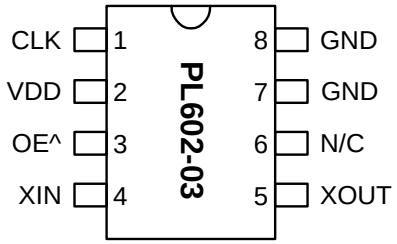
PL602-03

Low Phase Noise CMOS XO (48MHz to 100MHz)

FEATURES

- Low phase noise XO output for the 48MHz to 100MHz range (-130 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

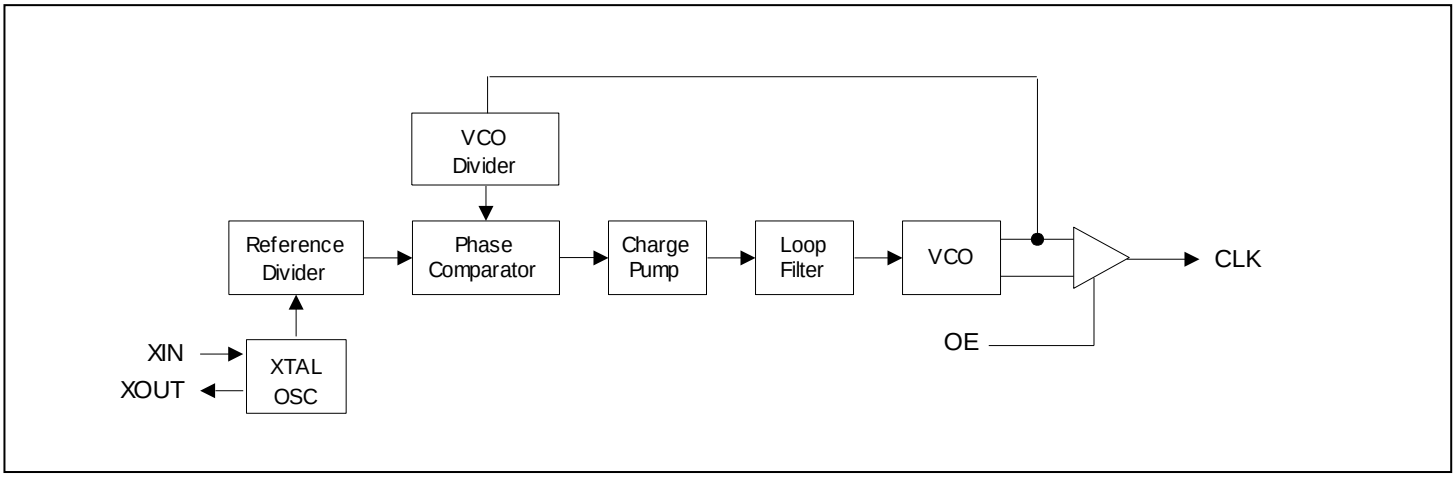
DESCRIPTION

The PL602-03 is a low cost, high performance and low phase noise XO, providing less than -130dBc at 10kHz offset in the 48MHz to 100MHz 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
X4	48 - 100MHz	CMOS

BLOCK DIAGRAM



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 - 25MHz 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}-0.4V, 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

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)		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 80MHz, with capacitive decoupling between VDD and GND.		20		ps
Phase Noise relative to carrier	80MHz @100Hz offset		-106		dBc/Hz
Phase Noise relative to carrier	80MHz @1kHz offset		-124		dBc/Hz
Phase Noise relative to carrier	80MHz @10kHz offset		-130		dBc/Hz
Phase Noise relative to carrier	80MHz @100kHz offset		-122		dBc/Hz
Phase Noise relative to carrier	80MHz @1MHz offset		-121		dBc/Hz

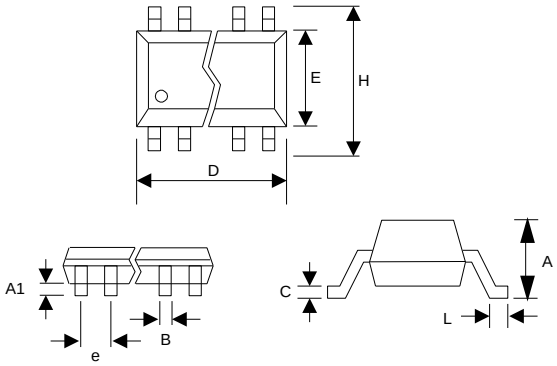
5. Crystal Specifications

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)

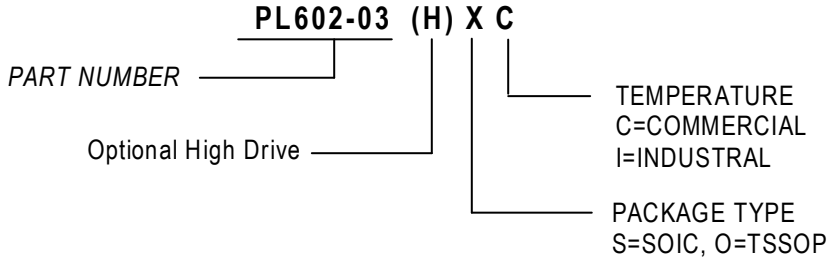
	Narrow SOIC		TSSOP	
Symbol	Min.	Max	Min.	Max
A	1.34	1.74	-	1.20
A1	0.10	0.25	0.05	0.15
B	0.33	0.51	0.19	0.30
C	0.19	0.25	0.09	0.20
D	4.80	4.95	2.90	3.10
E	3.80	4.00	4.30	4.50
H	5.80	6.20	6.20	6.60
L	0.38	1.27	0.45	0.75
e	1.27 BSC		0.65 BSC	



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
PL602-03OC	P602-03 OC LLLLL	8-Pin SOP Tube
PL602-03OC-R		8-Pin SOP (Tape and Reel)
PL602-03HOC	P602-03 HOC LLLLL	8-Pin SOP Tube
PL602-03HOC-R		8-Pin SOP (Tape and Reel)
PL602-03SC	P602-03 SC LLLLL	8-Pin SOP Tube
PL602-03SC-R		8-Pin SOP (Tape and Reel)
PL602-03HSC	P602-03 HSC LLLLL	8-Pin SOP Tube
PL602-03HSC-R		8-Pin SOP (Tape and Reel)

***Note: LLLLL designates lot number**

Micrel Inc., reserves the right to make changes in its products or specifications, or both at any time without notice. The information furnished by Micrel is believed to be accurate and reliable. However, Micrel 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**: Micrel'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 Micrel Inc.*