

FEATURES

- High stability for wide temperature ranges
- Sharp cut-off
- Low loss

Monolithic Crystal Filters have very high Q's and excellent temperature and aging characteristics. These filters offer narrow and intermediate bandwidths. The monolithic crystal filter is smaller and more cost effective than a discrete crystal filter. With the addition of coupling capacitors between two-pole sections, they can be cascaded to produce four, six and eight (or more) pole filter responses.

OPERATING CONDITIONS/ELECTRICAL CHARACTERISTICS

For 12.5 KHz Channel Spacing (Operating Temperature -20 to +70°C)

MODEL	NOMINAL FREQ. (fo) (MHz)	NUMBER OF POLES	PASSBAND 3dB MIN. (KHz)	RIPPLE MAX. (dB)	INSERTION LOSS MAX. (dB)	STOPBAND MAX. (dB) (KHz)	STOPBAND MAX. (dB) (KHz)	GUARANTEED ATTENUATION (dB) (fo ±KHz)	TERMINATING IMPEDANCE (Ohms/pF)	CASE
10M 7.5A	10.7	2	±3.75	0.5	1.5	20 ±18		35 +300 ~ +1000 50 -200 ~ -1000	1800//5.0	49/M
10M 7.5B	10.7	4	±3.75	1.0	2.5	40 ±14		65 +300 ~ +1000 80 -200 ~ -1000	1800//4.0	49/M x 2
10M 7.5C	10.7	6	±3.75	2.0	3.5	45 ±8.75	65 ±12.5	65 ±12.5 ~ ±300	1800//3.5	C1
10M 7.5D	10.7	8	±3.75	2.0	4.0	65 ±8.75	90 ±12.5	90 ±12.5 ~ ±300	1800//3.5	D1
21M 7.5A	21.4	2	±3.75	0.5	2.0	18 ±12.5		75 -910	1500//6.0	UM1-3
21M 7.5B	21.4	4	±3.75	1.0	2.5	35 ±12.5		90 ±910	850//5.0	UM1 3 x 2
21M 7.5C	21.4	6	±3.75	2.0	3.0	45 ±8.75	65 ±12.5	65 ±12.5 ~ ±300	850//5.0	D2
21M 7.5D	21.4	8	±3.75	2.0	4.0	65 ±9	90 ±12.5	90 ±12.5 ~ ±300	850//5.0	D2
21M 7.5E	21.4	10	±3.75	2.0	4.5	75 ±8.75	90 ±10.5	90 ±12.5 ~ ±300	850//5.0	E2

For 20 KHz Channel Spacing (Operating Temperature -20 to +70°C)

MODEL	NOMINAL FREQ. (fo) (MHz)	NUMBER OF POLES	PASSBAND 3dB MIN. (KHz)	RIPPLE MAX. (dB)	INSERTION LOSS MAX. (dB)	STOPBAND MAX. (dB) (KHz)	STOPBAND MAX. (dB) (KHz)	GUARANTEED ATTENUATION (dB) (fo ±KHz)	TERMINATING IMPEDANCE (Ohms/pF)	CASE
10M 12A	10.7	2	±6.0	0.5	2.0	18 ±23		35 +300 ~ +1000 40 -200 ~ -1000	2500//2.5	49/M
10M 12B	10.7	4	±6.0	1.0	2.5	40 ±20		65 +300 ~ +1000 80 -200 ~ -1000	2500//1.5	49/M x 2
10M 12C	10.7	6	±6.0	2.0	3.0	45 ±14	60 ±20	65 ±20 ~ ±300	2800//1.0	C-1
10M 12D	10.7	8	±6.0	2.0	4.0	65 ±14	90 ±20	90 ±20 ~ ±300	2800//1.0	D-1
21M 12A	21.4	2	±6.0	0.5	2.0	18 ±23		35 +350 ~ +1000 50 -200 ~ -1000	1200//3.0	UM1-3
21M 12B	21.4	4	±6.0	1.0	2.5	40 ±20		65 +350 ~ +1000 70 -200 ~ -1000	1200//2.5	UM1 x 2
21M 12C	21.4	6	±6.0	2.0	3.0	45 ±14	65 ±20	65 ±20 ~ ±300	1200//2.5	D-2
21M 12D	21.4	8	±6.0	2.0	4.0	65 ±14	90 ±20	90 ±20 ~ ±300	1200//2.5	D-2



MONOLITHIC CRYSTAL FILTERS

ELECTRICAL CHARACTERISTICS (10.7 and 21.4 MHz)

For 25 KHz Channel Spacing (Operating Temperature -20 to +70°C)

MODEL	NOMINAL FREQ. (fo) (MHz)	NUMBER OF POLES	PASSBAND 3dB MIN. (KHz)	RIPPLE MAX. (dB)	INSERTION LOSS MAX. (dB)	STOPBAND MAX. (dB) (KHz)	STOPBAND MAX. (dB) (KHz)	GUARANTEED ATTENUATION (dB) (fo ±KHz)	TERMINATING IMPEDANCE (Ohms/pF)	CASE
10M 15A	10.7	2	±7.5	0.5	2.0	18 ±25		35 +300 ~ +1000 40 -200 ~ -1000	3000//2.0	49/M
10M 15B	10.7	4	±7.5	1.0	2.5	40 ±25		55 +300 ~ +1000 80 -200 ~ -1000	3000//2.0	49/M x 2
10M 15C	10.7	6	±7.5	2.0	3.0	45 ±17.5	65 ±25	65 ±25 ~ ±300	3000//1.5	C-1
10M 15D	10.7	8	±7.5	2.0	4.0	70 ±17.5	90 ±25	90 ±25 ~ ±300	3000//1.5	D-1
10M 15E	10.7	10	±7.5	2.0	4.5	75 ±15	90 ±20	90 ±20 ~ ±300	3000//1.5	E-1
21M 15A	21.4	2	±7.5	0.5	1.5	18 ±25		35 +350 ~ +1000 50 -200 ~ -1000	1500//3.0	UM1-3
21M 15B	21.4	4	±7.5	1.0	2.0	40 ±25		65 +350 ~ +1000 80 -200 ~ -1000	1500//2.0	UM1-3 x 2
21M 15C	21.4	6	±7.5	2.0	2.5	45 ±17.5	65 ±25	65 ±25 ~ ±300	1500//2.0	D-2
21M 15D	21.4	8	±7.5	2.0	3.0	65 ±17.5	90 ±25	90 ±25 ~ ±300	1500//2.0	D-2
21M 15E	21.4	10	±7.5	2.0	4.0	75 ±17.5	90 ±20	90 ±25 ~ ±300	1500//2.0	E-2

For 50 KHz Channel Spacing (Operating Temperature -20 to +70°C)

MODEL	NOMINAL FREQ. (fo) (MHz)	NUMBER OF POLES	PASSBAND 3dB MIN. (KHz)	RIPPLE MAX. (dB)	INSERTION LOSS MAX. (dB)	STOPBAND MAX. (dB) (KHz)	STOPBAND MAX. (dB) (KHz)	GUARANTEED ATTENUATION (dB) (fo ±KHz)	TERMINATING IMPEDANCE (Ohms/pF)	CASE
10M 30A	10.7	2	±15	0.5	1.5	15 ±50		30 +300 ~ +1000 40 -300 ~ -1000	5000//0	49/M
10M 30B	10.7	4	±15	1.0	2.5	30 ±40		30 ±40 ~ ±300	5500//1.0	49/M x2
10M 30C	10.7	6	±15	2.0	3.0	60 ±45		60 ±45 ~ ±300	5500//1.0	C-1
10M 30D	10.7	8	±15	2.0	3.5	70 ±40	90 ±50	90 ±50 ~ ±300	5500//1.0	D-1
21M 30A	21.4	2	±15	0.5	1.5	15 ±45		35 +350 ~ +1000 45 -300 ~ -1000	1500//1.0	UM1-3
21M 30B	21.4	4	±15	1.0	2.0	40 ±50		65 +350 ~ +1000 80 -250 ~ -1000	1800//0.5	UM1-3 x 2
21M 30C	21.4	6	±15	2.0	2.5	45 ±35	65 ±50	65 ±50 ~ ±300	2200//0.5	D-2
21M 30D	21.4	8	±15	2.0	3.5	70 ±35	90 ±50	90 ±50 ~ ±1000	2200//0.5	D-2

45 MHz Monolithic Crystal Filters (Operating Temperature -20 to +70°C)

MODEL	NOMINAL FREQ. (fo) (MHz)	NUMBER OF POLES	PASSBAND 3dB MIN. (KHz)	RIPPLE MAX. (dB)	INSERTION LOSS MAX. (dB)	STOPBAND MAX. (dB) (KHz)	STOPBAND MAX. (dB) (KHz)	GUARANTEED ATTENUATION (dB) (fo ±KHz)	TERMINATING IMPEDANCE (Ohms/pF)	CASE
45M 7.5A	45.0	2	±3.75	1.0	2.0	10 ±12.5		65 -910	350//10.5	UM1-3
45M 7.5B	45.0	4	±3.75	1.0	4.0	30 ±12.5		90 ±910	350//6.5	UM1-3 x 2
45M 15A	45.0	2	±7.5	1.0	2.0	15 ±25		75 -910	650//5.0	UM1-3
45M 15B	45.0	4	±7.5	1.0	3.0	30 ±25		90 ±910	650//3.0	UM1-3 x 2
45M 20A	45.0	2	±10	0.5	2.0	15 ±30		65 -910	910//2.5	UM1-3
45M 20B	45.0	4	±10	1.0	3.0	35 ±40		90 ±910	910//2.5	UM1-3 x 2
45M 30A	45.0	2	±15	1.0	2.0	15 ±50		70 -910	1200//1.5	UM1-3
45M 30B	45.0	4	±15	1.0	3.0	35 ±50		90 ±910	1200//0.7	UM1-3 x 2

55 MHz Monolithic Crystal Filters (Operating Temperature -20 to +70°C)

MODEL	NOMINAL FREQ. (fo) (MHz)	NUMBER OF POLES	PASSBAND 3dB MIN. (KHz)	RIPPLE MAX. (dB)	INSERTION LOSS MAX. (dB)	STOPBAND MAX. (dB) (KHz)	STOPBAND MAX. (dB) (KHz)	GUARANTEED ATTENUATION (dB) (fo ±KHz)	TERMINATING IMPEDANCE (Ohms/pF)	CASE
55M 15A	55.0	2	±7.5	1.0	2.0	15 ±25		70 -910	600//3.0	UM1-3
55M 15B	55.0	4	±7.5	1.0	3.0	30 ±25		90 ±910	600//1.5	UM1-3 x 2
55M 20A	55.0	2	±10	1.0	2.0	15 ±30		75 -910	910//2.5	UM1-3
55M 20B	55.0	4	±10	1.0	3.0	25 ±25		90 ±910	910//1.0	UM1-3 x 2
55M 30A	55.0	2	±15	1.0	2.0	15 ±50		70 -910	1200//1.5	UM1-3
55M 30B	55.0	4	±15	1.0	3.0	30 ±50		90 ±910	1200//0.7	UM1-3 x 2
55M 32A	55.0	2	±16	0.5	2.5	4 ±29.5		65 -910	1250//1.3	UM1-3
55M 32B	55.0	4	±16	1.0	5.0	30 ±52		80 ±910	1250//0.5	UM1-3 x 2

70 MHz & 90 MHz Monolithic Crystal Filters (Operating Temperature -20 to +70°C)

MODEL	NOMINAL FREQ. (fo) (MHz)	NUMBER OF POLES	PASSBAND 3dB MIN. (KHz)	RIPPLE MAX. (dB)	INSERTION LOSS MAX. (dB)	STOPBAND MAX. (dB) (KHz)	STOPBAND MAX. (dB) (KHz)	GUARANTEED ATTENUATION (dB) (fo ±KHz)	TERMINATING IMPEDANCE (Ohms/pF)	CASE
70M 15A	70.0	2	±7.5	1.0	2.5	15 ±25		35 -910	2000//1.0	UM1-3
70M 15B	70.0	4	±7.5	1.0	4.0	40 ±35		70 ±910	2000//1.0	UM1-3 x 2
70M 20A	70.0	2	±10	1.0	2.5	15 ±28		35 -910	2500//1.0	UM1-3
70M 20B	70.0	4	±10	1.0	4.0	35 ±40		70 ±910	2500//1.0	UM1-3 x 2
90M 20A	90.0	2	±10	1.0	2.5	15 ±30		35 -910	2500//1.0	UM1-3
90M 20B	90.0	4	±10	1.0	4.0	30 ±30		70 ±910	2500//1.0	UM1-3 x 2

DIMENSIONS AND ELECTRICAL DIAGRAMS (mm)

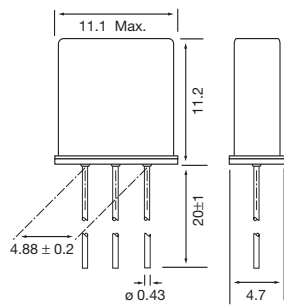


Figure 1) HC-49/M

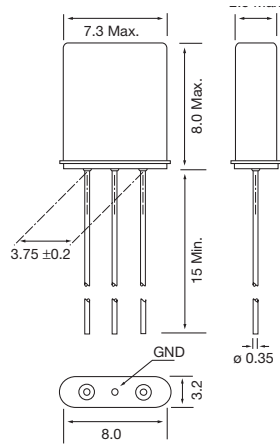


Figure 2) UM-1-3

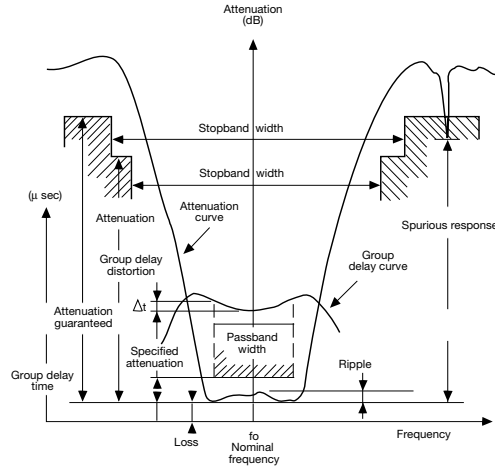
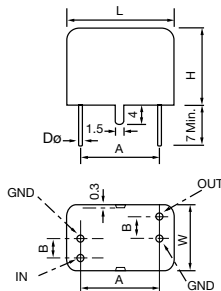


Figure 3) MCF Characteristics Curve



CASE	DIMENSIONS (mm)					
	L	W	H	A	B	D
D-2	11	8.5	11.5	7.4	2.0	0.30
E-2	13.4	8.5	11.5	9.8	2.0	0.30
C-1	15	12.0	15.0	9.0	2.5	0.43
D-1	18.5	12.0	15.0	13.4	2.5	0.43
E-1	23.0	12.0	15.0	17.8	2.5	0.43

Figure 4) SC Pkg with Dimensional Chart

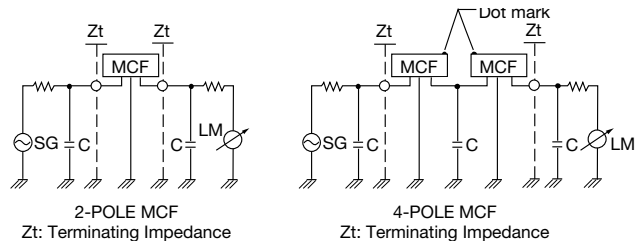


Figure 5) MCF Test Circuits