

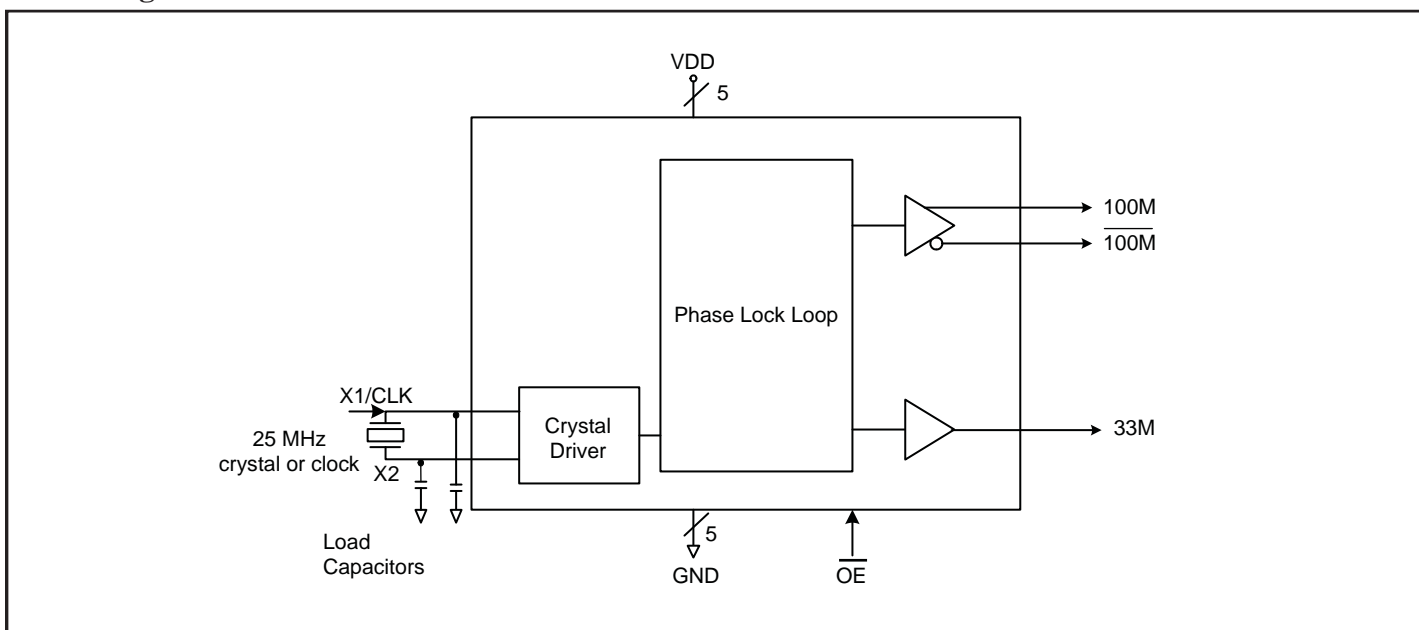
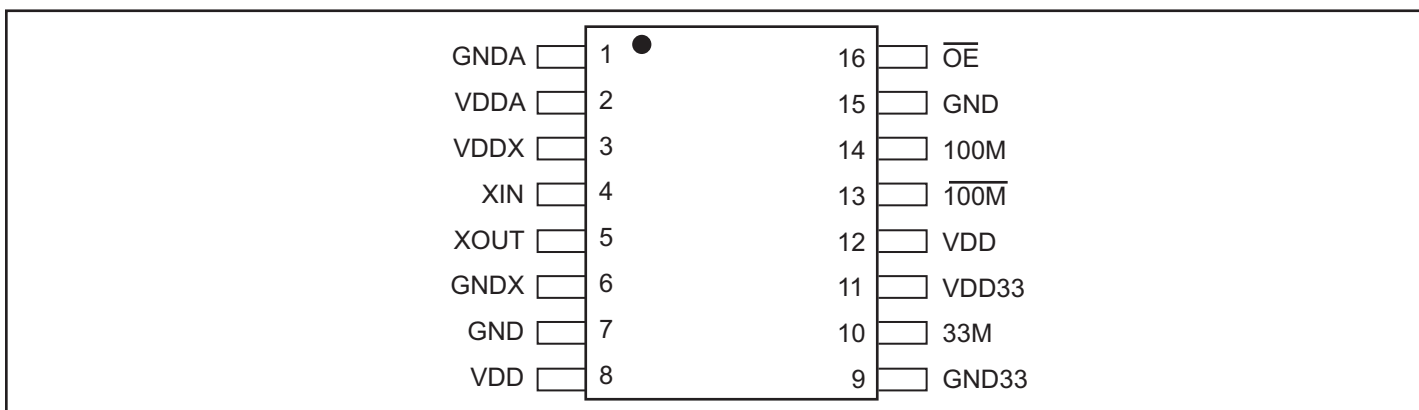
**Product Features**

- 100MHz Differential Output, 33MHz LVCMOS
- Supply voltage of 3.3V  $\pm 5\%$
- 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 LVC MOS 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 0.01 $\mu$ F should be connected between each V<sub>DD</sub> pin and the ground plane and placed as close to the V<sub>DD</sub> pin as possible.

## Electrical Specifications

### Maximum Ratings

Supply Voltage to Ground Potential.....	5.5V
All Inputs and Outputs .....	-0.5V to V <sub>DD</sub> +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<sub>DD</sub> = 3.3V ± 5%, T<sub>A</sub> = -40°C to +85°C)

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

**Notes:**

1. Single edge is monotonic when transitioning through region.

**100MHz Differential DC Characteristics** ( $V_{DD} = 3.3V \pm 5\%$ ,  $T_A = -40^{\circ}C$  to  $+85^{\circ}C$ )

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** ( $V_{DD} = 3.3V \pm 5\%$ ,  $T_A = -40^{\circ}C$  to  $+85^{\circ}C$ )

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 LVC MOS DC Characteristics** ( $V_{DD} = 3.3V \pm 5\%$ ,  $T_A = -40^{\circ}C$  to  $+85^{\circ}C$ )

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		$\Omega$

**33MHz LVC MOS AC Characteristics** ( $V_{DD} = 3.3V \pm 5\%$ ,  $T_A = -40^{\circ}C$  to  $+85^{\circ}C$ )

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

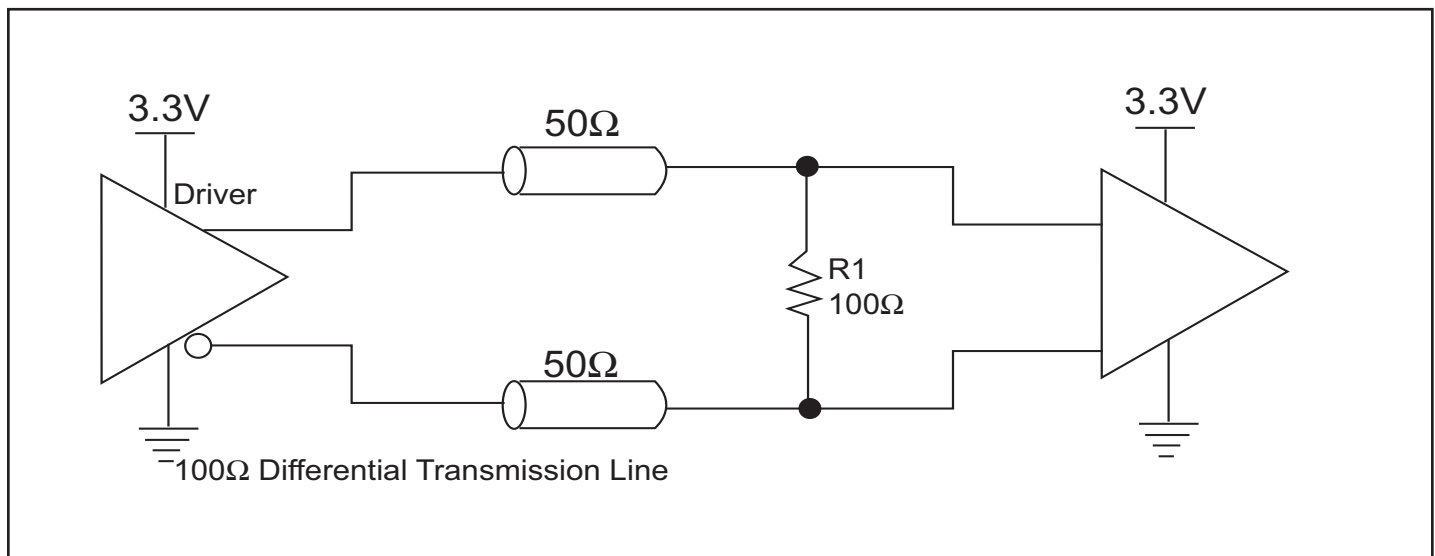
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$\theta_{JA}$	Thermal Resistance Junction to Ambient	Still air			90	$^{\circ}\text{C}/\text{W}$
$\theta_{JC}$	Thermal Resistance Junction to Case				24	$^{\circ}\text{C}/\text{W}$

### Recommended Crystal Specification

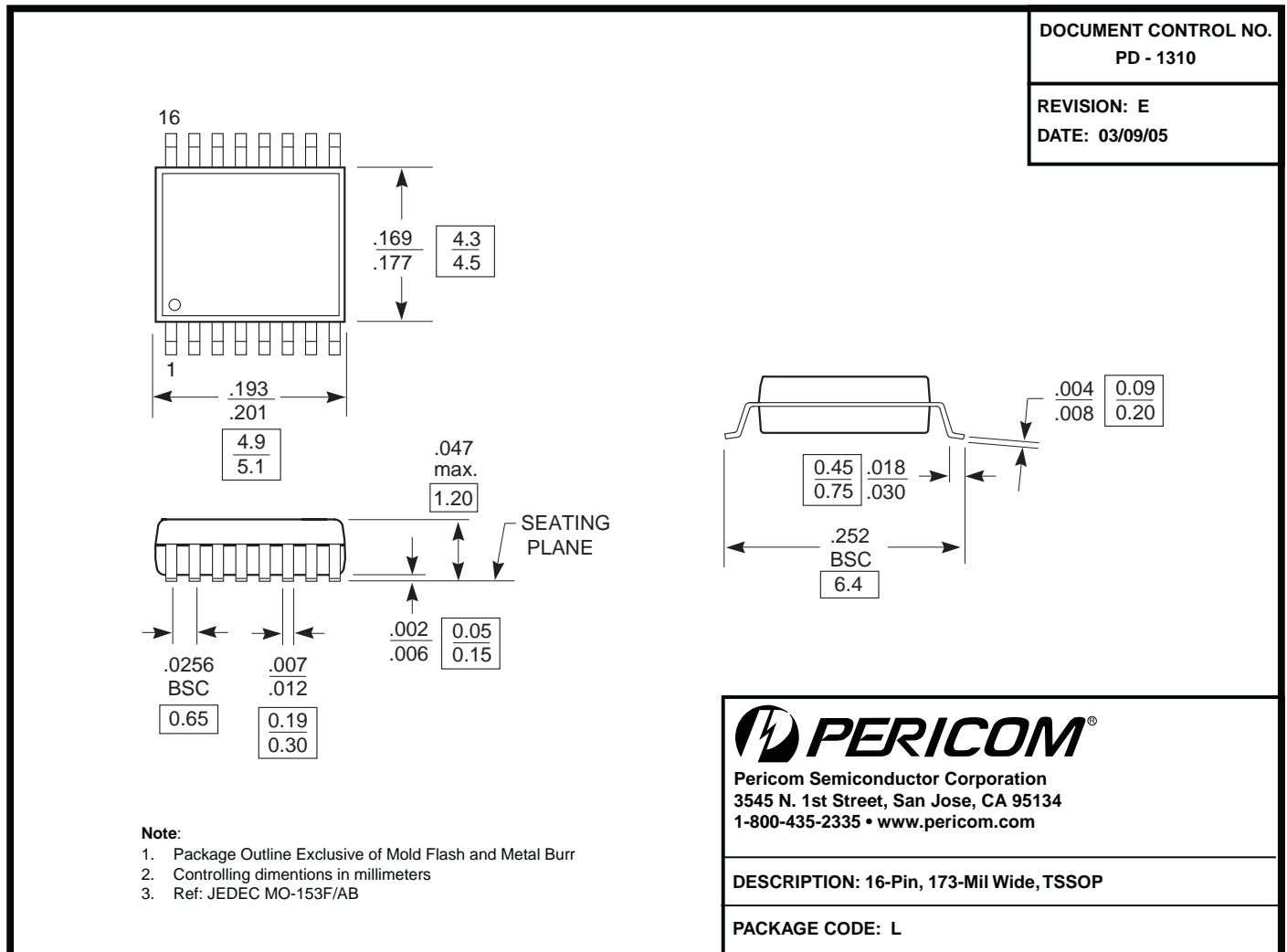
Pericom recommends SRX7278 for optimum performance.

Parameter	Value	Units
Mode of Oscillation	Fundamental AT	
Frequency	25	MHz
Frequency Tolerance	$\pm 20$	PPM
Temperature and Aging Stability	$\pm 30$	
Load Cap	20	pF
Equivalent Series Resistance	35	$\Omega$
Drive Level	100	$\mu\text{W}$

### 3.3V Differential Driver Termination



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

**Package Mechanical: 16-Pin, TSSOP (L)**

**Ordering Information(1-3)**

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

**Note:**

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