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1. OBJECTIVE

This specification defines the performance, test, quality, reliability and signal integrity requirements of 5 row Metral™ 1000 & 2000 family of products.

Standard product
84817-type 5 Row Metral™ 1000 Header
74977-type 5 Row Metral™ 2000 Header
84818-type 5 Row Metral™ 1000 Shroud
84621-type 5 Row Metral™ 2000 Shroud
73983-type 5x6 Metral™ 1000 Header
73993-type 5x6 Metral™ 1000 Shroud
84688-type 5 Row Metral™ 1000 Receptacle
73981-type 5x6 Metral™ 1000 Receptacle
10056334-type 5x6 Metral™ 1000 Receptacle
10041743-type 5x6 Metral™ 1000 Receptacle
84881-type 5 Row Metral™ 1000 Extended Header
84809-type 5 Row Metral™ 2000 Extended Header
84882-type 5 Row Metral™ 1000 Extended Shroud
84811-type 5 Row Metral™ 2000 Extended Shroud
84854-type 5 Row Metral™ 1000 Extended Receptacle
Selectively Loaded Product
74817-type 5x6 Metral™ 1000 Header
63743-type 5x12 Metral™ 1000 Header
60066-type 5x18 Metral™ 1000 Header
63779-type 5x24 Metral™ 1000 Heade
10043968-type 5-Row Metral™ 1000 Header with 4000 style Ground Spring and mixed Pins
58542-type 5-Row Metral™ 2000 Header with 4000 style Ground Spring
58543-type 5x6 Metral™ 2000 Shroud with 4000 style Ground Spring
55499-type 5x6 Metral™ 2000 Header
10035400-type 5x24 Metral™ 2000 Header
98122-type 5x6 Metral™ 1000 Extended Header
58392-type 5x6 Metral™ 2000 Extended Header

2. SCOPE

This specification is applicable to the termination characteristics of the Metral™ 1000 & 2000 family of products. Metral™ 1000 & 2000 products provide a board-to-board matched impedance interconnect.

3. GENERAL

3.1. Usage

The headers, shrouds and receptacles covered by this instruction are intended for use in a wide variety of environments.

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3.2. Visual

Visual examinations shall be performed with a magnification up to 10X (8 to 10X recommended). Parts should be free from blistering, cracks, discoloration, etc.

3.3. Banned/Restricted Substances

All product where the part number ends in 'LF' meet the European Union directives and other country regulations as described in GS-22-008. The part numbers that do not end in 'LF' meet all regulations except for Pb in SnPb plating.

3.4. Manufacturing Processability

All products covered by this specification will withstand exposure to 260°C for 60 seconds in a convection, infra-red or vapor phase reflow oven.

4. APPLICABLE DOCUMENTS

The following documents, of issue in effect at the date of latest revision of this specification, shall form a part of this specification to the extent specified herein.

4.1. Standards and Specifications

ASTM B488: Electrodeposited Coatings of Au /GXT for Engineering Uses

UL94V-0: Tests for Flammability of Plastic Materials in Devices and Appliances

IEC 512: International Electrical Commission Standards

IEC 61076-4-104: Connectors For Use In DC, Low Frequency Analogue And Digital High Speed Data Applications

GR-1089-CORE: Telcordia Specification "Electromagnetic Compatibility and Electrical Safety - Generic Criteria for Network Telecommunications Equipment"

GR-1217-CORE, Issue 1, November 1995: Telcordia Specification " Generic Requirements for Separable Electrical Connectors"

EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications

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4.2. FCI Documents

4.2.1. Process Specifications

Specification	Description
BUS-01-040	VG Site Equipment Calibration Guidelines
BUS-15-002/X	Nickel Plating
BUS-15-006/X	Tin/Lead Plating
BUS-15-008	Palladium Nickel Alloy Plating
BUS-15-005/X	Au /GXT in Contact Plating
GS-46-001	Tin (lead free) Plating
BUS-19-020	Porosity, Plating
BUS-19-040	Adhesion, Plating

4.2.2. Standards and Test Specifications

Specification	Description
BUS-03-108	Qualification Lab Method and Procedure-Crosstalk Test Methods
BUS-03-110	Qualification Lab Method and Procedure-Characteristic Impedance
BUS-03-111	Qualification Lab Method and Procedure-Propagation Delay Measurements
BUS-03-113	Qualification Lab Method and Procedure-Induction Measurements
BUS-03-114	Qualification Lab Method and Procedure-Capacitance Measurements
BUS-03-404	Normal Force Measurements
BUS-03-601	Current Rating / 30°C Temperature Rise

4.3. Lab Reports - Supporting Data

Supporting Data

EL 1997-10-082	EL 1998-010-039	EL 1999-02-091
EL 1998-02-087	EL 1997-011-012	EL 2000-02-012B
EL 2001-04-032	EL 2001-07-049	EL 2001-03-074
EL 2001-03-074D	EL 2001-08-019	EL 2001-08-019A
EL 2001-02-025A	EL-2007-01-012A	

5. REQUIREMENTS

5.1. Qualification

Connectors furnished under this specification shall be capable of meeting the qualification test requirements specified herein.

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5.2. Material

5.2.1. Metallic Parts

Contact, Receptacle: Copper Alloy Strip
Top Shield, Receptacle: Copper Alloy Strip
Vertical Shield, Receptacle: Copper Alloy Strip
Bottom Shield, Receptacle: Copper Alloy Strip
Pin, Header: Copper Alloy Strip
Ground Spring, Header and Shroud: Copper Alloy Strip
Stripline Shield, Header and Shroud: Copper Alloy Strip

5.2.2. Plastic Parts

Housing, Receptacle: LCP, GFR, Flame retardant UL94V-0, Natural
IMLA, Receptacle: LCP, GFR, Flame retardant UL94V-0, Natural
Housing, Header: LCP, GFR, Flame retardant UL94V-0, Natural
Housing, Shroud: LCP, GFR, Flame retardant UL94V-0, Natural

5.3. Finish

Plated finishes for qualification components shall be as specified herein or equivalent. The receptacle contacts and header pins shall be qualified to the minimum thickness of either Au or GXT™ specified on product prints over a 1.3 µm minimum Ni underplate for product where Telcordia CO performance is specified on the product drawing. The Au /GXT deposit shall meet the requirements of ASTM B488. Plating in press-fit area shall be Sn (lead free) over Ni if part number ends in 'LF' and SnPb over Ni if part number does not end in 'LF'.

Vertical receptacle shields shall be plated with 0.5 µm minimum Sn (lead free) over 1.2 µm minimum Ni if the part number ends in 'LF' and 0.5 µm minimum SnPb over 1.2 µm minimum Ni if the part number does not end in 'LF'. Top and bottom receptacle shields shall be plated with a minimum Au /GXT plating thickness specified on product prints over a 1.3 µm minimum Ni underplate. Plating in press-fit area shall be Sn (lead free) over Ni if part number ends in 'LF' and SnPb over Ni if part number does not end in 'LF'.

Header and shroud ground springs shall be plated with a 1.3 µm minimum Ni followed by the minimum Au /GXT plating thickness specified on product prints in the mating area. Plating in press-fit area shall be Sn (lead free) if part number ends in 'LF' and SnPb if part number does not end in 'LF'.

Header stripline shields shall be plated with Sn (lead free) over 1.3 µm Ni if the part number ends in 'LF' and SnPb over 1.3 µm Ni if the part number does not end in 'LF'. Shroud stripline shields shall be plated with a 1.3 µm minimum Ni followed by the minimum Au /GXT plating thickness specified on product prints in pin connection areas. Shroud stripline shields shall be plated with Sn (lead free) over 1.3 µm Ni if the part number ends in 'LF' and SnPb over 1.3 µm Ni if the part number does not end in 'LF' in the ground spring mating areas.

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6. ELECTRICAL CHARACTERISTICS

6.1. Low Level Contact Resistance

Measurements shall be performed using a four wire method with a maximum open circuit voltage of 20 mV and a maximum test current of 100 mA (see EIA-364-23). Maximum initial signal contact resistance is 12 mΩ. Initial to final measurements after environmental exposure shall not exceed a 10 mΩ change. Top, middle and bottom ground shields shall have an initial maximum contact resistance of 15 mΩ and also shall not exceed a 10 mΩ change.

a) Test Voltage - 20 mV DC maximum open circuit
b) Test Current - Not to exceed 100 mA

6.2. Insulation Resistance

The insulation resistance of mated connector pair connectors shall not be less than 1000 MΩ after environmental exposure when measured in accordance with EIA-364-21. The following details shall apply:

a) Test Voltage - 500 VDC
b) Electrification Time - 1 minute
c) Points of Measurement - Between adjacent contacts and between contacts and metal shields

6.3. Dielectric Withstanding Voltage

There shall be no evidence of arc-over, insulation breakdown or excessive leakage current (> 0.5 mA) when the mated connectors are tested in accordance with EIA-364-20. The following details shall apply:

a) Test Voltage - 500 VDC or 500 VAC peak RMS or AC, 60 Hz.
b) Test Duration - 60 seconds.
c) Test Condition – 1 atm
d) Voltage: Applied at a rate of 500 V per second.
e) Points of Measurement - Between adjacent contacts and between contacts and the metal shields

6.4. Current Rating

The temperature rise above ambient shall not exceed 30°C at any point in the system when all contacts are powered at 1 A or one contact is powered at 3 A. The following details shall apply:

a) Ambient Conditions - Still air at 25°C.
b) Reference - BUS-03-601.

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6.5. Capacitance

The specification requirement shall be satisfied when evaluated in accordance with FCI Test Specification BUS-03-114 and the following details:

a) Specification requirement 2.2 pF max.
b) Sample documentation
c) Sample test conditions
   Frequency: 1MHz
   Amplitude: 1 V
   Surrounding contacts tied to ground

6.6. Inductance

The specification requirement shall be satisfied when evaluated in accordance with FCI Test Specification BUS-03-113 and the following details:

a) Specification requirement 12 nH max.
b) Sample documentation
c) Sample test conditions - 1 MHz

6.7. Propagation Delay

The specification requirement shall be satisfied when evaluated in accordance with FCI Test Specification BUS-03-111 and the following details:

a) Specification requirement 225 pico-seconds max, 40 pico-seconds risetime 10 - 90% measured at 50%.
b) Skew between adjacent rows not to exceed 35 pico-seconds, total skew not to exceed 100 pico-seconds.
c) Sample documentation.

6.8. Characteristic Impedance

The specification requirement shall be satisfied when evaluated in accordance with FCI Test Specification BUS-03-110 and the details listed below. Note that one top shield j-hook (per connector) shifted to either side of the vertical shield constitutes acceptable workmanship and does not affect connector characteristic impedance.

a) Specification requirement 55±5 Ω single-ended except where Column 6 is not bounded by the shield of a neighboring module. In this case, the unshielded end column shall have a requirement of 61±5 Ω single-ended.
b) Sample documentation.
c) Sample test conditions @ 500 pico-seconds (10 - 90%) risetime with all lines terminated in its characteristic impedance.

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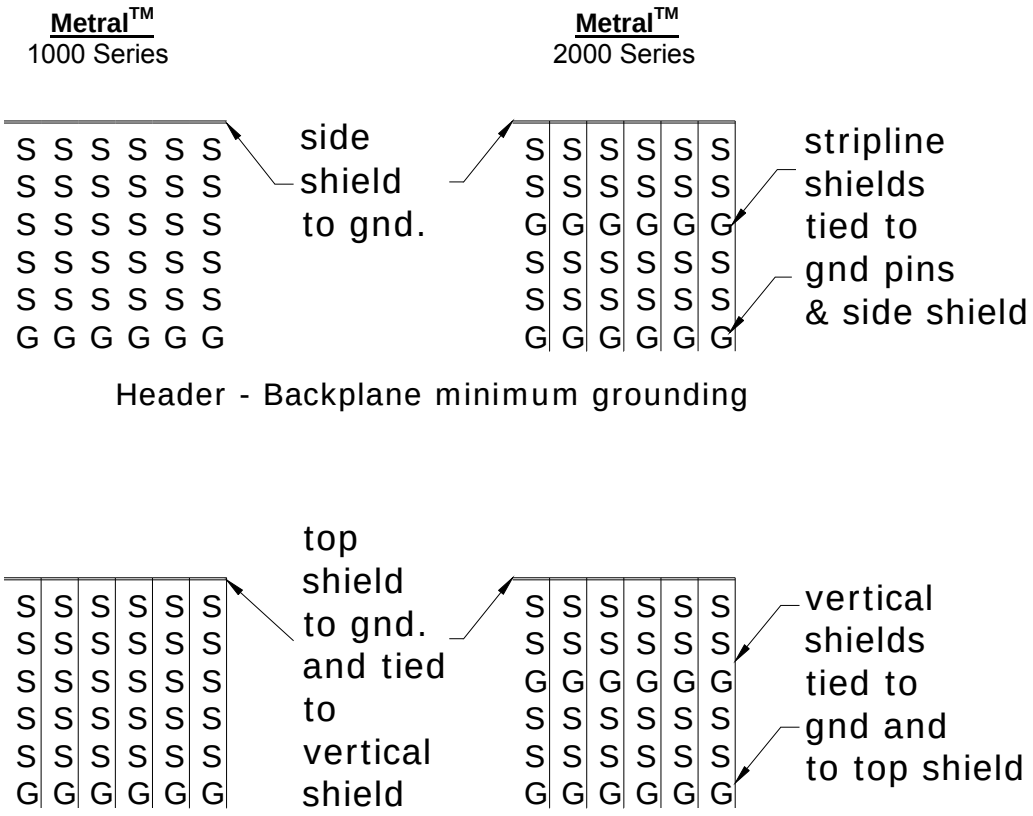
6.9. Crosstalk

The specification requirement shall be satisfied when evaluated in accordance with FCI Test Specification BUS-03-108 and the details listed below. Note that one top shield j-hook (per connector) shifted to either side of the vertical shield constitutes acceptable workmanship and does not affect connector crosstalk.

a) Specification requirement, less than 12% single active NEXT.
b) Sample documentation.
c) Sample test conditions, 500 pico-seconds rise time with all lines terminated in its characteristic impedance.

Figure 1 Crosstalk Test Setup



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7. MECHANICAL CHARACTERISTICS

7.1. Mating/Unmating Force

The force to mate a receptacle connector and compatible header shall not exceed 0.55 N per contact. The unmating force shall not be less than 0.15 N per contact. The following details shall apply:

a) Cross Head Speed – 25.4 mm/minute (1 inch/minute).
b) Lubrication - None
c) Utilize free floating fixtures.
d) Reference - EIA-364-13.

Total single module (5x6) mating force shall not exceed 21.5 N and total unmating force shall not be less than 5.9 N.

7.2. Header Signal Compliant Pin Insertion/Retention Force

The force required to insert an individual signal compliant pin into a plated through hole in a printed circuit board at a rate of 5.1 mm/minute (0.2 inches/minute) shall not exceed 100 N. The retention force in an axial direction opposite that of insertion shall not be less than 20 N.

Total single module (5x6) insertion force shall not exceed 3900 N when inserted by a standard application press.

7.3. Receptacle Signal Compliant Contact Insertion/Retention Force

The force required to insert an individual signal compliant contact into a plated through hole in a printed circuit board at a rate of 5.1 mm/minute (0.2 inches/minute) shall not exceed 32 N. The retention force in an axial direction opposite that of insertion shall not be less than 7 N.

Total single module (5x6) insertion force shall not exceed 1312 N when inserted by a standard application press.

7.4. PCB Hole Deformation Radius

Cross-section parallel to board surface. Photograph and measure the hole deformation (deformation of board material) radius at a point 0.25 mm (0.010 in) from the surface and at the center of the compliant pin section. The average hole deformation radius of 10 holes shall be no greater than 37.5 µm (0.0015 in) when measured from the finished hole. The absolute maximum deformation radius shall not exceed 50 µm (0.002 in). Reference Telcordia GR-1217-CORE, Section 5.1.7.

7.5. PCB Hole Wall Damage

Cross-section perpendicular to the board surface and through the compliant section wear track. Photograph and measure the copper thickness remaining between the compliant pin and the printed wiring board laminate. The minimum average copper thickness of 10 holes remaining between the compliant pin and the printed wiring board laminate shall not be less than 7.5 µm (0.0003 in). In addition, there shall be no copper cracks, separations between conductive interfaces or laminate-to-copper separations. Reference Telcordia GR-1217-CORE, Section 5.1.7.

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8. ENVIRONMENTAL CONDITIONS

After exposure to the following environmental conditions as specified in "**Table 1 - Test Sequences**" in accordance with the specified test procedure and/or details, the product shall show no physical damage and shall meet the electrical and mechanical requirements in Sections 6. and 7. Unless specified otherwise, product shall be mated during exposure.

8.1. Thermal Shock

EIA-364-32, Test Condition II

Test:

1. Number of cycles: 5
2. Temperature Range: Between -65°C +0°C/-5°C and +105°C +3°C/-5°C.
3. Time at each temperature: 30 minutes
4. Transfer time: 5 minutes maximum.

8.2. Humidity

Mated samples are to be exposed to cyclical humidity and temperature in accordance with EIA-364-31, Method IV, with the following exceptions. Samples are to be subjected to 50 cycles of 10 hour durations for a total of 500 hours (after 24 hours in a conditioning oven at 50±2°C). A cycle consists of the following steps.

Test:

1. Ramp from 25±2°C at 80%-98% RH to 65±2°C at 94±4% RH in 120 minutes.
2. Dwell at 65±2°C at 94±4% RH for 4 hours.
3. Ramp down to 25±2°C at 80%-98% RH in 120 minutes.
4. Dwell at 25±2°C at 80%-98% RH for 2 hours.

8.3. High Temperature Life

EIA-364-17, Method A, Test Condition 4. Headers and receptacles shall remain mated w/o any electrical load.

Test :

1. Temperature: 105±2°C
2. Duration: 1000 hours

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8.4. Mixed Flowing Gas (4-Gas)

Samples are to be exposed to an industrial gas mixture in accordance with Telcordia GR-1217-CORE, Section 9.1.3. The headers ONLY are to be exposed for 10 days to the gas mixture detailed below, with interim resistance measurements made after the 5th and 10th days. The samples are then mated with the appropriate receptacle and exposed to an additional 10 days with resistance measurements taken after the 15th and 20th days of exposure. The test chamber is to be maintained at a temperature of 30±1°C with a relative humidity of 70±2%.

Per Central Office Requirement

Gas	Gas Concentration
NO_2	200 ppb
Cl_2	10 ppb
H_2S	10 ppb
SO_2	100 ppb

8.5. Vibration Sinusoidal

Perform in accordance with Telcordia GR-1217-CORE, Sections 6.3.5 and 9.1.2.1.

Test:

1. Vibration amplitude: 0.06 inch DA or 10G acceleration.
2. Frequency range: 10 to 500 Hz
3. Duration: 8 hours along each of three orthogonal axes
4. Mounting: Rigidly mounted assemblies
5. Requirement: No discontinuities greater than 10 nano-seconds for signal contacts, 1 micro-second for ground connections.

8.6. Mechanical Shock

Perform in accordance with Telcordia GR-1217-CORE, Sections 6.3.5 and 9.1.2.1.

Test:

1. Conditions: half-sine 30G, 11 milli-second duration.
2. Shocks: 3 shocks along each of three orthogonal axis.
3. Mounting: Rigidly mounted assemblies.
4. Requirement: No discontinuities greater than 10 nano-seconds for signal contacts, 1 micro-second for ground connections.

8.7. Durability

Standard laboratory procedure as applicable to the specific product.

Test:

1. Number of cycles: 98 or 99 cycles per "**Table 1 - Test Sequences**".
2. Cycling rate: 127 mm/minute (5 inches/minute)
3. Mating and unmating forces to be measured per Section 7.1. on the first and last cycle.

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8.8. Dust Contamination

Perform in accordance with Telcordia GR-1217-CORE, Section 9.1.1.1 & Table 9-1 unmated.

8.9. Disturb

An Instron compression/tensile tester shall be used to back the fully seated receptacle from the header by 0.10 mm (0.004 in). The sample is then removed and measurements made.

9. QUALITY ASSURANCE PROVISIONS

9.1. Equipment Calibration

All test equipment and inspection facilities used in the performance of any test shall be maintained in a calibration system in accordance with ISO 9000.

9.2. Inspection Conditions

Unless otherwise specified herein, all inspections shall be performed under the following conditions:

Temperature: 25± 5°C
Relative humidity: 30% to 60%
Barometric pressure: Local ambient

9.3. Sample Quantity and Description

The test sequence for the qualification testing of the receptacle and header and sample size are shown in Tables 1 and 2. The minimum connections to be tested are specified in the descriptions of each test.

9.4. Acceptance

Electrical and mechanical requirements placed on test samples as indicated in the sections of this specification shall be established from test data using appropriate statistical techniques or shall otherwise be customer specified, and all samples tested in accordance with the product specification shall meet the stated requirements.

Failures attributed to equipment, test set-up or operator error shall not disqualify the product. If product failure occurs, corrective action shall be taken and samples resubmitted for qualification.

9.5. Qualification Testing

Qualification testing shall be performed on sample units with equipment and procedures normally used in production. The test sequence is shown in Tables 1 and 2.

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9.6. Re-Qualification Testing

If any of the following conditions occur, the responsible product engineer shall initiate re-qualification testing consisting of all applicable parts of the qualification test matrix, Tables 1 and 2.

a) A significant design change is made to the existing product, which impacts the product form, fit or function. Examples of significant changes shall include, but not be limited to, changes in the plating, material composition or thickness, contact force, pin/contact surface geometry, insulator or housing design, pin/contact base material or pin/contact lubrication.

b) A significant change is made to the manufacturing process which impacts the product form, fit or function.

c) A significant event occurs during production or end use requiring corrective action to be taken relative to the product design or manufacturing process

9.7. Qualification Test Sequence Per Table 1

The following connection points are to be tested for low level contact resistance in Test Groups 1 to 4 per Section 6.1 when called for in Table 1. When possible, resistance measurements should include the press-fit sections of the header and receptacle as well as the separable connection. Visual examination before any testing should confirm that the sample is not damaged or missing features. Visual examination after testing should confirm that the sample has not been damaged during testing except for the effects of the testing itself. All resistance measurements that are outside the limits should be confirmed before additional testing to assure that the measurements are correct.

TYPE OF CONNECTION	MIN. SAMPLE SIZE
Hdr. Signal Pin to Recept. Contact	100
Hdr. Ground Spring to Recept. Top Shield	96
Hdr. Ground Pin to Recept. Bottom Shield	100

For best results, use Metral™ 1000 headers for Test Groups 1 – 4 listed in Table 1. The Metral™ 2000 headers have stripline shields, which ground and common some of the pins to each other and the ground spring. For Test Groups 1 – 4, the minimum quantity can be reduced proportionally if monoblock parts are used.

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Table 1 - Test Matrix

		TEST GROUP								
		1	2	3	4	5	6	7	8	9
MIN QUANTITY OF 5x6 REC										
		40	32	40	32	14	4	4	32	6
MIN QUANTITY OF 5x6 HEADERS										
		40	32	40	32	4	4	4	32	4
TEST	**PARA**	**TEST SEQUENCE**								
		MFG	Hi-Temp Life	Thermal Shock & Humidity	Vibration & Mech. Shock	PCB Hole Deform.	Elect. Perform.	Current Rating	Mating/ Umating Force	EON Forces
EXAMINATION OF PRODUCT	3.2	1,22	1,6	1,16	1,14	1,5	1,7	1,3	1,3	1,5
MATE HEADER & RECEPTACLE		2,8,12	2	2,11	2,7					
UNMATE HEADER AND RECEPTACLE		6,10		9	5					
ELECTRICAL CHARACTERISTICS										
LOW LEVEL CONTACT RESISTANCE[1]	6.1	3,5,9,13,15 ,17,19,21	3,5	3,5,13	3,8,10,13					
INSULATION RESISTANCE[1]	6.2			6,14						
DIELECTRIC WITHSTANDING VOLTAGE[1]	6.3			7,15						
CURRENT RATING	6.4							2		
CAPACITANCE	6.5						2			
INDUCTANCE	6.6						3			
PROPAGATION DELAY	6.7						4			
CHARACTERISTIC IMPEDANCE	6.8						5			
CROSSTALK	6.9						6			
MECHANICAL CHARACTERISTICS										
MATING/UNMATING FORCE – 3 CYLCES	7.1								2	
COMPLIANT CONTACT INSERTION/RETENTION FORCE	7.2 & 7.3					2				2,4
PCB HOLE DEFORMATION RADIUS	7.4					3				
PCB HOLE WALL DAMAGE	7.5					4				
ENVIRONMENTAL CONDITIONS										
THERMAL SHOCK	8.1			4						
HUMIDITY	8.2			12						
HIGH TEMPERATURE LIFE	8.3		4							3
MFG HEADER ONLY (4-GAS) 5-DAYS	8.4	7,11								
MFG MATED (4-GAS) 5-DAYS	8.4	14,16								
VIBRATION SINUSOIDAL – 1 EACH AXIS	8.5				9					
MECHANICAL SHOCK	8.6				12					
DURABILITY 98 CYCLES	8.7	20								
DURABILITY 99 CYCLES	8.7	4		8	4,11					
DUST COMTAMINATION	8.8			10	6					
DISTURB	8.9	18								

1. Insulation resistance, dielectric withstanding voltage and low level contact resistance are to be measured on different contacts.

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9.8. Qualification Test Sequence Per Table 2

The following connections points are to be tested for low level contact resistance in Test Groups 10 to 17 per Section 6.1 when called for in Table 2. When possible, resistance measurements should exclude the press-fit sections of the header. Visual examination before any testing should confirm that the sample is not damaged or missing features. Visual examination after testing should confirm that the sample has not been damaged during testing except for the effects of the testing itself. All resistance measurements that are outside the limits should be confirmed before additional testing to assure that the measurements are correct.

TYPE OF CONNECTION	MIN. SAMPLE SIZE
Stripline Shield to Pin	100
Stripline Shield to Ground Spring	96

The testing per Table 2 checks the internal ground connections in the Metral™ 2000 headers and shrouds. When both headers and shrouds are being tested, the stripline shield-to-ground spring resistance changes need only be tested on either the header or shroud. The ground spring connection points are exactly the same design. For testing shrouds, a Metral 1000 rear plug-up (RPU) header must be inserted with the ground spring removed in the bottom side of the test board. The shroud is then assembled on the top side.

Table 2 - Test Matrix

		TEST GROUP							
		10	11	12	13	14	15	16	17
MIN QUANTITY OF 5x6 SHROUDS									
						32	32	32	32
MIN QUANTITY OF 5x6 HEADERS									
		32	32	32	32				
TEST	**PARA**	**TEST SEQUENCE**							
		MFG	Hi-Temp Life	Thermal Shock & Humidity	Vibration & Mech. Shock	MFG	Hi-Temp Life.	Thermal Shock & Humidity	Vibration & Mech. Shock
EXAMINATION OF PRODUCT	3.2	1,11	1,5	1,8	1,11	1,11	1,5	1,8	1,11
ELECTRICAL CHARACTERISTICS									
LOW LEVEL CONTACT RESISTANCE	6.1	2,4,6,8,10	2,4	2,4,7	2,4,8,10	2,4,6,8,10	2,4	2,4,7	2,4,8,10
ENVIRONMENTAL CONDITIONS									
THERMAL SHOCK	8.1			3				3	
HUMIDITY	8.2			6				6	
HIGH TEMPERATURE LIFE	8.3		3				3		
MIXED FLOWING GAS (4-GAS) 5-DAYS	8.4	3,5,7,9				3,5,7,9			
VIBRATION SINUSOIDAL 1-EACH AXIS	8.5				5,6,7				5,6,7
MECHANICAL SHOCK	8.6				9				9
DUST CONTAMINATION	8.8			5	3			5	3

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REVISION RECORD

REV	PAGE	DESCRIPTION	EC #	DATE
D	ALL	▪REVISE FORMAT	V12779	01/04/02
	7	▪ADD TOTAL MATING FORCE – SEC 7.1 ▪MIN UNMATING FORCE 0.20 N TO 0.17 N – SEC 7.1		
	8	▪ADD TOTAL INSERTION FORCE – SECS 7.3 & 7.4		
	10	▪ADD GROUND CONNECTION DISCONTINUITY REQUIREMENT – SEC 8.5		
	12	▪REMOVE QUALITY ASSURANCE TESTING (WAS SEC 9.7)		
	13	▪REMOVE DWV / ADD DISTURB – TEST GROUP 1 TABLE 1 ▪REMOVE NORMAL FORCE & LLCR BETWEEN VIBRATION AXES – TEST GROUP 4 TABLE 1 ▪REMOVE RISE TIME DEGRADATION – TEST GROUP 6 TABLE 1 ▪ADD TEST GROUP 8 TABLE 1		
	14	▪ADD METRAL™ 2000 HEADER & SHROUD INTERNAL GROUND TESTING & TABLE 2 – SEC 9.8		
E	1,2	▪MOVE TABLE OF CONTENTS TO BEGINNING	V20566	04/03/02
	4	▪REMOVE MIL STDS – WAS SEC 4.1 ▪REMOVE US FEDERAL SPECS – WAS SEC 4.2 ▪ADD ASTM B488 / REMOVE ANSI-J-002 – SEC 4.1 ▪REMOVE BUS-19-002/X – SEC 4.2.1		
	5	▪REMOVE BUS-03-109 – SEC 4.2.2 ▪ADD EL 2001-08-019 & EL 2001-08-019A – SEC 4.3 ▪CHANGE METALLIC DESIGNATIONS TO 'COPPER ALLOY' – SEC 5.2.1		
	9	▪MIN UNMATING FORCE 0.17 N TO 0.15 N & TOTAL UNMATING FORCE 6.6 N TO 5.9 N – SEC 7.1		
	10	▪REMOVE CONTACT NORMAL FORCE REQUIREMENT – WAS SEC 7.2 ▪CHANGE REFERENCE SPEC TO TELCORDIA GR-1217-CORE – SECS 7.4 & 7.5		
	12	▪ADD TELCORDIA SECTION REFS 6.3.5 AND 9.1.2.1 – SEC 8.5		
	15	▪REMOVE NORMAL FORCE – TEST GROUP 2 TABLE 1 ▪REVISE TEST SEQUENCE & RECEPTACLE TEST QUANTITY – TEST GROUP 5 TABLE 1 ▪ADD TEST GROUP 9 TABLE 1		
F	5	▪ADD EL 2001-02-025A – SEC 4.3	V20930	05/17/02
	8	▪ADD SHIFTED J-HOOK NOTE – SECS 6.8 & 6.9		
	10	▪ADD 'SIGNAL' TO FORCE REQUIREMENTS – SECS 7.2 & 7.3		
	12	▪REPLACE NOTE 4 RESISTANCE MEASUREMENTS WITH DISCONTINUITY REQUIREMENT – SEC 8.6		
G	All	Add lead free information	V05-0879	09/14/05
H	All	Change logo	V06-0405	04/26/06
J	6	REPLACE REFERENCE TO PRODUCT DRAWING WITH 30u" MIN Au OR GXT	V07-0245	3/23/07

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K	4,5 & 6 15 & 16 6 ALL PAGES	• MODIFIED THE TEXT "AU" TO "AU /GXT" • REMOVE THE TEXT "WITH 0.8 µm GOLD PLATING" • MODIFIED THE TEXT"0,8um minimum thickness " TO "minimum thickness of either Au or GXT™ " • AUTHORIZED & DATE CHANGED	ELX-I-17962	11/06/14

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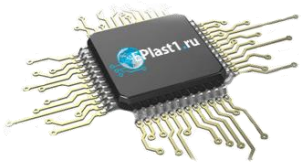

Как с нами связаться

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