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.

Coaxial Reflectionless

High Pass Filter

50Ω 2900 to 8700 MHz

ZXHF-K292M+

Generic photo used for illustration purposes only

CASE STYLE: UK3042

Connectors	Model
2.92mm-F	ZXHF-K292M+

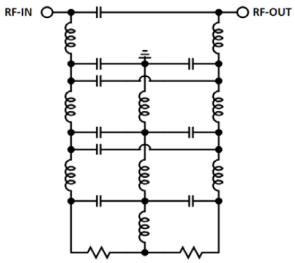
Features

- 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

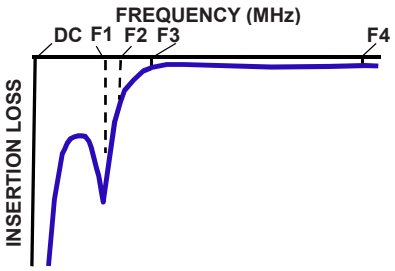
Applications

- Telecom
- Aerospace & Defense
- C band satellite Comm
- 5G Sub 6GHz

Functional Schematic



Typical Frequency Response



+RoHS Compliant

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

Electrical Specifications at 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Stop Band	Rejection	DC-F1	DC- 1950	22	32	-	dB
	Freq. Cut-Off	F2	2400	-	3.0	-	dB
	VSWR	DC-F1	DC- 1950	-	1.3	-	:1
Pass Band	Insertion Loss	F3-F4	2900 - 8700	-	1.7	2.5	dB
	VSWR	F3-F4	2900 - 8700	-	1.2	-	:1

Absolute Maximum Ratings[3]

Parameter	Ratings
Operating Temperature	-55°C to +105°C
Storage Temperature	-55°C to +105°C
RF Power Input, Passband (F3-F4)[1]	32dBm at 25°C
RF Power Input, Stopband (DC-F3)[2]	35dBm at 25°C

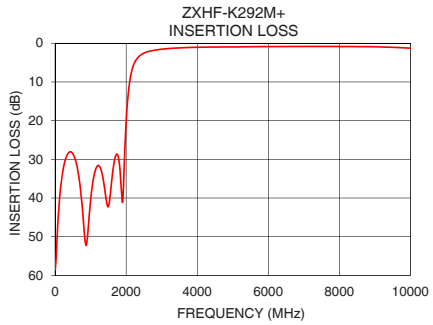
[1] Passband rating derates linearly to 29dBm at 105°C ambient
[2] Stopband rating derates linearly to 32dBm at 105°C ambient
[3] Permanent damage may occur if any of these limits are exceeded

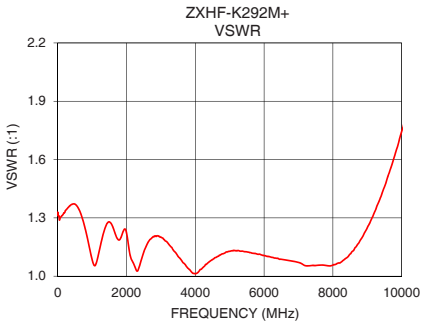
ESD rating

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

Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
1	58.54	1.33
10	58.12	1.32
100	43.21	1.31
200	34.00	1.33
250	31.46	1.34
300	29.74	1.35
500	28.59	1.37
1000	40.45	1.09
1950	30.14	1.24
2000	20.09	1.22
2000	20.09	1.22
2070	11.98	1.14
2400	3.09	1.07
2900	1.66	1.21
2900	1.66	1.21
5000	0.95	1.13
6000	0.86	1.11
7000	0.84	1.07
8700	0.87	1.16
10000	1.28	1.74





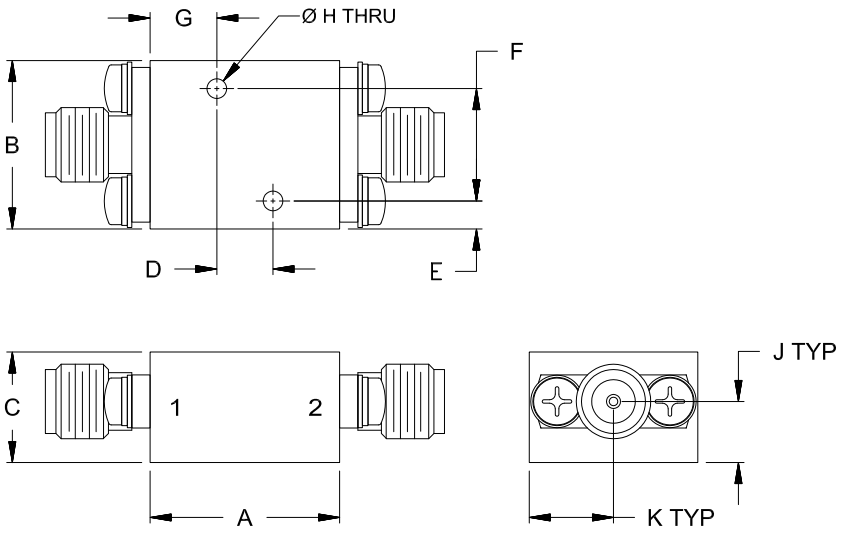
Notes

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 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

Coaxial Reflectionless High Pass Filter ZXHF-K292M+

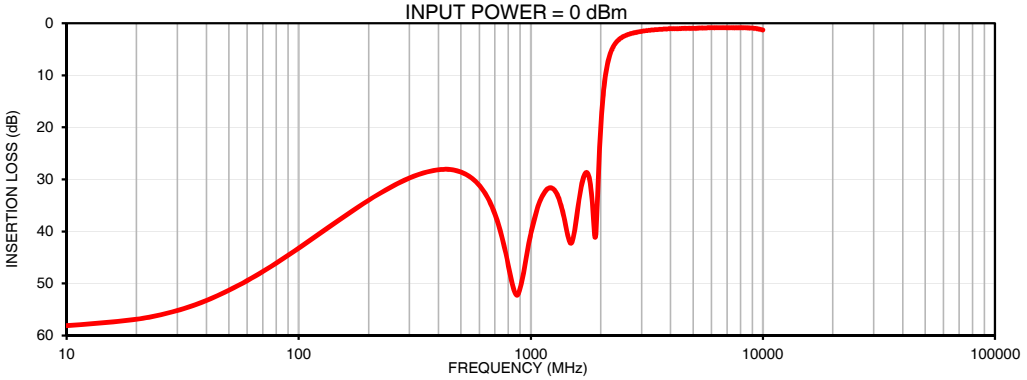
Typical Performance Data

FREQ.	Insertion Loss	Input Return Loss	Output Return Loss
(MHz)	(dB)	(dB)	(dB)
1	58.54	17.06	17.11
5	58.47	17.13	17.10
10	58.12	17.20	17.16
20	56.88	17.46	17.42
30	55.18	17.50	17.46
50	51.30	17.98	17.95
100	43.21	17.55	17.63
150	37.73	17.30	17.34
200	34.00	17.04	17.02
220	32.88	16.84	16.96
240	31.90	16.75	16.89
260	31.05	16.66	16.82
280	30.34	16.58	16.74
300	29.74	16.49	16.66
320	29.24	16.42	16.59
340	28.83	16.33	16.52
360	28.51	16.29	16.48
380	28.29	16.21	16.42
400	28.14	16.16	16.38
420	28.07	16.13	16.35
450	28.11	16.10	16.33
460	28.17	16.09	16.33
480	28.34	16.10	16.34
500	28.59	16.12	16.36
520	28.92	16.17	16.41
550	29.57	16.27	16.49
600	31.16	16.55	16.78
1000	40.45	27.69	27.47
1100	33.97	31.05	31.20
1500	42.14	18.24	18.16
1950	30.14	19.31	18.41
2000	20.09	19.92	18.67
2100	9.84	25.46	23.14
2200	5.80	29.79	27.07
2400	3.09	29.95	28.99
2600	2.21	22.35	22.33
2800	1.80	20.62	20.53
2900	1.66	20.54	20.29
3000	1.55	20.78	20.48
3400	1.25	24.51	23.46
3600	1.16	28.18	25.91
3800	1.09	34.29	28.65
4000	1.04	44.25	29.36
4200	1.01	34.04	27.98
4400	1.00	29.05	25.81
4600	0.98	26.75	24.25
4800	0.95	25.29	23.35
5000	0.95	24.40	22.65
5200	0.95	24.20	22.37
5400	0.92	24.43	22.72
5600	0.89	24.84	23.32
5800	0.87	25.41	24.02
6000	0.86	25.97	24.95
6200	0.86	26.59	26.12
6400	0.85	27.13	27.77
6600	0.84	27.84	29.38
7000	0.84	29.30	33.44
8000	0.84	31.19	43.46
8700	0.87	22.70	23.11
10000	1.28	11.33	11.38

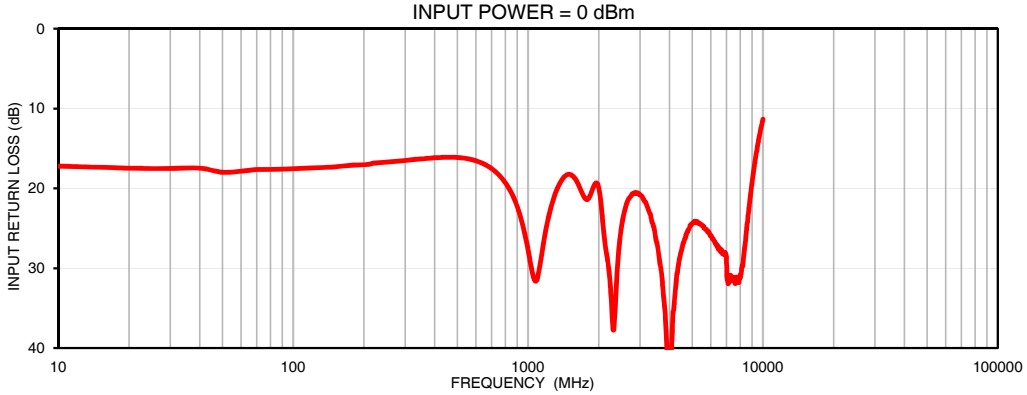
FREQ.	Group Delay
(MHz)	(ns)
2900	0.38
3000	0.35
3100	0.34
3200	0.32
3300	0.31
3400	0.30
3500	0.29
3600	0.28
3700	0.27
3800	0.27
3900	0.26
4000	0.25
4100	0.25
4200	0.24
4300	0.24
4400	0.24
4500	0.23
4600	0.23
4700	0.23
4800	0.23
4900	0.22
5000	0.22
5100	0.22
5200	0.21
5300	0.21
5400	0.21
5500	0.21
5600	0.21
5700	0.21
5800	0.21
5900	0.21
6000	0.21
6100	0.21
6200	0.20
6300	0.20
6400	0.20
6500	0.20
6600	0.20
6700	0.20
6800	0.20
6900	0.20
7000	0.20
7100	0.20
7200	0.20
7300	0.20
7400	0.20
7500	0.20
7600	0.20
7700	0.20
7800	0.20
7900	0.20
8000	0.19
8100	0.20
8200	0.20
8300	0.20
8400	0.20
8500	0.20
8600	0.20
8660	0.20
8700	0.20

Typical Performance Curves

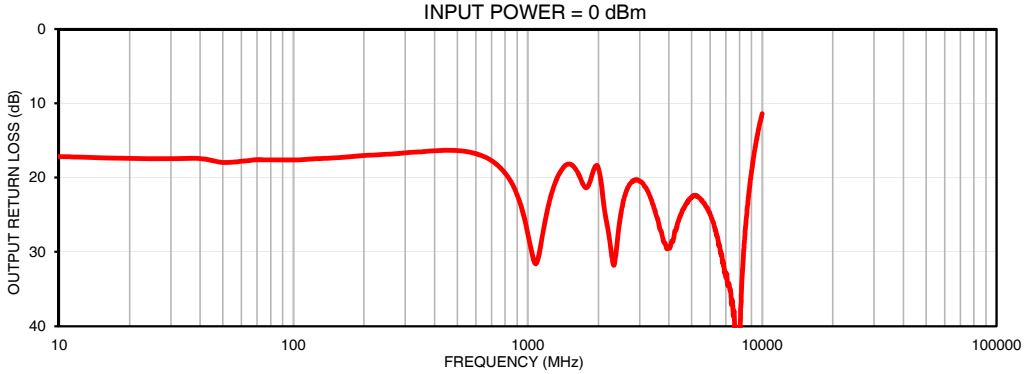
INSERTION LOSS
INPUT POWER = 0 dBm



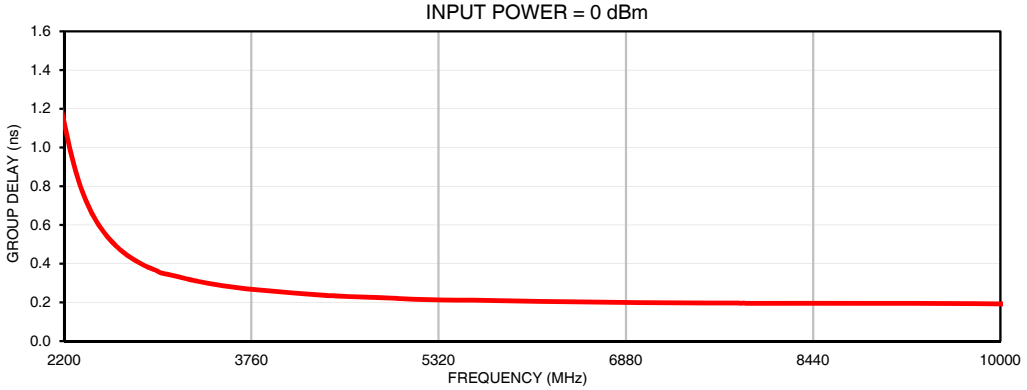
INPUT RETURN LOSS
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS
INPUT POWER = 0 dBm



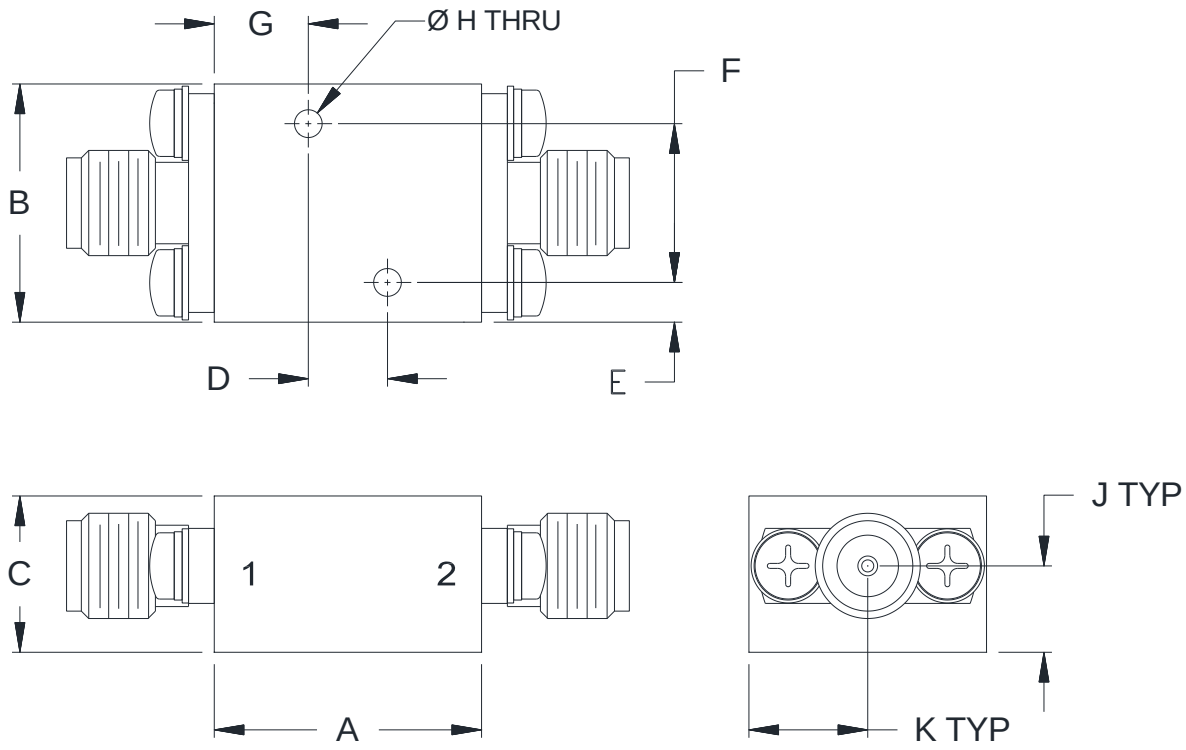
GROUP DELAY
INPUT POWER = 0 dBm



Case Style UK

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. ± .050; 3 Pl. ± .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.

Mini-Circuits

Environmental Specifications ENV002

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