

**ECN/PCN No.: 4120**

For Manufacturer			
<b>Product Description:</b> PLASTIC SMD MEMS OSCILLATOR	<b>Abrakon Part Number / Part Series:</b> EMK11	<input type="checkbox"/> Documentation only <input type="checkbox"/> ECN <input checked="" type="checkbox"/> EOL	<input checked="" type="checkbox"/> Series <input type="checkbox"/> Part Number
<b>Affected Revision:</b> N	<b>New Revision:</b> EOL	<b>Application:</b>	<input type="checkbox"/> Safety <input checked="" type="checkbox"/> Non-Safety
<b>Prior to Change:</b> Active <a href="https://abracon.com/datasheets/Ecliptek/EMK11.pdf">https://abracon.com/datasheets/Ecliptek/EMK11.pdf</a>			
<b>After Change:</b> EOL			
<b>Cause/Reason for Change:</b> Discontinuation of manufacturing capability.			
Change Plan			
<b>Effective Date:</b> 2/7/2022	<b>Additional Remarks:</b> N/A		
<b>Change Declaration:</b> N/A			
<b>Issued Date:</b> 2/7/2022	<b>Issued By:</b> <i>Brooke Cushman</i> Product Engineer	<b>Issued Department:</b> Engineering	
<b>Approval:</b> <i>Thomas Culhane</i> Engineering Director	<b>Approval:</b> <i>Reuben Quintanilla</i> Quality Director	<b>Approval:</b> <i>Ying Huang</i> Purchasing Director	
For Abracon EOL only			
<b>Last Time Buy (if applicable):</b> 5/7/2022	<b>Alternate Part Number / Part Series:</b> ASVDV (7.0x5.0mm)		
<b>Additional Approval:</b>	<b>Additional Approval:</b>	<b>Additional Approval:</b>	
Customer Approval (If Applicable)			
<b>Qualification Status:</b> <input type="checkbox"/> Approved <input type="checkbox"/> Not accepted <i>Note: It is considered approved if there is no feedback from the customer 1 month after ECN/PCN is released.</i>			
<b>Customer Part Number:</b>		<b>Customer Project:</b>	
<b>Company Name:</b>	<b>Company Representative:</b>	<b>Representative Signature:</b>	
<b>Customer Remarks:</b>			

## REGULATORY COMPLIANCE



## ITEM DESCRIPTION

MEMS Clock Oscillators LVCMOS (CMOS) 1.8Vdc 4 Pad 5.0mm x 7.0mm Plastic Surface Mount (SMD)

## ELECTRICAL SPECIFICATIONS

Nominal Frequency	1MHz to 125MHz
Frequency Tolerance/Stability	Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, and Output Load Change ±100ppm Maximum over 0°C to +70°C ±50ppm Maximum over 0°C to +70°C ±25ppm Maximum over 0°C to +70°C ±20ppm Maximum over 0°C to +70°C ±100ppm Maximum over -20°C to +70°C ±50ppm Maximum over -20°C to +70°C ±25ppm Maximum over -20°C to +70°C ±20ppm Maximum over -20°C to +70°C ±100ppm Maximum over -40°C to +85°C ±50ppm Maximum over -40°C to +85°C ±25ppm Maximum over -40°C to +85°C ±20ppm Maximum over -40°C to +85°C
Aging at 25°C	±1.5ppm Maximum First Year
Supply Voltage	1.8Vdc ±10%
Input Current	No Load 4.5mA Maximum over Nominal Frequency of 1MHz to 20MHz 5mA Maximum over Nominal Frequency of 20.000001MHz to 50MHz 6mA Maximum over Nominal Frequency of 50.000001MHz to 80MHz 7mA Maximum over Nominal Frequency of 80.000001MHz to 125MHz
Output Voltage Logic High (V <sub>oh</sub> )	I <sub>OH</sub> = -2mA 90% of V <sub>dd</sub> Minimum
Output Voltage Logic Low (V <sub>ol</sub> )	I <sub>OL</sub> = +2mA 10% of V <sub>dd</sub> Maximum
Rise/Fall Time	Measured from 20% to 80% of waveform 1.5nSec Typical, 3.5nSec Maximum
Duty Cycle	Measured at 50% of waveform 50 ±10(%) 50 ±5(%)
Load Drive Capability	15pF Maximum
Output Logic Type	CMOS
Output Control Function	Tri-State (Disabled Output: High Impedance) Power Down (Disabled Output: Logic Low)
Output Control Input Voltage Logic High (V <sub>ih</sub> )	70% of V <sub>dd</sub> Minimum or No Connect to Enable Output
Output Control Input Voltage Logic Low (V <sub>il</sub> )	30% of V <sub>dd</sub> Maximum to Disable Output
Power Down Output Enable Time	5mSec Maximum
Tri-State Output Enable Time	150nSec Maximum
Power Down Output Disable Time	150nSec Maximum
Tri-State Output Disable Time	150nSec Maximum
Standby Current	5µA Maximum (Disabled Output: Logic Low)
Period Jitter (RMS)	2pSec Typical, 5pSec Maximum
RMS Phase Jitter (F <sub>j</sub> = 900kHz to 7.5MHz; Random)	0.5pSec Typical, 1pSec Maximum

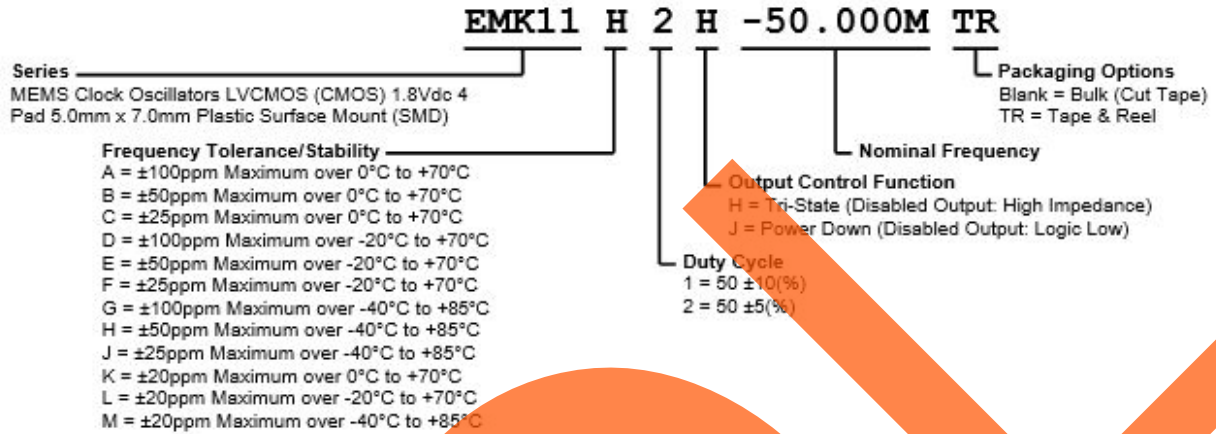
# EMK11 Series



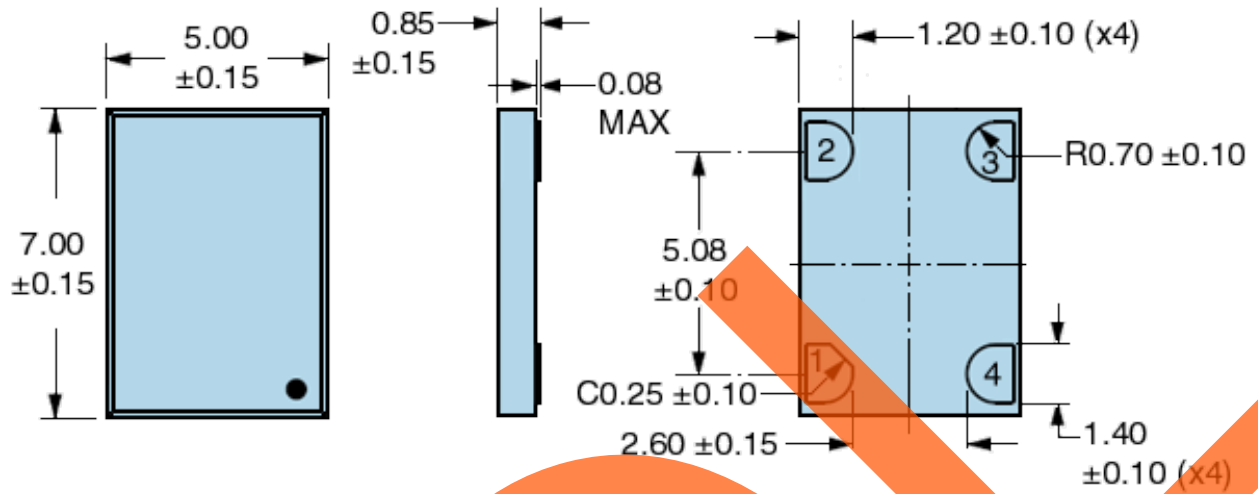
<b>RMS Phase Jitter</b> (Fj = 12kHz to 20MHz; Random)	1.5pSec Typical, 3pSec Maximum
<b>Start Up Time</b>	5mSec Maximum
<b>Storage Temperature Range</b>	-65°C to +150°C



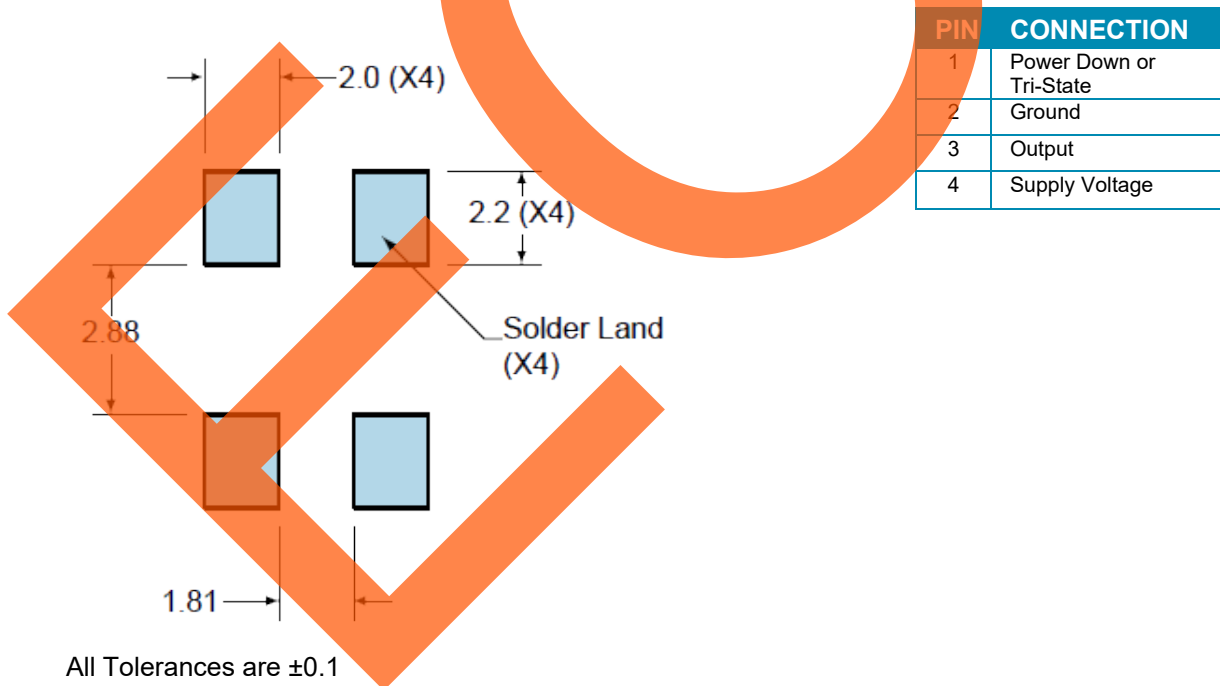
**PART NUMBERING GUIDE**



MECHANICAL DIMENSIONS



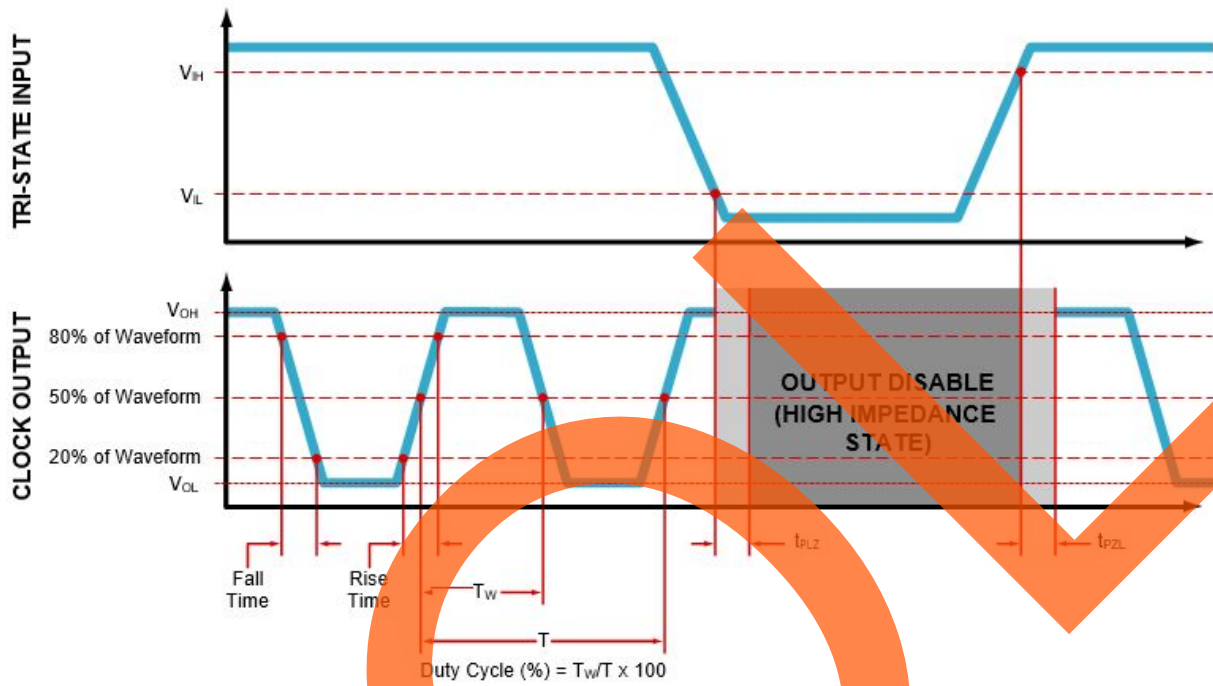
SUGGESTED SOLDER PAD LAYOUT



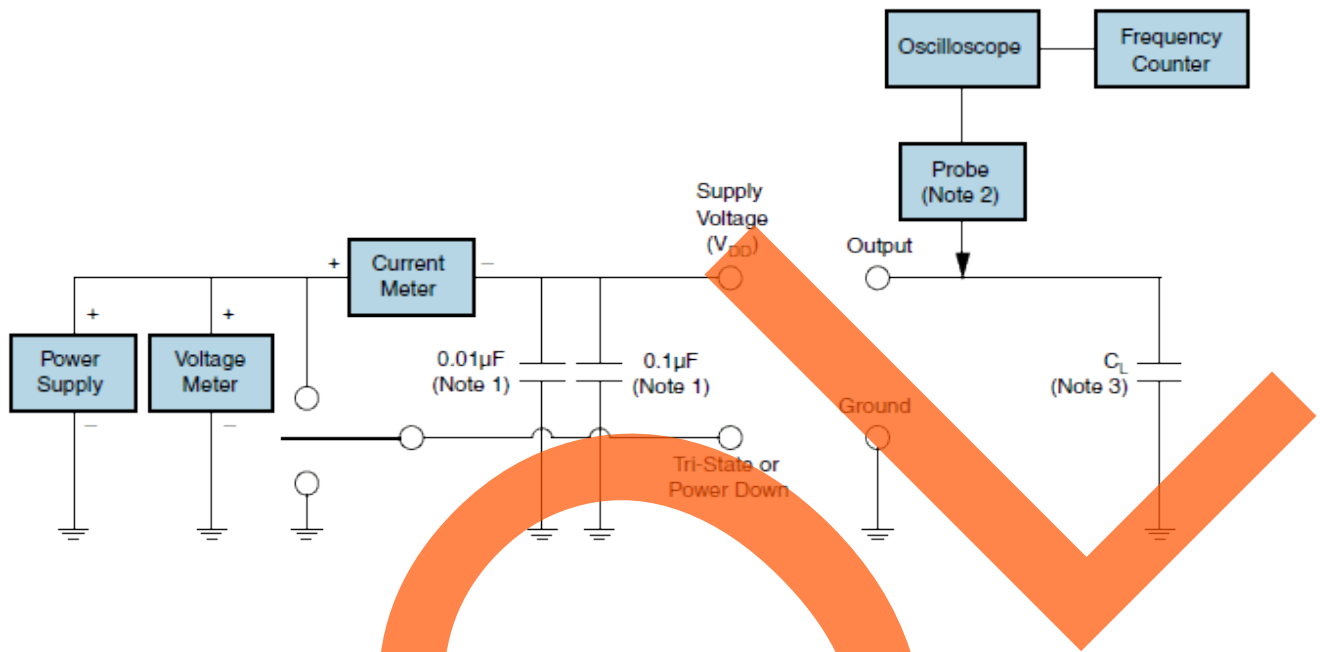
All Tolerances are ±0.1

All Dimensions in Millimeters

OUTPUT WAVEFORM & TIMING DIAGRAM



TEST CIRCUIT FOR CMOS OUTPUT



**Note 1:** An external 0.01µF ceramic bypass capacitor in parallel with a 0.1µF high frequency ceramic bypass capacitor close (less than 2mm) to the package ground and supply voltage pin is required.

**Note 2:** A low input capacitance (<12pF), 10X Attenuation Factor, High Impedance (>10Mohms), and High bandwidth (>300MHz) Passive probe is recommended.

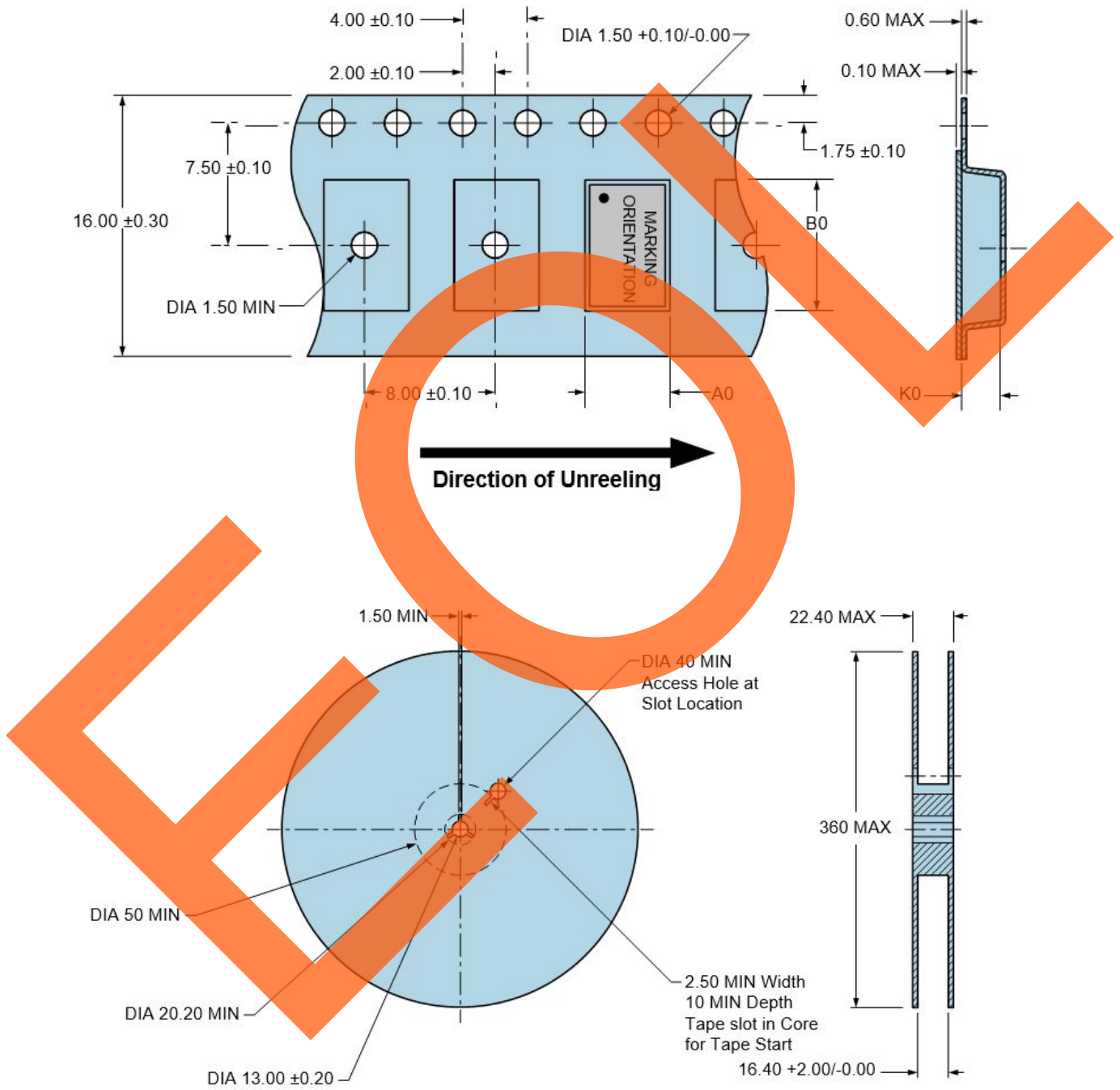
**Note 3:** Capacitance value  $C_L$  includes sum of all probe and fixture capacitance. See applicable specification sheet for Load Drive Capability.

**TAPE & REEL DIMENSIONS**

Quantity per Reel: 1,000 Units

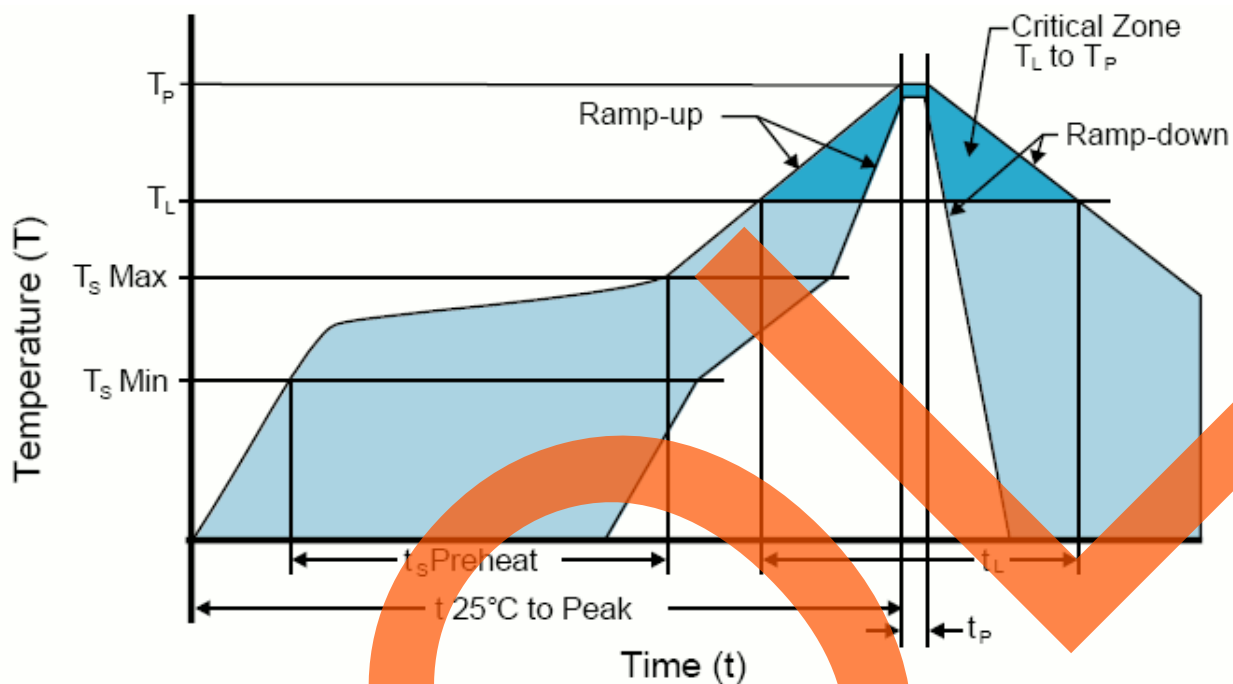
All Dimensions in Millimeters

Compliant to EIA-481





RECOMMENDED SOLDER REFLOW METHOD



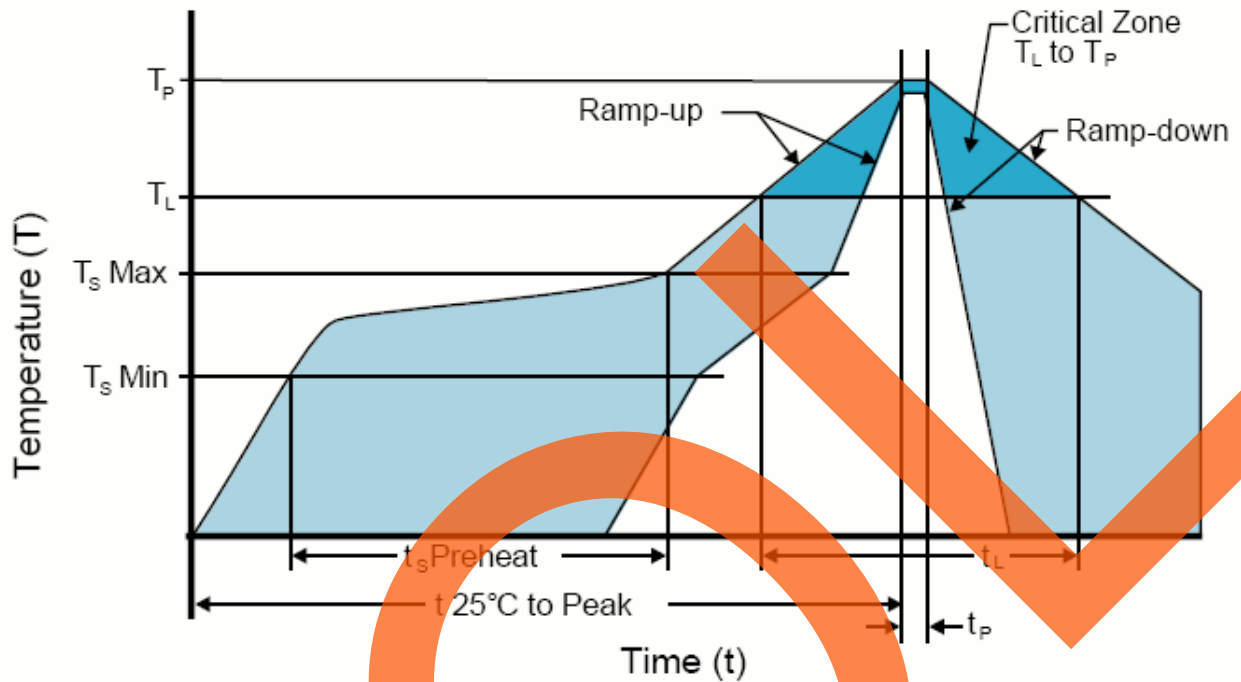
**HIGH TEMPERATURE INFRARED/CONVECTION**

T <sub>S</sub> MAX to T <sub>L</sub> (Ramp-up Rate)	3°C/Second Maximum
<b>Preheat</b>	
- Temperature Minimum (T <sub>S</sub> MIN)	150°C
- Temperature Typical (T <sub>S</sub> TYP)	175°C
- Temperature Maximum (T <sub>S</sub> MAX)	200°C
- Time (t <sub>s</sub> )	60 - 180 Seconds
<b>Ramp-up Rate (T<sub>L</sub> to T<sub>P</sub>)</b>	3°C/Second Maximum
<b>Time Maintained Above:</b>	
- Temperature (T <sub>L</sub> )	217°C
- Time (t <sub>L</sub> )	60 - 150 Seconds
<b>Peak Temperature (T<sub>P</sub>)</b>	260°C Maximum for 10 Seconds Maximum
<b>Target Peak Temperature (T<sub>P</sub> Target)</b>	250°C +0/-5°C
<b>Time within 5°C of actual peak (t<sub>p</sub>)</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><math>T_s</math> MAX to <math>T_L</math> (Ramp-up Rate)</b>	5°C/Second Maximum
<b>Preheat</b>	
- Temperature Minimum ( $T_s$ MIN)	N/A
- Temperature Typical ( $T_s$ TYP)	150°C
- Temperature Maximum ( $T_s$ MAX)	N/A
- Time ( $t_s$ )	60 - 120 Seconds
<b>Ramp-up Rate (<math>T_L</math> to <math>T_P</math>)</b>	5°C/Second Maximum
<b>Time Maintained Above:</b>	
- Temperature ( $T_L$ )	150°C
- Time ( $t_L$ )	200 Seconds Maximum
<b>Peak Temperature (<math>T_P</math>)</b>	240°C Maximum
<b>Target Peak Temperature (<math>T_P</math> Target)</b>	240°C Maximum 2 Times / 230°C Maximum 1 Time
<b>Time within 5°C of actual peak (<math>t_p</math>)</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.)