

# EH1320HSTTS-16.384M-G [Click part number to visit Part Number Details page](#)

## REGULATORY COMPLIANCE (Data Sheet downloaded on Feb 16, 2017)



◀ Click badges to download compliance docs

Regulatory Compliance standards are subject to updates by governing bodies. Click the badges to download the latest compliance docs for this part number directly from Ecliptek.



## ITEM DESCRIPTION

Quartz Crystal Clock Oscillators XO (SPXO) LVCMOS (CMOS) 3.3Vdc 8 Pin DIP Metal Thru-Hole 16.384MHz  $\pm 20$ ppm 0°C to +70°C

## ELECTRICAL SPECIFICATIONS

Nominal Frequency	16.384MHz
Frequency Tolerance/Stability	$\pm 20$ ppm Maximum (Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, 1st Year Aging at 25°C, Shock, and Vibration.)
Aging at 25°C	$\pm 5$ ppm/year Maximum
Operating Temperature Range	0°C to +70°C
Supply Voltage	3.3Vdc $\pm 10\%$
Input Current	35mA Maximum (No Load)
Output Voltage Logic High (Voh)	2.7Vdc Minimum (IOH = -8mA)
Output Voltage Logic Low (Vol)	0.5Vdc Maximum (IOL = +8mA)
Rise/Fall Time	6nSec Maximum (Measured at 20% to 80% of waveform)
Duty Cycle	50 $\pm 5$ (%) (Measured at 50% of waveform)
Load Drive Capability	30pF Maximum
Output Logic Type	CMOS
Pin 1 Connection	Tri-State (Disabled Output: High Impedance)
Tri-State Input Voltage (Vih and Vil)	70% of Vdd Minimum to enable output, 20% of Vdd Maximum to disable output (High Impedance), No Connect to enable output.
Absolute Clock Jitter	$\pm 250$ pSec Maximum, $\pm 100$ pSec Typical
One Sigma Clock Period Jitter	$\pm 50$ pSec Maximum, $\pm 40$ pSec Typical
Start Up Time	10mSec Maximum
Storage Temperature Range	-55°C to +125°C

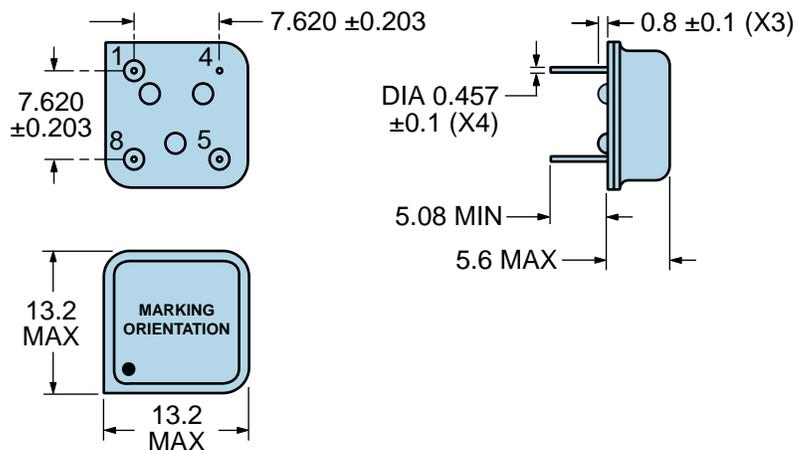
## ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

Fine Leak Test	MIL-STD-883, Method 1014, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C
Lead Integrity	MIL-STD-883, Method 2004
Mechanical Shock	MIL-STD-202, Method 213, Condition C
Resistance to Soldering Heat	MIL-STD-202, Method 210
Resistance to Solvents	MIL-STD-202, Method 215
Solderability	MIL-STD-883, Method 2003
Temperature Cycling	MIL-STD-883, Method 1010
Vibration	MIL-STD-883, Method 2007, Condition A

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## MECHANICAL DIMENSIONS (all dimensions in millimeters)

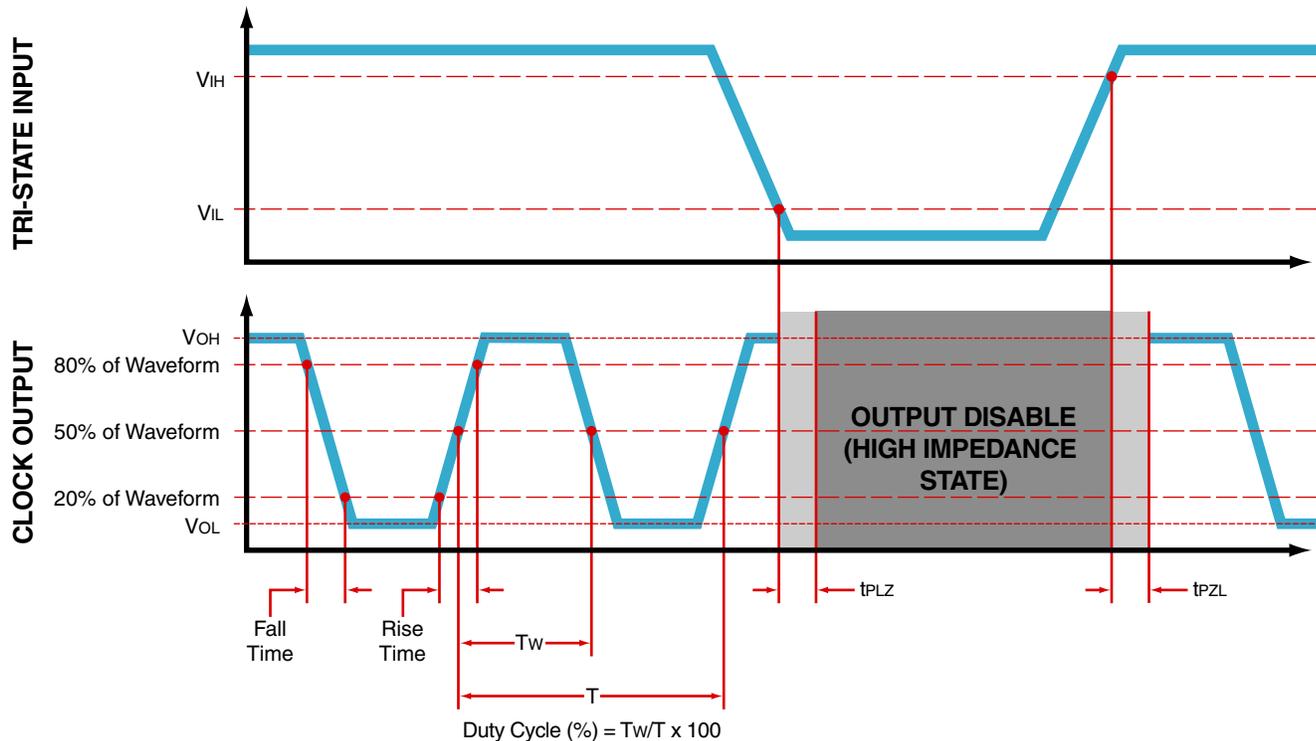


PIN	CONNECTION
1	Tri-State (High Impedance)
4	Case/Ground
5	Output
8	Supply Voltage

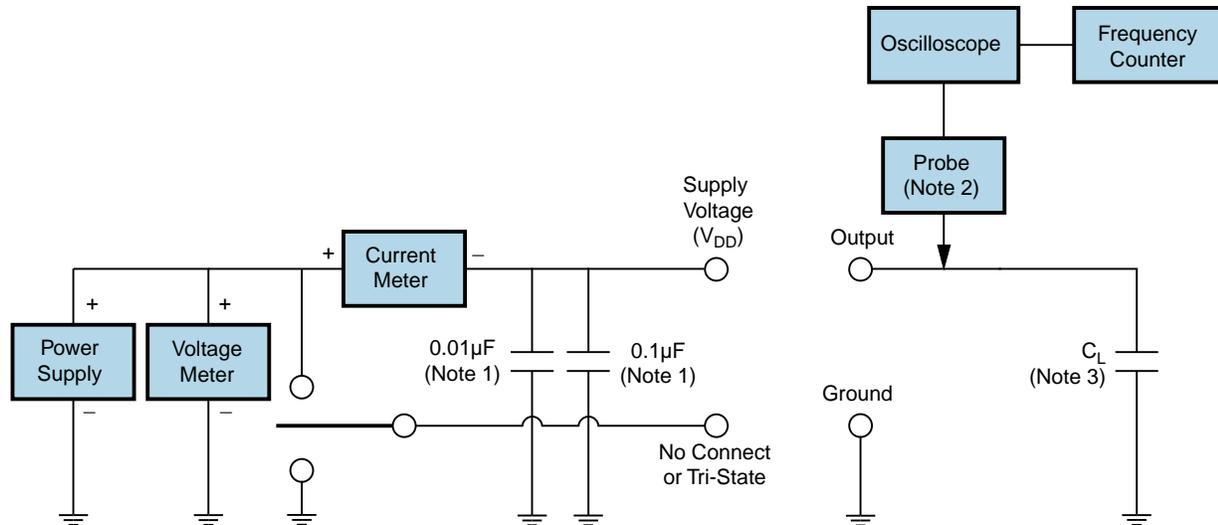
LINE	MARKING
1	<b>ECLIPTEK</b>
2	<b>EH13TS</b> <i>EH13=Product Series</i>
3	<b>16.384M</b>
4	<b>XXYZZ</b> <i>XX=Ecliptek Manufacturing Code</i> <i>Y=Last Digit of the Year</i> <i>ZZ=Week of the Year</i>

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## OUTPUT WAVEFORM & TIMING DIAGRAM



## Test Circuit for CMOS Output



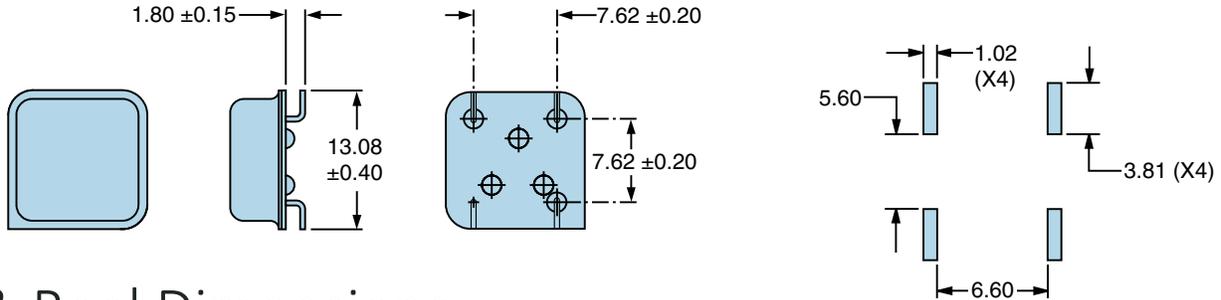
Note 1: An external  $0.1\mu\text{F}$  low frequency tantalum bypass capacitor in parallel with a  $0.01\mu\text{F}$  high frequency ceramic bypass capacitor close to the package ground and  $V_{DD}$  pin is required.

Note 2: A low capacitance ( $<12\text{pF}$ ), 10X attenuation factor, high impedance ( $>10\text{Mohms}$ ), and high bandwidth ( $>300\text{MHz}$ ) passive probe is recommended.

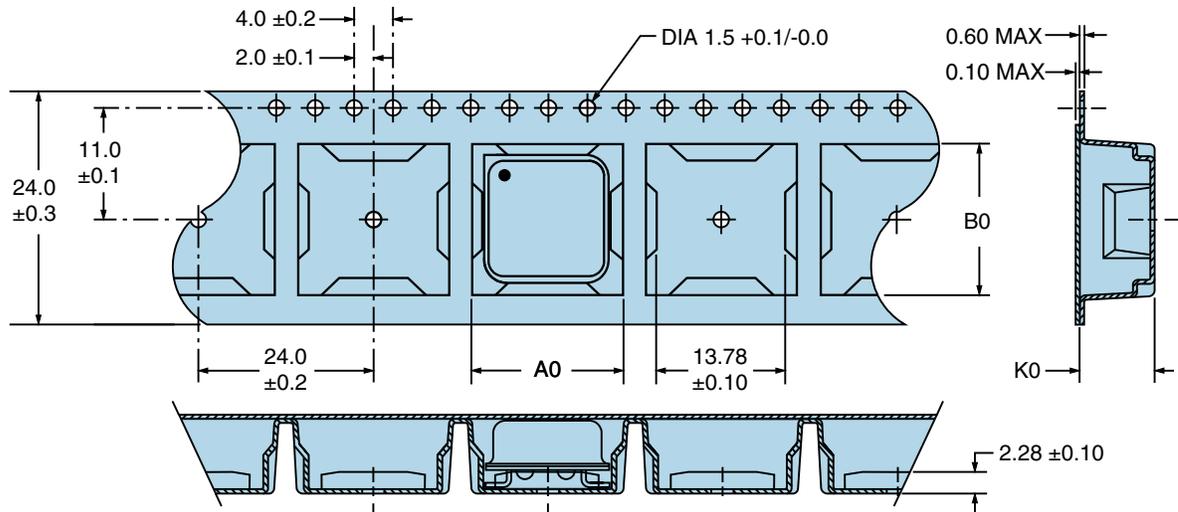
Note 3: Capacitance value  $C_L$  includes sum of all probe and fixture capacitance.

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## Gull Wing Option G Dimensions & Recommended Solder Pad Layout



## Tape & Reel Dimensions



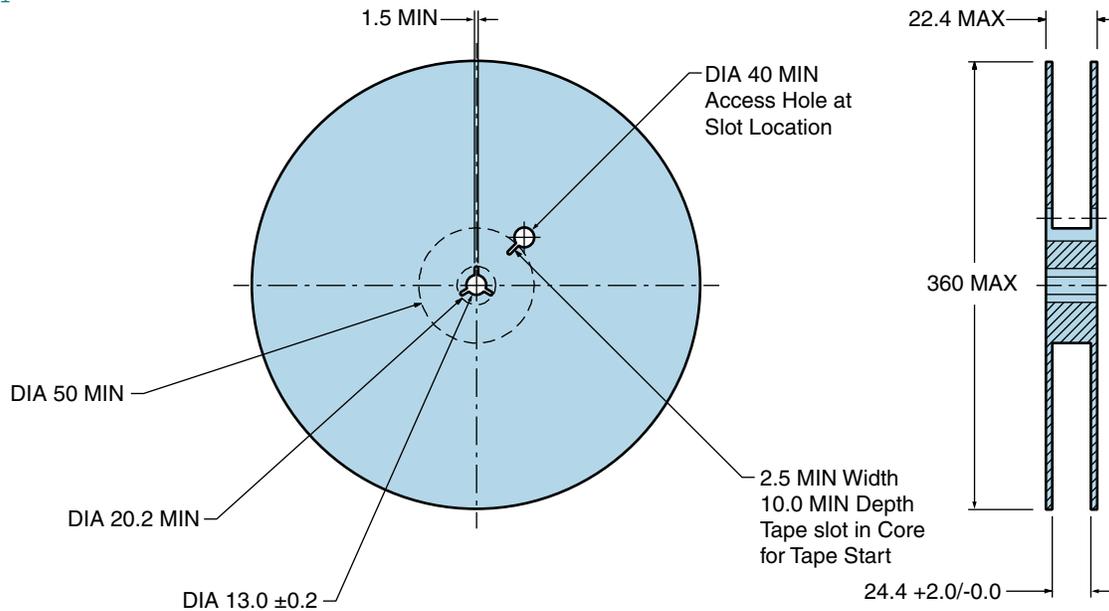
Direction of Unreeling



Quantity Per Reel: 700 Units Maximum

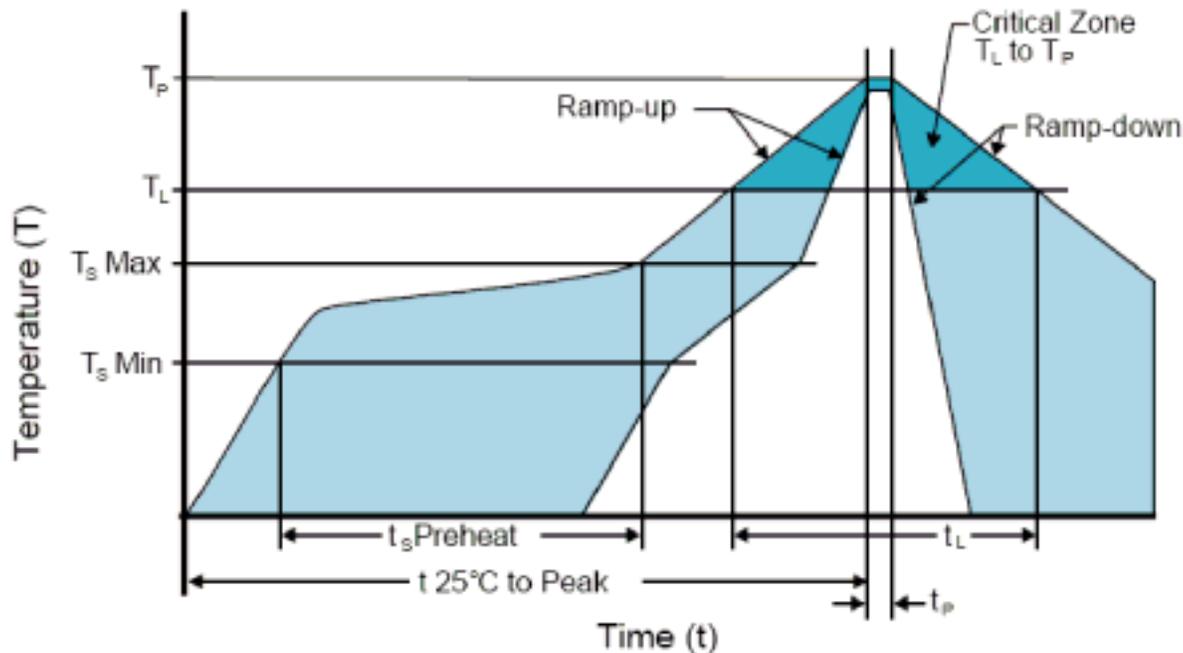
All Dimensions in Millimeters

Compliant to EIA-481



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## Recommended Solder Reflow Methods



### High Temperature Solder Bath (Wave Solder)

**Ts MAX to Tl (Ramp-up Rate)** 3°C/Second Maximum

#### Preheat

- Temperature Minimum (Ts MIN) 150°C  
 - Temperature Typical (Ts TYP) 175°C  
 - Temperature Maximum (Ts MAX) 200°C  
 - Time (ts MIN) 60 - 180 Seconds

**Ramp-up Rate (Tl to Tp)** 3°C/Second Maximum

#### Time Maintained Above:

- Temperature (Tl) 217°C  
 - Time (tL) 60 - 150 Seconds

**Peak Temperature (Tp)** 260°C Maximum for 10 Seconds Maximum

**Target Peak Temperature (Tp Target)** 250°C +0/-5°C

**Time within 5°C of actual peak (tp)** 20 - 40 Seconds

**Ramp-down Rate** 6°C/Second Maximum

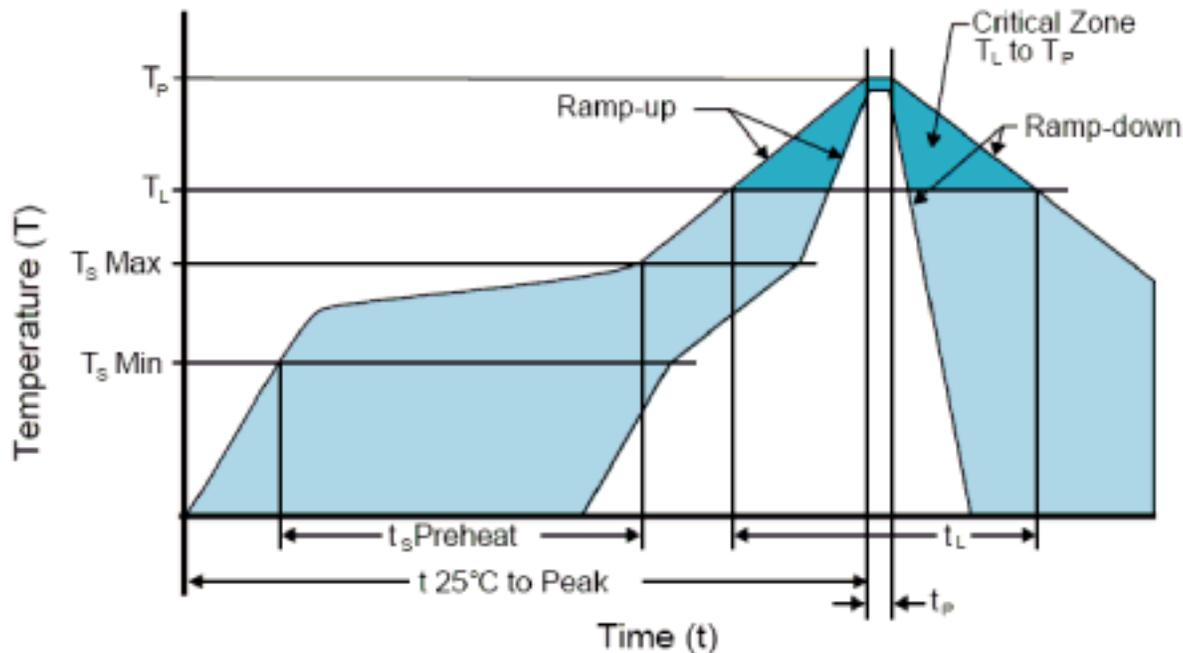
**Time 25°C to Peak Temperature (t)** 8 Minutes Maximum

**Moisture Sensitivity Level** Level 1

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## Recommended Solder Reflow Methods



### Low Temperature Infrared/Convection 185°C

<b><math>T_s</math> MAX to <math>T_L</math> (Ramp-up Rate)</b>	5°C/Second Maximum
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#### Preheat

- Temperature Minimum ( $T_s$ MIN)	N/A
- Temperature Typical ( $T_s$ TYP)	150°C
- Temperature Maximum ( $T_s$ MAX)	N/A
- Time ( $t_s$ MIN)	60 - 120 Seconds

<b>Ramp-up Rate (<math>T_L</math> to <math>T_P</math>)</b>	5°C/Second Maximum
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#### Time Maintained Above:

- Temperature ( $T_L$ )	150°C
- Time ( $t_L$ )	200 Seconds Maximum

<b>Peak Temperature (<math>T_P</math>)</b>	185°C Maximum
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<b>Target Peak Temperature (<math>T_P</math> Target)</b>	185°C Maximum 2 Times
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<b>Time within 5°C of actual peak (<math>t_p</math>)</b>	10 Seconds Maximum 2 Times
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<b>Ramp-down Rate</b>	5°C/Second Maximum
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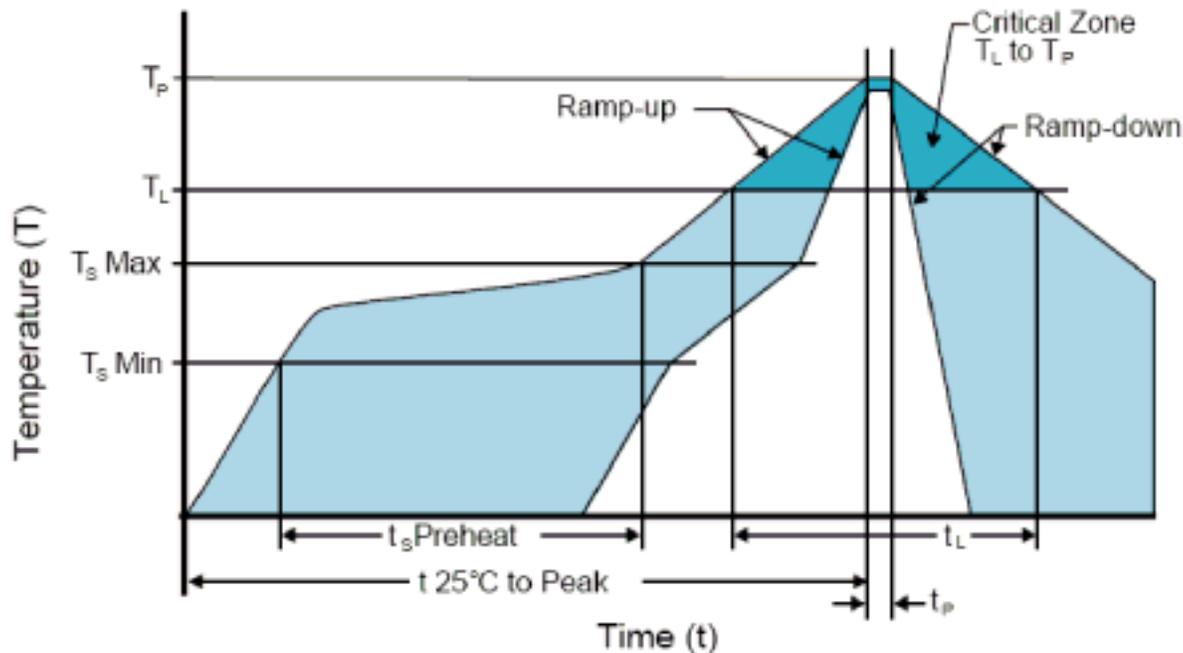
<b>Time 25°C to Peak Temperature (t)</b>	N/A
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<b>Moisture Sensitivity Level</b>	Level 1
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## Recommended Solder Reflow Methods



### Low Temperature Solder Bath (Wave Solder)

Ts 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> MIN)	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 1 Time / 235°C Maximum 2 Times
<b>Time within 5°C of actual peak (t<sub>p</sub>)</b>	5 Seconds Maximum 1 Time / 15 Seconds Maximum 2 Times
<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

### Low Temperature Manual Soldering

185°C Maximum for 10 Seconds Maximum, 2 times Maximum.

### High Temperature Manual Soldering

260°C Maximum for 5 Seconds Maximum, 2 times Maximum.