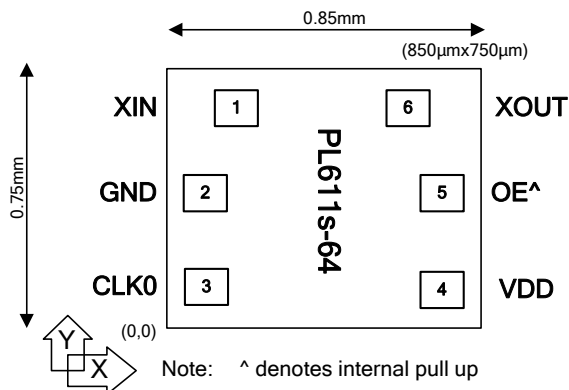


## 1.62V~3.63V PicoPLL Fixed Multiplier Clock

### FEATURES

- By 4 multiplication of input frequency
- Input Frequency: Fundamental crystal
  - 10MHz to 25MHz.
- Output Frequency range (from 1.8V ~ 3.3V)
  - - ≤68MHz @ 1.8V operation
    - ≤84MHz @ 2.5V operation
    - ≤100MHz @ 3.3V operation
- Very low Jitter
- Low current consumption: <5μA when OE is activated.
- Single 1.8V, 2.5V, or 3.3V ± 10% power supply
- Operating temperature range from -40°C to 85°C
- Available in 6 mil thickness

### PAD CONFIGURATION



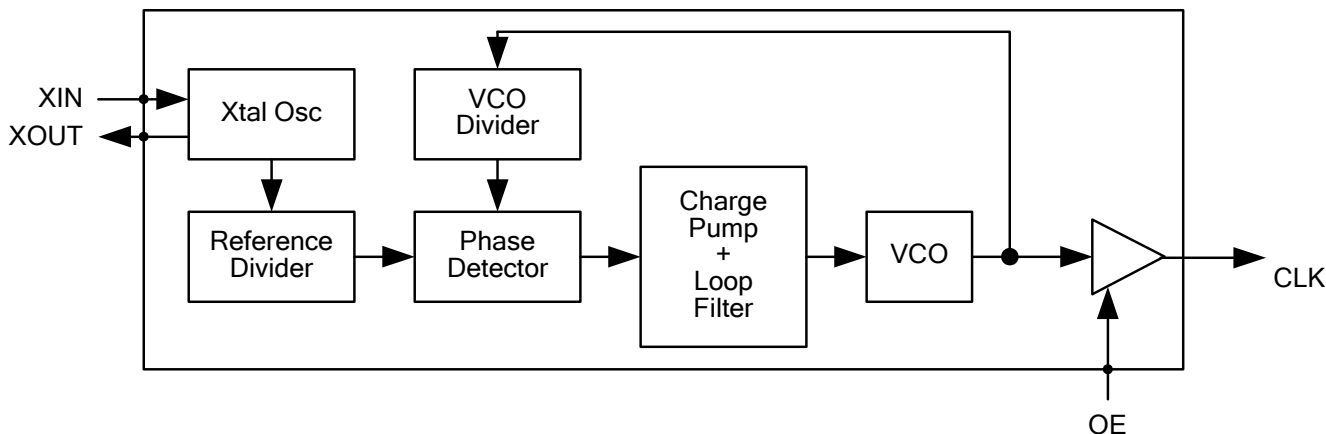
### DIE SPECIFICATION

Parameter	Value
Chip size	0.75 x 0.85mm
Chip thickness	Optional (See Ordering Information)
PAD size	90μm
Chip Base	GND level

### DESCRIPTION

The PL611s-64 is a high performance low-cost general purpose frequency synthesizer that is designed to fit in a small 2.5mmx2.0mm oscillator module for high performance, high frequency applications where the traditional 3<sup>rd</sup> overtone crystals are too large to fit the small form-factor packaging. The PL611s-64 offers the best phase noise and jitter performance, smallest die size, and power consumption of any comparable device. PL611s-64 consumes very little power, but is capable of producing up to 100MHz, from a low-cost 25MHz crystal input.

### BLOCK DIAGRAM



## 1.62V~3.63V PicoPLL Fixed Multiplier Clock

### PAD ASSIGNMENT AND DESCRIPTION

Name	Pad Assignment*			Type	Description
	Pad #	X (μm)	Y (μm)		
XIN	1	125	665	I	Crystal Input pad.
GND	2	85	375	P	GND connection.
CLK0	3	85	115	O	Programmable Clock Output.
VDD	4	765	115	P	VDD connection.
OE	5	765	375	B	Output Enable (OE) input. This pin incorporates an internal pull up resistor.
XOUT	6	725	665	O	Crystal Output pad.

\* Note: The X/Y coordinates indicate pad centers.

### 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		Year
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.

## 1.62V~3.63V PicoPLL Fixed Multiplier Clock

### AC SPECIFICATIONS

PARAMETERS	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Crystal Input Frequency (XIN)	Fund. Crystal, @ $V_{DD} = 3.3V$ operation	10		25	MHz
	Fund. Crystal, @ $V_{DD} = 2.5V$ operation	10		21	MHz
	Fund. Crystal, @ $V_{DD} = 1.8V$ operation	10		17	MHz
Output Frequency	@ $V_{DD} = 3.3V$ operation			100	MHz
	@ $V_{DD} = 2.5V$ operation			84	
	@ $V_{DD} = 1.8V$ operation			68	
Settling Time	At power-up (after $V_{DD} \geq 1.62V$ )			2	ms
Output Enable Time (See MTC-1)	OE Function; $T_a=25^\circ C$ , 15pF Load. Add one clock period to this measurement for a usable clock output.			10	ns
	PDB Function; $T_a=25^\circ C$ , 15pF Load			2	ms
Output Disable Time (See MTC-1)	$T_a=25^\circ C$ , 15pF Load			100	ns
VDD Sensitivity	Frequency vs. $V_{DD} \pm 10\%$	-2		2	ppm
Output Rise Time (See MTC-1)	15pF Load, 10/90% $V_{DD}$ , 3.3V		1	1.5	ns
	30pF Load, 10/90% $V_{DD}$ , 3.3V		2.0	2.5	ns
Output Fall Time (See MTC-1)	15pF Load, 90/10% $V_{DD}$ , 3.3V		1	1.5	ns
	30pF Load, 10/90% $V_{DD}$ , 3.3V		2.0	2.5	ns
Duty Cycle (See MTC-1)	Over entire frequency range, $V_{DD}/2$	45	50	55	%
Period Jitter, Pk-to-Pk (10,000 samples measured) (See MTC-3)	With capacitive decoupling between $V_{DD}$ and GND.		70		ps

## 1.62V~3.63V PicoPLL Fixed Multiplier Clock

### DC SPECIFICATIONS

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Supply Current, Dynamic, Loaded Output	$I_{DD}$	@ $V_{DD} = 3.3V$ , 40MHz, no load		4.2		mA
Supply Current, Dynamic, Loaded Output	$I_{DD}$	@ $V_{DD} = 2.5V$ , 40MHz, no load		2.9		mA
Supply Current, Dynamic, Loaded Output	$I_{DD}$	@ $V_{DD} = 1.8V$ , 40MHz, no load		2.0		mA
Stand By Current, Loaded Outputs (See MTC-1)	$I_{DD}$	When OE=0			<5	$\mu A$
Operating Voltage	$V_{DD}$		1.62		3.63	V
Output Low Voltage	$V_{OL}$	$I_{OL} = +4mA$			0.4	V
Output High Voltage	$V_{OH}$	$I_{OH} = -4mA$	$V_{DD} - 0.4$			V
Input Voltage	$V_{IH}$	OE Pin	$0.7V_{DD}$			V
	$V_{IL}$				$0.3V_{DD}$	V
Output Current, (See MCT-2)	$I_{OHD}$	$V_{OL} = 0.4V$ , $V_{OH} = 2.4V$ , 3.3V Operation	16			mA

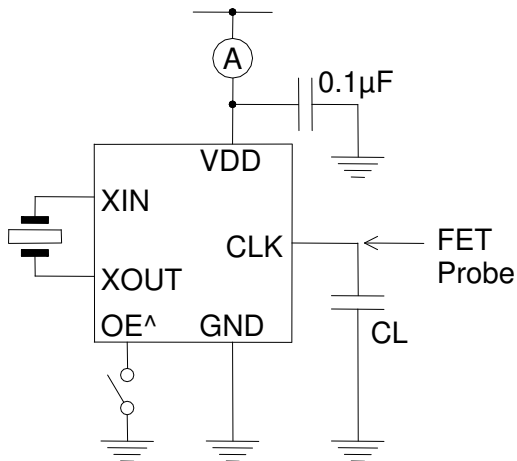
### CRYSTAL SPECIFICATIONS

PARAMETERS	SYMBOL	MIN.	TYP.	MAX.	UNITS
Fundamental Crystal Resonator Frequency	$F_{XIN}$	10		25	MHz
Crystal Loading Rating (The IC can be programmed for any value in this range.)	$C_L (xtal)$		12		pF
Operating Drive Level			100		$\mu W$
Crystal Shunt Capacitance	C0			4	pF
Effective Series Resistance, Fundamental, 10 - 50MHz (See MCT-4)	ESR			30	$\Omega$

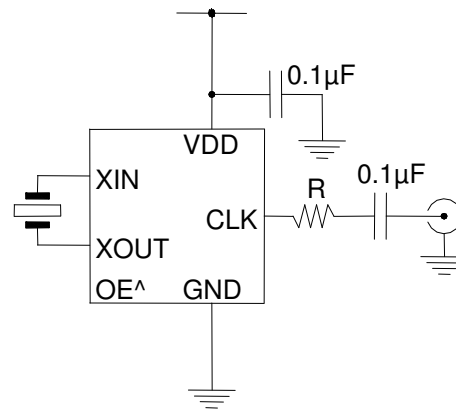
**1.62V~3.63V PicoPLL Fixed Multiplier Clock**

**MEASUREMENT TEST CIRCUITS (MTC)**

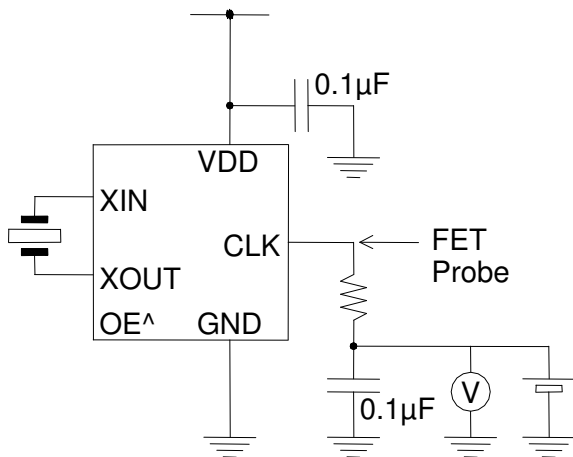
**MTC-1: Rise Time, Fall Time, Duty Cycle, VOL, VOH, I<sub>dd</sub>, Power Down Current, Output Enable/Disable**



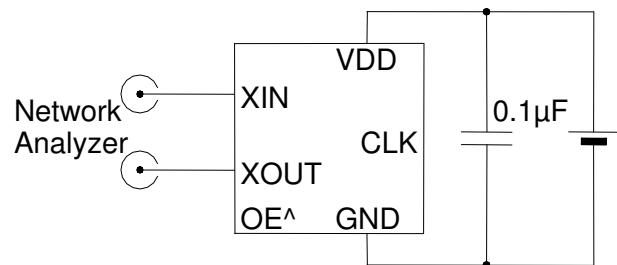
**MTC-3: Jitter and Phase Noise**



**MTC-2: Output Drive Current and Output Impedance**



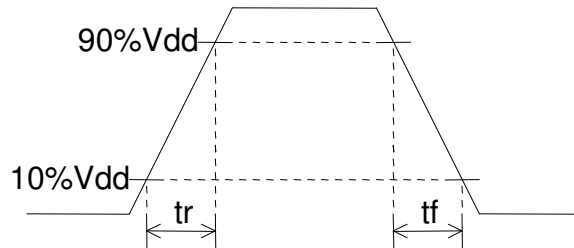
**MTC-4: Negative Resistance**



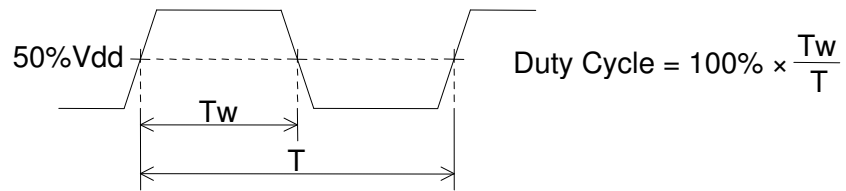
**1.62V~3.63V PicoPLL Fixed Multiplier Clock**

**WAVEFORM SWITCHING CHARACTERISTICS**

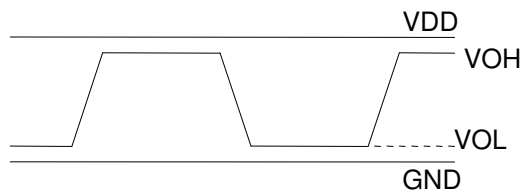
**Rise and Fall times:**



**Duty Cycle:**



**VOH, VOL:**



**1.62V~3.63V PicoPLL Fixed Multiplier Clock**

**ORDERING INFORMATION**

**For part ordering, please contact our Sales Department:**

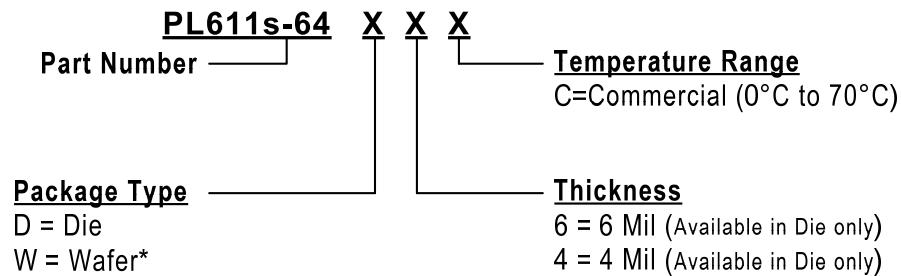
2880 Zanker Road, San Jose, California USA

Tel: (408) 571-1668 Fax: (408) 571-1688

**PART NUMBER**

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

Part number, Package type and Operating temperature range



\* Available in 8 Mil Thickness Only

Part / Order Number	Package Option	Temperature
PL611s-64DxC	Die (Waffle Pack)	0°C to +70°C
PL611s-64WxC	Wafer	0°C to +70°C

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