PRODUCT SPECIFICATION

1. SCOPE

1.1. Content

This specification covers the performance, tests and quality requirements for the MAG-MATE* Micro Series terminals. These terminals are designed for general use as a magnet wire to external circuit interface. Terminal is compatible with copper magnet wire in sizes 28 thru 34.

1.2. Qualification

When tests are performed on the subject product line, the procedures specified in AMP 109 series specitications shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. 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. AMP Specifications

A. 109-1: General Requirements for Test Specifications
B. 109 Series: Test Specifications as indicated in Figure 1. (Comply with MIL-STD-202, MIL-STD-1344 and EIA RS-364)
C. Corporate Bulletin 401-76: Cross-reference between AMP Test Specifications and Military or Commercial Documents
D. 114-2099: Terminal, Micro Series, MAG-MATE
E. 501-52: Test Report

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3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Materials

A. Terminal: Brass, post-tin plated
B. Cavity: Polyester, nylon or equivalent
C. Magnet Wire: Copper with polyester and polyamide-imide, NEMA: MW 35-C

3.3. Performance and Test Description

Terminals shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1.

3.4. Test Requirements and Procedures Summary

| Test Description | Requirement | Procedure |
|---|---|---|
| Examination of Product | Meets requirements of product drawing and AMP Spec 114-2099. | Visual, dimensional and functional per applicable inspection plan. |
| ELECTRICAL | | |
| Termination Resistance, Dry Circuit | See Figure 3. | Subject terminals assembled in cavities to 50 mv open circuit at 100 ma maximum, see Figure 4; AMP Spec 109-6-1. |
| Current Cycling | Termination resistance at stated test current, see Figure 3. | Subject termination to 480 cycles, 15 minutes "ON" - 15 minutes "OFF"; AMP Spec 109-51, cond A, test method 2. |
| MECHANICAL | | |
| Contact Insertion Force | 13 pounds maximum per contact. | Measure force to insert contact into housing; AMP Spec 109-41. |

Figure 1 (cont)

| Test Description | Requirement | Procedure |
|---|---|---|
| Contact Retention Force | 3.75 pounds minimum. | Measure force required to pull terminal from cavity; AMP Spec 109-30. |
| ENVIRONMENTAL | | |
| Thermal Shock (a) | Termination resistance, dry circuit, see Figure 3. | Subject terminals inserted into cavity to 25 cycles between -65° and 125°C; AMP Spec 109-22. |
| Humidity-Temperature Cycling | Termination resistance, dry circuit, see Figure 3. | Subject terminals inserted into cavity to 10 humidity-temperature cycles between 25° and 65°C at 95% RH; AMP Spec 109-23, method III, cond B. |
| Temperature Life (a) | Termination resistance, dry circuit, see Figure 3. | Subject terminals inserted into cavities to 118°C for 33 days; AMP Spec 109-43, test level 9, test duration I. |

(a) Shall remain in cavities and show no evidence of damage, cracking or chipping.

Figure 1 (end)

3.6. Terminal Qualification and Requalification Tests and Sequences

| Test or Examination | Test Group (a) | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| | Test Sequence (b) | | |
| Examination of Product | 1 | 1 | 1 |
| Termination Resistance, Dry Circuit | 2,6 | 2,4 | |
| Current Cycling | | 3 | |
| Contact Insertion Force | | | 2 |
| Contact Retention Force | | | 3 |
| Thermal Shock | 3 | | |
| Humidity-Temperature Cycling | 5 | | |
| Temperature Life | 4 | | |

(a) See Para 4.1.A.
(b) Numbers indicate sequence in which tests are performed.

Figure 2

| Wire Size, AWG | Current Cycling | | Temperature Life Humidity-Temperature Thermal Shock |
|---|---|---|---|
| | Copper | | Copper |
| | Resistance, milliohms maximum | Test Current amperes | Resistance, milliohms maximum |
| 28 | 15 | 5.0 | 15 |
| 29 | 20 | 4.5 | 20 |
| 30 | 24 | 3.5 | 24 |
| 31 | 34 | 2.0 | 34 |
| 32 | 37 | 1.5 | 37 |
| 33 | 43 | 1.0 | 43 |
| 34 | 48 | 1.0 | 48 |

Figure 3

Resistance Values

## 4. QUALITY ASSURANCE PROVISIONS

### 4.1. Qualification Testing

A. Sample Selection

Terminal cavities and contacts shall be prepared in accordance with applicable Instruction Sheets. They shall be selected at random from current production. Each Group shall consist of 10 or more interconnect termination assemblies per magnet wire size. All terminals shall be terminated in accordance with AMP Specification 114-2099.

B. Test Sequence

Qualification inspection shall be verified by testing samples as specified in Figure 2.

C. Acceptance

(1) Test results from development on pre-qualification samples will be used to determine upper and lower one-sided statistical tolerance limits for 99% reliability at 95% confidence, as follows. Let X bar and s denote the sample average and standard deviation, respectively, of the test data. Let k denote the normal distribution one-sided tolerance factor for 95% confidence and 99% reliability. The value of k varies with sample size. Values of k are given in various tables, for example, NBS Handbook 91, Factors for One-Sided Tolerance Limits for Normal Distribution. Suitability of the normal distribution for representing the data shall be verified with normal probability plots, goodness of fit tests, etc.

Then the upper one-sided tolerance limit for 99% reliability at 95% confidence is given by X bar + ks. The interpretation of this tolerance limit is as follows: based on the test data, and assuming a normal distribution for the test data, we can be 95% confident that 99% of the population of values represented by the sample data will not exceed X bar + ks. For any test parameter for which there is specified an upper requirement which is not to be exceeded, satisfactory performance of the product is achieved when the value of X bar + ks does not exceed the requirement value.

The lower one-sided tolerance limit for 95% confidence and 99% reliability is given by X bar - ks. This has a similar interpretation and corresponding application to lower requirement values.

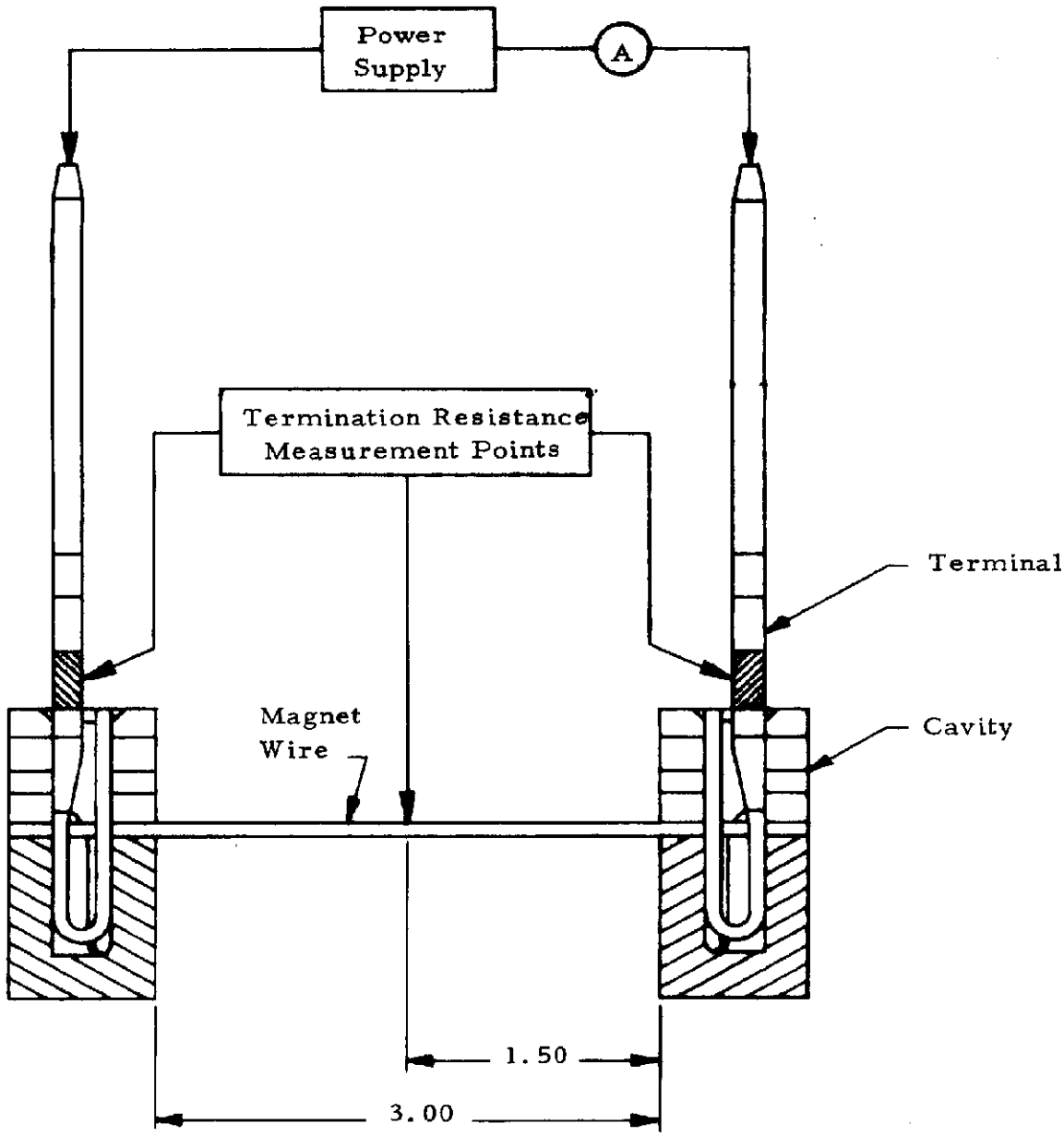
(2) Failures attributed to equipment, test setup, or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification.

4.2. Requalification Testing

Requalification shall be established by the cognizant divisional engineering function and may consist of all or any part of the overall qualification program provided that it is conducted within the required time period.

4.3. Quality Conformance Inspection

The applicable AMP inspection plan will 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.




Note: Termination equals millivolts divided by test current.

Figure 4

Resistance and Temperature Measurement Points