Testing procedure and testing location:		
☒ **CB Testing Laboratory:**	CERPASS TECHNOLOGY CORPORATION	
Testing location/ address.....:	NO.10, LANE 2, LIANFU STREET, LUZHU DIST., TAOYUAN CITY 33848 CHINESE TAIPEI	
☐ **Associated CB Testing Laboratory:**	N/A	
Testing location/ address.....:		
Tested by (name + signature).....:	Miller Chang	Miller Chang
Approved by (name + signature).....:	Stephen Lin	
☐ **Testing procedure: TMP/CTF Stage 1:**		
Testing location/ address.....:		
Tested by (name + signature).....:		
Approved by (name + signature).....:		
☐ **Testing procedure: WMT/CTF Stage 2:**		
Testing location/ address.....:		
Tested by (name + signature).....:		
Witnessed by (name + signature).....:		
Approved by (name + signature).....:		
☐ **Testing procedure: SMT/CTF Stage 3 or 4:**		
Testing location/ address.....:		
Tested by (name + signature).....:		
Witnessed by (name + signature).....:		
Approved by (name + signature).....:		
Supervised by (name + signature).....:		

List of Attachments (including a total number of pages in each attachment):

- National Differences (77 pages)
- Photo documentation (8 pages)
- Miscellanea (1 page)

Summary of testing:

Tests performed (name of test and test clause):

- Input Test (1.6.2)
- Durability of marking test (1.7.11)
- Energy hazard measurements. (2.1.1.5)
- SELV Reliability Test (2.2)
- Protective Bonding Test (2.6.3.4)
- Humidity Test (2.9.2)
- Working Voltage (2.10.2)
- Heating Test (4.5.2)
- Electric Strength (5.2)
- Abnormal operating and fault condition (5.3)

The maximum ambient temperature is specified as 85°C.

This report is a reissue of CBTR Ref. No. U1308058-870, CB Test Certificate Ref. No. DK-34725-UL. Based on previously conducted testing and the review of product modification, only below tests were deemed necessary.

- Input Test (1.6.2)
- Energy Hazards (2.1.1.5)
- SELV Reliability Test (2.2)
- Working Voltage (2.10.2)
- Heating Test (4.5.2)
- Electric Strength (5.2)
- Abnormal operating and fault condition (5.3)

Testing location:

CERPASS TECHNOLOGY CORPORATION

NO.10, LANE 2, LIANFU STREET, LUZHU DIST., TAOYUAN CITY 33848 CHINESE TAIPEI

Summary of compliance with National Differences:

List of countries addressed

Summary of compliance with National Differences to IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013 (for explanation of codes see below):

EU Group Differences, EU Special National Conditions, AT, DK, IT, SE, US, CA

☒ **The product fulfils the requirements of** EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013

Additional National Differences to IEC 60950-1:2005 (2nd Edition)+Am 1:2009 and EN 60950-1:2006+A11:2009+A1:2010+A12:2011 (for client's requirement):

EU Group Differences, EU Special National Conditions, CA, DE, DK, FI, GB, IL, KR, SE, SI, US

Additional National Differences to IEC 60950-1:2005 (2nd Edition) and EN 60950-1:2006+A11:2009 (for client's requirement):

AU, CH, CN, DK, ES, GB, IE, NO, SE.

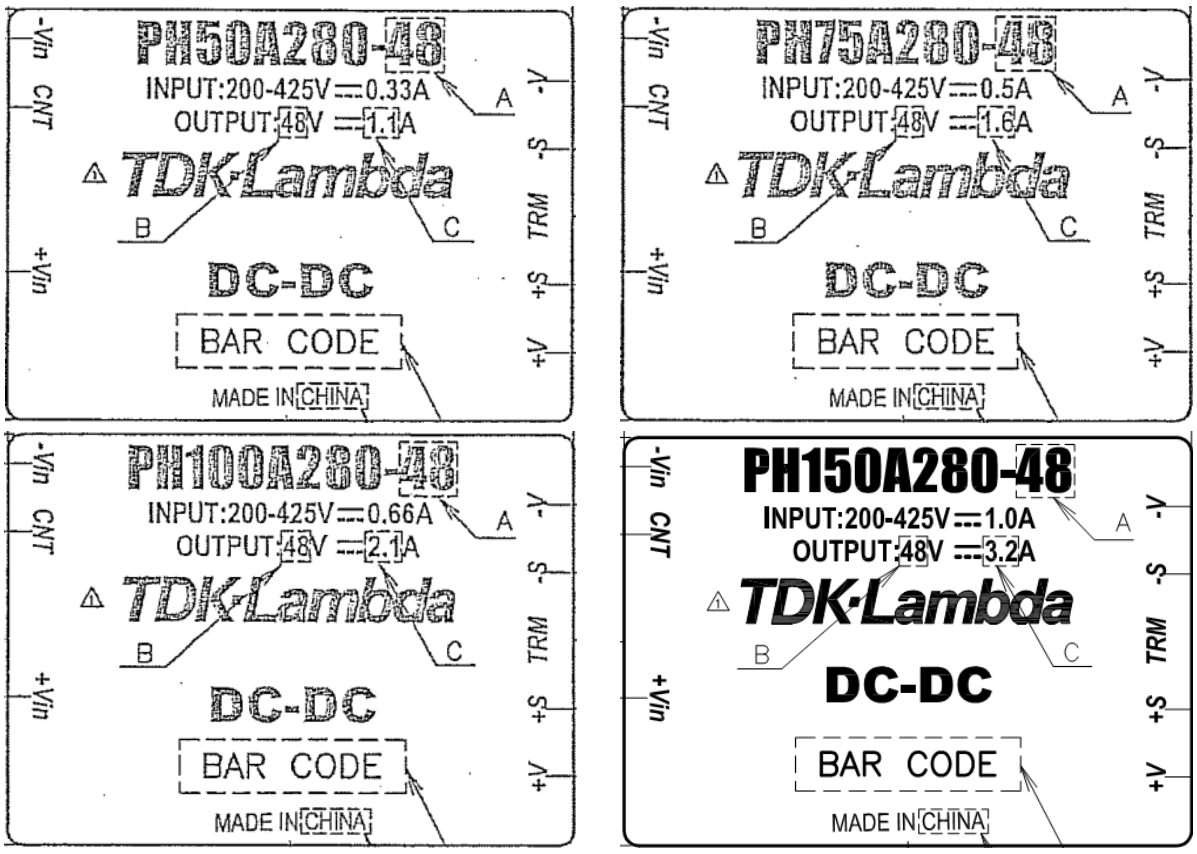
Explanation of used codes: AT=Austria, AU=Australia, CA=Canada, CH=Switzerland, CN=China, DE=Germany, DK=Denmark, ES=Spain, FI=Finland, GB=United Kingdom, IE=Ireland, IL=Israel, IT=Italy, KR=Republic of Korea, NO=Norway, SE=Sweden, SI=Slovenia, US=United States of America.

For National Differences see corresponding Attachment.

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

(Representative)



Test item particulars..... :	
Equipment mobility.....:	[] movable [] hand-held [] transportable [] stationary [x] for building-in [] direct plug-in
Connection to the mains.....:	[] pluggable equipment [] type A [] type B [] permanent connection [] detachable power supply cord [] non-detachable power supply cord [x] not directly connected to the mains
Operating condition.....:	[x] continuous [] rated operating / resting time:
Access location .....:	[x] operator accessible [] restricted access location
Over voltage category (OVC) .....:	[] OVC I [x] OVC II [] OVC III [] OVC IV [] other:
Mains supply tolerance (%) or absolute mains supply values .....:	N/A
Tested for IT power systems .....:	[] Yes [x] No
IT testing, phase-phase voltage (V) .....:	N/A
Class of equipment .....:	[x] Class I [] Class II [] Class III [] Not classified
Considered current rating of protective device as part of the building installation (A) .....:	N/A
Pollution degree (PD) .....:	[] PD 1 [x] PD 2 [] PD 3
IP protection class .....:	IPX0
Altitude during operation (m) .....:	Up to 3000
Altitude of test laboratory (m) .....:	Up to 2000
Mass of equipment (kg) .....:	Max. 0.056Kg

Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing.....:	
Date of receipt of test item .....:	2015-02-06
Date (s) of performance of tests.....:	2015-02-09 to 2015-02-10
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. **Throughout this report a ☐ comma / ☒ point is used as the decimal separator.**	

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :	☒ **Yes** ☐ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies) ..... :

1. WUXI TDK-LAMBDA ELECTRONICS CO., LTD.
   NO. 6 XING CHUANG ER LU WUXI JIANGSU 214028, P.R. CHINA.
2. TDK-LAMBDA CORP. NAGAOKA TECHNICAL CENTER
   2704-1 SETTAYA-MACHI, NAGAOKA-SHI, NIIGATA 940-1195, JAPAN.
3. TDK-LAMBDA MALAYSIA SDN. BHD.
   LOT 2 & 3, BATU 9 3/4, KAWASAN PERINDUSTRIAN, BANDAR BARU JAYA GADING, KUANTAN PAHANG 26070, MALAYSIA.
4. SENDAN ELECTRONICS MFG. CO., LTD.
   1010 HABUSHIN NANTO-SHI, TOYAMA 939-1756 JAPAN.
5. TDK-LAMBDA MALAYSIA SDN BHD
   PLO33 KAWASAN PERINDUSTRIAN SENAI 81400 SENAI MALAYSIA

General product information:

The DC-DC Power Module is building-in equipment which can be used in information technology equipment, all components mounted on minimum V-1 PCB and housed in plastic enclosure.

The model rating list as below:

Character / Model	Input Rated Voltage (Vdc)	Input Rated current (A)	Min. Output	Rated output	Max. Output	Max. Output Power (W)	Transformer (T101)
PH150A280-5	200-425	1.0	4.0 Vdc	5.0 Vdc	6.0 Vdc	100.0	C26302x / C27102x
			20 A	20 A	16.67 A		
PH150A280-12	200-425	1.0	9.6 Vdc	12 Vdc	13.2 Vdc	150.0	C26303x
			12.5 A	12.5 A	11.36 A		
PH150A280-15	200-425	1.0	12 Vdc	15 Vdc	16.5 Vdc	150.0	C26304x
			10 A	10 A	9.1 A		
PH150A280-24	200-425	1.0	19.2 Vdc	24 Vdc	26.4 Vdc	151.2	C26305x
			6.3 A	6.3 A	5.73 A		
PH150A280-28	200-425	1.0	22.4 Vdc	28 Vdc	30.8 Vdc	151.2	C26306x
			5.4 A	5.4 A	4.91 A		

PH150A280-48	200-425	1.0	38.4 Vdc	48 Vdc	52.8 Vdc	153.6	C26307x
			3.2 A	3.2 A	2.91 A		
PH100A280-3.3	200-425	0.66	2.97 Vdc	3.3 Vdc	3.96 Vdc	66.0	C27101x
			20 A	20 A	16.67A		
PH100A280-5	200-425	0.66	4.0 Vdc	5.0 Vdc	6.0 Vdc	100.0	C26302x / C27102x
			20 A	20 A	16.67 A		
PH100A280-12	200-425	0.66	9.6 Vdc	12 Vdc	13.2 Vdc	100.8	C26303x
			8.4 A	8.4 A	7.64 A		
PH100A280-24	200-425	0.66	19.2 Vdc	24 Vdc	26.4 Vdc	100.8	C26305x
			4.2 A	4.2 A	3.82 A		
PH100A280-48	200-425	0.66	38.4 Vdc	48 Vdc	52.8 Vdc	100.8	C26307x
			2.1 A	2.1 A	1.91 A		
PH75A280-3.3	200-425	0.5	2.97 Vdc	3.3 Vdc	3.96Vdc	49.5	C27101x
			15A	15 A	12.5 A		
PH75A280-5	200-425	0.5	4.0 Vdc	5.0 Vdc	6.0 Vdc	75.0	C26302x / C27102x
			15 A	15 A	12.50 A		
PH75A280-12	200-425	0.5	9.6 Vdc	12 Vdc	13.2 Vdc	75.6	C26353x / C27203x
			6.3 A	6.3 A	5.73 A		
PH75A280-15	200-425	0.5	12 Vdc	15 Vdc	16.5 Vdc	75.0	C27204x
			5 A	5 A	4.55 A		
PH75A280-24	200-425	0.5	19.2 Vdc	24 Vdc	26.4 Vdc	76.8	C26355x / C27205x
			3.2 A	3.2 A	2.91 A		
PH75A280-28	200-425	0.5	22.4 Vdc	28 Vdc	30.8 Vdc	75.6	C27206x
			2.7 A	2.7 A	2.45 A		
PH75A280-48	200-425	0.5	38.4 Vdc	48 Vdc	52.8 Vdc	76.8	C26357x / C27207x
			1.6 A	1.6 A	1.46 A		
PH50A280-5	200-425	0.33	4.0 Vdc	5.0 Vdc	6.0 Vdc	50.0	C26302x / C27102x
			10 A	10 A	8.33 A		
PH50A280-12	200-425	0.33	9.6 Vdc	12 Vdc	13.2 Vdc	50.4	C26353x / C27203x
			4.2 A	4.2 A	3.82 A		
PH50A280-24	200-425	0.33	19.2 Vdc	24 Vdc	26.4 Vdc	50.4	C26355x / C27205x
			2.1 A	2.1 A	1.91 A		
PH50A280-48	200-425	0.33	38.4 Vdc	48 Vdc	52.8 Vdc	52.8	C26357x / C27207x
			1.1 A	1.1 A	1.00 A		
Note:							

Model differences:

Model name		PH150A280	PH100A280	PH75A280	PH50A280
Item	Variable "z"				
Transformer (T101)	3.3		C27101x		
	5	C26302x / C27102x			
	12	C26303x		C26353x / C27203x (remove top heatsink base on C26303x)	
	15	C26304x		C27204x	
	24	C26305x		C26355x / C27205x (remove top heatsink base on C26305x)	
	28	C26306x		C27206x	
	48	C26307x		C26357x / C27207x (remove top heatsink base on C26307x)	
Glue (for heating use)	3.3		Yes	Optional	
	15	Yes			
	28				
	5				
	12				
	24				
	48				

Other comments:

The maximum operational ambient temperature as specified by the manufacturer is 85°C.

This equipment did not have fuse that shall be considered or evaluated in final system if it's necessary. The product was tested with manufacturer specified fuse, 2A / 450Vdc, type DCP20 by Daito.

Unless otherwise indicated, all tests were conducted on Models: **PH75A280-5**, **PH75A280-15, PH75A280-28, PH75A280-48**, **PH100A280-3.3, PH150A280-5, PA150A280-15, PH150A280-28** and **PH150A280-48** to represent the other models.

Definition of variable(s):

Variable	Range of variable:	Content:
z	3.3, 5, 12, 15, 24, 28, 48	To denote different output voltage (V dc).
/	When "a, b, c, d, or e" to denote "/2, /3, /T, /H, /V, /CO or -", then "/" is no need.	Marketing purpose, no safety relevant information

a, b, c, d, e	-, /2, /3, /T, /H, /V or /CO (1)These suffixes may be used together (e.g. /TV, /HTV3) (2) When character "-" occurs in model name, it does mean blank.	Marketing purpose, no safety relevant information.

Variable	Pin Length	OVP	OCP	OTP	Stud	Coating
-	5.08	Manual	Constant current model	Manual	with Treads	No coating
/2	2.79	N/A	N/A	N/A	N/A	N/A
/3	3.68	N/A	N/A	N/A	N/A	N/A
/T	N/A	N/A	N/A	N/A	without Threads	N/A
/H	N/A	N/A	Hiccup model	N/A	N/A	N/A
/V	N/A	Auto Reset	N/A	Auto Reset	N/A	N/A
/CO	N/A	N/A	N/A	N/A	N/A	Coating model

This report has been reissue, due to the following:

1. To upgrade standard to IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013 / EN 60950-1:2006 + A11:2009 + A1:2010+A12:2011+A2:2013
2. To add alternate transformer name C27102x, C27203x, C27205x and C27207x. See below
   1) For original transformer model name (C26302x), add alternate transformer name: C27102x
   2) For original transformer model name (C26353x), add alternate transformer name: C27203x
   3) For original transformer model name (C26355x), add alternate transformer name: C27205x
   4) For original transformer model name (C26302x), add alternate transformer name: C27102x
3. Update altitude to 3000m
4. Due to increase in altitude, update distance of PCB layout between Q101 and C151.
5. To add alternate photo coupler source, see appended table 1.5.1 for details.
6. To add see below model name, rating and transformer models

Character / Model	Input Rated Voltage (Vdc)	Input Rated current (A)	Min. Output	Rated output	Max. Output	Max. Output Power (W)	Transformer (T101)
PH150A280-15	200-425	1.0	12 Vdc	15 Vdc	16.5 Vdc	150.0	C26304x
			10 A	10 A	9.1 A		
PH150A280-28	200-425	1.0	22.4 Vdc	28 Vdc	30.8 Vdc	151.2	C26306x
			5.4 A	5.4 A	4.91 A		
PH100A280-3.3	200-425	0.66	2.97 Vdc	3.3 Vdc	3.96 Vdc	66.0	C27101x
			20 A	20 A	16.67A		
PH75A280-3.3	200-425	0.5	2.97 Vdc	3.3 Vdc	3.96Vdc	49.5	C27101x
			15A	15 A	12.5 A		

PH75A280-15	200-425	0.5	12 Vdc	15 Vdc	16.5 Vdc	75.0	C27204x
			5 A	5 A	4.55 A		
PH75A280-28	200-425	0.5	22.4 Vdc	28 Vdc	30.8 Vdc	75.6	C27206x
			2.7 A	2.7 A	2.45 A		

For the above described change(s) the following was considered to be necessary:

Modification	Testing	Comments	Result
1	● N/A	All clause and appended table have been evaluated.	Pass
2	● N/A	No further tests considered to be necessary.	Pass
3	● N/A	See sub-clause, appended table 2.10.3 and 2.10.4	Pass
4, 5	● N/A	No further tests considered to be necessary.	Pass
6	● Input Test (1.6.2) ● Energy Hazards (2.1.1.5) ● SELV Reliability Test (2.2) ● Working Voltage (2.10.2) ● Heating Test (4.5.2) ● Electric Strength (5.2) ● Abnormal operating and fault condition (5.3)	See sub-clause and appended table.	Pass

History of amendments and modifications:

Item	Certificate No. / Issue date	Test Report No. / Issue date	Remark
1	DK-34725-UL / 2013-09-12	U1308058-870 / 2013-09-10	Original report

Abbreviations used in the report:

- normal conditions	N.C.	- single fault conditions	S.F.C
- functional insulation	OP	- basic insulation	BI
- double insulation	DI	- supplementary insulation	SI
- between parts of opposite polarity	BOP	- reinforced insulation	RI
- short-circuited	s-c	- open-circuited	o-c
- over-loaded	o-l	- input	I/P
- output	O/P	- internal protection operated	IP
- no indication of dielectric breakdown	NB	- Cheesecloth remain intact	NC
- tissue paper remains intact	NT	- components damage	CD