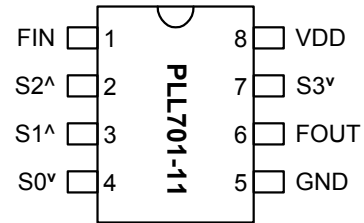


**Low EMI Spread Spectrum Multiplier Clock**

**FEATURES**

- Spread Spectrum Clock Generator with selectable multiplier ( 1x, 2x and 4x ).
- Reference input frequency: 24MHz-120MHz.
- Output frequency range: 24MHz to 240MHz.
- Selectable center spread modulation rate.
- TTL/CMOS compatible outputs.
- 3.3V Operating Voltage.
- Low short term jitter.
- Available in 8-Pin 150mil SOIC package.

**PIN CONFIGURATION**



FIN = 24 ~ 120 Mhz

Note: v: 30kΩ Internal Pull down. ^: 30kΩ Internal Pull up.

**DESCRIPTION**

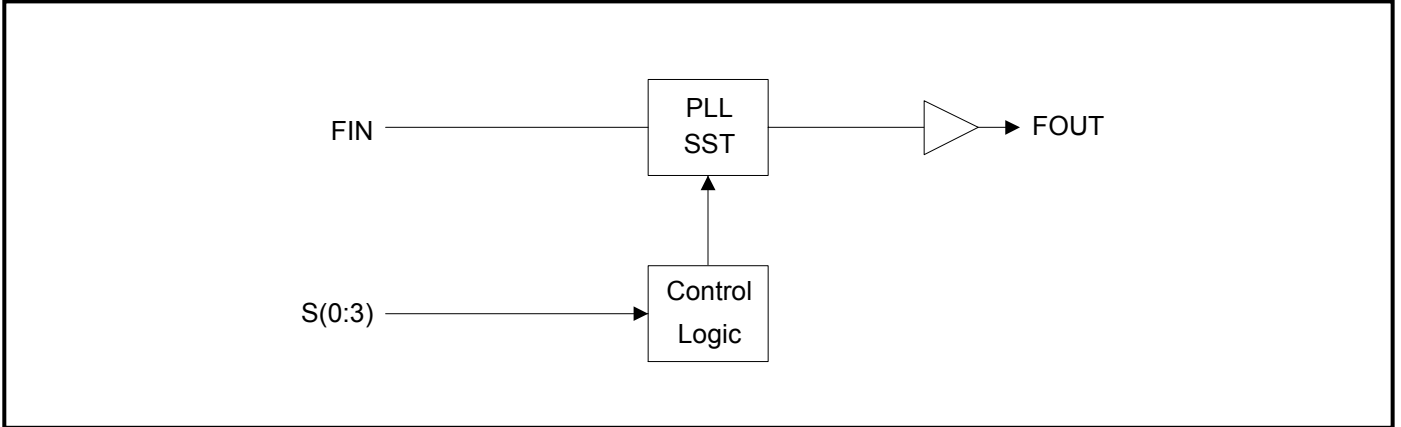
The PLL701-11 is a Spread Spectrum Clock Generator designed for the purpose of reducing EMI in high-speed digital systems, with the selectable Center Spread modulation amplitude (see table below). The output frequency is selected by programming 4 multiplier modes. The device operates over a very wide range of input frequencies and provides 1x to 4x modulated clock outputs.

**OUTPUT CLOCK (FOUT) SELECTION**

S3	S2	S1	S0	FIN Range (MHz)	FOUT	Spread Spectrum Modulation	
						Frequency	Magnitude
0	0	0	0	24 - 60	X1	Fin / 1024	±0.75%
0	0	0	1	24 - 60	X1		±1.00%
0	0	1	0	24 - 60	X1		±1.25%
0	0	1	1	24 - 60	X1		±1.50%
0	1	0	0	24 - 60	X2		±0.25%
0	1	0	1	24 - 60	X2		±0.50%
0	1	1	0	24 - 60	X2		±0.75%
0	1	1	1	24 - 60	X2		±1.00%
1	0	0	0	24 - 60	X2		±1.25%
1	0	0	1	24 - 60	X2		±1.50%
1	0	1	0	24 - 60	X4		±0.25%
1	0	1	1	24 - 60	X4		±0.50%
1	1	0	0	60 - 120	X1		±0.25%
1	1	0	1	60 - 120	X1		±0.50%
1	1	1	0	60 - 120	X1		±0.75%
1	1	1	1	60 - 120	X1		±1.00%

**Low EMI Spread Spectrum Multiplier Clock**

**BLOCK DIAGRAM**



**PIN DESCRIPTIONS**

Name	Number	Type	Description
FIN	1	I	Input Clock Frequency, 24MHz to 120MHz.
S2	2	I	Digital control input to select multiplication factor and SST modulation amplitude. Has internal pull-up.
S1	3	I	Digital control input to select multiplication factor and SST modulation amplitude. Has internal pull-up.
S0	4	I	Digital control input to select multiplication factor and SST modulation amplitude. Has internal pull-down.
GND	5	P	Ground.
FOUT	6	O	SST Modulated Clock Frequency Output. The frequency before modulation is synthesized by multiplying the input frequency by 1X, 2X, or 4X, depending on S(0:3).
S3	7	I	Digital control input to select multiplication factor and SST modulation amplitude. Has internal pull-down.
VDD	8	P	3.3V Power Supply.

## Low EMI Spread Spectrum 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	$V_{IH}$		$0.7* V_{DD}$			V
Input Low Voltage	$V_{IL}$				$0.3* V_{DD}$	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			
Output Low Voltage	$V_{OL}$	$I_{OL}=6mA, V_{DD}=3.3V$			0.4	
Input Frequency	$F_{IN}$		24		120	MHz
Maximum interruption of $F_{IN}$					none	μs
Input Capacitance	$C_{in1}$			4		pF
Pull-up Resistor	$R_{pu}$	PIN 2, 3		30		kΩ
Pull-down Resistor	$R_{pd}$	PIN 4, 7		30		kΩ
Short Circuit Current	$I_{sc}$			50		mA
3.3V Dynamic Supply Current	$I_{CC}$	No Load		20		mA

## Low EMI Spread Spectrum 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	%
Input to Output Delay			2		4	ns
Cycle to Cycle Jitter	$T_{cyc-cyc}$	Over output frequency range @ 3.3V			100	ps

### FUNCTIONAL DESCRIPTION

#### Selectable spread spectrum and modulation rates

The PLL701-11 provides selectable spread spectrum modulation, as well as selectable modulation rate. Selection is made by connecting specific pins to a logical “zero” or “one”, according to the output clock selection table and modulation rate selection table on page 1.

Pins 2 (S2), 3 (S1), 4 (S0), and 7 (S3) are used as inputs to select the spread spectrum modulation and multiplication factor as shown on the output clock selection table (page 1).

#### Default values for S(0:3) through internal pull-up and pull-down resistor

Selection pins S0 and S3 have an internal pull-down resistor of 30k $\Omega$ , pins 2 and 3 (S1 and S2) have an internal pull-up resistor of 30k $\Omega$ . This internal pull-up (or pull-down) resistor will pull the input value to a logical “one” (or “zero” respectively) by default, i.e. when no resistive load is connected between the pin and GND (VDD respectively). In order to override the internal pull-up (pull-down), the pin has to be connected to GND (VDD respectively).

**Low EMI Spread Spectrum 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:**  
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

**PLL701-11 X X X-R**

PART NUMBER \_\_\_\_\_

PACKAGE TYPE \_\_\_\_\_

S=SOIC

NONE= TUBE  
R= TAPE AND REEL

NONE= NORMAL PACKAGE  
L= GREEN PACKAGE

TEMPERATURE  
C=COMMERCIAL  
I=INDUSTRIAL

Order Number	Marking	Package Option
PLL701-11SC	P701-11SC	SOIC-Tube
PLL701-11SC-R	P701-11SC	SOIC-Tape and Reel
PLL701-11SCL	P701-11SCL	SOIC-Tube (GREEN)
PLL701-11SCL-R	P701-11SCL	SOIC-Tape and Reel (GREEN)

PhaseLink Corporation, reserves the right to make changes in its products or specifications, or both at any time without notice. The information furnished by Phaselink is believed to be accurate and reliable. However, PhaseLink makes no guarantee or warranty concerning the accuracy of said information and shall not be responsible for any loss or damage of whatever nature resulting from the use of, or reliance upon this product.

**LIFE SUPPORT POLICY:** PhaseLink's products are not authorized for use as critical components in life support devices or systems without the express written approval of the President of PhaseLink Corporation.