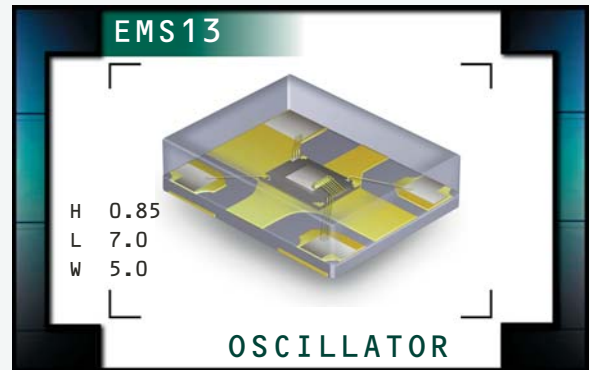


EMS13 Series



ECLIPTEK[®]
CORPORATION

- Spread Spectrum MEMS Clock Oscillators
- Low EMI LVCMOS Output
- +3.3V Supply Voltage
- Tri-State, Power Down, and Spread Disable Options
- Center Spread and Down Spread Modulation Options
- 4 Pad Plastic SMD Package
- 30,000 G Shock Resistance
- RoHS Compliant (Pb-Free)



ELECTRICAL SPECIFICATIONS

| | | |
|--|---|--|
| Nominal Frequency | | 1MHz to 87MHz, 93MHz to 175MHz |
| Operating Temperature Range | | -20°C to +70°C, or -40°C to +85°C |
| Storage Temperature Range | | -55°C to +125°C |
| Supply Voltage (V_{DD}) | | 3.3V _{DC} ±10% |
| Maximum Supply Voltage (V_{DD}) | | -0.5Vdc to +3.65Vdc |
| Input Current | ≤ 25.000MHz (Unloaded; Nominal Vdd) | 30mA Maximum |
| | > 25.000MHz (Unloaded; Nominal Vdd) | 40mA Maximum |
| Frequency Tolerance / Stability | Inclusive of All Conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, 1st Year Aging at 25°C, 260°C Reflow, Shock, and Vibration | ±50ppm or ±100ppm Maximum |
| Output Voltage Logic High (V_{OH}) | I _{OH} = -8mA | 90% of V _{DD} Minimum |
| Output Voltage Logic Low (V_{OL}) | I _{OL} = +8mA | 10% of V _{DD} Maximum |
| Rise Time / Fall Time | 20% to 80% of waveform | 2nSeconds Maximum |
| Duty Cycle | ≤ 75.000MHz (at 50% of waveform) | 50 ±5(%) |
| | > 75.000MHz (at 50% of waveform) | 50 ±10(%) |
| Load Drive Capability | | 15pF Maximum |
| Output Control Function | | Tri-State (High Impedance) Power Down (Logic Low) Spread Disabled (Disabled) |
| Tri-State Input Voltage (V_{IH} and V_{IL}) | 70% of V _{DD} Minimum or No Connection to Enable Output, 30% of V _{DD} Maximum to Disable at Output Control Function of Tri-State | Disabled Output: High Impedance |
| Power Down Input Voltage (V_{IH} and V_{IL}) | 70% of V _{DD} Minimum or No Connection to Enable Output, 30% of V _{DD} Maximum to Disable at Output Control Function of Power Down | Disabled Output: Logic Low |
| Spread Spectrum Input Voltage (V_{IH} and V_{IL}) | 70% of V _{DD} Minimum or No Connection to Enable Output, 30% of V _{DD} Maximum to Disable at Output Control Function of Spread Disable | Spread Spectrum Output: Disabled |
| Standby Current | Pad 1=Ground (at Output Control Function of Power Down) | 50µA Maximum |
| Disable Current | Pad 1=Ground (at Output Control Function of Tri-State) | 20mA Maximum |
| Spread Spectrum | Center Spread not available with Output Control Function of Spread Disable | ±0.25%, ±0.50%, ±1.00%, -0.50%, -1.00%, or -2.00% |
| Modulation Frequency | | 30kHz Min, 32kHz Typ, 35kHz Max |
| Period Jitter | Cycle to Cycle; Spread Spectrum-On; Fo=133.333M, Vdd=3.3Vdc | 30pSec Maximum |
| Aging | First Year at 25°C | ±1ppm Maximum |
| Start Up Time | | 10mSec Maximum |

MANUFACTURER
ECLIPTEK CORP.

CATEGORY
OSCILLATOR

SERIES
EMS13

PACKAGE
PLASTIC

VOLTAGE
3.3V

CLASS
OS6C

REV. DATE
04/10

PART NUMBERING GUIDE

EMS13 C H A - 50.00M TR

FREQUENCY TOLERANCE & STABILITY/ OPERATING TEMPERATURE RANGE

C = ±100ppm Maximum over -20°C to +70°C
 D = ±50ppm Maximum over -20°C to +70°C
 G = ±100ppm Maximum over -40°C to +85°C
 H = ±50ppm Maximum over -40°C to +85°C

OUTPUT CONTROL FUNCTION

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

AVAILABLE OPTIONS

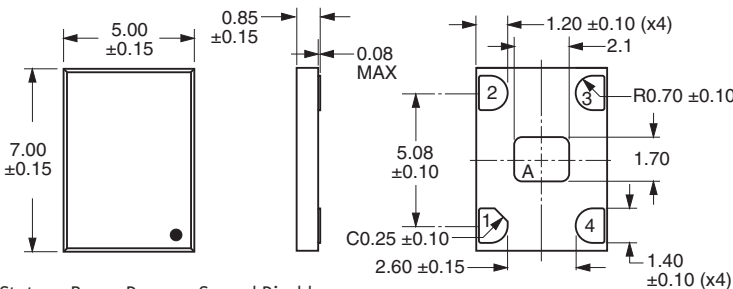
Blank = Bulk
 TR = Tape & Reel

FREQUENCY

SPREAD SPECTRUM

A = ±0.25% Center Spread
 B = ±0.50% Center Spread
 C = ±1.00% Center Spread
 D = -0.50% Down Spread
 E = -1.00% Down Spread
 F = -2.00% Down Spread

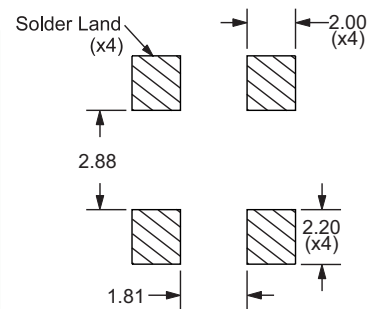
MECHANICAL DIMENSIONS ALL DIMENSIONS IN MILLIMETERS



Pad 1: Tri-State or Power Down or Spread Disable
 Pad 2: Case Ground
 Pad 3: Output
 Pad 4: Supply Voltage

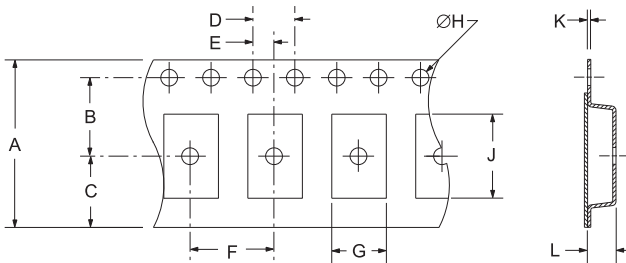
Note A: Center paddle is connected internally to oscillator ground (Pad 2).

SUGGESTED SOLDER PAD LAYOUT ALL DIMENSIONS IN MILLIMETERS

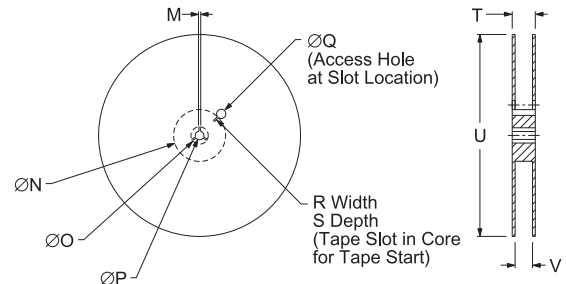


Tolerances = ±0.1

TAPE AND REEL DIMENSIONS ALL DIMENSIONS IN MILLIMETERS



| TAPE | A | B | C | D | E |
|------|-----------|----------|-----------|----------|------------|
| | 16.0 ±0.3 | 7.5 ±0.2 | 6.75 ±0.2 | 4.0 ±0.2 | 2.0 ±0.2 |
| F | G | H | J | K | L |
| | 8.0 ±0.2 | A0* | 1.5 ±0.1 | B0* | 0.30 ±0.05 |



| REEL | M | N | O | P | Q |
|------|---------|--------|----------|-----------|------------|
| | 1.5 MIN | 50 MIN | 20.2 MIN | 13.0 ±0.2 | 40 MIN |
| R | S | T | U | V | QTY/REEL |
| | 2.5 MIN | 10 MIN | 22.4 MAX | 180 MAX | 16.4 ±2/-0 |

*Compliant to EIA 481C

ENVIRONMENTAL/MECHANICAL SPECIFICATIONS

| Characteristic | Specification |
|------------------------------|--|
| ESD Susceptibility | MIL-STD-883, Method 3015, Class 2, HBM: 2000V |
| Flammability | UL94-V0 |
| Mechanical Shock | MIL-STD-883, Method 2002, Condition G, 30,000G |
| Moisture Resistance | MIL-STD-883, Method 1004 |
| Moisture Sensitivity Level | 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 (Four I/O Pads on bottom of package only) |
| Temperature Cycling | MIL-STD-883, Method 1010, Condition B |
| Thermal Shock | MIL-STD-883, Method 1011, Condition B |
| Vibration | MIL-STD-883, Method 2007, Condition A, 20G |

MARKING SPECIFICATIONS

Line 1: XXXX or XXXXX
 Ecliptek Manufacturing Lot Code

| MANUFACTURER | CATEGORY | SERIES | PACKAGE | VOLTAGE | CLASS | REV. DATE |
|----------------|------------|--------|---------|---------|-------|-----------|
| ECLIPTEK CORP. | OSCILLATOR | EMS13 | PLASTIC | 3.3V | OS6C | 04/10 |