

Bandpass Filter

50Ω 20 to 21 MHz

BBP-20R5+



Generic photo used for illustration purposes only

CASE STYLE: FF55

Connectors

Model

BNC

BBP-20R5+

Features

- Flat group delay over passband
- Good VSWR, 1.3:1 typical in passband
- High rejection (40dB form 40-380 MHz)

Applications

- Transmitters / Receivers - IF stage
- Harmonic rejection
- Test equipments
- Military

Electrical Specifications at 25°C

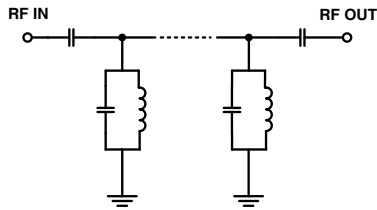
Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	-	-	20.5	-	MHz
	Insertion Loss	F1-F2	-	2.2	3.0	dB
	VSWR	F1-F2	-	1.3	1.6	:1
Stop Band, Lower	Insertion Loss	DC-F3	40	50	-	dB
		F3-F4	15.8 - 17	27	-	dB
	VSWR	DC-F4	-	20	-	:1
Stop Band, Upper	Insertion Loss	F5-F6	27 - 40	28	-	dB
		F6-F7	40 - 380	45	-	dB
	VSWR	F5-F7	27 - 380	20	-	:1

Maximum Ratings

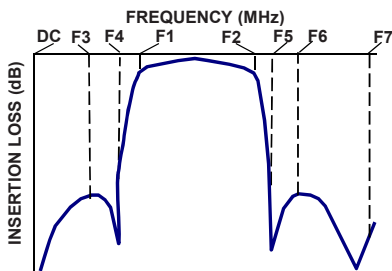
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	0.5 W max.

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

Functional Schematic



Typical Frequency Response

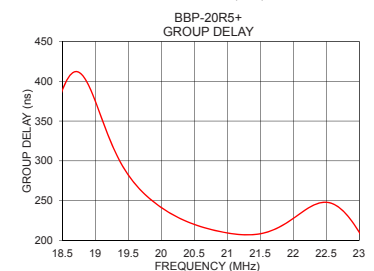
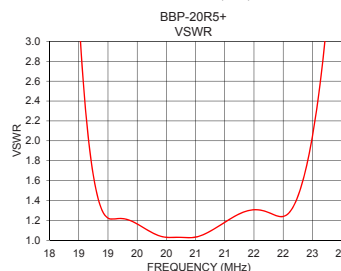
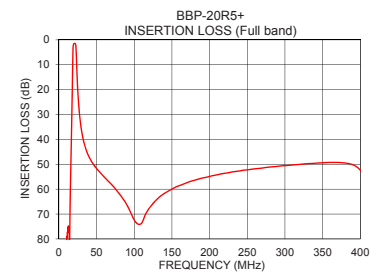
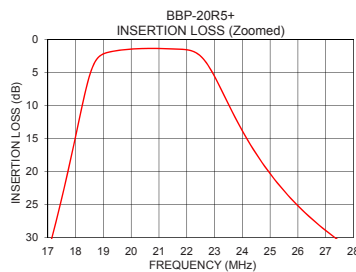


+RoHS Compliant

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

Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (ns)
1.0	98.76	3744.00	19.5	282.22
10.0	81.53	1498.50	19.6	271.33
15.0	62.87	174.64	19.7	262.11
15.8	50.22	112.05	19.8	254.31
17.0	32.36	48.32	19.9	247.41
17.1	30.76	44.24	20.0	241.31
17.7	20.43	22.27	20.1	235.95
18.0	14.68	13.12	20.2	231.18
18.7	3.41	1.85	20.3	226.99
20.0	1.49	1.03	20.4	223.32
20.5	1.40	1.03	20.5	220.13
21.0	1.40	1.18	20.6	217.33
22.7	3.53	2.91	20.7	214.95
24.0	13.84	22.15	20.8	212.81
25.0	20.33	48.71	20.9	210.93
27.0	28.91	111.48	21.0	209.38
27.5	30.49	126.54	21.1	208.18
40.0	47.04	320.77	21.2	207.31
150.0	59.97	93.85	21.3	207.06
380.0	49.47	61.09	21.5	208.37



Notes

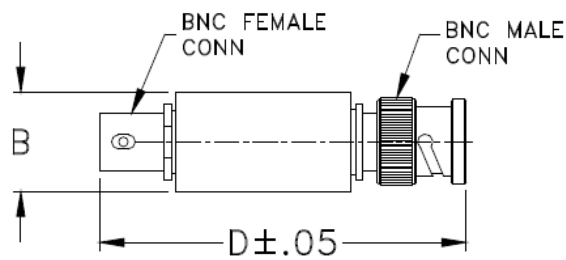
- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' 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



Coaxial Connections

PORT - 1	BNC-MALE
PORT - 2	BNC-FEMALE

Outline Drawing



Outline Dimensions (^{inch}/_{mm})

A	B	C	D	E	Wt.
--	0.57	--	2.59	--	grams
--	14.47	--	65.79	--	40

Note: Please refer to case style drawing for details

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

Typical Performance Data

FREQ. (MHz)	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
1.0	93.43	98.76	104.79	0.00	0.00	0.00	0.00	0.00	0.00
5.0	103.39	92.97	105.00	0.00	0.00	0.00	0.00	0.00	0.00
10.0	81.08	81.53	81.06	0.01	0.01	0.01	0.02	0.02	0.02
12.0	75.83	76.19	76.07	0.02	0.03	0.03	0.03	0.03	0.04
13.0	75.49	75.81	75.36	0.03	0.04	0.04	0.04	0.05	0.05
14.0	86.53	85.58	89.19	0.05	0.06	0.07	0.06	0.07	0.08
15.0	63.31	62.87	62.49	0.09	0.10	0.11	0.10	0.11	0.12
15.8	50.50	50.22	49.94	0.14	0.16	0.17	0.15	0.17	0.19
17.0	32.62	32.36	31.98	0.31	0.36	0.40	0.35	0.40	0.45
17.1	31.03	30.76	30.37	0.34	0.39	0.44	0.39	0.44	0.49
17.5	24.31	24.04	23.62	0.52	0.60	0.67	0.59	0.68	0.76
17.7	20.70	20.43	20.01	0.68	0.78	0.88	0.77	0.89	1.00
18.0	14.93	14.68	14.26	1.16	1.33	1.51	1.31	1.51	1.71
18.5	5.53	5.53	5.38	4.93	5.48	6.18	5.51	6.15	6.97
18.7	3.27	3.41	3.45	9.79	10.52	11.54	11.28	12.26	13.71
19.0	2.01	2.21	2.35	19.83	19.96	19.98	35.68	31.89	28.30
19.5	1.54	1.71	1.84	21.86	22.40	22.94	22.21	22.89	23.30
19.8	1.40	1.56	1.68	29.66	30.20	31.41	29.69	30.73	30.72
20.0	1.33	1.49	1.62	37.79	36.70	37.78	34.58	34.19	32.53
20.1	1.31	1.46	1.59	38.01	37.03	37.93	33.22	32.59	31.46
20.2	1.29	1.44	1.57	36.75	36.60	37.88	31.52	31.02	30.44
20.3	1.27	1.42	1.55	36.68	37.11	39.17	30.52	30.07	29.85
20.4	1.26	1.41	1.53	37.38	37.74	40.05	29.76	29.26	29.22
20.5	1.25	1.40	1.52	37.00	36.21	36.72	29.03	28.39	28.38
20.6	1.24	1.39	1.51	33.74	32.46	32.05	27.88	27.13	27.05
20.7	1.24	1.39	1.51	29.89	28.80	28.28	26.32	25.57	25.42
20.8	1.24	1.39	1.51	26.68	25.84	25.37	24.56	23.90	23.72
20.9	1.24	1.39	1.51	24.14	23.50	23.13	22.87	22.32	22.16
21.0	1.25	1.40	1.52	22.12	21.63	21.35	21.37	20.94	20.81
21.5	1.31	1.47	1.59	17.58	17.52	17.62	18.01	18.08	18.36
22.0	1.41	1.59	1.75	19.80	19.42	19.03	30.97	35.20	47.68
22.5	2.28	2.56	2.85	9.70	9.32	8.83	10.70	10.32	9.80
22.7	3.21	3.53	3.87	6.42	6.21	5.93	6.92	6.74	6.46
23.0	5.27	5.62	6.00	3.46	3.42	3.32	3.71	3.68	3.59
23.5	9.51	9.83	10.18	1.43	1.46	1.47	1.54	1.58	1.60
24.0	13.59	13.84	14.14	0.75	0.78	0.81	0.81	0.86	0.89
24.5	17.12	17.33	17.58	0.47	0.50	0.52	0.51	0.55	0.58
25.0	20.15	20.33	20.54	0.33	0.36	0.38	0.36	0.39	0.42
25.5	22.77	22.92	23.09	0.25	0.27	0.29	0.28	0.30	0.32
26.0	25.05	25.17	25.32	0.20	0.22	0.24	0.22	0.24	0.26
26.5	27.05	27.15	27.29	0.17	0.18	0.20	0.18	0.20	0.22
27.0	28.83	28.91	29.03	0.14	0.16	0.17	0.16	0.17	0.19
27.5	30.41	30.49	30.60	0.12	0.14	0.15	0.14	0.15	0.16
28.0	31.85	31.92	32.01	0.11	0.12	0.13	0.12	0.13	0.14
28.5	33.14	33.20	33.29	0.10	0.11	0.12	0.11	0.12	0.13
29.0	34.31	34.37	34.46	0.09	0.10	0.11	0.10	0.11	0.12
29.5	35.40	35.45	35.51	0.08	0.09	0.10	0.09	0.10	0.11
30.0	36.39	36.43	36.49	0.07	0.08	0.09	0.08	0.09	0.10
35.0	43.19	43.18	43.22	0.05	0.06	0.06	0.05	0.06	0.06
40.0	47.03	47.04	47.05	0.04	0.05	0.05	0.04	0.05	0.06
45.0	49.66	49.65	49.67	0.04	0.05	0.05	0.04	0.05	0.06
45.6	49.92	49.94	49.92	0.04	0.06	0.06	0.04	0.05	0.06
46.2	50.21	50.20	50.20	0.05	0.06	0.06	0.04	0.05	0.06
46.8	50.43	50.42	50.47	0.05	0.06	0.06	0.04	0.05	0.05
48.0	50.93	50.92	50.97	0.05	0.06	0.06	0.04	0.06	0.06
50.0	51.67	51.72	51.71	0.05	0.07	0.06	0.04	0.05	0.06
100.0	72.16	72.42	71.96	0.10	0.13	0.12	0.07	0.09	0.09
200.0	54.94	54.86	54.71	0.17	0.21	0.21	0.14	0.16	0.16
300.0	50.61	50.54	50.46	0.20	0.26	0.26	0.18	0.21	0.22
380.0	49.54	49.47	49.39	0.22	0.28	0.30	0.21	0.25	0.26

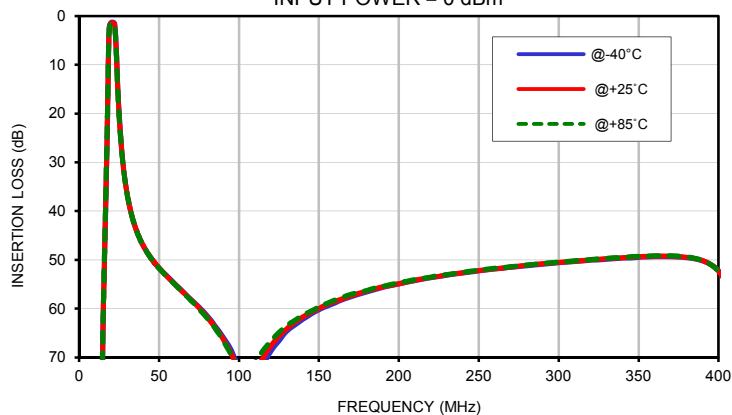
Typical Performance Data

FREQ.	GROUP DELAY		
(MHz)	(nsec)		
	@-40°C	@+25°C	@+85°C
18.0	218.18	224.59	233.55
18.1	250.35	257.05	266.46
18.2	286.60	292.62	301.85
18.3	324.36	329.01	336.78
18.4	359.84	362.31	367.67
18.5	388.74	388.61	390.95
18.6	408.32	405.62	404.80
18.7	416.92	412.15	408.15
18.8	414.56	407.96	401.65
18.9	402.12	394.72	386.82
19.0	382.42	375.10	366.84
19.1	359.24	352.66	345.07
19.2	336.23	330.93	324.36
19.3	315.82	311.69	306.37
19.4	298.64	295.41	291.21
19.5	284.75	282.22	278.79
19.6	273.37	271.33	268.52
19.7	263.89	262.11	259.82
19.8	255.79	254.31	252.25
19.9	248.77	247.41	245.67
20.0	242.49	241.31	239.73
20.1	237.01	235.95	234.57
20.2	232.12	231.18	230.00
20.3	227.82	226.99	226.01
20.4	224.07	223.32	222.40
20.5	220.75	220.13	219.32
20.6	217.86	217.33	216.64
20.7	215.36	214.95	214.36
20.8	213.19	212.81	212.32
20.9	211.23	210.93	210.54
21.0	209.69	209.38	209.07
21.1	208.35	208.18	208.04
21.2	207.46	207.31	207.38
21.3	206.99	207.06	207.25
21.4	207.16	207.33	207.76
21.5	208.03	208.37	209.04
21.6	209.83	210.34	211.28
21.7	212.53	213.27	214.42
21.8	216.30	217.24	218.51
21.9	221.06	222.05	223.40
22.0	226.70	227.58	228.89
22.1	232.82	233.48	234.50
22.2	238.97	239.21	239.79
22.3	244.31	243.98	243.83
22.4	248.16	247.08	246.05
22.5	249.89	247.96	245.85
22.6	248.82	246.03	243.05
22.7	244.60	241.07	237.15
22.8	237.40	233.27	228.64
22.9	227.27	222.83	217.68
23.0	214.98	210.38	204.99

Typical Performance Curves

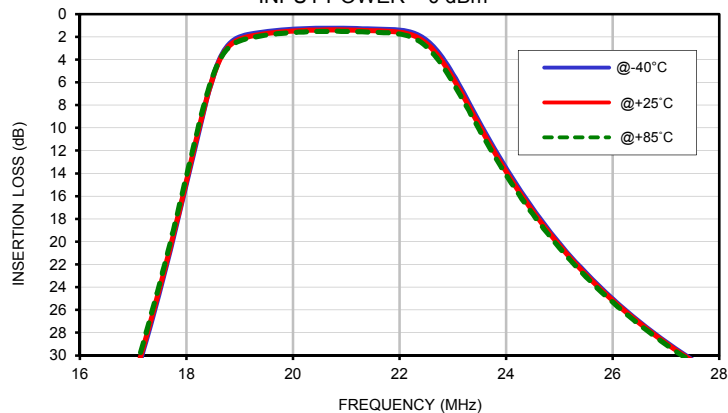
INSERTION LOSS vs. TEMPERATURE

INPUT POWER = 0 dBm



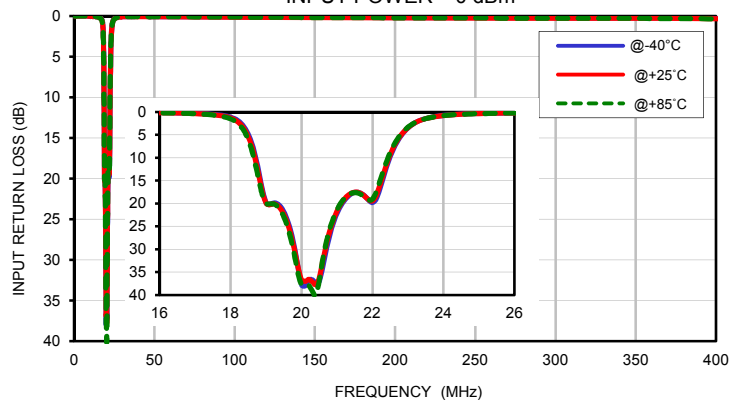
INSERTION LOSS vs. TEMPERATURE (Zoomed)

INPUT POWER = 0 dBm



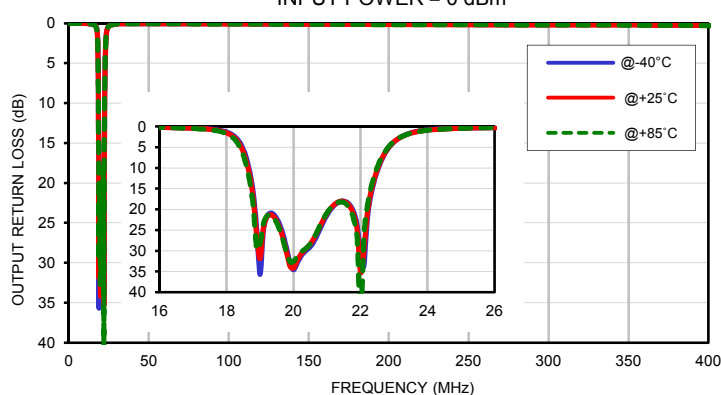
INPUT RETURN LOSS vs. TEMPERATURE

INPUT POWER = 0 dBm



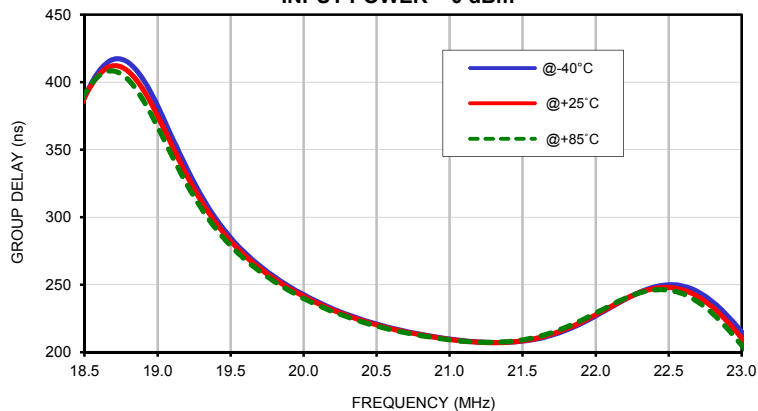
OUTPUT RETURN LOSS vs. TEMPERATURE

INPUT POWER = 0 dBm

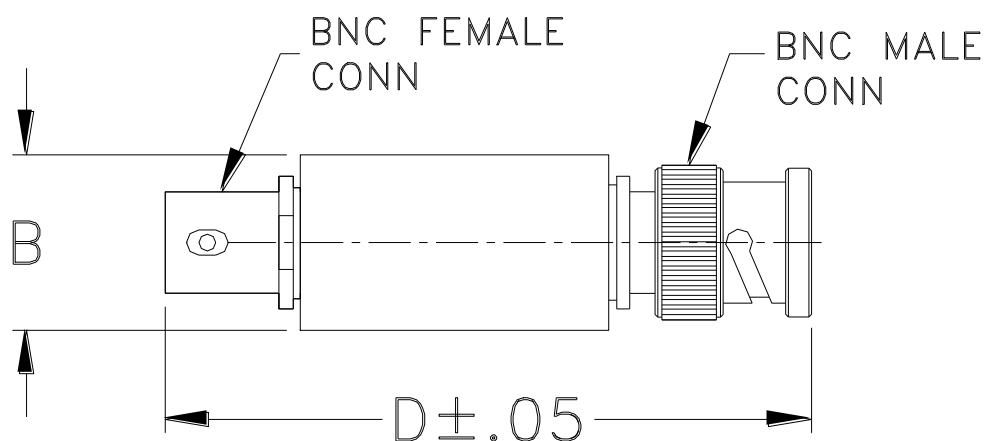


GROUP DELAY vs. TEMPERATURE

INPUT POWER = 0 dBm



Outline Dimensions



CASE #.	A	B	C	D	E	WT GRAMS
FF55	--	.57 (14.47)	--	2.59 (65.79)	--	40.0

Dimensions are in inches (mm). Tolerances: 2Pl. +.03/-.04; 3Pl. ± .015

Note:

- Case material: Stainless steel.



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	-40° to 85°C	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