#### XO5032BL-ULJ\_CMOS

Ultra-Low Jitter Crystal Oscillator

### **Features and Benefits**

Frequency range: 20MHz-50MHz Supply voltage: 1.8V/2.5V/3.3V

Current: 10mA Max.

Frequency stability vs. temperature: ±25PPM-100PPM

Aging: ±3PPM 1st year

Operating temperature: -40°C to +85°C

Size: 5.0x3.2x1.2 mm

### **Typical Applications**

- Wearable device
- Sport Video Cams
- Ultra-small Notebook PC
- Mobile Phones
- -Digital Circuit

### **Description**

XO5032BL-ULJ\_CMOS is the ultra-low jitter crystal oscillator. The RMS phase jitter can be 48fs typical. It can be widely used in the digital circuit and communication applications.

## **Mechanical Drawing & Pin Connections**

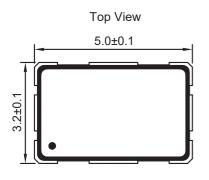
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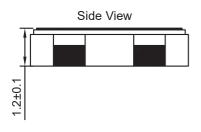
MD230032-1

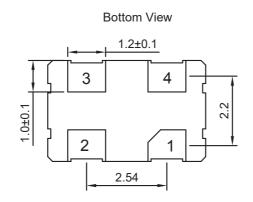
Land Pattern

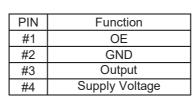
2.54

2









Unit in mm

1mm = 0.0394 inches

### XO5032BL-ULJ\_CMOS

Ultra-Low Jitter Crystal Oscillator

# **Specifications**

Specification   Sym   Condition   Min.   Typ.   Max.	Oscillator	Cum	Condition	Value			Unit	Note
RF Output Load   90%V <sub>cc</sub>   15	· · · · · · · · · · · · · · · · · · ·	Sym	Condition	Min. Typ.		Max.		
Output Load         90%Voc         NV           Output Level Low         90%Voc         V           Rise / Fall Time         @10%-90% of Voc         1.5         5         ns         For 3.3V           Duty Cycle         55         %         Startup Time         0.8         5         ms           Output Enable/Disable Function on PIN1         Disable output         70%Voc         V         V           Function on PIN1         Enable output         30%Voc         V           Enable/Disable Time         Enable in the Disable         1         ms           Power Supply           Voltage         Voc         1.8/2.5/3.3         V         See ordering section           Current With Output Disable         Voc =1.8V         3         5         mA           Current With Output Disable         Voc =2.5V         5         7         mA           Disable         Voc =1.8V         3         5         mA           Current With Output Disable         Voc =2.5V         5         7         mA           Voc =2.5V         5         3         uA         Voc =1.8V           Supply Voltage Vs.         Voc =3.3V         9         35 <td< th=""><th>Operational Frequency</th><th><math>f_0</math></th><th></th><th>20</th><th></th><th>50</th><th>MHz</th><th></th></td<>	Operational Frequency	$f_0$		20		50	MHz	
Output Level High Output Level Low         90%Vcc         V         V           Rise / Fall Time         @10%-90% of Vcc         1.5         5         ns         For 3.3V supply voltage           Duty Cycle Startup Time         45         0.8         5         ms         90%Vcc         V         V         V         For 3.3V supply voltage         V         For 3.3V supply voltage         V         V         Image: Startup Time of the public of the publ								
Output Level Low         (@10%-90% of V <sub>cc</sub> )         1.5         5         Ns         For 3.3V supply voltage           Rise / Fall Time         (@10%-90% of V <sub>cc</sub> )         1.5         5         ns         For 3.3V supply voltage           Duty Cycle         55         %         55         ms           Startup Time         0.8         5         ms           Output Enable/Disable Function on PIN1         Disable output         30%V <sub>cc</sub> V           Enable Disable Time         Enable output         1         ms           Power Supply         Enable Disable         1         ms           Voltage         V <sub>cc</sub> 1.8/2.5/3.3         V         See ordering section           Current With Quityut Disable         V <sub>cc</sub> =2.5V         5         7         mA           Current With Output Disable         V <sub>cc</sub> =2.5V         5         7         mA           Current With Output Disable         V <sub>cc</sub> =3.3V         7         10         mA           Supply Voltage Vs. Frequency Stability         English V <sub>cc</sub> =3.3V         9         35         uA           V <sub>cc</sub> =3.3V         9         35         uA         D           Frequency Stability         English Q <sub>cc</sub> = 1.8V         ±1.0         ppm </td <td></td> <td></td> <td></td> <td></td> <td>15</td> <td></td> <td></td> <td></td>					15			
Rise / Fall Time  @ 10%-90% of V <sub>cc</sub> 1.5				90%V <sub>cc</sub>				
Rise / Fall Time	Output Level Low					10%V <sub>cc</sub>	V	
Startup Time	Rise / Fall Time		@10%-90% of V <sub>cc</sub>		1.5	5	ns	supply
Output Enable/Disable Function on PIN1         Enable output         70%V <sub>cc</sub> V           Enable/Disable Time         Enable         1         ms           Power Supply           Voltage         V <sub>cc</sub> 1.8/2.5/3.3         V         See ordering section           Current         V <sub>cc</sub> = 1.8V         3         5         mA           Current With Output Disable         V <sub>cc</sub> = 2.5V         5         7         mA           Current With Output Disable         V <sub>cc</sub> = 1.8V         3         25         uA           Current With Output Disable         V <sub>cc</sub> = 2.5V         5         30         uA           Frequency Stability         V <sub>cc</sub> = 3.3V         9         35         uA           Frequency Stability         ©25°C         ±1.0         ppm         See ordering section           Vs. Temperature         ©-40°C to +85°C         ±25         ppm         See ordering section           RMS Jitter (12KHz-20MHz)         (3         48         300         fs           Phase Noise (25MHz, 3.3V)         (210Hz         -68         dBc/Hz           (2010KHz         -1170         dBc/Hz         dBc/Hz           (2010KHz         -1170         dBc/Hz           <	Duty Cycle			45		55	%	
Provided   Provided					0.8	5	ms	
Enable / Disable Time         Enable Disable         1 ms 200 ns           Power Supply           Voltage         V <sub>cc</sub> = 1.8V         3 5 mA 5 mA 5 mA 5 mA 7 mA 6 mA 7 mA 10 mA 7 mA 10 mA 7 mA 10 mA	Output Enable/Disable		Enable output	70%V <sub>cc</sub>			V	
Disable	Function on PIN1		Disable output			30%V <sub>cc</sub>	V	
Disable   Voc	Enable/Disable Time		Enable			1	ms	
Voltage         V <sub>cc</sub> 1.8/2.5/3.3         V         See ordering section           Current         V <sub>cc</sub> =1.8V         3         5         mA           V <sub>cc</sub> =2.5V         5         7         mA           V <sub>cc</sub> =3.3V         7         10         mA           Current With Output Disable         V <sub>cc</sub> =1.8V         3         25         uA           V <sub>cc</sub> =2.5V         5         30         uA           Frequency Stability           Supply Voltage Vs. Frequency Sensitivity         @25°C         ±1.0         ppm           Vs. Temperature         @-40°C to +85°C         ±25         ppm         See ordering section           Aging@+25°C         1st year         ±3.0         ppm           RMS Jitter (12KHz-20MHz)         48         300         fs           Phase Noise (25MHz)         @10Hz         -68         dBc/Hz           @10Hz         -102         dBc/Hz           @10KHz         -139         dBc/Hz           @10KHz         -157         dBc/Hz           @10KHz         -157         dBc/Hz           @10KHz         -166         dBc/Hz           @5MHz         @5MHz         -168         dBc/Hz	Enable/Disable Time		Disable			200	ns	
Voc   1.8V   3   5   mA	Power Supply							
Current         V <sub>cc</sub> = 2.5V         5         7         mA           Current With Output Disable         V <sub>cc</sub> = 1.8V         3         25         uA           V <sub>cc</sub> = 2.5V         5         30         uA           Frequency Stability           Supply Voltage Vs. Frequency Sensitivity         ©25°C         ±1.0         ppm           Vs. Temperature         ©-40°C to +85°C         ±25         ppm         See ordering section           Aging@+25°C         1st year         ±3.0         ppm         See ordering section           RMS Jitter (12KHz-20MHz)         48         300         fs         68         dBc/Hz           Phase Noise (25MHz,3.3V)         ©10Hz         -68         dBc/Hz         dBc/Hz         6Bc/Hz	Voltage	V <sub>cc</sub>			1.8/2.5/3.3		V	_
V <sub>cc</sub> = 3.3V   7   10   mA							mA	
Current With Output Disable         V <sub>cc</sub> = 1.8V         3         25         uA           V <sub>cc</sub> = 2.5V         5         30         uA           Frequency Stability           Supply Voltage Vs. Frequency Sensitivity         @25°C         ±1.0         ppm           Vs. Temperature         @-40°C to +85°C         ±25         ppm         See ordering section           Aging@+25°C         1st year         ±3.0         ppm           RMS Jitter (12KHz-20MHz)         48         300         fs           Gl0Hz         -68         dBc/Hz           Phase Noise (25MHz, 3.3V)         @10Hz         -102         dBc/Hz           (25MHz, 3.3V)         @10KHz         -157         dBc/Hz           © 100KHz         -170         dBc/Hz           © 2010KHz         -166         dBc/Hz           © 3010KHz         -168         dBc/Hz           Environmental Conditions           Operating temperature range         -40°C to +85°C (See ordering section)	Current				5	7	mA	
Current With Output Disable         V <sub>cc</sub> =2.5V         5         30         uA           Frequency Stability           Supply Voltage Vs. Frequency Sensitivity         @25°C         ±1.0         ppm           Vs. Temperature         @-40°C to +85°C         ±25         ppm         See ordering section           Aging@+25°C         1st year         ±3.0         ppm         Fee ordering section           RMS Jitter (12KHz-20MHz)         48         300         fs         68         dBc/Hz         dBc/Hz         68         dBc/Hz         68/Hz         68/Hz         68/Hz         dBc/Hz         68/Hz         dBc/Hz         68/Hz			V <sub>cc</sub> =3.3V				mA	
Disable         V <sub>cc</sub> = 2.5V         5         30         UA           Frequency Stability           Supply Voltage Vs. Frequency Sensitivity         @ 25°C         ±1.0         ppm         See ordering section           Vs. Temperature         @-40°C to +85°C         ±25         ppm         See ordering section           Aging@+25°C         1st year         ±3.0         ppm         Fee ordering section           RMS Jitter (12KHz-20MHz)         48         300         fs         dBc/Hz           Phase Noise (25MHz - 20MHz)         @100Hz         -102         dBc/Hz         dBc/Hz           Phase Noise (25MHz, 3.3V)         @10KHz         -139         dBc/Hz         dBc/Hz           (25MHz, 3.3V)         @100KHz         -170         dBc/Hz         dBc/Hz           (25MHz, 3.3V)         @1MHz         -166         dBc/Hz           (25MHz)         @5MHz         -168         dBc/Hz           Environmental Conditions         -40°C to +85°C (See ordering section)	Current With Output						uA	
V <sub>CC</sub> = 3.3V   9   35			V <sub>cc</sub> =2.5V				uA	
Supply Voltage Vs. Frequency Sensitivity         @25°C         ±1.0         ppm         See ordering section           Vs. Temperature         @-40°C to +85°C         ±25         ppm         See ordering section           Aging@+25°C         1st year         ±3.0         ppm           RMS Jitter (12KHz-20MHz)         48         300         fs           Q10Hz         -68         dBc/Hz           Q10Hz         -102         dBc/Hz           Q10Hz         -139         dBc/Hz           Q1KHz         -157         dBc/Hz           Q10KHz         -157         dBc/Hz           Q10KHz         -170         dBc/Hz           Q1MHz         -166         dBc/Hz           Q5MHz         -168         dBc/Hz    Environmental Conditions  Operating temperature range  -40°C to +85°C (See ordering section)			V <sub>cc</sub> =3.3V		9	35	uA	
Frequency Sensitivity         @25 C         ±1.0         ppm         See ordering section           Vs. Temperature         @-40°C to +85°C         ±25         ppm         See ordering section           Aging@+25°C         1st year         ±3.0         ppm           RMS Jitter (12KHz-20MHz)         48         300         fs           @10Hz         -68         dBc/Hz           @100Hz         -102         dBc/Hz           Phase Noise (25MHz,3.3V)         @10KHz         -157         dBc/Hz           @10KHz         -157         dBc/Hz           @10KHz         -170         dBc/Hz           @1MHz         -166         dBc/Hz           @5MHz         -168         dBc/Hz    Environmental Conditions  Operating temperature range  -40°C to +85°C (See ordering section)								
Aging@+25°C			@25°C			±1.0	ppm	
RMS Jitter (12KHz-20MHz)	Vs. Temperature		@-40°C to +85°C			±25	ppm	
(12KHz-20MHz)         48         300         fs           (25MHz,3.3V)         (25MHz,3.3V)         (25MHz)         (2			1st year			±3.0	ppm	
					48	300	fs	
	Phase Noise		@10Hz		-68		dBc/Hz	
@10KHz			@100Hz		-102		dBc/Hz	
(25MHz,3.3V)       @10KHz       -157       dBc/Hz         @100KHz       -170       dBc/Hz         @1MHz       -166       dBc/Hz         @5MHz       -168       dBc/Hz         Environmental Conditions         Operating temperature range       -40°C to +85°C (See ordering section)					-139		dBc/Hz	
@100KHz					-157		dBc/Hz	
@1MHz -166 dBc/Hz			@100KHz		-170		dBc/Hz	
©5MHz -168 dBc/Hz  Environmental Conditions  Operating temperature range -40°C to +85°C (See ordering section)					-166		dBc/Hz	
Environmental Conditions Operating temperature range -40°C to +85°C (See ordering section)								
	<b>Environmental Condition</b>	าร						
	Operating temperature range -40°C to +85°C (See ordering section)							

## **Ordering Information**

XO5032BL-ULJ_CMOS	-	xMHz	-01	02	03
Group			Cc	de	

For example, XO5032BL-ULJ\_CMOS -25MHz-111 denotes the XO has the following specifications:

Frequency: 25MHz

Temperature Range: -10°C to +70°C

Stability Over Temperature: ±25 ppm Supply Voltage: ±25 ppm 1.8V

01	Temperature Range
Code	Specification
1	-10°C to +70°C
2	-40°C to +85°C

02	Frequency Stability
Code	Specification
1	±25 ppm
2	±50 ppm
3	±100 ppm

03	Supply Voltage
Code	Specification
1	1.8 V ±5%
2	2.5 V ±10%
3	3.3 V ±10%