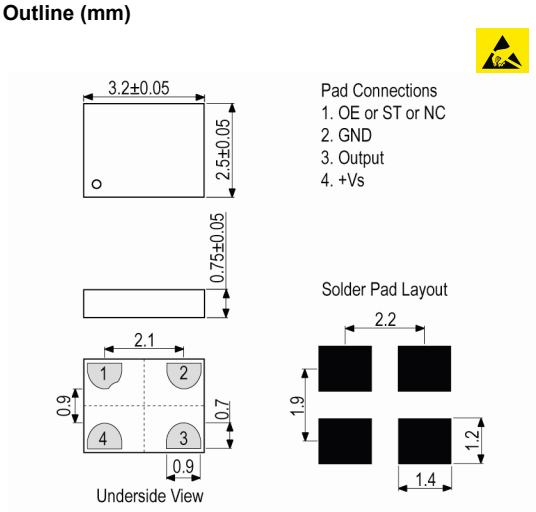
ISSUE 1; April 2016

Description

- High frequency and high temperature 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.

Outline (mm)



Frequency Parameters

- Frequency 115.194001MHz to 137.0MHz
- Frequency Stability ±20.00ppm to ±50.00ppm
- Frequency Stability: Inclusive of frequency tolerance @ 25°C, operating temperature range, supply voltage variation, load variation (15pF ±10%) and 1st year ageing @ 25°C.

Electrical Parameters

- Supply Voltage 3.3V ±10%
- Absolute Maximum Supply Voltage Rating: -0.5 to 4.0V
- Supply Current (F=125MHz, @ Vs=3.3V and no load): 8mA max

Operating Temperature Ranges

- -40 to 105°C
- -40 to 125°C

Output Details

- Output Compatability CMOS
- Drive Capability 15pF
- Output Voltage Levels:
  Output Low (VoL): 10%Vs max
  Output High (VoH): 90%Vs min
- Programmable Drive Strength: The IQMS-138 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.

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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=4.7mA max. A pull-up resistor of 10kΩ max is recommended if pad 1 is not externally connected.
  Output Enable/Disable Time (F=115.194001MHz): 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=125MHz): 2.5ps RMS max
- Phase Jitter (F=125MHz, 12kHz to 20MHz): 2ps RMS max
- Peak to Peak Jitter (F=125MHz): 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 ±10%

Frequency Min	Frequency Max	Temperature Range	Stability (Min)	Current (NoLoad)	Rise and Fall Time (80/20%)	Duty Cycle
		°C	ppm	mA	ns	%
115.194001MHz	137.0MHz	-40 to 105	±20.0	8	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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