PI6C557-10

Network Clock Generator

Product Features

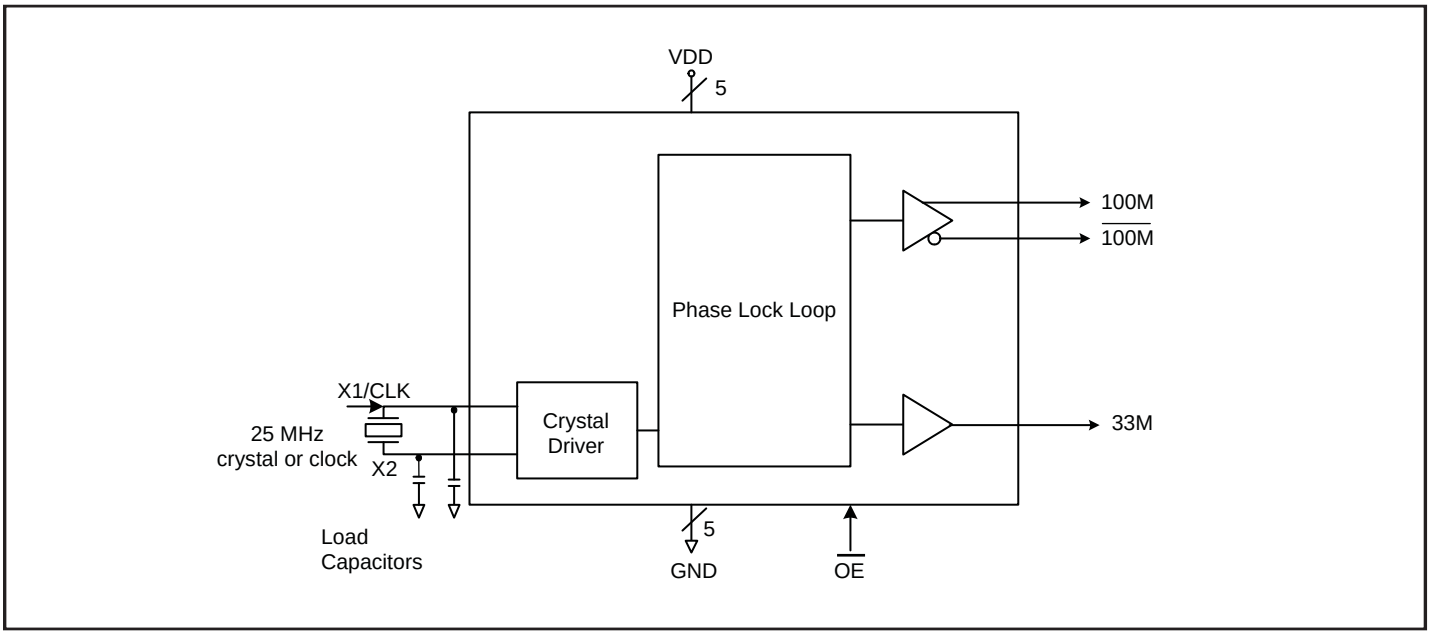
- 100MHz Differential Output, 33MHz LVCMOS
- Supply voltage of 3.3V ±5%
- 25MHz input frequency
- Jitter 60ps cycle-to-cycle (typ) 100MHz
- Industrial temperature range
- Packaging: (Pb-free and Green)
  —16-pin, 173 mils wide TSSOP

Description

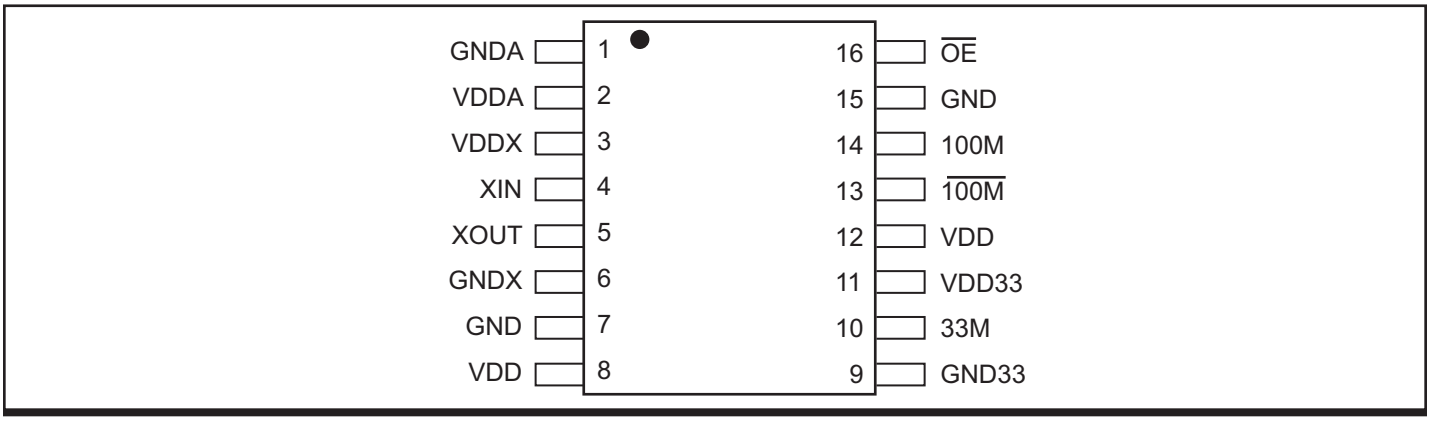
The PI6C557-10 is an integrated 100MHz differential and 33MHz LVCMOS clock generator. It uses a 25MHz quartz crystal to provide an input frequency reference. The high performance internal PLL multiplier is a proven design that ships world-wide for PCI Express applications.

The PI6C557-10 is available in a 16 lead 4.4 x 5.0mm TSSOP package and is operated from a single 3.3V supply. Separate supply pins are provided for analog core, 100MHz differential output, and 33MHz LVCMOS output to adhere to lowest risk, best known power supply partitioning practices.

Block Diagram



Pin Configuration



Pin Description

Pin #	Pin Name	I/O Type	Description
1	GNDA	Power	Analog Ground
2	VDDA	Power	Analog power, connect to clean 3.3V source
3	VDDX	Power	Crystal oscillator circuit power
4	XIN	Input	Crystal input.
5	XOUT	Output	Crystal output.
6	GNDX	Power	Crystal power ground.
7	GND		Ground.
8	VDD		Power.
9	GND33	Power	Ground for 33MHz output.
10	33M	Output	33.3MHz LVCMOS output.
11	VDD33	Power	Power for 33MHz output
12	VDD	Power	Power.
13	$\overline{100M}$	Output	Complimentary 100MHz differential output.
14	100M	Output	100MHz differential output.
15	GND	Power	Ground.
16	$\overline{OE}$	Input	Output enable, tristates both 100MHz and 33MHz outputs when HIGH. Internal pull-down is 30Kohm.

Application Information

Decoupling Capacitors

Decoupling capacitors of 0.01μF should be connected between each V_{DD} pin and the ground plane and placed as close to the V_{DD} pin as possible.

Electrical Specifications

Maximum Ratings

Supply Voltage to Ground Potential	5.5V
All Inputs and Outputs	-0.5V to V_{DD}+0.5V
Ambient Operating Temperature	-40 to +85°C
Storage Temperature	-65 to +150°C
Junction Temperature	150°C
Soldering Temperature	260°C

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.

DC Characteristics (V_{DD} = 3.3V ± 5%, T_A = -40°C to +85°C)

Symbol	Parameter	Conditions		Min.	Typ.	Max.	Unit
V_{DD}	Supply Voltage			3.135	3.3	3.465	V
V_{IH}	Input High Voltage(1)	$\overline{OE}$		2.0		V_{DD} +0.3	V
V_{IL}	Input Low Voltage(1)	$\overline{OE}$		GND -0.3		0.8	V
I_{IL}	Input Leakage Current	0 < Vin < V_{DD}	With input pull-up and pull-downs	-20		150	µA
I_{DD}	Operating Supply Current	Normal Operation			35	51	mA
I_{DDOE}		$\overline{OE}$ = HIGH			27	40	mA
C_{IN}	Input Capacitance	Input pin capacitance			5		pF
C_{OUT}	Output Capacitance	Output pin capacitance			6.5		pF
L_{PIN}	Pin Inductance					5	nH

Notes:
1. Single edge is monotonic when transitioning through region.

100MHz Differential DC Characteristics (V_{DD} = 3.3V ± 5%, T_A = -40°C to +85°C)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V_{OD}	Differential Output Voltage		400	725	850	mV
V_{OC}	Common Mode Voltage		1.0	1.25	1.6	V

100MHz Differential AC Characteristics (V_{DD} = 3.3V ± 5%, T_A = -40°C to +85°C)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
f_{out}	Output Frequency				100	MHz
t_r/t_f	Output Rise/Fall time	20% - 80% 100-Ohm Differential Termination C_L = 10pF	1	1.2	1.4	ns
t_{DC}	Output duty cycle		47		53	%
	Phase Jitter	1E-6 BER PCIE Gen 1 (pk-pk)			86	ps

33MHz LVCMOS DC Characteristics (V_{DD} = 3.3V ± 5%, T_A = -40°C to +85°C)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V_{OL}	Output Voltage Low	V_{DD} = 3.135V, I_{OL} = 6mA			0.4	V
V_{OH}	Output Voltage High	V_{DD} = 3.135V, I_{OH} = –6mA	2.4			
Z_O	Output Impedance			45		Ω

33MHz LVCMOS AC Characteristics (V_{DD} = 3.3V ± 5%, T_A = -40°C to +85°C)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
f_{out}	Output Frequency				33.3	MHz
t_r/t_f	Output Rise/Fall time	20% to 80%, C_L = 10pF		3	4	ns
t_{DC}	Output Duty Cycle	$t_{DC} = t_H/t_{CY}$, t_H = High Pulse Width, t_{CY} = Output Cycle Time, @ $V_{DD}/2$	45		55	%
J_{CC}	Jitter, Cycle-to-Cycle				300	ps

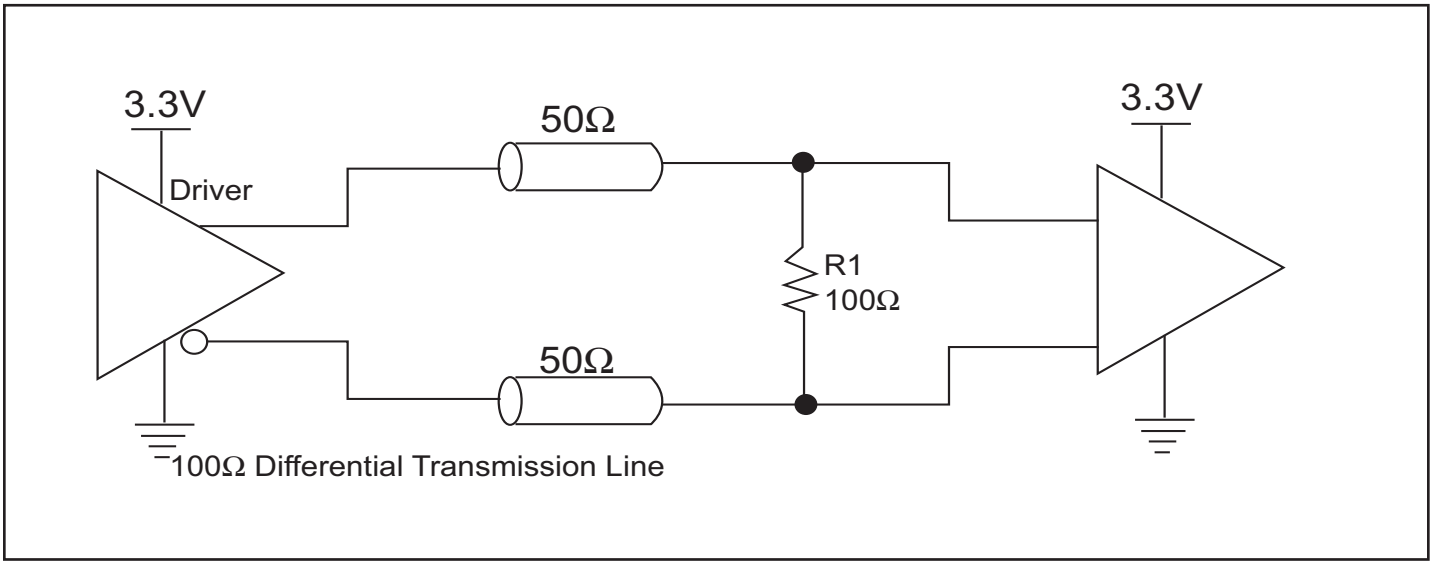
Thermal Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
θ_{JA}	Thermal Resistance Junction to Ambient	Still air			90	°C/W
θ_{JC}	Thermal Resistance Junction to Case				24	°C/W

Recomended Crystal Specification
Pericom recommends SRX7278 for optimium performance.

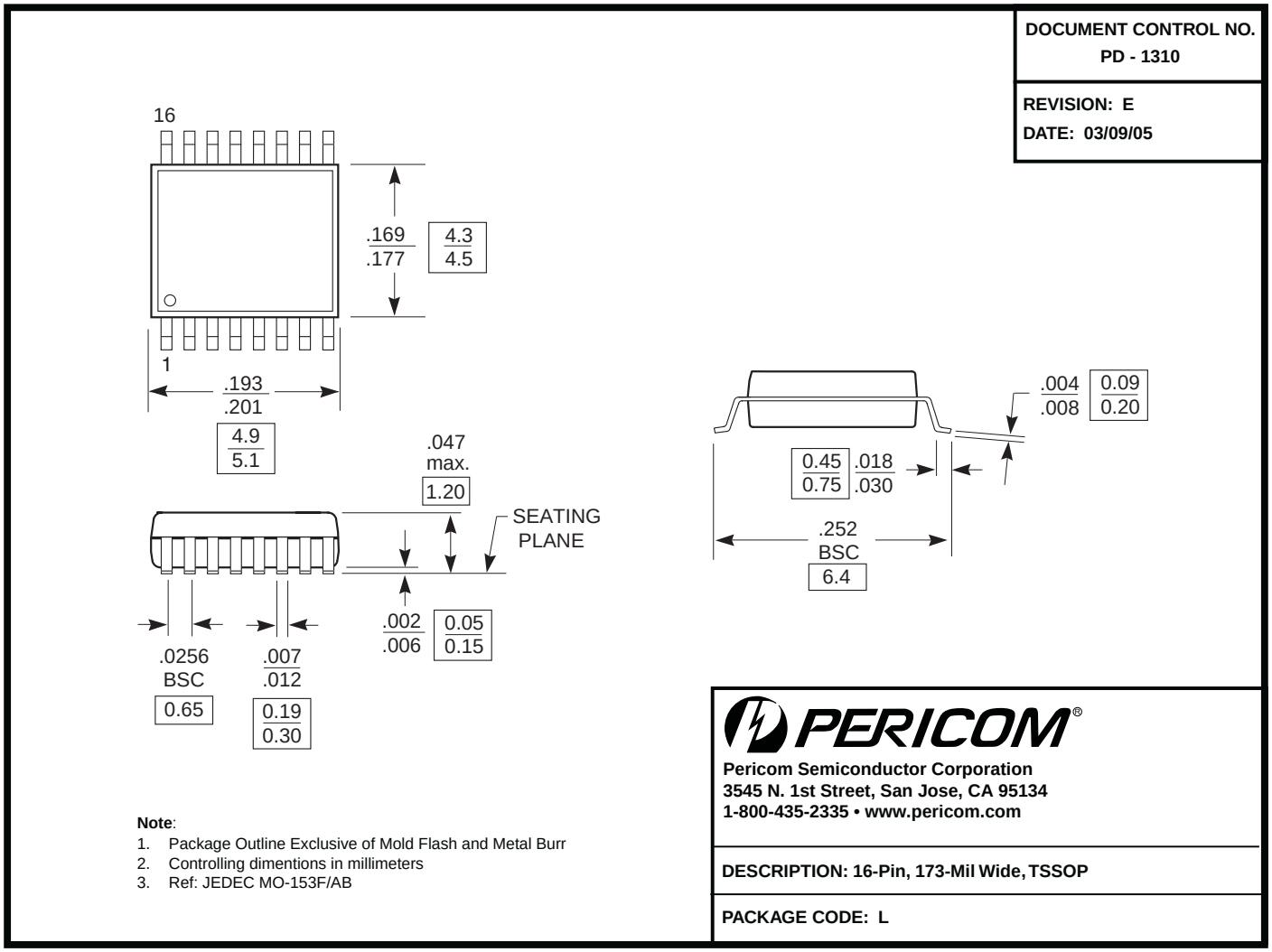
Parameter	Value	Units
Mode of Oscillation	Fundamental AT	
Frequency	25	MHz
Frequency Tolerance	±20	PPM
Temperature and Aging Stability	±30	
Load Cap	20	pF
Equivelent Series Resistance	35	Ω
Drive Level	100	µW

3.3V Differential Driver Termination



A general interface is shown above. In a 100Ω differential transmission line environment, drivers require a matched load termination of 100Ω across near the receiver input.

Package Mechanical: 16-Pin, TSSOP (L)



Ordering Information[1-3]

Ordering Code	Package Code	PackageType
PI6C557-10LE	L	Pb-free & Green, 16-Pin TSSOP

Note:

1. Thermal characteristics and package top marking information can be found at http://www.pericom.com/packaging/
2. E = lead-free and green packaging
3. Adding an X suffix = tape/reel