

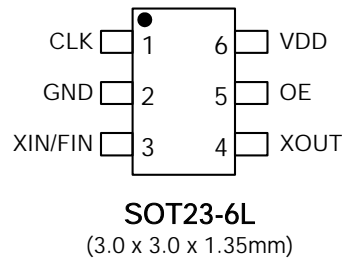
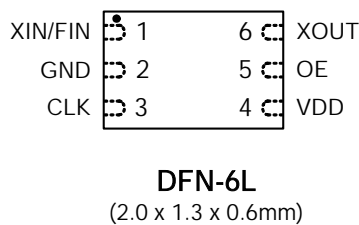
FEATURES

- 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 ± 10% power supply
- Operating Temperature Range:
 - 0°C to 70°C (Commercial)
 - -40°C to 85°C (Industrial)
- Available in 6-pin DFN or SOT23 GREEN/RoHS Compliant Packages

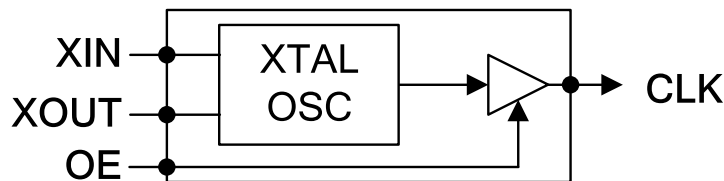
DESCRIPTION

The PL610-37 is a high performance general purpose oscillator IC for outputs up to 60MHz. The OE function will put the IC into standby mode with a current consumption of <5uA. 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.

PACKAGE PIN CONFIGURATION



BLOCK DIAGRAM



PACKAGE PIN ASSIGNMENT

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

LAYOUT RECOMMENDATIONS

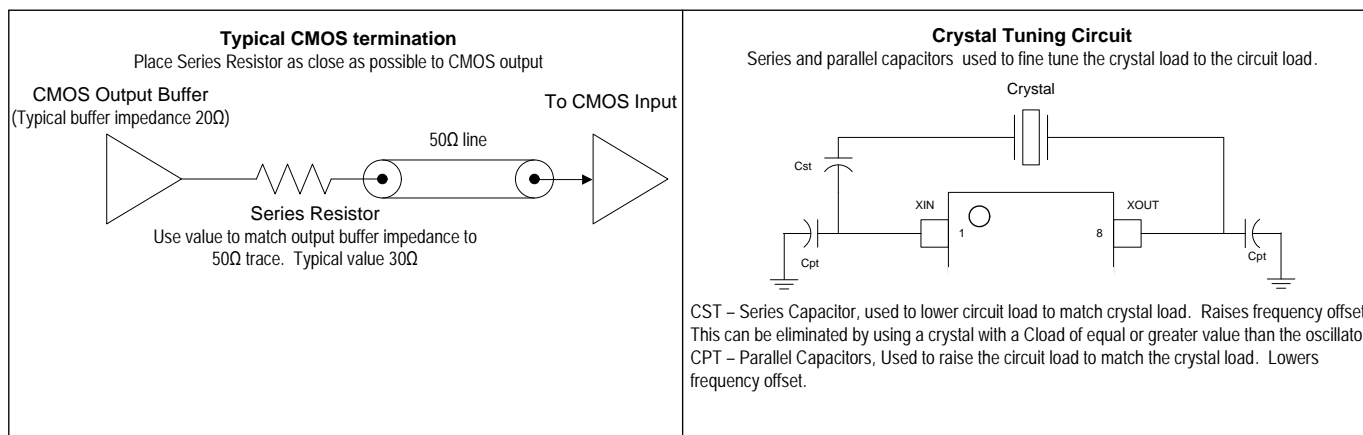
The following guidelines are to assist you with a performance optimized PCB design:

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 V_{DD} pin(s) to limit noise from the power supply
- Multiple V_{DD} pins should be decoupled separately for best performance.
- Addition of a ferrite bead in series with V_{DD} 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.



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		5		60	MHz
VDD Sensitivity	Frequency vs. V_{DD} , $\pm 10\%$	-2		2	ppm
Output Enable Time (OE pin change from GND to V_{DD})	OE Function; $T_a=25^\circ\text{C}$, 15pF Load. Add one clock period to this measurement for a usable clock output.			2	ms
Output Rise Time	15pF Load, 10/90% V_{DD} , 3.3V		1	2	ns
Output Fall Time	15pF Load, 90/10% V_{DD} , 3.3V		1	2	ns
Duty Cycle		45	50	55	%

* For 1.8V operation, the 50% $\pm 5\%$ duty cycle is guaranteed for frequencies $\leq 40\text{MHz}$.

DC SPECIFICATIONS

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Supply Current, Dynamic, with Loaded CMOS Output	I_{DD}	$V_{DD}=3.3\text{V}$, 40MHz, load=3pF		2.7		mA
		$V_{DD}=2.5\text{V}$, 40MHz, load=3pF		1.9		mA
		$V_{DD}=1.8\text{V}$, 40MHz, load=3pF		1.25		mA
		$V_{DD}=1.8\text{V}$, 2MHz, load=3pF		0.65		mA
Supply Current, OE Low	I_{DD_SB}			5	μA	
Operating Voltage	V_{DD}		1.62		3.63	V
Output Low Voltage	V_{OL}	$I_{OL} = +4\text{mA}$ Standard Drive			0.4	V
Output High Voltage	V_{OH}	$I_{OH} = -4\text{mA}$ Standard Drive	2.4			V
Output Current	I_{OD}	$V_{OL} = 0.4\text{V}$, $V_{OH} = 2.4\text{V}$	16			mA

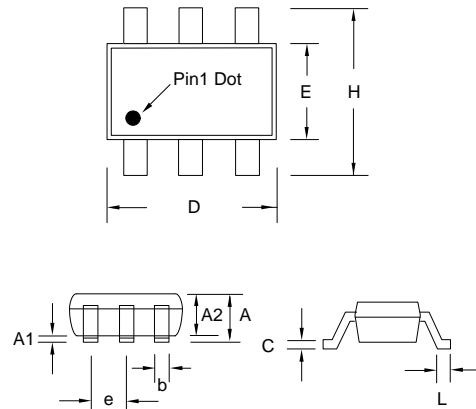
CRYSTAL SPECIFICATIONS

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	Ω

PACKAGE DRAWINGS (GREEN PACKAGE COMPLIANT)

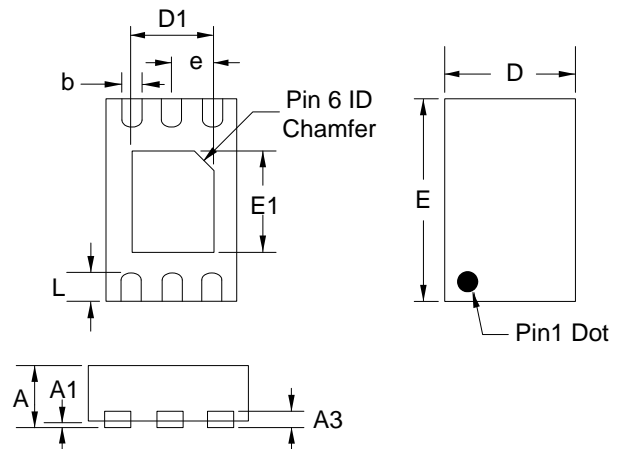
SOT23-6 L

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



ORDERING INFORMATION (GREEN PACKAGE COMPLIANT)

For part ordering, please contact our Sales Department:

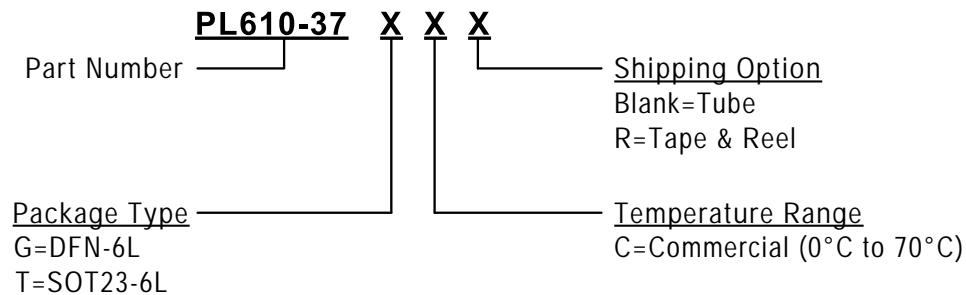
47745 Fremont Blvd., Fremont, CA 94538, USA

Tel: (510) 492-0990 Fax: (510) 492-0991

PART NUMBER

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

Part number, Package type and Operating temperature range



Part/Order Number	Marking	Package Option
PL610-37GC-R	E37 LLL	6-Pin DFN (Tape and Reel)
PL610-37TC-R	E37 LLL	6-Pin SOT-23 (Tape and Reel)

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