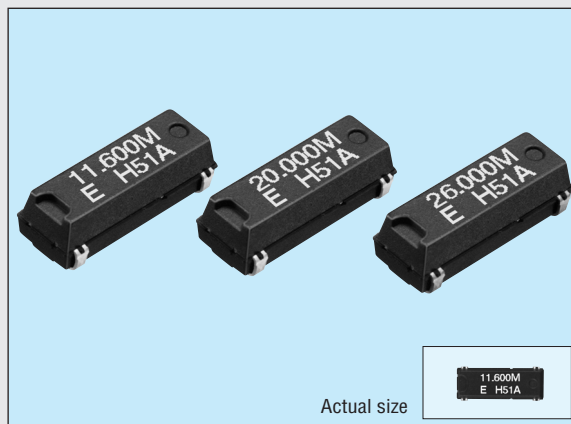


SMD HIGH-STABILITY CRYSTAL UNIT

MA-406H

- High-density mounting-type SMD.
- Excellent heat-resistance and environment capability.
- 9.6 MHz to 27.0 MHz available.



Actual size

11.600M
E
H51A

Specifications (characteristics)

Item	Symbol	Specifications	Remarks	
Nominal frequency range	f	9.600 MHz to 27.000 MHz	Fundamental mode	
Temperature range	Storage temperature	T _{STG}	-55 °C to +125 °C	Stored as bare product after unpacking
	Operable temperature	T _{OPR}	-40 °C to +85 °C	
Drive level	Maximum drive level	GL	2 mW Max.	Only crystal oscillation is guaranteed
	Recommended drive level	DL	10 μW to 100 μW	
Soldering condition (reflow)	T _{SOL}	+240 °C Max. within 10 s and under +200 °C within 40 s		
Frequency tolerance (standard)	Δf/f	±10 × 10 ⁻⁶	T _a =+25 °C ±3 °C, DL=100 μW	
Frequency temperature characteristics		As per below table		
Load capacitance	C _L	10 pF to ∞	Please specify	
Series resistance	R ₁	As per below table	Operable temperature range, DL=100 μW	
Shunt capacitance	C ₀	3.0 pF Max.		
Insulation resistance	IR	500 MΩ Min.		
Aging	fa	±1 × 10 ⁻⁶ /year Max.	T _a =+25 °C ±1 °C, DL=100 μW	
Shock resistance	S. R.	±1 × 10 ⁻⁶ Max.	Three drops on a hard wooden board from 750 mm or excitation test with 29400 m/s ² × 0.3 ms × 1/2 sine wave × 3 directions	

Measured values for frequency tolerance and temperature characteristics need to be brought into mutual correlation prior to the start of production. Metal may be exposed on the top of this product. This won't affect any quality, reliability or electrical spec.

Frequency temperature characteristics

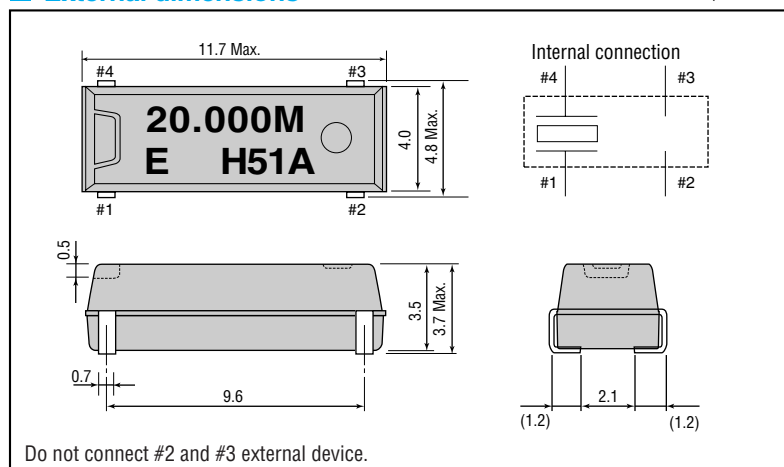
Temperature range	Frequency tolerance
0 °C to +50 °C	± 3 × 10 ⁻⁶ Min.
-10 °C to +60 °C	± 5 × 10 ⁻⁶ Min.
-20 °C to +70 °C	± 7 × 10 ⁻⁶ Min.
-30 °C to +80 °C	±10 × 10 ⁻⁶ Min.
-40 °C to +85 °C	±15 × 10 ⁻⁶ Min.

Series resistance

Frequency (MHz)	Series resistance (Ω)
9.6 ≤ f < 10.0	50 Ω Max.
10.0 ≤ f < 12.0	40 Ω Max.
12.0 ≤ f < 16.0	30 Ω Max.
16.0 ≤ f ≤ 27.0	25 Ω Max.

External dimensions

(Unit: mm)



Recommended soldering pattern

(Unit: mm)

