REGULATORY COMPLIANCE

Lead Free COMPLIANT | EU RoHS 2011/65 + 2015/863 COMPLIANT | China RoHS COMPLIANT | REACH SVHC COMPLIANT | DRC CONFLICT FREE

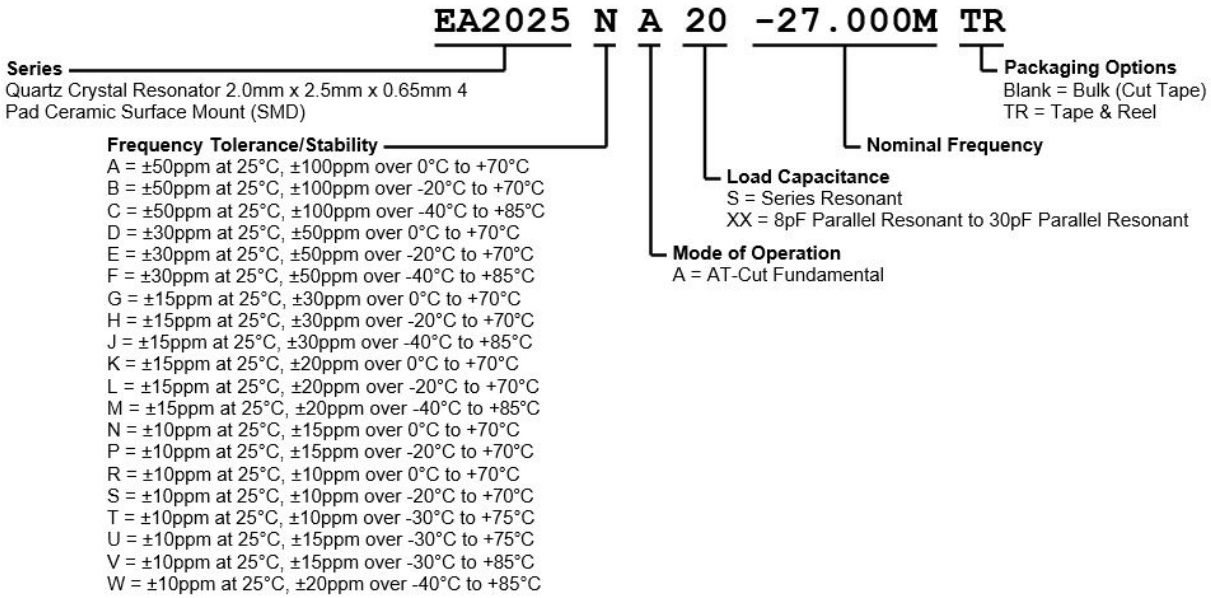
ITEM DESCRIPTION

Quartz Crystal Resonator 2.0mm x 2.5mm x 0.65mm 4 Pad Ceramic Surface Mount (SMD)

ELECTRICAL SPECIFICATIONS

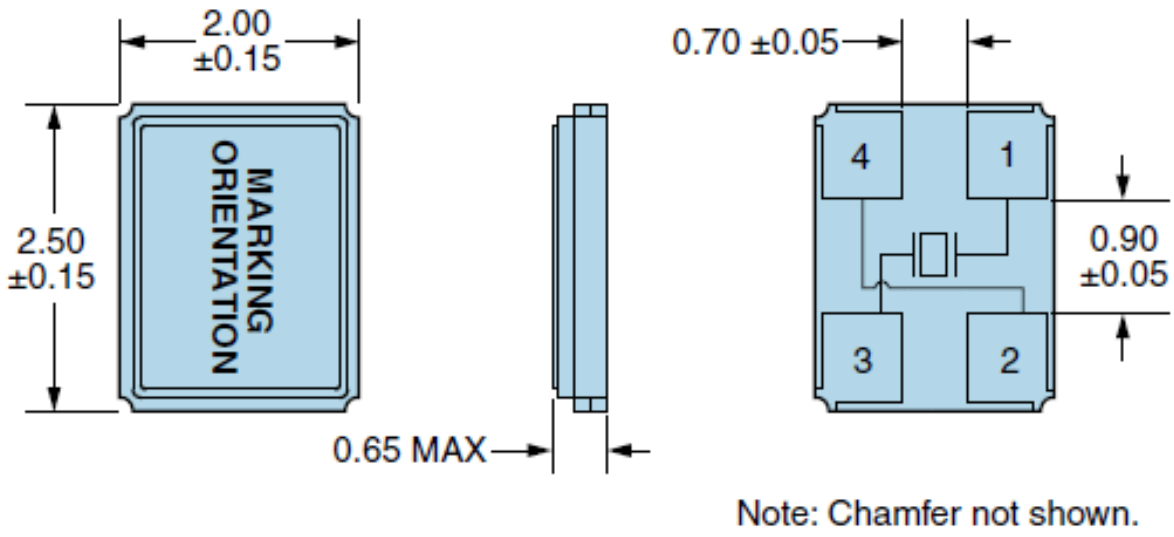
Nominal Frequency	12MHz to 54MHz
Frequency Tolerance/Stability	±50ppm at 25°C, ±100ppm over 0°C to +70°C ±50ppm at 25°C, ±100ppm over -20°C to +70°C ±50ppm at 25°C, ±100ppm over -40°C to +85°C ±30ppm at 25°C, ±50ppm over 0°C to +70°C ±30ppm at 25°C, ±50ppm over -20°C to +70°C ±30ppm at 25°C, ±50ppm over -40°C to +85°C ±15ppm at 25°C, ±30ppm over 0°C to +70°C ±15ppm at 25°C, ±30ppm over -20°C to +70°C ±15ppm at 25°C, ±30ppm over -40°C to +85°C ±15ppm at 25°C, ±20ppm over 0°C to +70°C ±15ppm at 25°C, ±20ppm over -20°C to +70°C ±15ppm at 25°C, ±20ppm over -40°C to +85°C ±10ppm at 25°C, ±15ppm over 0°C to +70°C ±10ppm at 25°C, ±15ppm over -20°C to +70°C ±10ppm at 25°C, ±10ppm over 0°C to +70°C ±10ppm at 25°C, ±10ppm over -20°C to +70°C ±10ppm at 25°C, ±10ppm over -30°C to +75°C ±10ppm at 25°C, ±15ppm over -30°C to +75°C ±10ppm at 25°C, ±15ppm over -30°C to +85°C ±10ppm at 25°C, ±20ppm over -40°C to +85°C
Aging at 25°C	±3ppm/year Maximum
Load Capacitance	Series Resonant, 8pF Parallel Resonant to 30pF Parallel Resonant
Shunt Capacitance	5pF Maximum
Equivalent Series Resistance	180 Ohms Maximum over Nominal Frequency of 12MHz to 12.999999MHz 150 Ohms Maximum over Nominal Frequency of 13MHz to 15.999999MHz 100 Ohms Maximum over Nominal Frequency of 16MHz to 19.999999MHz 80 Ohms Maximum over Nominal Frequency of 20MHz to 29.999999MHz 60 Ohms Maximum over Nominal Frequency of 30MHz to 39.999999MHz 50 Ohms Maximum over Nominal Frequency of 40MHz to 54MHz
Mode of Operation	AT-Cut Fundamental
Drive Level	100µWatts Maximum
Spurious Response	Measured from Fo to Fo +5000ppm -3dB Minimum
Storage Temperature Range	-40°C to +85°C
Insulation Resistance	Measured at 100Vdc 500 Megaohms Minimum

PART NUMBERING GUIDE



ENVIRONMENTAL & MECHANICAL SPECIFICATIONS	
ESD Susceptibility	MIL-STD-883, Method 3015, Class 1, HBM: 1500V
Fine Leak Test	MIL-STD-883, Method 1014, Condition A
Flammability	UL94-V0
Gross Leak Test	MIL-STD-883, Method 1014, Condition C
Mechanical Shock	MIL-STD-883, Method 2002, Condition B
Moisture Resistance	MIL-STD-883, Method 1004
Moisture Sensitivity	J-STD-020, MSL 1
Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition K
Resistance to Solvents	MIL-STD-202, Method 215
Solderability	MIL-STD-883, Method 2003
Temperature Cycling	MIL-STD-883, Method 1010, Condition B
Vibration	MIL-STD-883, Method 2007, Condition A

MECHANICAL DIMENSIONS

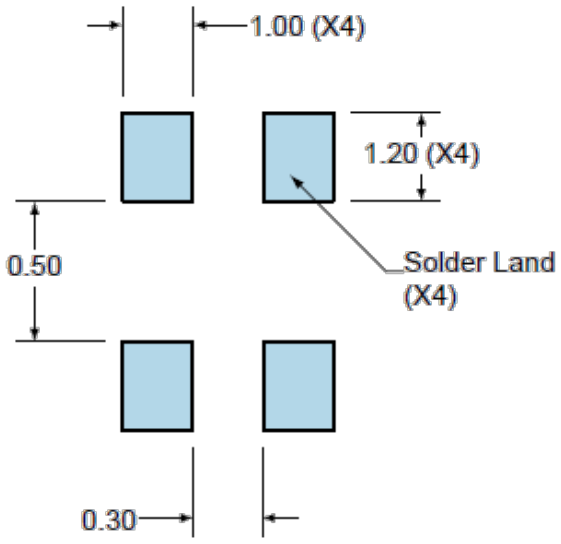


Note: Chamfer not shown.

Seam Sealed

Terminal Plating Thickness: Gold (0.3 to 1.0µm) over Nickel (1.27 to 8.89µm).

SUGGESTED SOLDER PAD LAYOUT



PIN	CONNECTION
1	Crystal
2	Cover/Ground
3	Crystal
4	Cover/Ground

All Tolerances are ±0.1

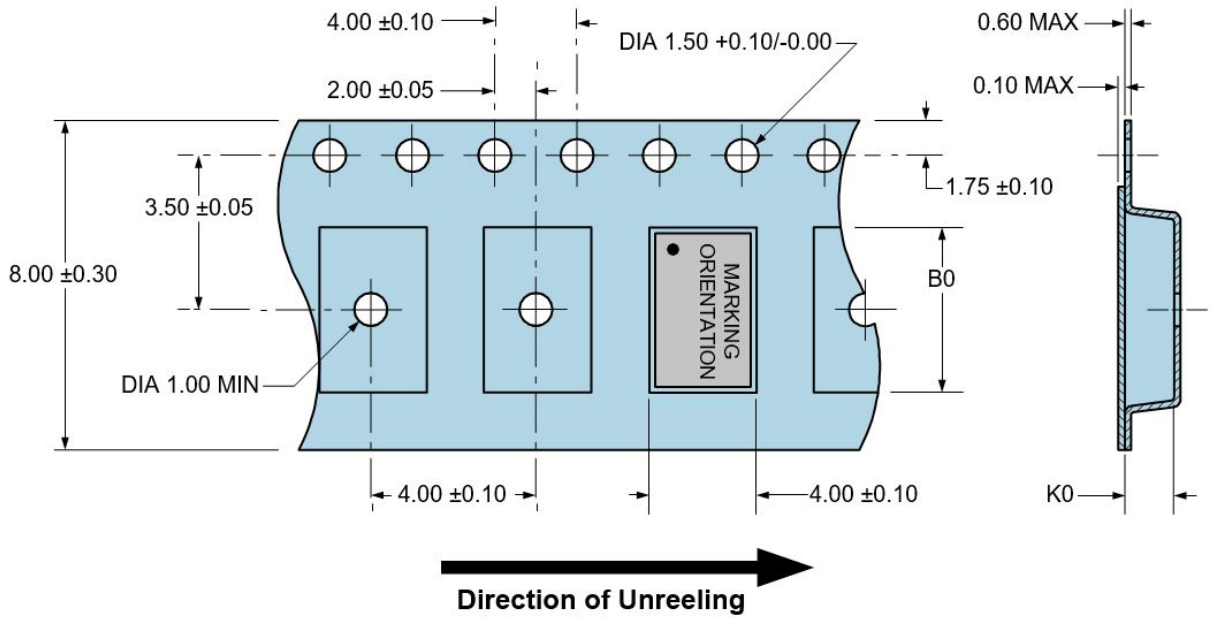
All Dimensions in Millimeters

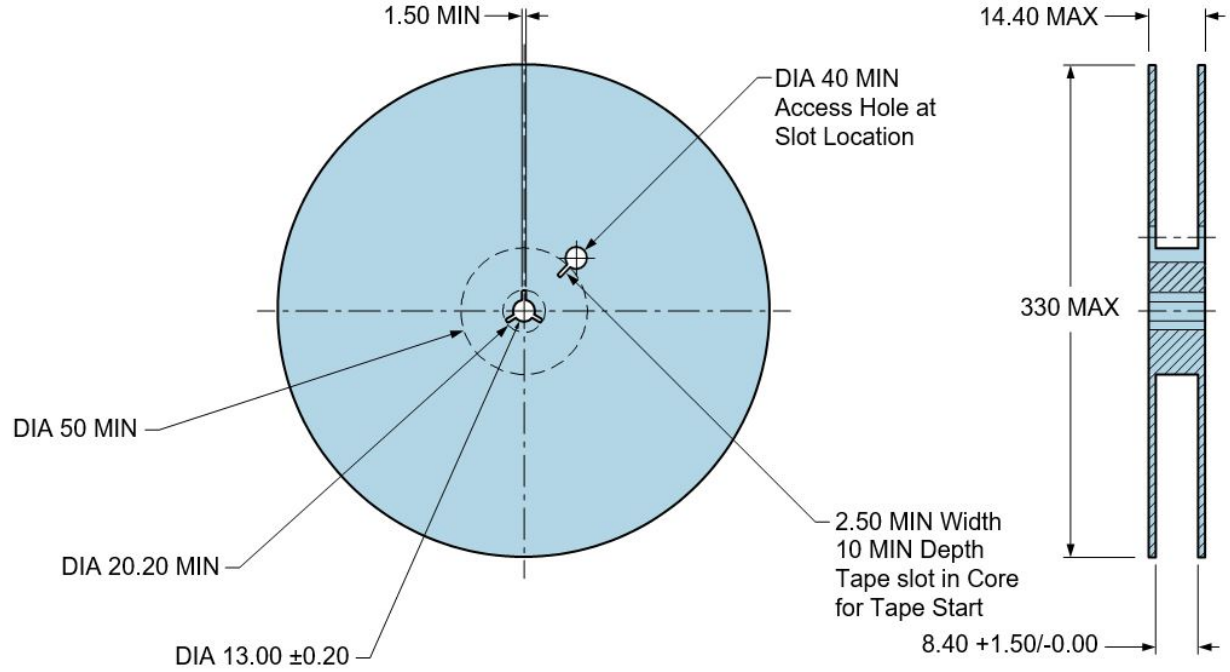
TAPE & REEL DIMENSIONS

Quantity per Reel: 1,000 Units

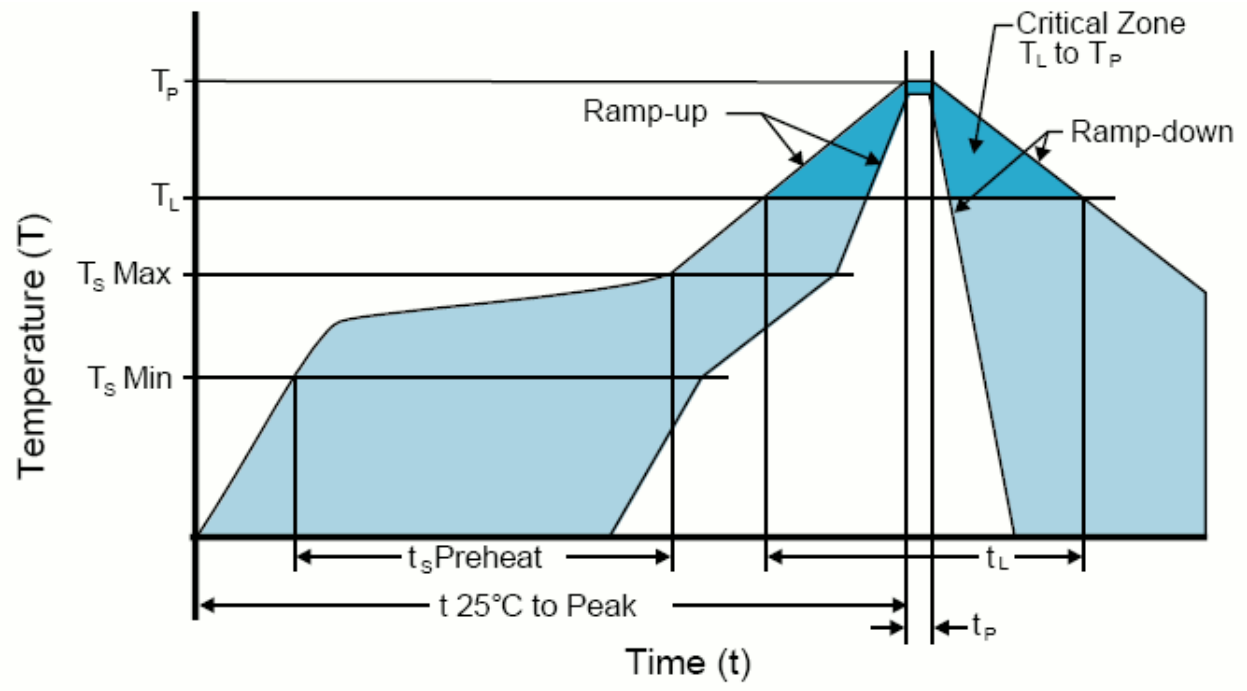
All Dimensions in Millimeters

Compliant to EIA-481





RECOMMENDED SOLDER REFLOW METHOD

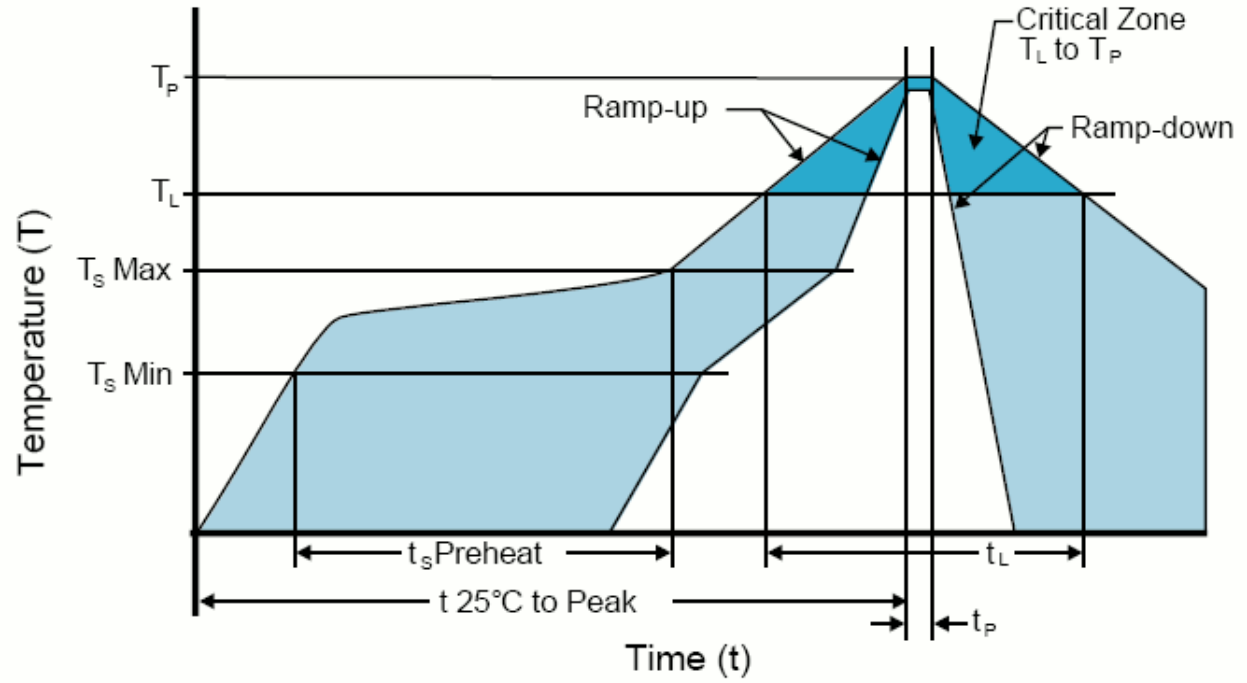


HIGH TEMPERATURE INFRARED/CONVECTION	
T_S MAX to T_L (Ramp-up Rate)	3°C/Second Maximum
Preheat **- Temperature Minimum (T_S MIN)** **- Temperature Typical (T_S TYP)** **- Temperature Maximum(T_S MAX)** **- Time (t_s MIN)**	 150°C 175°C 200°C 60 - 180 Seconds
Ramp-up Rate (T_L to T_P)	3°C/Second Maximum
Time Maintained Above: **- Temperature (T_L)** **- Time (t_L)**	 217°C 60 - 150 Seconds
Peak Temperature (T_P)	260°C Maximum for 10 Seconds Maximum
Target Peak Temperature(T_P Target)	250°C +0/-5°C
Time within 5°C of actual peak (t_p)	20 - 40 Seconds
Ramp-down Rate	6°C/Second Maximum
Time 25°C to Peak Temperature (t)	8 Minutes Maximum
Moisture Sensitivity Level	Level 1
Additional Notes	Temperatures shown are applied to body of device.

High Temperature Manual Soldering

260°C Maximum for 5 Seconds Maximum, 2 times Maximum. (Temperatures shown are applied to body of device.)

RECOMMENDED SOLDER REFLOW METHOD



LOW TEMPERATURE INFRARED/CONVECTION	
T_S MAX to T_L (Ramp-up Rate)	5°C/Second Maximum
Preheat **- Temperature Minimum (T_S MIN)** **- Temperature Typical (T_S TYP)** **- Temperature Maximum(T_S MAX)** **- Time (t_S MIN)**	 N/A 150°C N/A 30 - 60 Seconds
Ramp-up Rate (T_L to T_P)	5°C/Second Maximum
Time Maintained Above: **- Temperature (T_L)** **- Time (t_L)**	 150°C 200 Seconds Maximum
Peak Temperature (T_P)	245°C Maximum
Target Peak Temperature(T_P Target)	245°C Maximum 2 Times/230˚C Maximum 1Time
Time within 5°C of actual peak (t_P)	10 Seconds Maximum 2 Times / 80 Seconds Maximum 1 Time
Ramp-down Rate	5°C/Second Maximum
Time 25°C to Peak Temperature (t)	N/A
Moisture Sensitivity Level	Level 1
Additional Notes	Temperatures shown are applied to body of device.

Low Temperature Manual Soldering

185°C Maximum for 10 Seconds Maximum, 2 times Maximum. (Temperatures shown are applied to body of device.)