Engineering/Process Change Notice

ECN/PCN No.: 4476

For Manufacturer			
Product Description: Ceramic SMD Crystal Oscillator	**Abracon Part Number / Part Series:** EP16E7 Series	☐ Documentation only ☒ ECN ☒ EOL	☒ Series ☐ Part Number
Affected Revision: Rev. G 12/11/2012	**New Revision:** EOL	**Application:**	☐ Safety ☒ Non-Safety
Prior to Change: ACTIVE			
After Change: **EOL**			
Cause/Reason for Change: Discontinuation of manufacturing capability			

Change Plan		
Effective Date: 11/15/2022	**Additional Remarks:** N/A	
Change Declaration: N/A		
Issued Date: 11/15/22	**Issued By:** *Conor Healey*	**Issued Department:** Engineering
Approval: *Thomas Culhane* Engineering Director	**Approval:** *Reuben Quintanilla* Quality Director	**Approval:** *Ying Huang* Purchasing Director

For Abracon EOL only		
Last Time Buy (if applicable): None	**Alternate Part Number / Part Series:** ASEDV, ASE3, AP3S	
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

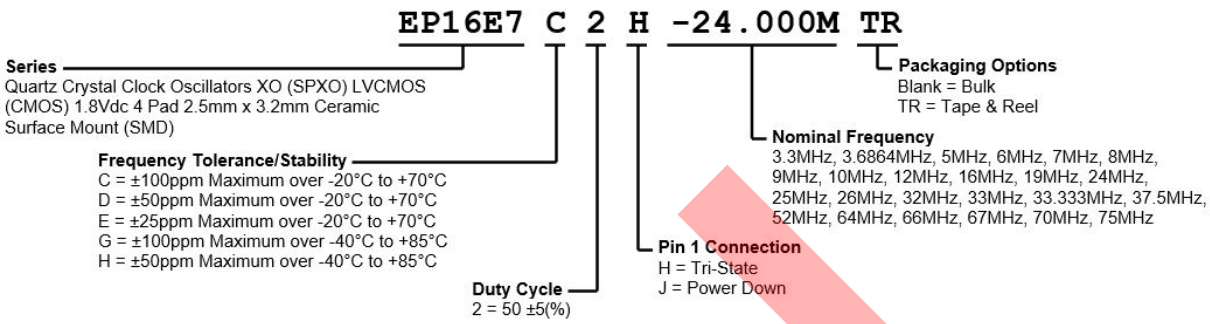
ITEM DESCRIPTION

Quartz Crystal Clock Oscillators XO (SPXO) LVCMOS (CMOS) 1.8Vdc 4 pad 2.5mm x 3.2mm Ceramic Surface Mount (SMD)

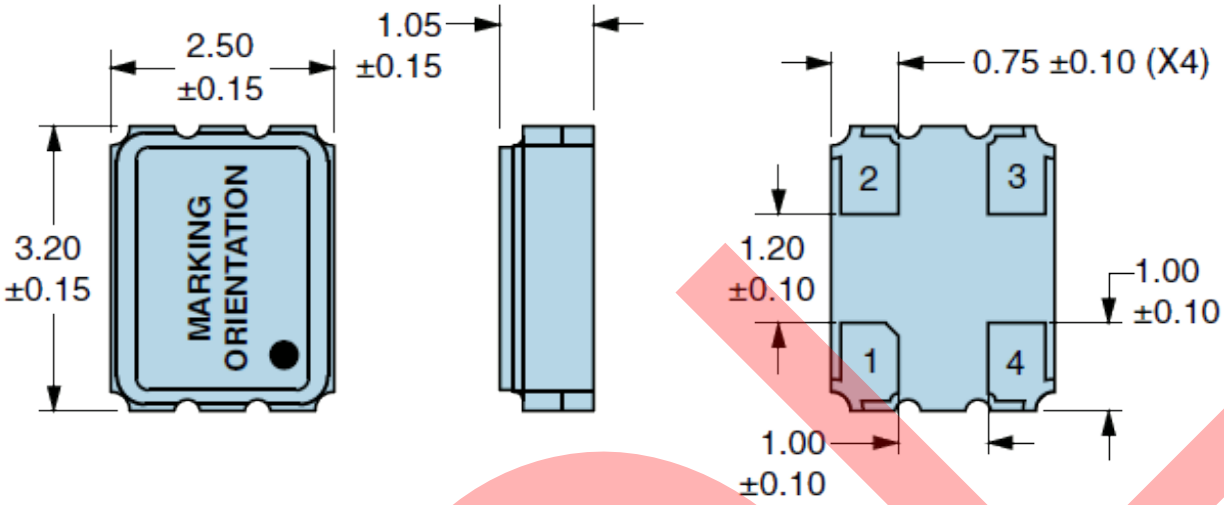
ELECTRICAL SPECIFICATIONS

Nominal Frequency	3.3MHz to 75MHz
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, First Year Aging at 25°, 260°C Reflow, Shock, and Vibration ±100ppm Maximum over -20°C to +70°C ±50ppm Maximum over -20°C to +70°C ±25ppm Maximum over -20°C to +70°C ±100ppm Maximum over -40°C to +85°C ±50ppm Maximum over -40°C to +85°C
Aging at 25°C	±5ppm/year Maximum
Supply Voltage	1.8Vdc ±5%
Input Current	8mA Maximum over Nominal Frequency of 3.3MHz to 25MHz 9mA Maximum over Nominal Frequency of 25.000001MHz to 50MHz 12mA Maximum over Nominal Frequency of 50.000001MHz to 75MHz
Output Voltage Logic High (V_{OH})	IOH = -8mA 90% of Vdd Minimum
Output Voltage Logic Low (V_{OL})	IOL = +8mA 10% of Vdd Maximum
Rise/Fall Time	Measured at 20% to 80% of waveform 6nSec Maximum over Nominal Frequency of 3.3MHz to 50MHz 4nSec Maximum over Nominal Frequency of 50.000001MHz to 75MHz
Duty Cycle	Measured at 50% of waveform 50 ±5(%)
Load Drive Capability	15pF Maximum
Output Logic Type	CMOS
Pin 1 Connection	Tri-State Power Down
Pin 1 Input Voltage (Vih and Vil)	90% of Vdd Minimum or No Connect to Enable Output, 10% of Vdd Maximum to Disable Output
Standby Current	30µA Maximum (Pin 1 = Ground, Power Down)
Disable Current	4mA Maximum (Pin 1 = Ground, Tri-State)
Absolute Clock Jitter	350pSec Maximum over Nominal Frequency of 3.3MHz to 24.999999MHz 200pSec Maximum over Nominal Frequency of 25MHz to 75MHz
Start Up Time	10mSec Maximum
Storage Temperature Range	-55°C to 125°C

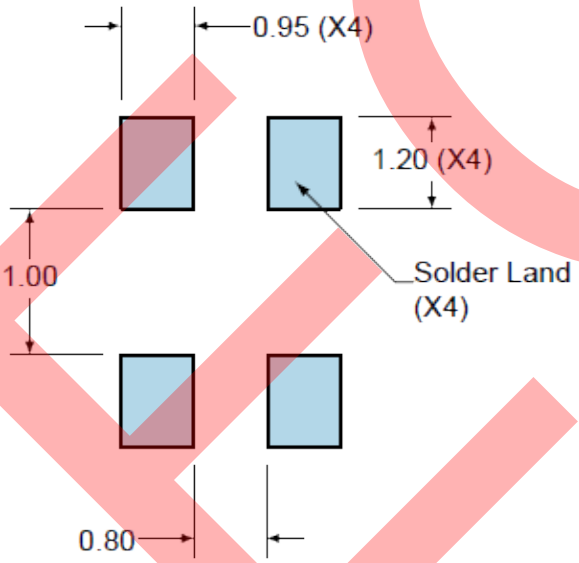
PART NUMBERING GUIDE



MECHANICAL DIMENSIONS



SUGGESTED SOLDER PAD LAYOUT

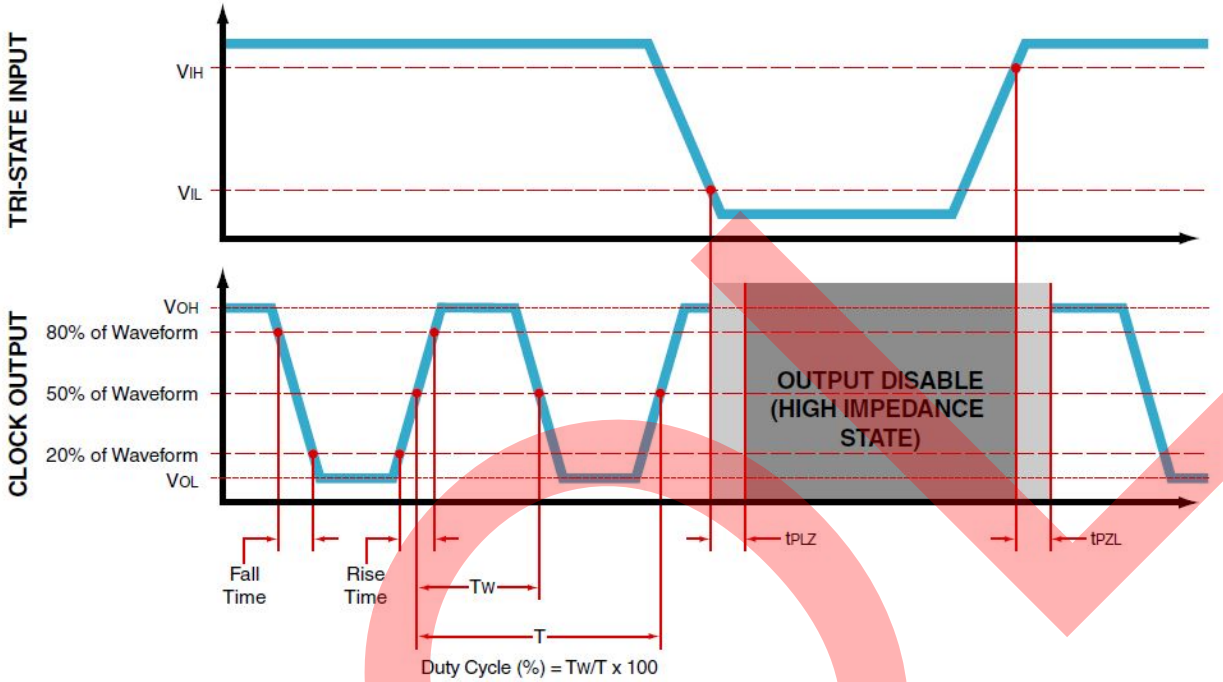


PIN	CONNECTION
1	Power Down Or Tri-State
2	Ground
3	Output
4	Supply Voltage

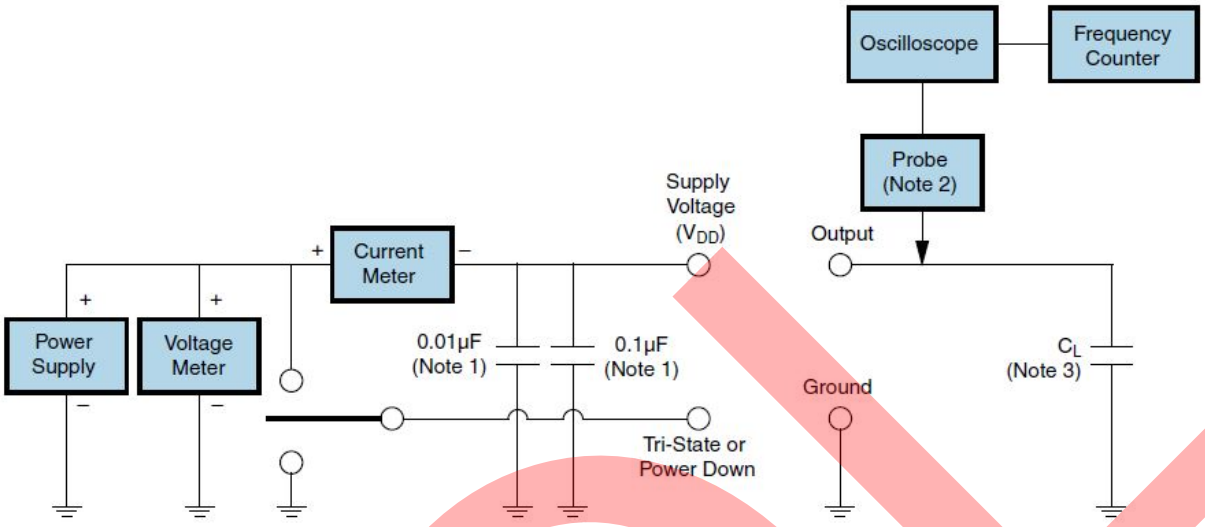
All Tolerances are ±0.1

All Dimensions in Millimeters

OUTPUT WAVEFORM & TIMING DIAGRAM



TEST CIRCUIT FOR CMOS OUTPUT



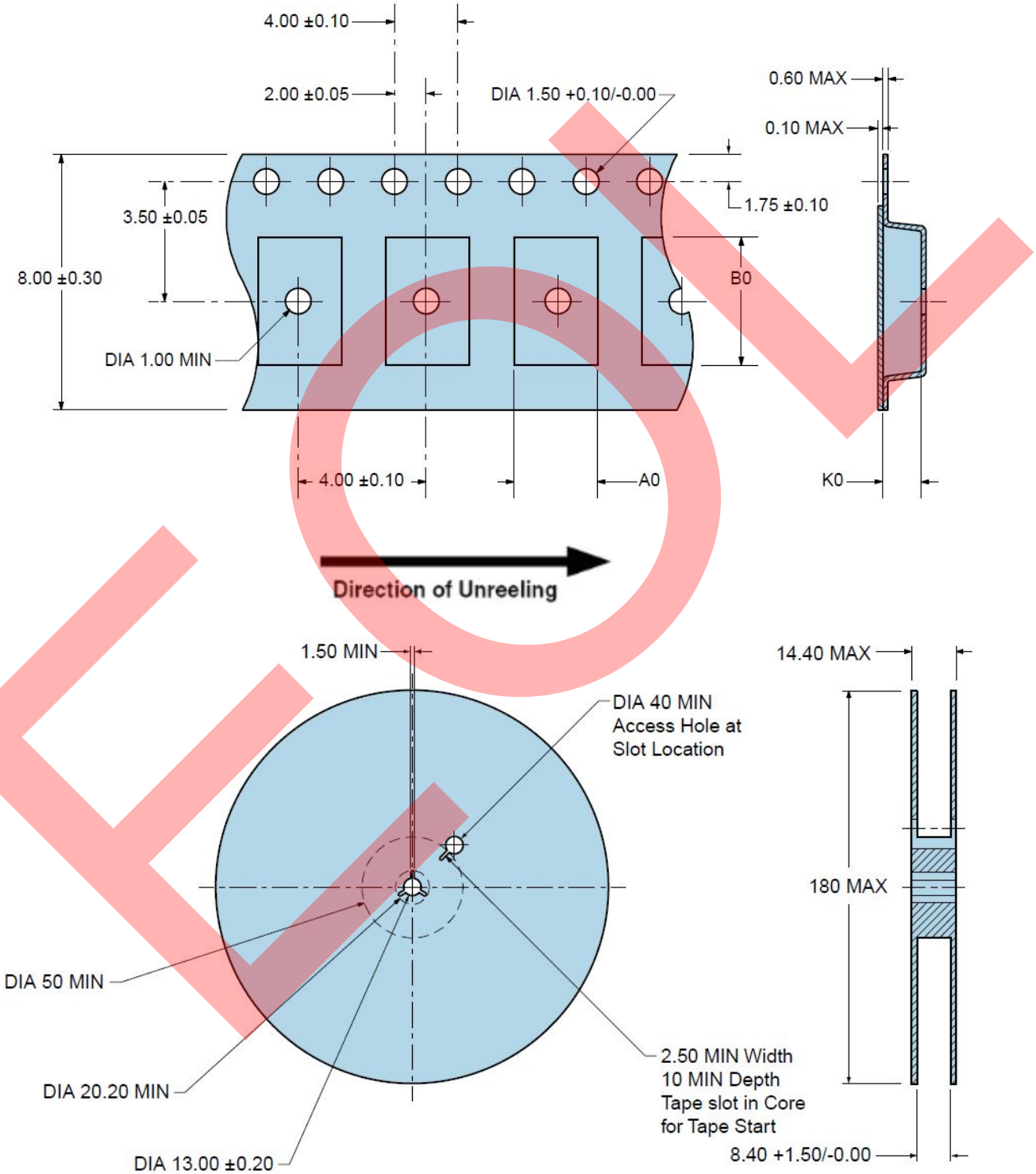
Note 1: An external 0.01µF Ceramic bypass capacitor in parallel with a 0.1µF high frequency ceramic bypass Capacitor close (less Than 2mm) to the package ground and supply voltage pin is required.
Note 2: A low input capacitance (<12pF), 10X Attenuation factor, High impedance (>10Mohms), and High bandwidth (>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

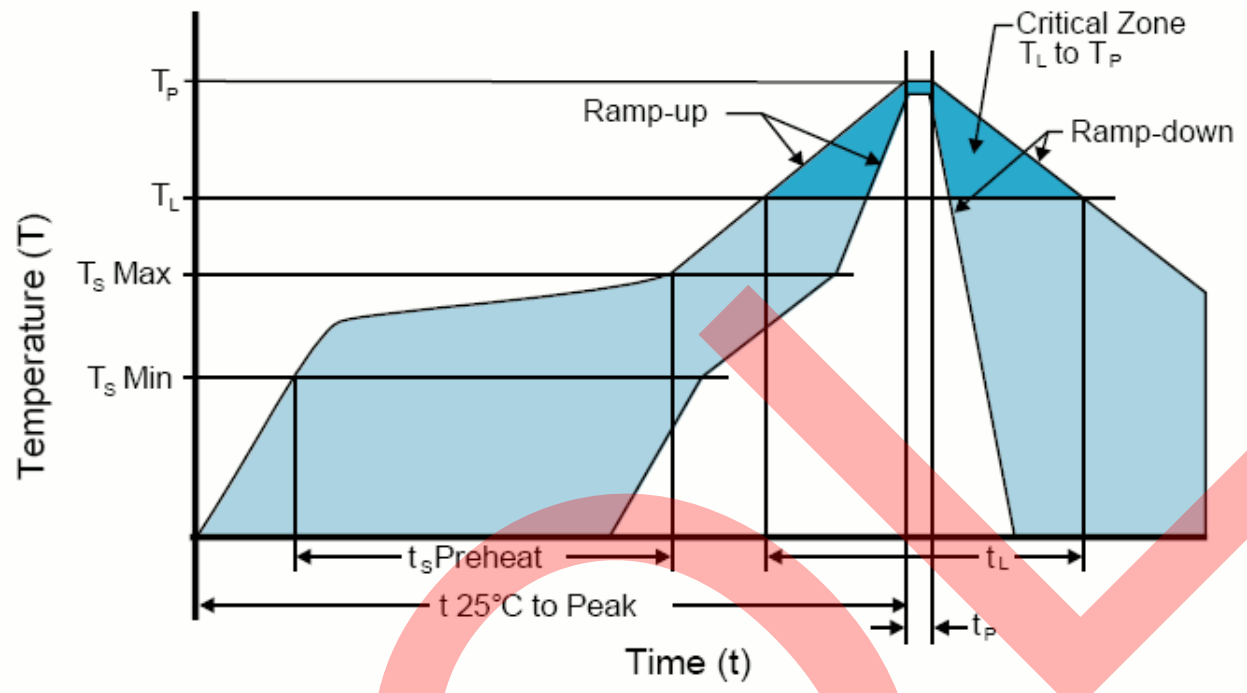
Quantity per Reel: 1,000 Units

All Dimensions in Millimeters

Compliant to EIA-481



RECOMMENDED SOLDER REFLOW METHOD

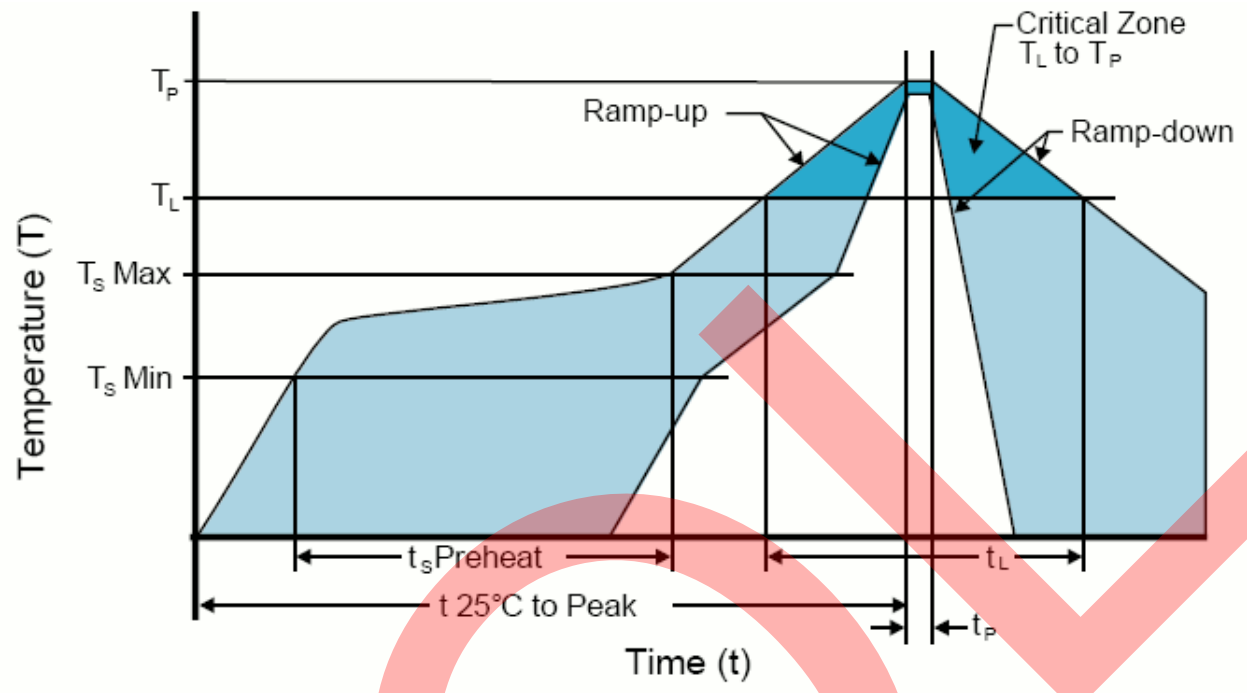


HIGH TEMPERATURE INFRARED/CONVECTION	
T_S MAX to T_L (Ramp-up Rate)	3°C/Second Maximum
Preheat **- Temperature Minimum (T_S MIN)** **- Temperature Typical (T_S TYP)** **- Temperature Maximum(T_S MAX)** **- Time (t_s MIN)**	 150°C 175°C 200°C 60 - 180 Seconds
Ramp-up Rate (T_L to T_P)	3°C/Second Maximum
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.)