

# EA5070MA12-16.000M TR [Click part number to visit Part Number Details page](#)

## REGULATORY COMPLIANCE (Data Sheet downloaded on Feb 17, 2016)



◀ 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 5.0mm x 7.0mm x 1.3mm 4 Pad Ceramic Surface Mount (SMD) 16.000MHz  $\pm$ 15ppm at 25°C,  $\pm$ 20ppm over -40°C to +85°C 12pF Parallel Resonant

## ELECTRICAL SPECIFICATIONS

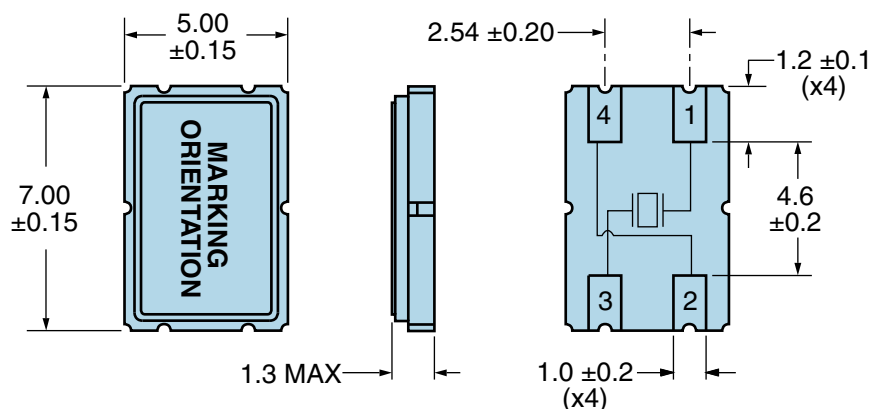
|                               |  |
|-------------------------------|--|
| Nominal Frequency             | 16.000MHz  |
| Frequency Tolerance/Stability | $\pm$ 15ppm at 25°C, $\pm$ 20ppm over -40°C to +85°C |
| Aging at 25°C                 | $\pm$ 3ppm/year Maximum                              |
| Load Capacitance              | 12pF Parallel Resonant                               |
| Shunt Capacitance             | 7pF Maximum  |
| Equivalent Series Resistance  | 30 Ohms Maximum                                      |
| Mode of Operation             | AT-Cut Fundamental                                   |
| Drive Level                   | 50 $\mu$ Watts Maximum                               |
| Spurious Response             | -3dB Minimum (Measured from Fo to Fo +5000ppm)       |
| Storage Temperature Range     | -40°C to +85°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         |
| 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)



Note: Chamfer and index mark not shown.

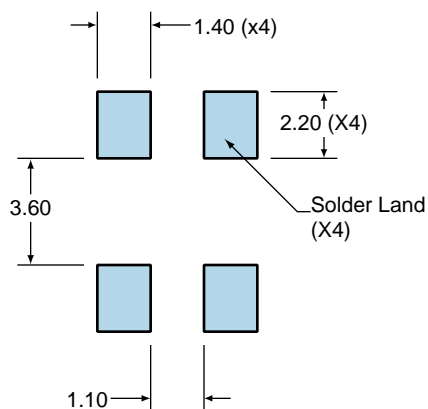
| PIN | CONNECTION   |
|-----|--------------|
| 1   | Crystal      |
| 2   | Cover/Ground |
| 3   | Crystal      |
| 4   | Cover/Ground |

| LINE | MARKING   |
|------|---|
| 1    | <b>E16.00</b><br>E=Ecliptek Designator                  |
| 2    | <b>XXXXX</b><br>XXXXX=Ecliptek Manufacturing Identifier |

**Terminal Plating Thickness:** Gold (0.3 to 1.0µm). Nickel (1.27 to 8.89µm).

### Suggested Solder Pad Layout

All Dimensions in Millimeters



All Tolerances are ±0.1

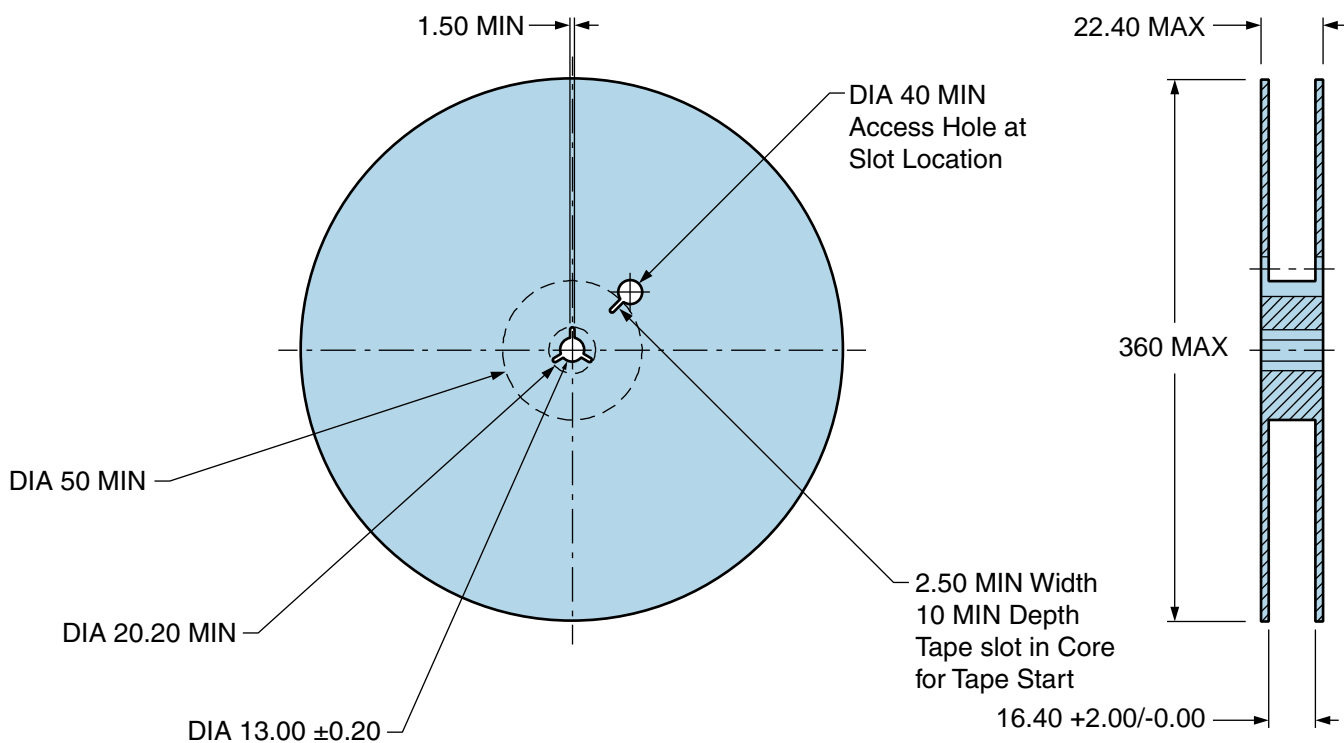
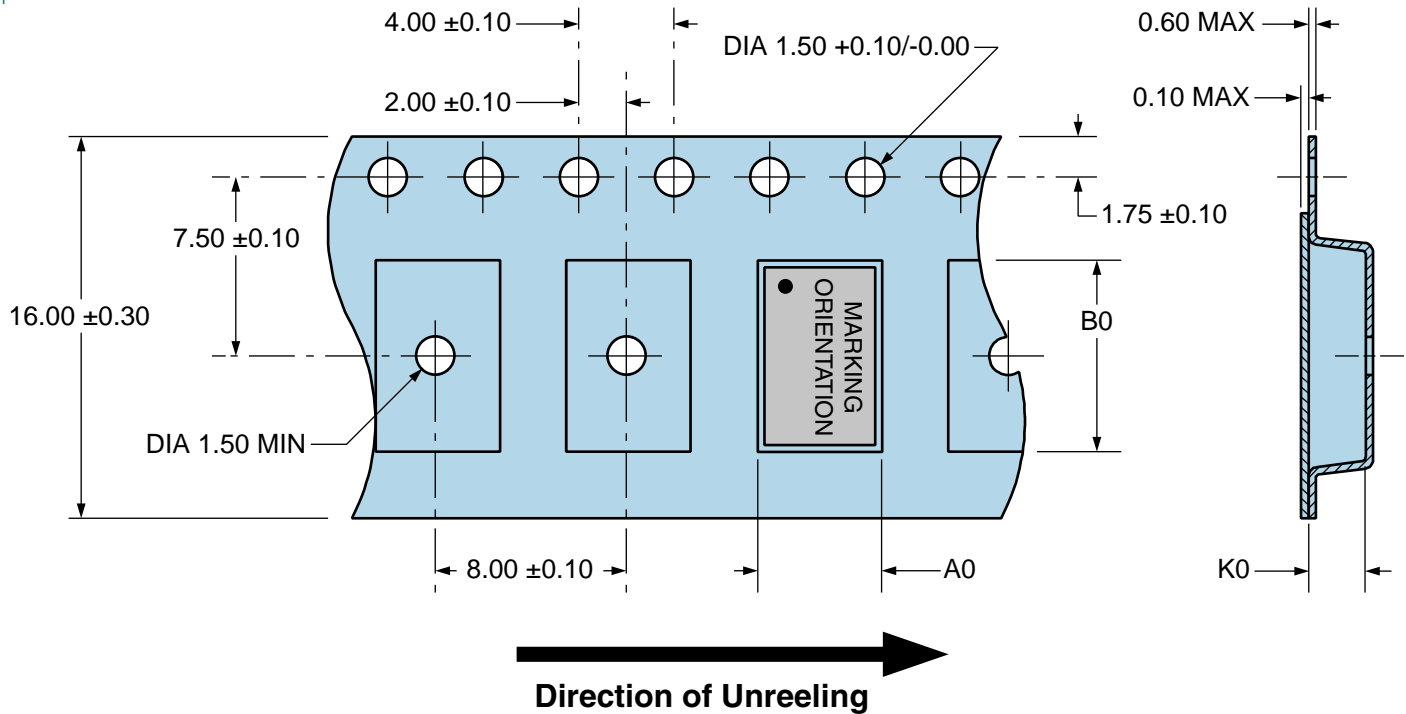
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## Tape & Reel Dimensions

Quantity Per Reel: 1,000 units

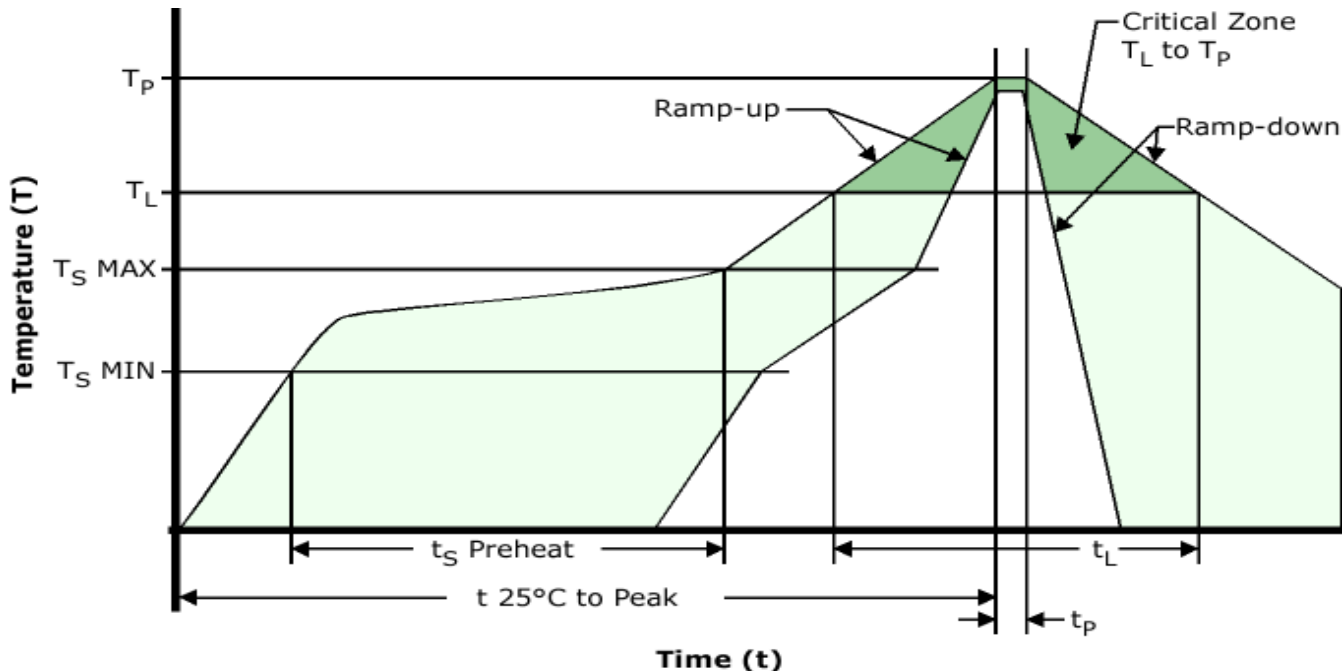
All Dimensions in Millimeters

Compliant to EIA-481



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## Recommended Solder Reflow Methods

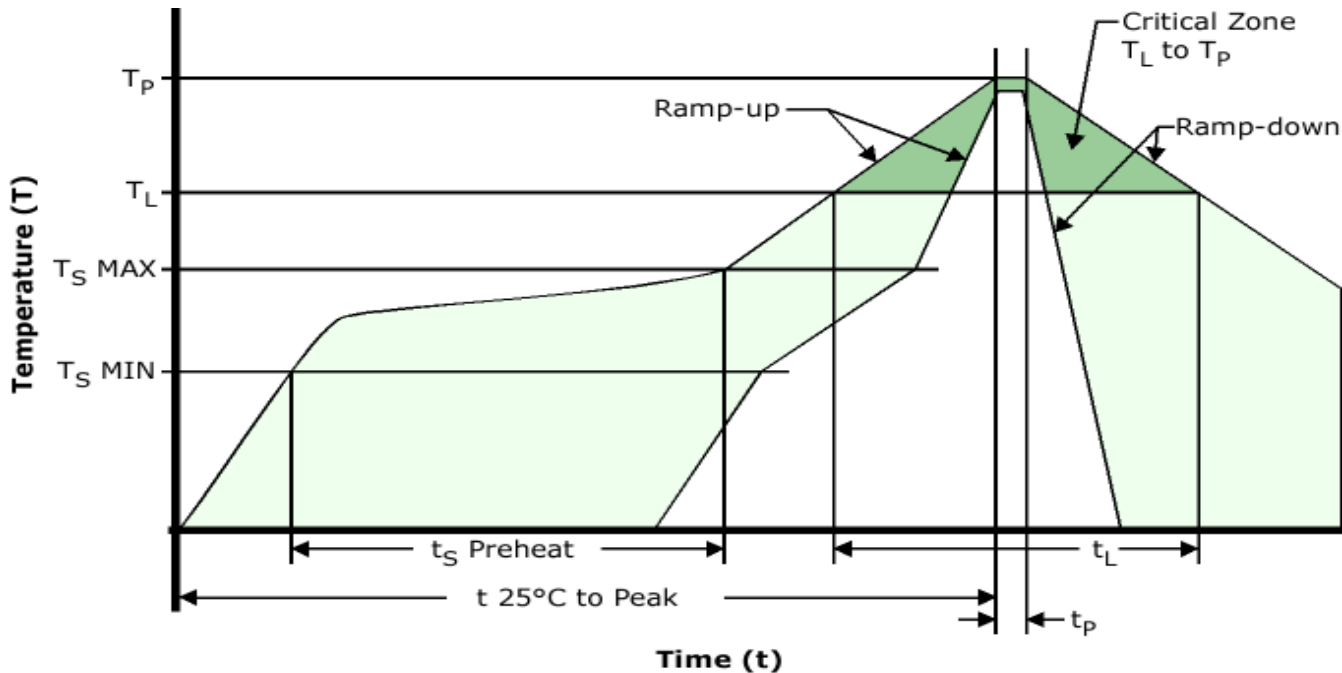


## High Temperature Infrared/Convection

|  |  |
|--|--|
| $T_S$ MAX to $T_L$ (Ramp-up Rate)                          | 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. |

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## Recommended Solder Reflow Methods



### Low Temperature Infrared/Convection 245°C

|  |  |
|--|--|
| Ts MAX to TL (Ramp-up Rate)                | 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 2 Times / 230°C Maximum 1 Time           |
| <b>Time within 5°C of actual peak (tp)</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.)