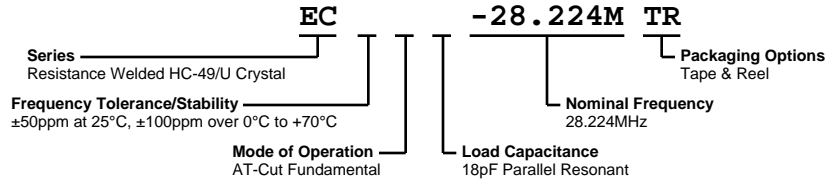


# EC-28.224M TR



## ELECTRICAL SPECIFICATIONS

|                               |   |
|-------------------------------|---|
| Nominal Frequency             | 28.224MHz                                 |
| Frequency Tolerance/Stability | ±50ppm at 25°C, ±100ppm over 0°C to +70°C |
| Aging at 25°C                 | ±5ppm/year Maximum                        |
| Load Capacitance              | 18pF Parallel Resonant                    |
| Shunt Capacitance (C0)        | 7pF Maximum                               |
| Equivalent Series Resistance  | 25 Ohms Maximum                           |
| Mode of Operation             | AT-Cut Fundamental                        |
| Drive Level                   | 2mWatts 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 |

## MECHANICAL DIMENSIONS (all dimensions in millimeters)

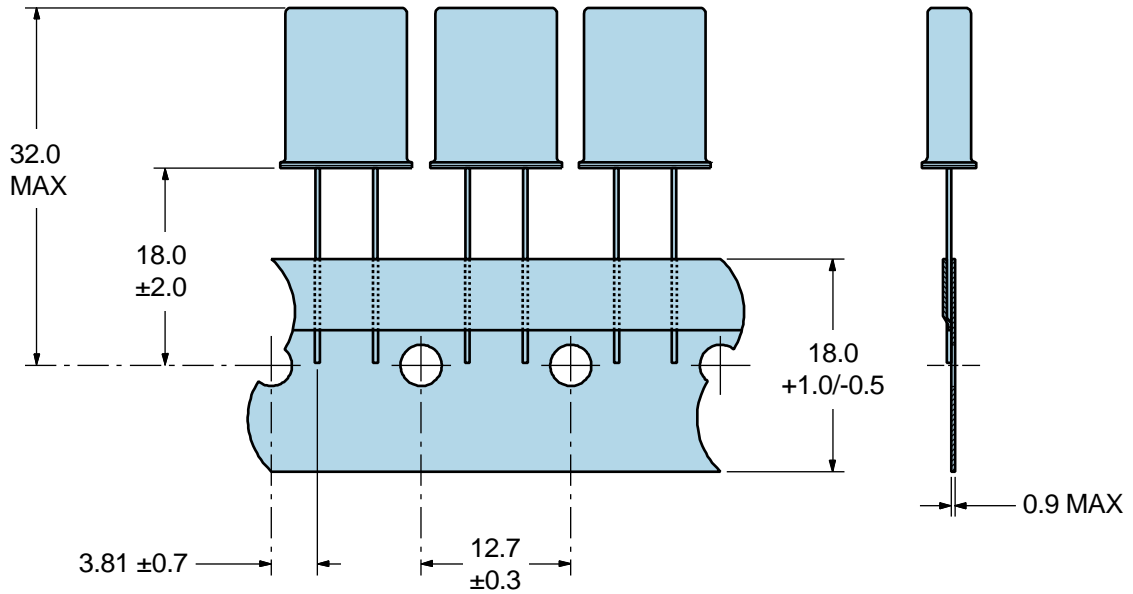


| LINE | MARKING   |
|------|---|
| 1    | ECLIPTEK  |
| 2    | E28.224M<br>E=Ecliptek Designator or Blank (No Marking) |
| 3    | XX<br>XX=Ecliptek Manufacturing Code                    |

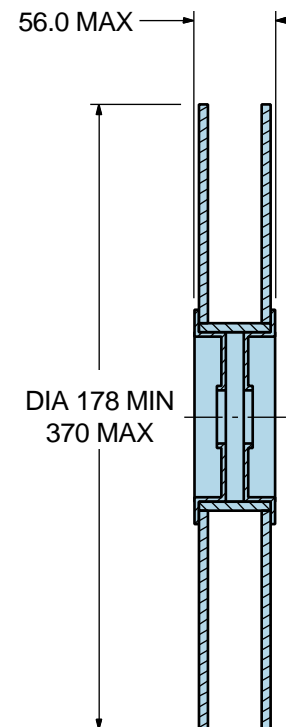
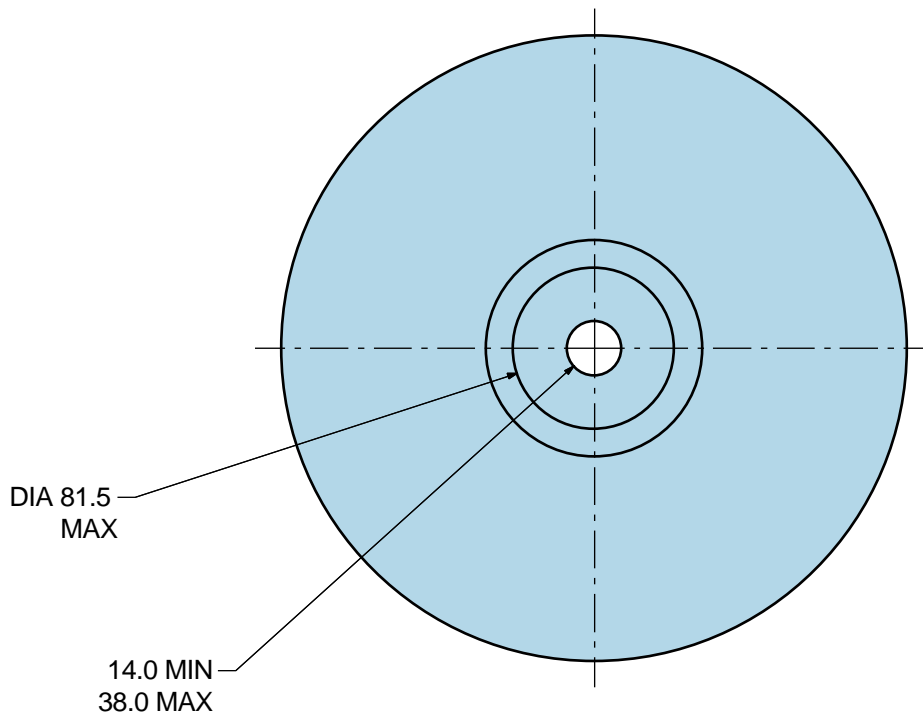
# EC-28.224M TR

## Tape & Reel Dimensions

Quantity Per Reel: 1,000 Pieces



\*Compliant to EIA 468B



## Recommended Solder Reflow Methods



### High Temperature Solder Bath (Wave Solder)

|  |                                      |
|--|--------------------------------------|
| <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                              |

## Recommended Solder Reflow Methods



### Low Temperature Solder Bath (Wave Solder)

|  |   |
|--|---|
| $T_s$ 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)  | 30 - 60 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>                 | 245°C Maximum   |
| <b>Target Peak Temperature (<math>T_p</math> Target)</b>   | 245°C Maximum 1 Time / 235°C Maximum 2 Times          |
| <b>Time within 5°C of actual peak (<math>t_p</math>)</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   |

### 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.