

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:

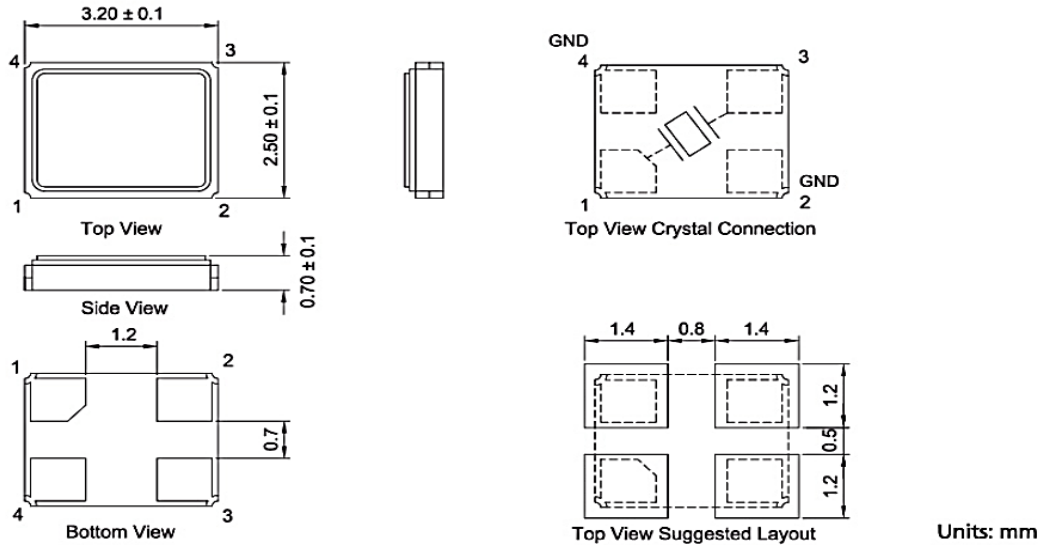
[1] Please contact us for low aging +/-1ppm grade crystals.

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

Please contact us for available frequencies

Frequency Tolerance (at 25°C)

A ± 30 ppm

D ± 20 ppm

E ± 10 ppm

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)

Packaging Method

T Tape & Reel

Load Capacitance

B 6 pF

V 8 pF

C 9 pF

Q 10 pF

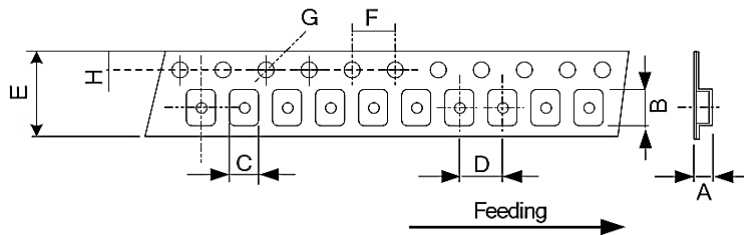
E 12 pF

I 16 pF

J 18 pF

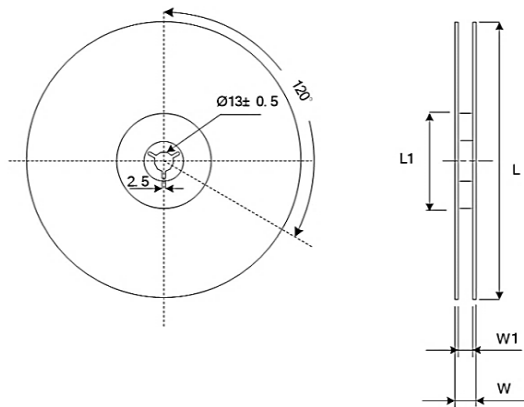
K 20 pF

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 : $220^{\circ}\text{C} \pm 10^{\circ}\text{C}$, 60 sec. Min.

Peak temperature : $260^{\circ}\text{C} \pm 10^{\circ}\text{C}$, 10 sec. Min.

