

# E2UCA20-20.000M

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## REGULATORY COMPLIANCE (Data Sheet downloaded on Mar 1, 2017)


[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

Quartz Crystal Resonator HC49/US Thru-Hole 3.68mm Height Metal Resistance Weld Seal 20.000MHz  $\pm 50$ ppm at 25°C,  $\pm 100$ ppm over -40°C to +85°C 20pF Parallel Resonant

## ELECTRICAL SPECIFICATIONS

|                               |                                                         |
|-------------------------------|---------------------------------------------------------|
| Nominal Frequency             | 20.000MHz                                               |
| Frequency Tolerance/Stability | $\pm 50$ ppm at 25°C, $\pm 100$ ppm over -40°C to +85°C |
| Aging at 25°C                 | $\pm 5$ ppm/year Maximum                                |
| Load Capacitance              | 20pF Parallel Resonant                                  |
| Shunt Capacitance             | 7pF Maximum                                             |
| Equivalent Series Resistance  | 50 Ohms Maximum                                         |
| Mode of Operation             | AT-Cut Fundamental                                      |
| Drive Level                   | 1mWatt Maximum                                          |
| Storage Temperature Range     | -40°C to +125°C                                         |
| Insulation Resistance         | 500 Megaohms Minimum (Measured at 100Vdc)               |

## 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         |
| Lead Integrity               | MIL-STD-883, Method 2004                      |
| Mechanical Shock             | MIL-STD-202, Method 213, Condition C          |
| Moisture Resistance          | MIL-STD-883, Method 1004                      |
| Moisture Sensitivity         | J-STD-020, MSL1                               |
| 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)

| LINE | MARKING                                         |
|------|-------------------------------------------------|
| 1    | <b>E20.000M</b><br><i>E=Ecliptek Designator</i> |



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Recommended Solder Reflow Methods



High Temperature Solder Bath (Wave Solder)

|                                     |                                                                            |
|-------------------------------------|----------------------------------------------------------------------------|
| 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                                                                    |
| Additional Notes                    | Temperatures shown are applied to back of PCB board and device leads only. |

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Recommended Solder Reflow Methods



Low Temperature Solder Bath (Wave Solder)

|                                            |  |                                                                            |
|--------------------------------------------|--|----------------------------------------------------------------------------|
| <b>TS MAX to TL (Ramp-up Rate)</b>         |  | 5°C/Second Maximum                                                         |
| <b>Preheat</b>                             |  |                                                                            |
| - Temperature Minimum (TS MIN)             |  | N/A                                                                        |
| - Temperature Typical (TS TYP)             |  | 150°C                                                                      |
| - Temperature Maximum (TS MAX)             |  | N/A                                                                        |
| - Time (ts MIN)                            |  | 30 - 60 Seconds                                                            |
| <b>Ramp-up Rate (TL to TP)</b>             |  | 5°C/Second Maximum                                                         |
| <b>Time Maintained Above:</b>              |  |                                                                            |
| - Temperature (TL)                         |  | 150°C                                                                      |
| - Time (tL)                                |  | 200 Seconds Maximum                                                        |
| <b>Peak Temperature (TP)</b>               |  | 245°C Maximum                                                              |
| <b>Target Peak Temperature (TP Target)</b> |  | 245°C Maximum 1 Time / 235°C Maximum 2 Times                               |
| <b>Time within 5°C of actual peak (tP)</b> |  | 5 Seconds Maximum 1 Time / 15 Seconds Maximum 2 Times                      |
| <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>                    |  | Temperatures shown are applied to back of PCB board and device leads only. |

Low Temperature Manual Soldering

185°C Maximum for 10 Seconds Maximum, 2 times Maximum. (Temperatures shown are applied to back of PCB board and device leads only.)

High Temperature Manual Soldering

260°C Maximum for 5 Seconds Maximum, 2 times Maximum. (Temperatures shown are applied to back of PCB board and device leads only.)