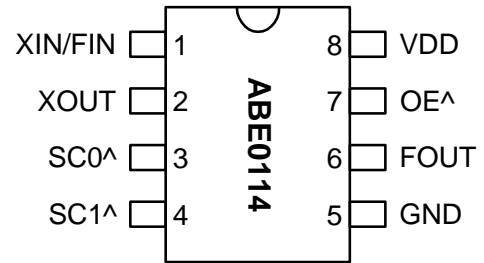


## Low EMI Spread Spectrum 6x Multiplier Clock

### FEATURES

- Spread Spectrum Clock Generator with integrated 6x frequency multiplier.
- Input frequency range: 10MHz to 30MHz
- Output frequency range: 60MHz to 180MHz.
- Accepts input from external clocks or crystal.
- Selectable Center Spread SST modulation amplitude.
- Output Enable feature (OE).
- TTL/CMOS compatible outputs.
- 3.3V Operating Voltage.
- Low short term jitter.
- Available in 8-Pin 150mil SOIC.

### PIN CONFIGURATION



XIN/FIN = 10 ~ 30 MHz

Note: ^: Internal pull-up resistor (30 kΩ).

### DESCRIPTION

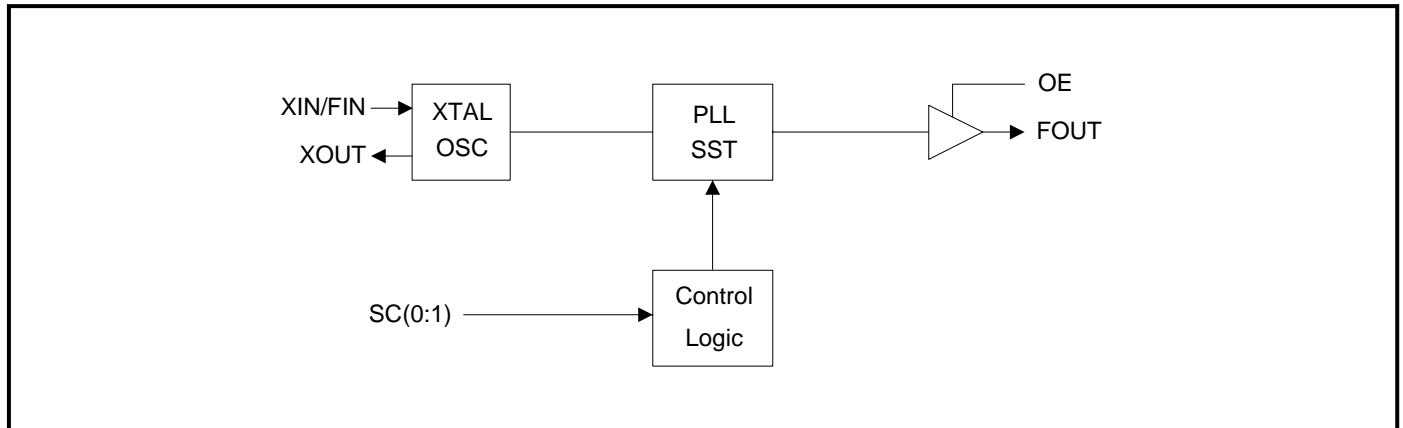
The ABE0114 is a Spread Spectrum Clock Generator designed to reduce EMI in high-speed digital systems. Its spread spectrum modulation amplitude is selectable via the input selector pins. The chip multiplies any input from 10MHz to 30MHz by 6x. The chip provides an output Enable/Disable input permitting the user to tri-state the output.

### SPREAD SPECTRUM SELECTION

SC1	SC0	FOUT	SST Modulation		
			Magnitude	Frequency	Type
0	0	X6	0.250%	Fin / 512	Center
0	1	X6	0.500%		Center
1	0	X6	0.750%		Center
1	1	X6	n/a		SST turned off

## Low EMI Spread Spectrum 6x Multiplier Clock

### BLOCK DIAGRAM



### PIN DESCRIPTION

Name	Number	Type	Description
XIN/FIN	1	I	Crystal input to be connected to fundamental parallel mode crystal. ( $C_L=18\text{pF}$ ) or clock input.
XOUT	2	O	Crystal output.
SC0	3	I	Digital control input to select modulation rate. $30\text{k}\Omega$ internal pull-up.
SC1	4	I	Digital control input to select modulation rate. $30\text{k}\Omega$ internal pull-up.
GND	5	P	Ground connection.
FOUT	6	O	Modulated Clock Frequency Output ( $F_{\text{OUT}} = 6 \times F_{\text{IN}}$ ).
OE	7	I	Output Enable. When low, Tri-states the outputs. $30\text{k}\Omega$ internal pull-up.
VDD	8	P	3.3V Power Supply connection.

### FUNCTIONAL DESCRIPTION

#### Selectable spread spectrum and modulation rates

The ABE0114 provides center spread modulation as well as selectable modulation rate. Selection is made by connecting pins 3 (SC0) and 4 (SC1) to a logical "zero" or "one", according to the Spread Spectrum Selection table on page 1.

#### Connecting a selection pin to a logical "one"

All selection pins have an internal pull-up resistor ( $30\text{k}\Omega$ ). This internal pull-up resistor will pull the input value to a logical "one" by default, i.e. when no connection is made to GND. No external pull-up resistor is therefore required for connecting a logical "one" upon power-up.

#### Connecting a selection pin to a logical "zero"

Pins 3 (SC0), 4 (SC1), and 7 (OE) simply need to be grounded to pull the input down to a logical "zero".

## Low EMI Spread Spectrum 6x Multiplier Clock

### 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. DC/AC Specifications

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Supply Voltage	$V_{DD}$		2.97		3.63	V
Input High Voltage	$V_{IH}$		$0.7 \cdot V_{DD}$			V
Input Low Voltage	$V_{IL}$				$0.3 \cdot V_{DD}$	V
Input High Current	$I_{IH}$				100	μA
Input Low Current	$I_{IL}$				100	μA
Output High Voltage	$V_{OH}$	$I_{OH}=5mA, V_{DD}=3.3V$	2.4			V
Output Low Voltage	$V_{OL}$	$I_{OL}=6mA, V_{DD}=3.3V$			0.4	V
Input Frequency	$F_{XIN}$	When using a crystal	10		30	MHz
	$F_{IN}$	When using reference clock	10		30	MHz
Maximum interruption of $F_{IN}$		When using reference clock			100	μs
Load Capacitance	$C_L$	Between XIN and XOUT*		18		pF
Short Circuit Current	$I_{sc}$			50		mA
3.3V Dynamic Supply Current	$I_{CC}$	No Load		20		mA

\*Note: Pin XIN and XOUT each has a 36pF capacitance. When used with a XTAL, the two capacitors combined load the crystal with 18pF. If driving XIN with a reference clock signal, the load capacitance will be 36pF (typical).

**Low EMI Spread Spectrum 6x Multiplier Clock****3. TIMING CHARACTERISTICS**

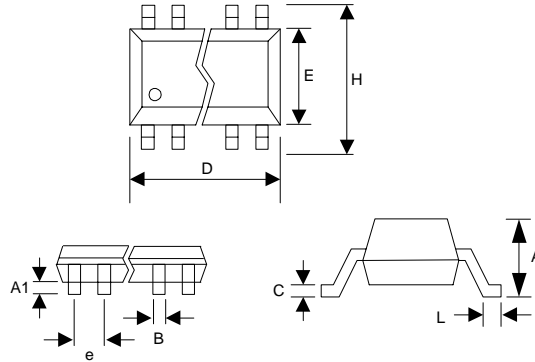
PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Rise Time	$T_r$	Measured at 0.8V ~ 2.0V @ 3.3V	0.8	0.95	1.1	ns
Fall Time	$T_f$	Measured at 2.0V ~ 0.8V @ 3.3V	0.78	0.85	0.9	ns
Output Duty Cycle	$D_T$		45	50	55	%
Cycle to Cycle Jitter	$T_{cyc-cyc}$	FOUT=72MHz @ 3.3V			100	ps

## Low EMI Spread Spectrum 6x Multiplier Clock

### PACKAGE INFORMATION

8 PIN Narrow SOIC ( mm )

Symbol	SOIC	
	Min.	Max.
A	1.47	1.73
A1	0.10	0.25
B	0.33	0.51
C	0.19	0.25
D	4.80	4.95
E	3.80	4.00
H	5.80	6.20
L	0.38	1.27
e	1.27 BSC	

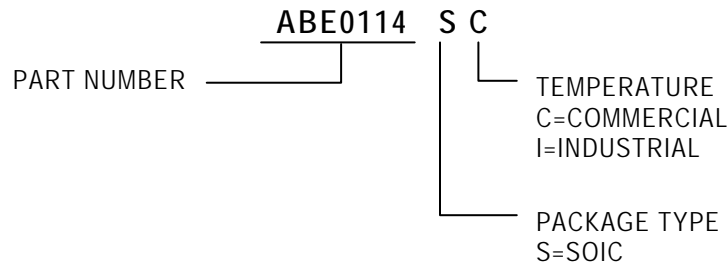


### ORDERING INFORMATION

*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



Order Number	Marking	Package Option
ABE0114SC-T	ABE0114SC	SOIC -Tape and Reel
ABE0114SC	ABE0114SC	SOIC -Tube

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