# Oscillator (CMOS/LVPECL/LVDS/HCSL Output)

## LV7050

### 7.0 x 5.0 mm SMD LVPECL/LVDS/HCSL Crystal Oscillator

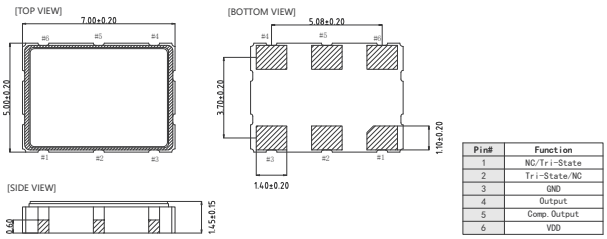
### FEATURES

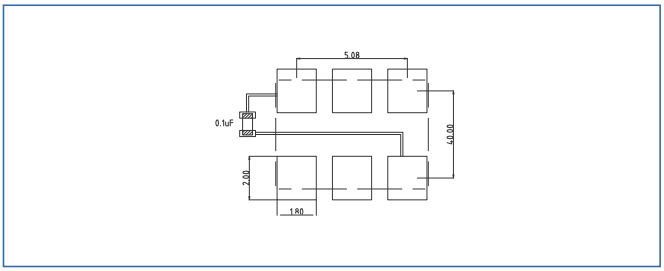
- Typical 7.0 x 5.0 x 1.45 mm hermetically sealed ceramic package
- Very low jitter performance: typical 0.3 pS RMS from 12 kHz ~ 20 MHz
- Fundamental/3rd overtone crystal design
- Output frequency up to 320 MHz
- Operating temperature up to 125°C
- Tri-state enable/disable

### TYPICAL APPLICATION

- 10 Gbit Ethernet, Fiber Channel, Storage Area Network, SONET
- Enterprise Servers, Reference clocks for ADC and DAC
- Telecom

### DIMENSIONS




### ELECTRICAL SPECIFICATION

| Parameter | | LVPECL | | | | LVDS | | | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 3.3V | | 2.5V | | 3.3V | | 2.5V | | |
| | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | |
| Supply Voltage Variation (VDD) | | VDD-5% | VDD+5% | VDD-5% | VDD+5% | VDD-5% | VDD+5% | VDD-5% | VDD+5% | V |
| Frequency Range | | 10 | 320 | 10 | 320 | 10 | 320 | 10 | 320 | MHz |
| Standard Frequency | | 77.76, 106.25, 125, 155.52, 156.25, 187.5, 212.5, 312.5 | | | | | | | | |
| Supply Current | 10MHz≤$F_O$<160MHz | — | 75 | — | 75 | — | 50 | — | 50 | mA |
| | 160MHz≤$F_O$<250MHz | — | 100 | — | 100 | — | 50 | — | 50 | |
| | 250MHz≤$F_O$<320MHz | — | 100 | — | 100 | — | 65 | — | 65 | |
| Output Level | Output High | 2.275 | — | 1.475 | — | — | 1.6 | — | 1.6 | V |
| | Output Low | — | 1.68 | — | 0.88 | 0.9 | — | 0.9 | — | |
| Transition Time: Rise/Fall Time+ | | — | 1 | — | 1 | — | 1 | — | 1 | nSec |
| Startup Time | | — | 10 | — | 10 | — | 10 | — | 10 | mSec |
| Tri-State (Input to Pin2 or Pin1) | Enable (High Voltage or Floating) | 2.31 | — | 1.75 | — | 2.31 | — | 1.75 | — | V |
| | Disable (Low Voltage or GND) | — | 0.99 | — | 0.75 | — | 0.99 | — | 0.75 | |
| Aging (@25°C, 1st Year) | | — | ±3 | — | ±3 | — | ±3 | — | ±3 | ppm |
| Storage Temp. Range | | -55 | 125 | -55 | 125 | -55 | 125 | -55 | 125 | °C |
| Phase Noise @ 156.25 MHz | 100 Hz | -100 | | -100 | | -100 | | -100 | | dBc/Hz |
| | 1 kHz | -130 | | -130 | | -130 | | -130 | | |
| | 10 kHz | -145 | | -145 | | -145 | | -145 | | |
| RMS Phase Jitter (Intergrated 12KHz ~ 20MHz) | $F_O$<80MHz | — | 1 | — | 1 | — | 1 | — | 1 | pSec |
| | 80MHz≤$F_O$<125MHz | — | 0.5 | — | 0.5 | — | 0.5 | — | 0.5 | |
| | 125MHz≤$F_O$<170MHz | — | 0.3 | — | 0.3 | — | 0.3 | — | 0.3 | |
| | 170MHz≤$F_O$<200MHz | — | 0.5 | — | 0.5 | — | 0.5 | — | 0.5 | |
| | 200MHz≤$F_O$ | — | 0.3 | — | 0.3 | — | 0.3 | — | 0.3 | |

# Oscillator (CMOS/LVPECL/LVDS/HCSL Output)

| Parameter | | HCSL | | | | Unit |
|---|---|---|---|---|---|---|
| | | 3.3V | | 2.5V | | |
| | | Min. | Max. | Min. | Max. | |
| Supply Voltage Variation(VDD) | | VDD-5% | VDD+5% | VDD-5% | VDD+5% | V |
| Frequency Range | | 25 | 175 | 25 | 175 | MHz |
| Standard Frequency | | 100 | | | | |
| Supply Current | 25MHz≤$F_o$≤175MHz | — | 50 | — | 50 | mA |
| Output Level | Output High | 0.6 | — | 0.58 | — | V |
| | Output Low | — | 0.15 | — | 0.15 | |
| Transition Time: Rise/Fall Time+ | | — | 0.5 | — | 0.5 | nSec |
| Startup Time | | — | 10 | — | 10 | mSec |
| Tri-State (Input to Pin2 or Pin1) | Enable (High Voltage or Floating) | 0.7VDD | — | 0.7VDD | — | V |
| | Disable (Low Voltage or GND) | — | 0.3VDD | — | 0.3VDD | |
| Aging (@25°C, 1st Year) | | — | ±3 | — | ±3 | ppm |
| Storage Temp. Range | | -55 | 125 | -55 | 125 | °C |
| RMS Phase Jitter (Intergrated 12KHz ~ 20MHz) | 25MHz≤$F_o$≤175MHz | — | 0.5 | — | 0.5 | pSec |

Standard frequencies are frequencies which the crystal has been designed and does not imply a stock position.
+ Transition times are measured between 20% and 80% of VDD.

## FREQ. STABILITY vs. TEMP. RANGE

| Temp.(°C) \ ppm | ±25 | ±50 |
|---|---|---|
| -10 ~ +60 | ○ | ○ |
| -20 ~ +70 | ○ | ○ |
| -40 ~ +85 | △ | ○ |
| -40 ~ +125 | × | ○ |

*o: Available Δ: Condition X: Not available
*Inclusive of calibration @ 25 °C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration

**Note: not all combination of options are available. Other specifications may be available upon request.**
Specifications subject to change without notice.