CAVITY

Bandpass Filter ZVBP MODEL SERIES

50Ω DC to 57 GHz

THE BIG DEAL

- Very low insertion loss with excellent power handling
- Fast roll-off with wide stopband
- Passbands upto 36 GHz
- Stopband up to 57 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 0.5% 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

REV. A
ECO-015165
ZVBP-11R175G-S+
EDU2694
URJ
221001

CAVITY

Bandpass Filter

ZVBP-11R175G-S+

50Ω 10575 to 11775 MHz SMA-Female

FEATURES

- Low insertion loss, 0.4 dB typ.
- Good return loss, 18 dB typ.
- Great Rejection (40 to 100 dB typ.)
- Stopband up to 26500 MHz

Generic photo used for illustration purposes only

Model No.	ZVBP-11R175G-S+
Case Style	WN3325
Connectors	SMA-Female

APPLICATIONS

- Test & Measurement Equipment
- Radar, EW, and ECM Defense Systems

+RoHS Compliant

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

ELECTRICAL SPECIFICATIONS AT 25°C

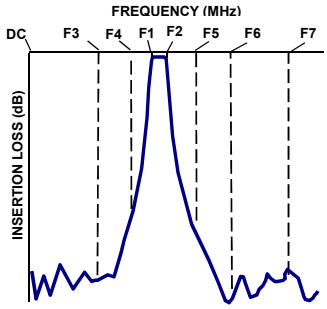
Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Passband	Center Frequency	Fc	—	—	11175	—	MHz
	Insertion Loss	F1-F2	10575 - 11775	—	0.4	0.7	dB
	Return Loss	F1-F2	10575 - 11775	14	18	—	dB
Stop Band, Lower	Rejection	DC-F3	DC - 8425	55	63	—	dB
		F3-F4	8425 - 9630	30	38	—	dB
Stop Band, Upper	Rejection	F5-F6	12700 - 13925	30	37	—	dB
		F6-F7	13925 - 26500	55	64	—	dB

MAXIMUM RATINGS

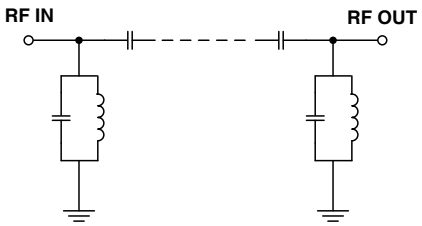
Parameter	Ratings
Operating temperature	-40°C to +85°C
Storage temperature	-55°C to +100°C
RF Power Input	20W max. at 25°C

Permanent damage may occur if any of these limits are exceeded
Input and output ports are DC short to ground.

TYPICAL FREQUENCY RESPONSE



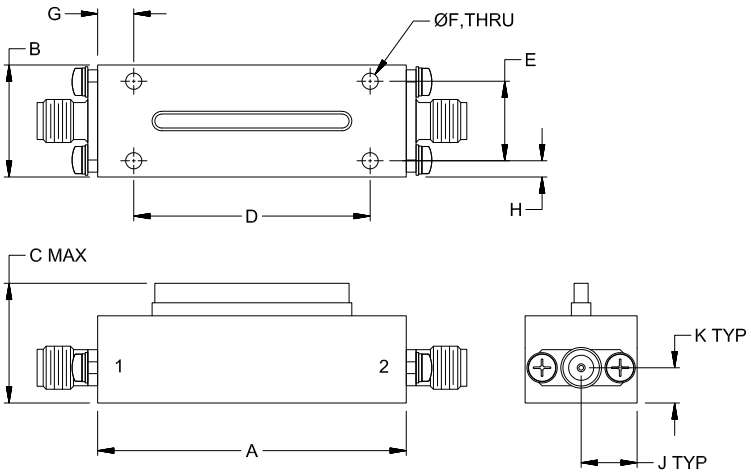
FUNCTIONAL SCHEMATIC



COAXIAL CONNECTIONS

PORT 1	SMA-Female
PORT 2	SMA-Female

OUTLINE DRAWING



OUTLINE DIMENSIONS (Inches / mm)

A	B	C	D	E	F
1.90	**.69**	**.85**	**1.455**	**.490**	**.090**
48.3	17.5	21.6	36.96	12.45	2.29
G	H	J	K		Wt.
.22	**.10**	**.35**	**.22**		grams
5.7	2.5	8.8	5.5		37

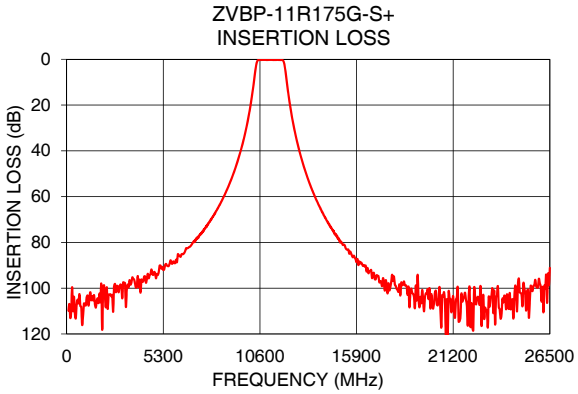
Note. Please refer to case style drawing for details

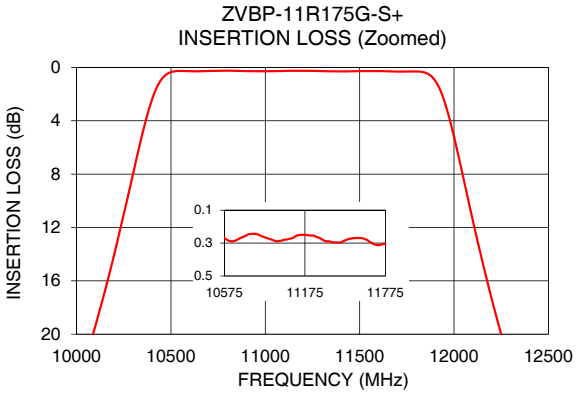
Bandpass Filter

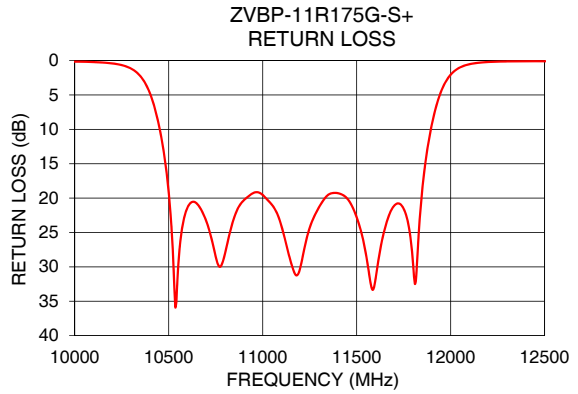
ZVBP-11R175G-S+

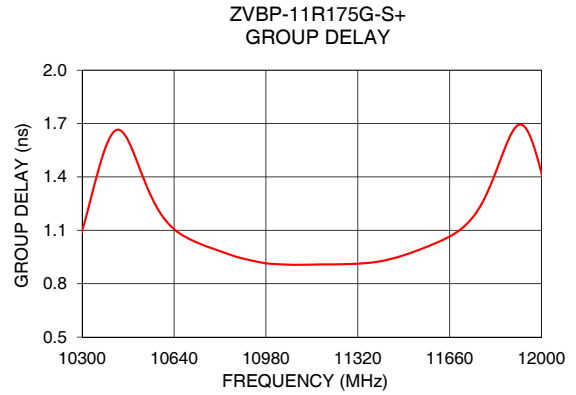
TYPICAL PERFORMANCE DATA AT 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)	Frequency (MHz)	GROUP DELAY (ns)
100	109.82	0.01	10575	1.23
1000	106.89	0.02	10600	1.17
8425	63.12	0.06	10700	1.05
10000	24.05	0.15	10850	0.96
10385	3.06	3.80	10900	0.94
10575	0.27	23.77	10950	0.92
10900	0.27	20.30	11000	0.91
11175	0.25	31.16	11050	0.91
11500	0.27	22.78	11100	0.91
11775	0.30	23.79	11150	0.91
11960	3.04	3.79	11175	0.91
12250	20.03	0.15	11200	0.91
12700	38.03	0.11	11250	0.91
13925	65.32	0.22	11350	0.92
26500	91.18	0.58	11775	1.24









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

Cavity Band Pass Filter ZVBP-11R175G-S+

Typical Performance Data

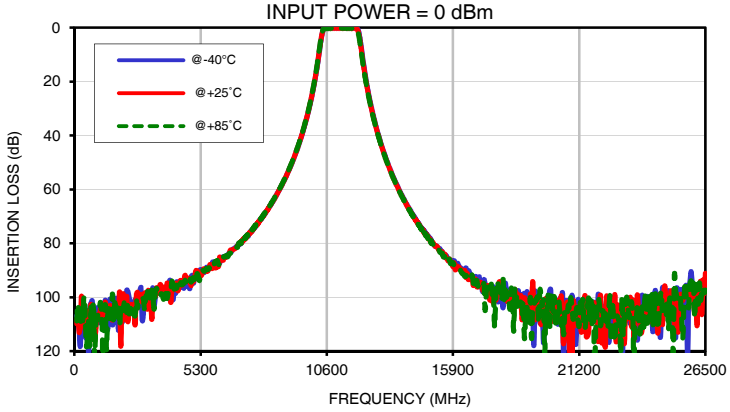
FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURN LOSS (dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
100	106.92	109.82	108.78	0.05	0.01	0.04	0.02	0.00	0.01
500	115.06	113.18	117.93	0.01	0.04	0.06	0.03	0.06	0.06
1000	108.08	106.89	106.12	0.06	0.02	0.05	0.03	0.08	0.08
1500	100.69	103.04	106.20	0.04	0.04	0.02	0.00	0.05	0.05
2000	109.45	99.56	103.05	0.05	0.04	0.01	0.01	0.05	0.05
2500	103.29	103.00	106.58	0.05	0.06	0.04	0.04	0.03	0.05
3000	103.35	98.77	99.71	0.05	0.06	0.05	0.06	0.02	0.06
3500	98.41	98.44	98.22	0.02	0.12	0.12	0.06	0.03	0.08
4000	93.86	96.31	98.50	0.01	0.14	0.13	0.04	0.06	0.11
4500	95.06	95.68	95.35	0.03	0.17	0.18	0.01	0.08	0.13
5000	94.79	94.22	92.78	0.05	0.19	0.18	0.02	0.11	0.16
5500	90.02	90.09	89.94	0.08	0.22	0.20	0.05	0.14	0.17
6000	87.68	87.58	86.34	0.08	0.22	0.18	0.06	0.15	0.18
6500	83.60	83.84	83.80	0.08	0.21	0.17	0.05	0.14	0.16
7000	79.84	79.35	80.08	0.04	0.17	0.12	0.05	0.13	0.14
7500	74.68	74.97	74.64	0.00	0.14	0.08	0.03	0.11	0.11
8000	69.17	68.99	68.83	0.05	0.11	0.03	0.01	0.10	0.10
8200	66.33	66.26	66.13	0.08	0.08	0.01	0.00	0.10	0.10
8425	63.08	63.12	62.82	0.09	0.06	0.01	0.00	0.10	0.10
9000	53.13	53.01	52.79	0.14	0.04	0.00	0.03	0.08	0.11
9630	37.72	37.52	37.27	0.13	0.07	0.10	0.06	0.07	0.14
9850	30.37	30.12	29.83	0.12	0.10	0.16	0.06	0.09	0.17
10085	20.42	20.10	19.72	0.03	0.20	0.29	0.01	0.15	0.28
10265	10.52	10.10	9.61	0.48	0.77	0.95	0.42	0.66	0.88
10385	3.35	3.06	2.66	3.14	3.80	4.47	2.96	3.61	4.34
10575	0.10	0.27	0.34	25.99	23.77	21.70	26.26	23.49	21.11
10700	0.10	0.27	0.33	24.26	23.36	23.09	22.09	21.63	21.59
10800	0.08	0.24	0.29	27.34	28.01	27.65	26.82	28.21	32.32
11000	0.13	0.28	0.33	18.27	19.53	20.07	18.81	19.96	20.74
11100	0.10	0.26	0.31	22.50	24.06	24.75	23.28	24.66	25.54
11175	0.08	0.25	0.30	29.23	31.16	30.67	37.89	40.89	37.69
11300	0.11	0.28	0.31	19.96	21.31	22.16	21.02	22.14	22.99
11500	0.12	0.27	0.32	19.94	22.78	26.23	20.79	23.03	24.50
11600	0.09	0.27	0.33	33.38	31.85	28.61	29.22	27.12	24.74
11700	0.14	0.31	0.36	21.04	21.09	21.28	20.68	20.80	21.40
11775	0.14	0.30	0.35	20.71	23.79	28.11	20.99	24.30	31.74
11960	2.19	3.04	3.81	4.64	3.79	2.98	4.54	3.69	2.97
12080	9.29	10.25	11.02	0.61	0.66	0.50	0.67	0.68	0.60
12250	19.37	20.03	20.54	0.04	0.15	0.09	0.06	0.17	0.20
12475	29.63	30.08	30.39	0.12	0.09	0.09	0.03	0.12	0.17
12700	37.68	38.03	38.24	0.12	0.11	0.14	0.03	0.13	0.21
13300	53.42	53.71	53.82	0.10	0.16	0.27	0.04	0.14	0.28
13925	65.07	65.32	65.43	0.06	0.22	0.36	0.03	0.17	0.33
14200	69.18	69.38	69.56	0.04	0.25	0.40	0.01	0.19	0.36
14500	73.31	73.35	73.71	0.02	0.27	0.42	0.02	0.19	0.37
14700	75.76	76.36	76.08	0.02	0.27	0.42	0.01	0.20	0.37
15000	78.93	80.06	79.52	0.00	0.30	0.45	0.00	0.21	0.39
15500	84.78	84.93	85.05	0.02	0.31	0.45	0.01	0.20	0.37
16000	87.63	89.90	87.95	0.04	0.33	0.44	0.02	0.19	0.34
16500	91.44	91.16	92.46	0.04	0.33	0.42	0.05	0.16	0.30
17000	92.38	94.38	95.30	0.07	0.33	0.41	0.07	0.14	0.26
17500	95.66	96.55	94.46	0.03	0.29	0.35	0.08	0.11	0.21
18000	103.92	98.40	93.10	0.03	0.28	0.30	0.09	0.10	0.17
19000	98.16	102.51	103.74	0.03	0.21	0.20	0.09	0.06	0.12
20000	97.07	102.59	100.73	0.09	0.17	0.15	0.09	0.06	0.12
22000	98.96	116.36	100.35	0.14	0.18	0.27	0.10	0.14	0.25
23000	124.45	109.95	99.79	0.10	0.23	0.42	0.09	0.19	0.37
24000	105.01	103.27	98.38	0.08	0.29	0.53	0.04	0.25	0.50
25000	108.40	107.86	100.41	0.01	0.38	0.64	0.00	0.33	0.61
26500	96.50	91.18	97.35	0.25	0.58	0.79	0.09	0.43	0.68

Typical Performance Data

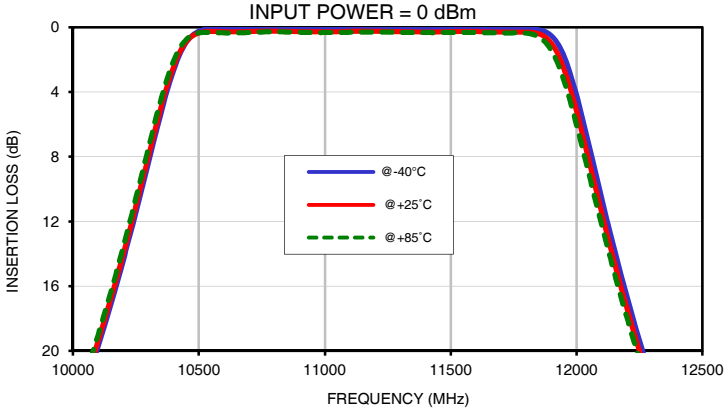
FREQ. (MHz)	GROUP DELAY (nsec)		
	@-40°C	@+25˚C	@+85˚C
10575	1.26	1.23	1.21
10600	1.20	1.17	1.15
10630	1.14	1.12	1.10
10660	1.10	1.08	1.07
10690	1.07	1.06	1.05
10720	1.04	1.03	1.03
10750	1.02	1.02	1.01
10780	1.01	1.00	1.00
10810	0.99	0.98	0.98
10840	0.97	0.97	0.97
10870	0.96	0.95	0.95
10900	0.94	0.94	0.94
10930	0.93	0.93	0.93
10960	0.92	0.92	0.92
10990	0.91	0.91	0.91
11020	0.91	0.91	0.91
11050	0.91	0.91	0.91
11080	0.91	0.91	0.91
11110	0.91	0.91	0.91
11140	0.91	0.91	0.91
11175	0.91	0.91	0.91
11200	0.91	0.91	0.91
11230	0.91	0.91	0.91
11260	0.91	0.91	0.91
11290	0.91	0.91	0.91
11320	0.91	0.91	0.92
11350	0.91	0.92	0.92
11370	0.92	0.92	0.92
11400	0.92	0.93	0.93
11430	0.93	0.93	0.94
11460	0.94	0.95	0.95
11490	0.95	0.96	0.97
11520	0.97	0.98	0.98
11550	0.99	0.99	1.00
11580	1.01	1.01	1.02
11610	1.02	1.03	1.04
11640	1.04	1.05	1.06
11670	1.07	1.07	1.09
11700	1.09	1.10	1.12
11740	1.14	1.16	1.19
11775	1.20	1.24	1.28

Typical Performance Curves

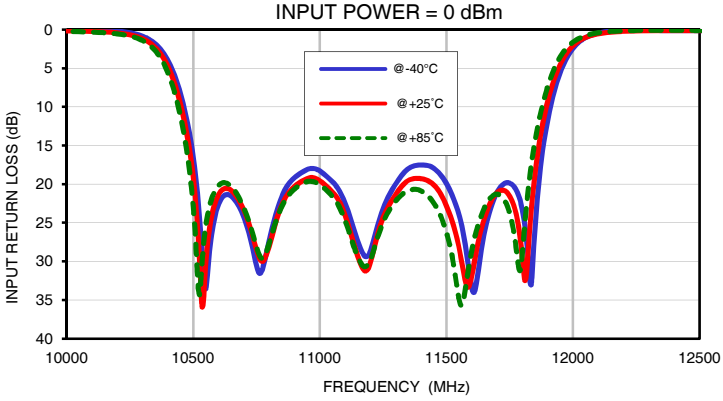
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



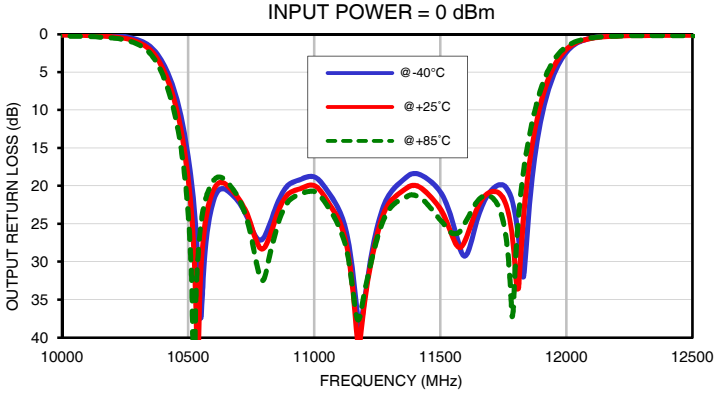
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



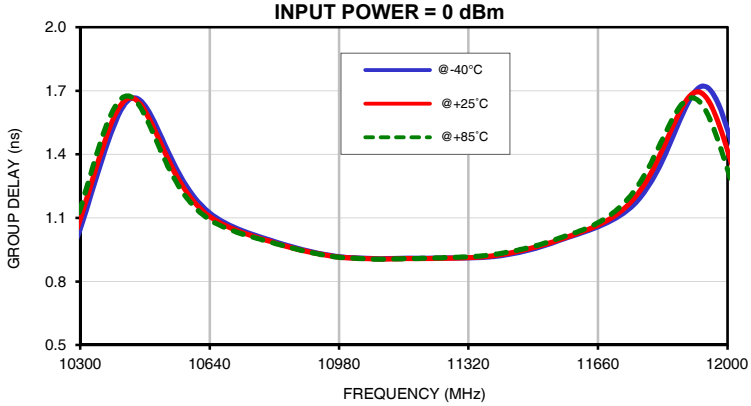
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



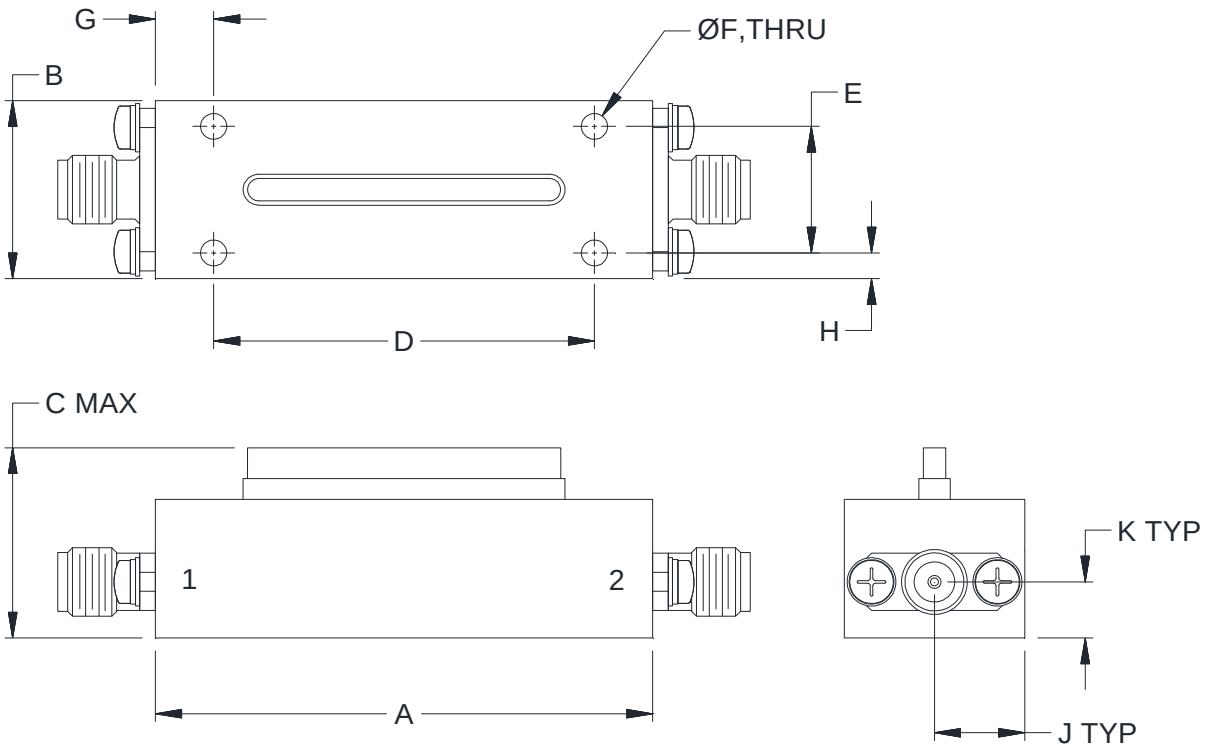
GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



Case Style WN

Outline Dimensions

WN3325



CASE#	A	B	C	D	E	F
WN3325	1.90 (48.3)	.69 (17.5)	.85 (21.6)	1.455 (36.96)	.490 (12.45)	.090 (2.29)

CASE#	G	H	J	K	WT. GRAMS
WN3325	.22 (5.7)	.10 (2.5)	.35 (8.8)	.22 (5.5)	37

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

Notes:

1. Case material: Aluminum.
2. Case Finish: Powder coated 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