

ISSUE 1; April 2016

Description

- High temperature and low stability 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:
 - Industrial
 - Medical
 - Non AEC-Q100 Automotive
 - Avionics
 - Other high temperature applications
 - Industrial Sensors
 - PLC
 - Motor Servo
 - Outdoor Networking Equipment
 - Medical Video Cam
 - Asset Tracking Systems
- 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 2.0 x 1.6mm, 2.5 x 2.0mm, 5.0 x 3.2mm or 7.0 x 5.0mm.
- Note: All Min and Max limits are specified over temperature and rated operating voltage with 15pF output load unless otherwise stated. Typical values are @ 25°C and nominal supply voltage.

Frequency Parameters

- Frequency 1.0MHz to 110.0MHz
- Frequency Stability $\pm 20.00\text{ppm}$ to $\pm 50.00\text{ppm}$
- Frequency Stability: Inclusive of frequency tolerance @ 25°C, operating temperature range, supply voltage variation, load variation (15pF $\pm 10\%$) and 1st year ageing @ 25°C.

Electrical Parameters

- Supply Voltage 3.3V $\pm 10\%$
- Absolute Maximum Supply Voltage Rating: -0.5 to 4.0V
- Supply Current (F=20MHz, @ Vs=3.3V and no load): 4.7mA max

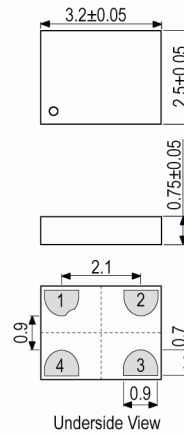
Operating Temperature Ranges

- 40 to 105°C
- 40 to 125°C

Output Details

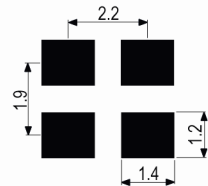
- Output Compatibility CMOS
- Drive Capability 15pF
- Output Voltage Levels:
 - Output Low (VoL): 10%Vs max
 - Output High (VoH): 90%Vs min
- Programmable Drive Strength: The IQMS-137 includes a programmable drive strength feature to provide a flexible tool to optimise the clock rise/fall time for specific 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:

UK: +44 (0)1460 270200
 Germany: 0800 1808 443

France: 0800 901 383
 USA: +1.760.318.2824

Email: info@iqdfrequencyproducts.com
 Web: www.iqdfrequencyproducts.com

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=4.5mA max. A pull-up resistor of 10kΩ max is recommended if pad 1 is not externally connected.
Output Enable/Disable Time (F=110MHz): 130ns 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 8.5μA 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): 5ms 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': 150kΩ max
Pad 1: ST logic '0': 2MΩ min
- **Start Up Time** (measured from the time Vs reaches its rated minimum value): 5ms max

Noise Parameters

- **Period Jitter** (F=75MHz): 2.5ps RMS max
- **Phase Jitter** (F=75MHz, 12kHz to 20MHz): 2ps RMS max
- **Peak to Peak Jitter** (F=75MHz): 20ps max

Environmental Parameters

- **Storage Temperature Range:** -65 to 150°C
- **Junction Temperature:** 150°C max
(Note: Exceeding this temperature for an extended period of time may damage the oscillator.)
- **Operating Junction Temperature:**
115°C max (@ max operating temperature [ambient]=105°C)
135°C max (@ max operating temperature [ambient]=125°C)
(Note: Datasheet specifications are not guaranteed if the junction temperature exceeds the maximum operating junction temperature.)
- **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 (80/20%)	Duty Cycle
		°C	ppm	mA	ns	%
1.0MHz	110.0MHz	-40 to 125	$\pm$ 20.0	4.7	2	45/55%

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