

Coaxial Reflectionless High Pass Filter

ZXHF Series

50Ω

DC to 30 GHz



The Big Deal

- Patented design eliminates in band spurs
- Wideband performance up to 30 GHz

Product Overview

Mini-Circuits' ZXHF Series reflectionless filters employs a novel filter topology which absorbs and terminates stop band signals internally rather than reflecting them back to the source. Reflectionless filters eliminate stopband reflections, allowing them to be paired with sensitive devices and used in applications that otherwise require circuits such as isolation amplifiers or attenuators. This is developed in a new broadband, stable connectorized package.

Key Features

Feature	Advantages
Easy integration with sensitive reflective components, e.g. mixers, multipliers	Reflectionless filters absorb unwanted signals, preventing reflections back to the source. This reduces generation of additional unwanted signals without the need for extra components like attenuators, improving system dynamic range.
Cascadable	Reflectionless filters can be cascaded in multiple sections to provide sharper and higher attenuation, while also preventing any standing waves that could affect pass band signals.
Excellent stability over temperature	Minimal variation in electrical performance across temperature.
Operating temperature up to 105°C	Suitable for operation close to high power components.
Broadband connectorized package	The connectorized package works well even in high frequencies and easy to interface with other devices. This is well suited for test setups.

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



High Pass Filter

ZXHF-K63M+

50Ω 5900 to 19000 MHz



Generic photo used for illustration purposes only

Features

- Match to 50Ω in the stop band, eliminates undesired reflections
- Cascadable
- Temperature stable, up to 105°C
- Protected by US Patent No. 8,392,495 ; 9,705,467, additional patent pending
- Protected by China Patent 201080014266.1
- Protected by Taiwan Patent 1581494

Applications

- Military/Defense
- Satellite communication
- Mobile
- Space research

CASE STYLE: UK3042
Connectors Model
2.92mm-F ZXHF-K63M+

Electrical Specifications at 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Stop Band	Rejection	DC-F1	DC- 3000	23	27	-	dB
		F1-F2	3000 - 4100	18	25	-	dB
	Freq. Cut-Off	F3	5000	-	3.0	-	dB
	VSWR	DC-F1	DC- 3000	-	1.2	-	:1
		F1-F2	3000 - 4100	-	1.2	-	:1
Pass Band	Insertion Loss	F4-F5	5900 - 10000	-	1.9	2.7	dB
		F5-F6	10000 - 19000	-	2.0	3.0	dB
	VSWR	F4-F5	5900 - 10000	-	1.2	-	:1
		F5-F6	10000 - 19000	-	1.4	-	:1

Absolute Maximum Ratings³

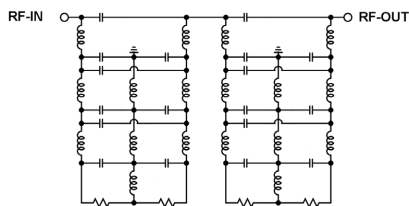
Parameter	Ratings
Operating Temperature	-55°C to +105°C
Storage Temperature	-55°C to +105°C
RF Power Input, Passband (F4-F6) ¹	1W at 25°C
RF Power Input, Stopband (DC-F4) ²	1.25W at 25°C

¹ Passband rating derates linearly to 0.5W at 105°C ambient² Stopband rating derates linearly to 0.63W at 105°C ambient³ Permanent damage may occur if any of these limits are exceeded

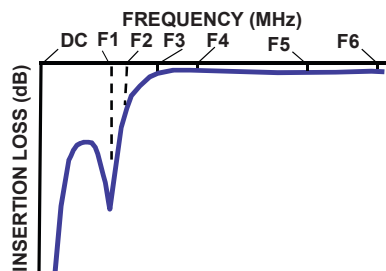
ESD rating

Human body model (HBM): Class 2(Pass 2000V) in accordance with ANSI/ESD 5.1-2001

Functional Schematic



Typical Frequency Response

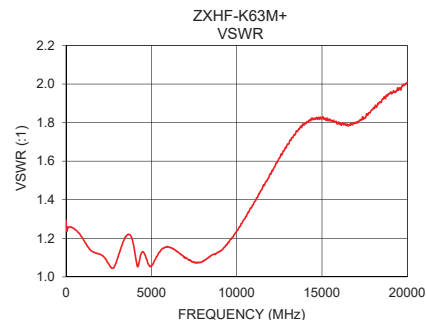
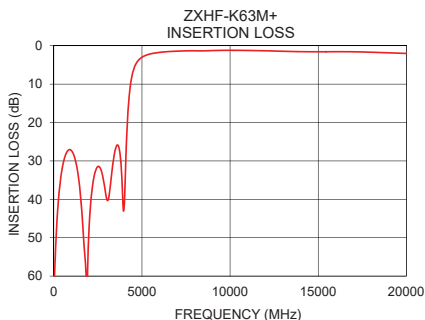


+RoHS Compliant

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)
1	62.29	1.27
100	52.97	1.25
500	31.33	1.25
1000	27.31	1.20
1400	34.27	1.14
2000	47.46	1.12
3000	39.91	1.09
4100	27.60	1.09
4200	17.74	1.05
5000	2.99	1.05
5900	1.79	1.16
8000	1.31	1.08
10000	1.19	1.24
11000	1.22	1.38
12000	1.31	1.53
15000	1.57	1.82
16000	1.54	1.79
17000	1.57	1.80
18000	1.68	1.87
19000	1.84	1.96



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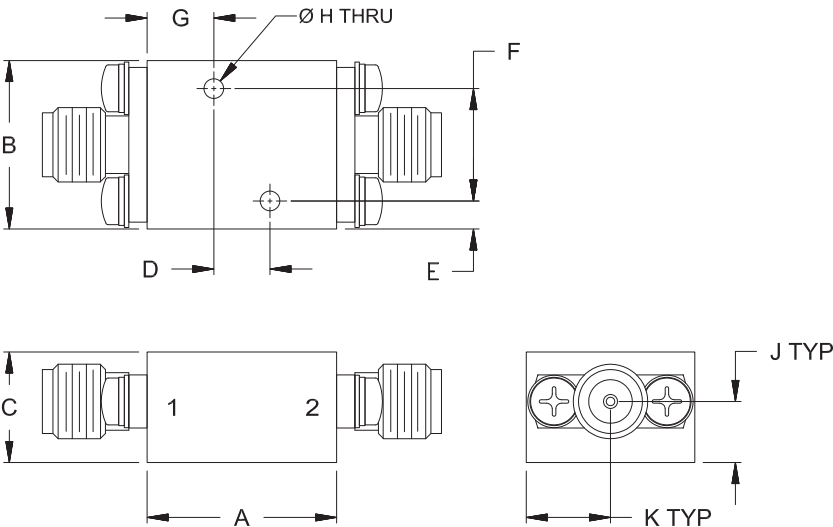
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ECO-004800
ZXHF-K63M+
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Coaxial Connections

PORT - 1	2.92mm-Female
PORT - 2	2.92mm-Female

Outline Drawing



Outline Dimensions (inch
mm)

A	B	C	D	E	F
.68	.60	.39	.200	.10	.400
17.1	15.2	10.0	5.08	2.5	10.16
G	H	J	K	Wt.	
.24	.070	.22	.30	grams	
6.0	1.78	5.5	7.6	24	

Note: Please refer to case style drawing for details

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Coaxial Reflectionless High Pass Filter

ZXHF-K63M+

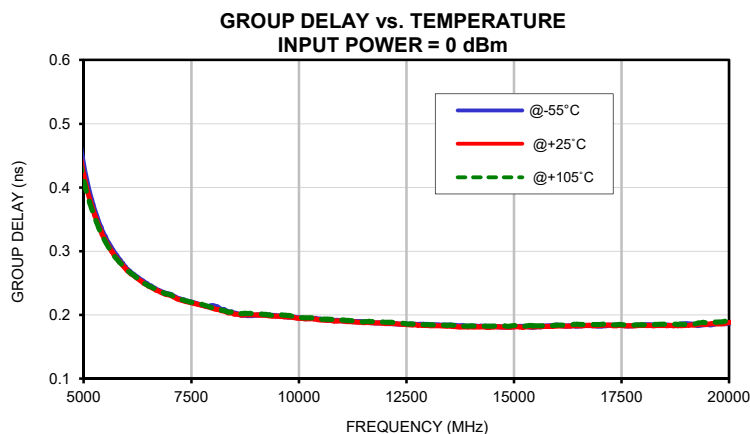
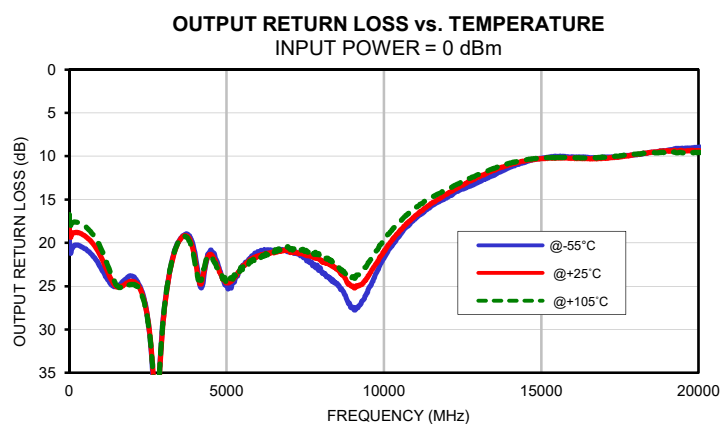
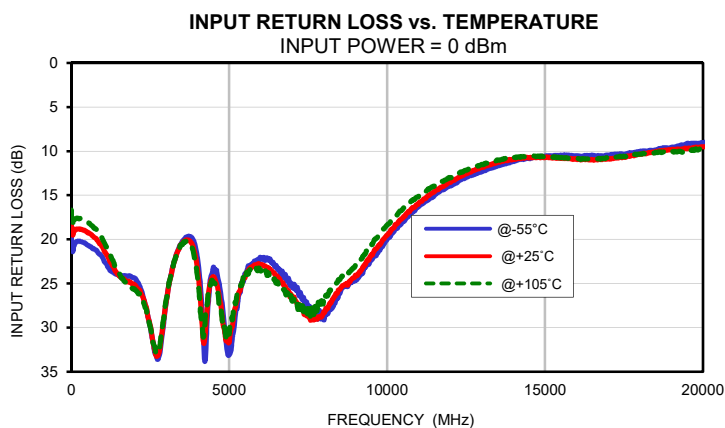
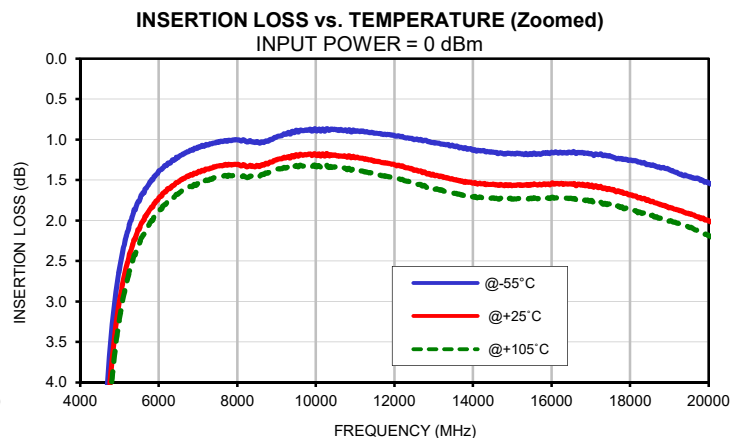
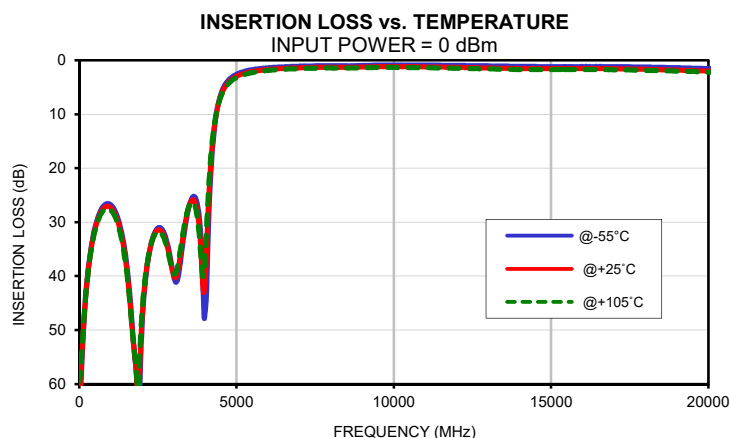
Typical Performance Data

FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-55°C	@+25°C	@+105°C	@-55°C	@+25°C	@+105°C	@-55°C	@+25°C	@+105°C
1	66.52	62.29	59.42	20.34	18.61	17.36	20.58	18.80	17.52
50	60.97	58.64	56.71	21.34	19.49	18.10	21.19	19.34	17.97
100	53.89	52.97	52.07	20.64	19.05	17.73	20.63	18.96	17.67
400	33.86	34.17	34.38	20.38	18.97	17.79	20.49	18.99	17.83
500	30.97	31.33	31.60	20.60	19.16	18.02	20.68	19.20	18.06
600	28.95	29.35	29.66	20.81	19.37	18.28	20.96	19.51	18.41
750	27.15	27.60	27.96	21.15	19.83	18.75	21.48	20.07	19.02
800	26.82	27.28	27.66	21.27	19.96	18.93	21.70	20.32	19.30
1000	26.77	27.31	27.75	22.13	20.98	20.08	22.84	21.56	20.60
1200	28.78	29.42	29.93	23.35	22.30	21.53	24.11	23.18	22.39
1400	33.48	34.27	34.88	23.93	23.64	23.16	25.01	24.68	24.23
2000	48.80	47.46	46.42	24.38	25.13	25.63	23.86	24.44	24.79
2100	41.06	40.54	40.14	24.84	25.55	26.04	24.11	24.56	24.87
2200	36.56	36.40	36.27	25.65	26.07	26.55	24.76	24.94	25.19
2300	33.63	33.71	33.74	26.89	26.92	27.31	25.51	25.69	25.89
2400	31.91	32.15	32.31	28.28	28.27	28.56	26.75	26.94	27.15
2500	31.08	31.46	31.72	29.94	29.78	29.98	28.89	28.85	29.06
3000	40.00	39.91	39.53	27.23	27.11	26.88	28.38	28.58	28.31
3500	26.81	26.84	26.87	20.34	20.49	20.60	19.69	19.77	19.77
3800	28.26	30.14	31.46	19.77	20.40	20.84	19.11	19.45	19.71
4000	46.72	41.20	36.59	22.22	23.49	24.47	21.34	21.95	22.43
4100	32.19	27.60	24.89	25.69	27.41	28.58	23.60	24.08	24.26
4150	24.53	21.94	20.31	28.74	30.04	30.07	24.91	24.70	24.28
4200	19.24	17.74	16.71	32.32	31.81	30.90	25.19	24.71	24.30
4300	12.42	12.04	11.72	29.22	27.97	27.44	23.30	22.99	22.81
5000	2.60	2.99	3.22	33.08	31.69	30.73	24.77	24.58	24.45
5100	2.34	2.73	2.94	31.09	29.85	29.13	24.82	24.55	24.43
5200	2.15	2.53	2.73	28.43	27.65	27.30	24.44	24.24	24.19
5300	1.99	2.36	2.56	26.36	26.05	26.00	23.80	23.82	23.87
5400	1.87	2.23	2.42	24.84	25.04	25.18	23.26	23.35	23.47
5500	1.76	2.11	2.29	23.89	24.35	24.59	22.65	22.93	23.11
5600	1.66	2.00	2.18	23.03	23.62	23.95	22.26	22.51	22.74
5700	1.58	1.92	2.09	22.82	23.20	23.64	21.93	22.19	22.47
5800	1.52	1.85	2.02	22.45	22.90	23.42	21.51	21.84	22.15
5900	1.45	1.79	1.95	22.30	22.85	23.55	21.18	21.64	21.97
6000	1.39	1.72	1.88	22.12	22.84	23.59	21.01	21.49	21.82
6100	1.35	1.67	1.82	22.07	23.04	23.88	20.86	21.37	21.67
6200	1.32	1.63	1.78	22.11	23.16	24.11	20.78	21.27	21.53
6300	1.29	1.60	1.75	22.27	23.41	24.28	20.79	21.22	21.41
7000	1.09	1.40	1.54	25.45	26.63	27.02	20.96	21.00	20.69
8000	1.00	1.31	1.44	29.15	28.20	26.47	23.16	22.00	21.51
8500	1.02	1.32	1.44	26.14	25.68	24.58	24.74	23.04	22.64
9000	0.97	1.25	1.37	24.52	24.05	22.89	27.43	24.97	23.90
9500	0.88	1.19	1.32	22.33	21.75	20.53	25.41	23.81	22.28
10000	0.89	1.19	1.33	19.99	19.52	18.39	21.80	21.05	19.74
10500	0.88	1.19	1.34	17.97	17.56	16.55	19.17	18.67	17.58
11000	0.90	1.22	1.38	16.30	15.90	15.10	17.23	16.86	15.96
11500	0.92	1.27	1.43	14.99	14.58	13.93	15.77	15.48	14.79
12000	0.95	1.31	1.48	13.96	13.55	13.03	14.81	14.39	13.86
12500	1.00	1.38	1.54	12.97	12.55	12.15	13.79	13.36	12.99
13000	1.04	1.43	1.60	12.30	11.82	11.50	13.01	12.42	12.12
13500	1.08	1.49	1.66	11.63	11.23	10.98	12.21	11.64	11.43
14000	1.13	1.54	1.71	11.18	10.93	10.72	11.29	10.95	10.78
14500	1.15	1.55	1.72	10.84	10.76	10.63	10.68	10.53	10.44
15000	1.17	1.57	1.74	10.57	10.73	10.61	10.25	10.29	10.20
15500	1.18	1.56	1.73	10.46	10.77	10.73	10.01	10.21	10.15
16000	1.16	1.54	1.72	10.57	10.93	10.89	10.09	10.25	10.19
17000	1.17	1.57	1.75	10.45	10.90	10.83	10.13	10.25	10.15
18000	1.26	1.68	1.86	10.03	10.35	10.33	9.83	9.82	9.78
19000	1.37	1.84	2.01	9.57	9.81	10.00	9.34	9.35	9.54

Typical Performance Data

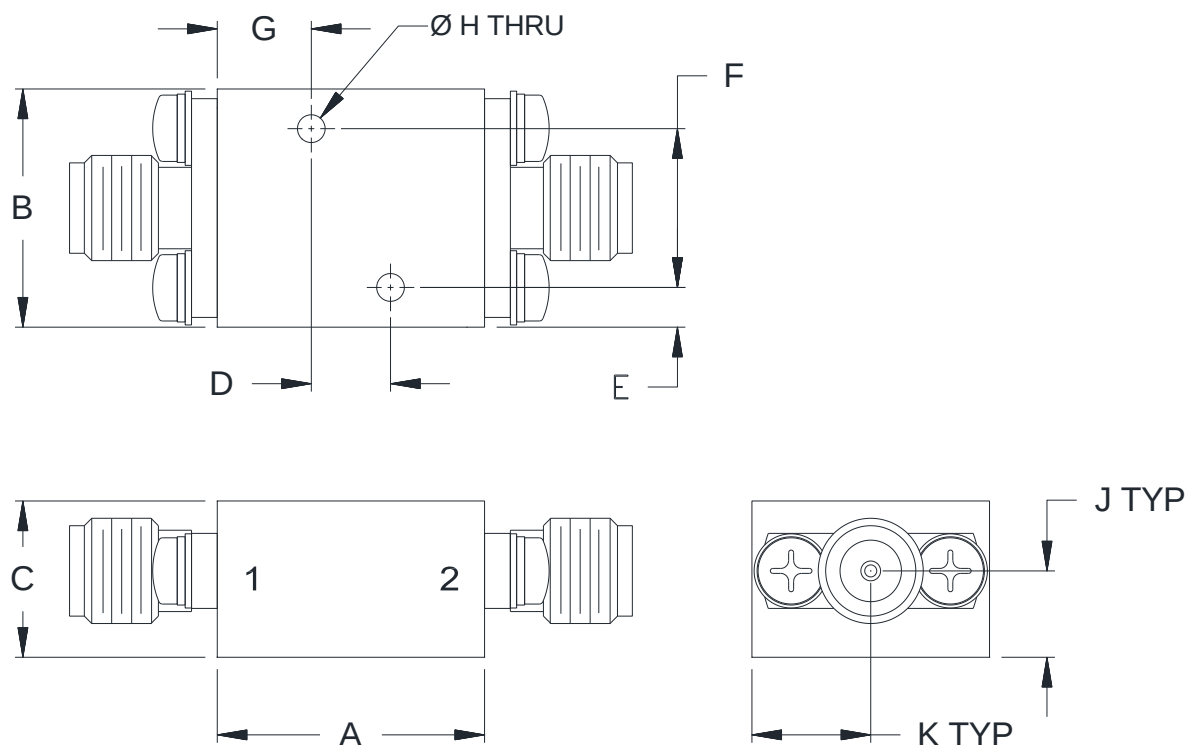
FREQ.	GROUP DELAY		
(MHz)	(nsec)		
	@-55°C	@+25°C	@+105°C
5900	0.28	0.28	0.28
6000	0.27	0.27	0.27
6100	0.27	0.26	0.26
6200	0.26	0.26	0.26
6300	0.26	0.25	0.25
6400	0.25	0.25	0.25
6500	0.25	0.25	0.25
6600	0.24	0.24	0.24
6700	0.24	0.24	0.24
6800	0.24	0.24	0.24
6900	0.23	0.23	0.23
7000	0.23	0.23	0.23
7100	0.23	0.23	0.23
7200	0.23	0.22	0.23
7300	0.22	0.22	0.22
7400	0.22	0.22	0.22
7500	0.22	0.22	0.22
7600	0.22	0.22	0.22
7700	0.22	0.22	0.22
7800	0.21	0.21	0.22
7900	0.21	0.21	0.21
8000	0.21	0.21	0.21
8100	0.21	0.21	0.21
8200	0.21	0.21	0.21
8300	0.21	0.21	0.21
8400	0.20	0.20	0.20
8500	0.20	0.20	0.20
8600	0.20	0.20	0.20
8700	0.20	0.20	0.20
10000	0.20	0.19	0.20
10500	0.19	0.19	0.19
11000	0.19	0.19	0.19
11500	0.19	0.19	0.19
12000	0.19	0.19	0.19
12500	0.19	0.18	0.19
13000	0.18	0.18	0.18
13500	0.18	0.18	0.18
14000	0.18	0.18	0.18
14500	0.18	0.18	0.18
15000	0.18	0.18	0.18
15500	0.18	0.18	0.18
16000	0.18	0.18	0.18
16500	0.18	0.18	0.19
17000	0.18	0.18	0.18
17500	0.18	0.18	0.18
17800	0.18	0.18	0.18
18000	0.18	0.18	0.18
18500	0.18	0.18	0.19
18600	0.18	0.18	0.19
18800	0.18	0.18	0.19
19000	0.19	0.18	0.19

Typical Performance Curves



Outline Dimensions

UK3042



CASE#	A	B	C	D	E	F
UK3042	.68 (17.1)	.60 (15.2)	.39 (10.0)	.200 (5.08)	.10 (2.5)	.400 (10.16)

CASE#	G	H	J	K	WT.GRAMS
UK3042	.24 (6.0)	.070 (1.78)	.22 (5.5)	.30 (7.6)	24

Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm .050$; 3 Pl. $\pm .015$

Notes:

- Case material: Brass alloy.
- Case Finish:
 - Case & Cover of the units –Gold plating.
- Refer to the individual model data sheet for the type of connectors available.



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



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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	-55° to 105°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 105°C Ambient Environment	Individual Model Data Sheet