# PCS1P2857A/B

## Multi-Output Clock Generator

### Features

- Generates multiple clock outputs from an inexpensive 27MHz crystal .
- Frequency outputs: PCS1P2857A
  - CLK1 : 27 MHz
  - CLK2 : 24 MHz
  - CLK3 : 14.31818 MHz
  - CLK4 : 14.31818 MHz
- Frequency outputs: PCS1P2857B
  - CLK1 : 27 MHz
  - CLK2 : 24 MHz
  - CLK3 : 28.322 MHz
- Operates with a 3.3V ± 5%V Supply Voltage
- Available in 8 -pin SOIC and 8 -pin TSSOP.

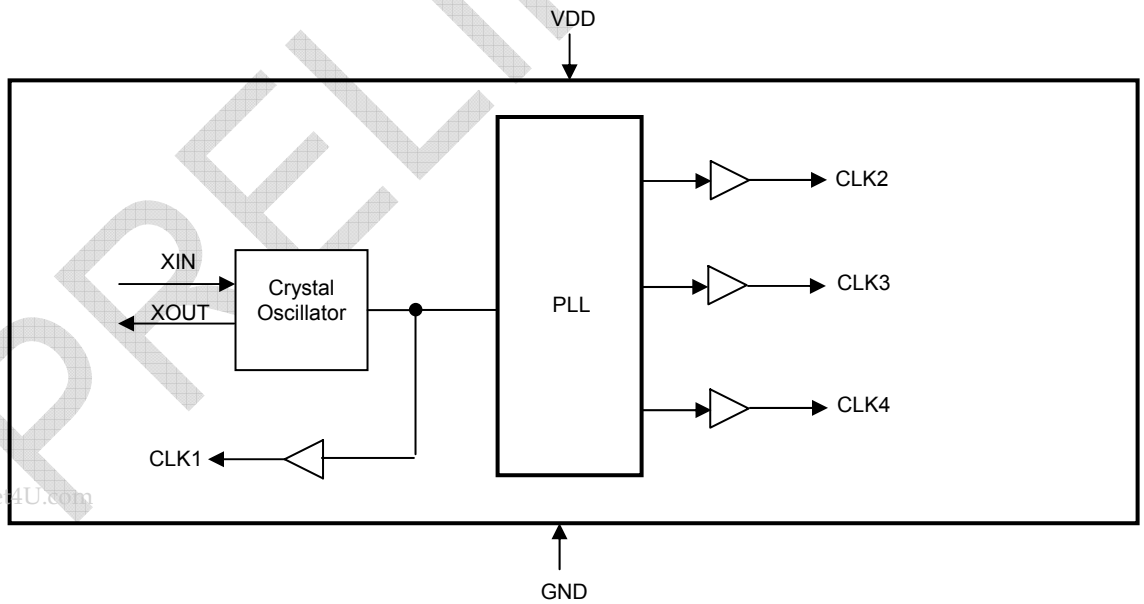
### Product Description

The PCS1P2857A/B is a versatile multi output clock generator. The PCS1P2857A/B uses the latest PLL technology. The four Clock outputs are generated using an inexpensive 27MHz Crystal. The accuracy of the 27MHz Input Clock should be within ±50ppm. The outputs consist of 24 MHz, 14.31818 MHz, and 28.322 MHz clocks together with a 27 MHz reference clock. The device operates from a Supply Voltage of 3.3V±5%V. The device is available in a 8 pin SOIC and 8 pin TSSOP JEDEC package.

### Application

PCS1P2854A/B is targeted for use in HDTV digital video.

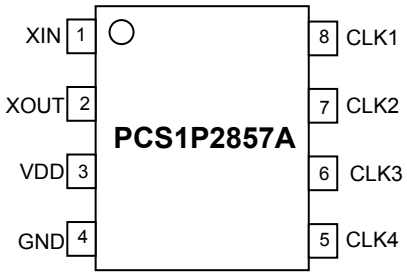
### Block Diagram

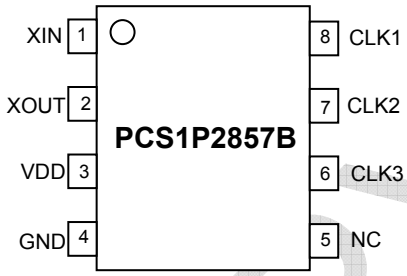





PulseCore Semiconductor Corporation
1715 S. Bascom Ave Suite 200, Campbell, CA 95008 • Tel: 408-879-9077 • Fax: 408-879-9018
www.pulsecoresemi.com

## Pin Deseription




## Pin Description

| Pin # | Pin Name | Pin Type | Pin Description |
|---|---|---|---|
| 1 | XIN | Input | Crystal connection or external reference frequency input. It can be connected to a 27MHz Fundamental mode crystal |
| 2 | XOUT | Output | Connection to crystal. If using an external reference clock, this pin must be left unconnected. |
| 3 | VDD | Power | Connect to +3.3V. |
| 4 | GND | Power | Connect to ground. |
| 5 | CLK4 | Output | 14.31818MHz Clock output (PCS1P2857A) |
| | NC | - | No connection (PCS1P2857B) |
| 6 | CLK3 | Output | 14.31818MHz Clock output (PCS1P2857A) |
| | | | 28.322MHz Clock output (PCS1P2857B) |
| 7 | CLK2 | Output | 24MHz Clock output |
| 8 | CLK1 | | 27MHz Reference Clock output |

## Absolute Maximum Ratings

| Symbol | Parameter | Rating | Unit |
|---|---|---|---|
| VDD | Power Supply Voltage relative to Ground | -0.5 to +4.6 | V |
| $V_{IN}$ | Input Voltage relative to Ground (Input Pins) | -0.5 to VDD+0.5 | |
| $T_{STG}$ | Storage temperature | -65 to +150 | °C |
| $T_A$ | Operating temperature | 0 to +70 | °C |
| $T_s$ | Max. Soldering Temperature (10 sec) | 260 | °C |
| $T_J$ | Junction Temperature | 125 | °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.

## DC Electrical Characteristics

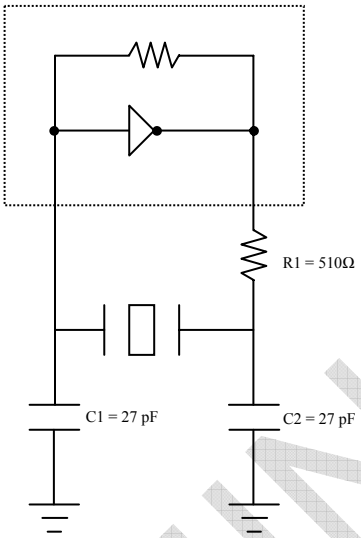
| Symbol | Parameter | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| $V_{IL}$ | Input low voltage | GND - 0.3 | - | 0.8 | V |
| $V_{IH}$ | Input high voltage | 2.0 | - | VDD + 0.3 | V |
| $I_{IL}$ | Input low current | - | - | -35 | µA |
| $I_{IH}$ | Input high current | - | - | 35 | µA |
| $V_{OL}$ | Output low voltage (VDD = 3.3V, $I_{OL}$ =12mA) | - | - | 0.4 | V |
| $V_{OH}$ | Output high voltage (VDD = 3.3V, $I_{OH}$ =12mA) | 2.4 | - | - | V |
| $I_{DD}$ | Static supply current | - | TBD | - | mA |
| $I_{CC}$ | Dynamic supply current ( VDD =3.3V ) | - | TBD | - | mA |
| VDD | Operating Voltage | 3.135 | 3.3 | 3.465 | V |
| $Z_{OUT}$ | Output Impedance | - | 20 | - | Ω |
| $C_{IN}$ | Input Capacitance | - | 5 | - | pF |
| $R_{PD}$ | CLK outputs Internal resistor | - | 360 | - | kΩ |

## AC Electrical Characteristics

| Symbol | Parameter | | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| CLKIN | Input frequency | | | - | 27 | - | MHz |
| CLK OUT | Output frequency | PCS1P2857A | | - | 27 | - | MHz |
| | | | | - | 24 | - | MHz |
| | | | | - | 14.31818 | - | MHz |
| | | PCS1P2857B | | - | 27 | - | MHz |
| | | | | - | 24 | - | MHz |
| | | | | - | 28.322 | - | MHz |
| $t_{LH}$* | Output rise time (Measured from 0.8V to 2.0V) | | | 0.8 | 1.4 | 2.0 | nS |
| $t_{HL}$* | Output fall time ( Measured from 2.0V to 0.8V) | | | 0.8 | 1.4 | 2.0 | nS |
| $t_{JC}$* | Jitter (Cycle to cycle) | | | - | TBD | - | pS |
| | Synthesis Error (Output Frequency) | PCS1P2857A | 14.31818MHz | - | -0.13 | - | ppm |
| | | | Other outputs | - | 0 | - | ppm |
| | | PCS1P2857B | 28.322MHz | - | 5.68 | - | ppm |
| | | | Other outputs | - | 0 | - | ppm |
| $t_D$* | Output duty cycle | | | 40 | 50 | 60 | % |
| $t_{ON}$ | Power up Time (first locked cycle after power-up) | | | - | 3 | 5 | mS |

*$t_{LH}$ and $t_{HL}$ are measured into a capacitive load of 15pF

### Typical Crystal Oscillator Circuit

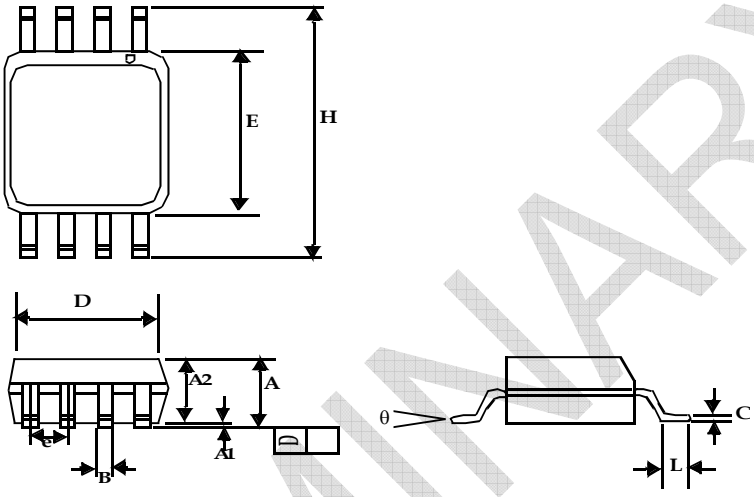



### Typical Crystal Specifications

| Fundamental AT cut parallel resonant crystal | |
|---|---|
| Nominal frequency | 27MHz |
| Frequency tolerance | ± 50 ppm or better at 25°C |
| Operating temperature range | -25°C to +85°C |
| Storage temperature | -40°C to +85°C |
| Load capacitance | 18pF |
| Shunt capacitance | 7pF maximum |
| ESR | 25Ω |

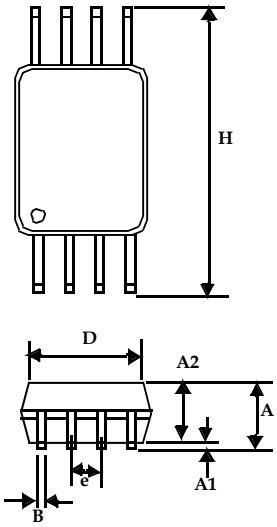
## Package Information

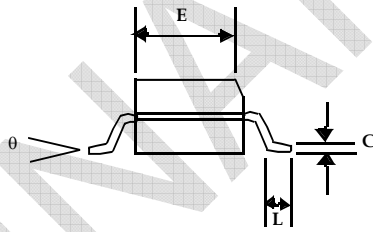
### 8-Pin SOIC Package




| Symbol | Dimensions | | | |
|---|---|---|---|---|
| | Inches | | Millimeters | |
| | Min | Max | Min | Max |
| A1 | 0.004 | 0.010 | 0.10 | 0.25 |
| A | 0.053 | 0.069 | 1.35 | 1.75 |
| A2 | 0.049 | 0.059 | 1.25 | 1.50 |
| B | 0.012 | 0.020 | 0.31 | 0.51 |
| C | 0.007 | 0.010 | 0.18 | 0.25 |
| D | 0.193 BSC | | 4.90 BSC | |
| E | 0.154 BSC | | 3.91 BSC | |
| e | 0.050 BSC | | 1.27 BSC | |
| H | 0.236 BSC | | 6.00 BSC | |
| L | 0.016 | 0.050 | 0.41 | 1.27 |
| θ | 0° | 8° | 0° | 8° |

## 8-lead Thin Shrunk Small Outline Package (4.40-MM Body)



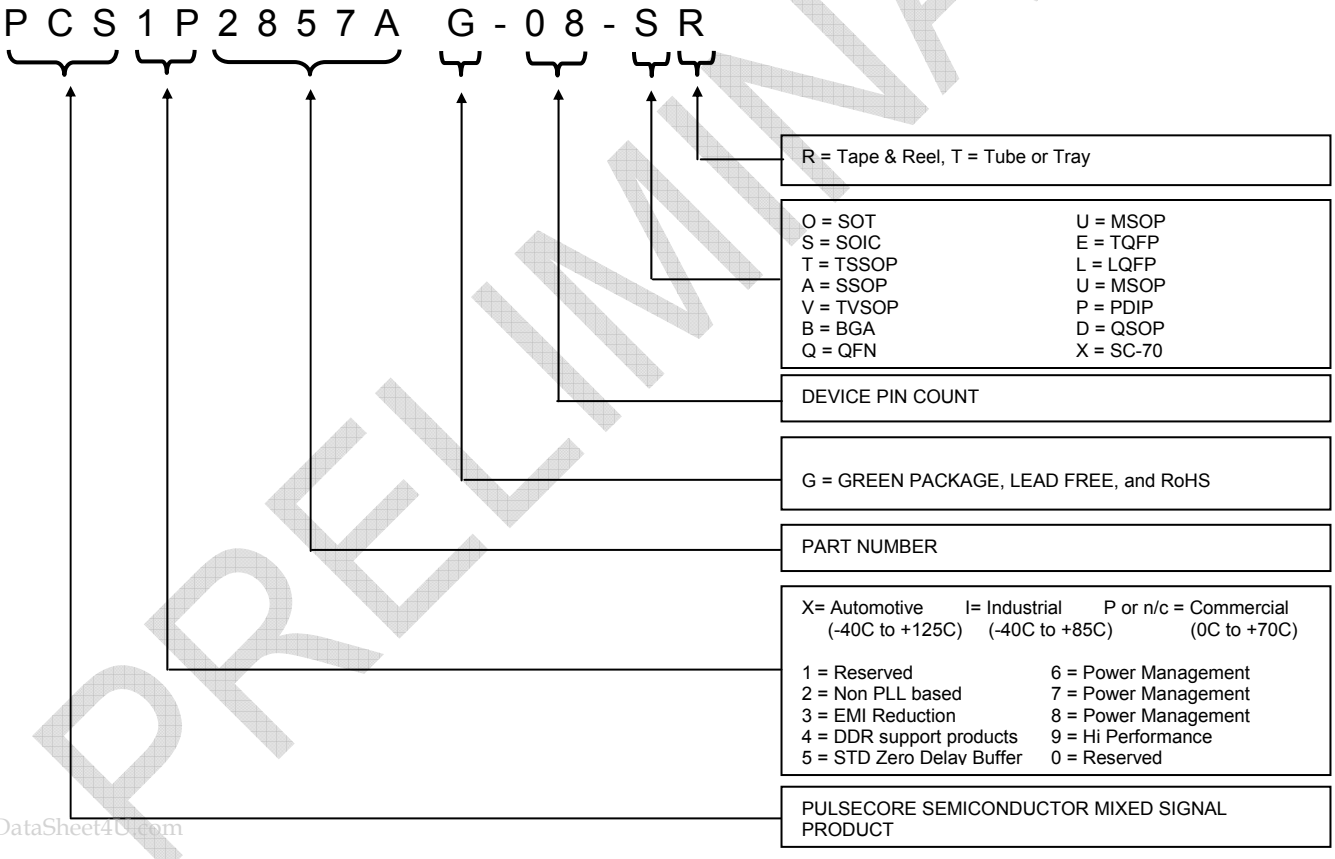




| Symbol | Dimensions | | | |
|---|---|---|---|---|
| | Inches | | Millimeters | |
| | Min | Max | Min | Max |
| A | | 0.043 | | 1.10 |
| A1 | 0.002 | 0.006 | 0.05 | 0.15 |
| A2 | 0.033 | 0.037 | 0.85 | 0.95 |
| B | 0.008 | 0.012 | 0.19 | 0.30 |
| c | 0.004 | 0.008 | 0.09 | 0.20 |
| D | 0.114 | 0.122 | 2.90 | 3.10 |
| E | 0.169 | 0.177 | 4.30 | 4.50 |
| e | 0.026 BSC | | 0.65 BSC | |
| H | 0.252 BSC | | 6.40 BSC | |
| L | 0.020 | 0.028 | 0.50 | 0.70 |
| θ | 0° | 8° | 0° | 8° |

## Ordering Information

| Part Number | Marking | Package | Temperature |
|---|---|---|---|
| PCS1P2857AG-08SR | 3P2857AG | 8-Pin SOIC, TAPE & REEL, Green | Commercial |
| PCS1P2857AG-08ST | 3P2857AG | 8-Pin SOIC, TUBE, Green | Commercial |
| PCS1P2857AG-08TR | 3P2857AG | 8-Pin TSSOP, TAPE & REEL, Green | Commercial |
| PCS1P2857AG-08TT | 3P2857AG | 8-Pin TSSOP, TUBE, Green | Commercial |
| PCS1P2857BG-08SR | 3P2857BG | 8-Pin SOIC, TAPE & REEL, Green | Commercial |
| PCS1P2857BG-08ST | 3P2857BG | 8-Pin SOIC, TUBE, Green | Commercial |
| PCS1P2857BG-08TR | 3P2857BG | 8-Pin TSSOP, TAPE & REEL, Green | Commercial |
| PCS1P2857BG-08TT | 3P2857BG | 8-Pin TSSOP, TUBE, Green | Commercial |

## Device Ordering Information



PulseCore Semiconductor Corporation
1715 S. Bascom Ave Suite 200
Campbell, CA 95008
Tel: 408-879-9077
Fax: 408-879-9018
www.pulsecoresemi.com


Part Numbers: PCS1P2857A/B
Document Version: 0.1

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