

REGULATORY COMPLIANCE

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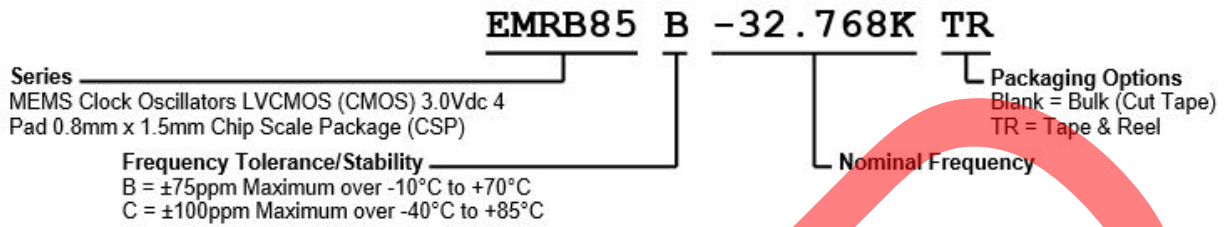
ITEM DESCRIPTION

MEMS Clock Oscillators LVCMOS (CMOS) 3.0Vdc 4 Pad 0.8mm x 1.5mm Chip Scale Package (CSP)

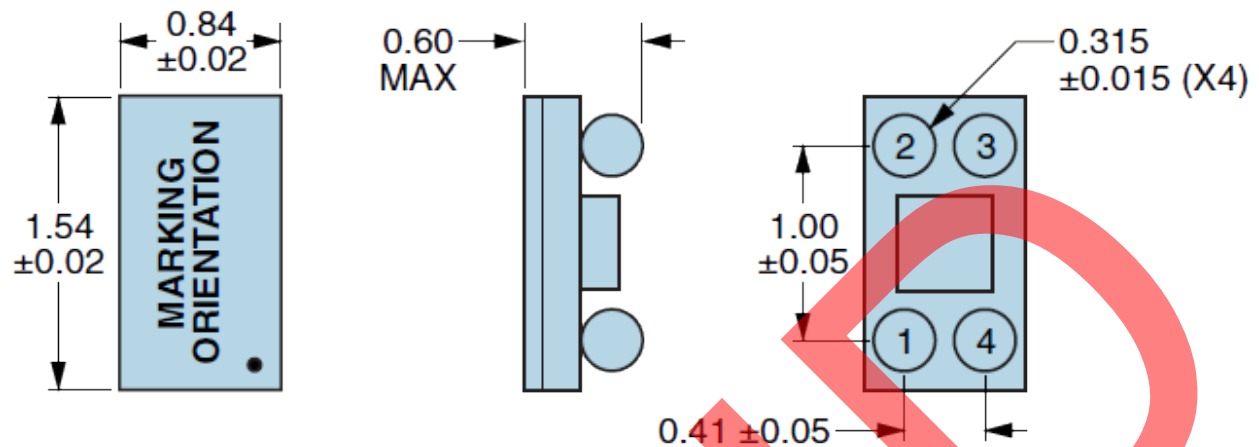
ELECTRICAL SPECIFICATIONS

Nominal Frequency	32.768kHz
Frequency Tolerance/Stability	Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, and Output Load Change ±75ppm Maximum over -10°C to +70°C ±100ppm Maximum over -40°C to +85°C
Frequency Tolerance	Measured at 25°C ±2°C, at Vdd=3.0Vdc, Post Reflow, with board level underfill ±20ppm Maximum
Aging at 25°C	±1ppm Maximum First Year
Supply Voltage	3.0Vdc ±10%
Core Operating Current	0.9µA Typical (at 25°C), 1.4µA Maximum at Frequency Tolerance/Stability of ±100ppm Maximum over -40°C to +85°C 0.9µA Typical (at 25°C), 1.3µA Maximum at Frequency Tolerance/Stability of ±75ppm Maximum over -10°C to +70°C
Output Stage Operating Current	0.065µA/Vpp Typical, 0.125µA/Vpp Maximum
Input Current	No Load, Nominal Vdd 1.1µA Typical (at 25°C), 1.9µA Maximum at Frequency Tolerance/Stability of ±100ppm Maximum over -40°C to +85°C 1.1µA Typical (at 25°C), 1.7µA Maximum at Frequency Tolerance/Stability of ±75ppm Maximum over -10°C to +70°C
Output Voltage Logic High (V _{OH})	I _{OH} = -10µA 90% of Vdd Minimum
Output Voltage Logic Low (V _{OL})	I _{OL} = +10µA 10% of Vdd Maximum
Rise/Fall Time	Measured from 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
Period Jitter (RMS)	Measured at 25°C 35nSec Typical
Power Supply Ramp	Measured at 0Vdc to 90% of Vdd 100mSec Maximum
Start Up Time	Measured at Nominal Vdd 180mSec Typical, 300mSec Maximum (at 25°C) 450mSec Maximum (over Operating Temperature Range)
Storage Temperature Range	-55°C to +125°C

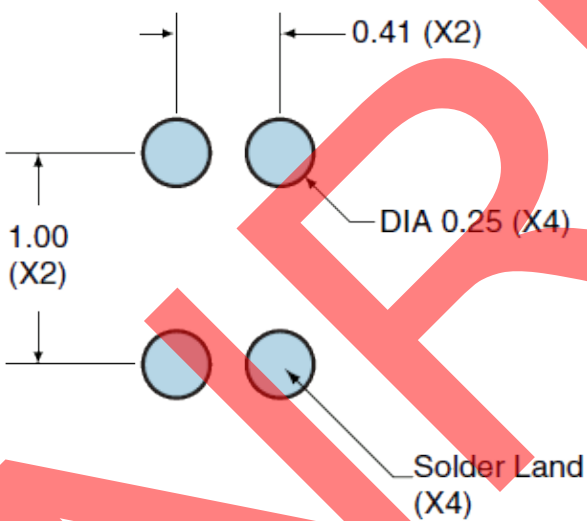
PART NUMBERING GUIDE



MECHANICAL DIMENSIONS



SUGGESTED SOLDER PAD LAYOUT

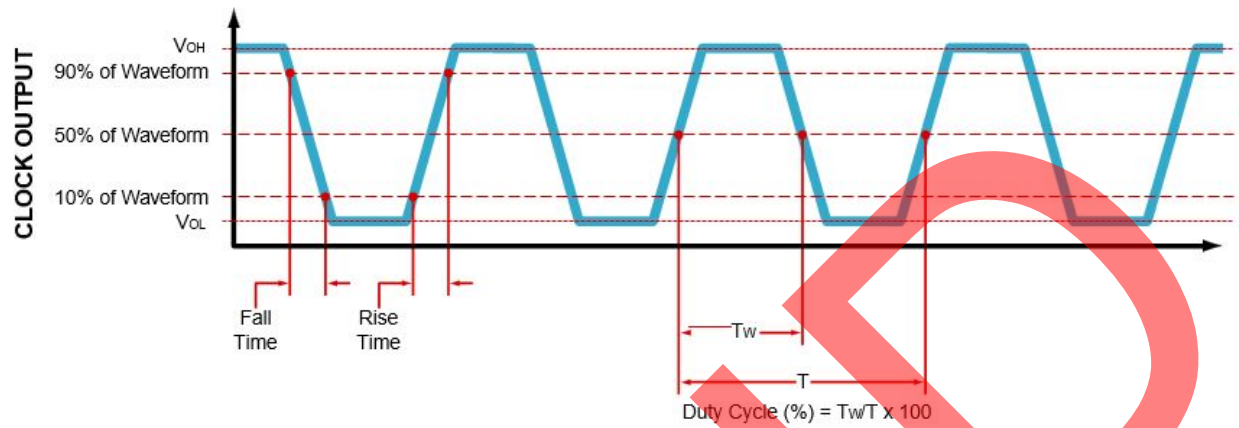


PIN	CONNECTION
1	Ground
2	Output
3	Supply Voltage
4	Ground

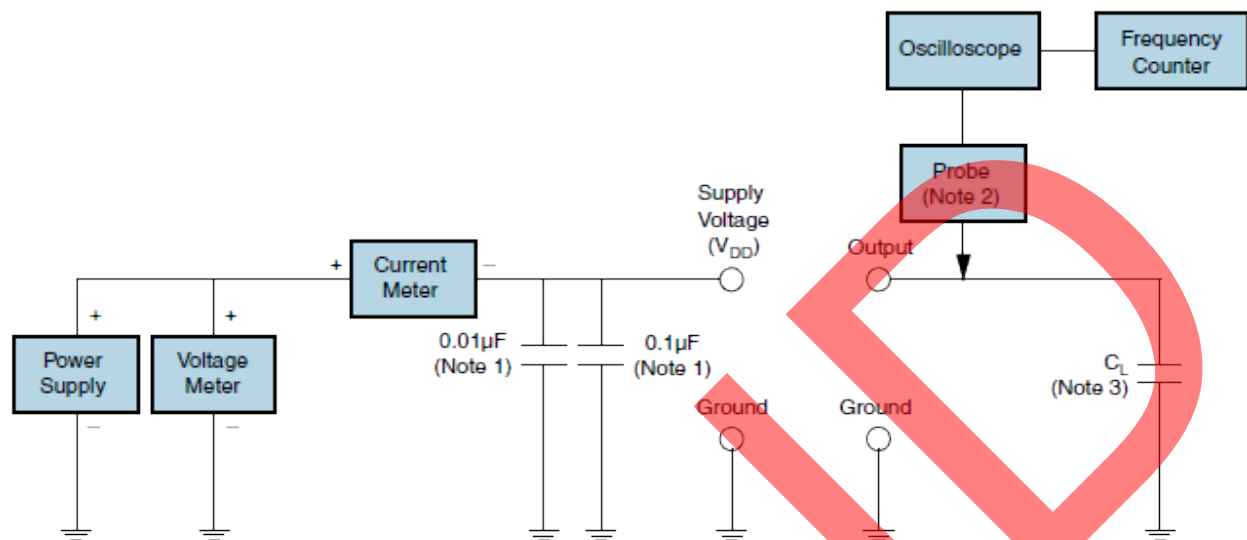
All Tolerances are ± 0.1

All Dimensions in Millimeters

OUTPUT WAVEFORM & 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 close (less Than 2mm) to the package ground and supply voltage pin is required.

Note 2: A low input capacitance ($<12\text{pF}$), 10X attenuation factor, high impedance ($>10\text{Mohms}$), and high bandwidth ($>300\text{MHz}$) Passive probe is recommended.

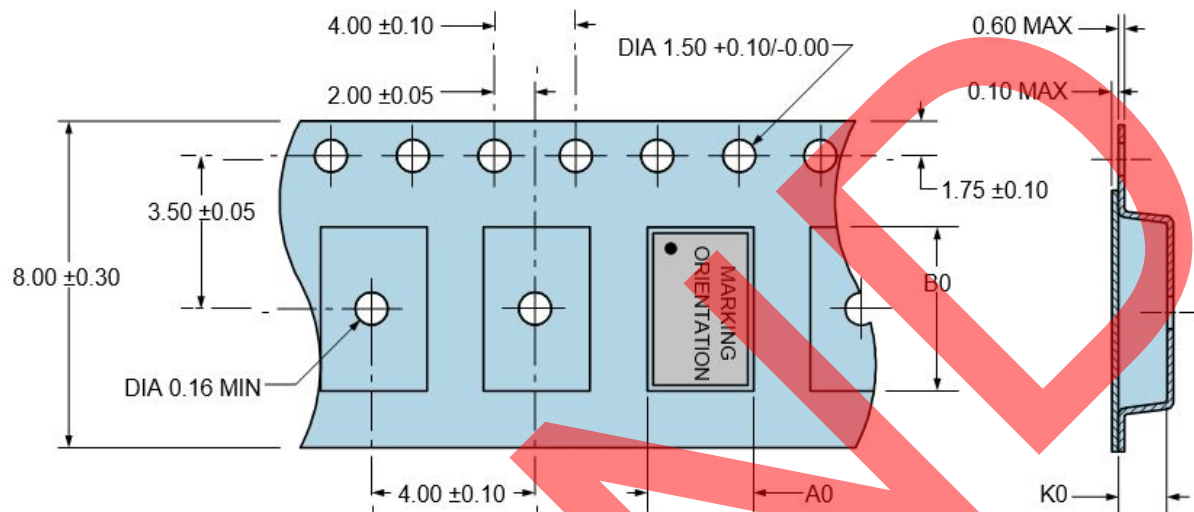
Note 3: Capacitance value C_L includes sum of all probe and fixture capacitance. See applicable specification sheet for 'Load Drive Capability'.

TAPE & REEL DIMENSIONS

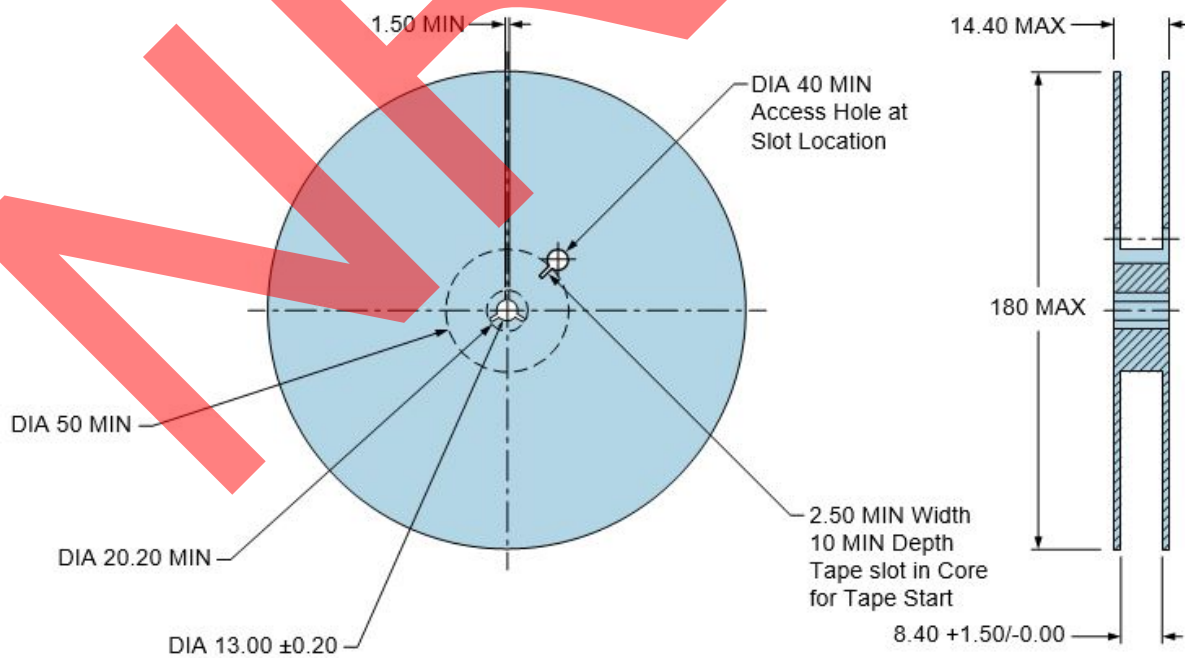
Quantity per Reel: 3000 Units

All Dimensions in Millimeters

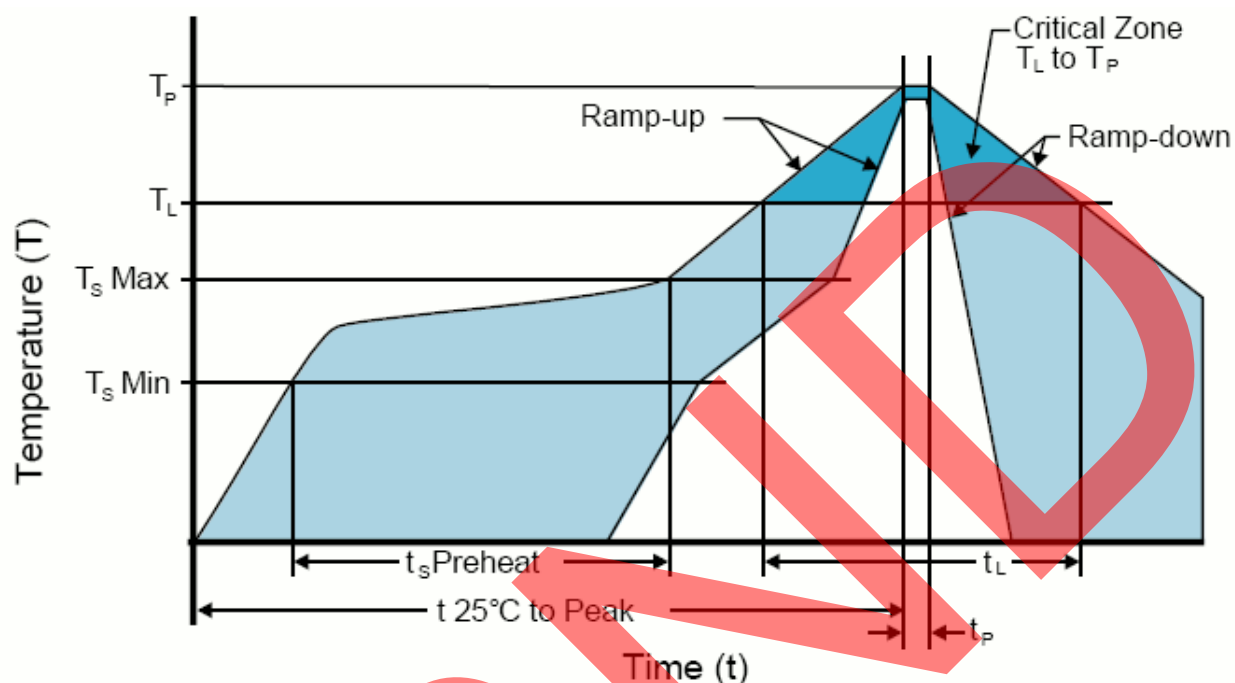
Compliant to EIA-481



Direction of Unreeling



RECOMMENDED SOLDER REFLOW METHOD



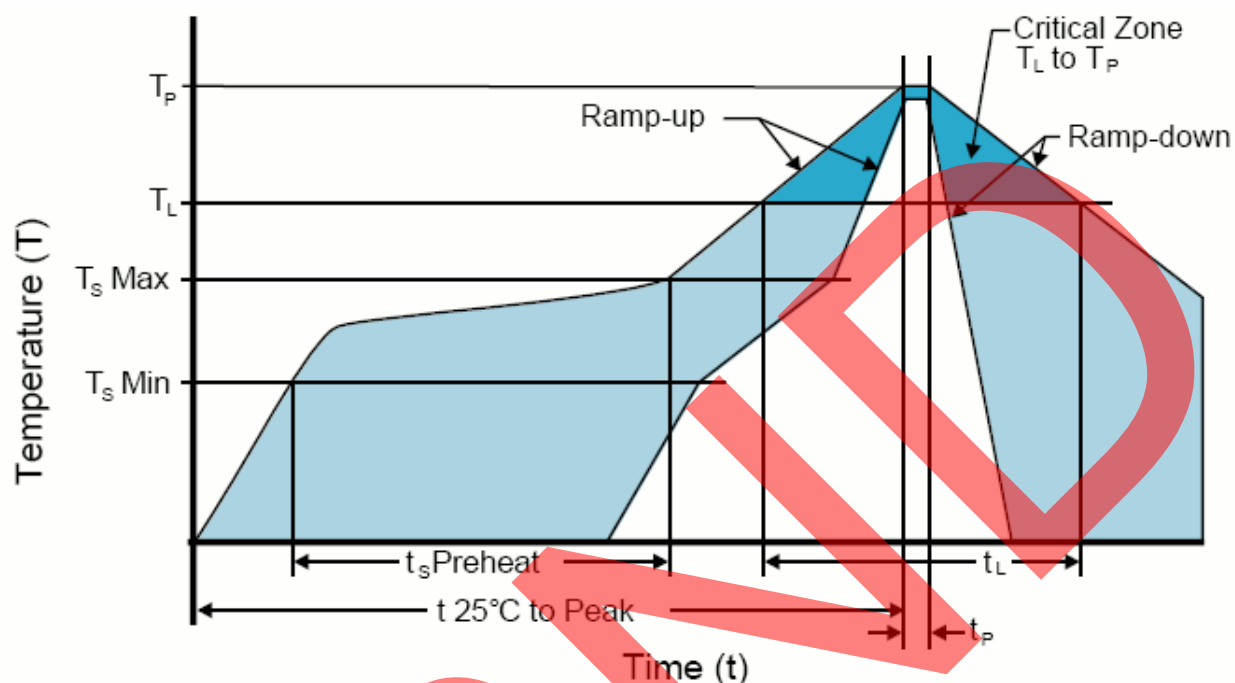
HIGH TEMPERATURE INFRARED/CONVECTION

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 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)	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.)

Mouser Electronics

Authorized Distributor

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