

MONOLITHIC CRYSTAL FILTERS

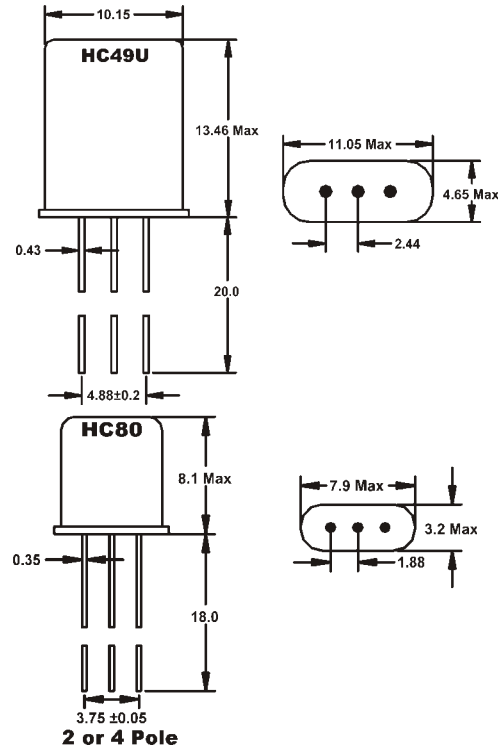
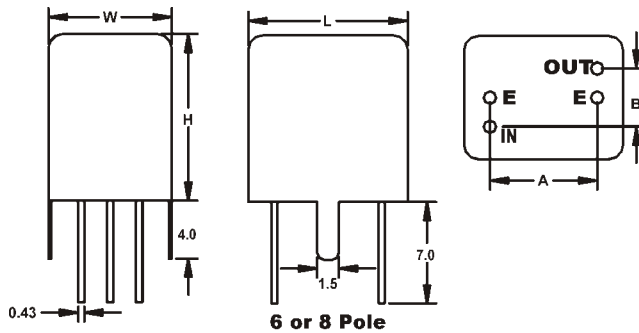
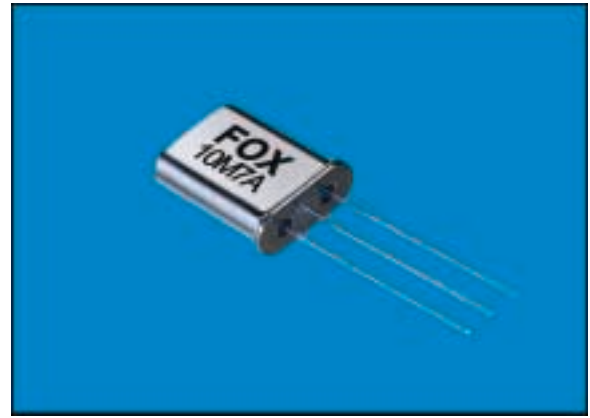
Fox filters offer excellent features such as sharp cut off characteristics, low loss and high stability over a wide temperature range which are superior to LC Filters and Ceramic Filters.

The basic building block for all custom built Fox filters is the two-pole monolithic filter available in standard package as shown. Two-pole monolithic filters are cascaded to produce four, six and eight pole filter responses with the addition of coupling capacitors between two-pole sections. Standard Fox filters are available with center frequencies from 10.7 MHz to 90 MHz, and from two to eight poles.

For custom made filters, please specify the following:

- Holder Size
- Insertion Loss
- Ripple
- Nominal Frequency
- Attenuation
- Terminating Impedance
- Pass Bandwidth
- Spurious Response
- Operating Temp. Range

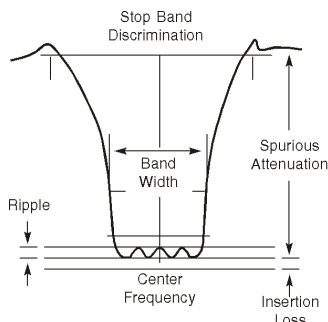
Note: 45F Series 45.000 MHz fundamental is a special filter designed for mobile radio and cellular phone applications.



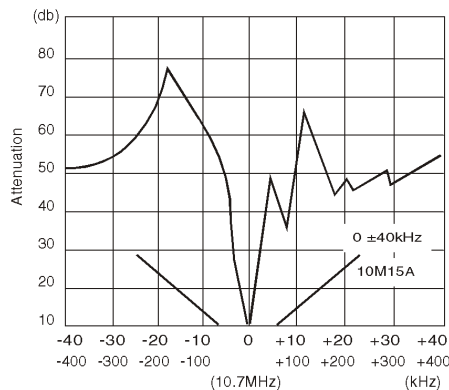
• MULTI-POLE PACKAGE DIMENSIONS

CASE TYPE	L		W		H		A		B	
C	0.590	(15.0)	0.472	(12.0)	0.591	(15.0)	0.354	(9.0)	0.197	(5.0)
D	0.728	(18.5)	0.472	(12.0)	0.591	(15.0)	0.531	(13.5)	0.197	(5.0)
CN	0.433	(11.0)	0.335	(8.5)	0.453	(11.5)	0.291	(7.4)	0.157	(4.0)

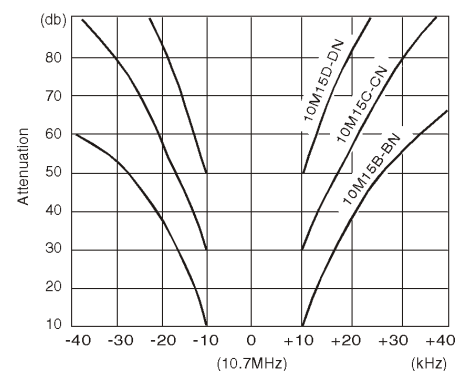
FILTER PARAMETERS



10.7MHz TWO POLE CHARACTERISTICS



MULTI-POLE CHARACTERISTICS



• STANDARD MONOLITHIC CRYSTAL FILTERS

Type	Frequency MHz	Pole	Case	Pass Band dB kHz	Stop Band dB kHz	Stop Band dB kHz	Ripple Max dB	Loss Max dB	Attenuation Guaranteed to $\pm$ kHz	Terminating Impedance ohms/pF
10M7A	10.700	2	49U	3 $\pm$ 3.75	20 $\pm$ 18		0.5	1.5	35 +300 ~ +1000 40 -200 ~ -1000	1.8K//6.0
10M7B	10.700	4	49Ux2	3 $\pm$ 3.75	40 $\pm$ 14		1.0	2.5	50 +300 ~ +1000 70 -200 ~ -1000	1.8K//5.0 Cc = 11pF
10M7C	10.700	6	C	3 $\pm$ 3.75	45 $\pm$ 8.75	65 $\pm$ 12.5	2.0	3.5	65 $\pm$ 12.5 ~ $\pm$ 300	1.8K//5.0
10M7D	10.700	8	D	3 $\pm$ 3.75	65 $\pm$ 8.75	90 $\pm$ 12.5	2.0	4.0	90 $\pm$ 12.5 ~ $\pm$ 300	1.8K//5.0
10M12A	10.700	2	49U	3 $\pm$ 6.0	20 $\pm$ 25		0.5	1.5	35 +300 ~ +1000 40 -200 ~ -1000	3.3K//1.5
10M12B	10.700	4	49Ux2	3 $\pm$ 6.0	40 $\pm$ 20		1.0	2.5	50 +300 ~ +1000 70 -200 ~ -1000	3.3K//1.5 Cc = 6pF
10M12C	10.700	6	C	3 $\pm$ 6.0	50 $\pm$ 14	65 $\pm$ 20	2.0	3.0	65 $\pm$ 20 ~ $\pm$ 300	3.3K//2.0
10M12D	10.700	8	D	6 $\pm$ 6.0	65 $\pm$ 14	90 $\pm$ 20	2.0	3.5	90 $\pm$ 20 ~ $\pm$ 300	3.3K//2.0
10M15A	10.700	2	49U	3 $\pm$ 7.5	18 $\pm$ 25		0.5	1.5	35 +300 ~ +1000 40 -200 ~ -1000	3.0K//2.0
10M15B	10.700	4	49Ux2	3 $\pm$ 7.5	40 $\pm$ 25		1.0	2.5	50 +300 ~ +1000 70 -200 ~ -1000	3.0K//2.0 Cc = 5pF
10M15C	10.700	6	C	3 $\pm$ 7.5	50 $\pm$ 17.5	65 $\pm$ 25	2.0	3.0	65 $\pm$ 25 ~ $\pm$ 300	3.3K//1.5
10M15D	10.700	8	D	6 $\pm$ 7.5	65 $\pm$ 17.5	90 $\pm$ 25	2.0	3.5	90 $\pm$ 25 ~ $\pm$ 300	3.3K//1.5
10M20A	10.700	2	49U	3 $\pm$ 10.0	18 $\pm$ 34		0.5	1.5	35 +300 ~ +1000 40 -200 ~ -1000	3.9K//1.0
10M20B	10.700	4	49Ux2	3 $\pm$ 10.0	40 $\pm$ 34		1.0	2.5	50 +300 ~ +1000 70 -200 ~ -1000	3.9K//1.0 Cc = 3pF
16M15A	16.900	2	49U	3 $\pm$ 7.5	18 $\pm$ 25		0.5	1.5	35 +300 ~ +1000 40 -200 ~ -1000	1.8K//2.0
16M15B	16.900	4	49Ux2	3 $\pm$ 7.5	40 $\pm$ 25		1.0	2.5	50 +300 ~ +1000 70 -200 ~ -1000	1.8K//1.5 Cc = 7.5pF
16M15C	16.900	6	C	3 $\pm$ 7.5	45 $\pm$ 17.5	65 $\pm$ 25	2.0	3.0	65 $\pm$ 25 ~ $\pm$ 300	1.8K//1.5
16M15D	16.900	8	D	3 $\pm$ 7.5	65 $\pm$ 17.5	90 $\pm$ 25	2.0	3.5	90 $\pm$ 25 ~ $\pm$ 300	1.8K//1.5
21M7A	21.400	2	HC80	3 $\pm$ 3.75	20 $\pm$ 18		0.5	1.5	35 +350 ~ +1000 50 -200 ~ -1000	850//6.0
21M7B	21.400	4	HC80x2	3 $\pm$ 3.75	40 $\pm$ 14		1.0	2.5	65 +350 ~ +1000 80 -200 ~ -1000	850//5.0 Cc = 16pF
21M7C	21.400	6	CN	3 $\pm$ 3.75	45 $\pm$ 8.75	65 $\pm$ 12.5	2.0	3.0	65 $\pm$ 12.5 ~ $\pm$ 300	850//5.0
21M7D	21.400	8	CN	3 $\pm$ 3.75	65 $\pm$ 9.0	90 $\pm$ 12.5	2.0	4.0	90 $\pm$ 12.5 ~ $\pm$ 300	850//5.0
21M12A	21.400	2	HC80	3 $\pm$ 6.0	20 $\pm$ 25		0.5	1.5	35 +350 ~ +1000 50 -200 ~ -1000	1.2K//3.0
21M12B	21.400	4	HC80x2	3 $\pm$ 6.0	40 $\pm$ 20		1.0	2.5	65 +350 ~ +1000 80 -200 ~ -1000	1.2K//2.5 Cc = 10.5pF
21M12C	21.400	6	CN	3 $\pm$ 6.0	45 $\pm$ 14	65 $\pm$ 20	2.0	2.5	65 $\pm$ 20 ~ $\pm$ 300	1.2K//2.5
21M12D	21.400	8	CN	3 $\pm$ 6.0	65 $\pm$ 14	90 $\pm$ 20	2.0	3.0	90 $\pm$ 20 ~ $\pm$ 300	1.2K//2.5
21M15A	21.400	2	HC80	3 $\pm$ 7.5	18 $\pm$ 25		0.5	1.5	35 +350 ~ +1000 50 -200 ~ -1000	1.5K//2.0
21M15B	21.400	4	HC80x2	3 $\pm$ 7.5	40 $\pm$ 25		1.0	2.5	65 +350 ~ +1000 80 -200 ~ -1000	1.5K//2.0 Cc = 8pF
21M15C	21.400	6	CN	3 $\pm$ 7.5	45 $\pm$ 17.5	65 $\pm$ 25	2.0	2.5	65 $\pm$ 25 ~ $\pm$ 300	1.5K//2.0
21M15D	21.400	8	CN	3 $\pm$ 7.5	65 $\pm$ 17.5	90 $\pm$ 25	2.0	3.0	90 $\pm$ 25 ~ $\pm$ 300	1.5K//2.0
21M20A	21.400	2	HC80	3 $\pm$ 10.0	18 $\pm$ 34		0.5	2.0	35 +350 ~ +1000 50 -200 ~ -1000	1.8K//1.5
21M20B	21.400	4	HC80x2	3 $\pm$ 10.0	40 $\pm$ 34		1.0	2.5	65 +350 ~ +1000 80 -200 ~ -1000	1.8K//1.5 Cc = 5pF
21M30A	21.400	2	HC80	3 $\pm$ 15.0	15 $\pm$ 45		0.5	1.5	35 +350 ~ +1000 50 -300 ~ -1000	3.0K//0.5
21M30B	21.400	4	HC80x2	3 $\pm$ 15.0	40 $\pm$ 50		1.0	2.5	65 +350 ~ +1000 80 -300 ~ -1000	3.0K//0.5 Cc = 3pF
45F15A	45.000	2	HC80	3 $\pm$ 7.5	15 $\pm$ 25		1.0	2.0	35 +500 ~ +1000 40 -200 ~ -1000	650//4.5
45F15B	45.000	4	HC80x2	3 $\pm$ 7.5	30 $\pm$ 25		1.0	3.0	70 +500 ~ +1000 -200 ~ -1000	650//1.5 Cc = 9pF
45F20A	45.000	2	HC80	3 $\pm$ 10.0	15 $\pm$ 34		1.0	2.0	35 +500 ~ +1000 40 -200 ~ -1000	700//2.5
45F20B	45.000	4	HC80x2	3 $\pm$ 10.0	40 $\pm$ 48		1.0	3.0	70 +500 ~ +1000 -200 ~ -1000	700//1.5 Cc = 6.5pF
45F30A	45.000	2	HC80	3 $\pm$ 15.0	15 $\pm$ 50		1.0	2.0	35 +500 ~ +1000 -300 ~ -1000	800//1.5
45F30B	45.000	4	HC80x2	3 $\pm$ 15.0	40 $\pm$ 60		1.0	3.0	70 +500 ~ +1000 -300 ~ -1000	800//1.0 Cc = 5pF
45M15A	45.000	2	HC80	3 $\pm$ 7.5	18 $\pm$ 28		1.0	2.0	35 +500 ~ +1000 -200 ~ -1000	4K//1.0
45M15B	45.000	4	HC80x2	3 $\pm$ 7.5	40 $\pm$ 30		1.0	3.0	70 +500 ~ +1000 -200 ~ -1000	4K//1.0 Cc = -1pF
45M20A	45.000	2	HC80	3 $\pm$ 10.0	15 $\pm$ 30		1.0	2.0	35 +500 ~ +1000 -200 ~ -1000	5K//1.0
45M20B	45.000	4	HC80x2	3 $\pm$ 10.0	35 $\pm$ 40		1.0	3.0	70 +500 ~ +1000 -200 ~ -1000	5K//1.0 Cc = -1.5pF
70M15A	70.000	2	HC80	3 $\pm$ 7.5	15 $\pm$ 30		1.0	2.0	35 +500 ~ +1000 -200 ~ -1000	2.0K//1.0
70M15B	70.000	4	HC80x2	3 $\pm$ 7.5	25 $\pm$ 25		1.0	3.0	70 +500 ~ +1000 -200 ~ -1000	2.0K//1.0 Cc = -1pF
70M20A	70.000	2	HC80	3 $\pm$ 10.0	15 $\pm$ 40		1.0	2.0	35 +500 ~ +1000 -200 ~ -1000	2.5K//1.0
70M20B	70.000	4	HC80x2	3 $\pm$ 10.0	35 $\pm$ 40		1.0	3.0	70 +500 ~ +1000 -200 ~ -1000	2.5K//1.0 Cc = -1pF

All specifications subject to change without notice. Rev. 05/01/02

Note: Operating Temperature -20°C to +70°C