

## 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  $\pm$  5%V Supply Voltage
- Available in 8 -pin SOIC and 8 -pin TSSOP.

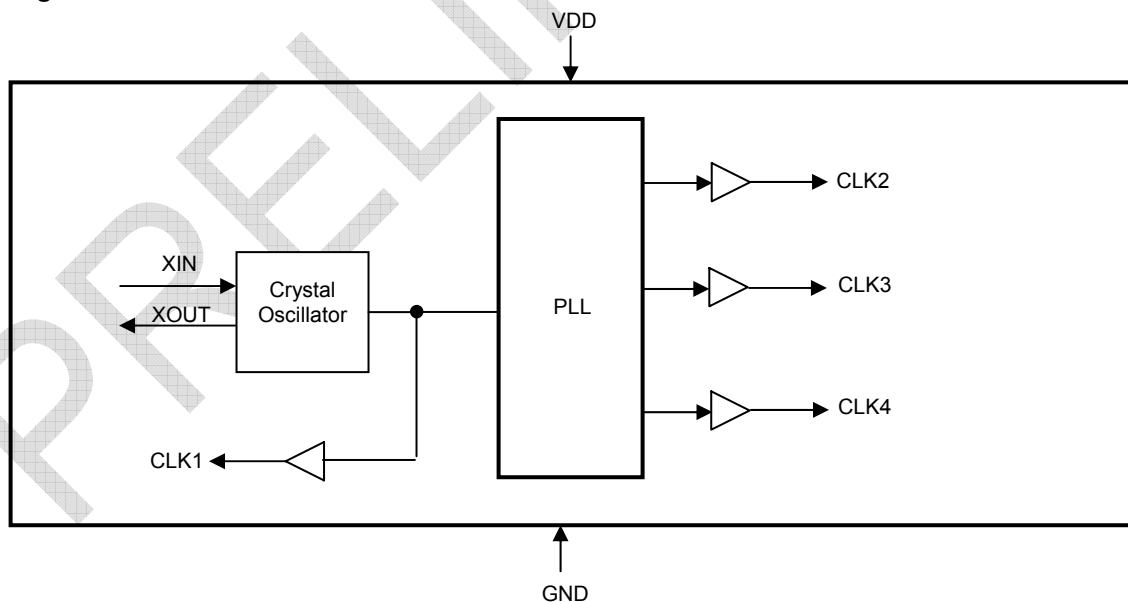
### Product Description

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  $\pm 50$ ppm. 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 $\pm$ 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



Pin Description



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 <sub>IN</sub>	Input Voltage relative to Ground (Input Pins)	-0.5 to VDD+0.5	
T <sub>STG</sub>	Storage temperature	-65 to +150	°C
T <sub>A</sub>	Operating temperature	0 to +70	°C
T <sub>s</sub>	Max. Soldering Temperature (10 sec)	260	°C
T <sub>J</sub>	Junction Temperature	125	°C
T <sub>DV</sub>	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.



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**DC Electrical Characteristics**

Symbol	Parameter	Min	Typ	Max	Unit
V <sub>IL</sub>	Input low voltage	GND - 0.3	-	0.8	V
V <sub>IH</sub>	Input high voltage	2.0	-	VDD + 0.3	V
I <sub>IL</sub>	Input low current	-	-	-35	μA
I <sub>IH</sub>	Input high current	-	-	35	μA
V <sub>OL</sub>	Output low voltage (VDD = 3.3V, I <sub>OL</sub> = 12mA)	-	-	0.4	V
V <sub>OH</sub>	Output high voltage (VDD = 3.3V, I <sub>OH</sub> = 12mA)	2.4	-	-	V
I <sub>DD</sub>	Static supply current	-	TBD	-	mA
I <sub>CC</sub>	Dynamic supply current ( VDD = 3.3V )	-	TBD	-	mA
VDD	Operating Voltage	3.135	3.3	3.465	V
Z <sub>OUT</sub>	Output Impedance	-	20	-	Ω
C <sub>IN</sub>	Input Capacitance	-	5	-	pF
R <sub>PD</sub>	CLK outputs Internal resistor	-	360	-	kΩ

**AC Electrical Characteristics**

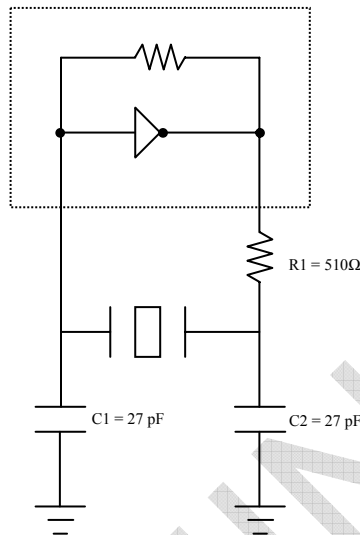
Symbol	Parameter		Min	Typ	Max	Unit	
CLKIN	Input frequency		-	27	-	MHz	
CLK OUT	Output frequency	PCS1P2857A	-	27	-	MHz	
			-	24	-	MHz	
			-	14.31818	-	MHz	
		PCS1P2857B	-	27	-	MHz	
			-	24	-	MHz	
			-	28.322	-	MHz	
			-	28.322	-	MHz	
t <sub>LH</sub> *	Output rise time (Measured from 0.8V to 2.0V)		0.8	1.4	2.0	nS	
t <sub>HL</sub> *	Output fall time ( Measured from 2.0V to 0.8V)		0.8	1.4	2.0	nS	
t <sub>JC</sub> *	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 <sub>D</sub> *	Output duty cycle		40	50	60	%	
t <sub>ON</sub>	Power up Time (first locked cycle after power-up)		-	3	5	mS	

\*t<sub>LH</sub> and t<sub>HL</sub> are measured into a capacitive load of 15pF

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Typical Crystal Oscillator Circuit

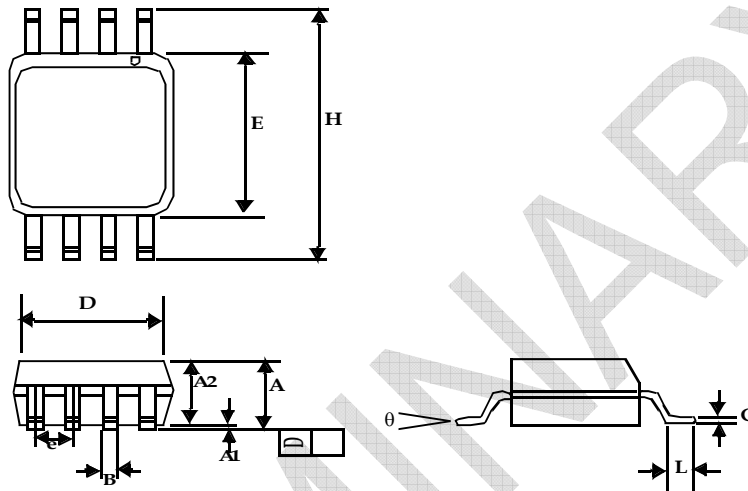


Typical Crystal Specifications

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

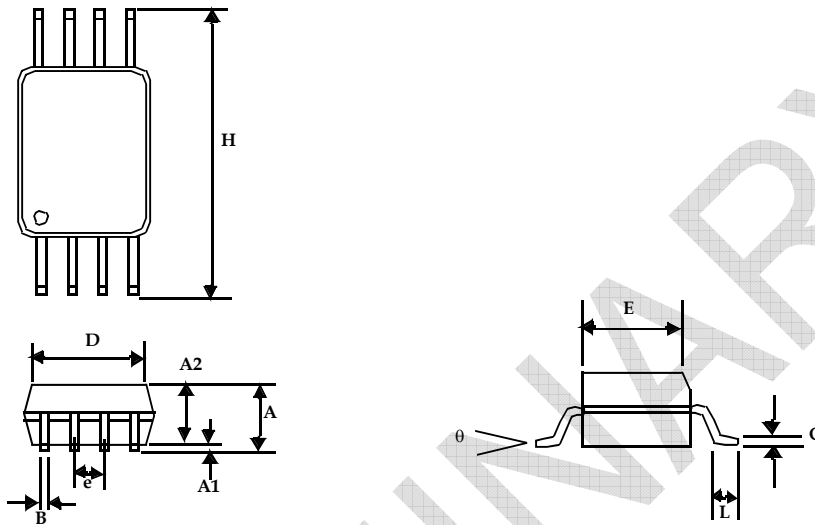
Package Information

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
theta	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°



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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

PCS1P2857AG-08-SR

R = Tape & Reel, T = Tube or Tray

O = SOT	U = MSOP
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

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)
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1 = Reserved	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

PULSECORE SEMICONDUCTOR MIXED SIGNAL PRODUCT

Licensed under US patent Nos 5,488,627 and 5,631,920



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

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