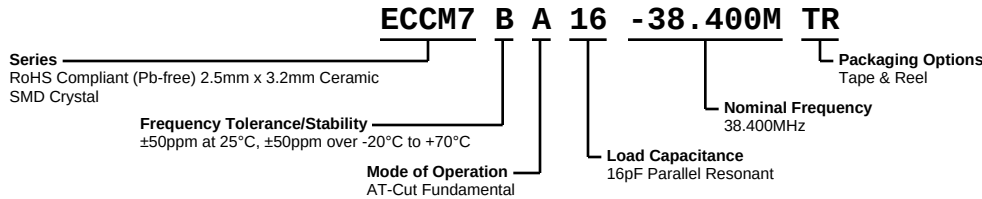


# ECCM7BA16-38.400M TR



**ECLIPTEK**  
CORPORATION



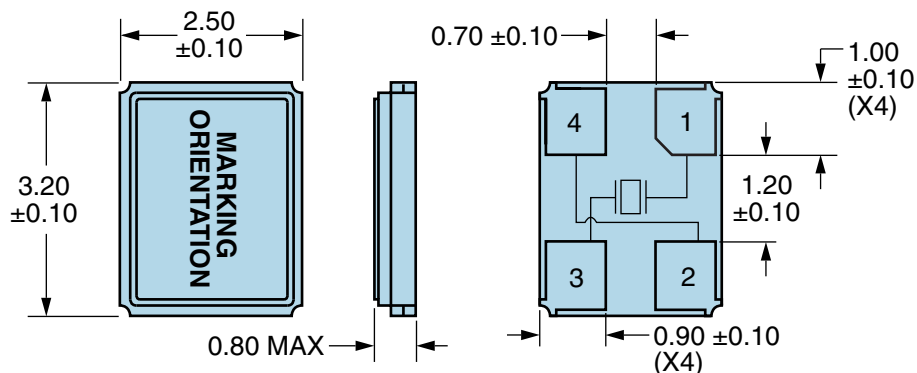
## ELECTRICAL SPECIFICATIONS

|                               |                                            |
|-------------------------------|--------------------------------------------|
| Nominal Frequency             | 38.400MHz                                  |
| Frequency Tolerance/Stability | ±50ppm at 25°C, ±50ppm over -20°C to +70°C |
| Aging at 25°C                 | ±3ppm/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                   | 100µWatts Maximum                          |
| Crystal Cut                   | AT-Cut                                     |
| Spurious Response             | >3dB (from Fo to Fo +5000ppm)              |
| Storage Temperature Range     | -40°C to +85°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)



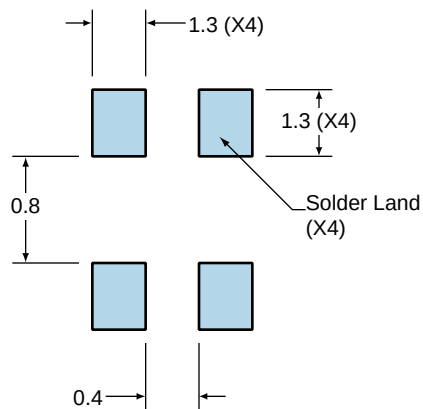
| PIN | CONNECTION   |
|-----|--------------|
| 1   | Crystal      |
| 2   | Cover/Ground |
| 3   | Crystal      |
| 4   | Cover/Ground |

| LINE | MARKING                                                 |
|------|---------------------------------------------------------|
| 1    | <b>E38.4</b><br>E=Ecliptek Designator                   |
| 2    | <b>XXXXX</b><br>XXXXX=Ecliptek Manufacturing Identifier |

# ECCM7BA16-38.400M TR

## Suggested Solder Pad Layout

All Dimensions in Millimeters

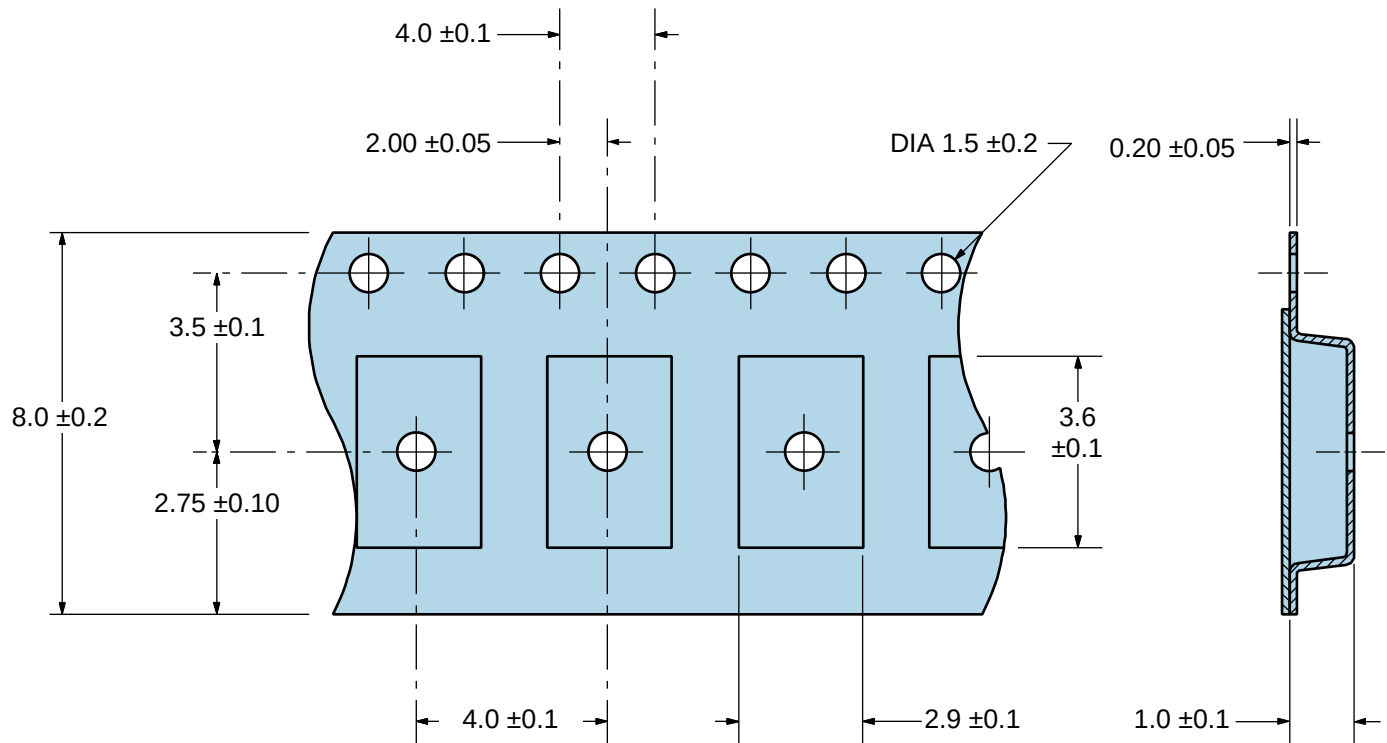


All Tolerances are  $\pm 0.1$

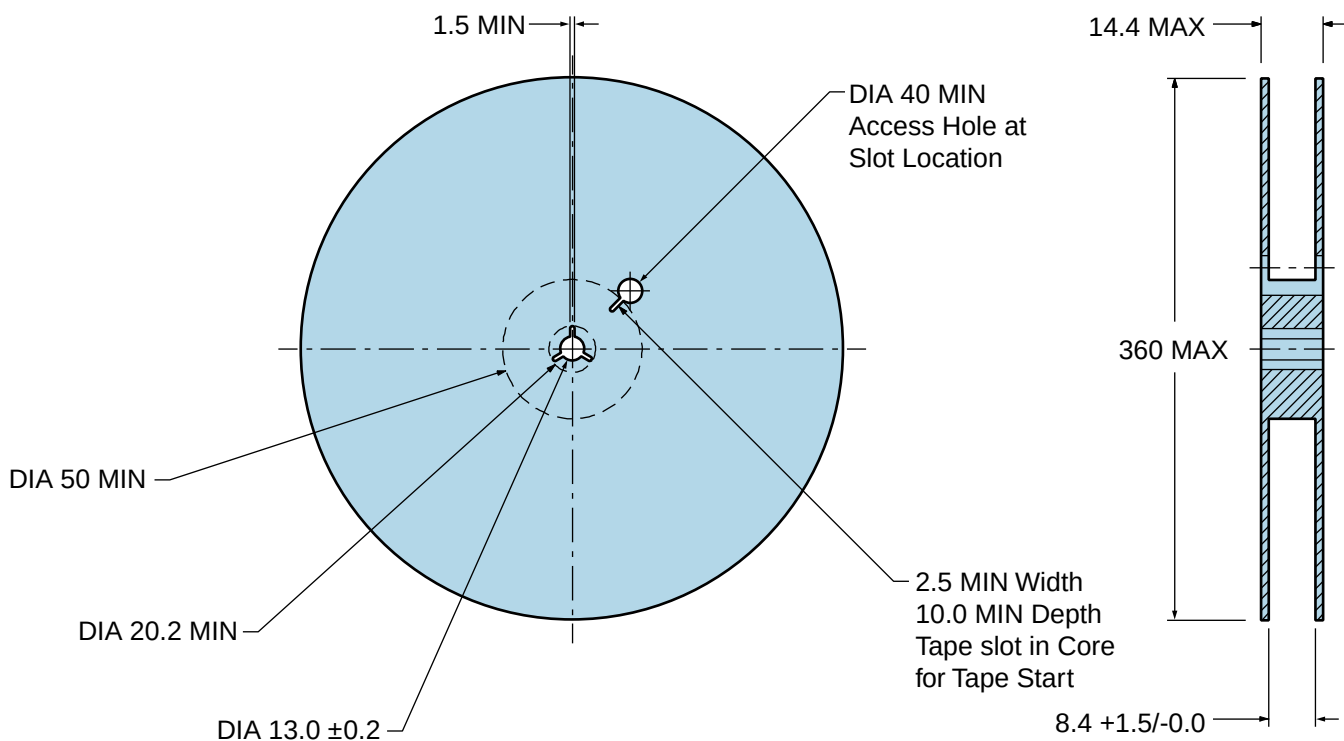
# ECCM7BA16-38.400M TR

## Tape & Reel Dimensions

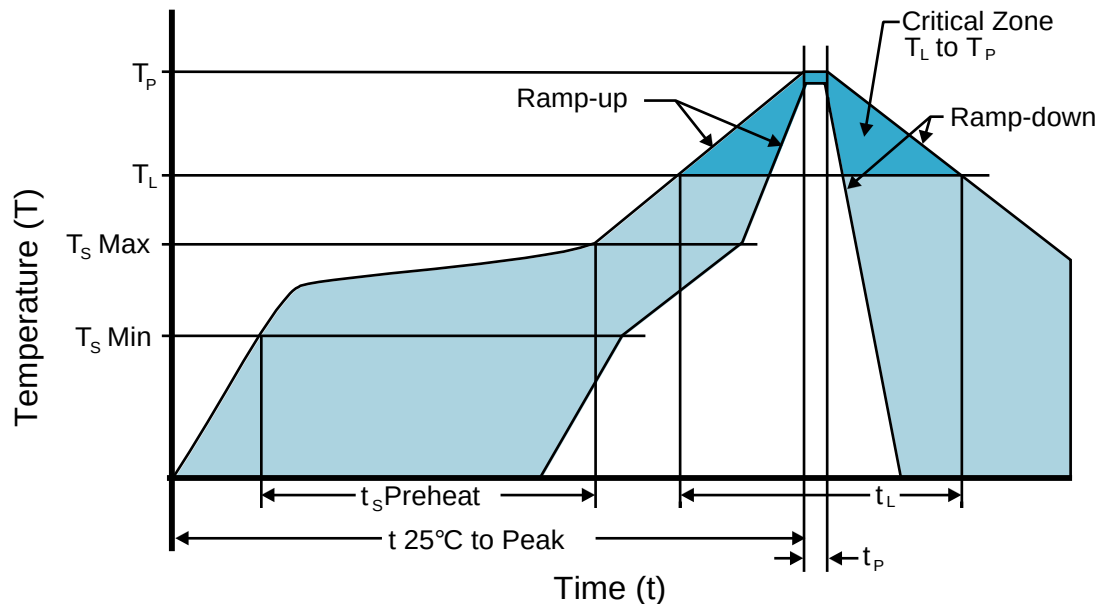
Quantity Per Reel: 3,000 units



\*Compliant to EIA 481A



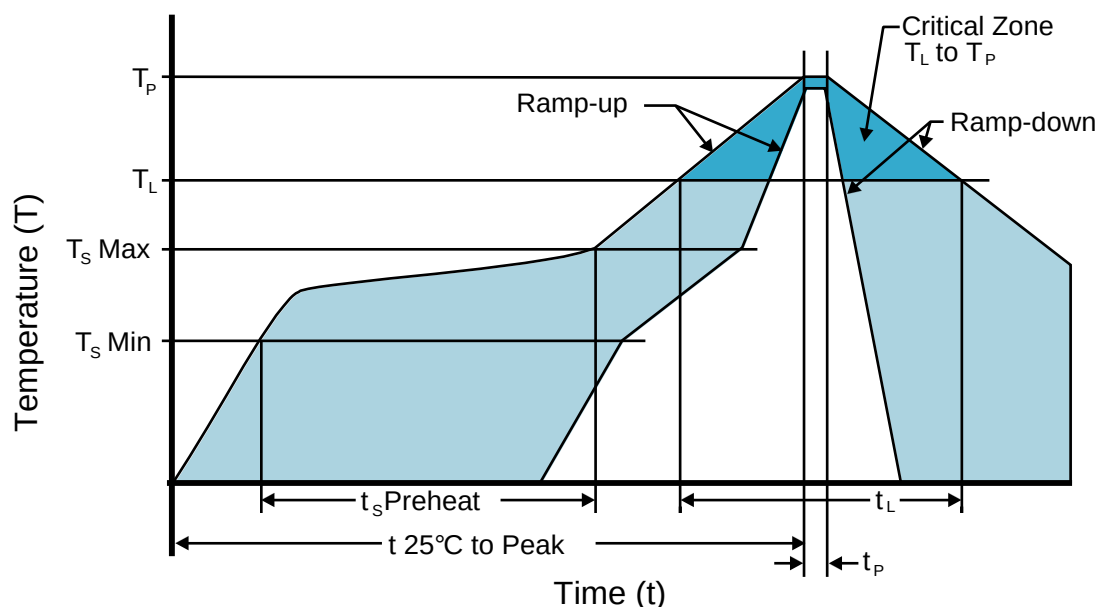
## Recommended Solder Reflow Methods



### 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.