

## 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, Issued: 2014-12-01 (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>	<p>CUS600My-zxxxxxxx, CME600Ay-zxxxxxxx, CUS500M1-zxxxxxxx, CME500A-zxxxxxxx z=12, 19, 24, 28, 32, 36, 48; y=blank, or 1; (Where xxxxxx can be any alphanumeric character, symbol or blank, non safety relevant information) Suffix options example for "xxxxxxx" would 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 or /CO denotes for single side PWB Coating; /C2 or /CO2 denotes for double side PWB Coating; /SF denotes for single fuse; /G denotes for low earth leakage current; /EF denotes for end fan; It is for class I construction only. other alphanumeric character, symbol only for market purposes, no construction differences and no safety impact.</p>
<b>Rating:</b>	<p>Input: See the model list on enclosure 7-01 for details Output: See the model list on enclosure 7-01 for details</p>
<b>Applicant Name and Address:</b>	<p>TDK-LAMBDA (CHINA) ELECTRONICS CO LTD NO.95,ZHUJIANG RD, XINWU DISTRICT WUXI JIANGSU 214028 CHINA</p>

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.

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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.

The models CUS500M1-zxxxxxxx and CME500A-zxxxxxxx are identical except for the model designation, which are similar to original models CUS600M1-zxxxxxxx, CME600A1-zxxxxxxx with following differences:

- 1) Rated input current, output ratings.
- 2) Add alternate heatsink combination 2. See below table for details:

Parts	Combination 1 (CUS600M1 heatsink)	Combination 2 (tested in this report)
KFA1 (Pri. side)	CA878-32-01x	CA922-32-01x
KFA2 (Pri. side)	CA878-32-03x	without
KFA3 (Sec. side)	CA878-32-05x (12V) (optional) CA878-32-04x (others) (optional)	without
HS201 & HS204 (Sec. side)	TZDD3271 (optional)	without
KKE1 (Sec. side)	CA878-33-01x (optional)	without

- 3) Component parameter adjustment for MOSFET (Q1), Diode (D1), Primary Electrolytic Capacitor (C6) and Resistor (R108).

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 location of T2 is different in models CUS600My-zxxxxxxx, CME600Ay-zxxxxxxx, or CUS600M1-zxxxxxxx, CME600A1-zxxxxxxx. The T2 used in CUS600M-zxxxxxxx, CME600A-zxxxxxxx are isolation component; and The T2 used in CUS600M1-zxxxxxxx, CME600A1-zxxxxxxx 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 +70°C (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)	For models CUS600My-zxxxxxxx, CME600Ay-zxxxxxxx: Approx. 0.75; CUS500M1-zxxxxxxx, CME500A-zxxxxxxx: Approx. 0.43

**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 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 OBJ2 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	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__ ), '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.