Engineering/Process Change Notice

ECN/PCN No.: 3737

For Manufacturer			
Product Description: Quartz Crystal Clock Oscillator XO (SPXO) HCMOS/TTL (CMOS) **5.0Vdc** J-Lead 9.8mm x 14.0mm Plastic Surface Mount (SMD) **with powerdown option**	**Abracon Part Number / Part Series:** EP14		☒ Series ☐ Part Number
Affected Revision: F	**New Revision:** N/A, EOL	**Application:**	☐ Safety ☒ Non-Safety
Prior to Change: N/A, EOL			
After Change: N/A, EOL			
Cause/Reason for Change: Discontinuation of standard product series.			

Change Plan		
Effective Date: 01/29/2021	**Additional Remarks:** N/A	
Change Declaration: N/A, EOL		
Issued Date: 01/29/2021	**Issued By:** *Brooke Cushman* Product Engineer	**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): NO LAST TIME BUY	**Alternate Part Number / Part Series:** ASL, ASL1, & ASL2	
Additional Approval: *N/A*	**Additional Approval:** *N/A*	**Additional Approval:** *N/A*

Affected Part Numbers
EP1400SJETPDC-1.8432M
EP1400SJETPDC-1.8432M TR
EP1400SJETTPDL-12.160M TR
EP1400SJETTPDL-12.600M TR
EP1400SJETTSC-11.0592M
EP1400SJETTSC-2.000M
EP1400SJETTSC-66.000M TR
EP1400SJETTSL-1.000M
EP1400SJETTTSL-1.000M
EP1400SJETTTSL-16.000M
EP1400SJETTTSL-20.000M
EP1400SJETTTSL-25.000M
EP1400SJETTTSL-25.000M TR
EP1400SJETTTSL-25.1771M

EP1400SJPDC-16.000M
EP1400SJPDC-3.000M
EP1400SJPDC-48.000M
EP1400SJPDC-48.000M TR
EP1400SJTSC-125.000M
EP1400SJTSC-14.400M
EP1400SJTSC-16.000M TR
EP1400SJTSC-2.250M
EP1400SJTSC-2.750M
EP1400SJTSC-32.768M
EP1400SJTSC-48.000M
EP1400SJTSC-48.000M TR
EP1400SJTSC-66.000M TR
EP1400SJTSL-1.000M
EP1400SJTSL-1.000M TR
EP1400SJTSL-18.432M
EP1400SJTSL-20.000M
EP1400SJTSL-25.000M
EP1400SJTSL-25.000M TR
EP1400SJTSL-39.3216M
EP1400SJTTSC-32.000MTR
EP1400SJTTSL-24.545M
EP1400SJTTSL-24.545M TR
EP1445SJETTTSL-24.000M
EP1445SJTSC-24.000M TR
EP1445SJTSL-5.000M
EP1445SJTSL-5.000M TR

REGULATORY COMPLIANCE

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

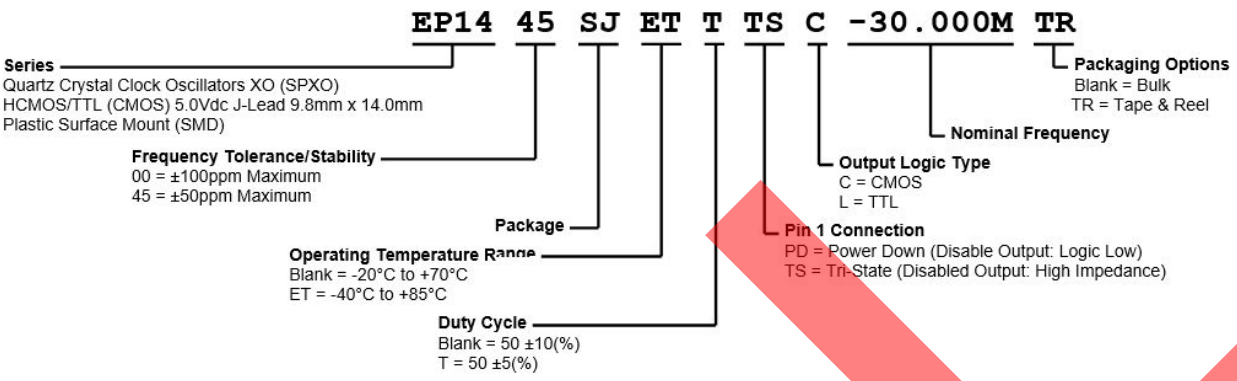
ITEM DESCRIPTION

Quartz Crystal Clock Oscillators XO (SPXO) HCMOS/TTL (CMOS) 5.0Vdc J-Lead 9.8mm x 14.0mm Plastic Surface Mount (SMD)

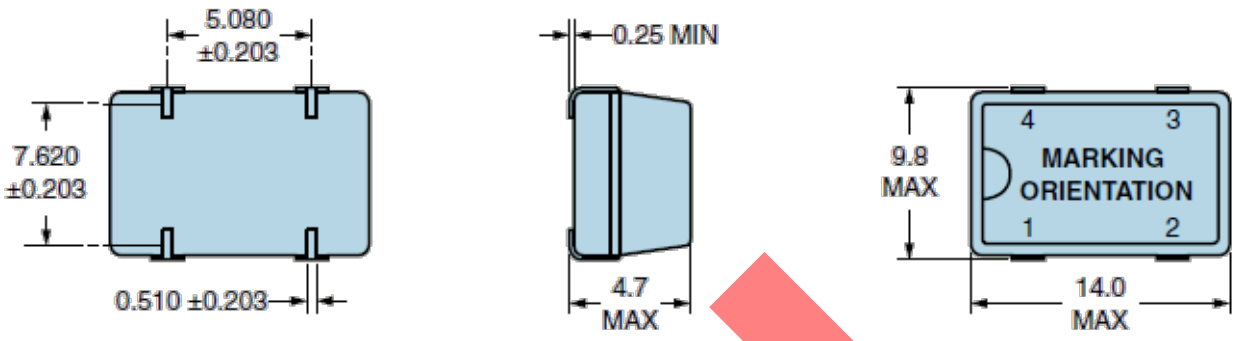
ELECTRICAL SPECIFICATIONS

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, Output Load Change, First Year Aging at 25°C, Shock, and Vibration ±100ppm Maximum ±50ppm Maximum
Aging at 25°C	±5ppm/year Maximum
Operating Temperature Range	-20°C to +70°C -40°C to +85°C
Supply Voltage	5.0Vdc ±10%
Input Current	Unloaded 45mA Maximum
Output Voltage Logic High (V_{OH})	IOH = -16mA Vdd-0.4Vdc Minimum (Output Logic Type of CMOS) 2.4Vdc Minimum (Output Logic Type of TTL)
Output Voltage Logic Low (V_{OL})	IOL = +16mA 0.4Vdc Maximum
Rise/Fall Time	4nSec Maximum (Measured at 20% to 80% of waveform, Output Logic Type of CMOS) 4nSec Maximum (Measured at 0.8Vdc to 2.0Vdc, Output Logic Type of TTL)
Duty Cycle	Measured at 1.4Vdc with TTL Load; Measured at 50% of waveform with HCMOS Load 50 ±10(%) 50 ±5(%) (Not available with Output Logic Type of TTL over Nominal Frequency range of 27.000001MHz to 125MHz; Not available with Output Logic Type of CMOS over Nominal Frequency range of 50.000001MHz to 125MHz)
Load Drive Capability	50pF HCMOS Load Maximum over 1MHz to 50MHz at Output Logic Type of CMOS 15pF HCMOS Load Maximum over 50.000001MHz to 125MHz at Output Logic Type of CMOS 10TTL Load Maximum over 1MHz to 40MHz at Output Logic Type of TTL 5TTL Load Maximum over 40.000001MHz to 125MHz at Output Logic Type of TTL
Output Logic Type	CMOS TTL
Pin 1 Connection	Power Down (Disable Output: Logic Low) Tri-State (Disabled Output: High Impedance)
Tri-State Input Voltage (Vih and Vil)	+2.0Vdc Minimum to enable output, +0.8Vdc Max, to disable output, No Connect to enable output.
Disable Current	30mA Maximum (Pin 1 = Ground, Disabled Output: High Impedance)
Standby Current	50µA Maximum (Pin 1 = Ground, Disabled Output: Logic Low)
Absolute Clock Jitter	±250pSec Maximum, ±100pSec Typical over Nominal Frequency of 1MHz to 33MHz ±100pSec Maximum, ±50pSec Typical over Nominal Frequency of 33.000001MHz to 125MHz
One Sigma Clock Period Jitter	±50pSec Maximum over Nominal Frequency of 1MHz to 33MHz ±30pSec Maximum over Nominal Frequency of 33.000001MHz to 125MHz
Start Up Time	10mSec Maximum
Storage Temperature Range	-55°C to +125°C

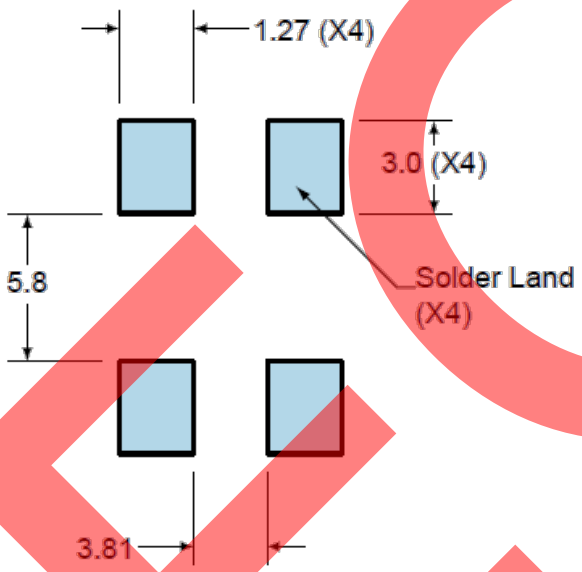
PART NUMBERING GUIDE



MECHANICAL DIMENSIONS



SUGGESTED SOLDER PAD LAYOUT

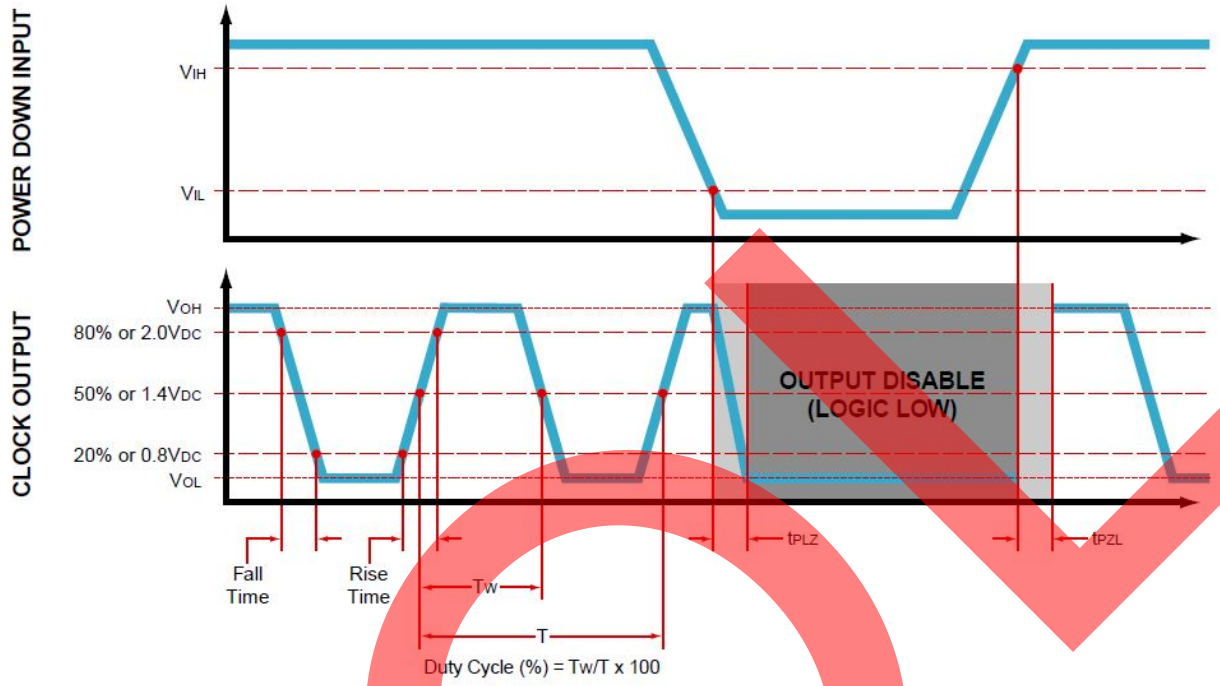


PIN	CONNECTION
1	Power Down Or Tri-State
2	Ground
3	Output
4	Supply Voltage

All Tolerances are ±0.1

All Dimensions in Millimeters

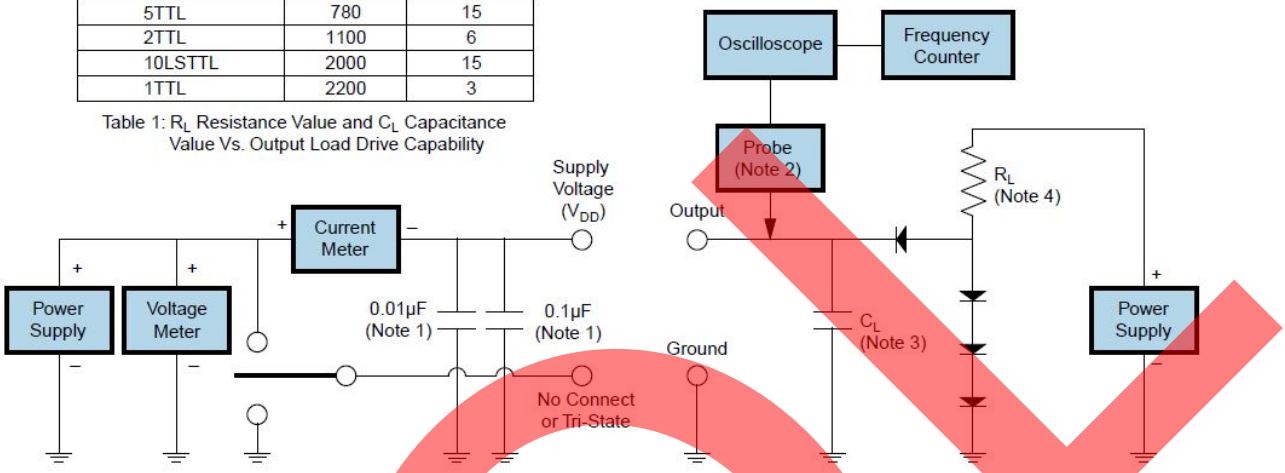
OUTPUT WAVEFORM & TIMING DIAGRAM



TEST CIRCUIT FOR TTL OUTPUT

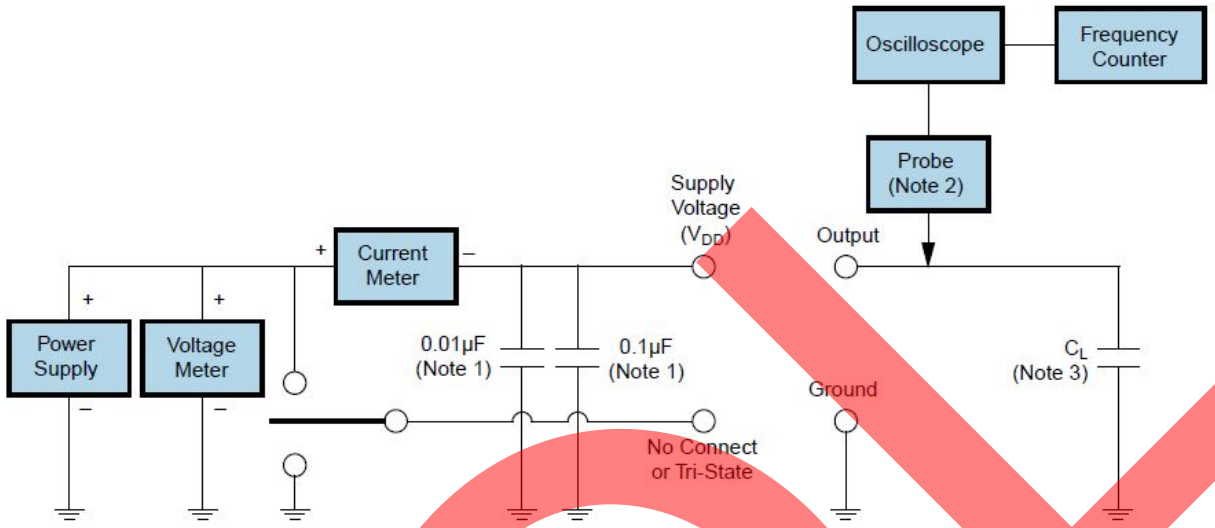
Output Load Drive Capability	R_L Value (Ohms)	C_L Value (pF)
10TTL	390	15
5TTL	780	15
2TTL	1100	6
10LSTTL	2000	15
1TTL	2200	3

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



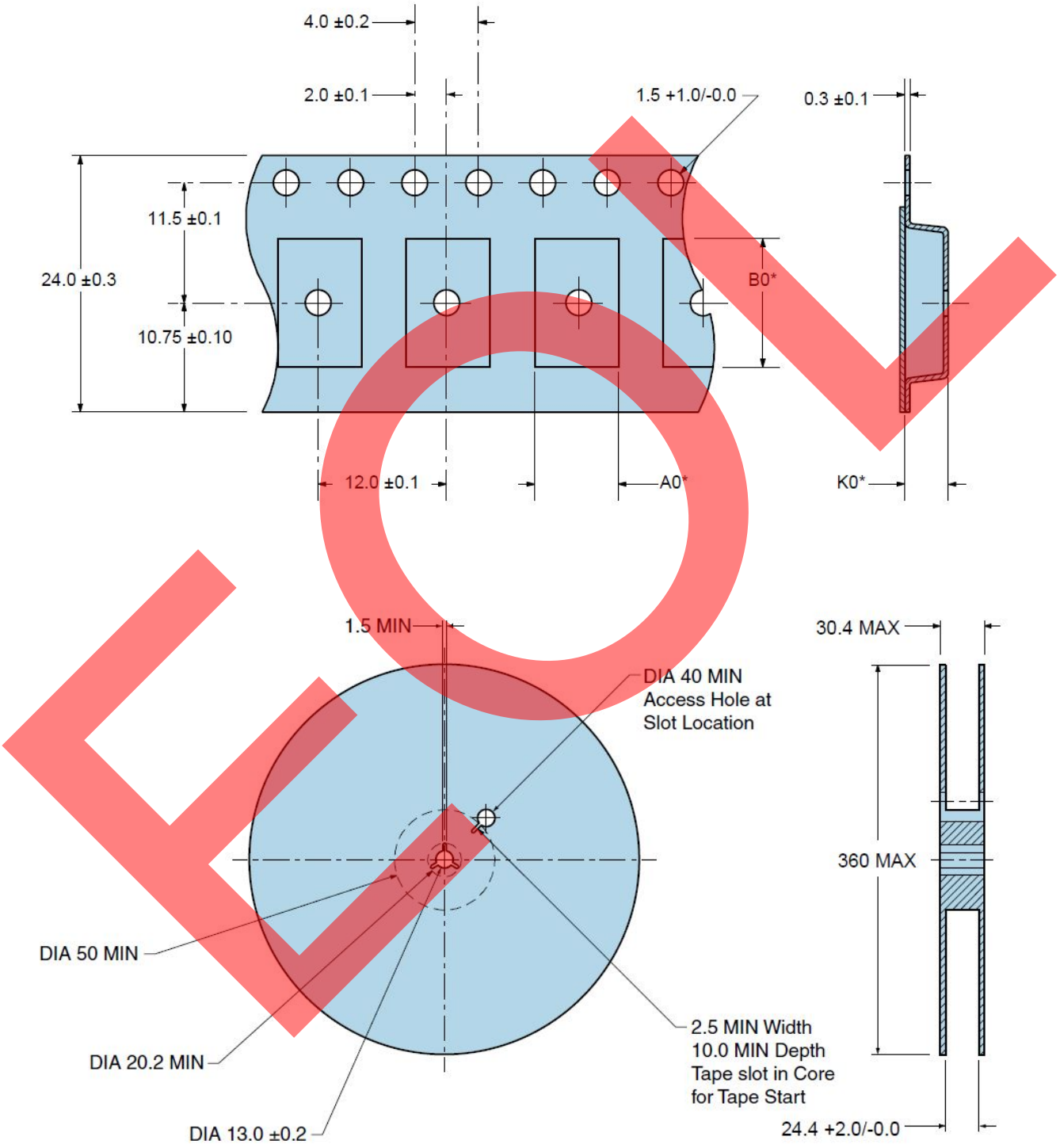
Note 1: An external 0.1µF low frequency tantalum bypass capacitor in parallel with a 0.01µF high frequency ceramic bypass Capacitor close to the package ground and V_{DD} pin is required.
Note 2: A low capacitance (<12pF), 10X Attenuation Factor, High Impedance (>10Mohms), and High bandwidth (>300MHz)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

TAPE & REEL DIMENSIONS

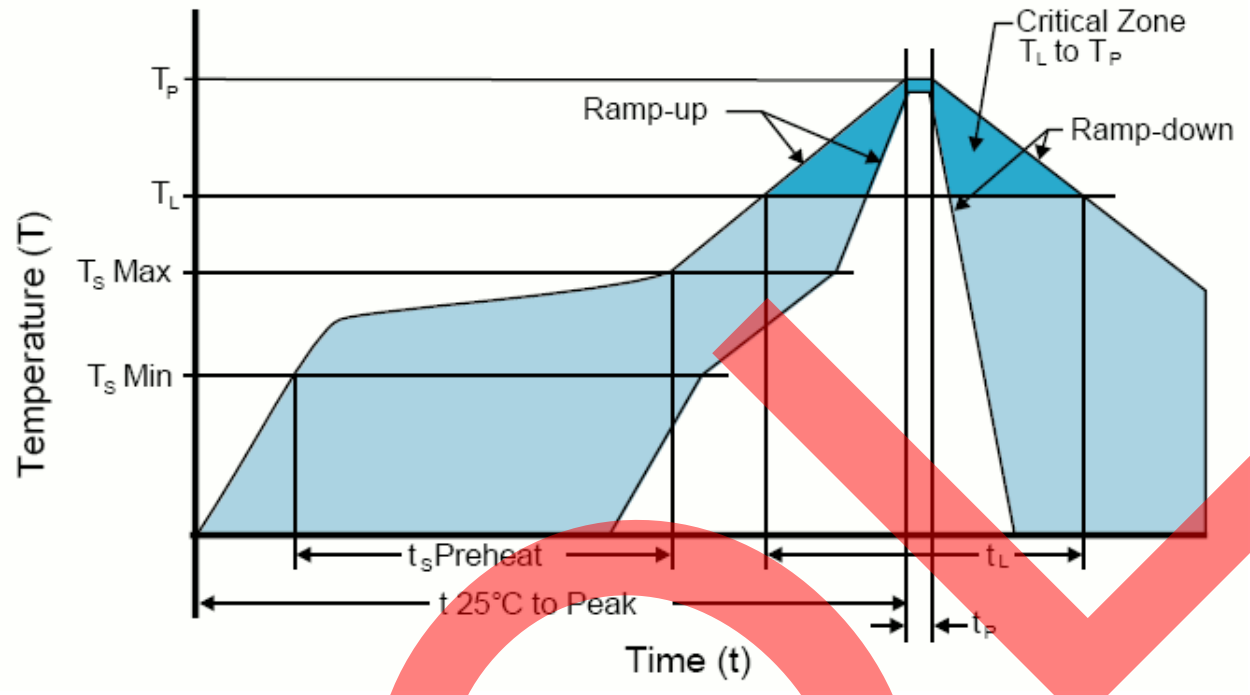
Quantity per Reel: 500 Units

All Dimensions in Millimeters

Compliant to EIA-481



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.

High Temperature Manual Soldering

260°C Maximum for 5 Seconds Maximum, 2 times Maximum. (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.)