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Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



3.3V Low Skew 1-to-4 LVTTL/LVCMOS to LVPECL Fanout Buffer

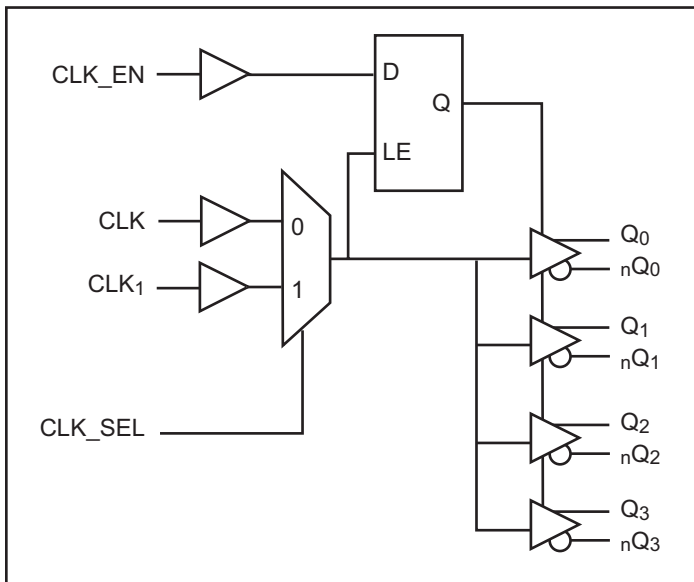
Features

- Maximum operation frequency: 500 MHz
- 4 pair of differential LVPECL outputs
- Selectable CLK₀ and CLK₁ inputs
- CLK₀, CLK₁ accept LVCMOS, LVTTL input level
- Output Skew: 80ps (maximum)
- Part-to-part skew: 150ps (maximum)
- Propagation delay: 1.9ns (maximum)
- 3.3V power supply
- Additive jitter of 36.7fs (typical)
- Operating Temperature: -40°C to 85°C
- Packaging (Pb-free & Green available):
— 20-pin TSSOP (L)

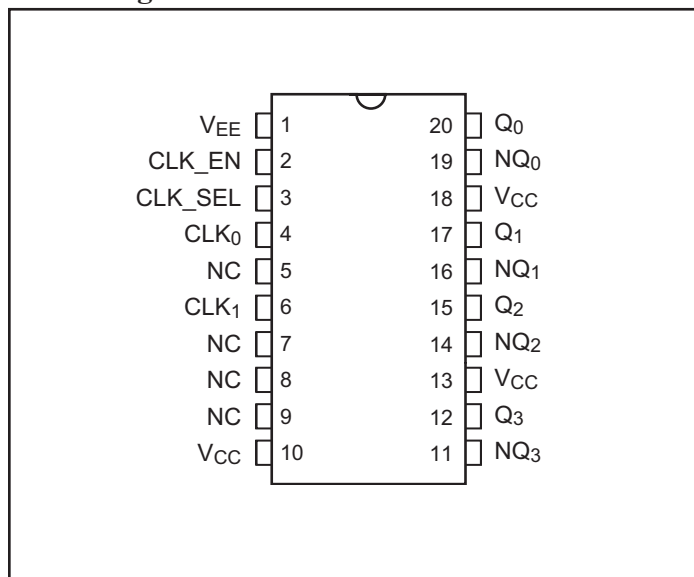
Description

The PI6C48535-01 is a high-performance low-skew LVPECL fanout buffer. PI6C48535-01 features two selectable single-ended clock inputs and translates to four LVPECL outputs. The CLK₀ and CLK₁ inputs accept LVCMOS or LVTTL signals. The outputs are synchronized with input clock during asynchronous assertion/deassertion of CLK_EN pin. PI6C48535-01 is ideal for single-ended LVTTL/LVCMOS to LVPECL translations. Typical clock translation and distribution applications are data-communications and telecommunications.

Block Diagram



Pin Configuration



Pin Description

Name	Pin #	Type	Description
V _{EE}	1	P	Connect to Negative power supply
CLK_EN	2	I_PU	Synchronizing clock enable. When high, clock outputs follow clock input. When low, Qx outputs are forced low, nQx outputs are forced high. LVCMOS/LVTTL level with 50KΩ pull up.
CLK_SEL	3	I_PD	Clock select input. When high, selects CLK ₁ input. When low, selects CLK ₀ input. LVCMOS/LVTTL level with 50KΩ pull down.
CLK ₀	4	I_PD	LVCMOS / LVTTL clock input
CLK ₁	6	I_PD	LVCMOS / LVTTL clock input
NC	5, 7, 8, 9		No internal connection.
V _{CC}	10, 13, 18	P	Connect to 3.3V.
Q _{3, nQ3}	11, 12	O	Differential output pair, LVPECL interface level.
Q _{2, nQ2}	14, 15	O	Differential output pair, LVPECL interface level.
Q _{1, nQ1}	16, 17	O	Differential output pair, LVPECL interface level.
Q _{0, nQ0}	19, 20	O	Differential output pair, LVPECL interface level.

Notes:

1. I = Input, O = Output, P = Power supply connection, I_PD = Input with pull down, I_PU = Input with pull up.

Pin Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
C _{IN}	Input Capacitance				4	pF
R _{pullup}	Input Pullup Resistance			50		KΩ
R _{pulldown}	Input Pulldown Resistance			50		

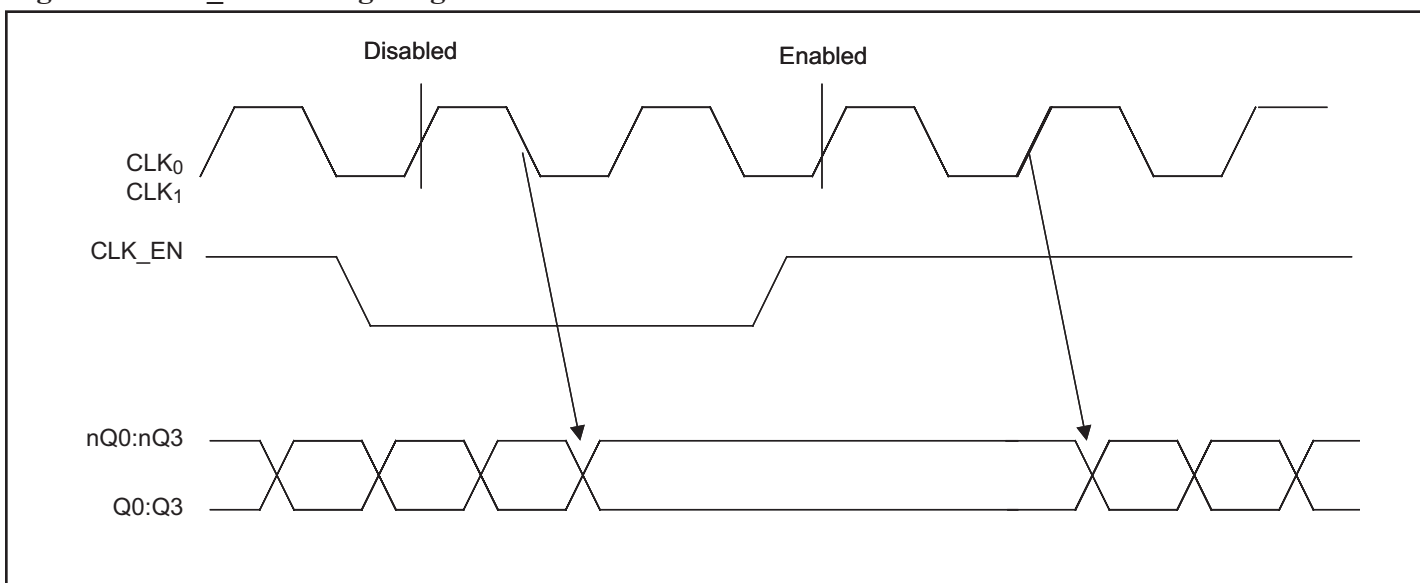
Control Input Function Table

Inputs			Outputs	
CLK_EN	CLK_SEL	Selected Source	Q ₀ :Q ₃	nQ ₀ :nQ ₃
0	0	CLK ₀	Disabled: Low	Disabled: High
0	1	CLK ₁	Disabled: Low	Disabled: High
1	0	CLK ₀	Enabled	Enabled
1	1	CLK ₁	Enabled	Enabled

Notes:

1. After CLK_EN switches, the clock outputs are disabled or enabled following a rising and falling input clock edge as show below.

Figure 1. CLK_EN Timing Diagram



Clock Input Function Table

Inputs	Outputs	
CLK ₀ or CLK ₁	Q ₀ :Q ₃	nQ ₀ :nQ ₃
0	LOW	HIGH
1	HIGH	LOW

Absolute Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V _{CC}	Supply voltage	Referenced to GND			4.6	V
V _{IN}	Input voltage	Referenced to GND	-0.5		V _{CC} +0.5V	
V _{OUT}	Output voltage	Referenced to GND	-0.5		V _{CC} +0.5V	
T _{STG}	Storage temperature		-65		150	°C

Notes:

- Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. These ratings are stress specifications only and correct functional operation of the device at these or any other conditions above those listed in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect product reliability.

Operating Conditions

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V _{CC}	Power Supply Voltage		3.0	3.3	3.6	V
T _A	Ambient Temperature		-40		85	°C
I _{EE}	Power Supply Current	500 MHz			60	mA

LVCMOS/LVTTL DC Characteristics ($T_A = -40^{\circ}\text{C}$ to 85°C , $V_{CC} = 3.0\text{V}$ to 3.6V unless otherwise stated below.)

Symbol	Parameter		Conditions	Min.	Typ.	Max.	Units
V_{IH}	Input High Voltage	CLK ₀ , CLK ₁ , CLK_EN, CLK_SEL		2		$V_{CC}+0.3$	V
V_{IL}	Input Low Voltage	CLK ₀ , CLK ₁		-0.3		1.3	V
		CLK_EN, CLK_SEL		-0.3		0.8	V
I_{IH}	Input High Current	CLK ₀ , CLK ₁ , CLK_SEL	$V_{IN} = V_{CC} = 3.6\text{V}$			150	uA
		CLK_EN	$V_{IN} = V_{CC} = 3.6\text{V}$			5	uA
I_{IL}	Input Low Current	CLK ₀ , CLK ₁ , CLK_SEL	$V_{IN} = 0\text{V}$, $V_{CC} = 3.6\text{V}$	-5			uA
		CLK_EN	$V_{IN} = 0\text{V}$, $V_{CC} = 3.6\text{V}$	-150			uA

LVPECL DC Characteristics ($T_A = -40^{\circ}\text{C}$ to 85°C , $V_{CC} = 3.0\text{V}$ to 3.6V unless otherwise stated below.)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V_{OH}	Output High Voltage ⁽¹⁾		$V_{CC}-1.4$		$V_{CC}-0.9$	V
V_{OL}	Output Low Voltage ⁽¹⁾		$V_{CC}-2.0$		$V_{CC}-1.7$	
V_{SWING}	Peak-to-peak Output Voltage Swing		0.6		1.0	

Notes:

1. Outputs terminated with 50Ω to $V_{CC}-2.0\text{V}$

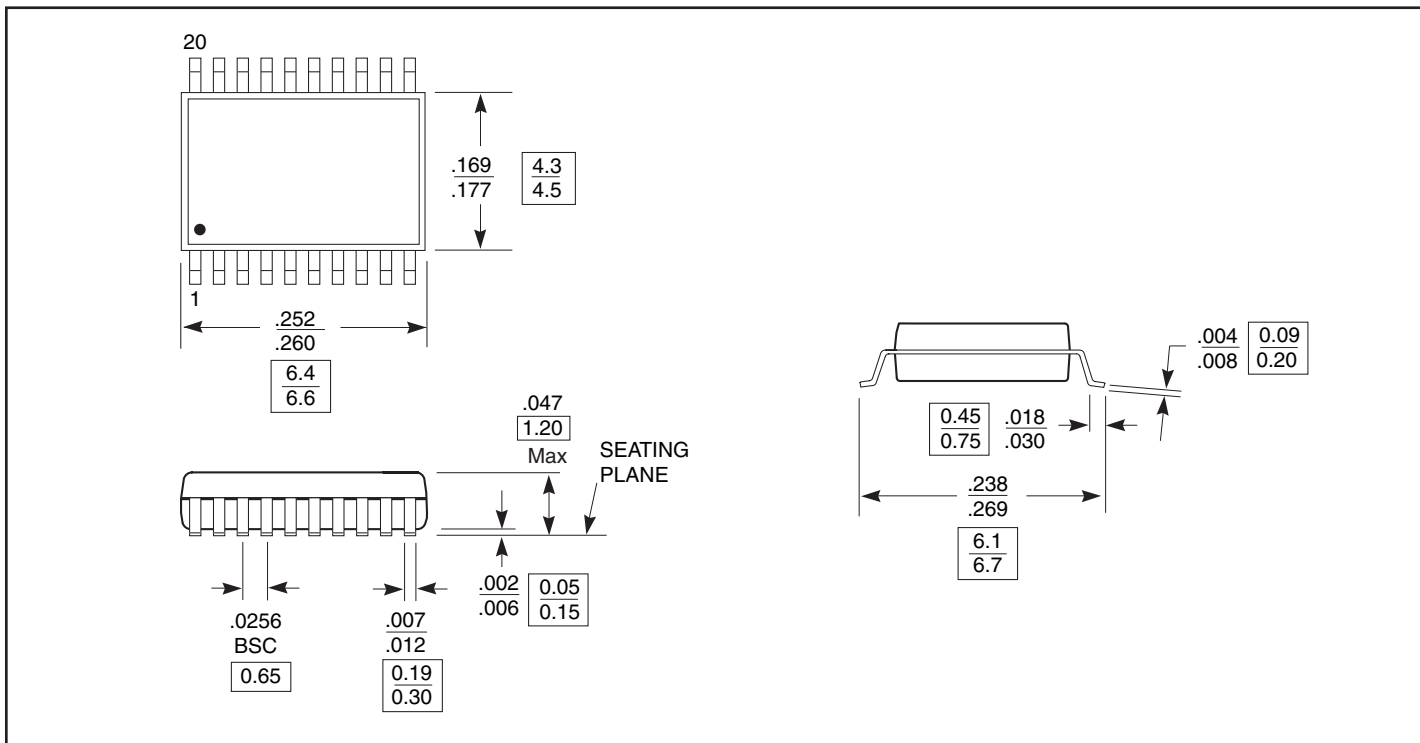
AC Characteristics ($T_A = -40^{\circ}\text{C}$ to 85°C , $V_{CC} = 3.0\text{V}$ to 3.6V)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
f_{max}	Output Frequency				500	MHz
t_{pd}	Propagation Delay ⁽¹⁾		1.0		1.9	ns
$T_{sk(o)}$	Output-to-output Skew ⁽²⁾				80	ps
$T_{sk(pp)}$	Part-to-part Skew ⁽³⁾				150	
t_r/t_f	Output Rise/Fall time	20% - 80%	80		400	
odc	Output Duty Cycle		40		60	%
J_{add}	Additive Jitter	At 155.25MHz over 12kHz to 20MHz		36.7		fs

Notes:

1. Measured from the $V_{CC}/2$ of the input to the differential output crossing point
2. Defined as skew between outputs at the same supply voltage and with equal load condition. Measured at the outputs differential crossing point.
3. Defined as skew between outputs on different parts operating at the same supply voltage and with equal load condition. Measured at the outputs differential crossing point.
4. All parameters are measured at 500 MHz unless noted otherwise

Packaging Mechanical: 20-Pin TSSOP (L)



Ordering Information

Ordering Code	Package Code	Package Description
PI6C48535-01LE	L	Pb-free & Green 20-pin 173-mil wide TSSOP

Notes:

- Thermal characteristics can be found on the company web site at www.pericom.com/packaging/
- E = Pb-free & Green
- X suffix = Tape/Reel