

EMRB61C-32.768K

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REGULATORY COMPLIANCE (Data Sheet downloaded on Jan 9, 2020)


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ITEM DESCRIPTION

MEMS Clock Oscillators LVCMOS (CMOS) 1.8Vdc 4 Pad 1.2mm x 2.0mm Plastic Surface Mount (SMD) 32.768KHz \pm 100ppm over -40°C to +85°C

ELECTRICAL SPECIFICATIONS

Nominal Frequency	32.768KHz
Frequency Tolerance/Stability	\pm 100ppm 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)
Frequency Tolerance	\pm 20ppm Maximum (Measured at 25°C \pm 2°C, at Vdd=1.8Vdc, Post Reflow)
Aging at 25°C	\pm 1ppm Maximum First Year
Supply Voltage	1.8Vdc \pm 10%
Input Current	1.0 μ A Typical (at 25°C), 2.2 μ A Maximum (No Load, Nominal Vdd)
Output Voltage Logic High (Voh)	90% of Vdd Minimum (IOH = -10 μ A)
Output Voltage Logic Low (Vol)	10% of Vdd Maximum (IOL = +10 μ A)
Rise/Fall Time	100nSec Typical, 200nSec Maximum (Measured from 10% to 90% of waveform)
Duty Cycle	50 \pm 2(%) (Measured at 50% of waveform)
Load Drive Capability	15pF Maximum
Output Logic Type	CMOS
Period Jitter (RMS)	35nSec Typical (Measured at 25°C)
Power Supply Ramp	100mSec Maximum (Measured at 0Vdc to 90% of Vdd)
Start Up Time	180mSec Typical, 500mSec Maximum (Measured at Nominal Vdd)
Storage Temperature Range	-55°C to +125°C

ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

ESD Susceptibility	JESD22-A114, HBM, 3000V
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
Temperature Cycling	JESD22-A104, Condition G
Vibration	MIL-STD-883, Method 2007, Condition C, 70G

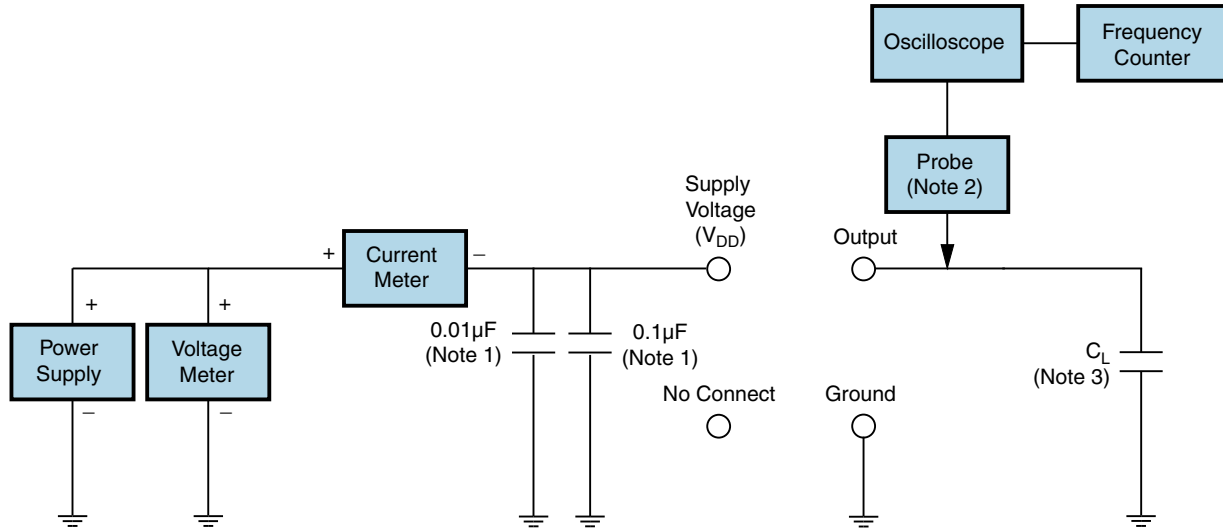
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OUTPUT WAVEFORM



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Test Circuit for CMOS Output



Note 1: An external $0.01\mu\text{F}$ ceramic bypass capacitor in parallel with a $0.1\mu\text{F}$ 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 ($<12\text{pF}$), 10X Attenuation Factor, High Impedance ($>10\text{Mohms}$), and High bandwidth ($>300\text{MHz}$) 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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Recommended Solder Reflow Methods



High Temperature Infrared/Convection

$T_s \text{ MAX to } T_L$ (Ramp-up Rate)	$3^\circ\text{C/Second Maximum}$
Preheat	
- Temperature Minimum ($T_s \text{ MIN}$)	150°C
- Temperature Typical ($T_s \text{ TYP}$)	175°C
- Temperature Maximum ($T_s \text{ MAX}$)	200°C
- Time ($t_s \text{ MIN}$)	60 - 180 Seconds
Ramp-up Rate (T_L to T_p)	$3^\circ\text{C/Second Maximum}$
Time Maintained Above:	
- Temperature (T_L)	217°C
- Time (t_L)	60 - 150 Seconds
Peak Temperature (T_p)	$260^\circ\text{C Maximum for 10 Seconds Maximum}$
Target Peak Temperature ($T_p \text{ Target}$)	$250^\circ\text{C } +0/-5^\circ\text{C}$
Time within 5°C of actual peak (t_p)	20 - 40 Seconds
Ramp-down Rate	$6^\circ\text{C/Second Maximum}$
Time 25°C to Peak Temperature (t)	8 Minutes Maximum
Moisture Sensitivity Level	Level 1
Additional Notes	Temperature shown are applied to body of device.

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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 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
Additional Notes	Temperature shown are applied to body of device.

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.)