LUMPED LC COAXIAL

High Pass Filter

ZHPB-500-S+

50Ω 0.5 to 14 GHz SMA Female

KEY FEATURES

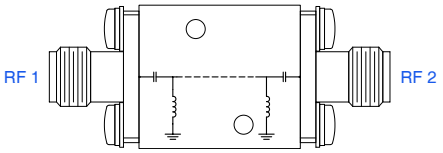
- Low Insertion Loss, 0.9 dB Typ.
- Good Return Loss, 15 dB Typ.
- Good Rejection, 45 dB Typ.

Generic photo used for illustration purposes only

APPLICATIONS

- Test and Measurement

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

Mini-Circuits' ZHPB-500-S+ is a high pass filter built in broadband connectorized package. Covering 0.5-14 GHz bandwidth, these units offer good matching within the passband and good rejection in stopband. ZHPB-500-S+ offer good return loss up to 14 GHz and excellent insertion loss of 0.9 dB Typ.

ELECTRICAL SPECIFICATIONS AT +25°C

Parameter		F#	Frequency (GHz)	Min.	Typ.	Max.	Units
Passband	Insertion Loss	F3-F4	0.5 - 8	—	0.9	2.0	dB
		F4-F5	8 - 14	—	2.5	—	
	Return Loss	F3-F4	0.5 - 8	12	15	—	dB
		F4-F5	8 - 14	—	10	—	
Stopband	Rejection	DC-F1	DC - 0.15	35	45		
		F1-F2	0.15 - 0.2	20	30	—	dB
	Freq. Cut-Off [1]	Fc	0.4	—	3	—	dB

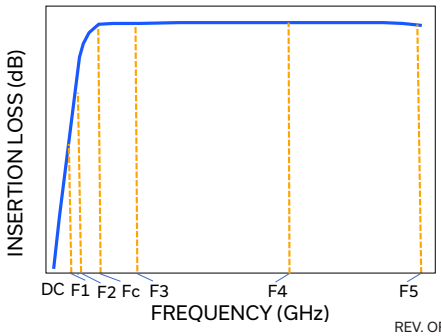
1. Typical variation ± 5%.

ABSOLUTE MAXIMUM RATINGS[2]

Parameter	Ratings
Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C
Input Power[3]	1 W at 25°C

2. Permanent damage may occur if any of these limits are exceeded.
3. Power rating applies only to signals within the passband.

TYPICAL FREQUENCY RESPONSE



REV. OR
ECO-030148
ZHPB-500-S+
EDU5406
MCINU
260624

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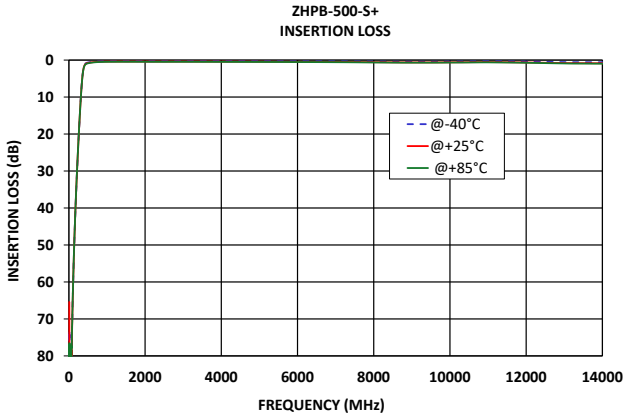
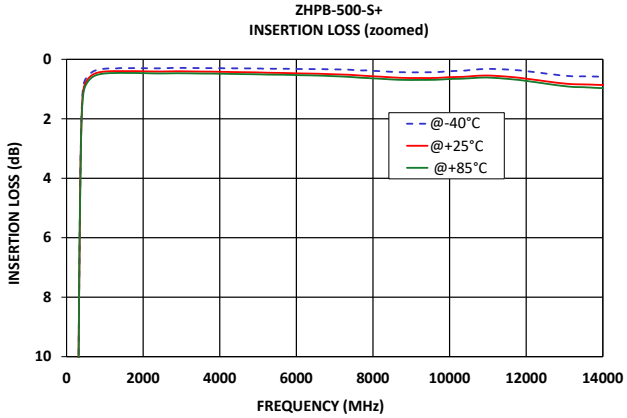
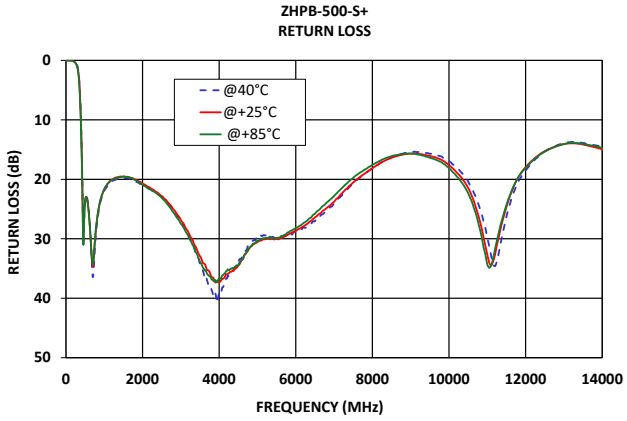
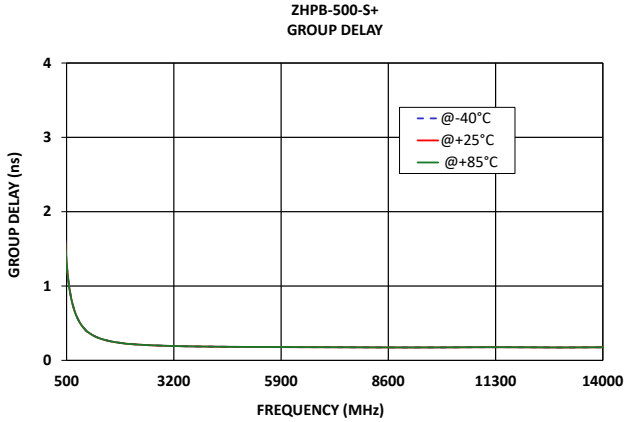
TYPICAL PERFORMANCE GRAPHS









High Pass Filter

ZHPB-500-S+

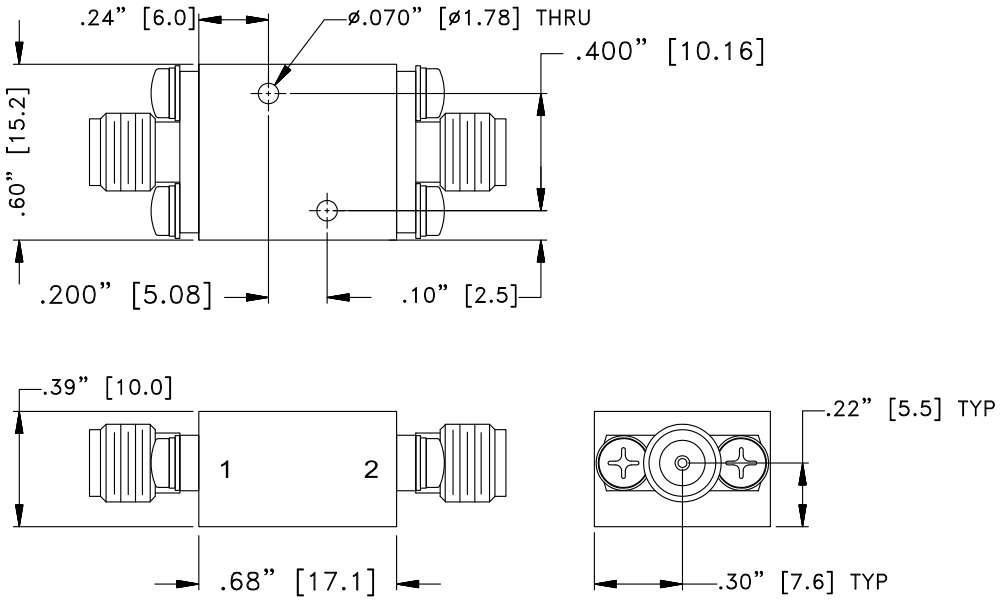
50Ω 0.5 to 14 GHz SMA Female

CONNECTOR DESCRIPTION

Function	Connector
RF1[4]	SMA Female
RF2[4]	SMA Female

4. This filter is bi-directional, RF1 and RF2 ports may be interchanged, see S-Parameters for actual performance.

CASE STYLE DRAWING



Unit weight: 24grams
Dimensions are in inches (mm). Tolerances: 2 Pl.±.050"; 3 Pl.±.015"

PRODUCT MARKING*: ZHPB-500-S+

*Marking may contain other features or characters for internal lot control.

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ADDITIONAL INFORMATION IS AVAILABLE ON OUR DASHBOARD CLICK HERE

Performance Data & Graphs	Data Graphs S-Parameter (S2P Files) Data Set (.zip file)
Case Style	UK3042
RoHs Status	Compliant
Environmental Ratings	ENV46

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-Circuits' 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/terms/viewterm.html

Coaxial High Pass Filter ZHPB-500-S+

Typical Performance Data

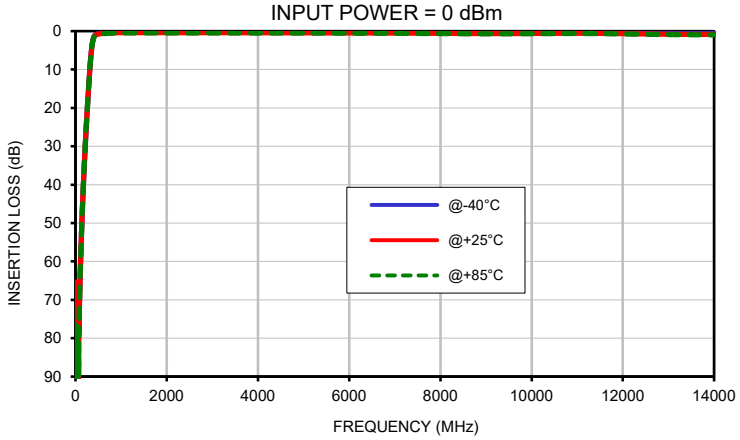
FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
10	74.30	65.42	77.06	0.01	0.00	0.00	0.02	0.01	0.02
20	82.06	84.50	91.85	0.02	0.01	0.01	0.01	0.01	0.02
30	103.48	84.76	82.91	0.01	0.01	0.00	0.01	0.01	0.02
40	95.30	94.61	86.64	0.01	0.01	0.00	0.01	0.01	0.01
50	91.28	83.42	92.76	0.00	0.01	0.00	0.01	0.01	0.01
60	88.12	89.45	90.57	0.00	0.01	0.00	0.01	0.01	0.01
70	80.70	78.91	81.25	0.00	0.01	0.01	0.01	0.01	0.02
100	65.10	64.94	64.41	0.01	0.01	0.02	0.02	0.03	0.04
150	46.79	46.60	46.47	0.03	0.05	0.08	0.05	0.08	0.09
200	33.27	33.08	32.97	0.11	0.17	0.21	0.13	0.19	0.21
300	12.45	12.37	12.31	0.98	1.16	1.29	1.03	1.21	1.33
400	1.54	1.67	1.79	11.99	12.66	13.11	12.56	13.30	13.84
450	0.82	0.95	1.06	30.14	30.14	30.97	33.88	34.14	32.94
480	0.70	0.83	0.93	25.90	25.51	25.50	24.89	24.36	24.12
500	0.65	0.77	0.87	23.61	23.57	23.60	22.90	22.55	22.52
600	0.50	0.60	0.68	25.59	25.96	26.01	24.87	24.72	24.87
800	0.36	0.45	0.52	27.95	27.39	27.19	28.12	27.38	27.43
1000	0.32	0.41	0.48	21.93	21.70	21.63	21.62	21.40	21.32
1200	0.30	0.40	0.46	20.39	20.04	20.15	19.91	19.70	19.66
1300	0.31	0.40	0.46	20.05	19.70	19.84	19.70	19.46	19.47
1500	0.29	0.40	0.46	19.81	19.52	19.58	19.81	19.39	19.50
1800	0.29	0.40	0.46	20.28	20.01	20.12	20.05	19.83	19.85
1950	0.30	0.40	0.46	20.77	20.47	20.67	20.39	20.23	20.27
2000	0.30	0.40	0.47	20.97	20.71	20.94	20.58	20.43	20.47
2100	0.30	0.40	0.47	21.32	21.09	21.32	20.99	20.78	20.90
2200	0.30	0.41	0.47	21.69	21.44	21.68	21.47	21.15	21.36
2400	0.30	0.41	0.47	22.51	22.30	22.57	22.28	21.94	22.29
2500	0.30	0.41	0.48	22.95	22.81	23.11	22.64	22.39	22.69
2700	0.29	0.41	0.47	24.33	24.17	24.64	23.59	23.64	23.82
2900	0.29	0.40	0.47	26.00	25.92	26.50	25.59	25.59	26.04
3000	0.29	0.40	0.47	27.02	26.84	27.49	26.85	26.71	27.25
3200	0.29	0.41	0.47	29.41	28.99	29.66	29.26	28.69	29.44
3500	0.30	0.41	0.48	34.27	32.94	33.90	33.94	32.96	33.72
4000	0.30	0.42	0.48	39.20	37.34	36.64	39.62	39.26	38.57
4900	0.31	0.44	0.50	30.32	30.91	30.79	30.10	30.93	30.54
5500	0.32	0.46	0.52	29.79	29.99	29.97	28.74	29.34	29.07
6000	0.32	0.47	0.53	28.78	28.66	28.14	28.82	28.75	28.48
6300	0.33	0.48	0.54	27.79	27.49	26.93	27.96	27.80	27.09
6600	0.33	0.49	0.55	26.53	25.85	25.18	26.67	26.19	25.34
6700	0.33	0.49	0.55	25.89	25.33	24.52	26.07	25.52	24.67
7200	0.34	0.51	0.58	22.74	22.40	21.51	22.39	22.15	21.21
7500	0.36	0.53	0.60	20.71	20.52	19.76	20.71	20.62	19.74
8000	0.39	0.57	0.64	18.13	18.14	17.57	18.32	18.33	17.71
8200	0.40	0.58	0.65	17.28	17.31	16.89	17.41	17.43	16.96
9000	0.44	0.63	0.70	15.41	15.68	15.67	15.47	15.77	15.72
9200	0.44	0.63	0.69	15.40	15.72	15.84	15.30	15.65	15.72
9400	0.44	0.63	0.69	15.59	15.94	16.19	15.35	15.76	15.93
9800	0.42	0.62	0.68	16.15	16.72	17.10	16.05	16.63	16.99
10000	0.40	0.60	0.66	16.94	17.60	18.13	16.84	17.55	18.02
10200	0.39	0.59	0.66	18.06	18.83	19.50	18.02	18.81	19.43
10400	0.38	0.58	0.65	19.42	20.39	21.17	19.45	20.56	21.25
10600	0.35	0.56	0.63	21.47	22.89	23.81	21.49	23.05	23.96
10800	0.33	0.55	0.62	24.81	26.91	28.24	24.52	26.76	28.17
11000	0.32	0.55	0.61	29.83	32.65	34.32	30.33	35.05	38.53
11200	0.33	0.56	0.63	34.61	32.72	31.79	48.48	36.91	34.15
11400	0.34	0.57	0.65	29.12	26.91	26.45	29.72	27.03	26.31
12000	0.40	0.65	0.73	18.51	17.95	18.07	18.53	17.94	17.94
12500	0.48	0.74	0.82	15.31	15.26	15.34	15.06	14.96	14.99
13000	0.55	0.82	0.90	13.92	14.09	14.06	13.62	13.76	13.69
14000	0.58	0.86	0.97	14.62	15.00	14.74	14.32	14.75	14.45

Typical Performance Data

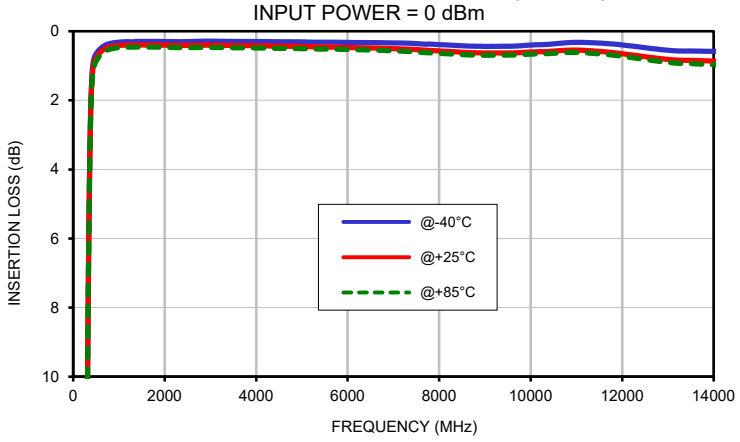
FREQ.	GROUP DELAY		
	(nsec)		
(MHz)	@-40°C	@+25°C	@+85°C
500	1.33	1.32	1.31
1000	0.39	0.39	0.39
1500	0.27	0.27	0.27
2000	0.22	0.22	0.22
2400	0.21	0.21	0.21
2800	0.20	0.20	0.20
3200	0.19	0.19	0.19
3600	0.19	0.19	0.19
4000	0.19	0.19	0.19
4400	0.18	0.18	0.18
4800	0.18	0.18	0.18
5200	0.18	0.18	0.18
5600	0.18	0.18	0.18
6000	0.18	0.18	0.18
6400	0.18	0.18	0.18
6800	0.18	0.18	0.18
7000	0.18	0.18	0.18
7200	0.18	0.18	0.18
7400	0.18	0.18	0.18
7600	0.18	0.18	0.18
7800	0.18	0.18	0.18
8000	0.18	0.17	0.18
8200	0.18	0.17	0.17
8400	0.17	0.17	0.17
8600	0.17	0.17	0.17
8700	0.17	0.17	0.17
8800	0.17	0.17	0.17
9000	0.17	0.17	0.17
9200	0.17	0.17	0.17
9400	0.17	0.17	0.17
9600	0.17	0.17	0.17
9800	0.17	0.17	0.17
10000	0.17	0.17	0.17
10500	0.18	0.18	0.18
11000	0.18	0.18	0.18
11500	0.18	0.18	0.18
12000	0.18	0.18	0.18
12500	0.17	0.17	0.17
13000	0.17	0.17	0.17
14000	0.18	0.18	0.18

Typical Performance Curves

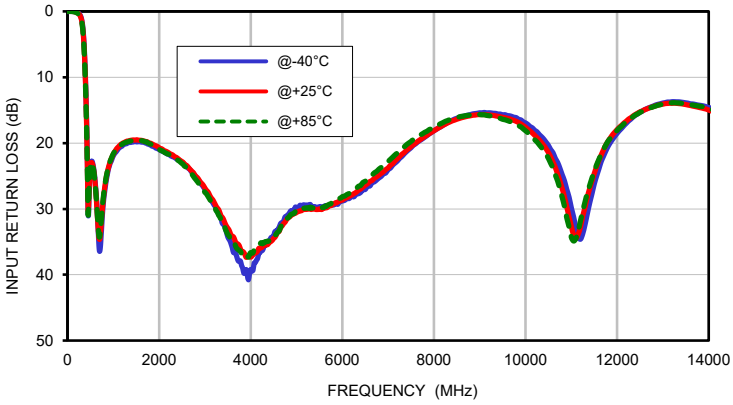
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



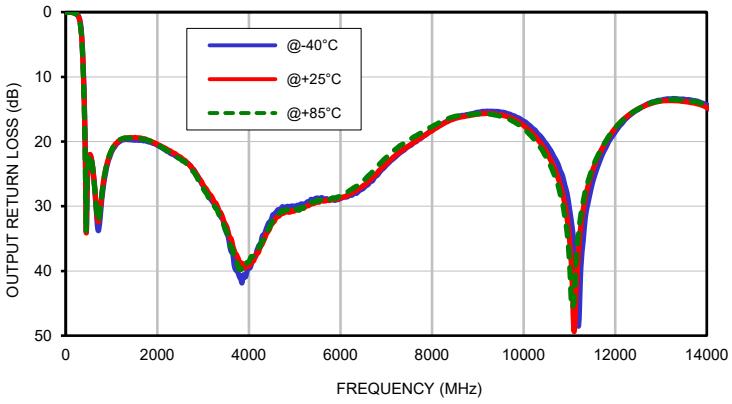
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



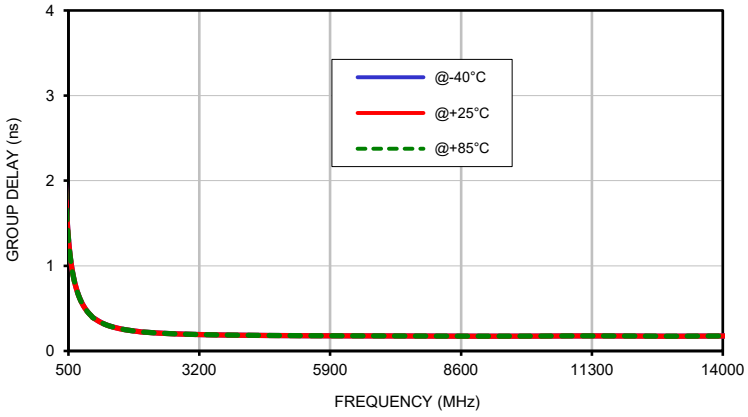
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



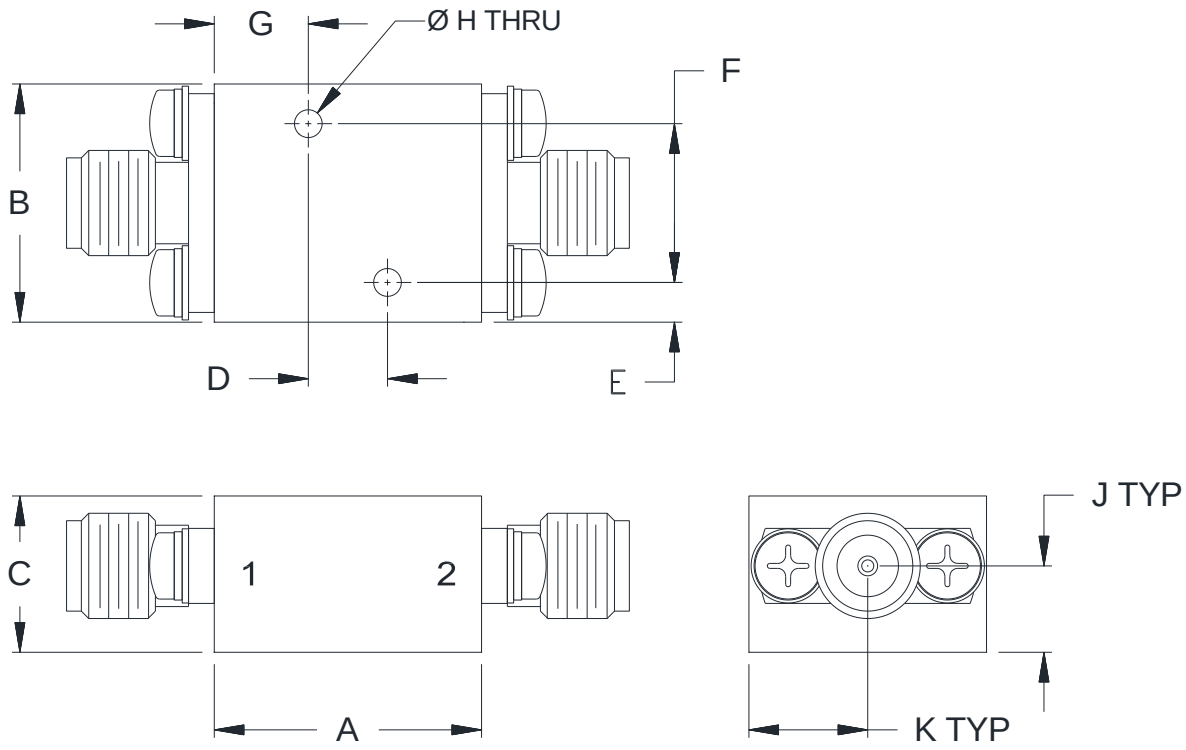
GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



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.

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RF/IF MICROWAVE COMPONENTS

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Mini-Circuits

Environmental Specifications ENV46

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 100°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 40°C, 96 hours; Units may require bake-out after humidity to restore full performance.	MIL-STD-202, Method 103, Condintion B
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	50g, 11ms half-sine, 3 shocks each direction 3 axes (total 18)	MIL-STD-202, Method 213, Condition A

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