



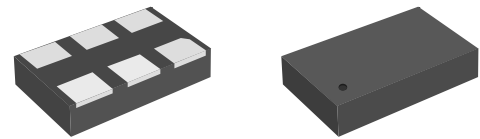
125.00 MHz Ultra-Low Jitter Oscillator Plus-PPM Margining MEMS Oscillator (LVDS)

4HF125000Z4

ADVANCE DATASHEET

Features

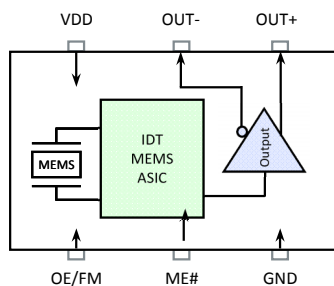
- Nominal Frequency: 125.00 MHz (LVDS)
- Any Freq Tuning (± 1000 ppm): 124.875 to 125.125 MHz
- RMS phase jitter: 0.15 ps typical
- Frequency Stability: ± 25 / ± 50 ppm
- Standard Packages: 7050 / 5032 / 3225
- Internal MEMS Resonator No external XTAL or XO required



7.0 x 5.0 mm package shown
(also available in 5.0 x 3.2 and 3.2 x 2.5 mm)

The **4HF125000Z4** is an ultra-low Phase Jitter (100 fs) oscillator capable of up to ± 1000 ppm of real time frequency margining in one ppm steps. It is ideal for applications requiring extremely low jitter and/or Plus-PPM clocking. Any frequency from 124.875 to 125.125 MHz can be generated in real time without any external XTAL or XO.

Block Diagram

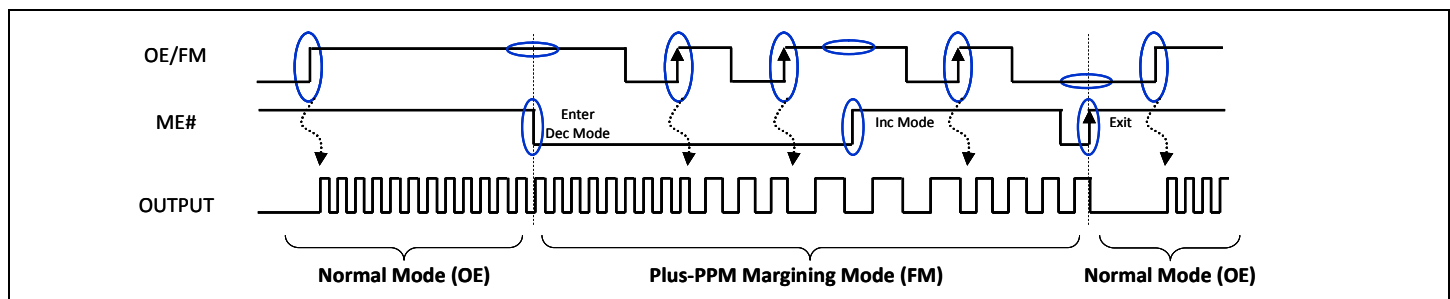


Pin Description

| Pin # | Name | Description |
|-------|------|---|
| 1* | OE | Output Enable |
| | FM | Frequency Margining (decrement/increment) |
| 2* | ME# | Margining Enable |
| 3 | GND | Ground |
| 4 | OUT+ | Output |
| 5 | OUT- | Output (Complementary) |
| 6 | VDD | Power Supply Voltage |

* Pulled high internally

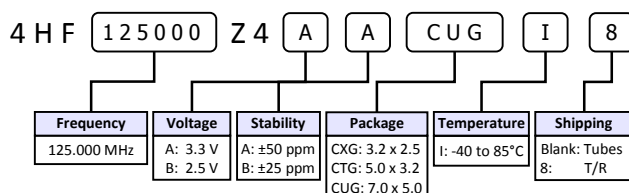
Plus-PPM Margining & Real Time Frequency Tuning (± 1000 ppm)



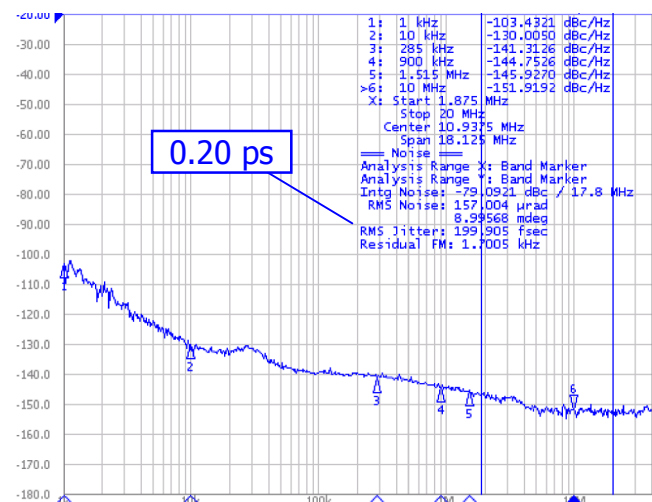
Part Ordering Information

| Package (mm) | Voltage (V) | Ordering Code | |
|--------------|-------------|-------------------|-------------------|
| | | ± 50 ppm | ± 25 ppm |
| 7.0 x 5.0 | 3.3 | 4HF125000Z4AACUGI | 4HF125000Z4ABCUGI |
| | 2.5 | 4HF125000Z4BACUGI | 4HF125000Z4BBCUGI |
| 5.0 x 3.2 | 3.3 | 4HF125000Z4AACTGI | 4HF125000Z4ABCTGI |
| | 2.5 | 4HF125000Z4BACTGI | 4HF125000Z4BBCTGI |
| 3.2 x 2.5 | 2.5 | 4HF125000Z4BACXGI | 4HF125000Z4BBCXGI |

* Factory minimum order quantity: 500pcs (T/R)

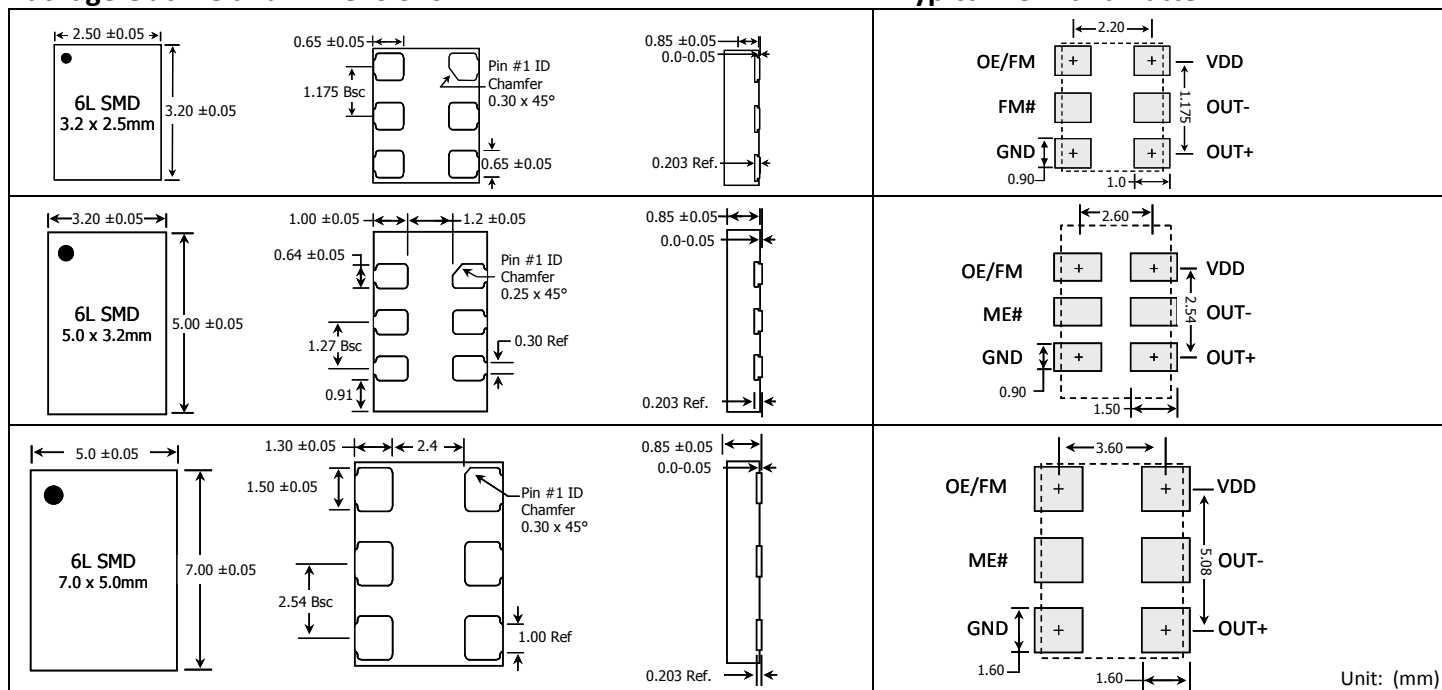


Typical Phase Jitter



| Parameter | 2.5 V Specifications | | | 3.3 V Specifications | | | Units | Conditions |
|-----------------------------------|----------------------|--------|--------------------|----------------------|--------|--------------------|-------|---|
| | Min | Typ | Max | Min | Typ | Max | | |
| Supply Voltage (V _{DD}) | 2.375 | 2.50 | 2.625 | 2.97 | 3.30 | 3.63 | V | |
| Output Frequency | | 125.00 | | | 125.00 | | MHz | |
| Frequency Stability | - 50 | | + 50 | - 50 | | + 50 | ppm | Includes supply voltage and temperature variation (-40 to 85°C), reflow drift, and aging. |
| Supply Current | | 100 | | | 105 | | mA | No load |
| Enable/Disable Time | | | 1 | | | 1 | us | Guaranteed by design |
| Input HIGH/LOW level | 0. 7V _{DD} | | 0.3V _{DD} | 0. 7V _{DD} | | 0.3V _{DD} | V | At OE pin |
| Output LOW level | | 1.05 | | | 1.05 | | V | |
| Output HIGH level | | 1.40 | | | 1.40 | | V | |
| Amplitude (V _A) | | 0.35 | | | 0.35 | | V | Single Ended output swing (Pk-Pk) |
| Mid Level (V _M) | | 1.22 | | | 1.22 | | V | |
| Rise/Fall Time (T _R) | | 280 | | | 300 | | ps | Maximum; 20/80% of V _A ; Output load (CL) = 2pF; Guaranteed by Char. |
| Symmetry (SYM) | 48 | 50 | 52 | 48 | 50 | 52 | % | Worst case; measured at 50% of waveform |
| Phase Jitter | | 0.20 | | | 0.20 | | ps | 1.875MHz to 20MHz, RMS; Measured Differentially (IEEE802.3-2005) |
| | | 0.31 | | | 0.31 | | ps | 12k to 20MHz, RMS; Measured Differentially |
| Period Jitter | | 3.7 | | | 3.7 | | ps | RMS |
| Cycle-to-Cycle Jitter | | 25 | | | 25 | | ps | 1,000 cycles, Peak |
| Start-up Time | | 10 | | | 10 | | ms | Output valid time after power up, 25°C |
| Aging | | ± 5 | | | ± 5 | | ppm | 25°C, 10 years |

Typical PCB Land Pattern



Technical Support
MEMS_Support@idt.com
www.idt.com/go/MEMS

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