

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:	CPS253-M-XXX, CPS253-M1-XXX, CPS255-M-XXX, CPS258-M-XXX (where -XXX can be any alphanumeric character, symbol or blank that represents customer identity that do not affect safety)
Rating:	<p>For Model CPS253-M-XXX Input: 100-240Vac, 3A, 50/60Hz DC Output: +12V, 20.83A MAX +12V FAN, 0.5 A MAX Maximum Output Power: 155W Convection Cooling 250W Forced Air Cooling</p> <p>For Model CPS253-M1-XXX Input: 100-240Vac, 3A, 50/60Hz DC Output: +12V, 20.83A MAX +12V FAN, 0.5 A MAX +5Vsb, 0.1A MAX Maximum Output Power: 155W Convection Cooling 250W Forced Air Cooling</p> <p>For Model CPS255-M-XXX Input: 100-240Vac, 3A, 50/60Hz DC Output: +24V, 10.42A MAX +12V FAN, 0.5 A MAX</p>

	<p>Maximum Output Power: 155W Convection Cooling 250W Forced Air Cooling</p> <p>For Model CPS258-M-XXX Input: 100-240Vac, 3A, 50/60Hz DC Output: +48V, 5.21A MAX +12V FAN, 0.5 A MAX Maximum Output Power: 155W Convection Cooling 250W Forced Air Cooling</p>
Applicant Name and Address:	<p>ASTEC INTERNATIONAL LTD 16TH FL LU PLAZA 2 WING YIP ST KWUN TONG KOWLOON HONG KONG</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.

Prepared By: ChiWah Leung / Handler

Reviewed By: Paul Wan / 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 equipment is an AC switching power supply designed to deliver 155W rated output power during natural convection cooling and 250W during forced air cooling at minimum of 10CFM. This equipment is intended for use in Class I or Class II application. Reinforced insulation is provided between primary and secondary circuits and basic insulation is provided between primary circuits and Earth as well as secondary circuit and earth. When the equipment is used as Class II, earth trace is considered dead metal.

Model Differences

Model CPS255-M-XXX is identical to Model CPS253-M-XXX except for the following safety controlled parameters:

- 1) Model name and Ratings of DC output;
- 2) Power Transformer (T501) and Resonant Choke (L4);
- 3) Output connector (CPS253-M-XXX with bus bar connector while CPS255-M-XXX with 6 pin output connector same material of input connector)

Model CPS258-M-XXX is identical to Model CPS253-M-XXX and CPS255-M-XXX except for the following safety controlled parameters:

- 1) Model name and Ratings of DC output;
- 2) Power Transformer (T501)

Model CPS253-M1-XXX is identical to model CPS253-M-XXX except for below safety controlled parameters:

- 1.) Model name and additional output voltage, +5Vsb;
- 2.) Rating of Discharge Resistor (R16, R38, R41);
- 3.) Auxiliary Transformer

Test Item Particulars

Classification of use by	Skilled person
Supply Connection	AC Mains
Supply % Tolerance	+10%/-10%
Supply Connection – Type	To be considered in the End System
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	Class I Class II
Access location	N/A
Pollution degree (PD)	PD 2
Manufacturer's specified maximum operating ambient (°C)	50
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)	1

Technical Considerations

- 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 following are available from the Applicant upon request : Installation (Safety) Instructions / Manual
- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification: 50 degree C maximum ambient temperature at 155W load with natural convection cooling. Above 50 degree C the power shall be derated at 2.9% / degree C up to 70 degree C for input line voltage of 90-100Vac/ 127Vdc, and it shall be de-rated at 2.5% / degree C for input line voltage 100- 264Vac/ 250Vdc. Below 100 Vac, and up to 50 degree C, derate power at 1% / Vac. The total output power for forced air cooling of minimum 10 CFM shall be 250W at 50 degree C. At ambient above 50 degree C the power shall be derated at 1.9% / degree C up to 70 degree C. Below 100 Vac, and up to 50 degree C, derate power at 1% / Vac
- The Clearance and Creepage distances have additionally been assessed for suitability up to 5000 meters elevation. Clearance distances are calculated according to IEC60664-1 table A-2 multiplexer factor 1.48
- The equipment is component level power supply intended for use in Class I or Class II application

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 : For Model CPS253-M-XXX,, Primary-Earthed Dead Metal: 243.5 Vrms, 620 Vpk, Primary-SELV: 245.5 Vrms, 624 Vpk, , For Model CPS255-M-XXX,, Primary-Earthed Dead Metal: 250.5 Vrms, 636 Vpk, Primary-SELV: 254.1 Vrms, -575 Vpk., , For Model CPS258-M-XXX,, Primary-Earthed Dead Metal: 261.1 Vrms, 678 Vpk , Primary-SELV: 268.8 Vrms, -578 Vpk, For Model CPS253-M1-XXX,, Primary-Earthed Dead Metal: 368.1Vrms, 726Vpk, Primary-SELV: 367.1Vrms, 764Vpk
- The following output circuits are at ES1 energy levels : All
- The following output circuits are at PS3 energy levels : All
- 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 : not been conducted
- 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) : T501(Class F) designated 155-10C; TX601 (Class F) designated 155-10C
- 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"
- Fan output should be considered part of the 250W output power
- The 12V, 24V and 48V output voltage can be adjusted to 0%/+10%. The Fan Output may move according to set point. All potentiometers shall be sealed single-turn. Output load setting beyond nominal output voltage shall cause the power supply to be de-rated to 200W maximum power for Forced Air conditions