

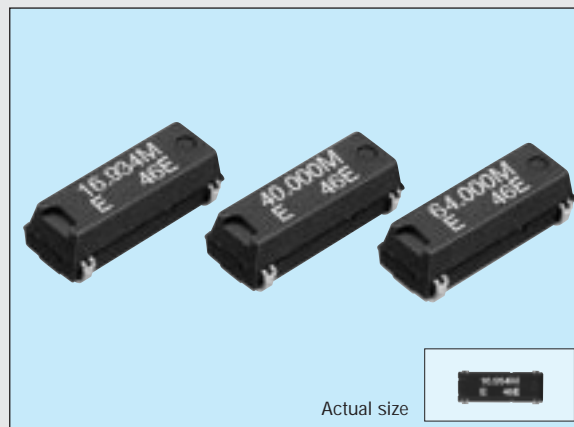
SMD HIGH-FREQUENCY CRYSTAL UNIT

# MA-406

Products number

**Q22MA406xxxxx00**

- High-density mounting-type SMD.
- Excellent heat-resistance and environment capability.
- Cover a wide frequency range, from 4 MHz to 64 MHz.



## Specifications (characteristics)

Item	Symbol	Specifications	Remarks	
Nominal frequency	f	4.000 MHz to 29.999 MHz *1	Fundamental mode	
		30.000 MHz to 64.000 MHz *2	3rd overtone mode	
Temperature range	Storage temperature	T <sub>STG</sub>	-55 °C to +125 °C	Stored as bare product after unpacking
	Operating temperature	T <sub>OPR</sub>	-20 °C to +70 °C	Please contact us on availability of -40 °C to +85 °C
Drive level	Maximum drive level	GL	2 mW	Only crystal oscillation is guaranteed
	Recommended drive level	DL	10 μW to 100 μW	
Frequency tolerance (standard)	Δf/f	±50 x 10 <sup>-6</sup>	T <sub>a</sub> =+25 °C±3 °C	
Frequency temperature characteristics (standard)		Under 5.5 MHz: ±50 x 10 <sup>-6</sup>	-20 °C to +70 °C	
		Over 5.5 MHz: ±30 x 10 <sup>-6</sup>		
Load capacitance	C <sub>L</sub>	Fundamental: 10 pF to ∞	Please specify	
		Over tone: 5 pF to ∞		
Series resistance	R <sub>1</sub>	As per table below	-20 °C to +70 °C , DL=100 μW	
Shunt capacitance	C <sub>0</sub>	5 pF Max.		
Insulation resistance	IR	500 MΩ Min.		
Aging	f <sub>a</sub>	±5 x 10 <sup>-6</sup> / year	T <sub>a</sub> =+25 °C ±3 °C , first year	
Shock resistance	S.R.	±10 x 10 <sup>-6</sup> Max.	Three drops on a hard board from 750 mm or excitation test with 29400 m/s <sup>2</sup> x 0.3 ms x 1/2 sine wave x 3 directions	

\*1 8.0 MHz < f < 8.2 MHz: Unavailable.

4.0 MHz ≤ f < 5.5 MHz : See "Available frequencies form 4.0 MHz to less than 5.5 MHz" on page 22.

\*2 26.000 MHz ≤ f < 30.000 MHz :please contact us for inquiries for 3rd overtone mode.

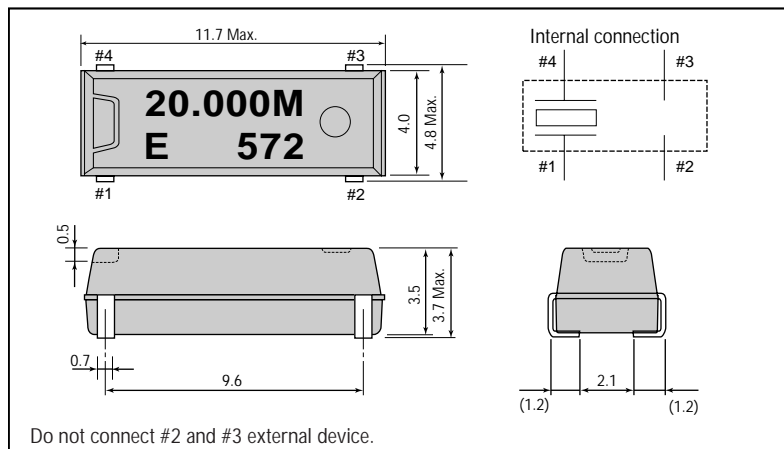
Metal may be exposed on the top of this product. This won't affect any quality, reliability or electrical spec.

## Series resistance

Frequency (MHz)	4.0 ≤ f < 5.5	5.5 ≤ f < 6.0	6.0 ≤ f < 10.0	10.0 ≤ f < 12.0	12.0 ≤ f < 16.0	16.0 ≤ f < 30.0	26.0 ≤ f ≤ 36.0	36.0 < f ≤ 64.0
Series resistance (Ω)	150 Ω Max.	100 Ω Max.	80 Ω Max.	60 Ω Max.	50 Ω Max.	40 Ω Max.	100 Ω Max.	80 Ω Max.
Oscillation mode	Fundamental mode						3rd overtone mode	

## External dimensions

(Unit: mm)



## Recommended soldering pattern

(Unit: mm)

