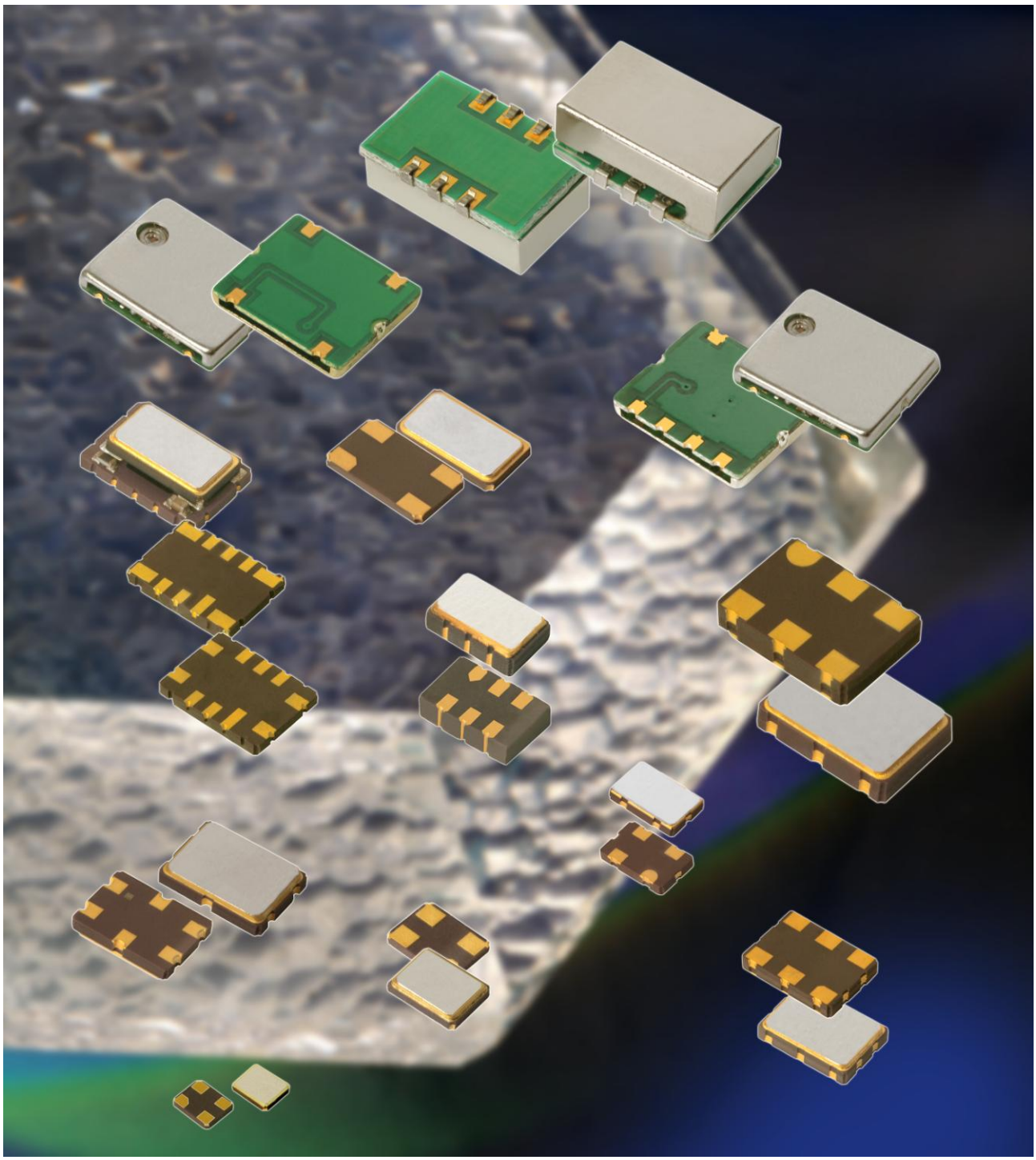
QuartzCom
the communications company

Quartz Filters

MORE THAN FREQUENCY

Crystal Filters & Monolithic Crystal Filters (MCF)



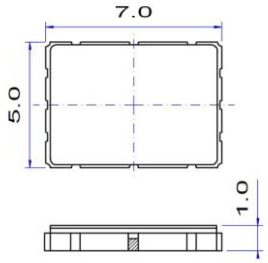
Quartz Filter

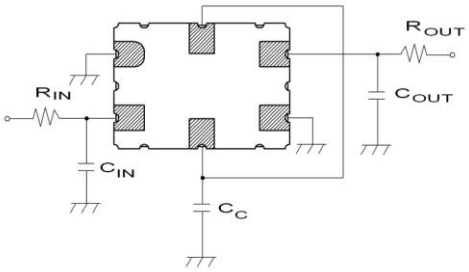
Ceramic packaged SMD MCF

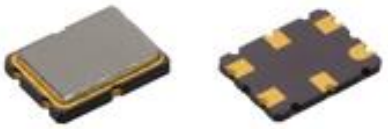
Type	Nominal Frequency	Pole	Pass Band		Attenuation Band		Ripple max.	Insertion Loss	Attenuation Guaranteed		Terminal Impedance Z_{IN} = Z_{OUT}
	[MHz]		[dB]	[kHz]	[dB]	[kHz]	[dB]	[dB]	[dB]	[Fo ~ ±kHz]	[Ω // pF // pF]
21S7A	21.4000	2	3	±3.75	18	±18	1.0	1.5	50	-910 ±10	850 // 6.0
21S7B	21.4000	4	3	±3.75	35	±14	1.0	2.5	80	-910 ±10	1000 // 4.5 Cc = 4.5
21S12B	21.4000	4	3	±6.0	30	±20	1.0	2.5	80	-910 ±10	1500 // 2.0 Cc = 8.0
21S15A	21.4000	2	3	±7.5	15	±25	1.0	1.5	50	-910 ±10	1500 // 2.0
21S15B	21.4000	4	3	±7.5	35	±25	1.0	2.5	80	-910 ±10	1500 // 5.0 Cc = 5.0
21S30A	21.4000	2	3	±15.0	15	±45	1.0	1.5	45	-910 ±10	3000 // 0
21S30B	21.4000	4	3	±15.0	35	±50	1.0	2.5	80	-910 ±10	3000 // -1.5 Cc = 6.0
32S8A	32.7680	2	3	±4.0	40	±40	1.0	2.0	60	-910 ±10	650 // 4.5
38S8AF	38.4000	2	3	±4.0	40	±40	1.0	2.0	65	-910 ±10	650 // 4.5
45S7BF	45.0000	4	3	±3.75	30	±12	1.0	4.0	80	-910 ±10	550 // 2.5 Cc = 15.5
45S15BF	45.0000	4	3	±7.5	35	±25	1.0	3.0	80	-910 ±10	900 // 2.0 Cc = 7.0
45S12BF	45.0000	4	3	±6.0	30	±20	1.0	3.0	80	-910 ±10	950 // 1.2 Cc = 8.0
45S12BF10	45.1000	4	3	±6.0	30	±20	1.0	3.0	80	-910 ±10	950 // 1.2 Cc = 8.0
45S20BF	45.0000	4	3	±10.0	25	±25	1.0	3.0	80	-910 ±10	1'000 // 1.6 Cc = 5.0
45S30BF	45.0000	4	3	±15.0	30	±50	1.0	3.0	80	-910 ±10	1500 // 0.7 Cc = 3.0
45S34AF	45.0000	2	3	±17.0	15	±60	1.0	2.5	65	-910 ±10	800 // 2.9
70S15A	70.0000	2	3	±7.5	18	±20	1.0	3.0	50	-910 ±10	1500 // -1
73S13B	73.0000	4	3	±6.5	30	±20	1.0	4.0	70	-910 ±10	1700 // -0.6 Cc = -1.3
90S7A	90.0000	2	3	±10.0	15	±35	1.0	4.0	30	-910 ±10	1800 // -0.8
92S6A	92.1600	2	3	±3.0	30	±30	1.0	3.0	30	-910 ±10	2000 // -1

operating temperature range	-20 ~ +70 °C -30 ~ +75 °C -40 ~ +85 °C	commercial application on request industrial application
packaging units for SMD type	tape & reel:	500 or 1k pieces
other nominal frequencies , pass band and attenuations on request		

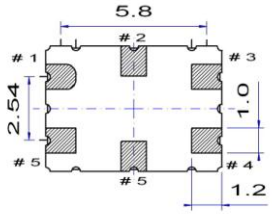
4 Poles

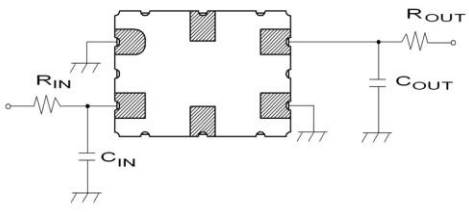






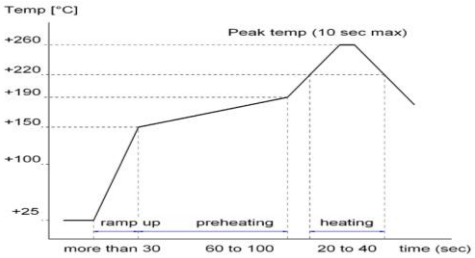
2 Poles





dimensions in mm

Example for IR reflow soldering temperature



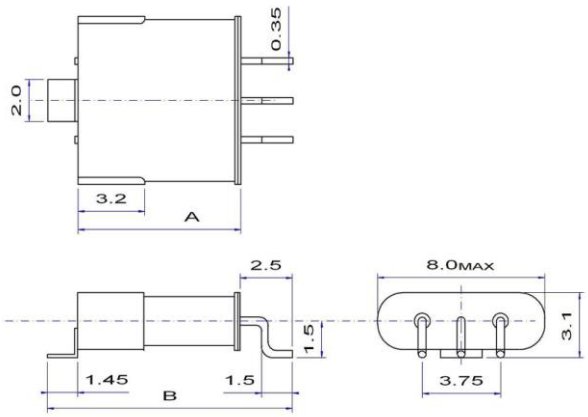
Quartz Filter

Metal packaged SMD & Through hole MCF

Type	Nominal Frequency	Pole	Pass Band		Attenuation Band		Ripple max.	Insertion Loss	Attenuation Guaranteed		Terminal Impedance Z_{IN} = Z_{OUT}	
	[MHz]		[dB]	[kHz]	[dB]	[kHz]	[dB]	[dB]	[dB]	[Fo ~ ± kHz]	[Ω // pF // pF]	
21M7A	21.4000	2	3	±3.75	20	±18.0	0.5	1.5	35 50	+350 ~ +1000 -200 ~ -1000	850 // 6.0	
21M7B	21.4000	4	3	±3.75	40	±14.0	1.0	2.5	65 80	+350 ~ +1000 -200 ~ -1000	850 // 5.0	Cc = 18
21M15A	21.4000	2	3	±7.5	18	±25.0	0.5	1.5	35 50	+350 ~ +1000 -200 ~ -1000	1500 // 2.0	
21M15B	21.4000	4	3	±7.5	40	±25.0	1.0	2.5	65 80	+350 ~ +1000 -200 ~ -1000	1500 // 2.0	Cc = 8
35M8ET	35.4000	10	3	±4.0	50	±8.0	1.0	5.0	80	±1000	50	
35M26ET	35.4000	10	3	±13.0	55	±22.0	1.0	3.0	80	±1000	50	
45M7AF	45.0000	2	3	±3.75	10	±12.5	1.0	2.0	65	-910	200 // 4.0	
45M7BF	45.0000	4	3	±3.75	30	±12.5	1.0	4.0	90	±900 ~ ±1000	350 // 6.5	Cc = 18
45M15AF	45.0000	2	3	±7.5	15	±25.0	1.0	2.0	35 65	+900 ~ +1000 -900 ~ -1000	650 // 3.0	
45M15BF	45.0000	4	3	±7.5	30	±25.0	1.0	3.0	90	±900 ~ ±1000	650 // 3.0	Cc = 9
45M20BF	45.0000	4	3	±10.0	30	±40.0	1.0	3.0	90	±900 ~ ±1000	800 // 2.0	Cc = 6.5
45M30BF	45.0000	4	3	±15.0	30	±50.0	1.0	3.0	90	±900 ~ ±1000	1200 // 0.7	Cc = 3.5
70M15B	70.0000	4	3	±7.5	25	±25.0	1.0	3.0	70	+500 ~ +1000 -200 ~ -1000	2000 // -1	Cc = -1
90M15B	90.0000	4	3	±7.5	25	±25.0	1.0	3.5	70	+500 ~ +1000 -200 ~ -1000	1400 // -1	Cc = -1

operating temperature range	-20 ~ +70 °C -40 ~ +85 °C	commercial application industrial application	
packaging units for SMD type	tape & reel:	500 or 1k pieces	
other nominal frequencies , pass band and attenuations on request			

2 Poles & 4 Poles



Type	A	B
UM-1 MJ	8.0	12.0
UM-5 MJ	6.0	10.0
UM-4 MJ	4.5	8.5

dimensions in mm

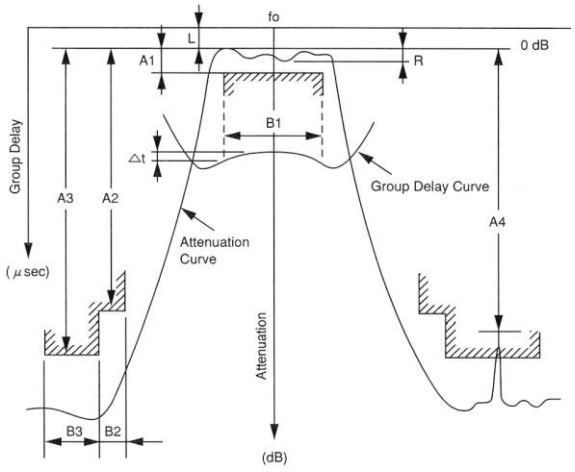
2 Poles & 4 Poles

6 Poles, 8 Poles & 10 Poles

Quartz Filter

Terms and Definitions for Quartz Crystal Filters

Term	Reference Symbol	Definition
nominal frequency	fo (MHz)	frequency given in specification, to which other frequencies may be referred
pass band	B1 (kHz) A1 (dB)	band of frequencies B1 in which the attenuation is equal to or less than a specified value A1 (IF) band of frequencies B1 in which the attenuation is equal to or less than the insertion loss L (RF)
insertion loss	L (dB)	the logarithmic ratio of the power delivered to the load impedance before insertion of the filter to the power delivered to the load impedance after insertion of the filter
ripple	R (dB)	the difference between the minimum peak attenuation and the maximum peak attenuation within a pass band
stop band attenuation	B2 (kHz), A2 (dB) B3 (kHz), A3 (dB)	bands of frequencies B2 and B3 in which the attenuations are equal to or greater than specified values A2 and A3 respectively
guaranteed attenuation	A3 (dB)	the maximum guaranteed attenuation at the specified frequency range
spurious response	A4 (dB)	minimum attenuation caused by extraordinary response in the stop band; spurious response usually appears at a higher frequency than the centre frequency.
group delay distortion	△t (µs)	the difference between the maximum and minimum group delay within a passband B1 unless otherwise specified
terminating impedance	Zt: Rt // Ct (Ω // pF)	either of the impedances presented to the filter by the source or by the load (Rt: resistive portion Ct: parallel capacitive portion including stray capacitance)
coupling impedance	Zc (pF)	the impedance inserted between the filter elements when the filter is composed of two or more elements

Characteristics	Required specification for quotation request	Units	Example
	**Type**		**45S15BF**
	number of pole		**4**
	nominal frequency	**MHz**	**45.000**
	pass band @ 3 dB	**kHz**	**±7.5 kHz**
	insertion loss	**dB**	**3.0 dB**
	ripple	**dB**	**1.0 dB**
	stop band attenuation	**dB / ± kHz**	**35 dB @ Fo ±25 kHz**
	guaranteed attenuation	**dB / ± kHz**	**80 dB @ Fo - 900 ±10 kHz**
	terminating impedance	**Ω // pF**	**900 Ω // 2.0 pF**
	coupling capacitance Cc (for 4 pole only)	**pF**	**7.0 pF**
	package type		**SMD 7.0 x 5.0 mm**
	operating temperature range	**°C**	**-20 ~ +85 °C**
	storage temperature range	**°C**	**-55 ~ +125 °C**

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