





EH25 00 ET

Series —
RoHS Compliant (Pb-free) 5.0V 4 Pad 5mm x 7mm
Ceramic SMD HCMOS/TTL High Frequency Oscillator

Frequency Tolerance/Stability — ±100ppm Maximum

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

TS -29.4912M

Nominal Frequency 29.4912MHz

Pin 1 Connection
Tri-State (High Impedance)

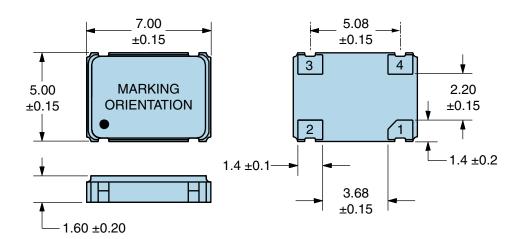
- Duty Cycle 50 ±10(%)

ELECTRICAL SPECIFICATIONS		
Nominal Frequency	29.4912MHz	
Frequency Tolerance/Stability	±100ppm Maximum (Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over to Operating Temperature Range, Supply Voltage Change, Output Load Change, First Year Aging at 25°C, Shock, and Vibration)	
Aging at 25°C	±5ppm/year Maximum	
Operating Temperature Range	-40°C to +85°C	
Supply Voltage	5.0Vdc ±10%	
Input Current	50mA Maximum (No Load)	
Output Voltage Logic High (Voh)	2.4Vdc Minimum with TTL Load, Vdd-0.4Vdc Minimum with HCMOS Load (IOH= -16mA)	
Output Voltage Logic Low (Vol)	0.4Vdc Maximum with TTL Load, 0.5Vdc Maximum with HCMOS Load (IOH= +16mA)	
Rise/Fall Time	6nSec Maximum (Measured at 0.8Vdc to 2.0Vdc with TTL Load; Measured at 20% to 80% of waveform with HCMOS Load)	
Duty Cycle	50 ±10(%) (Measured at 1.4Vdc with TTL Load; Measured at 50% of waveform with HCMOS Load)	
Load Drive Capability	10TTL Load or 50pF HCMOS Load Maximum	
Output Logic Type	CMOS	
Pin 1 Connection	Tri-State (High Impedance)	
Tri-State Input Voltage (Vih and Vil)	+2.2Vdc Minimum to enable output, +0.8Vdc Maximum to disable output (High Impedance), No Connect to enable output.	
Absolute Clock Jitter	±250pSec Maximum, ±100pSec Typical	
One Sigma Clock Period Jitter	±50pSec Maximum, ±30pSec Typical	
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	Ground
3	Output
4	Supply Voltage

LINE	MARKING
1	ECLIPTEK
2	29.491M
3	XXXXXX XXXXXX=Ecliptek Manufacturing Identifier

Suggested Solder Pad Layout

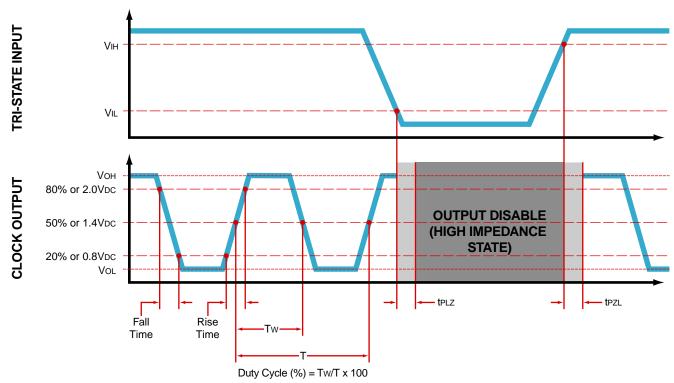
All Dimensions in Millimeters



All Tolerances are ±0.1



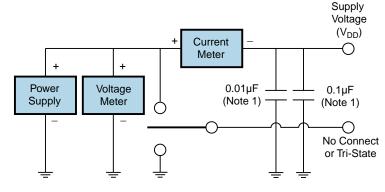
OUTPUT WAVEFORM & TIMING DIAGRAM

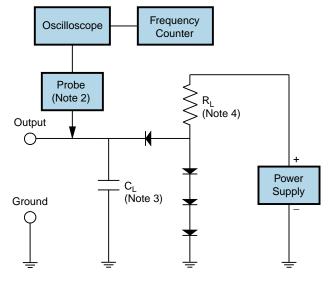


Test Circuit for TTL Output

Output Load Drive Capability	R _L Value (Ohms)	C _L Value (pF)
10TTL	390	15
5TTL	780	15
2TTL	1100	6
10LSTTL	2000	15
1TTL	2200	3

Table 1: R_L Resistance Value and C_L Capacitance Value Vs. Output Load Drive Capability





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.

Note 4: Resistance value R_L is shown in Table 1. See applicable specification sheet for 'Load Drive Capability'.

Note 5: All diodes are MMBD7000, MMBD914, or equivalent.



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

3°C/second Maximum
150°C
175°C
200°C
60 - 180 Seconds
3°C/second Maximum
217°C
60 - 150 Seconds
260°C Maximum for 10 Seconds Maximum
250°C +0/-5°C
20 - 40 seconds
6°C/second Maximum
8 minutes Maximum
Level 1
Temperatures shown are applied to body of device.



Recommended Solder Reflow Methods



Low Temperature Infrared/Convection 240°C

T _s MAX to T _∟ (Ramp-up Rate)	5°C/second Maximum
Preheat	
- Temperature Minimum (Ts 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∟)	150°C
- Time (t∟)	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 (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
Additional Notes	Temperatures shown are applied to body of device.

Low Temperature Manual Soldering

185°C Maximum for 10 seconds Maximum, 2 times Maximum. (Temperatures shown are applied to body of device.)

High Temperature Manual Soldering

260°C Maximum for 5 seconds Maximum, 2 times Maximum. (Temperatures shown are applied to body of device.)