UL TEST REPORT AND PROCEDURE

Standard:	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)
Certification Type:	Component Recognition
CCN:	QQJQ2, QQJQ8 (Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment)
Complementary CCN:	N/A
Product:	Switching Power Supply
Model:	CUS600My-zxxxxxxx, CME600Ay-zxxxxxxx z=12, 19, 24, 28, 32, 36, 48; y=blank, or 1; (Where xxxxxxx can be any alphanumeric character, symbol or blank, non safety relevant information) Suffix options example for "xxxxxxx" whould be used shown below may be used together; Blank denotes for Standard model; /ADJ denotes for output adjustable (only applicable to y=blank); /T denotes for terminal block connector; /J denotes for JST connector; /M denotes for molex connector; /C denotes for single side PWB Coating; /C2 denotes for double side PWB Coating; /SF denotes for single fuse; /G denotes for low earth leakage current; /EF denotes for end fan; other alphanumeric character, symbol only for market purposes, no construction differences and no safety impact.
Rating:	Input: 100-240 Vac, 7.0 A or 4.5A, 50-60 Hz Output: See the model list on enclosure 7-01 for details
Applicant Name and Address:	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.

The applicant is authorized to reproduce the referenced Test Report provided it is reproduced in its entirety.

UL authorizes the applicant to reproduce the latest pages of the referenced Test Report consisting of the first page of the Specific Technical Criteria through to the end of the Conditions of Acceptability.

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Prepared By: Star Gu / Project Handler Reviewed By: Jie Qian / Reviewer

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 PSU is a component type switching mode power supplies intended for the earthed construction or non-earthed construction of medical equipment.

- For earthed construction (Class I), the PSU need to be reliably earthed and professionally installed and fixed with metal screws.

- For non-earthed construction (Class II), no earthing connection is required. The PSU need to be fixed so, that it is insulated from any unearthed accessible conductive part by reinforced insulation.

Model Differences

Model CME600Ay-zxxxxxxx is identical to model CUS600My-zxxxxxxx, except for model name.

All models are identical, except for the optional chassis, cover, turns of Transformer secondary and the rating of some components which results in different output ratings; y will be blank, or 1 means the difference of T2 and relevant circuit construction.

Cause the schematic has some differences which didn't impact the product safety, CUS600M1 & CME600A1 series' PCB has minor differences from CUS600M & CME600A series'.

CUS600M1 & CME600A1 series are no standby power circuit.

The locateion of T2 is different in models CUS600My-zxxxxxxx, CME600Ay-zxxxxxxx, or CUS600M1-zxxxxxxx, CME600A1-zxxxxxxx. The T2 uesed in CUS600M-zxxxxxxx, CME600A-zxxxxxxx are isolation component; and The T2 uesed in CUS600M1zxxxxxxx, CME600A1zxxxxxxx are located primary circuit/ The output of T2 intended to supply the internal chip, and its 12Vdc output can supply the Fan which is specific to model with suffix /EF. The Fan EFB0412HHD is identical with EFB0405HHD of CUS600My-zxxxxxxx, CME600Ay-zxxxxxxx (y=blank) in CFM.

Chassis and cover of CUS600M / CUS600M1 could be exchanged.

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	N/A
Pollution degree (PD)	PD 2
Manufacturer's specified maximum operating ambient (°C)	up to +70ºC (operating temperature depending on equipment's load, mounting position, Refer to Enclosure 6-01 and 6-02 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. 0.75

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 +70ºC (operating temperature depending on equipment's load, mounting position, Refer to Enclosure 6-01 and 6-02 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: 271 Vrms, 464 Vpk, Primary-Secondary: 271Vrms, 464Vpk
- The following output circuits are at ES1 energy levels : All output
- The following output circuits are at PS3 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).
- 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
Equipment identification marking – Manufacturer identification	Listees 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___), '250V, T10AH' located on or adjacent to fuse or fuseholder or in service manual.

Special Instructions to UL Representative

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.

CUS600M**y**-**zxxxxxxx**, CME600A**y**-**zxxxxxxx**
(**y** = blank; **z** = 12, 19, 24, 28, 32, 36 or 48; **xxxxxxx** = /ADJ, /T, /J, /M, /C, /C2, /SF, /G, /EF, other alphanumeric character, symbol or blank)

Definition of various:

Variable:	Suffix	Description
y	blank	-
z	12, 19, 24, 28, 32, 36 or 48	Denoting output voltage from 12 Vdc to 48 Vdc.
xxxxxxx	blank	Denoting for Standard model
	/ADJ	Denoting output adjustable
	/T	Denoting terminal block connector
	/J	Denoting JST connector
	/M	Denoting molex connector
	/C	Denoting single side PWB coating
	/C2	Denoting double side PWB coating
	/SF	Denoting single fuse
	/G	Denoting low earth leakage current
	/EF	Denoting end fan
	other alphanumeric character, symbol	Used for market purposes, no construction differences and no safety impact.

Table A for rating differences between the models:

Series Model	I/p voltage (Vac)	Freq (Hz)	I/p current (A)	Output Channel	Minimal output	Rated output (typical)	Maximum output
Convection cooling condition							
CUS600My-12xxxxxxx CME600Ay-12xxxxxxx	100-240	50-60	4.5	Main output	10.8Vdc	12Vdc	12.9Vdc
					10.8Vdc – 12.9Vdc, Normal: 33.4A Max.& Rated: 400.8W Max, Peak: 50A Max.& 600W Max.(Dynamic)		
				Standby power (Optional)	5 Vdc (Rated)		
					2A (Rated)		
CUS600My-19xxxxxxx CME600Ay-19xxxxxxx	100-240	50-60	4.5	Main output	17.1Vdc	19Vdc	20.5Vdc
					17.1Vdc – 20.5Vdc, Normal: 21.1A Max.& Rated: 400.9W Max, Peak: 31.6A Max.& 600.4W Max.(Dynamic)		
				Standby power (Optional)	5 Vdc (Rated)		
					2A (Rated)		
CUS600My-24xxxxxxx CME600Ay-24xxxxxxx	100-240	50-60	4.5	Main output	21.6Vdc	24Vdc	25.9Vdc
					21.6Vdc – 25.9Vdc, Normal: 16.7A Max.& Rated: 400.8W Max, Peak: 25A Max.& 600W Max.(Dynamic)		
					5 Vdc (Rated)		

				Standby power (Optional)	2A (Rated)		
CUS600My-28xxxxxxx CME600Ay-28xxxxxxx	100-240	50-60	4.5	Main output	25.2Vdc	28Vdc	30.2Vdc
					25.2Vdc – 30.2Vdc, Normal: 14.3A Max.& Rated: 400.4W Max, Peak: 21.5A Max.& 602W Max.(Dynamic)		
				Standby power (Optional)	5 Vdc (Rated)		
					2A (Rated)		
CUS600My-32xxxxxxx CME600Ay-32xxxxxxx	100-240	50-60	4.5	Main output	28.8Vdc	32Vdc	34.5Vdc
					28.8Vdc – 34.5Vdc, Normal: 12.5A Max.& Rated: 400W Max, Peak: 18.8A Max.& 601.6W Max.(Dynamic)		
				Standby power (Optional)	5 Vdc (Rated)		
					2A (Rated)		
CUS600My-36xxxxxxx CME600Ay-36xxxxxxx	100-240	50-60	4.5	Main output	32.4Vdc	36Vdc	38.8Vdc
					32.4Vdc – 38.8Vdc, Normal: 11.1A Max.& Rated: 399.6W Max, Peak: 16.7A Max.& 601.2W Max.(Dynamic)		
				Standby power (Optional)	5 Vdc (Rated)		
					2A (Rated)		
CUS600My-48xxxxxxx CME600Ay-48xxxxxxx	100-240	50-60	4.5	Main output	43.2Vdc	48Vdc	51.8Vdc
					43.2Vdc – 51.8Vdc, Normal: 8.4A Max.& Rated: 403.2W Max, Peak: 12.6A Max.& 604.8W Max.(Dynamic)		
				Standby power (Optional)	5 Vdc (Rated)		
					2A (Rated)		
Forced air cooling condition(airflow: air velocity 2.7m/s & air volume 28.6CFM)							
CUS600My-12xxxxxxx CME600Ay-12xxxxxxx	100-240	50-60	7.0	Main output	10.8Vdc	12Vdc	12.9Vdc
					50A	50A	46.6A
				Standby power (Optional)	5 Vdc (Rated)		
					2A (Rated)		
CUS600My-19xxxxxxx CME600Ay-19xxxxxxx	100-240	50-60	7.0	Main output	17.1Vdc	19Vdc	20.5Vdc
					31.6A	31.6A	29.3A
				Standby power (Optional)	5 Vdc (Rated)		
					2A (Rated)		
CUS600My-24xxxxxxx CME600Ay-24xxxxxxx	100-240	50-60	7.0	Main output	21.6Vdc	24Vdc	25.9Vdc
					25A	25A	23.2A
				Standby power (Optional)	5 Vdc (Rated)		
					2A (Rated)		

CUS600My-28xxxxxxx CME600Ay-28xxxxxxx	100-240	50-60	7.0	Main output	25.2Vdc	28Vdc	30.2Vdc
					21.5A	21.5A	20.0A
				Standby power (Optional)	5 Vdc (Rated)		
					2A (Rated)		
CUS600My-32xxxxxxx CME600A-32xxxxxxx	100-240	50-60	7.0	Main output	28.8Vdc	32Vdc	34.5Vdc
					18.8A	18.8A	17.5A
				Standby power (Optional)	5 Vdc (Rated)		
					2A (Rated)		
CUS600My-36xxxxxxx CME600Ay-36xxxxxxx	100-240	50-60	7.0	Main output	32.4Vdc	36Vdc	38.8Vdc
					16.7A	16.7A	15.5A
				Standby power (Optional)	5 Vdc (Rated)		
					2A (Rated)		
CUS600My-48xxxxxxx CME600Ay-48xxxxxxx	100-240	50-60	7.0	Main output	43.2Vdc	48Vdc	51.8Vdc
					12.6A	12.6A	11.7A
				Standby power (Optional)	5 Vdc (Rated)		
					2A (Rated)		
Remark: Operating temp.: up to +70ºC (operating temperature depending on equipment's load, mounting position, for details refer to instruction manual). /EF the standby current (2A) is including the fan current(0.3A).							

CUS600M1-**zxxxxxxx**, CME600A1-**zxxxxxxx**
(**z** = 12, 19, 24, 28, 32, 36 or 48; **xxxxxxx** = /T, /J, /M, /C, /C2, /SF, /G, /EF, other alphanumeric character, symbol or blank)

Definition of various:

Variable:	Suffix	Description
z	12, 19, 24, 28, 32, 36 or 48	Denoting output voltage from 12 Vdc to 48 Vdc.
xxxxxxx	blank	Denoting for Standard model
	/T	Denoting terminal block connector
	/J	Denoting JST connector
	/M	Denoting molex connector
	/C	Denoting single side PWB coating
	/C2	Denoting double side PWB coating
	/SF	Denoting single fuse
	/G	Denoting low earth leakage current
	/EF	Denoting end fan
	other alphanumeric character, symbol	Used for market purposes, no construction differences and no safety impact.

Table A for rating differences between the models:

Series Model	I/p voltage (Vac)	Freq (Hz)	I/p current (A)	Minimal output	Rated output (typical)	Maximum output
Convection cooling condition						
CUS600M1-12**xxxxxxx** CME600A1-12**xxxxxxx**	100-240	50-60	4.5	10.8Vdc	12Vdc	12.9Vdc
				10.8Vdc – 12.9Vdc Normal Rating: 33.4A, 400.8W Max. Peak Rating: 50A, 600W Max. (Dynamic)		
CUS600M1-19**xxxxxxx** CME600A1-19**xxxxxxx**	100-240	50-60	4.5	17.1Vdc	19Vdc	20.5Vdc
				17.1Vdc – 20.5Vdc Normal Rating: 21.1A, 400.9W Max. Peak Rating: 31.6A, 600.4W Max. (Dynamic)		
CUS600M1-24**xxxxxxx** CME600A1-24**xxxxxxx**	100-240	50-60	4.5	21.6Vdc	24Vdc	25.9Vdc
				21.6Vdc – 25.9Vdc, Normal Rating: 16.7A, 400.8W Max. Peak Rating: 25A, 600W Max. (Dynamic)		
CUS600M1-28**xxxxxxx** CME600A1-28**xxxxxxx**	100-240	50-60	4.5	25.2Vdc	28Vdc	30.2Vdc
				25.2Vdc – 30.2Vdc, Normal Rating: 14.3A, 400.4W Max. Peak Rating: 21.5A, 602W Max. (Dynamic)		
CUS600M1-32**xxxxxxx** CME600A1-32**xxxxxxx**	100-240	50-60	4.5	28.8Vdc	32Vdc	34.5Vdc
				28.8Vdc – 34.5Vdc, Normal Rating: 12.5A, 400W Max. Peak Rating: 18.8A, 601.6W Max. (Dynamic)		
CUS600M1-36**xxxxxxx** CME600A1-36**xxxxxxx**	100-240	50-60	4.5	32.4Vdc	36Vdc	38.8Vdc
				32.4Vdc – 38.8Vdc, Normal Rating: 11.1A, 399.6W Max. Peak Rating: 16.7A, 601.2W Max. (Dynamic)		
CUS600M1-48**xxxxxxx** CME600A1-48**xxxxxxx**	100-240	50-60	4.5	43.2 Vdc	48 Vdc	51.8 Vdc
				43.2Vdc – 51.8Vdc, Normal Rating: 8.4A, 403.2W Max, Peak Rating: 12.6A, 604.8W Max. (Dynamic)		
Forced air cooling condition (airflow: air velocity 2.7m/s & air volume 28.6CFM)						
CUS600M1-12**xxxxxxx** CME600A1-12**xxxxxxx**	100-240	50-60	7.0	10.8Vdc	12Vdc	12.9Vdc
				50A	50A	46.6A
CUS600M1-19**xxxxxxx** CME600A1-19**xxxxxxx**	100-240	50-60	7.0	17.1Vdc	19Vdc	20.5Vdc
				31.6A	31.6A	29.3A
CUS600M1-24**xxxxxxx** CME600A1-24**xxxxxxx**	100-240	50-60	7.0	21.6Vdc	24Vdc	25.9Vdc
				25A	25A	23.2A
CUS600M1-28**xxxxxxx**	100-240	50-60	7.0	25.2Vdc	28Vdc	30.2Vdc

CME600A1-28**xxxxxxx**				21.5A	21.5A	20.0A
CUS600M1-32**xxxxxxx** CME600A1-32**xxxxxxx**	100-240	50-60	7.0	28.8Vdc	32Vdc	34.5Vdc
				18.8A	18.8A	17.5A
CUS600M1-36**xxxxxxx** CME600A1-36**xxxxxxx**	100-240	50-60	7.0	32.4Vdc	36Vdc	38.8Vdc
				16.7A	16.7A	15.5A
CUS600M1-48**xxxxxxx** CME600A1-48**xxxxxxx**	100-240	50-60	7.0	43.2Vdc	48Vdc	51.8Vdc
				12.6A	12.6A	11.7A
Remark: Operating temp.: up to +70ºC (operating temperature depending on equipment's load, mounting position, for details refer to instruction manual).						