



IQXO-40x

IQXO-40x

32.768kHz miniature 2 x 1.6mm crystal oscillator in an hermetically sealed ceramic package with a seam sealed metal lid.

Model Name	Description
IQXO-402	A 3.3V version
IQXO-403	A 2.5V version
IQXO-404	A 1.8V version

ISSUE 4; December 2023

Description

- 32.768kHz miniature 2 x 1.6mm crystal oscillator in an hermetically sealed ceramic package with a seam sealed metal lid.



Frequency Parameters

- Frequency: 32.768kHz
- Frequency Stability: $\pm 25.00\text{ppm}$ to $\pm 100.00\text{ppm}$
- Ageing: $\pm 3\text{ppm}$ max per year @ 25°C

Electrical Parameters

- Supply Voltage: 3.3V $\pm 10\%$

Operating Temperature Ranges

- 20 to 70°C
- 40 to 85°C
- 40 to 125°C

Output Details

- Output Compatibility: CMOS
- Drive Capability: 15pF

Output Control

- Standby Operation:
 - Logic '1' ($\geq 70\%V_S$) to pad 1 enables oscillator output
 - Logic '0' ($\leq 30\%V_S$) to pad 1 disables oscillator output; when disabled the oscillator output goes to the high impedance state.
 - No connection to pad 1 enables oscillator output.
- Standby Current:
 - 10 μA max @ -40 to 85°C
 - 20 μA max @ -40 to 125°C
- Start-up Time: 10ms max
 - 0.3ms typ to 90% of final amplitude (under ideal conditions @ 25°C)

Environmental Parameters

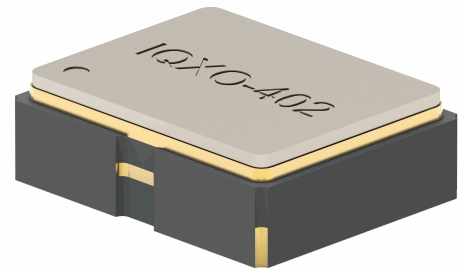
- Storage Temperature Range: -55 to 125°C
- Shock : 1500G, 0.5ms, 3 times for each surface, total 18 times.
- Vibration: Frequency range: 20~2000Hz, peak to peak amplitude 1.52mm, peak acceleration: 20G (196m/s²), 3 directions (X, Y,Z), each cycle: 20min, 4 cycles for each direction.

Ordering Information

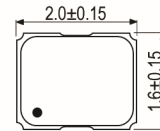
- Frequency
 - Model*
 - Output
 - Frequency Stability*
 - Operating Temperature Range*
 - Supply Voltage
 - (*minimum required)
- Example
 - 32.768kHz IQXO-402
 - CMOS $\pm 30\text{ppm}$ -20 to 70C 3.3V

Compliance

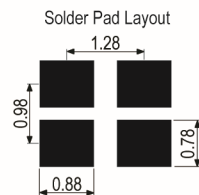
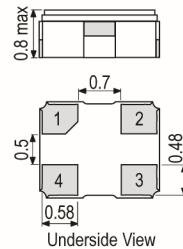
- RoHS Status (2015/863/EU): Compliant
- REACH Status: Compliant
- MSL Rating (JDEC-STD-033): Not Applicable



Outline (mm)



- Pad Connections
- Standby Operation
 - GND
 - Output
 - +Vs





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Packaging Details

- Tape & reel in accordance with EIA-481
Quantities below the standard reel size to be supplied on cut tape.

Standard Reel Quantity: 3,000 Pieces

Electrical Specification - maximum limiting values 3.30V ±10%

Frequency	Temperature Range	Stability (Min)	Current Draw	Rise and Fall Time	Duty Cycle
	°C	ppm	mA	ns	%
32.768kHz	-40 to 85	±30.00	0.2	100	40/60%
	-40 to 125	±100.00	0.2	100	40/60%
	-20 to 70	±25.00	0.2	100	40/60%

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Description

- 32.768kHz miniature 2 x 1.6mm crystal oscillator in an hermetically sealed ceramic package with a seam sealed metal lid.



Frequency Parameters

- Frequency: 32.768kHz
- Frequency Stability: $\pm 25.00\text{ppm}$ to $\pm 100.00\text{ppm}$
- Ageing: $\pm 3\text{ppm}$ max per year @ 25°C

Electrical Parameters

- Supply Voltage: 2.5V $\pm 5\%$
- Start-up Time: 0.3ms typ, 10ms max

Operating Temperature Ranges

- 20 to 70°C
- 40 to 85°C
- 40 to 125°C

Output Details

- Output Compatibility: CMOS
- Drive Capability: 15pF

Output Control

- Standby Operation:
Logic '1' ($\geq 70\%V_S$) to pad 1 enables oscillator output
Logic '0' ($\leq 30\%V_S$) to pad 1 disables oscillator output; when disabled the oscillator output goes to the high impedance state.
No connection to pad 1 enables oscillator output.
- Standby Current (pad 1 at logic '0'):
10 μA max @ -40+85°C
20 μA max @ -40+125°C

Environmental Parameters

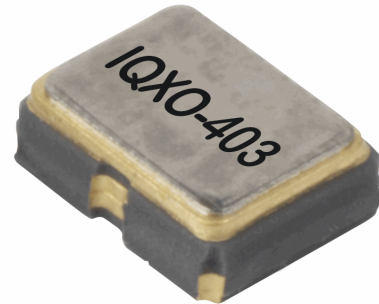
- Storage Temperature Range: -55 to 125°C
- Shock: 1500G, 0.5ms, 3 times for each surface, total 18 times.
- Vibration: Frequency range: 20~2000Hz, peak to peak amplitude 1.52mm, peak acceleration: 20G (196m/s²), 3 directions (X, Y, Z), each cycle: 20min, 4 cycles for each direction.

Ordering Information

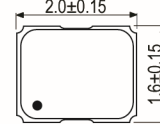
- Frequency
Model*
Output
Frequency Stability*
Operating Temperature Range*
Supply Voltage
(*minimum required)
- Example
32.768kHz IQXO-403
CMOS $\pm 30\text{ppm}$ -20 to 70C 2.5V

Compliance

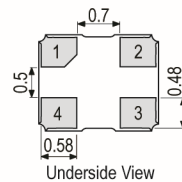
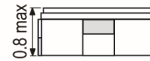
- RoHS Status (2015/863/EU): Compliant
- REACH Status: Compliant
- MSL Rating (JDEC-STD-033): Not Applicable



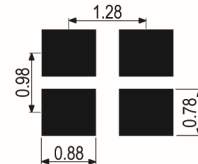
Outline (mm)



- Pad Connections
- Standby Operation
 - GND
 - Output
 - +Vs



Solder Pad Layout





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Packaging Details

- Pack Style: Reel Tape & reel in accordance with EIA-481
Pack Size: 3,000
- Pack Style: Cutt In tape, cut from a reel
Pack Size: 100

Electrical Specification - maximum limiting values 2.50V \pm 5%

Frequency	Temperature Range	Stability (Min)	Current Draw	Rise and Fall Time	Duty Cycle
	°C	ppm	mA	ns	%
32.768kHz	-40 to 85	\pm 30.00	0.2	100	40/60%
	-40 to 125	\pm 100.00	0.2	100	40/60%
	-20 to 70	\pm 25.00	0.2	100	40/60%

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Description

- 32.768kHz miniature 2 x 1.6mm crystal oscillator in an hermetically sealed ceramic package with a seam sealed metal lid.



Frequency Parameters

- Frequency: 32.768kHz
- Frequency Stability: $\pm 25.00\text{ppm}$ to $\pm 100.00\text{ppm}$
- Ageing: $\pm 3\text{ppm}$ max per year @ 25°C

Electrical Parameters

- Supply Voltage: 1.8V $\pm 5\%$

Operating Temperature Ranges

- 20 to 70°C
- 40 to 85°C
- 40 to 125°C

Output Details

- Output Compatibility: CMOS
- Drive Capability: 15pF

Output Control

- Standby Operation:
 - Logic '1' ($\geq 70\%V_S$) to pad 1 enables oscillator output
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 - 10 μA max @ -40 to 85°C
 - 20 μA max @ -40 to 125°C
- Start-up Time: 10ms max
 - 0.3ms typ to 90% of final amplitude (under ideal conditions @ 25°C)

Environmental Parameters

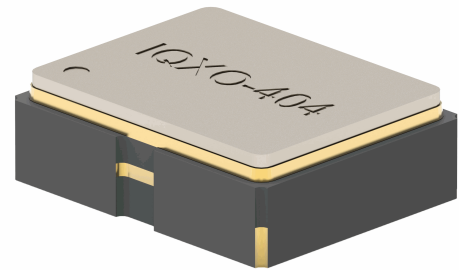
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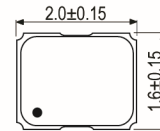
- Frequency
 - Model*
 - Output
 - Frequency Stability*
 - Operating Temperature Range*
 - Supply Voltage
 - (*minimum required)
- Example
 - 32.768kHz IQXO-404
 - CMOS $\pm 30\text{ppm}$ -20 to 70C 1.8V

Compliance

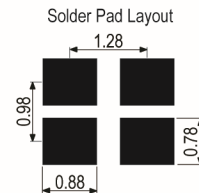
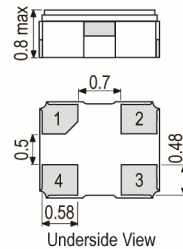
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Outline (mm)



- Pad Connections
- Standby Operation
 - GND
 - Output
 - +Vs



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Packaging Details

- Tape & reel in accordance with EIA-481
Quantities below the standard reel size to be supplied on cut tape.

Standard Reel Quantity: 3,000 Pieces

Electrical Specification - maximum limiting values 1.80V ±5%

Frequency	Temperature Range	Stability (Min)	Current Draw	Rise and Fall Time	Duty Cycle
	°C	ppm	mA	ns	%
32.768kHz	-40 to 85	±30.00	0.2	100	40/60%
	-40 to 125	±100.00	0.2	100	40/60%
	-20 to 70	±25.00	0.2	100	40/60%

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Sales Office Contact Details:

UK: +44 (0)1460 270200

USA: +1 760 668 8935

Email: info@iqdfrequencyproducts.com

Web: www.iqdfrequencyproducts.com