

# EMRA33L2H-20.000M TR [Click part number to visit Part Number Details page](#)

## REGULATORY COMPLIANCE (Data Sheet downloaded on Jun 19, 2020)



◀ Click badges to download compliance docs

Regulatory Compliance standards are subject to updates by governing bodies. Click the badges to download the latest compliance docs for this part number directly from Ecliptek.



## ITEM DESCRIPTION

MEMS Clock Oscillators LVCMOS (CMOS) 3.3Vdc 4 Pad 2.5mm x 3.2mm Plastic Surface Mount (SMD) 20.000MHz ±25ppm over -40°C to +85°C

## ELECTRICAL SPECIFICATIONS

|  |  |
|--|--|
| Nominal Frequency                                | 20.000MHz  |
| Frequency Tolerance/Stability                    | ±25ppm 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                                    | ±1.5ppm Maximum First Year   |
| Supply Voltage                                   | 3.3Vdc ±10%  |
| Input Current                                    | 5mA Maximum (No Load)  |
| Output Voltage Logic High (Voh)                  | 90% of Vdd Minimum (IOH = -4mA)  |
| Output Voltage Logic Low (Vol)                   | 10% of Vdd Maximum (IOL = +4mA)  |
| Rise/Fall Time                                   | 1.2nSec Typical, 3nSec 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, 4pSec 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                         |

## EMRA33L2H-20.000M TR [Click part number to visit Part Number Details page](#)

### 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  $\pm 0.1$

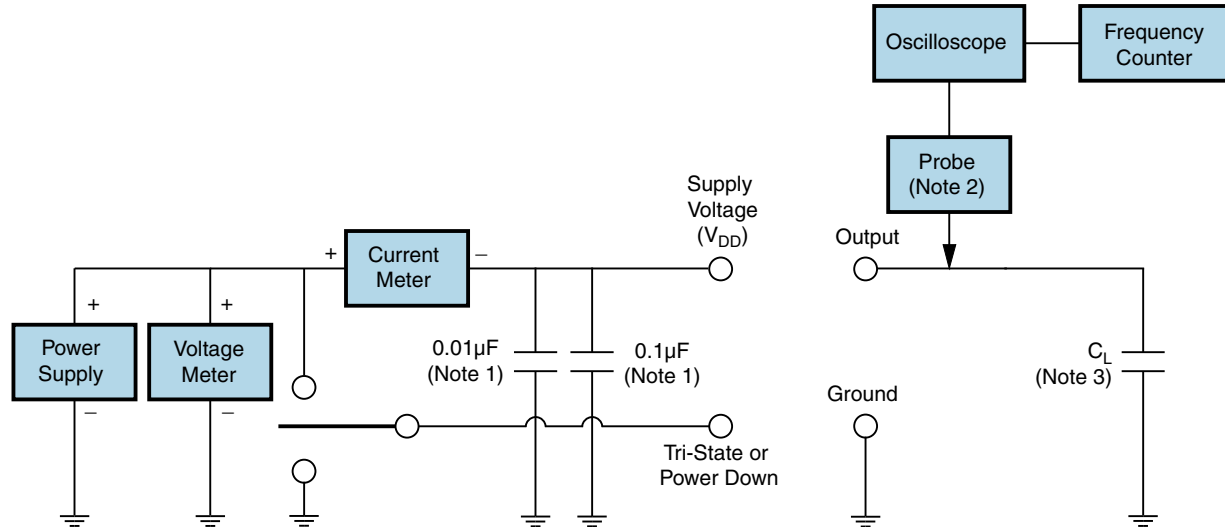
# EMRA33L2H-20.000M TR [Click part number to visit Part Number Details page](#)

## OUTPUT WAVEFORM & TIMING DIAGRAM



# EMRA33L2H-20.000M TR [Click part number to visit Part Number Details page](#)

## 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 input capacitance (<12pF), 10X Attenuation Factor, High Impedance (>10Mohms), and High bandwidth (>300MHz) passive probe is recommended.

Note 3: Capacitance value C<sub>L</sub> includes sum of all probe and fixture capacitance. See applicable specification sheet for 'Load Drive Capability'.

# EMRA33L2H-20.000M TR

## Tape & Reel Dimensions

Quantity Per Reel: 1,000 units

All Dimensions in Millimeters

Compliant to EIA-481



# EMRA33L2H-20.000M TR [Click part number to visit Part Number Details page](#)

## Recommended Solder Reflow Methods



### High Temperature Infrared/Convection

|  |  |
|--|--|
| <b><math>T_s</math> MAX to <math>T_L</math> (Ramp-up Rate)</b> | 3°C/Second Maximum                               |
| <b>Preheat</b>   |  |
| - 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                                 |
| <b>Ramp-up Rate (<math>T_L</math> to <math>T_P</math>)</b>     | 3°C/Second Maximum                               |
| <b>Time Maintained Above:</b>                                  |  |
| - Temperature ( $T_L$ )  | 217°C  |
| - Time ( $t_L$ )   | 60 - 150 Seconds                                 |
| <b>Peak Temperature (<math>T_P</math>)</b>                     | 260°C Maximum for 10 Seconds Maximum             |
| <b>Target Peak Temperature (<math>T_P</math> Target)</b>       | 250°C +0/-5°C                                    |
| <b>Time within 5°C of actual peak (<math>t_p</math>)</b>       | 20 - 40 Seconds                                  |
| <b>Ramp-down Rate</b>  | 6°C/Second Maximum                               |
| <b>Time 25°C to Peak Temperature (t)</b>                       | 8 Minutes Maximum                                |
| <b>Moisture Sensitivity Level</b>                              | Level 1  |
| <b>Additional Notes</b>  | Temperature shown are applied to body of device. |

# EMRA33L2H-20.000M TR [Click part number to visit Part Number Details page](#)

## Recommended Solder Reflow Methods



### Low Temperature Infrared/Convection 240°C

|  |  |
|--|--|
| $T_s$ MAX to $T_L$ (Ramp-up Rate)                          | 5°C/Second Maximum                                     |
| <b>Preheat</b>   |  |
| - 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                                       |
| <b>Ramp-up Rate (<math>T_L</math> to <math>T_P</math>)</b> | 5°C/Second Maximum                                     |
| <b>Time Maintained Above:</b>                              |  |
| - Temperature ( $T_L$ )                                    | 150°C  |
| - Time ( $t_L$ )   | 200 Seconds Maximum                                    |
| <b>Peak Temperature (<math>T_P</math>)</b>                 | 240°C Maximum  |
| <b>Target Peak Temperature (<math>T_P</math> Target)</b>   | 240°C Maximum 2 Times / 230°C Maximum 1 Time           |
| <b>Time within 5°C of actual peak (<math>t_p</math>)</b>   | 10 Seconds Maximum 2 Times / 80 Seconds Maximum 1 Time |
| <b>Ramp-down Rate</b>                                      | 5°C/Second Maximum                                     |
| <b>Time 25°C to Peak Temperature (t)</b>                   | N/A  |
| <b>Moisture Sensitivity Level</b>                          | Level 1  |
| <b>Additional Notes</b>                                    | 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.)

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Ecliptek:](#)

[EMRA33L2H-20.000M TR](#)





Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.