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:	DS1100SDC-3-XXX, DS500SDC-3-XXX (where -XXX can be any alphanumeric character, symbol or blank that represents customer identity that do not affect safety.)
Rating:	For DS1100SDC-3-XXX: DC Input: 32A, -48 to -60Vdc DC Outputs: 91.6A +12V, 3.0A +12Vsb, maximum output power is 1100W For DS500SDC-3-XXX: DC Input: 15A, -48 to -60Vdc DC Outputs: 41.6A +12V, 3.0A +12Vsb, maximum output power is 500W
Applicant Name and Address:	ASTEC INTERNATIONAL LTD 16TH FL LU PLAZA 2 WING YIP ST, 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: Tony Yeung 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

The equipment is switching power supply, intended for building in as a component used in information technology equipment which employs with isolating transformers.

Model Differences

Model DS500SDC-3-XX is similar to model DS1100SDC-3-XX except the input and output rating, schematic and PWB layout. See Enclosure ID7-06 for detail.

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : DC mains supply
- Operating condition : continuous
- Access location : To be considered in end system
- Over voltage category (OVC) : OVC II
- Mains supply tolerance (%) or absolute mains supply values : +25%, -15%
- 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) : 32
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : 3048
- Altitude of test laboratory (m) : < 2000
- Mass of equipment (kg) : 1.05
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: For model DS1100SDC-3-XXX: 50 deg. C max. at 1100W load; 55 deg. C at 750W load and 65 deg. C at 400W load for Forward airflow condition. 50 deg. C max. at 1100W load; 45 deg. C at 750W load and 55 deg. C at 400W load for Reverse airflow condition. For model DS500SDC-3-XXX: 50 deg. C max. at 500W load; 55 deg. C at 375W load and 65 deg. C at 250W load for Forward airflow condition. 40 deg. C max. at 500W load; 45 deg. C at 375W load and 55 deg. C at 250W load for Reverse airflow condition.
- The equipment disconnect device is considered to be: DC Input connector
- The class of laser product is: Class 1 (I)
- The following are available from the Applicant upon request: Installation (Safety) Instructions / Manual
- The product is intended for use on the following power systems: DC mains supply
- 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).
- For model DS500SDC-3-XXX, Main (+12V) output has a tolerance of +/- 5%, with a maximum allowed output current of 41.6A and output power of 500W.

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 creepage and clearance distances have additionally been assessed for suitability up to 3048 meters.
- No energy hazard (below 240VA) exists at the PSU outputs in the removed condition.
- The PSU is evaluated to be connected to DC mains supply of -(48-60)Vdc, including consideration of float voltage up to -75Vdc.
- Basic insulation is maintained between input circuit and protective earth, as well as between input circuit and output circuit.
- The power supply has been evaluated for use in Class 1 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 for use in other than Class 1 equipment.
- Input is considered TNV-2.
- Fan provided in this sub-assembly is not intended for operator access. Fan grill is added for a power supply with reverse airflow condition to prevent access to hazardous moving parts or fan blades.
- The following Production-Line tests are conducted for this product: Electric Strength, Earthing Continuity
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: For model DS1100SDC-3-XXX: Input to Output: 513 Vrms, 866 Vpk; Input to PE: 513 Vrms, 866 Vpk. For model DS500SDC-3-XXX: Input to Output: 468 Vrms, 789 Vpk; Input to PE: 467 Vrms, 789 Vpk.
- The following secondary output circuits are SELV: +12V, +12Vsb
- The following secondary output circuits are at hazardous energy levels: +12V
- The following secondary output circuits are at non-hazardous energy levels: +12Vsb
- The power supply terminals and/or connectors are: Not investigated for field wiring,
- The investigated Pollution Degree is: 2
- 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): examples: CT1, T111, T112 and T110 (Class F) ,
- The following end-product enclosures are required: Fire, Electrical
- The equipment is suitable for direct connection to: DC mains supply