Multi-Output Clock Synthesizer

Features

- Generates multiple clock outputs from an inexpensive 25MHz crystal or external reference clock
- Frequency outputs:
  - 25MHz Reference clock
  - 33MHz
  - 48MHz (2 outputs)
  - 127MHz (2 outputs)
- Zero ppm frequency synthesis error for all CLK outputs
- Supply Voltage :3.3V ± 5%V
- Low jitter design
- Packaged in 16 pin TSSOP
- Industrial Temperature range
- Compatible with CY22393XC-F12
- Advanced low-power CMOS process

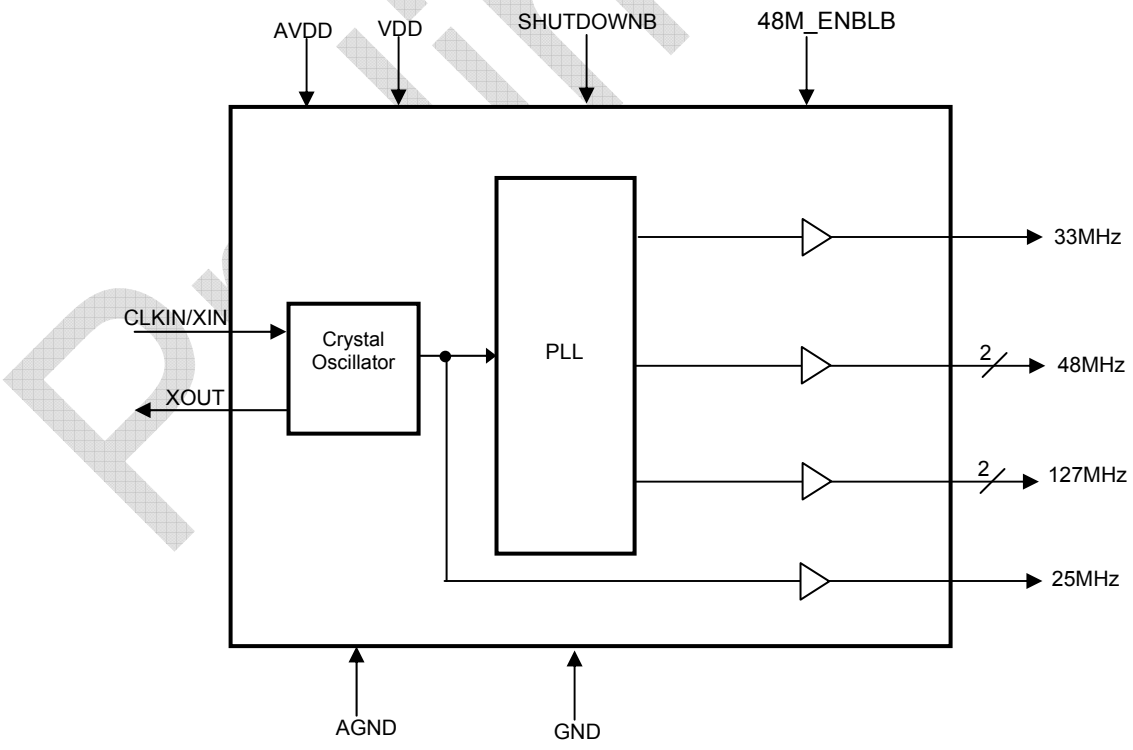
Product Description

The PCS1P2859A is a Precision multi-PLL based frequency synthesizer. The six Clock outputs are generated using an inexpensive 25MHz Crystal. The outputs consist of 25 MHz reference clock, 33 MHz, two 127MHz and two 48MHz clocks. The SHUTDOWNB tri-states all the clocks when enabled. The device operates from a Supply Voltage of 3.3V±5%V. The device is available in a 16-pin TSSOP JEDEC package for Industrial temperature range.

Application

PCS1P2859A is targeted for use in high-end multimedia, communications and consumer applications.

Block Diagram



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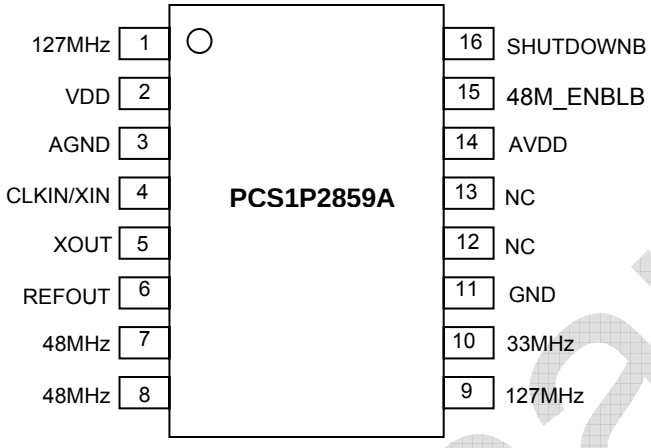
Pin Diagram



Pin Description

Pin #	Pin Name	Pin Type	Pin Description
1	127MHz	Output	127MHz Clock Output
2	VDD	Power	Connect to +3.3V
3	AGND	Power	Connect to ground
4	CLKIN / XIN	Input	External reference Clock or Input Crystal connection.
5	XOUT	Output	Connection to crystal. If using an external reference clock, this pin must be left unconnected
6	REFOUT	Output	25MHz Reference Clock output
7	48MHz	Output	48MHz Clock Output
8	48MHz	Output	48MHz Clock Output
9	127MHz	Output	127MHz Clock Output
10	33MHz	Output	33MHz Clock Output
11	GND	Power	Connect to ground
12	NC		No connection
13	NC		No connection
14	AVDD	Power	Connect to +3.3V
15	48M_ENBLB	Input	48MHz Output Enable bit. When this pin is made LOW, the 48MHz clocks are enabled.Tri-states 48MHz clocks when this pin is HIGH.
16	SHUTDOWNB	Input	Output Enable bit. When this pin is made HIGH, all clocks are enabled. Tri-states all clocks when this pin is LOW.

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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+0.3	
T_{STG}	Storage temperature	-65 to +150	°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.

Operating Conditions

Parameter	Description	Min	Typ	Max	Unit
VDD /AVDD	Operating Voltage	3.135	3.3	3.465	V
T_A	Operating Temperature (Ambient Temperature)	-40		+85	°C
C_L	Load Capacitance			15	pF
C_{IN}	Input Capacitance		5		pF

DC Electrical Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Units
VDD /AVDD	Operating Voltage		3.135	3.3	3.465	V
V_{IH}	Input High Voltage		2.2		VDD+0.3	V
V_{IL}	Input Low Voltage		GND-0.3		1.0	V
V_{OH}	Output High Voltage	VDD=3.135,I_{OH}= -12mA	2.4			V
V_{OL}	Output Low Voltage	VDD=3.135, I_{OL}= 12mA			0.4	V
I_{OZ}	Output Leakage Current	Three-state outputs			10	µA
I_{CC}	Static Current	CLKIN and SHUTDOWN Pins pulled low			5.5	µA
I_{DD}	Dynamic Current	No Load, All Clocks on			35	mA
Z_{OUT}	Nominal output impedance			30		Ω

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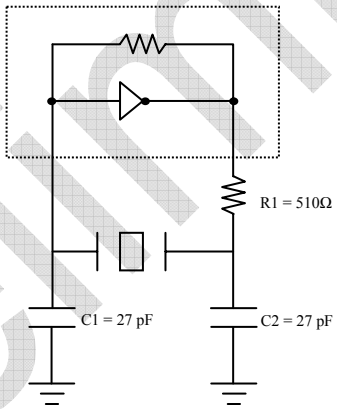
AC Electrical Characteristics

Symbol	Parameter		Min	Typ	Max	Unit
CLKIN/XIN	Input Clock Frequency			25		MHz
CLK OUT	Output Clock Frequency	Pin 10		33		MHz
		Pin 7,8		48		
		Pin 1,9		127		
		Pin 6		25		
$t_{LH}1$	Rising edge slew rate (Measured from 20% to 80%)		1.1	1.7		V/nS
$t_{HL}1$	Falling edge slew rate (Measured from 80% to 20%)		1.3	2		V/nS
$T_{PJ}1$	Peak-to-peak Period Jitter @ VDD/2			300		pS
	Synthesis Error (Output Frequency)			0		ppm
$t_{D}1$	Output Duty Cycle		45	50	55	%
t_{LOCK}	PLL Lock Time from Power-Up			1	3	mS
NOTE: 1. Measured with 15pF capacitive load						

Typical Crystal Oscillator Circuit



Typical Crystal Specifications

Fundamental AT cut parallel resonant crystal	
Nominal frequency	25MHz
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

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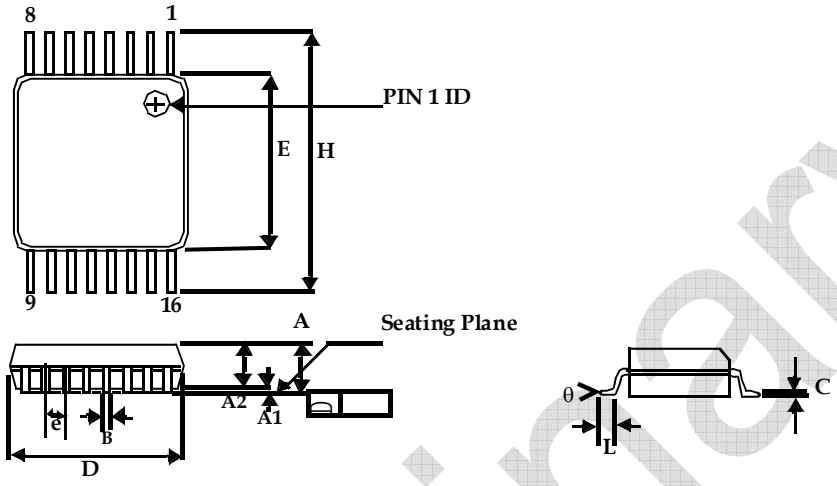
Package Information

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



Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A		0.043		1.20
A1	0.002	0.006	0.05	0.15
A2	0.031	0.041	0.80	1.05
B	0.007	0.012	0.19	0.30
C	0.004	0.008	0.09	0.20
D	0.193	0.201	4.90	5.10
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	0.030	0.50	0.75
θ	0°	8°	0°	8°

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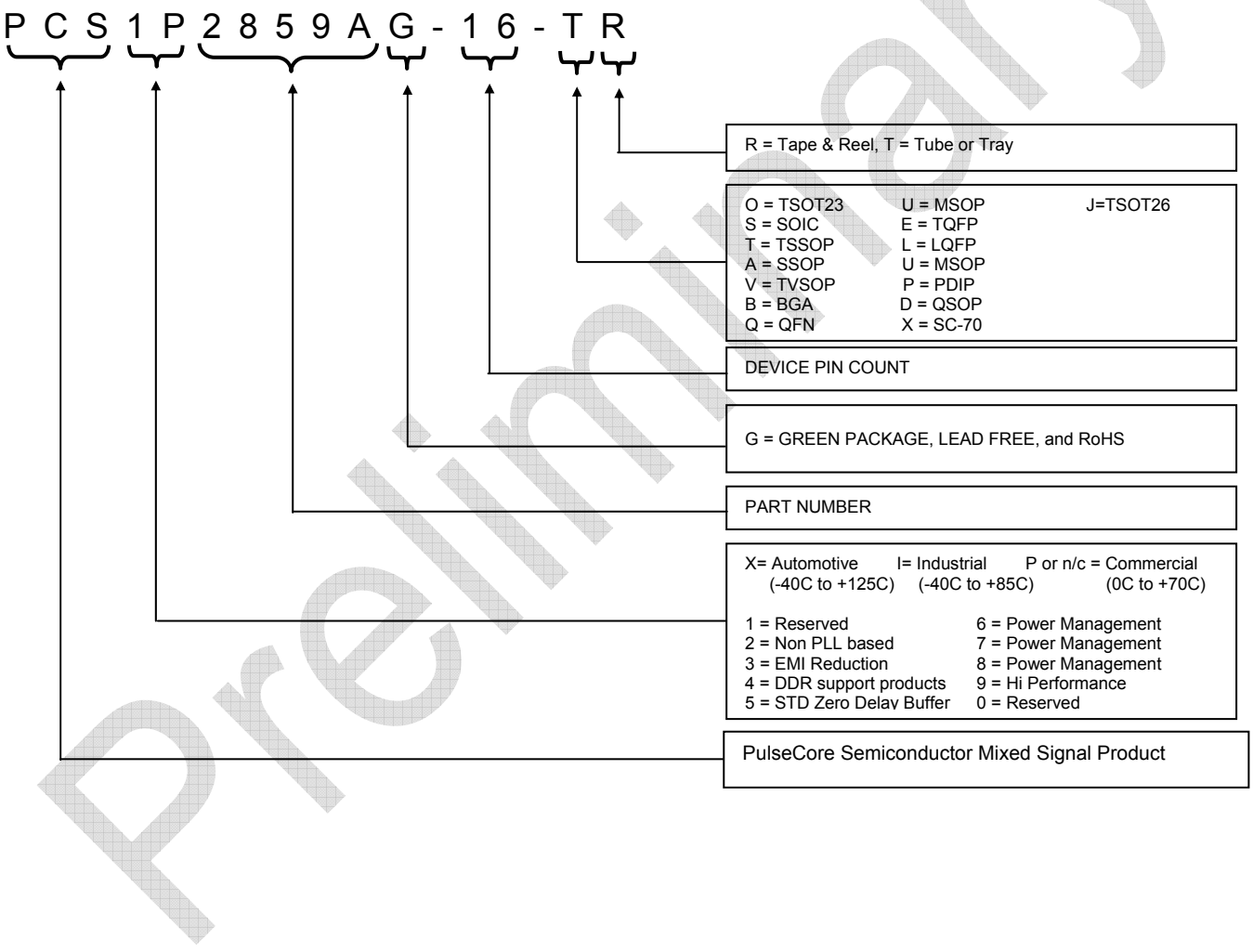
Ordering Code

Part Number	Marking	Package	Temperature
PCS1P2859AG-16TR	1P2859AG	16-Pin TSSOP, TAPE & REEL, Green	Commercial
PCS1P2859AG-16TT	1P2859AG	16-Pin TSSOP, TUBE, Green	Commercial
PCS1I2859AG-16TR	1I2859AG	16-Pin TSSOP, TAPE & REEL, Green	Industrial
PCS1I2859AG-16TT	1I2859AG	16-Pin TSSOP, TUBE, Green	Industrial

Device Ordering Information



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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
Many PulseCore Semiconductor products are protected by issued patents or by applications for patent

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