

# 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 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	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](http://www.minicircuits.com/MCLStore/terms.jsp)



# Coaxial Reflectionless High Pass Filter

## ZXHF-K23+

50Ω 2010 to 10100 MHz



Generic photo used for illustration purposes only

CASE STYLE: UK3042  
Connectors Model  
2.92mm-F ZXHF-K23+

### 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

- Military/Defense
- X Band Radars

### Electrical Specifications at 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Stop Band	Rejection	DC-F1	DC- 1210	11	14	-	dB
	Freq. Cut-Off	F2	1650	-	3.3	-	dB
	VSWR	DC-F1	DC- 1210	-	1.2	-	:1
Pass Band	Insertion Loss	F3-F5	2010 - 10100	-	1.5	2.8	dB
	VSWR	F3-F4 F4-F5	2010 - 3200 3200 - 10100	- -	1.6 2.0	- -	:1

### Absolute Maximum Ratings<sup>3</sup>

Parameter	Ratings
Operating Temperature	-55°C to + 105°C
Storage Temperature	-55°C to + 105°C
RF Power Input, Passband (F3-F5) <sup>1</sup>	2W at 25°C
RF Power Input, Stopband (DC-F3) <sup>2</sup>	0.5W at 25°C

<sup>1</sup> Passband rating derates linearly to 1W at 105°C ambient

<sup>2</sup> Stopband rating derates linearly to 0.25W at 105°C ambient

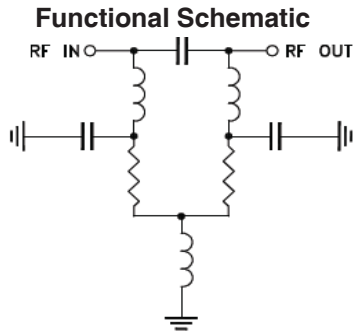
<sup>3</sup> Permanent damage may occur if any of these limits are exceeded

### ESD rating

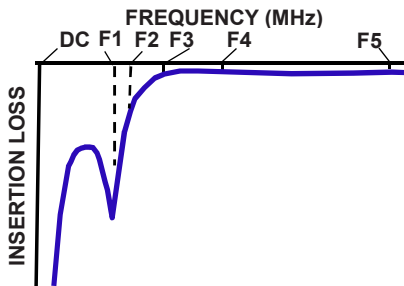
Human body model (HBM): Class 2(2000 to <4000 V) in accordance with ANSI/ESD 5.1-2001

### Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
1	38.13	1.09
100	25.63	1.08
500	14.72	1.15
1000	24.41	1.21
1100	22.24	1.21
1200	15.09	1.20
1210	14.55	1.20
1500	5.34	1.16
1600	3.87	1.16
1650	3.34	1.17
2000	1.49	1.23
2010	1.46	1.23
2500	0.98	1.34
3200	0.94	1.47
5000	1.04	1.60
8000	1.02	1.49
9000	1.14	1.57
10000	1.33	1.71
10100	1.38	1.74
12000	2.09	2.37

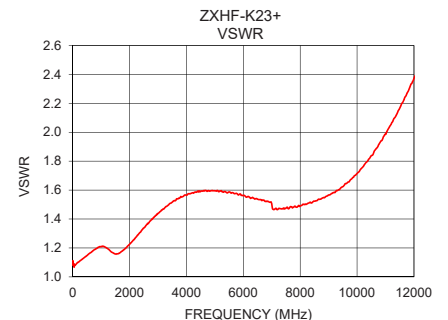
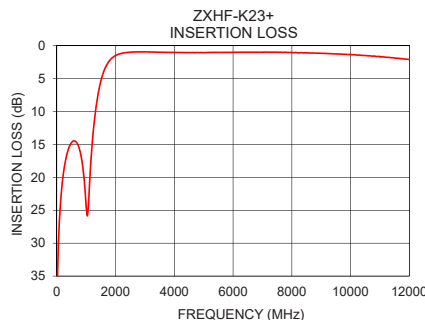


### Typical Frequency Response



**+RoHS Compliant**

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



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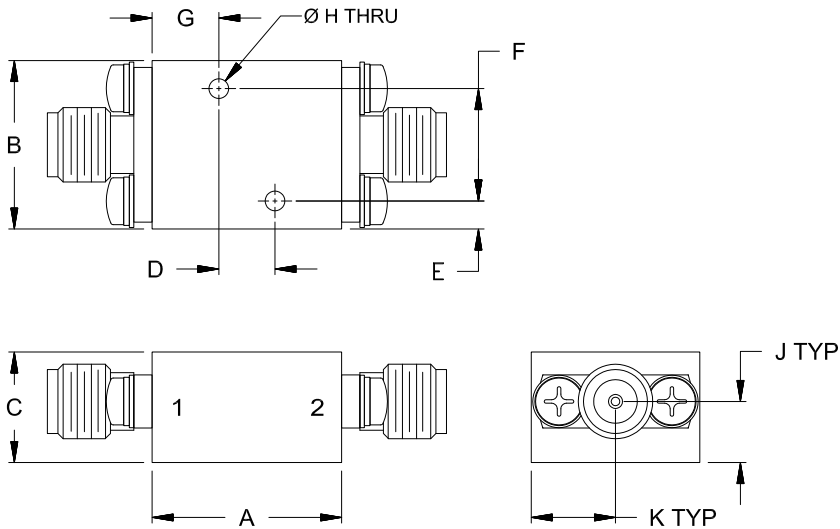
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## Coaxial Connections

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

## Outline Drawing



## Outline Dimensions ( $\frac{\text{inch}}{\text{mm}}$ )

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

Note: Please refer to case style drawing for details

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# Coaxial Reflectionless High Pass Filter

# ZXHF-K23+

## Typical Performance Data

FREQ.	Insertion Loss	Input Return Loss	Output Return Loss	FREQ.	Group Delay
(MHz)	(dB)	(dB)	(dB)	(MHz)	(ns)
1	38.13	27.35	27.77	2010	0.33
5	37.92	27.78	27.89	2050	0.32
10	37.38	27.72	27.85	2100	0.31
15	36.62	27.75	27.84	2250	0.28
25	34.84	27.67	27.77	2400	0.26
50	30.71	29.72	29.15	2550	0.25
100	25.63	27.95	27.63	2700	0.23
250	18.60	25.64	25.60	2800	0.23
300	17.34	25.13	24.95	3000	0.22
450	15.09	23.69	23.58	3150	0.21
500	14.72	23.27	23.18	3300	0.21
550	14.50	22.80	22.75	3450	0.20
600	14.46	22.42	22.40	3600	0.20
650	14.58	22.12	22.08	3750	0.20
750	15.41	21.37	21.42	3900	0.19
900	19.01	20.66	20.72	4050	0.19
950	21.36	20.46	20.57	4200	0.19
1000	24.41	20.48	20.51	4350	0.19
1200	15.09	20.89	20.85	4500	0.19
1210	14.55	20.93	20.91	4650	0.19
1300	10.55	21.52	21.44	4800	0.18
1500	5.34	22.68	22.35	4950	0.18
1520	5.00	22.74	22.37	5100	0.18
1600	3.87	22.59	22.18	5250	0.18
1650	3.34	22.34	22.01	5400	0.18
1900	1.79	20.61	20.36	5500	0.18
1950	1.62	20.22	20.02	5700	0.18
2000	1.49	19.87	19.68	5800	0.18
2010	1.46	19.80	19.60	6000	0.18
2100	1.29	19.19	19.02	6200	0.18
2400	1.01	17.35	17.21	6300	0.18
2500	0.98	16.81	16.73	6400	0.18
3000	0.93	14.88	14.92	6600	0.18
3200	0.94	14.42	14.48	6750	0.18
4000	1.01	13.15	13.24	6900	0.18
4500	1.04	12.83	12.91	7000	0.18
4800	1.03	12.82	12.83	7400	0.18
5000	1.04	12.79	12.88	7500	0.18
5500	1.01	12.89	12.85	7600	0.18
5800	1.01	13.07	12.95	7700	0.18
6000	0.99	13.16	13.00	7800	0.18
6200	0.98	13.29	13.12	7900	0.18
6500	0.98	13.49	13.24	8100	0.18
7000	0.98	13.94	13.69	8200	0.18
7300	0.99	14.38	14.18	8400	0.18
7400	0.97	14.40	14.07	8550	0.18
7500	0.97	14.34	14.18	8700	0.18
7800	1.00	14.15	13.98	8850	0.18
8000	1.02	14.12	13.93	9000	0.18
8200	1.07	13.97	13.77	9150	0.18
8500	1.07	13.66	13.55	9300	0.18
8800	1.12	13.36	13.23	9400	0.18
9000	1.14	13.13	13.03	9450	0.18
9200	1.18	12.91	12.80	9500	0.18
9500	1.24	12.48	12.34	9550	0.18
10000	1.33	11.60	11.52	9650	0.18
10100	1.38	11.40	11.31	9700	0.18
10200	1.41	11.21	11.14	10000	0.18
10300	1.42	10.98	10.94	10050	0.18
12000	2.09	7.81	7.93	10100	0.18



ISO 9001 ISO 14001 AS 9100 CERTIFIED



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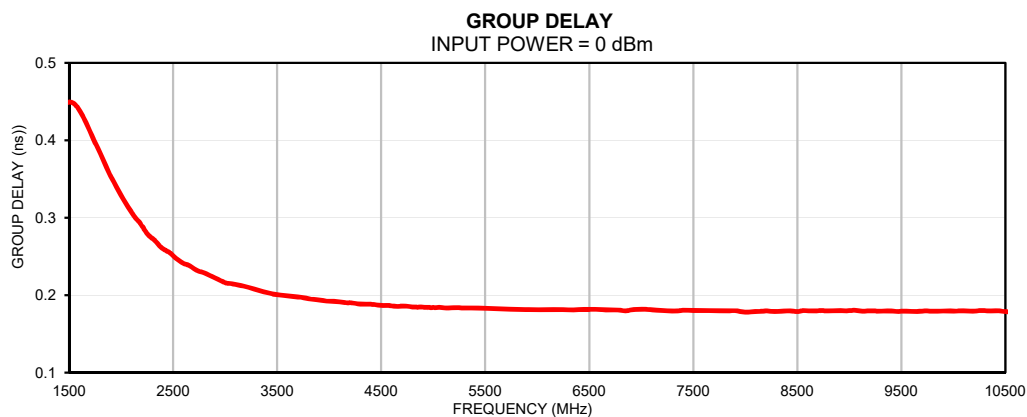
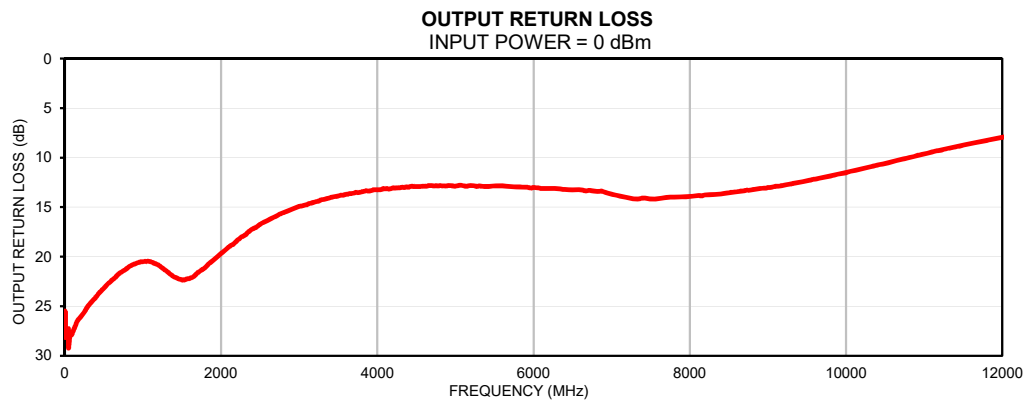
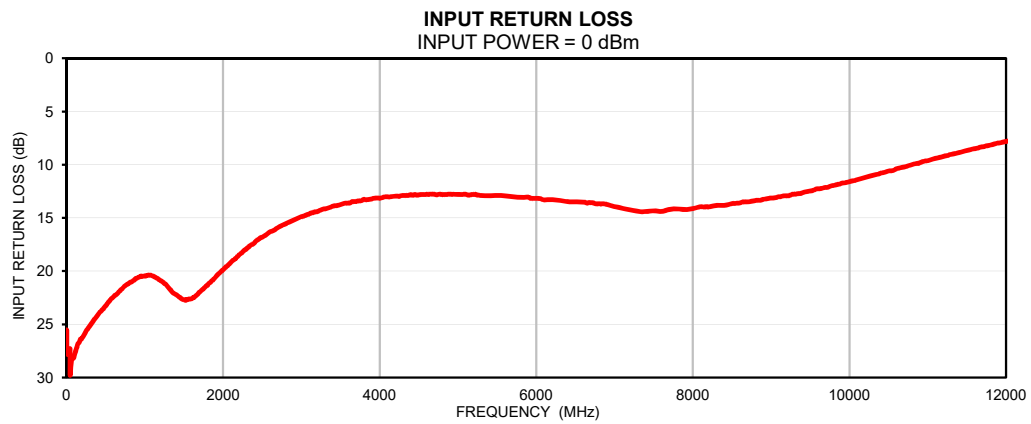
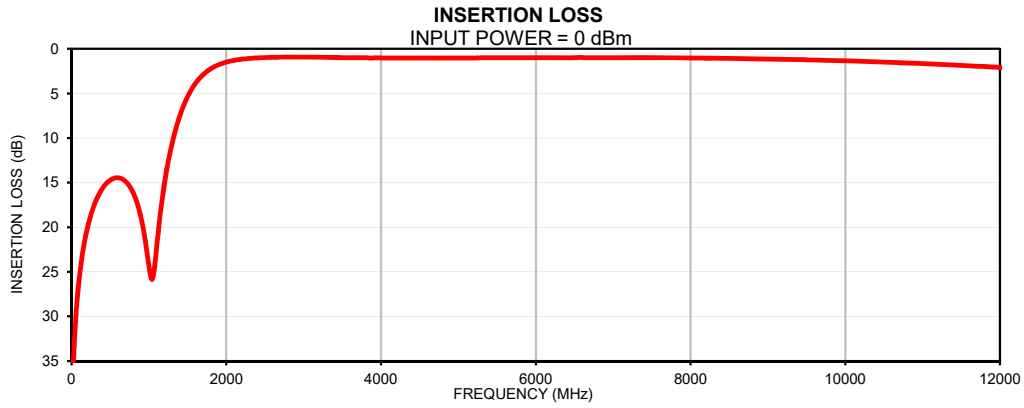
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IF/RF MICROWAVE COMPONENTS

REV. OR  
ZXHF-K23+  
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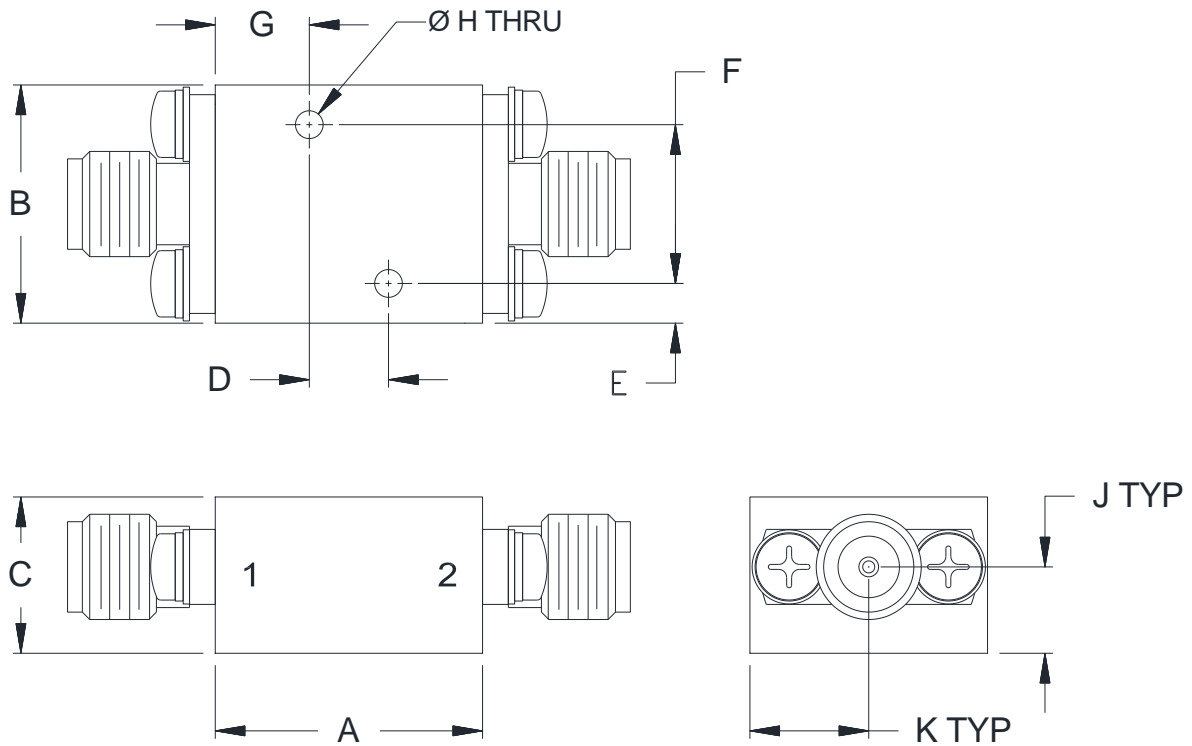
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## Typical Performance Curves



## 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.

<b>Specification</b>	<b>Test/Inspection Condition</b>	<b>Reference/Spec</b>
Operating Temperature	-55° to 105°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 105°C Ambient Environment	Individual Model Data Sheet