

## REGULATORY COMPLIANCE



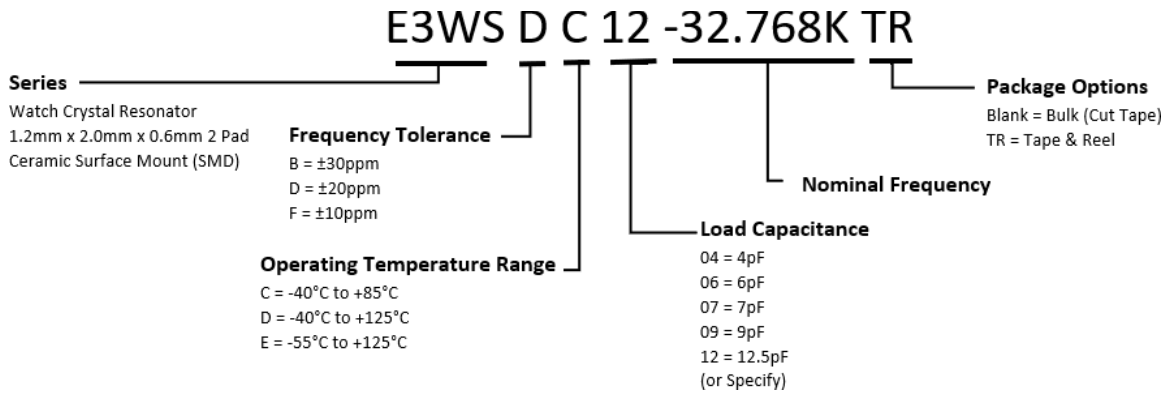
## ITEM DESCRIPTION

Watch Crystal Resonator 1.2mm x 2.0mm x 0.6mm 2 Pad Plastic Surface Mount (SMD) 32.768kHz

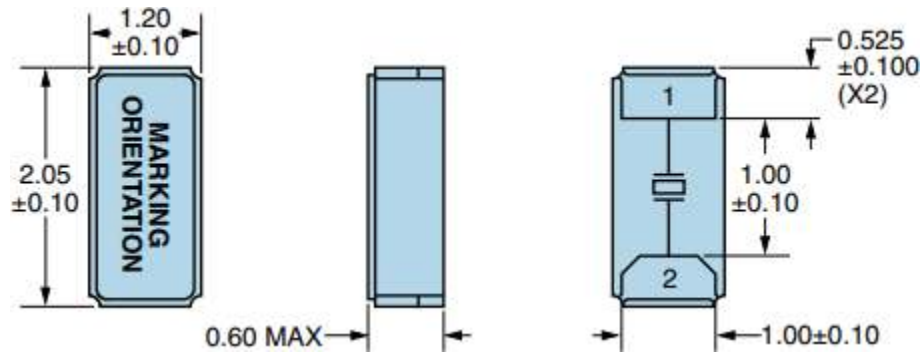
## ELECTRICAL SPECIFICATIONS

<b>Nominal Frequency</b>	32.768kHz
<b>Frequency Tolerance (at 25°C)</b>	±20ppm (See Options)
<b>Load Capacitance</b>	12.5pF (See Options)
<b>Operating Temperature Range</b>	-40°C to +85°C (See Options)
<b>Storage Temperature Range</b>	-55°C to +125°C
<b>Turnover Temperature</b>	+25°C±5°C
<b>Mode of Operation</b>	Flexural Mode (Tuning Fork)
<b>Frequency Stability</b>	-0.03ppm/(Change in °C) <sup>2</sup> Typical, -0.04ppm/(Change in °C) <sup>2</sup> Maximum, Parabolic Curve
<b>Equivalent Series Resistance</b>	90,000 Ohms Maximum (-40°C to +85°C Option) 110,000 Ohms Maximum (-40°C to +125°C Option)
<b>Drive Level</b>	0.5µWatt Maximum
<b>Aging (at 25°C)</b>	±2ppm/First Year Maximum
<b>Quality Factor</b>	9000 Minimum
<b>Shunt Capacitance (Co)</b>	0.9 pF ~ 1.2pF Typical
<b>Insulation Resistance</b>	500 Megaohms Minimum (Measured at 100Vdc ±15Vdc)

## PART NUMBERING GUIDE

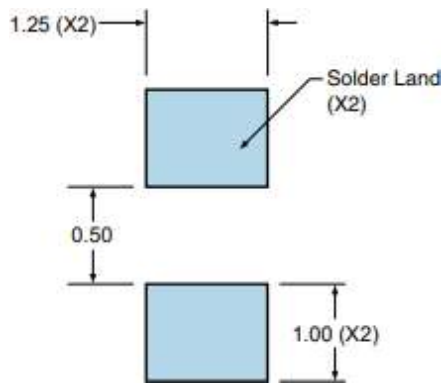


**MECHANICAL DIMENSIONS**



Note: Due to material availability, the outline and finish color of the component may vary. This variation in no way affects the electrical performance of the product.

**SUGGESTED SOLDER PAD LAYOUT**



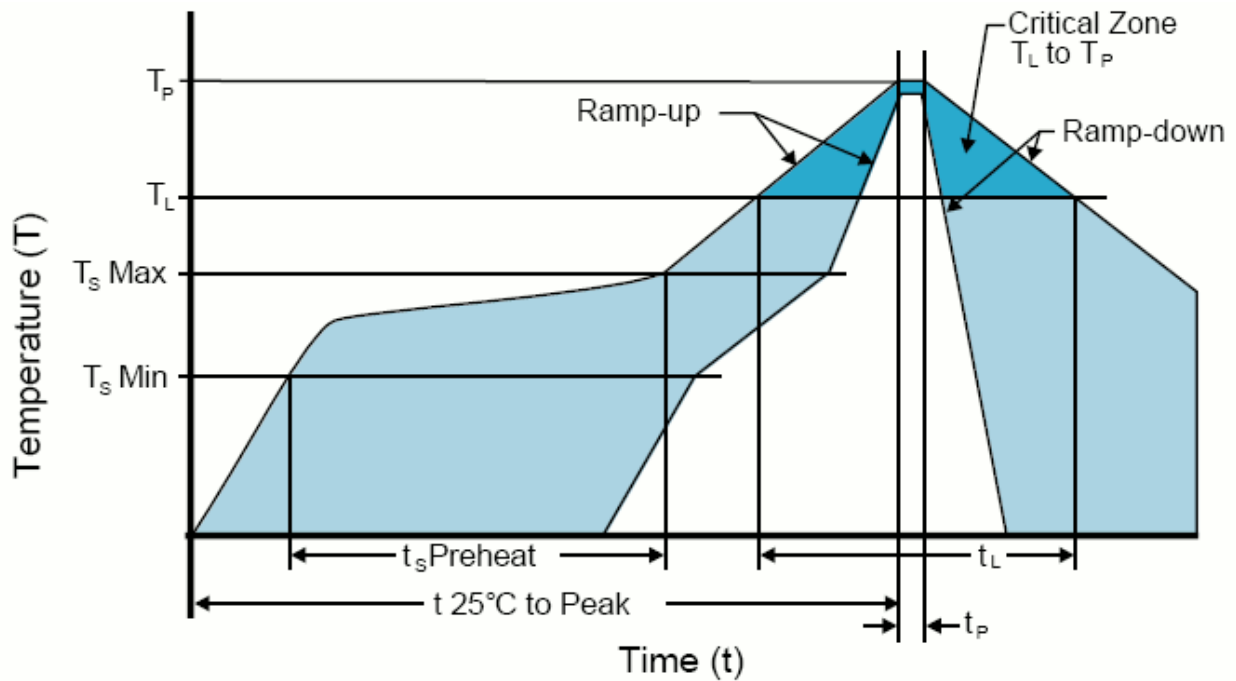
PIN	CONNECTION
1	Crystal
2	Crystal

All Tolerances are  $\pm 0.1$

All Dimensions in Millimeters



RECOMMENDED SOLDER REFLOW METHODS

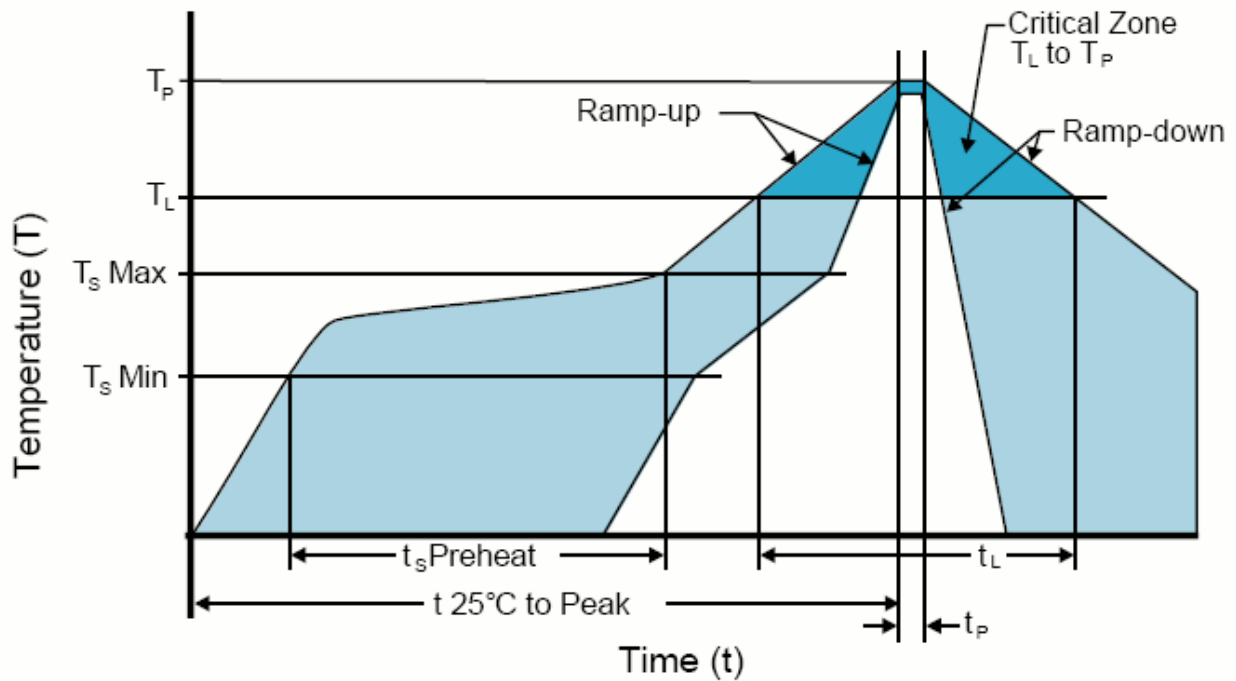


LOW TEMPERATURE INFRARED/CONVECTION 240°C	
T <sub>s</sub> MAX to T <sub>L</sub> (Ramp-up Rate)	5°C/Second Maximum
<b>Preheat</b>	
- Temperature Minimum (T <sub>s</sub> MIN)	N/A
- Temperature Typical (T <sub>s</sub> TYP)	150°C
- Temperature Maximum(T <sub>s</sub> MAX)	N/A
- Time (t <sub>s</sub> )	60 - 120 Seconds
Ramp-up Rate (T <sub>L</sub> to T <sub>p</sub> )	5°C/Second Maximum
<b>Time Maintained Above:</b>	
- Temperature (T <sub>L</sub> )	150°C
- Time (t <sub>L</sub> )	200 Seconds Maximum
Peak Temperature (T <sub>p</sub> )	245°C Maximum
Target Peak Temperature (T <sub>p</sub> Target)	245°C Maximum 2 Times / 230°C Maximum 1 Time
Time within 5°C of actual peak (t <sub>p</sub> )	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.)

**RECOMMENDED SOLDER REFLOW METHOD**



**LOW TEMPERATURE INFRARED/CONVECTION 245°C**

T <sub>s</sub> MAX to T <sub>L</sub> (Ramp-up Rate)	5°C/Second Maximum
<b>Preheat</b>	
- Temperature Minimum (T <sub>s</sub> MIN)	N/A
- Temperature Typical (T <sub>s</sub> TYP)	150°C
- Temperature Maximum(T <sub>s</sub> MAX)	N/A
- Time (t <sub>s</sub> )	30 - 60 Seconds
Ramp-up Rate (T <sub>L</sub> to T <sub>p</sub> )	5°C/Second Maximum
<b>Time Maintained Above:</b>	
- Temperature (T <sub>L</sub> )	150°C
- Time (t <sub>L</sub> )	200 Seconds Maximum
Peak Temperature (T <sub>p</sub> )	245°C Maximum
Target Peak Temperature (T <sub>p</sub> Target)	245°C Maximum 2 Times / 230°C Maximum 1 Time
Time within 5°C of actual peak (t <sub>p</sub> )	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.)

**High Temperature Manual Soldering**

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