

UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 2nd Edition, 2014-10-14 (Information Technology Equipment - Safety - Part 1: General Requirements) CAN/CSA C22.2 No. 60950-1-07, 2nd Edition, 2014-10 (Information Technology Equipment - Safety - Part 1: General Requirements)
Certification Type:	Component Recognition
CCN:	QQGQ2, QQGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
Product:	Switching Power Supply
Model:	73-954-0001-G2, uMP04X-XXX-XXX-XXX-XXX-XX (Please refer to Enclosure ID 7-01, for model name configuration details of uMP04X)
Rating:	73-949-0001-G2, uMP09X-XXX-XXX-XXX-XXX-XX (Please refer to Enclosure ID 7-20, for model name configuration details of uMP09X)
	For 73-954-0001-G2: AC Input: 100 - 240V 8A max 50/60Hz DC Input: 120V min - 350V max 6.5A max AC Output Voltage: 380V +10/-20V RMS Square Wave, 500W Max.
	AC Input: 200 - 240V 8A max 50/60Hz DC Input: 254V min - 350V max 6.5A max AC Output Voltage: 380V +10/-20V RMS Square Wave, 700W Max.
	For uMP04X-XXX-XXX-XXX-XXX-XX: AC Input: 100 - 240V 8A max 50/60Hz DC Input: 120V min - 350V max 6.5A max Output: 400W, Refer details in report
	AC Input: 200 - 240V 8A max 50/60Hz DC Input: 254V min - 350V max 6.5A max Output: 600W, Refer details in report
	For 73-949-0001-G2: AC Input: 100 - 240V 9A max 50/60Hz DC Input: 120V min - 350V max 6.5A max AC Output Voltage: 380V +10/-20V RMS Square Wave, 700W Max.
	AC Input: 200 - 240V 9A max 50/60Hz DC Input: 254V min - 350V max 6.5A max AC Output Voltage: 380V +10/-20V RMS Square Wave, 1300W Max.
	For uMP09X-XXX-XXX-XXX-XXX-XX: AC Input: 100 - 240V 9A max 50/60Hz DC Input: 120V min - 350V max 6.5A max Output: 550W, Refer details in report
	AC Input: 200 - 240V 9A max 50/60Hz DC Input: 254V min - 350V max 6.5A max Output: 1100W, Refer details in report

Issue Date: 2015-05-21
2016-07-06

Page 2 of 19

Report Reference #

E186249-A294-UL

Applicant Name and Address:	ASTEC INTERNATIONAL LIMITED 16TH FLOOR, LU PLAZA 2 WING YIP STREET, KWUN TONG, KOWLOON, HONGKONG
------------------------------------	--

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: Leung Chi Wah

Reviewed by: Paul Wan

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

Class I Switching Power Supply, model 73-954-0001-G2 and 73-949-0001-G2 intended for Information Technology Product, provided with AC or DC input connector for power supplied. The equipment is provided with reinforced insulation between primary circuit and secondary circuit, basic insulation between primary and earth.

Class I Switching Power Supply, model uMP04X-XXX-XXX-XXX-XXX-XX and uMP09X-XXX-XXX-XXX-XXX-XX intended for Information Technology Product, provided with AC or DC input connector for power supplied where X is any alphanumeric character or blank for specific model designation. See report for details.

uMP04 configured model series was combined with a recognized AC-DC modules, model 73-961-0003, 73-961-0005, 73-961-0012, 73-961-0024, 73-961-0048, 73-962-0001 and 73-962-0002 under file E132002-A120 installed to the case model 73-954-0001-G2.

uMP09 configured model series was combined with a recognized AC-DC modules, model 73-961-0003, 73-961-0005, 73-961-0012, 73-961-0024, 73-961-0048, 73-962-0001, 73-962-0002 under file E132002-A120 and model 73-963-0048 under file E132002-A319 installed to the Case model 73-949-0001-G2.

Model Differences

73-954-0001-G2 is a subassembly of uMP04 configured series model. See Model Configuration based on Enclosure-Miscellaneous ID7-01 for details.

73-949-0001-G2 is a subassembly of uMP09 configured series model. See Model Configuration based on Enclosure-Miscellaneous ID7-20 for details.

73-949-0001-G2 is identical to 73-954-0001-G2 except for model designation, input current rating for AC inputs, and output power ratings.

uMP09X-XXX-XXX-XXX-XXX-XX is identical to uMP04X-XXX-XXX-XXX-XXX-XX except for model designation, input current rating for AC inputs, and output power ratings.

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : To be considered in the end system
- Operating condition : continuous

- Access location : restricted access location
- Over voltage category (OVC) : OVC II
- Mains supply tolerance (%) or absolute mains supply values : +10%, -10% (For AC input application only)
- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : N/A
- Class of equipment : Class I (earthed)
- Considered current rating of protective device as part of the building installation (A) : See cover page for current rating
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : 3048m
- Altitude of test laboratory (m) : <2000m
- Mass of equipment (kg) : <18kg
- The power supply can operate in reverse airflow direction at 40 degree C
- Model 73-954-0001-G2 is subassembly of uMP04 configured series model.
- uMP04 and uMP09 configured series models consist of front-end case model 73-954-0001-G2 and 73-949-0001-G2 respectively and any combination of separately approved AC-DC module series as output. Each uMP04 and uMP09 configured series models have 4 slots for AC-DC modules.
- The power supply was tested in inhibit mode (fan off condition) up to maximum 50 degree C ambient temperature
- The means of connection to the mains supply is: To be considered in the end system.
- The product is intended for use on the following power systems: TN
- The equipment disconnect device is considered to be: To be considered in the end system.
- The product was investigated to the following additional standards: EN 60950-1:2006 + A11:2009 +A1:2010+A12:2010+A2:2013 (which includes all European national differences, including those specified in this test report).
- The following were investigated as part of the protective earthing/bonding: Printed wiring board trace (refer to Enclosure - Schematics + PWB for layouts)
- 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 of: Maximum ambient temperature around the power supply must not exceed 50 degree C at full load, forward airflow. Each output derates 2.5% per degree from 50 degree C to 70 degree C ambient temperature.
- The UL Listed (JDDZ) Branch Circuit Fuse is employed as the protection device for the Limited Short Circuit Tests (2.6.4)
- Model 73-949-0001-G2 is subassembly of uMP09 configured series model.

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 power supply has been evaluated for use in Class I equipment as defined in UL 60950-1 second edition and CAN/CSA C22.2 No. 60950-1-07. An additional evaluation shall be made if the power

supply is intended to use other than Class I

- The creepage and clearance distance have additionally been assessed for suitability up to 3048m.
- The power supply was not evaluated for system mounting. When installed in end system, proper evaluation should be considered.
- The following secondary output circuits are at hazardous energy levels: All outputs of AC-DC modules except outputs of 73-961-0003, 73-961-0005 and 73-963-0048.
- The following secondary output circuits are SELV: output of module 73-961-0003, 73-961-0005, 73-961-0012, 73-961-0024, 73-961-0048, 73-962-0001 and 73-962-0002.
- The following Production-Line tests are conducted for this product: Electric Strength
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-SELV: 364.1 Vrms, 751 Vpk Primary-Earthed Dead Metal: 364.4 Vrms, 751 Vpk
- 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 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, T101 (Class F)
- The following end-product enclosures are required: Mechanical, Fire, Electrical
- The equipment is suitable for direct connection to: AC and/or DC mains supply
- Output of 73-954-0001-G2 and 73-949-0001-G2 are to be considered in the end system. AC output waveform is specially configured as square wave format to fit with end system special usage.
- AC inlet is not considered as disconnect device for DC input application