

Cavity Bandpass Filters

ZVBP Model Series

50Ω 24.25 to 43.5 GHz

The Big Deal

- Very low insertion loss with excellent power handling
- Sharp roll-off with wide stopband
- Passbands from 24.25 to 43.5 GHz covering 5G bands*.
- Stopbands up to 57 GHz



Product Overview

Mini-Circuits' cavity filters are designed by implementing resonant structures with very high Q and are ideal for narrow-band, high-selectivity applications. These designs can provide bandwidths as narrow as 3% with very high selectivity and excellent low noise floor. Low insertion loss combined with excellent power handling makes them well-suited for transmitter and receiver front end. Advanced filter design and construction enables stopband width greater than 3x the center frequency.

Key Features

Feature	Advantages
5G bands	Use in various 5G applications, covering n257, n258, n259, n260, and n261 bands.
Low insertion loss	Low signal loss results in better SNR in receiver front end and better power delivery to antenna in transmitter
Sharp roll-off	Higher selectivity results in better adjacent channel rejection and dynamic range
Wide stopband	Wide spur free band results in better receiver sensitivity
High power handling	Well suited for transmitter application
Protective assembly	Prevents accidental de-tuning of precisely tuned resonant circuit

*High frequency models operating above 40 GHz are available with 2.4mm connectors.



Bandpass Filter

50Ω 37000 to 40000 MHz

ZVBP-38500-K+



Generic photo used for illustration purposes only

CASE STYLE: UH3129

Connectors	Model
2.92mm-F	ZVBP-38500-K+

Features

- Low insertion loss, 2.0 dB typical
- Good return loss, 21 dB typical
- High rejection
- Broad stopband performance up to 31 GHz
- Sharp roll-off
- Also available with 2.4mm connectors (model ZVBP-38500-V+)

Applications

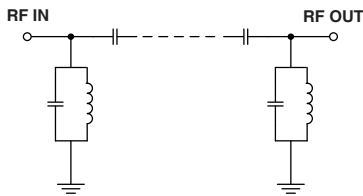
- 5G band n260

Electrical Specifications¹ at 25°C

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	-	-	38500	-	MHz
	Insertion Loss	F1-F2	37000 - 40000	-	2.1	dB
	Return Loss	F1-F2	37000 - 40000	15	27	dB
Stop Band, Lower	Insertion Loss	DC-F3	DC - 36500	80	127	dB
	Return Loss	DC-F3	DC - 36500	-	0.21	dB
Stop Band, Upper	Insertion Loss	F4-F5	40500 - 55000	80	116	dB
	Return Loss	F4-F5	40500 - 55000	-	0.68	dB

¹Data measured after calibrating using 2.92mm cal kit.

Simplified Functional Schematic



Maximum Ratings

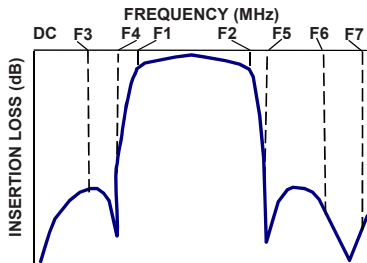
Operating Temperature	-30°C to 70°C
Storage Temperature	-30°C to 70°C
RF Power Input	2.5 W

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

Typical Performance Data at 25°C

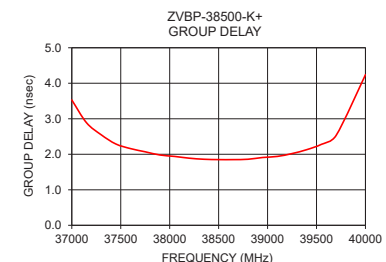
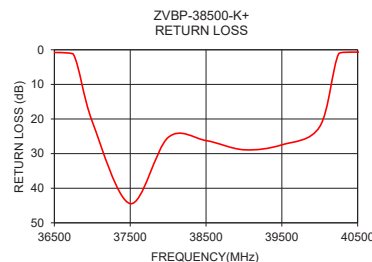
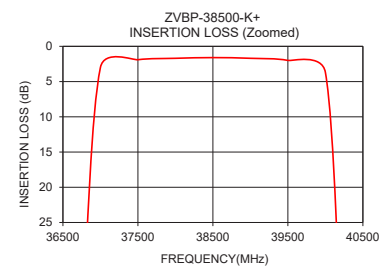
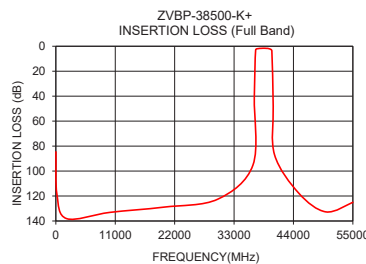
Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)	Frequency (MHz)	Group Delay (nsec)
10	84.6	0.01	37000	3.53
200	118.6	0.03	37150	2.89
2000	138.1	0.12	37300	2.55
10000	133.1	0.15	37450	2.29
20000	128.9	0.27	37600	2.16
30000	122.5	0.09	37750	2.07
36500	95.2	0.78	37900	1.98
36750	41.1	1.28	38050	1.94
37000	3.0	20.77	38200	1.89
37500	1.9	44.45	38350	1.86
38000	1.7	25.34	38500	1.85
38500	1.6	26.23	38650	1.85
39000	1.7	28.89	38800	1.86
39500	2.0	27.47	38950	1.91
40000	3.7	22.20	39100	1.94
40250	48.2	1.15	39250	2.02
40500	87.0	0.68	39400	2.13
45000	117.8	0.02	39550	2.28
50000	132.7	0.45	39700	2.53
55000	125.0	0.99	40000	4.24

Typical Frequency Response



+RoHS Compliant

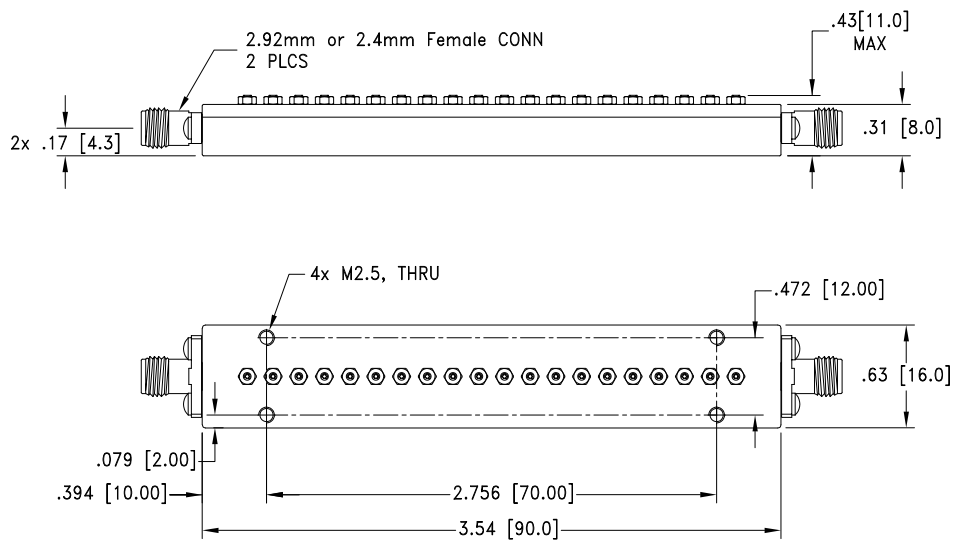
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications



Coaxial Connections

PORT 1	2.92mm-FEMALE
PORT 2	2.92mm-FEMALE

Outline Drawing



Weight: 85 grams $\pm$ 5 grams ;
 Dimensions are in inches [mm]. Tolerances: 2 Pl. $\pm$.03; 3 Pl. $\pm$.015

Additional 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

Typical Performance Data

FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-30°C	@+25°C	@+70°C	@-30°C	@+25°C	@+70°C	@-30°C	@+25°C	@+70°C
100	109.33	106.70	113.34	0.01	0.02	0.03	0.01	0.02	0.03
200	111.51	111.92	117.64	0.02	0.03	0.04	0.02	0.03	0.04
300	109.87	108.08	102.34	0.04	0.05	0.06	0.03	0.05	0.06
400	109.78	111.11	107.24	0.04	0.06	0.07	0.04	0.05	0.07
500	110.39	122.41	113.80	0.04	0.06	0.07	0.04	0.06	0.07
600	103.50	109.65	103.63	0.04	0.07	0.08	0.04	0.06	0.08
800	108.59	109.10	117.85	0.05	0.07	0.09	0.04	0.07	0.09
1000	106.08	104.60	109.23	0.05	0.08	0.10	0.04	0.07	0.10
1200	104.31	103.64	117.27	0.04	0.08	0.10	0.03	0.07	0.10
1500	119.17	105.63	103.44	0.04	0.08	0.10	0.03	0.07	0.10
2000	109.12	122.65	116.05	0.03	0.07	0.10	0.02	0.07	0.10
2500	107.09	106.81	105.59	0.01	0.06	0.10	0.00	0.06	0.10
3000	103.85	113.18	106.05	0.00	0.06	0.09	0.01	0.05	0.09
3500	112.48	108.15	103.72	0.01	0.05	0.08	0.02	0.04	0.09
4000	107.80	113.24	110.50	0.02	0.04	0.08	0.04	0.03	0.08
4500	110.26	109.47	111.74	0.03	0.04	0.08	0.05	0.03	0.08
5000	110.21	115.59	117.71	0.03	0.04	0.09	0.05	0.03	0.09
5500	111.60	114.47	105.92	0.03	0.05	0.10	0.05	0.04	0.10
6000	114.98	109.39	115.90	0.02	0.06	0.11	0.04	0.05	0.12
6500	114.99	103.14	108.58	0.01	0.08	0.13	0.02	0.07	0.14
7000	108.32	108.88	106.06	0.02	0.10	0.15	0.00	0.10	0.17
8000	105.62	110.12	122.43	0.05	0.15	0.21	0.03	0.14	0.22
10000	103.83	118.84	104.68	0.03	0.14	0.21	0.02	0.14	0.23
15000	102.03	114.62	106.15	0.12	0.02	0.11	0.20	0.04	0.10
20000	114.42	113.00	104.65	0.03	0.25	0.37	0.07	0.29	0.44
25000	112.30	103.28	106.48	0.30	0.06	0.09	0.36	0.08	0.13
30000	101.09	92.05	96.67	0.15	0.42	0.58	0.15	0.43	0.65
35000	107.51	96.00	91.68	0.26	0.08	0.28	0.39	0.01	0.32
36500	87.38	86.21	81.59	0.78	1.20	1.49	0.48	0.88	1.15
36800	37.70	30.78	23.99	1.32	2.15	3.10	0.56	1.35	2.13
36840	29.22	21.77	14.57	1.78	2.99	5.11	0.86	1.91	3.61
36900	15.16	8.31	5.28	3.70	9.24	25.31	2.30	6.28	14.41
37000	3.11	3.21	3.32	22.47	27.14	29.00	20.95	30.43	28.44
37300	1.65	2.08	2.38	21.76	22.18	22.76	24.37	24.19	21.62
37600	1.33	1.77	2.07	27.63	28.20	30.22	20.67	21.08	21.48
37900	1.22	1.66	1.97	20.03	20.42	21.62	21.76	21.36	24.83
38200	1.11	1.55	1.87	23.66	23.85	23.11	29.61	28.82	24.11
38500	1.08	1.52	1.84	31.88	31.63	29.32	33.08	30.31	26.94
39000	1.13	1.59	1.92	23.09	22.13	22.72	21.60	20.41	21.35
39500	1.31	1.83	2.20	31.55	24.72	23.70	22.47	20.59	21.51
40000	2.32	3.24	4.10	25.28	18.88	21.01	28.67	19.29	19.31
40120	4.45	9.27	17.67	16.60	9.99	6.68	11.51	4.91	2.39
40160	8.78	18.30	27.98	8.89	5.63	3.84	4.26	1.98	1.39
40200	18.03	28.60	37.38	4.73	3.28	2.55	1.45	1.11	0.98
40500	75.38	80.06	83.42	0.08	0.37	0.54	0.44	0.02	0.26
41000	96.41	89.37	91.78	0.34	0.02	0.29	0.44	0.05	0.32
41500	87.27	101.83	89.11	0.24	0.11	0.38	0.20	0.11	0.48
42100	96.28	95.92	96.09	0.04	0.28	0.52	0.03	0.30	0.66
42550	99.61	85.01	89.64	0.08	0.39	0.61	0.12	0.41	0.77
43000	85.51	90.18	94.74	0.19	0.48	0.69	0.14	0.47	0.84
43600	88.90	97.94	104.41	0.23	0.53	0.76	0.18	0.58	0.92
44050	89.20	98.53	94.22	0.24	0.57	0.80	0.19	0.59	0.91
44500	105.41	94.41	90.66	0.22	0.58	0.82	0.20	0.60	0.87
45550	88.60	93.33	94.36	0.07	0.46	0.65	0.10	0.48	0.67
46000	91.53	90.74	91.56	0.02	0.40	0.58	0.02	0.41	0.59
47200	105.01	98.98	102.80	0.31	0.11	0.29	0.49	0.11	0.25
48100	86.48	87.31	90.74	0.56	0.06	0.18	0.72	0.16	0.03
49000	92.03	90.57	87.90	0.71	0.19	0.08	0.83	0.32	0.01
51100	97.61	100.19	86.14	0.43	0.03	0.35	0.54	0.01	0.41
55000	88.71	88.99	86.74	1.21	0.60	0.34	0.96	0.18	0.14

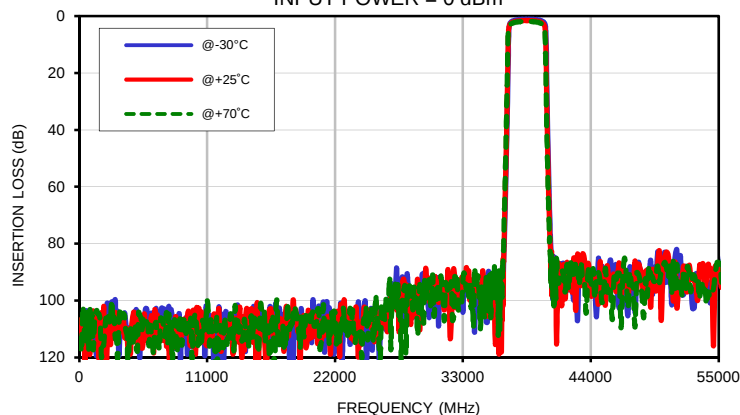
Typical Performance Data

FREQ.	GROUP DELAY		
(MHz)	(nsec)		
	@-30°C	@+25°C	@+70°C
37000	5.02	4.40	3.93
37050	4.15	3.75	3.49
37100	3.61	3.37	3.19
37150	3.28	3.11	2.98
37200	3.04	2.92	2.82
37250	2.86	2.76	2.68
37300	2.72	2.64	2.57
37350	2.60	2.54	2.48
37400	2.51	2.45	2.41
37450	2.43	2.38	2.34
37500	2.36	2.31	2.28
37550	2.30	2.26	2.23
37600	2.24	2.21	2.18
37650	2.19	2.16	2.14
37700	2.15	2.12	2.10
37750	2.11	2.09	2.07
37800	2.08	2.05	2.04
37850	2.04	2.02	2.01
37900	2.01	2.00	1.98
38000	1.97	1.96	1.95
38100	1.94	1.93	1.92
38200	1.91	1.90	1.89
38300	1.88	1.87	1.87
38400	1.86	1.86	1.86
38500	1.86	1.86	1.86
38600	1.85	1.85	1.85
38700	1.85	1.85	1.85
38800	1.85	1.86	1.86
38900	1.87	1.88	1.89
39000	1.89	1.90	1.91
39100	1.92	1.93	1.95
39150	1.93	1.95	1.97
39200	1.95	1.97	1.99
39300	2.00	2.03	2.05
39400	2.06	2.09	2.12
39500	2.14	2.18	2.22
39600	2.25	2.30	2.36
39700	2.40	2.47	2.54
39800	2.59	2.70	2.81
39900	2.91	3.10	3.32
40000	3.52	3.96	4.51

Typical Performance Curves

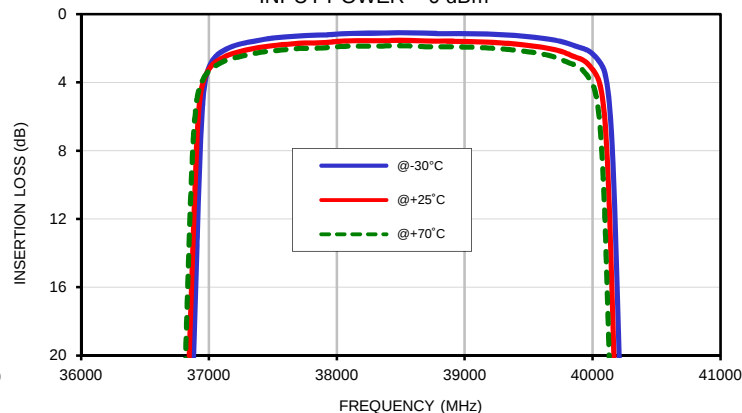
INSERTION LOSS vs. TEMPERATURE

INPUT POWER = 0 dBm



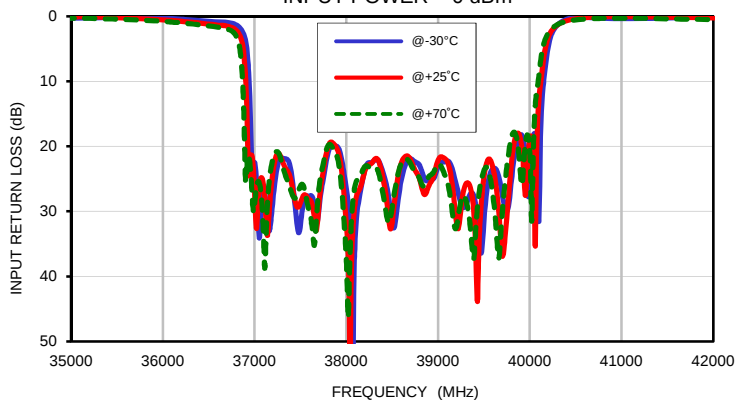
INSERTION LOSS vs. TEMPERATURE (Zoomed)

INPUT POWER = 0 dBm



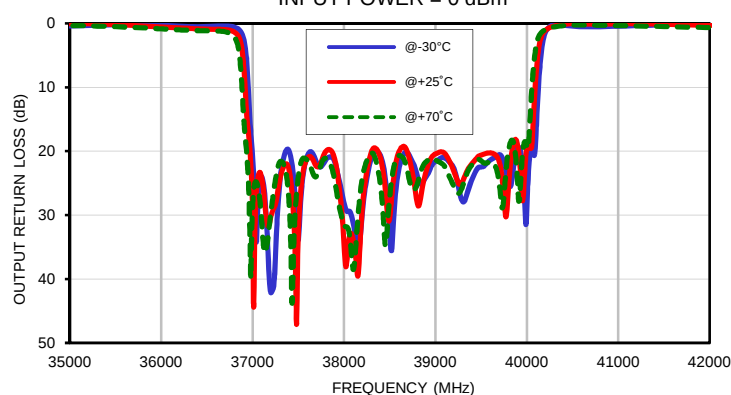
INPUT RETURN LOSS vs. TEMPERATURE

INPUT POWER = 0 dBm



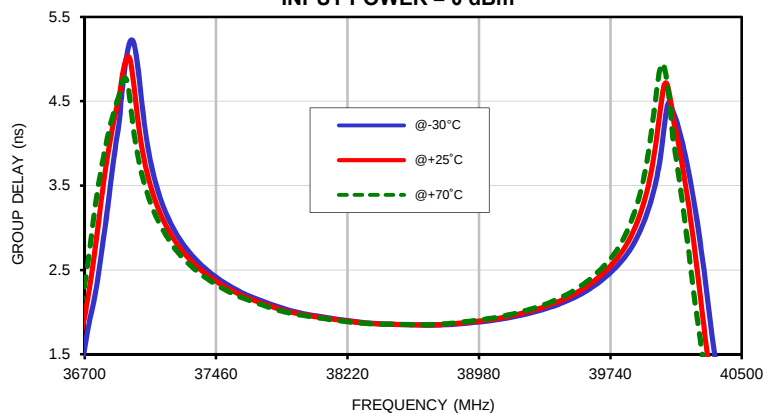
OUTPUT RETURN LOSS vs. TEMPERATURE

INPUT POWER = 0 dBm



GROUP DELAY vs. TEMPERATURE

INPUT POWER = 0 dBm

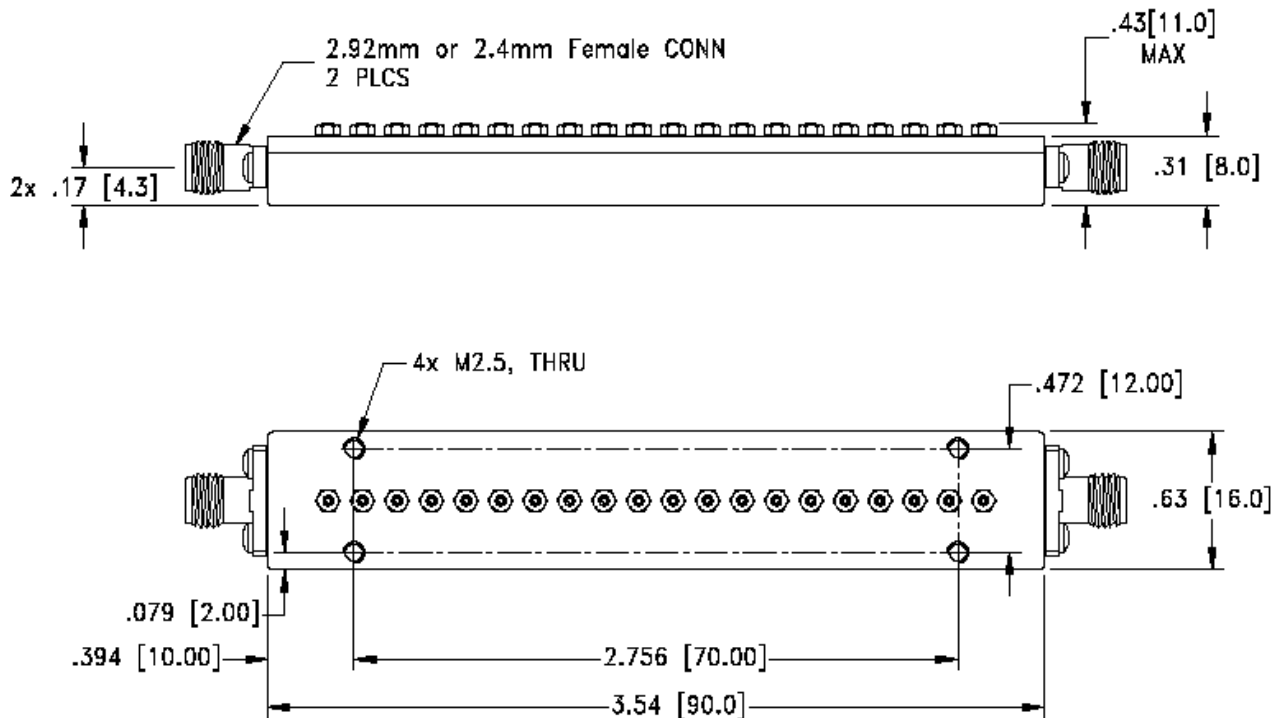


Case Style

UH

Outline Dimensions

UH3129



Weight: 85 grams $\pm$ 5 grams;

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

Notes:

1. Case material: H62 Copper Alloy
2. Case Finish: Black Painting

Mini-Circuits®
ISO 9001 ISO 14001 CERTIFIED

ALL NEW
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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	-30° to 70°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-30° to 70° C Ambient Environment	Individual Model Data Sheet
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C