



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 2 Watt 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 2 Watt rating	Good power handling
Excellent VSWR	Well matched for 50 Ω systems
Flat attenuation	Good performance over the band.

Mini-Circuits



COAXIAL

# Fixed Attenuator

HAT-15A+

## 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

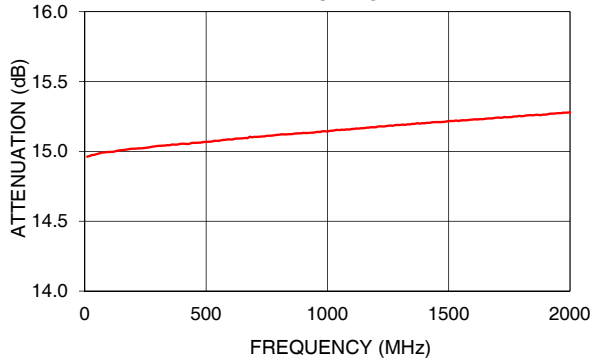
Parameter	Condition (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		DC	-	2000	MHz
Attenuation <sup>1</sup> nominal <sup>3</sup>	10	-	15 ± 0.3	-	dB
Attenuation Flatness <sup>2</sup>	DC - 500	-	0.20	-	dB
	DC - 1000	-	0.30	-	
	DC - 2000	-	0.30	-	
VSWR	DC - 500	-	1.30	-	:1
	DC - 1000	-	1.30	-	
	DC - 2000	-	1.35	-	
Input Power <sup>4</sup>		-	-	1.4	W

1. Attenuation varies by 0.3 dB max. over temperature.
2. Flatness = variation over band divided by 2.
3. Nominal attenuation at 10 MHz
4. RF power at 25°C is 1.4W; Derate linearly to 1.0W at 85°C

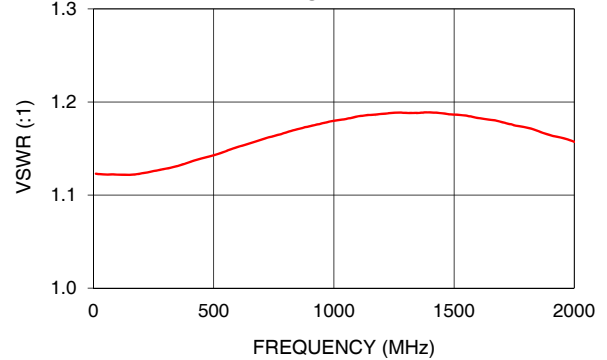
## TYPICAL PERFORMANCE DATA

Frequency (MHz)	Attenuation (dB)	VSWR (:1)
10	14.96	1.12
50	14.98	1.12
100	15.00	1.12
250	15.03	1.13
400	15.05	1.14
500	15.07	1.14
600	15.09	1.15
800	15.12	1.17
1000	15.14	1.18
1200	15.17	1.19
1300	15.19	1.19
1500	15.22	1.19
1700	15.24	1.18
1800	15.25	1.17
2000	15.28	1.16

HAT-15A+ ATTENUATION



HAT-15A+ 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)

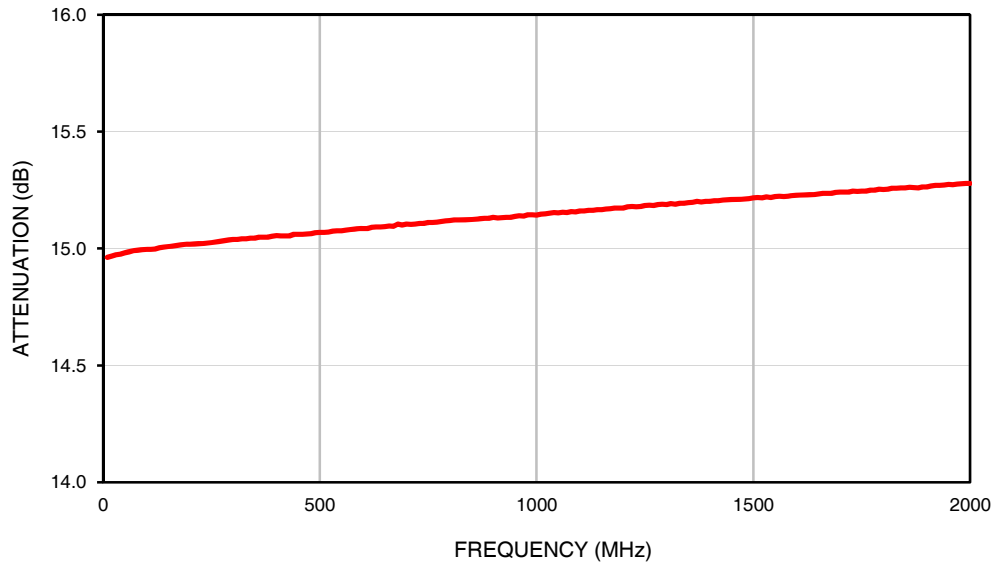


*Typical Performance Data*

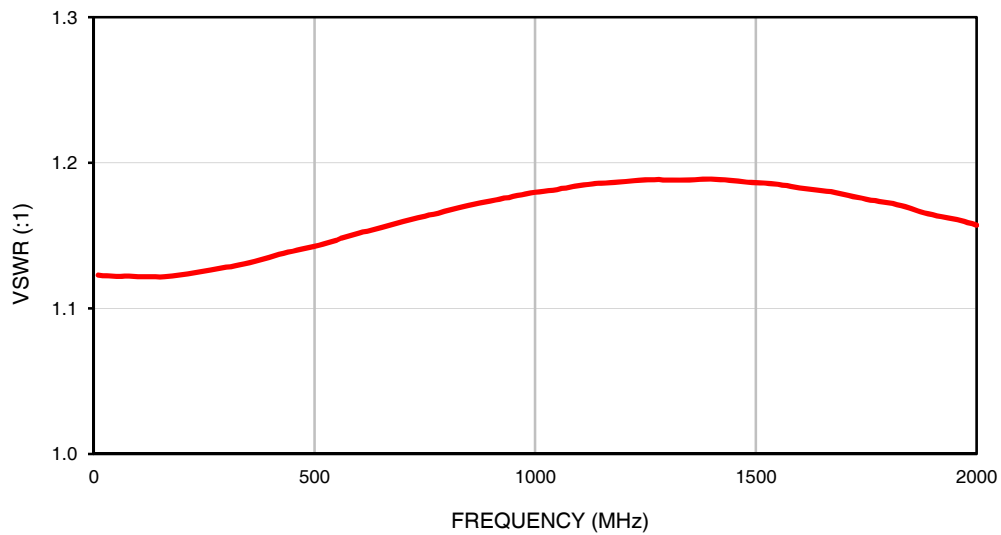
FREQ.	ATTENUATION	VSWR
(MHz)	(dB)	(:1)
10	14.96	1.12
20	14.97	1.12
50	14.98	1.12
80	14.99	1.12
100	15.00	1.12
120	15.00	1.12
150	15.01	1.12
180	15.02	1.12
210	15.02	1.12
240	15.02	1.13
270	15.03	1.13
300	15.04	1.13
330	15.04	1.13
360	15.05	1.13
390	15.05	1.13
420	15.05	1.14
450	15.06	1.14
480	15.06	1.14
500	15.07	1.14
530	15.07	1.15
560	15.08	1.15
590	15.09	1.15
620	15.09	1.15
650	15.09	1.16
680	15.10	1.16
710	15.10	1.16
750	15.11	1.16
780	15.12	1.17
810	15.12	1.17
840	15.12	1.17
890	15.13	1.17
920	15.13	1.18
950	15.14	1.18
980	15.14	1.18
1000	15.14	1.18
1030	15.15	1.18
1050	15.15	1.18
1080	15.16	1.18
1110	15.16	1.19
1150	15.17	1.19
1180	15.17	1.19
1200	15.17	1.19
1230	15.18	1.19
1250	15.18	1.19
1280	15.19	1.19
1300	15.19	1.19
1350	15.20	1.19
1400	15.20	1.19
1450	15.21	1.19
1500	15.22	1.19
1550	15.22	1.19
1600	15.23	1.18
1650	15.23	1.18
1700	15.24	1.18
1750	15.25	1.17
1800	15.25	1.17
1850	15.26	1.17
1900	15.26	1.16
1950	15.27	1.16
2000	15.28	1.16

## Typical Performance Curves

### ATTENUATION



### VSWR

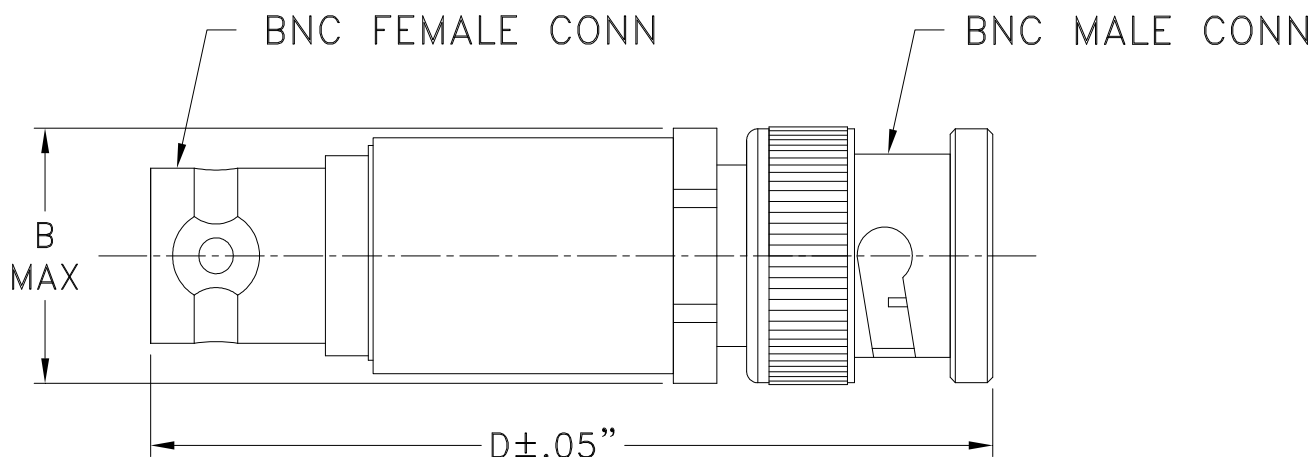


# Case Style

# 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



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.

Specification	Test/Inspection Condition	Reference/Spec
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