

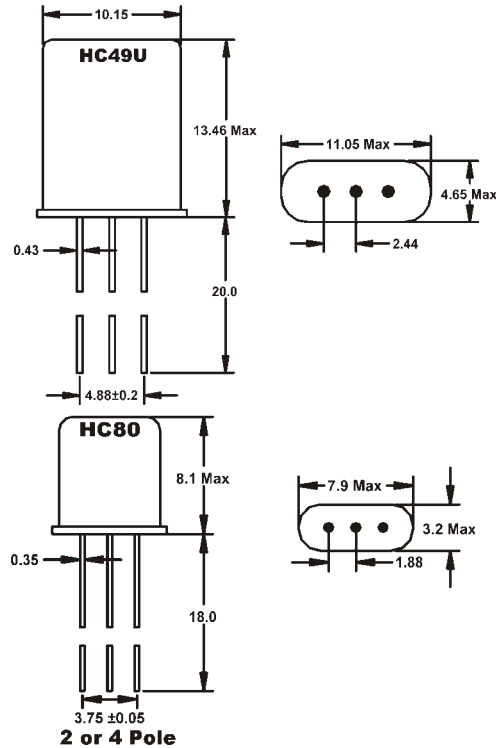
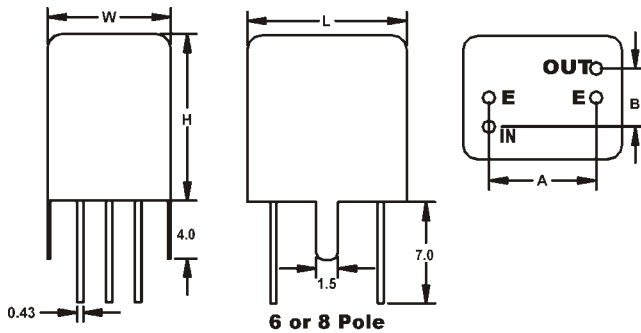
MONOLITHIC CRYSTAL FILTERS

The basic building block for all custom built 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 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:

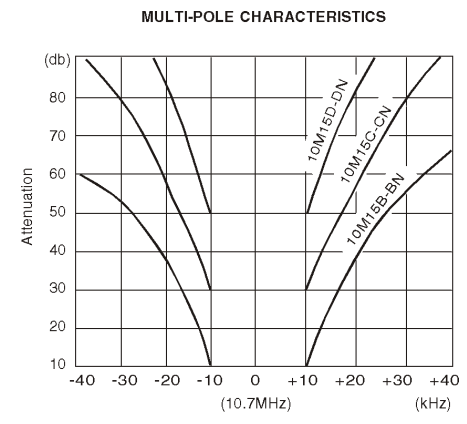
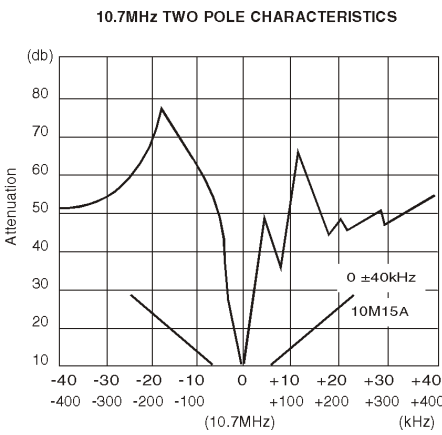
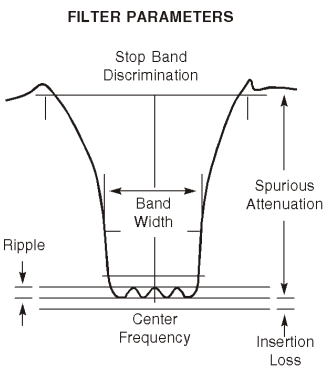
- Holder Size
- Nominal Frequency
- Pass Bandwidth
- Insertion Loss
- Attenuation
- Spurious Response
- Ripple
- Terminating Impedance
- Operating Temp. Range

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)

FILTERS



• STANDARD MONOLITHIC CRYSTAL FILTERS

Type	Frequency MHz	Pole	Case	Pass Band dB kHz	Stop Band 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 +300 ~ +1000 40 -200 ~ -1000	1.8K//6.0
10M7B	10.700	4	49Ux2	3 ±3.75	40 ±14	1.0	2.5	50 +300 ~ +1000 70 -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 +300 ~ +1000 40 -200 ~ -1000	3.3K//1.5
10M12B	10.700	4	49Ux2	3 ±6.0	40 ±20	1.0	2.5	50 +300 ~ +1000 70 -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 +300 ~ +1000 40 -200 ~ -1000	3.0K//2.0
10M15B	10.700	4	49Ux2	3 ±7.5	40 ±25	1.0	2.5	50 +300 ~ +1000 70 -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 +300 ~ +1000 40 -200 ~ -1000	3.9K//1.0
10M20B	10.700	4	49Ux2	3 ±10.0	40 ±34	1.0	2.5	50 +300 ~ +1000 70 -200 ~ -1000	3.9K//1.0 Cc = 3pF
16M15A	16.900	2	49U	3 ±7.5	18 ±25	0.5	1.5	35 +300 ~ +1000 40 -200 ~ -1000	1.8K//2.0
16M15B	16.900	4	49Ux2	3 ±7.5	40 ±25	1.0	2.5	50 +300 ~ +1000 70 -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 +350 ~ +1000 50 -200 ~ -1000	850//6.0
21M7B	21.400	4	HC80x2	3 ±3.75	40 ±14	1.0	2.5	65 +350 ~ +1000 80 -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 +350 ~ +1000 50 -200 ~ -1000	1.2K//3.0
21M12B	21.400	4	HC80x2	3 ±6.0	40 ±20	1.0	2.5	65 +350 ~ +1000 80 -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 +350 ~ +1000 50 -200 ~ -1000	1.5K//2.0
21M15B	21.400	4	HC80x2	3 ±7.5	40 ±25	1.0	2.5	65 +350 ~ +1000 80 -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 +350 ~ +1000 50 -200 ~ -1000	1.8K//1.5
21M20B	21.400	4	HC80x2	3 ±10.0	40 ±34	1.0	2.5	65 +350 ~ +1000 80 -200 ~ -1000	1.8K//1.5 Cc = 5pF
21M30A	21.400	2	HC80	3 ±15.0	15 ±45	0.5	1.5	35 +350 ~ +1000 50 -300 ~ -1000	3.0K//0.5
21M30B	21.400	4	HC80x2	3 ±15.0	40 ±50	1.0	2.5	65 +350 ~ +1000 80 -300 ~ -1000	3.0K//0.5 Cc = 3pF
45F15A	45.000	2	HC80	3 ±7.5	15 ±25	1.0	2.0	35 +500 ~ +1000 40 -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 +500 ~ +1000 40 -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