Coaxial

Coaxial-Ceramic Resonator Filters and Multiplexers

50Ω DC to 6 GHz

The Big Deal

- Low insertion loss with excellent power handling
- Passbands up to 6 GHz
- Fractional bandwidth from <1 to 25%
- Excellent temperature stability
- Rugged construction to handle demanding environmental conditions

Product Overview

Mini-Circuits' *Coaxial-Ceramic Resonator filters* offer low insertion loss in very small form factors, using ceramic material with high dielectric constant and superior Q factor. Bandpass and bandstop filters,diplexer and multiplexer designs can be constructed using this technology. Low insertion loss combined with excellent power handling makes these filters well suited for transmitter and receiver signal chains. Advanced filter design and construction can achieve stopband width greater than 3x the center frequency

All our coaxial-ceramic resonator filters are built with rugged construction, qualified to withstand multiple demanding reflow cycles. Custom integrated assembly with LNA in greatly simplifying system integration. They can be realized in small form factors with high-quality, precise machining for applications where size is critical. Excellent repeat-ability across units is achieved through precise tuning and process control.

Key Features

Feature	Advantages
Low insertion loss	Low signal loss results in better SNR in signal chain
Fast roll-off	Higher selectivity results in better adjacent channel rejection and dynamic range
Wide stop band	Wide spur-free stopband results in better receiver sensitivity
Excellent power handling	Well suited for transmitter applications
Rugged Construction	These filter assemblies have been qualified over a wide range of thermal, mechanical and environmental conditions including withstanding the stress of extensive solder reflow cycles
Small Size	Very well suited for high performance applications where size is a constraint.
Temperature stability	Very minimal change in electrical performance across temperature makes these filters suitable for a wide range of operating conditions.

Coaxial

Bandpass Filter

ZX75BP-4700-S+

50Ω 4400 to 5000 MHz

Generic photo used for illustration purposes only

CASE STYLE: KD1465

Connectors	Model
SMA	ZX75BP-4700-S+

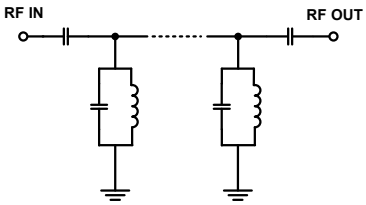
Features

- Low insertion loss
- High selectivity
- Connectorized package

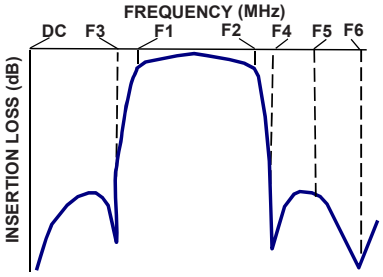
Applications

- Defense systems
- Fixed satellite
- Radio astronomy
- Radar and navigation system

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

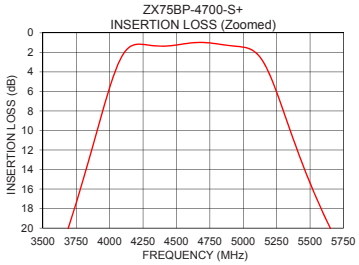
Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	-	-	-	4700	-	MHz
	Insertion Loss	F1-F2	4400 - 5000	-	2.0	3.0	dB
	VSWR	F1-F2	4400 - 5000	-	1.92	2.32	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC - 2800	40	45	-	dB
	VSWR	DC-F3	DC - 2800	-	20	-	:1
Stop Band, Upper	Insertion Loss	F4-F5	6300 - 8000	30	40	-	dB
		F5-F6	8000 - 10000	20	25	-	dB
	VSWR	F4-F6	6300 - 10000	-	20	-	:1

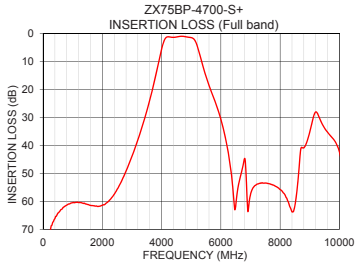
Maximum Ratings	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	1 W Max.

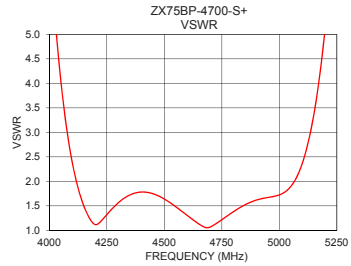
Permanent damage may occur if any of these limits are exceeded.

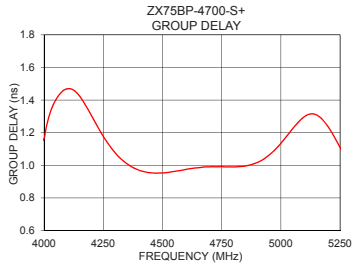
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
10	81.23	1248.22	4400	0.97
100	77.17	235.82	4425	0.96
1000	60.49	116.02	4450	0.95
2800	49.22	129.35	4475	0.95
3000	43.93	117.32	4500	0.95
3420	30.65	87.85	4525	0.96
3680	20.48	57.96	4550	0.96
3900	10.33	18.40	4575	0.97
4060	3.29	3.64	4600	0.98
4400	1.36	1.78	4650	0.98
4700	0.98	1.07	4700	0.99
5000	1.47	1.72	4725	0.99
5155	3.09	3.50	4750	0.99
5400	11.84	24.19	4775	0.99
5650	19.96	55.17	4800	0.99
6000	30.65	79.42	4850	1.00
6300	45.90	88.31	4875	1.00
8000	55.79	73.84	4900	1.02
9200	28.04	2.47	4950	1.06
10000	42.31	5.17	5000	1.13









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.

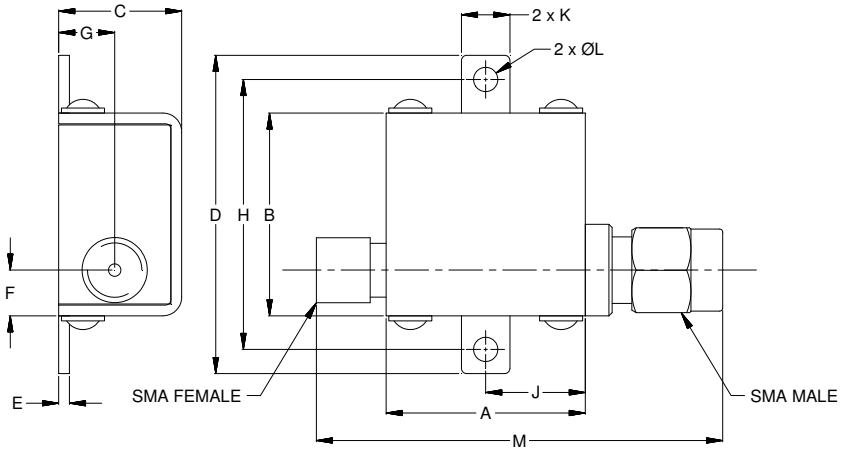
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.

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	SMA-MALE
PORT - 2	SMA-FEMALE

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F	G
.74	**.75**	**.46**	**1.18**	**.04**	**.17**	**.21**
18.80	19.05	11.68	29.97	1.02	4.32	5.33

H	J	K	L	M		Wt.
1.00	**.37**	**.18**	**.09**	**1.51**		grams
25.40	9.40	4.57	2.29	38.4		21.4

Note: Please refer to case style drawing for details

Coaxial Band Pass Filter ZX75BP-4700-S+

Typical Performance Data

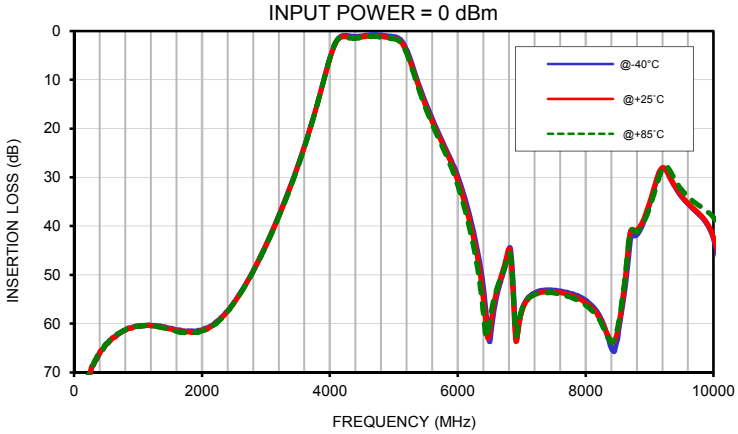
FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
10	75.53	81.23	77.14	0.01	0.01	0.02	0.05	0.07	0.09
50	85.22	80.34	77.78	0.03	0.04	0.04	0.09	0.11	0.12
100	77.60	77.17	76.39	0.06	0.07	0.07	0.12	0.14	0.16
200	71.34	71.94	71.10	0.10	0.12	0.12	0.17	0.20	0.21
250	70.25	70.06	69.86	0.11	0.13	0.13	0.18	0.22	0.23
500	64.18	64.21	64.27	0.12	0.17	0.18	0.22	0.27	0.30
750	61.60	61.68	61.65	0.11	0.16	0.19	0.22	0.28	0.30
1000	60.55	60.49	60.59	0.08	0.15	0.19	0.19	0.25	0.28
1250	60.35	60.44	60.58	0.05	0.13	0.18	0.18	0.25	0.27
1500	60.95	61.12	61.22	0.02	0.12	0.17	0.20	0.27	0.29
1750	61.55	61.70	61.89	0.01	0.11	0.17	0.23	0.30	0.32
2000	61.37	61.40	61.49	0.01	0.10	0.16	0.26	0.33	0.35
2250	59.43	59.51	59.61	0.01	0.11	0.17	0.28	0.36	0.38
2500	55.65	55.70	55.78	0.00	0.12	0.18	0.29	0.39	0.41
2750	50.43	50.43	50.51	0.01	0.13	0.19	0.31	0.42	0.46
2800	49.21	49.22	49.27	0.01	0.13	0.20	0.32	0.43	0.48
3000	43.95	43.93	44.02	0.01	0.15	0.22	0.35	0.48	0.54
3420	30.52	30.65	30.77	0.04	0.20	0.30	0.54	0.71	0.79
3500	27.58	27.70	27.82	0.05	0.22	0.32	0.61	0.79	0.87
3600	23.72	23.81	23.93	0.08	0.25	0.36	0.72	0.91	0.99
3680	20.41	20.48	20.58	0.12	0.30	0.42	0.84	1.03	1.11
3800	15.04	15.12	15.18	0.29	0.48	0.60	1.11	1.31	1.38
4000	5.60	5.61	5.48	2.17	2.50	2.74	2.94	3.28	3.48
4060	3.28	3.29	3.16	4.32	4.90	5.43	4.88	5.47	5.98
4100	2.16	2.21	2.12	6.83	7.78	8.75	7.05	7.96	8.90
4200	0.96	1.18	1.26	20.41	25.14	26.93	15.61	16.63	17.52
4400	1.11	1.36	1.50	11.05	11.02	10.79	11.06	10.90	10.63
4500	1.01	1.24	1.35	12.06	12.32	12.42	11.93	12.13	12.23
4700	0.73	0.98	1.11	32.75	29.58	27.15	32.36	33.49	28.34
4900	1.00	1.30	1.48	12.87	12.55	12.19	14.26	13.85	13.10
5000	1.15	1.47	1.62	11.66	11.52	11.68	14.40	14.53	14.48
5100	1.73	2.10	2.26	7.80	7.82	8.16	10.80	10.92	11.21
5160	2.77	3.21	3.42	4.82	4.88	5.09	6.97	7.00	7.05
5200	3.84	4.34	4.61	3.31	3.41	3.57	5.09	5.14	5.16
5500	14.88	15.36	15.90	0.27	0.45	0.58	1.46	1.79	1.97
5700	20.88	21.39	22.02	0.14	0.29	0.38	1.73	2.16	2.43
5800	23.67	24.20	24.92	0.11	0.26	0.33	2.11	2.55	2.83
6000	29.85	30.65	31.65	0.08	0.22	0.26	2.64	2.99	3.14
6200	38.59	39.77	41.27	0.06	0.20	0.24	2.05	2.28	2.37
6300	44.40	45.90	47.86	0.05	0.20	0.23	1.65	1.88	1.98
6600	54.92	53.83	53.34	0.01	0.19	0.24	0.97	1.22	1.36
6800	44.79	44.68	45.68	0.03	0.19	0.26	1.06	1.38	1.49
7000	57.20	57.52	57.19	0.07	0.18	0.29	0.70	0.92	1.05
7200	53.76	53.99	54.04	0.09	0.18	0.34	0.63	0.83	0.93
7400	53.09	53.38	53.68	0.10	0.18	0.38	0.58	0.77	0.84
7600	53.31	53.63	54.01	0.10	0.19	0.42	0.55	0.71	0.76
7800	53.91	54.33	54.76	0.07	0.21	0.46	0.50	0.66	0.68
8000	55.23	55.79	56.26	0.02	0.24	0.49	0.45	0.60	0.62
8200	58.00	58.57	58.91	0.05	0.29	0.52	0.40	0.55	0.57
8400	65.02	63.75	63.91	0.19	0.41	0.61	0.35	0.51	0.52
8600	54.26	52.86	52.29	1.06	1.46	1.65	0.30	0.47	0.48
8800	41.80	40.88	41.21	1.49	1.63	1.69	0.25	0.43	0.45
9000	35.56	35.19	36.20	1.33	1.63	1.41	0.21	0.40	0.42
9200	28.08	28.04	28.24	6.31	7.46	6.39	0.19	0.39	0.41
9400	32.04	31.93	30.54	1.54	1.86	2.24	0.15	0.36	0.40
9500	33.99	33.83	32.53	1.14	1.43	1.54	0.13	0.34	0.38
9600	35.47	35.28	33.97	1.03	1.35	1.36	0.12	0.33	0.37
9700	36.74	36.57	35.12	1.10	1.47	1.40	0.11	0.32	0.37
9800	38.00	37.78	36.04	1.34	1.76	1.62	0.10	0.32	0.37
10000	42.59	42.31	38.23	2.95	3.40	2.75	0.08	0.31	0.37

Typical Performance Data

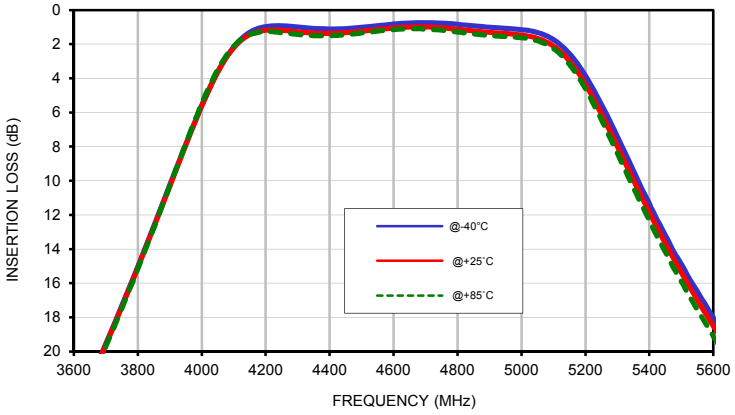
FREQ. (MHz)	GROUP DELAY (ns)		
	@-40°C	@+25°C	@+85°C
4400	0.99	0.97	0.96
4410	0.98	0.97	0.96
4420	0.97	0.96	0.95
4430	0.97	0.96	0.95
4440	0.97	0.96	0.95
4450	0.96	0.95	0.95
4460	0.96	0.95	0.95
4470	0.96	0.95	0.95
4480	0.96	0.95	0.95
4490	0.96	0.95	0.95
4500	0.96	0.95	0.95
4510	0.96	0.95	0.95
4520	0.96	0.96	0.95
4530	0.97	0.96	0.96
4540	0.97	0.96	0.96
4550	0.97	0.96	0.96
4560	0.97	0.96	0.97
4570	0.97	0.97	0.97
4580	0.98	0.97	0.97
4590	0.98	0.97	0.97
4600	0.98	0.98	0.98
4610	0.98	0.98	0.98
4620	0.99	0.98	0.98
4630	0.99	0.98	0.98
4640	0.99	0.98	0.98
4650	0.99	0.98	0.99
4660	0.99	0.99	0.99
4670	1.00	0.99	0.99
4680	1.00	0.99	0.99
4690	1.00	0.99	0.99
4700	1.00	0.99	0.99
4710	1.00	0.99	0.99
4720	1.00	0.99	0.99
4730	1.00	0.99	0.99
4740	1.00	0.99	0.99
4750	1.00	0.99	0.99
4760	1.00	0.99	0.99
4770	1.00	0.99	0.98
4780	1.00	0.99	0.98
4790	1.00	0.99	0.98
4800	1.00	0.99	0.98
4810	1.00	0.99	0.98
4820	1.00	0.99	0.98
4830	1.00	0.99	0.98
4840	1.01	0.99	0.98
4850	1.01	1.00	0.99
4860	1.01	1.00	0.99
4870	1.01	1.00	0.99
4880	1.02	1.01	1.00
4890	1.02	1.01	1.00
4900	1.03	1.02	1.01
4910	1.03	1.02	1.02
4920	1.04	1.03	1.02
4930	1.05	1.04	1.03
4940	1.06	1.05	1.05
4950	1.07	1.06	1.06
4960	1.08	1.07	1.07
4970	1.09	1.09	1.09
5000	1.14	1.13	1.14

Typical Performance Curves

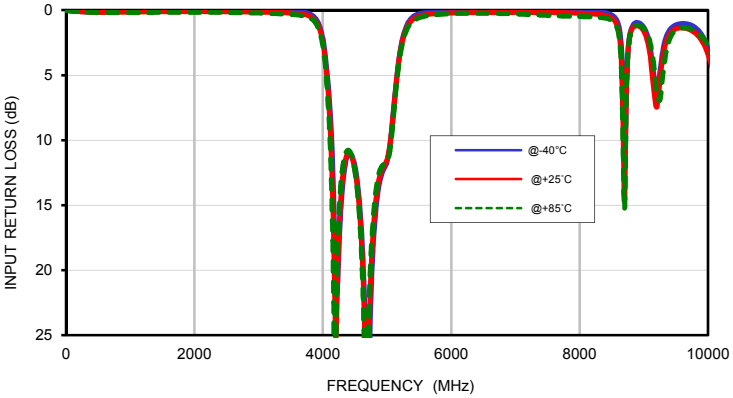
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



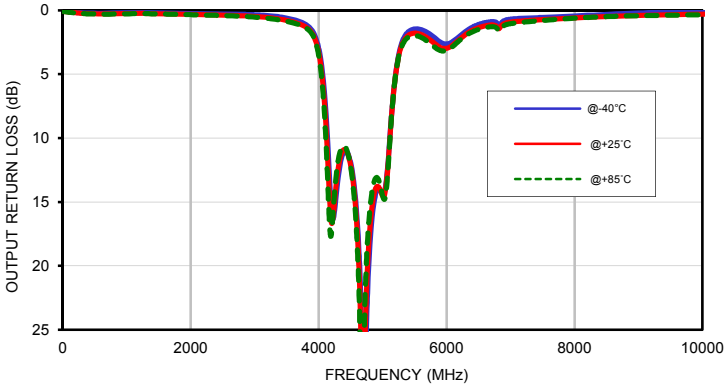
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



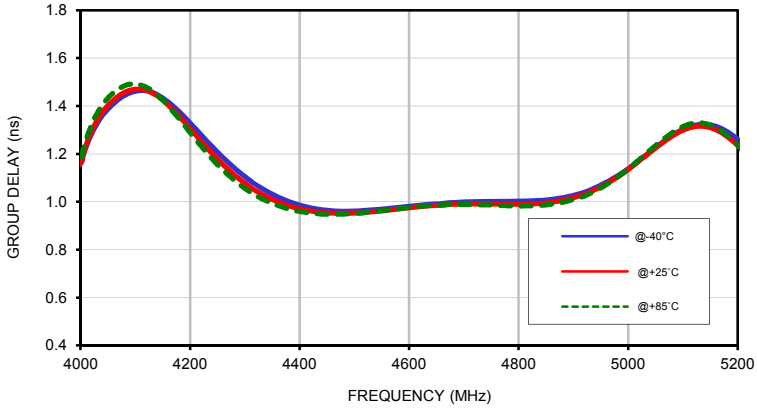
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm

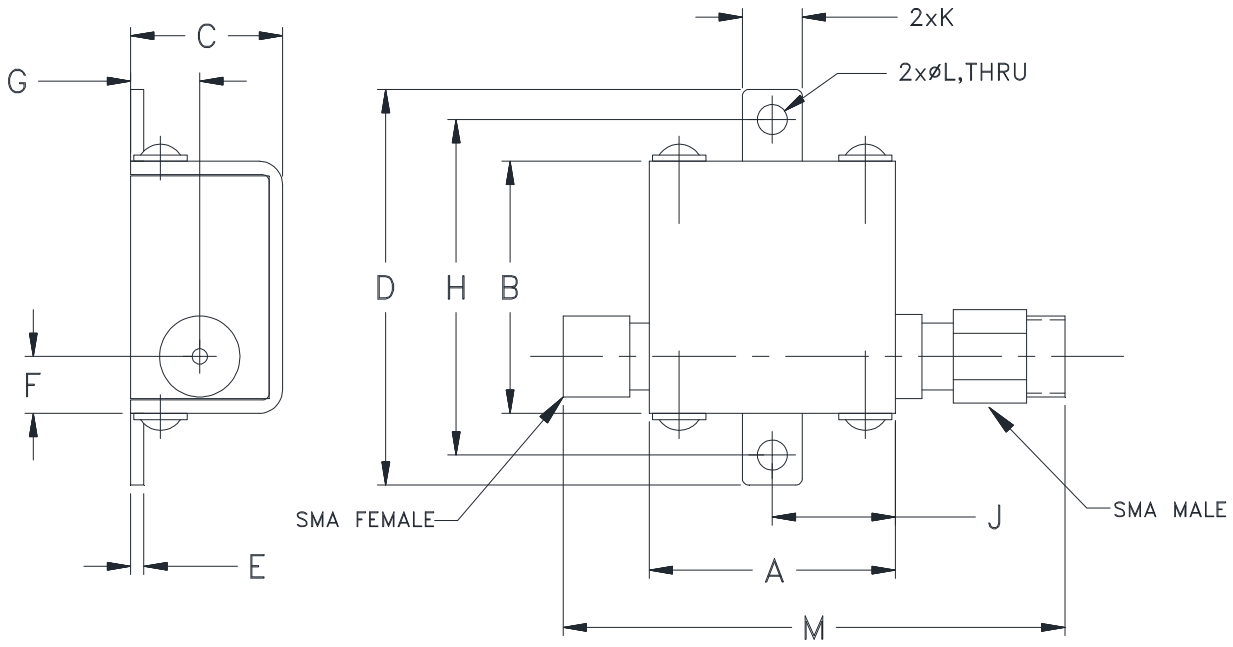


GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



Case Style KD

Outline Dimensions KD1465



CASE #.	A	B	C	D	E	F	G	H	J	K	L	M	WT. GRAM
KD1465	0.74 (18.80)	.75 (19.05)	.46 (11.68)	1.18 (29.97)	.04 (1.02)	.17 (4.32)	.21 (5.33)	1.00 (25.40)	.37 (9.40)	.18 (4.57)	.09 (2.29)	1.51 (38.4)	21.4

Dimensions are in inches (mm). Tolerances: 2Pl. ± .03; 3Pl. ± .015
Tolerance on hole size and interaxes dimensions to be ± .005.

Note:
1. Case material: Brass
2. Case finish: Gold
3. Cover: Nickel plated.

Mini-Circuits®
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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