

ISSUE 1; March 2016

**Description**

- Low stability and low jitter MEMS oscillator with CMOS output in a plastic package featuring a programmable drive strength feature to optimise specific clock applications. Factory programmable for a short lead time. Uses SiTime's MEMS First™ technology.
- APPLICATIONS:
  - SATA
  - SAS
  - Ethernet
  - PCI Express
  - Video
  - WiFi
  - Computing
  - Storage
  - Networking
  - Telecom
  - Industrial control
- This specification provides guidance on the performance of 3.3V devices in a 3.2 x 2.5mm package. Other supply voltage options are available at 1.8V, 2.5V, 2.8V or 3.0V. Other package size options are available as 2.5 x 2.0mm, 5.0 x 3.2mm or 7.0 x 5.0mm.
- Note: All electrical characteristics are specified with 15pF output load and at nominal supply voltage unless otherwise stated.

**Frequency Parameters**

- Frequency 1.0MHz to 80.0MHz
- Frequency Stability ±10.00ppm to ±50.00ppm
- Ageing ±1.5ppm max 1st year, ±5ppm max over 10yrs, @ 25°C
- Frequency Stability: Inclusive of frequency tolerance @ 25°C, operating temperature range, supply voltage variation and load variation.

**Electrical Parameters**

- Supply Voltage 3.3V ±10%
- Absolute Maximum Supply Voltage Rating: -0.5 to 4.0V
- Supply Current (F=20MHz, @ Vs=3.3V and no load): 33mA max

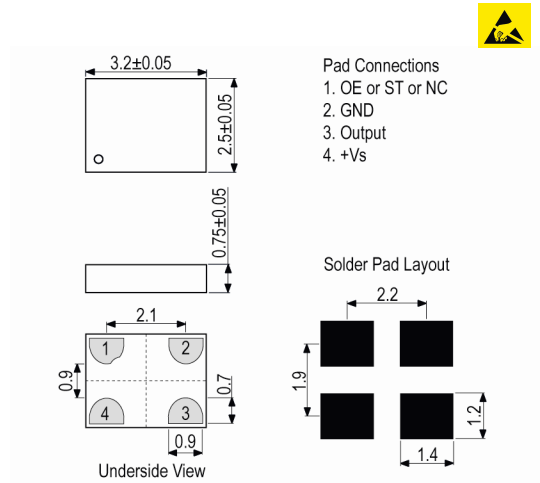
**Operating Temperature Ranges**

- -20 to 70°C
- -40 to 85°C

**Output Details**

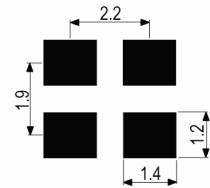
- Output Compatibility CMOS
- Drive Capability 15pF
- Output Voltage Levels:
  - Output Low (VoL): 10%Vs max
  - Output High (VoH): 90%Vs min
- Programmable Drive Strength: The IQMS-135 includes a programmable drive strength feature to provide a flexible tool to optimise the clock rise/fall time for specific applications.
- Slower rise and fall time provides reduced EMI. Fast rise and fall time gives reduced jitter. Please contact an IQD Sales Office to discuss options.

**Outline (mm)**



- Pad Connections
1. OE or ST or NC
  2. GND
  3. Output
  4. +Vs

Solder Pad Layout



**Sales Office Contact Details:**

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#### Output Control

- Enable/Disable Mode (OE):  
Logic '1' (70%Vs min) to pad 1 enables the oscillator output.  
Logic '0' (30%Vs max) to pad 1 disables the oscillator output, the output goes to a high impedance state. Only the output driver is disabled. Supply current=31mA max. A pull-up resistor of 10kΩ max is recommended if pad 1 is not externally connected.  
Output Enable/Disable Time (F=80MHz): 150ns max  
(Note: For other frequencies time=100ns + 3 cycles.)
- Standby Mode (ST):  
Logic '1' (70%Vs min) to pad 1 enables the oscillator output.  
Logic '0' (30%Vs max) to pad 1 the oscillator output is low level (weak pull-down). Device goes to sleep mode. Supply current reduces to 70μA max. A pull-up resistor of 10kΩ max is recommended if pad 1 is not externally connected.  
Resume Time (measured from the time pad 1 crosses 50% threshold): 10ms max
- No Connect Mode (NC):  
No connection to pad 1 enables the oscillator output.
- Input Pull-Up Impedance:  
Pad 1: OE logic '1' or logic '0', or ST logic '1': 250kΩ max  
Pad 1: ST logic '0': 2MΩ min
- Start Up Time (measured from the time Vs reaches its rated minimum value): 10ms max

#### Noise Parameters

- Period Jitter (F=75MHz): 2ps RMS max
- Phase Jitter (F=10MHz, 12kHz to 20MHz): 1ps RMS max

#### Environmental Parameters

- Storage Temperature Range: -65 to 150°C
- Junction Temperature: 150°C max
- Electrostatic Discharge: 2000V max
- Mechanical Shock: MIL-STD-883F, Method 2002.
- Vibration: MIL-STD-883F, Method 2007.
- Thermal Cycling: JESD-22, Method A104.
- Solderability: MIL-STD-883F, Method 2003.

#### Manufacturing Details

- Maximum Process Temperature: 260°C (40secs max)
- Note: Connect a capacitor of 0.1μF min between Vs and GND.

#### Compliance

- |                              |           |
|------------------------------|-----------|
| ■ RoHS Status (2011/65/EU)   | Compliant |
| ■ REACh Status               | Compliant |
| ■ MSL Rating (JDEC-STD-033): | 1         |

#### Packaging Details

- Pack Style: Reel      Tape & reel in accordance with EIA-481-D  
Pack Size: 1,000

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Electrical Specification - maximum limiting values 3.3V  $\pm$ 10%

Frequency Min	Frequency Max	Temperature Range	Stability (Min)	Current (NoLoad)	Rise and Fall Time (10/90%)	Duty Cycle
		°C	ppm	mA	ns	%
1.0MHz	80.0MHz	-20 to 70	$\pm$ 10.0	33	2	45/55%
		-40 to 85	$\pm$ 10.0	33	2	45/55%

*This document was correct at the time of printing; please contact your local sales office for the latest version.*

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