

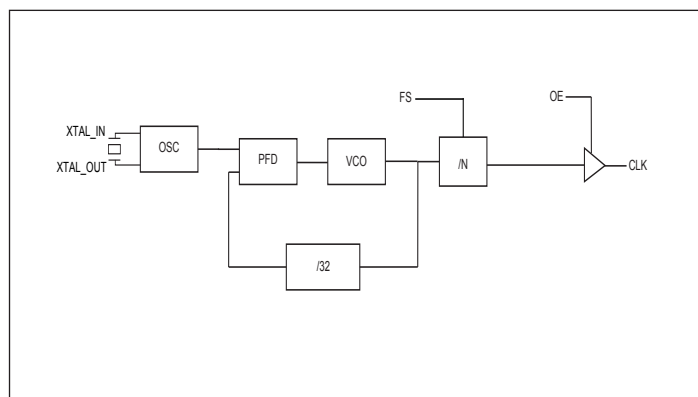
Features

- Single LVC MOS output
- Supports 70MHz - 170MHz output frequency range
- RMS phase jitter @ 155.52MHz, (1.875MHz – 20MHz): 0.2ps (typical)
- Full 3.3V or 2.5V supply modes
- Industrial ambient operating temperature
- Available in lead-free package: 8-TSSOP

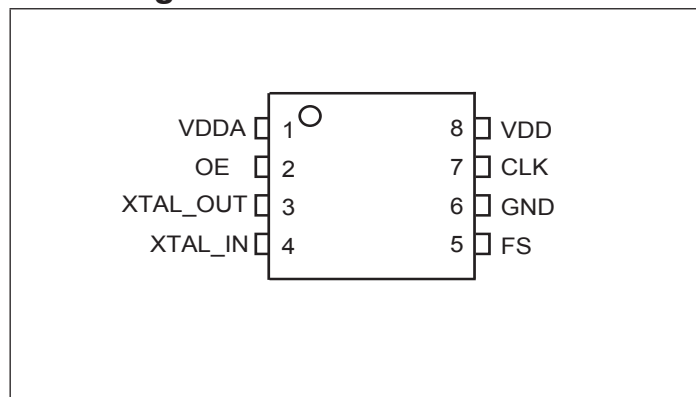
Applications

- Networking systems
- SONET / SDH systems
- Server / Storage Systems

Block Diagram



Pin Configuration



Pinout Table

Pin No.	Pin Name	I/O Type		Description
1	VDDA	Power		Analog Power Supply
2	OE	Input	Pull-up	High: Output enabled; Low: Output high impedance
3, 4	XTAL_OUT, XTAL_IN	Crystal		Crystal Input and Output
5	FS	Input	Pull-down	Output Frequency Select
6	GND	Power		Ground
7	CLK	Output		Output Clock
8	VDD	Power		Power Supply

Output Frequency Table

FS	Crystal Frequency (MHz)	Output Frequency (MHz)
0	20.141601	161.132812
1		80.566406
0	19.53125	156.25
1		78.125
0	19.44	155.52
1		77.76
0	18.75	150
1		75

Typical Crystal Requirement

Parameter	Minimum	Typical	Maximum	Units
Mode of Oscillation	Fundamental			
Frequency	17.5		21.25	MHz
Equivalent Series Resistance (ESR)			50	Ω
Shunt Capacitance			7	pF
Drive Level			1	mW

Recommended Crystal Specification

Pericom recommends:

- a) FLxxx, SMD 3.2x2.5(4P), xxxMHz, CL=18pF, +/-20ppm
<http://www.pericom.com/pdf/datasheets/se/FL.pdf>
- b) b) FYxxxxx, SMD 5x3.2(4P), xxxMHz, CL=18pF, +/-30ppm
http://www.pericom.com/pdf/datasheets/se/FY_F9.pdf

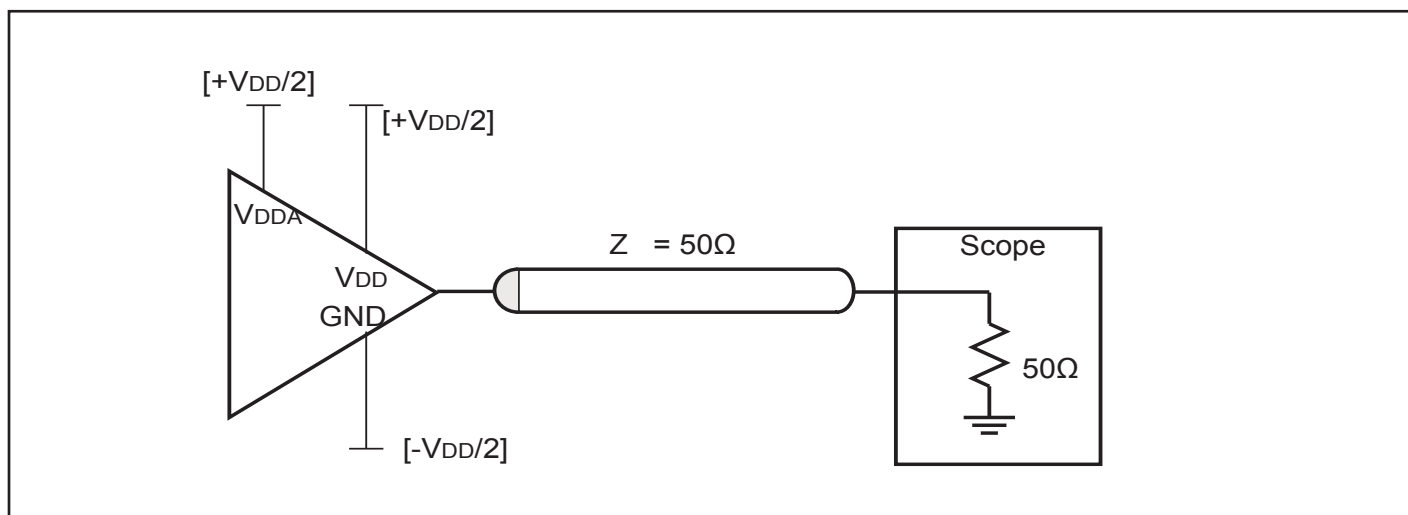
AC Electrical Characteristics, ($V_{DD} = V_{DDA}$, $T_A = -40$ to 85°C)

Symbol	Parameter	Condition	Min.	Typ.	Max	Units
f_{OUT}	Output Frequency		70		170	MHz
$t_{jit(\phi)}$	RMS Phase Jitter, (Random) ⁽¹⁾	155.52MHz, (1.875MHz - 20MHz)		0.2		ps
		77.76MHz, (1.875MHz - 20MHz)		0.25		ps
t_R / t_F	Output Rise/Fall Time	20% to 80%	200		800	ps
ϕ_{DC}	Output Duty Cycle		48		52	%

Note:

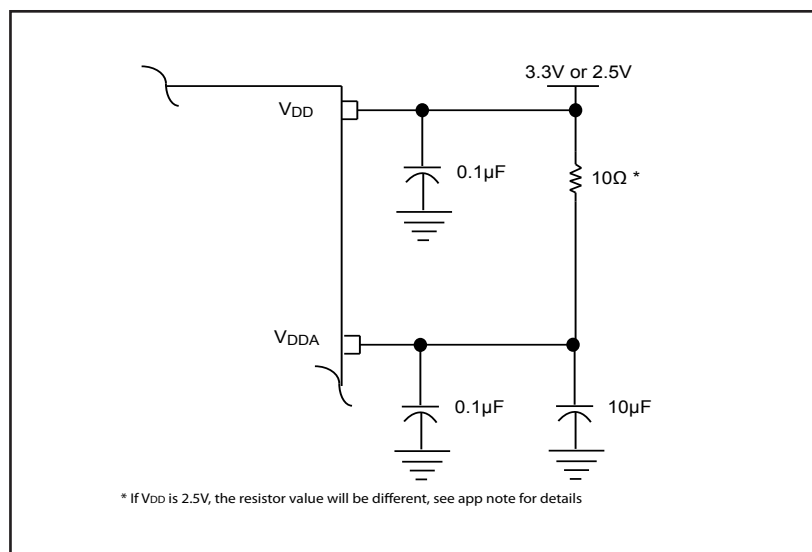
1. Please refer to the Phase Noise Plots.

LVCMOS Test Circuit



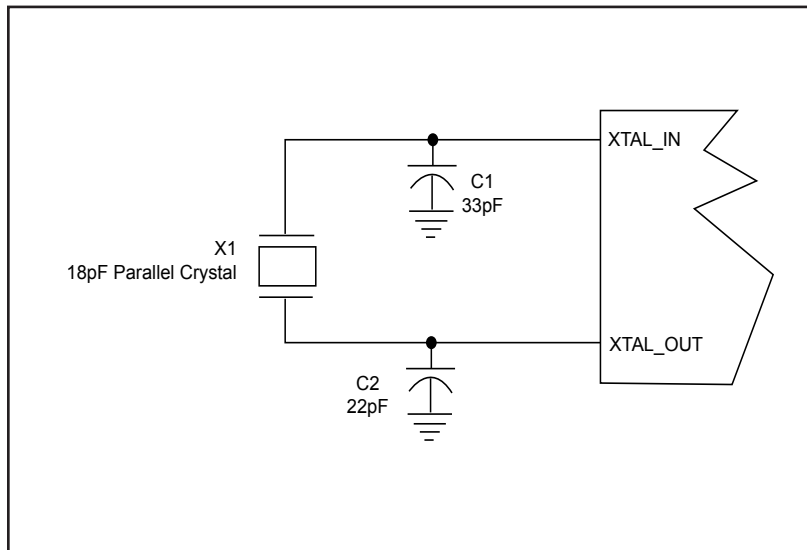
Power Supply Filtering Techniques

As in any high speed analog circuitry, the power supply pins are vulnerable to random noise. To achieve optimum jitter performance, power supply isolation is required. The PI6LC48C51 provides separate power supplies to isolate any high switching noise from the outputs to the internal PLL. V_{DD} and V_{DDA} should be individually connected to the power supply plane through vias, and $0.1\mu\text{F}$ bypass capacitors should be used for each pin. Figure below illustrates this for a generic V_{DD} pin and also shows that V_{DDA} requires that an additional 10Ω resistor along with a $10\mu\text{F}$ bypass capacitor be connected to the V_{DDA} pin.



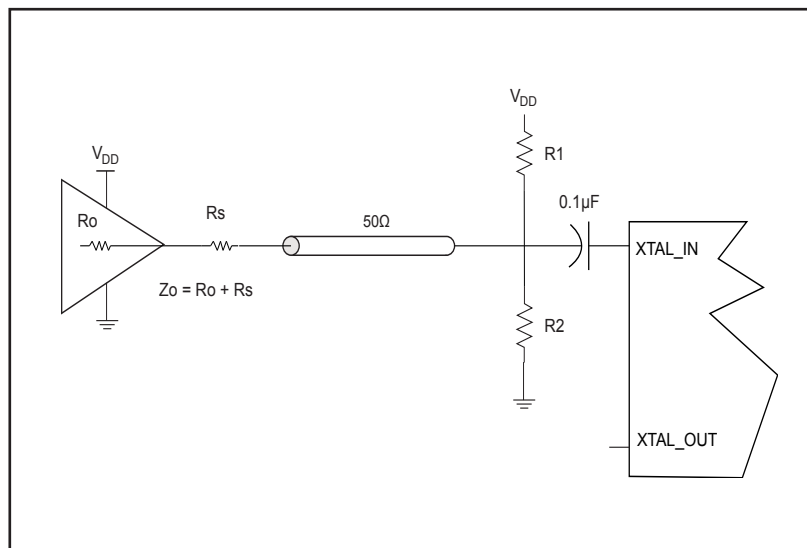
Crystal Input Interface

The clock generator has been characterized with 18pF parallel resonant crystals. The capacitor values shown in the figure below were determined using a 17.5~21.25MHz, 18pF parallel resonant crystal and were chosen to minimize the ppm error.

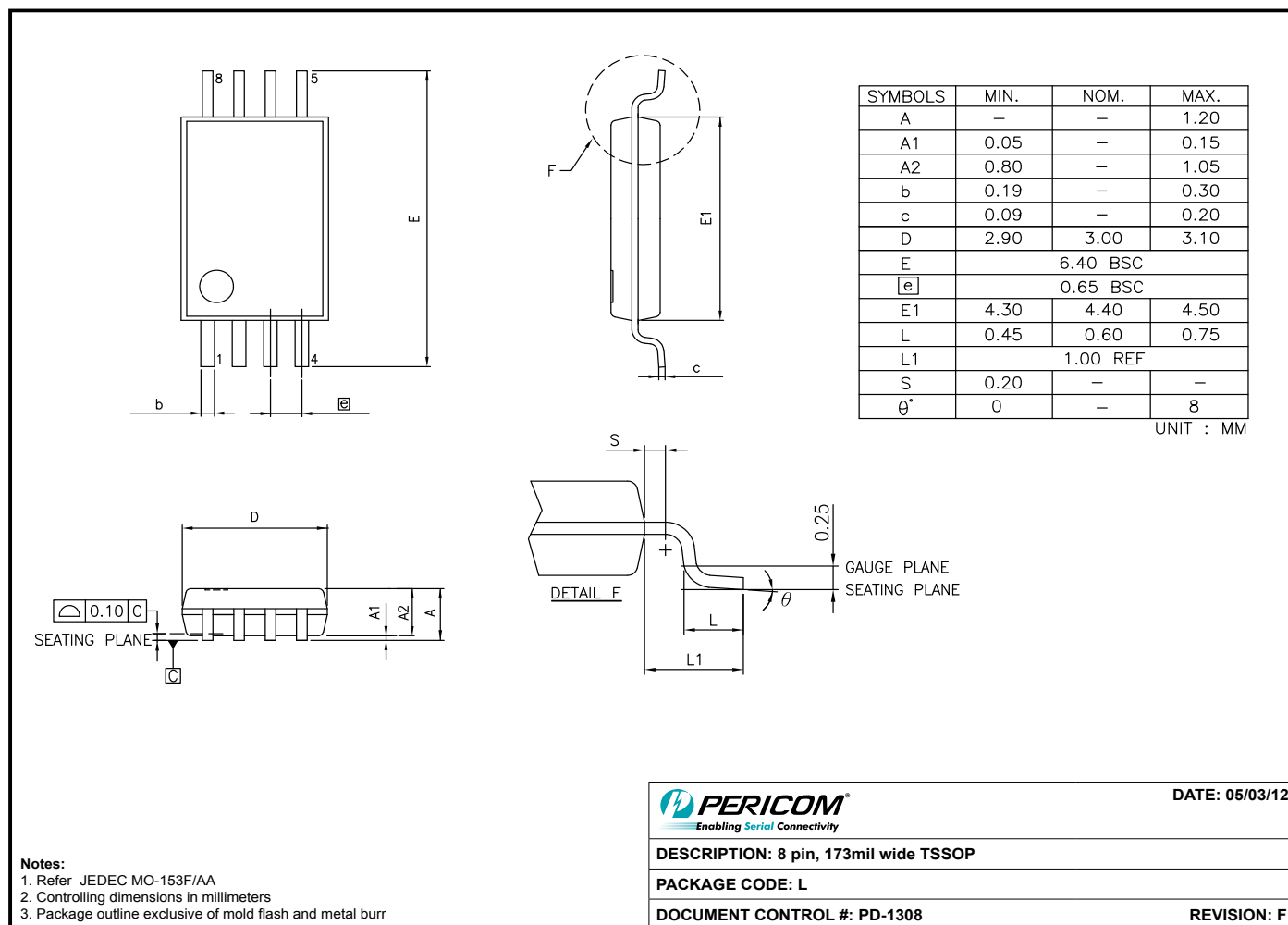


LVCMOS to XTAL Interface

The XTAL_IN input can accept a single-ended LVCMOS signal through an AC coupling capacitor. A general interface diagram is shown in the figure below. The XTAL_OUT pin can be left floating. The input edge rate can be as slow as 10ns. For LVCMOS signals, it is recommended that the amplitude be reduced from full swing to half swing in order to prevent signal interference with the power rail and to reduce noise. This configuration requires that the output impedance of the driver (R_o) plus the series resistance (R_s) equals the transmission line impedance. In addition, matched termination at the crystal input will attenuate the signal in half. This can be done in one of the two ways. First, R_1 and R_2 in parallel should equal the transmission line impedance. For most 50Ω applications, R_1 and R_2 can be 100Ω. This can also be accomplished by removing R_1 and making R_2 50Ω. By overdriving the crystal oscillator, the device will be functional, but note, the device performance is guaranteed by using a quartz crystal.



Packaging Mechanical: 8-Contact TSSOP (L)



12-0370

Ordering Information

Ordering Code	Packaging Type	Package Description	Operating Temperature
PI6LC48C51LIE	L	Pb-free & Green, 8-pin TSSOP	Industrial
PI6LC48C51LIEX	L	Pb-free & Green, 8-pin TSSOP, Tape & Reel	Industrial

Notes:

- Thermal characteristics can be found on the company web site at www.pericom.com/packaging/
- "E" denotes Pb-free and Green
- Adding an "X" at the end of the ordering code denotes tape and reel packaging