



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
- 6 Pin TSOT-26 package
- Commercial, Industrial and Extended Industrial temperature range

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.

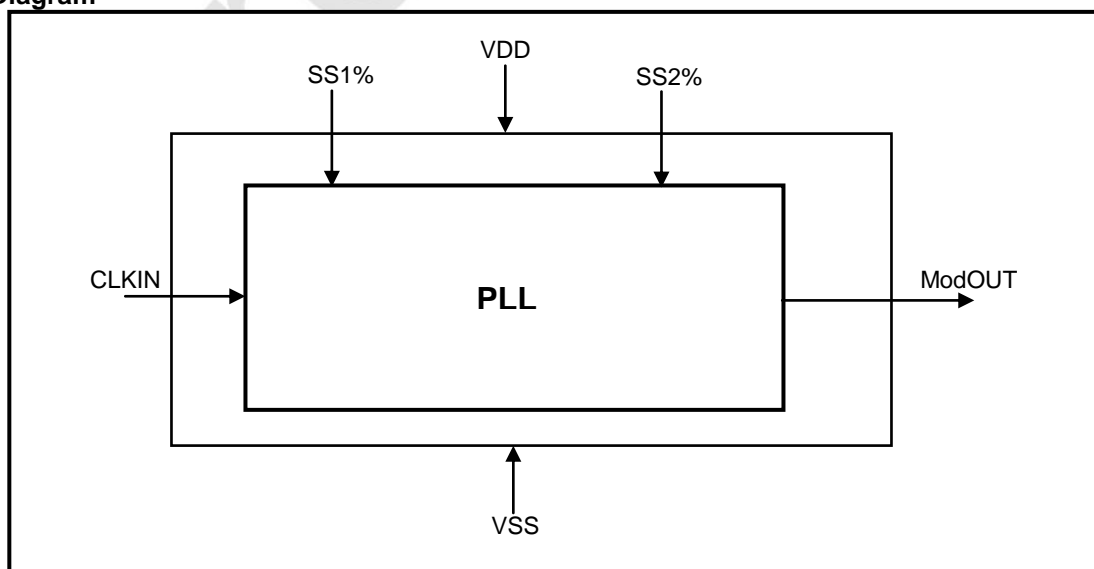
PCS3P6200A reduces electromagnetic interference (EMI) at the clock source, allowing system wide reduction of EMI of all clock dependent signals. PCS3P6200A allows significant system cost savings by reducing the number of circuit board layers, ferrite beads, shielding that are traditionally required to 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 6 Pin TSOT-26 Package, over Commercial, Industrial and Extended Industrial temperature range.

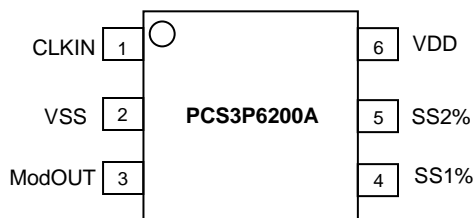
Application

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

Block Diagram



Pin Configuration (6L TSOT- 26 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 | $\pm 1.50\%$ |
| L | H | $\pm 1.25\%$ |
| H | L | $\pm 0.75\%$ |
| H | H | $\pm 1.00\%$ |

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 | Commercial | 0 | °C |
| | | Industrial | -40 | |
| | | Extended Industrial | -40 | |
| 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.

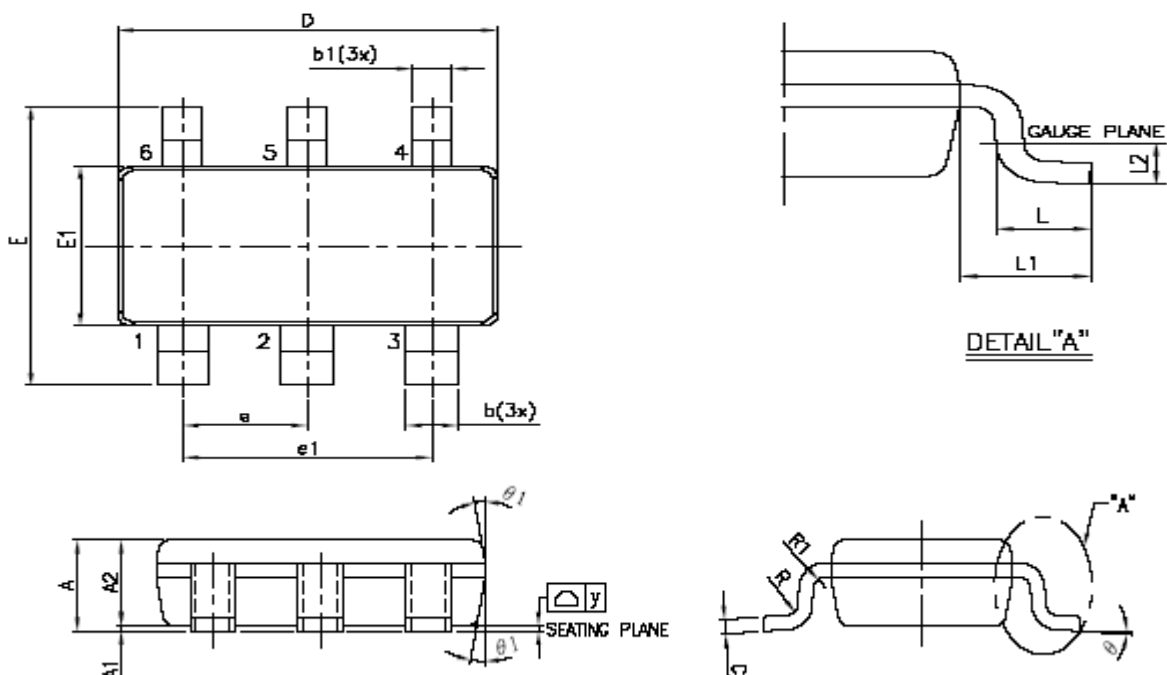
AC Electrical Characteristics for 3.3V Supply

| 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 |
|------------------|---------|-----------------------------------|---------------------|
| PCS3P6200AG-06JR | AC4LL | 6-Pin TSOT-26, TAPE & REEL, Green | Commercial |
| PCS3I6200AG-06JR | AC2LL | 6-Pin TSOT-26, TAPE & REEL, Green | Industrial |
| PCS3E6200AG-06JR | AC5LL | 6-Pin TSOT-26, TAPE & REEL, Green | Extended Industrial |

LL = 2 Character LOT #

Device Ordering Information

P C S 3 P 6 2 0 0 A G - 0 6 J R

R = Tape & Reel, T = Tube or Tray

| | | |
|------------|-----------|------------|
| O = TSOT23 | U = MSOP | J = TSOT26 |
| S = SOIC | E = TQFP | |
| T = TSSOP | L = LQFP | |
| A = SSOP | U = MSOP | |
| V = TVSOP | P = PDIP | |
| B = BGA | D = QSOP | |
| Q = QFN | X = SC-70 | |

DEVICE PIN COUNT

F = LEAD FREE AND RoHS COMPLIANT PART
G = GREEN PACKAGE, LEAD FREE, and RoHS


PART NUMBER

X = Automotive (-40C to +125C) I = Industrial (-40C to +85C) P or n/c = Commercial (0C to +70C)
E = Extended Industrial (-40C to +105C)

| | |
|---------------------------|----------------------|
| 1 = Clock Generator | 6 = Power Management |
| 2 = Non PLL based | 7 = Power Management |
| 3 = EMI Reduction | 8 = Power Management |
| 4 = DDR support products | 9 = Hi Performance |
| 5 = STD Zero Delay Buffer | 0 = Reserved |

ON Semiconductor Mixed Signal Product

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