CAVITY COAXIAL

Bandpass Filter

ZVBP-28000-K1+

50Ω 26.5 to 29.5 GHz 2.92mm Female

KEY FEATURES

- Low Insertion Loss, 0.7dB Typ.
- Good Return Loss, 20dB Typ.
- High Rejection, 80dB Typ.
- Power Handling: 2.5W.
- Stopband up to 46GHz.

Generic photo used for illustration purposes only

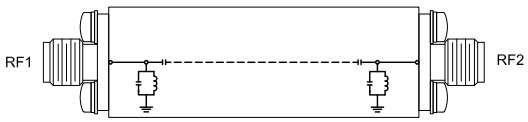
APPLICATIONS

- 5G band n257.

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 3% 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.

FUNCTIONAL DIAGRAM



ELECTRICAL SPECIFICATIONS[1,2] AT +25°C

Parameter		F#	Frequency (GHz)	Min.	Typ.	Max.	Units
Passband	Center Frequency	—	—	—	28	—	GHz
	Insertion Loss	F1-F2	26.5 - 29.5	—	0.7	1.2	dB
	Return Loss	F1-F2	26.5 - 29.5	15	20	—	dB
Stop Band, Lower	Rejection	DC-F3	DC - 25	52	60	—	dB
Stop Band, Upper	Rejection	F4-F5	31 - 46	44	52	—	dB

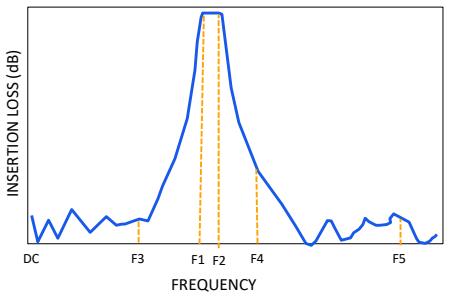
1. This filter is bi-directional RF1 and RF2 ports may be interchanged, see S-Parameters for actual performance.
2. Data measured after calibrating using 2.92mm cal kit.

ABSOLUTE MAXIMUM RATINGS[3,4]

Parameter	Ratings
Operating Temperature	-30°C to +70°C
Storage Temperature	-30°C to +70°C
Input Power[5]	2.5W at 25°C

3. Permanent damage may occur if any of these limits are exceeded.
4. Input and output ports are DC short to ground.
5. Power rating applies only to signals within the passband.

TYPICAL FREQUENCY RESPONSE AT +25°C



REV. OR
ECO-019871
ZVBP-28000-K1+
EDU4742
URJ
231219

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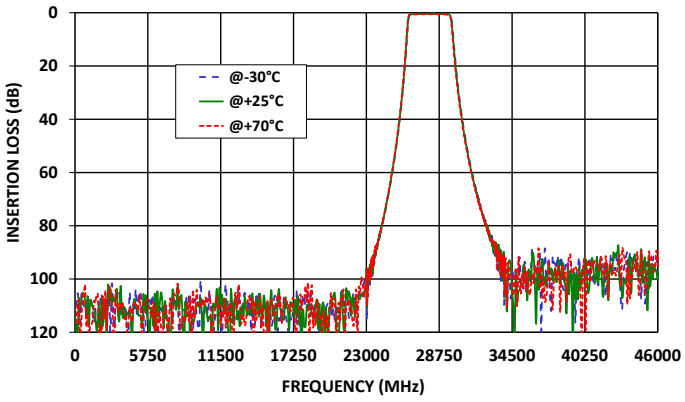
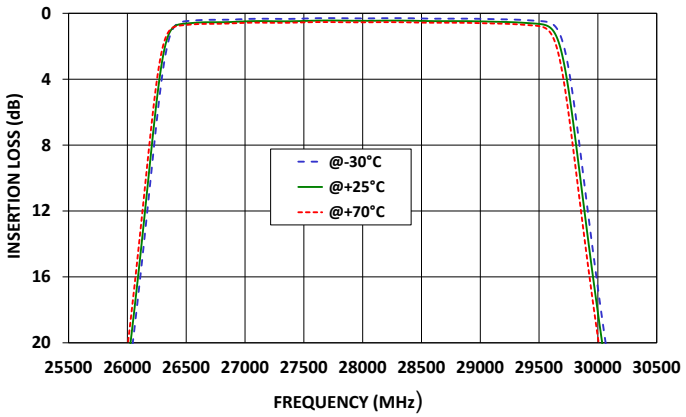
TYPICAL PERFORMANCE GRAPHS

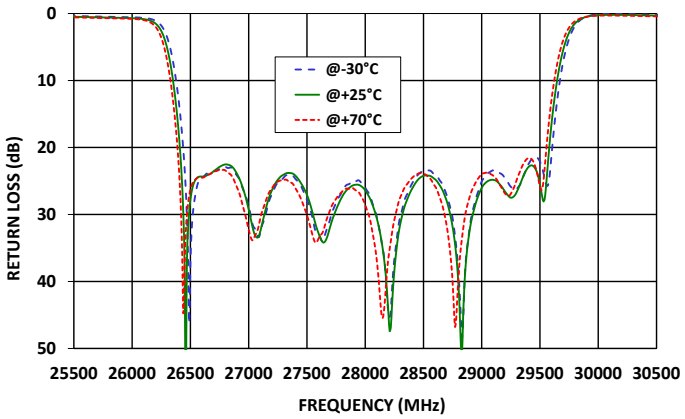
ZVBP-28000-K1+
INSERTION LOSS



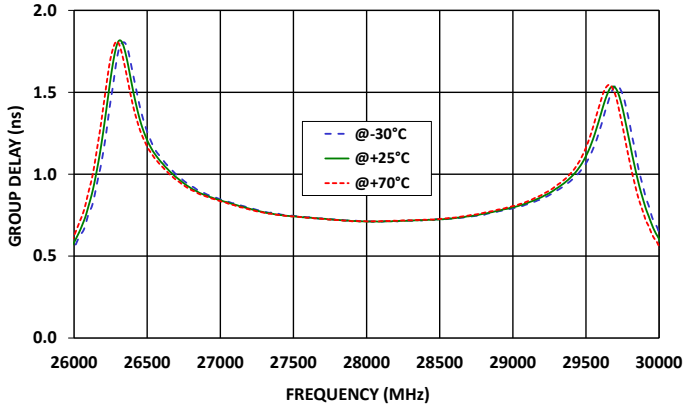
ZVBP-28000-K1+
INSERTION LOSS (Zoomed)



ZVBP-28000-K1+
RETURN LOSS



ZVBP-28000-K1+
GROUP DELAY



Bandpass Filter

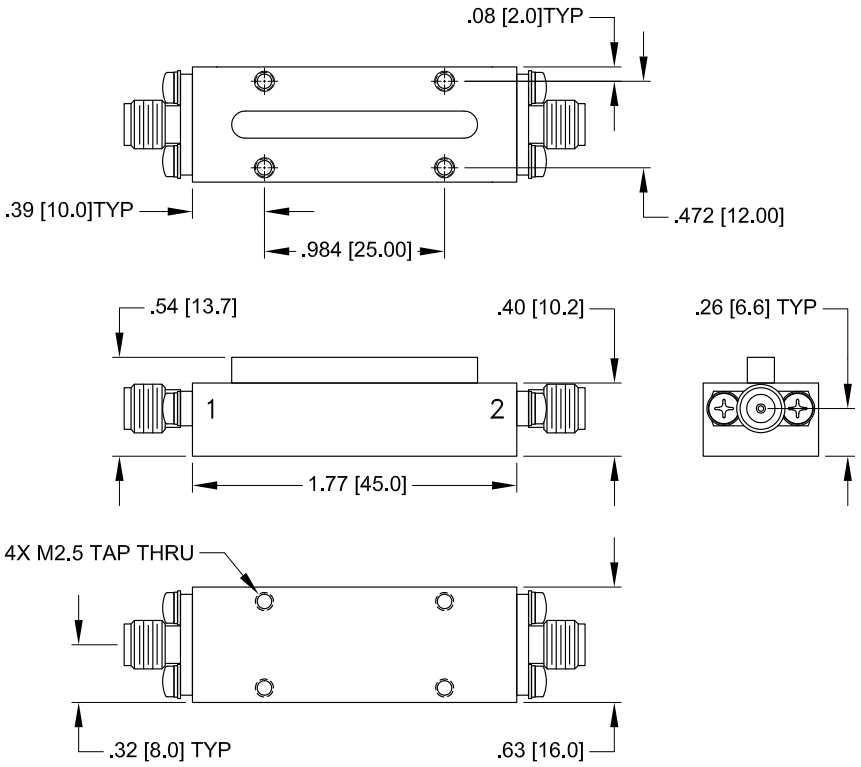
ZVBP-28000-K1+

50Ω 26.5 to 29.5 GHz 2.92mm Female

CONNECTOR DESCRIPTION

Function	Marking on Unit	Connector
RF1[1]	1	2.92mm Female
RF2[1]	2	2.92mm Female

CASE STYLE DRAWING



Unit Weight: 58 Grams.
Dimensions are in inches (mm). Tolerances: 2 Pl. ± .100; 3 Pl. ± .015

PRODUCT MARKING*: ZVBP-28000-K1+

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

Bandpass Filter

ZVBP-28000-K1+

50Ω 26.5 to 29.5 GHz 2.92mm Female

ADDITIONAL INFORMATION IS AVAILABLE ON OUR DASHBOARD CLICK HERE

Performance Data & Graphs	Data Graphs S-Parameter (S2P Files) Data Set (.zip file)
Case Style	ZP3566
RoHS Status	Compliant
Environmental Ratings	ENV77T1

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

Cavity Band Pass Filter ZVBP-28000-K1+

Typical Performance Data

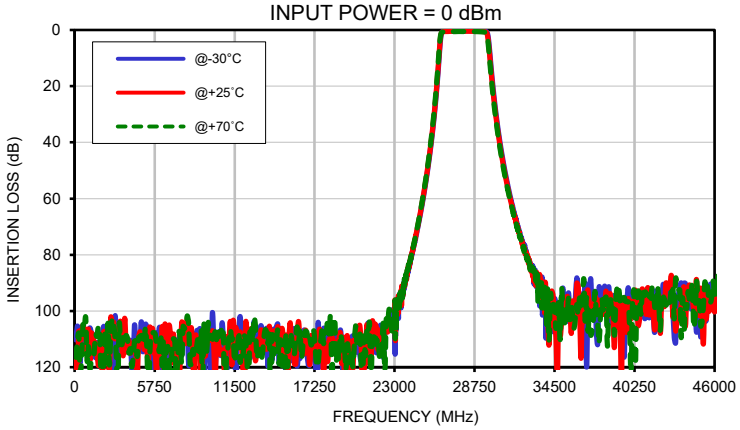
FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURN LOSS (dB)		
	@-30°C	@+25°C	@+70°C	@-30°C	@+25°C	@+70°C	@-30°C	@+25°C	@+70°C
100	110.31	116.40	116.52	0.02	0.03	0.04	0.02	0.03	0.04
200	105.35	122.89	110.30	0.04	0.05	0.06	0.04	0.05	0.06
400	118.46	110.57	121.92	0.08	0.09	0.10	0.07	0.08	0.09
800	110.14	108.03	102.41	0.11	0.13	0.14	0.08	0.10	0.12
1000	108.28	106.39	112.67	0.11	0.13	0.15	0.08	0.11	0.12
1500	116.56	111.54	108.24	0.10	0.12	0.14	0.08	0.11	0.13
2000	107.90	124.81	117.91	0.07	0.10	0.12	0.06	0.10	0.12
2400	112.70	109.99	104.34	0.05	0.08	0.10	0.05	0.09	0.11
3000	108.84	106.73	116.08	0.03	0.07	0.09	0.03	0.07	0.09
3500	105.37	115.68	109.22	0.02	0.05	0.07	0.01	0.06	0.08
4500	111.88	124.91	116.21	0.00	0.05	0.07	0.00	0.04	0.07
5500	130.01	111.88	107.89	0.03	0.07	0.10	0.02	0.07	0.09
9000	106.23	112.12	115.79	0.11	0.18	0.21	0.10	0.16	0.20
9500	107.55	112.18	114.24	0.09	0.15	0.19	0.08	0.15	0.18
11000	116.53	110.71	114.21	0.03	0.04	0.08	0.02	0.05	0.09
12000	109.50	112.52	110.68	0.09	0.02	0.02	0.08	0.00	0.04
13000	112.29	117.77	105.56	0.11	0.04	0.00	0.10	0.02	0.03
14500	105.66	114.08	111.64	0.02	0.05	0.11	0.01	0.07	0.12
15000	109.82	109.46	125.27	0.03	0.11	0.16	0.03	0.11	0.17
16000	119.65	108.74	105.69	0.15	0.23	0.29	0.13	0.21	0.27
17000	114.47	108.75	112.11	0.25	0.33	0.39	0.20	0.29	0.35
18500	110.24	109.17	124.71	0.23	0.33	0.38	0.19	0.29	0.35
20000	108.93	120.40	119.89	0.06	0.16	0.20	0.03	0.14	0.18
22000	105.13	109.89	117.50	0.21	0.10	0.05	0.19	0.07	0.01
22500	104.06	107.46	104.85	0.24	0.13	0.07	0.21	0.09	0.02
23000	100.08	104.41	102.42	0.23	0.12	0.04	0.21	0.08	0.01
23500	95.85	98.06	92.80	0.20	0.08	0.01	0.16	0.04	0.05
24000	85.35	85.11	83.64	0.11	0.01	0.10	0.09	0.03	0.12
25000	61.49	60.91	60.46	0.17	0.29	0.39	0.16	0.28	0.38
26000	22.70	21.59	20.31	0.57	0.70	0.80	0.47	0.61	0.70
26500	0.48	0.62	0.71	37.44	27.84	26.28	24.45	24.54	25.25
27000	0.35	0.49	0.58	28.75	29.24	32.23	21.52	22.23	22.60
28000	0.31	0.46	0.55	25.96	26.40	28.55	26.84	26.85	29.41
28500	0.31	0.46	0.56	23.50	24.23	23.94	22.58	22.95	22.90
29500	0.47	0.64	0.78	22.13	25.50	25.87	22.64	26.97	30.87
29750	3.32	4.62	6.04	3.75	2.85	2.10	3.75	2.83	2.08
30000	16.68	18.17	19.68	0.12	0.24	0.32	0.11	0.24	0.33
30060	19.73	21.16	22.58	0.07	0.21	0.30	0.06	0.20	0.31
30070	20.22	21.64	23.05	0.07	0.21	0.30	0.06	0.20	0.31
30100	21.67	23.05	24.42	0.06	0.20	0.30	0.06	0.20	0.31
30300	30.26	31.49	32.64	0.10	0.23	0.35	0.11	0.24	0.37
31000	51.95	52.97	53.71	0.33	0.44	0.56	0.34	0.45	0.57
33000	88.48	89.48	86.01	0.27	0.43	0.49	0.23	0.40	0.47
34000	96.65	102.49	92.15	0.07	0.26	0.31	0.02	0.22	0.28
35000	97.45	104.51	91.95	0.11	0.07	0.13	0.18	0.04	0.10
36000	94.83	101.13	101.94	0.25	0.07	0.02	0.29	0.09	0.01
37000	95.58	102.04	99.93	0.27	0.10	0.00	0.28	0.12	0.01
38000	96.38	101.20	99.64	0.16	0.03	0.09	0.16	0.04	0.10
39000	95.51	105.77	91.32	0.01	0.10	0.24	0.00	0.12	0.26
40000	97.55	97.54	122.92	0.16	0.29	0.44	0.18	0.31	0.47
40500	98.30	105.19	92.94	0.34	0.56	0.70	0.43	0.65	0.76
41000	102.65	100.42	93.28	0.34	0.47	0.61	0.38	0.49	0.63
41500	92.24	94.75	91.73	0.38	0.52	0.66	0.37	0.52	0.66
42000	98.83	94.57	98.70	0.36	0.52	0.65	0.35	0.52	0.64
42500	92.45	90.13	97.90	0.44	0.61	0.73	0.37	0.55	0.66
43000	99.90	102.04	91.08	0.41	0.61	0.71	0.40	0.59	0.69
43500	91.43	101.70	92.50	0.40	0.59	0.67	0.35	0.55	0.63
44000	94.23	93.99	99.15	0.34	0.54	0.60	0.25	0.48	0.55
45000	109.26	92.05	105.27	0.17	0.40	0.44	0.06	0.34	0.39
46000	100.23	100.36	95.20	0.10	0.17	0.21	0.22	0.11	0.13

Typical Performance Data

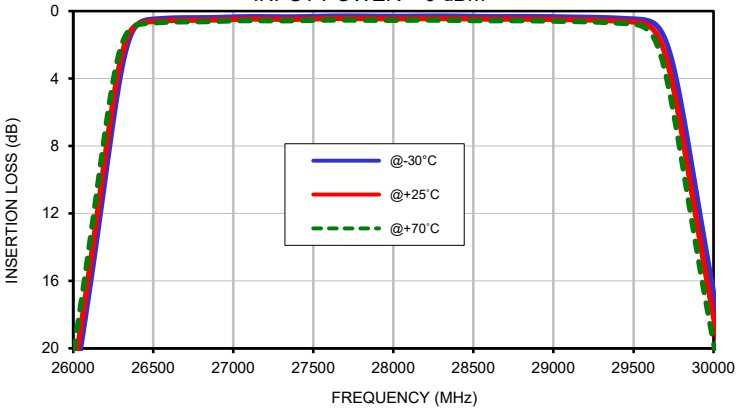
FREQ. (MHz)	GROUP DELAY (nsec)		
	@-30°C	@+25°C	@+70°C
26500	1.26	1.21	1.17
26510	1.24	1.19	1.15
26520	1.21	1.17	1.14
26530	1.19	1.15	1.13
26540	1.17	1.14	1.11
26550	1.16	1.13	1.10
26560	1.14	1.11	1.09
26570	1.13	1.10	1.08
26580	1.12	1.09	1.07
26590	1.11	1.08	1.06
26600	1.10	1.07	1.05
26610	1.08	1.06	1.04
26620	1.07	1.05	1.03
26630	1.06	1.04	1.02
26640	1.05	1.03	1.01
26700	1.00	0.98	0.96
27000	0.85	0.84	0.84
27100	0.82	0.81	0.81
27200	0.79	0.79	0.78
27300	0.77	0.77	0.76
27400	0.76	0.75	0.75
27500	0.75	0.74	0.74
27600	0.74	0.73	0.73
27700	0.73	0.73	0.73
27800	0.72	0.72	0.72
27900	0.71	0.71	0.71
28000	0.71	0.71	0.71
28100	0.71	0.71	0.71
28200	0.71	0.71	0.72
28300	0.72	0.72	0.72
28400	0.72	0.72	0.72
28500	0.72	0.73	0.73
28600	0.73	0.73	0.74
28700	0.74	0.74	0.75
28800	0.75	0.76	0.76
28900	0.77	0.78	0.78
29000	0.79	0.80	0.81
29100	0.82	0.82	0.83
29300	0.90	0.91	0.93
29400	0.96	0.98	1.01
29500	1.07	1.11	1.16

Typical Performance Curves

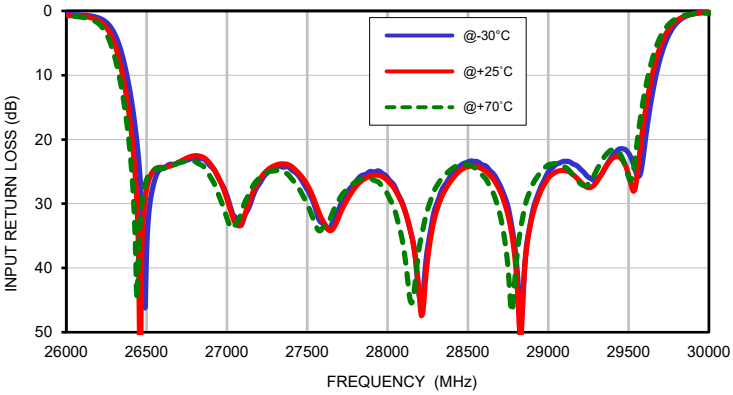
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



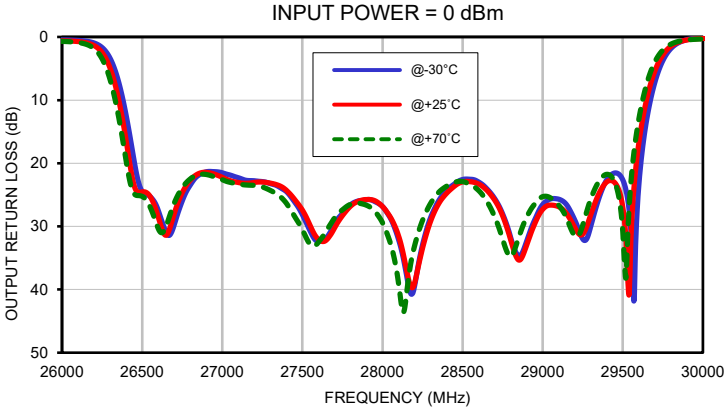
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



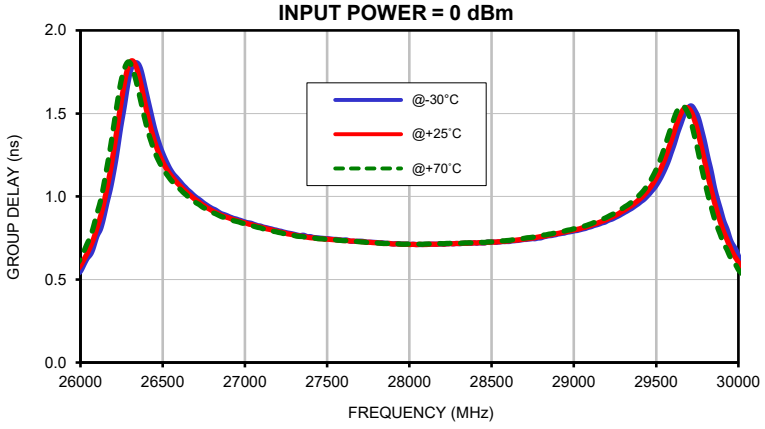
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



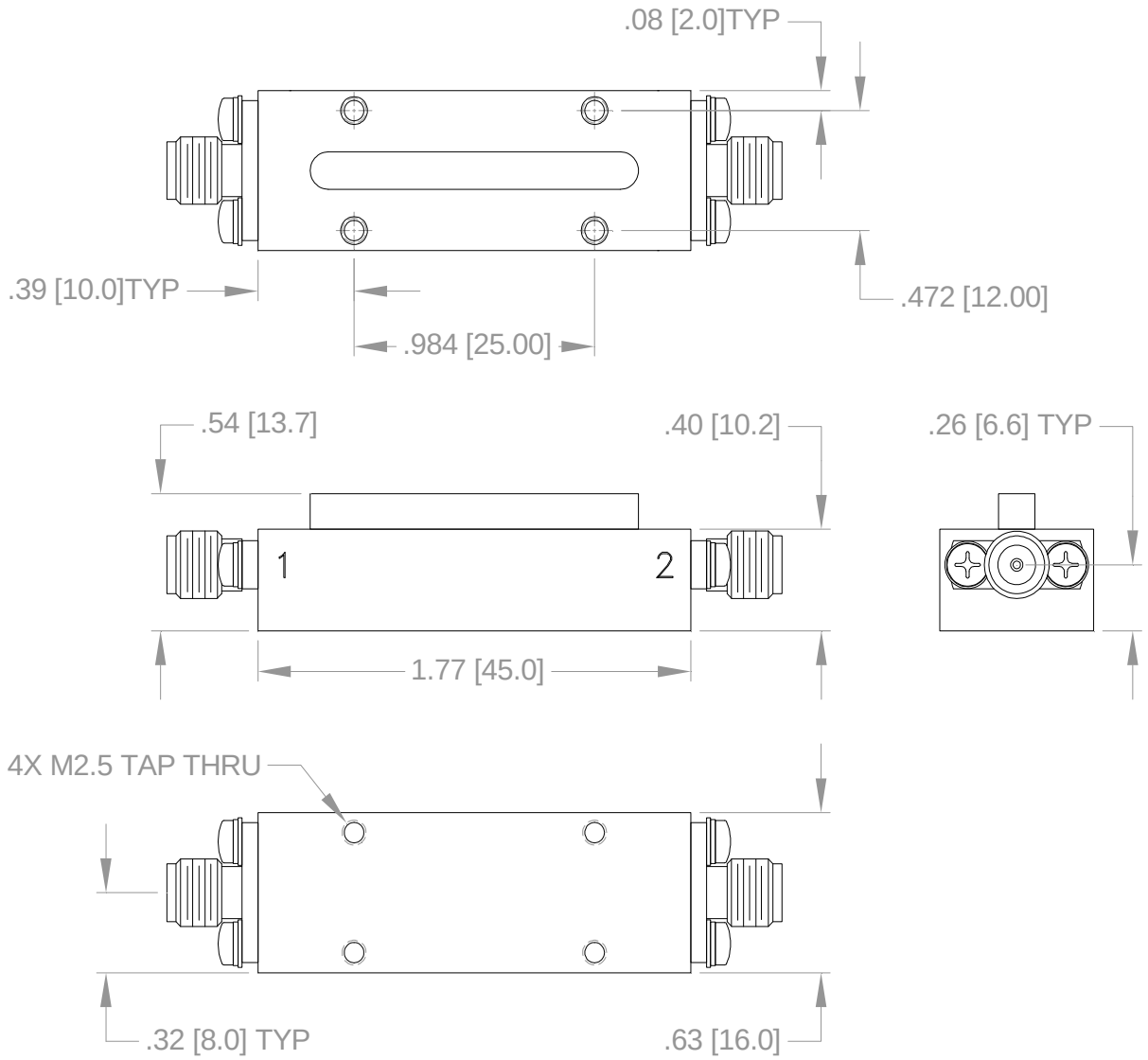
GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



Case Style ZP

Outline Dimensions

ZP3566



Dimensions are in inches [mm]. Tolerances: 2 Pl. ± .100; 3 Pl. ± .015

Notes:

1. Case material: Brass.
2. Case Finish: Powder coated.
3. Unit Weight: 58 grams.
4. 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 ENV77T1

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	-30° to 70°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-30° to 70° C Ambient Environment	Individual Model Data Sheet
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C

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