



## REGULATORY COMPLIANCE (Data Sheet downloaded on Feb 20, 2018)



## ITEM DESCRIPTION

Oven Controlled Quartz Crystal Clock Oscillators OCXO HCMOS (CMOS) 5.0Vdc SC-Cut 5-Pin DIP 25.5mm X 25.5mm X 15.0mm Metal Thru-Hole 20.000MHz  $\pm$ 500ppb Maximum  $\pm$ 100ppb Maximum -20°C to +70°C

## ELECTRICAL SPECIFICATIONS

Nominal Frequency	20.000MHz
Initial Tolerance	$\pm$ 500ppb Maximum (Measured at nominal Vdd and Vc)
Frequency Stability	$\pm$ 100ppb Maximum
Frequency Stability vs. Input Voltage	$\pm$ 20ppb Maximum (Vdd $\pm$ 5%)
Frequency Stability vs. Load	$\pm$ 20ppb Maximum (Vload $\pm$ 5%)
Frequency Stability vs. Aging (1 Day)	$\pm$ 2.0ppb Maximum
Frequency Stability vs. Aging (1 Year)	$\pm$ 100ppb Maximum
Frequency Stability vs. Aging (10 Years)	$\pm$ 500ppb Maximum
Operating Temperature Range	-20°C to +70°C
Supply Voltage	5.0Vdc $\pm$ 5%
Warm Up Time	3 Minutes Maximum (Referenced to $\pm$ 50ppb of final frequency at 1 hour at 25°C)
Power Consumption	1.2Watts Maximum at Steady State at 25°C 3.6Watts Maximum during Warm Up
Output Voltage Logic High (Voh)	Vdd-0.5Vdc Minimum (IOH = -8mA)
Output Voltage Logic Low (Vol)	0.5Vdc Maximum (IOL = +8mA)
Rise/Fall Time	6nSec Maximum (Measured at 20% to 80% of waveform)
Duty Cycle	50 $\pm$ 5% (Measured at 50% of waveform)
Load Drive Capability	15pF Maximum
Output Logic Type	CMOS
Control Voltage	2.5Vdc $\pm$ 2.5Vdc
Control Voltage Range	0.0Vdc to Vdd
Frequency Deviation	$\pm$ 0.5ppm Minimum (Referenced to Fo at Vc=2.5Vdc; Vdd=5.0Vdc)
Linearity	$\pm$ 10% Maximum
Reference Voltage Output	4.5Vdc $\pm$ 0.3Vdc (Pin 4)
Transfer Function	Positive Transfer Characteristic
Crystal Cut	SC-Cut
Input Impedance	10kOhms Typical
Phase Noise	-85dBc/Hz at 1Hz Offset -100dBc/Hz at 10Hz Offset -130dBc/Hz at 100Hz Offset -145dBc/Hz at 1kHz Offset -150dBc/Hz at 10kHz Offset (All Values are Typical)
Storage Temperature Range	-55°C to +125°C

## ENVIRONMENTAL &amp; MECHANICAL SPECIFICATIONS

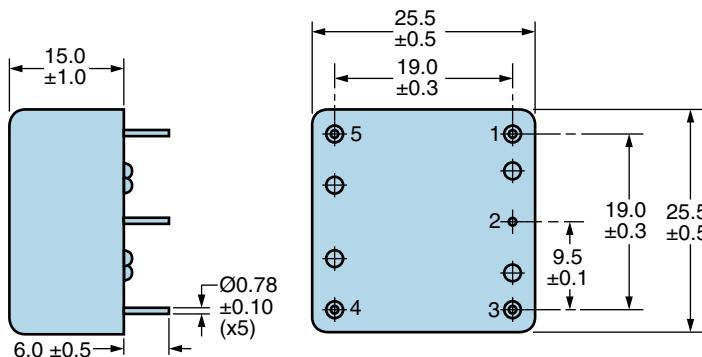
Gross Leak Test	MIL-STD-883, Method 1014, Condition C
Lead Integrity	MIL-STD-883, Method 2004
Mechanical Shock	MIL-STD-202, Method 213 Condition C
Resistance to Soldering Heat	MIL-STD-202, Method 210

## ENVIRONMENTAL &amp; MECHANICAL SPECIFICATIONS CONTINUED

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



## MECHANICAL DIMENSIONS (all dimensions in millimeters)



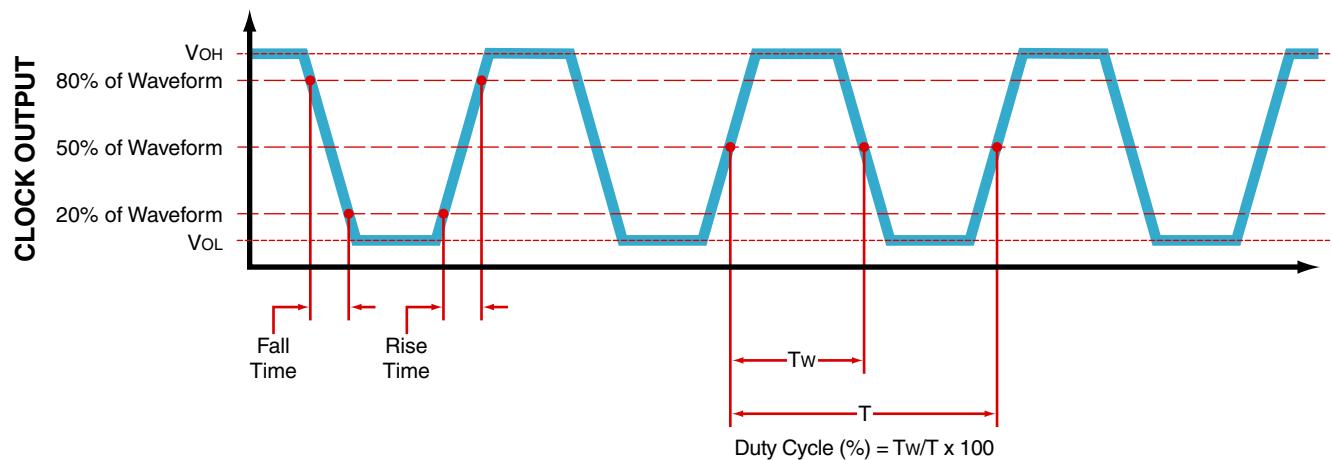
PIN	CONNECTION
1	Output
2	Case/Ground
3	Voltage Control
4	Reference Voltage Output
5	Supply Voltage

LINE	MARKING
1	ECLIPTEK
2	20.000M
3	XXXXX XXXXX=Ecliptek Manufacturing Identifier

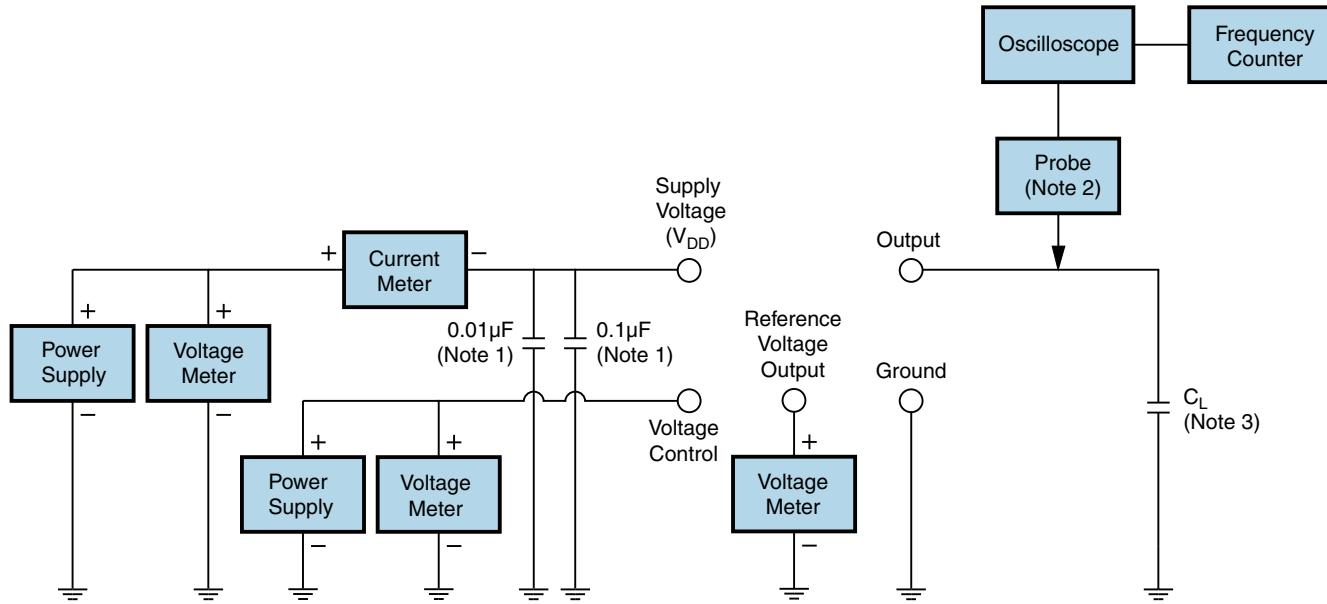


## OUTPUT WAVEFORM





## Test Circuit for Voltage Control Option

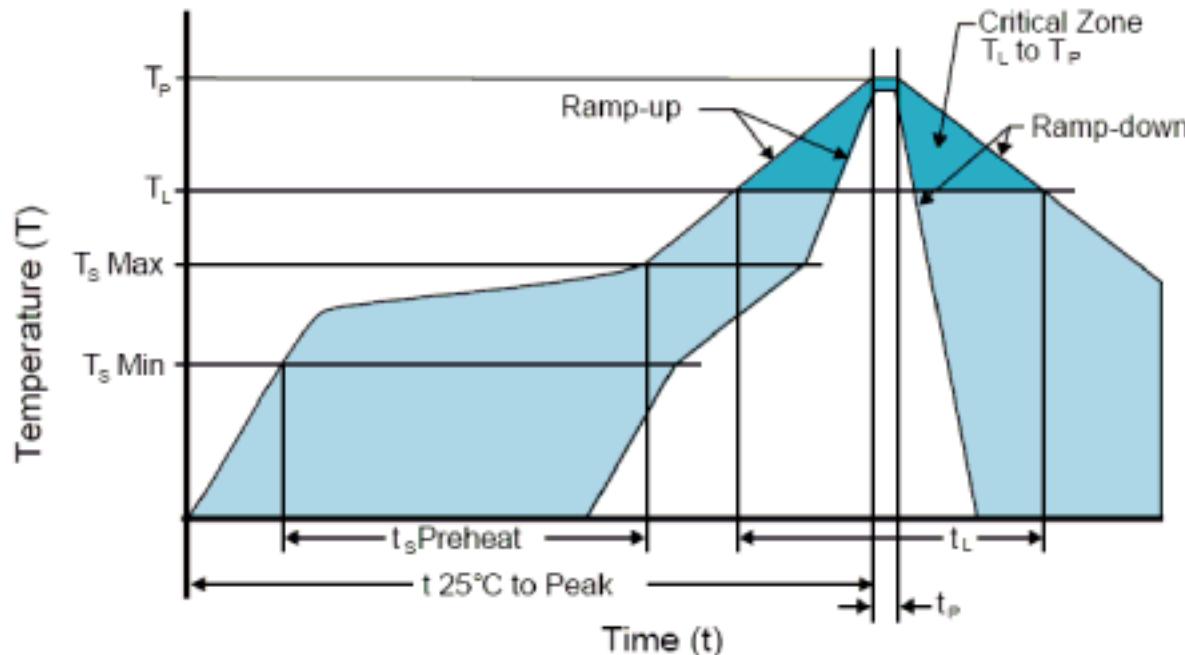


Note 1: An external 0.01µF ceramic bypass capacitor in parallel with a 0.1µF high frequency ceramic bypass capacitor close (less than 2mm) to the package ground and supply voltage pin is required.

Note 2: A low input 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.

## Recommended Solder Reflow Methods



## Low Temperature Solder Bath (Wave Solder)

$T_s \text{ MAX to } T_l$ (Ramp-up Rate)	5°C/Second Maximum
<b>Preheat</b>	
- 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 ( $t_s \text{ MIN}$ )	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 \text{ Target}</math>)</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.

## Low Temperature Manual Soldering

185°C Maximum for 10 Seconds Maximum, 2 times Maximum. (Temperatures listed are applied to device leads only.)

## High Temperature Manual Soldering

260°C Maximum for 5 Seconds Maximum, 2 times Maximum. (Temperatures listed are applied to device leads only.)