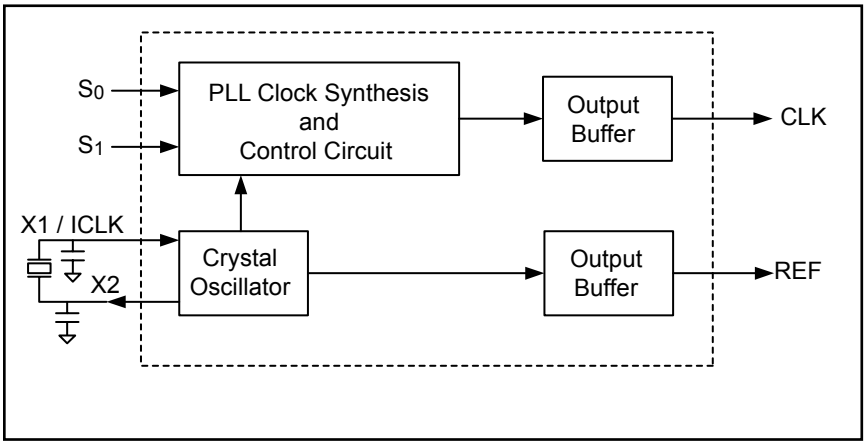
Features

- Zero ppm multiplication error
- Input crystal frequency range: 5 - 30MHz
- Input clock frequency range: 4 - 50MHz
- Output clock frequencies range ≤ 200MHz
- Period jitter ≤ 100ps (typ)
- 9 Selectable frequencies controlled by S_0 and S_1 pins
- Supply voltage: 3.3V ±10% or 5.0V ±10%
- Packaging (Pb-Free and Green):
  —8-pin SOIC (W)

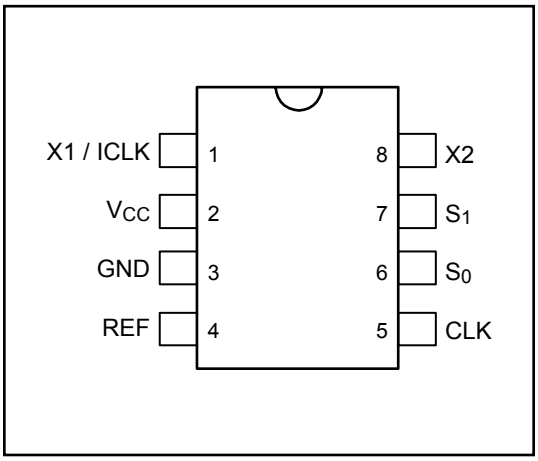
Description

The PI6C4512 is a precision general-purpose clock synthesizer with fmax≤ 200MHz. The PI6C4512 uses an external low-cost crystal to generate a very accurate rate and stable system clocks.

Block Diagram



Pin Configuration



Clock Output Table(1)

S_1	S_0	CLK
0	0	x 4
0	M	x (16/3)
0	1	x 5
M	0	x 2.5
M	M	x 2
M	1	x (10/3)
1	0	x 6
1	M	x 3
1	1	x 8

Notes:
1. M = Mid-level (unconnected, biases to $V_{CC}/2$).

Maximum Ratings

(Above which the useful life may be impaired. For user guidelines, not tested)

Storage temperature	-65°C to +150ºC
Ambient Operating Temperature	0°C to +70ºC
Supply Voltage to Ground Potential (V_{CC})	-0.3V to +7.0V
Inputs (Referenced to GND)	-0.5V to V_{CC} +0.5V
Clock Output (Referenced to GND)	-0.5V to V_{CC} +0.5V
Soldering Temperature (Max of 10 seconds)	260ºC

Note:
Stresses greater than those listed under MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

Pin Description

Name	Pin	Description
X1/ICLK	1	Crystal connection or clock input.
V_{CC}	2	Supply voltage: 3.3V ±10% or 5.0V ±10%
GND	3	Connect to GND
REF	4	Buffered crystal oscillator output clock
CLK	5	Clock output
S_0	6	Multiplier select pin 0. Connect to GND or V_{CC} or float (no connection).
S_1	7	Multiplier select pin 1. Connect to GND or V_{CC} or float (no connection).
X2	8	Crystal connection. Leave unconnected for clock input.

External Components

The PI6C4512 requires a minimum number of external components for proper operation. Decoupling capacitors of 0.1µF || 0.01µF should be connected between each V_{DD} and GND and placed as close to the chip as possible. A series termination resistor of 33Ω may be used for clock outputs. If a crystal is used, it should be a fundamental mode, parallel resonant crystal. Crystal capacitors should be connected from X_1 to ground and from X_2 to ground to according to the crystal specifications. The value of capacitors is given by the following equation, where C_L is the crystal load capacitance: Crystal caps (pF) = (C_L -15) x 2.

Recommended Operation Conditions

Symbol	Description	Test Condition	Min.	Typ.	Max.	Units
V_{CC}	Supply Voltage		3		5.5	V
T_A	Operating Temperature		0		+70	°C

DC Electrical Characteristics (V_{CC} = 3.3V ± 10% and 5.0V ± 10%, T_A = 0°C to +70°C, unless otherwise noted)

Symbol	Description	Test Condition	Pin	Min.	Typ.	Max.	Units
V_{CC}	Supply voltage		V_{CC}	3		5.5	V
I_{CC}	Supply current	No load, 20MHz crystal	V_{CC}	`	12	30	mA
V_{IH}	Input logic HIGH		ICLK	(V_{CC}/2) +1	V_{CC}/2		V
V_{IL}	Input logic LOW		ICLK		V_{CC}/2	(V_{CC}/2)-1	V
V_{IH}	Input logic HIGH		S_0, S_1	V_{CC}-0.5			V
V_{IM}	Input mid-level		S_0, S_1		V_{CC}/2		V
V_{IL}	Input logic LOW		S_0, S_1			0.5	V
V_{OH}	High-level output voltage	I_{OH} = -12mA	CLK, REF	2.4			V
V_{OL}	Low-level output voltage	I_{OL} = +12mA	CLK, REF			0.4	V
I_S	Short circuit current		CLK		±70		mA

AC Electrical Characteristics (V_{CC} = 3.3V ±10% and 5.0V ± 10%, T_A = 0°C to +70°C, unless noted)

Symbol	Parameter	Test Condition	Pin	Min.	Typ.	Max.	Unit
F_{IN}	Input Frequency	Crystal	ICLK	5		30	MHz
		Clock	ICLK	4		50	MHz
F_{OUT}	Output frequency(1)	V_{CC}: 4.5V to 5.5V	CLK	20		200	MHz
		V_{CC}: 3.0V to 3.6V	CLK	20		180	MHz
T_R	Output clock rise time	0.8V to 2.0V, C_L = 15pF load	CLK		1		ns
T_F	Output clock fall time	2.0V to 0.8V, C_L = 15pF load	CLK		1		ns
T_{DC}	Output clock duty-cycle	At V_{CC}/2, f ≤ 150MHz	CLK	45	50	55	%
		At V_{CC}/2, f > 150MHz	CLK	40	50	60	
BW	PLL bandwidth	f ≤ 150MHz	CLK	10			kHz
T_{PJ}	Period Jitter	100MHz to 200MHz	CLK		100	250	ps

Notes:
1. The phase relationship between input and output clocks can change at power up.

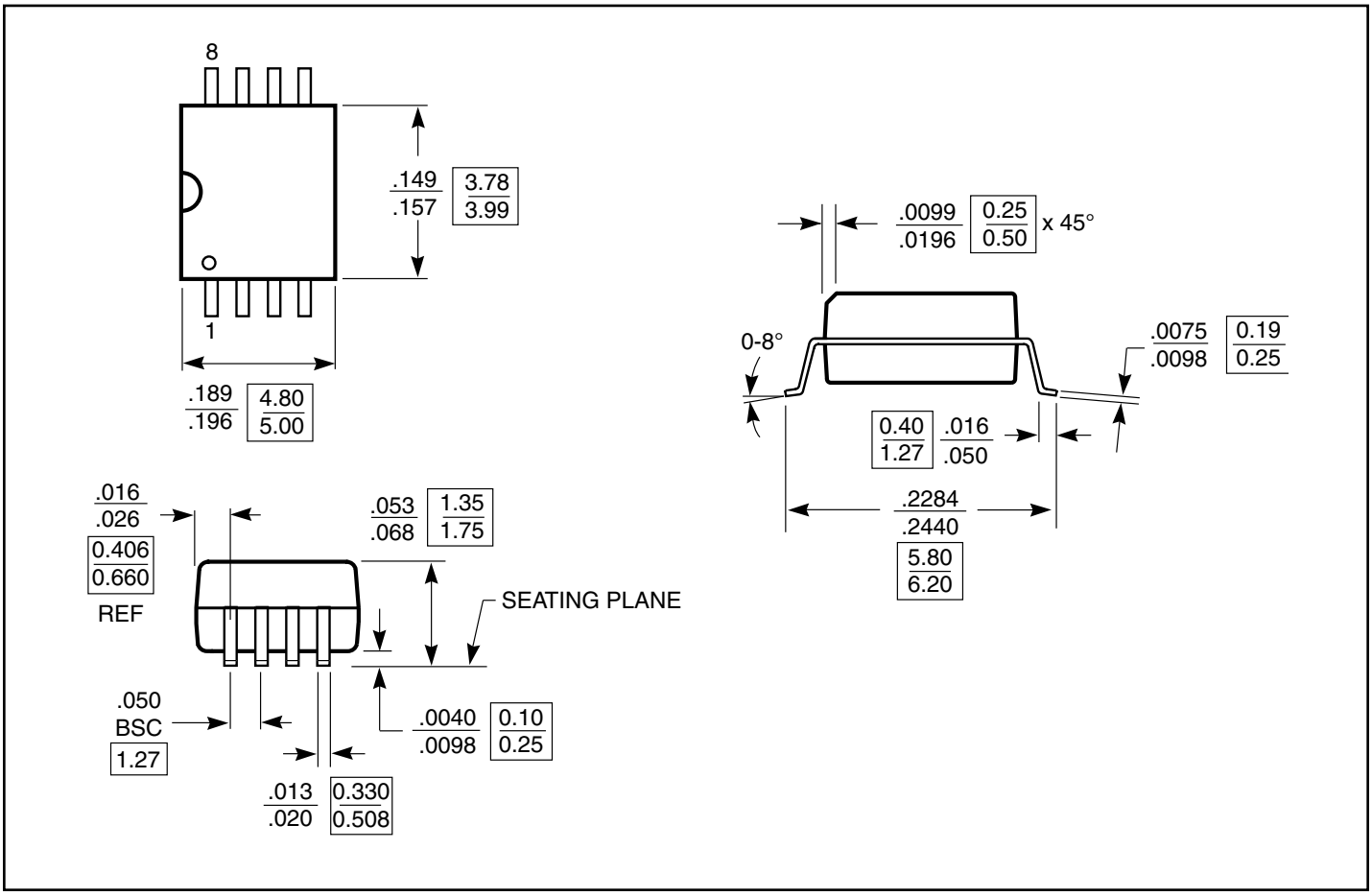
Recommended Crystal

Pericom recommends the Pericom 49S SMD series crystal, which is a low cost, low profile SMD crystal packaged in a HC-49/u short SMD package.

Recommended Crystal Specifications

Parameter	Value	Units
Mode of Oscillation	Fundamental	AT
Frequency	5 - 30	MHz
Frequency Tolerance	±50	PPM
Temperature and Aging Stability	±50	PPM
CO/CI Ratio	240	
Load Cap	18	pF
Equivalent Series Resistance	30	Ω

Packaging Mechanical: 8-Pin SOIC (W)



Ordering Information[1,2]

Ordering Code	Package Code	Package Description
PI6C4512W	W	8-pin SOIC
PI6C4512WE	WE	Pb-Free and Green 8-pin SOIC

Note:
1. Thermal characteristics can be found on the company web site at www.pericom.com/packaging/
2. E = Pb-free and Green