



THE DATASHEET OF 7M48072002

Features

Frequency range : 10MHz to 114MHz
 Ceramic SMD package
 Seam sealing
 External dimensions (mm)
 L : 3.2 x W : 2.5 x H : 0.7
 RoHS compliant & Pb free

Applications

Bluetooth, Wireless LAN
 Cellular phone, Pager, DSC
 Display, TV
 Computer peripherals
 Consumer products

Electrical Characteristics

Item		7M	Conditions
Frequency Range	F_0	10MHz ~ 114MHz	
Frequency Tolerance	F_{tol}	$\pm 30\text{ppm}$, $\pm 20\text{ppm}$, $\pm 10\text{ppm}$	at 25°C
Frequency Stability over Operating Temperature Range (refer to 25°C)	F_{stab}	$\pm 30\text{ ppm}$	-20°C ~ +70°C
		$\pm 20\text{ ppm}$	
		$\pm 10\text{ ppm}$	
		$\pm 10\text{ ppm}$	-30°C ~ +85°C
		$\pm 30\text{ ppm}$	-40°C ~ +85°C
		$\pm 20\text{ ppm}$	
		$\pm 15\text{ ppm}$	
		$\pm 60\text{ ppm}$	-40°C ~ +125°C
Operating Temperature Range	T_{OTR}	-20°C ~ +70°C	
		-40°C ~ +85°C	
		-40°C ~ +125°C	
Shunt Capacitance	C_0	3pF Max.	
Drive Level	D_L	1 ~ 200μW (100μW Typ.)	
Load Capacitance	C_L	6pF, 8pF, 9pF, 10pF 12pF, 16pF, 18pF, 20pF	
Aging (at 25°C ± 3°C, first year)	F_{aging}	$\pm 3\text{ppm Max.}$	Note [1]
Storage Temperature Range	T_{STR}	-55°C ~ +125°C	

Notes:

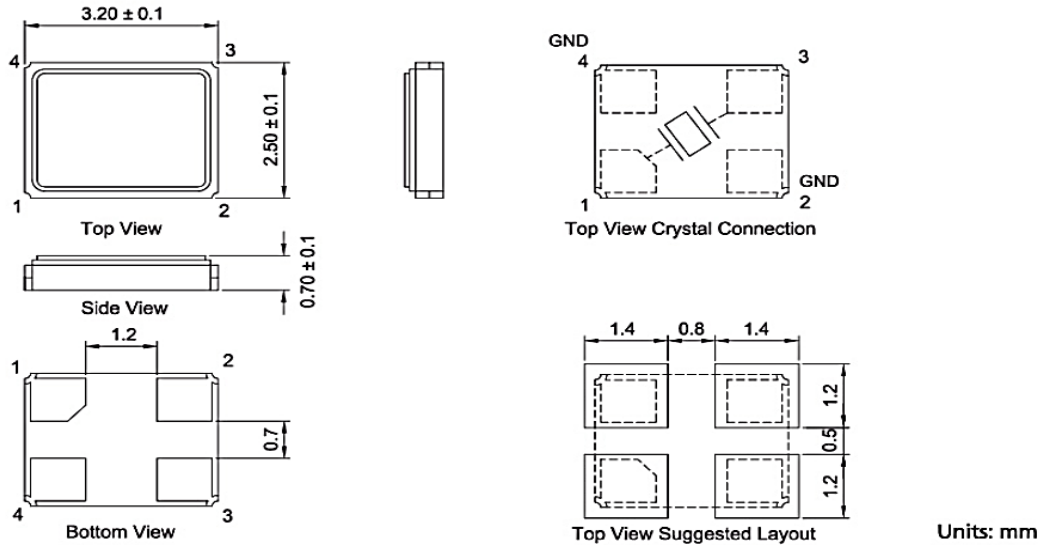
[1] Please contact us for low aging +/-1ppm grade crystals.

Motional Resistance (ESR)

Fundamental	
10 ~ 12 MHz	150Ω Max.
12 ~ 16 MHz	80Ω Max.
16 ~ 20 MHz	60Ω Max.
20 ~ 64 MHz	50Ω Max.

3rd Overtone	
60 ~ 80 MHz	80Ω Max.
80 ~ 114 MHz	60Ω Max.

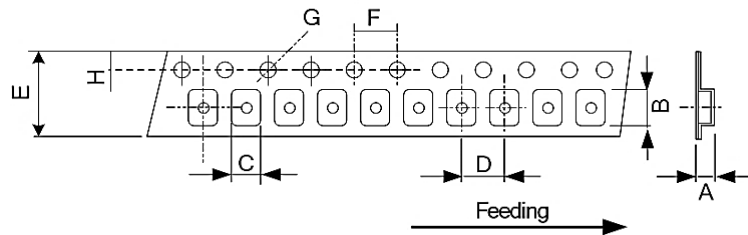
Dimensions



Ordering Information

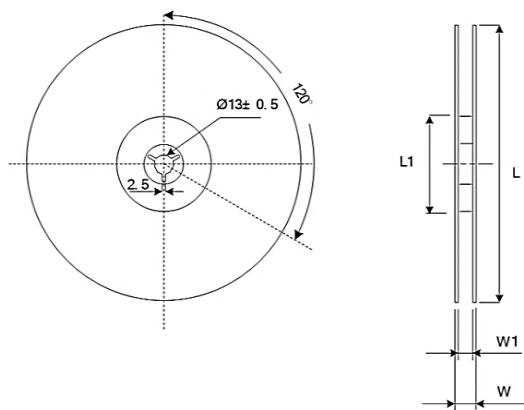
7M	-	20.000M	A	H	E	-	T
Frequency in Hz			Packaging Method				
Please contact us for available frequencies			T Tape & Reel				
Frequency Tolerance (at 25°C)			Load Capacitance				
A	± 30 ppm		B 6 pF				
D	± 20 ppm		V 8 pF				
E	± 10 ppm		C 9 pF				
			Q 10 pF				
			E 12 pF				
			I 16 pF				
			J 18 pF				
			K 20 pF				
Frequency Stability (over Temp.)							
A	± 30 ppm (-20°C ~ +70°C)						
D	± 20 ppm (-20°C ~ +70°C)						
E	± 10 ppm (-20°C ~ +70°C)						
T	± 10 ppm (-30°C ~ +85°C)						
H	± 30 ppm (-40°C ~ +85°C)						
I	± 20 ppm (-40°C ~ +85°C)						
J	± 15 ppm (-40°C ~ +85°C)						
K	± 60 ppm (-40°C ~ +125°C)						

Packing



DIMENSIONS	A	B	C	D	E	F	G	H
	1.65 ±0.10	3.40 ±0.10	2.70 ±0.10	4.00 ±0.10	8.00 ±0.20	4.00 ±0.10	1.55 ±0.05	1.75 ±0.10

(Unit: mm)



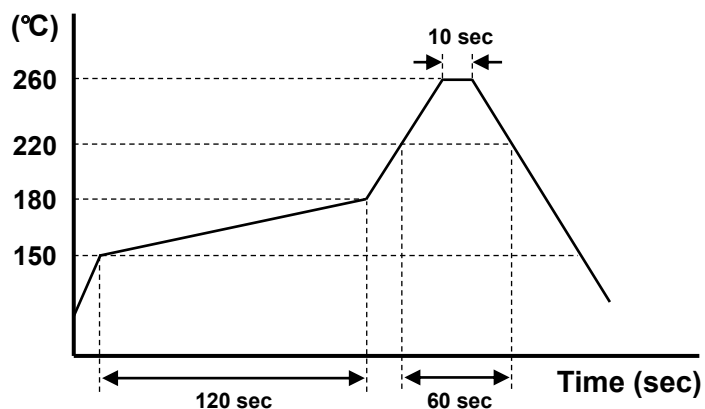
DIMENSIONS	L	L1	W	W1
	178 ±1.00	60.2 ±0.50	11.5 ±0.2	8 ±0.1

(Unit: mm)

Reflow Profile

Solder melting point : 220°C ± 10°C, 60 sec. Min.

Peak temperature : 260°C ± 10°C, 10 sec. Min.



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