

EMRA41K2H-40.000M TR

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REGULATORY COMPLIANCE (Data Sheet downloaded on Jun 20, 2020)


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ITEM DESCRIPTION

MEMS Clock Oscillators LVCMOS (CMOS) 1.8Vdc 4 Pad 2.0mm x 2.5mm Plastic Surface Mount (SMD) 40.000MHz ± 50 ppm over -40°C to +85°C

ELECTRICAL SPECIFICATIONS

Nominal Frequency	40.000MHz
Frequency Tolerance/Stability	± 50 ppm Maximum over -40°C to +85°C (Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, and Output Load Change)
Aging at 25°C	± 1.5 ppm Maximum First Year
Supply Voltage	1.8Vdc $\pm 10\%$
Input Current	5mA Maximum (No Load)
Output Voltage Logic High (Voh)	90% of Vdd Minimum (IOH = -2mA)
Output Voltage Logic Low (Vol)	10% of Vdd Maximum (IOL = +2mA)
Rise/Fall Time	1.5nSec Typical, 3.5nSec Maximum (Measured from 20% to 80% of waveform)
Duty Cycle	50 ± 5 (%) (Measured at 50% of waveform)
Load Drive Capability	15pF Maximum
Output Logic Type	CMOS
Output Control Function	Tri-State (Disabled Output: High Impedance)
Output Control Input Voltage Logic High (Vih)	70% of Vdd Minimum or No Connect to Enable Output
Output Control Input Voltage Logic Low (Vil)	30% of Vdd Maximum to Disable Output
Tri-State Output Enable Time	150nSec Maximum
Tri-State Output Disable Time	150nSec Maximum
Period Jitter (RMS)	2pSec Typical, 5pSec Maximum
RMS Phase Jitter (Fj = 900kHz to 7.5MHz; Random)	0.5pSec Typical, 1pSec Maximum
RMS Phase Jitter (Fj = 12kHz to 20MHz; Random)	1.5pSec Typical, 3pSec Maximum
Start Up Time	5mSec Maximum
Storage Temperature Range	-65°C to +150°C

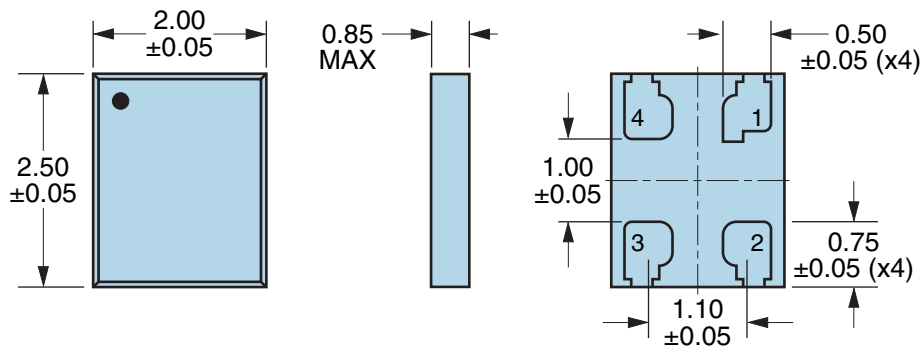
ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

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

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MECHANICAL DIMENSIONS (all dimensions in millimeters)

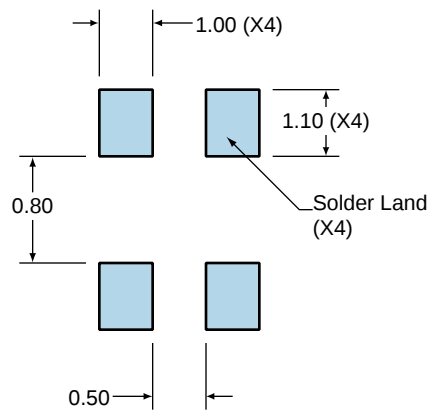


PIN	CONNECTION
1	Tri-State (High Impedance)
2	Ground
3	Output
4	Supply Voltage

LINE	MARKING
1	Ecliptek Manufacturing Identifier

Suggested Solder Pad Layout

All Dimensions in Millimeters



All Tolerances are ±0.1

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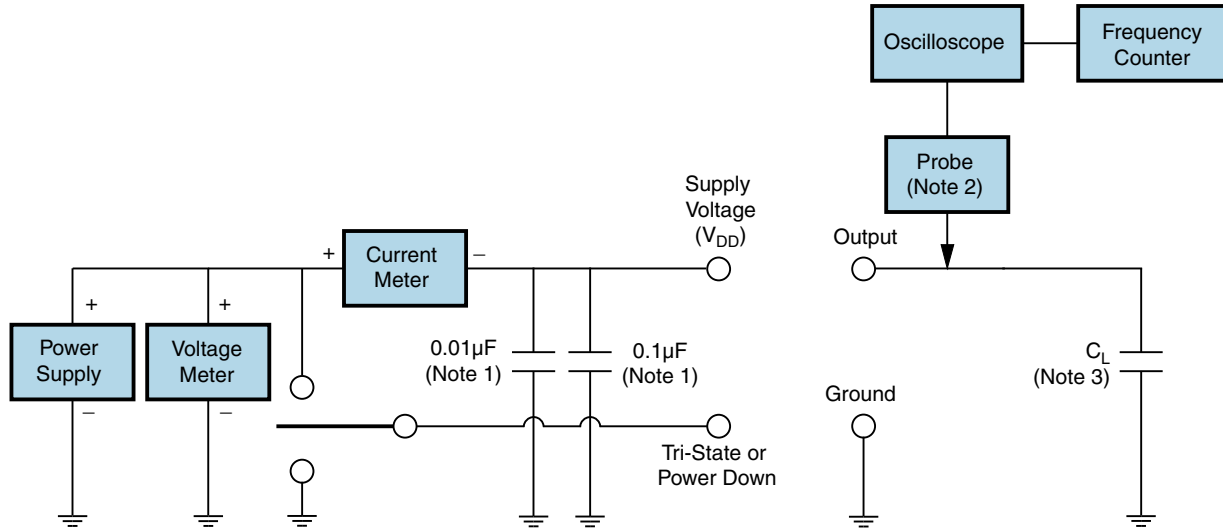
OUTPUT WAVEFORM & TIMING DIAGRAM



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Test Circuit for CMOS Output



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

Note 2: A low input 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. See applicable specification sheet for 'Load Drive Capability'.

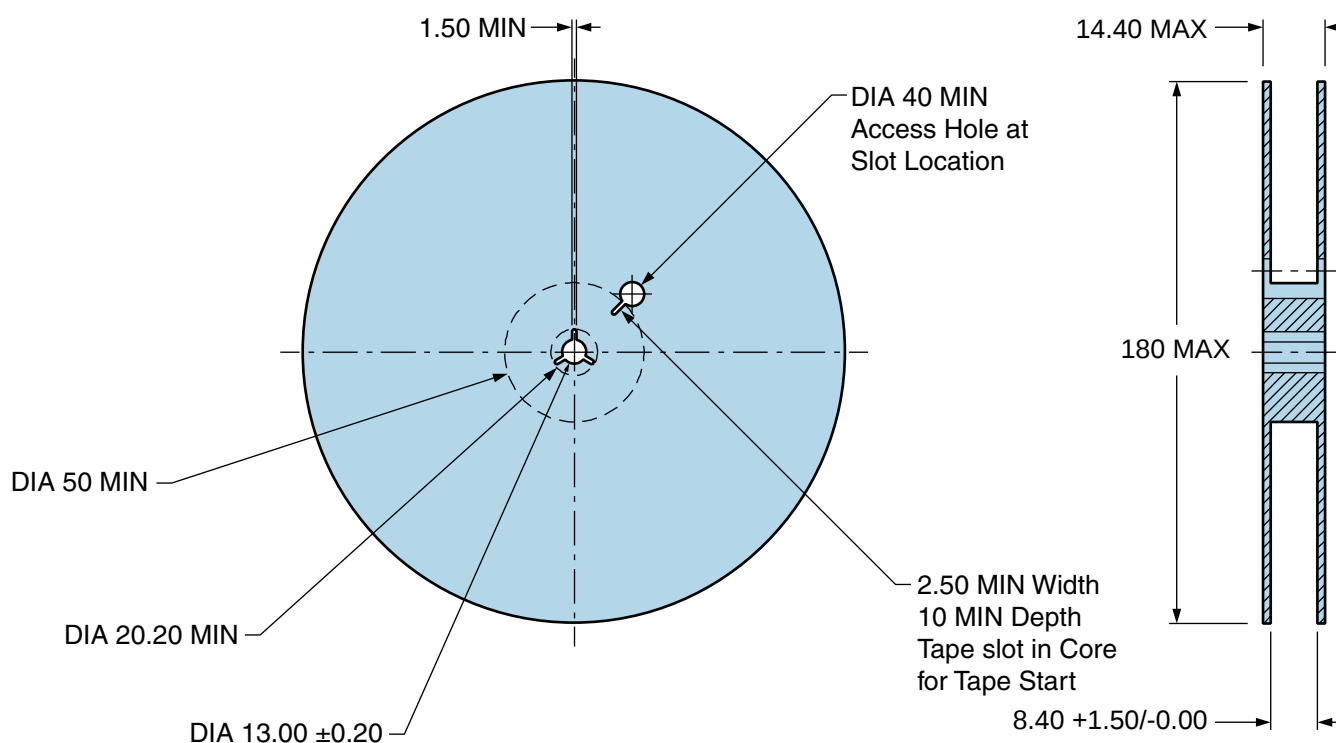
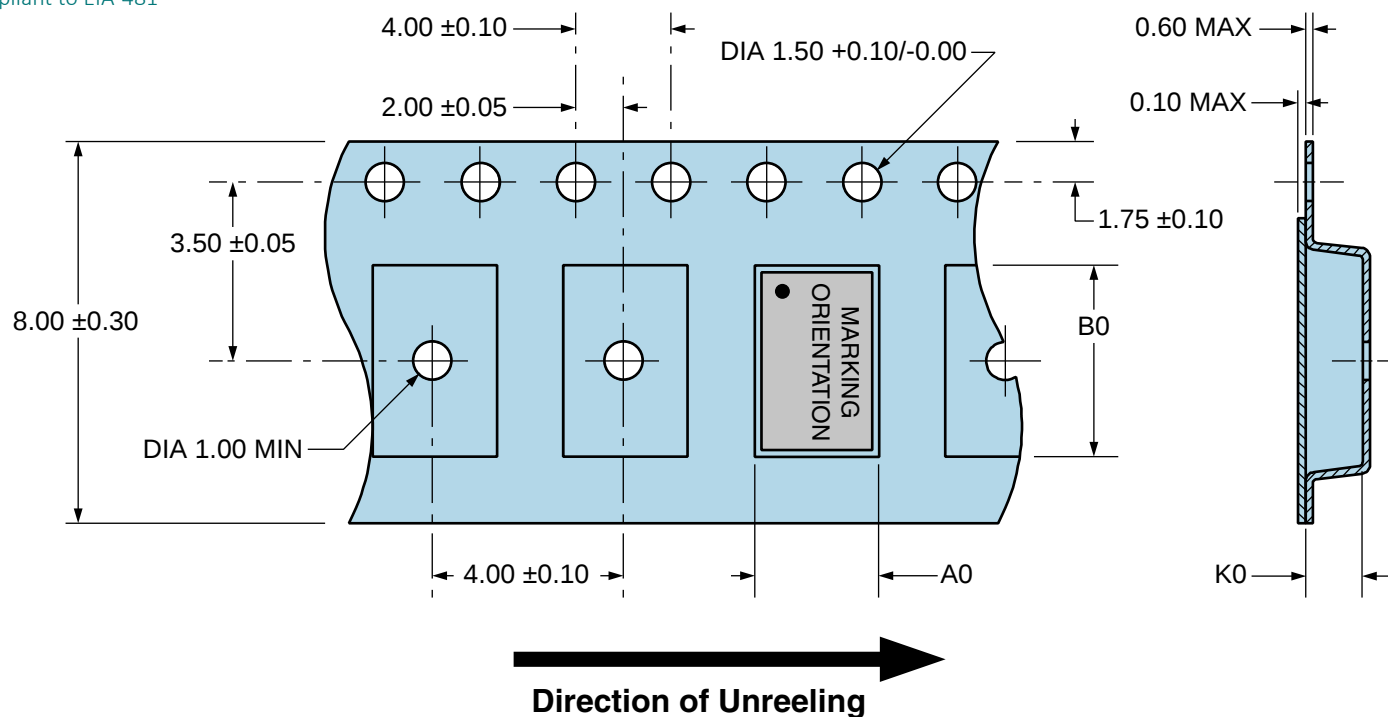
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Tape & Reel Dimensions

Quantity Per Reel: 1,000 units

All Dimensions in Millimeters

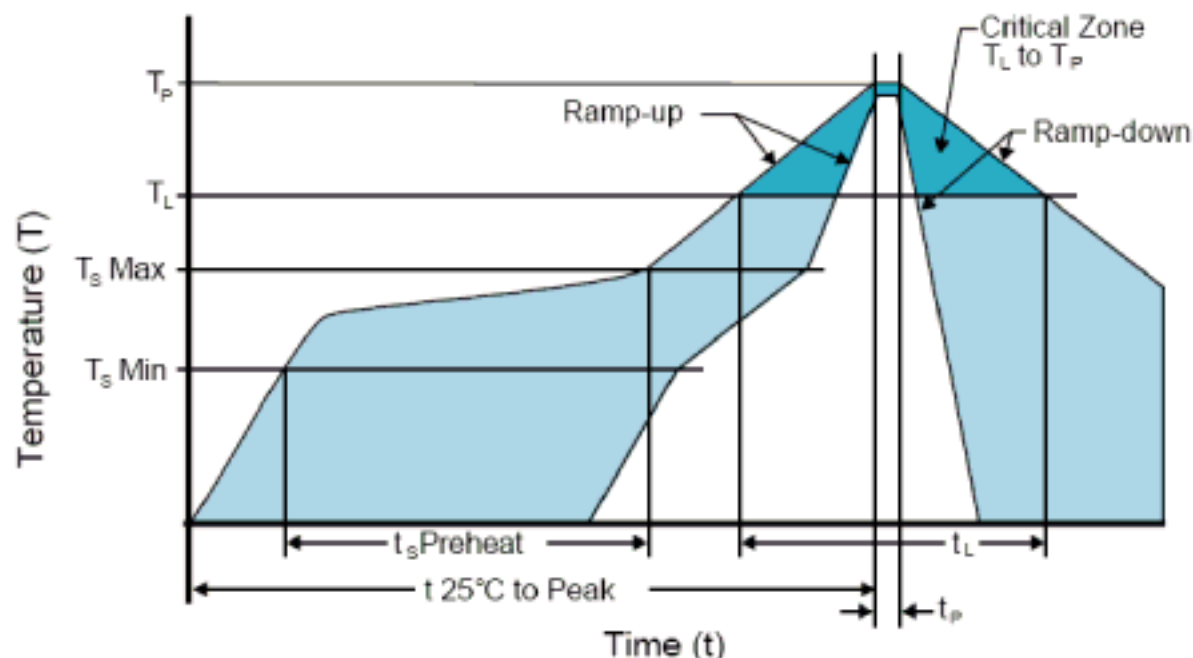
Compliant to EIA-481



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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
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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
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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
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Target Peak Temperature (T_P Target)	250°C +0/-5°C
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Time within 5°C of actual peak (t_P)	20 - 40 Seconds
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Ramp-down Rate	6°C/Second Maximum
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Time 25°C to Peak Temperature (t)	8 Minutes Maximum
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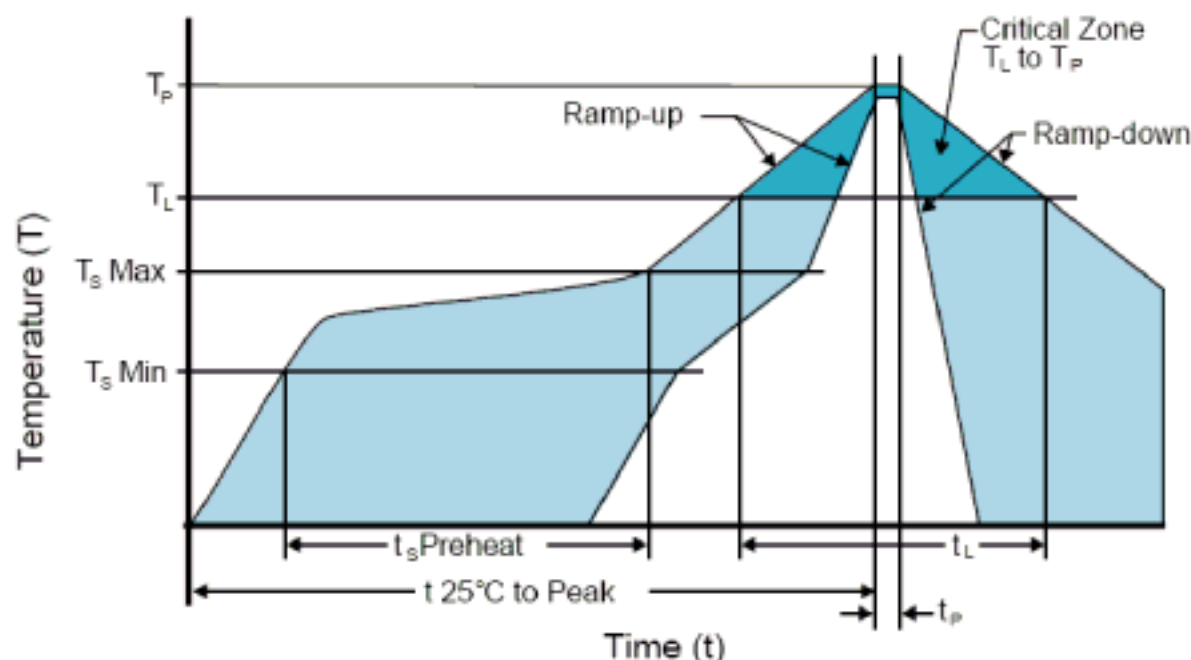
Moisture Sensitivity Level	Level 1
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Additional Notes	Temperature shown are applied to body of device.
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Recommended Solder Reflow Methods



Low Temperature Infrared/Convection 240°C

TS MAX to TL (Ramp-up Rate)	5°C/Second Maximum
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Preheat

- Temperature Minimum (TS MIN)	N/A
- Temperature Typical (TS TYP)	150°C
- Temperature Maximum (TS MAX)	N/A
- Time (ts MIN)	60 - 120 Seconds

Ramp-up Rate (TL to TP)	5°C/Second Maximum
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Time Maintained Above:

- Temperature (TL)	150°C
- Time (tL)	200 Seconds Maximum

Peak Temperature (TP)	240°C Maximum
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Target Peak Temperature (TP Target)	240°C Maximum 2 Times / 230°C Maximum 1 Time
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Time within 5°C of actual peak (tP)	10 Seconds Maximum 2 Times / 80 Seconds Maximum 1 Time
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Ramp-down Rate	5°C/Second Maximum
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Time 25°C to Peak Temperature (t)	N/A
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Moisture Sensitivity Level	Level 1
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Additional Notes	Temperature shown are applied to body of device.
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Low Temperature Manual Soldering

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

High Temperature Manual Soldering

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

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