



COAXIAL

# Fixed Attenuator

HAT-A-SERIES

Mini-Circuits

50Ω

Up to 2W

DC to 2000 MHz

## THE BIG DEAL

- Wideband coverage, DC to 2000 MHz
- Up to 2Watt rating
- Rugged unibody construction
- Excellent VSWR
- Excellent flatness

## APPLICATIONS

- Signal level adjustment
- impedance matching



Generic photo used for illustration purposes only

Model No.	HAT-A-SERIES
Case Style	FF747
Connectors	BNC Male-BNC Female

### +RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

## PRODUCT OVERVIEW

Mini-Circuits' HAT-A series are fixed attenuators from DC to 2000 MHz frequency range with excellent flatness in attenuation. HAT-A series is available with nominal attenuation of 1 to 30 dB. This attenuator series support testing and measurement application. Precise performance, excellent VSWR and rugged unibody construction makes this model ideal solution for systems requiring precise attenuation across very wide frequency range.

## KEY FEATURES

Feature	Advantages
Rugged construction	Excellent durability for a long lifetime of use
Up to 2Watt rating	Good power handling
Excellent VSWR	Well matched for 50Ω systems
Flat attenuation	Good performance over the band.





COAXIAL

# Fixed Attenuator

HAT-10A+

## MAXIMUM RATINGS

Operating Temperature	-45°C to 100°C
Storage Temperature	-55°C to 100°C

Permanent damage may occur if any of these limits are exceeded.

## OUTLINE DRAWING

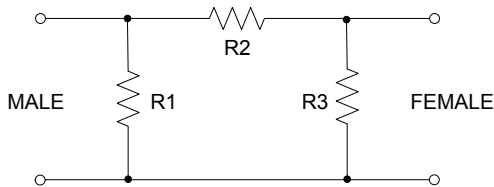


## OUTLINE DIMENSIONS (Inch/mm)

B	D	wt
.62	1.94	grams
15.75	49.28	30.0

Note: Please refer to case style drawing for details

## ELECTRICAL SCHEMATIC



## ELECTRICAL SPECIFICATIONS AT 25°C

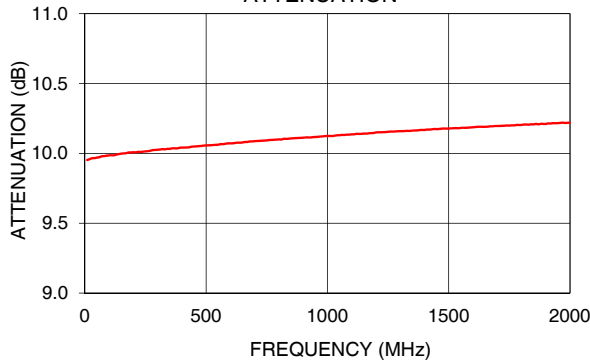
Parameter	Condition (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		DC	-	2000	MHz
Attenuation <sup>1</sup> nominal <sup>3</sup>	10	-	10 ± 0.3	-	dB
Attenuation Flatness <sup>2</sup>	DC - 500	-	0.20	-	dB
	DC - 1000	-	0.25	-	
	DC - 2000	-	0.30	-	
VSWR	DC - 500	-	1.20	-	:1
	DC - 1000	-	1.20	-	
	DC - 2000	-	1.25	-	
Input Power <sup>4</sup>		-	-	1.7	W

- Attenuation varies by 0.3 dB max. over temperature.
- Flatness = variation over band divided by 2.
- Nominal attenuation at 10 MHz
- RF power at 25°C is 1.7W; Derate linearly to 1.0W at 85°C

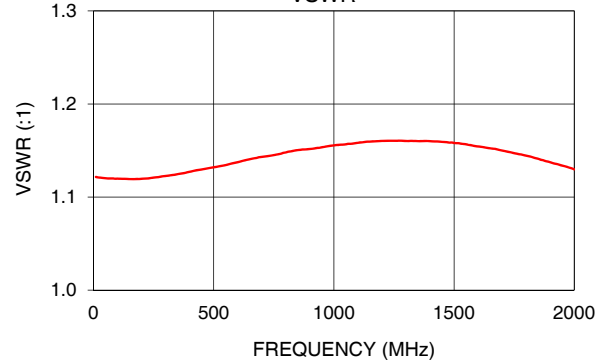
## TYPICAL PERFORMANCE DATA

Frequency (MHz)	Attenuation (dB)	VSWR (:1)
10	9.95	1.12
50	9.97	1.12
100	9.99	1.12
250	10.01	1.12
400	10.04	1.13
500	10.06	1.13
600	10.07	1.14
800	10.10	1.15
1000	10.12	1.16
1200	10.15	1.16
1300	10.16	1.16
1500	10.18	1.16
1700	10.20	1.15
1800	10.20	1.14
2000	10.22	1.13

HAT-10A+ ATTENUATION



HAT-10A+ VSWR



### NOTES

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard. Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)

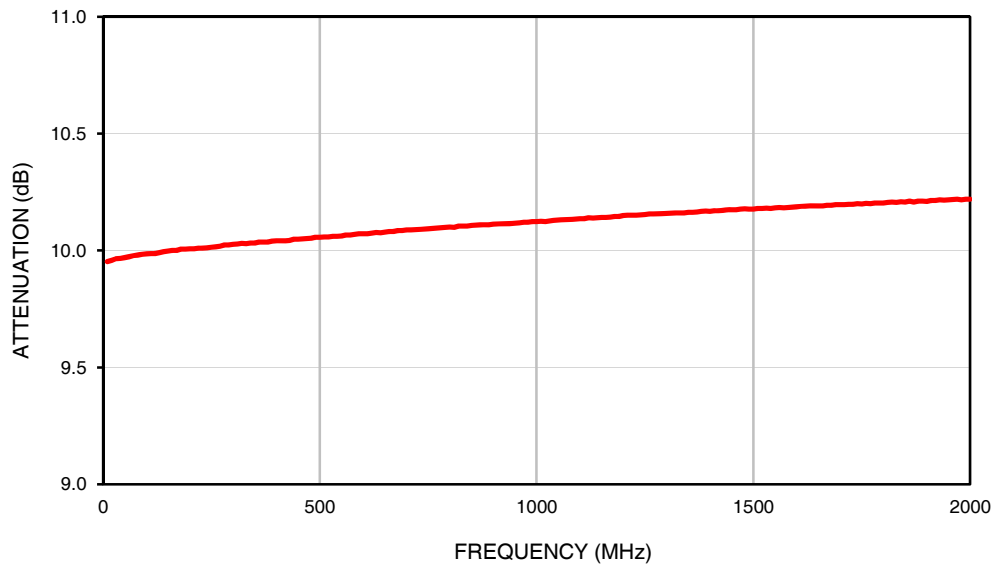


*Typical Performance Data*

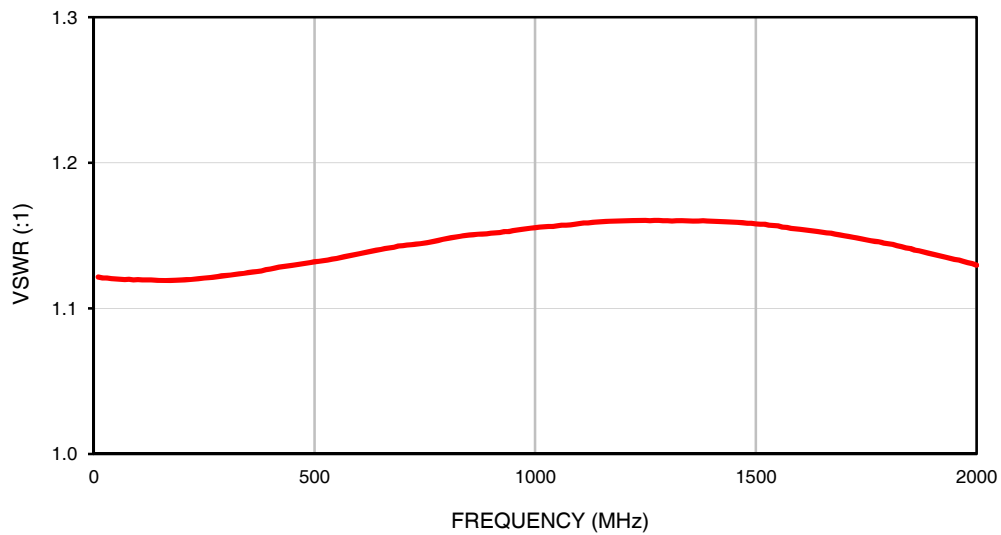
FREQ.	ATTENUATION	VSWR
(MHz)	(dB)	(:1)
10	9.95	1.12
20	9.96	1.12
50	9.97	1.12
80	9.98	1.12
100	9.99	1.12
120	9.99	1.12
150	10.00	1.12
180	10.01	1.12
210	10.01	1.12
240	10.01	1.12
270	10.02	1.12
300	10.03	1.12
330	10.03	1.12
360	10.04	1.13
390	10.04	1.13
420	10.04	1.13
450	10.05	1.13
480	10.05	1.13
500	10.06	1.13
530	10.06	1.13
560	10.07	1.14
590	10.07	1.14
620	10.07	1.14
650	10.08	1.14
680	10.09	1.14
710	10.09	1.14
750	10.09	1.15
780	10.10	1.15
810	10.10	1.15
840	10.11	1.15
890	10.11	1.15
920	10.11	1.15
950	10.12	1.15
980	10.12	1.15
1000	10.12	1.16
1030	10.13	1.16
1050	10.13	1.16
1080	10.13	1.16
1110	10.14	1.16
1150	10.14	1.16
1180	10.15	1.16
1200	10.15	1.16
1230	10.15	1.16
1250	10.15	1.16
1280	10.16	1.16
1300	10.16	1.16
1350	10.16	1.16
1400	10.17	1.16
1450	10.17	1.16
1500	10.18	1.16
1550	10.18	1.16
1600	10.19	1.15
1650	10.19	1.15
1700	10.20	1.15
1750	10.20	1.15
1800	10.20	1.14
1850	10.21	1.14
1900	10.21	1.14
1950	10.22	1.13
2000	10.22	1.13

## Typical Performance Curves

### ATTENUATION



### VSWR

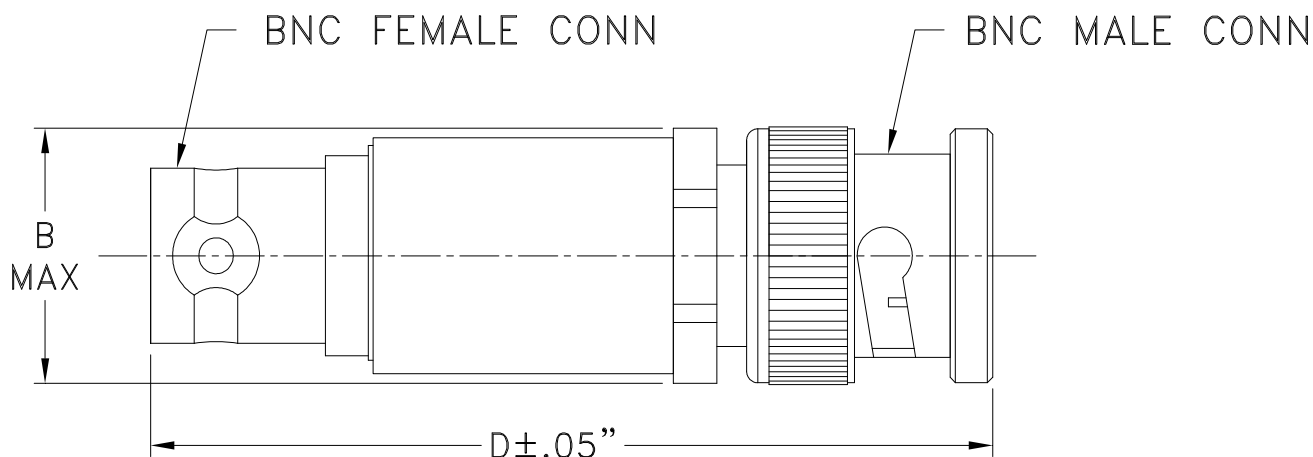


# Case Style

# FF

## Outline Dimensions

### FF747



CASE #.	A	B	C	D	E	WT GRAMS
FF747	--	.62 (15.75)	--	1.94 (49.28)	--	30.0

Dimensions are in inches (mm). Tolerances: 2Pl. ± .04; 3Pl. ± .030

### Notes:

1. Case material: Brass.
2. Case finish: Nickel plate.

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RF/IF MICROWAVE COMPONENTS

FF747 Rev.: AR (13/AUG/21) ECO-009237 File: FF747

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All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

<b>Specification</b>	<b>Test/Inspection Condition</b>	<b>Reference/Spec</b>
Operating Temperature	-45° to 100° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D
Humidity	90% RH, 65°C Units may require bake-out after humidity to restore full performance.	MIL-STD-202, Method 103
Thermal Shock	-65° to 125°C, 5 cycles	MIL-STD-202, Method 107, Condition B
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)	MIL-STD-202, Method 213, Condition I