



# Extended-K™ Male 4-Hole Flange Launcher Connector

Mode-free and Traceable Performance

## EK104M-R

DC to 43.5 GHz



## Introduction

Anritsu Extended-K™ EK104M-R series 4-hole Flange launchers are the only class of K connectors (2.92 mm) capable of providing mode-free and traceable performance from DC to 43.5 GHz in the connector market. These new connectors address the signal interface for new 5G telecommunication standards equipment including internal system components as well as aerospace and defense transceiver systems.

The Extended-K connectors provide an alternative to more expensive Q connectors (2.4 mm) when coverage past 43.5 GHz is not warranted or necessary. Additionally, Anritsu Extended-K connectors are traceable to 43.5 GHz, enabling accurate measurement uncertainty budgeting for the tightest measurement requirements. Anritsu provides the highest quality connectors with hard specifications using a coverage factor of K=2 meaning a 95% confidence level of performance guaranteed. Connectors are randomly sample tested per various lots to ensure Extended-K connectors meet electrical specifications.

For frequency domain systems and products, Extended-K connectors provide low insertion loss and good return loss ensuring minimal signal interaction through the connector. For time domain systems and products, Extended-K has good eye diagram characteristics in both NRZ and PAM4, displaying minimal impact on signal fidelity.

## Definitions

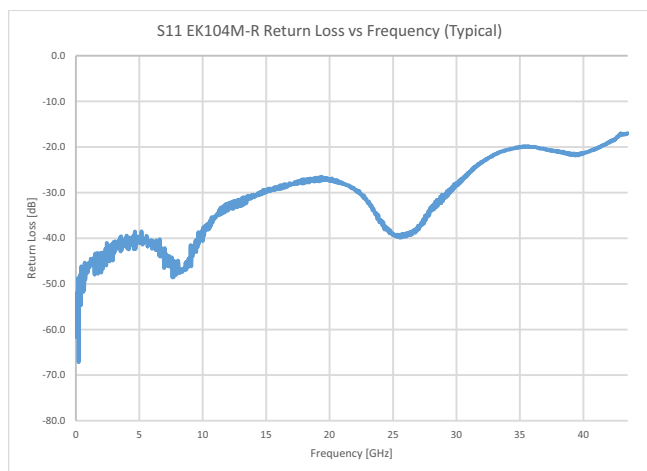
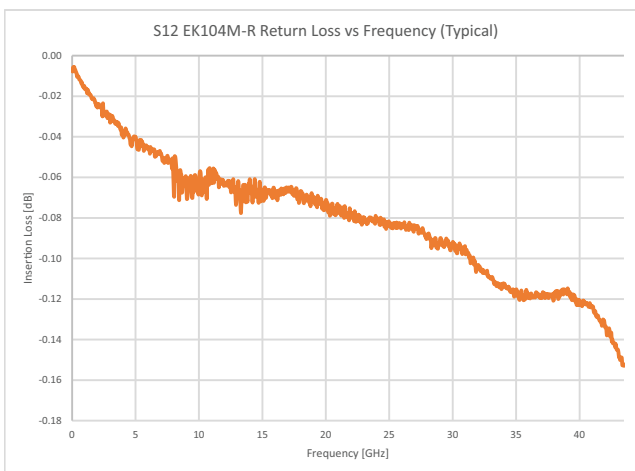
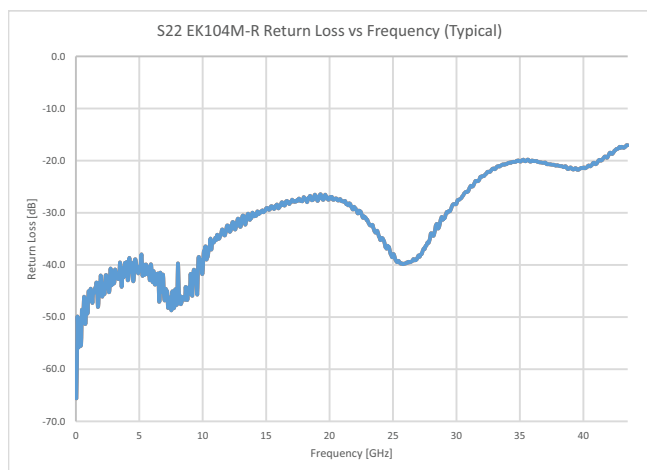
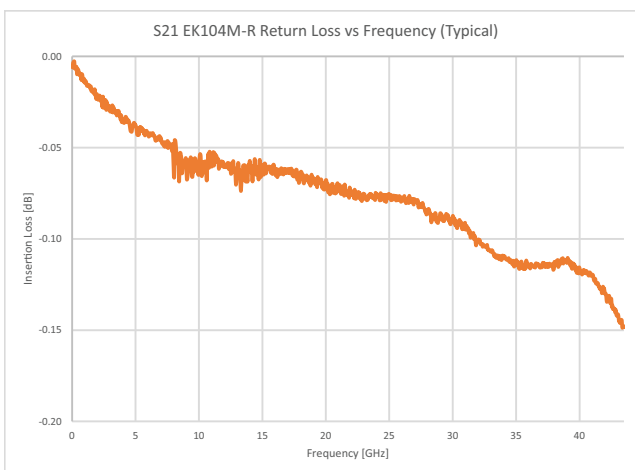
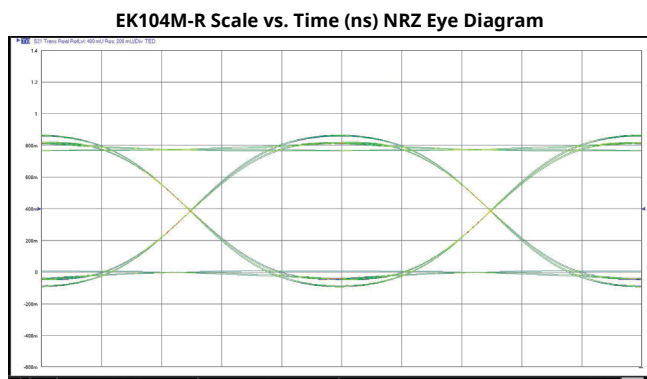
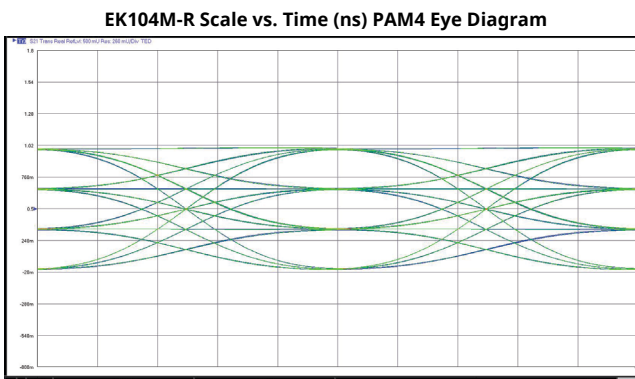
|                                  |                                                                                                                                                                                                                                          |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Specifications                   | Specifications are warranted and include guard-bands, unless otherwise stated.                                                                                                                                                           |
| Typical Performance              | Typical performance indicates the measured performance of an average unit.<br>It does not include guard-bands and are shown in parenthesis, such as (-30 dB), or noted as Typical.                                                       |
| Measurement Method               | Connectors are measured in a back-to-back configuration using an Anritsu proprietary fixture. Data provided for Extended-K connectors are done with Insertion loss doubled from the specification because of back-to-back configuration. |
| Specifications Subject to Change | All specifications subject to change without notice. For the most current data sheet, please visit the Anritsu website: <a href="http://www.anritsu.com">www.anritsu.com</a>                                                             |

## Highlights

- Traceable and Mode-free Performance up to 43.5 GHz
- Performance Exceeding SMA Below 18 GHz
- Mate Compatible with SMA, WSMA, 3.5mm, and 2.92 mm
- Four-hole Flange Mounting
- Superior Reliability
- Low VSWR
- Low Insertion Loss
- Complete Testability on Existing Network Analyzers

**Electrical**

|                                 |                          |                     |
|---------------------------------|--------------------------|---------------------|
| Frequency Range                 | DC to 43.5 GHz           |                     |
| VSWR                            | DC to 10 GHz             | 1.07 (1.02)         |
|                                 | > 10 to 25 GHz           | 1.16 (1.09)         |
|                                 | > 25 to 35 GHz           | 1.38 (1.22)         |
|                                 | > 35 GHz                 | 1.58 (1.33)         |
| Return Loss                     | DC to 10 GHz             | -29.4 dB (-40 dB)   |
|                                 | > 10 to 25 GHz           | -22.1 dB (-27 dB)   |
|                                 | > 25 to 35 GHz           | -15.9 dB (-20 dB)   |
|                                 | > 35 GHz                 | -13.0 dB (-17 dB)   |
| Insertion Loss                  | DC to 5 GHz              | -0.08 dB (-0.04 dB) |
|                                 | > 5 to 20 GHz            | -0.11 dB (-0.07 dB) |
|                                 | > 20 to 30 GHz           | -0.13 dB (-0.09 dB) |
|                                 | > 30 to 40 GHz           | -0.16 dB (-0.12 dB) |
|                                 | > 40 to 43.5 GHz         | -0.23 dB (-0.15 dB) |
| Impedance                       | 50 $\Omega$              |                     |
| Insulation Resistance           | $\geq 5 \text{ G}\Omega$ |                     |
| RF Leakage                      | -90 dB (typical)         |                     |
| Dielectric Withstanding voltage | 750 Vrms                 |                     |
| Working Voltage                 | 250 Vrms                 |                     |

Electrical Performance<sup>1,2,3,4,5</sup>

1. All plots typical.
2. Plot is a back-to-back measurement of two EK104M-R connectors with a 12 mil pin installed.
3. S12 (dB) and S21 (dB) of single EK104M-R is equal to S12/2 (dB) and S21/2 (dB) of the back to back measurement.
4. S11 (dB) and S22 (dB) of single EK104M-R is equal to S11-6 (dB) and S22-6 (dB) of the back to back measurement.
5. NRZ and PAM4 plots created with .s2p simulations using VectorStar eye diagram software.

Mechanical Data

|                |                                                  |
|----------------|--------------------------------------------------|
| Mating Cycles  | > 500                                            |
| Connector Type | K(m), 2.92 mm                                    |
| Pin Depth      | 0.000 to -0.13 mm for male and female connectors |
| Weight         | 1.89 g                                           |

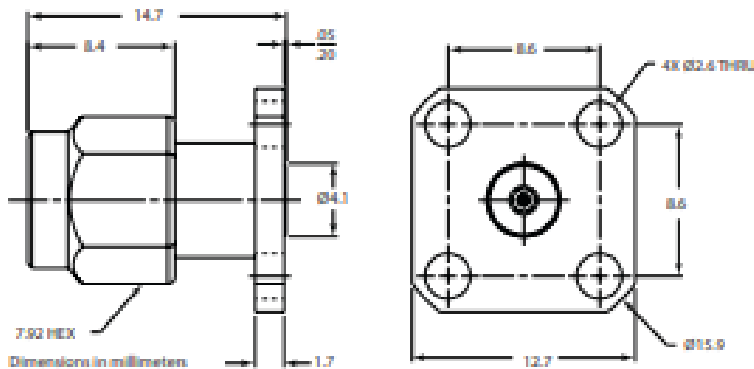
Regulatory Compliance

|                |                                                 |
|----------------|-------------------------------------------------|
| European Union | RoHS Directive: 2011/65/EU + Amendment 2015/863 |
|----------------|-------------------------------------------------|

Material Data

|                  |                                                                        |
|------------------|------------------------------------------------------------------------|
| Outer Conductor  | Passivated Stainless Steel                                             |
| Bead Holder      | Passivated Stainless Steel                                             |
| Center Conductor | Heat-treated Beryllium Copper, Gold-plated over Nickel<br>MIL-G-45204C |

Outline Drawing



All dimensions are in mm.

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**Installation Resources**

For installation procedures, please visit [www.anritsu.com](http://www.anritsu.com) and search for PN: 10100-00046. This part number references the *K Connector Instruction Sheets*, which outlines the technique required to install any of the K connectors or Extended-K connectors. The *K Connector Instruction Sheets* also list a section, the Tools and Materials section, for each connector that identifies all parts needed to install an Anritsu Extended-K connector.

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**Accessories**

|          |                                                                                                                             |
|----------|-----------------------------------------------------------------------------------------------------------------------------|
| 01-101A  | K Connector Evaluation Kit                                                                                                  |
| 01-103   | Soldering Fixture for Sparkplug Launcher Glass Bead                                                                         |
| 01-104   | Drill and Tap Set (For precision machining of concentric holes in microwave housing for K connector)                        |
| 01-105A  | Male and Female Sparkplug torquing kit for K & V Connector                                                                  |
| 01-106   | K Soldering fixture for Flange Launcher glass bead                                                                          |
| 01-107M  | K cable sleeve soldering fixture, male connector                                                                            |
| 01-107F  | K cable sleeve soldering fixture, female connector                                                                          |
| 01-108   | Drill and Tap Set (For precision machining of concentric holes in microwave housing for K connector using sliding contacts) |
| 01-118   | K connector cable assembling fixture for 0.118" semi-rigid coax cable                                                       |
| 01-201   | Torque end wrench, 5/16 in, 0.9 N·m (8lbf-in), For tightening male devices, for SMA, 3.5 mm, 2.4 mm, K and V connectors.    |
| 01-202   | Universal test port connector wrench                                                                                        |
| 01-204   | Anritsu stainless steel connector wrench                                                                                    |
| K110-1-R | Microstrip stress relief contact                                                                                            |
| K110-2-R | Stripline stress relief contact                                                                                             |
| K110-3-R | Microstrip stress relief contact (larger contact pad)                                                                       |
| S110-1-R | Microstrip and coplanar waveguide stress relief contact for 0.38 mm glass feedthrough center conductor                      |
| S110-3-R | Microstrip and coplanar waveguide stress relief contact for 0.38 mm glass feedthrough center conductor (Larger contact pad) |

**Notes**

## Training at Anritsu

Anritsu has designed courses to help you stay up to date with technologies important to your job. For available training courses, visit: [www.anritsu.com/training](http://www.anritsu.com/training)



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