





ECN/PCN No.: 4137

For Manufacturer			
Product Description: PLASTIC SMD MEMS OSCILLATOR	Abracon Part Number / Part Series: EMRA31	<input type="checkbox"/> Documentation only <input type="checkbox"/> ECN <input checked="" type="checkbox"/> EOL	<input checked="" type="checkbox"/> Series <input type="checkbox"/> Part Number
Affected Revision: C	New Revision: EOL	Application:	<input type="checkbox"/> Safety <input checked="" type="checkbox"/> Non-Safety
Prior to Change: Active https://abracon.com/datasheets/Ecliptek/EMRA31.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: ASEDV (3.2x2.5mm)		
Additional Approval:	Additional Approval:	Additional Approval:	
Customer Approval (If Applicable)			
Qualification Status: <input type="checkbox"/> Approved <input type="checkbox"/> Not accepted <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

 <p>Lead Free COMPLIANT</p>	 <p>EU RoHS 2011/65 + 2015/863 COMPLIANT</p>	 <p>China RoHS COMPLIANT</p>	 <p>REACH SVHC COMPLIANT</p>
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ITEM DESCRIPTION

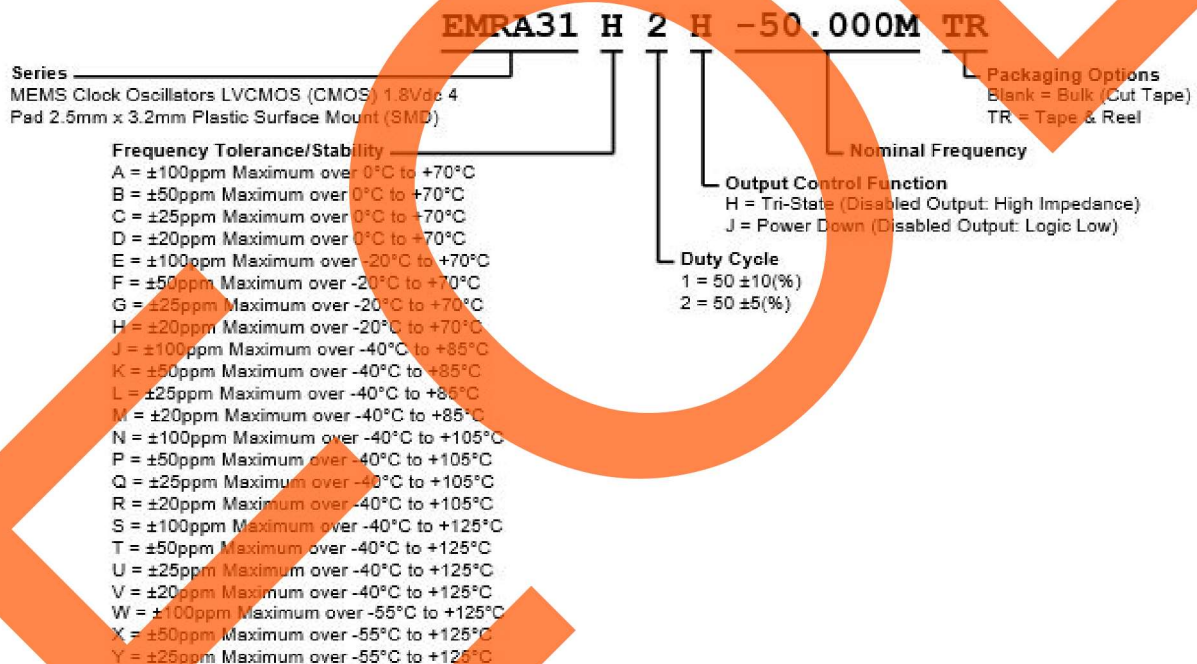
MEMS Clock Oscillators LVCMOS (CMOS) 1.8Vdc 4 Pad 2.5mm x 3.2mm Plastic Surface Mount (SMD)

ELECTRICAL SPECIFICATIONS

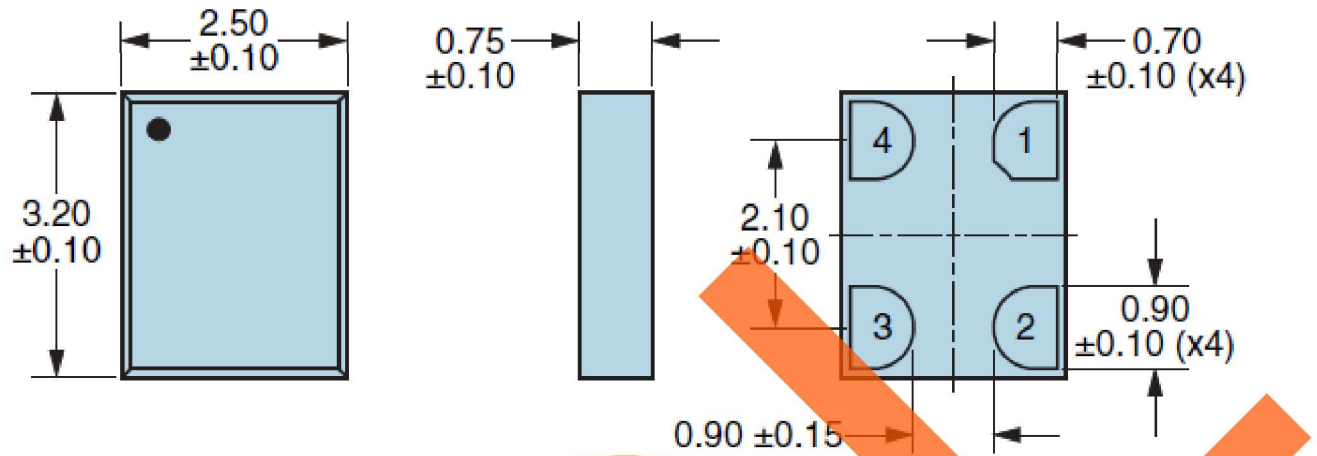
Nominal Frequency	1MHz to 137MHz
Frequency Tolerance/Stability	Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, and Output Load Change ±100ppm Maximum over 0°C to +70°C ±50ppm Maximum over 0°C to +70°C ±25ppm Maximum over 0°C to +70°C ±20ppm Maximum over 0°C to +70°C ±100ppm Maximum over -20°C to +70°C ±50ppm Maximum over -20°C to +70°C ±25ppm Maximum over -20°C to +70°C ±20ppm Maximum over -20°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 ±20ppm Maximum over -40°C to +85°C ±100ppm Maximum over -40°C to +105°C ±50ppm Maximum over -40°C to +105°C ±25ppm Maximum over -40°C to +105°C ±20ppm Maximum over -40°C to +105°C ±100ppm Maximum over -40°C to +125°C ±50ppm Maximum over -40°C to +125°C ±25ppm Maximum over -40°C to +125°C ±20ppm Maximum over -40°C to +125°C ±100ppm Maximum over -55°C to +125°C ±50ppm Maximum over -55°C to +125°C ±25ppm Maximum over -55°C to +125°C
Aging at 25°C	±1.5ppm Maximum First Year
Supply Voltage	1.8Vdc ±10%
Input Current	No Load 4.5mA Maximum over Nominal Frequency of 1MHz to 20MHz 5mA Maximum over Nominal Frequency of 20.000001MHz to 50MHz 6mA Maximum over Nominal Frequency of 50.000001MHz to 80MHz 7mA Maximum over Nominal Frequency of 80.000001MHz to 137MHz
Output Voltage Logic High (V_{OH})	I _{OH} = -2mA 90% of V _{DD} Minimum
Output Voltage Logic Low (V_{OL})	I _{OL} = +2mA 10% of V _{DD} Maximum
Rise/Fall Time	Measured from 20% to 80% of waveform 1.5nSec Typical, 3.5nSec Maximum
Duty Cycle	Measured at 50% of waveform 50 ±10(%) 50 ±5(%)
Load Drive Capability	15pF Maximum
Output Logic Type	CMOS
Output Control Function	Tri-State (Disabled Output: High Impedance) Power Down (Disabled Output: Logic Low)
Output Control Input Voltage Logic High (V_{IH})	70% of V _{DD} Minimum or No Connect to Enable Output

Output Control Input Voltage Logic Low (Vil)	30% of Vdd Maximum to Disable Output
Power Down Output Enable Time	5mSec Maximum (Disabled Output: Logic Low)
Tri-State Output Enable Time	150nSec Maximum (Disabled Output: High Impedance)
Power Down Output Disable Time	150nSec Maximum (Disabled Output: Logic Low)
Tri-State Output Disable Time	150nSec Maximum (Disabled Output: High Impedance)
Standby Current	5µA Maximum (Disabled Output: Logic Low)
Period Jitter (RMS)	2pSec Typical, 5pSec Maximum
RMS Phase Jitter (Fj = 900kHz to 7.5MHz; Random)	0.5pSec Typical, 1pSec Maximum
RMS Phase Jitter (Fj = 12kHz to 20MHz; Random)	1.5pSec Typical, 3pSec Maximum
Start Up Time	5mSec Maximum
Storage Temperature Range	-65°C to +150°C

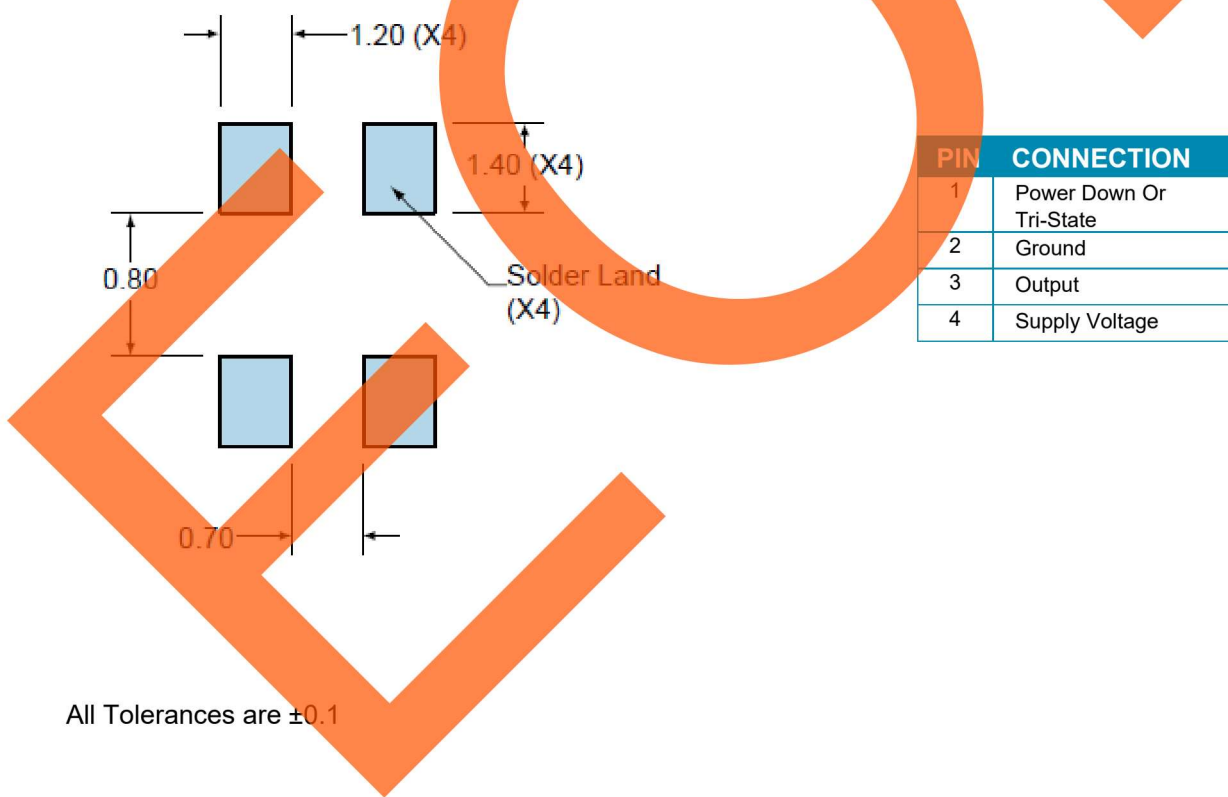
PART NUMBERING GUIDE



MECHANICAL DIMENSIONS



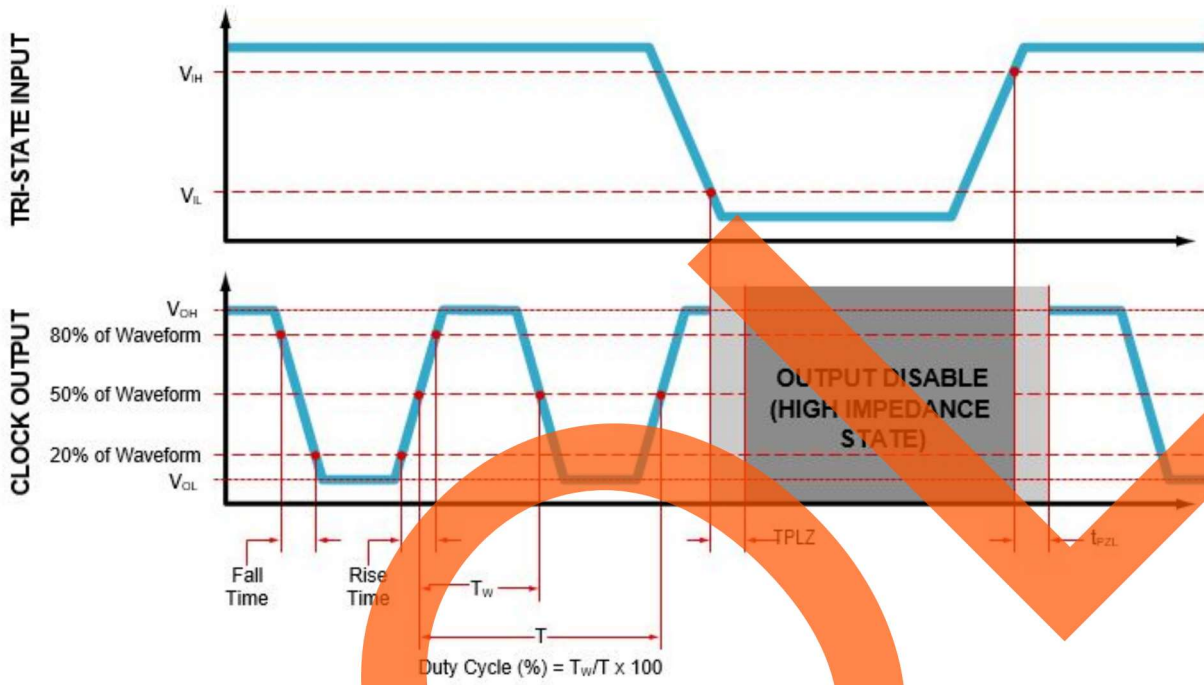
SUGGESTED SOLDER PAD LAYOUT



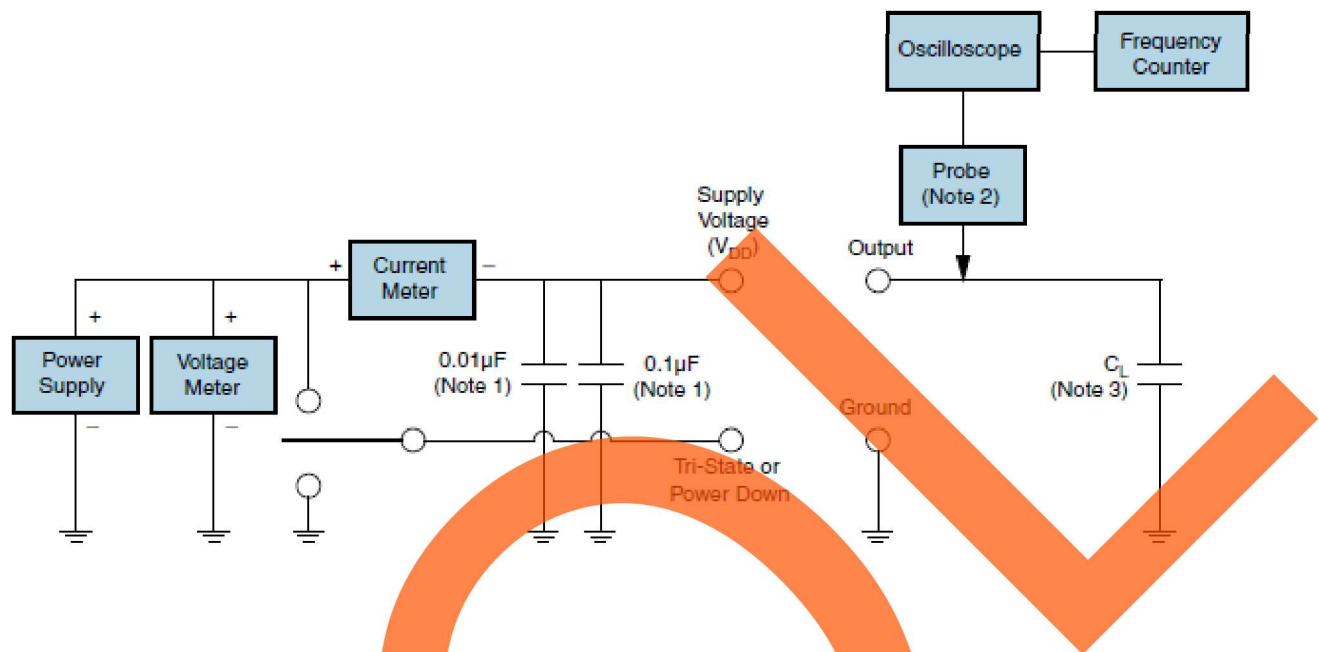
All Tolerances are ± 0.1

All Dimensions in Millimeters

OUTPUT WAVEFORM & TIMING DIAGRAM



TEST CIRCUIT FOR CMOS OUTPUT



Note 1: An external $0.01\mu\text{F}$ ceramic bypass capacitor in parallel with a $0.1\mu\text{F}$ high frequency ceramic bypass capacitor (less than 2mm) to the package ground and supply voltage 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. See applicable specification sheet for "Load Drive Capability".

TAPE & REEL DIMENSIONS

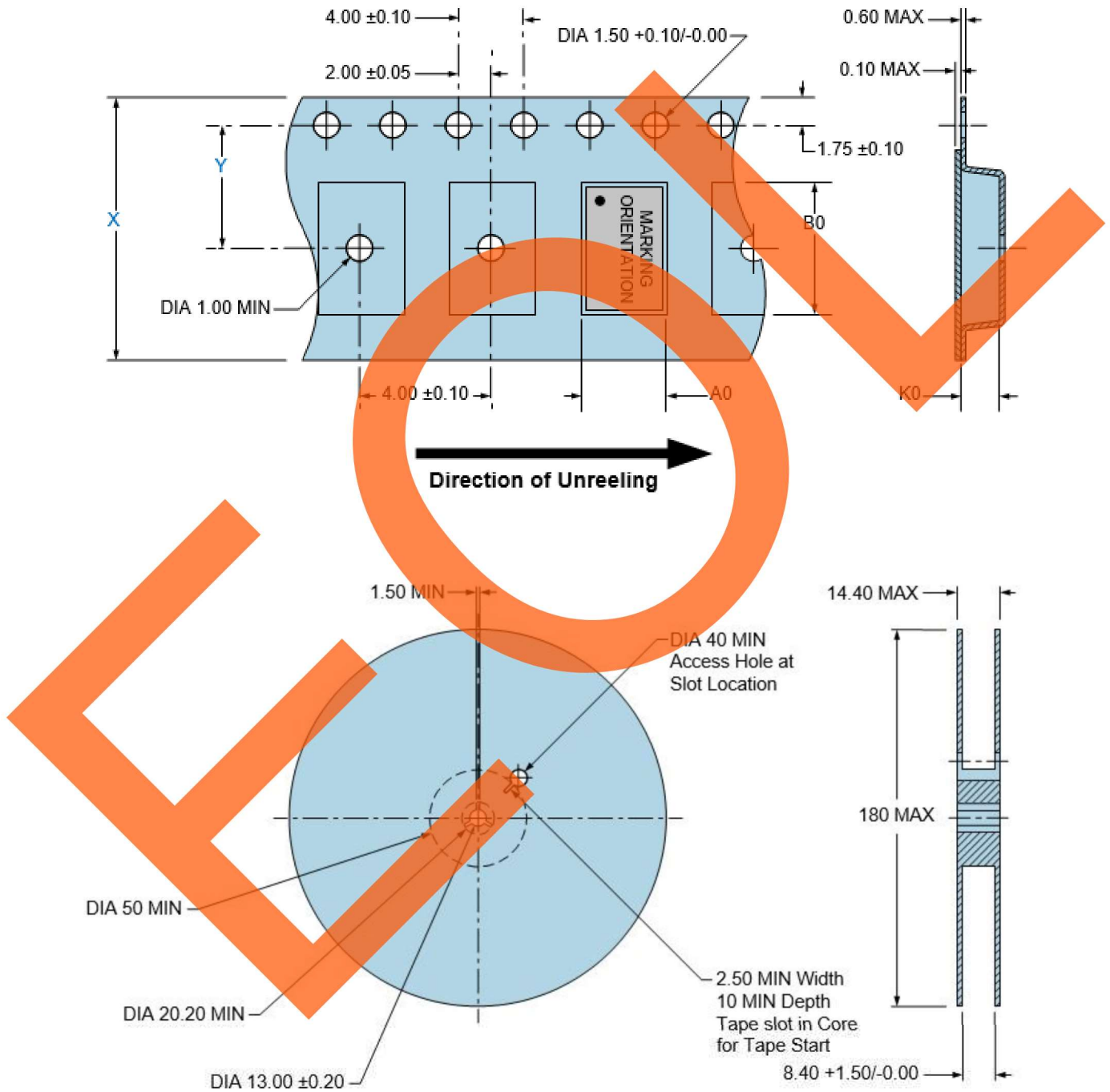
Quantity per Reel: 1000 Units

All Dimensions in Millimeters

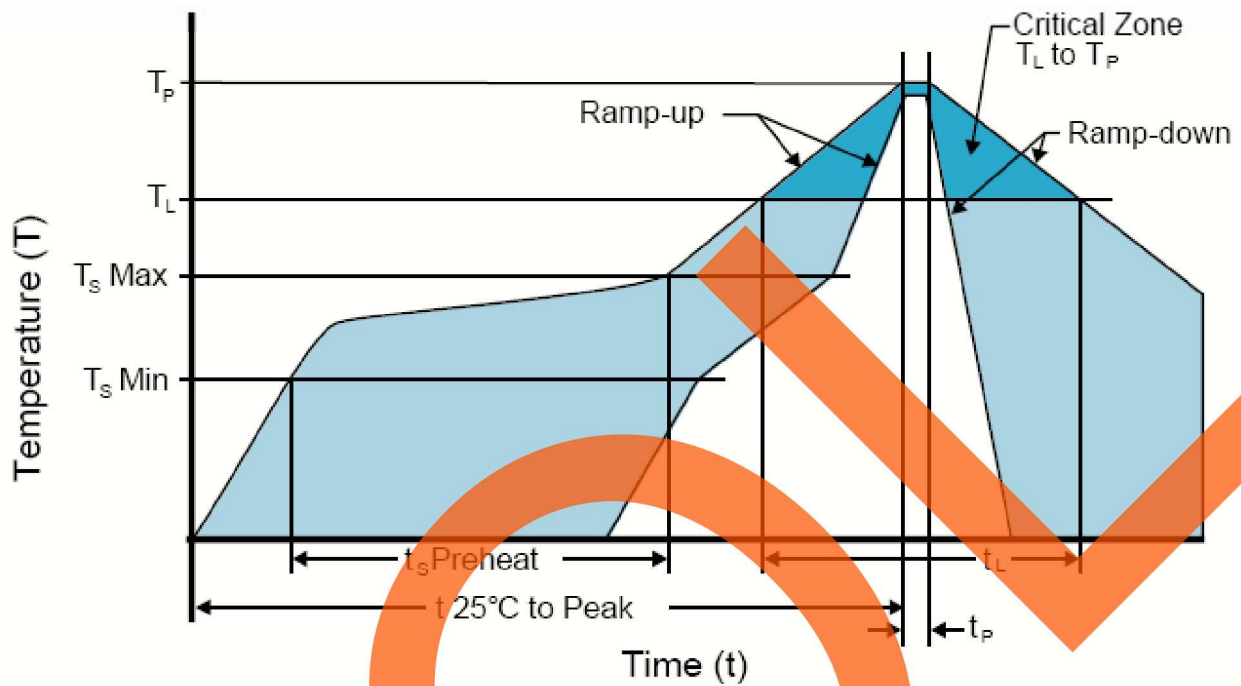
Compliant to EIA-481

X = 8.00 ±0.30 or 12

Y = 3.50 ±0.05 or 5.5



RECOMMENDED SOLDER REFLOW METHOD



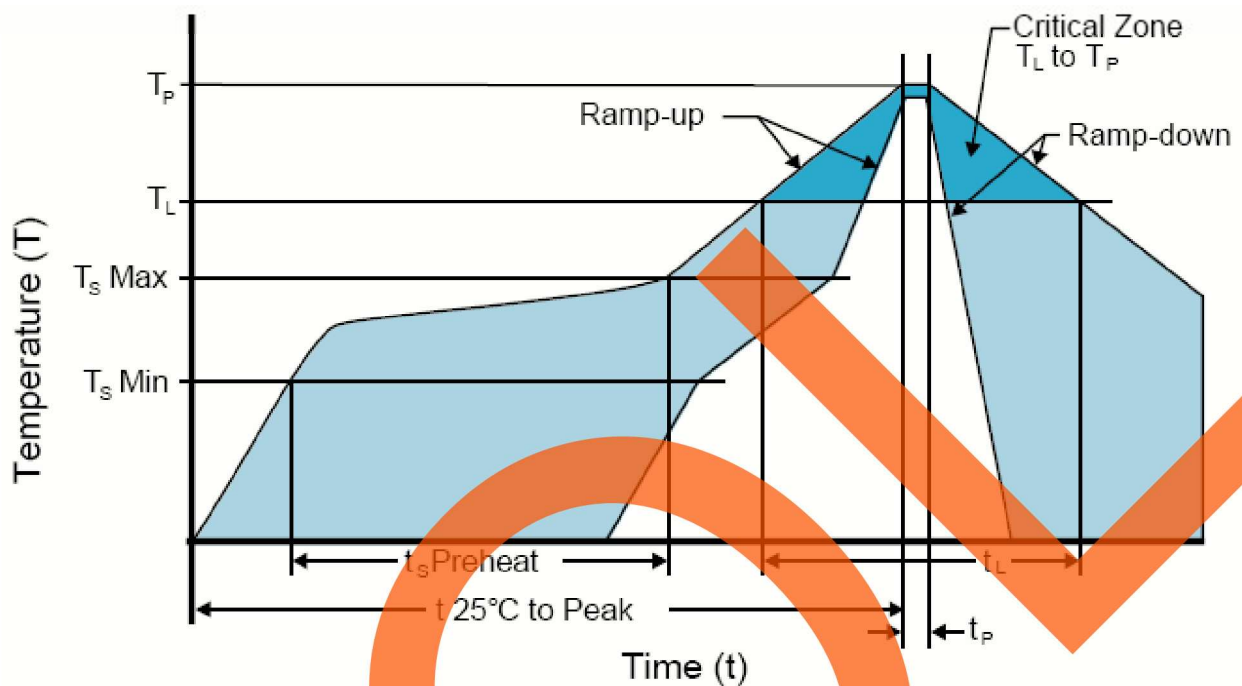
HIGH TEMPERATURE INFRARED/CONVECTION

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)	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

$T_s \text{ MAX to } T_L$ (Ramp-up Rate)	5°C/Second Maximum
Preheat	
- Temperature Minimum ($T_s \text{ MIN}$)	N/A
- Temperature Typical ($T_s \text{ TYP}$)	150°C
- Temperature Maximum ($T_s \text{ MAX}$)	N/A
- Time (t_s)	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)	200 Seconds Maximum
Peak Temperature (T_P)	240°C Maximum
Target Peak Temperature ($T_P \text{ Target}$)	240°C Maximum 2 Times / 230°C Maximum 1 Time
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.)