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Spread Spectrum EMI Reduction IC for HD Display

Features

- Clock Generator for Display Systems
- Wide Operating Frequency Range covering most of the pixel frequencies
- Generates a low EMI 1x Output
- Frequency range: 25MHz - 120MHz
- 4 Frequency Deviation selection options: $\pm 1.50\%$, $\pm 1.25\%$, $\pm 0.75\%$, $\pm 1.00\%$
- Supply voltage : $3.3V \pm 0.3V$
 $2.5V \pm 0.125V$
- ModRate 85KHz @ 72MHz
- 6L-TSOT23 (6L-TSOT26) package
- These devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

Product Description

PCS3P6200A is a versatile spread spectrum modulator designed specifically for a wide range of clock frequencies. The device addresses the need of a low EMI

clock generator for use in display systems covering wide choice of pixel frequencies.

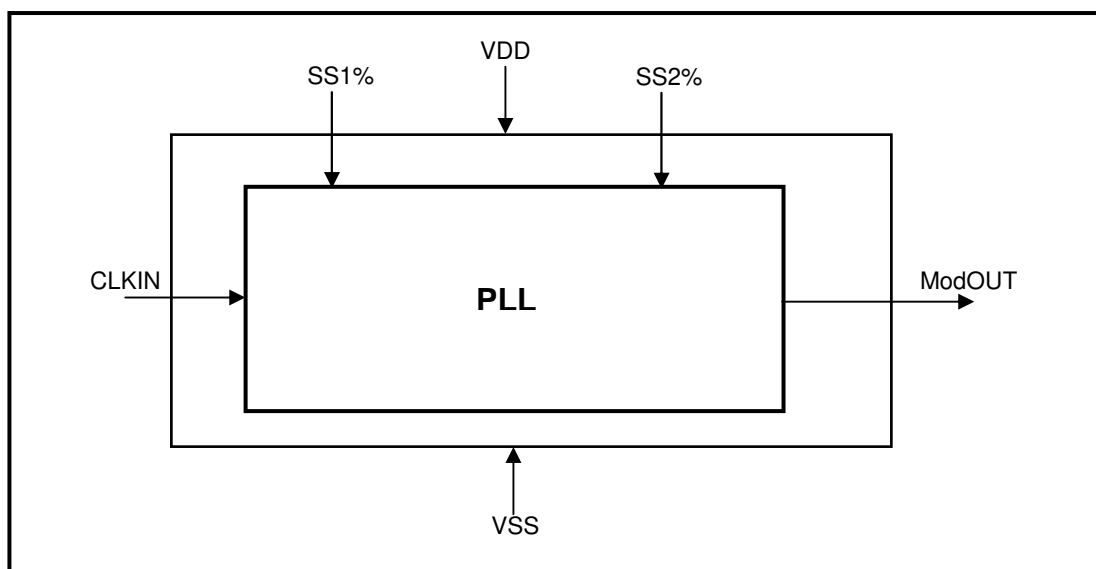
PCS3P6200A reduces electromagnetic interference (EMI) at the clock source, allowing system wide reduction of EMI of all clock dependent signals. PCS3P6200A allows significant system cost savings by reducing the number of circuit board layers, ferrite beads, shielding that are traditionally required to pass EMI regulations.

The Supply Voltage of the Device is 3.3V/2.5V. It has two Spread Selection Pins, SS1% and SS2% to select among the four possible deviation options. The Frequency Deviation across the Frequency range remains within $\pm 10\%$ of the selected deviation. Refer to *the Frequency Deviation Selection Table for details*. The Device is available in a 6L-TSOT23 Package.

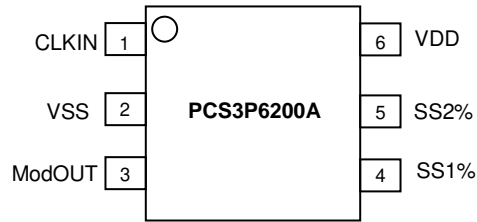
Application

PCS3P6200A is targeted for use in a broad range of applications including Liquid Crystal and Plasma Displays.

Block Diagram



Pin Configuration (6L- TSOT23 Package)



Pin Description

Pin#	Pin Name	Type	Description
1	CLKIN	I	External Reference Clock Input.
2	VSS	P	Ground to entire chip.
3	ModOUT	O	Modulated Frequency Output.
4	SS1%	I	Frequency Deviation Selection. Refer to <i>Frequency Deviation Selection Table</i> for details. Has an Internal pull-up resistor.
5	SS2%	I	Frequency Deviation Selection. Refer to <i>Frequency Deviation Selection Table</i> for details. Has an Internal pull-up resistor.
6	VDD	P	Power to entire chip.

Frequency Deviation Selection Table

SS2%	SS1%	Frequency Deviation
L	L	± 1.50%
L	H	± 1.25%
H	L	± 0.75%
H	H	± 1.00%

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
V_{DD}, V_{IN}	Voltage on any pin with respect to Ground	-0.5 to +4.6	V
T_{STG}	Storage temperature	-65 to +125	°C
T_s	Max. Soldering Temperature (10 sec)	260	°C
T_J	Junction Temperature	150	°C
T_{DV}	Static Discharge Voltage (As per JEDEC STD22- A114-B)	2	KV

Note: These are stress ratings only and are not implied for functional use. Exposure to absolute maximum ratings for prolonged periods of time may affect device reliability.

Operating Conditions for 2.5V and 3.3V Supply Voltage

Parameter	Description	Min	Max	Unit
$V_{DD(2.5)}$	Supply Voltage	2.375	2.625	V
$V_{DD(3.3)}$		3.0	3.6	
T_A	Operating Temperature	-40	+85	°C
C_L	Load Capacitance		15	pF

DC Electrical Characteristics for 2.5V Supply

Symbol	Parameter	Min	Typ	Max	Unit
V_{IL}	Input low voltage	$V_{SS} - 0.3$		0.7	V
V_{IH}	Input high voltage	1.7		$V_{DD} + 0.3$	V
I_{IL}	Input low current			-35	μA
I_{IH}	Input high current			35	μA
V_{OL}	Output low voltage ($V_{DD} = 2.5V, I_{OL} = 8\text{ mA}$)			0.6	V
V_{OH}	Output high voltage ($V_{DD} = 2.5V, I_{OH} = -8\text{ mA}$)	1.8			V
I_{DD}	Static supply current ¹			4	mA
I_{CC}	Dynamic supply current, Unloaded Output		9	11	mA
V_{DD}	Operating voltage	2.375	2.5	2.625	V
t_{ON}	Power-up time (first locked cycle after power-up)			3	mS
C_{IN}	Input Capacitance		5		pF
Z_{OUT}	Output Impedance		40		Ω

Note: 1. CLKIN pin is pulled low.

AC Electrical Characteristics for 2.5V Supply

Symbol	Parameter	Min	Typ	Max	Unit
CLKIN	Input frequency	25		120	MHz
ModOUT	Output frequency	25		120	MHz
t_{LH}^1	Output rise time (measured from 0.7V to 1.7V)		2	2.7	nS
t_{HL}^1	Output fall time (measured from 1.7V to 0.7V)		1	1.5	nS
t_{JC}	Jitter (Cycle-to-cycle)		±250	±300	pS
t_D	Output duty cycle	40	50	60	%

Note: 1. t_{LH} and t_{HL} are measured into a capacitive load of 15pF.

DC Electrical Characteristics for 3.3V Supply

Symbol	Parameter	Min	Typ	Max	Unit
V_{IL}	Input low voltage	VSS - 0.3		0.8	V
V_{IH}	Input high voltage	2.0		VDD + 0.3	V
I_{IL}	Input low current			-35	μA
I_{IH}	Input high current			35	μA
V_{OL}	Output low voltage (VDD = 3.3V, I_{OL} = 8 mA)			0.4	V
V_{OH}	Output high voltage (VDD = 3.3V, I_{OH} = -8 mA)	2.5			V
I_{DD}	Static supply current ¹			4.5	mA
I_{CC}	Dynamic supply current, Unloaded Output		11	14	mA
V_{DD}	Operating voltage	3.0	3.3	3.6	V
t_{ON}	Power-up time (first locked cycle after power-up)			3	mS
C_{IN}	Input Capacitance		5		pF
Z_{OUT}	Output Impedance		35		Ω

Note: 1. CLKIN pin is pulled low.

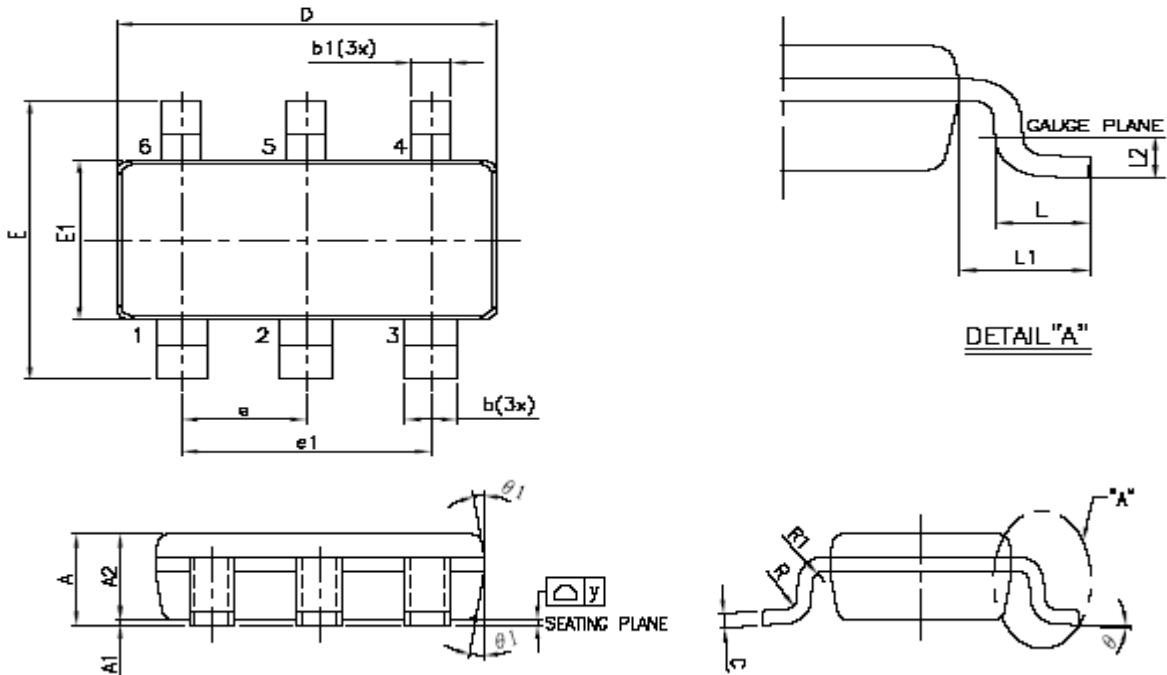
AC Electrical Characteristics for 3.3V Supply

Symbol	Parameter	Min	Typ	Max	Unit
CLKIN	Input frequency	25		120	MHz
ModOUT	Output frequency	25		120	MHz
t_{LH}^1	Output rise time (measured from 0.8 to 2.0V)		1.3	2	nS
t_{HL}^1	Output fall time (measured at 2.0V to 0.8V)		0.9	1.3	nS
t_{JC}	Jitter (Cycle-to-cycle)		±225	±300	pS
t_D	Output duty cycle	45	50	55	%

Note: 1. t_{LH} and t_{HL} are measured into a capacitive load of 15pF.

Note: All parameters are at an Extended Industrial temperature range unless otherwise stated.

Package Information (6L -TSOT26)



Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.0295	0.035	0.75	0.90
A1	0.00	0.0039	0.00	0.10
A2	0.0275	0.0314	0.70	0.80
b	0.0157	0.0197	0.40	0.50
b1	0.0118	0.0157	0.30	0.40
c	0.0031	0.0078	0.08	0.20
D	0.1141		2.90 REF	
E	0.1023	0.1181	2.60	3.00
E1	0.0590	0.0069	1.50	1.70
e	0.0374		0.95 BSC	
e1	0.0748		1.90 BSC	
L	0.0118	0.0236	0.30	0.60
L1	0.0236 REF		0.60 REF	
L2	0.0098 BSC		0.25 BSC	
R	0.0039	0.10
R1	0.0039	0.0098	0.10	0.25
θ	0°	8°	0°	8°
y	0.0039	0.10

Ordering Code


Part Number	Marking	Package Type	Temperature
PCS3I6200AG-06JR	AC2	6L-TSOT23 (6L-TSOT26), TAPE & REEL, Green	-40°C to +85°C
PCS3H6200AG-06JR*	AC5	6L-TSOT23 (6L-TSOT26), TAPE & REEL, Green	-40°C to +85°C

A "microdot" placed at the end of last row of marking or just below the last row toward the center of package indicates Pb-free.

* indicates HVS tested Devices

Licensed under U.S Patent #5,488,627 and #5,631,921

Note: This product utilizes US Patent #6,646,463 Impedance Emulator Patent issued to PulseCore Semiconductor, dated 11-11-2003.
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