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## EMRE23 Series Oscillator

MEMS Clock Oscillators LVDS (DS) 3.3Vdc 6 Pad 3.2mm x 5.0mm Plastic Surface Mount (SMD)



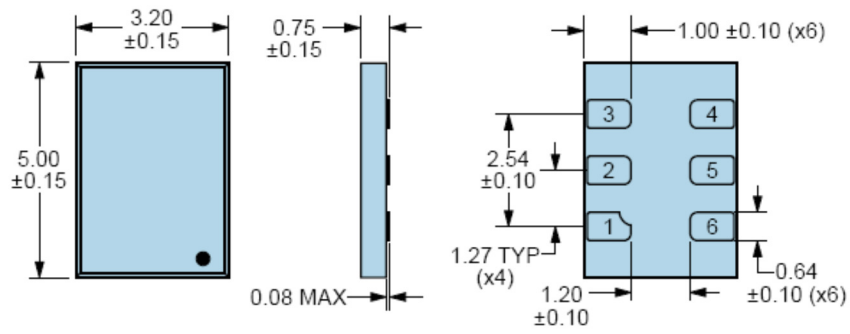
Revision A 05/11/2012

### Electrical Specifications

<b>Nominal Frequency</b>	1.000MHz to 625.000MHz <i>Some frequencies within this range may not be available.</i>
<b>Frequency Tolerance/Stability</b>	(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
<b>Operating Temperature Range</b>	0°C to +70°C -20°C to +70°C -40°C to +85°C
<b>Supply Voltage (V<sub>DD</sub>)</b>	3.3V <sub>DC</sub> ±10%
<b>Input Current</b>	Excluding Load Termination Current 45mA Typical, 55mA Maximum
<b>Differential Output Voltage (V<sub>od</sub>)</b>	200mV <sub>DC</sub> Minimum, 350mV <sub>DC</sub> Typical, 500mV <sub>DC</sub> Maximum
<b>Offset Voltage (V<sub>os</sub>)</b>	1.125V Minimum, 1.20V Typical, 1.375V Maximum
<b>Differential Output Error (dV<sub>od</sub>)</b>	50mV <sub>DC</sub> Maximum
<b>Offset Error (dV<sub>os</sub>)</b>	50mV <sub>DC</sub> Maximum
<b>Duty Cycle</b>	Measured at 50% of waveform 50 ±10(%) 50 ±5(%) (Not available over Nominal Frequency range of 312.500001MHz to 524.999999MHz)
<b>Rise Time/Fall Time</b>	Measured at 20% to 80% of Waveform 500pSec Typical, 600pSec Maximum
<b>Load Drive Capability</b>	100 Ohms Between Output and Complementary Output
<b>Output Logic Type</b>	LVDS
<b>Logic Control / Additional Output</b>	Output Enable (OE) and Complementary Output
<b>Output Control Input Voltage</b>	V <sub>ih</sub> of 70% of V <sub>dd</sub> Minimum or No Connect to Enable Output and Complementary Output, V <sub>il</sub> of 30% of V <sub>DD</sub> Maximum to Disable Output and Complementary Output (High Impedance)
<b>Output Enable Current</b>	35mA Maximum (OE) Without Load at Logic Control / Additional Output of Output Enable (OE) and Complementary Output
<b>RMS Phase Jitter</b>	F <sub>j</sub> = 12kHz to 20MHz; Random 0.5pSec Typical, 1pSec Maximum

<b>Period Jitter (Deterministic)</b>	0.2pSec Typical
<b>Period Jitter (Random)</b>	1.0pSec Typical
<b>Period Jitter (RMS)</b>	1.4pSec Typical, 1.7pSec Maximum
<b>Period Jitter (pk-pk)</b>	15pSec Typical, 20pSec Maximum
<b>Aging (at 25°C)</b>	±1ppm First Year Maximum
<b>Start Up Time</b>	10mSec Maximum
<b>Storage Temperature Range</b>	-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**

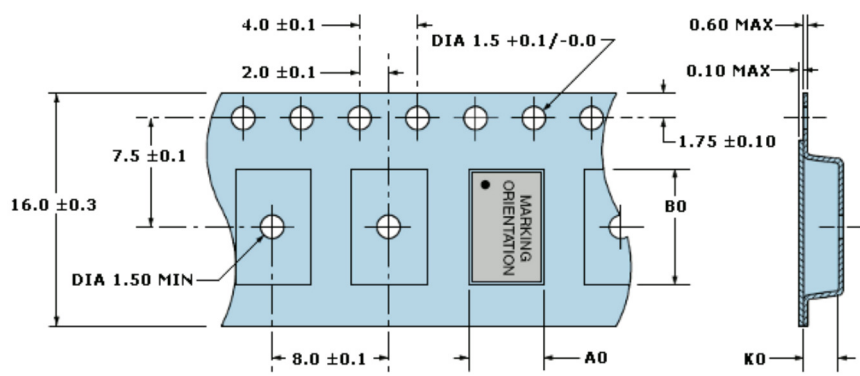
- XXXXX = Ecliptek Manufacturing Lot Code

## Environmental and Mechanical Specifications

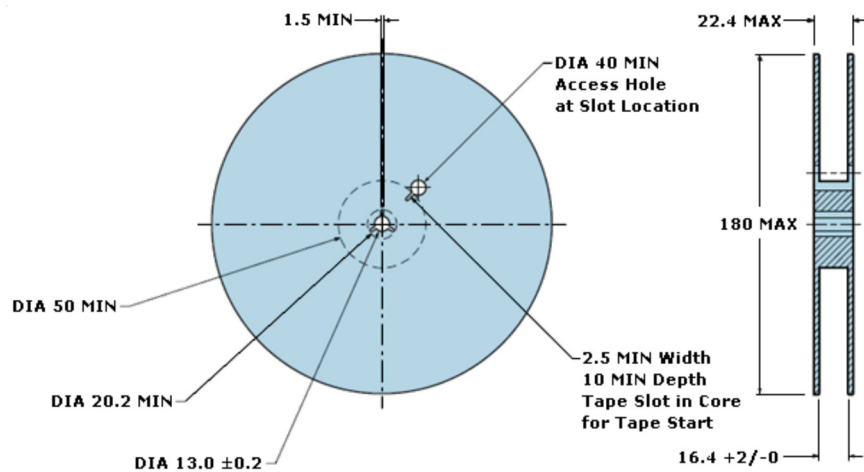
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<b>ESD Susceptibility:</b>	MIL-STD-883, Method 3015, Class 2, HBM:2000V
<b>Flammability:</b>	UL94-V0
<b>Mechanical Shock:</b>	MIL-STD-883, Method 2002, Condition G, 30,000G
<b>Moisture Resistance:</b>	MIL-STD-883, Method 1004
<b>Moisture Sensitivity Level:</b>	J-STD-020, MSL 1
<b>Resistance to Soldering Heat:</b>	MIL-STD-202, Method 210, Condition K
<b>Resistance to Solvents:</b>	MIL-STD-202, Method 215
<b>Solderability:</b>	MIL-STD-883, Method 2003 (Six I/O Pads on bottom of package only)
<b>Temperature Cycling:</b>	MIL-STD-883, Method 1010, Condition B
<b>Thermal Shock:</b>	MIL-STD-883, Method 1011, Condition B
<b>Vibration:</b>	MIL-STD-883, Method 2007, Condition A, 20G
<b>Thermal Resistance (<math>\theta_{JA}</math>):</b>	68°C/W (degrees Celsius per Watt)
<b>Thermal Resistance (<math>\theta_{JC}</math>):</b>	45°C/W (degrees Celsius per Watt)

### Tape & Reel Dimensions

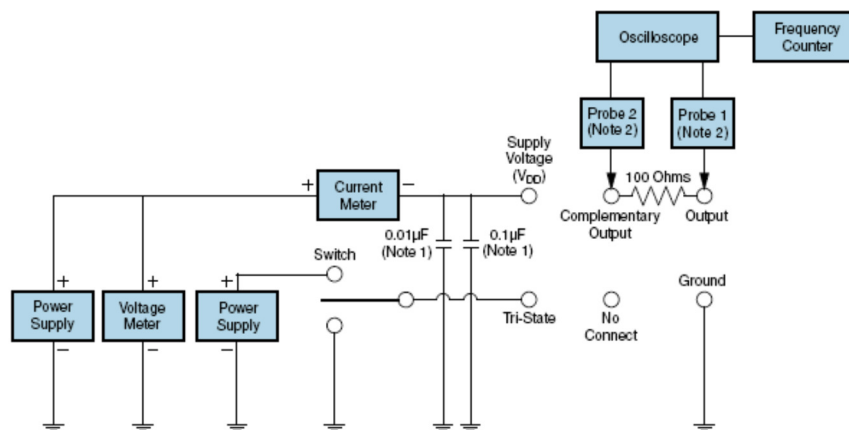


Direction of Unreeling



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

## Test Circuit for Tri-State and Complementary Output



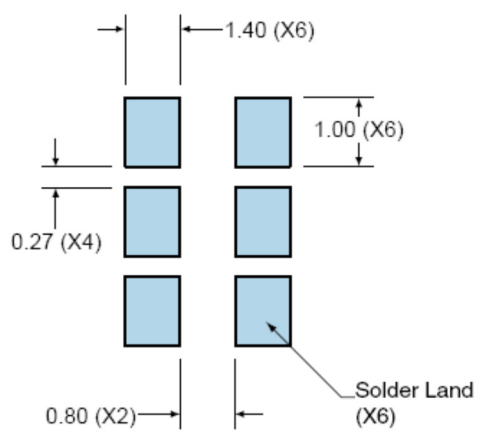
**Note 1:** An external 0.01µF ceramic bypass capacitor in parallel with a 0.1µF high frequency ceramic bypass capacitor close (less than 2mm) to the package ground and supply voltage pin is required.

**Note 2:** A low capacitance (<12pF), 10X Attenuation 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.

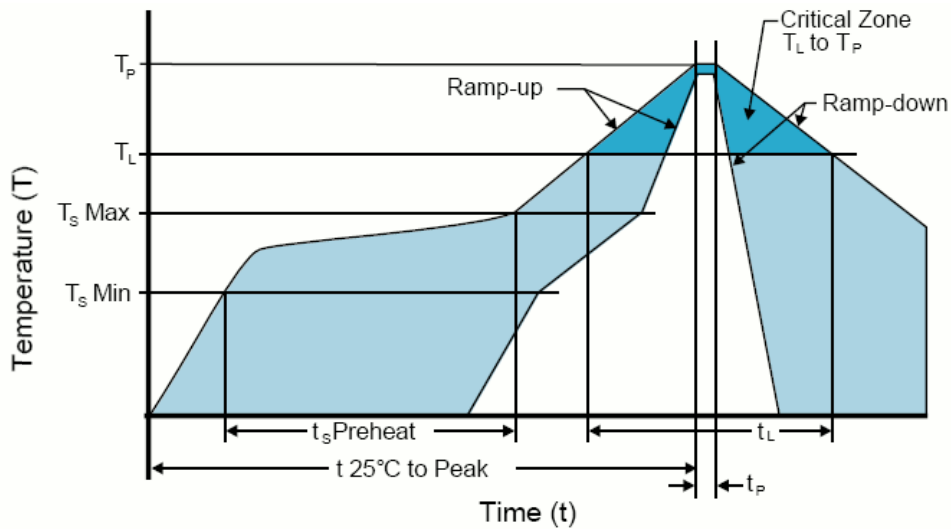
### Recommended Solder Pad Dimensions

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Tolerances =  $\pm 0.1$   
All Dimensions in Millimeters

## Solder Reflow Profile



### High Temperature Infrared/Convection

**Note:** Temperatures shown are applied to body of device.

<b>T<sub>S</sub> MAX to T<sub>L</sub> (Ramp-up Rate)</b>	3°C/second Maximum
<b>Preheat</b>	
- Temperature Minimum (T <sub>S</sub> MIN)	150°C
- Temperature Typical (T <sub>S</sub> TYP)	175°C
- Temperature Maximum (T <sub>S</sub> MAX)	200°C
- Time (t <sub>s</sub> )	60 - 180 Seconds
<b>Ramp-up Rate (T<sub>L</sub> to T<sub>P</sub>)</b>	3°C/second Maximum
<b>Time Maintained Above:</b>	
- Temperature (T <sub>L</sub> )	217°C
- Time (t <sub>L</sub> )	60 - 150 Seconds
<b>Peak Temperature (T<sub>P</sub>)</b>	260°C Maximum for 10 Seconds Maximum
<b>Target Peak Temperature (T<sub>P</sub> Target)</b>	250°C +0/-5°C
<b>Time within 5°C of actual peak (t<sub>p</sub>)</b>	20 - 40 seconds
<b>Ramp-down Rate</b>	6°C/second Maximum
<b>Time 25°C to Peak Temperature (t)</b>	8 minutes Maximum
<b>Moisture Sensitivity Level</b>	Level 1

**Low Temperature Infrared/Convection**

**Note:** Temperatures shown are applied to body of device.

**T<sub>S</sub> MAX to T<sub>L</sub> (Ramp-up Rate)** 5°C/second Maximum

**Preheat**

- **Temperature Minimum (T<sub>S</sub> MIN)** N/A

- **Temperature Typical (T<sub>S</sub> TYP)** 150°C

- **Temperature Maximum (T<sub>S</sub> MAX)** N/A

- **Time (t<sub>S</sub>)** 60 - 120 Seconds

**Ramp-up Rate (T<sub>L</sub> to T<sub>P</sub>)** 5°C/second Maximum

**Time Maintained Above:**

- **Temperature (T<sub>L</sub>)** 150°C

- **Time (t<sub>L</sub>)** 200 Seconds Maximum

**Peak Temperature (T<sub>P</sub>)** 240°C Maximum

**Target Peak Temperature (T<sub>P</sub> Target)** 240°C Maximum 2 Times / 230°C Maximum 1 Time

**Time within 5°C of actual peak (t<sub>p</sub>)** 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:  $\pm 100\text{ppm}$  Maximum over  $0^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$







Duty Cycle:  $50 \pm 10\%$

Packaging Options:

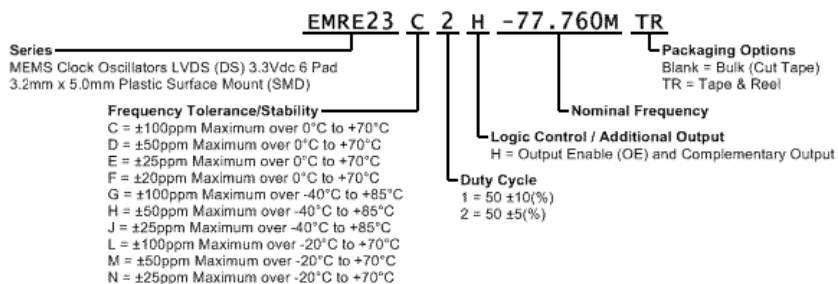
 Next

## 2 - Next Page

Access these Part Number specific resources and tools

-  P/N Specific Data Sheet
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-  My Part Number [?](#)

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