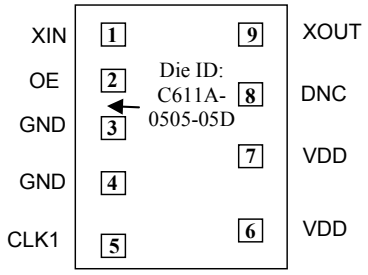
PL611-25

Programmable Quick Turn Clock™

FEATURES

- Advanced programmable PLL design
- Very low Jitter and Phase Noise (< 40ps Pk-Pk typical)
- Two registers banks for 2-time programming.
- Output frequency up to 200MHz CMOS.
- Crystal inputs:
  - Fundamental crystal: 10MHz-30MHz
  - 3RD overtone crystal: Up to 75MHz
- Single 2.5V or 3.3V ± 10% power supply
- Operating temperature range from -40°C to 85°C
- Available in Die form only

PAD LAYOUT AND DIE ID



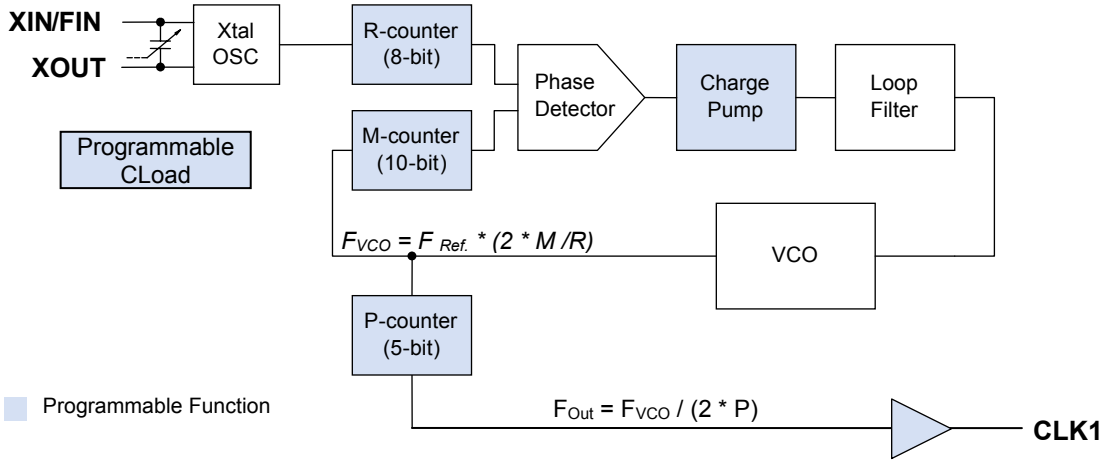
DIE AND WAFER SPECIFICATION

Name	Value
Die Size	31.5x55.1 mil
Reverse side	GND
Pad Opening	80 micron x 80 micron
Wafer Diameter	8”
Die Per Wafer	22,277
Wafer Thickness	12 mil

DESCRIPTION

The PL611-25 is a low-cost general purpose frequency synthesizer and a member of PhaseLink’s Factory Programmable ‘Quick Turn Clock (QTC)’ family. PhaseLink’s PL611-25 product family can generate any output frequency up to 200 MHz from fundamental crystal input between 10 MHz - 30 MHz, or a 3rd overtone crystal of up to 75Mhz.

BLOCK DIAGRAM



KEY PROGRAMMING PARAMETERS

CLK[0:2] Output Frequency	Output Drive Strength	Crystal Load	# of Register Banks	Charge-Pump Current
Fout = FIN * M / (R * P) where M=10 bit R= 8 bit P= 5 bit CLK1= VCO / 2 * P	Std: 10mA (default) High: 24mA	+/- 200ppm tuning.	2	4 levels of pump current setting

PAD ASSIGNMENT and DESCRIPTION

Name	Die Pads			Type	Description
	Pad #	X (µm)	Y(µm)		
XIN	1	101.5	1274.0	I	Crystal input.
OE	2	101.5	1075.0	I	Output Enable
GND	3	101.5	878.4	P	GND connection.
GND	4	101.5	671.8	P	GND connection.
CLK1	5	101.5	425.0	O	Programmable Clock Output.
VDD	6	697	483.0	P	VDD connection.
	7	697	790.0		
DNC	8	697	1024.0	-	Do Not Connect
XOUT	9	697	1274.0	O	Crystal output.

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
Data Retention @ 85° C		10		Years
Soldering Temperature (Green Package)			260	°C
Storage Temperature	T_S	-65	150	°C
Ambient Operating Temperature*		-40	+85	°C

Note: 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.

AC SPECIFICATIONS

PARAMETERS	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Crystal Input Frequency	Fundamental Crystal	10		30	MHz
	3rd Overtone Crystal			75	MHz
Settling Time	At power-up (after VDD increases over 1.62V)			10	ms
VDD Sensitivity	Frequency vs. VDD+/-10%	-2		2	ppm
Output Rise Time	15pF Load, 10/90%VDD, Standard drive		2.5	3.5	ns
	15pF Load, 10/90%VDD, High drive		1.0	1.5	ns
Output Fall Time	15pF Load, 90/10%VDD, Standard drive		2.5	3.5	ns
	15pF Load, 90/10%VDD, High drive		1.0	1.5	ns
Duty Cycle	At VDD/2	45	50	55	%
Max. output skew between same frequency clocks	Equal loading (15 pF). Equal frequency & drive strength			500	ps
Period Jitter, peak-to-peak* (measured from 10,000 samples)	With capacitive decoupling between VDD and GND. Operating only one output.		40		ps

* Note: Jitter performance depends on the programming parameters.

DC SPECIFICATIONS

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Supply Current, Dynamic, with Loaded Outputs	I_{DD}	At 10MHz, load=15pF			15	mA
Operating Voltage	V_{DD}		2.25		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	I_{OSD}	V_{OL} = 0.4V, V_{OH} = 2.4V (Standard drive)		10		mA
	I_{OHD}	V_{OL} = 0.4V, V_{OH} = 2.4V (High Drive)		24		mA
Short-circuit Current	I_S			±50		mA

CRYSTAL SPECIFICATIONS

PARAMETERS	SYMBOL	MIN.	TYP.	MAX.	UNITS
Fundamental Crystal Resonator Frequency	F_{XIN}	10		30	MHz
3rd Overtone Crystal Resonator Frequency	F_{XIN}			75	MHz
Crystal Loading Rating (The IC can be programmed for any value in this range.)	$C_{L\ (xtal)}$	5		20	pF
Maximum Sustainable Drive Level				500	µW
Operating Drive Level			100		µW
Crystal Shunt Capacitance	C0			6	pF
Effective Series Resistance, Fundamental, 10-30MHz	R_S			30	Ω
Effective Series Resistance, 3rd Overtone, 30-50MHz [CO< 4pF, C_L=5pF/8pF]	ESR			100/70	Ω
Effective Series Resistance, 3rd Overtone, 50-65MHz, [CO< 4pF, C_L=5pF/8pF]	ESR			60/40	Ω
Effective Series Resistance, 3rd Overtone, 65-75MHz [CO< 4pF, C_L=5pF/8pF	ESR			45/30	Ω

Note: A detailed crystal specification document is also available for this part

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

PL611-25 WX

PART NUMBER

PACKAGE TYPE
W= WAFER

TEMPERATURE
C=COMMERCIAL
I = INDUSTRIAL

Part / Order Number	Marking	TEMPERATURE
PL611-25WC	P611-25WC	0- +70º C