

### FEATURES

- **Miniature 7.0 x 5.0 x 1.4mm, hermetically-sealed package**
- **Frequency Range 312kHz to 160MHz**
- **Tristate (Enable/Disable) function as standard**
- **Supply voltage range: 1.0, 1.2, 1.5, 1.8, 2.5, 3.3 or 5.0 Volts**
- **High output load version (50pF) available**



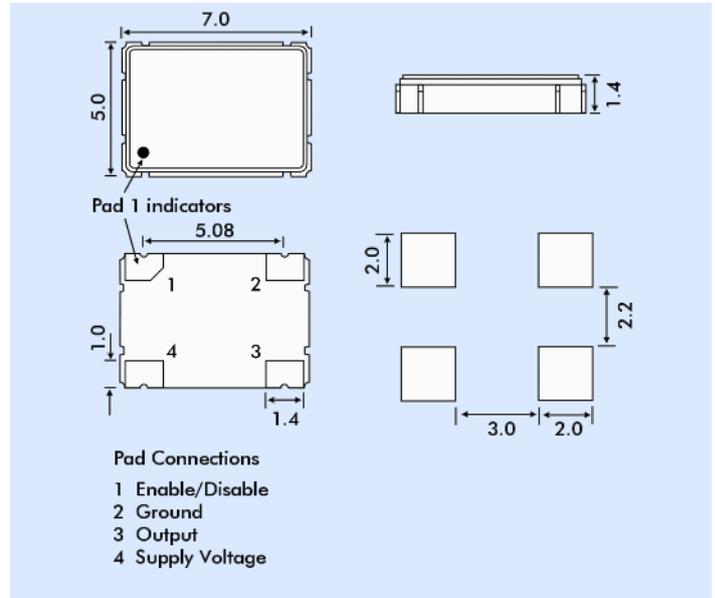
### DESCRIPTION

XO91 oscillators consist of a TTL/CMOS-compatible hybrid circuit together with a miniature quartz crystal packaged in a low-profile, industry-standard 7 x 5mm ceramic package. The high quality design and build quality of the XO91 provides a stable and reliable clock oscillator. XO91 supply voltage range is from 1.0 to 5.0 Volts.

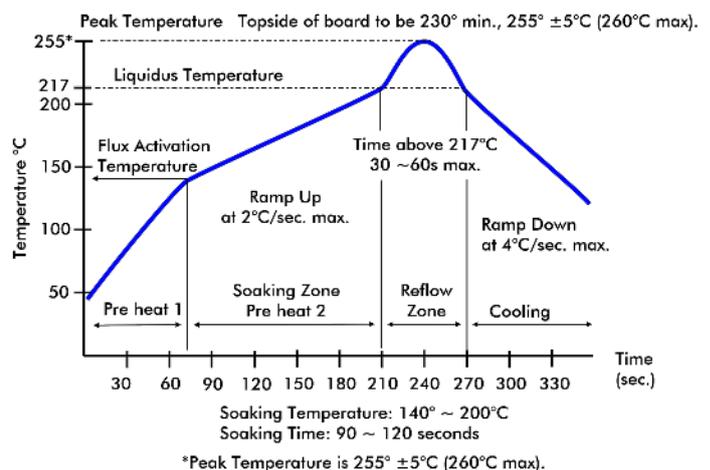
### SPECIFICATION

Frequency Range:	312kHz to 160.0MHz
Supply Voltage:	1.0, 1.2, 1.5, 1.8, 2.5, 3.3 Volts $\pm 5\%$ or 5.0 Volts $\pm 10\%$
Output Logic:	HCMOS/LSTTL
Frequency Stability*	
0° to +50°C:	from $\pm 10$ ppm
-20° to +70°C:	from $\pm 15$ ppm
-40° to +85°C:	from $\pm 25$ ppm
-55° to +105°C:	from $\pm 100$ ppm
Rise/Fall Time:	see table
Output Voltage:	
HIGH '1':	90%Vdd minimum
LOW '0':	10%Vdd maximum
Output Load:	15pF (30pF and 50pF available for supply voltages 3.3 and 5.0 Volts)
Duty Cycle:	50% $\pm 5\%$ typical
Supply Current:	See table
Rise/Fall Times:	See table
Operating Temperature	
	-10~70°C (Commercial)
	-40~+85°C (Industrial)
	-55~+105°C (Military)
Startup Time	
312kHz to 32MHz:	5ms max.
32MHz+ to 160MHz:	10ms max. (to reach 90% amplitude at $25 \pm 2^\circ\text{C}$ )
Ageing:	$\pm 5$ ppm max. In first year
Phase Jitter RMS:	< 1ps typical
Enable Time:	100ms max.
Disable Time:	100ns max.
Tristate Function (Pad 1):	
	Output (Pad 3) is active if Pad 1 is not connected or a voltage to Pad 1 is 'HIGH'. Output is high impedance when 'LOW' or GROUND is applied to Pad 1.

### OUTLINE & DIMENSIONS



### SOLDER TEMPERATURE PROFILE



\* Frequency stability is inclusive of calibration tolerance at 25°C, frequency change due to shock & vibration,  $\pm 10\%$  supply voltage variation and stability over temperature range.

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

### SUPPLY VOLTAGE-DEPENDENT PARAMETERS

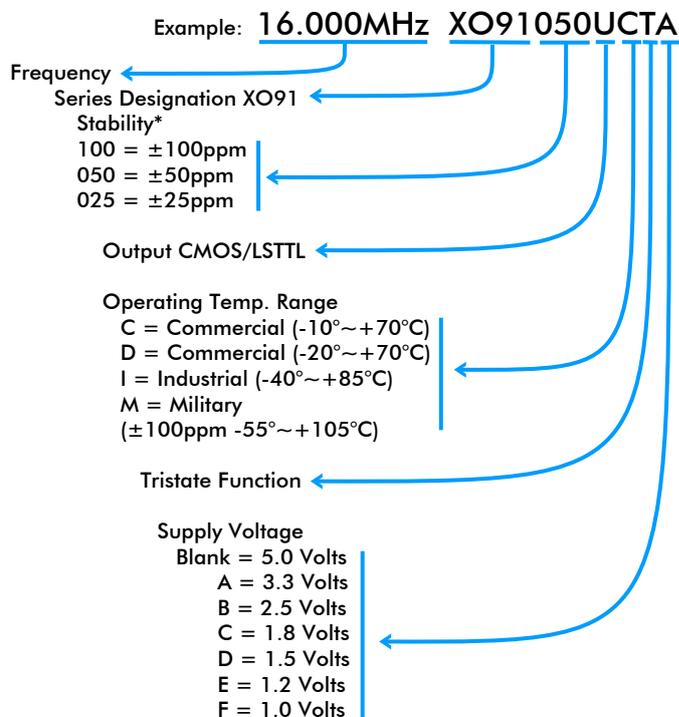
Supply Voltage	+1.0VDC±5% Code = 'F'	+1.2VDC±5% Code = 'E'	+1.5VDC±5% Code = 'D'	+1.8VDC±5% Code = 'C'	+2.5VDC±5% Code = 'B'	+3.3VDC±5% Code = 'A'	+5.0VDC±10% Code = '_'
Frequency Range	312kHz~60MHz	312kHz~60MHz	312kHz~60MHz	156kHz~160MHz	156kHz~160MHz	156kHz~160MHz	156kHz~160MHz
Logic HIGH '1' (90%V <sub>dd</sub> 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% V <sub>dd</sub> 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)

### 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:	248°C max. (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.

### PART NUMBERING



\* For other stability requirements enter figure required.  
E.g. for ±20 ppm enter '020' after 'XO91'.