TE Connectivity Micro-MaTch Value line

1. SCOPE

1.1. Content

This specification covers the general description and performance requirements of the Micro-MaTch Miniature Connector System – Value line for Board to Board and wire to board interconnections, which includes 4- 20 position (only even positions) below connector types with staggered contact pattern and centerline distance of 1.27 mm between contacts.

- Female-On-Board, Top entry, Thru hole (FOB-TE-THT)
- Female-On-Board, Side entry, Thru hole (FOB-SE-THT)
- Female-On-Board, Top entry, Surface Mount (FOB-TE-SMT)
- Male-On-Board, Top entry, Thru hole (MOB-TE-THT)
- Male-On-Board, Top entry, Surface Mount (MOB-TE-SMT)
- Male-On-Wire (MOW)
- Paddle Board Connector (PBC)

1.2. Qualification

When tests are performed on the subject product line, the procedures specified in this specification, Figure 2 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS

The following documents and forms constitute a part of this specification to the extent specified herein. Unless otherwise indicated, the latest edition of the document applies.

2.1. Documents

- 114-13318 Application Specification Micro-MaTch Miniature SMD Connectors
- 114-19016 Application Specification Micro-MaTch Miniature Connector System (MOW & PBC)

2.2. Reference Documents

- 501-19208 Test report (Micro-MaTch Value line)
- 501-19094 Test report lead-free wave soldering-heat (IDC-connection Paddle-Board)
- 501-19093 Test report lead-free wave soldering-heat (Wave-solder connectors)
- 501-19092 Test report lead-free reflow soldering-heat (SMD connectors)

2.3. Drawings

- 2178710 (FOB-TE-THT)
- 2178711 (FOB-TE-SMD)
- 2823451(FOB-TE-THT-W/LATCH)
- 2823056 (FOB-TE-SMD-W/LATCH)
- 2315666 (FOB-SE-THT)
- 2315677 (FOB-SE-THT-W/LATCH)
- 2315640 (MOB-TE-THT)
- 2315650 (MOB-TE-SMD)
- 2178712 (MOW)
- 2178713 (PBC)

| Indicates Change

2.4. Industry Standard

- I.E.C. 512: Connectors used for frequencies below 3 MHz.
- I.E.C 68: Basic environmental testing procedures for electric components and electronic equipment.

3. REQUIREMENTS

3.1. Design and Construction

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

3.2. Ribbon cable specification

The TE Micro-MaTch connectors with IDC (insulation displacement connector) are designed for the application of ribbon cable with the following dimensions and properties:

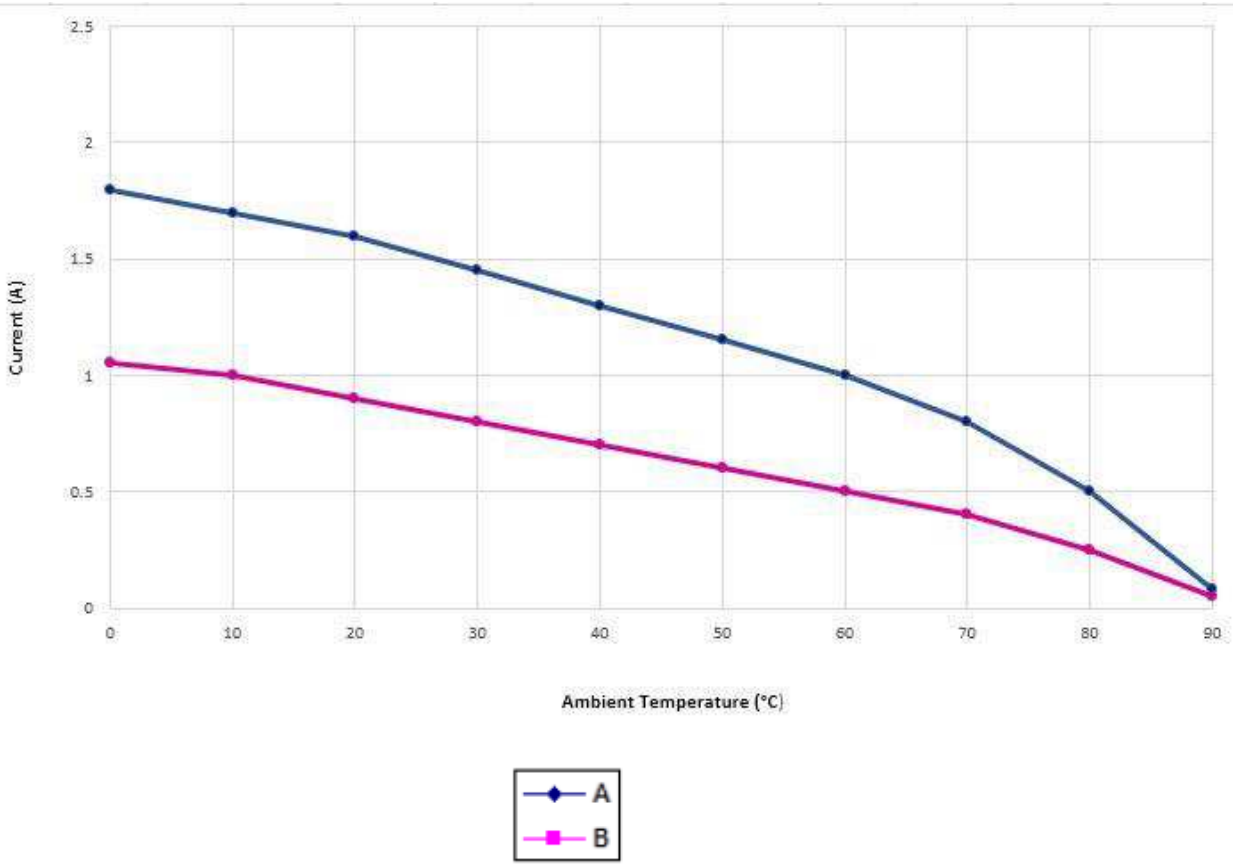
- Cable style: AWG 28, UL style 2651
- Conductor spacing: 1.27 mm (.050 in.)
- Conductor diameter: solid 0.30 mm; stranded 7*0,12-0,13 mm
- Insulation diameter: 0.9 mm ±0.1 mm
- TE approved cable
  - Part Number: 971111 Series Flat ribbon cables
    Insulation type: semi rigid PVC, 105°C
- Other TE approved cables:
  - Part Number: 167019 Series Flat ribbon cables
    Insulation type: semi rigid PVC, 105°C
  - Part Number: 1719754 Series Flat ribbon cables
    Insulation type: TPE, 125°C

In principle, ribbon cable must be approved by TE prior to application.

NOTE
Micro MaTch connectors with IDC (insulation displacement connector), MOW & PBC are designed for the application of ribbon cable with a profile that can be oval or round.

3.3. Ratings

- Operating Temperature: Continuous operation throughout an ambient temperature range of -30°C to 85°C.
- Voltage rating: 100 Volts DC or alternating current peak.
- Current rating: For current carrying capacity see de-rating curves



A valid for:
SMD Female Top Entry with Male on Wire
Female Side Entry with Male on Wire
Paddle Board

B valid for:
Female Top Entry with Male on Board
Female Top Entry with Male on Wire
Female Side Entry with Male on Board

Figure 1

3.4. Test Requirements and Procedures Summary

Unless otherwise specified, all tests are performed at ambient temperature

Test description	Requirement	Procedure
Examination of product	Meets requirements of product drawing and applicable Application specification	Visual, dimensional and functional per applicable inspection plan. In acc. with IEC 60512-1-1, test 1a. Magnification 10x.
ELECTRICAL		
Solder ability for through hole versions	Solderbath temp 235°C. Ageing 3, 16 hrs. at 155°C (Simulates 2 year solderability.) Min 95% wetting.	In acc. with IEC 60512-12-1
Resistance to soldering heat for through hole versions	Solder bath temp. 265°C Dip duration: 10 seconds Mount connectors in a PC-Board as intended to be applied. Requirement: No detrimental effects.	In acc. with: TE Test Spec 109-202 Method § 4.3, condition B. or IEC 60068-2-20, Test Tb, Method 1a
Solderability for SMD	Appearance of the specimen shall be inspected after the test with 10x magnification of any damage such as pinholes, void or rough surface. Solderbath temp 235°C. Ageing 3, 16 hrs. at 155°C. (Simulates 2 year solderability.) Min 95% wetting.	In acc. with IEC 60512-12-1
Resistance to Soldering Heat for SMD	2 cycles of 260°C peak reflow soldering simulation curve. Test severity shall not include moisture soak. Requirement: No detrimental effects.	In acc. with: TE Test Spec 109-201 Reflow curve § 3.3, Test method B, condition B
Insulation resistance	Test voltage 100V DC- or AC-Peak. Duration: 1 minute. Requirement: 1000 MΩ min.	In acc. with IEC 60512-3-1; Test 3a
Dielectric Strength	Test voltage: 500 VAC. Duration: 1 minute Requirement: No break-down or flash-over	In acc. with IEC 60512-4-1: Test 4a
Termination resistance THT	Maximum open voltage 20 mV. Maximum current 100 mA. Termination resistance consists of bulk cable + bulk connectors and contact resistance. Requirement: 15 Milliohms max. (excluding bulk cable)	In acc. with IEC 60512-2-1, test 2a. Under dry circuit conditions. All contacts measured.

Figure 2 (continued)

Test description	Requirement	Procedure
SMD	Max. open voltage 20 mV Max. current 100 mA Termination resistance consists of bulk resistance of contact + solder connection. Requirement: 15 mΩ max.	In acc. with IEC 60512-2-1, test 2a. Under dry circuit conditions. All contacts measured.
PBC	Max. open voltage 20 mV Max. current 100 mA Termination resistance consists of IDC slot resistance + contact bulk resistance Requirement: 15 mΩ max.	
MECHANICAL		
Contact retention in housing	10 N min. per contact. No dislodge from housing.	In acc. with IEC 60512-15-2. Test 15b
Durability / mating cycle	Number of operations: 8 Frequency: 10 times/min. Minimum time between 2 operations: 1 sec.	In acc. with IEC 60512-9-1, test 9a.
Tensile strength of cable termination	min. force 10N/contact	Soldered connector/ cable assembly is loaded with force, perpendicular to board surface.
Engaging and separating force	Engaging max 6N/contact Separating min 0.9 N/contact	In acc. with IEC 60512-13-1, Test 13a,
Vibration	10-55 Hz Sweep rate: 1oct. / min. / 0.35 mm 10 cycles (45 minutes) in each direction. Requirements: No physical damage No discontinuity >1 µ sec.	In acc. with IEC 60512-6-4, test 6d. In acc. with IEC 68-2-6 test Fc. procedure 8.2.1
Connector insertion force in PCB (only paddle board)	Max 5N per contact	Terminated paddle board connector is inserted into PC board with appropriate hole pattern.
Connector extraction force out of PCB (only paddle board)	Min force 0.5 N per contact (depends on hole size and board material)	Terminated paddle board connector is extracted from PC board.
ENVIRONMENTAL		
Damp heat cyclic	25/ 55°C 12/12 hours. unmated total 6 cycles.	In acc. with IEC 60512-11-12 test 11m.
Dry heat under cyclic current loading	Temp. 70°C, test current 125 % of rated current (par 3.4.) 500 cycles. 45 min ON/15 min OFF.	In acc. with IEC 60512-9-5 test 9e.
Cold test	Temperature: - 30 ° C Duration 2 hrs, unmated	In acc. with IEC 60512-11-10, test 11j.
Rapid change of temperature	-30/+85°C 15 min/15 min, 10 cycles mated.	In acc. with IEC 60512-11-4, test 11d.
Temperature life	Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence	EIA-364-17, Method A, Test Condition 4, Test Time Condition C. Subject mated specimens to 105°C for 500 hours.

Figure 2 (end)

3.5. Test Sequence

A. Female Top Entry / Side Entry (THT / SMD) in combination with MOW /MOB connector

Test or Examination	Test Group (a)								
	1	2	3	4	5	6	7	8	9
	Test Sequence (b)								
Examination of product	1, 8	1, 11	1, 7	1,5	1,5	1,11	1,13	1,3	1,4
Solderability								2	
Resistance to soldering heat									3
Insulation resistance							2,8,11		
Dielectric Strength (Voltage proof)							3,9,12		
Termination resistance	2, 7	3, 7, 9	2, 4, 6		2,4	2,6,10			
Contact retention in housing.									2,5
Mechanical operation (Durability)		5							
Tensile strength of cable termination.				2,4					
Engaging force		2, 6 (d)				3,7			
separating force		4, 10				4,8			
Vibration			5			9			
Damp heat cyclic	4(c), 6	8					5(c), 7		
Dry heat under cyclic current loading					3,				
Dry heat test	3						4		
Cold test	5						6		
Rapid change of temperature			3	3			10		
Temperature life						5			

B. Paddle board connector

Test or Examination	Test Group (a)						
	1	2	3	4	5	6	7
	Test Sequence (b)						
Examination of product	1,6	1,5	1,8	1,5	1,4	1,3	1,3
Solder ability						2	
Resistance to soldering heat							2
Insulation resistance							
Dielectric Strength (Voltage proof)							
Termination resistance	2,4		2,7	2,4			
Tensile strength of cable termination.	5	2,4					
Connector push in force in a PCB					2		
Connector push out force in a PCB					3		
Damp heat cyclic			4 (c), 6				
Dry heat under cyclic current loading				3			
Dry heat test			3				
Cold test			5				
Rapid change of temperature		3					
Temperature life	3						

NOTE

a) At least 5 connectors of the 6 positions or at least 30 contacts shall be used for each test group and they shall be selected at random from production.

b) Numbers indicate sequence in which tests are performed.

c) First cycle

d) Engaging force last cycle