Coaxial

Coaxial-Ceramic Resonator Filters and Multiplexers

50Ω DC to 6 GHz

The Big Deal

- Low insertion loss with excellent power handling
- Passbands up to 6 GHz
- Fractional bandwidth from <1 to 25%
- Excellent temperature stability
- Rugged construction to handle demanding environmental conditions

Product Overview

Mini-Circuits' *Coaxial-Ceramic Resonator filters* offer low insertion loss in very small form factors, using ceramic material with high dielectric constant and superior Q factor. Bandpass and bandstop filters,diplexer and multiplexer designs can be constructed using this technology. Low insertion loss combined with excellent power handling makes these filters well suited for transmitter and receiver signal chains. Advanced filter design and construction can achieve stopband width greater than 3x the center frequency

All our coaxial-ceramic resonator filters are built with rugged construction. Excellent repeatability across units is achieved through precise tuning and process control.

Key Features

Feature	Advantages
Low insertion loss	Low signal loss results in better SNR in signal chain
Fast roll-off	Higher selectivity results in better adjacent channel rejection and dynamic range
Wide stop band	Wide spur-free stopband results in better receiver sensitivity
Excellent power handling	Well suited for transmitter applications
Rugged Construction	These filter assemblies have been qualified over a wide range of thermal, mechanical and environmental conditions including withstanding the stress of extensive solder reflow cycles
Small Size	Very well suited for high performance applications where size is a constraint.
Temperature stability	Very minimal change in electrical performance across temperature makes these filters suitable for a wide range of operating conditions.

Coaxial

Bandpass Filter

50Ω 2490 to 2510 MHz

ZCBP6-2500-S+

Generic photo used for illustration purposes only
CASE STYLE: ZZ2007-1

Connectors	Model
SMA-F\M	ZCBP6-2500-S+
BRACKET (OPTION "B")	

Features

- Low passband Insertion loss, 1.7dB typ.
- High rejection, 60dB typ.
- Connectorized package

Applications

- Defense/Military
- Radio determination satellite service

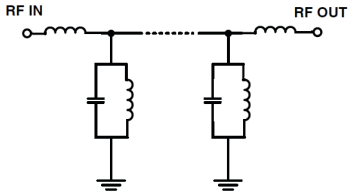
Electrical Specifications at 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	—	—	—	2500	—	MHz
	Insertion Loss	F1-F2	2490 - 2510	—	1.7	2.3	dB
	VSWR	F1-F2	2490 - 2510	—	1.33	1.67	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC - 2040	45	60	—	dB
		F3-F4	2040 - 2385	20	29	—	dB
Stop Band, Upper	Insertion Loss	F5-F6	2605 - 2800	20	27	—	dB
		F6-F7	2800 - 3900	40	55	—	dB

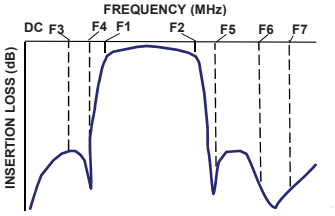
Maximum Ratings	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input *	7 W at 25°C

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

Functional Schematic

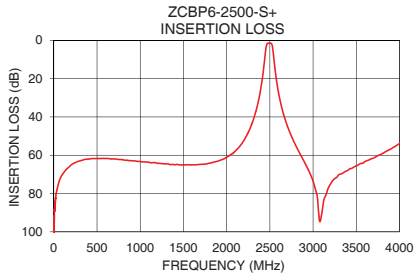


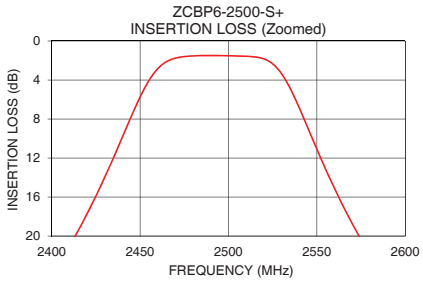
Typical Frequency Response

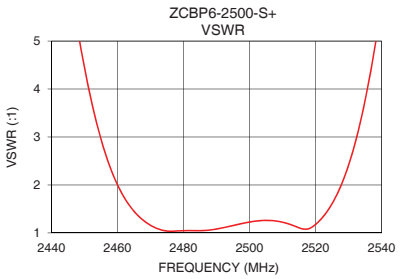


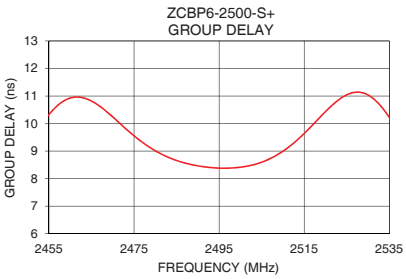
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nSec)
1	96.19	1900.63	2482	8.85
50	75.44	328.58	2484	8.72
100	70.04	209.12	2486	8.61
1000	63.25	274.26	2488	8.53
2040	59.89	114.22	2490	8.46
2385	27.91	43.91	2492	8.42
2412	20.42	27.86	2494	8.39
2458	3.26	2.33	2496	8.38
2490	1.49	1.08	2498	8.39
2494	1.49	1.14	2500	8.41
2500	1.51	1.23	2502	8.47
2504	1.53	1.26	2504	8.55
2510	1.57	1.22	2506	8.66
2532	3.91	2.88	2508	8.81
2578	21.31	33.36	2510	9.00
2605	28.48	50.17	2512	9.22
2620	31.74	57.53	2514	9.49
2800	54.94	85.46	2516	9.79
3200	75.18	83.34	2518	10.12
3900	56.78	85.36	2520	10.44









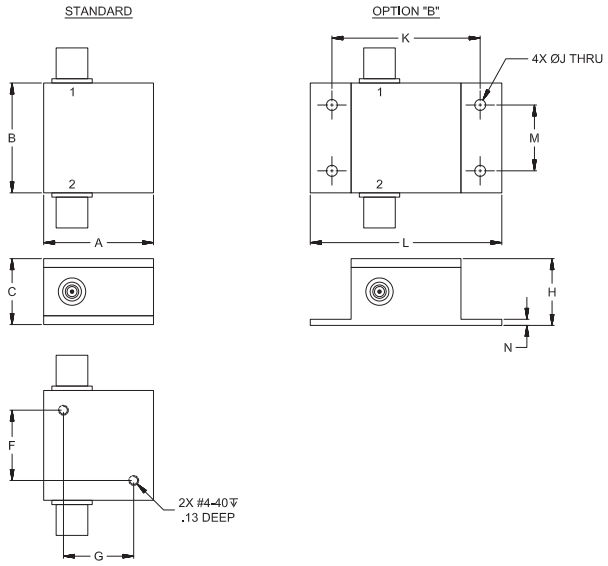
+RoHS Compliant
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

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 Connections

PORT - 1	SMA-FEMALE
PORT - 2	SMA-MALE

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H	J	K	L	M	N	Wt.
1.25	**1.25**	**.75**	**--**	**--**	**.800**	**.800**	**.76**	**.125**	**1.688**	**2.18**	**.750**	**.07**	grams
31.75	31.75	19.05			20.32	20.32	19.30	3.18	42.88	55.37	19.05	1.78	38

Note: Please refer to case style drawing for details

Coaxial Band Pass Filter ZCBP6-2500-S+

Typical Performance Data

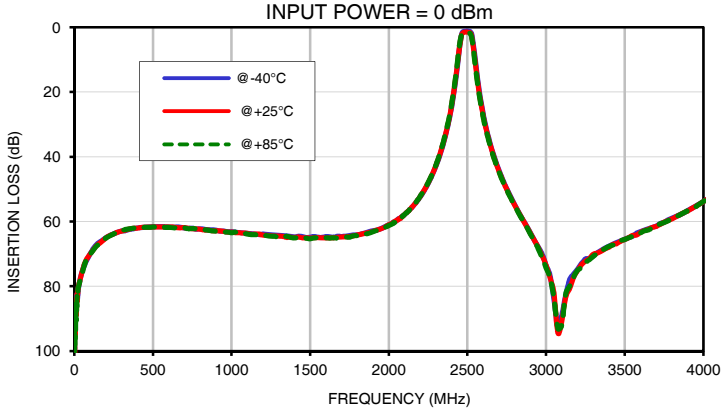
FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
1	98.27	96.19	102.52	0.01	0.01	0.01	0.00	0.01	0.01
10	88.91	88.40	90.71	0.02	0.02	0.02	0.01	0.02	0.02
25	80.81	80.36	80.47	0.03	0.03	0.04	0.03	0.03	0.03
50	75.43	75.44	75.96	0.05	0.05	0.06	0.05	0.05	0.05
75	72.33	71.93	71.96	0.06	0.07	0.07	0.07	0.06	0.07
100	70.11	70.04	70.16	0.08	0.08	0.09	0.08	0.08	0.08
300	62.92	62.98	62.90	0.10	0.12	0.13	0.10	0.12	0.12
500	61.58	61.69	61.70	0.07	0.10	0.11	0.07	0.10	0.11
700	61.97	61.90	61.95	0.04	0.08	0.09	0.05	0.08	0.09
1000	63.16	63.25	63.46	0.02	0.06	0.08	0.02	0.07	0.10
1200	63.90	64.22	64.04	0.02	0.07	0.09	0.01	0.07	0.11
1400	64.80	64.96	65.08	0.03	0.08	0.11	0.02	0.08	0.12
1500	64.87	65.10	65.31	0.04	0.09	0.12	0.02	0.09	0.13
1700	64.63	64.75	64.91	0.05	0.11	0.14	0.04	0.10	0.14
1900	62.89	63.07	63.09	0.07	0.13	0.16	0.06	0.12	0.16
2000	61.02	61.00	61.24	0.08	0.15	0.18	0.07	0.13	0.16
2040	59.99	59.89	60.18	0.09	0.15	0.18	0.07	0.13	0.17
2100	57.84	57.84	57.88	0.10	0.16	0.19	0.08	0.14	0.17
2200	52.33	52.25	52.22	0.12	0.19	0.22	0.10	0.16	0.19
2300	42.83	42.63	42.47	0.15	0.23	0.27	0.14	0.20	0.23
2385	28.34	27.91	27.54	0.29	0.40	0.46	0.27	0.36	0.41
2412	20.98	20.42	19.93	0.47	0.62	0.72	0.45	0.60	0.68
2438	11.32	10.69	10.10	1.28	1.68	2.00	1.27	1.67	1.98
2458	3.31	3.26	3.10	6.55	7.98	9.45	6.66	8.18	9.75
2490	1.20	1.49	1.66	29.19	28.19	25.08	21.40	21.34	19.80
2492	1.19	1.49	1.66	33.00	25.79	23.17	21.62	20.68	19.12
2494	1.19	1.49	1.67	37.17	23.74	21.59	21.73	19.97	18.48
2496	1.19	1.50	1.68	34.34	22.09	20.33	21.64	19.28	17.90
2498	1.19	1.50	1.68	29.92	20.79	19.37	21.39	18.66	17.44
2500	1.20	1.51	1.69	26.93	19.82	18.69	21.04	18.18	17.12
2502	1.20	1.52	1.70	24.95	19.16	18.29	20.72	17.87	16.99
2504	1.21	1.53	1.71	23.68	18.80	18.18	20.53	17.77	17.10
2506	1.22	1.54	1.73	23.00	18.77	18.41	20.57	17.95	17.49
2508	1.23	1.55	1.74	22.89	19.13	19.05	20.95	18.46	18.26
2510	1.24	1.57	1.76	23.39	19.95	20.23	21.81	19.46	19.62
2530	2.66	3.35	3.95	8.34	7.65	6.86	8.33	7.68	6.94
2548	9.28	10.25	11.02	1.64	1.67	1.66	1.62	1.67	1.66
2574	19.32	20.05	20.61	0.46	0.57	0.63	0.44	0.55	0.61
2605	27.96	28.48	28.88	0.25	0.35	0.40	0.23	0.32	0.36
2615	30.23	30.70	31.07	0.22	0.31	0.36	0.20	0.29	0.33
2700	44.12	44.42	44.61	0.14	0.22	0.26	0.13	0.20	0.23
2750	49.84	50.10	50.27	0.13	0.21	0.25	0.12	0.18	0.21
2800	54.72	54.94	55.01	0.12	0.20	0.24	0.11	0.17	0.20
2850	59.19	59.35	59.40	0.12	0.20	0.23	0.12	0.17	0.20
2900	63.55	63.59	63.86	0.12	0.20	0.23	0.11	0.17	0.19
2950	67.97	68.03	68.31	0.12	0.20	0.24	0.11	0.17	0.19
3000	73.61	73.46	74.33	0.12	0.20	0.23	0.11	0.17	0.19
3050	83.97	82.09	83.63	0.13	0.21	0.24	0.11	0.17	0.19
3100	88.79	90.75	91.99	0.12	0.20	0.23	0.11	0.17	0.19
3150	77.91	80.67	79.96	0.13	0.21	0.24	0.11	0.17	0.19
3200	74.72	75.18	75.06	0.13	0.21	0.24	0.10	0.16	0.19
3250	71.56	72.25	72.67	0.13	0.20	0.23	0.10	0.16	0.19
3300	70.62	70.11	70.76	0.13	0.21	0.24	0.10	0.17	0.19
3400	67.61	67.96	67.68	0.12	0.21	0.24	0.10	0.16	0.19
3500	65.44	65.59	65.54	0.13	0.21	0.24	0.09	0.16	0.19
3600	63.17	63.33	63.52	0.12	0.21	0.24	0.09	0.16	0.19
3700	61.43	61.51	61.32	0.12	0.21	0.24	0.09	0.16	0.20
3800	59.01	59.20	59.15	0.11	0.21	0.24	0.09	0.16	0.20
3850	57.89	57.91	57.96	0.11	0.21	0.24	0.09	0.17	0.20
3900	56.59	56.78	56.69	0.11	0.20	0.24	0.09	0.16	0.20

Typical Performance Data

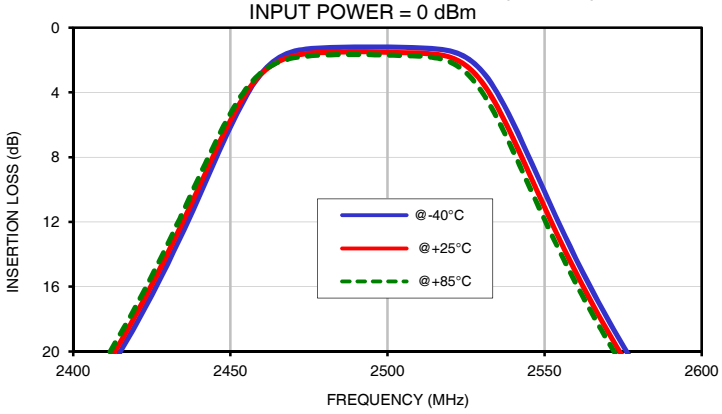
FREQ. (MHz)	GROUP DELAY (ns)		
	@-40°C	@+25°C	@+85°C
2460	11.11	10.93	10.85
2462	11.25	10.96	10.80
2464	11.26	10.89	10.66
2466	11.16	10.73	10.46
2468	10.95	10.51	10.21
2470	10.68	10.24	9.95
2472	10.37	9.96	9.68
2474	10.04	9.68	9.43
2476	9.74	9.43	9.21
2478	9.45	9.20	9.01
2480	9.20	9.01	8.84
2482	9.00	8.85	8.71
2484	8.83	8.72	8.60
2486	8.70	8.61	8.51
2488	8.60	8.53	8.45
2490	8.53	8.46	8.39
2492	8.48	8.42	8.36
2494	8.45	8.39	8.34
2496	8.44	8.38	8.34
2498	8.45	8.39	8.37
2500	8.47	8.41	8.41
2502	8.50	8.47	8.48
2504	8.57	8.55	8.59
2506	8.65	8.66	8.73
2508	8.77	8.81	8.91
2510	8.92	9.00	9.13
2512	9.11	9.22	9.39
2514	9.34	9.49	9.68
2516	9.61	9.79	9.99
2518	9.91	10.12	10.31
2520	10.23	10.44	10.60
2522	10.54	10.72	10.84
2524	10.82	10.96	11.00
2526	11.04	11.11	11.06
2528	11.17	11.14	10.99
2530	11.19	11.04	10.79
2532	11.07	10.80	10.45
2534	10.82	10.44	10.02
2536	10.45	9.97	9.49
2538	9.96	9.42	8.90
2540	9.39	8.81	8.29

Typical Performance Curves

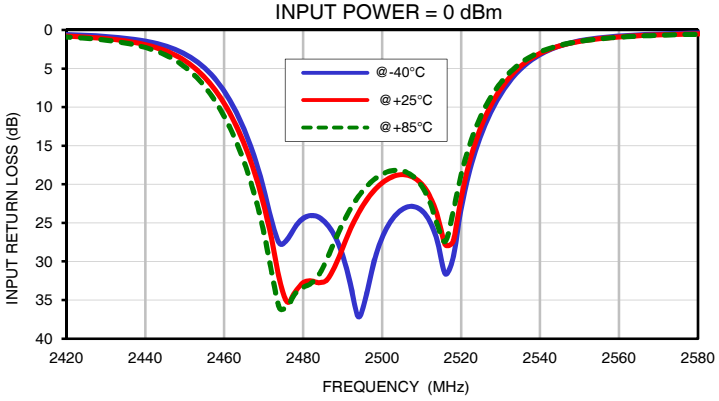
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



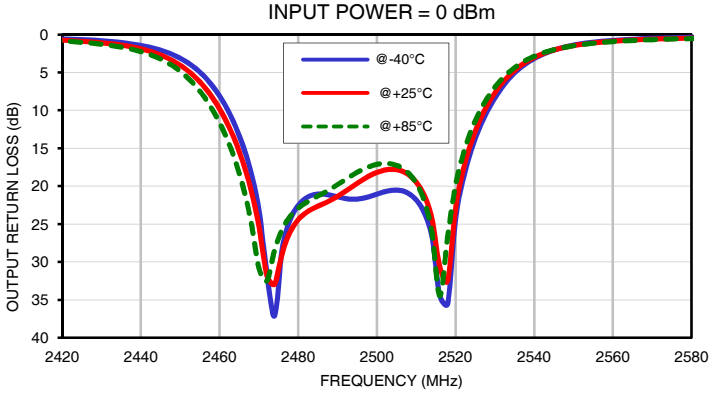
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



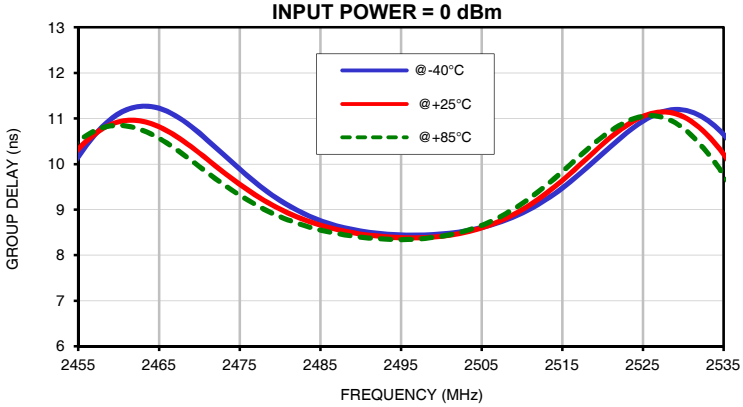
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



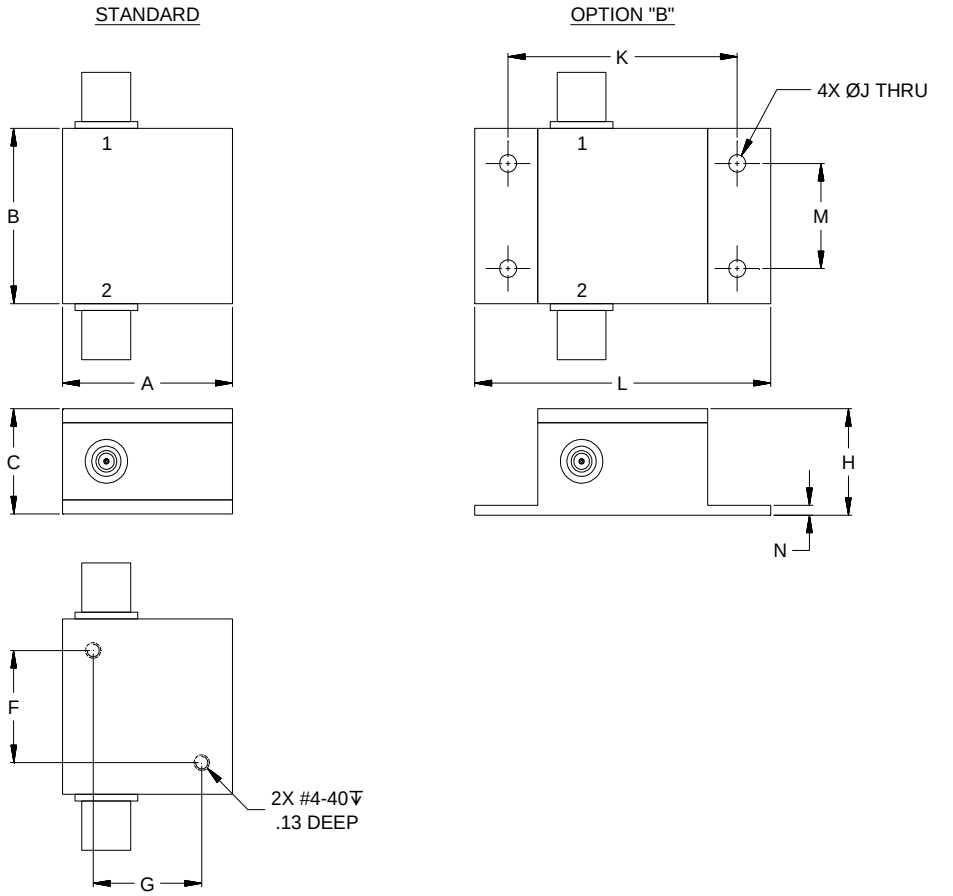
GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



Case Style ZZ

Outline Dimensions

ZZ2007-1



CASE#	A	B	C	D	E	F	G	H	J	K	L	M
ZZ2007-1	1.25 (31.75)	1.25 (31.75)	.75 (19.05)	--	--	.800 (20.32)	.800 (20.32)	.76 (19.30)	.125 (3.18)	1.688 (42.88)	2.18 (55.37)	.750 (19.05)

CASE#	N	WT.GRAMS
ZZ2007-1	.07 (1.78)	38.0

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

Notes:

1. Case material: Aluminum alloy.
2. Case finish:
   For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.
3. Mounting bracket available on request. Add suffix B to part number
4. Refer to the individual model data sheet for the type of connectors available.

Mini-Circuits

Environmental Specifications ENV125

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 Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet