

ECN/PCN No.: **4457**

| For Manufacturer | | | |
|--|---|---|--|
| Product Description: Ceramic SMD Crystal Oscillator | Abracon Part Number / Part Series: EH25 Series | <input type="checkbox"/> Documentation only <input checked="" type="checkbox"/> ECN <input checked="" type="checkbox"/> EOL | <input checked="" type="checkbox"/> Series <input type="checkbox"/> Part Number |
| Affected Revision: Rev. G 06/08/2012 | New Revision: EOL | Application: <input type="checkbox"/> Safety <input checked="" type="checkbox"/> 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: | Issued Department: | |
| Approval: | Approval: | Approval: | |
| For Abracon EOL only | | | |
| Last Time Buy (if applicable): 02-15-2023 <small>Based upon material availability, contact Abracon for details</small> | Alternate Part Number / Part Series: ASL, FO7HH | | |
| Additional Approval: | Additional Approval: | Additional Approval: | |
| Customer Approval (If Applicable) | | | |
| Qualification Status: <div style="text-align: center;"><input type="checkbox"/> Approved <input type="checkbox"/> Not accepted</div> <i>Note: It is considered approved if there is no feedback from the customer 1 month after ECN/PCN is released.</i> | | | |
| 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 |
|--|--|--|---|--|

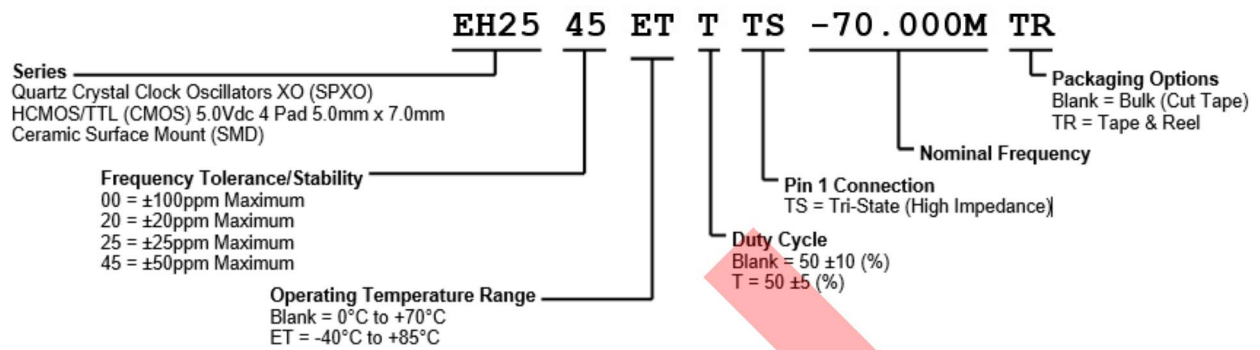
ITEM DESCRIPTION

Quartz Crystal Clock Oscillators XO (SPXO) HCMOS/TTL (CMOS) 5.0Vdc 4 Pad 5.0mm x 7.0mm Ceramic Surface Mount (SMD)

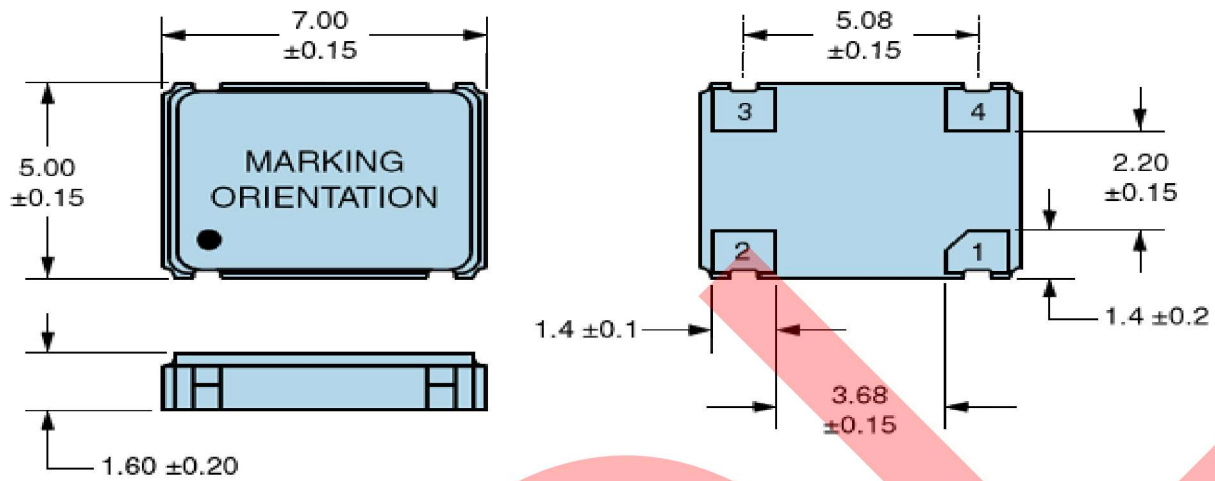
ELECTRICAL SPECIFICATIONS

| | |
|--|--|
| Nominal Frequency | 1MHz to 155.52MHz |
| 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°C, Shock, and Vibration ±100ppm Maximum ±20ppm Maximum ±25ppm Maximum ±50ppm Maximum |
| Aging at 25°C | ±5ppm/year Maximum |
| Operating Temperature Range | 0°C to +70°C -40°C to +85°C |
| Supply Voltage | 5.0Vdc ±10% |
| Input Current | No Load 50mA Maximum |
| Output Voltage Logic High (V_{OH}) | I _{OH} = -16mA 2.4Vdc Minimum with TTL Load, V _{DD} -0.4Vdc Minimum with HCMOS Load |
| Output Voltage Logic Low (V_{OL}) | I _{OL} = +16mA 0.4Vdc Maximum with TTL Load, 0.5Vdc Maximum with HCMOS Load |
| Rise/Fall Time | Measured at 0.8Vdc to 2.0Vdc with TTL Load; Measured at 20% to 80% of waveform with HCMOS Load 6nSec Maximum over Nominal Frequency of 1MHz to 70MHz 4nSec Maximum over Nominal Frequency of 70.000001MHz to 155.52MHz |
| Duty Cycle | 50 ±10 (%) (Measured at 1.4Vdc with TTL Load; Measured at 50% of waveform with HCMOS Load over Nominal Frequency range of 1MHz to 70MHz; Measured at 50% of waveform with TTL Load or with HCMOS Load over Nominal Frequency range of 70.000001MHz to 155.52MHz) 50 ±5 (%) (Measured at 50% of waveform with TTL Load or with HCMOS Load) |
| Load Drive Capability | 10TTL Load or 50pF HCMOS Load Maximum over Nominal Frequency of 1MHz to 70MHz 5TTL Load or 15pF HCMOS Load Maximum over Nominal Frequency of 70.000001MHz to 155.52MHz |
| Output Logic Type | CMOS |
| Pin 1 Connection | Tri-State (High Impedance) |
| Tri-State Input Voltage (V_{IH} and V_{IL}) | +2.2Vdc Minimum to enable output, +0.8Vdc Maximum to disable output (High Impedance), No Connect to enable output. |
| Absolute Clock Jitter | ±250pSec Maximum, ±100pSec Typical |
| One Sigma Clock Period Jitter | ±50pSec Maximum, ±30pSec Typical |
| Start Up Time | 10mSec Maximum |
| Storage Temperature Range | -55°C to +125°C |

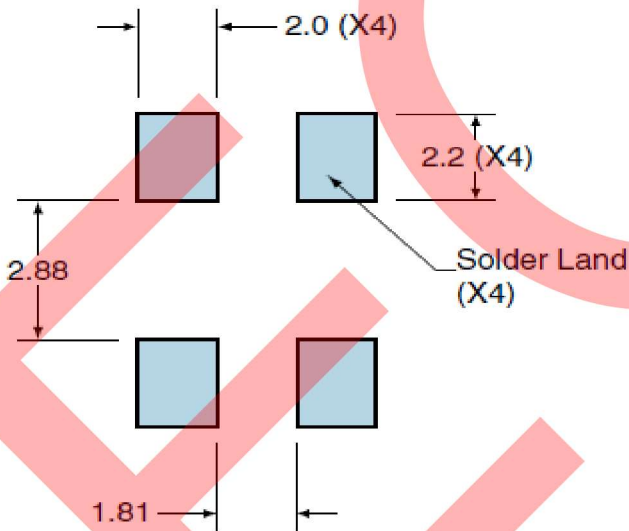
PART NUMBERING GUIDE



MECHANICAL DIMENSIONS



SUGGESTED SOLDER PAD LAYOUT

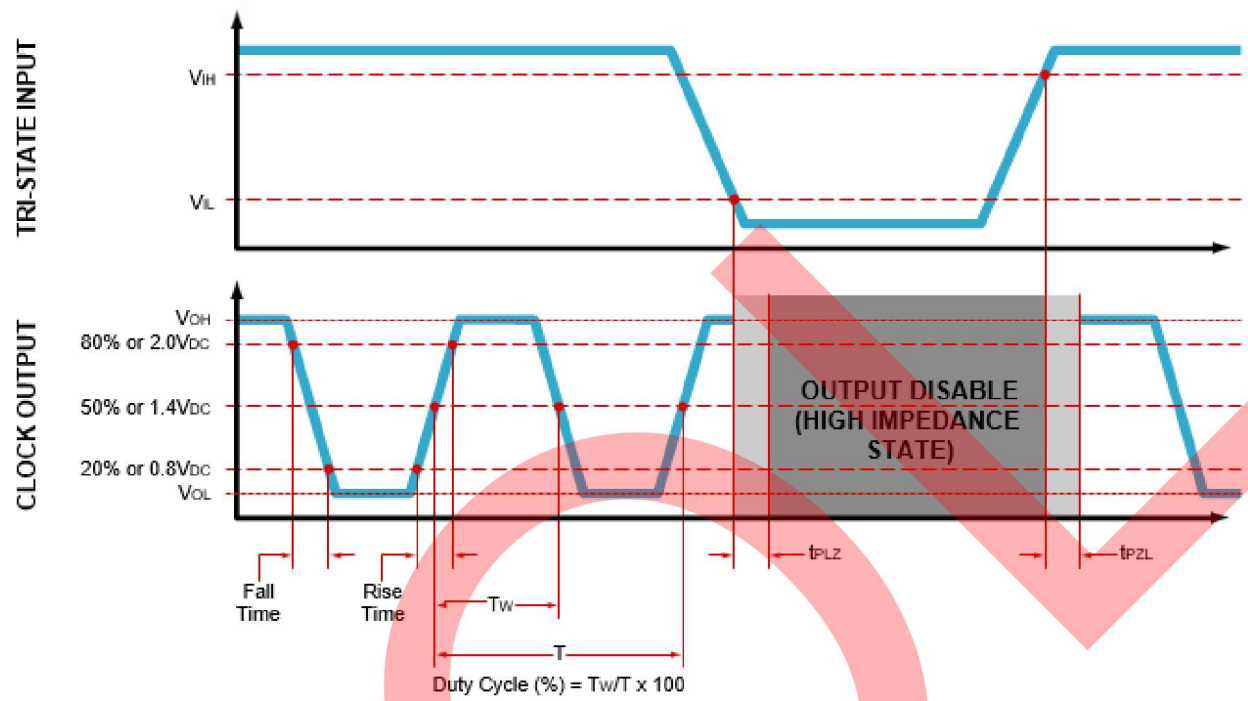


| PIN | CONNECTION |
|-----|----------------|
| 1 | Tri-State |
| 2 | Ground |
| 3 | Output |
| 4 | Supply Voltage |

All Tolerances are ± 0.1

All Dimensions in Millimeters

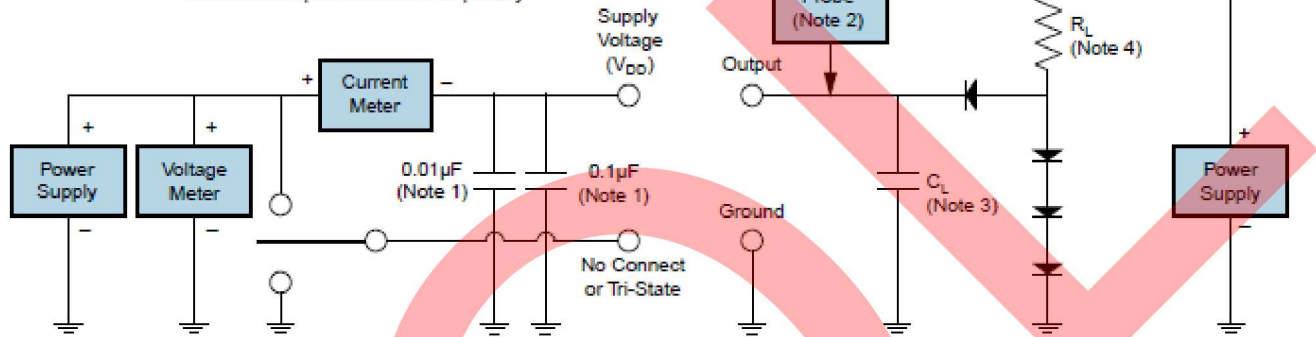
OUTPUT WAVEFORM & TIMING DIAGRAM



TEST CIRCUIT FOR TTL OUTPUT

| Output Load Drive Capability | R_L Value (Ohms) | C_L Value (pF) |
|------------------------------|--------------------|------------------|
| 10TTL | 390 | 15 |
| 5TTL | 780 | 15 |
| 2TTL | 1100 | 6 |
| 10LSTTL | 2000 | 15 |
| 1TTL | 2200 | 3 |

Table 1: R_L Resistance Value and C_L Capacitance Value Vs. Output Load Drive Capability



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

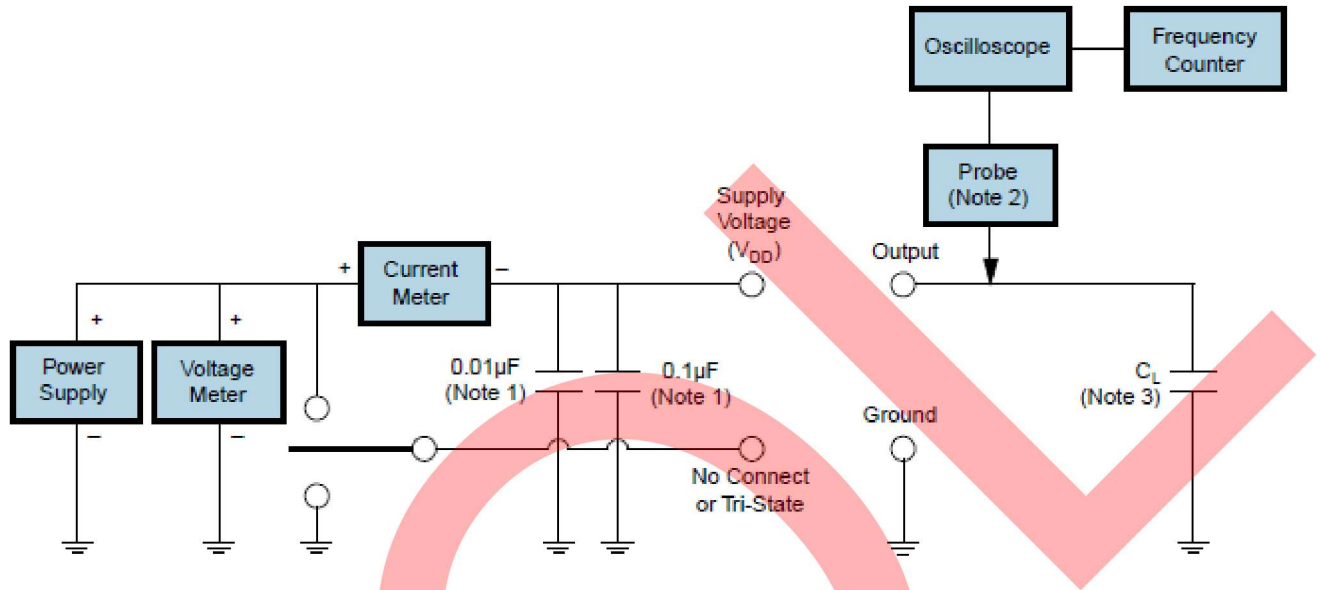
Note 2: A low capacitance (<12pF), 10X attenuation factor, high impedance (>10Mohms), and high bandwidth (>300MHz) passive probe is recommended.

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

Note 4: Resistance value R_L is shown in Table 1. See applicable specification sheet for "Load Drive Capability".

Note 5: All diodes are MMBD7000, MMBD914, or equivalent.

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.

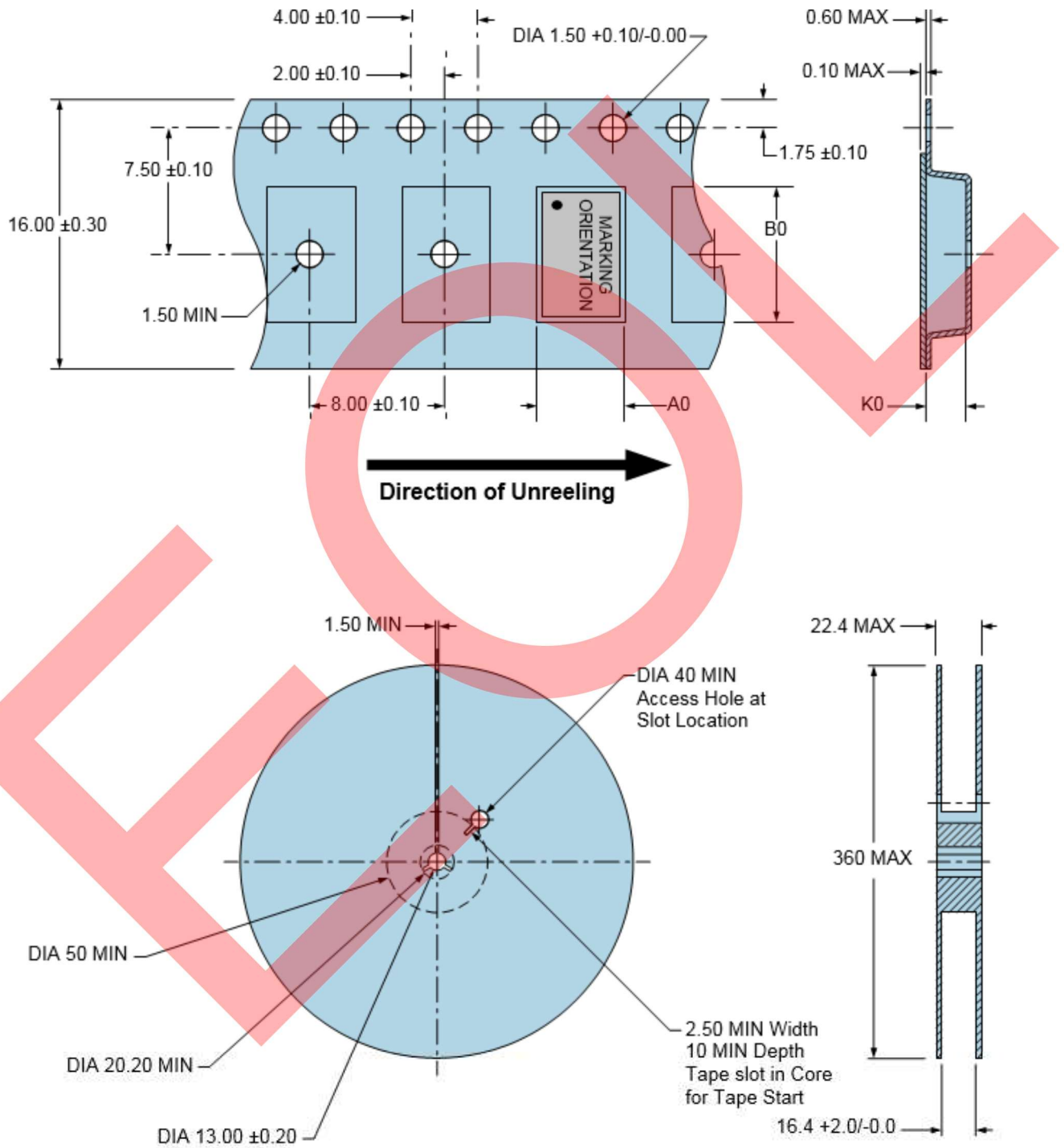
Note 3: Capacitance value C_L includes sum of all probe and fixture capacitance.

TAPE & REEL DIMENSIONS

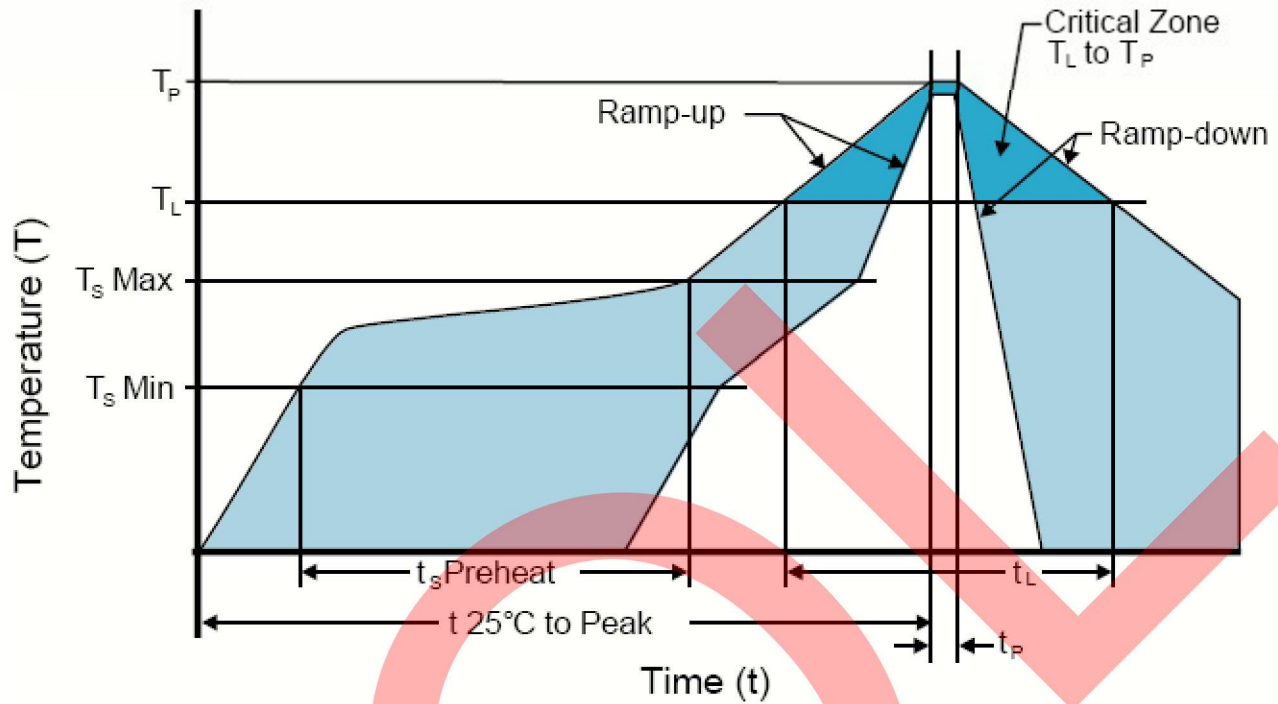
Quantity per Reel: 1,000 Units

All Dimensions in Millimeters

Compliant to EIA-481



RECOMMENDED SOLDER REFLOW METHOD



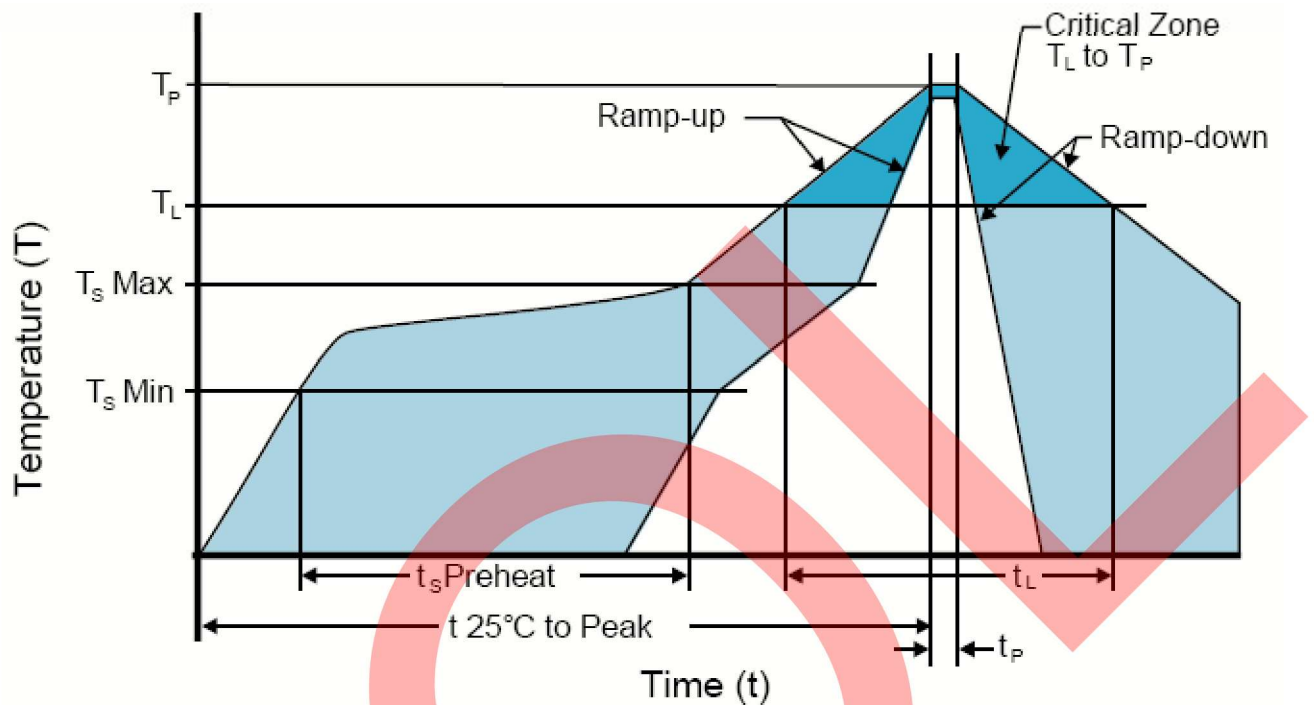
HIGH TEMPERATURE INFRARED/CONVECTION

| | |
|--|---|
| T_S MAX to T_L (Ramp-up Rate) | 3°C/Second Maximum |
| Preheat | |
| - Temperature Minimum (T _S MIN) | 150°C |
| - Temperature Typical (T _S TYP) | 175°C |
| - Temperature Maximum (T _S MAX) | 200°C |
| - Time (t _S MIN) | 60 - 180 Seconds |
| Ramp-up Rate (T_L to T_P) | 3°C/Second Maximum |
| Time Maintained Above: | |
| - Temperature (T _L) | 217°C |
| - Time (t _L) | 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 240°C | |
|---|--|
| T _s MAX to T _L (Ramp-up Rate) | 5°C/Second Maximum |
| 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 |
| Ramp-up Rate (T_L to T_P) | 5°C/Second Maximum |
| Time Maintained Above: | |
| - Temperature (T _L) | 150°C |
| - Time (t _L) | 200Seconds Maximum |
| Peak Temperature (T_P) | 240°C |
| 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.)