PLL602-04

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

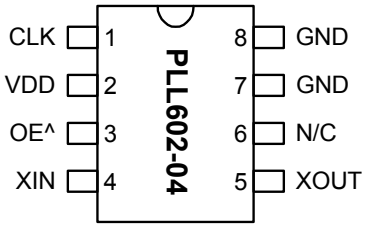
FEATURES

- Low phase noise XO 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.
- Low jitter (RMS): 4ps period jitter (1 sigma).
- Selectable High Drive (30mA) or Standard Drive (10mA) output.
- 3.3V operation.
- Available in 8-Pin TSSOP or SOIC.

DESCRIPTION

The PLL602-04 is a low cost, high performance and low phase noise XO, providing less than -125 dBc at 10kHz offset in the 96MHz to 200MHz operating range. The very low jitter (4ps RMS period jitter) makes this chip ideal for 155.52MHz SONET and SDH applications, and for 125MHz and 106.25MHz applications. Input crystal can range from 12 to 25MHz (fundamental resonant mode).

PIN CONFIGURATION

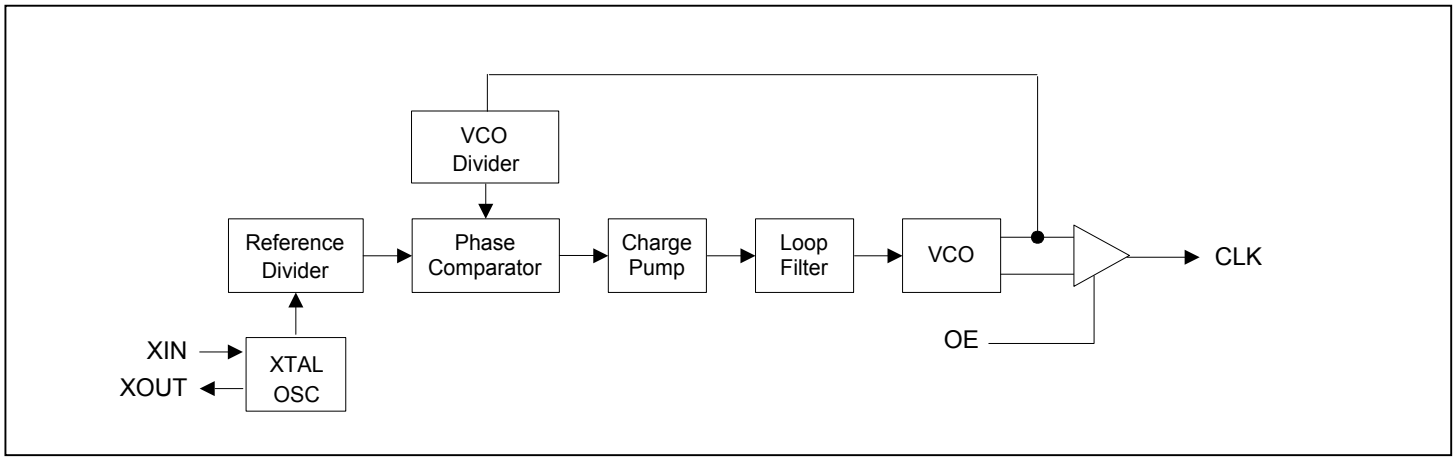


Note: ^ denotes internal pull up

OUTPUT RANGE

MULTIPLIER	FREQUENCY RANGE	OUTPUT BUFFER
x8	96 - 200MHz	CMOS

BLOCK DIAGRAM



PIN DESCRIPTIONS

Name	Number	Type	Description
CLK	1	O	Output clock.
VDD	2	P	+3.3V 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 Specifications on page 3.
XOUT	5	I	Crystal output. See Crystal Specifications 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
Junction Temperature	T_J		125	°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 Electrical Specifications

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Supply Current, Dynamic, with Loaded Outputs	I_{DD}	F_{XIN} = 12 - 25MHz Output load of 10pF		16	20	mA
Operating Voltage	V_{DD}		2.97		3.63	V
Output drive current (High Drive)	I_{OH}	V_{OH}= V_{DD}-0.4V, V_{DD}=3.3V	30			mA
	I_{OL}	V_{OL} = 0.4V, V_{DD} = 3.3V	30			mA
Output drive current (Standard Drive)	I_{OH}	V_{OH}= V_{DD}-0.4V, V_{DD}=3.3V	10			mA
	I_{OL}	V_{OL} = 0.4V, V_{DD} = 3.3V	10			mA
Short Circuit Current				±50		mA

3. AC Specification

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)		0.3V ~ 3.0V with 15 pF load		1.2		
Output Clock Duty Cycle		Measured @ 50% V_{DD}	45	50	55	%

4. Jitter and Phase Noise Specification

PARAMETERS	CONDITIONS	MIN.	TYP.	MAX.	UNITS
RMS Period Jitter (1 sigma – 1000 samples)	at 155MHz, with capacitive decoupling between VDD and GND.		4		ps
Phase Noise relative to carrier	155MHz @100Hz offset		-95		dBc/Hz
Phase Noise relative to carrier	155MHz @1kHz offset		-120		dBc/Hz
Phase Noise relative to carrier	155MHz @10kHz offset		-125		dBc/Hz
Phase Noise relative to carrier	155MHz @100kHz offset		-121		dBc/Hz

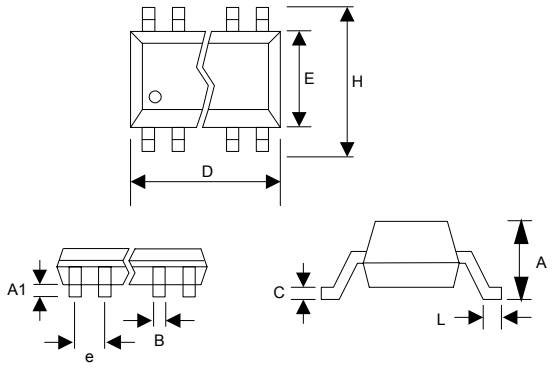
5. Crystal Specifications

PARAMETERS	SYMBOL	MIN.	TYP.	MAX.	UNITS
Crystal Resonator Frequency	F_{XIN}	12		25	MHz
Crystal Loading Capacitance Rating	$C_{L\ (xtal)}$		20		pF
Driving power			1		mW
ESR	R_S			30	Ω

PACKAGE INFORMATION

8 PIN (dimensions in mm)

	Narrow SOIC		TSSOP	
Symbol	Min.	Max.	Min.	Max.
A	1.47	1.73	-	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	



ORDERING INFORMATION

For part ordering, please contact our Sales Department:

47745 Fremont Blvd., Fremont, CA 94538, USA
Tel: (510) 492-0990 Fax: (510) 492-0991

PART NUMBER

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

PLL602-04 (H) X C

- *PART NUMBER*
- Optional High Drive
- TEMPERATURE
  C=COMMERCIAL
  I=INDUSTRAL
- PACKAGE TYPE
  S=SOIC, O=TSSOP

Order Number	Marking	Package Option
PLL602-04OC-R	P602-04OC	TSSOP - Tape and Reel
PLL602-04OC	P602-04OC	TSSOP – Tube
PLL602-04HOC-R	P602-04HOC	TSSOP - Tape and Reel
PLL602-04HOC	P602-04HOC	TSSOP – Tube
PLL602-04SC-R	P602-04SC	SOIC - Tape and Reel
PLL602-04SC	P602-04SC	SOIC - Tube
PLL602-04HSC-R	P602-04HSC	SOIC - Tape and Reel
PLL602-04HSC	P602-04HSC	SOIC - Tube