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EMRA13 Series Oscillator

MEMS Clock Oscillators LVCMOS (CMOS) 3.3Vdc 4 Pad 5.0mm x 7.0mm Plastic Surface Mount (SMD)

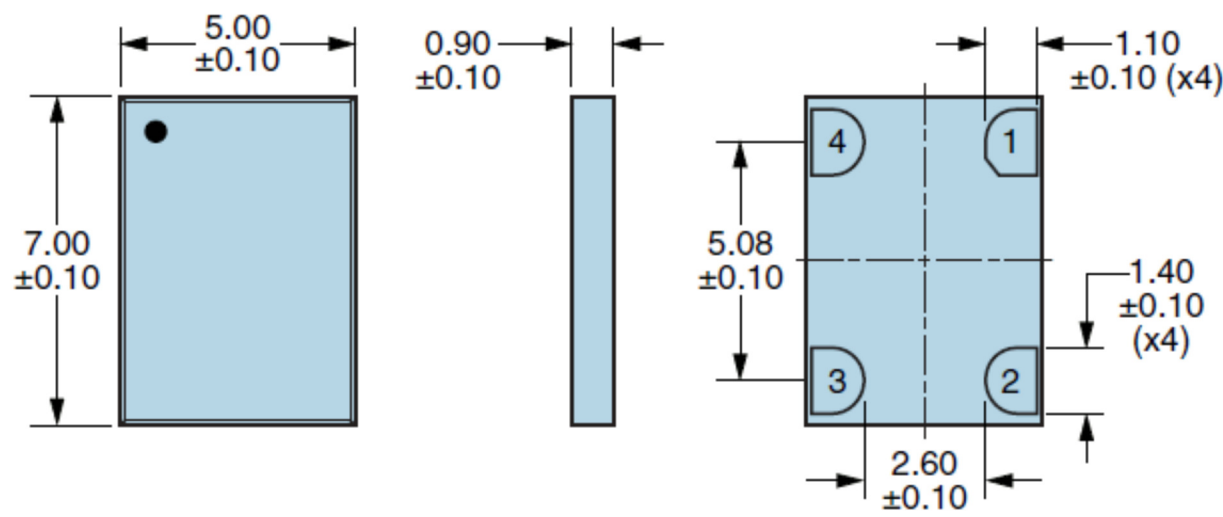


Revision C 03/31/2014

Electrical Specifications

Nominal Frequency	1.000MHz to 137.000MHz <i>Some frequencies within this range may not be available.</i>
Frequency Tolerance/Stability	(Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, and Output Load Change) ±100ppm Maximum ±50ppm Maximum ±25ppm Maximum ±20ppm Maximum
Operating Temperature Range	0°C to +70°C -20°C to +70°C -40°C to +85°C -40°C to +105°C -40°C to +125°C -55°C to +125°C
Supply Voltage (V _{DD})	3.3V _{DC} ±10%
Input Current	No Load 5mA Maximum over Nominal Frequency of 1MHz to 20MHz 6mA Maximum over Nominal Frequency of 20.000001MHz to 50MHz 7mA Maximum over Nominal Frequency of 50.000001MHz to 80MHz 9mA Maximum over Nominal Frequency of 80.000001MHz to 137MHz
Output Voltage Logic High (V _{OH})	I _{OH} = -4mA 90% of V _{DD} Minimum
Output Voltage Logic Low (V _{OL})	I _{OL} = +4mA 10% of V _{DD} Maximum
Duty Cycle	Measured at 50% of waveform 50 ±10(%) 50 ±5(%)
Rise Time/Fall Time	Measured at 20% to 80% of waveform 1.2nSec Typical, 3nSec Maximum
Load Drive Capability	15pF Maximum
Output Logic Type	CMOS
Output Control Function	Tri-State (Disabled Output: High Impedance) Power Down (Disabled Output: Logic Low)
Output Control Input Voltage Logic High (V _{Ih})	70% of V _{dd} Minimum or No Connect to Enable Output
Output Control Input Voltage Logic Low (V _{Il})	30% of V _{dd} Maximum to Disable Output
Power Down Output Enable Time	5mSec Maximum
Tri-State Output Enable Time	150nSec Maximum
Power Down Output Disable Time	150nSec Maximum
Tri-State Output Disable Time	150nSec Maximum
Standby Current	10µA Maximum
Period Jitter (RMS)	2pSec Typical, 4pSec Maximum
RMS Phase Jitter (F _J = 900kHz to 7.5MHz; Random)	0.5pSec Typical, 1pSec Maximum
RMS Phase Jitter (F _J = 12kHz to 20MHz; Random)	1.5pSec Typical, 3pSec Maximum
Aging (at 25°C)	±1.5ppm Maximum First Year
Start Up Time	5mSec Maximum
Storage Temperature Range	-65°C to +150°C

Mechanical Dimensions



All Dimensions in Millimeters

Pin 1: Power Down (Logic Low) Or Tri-State (High Impedance)

Pin 2: Ground

Pin 3: Output

Pin 4: Supply Voltage

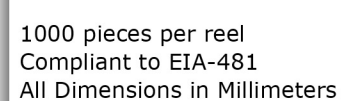
Marking Specifications

Line 1: **Ecliptek Manufacturing Identifier**

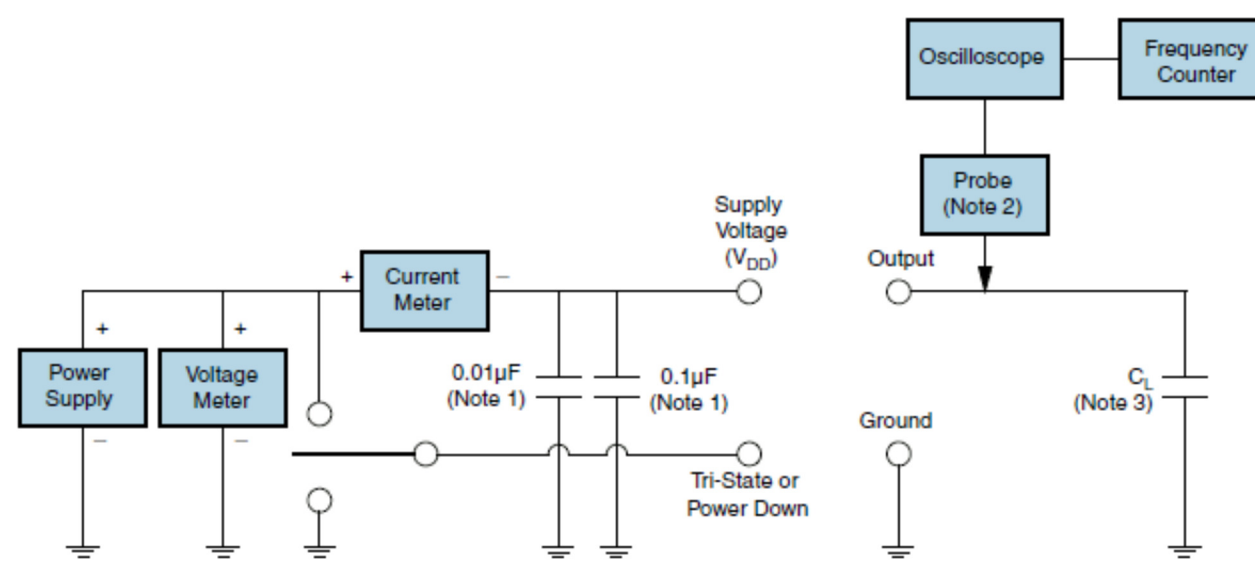
Environmental and Mechanical Specifications

ESD Susceptibility	JESD22-A114, HBM, 2000V
Flammability	UL94-V0
Mechanical Shock	MIL-STD-883, Method 2002, Condition E, 10,000G
Moisture Sensitivity	J-STD-020, MSL 1
Solderability	MIL-STD-883, Method 2003 (Four I/O Pads on bottom of package only)
Temperature Cycling	JESD22-A104, Condition B
Vibration	MIL-STD-883, Method 2007, Condition A, 20G
Thermal Resistance (θ_{JA})	191°C/W (degrees Celsius per Watt)
Thermal Resistance (θ_{JC})	30°C/W (degrees Celsius per Watt)

Tape & Reel Dimensions



Test Circuit for CMOS Output

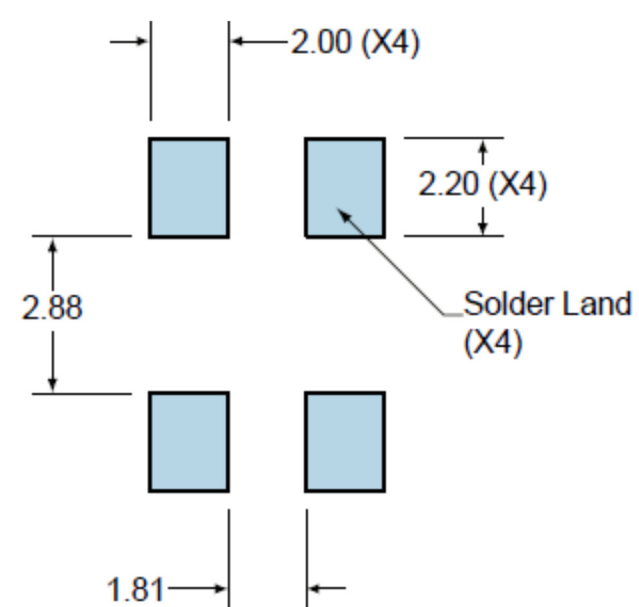


Note 1: An external 0.01µF ceramic bypass capacitor in parallel with a 0.1µF high frequency ceramic bypass capacitor close (less than 2mm) to the package ground and supply voltage pin is required.

Note 2: A low capacitance (<12pF), 10X Attenuation Factor, High Impedance (>10Mohms), and High bandwidth (>300MHz) passive probe is recommended.

Note 3: Capacitance value CL includes sum of all probe and fixture capacitance. See applicable specification sheet for “Load Drive Capability”.

Recommended Solder Pad Dimensions



Tolerances = ± 0.1
All Dimensions in Millimeters

Low Temperature Infrared/Convection

Note: Temperatures shown are applied to body of device.

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)	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 2 Times / 230°C Maximum 1 Time
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

High Temperature Manual Soldering

Note: Temperatures listed are applied to body of device.
260°C Maximum for 5 seconds Maximum, 2 times Maximum.

Low Temperature Manual Soldering

Note: Temperatures listed are applied to body of device.
185°C Maximum for 10 seconds Maximum, 2 times Maximum.

1 - Build A Part Number

Select the parameters that meet your requirements and then click Next

Frequency in Megahertz (1 to 137):

Some frequencies within this range may not be available

Frequency Tolerance/Stability:

±100ppm Maximum over 0°C to +70°C

Duty Cycle:

50 ±10%

Output Control Function:

Tri-State (Disabled Output: High Impedance)

Packaging Options:

Tape & Reel

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Access these Part Number specific resources and tools

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Part Numbering Guide

EMRA13 H 2 H -50.000M TR

Series

MEMS Clock Oscillators LVCMOS (CMOS) 3.3Vdc 4 Pad 5.0mm x 7.0mm Plastic Surface Mount (SMD)

Frequency Tolerance/Stability

A = ±100ppm Maximum over 0°C to +70°C
B = ±50ppm Maximum over 0°C to +70°C
C = ±25ppm Maximum over 0°C to +70°C
D = ±20ppm Maximum over 0°C to +70°C
E = ±100ppm Maximum over -20°C to +70°C
F = ±50ppm Maximum over -20°C to +70°C
G = ±25ppm Maximum over -20°C to +70°C
H = ±20ppm Maximum over -20°C to +70°C
J = ±100ppm Maximum over -40°C to +85°C
K = ±50ppm Maximum over -40°C to +85°C
L = ±25ppm Maximum over -40°C to +85°C
M = ±20ppm Maximum over -40°C to +85°C
N = ±100ppm Maximum over -40°C to +105°C
P = ±50ppm Maximum over -40°C to +105°C
Q = ±25ppm Maximum over -40°C to +105°C
R = ±20ppm Maximum over -40°C to +105°C
S = ±100ppm Maximum over -40°C to +125°C
T = ±50ppm Maximum over -40°C to +125°C
U = ±25ppm Maximum over -40°C to +125°C
V = ±20ppm Maximum over -40°C to +125°C
W = ±100ppm Maximum over -55°C to +125°C
X = ±50ppm Maximum over -55°C to +125°C
Y = ±25ppm Maximum over -55°C to +125°C

Output Control Function

H = Tri-State (Disabled Output: High Impedance)
J = Power Down (Disabled Output: Logic Low)

Nominal Frequency

Duty Cycle

1 = 50 ±10(%)
2 = 50 ±5(%)

Packaging Options

Blank = Bulk (Cut Tape)
TR = Tape & Reel



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