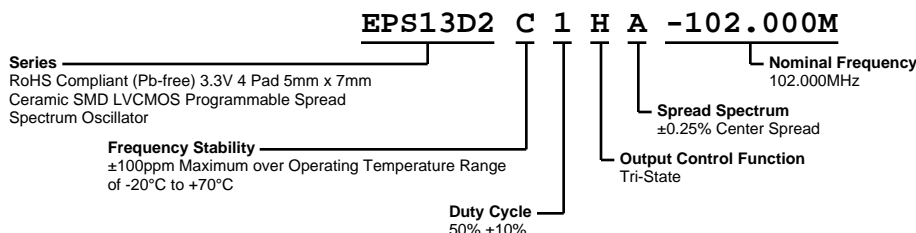


# EPS13D2C1HA-102.000M



**ECLIPTEK**  
CORPORATION



## ELECTRICAL SPECIFICATIONS

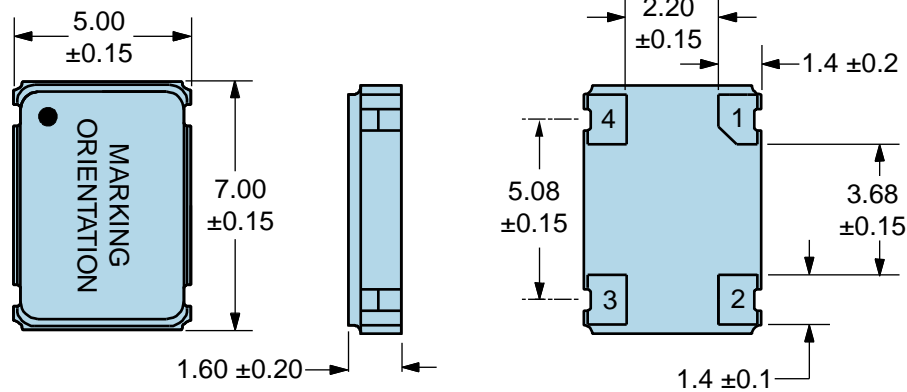
Nominal Frequency	102.000MHz
Frequency Stability	±100ppm Maximum over Operating Temperature Range of -20°C to +70°C (Inclusive of all conditions: Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, First Year Aging at 25°C, Shock, and Vibration.)
Aging at 25°C	±5ppm First Year Maximum
Supply Voltage	3.3Vdc ±0.3Vdc
Maximum Supply Voltage	-0.5Vdc to +7.0Vdc
Input Current	30mA Maximum (Unloaded; Vdd=3.3Vdc)
Output Voltage Logic High (Voh)	Vdd-0.4Vdc Minimum (IOH=-8mA)
Output Voltage Logic Low (Vol)	0.4Vdc Maximum (IOL=+8mA)
Rise/Fall Time	2.7nSec Maximum (Measured at 20% to 80% of Waveform)
Duty Cycle	50% ±10% (Measured at 50% of Waveform)
Load Drive Capability	15pF Maximum
Output Logic Type	CMOS
Output Control Function	Tri-State (High Impedance Internal Pull Down Resistor of 100kOhms Typical on Pad 3, Internal Pull Up Resistor of 100kOhms Typical on Pad 1)
Tri-State Input Voltage (Vih and Vil)	70% of Vdd Minimum or No Connection to Enable Output, 30% of Vdd Maximum to Disable Output
Tri-State Output Disable Time	350nSec Maximum
Tri-State Output Enable Time	350nSec Maximum
Disable Current	20mA Maximum (Unloaded; Pad 1=Ground; Vdd=3.3Vdc)
Spread Spectrum	±0.25% Center Spread
Modulation Frequency	30kHz Minimum, 31.5kHz Typical, 33kHz Maximum
Period Jitter	400pSec Maximum (Cycle to Cycle; Spread Spectrum-On; Vdd=3.3Vdc)
Start Up Time	10mSec Maximum
Storage Temperature Range	-55°C to +125°C

## ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

Fine Leak Test	MIL-STD-883, Method 1014, Condition A
Gross Leak Test	MIL-STD-883, Method 1014, Condition C
Mechanical Shock	MIL-STD-202, Method 213, Condition C
Resistance to Soldering Heat	MIL-STD-202, Method 210
Resistance to Solvents	MIL-STD-202, Method 215
Solderability	MIL-STD-883, Method 2003
Temperature Cycling	MIL-STD-883, Method 1010
Vibration	MIL-STD-883, Method 2007, Condition A

# EPS13D2C1HA-102.000M

## MECHANICAL DIMENSIONS (all dimensions in millimeters)

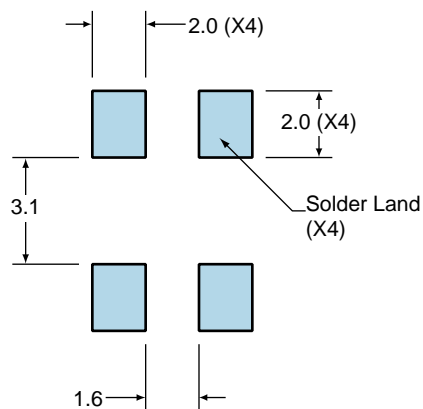


PIN	CONNECTION
1	Tri-State
2	Case/Ground
3	Output
4	Supply Voltage

LINE	MARKING
1	<b>ECLIPTEK</b>
2	<b>102.00M</b>
3	<b>SXXYYZ</b> S=Configuration Designator XX=Ecliptek Manufacturing Code Y=Last Digit of the Year ZZ=Week of the Year

## Suggested Solder Pad Layout

All Dimensions in Millimeters



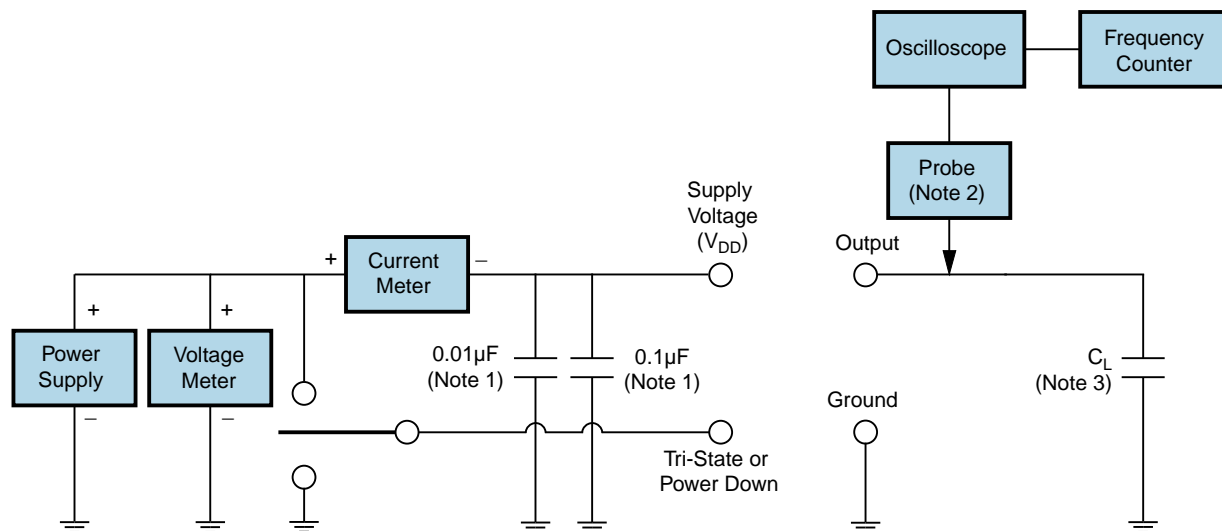
All Tolerances are  $\pm 0.1$

# EPS13D2C1HA-102.000M

## 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
--	--------------------

#### 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
---------------------------------	--------------------

#### 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
----------------------------	--------------------------------------

Target Peak Temperature ( $T_p \text{ Target}$ )	250°C +0/-5°C
--	---------------

Time within 5°C of actual peak ( $t_p$ )	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
----------------------------	---------

## 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.