



LVDS

LVDS Output

10 MHz to 160 MHz

Differential Output Crystal Oscillator

DESCRIPTION

Statek's surface mount Differential Output Crystal Oscillator is designed for applications requiring low jitter and ultra high frequency differential outputs in a small footprint. Offered at frequencies from 10 MHz to 160 MHz with operation over a temperature range of -55°C to +125°C.

FEATURES

- High Shock option
- Low phase noise - Low phase jitter
- V_{DD} supply 2.5 V and 3.3 V
- Low Allan deviation; no PLL artifacts
- High Frequency Fundamental Mode Crystal
- Ultra-low period jitter

APPLICATIONS

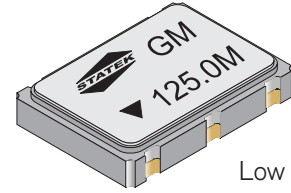
Military & Aerospace

- Avionics
- Communications
- Guidance and Navigation

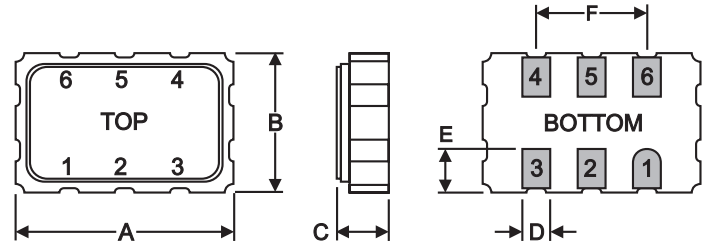
ENABLE/DISABLE OPTION FUNCTION TABLE

| | Enable (PIN 1 High*) | Disable (PIN 1 Low) |
|------------|----------------------|---------------------|
| Output | Frequency Output | High Z State |
| Oscillator | Oscillates | Oscillator stops |
| Current | Normal | Very Low |

*When PIN 1 is allowed to float, it is held high by an internal pull-up resistor.



DIMENSIONS



PACKAGE DIMENSIONS

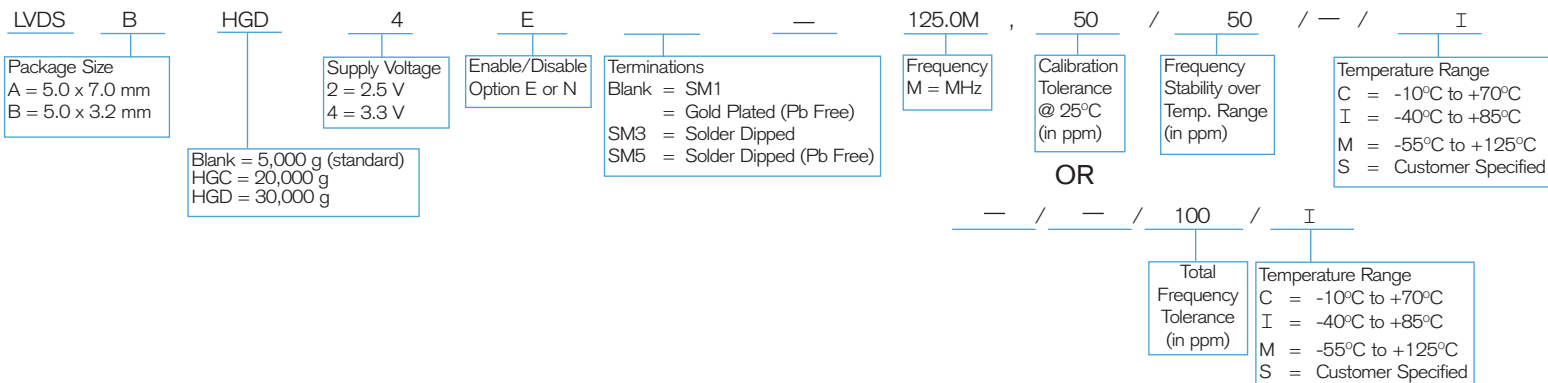
| Dimension | 5mm x 3.2mm | 5mm x 7mm |
|-------------|-------------|-----------|
| A | 5.00 | 7.00 |
| B | 3.20 | 5.00 |
| C (SM1) | 1.30 | 1.50 |
| C (SM3/SM5) | 1.40 | 1.60 |
| D | 0.64 | 1.40 |
| E | 1.20 | 1.10 |
| F | 2.54 | 5.08 |

All dimensions are Typical (mm)

PIN CONNECTIONS

1. (E) Enable/Disable or not connected (N)
2. (NC) Not Connected
3. Ground
4. LVDS
5. LVDS (complementary)
6. Supply Voltage (V_{DD})

HOW TO ORDER LVDS SURFACE MOUNT CRYSTAL OSCILLATORS



10231 Rev A



ABSOLUTE MAXIMUM RATINGS

| | |
|-------------------------------------|----------------------|
| Supply Voltage V_{DD} | -0.3 V to 4.0 V |
| Storage Temperature | -55°C to +150°C |
| Maximum Process Temperature | 260°C for 10 seconds |
| ESD Protection Human Body Model 2kV | |

PACKAGING OPTIONS

- LVDS - Tray Pack
- Tape and reel Per EIA 481

SPECIFICATIONS

| | |
|--------------------------------|---|
| Frequency | LVDSA;B :10 MHz to 160 MHz |
| Operating Temperature | -40°C to +85°C; -55°C to +125°C |
| Supply Voltage | 3.3V ±10% (2.5V ±10% available) |
| Shock, survival ^{1,2} | 5,000 g, 0.3 ms, ½ sine : LVDSA 20,000 g, 0.3 ms, ½ sine : LVDSB 30,000 g, 0.3 ms, ½ sine : LVDSB |
| Vibration, survival | 20 g, 10-2,000 Hz swept sine |

1. Per MIL-STD-202G, Method 204D, Random vibration testing also available.
2. Shock survival 10 MHz - 125 MHz.

SPECIFICATIONS TABLE Parameters listed are at 25°C unless otherwise noted.

| Parameter | Symbol | Units | Tightest | Standard | Maximum | Conditions / Comments | |
|--|------------------|-------|----------|----------|-----------|---|--|
| Frequency Stability ² | | ppm | ±50 | ±75 | ±100 | -55°C to +125°C | |
| | | ppm | ±30 | ±50 | ±100 | -40°C to +85°C | |
| Aging | | ppm | | ±5 | | First year depending on frequency | |
| Calibration Tolerance | | ppm | ±25 | ±50 | ±100 | @25°C Other tolerances available | |
| Frequency Tolerance (Total) | | ppm | ±40 | ±50 | ±100 | -40°C to +85°C | |
| LVDS Output Parameter | Symbol | Units | Minimum | Typical | Maximum | Conditions / Comments | |
| Output Differential Voltage | V_{OD} | mV | 247 | 330 | 454 | RL = 100 Ω (1%) See figure 1 | |
| Output Differential Voltage Error | ΔV_{OD} | mV | | | 50 | | |
| Output High Voltage | V_{OH} | V | | 1.4 | 1.6 | | |
| Output Low Voltage | V_{OL} | V | 0.9 | 1.1 | | | |
| Offset Voltage | V_{OS} | V | 1.125 | 1.250 | 1.375 | | |
| Offset Voltage Error | ΔV_{OS} | mV | 0 | | 50 | | |
| Output Leakage | I_{OS} | uA | | | 10 | $V_{OUT} = V_{DD}$ or GND (OE=0V) | |
| Stand by Current | I_{OSD} | uA | | | 15 | 30 | $T_a \leq +85^\circ\text{C}$ $T_a > +85^\circ\text{C}$ |
| Rise Time (Differential Clock) | t_R | ps | | 200 | | RL = 100 Ω (20% to 80%) | |
| Fall Time (Differential Clock) | t_F | ps | | 200 | | See figures 2 and 3 | |
| Supply Current (Outputs Loaded) | I_{DD} | mA | | 25* | 30 | *Typical for 160 MHz, 3.3V | |
| Duty Cycle (Output Clock) ³ | | % | 40 | | 60 | @ Differential 0V - See Figures 2 and 3 | |
| Output Swing | V_{DIFF} | V | 0.4 | | | Figure 2 | |
| Timing Jitter - 125 MHz | Symbol | Units | Minimum | Typical | Maximum | Conditions / Comments | |
| Jitter (Integrated) | | pS | | 0.074 | | 125 MHz (12 kHz to 20 MHz RMS) | |
| Jitter (Period) | | pS | | 1.0 | | 125 MHz (10,000 cycles RMS) | |
| Phase Noise - 125 MHz | Offset Frequency | | @ 1 kHz | @ 10 kHz | @ 100 kHz | @ 1 MHz @ 10 MHz | |
| Typical (LVDS) | $L(f)$ dBc/Hz | | -127 | -144 | -155 | -158 -161 | |

2. Does not include calibration tolerance.
3. Contact factory for 45-55% duty cycle.

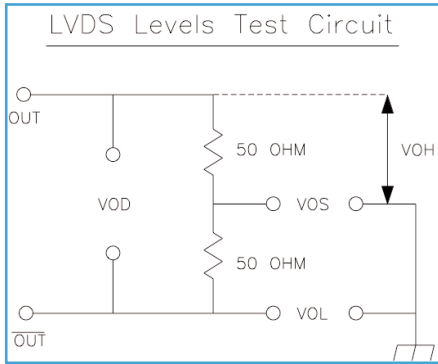


Figure 1

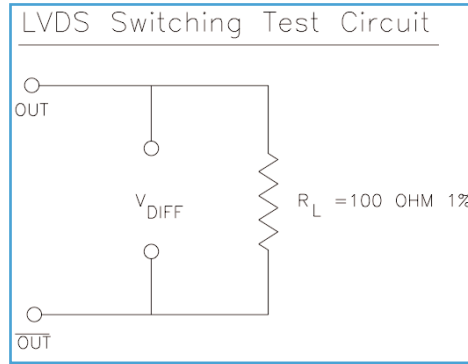


Figure 2

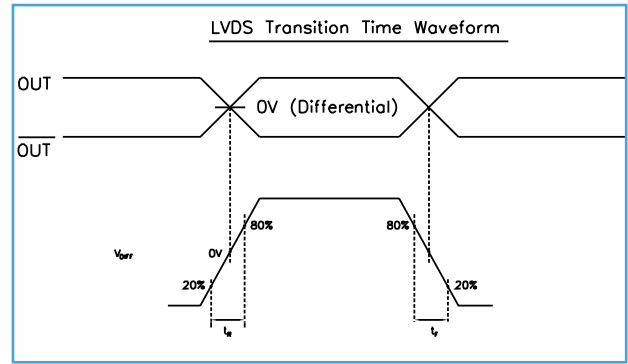


Figure 3

PHASE NOISE PERFORMANCE AT 125 MHZ

