# EB2532 Series

## REGULATORY COMPLIANCE

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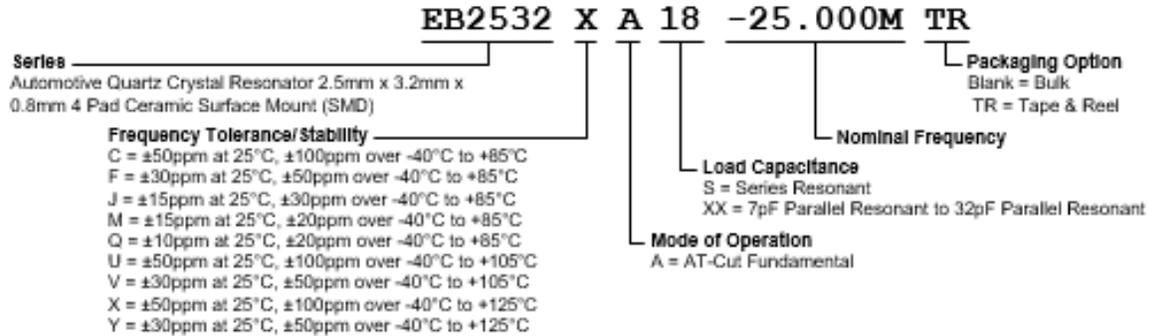
**DRC CONFLICT FREE**

## ITEM DESCRIPTION

Automotive Grade Quartz Crystal Resonator 2.5mm x 3.2mm x 0.8mm 4 Pad Ceramic Surface Mount (SMD)

## ELECTRICAL SPECIFICATIONS

| | |
|---|---|
| **Nominal Frequency** | 8MHz to 66MHz |
| **Frequency Tolerance/Stability** | ±50ppm at 25°C, ±100ppm over -40°C to +85°C<br>±30ppm at 25°C, ±50ppm over -40°C to +85°C<br>±15ppm at 25°C, ±30ppm over -40°C to +85°C<br>±15ppm at 25°C, ±20ppm over -40°C to +85°C<br>±10ppm at 25°C, ±20ppm over -40°C to +85°C<br>±50ppm at 25°C, ±100ppm over -40°C to +105°C<br>±30ppm at 25°C, ±50ppm over -40°C to +105°C<br>±50ppm at 25°C, ±100ppm over -40°C to +125°C<br>±30ppm at 25°C, ±50ppm over -40°C to +125°C |
| **Aging at 25°C** | ±3ppm/year Maximum |
| **Load Capacitance** | Series Resonant, 7pF Parallel Resonant to 32pF Parallel Resonant |
| **Shunt Capacitance** | 3pF Maximum |
| **Equivalent Series Resistance** | 800 Ohms Maximum over Nominal Frequency of 8MHz to 9.999999MHz<br>250 Ohms Maximum over Nominal Frequency of 10MHz to 10.999999MHz<br>150 Ohms Maximum over Nominal Frequency of 11MHz to 11.999999MHz<br>100 Ohms Maximum over Nominal Frequency of 12MHz to 12.999999MHz<br>80 Ohms Maximum over Nominal Frequency of 13MHz to 15.999999MHz<br>70 Ohms Maximum over Nominal Frequency of 16MHz to 20.999999MHz<br>60 Ohms Maximum over Nominal Frequency of 21MHz to 29.999999MHz<br>50 Ohms Maximum over Nominal Frequency of 30MHz to 66MHz |
| **Mode of Operation** | AT-Cut Fundamental |
| **Drive Level** | 200µWatts Maximum |
| **Crystal Cut** | AT-Cut |
| **Spurious Response** | Measured from Fo to Fo +5000ppm<br>-3dB Minimum |
| **Storage Temperature Range** | -50°C to +150°C |
| **Insulation Resistance** | Measured at 100Vdc<br>500 Megaohms Minimum |

## PART NUMBERING GUIDE

EB2532 X A 18 -25.000M TR

**Series**
Automotive Quartz Crystal Resonator 2.5mm x 3.2mm x 0.8mm 4 Pad Ceramic Surface Mount (SMD)

**Frequency Tolerance/Stability**
C = ±50ppm at 25°C, ±100ppm over –40°C to +85°C
F = ±30ppm at 25°C, ±50ppm over –40°C to +85°C
J = ±15ppm at 25°C, ±30ppm over –40°C to +85°C
M = ±15ppm at 25°C, ±20ppm over –40°C to +85°C
Q = ±10ppm at 25°C, ±20ppm over –40°C to +85°C
U = ±50ppm at 25°C, ±100ppm over –40°C to +105°C
V = ±30ppm at 25°C, ±50ppm over –40°C to +105°C
X = ±50ppm at 25°C, ±100ppm over –40°C to +125°C
Y = ±30ppm at 25°C, ±50ppm over –40°C to +125°C

**Mode of Operation**
A = AT-Cut Fundamental

**Load Capacitance**
S = Series Resonant
XX = 7pF Parallel Resonant to 32pF Parallel Resonant

**Nominal Frequency**

**Packaging Option**
Blank = Bulk
TR = Tape & Reel

## 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 |

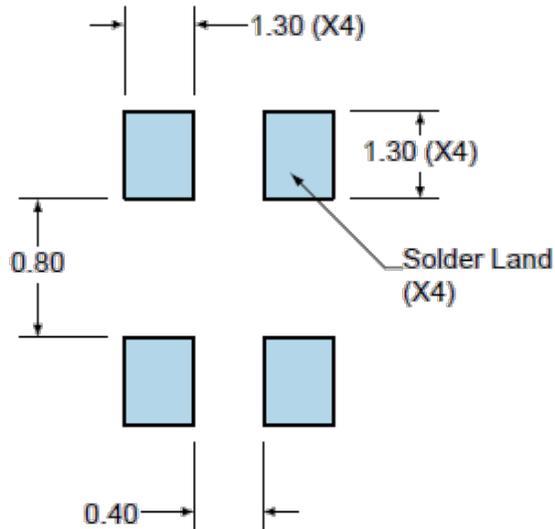## MECHANICAL DIMENSIONS
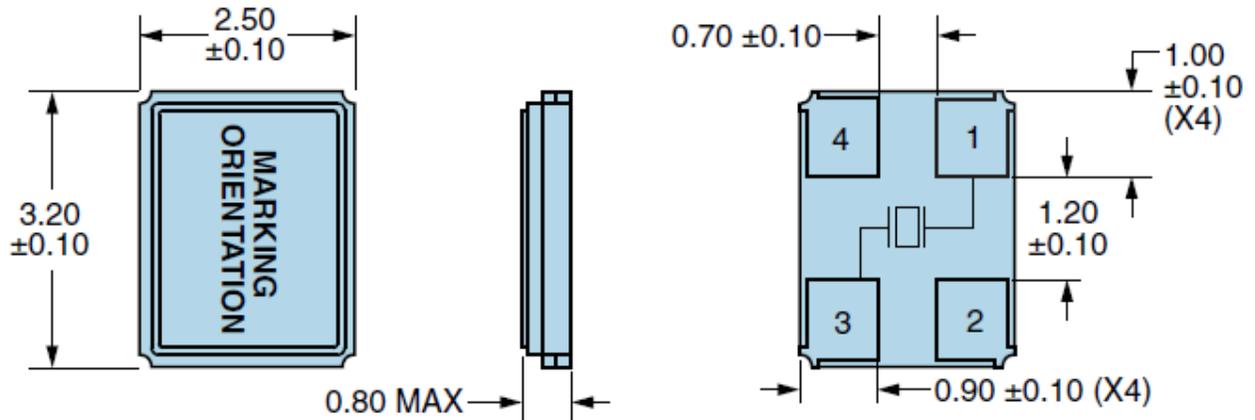


**Note:** Chamfer not shown.

**Seam Sealed**

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

## SUGGESTED SOLDER PAD LAYOUT



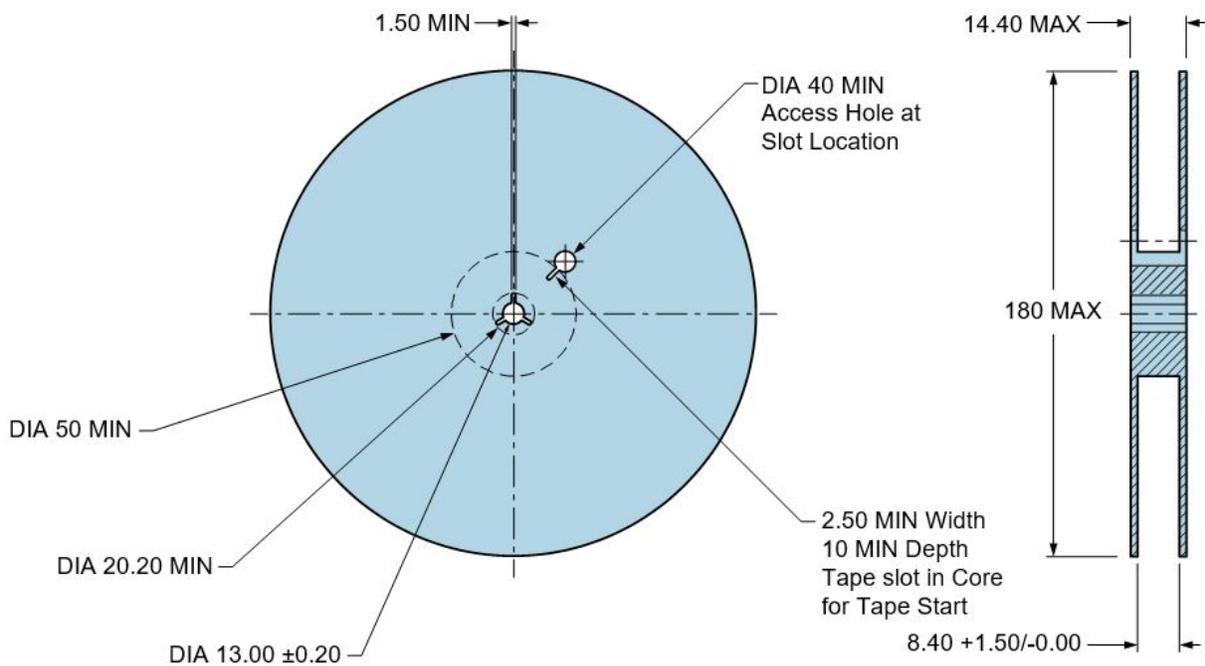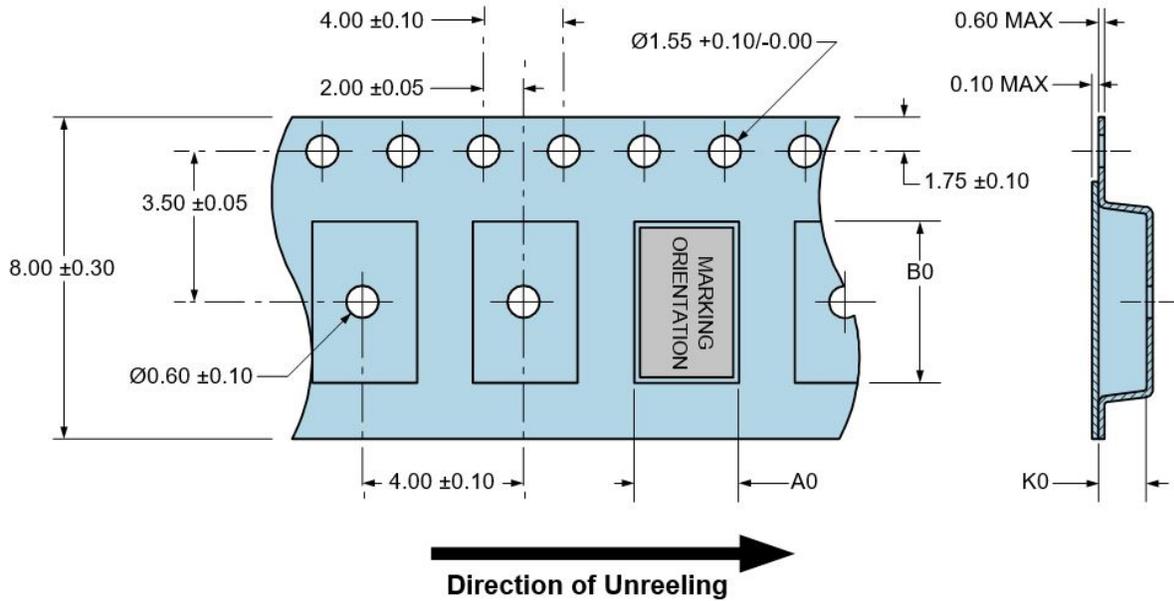| PIN | CONNECTION |
|-----|------------|
| 1 | Crystal |
| 2 | Cover/Ground |
| 3 | Crystal |
| 4 | Cover/Ground |

All Tolerances are ±0.1

**All Dimensions in Millimeters**

## TAPE & REEL DIMENSIONS

Quantity per Reel: 3,000 Units

All Dimensions in Millimeters

Compliant to EIA-481



**Direction of Unreeling**

4.00 ±0.10
2.00 ±0.05
Ø1.55 +0.10/-0.00
0.60 MAX
0.10 MAX
3.50 ±0.05
1.75 ±0.10
8.00 ±0.30
B0
MARKING ORIENTATION
Ø0.60 ±0.10
4.00 ±0.10
A0
K0



1.50 MIN
DIA 40 MIN
Access Hole at
Slot Location
14.40 MAX
DIA 50 MIN
180 MAX
DIA 20.20 MIN
2.50 MIN Width
10 MIN Depth
Tape slot in Core
for Tape Start
DIA 13.00 ±0.20
8.40 +1.50/-0.00

## RECOMMENDED SOLDER REFLOW METHOD
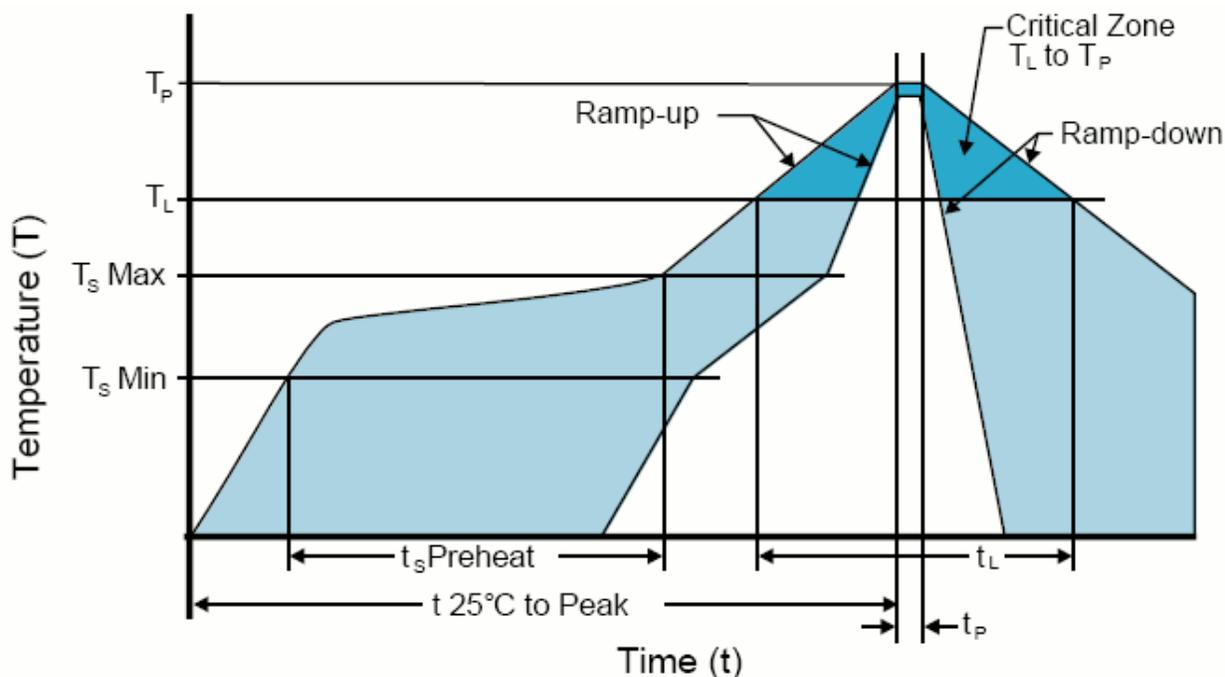


| HIGH TEMPERATURE INFRARED/CONVECTION | |
|---|---|
| $T_S$ MAX to $T_L$ (Ramp-up Rate) | 3°C/Second Maximum |
| **Preheat** **- Temperature Minimum ($T_S$ MIN)** **- Temperature Typical ($T_S$ TYP)** **- Temperature Maximum($T_S$ MAX)** **- Time ($t_s$ MIN)** | 150°C 175°C 200°C 60 - 180 Seconds |
| **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
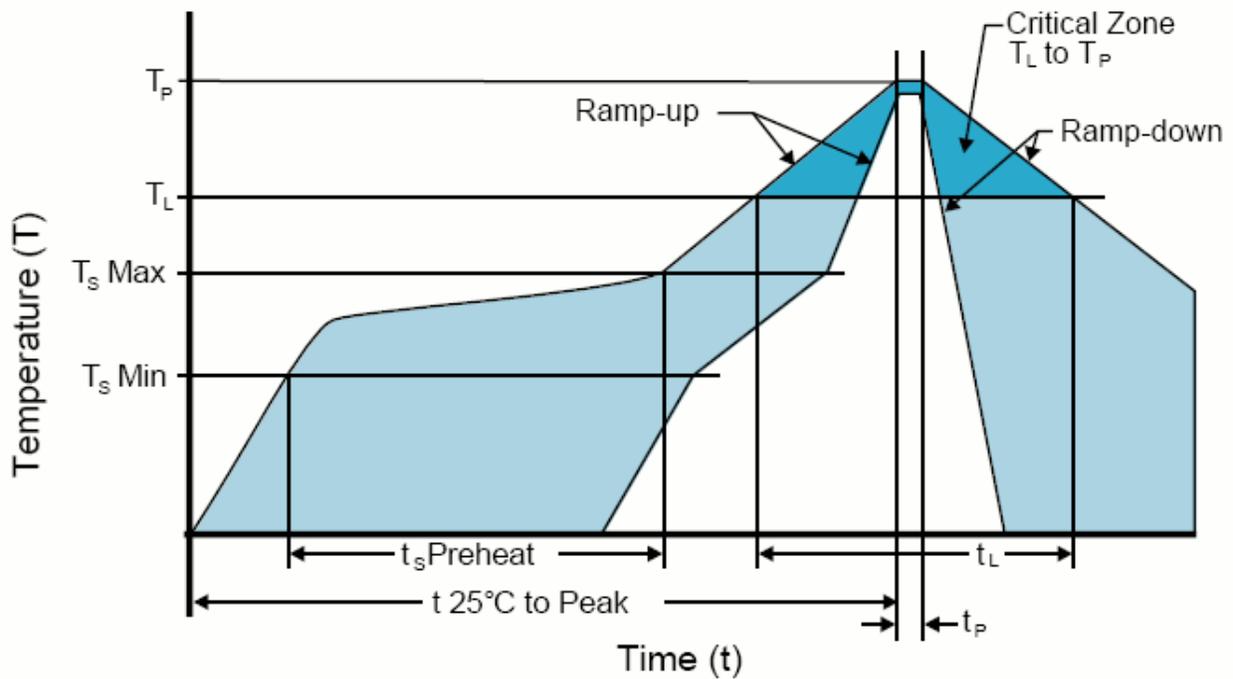


| LOW TEMPERATURE INFRARED/CONVECTION | |
|---|---|
| $T_S$ MAX to $T_L$ (Ramp-up Rate) | 5°C/Second Maximum |
| Preheat<br>- Temperature Minimum ($T_S$ MIN)<br>- Temperature Typical ($T_S$ TYP)<br>- Temperature Maximum($T_S$ MAX)<br>- Time ($t_S$ MIN) | N/A<br>150°C<br>N/A<br>30 - 60 Seconds |
| Ramp-up Rate ($T_L$ to $T_P$) | 5°C/Second Maximum |
| Time Maintained Above:<br>- Temperature ($T_L$)<br>- Time ($t_L$) | 150°C<br>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.)

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