



ELECTRICAL SPECIFICATIONS

| PARAMETER | SYMBOL | CONDITION | VALUE | | | UNIT |
|--|--------------------------------|---|-------|------|---------|------|
| | | | Min. | Typ. | Max. | |
| Frequency Range* | f_0 | | 5.000 | | 100.000 | MHz |
| Supply Voltage | V_s | $V_s \pm 5\%$ | 3.135 | 3.3 | 3.465 | V |
| | | | 4.75 | 5.0 | 5.25 | |
| | | | 11.40 | 12.0 | 12.60 | |
| Power Consumption | P_s | Steady state, @ 25°C | | | 2.4 | W |
| | $P_{s,w}$ | During warm-up, @ 25°C | | | 6.0 | W |
| Warm-up Time | t_w | $V_s, T_a = +25^\circ\text{C}$, within ± 100 ppb of final frequency with reference after 1 hour on | | | 5 | min |
| Frequency Calibration | $\Delta f/f_0$ | $T_a = +25^\circ\text{C}$, after 15mins power on ref. to nominal frequency | -100 | | +100 | ppb |
| Frequency Stability vs. Temperature* | $\Delta f/f_0 (T_a)$ | Measurement referenced to $(f_{\max} + f_{\min})/2$. See Table | -5 | | +5 | ppb |
| Frequency Stability vs. Supply Voltage | $\Delta f/f_0 (\Delta V_{CC})$ | $T_a = 25^\circ\text{C}$, $V_s \pm 5\%$, load = 15pF | -0.3 | | +0.3 | ppb |
| Frequency Stability vs. Load Variation | $\Delta f/f_0 (\Delta I)$ | $T_a = 25^\circ\text{C}$, V_s , load = 15pF $\pm 5\%$ | -0.3 | | +0.3 | ppb |
| Aging, after 30 days of operation | $\Delta f/\Delta t_d$ | Per day | -0.3 | | +0.3 | ppb |
| | $\Delta f/\Delta t_y$ | First year | -50 | | +50 | ppb |
| | $\Delta f/\Delta t_y$ | 10 years | -0.3 | | +0.3 | ppm |
| Operating Temperature Range* | | See Table 1 | -40 | | +85 | °C |
| Storage Temperature | $T_{(stg)}$ | | -40 | | +105 | °C |
| Short Term Stability | | $\tau = 1s$ | | | 0.05 | ppb |
| Control Voltage Range | V_C | | 0 | 1.65 | 3.0 | V |
| Frequency Tuning Range | | $V_C = 0V$ | -4 | | -2 | ppm |
| | | $V_C = 1.65V$ | -200 | | +200 | ppb |
| | | $V_C = 3.3V$ | +2 | | +4 | ppm |
| Linearity | | | -10 | | +10 | % |

*Not any Combination Frequency-Operating Temperature Range- Stability is available. Please consult factory
 **The above Specification is an example for 10.000MHz, 12V

OCXO SERIES 3000

PHASE NOISE

| PARAMETER | SYMBOL | CONDITION | VALUE | | | UNIT |
|-----------------|--------------------------|-----------|-------|------|------|--------|
| | | | Min. | Typ. | Max. | |
| @1 Hz Offset | $\mathcal{E} (\Delta f)$ | | | | -90 | dBc/Hz |
| @10 Hz Offset | $\mathcal{E} (\Delta f)$ | | | | -120 | dBc/Hz |
| @100 Hz Offset | $\mathcal{E} (\Delta f)$ | | | | -140 | dBc/Hz |
| @1 kHz Offset | $\mathcal{E} (\Delta f)$ | | | | -150 | dBc/Hz |
| @10 kHz Offset | $\mathcal{E} (\Delta f)$ | | | | -150 | dBc/Hz |
| @100 kHz Offset | $\mathcal{E} (\Delta f)$ | | | | -155 | dBc/Hz |

CMOS OUTPUT CHARACTERISTICS

| PARAMETER | SYMBOL | CONDITION | VALUE | | | UNIT |
|----------------|--------------------------------|-------------------------------------|-------|---------|------|------|
| | | | Min. | Typ. | Max. | |
| Output Levels | VOH/VOL | V _{CC} = 5.0V, load = 15pF | | 3.8/0.5 | | V |
| Duty Cycle | DC | load = 15pF | | 45/55 | | % |
| Rise/Fall Time | t _r /t _f | 10% ~ 90% V _{out} | | | 5 | ns |
| Load | | | | 15 | | pF |

SINE-WAVE OUTPUT CHARACTERISTICS

| PARAMETER | SYMBOL | CONDITION | VALUE | | | UNIT |
|---------------|--------|-----------|-------|------|------|----------|
| | | | Min. | Typ. | Max. | |
| Output Levels | | | 5 | 7 | 9 | dBm |
| Harmonics | | | | | -40 | dBc |
| Spurious | | | | | -70 | dBc |
| Load | | | | 50 | | Ω |

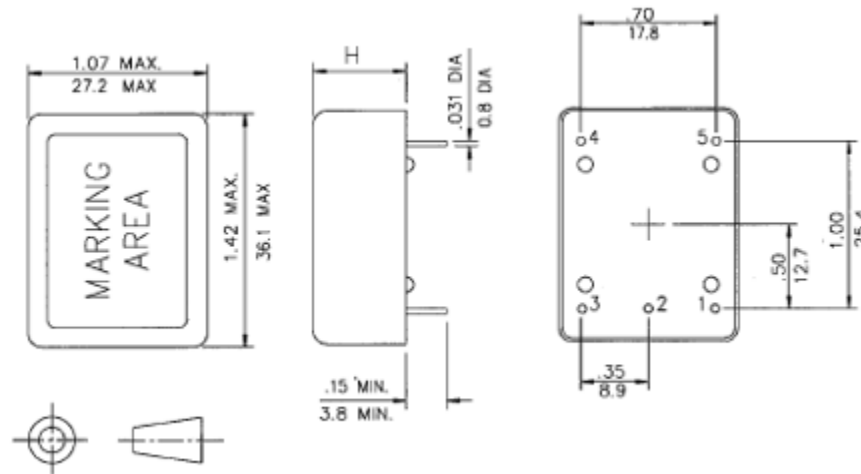
Table 1

| TEMPERATURE RANGE °C | FREQUENCY STABILITY (ppb) | | | | | | |
|-------------------------|---------------------------|----|----|----|----|-----|-----|
| | 5 | 10 | 20 | 30 | 50 | 100 | 200 |
| 0 ~ +60 | Y | Y | Y | Y | Y | Y | Y |
| -10 ~ +60 | Y | Y | Y | Y | Y | Y | Y |
| -20 ~ +70 | Y | Y | Y | Y | Y | Y | Y |
| -30 ~ +70 | Y | Y | Y | Y | Y | Y | Y |
| -40 ~ +75 | Y | Y | Y | Y | Y | Y | Y |
| -40 ~ +85 | Y | Y | Y | Y | Y | Y | Y |
| -55 ~ +85 | - | - | Y | Y | Y | Y | Y |

ENVIRONMENTAL MECHANICAL CONDITIONS

| | |
|---------------------------|---|
| Storage temperature range | -55°C to +105°C |
| Drop Test | The test shall be carried out as the provisions of the IEC60028-2-32 test Ed. 10cm height, 3 times on hard board with thickness of 3cm |
| Bumping Test | Device are bumped to three mutually perpendicular axes at peak acceleration of 400m/s ² , each 4000±10times, 6ms pulse duration time |
| Vibration Test | Frequency range: 1Hz-4Hz-100Hz-200Hz Acceleration: 0.0001g ² /Hz-0.01g ² /Hz-0.01g ² /Hz-0.001g ² /Hz Grms=1.15g Sweep time: 30 minutes (perpendicular axes each sweep time) |
| Mechanical Shock | 100g, 6mS duration, 1/2 sine wave, 3 shocks each direction along 3 mutually perpendicular planes. |
| Thermal shock | 0.5h@-40°C, 0.5h@+85°C, Note: the changing time < 30 seconds, cycling for 100 times |

MECHANICAL DIMENSIONS AND PIN FUNCTIONING



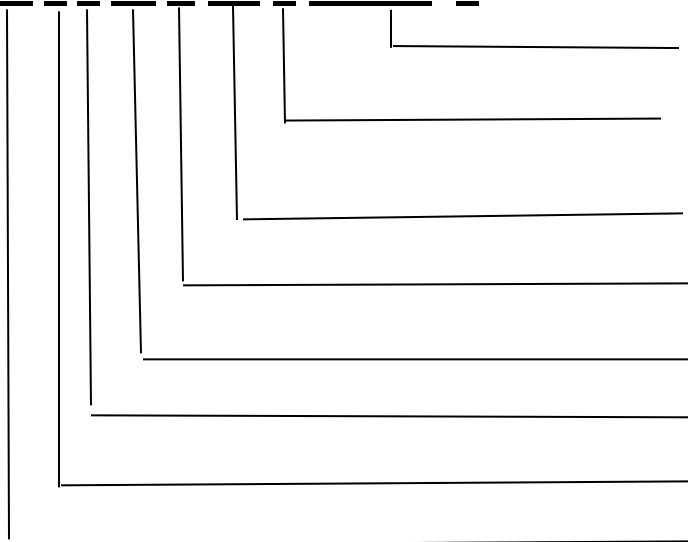
| PIN | SYMBOL | FUNCTION |
|-----|-------------------------|---------------------------------|
| 1 | N/C or V _C | No connect or Control Voltage |
| 2 | N/C or V _{ref} | No connect or Reference Voltage |
| 3 | V _s | Supply Voltage |
| 4 | OUTPUT | RF Output |
| 5 | GND | Case/Ground |

OCXO SERIES 3000

■ **PART NUMBERING SYSTEM**

| Prefix | Output Type | Cut Type | Series | Revision | Temperature Range | Stability | Frequency | Supply Voltage |
|--------|----------------------|---|---------|----------|---|---|-----------|------------------------------------|
| OX | 4: LVCMOS 6: SINE | 1: No Control Voltage 5: Control Voltage | 30:3000 | A | First letter: Lowest Temperature, Second letter: Highest Temperature: From A=-55°C to Z=+70°C, Then: 1=+75°C, 2=+80°C, 3=+85°C... in 5°C Steps Example: HZ: -20°C to +70°C LZ: 0°C to +70°C D3: -40°C to +85°C | Value x 10E-2 in ppm Example: 0.5= 5 ppb 1= 0.01 ppm | In MHz | 3: 3.3 V 5: 5.0 V 12: 12.0 V |

OX 4 5 60 A-D3-1-20.000- 5



Supply Voltage: 5 V

Frequency: 20 MHz

Temp Stability: $1 \times 10E^{-2} = \pm 0.01$ ppm

Operating Temp Range: -40° C to 85°C

Revision: "A"

SERIES: 3000

Electrical Control Voltage

Output: LVCMOS

Prefix: OCXO