





EC37 45

Series —
RoHS Compliant (Pb-free) Ceramic 3.2mm x 5mm SMD 2.5V LVCMOS Oscillator

Frequency Tolerance/Stability \_\_\_\_\_\_ ±50ppm Maximum

Operating Temperature Range --10°C to +70°C

TS -50.000M

Nominal Frequency 50.000MHz

Pin 1 Connection
Tri-State (High Impedance)

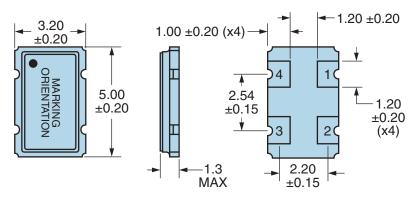
- Duty Cycle 50 ±10(%)

ELECTRICAL SPECIFICATIONS		
Nominal Frequency	50.000MHz	
Frequency Tolerance/Stability	±50ppm Maximum (Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Ouput Load Change, First Year Aging at 25°C, Shock, and Vibration)	
Operating Temperature Range	-10°C to +70°C	
Supply Voltage	2.5Vdc ±5%	
Input Current	20mA Maximum	
Output Voltage Logic High (Voh)	90% of Vdd Minimum (IOH= -4mA)	
Output Voltage Logic Low (Vol)	10% of Vdd Maximum (IOL= +4mA)	
Rise/Fall Time	4nSec 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	
Pin 1 Connection	Tri-State (High Impedance)	
Tri-State Input Voltage (Vih and Vil)	90% of Vdd Minimum or No Connect to Enable Output, 10% of Vdd Maximum to Disable Output (High Impedance)	
Standby Current	10µA Maximum (Disabled Output: High Impedance)	
RMS Phase Jitter	1pSec Maximum (12kHz to 20MHz offset frequency)	
Start Up Time	10mSec Maximum	
Storage Temperature Range	-55°C to +125°C	

ENVIRONMENTAL & MECHANICAL SPECIFICATIONS		
ESD Susceptibility	MIL-STD-883, Method 3015, Class 1, HBM: 1500V	
Fine Leak Test	MIL-STD-883, Method 1014, Condition A	
Flammability	UL94-V0	
Gross Leak Test	MIL-STD-883, Method 1014, Condition C	
Mechanical Shock	MIL-STD-883, Method 2002, Condition B	
Moisture Resistance	MIL-STD-883, Method 1004	
Moisture Sensitivity	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	
Temperature Cycling	MIL-STD-883, Method 1010, Condition B	
Vibration	MIL-STD-883, Method 2007, Condition A	



### **MECHANICAL DIMENSIONS (all dimensions in millimeters)**



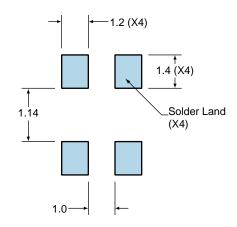
Note: Pin 1 Chamfer not shown.

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

LINE	MARKING
1	E=Ecliptek Designator
2	XXYZZ 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 ±0.1



#### **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  $\dot{C}_L$  includes sum of all probe and fixture capacitance.



### **Recommended Solder Reflow Methods**



### **High Temperature Infrared/Convection**

T <sub>s</sub> MAX to T <sub>∟</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∟)	217°C
- Time (t∟)	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



### **Recommended Solder Reflow Methods**



### Low Temperature Infrared/Convection 240°C

T <sub>S</sub> MAX to T <sub>L</sub> (Ramp-up Rate)	5°C/second Maximum
Preheat	
- 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
Ramp-up Rate (T <sub>L</sub> to T <sub>P</sub> )	5°C/second Maximum
Time Maintained Above:	
- Temperature (T∟)	150°C
- Time (t∟)	200 Seconds Maximum
Peak Temperature (T <sub>P</sub> )	240°C Maximum
Target Peak Temperature (T <sub>P</sub> Target)	240°C Maximum 1 Time / 230°C Maximum 2 Times
Time within 5°C of actual peak (t <sub>p</sub> )	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.