

# EMRE12J2H-156.250M



## ITEM DESCRIPTION

MEMS Clock Oscillators LVDS (DS) 2.5Vdc 6 Pad 5.0mm x 7.0mm Plastic Surface Mount (SMD) 156.250MHz  $\pm 25$ ppm over -40°C to +85°C

## ELECTRICAL SPECIFICATIONS

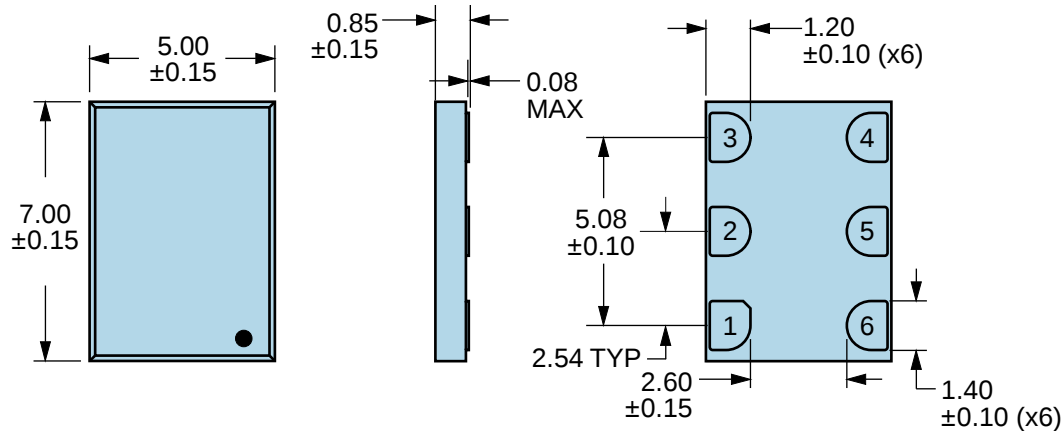
|                                   |                                                                                                                                                                                                                                                                  |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal Frequency                 | 156.250MHz                                                                                                                                                                                                                                                       |
| Frequency Tolerance/Stability     | $\pm 25$ ppm Maximum over -40°C to +85°C (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) |
| Aging at 25°C                     | $\pm 1$ ppm Maximum First Year                                                                                                                                                                                                                                   |
| Supply Voltage                    | 2.5Vdc $\pm 10\%$                                                                                                                                                                                                                                                |
| Input Current                     | 45mA Typical, 55mA Maximum (Excluding Load Termination Current)                                                                                                                                                                                                  |
| Differential Output Error (dVod)  | 50mVdc Maximum                                                                                                                                                                                                                                                   |
| Differential Output Voltage (Vod) | 200mVdc Minimum, 350mVdc Typical, 500mVdc Maximum                                                                                                                                                                                                                |
| Offset Voltage (Vos)              | 1.125V Minimum, 1.20V Typical, 1.375V Maximum                                                                                                                                                                                                                    |
| Rise/Fall Time                    | 500pSec Typical, 600pSec Maximum (Measured over 20% to 80% of waveform)                                                                                                                                                                                          |
| Duty Cycle                        | 50 $\pm 5$ (%) (Measured at 50% of waveform)                                                                                                                                                                                                                     |
| Offset Error (dVos)               | 50mVdc Maximum                                                                                                                                                                                                                                                   |
| Load Drive Capability             | 100 Ohms Between Output and Complementary Output                                                                                                                                                                                                                 |
| Output Logic Type                 | LVDS                                                                                                                                                                                                                                                             |
| 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 Vdd Maximum to Disable Output and Complementary Output (High Impedance)                                                                                         |
| Output Enable Current             | 35mA Maximum (OE) Without Load                                                                                                                                                                                                                                   |
| RMS Phase Jitter                  | 0.5pSec Typical, 1pSec Maximum (Fj = 12kHz to 20MHz; Random)                                                                                                                                                                                                     |
| 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                                                                                                                                                                                                                                                  |

## ENVIRONMENTAL & 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                        |



### MECHANICAL DIMENSIONS (all dimensions in millimeters)

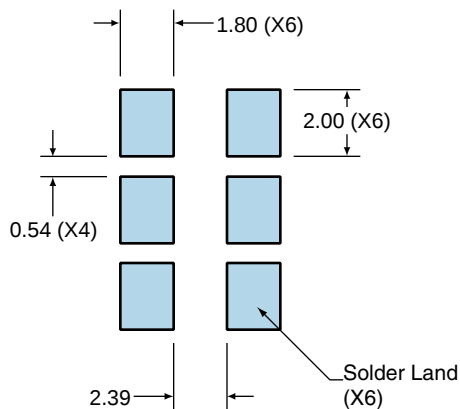


| PIN | CONNECTION           |
|-----|----------------------|
| 1   | Output Enable (OE)   |
| 2   | No Connect           |
| 3   | Case Ground          |
| 4   | Output               |
| 5   | Complementary Output |
| 6   | Supply Voltage       |

| LINE | MARKING                                             |
|------|-----------------------------------------------------|
| 1    | XXXXXX<br>XXXXXX=Ecliptek<br>Manufacturing Lot Code |

## Suggested Solder Pad Layout

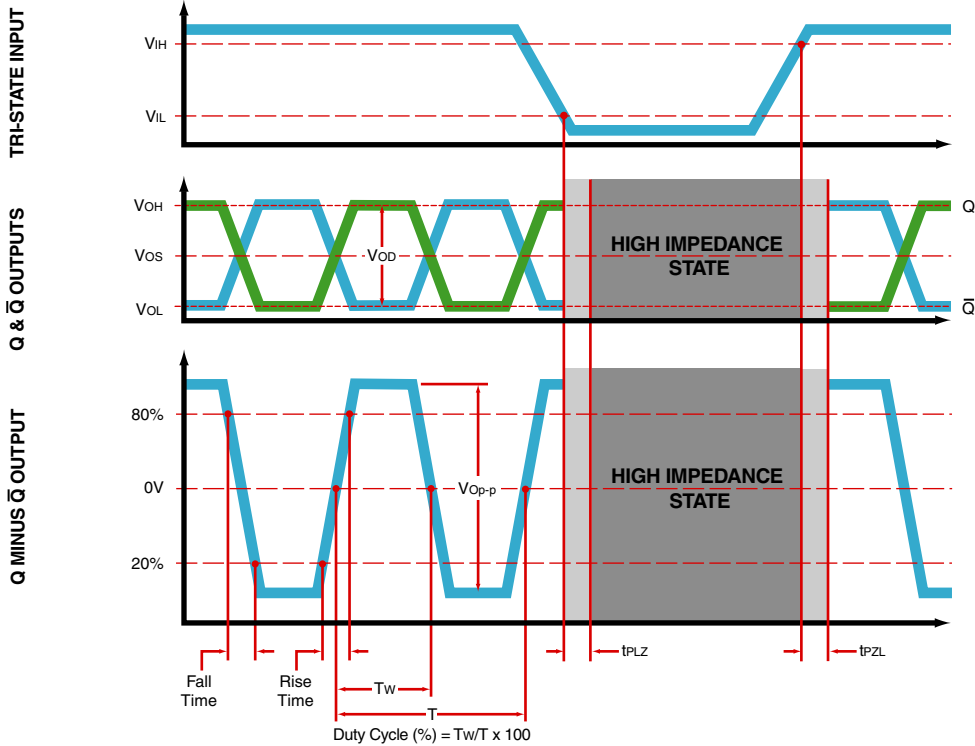
All Dimensions in Millimeters



All Tolerances are  $\pm 0.1$

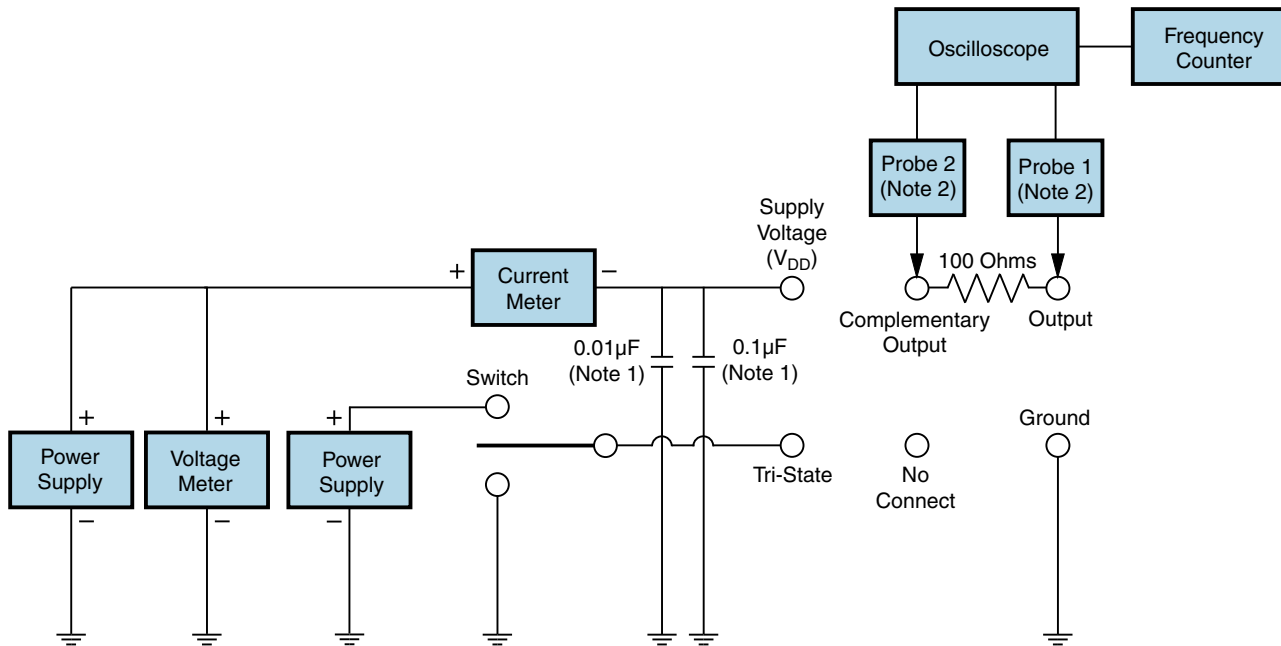
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OUTPUT WAVEFORM & TIMING DIAGRAM



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## 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.

EMRE12J2H-156.250M 

Recommended Solder Reflow Methods



High Temperature Infrared/Convection

|                                                     |                                      |
|-----------------------------------------------------|--------------------------------------|
| T <sub>S</sub> MAX to T <sub>L</sub> (Ramp-up Rate) | 3°C/Second Maximum                   |
| Preheat                                             |                                      |
| - 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> MIN)                         | 60 - 180 Seconds                     |
| Ramp-up Rate (T <sub>L</sub> to T <sub>P</sub> )    | 3°C/Second Maximum                   |
| Time Maintained Above:                              |                                      |
| - Temperature (T <sub>L</sub> )                     | 217°C                                |
| - Time (t <sub>L</sub> )                            | 60 - 150 Seconds                     |
| Peak Temperature (T <sub>P</sub> )                  | 260°C Maximum for 10 Seconds Maximum |
| Target Peak Temperature (T <sub>P</sub> Target)     | 250°C +0/-5°C                        |
| Time within 5°C of actual peak (t <sub>P</sub> )    | 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                              |

# EMRE12J2H-156.250M

## Recommended Solder Reflow Methods



## Low Temperature Infrared/Convection 240°C

Ts MAX to Tl (Ramp-up Rate) 5°C/Second Maximum

### Preheat

- Temperature Minimum (Ts MIN) N/A
- Temperature Typical (Ts TYP) 150°C
- Temperature Maximum (Ts MAX) N/A
- Time (ts MIN) 60 - 120 Seconds

Ramp-up Rate (Tl to Tp) 5°C/Second Maximum

### Time Maintained Above:

- Temperature (Tl) 150°C
- Time (tL) 200 Seconds Maximum

Peak Temperature (Tp) 240°C Maximum

Target Peak Temperature (Tp Target) 240°C Maximum 2 Times / 230°C Maximum 1 Time

Time within 5°C of actual peak (tp) 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

## Low Temperature Manual Soldering

185°C Maximum for 10 Seconds Maximum, 2 times Maximum.

## High Temperature Manual Soldering

260°C Maximum for 5 Seconds Maximum, 2 times Maximum.

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#### Как с нами связаться

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