

# EC2H-28.704M-I2 TR

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## REGULATORY COMPLIANCE (Data Sheet downloaded on Feb 19, 2018)



## ITEM DESCRIPTION

Quartz Crystal Resonator HC49/US Thru-Hole 3.68mm Height Metal Resistance Weld Seal 28.704MHz  $\pm 15$ ppm at 25°C,  $\pm 30$ ppm over -40°C to +85°C 18pF Parallel Resonant

## ELECTRICAL SPECIFICATIONS

|                               |                                                        |
|-------------------------------|--------------------------------------------------------|
| Nominal Frequency             | 28.704MHz                                              |
| Frequency Tolerance/Stability | $\pm 15$ ppm at 25°C, $\pm 30$ ppm over -40°C to +85°C |
| Aging at 25°C                 | $\pm 5$ ppm/year Maximum                               |
| Load Capacitance              | 18pF Parallel Resonant                                 |
| Shunt Capacitance (C0)        | 7pF Maximum                                            |
| Equivalent Series Resistance  | 40 Ohms Maximum                                        |
| Mode of Operation             | AT-Cut Fundamental                                     |
| Drive Level                   | 1mWatt Maximum                                         |
| Storage Temperature Range     | -40°C to +85°C                                         |
| Insulation Resistance         | 500 Megaohms Minimum at 100Vdc                         |

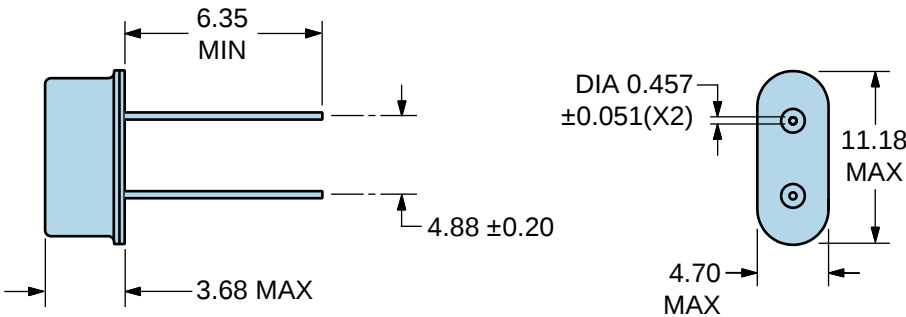
## ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

|                              |                                      |
|------------------------------|--------------------------------------|
| Fine Leak Test               | MIL-STD-883, Method 1014 Condition A |
| 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  |
| Resistance to Soldering Heat | MIL-STD-202, Method 210              |
| Resistance to Solvents       | MIL-STD-202, Method 215              |
| Solderability                | MIL-STD-883, Method 2003             |
| Temperature Cycling          | MIL-STD-883, Method 1010             |
| Vibration                    | MIL-STD-883, Method 2007 Condition A |

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MECHANICAL DIMENSIONS (all dimensions in millimeters)



| LINE | MARKING                                                                               |
|------|---------------------------------------------------------------------------------------|
| 1    | <b>E28.704M</b><br><i>E=Ecliptek Designator</i><br><i>M=Frequency Unit of Measure</i> |

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Tape & Reel Dimensions

All Dimensions in Millimeters  
Compliant to EIA-481

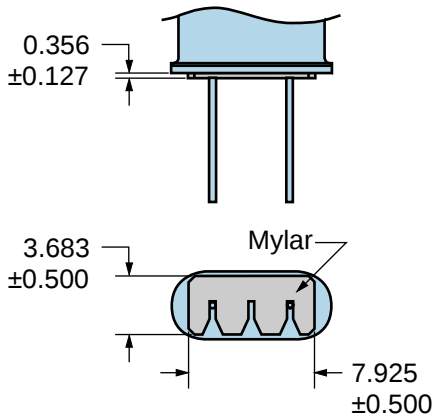


\*Compliant to EIA 468B



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Value Added Option - Mylar Insulator Tab



All dimensions are in millimeters

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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                              |

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Recommended Solder Reflow Methods



Low Temperature Solder Bath (Wave Solder)

|                                     |                                                       |
|-------------------------------------|-------------------------------------------------------|
| TS MAX to TL (Ramp-up Rate)         | 5°C/Second Maximum                                    |
| Preheat                             |                                                       |
| - Temperature Minimum (TS MIN)      | N/A                                                   |
| - Temperature Typical (TS TYP)      | 150°C                                                 |
| - Temperature Maximum (TS MAX)      | N/A                                                   |
| - Time (ts MIN)                     | 30 - 60 Seconds                                       |
| Ramp-up Rate (TL to TP)             | 5°C/Second Maximum                                    |
| Time Maintained Above:              |                                                       |
| - Temperature (TL)                  | 150°C                                                 |
| - Time (tL)                         | 200 Seconds Maximum                                   |
| Peak Temperature (TP)               | 245°C Maximum                                         |
| Target Peak Temperature (TP Target) | 245°C Maximum 1 Time / 235°C Maximum 2 Times          |
| Time within 5°C of actual peak (tP) | 5 Seconds Maximum 1 Time / 15 Seconds Maximum 2 Times |
| 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.