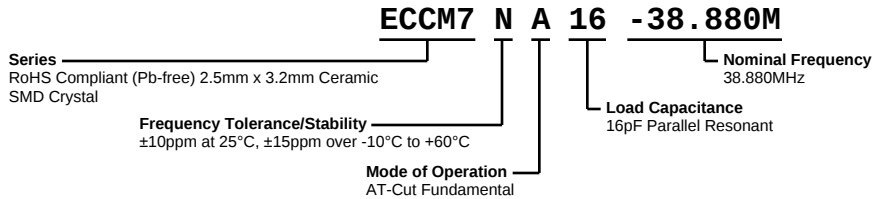


# ECCM7NA16-38.880M



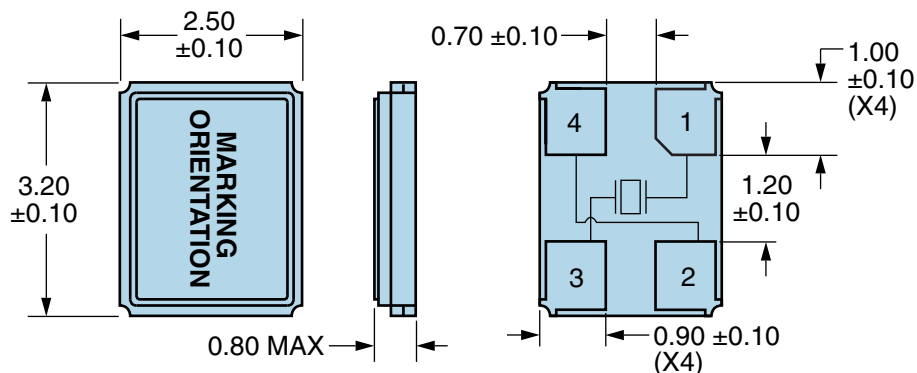
## ELECTRICAL SPECIFICATIONS

|                               |                                                                                                               |
|-------------------------------|---------------------------------------------------------------------------------------------------------------|
| Nominal Frequency             | 38.880MHz                                                                                                     |
| Frequency Tolerance/Stability | $\pm 10\text{ppm}$ at $25^\circ\text{C}$ , $\pm 15\text{ppm}$ over $-10^\circ\text{C}$ to $+60^\circ\text{C}$ |
| Aging at $25^\circ\text{C}$   | $\pm 3\text{ppm}/\text{Year}$ Maximum                                                                         |
| Load Capacitance              | 16pF Parallel Resonant                                                                                        |
| Shunt Capacitance (C0)        | 5pF Maximum                                                                                                   |
| Equivalent Series Resistance  | 60 Ohms Maximum                                                                                               |
| Mode of Operation             | AT-Cut Fundamental                                                                                            |
| Drive Level                   | 100 $\mu$ Watts Maximum                                                                                       |
| Crystal Cut                   | AT-Cut                                                                                                        |
| Spurious Response             | >3dB (from $F_0$ to $F_0 + 5000\text{ppm}$ )                                                                  |
| Storage Temperature Range     | $-40^\circ\text{C}$ to $+85^\circ\text{C}$                                                                    |
| Insulation Resistance         | 500 Megaohms Minimum 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)



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

| LINE | MARKING                                                 |
|------|---------------------------------------------------------|
| 1    | <b>E38.8</b><br>E=Ecliptek Designator                   |
| 2    | <b>XXXXX</b><br>XXXXX=Ecliptek Manufacturing Identifier |

# ECCM7NA16-38.880M

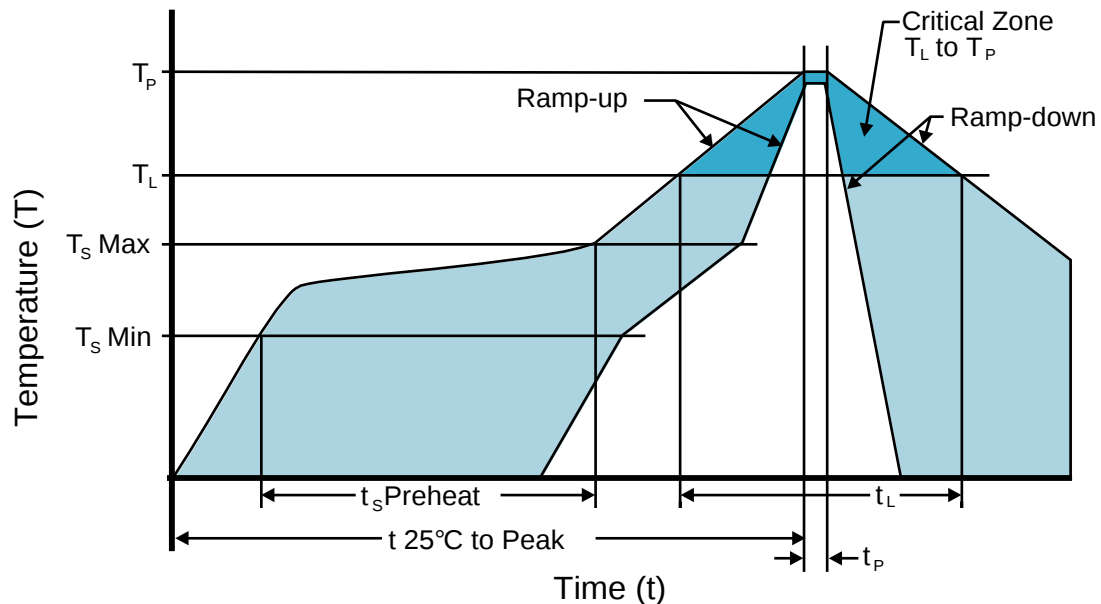
## Suggested Solder Pad Layout

All Dimensions in Millimeters



All Tolerances are  $\pm 0.1$

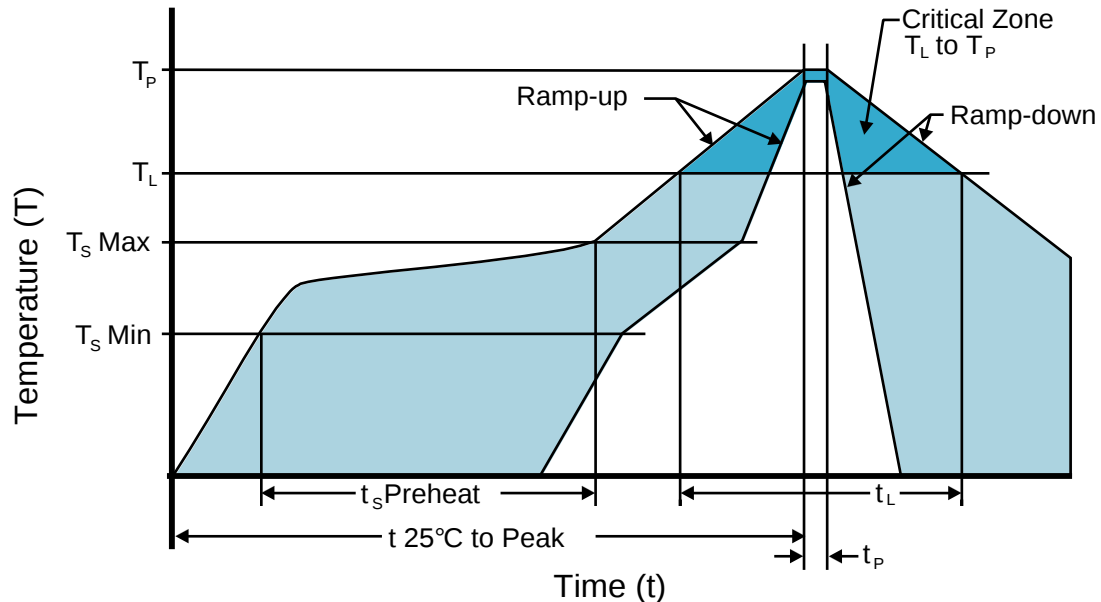
## Recommended Solder Reflow Methods



### High Temperature Infrared/Convection

|                                                            |                                      |
|------------------------------------------------------------|--------------------------------------|
| $T_S$ MAX to $T_L$ (Ramp-up Rate)                          | 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 Infrared/Convection 245°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) 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.