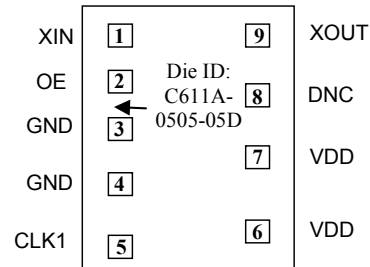


**Programmable Quick Turn Clock™**

**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
  - 3<sup>RD</sup> 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**

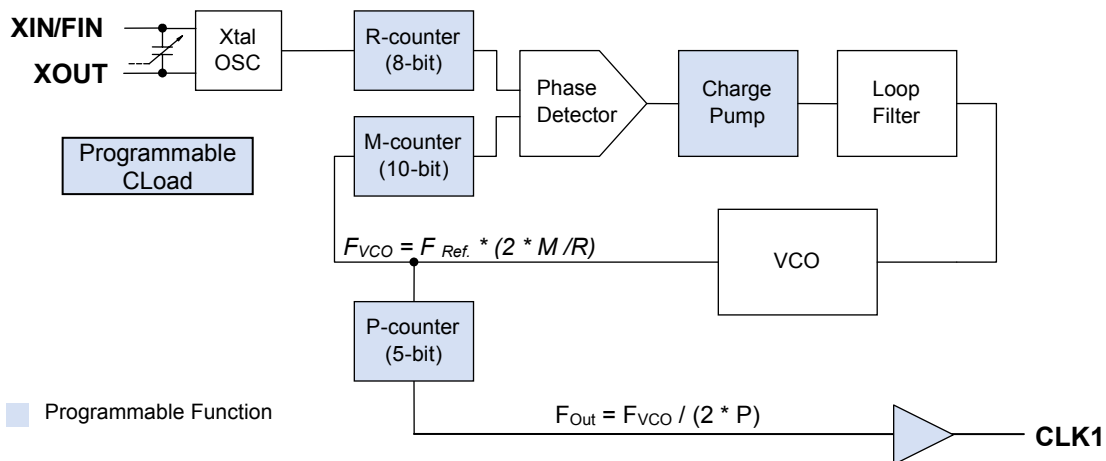
Name	Value
Die Size	31.5x55.1 mil
Reverse side	GND
Pad Opening	80 micron x 80 micron
Wafer Diameter	8"
Die Per Wafer	22,277
Wafer Thickness	12 mil

**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
$F_{out} = F_{IN} * M / (R * P)$ 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.

**Programmable Quick Turn Clock™**
**ELECTRICAL SPECIFICATIONS**
**ABSOLUTE MAXIMUM RATINGS**

PARAMETERS	SYMBOL	MIN.	MAX.	UNITS
Supply Voltage Range	V <sub>DD</sub>	-0.5	4.6	V
Input Voltage Range	V <sub>I</sub>	-0.5	V <sub>DD</sub> +0.5	V
Output Voltage Range	V <sub>O</sub>	-0.5	V <sub>DD</sub> +0.5	V
Data Retention @ 85° C		10		Years
Soldering Temperature (Green Package)			260	°C
Storage Temperature	T <sub>S</sub>	-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
	3 <sup>rd</sup> Overtone Crystal			75	MHz
Settling Time	At power-up (after V <sub>DD</sub> increases over 1.62V)			10	ms
V <sub>DD</sub> Sensitivity	Frequency vs. V <sub>DD</sub> +/-10%	-2		2	ppm
Output Rise Time	15pF Load, 10/90%V <sub>DD</sub> , Standard drive		2.5	3.5	ns
	15pF Load, 10/90%V <sub>DD</sub> , High drive		1.0	1.5	ns
Output Fall Time	15pF Load, 90/10%V <sub>DD</sub> , Standard drive		2.5	3.5	ns
	15pF Load, 90/10%V <sub>DD</sub> , High drive		1.0	1.5	ns
Duty Cycle	At V <sub>DD</sub> /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 V <sub>DD</sub> 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 <sub>DD</sub>	At 10MHz, load=15pF			15	mA
Operating Voltage	V <sub>DD</sub>		2.25		3.63	V
Output Low Voltage	V <sub>OL</sub>	I <sub>OL</sub> = +4mA (Standard drive)			0.4	V
Output High Voltage	V <sub>OH</sub>	I <sub>OH</sub> = -4mA (Standard drive)	V <sub>DD</sub> - 0.4			V
Output Current	I <sub>OSD</sub>	V <sub>OL</sub> = 0.4V, V <sub>OH</sub> = 2.4V (Standard drive)		10		mA
	I <sub>OHD</sub>	V <sub>OL</sub> = 0.4V, V <sub>OH</sub> = 2.4V (High Drive)		24		mA
Short-circuit Current	I <sub>s</sub>			±50		mA

**CRYSTAL SPECIFICATIONS**

PARAMETERS	SYMBOL	MIN.	TYP.	MAX.	UNITS
Fundamental Crystal Resonator Frequency	F <sub>XIN</sub>	10		30	MHz
3 <sup>rd</sup> Overtone Crystal Resonator Frequency	F <sub>XIN</sub>			75	MHz
Crystal Loading Rating (The IC can be programmed for any value in this range.)	C <sub>L(xtal)</sub>	5		20	pF
Maximum Sustainable Drive Level				500	μW
Operating Drive Level			100		μW
Crystal Shunt Capacitance	C <sub>0</sub>			6	pF
Effective Series Resistance, Fundamental, 10-30MHz	R <sub>s</sub>			30	Ω
Effective Series Resistance, 3 <sup>rd</sup> Overtone, 30-50MHz [C <sub>0</sub> < 4pF, C <sub>L</sub> =5pF/8pF]	ESR			100/70	Ω
Effective Series Resistance, 3 <sup>rd</sup> Overtone, 50-65MHz, [C <sub>0</sub> < 4pF, C <sub>L</sub> =5pF/8pF]	ESR			60/40	Ω
Effective Series Resistance, 3 <sup>rd</sup> Overtone, 65-75MHz [C <sub>0</sub> < 4pF, C <sub>L</sub> =5pF/8pF]	ESR			45/30	Ω

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

**Programmable Quick Turn Clock™**

**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- +70° C

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