

## REGULATORY COMPLIANCE



## ITEM DESCRIPTION

Watch Crystal Resonator 1.5mm x 3.2mm x 0.9mm 2 Pad Plastic Surface Mount (SMD)

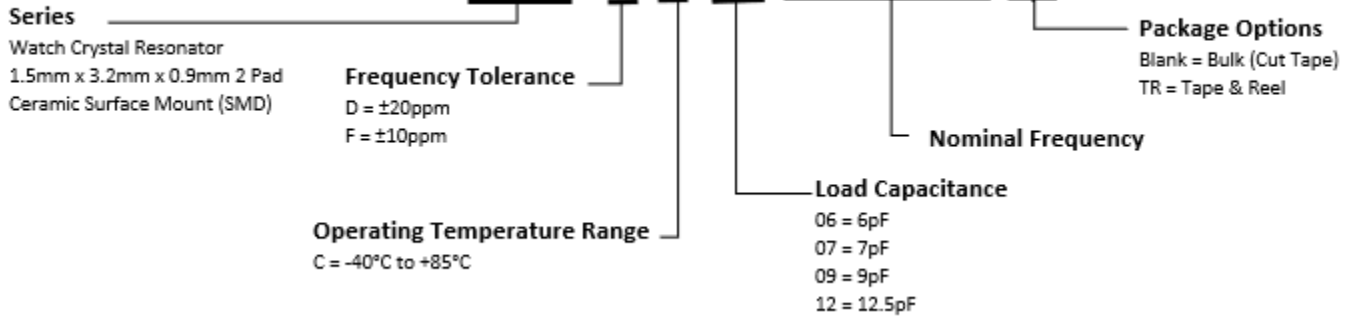
## ELECTRICAL SPECIFICATIONS

<b>Frequency</b>	32.768kHz
<b>Equivalent Series Resistance (ESR)</b>	70 kOhms Max
<b>Shunt Capacitance (Co)</b>	1.6pF Max
<b>Frequency Tolerance (at 25°C)</b>	±20ppm (Tested at 0.1µW, See Options)
<b>Frequency Stability (over Temperature)</b>	-0.040ppm/(Change in °C) <sup>2</sup> Max
<b>Turn over Temperature</b>	25°C ±5°C
<b>Mode of Operation</b>	Flexural Mode (Tuning Fork)
<b>Load Capacitance</b>	6pF, 7pF, 9pF, 12.5pF or Specify
<b>Drive Level</b>	0.1 µWatt Typical, 0.5µWatt Max
<b>Aging (@25°C± 3°C)</b>	±2ppm/First Year Max
<b>Operating Temperature Range</b>	-40°C to +85°C
<b>Storage Temperature Range</b>	-55°C to +125°C
<b>Insulation Resistance</b>	500 Mohms Minimum (at 100Vdc +/-15Vdc)

# E8WS Series

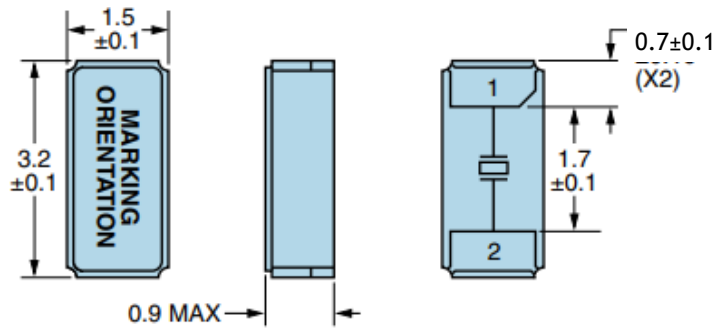
## PART NUMBERING GUIDE

**E8WS D C 12 -32.768K TR**



# E8WS Series

## MECHANICAL DIMENSIONS



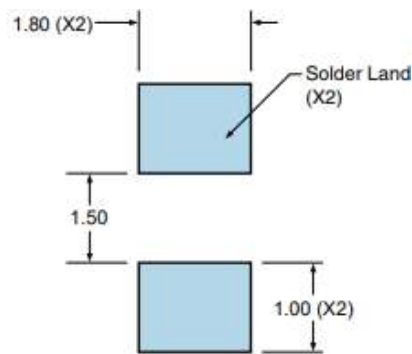
PIN	CONNECTION
1	Crystal
2	Crystal

**Seam Sealed**

**Terminal Plating Thickness:** Gold (0.3 to 1.0 $\mu$ m) over Nickel (3.0 to 4.0 $\mu$ m).

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



All Tolerances are  $\pm 0.1$ .

**All Dimensions in Millimeters**

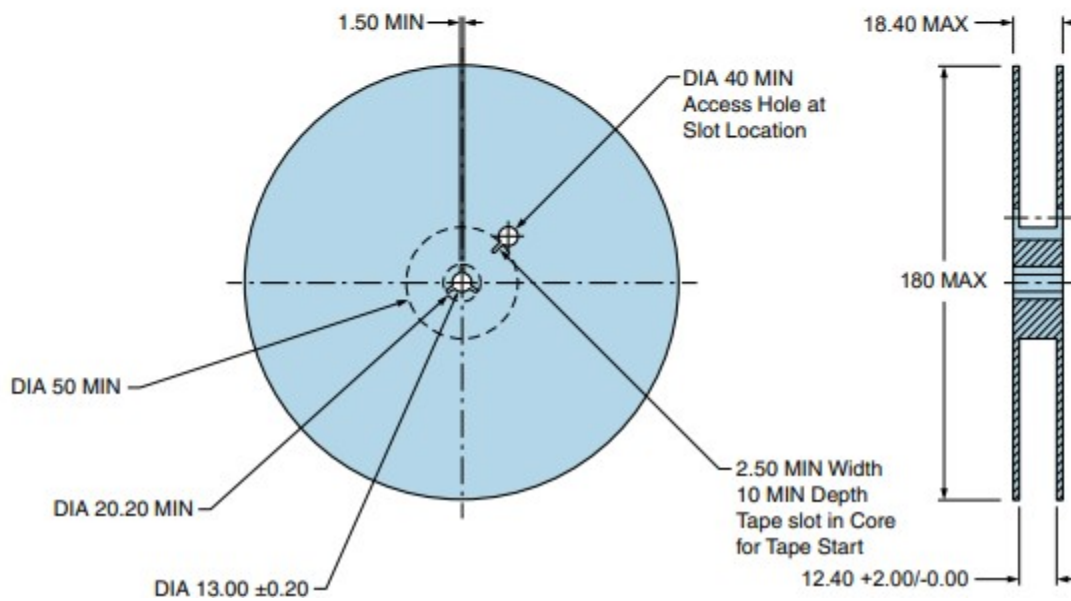
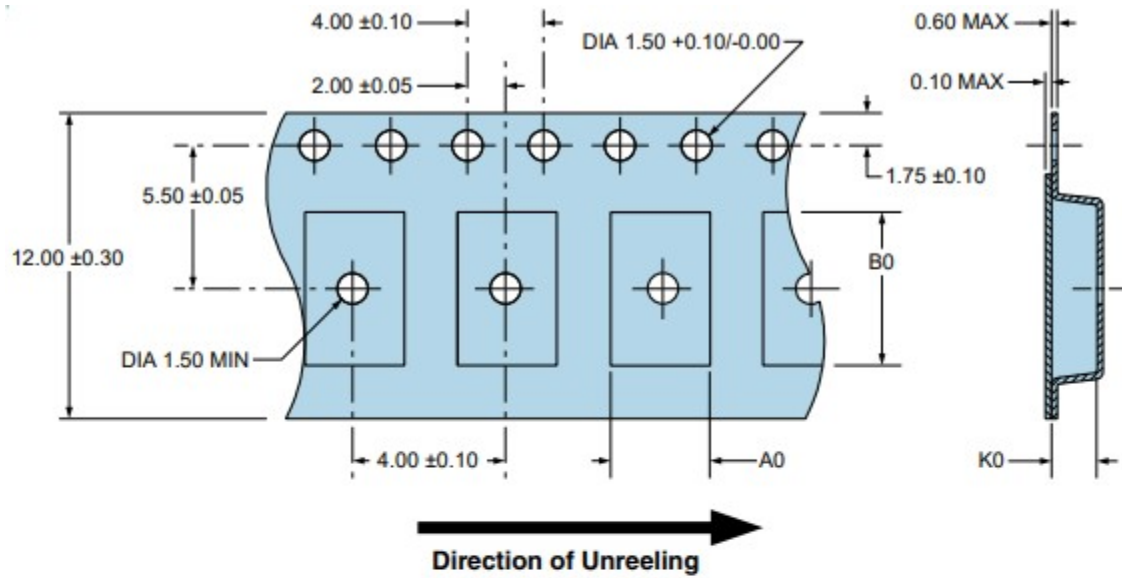
# E8WS Series

## TAPE & REEL DIMENSIONS

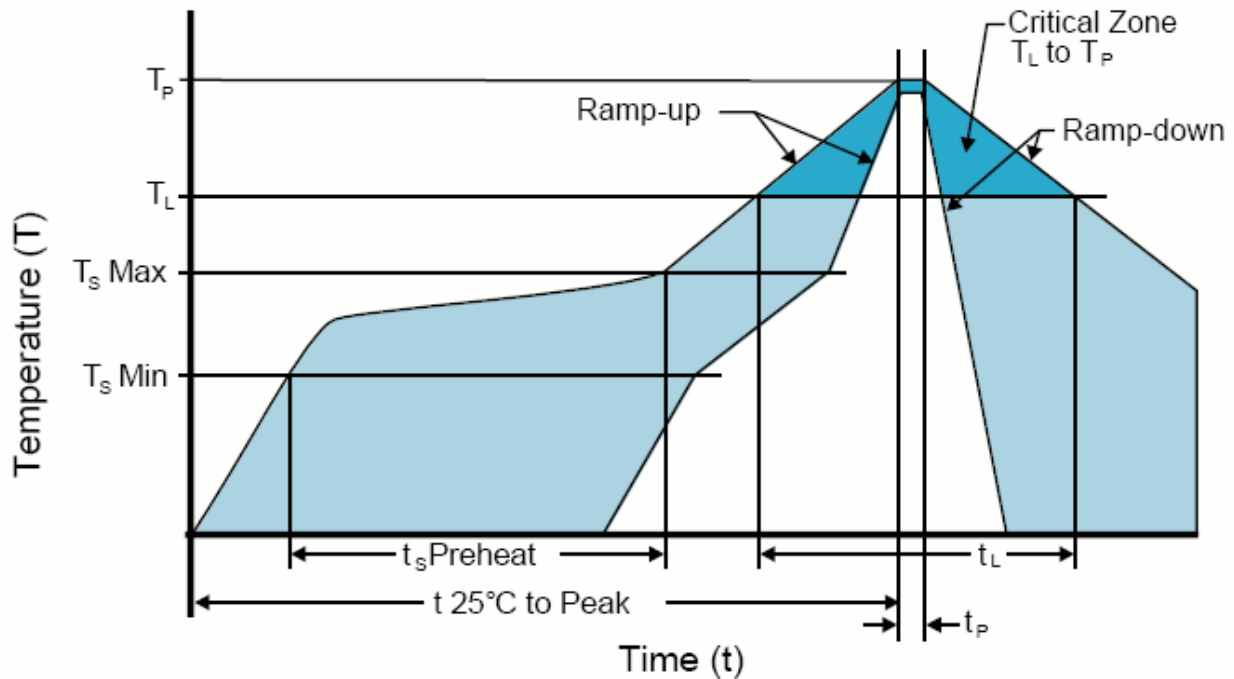
Quantity per Reel: 3000 Units

All Dimensions in Millimeters

Compliant to EIA-481



## RECOMMENDED SOLDER REFLOW METHOD



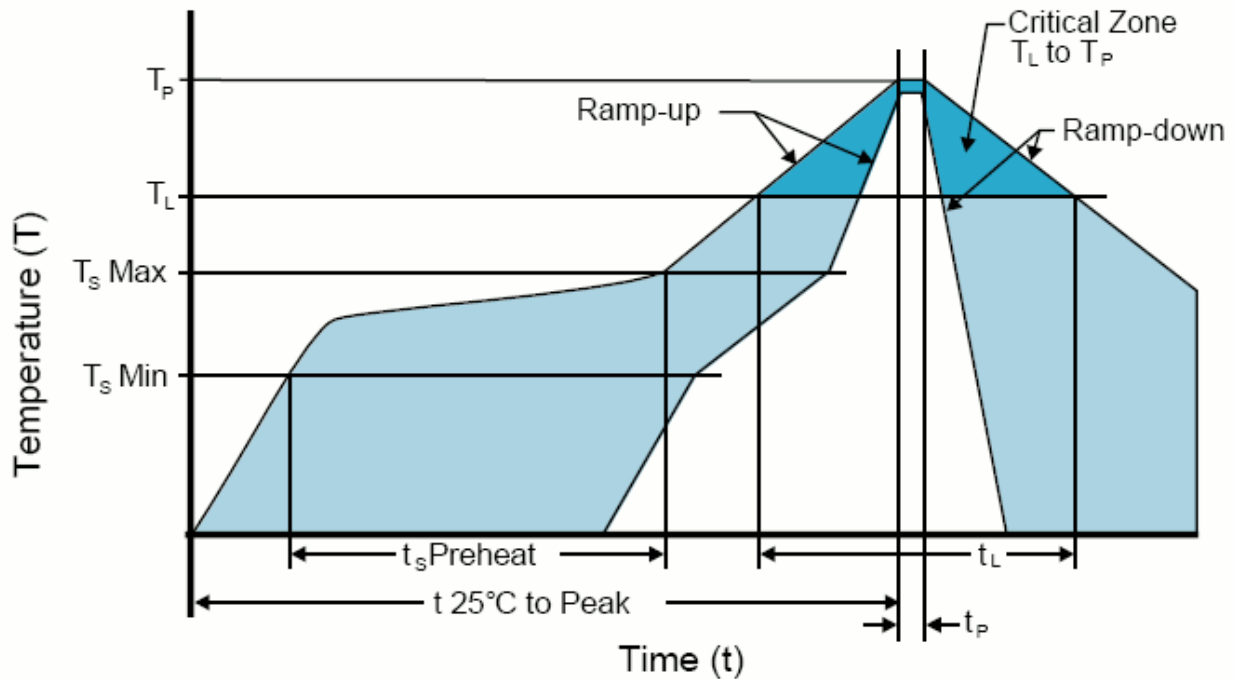
### HIGH TEMPERATURE INFRARED/CONVECTION

<b><math>T_s\text{ MAX to } T_L</math> (Ramp-up Rate)</b>	3°C/Second Maximum
<b>Preheat</b>	
- Temperature Minimum ( $T_s\text{ MIN}$ )	150°C
- Temperature Typical ( $T_s\text{ TYP}$ )	175°C
- Temperature Maximum ( $T_s\text{ MAX}$ )	200°C
- Time ( $t_s$ )	60 - 180 Seconds
<b>Ramp-up Rate (<math>T_L</math> to <math>T_P</math>)</b>	3°C/Second Maximum
<b>Time Maintained Above:</b>	
- Temperature ( $T_L$ )	217°C
- Time ( $t_L$ )	60 - 150 Seconds
<b>Peak Temperature (<math>T_P</math>)</b>	260°C Maximum for 10 Seconds Maximum
<b>Target Peak Temperature (<math>T_P\text{ Target}</math>)</b>	250°C +0/-5°C
<b>Time within 5°C of actual peak (<math>t_p</math>)</b>	20 - 40 Seconds
<b>Ramp-down Rate</b>	6°C/Second Maximum
<b>Time 25°C to Peak Temperature (t)</b>	8 Minutes Maximum
<b>Moisture Sensitivity Level</b>	Level 1
<b>Additional Notes</b>	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

<b>T<sub>S</sub> MAX to T<sub>L</sub> (Ramp-up Rate)</b>	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
<b>Ramp-up Rate (T<sub>L</sub> to T<sub>P</sub>)</b>	5°C/Second Maximum
<b>Time Maintained Above:</b>	
- Temperature (T <sub>L</sub> )	150°C
- Time (t <sub>L</sub> )	200 Seconds Maximum
<b>Peak Temperature (T<sub>P</sub>)</b>	245°C Maximum
<b>Target Peak Temperature (T<sub>P</sub> Target)</b>	245°C Maximum 2 Times / 230°C Maximum 1 Time
<b>Time within 5°C of actual peak (t<sub>p</sub>)</b>	10 Seconds Maximum 2 Times / 80 Seconds Maximum 1 Time
<b>Ramp-down Rate</b>	5°C/Second Maximum
<b>Time 25°C to Peak Temperature (t)</b>	N/A
<b>Moisture Sensitivity Level</b>	Level 1
<b>Additional Notes</b>	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.)