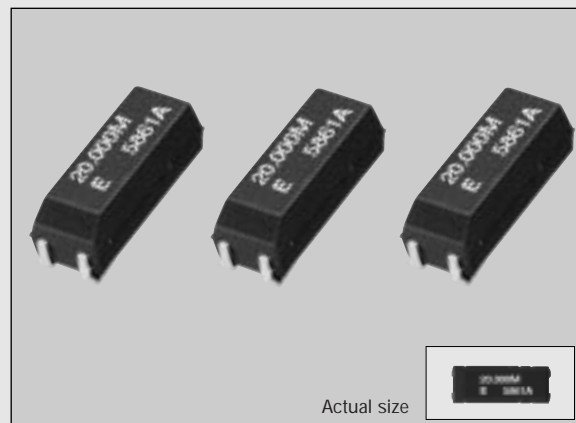SMD HIGH-FREQUENCY CRYSTAL UNIT

MA-505/MA-506

- High-density mounting-type SMD.
- Excellent heat-resistance and environment capability.
- Capable of covering a wide range of frequency range from 4.0 MHz to 64 MHz.

Actual size

■ Specifications (characteristics)

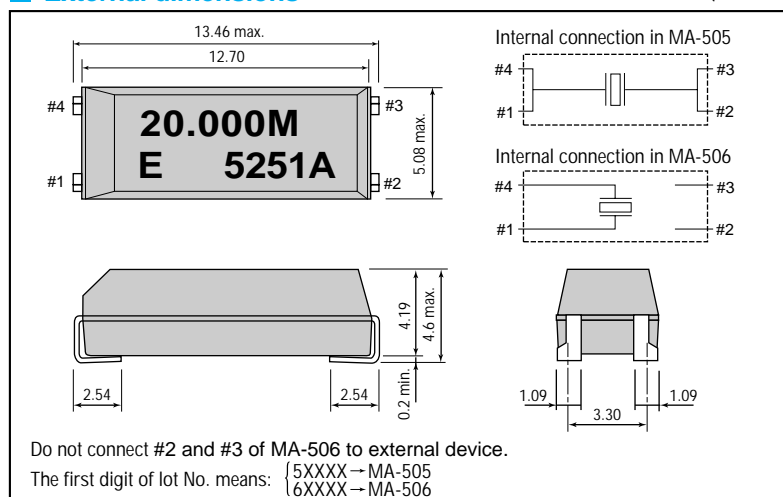| Item		Symbol	Specifications	Remarks
Nominal frequency range		f	4.000 MHz to 30.000 MHz *1	Fundamental mode
			26.000 MHz to 64.000 MHz	3rd overtone mode
Temperature range	Storage temperature	T$_{STG}$	-55°C to +125°C	Stored as bare product after unpacking
	Operating temperature	T$_{OPR}$	-20°C to +70°C	
Drive level	Maximum drive level	GL	2mW max.	Only crystal oscillation is guaranteed
	Recommended drive level	DL	10µW to 100µW	
Soldering condition		T$_{SOL}$	Twice at under 260°C within 10 sec. or under 230°C within 3 min.	
Frequency tolerance (standard)		Δf/f	±50ppm	Ta=25°C±3°C, DL=100µW
Frequency temperature characteristics (standard)			Under 5.5 MHz: ±50ppm	-20°C to +70°C, DL=100µW
			Over 5.5 MHz: ±30ppm	
Load capacitance		C$_L$	Fundamental: 10pF to ∞. Over tone: 5pF to ∞	Please specify
Series resistance		R$_1$	As per below table	-20°C to +70°C, DL=100µW
Shunt capacitance		C$_0$	5pF max.	
Insulation resistance		IR	500 MΩ min.	
Aging		fa	±5ppm/year max.	Ta=25°C±3°C, first year
Shock resistance		S. R.	±10ppm max.	Three drops on a hard board from 75 cm or excitation test with 3000G x 0.3ms x 1/2 sine wave x 3 directions

*1 8.0 MHz < f < 8.2 MHz: Unavailable.
 For frequencies below 5.5 MHz, see "Available frequencies from 4.0 MHz to less than 5.5 MHz" on page 20.
 26.000 MHz to 30.000 MHz: If not specified, 3rd overtone will be delivered.

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 resonance 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.
Mode	Fundamental mode						3rd overtone mode	

■ External dimensions (Unit: mm)

13.46 max.
12.70

#4   #3
#1   #2

20.000M
E   5251A

5.08 max.

Internal connection in MA-505
#4 ─── #3
#1 ─── #2

Internal connection in MA-506
#4   #3
#1 ─── #2

4.19
4.6 max.
2.54   2.54   0.2 min.
1.09   3.30   1.09

Do not connect #2 and #3 of MA-506 to external device.
The first digit of lot No. means: { 5XXXX → MA-505
                                     6XXXX → MA-506

■ Recommended soldering pattern (Unit: mm)

MA-505
5.6
4.1   7.0   4.1

MA-506
2.1
1.5
2.1
4.1   7.0   4.1