COVER PAGE FOR TEST REPORT

Product Category:	Power Supplies, Medical and Dental
Product Category CCN:	QQHM2, QQHM8
Test Procedure:	Component Recognition
Product:	AC/DC to DC Switching Power Supply
Model/Type Reference:	NTS503-M, NTS505-M, NTS508-M
Rating(s):	AC Input: 7.1A , 100-250V, 50/60/Hz DC Input: 7.1A , 120Vmin.-300Vmax. NTS503-M: Outputs: 41.67A +12V; 2A +5Vstby; 1A +12V(Fan_Out) NTS505-M: Outputs: 20.84A +24V; 2A +5Vstby; 1A +12V(Fan_Out) NTS508-M: Outputs: 10.42A +48V; 2A +5Vstby; 1A +12V(Fan_Out)
Standards:	UL 60601-1, 1st Edition, 2006-04-26 (Medical Electrical Equipment, Part 1: General Requirements for Safety) CAN/CSA-C22.2 No. 601.1-M90, 2005 (Medical Electrical Equipment - Part 1: General Requirements for Safety)
Applicant Name and Address:	ASTEC INTERNATIONAL LTD PHILIPPINES BRANCH TECHNO PLAZA 1 BLDG, 3RD & 4TH FL 18 ORCHARD RD BAGUMBAYAN EASTWOOD CITY CYBERPARK QUEZON CITY 1110 METRO MA PHILIPPINES

This Report includes the following parts, in addition to this cover page:

1. Specific Inspection Criteria
2. Specific Technical Criteria
3. Clause Verdicts
4. Critical Components
5. Test Results
6. National Differences
7. Enclosures

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.

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 Underwriters Laboratories Inc. (UL) or any authorized licensee of UL.

Test Report By:

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Reviewed By:

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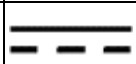
SPECIFIC INSPECTION CRITERIA

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

BB1.0	**Supporting Documentation**
BB1.1	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.

BC1.0	**Markings and instructions**	
BC1.1	The following markings and instructions are provided as indicated.	
BC1.2	All clause references are from UL 60601-1, 1st Edition, 2006-04-26 (Medical Electrical Equipment, Part 1: General Requirements for Safety).	
Standard Clause	Clause Title	Marking or Instruction Details
6.1e	Company identification	Classified or Recognized company's name, Trade name, Trademark or File
6.1f	Model	Model number
6.1g	Supply Connection	Voltage range, ac/dc, phases if more than single phase
	Alternating current	
	Direct current	
6.1h	Supply Frequency	Rated frequency range in hertz
6.1j	Power Input	Amps, VA, or Watts
6.1n	Fuses	Ratings (current and voltage) and type. (located adjacent to fuse OR as a diagram inside enclosure)
6.1p	Output	Rated output voltage, power, frequency.
6.2f	Protective earth ground	

BD1.0	**Production-Line Testing Requirements**			
BD1.1	**Test Exemptions** - The following models are exempt from the indicated test			
	Model	Grounding Continuity	Dielectric Voltage Withstand	Patient Circuit Dielectric Voltage Withstand
	N/A			
BD1.2	**Solid-State Component Test Exemptions** - The following solid-state components may be disconnected from the remainder of the circuitry during either Dielectric Voltage Withstand Test:			
	N/A			

BE1.0	**Sample and Test Specifics for Follow-Up Tests at UL**			
BE1.1	The following tests shall be conducted in accordance with the Generic Inspection Instructions			
	Model	Samples	Test	Test Details
	N/A			

SPECIFIC TECHNICAL CRITERIA

TEST REPORT **UL 60601-1** **Medical Electrical Equipment** **Part 1: General requirements for safety**	
Report Reference No..... :	E182560-A8-UL-1
Compiled by ..... :	Chirky Lin
Reviewed by ..... :	Jimmy Deng
Date of issue ..... :	2008-12-15
Standards ..... :	UL 60601-1, 1st Edition, 2006-04-26 (Medical Electrical Equipment, Part 1: General Requirements for Safety) CAN/CSA-C22.2 No. 601.1-M90, 2005 (Medical Electrical Equipment - Part 1: General Requirements for Safety)
Test procedure ..... :	Component Recognition
Non-standard test method ..... :	N/A
Test item description ..... :	AC/DC to DC Switching Power Supply
Trademark ..... :	None
Model and/or type reference ..... :	NTS503-M, NTS505-M, NTS508-M
Rating(s) ..... :	AC Input: 7.1A , 100-250V, 50/60/Hz DC Input: 7.1A , 120Vmin.-300Vmax. NTS503-M: Outputs: 41.67A +12V; 2A +5Vstby; 1A +12V(Fan_Out) NTS505-M: Outputs: 20.84A +24V; 2A +5Vstby; 1A +12V(Fan_Out) NTS508-M: Outputs: 10.42A +48V; 2A +5Vstby; 1A +12V(Fan_Out)

GENERAL INFORMATION				
Test item particulars (see also clause 5):				
Classification of installation and use ..... :	N/A - Recognized Switching Power Supply			
Supply connection ..... :	Terminal Block			
Accessories and detachable parts included in the evaluation ..... :	None			
Options included ..... :	None			
Possible test case verdicts:				
- test case does not apply to the test object ..... :	N / A			
- test object does meet the requirement ..... :	P(Pass)			
- test object does not meet the requirement ..... :	F(Fail) (acceptable only if a corresponding, less stringent national requirement is "Pass")			
Abbreviations used in the report:				
- normal condition ..... :	N.C.	- single fault condition .....:	S.F.C.	
- operational insulation ..... :	OP	- basic insulation .....:	BI	
- basic insulation between parts of opposite polarity:	BOP	- supplementary insulation .....:	SI	
- double insulation ..... :	DI	- reinforced insulation .....:	RI	
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	The equipment is a switching type power supply which electronic components mounted on PWB and housed in plastic enclosure for medical electrical equipment.
CC1.0	**Model Differences**
CC1.1	All models are similar except for primary chokes (L9, L10), bridge rectifier rated (DB1), PFC TRANSISTORS (Q3, Q19), POWER TRANSISTORS (Q6, Q15, Q17, Q18, Q20, Q23, Q24, Q40, Q43, Q44), output ratings, output power, transformer secondary windings, secondary components, and model designation number. See below output rated list for details. NTS503-M: Outputs: 41.67A +12V; 2A +5Vstby; 1A +12V(Fan_Out)

	NTS505-M: Outputs: 20.84A +24V; 2A +5Vstby; 1A +12V(Fan_Out) NTS508-M: Outputs: 10.42A +48V; 2A +5Vstby; 1A +12V(Fan_Out)	
CD1.0	**Additional Information**	
CD1.1	N/A	
CE1.0	**Technical Considerations**	
CE1.1	The product was investigated to the following additional standards:	CAN/CSA-C22.2 No. 601.1-M90 (R2005) (includes National Differences for Canada), UL 60601-1, 1st Edition, 2006-04-26 (includes National Differences for USA)
CE1.2	The product was not investigated to the following standards or clauses:	Clause 52.1, Programmable Electronic Systems (IEC 601-1-4), Clause 48, Biocompatibility (ISO 10993-1), Clause 36, Electromagnetic Compatibility (IEC 601-1-2)
CE1.3	The product is Classified only to the following hazards:	Fire, Shock
CE1.4	The degree of protection against harmful ingress of water is:	Ordinary
CE1.6	The mode of operation is:	Continuous
CE1.7	Software is relied upon for meeting safety requirements related to mechanical, fire and shock:	No
CE1.8	The product is suitable for use in the presence of a flammable anesthetics mixture with air or oxygen or with nitrous oxide:	No
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:	
CF2.0	This power supply has been judged on the basis of the required creepage and Clearances in the First Edition of the Standard for Medical Electrical Equipment, UL 60601-1, Sub clause 57.10, which covers the end-use product for which the component was designed.	--
CF2.1	The need for conduction enclosure and patient leakage current tests should be considered as part of the end product evaluation.	--
CF2.2	The power supply was evaluated as Double	--

	Insulation or Reinforced Insulation between Primary and Secondary, See insulation diagram for details.	
CF2.3	These power supplies are rated for use in 50°C ambient at full, rated output, with output derating at 2.5% per °C from 50°C to, 70°C. An end system ventilation set-up (30CFM Forced air cooling), was utilized for ventilation during testing.	--
CF2.4	The reference voltage for Dielectric Voltage Test in End Product: 438 Vrms.	--
CF2.5	This power supply was tested on a 20 A branch circuit. If used on a branch circuit greater than this, additional testing may be necessary.	--
CF2.6	This power supply has been evaluated as a Class I, continuous operation, ordinary Equipment and has not been evaluated for use in the presence of a flammable anesthetic mixture with air, oxygen, or nitrous oxide. An additional evaluation shall be made if the power supply is intended for use in other than Class I equipment.	--
CF2.7	The acceptability of output connectors, insulating materials, and temperatures shall be considered in the end use product.	--
CF2.8	Consideration should be given to measuring the temperatures on power electronic components and transformer windings when the power supply is installed in the end-use equipment. The All primary transformers incorporates a Class 155 (F) insulation system.	--
CF2.9	The suitaility of leakage current ahould be determined in end product.	--