Ultra Low Current XO 10 MHz to 52 MHz

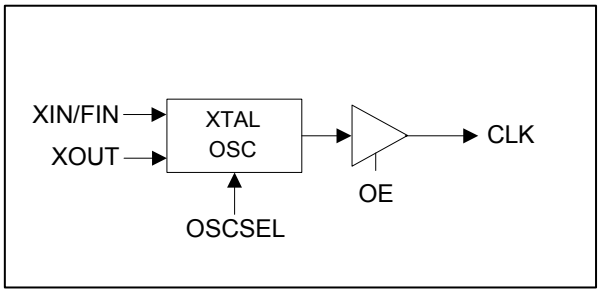
FEATURES

- Low phase noise (-145 dBc @ 10kHz offset).
- CMOS output with OE tri-state control.
- Ultra Low current consumption (<2mA, at 27MHz, 3.3V)
- 10 to 52MHz fundamental or 3rd OT crystal input.
- 12mA drive capability at TTL output.
- Low jitter (RMS): 2.5ps period jitter.
- 1.8V, 2.5V and 3.3V DC operation.
- Available in 8 pin SOIC

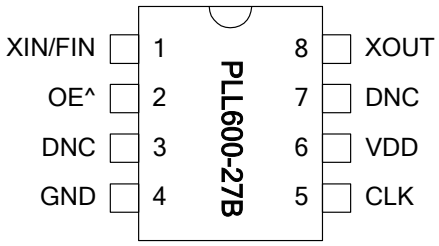
DESCRIPTION

The PLL600-27B form a low cost family of XO IC's, designed to consume the lowest current on the market for the 10MHz to 52MHz range. It accepts fundamental resonant mode crystal input from 10 to 52MHz. Providing less than -145 dBc at 10kHz offset at 30MHz and with a very low jitter (2.5 ps RMS period jitter) makes this chip ideal for applications requiring low current frequency sources.

BLOCK DIAGRAM

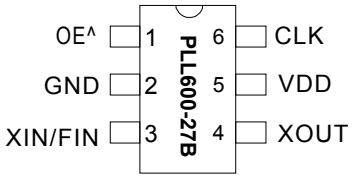


PIN ASSIGNMENT (PACKAGE)



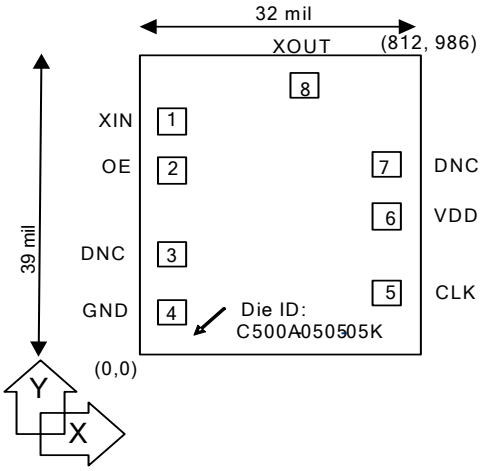
^ : denotes internal pull-up

8-pin SOIC



SOT-23

PAD LAYOUT



OE LOGIC SELECTION TABLE

OE^	OUTPUT
0	Disabled - osc. off
1(default)	Enabled

^ Internal Pull-up, default value is '1' when not connected.

PACKAGE PIN DESCRIPTION

Name	Pin No.		Pad			Type	Description
	SOIC-8	SOT-6	No.	X (μm)	Y (μm)		
XIN/FIN	1	3	1	94.18	768.60	I	Crystal input or reference clock input pin.
OE	2	1	2	94.16	605.03	I	Output Enable input. See Table on page 1.
DNC	3	-	4	94.18	331.76	-	Do Not Connect.
GND	4	2	3	94.19	140.38	P	Ground connection.
CLK	5	6	5	715.31	203.87	O	Output clock.
VDD	6	5	6	715.31	455.73	P	Power supply connection.
DNC	7	-	7	715.47	626.72	-	Do Not Connect.
XOUT	8	4	8	476.91	888.88	O	Crystal output.

OE has internal pull-up resistor, so the default value is '1' when not connected.

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. AC Electrical Specifications

PARAMETERS	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Input Crystal Frequency		10		52	MHz
Settling time	At power-up (Vdd reaches 1.62V)			10	ms
	Disable to enable, osc. Off			10	ms
	Disable to enable, osc. On			500	µs
Output Clock Rise/Fall Time	0.8V ~ 2.0V with 10 pF load		1.15		ns
	0.3V ~ 3.0V with 15 pF load		2.4		
VDD sensitivity	Frequency vs. VDD +/- 10%	0.8		0.8	ppm
Output Clock Duty Cycle	Measured @ 50% V_{DD}	45	50	55	%

3. Jitter and Phase Noise Specifications

PARAMETERS	CONDITIONS	MIN.	TYP.	MAX.	UNITS
RMS Period Jitter (1 sigma – 10,000 samples)	With capacitive decoupling between VDD and GND.		2.1	2.5	ps
Phase Noise relative to carrier	27MHz @100Hz offset		-108		dBc/Hz
Phase Noise relative to carrier	27MHz @1kHz offset		-135		dBc/Hz
Phase Noise relative to carrier	27MHz @10kHz offset		-147		dBc/Hz
Phase Noise relative to carrier	27MHz @100kHz offset		-148		dBc/Hz
Phase Noise relative to carrier	27MHz @1MHz offset		-148		dBc/Hz

4. DC Specification

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Supply Current, Dynamic, with Loaded Outputs (at VDD = 3.3V)	I_{DD}	At 10MHz, Cload=15pF		1.3	1.5	mA
		At 13.5MHz, Cload=15pF		1.5	1.7	
		At 17.7MHz, Cload=15pF		1.7	2.0	
		At 27MHz, Cload=15pF		2.3	2.7	
		At 48MHz, Cload=15pF		4.0	4.6	
Operating Voltage	V_{DD}		1.62		3.63	V
Output High Voltage	V_{OH}	I_{OH} = -12mA (3.3V)	2.4			V
Output Low Voltage	V_{OL}	I_{OL} = 12mA (3.3V)			0.4	V
Output High Voltage at CMOS level	V_{OHC}	I_{OH} = -4mA	V_{DD} – 0.4			V
Output drive current		At TTL level (3.3V)	12	17		mA
Short Circuit Current		(3.3V)		±50		mA

5. Crystal Specifications

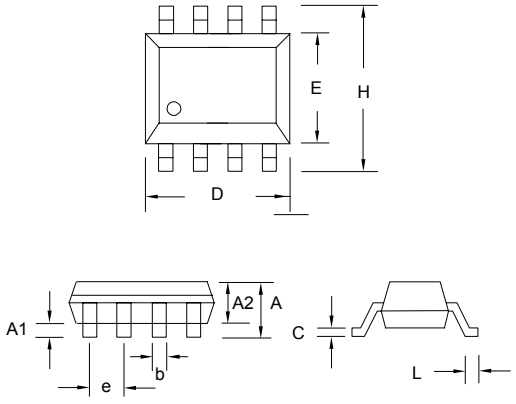
PARAMETERS	SYMBOL	MIN.	TYP.	MAX.	UNITS
Crystal Resonator Frequency	F_{XIN}	10		52	MHz
Crystal Loading Rating	$C_{L\ (xtal)}$		8.5		pF
Maximum Sustainable Drive Level				200	µW
Operating Drive Level			50		µW
C0 (for frequencies below 30MHz)				5	pF
C0 (for frequencies above 30MHz)				4	pF
ESR	R_S			30	Ω

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

PACKAGE INFORMATION

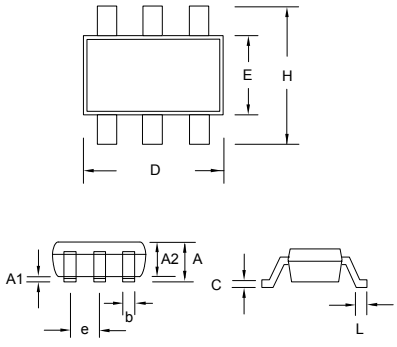
SOIC (8L)

Symbol	Dimension in MM	
	Min.	Max.
A	1.47	1.73
A1	0.1	0.25
A2		
B	0.33	0.51
C		
D	4.8	4.95
E	3.8	4.0
H	6.0 BSC	
L	0.38	1.27
e	1.27 BSC	



SOT-23 (6L)

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	3.00
L	0.35	0.55
e	0.95 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

PLL600-27B X X X-R

PART NUMBER

PACKAGE TYPE
S=SOIC
T= SOT

TEMPERATURE
C=COMMERCIAL
I= INDUSTRIAL

NONE= NORMAL PACKAGE
L= GREEN PACKAGE

NONE= TUBE
R= TAPE AND REEL

Note: PhaseLink Supports GREEN Packaging

Part / Order Number	Marking	Package Option
PLL600-27BSC	P600-27BSC	8-Pin SOIC (Tube)
PLL600-27BSC-R	P600-27BSC	8-Pin SOIC (Tape and Reel)
PLL600-27BSCL	P600-27BSCL	8-Pin SOIC (Tube), GREEN
PLL600-27BSCL-R	P600-27BSCL	8-Pin SOIC (Tape and Reel), GREEN
PLL600-27BTCL-R	P600-27BTC	6-Pin SOT (Tape and Reel)

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