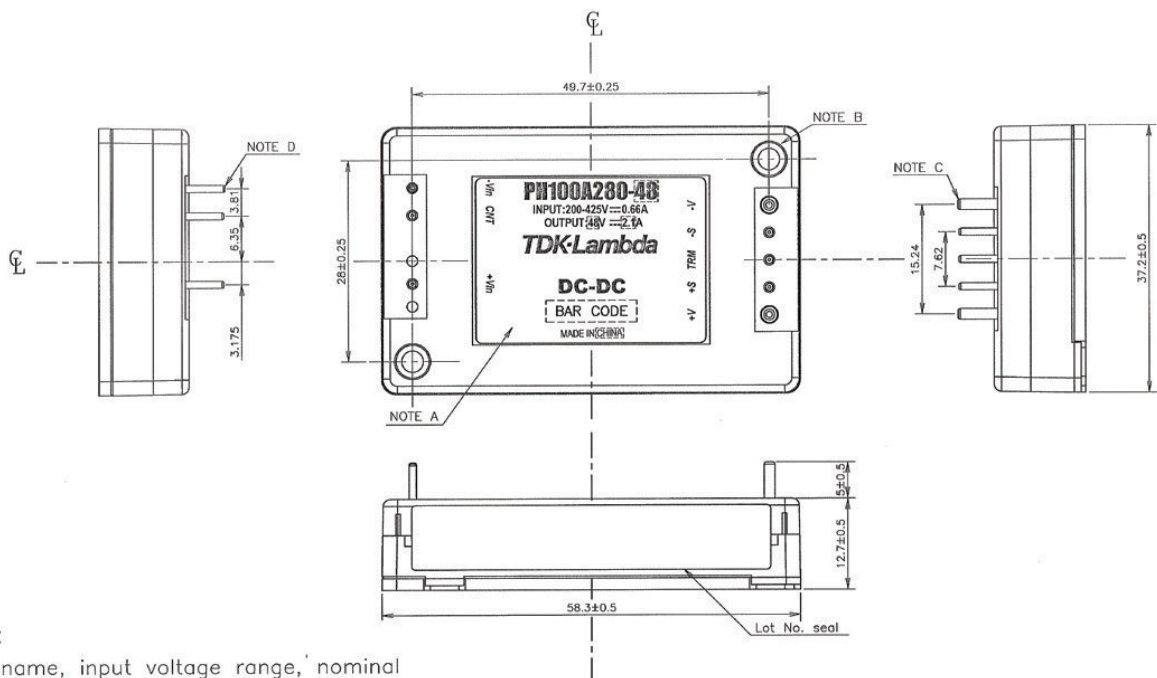


## Basic Connection PH-A 280 Series

Read instruction manual carefully before using the Power Module



## Outline Drawing PH50-A to PH150-A 280 Series

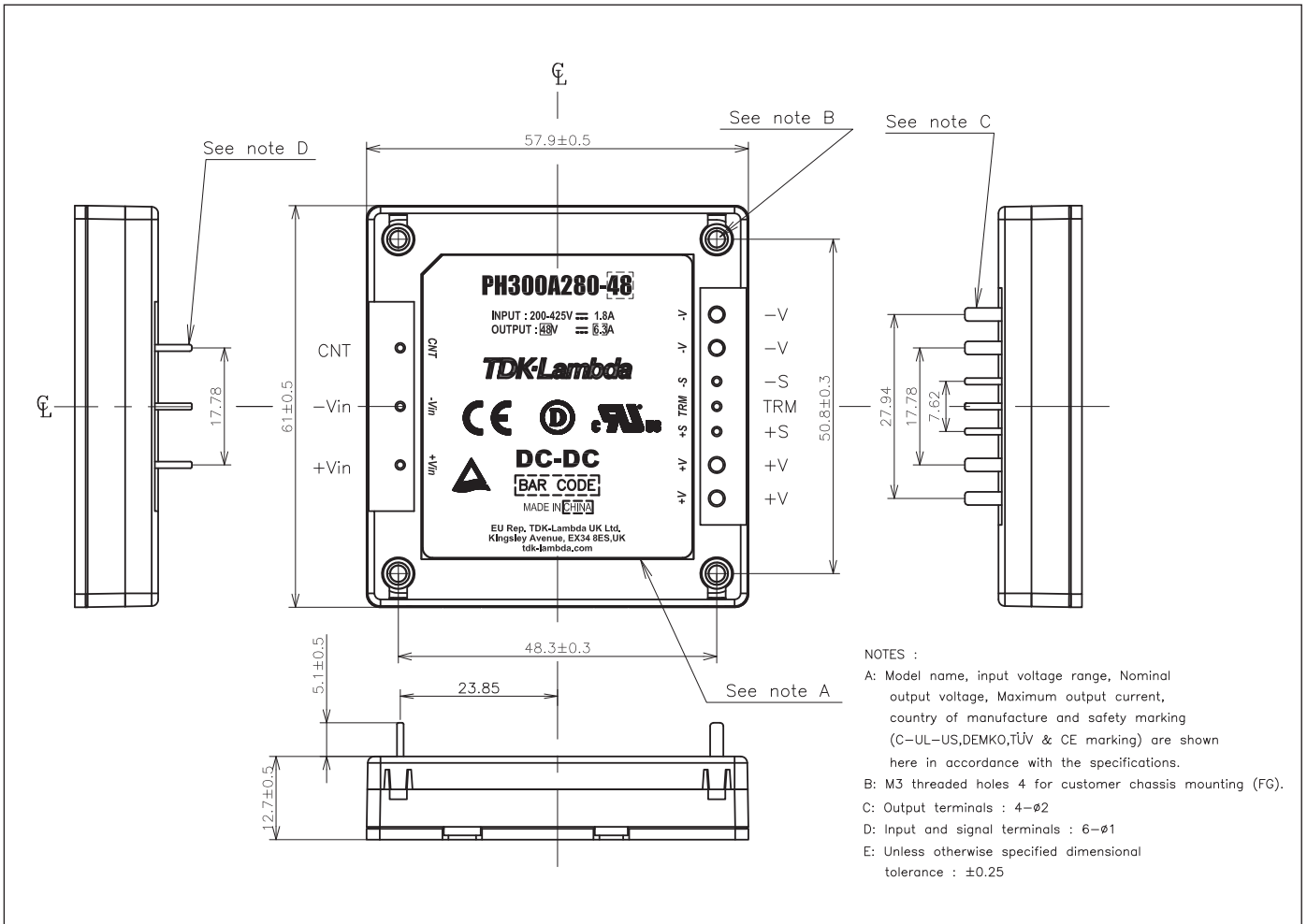


### NOTES :

- A: Model name, input voltage range, nominal output voltage, maximum output current, country of manufacture and safety marking (C-UL-US & CE marking) are shown here in accordance with the specifications.
- B: M3 tapped holes 2 for customer chassis mounting (FG).
- C: Output pin : 2- $\phi$ 1.5
- D: Input and Signal pin : 6- $\phi$ 1.0
- E: Unless otherwise specified dimensional tolerance :  $\pm$ 0.25mm



## Outline Drawing PH300-A 280 Series





## PH-F Series

Full Function 50W to 300W  
DC-DC Converters

- High Density
- Wide Range Input
- Wide output adjustment capability
- Remote On/Off
- Fixed Switching Frequency
- International Safety Approvals
- Parallel Operation

### Key Market Segments & Applications

Telecom  
Custom Power Supplies  
N+1 redundant systems  
Scalable systems  
Point of Load

### PH-F Features and Benefits

#### Features

- Low component count
- Wide output adjustment
- Signals to support N+1 redundancy
- Variety of input voltages

#### Benefits

- High reliability demonstrated 5 million hours MTBF
- Avoids the need for custom modules
- Ease of use in redundant configurations
- Systems can operate from different input voltages

### Specifications

ITEMS		2V	3.3V	5V	12V	15V	24V	28V
Input range	VDC	24V nom: 18-36, 48V nom: 36-76V, 110V nom: 82-185V, 280V nom: 200-400V						
Output Voltage Adj. Range	VDC	1.6~2.4	2.64~3.96	2~6	4.8~14.4	6~18	9.6~28.8	11.2~33.6
Line Regulation	-	0.4% or 20mV (whichever is greater) over entire input range with constant load						
Load Regulation	-	0.8% or 40mV (whichever is greater) from no load to full load with constant input line						
Ripple and Noise	mV	100		150		240	280	
Series Operation	-	Possible - Refer to installation manual						
Over Voltage Protection	-	150 - 180%		125 - 145%				
Overload Protection	-	Approximately 105 - 140%, automatic recovery						
Remote On/Off	-	Short = ON, Open = OFF						
Remote Sensing	-	Yes						
Parallel operation	-	Using current share pin (PC). Will share within 5%, see app. notes for connection details						
Inverter Good signal	-	Signal available for status of inverter						
Auxiliary Bias Supply	-	7-10V 10mA auxiliary voltage to supply power to interface circuits (AUX pin)						
Thermal Protection	-	Internal sensing, self resetting						
Cooling	-	Conduction or forced air. See application notes for cooling and heatsink selection						
Operating Temperature Range	°C	Baseplate temperature -20°C to +85°C ( -40°C start up versions available (2))						
Storage Temperature	°C	-40°C to +85°C						
Temperature Coefficient	-	0.02%/°C						
Isolation	-	Input to output: 3000VAC, Input to Baseplate: 2500VAC(1)						
Isolation Resistance	Ω	Output to Baseplate -100mΩ at 500VDC and 70%RH						
Safety Agency Approval	-	UL60950-1, CSA22.2 No.60950-1, EN60950-1 (except PH300F-24) and CE Mark.						
Warranty	yrs	2						

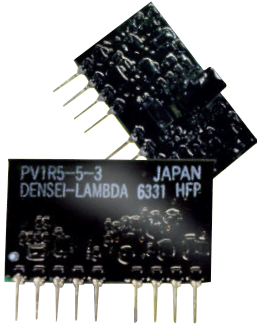
**Note:** See Installation Manual for full details, test methods of parameters and application notes

(1) 24V input models input to output: 2kVAC; input to baseplate: 2kVAC

(2) Please consult sales







## PV Series

Single Inline Package

DC-DC Converters (1-3 Watts)

- SIP Style Footprint
- 5V, 12V, 24V, & 48V Inputs
- Single and Dual Outputs
- Adjustable Output Voltages
- Input - Output Isolation

### Key Market Segments & Applications

Telecom & Datacom  
 Test and Measurement  
 Point of Load

### PV Features and Benefits

#### Features

- Single Inline Package (SIP)
- Wide Input Voltage Range
- Isolated Output
- Wide Operating Temperature Range

#### Benefits

- Uses Less PCB Area
- Accepts Unregulated Input Voltages
- Can Be Configured for + or - Outputs
- Supports Harsh Operating Environments

### Specifications

ITEMS	Output Volt.	Output Volt.		
		3.3V	5V	12V
DC Input ranges	VDC	5V: 4.5V-9V; 12V: 9V-18V, 24V: 18V-36V, 48V: 36V-72		
Efficiency (typical)	-	77%		
Output Voltage Accuracy	-	±5%		
Output Voltage Adjustment	VDC	3.3V-3.67V	5V-6V	12V-15V
Preload	A	0		
Ripple & Noise	mV	100mV	120mV	
Max Line Regulation	mV	20mV		
Max Load Regulation	mV	40mV		
Overcurrent Protection	A	Auto recovery (1)		
Overvoltage Protection	%	None		
Temperature Coefficient	-	0.02%/°C		
Cooling	-	Convection cooled		
Isolation Voltage	VAC	Input-Output: 500VAC 1 min. (5mA)		
Isolation Resistance	Ohm	Greater than 100M		
Shock	-	20G		
Vibration	-	10-55Hz (sweep for 1 min.) 1.5mm constant amplitude max 9G X,Y,Z 2 hours each		
Humidity (non condensing)	-	30%-90% RH (non condensing)		
Storage Humidity	-	10%-95% RH (non condensing)		
Operating Temp. Range	-	-20 to 70°C, derate linearly to 50% load from 50 to 70°C		
Storage Temperature	°C	-30°C to +85°C		
Weight (Typ)	g	5		
Size (LxWxH)	mm	28.5x18x8.5(PV1R5); 33x18x8.5 (PV3)		
Warranty	-	2 years		

**Note:** See Installation Manual for full details, test methods of parameters and application notes

1) Avoid operation in short circuit or overload for more than 30 seconds

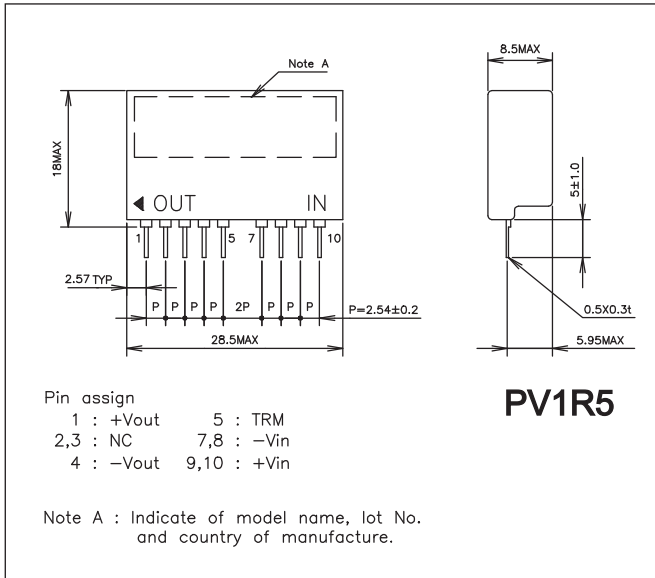


Model Selector				
Model	Output Voltage (V)	Output Current (A)	Output Power (W)	Input Voltage (V)
<b>Single Output</b>				
PV1R5-5-3.3	3.3	0.4	1.3	5.0
PV1R5-48-3.3	3.3	0.4	1.3	48.0
PV3-5-3.3	3.3	0.6	2.0	5.0
PV3-48-3.3	3.3	0.6	2.0	48.0
PV1R5-5-5	5.0	0.3	1.5	5.0
PV1R5-12-5	5.0	0.3	1.5	12.0
PV1R5-24-5	5.0	0.3	1.5	24.0
PV1R5-48-5	5.0	0.3	1.5	48.0
PV3-5-5	5.0	0.6	3.0	5.0
PV3-12-5	5.0	0.6	3.0	12.0
PV3-24-5	5.0	0.6	3.0	24.0
PV3-48-5	5.0	0.6	3.0	48.0
PV1R5-5-12	12.0	0.125	1.5	5.0
PV3-5-12	12.0	0.25	3.0	5.0
<b>Dual Outputs</b>				
PVD1R5-5-1212	±12.0	0.06	1.44	5.0
PVD1R5-12-1212	±12.0	0.06	1.44	12.0
PVD1R5-24-1212	±12.0	0.06	1.44	24.0
PVD1R5-48-1212	±12.0	0.06	1.44	48.0
PVD3-5-1212	±12.0	0.125	3.0	5.0
PVD3-12-1212	±12.0	0.125	3.0	12.0
PVD3-24-1212	±12.0	0.125	3.0	24.0
PVD3-48-1212	±12.0	0.125	3.0	48.0

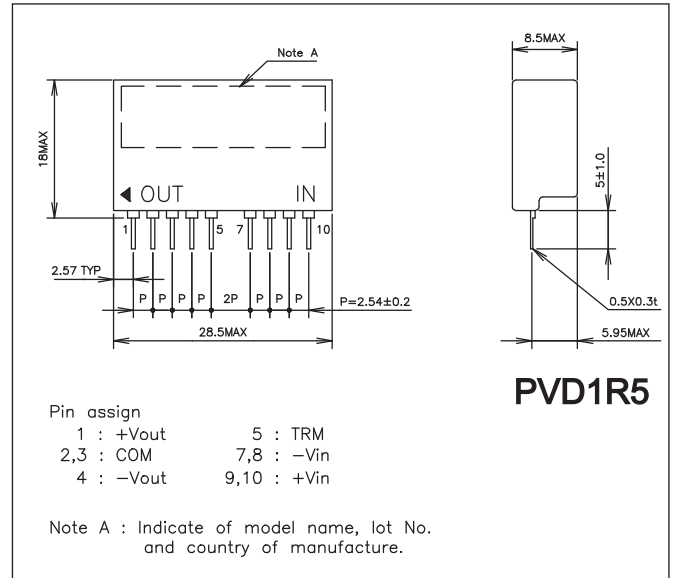
PIN Assignments	
Pin Description	Function
-Vin	Negative Input Terminal
+Vin	Positive Input Terminal
+Vout	Positive Output Terminal
-Vout	Negative Output Terminal
NC	No connection
COM	Common
TRM	Trim



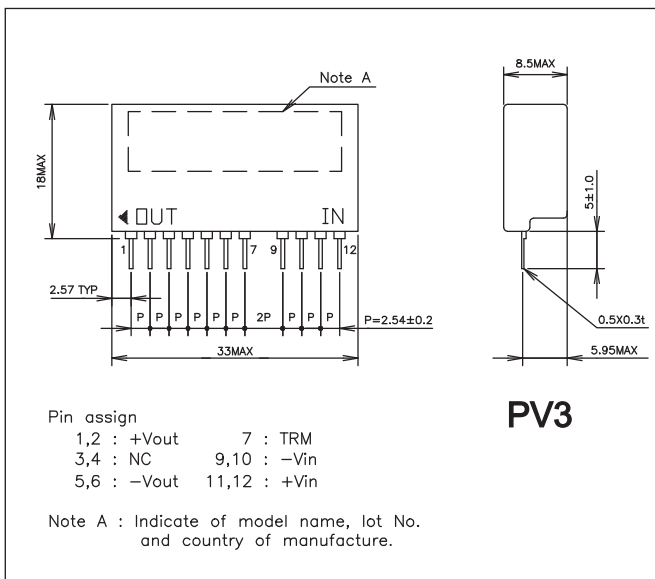
## Outline Drawing PV1R5 Series



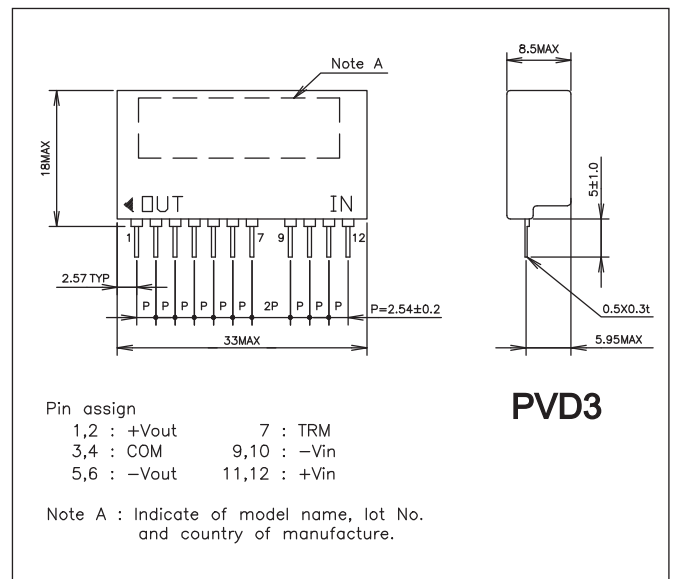
## Outline Drawing PVD1R5 Series

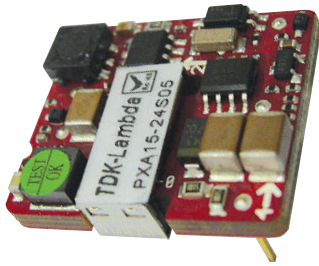


## Outline Drawing PV3 Series



## Outline Drawing PVD3 Series





## PXA15 Series

Single Output 15W  
DC-DC Converters

- Industry Standard 1" x 1" Footprint
- 9-36V or 18-75VDC Input
- Pin & Surface Mount Models
- Efficiency up to 88%
- Fixed switching Frequency

### Key Market Segments & Applications

Telecom/Datcom  
Process Control  
Wireless Network  
Measurement & Test

### PXA15 Features and Benefits

#### Features

- UL, C-UL, VDE CE
- 2:1 and 4:1 Range Input
- Surface mount or Through hole

#### Benefits

- Easier system approvals
- Less parts to inventory
- Reduced radiated noise

Specifications		Single Output	
Max Output Power		15W	
Voltage Accuracy		+/-1%	
Voltage Adjustment (1)		+/-10%	
Minimum Load		None	
Line Regulation		+/-0.2%	
Load Regulation		+/-0.2%	
Ripple and Noise		See table	
Start up time	Nominal VIN and constant Resistive load		Power Up 30mS Remote ON/OFF 30mS
Start up voltage 2:1 Input 24V/48V		17VDC/33VDC	
Start up voltage 4:1 Input 24V/48V		9VDC/18VDC	
Shut down voltage 2:1 Input 24V/48V		14.5VDC/30.5VDC	
Shut down voltage 4:1 24V/48V		8VDC/16VDC	
Remote on/off		Positive Logic: ON: Open or 3-15V, OFF Short or <1.2V Negative Logic: ON: Short or <1.2V, OFF: Open or 3-15V	
Efficiency		See table	
Temperature Coefficient		<+/-0.02%/°C	
Operating Temperature		-40°C to +85°C, derating necessary above 60°C	
Storage Temperature		-55°C to +125°C	
Thermal Shock		MIL-STD-810F	
Relative Humidity (non condensing)		5 to 95%	
Transient Response (25% step load change)		PXA < 200µS, PXA-W < 300µS recovery	
Overvoltage Protection (Zener clamp)		120 - 130%	
Overcurrent and Short Circuit Protection		Typically at 150%, hiccup with self recovery	
Input Surge Voltage (Maximum for 100ms)		24V input: 50V, 48V input: 100V	
Reflected input ripple (peak to peak)		30mA Typ	
Isolation Voltage (Basic Insulation)		2250VDC minimum	
Isolation Resistance		10 <sup>9</sup> Ω minimum	
Isolation Capacitance (max)		2:1 Input, 1000pF/ 4:1 Input, 1500pF	
Typical Switching Frequency (Fixed)	2:1 Input	3.3V, 5V 12V, 15V	270kHz 470kHz
	4:1 Input	3.3V, 5V 12V, 15V	350kHz 400kHz
MTBF (BELLCORE TR-NWT-000332)	2:1 Input		2,200,000 hours
	4:1 Input		1,322,000 hours
Conducted and Radiated Emissions (2)		MIL-STD-810F EN55022 Level A	
Immunity (3)		EN61000-4-3, -4, -5, -6 Pref Criteria A	
Safety Agency Certifications		IEC60950-1, UL60950-1, EN60950-1, CE Mark	
Size mm (L x W x H)		27.9 x 23.9 x 8.5	
Weight (g)		10.5	
Warranty (yrs)		2	



Model Selector								
Model	Output Voltage V	Output Current A	Output Power W	Input Voltage V	Nominal Input Current mA	Efficiency %	Ripple and Noise mVp-p	Max Load Capacitance $\mu$ F
<b>4:1 INPUT      Single Outputs</b>								
PXA15-24WS3P3	3.3V	4.0A	13.2W	9 - 36VDC	680mA	85%	100mVp-p	1000 $\mu$ F
PXA15-48WS3P3	3.3V	4.0A	13.2W	18 - 75VDC	340mA	85%	100mVp-p	1000 $\mu$ F
PXA15-24WS05	5V	3.0A	15W	9 - 36VDC	754mA	87%	100mVp-p	1000 $\mu$ F
PXA15-48WS05	5V	3.0A	15W	18 - 75VDC	377mA	87%	100mVp-p	1000 $\mu$ F
PXA15-24WS12	12V	1.25A	15W	9 - 36VDC	793mA	86%	100mVp-p	330 $\mu$ F
PXA15-48WS12	12V	1.25A	15W	18 - 75VDC	397mA	86%	100mVp-p	330 $\mu$ F
PXA15-24WS15	15V	1.0A	15W	9 - 36VDC	763mA	86%	100mVp-p	220 $\mu$ F
PXA15-48WS15	15V	1.0A	15W	18 - 75VDC	382mA	86%	100mVp-p	220 $\mu$ F
<b>2:1 INPUT</b>								
PXA15-24S3P3	3.3V	3.5A	10.5W	18-36VDC	587mA	86%	75mVp-p	1000 $\mu$ F
PXA15-48S3P3	3.3V	3.5A	10.5W	36-75VDC	297mA	85%	75mVp-p	1000 $\mu$ F
PXA15-24S05	5V	3.0A	15W	18-36VDC	753mA	87%	75mVp-p	1000 $\mu$ F
PXA15-48S05	5V	3.0A	15W	36-75VDC	377mA	87%	75mVp-p	1000 $\mu$ F
PXA15-24S12	12V	1.25A	15W	18-36VDC	753mA	87%	100mVp-p	330 $\mu$ F
PXA15-48S12	12V	1.25A	15W	36-75VDC	377mA	87%	100mVp-p	330 $\mu$ F
PXA15-24S15	15V	1.0A	15W	18-36VDC	744mA	88%	100mVp-p	220 $\mu$ F
PXA15-48S15	15V	1.0A	15W	36-75VDC	372mA	88%	100mVp-p	220 $\mu$ F

### Specification Notes:

- (1) Output can be trimmed using an external resistor
- (2) To meet EN55022 Class B external filter components are required. See additional application note.
- (3) To meet EN61000-4-4, EN610004-5 an external filter capacitor is required. See additional application note.

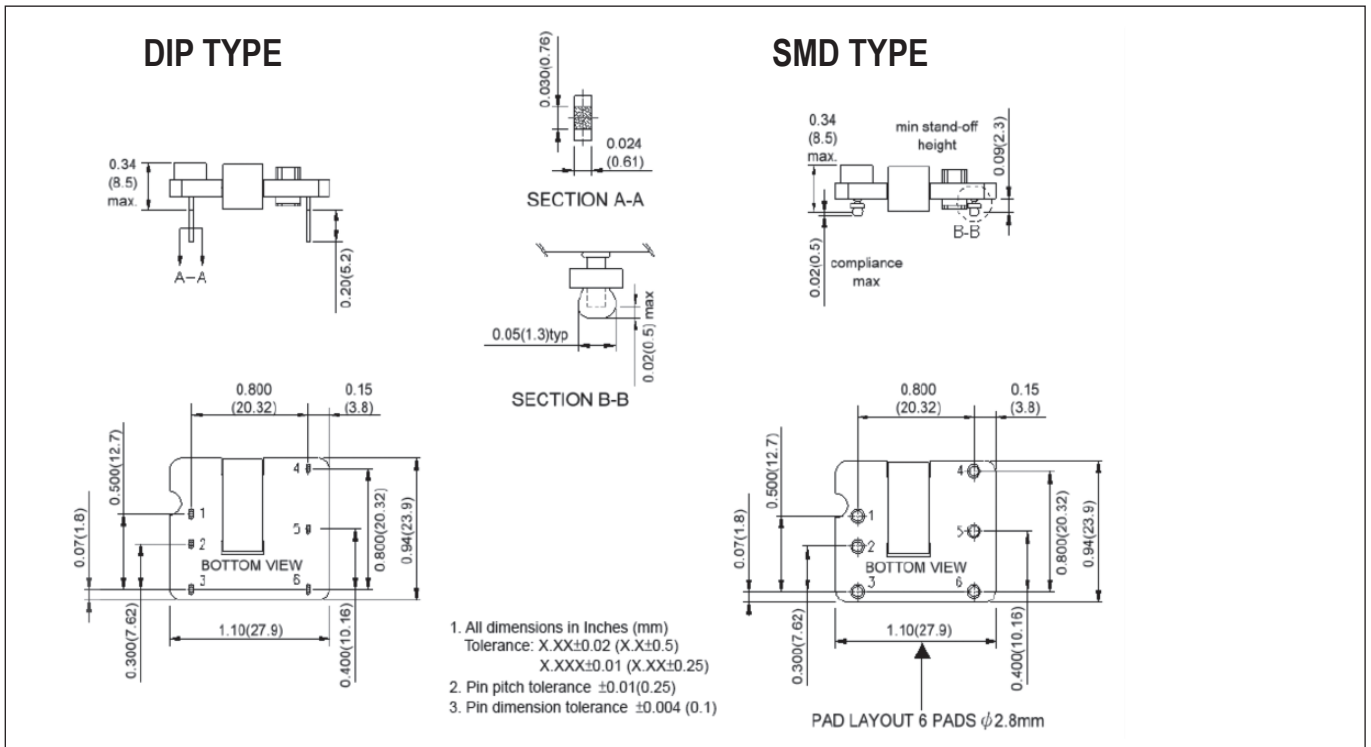
Remote On/Off Options	
Suffix	Description
P	Positive Logic
N	Negative Logic
S	Surface Mount
T	Trim

-NST or -NT as standard  
Delete suffix if not required

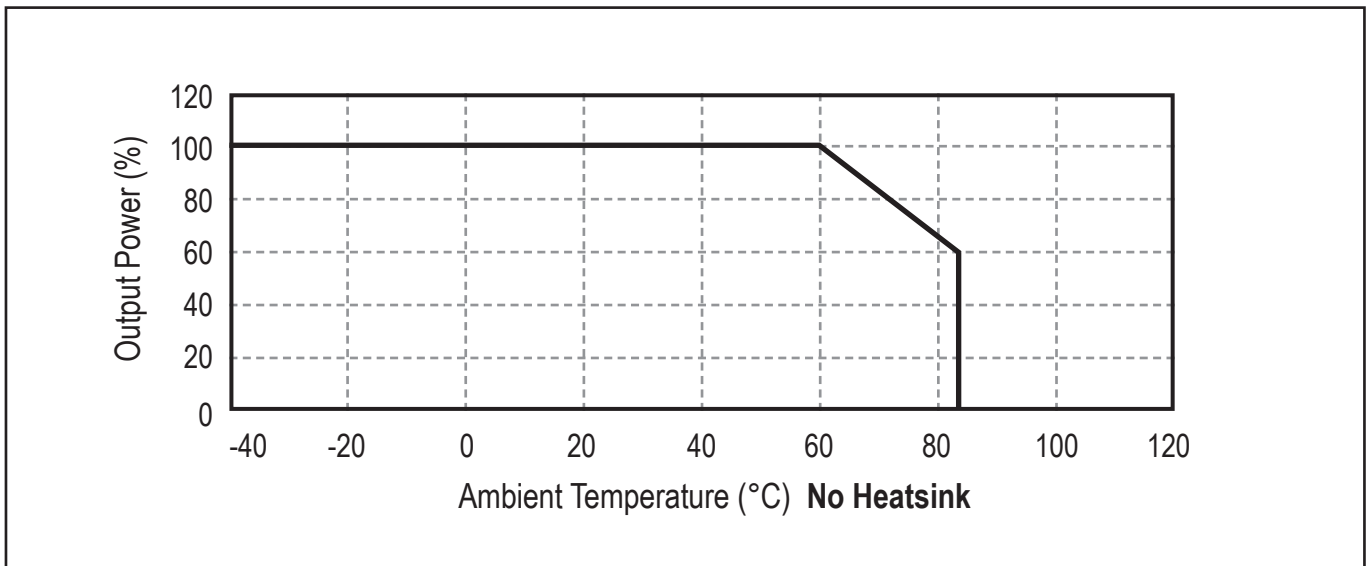
Pinout - Single Output	
Pin#	Function
1	+ Input
2	- Input
3	Remote On/Off
4	+ Output
5	Trim
6	- Output



## Outline Drawing PXA15 Series



## Derating Curve PXA15 Series





## PXB15 Series

Single and Dual output 15W  
DC-DC converters

- Industry Standard 1" x 1" Footprint
- 9-36V or 18-75VDC Input
- Six Sided Shield
- Standard pin out compatible with 2" x 1" products
- Efficiency up to 89%
- Fixed switching frequency

### Key Market Segments & Applications

Telecom/Datacom  
Process Control  
Wireless Network  
Measurement & Test

### PXB15 Features and Benefits

#### Features

- UL, C-UL, VDE CE
- 2:1 and 4:1 Range Input
- Low Profile

#### Benefits

- Easier system approvals
- Less parts to inventory
- Reduced radiated noise

Specifications	Single Output	Dual Output
Max Output Power	15W	
Voltage Accuracy	+/-1%	
Voltage Adjustment (1)	+/-10%	
Minimum Load	None	
Line Regulation Single/Dual output	+/-0.2%	+/-0.5%
Load Regulation Single/Dual output	+/-0.2%	+/-1.0%
Cross regulation	+/-5%	
Ripple and Noise	See table	
Start up time	Nominal VIN and constant Resistive load	Power Up 30mS Remote ON/OFF 30mS
Start up voltage 2:1 Input 12V/24V/48V	9VDC/17VDC/33VDC	
Start up voltage 4:1 Input 24V/48V	9VDC/18VDC	
Shut down voltage 2:1 Input 12V/24V/48V	8VDC/14.5VDC/30.5VDC	
Shut down voltage 4:1 24V/48V	8VDC/16VDC	
Remote on/off	Positive Logic: ON: Open or 3-15V, OFF Short or <1.2V Negative Logic: ON: Short or <1.2V, OFF: Open or 3-15V	
Efficiency	See table	
Temperature Coefficient	<+/-0.02%/°C	
Operating Temperature	-40° to +85°C, derating necessary above 60°C	
Storage Temperature	-55° to +125°C	
Thermal Shock	MIL-STD-810F	
Relative Humidity (non condensing)	5 to 95%	
Transient Response (25% step load change)	250µs recovery	
Overshoot Protection (Zener clamp)	120-130%	
Overcurrent and Short Circuit Protection	Typically at 150%, hiccup with self recovery	
Input Surge Voltage (Maximum for 100ms)	12V input: 36V, 24V input: 50V, 48V input: 100V	
Reflected input ripple (peak to peak)	30mA	
Isolation Voltage Input to Output	1600VDC minimum	
Input (output) to Case	1000VDC minimum	
Isolation Resistance	10 <sup>9</sup> Ω minimum	
Isolation Capacitance (max)	1000pF	
Switching Frequency (Fixed)	400kHz typ	
MTBF (BELLCORE TR-NWT-000332)	1,330,000 hours	
Vibration	MIL-STD-810F	
Conducted and Radiated Emissions (2)	EN55022 Level A	
Immunity (3)	EN61000-4-2, -3, -4, -5, -6 Pref Criteria A	
Safety Agency Certifications	IEC60950-1, UL60950-1, EN60950-1, CE Mark	
Size (mm) (L x W x H)	25.4 x 25.4 x 9.9	
Weight (g)	15	
Warranty (yrs)	2	



Model Selector								
Model	Output Voltage V	Output Current A	Output Power W	Input Voltage V	Nominal Input Current mA	Efficiency %	Ripple and Noise mVp-p	Max Load Capacitance uF
<b>4:1 INPUT</b>		<b>Single Outputs</b>						
PXB15-24WS3P3	3.3V	4.0A	13.2W	9 - 36VDC	688mA	86%	75mVp-p	12000uF
PXB15-48WS3P3	3.3V	4.0A	13.2W	18 - 75VDC	336mA	86%	75mVp-p	12000uF
PXB15-24WS05	5.0V	3.0A	15W	9 - 36VDC	762mA	86%	75mVp-p	6000uF
PXB15-48WS05	5.0V	3.0A	15W	18 - 75VDC	382mA	86%	75mVp-p	6000uF
PXB15-24WS12	12V	1.25A	15W	9 - 36VDC	783mA	87%	100mVp-p	1000uF
PXB15-48WS12	12V	1.25A	15W	18 - 75VDC	392mA	87%	100mVp-p	1000uF
PXB15-24WS15	15V	1.0A	15W	9 - 36VDC	753mA	87%	100mVp-p	660uF
PXB15-48WS15	15V	1.0A	15W	18 - 75VDC	377mA	87%	100mVp-p	660uF
<b>4:1 INPUT</b>		<b>Dual Outputs</b>						
PXB15-24WD05	±5V	1.5A	15W	9 - 36VDC	772mA	85%	100mVp-p	±3000uF
PXB15-24WD12	±12V	0.625A	15W	9 - 36VDC	753mA	87%	100mVp-p	±520uF
PXB15-24WD15	±15V	0.5A	15W	9 - 36VDC	744mA	88%	100mVp-p	±330uF
PXB15-48WD05	±5V	1.5A	15W	18 - 75VDC	386mA	85%	100mVp-p	±3000uF
PXB15-48WD12	±12V	0.625A	15W	18 - 75VDC	382mA	86%	100mVp-p	±520uF
PXB15-48WD15	±15V	0.5A	15W	18 - 75VDC	377mA	87%	100mVp-p	±330uF
<b>2:1 INPUT</b>		<b>Single Outputs</b>						
PXB15-12S3P3	3.3V	4.0A	13.2W	9 - 18VDC	1375mA	84%	75mVp-p	12000uF
PXB15-24S3P3	3.3V	4.0A	13.2W	18 - 36VDC	671mA	86%	75mVp-p	12000uF
PXB15-48S3P3	3.3V	4.0A	13.2W	36 - 75VDC	336mA	86%	75mVp-p	12000uF
PXB15-12S05	5.0V	3.0A	15W	9 - 18VDC	1542mA	86%	75mVp-p	6000uF
PXB15-24S05	5.0V	3.0A	15W	18 - 36VDC	763mA	86%	75mVp-p	6000uF
PXB15-48S05	5.0V	3.0A	15W	36 - 75VDC	372mA	88%	75mVp-p	6000uF
PXB15-12S12	12V	1.25A	15W	9 - 18VDC	1605mA	85%	100mVp-p	1000uF
PXB15-24S12	12V	1.25A	15W	18 - 36VDC	783mA	87%	100mVp-p	1000uF
PXB15-48S12	12V	1.25A	15W	36 - 75VDC	387mA	88%	100mVp-p	1000uF
PXB15-12S15	15V	1.0A	15W	9 - 18VDC	1506mA	87%	100mVp-p	660uF
PXB15-24S15	15V	1.0A	15W	18 - 36VDC	744mA	88%	100mVp-p	660uF
PXB15-48S15	15V	1.0A	15W	36 - 75VDC	372mA	88%	100mVp-p	660uF
<b>2:1 INPUT</b>		<b>Dual Outputs</b>						
PXB15-12D05	±5V	±1.5A	15W	9 - 18VDC	1543mA	85%	100mVp-p	±3000uF
PXB15-12D12	±12V	±0.625A	15W	9 - 18VDC	1506mA	87%	100mVp-p	±520uF
PXB15-12D15	±15V	±0.5A	15W	9 - 18VDC	1488mA	88%	100mVp-p	±330uF
PXB15-24D05	±5V	±1.5A	15W	18 - 36VDC	772mA	85%	100mVp-p	±3000uF
PXB15-24D12	±12V	±0.625A	15W	18 - 36VDC	744mA	88%	100mVp-p	±520uF
PXB15-24D15	±15V	±0.5A	15W	18 - 36VDC	744mA	88%	100mVp-p	±320uF
PXB15-48D05	±5V	±1.5A	15W	36 - 75VDC	386mA	85%	100mVp-p	±3000uF
PXB15-48D12	±12V	±0.625A	15W	36 - 75VDC	368mA	89%	100mVp-p	±520uF
PXB15-48D15	±15V	±0.5A	15W	36 - 75VDC	372mA	88%	100mVp-p	±330uF

### Specification Notes:

- (1) Output can be trimmed using an external resistor (Single Output only).
- (2) To meet EN55022 Class B external filter components are required. See additional application note.
- (3) To meet EN61000-4-4, EN61000-5 an external filter capacitor is required. See additional application note.

Options	
Suffix	Description
P	Positive Logic
N	Negative Logic
T	Trim

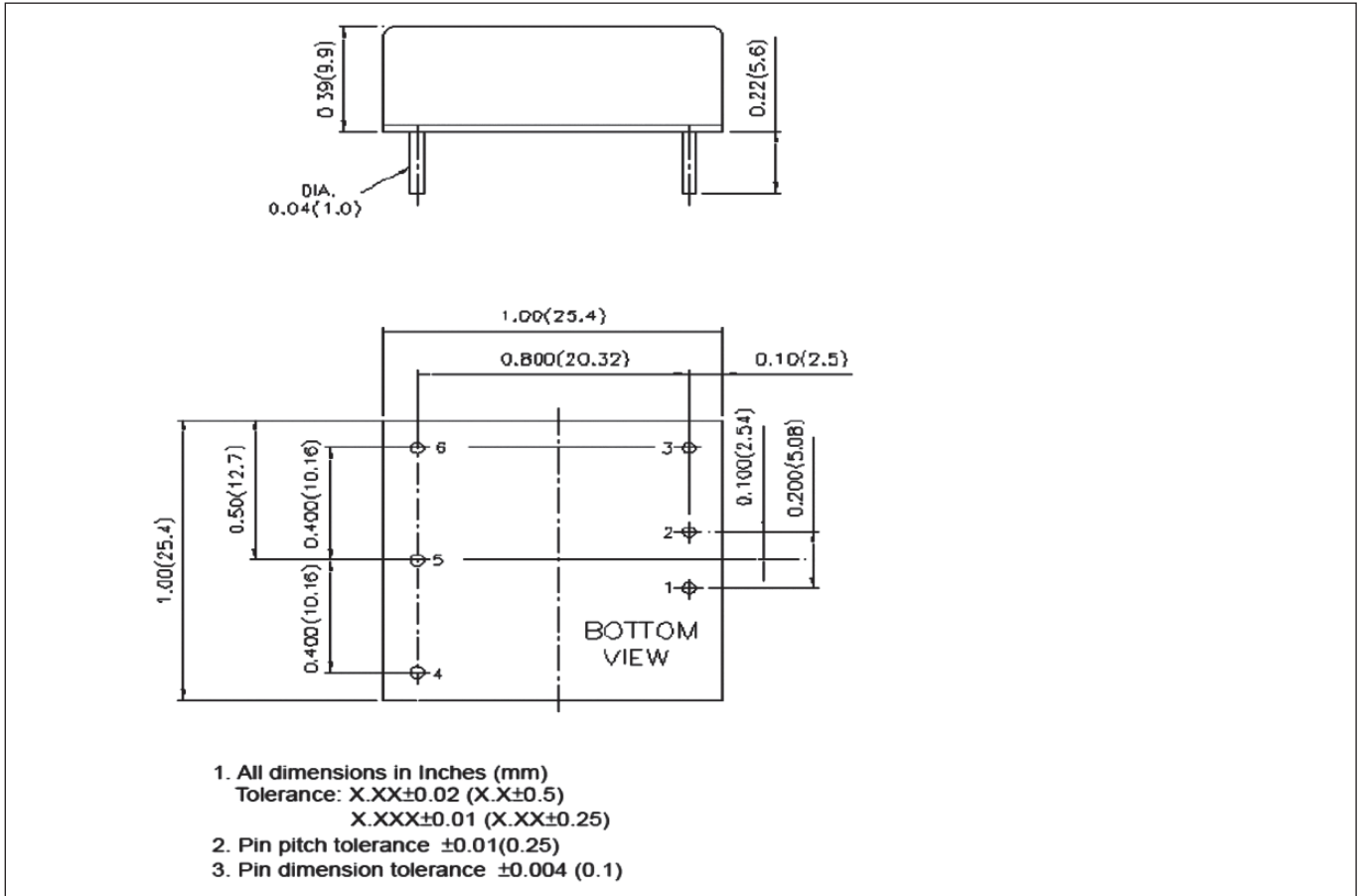
-NT as standard on Single Outputs, N as standard on Dual Outputs.

Delete suffix if not required



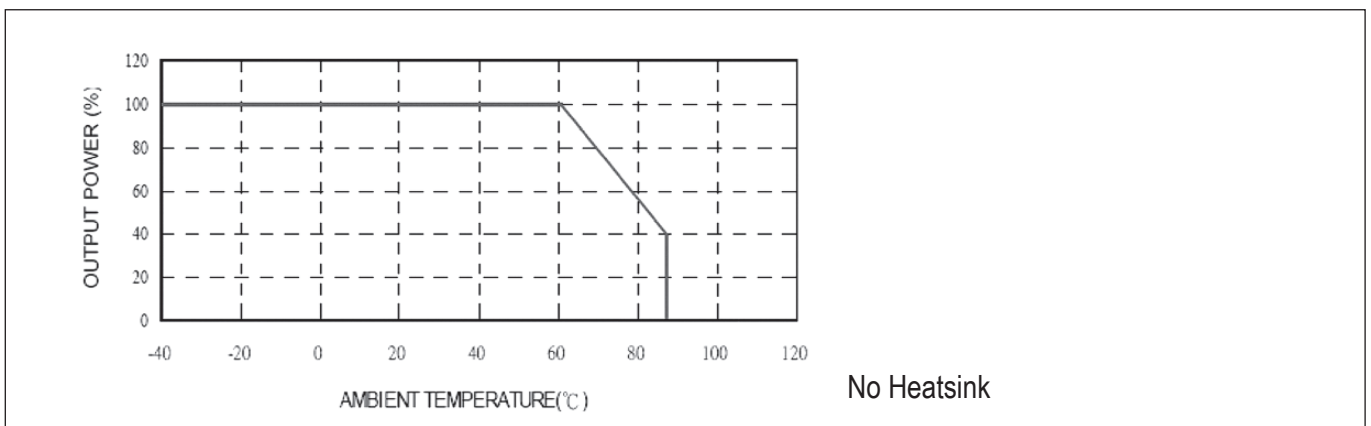


## Outline Drawing PXB15 Series



Pinout		
Pin#	Function	
	<b>Single Output</b>	<b>Dual Output</b>
1	+ Input	+ Input
2	- Input	- Input
3	Remote On/Off	Remote On/Off
4	+ Output	+ Output
5	Trim (Single o/p only)	Common
6	- Output	- Output

## Derating Curve PXB15 Series





## PXC05 Series

Single and Dual Output 5W  
DC-DC Converters

- Industry Standard 24 Pin Dip Package
- Five Sided Shielding
- Wide Range 4:1 Input
- 3.3, 5, 12, 15 Volt Outputs
- Pin & Surface Mount Models

### Key Market Segments & Applications

Telecom  
Datacom  
Factory Automation & Process Control

### PXC05 Features and Benefits

#### Features

- UL, C-UL, TUV, CE approvals
- Wide range input
- Five sided shielding

#### Benefits

- Easier system approvals
- Less parts to inventory
- Reduced radiated noise

#### Specifications

ITEMS	PXC05
Max Output Power	5W
Voltage Accuracy	+/-2%
Voltage Adjustment	None
Minimum Load (1)	10%
Line Regulation	+/-0.2%
Load Regulation (25% to 100%)	Single Output: +/-0.5%, Dual Output: +/-1%
Cross Regulation (25% to 100%)	Dual +/-5%
Ripple and Noise	50mVp-p (20MHz bandwidth)
Start up time	600ms
Temperature Coefficient	<+/-0.02%/°C
Operating Temperature	See derating curves
Maximum Case Temperature	+100°C
Storage Temperature	-55°C to +105°C
Thermal Shock	MIL-STD-810D
Relative Humidity (non condensing)	5 to 95%
Transient Response	200µs recovery (25% step load change)
Overvoltage Protection	None
Overcurrent Protection	Typically at 170%, self recovery
Input Surge Voltage (Max for 100ms)	12V input: 36V, 24V input: 50V, 48V input: 100V
Reflected input ripple (peak to peak) (2)	20mA
Isolation Voltage	1600VDC min.
Isolation Resistance	10 <sup>9</sup> Ω min.
Isolation Capacitance (max)	300pF
Typical Switching Frequency (Fixed)	300kHz
MTBF (BELLCORE TR-NWT-000332)	3,165,000 hours
Vibration	10 - 55Hz, 2G, 30 minutes each X, Y, Z axis
Conducted and Radiated Emissions	EN55022 Level A
Immunity	EN61000-4-2, -3, -4, -5, -6 Pref Criteria 2
Safety Agency Approval	IEC60950-1, UL/CSA60950-1, EN60950-1, CE Mark
Size mm (L x W x H)	32 x 21 x 11
Weight (g)	DIP 16 SMD 18
Warranty (yrs)	3

**Notes:** (1) To meet regulation & noise specifications. Operation at zero load will not damage the device  
(2) 12µH source impedance in series with + input (3) SMD package: Add suffix "/SMD" to model number.



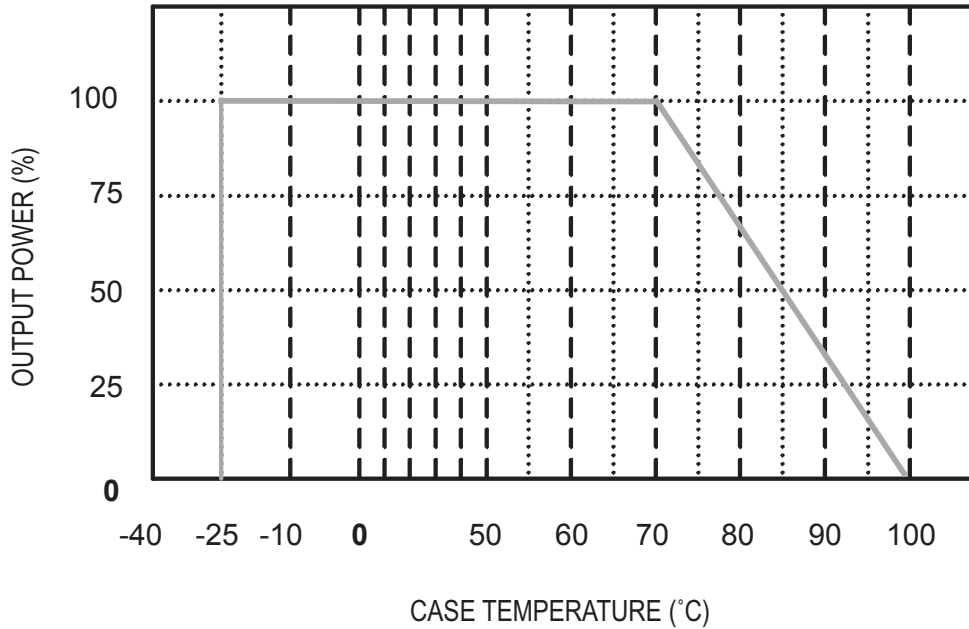
Model Selector							
Model	Output Voltage (V)	Output Current (mA)	Output Power (W)	Input Voltage (V)	Nominal Input Current (mA)	Efficiency (%)	Max Load Capacity (uF)
<b>Single Outputs</b>							
PXC05-24WS3P3	3.3	1000	3.3	9 - 36VDC	191	76	2200
PXC05-48WS3P3	3.3	1000	3.3	18 - 75VDC	100	73	2200
PXC05-24WS05	5	1000	5	9 - 36VDC	285	77	1000
PXC05-48WS05	5	1000	5	18 - 75VDC	145	76	1000
PXC05-24WS12	12	470	5.64	9 - 36VDC	309	80	220
PXC05-48WS12	12	470	5.64	18 - 75VDC	155	80	220
PXC05-24WS15	15	400	6	9 - 36VDC	329	80	150
PXC05-48WS15	15	400	6	18 - 75VDC	167	79	150
<b>Dual Outputs</b>							
PXC05-24WD05	+/-5	+/-500	5	9 - 36VDC	282	78	+/-680
PXC05-48WD05	+/-5	+/-500	5	18 - 75VDC	145	76	+/-680
PXC05-24WD12	+/-12	+/-230	5.52	9 - 36VDC	295	82	+/-100
PXC05-48WD12	+/-12	+/-230	5.52	18 - 75VDC	151	80	+/-100
PXC05-24WD15	+/-15	+/-190	5.7	9 - 36VDC	313	80	+/-68
PXC05-48WD15	+/-15	+/-190	5.7	18 - 75VDC	159	79	+/-68

DIP Pin Connection			
Pin #	Single	Function	Dual
2	- Input		- Input
3	- Input		- Input
9	NC		Common
10	no pin		no pin
11	NC		- Output
23	+ Input		+ Input
22	+ Input		+ Input
16	- Output		Common
15	no pin		no pin
14	+ Output		+ Output

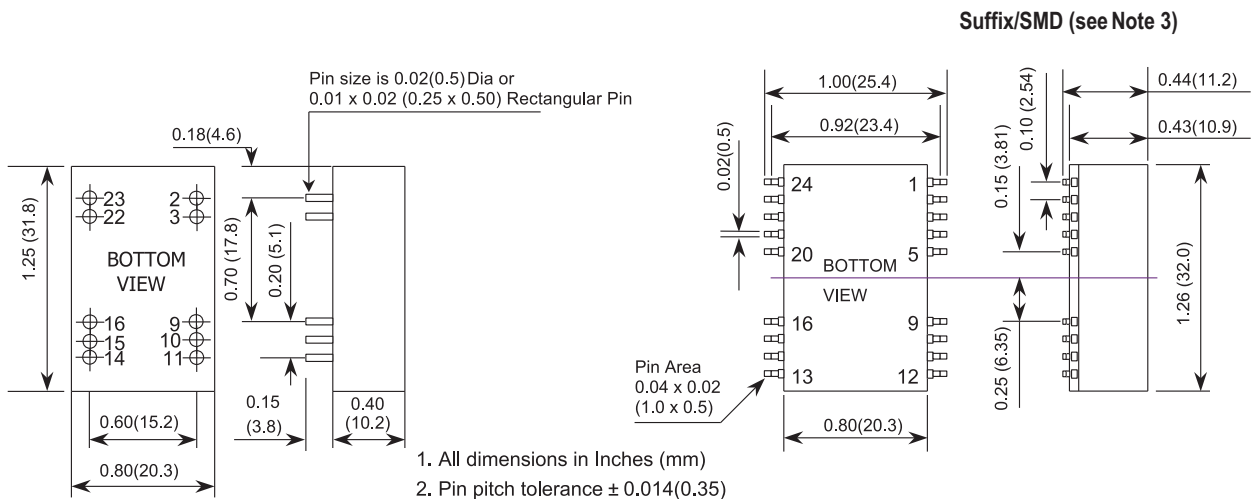
SMD Pin Connection			
Pin #	Single	Function	Dual
2	- Input		- Input
3	- Input		- Input
9	NC		Common
10	NC		NC
11	NC		- Output
23	+ Input		+ Input
22	+ Input		+ Input
16	- Output		Common
15	NC		NC
14	+ Output		+ Output
Others	NC		NC



## Derating Curve PXC05 Series



## Outline Drawing PXC05 Series





- Industry Standard 2" x 1" Footprint
- Six Sided Shielding
- Agency Approved
- 12V, 24V and 48V Inputs

## PXD Series

Single and Dual Output 10 to 20W  
DC-DC Converters

### Key Market Segments & Applications

- Telecom
- Datacom
- Point of Load

### PXD Features and Benefits

#### Features

- UL, CSA, EN, CE Approvals
- Wide Range Input
- Six Sided Shielding

#### Benefits

- Easier System Approvals
- Less Parts to Inventory
- Reduced Radiated Noise

### Specifications

ITEMS	PXD10	PXD15	PXD20
Max Output Power	10W	15W	20W
Voltage Accuracy	±2%	±1%	±1%
Voltage Adjustment (Single O/P Only)	None	None	±10%
Minimum Load, each output (1)	10%	10%	Single 0%; Dual 10%
Line Regulation	±1%	±1%	±0.2%
Load Regulation (10% to 100%)	Single Output: ±1% Dual Output: ±2%	Single Output: ±1% Dual Output: ±2%	±0.5% -
Cross Regulation (25% to 100%)		±5%	
Ripple and Noise	Single 50mV, Dual 75mV		Single 75mV, Dual 100mV
Start up time	20ms		10ms
Remote on/off (3)	Positive Logic: ON: Open or 3.5-12V, OFF Short or <1.2V Negative Logic: ON: Short or <1.2V, OFF: Open or 3.5-12V		
Temperature Coefficient	<±0.02%/°C		
Operating Temperature	-40°C to +85°C (model dependent - see derating curves)		
Maximum Case Temperature	+100°C		
Storage Temperature	-55°C to +105°C		
Thermal Shock	MIL-STD-810D		
Relative Humidity	5 to 95% (non condensing)		
Transient Response (25% step load chg.)	500µS recovery	500µS recovery	300µS recovery
Overvoltage Protection (Zener clamp)	1.5-3.3V: 3.9V, 5V: 6.2V, 12V: 15V, 15V: 18V		
Overcurrent & Short Circuit Protection	Typically at 150%, hiccup with self recovery		
Input Surge Voltage (Max. for 100ms)	12V input: 36V, 24V input: 50V, 48V input: 100V		
Reflected input ripple (peak to peak) (2)	30mA	20mA	20mA
Isolation Voltage	1600VDC minimum		
Isolation Resistance	109 Ω minimum		
Isolation Capacitance (max)	300pF		1000pF
Typical Switching Frequency (Fixed)	300kHz	Single: 500kHz Dual: 300kHz	500kHz
MTBF (BELLCORE TR-NWT-000332)	1,976,000 hours	2,041,000 hours	1,791,000 hours
Vibration	10 - 55Hz, 2G, 30 minutes each X, Y, Z axis		
Conducted and Radiated Emissions	EN55022 Level A		
Immunity	EN61000-4-2, -3, -4, -5, -6 Pref Criteria 2		
Safety Agency Approval	IEC606950, UL1950, EN60950, CE Mark (48V input only)		
Size mm (L x W x H)	50.8 x 25.4 x 10.2		
Weight (g)	27		
Warranty (yrs)	3		



**Specification Notes:** (1) To meet regulation & noise specifications. Operation at zero load will not damage the device.  
 (2) 12 $\mu$ H source impedance in series with + input (3) Positive logic standard on 20W (see options table). Input current 2.5mA

Model Selector						
Output Volt (V)	Output Current (A)	Output Power (W)	Input Volt (V)	Model	Efficiency (%)	
3.3	2.0	6.6	9 - 18VDC	PXD10-12S3P3	80	
3.3	2.0	6.6	18 - 36VDC	PXD10-24S3P3	80	
3.3	2.0	6.6	36 - 75VDC	PXD10-48S3P3	79	
3.3	5.0	16.5	9 - 18VDC	PXD20-12S3P3	84	
3.3	5.0	16.5	18 - 36VDC	PXD20-24S3P3	86	
3.3	5.0	16.5	36 - 75VDC	PXD20-48S3P3	87	
5	2.0	10	9 - 36VDC	PXD10-24WS05	80	
5	2.0	10	18 - 75VDC	PXD10-48WS05	80	
5	4.0	20	9 - 18VDC	PXD20-12S05	87	
5	4.0	20	18 - 36VDC	PXD20-24S05	89	
5	4.0	20	36 - 75VDC	PXD20-48S05	89	
12	0.83	10	9 - 36VDC	PXD10-24WS12	82	
12	0.83	10	18 - 75VDC	PXD10-48WS12	84	
12	1.67	20	9 - 18VDC	PXD20-12S12	85	
12	1.67	20	18 - 36VDC	PXD20-24S12	87	
12	1.67	20	36 - 75VDC	PXD20-48S12	88	
15	0.67	10	9 - 36VDC	PXD10-24WS15	80	
15	0.67	10	18 - 75VDC	PXD10-48WS15	84	
15	1.33	20	9 - 18VDC	PXD20-12S15	85	
15	1.33	20	18 - 36VDC	PXD20-24S15	87	
15	1.33	20	36 - 75VDC	PXD20-48S15	87	
Dual Outputs						
±5	±1.0	10	18 - 75VDC	PXD10-48WD05	82	
±5	±1.0	10	9 - 36VDC	PXD10-24WD05	82	
±5	±1.5	15	9 - 18VDC	PXD15-12D05	83	
±5	±1.5	15	18 - 36VDC	PXD15-24D05	84	
±5	±1.5	15	36 - 75VDC	PXD15-48D05	85	
±12	±0.416	10	9 - 36VDC	PXD10-24WD12	80	
±12	±0.416	10	18 - 75VDC	PXD10-48WD12	78	
±12	±0.833	20	9 - 18VDC	PXD20-12D12	86	
±12	±0.833	20	18 - 36VDC	PXD20-24D12	87	
±12	±0.833	20	36 - 75VDC	PXD20-48D12	88	
±15	±0.333	10	9 - 36VDC	PXD10-24WD15	80	
±15	±0.333	10	18 - 75VDC	PXD10-48WD15	81	
±15	±0.667	20	9 - 18VDC	PXD20-12D15	86	
±15	±0.667	20	18 - 36VDC	PXD20-24D15	87	
±15	±0.667	20	36 - 75VDC	PXD20-48D15	87	

\* OTHER MODELS AVAILABLE ON REQUEST \*

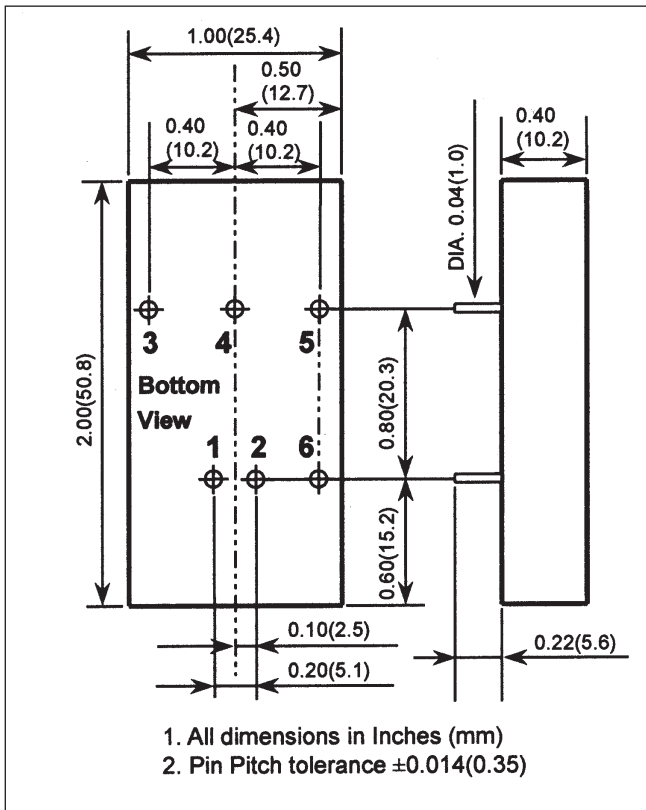
Pinout		
Pin#	Function	
	Single Output	Dual Output
1	+ Input	+ Input
2	- Input	- Input
3	+ Output	+ Output
4	Trim (20W only)	Common
5	- Output	- Output
6	Remote On/Off	Remote On/Off

**Notes:**

- (1) With external ceramic capacitor (24V: 4.7 $\mu$ F, 48V: 2.2 $\mu$ F) connected across input pins
- (2) For EN61000-4-4 & -5 compliance fit external electrolytic capacitor (24V: 330 $\mu$ F, 48V: 220 $\mu$ F) connected across input pins



## Outline Drawing PXD Series



## PXD10 & 15 Series

Options	Single Output	Dual Output
Suffix	Function	Function
No Suffix	No Logic & No Trim	No Logic & No Trim
P	Positive Logic (No Trim Function)	Positive Logic (No Trim Function)
N	Negative Logic (No Trim Function)	Negative Logic (No Trim Function)

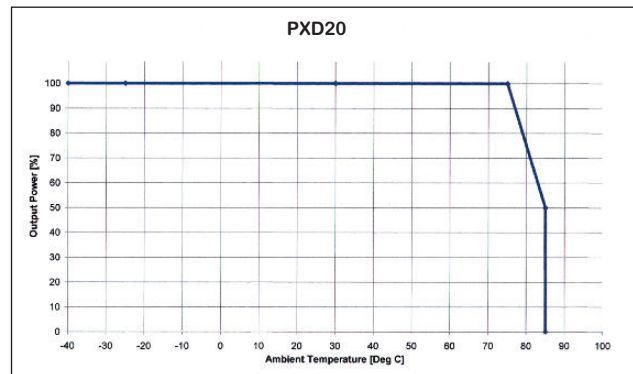
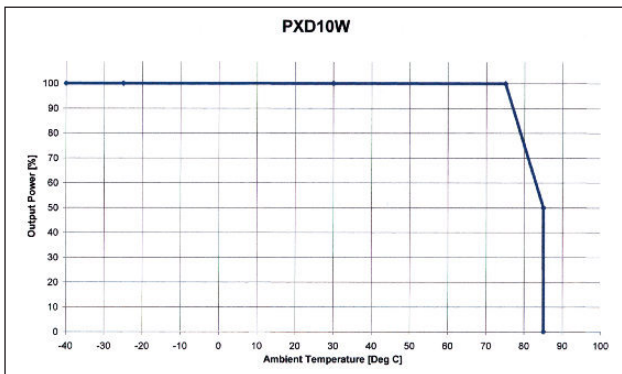
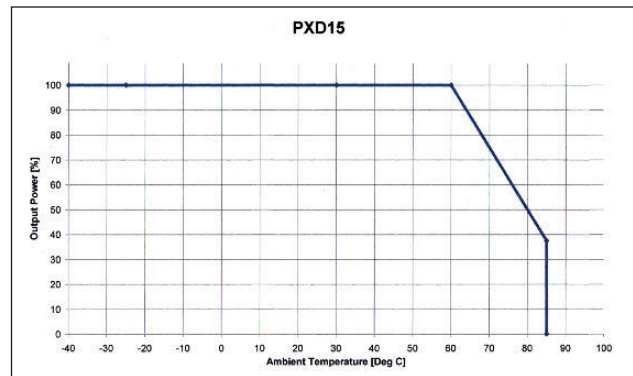
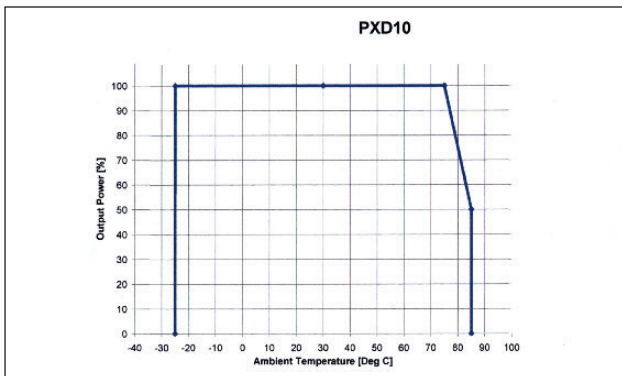
Add suffix for required options, Example PXD15-48S12-N

## PXD20 Series

Options	Single Output	Dual Output
Suffix	Function	Function
No Suffix	Positive Logic & Output Trim	Positive Logic (No Trim Function)
N	Negative Logic & Output Trim	Negative Logic (No Trim Function)

Add suffix for N option, Example PXD20-48S12-N

## Derating Curves PXD Series





- Industry Standard 2" x 1" Footprint
- Six Sided Shielding
- Safety Agency Certifications
- 9-36V or 18-75VDC Input

## PXD20W Series

Single and Dual Output  
20W DC-DC Converters

### Key Market Segments & Applications

- Telecom
- Datacom
- Process Control

### PXD20W Features and Benefits

#### Features

- Safety Certification
- Wide range input
- Six sided shielding

#### Benefits

- Easier system approvals
- Less parts to inventory
- Reduced radiated noise

Specifications	Single Output	Dual Output
ITEMS		
Max Output Power		20W
Voltage Accuracy		±1%
Voltage Adjustment	±10%	None
Minimum Load		None
Line Regulation	±0.2%	±0.5%
Load Regulation	±0.5%	±1%
Cross Regulation (25% to 100%)	-	±5%
Ripple and Noise	See table	
Start up time	20ms	
Remote on/off	Positive Logic: ON: Open or 3-12V, OFF Short or <1.2V Negative Logic: ON: Short or <1.2V, OFF: Open or 3-12V	
Temperature Coefficient	<+/-0.02%/°C	
Operating Temperature	-40°C to +66°C, derating necessary above 66°C	
Maximum Case Temperature	+105°C	
Storage Temperature	-55°C to +125°C	
Thermal Shock	MIL-STD-810F	
Relative Humidity (non condensing)	5 to 95%	
Transient Response (25% step load change)	250µs recovery	
Overvoltage Protection (Zener clamp)	3.3: 3.9V, 5V: 6.2V, 12V: 15V, 15V: 18V	
Overcurrent and Short Circuit Protection	Typically at 150%, hiccup with self recovery	
Input Surge Voltage (Maximum for 100ms)	24V input: 50V, 48V input: 100V	
Reflected input ripple (peak to peak)	20mA	
Isolation Voltage	1600VDC minimum	
Isolation Resistance	10 <sup>9</sup> Ω minimum	
Isolation Capacitance (max)	1500pF	
Typical Switching Frequency (Fixed)	400kHz	
MTBF (BELLCORE TR-NWT-000332)	1,620,000 hours	
Vibration	MIL-STD-810F	
Conducted and Radiated Emissions (1)	EN55022 Level A	
Immunity (2)	EN61000-4-2, -3, -4, -5, -6	
Safety Agency Certifications	IEC60950-1, UL60950-1, EN60950-1, CE Mark	
Size mm (L x W x H)	50.8 x 25.4 x 10.2	
Weight (g)	27	
Warranty (yrs)	3	





Model Selector							
Model	Output Volt (V)	Output Curr (A)	Output Power (W)	Input Volt (V)	Ripple & Noise (note 3)	Max Output Capacitance (note 4)	Eff.(%)
PXD20-24WS3P3	3.3V	5.5A	18W	9 - 36VDC	60mVp-p	18000 $\mu$ F	85%
PXD20-24WS05	5V	4.0A	20W	9 - 36VDC	75mVp-p	9600 $\mu$ F	88%
PXD20-24WS12	12V	1.67A	20W	9 - 36VDC	75mVp-p	1650 $\mu$ F	86%
PXD20-24WS15	15V	1.33A	20W	9 - 36VDC	75mVp-p	1050 $\mu$ F	86%
PXD20-24WD05	$\pm$ 5V	$\pm$ 2.0A	20W	9 - 36VDC	100mVp-p	$\pm$ 4800 $\mu$ F	88%
PXD20-24WD12	$\pm$ 12V	$\pm$ 0.83A	20W	9 - 36VDC	100mVp-p	$\pm$ 825 $\mu$ F	87%
PXD20-24WD15	$\pm$ 15V	$\pm$ 0.67A	20W	9 - 36VDC	100mVp-p	$\pm$ 525 $\mu$ F	87%
PXD20-48WS3P3	3.3V	5.5A	18W	18 - 75VDC	60mVp-p	18000 $\mu$ F	85%
PXD20-48WS05	5V	4.0A	20W	18 - 75VDC	75mVp-p	9600 $\mu$ F	88%
PXD20-48WS12	12V	1.67A	20W	18 - 75VDC	75mVp-p	1650 $\mu$ F	87%
PXD20-48WS15	15V	1.33A	20W	18 - 75VDC	75mVp-p	1050 $\mu$ F	87%
PXD20-48WD05	$\pm$ 5V	$\pm$ 2.0A	20W	18 - 75VDC	100mVp-p	$\pm$ 4800 $\mu$ F	89%
PXD20-48WD12	$\pm$ 12V	$\pm$ 0.83A	20W	18 - 75VDC	100mVp-p	$\pm$ 825 $\mu$ F	88%
PXD20-48WD15	$\pm$ 15V	$\pm$ 0.67A	20W	18 - 75VDC	100mVp-p	$\pm$ 525 $\mu$ F	88%

### Specification Notes:

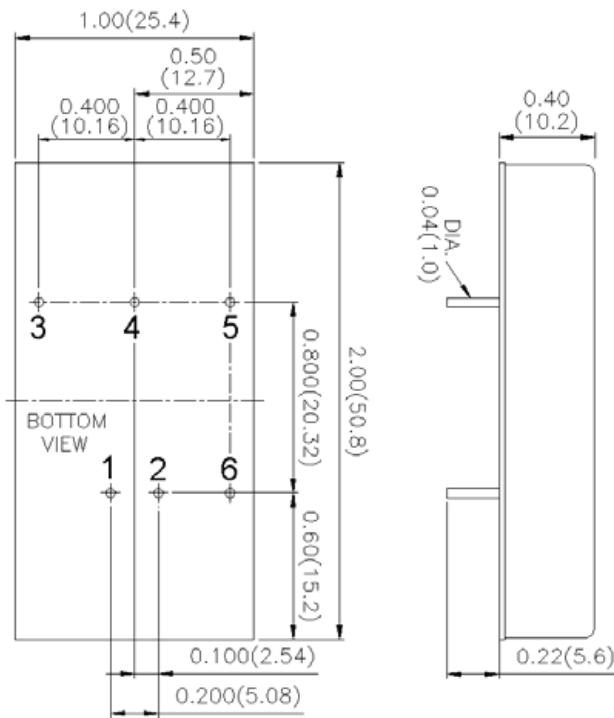
- (1) With external ceramic capacitor (24V: N/A, 48V: 1 $\mu$ F/100V) connected across input pins
- (2) For EN61000-4-4 & -5 compliance, fit external electrolytic capacitor 220 $\mu$ F/100V, ESR 48M $\Omega$  connected across input pins
- (3) Typical value @ nominal input/output
- (4) Value with minimum Vin and constant resistive load

Options	Single Output	Dual Output
Suffix	Function	Function
No Suffix	Positive Logic & Output Trim	Positive Logic (No trim function)
N	Negative Logic & Output Trim	Negative Logic (No trim function)

Add suffix for N option, Example PXD20-48WS12-N



## Outline Drawing PXD20W Series

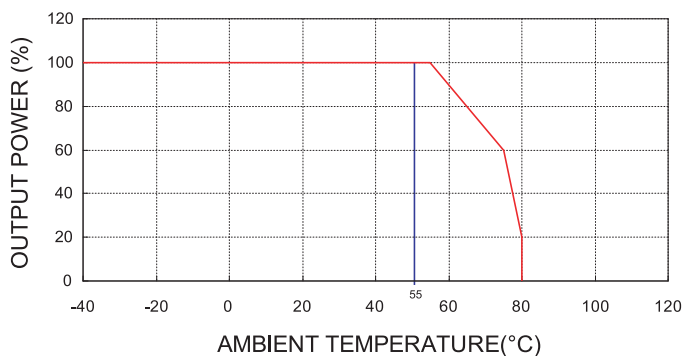


1. All dimensions in Inches (mm)  
Tolerance: X.XX±0.02 (X.X±0.5), X.XXX±0.01 (X.XX±0.25)
2. Pin pitch tolerance ±0.01(0.25)
3. Pin dimension tolerance ±0.004 (0.1)

### Pinout

Pin#	Function	
	<b>Single Output</b>	<b>Dual Output</b>
1	+ Input	+ Input
2	- Input	- Input
3	+ Output	+ Output
4	Trim	Common
5	- Output	- Output
6	CTRL	CTRL

## Derating Curve PXD20W Series





- Industry Standard 2" x 1" Footprint
- Six Sided Shielding
- Safety Agency Certifications
- 9-36V or 18-75VDC Input

## PXD30W Series

Single and Dual output 30W  
DC-DC converters

### Key Market Segments & Applications

- Telecom
- Datacom
- Process Control

### PXD30W Features and Benefits

#### Features

- Safety Certification
- Wide range input
- Six sided shielding

#### Benefits

- Easier system approvals
- Less parts to inventory
- Reduced radiated noise

Specifications	Single Output	Dual Output
ITEMS		
Max Output Power		30W
Voltage Accuracy		±1%
Voltage Adjustment	±10%	None
Minimum Load		None
Line Regulation		±0.2%
Load Regulation	±0.5%	±1%
Cross Regulation (25% to 100%)	-	±5%
Ripple and Noise	<5.1V output: 100mV, 12-15V output: 150mV	
Start up time	30ms	
Remote on/off	Positive Logic: ON: Open or 3-12V, OFF Short or <1.2V Negative Logic: ON: Short or <1.2V, OFF: Open or 3-12V	
Temperature Coefficient	<+/-0.02%/°C	
Operating Temperature	-40°C to +85°C, derating necessary above 50°C	
Maximum Case Temperature	+105°C (Overtemperature Protection +115°C)	
Storage Temperature	-55°C to +125°C	
Thermal Shock	MIL-STD-810F	
Relative Humidity (non condensing)	5 to 95%	
Transient Response (25% step load change)	250µs recovery	
Overvoltage Protection (Zener clamp)	5V: 6.2V, 12V: 15V, 15V: 18V	
Overcurrent and Short Circuit Protection	Typically at 150%, hiccup with self recovery	
Input Surge Voltage (Maximum for 100ms)	24V input: 50V, 48V input: 100V	
Reflected input ripple (peak to peak)	20mA	
Isolation Voltage	1600VDC minimum	
Isolation Resistance	10 <sup>9</sup> Ω minimum	
Isolation Capacitance (max)	1500pF	
Typical Switching Frequency (Fixed)	430kHz	
MTBF (BELLCORE TR-NWT-000332)	3,163,000 hours	
Vibration	MIL-STD-810F	
Conducted and Radiated Emissions (1)	EN55022 Level A	
Immunity (2)	EN61000-4-2, -3, -4, -5, -6 Pref Criteria A	
Safety Agency Certifications	IEC60950-1, UL60950-1, EN60950-1, CE Mark	
Size mm (L x W x H)	50.8 x 25.4 x 10	
Weight (g)	30.5	
Warranty (yrs)	3	



Model Selector					
Output Volt (V)	Output Curr (A)	Output Power (W)	Input Volt (V)	Model	Eff.(%)
<b>Single Outputs</b>					
3.3V	7.5A	24.75W	9 - 36VDC	PXD30-24WS3P3	86%
3.3V	7.5A	24.75W	18 - 75VDC	PXD30-48WS3P3	86%
5V	6.0A	30W	9 - 36VDC	PXD30-24WS05	88%
5V	6.0A	30W	18 - 75VDC	PXD30-48WS05	88%
12V	2.5A	30W	9 - 36VDC	PXD30-24WS12	89%
12V	2.5A	30W	18 - 75VDC	PXD30-48WS12	90%
15V	2.0A	30W	9 - 36VDC	PXD30-24WS15	89%
15V	2.0A	30W	18 - 75VDC	PXD30-48WS15	91%
<b>Dual Outputs</b>					
±5V	±3.0A	30W	9 - 36VDC	PXD30-24WD05	88%
±5V	±3.0A	30W	18 - 75VDC	PXD30-48WD05	88%
±12V	±1.25A	30W	9 - 36VDC	PXD30-24WD12	87%
±12V	±1.25A	30W	18 - 75VDC	PXD30-48WD12	88%
±15V	±1.0A	30W	9 - 36VDC	PXD30-24WD15	87%
±15V	±1.0A	30W	18 - 75VDC	PXD30-48WD15	88%

#### Specification Notes:

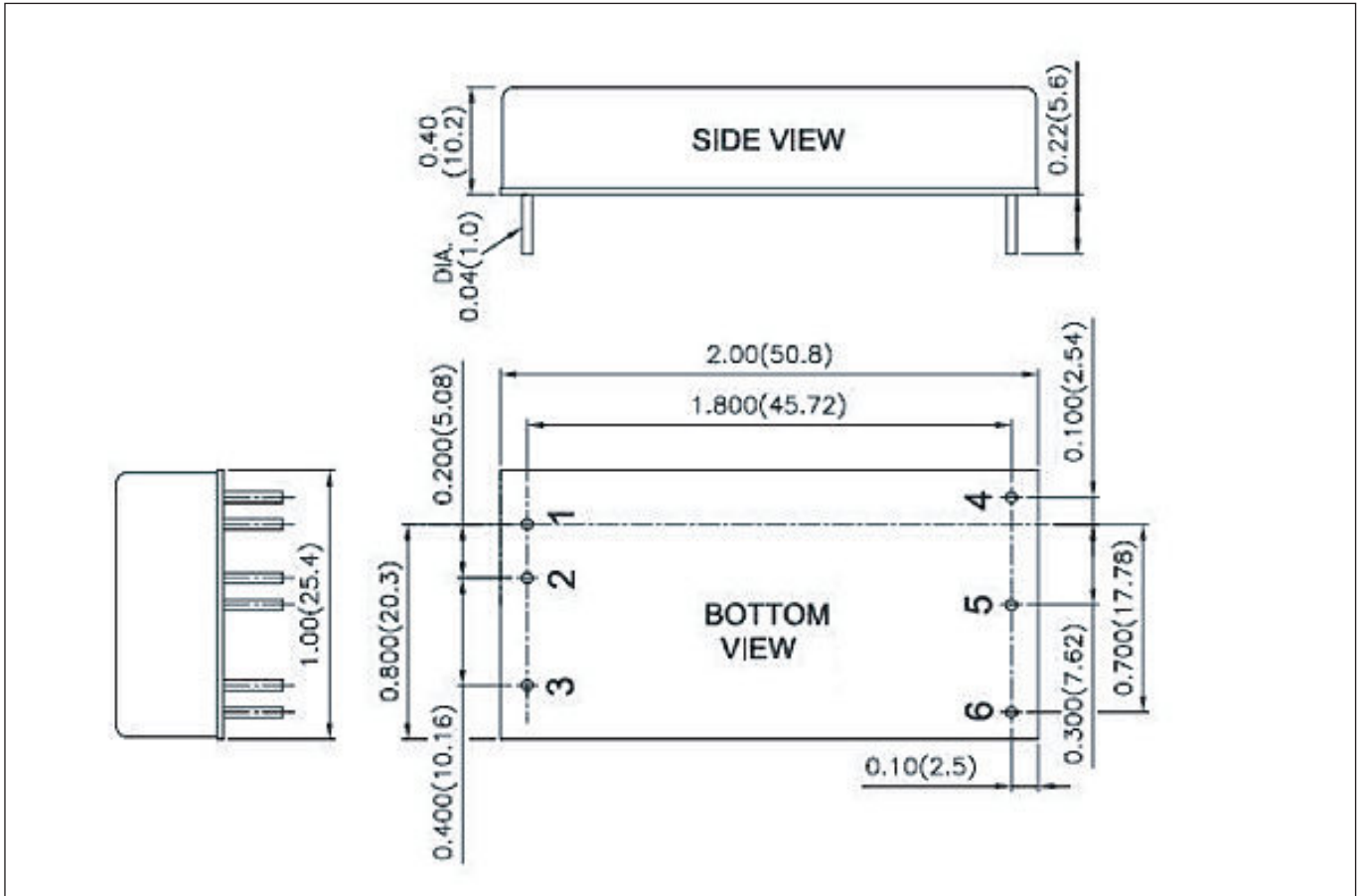
- (1) With external ceramic capacitor (24V: 4.7uF, 48V: 2.2uF) connected across input pins
- (2) For EN61000-4-4 & -5 compliance fit external electrolytic capacitor (24V: 330uF, 48V: 220uF) connected across input pins

Options	Single Output	Dual Output
Suffix	Function	Function
No Suffix	Positive Logic & Output Trim	Positive Logic (No trim function)
N	Negative Logic & Output Trim	Negative Logic (No trim function)

*Add suffix for N option, Example PXD30-48WS12-N*



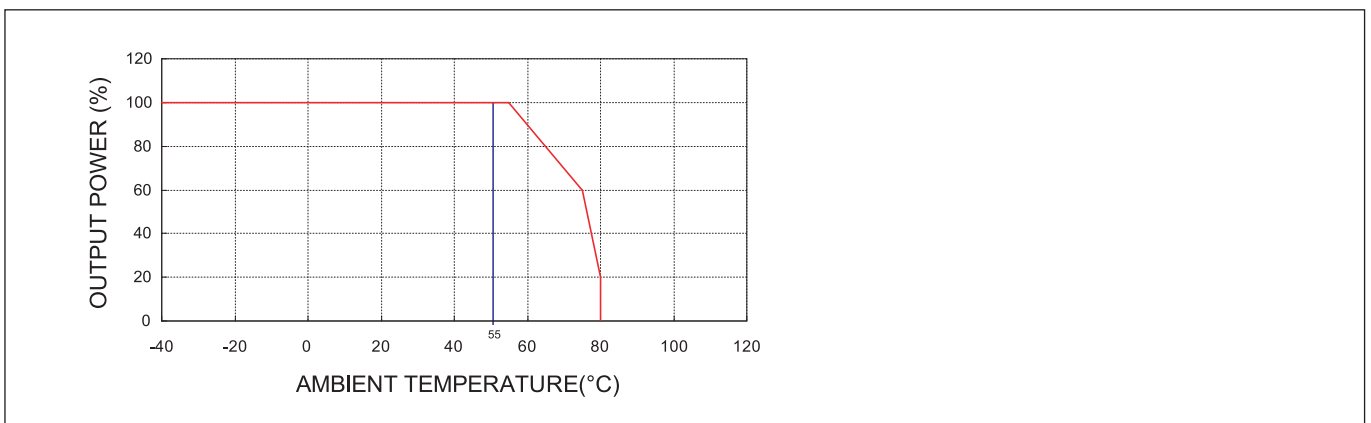
## Outline Drawing PXD30W Series



### Pinout

Pin#	Function	
	<b>Single Output</b>	<b>Dual Output</b>
1	+ Input	+ Input
2	- Input	- Input
3	Remote On/Off	Remote On/Off
4	+ Output	+ Output
5	- Output	Common
6	Trim	- Output

## Derating Curve PXD30W Series





- Industry Standard 2" x 1.6" Footprint
- Six Sided Shielding
- Agency Approved
- 12V, 24V and 48V Inputs

## PXE Series

Single and Dual 20W to 30W  
DC-DC Converters

### Key Market Segments & Applications

Telecom  
Datacom  
Point of Load

### PXE Features and Benefits

#### Features

- UL, CSA, EN, CE Approvals
- Wide Range Input
- Six Sided Shielding

#### Benefits

- Easier System Approvals
- Less Parts to Inventory
- Reduced Radiated Noise

### Specifications

ITEMS	PXE20	PXE30
Max Output Power	20W	30W
Voltage Accuracy	±2%	±1%
Voltage Adjustment	±10%	
Minimum Load, each output (1)	10%	None
Line Regulation	±0.2% for single, ±0.5% for dual	
Load Regulation (25% to 100%)	Single ±0.5%, Dual ±3%	Single ±0.5%, Dual ±1%
Cross Regulation (25% to 100%)	Dual ±5%	
Ripple and Noise (P-P)	Single: 75mV; Dual: 100mV	
Start up time	20ms typ.	25ms typ.
Remote on/off (3) (4)	Positive Logic: ON: Open or 3.5-12V, OFF Short or <1.2V	
Temperature Coefficient	<±0.02%/°C	
Operating Temperature	-40°C to +85°C	
Maximum Case Temperature	+100°C	
Storage Temperature	-55°C to +105°C	
Thermal Shock	MIL-STD-810D	
Relative Humidity (non condensing)	5 to 95%	
Transient Response (25% step load change)	500µs recovery	300µs recovery
Overvoltage Protection (Zener clamp)	3.3V: 3.9V, 5V: 6.2V, 12V: 15V, 15V: 18V	
Overcurrent and Short Circuit Protection	Typically at 150%, hiccup with self recovery	
Input Surge Voltage (Maximum for 100ms)	12V input: 36V, 24V input: 50V, 48V input: 100V	
Reflected input ripple (peak to peak) (2)	25mA	30mA
Isolation Voltage	1600VDC minimum (Input-Output, Input-Case)	
Isolation Resistance	10 <sup>9</sup> Ω minimum	
Isolation Capacitance (max)	300pF	1000pF
Typical Switching Frequency (Fixed)	300kHz	
MTBF (BELLCORE TR-NWT-000332)	1,976,000 hours	1,535,000 hours
Vibration	10 - 55Hz, 2G, 30 minutes each X, Y, Z axis	
Conducted and Radiated Emissions	EN55022 Level A	
Immunity	EN61000-4-2, -3, -4, -5, -6 Pref Criteria 2	
Safety Agency Approval	IEC606950, UL1950, EN60950, CE Mark (48V input only)	
Size mm (L x W x H)	50.8 x 40.6 x 10.2	
Weight (g)	48	
Warranty (yrs)	3	

**Notes:** (1) To meet regulation & noise specifications. Operation at zero load will not damage the device.  
(3) Max sink current 20mA (PXE20), 2.5mA (PXE30); The on/off pin is referenced to the negative input

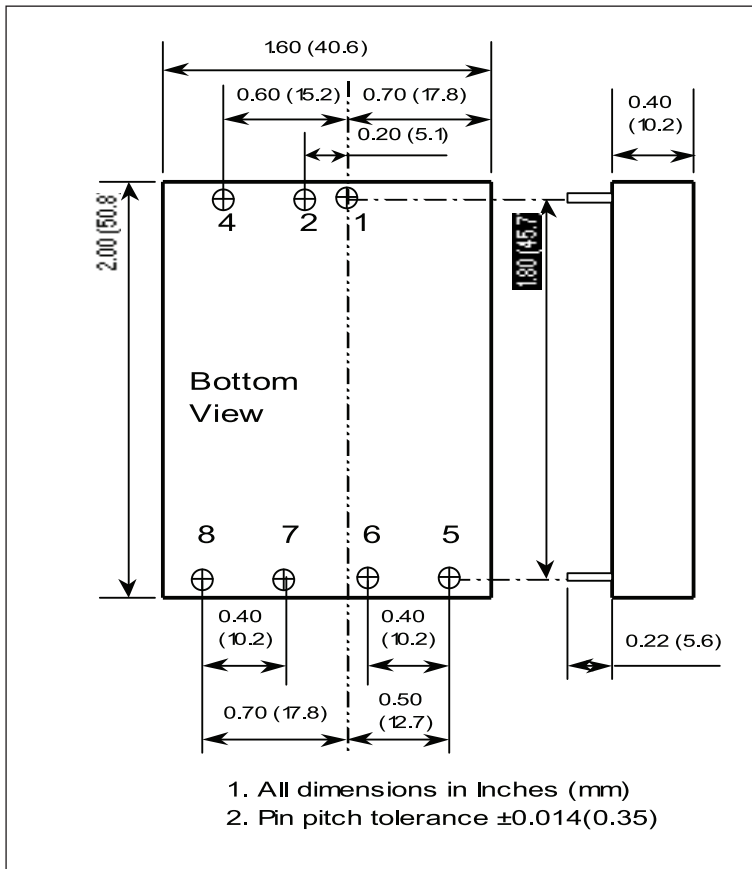
(2) 12µH source impedance in series with + input  
(4) Negative Logic : **OFF** Open or 3.5V -12V **ON** Short or <1.2V



Model Selector					
Output Volt (V)	Output Curr (A)	Output Power (W)	Input Volt (VDC)	Model	Efficiency (%)
<b>Single Outputs</b>					
1.5	8.0	30	10 - 40	PXE30-24WS1P5	80
1.5	8.0	30	18 - 75	PXE30-48WS1P5	80
1.8	8.0	30	10 - 40	PXE30-24WS1P8	83
1.8	8.0	30	18 - 75	PXE30-48WS1P8	83
2.5	8.0	30	10 - 40	PXE30-24WS2P5	85
2.5	8.0	30	18 - 75	PXE30-48WS2P5	86
3.3	6.0	18	9 - 18	PXE30-12S3P3	85
3.3	6.0	18	18 - 36	PXE30-24S3P3	88
3.3	6.0	18	36 - 75	PXE30-48S3P3	87
3.3	6.0	30	10 - 40	PXE30-24WS3P3	87
3.3	6.0	30	18 - 75	PXE30-48WS3P3	87
3.3	6.0	30	10 - 40	PXE30-24WS3P3	87
5	4.0	20	9 - 36	PXE20-24WS05	79
5	4.0	20	18 - 75	PXE20-48WS05	80
5	6.0	30	9 - 18	PXE30-12S05	87
5	6.0	30	18 - 36	PXE30-24S05	88
5	6.0	30	36 - 75	PXE30-48S05	89
5	6.0	30	10 - 40	PXE30-24WS05	87
5	6.0	30	18 - 75	PXE30-48WS05	88
12	1.67	20	9 - 36	PXE20-24WS12	81
12	1.67	20	18 - 75	PXE20-48WS12	81
12	2.5	30	9 - 18	PXE30-12S12	88
12	2.5	30	18 - 36	PXE30-24S12	89
12	2.5	30	36 - 75	PXE30-48S12	90
12	2.5	30	10 - 40	PXE30-24WS12	87
12	2.5	30	18 - 75	PXE30-48WS12	87
15	1.33	20	9 - 36	PXE20-24WS15	81
15	1.33	20	18 - 75	PXE20-48WS15	81
15	2.0	30	9 - 18	PXE30-12S15	88
15	2.0	30	18 - 36	PXE30-24S15	89
15	2.0	30	36 - 75	PXE30-48S15	90
15	2.0	30	10 - 40	PXE30-24WS15	88
15	2.0	30	18 - 75	PXE30-48WS15	88
<b>Dual Outputs</b>					
±5	±2.0	20	9 - 36	PXE20-24WD05	79
±5	±2.0	20	18 - 75	PXE20-48WD05	79
±12	±0.833	20	9 - 36	PXE20-24WD12	81
±12	±0.833	20	18 - 75	PXE20-48WD12	83
±12	±1.25	30	9 - 18	PXE30-12D12	87
±12	±1.25	30	18 - 36	PXE30-24D12	88
±12	±1.25	30	36 - 75	PXE30-48D12	88
±12	±1.25	30	10 - 40	PXE30-24WD12	84
±12	±1.25	30	18 - 75	PXE30-48WD12	85
±15	±0.666	20	9 - 36	PXE20-24WD15	82
±15	±0.666	20	18 - 75	PXE20-48WD15	84
±15	±1.0	30	9 - 18	PXE30-12D15	87
±15	±1.0	30	18 - 36	PXE30-24D15	88
±15	±1.0	30	36 - 75	PXE30-48D15	88
±15	±1.0	30	10 - 40	PXE30-24WD15	85
±15	±1.0	30	18 - 75	PXE30-48WD15	86



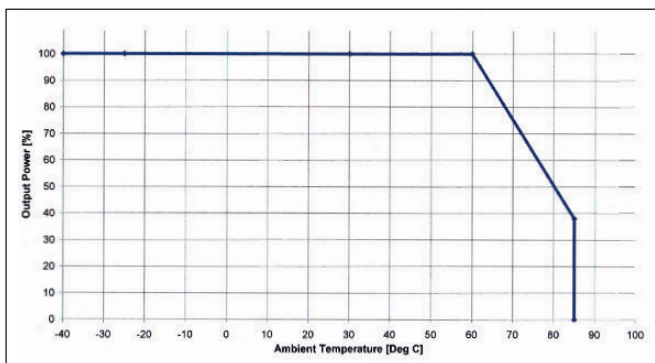
## Outline Drawing PXE Series



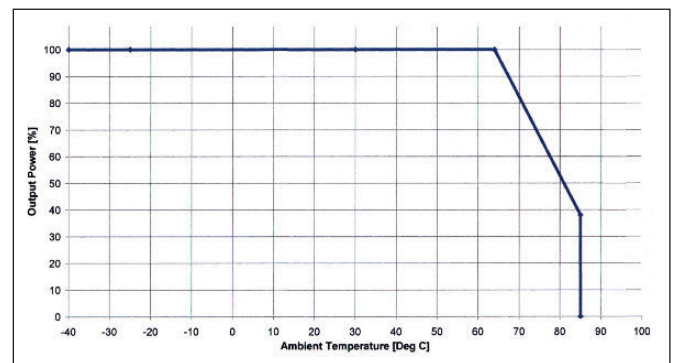
## Pinout

PIN #	Function	
	Single Output	Dual Output
1	+ Input	+ Input
2	- Input	- Input
4	Remote on/off	Remote on/off
5	No Pin	+ Output
6	+ Output	Common
7	- Output	- Output
8	Trim	Trim

## Derating Curve PXE20 Series



## Derating Curve PXE30 Series



Options	Single Output	Dual Output
Suffix	Function	Function
No Suffix	Positive Logic & Output Trim	Positive Logic & Output Trim
N	Negative Logic & Output Trim <sup>(4)</sup> (PXE30 wide range only)	Negative Logic & Output Trim <sup>(4)</sup> (PXE30 wide range only)
Add suffix for N option, Example PXE30-48S12-N		







- Industry Standard 2" x 2" Footprint
- Six Sided Shielding
- Agency Approved
- 12, 24 and 48V Inputs
- 4:1 Wide Range Input Models

## PXF Series

Single, Dual, Triple Output 40W & 60W  
DC-DC Converters

### Key Market Segments & Applications

- Telecom
- Datacom
- Point of Load

### PXF Features and Benefits

#### Features

- UL, CSA, EN, CE Approvals
- Wide Range Input
- Six Sided Shielding

#### Benefits

- Easier System Approvals
- Less Parts to Inventory
- Reduced Radiated Noise

### Specifications

ITEMS	PXF
Maximum Output Power	40W or 60W
Voltage Accuracy (Full Load, Nom. Vin)	Single, Dual and Triple Main $\pm 1\%$ , Triple Auxiliaries $\pm 5\%$
Voltage Adjustment (1)	$\pm 10\%$ (Single and Dual Output Only)
Minimum Load, each output (2)	Single Output = 0%, Dual and Triple = 10% of full load rating
Line Regulation	Single / Dual $\pm 0.5\%$ , Triple (main) $\pm 1\%$ , Triple (auxiliary) $\pm 5\%$
Load Regulation (10% to 100%) (3)	Single $\pm 0.5\%$ , Dual $\pm 1\%$ , Triple (main) $\pm 2\%$ , Triple (auxiliary) $\pm 5\%$
Cross Regulation (25% to 100%) (4)	Triple (main) $\pm 1\%$ , Dual/Triple (auxiliary) $\pm 5\%$
Start up time	PXF40: 25ms typ., PXF40xxW, PXF60: 20ms max.
Remote on/off (referenced to negative input)	Positive Logic: ON: Open or 3.0-12V, OFF Short or <1.2V
Temperature Coefficient	$< \pm 0.02\%/^{\circ}\text{C}$
Operating Temperature	See derating curves
Maximum Case Temperature	PXF40: $+100^{\circ}\text{C}$ , PXF40-xxW $+105^{\circ}\text{C}$ , PXF60 $+110^{\circ}\text{C}$
Storage Temperature	PXF40: $-55^{\circ}\text{C}$ to $+105^{\circ}\text{C}$ , PXF40xxW, PXF60 $+125^{\circ}\text{C}$
Thermal Shock	MIL-STD-810F
Relative Humidity (non condensing)	5 to 95%
Transient Response (25% step load change)	250 $\mu\text{s}$ recovery
Overvoltage Protection (Zener clamp)	Typical 3.3V: 3.9V, 5V: 6.2V, 12V: 15V, 15V: 18V
Overcurrent and Short Circuit Protection	Typically at 150%, hiccup with self recovery
Input Surge Voltage (Maximum for 100ms)	12V input: 36V, 24V input: 50V, 48V input: 100V
Reflected input ripple (peak to peak) (5)	PXF40: 40mA, PXF40xxW, PXF60: 20mA
Isolation Voltage	Input - Output, Input to Case: 1600VDC minimum
Isolation Resistance	$10^9 \Omega$ minimum
Isolation Capacitance (max)	PXF40, PXF60: 1000pF, PXF40xxW: 2500pF
Switching Frequency (Fixed)	300kHz (typ.)
MTBF (BELLCORE TR-NWT-000332)	PXF40: 1,398,000; PXF40xxW: 1,105,000, PXF60: 1,093,000 hours
Vibration	10 - 55Hz, 10G, 30 minutes each X, Y, Z axis
Conducted and Radiated Emissions	EN55022 Level A, see installation manual
Immunity	EN61000-4-2, -3, -4, -5, -6
Safety Agency Approval	IEC60950-1, UL60950-1, EN60950-1, CE Mark (48V input only)
Size mm (L x W x H)	50.8 x 50.8 x 10.1
Weight (g)	60
Warranty (yrs)	3



Refer to application notes on website for external circuitry and PCB layout

- (1) Maximum output deviation is 10% inclusive of remote sense and trim. If remote sense is not being used, the +Sense and - Sense should be connected to their corresponding outputs; + output, - output.
- (2) Dual and Triple output models require a minimum load of 10% on the output to maintain specified regulation. No load operation will not damage the device.
- (3) Load regulation for triple output: Main output:10-100%, with 10-100% balanced load on auxiliaries. Auxiliary outputs: 10% to 100% balanced on all outputs.
- (4) Cross regulation for dual output: asymmetrical load 25% / 100% full load. Cross regulation for triple output: Main output 100% load, auxiliary 100%, other auxiliary 25% to 100%. Auxiliary outputs: main output 100% load, auxiliary 100%, other auxiliary 25% to 100% or main output 25%, auxiliary 25%, other auxiliary 25% to 100%.
- (5) Simulated Source impedance of 12 $\mu$ H placed in series with + input.

Model Selector						
Output Volt(V)	Output Curr(A)	Input Volt(VDC)	Model	Ripple/Noise (mV)	Efficiency (%)	Max Load Cap( $\mu$ F)
<b>Single Outputs</b>						
3.3	8	9 - 18	PXF40-12S3P3	50	84	21000
3.3	10	9 - 36	PXF40-24WS3P3	50	86	25750
3.3	8	18 - 36	PXF40-24S3P3	50	87	21000
3.3	10	18 - 75	PXF40-48WS3P3	50	86	25750
3.3	14	18 - 36	PXF60-24S3P3	75	89	36000
3.3	8	36 - 75	PXF40-48S3P3	50	88	21000
3.3	14	36 - 75	PXF60-48S3P3	75	89	36000
5	8	9 - 18	PXF40-12S05	50	86	13600
5	8	9 - 36	PXF40-24WS05	50	87	13600
5	8	18 - 36	PXF40-24S05	50	89	13600
5	8	18 - 75	PXF40-48WS05	50	88	13600
5	8	36 - 75	PXF40-48S05	50	90	13600
5	12	18 - 36	PXF60-24S05	75	90	20400
5	12	36 - 75	PXF60-48S05	75	90	20400
12	3.333	9 - 18	PXF40-12S12	75	86	2360
12	3.333	9 - 36	PXF40-24WS12	75	87	2360
12	3.333	18 - 36	PXF40-24S12	75	88	2360
12	3.333	18 - 75	PXF40-48WS12	75	87	2360
12	3.333	36 - 75	PXF40-48S12	75	89	2360
12	5	18 - 36	PXF60-24S12	100	90	3550
12	5	36 - 75	PXF60-48S12	100	90	3550
15	2.666	9 - 18	PXF40-12S15	75	87	1510
15	2.666	9 - 36	PXF40-24WS15	75	87	1510
15	2.666	18 - 36	PXF40-24S15	75	89	1510
15	2.666	18 - 75	PXF40-48WS15	75	87	1510
15	2.666	36 - 75	PXF40-48S15	75	89	1510
15	4	18 - 36	PXF60-24S15	100	90	2300
15	4	36 - 75	PXF60-48S15	100	90	2300
<b>Dual Outputs</b>						
$\pm 12$	$\pm 1.667$	9 - 36	PXF40-24WD12	120	86	$\pm 1200$
$\pm 12$	$\pm 1.8$	9 - 18	PXF40-12D12	120	85	$\pm 1200$
$\pm 12$	$\pm 1.8$	18 - 36	PXF40-24D12	120	87	$\pm 1200$
$\pm 12$	$\pm 1.667$	18 - 75	PXF40-48WD12	120	86	$\pm 1200$
$\pm 12$	$\pm 1.8$	36 - 75	PXF40-48D12	120	87	$\pm 1200$
$\pm 15$	$\pm 1.333$	9 - 36	PXF40-24WD15	150	86	$\pm 750$
$\pm 15$	$\pm 1.4$	9 - 18	PXF40-12D15	150	85	$\pm 750$
$\pm 15$	$\pm 1.4$	18 - 36	PXF40-24D15	150	87	$\pm 750$
$\pm 15$	$\pm 1.333$	18 - 75	PXF40-48WD15	150	86	$\pm 750$
$\pm 15$	$\pm 1.4$	36 - 75	PXF40-48D15	150	87	$\pm 750$
<b>Triple Outputs</b>						
3.3V, $\pm 12$ V	6.0, $\pm 0.4$	9 - 18	PXF40-12T3312	50 / 75	83	13000, $\pm 330$
3.3V, $\pm 12$ V	6.0, $\pm 0.4$	18 - 36	PXF40-24T3312	50 / 75	85	13000, $\pm 330$
3.3V, $\pm 12$ V	6.0, $\pm 0.4$	36 - 75	PXF40-48T3312	50 / 75	86	13000, $\pm 330$
5V, $\pm 12$ V	6.0, $\pm 0.4$	9 - 18	PXF40-12T0512	50 / 75	85	6800, $\pm 330$
5V, $\pm 12$ V	6.0, $\pm 0.4$	18 - 36	PXF40-24T0512	50 / 75	87	6800, $\pm 330$
5V, $\pm 12$ V	6.0, $\pm 0.4$	36 - 75	PXF40-48T0512	50 / 75	88	6800, $\pm 330$
5V, $\pm 15$ V	6.0, $\pm 0.3$	9 - 18	PXF40-12T0515	50/75	86	6800, $\pm 110$
5V, $\pm 15$ V	6.0, $\pm 0.3$	18 - 36	PXF40-24T0515	50/75	87	6800, $\pm 110$
5V, $\pm 15$ V	6.0, $\pm 0.3$	36 - 75	PXF40-48T0515	50/75	88	6800, $\pm 110$







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## Single and Dual Output 3W DC-DC Converters



Features	Benefits
• 60601-1 approval	• Easier system approval
• I/O isolation 5kVAC, 2MOPP	• Patient protection at 250VAC rms working voltage
• 0.25 $\mu$ A low leakage	• Wide range of medical applications
• 4:1 Wide input range	• Less parts to inventory

Specification																	
Model	PXC-M03																
Rated input voltage range	24V nominal: 9-36VDC, 48V nominal: 18-75VDC																
Input surge voltage (max 3 seconds)	24V Nom : 50VDC   48V Nom: 100VDC																
Switching frequency	150kHz																
Maximum input current (no load)	See Table																
Fusing	No internal fuse																
Max output power (W)	3																
Voltage accuracy	Single/Dual $\pm$ 1%																
Voltage adjustment (Note 1)	Single output 3.3V, 5V & 12V: $\pm$ 10%, 15V & 24V: -10%/+20% Dual output $\pm$ 5V, $\pm$ 12V & $\pm$ 15V: $\pm$ 10%																
Line regulation (LL to HL at full load)	Single output $\pm$ 0.2%, Dual output $\pm$ 0.5%																
Ripple and noise (Note 7)	Measured with a 20MHz bandwidth - see table																
Start up time (Nominal Vin and constant resistive load)	Power on: 30ms, Remote ON/OFF: 30ms																
Start up voltage	24Vin(nom) 9V, 48V(nom) 18V																
Shutdown voltage	24Vin(nom) 8V, 48V(nom) 16V																
Remote on/off (option) (Note 1 & Note 6)	DC ON: OPEN or 0 to 1.2VDC DC OFF: 2.2 to 12VDC																
Efficiency	See Table																
Over current protection, factory set	Hiccup, 150% of rated full load																
Short circuit protection (Note 2)	Continuous, auto recovery																
Overvoltage protection	<table border="0"> <tr> <td>3.3V output</td> <td>3.7 to 5V</td> </tr> <tr> <td>5V output</td> <td>5.6 to 7.0V</td> </tr> <tr> <td>12V output</td> <td>13.5 to 16V</td> </tr> <tr> <td>15V output</td> <td>18.3 to 22.0V</td> </tr> <tr> <td>24V output</td> <td>29.1 to 34.5V</td> </tr> <tr> <td>5V/5V output</td> <td>5.6 to 7.0V</td> </tr> <tr> <td>12V/12V output</td> <td>13.5 to 18.2V</td> </tr> <tr> <td>15V/15V output</td> <td>17.0 to 22.0V</td> </tr> </table>	3.3V output	3.7 to 5V	5V output	5.6 to 7.0V	12V output	13.5 to 16V	15V output	18.3 to 22.0V	24V output	29.1 to 34.5V	5V/5V output	5.6 to 7.0V	12V/12V output	13.5 to 18.2V	15V/15V output	17.0 to 22.0V
3.3V output	3.7 to 5V																
5V output	5.6 to 7.0V																
12V output	13.5 to 16V																
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24V output	29.1 to 34.5V																
5V/5V output	5.6 to 7.0V																
12V/12V output	13.5 to 18.2V																
15V/15V output	17.0 to 22.0V																
Operating temperature	-40°C ~ +94°C (without derating), +94°C ~ +105°C (with derating - see curve)																
Storage temperature	-55°C ~ +125°C																
Thermal shock	MIL-STD-810F																
Relative humidity (non condensing)	5% to 95% RH																
Transient response (25% step load change)	250 $\mu$ S																
Isolation voltage (1 minute) (Note 8)	5kVAC																
Isolation capacitance (max)	17pF																
MTBF MIL-HDBK-217F (Note 3)	644,400 hrs																
Vibration	MIL-STD-810F																
Conducted and radiated emissions (Note 4)	EN55011, EN55022, Class A and FCC part 18 EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6: Perf. Criteria A																
Immunity (Note 5)	IEC60601-1, ANSI/AAMI ES60601-1, EN60601-1, CE Mark																
Safety	IEC60601-1, ANSI/AAMI ES60601-1, EN60601-1, CE Mark																
Size (H x W x D)	10.2 x 20.3 x 31.8 mm																
Weight	14g																
Connector	PCB mount																
Cooling	Convection																
Warranty yrs	5																

Notes: See page 2



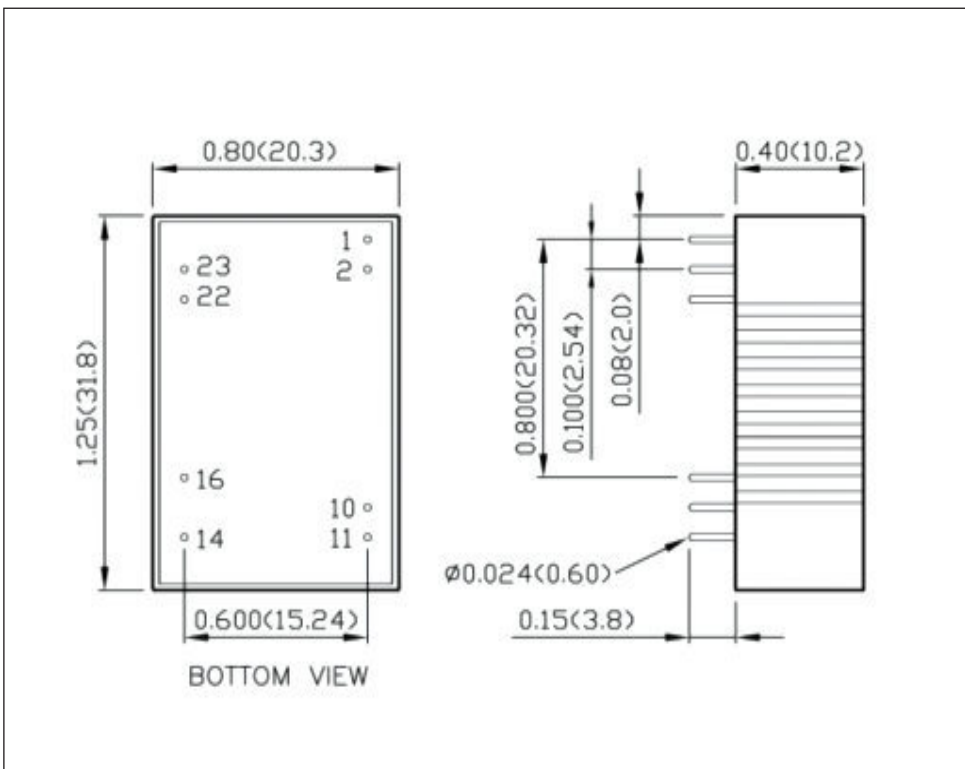
## Model Selector

Model	Input Voltage (VDC)	Output Voltage (VDC)	Output Current Full Load (mA)	Output (7) Ripple & Noise (mV)	Input Current No Load mA	Efficiency % (2)	Maximum Capacitive Load (2)
PXC-M03-24WS3P3	9 ~ 36	3.3	1000	30	6	82	1050
PXC-M03-24WS05	9 ~ 36	5	600	30	6	84.5	750
PXC-M03-24WS12	9 ~ 36	12	250	40	6	87	130
PXC-M03-24WS15	9 ~ 36	15	200	40	6	87	100
PXC-M03-24WS24	9 ~ 36	24	125	50	6	87	39
PXC-M03-24WD05	9 ~ 36	±5	±300	30	6	83	±430
PXC-M03-24WD12	9 ~ 36	±12	±125	40	6	87	75
PXC-M03-24WD15	9 ~ 36	±15	±100	40	6	86	56
PXC-M03-48WS3P3	18 ~ 75	3.3	1000	30	4	81	1050
PXC-M03-48WS05	18 ~ 75	5	600	30	4	84	750
PXC-M03-48WS12	18 ~ 75	12	250	40	4	87	130
PXC-M03-48WS15	18 ~ 75	15	200	40	4	86.5	100
PXC-M03-48WS24	18 ~ 75	24	125	50	4	86.5	39
PXC-M03-48WD05	18 ~ 75	±5	±300	30	4	83	±430
PXC-M03-48WD12	18 ~ 75	±12	±125	40	4	86	±75
PXC-M03-48WD15	18 ~ 75	±15	±100	40	4	86	±56

### Notes

1. Not available for A type pin configuration
2. Typical value at nominal input voltage and full load.
3. MIL-HDBK-217F Notice2 @Ta=25 °C, Full load (Ground Benign, controlled environment).
4. Built in Class A filter. Class B can be achieved with the addition of external components for further information contact your local TDK-Lambda sales office
5. Meeting EN61000-4-4 and 61000-4-5 requires and additional input electrolytic capacitor: 5V input -1000µF/25V, 12V & 24V input - 470µF/50V and 48V input - 330µF/100V
6. The ON/OFF control pin voltage is referenced to -Vin.The ctrl pin input current is <1mA.Remote off input current is typically 2.5mA
7. For R & N, measure the 24V output with a 4.7µF/50V X7R MLCC. All other outputs use a 10µF25V X7R MLCC. Nominal input, full load at +25°C
8. Reinforced insulation 8mm at 250VAC

## Outline Drawing PXC-M03



## Pin Assignment PXC-M03

PIN	Single	Dual
1	CtrlL (Option) / No pin*	CtrlL (Option) / No pin*
2	-Vin	-Vin
10	Trim (option) / No Pin*	Trim (option) / No Pin*
11	No Pin / NC **	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin	+Vin
23	+Vin	+Vin

### NOTES:

\* If the Ctrl or Trim option is not selected there will be no pin fitted in the corresponding pin number position.

\*\* Pin 11 is "No pin" for PXC-M03-xxWSxxx-T, PXC-M03-xxWSxxx-PT

Pin 11 is "NC" for: PXC-M03-xxWSxxx, PXC-M03-xxWSxxx-P

## Options

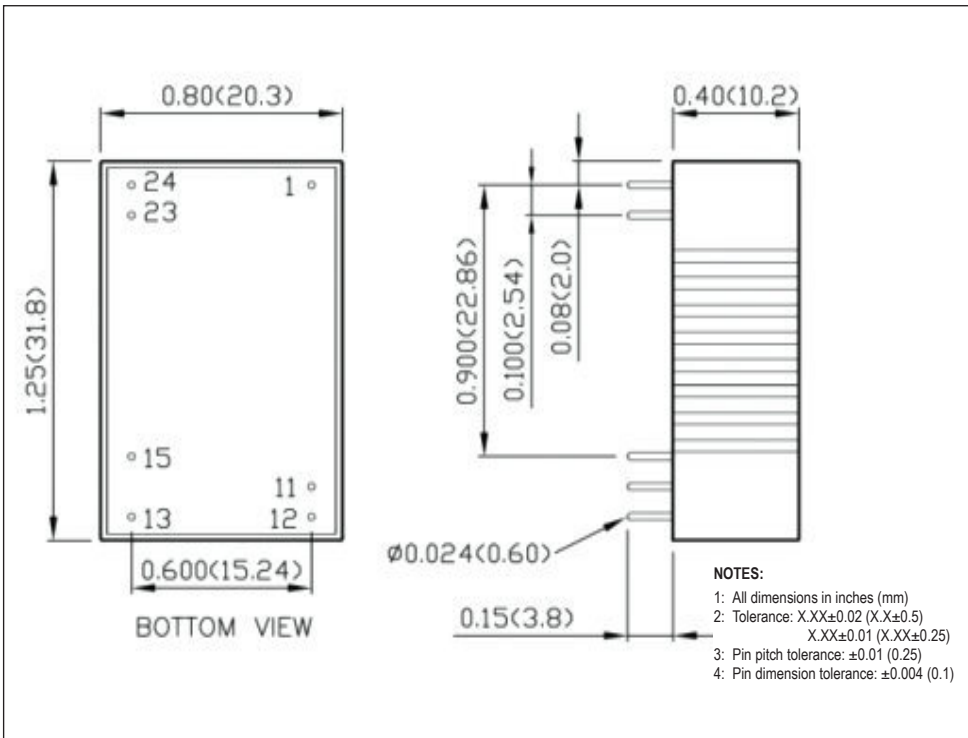
Suffix	Description
P	Positive Logic
T	Trim
PT	Positive Logic & Trim

Standard part is no suffix. Add P, T, or PT as required

## External Output Trimming

The output of the PXC-M03 (W) can be adjusted by connecting an external resistor. See application note on the website.

## Outline Drawing PXC-M03 A-type



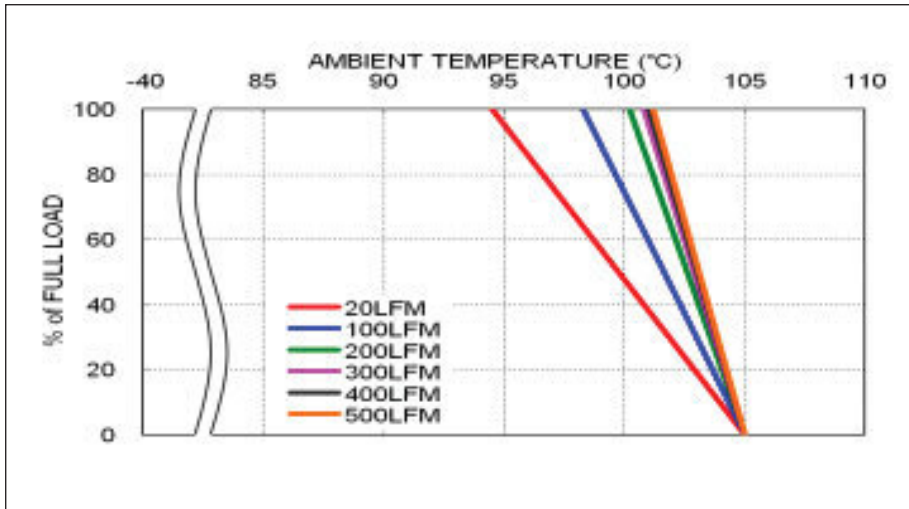
## Pin Assignment PXC-M03 A-type

PIN	Single	Dual
1	+Vin	+Vin
11	No Pin	Common
12	-Vout	No Pin
13	+Vout	-Vout
15	No Pin	+Vout
23	-Vin	-Vin
24	-Vin	-Vin

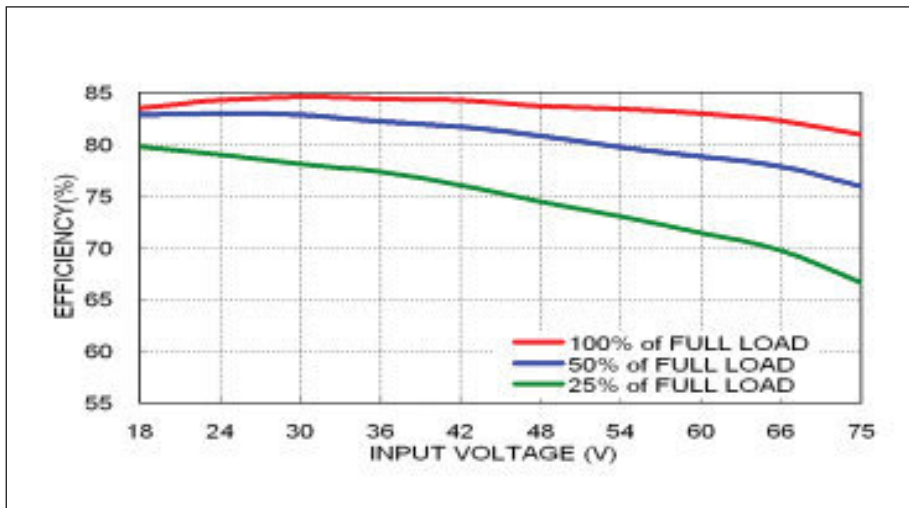
Note. For A - type add suffix -A



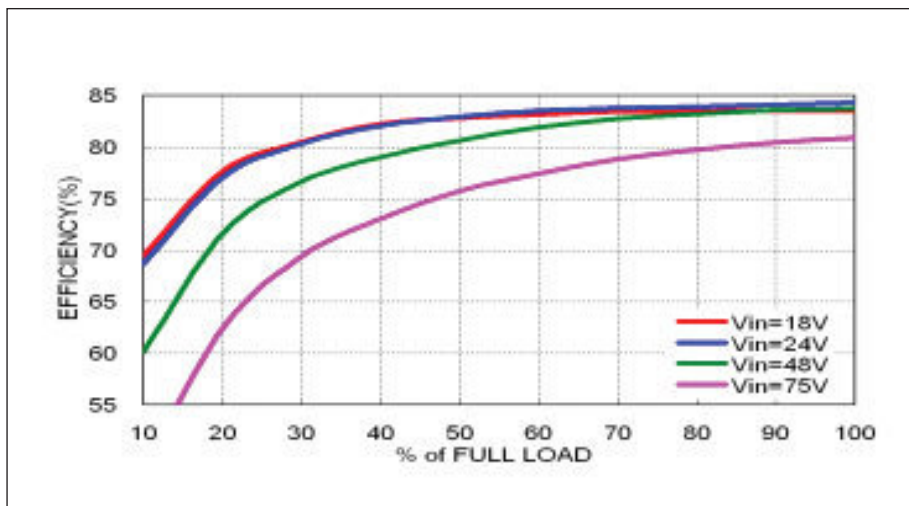
PXC-M03-48WS05A Derating curve



PXC-M03-48WS05A Efficiency Vs Input Voltage



PXC-M03-48WS05A Efficiency Vs Output Voltage







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## Single and Dual Output 6W DC-DC Converters



Features	Benefits
• 60601-1 approval	• Easier system approval
• I/O isolation 5kVAC, 2MOPP	• Patient protection at 250VAC rms working voltage
• 0.25 $\mu$ A low leakage	• Wide range of medical applications
• 4:1 Wide input range	• Less parts to inventory

Specification		
Model	PXC-M06 (W)	
Rated input voltage range	24V nominal: 9-36VDC, 48V nominal: 18-75VDC	
Input surge voltage (max 3 seconds)	24V Nom : 50VDC   48V Nom: 100VDC	
Switching frequency	250kHz	
Maximum input current (no load)	See Table	
Fusing	No internal fuse	
Max output power (W)	6	
Voltage accuracy	Single/Dual $\pm$ 1%	
Voltage adjustment (Note 1)	Single output 3.3V, 5V & 12V: $\pm$ 10%, 15V & 24V: -10%/+20% Dual output $\pm$ 5V, $\pm$ 12V & $\pm$ 15V: $\pm$ 10%	
Line regulation (LL to HL at full load)	Single output $\pm$ 0.2%, Dual output $\pm$ 0.5%	
Ripple and noise (Note 7)	Measured with a 20MHz bandwidth - see table	
Start up time (Nominal Vin and constant resistive load)	Power on: 30ms, Remote ON/OFF: 30ms	
Start up voltage	24Vin(nom) 9V, 48V(nom) 18V	
Shutdown voltage	24Vin(nom) 8V, 48V(nom) 16V	
Remote on/off (option) (Note 1 & Note 6)	DC ON: OPEN or 0 to 1.2VDC DC OFF: 2.2 to 12VDC	
Efficiency	See Table	
Over current protection, factory set	Hiccup, 150% of rated full load	
Short circuit protection (Note 2)	Continuous, auto recovery	
Overvoltage protection	3.3V output	3.7 to 5V
	5V output	5.6 to 7.0V
	12V output	13.5 to 16V
	15V output	18.3 to 22.0V
	24V output	29.1 to 34.5V
	5V/5V output	5.6 to 7.0V
	12V/12V output	13.5 to 18.2V
15V/15V output	17.0 to 22.0V	
Operating temperature	-40°C ~ +88°C (without derating), +88°C ~ +105°C (with derating - see curve)	
Storage temperature	-55°C ~ +125°C	
Thermal shock	MIL-STD-810F	
Relative humidity (non condensing)	5% to 95% RH	
Transient response (25% step load change)	250 $\mu$ S	
Isolation voltage (1 minute) (Note8)	5kVAC	
Isolation capacitance (max)	17pF	
MTBF MIL-HDBK-217F (Note 3)	644,400 hrs	
Vibration	MIL-STD-810F	
Conducted and radiated emissions (Note 4)	EN55011, EN55022, Class A and FCC part 18	
Immunity (Note 5)	EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6: Perf. Criteria A	
Safety	IEC60601-1, ANSI/AAMI ES60601-1, EN60601-1, CE Mark	
Size (H x W x D)	10.2 x 20.3 x 31.8 mm	
Weight	14g	
Connector	PCB mount	
Cooling	Convection	
Warranty yrs	5	

Notes: See page 2





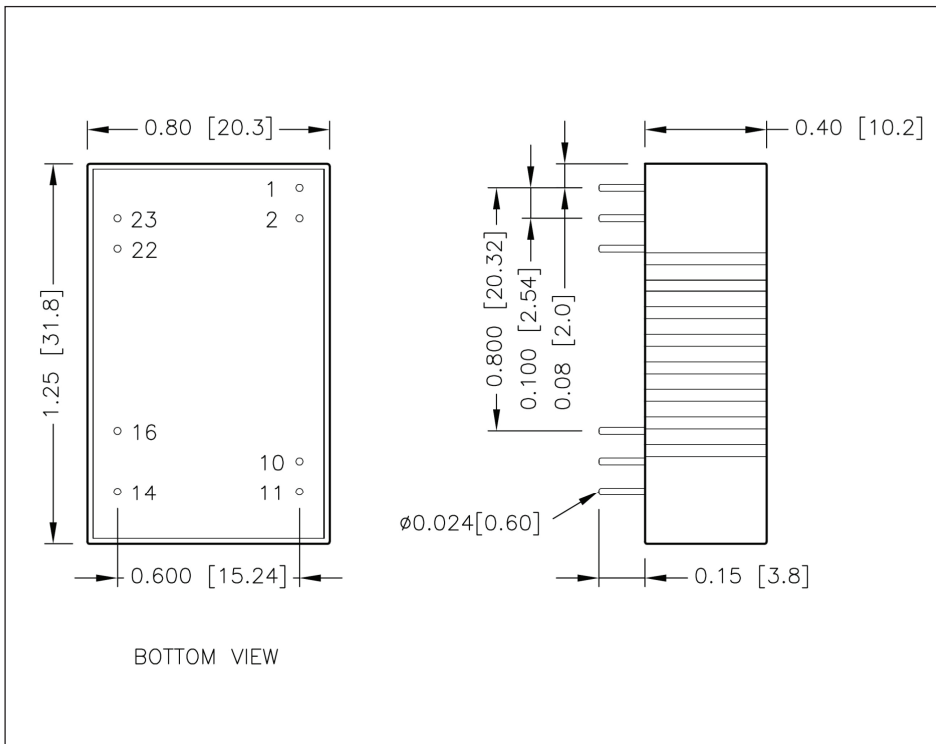
## Model Selector

Model	Input Voltage (VDC)	Output Voltage (VDC)	Output Current Full Load (mA)	Output <sup>(7)</sup> Ripple & Noise (mV)	Input Current No Load mA	Efficiency % <sup>(2)</sup>	Maximum Capacitive Load <sup>(2)</sup>
PXC-M06-24WS3P3	9 ~ 36	3.3	1800	30	6	83	2100
PXC-M06-24WS05	9 ~ 36	5	1200	30	6	86	1500
PXC-M06-24WS12	9 ~ 36	12	500	40	6	89	260
PXC-M06-24WS15	9 ~ 36	15	400	40	6	89	210
PXC-M06-24WS24	9 ~ 36	24	250	50	6	88.5	75
PXC-M06-24WD05	9 ~ 36	±5	±600	30	6	85	± 860
PXC-M06-24WD12	9 ~ 36	±12	±250	40	6	88.5	± 150
PXC-M06-24WD15	9 ~ 36	±15	±200	40	6	88.5	± 110
PXC-M06-48WS3P3	18 ~ 75	3.3	1800	30	4	82.5	2100
PXC-M06-48WS05	18 ~ 75	5	1200	30	4	86.5	1500
PXC-M06-48WS12	18 ~ 75	12	500	40	4	88	260
PXC-M06-48WS15	18 ~ 75	15	400	40	4	88.5	210
PXC-M06-48WS24	18 ~ 75	24	250	50	4	88	75
PXC-M06-48WD05	18 ~ 75	±5	±600	30	4	85	± 860
PXC-M06-48WD12	18 ~ 75	±12	±250	40	4	88	± 150
PXC-M06-48WD15	18 ~ 75	±15	±200	40	4	87	± 110

### Notes

- Not available for A type pin configuration
- Typical value at nominal input voltage and full load.
- MIL-HDBK-217F Notice2 @Ta=25 °C, Full load (Ground Benign, controlled environment).
- Built in Class A filter. Class B can be achieved with the addition of external components for further information contact your local TDK-Lambda sales office
- Meeting EN61000-4-4 and 61000-4-5 requires and additional input electrolytic capacitor: 5V input -1000µF/25V, 12V & 24V input - 470µF/50V and 48V input - 330µF/100V
- The ON/OFF control pin voltage is referenced to -Vin. The ctrl pin input current is <1mA. Remote off input current is typically 2.5mA
- For R & N, measure the 24V output with a 4.7µF/50V X7R MLCC. All other outputs use a 10µF/25V X7R MLCC. Nominal input, full load at +25°C
- Reinforced insulation 8mm at 250VAC

## Outline Drawing PXC-M06 (W)



Pin Assignment PXC-M06 (W)		
PIN	Single	Dual
1	CtrlL (Option) / No pin*	CtrlL (Option) / No pin*
2	-Vin	-Vin
10	Trim (option) / No Pin*	Trim (option) / No Pin*
11	No Pin / NC **	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin	+Vin
23	+Vin	+Vin

**NOTES:**

\* If the Ctrl or Trim option is not selected there will be no pin fitted in the corresponding pin number position.

\*\* Pin 11 is "No pin" for PXC-M06-xxWSxxx-T, PXC-M06-xxWSxxx-PT

Pin 11 is "NC" for: PXC-M06-xxWSxxx, PXC-M06-xxWSxxx-P

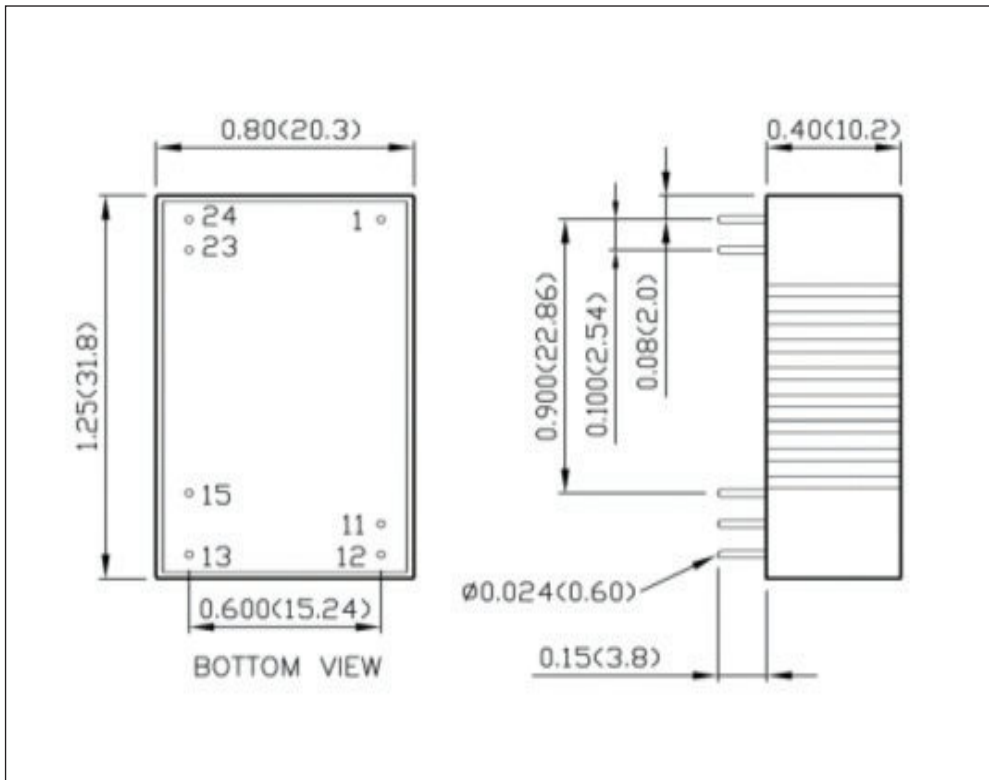
Options	
Suffix	Description
P	Positive Logic
T	Trim
PT	Positive Logic & Trim

Standard part is no suffix. Add P, T, or PT as required

### External Output Trimming

The output of the PXC-M06 (W) can be adjusted by connecting an external resistor. See application note on the website.

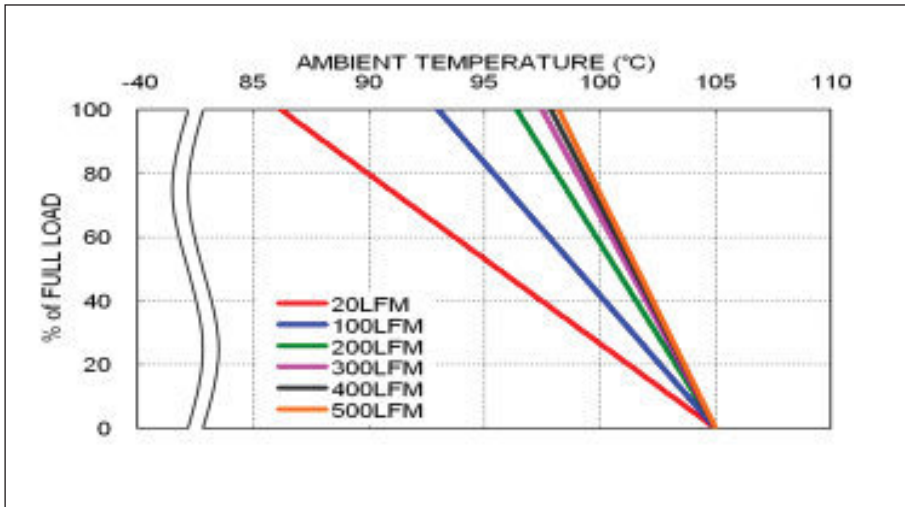
### Outline Drawing PXC-M06 (W) A-type



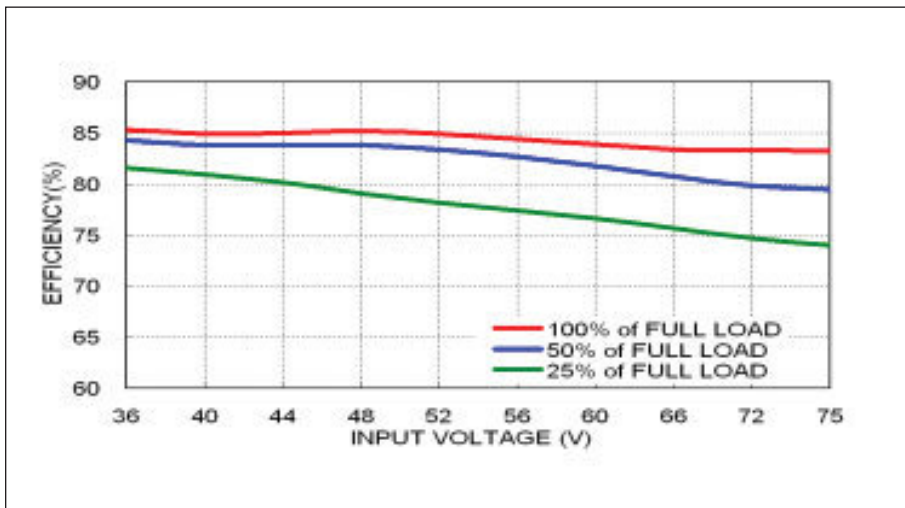
Pin Assignment PXC-M06 (W) A-type		
PIN	Single	Dual
1	+Vin	+Vin
11	No Pin	Common
12	-Vout	No Pin
13	+Vout	-Vout
15	No Pin	+Vout
23	-Vin	-Vin
24	-Vin	-Vin



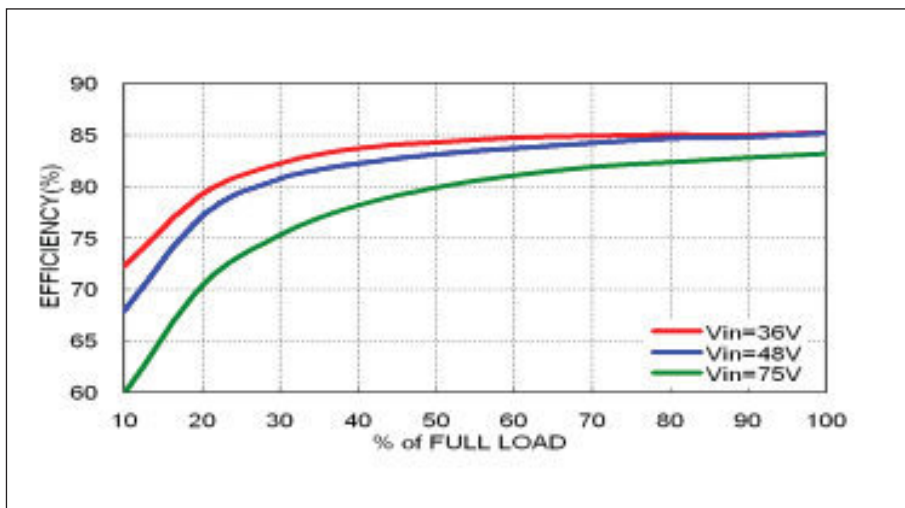
PXC-M06-48WS05A Derating curve



PXC-M06-48WS05A Efficiency Vs Input Voltage



PXC-M06-48WS05A Efficiency Vs Output Voltage





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## Single and Dual Output 10W DC-DC Converters



Features	Benefits
• 60601-1 approval	• Easier system approval
• I/O isolation 5kVAC, 2MOPP	• Patient protection at 250VAC rms working voltage
• 0.25µA low leakage	• Wide range of medical applications
• 4:1 Wide input range	• Less parts to inventory

Specification		
Model	PXC-M10 (W)	
Rated input voltage range	24V nominal: 9-36VDC, 48V nominal: 18-75VDC	
Input surge voltage (max 3 seconds)	24V Nom : 50VDC   48V Nom: 100VDC	
Switching frequency	300kHz	
Maximum input current (no load)	See Table	
Fusing	No internal fuse	
Max output power (W)	10	
Voltage accuracy	Single/Dual ± 1%	
Voltage adjustment (Note 1)	Single output 3.3V, 5V & 12V: ± 10%, 15V & 24V: -10%/+20% Dual output ±5V, ±12V & ±15V: ±10%	
Line regulation (LL to HL at full load)	Single output ± 0.2%, Dual output ± 0.5%	
Ripple and noise (Note 7)	Measured with a 20MHz bandwidth - see table	
Start up time (Nominal Vin and constant resistive load)	Power on: 30ms, Remote ON/OFF: 30ms	
Start up voltage	24Vin(nom) 9V, 48V(nom) 18V	
Shutdown voltage	24Vin(nom) 8V, 48V(nom) 16V	
Remote on/off (option) (Note 1 & Note 6)	DC ON: OPEN or 0 to 1.2VDC DC OFF: 2.2 to 12VDC	
Efficiency	See Table	
Over current protection, factory Set	Hiccup, 150% of rated full load	
Short circuit protection (Note 2)	Continuous, auto recovery	
Overvoltage protection	3.3V output	3.7 to 5V
	5V output	5.6 to 7.0V
	12V output	13.5 to 16V
	15V output	18.3 to 22.0V
	24V output	29.1 to 34.5V
	5V/5V output	5.6 to 7.0V
	12V/12V output	13.5 to 18.2V
15V/15V output	17.0 to 22.0V	
Operating temperature	-40°C ~ +77°C (without derating), +77°C ~ +105°C (with derating - see curve)	
Storage temperature	-55°C ~ +125°C	
Thermal shock	MIL-STD-810F	
Relative humidity (non condensing)	5% to 95% RH	
Transient response (25% step load change)	250µS	
Isolation voltage (1 minute) (Note 8)	5kVAC	
Isolation capacitance (max)	17pF	
MTBF MIL-HDBK-217F (Note 3)	384,900 hrs	
Vibration	MIL-STD-810F	
Conducted and radiated emissions (Note 4)	EN55011, EN55022, Class A and FCC part 18	
Immunity (Note 5)	EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6: Perf. Criteria A	
Safety	IEC60601-1, ANSI/AAMI ES60601-1, EN60601-1, CE Mark	
Size (H x W x D)	10.2 x 20.3 x 31.8 mm	
Weight	14g	
Connector	PCB mount	
Cooling	Convection	
Warranty yrs	5	

Notes: See page 2



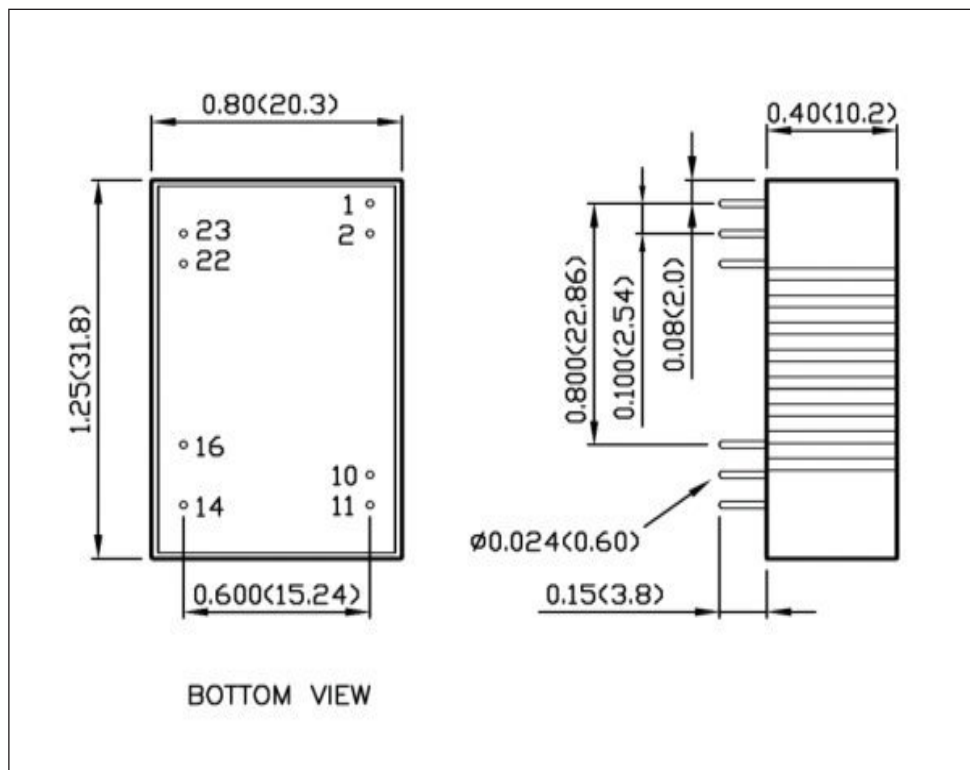
## Model Selector

Model	Input Voltage (VDC)	Output Voltage (VDC)	Output Current Full Load (mA)	Output (7) Ripple & Noise (mV)	Input Current No Load mA	Efficiency % (2)	Maximum Capacitive Load (2)
PXC-M10-24WS3P3	9 ~ 36	3.3	2500	30	6	83	3000
PXC-M10-24WS05	9 ~ 36	5	2000	30	6	86.5	2500
PXC-M10-24WS12	9 ~ 36	12	830	40	6	89	430
PXC-M10-24WS15	9 ~ 36	15	670	40	6	89	350
PXC-M10-24WS24	9 ~ 36	24	416	50	6	89	125
PXC-M10-24WD05	9 ~ 36	±5	±1000	30	6	85	± 1440
PXC-M10-24WD12	9 ~ 36	±12	±416	40	6	89	± 250
PXC-M10-24WD15	9 ~ 36	±15	±333	40	6	88	± 180
PXC-M10-48WS3P3	18 ~ 75	3.3	2500	30	4	82.5	3000
PXC-M10-48WS05	18 ~ 75	5	2000	30	4	86.5	2500
PXC-M10-48WS12	18 ~ 75	12	830	40	4	89	430
PXC-M10-48WS15	18 ~ 75	15	670	40	4	89	350
PXC-M10-48WS24	18 ~ 75	24	416	50	4	88.5	125
PXC-M10-48WD05	18 ~ 75	±5	±1000	30	4	85	± 1440
PXC-M10-48WD12	18 ~ 75	±12	±416	40	4	88	± 250
PXC-M10-48WD15	18 ~ 75	±15	±333	40	4	88	± 180

### Notes

- Not available for A type pin configuration
- Typical value at nominal input voltage and full load.
- MIL-HDBK-217F Notice2 @Ta=25 °C, Full load (Ground Benign, controlled environment).
- Built in Class A filter. Class B can be achieved with the addition of external components for further information contact your local TDK-Lambda sales office
- Meeting EN61000-4-4 and 61000-4-5 requires and additional input electrolytic capacitor: 5V input -1000µF/25V, 12V & 24V input - 470µF/50V and 48V input - 330µF/100V
- The ON/OFF control pin voltage is referenced to -Vin.The ctrl pin input current is <1mA.Remote off input current is typically 2.5mA
- For R & N, measure the 24V output with a 4.7µF/50V X7R MLCC. All other outputs use a 10µF25V X7R MLCC. Nominal input, full load at +25°C
- Reinforced insulation 8mm at 250VAC

## Outline Drawing PXC-M10 (W)



## Pin Assignment PXC-M10 (W)

PIN	Single	Dual
1	CtrlL (Option) / No pin*	CtrlL (Option) / No pin*
2	-Vin	-Vin
10	Trim (option) / No Pin*	Trim (option) / No Pin*
11	No Pin / NC**	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin	+Vin
23	+Vin	+Vin

### NOTES:

\* If the Ctrl or Trim option is not selected there will be no pin fitted in the corresponding pin number position.

\*\* Pin 11 is "No pin" for PXC-M10-xxWSxxx-T, PXC-M10-xxWSxxx-PT

Pin 11 is "NC" for: PXC-M10-xxWSxxx, PXC-M10-xxWSxxx-P

## Options

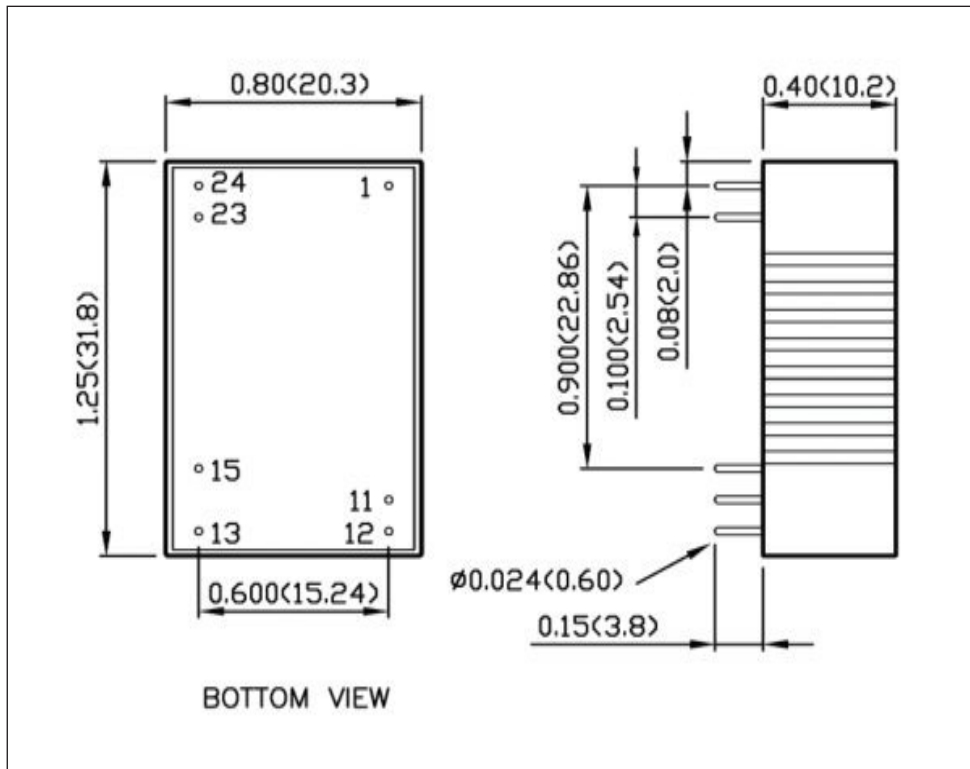
Suffix	Description
P	Positive Logic
T	Trim
PT	Positive Logic & Trim

Standard part is no suffix. Add P, T, or PT as required

## External Output Trimming

The output of the PXC-M10 (W) can be adjusted by connecting an external resistor. See application note on the website.

## Outline Drawing PXC-M10 A-type

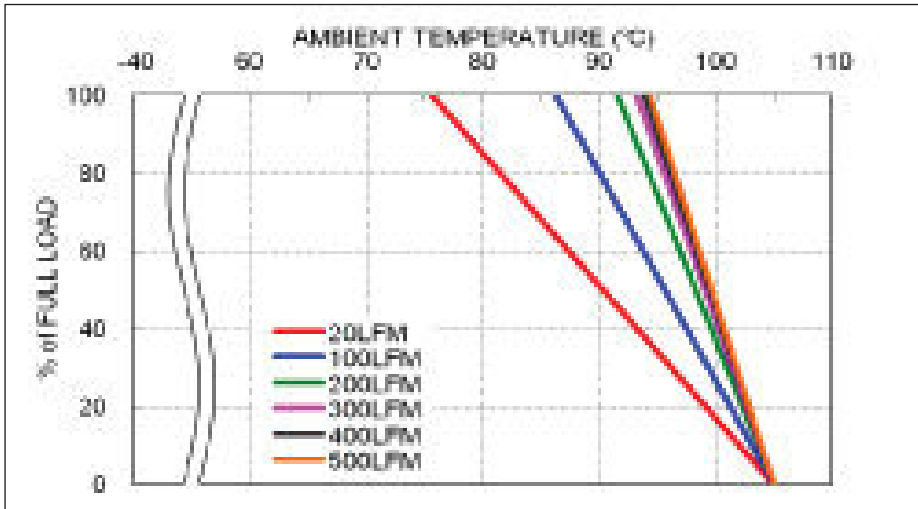


## Pin Assignment PXC-M10 (W) A-type

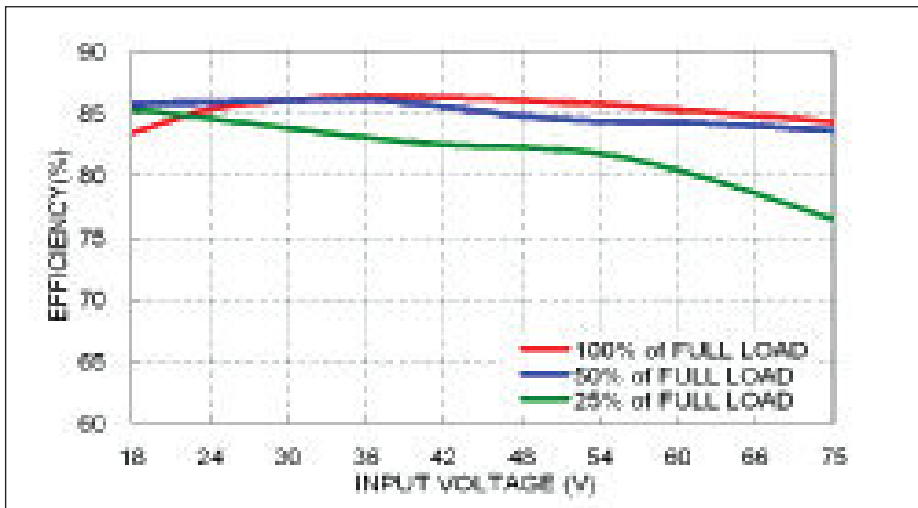
PIN	Single	Dual
1	+Vin	+Vin
11	No Pin	Common
12	-Vout	No Pin
13	+Vout	-Vout
15	No Pin	+Vout
23	-Vin	-Vin
24	-Vin	-Vin



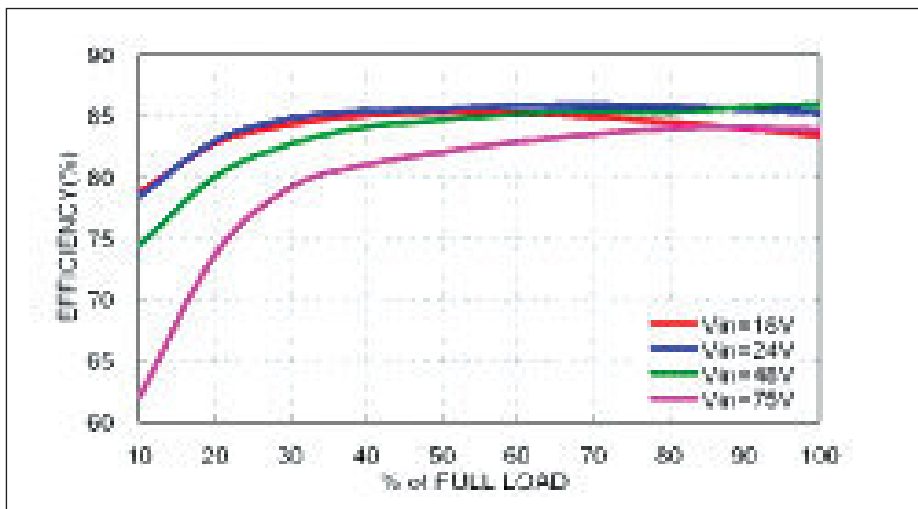
PXC-M10-48WS05A Derating curve



PXC-M10-48WS05A Efficiency Vs Input Voltage



PXC-M10-48WS05A Efficiency Vs Output Voltage





Renewable



Industrial



Test

## 2500W Bi-Directional DC-DC Converter



Features	Benefits
1U rackmount	Utilises less system space
High efficiency >92%	Minimises heat in system
Digital Interface	User configurable & offers various operation modes
Full Digital Control	Unit features fast charge/discharge & discharge/charge direction changes

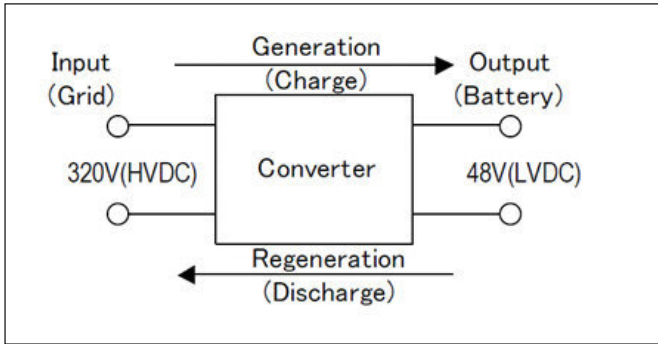
Specification			
Model		Low Voltage DC (Battery Side)	High Voltage DC (Grid Side)
Voltage Range (1) (2)	VDC	36 - 60VDC (48V Nominal)	300 - 380VDC (320V Nominal)
Output Current (Maximum)	A	±52A	±7.8A
Constant Current Programming Range (1) (2)	A	2.4 - 56A	0.5 - 8.5A
Maximum Output Power	W	±2,496W	±2,496W
Efficiency	%	≥92%	≥92%
Pre-charge Voltage (required)	VDC	>36V	>300V
Inrush Current (Typical)	A	5.5A	3.6A
Line Regulation (Maximum)	-	240mV	1.52V
Load Regulation (Maximum)	-	480mV	3.04V
Temperature Regulation (Maximum)	-	300mV	1.9V
Output Ripple & Noise (Maximum pk-pk)	-	480mV	3.2V
Sink Current (When applied V > output set V)	mA	300mA	50mA
Overcurrent Protection (Manual reset)	A	60A	9.5A
Overpower Protection	W	2600W (Constant power)	2600W (Constant power)
Under & Overvoltage Protection (2)	V	32 - 68V	260 - 410V
Overtemperature Protection	-	Yes, Alarm signal is given	
Remote On/Off & Reset (2)	-	Yes	
Parallel Operation	-	Yes (Droop mode, can be set via RS-485)	
Front panel Indicators and Settings	-	Operating mode (Generating, Regenerating & Alarm), Alarm clear & RS-485 address selection	
Operating Temperature	°C	-10 to +40°C, full load	
Storage Temperature	°C	-20 to +70°C	
Humidity (Non condensing)	%RH	Operating: 30 - 90%RH, Storage: 10 - 95%RH	
Cooling	-	Internal fan	
Vibration (Non operating)	-	10-500Hz (1 min sweep), 10.2m/s <sup>2</sup> constant for 1 hour in each direction: X, Y & Z axis	
Shock	-	196.1m/s <sup>2</sup> maximum	
Withstand Voltage	-	Input (HVDC) to Output (LVDC) 3kVAC, Input to Ground 2kVAC, Output to Ground 500VAC	
Isolation Resistance	MΩ	>100MΩ at 25°C & 70%RH, Output to Ground 500VDC	
Safety Certifications	-	UL60950-1, CSA60950-1, EN60950-1, CE mark	
Size (W x H x D)	mm	422.8 x 43.6 x 400	
Weight	g	8000	
Warranty	Yrs	5	

Notes: (1) See installation manual for detailed specifications & test methods (2) Can be set via RS-485

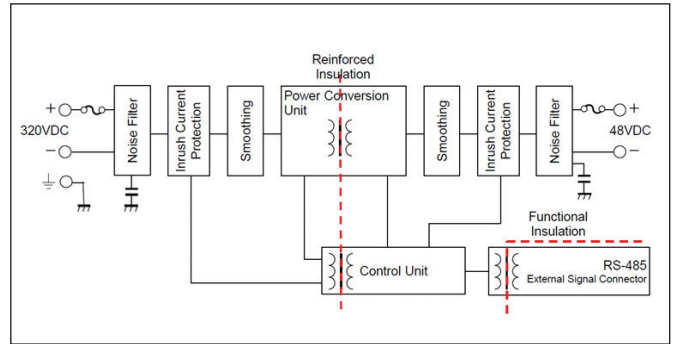




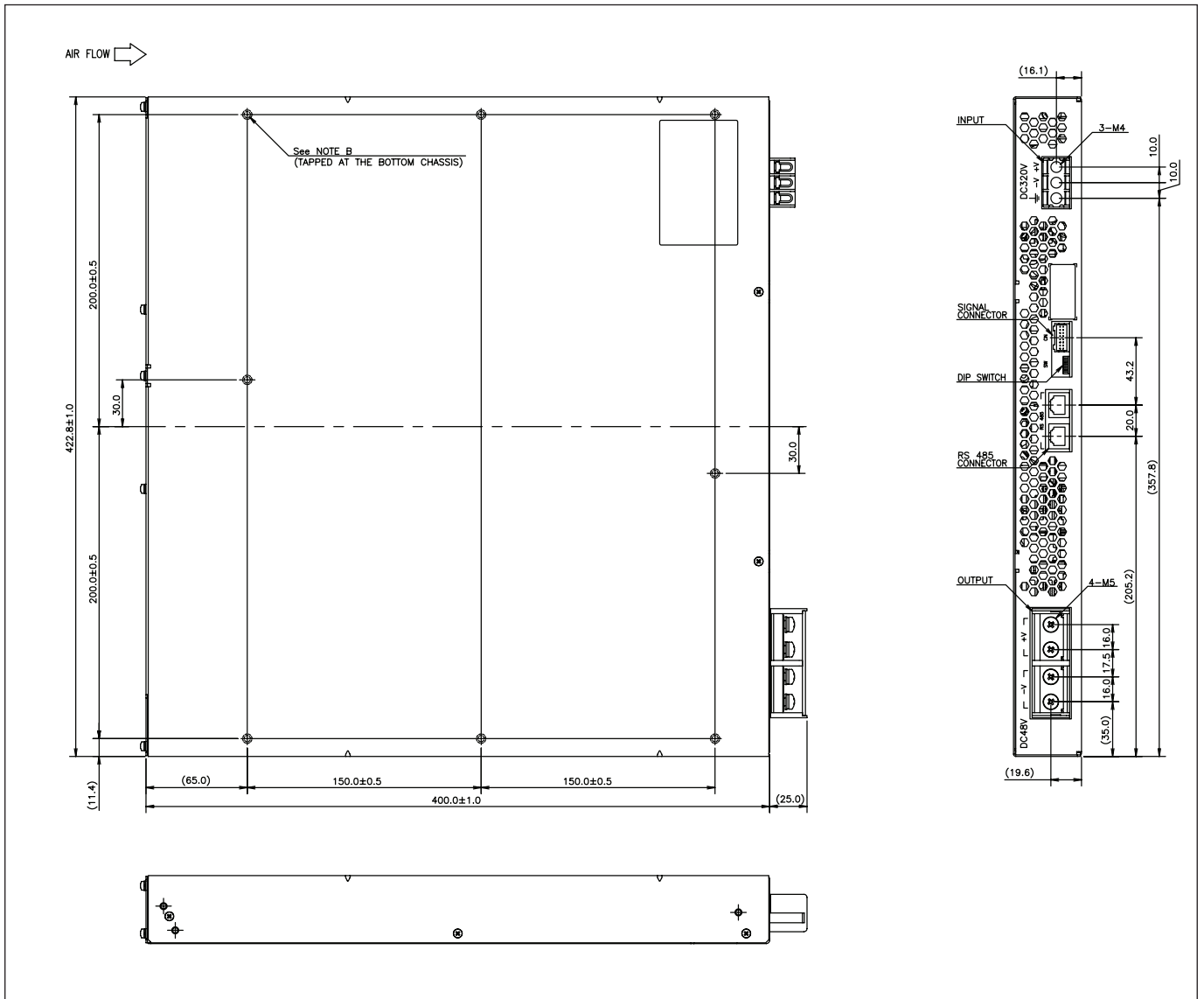
## Basic Operation



## Block Diagram



## Outline Drawing EZA Series



RS-485 Functions			
Model		Low Voltage DC (Battery Side)	High Voltage DC (Grid Side)
Voltage Setting Accuracy	-	< $\pm 0.6V$	< $\pm 4V$
Current Setting Accuracy	-	< $\pm 0.8A$	< $\pm 0.125A$
Voltage Setting Resolution	-	< 60mV	< 0.4V
Current Setting Resolution	-	< 50mA	< 8mA
Voltage Reading Accuracy	-	< $\pm 0.6V$	< $\pm 4V$
Current Reading Accuracy	-	< $\pm 0.8A$	< $\pm 0.125A$
Voltage Reading Resolution	-	< 60mV	< 0.4V
Current Reading Resolution	-	< 50mA	< 8mA
RS-485 Baud Rate	-	19.2kbps / 33.6kbps / 57.6kbps (Set by DIP Switch)	
RS-485 Maximum Connection	-	14	



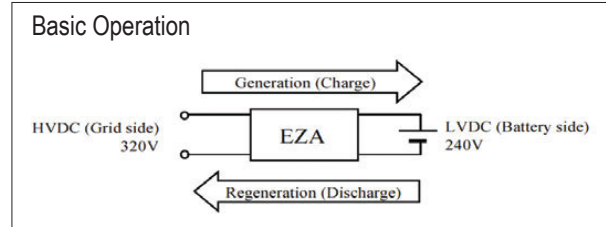


## 11,000W Bi-Directional DC-DC Converter



Renewable

Features	Benefits
• 1U rackmount	• Utilises Less System Space
• Battery Side 240VDC	• Suitable for 150-300V Batteries
• Grid Side 320VDC	• Operates on HVDC Systems
• High Efficiency (95%)	• Minimises Heat in System



Specification			
Model	EZA11K-320240		
		Low Voltage DC (Battery Side)	High Voltage DC (Grid Side)
Voltage Range <sup>(1)(2)</sup>	VDC	150 - 300VDC (240V Nominal)	240 - 400VDC (320V Nominal)
Output Current (Maximum)	A	±45.8A	±34.4A
Constant Current Programming Range <sup>(1)(2)</sup>	A	1 - 50A	1 - 40A
Maximum Output Power	W	±11,000W	±11,000W
Efficiency	%	95%	95%
Pre-charge Voltage (required)	VDC	>150V	>240V
Inrush Current (Typical)	A	3.6A	3.6A
Line Regulation (Maximum)	V	1.2V	1.6V
Load Regulation (Maximum)	V	2.4V	3.2V
Temperature Regulation (Maximum)	V	1.5V	2.0V
Output Ripple & Noise (Maximum pk-pk)	V	3V	4V
Sink Current (When applied V > output set V)	A	1.6A	1.2A
Overcurrent Protection (Manual reset)	A	70A	60A
Overpower Protection	W	12,000W (Constant power)	12,000W (Constant power)
Input Current Limit (typical)	A	52A	42A
Under & Overvoltage Protection <sup>(2)</sup>	V	144 - 306V	230 - 410V
Overtemperature Protection	-	Yes, Alarm signal is given	
Remote On/Off & Reset <sup>(2)</sup>	-	Yes	
Parallel Operation	-	Yes (Droop mode, can be set via RS-485)	
Front panel Indicators and Settings	-	Operating mode (Generating, Regenerating & Alarm), Alarm clear & RS-485 address selection	
Operating Temperature	°C	-10°C to +50°C, full load. Refer to application notes for input/output derating	
Storage Temperature	°C	-20°C to +70°C	
Humidity (Non condensing)	%RH	Operating: 30 - 85%RH, Storage: 20 - 85%RH	
Cooling	-	Internal fans	
Vibration (Non operating)	-	10-55Hz (1 min sweep), 19.6m/s <sup>2</sup> constant for 1 hour in each direction: X, Y & Z axis	
Shock	-	196.1m/s <sup>2</sup> maximum	
Withstand Voltage <sup>(3)</sup>	-	Input (HVDC) to Output (LVDC) 2.2kVAC, Input/Output to Ground 2kVAC, Signals to Ground 400VAC	
Isolation Resistance	MΩ	>100MΩ at 25°C & 70%RH, Input/Output to Ground 1kVDC, Signals to Ground 500VAC	
Safety Certification	-	IEC/EN/UL/CSA60950-1, IEC/EN/UL/CSA62368-1, CE Mark (LVD, EMC RoHS)	
Size (W x H x D)	mm	422.8 x 43.6 x 530	
Weight	kg	20	
Warranty	yrs	5	

Notes: (1) See installation manual for detailed specifications & test methods (2) Can be set via RS-485 or signal connector

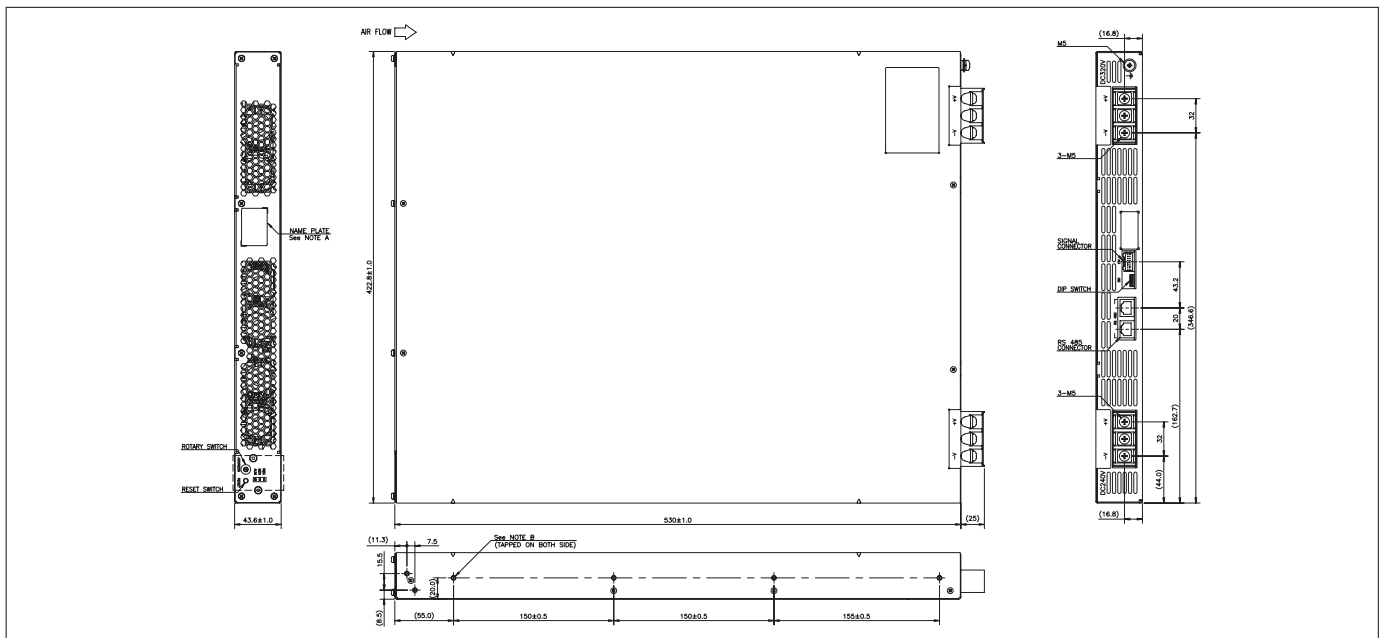
(3) See specification on website for signal isolation voltages



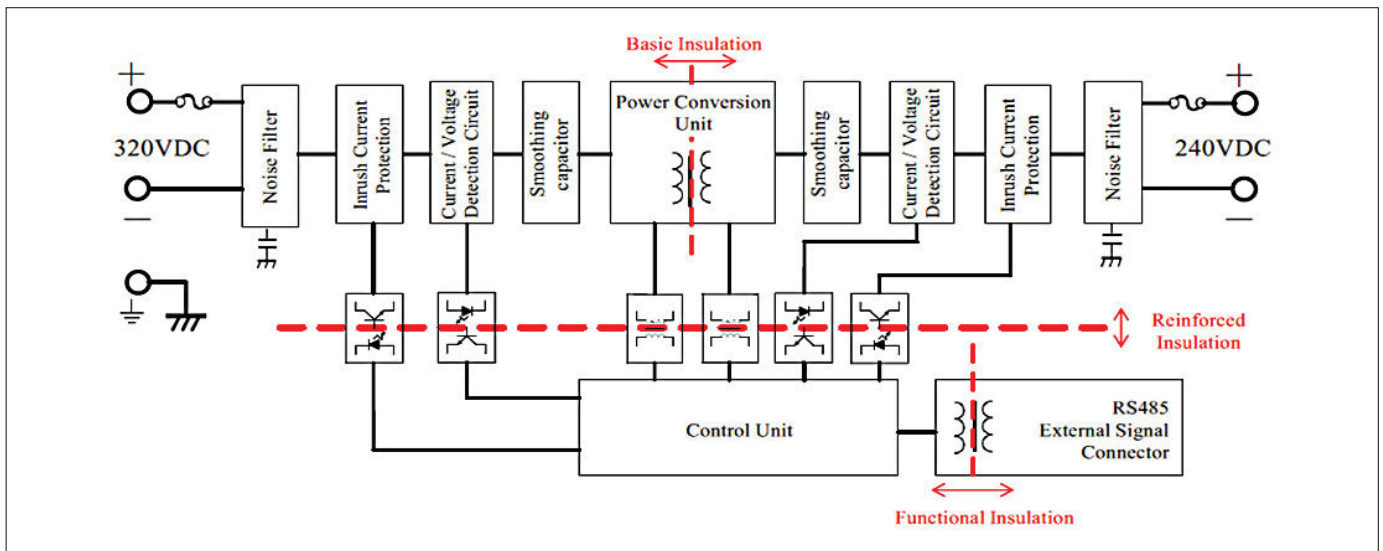
## RS-485 Functions

Items		
Voltage Setting Accuracy	-	< ±6V
Current Setting Accuracy	-	< ±1A
Voltage Setting Resolution	-	< 600mV
Current Setting Resolution	-	< 100mA
Voltage Reading Accuracy	-	< ±6V
Current Reading Accuracy	-	< ±1A
Voltage Reading Resolution	-	< 600mV
Current Reading Resolution	-	< 100mA
RS-485 Baud Rate	-	19.2kbps / 33.6kbps / 57.6kbps (Set by DIP Switch)
RS-485 Maximum Connection	-	14

## Outline Drawing EZA11K



## Block Diagram EZA11K





# DC-DC Converters - POL

(non Isolated)

Index

CE-1000	130	iCG	152
iAA/iAC	133	iCH	154
iAD	136	iFB	156
iAF	138	PL5	158
iAH	140	PL10-20S	161
iBA/iBC	142	PL10-20SMS	164
iBD	144	i3A	167
iBF	146	i6A	169
iBH	148	i6A4W	172
iCF	150	i6AN	175



## Features Point of Load Converters

- No galvanic isolation
- High efficiency
- Very fast transient response time
- SMT or through hole mounting
- Supply of logic voltages below 5V direct at the load





## CE Series

1.2 - 2.5A Point of Load  
Converters

- 3 to 5V or 9 to 26V Input
- Outputs 1V to 12V
- Surface Mount
- Low 4.2mm to 5.5mm Profile
- Non Isolated Output

### Key Market Segments & Applications

Telecommunications  
Datacom  
Instrumentation

### CE Series Features and Benefits

#### Features

- Wide range output
- Constant switching frequency
- Five sided shielding

#### Benefits

- Reduces need for custom models
- Easier system filtering
- Reduced EMI

### Specifications

MODELS		CE-1003	CE-1004	CE-1005	CE-1050
ITEMS					
Nominal Output Voltage VDC		1.5 to 3.3	3.3 to 5.0	1 to 3.3	(2) 3.3 to 12.6
Input Voltage Range VDC		6 - 16		3 - 5.25	9 - 26.4
Input Current (max)	A	2.4			1.8
Ripple & Noise (typ) (pk - pk)	mV	100		50	
Total Regulation (max)	mV	±5%		±4%	±5%
Overload Protection (typ)	A	2		3	3.5
Remote On / Off (1)	-	ON = 2 - 6V; OFF= 0-0.6V		ON = <0.5V; OFF= >2V	ON = 3 -6V; OFF= 0-0.3V
Temperature (operating)	°C	-40°C to +85°C (CE1003, 80% load above 70°C)			-20°C to +85°C
Temperature (storage)	°C	-40°C to +85°C			-20°C to +85°C
Humidity (operating)	-	10 - 90% RH Non condensing @ max temp +38°C			
Humidity (storage)	-	Sealed packaging, see Technical Download			
Cooling	-	Convection or forced air			
Vibration (non operating)	-	Frequency: 10-2000Hz, Sweep time: 4 minutes per cycle Amplitude: 10G, 30 minutes each x, y, and z direction			
Shock	-	Peak Acceleration: 100G, Duration: 6msec; three times each axis			
Weight (max)	g	1.8		1.7	3.7
Size	mm	18.3 x 12.3 x 4.2			21.3 x 16.4 x 5.5
Warranty	yrs	1			

- Notes:** (1) Pin 5  
(2) Input / output voltage differential must be at least 4V.



## Model Selector

Model	Output Voltage (V)	Output Current (A)	Efficiency (typ)
CE-1003	1.5 - 3.3 <sup>(2)</sup>	1.5	86.5%
CE-1004	3.3 - 5 <sup>(2)</sup>	1.5	86.5%
CE-1005	1.0 - 3.3	2.5 <sup>(3)</sup>	91.5%
CE-1050	3.3 - 12.6	2.5 <sup>(4)</sup>	90.0%

### Notes:

- (2) See Programming Table
- (3) See CE-1005 Derating Table
- (4) See CE-1050 Derating Curves

## CE-1005 Derating Table

Vout	3.3 Vin	5.0 Vin
1.0	1.75A	1.5A
1.2	1.85A	1.65A
1.5	2.00A	1.85A
1.8	2.15A	2.0A
2.0	2.25A	2.2A
2.5	2.50A	2.5A
3.3	-	2.5A

CC-1005 can be trimmed with external resistor

## CE-1003, 1004 Programming Table

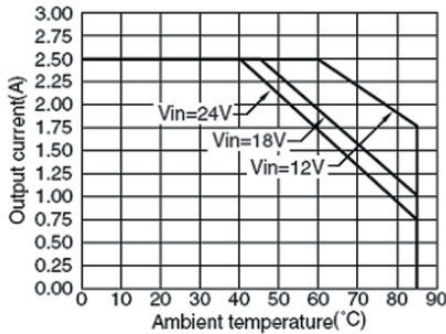
Pin 7	Pin 8	Pin 9	Output Voltage CE-1003	(Vout) CE-1004
0	0	0	3.3	5.0
0	0	1	3.0	4.8
0	1	0	2.8	4.5
0	1	1	2.5	4.3
1	0	0	2.3	4.0
1	0	1	2.0	3.8
1	1	0	1.8	3.5
1	1	1	1.5	3.3

0 = Short to GND 1 = Open

See web site for detailed specifications

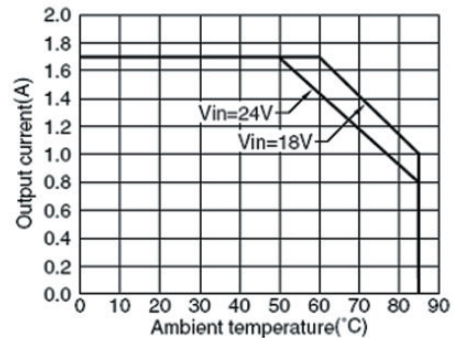
## Derating Curve CE-1050 Series

Vout=3.3V



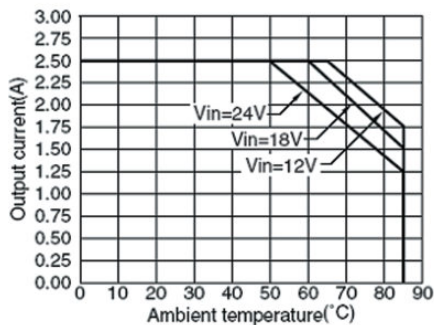
Vout=9.0V

Vout=9.0V



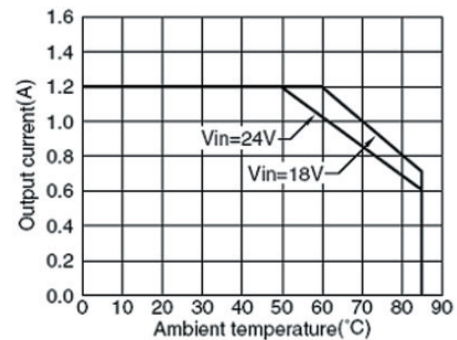
Vout=5.0V

Vout=5.0V

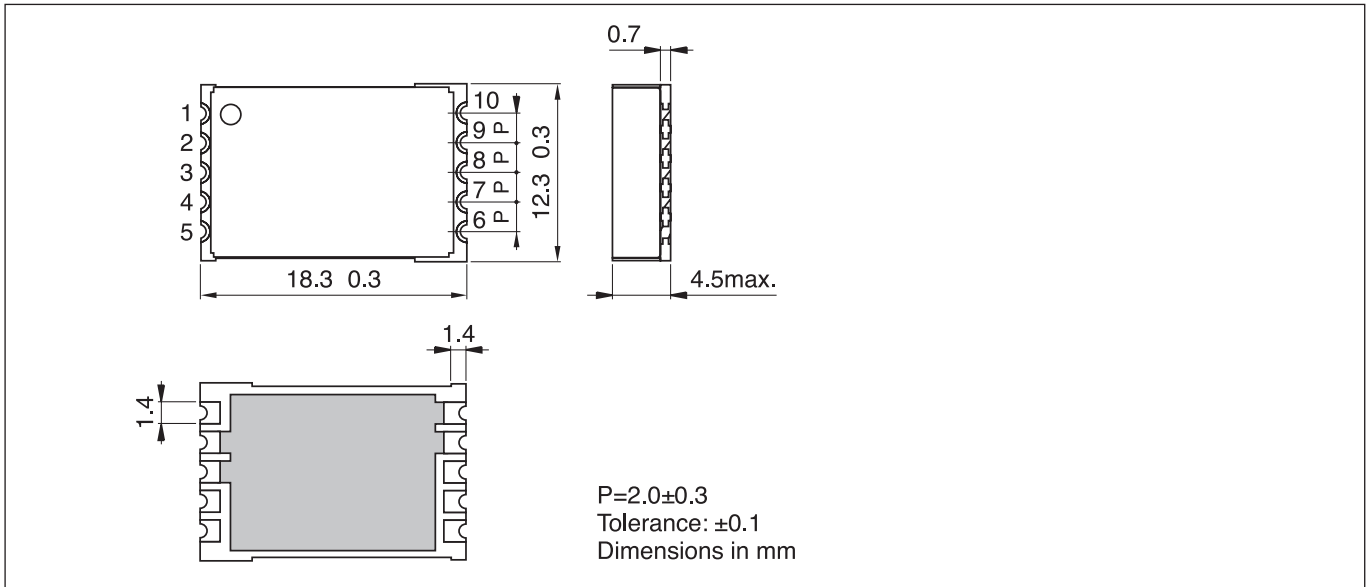


Vout=12V

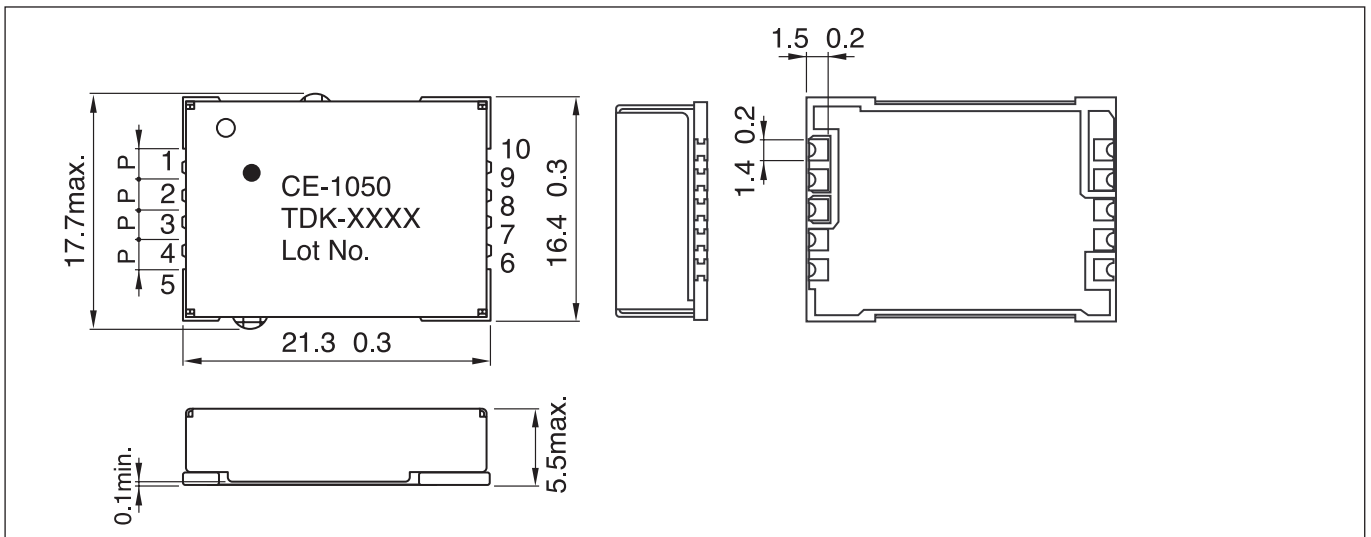
Vout=12V



## Outline Drawing CE-1000 Series



## Outline Drawing CE-1050 Series

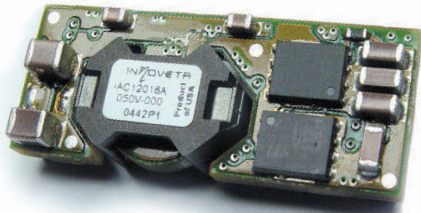


### Pinout

Pin	CE-1003	CE-1004	CE-1005	CE-1050
1	Vin	Vin	Vin	Vin
2	Vin	Vin	Vin	Vin
3	GND	GND	GND	GND
4	GND	GND	GND	GND
5	On / Off	On / Off	On/Off	On/Off
6	GND	GND	GND	GND
7	Vs-0	Vs-0	GND	GND
8	Vs-1	Vs-1	Vset	Vset
9	Vs-2	Vs-2	Vout	Vout
10	Vout	Vout	Vout	Vout







- Standard Industry Footprint (DOSA)
- 3.0-5.5V and 6.0-14.0V Input
- 0.8-5.0V Nominal Outputs
- Surface Mount
- Low 8.5mm Profile
- Non Isolated Output

## iAA/iAC Series

15 to 16A

Point of Load Converter

### iAA / iAC Features and Benefits

#### Features

- High operating efficiency (up to 95%)
- Constant switching frequency
- Starts with pre-biased output

#### Benefits

- Reduced system heating
- Easier system filtering
- Supports complex digital systems

Specifications			
MODEL		iAA05015A008V	iAC12016A008V
ITEMS			
Nominal Output Voltage	VDC	0.75-3.63	0.8 - 5.0
Input Voltage Range	VDC	3.0-5.5 <sup>(2)</sup>	6.0 <sup>(1)</sup> - 14
Input Current (max)	A	16	18
Output Voltage Tolerance	VDC	±3.3% Vo, set	-2.5 to +3.5% Vo, set
Ripple & Noise (max) (pk to pk) (3)	mV	75	100
Line Regulation (max)	mV	5	10
Load Regulation (max)	mV	10	15
Overload Protection	%	Inception - 175-235% of rated output; Short circuit - auto recovery	
Overvoltage Protection	-	N/A	
Remote Sense	-	Yes	
Remote On / Off	-	Positive or Negative Logic available, see Feature Set	
Temperature (operating)	°C	-40°C to +125°C	
Temperature (storage)	°C	-55°C to +125°C	
Humidity (operating)	-	20 - 95% RH Non condensing	
Humidity (storage)	-	Per IPC / JEDEC J-STD-020, for MSL-2 (<30C/60%RH) in original packaging	
Cooling	-	Convection or forced air	
Isolation Voltage	-	N/A	
Vibration (non operating)	-	5 to 50Hz @ 0.5g (4.9m/s <sup>2</sup> ), and 50 to 500Hz @ 1.5g (14.7m/s <sup>2</sup> ) per Bellcore TR-EOP-000063-5.4.4	
Shock	-	196.1m/s <sup>2</sup>	
Safety Agency Approvals	-	UL60950 (US and Canada), VDE0805 (IEC60950), CB scheme (IEC60950)	
Weight (max)	g	12	
Size	mm	33 x 13.5 x 8.5	
Warranty	yrs	3	

#### Notes:

- (1) 8.3 - 14V when output is >3.63V
- (2) 4.5 - 5.5V when output is >3.0V
- (3) Measured across one 0.1µF ceramic capacitor and one 47µF ceramic capacitor; BW = 20MHz



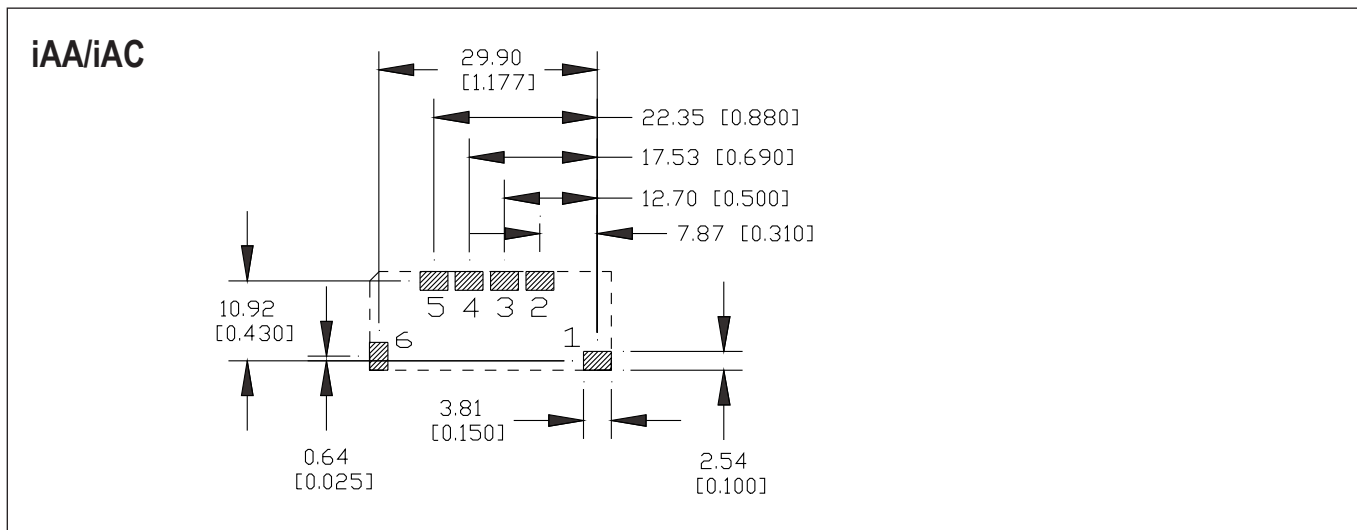
Model Selector						
Model	Output Voltage (V)	On/Off Logic Positive	On/Off Logic Negative	Output Curr. (A)	Max. Output Power (W)	Efficiency at Full Load (%)
iAA05015A008V-000-R	0.75 - 3.63	✓		15	49.5	94.5
iAC12016A008V-002-R	0.8 - 5.0	✓		16	80	94
iAC12016A008V-003-R	0.8 - 5.0		✓	16	80	94

NB other configurations on request

Pinout		
PIN	iAA	iAC
1	Vin	On/Off
2	Gnd	Vin
3	Vout	Gnd
4	Trim	Vout
5	Sense	Trim
6	On/Off	Sense
7	-	-



## Recommended Footprint (Top View) iAA/iAC (no sequence) Series





- Standard DOSA SIP Footprint
- 6.0-14VDC Input
- 0.8-5.5V Outputs
- Through Hole Mounting
- Low 13.97mm Profile
- Non Isolated Output

## iAD Series

### 16A Point of Load Converters

#### iAD Features and Benefits

##### Features

- High operating efficiency (up to 94%)
- Constant switching frequency
- Starts with pre-biased output

##### Benefits

- Reduced system heating
- Easier system filtering
- Supports complex digital systems

#### Specifications

ITEMS	MODEL	iAD
Nominal Output Voltage	VDC	0.8 - 5.5V
Input Voltage Range	VDC	6 - 14V
Input Current (max)	A	18A
Output Voltage Tolerance	VDC	N/A
Ripple & Noise (max) (pk-pk)	mV	100
Line Regulation (max)	mV	15
Load Regulation (max)	mV	22
Overload Protection	%	Inception - 28A; Short circuit - auto recovery
Overvoltage Protection	-	N/A
Remote Sense	-	Yes
Remote On / Off	-	Positive or Negative Logic available, see Feature Set
Sequencing	-	Yes, see feature set
Temperature (operating)	°C	-40°C to +125°C
Temperature (storage)	°C	-55°C to +125°C
Humidity (operating)	-	20 - 95% RH Non condensing
Humidity (storage)	-	10 - 95% RH Non condensing
Cooling	-	Convection or forced air
Isolation Voltage	-	none
Vibration (non-operating)	-	5 to 50Hz@0.5g (4.9m/s <sup>2</sup> ), & 50 to 500Hz@1.5g (14.7m/s <sup>2</sup> ) per Bellcore TR-EOP-000063-5.4.4
Shock	-	196.1m/s <sup>2</sup>
Safety Agency Certifications	-	UL60950 (US and Canada), VDE0805 (IEC60950), CB scheme (IEC60950)
Weight (max)	g	12
Size (LxWxH)	mm	50.8 x 7.9 x 14
Warranty	yrs	3



## Model Selector

Model	Output Voltage (V)	Output Adjust (V)	Output Curr. (A)	Max. Output Power (W)	Efficiency at Full Load (%)
iAD12016A008V-000-R	0.80 - 5.5	0.80 - 5.5	16	80	94% at 5V
iAD12016A008V-001-R	0.80 - 5.5	0.80 - 5.5	16	80	94% at 5V

NB other configurations on request

## Feature Set

Feat. Set	Pos. Logic On/Off	Neg. Logic On/Off	Input Voltage	Seq.	0.13" Pin	0.2" Pin
00*	X		6 - 14V	X	X	
01		X	6 - 14V	X	X	
02	X		6 - 14V		X	
03		X	6 - 14V		X	
04	X		6 - 14V	X		X
05		X	6 - 14V	X		X
06	X		6 - 14V			X
07		X	6 - 14V			X

\* Preferred feature set

Model Number Example: iAD12016A008V-001-R

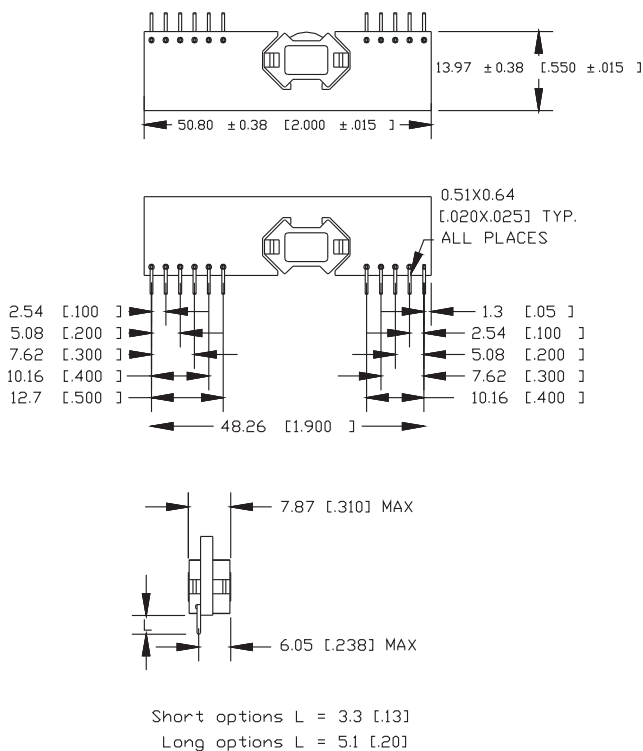
## Pinout

PIN	Function	PIN	Function
1	Vout	6	GND
2	Vout	7	Vin
3	Sense	8	Vin
4	Vout	9	Sequencing
5	GND	10	Trim
		11	On / Off

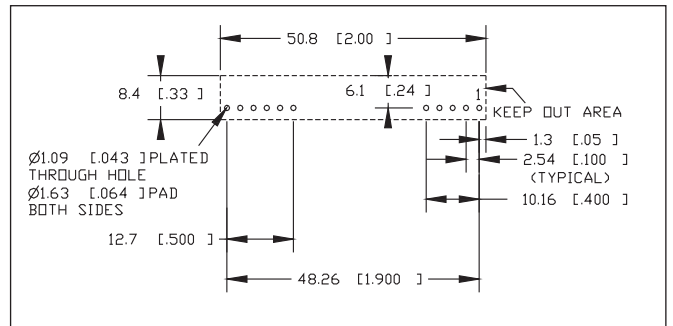
## Outline Drawing iAD Series

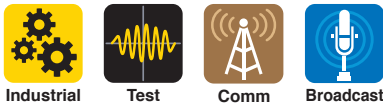
### Mechanical Specifications:

Dimensions are in mm [in]. Unless otherwise specified tolerances are: x.x ±0.5 [0.02], x.xx ±0.25 [0.010]

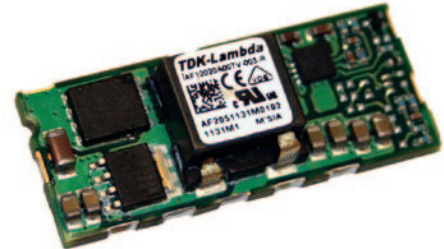


## Recommended Hole Pattern (Top View)





## 20A Non-isolated SMT Point of Load



Features	Benefits
• Fully Optimised Control Loop with Excellent Transient Response	• No External Loop Tuning Components Needed
• DOSA Compatible Footprint	• Ideal for Second Sourcing
• LGA or EPC Format	• Choice of Layout

Specification		
Model	iAF	
DC Output Voltage	V	0.70 - 5.5
DC Input Voltage	V	4.5 - 14
Efficiency	%	82 - 93.5 (1.2Vout to 5Vout)
Output Voltage Tolerance	%	±3
Switching Frequency	kHz	600
Line Regulation	mV	3
Load Regulation	mV	7
Preload	-	none
Output Ripple and Noise	mVpp	10
Overcurrent Protection	A	Hiccup Type
Remote On / Off	-	yes
Remote Sense	-	(+) Sense
Power Good Signal	-	yes
Operating Temperature	°C	-40°C to 115°C (see thermal data on website)
Storage Temperature	°C	-55°C to 125°C
Safety Agency Approvals	-	UL60950-1, CSA 22.2 No.60950-1-03; VDE CB scheme (IEC60950-1, EN60950-1)
Weight	g	5.5g
Size (LxWxH)	mm	33 x 13.46 x 7.75
Warranty	yrs	3 years

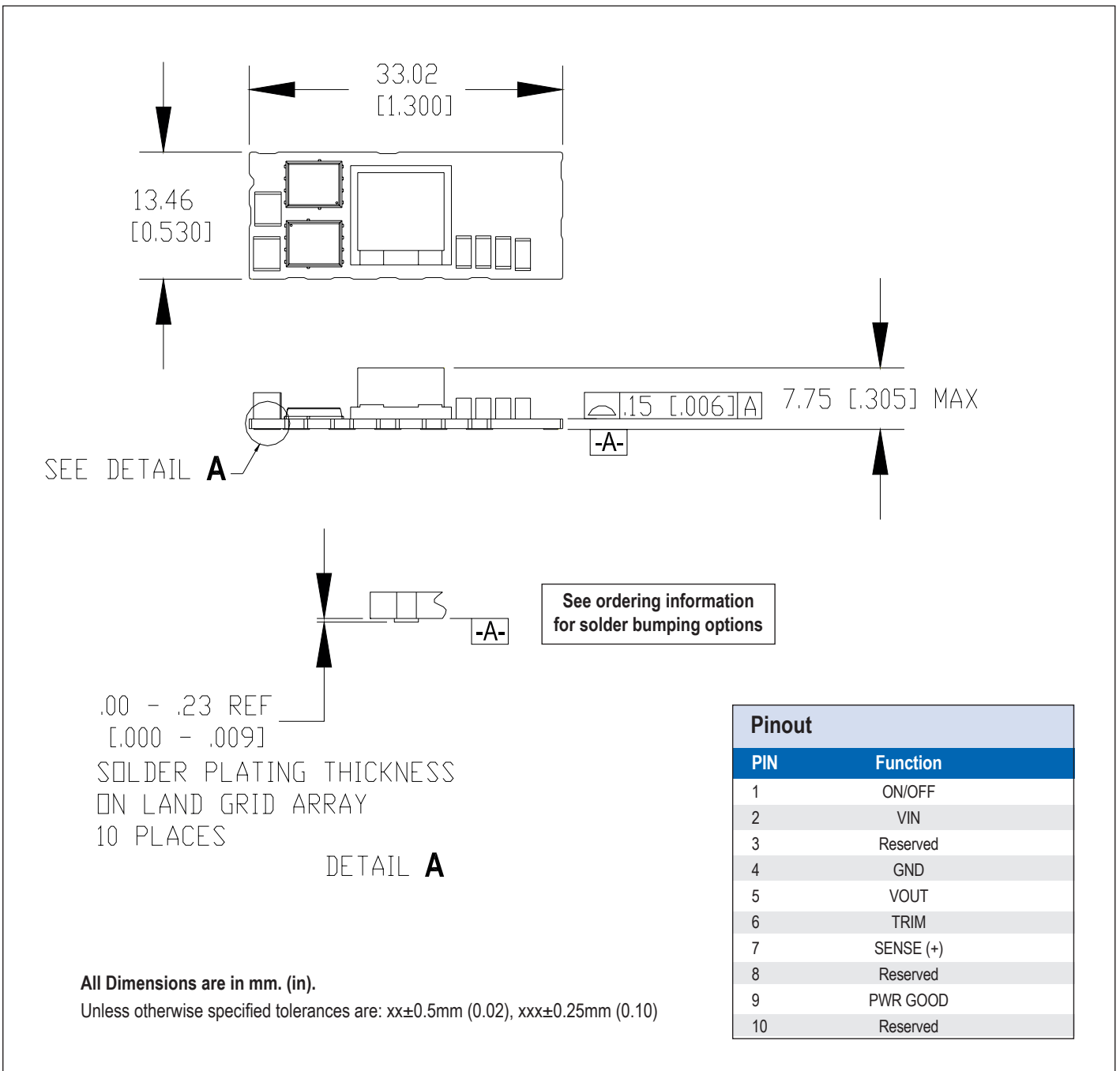


## Model Selector

Model	Input Voltage (V)	Output Current (A)	Output Voltage (V)	Positive Logic On/Off	Negative Logic On/Off	Sequencing	LGA Solder Bumping
iAF12020A007V-007-R	4.5 -14	20	0.70 - 5.5	-	yes	-	yes*

\*For EPC solder bumping specify -003-R model suffix

## Outline Drawing iAF Series





## 40A Non-isolated SMT Point of Load



Features	Benefits
• DOSA Compatible Footprint	• Ideal for Second Sourcing
• Constant Switching Frequency	• Predictable EMI
• No external Loop Tuning Components Needed	• Less Board Area Needed
• Excellent Transient Response	• For Sensitive Applications

Specification		
Model		iAH12
DC Output Voltage	V	0.7 - 5.5
DC Input Voltage	V	3.5 - 17
Efficiency	%	84 - 96
Output Voltage Tolerance	%	±3
Switching Frequency	kHz	600
Line Regulation	mV	4
Load Regulation	mV	7
External Load Capacitance	uF	200 - 2000
Output Ripple and Noise	mVpp	20
Overcurrent Protection	A	50A typical
Remote On / Off	-	Yes, see model selector table
Remote Sense	-	(+) Sense, compensating up to 0.5V
Power Good	-	Yes, Low on fail
Operating Temperature	°C	-40°C to 115°C (see thermal data on website)
Storage Temperature	°C	-55°C to 125°C
Safety Agency Approvals	-	IEC/EN 60950-1, UL/CSA 60950-1, CE mark (LVD & RoHS2)
Weight	gms	12g
Size (LxWxH)	mm	33 x 13.5 x 10.2
Warranty	yrs	3 years



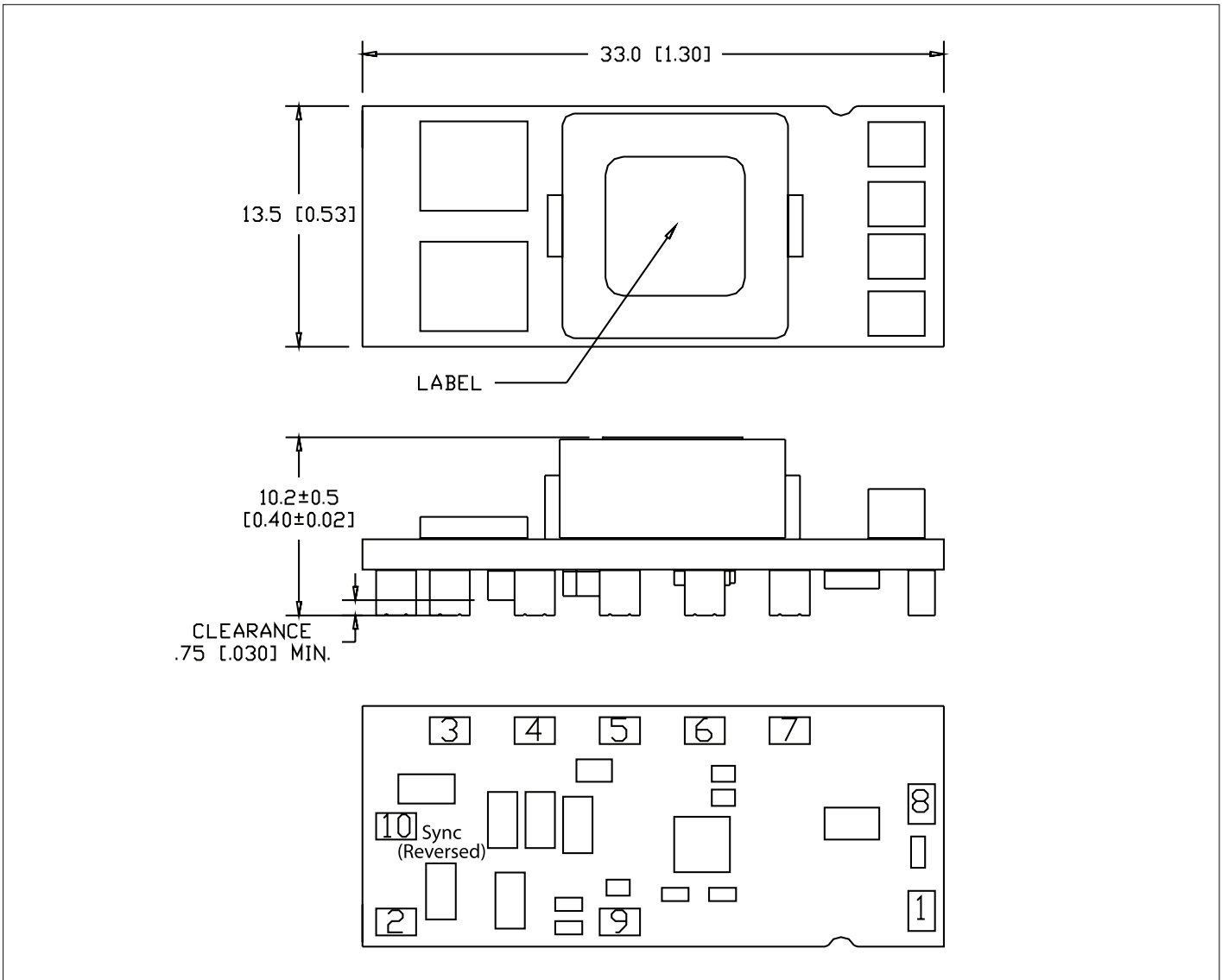


## Model Selector

Input Model	Input Voltage (V)	Output Current (A)	Output Voltage (V)	Positive Logic On/Off	Negative Logic On/Off	Sequencing
iAH12040A007V-006-R	3.5 - 17	40	0.7 - 5.5	yes	-	-
iAH12040A007V-007-R	3.5 - 17	40	0.7 - 5.5	-	yes	-

Preferred

## Outline Drawing iAH Series



## Pin Assignment

PIN	Function	PIN	Function
1	ON / OFF	6	TRIM
2	VIN	7	SENSE (+)
3	Sequencing	8	Reserved
4	GND	9	PWR Good
5	VOUT	10	Sync (Reserved)





- Standard Industry Footprint (DOSA)
- 3.0-5.5V and 6.0-14.0V Input
- 0.8-5.0V Nominal Output
- Surface Mount
- Low 8.38mm Profile
- Non Isolated Output

## iBA/iBC Series

7 to 8A point of load converter

### iBA/iBC Features and Benefits

#### Features

- High operating efficiency (up to 95%)
- Constant switching frequency
- Starts with pre-biased output

#### Benefits

- Reduced system heating
- Easier system filtering
- Supports complex digital systems

### Specifications

ITEMS		MODEL	iBA05008A008V	iBC12007A008V
Nominal Output Voltage	VDC		0.75 - 3.63	0.8 - 5.0
Input Voltage Range (2)	VDC		3.0 - 5.5	6.0 <sup>(1)</sup> - 14 or 9.6 - 14
Input Current (max)	A			8.5
Output Voltage Tolerance	VDC			N/A
Ripple & Noise (max) (pk to pk) (3)	mV		75	100
Line Regulation (max)	mV		5	20
Load Regulation (max)	mV		10	30
Overload Protection	%		Inception- 185-215% of rated output; Short circuit - auto recovery	
Overvoltage Protection	-		N/A	
Remote Sense	-		No	
Remote On / Off	-		Positive or Negative Logic available, see Feature Set	
Sequencing	-		No	Yes
Temperature (operating)	°C		-40 to 125	
Temperature (storage)	°C		-55 to 125	
Humidity (operating)	-		20-95% RH Non condensing	
Humidity (storage)	-		Per IPC / JEDEC J-STD-020, for MSL-2 (<30C/60%RH) in original packaging	
Cooling	-		Convection or forced air	
Isolation Voltage	VDC		none	
Vibration (non operating)	-		5 to 50Hz @ 0.5g (4.9m/s <sup>2</sup> ), and 50 to 500Hz @ 1.5g (14.7m/s <sup>2</sup> ) per Bellcore TR-EOP-000063-5.4.4	
Shock	-		196.1m/s <sup>2</sup>	
Safety Agency Approvals	-		UL60950 (US and Canada), VDE0805 (IEC60950), CB scheme (IEC60950)	
Weight (max)	g		7	
Size	mm		20.3 x 11.4 x 8.38	27.9 x 11.4 x 8.38
Warranty	-		3 Years	

- Notes:**
- (1) 8.3-14V when output is >3.63V
  - (2) 4.5-5.5V when output is >3.0V
  - (3) Measured across one 0.1uF ceramic capacitor and one 47uF ceramic capacitor; BW = 20MHz

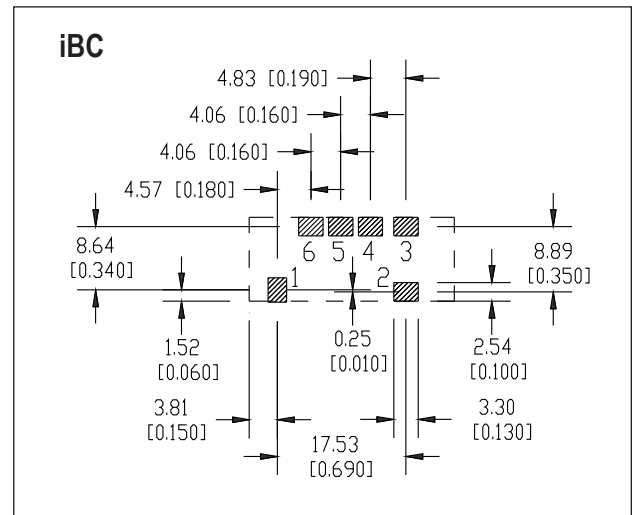
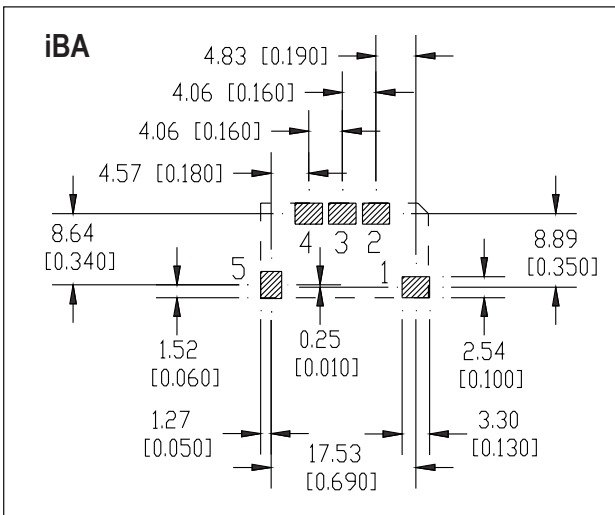


## Model Selector

Model	Output Voltage	Output Adjust	Output Curr. (A)	Max. Output Power (W)	Efficiency at Full Load (%)
iBA05008A008V-000-R	0.75 - 3.63	0.75 - 3.63	8	26.4	94
iBA05008A008V-001-R	0.75 - 3.63	0.75 - 3.63	8	26.4	94
iBC12007A008V-000-R	0.8 - 5.0	0.8 - 5.0	7	35	93
iBC12007A008V-001-R	0.8 - 5.0	0.8 - 5.0	7	35	93
iBC12007A008V-002-R	0.8 - 5.0	0.8 - 5.0	7	35	93

NB other configurations on request

## Recommended Footprint iBA iBC Series (Top View)



## Feature Set

	Feature Set	Pos. Logic On / Off	Neg. Logic On / Off	Sequencing	(6-14V) Input Rng
iBA	00	X			
	01		X		
iBC	00	X		X	X
	01*		X	X	X
	02	X			X
	03		X		X
	05		X	X	
	06	X			

\* Preferred feature set  
Model Number Example: iBC12007A008V-001-R

## Pinout

PIN	iBA Function	iBC Function
1	Vin	On/Off
2	Gnd	Vin
3	Trim	Seq
4	Vout	Gnd
5	On/Off	Trim
6	-	Vout





- Standard SIP Footprint (DOSA)
- 6.0-14VDC Input
- 0.8 - 5.5V Outputs
- Through Hole Mounting
- Low 12.7mm Profile
- Non Isolated Output

## iBD Series

7A point of load converter

### iBD Features and Benefits

#### Features

- High operating efficiency (up to 92%)
- Constant 240kHz switching frequency
- Starts with pre-biased output

#### Benefits

- Reduced system heating
- Easier system filtering
- Supports complex digital systems

### Specifications

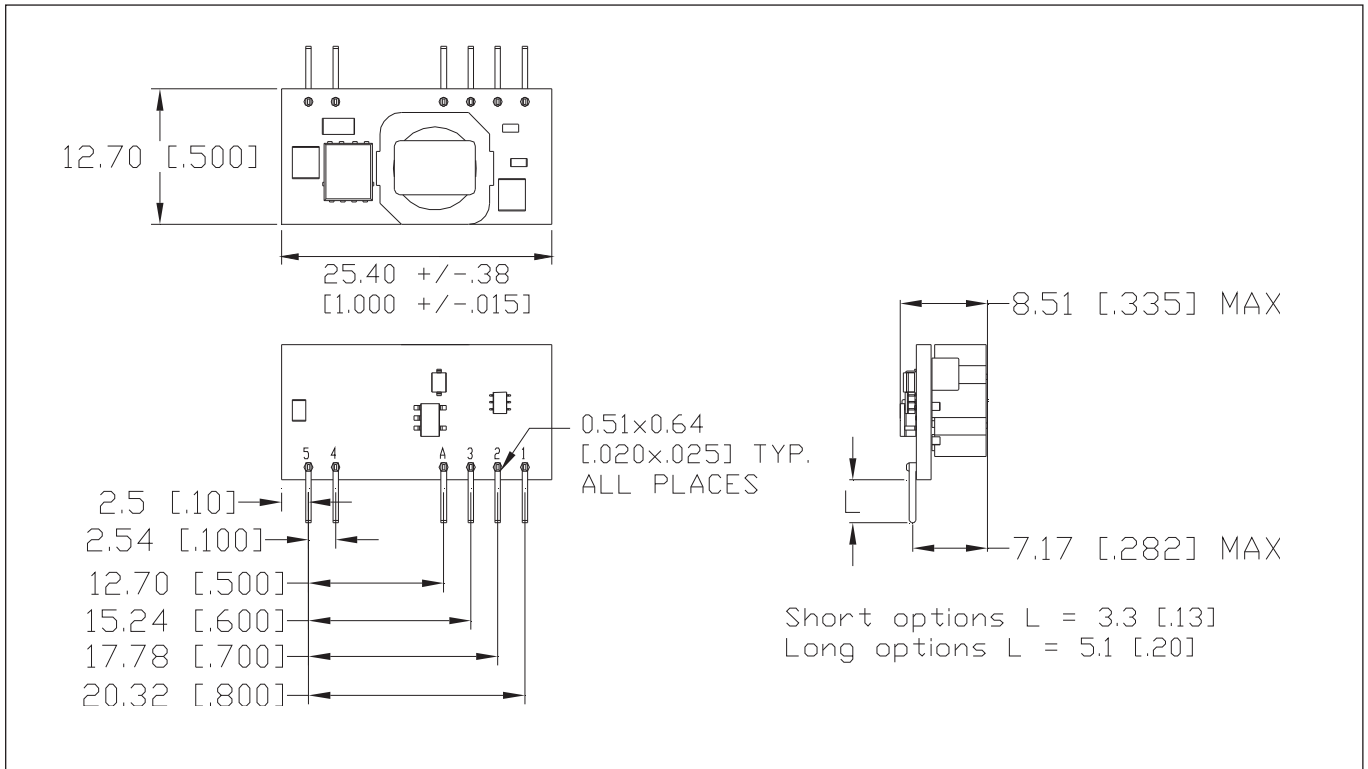
ITEMS	MODEL		iBD
Nominal Output Voltage	VDC		0.8 - 5.5V
Input Voltage Range	VDC		6 - 14V
Input Current (max)	A		7A
Output Voltage Tolerance	%		±3.5
Ripple & Noise (max) (pk - pk)	mV		125
Line Regulation (max)	%		0.2%
Load Regulation (typical)	mV		20
Overload Protection	A		Inception- 11.5A; Short circuit - auto recovery
Overvoltage Protection	-		N/A
Remote Sense	-		Yes
Remote On / Off	-		Positive Logic standard. Negative logic available, see detailed datasheet
Sequencing	-		Yes
Temperature (operating)	°C		-40 to 105 (See detailed datasheet for derating)
Temperature (storage)	°C		-55 to 125
Humidity (operating)	%RH		20-95 Non condensing
Humidity (storage)	%RH		10-95 Non condensing
Cooling	-		Convection or forced air (See detailed datasheet for derating)
Isolation Voltage	-		None
Vibration (non operating)	-		5 to 50Hz@0.5g(4.9m/s <sup>2</sup> ), & 50 to 500Hz@1.5g(14.7m/s <sup>2</sup> ) per Bellcore TR-EOP-000063-5.4.4
Shock	-		196.1m/s <sup>2</sup>
Safety Agency Certifications	-		Pending - UL60950 (US and Canada), VDE0805 (IEC60950), CB scheme (IEC60950)
Weight (max)	g		6
Size (LxWxH)	mm		25.4 x 8.51 x 12.7
Warranty	yrs		3 Years



## Model Selector

Model	Output Voltage	Output Adjust	Output Curr. (A)	Max. Output Power (W)	Efficiency at Full Load (%)
iBD12007A008V-000-R	0.80 - 5.5	0.80 - 5.5	7	35	92% at 5V

## Outline Drawing iBD



## Pinout

PIN	Function
1	Vout
2	Trim
3	GND
A	Sequencing
4	Vin
5	On / Off





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## 12A Non-isolated SMT Point of Load



Features	Benefits
• Fully Optimised Control Loop with Excellent Transient Response	• No External Loop Tuning Components Needed
• DOSA Compatible Footprint	• Ideal for Second Sourcing
• LGA or EPC Format	• Choice of Layout

Specification		
Model	iBF	
DC Output Voltage	V	0.70 - 5.5
DC Input Voltage	V	4.5 - 14
Efficiency	%	83 - 94.5 (1.2Vout to 5Vout)
Output Voltage Tolerance	%	±3
Switching Frequency	kHz	600
Line Regulation	mV	6
Load Regulation	mV	5
Preload	-	none
Output Ripple and Noise	mVpp	30
Overcurrent Protection	A	Hiccup Type
Remote On / Off	-	yes
Remote Sense	-	yes
Power Good Signal	-	yes
Operating Temperature	°C	-40°C to 115°C (see thermal data on website)
Storage Temperature	°C	-55°C to 125°C
Safety Agency Approvals	-	UL60950-1, CSA 22.2 No.60950-1-03; VDE CB scheme (IEC60950-1, EN60950-1)
Weight	g	5.5g
Size (LxWxH)	mm	20.32 x 11.43 x 8.5
Warranty	yrs	3

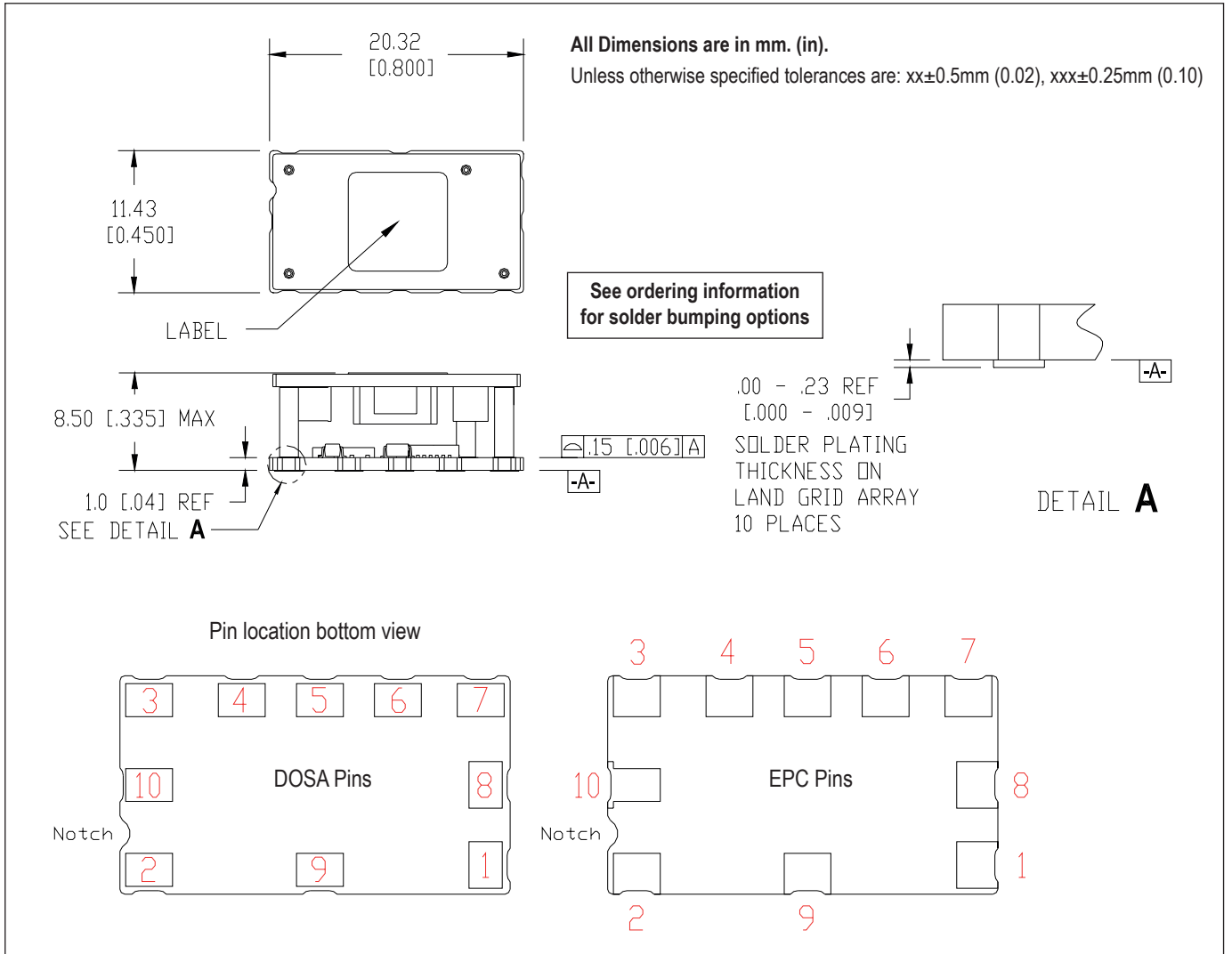


## Model Selector

Model	Input Voltage (V)	Output Current (A)	Output Voltage (V)	Positive Logic On/Off	Negative Logic On/Off	Sequencing	LGA Solder Bumping
iBF12012A007V-007-R	4.5 - 14	12	0.70 - 5.5	-	yes	-	yes*

\*For EPC solder bumping specify -003-R model suffix

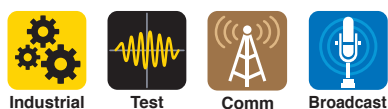
## Outline Drawing iBF Series



## Pin Assignment

PIN	Function
1	ON/OFF
2	VIN
3	SEQ
4	GND
5	TRIM
6	VOUT
7	SENSE (+)
8	SENSE (-) Reserved
9	PWR GOOD
10	SYNC RES





## 20A Non-isolated SMT Point of Load



Features	Benefits
DOSA Compatible Footprint	Ideal for Second Sourcing
Constant Switching Frequency	Predictable EMI
No External Loop Tuning Components Needed	Less Board Area Needed
Excellent Transient Response	For Sensitive Applications

Specification			
Model		iBH12	
DC Output Voltage	V	0.7 - 5.5	
DC Input Voltage	V	3.5 - 14	
Efficiency	%	85.5 - 96	
Output Voltage Tolerance	%	±3	
Switching Frequency	kHz	600	
Line Regulation	mV	4	
Load Regulation	mV	7	
External Load Capacitance	uF	200 - 2000	
Output Ripple and Noise	mVpp	20	
Overcurrent Protection	A	35A typical	
Remote On / Off	-	Yes, see model selector table	
Remote Sense	-	(+) Sense, compensating up to 0.5V	
Power Good	-	Yes, Low on fail	
Operating Temperature	°C	-40°C to 115°C (see thermal data on website)	
Storage Temperature	°C	-55°C to 125°C	
Safety Agency Approvals	-	IEC/EN 60950-1, UL/CSA 60950-1, CE mark (LVD & RoHS2)	
Weight	gms	6g	
Size (LxWxH)	mm	20.3 x 11.4 x 9.9	
Warranty	yrs	3	



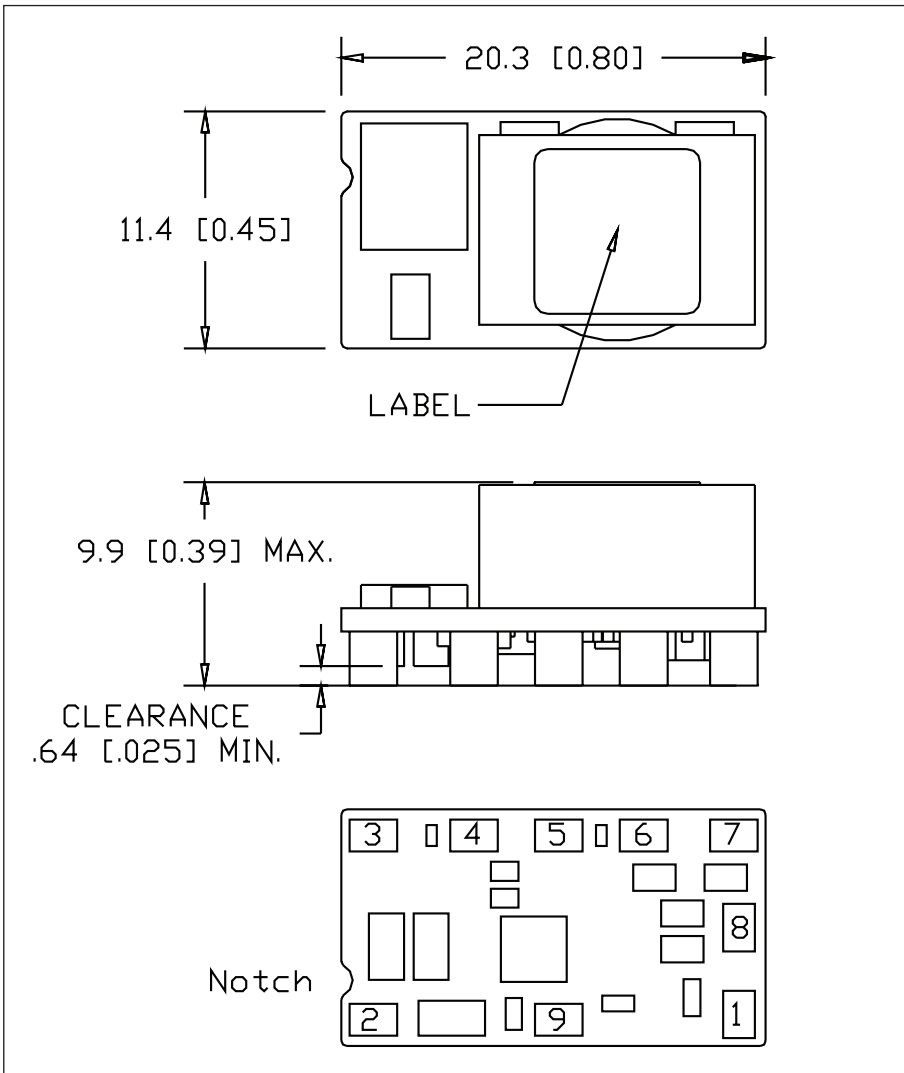


## Model Selector

Input Model	Input Voltage (V)	Output Current (A)	Output Voltage (V)	Positive Logic On/Off	Negative Logic On/Off	Sequencing
iBH12020A007V-006-R	3.5 - 14	20	0.7 - 5.5	yes	-	-
iBH12020A007V-007-R	3.5 - 14	20	0.7 - 5.5	-	yes	-

Preferred

## Outline Drawing iBH Series



## Pin Assignment

PIN	Function	PIN	Function
1	ON/OFF	6	VOUT
2	VIN	7	SENSE (+)
3	Sequencing	8	Reserved
4	GND	9	PWR GOOD
5	TRIM		





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## 3A Non-isolated SMT Point of Load



Features	Benefits
• Fully Optimised Control Loop with Excellent Transient Response	• No External Loop Tuning Components Needed
• DOSA Compatible Footprint	• Ideal for Second Sourcing
• LGA or EPC Format	• Choice of Layout

Specification		
Model	iCF	
DC Output Voltage	V	0.7 - 5.5
DC Input Voltage	V	4.5 - 14
Efficiency	%	85 - 93.5 (1.2Vout to 5Vout)
Output Voltage Tolerance	%	±3
Switching Frequency	kHz	600
Line Regulation	mV	3
Load Regulation	mV	6
Preload	-	none
Output Ripple and Noise	mVpp	15
Overcurrent Protection	A	Hiccup Type
Remote On / Off	-	yes
Remote Sense	-	yes
Power Good Signal	-	yes
Operating Temperature	°C	-40°C to 115°C (see thermal data on website)
Storage Temperature	°C	-55°C to 125°C
Safety Agency Approvals	-	UL60950-1, CSA 22.2 No.60950-1-03; VDE CB scheme (IEC60950-1, EN60950-1)
Weight	g	1.5g
Size (LxWxH)	mm	12.2 x 12.2 x 4.45
Warranty	yrs	3

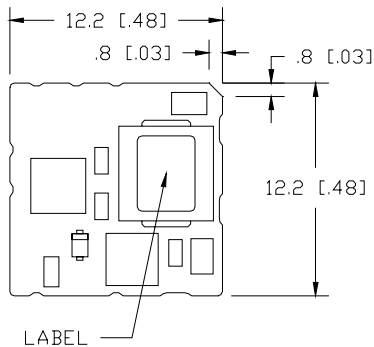


## Model Selector

Model	Input Voltage (V)	Output Current (A)	Output Voltage (V)	Positive Logic On/Off	Negative Logic On/Off	Sequencing	LGA Solder Bumping
iCF12003A007V-007-R	4.5 -14	3	0.70 - 5.5	-	yes	-	yes*

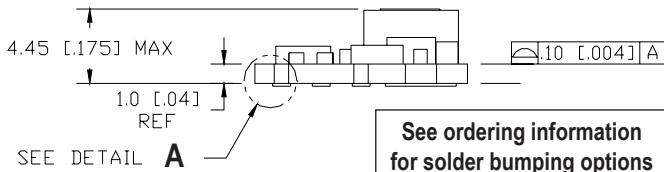
\*For EPC solder bumping specify -003-R model suffix

## Outline Drawing iCF Series



All Dimensions are in mm. (in).

Unless otherwise specified tolerances are:  $xx \pm 0.5\text{mm}$  (0.02),  $xxx \pm 0.25\text{mm}$  (0.10)



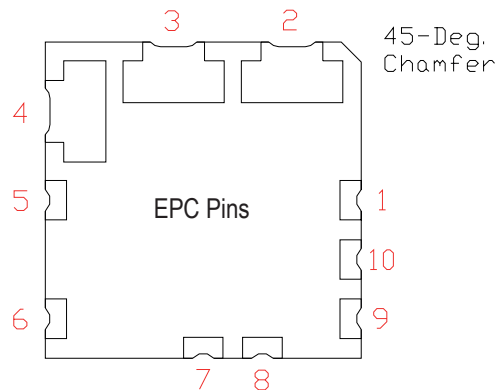
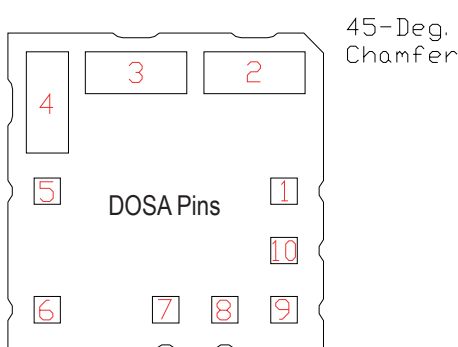
SEE DETAIL A

See ordering information for solder bumping options

.00 - .23 REF  
[.000 - .009]  
SOLDER PLATING THICKNESS ON LAND GRID ARRAY 10 PLACES

DETAIL A

Pin location bottom view



### Pin Assignment

PIN	Function	PIN	Function
1	ON/OFF	6	TRIM
2	VIN	7	GND
3	GND	8	No Connection
4	VOUT	9	No Connection
5	SENSE	10	PWR GOOD





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## 6A Non-isolated SMT Point of Load



Features	Benefits
• Fully Optimised Control Loop with Excellent Transient Response	• No External Loop Tuning Components Needed
• DOSA Compatible Footprint	• Ideal for Second Sourcing
• LGA or EPC Format	• Choice of Layout

Specification		
Model	iCG	
DC Output Voltage	V	0.70 - 5.5
DC Input Voltage	V	4.5 - 14
Efficiency	%	84 - 94 (1.2Vout to 5Vout)
Output Voltage Tolerance	%	±3
Switching Frequency	kHz	600
Line Regulation	mV	3
Load Regulation	mV	6
Preload	-	none
Output Ripple and Noise	mVpp	15
Overcurrent Protection	A	Hiccup Type
Remote On / Off	-	yes
Remote Sense	-	yes
Power Good Signal	-	yes
Operating Temperature	°C	-40°C to 115°C (see thermal data on website)
Storage Temperature	°C	-55°C to 125°C
Safety Agency Approvals	-	UL60950-1, CSA 22.2 No.60950-1-03; VDE CB scheme (IEC60950-1, EN60950-1)
Weight	g	3g
Size (LxWxH)	mm.	12.2 x 12.2 x 8.5
Warranty	yrs	3

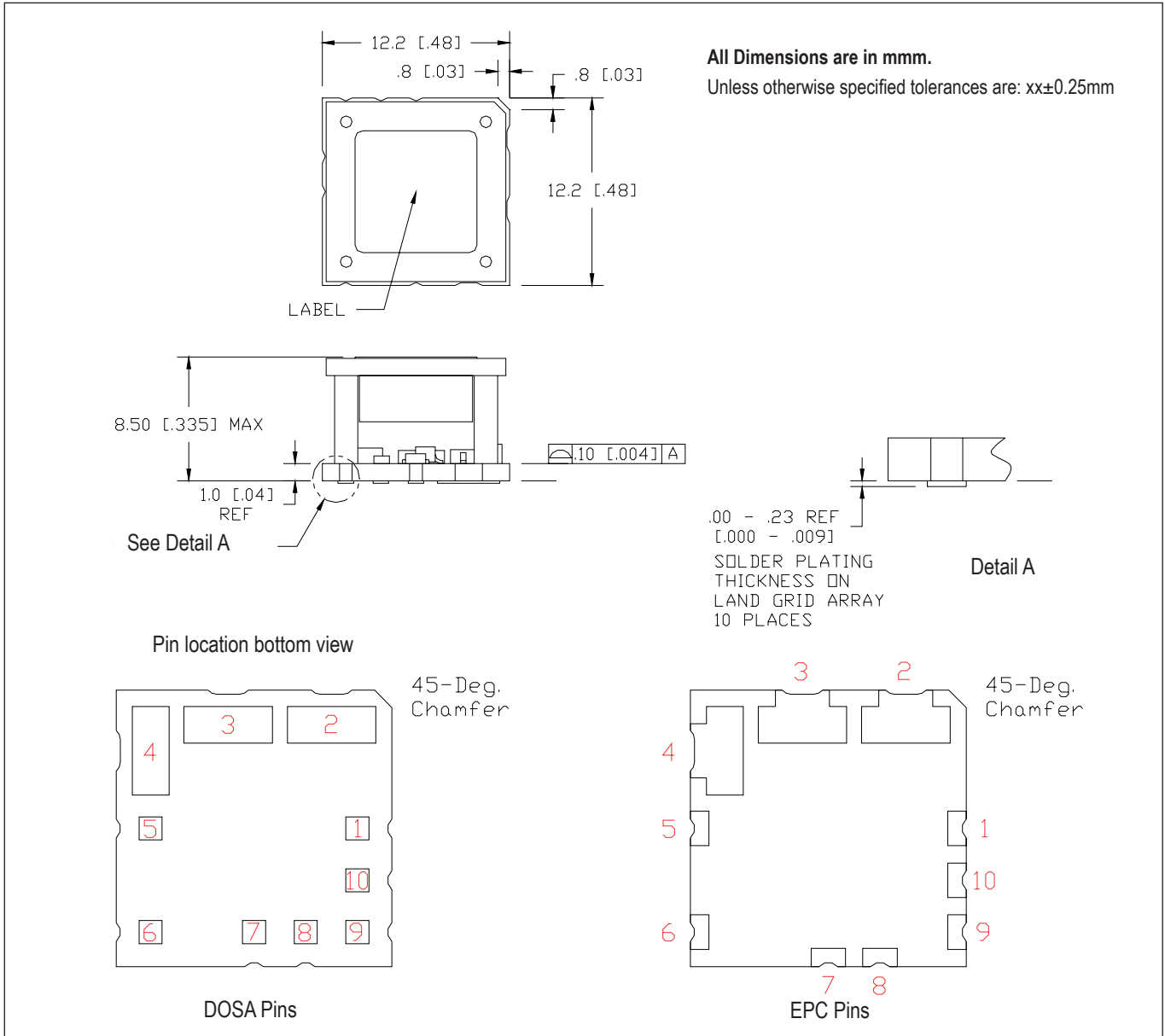


## Model Selector

Model	Input Voltage (V)	Output Current (A)	Output Voltage (V)	Positive Logic On/Off	Negative Logic On/Off	Sequencing	LGA Solder Bumping
iCG12006A007V-007-R	4.5 - 14	6	0.70 - 5.5	-	yes	-	yes*

\*For EPC solder bumping specify -003-R model suffix

## Outline Drawing iCG Series



## Pin Assignment

PIN	Function	PIN	Function
1	ON/OFF	6	TRIM
2	VIN	7	GND
3	GND	8	No Connection
4	VOUT	9	Reserved
5	SENSE	10	PWR GOOD





Industrial



Test



Comm



Broadcast

## 85W, 12A Non-isolated SMT Point of Load



Features	Benefits
• DOSA Compatible Footprint	• Ideal for Second Sourcing
• Constant Switching Frequency	• Predictable EMI
• No external Loop Tuning Components Needed	• Less Board Area Needed
• Excellent Transient response	• For Sensitive Applications

Specification		
Model	iCH	
DC Output Voltage	V	0.7 - 8.5
DC Input Voltage	V	4.5 - 14
Efficiency	%	88.5 - 97
Output Voltage Tolerance	%	±3
Switching Frequency	kHz	500
Line Regulation	mV	5
Load Regulation	mV	6
External Load Capacitance	uF	200 - 2000
Output Ripple and Noise	mVpp	15
Overcurrent Protection	A	22A typical
Remote On / Off	-	Positive Logic (For Negative Logic Contact Factory)
Remote Sense	-	(+) Sense, compensating up to 0.5V
Power Good	-	Yes, Low on fail
Operating Temperature	°C	-40°C to 115°C (see thermal data on website)
Storage Temperature	°C	-55°C to 125°C
Safety Agency Approvals	-	IEC/EN 60950-1, UL/CSA 60950-1, CE mark (LVD & RoHS2)
Weight	g / oz	2.5g / 0.088 oz
Size (LxWxH)	mm	12.2 x 12.2 x 8.5
Warranty	yrs	3

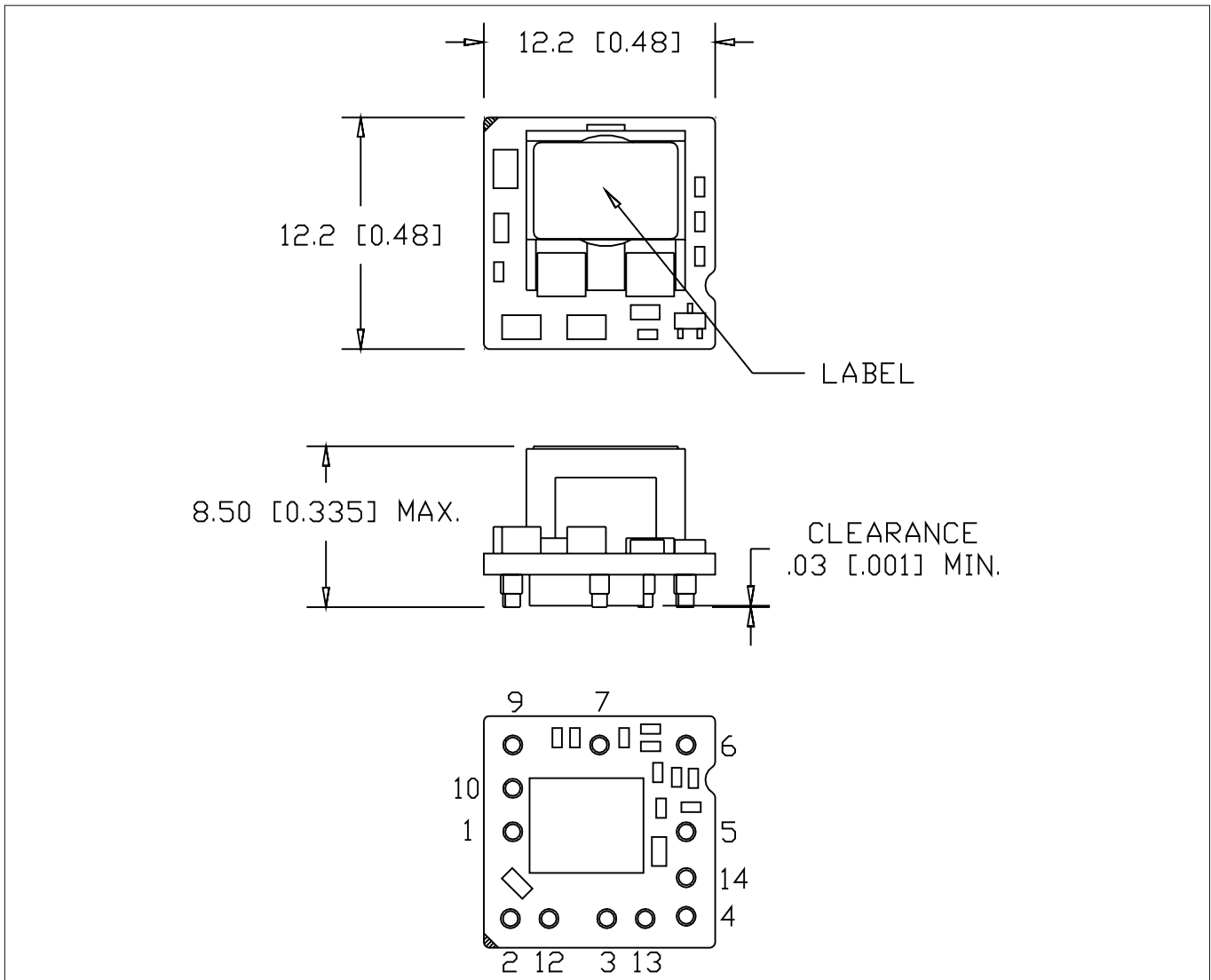


## Model Selector

Input Model	Input Voltage (V)	Output Current (A)	Output Voltage (V)	Positive Logic On/Off	Negative Logic On/Off
iCH12012A007V-007-R	4.5 - 14	12	0.7 - 8.5	-	yes
iCH12012A007V-006-R	4.5 - 14	12	0.7 - 8.5	yes	-

Preferred

## Outline Drawing iCH Series



## Pin Assignment

PIN	Function	PIN	Function
1	ON / OFF	8	Not Fitted
2	VIN	9	Not Connected
3	GND	10	PWR GOOD
4	VOUT	11	Not Fitted
5	SENSE (+)	12	VIN
6	TRIM	13	GND
7	GND	14	VOUT





Test



Industrial

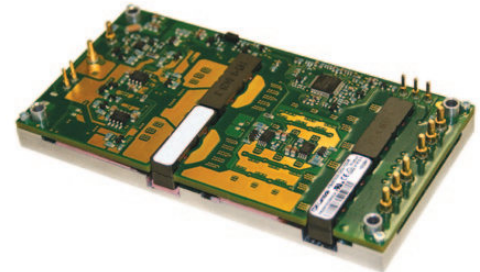


Broadcast



Comm

## 600W Full Brick DC-DC Converters



Features	Benefits
• Standard Full Brick Footprint	• Second Sourcing
• 36 - 75VDC Input	• Suitable for Telecom
• 9.6 and 12V Nominal Outputs	• For use with POL's
• Up to 94% Efficiency	• Better System Thermal Management

Specification		iFB	
Model			
Nominal Output Voltage	VDC	9.6V	12V
Input Voltage Range	VDC	36-75	
Input Current	A	18.7A Maximum	
Efficiency (48V input)	%	93% @ 70% load	94% @ 84% load
Output Voltage Adjustment	VDC	5.76 - 10.56	7.2 - 13.2
Output Voltage Accuracy	%	±3%	
Ripple & Noise (max) pk-pk	mV	140	175
Line Regulation (typ)	mV	3	7
Load Regulation (typ)	mV	2	2
Overcurrent Protection (typ)	A	64	60
Overvoltage Protection (typ)	V	11.7	14.8
Remote On/Off	-	Yes	
Remote Sense	-	Yes	
Operating Temperature	°C	-40°C to +125°C	
Storage Temperature	°C	-55°C to +125°C	
Temperature regulation (typ)	mV	40	
Humidity (operating)	%	20-95% RH Non condensing	
Humidity (storage)	%	10-95% RH Non condensing	
Cooling	-	Conduction, convection or forced air	
Isolation Voltage	VDC	Input to baseplate, Input to Output 1500VDC; Output to base plate 500VDC	
Isolation Resistance	Ω	>15MΩ	
Vibration	-	Bellcore TR-EOP-000063, Section 5.4.4	
Shock	-	MIL-STD-202G, Method 213B, Test Condition I	
Safety Agency Certifications	-	UL60950 (US and Canada), VDE0805, CB Scheme (IEC950), CE Mark (EN60950)	
Weight (Typ)	g	225	
Size (WxHxD)	mm	116.84 x 60.96 x 13.21	
Warranty	yrs	3	

**Note:** See Installation Manual for full details, test methods of parameters and application notes

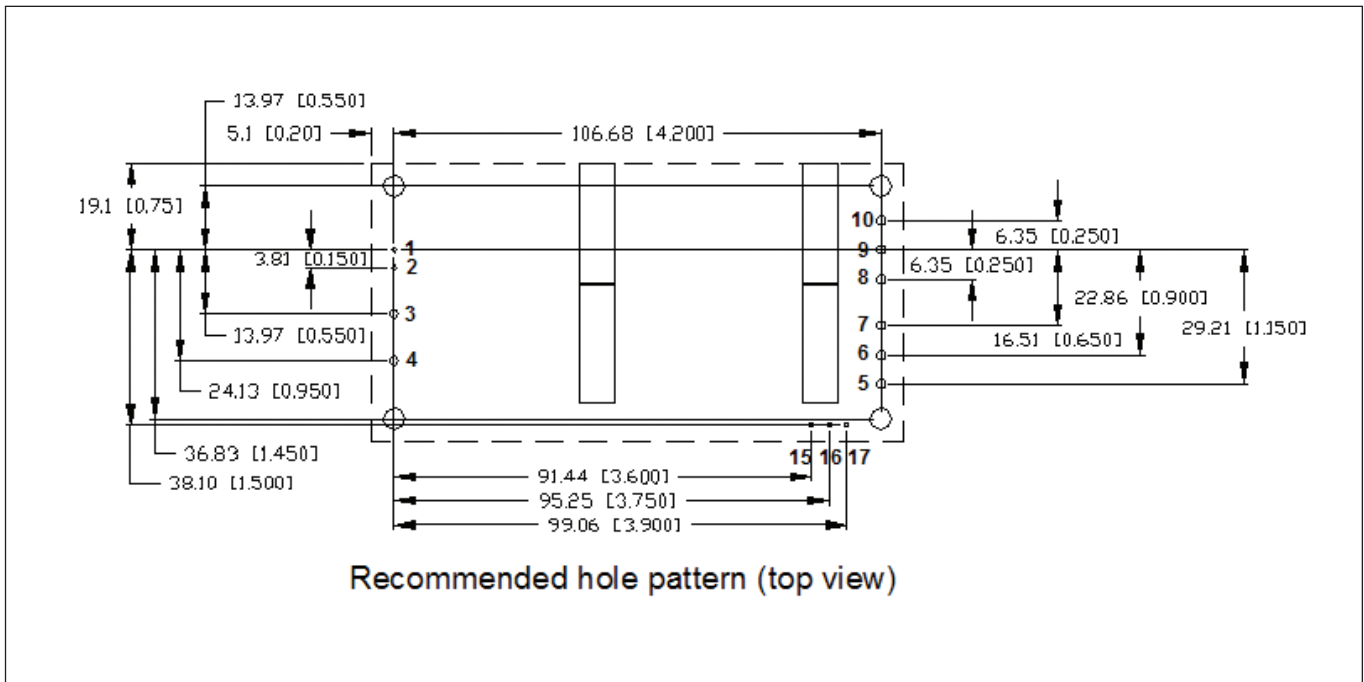




## Model Selector

Input Model	Output Voltage (V)	Max. Voltage (V)	Max. Current (A)	Power (W)	OVP	Pin Length (in)
iFB48058A096V-122-R	36 - 75	9.6	58	557	Latching	0.166
iFB48050A120V-122-R	36 - 75	12	50	600	Latching	0.166

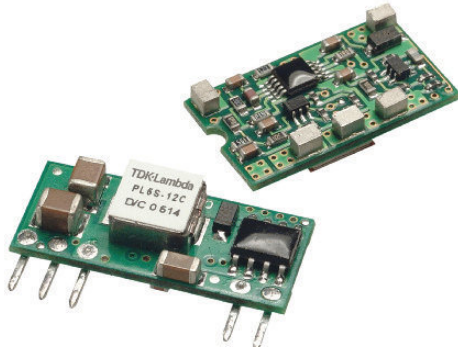
## Outline Drawing iFB Series



## Pinout

PIN	Function	PIN	Function	PIN	Function
1	ON/OFF (+)	7	Vout (-)	13	not available
2	ON/OFF (-)	8	Vout (+)	14	not available
3	Vin (+)	9	Vout (+)	15	TRIM
4	Vin (-)	10	Vout (+)	16	SENSE (+)
5	Vout (-)	11	not available	17	SENSE (-)
6	Vout (-)	12	not available		





## PL5 Series

5A Non-Isolated  
DC-DC Converters

- Industry Standard Package and Pin Out
- DOSA Compatible Models
- Low Voltage Outputs to 0.75V
- Pin and SMT Versions
- Output Voltage Adjustment
- Remote On/Off

### Key Market Segments & Applications

Telecommunications  
Data Communications  
Networking Equipment  
Test Equipment  
Industrial Electronics  
Distributed Power Architecture

### PL5 Features and Benefits

#### Features

- High Efficiency up to 94%
- Wide Output Voltage Adjustment Range
- SMT or Through Hole Packages
- Industry Standard Pin Out

#### Benefits

- Reduces Input Current Draw
- Stock One Part for all Voltages
- Multiple Mounting Methods
- Second Sourcing

Specifications			PL5S-05C	PL5SMS-05C	PL5S-12C	PL5SMS-12C
ITEMS	MODEL					
Output Voltage Range	(2)	VDC	0.75 - 3.3VDC		0.75 - 5.0VDC	
Output Current		A	5 Amps			
Output Voltage Accuracy		%	±1.5%			
Turn on/off Threshold (typ)		VDC	On: 2.0V, Off: 1.9V		On: 8.0V, Off: 7.9V	
Ripple & Noise (Typ)	(1)	mV	20mV rms, 50mV pk-pkVo=5VDC, 45mV rms, 75mV pk-pk			
Line Regulation (Typ)		%	± 0.4% (Vo=3.3V)		± 0.2% (Vo=3.3V)	
Load Regulation (Typ)		%	± 0.5% (Vo=3.3V)			
Capacitive Load (max)		µF	3000µF			
Transient Response		-	<200µs settling time for 25% load change			
Overcurrent Protection		-	Continuous			
Overvoltage Protection		-	N/A			
Over Temp. Protection		°C	120°C typ.			
Remote Sense		-	N/A			
Remote On / Off		-	On: Vin or open circuit; Off: <0.4VDC			
Operating Temperature		°C	-40°C to +85°C			
Operating Humidity		%	20 - 95% Non condensing			
Storage Temperature		°C	-55°C to +125°C			
Storage Humidity		%	10 - 95% Non condensing			
Cooling		-	Convection, or forced air			
Vibration (non operating)		-	10 - 500 -10 Hz, amplitude 1.524mm, X, Y, Z 6 minutes each			
Shock		-	half sine wave, 40g, 11ms, 3 times each axis, +X, -X, +Y, -Y, +Z, -Z			
Safety Agency Approvals		-	UL/C-UL60950			
Switching Frequency		kHz	300kHz			
Weight (Typ)		g	2.1	2.4	2.1	2.4
Size (W x L x H)		-	See outline drawing			
Warranty		yrs	2			

**Note: See Installation Manual for full details, test methods of parameters and application notes**

(1) The output noise is measured with a 10µF tantalum cap and 1µF ceramic cap across output (2) See application notes for Trim equations and tables



## Model Selector

Model	Input Voltage (VDC)	Output Voltage (VDC)	Output Curr. (A)	Input Current* No Load (mA)	Input Current* Full Load (mA)	Eff. (%)
	3.0 - 5.5	0.75	5	25	949	79
	3.0 - 5.5	1.2	5	30	1412	85
	3.0 - 5.5	1.5	5	30	1724	87
<b>PL5S-05C and PL5SMS-05C</b>	3.0 - 5.5	1.8	5	35	2022	89
	3.0 - 5.5	2	5	35	2222	90
	3.0 - 5.5	2.5	5	35	2217	92
	4.5 - 5.5	3.3	5	35	3511	94
	8.3 - 14	0.75	5	20	428	73
	8.3 - 14	1.2	5	25	625	80
	8.3 - 14	1.5	5	25	762	82
<b>PL5S-12C and PL5SMS-12C</b>	8.3 - 14	1.8	5	30	893	84
	8.3 - 14	2	5	30	980	85
	8.3 - 14	2.5	5	35	1197	87
	8.3 - 14	3.3	5	45	1545	89
	8.3 - 14	5.0	5	50	2264	92

PL5S - SIL 5 pins

PL5SMS - Surface Mount

\* At nominal input voltage (5V or 12V depending on model)

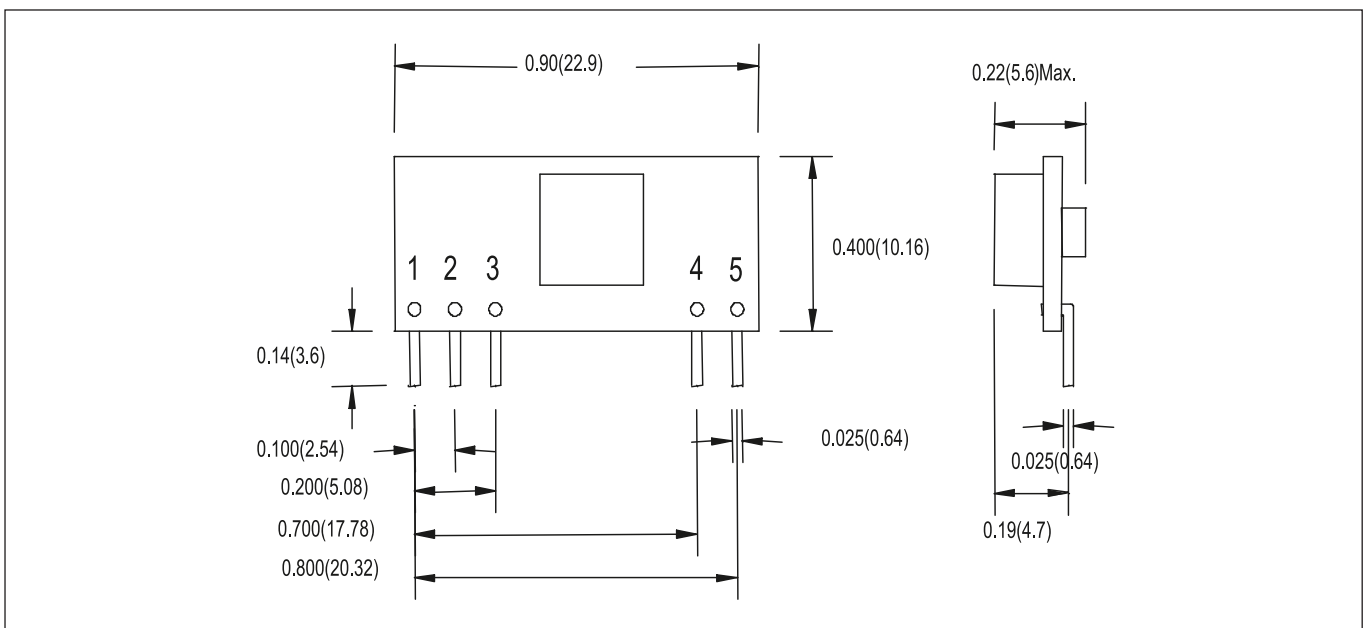
## Remote On /Off Option

Suffix	Function
Blank	On: Vin or open circuit; Off<0.4VDC
N	On: open circuit or <0.4VDC; Off: >2.8VDC to Vin

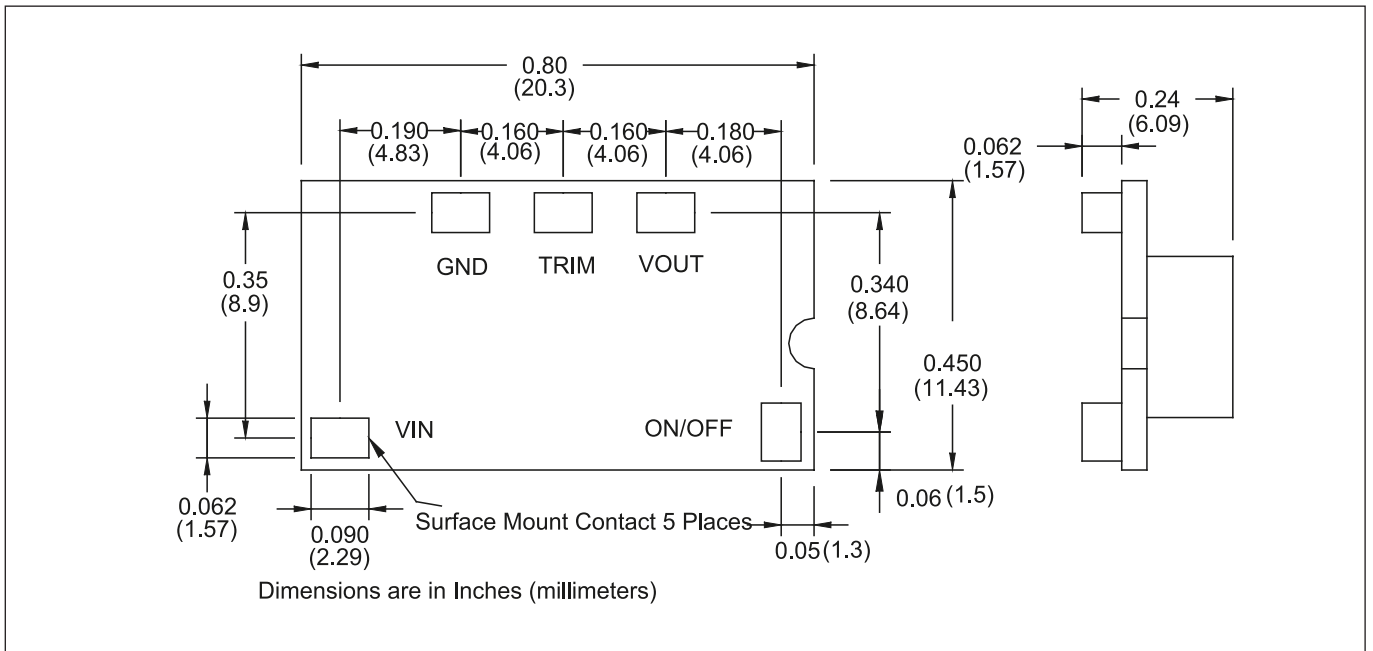
## Pinout

PIN	Function	PIN	Function
1	+ Output	2	Trim
3	Common	4	+V Input
5	On/Off		

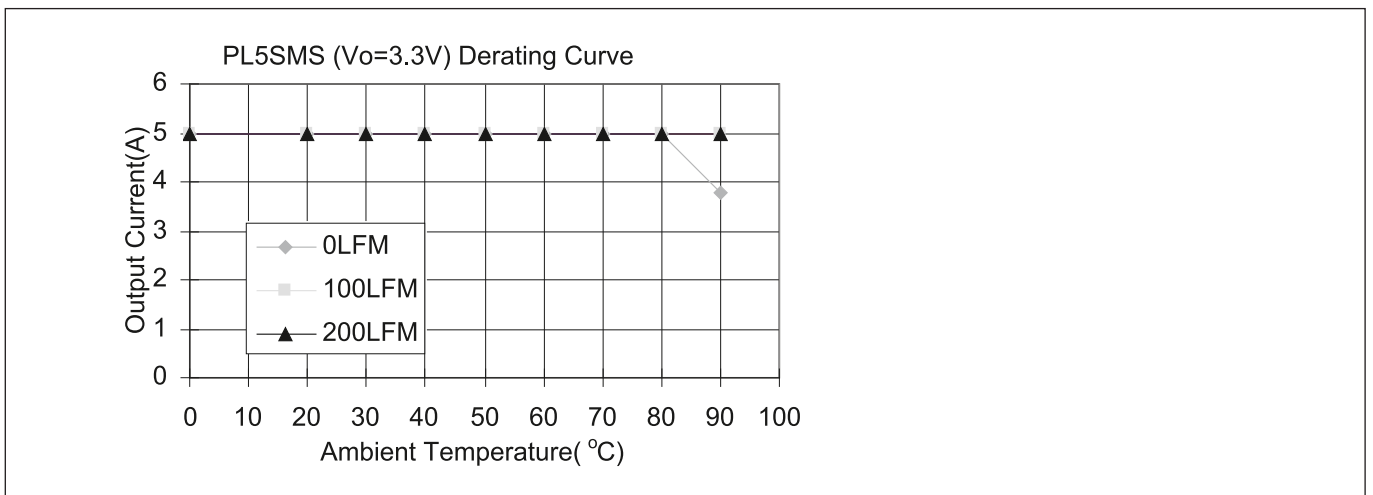
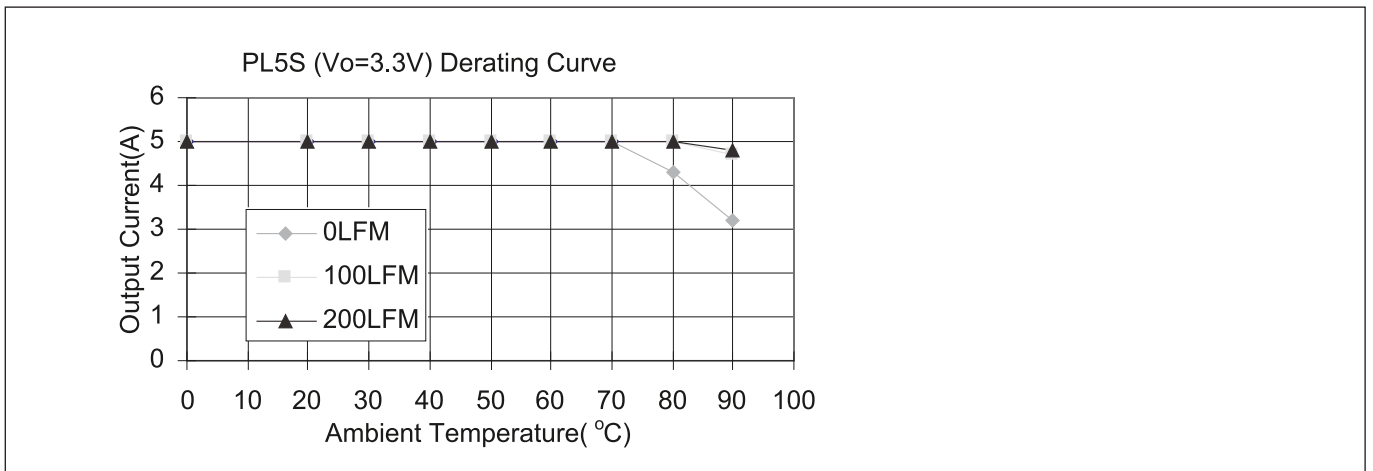
## Outline Drawing PL5S Series

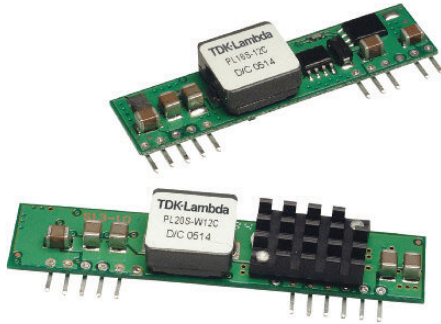


## Outline Drawing PL5SMS Series



## Derating Curve





## PL10-20S Series

10-20A Non-Isolated  
DC-DC Converters

- Industry Standard Package and Pin Out
- DOSA Compatible Models
- Low Voltage Outputs to 0.75V
- Wide Input Range 6 to 14V ('W' Models)
- Output Voltage Adjustment
- Remote On/Off and Sequencing ('W' Models)

### Key Market Segments & Applications

Distributed Power Architecture  
Telecommunications  
Data Communications  
Networking Equipment  
Test Equipment  
Industrial Electronics

### PL10-20S Features and Benefits

#### Features

- High Efficiency up to 95%
- Wide Output Voltage Adjustment Range
- Through Hole Packages
- Industry Standard Pin Out

#### Benefits

- Reduces Input Current Draw
- Stock One Part for all Voltages
- Less PCB Space Used
- Second Sourcing

#### Specifications

MODEL		PL10S-W12C	PL10S-12	PL16S-12C	PL16S-W12C	PL20S-W12C
ITEMS						
Output Voltage Range	(2) VDC	0.75 - 5.0VDC				
Output Current	A	10		16		20
Output Voltage Accuracy	%	±1.5% max.				
Turn on/off Threshold (typ)	VDC	On: 5.0V, Off: 4.0V	On: 8.0V, Off: 7.7V		On: 5.0V, Off: 4.0V	
Ripple & Noise (Typ)	(2) mV	20mV rms, 75mV pk-pk		30mV rms, 75mV pk-pk		
Line Regulation (Typ)	%	±0.2% (Vo=3.3V)				
Load Regulation (Typ)	%	±0.5% (Vo=3.3V)				
Capacitive Load (max)	μF	8000μF				
Transient Response	-	<200μs settling time for 25% load change				
Overcurrent Protection	-	Continuous				
Overvoltage Protection	-	N/A				
Over Temp. Protection	°C	+120°C typ.		+130°C typ.		
Remote Sense	-	Yes				
Remote On / Off	-	On: Vin or open circuit; Off: <0.4VDC				
Power Good Signal (logic high)	%	Optional	N/A		Optional	
Operating Temperature	°C	-40°C to +85°C				
Operating Humidity	%	20 - 95% Non condensing				
Storage Temperature	°C	-55°C to +125°C				
Storage Humidity	-	10 - 95% Non condensing				
Cooling	-	Convection, or forced air				
Vibration (non operating)	-	10 - 500 - 10Hz, amplitude 1.524mm, X, Y, Z 6 minutes each				
Shock	-	Half sine wave, 40g, 11ms, 3 times each axis, +X, -X, +Y, -Y, +Z, -Z				
Safety Agency Approvals	-	UL/C-UL60950				
Sequencing/Tracking	-	Yes	-		Yes	
Switching Frequency	kHz	300kHz				
Weight (Typ)	g	8.0	10.0	8.0	8.5	10.1
Size (WxHxD)	-	See outline drawing				
Warranty	yrs	2				

Note: See Installation Manual for full details, test methods of parameters and application notes

(1) The output noise is measured with a 10μF tantalum cap and 1μF ceramic cap across output (2) See application notes for Trim equations and tables



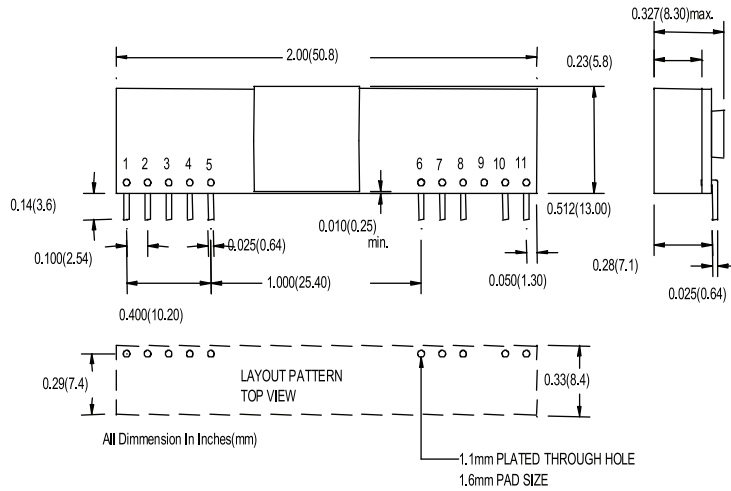
Model Selector						
Model	Input Voltage (VDC)	Output Voltage (VDC)	Output Curr. (A)	No Load (mA)	Full Load (mA)	Eff. (%)
PL10S-W12C	6.0 - 14	0.75	10	40	762	82
	6.0 - 14	1.2	10	40	1149	87
	6.0 - 14	1.5	10	50	1404	89
	6.0 - 14	1.8	10	40	1666	90
	6.0 - 14	2.0	10	60	1832	91
	6.0 - 14	2.5	10	65	2264	92
	6.0 - 14	3.3	10	75	2956	93
	6.5 - 14	5.0	10	95	4386	95
PL10S-12-1V0	9.0 -14	1.0	10	50	992	84
PL10S-12-1V2	9.0 -14	1.2	10	50	1163	86
PL10S-12-1V5	9.0 -14	1.5	10	50	1404	89
PL10S-12-1V8	9.0 -14	1.8	10	60	1666	90
PL10S-12-2V0	9.0 -14	2.0	10	60	1832	91
PL10S-12-2V5	9.0 -14	2.5	10	70	2264	92
PL10S-12-3V3	9.0 -14	3.3	10	70	2956	93
PL10S-12-5V0	9.0 -14	5.0	10	70	4385	95
PL10S-12-C	8.3 -14	0.75-5.0	10	70	4385	95
PL16S-12C	9.0 -14	0.75	16	40	1299	77
	9.0 -14	1.2	16	50	1928	83
	9.0 -14	1.5	16	50	2326	86
	9.0 -14	1.8	16	60	2727	88
	9.0 -14	2.0	16	60	2996	89
	9.0 -14	2.5	16	65	3704	90
	9.0 -14	3.3	16	75	4783	92
	9.0 -14	5.0	16	75	7092	94
PL16S-W12C	6.0 - 14	0.75	16	40	1250	80
	6.0 - 14	1.2	16	40	1882	85
	6.0 - 14	1.5	16	50	2273	88
	6.0 - 14	1.8	16	60	2697	89
	6.0 - 14	2.0	16	60	2963	90
	6.0 - 14	2.5	16	65	3663	91
	6.0 - 14	3.3	16	75	4731	93
	6.5 - 14	5.0	16	95	7092	94
PL20S-W12C	6.0 - 14	0.75	20	40	1603	78
	6.0 - 14	1.2	20	50	2381	84
	6.0 - 14	1.5	20	50	2874	87
	6.0 - 14	1.8	20	50	3409	88
	6.0 - 14	2.0	20	60	3745	89
	6.0 - 14	2.5	20	65	4630	90
	6.0 - 14	3.3	20	75	5978	92
	6.5 - 14	5.0	20	95	8865	94

Pinout			
PL10S-W, 16S-W, 20S-W		PL16S-12C	
PIN	Function	PIN	Function
1	+Output	1	+Output
2	+Output	2	+Output
3	+Sense	3	+Sense
4	+Output	4	+Output
5	Common	5	Common
6	No Pin/PGood option	6	Common
7	Common	7	+V Input
8	+V Input	8	+V Input
9	+V Input	9	No Pin
10	Sequencing	10	Trim
11	Trim	11	On/Off Control
12	On/Off Control		

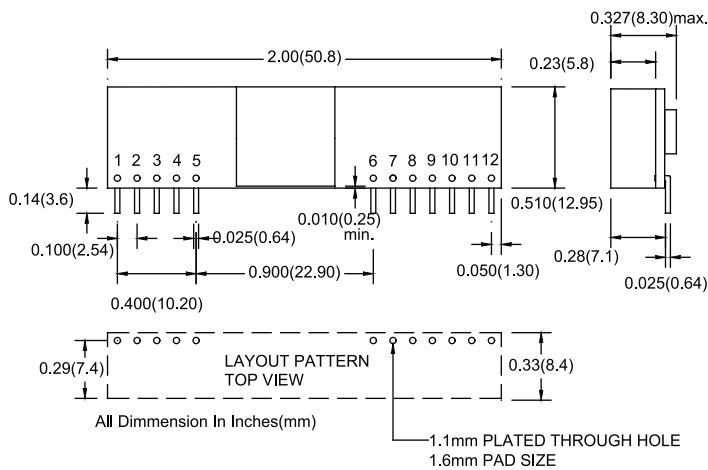
Options	
Remote On / Off Option	
Blank	On: Vin or open circuit; Off: <0.4VDC
N	On: open circuit or <0.4VDC; Off: >2.8VDC to Vin
Power Good Option	
P	(available on W12C models)



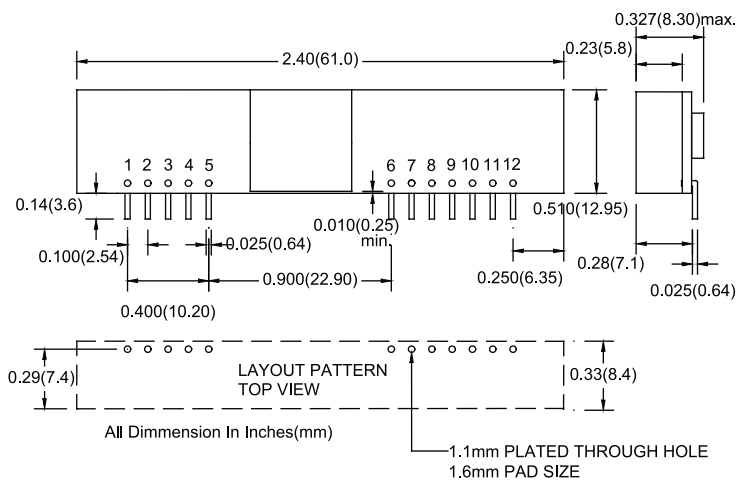
## Outline Drawing PL16S-12C Series

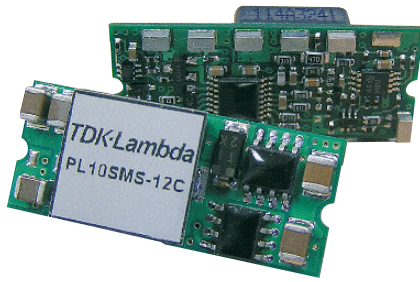


## Outline Drawing PL10S-W12C & PL16S-W12C Series



## Outline Drawing PL20S-W12C Series





## PL10-20SMS Series

10-20A Surface Mount  
Non-Isolated DC-DC Converters

- Industry Standard Package and Footprint
- DOSA Compatible Models
- Low Voltage Outputs to 0.75V
- Wide Input Range 6 to 14V (on 'W' models)
- Output Voltage Adjustment
- Remote On/Off and Sequencing ('W' models)

### Key Market Segments & Applications

Telecommunications  
Data Communications  
Networking Equipment  
Test Equipment  
Industrial Electronics  
Distributed Power Architecture

### PL10-20SMS Features and Benefits

#### Features

- High Efficiency up to 95%
- Wide Output Voltage Adjustment Range
- SMT Packages
- Industry Standard Pin Out

#### Benefits

- Reduces Input Current Draw
- Stock One Part for all Voltages
- Low Assembly Cost
- Second Sourcing

Specifications			PL10SMS-12C	PL10SMS-W12C	PL15SMS05C	PL16SMS-12C	PL16SMS-W12C	PL20SMS-W12C
ITEMS	MODELS							
Output Voltage Range	(2)	VDC	0.75-5.0		0.75-3.3	0.75-5.0		
Output Current		A	10		15	16		20
Output Voltage Accuracy		%	±1.5%					
Turn On/Off Threshold	ON	VDC	8.0V	5.0V	2.8V	8.0V	5.0V	5.0V
	OFF	VDC	7.7V	4.0V	2.7V	7.7V	4.0V	4.0V
Ripple & Noise (Typ)	(1)	mV	V		30mV rms, 75mV pk-pk			
Line Regulation (Typ)		%	±0.2% (Vo=3.3V)					
Load Regulation (Typ)		%	±0.5% (Vo=3.3V)					
Capacitive Load (max)		μF	8000μF		10000μF	8000μF		
Transient Response		-	<200μs settling time for 25% load change					
Overcurrent Protection		-	Continuous					
Overvoltage Protection		-	N/A					
Over Temp. Protection		°C	+120°C typ.	+130°C typ.	+120°C typ.	+130°C typ.		
Remote Sense		-	Yes					
Remote On / Off		-	On: Vin or open circuit; Off: <0.4VDC					
Sequencing/Tracking		-	-	Yes	-	-	Yes	Yes
Power Good Signal (logic high)		-	-	Optional	-	-	Optional	
Operating Temperature		°C	-40°C to +85°C					
Operating Humidity		%	20 - 95% Non condensing					
Storage Temperature		°C	-55°C to +125°C					
Storage Humidity		%	10 - 95% Non condensing					
Cooling		-	Convection, or forced air					
Vibration (non operating)		-	10 - 500 - 10Hz, amplitude 1.524mm, X, Y, Z 6 minutes each					
Shock		-	Half sine wave, 40g, 11ms, 3 times each axis, +X, -X, +Y, -Y, +Z, -Z axis					
Safety Agency Approvals		-	UL/C-UL60950					
Switching Frequency		kHz	300kHz					
Weight (Typ)		g	6.5	7.7	6.5	6.8	7.7	10.7
Size (WxHxD)		-	See outline drawing					
Warranty		yrs	2					

**Note: See Installation Manual for full details, test methods of parameters and application notes**

(1) The output noise is measured with a 10μF tantalum cap and 1μF ceramic cap across output. (2) See Application Notes for Trim equations and tables.





Model Selector						
Model	Input Voltage (VDC)	Output Voltage (VDC)	Output Curr. (A)	No Load (mA)	Full Load (mA)	Eff. (%)
<b>PL10SMS-12C</b>	8.3 - 14	0.75	10	50	762	82
	8.3 - 14	1.2	10	50	1163	86
	8.3 - 14	1.5	10	50	1404	89
	8.3 - 14	1.8	10	60	1666	90
	8.3 - 14	2.0	10	60	1832	91
	8.3 - 14	2.5	10	60	2264	92
	8.3 - 14	3.3	10	70	2956	93
	8.3 - 14	5.0	10	70	4385	94
<b>PL10SMS-W12C</b>	6.0 - 14	0.75	10	40	762	82
	6.0 - 14	1.2	10	40	1149	87
	6.0 - 14	1.5	10	50	1404	89
	6.0 - 14	1.8	10	40	1666	90
	6.0 - 14	2.0	10	60	1832	91
	6.0 - 14	2.5	10	65	2264	92
	6.0 - 14	3.3	10	75	2956	93
	6.5 - 14	5.0	10	95	4386	95
<b>PL15SMS-05C</b>	3.0 - 5.5	0.75	15	60	3658	82
	3.0 - 5.5	1.2	15	60	4286	84
	3.0 - 5.5	1.5	15	60	5172	87
	3.0 - 5.5	1.8	15	70	6136	88
	3.0 - 5.5	2.0	15	70	6742	89
	3.0 - 5.5	2.5	15	70	8152	92
	4.5 - 5.5	3.3	15	70	10532	94
	9.0 - 14	0.75	16	40	1299	77
<b>PL16SMS-12C</b>	9.0 - 14	1.2	16	50	1928	83
	9.0 - 14	1.5	16	50	2326	86
	9.0 - 14	1.8	16	60	2727	88
	9.0 - 14	2.0	16	60	2996	89
	9.0 - 14	2.5	16	65	3704	90
	9.0 - 14	3.3	16	75	4783	92
	9.0 - 14	5.0	16	75	7092	94
	9.0 - 14	0.75	16	40	1250	80
<b>PL16SMS-W12C</b>	6.0 - 14	1.2	16	40	1882	85
	6.0 - 14	1.5	16	50	2273	88
	6.0 - 14	1.8	16	60	2697	89
	6.0 - 14	2.0	16	60	2963	90
	6.0 - 14	2.5	16	65	3663	91
	6.0 - 14	3.3	16	75	4731	93
	6.5 - 14	5.0	16	95	7092	94
	6.0 - 14	0.75	20	40	1603	78
<b>PL20SMS-W12C</b>	6.0 - 14	1.2	20	50	2381	84
	6.0 - 14	1.5	20	50	2874	87
	6.0 - 14	1.8	20	50	3409	88
	6.0 - 14	2.0	20	60	3745	89
	6.0 - 14	2.5	20	65	4630	90
	6.0 - 14	3.3	20	75	5978	92
	6.5 - 14	5.0	20	95	8865	94

## Options

### Remote On / Off Option

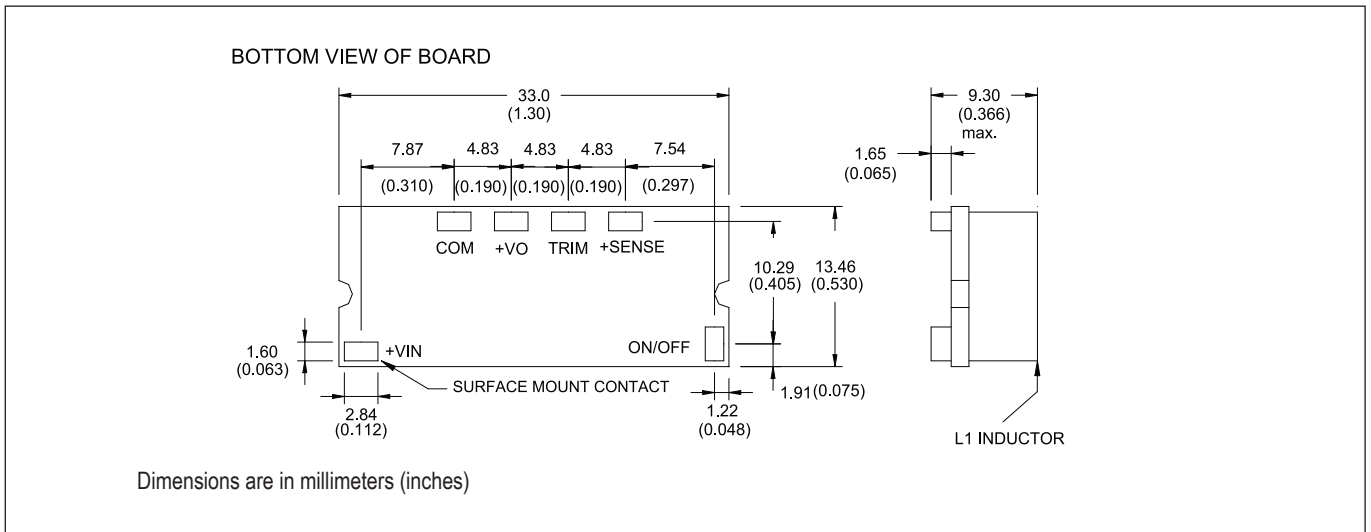
Blank    On: Vin or open circuit; Off: <0.4VDC  
 N        On: open circuit or <0.4VDC; Off: >2.8VDC to Vin

### Power Good Option

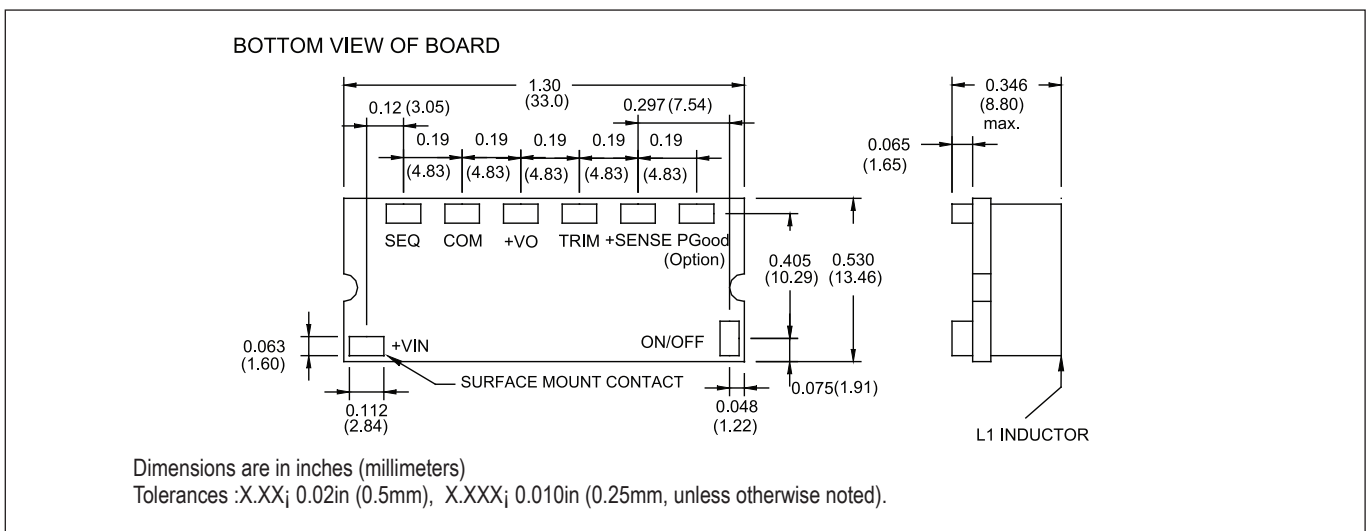
P        (available on W12C models)



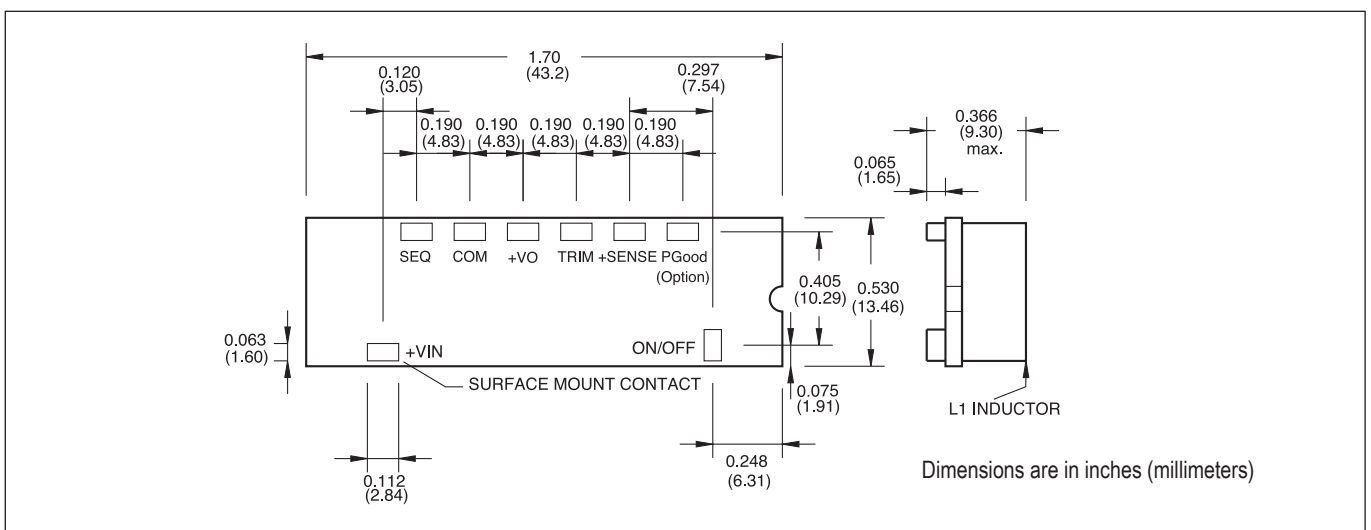
## Outline Drawing PL10SMS-12C, PL15SMS-05C & PL16SMS-12C Series



## Outline Drawing PL10SMS-W12C & PL16SMS-W12C Series



## Outline Drawing PL20SMS-W12C Series





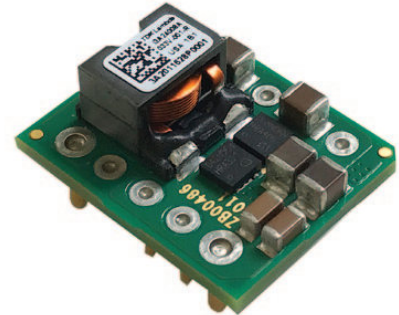
Industrial

Test

Comm

Broadcast

## 100W, 9 to 53V Input Non-isolated DC-DC Converters



Features	Benefits
• 100W 4.5 or 8A Output	
• 1/32nd brick Footprint	
• Wide Output Adjustment 3.3 to 16.5V or 5 to 30V	
• Minimal External Components Needed	

Specification			
Model			
		i3AW008A033V	i3A4W005A150V
DC Output Voltage (1)	V	3.3 - 16.5	5 - 30
DC Input Voltage	V	9 - 53 (Turn on at 10V or greater)	
Efficiency (Typical)	%	89 - 96.5	95.5 - 98
Output Voltage Tolerance	%	±4	
Switching Frequency	kHz	450	400
Line Regulation	%	0.3%	0.2%
Load Regulation	%	0.7%	0.5%
External Load Capacitance	uF	0 - 1200	
Output Ripple and Noise	mVpp	20	40
Overcurrent Protection (Typ)	A	14	9
Remote On / Off	-	Negative Logic (For Positive Logic Contact Factory)	
Remote Sense	-	(+ Sense, compensating up to 5% of output voltage)	
Power Good	-	Optional, contact factory for status	
Operating Temperature	°C	-40°C to 125°C (see thermal data on website)	
Storage Temperature	°C	-55°C to 125°C	
Safety Agency Certifications	-	UL/EN60950, CE Mark	
Weight	g	8	
Size (LxWxH)	mm	19.1 x 23.4 x 9.6	
Warranty	yrs	3	

**Note:** (1) Output voltage cannot exceed input voltage (see graph on page 2)

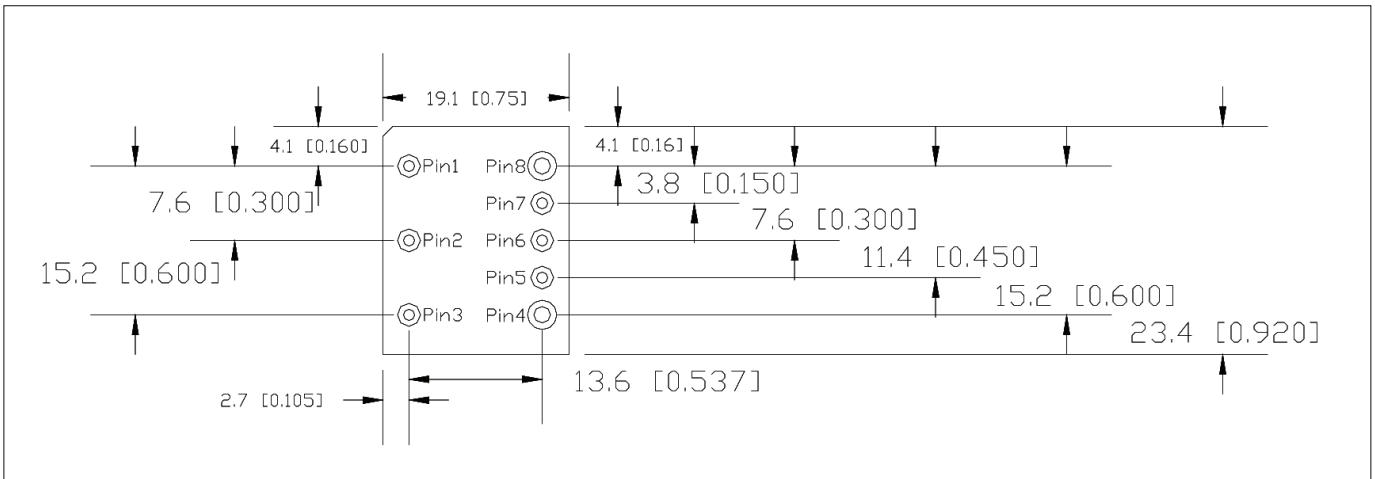


## Model Selector

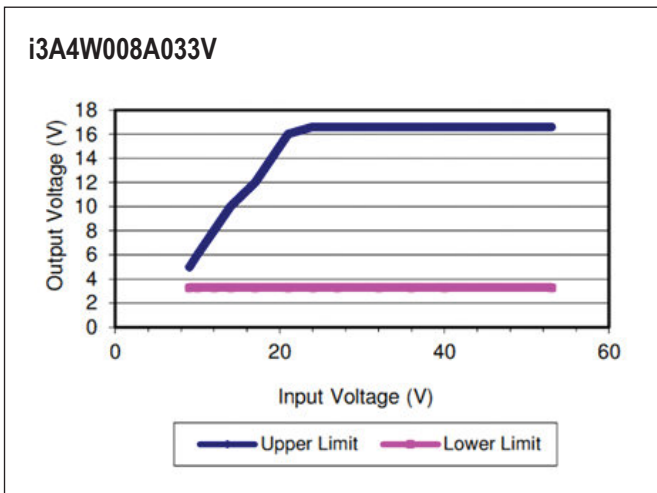
Model	Input Voltage (V)	Output Current (A)	Output Voltage (V) <sup>(1)</sup>	Positive Logic On/Off	Negative Logic On/Off
i3A4W008A033V-001-R	9 - 53	8	3.3 - 16.5	-	Yes
i3A4W005A150V-001-R	9 - 53	4.5	5 - 30	-	Yes

Note: (1) Output voltage cannot exceed input voltage (see graph below)

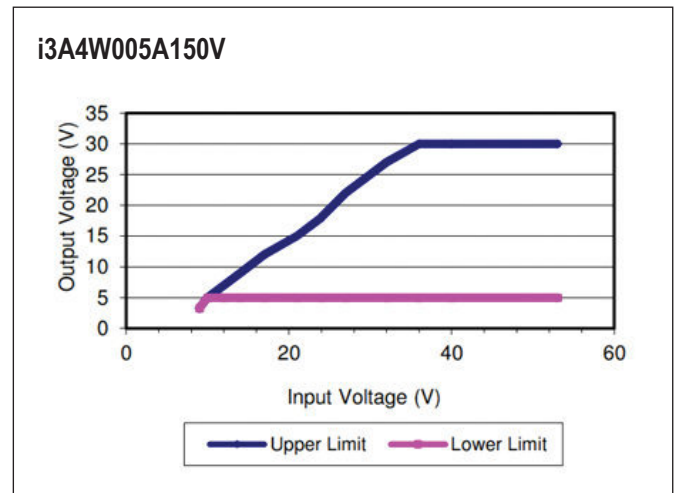
## Outline Drawing i3AW



## Output Voltage vs Input Voltage Operating Range



## Output Voltage vs Input Voltage Operating Range



## Pin Assignment

PIN	Function	PIN	Function
1	VIN (+)	5	PWR GOOD (Option)
2	ON / OFF	6	TRIM
3	VIN (-)	7	SENSE (+)
4	VOUT (-)	8	VOUT (+)





Industrial



Test

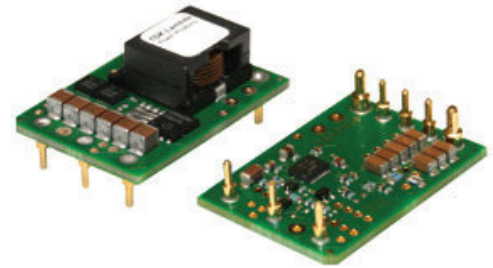


Comm



Broadcast

## 250W, 9-40V Input Non-isolated DC-DC Converter



Features	Benefits
• 250W 14A in a 1/16th brick package	• Very High Power Density
• Very high Efficiency up to 98%	• Easier Thermal Management
• Wide Output Adjustment 3.3 to 24V	• Address Multiple Applications
• Minimal External Components Needed	• Less Board Area Required

Specification		
Model		i6A
DC Output Voltage	V	3.3 - 24
DC Input Voltage	V	9 - 40 (Turn on at 10V or greater)
Efficiency	%	92.5 - 98
Output Voltage Tolerance	%	±4
Switching Frequency	kHz	400
Line Regulation	%	0.3
Load Regulation	%	1
External Load Capacitance	uF	0 - 2000
Output Ripple and Noise	mVpp	20
Overcurrent Protection	A	22A typical
Remote On / Off	-	Negative Logic (For Positive Logic Contact Factory)
Remote Sense	-	(+) Sense, compensating up to 0.5% of output voltage
Power Good	-	Optional (Full Feature Version)
Sync & Sequencing	-	Optional (Full Feature Version)
Operating Temperature	°C	-40°C to 125°C (see thermal data on website)
Storage Temperature	°C	-55°C to 125°C
Safety Agency Approvals	-	IEC/EN 60950-1, UL/CSA 60950-1, CE mark (LVD & RoHS2)
Weight	g	15g
Size (LxWxH)	mm	33 x 22.9 x 12.7
Warranty	yrs	3

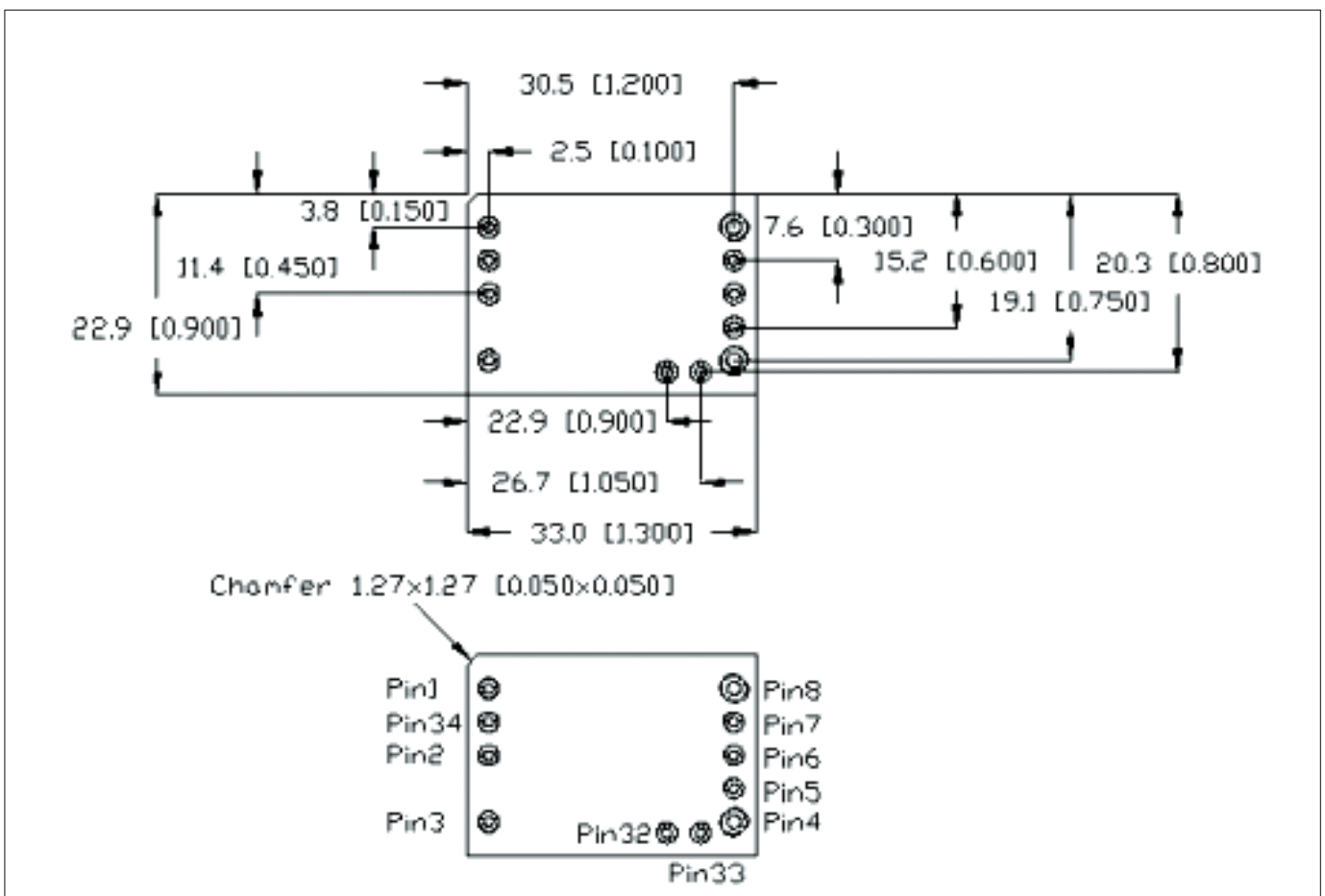


## Model Selector

Input Model	Input Voltage (V)	Output Current (A)	Output Voltage (V)	Positive Logic On/Off	Negative Logic On/Off	Full Feature
i6A24014A033V-000-R	9 - 40	14	3.3 - 24	Yes	-	-
i6A24014A033V-001-R	9 - 40	14	3.3 - 24	-	Yes	-
i6A24014A033V-002-R	9 - 40	14	3.3 - 24	Yes	-	Yes
i6A24014A033V-003-R	9 - 40	14	3.3 - 24	-	Yes	Yes

Preferred

## Outline Drawing i6A Series

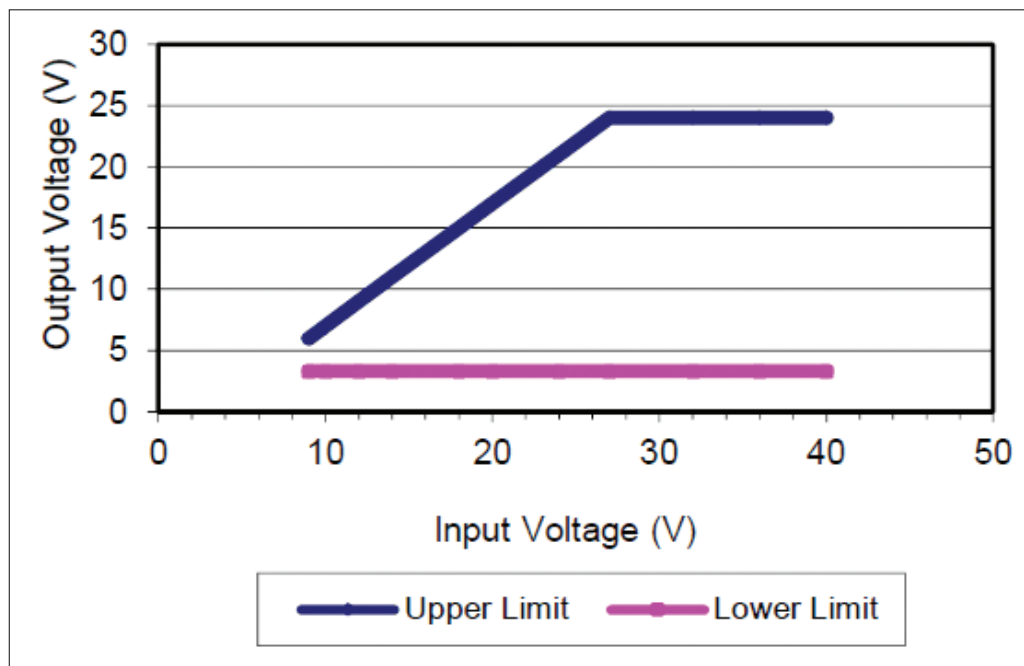


## Pin Assignment

PIN	Function	PIN	Function
1	VIN (+)	7	SENSE (+)
2	ON / OFF	8	VOUT (+)
3	VIN (-)	32	Sync (Option)
4	VOUT (-)	33	MS (Option)
5	PWR GOOD (Option)	34	SEQ (Option)
6	TRIM		



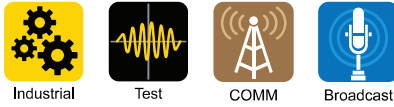
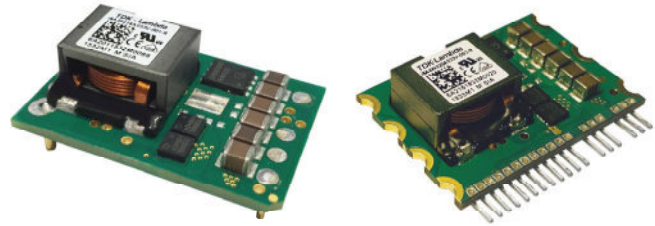
## Output voltage vs input voltage operating range i6A Series



*Note: Output voltage cannot exceed input voltage (see graph above)*



## 250W, 9-53V Input Non-isolated DC-DC Converters



The i6A 4W series of non-isolated step-down converters are ideal for creating additional high current output voltages from a single output 12V, 24V or 48V AC-DC power supply. The highly efficient i6A 4W series accepts a very wide DC input and has a wide output adjustment range, with a choice of 1/16th brick footprint or SIP package.

Features	Benefits
• Up to 250W in a 1/16th brick or SIP package	• Very High Power Density
• Very high Efficiency up to 97%	• Easier Thermal Management
• Wide Output Adjustment 3.3 to 15V & 3.3 to 40V	• One Part For Multiple Applications
• Minimal External Components Needed	• Less Board Area Required
• Low Airflow With Minimal Derating Requirements	• Easier To Cool In End System

### Model Selector

Model	Output Voltage (V) <sup>(1)</sup>	Max Current (A)	Max Power (W)	Positive Logic On/Off	Negative Logic On/Off	Full Feature	Package
i6A4W010A033V-001-R	3.3 to 40	10	250	-	Yes	-	DIP
i6A4W010A033V-0S1-R	3.3 to 40	10	250	-	Yes	-	SIP
i6A4W020A033V-000-R	3.3 to 15	20	250	Yes	-	-	DIP
i6A4W020A033V-001-R	3.3 to 15	20	250	-	Yes	-	DIP
i6A4W020A033V-0S1-R	3.3 to 15	20	250	-	Yes	-	SIP
i6A4W020A033V-002-R	3.3 to 15	20	250	Yes	-	Yes	DIP
i6A4W020A033V-0S3-R	3.3 to 15	20	250	-	Yes	Yes	SIP
i6A4W020A033V-005-R	3.3 to 15	20	250	-	Yes	Yes <sup>(2)</sup>	DIP

Preferred model

### Specification

Model	i6A4W010A033V	i6A4W020A033V
<b>Input</b>		
Input Voltage range	9 to 53V (Turn on at 10V or greater)	
Input Current	20A maximum	
Efficiency	94 - 97.5	90 - 97.0
Safety Agency Certifications	IEC/UL/CSA/EN 60950-1, CE Mark (LVD and RoHS)	
<b>Output</b>		
Output Voltage Tolerance	±4	
Switching Frequency	400	
Line Regulation	0.3	0.4
Load Regulation	0.9	1.2
External Load Capacitance	0 - 1500	
Output Ripple & Noise (pk-pk)	50	20
Overcurrent Protection Threshold	15	27
Overvoltage Protection	None	
Remote On / Off	See options table	
Remote Sense	(+ Sense, compensating up to 5% of output voltage	
Power Good	Optional (Full Feature Version)	
Sync & Sequencing	Optional (Full Feature Version)	
Parallel Operation	Not possible	
Series operation	Not possible	





## Specification

Model		i6A4W010A033V	i6A4W020A033V
<b>Environmental</b>			
Operating Temperature	°C	-40 to 125 (see thermal data on website)	
Storage Temperature	°C	-55 to 125	
Cooling	-	Convection or forced air	
<b>Other</b>			
Weight	g	15	
Size (LxWxH)	mm	DIP Version: 33 x 22.9 x 12.1, SIP Version: 33 x 11.4 x 24.8	
Size (LxWxH)	In	DIP Version: 1.30 x 0.9 x 0.74, SIP Version: 1.30 x 0.45 x 0.98	
Warranty	yrs	3	

### Notes

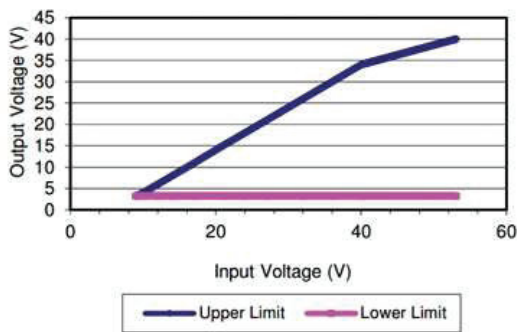
See website for detailed specifications, test methods and installation manual

(1) Output voltage cannot exceed input voltage (see graphs below).

(2) Full Feature module but without the SEQ pin installed.

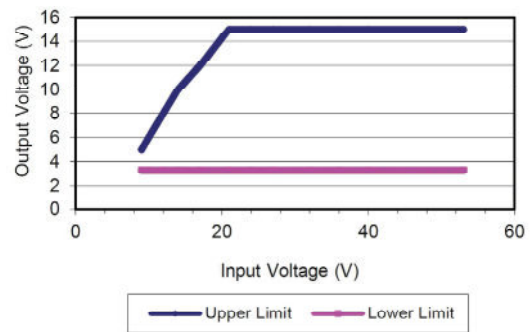
### Output vs Input Voltage Operating Range

#### i6A4W10A



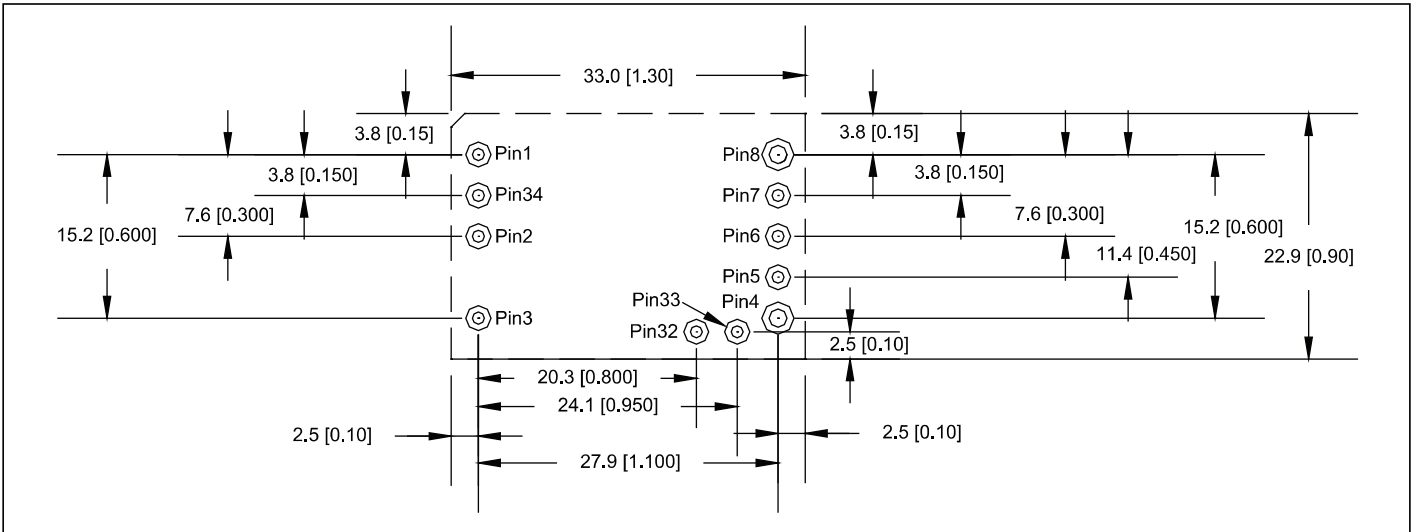
### Output vs Input Voltage Operating Range

#### i6A4W20A



## Mechanical Specification (DIP Style)

### Recommended Hole Pattern (top view)



### Pinout

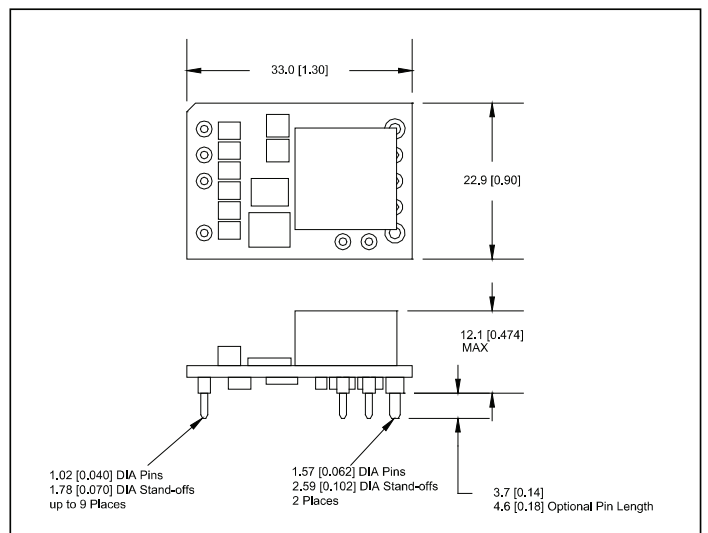
PIN	Function	PIN	Function
1	VIN (+)	7	SENSE (+)
2	ON / OFF	8	VOUT (+)
3	VIN (-)	32	Sync (Option)
4	VOUT (-)	33	MS (Option)
5	PWR GOOD (Option)	34	SEQ (Option)
6	TRIM		

### Evaluation Boards (DIP Version)

Evaluation kit part #	Contents
i6A20A-001-EVK-S1PX	Populated with one piece of i6A4W020A033V-001-R
i6A20A-001-EVK-S1CC	Populated with one piece of i6A4W020A033V-001-R to set for constant current operation
i6A10A-001-EVK-S1PX	Populated with one piece of i6A4W010A033V-001-R.
i6A10A-001-EVK-S1CC	Populated with one piece of i6A4W010A033V-001-R set for constant current operation.

User manual available at I6A4W technical files in our website, contact technical support for more details on constant current version.

### Mechanical Specification





Industrial



Test

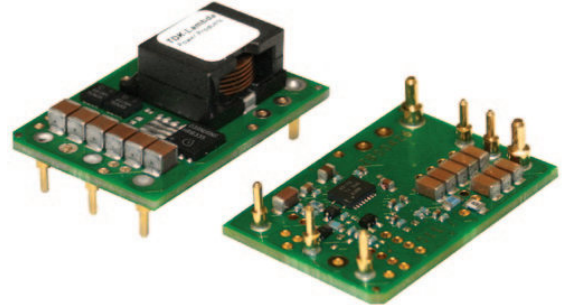


Comm



Broadcast

## 75W, 9 to 40V Input Non-isolated DC-DC Converter with Negative Output



Features	Benefits
• Polarity Inversion	• Provides Negative Outputs
• High efficiency up to 94%	• Easier Thermal Management
• Wide Output Adjustment -3.3 to -30V	• Address Multiple Applications
• Minimal External Components Needed	• Less Board Area Required

Specification		6A24-N
DC Output Voltage	V	-3.3 to -30
DC Output Power (max)	W	75
DC Input Voltage	V	9 to 40 (Turn on at 10V or greater)
Efficiency	%	90 - 94
Output Voltage Tolerance	%	±4
Switching Frequency	kHz	400
Line Regulation	%	0.5
Load Regulation	%	0.6
External Load Capacitance	uF	200 - 1600
Output Ripple and Noise	mVpp	20
Overcurrent Protection	A	15
Remote On / Off	-	See options table
Remote Sense	-	(-) Sense, compensating up to 0.5% of output voltage
Operating Temperature	°C	-40°C to +125°C (see thermal data on website)
Storage Temperature	°C	-55°C to +125°C
Safety Agency Certifications	-	Pending
Weight	g	15g
Size (LxWxH)	mm	33 x 22.9 x 12.7
Warranty	yrs	3

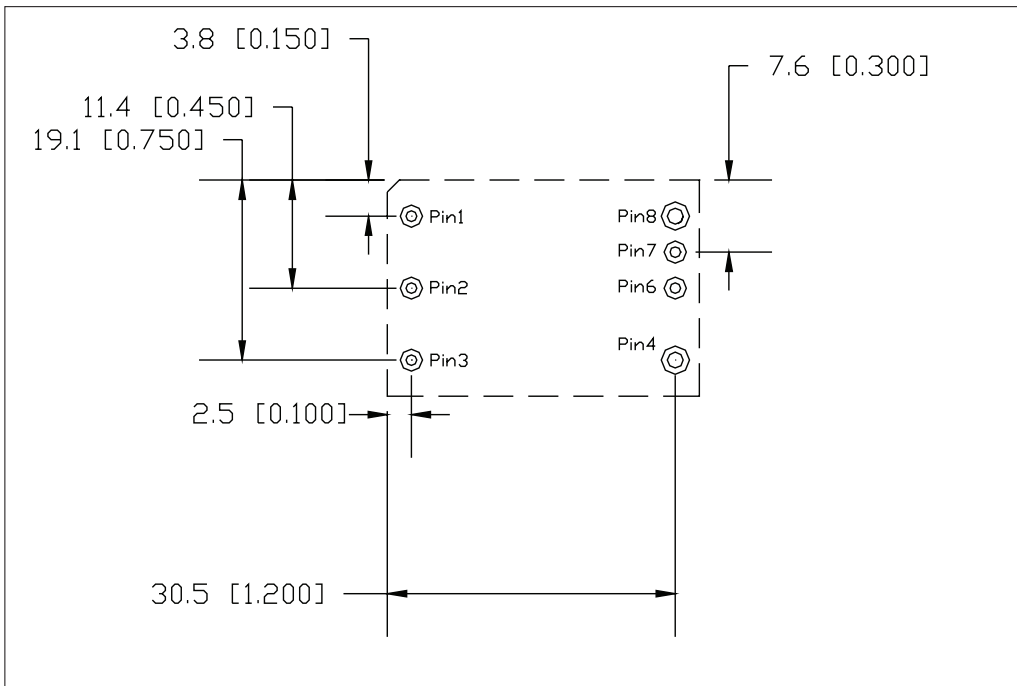


## Model Selector

Input Model	Input Voltage (V)	Output Current (A)	Output Voltage (V)	Positive Logic On/Off	Negative Logic On/Off
i6A24008A033V-N00-R	+9 to +40	8	-3.3 to -30	Yes	-
i6A24008A033V-N01-R	+9 to +40	8	-3.3 to -30	-	Yes

Preferred

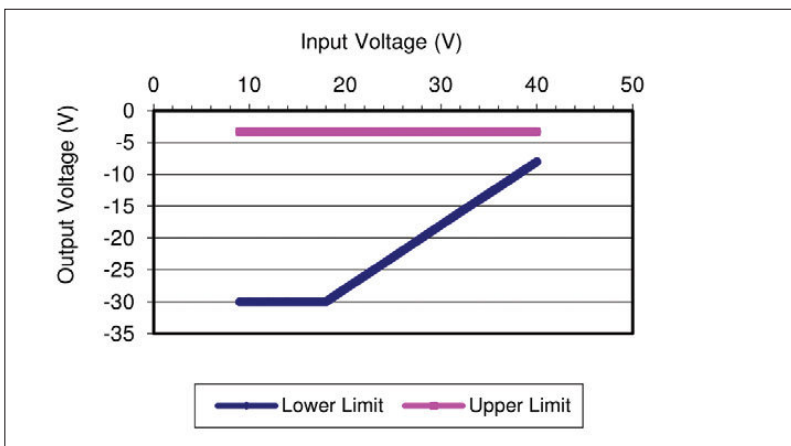
## Outline Drawing i6AN Series



## Pin Assignment

PIN	Function	PIN	Function
1	VIN (+)	6	TRIM
2	ON / OFF	7	SENSE
3	VOUT (-)	8	VIN (-), VOUT (+)
4	VOUT (-)		

## i6AN Series Output Voltage v's Input Voltage Operating Range





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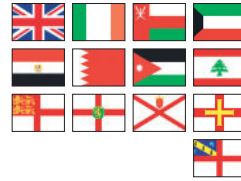
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