

Descriptive Report and Test Results

MASTER CONTRACT: 251006 REPORT: 2345690 PROJECT: 70024647

Edition 1: October 15, 2010; Project 2345690 - Toronto Issued by A. Yeung, P. Eng.

Contents: Certificate of Compliance – Pages 1 of 2 Supplement to Certificate of Compliance – Page 1 Description and Tests - Pages 1 to 56 Label – Att. 1-1 to 1-2 Photos – Att. 2-1 to 2-48 Schematics – Att. 3-1 to 3-86 Constructions – Att. 4-1 to 4-30 User Manual – Att. 5-1 to 5-86 Components Specification – Att. 6-1 to 6-52

Edition 2: April 24, 2012; Project 2502294 - Toronto Issued by A. Yeung, P. Eng.

Report re-issued (to cover alternate power supply H1U-6250P of EMACS)

Labels added: Att. 1-3 to 1-6

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Edition 3: February 27, 2013; Project 2605834 - Toronto Issued by A. Yeung, P. Eng. Report re-issued (to update F1=0 Ω ; F2=Littelfuse P/N 1812L050 and Power Supply P/N to IS-350R2UP) Schematic replaced: Att. 3-67, 3-68 Component Specifications added: Att. 6-53, 5-54 Contents: Certificate of Compliance – Pages 1 of 2 Supplement to Certificate of Compliance - Page 1 Description and Tests - Pages 1 to 54 Label - Att. 1-1 to 1-6 Photos – Att. 2-1 to 2-48 Schematics – Att. 3-1 to 3-86 Constructions – Att. 4-1 to 4-30 User Manual – Att. 5-1 to 5-86 Components Specification - Att. 6-1 to 6-54 **Edition 4:** February 13, 2015; Project 70020527 - Toronto Issued by: Anthony Yeung, P.Eng. Report re-issued: To add alternative fan module and power supply to model TMG800 and TMP800 _ Change rating of TMG800 and TMP800 to 1.1A at 100-240 Vac Photos pages added: Att. 2-49 to 2-58 Components Specification pages added: Att. 6-55 to 6-81 Contents: Certificate of Compliance - Pages 1 of 2 Supplement to Certificate of Compliance - Page 1 Description and Tests - Pages 1 to 55 Label – Att. 1-1 to 1-6 Photos – Att. 2-1 to 2-58 Schematics – Att. 3-1 to 3-86 Constructions – Att. 4-1 to 4-30 User Manual – Att. 5-1 to 5-86 Components Specification - Att. 6-1 to 6-81

Edition 5: April 10, 2015; Project 70024647 – Toronto Issued by: Anthony Yeung, P. Eng.

Report re-issued:

- To add alternative AC and DC power supply to TMG800/TMP800
- Photographs added: Att. 2- 59 to 2-63
- Schematics added Att. 3-87 to 3-94
- Constructions added: Att. 4-31, 4-36

Contents: Certificate of Compliance – Pages 1 of 2 Supplement to Certificate of Compliance – Page 1 Description and Tests – Pages 1 to 55 Label – Att. 1-1 to 1-6 Photos – Att. 2-1 to 2-63 Schematics – Att. 3-1 to 3-96 Constructions – Att. 4-1 to 4-36 User Manual – Att. 5-1 to 5-86 Components Specification – Att. 6-1 to 6-81

PRODUCTS

CLASS 3862 13 – Information Technology Equipment CLASS 3862 93 - Information Technology Equipment - CERTIFIED TO U.S. STANDARDS

Part A:

Tmedia Media Gateway Series; TMG800 (1U BOX), Rated:100-240 Vac, 47-63 Hz, 1.1 A or -46 to -65Vdc, 1.5A Tmedia Gateway Series; TMP800 (1U BOX), Rated:100-240 Vac, 47-63 Hz, 1.1 A or -46 to -65Vdc, 1.5A

Part B:

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Tmedia Media Gateway Series; TMG3200 (1U BOX), Rated: -46 to -65Vdc, 2.8A
TMP6400 (1U BOX), Rated: -46 to -65Vdc, 2.6A
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Tmedia Media Gateway Series; TMG3200 (2U BOX), Rated: 100-240Vac, 47-63Hz, 1.1A or -46 to -65Vdc, 2.8A Tmedia Media Gateway Series; TMP6400 (2U BOX), Rated: 100-240Vac, 47-63Hz, 1.0A or -46 to -65Vdc, 2.6A

Part C:

Tmedia Media Gateway Series; TMG5800 (2U BOX), Rated: 100-240Vac, 47-63Hz, 2.8A Tmedia Media Gateway Series; TMP5900 (2U BOX), Rated: 100-240Vac, 47-63Hz, 2.8A

Note: The above systems are rated at 25°C ambient temperature.

APPLICABLE REQUIREMENTS

CAN/CSA-C22.2 No. 60950-1-07 (Second Edition), Amendment 1: 2011 (MOD)	-	Information Technology Equipment – Safety – Part 1: General Requirements
ANSI/UL Std No. 60950-1-2011 (Second Edition)	_	Information Technology Equipment – Safety – Part 1: General Requirements

MARKINGS

The manufacturer is required to apply the following markings:

- Products shall be marked with the markings specified by the particular product standard.
- Products certified for Canada shall have all Caution and Warning markings in both English and French.

Additional bilingual markings not covered by the product standard(s) may be required by the Authorities Having Jurisdiction. It is the responsibility of the manufacturer to provide and apply these additional markings, where applicable, in accordance with the requirements of those authorities.

ALTERATIONS

Markings as above appear on each unit.

FACTORY TESTS

See Design Manual for details of test required.

For voltage rated at 30 Vrms or 42.4 to 60 V peak and below - Not applicable.

- (a) <u>Production-Line Dielectric Voltage-Withstand Test</u>: As described in the Design Manual for grounded units up to 250V ac and for safety isolation transformers in power supplies.
- (b) <u>Production-Line Earthing-Continuity Test</u>: As described in Design Manual.

<u>Equipment</u>: The equipment at the conclusion of manufacture, before shipment shall withstand for one second, without breakdown, the application of 1500Vac between live parts and exposed non-current-carrying metal parts. The factory test may be made at existing room temperature.

As an alternative, the equivalent dc voltage (2121V) may be used.

<u>Warning</u>: The factory test(s) specified may present a hazard of injury to personnel and/or property and should only be performed by persons knowledgeable of such hazards and under conditions designed to minimize the possibility of injury.

SPECIAL INSTRUCTIONS FOR FIELD SERVICES

Component descriptions marked with either the "(INT)" or "(INT*)" identifiers may be substituted with other components providing the requirements specified under the notes in the "Description" are complied with.

COMPONENT SPECIAL PICKUP

Component descriptions marked with the identifier "(CT)" are subject to annual pickup and Conformity Testing.

DESCRIPTION

Notes:

- 1. Component Substitution
 - a) Critical components (those identified by mfr name, cat no), which are NOT identified with either "INT" or "INT*" are not eligible for substitution without evaluation and report updating.
 - b) The term "INT" means a "Certified" and/or "Listed" (or a "Recognized" and/or "Accepted") component may be replaced by one "Certified" and/or "Listed" by an organization (accredited by OSHA/SCC), for the same application; providing the applicable country identifiers are included and requirements in item "d" below are complied with.
 - c) The term "INT*" means a "Recognized" and/or "Accepted" component may be replaced by one "Recognized" and/or "Accepted" by an organization (accredited by OSHA/SCC), for the same application, providing the applicable country identifiers are included, the component is **also** CSA Certified, the requirements in item "d" below are complied with and any "conditions of suitability" for the component (as recorded in this descriptive report) are complied with.
 - d) Components which have been substituted, must be of an equivalent rating, configuration (size, orientation, mounting) and the applicable minimum creepage and clearance distances are to be maintained from live parts to bonded metal parts and secondary parts.
 - e) Substitution of a "Certified" and/or "Listed" component with a component that is "Recognized" or "Accepted" is not permitted without evaluation and report updating.

The TelcoBridges Tmedia Media Gateway Series is carrier-grade media gateway that meets the needs of service providers looking to drive convergence between TDM and IP networks, consolidating multiple devices for signaling, connectivity and IVR with a single device.

The Tmedia Media Gateway Series consists of three groups, Low Density, High Density and High Density with PC Server. The High Density can come in 1U or 2U form factors. The Low Density has only 1U form factory and the High Density with PC Server has only 2U form factors.

The High Density 2U Series has two power supply slots that it can be configured with one or two AC or DC power supplies. Each power supply has an independent power input source. The second power supply is redundant to provide a backup and load sharing purpose.

The Tmedia Media Gateway Series models are:

- Low Density TMG800 (1U BOX)
- High Density TMG3200/TMP6400 (1U BOX) and TMG3200/TMP6400 (2U BOX)
- High Density with PC Server TMG5800/TMP5900 (2U BOX)

Note: The main difference between the TMG and TMP versions is that the TMP has not software installed. The differences between 1U and 2U versions are the chassis, power supply and the fan module.

The Tmedia Media Gateway Series normal configurations are:

- Low Density 8x Trunk E1/T1, 3x 10/100/1G Ethernet ports, DSP Processing, 1 Voip Module
- High Density 16x E1/T1, 4x 10/100/1G Ethernet, MBL port, Linux host processor, Dual Voip Module
- High Density with PC Server Same as High Density with Intel dual quad core Xeon cpu and special software

The following power assembly configurations are possible:

- Two redundant AC power assemblies (TMP800/TMG800 (1U BOX), TMG3200/TMP6400 (2U BOX) and TMG5800/TMP5900 (2U BOX))
- Two redundant DC power assemblies (TMG3200/TMP6400 (2U BOX) and TMG5800/TMP5900 (2U BOX))
- One DC power assembly (TMG800 (1U BOX) and TMG3200/TMP6400 (1U BOX))

There are no direct connections to a Telecommunication Network (TNV).

The equipment is rated for a maximum ambient temperature of 55°C.

Part A: Model: TMG800/TMP800 (1U BOX) – AC/DC

Object/part No.	Manufacturer/ trademark	type/model	Technical data	mark(s) of conformity ¹)
+ Chassis / assembly	TelcoBridges	Dimension: approx. 11 (D) by 17.4 (W) by 1.8 (H) inch Part#: 2000-90063	Material: Metal sheet; various thickness; Finish: 0.9mm Satin Coat; Secured with screws	See Att. 2-1 to 2-4; Att. 4-1 to 4-7
+ 3 Fan holder	Various	Dimension: approx. 0.5 (D) by 5.8 (W) by 1.6 (H) inch Part#: 2000-90062	Material: Metal sheet; various thickness; Finish: 0.9mm Satin Coat; Secured with screws	See Att. 2-4 and 2-7; Att. 4-8
Power supply, DC	SunPower	DC-DC, Switching power supply Part#: SDX-6250-48	Rating: 40-65V; 9Amax; Various output voltages; Total: 250WMax	UL, E129733 TUV, CE See Att. 2-14; Att. 6-1 to 6-3
Alternate AC power Supply for AC input option	EMACS	Part#: H1U-6250P	Rating: 100-240 Vac, 47~63 Hz, 4.0A-2.0A, 250 Watts (max.)	cULus
Alternate (Ed. 4) AC power Supply for AC input option (x2)	ETASIS Electronics	EFRP-S207	Input: 100-240 Vac, 47~63 Hz, 3.0A-1.5A, 200 Watts (max.) Output: 12Vdc/16A, -12Vdc/0.5, 5Vsb/2A	cURus (E176239) TUV.
Alternate (Ed. 5) AC power Supply for AC input option (x2)	ETASIS Electronics	EFRP-S2207-H	Input: 100-240 Vac, 47~63 Hz, 3.0A-1.5A, 200 Watts (max.) Output: 12Vdc/16A, -12Vdc/0.5A, 5Vsb/2A; +3.3V/20A; 5Vdc, 20A	cURus TUV.
Alternate (Ed.5) AC power Supply for AC input option	Brick	TP-AC300-12	Input: 85 to 264 Vac, 250 W. max Output 12Vdc, 25Amp max, no fan.	cURus
Fan (x3)	Sunon	GM Series High Speed 40mm 17 CFM Vapo Bearing 8 Motor Pole Fan; Part#: GM1204PQV1-8A	Rating: 12 VDC; Dimensions: 40 x 40 x 28 mm	UL See Att. 2-7
Fan (x3) Alternate (Ed. 4)	Sunon	SG40281B1-000U-S99	Rating: 12 Vdc, 520mA, 6.24W; 25.6 CFM, 1.45Inch-H ₂ 0 Dimensions: 40 x 40 x 28 mm	cURus (E77551)

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Object/part No.	Manufacturer/ trademark	type/model	Technical data	mark(s) of conformity ¹)
+ Motherboard	Various	Material: FR-4; Measured 10.9 by 8.7 by 0.06 inch thick approx.; 6- layer	94V-0	UL94 V-0 See Att. 2-5 and 2-6
		Part#: 1700-00063		
+ Connector; J2	Molex	4.2mm pitch mini-fit Jr. Header, Dual row, vertical, 20 circuits;Housing: PA Polyamide Nylon 6/6; 94V-2Part#: 39-29-920294V-2		UL, E29179; CSA, LR19980; TUV, R72081037 See Att. 6-4 to 6-5
+ Connector; J4	Bel Stewart	EMI-RFI shielded, ESD grounded, 2 port PCB Harmonica CAT 5 Jack, Non-flange	Housing; Thermoplastic; 94V-0	UL See Att. 6-6
		Part#: SS-7188S-A-PGA-BA		
+ Connector; J5, J6	Amphenol	High speed RJ45, modular jack, 8 position, 8 contacts, shielded with LEDs; 1 port or 2 ports	Housing: Thermoplastic, PA 4/6; 94V0	UL See Att. 6-7 to 6-8
		Part#: RJHS-5381 and RJHSE-5381-02		
+ Connector; J10, J13	Amphenol	4 ports, high speed, modular jack, 8 position, 8 contacts, shielded with LEDs.	Housing: Thermoplastic, PA 4/6; 94V0	UL See Att. 6-9
		Part#: RJHSE-5381-04		
+ DC-DC convertors; PS1-PS7	Texas Instruments	PTH series DC/DC convertor, Input non-isolated wide output adjust power module;	Meets 94V-0	SELV UL, CSA, VDE
		Part#: PTV05020W, PTH05050W, PTV03020W, PTH03050W;		
+ Heatsink	Radian Heatsinks	Dimensions: 4.6'' x 2.4'' x Aluminum with black anodize		Evaluated with product; See Att. 2-5
+ Protection device; F2-F33	Тусо	PolySwitch, PTC Device Part#: TRF250-145U	Rating: 60Vdc, 3A; Fault voltage: 250Vrms	UL, CSA, TUV; See Att. 2-5 and Att. 6-10

Part B:

Model: TMG3200 / TMP6400 (1U BOX) - DC

Object/part No.	Manufacturer/ trademark	type/model	Technical data	mark(s) of conformity ¹)
+ Chassis / assembly (1U BOX)	TelcoBridges	Dimension: approx. 15.9 (D) by 16.8 (W) by 1.7 (H) inch Part#: 2000-90033	Material: Metal sheet; various thickness; Finish: 0.9mm Satin Coat; Secured with screws	See Att. 2-10 to 2-13; Att. 4-9 to 4-14
+ 4 Fan holder	Various	Dimension: approx. 0.5 (D) by 5.8 (W) by 1.6 (H) inch Part#: 2000-90035	Material: Metal sheet; various thickness; Finish: 0.9mm Satin Coat; Secured with screws	See Att. 2-13 and 2-17; Att. 4-14
Power supply, DC	SunPower	DC-DC, Switching power supply Part#: SDX-6250-48	Rating: 40-65V; 9Amax; Various output voltages; Total: 250WMax	UL, E129733 TUV, CE See Att. 2-14; Att. 6-1 to 6-3
Fan (x4)	Sunon	GM Series High Speed 40mm 17 CFM Vapo Bearing 8 Motor Pole Fan; Part#: GM1204PQV1-8A	Rating: 12 VDC; Dimensions: 40 x 40 x 28 mm	UL See Att. 2-17
+ Motherboard	Various	Material: FR-4; Measured 13.6 by 11.8 by 1.6mm thick approx.; 14-layer Part#: 1700-00039	94V-0	UL94 V-0 See Att. 2-15 and 2-16
Fuse F1	Various	0 ohm	-	See Att. 3-68
Fuse F2	Littelfuse	Resettable PTC 1812L050 series	ε	
+ Connector; J2	Molex			UL, E29179; CSA, LR19980; TUV, R72081037 See Att. 6-4 to 6-5
+ Connector; J4	Bel Stewart	EMI-RFI shielded, ESD grounded, 2 port PCB Harmonica CAT 5 Jack, Non-flange Part#: SS-718802S	Housing; Thermoplastic; 94V- 0	UL See Att. 6-6

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Object/part No.	Manufacturer/ trademark	type/model	Technical data	mark(s) of conformity ¹)
+ Connector; J7	Amphenol	4 ports, high speed, modular jack, 8 position, 8 contacts, shielded with LEDs.	Housing: Thermoplastic, PA 4/6; 94V0	UL See Att. 6-9
+ DC-DC convertors; PS1, PS7, PS8	Texas Instruments	Part#: RJHSE-5381-04 PTH series DC/DC convertor, Input non-isolated wide output adjust power module; Part#: PTH05050W	Meets 94V-0	SELV UL, CSA, VDE
+ DC-DC convertors; PS3, PS4	Texas Instruments	Part#: PTH05050W, PTV series DC/DC convertor, Input non-isolated wide output adjust power module; Part#: PTV03020W		SELV UL, CSA, VDE
+ DC-DC convertors; PS5, PS6	Texas Instruments	ATH series DC/DC convertor, Input non-isolated wide output adjust power module; Part#: ATH030A0X3		SELV UL, CSA, VDE
+ Heatsink	Radian Heatsinks	Black ICE Series; Full Bricks Dimensions: 4.6'' x 2.4'' x 0.45'' Part#: HS1596EB	Material: Fin Aluminum with black anodize plating	Evaluated with product; See Att. 2-5
+ Display card PCB	Various	Material: FR-4; Measured 7.5 by 1.5 by 0.06 inch thick approx.; 14-layer Part#: 1700-00043	94V-0	UL94 V-0 See Att. 2-24 and 2-25
+ 16T1/E1 card PCB	Various	Material: FR-4; Measured 63 by 6.5 by 0.06 inch thick approx.; 6-layer Part#: 1700-00044		UL94 V-0 See Att. 2-20 and 2-21
+ Protection device; F1- F64	Тусо	PolySwitch, PTC DeviceRating: 60Vdc,Part#: TRF250-145UFault voltage: 250Vrms		UL, CSA, TUV; See Att. 2-20 and Att. 6-10
+ Connector; J1	Molex	High speed RJ45, Stacked modular jack, 2x8 position, shielded with LEDs; Part#: 44520-0003	Housing: Polyester (PBT); 94V0	UL See Att. 6-11 to 6-12

TMG3200 / TMP6400 (2U BOX) - DC/AC

Object/part No.	Manufacturer/ trademark	type/model	Technical data	mark(s) of conformity ¹)
+ Chassis / assembly (2U BOX)	TelcoBridges	Dimension: approx. 15.9 (D) by 16.8 (W) by 3.5 (H) inch Part#: 2000-90037	Material: Metal sheet; various thickness; Finish: 0.9mm Satin Coat; Secured with screws	See Att. 2-26 to 2-28; Att. 4-15 to 4-20
+ 2 Fan holder	Various	Dimension: approx. 0.45 (D) by 6.7 (W) by 3.1 (H) inch Part#: 2000-90039	Material: Metal sheet; various thickness; Finish: 0.9mm Satin Coat; Secured with screws	See Att. 2-33; Att. 4-21
Power supply, DC	Zippy Technology	Redundancy DC-DC, Switching power supply Part#: DR2G-6350F	Rating: -36 to - 72Vdc; 35Amax; Various output voltages; Total: 350WMax	UL, E143756 TUV, CE See Att. 2-28 and 2-29; Att. 6-13 to 6-14
Power supply, AC (Alternate)	iStarUSA	Redundancy AC-DC, Switching power supply Part#: IS-350R2UP	Rating: 100-240Vac; 35Amax; Various output voltages; Total: 350WMax	UL, E155314 TUV, CB, CE See Att. 2-30 to 2-32; Att. 6-15 to 6-20
Fan (x2)	Delta	Ball Bearing type, High Speed 80mm 67 CFM Part#: FFB0812SH	Rating: 12 VDC; Dimensions: 80 x 80 x 25.4 mm; 94V-0	UL, CSA See Att. 2-33 Att. 6-21
+ Motherboard	Various	Material: FR-4; Measured 13.6 by 11.8 by 1.6mm thick approx.; 14- layer Part#: 1700-00039	94V-0	UL94 V-0 See Att. 2-15 and 2-16
+ Connector; J2	Molex	4.2mm pitch mini-fit Jr. Header, Dual row, vertical, 20 circuits; Part#: 39-29-9202	4.2mm pitch mini-fit Jr. Header, Dual row, vertical, 20 circuits; Housing: PA Polyamide Nylon 6/6: 94V-2	
+ Connector; J4	Bel Stewart	EMI-RFI shielded, ESD grounded, 2 port PCB Harmonica CAT 5 Jack, Non-flange Part#: SS-718802S	Housing; Thermoplastic; 94V-0	UL See Att. 6-6
+ Connector; J7	Amphenol	4 ports, high speed, modular jack, 8 position, 8 contacts, shielded with LEDs. Part#: RJHSE-5381-04	Housing: Thermoplastic, PA 4/6; 94V0	UL See Att. 6-9

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Object/part No.	Manufacturer/ trademark	type/model	Technical data	mark(s) of conformity ¹)
+ DC-DC convertors; PS1, PS7, PS8	Texas Instruments	PTH series DC/DC convertor, Input non-isolated wide output adjust power module; Part#: PTH05050W,	Meets 94V-0	SELV UL, CSA, VDE
+ DC-DC convertors; PS3, PS4	Texas Instruments	PTV series DC/DC convertor, Input non-isolated wide output adjust power module; Part#: PTV03020W	Meets 94V-0	SELV UL, CSA, VDE
+ DC-DC convertors; PS5, PS6	Texas Instruments	ATH series DC/DC convertor, Input non-isolated wide output adjust power module; Part#: ATH030A0X3	Meets 94V-0	SELV UL, CSA, VDE
+ Heatsink	Radian Heatsinks	Black ICE Series; Full Bricks Dimensions: 4.6'' x 2.4'' x 0.45'' Part#: HS1596EB	Material: Fin Aluminum with black anodize plating	Evaluated with product; See Att. 2-5
+ Display card PCB	Various	Material: FR-4; Measured 7.5 by 1.5 by 0.06 inch thick approx.; 14-layer Part#: 1700-00043	94V-0	UL94 V-0 See Att. 2-24 and 2-25
+ 16T1/E1 card PCB	Various	Material: FR-4; Measured 63 by 6.5 by 0.06 inch thick approx.; 6- layer Part#: 1700-00044	terial: FR-4; Measured 63 by by 0.06 inch thick approx.; 6- er	
+ Protection device; F1- F64	Тусо	PolySwitch, PTC DeviceRating: 60Vdc,Part#: TRF250-145U3A; Fault voltag250Vrms		UL, CSA, TUV; See Att. 2-20 and Att. 6-10
+ Connector; J1	Molex	High speed RJ45, Stacked modular jack, 2x8 position, shielded with LEDs; Part#: 44520-0003	Housing: Polyester (PBT); 94V0	UL See Att. 6-11 to 6-12

Part C: Model: TMG5800 / TMP5900 (2U BOX) - AC

Object/part No.	Manufacturer/ trademark	type/model	Technical data	mark(s) of conformity ¹)
+ Chassis / assembly (2U BOX)	TelcoBridges	Dimension: approx. 15.9 (D) by 16.8 (W) by 3.5 (H) inch Part#: 2000-90069	Material: Metal sheet; various thickness; Finish: 0.9mm Satin Coat; Secured with screws	See Att. 2-35 to 2-38; Att. 4-22 to 4-29
+ 8 Fan holder	Various	Dimension: approx. 0.45 (D) by 6.7 (W) by 3.2 (H) inch Part#: 2000-90039	Material: Metal sheet; various thickness; Finish: 0.9mm Satin Coat; Secured with screws	See Att. 2-40; Att. 4-30
Power supply, AC	iStarUSA	Redundant AC-DC, Switching power supply; 20+4 pin Part#: IS-500R2UP	Rating: 100- 240Vac; Various output voltages; Total: 500WMax	UL, E311876 TUV, CE See Att. 2-38 to 2-39; Att. 6-22 to 6-35
Fan (x8)	Sunon	GM Series High Speed 40mm 17 CFM Vapo Bearing 8 Motor Pole Fan; Part#: GM1204PQV1-8A	Rating: 12 VDC; Dimensions: 40 x 40 x 28 mm	UL See Att. 2-40
+ Motherboard	Various	Material: FR-4; Measured 13.6 by 11.8 by 1.6mm thick approx.; 14-layer Part#: 1700-00039	94V-0	UL94 V-0 See Att. 2-15 and 2-16
+ Connector; J2	Molex	4.2mm pitch mini-fit Jr. Header, Dual row, vertical, 20 circuits; Part#: 39-29-9202	Housing: PA Polyamide Nylon 6/6; 94V-2	UL, E29179; CSA, LR19980; TUV, R72081037 See Att. 6-4 to 6-5
+ Connector; J4	Bel Stewart	EMI-RFI shielded, ESD grounded, 2 port PCB Harmonica CAT 5 Jack, Non-flange Part#: SS-718802S	Housing; Thermoplastic; 94V-0	UL See Att. 6-6
+ Connector; J7	Amphenol	4 ports, high speed, modular jack, 8 position, 8 contacts, shielded with LEDs. Part#: RJHSE-5381-04	Housing: Thermoplastic, PA 4/6; 94V0	UL See Att. 6-9

Object/part No.	Manufacturer/ trademark	type/model	Technical data	mark(s) of conformity1)
+ DC-DC convertors; PS1, PS7, PS8	Texas Instruments	PTH series DC/DC convertor, Input non-isolated wide output adjust power module;	Meets 94V-0	SELV UL, CSA, VDE
		Part#: PTH05050W,		
+ DC-DC convertors; PS3, PS4	Texas Instruments	PTV series DC/DC convertor, Input non-isolated wide output adjust power module;	Meets 94V-0	SELV UL, CSA, VDE
		Part#: PTV03020W		
+ DC-DC convertors; PS5, PS6	Texas Instruments	ATH series DC/DC convertor, Input non-isolated wide output adjust power module;	Meets 94V-0	SELV UL, CSA, VDE
		Part#: ATH030A0X3		
+ Heatsink	Radian Heatsinks	Black ICE Series; Full Bricks Dimensions: 4.6'' x 2.4'' x 0.45'' Part#: HS1596EB	Material: Fin Aluminum with black anodize plating	Evaluated with product; See Att. 2-5
+ Display card PCB	Various	Material: FR-4; Measured 7.5 by 1.5 by 0.06 inch thick approx.; 14-layer Part#: 1700-00043	94V-0	UL94 V-0 See Att. 2-24 and 2-25
+ 16T1/E1 card PCB	Various	Material: FR-4; Measured 63 by 6.5 by 0.06 inch thick approx.; 6- layer Part#: 1700-00044	94V-0	UL94 V-0 See Att. 2-20 and 2-21
+ Protection device; F1- F64	Тусо	PolySwitch, PTC Device Part#: TRF250-145U	Rating: 60Vdc, 3A; Fault voltage: 250Vrms	UL, CSA, TUV; See Att. 2-20 and Att. 6-10
+ Connector; J1	Molex	High speed RJ45, Stacked modular jack, 2x8 position, shielded with LEDs;	Housing: Polyester (PBT); 94V0	UL See Att. 6-11 to 6-12
+ ATX Adaptor PCB	Various	Part#: 44520-0003 Material: FR-4; Measured 4.6 by 2.6 by 0.06 inch thick approx.; 4- layer Part#: 1700-00068	94V-0	UL94 V-0 See Att. 2-47 and 2-48

MASTER CONTRACT: 251006 REPORT: 2345690 PROJECT: 70024647

Object/part No.	Manufacturer/ trademark	type/model	Technical data	mark(s) of conformity1)
+ Connector; J3	Amphenol	Single-ports, high speed, modular jack, 8 positions, 8 contacts, shielded with LEDs. Part#: RJHSE-3380	Housing: Thermoplastic, PA 4/6; 94V0	UL See Att. 6-36 and 6-37
+ Connector; J2	Molex	Disk drive power connector; R/A Horizontal Header, right angle; 4 circuits Part#: 53109-0410	Housing: Polyamide Nylon; 94V0	UL See Att. 6-38
+ PCI Express Adaptor PCB	Various	Material: FR-4; Measured 1.55 by 0.8 by 0.06 inch thick approx.; 4-layer Part#: 1700-00069	94V-0	UL94 V-0 See Att. 2-47 and 2-48
Server motherboard	Intel	Computer server board. Part#: S3420gp	94V-0	SELV, Evaluated with product See Att. 2-20 and Att. 6-10

TEST:

Project 251006 (Edition 1)

Part A:

Device Tested: TMG800 (1U BOX) – DC version

The Clauses evaluated as per CAN/CSA C22.2 No 60950-1-03 and ANSI/UL 60950-1 1st ed as follows:

	Dowor Interfee	a (Innut) Tast		CSA/UL 60950-1	IEC 60950-1		
	Power Interfac	e (mput) Test	Clause	1.6.2	1.6.2		
<u>Accepta</u>	nce Criteria (or Max	imum Allowable Limit	t <u>s)</u> : Maximum 1	0% Deviation			
Complia	ance: Yes (x) No (()→ See "X"					
Test			Input	·			
No	Volts	Hz	Amps		Watts		
1	-46Vdc	NA	-1.16		53.4		
2	-48Vdc	NA	-1.12 53.8				
3	-52Vdc	NA	-1.04		54.1		
4	-63Vdc	NA	-0.89		55.9		
5	-65Vdc	NA	-0.87		56.6		
	Test Conditions						
1-5	DC input current measured with TMG800 (1U BOX) - DC unit operated with external computer, hubs and loop back cable to simulate worst power consumption.						

Heating Test		C	CSA/UL 60950-1	IEC 60950-1		
_			Clause	4.5.1	4.5.1	
Acceptance Criteria (or Maximum All	owable Limit	<u>s)</u> : Model:	TMG800 (1	U BOX) - DC		
Table 4B for allowed temperature limit						
Compliance: Yes (x) No () \rightarrow See						
Rated Voltage or Voltage Range: -46	5 to -65Vdc					
Rated Supply Frequency: NA						
$U_{\text{rest}} = V_{\text{rest}} (100/1) (101/1) = 16 V_{\text{rest}}$						
<u>Upper Limit (+0%)</u> : $(x 1)V = -46 V$ Lower Limit (-0%): $(x 1)V = -65V$						
	ce refer to C	1115 and/o	r manufactur	er specifications		
<u>Note</u> . Torother input voltage toleran	Note: For other input voltage tolerance, refer to Cl 1.4.5 and/or manufacturer specifications.					
Duty Cycle/Operating Condition: Con	ntinuous					
Rated Ambient: 55 °C						
	Μ	lax Temp M	easured (Deg	; °C) *	Max Temp	
	NA Hz,	NA Hz,	NA Hz,	#1 NA	Allowed	
T.C. Locations	-46Vdc;	-48Vdc;	-65Vdc;	Hz, -65Vdc;	(Deg °C)	
	Normal	Normal	Normal	Abnormal		
				Blocked		
				Front Air		
				vents		
J6	58.4	58.4	58.4	61	85	
J10	58.8	58.8	58.8	60.7	85	
Big heatsink left, rear view	58.2	58.2	58.1	65.8	NA	
Big heatsink right, rear view	57.7	57.8	57.7	65.1	NA	
Fan module, Mid fan rotor	62.9	62.5	63	71	70	
Heatsink on plug in module 1	56.4	56.4	56.4	57	NA	
Mid main PCB	63.5	63.4	63.5	70.7	105	
J2	59.6	59.6	59.7	63.8	105	
Power supply, DC Top	58.6	58.6	58.6	61.6	70	
Power supply, DC bottom	58.8	58.8	58.9	62.2	70	
T2	59.6	59.6	59.6	64.6	70	
T3	60	60	60.1	63.5	85	
Inside ambient	61.7	61.7	61.7	66.8	NA	
Top chassis	56.9	56.9	56.9	59.4	NA	
Chamber Ambient	55.7	55.8	55.7	56.3	NA	

Electric Strength Test		CSA/UL 60950-1	IEC 60950-1
(After Heating)	Clause	5.2	5.2
Acceptance Criteria (or Maximum Allowable Limits): No	insulation bi	reakdown during test.	
See Table 5B for required test voltage		-	
Compliance: Yes (x) No () \rightarrow See "X"			
Location		Test Voltage	Result
(A) ON COMPLETE SYSTEM:			
Primary DC input terminals and earth (chassis) – C	1 1000Vdc	Pass	
Primary DC input terminals and earth (chassis) – E	thernet #1	1000Vdc	Pass
Primary DC input terminals and earth (chassis) – T	elco #1	1000Vdc	Pass
5 V secondary, Ethernet and earth (chassis)		707Vdc	Pass
5 V secondary, Telco and earth (chassis)		707Vdc	Pass
Comments:		·	
TMG800 (1 U BOX) - DC tested after the abnormal Hea	ting tests. No	o insulation breaks down.	

Ahnor	mal - Component Fa	ailure (System)	(1/2)		CS.	A/UL 60950-1	IEC	60950-1
	*		Clat	se		5.3		5.3
Acceptance	e Criteria (or Maxim	um Allowable I	<u>imits)</u> :					
If a Th En No Cla No in t No und In t sof sho che If a unt If t	a fire occurs it shall a e equipment shall not def o overheating during ass E; Max 165K for o exposure to hazard o conclusive test resu the equipment. o breakdown when e der test to cool down case of doubt, the te fwood surface. A si owing emission of fl eesecloth or the tissu a wire or a printed w til ultimate results of the circuit is interrup al), using new comp here there is 10,000	not propagate be ot emit molten n form in such a w tests of 5.3.6(c) r Class F; Max 1 ous voltages/ene ilts on simulated lectric strength t n). sts are to be con ingle layer of ch ame or molten n ie paper glows o riring board trace ccur. This appli oted by the open ionents as necess	eyond the equip netal. ay as to cause r . Max 125K fo 85K for Class I rgies, a max ter circuits but con est of 5.2 as app ducted with the eesecloth is to b netal. The equi f flames (CSA e opens, the gap es to each occur ing of a compor sary (CSA and U	on-con c Class I. np of 2 nclusiv elicable equipt e drap poment and UI it to b rence tent, th JL).	A; Max 2 300C is ac we test resu e is applie ment place bed loosely is determ L). we electrica (CSA and he test is to	50K for Class ceptable. Its are obtained d (without allow ed on a white tis y over part of the ined not to comp ally shorted and UL).	B; Max 140 I with tests r wing the equ ssue-paper-c e equipment ply if the I the test con vice (three ti	K for epeated lipment covered tinued mes
• Wł tha	less, the circuit need here there is 20,000 in 125V but is not gr	Is not be subject Ω or more of ad reater than 250V	ed to the test. (ditional series in	CŜA ai npedai	nd UL). nce in a ci	rcuit in which t	he voltage is	s greater
• Wi tha	less, the circuit need here there is 20,000 in 125V but is not gr e: Yes (x) No ()	ls not be subject Ω or more of ad	ed to the test. (ditional series in	CŜA ai npedai	nd UL). nce in a ci	rcuit in which t	he voltage is	s greater
or Wł tha Complianc	less, the circuit need here there is 20,000 in 125V but is not gr e: Yes (x) No () Model/Type:	Is not be subject Ω or more of ad reater than 250V →See "X"	ed to the test. (ditional series in , the circuit nee	CŜA ai npedai	nd UL). nce in a ci be subjec	rcuit in which t ted to the test.	the voltage is (CSA and U	s greater
or Wh tha <u>Complianc</u> Fuse	less, the circuit need here there is 20,000 in 125V but is not gr e: Yes (x) No () Model/Type: Characteristic	ls not be subject Ω or more of ad reater than 250V →See "X" F: Qu	ed to the test. (ditional series in , the circuit nee ick-Acting	CŜA ai npedai	nd UL). nce in a ci be subjec H: H	rcuit in which t ted to the test. Iigh Breaking C	the voltage is (CSA and U	s greater
or Wł tha <u>Complianc</u> Fuse Installed	less, the circuit need here there is 20,000 in 125V but is not gr e: Yes (x) No () Model/Type: Characteristic (Check \checkmark)	Is not be subject Ω or more of ad reater than 250V →See "X" F: Qu T: Tir	ed to the test. (ditional series in , the circuit nee ick-Acting ne-Lag	CŜA ai npedai	nd UL). nce in a ci be subjec H: H	rcuit in which t ted to the test. Iigh Breaking C ow Breaking C	the voltage is (CSA and U Capacity apacity	s greate
or Wh tha <u>Complianc</u> Fuse	less, the circuit need here there is 20,000 in 125V but is not gr e: Yes (x) No () Model/Type: Characteristic	Is not be subject Ω or more of ad reater than 250V →See "X" F: Qu T: Tir	ed to the test. (ditional series in , the circuit nee ick-Acting	CŜA ai npedai	nd UL). nce in a ci be subjec H: H	rcuit in which t ted to the test. Iigh Breaking C	the voltage is (CSA and U Capacity apacity ngth	s greater L).
• Wi tha <u>Complianc</u> Fuse Installed	less, the circuit need here there is 20,000 in 125V but is not gr e: Yes (x) No () Model/Type: Characteristic (Check \checkmark)	Is not be subject Ω or more of ad reater than 250V →See "X" F: Qu T: Tin ponent	ed to the test. (ditional series in , the circuit nee ick-Acting ne-Lag	CŜA ai npedai	nd UL). nce in a ci be subjec H: H	rcuit in which t ted to the test. Iigh Breaking C ow Breaking C	the voltage is (CSA and U Capacity apacity	s greater
• Wi tha <u>Complianc</u> Fuse Installed	less, the circuit need here there is 20,000 in 125V but is not gr e: Yes (x) No () Model/Type: Characteristic (Check \checkmark) Compo	Is not be subject Ω or more of ad reater than 250V →See "X" F: Qu T: Tin onent ake air vents	ed to the test. (ditional series in , the circuit nee ick-Acting ne-Lag	CŜA at npeda: ds not	nd UL). nce in a ci be subjec H: H L: L From	rcuit in which t ted to the test. Iigh Breaking C ow Breaking C Electric Stre To Ground	the voltage is (CSA and U Capacity apacity ngth	s greater L).
• Wh tha Compliance Fuse Installed Fault # F/A	less, the circuit need here there is 20,000 in 125V but is not gr e: Yes (x) No () Model/Type: Characteristic (Check ✓) Blocked front int Tempe	Is not be subject Ω or more of ad reater than 250V →See "X" F: Qu T: Tin onent ake air vents rature	ed to the test. (ditional series in , the circuit nee ick-Acting ne-Lag Short/Open Elapsed Time	CŜA at npeda: ds not	nd UL). nce in a ci be subjec H: H L: L From	rcuit in which t ted to the test. ligh Breaking C ow Breaking C Electric Stre To	the voltage is (CSA and U Capacity apacity ngth	s greate L).
• Wh tha Compliance Fuse Installed Fault #	less, the circuit need here there is 20,000 in 125V but is not gr e: Yes (x) No () Model/Type: Characteristic (Check \checkmark) Blocked front int	Is not be subject Ω or more of ad reater than 250V →See "X" F: Qu F: Qu T: Tin onent ake air vents rature #1 Abnormal,	ed to the test. (ditional series in , the circuit nee ick-Acting ne-Lag Short/Open Elapsed	CŜA at npeda: ds not	nd UL). nce in a ci be subjec H: H L: L From	rcuit in which t ted to the test. Iigh Breaking C ow Breaking C Electric Stre To Ground	the voltage is (CSA and U Capacity apacity ngth	s greate L).
or Wh tha Compliance Fuse Installed Fault # F/A	less, the circuit need here there is 20,000 in 125V but is not gr e: Yes (x) No () Model/Type: Characteristic (Check ✓) Blocked front int See Clause 4.5.1 Blocked front air	Is not be subject Ω or more of ad reater than 250V →See "X" F: Qu T: Tin onent ake air vents rature #1 Abnormal, vents result	ed to the test. (ditional series in , the circuit nee ick-Acting ne-Lag Short/Open Elapsed Time	CŜA at npeda: ds not	nd UL). nce in a ci be subjec H: H L: L From	rcuit in which t ted to the test. Iigh Breaking C ow Breaking C Electric Stre To Ground	the voltage is (CSA and U Capacity apacity ngth	s greate L).
• Wh tha Compliance Fuse Installed Fault # F/A	less, the circuit need here there is 20,000 in 125V but is not gr e: Yes (x) No () Model/Type: Characteristic (Check ✓) Blocked front int See Clause 4.5.1 Blocked front air table Reversed Input v	Is not be subject Ω or more of ad reater than 250V →See "X" F: Qu T: Tin onent ake air vents rature #1 Abnormal, vents result	ed to the test. (ditional series in ditional series in the circuit nee ick-Acting ne-Lag Short/Open Elapsed Time 1.5 hour	CŜA at npeda: ds not	nd UL). nce in a ci be subjec H: H L: L From	rcuit in which t ted to the test. Iigh Breaking C ow Breaking C Electric Stre To Ground	the voltage is (CSA and U Capacity apacity ngth	s greate L).
• Wh tha Compliance Fuse Installed Fault # F/A 1 2 Observation #1. Tested	less, the circuit need here there is 20,000 in 125V but is not gr e: Yes (x) No () Model/Type: Characteristic (Check ✓) Blocked front int See Clause 4.5.1 Blocked front air table Reversed Input v	Is not be subject Ω or more of ad reater than 250V →See "X" F: Qu T: Tin onent ake air vents rature #1 Abnormal, vents result oltage, +65Vdc BOX) – DC vers	ed to the test. (ditional series in the circuit nee ick-Acting ne-Lag Short/Open Elapsed Time 1.5 hour 10 min	CSA and mpeda and shot	nd UL). nce in a ci be subjec H: H L: L From Primary Primary	rcuit in which t ted to the test. Iigh Breaking C ow Breaking C Electric Stre To Ground Secondary mperature stabi	the voltage is (CSA and U Capacity apacity ngth Voltage	P/F
• Wh tha Compliance Fuse Installed Fault # F/A 1 2 Observation #1. Tested hazard com	less, the circuit need here there is 20,000 in 125V but is not gr e: Yes (x) No () Model/Type: Characteristic (Check ✓) Compo Blocked front int Tempe See Clause 4.5.1 Blocked front air table Reversed Input voons on TMG800 (1 U H	Is not be subject Ω or more of ad reater than 250V →See "X" F: Qu T: Tin onent ake air vents rature #1 Abnormal, vents result oltage, +65Vdc BOX) – DC vers the test stopped	ed to the test. (ditional series in , the circuit nee ick-Acting ne-Lag Short/Open Elapsed Time 1.5 hour 10 min	CSA and mpeda and shot	nd UL). nce in a ci be subjec H: H L: L From Primary Primary	rcuit in which t ted to the test. Iigh Breaking C ow Breaking C Electric Stre To Ground Secondary mperature stabi	the voltage is (CSA and U Capacity apacity ngth Voltage	s greate L). P/F P P
or Wh tha Compliance Fuse Installed Fault # F/A 1 2 Observation #1. Tested hazard con	less, the circuit need here there is 20,000 in 125V but is not gr e: Yes (x) No () Model/Type: Characteristic (Check ✓) Compo Blocked front int Tempe See Clause 4.5.1 Blocked front air table Reversed Input vo ons on TMG800 (1 U Head to the condition	Is not be subject Ω or more of ad reater than 250V →See "X" F: Qu T: Tin onent ake air vents rature #1 Abnormal, vents result oltage, +65Vdc BOX) – DC vers the test stopped	ed to the test. (ditional series in , the circuit nee ick-Acting ne-Lag Short/Open Elapsed Time 1.5 hour 10 min	CSA and mpeda and shot	nd UL). nce in a ci be subjec H: H L: L From Primary Primary	rcuit in which t ted to the test. Iigh Breaking C ow Breaking C Electric Stre To Ground Secondary mperature stabi	the voltage is (CSA and U Capacity apacity ngth Voltage	s greate L). P/F

Part B:

Device Tested: Model: TMG3200 / TMP6400 (1U BOX) and TMG3200 / TMP6400 (2U BOX)

The Clauses evaluated as per CAN/CSA C22.2 No 60950-1-03 and ANSI/UL 60950-1 1st ed as follows:

1) TMG3200 / TMP6400 (1U BOX) – DC version

	Power Interface (Input) Test		Clause CSA/UL 60950-1 IEC 60950-1					
	``	. /	Clause	1.6.2	1.6.2			
<u>Accepta</u>	nce Criteria (or Maximu	<u>m Allowable Limits)</u> : M	laximum 1	0% Deviation				
Complia	ance: Yes (x) No $()$ -	→ See "X"						
Test		Ι	nput					
No	Volts	Hz	Amps	5	Watts			
1	-46Vdc	NA	-1.45		66.7			
2	-48Vdc	NA	-1.4		67.2			
3	-52Vdc	NA	-1.31		68.1			
4	-65Vdc	NA	-1.07	,	69.6			
	Test Conditions							
1-4	DC input current measu	ared with TMG3200 / T s and loop back cable to s						
		•		_				

Heating Test			CSA/UL			60950-1					
Theating Test	Clause	4.5	.1		4.5.1						
Acceptance Criteria (or Maximum Alle	Acceptance Criteria (or Maximum Allowable Limits): Model: TMG3200 / TMP6400 (1U BO										
Table 4B for allowed temperature limit		i									
Compliance: Yes (x) No () \rightarrow See "											
Rated Voltage or Voltage Range: -48	65Vdc										
Rated Supply Frequency: NA											
Upper Limit $(+0\%)$: = -48Vdc											
$\underline{\text{Lower Limit (-0\%)}} = -65 \text{Vdc}$. 1/	C (• • • • •							
<u>Note</u> : For other input voltage tolerand	ce, refer to CI 1.4.5	and/or ma	nufacturer	specificatio	ons.						
Dutu Cuele/Onemating Conditions Con	4										
Duty Cycle/Operating Condition: Cor	unuous										
Rated Ambient: 55 °C											
	Max 7	Femp Meas	urad (Dag	°C) *		Max Temp					
-	NA Hz,	NA I	· · · · · · · · · · · · · · · · · · ·	NA Hz		Allowed					
T.C. Locations	-46Vdc;	-48V		-65Vdc		(Deg °C)					
T.C. Locations	Normal	-48 V Norn	· ·	Norma	-	(Deg C)					
PCB by U2 (DSP board)	64.4	INUIT	64.1	Inorma	64.2	105					
Big Heatsink leftside, rear view	58.8		58.7		58.8	NA					
Big Heatsink rightside, rear view	62.8		62.7		62.8	NA					
PCB, mid (Main board)	63.7		63.4		63.5	105					
PCB by U21 (Telecom board)	66.1		66		66	105					
TMS 1-2 connector (Main board)	58.6		58.7		58.7	80					
ETH 1-4 connector (Main board)	58.9		59		59	80					
T1 (Main board)	59.8		59.8		59.8	70					
J1 (Telecom board)	56.9		56.9		56.9	85					
T1 (Telecom board)	57.8		57.9		57.9	85					
Fan, mid on rotor	65.5		64.4		64.5	70					
PCB, Display board by U1	57.9		58		58	105					
J2 connector (Main board)	58.2		58.3		58.3	105					
PCB, big Heatsink board	62.5		62.5		62.6	105					
Internal ambient, mid	58.4		58.3		58.4	NA					
PSU, Top chassis	58.9		58.8		58.9	70					
PSU, side chassis	59.3		59.3		59.4	70					
Top chassis	56.2		59.5		59.4	NA NA					
Bottom chassis	58.8		59.1		59.1	NA					
Chamber ambient	55.6		55.6		55.7	NA					

Heating Test			CSA/UL 60950-1	IEC 60950-1
		Clause	4.5.1	4.5.1
Acceptance Criteria (or Maximum All	owable Limits): M	odel: TM	G3200 / TMP6400 ((1U BOX) - DC
Table 4B for allowed temperature lim				
Compliance: Yes (x) No () \rightarrow See				
Rated Voltage or Voltage Range: -48	365Vdc			
Rated Supply Frequency: NA				
$\mathbf{L}_{\mathbf{r}} = \mathbf{L}_{\mathbf{r}} $				
$\frac{\text{Upper Limit (+0\%):}}{\text{Lower Limit (-0\%):}} = -48 \text{Vdc}$				
<u>Note:</u> For other input voltage toleran	call refer to $Cl 1 4 5$	and/or m	anufacturar spacificat	tions
<u>Note</u> . For other input voltage toterall			anulactuler specifica	uons.
Duty Cycle/Operating Condition: Co	ntinuous			
Rated Ambient: 55 °C				
	Max T	emp Mea	sured (Deg °C) *	Max Temp
	#1 NA Hz		#2 NA Hz,	· · ·
T.C. Locations	-65Vdc;		-65Vdc;	(Deg °C)
	Abnormal, Block	ed A	bnormal, Locked fan	n rotor
	front vents			
PCB by U2 (DSP board)	73.9		64.6	105
Big Heatsink leftside, rear view	75.9		60.4	NA
Big Heatsink rightside, rear view	79.6		63.8	NA
PCB, mid (Main board)	74.7		64	105
PCB by U21 (Telecom board)	75.6		65	105
TMS 1-2 connector (Main board)	60.3		59.1	80
ETH 1-4 connector (Main board)	62.4		59.5	80
T1 (Main board)	65.2		61.1	70
J1 (Telecom board)	58.2		56.8	85
T1 (Telecom board)	64.2		59.1	85
Fan, mid on rotor	70.2		64.4	70
PCB, Display board by U1	60.8		59	105
J2 connector (Main board)	63.3		59.6	105
PCB, big Heatsink board	86.3		65.7	105
Internal ambient, mid	67.7		58.8	NA
PSU, Top chassis	62.2		59.4	70
PSU, side chassis	63		59.8	70
Top chassis	58.8		56.3	NA
Bottom chassis	66.3		59.8	NA
Chamber ambient	56.5		55.6	NA

Electric Strength Test		CSA/UL 60950-1	IEC 60950-1
(After Heating)	Clause	5.2	5.2
Acceptance Criteria (or Maximum Allowable Limits): No	insulation b	reakdown during test.	
See Table 5B for required test voltage			
Compliance: Yes (x) No () \rightarrow See "X"			
Location		Test Voltage	Result
(A) ON COMPLETE SYSTEM:			
Primary DC input terminals and earth (chassis) – C	1 1000Vdc	Pass	
Primary DC input terminals and earth (chassis) – E	Ethernet #1	1000Vdc	Pass
Primary DC input terminals and earth (chassis) – T	Telco #1	1000Vdc	Pass
5 V secondary, Ethernet and earth (chassis)		707Vdc	Pass
5 V secondary, Telco and earth (chassis)		707Vdc	Pass
Comments:		·	
TMG3200 / TMP6400 (1U BOX) - DC tested after the a	hnormal He	ating tests. No insulation br	eaks down

Abnormal Component I	ailura (Systa	(1/2))		CSA	/UL 60950-1	IEC	60950-1	
Abnormal - Component F	sm) (1/2	Clause			5.3		5.3		
 Acceptance Criteria (or Maxim If a fire occurs it shall The equipment shall in Enclosure shall not de No overheating during Class E; Max 165K for No exposure to hazard No conclusive test ress in the equipment. No breakdown when e under test to cool dow In case of doubt, the to softwood surface. A sissification of fice cheesecloth or the tissification of fice cheesecloth or the tissification. If a wire or a printed we until ultimate results of the circuit is interrupt total), using new comp Where there is 10,000 or less, the circuit need. Where there is 20,000 	hum Allowab not propagat ot emit molte form in such g tests of 5.3.6 r Class F; Ma lous voltages/ ults on simula electric streng n). ests are to be ingle layer of lame or molte ue paper glow viring board t ccur. This ap pted by the op ponents as net Ω or more of ds not be subj Ω or more of	ble Limi te beyon en metal a way a 6(c). M ax 185K /energie ated circ gth test o conduct f cheese en meta ws of fla trace op pplies to pening o cessary f additio	its): ad the equipmen 1. as to cause non-of- fax 125K for Cla K for Class H. es, a max temp of cuits but conclust of 5.2 as applica ted with the equipment atted with the equipment atted with the equipment of a component, (CSA and UL). onal series impen- o the test. (CSA onal series impen- o the test. (CSA	complia ass A; N of 300C sive test ble is ap ipment aped lo nt is de UL). o be elect ce (CSA the test dance in and Ul dance in	Aax 1 is acc resu pplied place osely termin ctrica and t is to n a cin L).	vith 2.1.1, 2.6.1 50K for Class ceptable. Its are obtained d (without allow d on a white the over part of the ned not to com Ily shorted and UL). be repeated two rcuit in which the	B; Max 140 I with tests wing the eq ssue-paper- le equipmer ply if the I the test con vice (three t the voltage	d 4.4.1 DK for repeated uipment covered t ntinued imes is 125V is greater	
than 125V but is not g Compliance: Yes (x) No ()		50V, the	e circuit needs n	ot be su	ibject	ed to the test.	(CSA and U	JL).	
Model/Type:FuseCharacteristicInstalled(Check ✓)		Quick-				igh Breaking (ow Breaking C			
Fault # Comp			Short/Open		-	Electric Str			
Blocked front in		5		Fro	m	То	Voltage	P/F	
F/A Tempe	erature]	Elapsed Time	Prim Prim	-	Ground Secondary			
1 See Clause 4.5.1 result table	#1 Abnorma	ıl 1	.8 hour	11111	ui y	Secondary		Р	
2 See Clause 4.5.1 result table	#2 Abnorma	ıl 1	.2 hour					Р	
3 Reversed Input y	Reversed Input voltage, +65Vdc 5 min P								
^									
Observations #1. Tested on TMG3200 / TN No safety hazard condition ob #2. Tested on TMG3200 / TN No safety hazard condition ob #3. NO safety hazard condition	served and the IP6400 (1U served and the served a	ne test s BOX) – ne test s	topped when ter - DC version syst topped when ter	nperatu stem an	re rea d test	stop after tem	tion. perature sta		

2) TMG3200 / TMP6400 (2U BOX) – DC version

	Power Interface (Input) Test Clause CSA/UL 60950-1 IEC 60950-1						
	-			Clause	1.6.2	1.6.2	
<u>Accepta</u>	nce Criteria (c	or Maximum Allowable	<u>e Limits)</u> : N	Aaximum	10% Deviation		
Complia	ance: Yes (x)	No () \rightarrow See "X"					
Test				Input			
No	Volts	Hz	Am	ips	V	Vatts	
1	-46Vdc	NA	-2.2	25	103.5		
2	-48Vdc	NA	-2.	16	103.7		
3	-52Vdc	NA	-2.0	02	105		
4	-65Vdc	NA	-1.0	68		109	
	Test Condition	ons					
1-4		rent measured with TN puter, hubs and loop be					
	external com	puter, hubs and loop b	ack cable to	sinulate	worst power consump	uon.	

Heating Test			CSA/UL 60950-1	IEC 60950-1			
Heating Test		Clause	4.5.1	4.5.1			
Acceptance Criteria (or Maximum Allowable Limits): Model: TMG3200 / TMP6400 (2U BO							
Table 4B for allowed temperature limit							
Compliance: Yes (x) No () \rightarrow See							
Rated Voltage or Voltage Range: -48	365Vdc						
Rated Supply Frequency: NA							
$\operatorname{Linner} \operatorname{Linnit} (100/) = 40 \operatorname{Vde}$							
$\frac{\text{Upper Limit (+0\%):}}{\text{Lower Limit (-0\%):}} = -48 \text{Vdc}$							
<u>Note</u> : For other input voltage toleran	ce refer to $Cl 1 A$	5 and/or ma	nufacturer specifica	tions			
<u>Note</u> . Torother input voltage toleran			inulacturer specifica	tions.			
Duty Cycle/Operating Condition: Con	ntinuous						
Rated Ambient: 55 °C	itiliuous						
<u></u>							
	Max	Temp Meas	sured (Deg °C) *	Max Temp			
	NA Hz,	NA I	• _ /	A			
T.C. Locations	-46Vdc;	-52V	dc; -65V	dc; (Deg °C)			
	Normal	Norr	nal Norn	nal			
PCB by U2 (DSP board)	61.8	61.		1 105			
Big Heatsink leftside, rear view	58.6	57.	9 57.	8 NA			
Big Heatsink rightside, rear view	60.1	59.	4 59.	2 NA			
PCB, mid (Main board)	62.6	62.	0 61.	8 105			
PCB by U21 (Telecom board)	62.4	61.	7 61.	6 105			
TMS 1-2 connector (Main board)	57.6	57.	0 56.	8 80			
ETH 1-4 connector (Main board)	58.5	57.	8 57.	7 80			
T1 (Main board)	60.3	59.					
J1 (Telecom board)	56.1	55.					
T1 (Telecom board)	58.2	57.					
Fan, mid on rotor	62.9	62.	2 62.	1 70			
PCB, Display board by U1	58.2	57.	5 57.	4 105			
J2 connector (Main board)	58.0	57.					
PCB, big Heatsink board	64.7	64.	0 63.	9 105			
Internal ambient, mid	57.6	57.	0 56.				
PSU, Top chassis	57.2	56.	6 56.				
PSU, side chassis	57.1	56.					
Top chassis	55.9	55.	2 55.	0 NA			
Bottom chassis	57.0	56.	4 56.	2 NA			
Chamber ambient	55.3	54.	6 54.	5 NA			

Note: * - Power supply recommended operating ambient temperature and can be increase with decrease output power. Power supply tested with the equipment and no safety hazard condition observed.

Heating Test			CSA/UL 60950-1	IEC 60950-1
Heating Test		Clause	4.5.1	4.5.1
Acceptance Criteria (or Maximum All	lowable Limits): M	odel: TM	G3200 / TMP6400 (2	2U BOX) - DC
Table 4B for allowed temperature lim Compliance: Yes (x) No () \rightarrow See				
Rated Voltage or Voltage Range: -43				
Rated Supply Frequency: NA	505 v dc			
<u>rated Supply Frequency</u> . In f				
<u>Upper Limit (+0%)</u> : = $-48Vdc$ <u>Lower Limit (-0%)</u> : = $-65Vdc$ <u>Note</u> : For other input voltage toleran	nce, refer to Cl 1.4.5	and/or ma	anufacturer specificati	ons.
Duty Cycle/Operating Condition: Co	ntinuous			
Rated Ambient: 55 °C				
			1 (20. 0.02) +	
			sured (Deg °C) *	Max Temp
T.C. Logations	#1 NA Hz	Ζ,	#2 NA Hz,	Allowed
T.C. Locations	-65Vdc;	A he	-65Vdc; bnormal, Locked fan :	(Deg °C)
	Abnormal, Block front vents	eu A	Idnormal, Locked Ian	10101
PCB by U2 (DSP board)	69.6		62.5	105
Big Heatsink leftside, rear view	69.4		62.2	NA
Big Heatsink rightside, rear view	73.0		63.3	NA
PCB, mid (Main board)	70.9		63.0	105
PCB by U21 (Telecom board)	74.9		63.6	105
TMS 1-2 connector (Main board)	60.3		57.9	80
ETH 1-4 connector (Main board)	62.9		59.4	80
T1 (Main board)	65.7		60.3	70
J1 (Telecom board)	57.1		56.4	85
T1 (Telecom board)	64.3		57.9	85
Fan, mid on rotor	64.8		60.5	70
PCB, Display board by U1	61.8		59.0	105
J2 connector (Main board)	62.0		59.5	105
PCB, big Heatsink board	82.6		72.4	105
Internal ambient, mid	60.5		58.8	NA
PSU, Top chassis	60.5		58.6	50 *
PSU, side chassis	60.9		58.7	50 *
Top chassis	58.3		56.9	NA
Bottom chassis	60.5		56.9	NA
Chamber ambient	55.9		55.2	NA

Note: * - Power supply recommended operating ambient temperature and can be increase with decrease output power. Power supply tested with the equipment and no safety hazard condition observed.

Electric Strength Test		CSA/UL 60950-1	IEC 60950-1
(After Heating)	Clause	5.2	5.2
Acceptance Criteria (or Maximum Allowable Limits): No	insulation b	reakdown during test.	
See Table 5B for required test voltage		-	
Compliance: Yes (x) No () \rightarrow See "X"			
Location		Test Voltage	Result
(A) ON COMPLETE SYSTEM:			
Primary DC input terminals and earth (chassis) – C	1 1000Vdc	Pass	
Primary DC input terminals and earth (chassis) – E	Ethernet #1	1000Vdc	Pass
Primary DC input terminals and earth (chassis) – T	Telco #1	1000Vdc	Pass
5 V secondary, Ethernet and earth (chassis)		707Vdc	Pass
5 V secondary, Telco and earth (chassis)		707Vdc	Pass
Comments:		·····	
TMG3200 / TMP6400 (2U BOX) - DC tested after the a	bnormal Hea	ating tests. No insulation br	eaks down.

A 1		- il	1/2)		CSA	A/UL 60950-1	IEC	60950-1
Abnorn	nal - Component F	allure (System) (Clause			5.3		5.3
Acceptance If a If a Ence No a Class No a No a in th No a in th No a in th No a in th No a in th No a in th No a in th In casoft show chees If a unda Unda	nal - Component F <u>Criteria (or Maxim</u> fire occurs it shall equipment shall not def overheating during ss E; Max 165K for exposure to hazard conclusive test resu- ne equipment. breakdown when e er test to cool down ase of doubt, the te wood surface. A s wing emission of fl esecloth or the tissu- wire or a printed w l ultimate results on the circuit is interrup l), using new comp ere there is 10,000 ess, the circuit need ere there is 20,000	aum Allowable Linot propagate begot emit molten ma form in such a wa tests of 5.3.6(c). Class F; Max 18 ous voltages/ener ilts on simulated lectric strength ten ingle layer of che ame or molten ma te paper glows of firing board trace ccur. This applie oted by the openin onents as necessa Ω or more of add is not be subjecte	imits): yond the equipme etal. y as to cause non Max 125K for C 35K for Class H. gies, a max temp circuits but concl est of 5.2 as applic ducted with the equipme flames (CSA and opens, the gap it s to each occurrent ng of a component ary (CSA and UL litional series imp d to the test. (CS	-compli lass A; of 300C usive tes able is a uipment fraped la ent is da l UL). to be ele nce (CS, t, the tes). edance : A and U	ance v Max 1 C is ac st resu applie t place oosely etermi ectrica A and st is to in a ci JL).	5.3 with 2.1.1, 2.6.1 .50K for Class ceptable. llts are obtained d (without allow ed on a white ti y over part of the ned not to com ally shorted and UL). b be repeated two rcuit in which the	1, 2.10.3 and B; Max 140 d with tests r wing the equ ssue-paper-c e equipment ply if the l the test con vice (three tin the voltage is	5.3 4.4.1 K for epeated ipment covered tinued mes s 125V
	125V but is not g						•	•
Compliance	: Yes(x) No()	→See "X"						
F	Model/Type:		1 4				- ·.	
Fuse Installed	Characteristic (Check ✓)		ck-Acting		-	ligh Breaking (
Fault #	× /	T: Tim			L.L	ow Breaking C		
Fault #	Comp Blocked front int		Short/Open	Fre	- 100	Electric Str To	Voltage	P/F
E/A			Elanged Time	_			vonage	F / F
F/A	Tempe	lature	Elapsed Time	Prin Prin		Ground Secondary		+
1	See Clause 4.5.1 result table, Bloc		4 hour		iiui y	Secondary		Р
2	See Clause 4.5.1 result table, Lock	#2 Abnormal	1 hour					Р
3	Reversed Input v	oltage, +65Vdc	10 min					Р
Observation								
	on TMG3200 / TM azard condition obs							oilized.
The safety II								
#2. Tested of	on TMG3200 / TM azard condition ob							oilized.
#2. Tested of No safety ha	azard condition ob ety hazard condition	served and the tes	st stopped when te					oilized.

TMG3200 / TMP6400 (2U BOX) – AC version

	Power Interfac	e (Input) Test	Clause	CSA/UL 60950-1 1.6.2	IEC 60950-1 1.6.2		
<u>Accepta</u>	nce Criteria (or Max	timum Allowable Lin	<u>mits)</u> : Maximum	10% Deviation			
Complia	ance: Yes (x) No	()→ See "X"					
Test			Input				
No	Volts	Hz	Amps		Watts		
1	90	60	1.03		92.7		
2	100	60	0.92		92		
3	120	60	0.77		92.4		
4	132	60	0.72		95.0		
5	198	50	0.52		103.0		
6	220	50	0.50		110		
7	240	50	0.48		115.2		
8	264	50	0.53		139.9		
-	Test Conditions						
1-8	AC input current measured with TMG3200 / TMP6400 (2U BOX) – AC unit operated with						
	external computer, hubs and loop back cable to simulate worst power consumption.						

Heating Test			CSA/UL 60950-1	IEC 60950-1					
-			Clause 4.5.1						
Acceptance Criteria (or Maximum Allowable Limits): Model: TMG3200 / TMP6400 (2U BOX) - AC									
Table 4B for allowed temperature limi									
Compliance: Yes (x) No () \rightarrow See '	'X''								
Rated Voltage or Voltage Range: 100 - 240Vac									
Rated Supply Frequency: NA									
<u>Upper Limit (+10%)</u> : = 90Vac <u>Lower Limit (-10%)</u> : = 246Vac <u>Note</u> : For other input voltage toleran <u>Duty Cycle/Operating Condition</u> : Con		5 and/or ma	nufacturer specifica	ations.					
<u>Rated Ambient</u> : 55 °C									
		<u>^</u>	sured (Deg $^{\circ}$ C) *	Max Temp					
T.C. Locations	60 Hz,	60 H							
T.C. Locations	90Vac;	132V	,						
DCD by U2 (DSD b cond)	Normal	Norr							
PCB by U2 (DSP board)	60.5 57.7	<u> </u>							
Big Heatsink leftside, rear view	58.9	57.							
Big Heatsink rightside, rear view									
PCB, mid (Main board) PCB by U21 (Telecom board)	<u>61.4</u> 61.5	61.							
TMS 1-2 connector (Main board)	56.7	56.							
ETH 1-4 connector (Main board)	57.8	57.							
T1 (Main board)	59.3	<u> </u>							
J1 (Main board) J1 (Telecom board)	55.4	<u> </u>							
T1 (Telecom board)	57.5	57.							
Fan, mid on rotor	63.5	63.							
PCB, Display board by U1	57.6	57.							
J2 connector (Main board)	57.5	57.							
PCB, big Heatsink board	63.5	63.							
Internal ambient, mid	56.0	55.							
PSU, Top chassis	56.4	56.							
PSU, side chassis	55.8	55.							
Top chassis	55.2	55.							
Bottom chassis	55.3	55.							
Chamber ambient	54.9	54.							
	ד.ד	54.	J 1	./ 11/1					

Note:

Redundancy test was operated with only one power supply module and the other was installed without AC power applied.

* - Power supply recommended operating ambient temperature and can be increase with decrease output power. Power supply tested with the equipment and no safety hazard condition observed.

Heating Test			CSA/UL 60950-1	IEC 60950-1
Heating Test	Clause	4.5.1	4.5.1	
Acceptance Criteria (or Maximum Alle	owable Limits): M	lodel: TM	G3200 / TMP6400 (2	2U BOX) - AC
Table 4B for allowed temperature limi				
Compliance: Yes (x) No () \rightarrow See "				
Rated Voltage or Voltage Range: 100) - 240Vac			
Rated Supply Frequency: NA				
Use or Limit $(+100/)$ = 00 Vac				
$\frac{\text{Upper Limit (+10\%)}}{\text{Lower Limit (-10\%)}} = 90 \text{Vac}$				
<u>Note</u> : For other input voltage tolerand	ce refer to $Cl 1/15$	and/or ma	nufacturer specificat	ions
<u>Note</u> . Tor other input voltage tolerand			inulactuler specificat	10115.
Duty Cycle/Operating Condition: Cor	ntinuous			
Rated Ambient: 55 °C				
	Max 7	Temp Meas	sured (Deg °C) *	Max Temp
	50 Hz,	-	50 Hz,	Allowed
T.C. Locations	198Vac	· · · · · · · · · · · · · · · · · · ·	264Vac;	(Deg °C)
	Norma	1	Normal	
PCB by U2 (DSP board)	60.5		60.3	105
Big Heatsink leftside, rear view	57.7		57.6	NA
Big Heatsink rightside, rear view	58.9		58.7	NA
PCB, mid (Main board)	61.4		61.3	105
PCB by U21 (Telecom board)	61.5		61.2	105
TMS 1-2 connector (Main board)	56.7		56.5	80
ETH 1-4 connector (Main board)	57.8		57.7	80
T1 (Main board)	59.3		59.2	70
J1 (Telecom board)	55.4		55.3	85
T1 (Telecom board)	57.5		57.5	85
Fan, mid on rotor	63.6		63.7	70
PCB, Display board by U1	57.6		57.5	105
J2 connector (Main board)	57.5		57.4	105
PCB, big Heatsink board	63.5		63.7	105
Internal ambient, mid	56.3		56.1	NA
PSU, Top chassis	56.4		56.3	50 *
PSU, side chassis	55.8		55.8	50 *
Top chassis	55.2		55.2	NA
Bottom chassis	55.4		55.3	NA
Chamber ambient	55.0		54.8	NA

Note: * - Power supply recommended operating ambient temperature and can be increase with decrease output power. Power supply tested with the equipment and no safety hazard condition observed.

Heating Test			CSA/UL 60950-1	IEC 60950-1				
Heating Test		Clause	4.5.1	4.5.1				
Acceptance Criteria (or Maximum Allowable Limits): Model: TMG3200 / TMP6400 (2U BOX) - AC								
Table 4B for allowed temperature lim								
Compliance: Yes (x) No () \rightarrow See								
Rated Voltage or Voltage Range: 10 Rated Supply Frequency: NA	0 - 240Vac							
<u>Upper Limit (+10%)</u> : = 90Vac <u>Lower Limit (-10%)</u> : = 246Vac <u>Note</u> : For other input voltage tolerar	-	and/or ma	anufacturer specificat	ions.				
Duty Cycle/Operating Condition: Co <u>Rated Ambient</u> : 55 °C	ntinuous							
	Max T	emp Mea	sured (Deg °C) *	Max Temp				
	#1 60 Hz	,	#2 60 Hz,	Allowed				
T.C. Locations	132Vac;		132Vac;	(Deg °C)				
	Abnormal, Block	ed Abnormal, Locked fa		rotor				
	front vents							
PCB by U2 (DSP board)	69.2		61.8	105				
Big Heatsink leftside, rear view	69.5		61.4	NA				
Big Heatsink rightside, rear view	73.0		62.8	NA				
PCB, mid (Main board)	70.3		62.0	105				
PCB by U21 (Telecom board)	72.8		63.1	105				
TMS 1-2 connector (Main board)	59.0		57.6	80				
ETH 1-4 connector (Main board)	61.9		59.0	80				
T1 (Main board)	64.1		59.8	70				
J1 (Telecom board)	56.3		56.1	85				
T1 (Telecom board)	63.3		57.4	85				
Fan, mid on rotor	70.1		60.5	70				
PCB, Display board by U1	60.7		58.3	105				
J2 connector (Main board)	62.0		59.0	105				
PCB, big Heatsink board	81.0	71.8		105				
Internal ambient, mid	57.6	57.9		NA				
PSU, Top chassis	58.8		57.6	50 *				
PSU, side chassis	58.8		57.4	50 *				
Top chassis			56.4	NA				
Bottom chassis	56.7		55.7	NA				
Chamber ambient	55.0		55.2	NA				

Note: * - Power supply recommended operating ambient temperature and can be increase with decrease output power. Power supply tested with the equipment and no safety hazard condition observed.

Electric Strength Test		CSA/UL 60950	IEC 60950-1
(After Heating)	Clause	5.2	5.2
Acceptance Criteria (or Maximum Allowable Limits): No	insulation b	eakdown during test.	
See Table 5B for required test voltage			
Compliance: Yes (x) No () \rightarrow See "X"			
Location		Test Volta	ge Result
(A) ON COMPLETE SYSTEM:			
Primary AC input terminals and earth (chassis)		2121Vdc	Pass
Primary AC input terminals and earth (chassis) – E	TH-1	2121Vdc	Pass
Primary AC input terminals and earth (chassis) – T	elco #1	2121Vdc	Pass
Primary AC input terminals and earth (chassis) – E	TH -3	2121Vdc	Pass
Primary AC input terminals and earth (chassis) – M	2121Vdc	Pass	
5 V secondary, ETH -1 and earth (chassis)	Pass		
5 V secondary, Telco #1 and earth (chassis)		707Vdc	Pass
5 V secondary, ETH-3 and earth (chassis)		707Vdc	Pass
Comments:		· · · · ·	
TMG3200 / TMP6400 (2U BOX) – AC version tested a	fter the abno	rmal Heating tests N	o insulation breaks
		ina maing costs, iv	
down.			

					CSA	A/UL 60950-1	IEC	60950-1			
Abnorr	Abnormal - Component Failure (System) (1/			lause	0.01	5.3		5.3			
Acceptance Criteria (or Maximum Allowable Limits):											
• If a fire occurs it shall not propagate beyond the equipment.											
• The equipment shall not emit molten metal.											
• Enclosure shall not deform in such a way as to cause non-compliance with 2.1.1, 2.6.1, 2.10.3 and 4.4.1											
	No overheating during tests of 5.3.6(c). Max 125K for Class A; Max 150K for Class B; Max 140K for										
	Class E; Max 165K for Class F; Max 185K for Class H.										
	No exposure to hazardous voltages/energies, a max temp of 300C is acceptable. No conclusive test results on simulated circuits but conclusive test results are obtained with tests repeated										
in th	ne equipment.							•			
	breakdown when e er test to cool down		est of 5.2 as a	applicab	le is applie	d (without allow	wing the equ	ipment			
soft sho	ase of doubt, the te wood surface. A si wing emission of fl	ingle layer of che ame or molten m	esecloth is t tetal. The ec	o be dra Juipmen	ped loosely t is determi	over part of th	e equipmen				
	esecloth or the tissu						1. 1				
	wire or a printed w						the test con	tinued			
	l ultimate results on ne circuit is interrup	11			·	/	riaa (thraa ti	mag			
	l), using new comp				ine test is to	be repeated tw	ice (unee u	mes			
	ere there is 10,000				ance in a ci	reuit in which t	he voltage i	s 125V			
	ess, the circuit need										
	ere there is 20,000			·		rcuit in which t	he voltage i	s greater			
thar	n 125V but is not gi		, the circuit r	needs no	t be subject	ed to the test.	(CSA and U	L).			
Compliance	: Yes(x) No()	→See "X"									
	Model/Type:										
Fuse	Characteristic	F: Qui	ck-Acting		H: H	igh Breaking C	Capacity				
Installed	(Check ✓)	T: Tin	ne-Lag		L: L	ow Breaking C	apacity				
Fault #	Comp	onent	Short/Ope	n		Electric Strength					
	Blocked front int	ake air vents			From	То	Voltage	P/F			
F/A	Tempe	rature	Elapsed 7	ime	Primary	Ground					
					Primary	Secondary					
1	See Clause 4.5.1 result table, Bloc		1 hour					Р			
2 See Clause 4.5.1 #2 Abnormal result table, Locked Fan rotor			1 hour					Р			
Observation			<u>I</u>			L	1	1			
#1. Tested on TMG3200 / TMP6400 (2U BOX) – AC version system and test stop after temperature stabilized.											
	azard condition ob		· ·	2							
2	on TMG3200 / TM							ilized			
	azard condition ob										
1.0 Survey II			or stopped w		r si acaro i ot						
Ambient 55	5°C										

Touch and Protective Conductor					CSA/UL	IEC 60950-1			
				Clause	Clause 5.1		5.1		
Comp	Compliance: Yes (x) No () \rightarrow See "X"								
No.	Leakage (mA)	Input Volt/Hz	Measured Volt(U ₂ #)	Location		Primary Power Switch*	Comments (eg:Filter Name/Type)		
1	1.53	264Vac / 50 Hz		Line to Ear	th, Forward	NA	Note 1		
2	0.84	264Vac / 50 Hz		Neutral to I	Earth, Forward	NA	Note 1		
3	1.54	264Vac / 50 Hz		Line to Ear	th, Reverse	NA	Note 1		
4	0.82	264Vac / 50 Hz		Neutral to I	Earth, Reverse	NA	Note 1		
 U₂ refers to voltage measured as per Annex D. Unit under test with: <u>Single-Pole Primary Power Switch</u>: Take four measurements (combination of two mains polarities and two primary power switch positions). <u>Double-Pole Primary Power Switch</u>: Take two measurements (for two possible mains polarities). Normal and reverse refer to input power polarity (switch P1 of Fig 5A & 5B). Accessible non-conductive parts is tested using a 10 cm x 2 cm metal foil in contact with the parts of the surface. 									
5 6		ent, EMC component					one at a time.		
6 7									
Comments:									
Note 1: Leakage current tested on TMG3200 / TMP6400 (2U BOX) - AC version with both power supplies operated.									

				CS	A/UL 60950-1	IEC 60950-1
	nce of Earthing Con		Clause		2.6.3.4	2.6.3.4
Acceptance Criteria	a (or Maximum Allo	owable Limits):				
and the resistance of the current rating	of the circuit is 16A calculated shall not e g of the circuit excee p across the protect	exceed 0.1 ohm. eds 16A, the test cr	urrent is 2 ti	mes the cu	-	
f the current rating	g of the circuit is 164 calculated shall not e		current is 2 t	imes the c	urrent rating of th	e circuit for 120s
	g of the circuit excee nd the voltage drop					
	Current ra	ating of circuit	Ti	me, minut	es	
		≤ 30		2		
	>30	and ≤ 60		4		
	>60	and ≤100		5		
	>100	and ≤200		8		
		>200		10		
		Ref: CSA C	C22.2 No 0.4	1		
Compliance: Yes ($(X) \operatorname{No}() \to \operatorname{See}$: "X"				
Earth Path Resista	nce Measurements:				-	
Test Current*	Max volt Drop	Test Time **	Calcu	lated		
(A)	(V)	(min)	Resistance	e (ohm)	From	То
40.3	0.523	4	0.0)1	Chassis Input earth terminal	Front chassis bottom right corner
	(Max allowable 4V)		(max all 0.1 o			
Comments:			1			I
	200 / TMP6400 (2U	(BOX) - AC versi	ion chassis v	with both r	ower cumplies inc	talled
	2007 11011 0400 (20	DOA) - AU VEISI		viii ooiii p	ower suppries ms	lancu.

Part C:

Device Tested: TMG5800 / TMP5900 (2U BOX) – AC version

The Clauses evaluated as per CAN/CSA C22.2 No 60950-1-03 and ANSI/UL 60950-1 1st ed as follows:

	Dowor Int	arfaga (Innut) Tagt			CSA/UL 60950-1	IEC 60950-1
	Power Interface (Input) Test		Clause	1.6.2	1.6.2	
<u>Accepta</u>	nce Criteria (or	Maximum Allowable 1	<u>Limits)</u> : N	/laximum	10% Deviation	
Complia	ance: Yes (x)	No () \rightarrow See "X"				
Test]	Input		
No	Volts	Hz		Amps		Watts
1	90	60		1.92		172.8
2	100	60		1.73		173
3	120	60		1.45		174
4	132	60		1.33		175.6
5	189	50		0.96		181.4
6	220	50		0.86		189.2
7	240	50		0.82		196.8
8	264	50		1.27		335.3
	Test Condition	IS				
1-8	The AC input	current measurements v	were condu	ucted on t	he TMG5800 / TMP	5900 (2U BOX) –
	AC version pr	oduct that operated wit	th both AC	c power su	pply modules. An ex	ternal computer,
	hubs and loop	back cables were used	to simulat	e the norm	nal maximum operation	on condition.

		CSA	/UL 60950-1	IEC 60950-1
Heating Test		Clause	4.5.1	4.5.1
Acceptance Criteria (or Maximum A	llowable Limits): T			
	<u> </u>		,	
Table 4B for allowed temperature lin	nits			
Compliance: Yes (x) $No() \rightarrow See$	"X"			
Rated Voltage or Voltage Range: 10	00-240 Vac	·		
Rated Supply Frequency: 50/60				
<u>Upper Limit (+10%)</u> : (240 x 1.1)V				
$\underline{\text{Lower Limit (-10\%)}}: (100 \times 0.90) \text{V}$		5 1/ 0	·	
Note: For other input voltage tolera	nce, refer to CI 1.4.	5 and/or manufact	urer specifications.	
Data Carls/Onerating Carlitians C				
Duty Cycle/Operating Condition: Co	ontinuous			
Rated Ambient: 55 °C				
	Max	Temp Measured (Deg °C) *	Max Temp
	60 Hz, 90Vac;	60 Hz, 120Vac	~ /	
T.C. Locations	Normal	Normal	Normal	(Deg °C)
PCB DSP board, by U2	66.2	65.9	66.3	105
Big Heatsink, CPU board	60.7	60.8	60.8	NA
PCB CPU board, by C24	65.3	65.3	65.4	105
PCB Power Interface board, by	05.5	05.5	05.1	105
C14	68.2	68.2	68.2	105
PCB Telco board, by U21	65.3	65.4	65.5	105
T1, Telco board	58.6	58.7	58.6	85
J1, Telco board	57.5	57.5	57.5	85
T1, Main board	61.2	61.2	61.3	70
Port 1, Main board	59.7	59.8	59.8	80
Port 2, Main board	61.4	61.3	61.5	80
PCB Main board, by U57	60.7	60.9	60.8	105
Inside ambient, Mid center	57.3	57.4	57.4	NA
Fan rotor, 2nd bottom right	62.4	62.4	62.5	70
PCB Display board, by U1	66	66	66.1	105
J2 power connector, Main board	60.1	60	60.1	105
CPU Heatsink, Mother board	60.9	62.7	61	NA
PCB Mother board, Mid	58.9	59.3	59	105
PCB Desktop adaptor	64	64.3	64.1	105
Power supply top chassis	59.7	59.8	59.8	50 *
Power supply side chassis	57.8	57.8	57.8	50 *
Inside top Mother board ambient	59.6	60.2	59.8	NA
Fan rotor, 2nd top right	63.8	63.7	63.9	70
Power supply module bottom				
chassis	62	62	62	50 *
EUT top chassis	55.9	56	56	NA
Chamber ambient	55.6	55.6	55.7	NA

Note: * - Power supply recommended operating ambient temperature and can be increase with decrease output power. Power supply tested with the equipment and no safety hazard condition observed.

		CSA	A/UL 60950-1	IEC 60950-1
Heating Test		Clause	4.5.1	4.5.1
Acceptance Criteria (or Maximum Al	lowable Limits): T	MG5800 / TMI	P5900 (2U BOX	K) – AC version
Table 4B for allowed temperature lim				
Compliance: Yes (x) No () \rightarrow See				
Rated Voltage or Voltage Range: 10	00-240 Vac			
Rated Supply Frequency: 50/60				
	26437			
<u>Upper Limit (+10%)</u> : $(240 \times 1.1)V =$				
Lower Limit (-10%): (100x 0.90)V Note: For other input voltage tolerar		and/or manufa	aturar spacificat	ions
<u>Note</u> . For other input voltage toleral	ice, ieiei io CI 1.4.5	anu/or manufa	cturer specificat	10118.
Duty Cycle/Operating Condition: Co	ontinuous			
Rated Ambient: 55 °C	mmuous			
		Max Temp Me	easured (Deg °C) *
	50 Hz, 189Vac;	50 Hz, 264Va		264Vac; Normal,
T.C. Locations	Normal	Normal		Redundancy
PCB DSP board, by U2	66.3	66.2		66.4
Big Heatsink, CPU board	60.8	60.7		60.9
PCB CPU board, by C24	65.4	65.3		65.5
PCB Power Interface board, by				
C14	68.2	68.2		68.6
PCB Telco board, by U21	65.4	65.8		65.5
T1, Telco board	58.6	58.6		58.7
J1, Telco board	57.5	57.5		57.6
T1, Main board	61.2	61.1		61.4
Port 1, Main board	59.8	59.7		59.9
Port 2, Main board	61.5	61.3		61.7
PCB Main board, by U57	60.8	60.7		60.9
Inside ambient, Mid center	57.4	57.3		57.4
Fan rotor, 2nd bottom right	62.5	62.5		62.7
PCB Display board, by U1	66.1	66		66.2
J2 power connector, Main board	60.1	60		60.3
CPU Heatsink, Mother board	61	61.3		61.2
PCB Mother board, Mid	59	59.1		59
PCB Desktop adaptor	64.1	64.4		64.2
Power supply top chassis	59.7	59.5		56.7
Power supply side chassis	57.8	57.7		56.4
Inside top Mother board ambient	59.7	60		59.9
Fan rotor, 2nd top right	63.8	64.7		63.8
Power supply module bottom				
chassis	61.9	61.6		61
EUT top chassis	56	56.1		56
Chamber ambient	55.6	55.6		55.6

Note: Redundancy was operated with only one power supply module and the other had no power applied. * - Power supply recommended operating ambient temperature and can be increase with decrease output power. Power supply tested with the equipment and no safety hazard condition observed.

Hasting Test		CSA/UL 60950-1	IEC 60950-1
Heating Test	Clause	4.5.1	4.5.1
Acceptance Criteria (or Maximum Allowable Limits): TI	MG5800 /	TMP5900 (2U BOX	() – AC version
Table 4B for allowed temperature limits			
Compliance: Yes (x) No () \rightarrow See "X"			
Rated Voltage or Voltage Range: 100-240 Vac			
Rated Supply Frequency: 50/60			
<u>Upper Limit (+10%)</u> : $(240 \times 1.1)V = _264V$ <u>Lower Limit (-10%)</u> : $(100 \times 0.90)V = _90V$ <u>Note</u> : For other input voltage tolerance, refer to Cl 1.4.5	and/or ma	anufacturer specificat	ions.
Duty Cycle/Operating Condition: Continuous Rated Ambient: 55 °C			

	Max Temp Mea	asured (Deg °C) *
	#1 50 Hz, 264Vac;	#2 50 Hz, 256Vac; Abnormal,
T.C. Locations	Abnormal, Blocked front vents	Locked bottom fan rotor
PCB DSP board, by U2	71.2	67.3
Big Heatsink, CPU board	75	62.8
PCB CPU board, by C24	84.6	68.1
PCB Power Interface board, by		
C14	91.5	68.5
PCB Telco board, by U21	74.6	65
T1, Telco board	67.8	60.6
J1, Telco board	58.1	57.3
T1, Main board	63.1	62.6
Port 1, Main board	60.8	61.2
Port 2, Main board	60.2	62.5
PCB Main board, by U57	72.7	62.2
Inside ambient, Mid center	69.4	58.7
Fan rotor, 2nd bottom right	85.1	63.8
PCB Display board, by U1	71.3	67.3
J2 power connector, Main board	75.8	61.1
CPU Heatsink, Mother board	68.2	61.2
PCB Mother board, Mid	68.3	59.4
PCB Desktop adaptor	74.2	64.5
Power supply top chassis	65.3	59.8
Power supply side chassis	66.4	58
Inside top Mother board ambient	68.6	59.7
Fan rotor, 2nd top right	74.1	63.8
Power supply module bottom		
chassis	66.5	62.1
EUT top chassis	60.8	56.1
Chamber ambient	56.2	55.6

Note: * - Power supply recommended operating ambient temperature and can be increase with decrease output power. Power supply tested with the equipment and no safety hazard condition observed.

Electric Strength Test		CSA/UL 60950-1	IEC 60950-1
(After Heating)	Clause	5.2	5.2
Acceptance Criteria (or Maximum Allowable Limits): No	insulation b	reakdown during test.	
See Table 5B for required test voltage			
Compliance: Yes (x) No () \rightarrow See "X"		i	
Location		Test Voltage	Result
(A) ON COMPLETE SYSTEM:			
Primary AC input terminals and earth (chassis)		2121Vdc	Pass
Primary AC input terminals and earth (chassis) – E	ETH #1	2121Vdc	Pass
Primary AC input terminals and earth (chassis) – T	felco #1	2121Vdc	Pass
Primary AC input terminals and earth (chassis) – E	2121Vdc	Pass	
Primary AC input terminals and earth (chassis) – N	/IBL - 1	2121Vdc	Pass
5 V secondary, ETH #1 and earth (chassis)		707Vdc	Pass
5 V secondary, Telco #1 and earth (chassis)		707Vdc	Pass
5 V secondary, Ethernet and earth (chassis)		707Vdc	Pass
5 V secondary, MBL and earth (chassis)		707Vdc	Pass
Comments:			
	0 1 1	1.77	
TMG5800 / TMP5900 (2U BOX) – AC version tested a	tter the abno	rmal Heating tests, No insu	lation breaks
down.			

Installed (Check ✓) T: Time-Lag L: Low Breaking Capacity Fault # Component Short/Open Electric Strength Blocked front intake air vents From To P/F F/A Temperature Elapsed Time Primary Ground I See Clause 4.5.1 #1 Abnormal, Blocked front vents result table 1.2 hour P	A has a set	nal Common ant Fo	iluna (Suntana) (1/2)	CSA/U	L 60950-1	IEC 60950-1	
If a fire occurs it shall not propagate beyond the equipment. The equipment shall not emit molten metal. Enclosure shall not deform in such a way as to cause non-compliance with 2.1.1, 2.6.1, 2.10.3 and 4.4.1 No overheating during tests of 5.3 (6c). Max 125K for Class A; Max 150K for Class B; Max 140K for Class F; Max 165K for Class F; Max 185K for Class A. No exposure to hazardous voltages/energies, a max temp of 300C is acceptable. No conclusive test results on simulated circuits but conclusive test results are obtained with tests repeated in the equipment. No breakdown when electric strength test of 5.2 as applicable is applied (without allowing the equipment under test to cool down). In case of doubt, the tests are to be conducted with the equipment placed on a white tissue-paper-covered softwood surface. A single layer of cheesecloth is to be draped loosely over part of the equipment showing emission of flame or molten metal. The equipment is determined not to comply if the cheesecloth or the tissue paper glows of flames (CSA and UL). If a wire or a printed wiring board trace opens, the gap it to be electrically shorted and the test continued until ultimate results occur. This applies to each occurrence (CSA and UL). If the circuit is interrupted by the opening of a component, the test is to be repeated twice (three times total), using new components as necessary (CSA and UL). Where there is 20,000 Ω or more of additional series impedance in a circuit in which the voltage is greater than 125V but is not greater than 250V, the circuit needs not be subjected to the test. (CSA and UL). Compliance:	Abnorr	nal - Component Fa	illure (System) ((1/2) Clause	;	5.3	5.3	
than 125V but is not greater than 250V, the circuit needs not be subjected to the test. (CSA and UL). Compliance: Yes (x) No () \rightarrow See "X" Model/Type: Model/Type: Fuse Characteristic F: Quick-Acting H: High Breaking Capacity Fault # Component Short/Open Electric Strength Blocked front intake air vents From To P/F F/A Temperature Elapsed Time Primary Ground See Clause 4.5.1 #1 Abnormal, Blocked front vents result table 1.2 hour P Quest Abstraction See Clause 4.5.1 #2 Abnormal, Locked bottom fan rotor result table 1.2 hour P Observations #1. Tested on TMG5800 / TMP5900 (2U BOX) – AC version system and test stop after temperature stabilized. No safety hazard condition observed and the test stopped when temperature reached stabilization. #2. Tested on TMG5800 / TMP5900 (2U BOX) – AC version system and test stop after temperature stabilized. No safety hazard condition observed and the test stopped when temperature reached stabilization.	 If a The Ence No Cla No No in tl No und In c soft sho che If a unti If the tota Wh or he 	fire occurs it shall ne equipment shall not elosure shall not defo overheating during ss E; Max 165K for exposure to hazardo conclusive test resu- he equipment. breakdown when el- ler test to cool down case of doubt, the test twood surface. A si wing emission of fla- esecloth or the tissu wire or a printed w il ultimate results oc- ne circuit is interrup l), using new compo- ere there is 10,000 g	hot propagate bey of emit molten m orm in such a wa tests of 5.3.6(c). Class F; Max 18 ous voltages/ener lts on simulated ectric strength te b). sts are to be cond ngle layer of che ame or molten m e paper glows of iring board trace ccur. This applie ted by the openin onents as necessa Ω or more of add s not be subjecte	yond the equipm etal. ay as to cause no Max 125K for 0 35K for Class H. rgies, a max temp circuits but conc est of 5.2 as appli ducted with the e essecloth is to be retal. The equipm f flames (CSA ar opens, the gap i s to each occurrent ng of a compone ary (CSA and UI litional series im d to the test. (CS	n-compliance with Class A; Max 150F o of 300C is accept lusive test results a cable is applied (w quipment placed o draped loosely over nent is determined d UL). to be electrically ence (CSA and UL nt, the test is to be L). pedance in a circui SA and UL).	K for Class B; Ma table. are obtained with without allowing the n a white tissue-p er part of the equi not to comply if shorted and the te). repeated twice (the t in which the vol	tests repeated he equipment aper-covered pment the est continued hree times ltage is 125V	
Fault # Component Short/Open Electric Strength Blocked front intake air vents From To P/F F/A Temperature Elapsed Time Primary Ground 1 See Clause 4.5.1 #1 Abnormal, Blocked front vents result table 1.2 hour P 2 See Clause 4.5.1 #2 Abnormal, Locked bottom fan rotor result 1.2 hour P 41. Tested on TMG5800 / TMP5900 (2U BOX) – AC version system and test stop after temperature stabilized. No safety hazard condition observed and the test stopped when temperature reached stabilization. #2. Tested on TMG5800 / TMP5900 (2U BOX) – AC version system and test stop after temperature stabilized. No safety hazard condition observed and the test stopped when temperature reached stabilization.	thar Compliance Fuse	n 125V but is not gr : Yes (x) No () Model/Type: Characteristic	eater than 250V, →See "X" F: Qui	the circuit need	not be subjected t	to the test. (CSA Breaking Capaci	and UL).	
Blocked front intake air vents From To P/F F/A Temperature Elapsed Time Primary Ground Primary Secondary Primary Secondary P See Clause 4.5.1 #1 Abnormal, Blocked front vents result table 1.2 hour P P See Clause 4.5.1 #2 Abnormal, Locked bottom fan rotor result table 1.2 hour P P Observations #1. Tested on TMG5800 / TMP5900 (2U BOX) – AC version system and test stop after temperature stabilized. No safety hazard condition observed and the test stopped when temperature reached stabilization. #2. Tested on TMG5800 / TMP5900 (2U BOX) – AC version system and test stop after temperature stabilized. No safety hazard condition observed and the test stopped when temperature reached stabilization.		· · · · · ·						
F/A Temperature Elapsed Time Primary Ground Primary Secondary Primary Secondary 1 See Clause 4.5.1 #1 Abnormal, Blocked front vents result table 1.2 hour P 2 See Clause 4.5.1 #2 Abnormal, Locked bottom fan rotor result table 1.2 hour P Observations #1. Tested on TMG5800 / TMP5900 (2U BOX) – AC version system and test stop after temperature stabilized. No safety hazard condition observed and the test stopped when temperature reached stabilization. #2. Tested on TMG5800 / TMP5900 (2U BOX) – AC version system and test stop after temperature stabilized. No safety hazard condition observed and the test stopped when temperature reached stabilization.	r'auti #	-		Short/Open		0	P/F	
1 See Clause 4.5.1 #1 Abnormal, Blocked front vents result table 1.2 hour P 2 See Clause 4.5.1 #2 Abnormal, Locked bottom fan rotor result table 1.2 hour P Observations #1. Tested on TMG5800 / TMP5900 (2U BOX) – AC version system and test stop after temperature stabilized. No safety hazard condition observed and the test stopped when temperature reached stabilization. #2. Tested on TMG5800 / TMP5900 (2U BOX) – AC version system and test stop after temperature stabilized. Wo safety hazard condition observed and the test stopped when temperature reached stabilization. #2. Tested on TMG5800 / TMP5900 (2U BOX) – AC version system and test stop after temperature stabilized.	F/A			Elapsed Time				
Blocked front vents result table Image: See Clause 4.5.1 #2 Abnormal, Locked bottom fan rotor result 1.2 hour P 2 See Clause 4.5.1 #2 Abnormal, Locked bottom fan rotor result 1.2 hour P Observations #1. Tested on TMG5800 / TMP5900 (2U BOX) – AC version system and test stop after temperature stabilized. No safety hazard condition observed and the test stopped when temperature reached stabilization. #2. Tested on TMG5800 / TMP5900 (2U BOX) – AC version system and test stop after temperature stabilized. No safety hazard condition observed and the test stopped when temperature reached stabilization. #2. Tested on TMG5800 / TMP5900 (2U BOX) – AC version system and test stop after temperature stabilized. No safety hazard condition observed and the test stopped when temperature reached stabilization.					Primary	Seconda	÷	
Locked bottom fan rotor result table Locked bottom fan rotor result table Observations #1. Tested on TMG5800 / TMP5900 (2U BOX) – AC version system and test stop after temperature stabilized. No safety hazard condition observed and the test stopped when temperature reached stabilization. #2. Tested on TMG5800 / TMP5900 (2U BOX) – AC version system and test stop after temperature stabilized. No safety hazard condition observed and the test stopped when temperature reached stabilization. #2. Tested on TMG5800 / TMP5900 (2U BOX) – AC version system and test stop after temperature stabilized. No safety hazard condition observed and the test stopped when temperature reached stabilization.	1		· · · · · · · · · · · · · · · · · · ·	1.2 hour			Р	
 #1. Tested on TMG5800 / TMP5900 (2U BOX) – AC version system and test stop after temperature stabilized. No safety hazard condition observed and the test stopped when temperature reached stabilization. #2. Tested on TMG5800 / TMP5900 (2U BOX) – AC version system and test stop after temperature stabilized. No safety hazard condition observed and the test stopped when temperature reached stabilization. 	2	Locked bottom fan rotor result		1.2 hour			Р	
No safety hazard condition observed and the test stopped when temperature reached stabilization. #2. Tested on TMG5800 / TMP5900 (2U BOX) – AC version system and test stop after temperature stabilized. No safety hazard condition observed and the test stopped when temperature reached stabilization.						<u> </u>		
#2. Tested on TMG5800 / TMP5900 (2U BOX) – AC version system and test stop after temperature stabilized. No safety hazard condition observed and the test stopped when temperature reached stabilization.							re stabilized.	
ν Α.Α Α.	#2. Tested	on TMG5800 / TM	P5900 (2U BOX	\mathbf{X}) – AC version	system and test sto	p after temperatu	re stabilized.	
			er ved und the te.	st stopped when	emperature reache	a staomzation.		

Touch and Protective Conductor				CSA/UL 6	0950-1	IEC 60950-1	
Current Measurement (2/2)		Clause	5.1		5.1		
Com	pliance: Yes (x)	No () \rightarrow See "X"	1				
No.	Leakage (mA)	Input Volt/Hz	Measured Volt(U ₂ #)	Location		Primary Power Switch*	Comments (eg:Filter Name/Type)
1	0.79	264Vac / 50 Hz		Line to Eart	Line to Earth, Forward		Note 1
2	0.73	264Vac / 50 Hz		Neutral to Earth, Forward		OFF	Note 1
3	0.63	264Vac / 50 Hz		Ground to Earth, Forward		OFF	Note 1
4	0.79	264Vac / 50 Hz		Line to Ear	h, Reverse	OFF	Note 1
5	0.73	264Vac / 50 Hz		Neutral to E	Earth, Reverse	OFF	Note 1
6	0.63	264Vac / 50 Hz		Ground to H	Earth, Reverse	OFF	Note 1
7	0.79	264Vac / 50 Hz		Line to Ear	h, Forward	ON	Note 2
8	0.74	264Vac / 50 Hz		Neutral to E	Earth, Forward	ON	Note 2
9	0.64	264Vac / 50 Hz		Ground to Earth, Forward		ON	Note 2
10	0.79	264Vac / 50 Hz		Line to Ear	h, Reverse	ON	Note 2
11	0.74	264Vac / 50 Hz		Neutral to E	Earth, Reverse	ON	Note 2
12	0.64	264Vac / 50 Hz		Ground to H	Earth, Reverse	ON	Note 2

Notes:

3

1 U_2 refers to voltage measured as per Annex D.

2 Unit under test with:

i. <u>Single-Pole Primary Power Switch</u>: Take four measurements (combination of two mains polarities and two primary power switch positions).

ii. <u>Double-Pole Primary Power Switch</u>: Take two measurements (for two possible mains polarities).

Normal and reverse refer to input power polarity (switch P1 of Fig 5A & 5B).

4 Accessible non-conductive parts is tested using a 10 cm x 2 cm metal foil in contact with the parts of the

surface.

- 8 For 3ph equipment, EMC components connected between line and earth are disconnected one at a time.
- 9 Switch 'e' is opened for equipment with protective earthing or functional earthing.
- 10 For IT equipment, the test is conducted using circuit from Fig 9, 10, 12 of IEC 60990.

Comments:

Note 1: Leakage current tested on **TMG5800 / TMP5900 (2U BOX)** – **AC** version with both power supplies operated and switch was OFF.

Note 2: Leakage current tested on **TMG5800 / TMP5900 (2U BOX)** – **AC** version with both power supplies operated and switch was ON.

Resistance	e of Farthing Con				A/UL 60950-1	IEC 60950-1
Acceptance Criteria (c of Latting Con	ductors	Clause		2.6.3.4	2.6.3.4
Acceptance enterna	or Maximum Allo					
IEC: If the circuit rating of and the resistance cal If the current rating o and the voltage drop North America: If the current rating o and the resistance cal If the current rating o	culated shall not e of the circuit exceed across the protect of the circuit is 164 culated shall not e of the circuit exceed	exceed 0.1 ohm. eds 16A, the test cu ive bonding shall r A or less, the test c exceed 0.1 ohm. eds 16A, the test cu	urrent is 2 ti not exceed 2 urrent is 2 t urrent is 2 ti	mes the cu 2.5V. times the cu mes the cu	rrent rating of the urrent rating of the rrent rating of the	circuit for 120s circuit for 120s circuit (to a
maximum 500A) and		*				e test time is:
		ating of circuit	T	ime, minut	es	
		<u>≤30</u>		2		
		and ≤ 60		4		
		and ≤ 100		5		
		$and \leq 200$		8		
		>200 Ref: CSA (222.2 No 0.4	<u>10</u> 4		
Compliance: Yes (X	X) No() \rightarrow See	e "X"				
Earth Path Resistance	e Measurements:					
Test Current*	Max volt Drop	Test Time **	Calcu	lated		
(A)	(V)	(min)	Resistan	ce (ohm)	From	То
39.9	0.448	4	0.0	01	Chassis Input earth terminal	Front chassis bottom right corner
((Max allowable 4V)		(max all 0.1 c			
Comments:			1			
Tested on TMG580	0 / TMP5900 (21)	BOX) – AC vers	ion chassis	with both r	ower supplies inst	alled
		2011, 110,015		, in oon j	se del supplies inst	

		CSA/UL 60950-1	IEC 60950-1
Marking Durability	Clause	1.7.13	1.7.13
Acceptance Criteria (or Maximum Allowable Limits):	c iuus e	1.7,15	1.7.15
After the rubbing tests, the marking shall be legible; it s	hall not be p	ossible to remove marking	g plates easily and
they shall show no curling.	Î	-	
* CSA 60950/UL 60950: Label securement shall meet	the Adhesior	requirements of CSA C2	2.2 No. 0.15 or
UL 969.	u ai dana d ta c	annales mith this tost	
Having a CSA approved label and marking system is co	insidered to c	comply with this test.	
Compliance: Yes (x) No () See "X"			
TESTS: Compliance is checked by inspection and rul	U U	0,	1
soaked with water and again for 15 sec with	a piece of cl	oth soaked with petroleun	1 spirit.
TESTS		PASS (✓)	FAIL (X)
1. Rubbed for 15 seconds with water		PA55 (*)	FAIL (A)
2. Rubbed for 15 seconds with water			
2. Rubbed for 15 seconds with perforedin spirit			
Comments:			
All products label is printed by UL/CSA recognize prin	ting system.		
<u> </u>			

Project 2502294: (Edition 2)

Update report to cover alternate power supply, Part No. H1U-6250P by EMACS

1.6.2	TABLE:	Electrical da	data (in normal conditions)				
U (V)	I (mA)	Irated (A)	P (W)	Fuse #	Ifuse (A)	Condition/status	
90	869		62.2	NA	NA		
100	858		60.4	NA	NA		
240	389		54.0	NA	NA		
264	400		57.2	NA	NA		

TMG800 Single Supply Serial No. TB007831

Supplementary information: Operated at full load conditions

TMP800 Dual Supply Serial No. TB007830

1.6.2	TABLE:	Electrical da	ta (in norma	l conditions)			Р
U (V)	I (mA)	Irated (A)	P (W)	Fuse #	Ifuse (A)	Condition/status	
90	897		66.8	NA	NA		
100	839		73.9	NA	NA		
240	488		65.0	NA	NA		
264	453		62.8	NA	NA		
Supplement	ary information	on: Operated u	under full load	d conditions			

TMG800 Single Supply Serial No. TB007831

5.2	TABLE: Electric strength tests, impu	lse tests and voltage surge te	sts	Р
Test voltage	applied between:	Voltage shape (AC, DC, impulse, surge)	Test voltage (V)	Breakdown Yes / No
Functional:				
NA				
Basic/supple	ementary:			
L/N to G		AC	1500	No
Reinforced:				
NA				
Supplement	ary information: Performed after heating	test		

TMG800 Dual Supply Serial No. TB007827

5.2	TABLE: Electric strength tes	ts, impulse tests and voltage	surge tests	-	Р
Test voltage applied	between:	Voltage shape (AC, DC, impulse, surge)	Test voltage (V)		eakdown /es / No
Functional:					
Basic/supplementary					
L/N to G		AC	1500		No
Supplementary inform	mation: Performed after heating	test			

5.3	TABLE: Fault cor	dition tests	1					Р
	Ambient temperatu	re (°C)			:			
	Power source for E output rating		,	51 /	:			
Component No.	Fault	Supply voltage (V)	Test time	Fuse #	re	e cur- ent A)	Observation	·
TMG800 Single Supply	Blocked Vents	240	1hr	NA	N	A	No charring of cheese clot paper.	h or tissue
TMG800 Dual Supply	Blocked Vents	240	1hr	NA	N	A	No charring of cheese clot paper.	h or tissue
TMG800 Single Supply	Locked Rotor	240	1hr	NA	N	A	No charring of cheese clot paper.	h or tissue
TMG800 Dual Supply	Locked Rotor	240	1hr	NA	N	A	No charring of cheese clot paper.	h or tissue
Supplementa	ry information: Test	ed under ful	l load condi	tions	•			

5.1	TABLE: touch	current measurement			Р
Measured b	etween:	Measured (mA)	Limit (mA)	Comments/conditions	
Normally O	pen	.60	3.5		
Reverse Op	en	.59	3.5		
Open Neutr	al	0	3.5		
Off		.02	3.5		
Normally C	losed	0	3.5		
Reverse Clo	osed	0	3.5		
supplement	ary information:			-	

TMG800 Single Supply Serial No. TB007831

TMP800 Dual Supply Serial No. TB007830

5.1	TABLE: touch curre	ent measurement			Р
Measured between:		Measured (mA)	Limit (mA)	Comments/conditions	
Normally Op	pen	.24	3.5		
Reverse Ope	en	.24	3.5		
Open Neutra	ıl	0	3.5		
Off		.01	3.5		
Normally Cl	osed	0	3.5		
Reverse Clos	sed	0	3.5		
supplementa	ry information:	-			

5.1	TABLE: touch	current measurement			Р
Measured between:		Measured (mA)			
Normally Op	pen	.6	3.5		
Reverse Ope	en	.6	3.5		
Open Neutra	ıl	0	3.5		
Off		.02	3.5		
Normally Cl	osed	0	3.5		
Reverse Clo	sed	0	3.5		
supplementa	ary information:				

TMP800 Single Supply Serial No. TB007835

TMG800 Dual Supply Serial No. TB007827

5.1	TABLE: touch	current measurement			Р
Measured between:		Measured (mA)	Limit (mA)	Comments/conditions	
Normally O	pen	.26	3.5		
Reverse Ope	en	.26	3.5		
Open Neutra	al	.01	3.5		
Off		0	3.5		
Normally Cl	losed	0	3.5		
Reverse Clo	sed	0	3.5		
supplementa	ary information:	·			

4.5	TABLE: Thermal requi	rements –	Config	urati	on 1 – 7	IMP	800 (w.	/ Single P/	S)	
	Supply voltage (V)		:	264 \	V					
	Ambient T _{min} (°C)		:	24.24	1					
	Ambient T _{max} (°C)									
Maximum n	neasured temperature T of p	oart/at::					T (°C	C)		Allowed T _{max} (°C)
L1 on P/S				57.36	5		90.2	8		
T1 on P/S				51.2	l		78.1	8		
T3 on P/S				47.27	7		70.3	0		
C1on P/S				40.76	5		57.2	8		
Battery- Ma	in Unit			43.13	3		62.02	2		
Fuse- Main	Unit			28.59)		32.94	4		
PCB Near H	Ieat Sink- Main Unit			25.39)		26.5	4		
Enclosure				32.8	l		41.3	8		
Supplement	ary information:									
Temperature	e T of winding:	t ₁ (°C)	R ₁ (Ω	2)	t ₂ (°C)	R	$R_{2}\left(\Omega ight)$	T (°C)	Allowed T _{max} (°C)	Insulation class
	tary information:Hi-Pot T minute with passing resul		s perfoi	rmed	betwee	n L/I	N – G a	t a value o	of 2125VDC	for a

4.5	TABLE: Thermal requi	TABLE: Thermal requirements – Configuration 1 – TMG800 (w/ Dual P/S)										
	Supply voltage (V) 264 V	7	:									
	Ambient T _{min} (°C) 24.24.		:									
	Ambient T _{max} (°C)		:									
Maximum	measured temperature T of I	part/at::			1		T (°C	C)		Allowed T _{max} (°C)		
L1 on P/S												
L2 on P/S			35	.50			46.7	6				
Clon P/S			41	.61			58.9	8				
T1 on P/S			43	.05			61.8	6				
T2 on P/S			45	.34			66.4	4				
PCB Back End P/S		35	35.99		47.74		4					
Battery- M	lain Unit		25	25.85			27.4	6				
Hard Drive	e		25	25.56 26.8		8						
PCB Near	Heat Sink		34	4.66 45.08		8						
PCB 1 Fus	se		24	24.76 2		25.2	8					
PCB2 Nea	r Heat Sink		28	28.63		33.02						
Cooling Fa	an Motor		30	30.31		36.38		8				
Enclosure			28	.21			32.1	8				
Supplemen	ntary information:				1							
Temperatu	re T of winding:	t ₁ (°C)	$R_{1}(\Omega)$	t ₂	(°C)	R	$L_2(\Omega)$	T (°C)	Allowed T _{max} (°C)	Insulation class		
	ntary information: Suppleme 125VDC for a period of 1 n					ing [·]	was pe	rformed	between L/N	– G at a		

4.5	TABLE: Thermal requi	rements –	Configura	ation 2	2 – TI	MP800 (y	w/ Dual P/	5)	
	Supply voltage (V) 264 V	7	:						
	Ambient T _{min} (°C) 22.8		:						
	Ambient T _{max} (°C)		:						
Maximum	measured temperature T of p	part/at::				Τ (°C)	·	Allowed T _{max} (°C)
L1 on P/S			38.	38.26 53.7		72			
L2 on P/S			34.	34.53 46.2		26			
Clon P/S			40.	24		57.	68		
T1 on P/S			40.	94		59.	08		
T2 on P/S			43.	98		65.	16		
PCB Back End P/S		32.	32.36		41.92				
Battery- N	Battery- Main Unit		27.	25		31	.7		
Fuse- Mai	n Unit		24.	18	25.56		56		
PCB Near	Heat Sink- Main Unit		34.	26		45.	72		
Enclosure			26.	26.85		30	.9		
Suppleme	ntary information:	•		1			-	1	1
Temperatu	ure T of winding:	t ₁ (°C)	$R_{1}\left(\Omega\right)$	t ₂ (°C)	$R_{2}\left(\Omega ight)$	T (°C)	Allowed T _{max} (°C)	Insulation class
	ntary information: Suppleme 125VDC for a period of 1 n					ing was p	erformed	oetween L/N	– G at a

4.5	TABLE: Thermal req	uirements –	Configu	ration 2 –	TMG80	0 (w/	Single P	/S)	
	Supply voltage (V) 264	V	:						
	Ambient T _{min} (°C) 22.8		:						
	Ambient T _{max} (°C)								
Maximum	n measured temperature T o	f part/at::			,	T (°C))		Allowed T _{max} (°C)
L1 on P/S			4:	45.39 67.					
T1 on P/S			3	9.59		56.38			
T3 on P/S	T3 on P/S					40.42			
Clon P/S				3.93		55.06			
Battery- N	Battery- Main Unit				27.14 31.				
Hard Driv	re		2:	5.12		27.44			
PCB Near	Heat Sink		34	34.54 46.28					
PCB 1 Fu	se		24	24.29 25.78					
PCB2 Nea	ar Heat Sink		28	28.74		34.68			
Cooling F	an Motor		30	30.22					
Enclosure			24	4.80		26.8			
Suppleme	ntary information:								
Temperatu	ure T of winding:	t ₁ (°C)	$R_1(\Omega)$	t ₂ (°C)	R ₂ ((Ω)	T (°C)	Allowed T _{max} (°C)	Insulation class
	ntary information: Suppler 2125VDC for a period of 1				sting wa	as per	formed b	etween L/N	– G at a

Project 2605834: (Edition 3)

Update F1=0 Ω ; F2=Littelfuse P/N 1812L050 and Power Supply P/N to IS-350R2UP. No tests are deemed necessary.

Project 70020527: (Edition 4)

Add alternative fan module and power supply to model TMG800 and TMP800. Change rating of TMG800 and TMP800 to 1.1A. Test results are filed in CSA archiving database (Documentum) in the Test Data folder under project number 251006-2345690(-70020527).

Unit Tested:

Model: TMG800 S/N: TB014357 Feed: AC (Two Power Supplies, model: EFRP-S207

Summary of Tests:

Clause	Test Description
1.6.2	Input Current Test
2.1.1.7	Discharge of Capacitors in Equipment Test
2.6.3.4	Resistance of Earthing Conductor Test
4.5.2	Temperature Test
5.1	Touch Current and Protective Conductor Current Test
5.2	Electric Strength Test
5.3	Abnormal Test- Component Failure (System)

Project 70024647: (Edition 5)

To add alternative AC and DC power supply to model TMG800 and TMP800, in the Test Data folder under project number 251006-2345690(-70024647).

Summary of Tests: Tested system with Brick AC power supply:

Clause	Test Description
1.6.2	Input Current Test
2.1.1.7	Discharge of Capacitors in Equipment Test
2.6.3.4	Resistance of Earthing Conductor Test
4.5.2	Temperature Test
5.1	Touch Current and Protective Conductor Current Test
5.2	Electric Strength Test