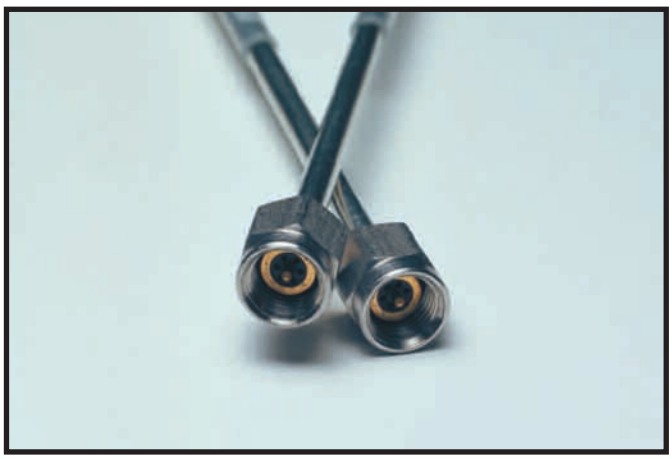
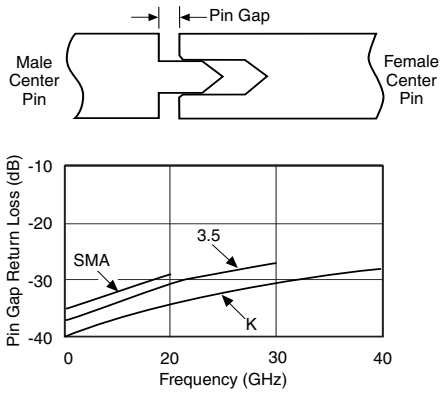
K CONNECTOR®

DC to 40 GHz





Effect of Pin Gap

The K Connector® is a precision coaxial connector system that operates up to 40 GHz. It is compatible with SMA, WSMA, and 3.5 mm connectors. It is well suited to applications in components, systems, or instrumentation.

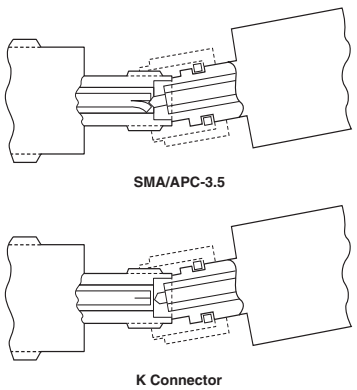
Visit www.anritsu.com for the latest information including installation instructions, outline drawings, and RoHS compliance status.

K Connector® features

- *Excellent performance up to 40 GHz*
- *Performance exceeding SMA below 18 GHz*
- *Superior reliability*
- *Compatibility with SMA, WSMA, and 3.5 mm*
- *Complete testability on existing network analyzers*
- *Components with -R suffix are RoHS compliant*

Exceptional reliability and repeatability

Microwave connector reliability is affected by insertion force, outer conductor strength, stress relief while mating, and mating alignment. The K Connector exhibits exceptional performance in all of these areas.



Shortened Male Pin Eliminates Damage to Female K Connector

For proper seating, a standard SMA or 3.5 mm connector can require in excess of 27N* of insertion force, In contrast, the K Connector requires only 2.3N*. The reduced wear on the female center conductor improves reliability. In addition, the K Connectors outer conductor is four times thicker than that of SMA. Taken together, the lower insertion force and the thicker wall offer more reliable connections than available from an SMA connector. Life tests show that the K Connector makes greater than 10,000 connections with negligible change in electrical characteristics.

All K Connectors, including the cable connectors, incorporate a feature that eliminates a major cause of connector failure; misalignment of the male pin with respect to the female contacts. To solve the problems the K Connector male pin is deliberately made shorter than the SMA or 3.5 mm pin. With this arrangement, the outer housing is properly aligned prior to the mating of the center conductors. Thus a proper, non-destructive alignment before mating is ensured.

The effect of pin gap on a connection is often overlooked, but is the dominant source of error in many connection systems. Pin gap is the short length of smaller diameter caused when a connector pair is mated. Pin gap causes a discontinuity at the connector interface. The K Connector has considerably less susceptibility to pin gap than either SMA or 3.5 mm connectors.

Many connector manufacturers specify connector performance assuming no pin gap, an unrealistic assumption. K Connectors are specified assuming pin gap to be at its maximum tolerance, to provide you the assurance of real-world specifications.

Compatibility

The K Connector interfaces electrically and mechanically with 3.5 mm connectors, including SMA and 3.5 mm without degradation in performance.

Launcher design

At the heart of the K Connector product line are the launchers. As their name implies, the launchers “launch” (make the transition) from a microwave circuit (microstrip, suspended substrate, stripline, or coplanar waveguide) to a coaxial connector and an outside transmission line. The key to making the transition without compromising electrical and mechanical objectives is the glass bead in the launcher assembly.

*Force is measured in Newtons (N).

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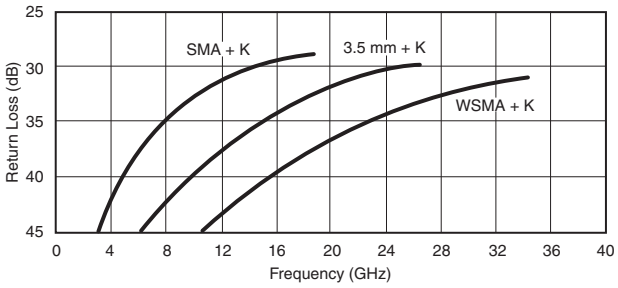
Low-reflection bead

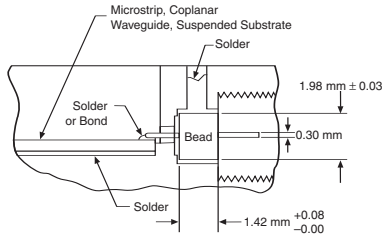
The K Connector®'s standard glass bead has a 0.30 mm center conductor and readily connects to fragile devices. The bead is appropriate for most applications employing Duroid® and ceramic (Alumina) microstrip, such as the 0.25 mm wide transmission line on a 0.25 mm thick Alumina substrate. Applications using suspended substrate geometry are equally well satisfied. The bead is constructed of Corning 7070 glass and has a gold-plated center conductor and a gold-plated Kovar® collar.

The outstanding design of the bead is largely accountable for the excellent performance of the K Connector launchers. Because the small 0.30 mm pin introduces minimal discontinuity, return loss is typically better than 20 dB at 40 GHz and better than 25 dB below 18 GHz. In addition, the design provides for soldering the bead to achieve a hermetic seal. 310°C max. soldering temperature is recommended.



Return Loss Characteristics

Both the sparkplug (screw-in) and the flange-mount K Connector launchers offer an additional advantage over existing designs. These launchers do not use an epoxy pin to secure the center conductor, as used in some SMA designs. Without an epoxy pin, the outer conductor remains solid, and thereby eliminates the leakage path common to pin-captivated designs. Furthermore, K launchers have a wall thickness that is four times that of typical launchers (0.8 vs. 0.2 mm). The heavier wall results in superior resistance to over-torquing. Finally, the K Connector launcher can be removed for repair without removal of the glass bead. This ensures that during removal the critical microcircuit-to-glass bead interface is not disturbed, hermeticity is preserved, and the micro-circuit will not be subjected to the additional stress caused by heating to soldering temperature. Hardware locking compound such as "Removable Loctite®" should be used to further secure the screw-in launcher in its housing.



Transition from Microcircuit to External Transmission Line

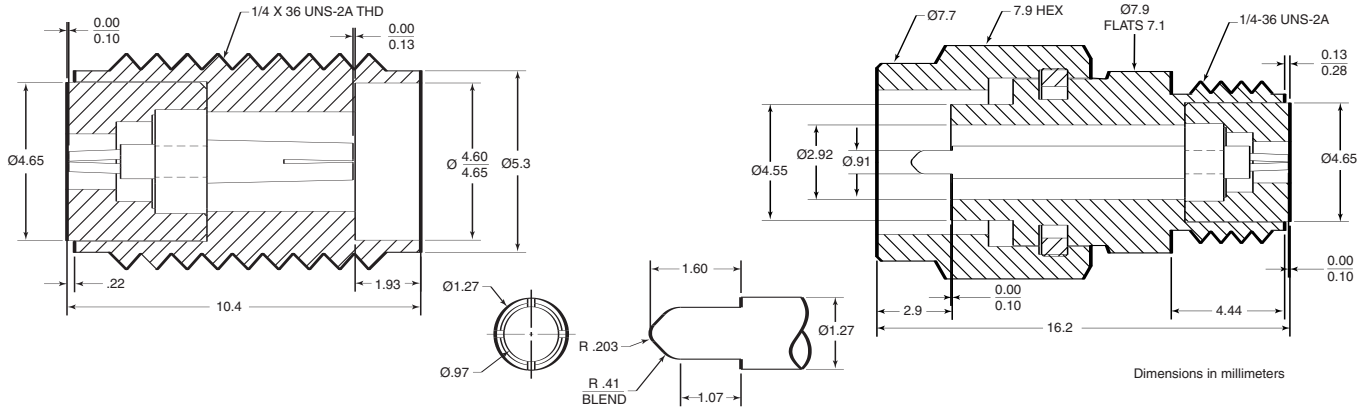
Complete family

Virtually every interface need can be satisfied by one or more of the K Connector items offered. There are six different models of K Connector launchers. Two sparkplug (screw-in) launchers are available, the K102F-R female version and the K102M-R male version. Both screw into the housing that encloses the microwave circuit, and, like all Anritsu launchers, they can be easily removed for replacement or repair without unsoldering the glass bead and its interface to the microwave circuit.

When the housing that encloses the microwave circuit is not thick enough to support a threaded, screw-in launcher, flush-mounted (flange) launchers are required. Models with two mounting holes are available in both male and female versions, K103M-R and K103F-R. Two other models, the K104F-R and K104M-R, have four mounting holes. Mounting hole spacing is identical to that of similar SMA flange launchers. The glass bead interface, of course, is the same design used for the sparkplug launcher.

Cable connectors

Both male and female cable connectors are available. The cable connectors, K101M-R and K101F-R, use gold-plated, beryllium-copper center conductors for optimum performance and wear characteristics, Typical return loss at 40 GHz for finished cables exceeds 16 dB (1.35 SWR).



K Connector® interface dimensions in metric measurements

K CONNECTOR®

DC to 40 GHz

Evaluation kit

01-101A
Evaluation Kit
Kit contains one K120 25 cm Male/Male Cable Assembly, two K102F-R Female Sparkplug Launcher Connector Assemblies, two K104F-R Female Flange Launcher Connector Assemblies, five K100 Glass Beads, one 01-102A Test Fixture, one 01-104 Drill and Tap Set, five K110-1-R Microstrip Sliding Contacts, and all other parts and fixtures required to assemble launchers with or without sliding contacts.

Tools and fixtures

01-103
Soldering Fixture for sparkplug launcher glass beads, package of 10

01-104
Drill and Tap Set
for precision machining of concentric holes for mounting K Connector® in microwave housing. (Drill Part No. B14094) (Tap Part No. 783-255)

01-105A
Male and Female Sparkplug Torquing Kit

01-106
K Soldering Fixture for flange launcher glass bead, package of 5.

01-107M or 01-107F
Cable Sleeve Soldering Fixture for K101M-R Male and K101F-R Female Cable Connectors, package of 10.

01-108
Drill and Tap Set
For precision machining of concentric holes for mounting K Connector® in microwave housing in applications where stress relief contacts are used. (Drill Part No. B16526) (Tap Part No. 783-255)

01-118
K Connector® Cable Assembling Fixture Kit for K118 semi-rigid coaxial cable.

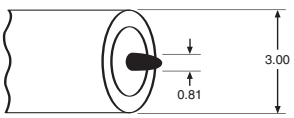
01-201
Torque wrench: 0.9 N-M (8 in-lb) for standard SMA and 3.5 mm connectors, and for the Anritsu K Connector® and V Connector®.

01-204
Handy stainless steel connector wrench for standard SMA, 3.5 mm, and 2.4 mm connectors, and for the Anristu K Connector® and V Connector®.

Semi-rigid coaxial cable

Type	Semi-rigid coaxial, tin-plated copper outer conductor, silver-plated copper center conductor.
Impedance	50 ± 2 Ω
Dielectric type	Microporous Teflon, 0.24 cm diameter
Dielectric constant	1.687
Relative velocity	0.77
Outside diameter	3.00 mm
Center conductor diameter	0.81 mm
Minimum bend radius	0.65 cm
Attenuation	1.6 dB/m at 10 GHz 2.3 dB/m at 20 GHz 3.3 dB/m at 30 GHz 4.7 dB/m at 40 GHz

K118
Semi-rigid Coaxial Cable
1.5m length of 3.00 mm semi-rigid cable for K101 series connector



Dimensions in millimeters

K CONNECTOR®

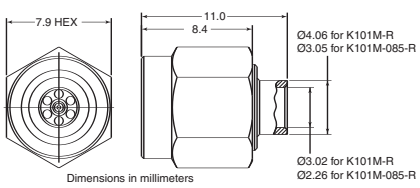
DC to 40 GHz

Launchers and cable connectors

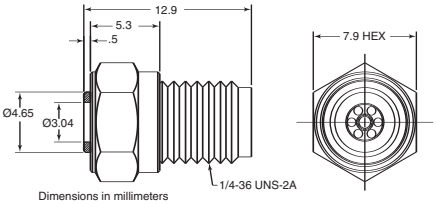
Coupling nut tightening torque	1.36 N-m max
Material	Passivated stainless steel with heat-treated beryllium copper center conductors
Pin depth	0.000 to -0.13 mm for male and female connectors
Temperature range	-55°C to +125°C (200°C available; contact factory)

K101M-R④⑥
K Male In-Line Cable Connector, DC-40 GHz for 3 mm cable

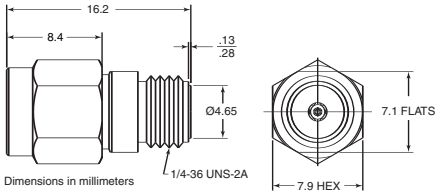
K101M-085-R④
for 2.16 mm cable



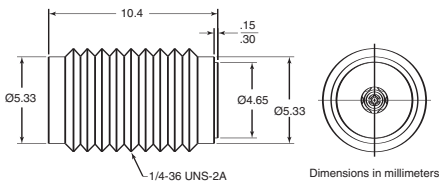
K101F-R⑤⑥
K Female In-Line Cable Connector, DC-40 GHz for 3 mm cable



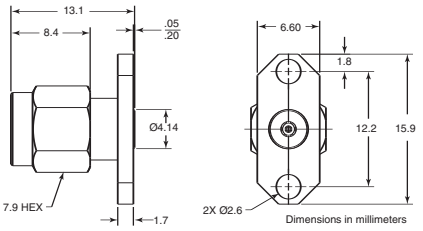
K102M-R③
K Male Sparkplug Launcher Connector, DC-40 GHz



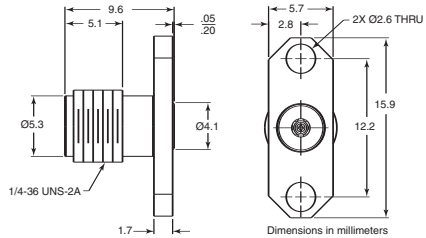
K102F-R③
K Female Sparkplug Launcher Connector, DC-40 GHz



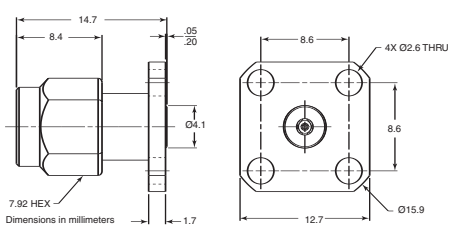
K103M-R
K Male Flange Launcher, two-hole, DC-40 GHz



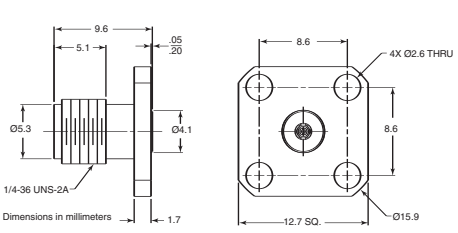
K103F-R
K Female Flange Launcher, two-hole, DC-40 GHz



K104M-R
K Male Flange Launcher, four-hole, DC-40 GHz



K104F-R
K Female Flange Launcher, four-hole, DC-40 GHz



① Use with 01-104 or 01-108 Drill and Tap Sets
② Use with 01-103 or 01-106 Soldering Fixtures
③ Use with 01-105A Male and Female Sparkplug Torquing Kit
④ Use with 01-107M Cable Sleeve Fixture
⑤ Use with 01-107F Cable Sleeve Fixture
⑥ Use with 01-118 Cable Assembly Fixture Kit

K CONNECTOR®

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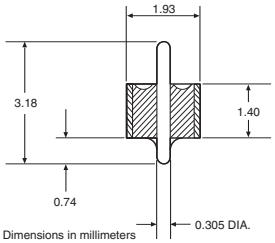
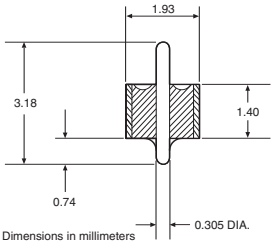
K100[①②]
Glass Beads for K102, K103, and K104 connectors
Note: Glass Beads are not available through Anritsu. They can be purchased from Advanced Technology Group. 101 Roundhill Drive, Rockaway, New Jersey 07866 Tel: 973-627-6955, Fax: 973-627-5980 www.advtechgr.com



K100B[①②]
High Hermeticity Glass Beads for K102, K103, and K104 connectors*
Note: Glass Beads are not available through Anritsu. They can be purchased from Advanced Technology Group. 101 Roundhill Drive, Rockaway, New Jersey 07866 Tel: 973-627-6955, Fax: 973-627-5980 www.advtechgr.com

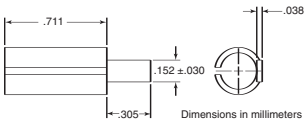


*Glass Bead Hermeticity Spec: Hermetic to 1 x 10-8 std cc He/sec at 1 atm differential

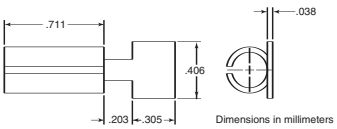
Stress relief contacts

Stress Relief Contacts provide an elegant yet simple solution to relieving stress at the interface of the microcircuit and its connecting coaxial conductor. These contacts simply slide onto the standard K100 and K100B glass bead pins.

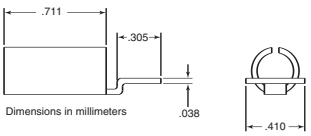
Frequency range	DC to 40 GHz
Material	0.025 mm heat-treated BeCu
Plating	Bondable gold over nickel



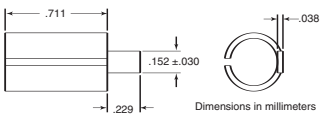
K110-1-R[①] *Microstrip and Coplaner Waveguide*



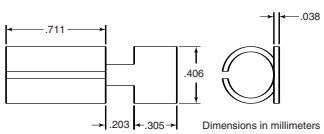
K110-3-R[①] *Microstrip*



K110-2-R[①] *Stripline*



S110-1 *Microstrip and Coplaner Waveguide for 0.38 mm glass feedthru center conductor*



S110-3 *Microstrip and Coplaner Waveguide for 0.38 mm glass feedthru center conductor*

Ordering information

Please specify model/order number, name, and quantity when ordering.

Model/Order No.	Name
01-101A	K Connector® (evaluation kit)
01-103	Soldering fixture for sparkplug launcher glass bead
01-104	Drill and tap set
01-105A	Male and female sparkplug torquing kit
01-106	Soldering fixture for flange launcher glass bead
01-107F	Cable sleeve soldering fixture, female connector
01-107M	Cable sleeve soldering fixture, male connector
01-108	Drill and tap set
01-118	Cable assembling fixture for K118 semi-rigid coax cable
01-201	Torque wrench, for SMA, 3.5mm, and K Connector and V Connector
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
K101M-R	K(m) in-line cable connector, DC to 40 GHz for K118 cable
K101M-085-R	K(m) in-line cable connector, DC to 40 GHz for V085 cable
K101F-R	K(f) in-line cable connector, DC to 40 GHz
K102M-R	K(m) sparkplug launcher connector, DC to 40 GHz
K102F-R	K(f) sparkplug launcher connector, DC to 40 GHz
K103M-R	K(m) flange launcher connector, DC to 40 GHz, 2 mounting holes
K103F-R	K(f) flange launcher connector, DC to 40 GHz, 2 mounting holes
K104M-R	K(m) flange launcher connector, DC to 40 GHz, 4 mounting holes
K104F-R	K(f) flange launcher connector, DC to 40 GHz, 4 mounting holes
K118	Coaxial cable, 1.5m of 3.00 mm semi-rigid cable for K101 series connector
S110-1*	Microstrip and coplaner waveguide stress relief contact for 0.38 mm glass feedthru center conductor
S110-3*	Microstrip and coplaner waveguide stress relief contact for 0.38 mm glass feedthru center conductor

*Sold in multiples of 10 only.

① Use with 01-108 Drill and Tap Set