# UL TEST REPORT AND PROCEDURE

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| **Standard:** | UL 60950-1, 2nd Edition, 2014-10-14 (Information Technology Equipment - Safety - Part 1: General Requirements)<br>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:** | 73-956-0001, 73-956-0001-G2, uMP16X-XXX-XXX-XXX-XXX-XXX-XXX-XX, 73-951-0001-G2, uMP10X-XXX-XXX-XXX-XXX-XXX-XXX-XX<br><br>where "X" may be "T" or "C" or "S", which indicates the input type;<br><br>where "XXX" may be "S2A", "S2B", "S2C", "S2D", "S2E", "S2F", "S2G", "S2H", "S2I", "S2J", "S2K", "S2L", "S2M", "S2N", "S2O", "S2P", "S2Q", "S2R", "S2S", "S2T", "S2U", "S2V", "S2W", "S2X", "S2Y", SKT","SKU","SKV","SKW", "SKX","SKY", "IQQ" and "D(E-R)(E-R)"<br>which indicates different output loading condition;<br><br>where "XX" may be "10", "20", "30","40", "50", "60", "70","80", "90","A0", "B0", "C0", "D0", "E0","F0", "G0","H0","J0","K0", "11", "21", "31", "41", "51", "61", "71","81", "91" "A1","B1", "C1", "D1", E1","F1","G1","H1", "J1", "K1", "13","23", "33", "43", "53", "63", "73","83", "93" , "A3","B3", "C3", "D3", "E3","F3", "G3","H3","J3","K3", "14","24", "34", "44", "54", "64", "74","84", "94" , "A4","B4", "C4", "D4", "E4","F4", "G4","H4","J4","K4",<br>"15", "25", "35", "45", "55", "65","75", "85","95", "A5", "B5","C5","D5", "E5","F5","G5","H5","J5","K5","00", "01", "03", "04" and "05" which indicates application state. |
| **Rating:** | For 73-956-0001:<br>AC Input: 100 - 240V, 13A max, 50/60Hz<br>DC Input: 120V min - 300V max, 13A max<br>AC Output Voltage: 380V, +10/-20V RMS Square Wave, 1000W Max.<br><br>AC Input: 200 - 240V, 10A max, 50/60Hz<br>DC Input: 254V min - 339V max, 10A max<br>AC Output Voltage: 380V, +10/-20V RMS Square Wave, 1600W Max.<br><br>For 73-956-0001-G2:<br>AC Input: 100 - 240V, 13A max, 50/60Hz<br>DC Input: 120V min -339V max, 13A max<br>AC Output Voltage: 380V, +10/-20V RMS Square Wave, 1000W Max.<br><br>AC Input: 200 - 240V, 10A max, 50/60Hz<br>DC Input: 254V min - 339V max, 10A max<br>AC Output Voltage: 380V, +10/-20V RMS Square Wave, 1600W Max. |

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| | AC Input: 110 - 240V, 13A max, 50/60Hz<br>AC Output Voltage: 380V, +10/-20V RMS Square Wave, 1200W Max.<br><br>AC Input: 220 - 240V, 13A max, 50/60Hz<br>AC Output Voltage: 380V, +10/-20V RMS Square Wave, 1800W Max.<br><br>For uMP16X-XXX-XXX-XXX-XXX-XXX-XXX-XX:<br>AC Input: 100 - 240V, 13A max, 50/60Hz<br>DC Input: 120V min - 339V max, 13A max<br>Output: 1000W Max., Refer details in report enclosure ID7-17.<br><br>AC Input: 200 - 240V, 10A max, 50/60Hz<br>DC Input: 254V min - 339V max, 10A max<br>Output: 1600W Max., Refer details in report enclosure ID7-17.<br><br>AC Input: 110 - 240V, 13A max, 50/60Hz<br>Output: 1200W Max., Refer details in report enclosure ID7-17.<br><br>AC Input: 220 - 240V, 13A max, 50/60Hz<br>Output: 1800W Max., Refer details in report enclosure ID7-17.<br><br>For 73-951-0001-G2:<br>AC Input: 100 - 240V, 13A max, 50/60Hz<br>DC Input: 120V min - 339V max, 13A max<br>AC Output Voltage: 380V, +10/-20V RMS Square Wave, 1000W Max.<br><br>AC Input: 200 - 240V, 10A max, 50/60Hz<br>DC Input: 254V min - 339V max, 10A max<br>AC Output Voltage: 380V, +10/-20V RMS Square Wave, 1200W Max.<br><br>For uMP10X-XXX-XXX-XXX-XXX-XXX-XXX-XX:<br>AC Input: 100 - 240V, 13A max, 50/60Hz<br>DC Input: 120V min - 339V max, 13A max<br>Output: 1000W Max. Refer details in report enclosure ID7-23.<br><br>AC Input: 200 - 240V, 10A max, 50/60Hz<br>DC Input: 254V min - 339V max, 10A max<br>Output: 1200W Max. Refer details in report enclosure ID7-23. |
| **Applicant Name and Address:** | ASTEC INTERNATIONAL LTD<br>16TH FL<br>LU PLAZA<br>2 WING YIP ST<br>KWUN TONG KOWLOON HONG KONG |

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: Suki Kwong Reviewed by: Brian Wong

**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, Models 73-956-0001 and 73-956-0001-G2, and 73-951-0001-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 uMP16X-XXX-XXX-XXX-XXX-XXX-XXX-XX and uMP10X-XXX-XXX-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.

uMP16 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 and model 73-963-0024 under file E186249-A319 installed to the recognized Case models 73-956-0001 and 73-956-001-G2 under E186249-A273-UL and E186249-A273-CB.

uMP10 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 and model 73-963-0024 under file E186249-A319 installed to the Case model 73-951-0001-G2.

**Model Differences**

Models 73-956-0001-G2 and 73-951-0001-G2 are identical to model 73-956-0001 except for model designation and input and output power rating.

Models 73-956-0001 and 73-956-0001-G2 are subassemblies of uMP16 configured series model while 73-951-0001-G2 is a subassembly of uMP10 configured series model.

**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) : NA
- Class of equipment : Class I (earthed)
- Considered current rating of protective device as part of the building installation (A) : 13A/10A
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : 3048 m
- Altitude of test laboratory (m) : <2000m
- Mass of equipment (kg) : 1.5
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: Maximum ambient temperature around the power supply must not exceed 50 degree C for forward airflow. . Each output derates 2.5% per degree from 50 degree C to 70 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 + A12:2011 + 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 power supply can operate in reverse airflow direction at 40°C ambient temperature.
- Models 73-956-0001 and 73-956-0001-G2 are subassemblies of uMP16 configured series model.
- uMP16 configured model series consists of the front-end case model 73-956-0001 or 73-956-0001-G2 and any combination of separately approved AC-DC module series as output. Each uMP16 series model has 6 slots for AC-DC modules.
- The power supply was tested in inhibit mode (fan off condition) up to maximum 50°C ambient temperature.
- Model 73-951-0001-G2 are subassemblies of uMP10 configured series model.
- uMP10 configured model series consists of the front-end case model 73-951-0001-G2 and any combination of separately approved AC-DC module series as output. Each uMP10 series model has 6 slots for AC-DC modules.

**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 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: 382.7 Vrms, 681 Vpk, Primary-Earthed Dead Metal: 382.8 Vrms, 681 Vpk for model 73-956-0001, Primary-SELV: 439.1Vrms, 698 Vpk Primary-Earthed Dead Metal: 444.7 Vrms, 707 Vpk for models 73-956-0001-G2, 73-951-0001-G2, uMP16X-XXX-XXX-XXX-XXX-XXX-XXX-XX and

uMP10X-XXX-XXX-XXX-XXX-XXX-XXX-XX .

- 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): T801 (Class F), T301 (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
- 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 3048 m.
- 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 73-962-0001.
- 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, 73-962-0002, 73-963-0048 and 73-963-0024.