

Bias Tees

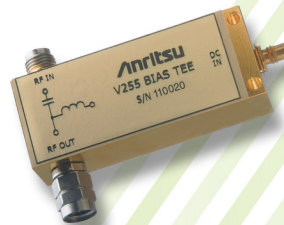
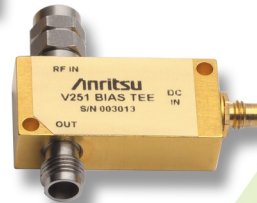
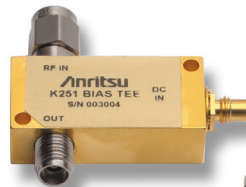
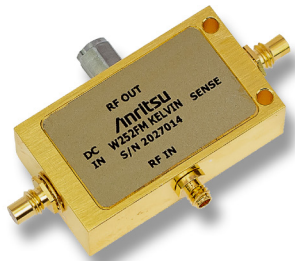
Precision, Kelvin, Ultra-wideband

K250 / V250
Bias Tee
100 MHz to 40 GHz
100 MHz to 60 GHz

K251 / V251
Wide-Band Bias Tee
50 kHz to 40 GHz
100 kHz to 65 GHz

V255 / W255MF / W255FM
Ultra Wide-Band Bias Tee
50 kHz to 65 GHz
50 kHz to 110 GHz

K252 / V252 / W252MF/ W252FM
Kelvin Bias Tee
100 MHz to 40 GHz
100 MHz to 65 GHz
100 MHz to 110 GHz



Introduction

Anritsu Bias Tees are designed for applications where both DC and RF signals must be applied to a device under test. Performance of Anritsu bias tees and kelvin bias tees can be attributed to their metrology-grade quality, robust mechanical designs, and trademarked RF connectors. K Connector™, V Connector™, and W1 Connector™ are fitted onto each bias tee to ensure minimal signal interaction through the connector whilst providing low insertion loss and good return loss characteristics.

Anritsu has a wide selection of bias tees to choose from. Standard bias tee offerings are available from frequencies as low as 50 kHz and frequencies as high as 110 GHz. Anritsu features standard, wide-band, and ultra-wide band bias tees allowing customers flexibility for frequency coverage depending on the application.

For kelvin bias tees, Anritsu offers frequency coverage of 100 kHz to 40/65 GHz and 100 MHz to 110 GHz. The kelvin bias tees are designed for applications where precise DC measurements are required. A high resistance of the DC coil results in a voltage drop that leads to a DC biasing error. With the sense coil on the kelvin bias tee, biasing errors can be minimized as the connection occurs post DC coil.

All bias tees come with an SMC connector for DC biasing.

Features

- 50 kHz to 110 GHz frequency coverage on standard bias tee products
- 100 MHz to 110 GHz frequency coverage on kelvin bias tee products
- The W1 connector™ is compatible with 1.00 mm connectors
- The V connector™ is compatible with 2.4 and 1.85 mm connectors
- The K connector™ is compatible with SMA, 3.5, and 2.92 mm connectors
- Design is robust and well suited for high-frequency system and instrumentation applications

Specifications

Available Models

Model	Frequency Range	RF Connectors ^a	DC Connectors	Impedance
W255MF	50 kHz to 110 GHz	In: W1(m) Out: W1(f)	SMC(m)	50 Ω
W255FM	50 kHz to 110 GHz	In: W1(f) Out: W1(m)	SMC(m)	50 Ω
W252MF	100 MHz to 110 GHz	In: W1(m) Out: W1(f)	SMC(m)	50 Ω
W252FM	100 MHz to 110 GHz	In: W1(f) Out: W1(m)	SMC(m)	50 Ω
V255	50 kHz to 65 GHz	In: V(f) Out: V(m)	SMC(m)	50 Ω
V251	100 kHz to 65 GHz	In: V(m) Out: V(f)	SMC(m)	50 Ω
V252	100 MHz to 65 GHz	In: V(m) Out: V(f)	SMC(m)	50 Ω
V250	100 kHz to 65 GHz	In: V(m) Out: V(f)	SMC(m)	50 Ω
K251	50 kHz to 40 GHz	In: K(m) Out: K(f)	SMC(m)	50 Ω
K250	100 MHz to 40 GHz	In: K(m) Out: K(f)	SMC(m)	50 Ω
K252	100 MHz to 40 GHz	In: K(m) Out: K(f)	SMC(m)	50 Ω

a. Out refers to DC + RF Out.

Specifications

Electrical

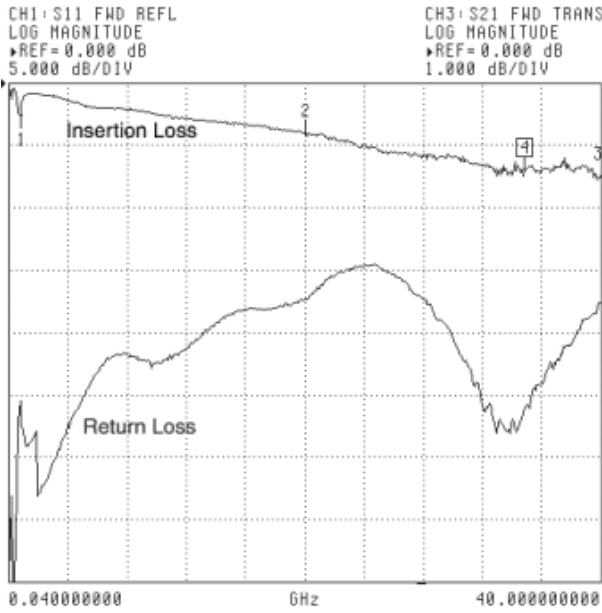
Typical specifications are not tested and are not warranted. They are generally representative of characteristic performance. Warranty: 1 year. Calibration period: 6 months. All specifications subject to change without notice.

For the most current data sheet, please visit the Anritsu web site: www.anritsu.com

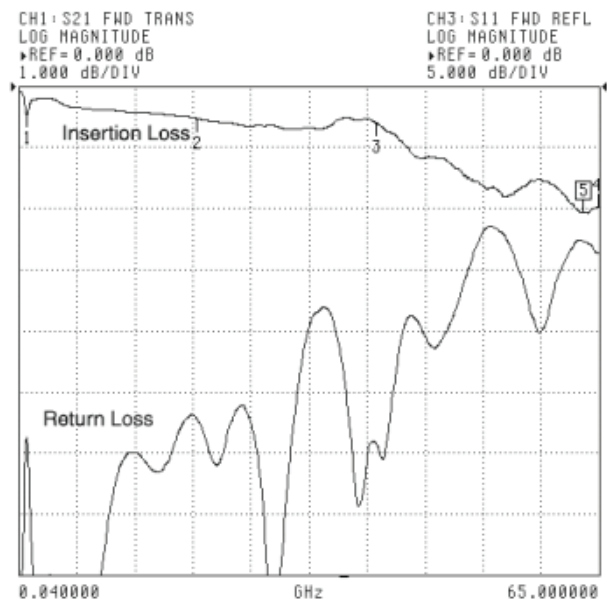
Model	Insertion Loss (dB)	Return Loss (dB)	Max DC Current (A)	Max DC Voltage (V)	Max RF Power (W)	Rise Time ^a (ps)	Group Delay ^a (ps)	Leakage Current ^a
W255 FM / MF	< 2.8	4 dB min at 50 kHz to 1 MHz 13 dB min at > 1 MHz to 22 GHz 10 dB min at > 22 GHz to 65 GHz 8 dB min at > 65 GHz to 110 GHz	0.4	16	1	3.2	108	80 pA
W252 FM / MF	< 3.5	12 dB min at 100 MHz to 26 GHz 9.5 dB min at > 26 GHz to 65 GHz 8 dB min at > 65 GHz to 110 GHz	0.4	16	1	3.2	108	80 pA
V255	1.25 ^a	< 15 ^a at 65 GHz	0.4	10		3	125	30 pA
V251	< 2.5 ^a	See Plot	0.1	16	1	< 5	113	50 nA
V252	< 3.7 ^a	10 at 60 GHz 8 at 65 GHz	0.5	50	1	-	-	20 pA
V250	< 2.2 ^a	13 ^b at 20 GHz 19 ^b at 40 GHz 8 ^b at 60 GHz	0.5	30	1	-	-	-
K251	< 2 ^a	See Plot	0.1	16	1	< 7	110	-
K250	< 1.2 ^a	15 ^b at 20 GHz 10 ^b at 40 GHz	0.5	30	1	-	-	-
K252	< 2.5 ^a	11	0.5	50	1	-	-	5 nA

a. Typical

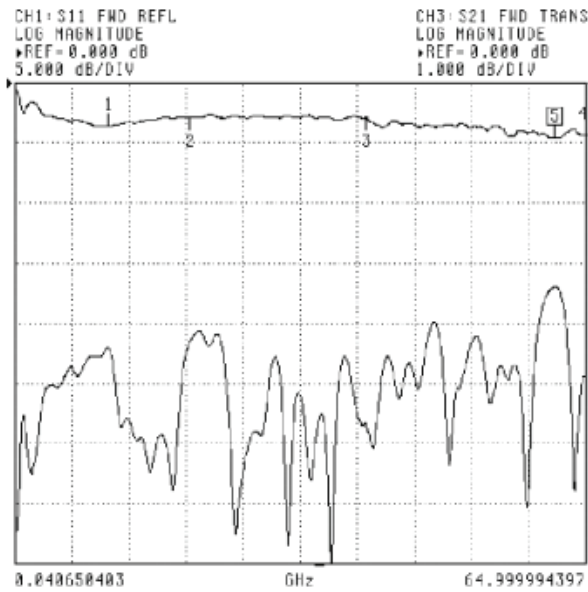
b. Minimum



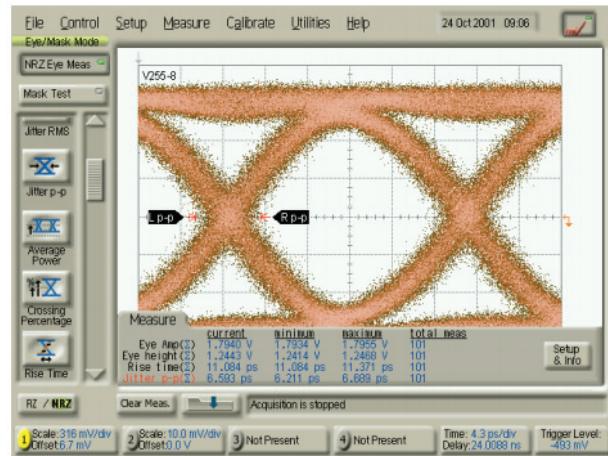
K251 Typical Return Loss/Insertion Loss



V251 Typical Return Loss/Insertion Loss

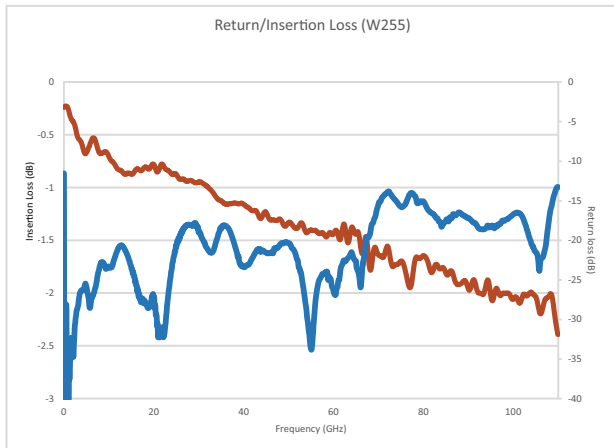


V255 Typical Return Loss/Insertion Loss

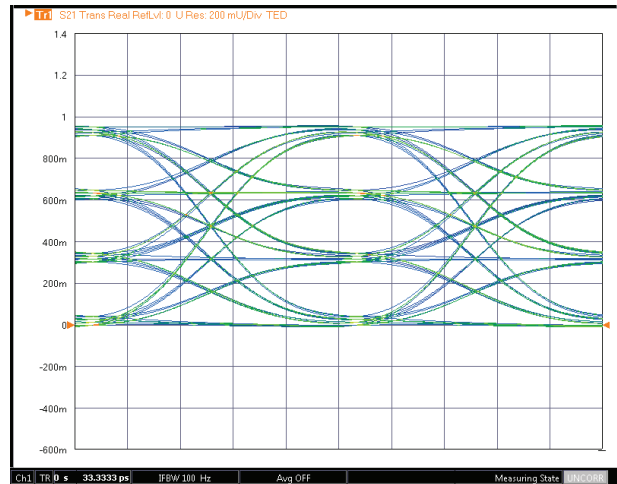


V255 Typical Eye Diagram

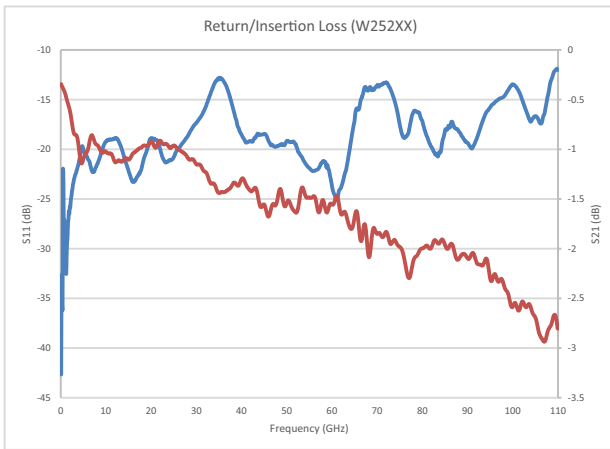
Specifications



W255 Typical Return Loss/Insertion Loss



W255 Scale vs Time (ns) PAM4 Eye Diagram with 60 GBPS Rate



W252XX Typical Return Loss/Insertion Loss

General

Weight	W252MF: 32 g
	W252FM: 32 g
	W255MF: 31.24 g
	W255FM: 31.24 g
	V255: 31.25 g
	V251: 31.25 g
	V252: 32 g
	V250: 31.25 g
	K251: 31.25 g
	K250: 31.25 g
	K252: 32 g

Environmental Tests per MIL-STD-202F

Thermal Shock	-55 °C to +150 °C
Shock	100 G _n peak sawtooth, method 213, test condition 1
Vibration	Sinewave: 10 Hz to 2000 Hz, 0.06" DA, method 204, test condition D
	Random: 50 Hz to 2000 Hz, 11.6 Grms, Power Spectral Density 0.1 Grms 2 Hz, Method 214, Test Condition 1, Letter D

Regulatory Compliance

K250, V250, K251, V251, K252, V252, V255, W255MF, W255FM, W252MF, W252FM RoHS Directive 2015/863/EU

Included

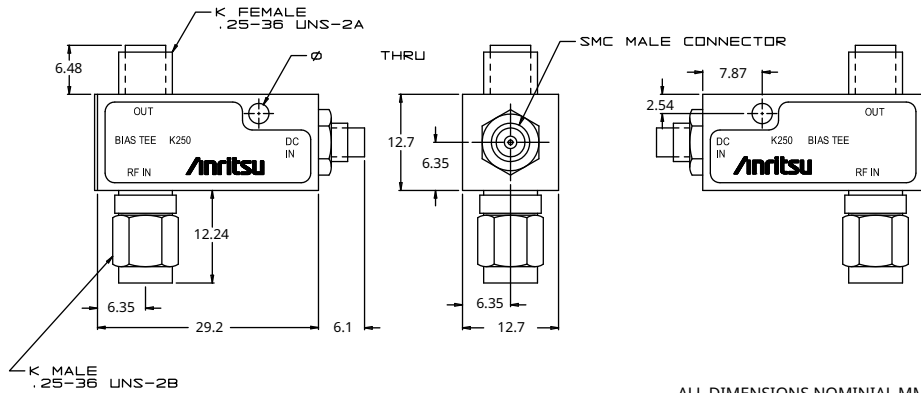
RG174 Coaxial cable, BNC(m) to SMC(m), 48 inches (1 cable for Standard Bias Tee, 2 cables for Kelvin Bias Tees)

Ordering Information

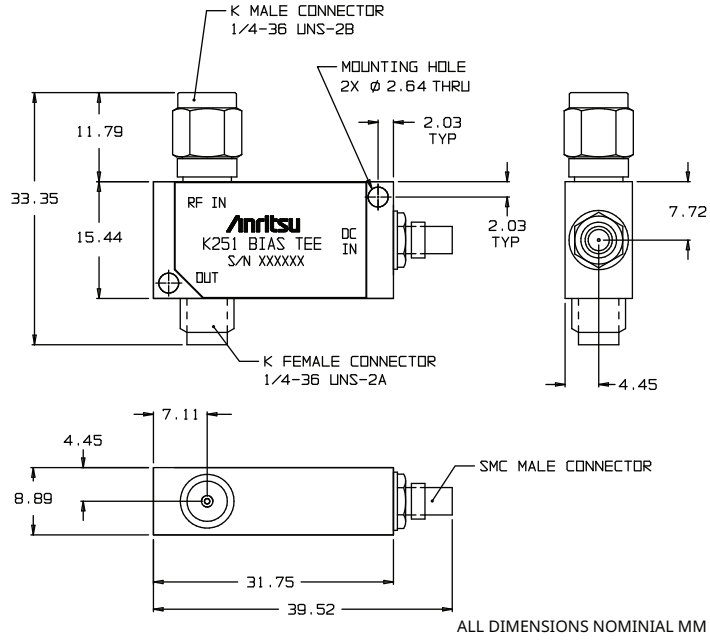
W252MF	Precision Ultra Wide Band Kelvin Bias Tee, 100 MHz to 110 GHz, W1(m) input, W1(f) output, SMC(m) bias and sense
W252FM	Precision Ultra Wide Band Kelvin Bias Tee, 100 MHz to 110 GHz, W1(f) input, W1(m) output, SMC(m) bias and sense
W255MF	Precision Ultra Wide Band Bias Tee, 50 kHz to 110 GHz, W1(m) input, W1(f) output, SMC(m) bias
W255FM	Precision Ultra Wide Band Bias Tee, 50 kHz to 110 GHz, W1(f) input, W1(m) output, SMC(m) bias
V255	Precision Ultra Wide Band Bias Tee, 50 kHz to 65 GHz, V(f) input, V(m) output, SMC(m) bias
V251	Ultra Wide Band Bias Tee, 100 kHz to 65 GHz, V(m) input, V(f) output, SMC(m) bias
V252	Ultra Wide Kelvin Band Bias Tee, 100 MHz to 65 GHz, V(m) input, V(f) output, SMC(m) bias and sense
V250	Precision Band Bias Tee, 100 MHz to 60 GHz, V(m) input, V(f) output, SMC(m) bias
K251	Ultra Wide Band Bias Tee, 50 kHz to 40 GHz, K(m) input, K(f) output, SMC(m) bias
K250	Ultra Wide Band Bias Tee, 100 MHz to 40 GHz, K(m) input, K(f) output, SMC(m) bias
K252	Ultra Wide Band Kelvin Bias Tee, 100 MHz to 40 GHz, K(m) input, K(f) output, SMC(m) bias and sense
SC8218	Cable, Triax (male) - SMC (female) (Inner-shield floating at SMC end), 1.5m (60 inches) long, two (2) cables needed per Kelvin Bias Tee)

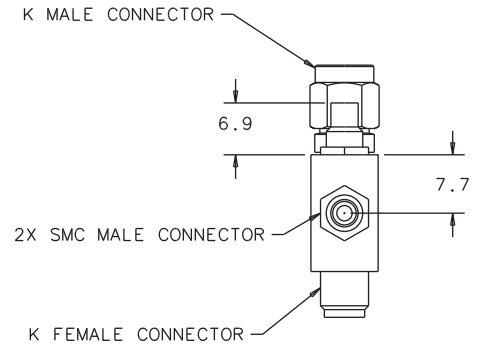
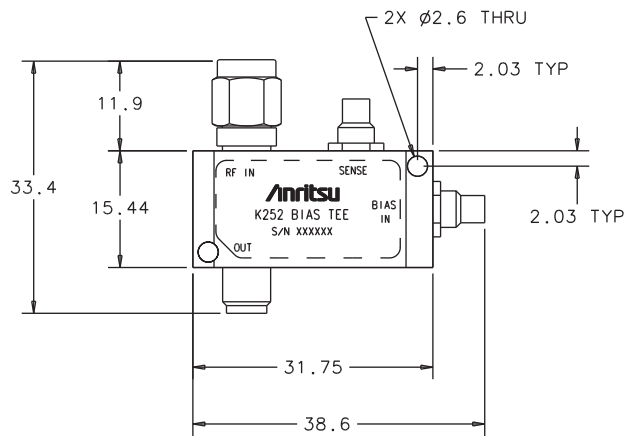
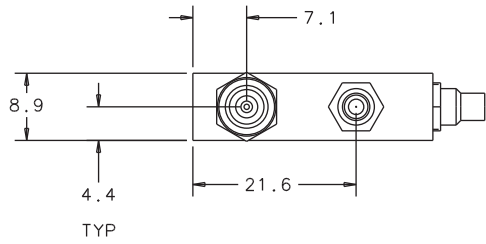
Dimensions

- The OUT port refers to DC + RF Out.
- All dimensions are in millimeters.

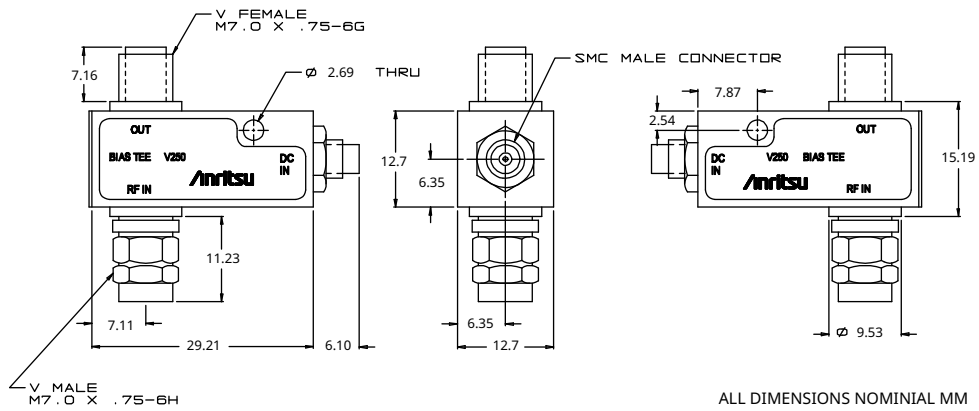


Specifications



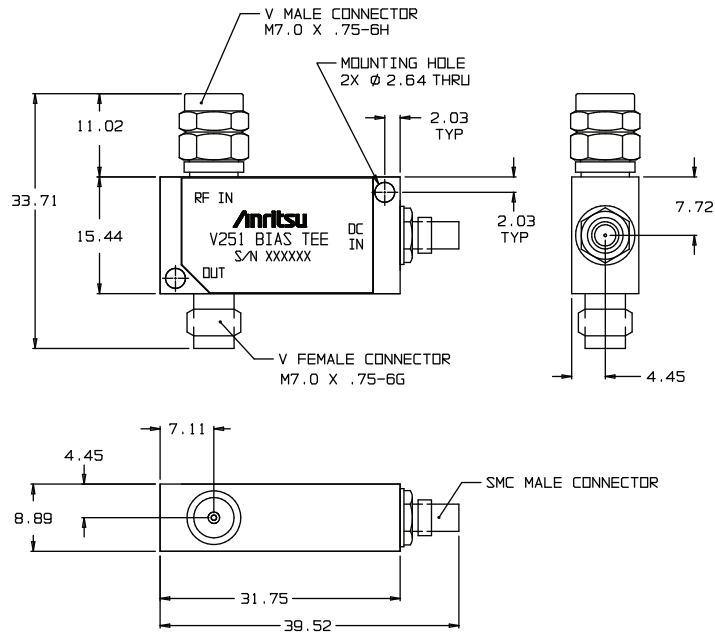


ALL DIMENSIONS NOMINAL MM

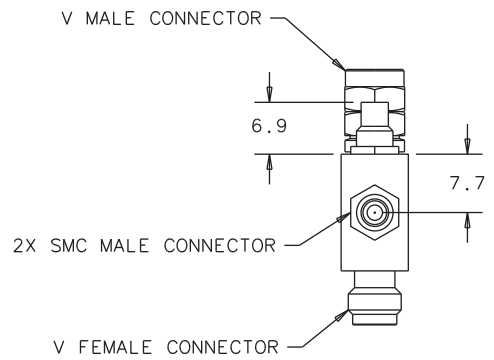
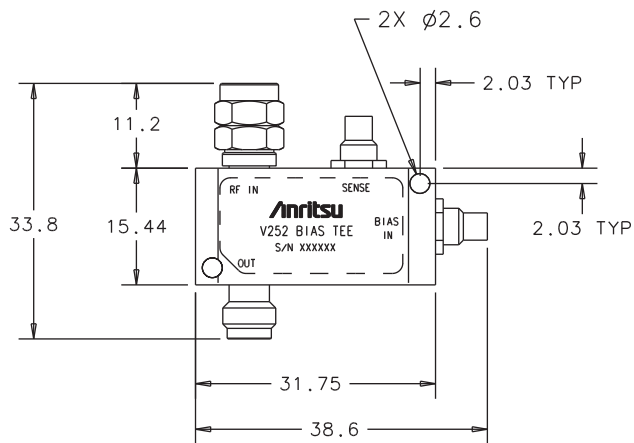
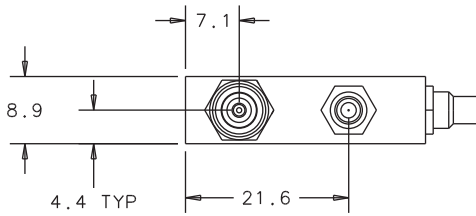


ALL DIMENSIONS NOMINAL MM

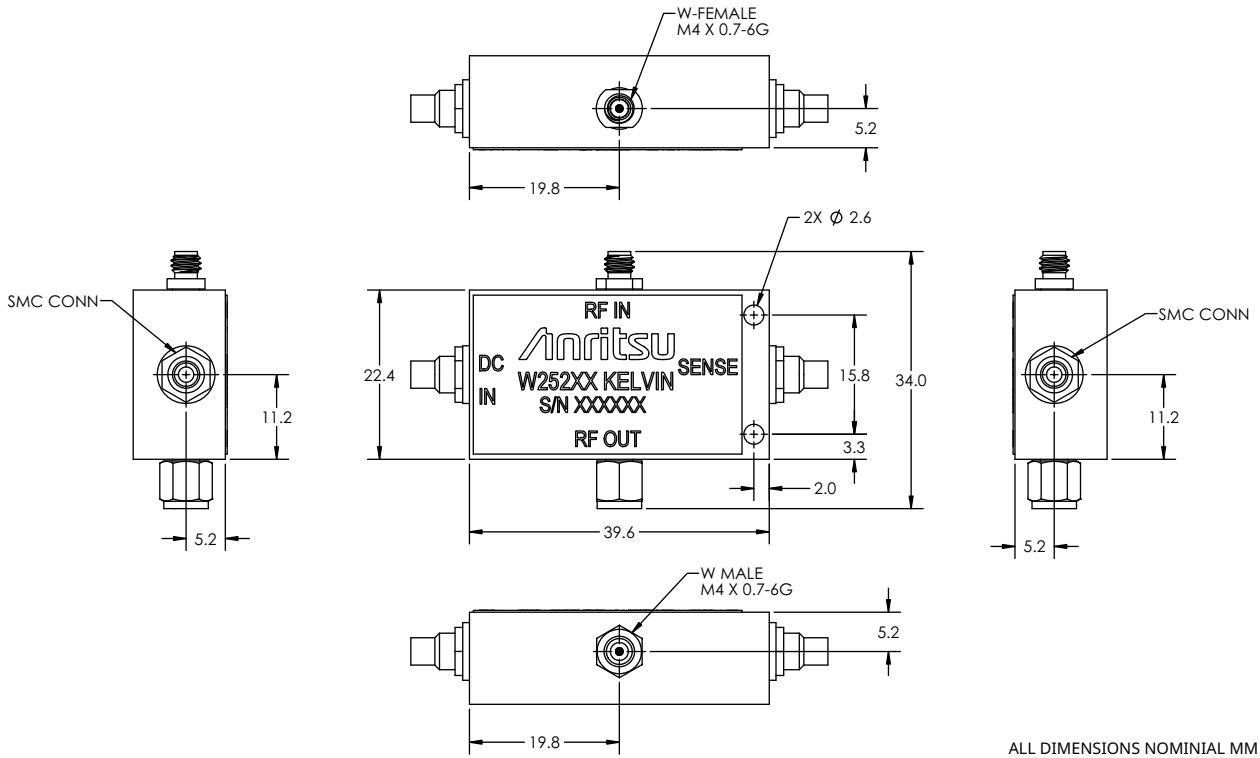
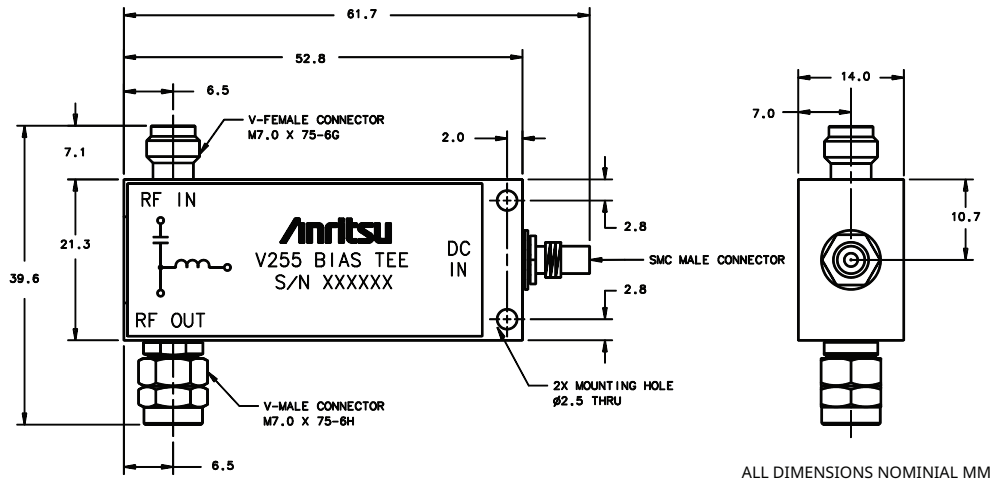
Specifications



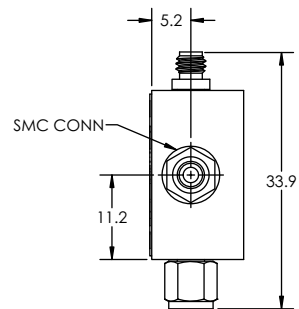
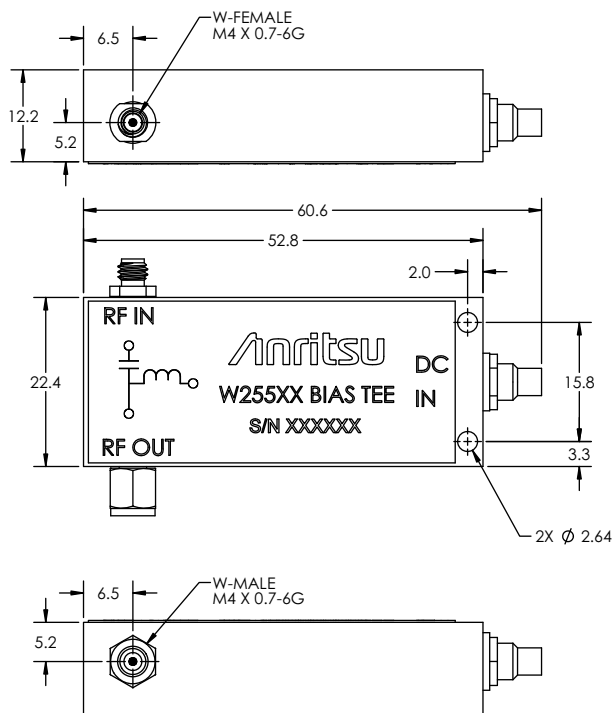
ALL DIMENSIONS NOMINAL MM



ALL DIMENSIONS NOMINAL MM



Specifications



ALL DIMENSIONS NOMINAL MM

Notes

Training at Anritsu

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



• United States

Anritsu Americas Sales Company
450 Century Parkway, Suite 190,
Allen, TX 75013, U.S.A.
Phone: +1-800-Anritsu (1-800-267-4878)

• Canada

Anritsu Electronics Ltd.
700 Silver Seven Road, Suite 120,
Kanata, Ontario K2V 1C3, Canada
Phone: +1-613-591-2003
Fax: +1-613-591-1006

• Brazil

Anritsu Elettronica Ltda.
Praça Amadeu Amaral, 27 - 1 Andar
01327-010 - Bela Vista - Sao Paulo - SP, Brazil
Phone: +55-11-3283-2511
Fax: +55-11-3288-6940

• Mexico

Anritsu Company, S.A. de C.V.
Blvd Miguel de Cervantes Saavedra #169 Piso 1,
Col. Granada, Mexico, Ciudad de Mexico,
11520, MEXICO
Phone: +52-55-4169-7104

• United Kingdom

Anritsu EMEA Ltd.
200 Capability Green,
Luton, Bedfordshire, LU1 3LU, U.K.
Phone: +44-1582-433200
Fax: +44-1582-731303

• France

Anritsu S.A.
12 avenue du Québec, Immeuble Goyave,
91140 VILLEBON SUR YVETTE, France
Phone: +33-1-60-92-15-50

• Germany

Anritsu GmbH
Nemetschek Haus, Konrad-Zuse-Platz 1,
81829 München, Germany
Phone: +49-89-442308-0
Fax: +49-89-442308-55

• Italy

Anritsu S.r.l.
Spaces Eur Arte, Viale dell'Arte 25, 00144 Roma, Italy
Phone: +39-6-509-9711

• Sweden

Anritsu AB
Kistagången 20 B, 2 tr, 164 40 Kista, Sweden
Phone: +46-8-534-707-00

• Finland

Anritsu AB
Technopolis Aviapolis, Teknobulevardi 3-5 (D208.5.),
FI-01530 Vantaa, Finland
Phone: +358-20-741-8100

• Denmark

Anritsu A/S
c/o Regus Winghouse, Ørestads Boulevard 73, 4th floor,
2300 Copenhagen S, Denmark
Phone: +45-7211-2200

• Russia

Anritsu EMEA Ltd.
Representation Office in Russia
Tverskaya str. 16/2, bld. 1, 7th floor,
Moscow 125009, Russia
Phone: +7-495-363-1694
Fax: +7-495-935-8962

• Spain

Anritsu EMEA Ltd.
Representation Office in Spain
Paseo de la Castellana, 141.
Planta 5, Edificio Cuzco IV
28046, Madrid, Spain
Phone: +34-91-572-6761

• Austria

Anritsu EMEA GmbH
Am Belvedere 10, A-1100 Vienna, Austria
Phone: +43-(0)1-717-28-710

• United Arab Emirates

Anritsu EMEA Ltd.
Anritsu A/S
Office No. 164, Building 17, Dubai Internet City
P. O. Box - 501901, Dubai, United Arab Emirates
Phone: +971-4-3758479

• India

Anritsu India Private Limited
6th Floor, Indiqube ETA, No.38/4, Adjacent to EMC2,
Doddanekundi, Outer Ring Road,
Bengaluru - 560048, India
Phone: +91-80-6728-1300
Fax: +91-80-6728-1301

• Singapore

Anritsu Pte. Ltd.
11 Chang Charn Road, #04-01, Shriro House
Singapore 159640
Phone: +65-6282-2400
Fax: +65-6282-2533

• Vietnam

Anritsu Company Limited
16th Floor, Peakview Tower, 36 Hoang Cau Street,
O Cho Dua Ward, Dong Da District, Hanoi, Vietnam
Phone: +84-24-3201-2730

• P.R. China (Shanghai)

Anritsu (China) Co., Ltd.
Room 2701-2705, Tower A, New Caohejing
International Business Center No. 391 Gui Ping Road
Shanghai, 200233, P.R. China
Phone: +86-21-6237-0898
Fax: +86-21-6237-0899

• P.R. China (Hong Kong)

Anritsu Company Ltd.
Unit 1006-7, 10/F., Greenfield Tower, Concordia Plaza,
No. 1 Science Museum Road, Tsim Sha Tsui East,
Kowloon, Hong Kong, P.R. China
Phone: +852-2301-4980
Fax: +852-2301-3545

• Japan

Anritsu Corporation
8-5, Tamura-cho, Atsugi-shi, Kanagawa, 243-0016 Japan
Phone: +81-46-296-6509
Fax: +81-46-225-8352

• South Korea

Anritsu Corporation, Ltd.
5FL, 235 Pangyoeyeok-ro, Bundang-gu, Seongnam-si,
Gyeonggi-do 13494, South Korea
Phone: +82-31-696-7750
Fax: +82-31-696-7751

• Australia

Anritsu Pty. Ltd.
Unit 20, 21-35 Ricketts Road,
Mount Waverley, Victoria 3149, Australia
Phone: +61-3-9558-8177
Fax: +61-3-9558-8255

• Taiwan

Anritsu Company Inc.
7F, No. 316, Sec. 1, NeiHu Rd., Taipei 114, Taiwan
Phone: +886-2-8751-1816
Fax: +886-2-8751-1817

List Revision Date: 20210610