



## Euro Style PCB Terminal Block Header & Plug

### 1. SCOPE

#### 1.1. Content

This specification covers performance, tests, and quality requirements for the Eurostyle Terminal Block header and plug. The product features, construction and dimensions shall be confirmed on the relevant customer drawings. Plug is designed to terminate solid / stranded wire by means of a screw activated clamp.

#### 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

The following documents constitute a part of this specification to the extent specified herein. Unless otherwise indicated, the latest edition of the document applies. In the event of conflict between the requirements of this specification and the product drawing, product drawing shall take precedence. In the event of conflict between the requirements of this specification and the reference documents, this specification shall take precedence.

#### 2.1. TE Documents

- 114-20079: Application specification - Eurostyle Terminal block Stacking connectors

#### 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

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

#### 2.4 Agency Recognition

- UL recognition: E60677  
(UL1059 & CSA C22.2 No. 158-10 - Terminal Blocks)

### 3. REQUIREMENTS

#### 3.1. Design and Construction

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

### 3.2. Ratings

Table 1

TE Plug Series	TE Mating TB Header (Horizontal / Vertical)	Housing /Color	PITCH (mm)	Voltage Max. VAC	Current A	Operating Temperature °C	Wire size AWG (Sol/Str)
1776242*	1776134* (HT)	Black	3.5	300	11A	-40° to 105°C	14-30
	2342076* (HT)						
	1776130* (HT)						
	2342071* (HT)						
284506*	284512*	Green					
	284514*						
2468511*	1776155* (HT)	Black	7.62	300	15A	-40° to 105°C	12-30
	1776154* (HT)						
796981*	796980*	Green					
	282966*						

### 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
- Clamping Screw : Copper alloy, Nickel plated
- Cage Clamp : Copper alloy, Nickel plated

#### TB Header (HT)

- Housing : High Temp PA, UL 94 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:



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)
<b>ELECTRICAL</b>		
Contact Resistance (Termination Resistance)	Initial <15m $\Omega$ Final < 20m $\Omega$	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.
Insulation Resistance.	$\geq 1000M \Omega$ (500 VDC)	The insulation resistance shall be measured between two adjacent terminations having a minimum spacing using 500V IEC 60512-3-1, Method C

Voltage proof	Dielectric strength - Connector must withstand potential of 1600 V 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 connector assembly.
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**MECHANICAL**

Contact pin Retention Force	Force per contact min 10N	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,	10-55-10 Hz traversed in 1 minute at 1.52mm amplitude 2 Hours each of 3 mutually perpendicular planes. IEC 60512-6-4.				
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" data-bbox="1036 1094 1432 1220"> <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
No. of cycles(min)	Plating thickness (min)					
25	3µm Tin					
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
Humidity, Steady State (Damp Heat)	Insulation Resistance 1000M Ω min. Contact resistance (Final) shall be met	Subject mated connectors to steady state humidity at 40°C±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 +105°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±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							8	9
	1	2	3	4	5	6	7		
	Test Sequence(a)								
Initial examination of product	1	1	1	1	1	1	1	1	1
Contact resistance	2, 6	2,4	2,4						
Insulation resistance				2,6					
Voltage Proof				3,7					
Vibration	4								
Mechanical shock	5								
Durability	3								
Contact retention in housing							2		
Thermal shock				4					
Humidity, Steady State			3	5					
Dry Heat / Temperature life		3							
Solderability (b)& (c)						2			
Resistance to wave Soldering heat (b)								2	
Resistance to Reflow Soldering heat (c)									2
Conductor tensile force test (Pull test) (d)					2	2			
Final examination of product	8	5	5	8	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.

## 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 114-20079. 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.