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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

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4.0 IEC REPORT

Group P - Preliminary

All specimens shall be subjected to the following tests:

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	
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



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Group A - Dynamic / Climatic

Test phase	IEC 512			Measurement to be performed Title	IEC 512		Requirements	
	Title	Test No.	Severity or condition of test		Test No.	PL	All connector styles	
A1.1			Speed: 10 mm/s max.	Engaging and separating forces	13a	1 x 2 x 3 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 x 2 x 3 x	Axial displacement 0,2 mm max. while force is applied 0,1 mm max. after removing force	
			Unmated connectors	Visual examination	1a	1 x 2 x 3 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 x 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 x 2 h in three axes			2 x		
			Unmated connectors			3		
			Connecting points: see 5.1.1 10 contacts per specimen	Visual examination	1a	1 x 2 x 3 x	There shall be no damage that would impair normal operation	
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 x 2 x 3	Duration of disturbance 1 µs max.	
			Unmated connectors	Visual examination	1a	1 x 2 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 x 2 x	Rise in relation to initial values 5 mΩ max.	
A9	Acceleration steady state	6a	Not applicable					



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



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Group B - Mechanical endurance

Test phase	IEC 512			Measure-ment to be performed	IEC 512	Requirements	
	Title	Test No.	Severity or condition of test			PL	All connector styles
B1			Method A 10 contacts per specimen. Gauges: see 3.9.1	Gauge retention force	16e	1 x 2 x 3 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 x 2 x 3 x	
			Unmated	Visual examination	1a	1 x 2 x 3 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 x 2 x 3 x	Rise in relation to initial values 5 mΩ max. 10 mΩ max.
			Test voltage 100 Vd.c. Method A Mated connectors Five contacts per specimen	Insulation resistance	3a	1 x 2 x 3 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 x 2 x 3 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 x 2 x 3 x	10 days 4 days
			Connecting points: see 5.1.1 10 contacts per specimen	Contact resistance	2a	1 x 2 x 3 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 x 2 x 3 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 x 2 x 3 x	Rise in relation to initial values 5 mΩ max. 10 mΩ max.
			Test voltage 100 Vd.c. Method A Mated connectors Five contacts per specimen	Insulation resistance	3a	1 x 2 x 3 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 x 2 x 3 x	There shall be no breakdown or flashover
			Method A 10 contacts per specimen Gauges: see 3.9.1	Gauge retention force	16e	1 x 2 x 3 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 x 2 x 3 x	No damage nor displacement likely to impair normal operation



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Group C - Moisture

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

Group D - Electrical load

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
D1	Mechanical operation	9a	Speed 10 mm/s max. Rest 30 s (unmated) Half of specified number of operations			1	x
D2	Electrical load and temperature	9b	Ambient temperature 70 °C			2	x
			Electrical load 1 A				
			Wire gauge = 0,12 mm ²				
			All contacts loaded				
			Duration 1000 h				
			Recovery time 2 h				
			Connecting points: see 5.1.1	Contact resistance	2a	1	x
			10 contacts per specimen			2	x
			Rise in relation to initial values				
			5 mΩ max.				
			Test voltage 100 V d.c.	Insulation resistance	3a	1	x
			Method A, mated connectors			2	x
			Five contacts per specimen				
			10 ³ MΩ min.				
			Test voltage 750 V r.m.s.	Voltage proof	4a	1	x
			Method B, mated connectors			2	x
			50 contacts per specimen				
			Wiring according to 5.1.4				
			There shall be no breakdown or flashover				
			Unmated	Visual examination	1a	1	x
						2	x
			There shall be no damage that would impair normal operation				

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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

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