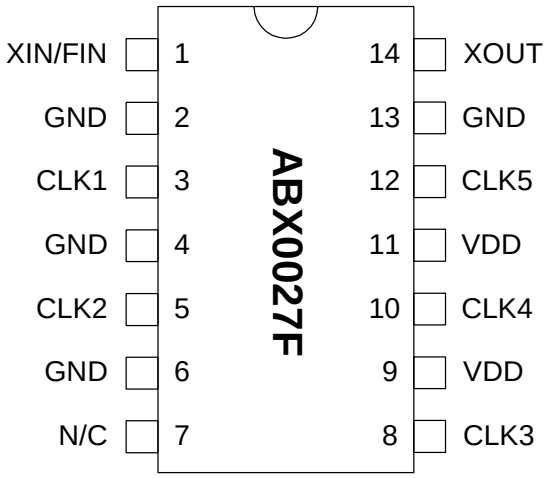
Low Power 5 Output XO 10MHz to 52MHz

FEATURES

- Generates 5 CMOS outputs.
- 10 to 52MHz fundamental or 3rd OT 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.

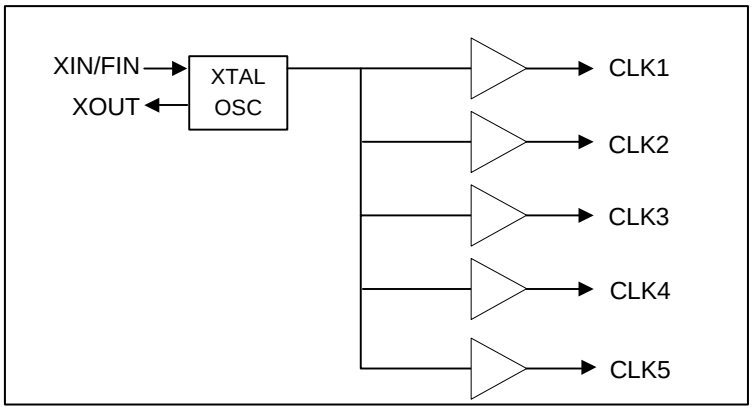
PIN ASSIGNMENT



DESCRIPTION

The ABX0027F is part of Abracon'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.

BLOCK DIAGRAM



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PIN DESCRIPTION

Name	Pin #	Type	Description
XIN	1	I	Crystal Input or Reference Clock input (10MHz to 52MHz).
GND	2,4,6,13	P	Ground.
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	Power supply.
CLK4	10	O	Buffered clock output.
CLK5	12	O	Buffered clock output.
XOUT	14	O	Crystal output.

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
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 @ 1.4V	45	50	55	%
Short Circuit Current			±50		mA

3. Jitter and Phase Noise Specifications

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

4. DC Specifications

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

5. Crystal Specification

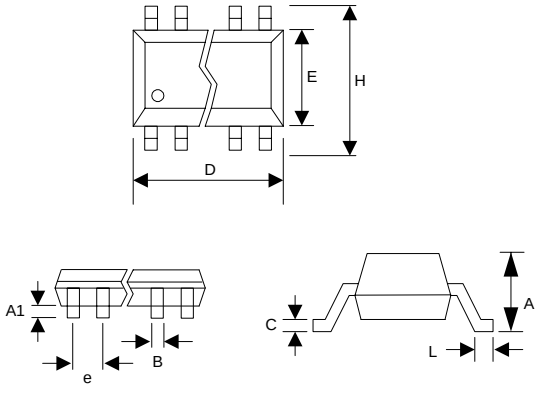
PARAMETERS	SYMBOL	MIN.	TYP.	MAX.	UNITS
Crystal Resonator Frequency	F_{XIN}	10		52	MHz
Crystal Loading Rating	$C_{L\ (xtal)}$		8.5		pF
Maximum Sustainable Drive Level				200	µW
Operating Drive Level			50		µW
C0 (for frequencies below 30MHz)				5	pF
C0 (for frequencies above 30MHz)				4	pF
ESR	R_S			30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

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

PACKAGE INFORMATION

14 PIN Narrow SOIC (mm)

	SOIC	
Symbol	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

For part ordering, please contact our Sales Department:
30332 Esperanza., Rancho Santa Margarita, Ca 92688
Ph: 949-546-8000 Fax: 949-546-8001

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

ABX0027F S C

PART NUMBER

TEMPERATURE
C=COMMERCIAL
I=INDUSTRIAL

PACKAGE TYPE
S=SOIC

Order Number	Marking	Package Option
ABX0027F SC	ABX0027F SC	SOIC - Tube
ABX0027F SC-T	ABX0027F SC	SOIC - Tape and Reel

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