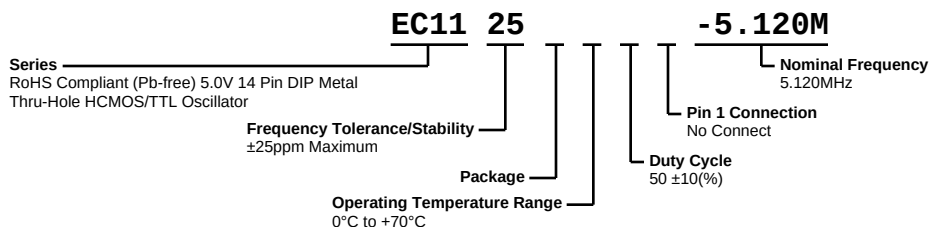


# EC1125-5.120M



**ECLIPTEK**  
CORPORATION



## ELECTRICAL SPECIFICATIONS

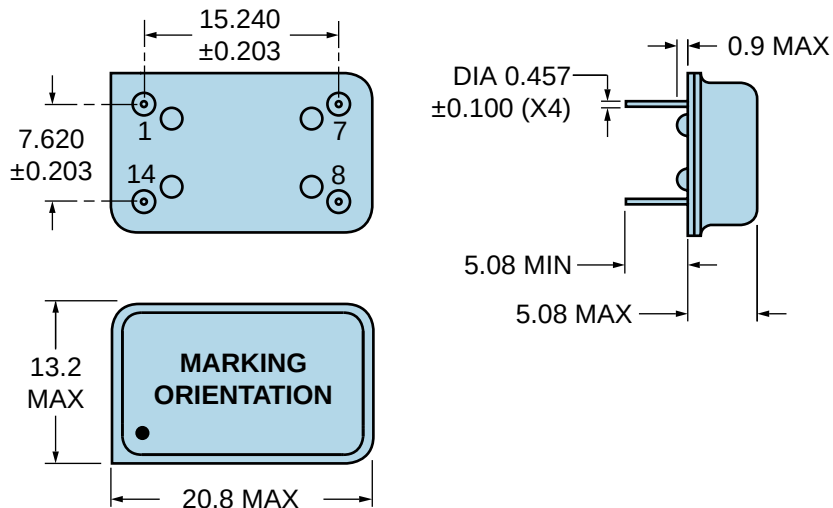
|                                       |                                                                                                                                                                                                                                        |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal Frequency                     | 5.120MHz                                                                                                                                                                                                                               |
| Frequency Tolerance/Stability         | $\pm 25$ ppm Maximum (Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, First Year Aging at 25°C, Shock, and Vibration) |
| Aging at 25°C                         | $\pm 5$ ppm/year Maximum                                                                                                                                                                                                               |
| Operating Temperature Range           | 0°C to +70°C                                                                                                                                                                                                                           |
| Supply Voltage                        | 5.0Vdc $\pm 10$ %                                                                                                                                                                                                                      |
| Input Current                         | 45mA Maximum                                                                                                                                                                                                                           |
| Output Voltage Logic High (Voh)       | 2.4Vdc Minimum with TTL Load, Vdd-0.5Vdc Minimum with HCMOS Load                                                                                                                                                                       |
| Output Voltage Logic Low (Vol)        | 0.4Vdc Maximum with TTL Load, 0.5Vdc Maximum with HCMOS Load                                                                                                                                                                           |
| Rise/Fall Time                        | 6nSec Maximum (Measured at 0.4Vdc to 2.4Vdc with TTL Load, at 20% to 80% of waveform with HCMOS Load)                                                                                                                                  |
| Duty Cycle                            | 50 $\pm 10$ (%) (Measured at 1.4Vdc with TTL Load or at 50% of waveform with HCMOS Load)                                                                                                                                               |
| Load Drive Capability                 | 10TTL or 50pF HCMOS Load                                                                                                                                                                                                               |
| Output Logic Type                     | CMOS                                                                                                                                                                                                                                   |
| Pin 1 Connection                      | No Connect                                                                                                                                                                                                                             |
| Tri-State Input Voltage (Vih and Vil) | +2.2Vdc Minimum to enable output, +0.8Vdc to disable output (High Impedance), No connect to enable output.                                                                                                                             |
| Absolute Clock Jitter                 | $\pm 100$ pSec Maximum                                                                                                                                                                                                                 |
| One Sigma Clock Period Jitter         | $\pm 25$ pSec Maximum                                                                                                                                                                                                                  |
| Start Up Time                         | 10mSec Maximum                                                                                                                                                                                                                         |
| Storage Temperature Range             | -55°C to +125°C                                                                                                                                                                                                                        |

## ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

|                              |                                       |
|------------------------------|---------------------------------------|
| Fine Leak Test               | MIL-STD-883, Method 1014, Condition A |
| Gross Leak Test              | MIL-STD-883, Method 1014, Condition C |
| Lead Integrity               | MIL-STD-883, Method 2004              |
| 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 |

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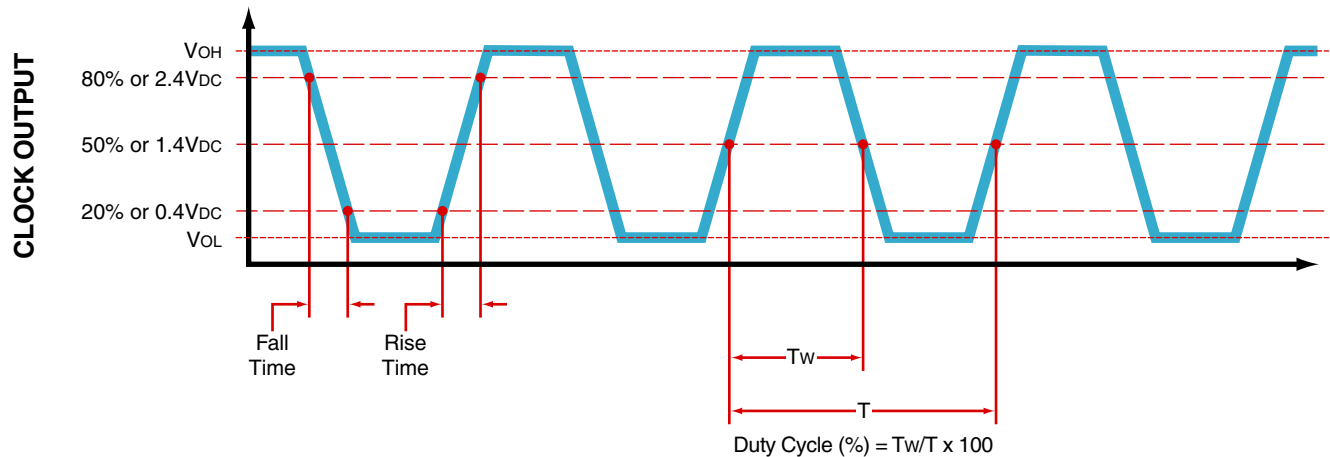
## MECHANICAL DIMENSIONS (all dimensions in millimeters)



| PIN | CONNECTION         |
|-----|--------------------|
| 1   | No Connect         |
| 7   | Ground/Case Ground |
| 8   | Output             |
| 14  | Supply Voltage     |

| LINE | MARKING                                                                                   |
|------|-------------------------------------------------------------------------------------------|
| 1    | <b>ECLIPTEK</b>                                                                           |
| 2    | <b>EC11</b><br>EC11=Product Series                                                        |
| 3    | <b>5.120M</b>                                                                             |
| 4    | <b>XXYZZ</b><br>XX=Ecliptek Manufacturing Code<br>Y=Last Digit of Year<br>ZZ=Week of Year |

## OUTPUT WAVEFORM

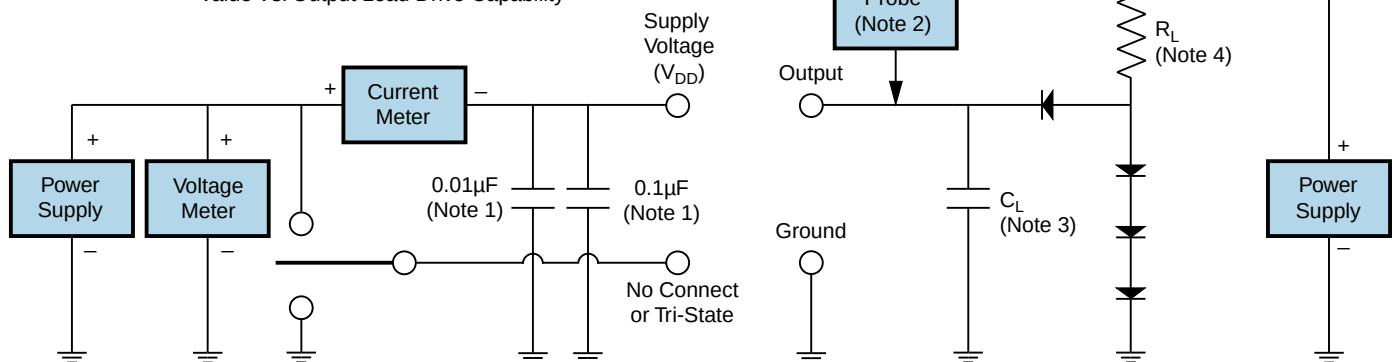


# EC1125-5.120M

## Test Circuit for TTL Output

| Output Load Drive Capability | $R_L$ Value (Ohms) | $C_L$ Value (pF) |
|------------------------------|--------------------|------------------|
| 10TTL                        | 390                | 15               |
| 5TTL                         | 780                | 15               |
| 2TTL                         | 1100               | 6                |
| 10LSTTL                      | 2000               | 15               |
| 1TTL                         | 2200               | 3                |

Table 1:  $R_L$  Resistance Value and  $C_L$  Capacitance Value Vs. Output Load Drive Capability



Note 1: An external 0.1 $\mu$ F low frequency tantalum bypass capacitor in parallel with a 0.01 $\mu$ F high frequency ceramic bypass capacitor close to the package ground and  $V_{DD}$  pin is required.

Note 2: A low capacitance (<12pF), 10X attenuation factor, high impedance (>10Mohms), and high bandwidth (>300MHz) passive probe is recommended.

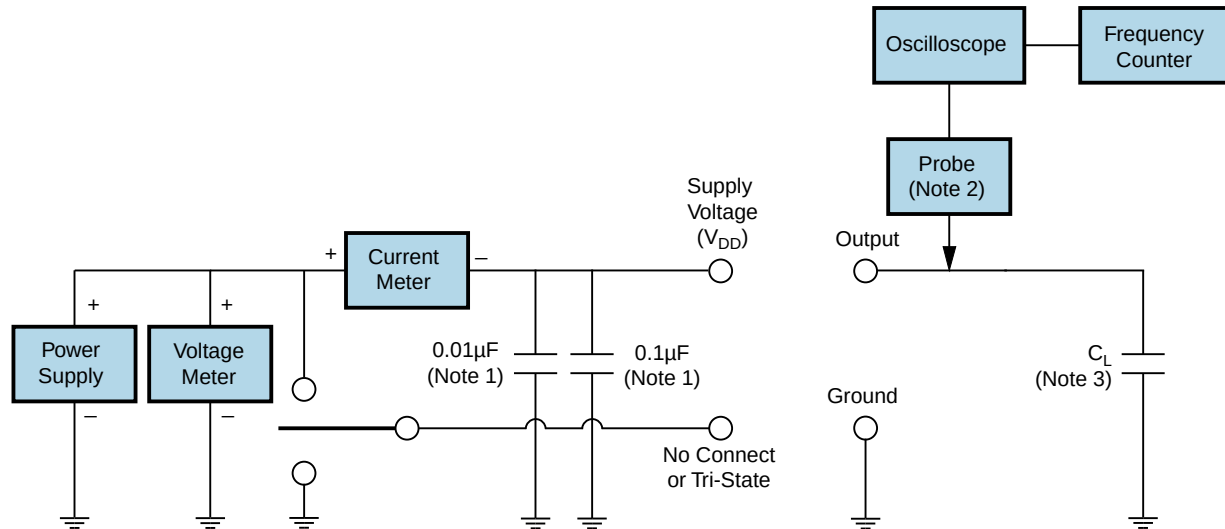
Note 3: Capacitance value  $C_L$  includes sum of all probe and fixture capacitance.

Note 4: Resistance value  $R_L$  is shown in Table 1. See applicable specification sheet for 'Load Drive Capability'.

Note 5: All diodes are MMBD7000, MMBD914, or equivalent.

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## Test Circuit for CMOS Output

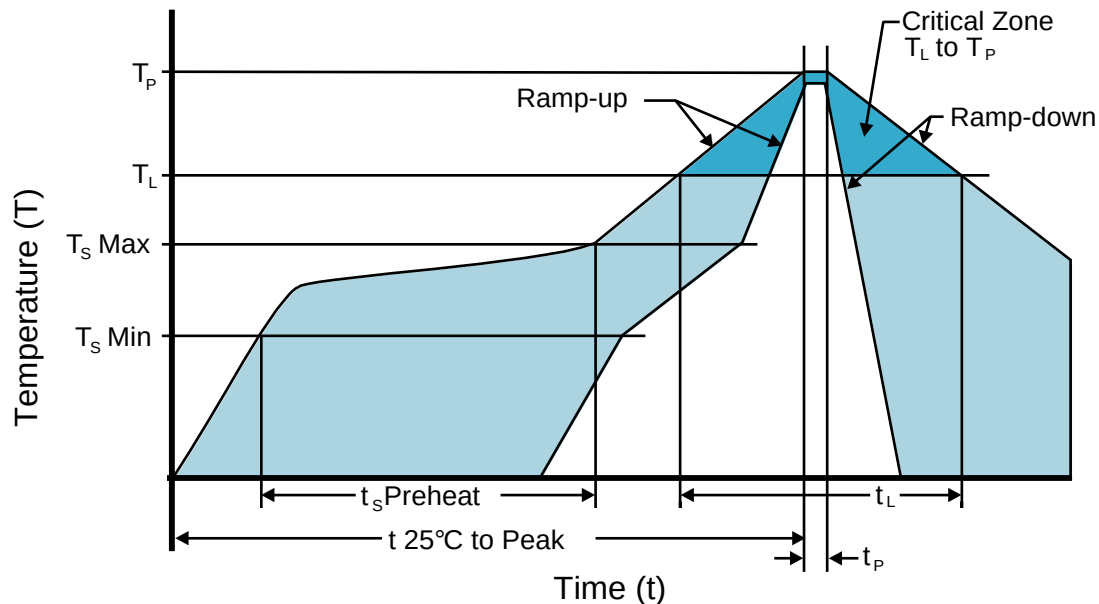


Note 1: An external  $0.1\mu\text{F}$  low frequency tantalum bypass capacitor in parallel with a  $0.01\mu\text{F}$  high frequency ceramic bypass capacitor close to the package ground and  $V_{DD}$  pin is required.

Note 2: A low capacitance ( $<12\text{pF}$ ), 10X attenuation factor, high impedance ( $>10\text{Mohms}$ ), and high bandwidth ( $>300\text{MHz}$ ) passive probe is recommended.

Note 3: Capacitance value  $C_L$  includes sum of all probe and fixture capacitance.

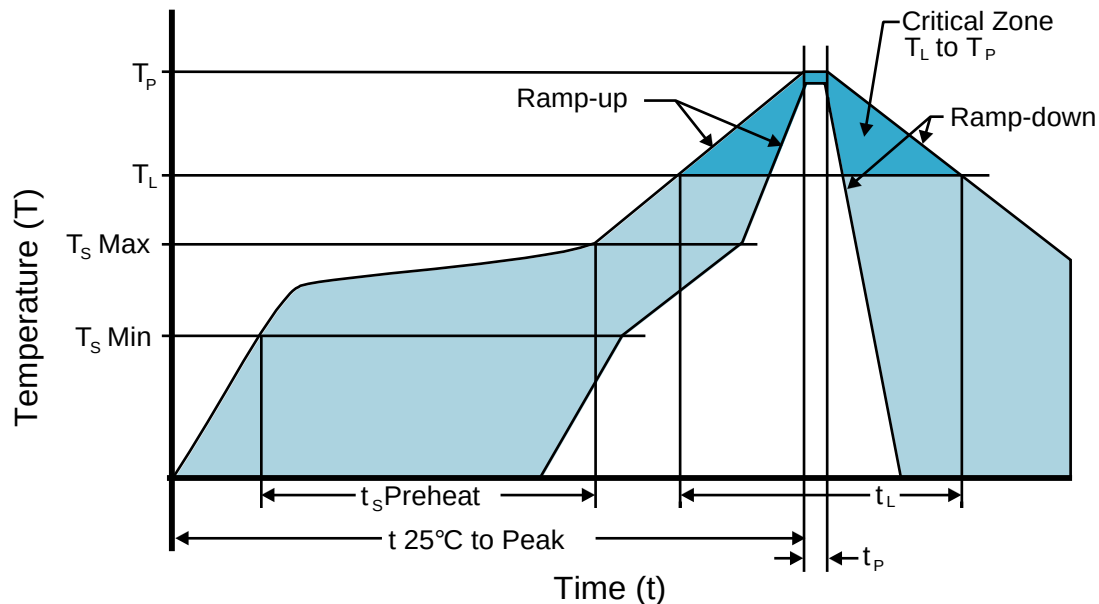
## Recommended Solder Reflow Methods



### High Temperature Solder Bath (Wave Solder)

|                                            |                                                                                                                                          |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ts MAX to TL (Ramp-up Rate)</b>         | 3°C/second Maximum                                                                                                                       |
| <b>Preheat</b>                             |                                                                                                                                          |
| - Temperature Minimum (Ts MIN)             | 150°C                                                                                                                                    |
| - Temperature Typical (Ts TYP)             | 175°C                                                                                                                                    |
| - Temperature Maximum (Ts MAX)             | 200°C                                                                                                                                    |
| - Time (ts MIN)                            | 60 - 180 Seconds                                                                                                                         |
| <b>Ramp-up Rate (TL to Tp)</b>             | 3°C/second Maximum                                                                                                                       |
| <b>Time Maintained Above:</b>              |                                                                                                                                          |
| - Temperature (TL)                         | 217°C                                                                                                                                    |
| - Time (tL)                                | 60 - 150 Seconds                                                                                                                         |
| <b>Peak Temperature (Tp)</b>               | 260°C Maximum for 10 Seconds Maximum                                                                                                     |
| <b>Target Peak Temperature (Tp Target)</b> | 250°C +0/-5°C                                                                                                                            |
| <b>Time within 5°C of actual peak (tp)</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                                                                                                                                  |
| <b>Additional Notes</b>                    | Temperatures shown are applied to back of PCB board and device leads only. Do not use this method for product with the Gull Wing option. |

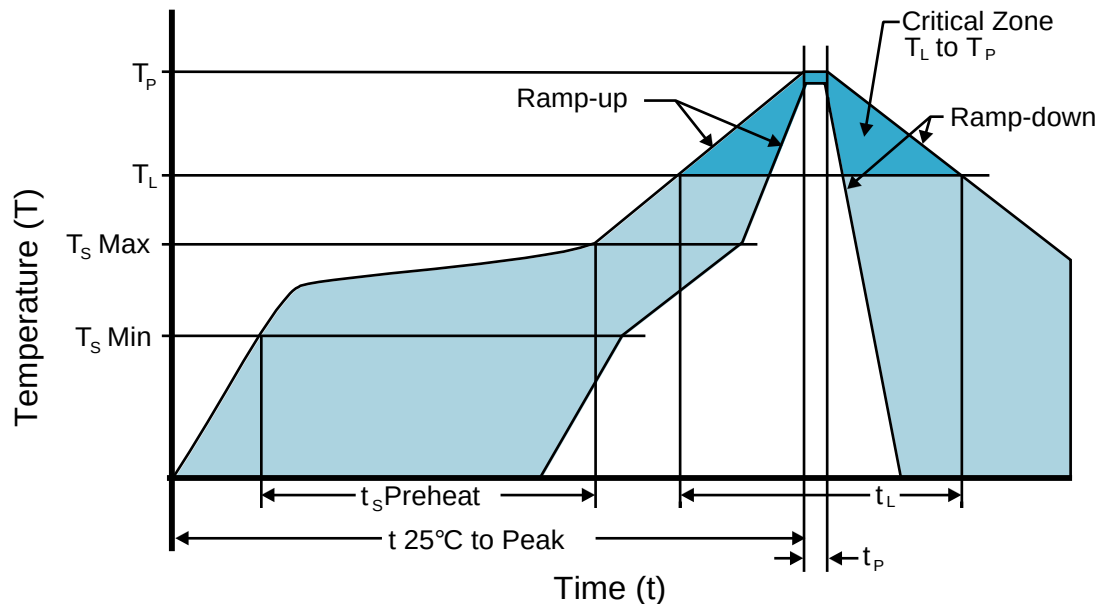
## Recommended Solder Reflow Methods



### Low Temperature Infrared/Convection 185°C

|                                                          |                                                                                                               |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>T<sub>s</sub> MAX to T<sub>L</sub> (Ramp-up Rate)</b> | 5°C/second Maximum                                                                                            |
| <b>Preheat</b>                                           |                                                                                                               |
| - Temperature Minimum (T <sub>s</sub> MIN)               | N/A                                                                                                           |
| - Temperature Typical (T <sub>s</sub> TYP)               | 150°C                                                                                                         |
| - Temperature Maximum (T <sub>s</sub> MAX)               | N/A                                                                                                           |
| - Time (t <sub>s</sub> MIN)                              | 60 - 120 Seconds                                                                                              |
| <b>Ramp-up Rate (T<sub>L</sub> to T<sub>p</sub>)</b>     | 5°C/second Maximum                                                                                            |
| <b>Time Maintained Above:</b>                            |                                                                                                               |
| - Temperature (T <sub>L</sub> )                          | 150°C                                                                                                         |
| - Time (t <sub>L</sub> )                                 | 200 Seconds Maximum                                                                                           |
| <b>Peak Temperature (T<sub>p</sub>)</b>                  | 185°C Maximum                                                                                                 |
| <b>Target Peak Temperature (T<sub>p</sub> Target)</b>    | 185°C Maximum 2 Times                                                                                         |
| <b>Time within 5°C of actual peak (t<sub>p</sub>)</b>    | 10 seconds Maximum 2 Times                                                                                    |
| <b>Ramp-down Rate</b>                                    | 5°C/second Maximum                                                                                            |
| <b>Time 25°C to Peak Temperature (t)</b>                 | N/A                                                                                                           |
| <b>Moisture Sensitivity Level</b>                        | Level 1                                                                                                       |
| <b>Additional Notes</b>                                  | Temperatures shown are applied to body of device. Use this method only for product with the Gull Wing option. |

## Recommended Solder Reflow Methods



### Low Temperature Solder Bath (Wave Solder)

|                                                                |                                                                                                                                          |
|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <b><math>T_s</math> MAX to <math>T_L</math> (Ramp-up Rate)</b> | 5°C/second Maximum                                                                                                                       |
| <b>Preheat</b>                                                 |                                                                                                                                          |
| - 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                                                                                                                          |
| <b>Ramp-up Rate (<math>T_L</math> to <math>T_p</math>)</b>     | 5°C/second Maximum                                                                                                                       |
| <b>Time Maintained Above:</b>                                  |                                                                                                                                          |
| - Temperature ( $T_L$ )                                        | 150°C                                                                                                                                    |
| - Time ( $t_L$ )                                               | 200 Seconds Maximum                                                                                                                      |
| <b>Peak Temperature (<math>T_p</math>)</b>                     | 245°C Maximum                                                                                                                            |
| <b>Target Peak Temperature (<math>T_p</math> Target)</b>       | 245°C Maximum 1 Time / 235°C Maximum 2 Times                                                                                             |
| <b>Time within 5°C of actual peak (<math>t_p</math>)</b>       | 5 seconds Maximum 1 Time / 15 seconds Maximum 2 Times                                                                                    |
| <b>Ramp-down Rate</b>                                          | 5°C/second Maximum                                                                                                                       |
| <b>Time 25°C to Peak Temperature (t)</b>                       | N/A                                                                                                                                      |
| <b>Moisture Sensitivity Level</b>                              | Level 1                                                                                                                                  |
| <b>Additional Notes</b>                                        | Temperatures shown are applied to back of PCB board and device leads only. Do not use this method for product with the Gull Wing option. |

### Low Temperature Manual Soldering

185°C Maximum for 10 seconds Maximum, 2 times Maximum. (Temperatures listed are applied to device leads only. This method can be utilized with both Gull Wing and Non-Gull Wing devices.)

### High Temperature Manual Soldering

260°C Maximum for 5 seconds Maximum, 2 times Maximum. (Temperatures listed are applied to device leads only. This method can be utilized with both Gull Wing and Non-Gull Wing devices.)