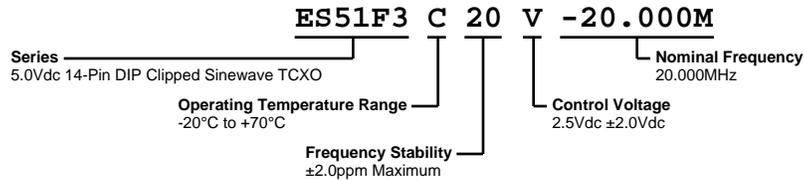


# ES51F3C20V-20.000M



## ELECTRICAL SPECIFICATIONS

Nominal Frequency	20.000MHz
Frequency Stability	±2.0ppm Maximum (Inclusive of Operating Temperature Range)
Frequency Stability vs. Input Voltage	±0.3ppm Maximum (±5%)
Aging at 25°C	±1ppm/Year Maximum
Frequency Stability vs. Load	±0.2ppm Maximum (±2pF)
Operating Temperature Range	-20°C to +70°C
Supply Voltage	5.0Vdc ±5%
Input Current	1.5mA Maximum
Output Voltage	1.0Vp-p Minimum
Load Drive Capability	10kOhms//10pF
Output Logic Type	Clipped Sinewave
Control Voltage	2.5Vdc ±2.0Vdc
Frequency Deviation	±7ppm Minimum, ±20ppm Maximum (Referenced to Fo at Vc=2.5Vdc; Vdd=5.0Vdc)
Transfer Function	Positive Transfer Characteristic
Internal Trim	±3ppm Minimum (Top of Can)
Modulation Bandwidth	10kHz Minimum (Measured at -3dB with a Control Voltage of 2.5Vdc)
Input Impedance	10kOhms Typical
Phase Noise	-70dBc at 10Hz Offset, -100dBc at 100Hz Offset, -130dBc at 1kHz Offset, -140dBc at 10kHz Offset, -145dBc at 100kHz Offset
Storage Temperature Range	-40°C to +85°C

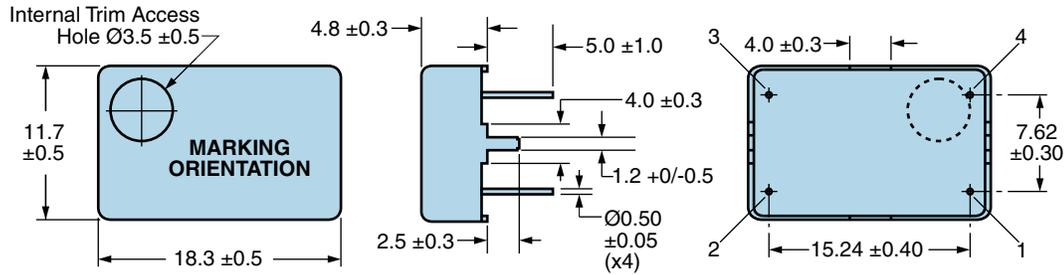
## ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

Fine Leak Test	MIL-STD-883, Method 1014 Condition A (Internal Crystal Only)
Gross Leak Test	MIL-STD-883, Method 1014 Condition C (Internal Crystal Only)
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

# ES51F3C20V-20.000M



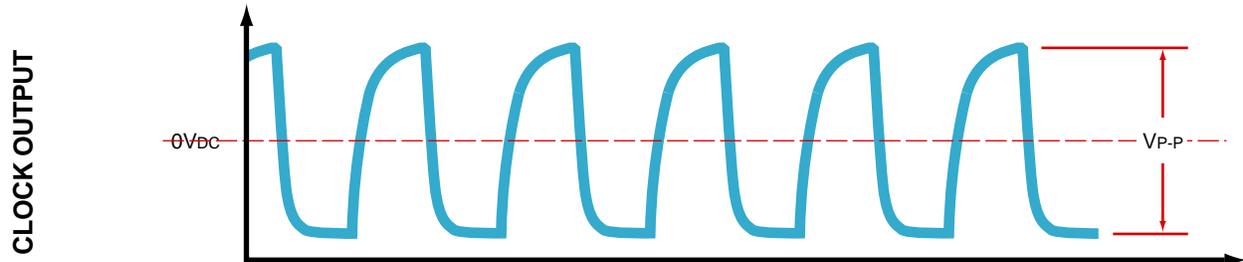
## MECHANICAL DIMENSIONS (all dimensions in millimeters)



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

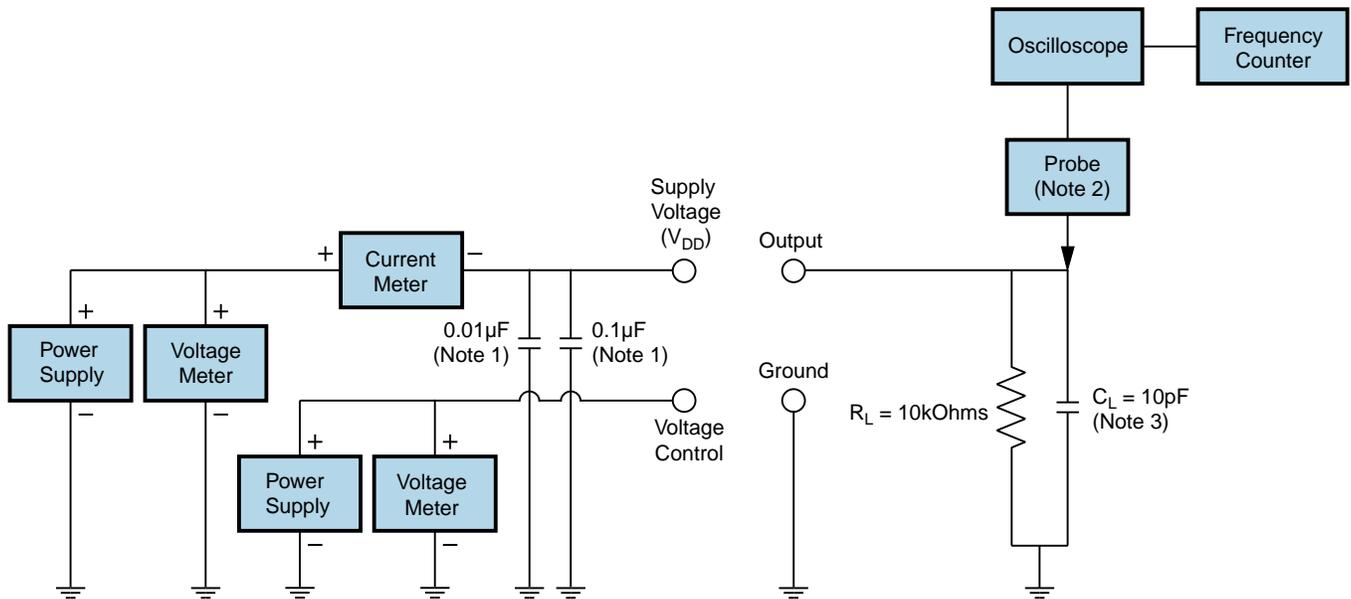
LINE	MARKING
1	<b>ECLIPTEK</b>
2	<b>20.000M</b>
3	<b>XXYYZZ</b> XX=Ecliptek Manufacturing Code Y=Last Digit of the Year ZZ=Week of the Year

## OUTPUT WAVEFORM



# ES51F3C20V-20.000M

## Test Circuit for Voltage Control Option

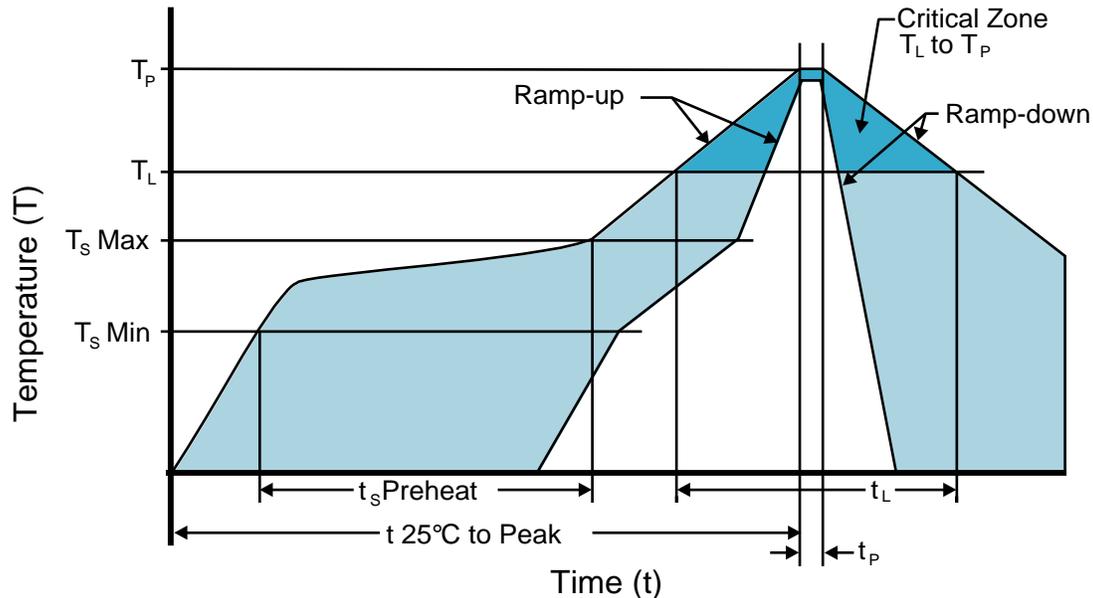


Note 1: An external  $0.1\mu\text{F}$  low frequency tantalum bypass capacitor in parallel with a  $0.01\mu\text{F}$  high frequency ceramic bypass capacitor close to the package ground and  $V_{DD}$  pin is required.

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



### Low Temperature Solder Bath (Wave Solder)

$T_S$ MAX to $T_L$ (Ramp-up Rate)	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

### 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.

### Low Temperature Solder Bath (Wave Solder) Note 1

Device is non-hermetic; Post reflow aqueous wash is not recommended

### Low Temperature Solder Bath (Wave Solder) Note 2

Temperatures shown are applied to back of PCB board and device leads only.