Engineering/Process Change Notice

ECN/PCN No.: 4148

For Manufacturer			
Product Description: PLASTIC SMD MEMS OSCILLATOR	**Abracon Part Number / Part Series:** EMRC12	☐ Documentation only ☐ ECN ☒ EOL	☒ Series ☐ Part Number
Affected Revision: A	**New Revision:** EOL	**Application:**	☐ Safety ☒ Non-Safety
Prior to Change: Active https://abracon.com/datasheets/Ecliptek/EMRC12.pdf			
After Change: EOL			
Cause/Reason for Change: Discontinuation of manufacturing capability.			

Change Plan		
Effective Date: 2/7/2022	**Additional Remarks:** N/A	
Change Declaration: N/A		
Issued Date: 2/7/2022	**Issued By:**	**Issued Department:**
Approval:	**Approval:**	**Approval:**

For Abracon EOL only		
Last Time Buy (if applicable): 5/7/2022	**Alternate Part Number / Part Series:** AK7 (frequency=100-220MHz), AX7 (frequency greater than 220MHz or less than 100MHz)	
Additional Approval:	**Additional Approval:**	**Additional Approval:**

Customer Approval (If Applicable)		
Qualification Status: ☐ Approved ☐ Not accepted *Note: It is considered approved if there is no feedback from the customer 1 month after ECN/PCN is released.*		
Customer Part Number:	**Customer Project:**	
Company Name:	**Company Representative:**	**Representative Signature:**
Customer Remarks:		

REGULATORY COMPLIANCE

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

ITEM DESCRIPTION

MEMS Clock Oscillators LVPECL (PECL) 2.5Vdc 6 Pad 5.0mm x 7.0mm Plastic Surface Mount (SMD)

ELECTRICAL SPECIFICATIONS

Nominal Frequency	1MHz to 625MHz
Frequency Tolerance/Stability	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, Reflow, Shock, and Vibration ±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 -40°C to +85°C ±50ppm Maximum over -40°C to +85°C ±25ppm Maximum over -40°C to +85°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
Aging at 25°C	±1ppm First Year Maximum
Supply Voltage	+2.5Vdc ±10%
Input Current	Excluding Load Termination Current 60mA Typical, 70mA Maximum
Output Voltage Logic High (V_{OH})	Vdd -1.10Vdc Minimum, 1.60Vdc Typical, Vdd -0.70Vdc Maximum
Output Voltage Logic Low (V_{OL})	Vdd -1.90Vdc Minimum, 0.80Vdc Typical, Vdd -1.50Vdc Maximum
Rise/Fall Time	Measured over 20% to 80% of waveform 300pSec Typical, 500pSec Maximum
Duty Cycle	Measured at 50% of waveform 50 ±10(%) 50 ±5(%) (Not available with Duty Cycle of 50 ±5(%) over Nominal Frequency range of 312.500001MHz to 524.999999MHz)
Output Swing (VOpp)	600mVdc Minimum, 800mVdc Typical, 1000mVdc Maximum
Load Drive Capability	50 Ohms into Vcc-2.0Vdc
Output Logic Type	LVPECL
Logic Control / Additional Output	Output Enable (OE) and Complementary Output
Output Control Input Voltage	Vih of 70% of Vdd Minimum or No Connect to Enable Output and Complementary Output, Vil of 30% of Vdd Maximum to Disable Output and Complementary Output (High Impedance)
Output Enable Current	35mA Maximum (Without Load)
RMS Phase Jitter	Fj = 12kHz to 20MHz; Random 0.5pSec Typical, 1pSec Maximum
Period Jitter (Deterministic)	0.2pSec Typical
Period Jitter (Random)	1.0pSec Typical
Period Jitter (RMS)	1.4pSec Typical, 1.7pSec Maximum
Period Jitter (pk-pk)	15pSec Typical, 20pSec Maximum
Start Up Time	10mSec Maximum
Storage Temperature Range	-55°C to +125°C

PART NUMBERING GUIDE

EMRC12 C 2 H -77.760M TR

Series
MEMS Clock Oscillators LVPECL (PECL) 2.5Vdc 6 Pad
5.0mm x 7.0mm Plastic Surface Mount (SMD)

Frequency Tolerance/Stability
C = ±100ppm Maximum over 0°C to +70°C
D = ±50ppm Maximum over 0°C to +70°C
E = ±25ppm Maximum over 0°C to +70°C
F = ±20ppm Maximum over 0°C to +70°C
G = ±100ppm Maximum over -40°C to +85°C
H = ±50ppm Maximum over -40°C to +85°C
J = ±25ppm Maximum over -40°C to +85°C
L = ±100ppm Maximum over -20°C to +70°C
M = ±50ppm Maximum over -20°C to +70°C
N = ±25ppm Maximum over -20°C to +70°C

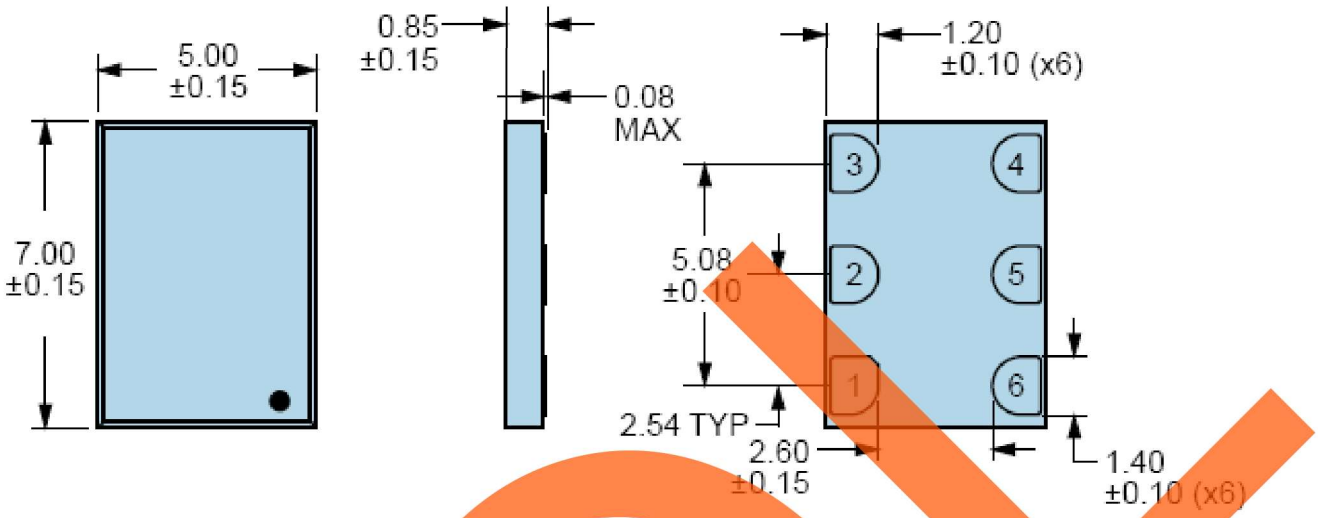
Duty Cycle
1 = 50 ±10(%)
2 = 50 ±5(%)

Logic Control / Additional Output
H = Output Enable (OE) and Complementary Output

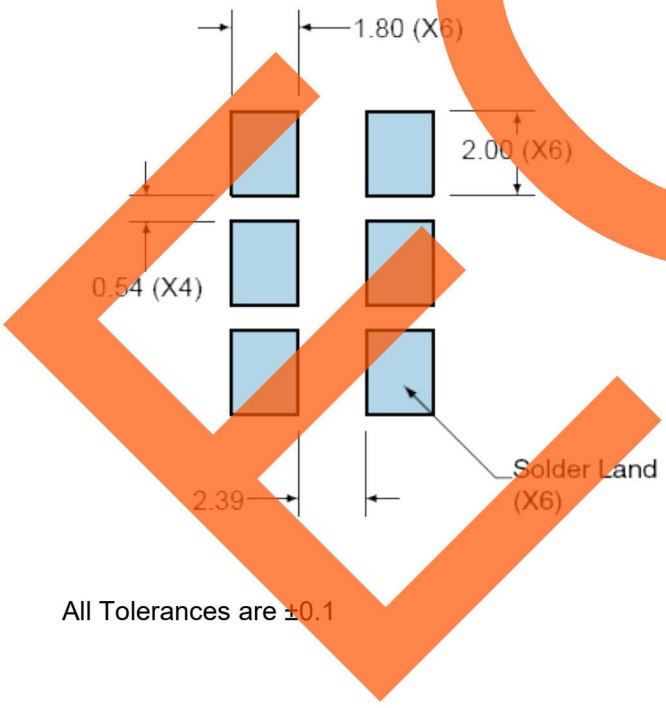
Nominal Frequency
1MHz to 312.5MHz
420MHz to 500MHz
525MHz to 625MHz

Packaging Options
Blank = Bulk (Cut Tape)
TR = Tape & Reel

MECHANICAL DIMENSIONS



SUGGESTED SOLDER PAD LAYOUT

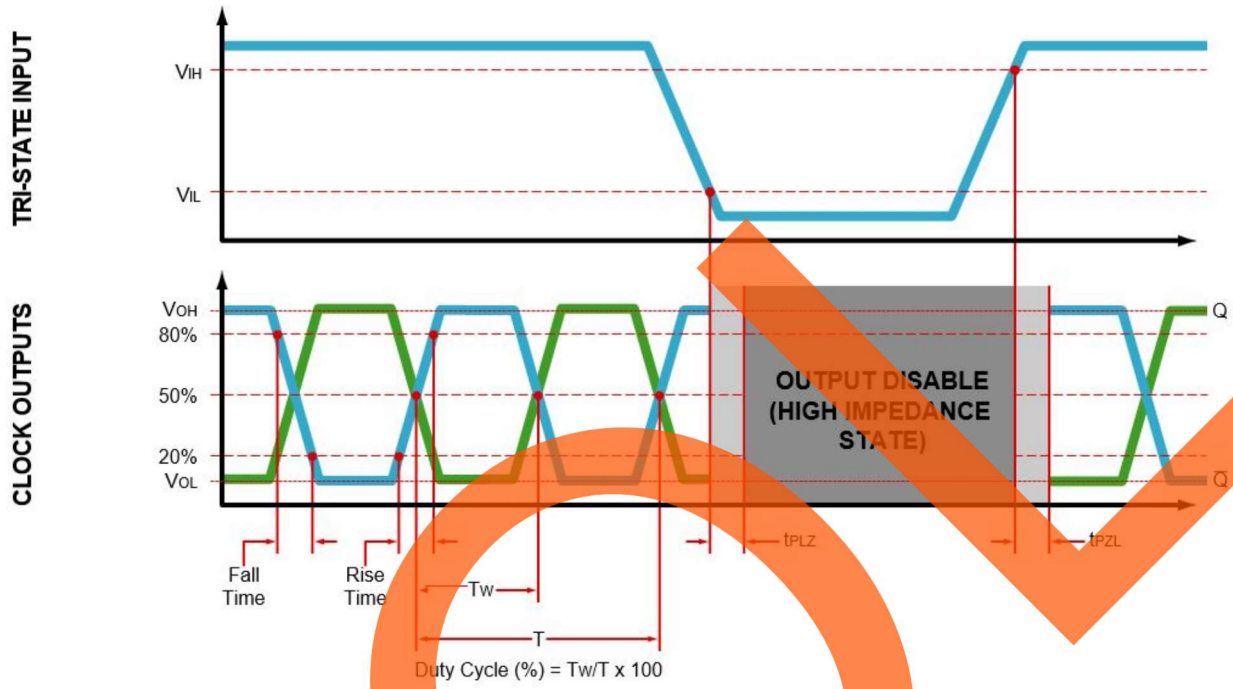


PIN	CONNECTION
1	Output Enable (OE)
2	No Connect
3	Case Ground
4	Output
5	Complementary Output
6	Supply Voltage

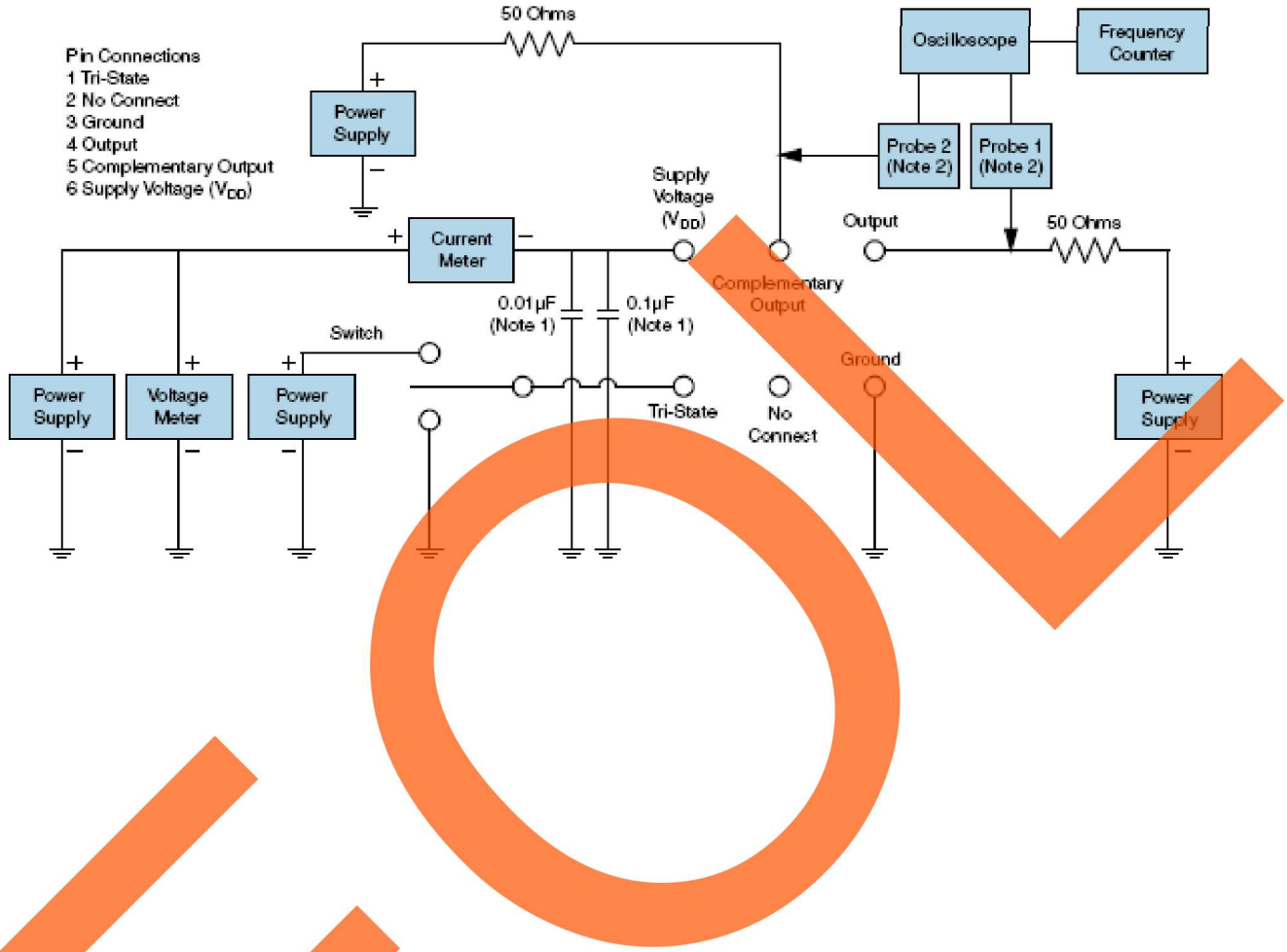
All Tolerances are ±0.1

All Dimensions in Millimeters

OUTPUT WAVEFORM & TIMING DIAGRAM



TEST CIRCUIT FOR TRI-STATE AND COMPLEMENTARY OUTPUT



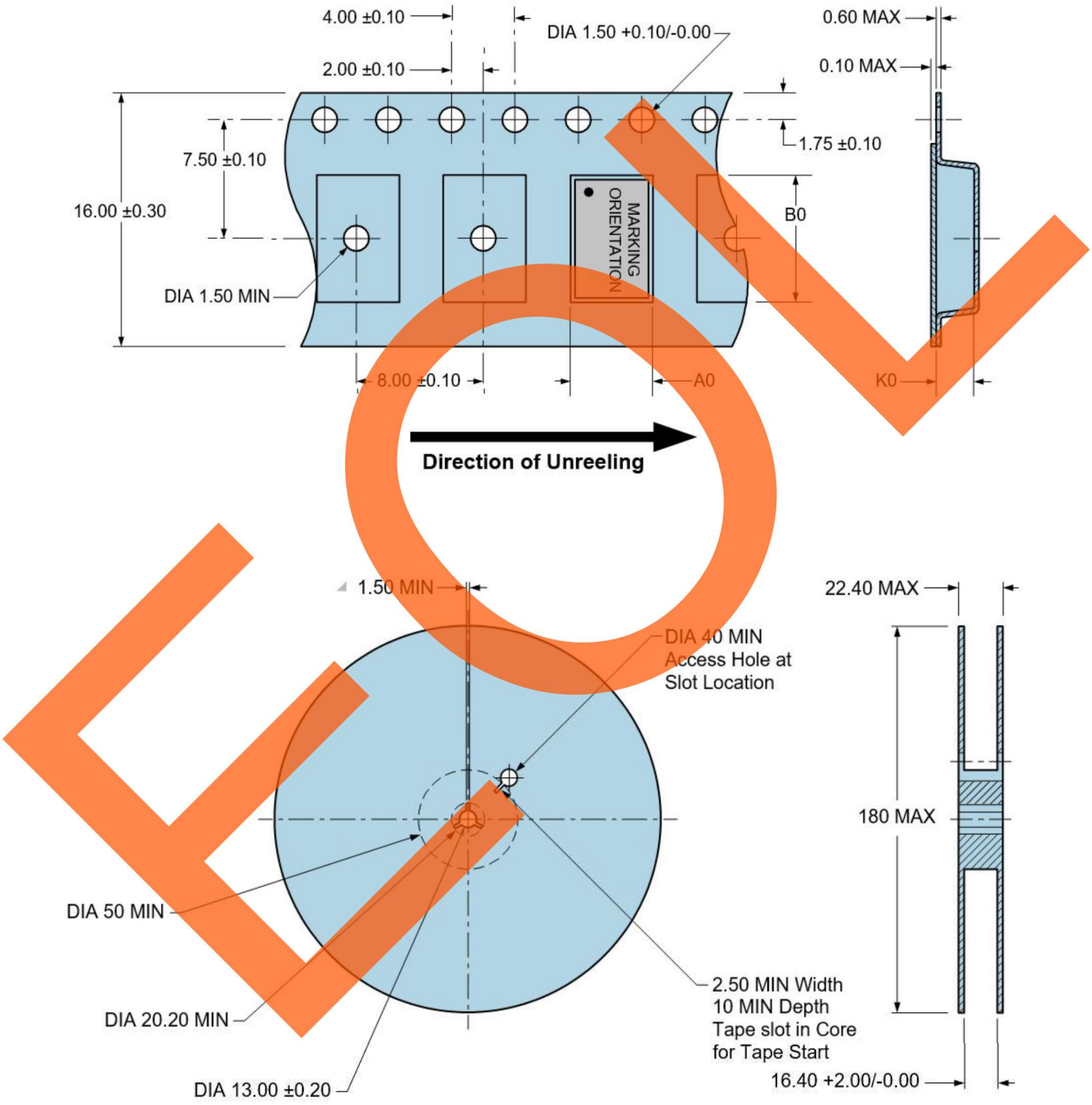
Note 1: An external 0.01µF ceramic bypass capacitor in parallel with a 0.1µF high frequency ceramic bypass capacitor close (less Than 2mm) to the package ground and supply voltage pin is required.
Note 2: A low capacitance (<12pF), 10X attenuation factor, high impedance (>10Mohms), and high bandwidth (>500MHz) passive Probe is recommended.
Note 3: Test circuit PCB traces need to be designed for a characteristic line impedance of 50 ohms.

TAPE & REEL DIMENSIONS

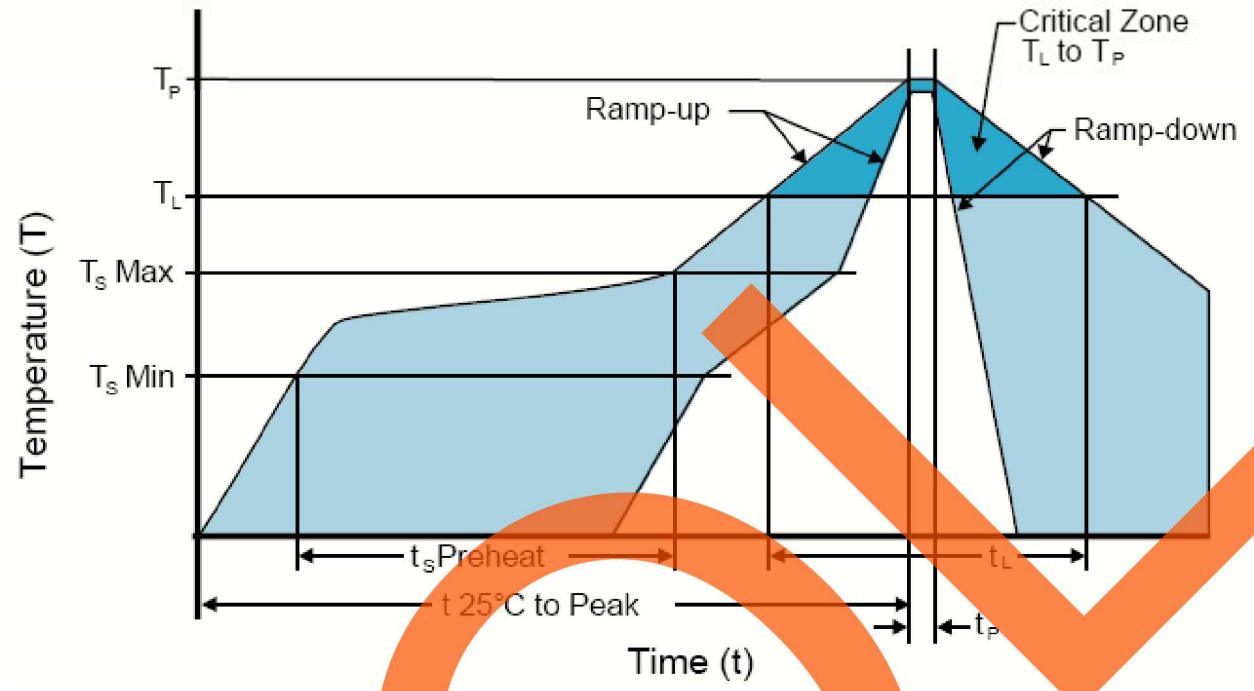
Quantity per Reel: 1,000 Units

All Dimensions in Millimeters

Compliant to EIA-481



RECOMMENDED SOLDER REFLOW METHOD

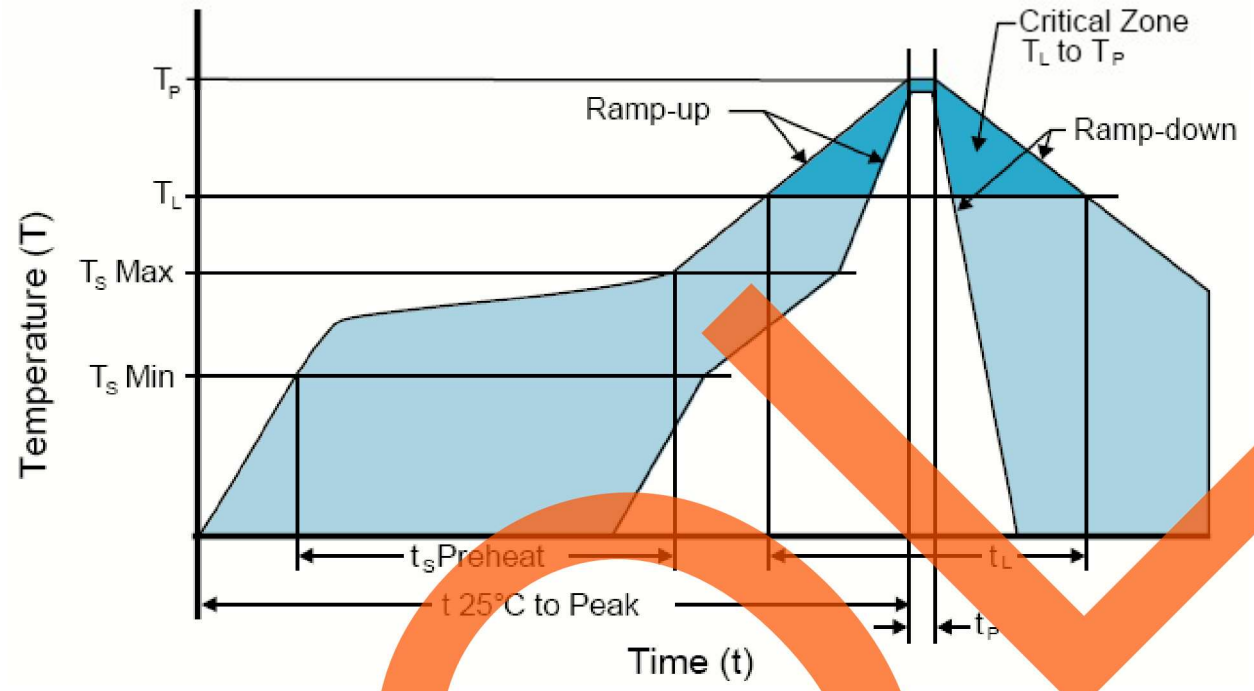


HIGH TEMPERATURE INFRARED/CONVECTION	
T_S MAX to T_L (Ramp-up Rate)	3°C/Second Maximum
Preheat - Temperature Minimum (T_S MIN) - Temperature Typical (T_S TYP) - Temperature Maximum(T_S MAX) - Time (t_s MIN)	 150°C 175°C 200°C 60 - 180 Seconds
Ramp-up Rate (T_L to T_P)	3°C/Second Maximum
Time Maintained 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 - Temperature Minimum (T_S MIN) - Temperature Typical (T_S TYP) - Temperature Maximum(T_S MAX) - Time (t_S MIN)	 N/A 150°C N/A 60 - 120 Seconds
Ramp-up Rate (T_L to T_P)	5°C/Second Maximum
Time Maintained Above: - Temperature (T_L) - Time (t_L)	 150°C 200 Seconds Maximum
Peak Temperature (T_P)	240°C Maximum
Target Peak Temperature(T_P Target)	240°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.)