

# EC3SM-12-20.000M TR

[Click part number to visit Part Number Details page](#)

## REGULATORY COMPLIANCE (Data Sheet downloaded on May 3, 2019)



## ITEM DESCRIPTION

Quartz Crystal Resonator HC49/UP 4 Pad Surface Mount (SMD) 4.0mm Height Metal Resistance Weld Seal 20.000MHz  $\pm 50$ ppm at 25°C,  $\pm 100$ ppm over 0°C to +70°C 12pF Parallel Resonant

## ELECTRICAL SPECIFICATIONS

|                               |                                                       |
|-------------------------------|-------------------------------------------------------|
| Nominal Frequency             | 20.000MHz                                             |
| Frequency Tolerance/Stability | $\pm 50$ ppm at 25°C, $\pm 100$ ppm over 0°C to +70°C |
| Aging at 25°C                 | $\pm 5$ ppm/year Maximum                              |
| Load Capacitance              | 12pF Parallel Resonant                                |
| Shunt Capacitance (C0)        | 7pF Maximum                                           |
| Equivalent Series Resistance  | 50 Ohms Maximum                                       |
| Mode of Operation             | AT-Cut Fundamental                                    |
| Drive Level                   | 1mWatts Maximum                                       |
| Storage Temperature Range     | -40°C to +85°C                                        |
| Insulation Resistance         | 500 Megaohms Minimum at 100Vdc                        |

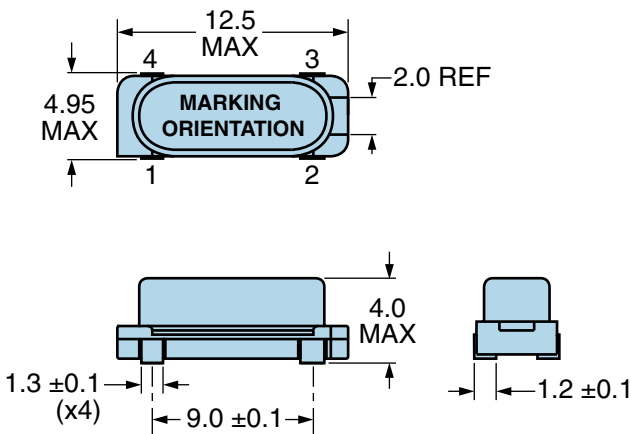
## ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

|                              |                                      |
|------------------------------|--------------------------------------|
| Fine Leak Test               | MIL-STD-883, Method 1014 Condition A |
| Gross Leak Test              | MIL-STD-883, Method 1014 Condition C |
| 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 |

EC3SM-12-20.000M TR

[Click part number to visit Part Number Details page](#)

MECHANICAL DIMENSIONS (all dimensions in millimeters)

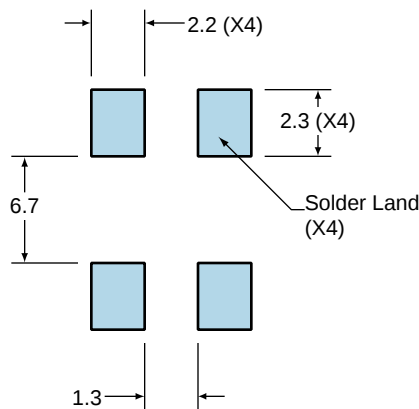


| PIN | CONNECTION         |
|-----|--------------------|
| 1   | Crystal            |
| 2   | Connected to Pin 3 |
| 3   | Connected to Pin 2 |
| 4   | Crystal            |

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

Suggested Solder Pad Layout

All Dimensions in Millimeters



All Tolerances are ±0.1

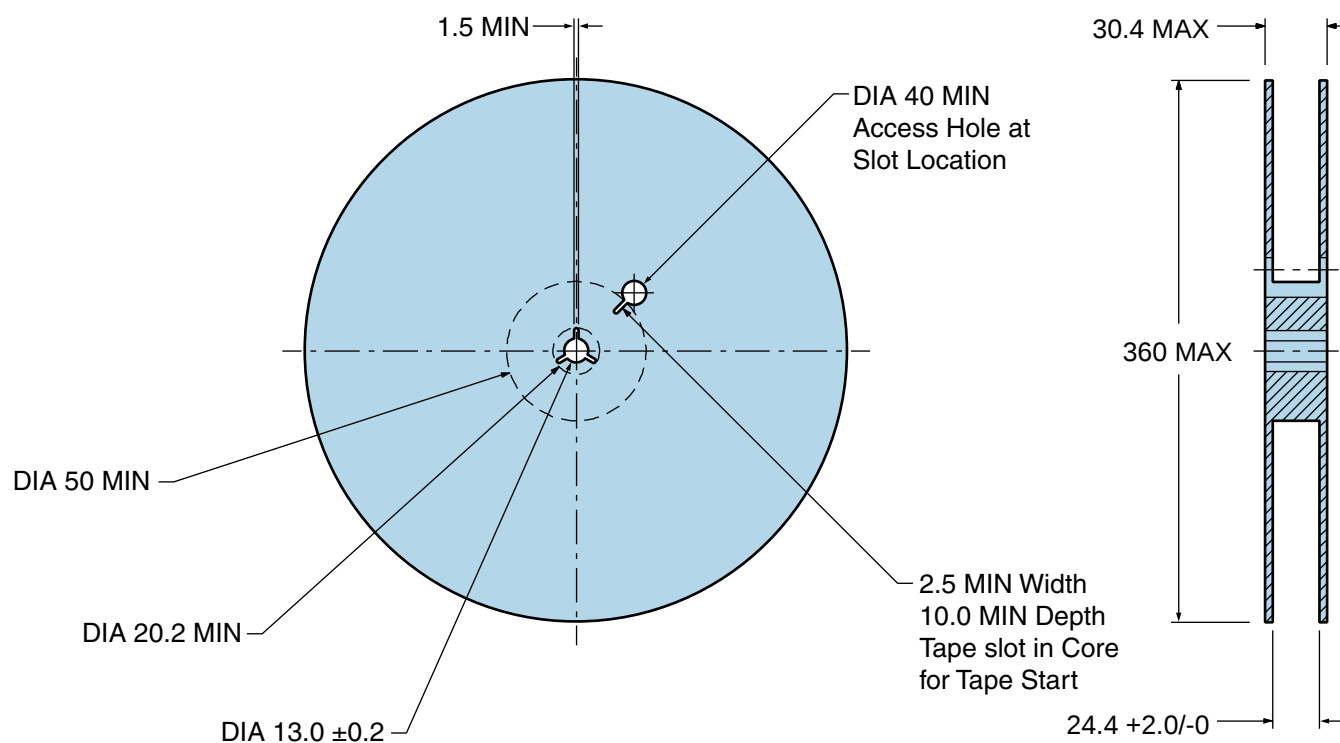
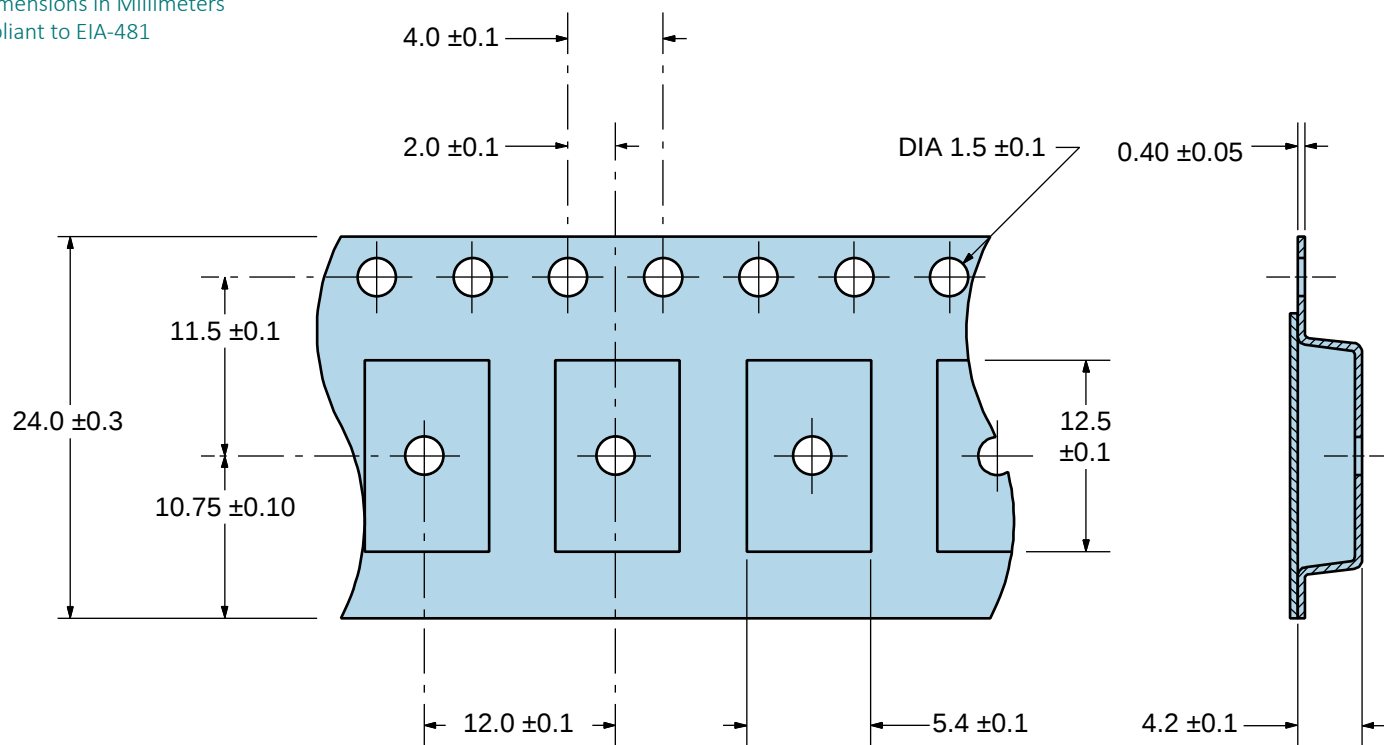
# EC3SM-12-20.000M TR

## Tape & Reel Dimensions

Quantity Per Reel: 1,000 units

All Dimensions in Millimeters

Compliant to EIA-481



EC3SM-12-20.000M TR

[Click part number to visit Part Number Details page](#)

Recommended Solder Reflow Methods



Low Temperature Infrared/Convection 225°C

|                                     |                            |
|-------------------------------------|----------------------------|
| 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)               | 225°C Maximum              |
| Target Peak Temperature (TP Target) | 225°C Maximum 2 Times      |
| Time within 5°C of actual peak (tp) | 80 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.