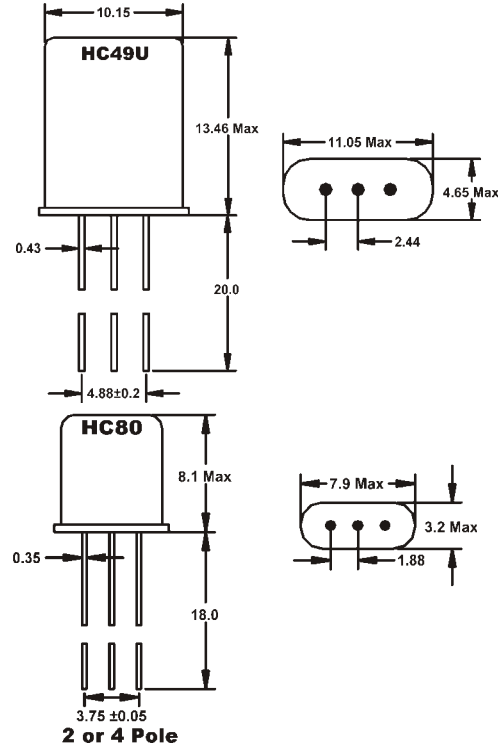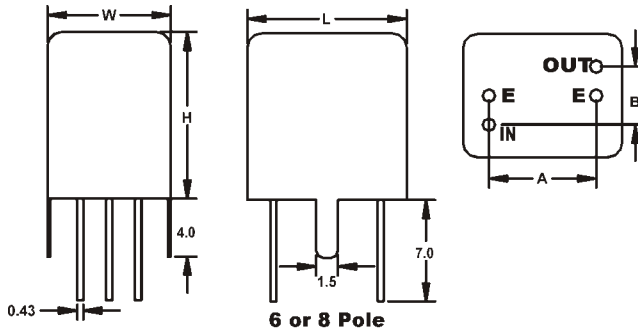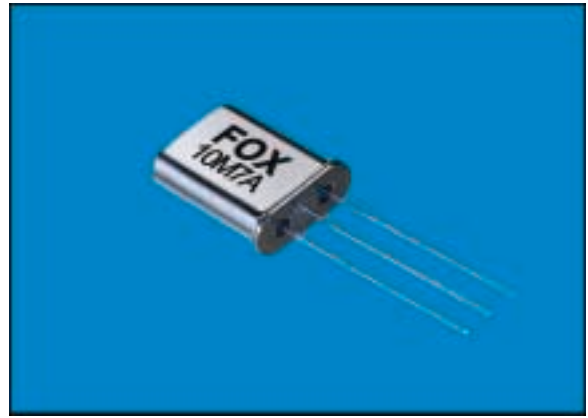# MONOLITHIC CRYSTAL
FILTERS

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.

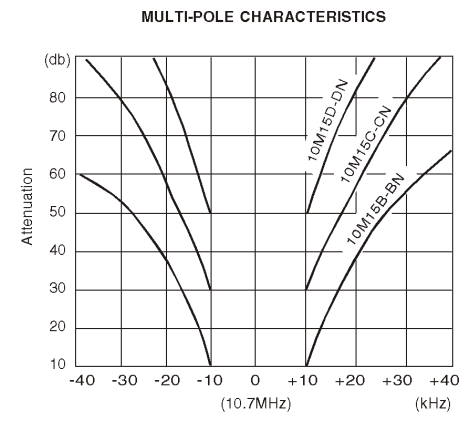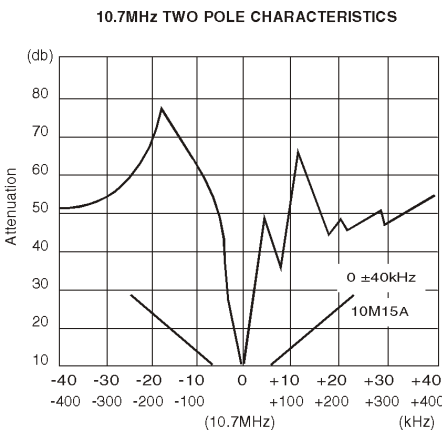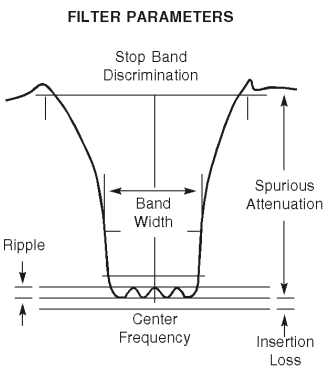For custom made filters, please specify the following:
- Holder Size
- Insertion Loss
- Ripple
- Nominal Frequency
- Attenuation
- Terminating Impedance
- Pass Bandwidth
- Spurious Response
- Operating Temp. Range

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

HC49U

10.15
13.46 Max
0.43
20.0
4.88±0.2
11.05 Max
4.65 Max
2.44

HC80

8.1 Max
0.35
18.0
3.75 ±0.05
7.9 Max
3.2 Max
1.88

2 or 4 Pole

W   L   H   OUT   E   E   B   IN   A

4.0   0.43   1.5   7.0

6 or 8 Pole

• 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

Stop Band Discrimination
Band Width
Spurious Attenuation
Ripple
Center Frequency
Insertion Loss

10.7MHz TWO POLE CHARACTERISTICS

(db)
80
70
60
50
40
30
20
10

0 ±40kHz
10M15A

-40   -30   -20   -10   0   +10   +20   +30   +40
-400 -300 -200 -100   +100 +200 +300 +400
(10.7MHz)   (kHz)

Attenuation

MULTI-POLE CHARACTERISTICS

(db)
80
70
60
50
40
30
20
10

10M15D-DN
10M15C-CN
10M15B-BN

-40   -30   -20   -10   0   +10   +20   +30   +40
(10.7MHz)   (kHz)

Attenuation

FILTERS

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

FILTERS