1.0 OBJECTIVE

This specification defines the performance, test and reliability requirements of the Headers Straight and Right Angle Press-Fit product HM1 versions

2.0 SCOPE

This specification is applicable to the termination characteristics of the Metral HEADER, which provides a separable, interconnect for printed circuit boards.

3.0 GENERAL

This document is composed of the following sections:

3.1 Lead Free / RoHs informations

All product where the part number ends in 'LF' meet the European Union directives and other country regulations as described in GS-47-0004.

Packaging specification: see GS-14-920

4.0 APPLICABLE DOCUMENTS

4.1 FCI Specifications

4.1.1 Engineering drawings: C-8626-xxxxx

4.2 Industry Product Specifications

4.2.1	IEC61076-4-104	Printed Board Connectors with Assessed Quality –Detail Specification for Two-part Modular Connectors, Basis Grid of 2mm, with Terminations on a multiple Grid of 0.5mm
4.2.2	EIA616	2 Millimeter, Two-Part Connectors for use with printed Boards and Back planes

4.3 Industry Performance Standards and Procedures

4.3.1	Telcordia GR-1217-CORE	Generic Requirements for separable electrical connectors Used in Telecommunications Hardware
4.3.2	EIA 364:	Electrical Connector/Socket test procedures including Environmental Classifications.
4.3.3	IEC60512	Electromechanical components for electronic equipment, Basic testing procedures and measuring methods
4.3.4	IEC352-5	Solderless Press-in connections General requirements, tests methods and practical guidance

4.5 Others Standards and Specifications

4.5.1	UL94-VO	Flammability

4.6 Tests Report

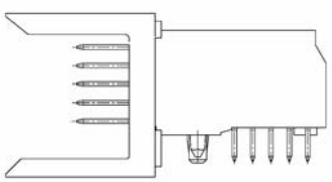
4.6.1	IEC Class 1	E91091 date: 10/12/1992 (FCI CRC) E93003 date: 11/01/1993 (FCI CRC) EA5-2705 date: 21/08/2006 (FCI DB)
4.6.2	Telcordia CO	R05-019 date: 10/12/1992 (FCI LFB) EA-1-2766 date: 26/04/2002 (FCI DB)
		EA-1-2767 date: 26/04/2002 (FCI DB)

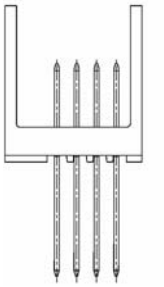
5.0 PERFORMANCES LEVELS

Part Numbers:

HM1xxxxxxxxxH6(P) or **8xxxx-1yy , 7xxxx-1yy (Specific for Narrow Body)**
HM1xxxxxxxxxH6(P)LF **8xxxx-1yyLF , 7xxxx-1yyLF**

These Part/Numbers meet requirements for
-IEC 61076-4-104 Class 1
-Telcordia GR-1217 CENTRAL OFFICE (CO), 4 Gazes





6.0 REQUIREMENTS

6.1 Material

Contacts… ..... Phosphor Bronze Alloy

Front housings
for HM1xxxxxxxxxH6(P
HM1xxxxxxxxxH6(P)LF.....Glass filled LCP Thermoplastic, UL94V0 flammability rating
Or converged part Numbers colour: Natural

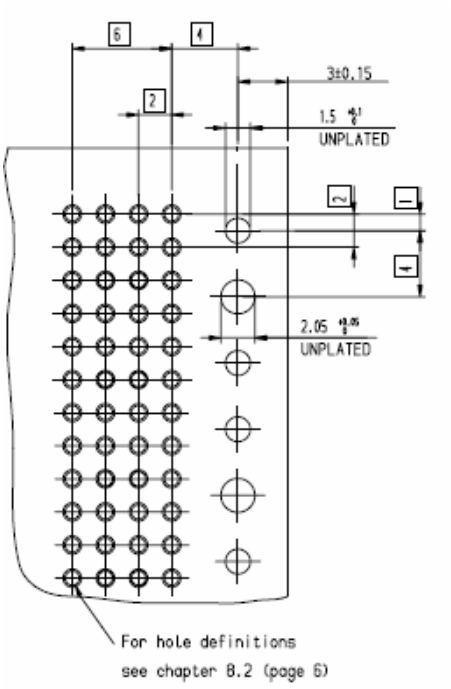
Rear housings or Keepers… .....Glass filled LCP Thermoplastic, UL94V0 flammability rating
colour: Natural

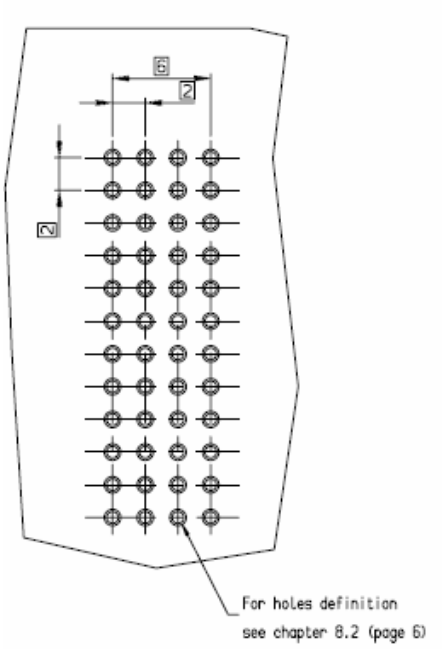
6.2 Contacts Finish (Plating)

Please refer the drawing 10159409.

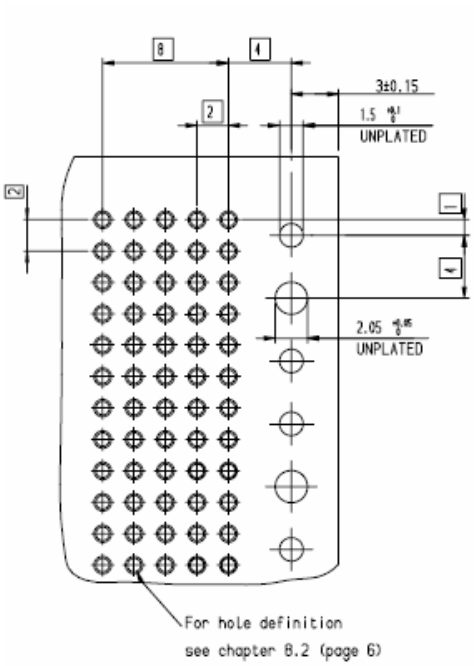
6.3 PCB recommended layout

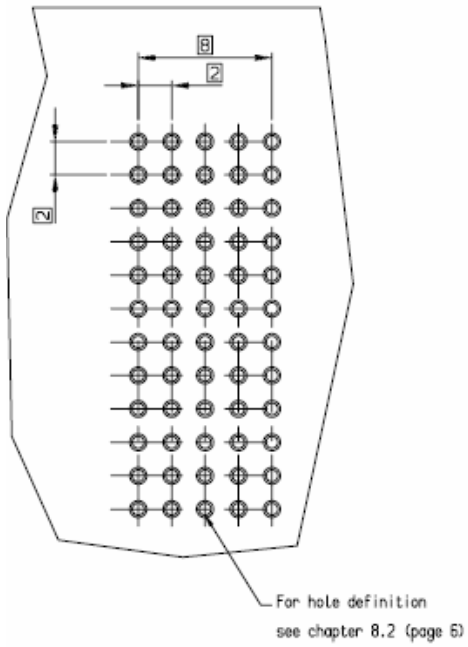
Header for 4 row Press-fit and Straight





Header for 5 row Press-fit and Straight





7.0 ELECTRICAL CHARACTERISTICS

7.1 Low Level Contact Resistance (LLCR)

The low level contact resistance shall not exceed the values shown below when measured in accordance with IEC60652 test 2a

-Signal contact Row A, B, C, D, E : 20 mΩ Maximum
-Power Blade contact Row A, B, C, D, E: 10 mΩ Maximum

7.2 Insulation Resistance

The insulation resistance of unmated connector between to adjacent contacts shall not be less than 5000 MΩ (megaOhms) initially, and shall not be less than1000 MΩ after environmental exposure .Test in accordance with IEC60652 ,test 4a

7.3 Dielectric Withstanding Voltage

There shall be no evidence of arc-over, insulation breakdown, when a test voltage of 1000V rms is applied. Test methodology in accordance with IEC60652,test 4a

7.4 Pin Current Capacity

7.4.1 Nominal Current

The nominal current carrying capacity shall be:
-1.5A (Amperes) per signal contact
-3A per power blade contact
when current is applied to all contacts. Test methodology in accordance to IEC60652,test 5b

7.4.2 Maximum Current capacity

The maximum current capacity shall be:
-Signal contact 2A (Amperes) at 20°C / 1.5A at 70°C
-Power blade contact 4A (Amperes) at 20°C / 2.75A at 70°C

7.5 Creepage and Clearance distances

The minimum distance for creepage and clearance is: 0.60mm

7.6 Wipping Length

The wipping length in plug in direction is: 2.0mm
When mating Header with “F series” or “TINT” receptacles

7.7 Capacitance

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

a. Spécification requirement 2.2 pF max.
b. Sample test conditions
   Frequency 1mhz
   Amplitude 1volts
   Surrounding Contacts tied to ground

7.8 Inductance

The inductance between adjacent contacts shall be no greater than 25 nH, and between one contact and all other surrounding contacts grounded shall be no greater than 15 nH. The following details apply per BUS-03-113:

a. Connectors shall be mated.
b. Measurements shall be made from tail to tail tip.
a. Test conditions 1 ns rise time pulse (0.0V to 1.0V), with a 50 –ohm termination.
b. Measurement equipment: Sampler/TDR/Scope equipment with a 50 Ohm reference impedance.

8.0 MECHANICAL CHARACTERISTICS

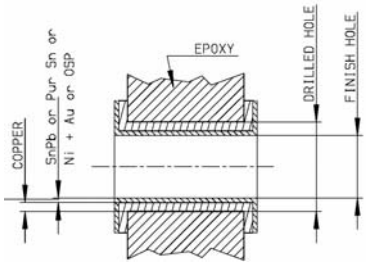
8.1 Contact Retention to Housing

There shall be no loosening of the contact or damage to the contact ,contact displacement 0.1mm maxi when a axial force of 10N is applied to a contact
Test in accordance to IEC60652,test 15a

8.2 PCB Holes definitions

		PRESS-FIT TERMINATION Hole : Ø0.7mm		
		TIN LEAD Holes	**Pure TIN Holes**	**COPPER OSP Holes**
P.C.B HOLES DEFINITION Note 1 and 2	Drill Diameter	Ø0.85 REF (Note 3)	Ø0.85 REF (Note 3)	Ø0.85 REF (Note 3)
	Drilled Hole	Ø0.81 -0.86	Ø0.81 -0.86	Ø0.81 -0.86
	Copper Underplating	25µ min i/ 50µ maxi	25µ min i/ 50µ maxi	25µ min i/ 50µ maxi
	TIN-LEAD holes (SnPb)	5µ mini – 15µ maxi		
	Pure TIN holes (Sn)		0.8µ mini – 1.2µ maxi	
	COPPER holes (OSP)			0.2µ mini – 0.5µ maxi
	FINISH HOLE – (Note 4)	Ø0.65 / Ø0.80	Ø0.69 / Ø0.80	Ø0.70 / Ø0.80

Note 1: These dimensions must be respected to secure Press-Fit Performances
Note 2: According to IEC-352-5 Specification
Note 3: Major requirement for Press-Fit performance
Note 4: Dimensions after reflow for Pure TIN and TIN LEAD



8.3 Press-Fit Performances

		EON + SPECIFIED HOLE DIM	
Insertion Force (N) –All plating types		≤ 55 N	≤ 55 N
Extraction Force (N)	Tin Lead hole Plated	≥ 20 N	≥ 15 N
	Pur Tin hole Plated	≥ 20 N	≥ 15 N
	Cu hole Plated (OSP)	≥ 20 N	≥ 15 N
		Header Straight	Header Right Angle

9.0 ENVIRONMENTAL CONDITIONS

After exposure to the following environmental conditions 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 of sections 7.0 and 8.0

9.1 Thermal Shock

Mated connectors shall be tested with cyclic variation from -55°C to +125°C for a minimum of 5 cycles ,30minutes at each extreme temperature,2 hours recovery time
Test according to IEC60652,test 11d

9.2 Temperature life

Mated connectors shall be tested at a temperature of 125°C for 1000 hours
Test according to IEC60652, test 9b

9.3 Moisture Resistance (Steady State Damp Heat)

Mated connectors shall be tested at a temperature humidity environment of 55°C and 93% R.H. for a total exposure of 56 days.
Test methodology shall be in accordance with IEC 60512, test 11C.

9.4 Durability

Mating / Unmating with an appropriately Receptacle connector with a minimum of 250 operations without any damages on contact area
Test methodology shall be in accordance with IEC 60512, test 9a.

9.5 Vibration

Mated connectors shall be tested in accordance with IEC 60512, test 6d. Test duration shall be monitored continuously during the vibration by an event detector, which is capable of detecting interruptions of one 1 microsecond or less.

Frequency Range: 10 HZ – 2,000 HZ
Amplitude: 200m/s^2.
10 sweeping cycles per axis. Full duration per axis is 2 hours

9.6 Shocks

Mated connectors shall be tested according to IEC 60512, test 6C. Connectors shall be exposed to 6 shocks in each of the 3 axis directions, for a total of 18 shocks. Continuity shall be monitored continuously during the shock by an event detector, which is capable of detecting interruptions of 1 microsecond or less.

Half-Sine Excitation: 30 g's
Duration: 11 ms

9.7 Industrial Mixed Flowing Gas (4 Gazes MFG)

Durability - Standard laboratory procedure as applicable to the specific product.
a. Number Cycles - 98 or 99 cycles per Table 1
b. Cycling Rate - 5 inches per minute

Mated connectors shall not experience a change in low-level contact resistance (LLCR) greater than 10mΩ □at any time during the sequence. Connectors shall be tested in accordance with section 9.1.3 of Telcordia GR-1217 CORE, central office (CO) conditions
Test sequence shall be a 10-day parallel mated and unmated exposure as per section 9.1.3.2 of the Telcordia GR-1217 CORE specification. Temperature shall be 30° ±□1° Celsius with relative humidity at 70% ±2%.

Gas	Four (4) Gas Mixture Central Office Environnent
NO_2	200 ± 50 ppb
CL_2	10 ± 3 ppb
H_2S	10 ± 5 ppb
SO_2	100 ± 20 ppb

Disturb - an Instron compression/tensile tester shall be used to back the fully seated receptacle from the header by 0.10mm. The sample is then removed and measurements made.

Durability - Standard laboratory procedure as applicable to the specific product.
a. Number Cycles - 98 or 99 cycles per Table 1
b. Cycling Rate - 5 inches per minute
a. per sections 9.1.1.1 and Table 9-1

10.0 PACKAGING

When suffix “P” is added in the Part/Number, the packaging is TRAY
(Example HM1W5xxxxxxxH6**P**LF

But marking on the connector is without P, (Example HM1W5xxxxxxxH6LF

-The preferred packaging for Vertical Header is TUBE
-The preferred packaging for Right Angle Header is TRAY

REVISION RECORD

REV	PAGE	DESCRIPTION	EC #	DATE
A	All	New Release	LS07-0072	05/03/2007
B	4	Add PCB recommended layout	LS08-0131	22/05/2008
C	All	Template updated	ELX-I-40028	16/02/2021
	3	Common plating drawing number added		