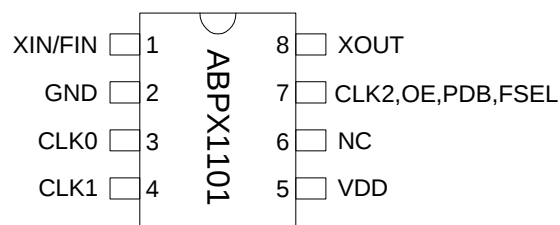


Advanced Programmable Clock

FEATURES

- Advanced programmable PLL design
- Very low Jitter and Phase Noise (30-70ps Pk-Pk typical)
- Up to 3 programmable outputs
- Two registers banks for 2-time programming.
- Output frequency up to 200MHz CMOS.
- Accepts Crystal or reference clock inputs
 - o Fundamental crystal: 10MHz-30MHz
 - o 3RD overtone crystal: Up to 75MHz
 - o Reference input: Up to 200MHz
- Accepts <1.0V reference signal input voltage
- One programmable I/O pin can be configured as Programmable clock, or Frequency Selection input, or output Enable (OE) or Power Down (PDB) input.
- Single 2.5V or 3.3V $\pm$ 10% power supply
- Operating temperature range from -40°C to 85°C
- Available in 8-pin MSOP/SOIC, and 6-pin SOT

PIN CONFIGURATION



**SOP-8
MSOP-8**

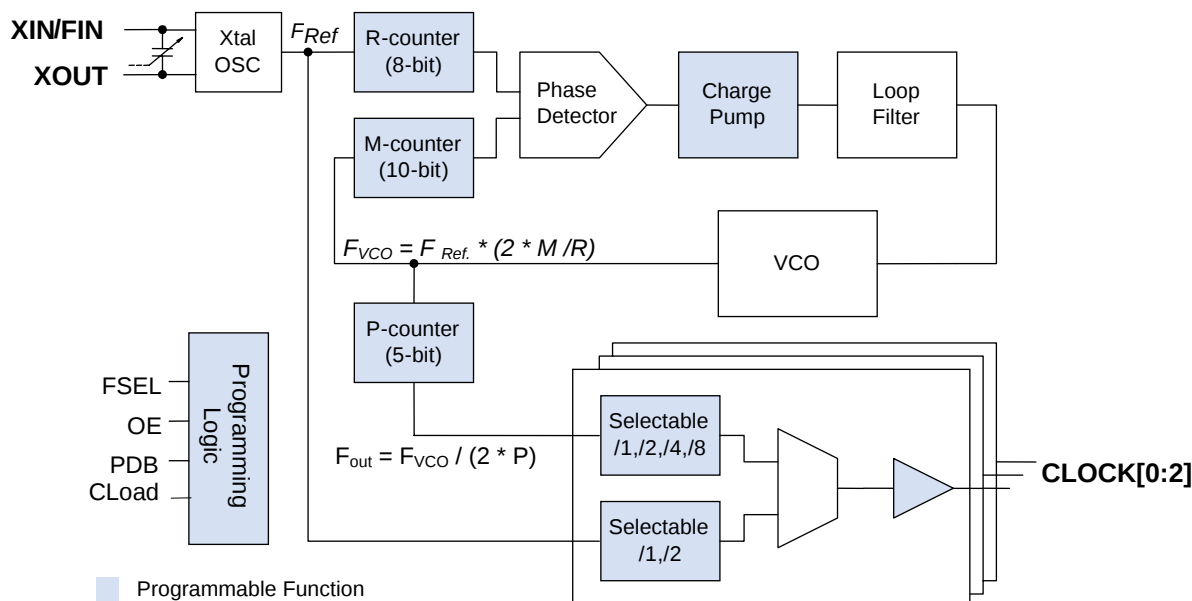


SOT-23

DESCRIPTION

The ABPX1101 is a low-cost general purpose frequency synthesizer and a member of Abracons' Advanced Programmable Clock family. Abracon's ABPX1101 product family offers the versatility of using a single Crystal or Reference Clock input and producing up to three different system clocks. They can generate any output frequency up to 200 MHz from fundamental crystal input between 10 MHz - 30 MHz, or a 3rd overtone crystal of up to 75MHz, or a Reference clock input of up to 200 MHz. Cascading of the ICs to produce additional clock frequencies is also supported.

BLOCK DIAGRAM



Advanced Programmable Clock

KEY PROGRAMMING PARAMETERS

CLK[0:2] Output Frequency	Output Drive Strength	Crystal Load	Programmable Input/Output	# of Register Banks	Charge- Pump Current
$F_{out} = F_{IN} * M / (R * P)$ where M=10 bit R= 8 bit P= 5 bit 1. CLK[0:2]= $F_{out}/[1,2,4,8]$ 2. CLK[0:2]= F_{IN} or $F_{IN}/2$	Std: 10mA (default) High: 24mA	+/- 200ppm tuning.	One output pin can be configured as 1. CLK2 - output 2. FSEL - input 3. OE - input 4. PDB - input	2	4 levels of pump current settings

PIN DESCRIPTION

Name	Pin #		Type	Description												
	MSOP-8 SOIC-8	SOT-23														
XIN/FIN	1	3	I	Crystal or Reference input pin												
GND	2	2	P	GND connection												
CLK[0:1]	3,4	1	O	Programmable Clock Output												
VDD	5	6	P	VDD connection (2.25~3.63V)												
NC	6			No Connect												
CLK2, OE, PDB, FSEL	7	5	B	This programmable I/O pin can be configured as a programmable clock output (CLK2), or Output Enable (OE) input, or Power Down input (PDB), or Frequency Selection (FSEL) input pin. This pin has an internal 60KΩ pull up resistor. <table><tr><th>State</th><th>OE</th><th>PDB</th><th>FSEL</th></tr><tr><td>0</td><td>Tristate CLK[0:1]</td><td>Power Down Mode</td><td>Select Bank '0' ROM</td></tr><tr><td>1 (default)</td><td>Normal mode</td><td>Normal mode</td><td>Select Bank '1' ROM</td></tr></table>	State	OE	PDB	FSEL	0	Tristate CLK[0:1]	Power Down Mode	Select Bank '0' ROM	1 (default)	Normal mode	Normal mode	Select Bank '1' ROM
State	OE	PDB	FSEL													
0	Tristate CLK[0:1]	Power Down Mode	Select Bank '0' ROM													
1 (default)	Normal mode	Normal mode	Select Bank '1' ROM													
XOUT	8	4	O	Crystal output pin												

Advanced Programmable Clock

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
Soldering Temperature (Green package)			260	°C
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.

AC SPECIFICATIONS

PARAMETERS	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Crystal Input Frequency(XIN)	Fundamental Crystal	10		30	MHz
	3 rd Overtone Crystal			75	MHz
Input (FIN) Frequency				200	MHz
Input (FIN) Signal Amplitude	Internally AC coupled	0.9		VDD	Vpp
Settling Time	At power-up (after VDD increases over 1.62V)			10	ms
Output Rise Time	15pF Load, 10/90%VDD, Standard drive		2.5	3.5	ns
	15pF Load, 10/90%VDD, High drive		1.0	1.5	ns
Output Fall Time	15pF Load, 90/10%VDD, Standard drive		2.5	3.5	ns
	15pF Load, 90/10%VDD, High drive		1.0	1.5	ns
Duty Cycle	At VDD/2	45	50	55	%
Max. output skew between same frequency clocks	Equal loading (15 pF). Equal frequency & drive strength			500	ps
Period Jitter, peak-to-peak* (measured from 10,000 samples)	With capacitive decoupling between VDD and GND. Operating only one output.		70		ps

* Note: Jitter performance depends on the programming parameters.

Advanced Programmable Clock

DC SPECIFICATIONS

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Supply Current, Dynamic, with Loaded Outputs	I _{DD}	At 10MHz, load=15pF (PDB=1)			15	mA
		PDB=0			5	μA
Operating Voltage	V _{DD}		2.25		3.63	V
Output Low Voltage	V _{OL}	I _{OL} = +4mA Standard drive			0.4	V
Output High Voltage	V _{OH}	I _{OH} = -4mA Standard drive	V _{DD} - 0.4			V
Output Current, Standard drive	I _{OSD}	V _{OL} = 0.4V, V _{OH} = 2.4V			10.7	mA
Output Current, High drive	I _{OHD}	V _{OL} = 0.4V, V _{OH} = 2.4V			24	mA
Short-circuit Current	I _s			±50		mA

CRYSTAL SPECIFICATIONS

PARAMETERS	SYMBOL	MIN.	TYP.	MAX.	UNITS
Fundamental Crystal Resonator Frequency	F _{XIN}	10		30	MHz
3 rd Overtone Crystal Resonator Frequency	F _{XIN}			75	MHz
Crystal Loading Rating (The IC can be programmed for any value in this range.)	C _{L (xtal)}	5		20	pF
Maximum Sustainable Drive Level				500	μW
Operating Drive Level			100		μW
Crystal Shunt Capacitance	C ₀			6	pF
Effective Series Resistance, Fundamental, 10-30MHz	ESR			30	Ω
Effective Series Resistance, 3 rd Overtone, 30-50MHz [C ₀ < 4pF, C _L =(5pF)/(8pF)]	ESR			100/70	Ω
Effective Series Resistance, 3 rd Overtone, 50-65MHz, [C ₀ < 4pF, C _L =5pF(5pF)/(8pF)]	ESR			60/40	Ω
Effective Series Resistance, 3 rd Overtone, 65-75MHz [C ₀ < 4pF, C _L =(5pF)/(8pF)]	ESR			45/30	Ω

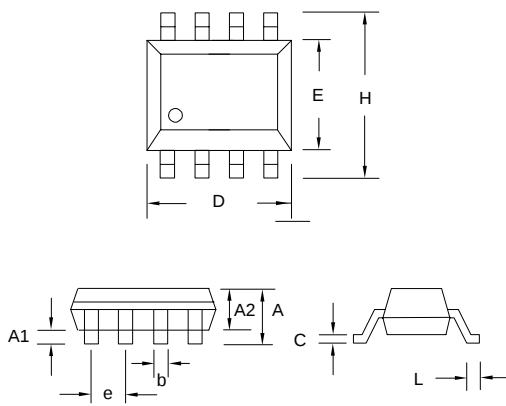
Note: A detailed crystal specification document is also available for this part

Advanced Programmable Clock

PACKAGE DRAWINGS (GREEN PACKAGE COMPLIANT)

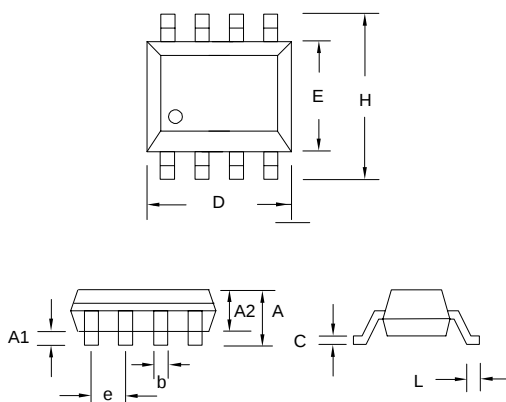
MSOP 8L

Symbol	Dimension in MM	
	Min.	Max.
A	---	1.10
A1	0.05	0.15
A2	0.81	0.91
B	0.25	0.40
C	0.13	0.23
D	2.90	3.10
E	2.90	3.10
H	4.90 BSC	
L	0.445	0.648
e	0.65 BSC	



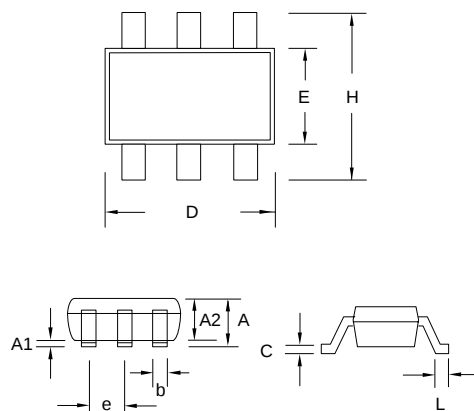
SOIC 8L

Symbol	Dimension in MM	
	Min.	Max.
A	1.35	1.75
A1	0.10	0.25
A2	1.25	1.50
B	0.33	0.53
C	0.19	0.27
D	4.80	5.00
E	3.80	4.00
H	5.80	6.20
L	0.40	0.89
e	1.27 BSC	



SOT-23 6 L

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	3.0
L	0.35	0.55
e	0.95 BSC	



Advanced Programmable Clock

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

ABPX1101-XXX X X-X

PART NUMBER

3 DIGIT ID Code *

PACKAGE TYPE

S=SOIC

M=MSOP

T=SOT

NONE= TUBE
T=TAPE and REEL

TEMPERATURE
C=COMMERCIAL
I = INDUSTRIAL

* Abracon will assign a unique 3-digit ID code for each approved programmed part number.

* Abracon offers Green Package Only for this product family.

Part / Order Number*	Marking	Package Option
ABPX1101-XXXSC	A1XXX	8-Pin SOIC (Tube)
ABPX1101-XXXSC-T	A1XXX	8-Pin SOIC (Tape and Reel)
ABPX1101-XXXMC	A1XXX	8-Pin MSOP (Tube)
ABPX1101-XXXMC-T	A1XXX	8-Pin MSOP (Tape and Reel)
ABPX1101-XXXTC-T	A1XXX	6-Pin SOT-23 (Tape and Reel)

* Ordering will include Programming ID number that will be supplied at the time the samples are provided.

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