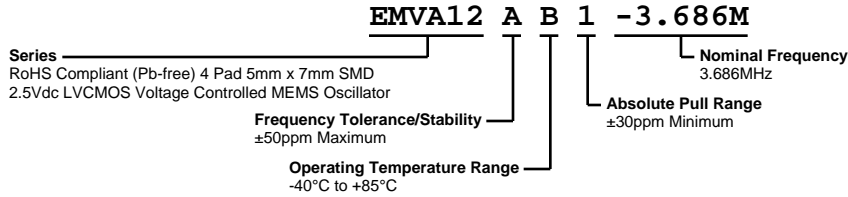


EMVA12AB1-3.686M



ECLIPTEK
CORPORATION



ELECTRICAL SPECIFICATIONS

| | |
|--|---|
| Nominal Frequency | 3.686MHz |
| Frequency Tolerance/Stability | ±50ppm 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, 260°C Reflow, Shock, and Vibration) |
| Aging at 25°C | ±1ppm Maximum First Year |
| Operating Temperature Range | -40°C to +85°C |
| Supply Voltage | 2.5Vdc ±5% |
| Input Current | 13mA Maximum |
| Output Voltage Logic High (Voh) | 90% of Vdd Minimum (IOH = -4mA) |
| Output Voltage Logic Low (Vol) | 10% of Vdd Maximum (IOL = +4mA) |
| Rise/Fall Time | 2nSec Maximum (Measured from 20% to 80% of waveform) |
| Duty Cycle | 50 ±5% (Measured at 50% of waveform) |
| Load Drive Capability | 15pF Maximum |
| Output Logic Type | CMOS |
| Absolute Pull Range | ±30ppm Minimum (Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, Shock, Vibration, and First Year Aging at 25°C over the Control Voltage (Vc).) |
| Control Voltage | 0.05Vdc to 1.7Vdc (Test Condition for APR) |
| Control Voltage Range | 0.0Vdc to 1.8Vdc |
| Linearity | 1% Maximum |
| Transfer Function | Positive Transfer Characteristic |
| Modulation Bandwidth | 8kHz Typical, 5kHz Minimum (Measured at -3dB, Vc = 0.875Vdc) |
| Input Impedance | 250kOhms Minimum |
| Input Leakage Current | 10µA Maximum |
| Typical Phase Noise at Offsets | -100dBc/Hz at offset of 10kHz, -115dBc/Hz at offset of 100kHz, -145dBc/Hz at offset of 1MHz, and -154dBc/Hz at offset of 10MHz |
| Period Jitter (RMS) | 3pSec Typical, 6pSec Maximum |
| Period Jitter (pk-pk) | 20pSec Typical, 40pSec Maximum |
| RMS Phase Jitter (Fj = 1.875MHz to 20MHz; Random) | 0.8pSec Typical |
| RMS Phase Jitter (Fj = 900kHz to 7.5MHz; Random) | 0.6pSec Typical |
| Start Up Time | 10mSec Maximum |
| Storage Temperature Range | -55°C to +125°C |

ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

| | |
|-------------------------------------|--|
| ESD Susceptibility | MIL-STD-883, Method 3015, Class 2, HBM 2000V |
| Flammability | UL94-V0 |
| Mechanical Shock | MIL-STD-883, Method 2002, Condition G, 30,000G |
| Moisture Resistance | MIL-STD-883, Method 1004 |
| Moisture Sensitivity Level | 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 (Four I/O Pads on bottom of package only) |

EMVA12AB1-3.686M

ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

| | |
|---------------------|--|
| Temperature Cycling | MIL-STD-883, Method 1010, Condition B |
| Thermal Shock | MIL-STD-883, Method 1011, Condition B |
| Vibration | MIL-STD-883, Method 2007, Condition A, 20G |

MECHANICAL DIMENSIONS (all dimensions in millimeters)



| PIN | CONNECTION |
|-----|-----------------|
| 1 | Control Voltage |
| 2 | Case Ground |
| 3 | Output |
| 4 | Supply Voltage |

| LINE | MARKING |
|------|---|
| 1 | XXXX or XXXXX XXXX or XXXXX=Ecliptek Manufacturing Lot Code |

Note A: Center paddle is connected internally to oscillator ground (Pad 2).

Suggested Solder Pad Layout

All Dimensions in Millimeters



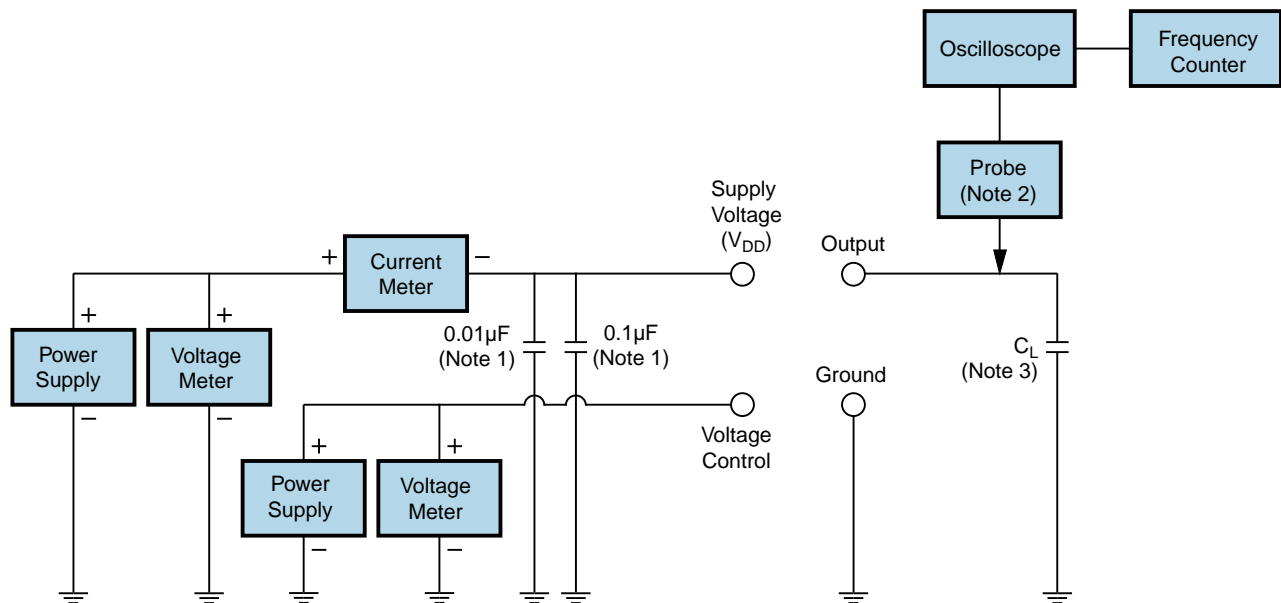
All Tolerances are ±0.1

EMVA12AB1-3.686M

OUTPUT WAVEFORM



Test Circuit for CMOS Output



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 ($>10M\Omega$), and high bandwidth ($>300MHz$) passive probe is recommended.

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

Recommended Solder Reflow Methods



High Temperature Infrared/Convection

| | |
|--|--------------------------------------|
| 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 |

Recommended Solder Reflow Methods



Low Temperature Infrared/Convection 240°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) | 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) | 240°C Maximum |
| Target Peak Temperature (T_P Target) | 240°C Maximum 1 Time / 230°C Maximum 2 Times |
| 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.