PI6C4911505-07

High Performance 1:5 LVPECL Fanout Buffer

Features

- 5 LVPECL outputs
- Up to 1.5GHz output frequency
- Ultra low additive phase jitter: < 0.03 ps (typ) (differential 156.25MHz, 12KHz to 20MHz integration range)
- Two selectable inputs
- Low delay from input to output (Tpd typ. 1.5ns)
- Separate Input output supply voltage for level shifting
- 2.5V / 3.3V power supply
- Industrial temperature support
- TSSOP-20 package

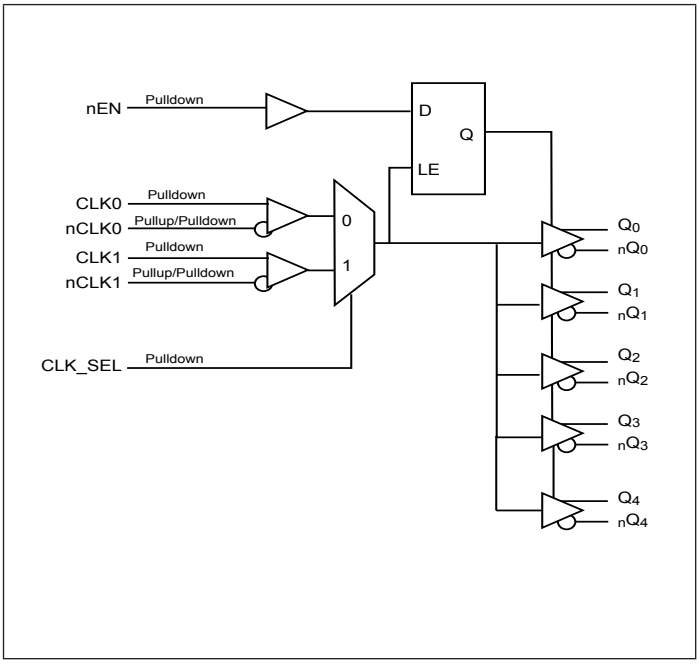
Description

The PI6C4911505-07 is a high performance fanout buffer device-which supports up to 1.5GHz frequency. The device has 2 selectable clock inputs that can accept most differential clock sources. This device is ideal for systems that need to distribute low jitter clock signals to multiple destinations.

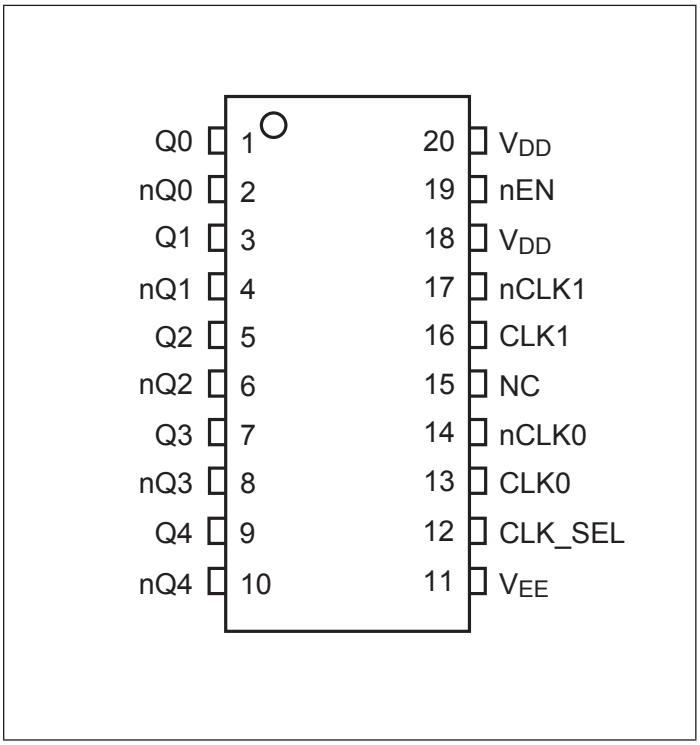
Applications

- Networking systems including switches and Routers
- High frequency backplane based computing and telecom platforms

Block Diagram



Pin Configuration (20-Pin TSSOP)



Pinout Table

Pin #	Pin Name	Type	Description
1, 2	Q0 nQ0	Output	LVPECL output clock
3, 4	Q1 nQ1	Output	LVPECL output clock
5, 6	Q2 nQ2	Output	LVPECL output clock
7, 8	Q3 nQ3	Output	LVPECL output clock
9, 10	Q4 nQ4	Output	LVPECL output clock
11	V_{EE}	Power	Negative power supply
12	CLK_SEL	Input	Clock input source selection pin
13, 14	CLK0 nCLK0	Input	Differential clock input
15	NC	-	No Connect
16, 17	CLK1 nCLK1	Input	Differential clock input
18, 20	V_{DD}	Power	Power supply
19	nEN	Input	Synchronizing clock enable. When LOW, clock outputs enabled. When HIGH, Q outputs are forced low, nQ outputs forced high.

Function Table

Table 1: Input select function

CLK_SEL	Function
0	CLK0, nCLK0
1	CLK1, nCLK1

Table 2: Output Mode select function

nEN	Outputs	
	Q0:Q4	nQ0:nQ4
1	Disabled; LOW	Disabled; HIGH
0	Enabled	Enabled

Table 3: Input select function

Input		Output		Device Mode
CLK0 / CLK1	nCLK0 / nCLK1	Q0:Q4	nQ0:nQ4	
LOW	HIGH	LOW	HIGH	Diff. -> Diff., Non-Inverting
HIGH	LOW	HIGH	LOW	Diff. -> Diff., Non-Inverting
LOW	Biased, Figure 1	LOW	HIGH	S-E -> Diff., Non-Inverting
HIGH	Biased, Figure 1	HIGH	LOW	S-E -> Diff., Non-Inverting
Biased, Figure 1	LOW	HIGH	LOW	S-E -> Diff., Inverting
Biased, Figure 1	HIGH	LOW	HIGH	S-E -> Diff., Inverting

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

Storage temperature.....-55 to +150°C
Supply Voltage to Ground Potential (V_{DD})..... -0.5 to +4.6V
Inputs (Referenced to GND) ..... -0.5 to V_{DD}+0.5V
Clock Output (Referenced to GND)..... -0.5 to V_{DD}+0.5V
Soldering Temperature (Max of 10 seconds) .....+260°C
Latch up.....200mA

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.

Power Supply Characteristics and Operating Conditions

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V_{DD}	Supply Voltage		3.0	3.3	3.6	V
			2.375	2.5	2.625	
I_{DD}	Power Supply Current	Outputs unloaded			160	mA
T_A	Ambient Operating Temperature		-40		85	°C

DC Electrical Specifications - Differential Inputs

Symbol	Parameter		Min.	Typ.	Max.	Units
I_{IH}	Input High current: CLK0, CLK1	Input = V_{DD}			150	uA
	Input High current: nCLK0, nCLK1	Input = V_{DD}			150	uA
I_{IL}	Input Low current: CLK0, CLK1	Input = GND	-5			uA
	Input Low current: nCLK0, nCLK1	Input = GND	-150			uA
C_{IN}	Input capacitance			4		PF
V_{IH}	Input high voltage				V_{DD}+0.3	V
V_{IL}	Input low voltage		-0.3			V
V_{ID}	Input Differential Amplitude PK-PK		0.15		V_{DD}-0.85	V
V_{CM}	Common model input voltage		V_{EE}+0.5		V_{DD}-0.85	V

DC Electrical Specifications - LVCMOS Inputs

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
I_{IH}	Input High current	Input = V_{DD}			150	uA
I_{IL}	Input Low current	Input = GND	-150			uA
V_{IH}	Input high voltage	V_{DD}=3.3V	2.0		3.765	V
V_{IL}	Input low voltage	V_{DD}=3.3V	-0.3		0.8	V
V_{IH}	Input high voltage	V_{DD}=2.5V	1.7		V_{DD}+0.3	V
V_{IL}	Input low voltage	V_{DD}=2.5V	-0.3		0.7	V

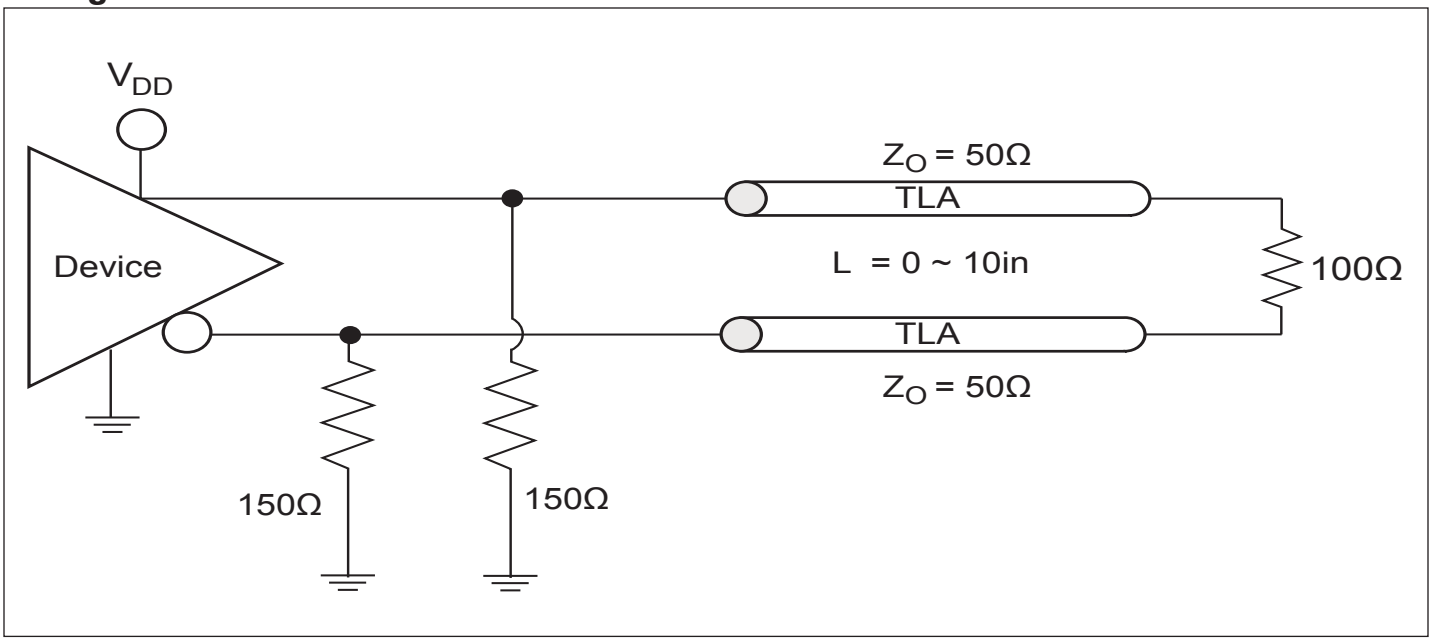
DC Electrical Specifications- LVPECL Outputs

Parameter	Description	Conditions	Min.	Typ.	Max.	Units
V_{OH}	Output High voltage	V_{DD}=3.3V	2.1		2.6	V
		V_{DD}=2.5V	1.3		1.6	
V_{OL}	Output Low voltage	V_{DD}=3.3V	1.3		1.8	V
		V_{DD}=2.5V	0.5		0.8	

AC Electrical Specifications

Parameter	Description	Conditions	Min.	Typ.	Max.	Units
F_{OUT}	Clock output frequency	LVPECL			1500	MHz
T_r	Output rise time	From 20% to 80%		150		ps
T_f	Output fall time	From 80% to 20%		150		ps
T_{ODC}	Output duty cycle	Frequency<650MHz, LVPECL input used	48		52	%
V_{PP}	Output swing Single-ended	LVPECL outputs	400			mV
T_j	Buffer additive jitter RMS	Differential clock input		0.03		ps
T_{SK}	Output Skew				35	ps
T_{PD}	Propagation Delay			1500		ps
$T_{P2P\ Skew}$	Part to Part Skew				150	ps

Configuration Test Load Board Termination for LVPECL



Application Information

Wiring the differenctial input to accept single ended levels

Figure 1 shows how the differential input can be wired to accept single ended levels. The reference voltage V_REF = V_{DD}/2 is generated by the bias resistors R1, R2 and C1. This bias circuit should be located as close as possible to the input pin. The ratio of R1 and R2 might need to be adjusted to postion the V_REF in the center of the input voltage swing. For example, if the input clock swing is only 2.5V and V_{DD} = 3.3V, V_REF should be 1.25V and R1/R2 = 0.609.

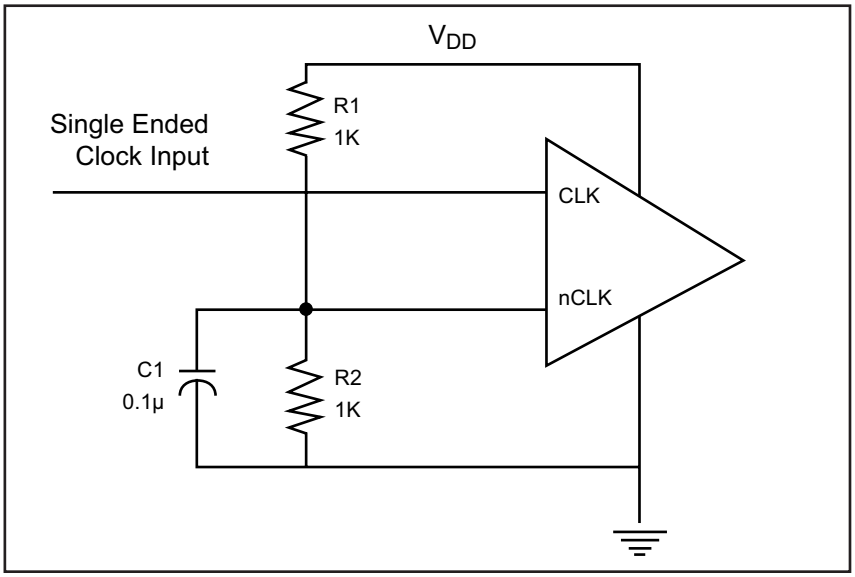
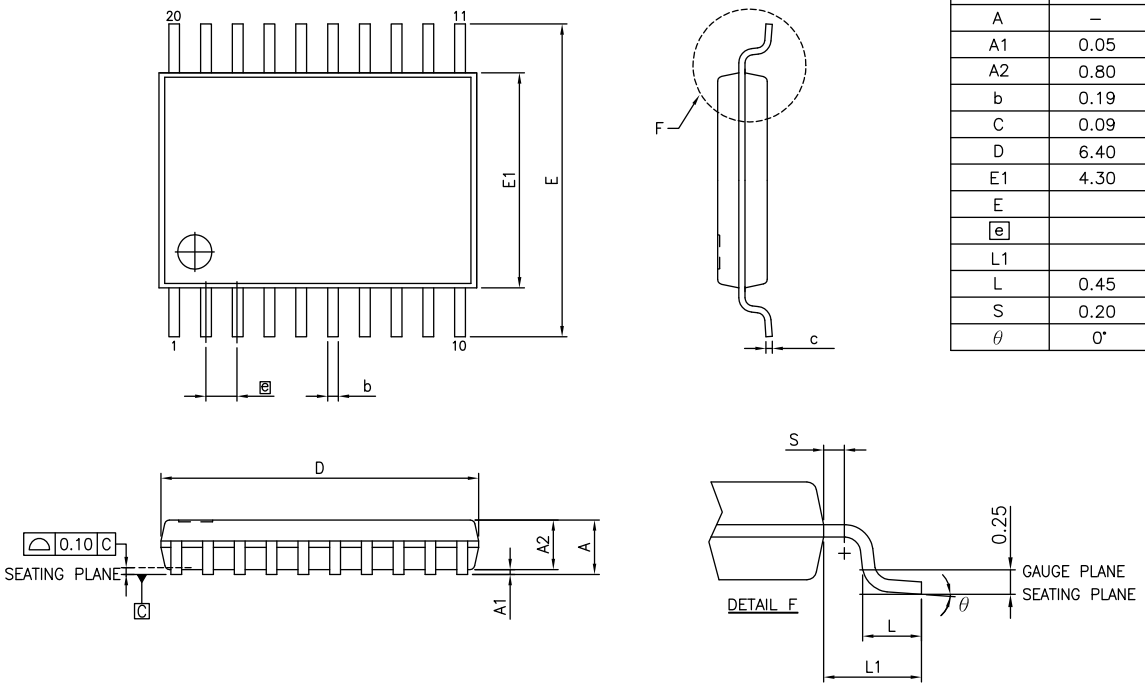


Figure 1. Single-ended input to Differential input device

Packaging Mechanical: 20-Pin TSSOP (L)



VARIATIONS (ALL DIMENSIONS SHOWN IN MM)

SYMBOLS	MIN.	NOM.	MAX.
A	–	–	1.20
A1	0.05	–	0.15
A2	0.80	–	1.05
b	0.19	–	0.30
C	0.09	–	0.20
D	6.40	6.50	6.60
E1	4.30	4.40	4.50
E		6.40 BSC	
e		0.65 BSC	
L1		1.00 REF	
L	0.45	0.60	0.75
S	0.20	–	–
θ	0°	–	8°

lotes:
. Refer JEDEC MO-153F/AC
. Controlling dimensions in millimeters
. Package outline exclusive of mold flash and metal burr

PERICOM Enabling Serial Connectivity — DATE: 05/03/12

DESCRIPTION: 20-pin, 173mil Wide TSSOP

PACKAGE CODE: L

DOCUMENT CONTROL #: PD-1311 — REVISION: F

Ordering Information[1-3]

Ordering Code	Package Code	Package Description
PI6C4911505-07LIE	L	20-pin, TSSOP, Pb-Free and Green

Notes:

1. 1Thermal characteristics can be found on the company web site at www.pericom.com/packaging/
2. E = Pb-free and Green
3. Adding an X suffix = Tape/Reel