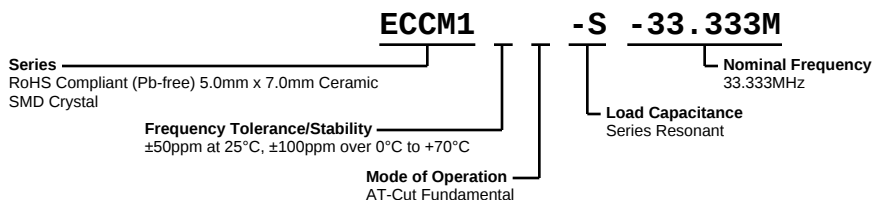


# ECCM1-S-33.333M



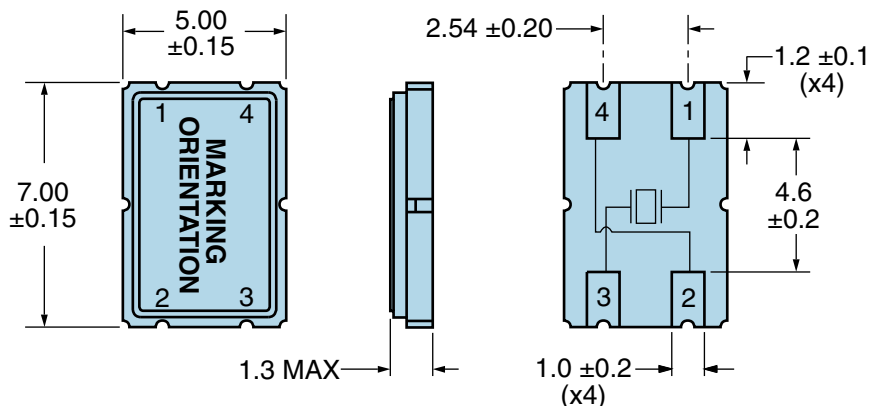
## ELECTRICAL SPECIFICATIONS

|                               |                                                |
|-------------------------------|------------------------------------------------|
| Nominal Frequency             | 33.333MHz                                      |
| Frequency Tolerance/Stability | ±50ppm at 25°C, ±100ppm over 0°C to +70°C      |
| Aging at 25°C                 | ±3ppm/year Maximum                             |
| Load Capacitance              | Series Resonant                                |
| Shunt Capacitance (C0)        | 7pF Maximum                                    |
| Equivalent Series Resistance  | 30 Ohms Maximum                                |
| Mode of Operation             | AT-Cut Fundamental                             |
| Drive Level                   | 50µWatts Maximum, 50µWatts Correlation         |
| 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         |

## MECHANICAL DIMENSIONS (all dimensions in millimeters)



Note: Chamfer and index mark not shown.

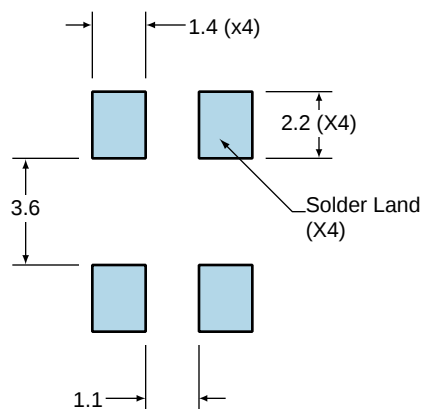
| PIN | CONNECTION   |
|-----|--------------|
| 1   | Crystal      |
| 2   | Cover/Ground |
| 3   | Crystal      |
| 4   | Cover/Ground |

| LINE | MARKING                                                 |
|------|---------------------------------------------------------|
| 1    | <b>E33.33</b><br>E=Ecliptek Designator                  |
| 2    | <b>XXXXX</b><br>XXXXX=Ecliptek Manufacturing Identifier |

# ECCM1-S-33.333M

## Suggested Solder Pad Layout

All Dimensions in Millimeters



All Tolerances are  $\pm 0.1$

## Recommended Solder Reflow Methods



### High Temperature Infrared/Convection

|                                                          |                    |
|----------------------------------------------------------|--------------------|
| <b>T<sub>s</sub> MAX to T<sub>L</sub> (Ramp-up Rate)</b> | 3°C/second Maximum |
|----------------------------------------------------------|--------------------|

#### Preheat

|                                            |                  |
|--------------------------------------------|------------------|
| - Temperature Minimum (T <sub>s</sub> MIN) | 150°C            |
| - Temperature Typical (T <sub>s</sub> TYP) | 175°C            |
| - Temperature Maximum (T <sub>s</sub> MAX) | 200°C            |
| - Time (t <sub>s</sub> MIN)                | 60 - 180 Seconds |

|                                                      |                    |
|------------------------------------------------------|--------------------|
| <b>Ramp-up Rate (T<sub>L</sub> to T<sub>P</sub>)</b> | 3°C/second Maximum |
|------------------------------------------------------|--------------------|

#### Time Maintained Above:

|                                 |                  |
|---------------------------------|------------------|
| - Temperature (T <sub>L</sub> ) | 217°C            |
| - Time (t <sub>L</sub> )        | 60 - 150 Seconds |

|                                         |                                      |
|-----------------------------------------|--------------------------------------|
| <b>Peak Temperature (T<sub>P</sub>)</b> | 260°C Maximum for 10 Seconds Maximum |
|-----------------------------------------|--------------------------------------|

|                                                       |               |
|-------------------------------------------------------|---------------|
| <b>Target Peak Temperature (T<sub>P</sub> Target)</b> | 250°C +0/-5°C |
|-------------------------------------------------------|---------------|

|                                                       |                 |
|-------------------------------------------------------|-----------------|
| <b>Time within 5°C of actual peak (t<sub>p</sub>)</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 Infrared/Convection 240°C

$T_s$  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) 60 - 120 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 ( $T_p$ ) 240°C Maximum

Target Peak Temperature ( $T_p$  Target) 240°C Maximum 1 Time / 230°C Maximum 2 Times

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.