





EH37 20 ET T TS -35.328M

Series — RoHS Compliant (Pb-free) 2.5V 4 Pad 3.2mm x 5mm Ceramic SMD LVCMOS Oscillator

Frequency Tolerance/Stability — ±20ppm Maximum

Operating Temperature Range -40°C to +85°C

Nominal Frequency 35.328MHz

Tri-State (High Impedance)

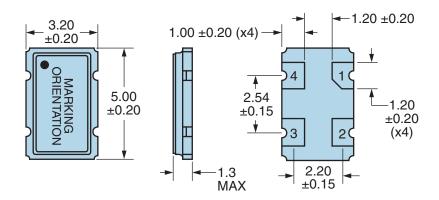
- Duty Cycle 50 ±5(%)

Operating Tempera 260°C Reflow, Shoot Aging at 25°C    Aging at 25°C    Departing Temperature Range    -40°C to +85°C    Supply Voltage    Input Current    Output Voltage Logic High (Voh)    Output Voltage Logic Low (Vol)    Rise/Fall Time    Duty Cycle    Load Drive Capability    Output Logic Type    Pin 1 Connection    Tri-State Input Voltage (Vih and Vil)    Standby Current    Dougle    Dou	(Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the ture Range, Supply Voltage Change, Output Load Change, First Year Aging at 25°, and Vibration)
Operating Tempera 260°C Reflow, Shoot Aging at 25°C    **Sppm/Year Maxim    Operating Temperature Range    -40°C to +85°C    **Supply Voltage    Input Current    Output Voltage Logic High (Voh)    Output Voltage Logic Low (Vol)    Rise/Fall Time    Output Cycle    Load Drive Capability    Output Logic Type    Pin 1 Connection    Tri-State Input Voltage (Vih and Vil)    Standby Current    Operating Tempera 260°C Reflow, Shoot    **Shoot Tempera 250°C    **Shoot Tempera 250°C	ture Range, Supply Voltage Change, Output Load Change, First Year Aging at 25°,
Operating Temperature Range  -40°C to +85°C  Supply Voltage  2.5Vdc ±5%  Input Current  Output Voltage Logic High (Voh)  Output Voltage Logic Low (Vol)  Rise/Fall Time  6nSec Maximum (No  Duty Cycle  Load Drive Capability  Output Logic Type  Pin 1 Connection  Tri-State Input Voltage (Vih and Vil)  Standby Current  -40°C to +85°C  -4	n, and violation,
Supply Voltage  2.5Vdc ±5%  Input Current  7mA Maximum (No  Output Voltage Logic High (Voh)  Output Voltage Logic Low (Vol)  Rise/Fall Time  6nSec Maximum (No  Duty Cycle  Load Drive Capability  0utput Logic Type  Pin 1 Connection  Tri-State Input Voltage (Vih and Vil)  Standby Current  2.5Vdc ±5%  7mA Maximum (No  90% of Vdd Minimu 15pF Maximum  CMOS  Tri-State (High Impedance)  Standby Current  10µA Maximum (Pin	um
Input Current  Output Voltage Logic High (Voh)  Output Voltage Logic Low (Vol)  Rise/Fall Time  Output Cycle  Load Drive Capability  Output Logic Type  Pin 1 Connection  Tri-State Input Voltage (Vih and Vil)  Standby Current  Output Logic Type  Toma Maximum (No  10% of Vdd Minimu  15pF Maximum  CMOS  Tri-State (High Impedance)  Standby Current  10µA Maximum (Pin	
Output Voltage Logic High (Voh)  Output Voltage Logic Low (Vol)  Rise/Fall Time  Onsec Maximum (Mossure Logic Type  Pin 1 Connection  Tri-State Input Voltage (Vih and Vil)  Standby Current  90% of Vdd Minimum (Mossure Logic Type CMOS)  Pin 1 Connection  Tri-State (High Impum 100%)  10µA Maximum (Pin 100%)	
Output Voltage Logic Low (Vol)  Rise/Fall Time  Outp Cycle  Load Drive Capability  Output Logic Type  Pin 1 Connection  Tri-State Input Voltage (Vih and Vil)  Standby Current  10% of Vdd Maximum  (No Sec Maximum (No Sec Maximum)  15pF Maximum  CMOS  Tri-State (High Imperimentation)  90% of Vdd Minimum (Impedance)  10µA Maximum (Pin	Load)
Rise/Fall Time       6nSec Maximum (Month of Month of Maximum (Month of Month o	m (IOH = -8mA)
Duty Cycle       50 ±5(%) (Measure         Load Drive Capability       15pF Maximum         Output Logic Type       CMOS         Pin 1 Connection       Tri-State (High Imperance)         Tri-State Input Voltage (Vih and Vil)       90% of Vdd Minimu Impedance)         Standby Current       10μA Maximum (Pin	ım (IOL = +8mA)
Load Drive Capability  Output Logic Type CMOS  Pin 1 Connection Tri-State Input Voltage (Vih and Vil) Standby Current  15pF Maximum  2mg OMOS  Pin 1 Connection Tri-State (High Imperimentation of Vdd Minimum Impedance)  10µA Maximum (Pin Imperimentation of Vdd Minimum Impedance)	Measured at 20% to 80% of waveform)
Output Logic Type CMOS Pin 1 Connection Tri-State (High Importing 190% of Vdd Minimu Impedance) Standby Current CMOS Tri-State (High Importing 190% of Vdd Minimu Impedance) 10µA Maximum (Pin	d at 50% of waveform)
Pin 1 Connection  Tri-State (High Importance)  Tri-State Input Voltage (Vih and Vil)  90% of Vdd Minimu Impedance)  Standby Current  10µA Maximum (Pin	
Tri-State Input Voltage (Vih and Vil)  90% of Vdd Minimu Impedance)  Standby Current  10µA Maximum (Pin	
Impedance) Standby Current 10µA Maximum (Pin	edance)
	m or No Connect to Enable Output, 10% of Vdd Maximum to Disable Output (High
	n 1 = Ground)
Absolute Clock Jitter ±100pSec Maximur	n
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)**

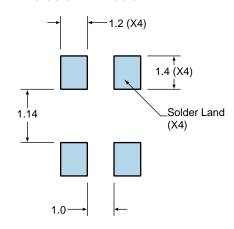


PIN	CONNECTION
1	Tri-State
2	Case Ground
3	Output
4	Supply Voltage

LINE	MARKING
1	EPO
<u> </u>	XXXXX XXXXX=Ecliptek Manufacturing Identifier

#### **Suggested Solder Pad Layout**

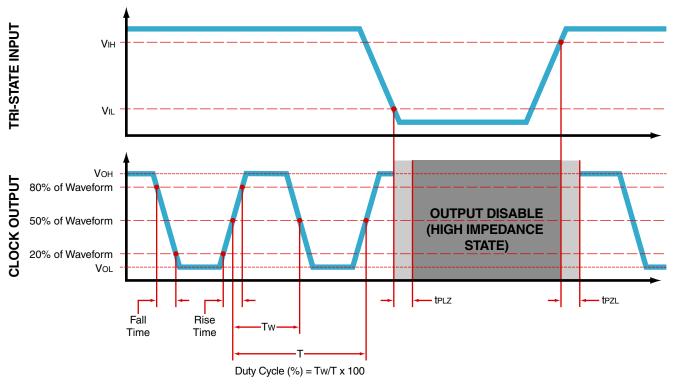
All Dimensions in Millimeters



All Tolerances are ±0.1



#### **OUTPUT WAVEFORM & TIMING DIAGRAM**



#### **Test Circuit for CMOS Output**



- Note 1: An external 0.01µF 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 (>300MHz) passive probe is recommended.
- Note 3: Capacitance value C<sub>1</sub> 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 (Ts 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 (tp)	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 (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.