EMRC13 Series Oscillator

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

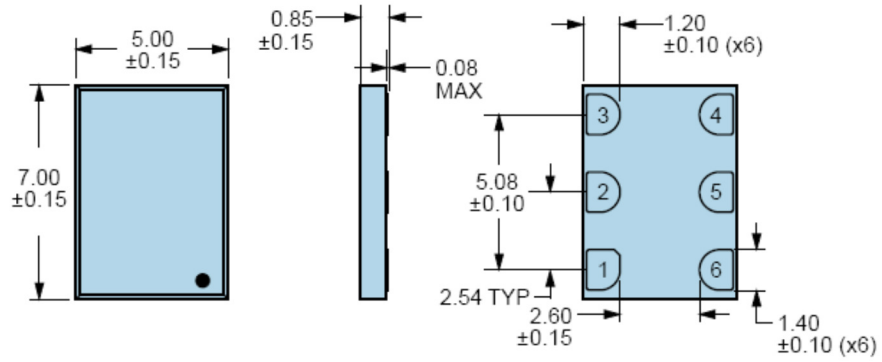
Revision A 05/11/2012

Electrical Specifications

Nominal Frequency	1.000MHz to 625.000MHz *Some frequencies within this range may not be available.*
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, Reflow, Shock, and Vibration) ±100ppm Maximum ±50ppm Maximum ±25ppm Maximum ±20ppm Maximum
Operating Temperature Range	0°C to +70°C -20°C to +70°C -40°C to +85°C
Supply Voltage (V_{DD})	3.3V_{DC} ±10%
Input Current	Excluding Load Termination Current 60mA Typical, 70mA Maximum
Output Voltage Logic High (V_{OH})	V_{DD} -1.10V_{DC} Minimum, 2.40V_{DC} Typical, V_{DD} -0.70V_{DC} Maximum
Output Voltage Logic Low (V_{OL})	V_{DD} -1.90V_{DC} Minimum, 1.60V_{DC} Typical, V_{DD} -1.50V_{DC} Maximum
Output Swing (VOpp)	600mVdc Minimum, 800mVdc Typical, 1000mVdc Maximum
Duty Cycle	Measured at 50% of waveform 50 ±10(%) 50 ±5(%) (Not available over Nominal Frequency range of 312.500001MHz to 524.999999MHz)
Rise Time/Fall Time	Measured at 20% to 80% of Waveform 300pSec Typical, 500pSec Maximum
Load Drive Capability	50 Ohms into V_{CC}-2.0V_{DC}
Output Logic Type	LVPECL
Logic Control / Additional Output	Output Enable (OE) and Complementary Output
Output Control Input Voltage	Vih of 70% of Vdd Minimum or No Connect to Enable Output and Complementary Output, Vil of 30% of V_{DD} Maximum to Disable Output and Complementary Output (High Impedance)
Output Enable Current	35mA Maximum (OE) Without Load at Logic Control / Additional Output of Output Enable (OE) and Complementary Output
RMS Phase Jitter	Fj = 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
Aging (at 25°C)	±1ppm First Year Maximum
Start Up Time	10mSec Maximum
Storage Temperature Range	-55°C to +125°C

Mechanical Dimensions



All Dimensions in Millimeters

Pin 1: Output Enable (OE)

Pin 2: No Connect

Pin 3: Case Ground

Pin 4: Output

Pin 5: Complementary Output

Pin 6: Supply Voltage

Marking Specifications

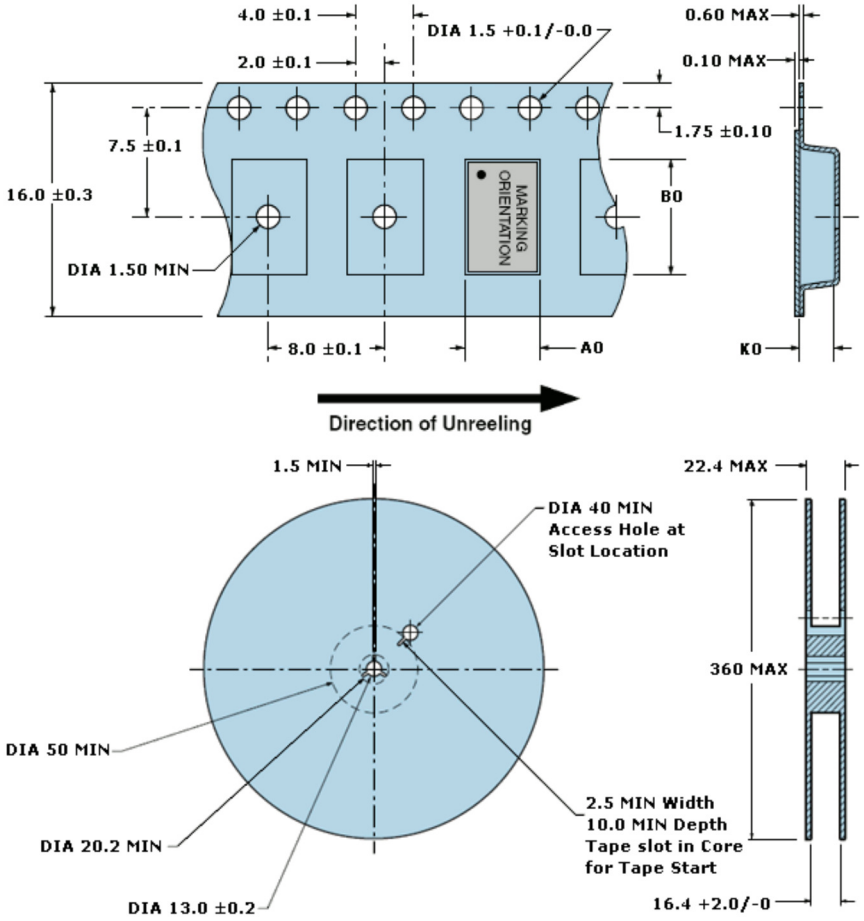
Line 1: **XXXXX**

- XXXXX = Ecliptek Manufacturing Lot Code

Environmental and Mechanical Specifications

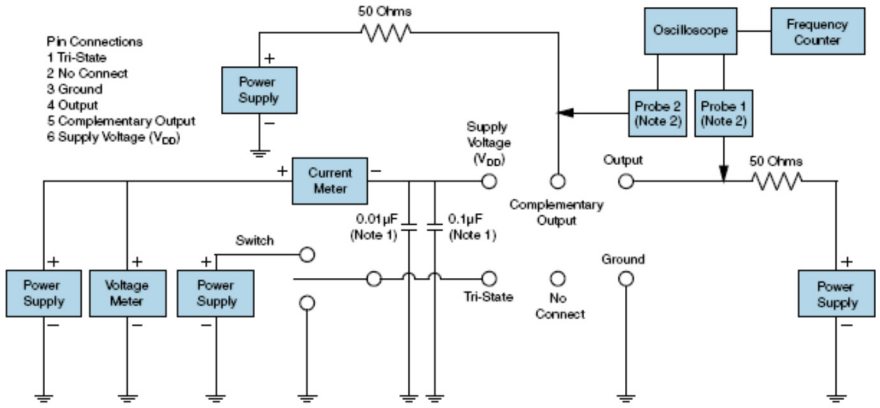
ESD Susceptibility:	MIL-STD-883, Method 3015, Class 2, HBM:2000V
Flammability:	UL94-V0
Mechanical Shock:	MIL-STD-883, Method 2002, Condition G, 30,000G
Moisture Resistance:	MIL-STD-883, Method 1004
Moisture Sensitivity Level:	J-STD-020, MSL 1
Resistance to Soldering Heat:	MIL-STD-202, Method 210, Condition K
Resistance to Solvents:	MIL-STD-202, Method 215
Solderability:	MIL-STD-883, Method 2003 (Six I/O Pads on bottom of package only)
Temperature Cycling:	MIL-STD-883, Method 1010, Condition B
Thermal Shock:	MIL-STD-883, Method 1011, Condition B
Vibration:	MIL-STD-883, Method 2007, Condition A, 20G
Thermal Resistance (θ_{JA}):	90°C/W (degrees Celsius per Watt)
Thermal Resistance (θ_{JC}):	48°C/W (degrees Celsius per Watt)

Tape & Reel Dimensions



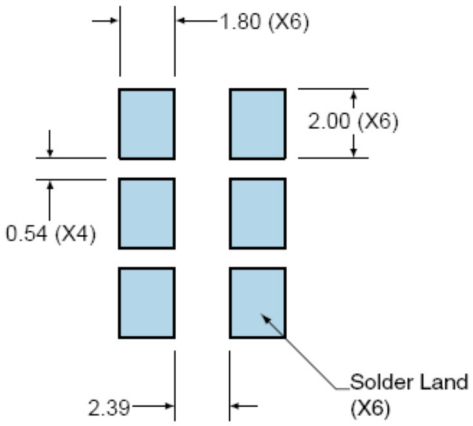
1000 pieces per reel
Compliant to EIA-481
All Dimensions in Millimeters

Test Circuit for Tri-State and Complementary Output



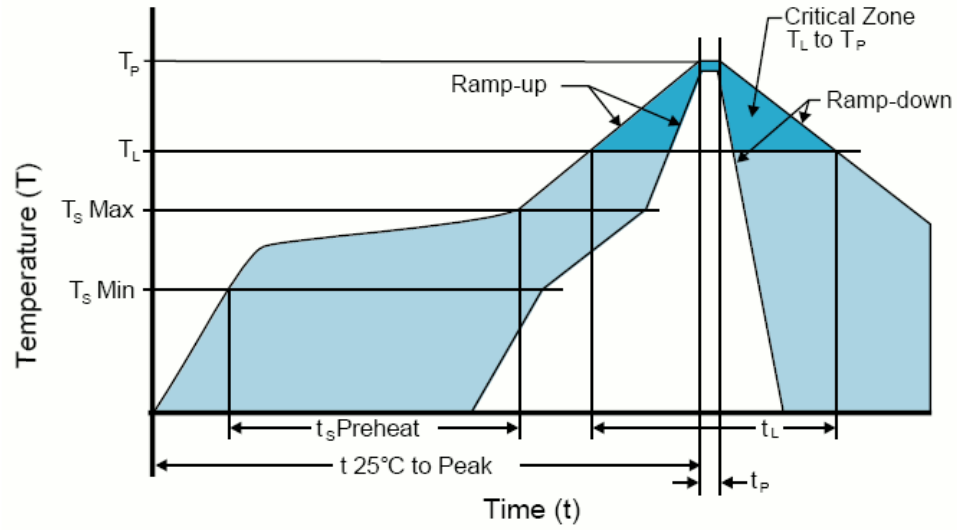
Note 1: An external 0.01µF ceramic bypass capacitor in parallel with a 0.1µF high frequency ceramic bypass capacitor close (less than 2mm) to the package ground and supply voltage pin is required.
Note 2: A low capacitance (<12pF), 10X Attentuation Factor, High Impedance (>10Mohms), and High bandwidth (>500MHz) passive probe is recommended.
Note 3: Test circuit PCB traces need to be designed for a characteristic line impedance of 50 ohms.

Recommended Solder Pad Dimensions



Tolerances = ±0.1
All Dimensions in Millimeters

Solder Reflow Profile



High Temperature Infrared/Convection

Note: Temperatures shown are applied to body of device.	
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

Low Temperature Infrared/Convection

Note: Temperatures shown are applied to body of device.

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

High Temperature Manual Soldering

Note: Temperatures listed are applied to body of device.
260°C Maximum for 5 seconds Maximum, 2 times Maximum.

Low Temperature Manual Soldering

Note: Temperatures listed are applied to body of device.
185°C Maximum for 10 seconds Maximum, 2 times Maximum.

1 - Build A Part Number

Select the parameters that meet your requirements and then click Next

Frequency in Megahertz (1 to 625):
Some frequencies within this range may not be available

Frequency Tolerance/Stability: ±100ppm Maximum over 0°C to +70°C

Duty Cycle: 50 ±10%

Packaging Options: Tape & Reel

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Access these Part Number specific resources and tools

- P/N Specific Data Sheet
- Automated Quick Quote
- Request Sample
- Download IPC-1752
- My Parts List
- My Part Number

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

Duty Cycle
1 = 50 ±10(%)
2 = 50 ±5(%)

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

Nominal Frequency

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