

## Low EMI Spread Spectrum Multiplier Clock

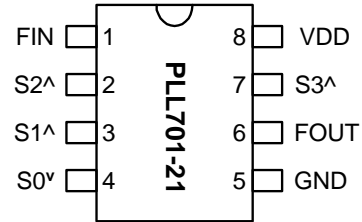
### FEATURES

- Spread Spectrum Clock Generator with selectable SST mode.
- Output frequency ranges: 24MHz to 200MHz.
- Selectable Center Spread Modulation.
- TTL/CMOS compatible outputs.
- 3.3V Operating Voltage.
- Low short-term jitter.
- Available in 8-Pin 150mil SOIC GREEN/RoHS compliant packaging.

### DESCRIPTION

The PLL701-21 is a Spread Spectrum Clock Generator designed for the purpose of reducing EMI in high-speed digital systems, with selectable Center Spread modulation magnitude (see table below). The device operates over a very wide range of input frequencies and provides a 1x modulated clock output.

### PIN CONFIGURATION



FIN = 24 ~ 200 Mhz

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

### SST BY-PASS SELECTOR

S3	Spread Spectrum Mode
0	OFF
1	ON (See below) Default

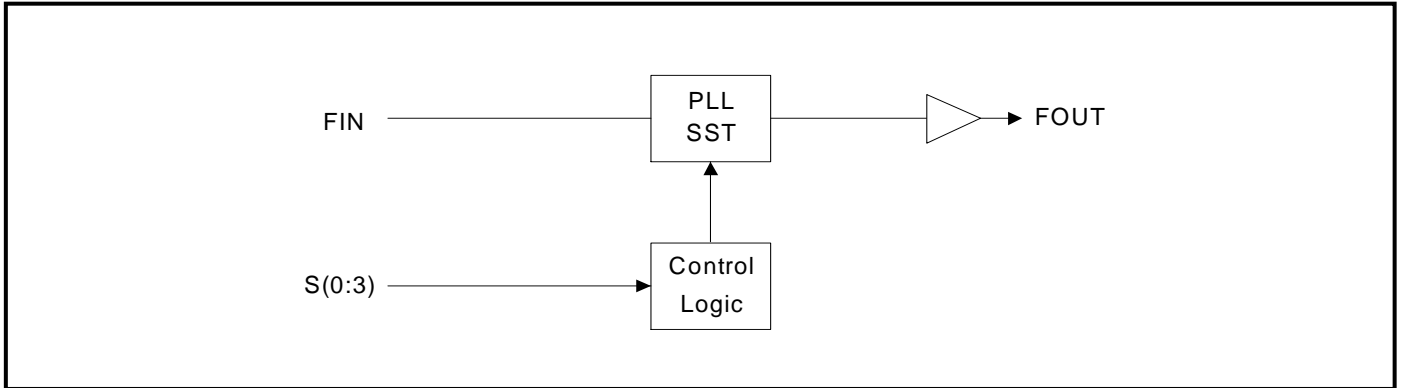
**Note:** S3 has an internal Pull Up. Default="1"

### MODULATION MAGNITUDE SELECTION

S2	S1	S0	FIN Range (MHz)	FOUT	Spread Spectrum Modulation	
					Frequency	Magnitude
0	0	0	24 - 200	X1	Fin / 1024	±0.75%
0	0	1	24 - 200	X1		±1.00%
0	1	0	24 - 200	X1		±1.25%
0	1	1	24 - 200	X1		±0.125%
1	0	0	24 - 200	X1		±0.25%
1	0	1	24 - 200	X1		±0.50%
1	1	0	24 - 200	X1		±0.375%
1	1	1	24 - 200	X1		±0.625%

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**BLOCK DIAGRAM**



**PIN DESCRIPTIONS**

Name	Number	Type	Description
FIN	1	I	Input Clock Frequency. 24MHz to 200MHz.
S2	2	I	Digital control input for SST modulation magnitude selection. Has internal pull-up.
S1	3	I	Digital control input for SST modulation magnitude selection. Has internal pull-up.
S0	4	I	Digital control input for SST modulation magnitude selection. Has internal pull-down.
GND	5	P	Ground.
FOUT	6	O	SST Modulated Clock Frequency Output.
S3	7	I	SST By-Pass Selector. S3 has internal pull-up. Default = "1"
VDD	8	P	3.3V Power Supply.

**ELECTRICAL SPECIFICATIONS**

**1. Absolute Maximum Ratings**

PARAMETERS	SYMBOL	MIN.	MAX.	UNITS
Supply Voltage	V <sub>DD</sub>		4.6	V
Input Voltage, dc	V <sub>I</sub>	-0.5	V <sub>DD</sub> +0.5	V
Output Voltage, dc	V <sub>O</sub>	-0.5	V <sub>DD</sub> +0.5	V
Storage Temperature	T <sub>S</sub>	-65	150	°C
Ambient Operating Temperature*	T <sub>A</sub>	-40	85	°C
Junction Temperature	T <sub>J</sub>		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.

## Low EMI Spread Spectrum Multiplier Clock

### 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	$\mu A$
Input Low Current	$I_{IL}$				100	$\mu A$
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	$F_{IN}$		24		200	MHz
Maximum interruption of $F_{IN}$					100	$\mu s$
Input Capacitance	$C_{in1}$			4		pF
Pull-up Resistor	$R_{pu}$	PIN 2, 3, 7		30		$k\Omega$
Pull-down Resistor	$R_{pd}$	PIN 4		30		$k\Omega$
Short Circuit Current	$I_{sc}$			50		mA
3.3V Dynamic Supply Current	$I_{CC}$	No Load		20		mA

### 3. TIMING CHARACTERISTICS

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Rise Time	$T_r$	Measured at 0.8V ~ 2.0V @ 3.3V, 15pF Load	0.8	0.95	1.1	ns
Fall Time	$T_f$	Measured at 2.0V ~ 0.8V @ 3.3V, 15pF Load	0.78	0.85	0.9	ns
Output Duty Cycle	$D_T$		45	50	55	%
Cycle to Cycle Jitter	$T_{cyc-cyc}$	Over output frequency range @ 3.3V			100	ps

## FUNCTIONAL DESCRIPTION

### Selectable spread spectrum and modulation rates

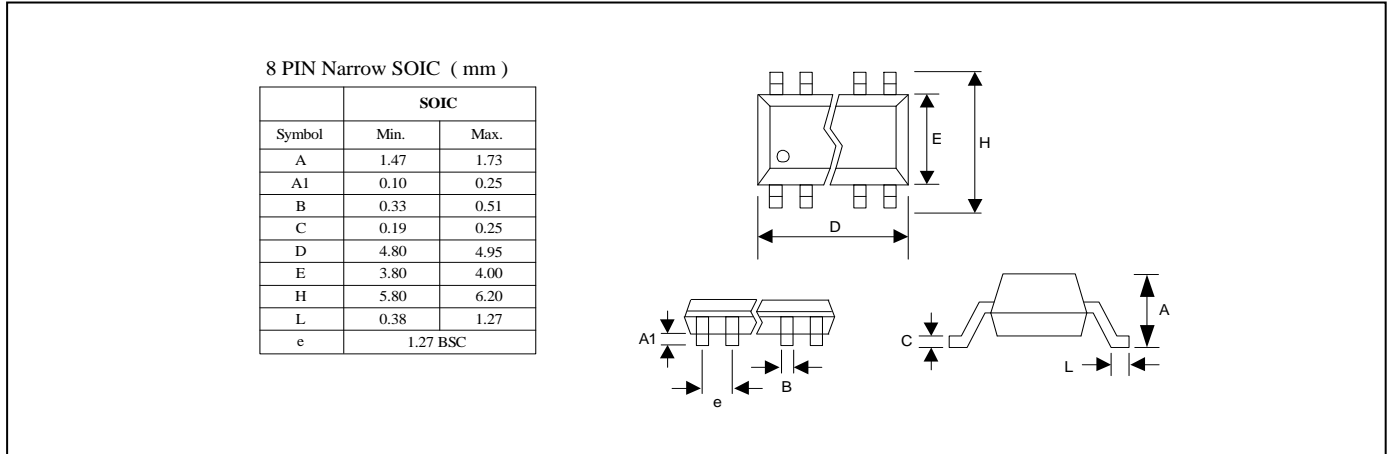
The PLL701-21 provides Center Spread modulation, as well as a selectable modulation magnitude. Selection is made by connecting pins 2 (S2), 3 (S1) and 4 (S0) to a logical “zero” or “one”, according to the modulation magnitude selection table on page 1.

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

Selection pin 4 (S0) has an internal pull-down resistor of 30k $\Omega$  while pins 2, 3 and 7 (S2, S1 and S3) have an internal pull-up resistor of 30k $\Omega$ . This internal pull-down (or pull-up) resistor will pull the input value to a logical “zero” (or “one” respectively) by default, i.e. when no connection is made between the pin and VDD (GND respectively). In order to override the internal pull-down (pull-up), the pin has to be connected to VDD (GND respectively).

**Low EMI Spread Spectrum Multiplier Clock**

**PACKAGE INFORMATION (GREEN PACKAGE COMPLIANT)**



**ORDERING INFORMATION (GREEN PACKAGE COMPLIANT)**

**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

**PLL701-21 S C- L**

PART NUMBER

PB free

PACKAGE TYPE  
S=SOIC

TEMPERATURE  
C=COMMERCIAL  
I=INDUSTRIAL

<u>Order Number</u>	<u>Marking</u>	<u>Package Option</u>
PLL701-21SC-LR	P701-21SCL	SOIC -Tape and Reel
PLL701-21SC-L	P701-21SCL	SOIC -Tube

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