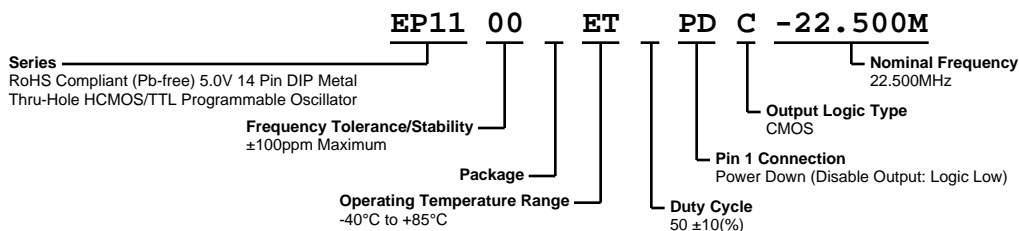


EP1100ETPDC-22.500M



ECLIPTEK
CORPORATION



ELECTRICAL SPECIFICATIONS

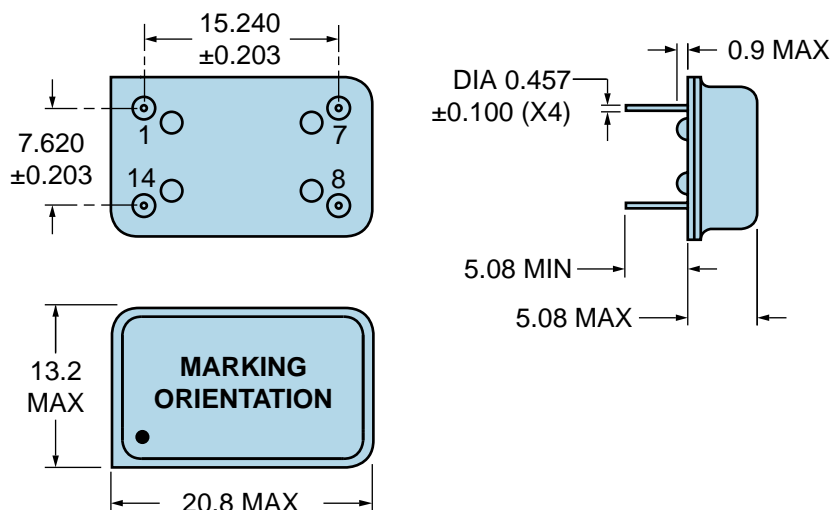
| | |
|-----------------------------------|---|
| Nominal Frequency | 22.500MHz |
| Frequency Tolerance/Stability | $\pm 100\text{ppm}$ Maximum (Inclusive of all conditions: Calibration Tolerance at 25°C , Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, First Year Aging at 25°C , Shock, and Vibration) |
| Aging at 25°C | $\pm 5\text{ppm/year}$ Maximum |
| Operating Temperature Range | -40°C to $+85^{\circ}\text{C}$ |
| Supply Voltage | 5.0Vdc $\pm 10\%$ |
| Input Current | 45mA Maximum (Unloaded) |
| Output Voltage Logic High (Voh) | Vdd-0.4Vdc Minimum (IOH = -16mA) |
| Output Voltage Logic Low (Vol) | 0.4Vdc Maximum (IOL = +16mA) |
| Rise/Fall Time | 4nSec Maximum (Measured at 20% to 80% of waveform) |
| Duty Cycle | $50 \pm 10(\%)$ (Measured at 1.4Vdc with TTL Load; Measured at 50% of waveform with HCMOS Load) |
| Load Drive Capability | 50pF HCMOS Load Maximum |
| Output Logic Type | CMOS |
| Pin 1 Connection | Power Down (Disable Output: Logic Low) |
| Pin 1 Input Voltage (Vih and Vil) | +2.0Vdc Minimum to enable output, +0.8Vdc to disable output, No Connect to enable output. |
| Standby Current | 50 μA Maximum (Pin 1 = Ground) |
| Disable Current | 30mA Maximum (Pin 1 = Ground) |
| Peak to Peak Jitter (tPK) | 100pSec Maximum, 50pSec Typical |
| RMS Period Jitter (tRMS) | 13pSec Maximum, 8pSec Typical |
| Start Up Time | 10mSec Maximum |
| Storage Temperature Range | -55°C to $+125^{\circ}\text{C}$ |

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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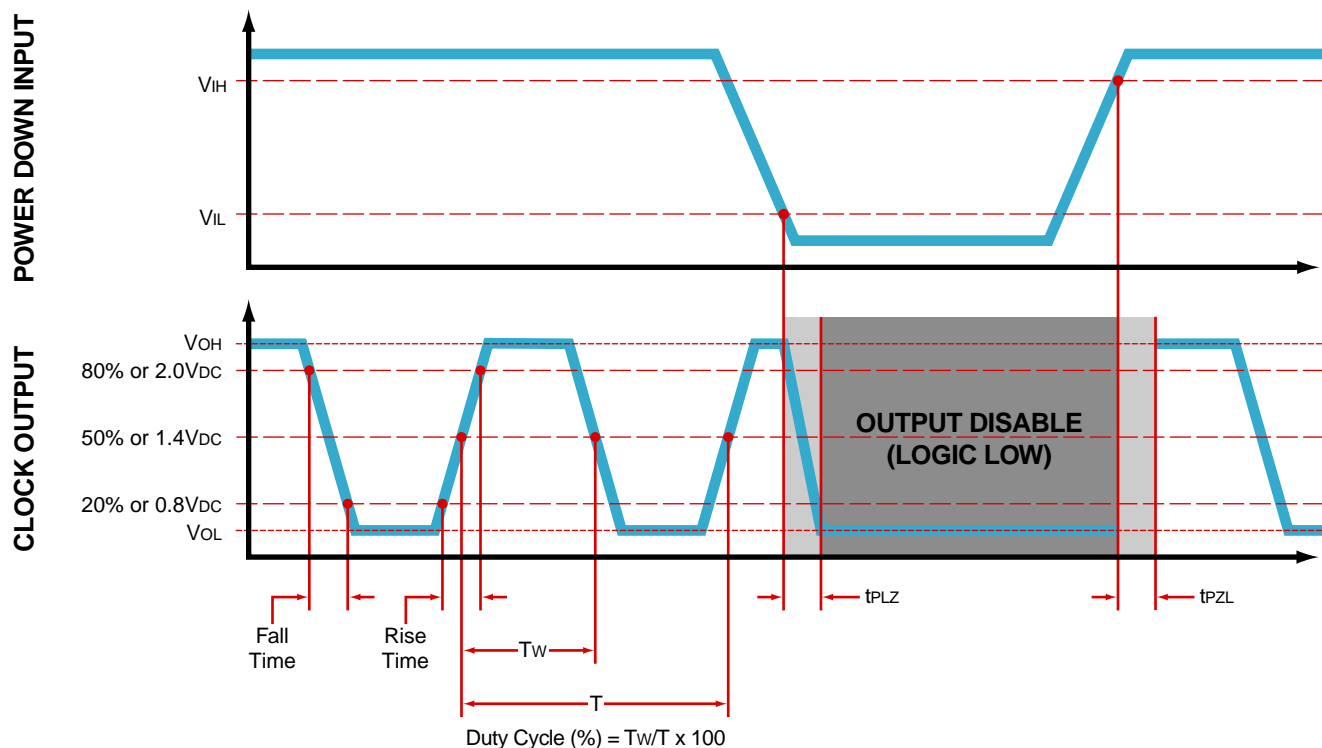
MECHANICAL DIMENSIONS (all dimensions in millimeters)



| PIN | CONNECTION |
|-----|------------------------|
| 1 | Power Down (Logic Low) |
| 7 | Ground/Case Ground |
| 8 | Output |
| 14 | Supply Voltage |

| LINE | MARKING |
|------|--|
| 1 | ECLIPTEK |
| 2 | EP11PD <i>EP11=Product Series</i> |
| 3 | 22.500M |
| 4 | XXYYZ <i>XX=Ecliptek Manufacturing Code</i> <i>Y=Last Digit of the Year</i> <i>ZZ=Week of the Year</i> |

OUTPUT WAVEFORM & TIMING DIAGRAM

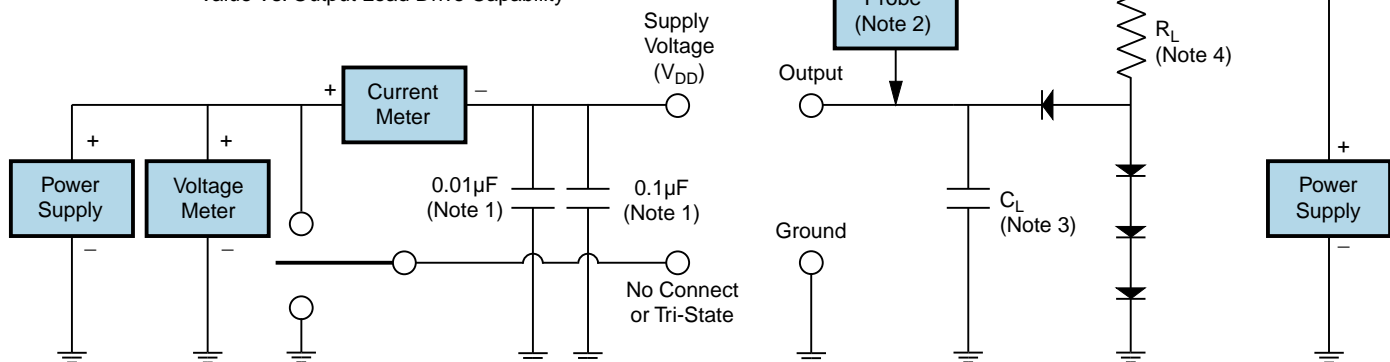


EP1100ETPDC-22.500M

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 0.1μF low frequency tantalum bypass capacitor in parallel with a 0.01μF 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.

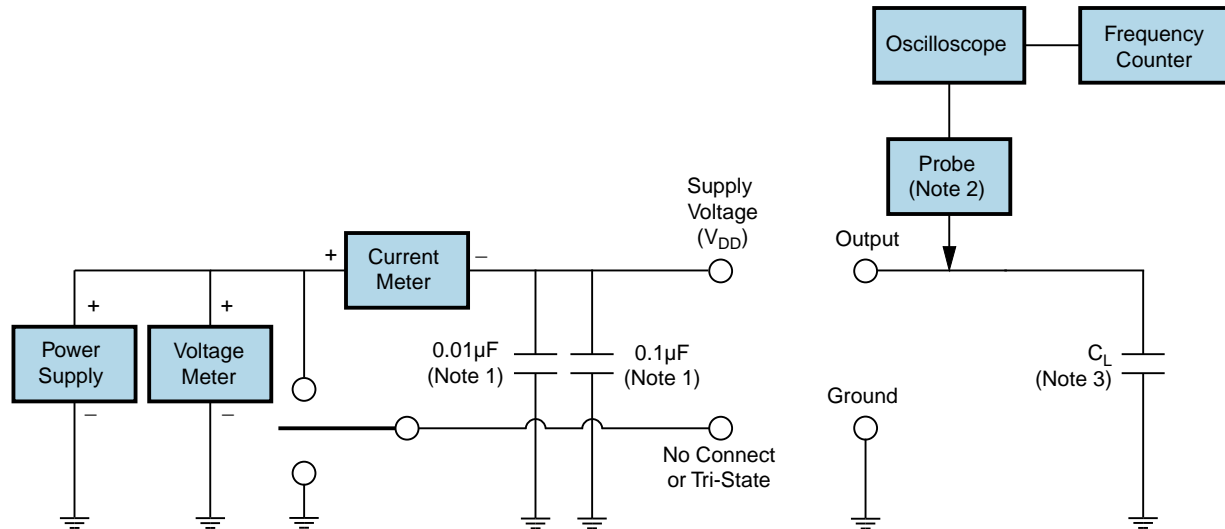
Note 3: Capacitance value C_L includes sum of all probe and fixture capacitance.

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.

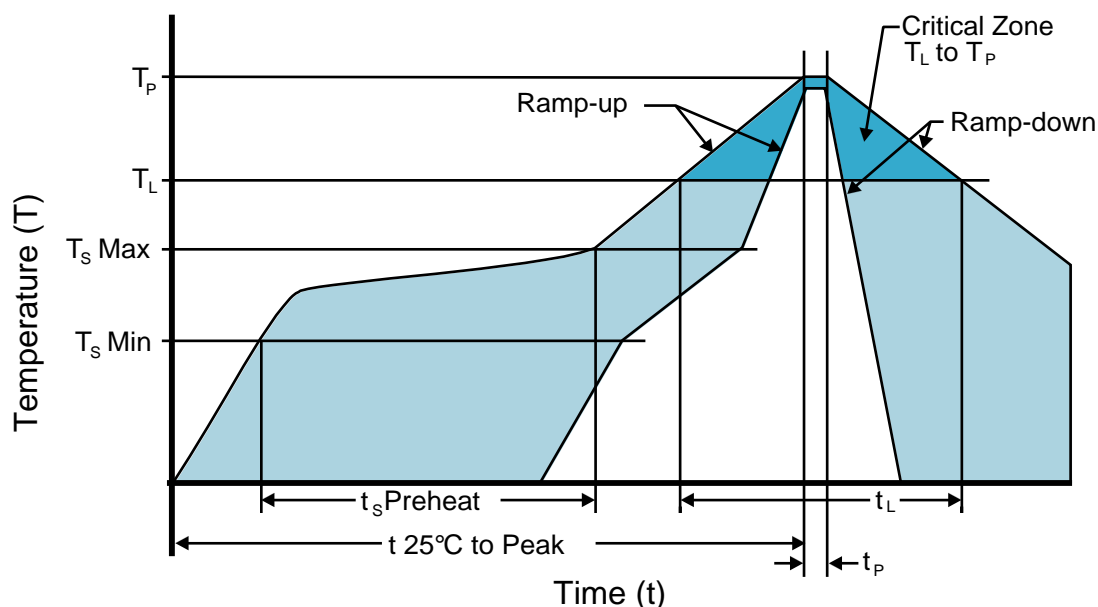
Recommended Solder Reflow Methods



High Temperature Solder Bath (Wave Solder)

| | |
|--|--|
| T_s MAX to T_L (Ramp-up Rate) | 3°C/second Maximum |
| Preheat | |
| - 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 |
| Ramp-up Rate (T_L to T_p) | 3°C/second Maximum |
| Time Maintained Above: | |
| - Temperature (T_L) | 217°C |
| - Time (t_L) | 60 - 150 Seconds |
| Peak Temperature (T_p) | 260°C Maximum for 10 Seconds Maximum |
| Target Peak Temperature (T_p Target) | 250°C +0/-5°C |
| Time within 5°C of actual peak (t_p) | 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 |
| Additional Notes | 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. |

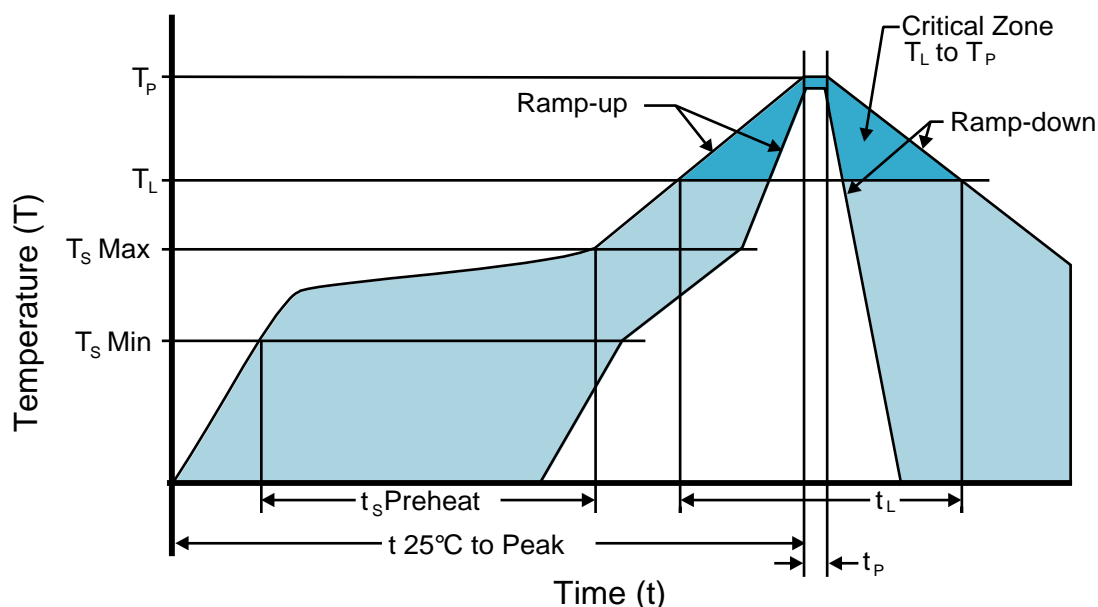
Recommended Solder Reflow Methods



Low Temperature Infrared/Convection 185°C

| | |
|--|---|
| $T_s \text{ MAX}$ to T_L (Ramp-up Rate) | 5°C/second Maximum |
| Preheat | |
| - Temperature Minimum ($T_s \text{ MIN}$) | N/A |
| - Temperature Typical ($T_s \text{ TYP}$) | 150°C |
| - Temperature Maximum ($T_s \text{ MAX}$) | N/A |
| - Time ($t_s \text{ MIN}$) | 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) | 185°C Maximum |
| Target Peak Temperature ($T_p \text{ Target}$) | 185°C Maximum 2 Times |
| Time within 5°C of actual peak (t_p) | 10 seconds Maximum 2 Times |
| Ramp-down Rate | 5°C/second Maximum |
| Time 25°C to Peak Temperature (t) | N/A |
| Moisture Sensitivity Level | Level 1 |
| Additional Notes | 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)

| | |
|--|--|
| 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 1 Time / 235°C Maximum 2 Times |
| Time within 5°C of actual peak (t_p) | 5 seconds Maximum 1 Time / 15 seconds Maximum 2 Times |
| Ramp-down Rate | 5°C/second Maximum |
| Time 25°C to Peak Temperature (t) | N/A |
| Moisture Sensitivity Level | Level 1 |
| Additional Notes | 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.)