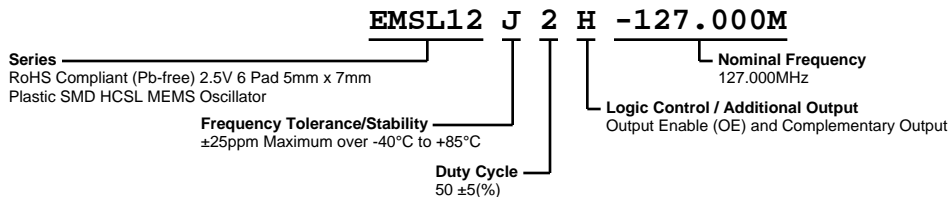


# EMSL12J2H-127.000M



**ECLIPTEK**  
CORPORATION



## ELECTRICAL SPECIFICATIONS

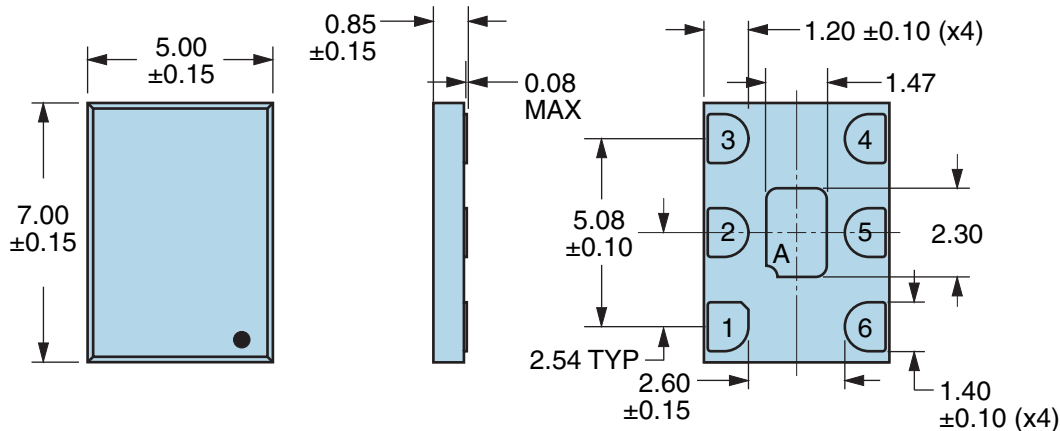
|   |  |
|---|--|
| Nominal Frequency                                 | 127.000MHz   |
| Frequency Tolerance/Stability                     | $\pm 25$ ppm Maximum over $-40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ (Inclusive of all conditions: Calibration Tolerance at $25^{\circ}\text{C}$ , Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, 1st Year Aging at $25^{\circ}\text{C}$ , Reflow, Shock, and Vibration) |
| Aging at $25^{\circ}\text{C}$                     | $\pm 1$ ppm First Year Maximum   |
| Supply Voltage                                    | +2.5Vdc $\pm 0.125$ Vdc  |
| Input Current                                     | 65mA Maximum (Excluding Load Termination Current)  |
| Output Voltage Logic High (Voh)                   | 750mVdc Typical, 600mVdc Minimum   |
| Output Voltage Logic Low (Vol)                    | 25mVdc Typical, 50mVdc Maximum   |
| Rise/Fall Time                                    | 300pSec Typical, 350pSec Maximum (Measured over 20% to 80% of waveform)  |
| Duty Cycle  | 50 $\pm 5$ (%) (Measured at 50% of waveform)   |
| Load Drive Capability                             | 50 Ohms to ground (Output and Complementary Output)  |
| Output Logic Type                                 | HCSSL  |
| Logic Control / Additional Output                 | Output Enable (OE) and Complementary Output  |
| Output Control Input Voltage                      | Vih of 70% of Vcc Minimum or No Connect to Enable Output and Complementary Output, Vil of 30% of Vcc Maximum to Disable Output and Complementary Output (High Impedance)   |
| Output Enable Current                             | 60mA Maximum (OE) Without Load   |
| Period Jitter (Deterministic)                     | 0.2pSec Typical  |
| Period Jitter (Random)                            | 2.0pSec Typical  |
| Period Jitter (RMS)                               | 1.5pSec Typical, 3.0pSec Maximum   |
| Period Jitter (pk-pk)                             | 20pSec Typical, 25pSec Maximum   |
| Period Jitter (Cycle to Cycle)                    | 10pSec Typical   |
| RMS Phase Jitter (Fj = 637kHz to 10MHz; Random)   | 1.6pSec Typical  |
| RMS Phase Jitter (Fj = 1.5MHz to 22MHz; Random)   | 0.6pSec Typical  |
| RMS Phase Jitter (Fj = 1.875MHz to 20MHz; Random) | 0.5pSec Typical  |
| Start Up Time                                     | 10mSec Maximum   |
| Storage Temperature Range                         | $-55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$  |

## 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                        |

# EMSL12J2H-127.000M

## MECHANICAL DIMENSIONS (all dimensions in millimeters)



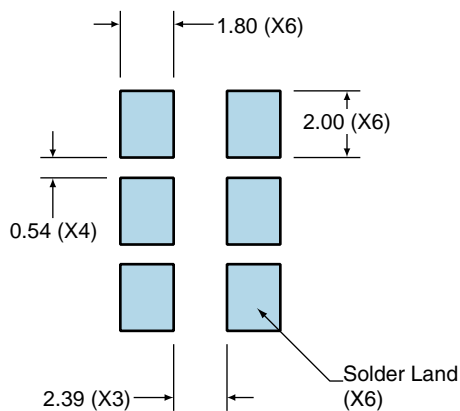
| PIN | CONNECTION           |
|-----|----------------------|
| 1   | Output Enable (OE)   |
| 2   | No Connect           |
| 3   | Case Ground          |
| 4   | Output               |
| 5   | Complementary Output |
| 6   | Supply Voltage       |

| LINE | MARKING   |
|------|---|
| 1    | XXXX or XXXXX<br>XXXX or XXXXX=Ecliptek<br>Manufacturing Lot Code |

Note A: Center paddle is connected internally to oscillator ground (Pad 3).

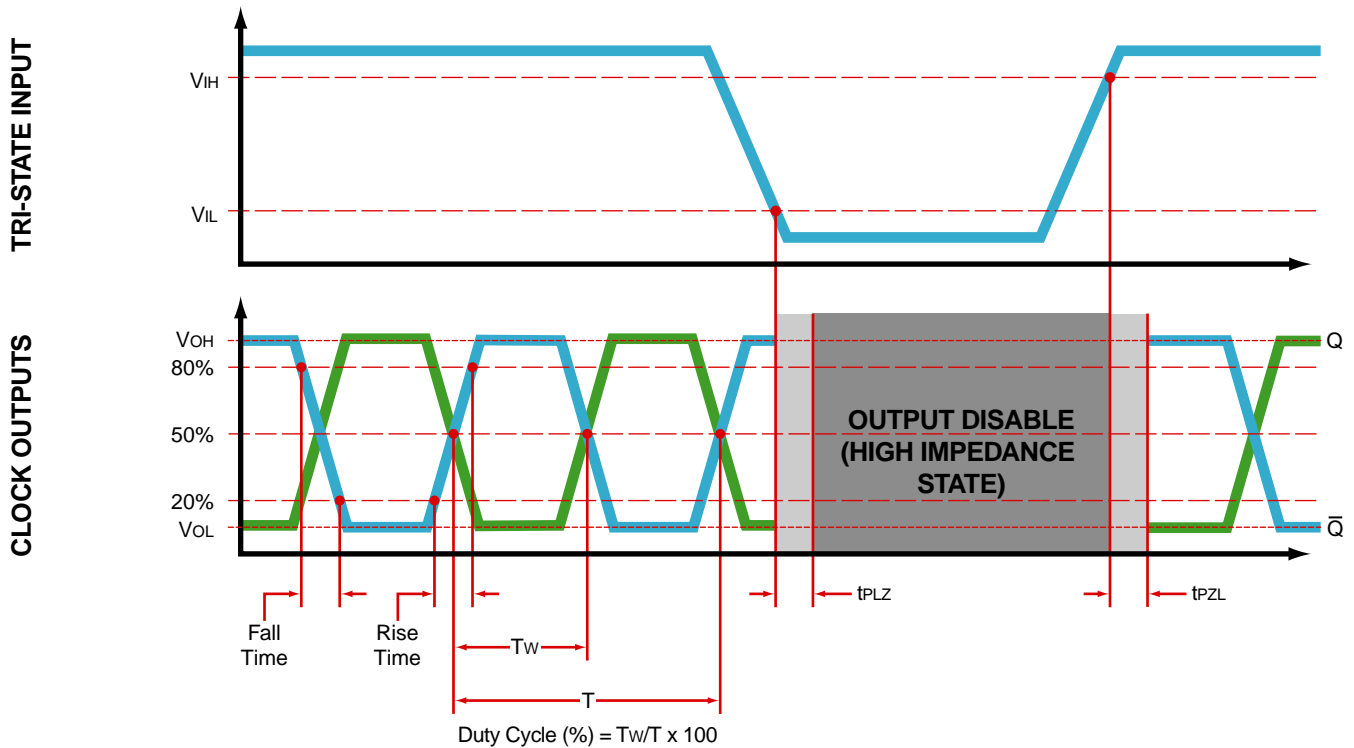
## Suggested Solder Pad Layout

All Dimensions in Millimeters

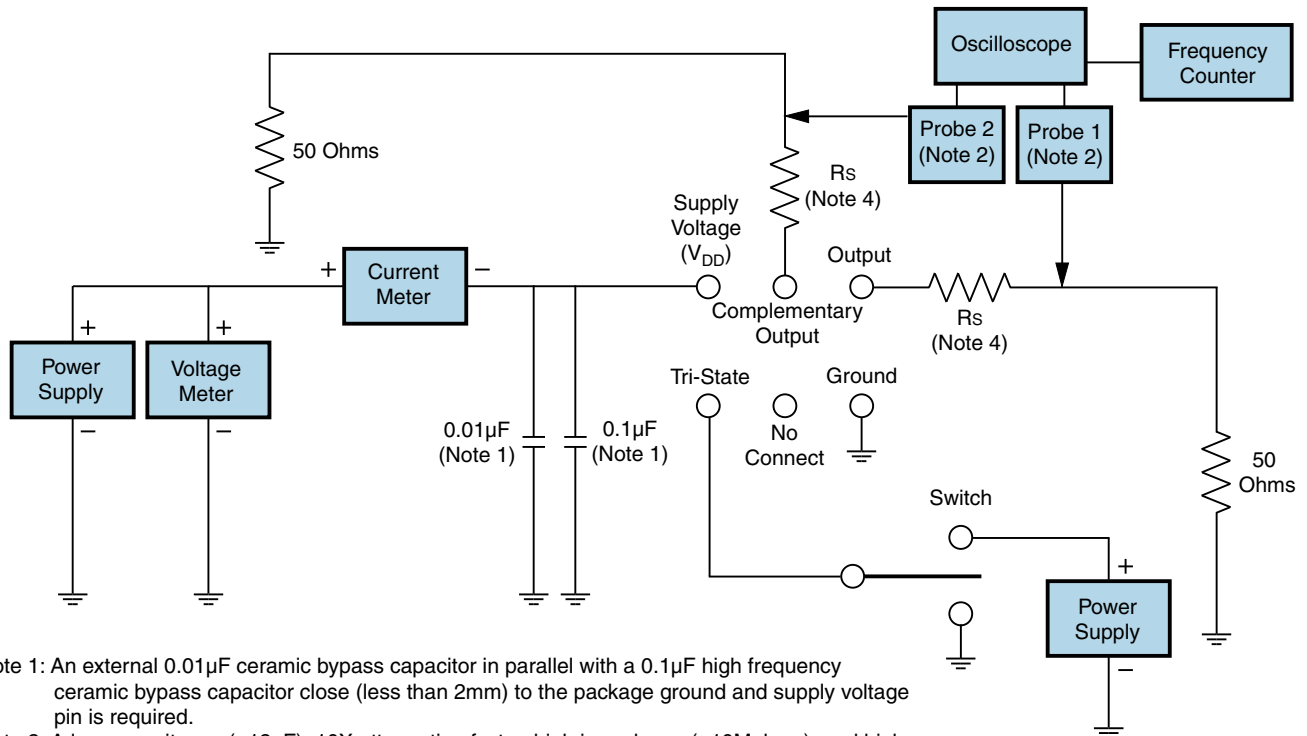


All Tolerances are  $\pm 0.1$

## OUTPUT WAVEFORM & TIMING DIAGRAM



## 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.
- Note 4: A 10 ohm to 33 ohm series resistor is required to limit overshoot. Rs value is circuit layout dependant.

## Recommended Solder Reflow Methods



### High Temperature Infrared/Convection

|  |                                      |
|--|--------------------------------------|
| <b><math>T_s</math> MAX to <math>T_L</math> (Ramp-up Rate)</b> | 3°C/second Maximum                   |
| <b>Preheat</b>   |                                      |
| - 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                     |
| <b>Ramp-up Rate (<math>T_L</math> to <math>T_p</math>)</b>     | 3°C/second Maximum                   |
| <b>Time Maintained Above:</b>                                  |                                      |
| - Temperature ( $T_L$ )  | 217°C                                |
| - Time ( $t_L$ )   | 60 - 150 Seconds                     |
| <b>Peak Temperature (<math>T_p</math>)</b>                     | 260°C Maximum for 10 Seconds Maximum |
| <b>Target Peak Temperature (<math>T_p</math> Target)</b>       | 250°C +0/-5°C                        |
| <b>Time within 5°C of actual peak (<math>t_p</math>)</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                              |

## Recommended Solder Reflow Methods



### Low Temperature Infrared/Convection 240°C

|  |  |
|--|--|
| <b>T<sub>s</sub> MAX to T<sub>L</sub> (Ramp-up Rate)</b> | 5°C/second Maximum                                     |
| <b>Preheat</b>   |  |
| - 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> MIN)                              | 60 - 120 Seconds                                       |
| <b>Ramp-up Rate (T<sub>L</sub> to T<sub>P</sub>)</b>     | 5°C/second Maximum                                     |
| <b>Time Maintained Above:</b>                            |  |
| - Temperature (T <sub>L</sub> )                          | 150°C  |
| - Time (t <sub>L</sub> )                                 | 200 Seconds Maximum                                    |
| <b>Peak Temperature (T<sub>P</sub>)</b>                  | 240°C Maximum  |
| <b>Target Peak Temperature (T<sub>P</sub> Target)</b>    | 240°C Maximum 1 Time / 230°C Maximum 2 Times           |
| <b>Time within 5°C of actual peak (t<sub>p</sub>)</b>    | 10 seconds Maximum 2 Times / 80 seconds Maximum 1 Time |
| <b>Ramp-down Rate</b>                                    | 5°C/second Maximum                                     |
| <b>Time 25°C to Peak Temperature (t)</b>                 | N/A  |
| <b>Moisture Sensitivity Level</b>                        | 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.