

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

50Ω 9900 to 20000 MHz

ZXHF-K14M+



Generic photo used for illustration purposes only

CASE STYLE: UK3042
Connectors Model
2.92mm-F ZXHF-K14M+

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 I581494

Applications

- Military/Defense
- Satellite communication
- Mobile
- Space research
- ELINT
- Broadband Receivers

Electrical Specifications at 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Stop Band	Rejection	DC-F1	DC- 5000	23	28	-	dB
		F1-F2	5000 - 7000	19	24	-	dB
	Freq. Cut-Off	F3	8800	-	3.5	-	dB
	VSWR	DC-F1	DC- 5000	-	1.2	-	:1
Pass Band		F1-F2	5000 - 7000	-	1.2	-	:1
	Insertion Loss	F4-F5	9900 - 15000	-	2.5	3.3	dB
		F5-F6	15000 - 20000	-	1.7	2.7	dB
	VSWR	F4-F5	9900 - 15000	-	1.2	-	:1
		F5-F6	15000 - 20000	-	1.5	-	: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 ambient

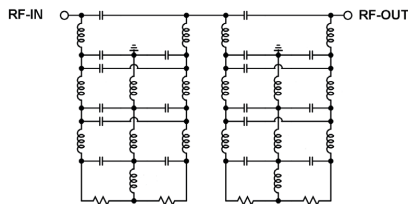
² Stopband rating derates linearly to 0.63W at 105°C ambient

³ Permanent damage may occur if any of these limits are exceeded

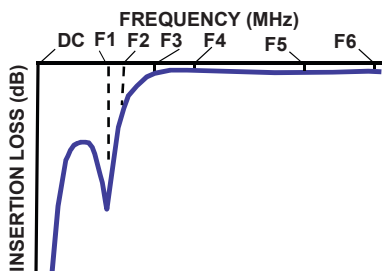
ESD rating

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

Functional Schematic



Typical Frequency Response

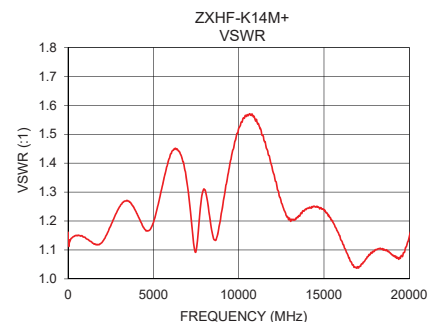
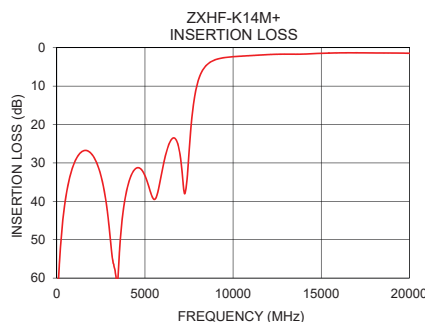


+RoHS Compliant

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	67.05	1.14
100	60.05	1.13
500	39.22	1.15
3000	48.20	1.25
5000	33.31	1.19
6500	23.90	1.44
7000	28.09	1.32
7400	33.70	1.11
8000	8.89	1.31
8800	3.50	1.16
9500	2.58	1.40
9900	2.36	1.50
10000	2.33	1.52
12000	1.78	1.37
14000	1.65	1.24
14500	1.54	1.25
15000	1.45	1.24
17000	1.33	1.04
18000	1.35	1.10
20000	1.44	1.15



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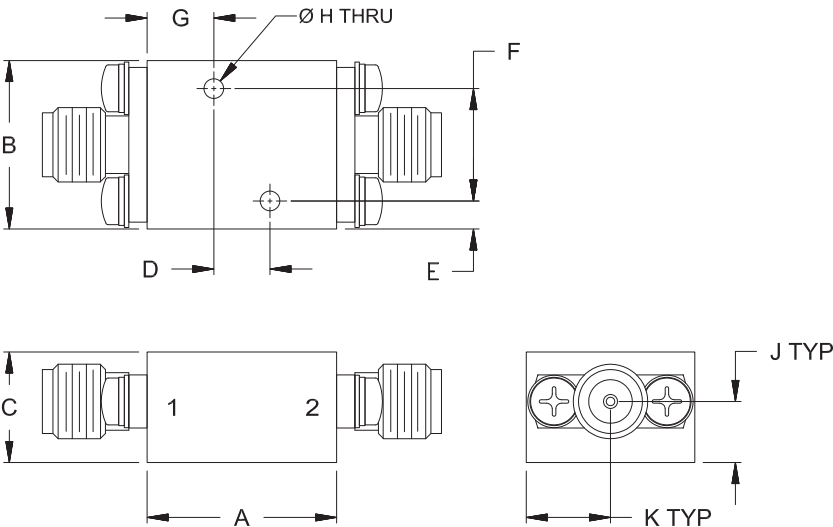
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ZXHF-K14M+
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Coaxial Connections

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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ZXHF-K14M+

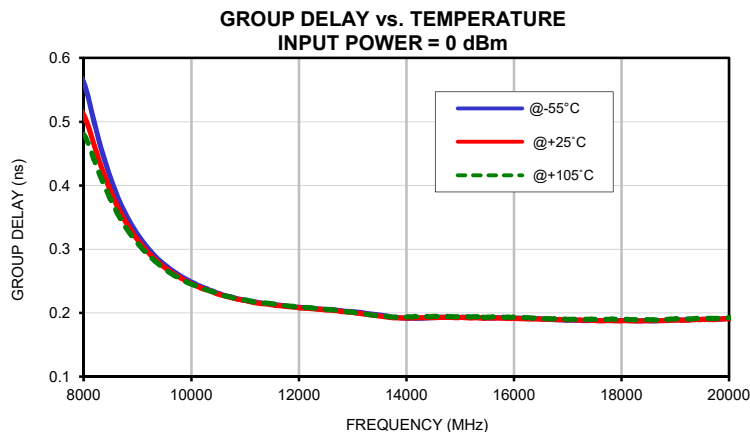
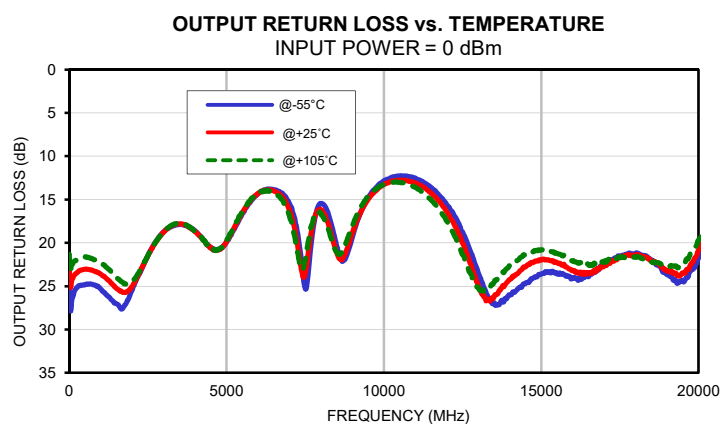
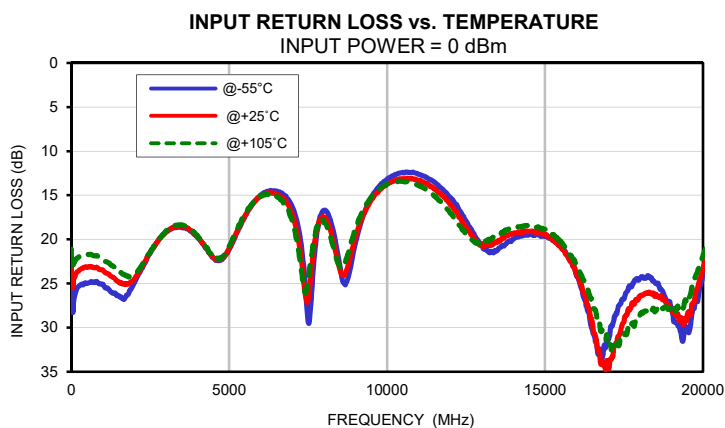
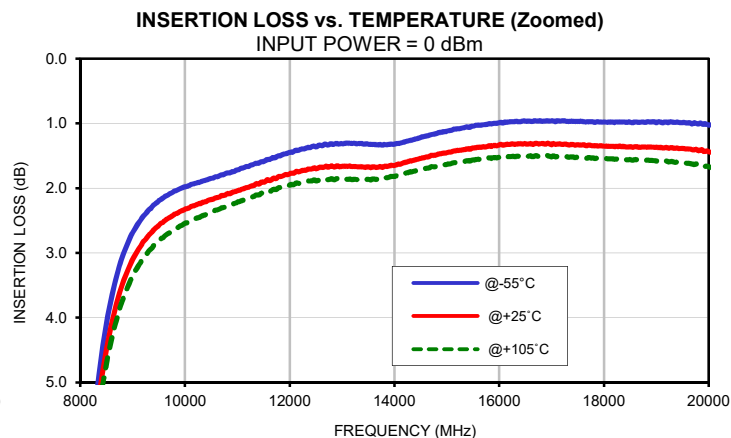
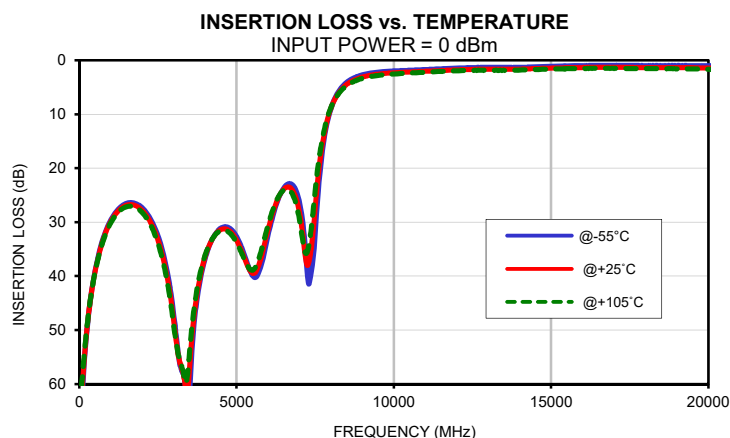
Typical Performance Data

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	71.62	67.05	63.89	26.27	23.94	22.24	26.50	24.13	22.43
50	67.36	64.39	62.03	28.19	25.42	23.34	27.77	25.09	23.11
100	61.61	60.05	58.63	26.59	24.36	22.60	26.40	24.19	22.47
400	42.49	42.56	42.57	25.02	23.18	21.70	24.89	23.12	21.69
500	39.07	39.22	39.32	25.02	23.11	21.68	24.84	23.04	21.63
600	36.35	36.55	36.70	24.85	23.08	21.71	24.79	23.07	21.70
750	33.20	33.44	33.63	24.87	23.23	21.88	24.82	23.18	21.87
800	32.34	32.58	32.79	24.77	23.16	21.85	24.85	23.25	21.96
1000	29.63	29.91	30.13	25.10	23.49	22.20	25.33	23.62	22.30
1200	27.86	28.15	28.41	25.72	23.97	22.68	26.06	24.17	22.86
1400	26.80	27.13	27.41	26.14	24.52	23.26	26.77	24.87	23.53
2000	27.33	27.81	28.20	24.93	24.50	24.00	25.42	25.02	24.48
2100	27.96	28.48	28.91	24.15	23.94	23.62	24.53	24.39	24.05
2200	28.77	29.34	29.79	23.49	23.29	23.10	23.74	23.68	23.47
2300	29.79	30.40	30.90	22.85	22.72	22.60	23.06	22.92	22.80
2400	31.02	31.69	32.24	22.09	22.02	21.94	22.21	22.18	22.12
2500	32.52	33.27	33.87	21.49	21.49	21.43	21.47	21.50	21.46
3000	46.91	48.20	48.99	19.17	19.15	19.04	18.73	18.77	18.72
3500	63.08	57.56	54.51	18.65	18.51	18.37	17.88	17.81	17.73
3800	42.19	41.37	40.71	19.13	19.05	18.89	18.15	18.19	18.12
4000	36.77	36.46	36.18	19.79	19.73	19.59	18.65	18.71	18.64
4100	34.92	34.77	34.61	20.16	20.15	20.00	19.01	19.05	18.98
4150	34.15	34.06	33.95	20.44	20.38	20.35	19.17	19.23	19.25
4200	33.48	33.45	33.40	20.63	20.60	20.44	19.35	19.43	19.35
4300	32.39	32.48	32.51	21.07	21.12	20.95	19.77	19.82	19.74
5000	32.66	33.31	33.75	21.14	21.06	20.75	19.91	19.84	19.62
5100	33.83	34.49	34.92	20.44	20.31	20.00	19.34	19.23	18.99
5200	35.28	35.90	36.25	19.56	19.46	19.13	18.68	18.55	18.31
5300	36.93	37.40	37.57	18.78	18.71	18.41	18.02	17.84	17.62
5400	38.59	38.72	38.58	18.08	18.00	17.71	17.30	17.15	16.92
5500	39.85	39.47	38.92	17.38	17.33	17.10	16.68	16.50	16.29
5600	40.25	39.30	38.36	16.71	16.73	16.53	16.05	15.93	15.74
5700	39.49	38.12	36.97	16.19	16.21	16.07	15.52	15.43	15.27
5800	37.62	36.16	34.99	15.66	15.76	15.64	15.04	14.95	14.83
5900	35.18	33.84	32.80	15.30	15.34	15.27	14.64	14.58	14.50
6000	32.54	31.47	30.62	14.95	15.03	15.02	14.33	14.29	14.25
6100	30.09	29.30	28.66	14.71	14.85	14.89	14.05	14.08	14.07
6200	27.93	27.42	26.99	14.55	14.75	14.82	13.89	13.94	13.96
6300	26.14	25.88	25.66	14.46	14.70	14.82	13.79	13.87	13.94
7000	26.23	28.09	29.48	16.34	17.19	18.02	15.48	16.25	16.94
8000	8.94	8.89	8.76	16.75	17.49	18.13	15.49	16.19	16.71
8800	3.08	3.50	3.75	23.88	22.46	21.15	21.70	21.04	19.96
9000	2.69	3.10	3.36	20.37	19.69	18.76	19.33	18.85	18.00
9900	2.01	2.36	2.59	13.43	13.94	13.88	13.11	13.51	13.42
10000	1.98	2.33	2.54	13.18	13.70	13.73	12.86	13.27	13.26
13000	1.31	1.66	1.86	20.71	20.63	20.41	23.50	24.97	25.19
13900	1.33	1.66	1.83	20.20	19.40	18.82	26.44	24.61	22.98
14000	1.32	1.65	1.82	19.96	19.29	18.67	26.01	24.23	22.61
14100	1.31	1.63	1.80	19.75	19.27	18.58	25.66	23.83	22.26
14200	1.28	1.60	1.77	19.62	19.21	18.57	25.55	23.65	22.12
14300	1.26	1.58	1.75	19.56	19.09	18.51	25.16	23.34	21.86
14400	1.24	1.56	1.73	19.52	19.05	18.43	24.96	23.02	21.59
14500	1.22	1.54	1.71	19.47	19.14	18.51	24.70	22.78	21.41
14600	1.20	1.52	1.69	19.43	19.06	18.46	24.59	22.46	21.17
15000	1.12	1.45	1.63	19.66	19.44	18.85	23.60	21.98	20.82
15500	1.04	1.38	1.56	20.72	20.80	20.20	23.54	22.27	21.21
16000	0.99	1.33	1.52	24.16	24.05	23.13	24.00	23.18	22.05
17000	0.96	1.33	1.52	31.43	34.35	32.01	22.40	22.67	22.14
18000	0.98	1.35	1.55	24.46	26.47	28.60	21.23	21.39	21.63
20000	1.03	1.44	1.67	23.99	23.35	21.85	21.78	20.84	19.66

Typical Performance Data

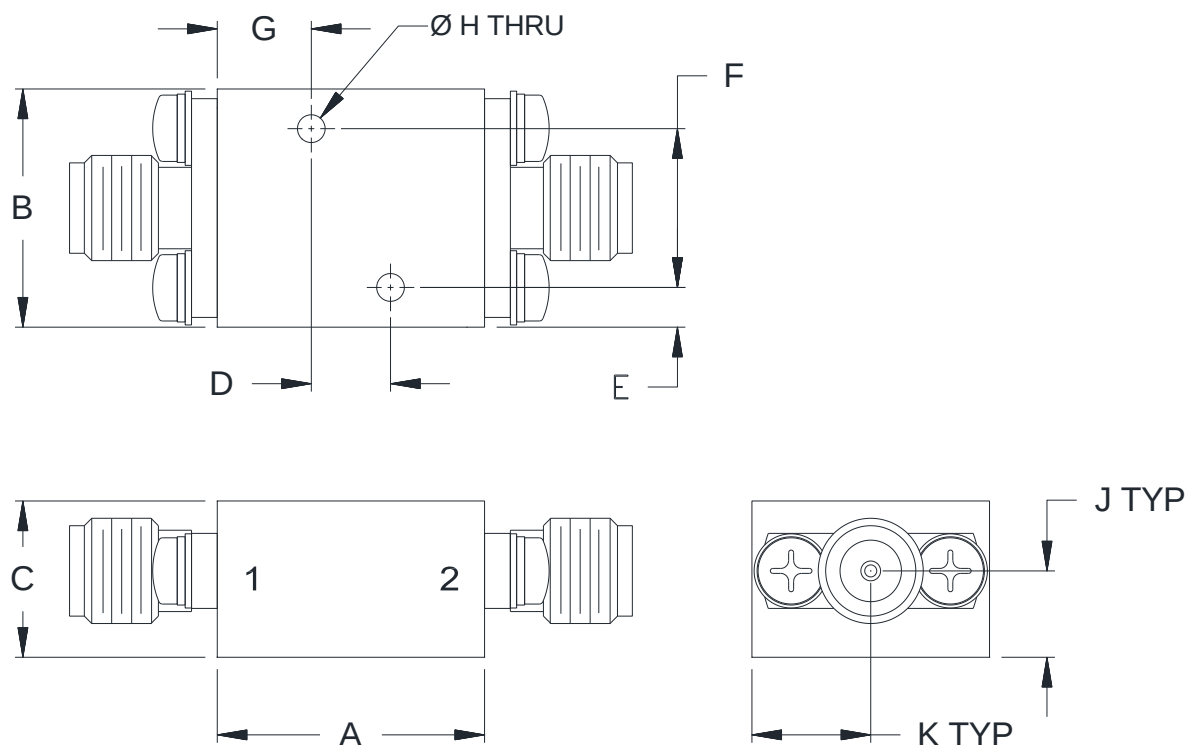
FREQ.	GROUP DELAY		
(MHz)	(nsec)		
	@-55°C	@+25°C	@+105°C
9900	0.25	0.25	0.25
10000	0.25	0.25	0.25
10200	0.24	0.24	0.24
10400	0.23	0.23	0.23
10600	0.23	0.23	0.23
10800	0.22	0.22	0.22
11000	0.22	0.22	0.22
11200	0.22	0.22	0.22
11400	0.21	0.21	0.22
11600	0.21	0.21	0.21
11800	0.21	0.21	0.21
12000	0.21	0.21	0.21
12200	0.21	0.21	0.21
12400	0.21	0.21	0.21
12600	0.21	0.20	0.21
12800	0.20	0.20	0.20
13000	0.20	0.20	0.20
13200	0.20	0.20	0.20
13400	0.20	0.20	0.20
13600	0.20	0.19	0.20
13800	0.19	0.19	0.19
14000	0.19	0.19	0.19
14200	0.19	0.19	0.19
14400	0.19	0.19	0.19
14600	0.19	0.19	0.19
14800	0.19	0.19	0.19
15000	0.19	0.19	0.19
15200	0.19	0.19	0.19
15400	0.19	0.19	0.19
15600	0.19	0.19	0.19
15800	0.19	0.19	0.19
16000	0.19	0.19	0.19
16200	0.19	0.19	0.19
16400	0.19	0.19	0.19
16600	0.19	0.19	0.19
16800	0.19	0.19	0.19
17000	0.19	0.19	0.19
17200	0.19	0.19	0.19
17400	0.19	0.19	0.19
17600	0.19	0.19	0.19
17800	0.19	0.19	0.19
18000	0.19	0.19	0.19
18200	0.19	0.19	0.19
18400	0.19	0.19	0.19
18600	0.19	0.19	0.19
18800	0.19	0.19	0.19
19000	0.19	0.19	0.19
19200	0.19	0.19	0.19
19400	0.19	0.19	0.19
19600	0.19	0.19	0.19
20000	0.19	0.19	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