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 20 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. Custom integrated assembly with LNA and bias tees results in greatly simplifying system integration . 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-3875-S+

50Ω 3845 to 3905 MHz

Generic photo used for illustration purposes only

CASE STYLE: QZ2439

Connectors	Model
SMA-F	ZVBP-3875-S+

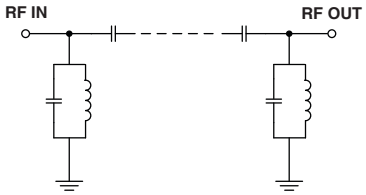
Features

- Low insertion loss, 0.6 dB typical
- Good VSWR, 1.3:1 typical
- High rejection
- Broad stopband performance up to 8.5 GHz
- Fast roll-off

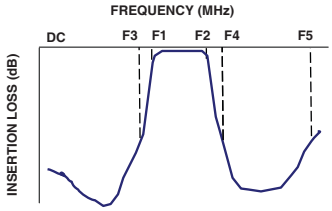
Applications

- Fixed and mobile communication network
- Satellite communication

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

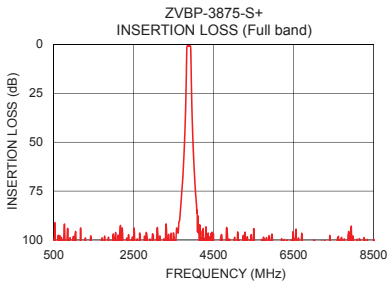
Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	-	-	-	3875	-	MHz
	Insertion Loss	F1-F2	3845-3905	-	0.6	1.2	dB
	VSWR	F1-F2	3845-3905	-	1.3	1.43	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC - 3785	37	43	-	dB
	VSWR	DC-F3	DC - 3785	-	20	-	:1
Stop Band, Upper	Insertion Loss	F4-F5	3970-8500	37	43	-	dB
	VSWR	F4-F5	3970-8500	-	20	-	:1

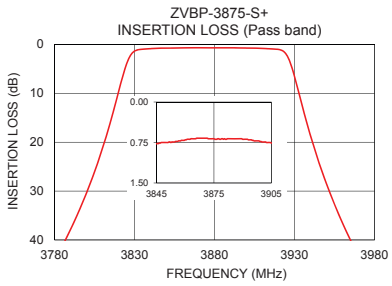
Maximum Ratings	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	10 W

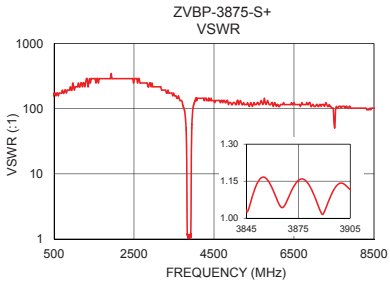
Permanent damage may occur if any of these limits are exceeded.

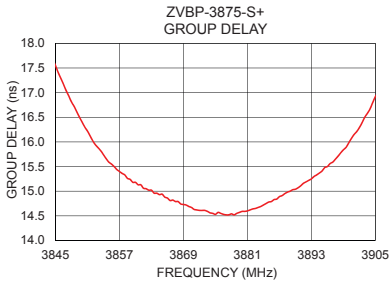
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
100	94.38	386.04	3845	17.55
1510	104.51	289.53	3850	16.40
3785	41.16	72.39	3855	15.59
3800	30.36	54.29	3858	15.33
3810	21.23	36.97	3860	15.18
3815	15.78	25.19	3863	15.02
3820	9.70	12.26	3865	14.94
3826	3.17	3.14	3870	14.69
3845	0.77	1.03	3875	14.53
3875	0.68	1.15	3880	14.59
3905	0.76	1.12	3882	14.64
3927	3.45	3.47	3883	14.67
3935	12.81	19.98	3885	14.78
3942	20.85	41.37	3888	14.95
3955	32.74	72.39	3890	15.04
3970	43.31	96.51	3895	15.41
4000	59.04	115.81	3898	15.71
5000	103.31	124.09	3900	15.98
7500	103.48	62.05	3903	16.50
8500	99.62	102.19	3905	16.92









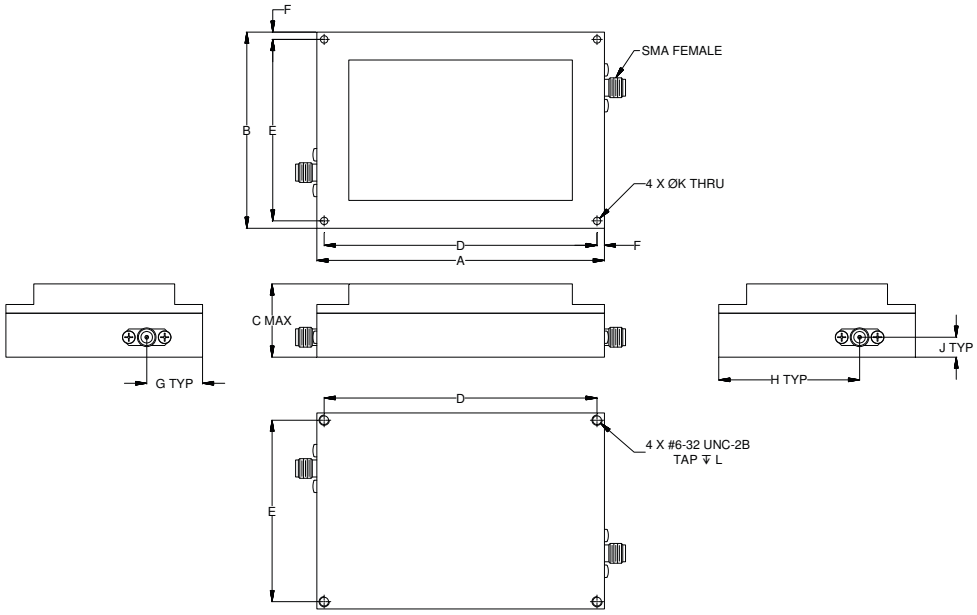
Notes

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	G	H
3.86	**2.64**	**.98**	**3.66**	**2.44**	**.10**	**.75**	**1.89**
98.00	67.00	25.00	93.00	62.00	2.50	19.00	48.00

J	K	L	Wt.
.27	**.100**	**.24**	grams
6.80	**2.54**	6.00	240

Note: Please refer to case style drawing for details

Cavity Band Pass Filter ZVBP-3875-S+

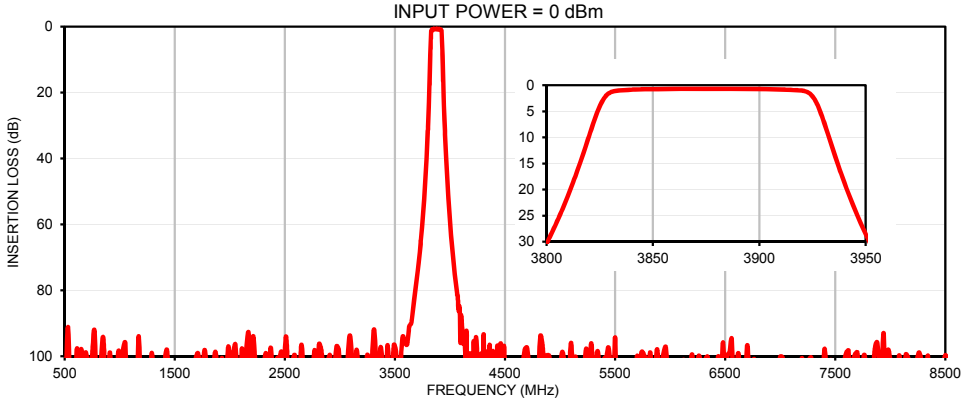
Typical Performance Data

FREQ. (MHz)	Insertion Loss (dB)	Input Return Loss (dB)	Output Return Loss (dB)
10	73.86	0.01	0.00
50	78.10	0.03	0.01
150	98.18	0.06	0.04
250	88.95	0.08	0.07
750	99.26	0.10	0.09
1250	103.98	0.07	0.06
2010	120.30	0.06	0.05
2510	93.94	0.06	0.06
2750	107.99	0.07	0.07
3010	110.85	0.08	0.08
3510	98.74	0.11	0.12
3750	59.09	0.17	0.18
3770	49.79	0.19	0.21
3780	44.22	0.22	0.24
3785	41.16	0.24	0.26
3790	37.85	0.26	0.27
3800	30.36	0.32	0.34
3810	21.23	0.47	0.51
3820	9.70	1.42	1.51
3825	4.01	4.45	4.67
3826	3.17	5.74	6.03
3827	2.49	7.40	7.79
3830	1.36	15.03	16.49
3845	0.77	37.50	45.76
3875	0.68	22.98	23.27
3905	0.76	25.22	27.26
3910	0.81	23.07	25.48
3920	1.02	33.07	30.98
3925	2.12	8.74	8.79
3927	3.45	5.16	5.22
3930	6.57	2.37	2.43
3940	18.69	0.49	0.53
3942	20.85	0.42	0.45
3945	23.91	0.35	0.38
3950	28.55	0.28	0.31
3955	32.74	0.24	0.26
3960	36.56	0.22	0.23
3970	43.31	0.18	0.20
3975	46.35	0.17	0.18
3980	49.18	0.16	0.18
3985	51.86	0.16	0.17
3990	54.41	0.15	0.16
3995	56.81	0.15	0.16
4000	59.04	0.15	0.15
4025	68.96	0.13	0.14
4050	77.23	0.13	0.14
4100	87.69	0.12	0.13
4250	104.47	0.13	0.13
4500	100.92	0.13	0.14
5000	103.31	0.14	0.15
5500	94.27	0.14	0.17
5800	104.83	0.15	0.17
6000	109.45	0.15	0.16
6200	99.49	0.15	0.16
6400	107.96	0.15	0.13
6500	109.92	0.14	0.14
7500	103.48	0.28	0.13
7500	103.48	0.28	0.13
8000	101.18	0.17	0.14
8500	99.62	0.17	0.15

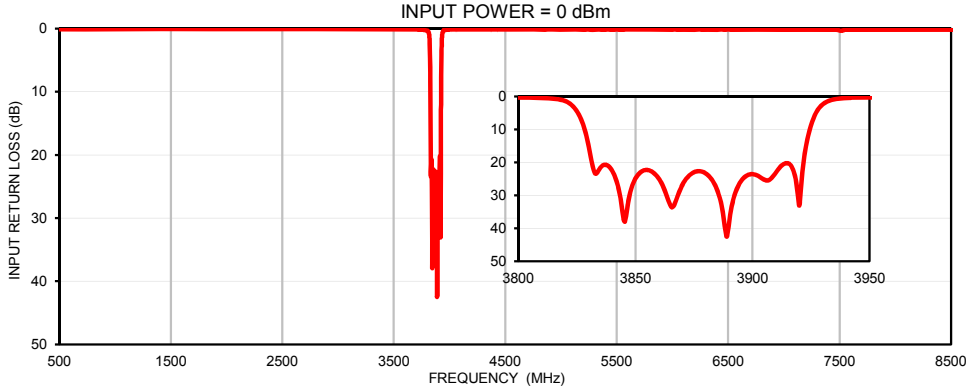
FREQ. (MHz)	Group Delay (ns)
3845	17.55
3846	17.29
3847	17.04
3848	16.81
3849	16.61
3850	16.40
3851	16.22
3852	16.02
3853	15.88
3854	15.74
3855	15.59
3856	15.50
3857	15.40
3858	15.33
3859	15.24
3860	15.18
3861	15.13
3862	15.05
3863	15.02
3864	14.96
3865	14.94
3866	14.86
3867	14.82
3868	14.79
3869	14.73
3870	14.69
3871	14.63
3872	14.61
3873	14.61
3874	14.56
3875	14.53
3876	14.55
3877	14.52
3878	14.54
3879	14.55
3880	14.59
3881	14.60
3882	14.64
3883	14.67
3884	14.72
3885	14.78
3886	14.83
3887	14.89
3888	14.95
3889	15.00
3890	15.04
3891	15.11
3892	15.19
3893	15.25
3894	15.33
3895	15.41
3896	15.50
3897	15.59
3898	15.71
3900	15.98
3901	16.15
3902	16.29
3903	16.50
3904	16.67
3905	16.92

Typical Performance Curves

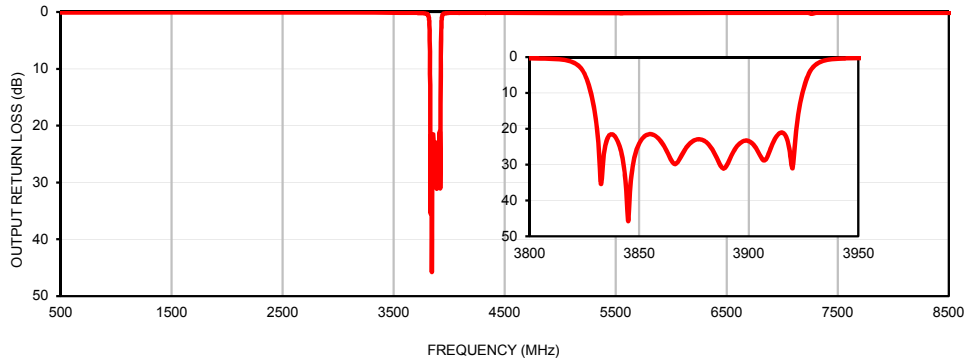
INSERTION LOSS
INPUT POWER = 0 dBm



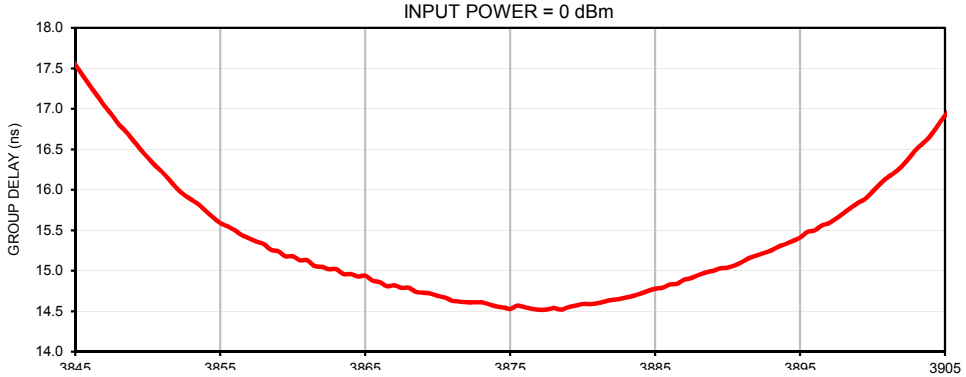
INPUT RETURN LOSS
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS
INPUT POWER = 0 dBm



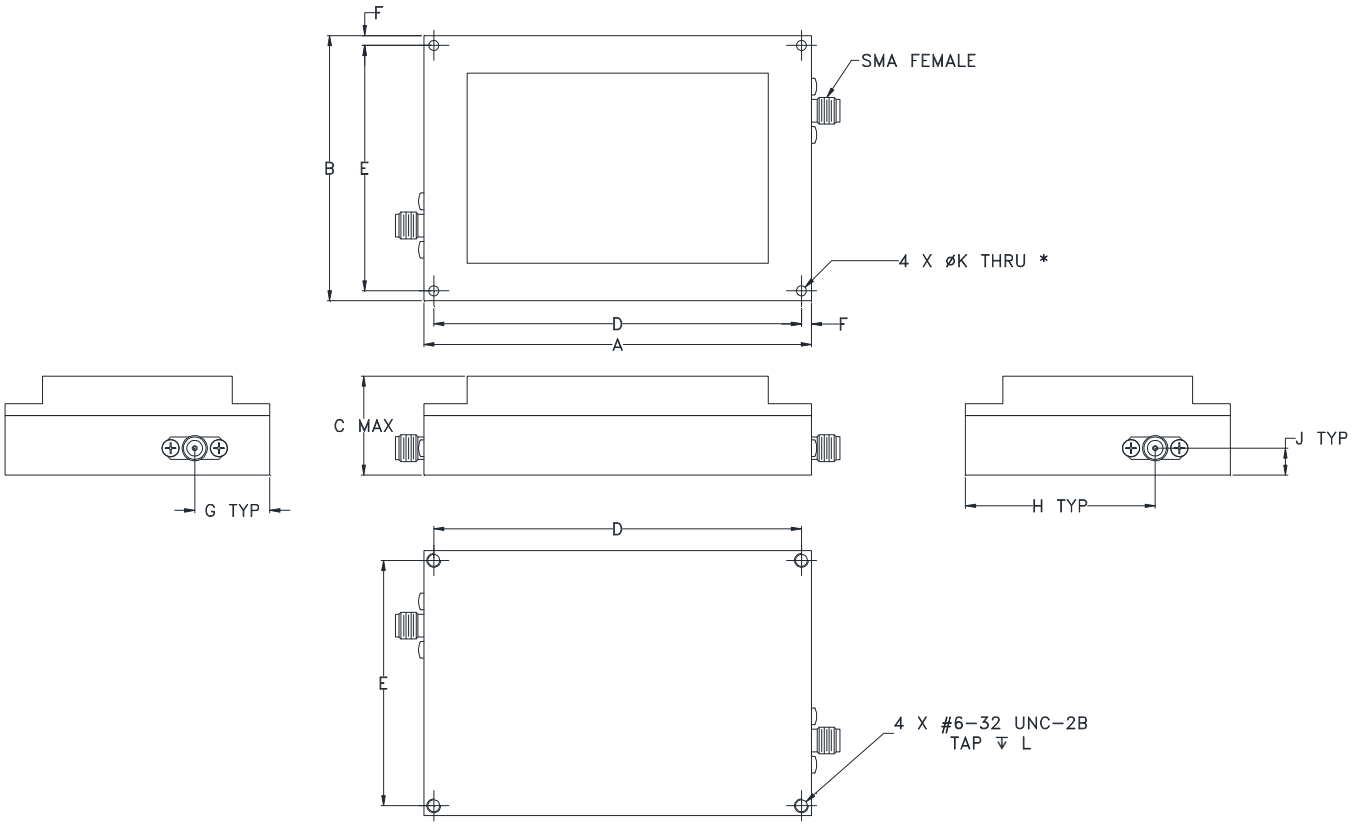
GROUP DELAY
INPUT POWER = 0 dBm



Case Style QZ

Outline Dimensions

QZ2439



CASE#	A	B	C	D	E	F	G
QZ2439	3.86 (98.00)	2.64 (67.00)	.98 (25.00)	3.66 (93.00)	2.44 (62.00)	.1 (2.50)	.75 (19.00)

CASE#	H	J	K*	L	WT. GRAMS
QZ2439	1.89 (48.00)	.27 (6.80)	.100 (2.54)	.24 (6.00)	240

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

*** Optional Feature for Mounting.**

Notes:

1. Case material: Brass & Aluminum alloy.
2. Case finish: Powder coated.
3. Refer to the individual model data sheet for the type of connectors available.

Mini-Circuits

Environmental Specifications ENV02T1

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	-40° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, 95% Coverage
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, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215