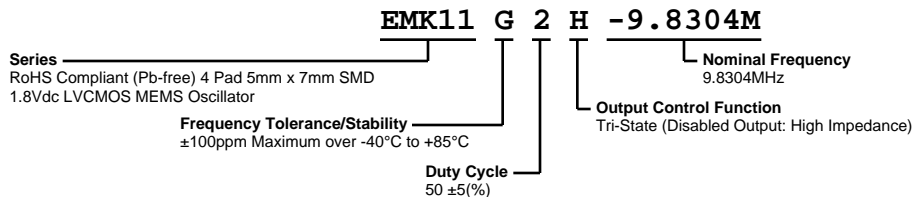


# EMK11G2H-9.8304M



**ECLIPTEK**  
CORPORATION



## ELECTRICAL SPECIFICATIONS

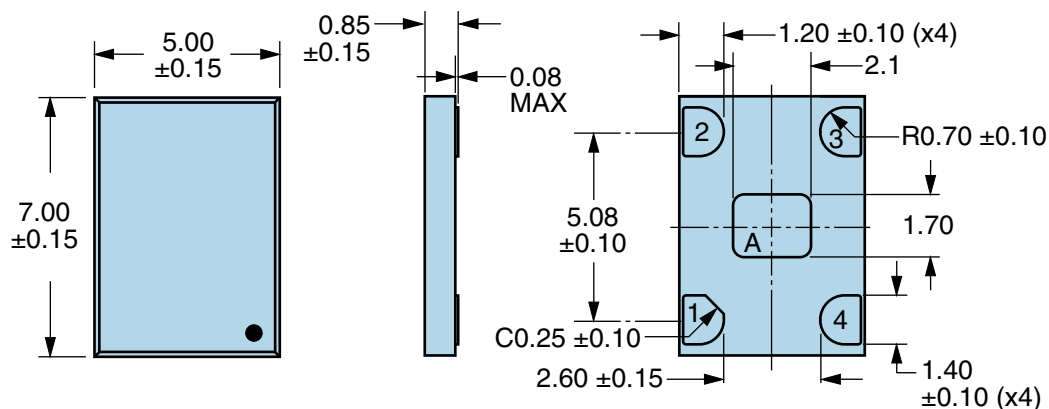
Nominal Frequency	9.8304MHz
Frequency Tolerance/Stability	±100ppm Maximum over -40°C to +85°C (Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, First Year Aging at 25°C, 260°C Reflow, Shock, and Vibration)
Aging at 25°C	±1ppm Maximum First Year
Operating Temperature Range	-40°C to +85°C
Supply Voltage	1.8Vdc ±5%
Input Current	15mA 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	Tri-State (Disabled Output: High Impedance)
Output Control Input Voltage	+0.7Vdd Minimum or No Connect to Enable Output, +0.3Vdd Maximum to Disable Output
Peak to Peak Jitter (tPK)	500pSec Maximum, 200pSec 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 (Four 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

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## MECHANICAL DIMENSIONS (all dimensions in millimeters)



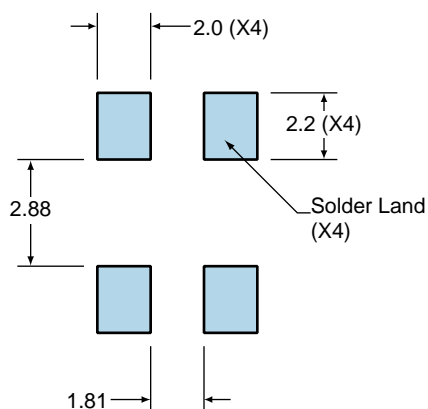
PIN	CONNECTION
1	Tri-State (High Impedance)
2	Ground
3	Output
4	Supply Voltage

LINE	MARKING
1	XXXX or XXXXX XXXX or XXXXX=Ecliptek Manufacturing Lot Code

## Suggested Solder Pad Layout

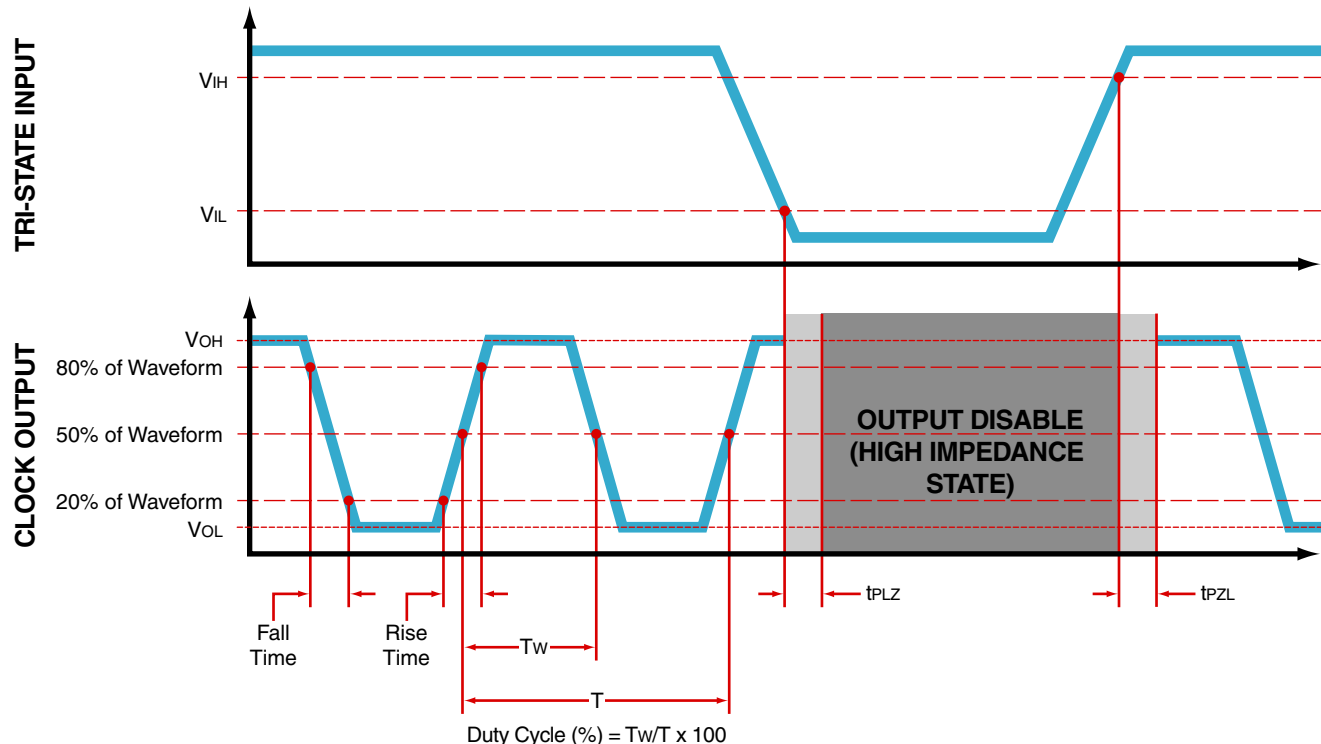
All Dimensions in Millimeters



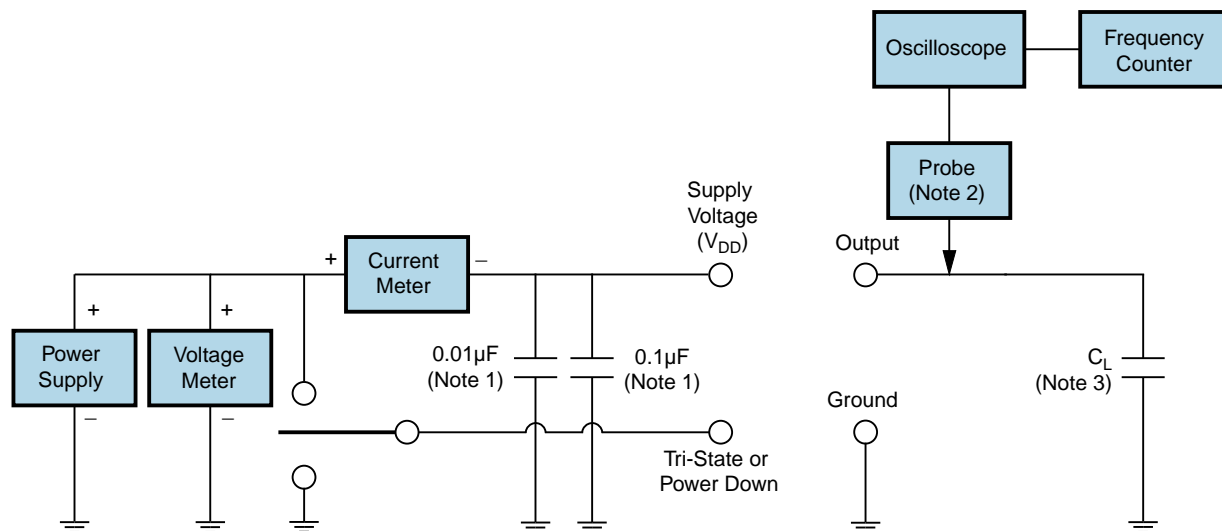
All Tolerances are ±0.1

# EMK11G2H-9.8304M

## OUTPUT WAVEFORM & TIMING DIAGRAM



## Test Circuit for CMOS Output

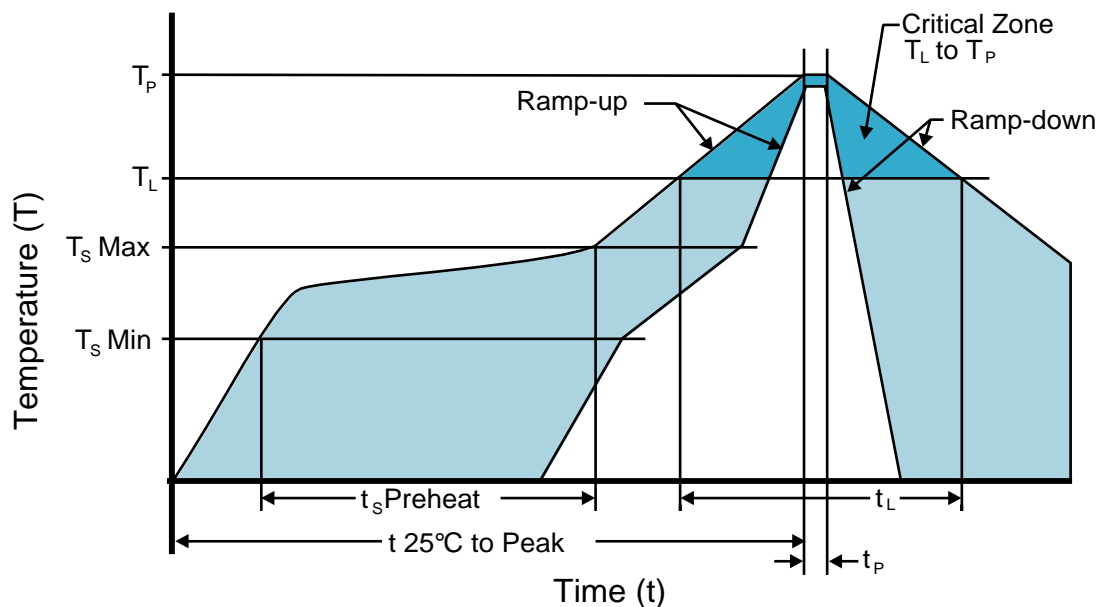


Note 1: An external 0.1 $\mu F$  low frequency tantalum bypass capacitor in parallel with a 0.01 $\mu F$  high frequency ceramic bypass capacitor close to the package ground and  $V_{DD}$  pin is required.

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
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#### Preheat

- 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

Ramp-up Rate ( $T_L$ to $T_p$ )	3°C/second Maximum
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#### 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
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Target Peak Temperature ( $T_p \text{ Target}$ )	250°C +0/-5°C
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Time within 5°C of actual peak ( $t_p$ )	20 - 40 seconds
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Ramp-down Rate	6°C/second Maximum
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Time 25°C to Peak Temperature (t)	8 minutes Maximum
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Moisture Sensitivity Level	Level 1
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## 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 1 Time / 230°C Maximum 2 Times

**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.