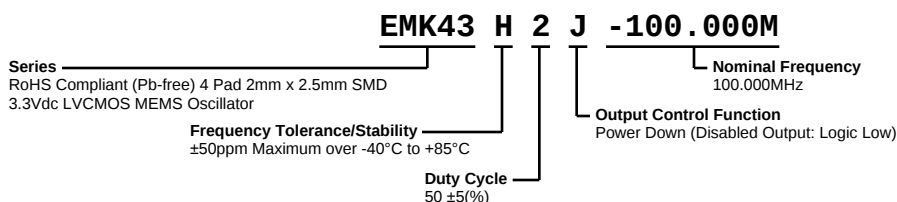


# EMK43H2J-100.000M



**ECLIPTEK®**  
CORPORATION



## ELECTRICAL SPECIFICATIONS

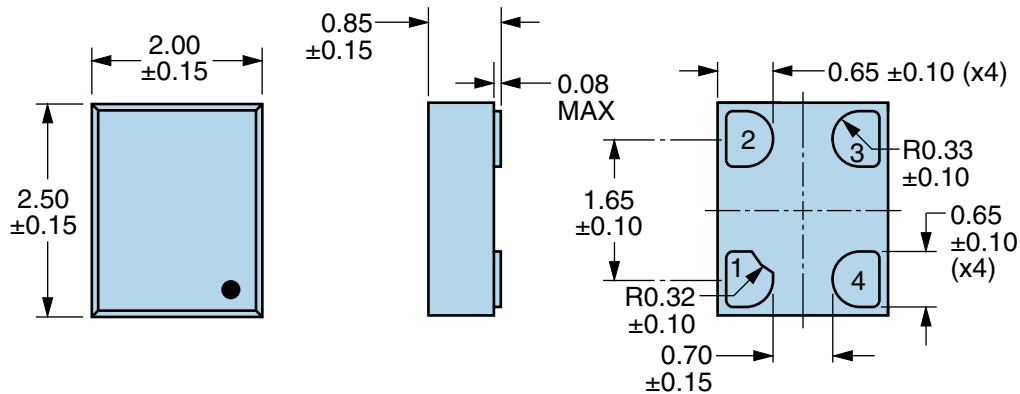
|                                 |                                                                                                                                                                                                                                                                    |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal Frequency               | 100.000MHz                                                                                                                                                                                                                                                         |
| Frequency Tolerance/Stability   | ±50ppm 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, First Year Aging at 25°C, 260°C Reflow, Shock, and Vibration) |
| Aging at 25°C                   | ±1ppm Maximum First Year                                                                                                                                                                                                                                           |
| Operating Temperature Range     | -40°C to +85°C                                                                                                                                                                                                                                                     |
| Supply Voltage                  | 3.3Vdc ±10%                                                                                                                                                                                                                                                        |
| Input Current                   | 25mA Maximum                                                                                                                                                                                                                                                       |
| Output Voltage Logic High (Voh) | 90% of Vdd Minimum (IOH=-8mA)                                                                                                                                                                                                                                      |
| Output Voltage Logic Low (Vol)  | 10% of Vdd Maximum (IOL=+8mA)                                                                                                                                                                                                                                      |
| Rise/Fall Time                  | 2nSec Maximum (Measured from 20% to 80% of waveform)                                                                                                                                                                                                               |
| Duty Cycle                      | 50 ±5(%) (Measured at 50% of waveform)                                                                                                                                                                                                                             |
| Load Drive Capability           | 15pF Maximum                                                                                                                                                                                                                                                       |
| Output Logic Type               | CMOS                                                                                                                                                                                                                                                               |
| Output Control Function         | Power Down (Disabled Output: Logic Low)                                                                                                                                                                                                                            |
| Output Control Input Voltage    | +0.7Vdd Minimum or No Connect to Enable Output, +0.3Vdd Maximum to Disable Output                                                                                                                                                                                  |
| Standby Current                 | 50µA Maximum (Disabled Output: Logic Low)                                                                                                                                                                                                                          |
| Peak to Peak Jitter (tPK)       | 250pSec Maximum, 100pSec Typical                                                                                                                                                                                                                                   |
| Start Up Time                   | 50mSec 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 (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                |

# EMK43H2J-100.000M

## MECHANICAL DIMENSIONS (all dimensions in millimeters)

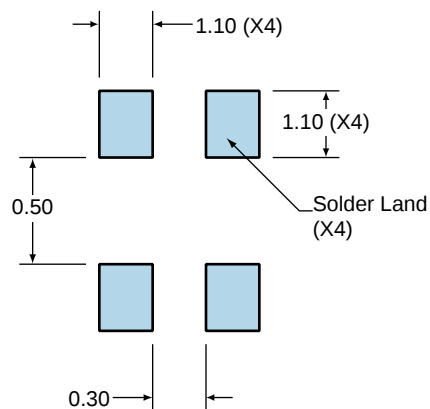


| PIN | CONNECTION     |
|-----|----------------|
| 1   | Power Down     |
| 2   | Ground         |
| 3   | Output         |
| 4   | Supply Voltage |

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

## Suggested Solder Pad Layout

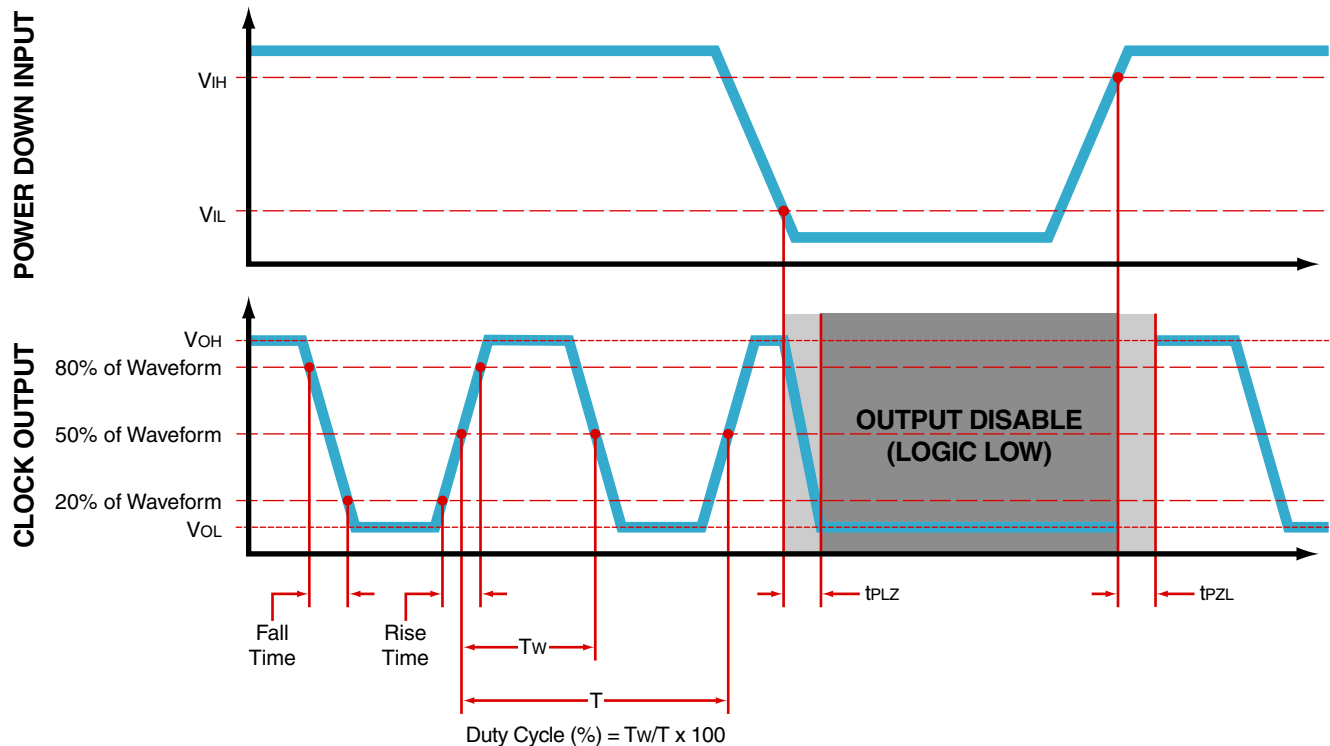
All Dimensions in Millimeters



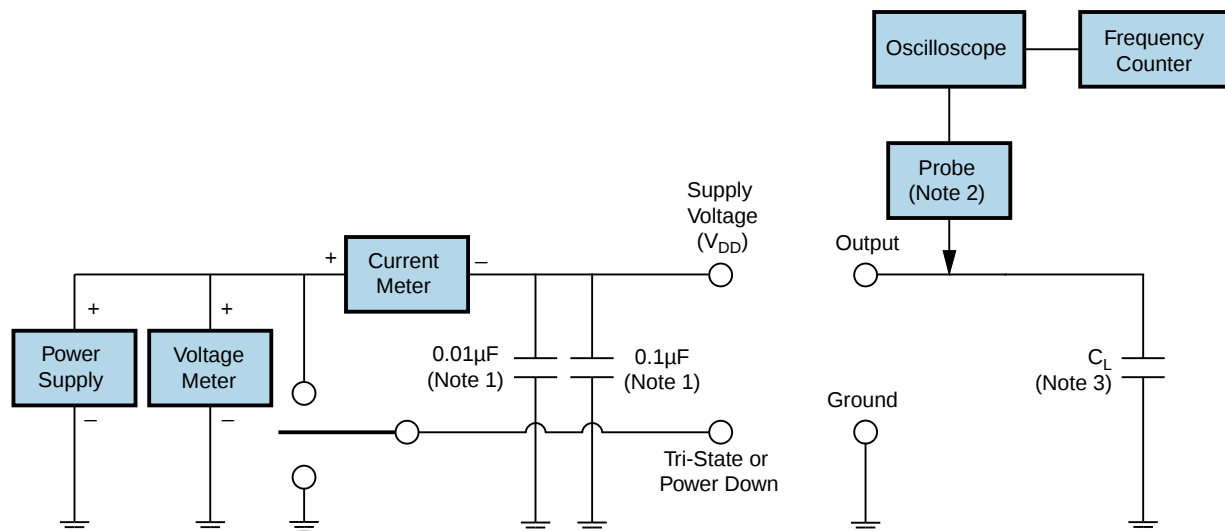
All Tolerances are ±0.1

# EMK43H2J-100.000M

## OUTPUT WAVEFORM & TIMING DIAGRAM



## Test Circuit for CMOS Output

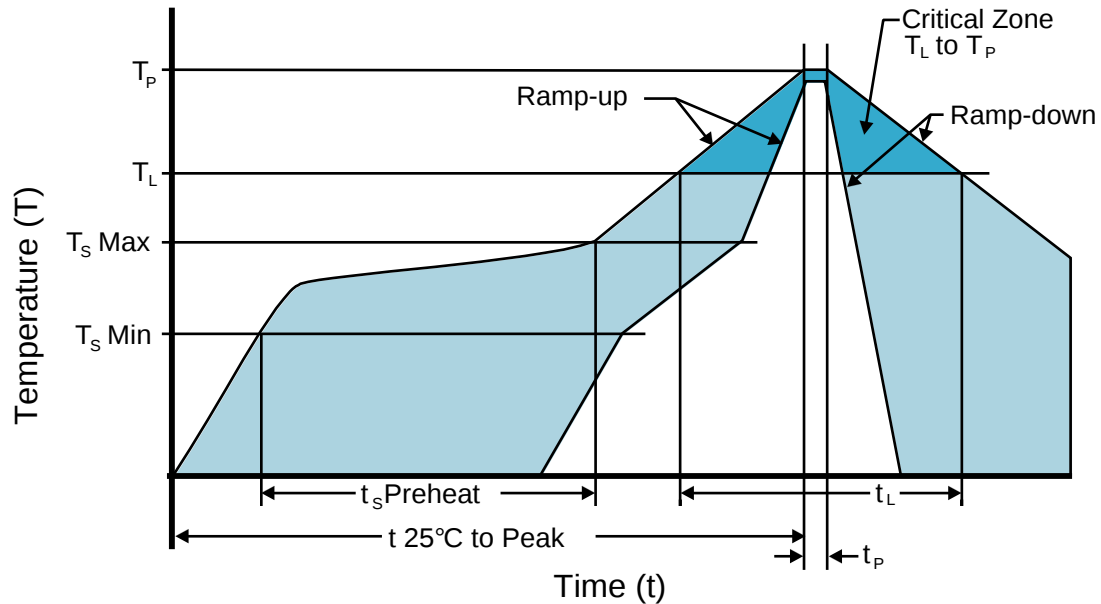


Note 1: An external 0.1  $\mu F$  low frequency tantalum bypass capacitor in parallel with a 0.01  $\mu F$  high frequency ceramic bypass capacitor close to the package ground and  $V_{DD}$  pin is required.

Note 2: A low capacitance (<12pF), 10X attenuation factor, high impedance (>10Mohms), and high bandwidth (>300MHz) passive probe is recommended.

Note 3: Capacitance value  $C_L$  includes sum of all probe and fixture capacitance.

## Recommended Solder Reflow Methods



### High Temperature Infrared/Convection

|                                                                  |                                      |
|------------------------------------------------------------------|--------------------------------------|
| $T_s \text{ MAX to } T_L$ (Ramp-up Rate)                         | 3°C/second Maximum                   |
| <b>Preheat</b>                                                   |                                      |
| - Temperature Minimum ( $T_s \text{ MIN}$ )                      | 150°C                                |
| - Temperature Typical ( $T_s \text{ TYP}$ )                      | 175°C                                |
| - Temperature Maximum ( $T_s \text{ MAX}$ )                      | 200°C                                |
| - Time ( $t_s \text{ MIN}$ )                                     | 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 \text{ Target}</math>)</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

$T_S$  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 ( $t_s$  MIN) 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 1 Time / 230°C Maximum 2 Times

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

### 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.