

**4x Low Phase Noise Multiplier PECL XO**

Universal Low Phase Noise IC

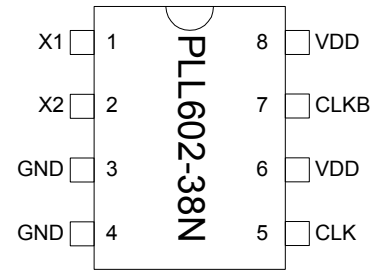
**FEATURES**

- Low phase noise output (-127dBc @ 10kHz frequency offset).
- 12MHz to 25MHz crystal input.
- 48MHz to 100MHz PECL output.
- 3.3V operation.
- Available in Green (RoHS Compliant) 8-Pin SOIC package.

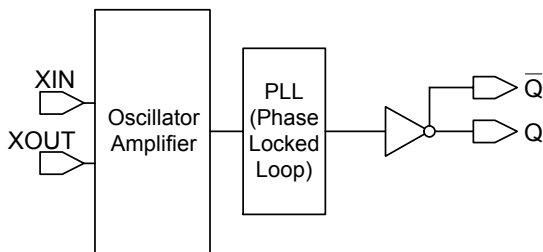
**DESCRIPTION**

The PLL602-38N is a high performance and low phase noise PECL XO IC chip. It provides phase noise performance as low as -127dBc at 10kHz offset and a typical RMS jitter of 4.5pS RMS ( at 100MHz ). It accepts a fundamental parallel resonant mode crystal input from 12MHz to 25MHz.

**PIN CONFIGURATION**  
(Top View)



**BLOCK DIAGRAM**



**PLL602-38N**

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### PIN DESCRIPTIONS

Name	TSSOP Pin number	Type	Description
X1	1	I	Crystal input. See Crystal Specifications on page 2.
X2	2	I	Crystal output. See Crystal Specifications on page 2.
GND	3,4	P	Ground.
CLK	5	O	True output PECL.
VDD	6,8	P	Power Supply.
CLKC	7	O	Complementary output PECL.

### 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
Junction Temperature	$T_J$		125	°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. General Electrical Specifications

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Supply Current, Dynamic (with Loaded Outputs)	$I_{DD}$	48MHz < $F_{out}$ < 100MHz			65	mA
Operating Voltage	$V_{DD}$		2.97		3.63	V
Short Circuit Current				±50		mA

#### 3. Crystal Specifications

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Crystal Resonator Frequency	$F_{XIN}$	Parallel Fundamental Mode	12		25	MHz
Crystal Loading Rating	$C_L$ (xtal)			20		pF
Recommended ESR	$R_E$	AT cut			30	Ω

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### 4. Jitter Specifications

PARAMETERS	CONDITIONS	FREQUENCY	MIN.	TYP.	MAX.	UNITS
Period jitter RMS	With capacitive decoupling between VDD and GND. Over 10,000 cycles.	100.00MHz		4.3		ps
Period jitter Peak-to-Peak	With capacitive decoupling between VDD and GND. Over 10,000 cycles.	100.00MHz		27		ps
Integrated jitter RMS	Integrated 12 kHz to 20 MHz	100.00MHz		2.6	4	ps

### 5. Phase Noise Specifications

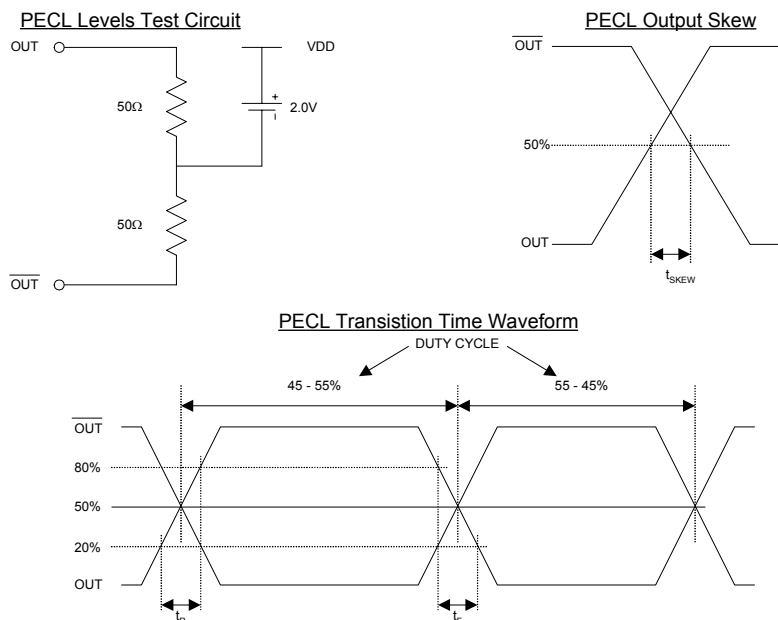
PARAMETERS	FREQUENCY	@10Hz	@100Hz	@1kHz	@10kHz	@100kHz	UNITS
Phase Noise relative to carrier (typical)	100.00MHz	-65	-95	-120	-125	-121	dBc/Hz

### 6. PECL Electrical Characteristics

PARAMETERS	SYMBOL	CONDITIONS	MIN.	MAX.	UNITS
Output High Voltage	$V_{OH}$	$R_L = 50 \Omega$ to $(V_{DD} - 2V)$ (see figure)	$V_{DD} - 1.025$		V
Output Low Voltage	$V_{OL}$			$V_{DD} - 1.620$	V

### 7. PECL Switching Characteristics

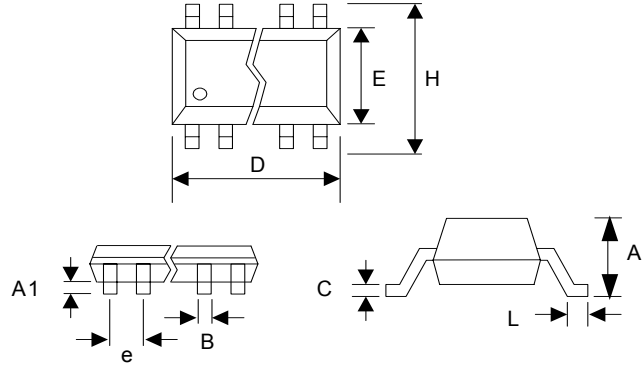
PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Clock Rise Time	$t_r$	20% to 80% of signal	300		600	ps
Clock Fall Time	$t_f$	80% to 20% of signal	300		600	ps
Duty Cycle		Measured @ 50% of signal	45	50	55	%



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**PACKAGE INFORMATION**

8 PIN SOIC (in mm)			
Symbol	Min.	Nom	Max.
A	1.35	1.55	1.75
A1	0.10	.175	0.25
B	0.33	0.43	0.53
C	0.19	0.23	0.27
D	4.80	4.90	5.00
E	3.80	3.90	4.00
H	5.80	6.00	6.20
L	0.40	0.645	0.89
e	1.27 BSC		



**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

**PLL602-38N X C X - R**

PART NUMBER

PACKAGE TYPE  
S=SOIC

TEMPERATURE  
C=COMMERCIAL

NONE= TUBE  
R=TAPE and REEL

NONE=NORMAL PACKAGE  
L=GREEN PACKAGE  
(RoHS Compliant)

Order Number	Marking	Package Option
PLL602-38NSCL-R	P602-38NSC	SOIC 8 - Tape and Reel
PLL602-38NSCL	P602-38NSC	SOIC 8 - Tube

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