1.0 OBJECTIVE

This specification defines the **IEC** test requirements of the Millipacs (2 mm Hard-Metric) signal connector. These are required for Millipacs to comply with the IEC 1076-4-101 Hard Metric standards.

2.0 SCOPE

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

3.0 GENERAL

This document is composed of the following sections:

Paragraph	Title
1.0	OBJECTIVE
2.0	SCOPE
3.0	GENERAL
4.0	IEC REPORT

4.0 IEC REPORT

Group P - Preliminary

All specimens shall be subjected to the following tests:

Test phase	IEC 512			Measurement to be performed	IEC 512	Requirements		
	Title	Test No.	Severity or condition of test	Title	Test No.	PL		All connector styles
P1	General examination		Unmated connectors	Visual examination	1a	1 2 3	x x x	There shall be no defect that would impair normal operation
				Examination of dimensions and mass	1b	1 2 3	x x x	The dimensions shall comply with those specified in 3, including creepage and clearance distances as specified in 4.2.1, and first possible contact point as specified in 3.5.2.
P2	Polarizing method	13e	Polarizing method: see 4.3.8 Robustness of coding: see 4.3.9 Insertion force to be applied: Styles A, L and M: 100 N Styles C and N: 50 N Style B: not applicable	Visual examination	1a	1 2 3	x x x	There shall be no defect that would impair normal operation
P3			Connecting points: see 5.1.1 10 contacts per specimen	Contact resistance	2a	1 2 3	x x x	20 mΩ max. See also 4.2.4
P4			Test voltage 100 V d.c. Method A Mated connectors Five contacts per specimen	Insulation resistance	3a	1 2 3	x x x	10^4 MΩ min. See also 4.2.5
P5			Test voltage 750 V r.m.s. Method B, mated connectors 50 contacts per specimen Wiring according to 5.1.4	Voltage proof	4a	1 2 3	x x x	There shall be no breakdown or flashover

Group A - Dynamic / Climatic

Test phase	IEC 512			Measure-ment to be performed	IEC 512	Requirements		
	Title	Test No.	Severity or condition of test	Title	Test No.	PL		All connector styles
A1.1			Speed: 10 mm/s max.	Engaging and sepa-rating forces	13a	1 2 3	x x x	See also 4.3.2
A2	Probe damage	16a	Not applicable	Gauge retention force	16e			Not applicable
A3.1	Solderability	12a	Not applicable					
A3.2	Resistance to soldering heat	12d	Not applicable					
A4				Voltage proof	4a			Not applicable
A5	Contact retention in insert	15a	Unmated connectors 10 contacts per specimen Force applied in two directions: see 4.3.3			1 2 3	x x x	Axial displacement 0,2 mm max. while force is applied 0,1 mm max. after removing force
			Unmated connectors	Visual examination	1a	1 2 3	x x x	There shall be no damage that would impair normal operation
A6	Bump	6b	Not applicable					
A7	Vibration	6d	Arrangement in fixture 5.1.2 Frequency 10 Hz to 2000 Hz Amplitude 1,5 mm or 200 m/s^2 Eight sweepings in each direction Full duration 3 × 2 h in three axes	Contact disturbance	2e	1	x	Duration of disturbance 1 µs max.
			Frequency range 10 Hz to 500 Hz Amplitude 0.35 mm or 50 m/s^2 10 sweepings in each direction Full duration 3 × 2 h in three axes			2 3	x	
			Unmated connectors	Visual examination	1a	1 2 3	x x x	There shall be no damage that would impair normal operation
			Connecting points: see 5.1.1 10 contacts per specimen	Contact resistance	2a	1 2	x x	Rise in relation to initial values 5 mΩ max.
A8	Shock	6c	Arrangement in fixture 5.1.2 Shock acceleration 500 m/s^2 Duration of impact 10 ms Five shocks in two directions of three axes	Contact disturbance	2e	1 2 3	x x	Duration of disturbance 1 µs max.
			Unmated connectors	Visual examination	1a	1 2	x x	There shall be no damage that would impair normal operation
			Connecting points: see 5.1.1 10 contacts per specimen	Contact resistance	2a	1 2	x x	Rise in relation to initial values 5 mΩ max.
A9	Acceleration steady state	6a	Not applicable					

A10	Rapid change of temperature	11d	-55 °C to 125 °C Five cycles 30 min/temp Recovery time 2 h Mated connectors			1 2 3	x x	
			Test voltage 100 V d.c. Method A Mated connectors Five contacts per specimen	Insulation resistance	3a	1 2 3	x x	10^4 MΩ min.
			Test voltage 750 V r.m.s. Method B, mated connectors 50 contacts per specimen Wiring according to 5.1.4	Voltage proof	4a	1 2 3	x x	There shall be no breakdown or flashover
			Unmated connectors	Visual examination	1a	1 2	x x	There shall be no damage that would impair normal operation
A11	Climatic sequence	11a	Mated connectors					
A11.1	Dry heat	11i	Method A, 125 °C, unloaded Duration 16 h, recovery time 2 h Test voltage 100 V d.c. Five contacts per specimen	Insulation resistance at high temperature	3a	1 2 3	x x x	10^3 MΩ min.
A11.2	Damp heat, cyclic first cycle	11m	55 °C, Variant 1			1	x	
			40 °C, Variant 1			2 3	x	
			Unmated connectors	Visual examination	1a	1 2 3	x x	There shall be no damage that would impair normal operation
A11.3	Cold	11j	-55 °C, duration 2 h Recovery time 2 h			1 2 3	x x x	
			Unmated connectors	Visual examination	1a	1 2 3	x x x	There shall be no damage that would impair normal operation
A11.4	Low air pressure	11k	30 kPa, test voltage 200 V r.m.s. Method B, mated connectors 50 contacts per specimen Wiring according to 5.1.4	Voltage proof	4a	1 2 3	x x	There shall be no breakdown or flashover
A11.5	Damp heat cyclic, remaining cycles	11m	55 °C, Variant 1			1	x	
			40 °C, Variant 1			2 3	x	
			Test voltage 100 V d.c. Method A, mated connectors Five contacts per specimen	Insulation resistance	3a	1 2 3	x x	10^3 MΩ min.
			Connecting points: see 5.1.1 10 contacts per specimen	Contact resistance	2a	1 2 3	x x	Rise in relation to initial values 5 mΩ max.
			Test voltage 750 V r.m.s. Method B, mated connectors 50 contacts per specimen Wiring according to 5.1.4	Voltage proof	4a	1 2 3	x x	There shall be no breakdown or flashover
A12.1			Speed: 10 mm/s max.	Engaging and separating forces	13a	1 2 3	x x x	See also 4.3.2
A13			Unmated	Visual examination	1a	1 2 3	x x x	There shall be no damage that would impair normal operation

Group B - Mechanical endurance

Test phase	IEC 512 Title	IEC 512 Test No.	IEC 512 Severity or condition of test	Measurement to be performed Title	IEC 512 Test No.	PL		Requirements All connector styles
B1			Method A 10 contacts per specimen. Gauges: see 3.9.1	Gauge retention force	16e	1 2 3	x x x	The gauge shall be retained
B2	Mechanical operation	9a	Speed 10 mm/s max. Rest 30 s (unmated) Half of specified number of operations			1 2 3	x x x	
			Unmated	Visual examination	1a	1 2 3	x x x	There shall be no damage that would impair normal operation
			Connecting points: see 5.1.1 10 contacts per specimen	Contact resistance	2a	1 2	x x	Rise in relation to initial values 5 mΩ max.
						3	x	10 mΩ max.
			Test voltage 100 Vd.c. Method A Mated connectors Five contacts per specimen	Insulation resistance	3a	1 2 3	x x x	10^4 MΩ min.
			Test voltage 750 V r.m.s. Method B, mated connectors 50 contacts per specimen Wiring according to 5.1.4	Voltage proof	4a	1 2 3	x x x	There shall be no breakdown or flashover
B3.2	Corrosion, industrial atmosphere	11g (under consideration)	See annex B Half number mated Half number unmated			1 2 3	x x	10 days 4 days
			Connecting points: see 5.1.1 10 contacts per specimen	Contact resistance	2a	1 2	x x	Rise in relation to initial values 5 mΩ max.
B4	Mechanical operation	9a	Speed 10 mm/s max. Rest 30 s (unmated) Remaining number of operations	Visual examination	1a	1 2 3	x x x	There shall be no damage that would impair normal operation
			Connecting points: see 5.1.1 10 contacts per specimen	Contact resistance	2a	1 2	x x	Rise in relation to initial values 5 mΩ max.
						3	x	10 mΩ max.
			Test voltage 100 Vd.c. Method A Mated connectors Five contacts per specimen	Insulation resistance	3a	1 2 3	x x x	10^4 MΩ min.
			Test voltage 750 V r.m.s. Method B, mated connectors 50 contacts per specimen Wiring according to 5.1.4	Voltage proof	4a	1 2 3	x x x	There shall be no breakdown or flashover
			Method A 10 contacts per specimen Gauges: see 3.9.1	Gauge retention force	16e	1 2 3	x x x	The gauge shall be retained
B5	Probe damage	16a	Not applicable					
B6	Static load, transverse	8a	Arrangement and applicable forces according to 5.1.3	Visual examination	1a	1 2 3	x x x	No damage nor displacement likely to impair normal operation

Group C - Moisture

Test phase	IEC 512			Measurement to be performed	IEC 512	Requirements		
	Title	Test No.	Severity or condition of test	Title	Test No.	PL		All connector styles
C1	Damp heat, steady state	11c	Unloaded Polarizing voltage 60 V d.c. Wiring according to 5.1.4			1 2	x x	56 days 21 days
			Test voltage 100 V d.c. Method A, mated connectors Five contacts per specimen	Insulation resistance	3a	1 2	x x	10^3 MΩ min.
			Connecting points: see 5.1.1 10 contacts per specimen	Contact resistance	2a	1 2	x x	Rise in relation to initial values 5mΩ max.
			Test voltage 750 V r.m.s. Method B, mated connectors 50 contacts per specimen Wiring according to 5.1.4	Voltage proof	4a	1 2	x x	There shall be no breakdown or flashover
			Speed: 10 mm/s max.	Engaging and separating forces	13a	1 2	x x	See also 4.3.2
			Unmated	Visual examination	1a	1 2	x x	There shall be no damage that would impair normal operation

Group D - Electrical load

Test phase	IEC 512			Measurement to be performed	IEC 512	Requirements		
	Title	Test No.	Severity or condition of test	Title	Test No.	PL		All connector styles
D1	Mechanical operation	9a	Speed 10 mm/s max. Rest 30 s (unmated) Half of specified number of operations			1 2	x x	
D2	Electrical load and temperature	9b	Ambient temperature 70 °C Electrical load 1 A Wire gauge = 0,12 mm^2 All contacts loaded Duration 1000 h Recovery time 2 h			1 2	x x	Temparature in centre of specimens shall not exceed the maximum operating temperature with more than 5 %
			Connecting points: see 5.1.1 10 contacts per specimen	Contact resistance	2a	1 2	x x	Rise in relation to initial values 5 mΩ max.
			Test voltage 100 V d.c. Method A, mated connectors Five contacts per specimen	Insulation resistance	3a	1 2	x x	10^3 MΩ min.
			Test voltage 750 V r.m.s. Method B, mated connectors 50 contacts per specimen Wiring according to 5.1.4	Voltage proof	4a	1 2	x x	There shall be no breakdown or flashover
			Unmated	Visual examination	1a	1 2	x x	There shall be no damage that would impair normal operation

REVISION RECORD

REV	PAGE	DESCRIPTION	EC #	DATE
A	All	New Release	B20028	11feb2002
B	All	Design upgrade on Millipacs RA Receptacle & Shielding Accessory	I04-0112	30Dec2004
C	All	Logo Change	I06-0085	22 Jun2006

Mouser Electronics

Authorized Distributor

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FCI / Amphenol:

HM2J09PE5110N9 HM2P07PDG1A1N9LF HM2R89PA8101N9 HM2R95PA8100N9 HM2P08PD5111N9LF HM2R01PA5100N9LF HM2P07PK5110GFLF HM2P08PK5111GFLF HM2R02PA5108N9LF HM2P08PD5110N9LF HM2P07PNU1A4GFLF HM2P70PDE121N9LF HM2R70PA5100N9LF HM2DK2348RLF HM2R02PA5100N9LF HM2P07PN5114GFLF HM2R10PA5108N9LF HM2P70PME124GFLF HM2P09PD5111N9LF HM2P07PDE120L9LLF HM2R70PA5108N9LF HM2P09PK5111GFLF HM2R10PA5100N9LF HM2H07P115LF HM2R71PA5108N9LF HM2DK1248PLF HM2P07PNW1G5GFLF HM2P71PNE12CGFLF HM2DK3567RLF HM2P07PD5110N9LF HM2DK3456PLF HM2P07PMF2R7GFLF HM2J07PE5110N9LF HM2DK1567PLF HM2P71PDE121N9LF HM2R30PA5100N9 HM2R01PA5101N9 HM2P09PK5111GF HM2P09PD5111N9 HM2P07PD5111N9 HM2R10PA5100N9 HM2R02PA5100N9 HM2P70PDE121N9 HM2J07PE5110N9 HM2R70PA5108N9 HM2R03PA5100N9 HM2R01PA5108N9 HM2R02PA5101N9 HM2P08PK5111GF HM2P08PD5111N9 HM2R30PA5101N9 HM2R71PA5108N9 HM2R03PA5101N9 HM2R02PA5108N9 HM2P07PD5110N9 HM2P09PD5110N9 HM2R10PA5101N9 HM2P07PDU1A1N9 HM2P09PK5110GF HM2R10PA5108N9 HM2P07PK5110GF HM2P08PD5110N9 HM2A30PG6020LF HM2A31PG60J0L9LF HM2A32PG5000LF HM2C01D0C010N9LF HM2C01D2C010N9LF HM2C06D0C010N9LF HM2C06D2C010N9LF HM2C12D2C011N9LF HM2DK1235PLF HM2DK1236PLF HM2DK1238PLF HM2DK1246RLF HM2DK1256RLF HM2DK1258PLF HM2DK1267PLF HM2DK1346RLF HM2DK1347PLF HM2DK1356PLF HM2DK1456PLF HM2DK1457PLF HM2DK1578RLF HM2DK2346PLF HM2DK2458PLF HM2DK2467PLF HM2DK2567PLF HM2DK2568PLF HM2DK2578PLF HM2DK3467PLF HM2DK3478PLF HM2DK3568PLF HM2DK3578PLF HM2DK4578RLF HM2DK4678PLF HM2E30PH5000LF HM2E32PH5000LF HM2G02LF HM2G06LF HM2H00P16LF