Cavity

Bandpass Filters

50Ω DC to 15 GHz

The Big Deal

- Very low insertion loss with excellent power handling
- Very fast roll-off with wide stopband
- Passbands up to 15 GHz
- Stopbands up to 22 GHz

Product Overview

Mini-Circuits' cavity filters are designed by implementing resonant structures with very high Q and are ideal for narrow-band, high-selectivity applications. These designs can provide bandwidths as narrow as 1% with very high selectivity and excellent low noise floor. Low insertion loss combined with excellent power handling makes them well-suited for transmitter and receiver front end. Advanced filter design and construction enables stopband width greater than 3x the center frequency.

Mini-Circuits' cavity filters feature a special protective assembly to prevent accidental de-tuning that would otherwise require expensive replacement or return to factory for re-tuning. Precise machining allows realization of cavity filters with small form factors for applications where size is critical. Excellent repeatability 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 receiver front end and better power delivery to antenna in transmitter
Fast roll-off	Higher selectivity results in better adjacent channel rejection and dynamic range
Wide stopband	Wide spur free band results in better receiver sensitivity
High power handling	Well suited for transmitter application
Protective assembly	Prevents accidental de-tuning of precisely tuned resonant circuit

Cavity

Bandpass Filter

ZVBP-11R7G-S+

50Ω 10700 to 12750 MHz

Generic photo used for illustration purposes only

CASE STYLE: UG2852

Connectors	Model
SMA-F	ZVBP-11R7G-S+

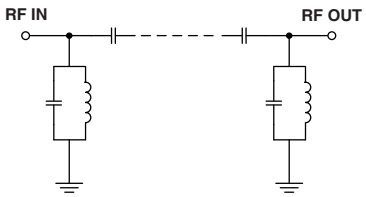
Features

- Low insertion loss, 1 dB typical
- Broad stopband performance upto 20 GHz
- High rejection

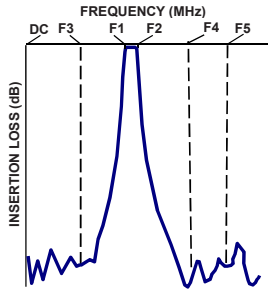
Applications

- Fixed and satellite communication
- Mobile communication
- Broadcasting satellite

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	Fc	-	-	11725	-	MHz
	Insertion Loss	F1-F2	10700 - 12750	-	1.0	2.0	dB
	VSWR	F1-F2	10700 - 12750	-	1.50	1.76	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC - 10200	43	54	-	dB
Stop Band, Upper	Insertion Loss	F4-F5	13200 - 20000	35	46	-	dB

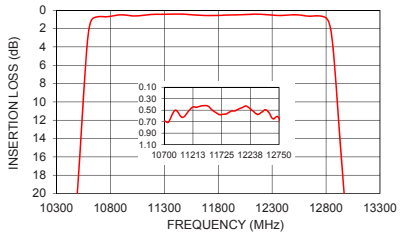
Maximum Ratings	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	10 W

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

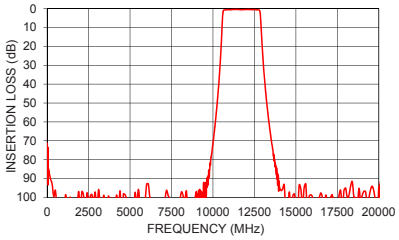
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
100	85.92	782.93	10700	2.52
500	96.28	226.13	10800	2.51
1000	120.05	177.34	10900	2.10
5000	103.35	133.63	11000	1.83
10000	71.20	98.13	11100	1.69
10200	55.18	84.58	11200	1.60
10420	30.99	55.86	11300	1.54
10490	20.43	35.57	11400	1.50
10590	3.04	3.36	11500	1.46
10700	0.69	1.36	11600	1.44
11000	0.61	1.45	11700	1.43
11725	0.58	1.47	11725	1.42
12000	0.49	1.26	11900	1.43
12750	0.64	1.05	12000	1.45
12860	3.54	4.14	12100	1.48
12970	20.34	35.77	12200	1.53
13050	30.83	48.08	12300	1.59
13200	46.22	70.54	12400	1.68
16000	99.81	87.48	12500	1.84
20000	94.63	95.09	12750	2.38

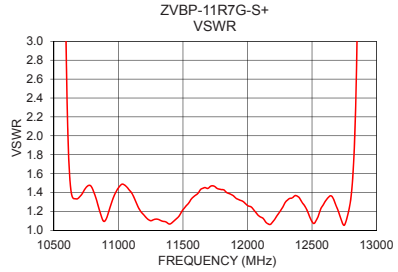
ZVBP-11R7G-S+
INSERTION LOSS (Zoomed)



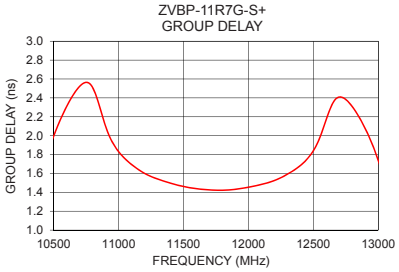
ZVBP-11R7G-S+
INSERTION LOSS



ZVBP-11R7G-S+
VSWR



ZVBP-11R7G-S+
GROUP DELAY



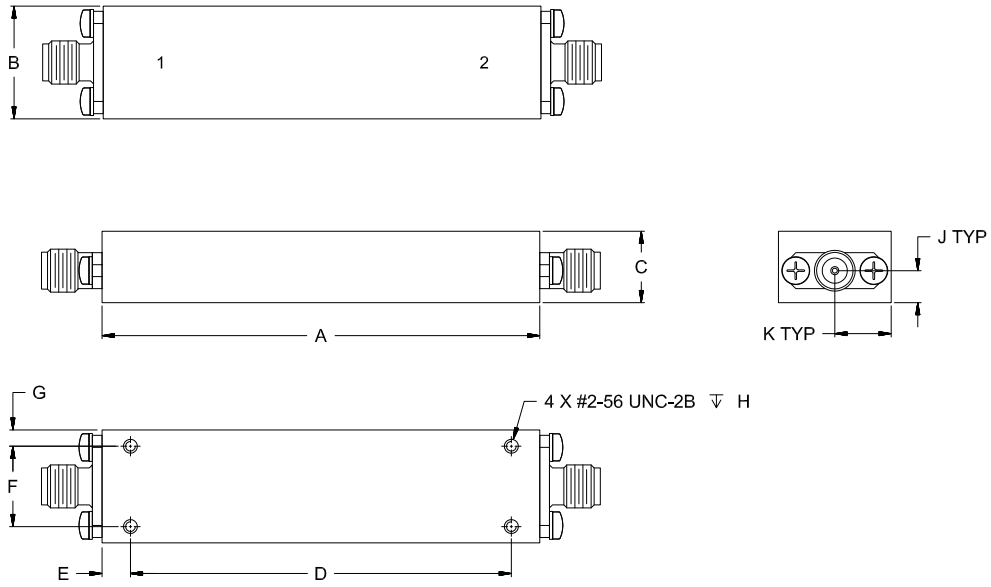
Notes

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-Female
PORT-2	SMA-Female

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F
2.70	**.70**	**.44**	**2.347**	**.18**	**.495**
68.5	17.7	11.2	59.61	4.4	12.57

G	H	J	K	Wt.
.10	**.100**	**.20**	**.35**	grams
2.5	2.54	5.0	8.8	**75**

Note: Please refer to case style drawing for details

Cavity Band Pass Filter ZVBP-11R7G-S+

Typical Performance Data

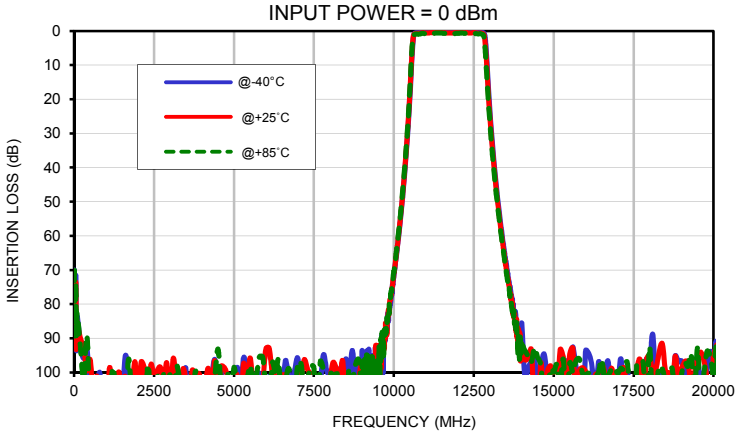
FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
100	83.57	85.92	82.88	0.02	0.02	0.02	0.03	0.03	0.03
200	92.67	90.10	93.13	0.01	0.01	0.00	0.01	0.01	0.00
500	106.99	96.28	111.24	0.06	0.08	0.08	0.05	0.06	0.07
1000	107.49	120.05	107.10	0.07	0.10	0.11	0.05	0.09	0.10
5000	107.31	103.35	98.57	0.05	0.13	0.23	0.01	0.12	0.24
8000	101.00	101.59	99.83	0.16	0.26	0.33	0.05	0.17	0.23
10000	72.15	71.20	70.52	0.02	0.18	0.35	0.01	0.19	0.37
10100	64.21	63.78	63.14	0.01	0.21	0.39	0.02	0.21	0.39
10200	55.78	55.18	54.56	0.01	0.21	0.40	0.05	0.24	0.44
10300	46.14	45.39	44.61	0.02	0.22	0.45	0.10	0.31	0.53
10350	40.70	39.85	39.02	0.05	0.26	0.49	0.11	0.33	0.56
10400	34.63	33.67	32.76	0.08	0.30	0.55	0.14	0.40	0.66
10420	32.02	30.99	30.06	0.09	0.31	0.57	0.14	0.38	0.64
10490	21.76	20.43	19.27	0.26	0.49	0.79	0.27	0.55	0.85
10500	20.11	18.73	17.52	0.30	0.55	0.86	0.31	0.59	0.89
10590	4.16	3.04	2.37	3.45	5.34	7.54	3.14	4.93	6.93
10600	2.91	2.12	1.74	4.95	7.48	10.23	4.55	6.90	9.33
10700	0.50	0.69	0.87	15.89	16.41	16.98	16.28	16.60	16.67
10800	0.44	0.67	0.89	15.64	14.97	14.52	16.18	15.65	15.26
11000	0.38	0.61	0.82	15.44	14.71	14.55	15.80	14.83	14.63
11500	0.25	0.44	0.61	19.41	20.15	21.79	18.99	19.53	21.31
11700	0.35	0.58	0.80	15.21	14.74	14.57	15.15	14.47	14.04
11725	0.35	0.58	0.81	15.08	14.41	14.15	15.24	14.53	13.95
12000	0.35	0.49	0.66	16.46	18.71	20.02	15.60	18.24	19.82
12500	0.29	0.49	0.70	24.59	27.13	28.97	23.72	26.30	31.82
12700	0.43	0.61	0.81	16.88	20.20	25.67	16.16	19.18	25.38
12750	0.39	0.64	0.90	31.31	31.76	26.13	26.48	27.66	26.17
12800	0.53	0.84	1.23	18.69	17.03	14.61	18.61	17.14	14.40
12850	1.41	2.58	4.22	8.40	5.81	4.19	8.92	6.13	4.32
12860	2.01	3.54	5.49	6.31	4.29	3.20	6.78	4.60	3.32
12900	6.93	9.30	11.71	1.68	1.33	1.32	1.87	1.55	1.45
12970	18.36	20.34	22.24	0.36	0.49	0.71	0.37	0.60	0.82
13000	22.74	24.54	26.24	0.28	0.42	0.60	0.24	0.50	0.74
13050	29.26	30.83	32.27	0.20	0.36	0.54	0.10	0.35	0.57
13100	35.01	36.43	37.69	0.14	0.29	0.44	0.03	0.30	0.54
13200	44.87	46.22	47.26	0.09	0.25	0.37	0.06	0.17	0.37
13300	53.30	54.55	55.54	0.05	0.21	0.31	0.10	0.11	0.29
13400	60.78	61.79	62.70	0.01	0.16	0.26	0.12	0.10	0.26
13500	67.37	68.48	69.54	0.01	0.15	0.24	0.15	0.07	0.24
13600	73.38	74.58	75.67	0.00	0.16	0.24	0.18	0.03	0.21
13700	79.31	80.89	81.67	0.01	0.13	0.22	0.20	0.01	0.16
13800	82.25	85.56	86.55	0.01	0.12	0.23	0.20	0.01	0.17
13900	87.50	93.52	91.89	0.02	0.12	0.22	0.19	0.02	0.19
14000	85.54	94.21	91.50	0.03	0.11	0.21	0.20	0.01	0.18
14100	101.71	96.35	93.58	0.00	0.13	0.26	0.23	0.03	0.15
14200	98.61	95.60	95.30	0.02	0.11	0.26	0.23	0.03	0.15
14300	96.73	93.32	97.01	0.03	0.09	0.24	0.21	0.02	0.16
14400	94.57	111.89	92.76	0.02	0.09	0.23	0.19	0.01	0.17
14500	108.82	117.19	95.67	0.02	0.13	0.28	0.19	0.00	0.18
14600	98.63	97.18	97.80	0.01	0.12	0.29	0.22	0.02	0.18
14700	94.60	111.87	110.50	0.01	0.10	0.27	0.18	0.02	0.21
15500	98.34	94.62	97.38	0.08	0.16	0.40	0.07	0.07	0.28
16000	93.61	99.81	100.75	0.07	0.20	0.47	0.00	0.14	0.39
16500	100.98	97.65	96.27	0.08	0.26	0.57	0.02	0.19	0.51
17000	103.88	102.46	100.29	0.02	0.24	0.59	0.07	0.24	0.58
17500	106.35	109.19	125.62	0.01	0.27	0.65	0.09	0.27	0.64
18000	97.09	95.06	92.51	0.00	0.27	0.67	0.11	0.29	0.66
18500	111.73	99.87	103.05	0.02	0.20	0.58	0.15	0.34	0.64
19000	96.64	98.93	100.77	0.06	0.23	0.58	0.11	0.36	0.68
20000	96.19	94.63	102.25	0.13	0.18	0.59	0.10	0.43	0.71

Typical Performance Data

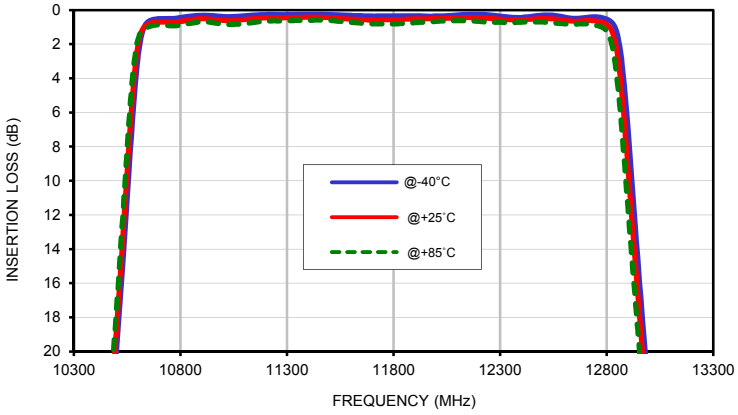
FREQ. (MHz)	GROUP DELAY (nsec)		
	@-40°C	@+25°C	@+85°C
10700	2.52	2.52	2.52
10750	2.57	2.56	2.55
10800	2.54	2.51	2.48
10850	2.38	2.33	2.28
10900	2.15	2.10	2.05
10950	1.98	1.94	1.90
11000	1.86	1.83	1.80
11050	1.78	1.75	1.73
11100	1.72	1.69	1.68
11150	1.66	1.64	1.63
11200	1.62	1.60	1.59
11250	1.58	1.57	1.55
11300	1.56	1.54	1.53
11350	1.53	1.52	1.51
11400	1.51	1.50	1.49
11450	1.49	1.48	1.47
11500	1.47	1.46	1.45
11550	1.46	1.45	1.44
11600	1.45	1.44	1.43
11650	1.44	1.43	1.42
11700	1.44	1.43	1.42
11725	1.44	1.42	1.41
11800	1.43	1.42	1.41
11850	1.43	1.43	1.42
11900	1.44	1.43	1.42
11950	1.45	1.44	1.44
12000	1.46	1.45	1.45
12050	1.47	1.47	1.46
12100	1.49	1.48	1.48
12150	1.50	1.50	1.50
12200	1.52	1.53	1.53
12250	1.55	1.55	1.56
12300	1.59	1.59	1.59
12350	1.63	1.63	1.64
12400	1.68	1.68	1.69
12450	1.74	1.75	1.76
12500	1.82	1.84	1.86
12550	1.94	1.98	2.02
12600	2.13	2.18	2.22
12650	2.32	2.35	2.36
12750	2.41	2.38	2.35

Typical Performance Curves

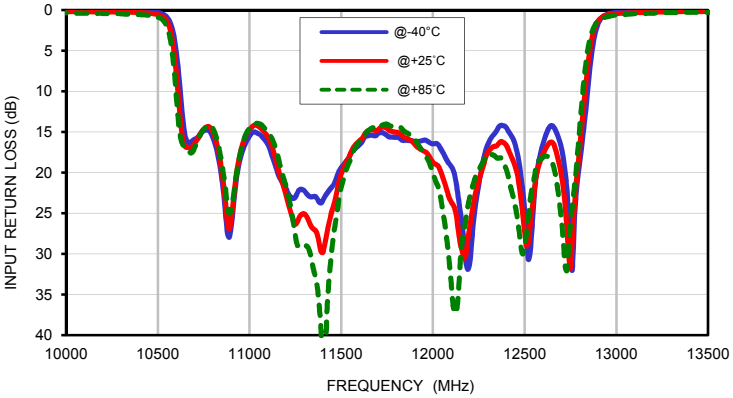
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



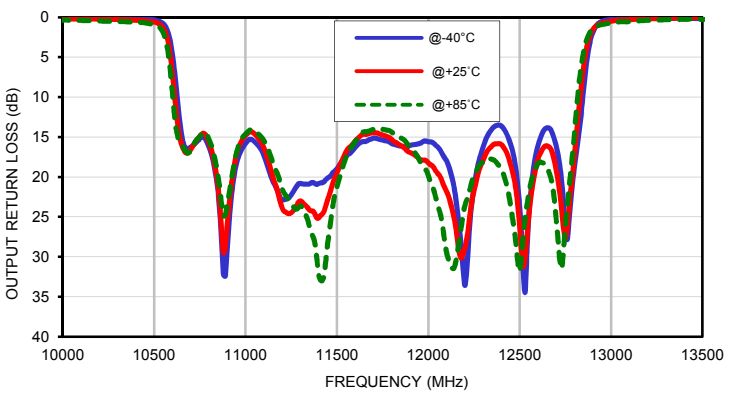
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



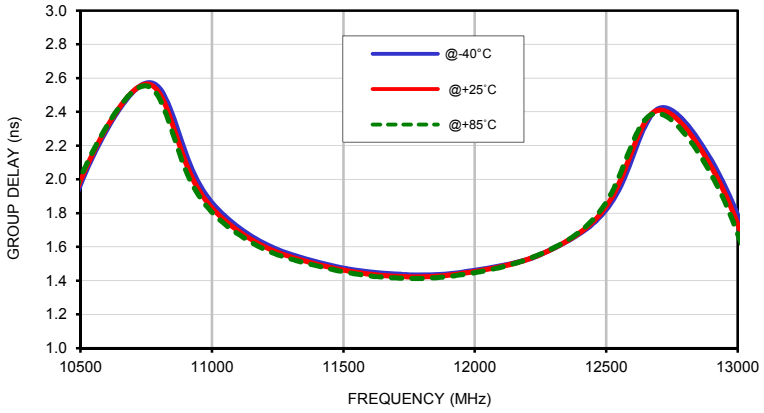
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



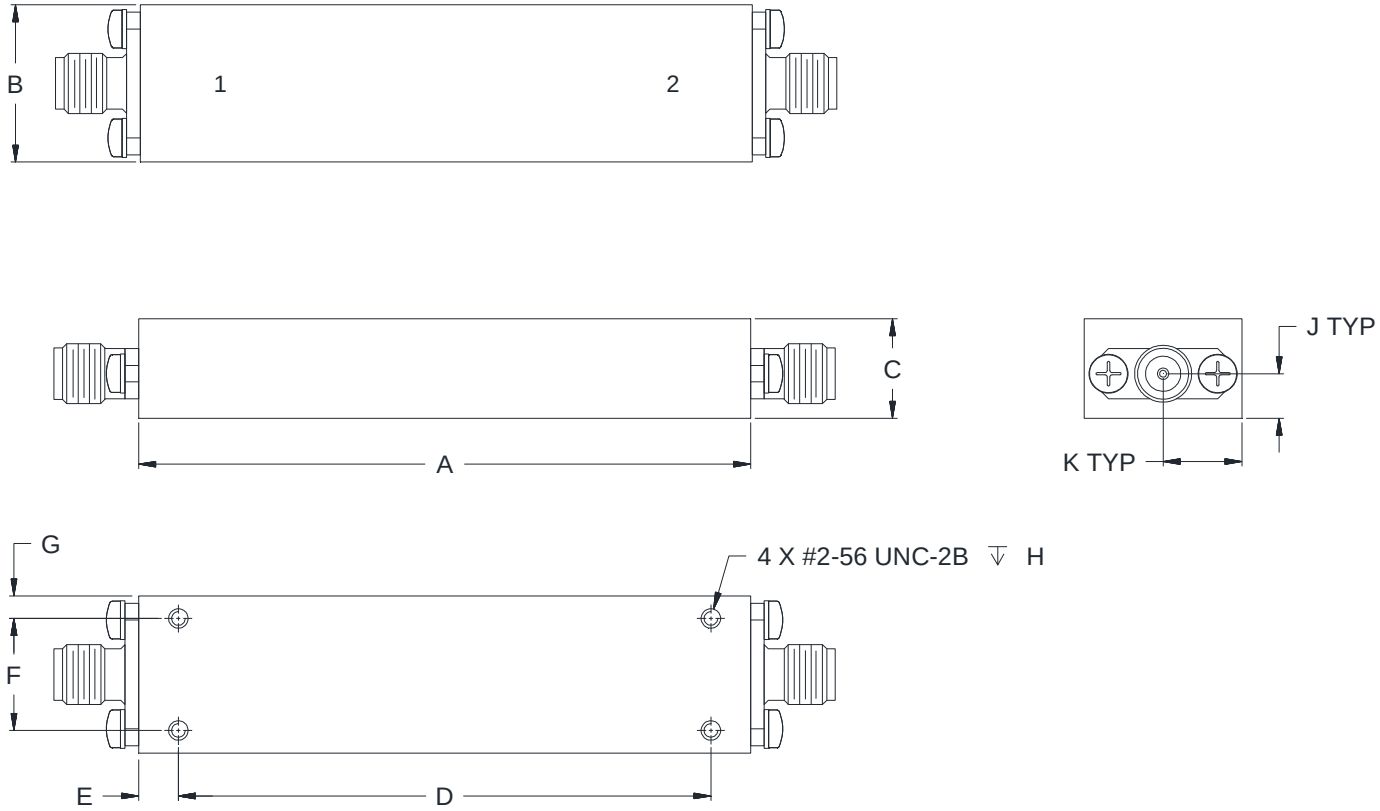
GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



Case Style UG

Outline Dimensions

UG2852



CASE#	A	B	C	D	E	F
UG2852	2.70 (68.5)	.70 (17.7)	.44 (11.2)	2.347 (59.61)	.18 (4.4)	.495 (12.57)

CASE#	G	H	J	K	WT.GRAMS
UG2852	.10 (2.5)	.100 (2.54)	.20 (5.0)	.35 (8.8)	75

Dimensions are in inches (mm). Tolerances: 2 Pl. ± .100; 3 Pl. ± .015

Notes:

1. Case material: Brass and Aluminum alloy.
2. Case Finish:
   a. Case & Cover of the units – Polyurethane spray painted over silver plating.
3. Refer to the individual model data sheet for the type of connectors available.

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