

# E1SDA16-12.960M TR



## ITEM DESCRIPTION

Quartz Crystal Resonator HC49/UP Short 2 Pad Surface Mount (SMD) 3.2mm Height Metal Resistance Weld Seal 12.960MHz  $\pm 30$ ppm at 25°C,  $\pm 50$ ppm over 0°C to +70°C 16pF Parallel Resonant

## ELECTRICAL SPECIFICATIONS

|                               |                                                      |
|-------------------------------|------------------------------------------------------|
| Nominal Frequency             | 12.960MHz                                            |
| Frequency Tolerance/Stability | $\pm 30$ ppm at 25°C, $\pm 50$ ppm over 0°C to +70°C |
| Aging at 25°C                 | $\pm 5$ ppm/year Maximum                             |
| Load Capacitance              | 16pF Parallel Resonant                               |
| Shunt Capacitance             | 7pF Maximum                                          |
| Equivalent Series Resistance  | 70 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         |
| 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>E12.960M</b><br>E=Ecliptek Designator |

## Suggested Solder Pad Layout

All Dimensions in Millimeters



All Tolerances are ±0.1

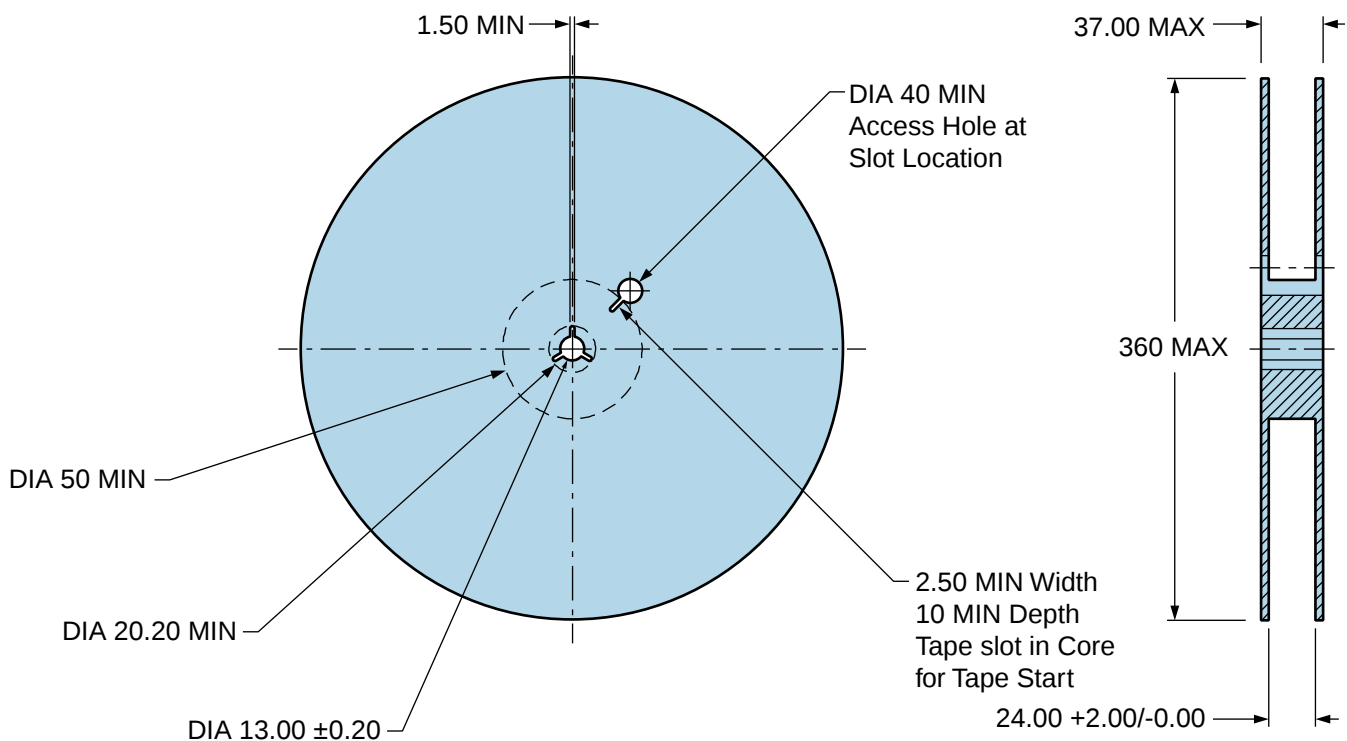
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## Tape & Reel Dimensions

Quantity Per Reel: 1,000 units

All Dimensions in Millimeters

Compliant to EIA-481



## Recommended Solder Reflow Methods



### High Temperature Infrared/Convection

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

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## Recommended Solder Reflow Methods



### Low Temperature Infrared/Convection 245°C Time (t)

**$T_s$  MAX to  $T_L$  (Ramp-up Rate)** 5°C/Second Maximum

#### Preheat

- 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

**Ramp-up Rate ( $T_L$  to  $T_P$ )** 5°C/Second Maximum

#### Time Maintained Above:

- Temperature ( $T_L$ ) 150°C
- Time ( $t_L$ ) 200 Seconds Maximum

**Peak Temperature ( $T_P$ )** 245°C Maximum

**Target Peak Temperature ( $T_P$  Target)** 245°C Maximum 2 Times / 230°C Maximum 1 Time

**Time within 5°C of actual peak ( $t_P$ )** 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.