



Terminations & Loads
Variable & Step Attenuators
Power Dividers & Splitters
Mechanical Phase Shifters



Microwave & RF
Components &
Subsystems
Part 2

Terminations & Loads



- /// dc to 50 GHz, up to 1,000 Watts
- /// Choice of frequency ranges, attenuation value and power level.
- /// **Express** shipment available on most models.
- /// Consistent, repeatable performance.
- /// High reliability.
- /// Rugged injection molded connectors.
- /// Low Intermodulation (LIM) versions available
- /// Custom performance and connector options available.

General Information

In this section of the catalog, each Termination is outlined utilizing individual data sheets containing product features, specifications, and outline drawings. These data sheets are preceded by a quick reference guide to help you select the Termination(s) that fits your needs. The page number for each Termination data sheet is given in the quick reference guide.












Aeroflex / Weinschel offers a full line of coaxial terminations and loads. Our terminations and loads can be found in almost every phase of microwave industry from simple directional coupler port termination to the design measurement and wireless communications systems.

NOTE: **EXPRESS** Shipment available via www.argosysales.com or 800-542-4457. Check with distributor for current products and stocking quantities.



Terminations . . . dc-50 GHz, 1 to 5 Watts



Model Number	Frequency Range (GHz)	Average Power (Watts)	Peak Power (kW)	SWR	Connector Type	Page No.	
♦ 1404N	dc-18.0	1	1	1.02-1.08*	N	91	
♦ 1406A ♦ 1408	dc-18.0	2	0.5	1.05-1.21* 1.04-1.15*	SMA	92	
♦ RS3016	dc-18.0	1	0.25	1.05-1.20*	SMA (Male only)	90	
♦ 1424	dc-12.4	5	5	1.03-1.30*	N	97	
♦ F1437RA M1437RA	dc-6.0	2	0.25	1.05-1.10* 1.15-1.20*	SMA (Female) SMA (Male)	90	
♦ 1443A	dc-18.0	5	0.5	1.20	SMA	98	
1445A	dc-40.0	5	0.2	1.20-1.35*	2.92mm	99	
♦ 1455	dc-18.0	2	1	1.20-1.30*	N	93	
♦ 1459/A	dc-40.0	2	0.5	1.10-1.25*	2.92mm	95	
1460/A	dc-50.0	2	0.5	1.10-1.22*	2.4mm	96	
1465/A	dc-32.0	2	0.5	1.06-1.15*	3.5mm	94	


* VARIES WITH FREQUENCY.

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Terminations & Loads



Medium Power . . . dc-26.5 GHz, 10 to 50 Watts

Model Number	Frequency Range (GHz)	Average Power (Watts)	Peak Power (kW)	SWR	Connector Type	Page No.	
♦ 1418	dc-18.0	10	1	1.15-1.40*	N	103	
♦ 1419	dc-18.0	10	1	1.20-1.35*	SMA	100	
♦ 1425	dc-12.4	10	1	1.03-1.40*	N	102	
♦ 1426	dc-10.0	50	5	1.20-1.30*	SMK (2.92mm) / N	111	
♦ 1427	dc-10.0	25	5	1.10-1.30*	SMK (2.92mm) / N	106	
♦ 1429	dc-18.0	25	1	1.20	N / 3.5mm	107	
♦ 1430	dc-18.0	50	1	1.15-1.30*	N / 3.5mm	112	
♦ 1444	dc-26.5	25	0.5	1.25	3.5mm	108	
1446	dc-6.0	25	5	1.20	7/16	105	
1447	dc-6.0	50	5	1.20	7/16	110	
♦ 1452	dc-4.0	25	5	1.10-1.20*	SMK (2.92mm) / N	104	
♦ 1453	dc-8.5	10	1	1.15-1.25*	N	101	
1467	dc-20.0	50	1	1.15-1.20*	3.5mm / N	113	
1468 <i>New</i>	dc-3.0	50	1		BNC / SMA N	109	
1477 <i>New</i>	dc-40.0	10	0.2	1.20-1.35*	SMK (2.92mm)	103a	
1478 <i>New</i>	dc-40.0	20	0.2	1.20-1.35*	SMK (2.92mm)	103b	

* VARIES WITH FREQUENCY.

- ♦ EXPRESS Shipment available via www.argosysales.com or 800-542-4457. Note: Other models may also be available from Express delivery.

High Power . . . dc-18 GHz, 100-1000 Watts



Model Number	Frequency Range (GHz)	Average Power (Watts)	Peak Power (kW)	SWR	Connector Type	Page No.	
♦ 1428	dc-1.5	150	10	1.10-1.15*	N	119	
♦ 1431	dc-18.0	100	1	1.20-1.30*	N / 3.5mm	116	
1432	dc-8.5	150	5	1.20-1.30*	N	121	
♦ 1433	dc-5.0	250	10	1.10-1.15*	N	122	
♦ 1434	dc-2.5	500	10	1.10	N	123	
♦ 1435	dc-5.0	150	10	1.10-1.15*	N	119	
♦ 1439	dc-2.5	150	10	1.20	N	118	
♦ 1440	dc-4.0	100	10	1.15	N	114	
1442	dc-8.5	100	5	1.20-1.30*	N	115	
1448	dc-6.0	150	10	1.25	7/16	120	
1456	dc-3.0	1,000	10	1.15-1.25*	N	124	
1469 <i>New</i>	dc-18.0	100	1	1.15	N / 3.5mm	117	
1475 <i>New</i>	dc-18.0	150	1	1.90	N / 3.5mm	121a	

* VARIES WITH FREQUENCY.

- ♦ EXPRESS Shipment available via www.argosysales.com or 800-542-4457.
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Low IMD . . . dc-20 GHz, 25 to 500 Watts


Model Number	Frequency Range (GHz)	Average Power (Watts)	Peak Power (kW)	SWR	Connector Type	Page No.	
1426-X-LIM	dc-8.5	50	5	1.20-1.30*	SMK (2.92mm) / N	111	
1427-X-LIM	dc-10.0	25	5	1.10-1.15*	SMK (2.92mm) / N	106	
1429-X-LIM	dc-18.0	25	1	1.20	N / 3.5mm	107	
1430-X-LIM	dc-18.0	50	1	1.15-1.30*	N / 3.5mm	112	
1435-X-LIM	dc-5.0	150	5	1.10-1.15*	N	119	
1432-X-LIM	dc-8.5	150	5	1.20-1.30*	N	121	
1433-X-LIM	dc-5.0	250	10	1.10-1.15*	N	122	
1434-X-LIM	dc-2.5	500	10	1.10	N	123	
1446	dc-6.0	25	5	1.20	7/16	105	
1447	dc-6.0	50	5	1.20	7/16	110	
1448	dc-6.0	150	10	1.25	7/16	120	
1469-X-LIM <i>New</i>	dc-18.0	100	1	1.15-1.20	N / 3.5mm	117	
1470-X-LIM <i>New</i>	dc-6	100	1	1.20	SMK (2.92mm) / N	128	
1471-X-LIM <i>New</i>	dc-6	250	1	1.20	SMK (2.92mm) / N	129	
1472-X-LIM <i>New</i>	dc-6	400	1	1.20	SMK (2.92mm) / N	130	
1473-X-LIM <i>New</i>	dc-6	550	1	1.20	SMK (2.92mm)	131	
1475-X-LIM <i>New</i>	dc-18.0	150	1	1.90	N / 3.5mm / N	121a	

Convection Cooled . . . dc-22 GHz, 50-550 Watts



Model Number	Frequency Range (GHz)	Average Power (Watts)	Peak Power (kW)	SWR	Connector Type	Page No.	
♦ 1441	dc-4.0	50	5	1.15	N	126	
1458	dc-22.0	50	1	1.30	3.5mm	127	
1470 <i>New</i>	dc-6.0	100	1	1.20	SMK (2.92mm) / N	128	
1471 <i>New</i>	dc-6.0	250	1	1.20	SMK (2.92mm) / N	129	
1472 <i>New</i>	dc-6.0	400	1	1.20	SMK (2.92mm) / N	130	
1473 <i>New</i>	dc-6.0	550	1	1.20	SMK (2.92mm) / N	131	
1474 <i>New</i>	dc-40.0	5	1	1.25-1.45	SMK (2.92mm)	125	
1476 <i>New</i>	dc-10.0	50	5	1.15-1.30	SMK (2.92mm) / N	128a	

Open / Short / Load...dc-2.0 GHz

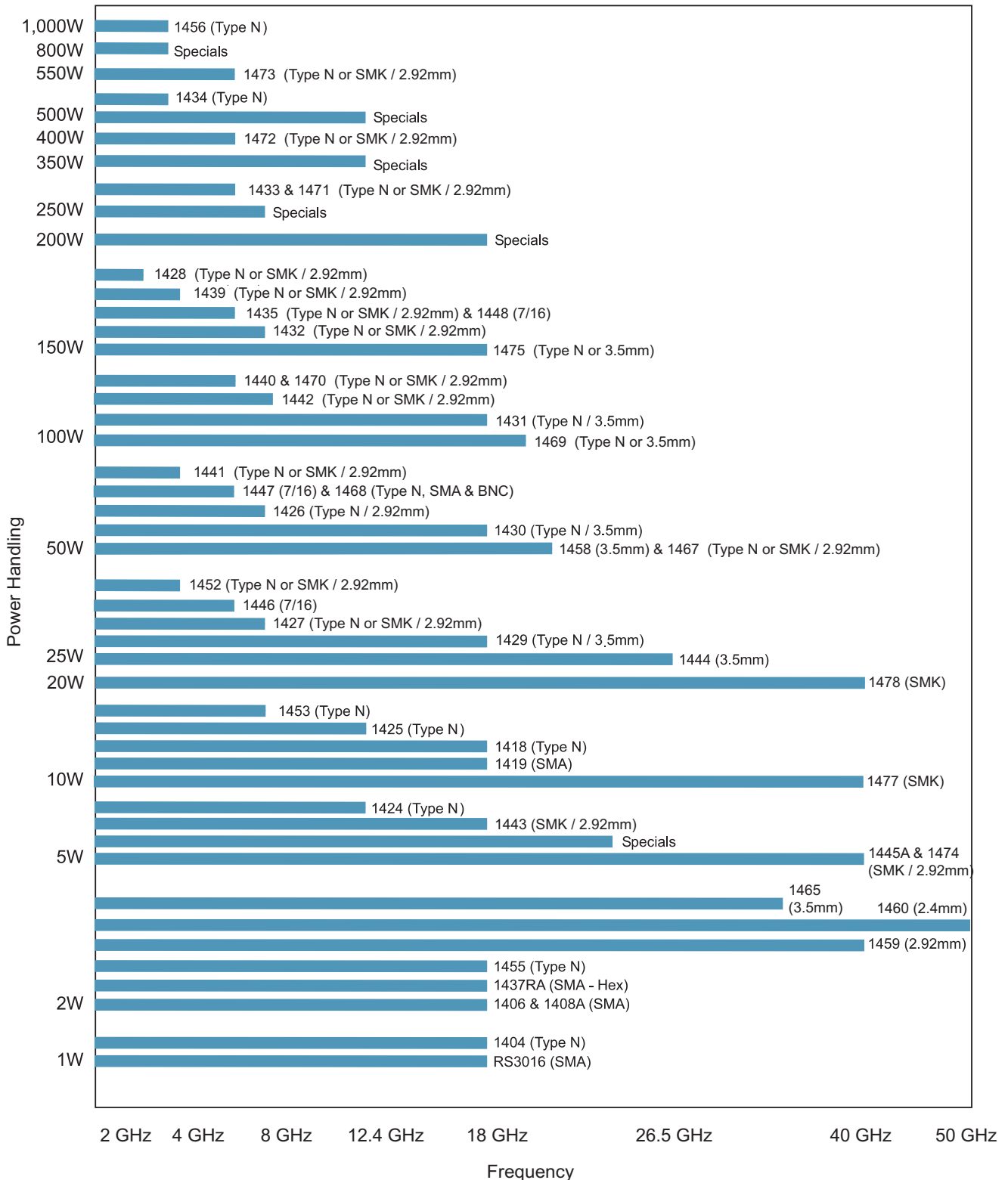
Model Number	Frequency Range (GHz)	Connector Type	Maximum SWR	Maximum Phase Tracking (Short / Open) (±)	Average Input Power (W)	Page No.	
1591	dc-2.0	TNC (f)	1.05 - 1.35*	3° - 7° *	1	170	

(f) denotes female & (m) denotes male.

* Varies with Frequency.

- ♦ EXPRESS Shipment available via www.argosysales.com or 800-542-4457.
Note: Other models may also be available from Express delivery.

Terminations & Loads



Termination Selection Guide: Power Handling / Frequency / Connector Type

Frequently Ask Questions about Coaxial Terminations...

What are the advantages of Aeroflex / Weinschel's terminations?

Most Aeroflex / Weinschel coaxial terminations feature a combination of advantages over other designs:

1. Most Aeroflex / Weinschel terminations feature injection molded dielectric for better center pin captivation and alignment. Injection molded dielectric also eliminates the need for the epoxy hole "stake" as seen in other designs. This epoxy hole in other designs is subject to RF leakage and movement when exposed to environmental extremes and prolonged use.
2. Aeroflex / Weinschel coaxial terminations have a proprietary resistor element fired at high temperatures (950°) for superior long term stability over temperature, power and time.
3. Aeroflex / Weinschel coaxial terminations have no solder contacts. They feature spring loaded plunger contacts to the resistor cards that provide expansion tolerant operation over wide temperature and power ranges.
4. Aeroflex / Weinschel terminations are made with high quality materials and machined to very close tolerances, the result is a design that stands up to severe environments and usage.
5. High power designs feature special high temperature support beads.

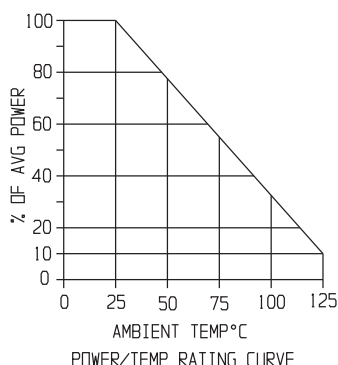
Can Aeroflex / Weinschel provide special terminations?

Yes. Aeroflex / Weinschel has produced many custom fixed attenuators and terminations. Specialized designs continue to be a significant part of Aeroflex / Weinschel's product offering. Special features may include:

1. Custom Connector Configurations
2. Matched Pairs or Sets
3. Lower VSWR
4. Conductive Cooled
5. Special Mounting & Environmental Conditions

How is the power rating calculated?

A termination will handle specified power at ambient temperatures as specified in the catalog. No special fan cooling is required. At higher temperatures the power rating

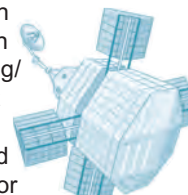


is calculated by using catalog specifications and a straight line graph. For instance the power rating of the Model 1430 attenuator is 100 watts at 25°C ambient and 10 watts at 125°C. Using linear graph paper, plot a straight line between these two points. This plot shows that the power rating at 75°C is approximately 56 Watts.

Can Aeroflex / Weinschel provide terminations for space applications?

Yes. Aeroflex / Weinschel terminations are being used on most major U.S. military and commercial communication satellites. Aeroflex / Weinschel Terminations can be screened to your specifications and testing requirements.

Aeroflex / Weinschel's use of precision connectors, injection molded captivation of connector contacts, internal pring/plunger contacts (no solder or contact fingers) and very precise and stable resistors result in a superior electrical and mechanical design that is ideally suited for space applications. Page 17 provides a list of Aeroflex / Weinschel's program experience and available testing programs for space qualified components.



Does Aeroflex / Weinschel offer High Reliability Models?

Most Aeroflex / Weinschel Corporation Terminations & Loads can be supplied according to customer specified testing, environmental or military or government specification requirements.

What is Third-Order Intermodulation Distortion?

(IM3) Intermodulation distortion (IM) consists of the spurious signals which result from the mixing of nth order frequencies in the non-linear elements of a component. Third order intermodulation distortion is of particular interest because third order products typically represent the highest level distortion appearing close to the desired signal, and as such the highest level non-filterable distortion. Third order IM level (IM3) is tested by injecting two pure tones of equal magnitude (f1 and f2) into the component to be tested. The third order IM products will appear in the output spectrum at the frequencies 2f1-f2 and 2f2-f1. These products are characterized by defining their level (in dBc) relative to the fundamental output tones at either f1 or f2.

Does Aeroflex / Weinschel offer any of terminations with IM3 specified?

Yes, Aeroflex / Weinschel has recently introduced new as well as updated models specifically for applications requiring low intermodulation distortion. These models are available in 25, 50, 150 Watt varieties. Aeroflex / Weinschel can also modify or specify IM3 on several of its standard standard models such as 1418, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1435, 1439, & 1442. Refer to the specific data sheet for IM3 details.

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How do I select a termination for my application?

Termination applications exist in almost every phase of microwave technology from design and measurement to systems. Good terminations are an indispensable aid in making bench measurements on microwave components in the engineering laboratory, as those ports of a multiport microwave device which are not involved in the measurement should be terminated in their characteristic impedance in order to ensure an accurate measurement. Many microwave systems employ directional couplers which require terminations on at least one port, and most have various modes of operation or test where terminations are needed on certain terminals.

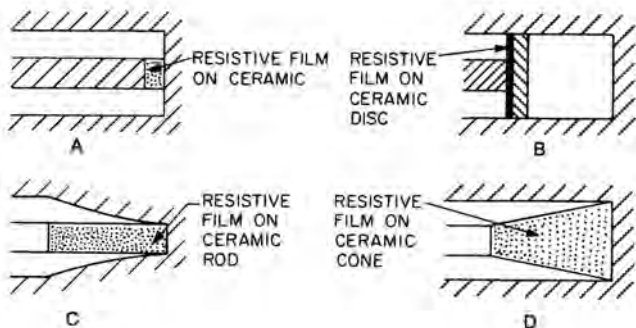
A matched termination of a generalized transmission line is ideally represented by an infinite length of that line having small, but non-zero loss per unit length so that all incident energy is absorbed and none is reflected. Although this type of matched load (termination) was actually used extensively during the early exploration of high frequencies where the wavelength was short enough for the method to be employed, more efficient and practical types of termination have been developed.

There are several ways in which a matched termination for a 50-ohm coaxial line may be realized. Some of these are shown below. Illustration A of the Figure shows a cross-section of coaxial line terminated in a lumped 50-ohm series resistor which is a short length of resistive film on a cylindrical ceramic substrate. Illustration B is similar to A except that the 50-ohm resistor is a film on a ceramic disc and appears in shunt with the open of the coaxial line.

More effective matched loads for very high frequencies are shown in illustration C and D.

The outer conductor in the design of illustration C is tapered in either an exponential or a tractrix curve from the region near the start of the resistive film on the inner conductor to the end of the resistor. The design of illustration to these parameters, it is usually necessary to specify the shaped ceramic body extending from the inner conductor. The advantage of this design is that it dissipates more power. Aeroflex / Weinschel matched termination designs are similar to those shown in C.

A well-matched attenuator of at least 20 dB loss can also be utilized as a termination. This is particularly useful in high power applications. For example our new Model 1456 1,000 Watt termination is supplied with a second connector for power monitoring



Model 1437RA Model RS3016 Subminiature, SMA Connector

dc to 6.0 GHz / 2 Watts
dc to 18.0 GHz / 1Watt

RoHS



Features

- /// Subminiature Size and Lightweight
- /// Low Cost & SWR
- /// Cellular Applications: Optimized for use in the wireless communications bands.

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: M/F1437RA: dc to 6.0 GHz
RS3016: dc to 18.0 GHz

POWER RATING:

Model 1437RA: 2.0 watts **average** @ 25°C ambient temperature, derated linearly to 0.5 watts @ 125°C. 250 watts **peak** maximum (5 μsec pulse width; 0.4% duty cycle).

Model RS3016: 1.0 watts **average** @ 25°C ambient temperature, derated linearly to 0 watts @ 125°C. 250 watts **peak** maximum (5 μsec pulse width; 0.2% duty cycle).

MAXIMUM SWR:			
Frequency Range (GHz)	F1437RA	M1437RA	RS3016
dc - 4	1.05	1.15	1.05
4 - 8 (6)	1.10	1.20	1.10
8 - 12.4	---	---	1.15
12.4 - 18	---	---	1.20

TEMPERATURE RANGE: -65°C to +125°C

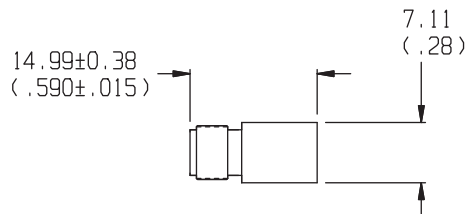
CONNECTOR: Model 1437RA: SMA connectors - mate nondestructively with MIL-C-39012 connectors. Choice of male or female connector, prefix model number with M for male and F for female. **Model RS3016** available in SMA male only!

CONSTRUCTION: Passivated stainless steel connectors with gold plated beryllium copper contacts.

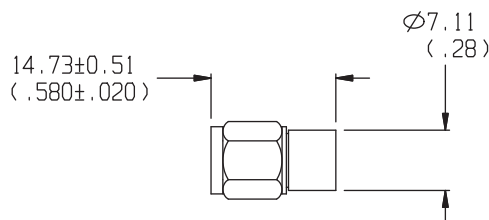
WEIGHT: M1437RA: 3.0 g (0.11 oz)
F1437RA: 4.0 g (0.14 oz)
RS3016: 2.3 g (0.08 oz)

PHYSICAL DIMENSIONS:

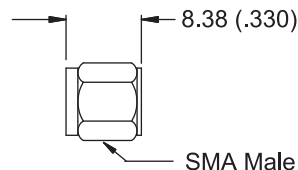
Model F1437RA:



Model M1437RA:



Model RS3016 (male only):



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Terminations & Loads



Model 1404N Precision Lab Standard N Connectors

dc to 18.0 GHz
1 Watt

RoHS



TEMPERATURE RANGE: -55°C to +85°C

TEST DATA: Swept data plots of SWR from 50 MHz to 18 GHz is available at additional cost.

CONNECTOR: Type N connector - mates nondestructively with MIL-C-39012 connector. Choice of male or female connector. When ordering, prefix model number with M for male and F for female.

CONSTRUCTION: Gold plated brass body; stainless steel connector; gold plated beryllium copper contacts.

WEIGHT: Net, 110 g (4 oz)

Features

- /// **Precision Connector** - Interface dimensions per MIL-STD-348 Test connector
- /// **Rugged Construction** - Numerically controlled machining is used to produce high quality uniform parts with controlled concentricity and surface finishes. The result is excellent SWR repeatability.

Specifications

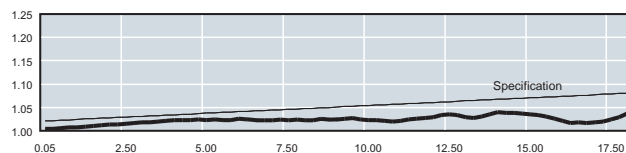
NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 18.0 GHz

POWER RATING: 1.0 watt **average** to 25 °C ambient temperature, derated linearly to 0.1 watts @ 125°C. 1 kilowatt **peak** maximum (5 μsec pulse width; 0.05 % duty cycle).

MAXIMUM SWR:

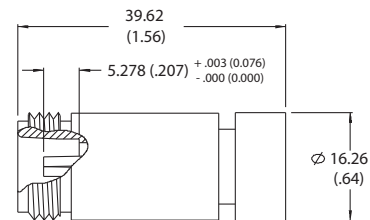
Model	SWR
F1404N	$\leq 1.04 + 0.0023f$ (GHz)
M1404N	$\leq 1.02 + 0.0033f$ (GHz)



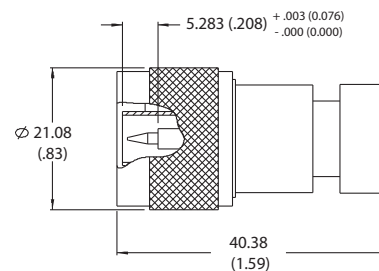
Typical M1404 SWR Performance

PHYSICAL DIMENSIONS:

MODEL F1404N:



MODEL M1404N:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Models 1406A & 1408

Subminiature, Ruggedized SMA Connectors

dc to 18.0 GHz

2 Watts



RoHS

TEMPERATURE RANGE: -54°C to +100°C

TEST DATA: Swept data plots of SWR from 50 MHz to 18 GHz is available at additional cost.

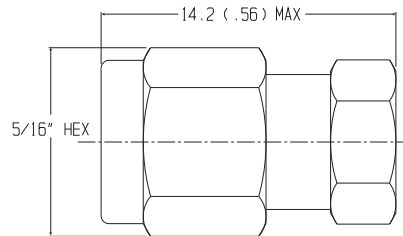
CONNECTOR: SMA connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Choice of male or female connector. When ordering, prefix model number with M for male and F for female.

CONSTRUCTION: Gold plated beryllium copper contacts with passivated stainless steel.

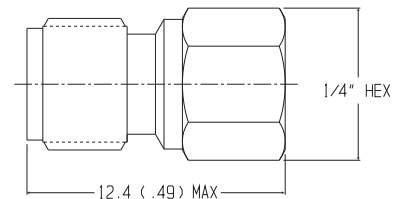
WEIGHT: Male Connector: 2.8 g (0.1 oz)
Female Connector: 1.4 g (0.05 oz)

PHYSICAL DIMENSIONS:

M1406 / M1408:



F1406 / F1408:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Features

Models 1406A & 1408 are general purpose subminiature terminations that operate in the frequency range of dc to 18 GHz but are usable to 26.5 GHz.

- /// **Low SWR** - Model 1406A has low VSWR across its operating range (typical SWR is less than specified). The Model 1408 has ultra-low SWR to 18 GHz (usable to 26.5 GHz).
- /// **Subminiature Size and Lightweight** - All models are approximately 0.5 inches long, and weigh less than 3 grams with male connector and 1.5 grams with female connector.
- /// **Rugged Construction.**

Specifications

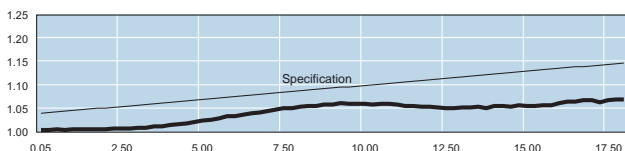
NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 18.0 GHz

POWER RATING: 2 Watts average @ 25 C ambient temperature derated linearly to 0.2 watt @ 100°C. 500 watts peak (5 μsec pulse width; 0.2% duty cycle).

MAXIMUM SWR:

Model	SWR
1406A	1.05 + 0.009f (GHz)
1408	1.04 + 0.006f (GHz)



Typical M1408 SWR Performance

Terminations & Loads



Model 1455 General Purpose, N Connectors

dc to 18.0 GHz
2 Watt



Features

- /// **Low Cost Type N Connector** - Interface dimensions per MIL-STD-348 Test connector.
- /// **Rugged Construction** - Numerically controlled machining is used to produce high quality uniform parts with controlled concentricity and surface finishes. The result is excellent SWR repeatability.

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 18.0 GHz

MAXIMUM SWR:

Frequency Range (GHz)	1455-3 1455-3C	1455-4 1455-4C
dc - 8	1.20	1.20
8 - 12.4	1.25	1.20
12.4 - 18	1.30	1.25

POWER RATING: 2 watts **average** to 25°C ambient temperature, derated linearly to 1 watts @ 125°C. 1 kilowatt **peak** (5 μsec pulse width; 0.5 % duty cycle)

TEMPERATURE RANGE: -65°C to +125°C

CONNECTOR: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Choice of male or female connector. Order as follows:

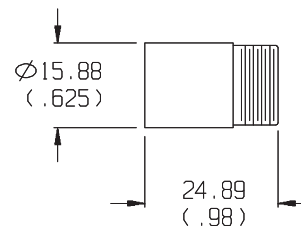
Model	Connector Type
1455-4	Type N Male
1455-3	Type N Female
1455-4C	Type N Male with chain
1455-3C	Type N Female with chain

CONSTRUCTION: Nickel plated brass connector; gold plated beryllium copper contacts, stainless steel bead chains.

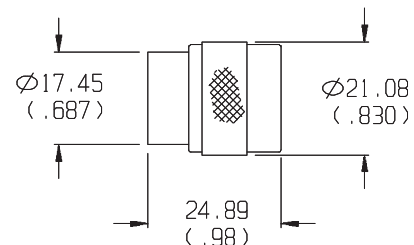
WEIGHT: 110 g (4 oz) maximum

PHYSICAL DIMENSIONS:

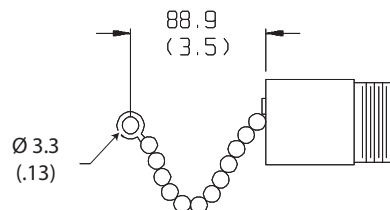
Model 1455-3:



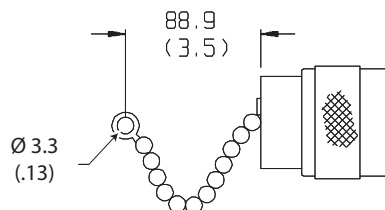
Model 1455-4:



Model 1455-3C:



Model 1455-4C:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Model 1465 Precision, 3.5mm Connectors

dc to 32.0 GHz
2 Watt



Features

- /// High Performance - Precision Lab Grade
- /// Subminiature Size and Lightweight - All models weigh 7 grams with male connector
- /// Low SWR Design Option
- /// Rugged Construction

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 32.0 GHz

POWER RATING: 2.0 watt **average** @ 25°C ambient temperature, derated linearly to 0.2 watts @ 100°C. 500 watts **peak** maximum (5 μsec pulse width; 0.2% duty cycle).

MAXIMUM SWR:		
Frequency Range (GHz)	F1465 M1465	F1465A M1465A
dc - 18	1.08	1.06
18 - 26.5	1.10	1.08
26.5 - 32	1.15	1.10

TEMPERATURE RANGE: -50°C to +100°C

STORAGE TEMPERATURE: -50°C to +125°C

TEST DATA: Swept data plots of SWR from 50 MHz to 32 GHz is available at additional cost.

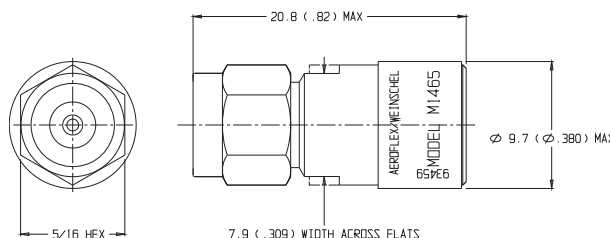
CONNECTOR: Male or Female 3.5mm connector - mate nondestructively with SMA, SMK, 2.92mm, and other 3.5mm connectors. Choice of male or female connector. When ordering, prefix model number with M for male and F for female.

PIN RECESSION: 0.003 maximum (male and female connectors)

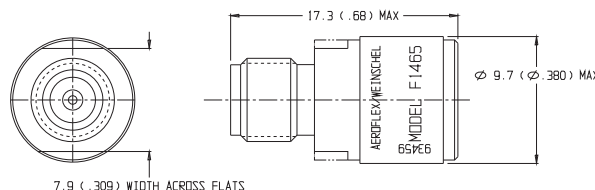
WEIGHT: 7.0 g (0.25 oz) maximum

PHYSICAL DIMENSIONS:

Model M1465/M1465A:



Model F1465/F1465A:



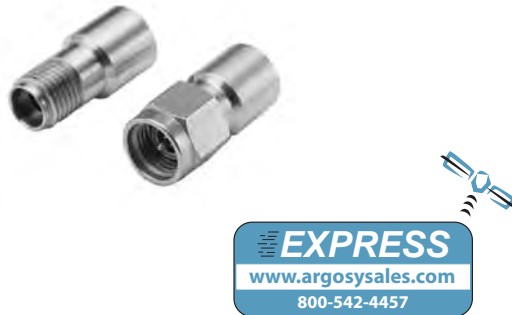
NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Terminations & Loads



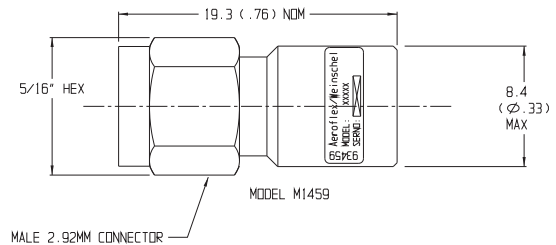
Model 1459 Precision, SMK Connectors

dc to 40.0 GHz
2 Watts

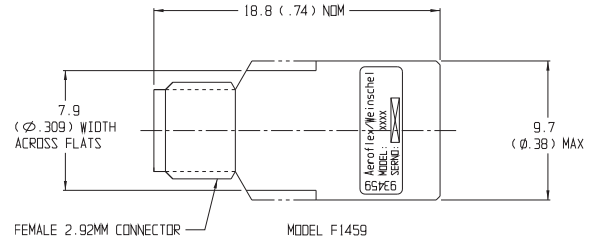


PHYSICAL DIMENSIONS:

Model M1459/M1459A:



Model F1459/F1459A:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Features

- High Performance - Precision Lab Grade
- Subminiature Size and Lightweight - All models weigh 6 grams with male connector
- Low SWR Design Option
- Rugged Construction

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 40.0 GHz

POWER RATING: 2.0 watt **average** @ 25°C ambient temperature, derated linearly to 0.2 watts @ 100°C. 500 watts **peak** maximum (5 μsec pulse width; 0.2% duty cycle).

MAXIMUM SWR:

Frequency Range (GHz)	F1459 M1459	F1459A	M1459A
dc - 18	1.15	1.10	1.10
18 - 40	1.25	1.18	1.15

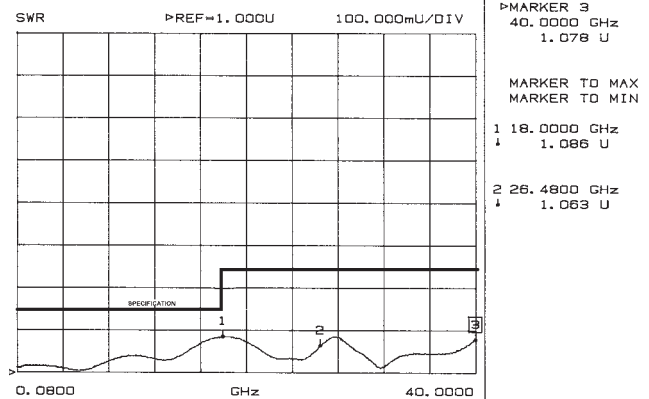
TEMPERATURE RANGE: -50°C to +100°C

TEST DATA: Swept data plots of SWR from 50 MHz to 40 GHz is available at additional cost.

CONNECTOR: SMK (2.92mm) connector compatible with SMA, 3.5mm and SMK connector. Choice of male or female connector. When ordering, prefix model number with M for male and F for female.

WEIGHT: 6.0 g (0.17 oz) maximum

S22 REVERSE REFLECTION



Typical M1459 SWR Performance

Model 1460 Precision, 2.4mm Connectors

dc to 50.0 GHz
2 Watt



Features

- /// High Performance - Precision Lab Grade
- /// Subminiature Size and Lightweight - All models weigh less than 6 grams with male connector
- /// Low SWR Design Option
- /// Rugged Construction

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 50.0 GHz

POWER RATING: 2.0 watt **average** @ 25°C ambient temperature, derated linearly to 0.2 watts @ 100°C. 500 watts **peak** maximum (5 μsec pulse width; 0.2% duty cycle).

MAXIMUM SWR:

Frequency Range (GHz)	F1460 M1460	M1460A F1460A
dc - 20	1.10	1.10
20 - 50	1.22	1.15

TEMPERATURE RANGE: -50°C to +100°C

TEST DATA: SWR Testing performed across the frequency band. Test data is available at additional cost.

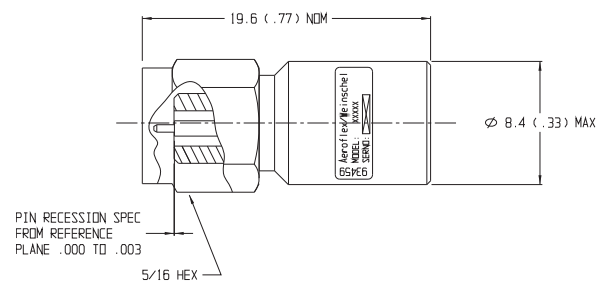
CONNECTOR: 2.4mm connector mates nondestructively with other 2.4mm connectors. Choice of male or female connector. When ordering, prefix model number with M for male and F for female.

TEST DATA: Swept data plots of SWR from 50 MHz to 32 GHz.

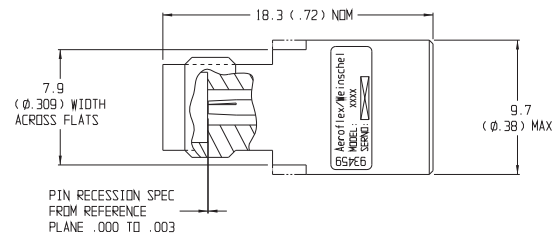
WEIGHT: 6.0 g (0.16 oz) maximum

PHYSICAL DIMENSIONS:

Model M1460/M1460A:



Model F1460/F1460A:



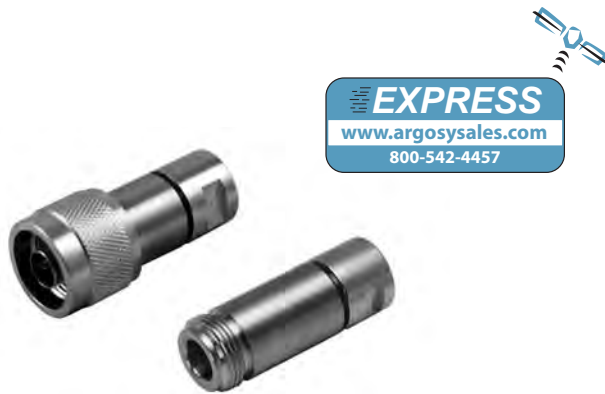
NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Terminations & Loads



Model 1424 N Connectors

dc to 12.4 GHz
5 Watt



TEST DATA: Swept data plots of SWR from 50 MHz to 12.4 GHz.

CONNECTOR: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector.

Connector Options	Type/Description
3	Type N, Female
4	Type N, Male

CONSTRUCTION: Stainless steel connector; gold plated beryllium copper contacts

WEIGHT: Net 60 g (2 oz)

PHYSICAL DIMENSIONS:

Features

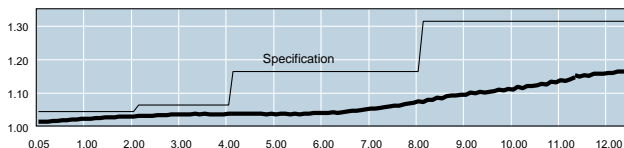
- Quality Connectors - Choice of male or female N connector that mate nondestructively with connector manufactured in accordance with MIL-C-39012.
- Rugged Construction.

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 12.4 GHz

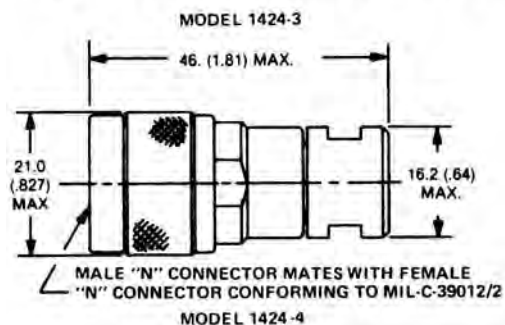
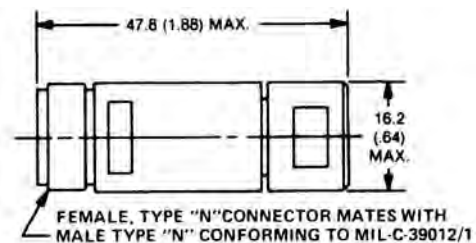
MAXIMUM SWR:	
Frequency (GHz)	SWR
dc - 2	1.03
2 - 4	1.05
4 - 8	1.15
8 - 12.4	1.30



Typical 1424-3 SWR Performance

POWER RATING: 5 watts **average** @ 25°C ambient temperature, derated linearly to 0 watts @ 125°C. 5 kilowatts **peak** (5 μsec pulse width; 0.05 % duty cycle)

TEMPERATURE RANGE: -55°C to +125°C

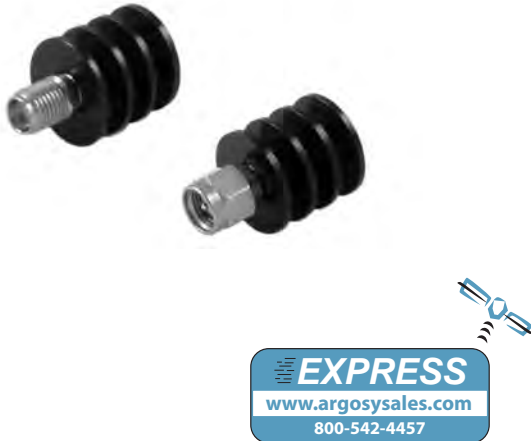


NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Model 1443A Subminiature, SMA Connectors

dc to 18.0 GHz
5 Watts

RoHS



Features

- /// **Compact Construction** - Lowest size/power ratio.
- /// **Precision Injection Molded Connector.**
- /// **Low SWR.**

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 18.0 GHz

MAXIMUM SWR:

Frequency (GHz)	SWR
dc - 18	1.15

POWER RATING: 5 watts **average** (mounted horizontally assuming unobstructed air flow and natural convection around unit) to 25°C ambient temperature, derated linearly to 0.5 watts @ 100°C. 500 watts **peak** (5 μsec pulse width; 0.5% duty cycle).

TEMPERATURE RANGE: -55°C to +100°C

TEST DATA: Swept data plots of SWR from 50 MHz to 18 GHz is available at additional cost.

CONNECTOR: SMA connector per MIL-STD-348 interface dimensions - mate nondestructively with SMK, 3.5mm, 2.92mm and SMA connectors per MIL-C-39012 .

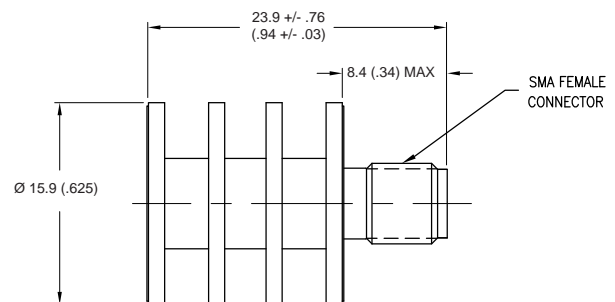
Choice of male (-2) or female (-1) connector.

CONSTRUCTION: Black, finned aluminum body, stainless steel connector; gold plated beryllium copper contacts.

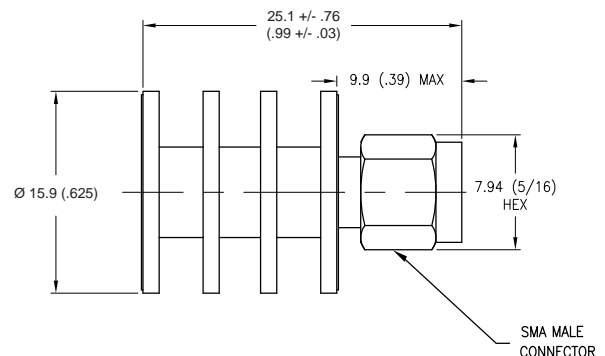
WEIGHT: 10 g (0.35 oz)

PHYSICAL DIMENSIONS:

Model 1443A-1:



Model 1443A-2:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Terminations & Loads



Model 1445A SMK Connectors

dc to 40.0 GHz
5 Watts



TEMPERATURE RANGE: -55°C to +125°C

TEST DATA: Swept data plots of SWR from 50 MHz to 40 GHz is available at additional cost.

CONNECTOR: 2.92mm connector mate nondestructively with SMA per MIL-C-39012, SMK, 3.5mm and other 2.92mm connector. Choice of male (-2) or female connector (-1).

CONSTRUCTION: Black, finned aluminum body, gold plated beryllium copper contacts.

WEIGHT: 200 g (7 oz)

PHYSICAL DIMENSIONS:

Features

- /// **Compact Construction** - Lowest size/power ratio.
- /// **Precision Injection Molded Connector.**

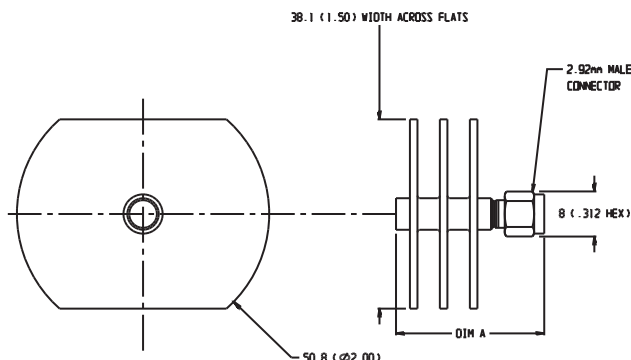
Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 40.0 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR
dc - 18	1.20
18 - 40	1.35

POWER RATING: 5 watts **average** (mounted horizontally) to 25°C ambient temperature, derated linearly to 0.5 watts @ 125°C. 200 watts **peak** (5 μsec pulse width; 1.25% duty cycle).



Model #	DIM A	Connector Type
1445A-1	33.8 (1.33)	2.92mm female
1445A-2	37.8 (1.49)	2.92mm male

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Model 1419

dc to 18.0 GHz

Medium Power, Ruggedized SMA Connectors

10 Watts

RoHS



Features

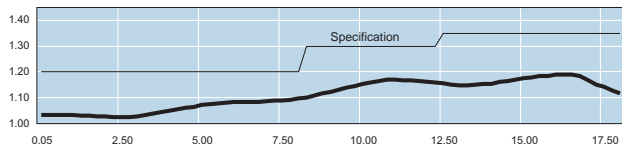
- /// **Miniature Size and Lightweight** - All models are approximately 1.6 inches long, and weigh less than 14 grams with male connector.
- /// **Quality Injection Molded Connector.**

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 18.0 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR
dc - 8	1.20
8 - 12.4	1.30
12.4 - 18	1.35



Typical M1419 SWR Performance

POWER RATING: 10 watts **average** (mounted horizontally) @ 25°C ambient temperature, derated linearly to 0 watts @ 125°C. 1 kilowatt **peak** (5 μsec pulse width; 0.5% duty cycle).

TEMPERATURE RANGE: -55°C to +125°C

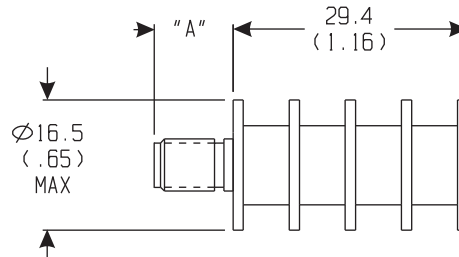
TEST DATA: Swept data plots of SWR from 50 MHz to 18 GHz.

CONNECTOR: SMA connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Choice of male or female connector. When ordering, prefix model number with M for male and F for female.

CONSTRUCTION: Black, finned aluminum body, stainless steel connector; gold plated beryllium copper contacts.

WEIGHT: 14 g (0.49 oz)

PHYSICAL DIMENSIONS:



Model #	DIM A	Connector Type
M1419	11.2 (0.44)	SMA male
F1419	9.4 (0.37)	SMA female

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Terminations & Loads



Model 1453 Medium Power, N Connectors

dc to 8.5 GHz
10 Watts



Features

- /// Optimized for Wireless OEM and Test Applications.
- /// Designed to meet environmental requirements of MIL-D-39030.
- /// Quality Injection Molded Connector.

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 8.5 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR
dc - 4	1.15
4 - 8.5	1.25

POWER RATING: 10 watts **average (mounted horizontally)** @ 25°C ambient temperature, derated linearly to 1 watt @ 125°C. 1 kilowatt **peak** (5 μsec pulse width; 0.5% duty cycle).

TEMPERATURE RANGE: -55°C to +125°C

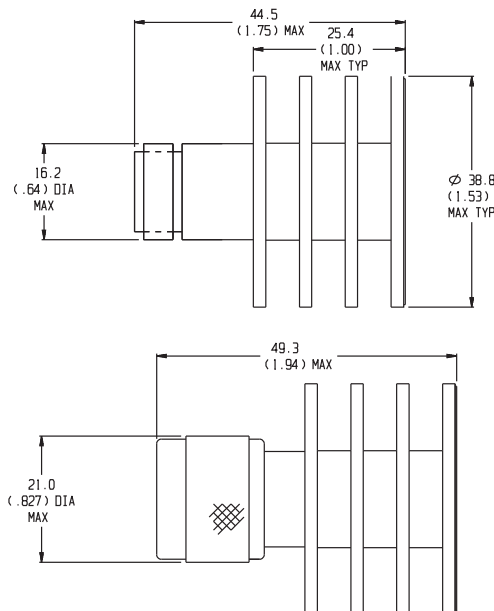
TEST DATA: Swept data plots of SWR from 50 MHz to 8.5 GHz.

CONNECTOR: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Choice of male (-4) or female connector (-3).

CONSTRUCTION: Black, finned aluminum body, stainless steel connector; gold plated beryllium copper contacts.

WEIGHT: 85 g (3 oz)

PHYSICAL DIMENSIONS:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Model 1425 Medium Power, N Connectors

dc to 12.4 GHz
10 Watts

RoHS



Features

- /// **Quality Connectors** - Choice of male or female N connector that mate nondestructively with connector manufactured in accordance with MIL-C-39012.
- /// **Rugged Construction.**

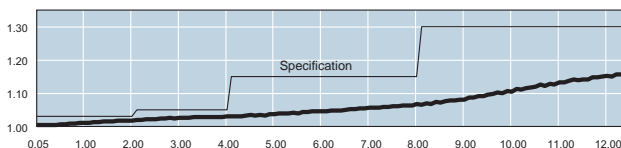
Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 12.4 GHz

MAXIMUM SWR:

Frequency (GHz)	SWR
dc - 2	1.03
2 - 4	1.05
4 - 8	1.15
8 - 12.4	1.30



Typical 1425-4 SWR Performance

POWER RATING: 10 watts **average (mounted horizontally)** @ 25°C ambient temperature, derated linearly to 0 watts @ 125°C. 1 kilowatt **peak** (5 μsec pulse width; 0.5% duty cycle).

TEMPERATURE RANGE: -55°C to +125°C

TEST DATA: Swept data plots of SWR from 50 MHz to 12.4 GHz is available at additional cost.

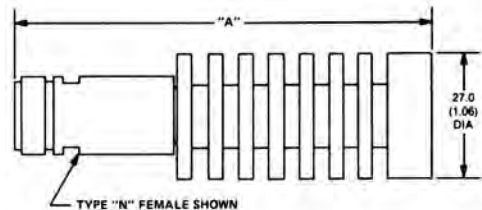
CONNECTOR: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector.

Connector Options	Type/Description
3	Type N, Female
4	Type N, Male

CONSTRUCTION: Black, finned aluminum body, stainless steel connector; gold plated beryllium copper contacts

WEIGHT: Net 110 g (4 oz)

PHYSICAL DIMENSIONS:



Model #	DIM A	Connector Type
1425-4	84.58 (3.33)	N, male
1425-3	86.36 (3.40)	N, female

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Terminations & Loads



Model 1418 Medium Power, N Connectors

dc to 18.0 GHz
10 Watts

RoHS



Features

- /// Optimized for Wireless OEM and Test Applications.
- /// Designed to meet environmental requirements of MIL-D-39030.
- /// Quality Injection Molded Connector.

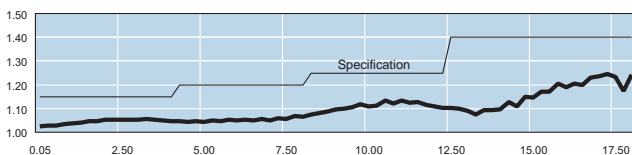
Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 18.0 GHz

MAXIMUM SWR:

Frequency (GHz)	SWR
dc - 4	1.15
4 - 8	1.20
8 - 12.4	1.25
12.4 - 18	1.40



Typical M1418 SWR Performance

POWER RATING: 10 watts **average (mounted horizontally)** @ 25°C ambient temperature, derated linearly to 0 watt @ 125°C. 1 kilowatt **peak** (5 μsec pulse width; 0.5% duty cycle).

TEMPERATURE RANGE: -55°C to +125°C

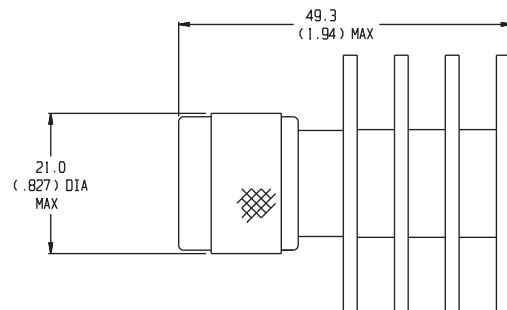
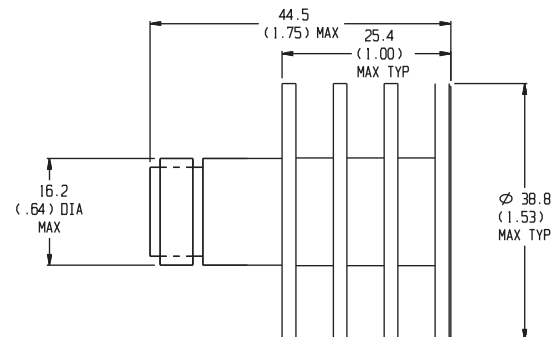
TEST DATA: Swept data plots of SWR from 50 MHz to 18 GHz.

CONNECTOR: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Choice of male or female connector. When ordering, prefix model number with M for male and F for female.

CONSTRUCTION: Black, finned aluminum body, stainless steel connector; gold plated beryllium copper contacts.

WEIGHT: 90 g (3 oz)

PHYSICAL DIMENSIONS:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Terminations & Loads



Model 1477 SMK Connectors

dc to 40.0 GHz
10 Watts



RoHS



TEMPERATURE RANGE: -55°C to +125°C

TEST DATA: Swept data plots of SWR from 50 MHz to 40 GHz is available at additional cost.

CONNECTOR: SMK (2.92mm) connector mate non-destructively with SMA per MIL-C-39012, 3.5mm and other 2.92mm connectors. Choice of male (-2) or female connector (-1).

CONSTRUCTION: Black, finned aluminum body, gold plated beryllium copper contacts.

WEIGHT: 200 g (7 oz)

PHYSICAL DIMENSIONS:

Features

- /// **Compact Construction** - Lowest size/power ratio.
- /// **Precision Injection Molded Connector.**

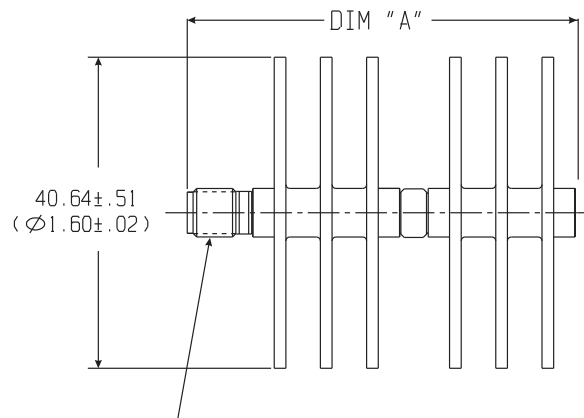
Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 40.0 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR
dc - 18	1.20
18 - 40	1.35

POWER RATING: 10 watts **average** (mounted horizontally) to 25°C ambient temperature, derated linearly to 0.5 watts @ 125°C. 200 watts **peak** (5 μsec pulse width; 1.25% duty cycle).



Model #	DIM A	Connector Type
1477-1		SMK female
1477-2		SMK male

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Model 1478 SMK Connectors

dc to 40.0 GHz
20 Watts



RoHS



Features

- /// **Compact Construction** - Lowest size/power ratio.
- /// **Precision Injection Molded Connector.**

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 40.0 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR
dc - 18	1.20
18 - 40	1.35

POWER RATING (mounted horizontally): 20 watts **average (unidirectional)** to 25°C ambient temperature, derated linearly to 2 Watts @ 125°C. 200 watts **peak** (5 μsec pulse width; 5% duty cycle).

TEMPERATURE RANGE: -55°C to +125°C

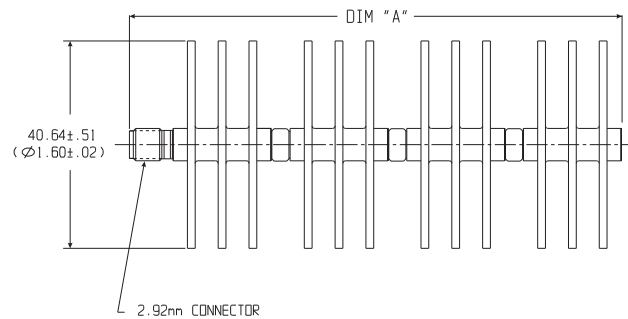
TEST DATA: Swept data plots of SWR from 50 MHz to 40 GHz is available at additional cost.

CONNECTOR: 2.92mm connector mate nondestructively with SMA per MIL-C-39012, SMK, 3.5mm and other 2.92mm connector. Choice of male (-2) or female connector (-1).

CONSTRUCTION: Black, finned aluminum body, gold plated beryllium copper contacts.

WEIGHT: 200 g (7 oz)

PHYSICAL DIMENSIONS:



Model #	DIM A	Connector Type
1478-1		SMK female
1478-2		SMK male

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Model 1452 Medium Power, N or SMK Connectors Convection Cooled

dc to 4.0 GHz
25 Watts

RoHS



TEST DATA: Swept data plots of SWR from 50 MHz to 4 GHz is available at additional cost.

CONNECTOR: Type N or SMK (2.92mm) connectors mate nondestructively with MIL-C-39012 connector.

Connector Options	Type/Description
1	SMK, Female
2	SMK, Male
3	Type N, Female
4	Type N, Male

CONSTRUCTION: Black, finned aluminum body, stainless steel connector; gold plated beryllium copper contacts.

WEIGHT: 150 g (5.2 oz)

PHYSICAL DIMENSIONS:

Features

- /// Optimized for Wireless OEM and Test Applications.
- /// Designed to meet environmental requirements of MIL-D-39030.
- /// Quality Injection Molded Connector.
- /// 5 Kilowatts Peak Power.

Specifications

NOMINAL IMPEDANCE: 50 Ω

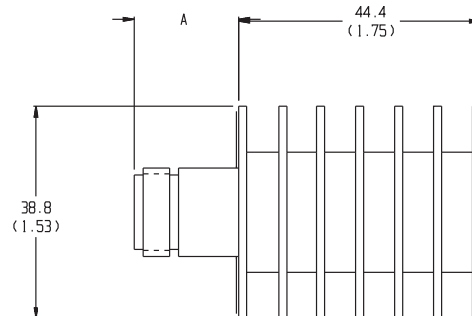
FREQUENCY RANGE: dc to 4.0 GHz

MAXIMUM SWR*:

Frequency (GHz)	SWR
dc - 2	1.10
2 - 4	1.20

POWER RATING: 25 watts average (mounted horizontally assuming unobstructed air flow and natural convection around unit) @ 25°C ambient temperature, derated linearly to 2.5 watts @ 125°C. 5 kilowatts peak (5 μsec pulse width; 0.25% duty cycle).

TEMPERATURE RANGE: -55°C to +125°C



Model #	DIM A	Connector Type
1452-1	12.7 (0.50)	2.92mm female
1452-2	14.0 (0.55)	2.92mm male
1452-3	15.0 (0.59)	N female
1452-4	22.9 (0.90)	N male

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Terminations & Loads

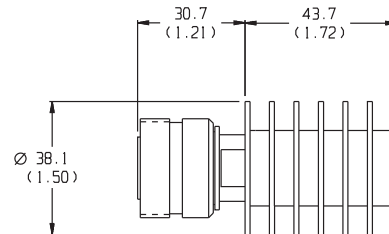


Model 1446 Medium Power, 7/16 Connectors Low Intermodulation Design

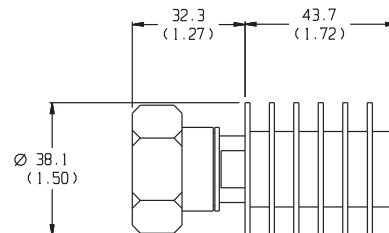
25 Watts
dc to 6.0 GHz



PHYSICAL DIMENSIONS:



MODEL NO. 1446-1 FEMALE



MODEL NO. 1446-2 MALE

NOTE: All dimensions are given in mm (inches) and tolerances are X.X+0.8 (0.3) unless otherwise specified.

Features

- /// Optimized for Wireless OEM and Test Applications.
- /// Designed to meet environmental requirements of MIL-D-39030.
- /// Custom Designs Available.

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 6.0 GHz

MAXIMUM SWR:

Frequency (GHz)	SWR
dc - 6	1.20

POWER RATING: (mounted horizontally assuming unobstructed air flow and natural convection around unit): 25 watts **average** @ 25°C ambient temperature, derated linearly to 2.5 watts @ 125°C. 5 kilowatts **peak** (5 μ sec pulse width; 0.25% duty cycle).

INTERMODULATION: IM3 (Reflected) = -100 dBc with two +41 dBm Input Tones @ 869 MHz and 891 MHz.

TEMPERATURE RANGE: -55°C to 125°C.

TEST DATA: Swept data plots of SWR from 50 MHz to 18 GHz is available at additional cost.

CONNECTOR: 7/16 connector that conforms to DIN 47 223, IEC 1694, VG 95250, CECC 22190. Choice of 7/16 male(-2) of 7/16 female (-1) connector

CONSTRUCTION: Black, finned aluminum body, silver plated brass connector.

WEIGHT: Net 216 g (7.6 oz) maximum

Model 1427 Medium Power, N or SMK Connectors Convection Cooled

dc to 10.0 GHz
25 Watts

RoHS



Features

- /// Designed to meet environmental requirements of Quality Injection Molded Connector.
- /// Low Intermodulation Option
- /// 5 Kilowatts Peak Power

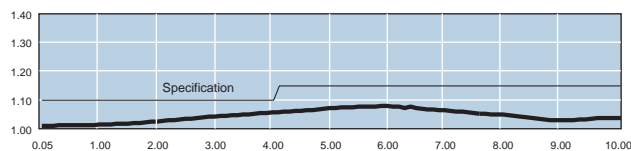
Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 10.0 GHz

MAXIMUM SWR:

Frequency (GHz)	SWR
dc - 4	1.10
4 - 8	1.15
8 - 10	1.30



Typical M1427 SWR Performance

POWER RATING: 25 watts **average (mounted horizontally)** @ 25°C ambient temperature, derated linearly to 2.5 watts @ 125°C. 5 kilowatts **peak** (5 μsec pulse width; 0.25% duty cycle).

TEMPERATURE RANGE: -55°C to +125°C

INTERMODULATION (Model 1427-X-LIM Only): IM3 (Reflected) = -100 dBc with two input signals @ 869 MHz and 891 MHz with an average power of +41 dBm each.

TEST DATA: Swept data plots of SWR from 50 MHz to 10 GHz is available at additional cost.

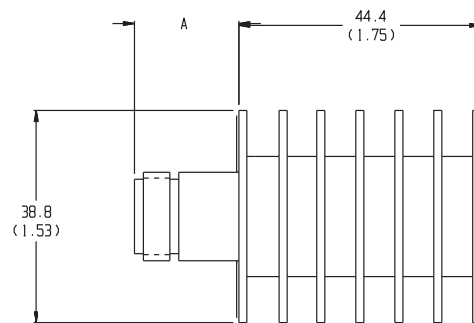
CONNECTOR: Type N or SMK (2.92mm) connectors mate nondestructively with MIL-C-39012 connector.

Connector Options	Type/Description
1	SMK, Female
2	SMK, Male
3	Type N, Female
4	Type N, Male

CONSTRUCTION: Black, finned aluminum body, stainless steel connector; gold plated beryllium copper contacts.

WEIGHT: 150 g (5.2 oz)

PHYSICAL DIMENSIONS:

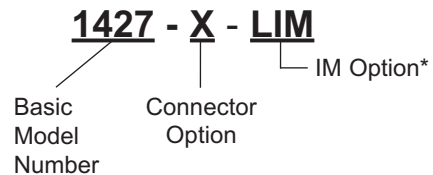


Model #	DIM A	Connector Type
1427-1	12.7 (0.50)	2.92mm female
1427-2	14.0 (0.55)	2.92mm male
1427-3	15.0 (0.59)	N female
1427-4	22.9 (0.90)	N male

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

MODEL NUMBER DESCRIPTION:

Example:



* Add -LIM to entire model number for Low Intermodulation option. Option not available through Express.

Terminations & Loads



Model 1429 Medium Power, N & 3.5mm Connectors Convection Cooled

dc to 18.0 GHz
25 Watts

RoHS



Features

- /// Designed to meet environmental requirements of MIL-D-39030.
- /// Rugged injection molded connector.
- /// Low Intermodulation Option.
- /// 1 Kilowatt Peak Power

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 18.0 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR
dc - 18	1.20

POWER RATING: 25 watts average (mounted horizontally assuming unobstructed air flow and natural convection around unit) @ 25°C ambient temperature, derated linearly to 2.5 watts @ 125°C. 1 kilowatt peak (5 μsec pulse width; 1.25% duty cycle).

INTERMODULATION (Model 1429-X-LIM Only): IM3 (Reflected) = -100 dBc with two input signals @ 869 MHz and 891 MHz with an average power of +41 dBm each.

TEMPERATURE RANGE: -55°C to +125°C

TEST DATA: Swept data plots of SWR from 50 MHz to 18 GHz is available at additional cost.

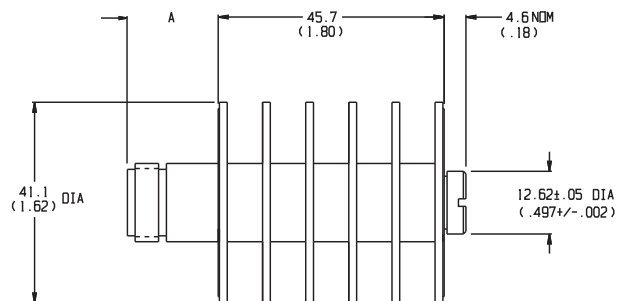
CONNECTOR: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Choice of male (-4) or female connector (-3).

3.5mm connector mate nondestructively with SMA per MIL-C-39012, 2.92mm and other 3.5mm connector. Choice of male (-2) or female connector (-1).

CONSTRUCTION: Black, finned aluminum body, stainless steel connector; gold plated beryllium copper female contact or stainless steel male contact.

WEIGHT: 100 g (3.5 oz)

PHYSICAL DIMENSIONS:

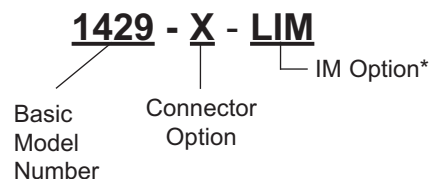


Model #	DIM A	Connector Type
1429-1	13.2 (0.52)	3.5mm female
1429-2	14.0 (0.55)	3.5mm male
1429-3	18.3 (0.72)	N female
1429-4	23.1 (0.91)	N male

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

MODEL NUMBER DESCRIPTION:

Example:



* Add -LIM to entire model number for Low Intermodulation option.

Model 1444 Medium Power, 3.5mm Connectors Convection Cooled

dc to 26.5 GHz
25 Watts

RoHS



TEMPERATURE RANGE: -55°C to +125°C

TEST DATA: Swept data plots of SWR from 50 MHz to 26.5 GHz.

CONNECTOR: 3.5mm connectors - mate nondestructively with SMA per MIL-C-39012, 2.92mm, and other 3.5mm connectors. Choice of male (-2) or female connector (-1).

CONSTRUCTION: Black, finned aluminum body, stainless steel connector; gold plated beryllium copper contacts.

WEIGHT: 100 g (3.5 oz)

PHYSICAL DIMENSIONS:

Features

- /// Designed to meet environmental requirements of MIL-D-39030.
- /// Precision Connectors.
- /// Flat Response.

Specifications

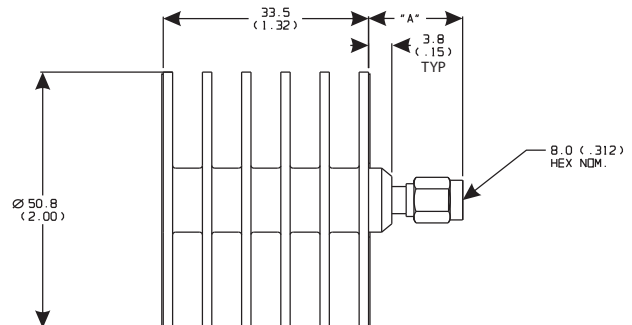
NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 26.5 GHz

MAXIMUM SWR:

Frequency (GHz)	SWR
dc - 26.5	1.25

POWER RATING: 25 watts average (**mounted horizontally**) average @ 25°C ambient temperature, derated linearly to 2.5 watt @ 125°C. 500 watts **peak** (5 μsec pulse width; 2.5% duty cycle).



Model #	DIM A	Connector Type
1444-1	15.0 (0.59)	3.5mm female
1444-2	16.0 (0.63)	3.5mm male

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Terminations & Loads



Model 1468

Medium Power, SMA, N & BNC Connectors

dc to 6.0 GHz

50 Watts

Low Cost Design

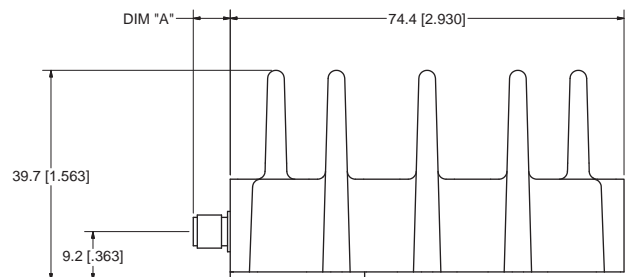
RoHS



CONSTRUCTION: Aluminum alloy body, stainless steel connector; gold plated beryllium copper contacts.

WEIGHT: Net 318 g (11.2 oz.) maximum

PHYSICAL DIMENSIONS:



Features

- /// Compact Construction - Lowest size/power ratio.
- /// Quality Injection Molded Connector.
- /// Ideal for high volume OEM Wireless Applications.

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 6.0 GHz

MAXIMUM SWR:

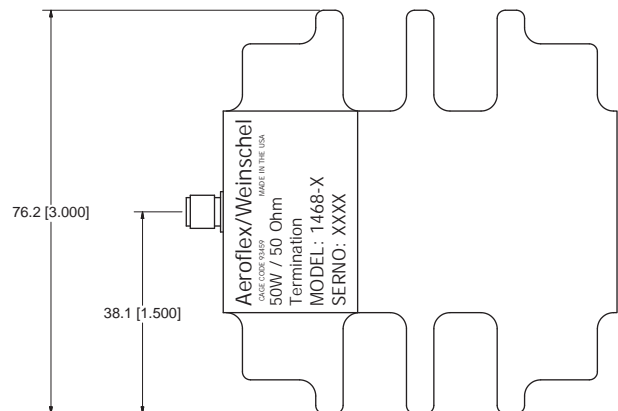
Frequency (GHz)	SWR
dc - 4	1.30
4 - 6	1.60

POWER RATING: 50 watts **average** at 25°C ambient temperature derated linearity to 5 Watts at 125°C. 1 kW peak (5 μsec pulse width: 2.5% duty cycle)

TEMPERATURE RANGE: -55°C to 125°C case.

CONNECTOR: SMA or Type N connector per MIL-STD-348 interface dimensions - mates nondestructively with MIL-C-39012 connector.

Connector Options	Type/Description
1	SMA, Female
2	SMA, Male
3	Type N, Female
4	Type N, Male
8	BNC Female
9	BNC Male



Model #	DIM A	Connector Type
1468-1	7.0 (0.275)	SMA female
1468-2	10.3 (0.405)	SMA male
1468-3	14.9 (0.587)	N female
1468-4	17.8 (0.700)	N male
1468-8		BNC Female
1468-9		BNC Male

NOTE:

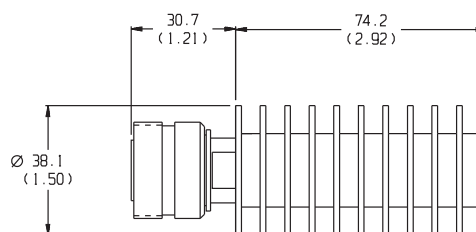
1. All dimensions are given in mm (inches) and are maximum, unless otherwise specified.
2. Minimum quantities apply. Contact Factory.

Model 1447 Medium Power, 7/16 Connectors *Low Intermodulation Design*

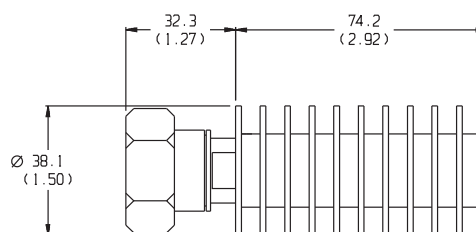
50 Watts dc to 6.0 GHz



PHYSICAL DIMENSIONS:



MODEL NO. 1447-1 FEMALE



MODEL NO. 1447-2 MALE

NOTE: All dimensions are given in mm (inches) and tolerances are X.X+0.8 (0.03) unless otherwise specified.

Features

- /// Optimized for Wireless OEM and Test Applications.
- /// Designed to meet environmental requirements of MIL-D-39030.
- /// Custom Designs Available.

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 6.0 GHz

MAXIMUM SWR:

Frequency (GHz)	SWR
dc - 6	1.20

POWER RATING: (mounted horizontally assuming unobstructed air flow and natural convection around unit): 50 watts **average** to 25°C ambient temperature, derated linearly to 5 watts @ 125°C. 5 kilowatt **peak** (5 μsec pulse width; 0.5% duty cycle).

INTERMODULATION: IM3 (Reflected) = -100 dBc with two +43 dBm Input Tones @ 869 MHz and 891 MHz.

TEMPERATURE RANGE: -55°C to 125°C.

TEST DATA: Swept data plots of SWR from 50 MHz to 6 GHz is available at additional cost.

CONNECTOR: 7/16 connector that conforms to DIN 47 223, IEC 1694, VG 95250, CECC 22190. Choice of 7/16 male(-2) of 7/16 female (-1) connector

CONSTRUCTION: Black, finned aluminum body, silver plated brass connector.

WEIGHT: Net 354 g (12.5 oz) maximum

Terminations & Loads



Model 1426 Medium Power, N & SMK Connectors Convection Cooled

dc to 10 GHz
50 Watts



Features

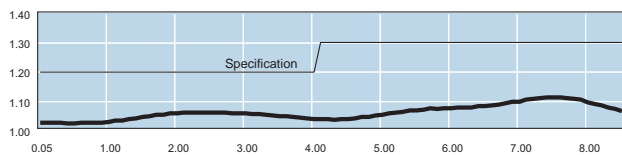
- /// **Rugged Construction** - Quality connector with special high temperature support bead.
- /// **Low Intermodulation Option**
- /// **5 Kilowatts Peak Power**

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 10 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR
dc - 4	1.20
4 - 10	1.30



Typical 1426-4 SWR Performance

POWER RATING: 50 watts **average** (mounted horizontally) to 25°C ambient temperature, derated linearly to 5 watts @ 125°C. 5 kilowatts **peak** (5 μsec pulse width; 0.5% duty cycle).

INTERMODULATION (Model 1426-X-LIM Only): IM3 (Reflected) = -100 dBc with two input signals @ 869 MHz and 891 MHz with an average power of +43 dBm each.

TEMPERATURE RANGE: -55°C to +125°C

TEST DATA: Swept data plots of SWR from 50 MHz to 10 GHz is available at additional cost.

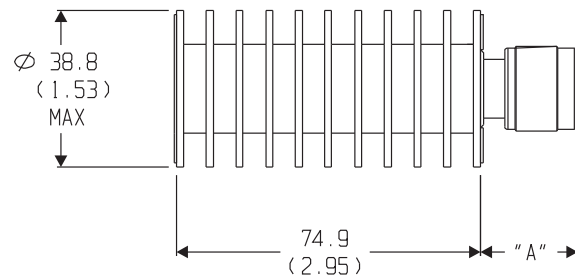
CONNECTOR: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Choice of male (-4) or female connector (-3).

SMK (2.92mm) connector mates nondestructively with SMA per MIL-C-39012, 3.5mm and other 2.92mm (SMK) connector. Choice of male (-2) or female connector (-1).

CONSTRUCTION: Black, finned aluminum body, stainless steel connector; gold plated beryllium copper female contacts and stainless steel male contacts.

WEIGHT: Net 280 g (10 oz.)

PHYSICAL DIMENSIONS:

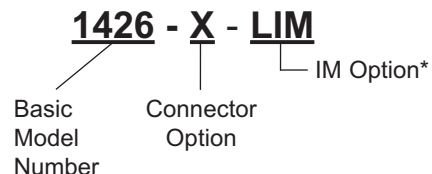


Model #	DIM A	Connector Type
1426-1	12.7 (0.50)	2.92mm female
1426-2	14.0 (0.55)	2.92mm male
1426-3	15.0 (0.59)	N female
1426-4	22.9 (0.90)	N male

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

MODEL NUMBER DESCRIPTION:

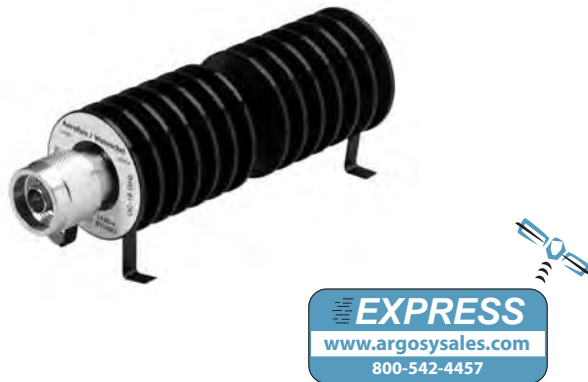
Example:



* Add -LIM to entire model number for Low Intermodulation option. Option not available through Express.

Model 1430
Medium Power, N & 3.5mm Connectors
Convection Cooled

dc to 18.0 GHz
50 Watts



Features

- /// Designed to meet environmental requirements of MIL-D-39030.
- /// Rugged injection molded connector.
- /// 1 Kilowatt Peak Power

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 18.0 GHz

MAXIMUM SWR:

Frequency (GHz)	SWR
dc - 8	1.15
8 - 18	1.30

POWER RATING: 50 watts **average (mounted horizontally assuming unobstructed air flow and natural convection around unit) @ 25°C ambient temperature, derated linearly to 5 watts @ 125°C. 1 kilowatt peak (5 μsec pulse width; 2.5% duty cycle).**

INTERMODULATION (Model 1430-X-LIM Only): IM3 (Reflected) = -100 dBc with two input signals @ 869 MHz and 891 MHz with an average power of +43 dBm each.

TEMPERATURE RANGE: -55°C to +125°C

TEST DATA: Swept data plots of SWR from 50 MHz to 18 GHz is available at additional cost.

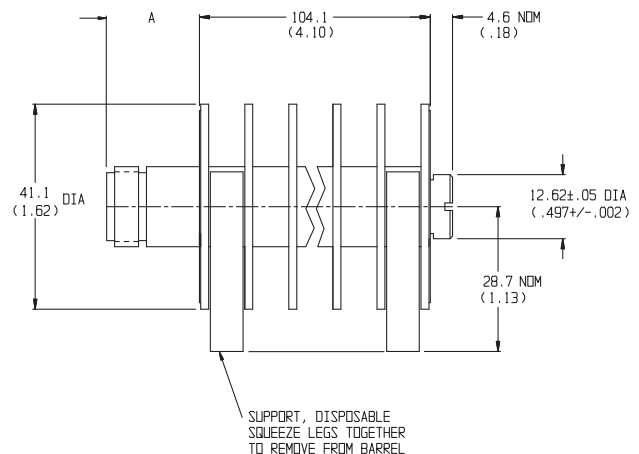
CONNECTOR: Type N connector - mate nondestructively with MIL-C-39012 connector. Choice of male (-4) or female connector (-3).

3.5mm connector mate nondestructively with SMA per MIL-C-39012, 2.92mm and other 3.5mm connector. Choice of male (-2) or female connector (-1).

CONSTRUCTION: Black, finned aluminum body, stainless steel connector; gold plated beryllium copper female contact or stainless steel male contact.

WEIGHT: 175 g (6 oz)

PHYSICAL DIMENSIONS:

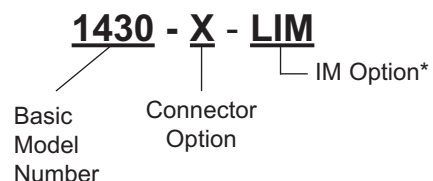


Model #	DIM A	Connector Type
1430-1	13.2 (0.52)	3.5mm female
1430-2	14.0 (0.55)	3.5mm male
1430-3	18.3 (0.72)	N female
1430-4	23.1 (0.91)	N male

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

MODEL NUMBER DESCRIPTION:

Example:



* Add -LIM to entire model number for Low Intermodulation option.

Terminations & Loads



Model 1467 Medium Power, N & 3.5mm Connectors Convection Cooled

dc to 20.0 GHz



50 Watts

RoHS



CONNECTOR: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Choice of male (-4) or female connector (-3).

3.5mm connector mate nondestructively with SMA per MIL-C-39012, 2.92mm, 3.5mm and other SMA connectors. Choice of male (-2) or female connector (-1).

CONSTRUCTION: Black, finned aluminum body, stainless steel connector; gold plated beryllium copper contacts.

WEIGHT: 100 g (3.5 oz)

PHYSICAL DIMENSIONS:

Features

- /// Designed to meet environmental requirements of MIL-D-39030.
- /// Rugged injection molded connector.
- /// 1 Kilowatt Peak Power

Specifications

NOMINAL IMPEDANCE: 50 Ω

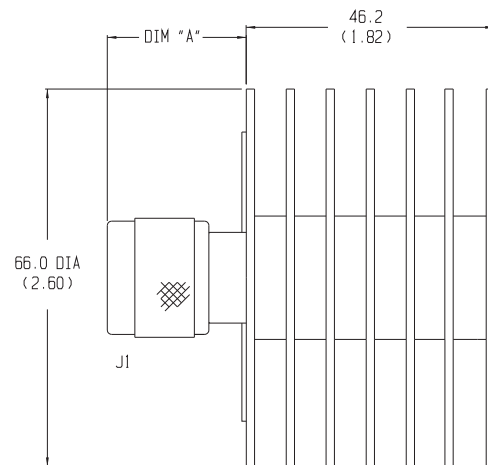
FREQUENCY RANGE: dc to 20.0 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR (maximum)
dc - 18.0	1.15
18.0 - 20.0	1.20

POWER RATING (mounted horizontally): 50 watts average to 25°C ambient temperature, derated linearly to 5 Watts @ 125°C. 1 kW peak (5 μsec pulse width; 2.5% duty cycle).

TEMPERATURE RANGE: -55 °C to 125 °C

TEST DATA: Swept data plots of SWR from 50 MHz to 20 GHz is available at additional cost .



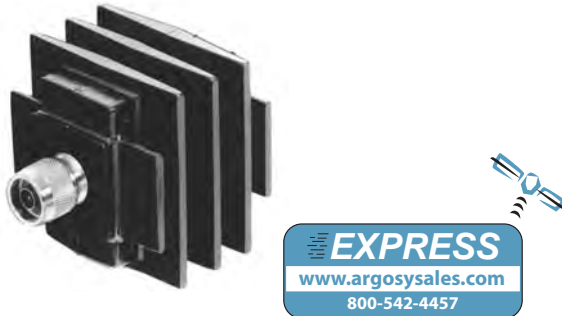
Connector	DIM A	Connector	DIM A
N Male	24.1 (0.95)	3.5mm Female	14.0 (0.55)
N Female	19.0 (0.75)	3.5mm Male	13.2 (0.52)

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Model 1440 High Power, N or SMK Connectors Convection Cooled

dc to 6.0 GHz
100 Watts

RoHS



EXPRESS
www.argosysales.com
800-542-4457

Features

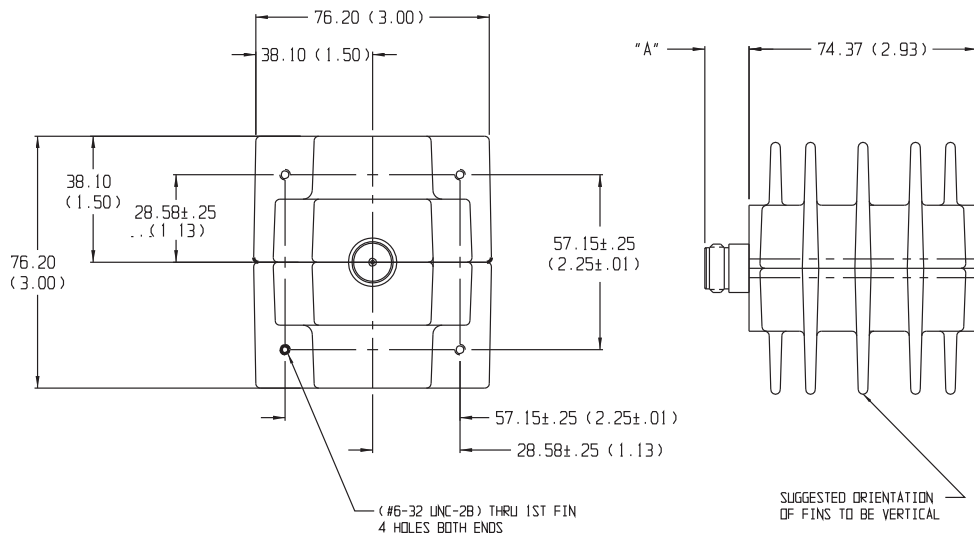
- /// **Compact Construction** - Lowest size/power ratio.
- /// **Low SWR**
- /// **Rugged Construction** - Quality connector with special high temperature support bead.
- /// **Ideal for Wireless Applications.**

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 6.0 GHz

PHYSICAL DIMENSIONS:



Model #	DIM A	Connector Type
1440-1	12.7 (0.50)	2.92mm female
1440-2	14.0 (0.55)	2.92mm male
1440-3	15.0 (0.59)	N female
1440-4	22.9 (0.90)	N male

MAXIMUM SWR:	
Frequency (GHz)	SWR
dc - 6	1.15

POWER RATING: 100 watts average (mounted horizontally assuming unobstructed air flow and natural convection around unit) to 25°C ambient temperature, derated linearly to 10 watts @ 125°C. 10 kilowatts peak (5 μsec pulse width; 0.5 % duty cycle).

TEMPERATURE RANGE: -55°C to +125°C

TEST DATA: Swept data plots of SWR from 50 MHz to 6 GHz.

CONNECTOR: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Choice of male (-4) or female connector (-3).

SMK (2.92mm) connector mates nondestructively with SMA per MIL-C-39012, 3.5mm and other 2.92mm (SMK) connector. Choice of male (-2) or female connector (-1).

CONSTRUCTION: Black, finned aluminum body, stainless steel connector; gold plated beryllium copper center contacts.

WEIGHT: 500 g (18 oz)

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Terminations & Loads



Model 1442 High Power, N or SMK Connectors Convection Cooled

dc to 10 GHz
100 Watts

RoHS



Features

- /// **Compact Construction** - Lowest size/power ratio.
- /// **Rugged Construction** - Quality connector with special high temperature support bead.

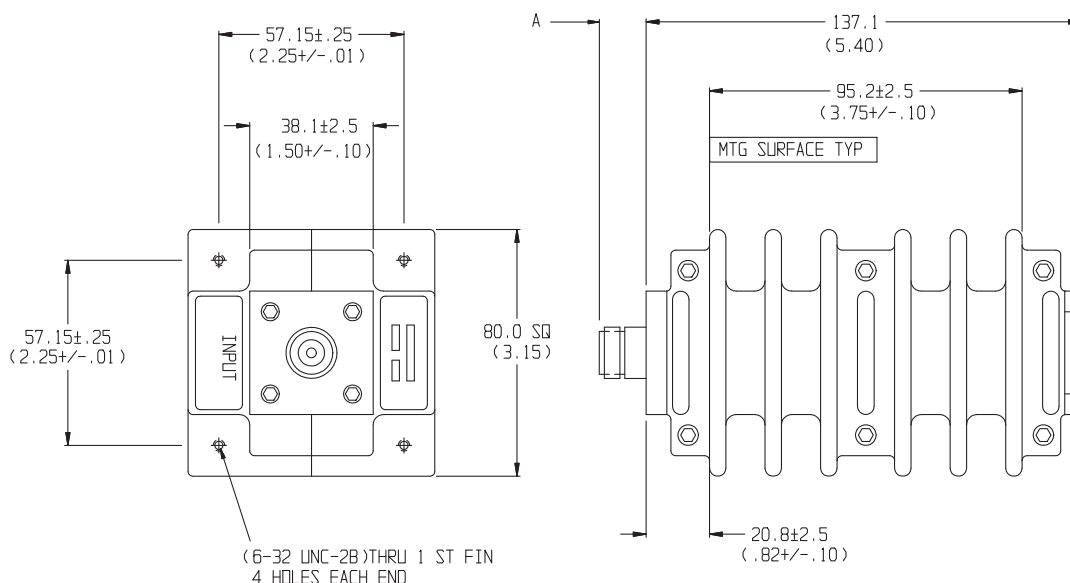
Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 10 GHz

POWER RATING (mounted horizontally with fins vertical): 100 watts **average** to 35°C ambient temperature, derated linearly to 10 watts @ 125°C. 5 kilowatts **peak** (5 μsec pulse width; 1.0% duty cycle).

PHYSICAL DIMENSIONS:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

MAXIMUM SWR:

Frequency (GHz)	SWR
dc - 4	1.20
4 - 10	1.30

TEMPERATURE RANGE: -55°C to +125°C

TEST DATA: Swept data plots of SWR from 50 MHz to 10 GHz is available at additional cost.

CONNECTOR: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Choice of male (-4) or female connector (-3).

SMK (2.92mm) connector mates nondestructively with SMA per MIL-C-39012, 3.5mm and other 2.92mm (SMK) connector. Choice of male (-2) or female connector (-1).

CONSTRUCTION: Black, finned aluminum body, stainless steel connector; gold plated beryllium copper contact or stainless steel male contact.

WEIGHT: 1,130 g (2 lbs, 8 oz)

Model #	DIM A	Connector Type
1442-1	12.7 (0.50)	2.92mm female
1442-2	14.0 (0.55)	2.92mm male
1442-3	15.0 (0.59)	N female
1442-4	22.9 (0.90)	N male

Model 1431 High Power, N & 3.5mm Connectors Convection Cooled

dc to 18.0 GHz
100 Watts

RoHS



Features

- /// Designed to meet environmental requirements of MIL-D-39030.
- /// Rugged injection molded connector.
- /// 1 Kilowatt Peak Power

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 18.0 GHz

MAXIMUM SWR:

Frequency (GHz)	SWR
dc - 8	1.20
8 - 18	1.30

POWER RATING: 100 watts average (mounted horizontally assuming unobstructed air flow and natural convection around unit) @ 25°C ambient temperature, derated linearly to 10 watts @ 125°C. 1 kilowatt peak (5 μsec pulse width; 5% duty cycle).

TEMPERATURE RANGE: -55°C to +125°C

TEST DATA: Swept data plots of SWR from 50 MHz to 18 GHz is available at additional cost.

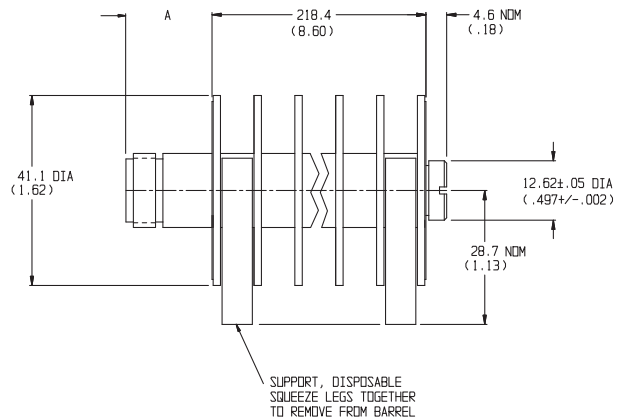
CONNECTOR: Type N connector mates nondestructively with MIL-C-39012 connector. Choice of male (-4) or female connector (-3).

3.5mm connector mates nondestructively with SMA per MIL-C-39012, 2.92mm and other 3.5mm connector. Choice of male (-2) or female connector (-1).

CONSTRUCTION: Black, finned aluminum body, stainless steel connector; gold plated beryllium copper contact or stainless steel male contact.

WEIGHT: 320 g (11 oz)

PHYSICAL DIMENSIONS:



Model #	DIM A	Connector Type
1431-1	13.2 (0.52)	3.5mm female
1431-2	14.0 (0.55)	3.5mm male
1431-3	18.3 (0.72)	N female
1431-4	23.1 (0.91)	N male

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Terminations & Loads



Model 1469 High Power, N & 3.5mm Connectors Convection Cooled

dc to 18.0 GHz



100 Watts

RoHS



Features

- /// Designed to meet environmental requirements of MIL-D-39030.
- /// Rugged injection molded connector.
- /// Low Intermodulation Option
- /// 1 Kilowatt Peak Power

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 18.0 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR (maximum)
dc - 18.0	1.15

POWER RATING (mounted horizontally): 100 watts average to 25°C ambient temperature, derated linearly to 10 Watts @ 125°C. 1 kW peak (5 μsec pulse width; 5% duty cycle).

INTERMODULATION (Model 1469-X-LIM Only): IM3 (Reflected) = -100 dBc with two input signals @ 869 MHz and 891 MHz with an average power of +43 dBm each.

TEMPERATURE RANGE: -55 °C to 125 °C

TEST DATA: Swept data plots of SWR from 50 MHz to 18 GHz is available at additional cost.

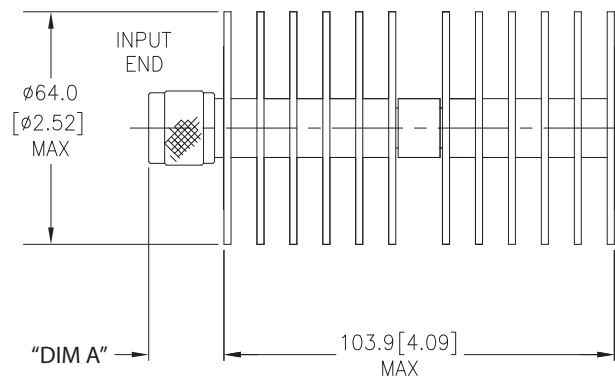
CONNECTOR: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Choice of male (-4) or female connector (-3).

3.5mm connector mates nondestructively with SMA per MIL-C-39012, 2.92mm (SMK) and other 3.5mm connector. Choice of male (-2) or female connector (-1).

CONSTRUCTION: Black, finned aluminum body, stainless steel connector; gold plated beryllium copper contacts.

WEIGHT: 320 g (11.3 oz)

PHYSICAL DIMENSIONS:

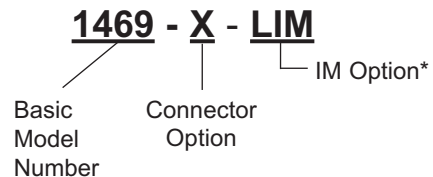


Model #	DIM A	Connector Type
1469-1	12.7 (0.50)	3.5mm female
1469-2	14.0 (0.55)	3.5mm male
1469-3	15.0 (0.59)	N female
1469-4	22.9 (0.90)	N male

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

MODEL NUMBER DESCRIPTION:

Example:



* Add -LIM to entire model number for Low Intermodulation option.

Model 1439 High Power, N or SMK Connectors Conduction / Convection Cooled

dc to 2.5 GHz
150 Watts

RoHS



MAXIMUM SWR*:	
Frequency (GHz)	SWR
dc - 2.5	1.20

POWER RATING: 150 watts average (mounted horizontally or vertically assuming unobstructed air flow and natural convection around unit), 10 kilowatts peak (5 μ sec pulse width; 0.75% duty cycle). Case temperature must be held to **100°C maximum**.

TEMPERATURE RANGE: -55°C to 100°C case

TEST DATA: Swept data plots of SWR from 50 MHz to 2.5 GHz is available at additional cost.

CONNECTOR: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Choice of male (-4) or female connector (-3).

SMK (2.92mm) connector mates nondestructively with SMA per MIL-C-39012, 3.5mm and other 2.92mm (SMK) connector. Choice of male (-2) or female connector (-1).

CONSTRUCTION: Black, finned aluminum body, stainless steel connector; gold plated beryllium copper female contact or stainless steel male contact.

WEIGHT: 850 g (1 lb, 14 oz)

Features

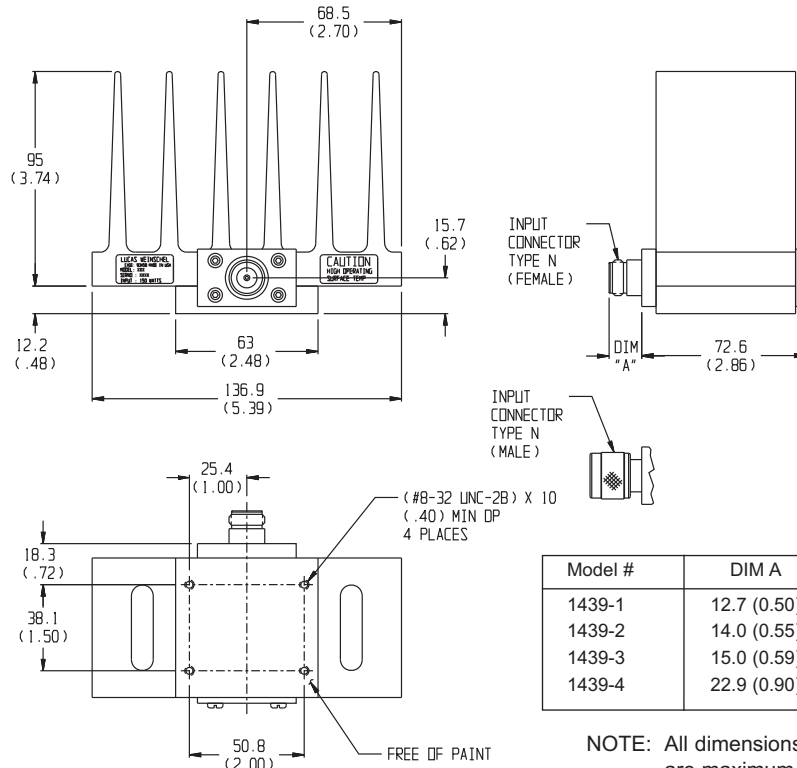
- /// **Compact Construction** - Lowest size/power ratio.
- /// **Flexible Mounting Position** - The units may be mounted in horizontal (fins up) or vertical position.
- /// **Rugged Construction** - Quality connector with special high temperature support bead.

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 2.5 GHz

PHYSICAL DIMENSIONS:



Model #	DIM A	Connector Type
1439-1	12.7 (0.50)	2.92mm female
1439-2	14.0 (0.55)	2.92mm male
1439-3	15.0 (0.59)	N female
1439-4	22.9 (0.90)	N male

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Terminations & Loads



Model 1428
Model 1435
High Power, N or SMK Connectors
Convection Cooled

dc to 1.5 GHz
dc to 6.0 GHz
150 Watts
 RoHS



POWER RATING: 150 watts average (mounted horizontally assuming unobstructed air flow and natural convection around unit) @ 25°C ambient temperature, derated linearly to 15 watts @ 125°C. 10 kilowatts peak (5 µsec pulse width; 0.75% duty cycle).

TEMPERATURE RANGE: -55°C to +125°C

TEST DATA: Swept data plots of SWR from 50 MHz to 1.5 / 6.0 GHz is available at additional cost.

CONNECTOR: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector.

Model 1428: Add M for male or F for female
 Model 1435: Add -4 for male or -3 for female

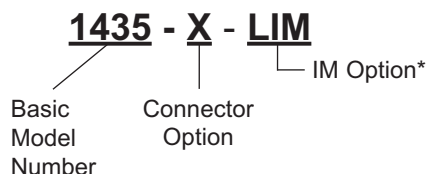
SMK (2.92mm) connector mates nondestructively with SMA per MIL-C-39012, 3.5mm and other 2.92mm (SMK) connector. Choice of male (-2) or female connector (-1). Model 1435 Only!

CONSTRUCTION: Black, finned aluminum body, stainless steel connector; gold plated beryllium copper female contact or stainless steel male contact.

WEIGHT: 1,130 g (2 lbs, 8 oz)

MODEL NUMBER DESCRIPTION:

Example:



* Add -LIM to entire model number for Low Intermodulation option.

Features

- /// **Low SWR** - Maximum SWR remains low through full frequency and power range.
- /// **Rugged Construction** - Quality connector with special high temperature support beads.

Specifications

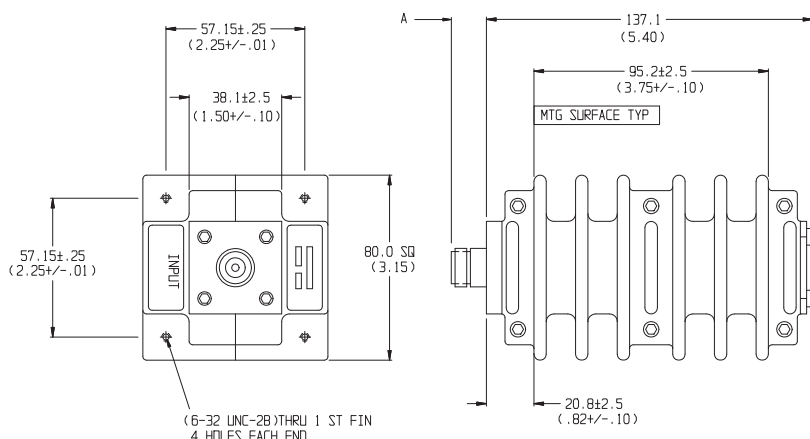
NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: Model 1428: dc to 1.5 GHz
 Model 1435: dc to 6.0 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR
dc - 2	1.10
2 - 6	1.15

INTERMODULATION (Model 1435-X-LIM Only): IM3 (Reflected) = -100 dBc with two input signals @ 869 MHz and 891 MHz with an average power of +43 dBm each.

PHYSICAL DIMENSIONS:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Model #	DIM A	Connector Type
1435-1	12.7 (0.50)	2.92mm female
1435-2	14.0 (0.55)	2.92mm male
F1428, 1435-3	15.0 (0.59)	N female
M1428, 1435-4	22.9 (0.90)	N male

Model 1448 High Power, 7/16 Connectors Convection Cooled, Low IMD Design

dc to 6.0 GHz
150 Watts



Features

- /// Optimized for Wireless OEM and Test Applications.
- /// Designed to meet environmental requirements of MIL-D-39030.
- /// Custom Designs Available.

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 6.0 GHz

MAXIMUM SWR:

Frequency (GHz)	SWR
dc - 6	1.25

INTERMODULATION: Third Order Reflected Levels (IM3), -100 dBc with two input signals @ 869 MHz and 891 MHz with average carrier power levels of +43 dBm each.

POWER RATING: 150 watts **average (mounted horizontally assuming unobstructed air flow and natural convection around unit)** @ 25°C ambient temperature, derated linearly to 15 watts @ 125°C. 10 kilowatts **peak** (5 μsec pulse width; 0.75% duty cycle).

TEMPERATURE RANGE: -55°C to +125°C

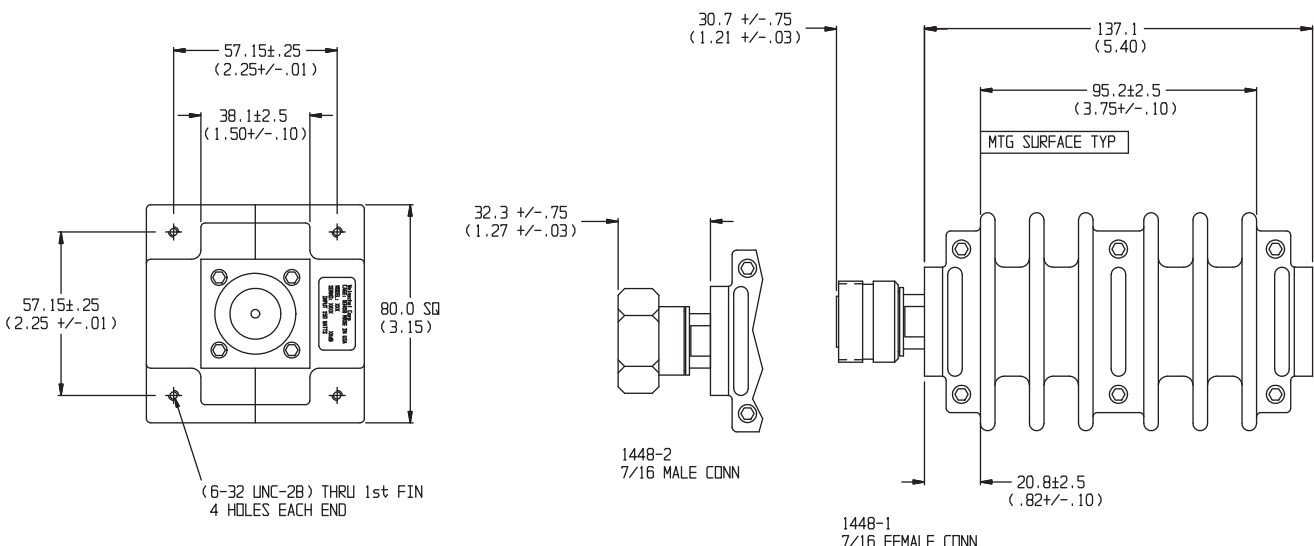
TEST DATA: Swept data plots of SWR from 50 MHz to 6 GHz is available at additional cost.

CONNECTOR: 7/16 connector that conforms to DIN 47 223, IEC 1694, VG 95250, CECC 22190. Choice of 7/16 male (-2) or 7/16 female (-1) connector.

CONSTRUCTION: Black, finned aluminum body, silver plated brass connector.

WEIGHT: 1,248 g (2.75 lbs)

PHYSICAL DIMENSIONS:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Terminations & Loads



Model 1432 High Power, N or SMK Connectors Convection / Conduction Cooled

dc to 10 GHz
150 Watts



Features

- Flexible Mounting Position - The units may be mounted in horizontal (fins up) or vertical position.
- Rugged Construction - Quality connector with special high temperature support bead.

Specifications

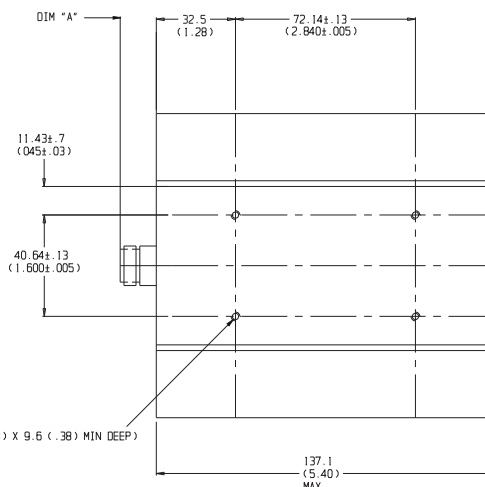
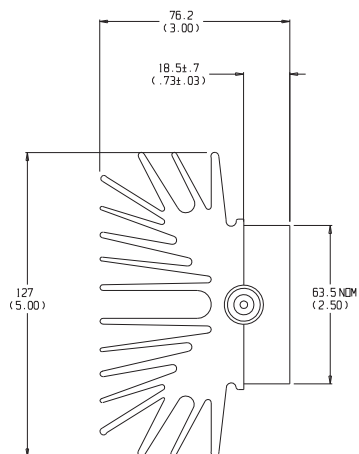
NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 10 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR
dc - 4	1.20
4 - 10	1.30

INTERMODULATION (Model 1432-X-LIM Only): IM3 (Reflected) = -100 dBc with two input signals @ 869 MHz and 891 MHz with an average power of +43 dBm each.

PHYSICAL DIMENSIONS:



Model #	DIM A	Connector Type
1432-1	12.7 (0.50)	2.92mm female
1432-2	14.0 (0.55)	2.92mm male
1432-3	15.0 (0.59)	N female
1432-4	22.9 (0.90)	N male

POWER RATING: 150 watts average (mounted horizontally or vertically assuming unobstructed air flow and natural convection around unit) to 25°C ambient temperature, derated linearly to 15 watts @ 125°C. 5 kilowatts peak (5 μsec pulse width; 1.5% duty cycle).

TEMPERATURE RANGE: -55°C to +125°C

TEST DATA: Swept data plots of SWR from 50 MHz to 10 GHz is available at additional cost.

CONNECTOR: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Choice of male (-4) or female (-3) connector.

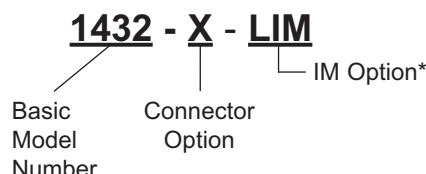
SMK (2.92mm) connector mates nondestructively with SMA per MIL-C-39012, 3.5mm and other 2.92mm (SMK) connector. Choice of male (-2) or female connector (-1).

CONSTRUCTION: Black, finned aluminum body, stainless steel connector; gold plated beryllium copper female contacts and stainless steel male contacts.

WEIGHT: 1,450 g (3 lbs., 3 oz.)

MODEL NUMBER DESCRIPTION:

Example:



* Add -LIM to entire model number for Low Intermodulation option.

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Terminations & Loads



Model 1475 High Power, N & 3.5mm Connectors Convection Cooled

dc to 18.0 GHz
150 Watts



RoHS



Features

- /// Quality injection molded connectors.
- /// Designed to meet environmental requirements of MIL-DTL-3933.
- /// Broadband performance, ideal for test applications.

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 18.0 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR (maximum)
dc - 18.0	1.90

POWER RATING (mounted horizontally): 150 watts average @ case temperature of -55°C to +100 °C maximum. 1 kilowatt peak (5 μsec pulse width; 7.5% duty cycle).

TEMPERATURE RANGE: -55°C to 100°C (case temp.)

TEMPERATURE RANGE: -55°C to +125°C

TEST DATA: Swept data plots of SWR from 50 MHz to 18 GHz is available at additional cost.

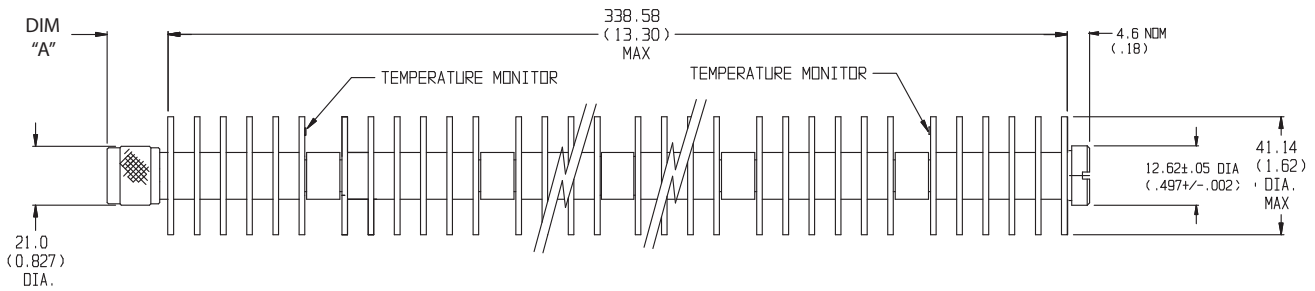
CONNECTOR: Type N connector - mate nondestructively with MIL-C-39012 connector. Choice of male (-4) or female connector (-3).

3.5mm connector mate nondestructively with SMA per MIL-C-39012, 2.92mm and other 3.5mm connector. Choice of male (-2) or female connector (-1).

CONSTRUCTION: Aluminum alloy body, stainless steel connectors; gold plated beryllium copper contacts.

WEIGHT: 480 g (17 oz.) maximum

PHYSICAL DIMENSIONS:



Connector	DIM A	Connector	DIM A
N Male	24.1 (0.95)	3.5mm Female	14.0 (0.55)
N Female	19.0 (0.75)	3.5mm Male	13.2 (0.52)

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Model 1433 High Power, N Connectors Convection Cooled

dc to 6.0 GHz
250 Watts

RoHS



INTERMODULATION (Model 1433-X-LIM Only): IM3 (Reflected) = -100 dBc with two input signals @ 869 MHz and 891 MHz with an average power of +43 dBm each.

POWER RATING: 250 watts average (mounted horizontally assuming unobstructed air flow and natural convection around unit) @ 25°C ambient temperature, derated linearly to 25 watts @ 125°C. 10 kilowatts peak (5 µsec pulse width; 1.25% duty cycle).

TEMPERATURE RANGE: -55°C to +125°C

TEST DATA: Swept data plots of SWR from 50 MHz to 6 GHz is available at additional cost-----.

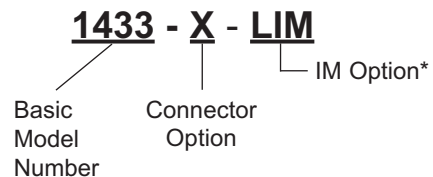
CONNECTOR: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Choice of male (-4) or female connector (-3).

CONSTRUCTION: Black, finned aluminum body, stainless steel connector; gold plated beryllium copper female contact or stainless steel male contact.

WEIGHT: Net 1,530 g (3 lbs., 6 oz.) maximum

MODEL NUMBER DESCRIPTION:

Example:



Features

- /// **Compact Construction** - Lowest size/power ratio.
- /// **Low SWR** - Maximum SWR remains low through full frequency and power range.
- /// **Rugged Construction** - Quality connector with special high temperature support beads.

Specifications

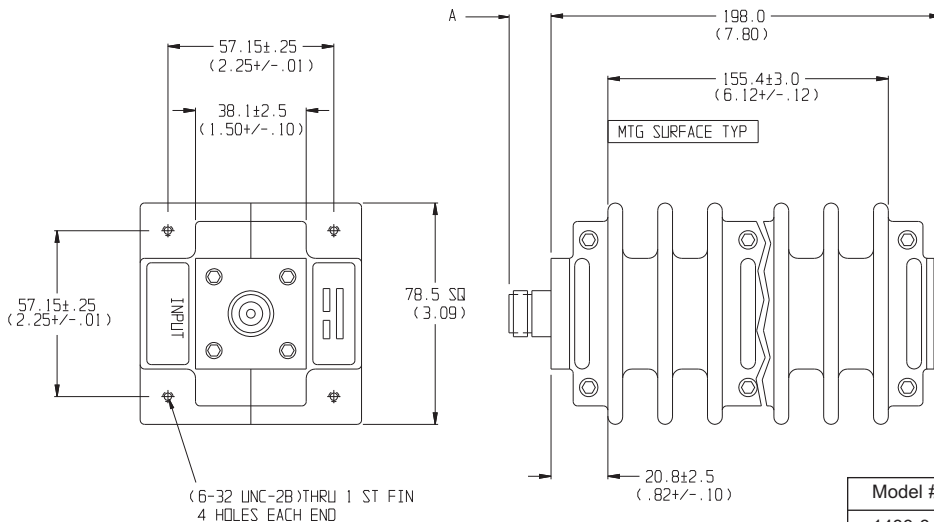
NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 6.0 GHz

MAXIMUM SWR:

Frequency (GHz)	SWR
dc - 2	1.10
2 - 6	1.15

PHYSICAL DIMENSIONS:



* Add -LIM to entire model number for Low Intermodulation option.

Model #	DIM A	Connector Type
1433-3	15.0 (0.59)	N female
1433-4	22.9 (0.90)	N male

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Terminations & Loads



Model 1434 High Power, N Connectors Convection Cooled

dc to 2.5 GHz
500 Watts



INTERMODULATION (Model 1434-X-LIM Only): IM3 (Reflected) = -100 dBc with two input signals @ 869 MHz and 891 MHz with an average power of +43 dBm each.

POWER RATING: 500 watts average (mounted horizontally assuming unobstructed air flow and natural convection around unit) @ 25°C ambient temperature, derated linearly to 50 watts @ 125°C. 10 kilowatts peak (5 µsec pulse width; 2.5% duty cycle).

TEMPERATURE RANGE: -55°C to +125°C

TEST DATA: Swept data plots of SWR from 50 MHz to 2.5 GHz is available at additional cost.

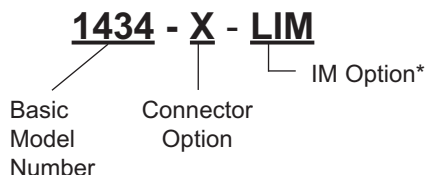
CONNECTOR: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Choice of male (-4) or female (-3) connector.

CONSTRUCTION: Black, finned aluminum body, stainless steel connector; gold plated beryllium copper female contacts and stainless steel male contacts.

WEIGHT: 3,640 g (8 lbs.)

MODEL NUMBER DESCRIPTION:

Example:



* Add -LIM to entire model number for Low Intermodulation option.

Features

- /// **Compact Construction** - Lowest size/power ratio.
- /// **Low SWR** - Maximum SWR remains low through full frequency and power range.
- /// **Rugged Construction** - Quality connector with special high temperature support bead.

Specifications

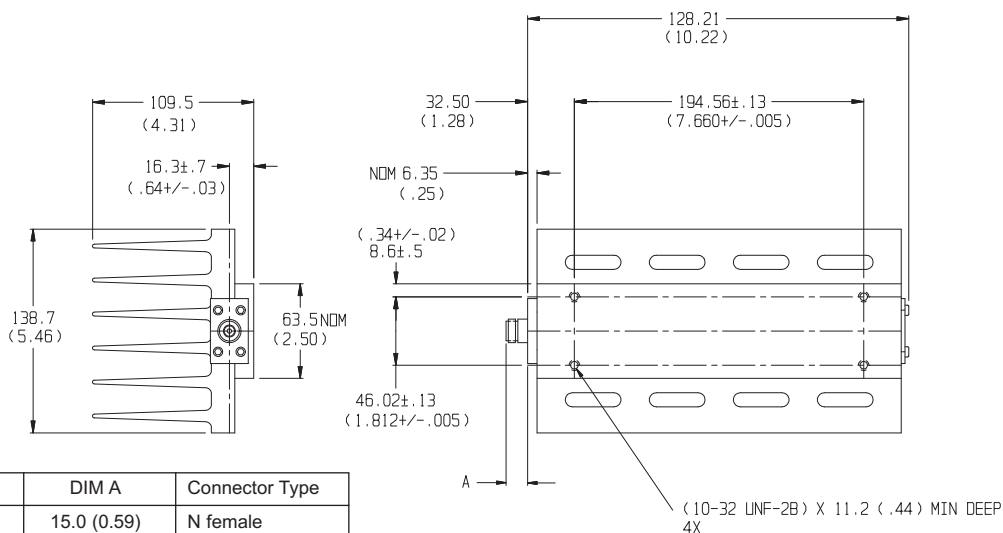
NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 2.5 GHz

MAXIMUM SWR:

Frequency (GHz)	SWR
dc - 2.5	1.10

PHYSICAL DIMENSIONS:



Model #	DIM A	Connector Type
1434-3	15.0 (0.59)	N female
1434-4	22.9 (0.90)	N male

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Model 1456 High Power, N Connectors Convection Cooled

dc to 3.0 GHz
1,000 Watts

RoHS



Features

- Quality Type N connectors with special high temperature support beads.
- Designed to meet environmental requirements of MIL-D-39030.

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 3.0 GHz

MAXIMUM SWR:

Frequency (GHz)	SWR
dc - 1.5	1.15
1.5 - 3.0	1.25

POWER RATING: 1,000 watts average (assuming unobstructed air flow and natural convection around unit) to 25°C ambient temperature, derated linearly to 100 watts @ 125°C. 10 kilowatt peak (5 μsec pulse width; 5% duty cycle).

TEMPERATURE RANGE: -55°C to +125°C with Power derating applied.

TEST DATA: Swept data plots of SWR from 50 MHz to 3 GHz is available at additional cost.

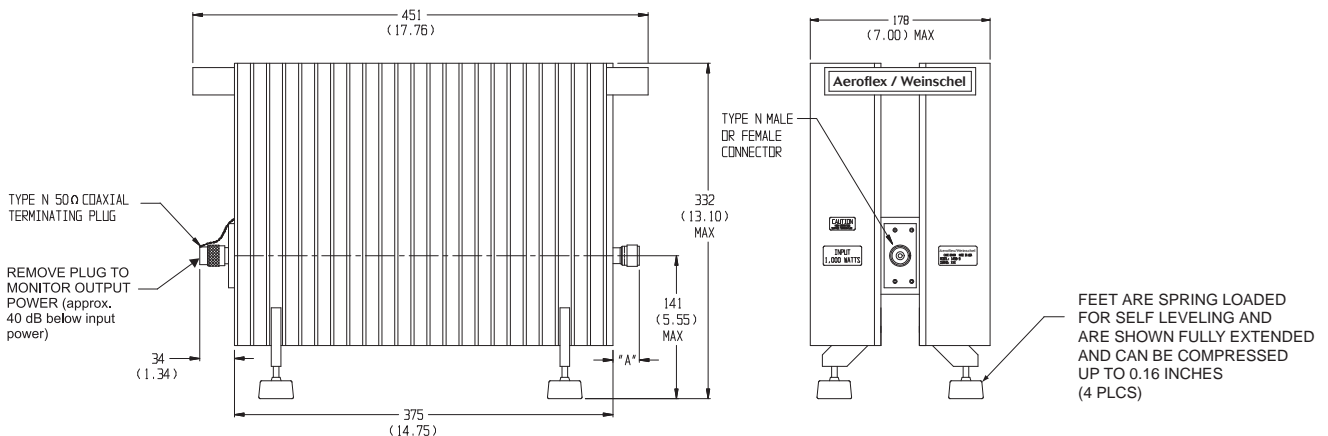
CONNECTOR: Type N connectors - mate nondestructively with MIL-C-39012 connector.

Connector Options	Type/Description
3	Type N, Female
4	Type N, Male

CONSTRUCTION: Black, finned aluminum body, stainless steel or silver plated brass connectors with gold plated beryllium copper or silver plated contacts.

WEIGHT: Net 13 kg (28.7 lbs) maximum

PHYSICAL DIMENSIONS:



Model #	DIM A	Connector Type
1456-3	15.0 (0.59)	N female
1456-4	22.9 (0.90)	N male

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Terminations & Loads



Models 1474 SMK Connectors Conduction Cooled

dc to 40.0 GHz
5 Watts



RoHS



Features

- /// **Compact Construction** - Lowest size/power ratio.
- /// **Rugged Construction** - Quality connector with special high temperature support bead.
- /// **Ideal for Space & Airborne Applications**

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 40.0 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR
dc - 26.5	1.25
26.5 - 40	1.45

POWER RATING: 5 watts **average** with case temperature limited to 100 °C with appropriate conductive heat sink. 200 watts **peak** (5 μsec pulse width; 1.25% duty cycle).

TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C

TEMPERATURE RANGE: -55 °C to 100 °C (case)

TEST DATA: Swept data plots of attenuation and SWR

from 50 MHz to 40 GHz is available at additional cost.

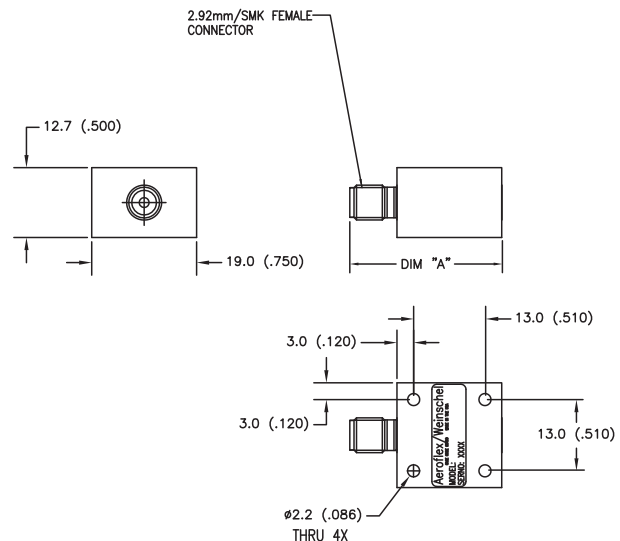
CONNECTORS: SMK (2.92mm) Male/Female connectors - mate nondestructively with SMA per MIL-C-39012, 3.5mm and other 2.92mm connectors.

Connector Options	Type/Description
1	SMK, Female
2	SMK, Male

CONSTRUCTION: Aluminum body, gold plated beryllium copper contacts.

WEIGHT: 17 g (0.6 oz.) maximum

PHYSICAL DIMENSIONS:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Model 1441
Medium Power, N or SMK Connectors
Conduction Cooled

dc to 4.0 GHz
50 Watts

RoHS



Features

- /// **Compact Construction** - Lowest size/power ratio.
- /// **Rugged Construction** - Quality connector with special high temperature support bead.
- /// **Ideal for Wireless Applications.**

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 4.0 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR
dc - 4	1.15

POWER RATING: 50 watts **average**, 5 kilowatts **peak** (5 μsec pulse width; 0.5% duty cycle) with case temperature held within **100°C maximum** with appropriate conductive heatsink.

TEMPERATURE RANGE: -55°C to 100°C case.

TEST DATA: Swept data plots of SWR from 50 MHz to 4 GHz is available at additional cost.

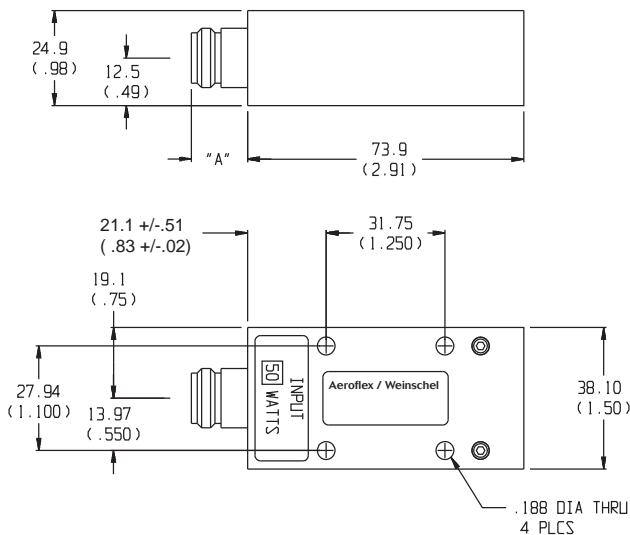
CONNECTOR: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Choice of male (-4) or female (-3) connector.

SMK (2.92mm) connector mates nondestructively with SMA per MIL-C-39012, 3.5mm and other 2.92mm (SMK) connector. Choice of male (-2) or female connector (-1).

CONSTRUCTION: Aluminum alloy body, stainless steel connector; gold plated beryllium copper contacts.

WEIGHT: Net 170g (6 oz.) maximum

PHYSICAL DIMENSIONS:



Model #	DIM A	Connector Type
1441-1	12.7 (0.50)	2.92mm female
1441-2	14.0 (0.55)	2.92mm male
1441-3	15.0 (0.59)	N female
1441-4	22.9 (0.90)	N male

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Terminations & Loads

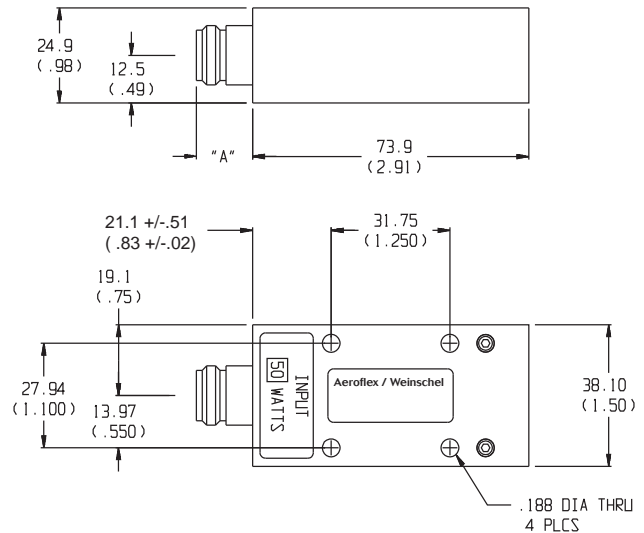


Model 1476 Medium Power, N or SMK Connectors Conduction Cooled

dc to 10.0 GHz
50 Watts



PHYSICAL DIMENSIONS:



Features

- /// **Compact Construction** - Lowest size/power ratio.
- /// **Rugged Construction** - Quality connector with special high temperature support bead.
- /// **Ideal for Wireless Applications.**

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 10.0 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR
dc - 4	1.15
4 - 10	1.30

Model #	DIM A	Connector Type
1476-1	12.7 (0.50)	2.92mm female
1476-2	14.0 (0.55)	2.92mm male
1476-3	15.0 (0.59)	N female
1476-4	22.9 (0.90)	N male

POWER RATING: 50 watts **average**, 5 kilowatts **peak** (5 μsec pulse width; 0.5% duty cycle) with case temperature held within **100°C maximum** with appropriate conductive heatsink.

TEMPERATURE RANGE: -55°C to 100°C case.

TEST DATA: Swept data plots of SWR from 50 MHz to 10 GHz is available at additional cost.

CONNECTOR: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Choice of male (-4) or female (-3) connector.

SMK (2.92mm) connector mates nondestructively with SMA per MIL-C-39012, 3.5mm and other 2.92mm (SMK) connector. Choice of male (-2) or female connector (-1).

CONSTRUCTION: Aluminum alloy body, stainless steel connector; gold plated beryllium copper contacts.

WEIGHT: Net 170g (6 oz.) maximum

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Terminations & Loads

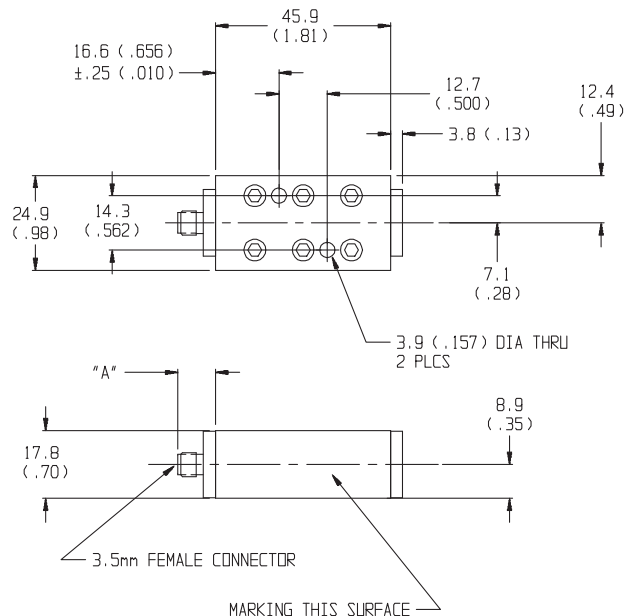


Models 1458 Medium Power, 3.5mm Connectors Conduction Cooled

dc to 22.0 GHz
50 Watts



PHYSICAL DIMENSIONS:



Features

- /// **Compact Construction** - Lowest size/power ratio.
- /// **Rugged Construction** - Quality connector with special high temperature support bead.
- /// **Ideal for Space & Airborne Applications**

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 22.0 GHz

MAXIMUM SWR:

Frequency (GHz)	SWR
dc - 22.0	1.30

POWER RATING: 50 watts **average**, 1 kilowatts **peak** (5 μsec pulse width; 2.5% duty cycle) with case temperature held within **90°C maximum** with appropriate conductive heatsink.

TEMPERATURE RANGE: -55°C to 90°C case.

TEST DATA: Swept data plots of SWR from 50 MHz to 22 GHz is available at additional cost.

CONNECTOR: 3.5mm connectors - mate nondestructively with SMA per MIL-C-39012, 2.92mm, and other 3.5mm connectors. Choice of male (-2) or female connector (-1).

CONSTRUCTION: Aluminum alloy body, stainless steel connector; gold plated beryllium copper contacts.

WEIGHT: Net 56 g (1.9 oz) maximum

Model #	DIM A	Connector Type
1458-1	9.9±0.5 (0.35±0.02)	3.5mm female
1458-2	13.4±0.5 (0.53±0.02)	3.5mm male

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Model 1470 High Power, N or SMK Connectors Conduction Cooled



dc to 6.0 GHz
100 Watts



Features

- /// Precision Connectors with high temperature support beads.
- /// Designed to meet environmental requirements of MIL-DTL-3933.
- /// 10 Kilowatts peak, Conduction Cooled
- /// Wireless Applications - Optimized for use in the communications bands.

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 6.0 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR
dc - 6	1.20

3rd ORDER INTERMODULATION (1470-X-LIM ONLY): Reflected Levels (IM3), -100 dBc with two input signals @ 869 MHz and 891 MHz with average carrier power levels of +43 dBm each.

POWER RATING (mounted horizontally): 100 watts average (unidirectional), 10 kilowatt peak (5 μsec pulse width; 0.5% duty cycle) with case temperature held within **100 °C maximum** with appropriate conductive heat sink.

TEMPERATURE RANGE: -55°C to 100°C

TEST DATA: Swept data plots of SWR from 50 MHz to 6 GHz is available at additional cost.

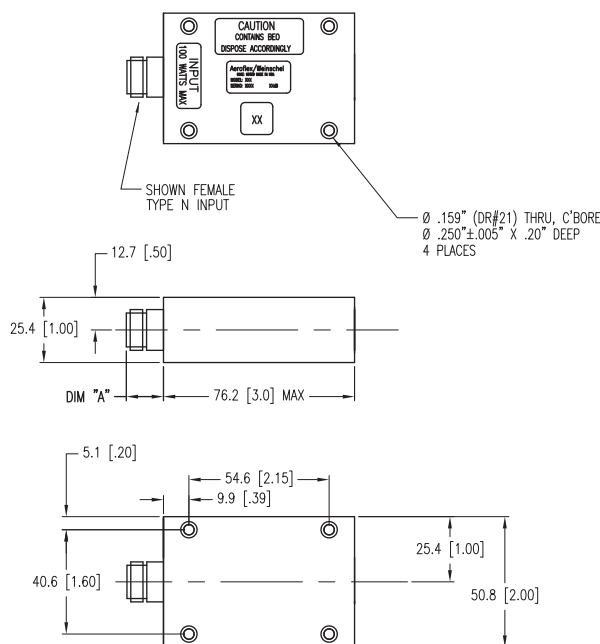
CONNECTORS: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Choice of male (-4) or female connector (-3).

SMK (2.92mm) connector mates nondestructively with SMA per MIL-C-39012, 3.5mm and other 2.92mm (SMK) connector. Choice of male (-2) or female connector (-1).

CONSTRUCTION: Aluminum alloy body, stainless steel connectors; gold plated beryllium copper contacts.

WEIGHT: 300 g (10.6 oz.) maximum

PHYSICAL DIMENSIONS:

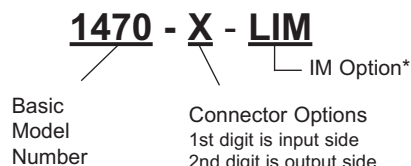


Model #	DIM A	Connector Type
1470-1	12.7 (0.50)	2.92mm female
1470-2	14.0 (0.55)	2.92mm male
1470-3	15.0 (0.59)	N female
1470-4	22.9 (0.90)	N male

NOTE: All dimensions are given in mm (inches) and are nominal, unless otherwise specified.

MODEL NUMBER DESCRIPTION:

Example:



* Add -LIM to entire model number for Low Intermodulation option.

Terminations & Loads



Model 1471 High Power, N or SMK Connectors Conduction Cooled



dc to 6.0 GHz
250 Watts



Features

- /// Precision Connectors with high temperature support beads.
- /// Designed to meet environmental requirements of MIL-DTL-3933.
- /// 10 Kilowatts peak, Conduction Cooled
- /// Wireless Applications - Optimized for use in the communications bands.

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 6.0 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR
dc - 6	1.20

3rd ORDER INTERMODULATION (1471-X-LIM ONLY): Reflected Levels (IM3), -100 dBc with two input signals @ 869 MHz and 891 MHz with average carrier power levels of +43 dBm each.

POWER RATING: 250 watts **average**, 10 kilowatt **peak** (5 μsec pulse width; 1.25% duty cycle) with case temperature held within **100 °C maximum** with appropriate conductive heat sink.

TEMPERATURE RANGE: -55°C to 100°C

TEST DATA: Swept data plots of SWR from 50 MHz to 6 GHz is available at additional cost.

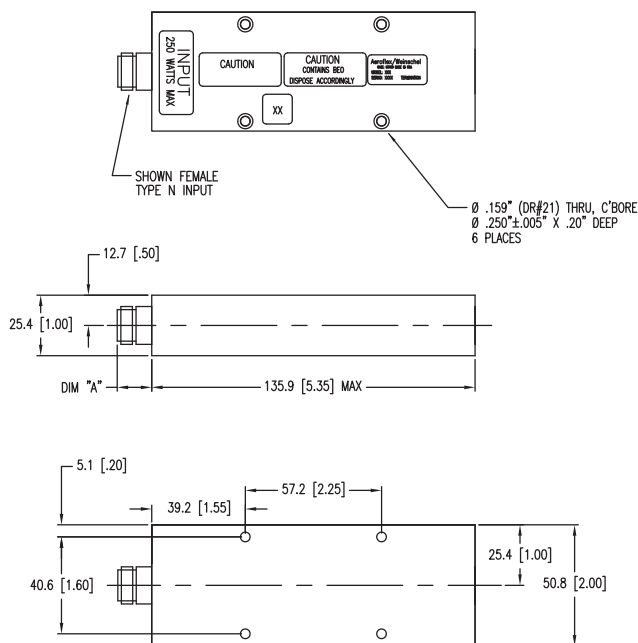
CONNECTORS: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Choice of male (-4) or female connector (-3).

SMK (2.92mm) connector mates nondestructively with SMA per MIL-C-39012, 3.5mm and other 2.92mm (SMK) connector. Choice of male (-2) or female connector (-1).

CONSTRUCTION: Aluminum alloy body, stainless steel connectors; gold plated beryllium copper contacts.

WEIGHT: 500 (17.6 oz.) maximum

PHYSICAL DIMENSIONS:

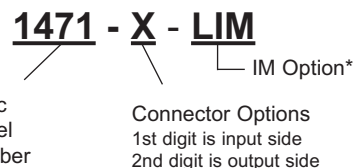


Model #	DIM A	Connector Type
1471-1	12.7 (0.50)	2.92mm female
1471-2	14.0 (0.55)	2.92mm male
1471-3	15.0 (0.59)	N female
1471-4	22.9 (0.90)	N male

NOTE: All dimensions are given in mm (inches) and are nominal unless otherwise specified.

MODEL NUMBER DESCRIPTION:

Example:



* Add -LIM to entire model number for Low Intermodulation option.

Model 1472 High Power, N or SMK Connectors Conduction Cooled



dc to 6.0 GHz
400 Watts



CONSTRUCTION: Aluminum alloy body, stainless steel connectors; gold plated beryllium copper contacts.

WEIGHT: 700 g (24.6 oz.) maximum

PHYSICAL DIMENSIONS:

Features

- /// Precision Connectors with high temperature support beads.
- /// Designed to meet environmental requirements of MIL-DTL-3933.
- /// 10 Kilowatts peak, Conduction Cooled
- /// Wireless Applications - Optimized for use in the communications bands.

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 6.0 GHz

MAXIMUM SWR:

Frequency (GHz)	SWR
dc - 6	1.20

3rd ORDER INTERMODULATION (1472-X-LIM ONLY): Reflected Levels (IM3), -100 dBc with two input signals @ 869 MHz and 891 MHz with average carrier power levels of +43 dBm each.

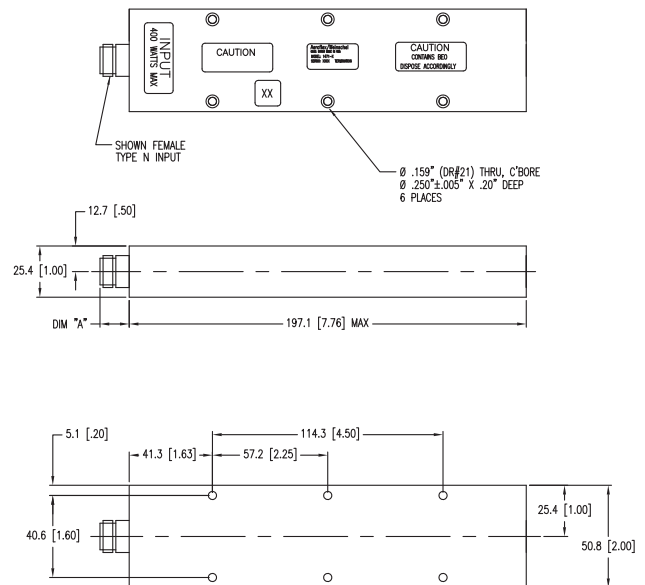
POWER RATING: 400 watts **average**, 10 kilowatt **peak** (5 μsec pulse width; 2.0% duty cycle) with case temperature held within **100 °C maximum** with appropriate conductive heat sink.

TEMPERATURE RANGE: -55°C to 100°C

TEST DATA: Swept data plots of SWR from 50 MHz to 6 GHz is available at additional cost.

CONNECTORS: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Choice of male (-4) or female connector (-3).

SMK (2.92mm) connector mates nondestructively with SMA per MIL-C-39012, 3.5mm and other 2.92mm (SMK) connector. Choice of male (-2) or female connector (-1).

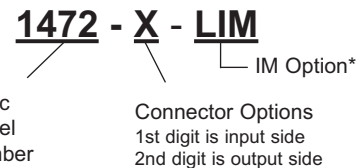


Model #	DIM A	Connector Type
1472-1	12.7 (0.50)	2.92mm female
1472-2	14.0 (0.55)	2.92mm male
1472-3	15.0 (0.59)	N female
1472-4	22.9 (0.90)	N male

NOTE: All dimensions are given in mm (inches) and are nominal, unless otherwise specified.

MODEL NUMBER DESCRIPTION:

Example:



* Add -LIM to entire model number for Low Intermodulation option.

Terminations & Loads



Model 1473 High Power, N or SMK Connectors Conduction Cooled



dc to 6.0 GHz
550 Watts

RoHS



CONSTRUCTION: Aluminum alloy body, stainless steel connectors; gold plated beryllium copper contacts and stainless steel male contacts.

WEIGHT: 900 g (31.7 oz.)

PHYSICAL DIMENSIONS:

Features

- /// Precision Connectors with high temperature support beads.
- /// Designed to meet environmental requirements of MIL-DTL-3933.
- /// 10 Kilowatts peak, Conduction Cooled
- /// Wireless Applications - Optimized for use in the communications bands.

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 6.0 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR
dc - 6	1.20

3rd ORDER INTERMODULATION (1473-X-LIM ONLY): Reflected Levels (IM3), -100 dBc with two input signals @ 869 MHz and 891 MHz with average carrier power levels of +43 dBm each.

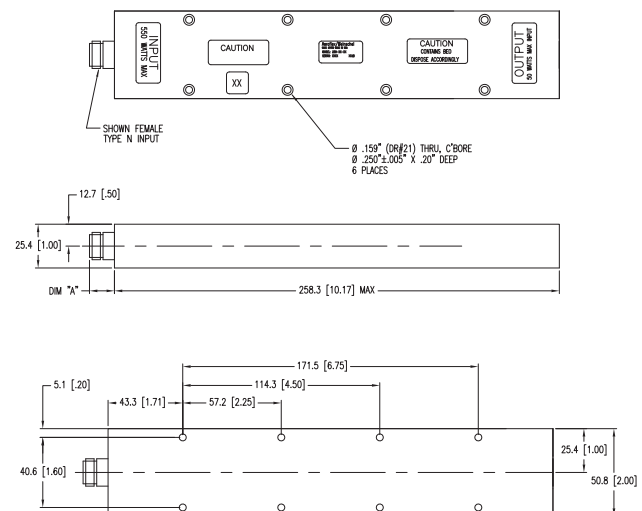
POWER RATING: 550 watts **average**, 10 kilowatt **peak** (5 μsec pulse width; 2.75% duty cycle) with case temperature held within **100 °C maximum** with appropriate conductive heat sink.

TEMPERATURE RANGE: -55°C to 100°C

TEST DATA: Swept data plots of SWR from 50 MHz to 6 GHz is available at additional cost.

CONNECTORS: Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Choice of male (-4) or female connector (-3).

SMK (2.92mm) connector mates nondestructively with SMA per MIL-C-39012, 3.5mm and other 2.92mm (SMK) connector. Choice of male (-2) or female connector (-1).



Model #	DIM A	Connector Type
1473-1	12.7 (0.50)	2.92mm female
1473-2	14.0 (0.55)	2.92mm male
1473-3	15.0 (0.59)	N female
1473-4	22.9 (0.90)	N male

NOTE: All dimensions are given in mm (inches) and are nominal, unless otherwise specified.

MODEL NUMBER DESCRIPTION:

Example:

1473 - X - LIM

Basic Model Number

Connector Options
1st digit is input side
2nd digit is output side

* Add -LIM to entire model number for Low Intermodulation option.

Model 1591 TNC Connectors Simplifies Test Setups

dc to 2.0 GHz
1 Watt



Features

- /// Miniature Size & Lightweight.
- /// 3-Port Cal Design for wireless communication test applications.

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 2.0 GHz
MAXIMUM INPUT POWER: 2 watt CW, 500 watt pulse
PHYSICAL DIMENSIONS:

MAXIMUM SWR (Load Port):

Frequency (GHz)	SWR
dc - 1	1.05
1 - 2	1.35

MAXIMUM PHASE TRACKING (Short / Open):

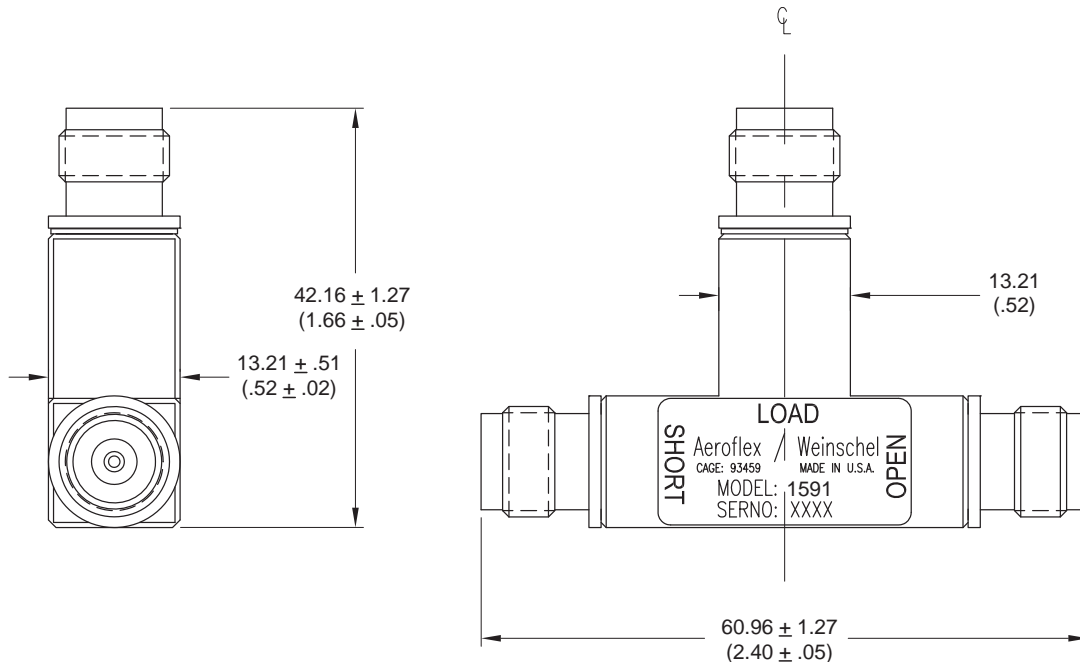
Frequency (GHz)	Tracking °
dc - 1	3°
1 - 2	7°

TEMPERATURE RANGE: -55°C to +125°C

CONSTRUCTION: Aluminum body and connectors; gold plated beryllium copper contacts.

TEST DATA: Test data can be provided at additional cost.

CONNECTORS: Female TNC connectors all ports-- - mate nondestructively with MIL-C-39012 connectors.



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified

Variable Attenuators (Step & Continuously)



- /// Wide Choice of Attenuation & Frequency Ranges.
- /// High Reliability & Long Life
- /// Rugged Construction & Connectors
- /// Rotational Stops Included on most models
- /// Low Cost Designs - Model 3056
- /// Custom Designs Available

General Information

In this section of the catalog, each Manual Step and Variable Attenuator is outlined utilizing individual data sheets containing product features, specifications, and outline drawings. These data sheets are preceded by a quick reference guide to help you select the Manual Step and Variable(s) that fits your needs. The page number for each Step Attenuator data sheet is given in the quick reference guide.

NOTE: *EXPRESS* Shipment available via www.argosysales.com or 800-542-4457. Check with distributor for current products and stocking quantities.



Continuously Variable Attenuators...dc-4.2 GHz



Frequency Model Number	Average Range (GHz)	Peak Power (Watts)	Residual Power (Watts)	Maximum Insertion Loss (dB)	Attenuation Range (dB)	Maximum SWR	Connector Type	Page No.
♦ 940-60 940-114	dc-4.0 dc-2.0	5	500	6	60 114	1.80 1.60	SMA/N SMA/N	136



Manual Step Attenuators...dc-26.5 GHz



Model Number	Frequency Range (GHz)	Incremental Attenuation Range (dB)	Insertion Loss (dB)	Average Power (Watts)	Peak Power (Watts)	Maximum SWR	Connector Type	Page No.
♦ 3003 3006 3007	dc-2.50 dc-1.25 dc-2.5	0-70/10 0-100/10 0-10/1	0.3 0.2 0.3	1	100	1.20 1.20 1.30	SMA	139
♦ 3010 3014	dc-2.5 dc-1.25	0-70/1 0-110/1	0.7 0.5			1.35 1.30		
♦ 3053 ♦ 3054	dc-6.0 dc-6.0	0-10/1 0-70/1	0.3-0.7* 0.8-1.3*			1.3-1.4* 1.3-1.55*	SMA	141
3056 <i>New</i>	dc-3.0	0-70/1	0.25-0.35*	1	100	1.30-1.40*	SMA	138
AC9009 ♦ AC9003 AC9004 AC9010 AC9011	dc-4.0	0-9/1 0-69/1 0-99/1 0-60/10 0-90/10	0.3 0.6 0.6 0.4 0.5	2	200	1.25 1.35 1.35 1.35 1.35	SMA	143
♦ AF9009 ♦ AF9003 AF9004 AF9010 AF9011	dc-18.0	0-9/1 0-69/1 0-99/1 0-60/10 0-90/10	0.3-1.0* 0.6-1.5* 0.6-1.5* 0.4-1.0* 0.5-1.0*	2	200	1.60 1.75 1.75 1.60 1.60	SMA	
9012-9 9012-70	dc-26.5	0-9/1 0-70/10	1.0-1.5* 1.0 or 2%	2	200	1.45-1.50*	2.92mm	149
AC115A AC116A AC117A AC118A AC119A	dc-4.0	0-9/1 0-60/10 0-69/1 0-90/10 0-99/1	0.3 0.3-0.4** 0.5-0.6** 0.4-0.5** 0.5-0.6**	2	200	1.25-1.30* 1.25-1.30* 1.50 1.25-1.30* 1.35-1.70*	SMA/N	146
AF115A AF116A AF117A AF118A AF119A	dc-18.0	0-9/1 0-60/10 0-69/1 0-90/10 0-99/1	0.7-1.0** 0.7-1.0** 1.2-1.5** 0.8-1.02** 1.2-15**	2	200	1.60 1.60 1.70 1.60 1.70	SMA/N	



* VARIES WITH FREQUENCY.

- ♦ EXPRESS Shipment available via www.argosysales.com or 800-542-4457.
Note: Other models may also be available from Express delivery.

Frequently Asked Questions about Variable & Manual Step Attenuators....

What are the applications for Weinschel's variable/manual step attenuators?

Continuously Variable Attenuators are used in applications where the need exists for controlling signal levels continuously without interrupting the circuit. Most Weinschel models are in linear scales, and have low frequency sensitivity with broad frequency coverage, resulting from the use of proven Aeroflex / Weinschel resistive films. The resistive elements located in these Variable Attenuators provide long-term stability over temperature and humidity.



Manual Step Attenuators are primarily used in areas demanding broadband accuracy with low SWR and accurate repeatability over large attenuation ranges. The Weinschel Step Attenuators utilize the excellent performance characteristics of the Weinschel fixed coaxial attenuators. The Weinschel step attenuators are widely used in many types of ATE and OEM systems operating throughout the world.

Aeroflex / Weinschel offers a selection of different attenuation ranges and frequency ranges to select from. These range from 0 to 10 dB in 1 dB steps up to 0 to 100 dB in 10 dB steps and frequency ranges from dc to 40 GHz. High volume fabrication techniques, including injection molding, stamping, broaching and thick film printing ensure a cost effective and uniform product.

What is the difference between insertion loss and incremental attenuation?

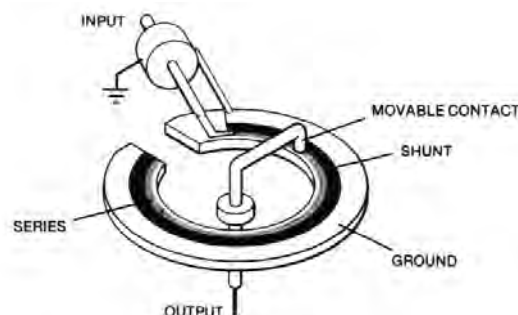
Step and variable attenuators have insertion loss and also incremental attenuation. Insertion loss is the loss through the attenuator when all cells are switched to zero dB. It is the residual loss of the device itself. Insertion loss usually increases with frequency reaching several dB at the higher frequencies and generally has very flat frequency response. Incremental attenuation is the attenuation values of the attenuators cells relative to the insertion loss. Since insertion loss is always present, the performance of a step or variable attenuator is always given as incremental attenuation relative to insertion loss. Insertion loss is considered part of the fixed performance of the system path in which the step or variable attenuator is located.

What types of variable attenuators does Weinschel offer?

There are several designs of continuously variable attenuator available in the marketplace: Piston, card, tee, and resistive center conductor. Weinschel offers only the Variable Card Attenuator Design.



Weinschel's 940 series uses a card resistor on a disk with a movable coaxial contact (shown below) similar in nature to a potentiometer and provides an incremental range of 114 dB incremental range at 2 GHz and 60 dB at 4 GHz. Because the shunt film is connected to ground permanently, in order to achieve the extended attenuation range, the minimum loss of this type attenuator is higher (4 to 6 dB).



Variable Attenuators



Specifications-Con't

CONNECTOR: SMA or Type N connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector.

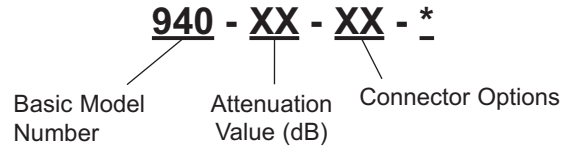
Connector Options	INPUT (J1)	OUTPUT (J2)
11	SMA, Female	SMA, Female
12	SMA, Female	SMA, Male
22	SMA, Male	SMA, Male
33	N, Female	N, Female
34	N, Female	N, Male
44	N, Male	N, Male

CONSTRUCTION: Aluminum body and stainless steel connector; gold plated beryllium copper contacts. Knob is included with each unit.

WEIGHT: Net 1,570 g (3 lbs, 8 oz)

MODEL NUMBER DESCRIPTION:

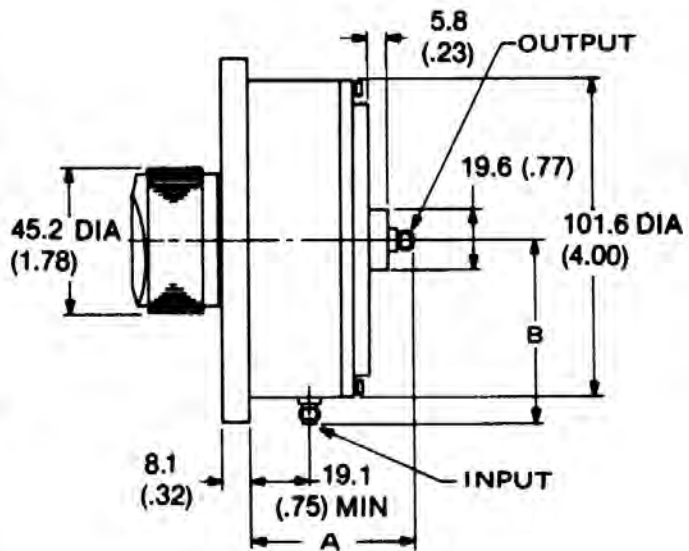
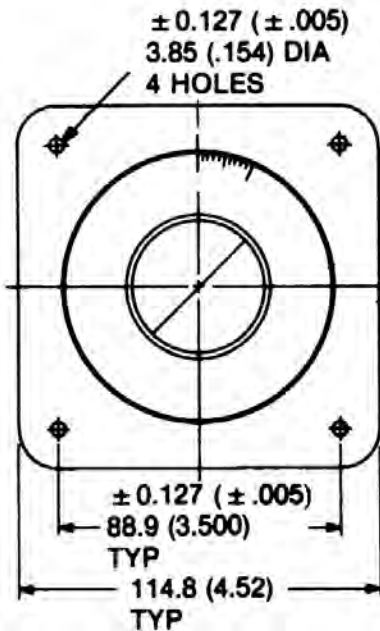
Example:



ACCESSORIES

ATTENUATOR STAND, MODEL 940 Z: This stand allows a user to easily mount any Model 940 for those bench applications.

PHYSICAL DIMENSIONS:



Model No.	DIM A	DIM B
940-XX-11	52.3 (2.06)	58.2 (2.29)
940-XX-12	55.6 (2.19)	58.2 (2.29)
940-XX-22	55.6 (2.19)	61.5 (2.42)
940-XX-33	61.0 (2.40)	68.1 (2.68)
940-XX-34	66.0 (2.60)	68.1 (2.68)
940-XX-44	66.0 (2.60)	71.9 (2.83)

NOTE:

1. All dimensions are given in mm (inches) and are maximum, unless otherwise specified.
2. Unit available with RoHS compliant materials, specify when ordering.

Model 3056 RF Manual Step Attenuator

dc to 3.0 GHz



1 Watt

SMA Connectors

RoHS



ATTENUATION ACCURACY (dB):

Frequency (GHz)	Accuracy
dc - 3.0	± 0.30 dB

MAXIMUM SWR & INSERTION LOSS:

Frequency (GHz)	SWR	Loss (dB)
dc-1.0	1.15	0.15
1.0-2.0	1.20	0.20
2.0-3.0	1.35	0.25

Features

- /// Rotational Stops Included
- /// Cost Effective OEM Design - Optimized for Wireless Communication System Applications.
- /// Custom Designs Available

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 3.0 GHz
ATTENUATION RANGE/STEPS: 0-10 dB in 1.0 dB steps
TEMPERATURE RANGE: -20 °C to +85 °C
POWER RATING: 1 watt **average** @ 25°C ambient temperature, derated linearly to 0.25 watt @ 85°C. 100 watts **peak** (5 μsec pulse width; 0.5 % duty cycle).

CONNECTOR: SMA female connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector.

SHAFT ROTATION: Clockwise for increasing attenuation

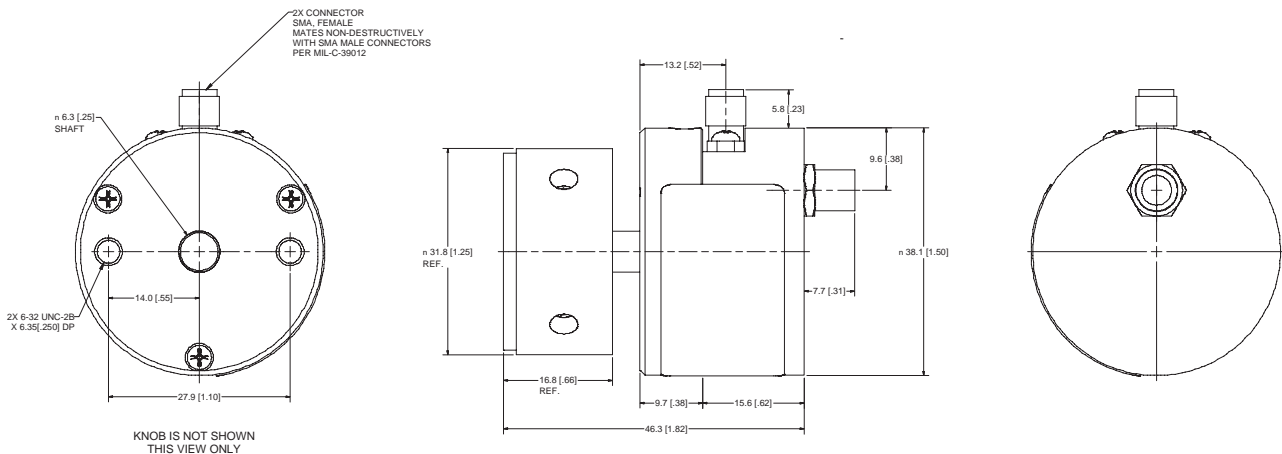
STEP ANGLE: 30.0°

CONSTRUCTION: Machined aluminum body. Knob is included with each unit.

WEIGHT: Net 110 g (4 oz)

NOTE: Minimum quantities apply. Contact factory or local sales representative for more information.

PHYSICAL DIMENSIONS:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Specifications-Con't

MAXIMUM SWR & ZERO INSERTION LOSS:

Model	Frequency (GHz)	SWR	Loss (dB)
3003	dc - 2.5	1.20	< 0.3
3006	dc - 1.25	1.20	< 0.2
3007	dc - 2.5	1.30	< 0.3
3010	dc - 2.5	1.35	< 0.7
3014	dc - 1.25	1.30	< 0.5

INCREMENTAL PHASE SHIFT: ~0.25° per dB x f(GHz)

CONSTRUCTION: Shafting and external hardware and connector shells: CRES Type 303, per ASTM-A582 passivated per QQ-P-35. Housing: AL ALLOY Gold Flash. Knob is included with each unit.

TEST DATA: Test data is available at additional cost.

WEIGHT: Single drum: Net 125 g (4.4 oz)
Dual drum: Net 201 g (9.9 oz)

SWITCHING LIFE: 1,000,000 steps

REPEATABILITY: ±0.1 dB over frequency range and rated life

ROTATION STOPS: Supplied on 10 dB step drums (not supplied on 1 dB drums).

MODEL NUMBER DESCRIPTION:

Example:

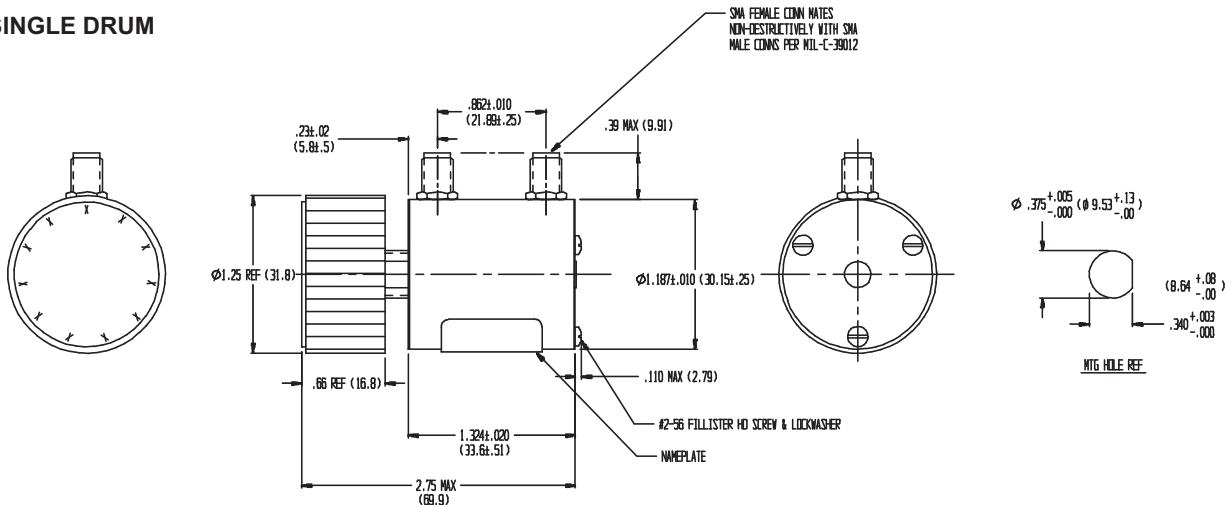
3010 - 100

Basic Model Number

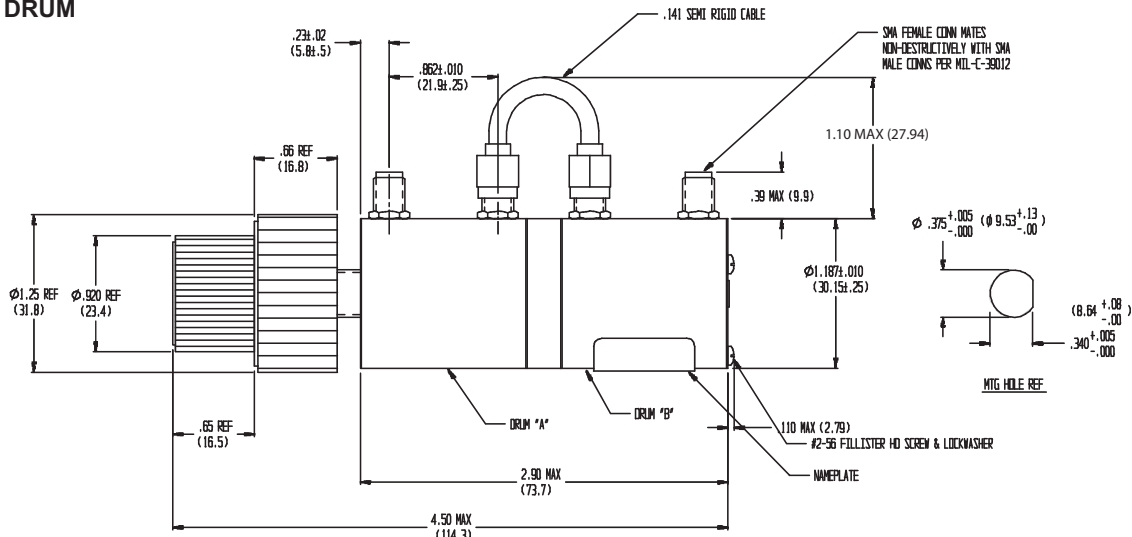
Additional Options no longer available. Add -100 Only!

PHYSICAL DIMENSIONS:

SINGLE DRUM



DUAL DRUM



Variable Attenuators



Models 3053 & 3054 Manual Step, Ruggedized SMA Connectors

dc to 6.0 GHz
1 Watt



Specifications

NOMINAL IMPEDANCE: 50 Ω
 FREQUENCY RANGE: dc to 6.0 GHz
 INCREMENTAL ATTENUATION RANGE/STEPS:
 Model 3053: 0-10 dB in 1 dB steps
 Model 3054: 0-70 dB in 1 dB steps
 POWER COEFFICIENT: < 0.006 dB/dB/watt
 TEMPERATURE COEFFICIENT: 0.0004 dB/dB/ $^{\circ}$ C
 TEMPERATURE RANGE:
 Operating: -40 $^{\circ}$ C to +65 $^{\circ}$ C
 Non-Operating: -54 $^{\circ}$ C to +85 $^{\circ}$ C

Features

- /// **High Reliability** - Repeatability better than 0.1 dB over frequency range and life. Weinschel patented detent mechanism, tested to 1,000,000 operations at +75 $^{\circ}$ C, operates dependably even down to -40 $^{\circ}$ C.
- /// **Product Uniformity** - High volume fabrication techniques, including injection molding, stamping, broaching and thick film printing ensure a cost effective and uniform product.
- /// **Low Frequency Sensitivity** - Typically 0.1 to 0.2 dB up to 2.5 GHz.
- /// **Shock Resistant** - 100% spring contact system withstands mechanical and thermal shock and eliminates the need for epoxy or solder.
- /// **Wide Selection** - Wide choice of attenuation ranges and increments in standard stock models. Single and dual drum configurations available.
- /// **Knob Included** - Knobs for both single and dual drum models are included with every attenuator. Characters are screened on the face of the knob insert which is coated with a clear layer of epoxy for protection.

Special Configurations

Some modifications to the basic configuration of the 3000 Series can be made during manufacturing. Examples of these special configurations are shafts having special lengths and ends; clockwise shaft rotation; modified mounting arrangements; and provisions for add-on items such as concentric potentiometer and ganged switches.

ATTENUATION ACCURACY:

Model	Accuracy
3053	\pm 0.3 dB
3054	\pm 0.3 dB or 2% (dc to 3 GHz) \pm 0.3 dB or 3.5% (3 to 6 GHz)

POWER RATING: 1 watts **average** @ 25 $^{\circ}$ C ambient temperature, derated linearly to 0 watts @ 65 $^{\circ}$ C. 100 watts **peak** (5 μ sec pulse width; 0.5 % duty cycle).

CONNECTOR: SMA female connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector.

SHAFT ROTATION: counter clockwise for increasing attenuation

STEP ANGLE: 32.7 $^{\circ}$

DRUM CONFIGURATIONS:

Single Drum: 3003, 3006, 3007, 3053
 Dual Drum: 3010, 3014, 3054

MAXIMUM SWR & ZERO INSERTION LOSS:

Model	Frequency (GHz)	SWR	Loss (dB)
3053	dc - 3.0	1.30	< 0.3
	3.0 - 6.0	1.40	< 0.7
3054	dc - 3.0	1.30	< 0.8
	3.0 - 6.0	1.55	< 1.3

SWITCHING LIFE: 1,000,000 steps

REPEATABILITY: ± 0.1 dB over frequency range and rated life

ROTATION STOPS: Supplied on 10 dB step drums (not supplied on 1 dB drums).

INCREMENTAL PHASE SHIFT: $\sim 0.25^\circ$ per dB x f(GHz)

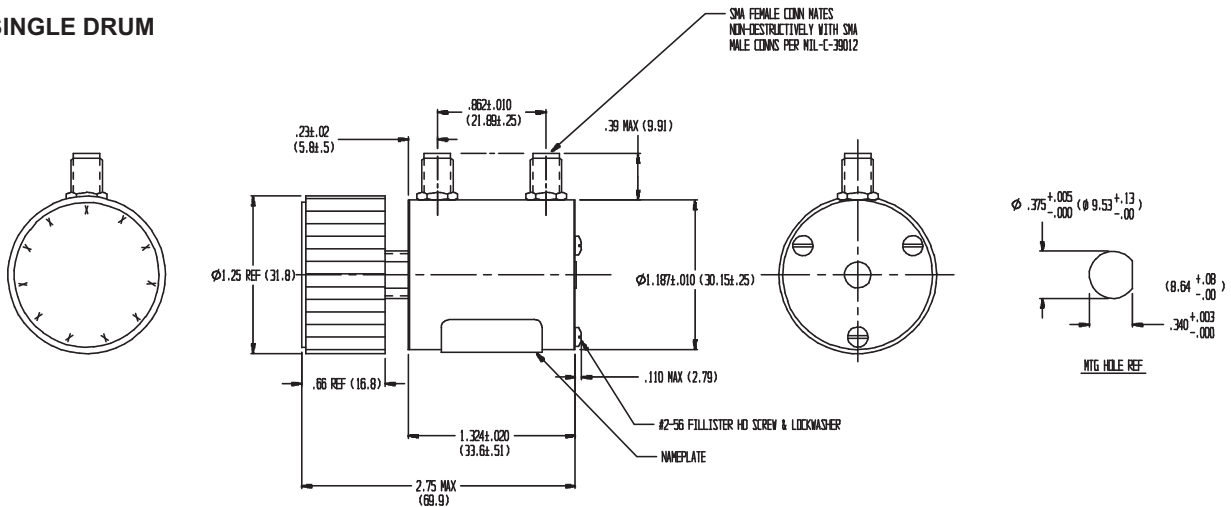
CONSTRUCTION: Shafting and external hardware and connector shells: CRES Type 303, per ASTM-A582 passivated per QQ-P-35. Housing: AL ALLOY Gold Flash. Knob is included with each unit.

TEST DATA: Test data is available at additional cost.

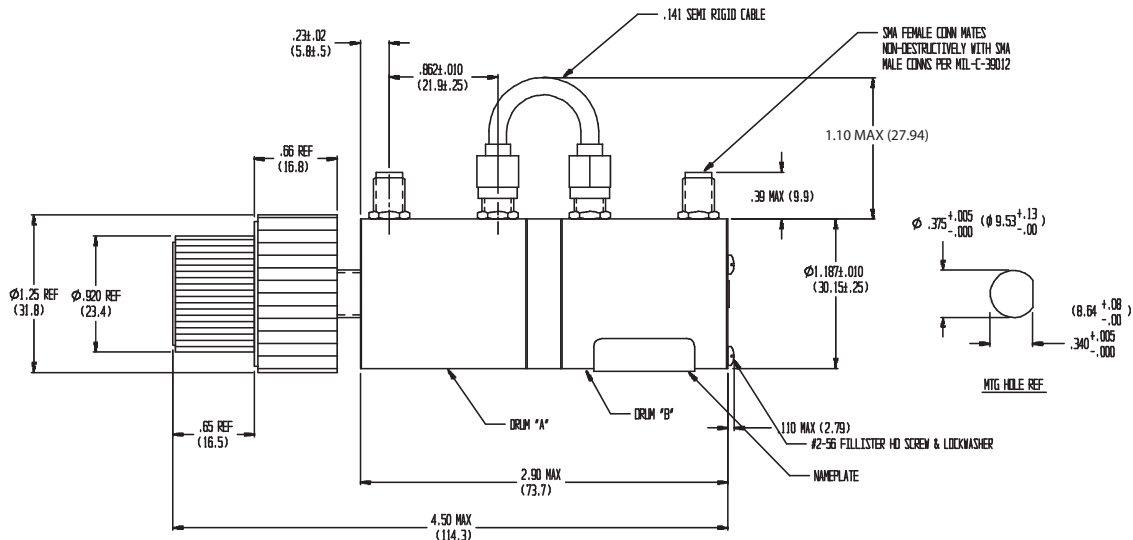
WEIGHT: Single drum: Net 125 g (4.4 oz)
Dual drum: Net 201 g (9.9 oz)

PHYSICAL DIMENSIONS:

SINGLE DRUM



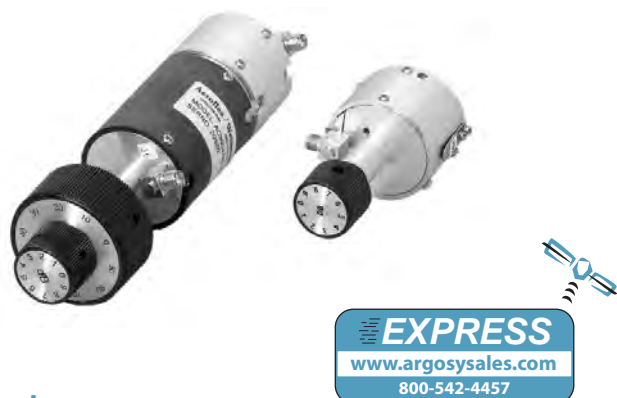
DUAL DRUM



Variable Attenuators



Models 9003, 9004, 9009, 9010 & 9011 dc to 18.0 GHz Manual Step, Ruggedized SMA Connectors 2 Watt



Features

- /// **Broadband** - Available in a choice of frequency ranges: dc to 4, dc to 8, dc to 12.4 and dc to 18 GHz.
- /// **Available Express Models:** AC-9003-69-31
AF-9003-9-12
AF-9003-69-31

Other models may be available for Express delivery.

- /// **Wide Choice of Attenuation Ranges** - A choice of five standard attenuation ranges is available: 0 to 9.0, 0 to 69 and 0 to 99 dB in 1 dB steps, and 0 to 60 and 0 to 90 dB in 10 dB steps.
- /// **Environmental** - Designed to meet most environmental requirements of MIL-A-24215 (Vibration, Shock, Relative Humidity to 95% and Altitude).
- /// **In-line Configuration** - Passivated stainless steel SMA connector are set parallel with control shaft (except units with right angle connector) to reduce volume for applications where space is critical. All models are bidirectional.
- /// **Precise Incremental Attenuation Accuracy** - Model 9000 series has flat frequency response and small deviation from nominal attenuation at all settings (e.g., deviation is only ± 2.5 dB at 99 dB setting at 18 GHz).
- /// **Excellent Repeatability and Long Switch Life.**
- /// **Custom Configurations Available Upon Request.**
- /// **Highly Accurate Detent Stepping** - Direct drive of attenuator drums eliminates gears and provides for excellent repeatability.
- /// **Safety Mechanical Stop** - A mechanical stop between maximum and 0 attenuation positions on all models except 0-9 dB unit is provided to prevent large power changes at attenuator output from damaging sensitive equipment.

Description

The Model 9000 series Step Attenuators are broadband miniature step attenuators that provide excellent performance characteristics suitable for use in high reliability 50 ohm systems and applications requiring extra-small components for the precision control of signal levels. The Model 9000 series can be used either as input or output attenuators in signal sources, receivers, field strength meters, spectrum analyzers, etc.

The SMA connector furnished on all models are available in either standard or right-angle configuration. The sex of front and rear connector is optional (refer to connector specification for specific combinations available). A knob(s), marked appropriately, is supplied with each unit.

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE (add Model No. Prefix to Designate Range):

All Models: dc to 4.0 GHz (AC)
dc to 18.0 GHz (AF)

Standard Incremental Attenuation Range:

Model 9009: 0 to 9 dB in 1 dB steps
Model 9003: 0 to 69 dB in 1 dB steps
Model 9004: 0 to 99 dB in 1 dB steps
Model 9010: 0 to 60 dB in 10 dB steps
Model 9011: 0 to 90 dB in 10 dB steps

MAXIMUM SWR:		
Frequency Range (GHz)	9009, 9010 9011	9003 9004
dc - 4	1.25	1.35
dc - 18	1.60	1.75

POWER RATING: 2 watts **average** to 25°C ambient temperature, derated linearly to 1 watt @ 54°C. 200 watts **peak** (5 μ sec pulse width; 0.5% duty cycle)

POWER COEFFICIENT: < 0.005dB/dB/watt

TEMPERATURE COEFFICIENT: < 0.0004 dB/dB/°C

TEMPERATURE RANGE:

Operating: 0°C to +54°C
Nonoperating: -54°C to +54°C

Specifications--con't

TEST DATA: Insertion Loss data is supplied as follows. Other test data can be supplied at additional cost.

dc to 4 GHz: At 50 MHz and 4 GHz
 dc to 18 GHz: At 50 MHz, 4, 8, 12 and 18 GHz

INCREMENTAL PHASE SHIFT: ~0.5° per dB per GHz

REPEATABILITY: Better than 0.05 dB across frequency band for switch life

SWITCH LIFE: Over 1,000,000 steps

SHAFT ROTATION: Clockwise for increasing attenuation.

CONSTRUCTION:

Drum Assembly: Aluminum alloy
 Housing: Phenolic or aluminum
 Control Shaft: Stainless steel
 Connector: Stainless steel
 Knob: Supplied with control knob

INDEXING: 36°

DRUM CONFIGURATIONS:

Single Drum: 9009, 9010, 9011
 Dual Drum: 9003, 9004

MAXIMUM INSERTION LOSS (dB):

Frequency Range (GHz)	Model No.				
	9009	9003	9004	9010	9011
dc - 4	0.3	0.6	0.6	0.4	0.5
dc - 18	1.0	1.5	1.5	1.0	1.0

CONNECTOR: SMA connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Front and rear SMA connector available in either standard or right-angle configuration, connector sex is optional as follows:

Connector Options	Type/Description
1	SMA, Female
2	SMA, Male*
3	SMA, Female, right-angle
4	SMA, Male, right-angle

*Standard male SMA connector not available as J1 connector.

WEIGHT:

9009	680 g (2.4 oz)
9010	160 g (5.7 oz)
9011	200 g (7.1 oz)
9003	260 g (9.0 oz)
9004	290 g (10.4 oz)

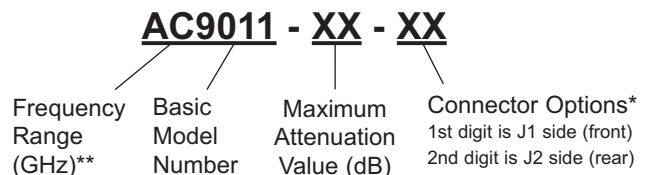
INCREMENTAL INSERTION LOSS (±dB):

Model Number	dB Range	Frequency Range (GHz)	
		dc-4	dc-18
9009	1-9	0.3	0.5
9003	1-9	0.3	0.5
	10-19	0.7	1.0
	20-29	0.9	1.2
	30-39	1.0	1.4
	40-49	1.1	1.5
	50-59	1.2	1.7
9004	60-69	1.3	1.9
	1-9	0.3	0.5
	10-19	0.7	1.0
	20-29	0.9	1.2
	30-39	1.0	1.4
	40-49	1.1	1.5
9010	50-59	1.2	1.7
	60-69	1.3	1.9
	70-79	1.4	2.1
	80-89	1.5	2.3
	90-99	1.6	2.5
	9011	10	0.3
20		0.3	1.0
30		0.4	1.0
40		0.5	1.2
50		0.7	1.5
60		0.8	1.8
9011	70	0.9	2.1
	80	1.0	2.3
	90	1.2	2.5

NA=Model no longer available.

MODEL NUMBER DESCRIPTION:

Example:



** Frequency Range

dc-4.0 GHz (AC)
 dc-8.0 GHz (AD)
 dc-12.4 GHz (AE)
 dc-18.0 GHz (AF)

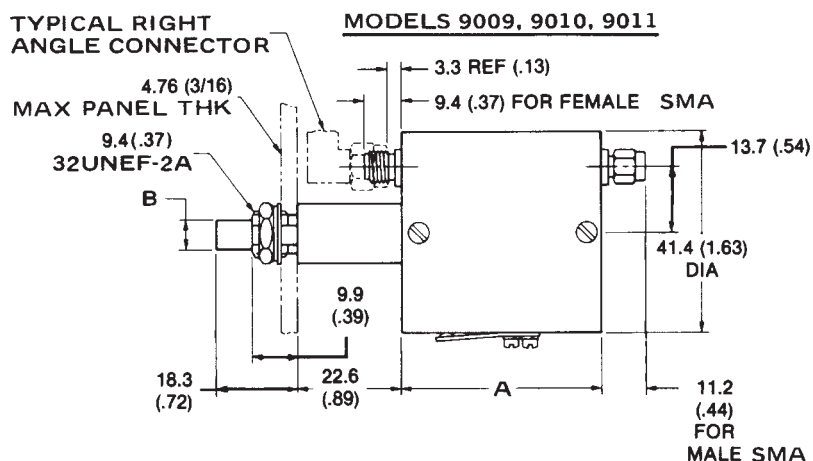
Available Models

AC9003, AC9004, AC9009, AC9010, AC9011
 No longer available, order AF as replacement
 No longer available, order AF as replacement
 AF9003, AF9004, AF9009, AF9010, AF9011

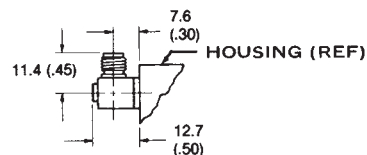
Variable Attenuators



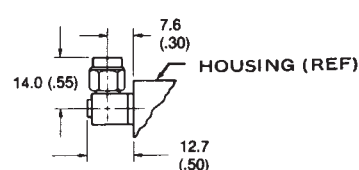
PHYSICAL DIMENSIONS:



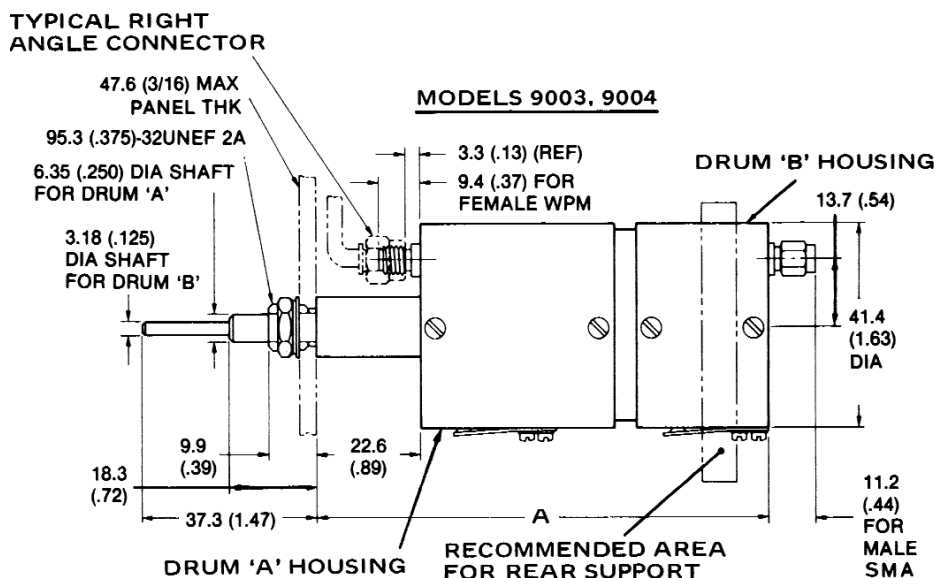
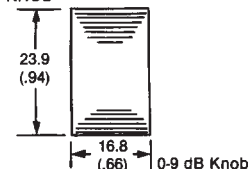
RIGHT ANGLE FEMALE SMA



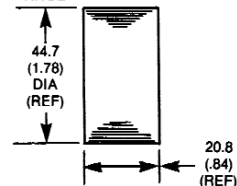
RIGHT ANGLE MALE SMA



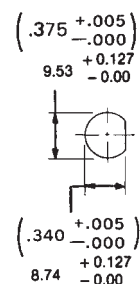
KNOB



KNOB



MOUNTING HOLE



Model No.	DIM A	DIM B
9003	96.3 (3.79)	---
9004	106.4 (4.19)	---
9009	28.7 (1.13)	3.25 (0.125)
9010	41.4 (1.63)	6.35 (0.250)
9011	51.6 (2.03)	6.35 (0.250)

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Models 115A thru 119A Manual Step Attenuators

dc to 18.0 GHz
2 Watt

Choice of Type N or SMA Connectors



Features

- /// **Safety Mechanical Stop** - A mechanical stop between maximum and 0 attenuation positions on all models prevents damage to the mechanical drive as well as preventing large power changes that could cause damage to sensitive equipment.
- /// **Choice of Attenuation Ranges** - Five standard attenuation ranges are available: 0-9 dB, 0-69 dB, and 0-99 dB in 1 dB steps, and 0-60 dB and 0-90 dB in 10 dB steps.
- /// **Broadband** - All models are available in a choice of 2 frequency ranges: dc-4 and dc-18 GHz.
- /// **Right-Angle Drive** - The center conductor of the connector is perpendicular to the control shaft, offering greater flexibility of applications: panel mounting or bench setup. All models are bidirectional.
- /// **Custom Configurations Available Upon Request.**
- /// **Low Deviation from Nominal Value** - These Mini Step Attenuators have flat frequency response over specified bands and excellent attenuation accuracy. Deviation from nominal value is low at all settings.
- /// **Excellent Repeatability and Long Life Switch** - Repeatability is better than 0.05 dB to 18.0 GHz for over 1,000,000 switchings of the drum.

Description

The Aeroflex / Weinschel Models 115A through 119A are a series of broadband, step attenuators in a right-angle drive configuration, where the center conductor of the connector is perpendicular to the control shaft. They feature excellent performance characteristics suitable for use in high reliability 50 ohm systems and applications requiring extra-small components for the precision control of power in discrete steps. They can be used either as input or output attenuators in signal sources, receivers, field strength meters, spectrum analyzers, etc.

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE (add Model No. Prefix to Designate Range):

All Models: dc to 4.0 GHz (AC)
dc to 18.0 GHz (AF)

STANDARD INCREMENTAL ATTENUATION RANGE:

Model 115A: 0 to 9 dB in 1 dB steps
Model 116A: 0 to 60 dB in 10 dB steps
Model 117A: 0 to 69 dB in 1 dB steps
Model 118A: 0 to 90 dB in 10 dB steps
Model 119A: 0 to 99 dB in 1 dB steps

MAXIMUM SWR (Models 117A & 119A):

Frequency Range (GHz)	117A & 119A	115A, 116A & 118A
dc - 4	1.35	1.25
4 - 12.4	1.50	1.60
12.4 - 18.0	1.70	1.60

POWER RATING: 2 watts **average** to 25°C ambient temperature, derated linearly to 1 watt @ 54°C. 200 watts **peak** (5 μ sec pulse width; 0.5% duty cycle)

POWER COEFFICIENT: < 0.005/dB/dB/watt

TEMPERATURE COEFFICIENT: < 0.0004/dB/dB/°C

TEMPERATURE RANGE: Operating: 0°C to +54°C
Nonoperating: -54°C to +54°C

INCREMENTAL PHASE SHIFT: ~0.5° per dB x f(GHz)

REPEATABILITY: Better than 0.05 dB across frequency band for switch life.

SWITCH LIFE: Over 1,000,000 steps

INDEXING: 36°

MAXIMUM INSERTION LOSS (dB):

Model Number	CONN Type	Frequency Range (GHz)	
		dc-4	dc-18
115A	N	0.3	0.7
	SMA	0.3	1.0
116A	N	0.3	0.7
	SMA	0.4	1.0
117A	N	0.5	1.2
	SMA	0.6	1.5
118A	N	0.4	0.8
	SMA	0.5	1.0
119A	N	0.5	1.2
	SMA	0.6	1.5

Variable Attenuators



Specifications (Con't):

TEST DATA: Insertion Loss data is supplied as follows.
 Other test data can be supplied at additional cost.
 dc to 4 GHz: At 50 MHz and 4 GHz
 dc to 18 GHz: At 50 MHz, 4, 8, 12 and 18 GHz

RELATIVE HUMIDITY: 95%

ALTITUDE: to 10,000 ft.

SHOCK (non-operating): 8 g's, 100 ms, 1/2 sine

DRUM CONFIGURATIONS:

Single Drum: 115A, 116A, 118A

Dual Drum: 117A, 119A

VIBRATION (non-operating):

5 to 8 cps, 0.20 inch double amplitude

8 to 15 cps, 0.10 inch double amplitude

15 to 55 cps, 0.36 inch double amplitude

Supported rigidly front and back

SHAFT ROTATION: Clockwise for increasing attenuation

CONSTRUCTION:

Materials: Housing: aluminum alloy, clear irridite,
 MIL-C-5541.

Dust Cover: Painted aluminum alloy

Drum: Aluminum alloy

Shaft: Passivated stainless steel

Connector: Stainless steel and beryllium
 copper contacts.

CONNECTOR: SMA and Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector. Connector sex is optional as follows:

Connector Options	Type/Description
1	SMA, Female
2	SMA, Male
3	Type N, Female
4	Type N, Male

WEIGHT:

115A	340 g (12 oz)
116A	340 g (12 oz)
117A	760 g (27 oz)
118A	450 g (16 oz)
119A	880 g (31 oz)

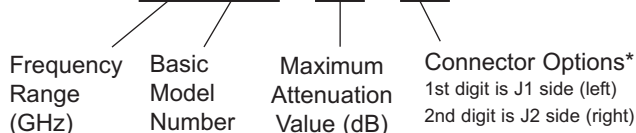
INCREMENTAL INSERTION LOSS (±dB):

Model Number	dB Range	Frequency Range (GHz)	
		dc-4	dc-18
115A	1-9	0.3	0.5
117A	1-9	0.3	0.5
	10-19	0.7	1.0
	20-29	0.9	1.2
	30-39	1.0	1.4
	40-49	1.1	1.5
	50-59	1.2	1.7
119A	60-69	1.3	1.9
	1-9	0.3	0.5
	10-19	0.7	1.0
	20-29	0.9	1.2
	30-39	1.0	1.4
	40-49	1.1	1.5
	50-59	1.2	1.7
	60-69	1.3	1.9
	70-79	1.4	2.1
	80-89	1.5	2.3
90-99	1.6	2.5	
116A	10	0.3	1.0
	20	0.3	1.0
	30	0.4	1.0
	40	0.5	1.2
	50	0.7	1.5
	60	0.8	1.8
118A	10	0.3	1.0
	20	0.3	1.0
	30	0.4	1.0
	40	0.5	1.2
	50	0.7	1.5
	60	0.8	1.8
	70	0.9	2.1
80	1.0	2.3	
90	1.2	2.5	

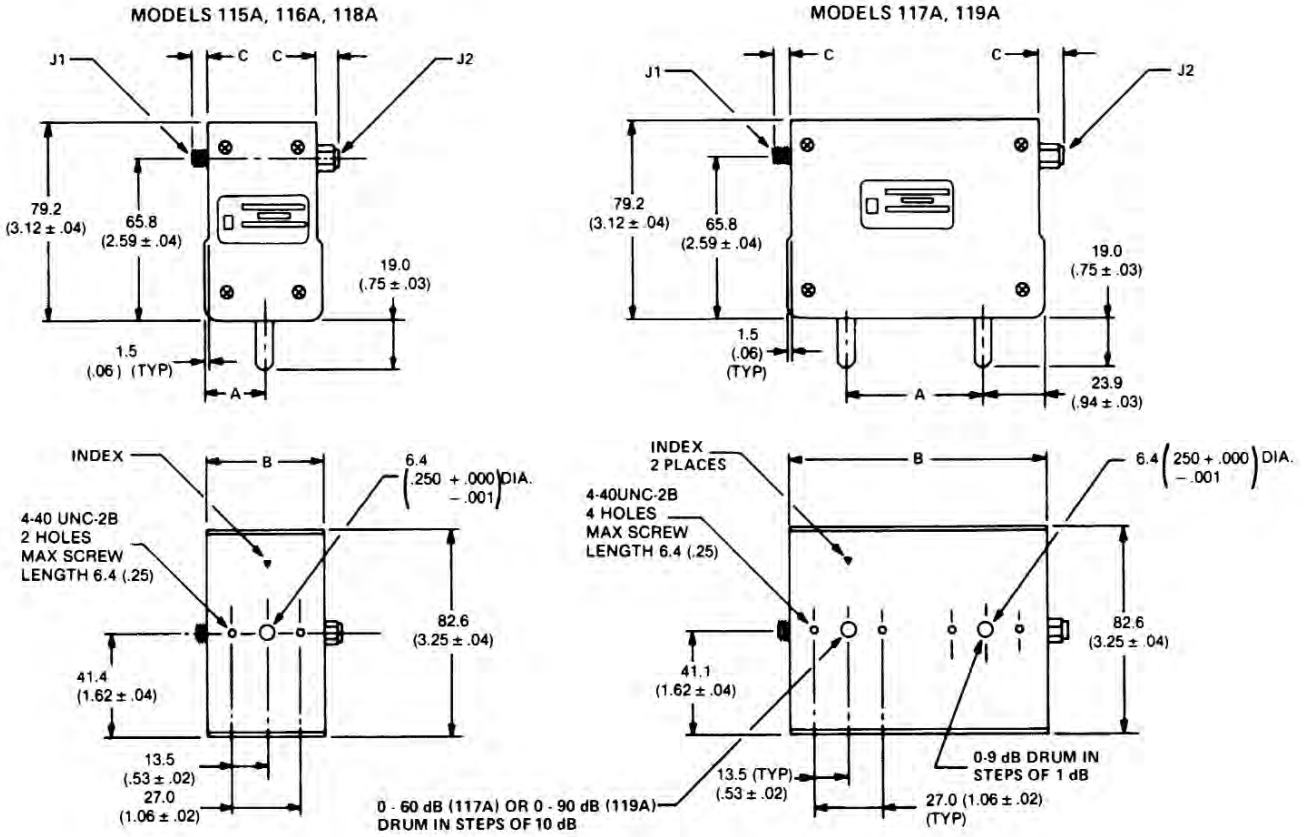
MODEL NUMBER DESCRIPTION:

Example:

AC116A - XX - XX



PHYSICAL DIMENSIONS:



Model No.	DIM A	DIM B
119A	58.7 (2.31)	111.3 (4.38)
118A	29.0 (1.14)	57.7 (2.27)
117A	54.0 (2.11)	101.1 (3.98)
116A	23.9 (0.94)	47.5 (1.87)
115A	23.9 (0.94)	47.5 (1.87)

CONN Type	DIM C
Type N, Male	20.6 (0.81)
Type N, Female	18.3 (0.72)
SMA, Male	9.4 (0.37)
SMA, Female	7.9 (0.31)

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Variable Attenuators



Model 9012 Manual Step, SMK Connectors

dc to 26.5 GHz
2 Watts



Features

- /// Choice of Attenuation Ranges and Step Sizes.
- /// Excellent Repeatability.
- /// Custom Configurations Available Upon Request.
- /// Highly Accurate Detent Stepping
- /// Ruggedized Connector - Injection molded to provide consistent interface dimensions.

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 26.5 GHz

INCREMENTAL ATTENUATION RANGE/STEPS:

Model 9012-9: 0-9 dB in 1 dB steps

Model 9012-70: 0-70 dB in 10 dB steps

INCREMENTAL ATTENUATION ACCURACY:

Model No.	Accuracy
9012-9	± 0.5 dB
9012-70	± 1.0 dB or 2%

MAXIMUM SWR:

Frequency Range (GHz)	9012
dc - 18	1.40
18 - 26.5	1.50

MAXIMUM ZERO INSERTION LOSS (\pm dB):

Frequency Range (GHz)	9012
dc - 18	1.00
18 - 26.5	1.50

POWER RATING: 2 watts **average** to 25°C ambient temperature, derated linearly to 1 watt @ 54°C. 200 watts **peak** (5 μ sec pulse width; 0.5% duty cycle)

POWER COEFFICIENT: < 0.005 dB/dB/watt

TEMPERATURE COEFFICIENT: < 0.0004 dB/dB/°C

TEMPERATURE RANGE:

Operating: 0°C to + 54°C

Nonoperating: -54°C to + 54°C

REPEATABILITY: ± 0.5 dB to 60 dB

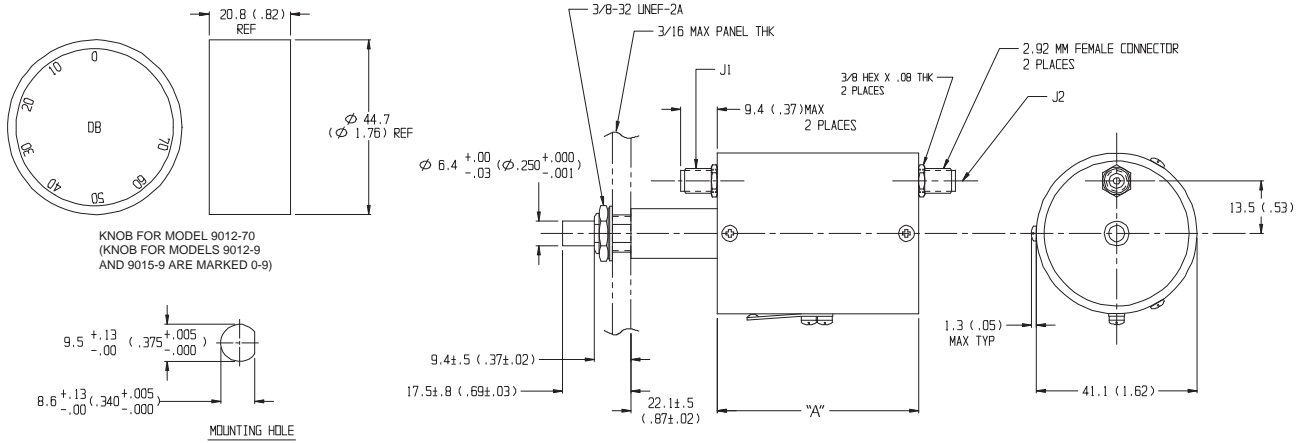
TEST DATA: Insertion loss and SWR data supplied at selected frequencies between 50 MHz and 26.5/40 GHz. Other test data can be provided at additional cost.

CONNECTOR: 2.92mm female connector - mate nondestructively with SMA connector per MIL-C-39012, SMK, 3.5mm, and other 2.92mm connector.

CONSTRUCTION: Stainless steel connector; gold plated beryllium copper contacts. Knob is included with each unit.

WEIGHT: Net 270 g (9.6 oz)

PHYSICAL DIMENSIONS:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Model No.	DIM A
9012-9, 9012-70	51.56 (2.03)

Power Splitters & Dividers



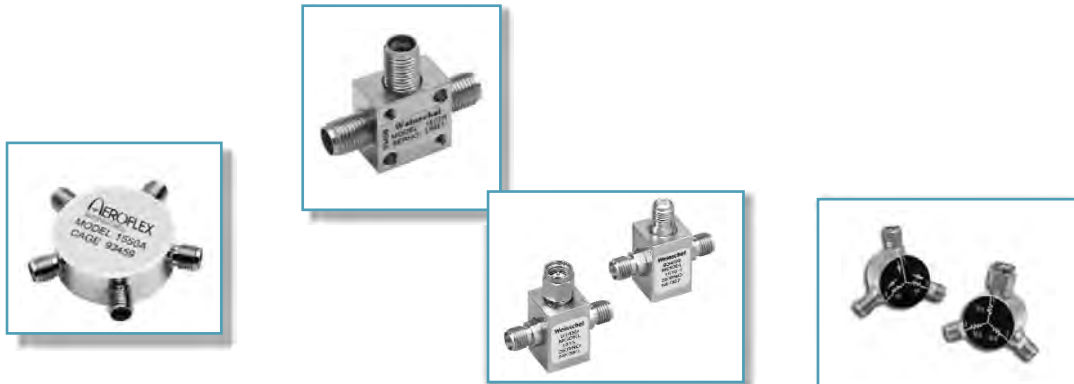
- /// Broadband Frequency Range - dc to 40 GHz
- /// Widest Selection of connector types & Frequency
- /// **Express** shipment available on select models.
- /// 4-Way Designs Available
- /// High Quality Construction & Connectors
- /// Stable - Low temperature and power coefficients ensure operating stability.
- /// Custom Designs Available on Request - Just contact us with your special requirement...
 - Broadband High Power
 - Low SWR\Return Loss
 - Unique Packaging

General Information

In this section of the catalog, each Resistive Power Splitter/Divider & Directional Coupler is outlined utilizing individual data sheets containing product features, specifications and outline drawings. These data sheets are preceded by a quick reference guide to help you select the product(s) that fits your needs. The page number for each product data sheet is given in the quick reference guide.






Aeroflex / Weinschel offers a comprehensive product line of Power Dividers, and Power Splitters. Many of these standard products were designed for particularly demanding broadband requirements, SWR, and high power system applications. As with the development of all Aeroflex / Weinschel products, high performance at competitive prices is of paramount importance.

NOTE: **EXPRESS** Shipment available via www.argosysales.com or 800-542-4457. Check with distributor for current products and stocking quantities.










Resistive Power Splitters...dc-40.0 GHz



Model Number	Frequency Range (GHz)	Connector Type	Maximum SWR		Maximum Insertion Loss (dB)	Amplitude Tracking (dB MAX)	Phase Tracking (\pm°)	Average Input Power (W)	Page No.	
			INPUT	OUTPUT						
♦ 1507R	dc-4.0	2.92mm (f) all	1.15	1.25	6.5	<0.20	<4.0	1	154	
♦ 1579	dc-26.5	3.5mm (f) al	1.50	1.45	8.5	0.40	5.0	0.5	155	
♦ 1593	dc-26.5	3.5mm (f) al	1.25	1.35	8.5	0.25	4.0	0.5	157	
♦ 1534	dc-40.0	2.92mm (f) all	160	160	10.5	0.50	4.0	1.0	158	
♦ 1870A	dc-18.0	N (f) all	1.15	1.15	7.5	0.20	2.0	1	156	

Resistive Power Dividers...dc-40.0 GHz, 2-Way & 4-Way



Model Number	Frequency Range (GHz)	Connector Type	Maximum SWR		Maximum Insertion Loss (dB)	Amplitude Tracking (dB MAX)	Phase Tracking (\pm°)	Average Input Power (W)	Page No.	
			INPUT	OUTPUT						
♦ 1506A	dc-18.0	N(m) IN (f) OUT	1.35	1.35	7.5	0.50	2.0	1	161	
1515	dc-18.0	SMA (m) IN (f) OUT	1.35	1.35	7.5	0.50	5.0	1	160	
♦ 1515-1		SMA (f) all								
♦ 1549R	dc-4.0	SMA (f) all	1.25	1.25	6	<0.20	<4.0	1	159	
♦ 1550A (4-way)	dc-3.0	SMA (f) all	1.25	1.25	13.5	0.50	10.0	1	164	
1575	dc-40.0	2.92mm (f) all	1.70	1.70	8.5	<0.25-0.50*	2.0-5.0*	1	163	
♦ 1580	dc-26.5	3.5mm (m) IN (f) OUT	1.25	1.25	8.5	0.20	8.0**	1	162	
1580-1		3.5mm (f) all								
♦ 1594 (4-way)	dc-18.0	3.5mm (f) all	1.30	1.30	14.5	2.50	50.0	2	164	

(f) denotes female & (m) denotes male.

* Varies with Frequency.

** Maximum between any two output ports

- ♦ EXPRESS Shipment available via www.argosysales.com or 800-542-4457.
Note: Other models may also be available from Express delivery.

Frequently Asked Questions about Power Splitters & Dividers. . .

What Types of power splitters and dividers does Weinschel offer?

Weinschel offers a variety of broadband (dc-40 GHz) resistive power splitters and dividers with Type N, SMA, 3.5mm, 2.92mm connector options. Power Dividers are available in 2 and 4 way configurations.

How does a resistive power splitter work?

Our resistive power splitters are intended for applications in which one of the two outputs are included in a leveling loop or used as a reference in a ratio measurement system, for the purpose of providing an output signal whose source impedance is essentially matched to 50 ohms. A basic design consists of three ports with a resistor on each of the two output ports, and is a unidirectional device.

What are some applications for a resistive power splitter?

Resistive power splitters provide exceptional amplitude tracking and a very low equivalent output SWR over very broad frequency ranges. They are used in applications in which one of the two outputs is included in a leveling loop or as a reference in a ratio systems such as:

- /// A dual channel insertion loss measuring system where the resistive power splitter provides reference and a signal channel.
- /// A precision power source where a power meter of known characteristics is used, either by ratio or leveling to provide a calibrated output.
- /// Provide a sampled output used for leveling a signal source - for instance in single channel attenuation measurements.

What applications use resistive power dividers?

- /// Broadband independent signal sampling - used in systems to simultaneously measure two different characteristics of one signal such as frequency and power.
- /// Distribution of a low power signals to two or more antennas.
- /// Laboratory measurements where a reference signal exactly tracking the reference signal is required.
- /// Resistive power dividers can be used as power combiners because they are bidirectional.

When do I use a power splitter or divider?

In simple terms many are confused as to the difference between power splitters and power dividers. Here is some basic information that we hope will help.

How do I determine the Insertion Loss for a Power Divider or Power Splitter?

For Resistive power divider: Isolation = Insertion Loss
 For Resistive power splitter: Isolation = Twice the Insertion Loss

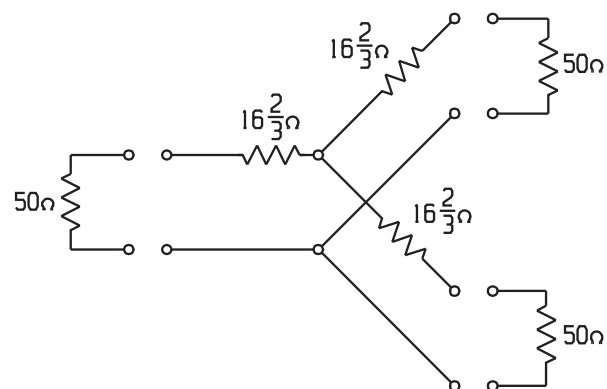
Power splitters are only used in a ratio systems or leveling loop.

- /// Power splitters can never be used to combined power. They are unidirectional.
- /// A basic power splitter has two resistors and three ports. Power dividers should not be used in ratio and leveling loop application because a mismatch condition of nominally 3:1 would exist.
- /// Power dividers can be used as power combiners because they are bi-directional. Power dividers can be used in a system to simultaneously measure two different characteristics of one signal such as frequency and attenuation, power splitters can not.
- /// A basic power divider has three resistors and three ports. A simple description of the circuit shows that any one of the three ports has 50 ohm input impedance when the others are terminated in 50 ohms. The insertion loss between any two ports is 6 dB.



What is a Resistive Power Divider?

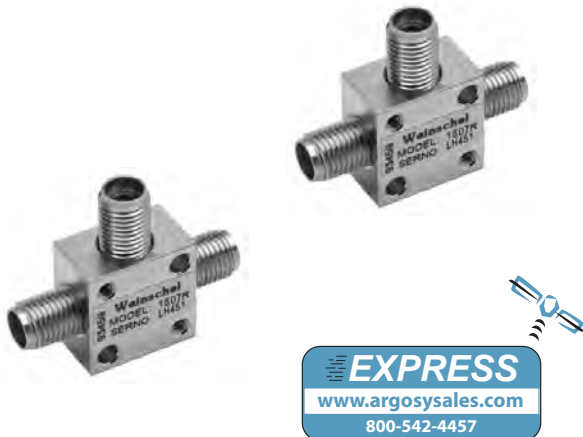
An equivalent circuit of the resistive divider is shown below. A simple analysis of this circuit will demonstrate that any one of the three ports has a 50 ohm input impedance when the other two are terminated in 50 ohms, and that the insertion loss between any two ports is 6 dB. A microwave network of this type consists of a symmetrical resistive film deposited on a ceramic substrate having three conducting contacts, each connected to the center conductor of a coaxial connector. Resistive dividers provide well-matched signals of essentially equal magnitude and phase over a very broad band as opposed to the reactive and hybrid types which employ frequency limitive techniques. The resistive divider is intended for applications where the output signals are used independently, such as the simultaneous monitoring of power and frequency.



Model 1507R
Broadband Resistive Power Splitter
(Matching), SMK Connectors

dc to 4.0 GHz
1 Watt

RoHS



MAXIMUM SWR:

Frequency (GHz)	Output*	Input
dc -4	1.15	1.25

*Equivalent output SWR when used in a leveling or ratio system.

TEMPERATURE RANGE: -55 °C to +125 °C

CONNECTORS: Female SMK (2.92 mm, SMA compatible) connectors all ports--mate nondestructively with other SMA, 2.92mm and 3.5mm connectors.

WEIGHT: 25 g (0.9 oz) maximum

PHYSICAL DIMENSIONS:

Features

These resistive power splitters are intended for RF and wireless applications in which one of the two outputs is included in a leveling loop or is used as a reference in a ratio system, for the purpose of providing an output signal whose source impedance is essentially matched to 50Ω. Some examples are:

- /// A dual channel insertion loss measuring system (ratio).
- /// A parallel IF substitution insertion loss measuring system (ratio or ALC loop).
- /// A precision power source (ratio or ALC loop).

Specifications

NOMINAL IMPEDANCE: 50 Ω

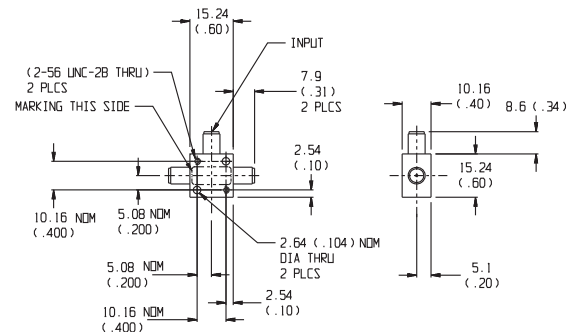
FREQUENCY RANGE: dc to 4.0 GHz

INSERTION LOSS: 6 dB nominal, 6.5 dB maximum
(Between input and either output)

MAXIMUM INPUT POWER: 1.0 watt CW (Input connector only)

AMPLITUDE & PHASE TRACKING (Maximum):

Frequency (GHz)	Tracking	
	Amplitude	Phase
dc - 4.0	<0.2 dB	<4°



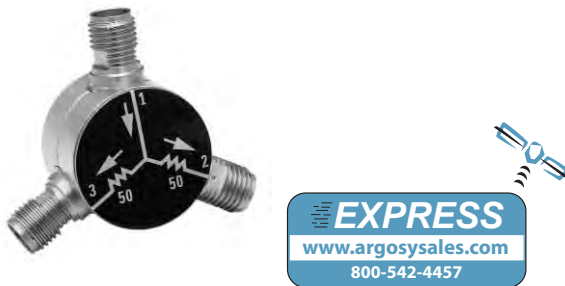
NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Power Splitters & Dividers



Model 1579 Broadband Resistive Power Splitter (Matching), 3.5mm Connectors

dc to 26.5 GHz
0.5 Watts



Features

These resistive power splitters are intended for RF and wireless applications in which one of the two outputs is included in a leveling loop or is used as a reference in a ratio system, for the purpose of providing an output signal whose source impedance is essentially matched to 50Ω. Some examples are:

- /// A dual channel insertion loss measuring system (ratio).
- /// A parallel IF substitution insertion loss measuring system (ratio or ALC loop).
- /// A precision power source (ratio or ALC loop).

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 26.5 GHz
INSERTION LOSS: 6 dB nominal, 8.5 dB maximum
 (Between input and either output)
MAXIMUM INPUT POWER: 0.5 watts CW (Input Connector only)

OUTPUT TRACKING (Between Ports):	
Frequency (GHz)	Tracking (maximum dB)
dc - 4	0.15
4 - 8	0.20
8 - 18	0.30
18 - 26.5	0.40

MAXIMUM INPUT SWR:	
Frequency (GHz)	Maximum SWR
dc - 26.5	1.50

PHASE TRACKING: ±5° nominal between output ports

EQUIVALENT OUTPUT SWR (Port 2 & 3):

Frequency (GHz)	Maximum SWR
dc - 18	1.25
18 - 26.5	1.45

*When used in a leveling or ratio system.

POWER COEFFICIENT: < 0.005 dB/dB/watt

TEMPERATURE COEFFICIENT: < 0.0004 dB/dB/°C

TEMPERATURE RANGE: -55°C to +125°C

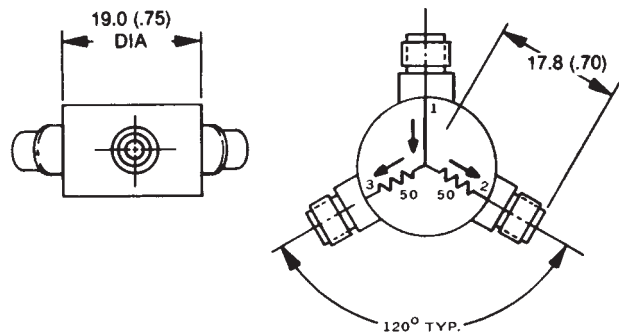
TEST DATA: Insertion Loss, SWR, and Tracking measurements performed across the frequency band. Test data available at additional cost.

CONNECTORS: Female 3.5mm connectors all ports--mate nondestructively with SMA, 2.92mm and other 3.5mm connectors.

CONSTRUCTION: Gold plated brass body; stainless steel connectors; gold plated beryllium copper contacts.

WEIGHT: 30 g (1 oz) maximum

PHYSICAL DIMENSIONS:

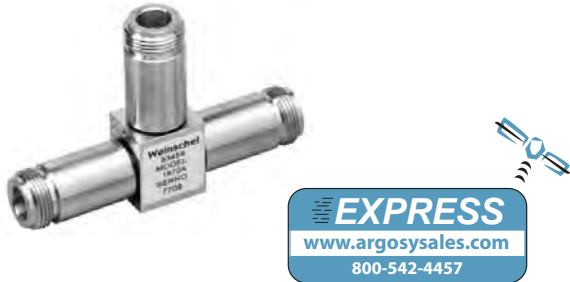


NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Model 1870A Broadband Resistive Power Splitter (Matching), Precision N Connectors

dc to 18.0 GHz
1 Watt

RoHS



Features

These resistive power splitters are intended for RF and wireless applications in which one of the two outputs is included in a leveling loop or is used as a reference in a ratio system, for the purpose of providing an output signal whose source impedance is essentially matched to 50Ω. Some examples are:

- /// A dual channel insertion loss measuring system (ratio).
- /// A parallel IF substitution insertion loss measuring system (ratio or ALC loop).
- /// A precision power source (ratio or ALC loop).

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 18.0 GHz
INSERTION LOSS: 6 dB nominal, 7.5 dB maximum
 (Between Input and either output).
MAXIMUM INPUT POWER: 1 watt average, 1 kilowatt peak
 (Input connector only)

OUTPUT TRACKING (Between Ports):

Frequency (GHz)	Tracking (maximum dB)
dc - 8	0.15
8 -18	0.20

PHASE TRACKING: ±2° nominal between output ports
POWER COEFFICIENT: < 0.005 dB/dB/watt
TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C
TEMPERATURE RANGE: -55°C to +85°C
CONSTRUCTION: Nickel plated brass body; stainless steel connectors; gold plated beryllium copper contacts.

MAXIMUM INPUT SWR:

Frequency (GHz)	Maximum SWR
dc - 18	1.30

EQUIVALENT OUTPUT SWR (Port 2 & 3):

Frequency (GHz)	Maximum SWR
dc - 2	1.05
2 - 4	1.07
4 - 8	1.10
8 - 18	1.15

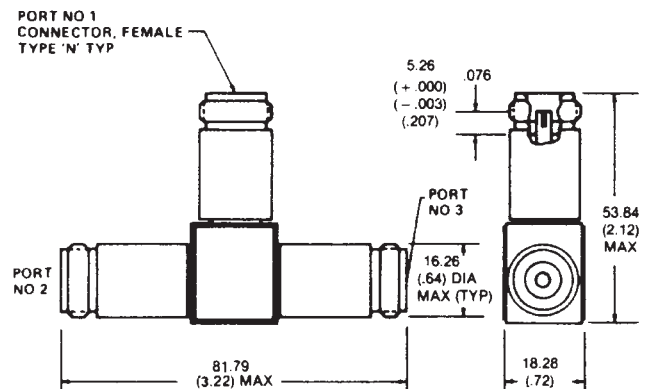
* When used in a leveling or ratio system.

TEST DATA: Insertion Loss, SWR, and Tracking measurements performed across the frequency band. Test data available at additional cost.

CONNECTORS: Type N female connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.

WEIGHT: Net 170 g (6 oz)

PHYSICAL DIMENSIONS:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Power Splitters & Dividers



Model 1593 Broadband Resistive Power Splitter (Matching), Subminiature, 3.5mm Connectors

dc to 26.5 GHz
1 Watt

RoHS



Features

These resistive power splitters are intended for RF and wireless applications in which one of the two outputs is included in a leveling loop or is used as a reference in a ratio system, for the purpose of providing an output signal whose source impedance is essentially matched to 50Ω. Some examples are:

- /// A dual channel insertion loss measuring system (ratio).
- /// A parallel IF substitution insertion loss measuring system (ratio or ALC loop).
- /// A precision power source (ratio or ALC loop).

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 26.5 GHz
INSERTION LOSS: 6 dB nominal, 8.5 dB maximum
 (Between input and either output)
MAXIMUM INPUT POWER: 1.0 watts CW (Input Connector only)

AMPLITUDE & PHASE TRACKING (Maximum):

Frequency (GHz)	Tracking	
	Amplitude	Phase
dc - 26.5	<0.25 dB	<4°

MAXIMUM INPUT SWR:

Frequency (GHz)	Maximum SWR
dc - 26.5	1.25

EQUIVALENT OUTPUT SWR (Port 2 & 3):

Frequency (GHz)	Maximum SWR
dc - 18	1.25
18 - 26.5	1.35

*When used in a leveling or ration system.

TEMPERATURE RANGE:

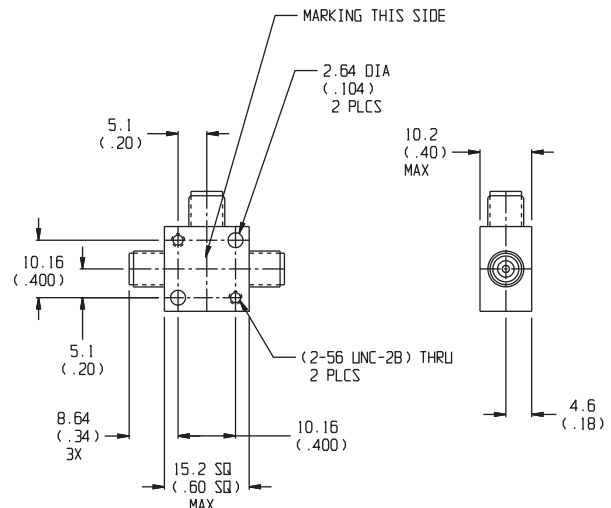
Operating: -55°C to +85°C
 Storage: -55°C to +125°C

TEST DATA: Insertion Loss, SWR, and Tracking measurements performed across the frequency band. Test data available at additional cost.

CONNECTORS: Female 3.5mm connectors all ports --mate nondestructively with SMA, 2.92mm and other 3.5mm connectors.

WEIGHT: 25 g (0.9 oz) maximum

PHYSICAL DIMENSIONS:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Model 1534 Broadband Resistive Power Splitter (Matching), Subminiature, SMK Connectors

dc to 40.0 GHz
1 Watt

RoHS



Features

These resistive power splitters are intended for RF and wireless applications in which one of the two outputs is included in a leveling loop or is used as a reference in a ratio system, for the purpose of providing an output signal whose source impedance is essentially matched to 50Ω. Some examples are:

- /// A dual-channel insertion loss measuring system where the resistive power splitter provides a reference and a signal channel for ratio meter.
- /// A parallel IF substitution insertion loss measuring system where the resistive power splitter provides a sampled output for leveling the signal source.
- /// A precision power source where a power meter of known characteristics is used, either by ratio or leveling to provide a calibrated output.

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 40.0 GHz

INSERTION LOSS: 6 dB nominal, 8.0 dB maximum to 26.5, 10.5 dB to 40 GHz
(Between input and either output)

MAXIMUM INPUT POWER: 1.0 watt CW (Input Connector only)

AMPLITUDE & PHASE RACKING (Maximum):

Frequency (GHz)	Tracking	
	Amplitude	Phase
dc - 18	<0.20 dB	<2°
18 - 26.5	<0.30 dB	<2°
26.5 - 40	<0.50 dB	<4°

MAXIMUM INPUT SWR:

Frequency (GHz)	Maximum SWR
dc - 18	1.25
18 - 26.5	1.40
26.5 - 40	1.60

EQUIVALENT OUTPUT SWR (Port 2 & 3):

Frequency (GHz)	Maximum SWR
dc - 26.5	1.35
26.5 - 40	160

*When used in a leveling or ration system.

TEMPERATURE RANGE:

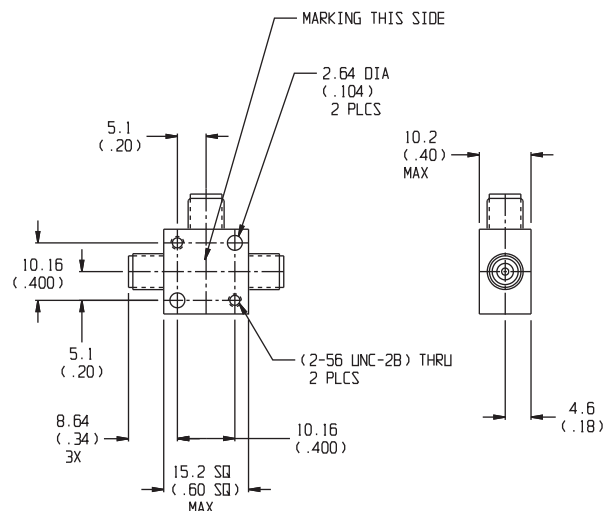
Operating: -55°C to +85°C
Storage: -55°C to +125°C

TEST DATA: Insertion Loss, SWR, and Tracking measurements performed across the frequency band. Test data available at additional cost.

CONNECTORS: Female SMK (2.92mm) connectors all ports--mate nondestructively with SMA, 2.92mm and other 2.92mm and 3.5mm connectors.

WEIGHT: 25 g (0.9 oz) maximum

PHYSICAL DIMENSIONS:

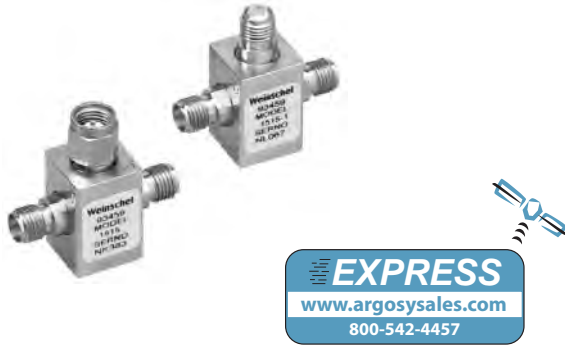


NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Model 1515 & 1515-1 Broadband Resistive Power Divider Ruggedized SMA Connectors

dc to 18.0 GHz
1 Watt

RoHS



Features

- Miniature Size & Lightweight - High power capability and high ambient temperature operation.
- Close Tracking & Low Frequency Sensitivity - Output power symmetry is excellent across the frequency range. Division is 6 dB from matched ports.

Specifications

- NOMINAL IMPEDANCE:** 50 Ω
- FREQUENCY RANGE:** dc to 18.0 GHz
- INSERTION LOSS (between input & either output arm):** 6 dB nominal, -0.2 dB, +1.2 to 10 GHz, 1.5 to 18 GHz
- MAXIMUM INPUT POWER:** 1 watt CW, 1 kilowatt peak (5 μsec pulse width, 0.05% duty cycle)
- NUMBER OF PORTS:** 3, interchangeable for input and output
- PHASE TRACKING:** 5° maximum between ports (J2 & J3) with input connector (J1).
- POWER COEFFICIENT:** < 0.005 dB/dB/watt

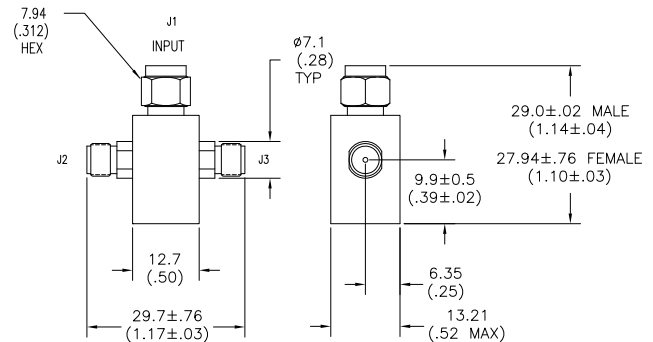
AMPLITUDE TRACKING-J2 & J3 (Maximum):

Frequency (GHz)	Tracking
dc - 4	0.2 dB
4 - 10	0.4 dB
10 - 18	0.5 dB

MAXIMUM SWR:

Frequency (GHz)	SWR
dc - 10	1.25
10 - 18	1.35

- TEMPERATURE COEFFICIENT:** < 0.0004 dB/dB/°C
- TEMPERATURE RANGE:** -55°C to +125°C
- CONSTRUCTION:** Nickel plated brass body; stainless steel connectors; gold plated beryllium copper contacts.
- TEST DATA:** Insertion loss data supplied at 50 MHz, 12.0, and 18.0 GHz. Other test data can be provided at additional cost.
- CONNECTORS: Model 1515:** Male SMA connector port 1 and Female SMA connectors ports 2 and 3.
- Model 1515-1:** SMA Female connectors all ports--all SMA connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.
- WEIGHT:** Net 30 g (1 oz)
- PHYSICAL DIMENSIONS:**



Model No.	Input Connector	Output Connector
1515	SMA Male	SMA Female
1515-1	SMA Female	SMA Female

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Power Splitters & Dividers



Model 1506A Broadband Resistive Power Divider Precision N Connectors

dc to 18.0 GHz
1 Watt

RoHS



MAXIMUM SWR:

Frequency (GHz)	SWR
dc - 10	1.25
10 - 18	1.35

POWER COEFFICIENT: < 0.005 dB/dB/watt

TEMPERATURE COEFFICIENT: < 0.0004 dB/dB/°C

TEMPERATURE RANGE: -55°C to +125°C

CONSTRUCTION: Nickel plated brass body; stainless steel connectors; gold plated beryllium copper contacts.

TEST DATA: Insertion loss data supplied at 50 MHz, 6.0, 12.0, and 18.0 GHz on nameplate only. No paper data supplied. Other test data can be provided at additional cost.

CONNECTORS: Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.

WEIGHT: Net 140 g (5 oz)

PHYSICAL DIMENSIONS:

Features

- /// **Accurate Division and Low Frequency Sensitivity** - The symmetry of output power between the two arms is excellent across the frequency range.
- /// **High Stability** - Low temperature and power coefficients ensure attenuation stability.
- /// **Test Data** - Each divider is calibrated at four frequencies, and the data is supplied on a permanently attached test data plate.
- /// **Matched Ports** - Symmetrical 6 dB division permits any port to be used as input.

Specifications

NOMINAL IMPEDANCE: 50 Ω

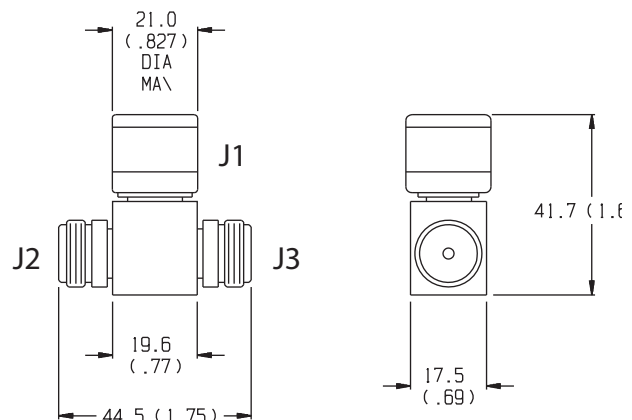
FREQUENCY RANGE: dc to 18.0 GHz

MAXIMUM INPUT POWER: 1 watt CW, 1 kilowatt peak (5 μsec pulse width, 0.05 % duty cycle)

INSERTION LOSS (between input & one output arm): 6 dB nominal, -0.2, +1.2 dB maximum to 10.0 GHz; +1.5 dB maximum to 18.0 GHz.

NUMBER OF PORTS: 3, interchangeable for input and output

PHASE TRACKING: 5° maximum between ports (J2 & J3) with input connector (J1).



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

AMPLITUDE TRACKING (Maximum):

Frequency (GHz)	Tracking
dc - 4	0.2 dB
4 - 10	0.4 dB
10 - 18	0.5 dB

Models 1580 & 1580-1
Broadband Resistive Power Dividers
3.5mm Connectors

dc to 26.5 GHz
1 Watt

RoHS



MAXIMUM SWR:

Frequency (GHz)	SWR
dc - 18	1.20
18 - 26.5	1.30

CONSTRUCTION: Gold plated brass body; stainless steel connectors; gold plated beryllium copper contacts.

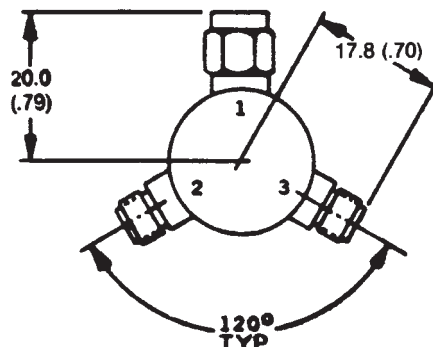
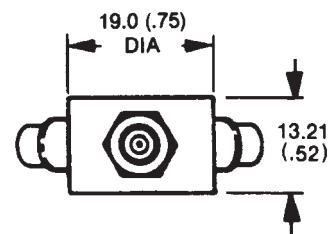
TEST DATA: Insertion loss, SWR and Tracking data covering 153 frequency points between 50 MHz and 26.5 GHz.

CONNECTORS:

Model 1580: Male 3.5mm connector port 1 and Female 3.5mm connectors ports 2 and 3--all mate nondestructively with SMA, 2.92mm and other 3.5mm connectors.

Model 1580-1: Female 3.5mm connectors all ports--mate nondestructively with SMA, 2.92mm and other 3.5mm connectors.

PHYSICAL DIMENSIONS:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Features

- /// **Miniature Size & Lightweight** - High power capability and high ambient temperature operation.
- /// **Close Tracking & Low Frequency Sensitivity** - Output power symmetry is excellent across the frequency range. Division is 6 dB from matched ports.
- /// **Test Data** - Provided for 153 frequency points

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 26.5 GHz

MAXIMUM INPUT POWER: 1 watt CW, 500 watt pulse

INSERTION LOSS (between input & one output arm): 6 dB nominal, 7.5 maximum to 18 GHz and 8.5 maximum to 26.5 GHz.

NUMBER OF PORTS: 3, interchangeable for input and output

TRACKING (Maximum):

Frequency (GHz)	Amplitude	Phase
dc - 26.5	0.30 dB	8°

POWER COEFFICIENT: < 0.005 dB/dB/watt

TEMPERATURE COEFFICIENT: < 0.0004 dB/dB/°C

TEMPERATURE RANGE: -55°C to +125°C

Power Splitters & Dividers



Model 1575 Broadband Resistive Power Divider Subminiature, SMK Connectors

dc to 40.0 GHz
1.0 Watt

RoHS



MAXIMUM SWR:

Frequency (GHz)	SWR
dc - 19	1.40
19 - 40	1.70

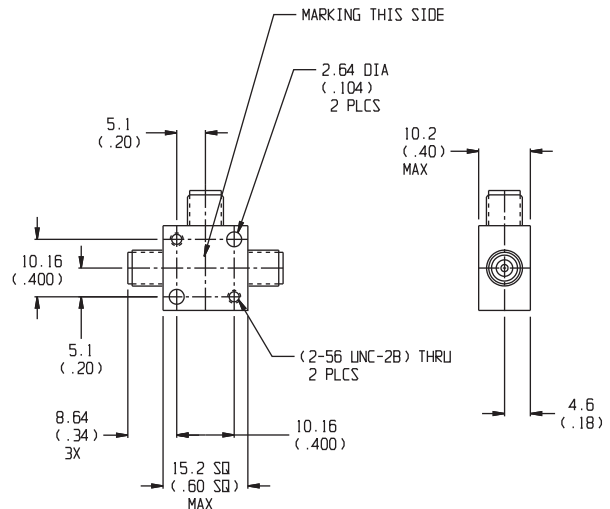
TEMPERATURE RANGE: -55°C to +85°C

TEST DATA: Insertion Loss, SWR, and Tracking measurements performed across the frequency band. Test data available at additional cost.

CONNECTORS: Female SMK (2.92mm) connectors all ports--mate nondestructively with SMA, 2.92mm and other 2.92mm and 3.5mm connectors.

WEIGHT: 25 g (0.9 oz) maximum

PHYSICAL DIMENSIONS:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Features

This three resistor Power Divider is designed for applications where an RF and Microwave signal must be accurately divided or combined.

- /// **Miniature Size and Lightweight** - High power capability and high ambient temperature operation.
- /// **Close Tracking and Low Frequency Sensitivity** - Output power symmetry is excellent across the frequency range. Division is 6 dB from matched ports.

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 40.0 GHz

INSERTION LOSS (Between input and either output):
6 dB nominal, 8.5 dB maximum

MAXIMUM INPUT POWER: 1.0 watts CW, 1 kilowatt peak, 5 μsec pulse width

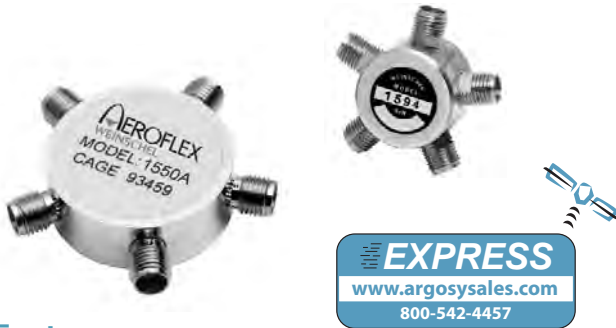
NUMBER OF PORTS: 3, interchangeable for input and output

AMPLITUDE & PHASE TRACKING (Maximum):

Frequency (GHz)	Tracking	
	Amplitude	Phase
dc - 19	<0.25 dB	2°
19 - 40	<0.50 dB	5°

Model 1550A Model 1594 4-WAY Resistive Power Dividers Subminiature, SMA / 3.5mm Connectors

RoHS



Features

- /// **Broadband Performance.**
- /// **Excellent Tracking Between Ports.**
- /// **Miniature Size and Light Weight.**
- /// **Wireless Applications** - Model 1550A is specifically designed for use in the wireless communications bands.

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: 1550A: dc to 3.0 GHz (usable to 5 GHz)
 1594: dc to 18.0 GHz

INSERTION LOSS*:
 Model 1550A: 12 dB nominal, 13.5 dB maximum
 Model 1594: 12 dB nominal, 14.5 dB maximum
 * input port to any output port with all other terminated.

MAXIMUM INPUT POWER: 1550A: 1 watt CW
 1594: 2 watts CW

AMPLITUDE & PHASE TRACKING (Maximum):			
Model No.	Frequency (GHz)	Tracking*	
		Amplitude	Phase
1550A	dc - 3	±0.5 dB	±10°
1594	dc - 12	<2.0 dB	<30°
	12 - 18	<2.5 dB	<50°

*Between output ports.

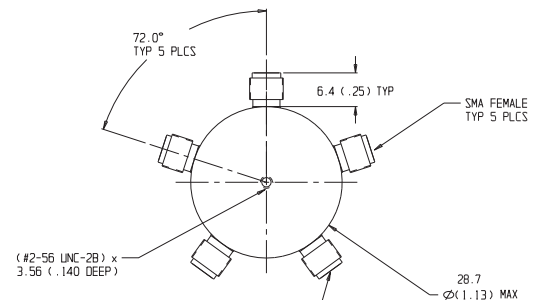
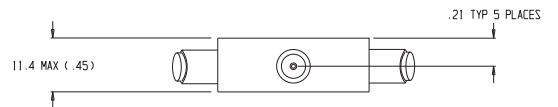
NUMBER OF PORTS: 1 input and 4 outputs
TEMPERATURE RANGE: -55°C to +100°C
CONNECTORS: Model 1550A: SMA female connectors all ports--mate nondestructively with other SMA, 2.92mm and 3.5mm connectors.
 Model 1594: 3.5mm female connectors all ports--mate non-destructively with other SMA, 2.92mm and 3.5mm connectors.

MAXIMUM SWR:	
Model No.	SWR
1550A	1.25
1594	1.30

WEIGHT: 1550A: 28 g (1.0 oz) maximum
 1594: 30 g (1.05 oz) maximum

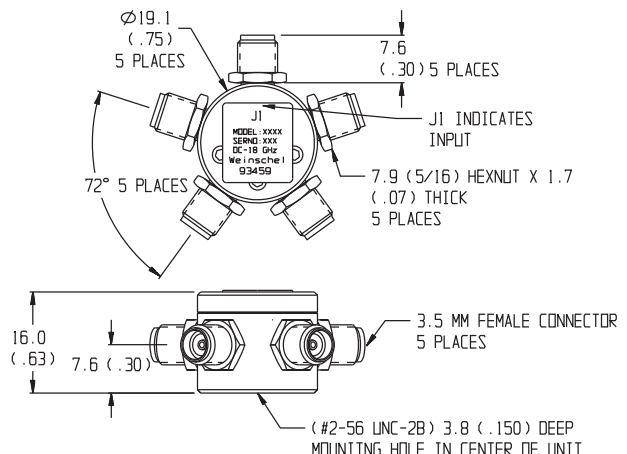
PHYSICAL DIMENSIONS:

Model 1550A:



CAUTION:
 TORQUE ON CONNECTORS NOT TO EXCEED 7 TO 10 INCH POUNDS (PER MIL-C-39012). THESE CONNECTORS ARE PRESS FIT. EXCEEDING THIS MAY CAUSE CONNECTOR TO COME LOOSE.

Model 1594:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Mechanical Phase Shifters



- /// DC to 20 GHz; Low Loss; Linear
- /// **Self Locking** - Internal mechanism eliminates the need for a locking nut. Ideal for phase trimming in densely packaged systems with minimum accessibility.
- /// **EDGE LINE** designs for ultra fine resolution to 22 GHz
- /// **COAXIAL** designs for broadband low-loss operation to 18 GHz
- /// **STRIPLINE** designs for lower cost applications to 12 GHz

General Information

In this section of the catalog, each Phase Shifter is outlined utilizing individual data sheets containing product features, specifications, and outline drawings. These data sheets are preceded by a quick reference guide to help you select the Phase Shifter(s) that fits your needs. The page number for each phase shifter data sheet is given in the quick reference guide.

Aeroflex / Weinschel offers a variety of Mechanical Phase Shifter designs that are ideally suited for delay line applications in optical and RF Networks. These designs provide linear adjustable phase shift in a very small in-line coaxial packages with long mechanical cycle life. Models can also be easily adapted to motorized control configurations.

NOTE: **EXPRESS** Shipment available via www.argosysales.com or 800-542-4457. Check with distributor for current products and stocking quantities.





Phase Shifters...dc to 20 GHz

Model Number	Frequency Range (GHz)	Connector Type	Incremental Phase Shift (Minimum)	Insertion Phase (Typical)	Average Power (Watts)	Maximum Insertion Loss (dB)	Maximum SWR	Page No.
♦ 917	dc to 20.0	SMK (2.92mm)	225° @ 20 GHz, 100° at 9 GHz.	890° @ 10 GHz	20	0.8	1.50	169
980-1	dc to 3.0	SMA	140° @ 3.0 GHz	560° @ 3.0 GHz	10	0.7-1.2*	1.30	167
♦ 980-2	dc to 3.0	SMA	340° @ 3.0 GHz	780° @ 3.0 GHz	10	1.5-2.0*	1.35	
♦ 980-3	dc to 7.0	SMA	170° @ 7.0 GHz	700° @ 3.0 GHz	10	0.5	1.30	
♦ 980-4	dc to 12.4	SMA	290° @ 12.0 GHz	1200° @ 12.0 GHz	10	1.0	1.45	
980K-1	dc to 3.0	SMA	140° @ 3.0 GHz	560° @ 3.0 GHz	10	0.7-1.2*	1.30	167
♦ 980K-2	dc to 3.0	SMA	340° @ 3.0 GHz	780° @ 3.0 GHz	10	1.5-2.0*	1.35	
980K-3	dc to 7.0	SMA	170° @ 7.0 GHz	700° @ 3.0 GHz	10	0.5	1.30	
980K-4	dc to 12.4	SMA	290° @ 12.0 GHz	1200° @ 12.0 GHz	10	1.0	1.45	
♦ 981	dc to 18.0	3.5mm	60° /GHz	1350@9.0 GHz	50 f = GHz	0.5+0.035 f *	1.80	170

* VARIES WITH FREQUENCY.

♦ EXPRESS Shipment available via www.argosysales.com or 800-542-4457.

Note: Other models may also be available from Express delivery.

Frequently Asked Questions about Phase Shifters . . .

Can you define the Characteristic Insertion Phase for a Mechanical Phase Shifter?

Mechanical phase shifters have an inherent delay / Zero phase shift even when sitting in the minimum position. That phase is the Characteristic Insertion Phase and is provided as a typical value.

Insertion phase is considered the fixed value of the phase shifter and is measured at the minimum setting.

What is Incremental phase shift?

Incremental phase shift is the adjustable amount of phase at a given frequency, over and above the insertion phase.

How is the absolute phase shift calculated for Model 980 series?

The absolute phase shift at any desired frequency is equal to the insertion phase plus the incremental adjustable phase.

The adjustable phase shift is realized in a total rotation of approximately ¼ turn of the adjustment shaft/knob. (minimum to maximum)

Phase vs. Frequency is a nominally linear response

$$\text{Time Delay} = \frac{\Delta\theta}{2\pi f} = \text{pSec}$$

$$\Delta\theta \text{ in radians, } f \text{ in GHz}$$

As frequency changes, phase shift change linearly, but time delay remains the same.

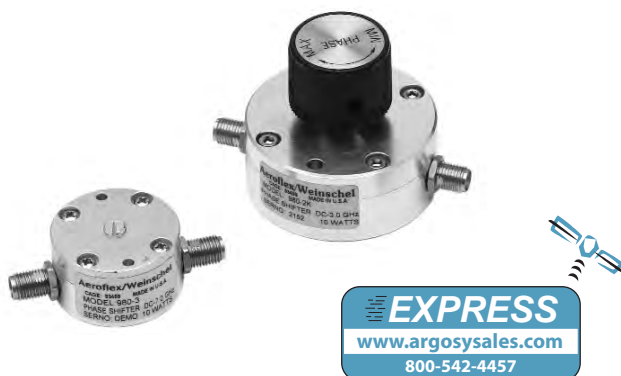
Mechanical Phase Shifters



Model 980 Coaxial Phase Shifters SMA Connectors

dc to 3.0/7.0/12.0 GHz
10 Watts

RoHS



Features

- /// **Self Locking** - Internal mechanism eliminates the need for a locking nut. Ideal for phase trimming in densely packaged systems with minimum accessibility.
- /// **Available Express Models** - 980-2, 980-2K, 980-3, 980-4
Other models may be available for Express Delivery.
- /// **Linear** - Nominally linear phase over the frequency range.
- /// **Optimized for Wireless OEM Applications.**
- /// **New Models with Adjustment Knobs**
(See Models 980-1K through 980-4K).

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE:

Model 980-1 & 980-1K:	dc to 3.0 GHz
Model 980-2 & 980-2K:	dc to 3.0 GHz
Model 980-3 & 980-3K:	dc to 7.0 GHz
Model 980-4 & 980-4K:	dc to 12.0 GHz

INCREMENTAL PHASE SHIFT (typical):

Model 980-1 & 980-1K:	140° @ 3.0 GHz
Model 980-2 & 980-2K:	340° @ 3.0 GHz
Model 980-3 & 980-3K:	170° @ 7.0 GHz
Model 980-4 & 980-4K:	290° @ 12.0 GHz

Incremental phase shift is adjustable phase range over and above it's insertion phase

PHASE VS FREQUENCY: Nominally linear response

INSERTION PHASE:

Model 980-1 & 980-1K:	560° (Typical) @ 3.0 GHz
Model 980-2 & 980-2K:	780° (Typical) @ 3.0 GHz
Model 980-3 & 980-3K:	700° (Typical) @ 7.0 GHz
Model 980-4 & 980-4K:	1200° (Typical) @ 12.0 GHz

MAXIMUM INSERTION LOSS (dB):

Model No.	Frequency Range (GHz)			
	1.5	3.0	7.0	12.0
980-1 & -1K	0.70 dB	1.20 dB	---	---
980-2 & -2K	1.50 dB	2.00 dB	---	---
980-3 & -3K	0.50 dB	0.50 dB	0.50 dB	---
980-4 & -4K	1.00 dB	1.00 dB	1.00 dB	1.00 dB

MAXIMUM SWR:

Frequency Range (GHz)	Model No.			
	980-1/1K	980-2/2K	980-3/3K	980-4/4K
dc - 3	1.30	1.35	1.30	1.30
3 - 7	---	---	1.30	1.30
7 - 12	---	---	---	1.60

POWER RATING: 10 watts average

TEMPERATURE RANGE:

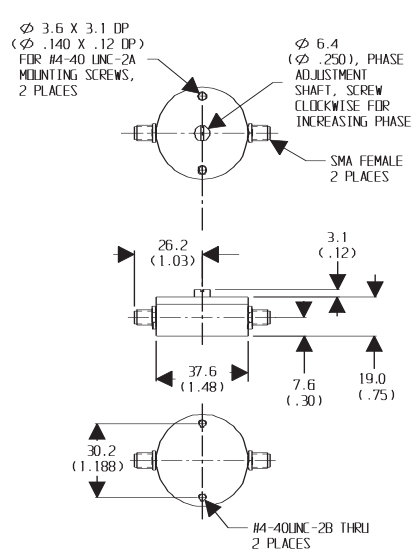
Operating:	-50°C to 85°C
Storage:	-50°C to 125°C

CONNECTOR: SMA female connector per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connector.

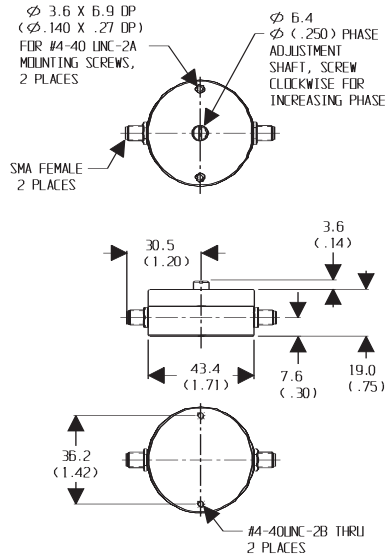
WEIGHT:

Models 980-1 & 980-2:	65 g (2.29 oz)
Models 980-1K & 980-2K:	78 g (2.75 oz)
Model 980-3 & 980-4:	35 g (1.24 oz)
Model 980-3K & 980-4K:	48 g (1.69 oz)

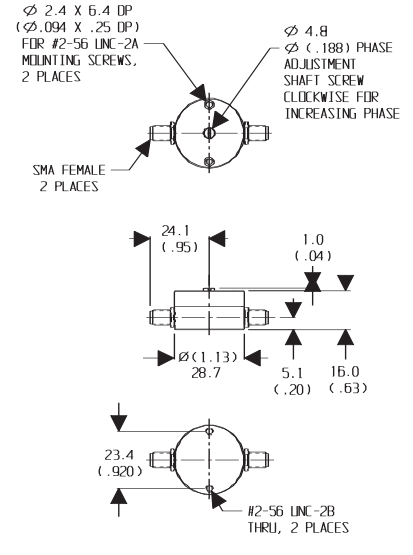
PHYSICAL DIMENSIONS:



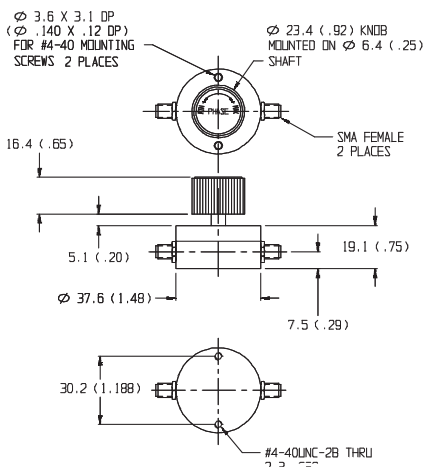
MODEL 980-1



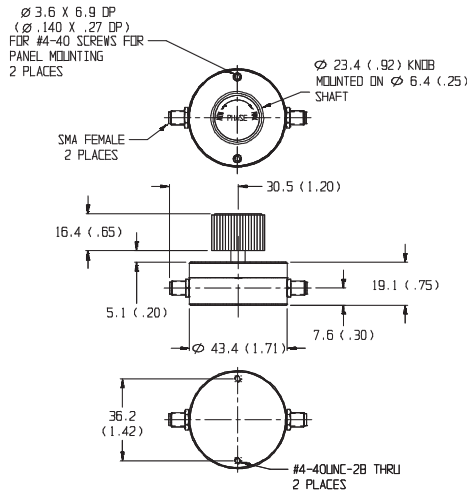
MODEL 980-2



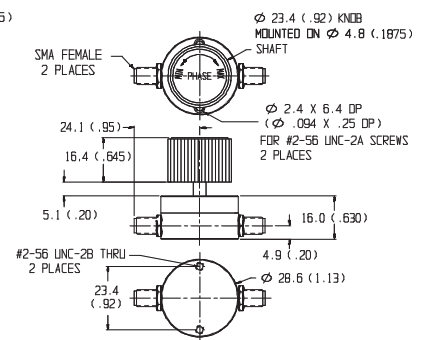
MODELS 980-3 & 980-4



MODEL 980-1K



MODEL 980-2K



MODEL 980-3K & 980-4K

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Mechanical Phase Shifters



Model 917 Miniature In-Line Phase Shifter Ruggedized 2.92mm Connector

dc to 20.0 GHz
20 Watts



CONNECTOR: SMK (2.92mm) connector compatible with SMA, 3.5mm, SMK and other 2.92mm connectors. Available connector options are:

Connector Options	Type/Description
1	SMK, Female
2	SMK, Male

WEIGHT: 45 g (1.6 oz)

PHYSICAL DIMENSIONS:

Features

- /// **Self Locking** - Internal mechanism eliminates the need for a locking nut. Ideal for phase trimming in densely packaged systems with minimum accessibility.
- /// **Linear** - Provides a linear adjustable phase shift to 20 GHz in a very small in-line coaxial package.

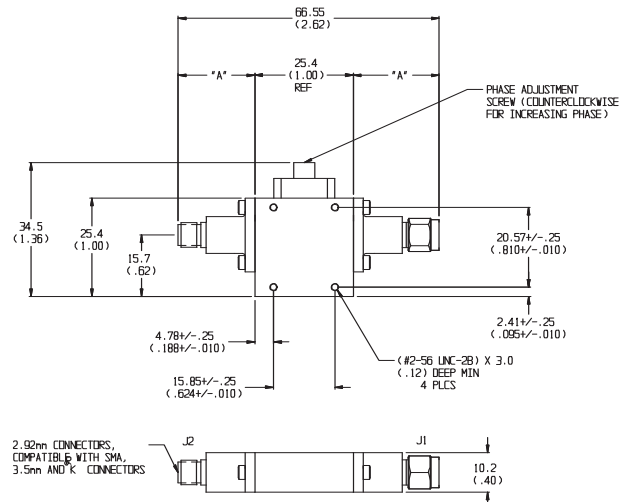
Specifications

- NOMINAL IMPEDANCE:** 50 Ω
- FREQUENCY RANGE:** dc to 20.0 GHz
- INCREMENTAL PHASE SHIFT:** Adjustable to 225° @ 20 GHz; 100° at 9 GHz (typical).
- RESOLUTION:** 0.5° per turn per GHz, typical (Adjustment shaft has 20 turns for full range).
- INSERTION PHASE:** 890° @ 10 GHz (Typical)
- PHASE VS FREQUENCY:** Nominally linear response
- INSERTION LOSS:** 0.8 dB maximum (0.5 dB typical @ 20 GHz)

MAXIMUM SWR:

Frequency Range (GHz)	SWR
dc - 20	1.5

- POWER RATING:** 20 watts average
- TEMPERATURE RANGE:** -55°C to 125°C.



CONN TYPE	DIM A
Female	19.81 (0.78)
Male	21.34 (0.84)

NOTE: All dimensions are given in mm (inches) and are nominal ±0.5 (0.02), unless otherwise specified.

MODEL NUMBER DESCRIPTION:

Example:

917 - XX

Basic Model Number

Connector Options*
1st digit is J1 side
2nd digit is J2 side

For More Information:



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