Anritsu Advancing beyond

Bias Tees

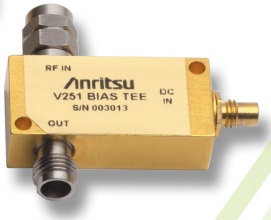
Precision, Kelvin, Ultra-wideband

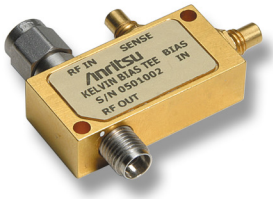
K250 / V250
Bias Tee
100 MHz to 40 GHz
100 MHz to 60 GHz

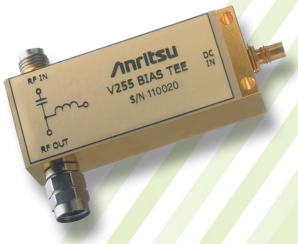
K251 / V251
Wide-Band Bias Tee
50 kHz to 40 GHz
100 kHz to 65 GHz

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

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.

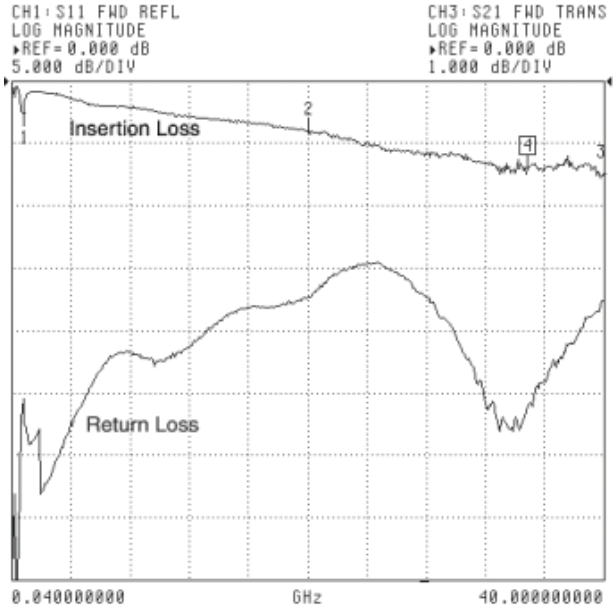
Specifications

Electrical

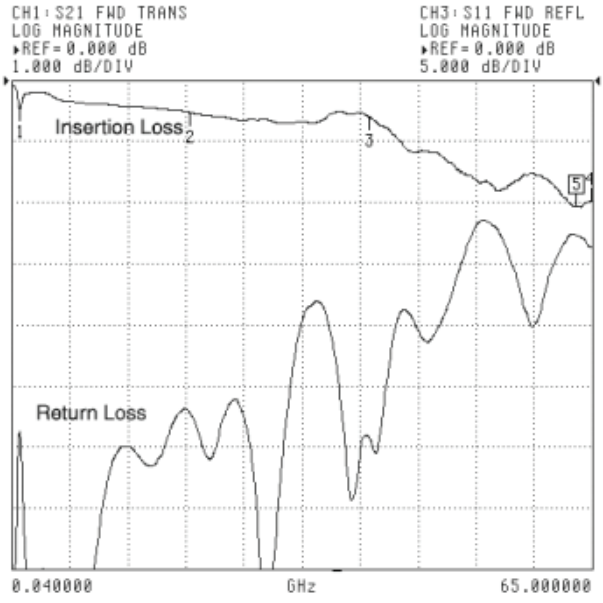
Typical specifications are not tested and are not warranted. They are generally representative of characteristic performance. Warranty: 1 year.
Calibration period: 6 months. All specifications subject to change without notice.
For the most current data sheet, please visit the Anritsu web site: www.anritsu.com.

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 9[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

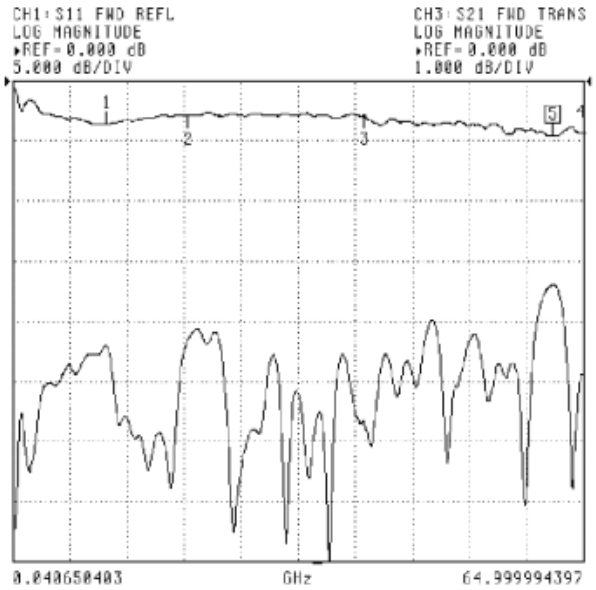
a. Typical
b. Minimum



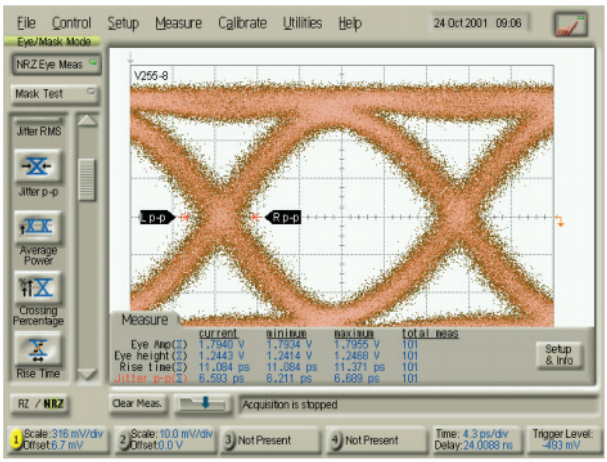
K251 Typical Return Loss/Insertion Loss



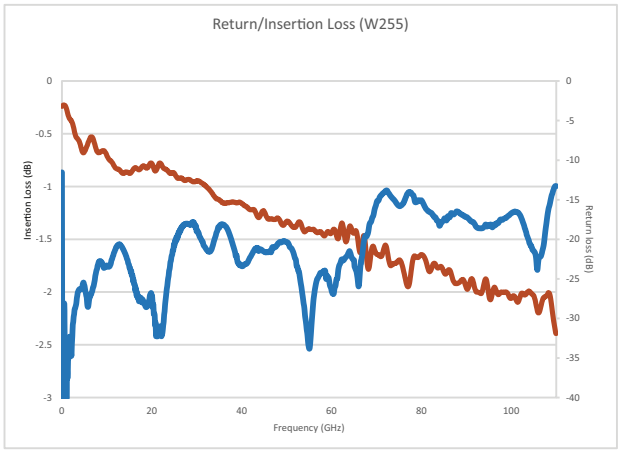
V251 Typical Return Loss/Insertion Loss



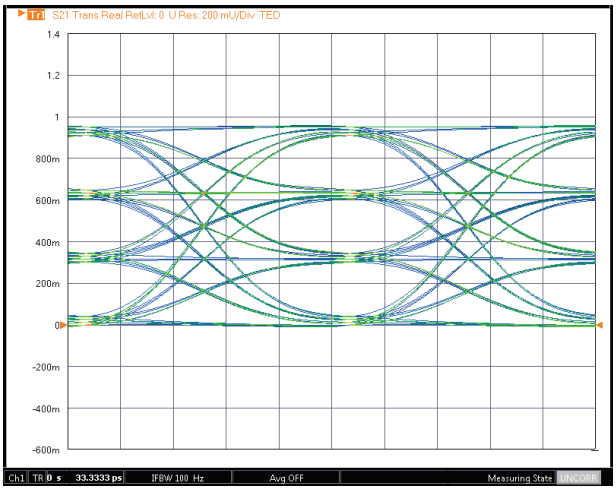
V255 Typical Return Loss/Insertion Loss



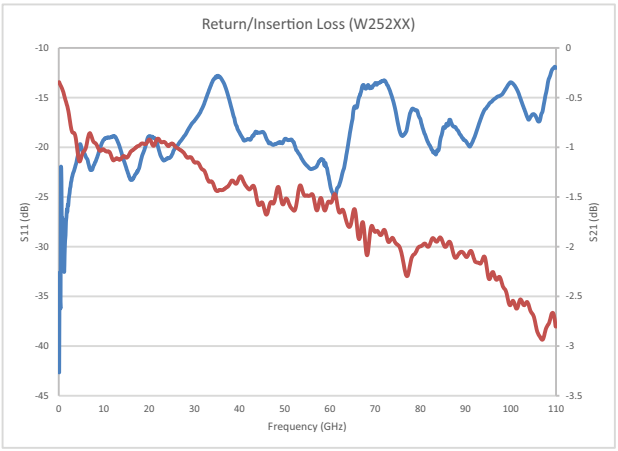
V255 Typical Eye Diagram



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

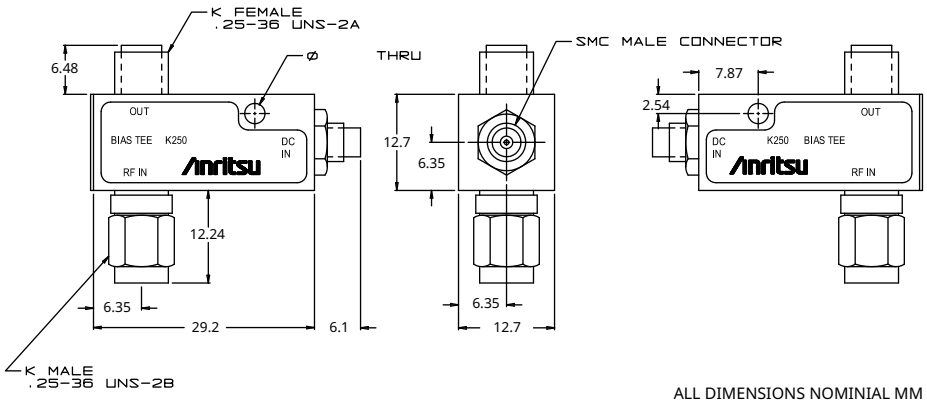
RG174	Coaxial cable, BNC(m) to SMC(m), 48 inches (1 cable for Standard Bias Tee, 2 cables for Kelvin Bias Tees)

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.



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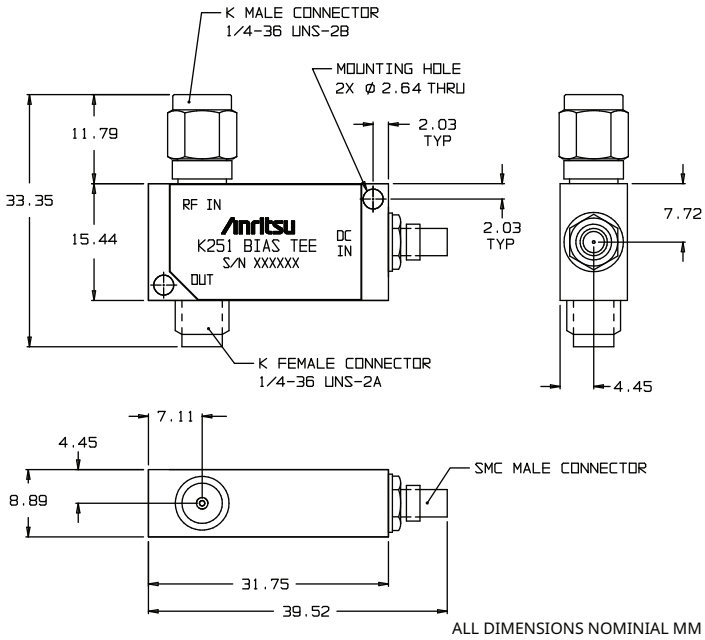
K MALE CONNECTOR
1/4-36 UNS-2B
MOUNTING HOLE
2X ⌀ 2.64 THRU
2.03
TYP
11.79
33.35
15.44
RF IN
Anritsu
K251 BIAS TEE
S/N XXXXXX
DC
IN
OUT
2.03
TYP
7.72
K FEMALE CONNECTOR
1/4-36 UNS-2A
4.45
7.11
4.45
SMC MALE CONNECTOR
8.89
31.75
39.52
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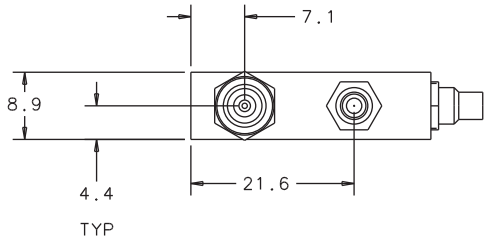

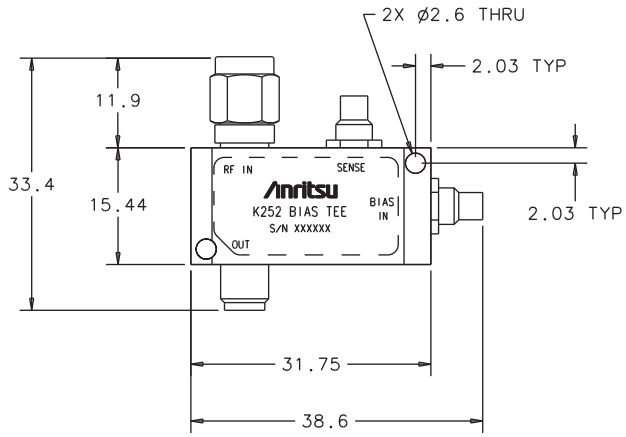

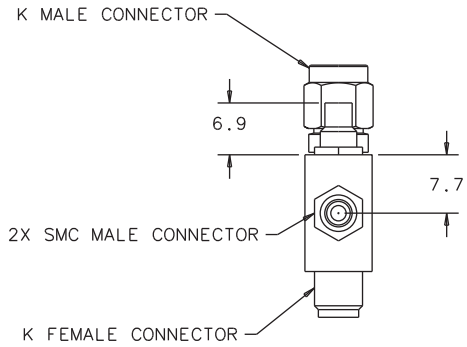

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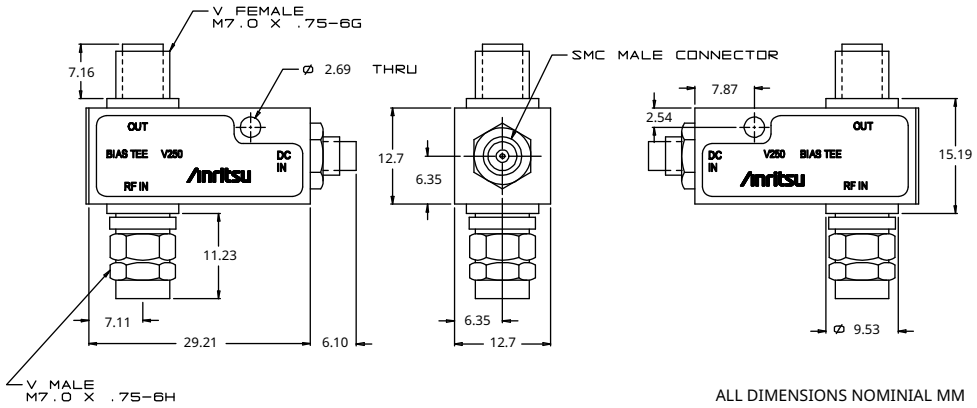

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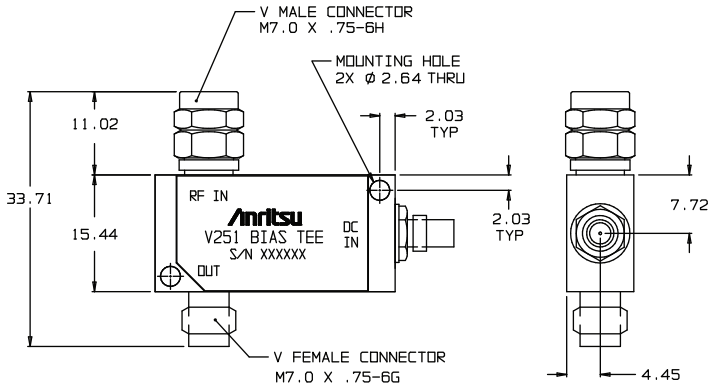

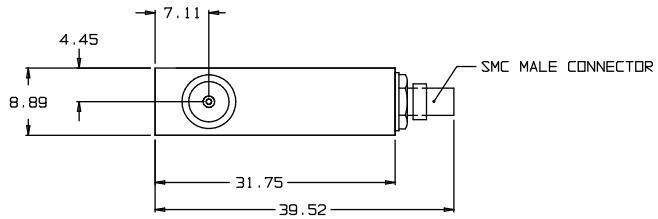

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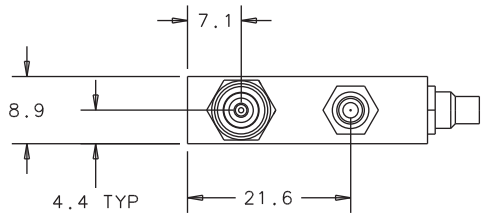

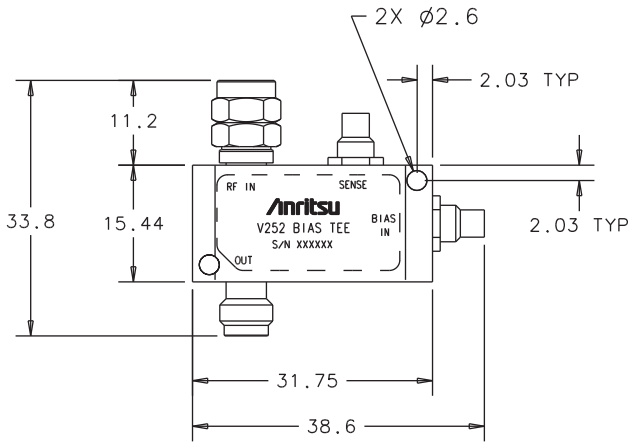

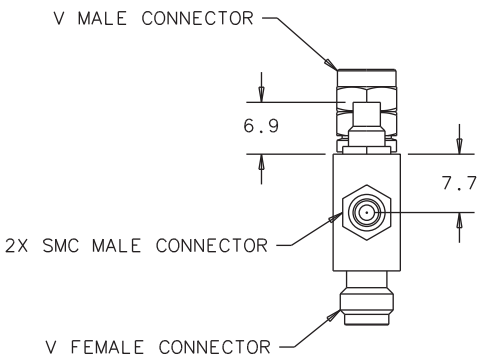

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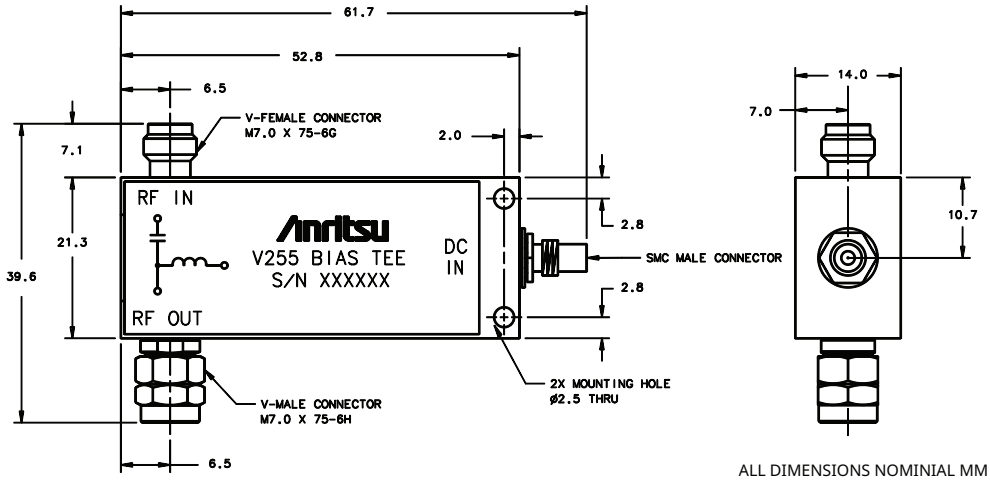

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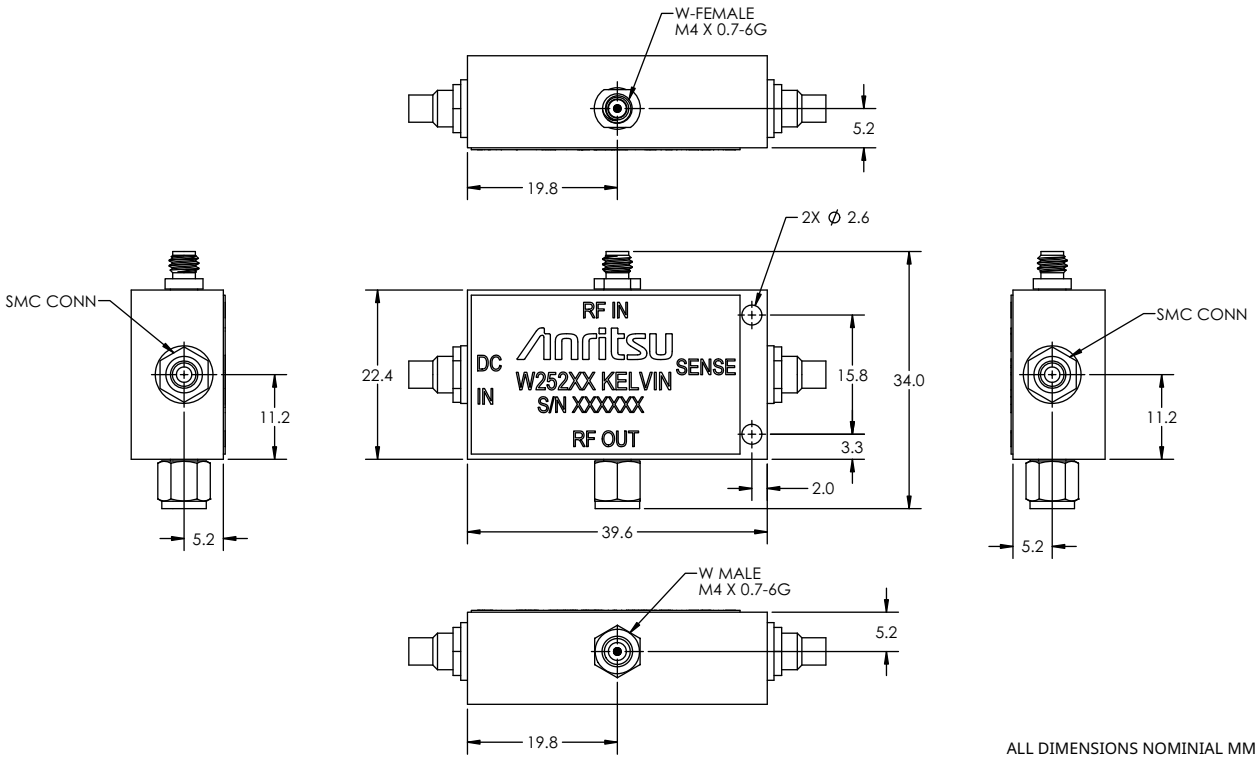

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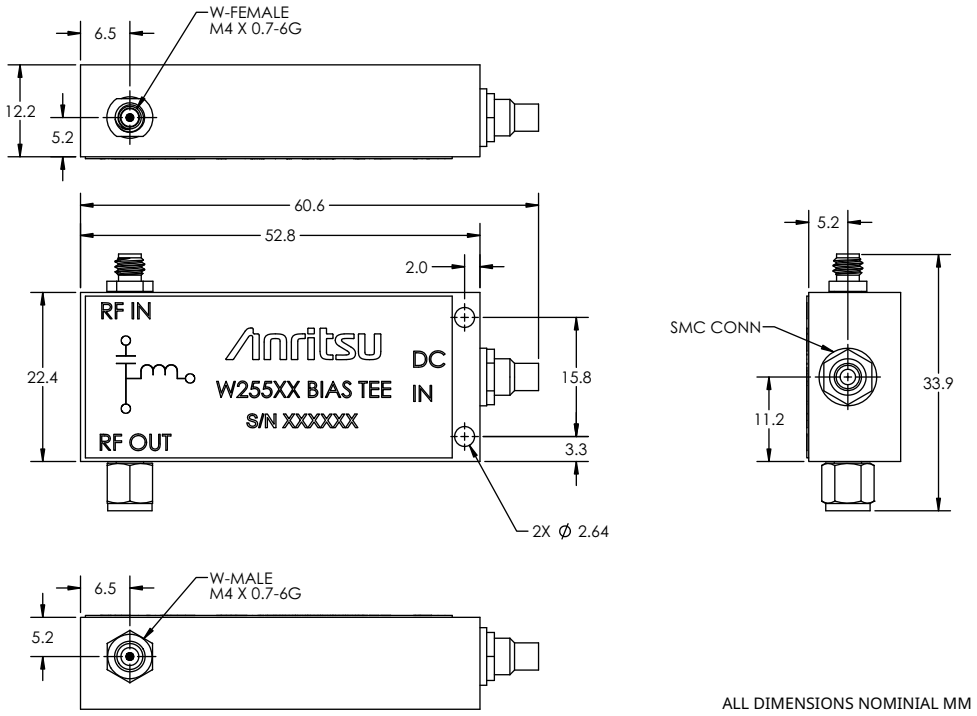

ALL DIMENSIONS NOMINIAL MM

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.

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