

## UL TEST REPORT AND PROCEDURE

<b>Standard:</b>	UL 62368-1, 2nd Ed, 2014-12-01 (Audio/video, information and communication technology equipment Part 1: Safety requirements) CAN/CSA C22.2 No. 62368-1-14, 2nd Ed-(Audio/video, information and communication technology equipment Part 1: Safety requirements)
<b>Certification Type:</b>	Component Recognition
<b>CCN:</b>	QQJQ2, QQJQ8 (Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment)
<b>Complementary CCN:</b>	N/A
<b>Product:</b>	Switching Power Supply
<b>Model:</b>	CUS200M-zxxxxxxx; CME200A-zxxxxxxx; CUS150M1-zxxxxxxx; CME150A-zxxxxxxx (z = 12, 18, 24, 36 or 48; xxxxxxx = T, M, MR, R, J, JR, L, A, CO2, S1, other alphanumeric character, symbol or blank)
<b>Rating:</b>	Input: 100-240 Vac, 3.0A, 50-60 Hz Output: See the model list on enclosure 7-01 for details
<b>Applicant Name and Address:</b>	TDK-LAMBDA (CHINA) ELECTRONICS CO LTD NO.95,ZHUJIANG RD, XINWU DISTRICT WUXI JIANGSU 214028 CHINA

This is to certify that representative samples of the products covered by this Test Report have been investigated in accordance with the above referenced Standards. The products have been found to comply with the requirements covering the category and the products are judged to be eligible for Follow-Up Service under the indicated Test Procedure. The manufacturer is authorized to use the UL Mark on such products which comply with this Test Report and any other applicable requirements of UL LLC ('UL') in accordance with the Follow-Up Service Agreement. Only those products which properly bear the UL Mark are considered as being covered by UL's Follow-Up Service under the indicated Test Procedure.

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Reviewed By: Jie Qian / Reviewer

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### Supporting Documentation

The following documents located at the beginning of this Procedure supplement the requirements of this Test Report:

- A. Authorization - The Authorization page may include additional Factory Identification Code markings.
- B. Generic Inspection Instructions -
  - i. Part AC details important information which may be applicable to products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of this Test Report.
  - ii. Part AE details any requirements which may be applicable to all products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of each Test Report.
  - iii. Part AF details the requirements for the UL Certification Mark which is not controlled by the technical standard used to investigate these products. Products are permitted to bear only the Certification Mark(s) corresponding to the countries for which it is certified, as indicated in each Test Report.

### Product Description

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

### Model Differences

Use single PCB layout (ZCCB166) for all models. All models are identical, except for the optional chassis, cover, turns of Transformer and the rating of some components which results in different output ratings.

Schematic and PCB layout for models CUS150M1 & CME150A are identical to models CUS200M & CME200A except for output power and some components rating.

Model CME200A-zxxxxxxx is identical to model CUS200M-zxxxxxxx, except for model name.

Model CME150A-zxxxxxxx is identical to model CUS150M1-zxxxxxxx, except for model name.

See Enclosed Miscellaneous 7-01 (Model Different List) for details.

### Test Item Particulars

Classification of use by	Ordinary person; Instructed person; Skilled person
Supply Connection	AC Mains
Supply % Tolerance	+10%/-10%
Supply Connection – Type	mating connector
Considered current rating of protective device as part of building or equipment installation	20 A; building;
Equipment mobility	for building-in
Over voltage category (OVC)	OVC II
Class of equipment	Not classified
Access location	restricted access area
Pollution degree (PD)	PD 2
Manufacturer's specified maximum operating ambient (°C)	up to +70°C (operating temperature depending on equipment's load, mounting position, Refer to Enclosure 6-01 to 6-06 for details).
IP protection class	IPX0
Power Systems	TN
Altitude during operation (m)	5000 m
Altitude of test laboratory (m)	2000 m or less

Mass of equipment (kg)	Approx. 0.33kg (with chassis and cover)
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**Technical Considerations**

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer’s specification of : up to +70°C (operating temperature depending on equipment’s load, mounting position, Refer to Enclosure 6-01 to 6-06 for details).
- The product is intended for use on the following power systems : TN
- Considered current rating of protective device as part of the building installation (A) : 20
- Mains supply tolerance (%) or absolute mains supply values : +10%/-10%
- The Risk Group of a lamp or lamp system (including LEDs) is : Exempt
- The following are available from the Applicant upon request : Installation (Safety) Instructions / Manual
- The product can be operated sea level up to 5000 m; the minimum clearance multiplied by the factor given in Table A.2 of IEC 60664-1: 1.48.
- The input circuit includes one fuse (F1A) in the Line conductor and the other fuse (F1B) is optional in neutral conductor. Overall consideration need to re-checked in the end-use product regarding addition of the second fuse having the same or better characteristics in order to comply with fusing requirements of Clause 8.11.5 of the standard.
- The metal enclosure of Class II equipment need to evaluate by end system.

**Engineering Conditions of Acceptability**

For use only in or with complete equipment where the acceptability of the combination is determined by UL LLC. When installed in an end-product, consideration must be given to the following:

- The following product-line tests are conducted for this product : Earthing Continuity, Electric Strength
- The end-product Electric Strength Test is to be based upon a maximum working voltage of : Primary-Earthed Dead Metal: 363 Vrms, 544 Vpk, Primary-Secondary: 363Vrms, 544Vpk
- The following output circuits are at ES1 energy levels : All output
- The following output circuits are at PS2 energy levels : All output
- The maximum investigated branch circuit rating is : 20 A
- The investigated Pollution Degree is : 2
- Proper bonding to the end-product main protective earthing termination is : Required
- An investigation of the protective bonding terminals has : been conducted
- The following input terminals/connectors must be connected to the end-product supply neutral : N
- The following end-product enclosures are required : Mechanical, Electrical, Fire
- The following magnetic devices (e.g. transformers or inductor) are provided with an OBJY2 insulation system with the indicated rating greater than Class A (105°C) : T1 (Class F); T2 (Class B)
- The equipment is suitable for direct connection to : AC mains supply
- The power supply was evaluated to be used at altitudes up to : "5,000 m"
- LIMITED SHORT-CIRCUIT TEST (Annex R) is to be evaluated in end products.

**Additional Information**

N/A

**Additional Standards**

The product fulfills the requirements of: N/A

**Markings and Instructions**

Clause Title	Marking or Instruction Details
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Equipment identification marking – Manufacturer identification	Listee's or Recognized companys name, Trade Name, Trademark or File Number
Equipment identification marking – model identification	Model Number
Equipment rating marking – ratings	"Input Ratings (voltage, frequency/dc, current/power)", "Output Ratings (voltage, frequency/dc, current/power)"
Fuses – replaceable by skilled person	(component ID: __F1A/F1B __), '250V, T5AH' located on or adjacent to fuse or fuse holder or in service manual.
<b>Special Instructions to UL Representative</b> Inspect the transformer(s) listed in table "Electric Strength Test Special Constructions" per BD1.1: When the tests are conducted at other location, inspect test record and specification sheet provided by the component manufacturer. Verify the specification sheet indicates 100% routine test specified in the table be conducted at the component manufacturer.	

<b>Model differences:</b>						
Series Model	I/p voltage (Vac)	Freq (Hz)	I/p current (A)	Minimal output	Rated output (typical)	Maximum output
Convection cooling condition						
CUS200M-12xxxxxxx CME200A-12xxxxxxx	100-240	50-60	3.0	11.4Vdc	12Vdc	12.6Vdc
				16.7A	16.7A	15.9A
CUS200M-18xxxxxxx CME200A-18xxxxxxx	100-240	50-60	3.0	17.1Vdc	18Vdc	19.8Vdc
				11.2A	11.2A	10.2A
CUS200M-24xxxxxxx CME200A-24xxxxxxx	100-240	50-60	3.0	22.8Vdc	24Vdc	26.4Vdc
				8.4A	8.4A	7.6A
CUS200M-36xxxxxxx CME200A-36xxxxxxx	100-240	50-60	3.0	34.2Vdc	36Vdc	39.6Vdc
				5.57A	5.57A	5.06A
CUS200M-48xxxxxxx CME200A-48xxxxxxx	100-240	50-60	3.0	45.6Vdc	48Vdc	52.8Vdc
				4.2A	4.2A	3.8A
CUS150M1-12xxxxxxx CME150A-12xxxxxxx	100-240	50-60	1.8	11.4Vdc	12Vdc	12.6Vdc
				12.5A	12.5A	11.9A
CUS150M1-18xxxxxxx CME150A-18xxxxxxx	100-240	50-60	1.8	17.1Vdc	18Vdc	19.8Vdc
				8.4A	8.4A	7.6A
CUS150M1-24xxxxxxx CME150A-24xxxxxxx	100-240	50-60	1.8	22.8Vdc	24Vdc	26.4Vdc
				6.3A	6.3A	5.7A
CUS150M1-36xxxxxxx CME150A-36xxxxxxx	100-240	50-60	1.8	34.2Vdc	36Vdc	39.6Vdc
				4.2A	4.2A	3.8A
CUS150M1-48xxxxxxx CME150A-48xxxxxxx	100-240	50-60	1.8	45.6Vdc	48Vdc	52.8Vdc
				3.2A	3.2A	2.9A
Forced air cooling condition(airflow: air velocity 1.5m/s)						
CUS200M-12xxxxxxx CME200A-12xxxxxxx	100-240	50-60	3.0	11.4Vdc	12Vdc	12.6Vdc
				21A	21A	20A
CUS200M-18xxxxxxx CME200A-18xxxxxxx	100-240	50-60	3.0	17.1Vdc	18Vdc	19.8Vdc
				14A	14A	12.7A
CUS200M-24xxxxxxx CME200A-24xxxxxxx	100-240	50-60	3.0	22.8Vdc	24Vdc	26.4Vdc
				10.5A	10.5A	9.5A
CUS200M-36xxxxxxx CME200A-36xxxxxxx	100-240	50-60	3.0	34.2Vdc	36Vdc	39.6Vdc
				7A	7A	6.4A
CUS200M-48xxxxxxx CME200A-48xxxxxxx	100-240	50-60	3.0	45.6Vdc	48Vdc	52.8Vdc
				5.3A	5.3A	4.8A

**Definition of variable(s):**

CUS200M-zxxxxxxx; CME200A-zxxxxxxx; CUS150M1-zxxxxxxx; CME150A-zxxxxxxx  
 (z = 12, 18, 24, 36 or 48; xxxxxxx = T, M, MR, R, J, JR, L, A, CO2, S1, other alphanumeric character, symbol or blank)

Note: Suffix options would be used shown below or used together.

Variable:	Range of variable:	Content:
z	12, 18, 24, 36 or 48	Denotes for different output voltage
xxxxxxx	T	Denotes for Terminal block connector
	M	Denotes for Molex connector
	MR	Denotes for Molex connector in reverse direction
	R	Denotes for JST connector or TE connectivity Connector in reverse direction
	J	Denotes for JST connector
	JR	Denotes for JST connector in reverse direction
	L	Denotes for chassis
	A	Denotes for cover & chassis
	CO2	Denotes PWB coating
	S1	Denotes for two pins input connector & FG Tap
	other alphanumeric character, symbol	For market purposes, no construction differences and no safety impact.
	blank	Denotes for JST connector or TE connectivity Connector