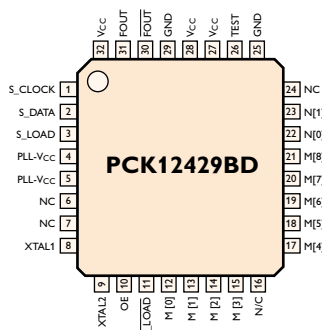


PCK12429

25-800 MHz Differential PECL Clock Generator Family

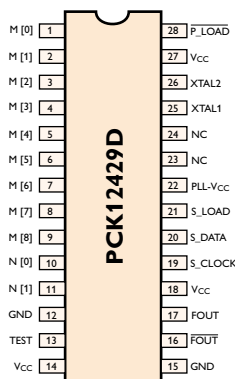
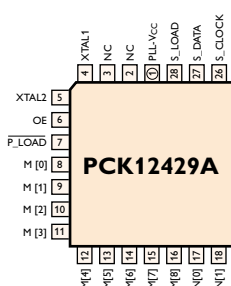
The PCK12429 provides a fully integrated crystal oscillator, PLL with integrated loop filter, and programmable frequency divider ratios to generate a high-quality, low-jitter differential PECL output clock from an external quartz crystal reference.



Features

- One 25-400 MHz differential PECL clock output
- ± 25 ps peak-to-peak output jitter
- Fully integrated PLL and loop filter - no external components needed
- Integrated series-resonant crystal oscillator - no external components needed besides crystal
- Frequency programmable to 1 MHz or finer resolution
- Parallel or 3-wire serial programming interface
- Synchronous output enable
- Synchronous frequency ramp-down on power-down (PCK12439)
- Offered in 28-pin PLCC, 32-pin LQFP and 28-pin SO packages

Pin Configuration



Order Information

Package	Container	PCK12429	PCK12429S	PCK12430	PCK12439
SO	Tube	PCK12429D	PCK12429SD	PCK12430D	PCK12439D
	T & R	PCK12429D-T	PCK12429SD-T	PCK12430D-T	PCK12439D-T
LQFP	T & R	PCK12429BD-T	PCK12429SBD-T	PCK12430BD-T	PCK12439BD-T
	Tray, single	PCK12429BD	PCK12429SBD	PCK12430BD	PCK12439BD
	Tray, multiple	PCK12429BD	PCK12429SBD	PCK12430BD	PCK12439BD
PLCC	Tube	PCK12429A	PCK12429SA	PCK12430A	PCK12439A
	T & R	PCK12429A-T	PCK12429SA-T	PCK12430A-T	PCK12439A-T

Semiconductors

Description

The PCK12429 uses an external quartz crystal reference frequency with an input range of 10-20 MHz to generate one output with a frequency between 25 and 400 MHz, programmable through either serial or parallel interface. In the typical case of a 16 MHz crystal, the PCK12429 derives an internal reference frequency of 1 MHz, which drives an internal PLL. The loop divider ratio, M, is programmable between 200 and 400 to create a VCO output frequency between 200 MHz and 400 MHz. The VCO output frequency can then be further divided by the output divider ratio N, which can be programmed to values of 1, 2, 4 or 8, for an overall output frequency range of 25 MHz (M=200, N=8) up to 400 MHz (M=400, N=1).

The PCK12429 has a fully integrated PLL loop filter and uses a pure series-resonant crystal oscillator, eliminating the need for external components. It uses separate voltage supplies to minimize noise-induced jitter. The resulting output is a high-quality differential PECL output clock signal with extremely low jitter of ± 25 ps peak-to-peak. Frequency lock is achieved in less than 10 ms with minimal frequency overshoot.

The basic function in this family is PCK12429, programmable from 25 MHz to 400 MHz. PCK12429S adds spread spectrum capability. For operation from 50 MHz to 800 MHz, PCK12430 can be used, or PCK12439 which adds a gradual frequency step-down function supporting system power-down modes.

Applications

- High-performance UNIX computing platforms
- IA-64 Itanium™ 2 architecture server motherboards
- High-performance PECL reference clock generation

Operating Characteristics

- Operates from a 3.3 V power supply
- 0°C to +70°C operating temperature range
- Input crystal frequency range between 10 MHz and 20 MHz
- Serial programming interface operates at up to 10 MHz

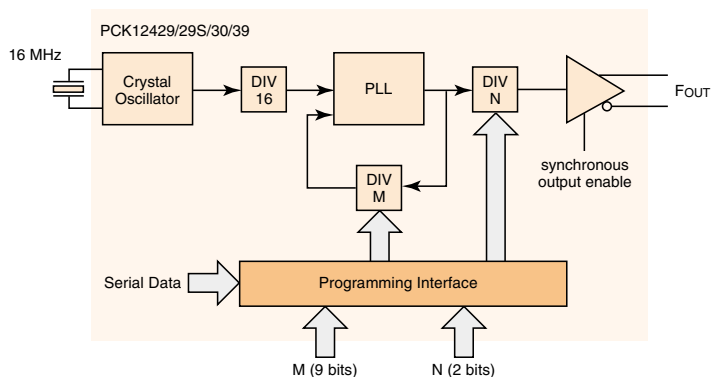
PHILIPS

PCK12429

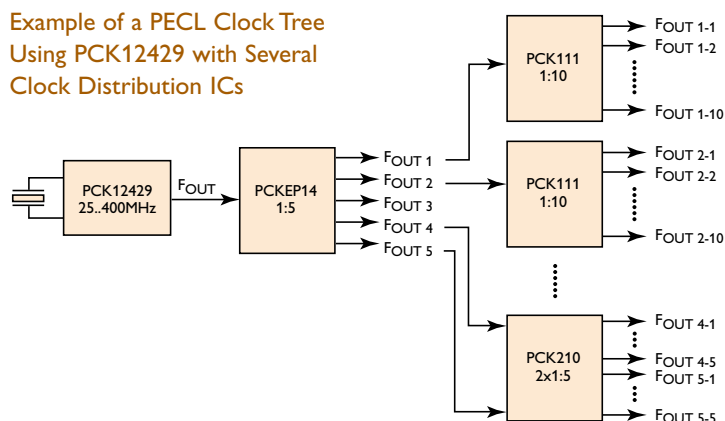
25-800 MHz Differential PECL Clock Generator Family



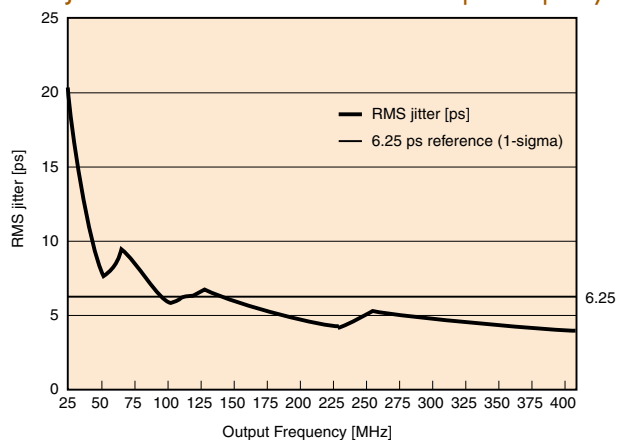
Functional Block Diagram



Example of a PECL Clock Tree Using PCK12429 with Several Clock Distribution ICs



Jitter Performance as a Function of Output Frequency



Divider ratios and output frequency ranges*

N	Output Division Ratio	M	PLL Division Ratio	Output Frequency	Frequency Step Increment
00	1	1 1001 0000	400	400	1 MHz
		
01	2	0 1100 1000	200	200	500 kHz
		
10	4	1 1001 0000	400	100	250 kHz
		
11	8	0 1100 1000	200	50	125 kHz
		1 1001 0000	400	50	
		
		0 1100 1000	200	25	

* using a 16 MHz crystal as an example reference frequency

Family Overview

Part Number	Function
PCK12429	25-400 MHz differential PECL clock generator
PCK12429S	25-400 MHz differential PECL clock generator with spread spectrum
PCK12430	50-800 MHz differential PECL clock generator
PCK12439	50-800 MHz differential PECL clock generator with frequency ramp-down mode

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