COAXIAL

Fixed Attenuator

HAT-A-SERIES

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

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

APPLICATIONS

- Signal level adjustment
- Impedance matching

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.

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Fixed Attenuator

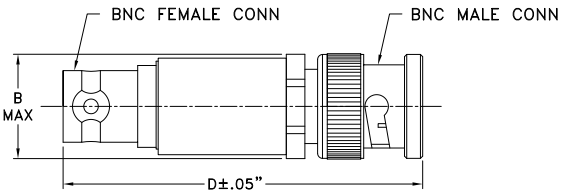
HAT-20A+

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

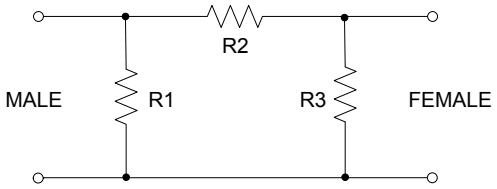


OUTLINE DIMENSIONS (Inch / mm)

B	D	wt
.62	1.94	grams
15.75	49.28	30.0

Note: Please refer to case style drawing for details

ELECTRICAL SCHEMATIC



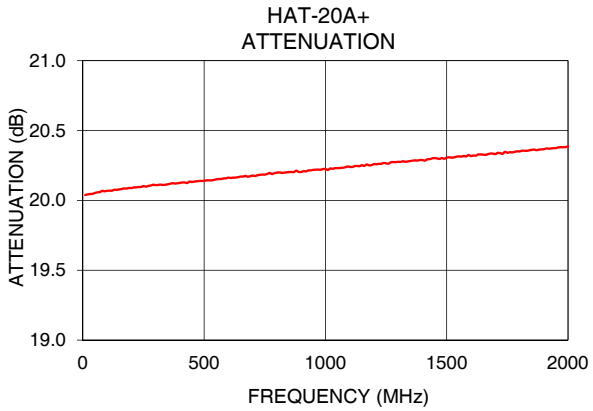
ELECTRICAL SPECIFICATIONS AT 25°C

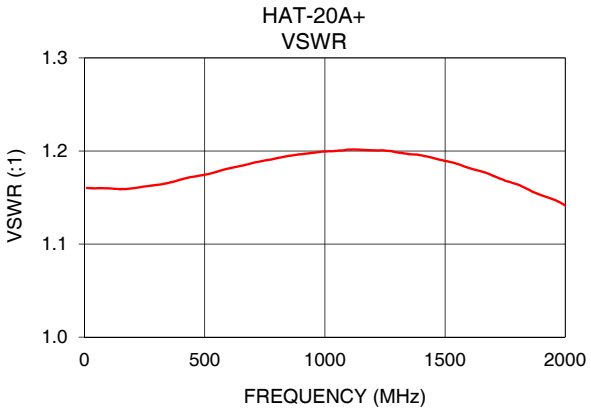
Parameter	Condition (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		DC	-	2000	MHz
Attenuation[1] nominal[3]	10	-	20 ± 0.3	-	dB
Attenuation Flatness[2]	DC - 500	-	0.15	-	dB
	DC - 1000	-	0.20	-	
	DC - 2000	-	0.30	-	
VSWR	DC - 500	-	1.20	-	:1
	DC - 1000	-	1.30	-	
	DC - 2000	-	1.30	-	
Input Power[4]		-	-	0.8	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 0.8W; Derate linearly to 0.6W at 85°C

TYPICAL PERFORMANCE DATA

Frequency (MHz)	Attenuation (dB)	VSWR (:1)
10	20.04	1.16
50	20.05	1.16
100	20.07	1.16
250	20.10	1.16
400	20.13	1.17
500	20.14	1.17
600	20.16	1.18
800	20.20	1.19
1000	20.22	1.20
1200	20.26	1.20
1300	20.28	1.20
1500	20.31	1.19
1700	20.33	1.17
1800	20.35	1.16
2000	20.39	1.14





NOTES

A. 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.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. 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

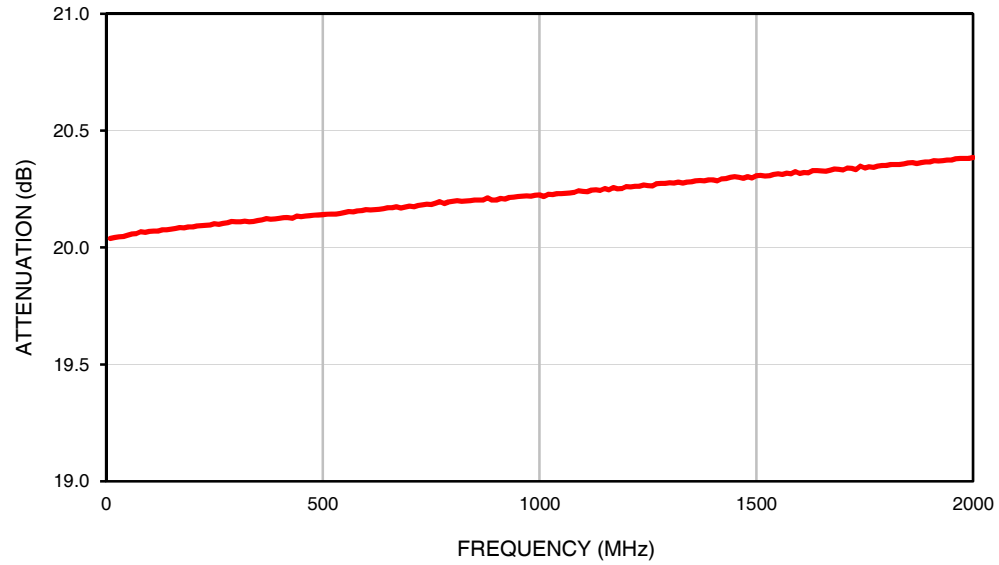
Coaxial Fixed Attenuator HAT-20A+

Typical Performance Data

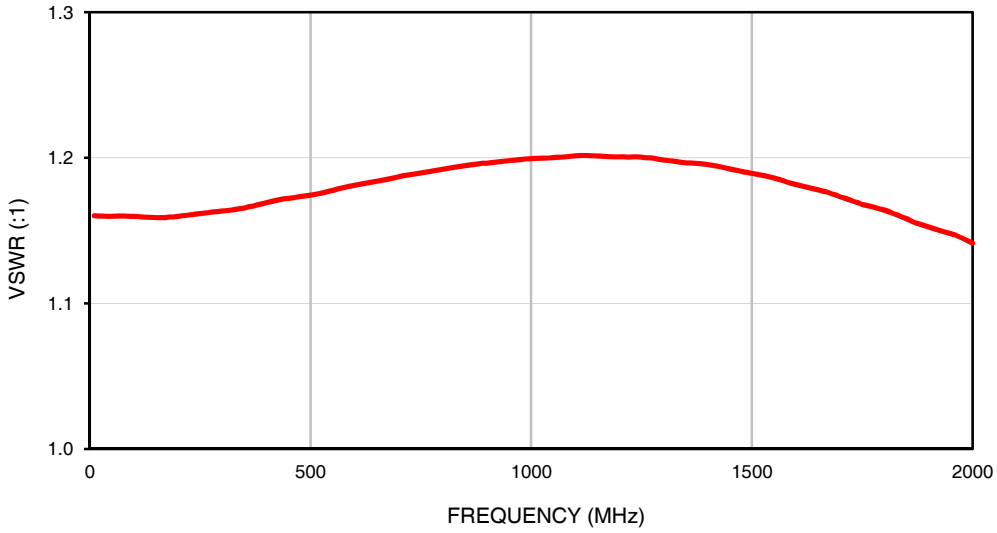
FREQ. (MHz)	ATTENUATION (dB)	VSWR (:1)
10	20.04	1.16
20	20.04	1.16
50	20.05	1.16
80	20.07	1.16
100	20.07	1.16
120	20.07	1.16
150	20.08	1.16
180	20.08	1.16
210	20.09	1.16
240	20.10	1.16
270	20.10	1.16
300	20.11	1.16
330	20.11	1.16
360	20.12	1.17
390	20.12	1.17
420	20.13	1.17
450	20.13	1.17
480	20.14	1.17
500	20.14	1.17
530	20.14	1.18
560	20.15	1.18
590	20.16	1.18
620	20.16	1.18
650	20.17	1.18
680	20.17	1.19
710	20.17	1.19
750	20.18	1.19
780	20.19	1.19
810	20.20	1.19
840	20.20	1.19
890	20.20	1.20
920	20.21	1.20
950	20.22	1.20
980	20.22	1.20
1000	20.22	1.20
1030	20.23	1.20
1050	20.23	1.20
1080	20.24	1.20
1110	20.24	1.20
1150	20.25	1.20
1180	20.25	1.20
1200	20.26	1.20
1230	20.26	1.20
1250	20.27	1.20
1280	20.27	1.20
1300	20.28	1.20
1350	20.28	1.20
1400	20.29	1.20
1450	20.30	1.19
1500	20.31	1.19
1550	20.32	1.19
1600	20.32	1.18
1650	20.33	1.18
1700	20.33	1.17
1750	20.34	1.17
1800	20.35	1.16
1850	20.36	1.16
1900	20.37	1.15
1950	20.37	1.15
2000	20.39	1.14

Typical Performance Curves

ATTENUATION

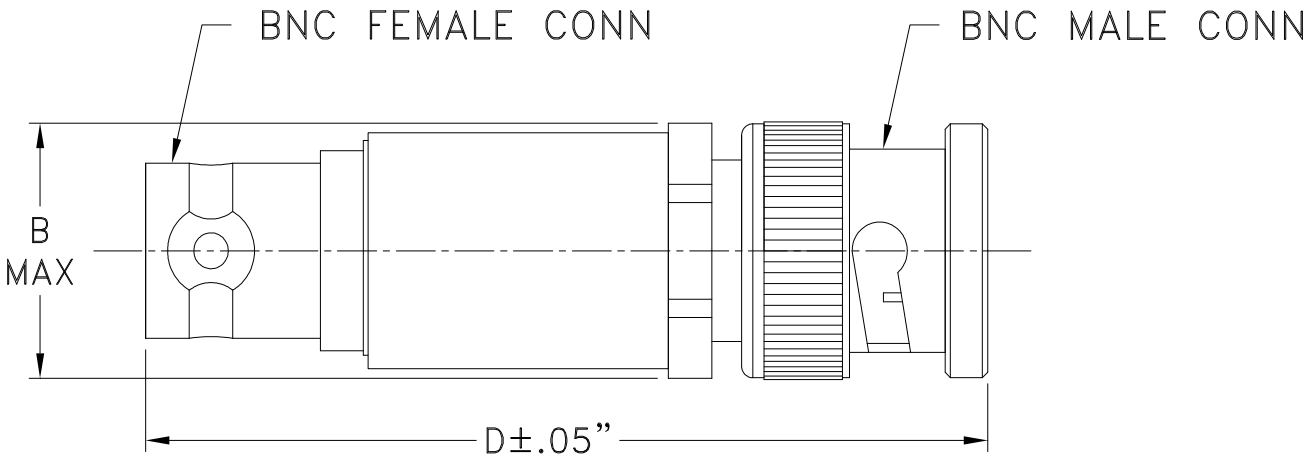


VSWR



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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Mini-Circuits

Environmental Specifications **ENV28T6**

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

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