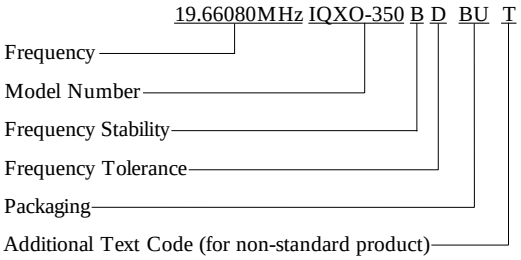
SPECIFYING SIMPLE PACKAGED CRYSTAL OSCILLATORS (SPXOs)

A typical SPXO specification reads like this:



The following notes define each element of the specification.

Frequency

Frequency is normally specified in kilohertz (kHz) up to 999.999 kHz and in megahertz (MHz) from 1.0MHz. All our computer-generated transaction documents follow this standard convention automatically.

The SPXO frequency should be described to seven significant figures. If seven significant figures are not used, we assume that any figure that might follow those given may be taken as zero. Thus a frequency given as 16.6MHz will be taken as 16.60, not 16.66667.

Model Number

The model number incorporates information which describes output compatibility and holder style.

Frequency Stability

The frequency stability of an SPXO includes the initial adjustment tolerance at room temperature, the tolerance over operating temperature range and the effect of supply voltage variation. This value is specified as 'parts per million' (ppm) and is available in four ranges; ±15ppm, ±25ppm, ±50ppm & ±100ppm.

- A = ±25ppm
- B = ±50ppm
- C = ±100ppm
- N = ±15ppm

Non-Standard Frequency Tolerances

During manufacture, it is possible to adjust some SPXO's to a specific tolerance at room temperature. The frequency tolerance forms part of the frequency stability. These oscillators have a second letter code to indicate the frequency tolerance.

- D = ±5ppm
- E = ±10ppm
- F= ±25ppm

Standard Operating Temperature Ranges

- 0 to 50°C –40 to 85°C
  0 to 70°C –55 to 125°C

Operating Temperature Range

An oscillator is designed to work over any one of three temperature ranges:

- Commercial: 0 to 70°C
- Military: –55 to 125°C
- Industrial: –40 to 85°C

Although in general oscillators will continue to operate outside their normal temperature range with a degradation in frequency stability, damage can result if the temperatures reached are excessive.

Packaging Code

All items are bulked packed only.

- BU = Bulk packed

Additional Text Code

If the product is non-standard, the letter 'T' will appear at the end of the product specification. This refers to additional text on the purchase order to identify the special requirements.

Outline Drawings

Dimensions on the oscillator outline drawings are shown only as a guide. Precise dimensions of oscillator holders are available from our Engineering Department upon request. All dimensions are shown in mm (& inches) and are nominal unless otherwise stated. All outlines are at a scale of 1:1 unless otherwise specified.

Delivery Options

The following Express delivery options are available for certain oscillators; timescales refer to despatch from our factories.

- 3 working days (Express service)
- 5 working days (Express service)
- 7 working days (Express service)
- 10 working days (Express service)

Prices for larger quantities and longer delivery times are generally lower due to substantially reduced manufacturing costs. Please refer to individual datasheets for further information.

Marking

Product will be indelibly marked as detailed in the individual data sheets. Where space is limited some or all of the information will be omitted/truncated at CFP's discretion. Full product description will be found on the individual batch packaging.

Ordering Information

- See individual data sheets

STOCK OSCILLATORS

Minimum Order Information Required

- Stock Number or Alpha Code

8-pin DIL Clock Oscillators- HCMOS/TTL

Frequency	Frequency Stability	Model No.	Stock No.	Alpha Code
3.68640MHz	±100ppm	IQXO-22C	SPXO003223	X363H
4.0MHz	±100ppm	IQXO-22C	SPXO003155	X351H
8.0MHz	±100ppm	IQXO-22C	SPXO003162	X352H
10.0MHz	±100ppm	IQXO-22C	SPXO003168	X353H
12.0MHz	±100ppm	IQXO-22C	SPXO003176	X354H
12.2880MHz	±100ppm	IQXO-22C	SPXO003257	X379H
14.318180MHz	±100ppm	IQXO-22C	SPXO003247	X373H
14.74560MHz	±100ppm	IQXO-22C	SPXO003277	X388H
16.0MHz	±100ppm	IQXO-22C	SPXO003182	X355H
20.0MHz	±100ppm	IQXO-22C	SPXO003189	X356H
24.0MHz	±100ppm	IQXO-22C	SPXO003239	X371H
24.5760MHz	±100ppm	IQXO-22C	SPXO003039	X386H
25.0MHz	±100ppm	IQXO-22C	SPXO003280	X390H
28.636360MHz	±100ppm	IQXO-22C	SPXO003254	X376H
32.0MHz	±100ppm	IQXO-22C	SPXO003213	X360H
32.7680MHz	±100ppm	IQXO-22C	SPXO003258	X380H
40.0MHz	±100ppm	IQXO-22C	SPXO003197	X357H
50.0MHz	±100ppm	IQXO-22C	SPXO003204	X358H
60.0MHz	±100ppm	IQXO-22C	SPXO003260	X381H
60.0MHz	±100ppm	IQXO-23C	SPXO003261	X381T
64.0MHz	±100ppm	IQXO-22C	SPXO003266	X384H
80.0MHz	±100ppm	IQXO-22C	SPXO003279	X389H

14-pin DIL Clock Oscillators - HCMOS/TTL

Frequency	Frequency Stability	Model No.	Stock No.	Alpha Code
1.0MHz	±100ppm	IQXO-350C	SPXO010197	X331B
1.84320MHz	±100ppm	IQXO-350C	SPXO011520	X337B
2.0MHz	±100ppm	IQXO-350C	SPXO000118	E618A
3.68640MHz	±100ppm	IQXO-350C	SPXO010296	X325B
4.0MHz	±100ppm	IQXO-350C	SPXO003154	X351A
4.0960MHz	±100ppm	IQXO-350C	SPXO003246	X373A
4.91520MHz	±100ppm	IQXO-350C	SPXO003222	X363A
5.0MHz	±100ppm	IQXO-350C	SPXO011220	X333B
6.0MHz	±100ppm	IQXO-350C	SPXO011505	X335B

Frequency	Frequency Stability	Model No.	Stock No.	Alpha Code
8.0MHz	±100ppm	IQXO-350C	SPXO003161	X352A
9.83040MHz	±100ppm	IQXO-350C	SPXO003210	X359A
10.0MHz	±100ppm	IQXO-350C	SPXO003167	X353A
11.28960MHz	±100ppm	IQXO-350C	SPXO003263	X382A
12.0MHz	±100ppm	IQXO-350C	SPXO003174	X354A
12.2880MHz	±100ppm	IQXO-350C	SPXO010198	X342B
14.74560MHz	±100ppm	IQXO-350C	SPXO010980	X388A
16.0MHz	±100ppm	IQXO-350C	SPXO003181	X355A
16.3840MHz	±50ppm	IQXO-350B	SPXO003236	X370A
18.4320MHz	±100ppm	IQXO-350C	SPXO003228	X367A
19.66080MHz	±100ppm	IQXO-350C	SPXO003225	X364A
20.0MHz	±100ppm	IQXO-350C	SPXO003188	X356A
24.0MHz	±100ppm	IQXO-350C	SPXO003238	X371A
25.0MHz	±100ppm	IQXO-350C	SPXO010147	X350B
30.0MHz	±100ppm	IQXO-350C	SPXO011178	X359B
32.0MHz	±100ppm	IQXO-350C	SPXO003211	X360A
32.7680MHz	±100ppm	IQXO-350C	SPXO010117	X380A
33.3330MHz	±100ppm	IQX0-350C	SPXO003227	X366A
33.330MHz	±100ppm	IQXO-350C	SPXO010220	X361B
40.0MHz	±50ppm	IQXO-350B	SPXO003196	X357B
40.0MHz	±100ppm	IQXO-350C	SPXO003195	X357A
40.960MHz	±50ppm	IQXO-350B	SPXO003220	X362A
48.0MHz	±100ppm	IQXO-350C	SPXO003246	X373A
50.0MHz	±100ppm	IQXO-350C	SPXO003203	X358A
64.0MHz	±100ppm	IQXO-350C	SPXO011525	X393B
66.0MHz	±100ppm	IQXO-350C	SPXO003232	X368A

IQXO-350 Commercial Oscillator

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Delivery Options

- Common frequencies are available from stock. Please see p34 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

- 25ppm, 50ppm, 100ppm
  (over operating temperature range)

Frequency Tolerance at 25°C (Optional)

- 5ppm, 10ppm, 25ppm

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: $981 m/s^2$ for 6ms, three shocks in each direction along the three mutually perpendicular planes

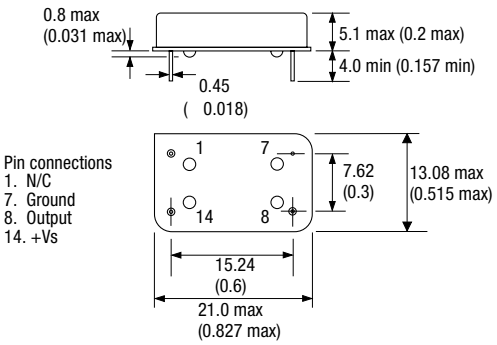
Marking

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

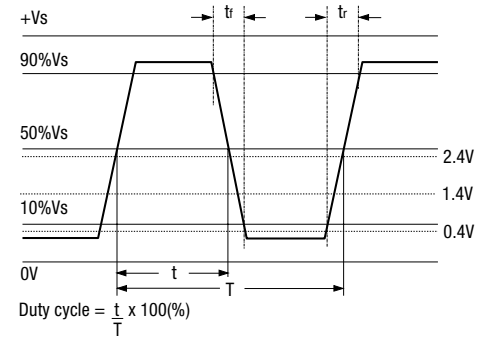
Minimum Order Information Required

- 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	±25ppm, ±50ppm, ±100ppm	5V±0.25V	10mA	10ns	10ns	45/55%	IQXO-350, -350I
100.0 to < 250.0kHz	±25ppm, ±50ppm, ±100ppm	5V±0.25V	10mA	15ns	15ns	45/55%	IQXO-350, -350I
250.0kHz to < 5.0MHz	±25ppm, ±50ppm, ±100ppm	5V±0.25V	30mA	15ns	15ns	45/55%	IQXO-350, -350I
5.0 to < 16.0MHz	±25ppm, ±50ppm, ±100ppm	5V±0.25V	15mA	10ns	10ns	45/55%	IQXO-350, -350I
16.0 to < 30.0MHz	±25ppm, ±50ppm, ±100ppm	5V±0.25V	30mA	10ns	10ns	45/55%	IQXO-350, -350I
30.0 to < 50.0MHz	±25ppm, ±50ppm, ±100ppm	5V±0.25V	40mA	8ns	8ns	45/55%	IQXO-350, -350I
50.0 to 80.0MHz	±25ppm, ±50ppm, ±100ppm	5V±0.25V	50mA	6ns	6ns	40/60%	IQXO-350, -350I

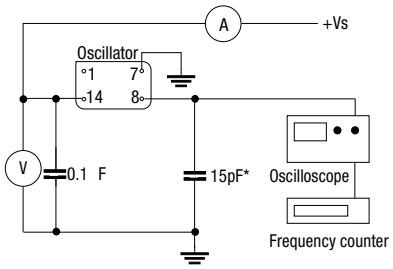
Ordering Example 22.0MHz IQXO-350I B F

Frequency
Model No
Operating Temperature Code: I = –40 to 85°C Not applicable for 0 to 70°C
Frequency Stability: A = ±25ppm; B = ±50ppm; C = ±100ppm
Frequency Tolerance @ 25°C: D = ±5ppm; E = ±10ppm; F = ±25ppm

Please note: Code combination A F is not available

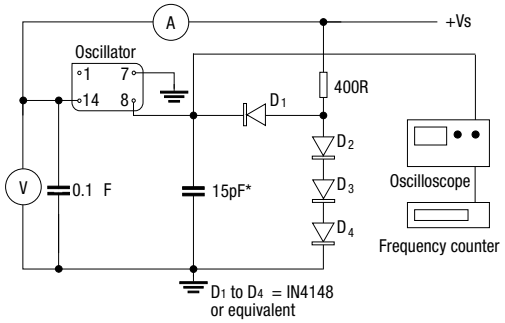
* Rise & Fall times will be 6ns max in TTL cct.
** Duty Cycle will be 40/60% in TTL cct for 5.0MHz

Test Circuit - HCMOS



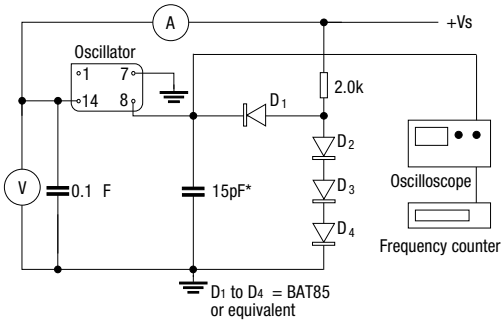
*Inclusive of jigging & equipment capacitance

Test Circuit - TTL



*Inclusive of jigging & equipment capacitance

Test Circuit - LS TTL



*Inclusive of jigging & equipment capacitance

SPXOs