

Low Power 5 Output XO 10MHz to 52MHz

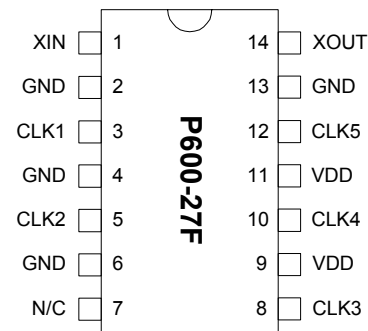
FEATURES

- Generates 5 CMOS outputs.
- 10 to 52MHz fundamental crystal input.
- Low phase noise (-130 dBc @ 10kHz offset).
- Low jitter (RMS): 2.5ps period jitter.
- 12mA drive capability at TTL output.
- 1.62V to 3.63V DC operation.
- Available in 14 pin 150mil SOIC.

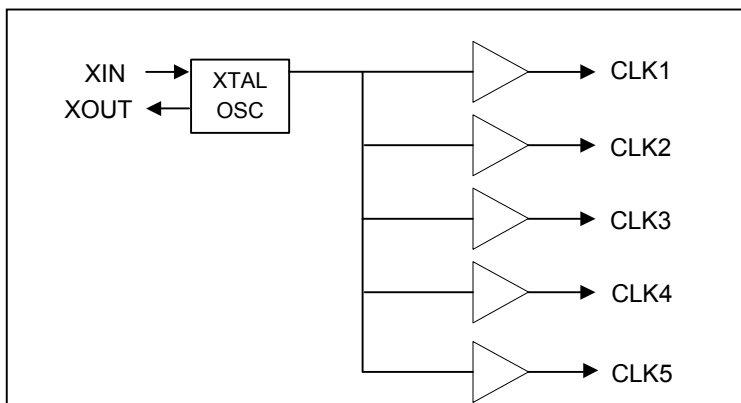
DESCRIPTION

The P600-27F is part of PhaseLink's low cost family of XO IC's, designed to replace multiple XO solutions saving the cost and board space of clock distribution buffers. In addition, it provides among the lowest current on the market for the 10MHz to 52MHz range. It accepts input crystals from 10 to 52MHz (fundamental resonant mode) and provides low phase noise (<-130dBc at 10kHz offset at 30MHz), and very low jitter (2.5 ps RMS period jitter) outputs.

PIN ASSIGNMENT



BLOCK DIAGRAM



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PIN DESCRIPTION

Name	Pin #	Type	Description
XIN	1	I	Crystal Input connector from 10-52MHz.
GND	2,4,6,13	P	Ground pin.
CLK1	3	O	Buffered clock output.
CLK2	5	O	Buffered clock output.
N/C	7	-	No connection.
CLK3	8	O	Buffered clock output.
VDD	9,11	P	VDD power supply pin.
CLK4	10	O	Buffered clock output.
CLK5	12	O	Buffered clock output.
XOUT	14	O	Crystal Output connection.

ELECTRICAL SPECIFICATIONS

1. Absolute Maximum Ratings

PARAMETERS	SYMBOL	MIN.	MAX.	UNITS
Supply Voltage Range	V _{CC}	-0.5	7	V
Input Voltage Range	V _I	-0.5	V _{CC} +0.5	V
Output Voltage Range	V _O	-0.5	V _{CC} +0.5	V
Soldering Temperature			260	°C
Storage Temperature	T _S	-65	150	°C
Ambient Operating Temperature		0	70	°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.

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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
Output Clock Rise/Fall Time	0.8V ~ 2.0V with 10 pF load		1.15		ns
	0.3V ~ 3.0V with 15 pF load		3.7		
VDD sensitivity	Frequency vs. VDD +/- 10%	0.8		0.8	ppm
Output Clock Duty Cycle	Measured @ 1.4V	45	50	55	%
Short Circuit Current			±50		mA

Note: (*) Preliminary Specifications still to be characterized.

3. Jitter and Phase Noise specification

PARAMETERS	CONDITIONS	MIN.	TYP.	MAX.	UNITS
RMS Period Jitter (1 sigma – 1000 samples)	With capacitive decoupling between VDD and GND.		2.1	2.5	ps
Phase Noise relative to carrier	30MHz @100Hz offset		-80		dBc/Hz
Phase Noise relative to carrier	30MHz @1kHz offset		-110		dBc/Hz
Phase Noise relative to carrier	30MHz @10kHz offset		-130		dBc/Hz
Phase Noise relative to carrier	30MHz @100kHz offset		-138		dBc/Hz
Phase Noise relative to carrier	30MHz @1MHz offset		-145		dBc/Hz

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4. DC Specification

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Supply Current, Dynamic, with Loaded Outputs @ 3.3V	I _{DD}	At 27MHz, Cload=10pF (3.3V)		6.0*		mA
Supply Current in tri-state	I _{DD}	Output disabled			520	μA
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 (3.3V)	V _{DD} - 0.4			V
Output drive current		At TTL level (3.3V)	12	17		mA
Short Circuit Current				±50		mA
ESD Protection		Human Body Model	2000			V

* Note: Preliminary I_{DD} values, to be measured.

5. Crystal Specification

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

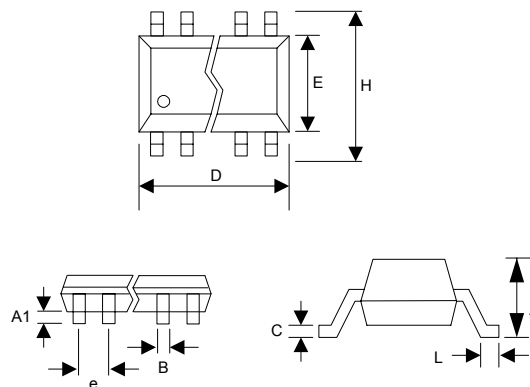
Note: A detailed crystal specification document is also available for this part

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PACKAGE INFORMATION

14 PIN Narrow SOIC (mm)

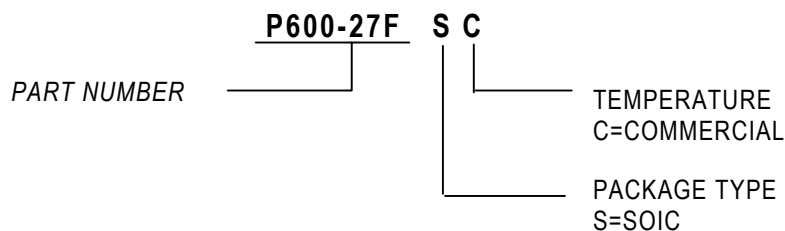
Symbol	SOIC	
	Min.	Max.
A	1.35	1.75
A1	0.10	0.25
B	0.33	0.51
C	0.19	0.25
D	9.80	10.00
E	3.80	4.00
H	5.80	6.20
L	0.40	1.27
e	1.27 BSC	



ORDERING INFORMATION

PART NUMBER

The order number for this device is a combination of the following:
Device number, Package type and Operating temperature range



Order Number	Marking	Package Option
P600-27F SC	P600-27F SC	SOIC - Tube
P600-27F SC-R	P600-27F SC	SOIC - Tape and Reel

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