

OSCILLATORS

Minimum Order Information Required

- Stock Number

8-pin DIL Clock Oscillators IQXO-22/-23-Serie

Frequency	Type	Frequency Stability	RS-No.	No.
3.68640MHz	HCMOS/TTL	±100ppm	226-1948	X363H
4.0MHz	HCMOS/TTL	±100ppm	226-1976	X351H
8.0MHz	HCMOS/TTL	±100ppm	226-2008	X352H
10.0MHz	HCMOS/TTL	±100ppm	226-2042	X353H
12.0MHz	HCMOS/TTL	±100ppm	226-2064	X354H
12.288MHz	HCMOS/TTL	±100ppm		X379H
14.31818MHz	HCMOS/TTL	±100ppm		X373H
14.74560MHz	HCMOS/TTL	±100ppm	190-0096	X388H
16.0MHz	HCMOS/TTL	±100ppm	190-0103	X355H
20.0MHz	HCMOS/TTL	±100ppm	190-0119	X356H
24.0MHz	HCMOS/TTL	±100ppm	226-2137	X371H
24.5760MHz	HCMOS/TTL	±100ppm		X386H
25.0MHz	HCMOS/TTL	±100ppm		X390H
25.1750MHz	HCMOS/TTL	±100ppm		X374H
28.63636MHz	HCMOS/TTL	±100ppm		X376H
32.0MHz	HCMOS/TTL	±100ppm	226-2171	X360H
32.768MHz	HCMOS/TTL	±100ppm		X380H
40.0MHz	HCMOS/TTL	±100ppm	226-2222	X357H
50.0MHz	HCMOS/TTL	±100ppm	226-2250	X358H
60.0MHz	HCMOS/TTL	±100ppm	190-0125	X381H
60.0MHz	HCMOS/TTL	±100ppm		X381T
64.0MHz	HCMOS/TTL	±100ppm	190-0131	X384H
80.0MHz	HCMOS/TTL	±100ppm	190-0147	X389H

IQXO-350-Serie

Frequency	Type	Frequency Stability	RS-No.	No.
6.0MHz	HCMOS/TTL	±100ppm		X335B
8.0MHz	HCMOS/TTL	±100ppm	316-6793	X352A
9.83040MHz	HCMOS/TTL	±100ppm	316-6721	X359A
10.0MHz	HCMOS/TTL	±100ppm	226-2036	X353A
11.2896MHz	HCMOS/TTL	±100ppm		X382A
12.0MHz	HCMOS/TTL	±100ppm	316-6737	X354A
12.288MHz	HCMOS/TTL	±100ppm		X342B
16.0MHz	HCMOS/TTL	±100ppm	316-6800	X355A
16.3840MHz	HCMOS/TTL	±50ppm		X370A
18.432MHz	HCMOS/TTL	±100ppm		X367A
19.66080MHz	HCMOS/TTL	±100ppm	316-6743	X364A
20.0MHz	HCMOS/TTL	±100ppm	316-6759	X356A
24.0MHz	HCMOS/TTL	±100ppm	226-2121	X371A
25.0MHz	HCMOS/TTL	±100ppm		X350B
30.0MHz	HCMOS/TTL	±100ppm	316-6816	X359B
32.0MHz	HCMOS/TTL	±100ppm	327-6092	X360A
32.768MHz	HCMOS/TTL	±100ppm		X380A
33.3330MHz	HCMOS/TTL	±100ppm		X366A
33.33MHz	HCMOS/TTL	±100ppm	316-6822	X361B
40.0MHz	HCMOS/TTL	±50ppm		X357B
40.0MHz	HCMOS/TTL	±100ppm	226-2216	X357A
48.0MHz	HCMOS/TTL	±100ppm	316-6765	X373B
50.0MHz	HCMOS/TTL	±100ppm	316-6838	X358A
64.0MHz	HCMOS/TTL	±100ppm	316-6844	X393B
66.0MHz	HCMOS/TTL	±100ppm	226-2272	X368A

14-pin DIL Clock Oscillators - HCMOS/TTL IQXO-350-Serie

Frequency	Type	Frequency Stability	RS-No.	No.
1.0MHz	HCMOS/TTL	±100ppm	316-6686	X331B
1.8432MHz	HCMOS/TTL	±100ppm	316-6692	X337B
2.0MHz	HCMOS/TTL	±100ppm		E618A
3.6864MHz	HCMOS/TTL	±100ppm	316-6715	X325B
4.0MHz	HCMOS/TTL	±100ppm	316-6771	X351A
4.096MHz	HCMOS/TTL	±100ppm		X373A
4.9152MHz	HCMOS/TTL	±100ppm	316-6787	X363A
5.0MHz	HCMOS/TTL	±100ppm		X333B

IQXO-22, -22I, -23, -23I Commercial Oscillator

ISSUE 14; 24 JUNE 1998

Delivery Options

- Common frequencies are available from stock. Please see p36 for details
- 3 day Express Manufacturing Service, subject to piece part stock availability.

Output Compatibility

- HCMOS/TTL
- Drive Capability: 50pF or 10 TTL
- Non tri-state (IQXO-22, -22I)
- Tri-state (IQXO-23, -23I)

Package Outline

- 8-pin DIL compatible resistance welded enclosure, hermetically sealed with glass to metal seals. Available over 0 to 70°C (IQXO-22, -23) or -40 to 85°C (IQXO-22I, -23I)

Standard Frequency Stabilities

- $\pm 25\text{ppm}$, $\pm 50\text{ppm}$, $\pm 100\text{ppm}$
(over operating temperature range)

Frequency Tolerance at 25°C (Optional)

- $\pm 5\text{ppm}$, $\pm 10\text{ppm}$, $\pm 25\text{ppm}$

Operating Temperature Range

- 0 to 70°C (IQXO-22, -23)
- 40 to 85°C (IQXO-22I, -23I)

Storage Temperature Range

- 55 to 125°C

Environmental Specification

- Terminal Strength: 0.91kg max. Force perpendicular to top & bottom.
- Hermetic Seal: not to exceed 1×10^{-8} mBar litres of Helium leakage
- Solderability: MIL-STD-202E, Method 208C
- Vibration: 10 to 55Hz 0.76mm displacement, sweep 60 seconds, duration 2 hours.
- Rapid Change of Temperature over Operating Temperature Range: 10 cycles
- Shock: 981m/s^2 for 6ms, three shocks in each direction along the three mutually perpendicular planes

Tri-state Operation (IQXO-23, -23I)

- Logic '0' to pin 1 disables oscillator output; when disabled the oscillator output goes to the high impedance state

- No connection or Logic '1' to pin 1 enables oscillator output
- Maximum 'pull-down' resistance required to disable output = $20\text{k}\Omega$
- Disable current $50\mu\text{A}$ typical

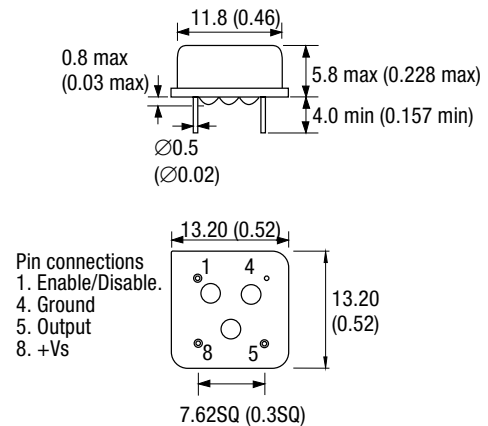
Marking

- Model number (+ Operating Temperature Code; if applicable)
- Frequency Stability Code
- Frequency Tolerance Code (Optional)
- Frequency
- Date code (Year/Week)

Minimum Order Information Required

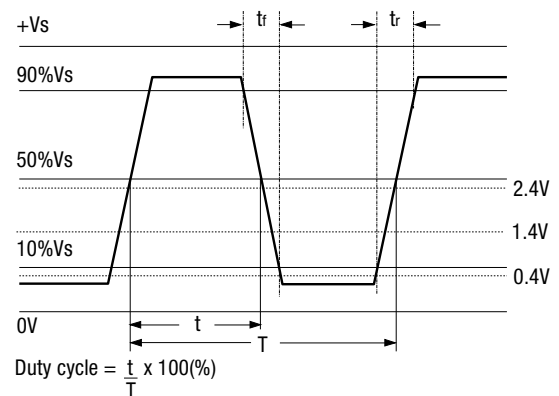
- Frequency + Model Number + Operating Temperature Code (if applicable) + Frequency Stability

Outline in mm (inches)



Note: Pin 1= No connection on non tri-state models

Output Waveform - HCMOS/TTL



Electrical Specification – maximum limiting values when measured in HCMOS test circuit

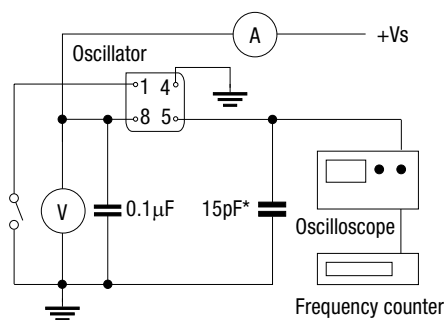
Frequency Range	Frequency Stability	Supply Voltage*	Supply Current	Rise Time (t_r)	Fall Time (t_f)	Duty Cycle	Model Number
500.0kHz to < 5.0MHz	$\pm 25\text{ppm}$, $\pm 50\text{ppm}$, $\pm 100\text{ppm}$	$5\text{V} \pm 0.25\text{V}$	20mA	15ns	15ns	45/55%	IQXO-22, -22I, -23, -23I
5.0 to < 16.0MHz	$\pm 25\text{ppm}$, $\pm 50\text{ppm}$, $\pm 100\text{ppm}$	$5\text{V} \pm 0.25\text{V}$	20mA	10ns	10ns	45/55%	IQXO-22, -22I, -23, -23I
16.0 to < 30.0MHz	$\pm 25\text{ppm}$, $\pm 50\text{ppm}$, $\pm 100\text{ppm}$	$5\text{V} \pm 0.25\text{V}$	30mA	10ns	10ns	45/55%	IQXO-22, -22I, -23, -23I
30.0 to < 50.0MHz	$\pm 25\text{ppm}$, $\pm 50\text{ppm}$, $\pm 100\text{ppm}$	$5\text{V} \pm 0.25\text{V}$	40mA	8ns	8ns	45/55%	IQXO-22, -22I, -23, -23I
50.0 to 80.0MHz	$\pm 25\text{ppm}$, $\pm 50\text{ppm}$, $\pm 100\text{ppm}$	$5\text{V} \pm 0.25\text{V}$	50mA	8ns	8ns	40/60%	IQXO-22, -22I, -23, -23I

Ordering Example

Frequency 22.0MHz
 Model No: -22, -22I = Non tri-state & -23, -23I = Tri-state
 Operating Temperature Code: I = -40 to 85°C Not applicable for 0 to 70°C
 Frequency Stability: A = $\pm 25\text{ppm}$; B = $\pm 50\text{ppm}$; C = $\pm 100\text{ppm}$
 Frequency Tolerance @ 25°C : D = $\pm 5\text{ppm}$; E = $\pm 10\text{ppm}$; F = $\pm 25\text{ppm}$

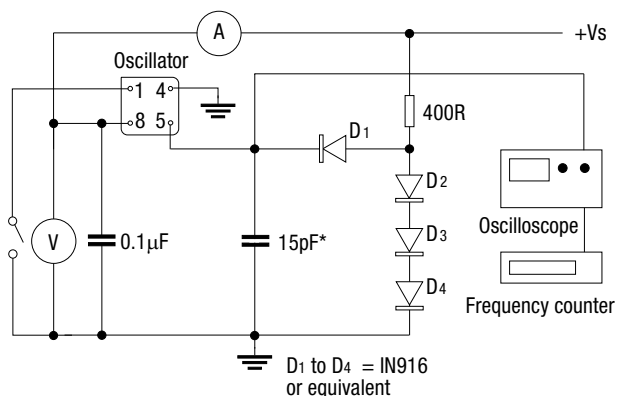
Please note: Code combination A F is not available

* A 3.3V version is available upon request. Please contact the Sales office for details.

Test Circuit - HCMOS


*Inclusive of jigging & equipment capacitance

Note: Pin 1 = No connection on non tri-state models

Test Circuit - TTL


*Inclusive of jigging & equipment capacitance

Note: Pin 1 = No connection on non tri-state models

IQXO-350, -350I Commercial Oscillator

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Delivery Options

- Common frequencies are available from stock. Please see p36 for details
- 3 day Express Manufacturing Service, subject to piece part stock availability.

Output Compatibility

- HCMOS/TTL
- Drive Capability: 50pF or 10 TTL
(1.0 to < 100.0kHz 15pF or 10 LS TTL only)

Package Outline

- 14-pin DIL compatible resistance welded enclosure, hermetically sealed with glass to metal seals. Available over 0 to 70°C (IQXO-350) or -40 to 85°C (IQXO-350I)

Standard Frequency Stabilities

- $\pm 25\text{ppm}$, $\pm 50\text{ppm}$, $\pm 100\text{ppm}$
(over operating temperature range)

Frequency Tolerance at 25°C (Optional)

- $\pm 5\text{ppm}$, $\pm 10\text{ppm}$, $\pm 25\text{ppm}$

Operating Temperature Range

- 0 to 70°C (IQXO-350)
- 40 to 85°C (IQXO-350I)

Storage Temperature Range

- 55 to 125°C

Environmental Specification

- Terminal Strength: 0.91kg max. Force perpendicular to top & bottom.
- Hermetic Seal: not to exceed 1×10^{-8} mBar litres of Helium leakage
- Solderability: MIL-STD-202E, Method 208C
- Vibration: 10 to 55Hz 0.76mm displacement, sweep 60 seconds, duration 2 hours.
- Rapid Change of Temperature over Operating Temperature Range: 10 cycles
- Shock: 981m/s^2 for 6ms, three shocks in each direction along the three mutually perpendicular planes

Marking

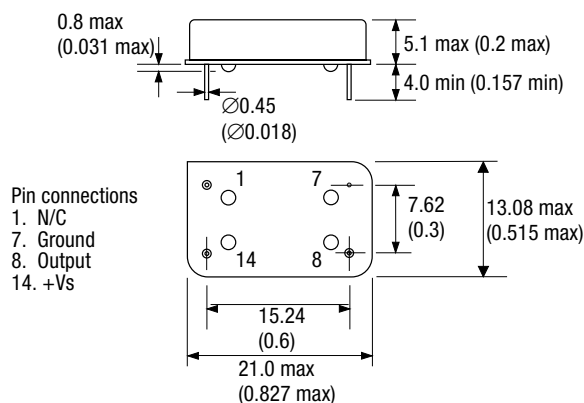
- Model number (+ Operating Temperature Code; if applicable)
- Frequency Stability Code
- Frequency Tolerance Code (Optional)
- Frequency

- Date code (Year/Week)

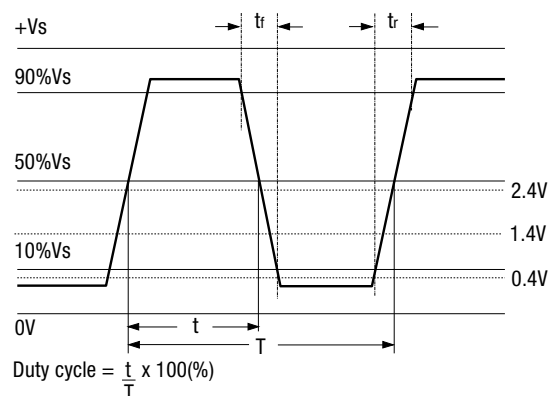
Minimum Order Information Required

- Frequency + Model Number + Operating Temperature Code (if applicable) + Frequency Stability

Outline in mm (inches)



Output Waveform - HCMOS/TTL/LS TTL



Electrical Specification – maximum limiting values when measured in HCMOS test circuit

Frequency Range	Frequency Stability	Supply Voltage	Supply Current	*Rise Time (t_r)	*Fall Time (t_f)	**Duty Cycle	Model Number
1.0 to < 100.0kHz	$\pm 25\text{ppm}$, $\pm 50\text{ppm}$, $\pm 100\text{ppm}$	$5V \pm 0.25V$	10mA	10ns	10ns	45/55%	IQXO-350, -350I
100.0 to < 250.0kHz	$\pm 25\text{ppm}$, $\pm 50\text{ppm}$, $\pm 100\text{ppm}$	$5V \pm 0.25V$	10mA	15ns	15ns	45/55%	IQXO-350, -350I
250.0kHz to < 5.0MHz	$\pm 25\text{ppm}$, $\pm 50\text{ppm}$, $\pm 100\text{ppm}$	$5V \pm 0.25V$	30mA	15ns	15ns	45/55%	IQXO-350, -350I
5.0 to < 16.0MHz	$\pm 25\text{ppm}$, $\pm 50\text{ppm}$, $\pm 100\text{ppm}$	$5V \pm 0.25V$	15mA	10ns	10ns	45/55%	IQXO-350, -350I
16.0 to < 30.0MHz	$\pm 25\text{ppm}$, $\pm 50\text{ppm}$, $\pm 100\text{ppm}$	$5V \pm 0.25V$	30mA	10ns	10ns	45/55%	IQXO-350, -350I
30.0 to < 50.0MHz	$\pm 25\text{ppm}$, $\pm 50\text{ppm}$, $\pm 100\text{ppm}$	$5V \pm 0.25V$	40mA	8ns	8ns	45/55%	IQXO-350, -350I
50.0 to 80.0MHz	$\pm 25\text{ppm}$, $\pm 50\text{ppm}$, $\pm 100\text{ppm}$	$5V \pm 0.25V$	50mA	8ns	8ns	40/60%	IQXO-350, -350I

Ordering Example

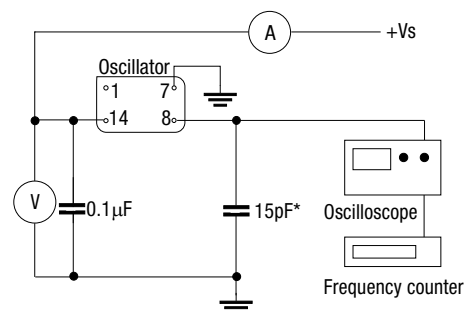
Frequency 22.0MHz
 Model No IQXO-350I
 Operating Temperature Code: I = -40 to 85°C Not applicable for 0 to 70°C
 Frequency Stability: A = $\pm 25\text{ppm}$; B = $\pm 50\text{ppm}$; C = $\pm 100\text{ppm}$
 Frequency Tolerance @ 25°C: D = $\pm 5\text{ppm}$; E = $\pm 10\text{ppm}$; F = $\pm 25\text{ppm}$

Please note: Code combination A F is not available

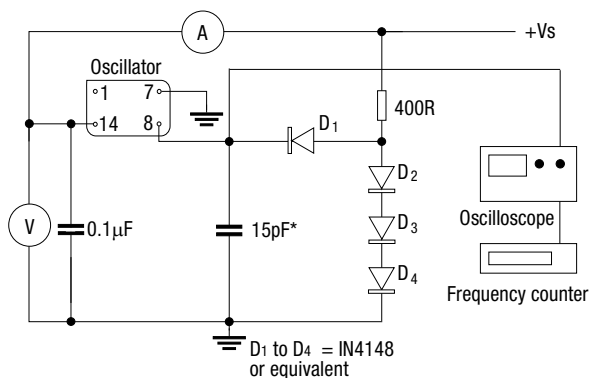
Test Circuit - HCMOS

* Rise & Fall times will be 6ns max in TTL cct.

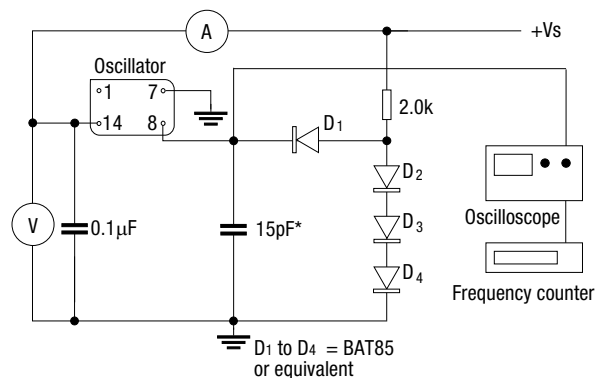
** Duty Cycle will be 40/60% in TTL cct for $\geq 5.0\text{MHz}$



*Inclusive of jigging & equipment capacitance

Test Circuit - TTL


*Inclusive of jigging & equipment capacitance

Test Circuit - LS TTL


*Inclusive of jigging & equipment capacitance