

Coaxial Reflectionless High Pass Filter

ZXHF Series

50Ω DC to 30 GHz



The Big Deal

- Patented design eliminates in band spurs
- Pass band cut-off up to 18.3 GHz
- Stop band up to 30 GHz

Product Overview

Mini-Circuits' ZXHF Series reflectionless filters employ 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	Ensures 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



Coaxial Reflectionless High Pass Filter

ZXHF-K1162+

50Ω 11.6 to 30 GHz



Generic photo used for illustration purposes only

CASE STYLE: UK3042
Connectors Model
2.92mm-F ZXHF-K1162+

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

Applications

- KU Band Satellite Transmission
- Microwave Radio
- Aerospace & Defense

Electrical Specifications at 25°C

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Stop Band	Rejection	DC-F1	DC - 2500	-	6.9	dB
		F1-F2	2500 - 8700	10	13.6	dB
	Freq. Cut-Off	F3	10400	-	3.3	dB
	VSWR	DC-F1	DC - 2500	-	2.7	:1
		F1-F2	2500 - 8700	-	1.8	:1
Pass Band	Insertion Loss	F4-F5	11600 - 20000	-	2.8	dB
		F5-F6	20000 - 30000	-	2.2	dB
	VSWR	F4-F5	11600 - 20000	-	2.0	:1
		F5-F6	20000 - 30000	-	1.9	: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	1.26W at 25°C
RF Power Input, Stopband (DC-F4) ²	0.25W at 25°C

¹ Passband rating derates linearly to 0.63W at 105°C ambient

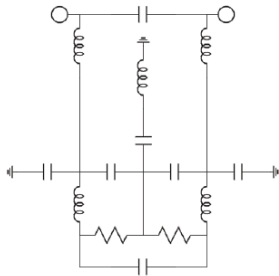
² Stopband rating derates linearly to 0.12W at 105°C ambient

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

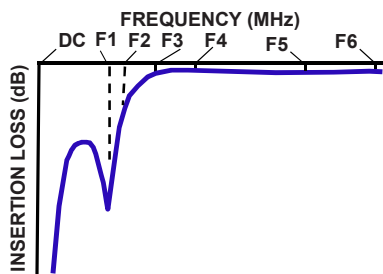
ESD rating

Human body model (HBM): Class 1A(250 to <500 V) in accordance with ANSI/ESD STM 5.1-2001

Functional Schematic



Typical Frequency Response

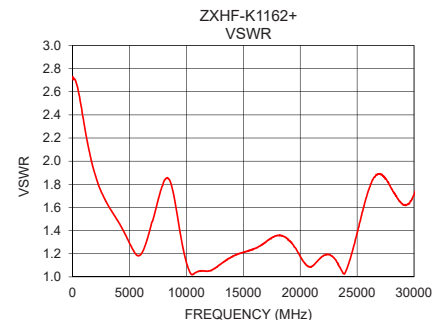
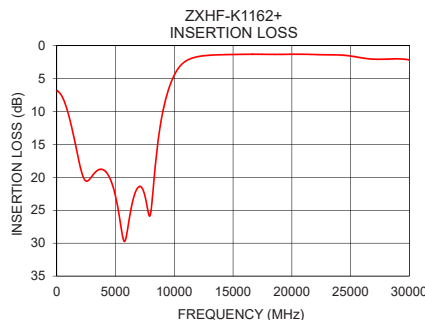


Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
25	6.93	2.73
100	6.92	2.71
500	7.89	2.61
1000	10.48	2.33
1400	13.45	2.12
2000	18.45	1.88
2500	20.57	1.74
5000	22.91	1.29
8000	25.29	1.82
8700	13.39	1.79
9500	6.68	1.36
10400	3.28	1.03
11600	1.83	1.05
12000	1.65	1.05
13000	1.44	1.11
15000	1.33	1.21
20000	1.29	1.18
22000	1.33	1.18
25000	1.56	1.38
30000	2.15	1.71

+RoHS Compliant

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



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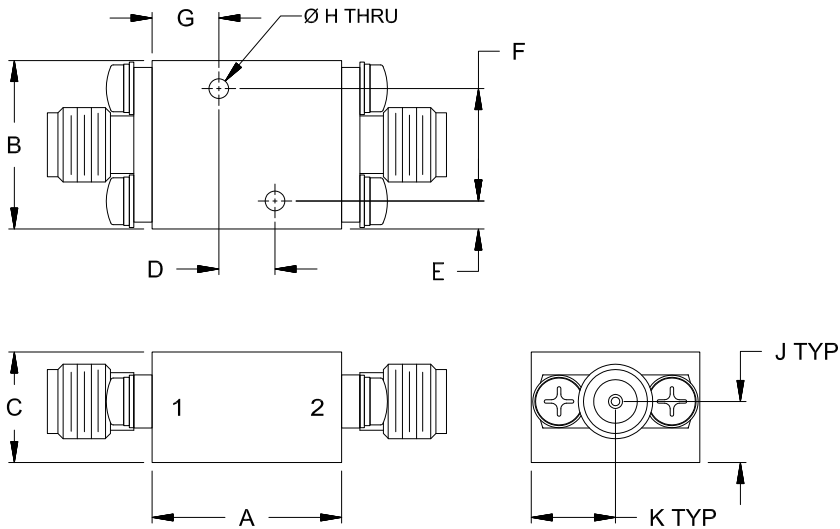
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ZXHF-K1162+
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Coaxial Connections

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-K1162+

Typical Performance Data

FREQ. (MHz)	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
	(dB)			(dB)			(dB)		
	@-55°C	@+25°C	@+105°C	@-55°C	@+25°C	@+105°C	@-55°C	@+25°C	@+105°C
25	6.90	6.93	6.95	6.68	6.67	6.66	6.70	6.69	6.68
50	6.79	6.82	6.84	6.75	6.75	6.73	6.75	6.75	6.73
100	6.89	6.92	6.94	6.71	6.72	6.72	6.73	6.73	6.72
400	7.49	7.56	7.61	6.85	6.89	6.90	6.86	6.90	6.91
500	7.81	7.89	7.95	6.96	7.02	7.05	6.96	7.01	7.04
600	8.19	8.29	8.36	7.10	7.16	7.21	7.09	7.16	7.21
750	8.89	9.02	9.11	7.35	7.43	7.51	7.34	7.43	7.51
800	9.14	9.27	9.37	7.42	7.52	7.60	7.42	7.52	7.61
1000	10.31	10.48	10.61	7.85	7.98	8.10	7.81	7.95	8.07
1200	11.69	11.89	12.05	8.27	8.44	8.61	8.22	8.40	8.56
1400	13.21	13.45	13.64	8.68	8.91	9.11	8.62	8.84	9.04
2000	18.14	18.45	18.68	9.95	10.31	10.59	9.84	10.17	10.46
2100	18.85	19.15	19.37	10.16	10.53	10.83	10.05	10.39	10.70
2200	19.44	19.72	19.93	10.36	10.74	11.05	10.24	10.61	10.92
2300	19.91	20.17	20.34	10.58	10.98	11.28	10.44	10.82	11.14
2400	20.22	20.44	20.59	10.75	11.17	11.48	10.62	11.02	11.34
2500	20.38	20.57	20.69	10.93	11.37	11.68	10.80	11.22	11.54
3000	19.71	19.80	19.84	11.82	12.30	12.64	11.73	12.20	12.50
3500	18.80	18.90	18.95	12.75	13.25	13.59	12.81	13.30	13.58
4000	18.72	18.89	18.99	13.73	14.26	14.59	14.15	14.71	15.02
4500	19.83	20.07	20.25	14.97	15.69	16.10	15.96	16.65	17.12
5000	22.58	22.91	23.14	16.82	17.92	18.64	18.20	19.25	20.21
5500	27.83	27.97	28.00	19.35	20.74	22.08	19.70	21.08	22.41
6000	28.73	28.13	27.65	20.12	21.12	22.15	18.29	19.15	19.69
6500	23.34	23.32	23.27	17.20	17.54	17.77	15.59	15.93	16.13
7000	21.08	21.41	21.64	14.01	14.27	14.33	13.32	13.57	13.74
7500	22.20	22.84	23.30	11.82	12.14	12.27	11.93	12.21	12.47
8000	26.51	25.29	24.00	10.39	10.73	11.01	11.07	11.41	11.76
8100	25.43	23.74	22.41	10.24	10.59	10.88	10.98	11.36	11.70
8200	23.31	21.80	20.50	10.14	10.50	10.82	10.92	11.35	11.70
8700	13.95	13.39	12.87	10.39	10.99	11.50	11.37	12.07	12.52
9000	10.46	10.18	9.89	11.36	12.22	12.80	12.29	13.24	13.78
9100	9.56	9.35	9.11	11.85	12.82	13.45	12.74	13.79	14.35
9500	6.71	6.68	6.58	14.82	16.42	17.24	15.08	16.54	17.43
9700	5.63	5.66	5.62	17.08	19.11	20.04	16.61	18.31	19.39
10000	4.31	4.44	4.45	21.55	24.59	25.99	19.32	21.32	22.88
10200	3.62	3.79	3.85	25.65	29.95	32.73	21.46	23.59	25.61
10400	3.07	3.28	3.36	31.48	38.12	49.99	23.83	26.16	28.58
11000	2.02	2.29	2.43	35.39	32.85	30.47	32.88	36.57	38.61
11600	1.54	1.83	1.99	32.43	32.17	29.02	40.39	36.18	32.58
12000	1.35	1.65	1.81	32.02	32.01	28.29	31.85	30.57	28.40
12500	1.23	1.53	1.69	28.58	28.86	26.05	26.60	26.35	24.62
13000	1.14	1.44	1.60	25.82	25.71	23.88	23.13	23.10	21.70
13500	1.08	1.39	1.56	24.24	23.49	22.47	21.11	20.80	19.93
14000	1.05	1.37	1.53	23.13	21.97	21.37	19.83	19.26	18.76
14500	1.03	1.34	1.51	22.22	20.92	20.53	18.85	18.21	17.88
15000	1.01	1.33	1.50	21.49	20.41	19.80	18.31	17.65	17.34
15500	0.99	1.31	1.48	20.15	19.71	18.86	17.93	17.48	17.05
16000	0.97	1.29	1.47	19.37	19.31	18.42	17.70	17.49	16.95
16500	0.97	1.29	1.47	18.57	18.48	17.78	17.81	17.66	17.05
17000	0.96	1.29	1.47	17.95	17.65	17.23	17.61	17.45	16.88
17500	0.97	1.30	1.48	17.06	16.77	16.48	17.33	17.19	16.78
20000	0.95	1.29	1.47	20.05	21.84	21.74	19.41	20.32	20.66
21000	0.92	1.29	1.48	27.85	27.54	29.75	23.90	23.34	25.47
22000	0.96	1.33	1.51	20.65	21.62	24.07	19.72	20.31	22.12
22500	0.98	1.35	1.54	19.64	21.09	23.65	18.82	19.67	21.50
23000	0.99	1.37	1.56	20.44	22.66	25.82	19.27	20.34	22.34
24000	0.99	1.40	1.62	35.65	32.76	28.03	22.13	21.69	21.62
26000	1.37	1.84	2.11	11.32	11.29	10.99	10.93	10.98	10.66
30000	1.56	2.15	2.41	12.18	11.65	11.98	12.26	11.74	11.97



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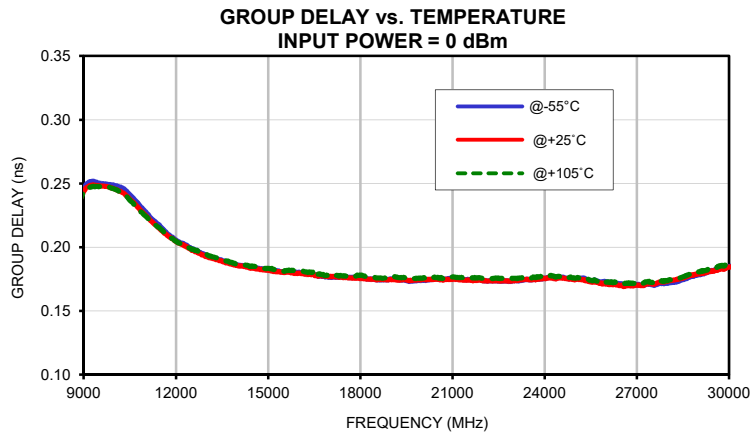
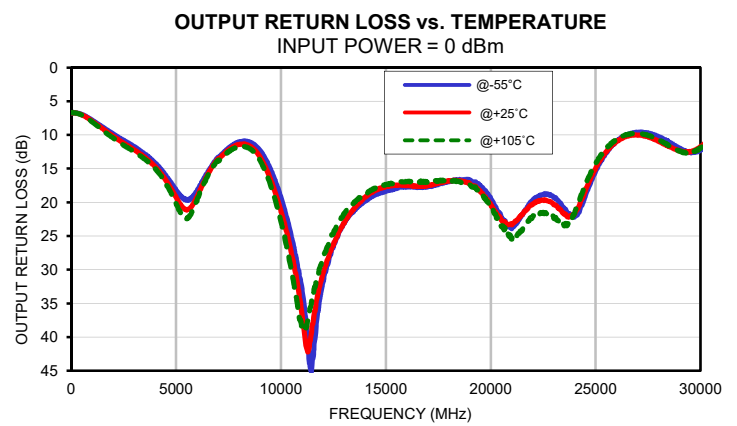
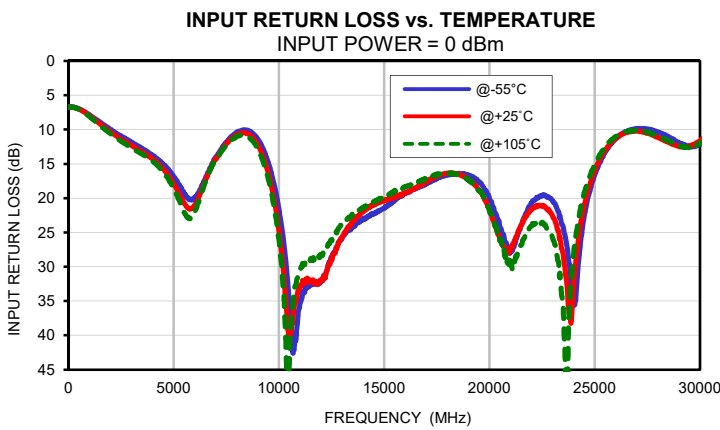
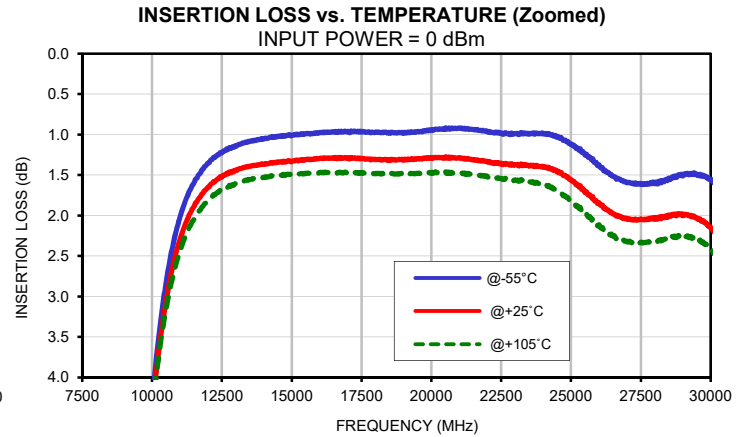
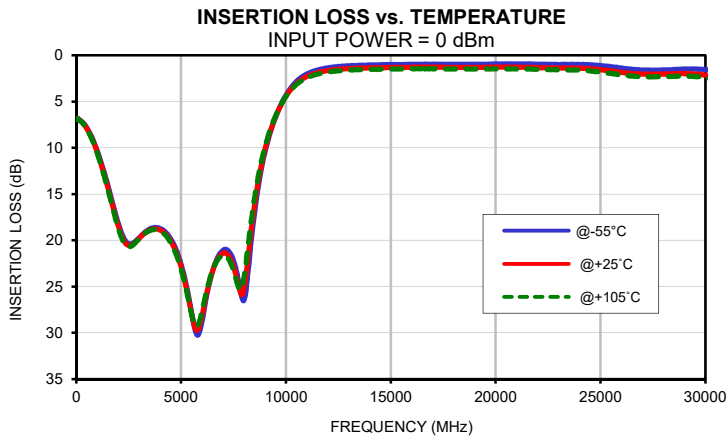
IF/RF MICROWAVE COMPONENTS

REV. OR
ZXHF-K1162+
200702

Typical Performance Data

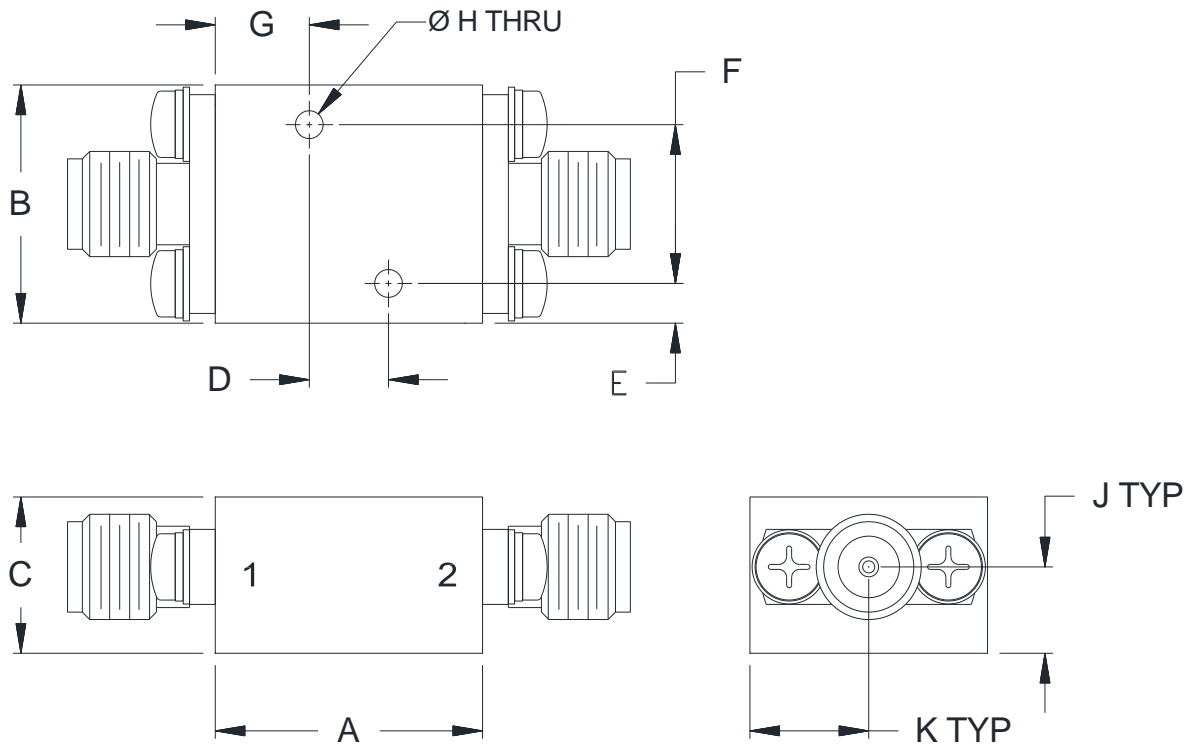
FREQ. (MHz)	GROUP DELAY		
	(nsec)		
	@-55°C	@+25°C	@+105°C
11600	0.21	0.21	0.21
12000	0.21	0.20	0.20
12400	0.20	0.20	0.20
12800	0.20	0.19	0.20
13200	0.19	0.19	0.19
13600	0.19	0.19	0.19
14000	0.19	0.19	0.19
14400	0.18	0.18	0.18
14800	0.18	0.18	0.18
15200	0.18	0.18	0.18
15600	0.18	0.18	0.18
16000	0.18	0.18	0.18
16400	0.18	0.18	0.18
16800	0.18	0.18	0.18
17200	0.18	0.18	0.18
17600	0.18	0.18	0.18
18000	0.18	0.18	0.18
18400	0.18	0.17	0.18
18800	0.17	0.17	0.18
19200	0.17	0.17	0.18
19600	0.17	0.17	0.18
20000	0.17	0.17	0.18
20400	0.18	0.18	0.18
20800	0.17	0.17	0.18
21200	0.17	0.17	0.18
21600	0.17	0.17	0.18
22000	0.17	0.17	0.18
22400	0.17	0.17	0.18
22800	0.17	0.17	0.18
23200	0.17	0.17	0.18
23600	0.17	0.17	0.18
24000	0.18	0.18	0.18
24400	0.18	0.18	0.18
24800	0.18	0.17	0.18
25200	0.18	0.17	0.18
25600	0.17	0.17	0.17
26000	0.17	0.17	0.17
26400	0.17	0.17	0.17
26800	0.17	0.17	0.17
27200	0.17	0.17	0.17
27600	0.17	0.17	0.17
28000	0.17	0.17	0.17
28400	0.17	0.18	0.18
28800	0.18	0.18	0.18
28900	0.18	0.18	0.18
29000	0.18	0.18	0.18
29100	0.18	0.18	0.18
29200	0.18	0.18	0.18
29500	0.18	0.18	0.18
29800	0.18	0.18	0.19
30000	0.18	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:

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



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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