

### FEATURES

- Ultra-miniature 2.5 x 2.0 x 0.9mm package
- Frequency Range 156kHz to 130MHz
- Tristate (Enable/Disable) function as standard
- Supply voltage 1.0, 1.2, 1.5, 1.8, 2.5, 3.3 or 5.0Volts



### DESCRIPTION

XO22 ultra-miniature oscillators consist of a TTL/CMOS-compatible hybrid circuit and a miniature quartz crystal packaged in a low-profile, industry-standard ceramic package. XO22 components are fully specified clock oscillators with low mass and a very small footprint.

### SUPPLY VOLTAGE-DEPENDENT PARAMETERS

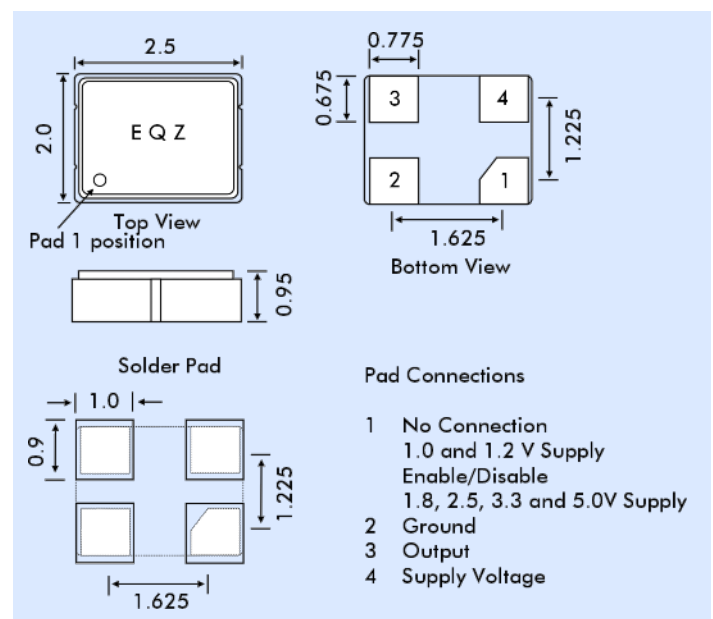
Supply Voltage	+1.0VDC±5% Code = 'F'	+1.2VDC±5% Code = 'E'	+1.5VDC±5% Code = 'D'	+1.8VDC±5% Code = 'C'	+2.5VDC±5% Code = 'B'	+3.3VDC±5% Code = 'A'	+3.3VDC±10% Code = '1'
Frequency Range	312kHz~60MHz	312kHz~60MHz	312kHz~60MHz	156kHz~160MHz	156kHz~160MHz	156kHz~160MHz	156kHz~160MHz
Logic HIGH '1' (90%Vdd min.)	0.90V min.	1.08V min.	1.35V min.	1.62V min.	2.25V min.	2.97V min.	4.5V min.
Logic LOW '0' (90% Vdd max.)	0.10V max	0.12V max	0.15V max.	0.18V max.	0.25V max.	0.33V max.	0.5V max.
Current Consumption	[0.3~1.5MHz] 4mA max.	[0.3~1.5MHz] 4mA max.	[0.3~1.5MHz] 4mA max.	[1.0~1.5MHz] 5mA max.	[0.3~1.5MHz] 5mA max.	[0.5~1.5MHz] 5mA max.	[0.5~1.5MHz] 5mA max.
	[1.5~20MHz] 4mA max.	[1.5~20MHz] 4mA max.	[1.5~20MHz] 4mA max.	[1.5~20MHz] 8mA max.	[1.5~20MHz] 8mA max.	[1.5~20MHz] 8mA max.	[1.5~20MHz] 8mA max.
	[20.1~50MHz] 4mA max.	[20.1~50MHz] 4mA max.	[20.1~50MHz] 4mA max.	[20.1~50MHz] 15mA max.	[20.1~50MHz] 15mA max.	[20.1~50MHz] 15mA max.	[20.1~50MHz] 15mA max.
	[50.1~60MHz] 12mA max.	[50.1~60MHz] 12mA max.	[50.1~60MHz] 12mA max.	[50.1~160MHz] 22mA max.	[50.1~160MHz] 25mA max.	[50.1~75MHz] 35mA max.	[50.1~75MHz] 35mA max.
Rise Time/ Fall Time	6ns max.	6ns max.	6ns max.	7ns max.	7ns max.	10ns max.	10ns max.

Measured between 10% ~ 90% of wave form (CL = 15pF)

### SPECIFICATION

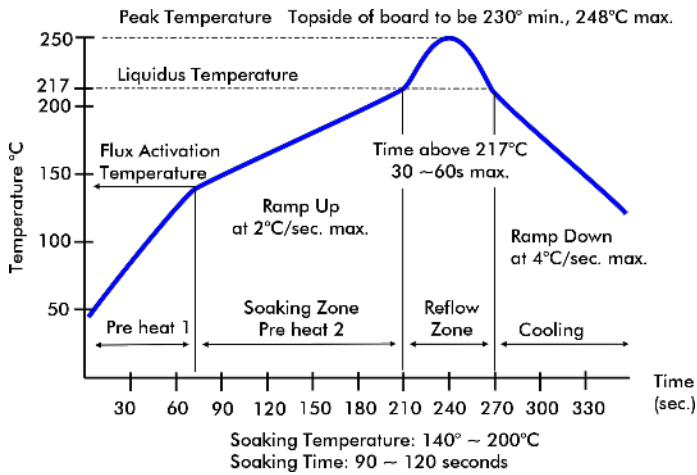
Frequency Range:	156kHz to 130.0MHz
Supply Voltage:	1.0, 1.2, 1.5, 1.8, 2.5, 3.3Volts ±5%, or 5.0V±10%
Output Logic:	HCMOS/LSTTL
Frequency Stability:	See table
Rise/Fall Time:	See table
Output Load	15pF (50pF available for 3.3V and 5.0V supply)
Duty Cycle:	50%±5% typical
Supply Current:	See table
Operating Temperature	
Commercial:	-10° to +70°C
Industrial:	-40° to +85°C
Storage Temperature:	-55 to +100°C
Start-up Time:	10ms max.
Ageing:	±5ppm max. in first year at 25°C
Tristate Function (Pad 1):	Enable/Disable function is standard for XO22. Output (Pad 3) is active if Pad 1 not connected or Pad 1 is 'HIGH'. Output high impedance when 'LOW' or GROUND is applied to Pad 1.
Packaging:	8mm tape, 180mm reel, 1k or 2k pieces per reel

### OUTLINE & DIMENSIONS



Note: Parameters are measured at ambient temperature of 25°C, supply voltage as stated and a load of 15pF

**SOLDER TEMPERATURE PROFILE**



**PART NUMBERING**

Example: **20.000MHz XO22050UCTA**

- Frequency ←
- Series Designation XO22 ←
- Temperature Stability\* ←
  - 100 = ±100ppm
  - 050 = ±50ppm
  - 025 = ±25ppm
- Output CMOS/LSTTL ←
- Operating Temp. Range ←
  - C = Commercial
  - I = Industrial
- Tristate Function ←
- Supply Voltage ←
  - Blank = 5.0 Volts
  - A = 3.3 Volts
  - B = 2.5 Volts
  - C = 1.8 Volts
  - D = 1.5 Volts
  - E = 1.2 Volts
  - F = 1.0 Volts

\* For other stability requirements enter figure required.  
E.g. for ±20ppm add '020' after 'XO22'.

**ENVIRONMENTAL PERFORMANCE SPECIFICATION**

RoHS Status:	Compliant
Storage Temperature Range:	-55° to +105°C
Humidity:	85% RH, 85°C for 48 hours
Hermetic Seal:	Leak rate 2x10 <sup>-8</sup> ATM -cm <sup>3</sup> /s max.
Solderability:	MIL-STD-202F Method 208E
Reflow:	260°C for 10 sec (see diagram)
Vibration:	MIL-STD-202F Method 204, 35±5 mins, 50 to 2000Hz
Shock:	MIL-STD-202F Method 213B, test Condition E, 50g 11ms.