



CRYSTAL CONTROLLED OSCILLATORS

1.8V LVCMOS SURFACE MOUNT 7.5x5mm CRYSTAL CLOCK OSCILLATOR



X221

ABSOLUTE MAXIMUM RATINGS

TABLE 1.0

| PARAMETER | UNITS | MINIMUM | NOMINAL | MAXIMUM | UNITS | NOTE |
|---------------------|-------|---------|---------|---------|-------|------|
| Storage Temperature | | -55 | - | 125 | °C | |
| Supply Voltage | (Vcc) | -0.5 | - | 3.6 | Vdc | |

OPERATING SPECIFICATIONS

TABLE 2.0

| PARAMETER | | MINIMUM | NOMINAL | MAXIMUM | UNITS | NOTE |
|-----------------------------|-------------------|---------|---------|---------|-------|------|
| Frequency Range | (Fo) | 70 | - | 165 | MHz | |
| Frequency Tolerance: | | -50 | - | 50 | ppm | 1 |
| Operating Temperature Range | | -40 | - | 85 | °C | |
| Supply Voltage | (Vcc) | 1.71 | 1.8 | 1.89 | Vdc | |
| Supply Current | 70 to 94.999 MHz | (Icc) | - | 11 | mA | |
| | 95 to 124.999 MHz | (Icc) | - | 17 | mA | |
| | 125 to 165 MHz | (Icc) | - | 23 | mA | |

INPUT CHARACTERISTICS

TABLE 3.0

| | | | | | | |
|--|--------|-------|--------|---|--------|-----|
| Enable Voltage | (High) | (Vih) | 0.7Vcc | - | - | Vdc |
| Disable Voltage | (Low) | (Vil) | - | - | 0.3Vcc | Vdc |
| Enable Time | | | - | - | 2 | mS |
| Disable Time | | | - | - | 200 | nS |
| Output Disable Current (Standby Current) | | (Icc) | - | - | 10 | uA |

LVCMOS OUTPUT CHARACTERISTICS

TABLE 4.0

| PARAMETER | | MINIMUM | NOMINAL | MAXIMUM | UNITS | NOTE |
|-----------------------------|--------|---------|---------|---------|-------|--------|
| LOAD | | - | - | 15 | pF | |
| Voltage | (High) | (Voh) | Vcc-0.4 | - | - | Vdc |
| | (Low) | (Vol) | - | 0.4 | Vdc | |
| Current | (High) | (Ioh) | -8 | - | - | mA |
| | (Low) | (Ioh) | - | 8 | mA | |
| Duty Cycle at 50% of Vcc | | | 45 | 50 | 55 | % |
| Rise / Fall Time 10% to 90% | | | - | 1.5 | 2.5 | nS |
| Start-Up Time | | | - | - | 2 | mS |
| Jitter (BW=10kHz to 20MHz) | | | - | - | 5 | pS RMS |
| Jitter (BW=12kHz to 20MHz) | | | - | - | 1 | pS RMS |

PACKAGE CHARACTERISTICS

TABLE 5.0

| | |
|---------|--|
| Package | Hermetically sealed ceramic surface mount package with metal cover |
|---------|--|

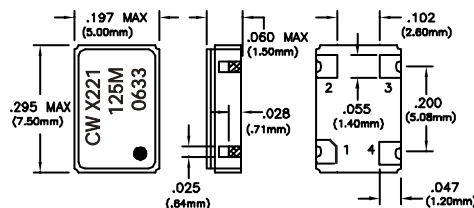
Note:

- Inclusive of calibration @ 25°C, frequency vs. temperature stability, supply voltage change, load change, shock and vibration, 10 years aging.

| Enable / Disable Function (Pad 1) | Output |
|-----------------------------------|--------------------------|
| High or Open | Enable |
| Low | Disable (High Impedance) |

| Pad | Connection |
|-----|----------------|
| 1 | Enable/Disable |
| 2 | Ground |
| 3 | Output |
| 4 | Vcc |

Dimensional $\pm .02"$ ($\pm 0.5mm$)
Tolerance: $\pm .008"$ ($\pm 0.2mm$)



DESCRIPTION

The Connor-Winfield X221 is a 1.8V, LVCMOS, Surface Mount, Fixed Frequency Crystal Oscillator (XO) designed for use in all applications requiring precision clocks. This oscillator features low stand-by current (10uA) when the output is disabled. The surface mount package is designed for high-density mounting and is optimum for mass production.

FEATURES

- 70 to 165 MHz
- 1.8V OPERATION
- TRI-STATE ENABLE/DISABLE FUNCTION
- POWER SAVING STAND-BY CURRENT: 10uA
- OVERALL FREQUENCY TOLERANCE: $\pm 50ppm$
- TEMPERATURE RANGE: -40 to 85°C
- CERAMIC SURFACE MOUNT PACKAGE
- TAPE AND REEL PACKAGING
- RoHS COMPLIANT / LEAD FREE

ORDERING INFORMATION

X221 - 125 MHz

CLOCK
SERIES

CENTER
FREQUENCY

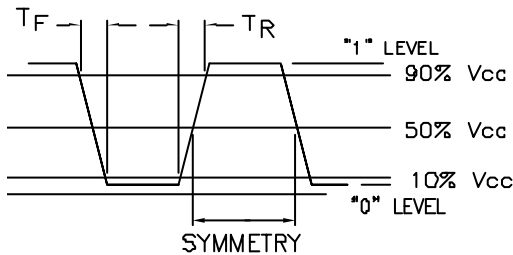
Specifications subject to change without notice.

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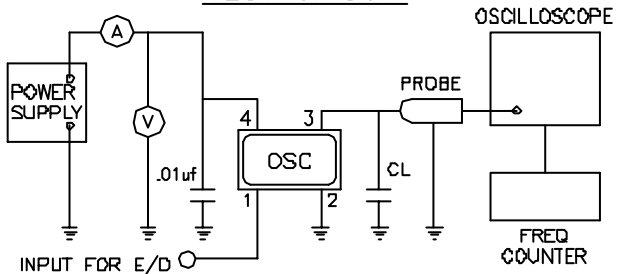
PRODUCT DATA SHEET

CRYSTAL CONTROLLED OSCILLATORS

OUTPUT WAVEFORM



TEST CIRCUIT



MECHANICAL CHARACTERISTICS

FREE DROP:

The specimen shall meet electrical characteristics after tested 3 times Free Drop testing on the hard wooden board from a height of 75cm.

VIBRATION:

The specimen shall meet electrical characteristics after tested by the following conditions;
10-55Hz 1.5mm Amplitude, 55-2000Hz 20G's,
2 hours for each plane.

THERMAL SHOCK:

After applied Thermal Shock of 260 °C max x 10 sec max x 2 times, or 230 °C max x 180 sec max, the specimen shall meet electrical characteristics.

SOLDERABILITY: (EIAJ-RGX-0102/101 Condition 1a)

1. Flux: MIL-F-14256 (WW Rosin=25%, Isopropyl alcohol=75%)
2. Solder: QQ-S-571 (Sn=63%, Pb=37%)
3. Solder bath temperature: 235 °C ± 5 °C.
4. Depth of immersion: Up to electrical terminal.
5. Immersing time: Within 2 sec ± 0.5 sec into solder bath.

After performing the above procedures, a newly soldered coverage shall be greater than 90%.

ENVIRONMENTAL CHARACTERISTICS

TEMPERATURE CYCLE:

The specimen shall meet electrical characteristics after tested 5 cycles of -55 °C/30 min & +125 °C/30 min.

HERMETICAL

No bubbles appear in Fluorinert (FC-43) at 125 °C ± 5 °C, for 5 minutes.

SOLVENT RESISTANCE:

Marking will withstand immersion in Isopropyl Alcohol or Trichloroethylene.

SOLDERING

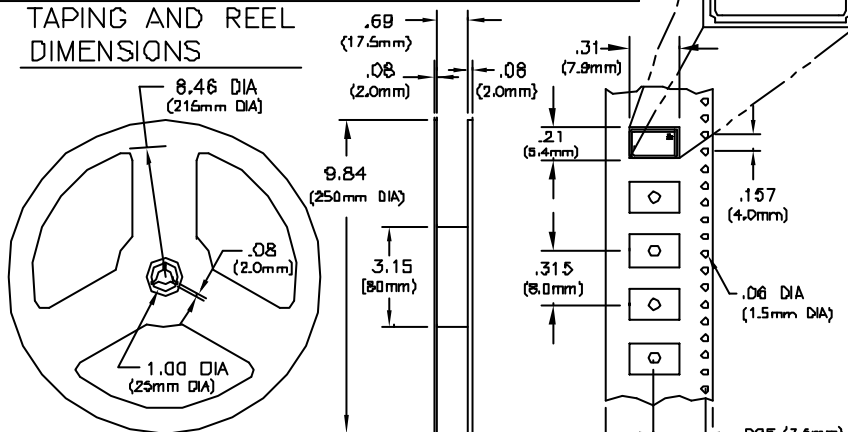
GENERAL CONDITIONS:

260 °C max x 10 sec max x 2 times max or 230 °C max x 180 sec max x 1 time.

TYPICAL OPERATION DATA (Vapor phase reflow)

20 to 100 sec up to 215 °C, 50 sec at 215 °C then down to room temperature per 1 to 5 °C/sec

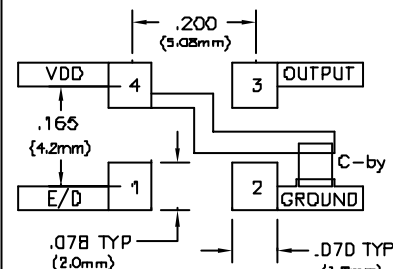
TAPING AND REEL DIMENSIONS



MEETS EIA-481A AND EIAJ-1009B
2,000 PCS/REEL

PIN 1

SUGGESTED PAD LAYOUT



Bypass capacitor, C-by, should be ceramic capacitor ≥ .01uf.

Dimensional ±.02" (±0.5mm)
Tolerance: ±.008" (±0.2mm)