

ECN/PCN No.: 4149

For Manufacturer			
Product Description: PLASTIC SMD MEMS OSCILLATOR	Abracon Part Number / Part Series: EMRC13	<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: A	New Revision: EOL	Application:	<input type="checkbox"/> Safety <input checked="" type="checkbox"/> Non-Safety
Prior to Change: Active https://abracon.com/datasheets/Ecliptek/EMRC13.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: <i>Brooke Cushman</i> Product Engineer	Issued Department: Engineering	
Approval: <i>Thomas Culhane</i> Engineering Director	Approval: <i>Reuben Quintanilla</i> Quality Director	Approval: <i>Ying Huang</i> Purchasing Director	
For Abracon EOL only			
Last Time Buy (if applicable): 5/7/2022	Alternate Part Number / Part Series: AK7 (frequency=100-220MHz), AX7 (frequency greater than 220MHz or less than 100MHz)		
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



ITEM DESCRIPTION

MEMS Clock Oscillators LVPECL (PECL) 3.3Vdc 6 Pad 5.0mm x 7.0mm Plastic Surface Mount (SMD)

ELECTRICAL SPECIFICATIONS

Nominal Frequency	1MHz to 625MHz
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, 1st Year Aging at 25°C, Reflow, Shock, and Vibration ±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 -40°C to +85°C ±50ppm Maximum over -40°C to +85°C ±25ppm Maximum over -40°C to +85°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
Aging at 25°C	±1ppm First Year Maximum
Supply Voltage	+3.3Vdc ±10%
Input Current	Excluding Load Termination Current 60mA Typical, 70mA Maximum
Output Voltage Logic High (V _{OH})	V _{dd} -1.10Vdc Minimum, 2.40Vdc Typical, V _{dd} -0.70Vdc Maximum
Output Voltage Logic Low (V _{OL})	V _{dd} -1.90Vdc Minimum, 1.60Vdc Typical, V _{dd} -1.50Vdc Maximum
Rise/Fall Time	Measured over 20% to 80% of waveform 300pSec Typical, 500pSec Maximum
Duty Cycle	Measured at 50% of waveform 50 ±10(%) 50 ±5(%) (Not available with Duty Cycle of 50 ±5(%) over Nominal Frequency range of 312.500001MHz to 524.999999MHz)
Output Swing (V _{Opp})	600mVdc Minimum, 800mVdc Typical, 1000mVdc Maximum
Load Drive Capability	50 Ohms into V _{cc} -2.0Vdc
Output Logic Type	LVPECL
Logic Control / Additional Output	Output Enable (OE) and Complementary Output
Output Control Input Voltage	V _{in} of 70% of V _{dd} Minimum or No Connect to Enable Output and Complementary Output, V _{il} of 30% of V _{dd} Maximum to Disable Output and Complementary Output (High Impedance)
Output Enable Current	35mA Maximum (OE) Without Load
RMS Phase Jitter	F _j = 12kHz to 20MHz; Random 0.5pSec Typical, 1pSec Maximum
Period Jitter (Deterministic)	0.2pSec Typical
Period Jitter (Random)	1.0pSec Typical
Period Jitter (RMS)	1.4pSec Typical, 1.7pSec Maximum
Period Jitter (pk-pk)	15pSec Typical, 20pSec Maximum
Start Up Time	10mSec Maximum
Storage Temperature Range	-55°C to +125°C

PART NUMBERING GUIDE

EMRC13 C 2 H -77.760M TR

Series
MEMS Clock Oscillators LVPECL (PECL) 3.3Vdc 6 Pad
5.0mm x 7.0mm Plastic Surface Mount (SMD)

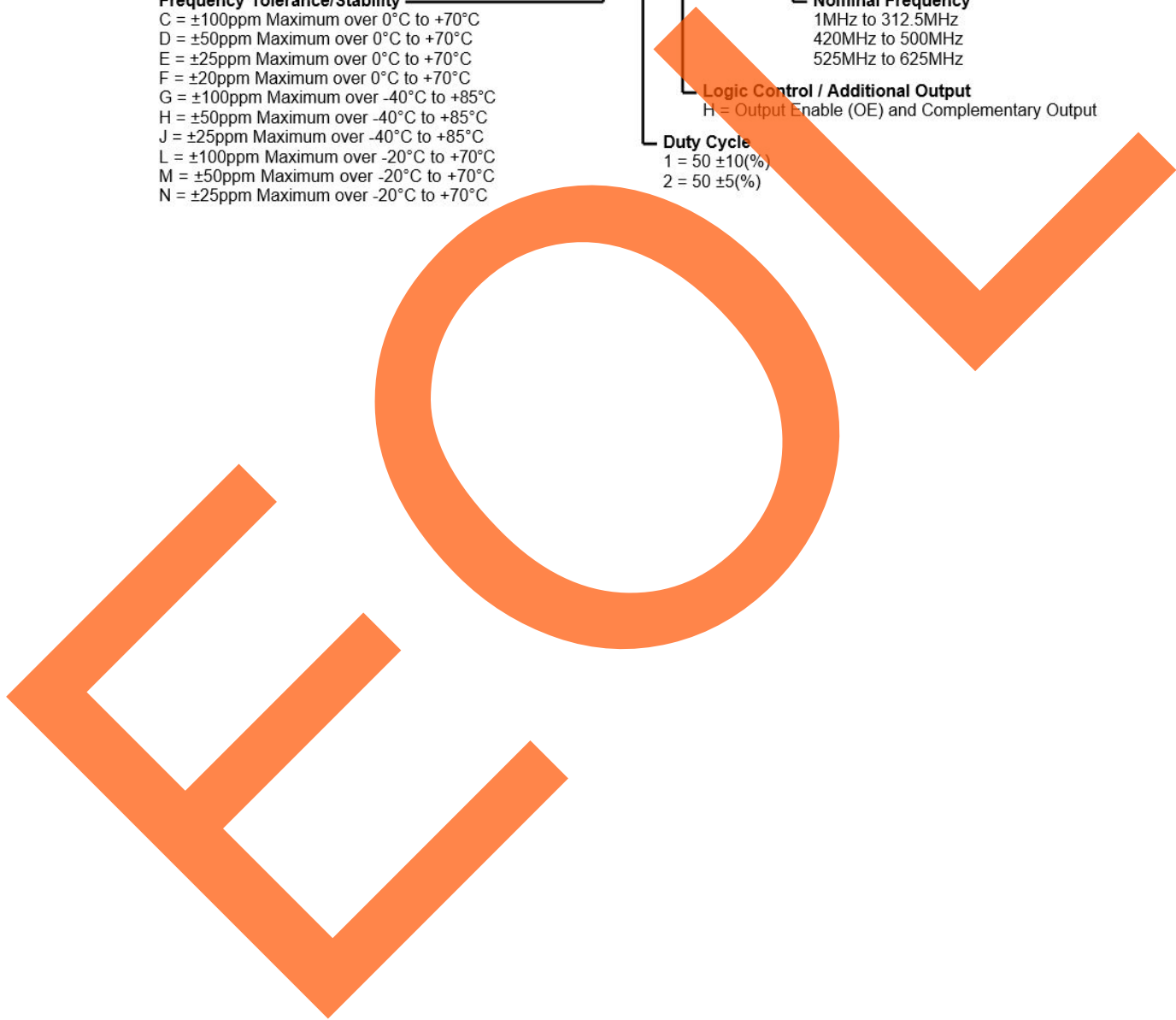
Frequency Tolerance/Stability
 C = ±100ppm Maximum over 0°C to +70°C
 D = ±50ppm Maximum over 0°C to +70°C
 E = ±25ppm Maximum over 0°C to +70°C
 F = ±20ppm Maximum over 0°C to +70°C
 G = ±100ppm Maximum over -40°C to +85°C
 H = ±50ppm Maximum over -40°C to +85°C
 J = ±25ppm Maximum over -40°C to +85°C
 L = ±100ppm Maximum over -20°C to +70°C
 M = ±50ppm Maximum over -20°C to +70°C
 N = ±25ppm Maximum over -20°C to +70°C

Nominal Frequency
 1MHz to 312.5MHz
 420MHz to 500MHz
 525MHz to 625MHz

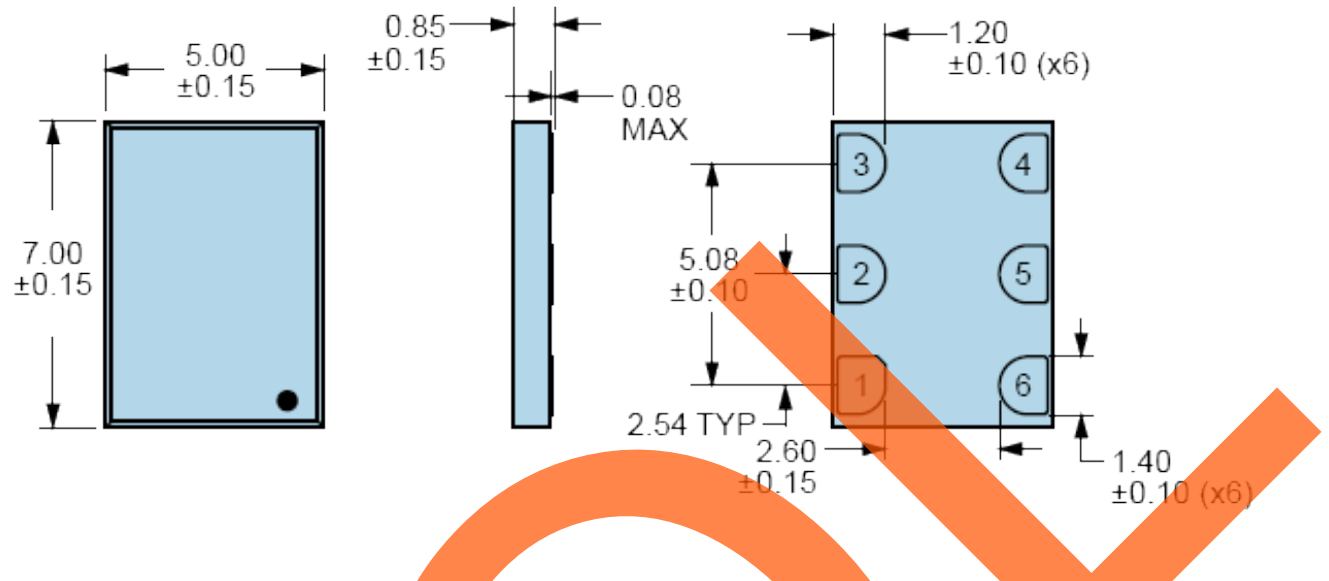
Packaging Options
 Blank = Bulk (Cut Tape)
 TR = Tape & Reel

Logic Control / Additional Output
 H = Output Enable (OE) and Complementary Output

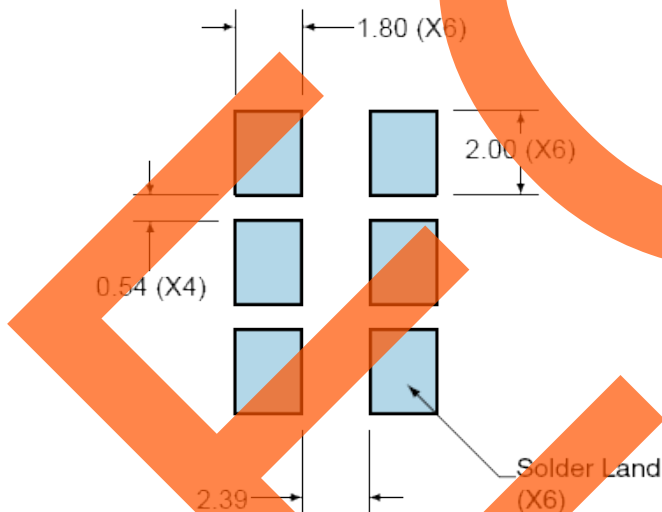
Duty Cycle
 1 = 50 ±10(%)
 2 = 50 ±5(%)



MECHANICAL DIMENSIONS



SUGGESTED SOLDER PAD LAYOUT

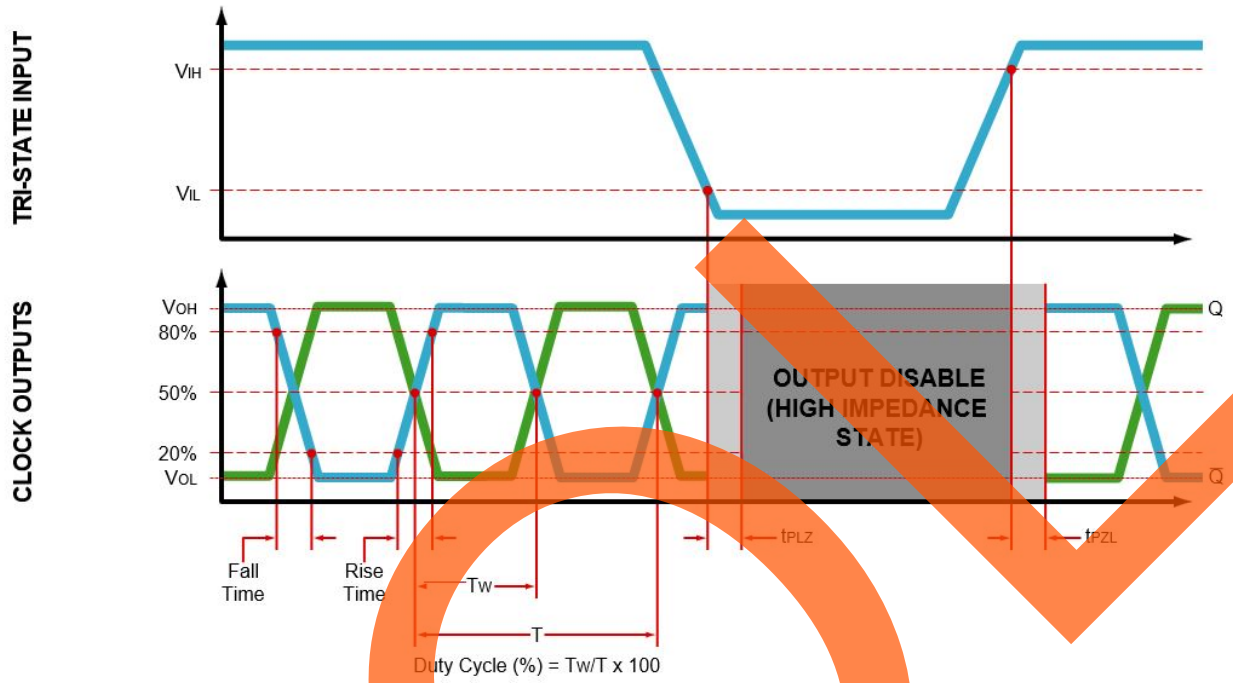


PIN	CONNECTION
1	Output Enable (OE)
2	No Connect
3	Case Ground
4	Output
5	Complementary Output
6	Supply Voltage

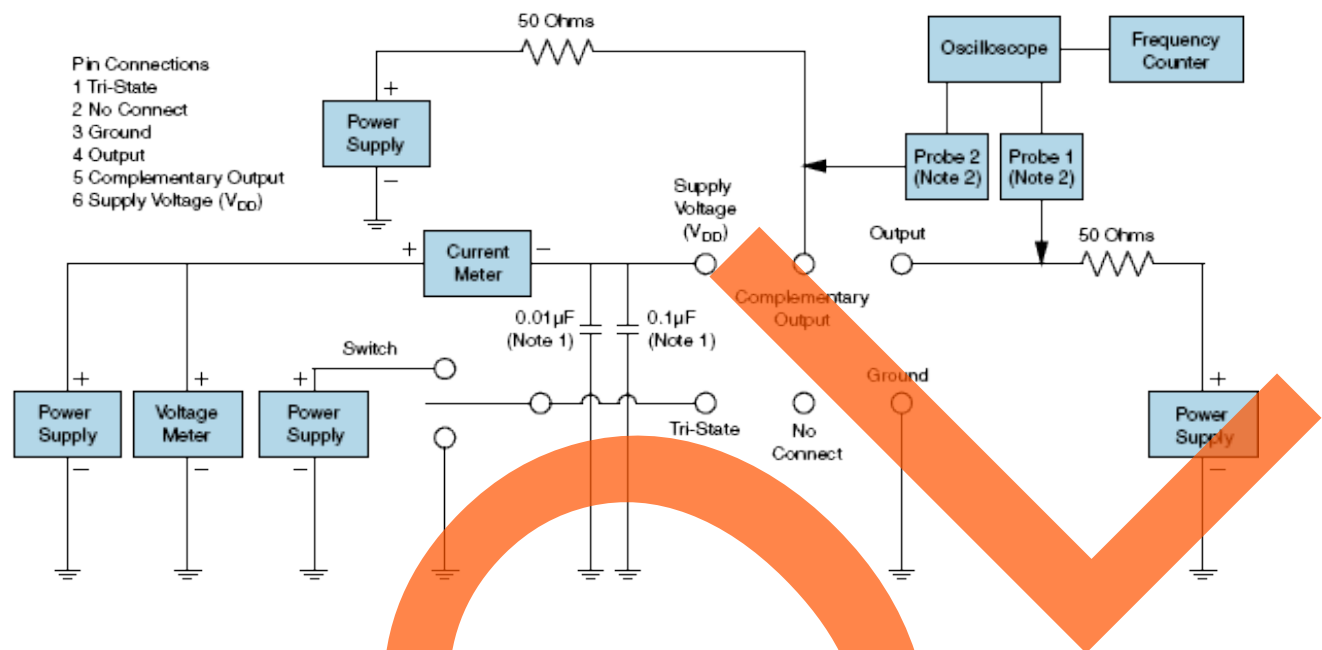
All Tolerances are ± 0.1

All Dimensions in Millimeters

OUTPUT WAVEFORM & TIMING DIAGRAM



TEST CIRCUIT FOR TRI-STATE AND COMPLEMENTARY 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 close (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 ($>500\text{MHz}$) passive probe is recommended.

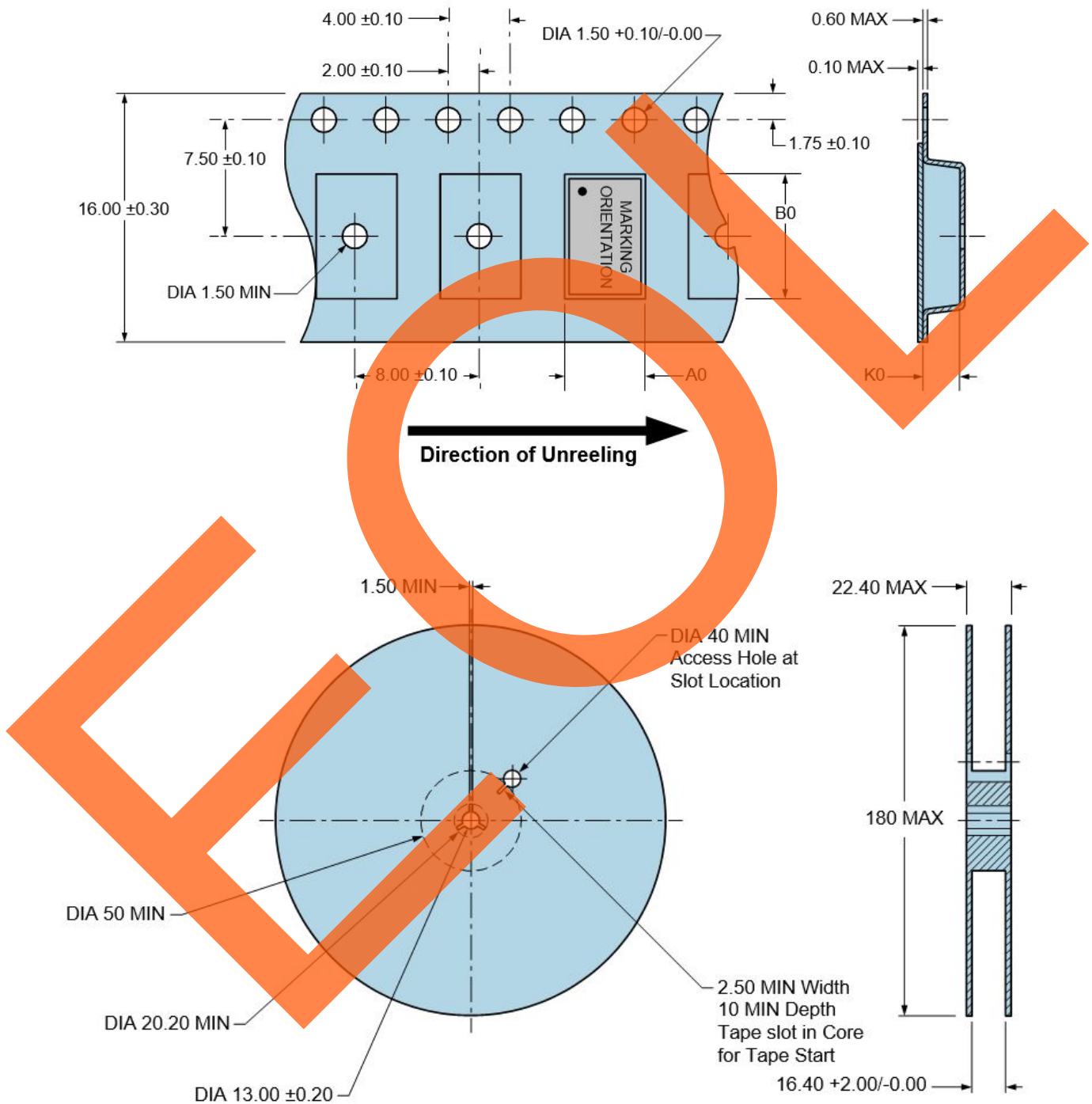
Note 3: Test circuit PCB traces need to be designed for a characteristic line impedance of 50 ohms.

TAPE & REEL DIMENSIONS

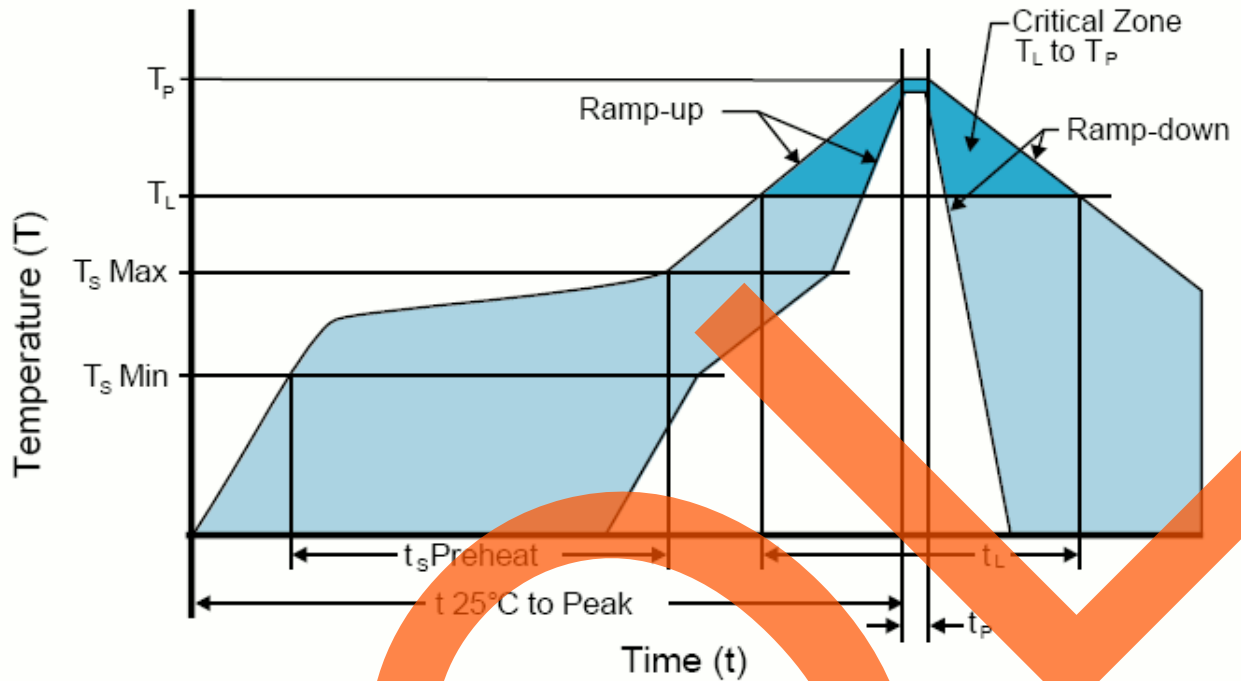
Quantity per Reel: 1,000 Units

All Dimensions in Millimeters

Compliant to EIA-481



RECOMMENDED SOLDER REFLOW METHOD



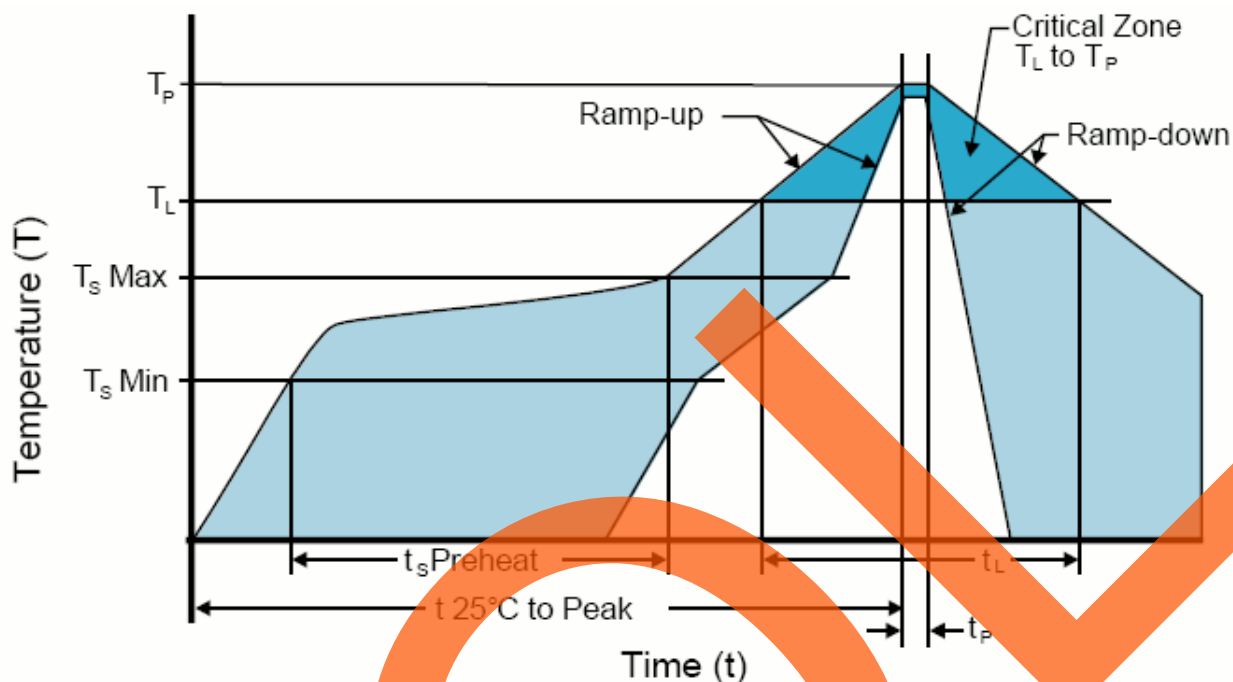
HIGH TEMPERATURE INFRARED/CONVECTION

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

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)	200 Seconds Maximum
Peak Temperature (T_P)	240°C Maximum
Target Peak Temperature (T_P 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.)