





ECN/PCN No.: 4163

For Manufacturer			
Product Description: PLASTIC SMD MEMS OSCILLATOR	Abracon Part Number / Part Series: EMTB85	<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: B	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: 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: none		
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
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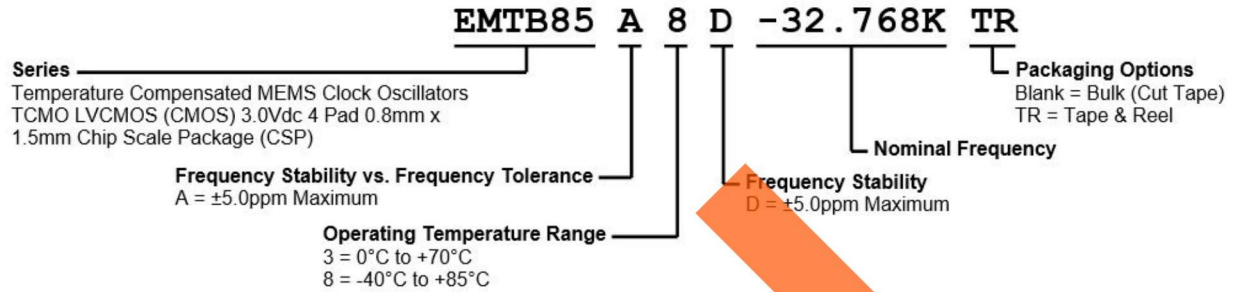
ITEM DESCRIPTION

Temperature Compensated MEMS Clock Oscillators TCMO LVC MOS (CMOS) 3.0Vdc 4 Pad 0.8mm x 1.5mm Chip Scale Package (CSP)

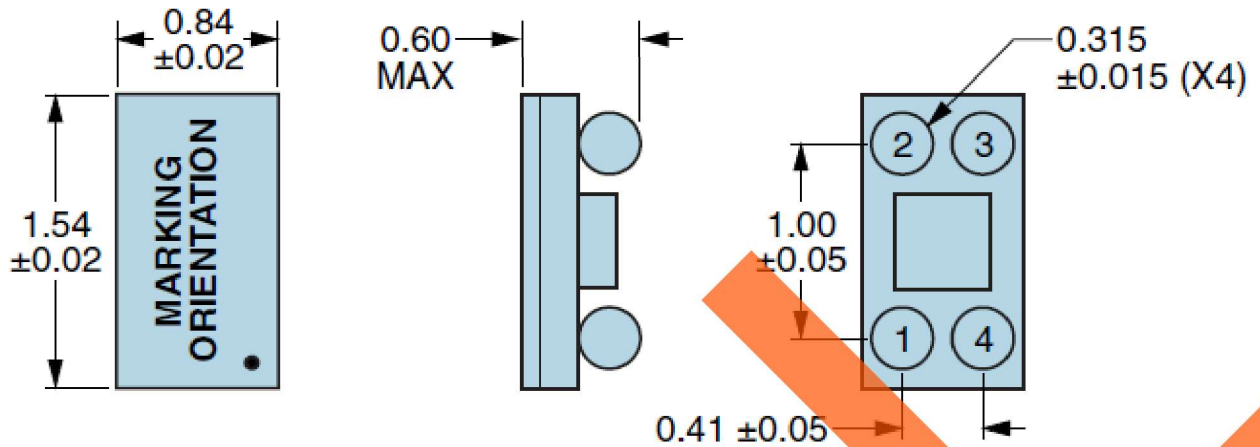
ELECTRICAL SPECIFICATIONS

Nominal Frequency	32.768kHz
Frequency Tolerance/Stability	Inclusive of Operating Temperature Range, Output Load Change ($\pm 20\%$), and Reflow, at Vdd=3.0Vdc ± 5.0 ppm Maximum
Frequency Stability vs. Frequency Tolerance	Measured at 25°C $\pm 2^\circ\text{C}$, at Vdd=3.0Vdc, Post Reflow ± 5.0 ppm Maximum
Frequency Stability vs. Input Voltage	± 0.75 ppm Maximum ($\pm 10\%$)
Frequency Stability vs. Aging	± 1 ppm/Year Maximum (at 25°C)
Operating Temperature Range	0°C to +70°C -40°C to +85°C
Supply Voltage	3.0Vdc $\pm 10\%$
Core Operating Current	0.99 μA Typical (at 25°C), 1.52 μA Maximum
Output Stage Operating Current	0.065 $\mu\text{A}/\text{Vpp}$ Typical, 0.125 $\mu\text{A}/\text{Vpp}$ Maximum
Input Current	No Load, Nominal Vdd 1.2 μA Typical (at 25°C), 1.9 μA Maximum
Output Voltage Logic High (V_{OH})	IOH = -10 μA 90% of Vdd Minimum
Output Voltage Logic Low (V_{OL})	IOL = +10 μA 10% of Vdd Maximum
Rise/Fall Time	Measured at 10% to 90% of waveform 100nSec Typical, 200nSec Maximum
Duty Cycle	Measured at 50% of waveform 50 ± 2 (%)
Load Drive Capability	15pF Maximum
Output Logic Type	CMOS
Peak to Peak Jitter (tPK)	2.5 μSec Maximum
Period Jitter (RMS)	Measured at 25°C 33nSec Typical
Power Supply Ramp	Measured at 0Vdc to 90% of Vdd 100mSec Maximum
Start Up Time	Measured at Nominal Vdd 180mSec Typical, 380mSec Maximum at Operating Temperature Range of -40°C to +85°C 180mSec Typical, 350mSec Maximum at Operating Temperature Range of 0°C to +70°C
Storage Temperature Range	-55°C to +125°C

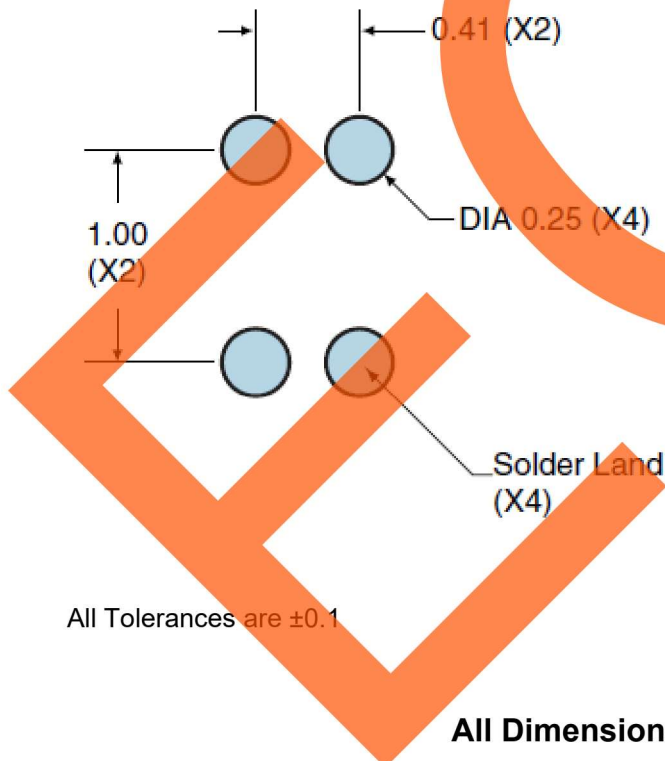
PART NUMBERING GUIDE



MECHANICAL DIMENSIONS



SUGGESTED SOLDER PAD LAYOUT

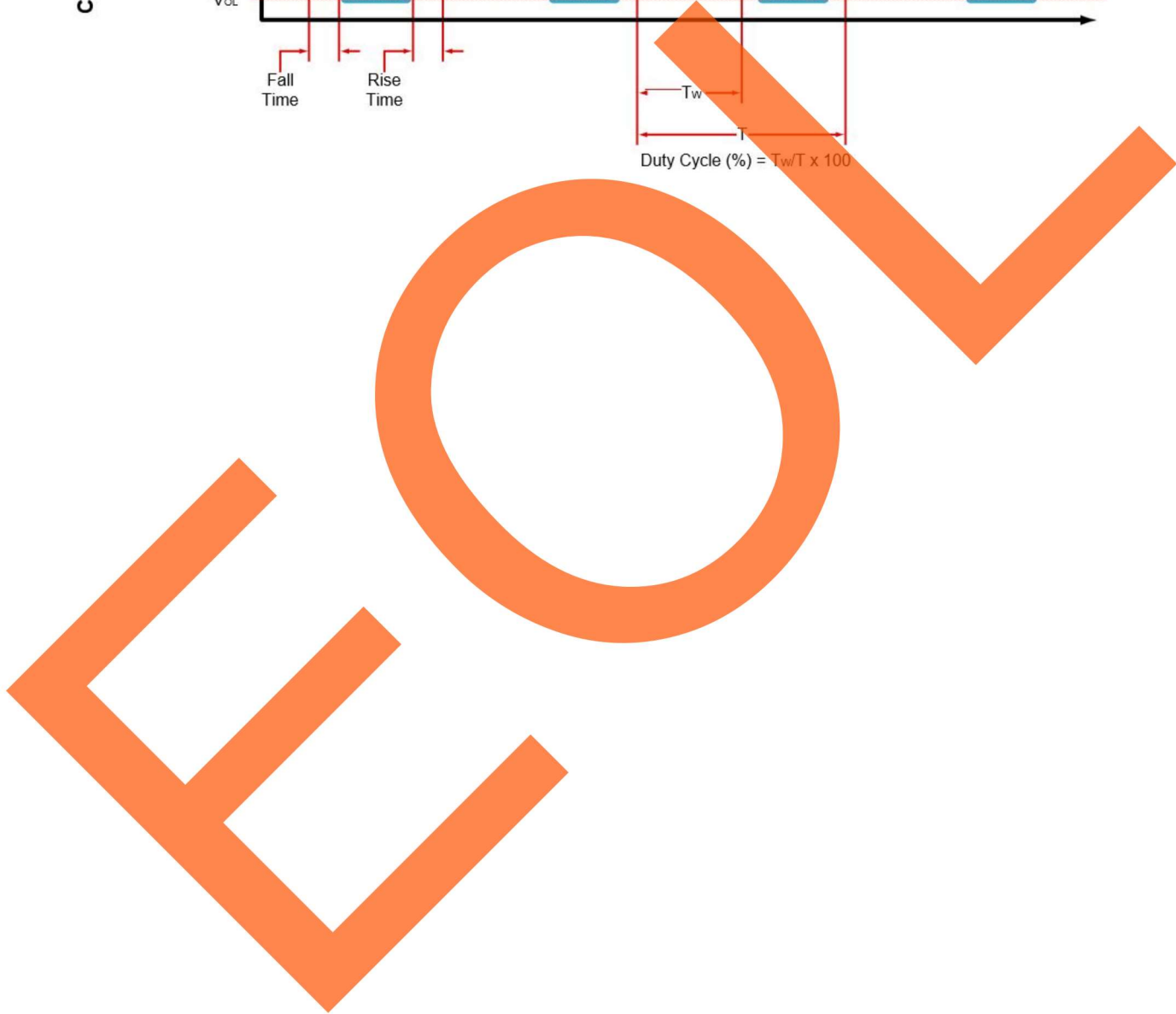
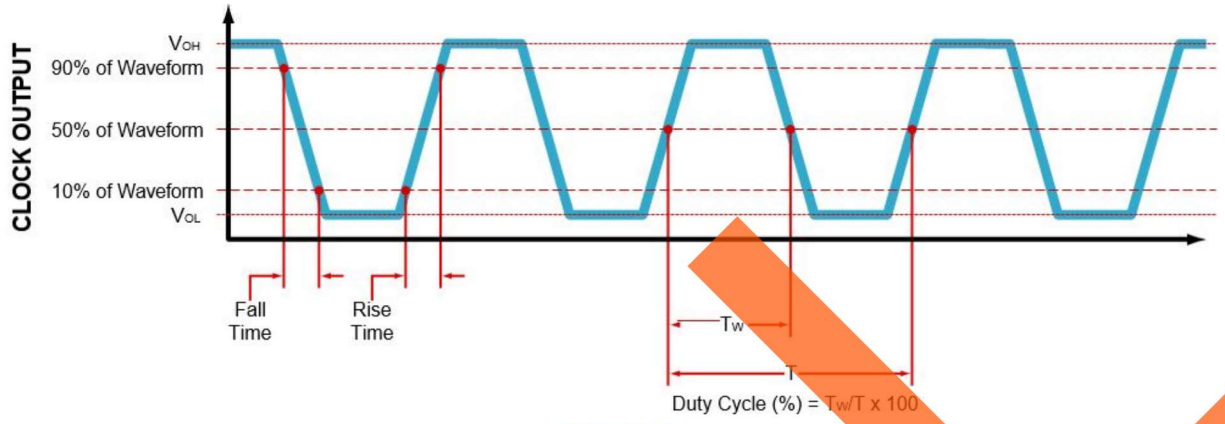


PIN	CONNECTION
1	Ground
2	Output
3	Supply Voltage
4	Ground

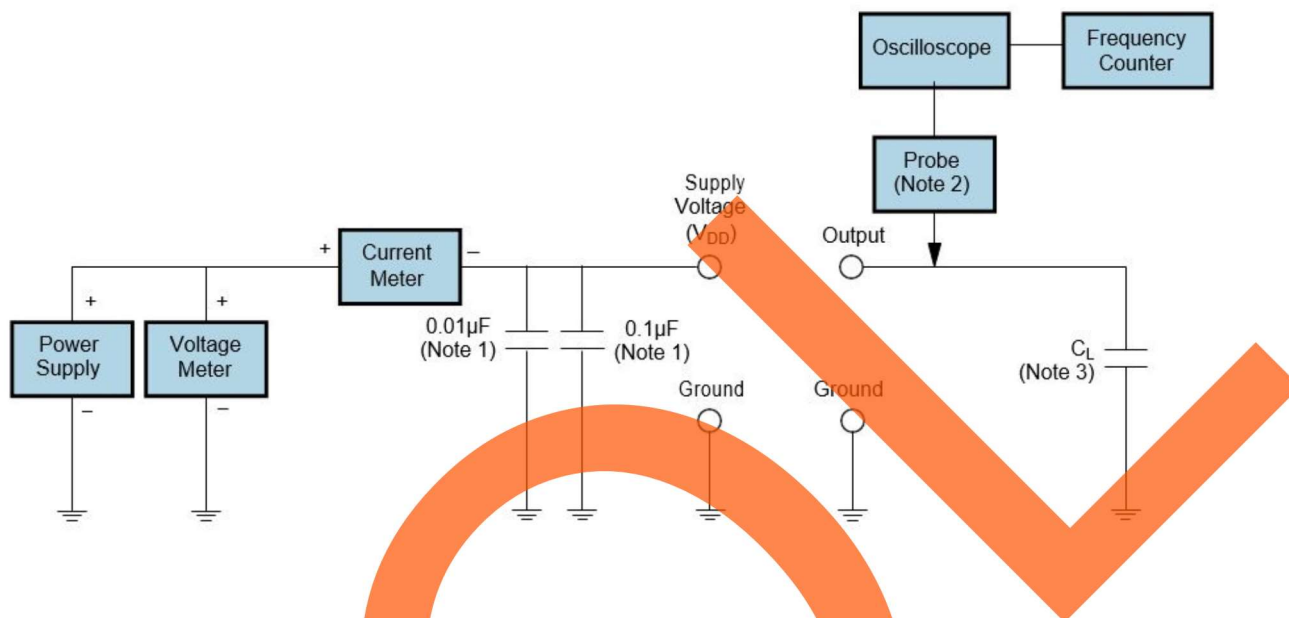
All Tolerances are ± 0.1

All Dimensions in Millimeters

OUTPUT WAVEFORM



TEST CIRCUIT FOR CMOS OUTPUT



Note 1: An external 0.01µF ceramic bypass capacitor in parallel with a 0.1µF high frequency ceramic bypass capacitor close (less than 2mm) to the package ground and supply voltage pin is required.

Note 2: A low input capacitance (<12pF), 10X Attenuation Factor, High Impedance (>10Mohms), and High bandwidth (>300MHz) Passive probe is recommended.

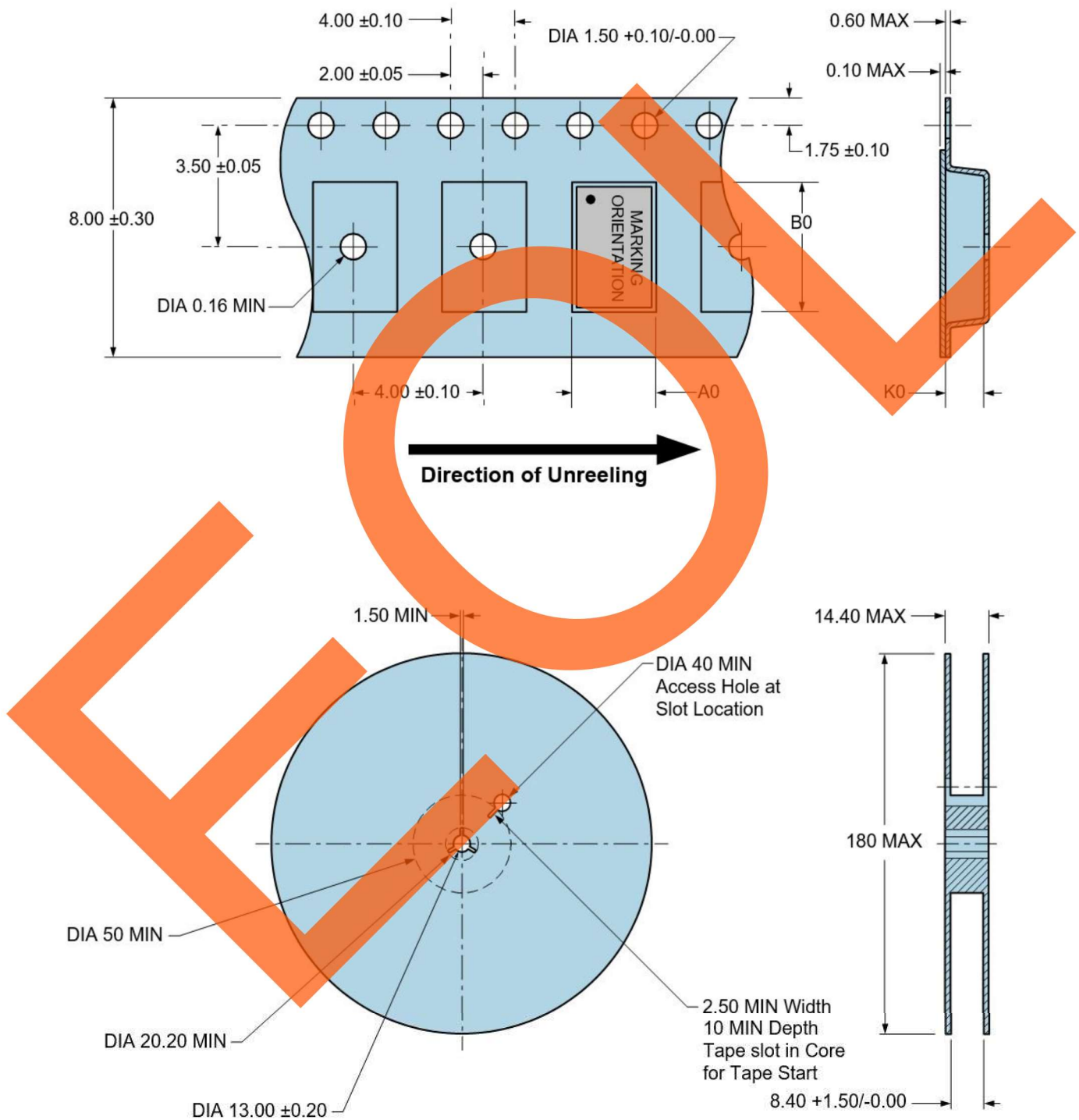
Note 3: Capacitance value CL includes sum of all probe and fixture capacitance. See applicable specification sheet for 'Load Drive Capability'.

TAPE & REEL DIMENSIONS

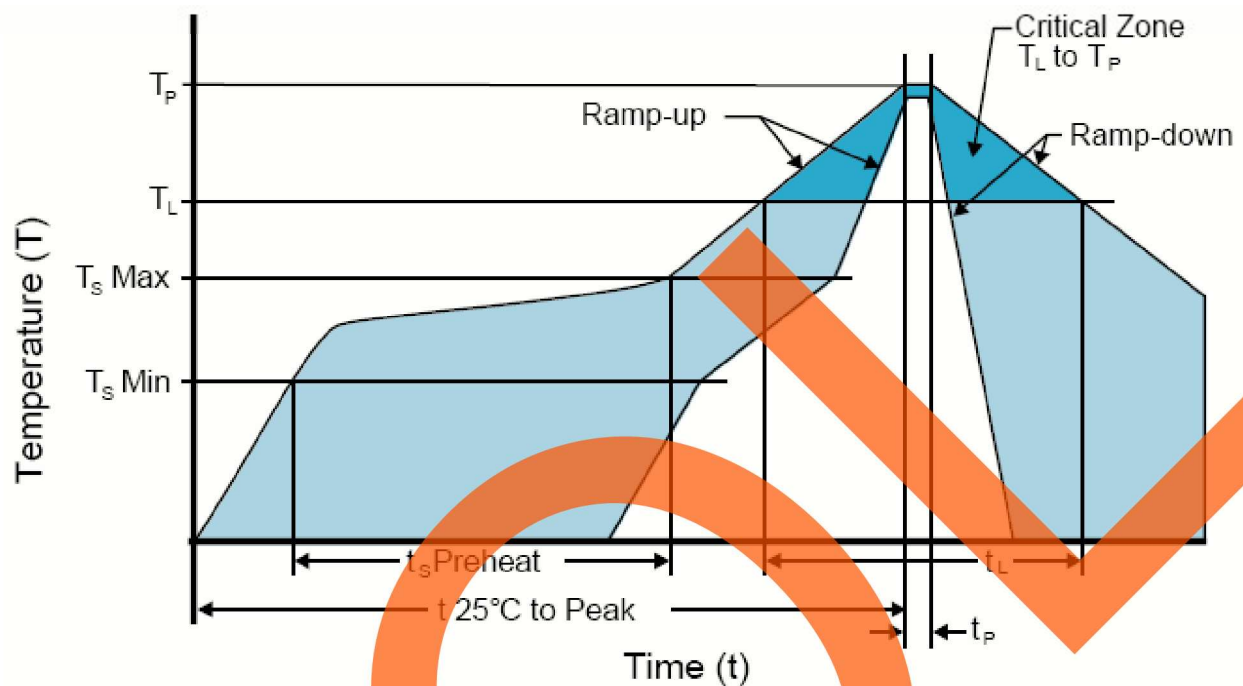
Quantity per Reel: 3,000 Units

All Dimensions in Millimeters

Compliant to EIA-481



RECOMMENDED SOLDER REFLOW METHOD



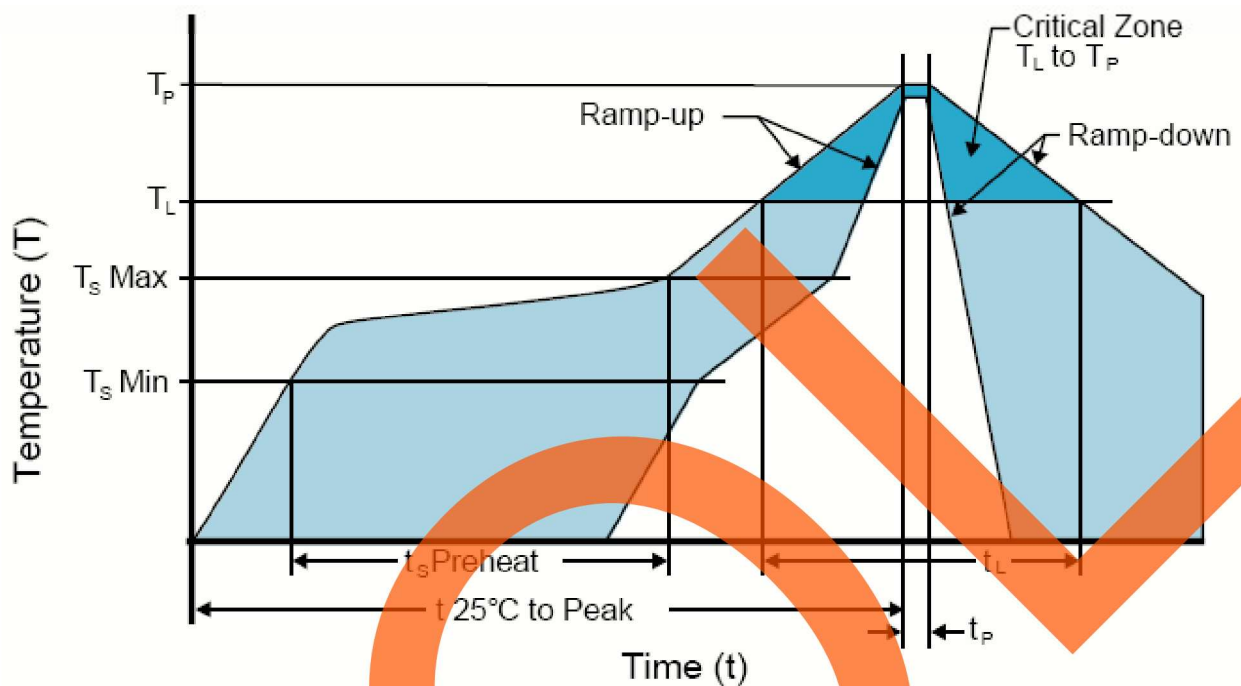
HIGH TEMPERATURE INFRARED/CONVECTION

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.)