
Terminal block Push-in Plug and Header

1. SCOPE

1.1. Content

This specification covers performance, tests, and quality requirements for the TE Connectivity (TE) Terminal block – Push-in Plug and Header. This Push-in plug is designed to terminate solid and stranded of specific range with respect to the centerline spacing as mentioned in Table 1.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Table 3 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS AND FORMS

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

2.1. TE Documents

- 114 -160803: Terminal block Push-in Plug and Header
- 501-19334: Qualification Test Report
- 501-162292: Qualification Test Report

2.2. Industry Documents

- IEC 60512 : Connectors for Electronic Equipment Tests and Measurements.
- UL 486E : Standard For Equipment Wiring Terminals For Use with Copper Conductors
- IEC 60998-2-1 : Connecting devices for low-voltage circuits for household and similar purposes - Part 2-1: Particular requirements for connecting devices as separate entities with screw-type clamping units.
- IEC 695-2-1 : Test method, Glow wire Test & Guidance

2.3. Reference Document

- TEC-109-197 TE Connectivity Test Specifications vs EIA and IEC Test Methods
- TEC-109-1 General Requirements for Testing

2.4 Agency Recognition

- UL recognition: E63810_20240419



(UL1059 & CSA C22.2 No. 158-10 - Terminal Blocks)

3. REQUIREMENTS

3.1. Design and Construction

Products shall be of the design, construction, materials, and physical dimensions specified on the applicable product drawings.

3.2. Ratings

Table 1

TE Plug Series	Version	TE Mating TB Header [Vertical (180)/ Horizontal (90)]	Housing /Color	PITCH (mm)	Voltage Max. VAC	Current A	Operating Temperature °C	Wire size AWG (Sol/Str)
2842474*	Single row w/o screw flange	2842476*	Green	3.50	150	8A	-40° to 115°C	16 - 24
		2842478*						
2842475*		2842477*	Black					
		2842479*						
2842480*	Single row With screw flange	2842482*	Green	3.50	150	8A	-40° to 115°C	16 - 24
		2842484*						
2842481*		2842483*	Black					
		2842485*						
2842487*	Dual row w/o screw flange	2842489* (HT)	Black	3.50	300	8A	-40° to 115°C	16 - 24
		2842542* (HT)			150	8A	-40° to 115°C	16 - 24
2842493*	Dual row With screw flange	2842495* (HT)	Black	3.50	300	8A	-40° to 115°C	16 - 24
		2842497* (HT)			150	8A	-40° to 115°C	16 - 24
2842499*	Dual row With side Latch	2842495* (HT)	Black	3.50	300	8A	-40° to 115°C	16 - 24
		2842541* (HT)			150	8A	-40° to 115°C	16 - 24
2842500*	Single row w/o screw flange	2842502*	Green	3.81	300	8A	-40° to 115°C	16 - 28
		2842504*						
2842501*		2842503*	Black					
		2842505*						
2842506*	Single row With screw flange	2842508*	Green	3.81	300	8A	-40° to 115°C	16 - 28
		2842510*						
2842507*		2842509*	Black					
		2842511*						
2842528*	Single row w/o screw flange	2842529*	Green	2.50	150	4A	-40° to 115°C	20 - 28
		2842530*						

2842543*	Single row w/o screw flange	2842546*	Green	5.00	300	15A	-40° to 115°C	24-14
		2842547*						
2842514*	Single row w/o screw flange	2842516*	Green	5.08	300	10A	-40° to 115°C	24-14
		2842518*						
2842520*	Single row With screw flange	2842522*	Green	5.08	300	10A	-40° to 115°C	24-14

i For product part number add prefix or suffix 1 to 9 to Series number*

3.3 Materials

Materials used in the construction of this product shall be as specified on the applicable product drawing. In case of a conflict between this document and the Product drawing, Product drawing shall be considered.

TB Plug

- Housing : PA66, UL 94 V0
- Contact : Copper alloy, Tin plated
- Push button/ Lever : POM UL94-HB, Color Orange
- Spring : Stainless steel
- Flange Screw : Steel , Zinc plated

TB Header (HT)

- Housing : LCP UL94 V0;
- Contact pin : Copper alloy, Tin plating over Nickel Underplating

TB Header

- Housing : PA 66, UL 94 V0
- Contact pin : Copper alloy, Tin plating over Nickel Underplating

3.4 Wire pull out force (reference UL 486E)

Table 2

Wire Size (AWG)	Pull force Min in N
12	60
14	50
16	40
20	30
24	13.4
26	8.9
28	4.5
30	2.2

4. TEST REQUIREMENTS AND PROCEDURES

4.1 Product is designed to meet the electrical, mechanical and environmental performance requirements specified below:

i Unless otherwise specified, all tests shall be performed at ambient environmental conditions per TE specification 109-1

Table 3

TEST DESCRIPTION	REQUIREMENT	PROCEDURE																		
Examination of product	Meets requirements of product drawing	Visually inspected per applicable quality inspection plan or IEC 60512-1-1 (Visual inspection)																		
ELECTRICAL																				
Contact Resistance (Termination Resistance)	<table border="1"> <thead> <tr> <th>PITCH in mm</th> <th>Initial (mΩ)</th> <th>Final (mΩ)</th> </tr> </thead> <tbody> <tr> <td>5.08</td> <td>10</td> <td>30</td> </tr> <tr> <td>5.00</td> <td>10</td> <td>30</td> </tr> <tr> <td>3.50</td> <td>10</td> <td>30</td> </tr> <tr> <td>3.81</td> <td>10</td> <td>30</td> </tr> <tr> <td>2.50</td> <td>10</td> <td>30</td> </tr> </tbody> </table>	PITCH in mm	Initial (mΩ)	Final (mΩ)	5.08	10	30	5.00	10	30	3.50	10	30	3.81	10	30	2.50	10	30	IEC 60512-2-1 (Contact resistance – millivolt level method) Contacts assembled in housing to closed circuit current of 100mA max at open circuit voltage of 20mV max.
	PITCH in mm	Initial (mΩ)	Final (mΩ)																	
	5.08	10	30																	
	5.00	10	30																	
	3.50	10	30																	
	3.81	10	30																	
2.50	10	30																		
Insulation Resistance.	<table border="1"> <thead> <tr> <th>PITCH in mm</th> <th>Initial Min(MΩ)</th> <th>Final Min(MΩ)</th> </tr> </thead> <tbody> <tr> <td>5.08</td> <td>2000</td> <td>1000</td> </tr> <tr> <td>5.00</td> <td>2000</td> <td>1000</td> </tr> <tr> <td>3.50</td> <td>2000</td> <td>1000</td> </tr> <tr> <td>3.81</td> <td>2000</td> <td>1000</td> </tr> <tr> <td>2.50</td> <td>2000</td> <td>1000</td> </tr> </tbody> </table>	PITCH in mm	Initial Min(MΩ)	Final Min(MΩ)	5.08	2000	1000	5.00	2000	1000	3.50	2000	1000	3.81	2000	1000	2.50	2000	1000	The insulation resistance shall be measured between two adjacent terminations having a minimum spacing using 500V DC IEC 60512-3-1, Method C
	PITCH in mm	Initial Min(MΩ)	Final Min(MΩ)																	
	5.08	2000	1000																	
	5.00	2000	1000																	
	3.50	2000	1000																	
	3.81	2000	1000																	
2.50	2000	1000																		
Voltage proof	Dielectric strength - Connector must withstand potential below for 1 min. No breakdown or flashover	IEC 60512-4-1 Measured by applying voltage potential to adjacent contacts, and between the grounds in the mated connector assembly.																		
	<table border="1"> <thead> <tr> <th>PITCH in mm</th> <th>Withstand potential (min)</th> </tr> </thead> <tbody> <tr> <td>5.08</td> <td>1600V</td> </tr> <tr> <td>5.00</td> <td>1600V</td> </tr> <tr> <td>3.50</td> <td>1600 V</td> </tr> <tr> <td>3.81</td> <td>1600 V</td> </tr> <tr> <td>2.50</td> <td>1300 V</td> </tr> </tbody> </table>		PITCH in mm	Withstand potential (min)	5.08	1600V	5.00	1600V	3.50	1600 V	3.81	1600 V	2.50	1300 V						
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	5.08		1600V																	
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2.50	1300 V																			

MECHANICAL

Connector Mating/ Unmating force	<table border="1"> <thead> <tr> <th>PITCH in mm</th> <th>Mating force per contact Max (N)</th> <th>Un-Mating force per contact Min (N)</th> </tr> </thead> <tbody> <tr> <td>5.08</td> <td>10</td> <td>4</td> </tr> <tr> <td>5.00</td> <td>10</td> <td>4</td> </tr> <tr> <td>3.50</td> <td>9.5</td> <td>3</td> </tr> <tr> <td>3.81</td> <td>9.5</td> <td>3</td> </tr> <tr> <td>2.50</td> <td>9.5</td> <td>3</td> </tr> </tbody> </table>	PITCH in mm	Mating force per contact Max (N)	Un-Mating force per contact Min (N)	5.08	10	4	5.00	10	4	3.50	9.5	3	3.81	9.5	3	2.50	9.5	3	Subject terminated contact and posts to mate and un-mate, to measure the force required to insert and extract by operating at a rate of 25.4 mm/min per contact IEC 60512-13-1 (Engaging and separating forces)
PITCH in mm	Mating force per contact Max (N)	Un-Mating force per contact Min (N)																		
5.08	10	4																		
5.00	10	4																		
3.50	9.5	3																		
3.81	9.5	3																		
2.50	9.5	3																		
Contact Retention Force	Force per contact min 15N	Apply axial pull-off load to contact mounted on housing and measure the force required to dislodge contact from housing. IEC-60512-15-1 Test 15a																		
Vibration.	No discontinuities of 1 microsecond or longer duration. no physical damage,	Subject mated specimens to 3.10G's rms between 20~500HZ. Fifteen minutes in each of 3 mutually perpendicular planes. Per EIA-364-28, Test Condition VII, Condition D.																		
Mechanical shock	No discontinuities of 1 microsecond or longer duration. no physical damage,	Subject mated connector, acceleration 50g, half sine wave pulses of 11msec, duration: 3 shocks, in each direction, 18 shocks in total IEC 60512-6-3.																		
Durability	Contact resistance (Final) shall be met.	IEC 60512-9-1 <table border="1"> <thead> <tr> <th>No. of cycles(min)</th> <th>Plating thickness (min)</th> </tr> </thead> <tbody> <tr> <td>25</td> <td>3µm Tin</td> </tr> </tbody> </table>	No. of cycles(min)	Plating thickness (min)	25	3µm Tin														
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Rotating test	The conductor shall neither slip out of the clamping unit nor break near the clamping, nor shall the conductor be damaged.	As per spec UL 486E																		
Conductor tensile force test (Pull test)	Conductor shall not slip out of the connecting device. See table 2 for min force values	As per spec UL 486E The force shall be applied in one smooth and continuous application, in the direction of the axis of the conductor for 1 minute																		

ENVIRONMENTAL

Dry heat/ Temperature Life (Heat Aging)	Contact resistance (Final) shall be met.	Temperature: 115°C Duration: 24 hours. IEC 60512-11-9
(Damp Heat) Humidity, Steady State	Insulation Resistance 1000M Ω min. Contact resistance (Final) shall be met	Subject mated connectors to steady state humidity at 40°C \pm 2°C and 90 R.H for 24 hrs. IEC 60512-11-12
Thermal Shock.	Contact resistance (Final) shall be met.	Subject mated connector assemblies on 5 cycles – 40 °C and +115°C for Tin Plated Contact for 30 minutes each duration at temperature extremes. IEC 60512-11-4 (Rapid change in Temp/thermal shock)
Solderability	The contact solder tails should be covered by a continuous new solder coating for 95% Minimum of affected area. No Physical damage shall occur	IEC 60512-12-1. Solder bath temp. 235°C Aging 3, 16 hours at 155°C
Resistance to Wave Soldering Heat	No physical damage shall occur.	TEC 109-202, Condition B Peak temp 260 \pm 5°C, hold time 10 +2/-0 sec.
Resistance to Reflow Soldering Heat	No physical damage shall occur. 3 cycles of 260°C peak reflow soldering simulation curve.	TEC 109-201, Condition B (reflow curve 3.3, test method B) Peak temperature: 260 +0/-5°C Time within 5°C of peak: 20 to 40 seconds

4.2 Product Qualification and Requalification Test Sequence

Table 4

Test or Examination	Test Group									
	1	2	3	4	5	6	7	8	9	10
	Test Sequence(a)									
Initial examination of product	1	1	1	1	1	1	1	1	1	1
Contact resistance	3, 7	2,4	2,4							
Insulation resistance				2,6						
Voltage Proof				3,7						
Vibration	5									
Mechanical shock	6									
Durability	4									
Mating Force	2									
Un-mating force	8									
Contact retention in housing (b)& (c)							2			
Thermal shock				4						
Humidity, Steady State			3	5						
Dry Heat / Temperature life		3								
Solderability (b)& (c)										2
Rotating test (d)					2					
Pull test (d)						2				
Resistance to wave Soldering heat (b)								2		
Resistance to Reflow Soldering heat (c)									2	
Final examination of product	9	5	5	8	3	3	3	3	3	3



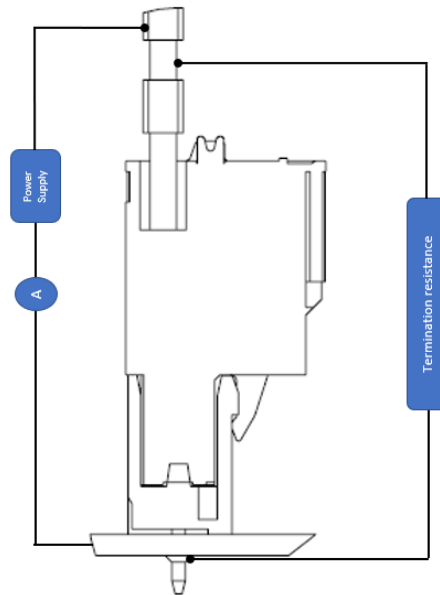
Note:

- (a) - Numbers indicate sequence in which tests are performed.
- (b) - Applicable for TB headers
- (c) - Applicable for TB headers (HT) only
- (d) - Applicable for TB plug only

5. QUALIFICATION TEST

Qualification test shall be performed according to the test methods and requirements specified in Table 3 according to sequence specified by Table 4

Figure 1 – Contact Resistance Measurement Set up



6. QUALITY ASSURANCE PROVISIONS

6.1. SAMPLE SELECTION

The test specimens to be used for the performance evaluation testing, shall be prepared in accordance with TE Application Specification 114-160803. They shall be selected at random from production. At least 5 connectors of the 6 positions or at least 30 contacts shall be used for each test group.

6.2. RE-QUALIFICATION TESTING

If the changes significantly affecting form, fit or function are made to product or manufacturing process, product assurance shall coordinate re-qualification testing, consisting of all or part of original testing sequence as determined by development/product, quality and reliability engineering.

6.3. ACCEPTANCE

Acceptance is based on verification that product meets requirements defined in section 4. Failures attributed to equipment; test setup or operator deficiencies shall not disqualify product. When product failure occurs, corrective action shall be taken, and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmitting.

6.4. QUALITY CONFORMANCE INSPECTION

Applicable TE quality inspection plan will specify sampling acceptable quality level to be used. Dimensions and functional requirements shall be in accordance with applicable product drawing and this specification.