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**Mag45\* Modular Jacks With Integrated Magnetics**

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**1. SCOPE**

## 1.1. Content

This specification covers performance, tests and quality requirements for the Tyco Electronics Mag45\* Modular Jacks with Integrated Magnetics.

## 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 was completed on 20Jun00. The Qualification Test Report number for this testing is 501-524. This documentation is on file at and available from Engineering Practices and Standards (EPS).

**2. APPLICABLE DOCUMENTS**

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. Tyco Electronics Documents

- 109-197: AMP Test Specifications vs EIA and IEC Test Methods
- 501-524: Qualification Test Report
- 502-1129: Engineering Report

## 2.2. Industry Standards

- ANSI X3.263: Information Technology - Fibre Distributed Data Interface (FDDI) - Token Ring Twisted Pair Physical Layer Medium Dependent (TP-PMD)
- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- FCC Part 68: Connection of Terminal Equipment to the Telephone, Connector Specifications
- IEEE 802-3: Local Area Networks: Carrier Sense Multiple Access With Collision Detection (CSMA/CD) Access Method and Physical Layer Specification
- MIL-STD-202: Test Method Standard - Electronic and Electrical Component Parts
- MIL-STD-810: Test Method Standard - Environmental Engineering Considerations and Laboratory Tests

**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. Materials

- **Contacts:** Phosphor bronze, overall nickel plating with selective gold plating in the contact area and selective tin-lead plating on the soldertails. RoHS compliant versions will have tin and/or SAC solder dip on the soldertails in place of tin-lead.
- **Housing:** High temperature PET molding compound, UL94V-0
- **LED:** Epoxy encapsulated diode lens, steel lead frame with nickel, copper, silver and tin-lead plating. RoHS compliant versions will have tin and/or SAC solder dip or tin dip in place of tin-lead.
- **Shield:** Brass, semi-bright (satin) nickel plating, selective tin-lead plating on the soldertails. RoHS compliant versions will have SAC solder dip on the soldertails in place of tin-lead.
- **Magnetics:** Epoxy encapsulated wound cores and printed circuit board. Printed circuit board assembly contains common mode choke cores, isolation transformer cores, auto transformer (center-tapped inductor) cores, resistors, and capacitors with wire bonded pad connections. Wound cores consist of quadruple polyurethane-nylon coated fine gage magnet wire wrapped on a manganese-zinc ferrite toroid.

3.3. Ratings

- **Voltage:** 150 volts AC
- **Current:** Signal application only
- **Temperature:**
  - Standard: 0 to 70°C
  - Extended temperature varieties: -40 to 85°C

3.4. Product Codes

Product Codes for this product family are H363, H364, H365 and H366

3.5. Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions per EIA-364.

3.6. Test Requirements and Procedures Summary

| Test Description        | Requirement                                                                                                                                                                                  | Procedure                                                                                              |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Examination of product. | Meet requirements of product drawing, and dimensional and plating requirements of FCC Part 68, Subpart F, Connector Specification per Figure 68.500(d)(2)(i) 8 Position Series Modular Jack. | Measure per drawing, inspect plating thickness per x-ray evaluation per EIA-364-48 Method C.           |
| <b>ELECTRICAL</b>       |                                                                                                                                                                                              |                                                                                                        |
| Dry circuit resistance. | $\Delta R$ 30 milliohms maximum. See Engineering Report 502-1129.                                                                                                                            | EIA-364-23A. Subject specimens to 100 mA maximum and 20 mV maximum open circuit voltage. See Figure 3. |

Figure 1 (cont)

| Test Description                        | Requirement                                                                          | Procedure                                                                                                                                                    |
|-----------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Open circuit inductance.                | OCL 350 $\mu$ H minimum.                                                             | ANSI X3.263, ref IEEE 802.3.<br>Measure and record mutual inductance of mated and mounted specimens at 100 kHz, 100 mV, 8 mA DC bias, and 25°C.              |
| <b>MECHANICAL</b>                       |                                                                                      |                                                                                                                                                              |
| Random vibration, operational.          | No discontinuities of 1 microsecond or longer duration.<br>See Note.                 | EIA-364-28D,<br>Test Condition VIIA.<br>Subject specimens to 1.0 G rms between 3-500 Hz. PSD of .003. 45 minutes in each of 3 mutually perpendicular planes. |
| Random vibration, non-operational.      | See Note.                                                                            | EIA-364-28D,<br>Test Condition VIIA.<br>Subject specimens to 1.0 G rms between 3-500 Hz. PSD of .003. 45 minutes in each of 3 mutually perpendicular planes. |
| Durability, 500 cycles.                 | See Note.                                                                            | EIA-364-9C.<br>Manually mate and unmate specimens with the plug locking tab inoperable for 500 cycles at a maximum rate of 300 cycles per hour.              |
| Durability, 2000 cycles.                | See Note.                                                                            | EIA-364-9C.<br>Manually mate and unmate specimens with the plug locking tab inoperable for 2000 cycles at a maximum rate of 300 cycles per hour.             |
| Mating force.                           | 20.02 N [4.5 lbf] maximum.<br>See Note.                                              | EIA-364-13B.<br>Measure force necessary to mate specimens at a maximum rate of 12.7 mm [.5 in] per minute.                                                   |
| Unmating force.                         | 20.02 N [4.5 lbf] maximum.<br>See Note.                                              | EIA-364-13B.<br>Measure force necessary to unmate specimens at a maximum rate of 12.7 mm [.5 in] per minute.                                                 |
| Normal force.                           | 100 gram force [3.53 ozf] minimum per FCC Part 68, Subpart F Connector Requirements. | EIA-364-4.<br>Measure and record normal force generated at any given deflection level within the normal operating range with an FCC compliant modular plug.  |
| Modular plug retention to modular jack. | 57.83 N [13 lbf] minimum.<br>Plug shall not disengage from jack.                     | EIA-364-98.<br>Subject mounted specimens to specified force applied for 1 minute in 4 directions with plug mated in jack and latch engaged.                  |

Figure 1 (cont)

| Test Description              | Requirement                                                                                | Procedure                                                                                                                                      |
|-------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| ENVIRONMENTAL                 |                                                                                            |                                                                                                                                                |
| Thermal shock.                | See Note.                                                                                  | EIA-364-32C.<br>Subject mated and mounted specimens to 5 cycles between -25 +0/-3 and 70 +3/-0°C with 60 minute dwell at temperature extremes. |
| Humidity-temperature cycling. | See Note.                                                                                  | EIA-364-31B, Method IV.<br>Subject mated and mounted specimens to 10 cycles (10 days) between 25 and 65°C at 90 to 95% RH.                     |
| Mixed flowing gas.            | See Note.                                                                                  | EIA-364-65, Class IIA (4 gas).<br>Subject mated and unmated specimens to environmental Class IIA for 10 days.                                  |
| Extended temperature.         | No discontinuities of 1 microsecond or longer duration at temperature levels.<br>See Note. | Subject mated and mounted specimens to 2 hours at each of the following temperatures: -5, 25, 55 and 75 ± 2°C.                                 |
| Humidity, non-operational     |                                                                                            | MIL-STD-810, Method 507.3.<br>Subject mated and mounted specimens to 10 cycles (10 days) between 30 and 60°C at 95 ± 5% RH.                    |
| Salt spray.                   | See Note.                                                                                  | EIA-364-26, Test Condition B.<br>Subject specimens to 5% spray at 35°C for 48 hours.                                                           |

**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 Figure 2.*

Figure 1 (end)

3.7. Product Qualification and Requalification Test Sequence

| Test or Examination                    | Test Group (a)    |      |   |          |
|----------------------------------------|-------------------|------|---|----------|
|                                        | 1                 | 2    | 3 | 4        |
|                                        | Test Sequence (b) |      |   |          |
| Examination of product                 |                   |      | 2 |          |
| Dry circuit resistance                 | 2,7,9             | 1,3  |   |          |
| Open circuit inductance                |                   |      |   | 1,5,8,10 |
| Random vibration, operational          |                   |      |   | 6        |
| Random vibration, non-operational      |                   |      |   | 7        |
| Durability, 500 cycles                 | 4                 |      |   |          |
| Durability, 2000 cycles                |                   |      |   | 2(c)     |
| Mating force                           | 1,5               |      |   |          |
| Unmating force                         | 3,6               |      |   |          |
| Normal force                           |                   |      | 1 |          |
| Modular plug retention to modular jack |                   |      | 3 |          |
| Thermal shock                          |                   |      |   | 4        |
| Humidity-temperature cycling           | 8                 |      |   |          |
| Mixed flowing gas                      |                   | 2(d) |   |          |
| Extended temperature                   |                   |      |   | 3        |
| Humidity, non-operational              |                   |      |   | 9        |
| Salt spray                             |                   |      | 4 |          |

**NOTE**

- (a) See paragraph 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.
- (c) Measure inductance initially and at 50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 650, 700, 750, 800, 1000, 1200, 1400, 1600, 1800 and 2000 cycles.
- (d) 10 days mated; 5 days unmated, 5 days mated.

Figure 2

**4. QUALITY ASSURANCE PROVISIONS**

4.1. Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Test group 1 shall consist of 16 specimens. Test groups 2 and 3 shall each consist of 1 specimen. Test group 4 shall consist of 45 specimens.

B. Test Sequence

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

#### 4.2. 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.

#### 4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of 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.

#### 4.4. 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.

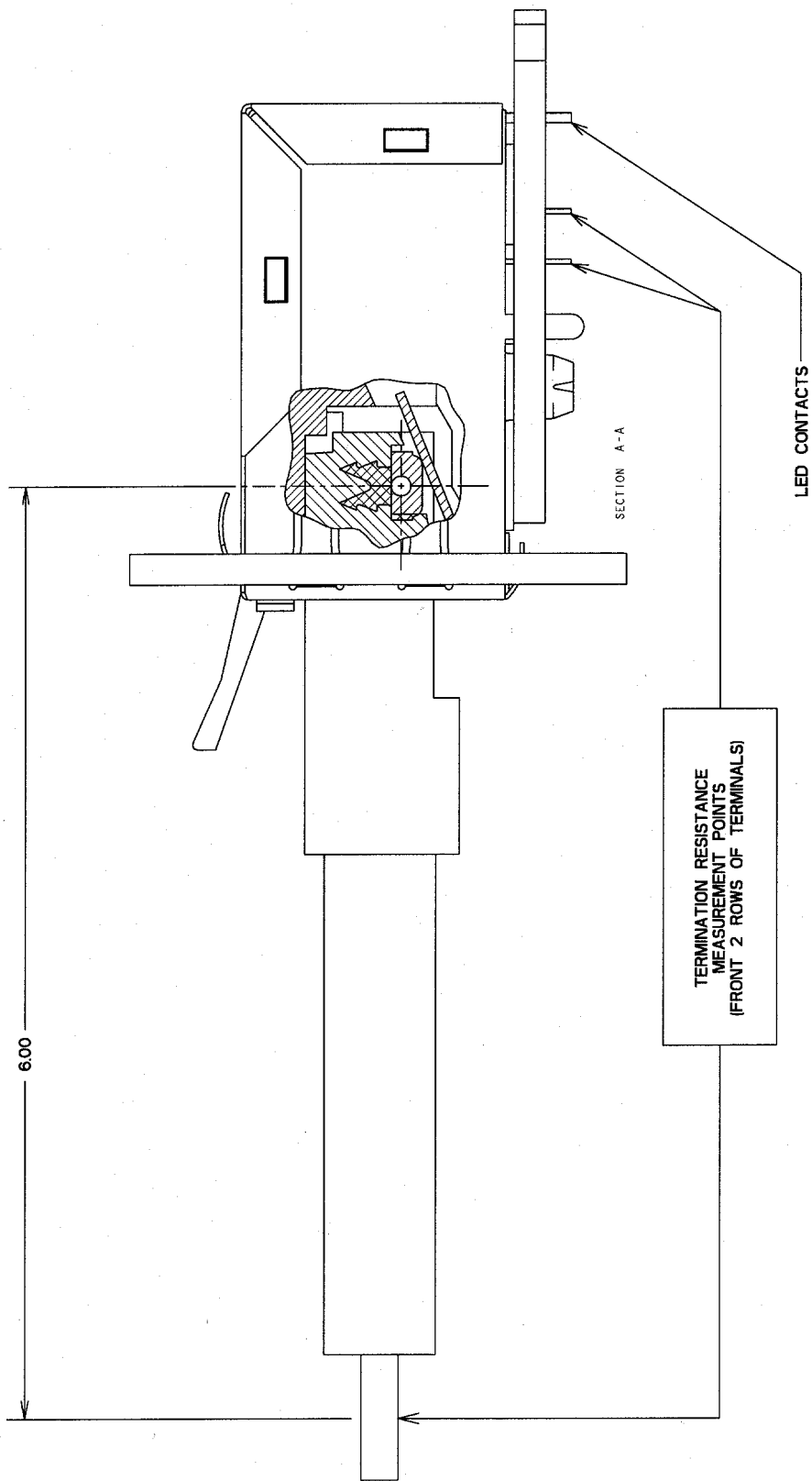


FIGURE 3