



NOTE

The product described in this document has not been fully tested to ensure conformance to the requirements outlined below. Therefore, TE Connectivity (TE) makes no representation or warranty, express or implied, that the product will comply with these requirements. Further, TE may change these requirements based on the results of additional testing and evaluation. Contact TE Engineering for further details.

MAG-MATE* Slim Line Terminals

1. SCOPE

1.1. Content

This specification covers performance, tests, and quality requirements for MAG-MATE* Slim Line terminals. These terminals are designed for general use as a magnet wire to external circuit interface and are compatible with copper wire sizes 17 AWG – 32 AWG or aluminum wire sizes 19 AWG – 21 AWG with coating of organic polymer material having NEMA temperature rating of 105°C to 200°C.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

1.3. Qualification Test Results

Successful qualification testing on the subject product line has been completed for application of the terminals on all copper wire sizes 17 through 32 AWG and aluminum wire sizes 19 AWG – 21 AWG. Qualification testing on the subject product line has not been completed for application of the terminals on aluminum wire sizes 17 AWG – 18 AWG and 22 AWG – 28 AWG.

2. APPLICABLE DOCUMENTS AND FORMS

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

2.1. TE Connectivity Specifications

- 114-2140 Application Specification – MAG-MATE* Slim Line Terminal with Tab
- EA20130481T Qualification Test Record – MAG-MATE* Slim Line Terminal on Aluminum Magnet Wire (Sizes 19 AWG – 21 AWG)
- CTL1039-062 Qualification Test Report – MAG-MATE* Slim Line Terminal on Copper Magnet Wire
- EA20200065T Qualification Test Record - MAG-MATE* Slim Line Terminal on Copper Magnet Wire (Sizes 0.83-0.63 Single, 0.80-0.63 Double)

2.2. Commercial Standards and Specifications

- EIA-364 Electrical Connector/Socket Test Procedures Including Environmental Classifications

2.3. Reference Documents

- 102-950 Qualification of Separable Interface Connectors
- 109-1 General Requirements for Testing
- 109-197 AMP Test Specifications vs EIA and IEC Test Methods

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Materials

Materials used in the construction of this product shall be as specified on the applicable TE drawing.

3.3. Ratings

- A. Voltage Rating: Meets all standard industry applied winding voltage rating requirements
- B. Current Rating: Meets all standard industry applied wire size current rating requirements
- C. Temperature Rating: -65°C to +150°C

3.4. Performance Requirements and Test Description

The product should meet the electrical, mechanical and environmental performance requirements specified in Figure 1. All tests shall be performed at ambient environmental conditions otherwise specified.

3.5. Test Requirements and Procedure Summary

Test Description	Requirement	Procedure
Examination of product	Meets requirements of product drawing.	Visual, dimensional and functional per applicable quality inspection plan.
Electrical		
Termination Resistance, Dry Circuit.	See Figure 2 and Figure 3.	EIA 364-23 Subject mated contacts assembled in housing to 50mv open circuit at 100ma maximum. See Figure 1.
Current Cycling	See Figure 3.	EIA 364-55 Current produces 100°C initial temperature rise on magnet wire. Take average reading from 3 thermocouples equally spaced on 12 inch length of magnet wire. Subject mated contacts to 480 cycles at test Current for 15 minutes ON and 15 minutes OFF. Read initially and after 480 cycles.
Mechanical		
Terminal Insertion Force	80 pounds (maximum)	EIA-364-5 Measure force necessary to insert terminal into housing cavity.
Terminal Extraction Force	5 pounds (minimum)	EIA-364-5 Measure force necessary to remove terminal from housing cavity.
Environmental		
Thermal Shock	No damage which could impair normal usage. Must meet termination resistance requirements in Figure 3.	EIA 364-32 Subject terminations to 25 cycles between -65°C and 125°C. Measure termination resistance initially and after 25 cycles.
Humidity-Temperature Cycling.	No damage which could impair normal usage.	EIA 364-31, Method IV (No preconditioning, No Cold Cycle or No Sub Cycle)

	Must meet termination resistance requirements in Figure 3.	Subject terminations to 10 humidity-temperature cycles between 25°C and 65°C at 95% RH. Measure termination resistance initially and after 10 cycles
Temperature Life	No damage which could impair normal usage. Must meet termination resistance requirements in Figure 3.	EIA 364-17 Subject terminations to temperature life at 118°C for 33 days. Measure termination resistance initially and after 33 days.

i **NOTE** Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in **Error! Reference source not found.**

Figure 1 (end)

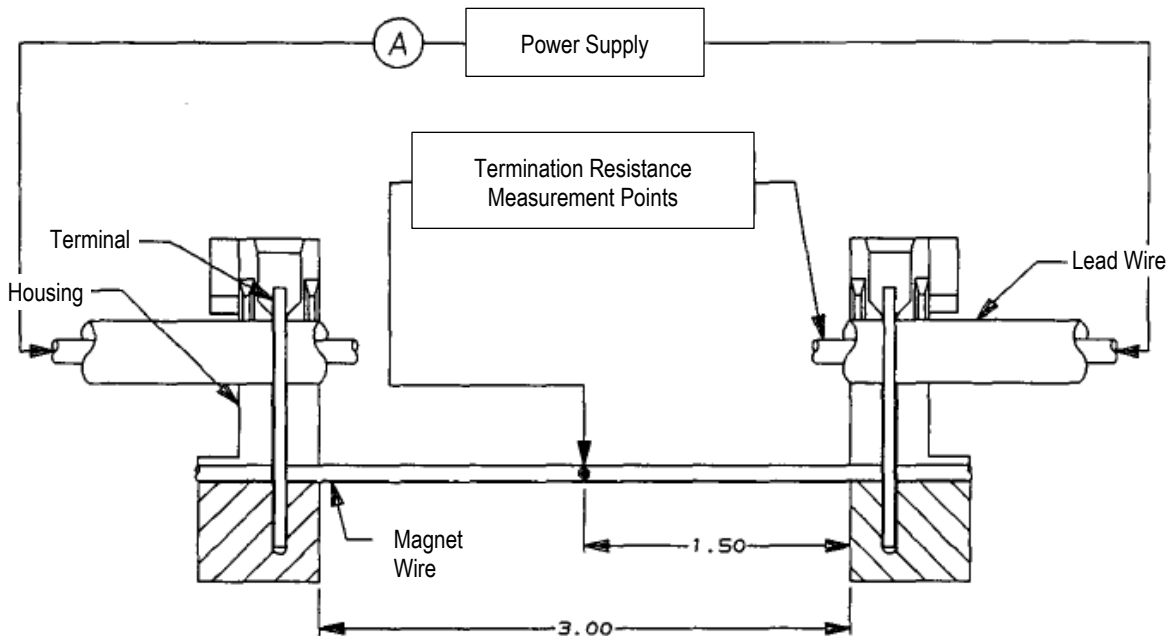


Figure 2: Termination Resistance, Dry Circuit, Measurement Points

i **NOTE** Termination resistance equals millivolts divided by the test current.

Wire Size [AWG] (c)	Current Cycling				Temperature Life, Humidity-Temperature Cycling, Thermal Shock	
	Copper Wire		Aluminum Wire		Copper	Aluminum
	Resistance [mΩ] (maximum)	Test Current (b) [Amperes] (maximum)	Resistance [mΩ] (maximum)	Test Current (b) [Amperes] (maximum)	Resistance [mΩ] (maximum)	Resistance [mΩ] (maximum)
17	1.4	22.0	2.9(a)	15.0(a)	1.1	2.2(a)
18	1.8	20.0	3.6(a)	13.5(a)	1.4	2.8(a)
19	2.2	18.0	4.4	12.0	1.7	3.4
20	2.7	16.0	5.5	11.0	2.1	4.2
21	3.5	14.0	7.0	9.5	2.7	5.4
22	4.3	12.5	8.6(a)	8.5(a)	3.3	6.6(a)
23	4.6	11.0	9.1(a)	7.5(a)	3.5	7.0(a)
24	5.7	9.5	11.4(a)	6.5(a)	4.4	8.8(a)
25	7.2	8.0	15.9(a)	5.5(a)	5.5	12.2(a)
26	9.1	7.5	18.2(a)	5.0(a)	7.0	14.0(a)
27	10.0	6.0	20.0(a)	4.0(a)	7.7	15.4(a)
28	14.4	5.0	28.9(a)	3.5(a)	11.1	22.2(a)
29	18.0	4.5	—	—	13.8	—
30	23.0	3.5	—	—	17.7	—
31	26.0	2.0	—	—	20.0	—
32	36.0	1.5	—	—	27.6	—


NOTE

- (a) Design objective value only. Product not yet qualified.
- (b) Current which produces 100° initial temperature on magnet wire. Average reading from 3 thermocouples equally spaced on 12 inch length of magnet wire.
- (c) For wire sizes that fall between those on the chart, extrapolated values for test currents and resistance requirements may be used.

Figure 3: Termination Resistance, Dry Circuit Requirements and Current Cycling Requirements for Copper and Aluminum Magnet Wire

3.6. Product Qualification and Requalification Test Sequence

TEST OR EXAMINATION	TEST GROUP (a)		
	1	2	3
	TEST SEQUENCE (b)		
Examination of Product	1, 9	1, 3	1, 4
Termination Resistance, Dry Circuit	2, 4(c), 6(c), 8(c)		
Current Cycling		2	
Terminal Insertion Force			2
Terminal Extraction Force			3
Thermal Shock	7(c)		
Humidity-Temperature Cycling	5(c)		
Temperature Life	3(c)		



NOTE

- (a) See paragraph 4.2.
- (b) Numbers indicate sequence in which tests are performed.
- (c) Termination Resistance measurements are made periodically throughout testing cycles. See Figure 1.

Figure 4

4. QUALITY ASSURANCE PROVISIONS

4.1. Test Conditions

Unless otherwise specified, all the tests shall be performed in any combination of the following test conditions shown in Figure 5.

Temperature	15°C – 35°C
Relative Humidity	45% – 75%
Atmospheric Pressure	86.6 – 106.6 kPa

Figure 5

4.2. Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable instruction sheets and shall be selected at random from current production. All test groups shall consist of 10 interconnect termination assemblies per magnet wire size.

B. Test Sequence

Qualification inspection shall be verified by testing specimens as specified in **Error! Reference source not found.**

4.3. Requalification Testing

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

4.4. Acceptance

Acceptance is based on verification that the product meets the requirements in Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken and specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.5. Quality Conformance Inspection

The applicable quality inspection plan shall specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.