

ISSUE 1; June 2021

Description

- Ultra low phase noise Simple Packaged Crystal Oscillator (SPXO) with an CMOS output in a hermetically sealed ceramic package with a metal lid.



Frequency Parameters

- Frequency: 20.0MHz to 50.0MHz
- Frequency Stability: $\pm 25.00\text{ppm}$ to $\pm 50.00\text{ppm}$
- Frequency Stability: Inclusive of tolerance @ 25°C, operating temperature range, supply voltage variation and load variation.

Electrical Parameters

- Supply Voltage: 2.5V $\pm 5\%$
- Rise Time (10% to 90%): 5ns max
Fall Time (90% to 10%): 3ns max
- Standby Current: 10 μA max

Operating Temperature Ranges

- 10 to 70°C
- 40 to 85°C

Output Details

- Output Compatibility: CMOS
- Drive Capability: 15pF
- Output Low Vol: 10% Vs max
Output High Voh: 90% Vs min
- Start-Up Time: 5ms max

Output Control

- Standby Operation:
Logic '1' ($\geq 70\%$ Vs) to pad 1 enables oscillator output.
Logic '0' ($\leq 30\%$ Vs) to pad 1 disables oscillator output; the oscillator output goes to the high impedance state.
No connection to pad 1 enables oscillator output.

Noise Parameters

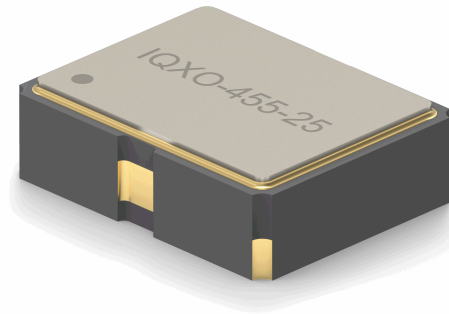
- Phase Noise (typ @ 25°C for 24.576MHz & 3.3V):
-101dBc/Hz @ 10Hz
-132dBc/Hz @ 100Hz
-155dBc/Hz @ 1kHz
-166dBc/Hz @ 10kHz
-174dBc/Hz @ 100kHz
-175dBc/Hz @ 1MHz
-175dBc/Hz @ 5MHz
- RMS Phase Jitter @ 24.576MHz & 3.3V (12kHz to 5MHz):
40fs typ

Environmental Parameters

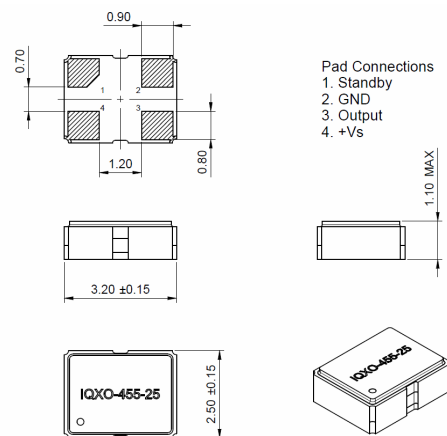
- Storage Temperature Range: -55 to 125°C
- Drop: 30cm free drop (3 times) onto a hard wooden board.
- Vibration: MIL-STD-202F, Method 201A, frequency range 10Hz~55Hz, X, Y, Z axis, 2 hours in each axis (6 hours total).

Manufacturing Details

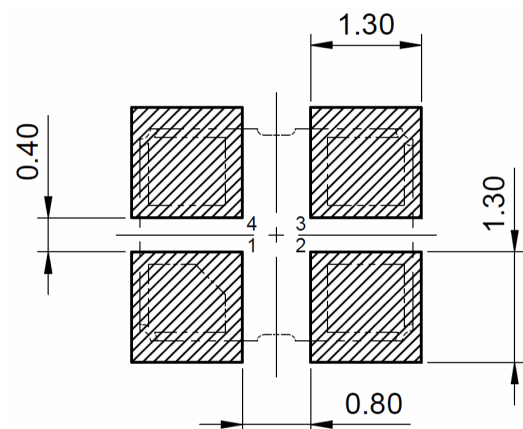
- Note: a 0.01 μF capacitor should be connected as close to the oscillator as possible between +Vs and GND.
- RoHS Terminations: NiAu



Outline (mm)



Recommended Solder Pad Layout



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Ordering Information

- Frequency*
Model*
Output
Frequency Stability (over operating temperature range)*
Operating Temperature Range*
Supply Voltage
(*minimum required)
- Example
50.0MHz IQXO-455-25
CMOS ±25ppm -40 to 85C 2.5V

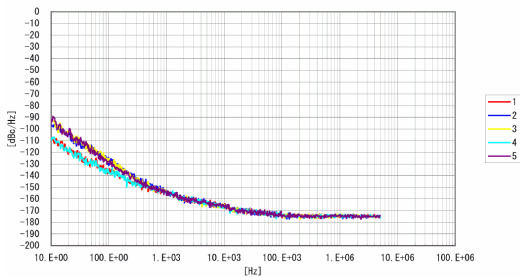
Compliance

- RoHS Status (2015/863/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
- Pack Style: Cutt Cut tape
Pack Size: 100

Example phase noise @ 24.576MHz



No.	Phase noise DATA						PHASE JITTER (ps) (120Hz-20kHz)	
	10Hz	100Hz	1kHz	10kHz	100kHz	1MHz		5MHz
1	-109	-136	-155	-165	-174	-175	-176	0.040
2	-97	-131	-153	-166	-174	-175	-176	0.040
3	-93	-125	-156	-168	-173	-174	-174	0.040
4	-110	-137	-154	-166	-174	-175	-176	0.039
5	-96	-128	-157	-166	-176	-175	-174	0.039
AVE	-101	-132	-155	-166	-174	-175	-175	0.040

Electrical Specification - maximum limiting values 2.5V ±5%

Frequency Min	Frequency Max	Temperature Range	Stability Min	Current Draw	Rise & Fall Time (10/90%)	Duty Cycle
		°C	ppm	mA	ns	%
20.0MHz	50.0MHz	-10 to 70	±25.0	10	-	45/55%
		-40 to 85	±25.0	10	-	45/55%

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