

Attenuators

SMA Subminiature "MINIPAD".

DC - 18 GHz High Performance

- DC-2, DC-4, DC-8, and DC-12.4 units available
- Rugged Stainless Steel Construction
- Any Male/Female combination available
- Low cost alternatives available

Midwest Microwave's SMA subminiature series of fixed coaxial attenuators (MINIPAD ®) provide temperature stable, ruggedly built, precision performance in a compact light weight package size. Attenuation values up through 30 dB in 1 dB increments are available with any of the units described and with any combination of female or male SMA connectors.

SPECIFICATIONS - HIGH PERFORMANCE

Frequency: DC - 18.0, DC - 12.4, DC - 8.0 GHz
DC - 4.0, and DC - 2.0 GHz

Attenuation Accuracy: 1-6 dB $\pm$ 0.3dB
7-20 dB $\pm$ 0.5 dB
21-30 dB $\pm$ 1.0 dB

VSWR: 1.07+.015 (f GHz) max.

Power: 2 Watts Average @ +25°C derated linearly to .5 watts @ +125°C

Peak Power: 200 Watts

Operating Temperature Range: -65 to +125C

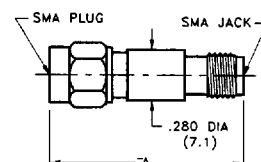
Finish: Passivated Stainless Steel



TYPE II LOW VSWR - HIGH PERFORMANCE IMPROVED SPECIFICATIONS

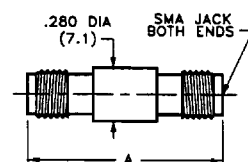
Frequency GHz	VSWR
DC - 4.0 GHz	1.12 max
4.0 - 8.0 GHz	1.15 max
8.0 - 18 GHz	1.20 max

DC - 18 GHz		290 Series	Model Numbers
Male/Female	Female/Female	Male/Male	
ATT-0290-XX-SMA-02	ATT-290F-XX-SMA-02	ATT-290M-XX-SMA-02	
XX = Attenuation Value: Select 01-30dB in 1dB increments (.5 dB increments available)			
HIGH PERFORMANCE			



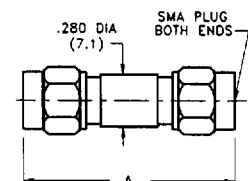
Attenuation Value	Length A
1-12 dB	0.86
13-30 dB	1.02

DC - 12.4 GHz		291 Series	Model Numbers
Male/Female	Female/Female	Male/Male	
ATT-0291-XX-SMA-02	ATT-291F-XX-SMA-02	ATT-291M-XX-SMA-02	
XX = Attenuation Value: Select 01-30dB in 1dB increments (.5 dB increments available)			
HIGH PERFORMANCE			



Attenuation Value	Length A
1-12 dB	0.90
13-30 dB	1.03

DC - 8.0 GHz		292 Series	Model Numbers
Male/Female	Female/Female	Male/Male	
ATT-0292-XX-SMA-02	ATT-292F-XX-SMA-02	ATT-292M-XX-SMA-02	
XX = Attenuation Value: Select 01-30dB in 1dB increments (.5 dB increments available)			
HIGH PERFORMANCE			



Attenuation Value	Length A
1-12 dB	0.98
13-30 dB	1.12

Note: * U.S. Patent No. 3,824,506 applies to all "MINIPAD" ® Fixed Attenuators

Attenuators

SMA Subminiature "MINIPAD"®

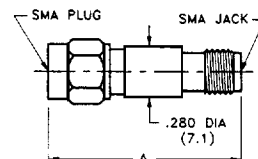
DC - 4.0 GHz		293 Series	Model Numbers
Male/Female	Female/Female	Male/Male	
ATT-0293-XX-SMA-02	ATT-293F-XX-SMA-02	ATT-293M-XX-SMA-02	
XX = Attenuation Value: Select 01-30dB in 1dB increments (.5 dB increments available)			
HIGH PERFORMANCE			

DC - 2.0 GHz		294 Series	Model Numbers
Male/Female	Female/Female	Male/Male	
ATT-0294-XX-SMA-02	ATT-294F-XX-SMA-02	ATT-294M-XX-SMA-02	
XX = Attenuation Value: Select 01-30dB in 1dB increments (.5 dB increments available)			
HIGH PERFORMANCE			



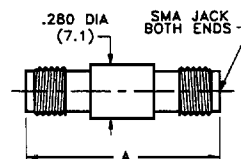
LOW VSWR - Type II High Performance Attenuators

DC - 18.0 GHz		451 Series	Model Numbers
Male/Female	Female/Female	Male/Male	
ATT-0451-XX-SMA-02	ATT-451F-XX-SMA-02	ATT-451M-XX-SMA-02	
XX = Attenuation Value: Select 01-30dB in 1dB increments			
LOW VSWR - see improved performance specifications on page 10.			



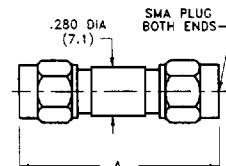
Attenuation Value	Length A
1-12 dB	0.86
13-30 dB	1.02

DC - 12.4 GHz		452 Series	Model Numbers
Male/Female	Female/Female	Male/Male	
ATT-0452-XX-SMA-02	ATT-452F-XX-SMA-02	ATT-452M-XX-SMA-02	
XX = Attenuation Value: Select 01-30dB in 1dB increments			
LOW VSWR - see improved performance specifications on page 10.			



Attenuation Value	Length A
1-12 dB	0.90
13-30 dB	1.03

DC - 4.0 GHz		454 Series	Model Numbers
Male/Female	Female/Female	Male/Male	
ATT-0454-XX-SMA-02	ATT-454F-XX-SMA-02	ATT-454M-XX-SMA-02	
XX = Attenuation Value: Select 01-30dB in 1dB increments			
LOW VSWR - see improved performance specifications on page 10.			



Attenuation Value	Length A
1-12 dB	0.98
13-30 dB	1.12

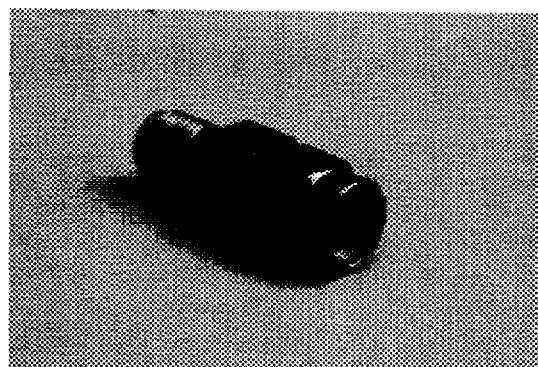
- Notes: 1. Low VSWR Models are available in Hex Body - Designate by substituting "HEX" for "SMA" in Model No.
2. U.S. Patent No. 3,824,506 applies to all "MINIPAD"® Fixed Attenuators

Attenuators

SMA Subminiature "MINIPAD"®

Hex Body Types - High Performance

DC - 18.0 GHz Hex Body 290HEX Series Model Numbers		
Male/Female	Female/Female	Male/Male
ATT-0290-XX-HEX-02	ATT-290F-XX-HEX-02	ATT-290M-XX-HEX-02
XX = Attenuation Value: Select 01-30dB in 1dB increments (.5 dB increments available)		
HIGH PERFORMANCE		



DC - 12.4 GHz Hex Body 291HEX Series Model Numbers		
Male/Female	Female/Female	Male/Male
ATT-0291-XX-HEX-02	ATT-291F-XX-HEX-02	ATT-291M-XX-HEX-02
XX = Attenuation Value: Select 01-30dB in 1dB increments (.5 dB increments available)		
HIGH PERFORMANCE		

SPECIFICATIONS - HIGH PERFORMANCE

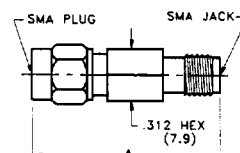
Attenuation Accuracy: 1-6 dB $\pm$ 0.3 dB
 7-20 dB $\pm$ 0.5 dB
 21-30 dB $\pm$ 1.0 dB

VSWR: $1.07 + .015(f \text{ GHz})$ max

Power: 2 Watts Average @ +25 °C derated linearly
 to .5 watts @ +125 °C and 200 Watts peak

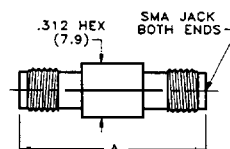
Operating Temperature Range: -65 °C to +125 °C
 Finish: Passivated Stainless Steel

DC - 8.0 GHz Hex Body 292HEX Series Model Numbers		
Male/Female	Female/Female	Male/Male
ATT-0292-XX-HEX-02	ATT-292F-XX-HEX-02	ATT-292M-XX-HEX-02
XX = Attenuation Value: Select 01-30dB in 1dB increments (.5 dB increments available)		
HIGH PERFORMANCE		



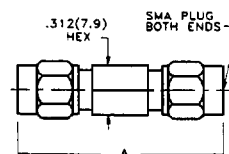
Attenuation Value	Length A
1-12 dB	0.86
13-30 dB	1.02

DC - 4.0 GHz Hex Body 293HEX Series Model Numbers		
Male/Female	Female/Female	Male/Male
ATT-0293-XX-HEX-02	ATT-293F-XX-HEX-02	ATT-293M-XX-HEX-02
XX = Attenuation Value: Select 01-30dB in 1dB increments (.5 dB increments available)		
HIGH PERFORMANCE		



Attenuation Value	Length A
1-12 dB	0.90
13-30 dB	1.03

DC - 2.0 GHz Hex Body 294HEX Series Model Numbers		
Male/Female	Female/Female	Male/Male
ATT-0294-XX-HEX-02	ATT-294F-XX-HEX-02	ATT-294M-XX-HEX-02
XX = Attenuation Value: Select 01-30dB in 1dB increments (.5 dB increments available)		
HIGH PERFORMANCE		



Attenuation Value	Length A
1-12 dB	0.98
13-30 dB	1.12

Note: * U.S. Patent No. 3,824,506 applies to all " Fixed Attenuators.

Attenuators

SMA Subminiature "MINIPAD"®

Round Body - Low Cost - Inexpensive Types

DC - 18.0 GHz		444 Series	Model Numbers
Male/Female		Female/Female	Male/Male
ATT-0444-XX-SMA-02		ATT-444F-XX-SMA-02	ATT-444M-XX-SMA-02
XX = Attenuation Value: Select 01-30dB in 1dB increments			
LOW COST			



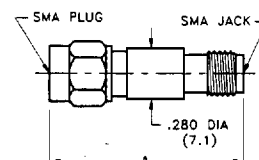
DC - 12.4 GHz		445 Series	Model Numbers
Male/Female		Female /Female	Male/Male
ATT-0445-XX-SMA-02		ATT-445F-XX-SMA-02	ATT-445M-XX-SMA-02
XX = Attenuation Value: Select 01-30dB in 1dB increments			
LOW COST			

SPECIFICATIONS - LOW COST

Attenuation Accuracy:

	DC - 12.4 GHz	12.4 - 18 GHz
1-4 dB	± 0.75 dB	± 0.75 dB
5-8 dB	± 0.75 dB	± 1.00 dB
9-12 dB	± 1.00 dB	± 1.25 dB
13-20 dB	± 1.50 dB	± 1.50 dB
21-30 dB	± 2.00 dB	± 2.00 dB

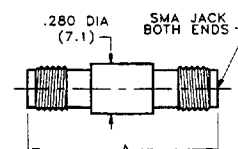
VSWR:	Frequency (GHz)	VSWR
	DC - 4.0	1.25 max
	4.0 - 12.4	1.45 max
	12.4 - 18.0	1.65 max



Attenuation Value	Length A
1-12 dB	0.86
13-30 dB	1.02

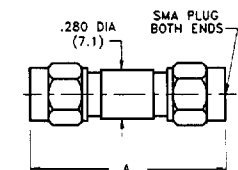
DC - 8.0 GHz		446 Series	Model Numbers
Male/Female		Female/Female	Male/Male
ATT-0446-XX-SMA-02		ATT-446F-XX-SMA-02	ATT-446M-XX-SMA-02
XX = Attenuation Value: Select 01-30dB in 1dB increments			
LOW COST			

DC - 4.0 GHz		447 Series	Model Numbers
Male/Female		Female/Female	Male/Male
ATT-0447-XX-SMA-02		ATT-447F-XX-SMA-02	ATT-447M-XX-SMA-02
XX = Attenuation Value: Select 01-30dB in 1dB increments			
LOW COST			



Attenuation Value	Length A
1-12 dB	0.90
13-30 dB	1.03

DC - 2.0 GHz		448 Series	Model Numbers
Male/Female		Female/Female	Male/Male
ATT-0448-XX-SMA-02		ATT-448F-XX-SMA-02	ATT-448M-XX-SMA-02
XX = Attenuation Value: Select 01-30dB in 1dB increments			
LOW COST			



Attenuation Value	Length A
1-12 dB	0.98
13-30 dB	1.12

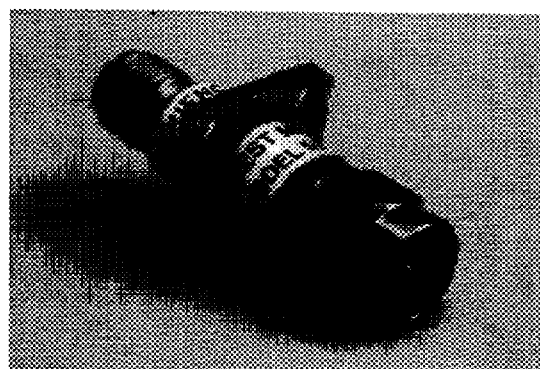
Note: Low Cost Models are available in Hex Body - Designate by substituting "HEX" for "000" in Model No.

Attenuators

SMA Subminiature "MINIPAD"®

Flange Mount Types - High Performance

DC - 18 GHz Flange Mount 523 Series		Model Numbers
Male/Female	Female/Female	Male/Male
ATT-0523-XX-SMA-02	ATT-523F-XX-SMA-02	ATT-523M-XX-SMA-02
XX = Attenuation Value: Select 01-30dB in 1dB increments (.5 dB increments available)		
HIGH PERFORMANCE		



DC - 12.4 GHz Flange Mount 524 Series		Model Numbers
Male/Female	Female/Female	Male/Male
ATT-0524-XX-SMA-02	ATT-524F-XX-SMA-02	ATT-524M-XX-SMA-02
XX = Attenuation Value: Select 01-30dB in 1dB increments (.5 dB increments available)		
HIGH PERFORMANCE		

SPECIFICATIONS - HIGH PERFORMANCE

Attenuation Accuracy: 1-6 dB ± 0.3 dB
7-20 dB ± 0.5 dB
21-30 dB ± 1.0 dB

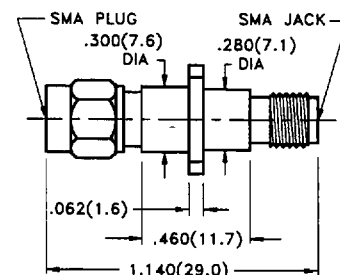
VSWR: 1.07+ .015(f GHz) max

Power: 2 Watts Average @ +25 °C derated linearly
to .5 watts @ +125 °C and 200 Watts peak

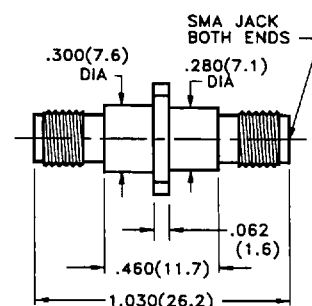
Operating Temperature Range: -65 to +125 °C

Finish: Passivated Stainless Steel

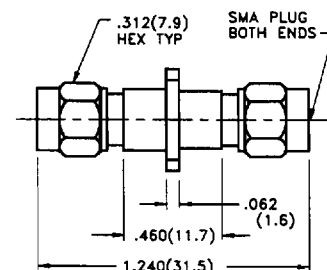
DC - 8.0 GHz Flange Mount 531 Series		Model Numbers
Male/Female	Female/Female	Male/Male
ATT-0531-XX-SMA-02	ATT-531F-XX-SMA-02	ATT-531M-XX-SMA-02
XX = Attenuation Value: Select 01-30dB in 1dB increments (.5 dB increments available)		
HIGH PERFORMANCE		



DC - 4.0 GHz Flange Mount 525 Series		Model Numbers
Male/Female	Female/Female	Male/Male
ATT-0525-XX-SMA-02	ATT-525F-XX-SMA-02	ATT-525M-XX-SMA-02
XX = Attenuation Value: Select 01-30dB in 1dB increments (.5 dB increments available)		
HIGH PERFORMANCE		



DC - 2.0 GHz Flange Mount 526 Series		Model Numbers
Male/Female	Female/Female	Male/Male
ATT-0526-XX-SMA-02	ATT-526F-XX-SMA-02	ATT-526M-XX-SMA-02
XX = Attenuation Value: Select 01-30dB in 1dB increments (.5 dB increments available)		
HIGH PERFORMANCE		



Note: * U.S. Patent No. 3,824,506 applies to all "Fixed Attenuators."

Attenuators

SMA Subminiature "MINIPAD"®

Flange Mount Types - Low Cost - Inexpensive

DC - 18 GHz Flange Mount 532 Series		Model Numbers
Male/Female	Female/Female	Male/Male
ATT-0532-XX-SMA-02	ATT-532F-XX-SMA-02	ATT-532M-XX-SMA-02
XX = Attenuation Value: Select 01-30dB in 1dB increments		
LOW COST		

DC - 12.4 GHz Flange Mount 533 Series		Model Numbers
Male/Female	Female/Female	Male/Male
ATT-0533-XX-SMA-02	ATT-533F-XX-SMA-02	ATT-533M-XX-SMA-02
XX = Attenuation Value: Select 01-30dB in 1dB increments		
LOW COST		

DC - 8.0 GHz Flange Mount 534 Series		Model Numbers
Male/Female	Female/Female	Male/Male
ATT-0534-XX-SMA-02	ATT-534F-XX-SMA-02	ATT-534M-XX-SMA-02
XX = Attenuation Value: Select 01-30dB in 1dB increments		
LOW COST		

DC - 4.0 GHz Flange Mount 535 Series		Model Numbers
Male/Female	Female/Female	Male/Male
ATT-0535-XX-SMA-02	ATT-535F-XX-SMA-02	ATT-535M-XX-SMA-02
XX = Attenuation Value: Select 01-30dB in 1dB increments		
LOW COST		

DC - 2.0 GHz Flange Mount 536 Series		Model Numbers
Male/Female	Female/Female	Male/Male
ATT-0536-XX-SMA-02	ATT-536F-XX-SMA-02	ATT-536M-XX-SMA-02
XX = Attenuation Value: Select 01-30dB in 1dB increments		
LOW COST		

Flange Mount type Attenuators are useful in many system or test instrument requirements where it is necessary to pass a signal through a panel and also take advantage of the opportunity to insert an attenuator while saving valuable space and weight. These units possess the same high performance characteristics as the standard 290 series.

The units are manufactured using rugged stainless steel construction and are designed to operate under very hostile environmental conditions.

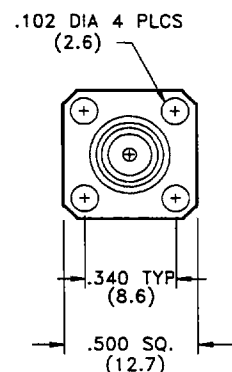
SPECIFICATIONS - LOW COST:

Attenuation Accuracy:

	DC - 12.4 GHz	12.4 - 18 GHz
1-10 dB	± 0.75 dB	± 0.75 dB
11-20 dB	± 0.75 dB	± 1.00 dB
21-30 dB	± 1.00 dB	± 1.25 dB

VSWR:	Frequency (GHz)	VSWR
	DC - 4.0	1.25 max
	4.0 - 12.4	1.45 max
	12.4 - 18.0	1.65 max

Power: 2 Watts Average @ +25 °C derated linearly to .5 watts @ 125C and 200 Watts peak
 Operating Temperature Range: -65 to +125 °C
 Finish: Passivated Stainless Steel



Typical End View - All Models