

MONOLITHIC CRYSTAL FILTERS

FILTRONETICS, INC

10.7MHz Series

Model Number	Center Frequency	Pass Band		Stop band		Ripple	Loss	Ultimate Attenuation		Terminating Impedance		Poles	Case
	(MHz)	(dB)	(KHz)	(dB)	(KHz)	(dB)	(dB)	(dB)	(Fo \pm kHz)	Zt (Z // pF)	C2 (pF)		
M10SO3	10.7	3	± 1.0	60	± 2.5	1.0	7.0	70	± 12.5 to ± 300	570//18.0	-	8	SC-4
M10AA_	10.7	3	± 3.75	20	± 18	0.5	1.5	35 50	+300 to +1000 -200 to -1000	1800//5.0	-	2	HC-A,B
M10AB_	10.7	3	± 3.75	40	± 14	1.0	2.5	65 80	+300 to +1000 -200 to -1000	1800//4.5	12	4	HC-A,B(x2)
M10AC3	10.7	3	± 3.75	45	± 8.75	2.0	3.5	65	± 12.5 to ± 300	1800//3.5	-	6	SC-3
M10AD4	10.7	6	± 3.75	65	± 8.75	2.0	4.0	90	± 12.5 to ± 300	1800//3.5	-	8	SC-4
M10DA_	10.7	3	± 6.0	20	± 25	0.5	1.5	35 40	+300 to +1000 -200 to -1000	2500//2.5	-	2	HC-A,B
M10DB_	10.7	3	± 6.0	40	± 20	1.0	2.5	65 80	+300 to +1000 -200 to -1000	1800//2.5	7	4	HC-A,B(x2)
M10DC3	10.7	3	± 6.0	45	± 14	2.0	3.0	65	± 20.0 to ± 300	2800//1.0	-	6	SC-3
M10DD4	10.7	6	± 6.0	65	± 14	2.0	4.0	90	± 20.0 to ± 300	2800//1.0	-	8	SC-4
M10FA_	10.7	3	± 7.5	18	± 25	0.5	1.5	35 40	+300 to +1000 -200 to -1000	3000//2.0	-	2	HC-A,B
M10FB_	10.7	3	± 7.5	40	± 25	1.0	2.5	65 80	+300 to +1000 -200 to -1000	3000//1.5	5	4	HC-A,B(x2)
M10FC3	10.7	3	± 7.5	45	± 17.5	2.0	3.0	65	± 25.0 to ± 300	2800//1.0	-	6	SC-3
M10FD4	10.7	6	± 7.5	60	± 15	2.0	3.5	90	± 25.0 to ± 300	2800//1.0	-	8	SC-4
M10GA_	10.7	3	± 10.0	15	± 30	0.5	1.5	35 40	+300 to +1000 -200 to -1000	3900//0.5	-	2	HC-49AB
M10GB_	10.7	3	± 10.0	40	± 34	1.0	2.5	65 80	+300 to +1000 -200 to -1000	3900//0.4	0	4	HC-A,B(x2)
M10GC3	10.7	3	± 10.0	60	± 34	2.0	3.0	60	± 34.0 to ± 300	3900//1.0	-	6	SC-3
M10GD4	10.7	6	± 10.0	80	± 30	2.0	3.5	80	± 30.0 to ± 300	3900//1.0	-	8	SC-4
M10JA_	10.7	3	± 15	15	± 50	0.5	1.5	30 40	+300 to +1000 -300 to -1000	5000//0	-	2	HC-A,B
M10JB_	10.7	3	± 15	30	± 40	1.0	2.5	65 80	+300 to +1000 -250 to -1000	5500//1.0	0	4	HC-A,B(x2)
M10JC3	10.7	3	± 15	60	± 45	2.0	3.0	60	± 45.0 to ± 300	5500//1.0	-	6	SC-3
M10JD4	10.7	6	± 15	60	± 30	2.0	3.5	80	± 40.0 to ± 300	5500//1.0	-	8	SC-4

Note: _ Specify Case Code, i.e., M10AAA = HC-49/UL Case (see Figure M1 through M6 for drawings). All "UM" packages can be made Surface Mount (See figure M3 for code).

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MONOLITHIC CRYSTAL FILTERS

FILTRONETICS, INC

16.9MHz Series (Marine Band)

Model Number	Center Frequency	Pass Band		Stop band		Ripple (dB)	Loss (dB)	Ultimate Attenuation		Terminating Impedance		Poles	Case
	(MHz)	(dB)	(KHz)	(dB)	(KHz)			(dB)	(dB)	(Fo±kHz)	Zt (Z // pF)		
M16AB_	16.9	3	±3.75	40	±14	1.0	2.5	65 80	+350 to +1000 -200 to -1000	850//5.0	20	4	HC-A,B(x2)
M16AG_	16.9	3	±3.75	30	±12.5	1.0	2.5	65 80	+350 to +1000 -200 to -1000	1000//4.0	18	4	UM-C,D(x2)
M16DB_	16.9	3	±6.0	40	±20	1.0	2.5	65 80	+350 to +1000 -200 to -1000	1500//2.0	9	4	HC-A,B(x2)
M16DG_	16.9	3	±6.0	40	±20	1.0	2.5	65 80	+350 to +1000 -200 to -1000	1500//3.0	8	4	UM-C,D,(2x2)
M16FB_	16.9	3	±7.5	40	±25	1.0	2.5	50 70	+350 to +1000 -200 to -1000	1800//1.5	7.5	4	HC-A,B(x2)
M16FG_	16.9	3	±7.5	40	±25	1.0	2.5	50 70	+350 to +1000 -200 to -1000	1800//1.5	7.5	4	UM-C,D(x2)

Other Series 10 to 90 MHz

Model Number	Center Frequency	Pass Band		Stop band		Ripple (dB)	Loss (dB)	Ultimate Attenuation		Terminating Impedance		Poles	Case
	(MHz)	(dB)	(KHz)	(dB)	(KHz)			(dB)	(dB)	(Fo±kHz)	Zt (Z // pF)		
M10SBB	10.0	3	±1	50	±10	0.5	5.0	60	+300 to +1000 -200 to -1000	750//15.0	39	4	HC-B
M10AGB	10.0	3	±3.5	50	±20	0.5	3.5	60	+300 to +1000 -200 to -1000	1800//4.5	12	4	HC-B
M20JAD	20.0	3	±15	15	±45	0.5	1.5	-	-	1500//1.0	-	2	UM-D
M24CAB	24.0	3	±5	20 40	±12 ±20	1.0	3.0	70	±910	1500//2.5	7.0	4	HC-B
M24CA_	24.0	3	±5	20	±25	1.0	2.0	25 50	+350 -200	1000//3.5	-	2	UM-C,KJ
M30SAB	30.0	3	±15	15	±60	1.0	2.0	50	-910	tbd	-	2	HC-B
M40ABC	40.0	3	±3.75	30	±12.5	1.0	5.0	80	±900	500//5.5	14	4	UM-C
M40JBC	40.0	3	±15	30	±50	1.0	3.0	80	±900 to ±1000	1800//0.7	2.5	4	UM-C
M46FBC	45.7	3	±7.5	30	±25	1.0	5.0	60	±900	650//3.0	9.0	4	UM-C
M60SBD	60.0	3	±3.0	50	±30	2.0	5.0	-	-	1000//0.7	2.5	4	UM-D
M75SBD	75.0	3	±10.5	50	±1000	1.0	3.0	50	±1000	4000//0.7	?	4	UM-D

Note: _ Specify Case Code, i.e., M10AAA = HC-49/UL Case (see Figure M1 through M6 for drawings). All "UM" packages can be made Surface Mount (See figure M3 for code).

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MONOLITHIC CRYSTAL FILTERS

FILTRONETICS, INC

21.4MHz Series

Model Number	Center Frequency	Pass Band		Stop band		Ripple	Loss	Ultimate Attenuation		Terminating Impedance		Poles	Case
	(MHz)	(dB)	(KHz)	(dB)	(KHz)	(dB)	(dB)	(dB)	(Fo±kHz)	Zt (Z // pF)	C2 (pF)		
M21AA_	21.4	3	±3.75	20	±18	0.5	1.5	35 50	+350 to +1000 -200 to -1000	850//6.0	-	2	UM-C~F
M21AF_	21.4	3	±3.75	20	±18	0.5	2.0	35 50	+350 to +1000 -200 to -1000	850//5.5	-	2	UM-G,H
M21AB_	21.4	3	±3.75	40	±14	1.0	2.5	65 80	+350 to +1000 -200 to -1000	850//5.0	16	4	UM-C~F(x2)
M21AG_	21.4	3	±3.75	40	±14	1.0	3.0	65 80	+350 to +1000 -200 to -1000	1000//4.5	12	4	UM-G,H(x2)
M21AC_	21.4	3	±3.75	45	±8.75	2.0	3.0	65	±12.5 to ±300	850//5.0	-	6	SC-1,3,4
M21AD_	21.4	3	±3.75	65	±9.0	2.0	4.0	90	±12.5 to ±300	850//5.0	-	8	SC-1,3,4
M21DA_	21.4	3	±6	20	±25	0.5	1.5	35 50	+350 to +1000 -200 to -1000	1200//3.0	-	2	UM-C~F
M21DF_	21.4	3	±6	20	±25	0.5	2.0	35 50	+350 to +1000 -200 to -1000	1200//3.0	-	2	UM-G,H
M21DB_	21.4	3	±6	40	±20	1.0	2.0	65 80	+350 to +1000 -200 to -1000	1200//2.5	10.5	4	UM-C~F(x2)
M21DG_	21.4	3	±6	40	±20	1.0	3.0	65 80	+350 to +1000 -200 to -1000	1600//2.5	7	4	UM-G,H(x2)
M21DC_	21.4	3	±6	45	±14	2.0	2.5	65	±20 to ±300	1200//2.5	-	6	SC-1,3,4
M21DD_	21.4	3	±6	65	±14	2.0	3.0	90	±20 to ±300	1200//2.5	-	8	SC-1,3,4
M21FA_	21.4	3	±7.5	18	±25	1.5	1.5	35 50	+350 to +1000 -200 to -1000	1500//2.5	-	2	UM-C~F
M21FF_	21.4	3	±7.5	15	±25	0.5	2.0	35 50	+350 to +1000 -200 to -1000	1500//2.0	-	2	UM-G,H
M21FB_	21.4	3	±7.5	40	±25	1.0	2.0	65 80	+350 to +1000 -200 to -1000	1500//2.0	8	4	UM-C~F(x2)
M21FG_	21.4	3	±7.5	40	±25	1.0	4.0	65 80	+350 to +1000 -200 to -1000	1900//2.0	5	4	UM-G,H(x2)
M21FC_	21.4	3	±7.5	45	±17.5	2.0	2.5	65	±25 to ±300	1500//2.0	-	6	SC-1,3,4
M21FD_	21.4	3	±7.5	65	±17.5	2.0	3.0	90	±25 to ±300	1500//2.0	-	8	SC-1,3,4
M21GA_	21.4	3	±10	15	±30	0.5	2.0	35 50	+350 to +1000 -350 to -1000	1800//2.5	-	2	UM-C~F
M21GB_	21.4	3	±10	45	±35	1.0	2.0	65 80	+350 to +1000 -200 to -1000	1800//1.5	5	4	UM-C~F(x2)
M21GC_	21.4	3	±10	60	±34	2.0	2.5	60	±34 to ±300	1800//1.5	-	6	SC-1,3,4
M21GD_	21.4	3	±10	80	±30	2.0	3.0	80	±30 to ±300	1800//1.5	-	8	SC-1,3,4
M21JA_	21.4	3	±15	15	±45	0.5	1.5	35 45	+350 to +1000 -350 to -1000	1500//1.0	-	2	UM-C, D
M21JB_	21.4	3	±15	40	±50	1.0	2.0	65 80	+350 to +1000 -250 to -1000	2000//0.5	3	4	UM-C, D(x2)
M21JC1	21.4	3	±15	65	±50	2.0	2.5	65	±50 to ±300	2000//0.5	-	6	SC-1
M21JC3	21.4	3	±15	65	±50	2.0	2.5	65	±50 to ±300	3000//0.0	-	6	SC-3
M21JD1	21.4	3	±15	80	±50	2.0	3.0	80	±50 to ±300	2000//0.5	-	8	SC-1
M21JD4	21.4	3	±15	80	±50	2.0	3.0	80	±50 to ±300	3000//0.0	-	8	SC-4
M21SAC	21.4	3	±25	15	±75	0.5	2.5	15	±75 to ±1000	2000//0.4	-	2	UM-C

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Surface Mount Series (SMD)

Model Number	Center Frequency	Pass Band		Stop band		Ripple	Loss	Ultimate Attenuation		Terminating Impedance		Poles	Case
	(MHz)	(dB)	(KHz)	(dB)	(KHz)	(dB)	(dB)	(dB)	(Fo±kHz)	Zt (Z // pF)	C2 (pF)		
M21AJJ	21.4	3	±3.75	20	±18	1.0	2.0	70	-910	850//6.0	-	2	HM-J
M21FJJ	21.4	3	±7.5	18	±25	1.0	2.0	70	-910	1500//1.5	-	2	HM-J
M21GFJ	21.4	3	±10	10	±30	1.0	2.0	70	-910	1800//1.0	-	2	HM-J
M21JFJ	21.4	3	±15	15	±45	1.0	2.0	70	-910	2000//1.5	-	2	HM-J
M21AKJ	21.7	3	±3.75	15	±12.5	1.0	2.0	70	-910	1200//5.0	-	2	HM-J
M21FKJ	21.7	3	±7.5	15	±25	1.0	2.0	70	-910	1500//1.0	-	2	HM-J
M24CHJ	24.0	3	±5	20	±25	1.0	2.0	25 50	+350 -200	1000//3.5	-	2	HM-J
M25AAJ	25.0	3	±3.75	10	±12.5	1.0	3.0	40	-910	TBD	-	2	HM-J
M29GAJ	29.0	3	±10	10	±25	1.0	2.0	70	-910	1800//1.5	-	2	HM-J
M45AJJ	45.0	3	±3.75	20	±25	1.0	2.0	70	-910	650//3.5	-	2	HM-J
M45DJJ	45.0	3	±6	15	±20	1.0	2.0	70	-910	650//5.0	-	2	HM-J
M45FJJ	45.0	3	±7.5	15	±25	1.0	2.0	70	-910	650//3.5	-	2	HM-J
M45FKL	45.0	3	±7.5	35	±25	1.0	3.0	70	±910	650//3.0	9.0	4	HM-L
M45JLJ	45.0	3	±15	15	±60	1.0	3.0	70	-910	1100//0	-	2	HM-J
M45JJJ	45.0	3	±15	15	±60	1.0	2.0	70	-910	1200//1.8	-	2	HM-J
M45JGL	45.0	3	±15	30	±60	1.0	4.0	70	±910	1000//1.5	5	4	HM-L
M70GBJ2	70.0	3	±10	35	±40	1.0	4.0	70	±910	2800//-2.0	-2.0	4	HM-J 2X
M70GBL	70.0	3	±10	35	±40	1.0	4.0	70	±910	1650//-1.1	-1.1	4	HM-L
M77FAJ	77.550	3	±7.5	18	±28	1.0	3.0	50	-910	1500//-1.0	-	2	HM-J
MA9FAJ	109.650	3	±7.5	18	±28	1.0	3.0	50	-910	1500//-1.0	-	2	HM-J
MB8KAJ	128.550	3	±16	20	±58	1.3	2.5	25 40	+300 to +10000 -915 to -10000	950//-1.6	-	2	HM-J
MCOHAK	130.000	3	±14	15	±50	1.0	3.5	65	-910	740//-1.2	-	2	HM-K

Note: _ Specify Case Code, i.e., M10AAA = HC-49/UL Case (see Figure M1 through M6 for drawings). All "UM" packages can be made Surface Mount (See figure M3 for code).

45MHz Fundamental Series

Model Number	Center Frequency	Pass Band		Stop band		Ripple	Loss	Ultimate Attenuation		Terminating Impedance		Poles	Case
	(MHz)	(dB)	(KHz)	(dB)	(KHz)	(dB)	(dB)	(dB)	(Fo±kHz)	Zt (Z // pF)	C2 (pF)		
M45AA_	45	3	±3.75	10	±12.5	1.0	2.0	65	-910	200//4.0	-	2	UM-C~H
M45AJC	45	3	±3.75	10	±12.5	1.0	2.0	65	-910	350//10.5	-	2	UM-C
M45AB_	45	3	±3.75	30	±12.5	1.0	4.0	90	±900 to ±1000	350//6.5	18	4	UM-C~H (x2)
M45AC1	45	3	±3.75	50	±12.5	2.0	6.0	80	±900	350//5.0	-	6	SC-1
M45AD1	45	3	±3.75	70	±12.5	2.0	7.0	80	±900	350//5.0	-	8	SC-1
M45DA_	45	3	±6	15	±22	1.0	2.0	65	-910	650//5.0	-	2	UM-C~H
M45DB_	45	3	±6	30	±20	1.0	3.0	90	±900 to ±1000	500//4.0	12	4	UM-C~H (x2)
M45DC1	45	3	±6	50	±20	2.0	6.0	80	±900	600//3.0	-	6	SC-1
M45DD1	45	3	±6	70	±20	2.0	7.0	80	±900	600//3.0	-	8	SC-1
M45FA_	45	3	±7.5	15	±25	1.0	2.0	35 65	+900 to +1000 -900 to -1000	650//5.0	-	2	UM-C~H
M45FB_	45	3	±7.5	30	±25	1.0	3.0	90	±900 to ±1000	650//5.0	9	4	UM-C~H (x2)
M45FC1	45	3	±7.5	60	±25	2.0	5.0	80	±900	650//1.5	-	6	SC-1
M45FD1	45	3	±7.5	80	±25	2.0	6.0	80	±900	650//1.5	-	8	SC-1
M45GA_	45	3	±10	15	±35	1.0	2.0	35 65	+900 to +1000 -900 to -1000	800//3.0	-	2	UM-C~H
M45GB_	45	3	±10	30	±40	1.0	3.0	90	±900 to ±1000	800//2.0	6.5	4	UM-C~H (x2)
M45GKD	45	3	±10	35	±40	1.0	3.0	-	-	800//2.2	TBD	4	UM-D (x2)
M45JA_	45	3	±15	15	±60	1.5	2.5	35 65	+900 to +1000 -900 to -1000	1200//0	-	2	UM-C~H
M45JFC	45	3	±15	15	±50	1.0	2.0	70	-910	1200//1.5	-	2	UM-C
M45JB_	45	3	±15	30	±50	1.0	3.0	90	±900 to ±1000	1200//0.7	3.5	4	UM-C~H (x2)
M45JC1	45	3	±15	60	±50	2.0	5.0	80	±900	1500//0.3	-	6	SC-1
M45JD1	45	3	±15	80	±50	2.0	6.0	80	±900	1500//0.3	-	8	SC-1
M45KAC	45	3	±16	15	±60	0.5	2.5	65	-910	1100//0.93	-	2	UM-C
M45KBC	45	3	±16	35	±50	1.0	4.0	80	±910	1500//0	4.0	4	UM-C

Note: _ Specify Case Code, i.e., M10AAA = HC-49/UL Case (see Figure M1 through M6 for drawings). All "UM" packages can be made Surface Mount (See figure M3 for code).

45MHz 3rd Overtone Series

Model Number	Center Frequency	Pass Band		Stop band		Ripple	Loss	Ultimate Attenuation		Terminating Impedance		Poles	Case
	(MHz)	(dB)	(KHz)	(dB)	(KHz)	(dB)	(dB)	(dB)	(Fo±kHz)	Zt (Z // pF)	C2 (pF)		
M45AF_	45	3	±3.75	10	±12.5	1.0	2.0	35	±900	2000//0.4	-	2	UM-C,D
M45AG_	45	3	±3.75	30	±12.5	1.0	4.0	75	±900	3000//0.3	-0.1	4	UM-C,D
M45DF_	45	3	±6	15	±22	1.0	2.0	35	±900	3000//0.1	-	2	UM-C,D
M45DG_	45	3	±6	30	±22	1.0	4.0	75	±900	3600//0.7	-1.0	4	UM-C,D
M45FF_	45	3	±7.5	15	±25	1.0	2.0	35	±900	4000//0.7	-	2	UM-C,D
M45FG_	45	3	±7.5	30	±25	1.0	4.0	75	±900	4000//0.8	-1.0	4	UM-C,D
M45GF_	45	3	±10	15	±35	1.0	2.0	35	±900	4000//0.1	-	2	UM-C,D
M45GG_	45	3	±10	30	±35	1.0	4.0	75	±900	4000//0.7	-1.2	4	UM-C,D

55MHz Fundamental Series

Model Number	Center Frequency	Pass Band		Stop band		Ripple	Loss	Ultimate Attenuation		Terminating Impedance		Poles	Case
	(MHz)	(dB)	(KHz)	(dB)	(KHz)	(dB)	(dB)	(dB)	(Fo±kHz)	Zt (Z // pF)	C2 (pF)		
M55FAC	55	3	±7.5	15	±25	1.0	2.0	70	-910	600//3.0	-	2	UM-C
M55FBC	55	3	±7.5	30	±25	1.0	3.0	90	±910	600//1.5	9.5	4	UM-C
M55GAC	55	3	±10	15	±30	1.0	2.0	75	-910	910//2.5	---	2	UM-C
M55GBC	55	3	±10	25	±25	1.0	3.0	90	±910	910//1.0	6.0	4	UM-C
M55JAC	55	3	±15	15	±50	1.0	2.0	70	-910	1200//1.5	-	2	UM-C
M55JBC	55	3	±15	30	±50	1.0	3.0	90	±910	1200//0.7	3.5	4	UM-C
M55KAC	55	3	±16	4.0	±29.5	0.5	2.5	65	-910	1250//1.3	-	2	UM-C
M55KBC	55	3	±16	30	±52	1.0	5.0	80	±910	1250//0.5	TBD	4	UM-C

Note: _ Specify Case Code, i.e., M10AAA = HC-49/UL Case (see Figure M1 through M6 for drawings). All “UM” packages can be made Surface Mount (See figure M3 for code).

MONOLITHIC CRYSTAL FILTERS

FILTRONETICS, INC

70MHz & 90MHz Series

Model Number	Center Frequency	Pass Band		Stop band		Ripple	Loss	Ultimate Attenuation		Terminating Impedance		Poles	Case
	(MHz)	(dB)	(KHz)	(dB)	(KHz)	(dB)	(dB)	(dB)	(Fo±kHz)	Zt (Z // pF)	2C (pF)		
M70AA_	70	3	±3.75	10	±12.5	1.0	2.0	35 35	+500 to +1000 -200 to -1000	2000//0	-	2	UM-C~H
M70AB_	70	3	±3.75	30	±12.5	1.0	4.0	70 75	+500 to +1000 -200 to -1000	1800//0	0.5	4	UM-C~H
M70DA_	70	3	±6	15	±22	1.0	2.0	35 35	+500 to +1000 -200 to -1000	2000//0.4	-	2	UM-C~H
M70DB_	70	3	±6	30	±25	1.0	3.0	70 75	+500 to +1000 -200 to -1000	2000//0.2	0	4	UM-C~H
M70FA_	70	3	±7.5	15	±25	1.0	2.5	35	-910	2000//1.0	-	2	UM-C~H
M70FB_	70	3	±7.5	25	±25	1.0	3.0	70 75	+500 to +1000 -200 to -1000	2000//0.4	-0.5	4	UM-C~H(x2)
M70FGC	70	3	±7.5	40	±35	1.0	4.0	70	±910	2000//1.0	-0.5	4	UM-C(x2)
M70GA_	70	3	±10	15	±40	1.0	2.0	35 35	+500 to +1000 -200 to -1000	2500//1.0	-	2	UM-C~H
M70GB_	70	3	±10	35	±40	1.0	3.0	70 75	+500 to +1000 -200 to -1000	2500//0.8	-1.0	4	UM-C~H
M70JA_	70	3	±15	15	±60	1.0	2.0	35 35	+500 to +1000 -200 to -1000	4000//0.7	-	2	UM-C~H
M70JB_	70	3	±15	30	±60	1.0	2.0	70 75	+500 to +1000 -200 to -1000	4000//0.8	-1.1	4	UM-C~H(x2)
M90AA_	90	3	±3.75	10	±12.5	1.0	2.0	35 35	+500 to +1000 -200 to -1000	2000//0.3	-	2	UM-C~H
M90AB_	90	3	±3.75	30	±12.5	1.0	4.0	70 75	+500 to +1000 -200 to -1000	1200//0.1	0.7	4	UM-C~H(x2)
M90DA_	90	3	±6	15	±22	1.0	2.0	35 35	+500 to +1000 -200 to -1000	2000//0	-	2	UM-C~H
M90DB_	90	3	±6	30	±25	1.0	3.0	70 75	+500 to +1000 -200 to -1000	1800//0.3	-0.2	4	UM-C~H(x2)
M90FA_	90	3	±7.5	15	±30	1.0	2.0	35 35	+500 to +1000 -200 to -1000	2000//0.1	-	2	UM-C~H
M90FB_	90	3	±7.5	25	±25	1.0	3.0	70 75	+500 to +1000 -200 to -1000	2000//0.5	-0.5	4	UM-C~H(x2)
M90GA_	90	3	±10	15	±40	1.0	2.0	35 35	+500 to +1000 -200 to -1000	2500//0.4	-	2	UM-C~H
M90GB_	90	3	±10	35	±40	1.0	3.0	70 75	+500 to +1000 -200 to -1000	2500//0.6	-0.8	4	UM-C~H(x2)
M90JA_	90	3	±15	15	±60	1.0	2.0	35 35	+500 to +1000 -200 to -1000	4000//0.7	-	2	UM-C~H
M90JB_	90	3	±15	30	±60	1.0	3.0	70 75	+500 to +1000 -200 to -1000	4000//0.7	-1.3	4	UM-C~H(x2)

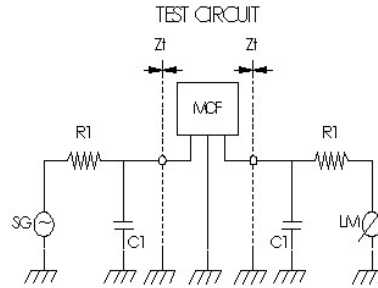
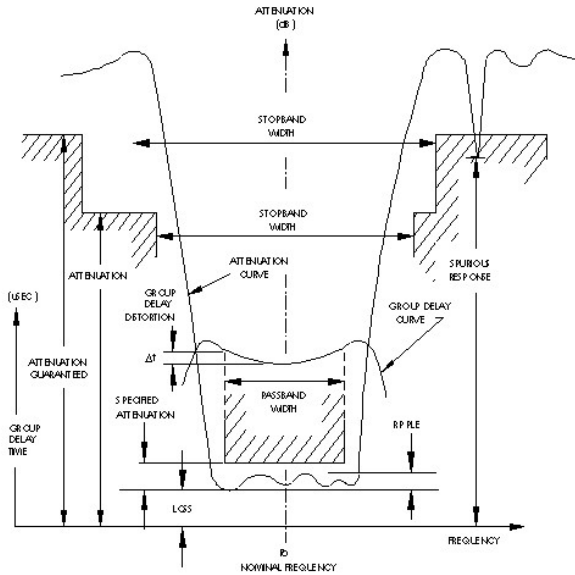
Note: *_ Specify Case Code, i.e., M10AAA = HC-49/UL Case (see Figure 1 through 6 for drawings). All "UM" packages can be made Surface Mount (See figure M3 for code).

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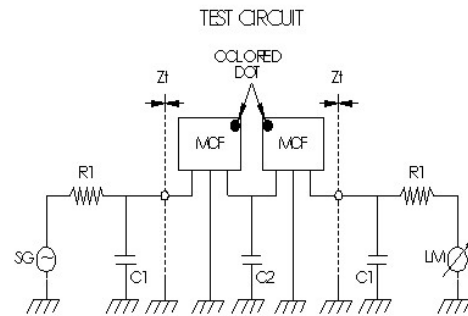
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04/29/07

MEASUREMENT DEFINITIONS



2 pole MCF
Z1 : TERMINATING IMPEDANCE
HC-4P/U8, LM11 PACKAGES
ALL SC-X PACKAGES - 2,4,6 & 8 POLE



4 pole MCF
Z1 : TERMINATING IMPEDANCE
HC-4P/U8, LM11 PACKAGES

R1 = TERMINATING RESISTANCE
C1 = TERMINATING CAPACITANCE
C2 = JUNCTION CAPACITANCE
CONSULT FACTORY FOR
ALTERNATE LOADING CIRCUITS

Case Code L

TOP VIEW

BOTTOM VIEW

Measurement circuit chart (BOTTOM VIEW)

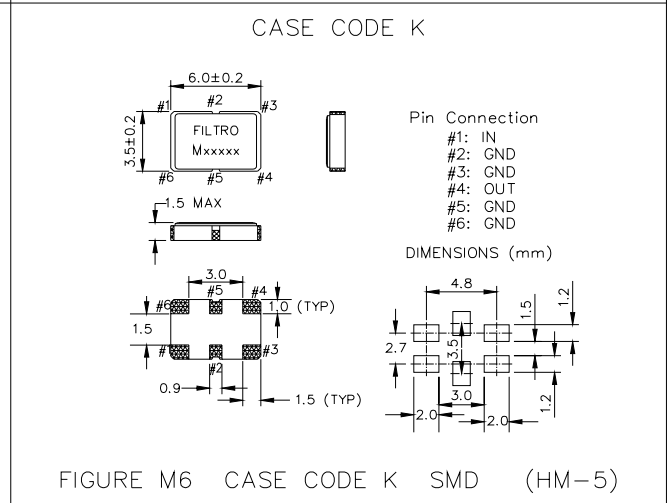
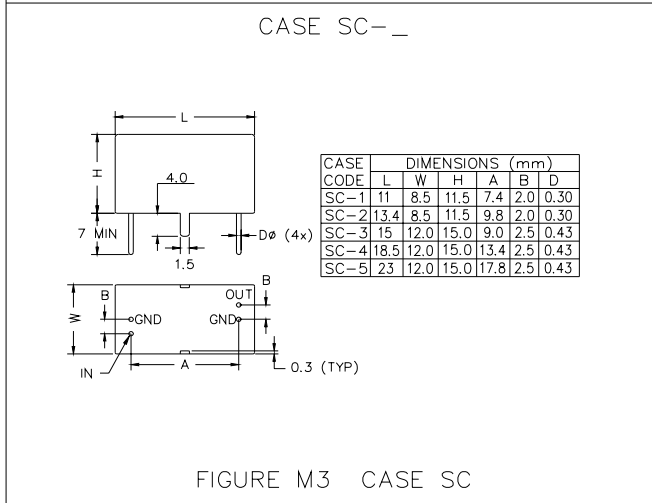
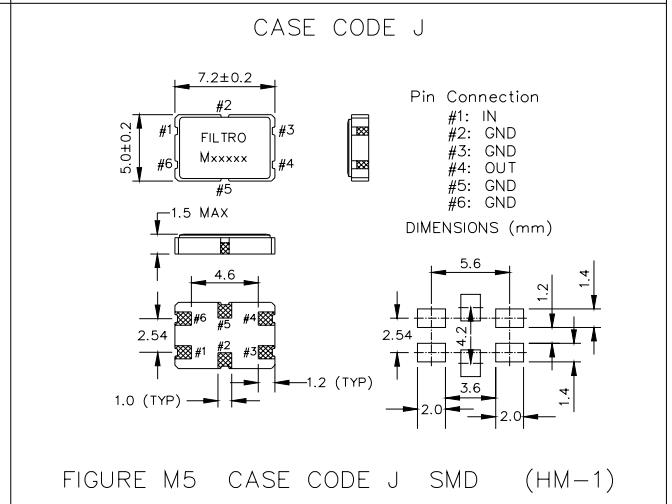
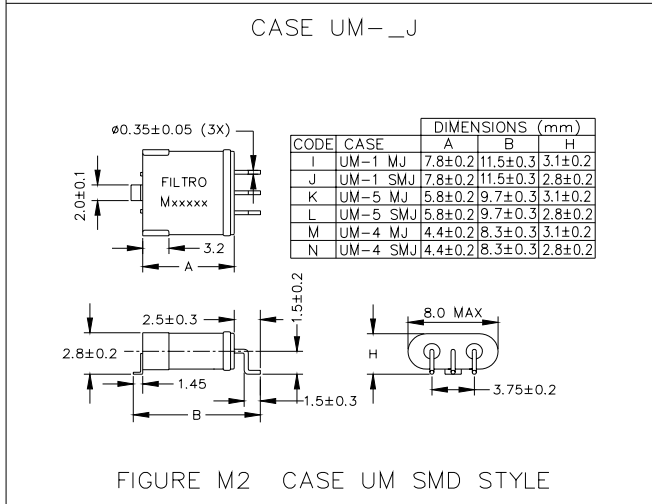
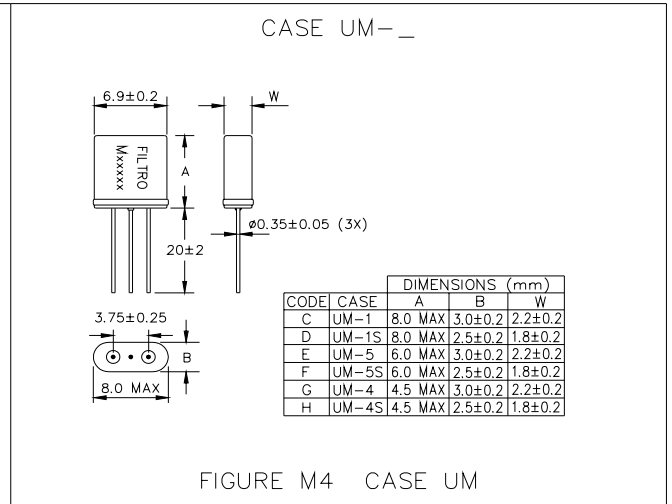
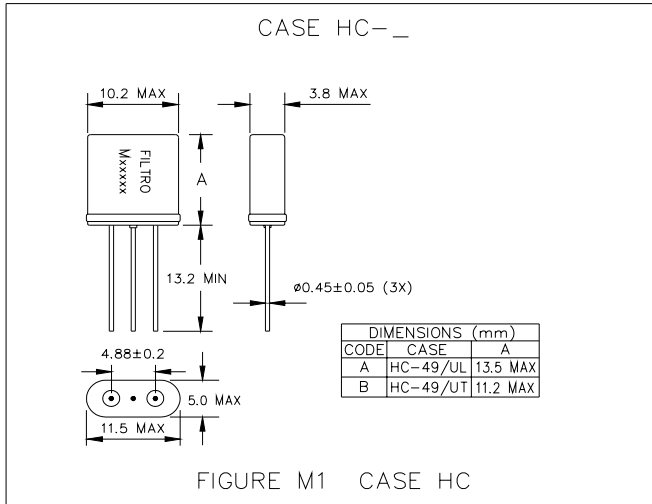
Legend:
#1 END
#2 Coupling CAP
#3 OUT/IN
#4 GND
#5 Coupling CAP
#6 IN/OUT

*Zc: The coupling capacitor external is necessary

Reference land pattern

All MCF's are RoHS compliant

Case Drawings for Monolithic Crystal Filters



MCF-01 DWG Rev 1/15/02