

COVER PAGE FOR TEST REPORT

Product Category:	Power Supplies for Information Technology Equipment Including Electrical Business Equipment
Product Category CCN:	QQGQ2, QGGQ8
Test Procedure:	Component Recognition
Product:	DC-DC Converter for Building-in
Model/Type Reference:	AIQ02R300
Rating(s):	INPUT: DC +250 to +420V, 0.5A Max. OUTPUT: DC +28V (+1.4V / -2.8V), 2.33A Max.
Standards:	UL 60950-1, 2nd Edition, 2007-03-27 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2007-03 (Information Technology Equipment - Safety - Part 1: General Requirements)
Applicant Name and Address:	ASTEC INTERNATIONAL LTD - PHILIPPINE BRANCH 16TH & 17TH FL LU PLAZA 2 WING YIP ST KWUN TONG KOWLOON HONG KONG
This Report includes the following parts, in addition to this cover page:	
<ol style="list-style-type: none">1. Specific Technical Criteria2. Critical Components	

Issue Date: 2009-08-28
Correction 1 2009-10-08

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Report Reference #

E186249-A110-UL-1

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 Underwriters Laboratories Inc. ('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.

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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.

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Test Report By:



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Reviewed By:



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SPECIFIC INSPECTION CRITERIA

BA1.0	Special Instructions to UL Representative
BA1.1	N/A

BB1.0	Supporting Documentation
BB1.1	<p>The following documents located at the beginning of this Procedure supplement the requirements of this Test Report:</p> <p>A. Authorization - The Authorization page may include additional Factory Identification Code markings.</p> <p>B. Generic Inspection Instructions -</p> <ol style="list-style-type: none"> 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.

BC1.0	Markings and instructions	
BC1.1	The following markings and instructions are provided as indicated.	
BC1.2	All clause references are from UL 60950-1, 2nd Edition, 2007-03-27 (Information Technology Equipment - Safety - Part 1: General Requirements).	
Standard Clause	Clause Title	Marking or Instruction Details
1.7.1	Power rating - Ratings	Ratings (voltage, frequency/dc, current)
	Power rating - Company identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
	Power rating - Model	Model Number

BD1.0	Production-Line Testing Requirements							
BD1.1	Electric Strength Test Special Constructions - Refer to Generic Inspection Instructions, Part AC for further information.							
						Test Potential		
	Model	Component	Removable Parts	Test probe location		V rms	V dc	Test Time, s
	N/A	-	-	-		-	-	-
BD1.2	Earthing Continuity Test Exemptions - This test is not required for the following models:			N/A				
BD1.3	Electric Strength Test Exemptions - This test is not required for the following models:			N/A				
BD1.4	Electric Strength Test Component Exemptions - The following solid-state components may be disconnected from the remainder of the circuitry during the performance of this test:			N/A				

BE1.0	Sample and Test Specifics for Follow-Up Tests at UL					
BE1.1	Model	Component	Material	Test	Sample(s)	Test Specifics
	N/A	-	-	-	-	-

SPECIFIC TECHNICAL CRITERIA

UL 60950-1:2005 (2nd Edition) Information technology equipment - Safety - Part 1: General requirements	
Report Reference No	E186249-A110-UL-1
Compiled by	Derek Chan
Reviewed by	Brian Wong
Date of issue	2009-08-28
Standards	UL 60950-1, 2nd Edition, 2007-03-27 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2007-03 (Information Technology Equipment - Safety - Part 1: General Requirements)
Test procedure	Component Recognition
Non-standard test method	N/A
Test item description	DC-DC Converter for Building-in
Trademark	EMERSON
Model and/or type reference	AIQ02R300
Rating(s)	INPUT: DC +250 to +420V, 0.5A Max. OUTPUT: DC +28V (+1.4V / -2.8V), 2.33A Max.

Particulars: test item vs. test requirements

Equipment mobility: for building-in
Connection to the mains: permanent connection
Operating condition: continuous
Over voltage category: OVC II
Mains supply tolerance (%): No direct connection
Tested for IT power systems: No
IT testing, phase-phase voltage (V): -
Class of equipment: Class I (earthed)
Mass of equipment (kg): <0.25
Pollution degree: PD 1
IP protection class: IP X0

Possible test case verdicts:

- test case does not apply to the test object: N / A
- test object does meet the requirement: Pass
- test object does not meet the requirement: Fail (acceptable only if a corresponding, less stringent national requirement is "Pass")

General remarks:

- "(see Enclosure #)" refers to additional information appended to the Test Report
- "(see appended table)" refers to a table appended to the Test Report
- Throughout the Test Report a point is used as the decimal separator

GENERAL PRODUCT INFORMATION:	
CA1.0	Report Summary
CA1.1	N/A
CB1.0	Product Description
CB1.1	This equipment is DC-DC Converter, intended for building in as a component used in information technology equipment. Reinforced insulation is provided between primary circuit and secondary circuit and basic insulation is provided between primary circuit and metal baseplate (protective earth). When installing the equipment, all requirements of the mentioned standard must be fulfilled.
CC1.0	Model Differences
CC1.1	N/A
CD1.0	Additional Information
CD1.1	Correction 1 - Correct the model number of Input Choke (L101) from HMF67-C001LFTR to HM67-C001LFTR.
CE1.0	Technical Considerations
CE1.2	The product was submitted and evaluated for use at the maximum ambient temperature (T _{ma}) permitted by the manufacturer's specification of: Maximum baseplate temperature of 100 deg C.
CE1.4	The product is intended for use on the following power systems: TN
CE1.13	The following are available from the Applicant upon request: Installation (Safety) Instructions / Manual
CE2.0	The equipment under test is a Class I, DC-DC converter for building-in. A suitable electrical, mechanical and fire enclosure shall be provided by the end-system. --
CE2.1	Model AIQ02R300 maintains Reinforced insulation between the Primary and Secondary circuits and Basic insulation between Primary circuits and baseplate. --
CE2.2	The output of Model AIQ02R300 is SELV. The maximum output power for the product is 68.5W (computed). --
CF1.0	Engineering Conditions of Acceptability
CF1.1	For use only in or with complete equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc. When installed in an end-product, consideration must be given to the following:
CF1.2	The following Production-Line tests are conducted for this product: Electric Strength, Earthing Continuity
CF1.3	The end-product Electric Strength Test is to be based upon a maximum working voltage of:

	Primary-Earthed Dead Metal: 301.3 Vrms, 468 Vpk, Primary-SELV: 323.9 Vrms, 486 Vpk
CF1.5	The following secondary output circuits are SELV: +28Vdc
CF1.7	The following secondary output circuits are at non-hazardous energy levels: +28Vdc
CF1.11	The power supply terminals and/or connectors are: Not investigated for field wiring
CF1.12	The maximum investigated branch circuit rating is: 20 A
CF1.13	The investigated Pollution Degree is: 1
CF1.15	Proper bonding to the end-product main protective earthing termination is: Required
CF1.16	An investigation of the protective bonding terminals has: Been conducted
CF1.19	The following end-product enclosures are required: Mechanical, Fire, Electrical
CF1.23	The equipment is suitable for direct connection to: DC mains supply
CF2.0	Electromedical Equipment connected to patient: Model AIQ02R300 is not an electromedical equipment intended to be physically connected to patient.
CF2.1	The clearance and creepage distance have additionally been assessed for suitable up to 3048 m elevation. Clearance distances were calculated using IEC 60664-1, Table A2, correction factor 1.15.
CF2.2	The product has been evaluated for use with a maximum baseplate temperature of 100 deg C.
CF2.3	The unit has no in-line fuse. For safe operation of Model AIQ02R300, a Bussmann type PCC-2 1/2, maximum 2.5A, minimum 450VDC or equivalent must be fitted in-line by the user prior to use.