EH3920TS-11.0592M

EH39 20 TS -11.0592M

Series
RoHS Compliant (Pb-free) 1.8V 4 Pad 3.2mm x 5mm
Ceramic SMD LVCMOS Oscillator

Nominal Frequency
11.0592MHz

Frequency Tolerance/Stability
±20ppm Maximum

Pin 1 Connection
Tri-State (High Impedance)

Operating Temperature Range
0°C to +70°C

Duty Cycle
50 ±10(%)

ELECTRICAL SPECIFICATIONS
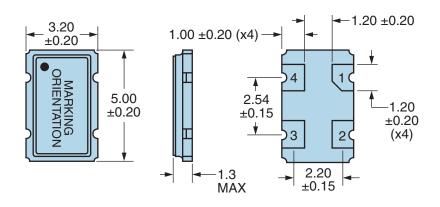
Nominal Frequency	11.0592MHz
Frequency Tolerance/Stability	±20ppm Maximum (Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, First Year Aging at 25°, 260°C Reflow, Shock, and Vibration)
Aging at 25°C	±5ppm/Year Maximum
Operating Temperature Range	0°C to +70°C
Supply Voltage	1.8Vdc ±5%
Input Current	3.5mA Maximum (No Load)
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	6nSec 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 (Pin 1 = Ground)
Absolute Clock Jitter	±100pSec Maximum
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

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MECHANICAL DIMENSIONS (all dimensions in millimeters)

3.20 ±0.20

MARKING ORIENTATION

5.00 ±0.20

1.00 ±0.20 (x4)

1.3 MAX

1.20 ±0.20

4   1

2.54 ±0.15

3   2

1.20 ±0.20 (x4)

2.20 ±0.15

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

LINE	MARKING
1	**EPO**
2	**XXXXX** *XXXXX=Ecliptek Manufacturing Identifier*

Suggested Solder Pad Layout

All Dimensions in Millimeters

1.2 (X4)

1.4 (X4)

Solder Land (X4)

1.14

1.0

All Tolerances are ±0.1

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OUTPUT WAVEFORM & TIMING DIAGRAM

TRI-STATE INPUT

V_{IH}

V_{IL}

CLOCK OUTPUT

V_{OH}
80% of Waveform
50% of Waveform
20% of Waveform
V_{OL}

OUTPUT DISABLE
(HIGH IMPEDANCE
STATE)

tPLZ

tPZL

Fall Time

Rise Time

Tw

T

Duty Cycle (%) = Tw/T x 100

Test Circuit for CMOS Output

Oscilloscope — Frequency Counter

Probe (Note 2)

Output

Ground

C_L (Note 3)

Supply Voltage (V_{DD})

Current Meter

Power Supply
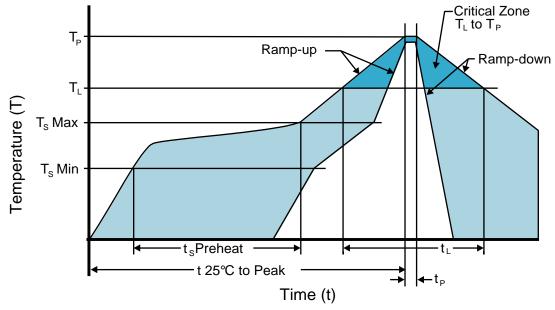
Voltage Meter

0.01µF (Note 1)

0.1µF (Note 1)

Tri-State

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_L includes sum of all probe and fixture capacitance.

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Recommended Solder Reflow Methods

High Temperature Infrared/Convection

T$_S$ MAX to T$_L$ (Ramp-up Rate)	3°C/second Maximum
Preheat	
- Temperature Minimum (T$_S$ MIN)	150°C
- Temperature Typical (T$_S$ TYP)	175°C
- Temperature Maximum (T$_S$ MAX)	200°C
- Time (t$_S$ 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$_P$ 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

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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.