A RAMI TECHNOLOGY Company

# Oven Controlled Crystal Oscillator

## OX4150A-D3-1-20.000-3.3-7

RoHS Compliant

## ELECTRICAL SPECIFICATIONS

| PARAMETER | SYMBOL | CONDITION | VALUE | | | UNIT |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| Nominal Frequency | $f_o$ | | | 20.000 | | MHz |
| Supply Voltage | $V_s$ | Vs ±5% @ 25°C | 3.135 | 3.3 | 3.465 | V |
| Power Consumption | $P_S$ | Steady state, @ 25°C | | | 1.5 | W |
| | $P_w$ | During warm-up, @ 25°C | | | 3.3 | W |
| Initial Frequency Accuracy | $\Delta f/f_0$ | Ta=+25°C, after 15 min power on, ref to nominal frequency | -500 | | +500 | ppb |
| Frequency Stability vs. Temperature | $\Delta f/f_0$ ($T_a$) | Ta= -40°C…+85°C, ref to +25˚C | -10 | | +10 | ppb |
| Frequency Stability vs. Supply Voltage | $\Delta f/f_0$ ($\Delta V_{CC}$) | Ta=25°C, Vs±5% | -2 | | +2 | ppb |
| Frequency Stability vs. Load Change | $\Delta f/f_0$ ($\Delta l$) | Ta=25°C, Load change, max.: ±5% | -2 | | +2 | ppb |
| Aging, after 30 days of operation | $\Delta f/\Delta t_d$ | Daily | -1 | | +1 | ppb |
| | $\Delta f/\Delta t_y$ | First year | -100 | | +100 | ppb |
| | $\Delta f/\Delta t_y$ | 10 years | -800 | | +800 | ppb |
| Short Term Stability | | | | 0.01 | | ppb/s |
| Total Stability | | 20 years from nominal freq after 30 min continuous operation for aging, temp, voltage, initial freq accuracy | -2 | | +2 | ppm |
| 2 Hours Holdover | | After 30 days continuous operation, for aging and ±1°C temp change | -1.5 | | +1.5 | µs |
| Warm-up | | Within ±0.1ppm, at 25°C, referenced to 1 hour | | | 5 | min |
| Operating Temperature Range | $T_a$ | | -40 | | +85 | °C |
| Storage Temperature | $T_{(stg)}$ | Absolute max | -40 | | +90 | °C |

## CMOS OUTPUT CHARACTERISTICS

| PARAMETER | SYMBOL | CONDITION | VALUE | | | UNIT |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| Output Levels | VOH/VOL | | | 2.4 / 0.4 | | V |
| Duty Cycle | DC | load = 15pF | **40** | | 60 | % |
| Rise/Fall Time | $t_r/t_f$ | 10% ~ 90% Vout | | | 6 | ns |
| Load | | | | 15 | | pF |
| Spurious | | | | | -60 | dBc |

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## PHASE NOISE

| PARAMETER | SYMBOL | CONDITION | VALUE | | | UNIT |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| @10 Hz Offset | £ (Δf) | | | | -80 | dBc/Hz |
| @10 Hz Offset | £ (Δf) | | | | -110 | dBc/Hz |
| @100 Hz Offset | £ (Δf) | | | | -135 | dBc/Hz |
| @1 kHz Offset | £ (Δf) | | | | -145 | dBc/Hz |
| @10 kHz Offset | £ (Δf) | | | | -150 | dBc/Hz |
| @10 kHz Offset | £ (Δf) | | | | -152 | dBc/Hz |

## ENVIRONMENTAL MECHANICAL CONDITIONS

| | |
|---|---|
| Operable Temperature Range | -40 to + 80℃ |
| Storage Temperature range | -40°C to +90°C |
| Drop Test | The test shall be carried out as the provisions of the IEC60028-2-32 test Ed.<br>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/s², each 4000±10times, 6ms pulse duration time |
| Vibration Test | Frequency range: 1Hz-4Hz-100Hz-200Hz<br>Acceleration: 0.0001g²/Hz-0.01g²/Hz-0.01g²/Hz-0.001g²/Hz<br>Grms=1.15g<br>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℃， 0.5h@+85℃， Note: the changing time < 30 seconds, cycling for 100 times |

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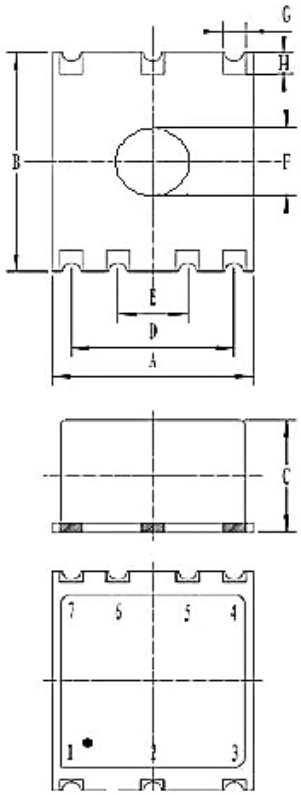
## MECHANICAL DIMENSIONS AND PIN FUNCTIONS




| DIMENSIONS | | | |
|---|---|---|---|
| | Min | Typ | Max |
| A | 21.7 | 22.0 | 22.3 |
| B | 25.1 | 25.4 | 25.7 |
| C | | | 13.0 |
| D | 17.7 | 17.8 | 17.9 |
| E | 7.5 | 7.6 | 7.7 |
| F | 5.8 | 6.0 | 6.2 |
| G | 2.4 | 2.5 | 2.6 |
| H | 2.4 | 2.5 | 2.6 |

| PIN | SYMBOL | FUNCTION |
|---|---|---|
| 1 | NC | No Connect |
| 2 | NC | No Connect |
| 3 | $V_S$ | Supply Voltage |
| 4 | OUTPUT | RF Output |
| 5 | NC | No Connect |
| 6 | NC | No Connect |
| 7 | GND | Ground |

| | Signed | Date |
|---|---|---|
| **Created** | CP | November 15, 2018 |
| **Eng. approved** | SP | November 15, 2018 |
| **REV A** | | |