



Test Report issued under the responsibility of:



TEST REPORT
IEC 60950-1
Information technology equipment – Safety –
Part 1: General requirements

Report Number : 50059575 001
Date of issue..... : 08.12.2016
Total number of pages : 96 (excluding attachments, see page 3)

Applicant's name : TDK-Lambda Corp. Nagaoka Technical Center
Address..... : 2704-1 Settaya-machi, Nagaoka-shi, Niigata, 940-1195, JAPAN

Test specification:

Standard..... : IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013

Test procedure : CB Scheme

Non-standard test method : N/A

Test Report Form No. : IEC60950_1F

Test Report Form(s) Originator : SGS Fimko Ltd

Master TRF : Dated 2014-02

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This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
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Test item description		Switching Power Supply	
Trade Mark		TDK <i>Lambda</i>	
Manufacturer		Same as applicant	
Model/Type reference		CUT35-zxxxxxxx (z = 522 or 5FF; xxxxxxx = A, B, L, other alphanumeric character, symbol or blank) Refer to page 12 for definition of variables	
Ratings		AC input: 100-240V, 1.0A, 50-60Hz DC output: See the model list on page 11 for details	
Testing procedure and testing location:			
<input checked="" type="checkbox"/>	CB Testing Laboratory:	TÜV Rheinland (Shanghai) Co., Ltd.	
Testing location/ address		No.177, 178, Lane 777, West Guangzhong Road Zhabei District Shanghai CHINA	
<input type="checkbox"/>	Associated CB Testing Laboratory:		
Testing location/ address			
Tested by (name + signature)		Sunny Sun	
Approved by (name + signature)		Roy Chen	
<input type="checkbox"/>	Testing procedure: TMP/CTF Stage 1:		
Testing location/ address			
Tested by (name + signature)			
Approved by (name + signature)			
<input type="checkbox"/>	Testing procedure: WMT/CTF Stage 2:		
Testing location/ address			
Tested by (name + signature)			
Witnessed by (name + signature)			
Approved by (name + signature)			
<input type="checkbox"/>	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):

- ATTACHMENT 1 - Technical documentation (26 pages)
- ATTACHMENT 2 - National Differences (57 pages)
- ATTACHMENT 3 - Photo documentation (9 pages)

Summary of testing:

All applicable tests as described in Test Case and Measurement Sections were performed.

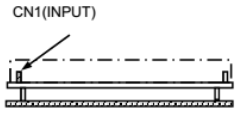
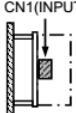
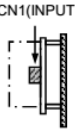
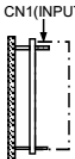

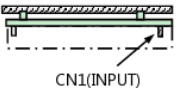
The maximum specified operation ambient temperature is 70°C.

Specified ambient temperature for operation is according to manufacturer's specification.(see chart of convection cooling and forced air cooling on below on below)

Unless otherwise specified, throughout this report, all tests were performed on models CUT35-522/A and CUT35-5FF/A only limited tests perform on models CUT35-522/L and CUT35-522 and perform construction check on models CUT35-522 to represent other similar models.

The load conditions used during testing: Maximum normal load according to sub-clause 1.2.2.1 for this equipment is the operation with the maximum specified DC-load with maximum power condition according to the manufacturer specified.

Mounting position:

(MOUNTING A)	(MOUNTING B) (STANDARD MOUNTING)	(MOUNTING C)	(MOUNTING D)	(MOUNTING E)	(MOUNTING F)
					

Derating Curve:

For CUT35-z/A

***COOLING: CONVECTION COOLING**

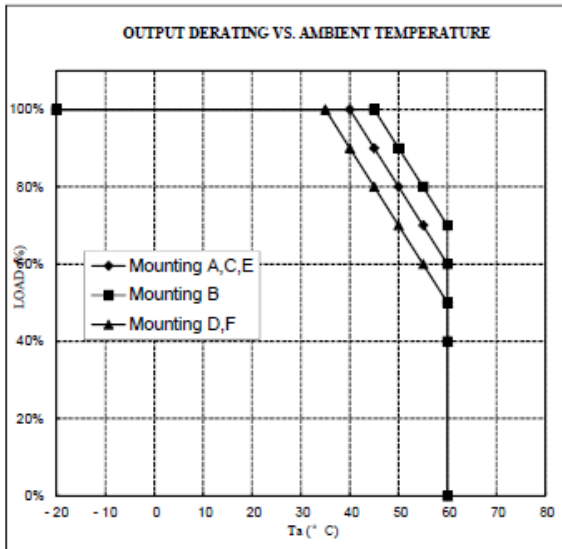
Ta (°C)	LOADING CONDITION(%)		
	Mounting A,C,E	Mounting B	Mounting D,F
-20	100	100	100
35	100	100	100
40	100	100	90
45	90	100	80
50	80	90	70
55	70	80	60
60	60	70	50

***COOLING: FORCED AIR COOLING**

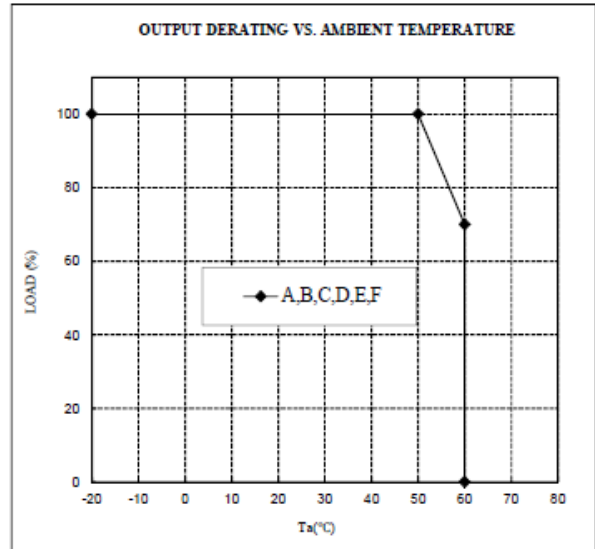
Ta (°C)	LOADING CONDITION(%)
	All Mounting (A,B,C,D,E,F)
-20~50	100
60	70

Air Velocity ≥ 0.7m/s: Air must flow through component side.

***COOLING: CONVECTION COOLING**



***COOLING: FORCED AIR COOLING**



For CUT35-z/L

***COOLING: CONVECTION COOLING**

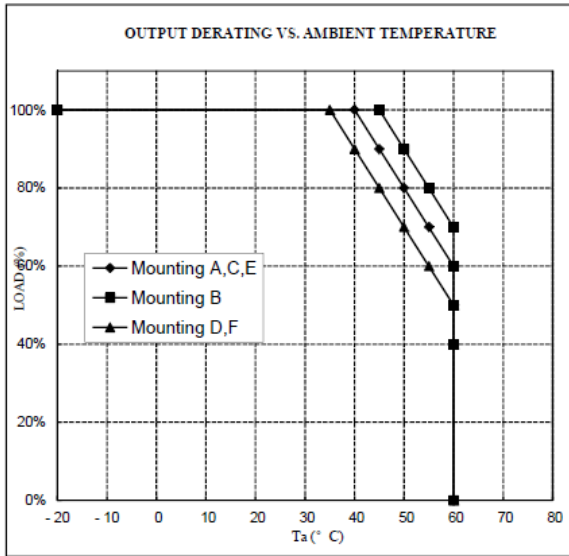
Ta (°C)	LOADING CONDITION(%)		
	Mounting A,C,E	Mounting B	Mounting D,F
-20	100	100	100
35	100	100	100
40	100	100	90
45	90	100	80
50	80	90	70
55	70	80	60
60	60	70	50

***COOLING: FORCED AIR COOLING**

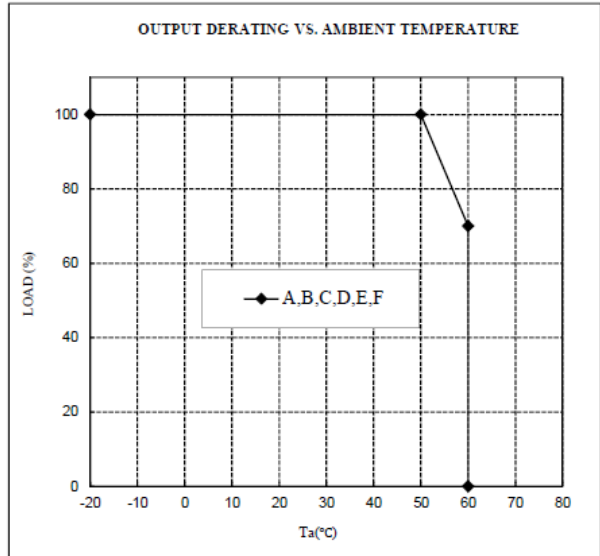
Ta (°C)	LOADING CONDITION(%)
	All Mounting (A,B,C,D,E,F)
-20~50	100
60	70

Air Velocity ≥ 0.7m/s: Air must flow through component side.

*COOLING: CONVECTION COOLING



*COOLING: FORCED AIR COOLING



For CUT35-z

*COOLING: CONVECTION COOLING

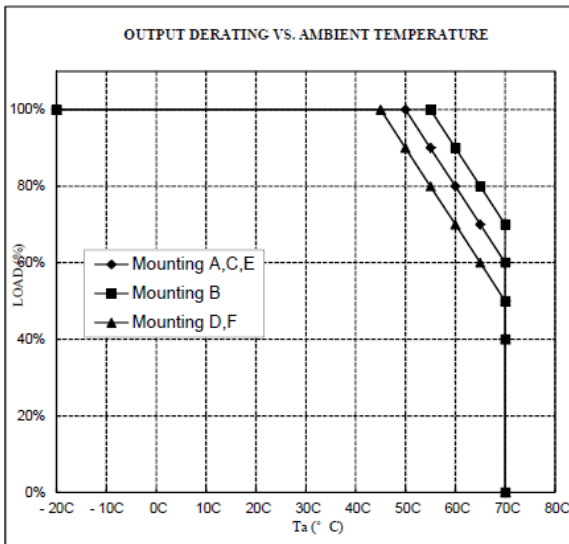
Ta (°C)	LOADING CONDITION(%)		
	Mounting A,C,E	Mounting B	Mounting D,F
-20	100	100	100
45	100	100	100
50	100	100	90
55	90	100	80
60	80	90	70
65	70	80	60
70	60	70	50

*COOLING: FORCED AIR COOLING

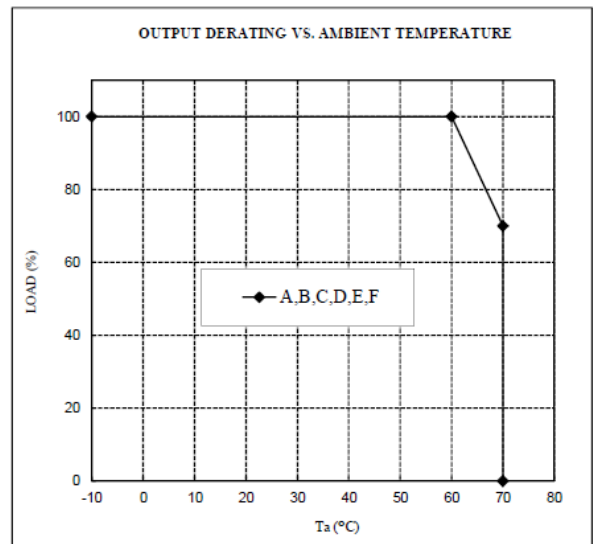
Ta (°C)	LOADING CONDITION(%)
	All Mounting (A,B,C,D,E,F)
-20~60	100
70	70

Air Velocity ≥ 0.7m/s: Air must flow through component side.

*COOLING: CONVECTION COOLING



*COOLING: FORCED AIR COOLING



The equipment is operated up to 3000m above sea level as declared by manufacturer. Clearances have been evaluated according to IEC 60664-1 table A.2 with a multiplication factor of 1.14 throughout this report.

Tests performed (name of test and test clause):		Testing location:
Clause	Test description	
1.6.2	Input Current	TÜV Rheinland (Shanghai) Co., Ltd. No.177, 178, Lane 777, West Guangzhong Road Zhabei District Shanghai CHINA
1.7.11	Durability	
2.1.1.5	Energy Hazards	
2.1.1.7	Discharge of Capacitors in equipment	
2.2.2	Voltages under normal conditions	
2.2.3	Voltages under fault conditions	
2.6.3.4	Resistance of earthing conductors and their terminations	
2.9.2	Humidity Conditioning - Electrical insulation	
2.10.2	Determination of working voltage	
4.2.2	Steady Force Test, 10N	
4.5.2	Temperature tests	
4.5.5	Resistance to abnormal heat	
5.1.6	Test measurements - Touch current and protective conductor current	
5.2	Electric strength	
5.3	Abnormal operating and fault conditions	
Annex C	Transformers	

Engineering samples without series number.

Summary of compliance with National Differences

List of countries addressed:

EU Group Differences, EU Special National Conditions, AR, AU, AT, BH, BY, BE, BR, BG, CA, CN, CO, HR, CZ, DK, FI, FR, DE, GR, HU, IN, ID, IE, IL, IT, JP, KE, KR, LR, MY, MX, AN, NZ, NG, NO, PK, PL, PT, RU, SA, RS, SG, SK, SI, ZA, ES, SE, CH, TH, TR, UA, AE, GB, US, VN

Explanation of used codes:

AR = Argentina**; AU = Australia**; AT = Austria*; BH = Bahrain**; BY = Belarus**;
 BE = Belgium*/**; BR = Brazil**; BG = Bulgaria*/**; CA = Canada; CN = China**;
 CO = Colombia**; HR = Croatia**; CZ = Czech** Republic*; DK = Denmark*; FI = Finland*/**;
 FR = France*/**; DE = Germany*/**; GR = Greece*/**; HU = Hungary*/**; IN = India**;
 ID = Indonesia**; IE = Ireland*/**; IL = Israel**; IT = Italy*; JP = Japan**; KE = Kenya**;
 KR = Korea, Republic of**; LR = Libya**; MY = Malaysia**; MX = Mexico**; AN = Netherlands Antilles*/**;
 NZ = New Zealand**; NG = Nigeria**; NO = Norway*/**; PK = Pakistan**; PL = Poland*/**;
 PT = Portugal*/**; RU = Russian Federation**; RO = Romania*/**; SA = Saudi Arabia**; RS = Serbia
 Republic of**; SG = Singapore**; SK = Slovakia*/**; SI = Slovenia*/**; ZA = South Africa**; ES = Spain*/**;
 SE = Sweden*; CH = Switzerland*/**; TH = Thailand**; TR = Turkey*/**; UA = Ukraine**;
 AE = United Arab Emirates**; GB = United Kingdom*; US = United States of America; VN = Vietnam**

Note(s):

Countries outside the CB Scheme membership may also accept this report.

* Only applicable for Group Differences (if any). See attachment 2 for details.

** No National Differences Declared

Germany, Denmark, Finland, United Kingdom, Israel, Republic of Korea, Sweden and Slovenia National differences to IEC 60950-1:2005 (Second Edition) + Am 1:2009 evaluated.

Australia, China, Switzerland, Spain, Ireland and Norway National differences to IEC 60950-1:2005 evaluated.

Japan National differences to IEC 60950-1:2001 evaluated.

The product fulfils the requirements of

EN 60950-1:2006+A11+A1+A12+A2,

UL 60950-1:2007 R10.14 and

CAN/CSA C22.2 No. 60950-1-07+A1:2011+A2:2014.

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>

<p>CUT35-522 INPUT: 100-240VAC ~ 1.0A 50-60Hz OUTPUT: CH1: +5 V = 3.0 A CH2: +12 V = 1.2 A CH3: -12 V = 0.5 A</p>	<p>BAR CODE 5.0mm</p>	<p>----- ----- ----- ----- ----- -----</p>
<p>TDK-Lambda MADE IN [CHINA]</p>		

<p>CUT35-5FF INPUT: 100-240VAC ~ 1.0A 50-60Hz OUTPUT: CH1: +5 V = 3.0 A CH2: +15 V = 1.0 A CH3: -15 V = 0.3 A</p>	<p>BAR CODE 5.0mm</p>	<p>----- ----- ----- ----- ----- -----</p>
<p>TDK-Lambda MADE IN [CHINA]</p>		

<p>CUT35-522/B INPUT: 100-240VAC ~ 1.0A 50-60Hz OUTPUT: CH1: +5 V = 3.0 A CH2: +12 V = 1.2 A CH3: -12 V = 0.5 A</p>	<p>BAR CODE 5.0mm</p>	<p>----- ----- ----- ----- ----- -----</p>
<p>TDK-Lambda MADE IN [CHINA]</p>		

<p>CUT35-5FF/B INPUT: 100-240VAC ~ 1.0A 50-60Hz OUTPUT: CH1: +5 V = 3.0 A CH2: +15 V = 1.0 A CH3: -15 V = 0.3 A</p>	<p>BAR CODE 5.0mm</p>	<p>----- ----- ----- ----- ----- -----</p>
<p>TDK-Lambda MADE IN [CHINA]</p>		

Cont.

CUT35-522/L
INPUT: 100-240VAC ~ 1.0A
50-60Hz
OUTPUT: CH1: +5 V = 3.0 A
CH2: +12 V = 1.2 A
CH3: -12 V = 0.5 A

BAR CODE
5.0mm

TDK-Lambda
 MADE IN CHINA

CUT35-5FF/L
INPUT: 100-240VAC ~ 1.0A
50-60Hz
OUTPUT: CH1: +5 V = 3.0 A
CH2: +15 V = 1.0 A
CH3: -15 V = 0.3 A

BAR CODE
5.0mm

TDK-Lambda
 MADE IN CHINA

CUT35-522/A
INPUT: 100-240VAC ~ 1.0A
50-60Hz
OUTPUT: CH1: +5 V = 3.0 A
CH2: +12 V = 1.2 A
CH3: -12 V = 0.5 A

BAR CODE
5.0mm

TDK-Lambda
 MADE IN CHINA

CUT35-5FF/A
INPUT: 100-240VAC ~ 1.0A
50-60Hz
OUTPUT: CH1: +5 V = 3.0 A
CH2: +15 V = 1.0 A
CH3: -15 V = 0.3 A

BAR CODE
5.0mm

TDK-Lambda
 MADE IN CHINA

Test item particulars	: See below
Equipment mobility	: <input type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input type="checkbox"/> stationary [x] for building-in <input type="checkbox"/> direct plug-in
Connection to the mains	: [x] pluggable equipment [x] type A <input type="checkbox"/> type B <input type="checkbox"/> permanent connection [x] detachable power supply cord <input type="checkbox"/> non-detachable power supply cord <input type="checkbox"/> not directly connected to the mains
Operating condition	: [x] continuous <input type="checkbox"/> rated operating / resting time:
Access location	: <input type="checkbox"/> operator accessible [x] restricted access location
Over voltage category (OVC)	: <input type="checkbox"/> OVC I [x] OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input type="checkbox"/> other:
Mains supply tolerance (%) or absolute mains supply values	: ±10%
Tested for IT power systems	: [x] Yes <input type="checkbox"/> No
IT testing, phase-phase voltage (V)	:
Class of equipment	: [x] Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III <input type="checkbox"/> Not classified
Considered current rating of protective device as part of the building installation (A)	: 16 (20 for US/CSA)
Pollution degree (PD)	: <input type="checkbox"/> PD 1 [x] PD 2 <input type="checkbox"/> PD 3
IP protection class	: IPX0
Altitude during operation (m)	: Up to 3000
Altitude of test laboratory (m)	: Approx 50
Mass of equipment (kg)	: ≈0.19kg (with chassis and cover)
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	: 19.10.2016
Date(s) of performance of tests	: 19.11.2016 to 07.12.2016
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See ATTACHMENT #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.	
Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> 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. Zhangjiagang Hua Yang Electronics Co., Ltd.
Zhao Feng Industrial Zone, Leyu Town, Zhangjiagang, Jiangsu 215622, P.R. China

General product information:

The EUT is a component type switching mode power supplies intended for the class I construction of information technology equipment.

The equipment employs PCB: CCB208 (primary, PB and secondary circuits)

All models are identical, except of the optional chassis, cover, turns of Transformer and the rating of some components which results in different output ratings. See Model List below for details.

For rating differences between the models see below tables:

Model differences						
Series Model	I/p voltage (Vac)	Freq (Hz)	I/p current (A)	Minimal output	Rated output (typical)	Maximum output
Convection cooling condition						
CUT35-522 ; CUT35-522/A ; CUT35-522/L	100-240	50-60	1.0	5.0Vdc	5.0Vdc	5.25Vdc
				3.0A	3.0A	2.85A
				12.0Vdc	12.0Vdc	12.0Vdc
				1.2A	1.2A	1.2A
				-12.0Vdc	-12.0Vdc	-12.0Vdc
				0.5A	0.5A	0.85A
Total output power is 35.4VA max. & CH2, CH3 is 20.4VA max.						
CUT35-5FF ; CUT35-5FF/A ; CUT35-5FF/L	100-240	50-60	1.0	5.0Vdc	5.0Vdc	5.25Vdc
				3.0A	3.0A	2.85A
				15.0Vdc	15.0Vdc	15.0Vdc
				1.0A	1.0A	1.0A
				-15.0Vdc	-15.0Vdc	-15.0Vdc
				0.3A	0.3A	0.65A
Total output power is 34.5VA max. & CH2, CH3 is 19.5VA max.						
Remark: Operating temp.: Up to 70 °C (operating temperature depending on equipment's load, mounting position, for details refer to instruction manual).						

Additional Information

- The product is component type S.M.P.S., the overall compliance shall be investigated in the complete information technology equipment, in particular as:
 - Fire enclosure
 - Mechanical enclosure
 - Electrical enclosure
- Some components are **pre-certified**, which have been evaluated according to the relevant requirements of IEC 60950-1, are employed in this product. Their suitability of use has been checked according to subclauses 1.5.1 and 1.5.2.
- The product is a **component** intended for incorporation in information technology equipment, the overall compliance shall be investigated in the complete information technology equipment
- Tests were repeated with each alternative source of components with identical results unless otherwise specified.

Markings and Instructions

- The installation instruction contains instructions for connection to an IT power distribution system. (See subclause 1.7.2.4):
- Fuse Identification (See subclause 1.7.6): F1/F2 : T2.5A 250Vac

The product also marked with:

CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE AND RATING OF FUSE.

Definition of variable(s):

CUT35-zxxxxxxx

(z = 522 or 5FF; xxxxxxx = A, B, L, other alphanumeric character, symbol or blank)

Variable:	Range of variable:	Content:
z	522 or 5FF	Denotes for different output voltage
xxxxxxx	A	Denotes for cover & chassis
	B	Denotes for Base plate
	L	Denotes for chassis under PWB
	other alphanumeric character, symbol	For market purposes, no construction differences and no safety impact.
	blank	Denotes for JST connector or TE connectivity Connector

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	-No component damage	NCD
-Open-circuited	o-c	-Component damage	CD
-Overloaded	o-l	-Test repeated, similar result	RT
-Internal protection operated	IP	-No indication of dielectric breakdown	NB
-Input	i/p	-Cheesecloth remained intact	NC
-Output	o/p	-Tissue paper remained intact	NT
-Constant temperatures were obtained	CT	-The unit can recover auto when removing the abnormal condition	RA

Indicate used abbreviations (if any)