

# EB19E2E2H-28.6363M TR

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## REGULATORY COMPLIANCE (Data Sheet downloaded on Jun 21, 2020)


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## ITEM DESCRIPTION

Quartz Crystal Clock Oscillators XO (SPXO) LVC MOS (CMOS) 1.62Vdc to 3.63Vdc 4 Pad 2.5mm x 3.2mm Ceramic Surface Mount (SMD) 28.6363MHz  $\pm 25$ ppm over -20°C to +70°C

## ELECTRICAL SPECIFICATIONS

|                                       |                                                                                                                                                                                                                                                            |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal Frequency                     | 28.6363MHz                                                                                                                                                                                                                                                 |
| Frequency Tolerance/Stability         | $\pm 25$ ppm Maximum over -20°C to +70°C (Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, First Year Aging at 25°C, Shock, and Vibration) |
| Supply Voltage                        | 1.62Vdc to 3.63Vdc                                                                                                                                                                                                                                         |
| Input Current                         | 4mA Maximum                                                                                                                                                                                                                                                |
| 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                        | 4nSec Maximum (Measured at 20% to 80% of waveform)                                                                                                                                                                                                         |
| Duty Cycle                            | 50 $\pm 5$ (%) (Measured at 50% of waveform)                                                                                                                                                                                                               |
| Load Drive Capability                 | 15pF Maximum                                                                                                                                                                                                                                               |
| Output Logic Type                     | CMOS                                                                                                                                                                                                                                                       |
| Pin 1 Connection                      | Tri-State (High Impedance)                                                                                                                                                                                                                                 |
| Tri-State Input Voltage (Vih and Vil) | 80% of Vdd Minimum or No Connect to Enable Output, 20% of Vdd Maximum to Disable Output (High Impedance)                                                                                                                                                   |
| Standby Current                       | 10 $\mu$ A Maximum (Disabled Output: High Impedance)                                                                                                                                                                                                       |
| RMS Phase Jitter                      | 1pSec Maximum (Fj = 12kHz to 20MHz)                                                                                                                                                                                                                        |
| Start Up Time                         | 10mSec Maximum                                                                                                                                                                                                                                             |
| Storage Temperature Range             | -55°C to +125°C                                                                                                                                                                                                                                            |

## ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

|                              |                                               |
|------------------------------|-----------------------------------------------|
| ESD Susceptibility           | MIL-STD-883, Method 3015, Class 1, HBM: 1500V |
| Fine Leak Test               | MIL-STD-883, Method 1014, Condition A         |
| Flammability                 | UL94-V0                                       |
| Gross Leak Test              | MIL-STD-883, Method 1014, Condition C         |
| Mechanical Shock             | MIL-STD-883, Method 2002, Condition B         |
| Moisture Resistance          | MIL-STD-883, Method 1004                      |
| Moisture Sensitivity         | 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                      |
| Temperature Cycling          | MIL-STD-883, Method 1010, Condition B         |
| Vibration                    | MIL-STD-883, Method 2007, Condition A         |

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MECHANICAL DIMENSIONS (all dimensions in millimeters)



| PIN | CONNECTION     |
|-----|----------------|
| 1   | Tri-State      |
| 2   | Case/Ground    |
| 3   | Output         |
| 4   | Supply Voltage |

| LINE | MARKING                                                          |
|------|------------------------------------------------------------------|
| 1    | <b>E28.6</b><br><i>E=Ecliptek Designator</i>                     |
| 2    | <b>XXXXXX</b><br><i>XXXXXX=Ecliptek Manufacturing Identifier</i> |

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  $0.01\mu F$  ceramic bypass capacitor in parallel with a  $0.1\mu F$  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 ( $>10M\Omega$ ), and high bandwidth ( $>300MHz$ ) passive probe is recommended.

Note 3: Capacitance value  $C_L$  includes sum of all probe and fixture capacitance.

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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

|                                     |                                      |
|-------------------------------------|--------------------------------------|
| Ts MAX to Tl (Ramp-up Rate)         | 3°C/Second Maximum                   |
| Preheat                             |                                      |
| - Temperature Minimum (Ts MIN)      | 150°C                                |
| - Temperature Typical (Ts TYP)      | 175°C                                |
| - Temperature Maximum (Ts MAX)      | 200°C                                |
| - Time (ts MIN)                     | 60 - 180 Seconds                     |
| Ramp-up Rate (Tl to Tp)             | 3°C/Second Maximum                   |
| Time Maintained Above:              |                                      |
| - Temperature (Tl)                  | 217°C                                |
| - Time (tL)                         | 60 - 150 Seconds                     |
| Peak Temperature (Tp)               | 260°C Maximum for 10 Seconds Maximum |
| Target Peak Temperature (Tp Target) | 250°C +0/-5°C                        |
| Time within 5°C of actual peak (tp) | 20 - 40 Seconds                      |
| Ramp-down Rate                      | 6°C/Second Maximum                   |
| Time 25°C to Peak Temperature (t)   | 8 Minutes Maximum                    |
| Moisture Sensitivity Level          | Level 1                              |

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## Recommended Solder Reflow Methods



### Low Temperature Infrared/Convection 240°C

|                                                     |                    |
|-----------------------------------------------------|--------------------|
| T <sub>s</sub> MAX to T <sub>L</sub> (Ramp-up Rate) | 5°C/Second Maximum |
|-----------------------------------------------------|--------------------|

#### Preheat

|                                            |                  |
|--------------------------------------------|------------------|
| - Temperature Minimum (T <sub>s</sub> MIN) | N/A              |
| - Temperature Typical (T <sub>s</sub> TYP) | 150°C            |
| - Temperature Maximum (T <sub>s</sub> MAX) | N/A              |
| - Time (t <sub>s</sub> MIN)                | 60 - 120 Seconds |

|                                                  |                    |
|--------------------------------------------------|--------------------|
| Ramp-up Rate (T <sub>L</sub> to T <sub>P</sub> ) | 5°C/Second Maximum |
|--------------------------------------------------|--------------------|

#### Time Maintained Above:

|                                 |                     |
|---------------------------------|---------------------|
| - Temperature (T <sub>L</sub> ) | 150°C               |
| - Time (t <sub>L</sub> )        | 200 Seconds Maximum |

|                                    |               |
|------------------------------------|---------------|
| Peak Temperature (T <sub>P</sub> ) | 240°C Maximum |
|------------------------------------|---------------|

|                                                 |                                              |
|-------------------------------------------------|----------------------------------------------|
| Target Peak Temperature (T <sub>P</sub> Target) | 240°C Maximum 2 Times / 230°C Maximum 1 Time |
|-------------------------------------------------|----------------------------------------------|

|                                                  |                                                        |
|--------------------------------------------------|--------------------------------------------------------|
| Time within 5°C of actual peak (t <sub>p</sub> ) | 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 |
|----------------------------|---------|

### Low Temperature Manual Soldering

185°C Maximum for 10 Seconds Maximum, 2 times Maximum.

### High Temperature Manual Soldering

260°C Maximum for 5 Seconds Maximum, 2 times Maximum.

# Mouser Electronics

Authorized Distributor

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#### Как с нами связаться

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