



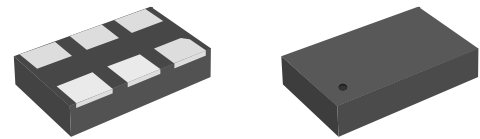
# 125.00 MHz Ultra-Low Jitter Oscillator Plus-PPM Margining MEMS Oscillator (LVPECL)

## 4HF125000Z3

### ADVANCE DATASHEET

#### Features

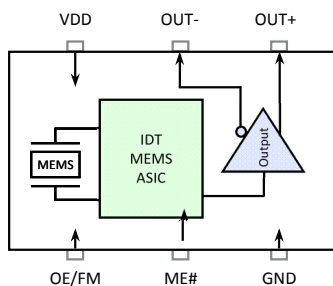
- Nominal Frequency: 125.00 MHz (LVPECL)
- Any Freq Tuning ( $\pm 1000$  ppm): 124.875 to 125.125 MHz
- RMS phase jitter: 0.1 ps typical
- Frequency Stability:  $\pm 25$  /  $\pm 50$  ppm
- Standard Packages: 7050 / 5032 / 3225
- Internal MEMS Resonator No external XTAL or XO required



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

The **4HF125000Z3** is an ultra-low Phase Jitter (100 fs) oscillator capable of up to  $\pm 1000$  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

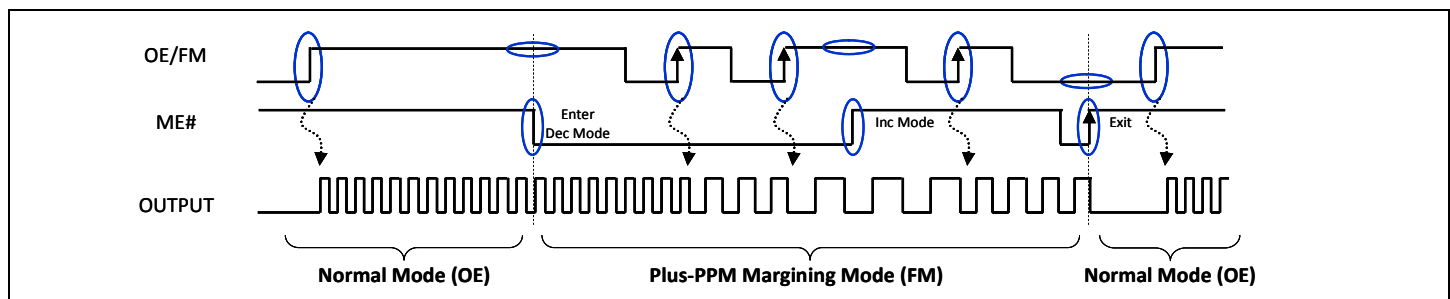


#### Pin Description

| 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

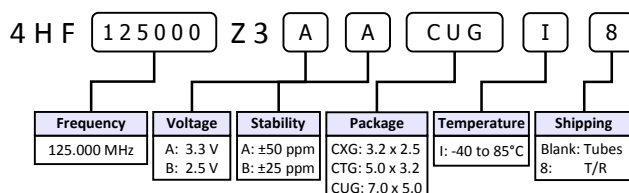
#### Plus-PPM Margining & Real Time Frequency Tuning ( $\pm 1000$ ppm)



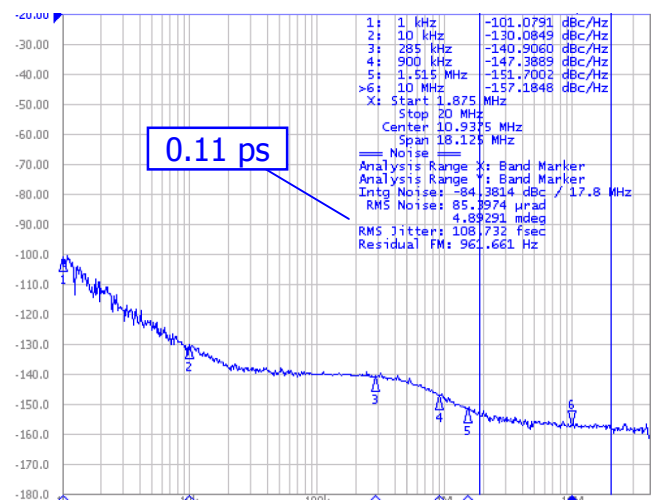
#### Part Ordering Information

| Package (mm) | Voltage (V) | Ordering Code     |                   |
|--------------|-------------|-------------------|-------------------|
|              |             | $\pm 50$ ppm      | $\pm 25$ ppm      |
| 7.0 x 5.0    | 3.3         | 4HF125000Z3AACUGI | 4HF125000Z3ABCUGI |
|              | 2.5         | 4HF125000Z3BACUGI | 4HF125000Z3BBCUGI |
| 5.0 x 3.2    | 3.3         | 4HF125000Z3AACTGI | 4HF125000Z3ABCTGI |
|              | 2.5         | 4HF125000Z3BACTGI | 4HF125000Z3BBCTGI |
| 3.2 x 2.5    | 2.5         | 4HF125000Z3BACXGI | 4HF125000Z3BBCXGI |

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



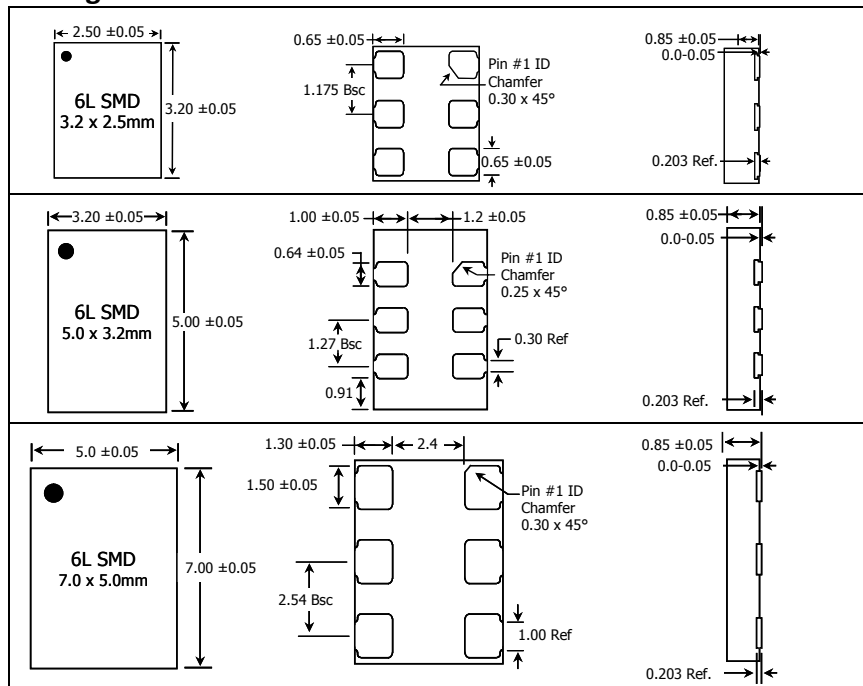
#### Typical Phase Jitter



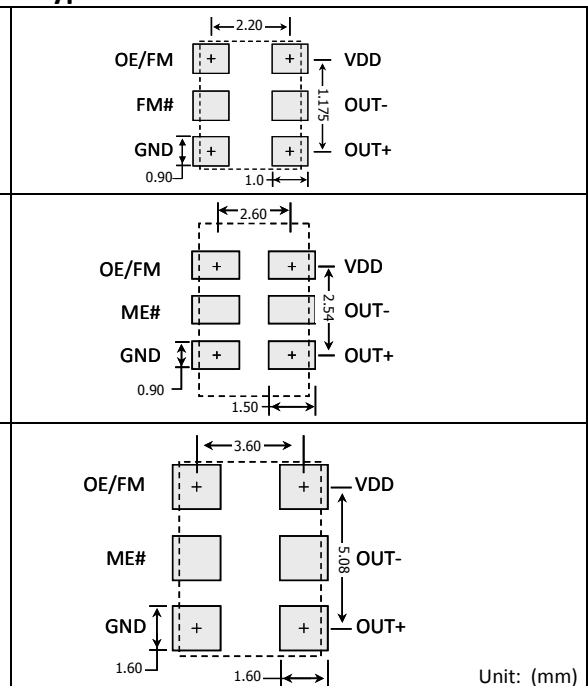
## Specification

| 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              |                      | 90           |              |                      | 95           |              | mA    | No load                                                                                   |
| Enable/Disable Time         |                      |              | 1            |                      |              | 1            | us    | Guaranteed by design                                                                      |
| Input HIGH/LOW level        | 0.7 $V_{DD}$         |              | 0.3 $V_{DD}$ | 0.7 $V_{DD}$         |              | 0.3 $V_{DD}$ | V     | At OE pin                                                                                 |
| Output LOW level            |                      | 0.8          | $V_{DD}-1.8$ |                      | 1.5          | $V_{DD}-1.8$ | V     |                                                                                           |
| Output HIGH level           | $V_{DD}-1.0$         | 1.6          |              | $V_{DD}-1.1$         | 2.3          |              | V     |                                                                                           |
| Amplitude ( $V_A$ )         |                      | 0.75         |              |                      | 0.75         |              | V     | Single Ended output swing (Pk-Pk)                                                         |
| Mid Level ( $V_M$ )         |                      | $V_{DD}-1.3$ |              |                      | $V_{DD}-1.3$ |              | V     |                                                                                           |
| Rise/Fall Time ( $T_R$ )    |                      |              | 300          |                      | 250          |              | 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                |                      | 0.11         |              |                      | 0.11         |              | ps    | 1.875MHz to 20MHz, RMS; Measured Differentially (IEEE802.3-2005)                          |
|                             |                      | 0.25         |              |                      | 0.25         |              | ps    | 12k to 20MHz, RMS; Measured Differentially                                                |
| Period Jitter               |                      | 2.5          |              |                      | 2.5          |              | ps    | RMS                                                                                       |
| Cycle-to-Cycle Jitter       |                      | 20           |              |                      | 20           |              | 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                                                                            |

## Package Outline and Dimensions



## Typical PCB Land Pattern



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## Sales

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## Technical Support

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