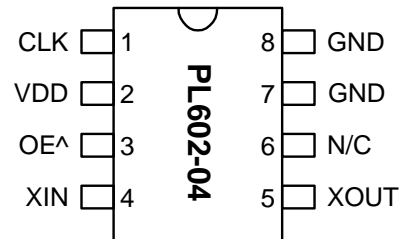


## Low Phase Noise CMOS XO (96MHz to 200MHz)

### FEATURES

- Low phase noise XO output for the 96MHz to 200MHz range (-125 dBc at 10kHz offset).
- 12 to 25MHz crystal input.
- Integrated crystal load capacitor: no external load capacitor required.
- Selectable High Drive (30mA) or Standard Drive (10mA) output.
- 3.3V operation.
- Available in 8-Pin TSSOP or SOIC.

### PIN CONFIGURATION



Note: ^ denotes internal pull up

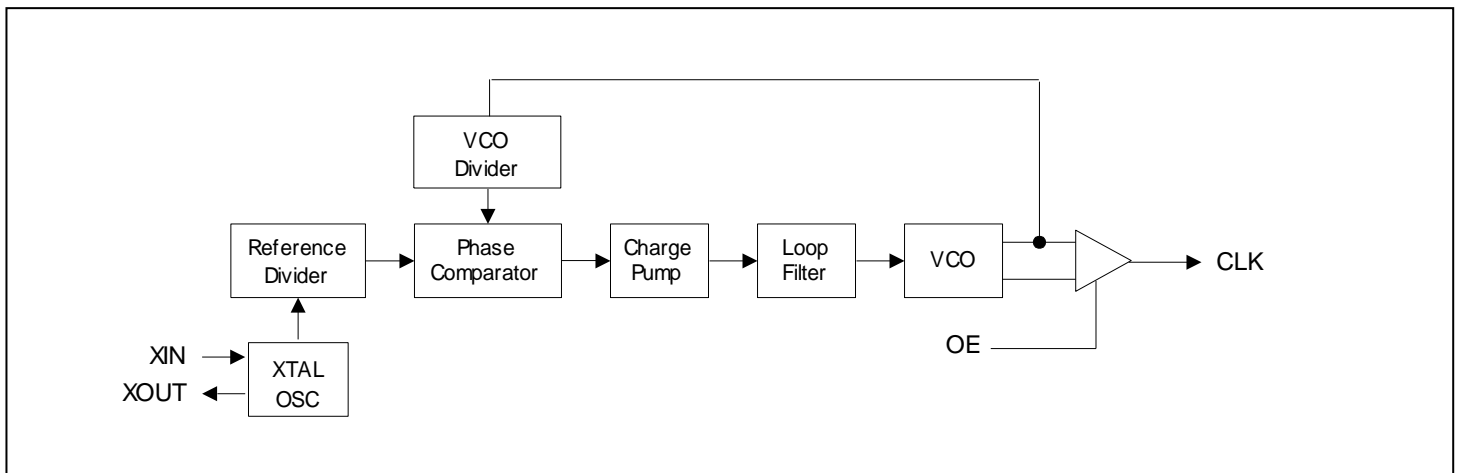
### DESCRIPTION

The PL602-04 is a low cost, high performance and low phase noise XO, providing less than -125dBc at 10kHz offset in the 96MHz to 200MHz operating range. The very low jitter makes this chip ideal for applications requiring clean reference frequency sources. Input crystal can range from 12 to 25MHz (fundamental resonant mode).

### OUTPUT RANGE

MULTIPLIER	FREQUENCY RANGE	OUTPUT BUFFER
X8	96 - 200MHz	CMOS

### BLOCK DIAGRAM



**Low Phase Noise CMOS XO (96MHz to 200MHz)**
**PIN DESCRIPTIONS**

Name	Number	Type	Description
CLK	1	O	Output clock.
VDD	2	P	power supply.
OE	3	I	Output enable input. Disables (tri-state) output when low. Internal pull-up enables output by default if pin is not connected to low.
XIN	4	I	Crystal input. See Crystal Specification on page 3.
XOUT	5	I	Crystal output. See Crystal Specification on page 3.
N/C	6	-	Not connected.
GND	7, 8	P	Ground.

**ELECTRICAL SPECIFICATIONS**
**1. Absolute Maximum Ratings**

PARAMETERS	SYMBOL	MIN.	MAX.	UNITS
Supply Voltage	$V_{DD}$		4.6	V
Input Voltage, dc	$V_I$	-0.5	$V_{DD}+0.5$	V
Output Voltage, dc	$V_O$	-0.5	$V_{DD}+0.5$	V
Storage Temperature	$T_S$	-65	150	°C
Ambient Operating Temperature*	$T_A$	-40	85	°C
Lead Temperature (soldering, 10s)			260	°C
ESD Protection, Human Body Model			2	kV

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.

\* Note: Operating Temperature is guaranteed by design for all parts (COMMERCIAL and INDUSTRIAL), but tested for COMMERCIAL grade only.

**2. DC Specifications**

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Supply Current, Dynamic, with Loaded Outputs	$I_{DD}$	$F_{XIN} = 12 - 25\text{MHz}$ Output load of 10pF			35	mA
Operating Voltage	$V_{DD}$		2.97		3.63	V
Output drive current (High Drive)	$I_{OH}$	$V_{OH} = V_{DD}-0.4\text{V}$ , $V_{DD}=3.3\text{V}$	30			mA
	$I_{OL}$	$V_{OL} = 0.4\text{V}$ , $V_{DD} = 3.3\text{V}$	30			mA
Output drive current (Standard Drive)	$I_{OH}$	$V_{OH} = V_{DD}-0.4\text{V}$ , $V_{DD}=3.3\text{V}$	10			mA
	$I_{OL}$	$V_{OL} = 0.4\text{V}$ , $V_{DD} = 3.3\text{V}$	10			mA

**Low Phase Noise CMOS XO (96MHz to 200MHz)**
**3. AC Specifications**

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Input Crystal Frequency			12		25	MHz
Output Clock Rise/Fall Time (Standard Drive)		0.3V ~ 3.0V with 15 pF load		2.4		ns
Output Clock Rise/Fall Time (High Drive)				1.2		
Output Clock Duty Cycle		Measured @ 50% V <sub>DD</sub>	45	50	55	%

**4. Jitter and Phase Noise Specification**

PARAMETERS	CONDITIONS	MIN.	TYP.	MAX.	UNITS
RMS Period Jitter (1 sigma – 1000 samples)	at 80MHz, with capacitive decoupling between VDD and GND.		20		ps
Phase Noise relative to carrier	155.52MHz @100Hz offset		-100		dBc/Hz
Phase Noise relative to carrier	155.52MHz @1kHz offset		-115		dBc/Hz
Phase Noise relative to carrier	155.52MHz @10kHz offset		-125		dBc/Hz
Phase Noise relative to carrier	155.52MHz @100kHz offset		-116		dBc/Hz
Phase Noise relative to carrier	155.52MHz @1MHz offset		-114		dBc/Hz
Phase Noise relative to carrier	155.52MHz @10MHz offset		-132		dBc/Hz

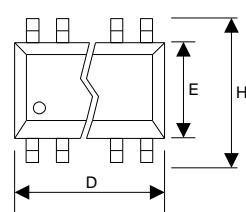
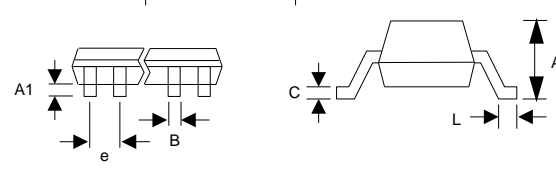
**5. Crystal Specifications**

PARAMETERS	SYMBOL	MIN.	TYP.	MAX.	UNITS
Crystal Resonator Frequency	F <sub>XIN</sub>	12		25	MHz
Crystal Loading Capacitance Rating	C <sub>L (xtal)</sub>		20		pF
Driving power			1		mW
ESR	R <sub>s</sub>			30	Ω

**PACKAGE INFORMATION**

8 PIN ( dimensions in mm )

Symbol	Narrow SOIC		TSSOP	
	Min.	Max	Min.	Max
A	1.34	1.74	-	1.20
A1	0.10	0.25	0.05	0.15
B	0.33	0.51	0.19	0.30
C	0.19	0.25	0.09	0.20
D	4.80	4.95	2.90	3.10
E	3.80	4.00	4.30	4.50
H	5.80	6.20	6.20	6.60
L	0.38	1.27	0.45	0.75
e	1.27 BSC		0.65 BSC	

## Low Phase Noise CMOS XO (96MHz to 200MHz)

### ORDERING INFORMATION

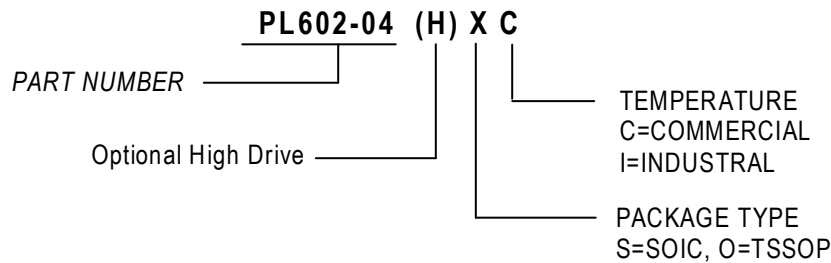
**For part ordering, please contact our Sales Department:**

2180 Fortune Drive, San Jose, CA 95131, USA

Tel: (408) 944-0800 Fax: (408) 474-1000

#### PART NUMBER

The order number for this device is a combination of the following:  
Device number, Package type and Operating temperature range



Part/Order Number (Commercial)	Marking*	Package Option
PL602-04OC	P602-04 OC	8-Pin SOP Tube
PL602-04OC-R	LLLLL	8-Pin SOP (Tape and Reel)
PL602-04HOC	P602-04 HOC	8-Pin SOP Tube
PL602-04HOC-R	LLLLL	8-Pin SOP (Tape and Reel)
PL602-04SC	P602-04 SC	8-Pin SOP Tube
PL602-04SC-R	LLLLL	8-Pin SOP (Tape and Reel)
PL602-04HSC	P602-04 HSC	8-Pin SOP Tube
PL602-04HSC-R	LLLLL	8-Pin SOP (Tape and Reel)

\*Note: LLLLL designates lot number

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