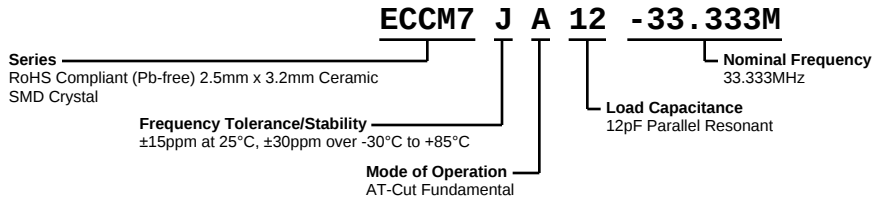


# ECCM7JA12-33.333M



**ECLIPTEK**  
CORPORATION



## ELECTRICAL SPECIFICATIONS

|                               |                                                                                                               |
|-------------------------------|---------------------------------------------------------------------------------------------------------------|
| Nominal Frequency             | 33.333MHz                                                                                                     |
| Frequency Tolerance/Stability | $\pm 15\text{ppm}$ at $25^\circ\text{C}$ , $\pm 30\text{ppm}$ over $-30^\circ\text{C}$ to $+85^\circ\text{C}$ |
| Aging at $25^\circ\text{C}$   | $\pm 3\text{ppm}/\text{Year}$ Maximum                                                                         |
| Load Capacitance              | 12pF 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>E33.3</b><br>E=EclipseTek Designator                   |
| 2    | <b>XXXXX</b><br>XXXXX=EclipseTek Manufacturing Identifier |

# ECCM7JA12-33.333M

## Suggested Solder Pad Layout

All Dimensions in Millimeters



All Tolerances are  $\pm 0.1$

## Recommended Solder Reflow Methods



### High Temperature Infrared/Convection

|                                                     |                    |
|-----------------------------------------------------|--------------------|
| T <sub>s</sub> MAX to T <sub>L</sub> (Ramp-up Rate) | 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 |

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

#### Time Maintained Above:

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

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

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

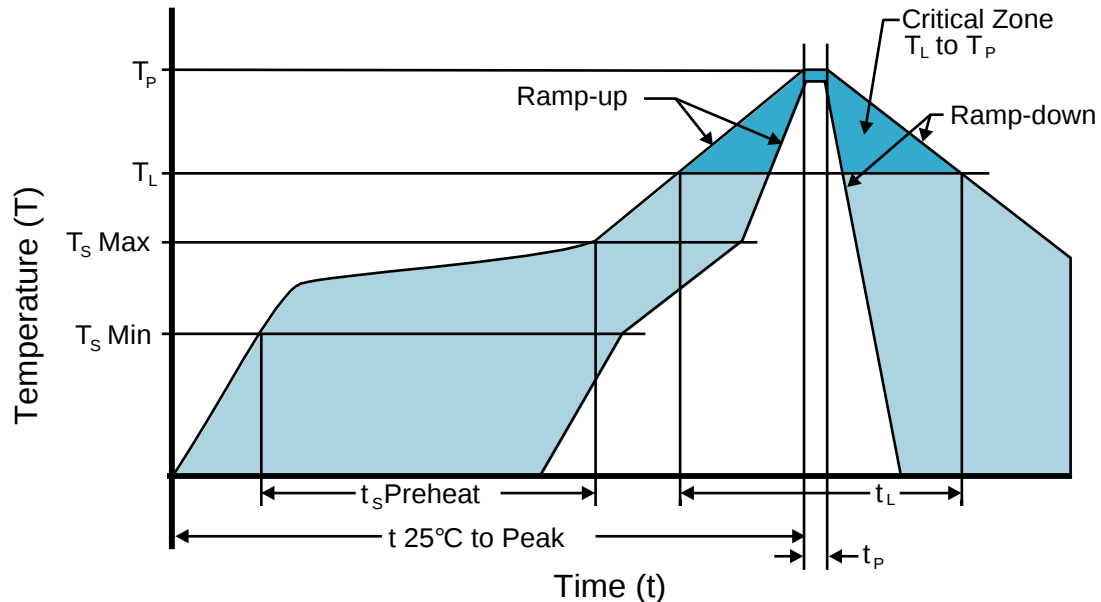
|                                                  |                 |
|--------------------------------------------------|-----------------|
| Time within 5°C of actual peak (t <sub>p</sub> ) | 20 - 40 seconds |
|--------------------------------------------------|-----------------|

|                |                    |
|----------------|--------------------|
| Ramp-down Rate | 6°C/second Maximum |
|----------------|--------------------|

|                                   |                   |
|-----------------------------------|-------------------|
| Time 25°C to Peak Temperature (t) | 8 minutes Maximum |
|-----------------------------------|-------------------|

|                            |         |
|----------------------------|---------|
| Moisture Sensitivity Level | 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.