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## KOAXXA\* SMA RF Interconnects

### 1. SCOPE

#### 1.1. Content

This specification covers performance, tests, and quality requirements for TE Connectivity (TE) KOAXXA\* SMA RF Interconnects.

#### 1.2. Qualification

When tests are performed on the KOAXXA\* SMA product, the procedures specified in Figure1 shall be used. All inspections shall be performed using the applicable product drawing.

### 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. TE Connectivity (TE) Documents

- 109-197: Test Specification (TE Test Specifications vs EIA and IEC Test Methods)
- TEC-109-201: Component heat resistance to lead-free reflow soldering.
- 501-134004: Qualification Test Report (KOAXXA\* SMA RF Interconnects)

#### 2.2. Industry Document

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- IEC 60169-15 and/or CECC 22110: Interface dimensions/specifications

### 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

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

### 3.3. Ratings

Voltage: 335 VAC RMS at sea level

Temperature Range: -65 to 85 °C

Characteristic Impedance: 50 ohms nominal

Resistance to Solder Heat: Lead free wave solder capable up to 260 °C for 5 sec (PCB connectors)

Always EU RoHS/ELV Compliant (certificate available by PN at TE.com)

### 3.4. Performance and Test Description

KOAXXA\* SMA products are 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.

### 3.5. Test Requirements and Procedures Summary

| Test Description                          | Requirement   | Procedure   |
|---|---|---|
| Initial examination of product.           | Meets requirements of product drawing.  | EIA-364-18.<br>Visual and dimensional (C of C) inspection per product drawing.  |
| Final examination of product.             | Meets visual requirements.  | EIA-364-18.<br>Visual inspection.   |
| <b>ELECTRICAL</b>                         |   |   |
| Low Level Contact Resistance.<br>( LLCR ) | Center contact:<br>25 milliohms initial, 10 milliohms delta R<br><br>Outer Contact:<br>10 milliohms initial, 15 milliohms delta R | EIA-364-23.<br>Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figures 3 and 4.                               |
| Insulation resistance.                    | 5000 megohms minimum  | EIA-364-21.<br>500 volts DC, 2 minute hold.<br>Test between adjacent contacts.  |
| Withstanding voltage.                     | Connector for flexible cable: 750 volts<br><br>Connector for Semi-rigid: 1000 volts   | EIA-364-20, Condition I.<br>requested volts AC (rms) at sea level. One minute hold with no breakdown or flashover.  |
| Voltage Standing Wave Ratio<br>(VSWR)     | See Table 1   | EIA-364-108.<br>Time domain gated around specimen under test.   |
| <b>MECHANICAL</b>                         |   |   |
| Sinusoidal vibration.                     | No discontinuities of 1 microsecond or longer duration.<br><br>See Note   | EIA-364-28, Test Condition II,<br>Subject mated specimens to 10 G's between 10 to 500 Hz.<br>3 hours in each of 3 mutually perpendicular planes. 9 hours total. |

| Test Description             | Requirement   | Procedure   |
|------------------------------|---|---|
| Mechanical shock.            | No discontinuities of 1 microsecond or longer duration.<br><br>See Note | EIA-364-27, Condition H.<br>Subject mated specimens to 30 G's half sine shock pulses of 1 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. |
| Durability.                  | See Note  | EIA-364-9.<br>Mate and un-mate specimens for 500 cycles at a rate of 12 cycles per minute.  |
| <b>ENVIRONMENTAL</b>         |   |   |
| Thermal shock                | See note  | EIA-364-32C.<br>Subject mated samples 5 cycles between -55°C and +85°C  |
| Humidity-temperature cycling | See note  | EIA-364-31B, Condition III.<br>Subject mated samples 10 cycles between 25° C and 65° C at 95% RH.   |
| Temperature life             | See note<br>LLCR measured on center contact only                        | EIA-364-17B.<br>Subject (mated) samples to temperature life at 85° C for 1000 hours.  |
| Mixed flowing gas            | See note<br>LLCR measured on center contact only                        | EIA-364-65A.<br>Subject mated samples to environmental class IIA for 14 days.   |

Figure 1

**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 1.*

3.6. Product Qualification and Requalification Test Sequence

| Test or Examination            | Test Group (a), (e) |        |        |     |   |
|--------------------------------|---------------------|--------|--------|-----|---|
|                                | 1                   | 2      | 3      | 4   | 5 |
|                                | Test Sequence (b)   |        |        |     |   |
| Initial Examination of Product | 1                   | 1      | 1      | 1   | 1 |
| LLCR                           | 2,4,7               | 2,4(c) | 2,4(c) |     |   |
| Insulation Resistance          |                     |        |        | 2,6 |   |
| Withstanding Voltage           |                     |        |        | 3,7 |   |
| Voltage Standing Wave Ratio    |                     |        |        |     | 2 |
| Sinusoidal Vibration           | 5                   |        |        |     |   |
| Mechanical Shock               | 6                   |        |        |     |   |
| Durability                     | 3                   |        |        |     |   |
| Thermal Shock                  |                     |        |        | 4   |   |
| Humidity Temperature Cycling   |                     |        |        | 5   |   |
| Temperature Life               |                     | 3      |        |     |   |
| Mixed Flowing Gas              |                     |        | 3      |     |   |
| Final Examination of Product   | 8                   | 5      | 5      | 8   | 3 |

**NOTE**

- (a) See paragraph 4.1.A.
- (b) Numbers indicate sequence in which tests are performed
- (c) Measured on center contact only
- (d) Cable applied connectors only
- (e) 90 N-cm of torque maximum shall be applied to all mated specimens prior to testing

Figure 2

3.7. RF Performance Requirements

| Voltage Standing Wave Ratio (VSWR) (a) | Configuration                                | Cable Type     |
|--|--|----------------|
| 1.2 max up to 18 GHz                   | Straight Cable Plug, Jack, and Bulkhead Jack | RG-402         |
| 1.3 max up to 12 GHz                   | Right Angle Cable Plug                       | RG-402         |
| 1.3 max up to 14 GHz                   | Straight Cable Plug, Jack, and Bulkhead Jack | RG-405         |
| 1.4 max up to 12 GHz                   | Right Angle Cable Plug                       | RG-405         |
| 1.4 max up to 8 GHz                    | Straight Cable Plug, Jack, and Bulkhead Jack | RG-316, RD-316 |
| 1.4 max up to 14 GHz                   | Right Angle Cable Plug                       | RG-316, RD-316 |
| 1.4 max up to 12 GHz                   | Straight Cable Plug, Jack, and Bulkhead Jack | RG-58          |
| 1.4 max up to 12 GHz                   | Right Angle Cable Plug                       | RG-58          |
| 1.4 max up to 8 GHz                    | Straight Cable Plug, Jack, and Bulkhead Jack | RG-178, RG-196 |
| 1.4 max up to 3 GHz                    | Right Angle Cable Plug                       | RG-178, RG-196 |
| 1.4 max up to 8 GHz                    | PCB Jack, Vertical                           | N/A            |
| 1.3 max up to 12 GHz                   | PCB Jack, Right Angle                        | N/A            |

Table 1

**NOTE**

(a) REF only. Typical VSWR plots are available at TE.com

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. Each test group shall consist of a minimum of 5 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 resubmitted.

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.

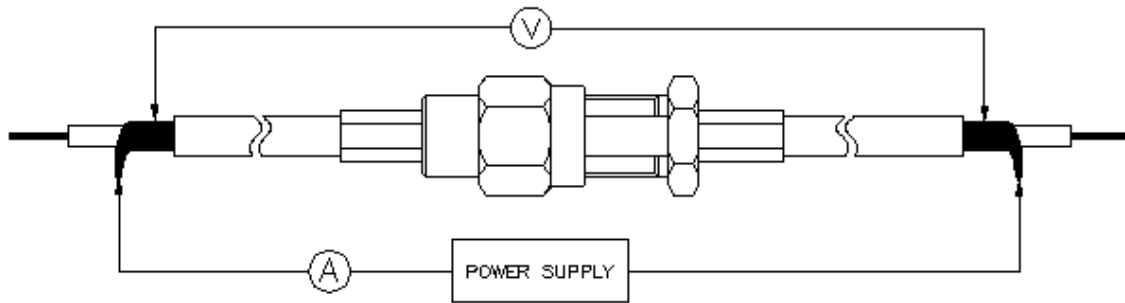


Figure 3  
Typical LLCR Measurement Points( cable end)

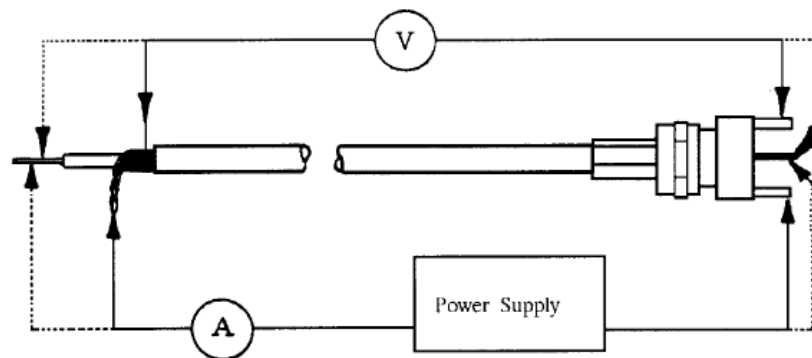


Figure 4  
Typical LLCR Measurement Points (PCB end)