

510 Series Direct-Reading Precision Attenuators

NEW MODELS AVAILABLE FROM WR-137 TO WR-62 WAVEGUIDE BANDS



Features

- Low VSWR
- Direct Reading
- Low Insertion Loss
- Anti-Backlash Drive
- Negligible Phase Shift
- Precision Construction
- Frequency Independent

Ordering Information

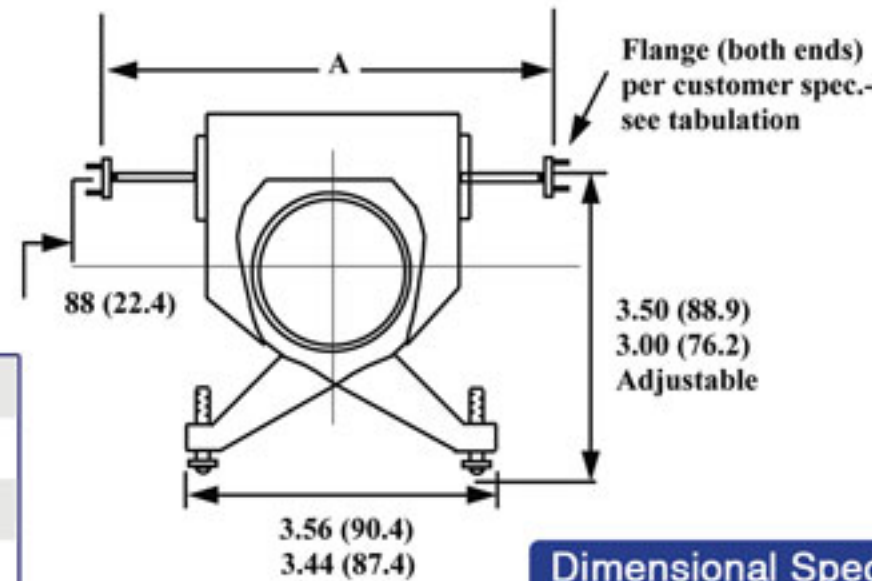
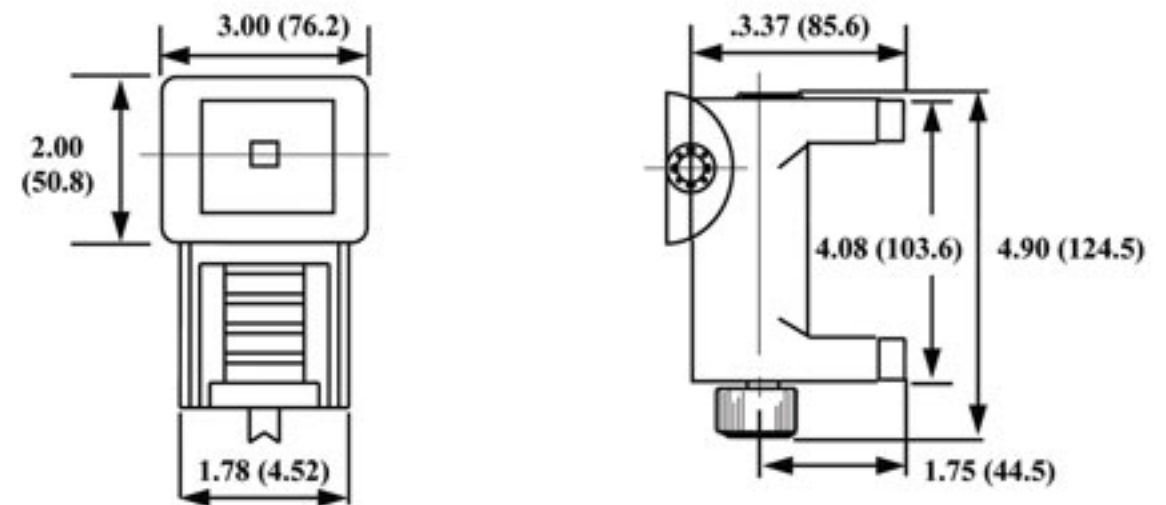


Description

Mi-Waves' 510 series direct-reading precision attenuators provide 0 to 60 dB of calibrated attenuation by rotation of a resistive vane mounted in a circular waveguide section. These units are often referred to as "precision rotary vane attenuators".

Applications

The 510 series direct reading precision attenuators are used in all RF measurement systems. They are most frequently used in RF substitution-type set-ups for precise measurement of characteristics such as isolation, coupling, insertion loss, and gain.



Description	Specification
Attenuation Range	0 dB to 60 dB (typical)
	0.1 dB or 2% of reading *
Accuracy	21 inches
(The greater of the two)	0 dB to 0.1 dB - 0.01 dB, 0.1 dB to 1.0 dB - 0.05 dB, 1.0 dB to
Scale Length	10.0 dB - 0.10 dB, 10.0 dB to 20.0 dB - 0.20 dB, 20.0 dB to 30.0 dB - 0.5 dB, 30.0 dB to 50.0 dB - 1.0 dB, Max Setting 60 dB
Scale Increments	Typical
	Negligible
Phase Shift vs. Attenuation	

* Depending upon frequency band. Consult MI-Wave for specifications.

Dimensional Specifications

Model No	A	
	in	mm
510K	8.48	215.0
510A	6.87	174.0
510B	6.25	159.0
510U	5.76	146.0
510V	4.50	114.3
510E	4.50	114.3
510W	4.50	114.3
510F	3.53	89.7
510D	3.44	87.4
510G	3.20	81.3

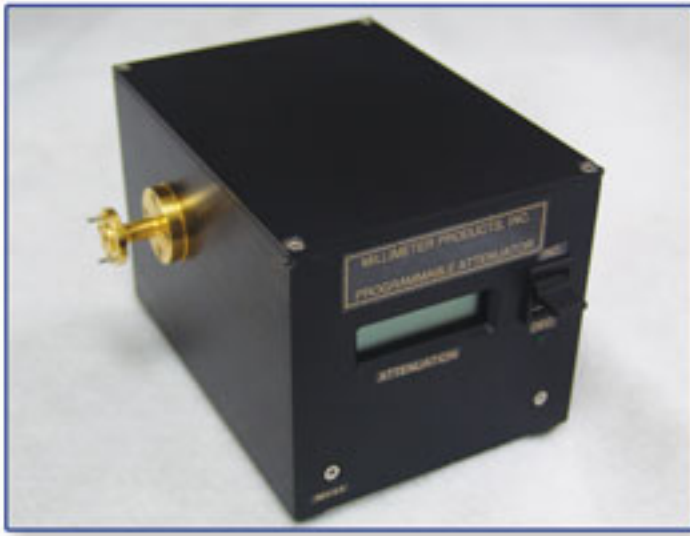
Other Bands Available
WR-137
WR-112
WR-90
WR-75
WR-62
WR-51
WR-34

Technical Specifications (typical)

Model No	510K	510A	510B	510U	510V	510E	510W	510F	510D	510G
Frequency Band (GHz)	18-26.5	26.5-40	33-50	40-50	50-75	60-90	75-110	90-140	110-170	140-220
Insertion Loss (dB) max	0.5	0.5	0.6	0.7	0.8	0.9	1.0	1.5	3.0	4.0
VSWR' Max.	1.30	1.15	1.15	1.15	1.20	1.20	1.20	1.25		
Average Power (watts)	1.0	0.5	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.1
Weight (oz)	52	38	38	36	29	28	28	.26	.24	24

511 Series Programmable Rotary Vane Attenuators

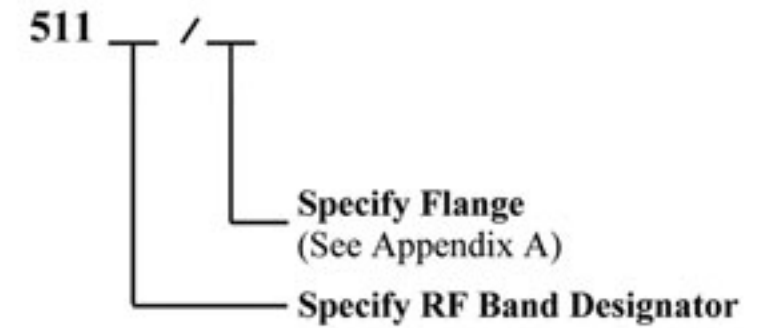
MI-WAVE
Millimeter Wave Products Inc.



Features

- Low Cost
- Compact Size
- 7.0 to 170 GHz
- High Accuracy
- Highly Reliable
- Digital Readout
- Low Insertion Loss
- IEEE-488 Interface
- Full Waveguide Bands
- Manual Operation Mode

Ordering Information



Example :

511A/599

Frequency Range 26.5 to 40 GHz

UG-599/U Flange

Description

Mi-Waves' 511 series precision programmable rotary vane attenuators are available in full waveguide bands from 7.0 to 220.0 GHz.

Attenuation control is either manually via a front panel or remote controlled using a standard IEEE-488 interface. The attenuators' small compact size incorporates both the electronic controller and microwave components. The unit operates from a single +24 volt DC source or with an optional AC adapter.

Attenuation range is from 0 to 60 dB in 0.1 dB steps with 0.05 dB steps from 0 to 20 dB. A digital readout is provided on the front panel to display attenuation settings. The attenuators are highly reliable and designed to be used in ATE and remote power control applications.

RS-232 Control Also Available.

Applications

Instrumentation

Remote Control of RF Power Levels

Fade Margin Testing of Microwave Radios

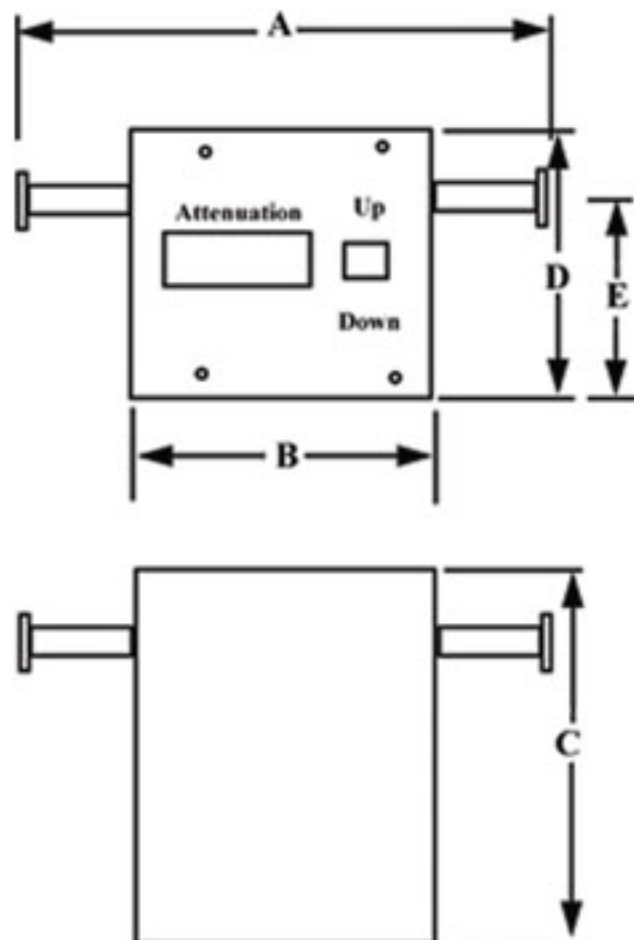
Fade Margin Testing of Microwave Radio

Equipment.

Technical Specifications (typical)

Model No	Frequency Band (GHz)	Waveguide (WR)	Insertion Loss (Max.)	VSWR (Max.)	Power (Max.)
511XL	7.0 - 10.0	112	0.5 dB	1.2:1	5 watts
511X	8.2 - 12.4	90	0.5 dB	1.2:1	2 watts
511XS	10.0 - 15.0	75	0.5 dB	1.25:1	2 watts
511KU	12.4 - 18.0	62	0.5 dB	1.25:1	2 watts
511K	18.0 - 26.5	42	0.5 dB	1.15:1	1 watt
511A	26.5 - 40.0	28	0.5 dB	1.15:1	0.5 watt
511B	33.0 - 50.0	22	0.6 dB	1.15:1	0.5 watt
511U	40.0 - 60.0	19	0.7 dB	1.15:1	0.4 watt
511V	50.0 - 75.0	15	0.8 dB	1.20:1	0.3 watt
511E	60.0 - 90.0	12	1.0 dB	1.2:1	0.25 watt
511W	75.0 - 110.0	10	1.0 dB	1.2:1	0.25 watt
511F	90.0 - 140.0	8	1.5 dB	1.3:1	0.2 watt
511D	110.0 - 170.0	7	3.0 dB	1.3:1	0.2 watt
511G	140.0 - 220.0	5	3.0 dB	1.3:1	0.2 watt

Dimensional Specifications



Model No	A		B		C		D		E	
	in	mm	in	mm	in	mm	in	mm	in	mm
511XL	11.69	296.9	4.66	118.3	6.32	160.5	4.04	102.6	2.29	58.2
511X	11.69	296.9	4.66	118.3	6.32	160.5	4.04	102.6	2.29	58.2
511XS	11.19	284.2	4.66	118.3	6.32	160.5	4.04	102.6	2.29	58.2
511KU	10.94	277.8	4.00	101.6	5.50	139.7	3.50	88.9	2.29	58.2
511K	8.48	215.4	4.00	101.6	5.50	139.7	3.50	88.9	2.29	58.2
511A	6.87	174.5	4.00	101.6	5.50	139.7	3.50	88.9	2.29	58.2
511B	6.24	158.4	4.00	101.6	5.50	139.7	3.50	88.9	2.29	58.2
511U	5.74	145.7	4.00	101.6	5.50	139.7	3.50	88.9	2.29	58.2
511V	4.50	114.3	4.00	101.6	5.50	139.7	3.50	88.9	2.29	58.2
511E	4.50	114.3	4.00	101.6	5.50	139.7	3.50	88.9	2.29	58.2
511W	4.50	114.3	4.00	101.6	5.50	139.7	3.50	88.9	2.29	58.2
511F	4.50	114.3	4.00	101.6	5.50	139.7	3.50	88.9	2.29	58.2
511D	4.50	114.3	4.00	101.6	5.50	139.7	3.50	88.9	2.29	58.2
511G	4.50	114.3	4.00	101.6	5.50	139.7	3.50	88.9	2.29	58.2