REGULATORY COMPLIANCE

Lead Free Pb COMPLIANT

EU RoHS 2011/65 + 2015/863 COMPLIANT

China RoHS e COMPLIANT

REACH SVHC COMPLIANT

DRC CONFLICT FREE

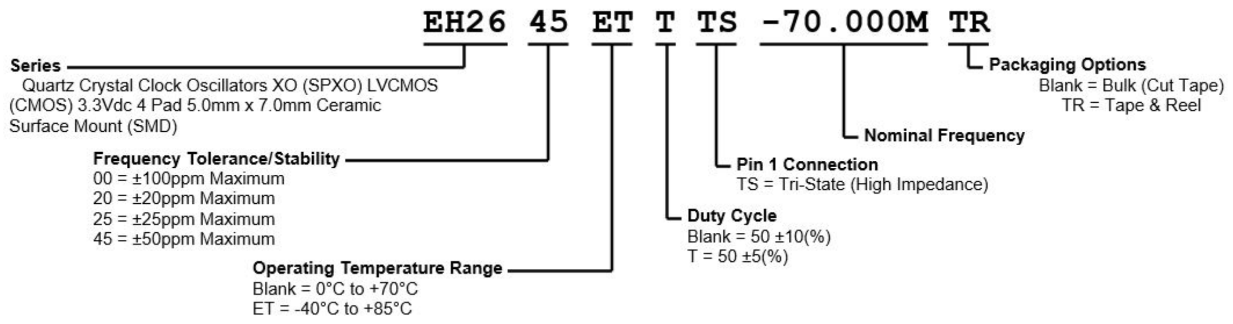
ITEM DESCRIPTION

Quartz Crystal Clock Oscillators XO (SPXO) LVCMOS (CMOS) 3.3Vdc 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	3.3Vdc ±10%
Input Current	No Load 35mA Maximum
Output Voltage Logic High (V_{OH})	IOH= -8mA 2.7Vdc Minimum
Output Voltage Logic Low (V_{OL})	IOL= +8mA 0.5Vdc Maximum
Rise/Fall Time	Measured at 20% to 80% of waveform 6nSec Maximum over Nominal Frequency of 1MHz to 70MHz 4nSec Maximum over Nominal Frequency of 70.000001MHz to 155.52MHz
Duty Cycle	Measured at 50% of waveform 50 ±10(%) 50 ±5(%)
Load Drive Capability	30pF Maximum over Nominal Frequency of 1MHz to 70MHz 15pF 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 (Vih and Vil)	70% of Vdd Minimum to enable output, 20% of Vdd Maximum to disable output, No Connect to enable output.
Absolute Clock Jitter	±250pSec Maximum, ±100pSec Typical
One Sigma Clock Period Jitter	±50pSec Maximum, ±40pSec Typical
Start Up Time	10mSec Maximum
Storage Temperature Range	-55°C to +125°C

PART NUMBERING GUIDE



EH26 45 ET T TS -70.000M TR

Series
Quartz Crystal Clock Oscillators XO (SPXO) LVCMOS (CMOS) 3.3Vdc 4 Pad 5.0mm x 7.0mm Ceramic Surface Mount (SMD)

Frequency Tolerance/Stability
00 = ±100ppm Maximum
20 = ±20ppm Maximum
25 = ±25ppm Maximum
45 = ±50ppm Maximum

Operating Temperature Range
Blank = 0°C to +70°C
ET = -40°C to +85°C

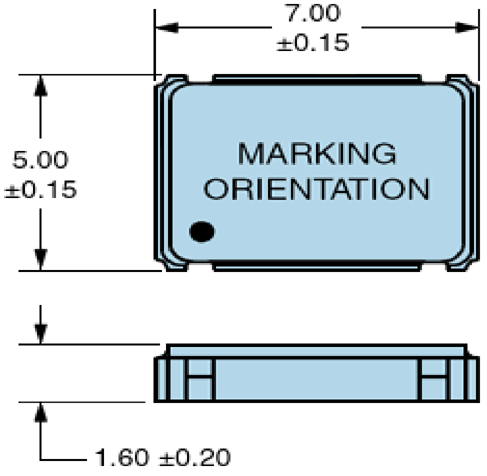
Duty Cycle
Blank = 50 ±10(%)
T = 50 ±5(%)

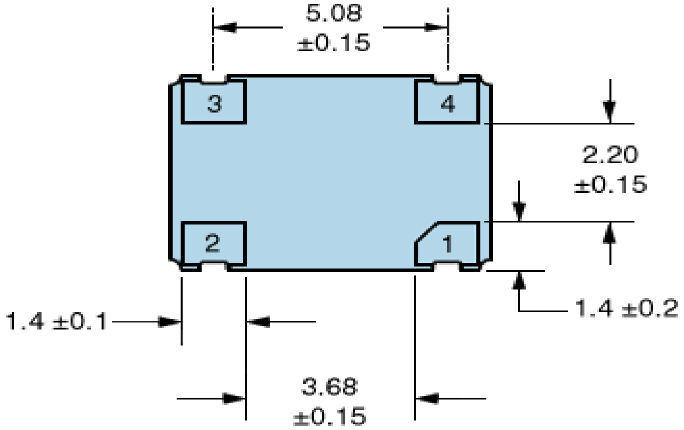
Pin 1 Connection
TS = Tri-State (High Impedance)

Nominal Frequency

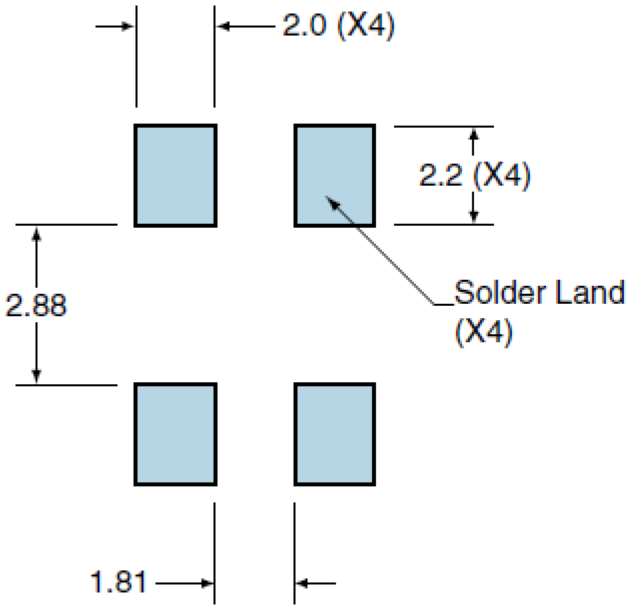
Packaging Options
Blank = Bulk (Cut Tape)
TR = Tape & Reel

MECHANICAL DIMENSIONS





SUGGESTED SOLDER PAD LAYOUT

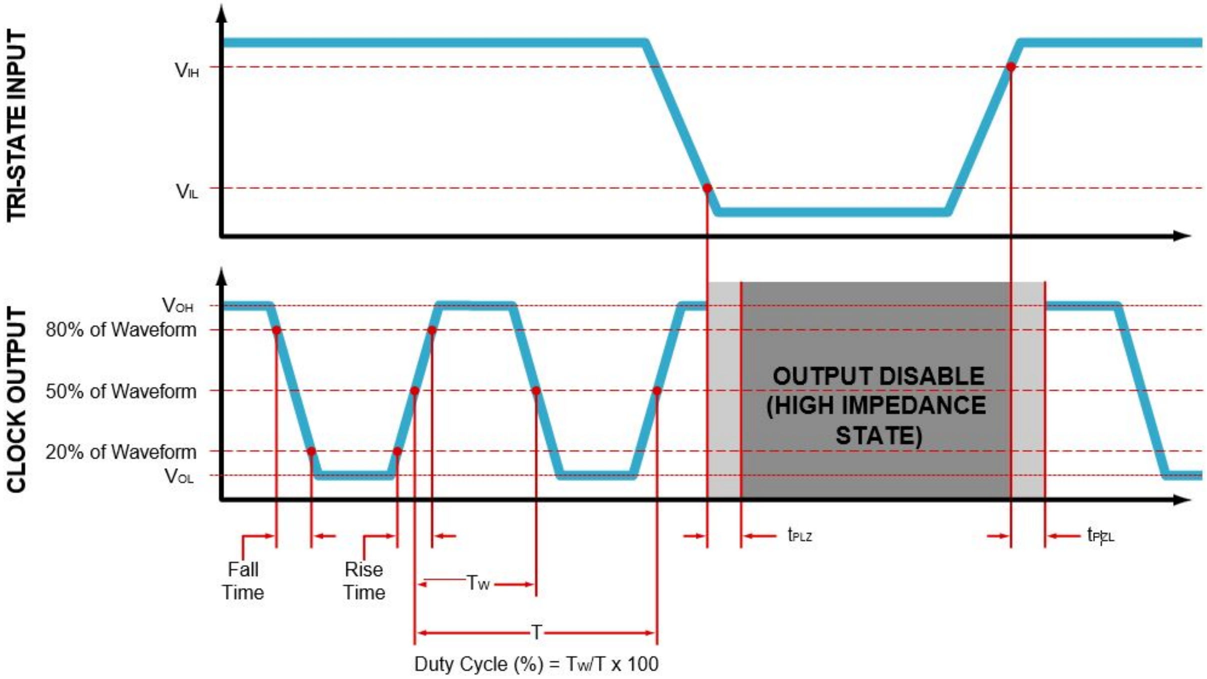


PIN	CONNECTION
1	Tri-State
2	Ground
3	Output
4	Supply Voltage

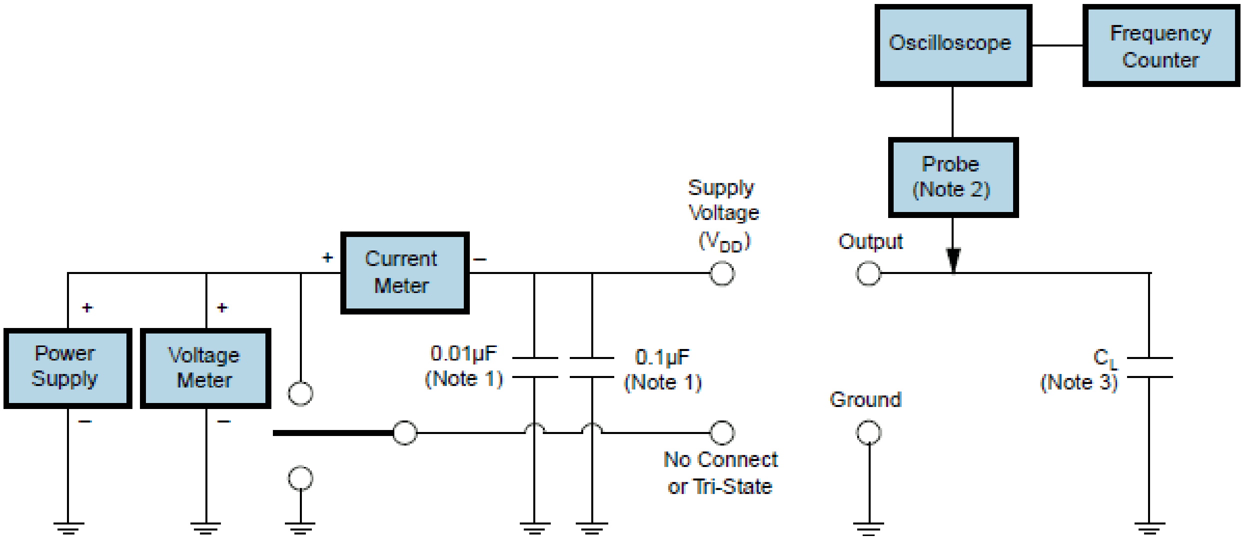
All Tolerances are ±0.1

All Dimensions in Millimeters

OUTPUT WAVEFORM & TIMING DIAGRAM



TEST CIRCUIT FOR CMOS OUTPUT



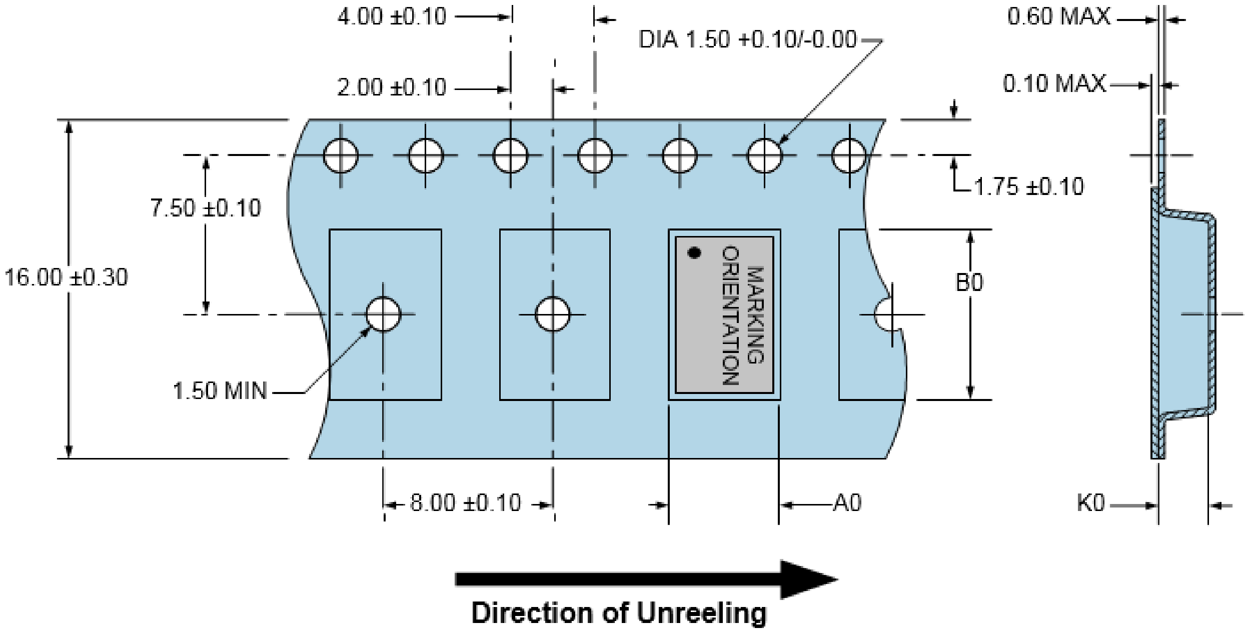
Note 1: An external 0.1µF low frequency tantalum bypass capacitor in parallel with a 0.01µF high frequency ceramic bypass Capacitor close to the package ground and V_{DD} pin is required.
Note 2: A low capacitance (<12pF), 10X attenuation factor, high impedance (>10Mohms), and high bandwidth (>300MHz) passive Probe is recommended.
Note 3: Capacitance value C_L includes sum of all probe and fixture capacitance.

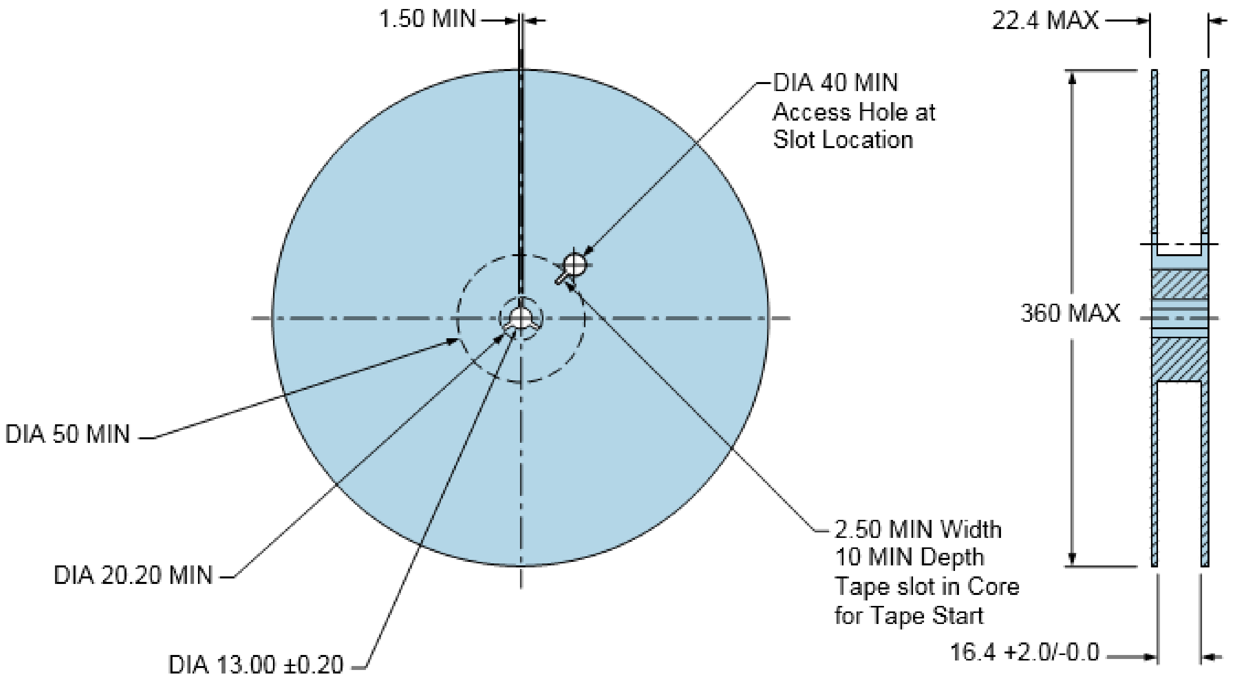
TAPE & REEL DIMENSIONS

Quantity per Reel: 1,000 Units

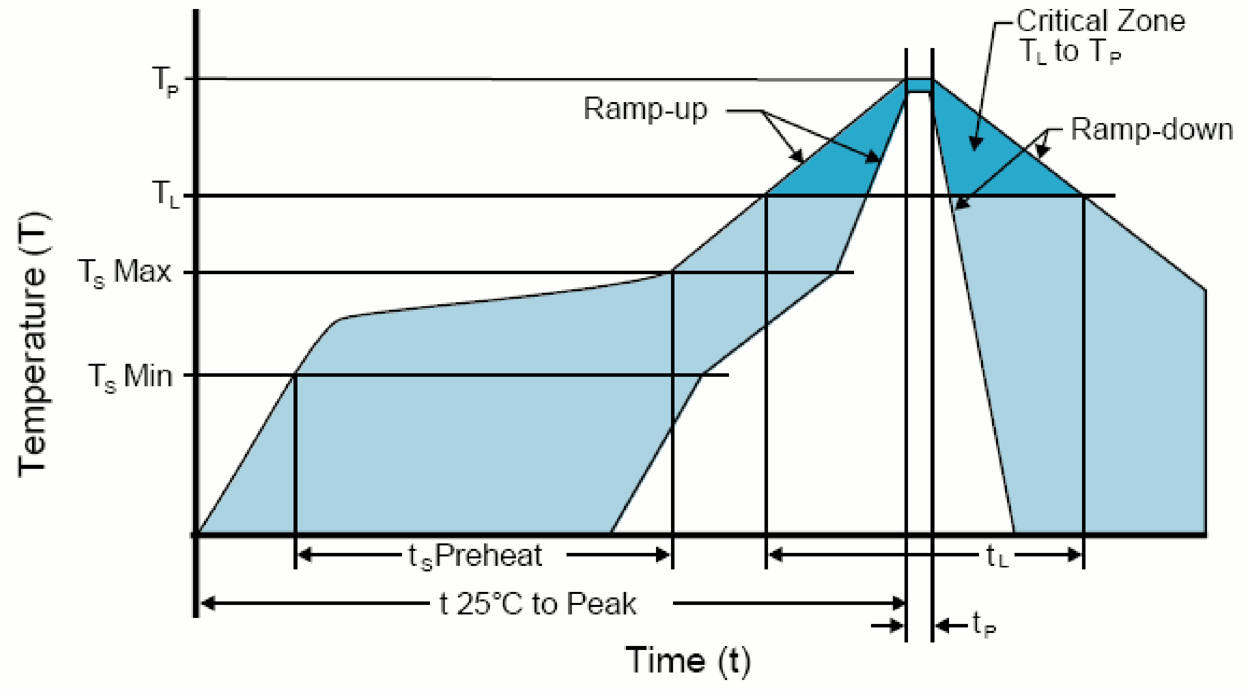
All Dimensions in Millimeters

Compliant to EIA-481





RECOMMENDED SOLDER REFLOW METHOD

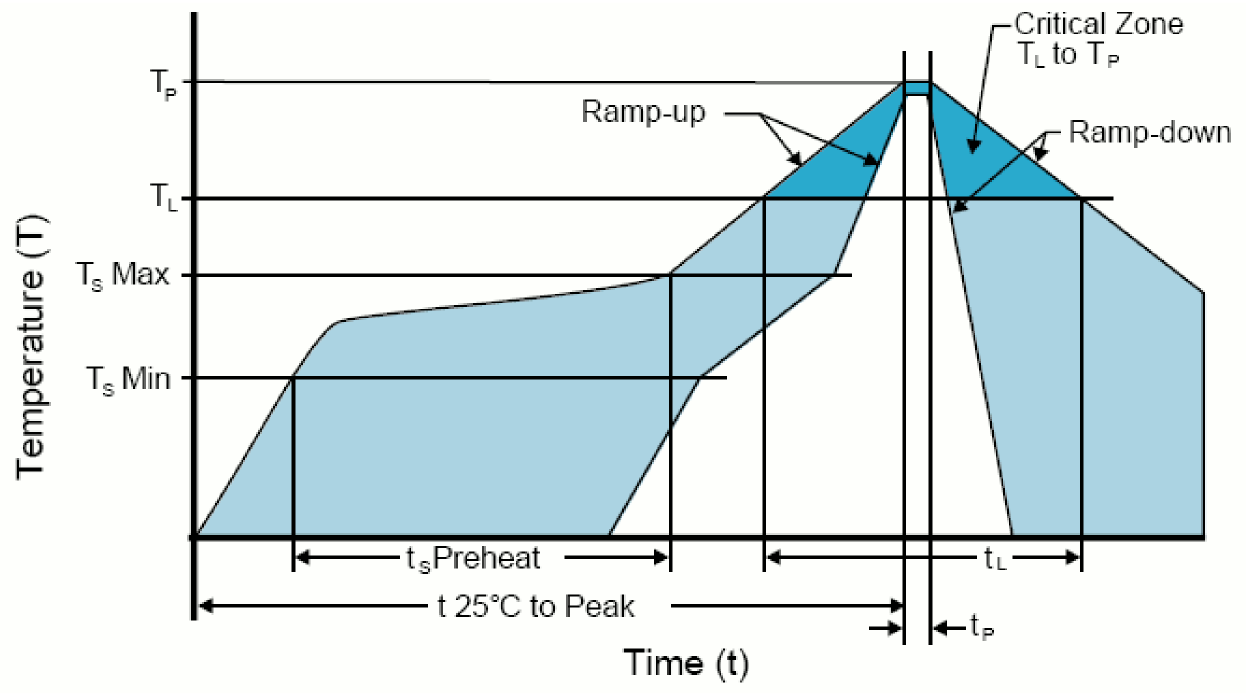


HIGH TEMPERATURE INFRARED/CONVECTION	
TS MAX to TL (Ramp-up Rate)	3°C/Second Maximum
Preheat **- Temperature Minimum (T_S MIN)** **- Temperature Typical (T_S TYP)** **- Temperature Maximum(T_S MAX)** **- Time (t_S MIN)**	 150°C 175°C 200°C 60 - 180 Seconds
Ramp-up Rate (TL to TP)	3°C/Second Maximum
Time Maintained Above: **- Temperature (T_L)** **- Time (t_L)**	 217°C 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
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

TS MAX to TL (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 (TL to TP)	5°C/Second Maximum
Time Maintained Above: **- Temperature (T$_L$)** **- Time (t$_L$)**	150°C 200Seconds Maximum
Peak Temperature (TP)	240°C
Target Peak Temperature(TP Target)	240°C Maximum 2 Times/230˚C Maximum 1Time
Time within 5°C of actual peak (tp)	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.)