

# HIGH PERFORMANCE GENERAL PURPOSE OSCILLATOR IC

**ABX1027**

**1.8V-3.3V, 5MHz to 60MHz XO IC**

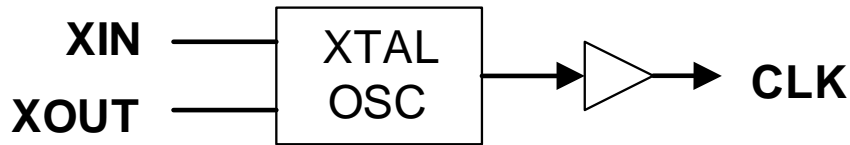
## FEATURES

- Wide frequency oscillator design.
- Single IC to cover up to 60MHz output frequency.
- Input Frequency:
  - Fundamental Crystal: 5MHz to 60MHz
  - Reference Clock: 5MHz to 60MHz
- Output Frequency: 5MHz to 60MHz
- Very low Jitter and Phase Noise
- Low current consumption
- Single 1.8V, 2.5V, or 3.3V  $\pm$  10% power supply
- Operating temperature range from -40°C to 85°C

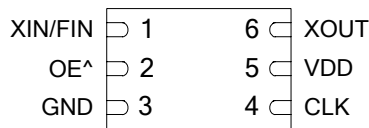
## DESCRIPTION

The ABX1027 is a high performance general purpose oscillator IC for outputs up to 60MHz. Designed to fit in a small 2 x 1.3mm DFN or 3 x 3mm SOT23 package, the PL610 offers the best phase noise and jitter performance and lowest power consumption of any comparable IC.

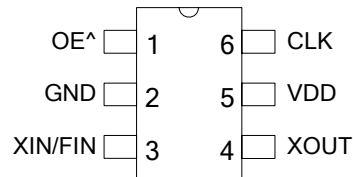
## BLOCK DIAGRAM



## PACKAGE PIN CONFIGURATION



**DFN-6L**  
(2.0mmx1.3mmx0.6mm)



**SOT23-6L**  
(3.0mmx3.0mmx1.35mm)

## PACKAGE PIN ASSIGNMENT

Name	Pin Assignment		Type	Description
	DFN Pin#	SOT Pin#		
XIN/FIN	1	3	I	Crystal or Reference Clock input pin
OE	2	1	I	Output Enable (OE) input
GND	3	2	P	GND connection
CLK	4	6	O	Clock Output
VDD	5	5	P	VDD connection
XOUT	6	4	O	Crystal Output pin
				Do Not Connect (DNC ) when FIN is present

# HIGH PERFORMANCE GENERAL PURPOSE OSCILLATOR IC

ABX1027

1.8V-3.3V, 5MHz to 60MHz XO IC

## LAYOUT RECOMMENDATIONS

The following guidelines are to assist you with a performance optimized PCB design:

### Signal Integrity and Termination Considerations

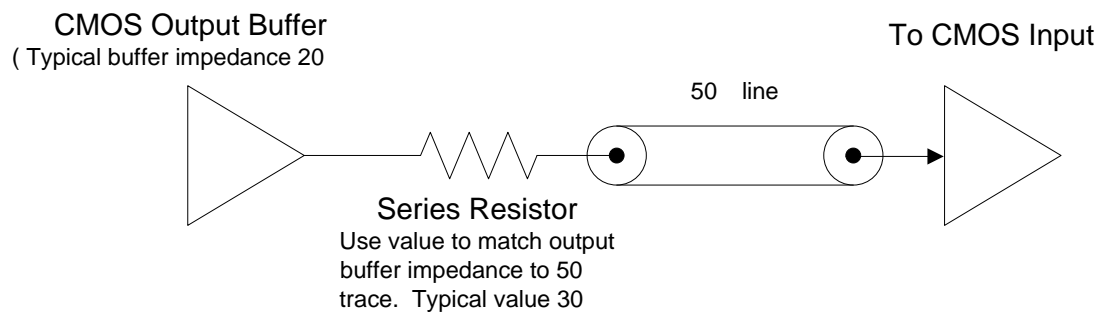
- Keep traces short!
- Trace = Inductor. With a capacitive load this equals ringing!
- Long trace = Transmission Line. Without proper termination this will cause reflections ( looks like ringing ).
- Design long traces as "striplines" or "microstrips" with defined impedance.
- Match trace at one side to avoid reflections bouncing back and forth.

### Decoupling and Power Supply Considerations

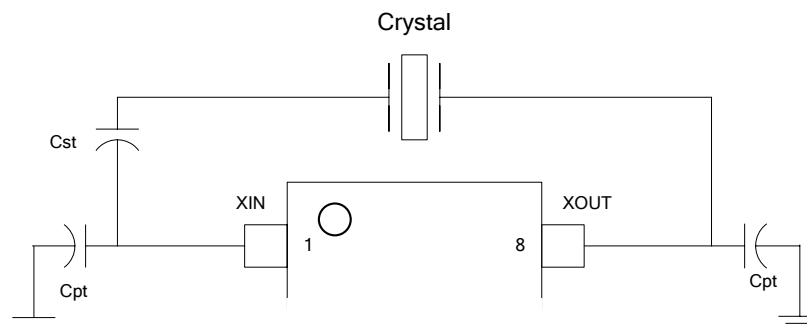
- Place decoupling capacitors as close as possible to the VDD pin(s) to limit noise from the power supply
- Multiple VDD pins should be decoupled separately for best performance.
- Addition of a ferrite bead in series with VDD can help prevent noise from other board sources
- Value of decoupling capacitor is frequency dependant. Typical values to use are 0.1 $\mu$ F for designs using crystals < 50MHz and 0.01 $\mu$ F for designs using crystals > 50MHz.

### Typical CMOS termination

Place Series Resistor as close as possible to CMOS output



Series and parallel capacitors used to fine tune the crystal load to the circuit load.



- Series Capacitor, used to lower circuit load to match crystal load. Raises frequency offset. This can be eliminated by using a crystal with a Load of equal or greater value than the oscillator.
- Parallel Capacitors, Used to raise the circuit load to match the crystal load. Lowers frequency offset.

# HIGH PERFORMANCE GENERAL PURPOSE OSCILLATOR IC

ABX1027

1.8V-3.3V, 5MHz to 60MHz XO IC

## ELECTRICAL SPECIFICATIONS

### ABSOLUTE MAXIMUM RATINGS

PARAMETERS	SYMBOL	MIN.	MAX.	UNITS
Supply Voltage Range	$V_{DD}$	-0.5	4.6	V
Input Voltage Range	$V_I$	-0.5	$V_{DD}+0.5$	V
Output Voltage Range	$V_O$	-0.5	$V_{DD}+0.5$	V
Storage Temperature	$T_S$	-65	150	?C
Ambient Operating Temperature		-40	85	?C

Exposure of the device under conditions beyond the limits specified by Maximum Ratings for extended periods may cause permanent damage to the device and affect product reliability. These conditions represent a stress rating only, and functional operations of the device at these or any other conditions above the operational limits noted in this specification is not implied.

### AC SPECIFICATIONS

PARAMETERS	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Crystal Input Frequency (XIN)	Fundamental Crystal	5		60	MHz
Output Frequency	@ Vdd=1.8V-3.3V	5		60	MHz
VDD Sensitivity	Frequency vs. VDD+/-10%	-2		2	ppm
Output Rise Time	15pF Load, 10/90%VDD, High Drive, 3.3V		1	1.2	ns
Output Fall Time	15pF Load, 90/10%VDD, High Drive, 3.3V		1	1.2	ns
Duty Cycle		45	50	55	%

### DC SPECIFICATIONS

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Supply Current, Dynamic, with Loaded CMOS Output	$I_{DD}$	@Vdd=3.3V,25MHz, load=15pF		3.4		mA
		@Vdd=2.5V,25MHz, load=10pF		2.1		mA
		@Vdd=1.8V,25MHz, load=5pF		0.9		mA
		@Vdd=1.8V,2.0MHz, load=5pF		0.65		mA
Operating Voltage	$V_{DD}$		1.62	2.5	3.63	V
Output Low Voltage	$V_{OL}$	$I_{OL} = +4mA$ Standard Drive			0.4	V
Output High Voltage	$V_{OH}$	$I_{OH} = -4mA$ Standard Drive	$V_{DD} - 0.4$			V
Output Current, Low Drive	$I_{OLD}$	$V_{OL} = 0.4V, V_{OH} = 2.4V$	4			mA
Output Current, Standard	$I_{OSD}$	$V_{OL} = 0.4V, V_{OH} = 2.4V$	8			mA
Output Current, High Drive	$I_{OHD}$	$V_{OL} = 0.4V, V_{OH} = 2.4V$	16			mA

# HIGH PERFORMANCE GENERAL PURPOSE OSCILLATOR IC

ABX1027

1.8V-3.3V, 5MHz to 60MHz XO IC

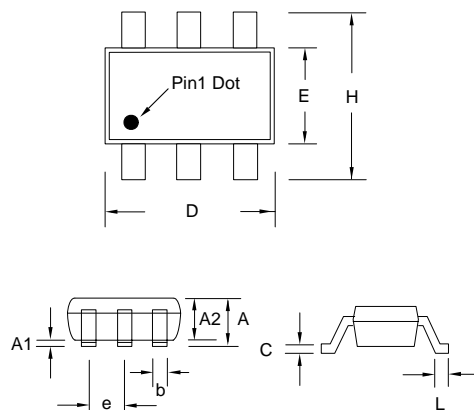
## CRYSTAL SPECIFICATIONS

PARAMETERS	SYMBOL	MIN.	TYP.	MAX.	UNITS
Fundamental Crystal Resonator Frequency	$F_{XIN}$	5		60	MHz
Crystal Loading Rating	$C_L$ (xtal)		12		pF
Maximum Sustainable Drive Level				100	µW
Operating Drive Level			25		µW
Crystal Shunt Capacitance	$C_0$			3	pF
Effective Series Resistance	ESR			50	?

## PACKAGE DRAWINGS (GREEN PACKAGE COMPLIANT)

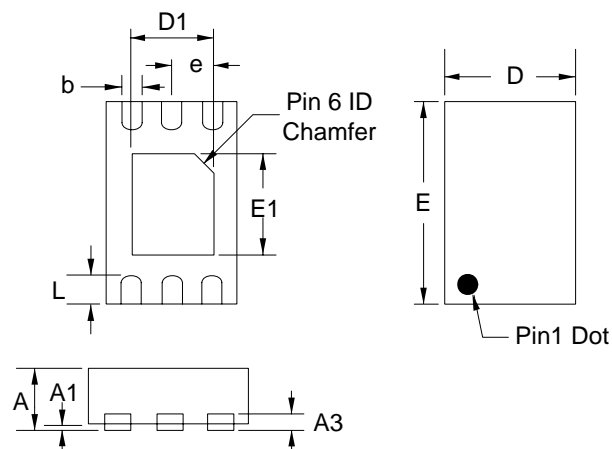
### SOT23-6 L

Symbol	Dimension in MM	
	Min.	Max.
A	1.05	1.35
A1	0.05	0.15
A2	1.00	1.20
b	0.30	0.50
c	0.08	0.20
D	2.80	3.00
E	1.50	1.70
H	2.60	3.0
L	0.35	0.55
e	0.95 BSC	



### DFN-6L

Symbol	Dimension in MM	
	Min.	Max.
A	0.50	0.60
A1	0.00	0.05
A3	0.152	0.152
b	0.15	0.25
e	0.40BSC	
D	1.25	1.35
E	1.95	2.05
D1	0.75	0.85
E1	0.95	1.05
L	0.20	0.30



# HIGH PERFORMANCE GENERAL PURPOSE OSCILLATOR IC

ABX1027

1.8V-3.3V, 5MHz to 60MHz XO IC

## ORDERING INFORMATION (GREEN PACKAGE COMPLIANT)

**For part ordering, please contact our Sales Department:**

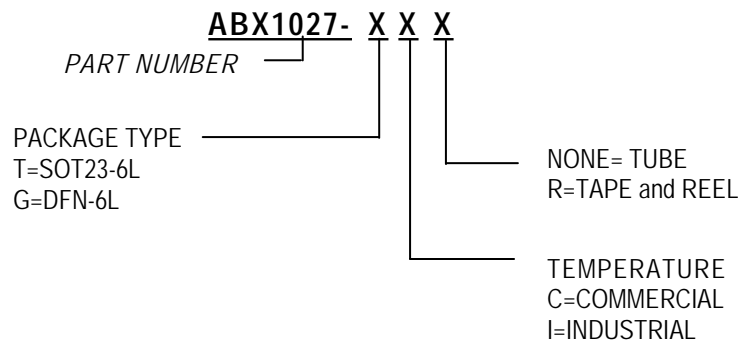
30332 Esperanza., Rancho Santa Margarita, Ca 92688

Ph: 949-546-8000 Fax: 949-546-8001

### PART NUMBER

The order number for this device is a combination of the following:

Part number, Package type and Operating temperature range



Part/Order Number	Marking†	Package Option
ABX1027GC-R	E27	6-Pin DFN (Tape and Reel)
ABX1027TC-R	61027	6-Pin SOT-23 (Tape and Reel)

† Note: 'XXX' designates marking identifier that could be independent of the part number.

*Abrakon Corporation, reserves the right to make changes in its products or specifications, or both at any time without notice. The information furnished by Abracon is believed to be accurate and reliable. However, Abracon makes no guarantee or warranty concerning the accuracy of said information and shall not be responsible for any loss or damage of whatever nature resulting from the use of, or reliance upon this product.*

**LIFE SUPPORT POLICY:** ABRACON's products are not authorized for use as critical components in life support devices or systems without the express written approval of the President of Abracon Corporation.