

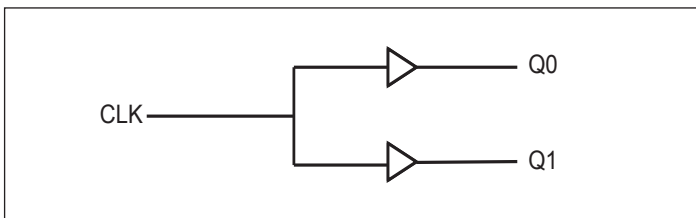
PI6C49X0202

Low Skew, 1-To-2 LVCMOS/LVTTL Fanout Buffer

Description

The DIODES PI6C49X0202 is a low skew, 1-to-2 LVCMOS/LVTTL High Performance Fanout Buffer. The PI6C49X0202 has a single ended clock input. The single ended clock input accepts LVCMOS or LVTTL input levels. The PI6C49X0202 features a pair of LVCMOS/LVTTL outputs. Guaranteed output and part-to-part skew characteristics make the PI6C49X0202 ideal for clock distribution applications demanding well defined performance and repeatability.

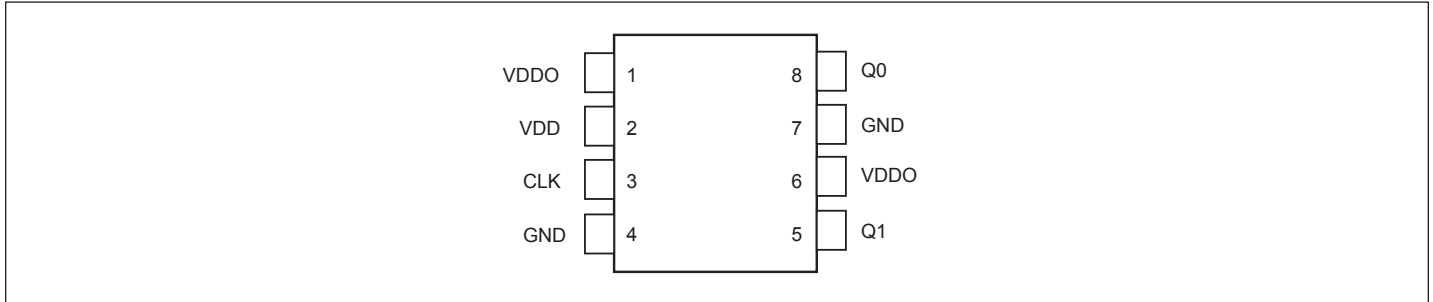
Block Diagram



Features

- 2 LVCMOS/LVTTL Outputs
- LVCMOS/LVTTL Clock Input Accepts LVCMOS or LVTTL Input Levels
- Maximum Output Frequency: 250MHz
- Output Skew: 25ps (typical)
- Part-to-Part Skew: 250ps (typical)
- Full 3.3V, 2.5V Operation Modes
- Ambient Operating Temperature: -40°C to 85°C
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. “Green” Device (Note 3)
- For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative.
<https://www.diodes.com/quality/product-definitions/>
- Packaging (Pb-free & Green):
 - 8-pin, SOIC (W)

Pin Configuration



Pin Descriptions

Pin#	Pin Name	Type		Pin Description
1, 6	VDDO	Power		Output supply pins.
2	VDD	Power		Core supply pin.
3	CLK	Input	Pulldown	LVC MOS/LVTTL clock input.
4, 7	GND	Power		Power supply ground.
5	Q1	Output		Single clock output. LVC MOS/LVTTL interface levels.
8	Q0	Output		Single clock output. LVC MOS/LVTTL interface levels.

Note: Pulldown refer to internal input resistors, typical values in Pin Characteristics table.

Pin Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units
C_N	Capacitance		4		pF
$R_{PULLDOWN}$	Input Pulldown Resistor		51		k Ω
R_{OUT}	Output Impedance	5	7	12	Ω

Maximum Ratings

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

Maximum Supply Voltage, VDD, VDDO.....	4.6V
Inputs, V _I	-0.5V to VDD +0.5V
Output, V _O	-0.5V to VDDO +0.5V
Storage Temperature	-65°C to 150°C
ESD Protection (HBM).....	2000V

Note:

Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These ratings are stress specifications only. Functional operation of product at these conditions or any conditions beyond those listed in the DC Characteristics or AC Characteristics is not implied. Exposure to absolute maximum rating conditions for extended periods may affect product reliability.

Power Supply DC Characteristics

T_A = -40°C to 85°C

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
VDD	Core Supply Voltage	3.3V Operation	3.135	3.3	3.465	V
		2.5V Operation	2.375	2.5	2.625	
VDDO	Output Power Supply Voltage	3.3V Supply	3.135	3.3	3.465	V
		2.5V Supply	2.375	2.5	2.625	
IDD	Power Supply Current				5	mA
IDDO	Output Supply Current	Unloaded, 25MHz			6.5	mA

Note: Parameters measured up to f_{max} unless otherwise noted.

LVC MOS/LVTTL DC Characteristics

T_A = -40°C to 85°C

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V _{IH}	Input High Voltage	VDD = 3.3V	2		VDD+0.3	V
		VDD = 2.5V	1.7		VDD+0.3	
V _{IL}	Input Low Voltage	VDD = 3.3V	-0.3		0.8	V
		VDD = 2.5V	-0.3		0.8	
I _{IH}	Input High Current	VDD = V _{IN} = 3.465V			100	μA
		VDD = V _{IN} = 2.625V			80	
I _{IL}	Input Low Current	VDD = 3.465V, V _{IN} = 0V	-5			μA
		VDD = 2.625V, V _{IN} = 0V	-5			
V _{OH}	Output High Voltage	VDDO = 3.3V I _{OH} = -100μA	2.9			V
		VDDO = 2.5V I _{OH} = -100μA	2.2			V
V _{OL}	Output Low Voltage	VDDO = 3.3V I _{OL} = 100μA			0.2	V
		VDDO = 2.5V I _{OL} = 100μA			0.2	V

AC Characteristics

VDD = 3.3V ± 5%, T_A = -40°C to 85°C

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
f _{MAX}	Output Frequency	VDDO = 3.3V	4		250	MHz
		VDDO = 2.5V	4		250	
t _{pLH}	Propagation Delay, Low-to-High ⁽¹⁾	VDDO = 3.3V, f ≤ 250MHz	1.4		2.2	ns
		VDDO = 2.5V, f ≤ 250MHz	1.5		3.0	
tsk(o)	Output Skew ⁽²⁾			25	80	ps
tsk(pp)	Part-to-Part Skew ⁽³⁾			250	800	ps
t _R	Output Rise Time ⁽⁴⁾	VDDO = 3.3V	100	300	400	ps
		VDDO = 2.5V	100	350	500	
t _F	Output Fall Time ⁽⁴⁾	VDDO = 3.3V	100	300	400	ps
		VDDO = 2.5V	100	350	500	
odc	Output Duty Cycle ⁽⁵⁾	f ≤ 133MHz	48		52	%
		133MHz < f ≤ 200MHz	47		53	%
		200MHz < f ≤ 250MHz	47		53	%
t _{jit}	Additive RMS Jitter	156.25MHz (@12kHz to 20MHz)		0.1		ps
		125MHz (@12kHz to 20MHz)		0.07		ps

Note:

Parameters measured at f_{MAX} unless otherwise noted.

1. Measured from VDD / 2 of the input to VDDO / 2 of the output.
2. Defined as skew between outputs at the same supply voltage and with equal load conditions. Measured at VDDO / 2.
3. Defined as skew between outputs on different devices operating at the same supply voltages and with equal load conditions. Using the same type of inputs on each device, the outputs are measured at VDDO / 2.
4. Defined from 20% to 80%
5. Measured at VDDO / 2

AC Characteristics

VDD = 2.5V ± 5%, T_A = -40°C to 85°C

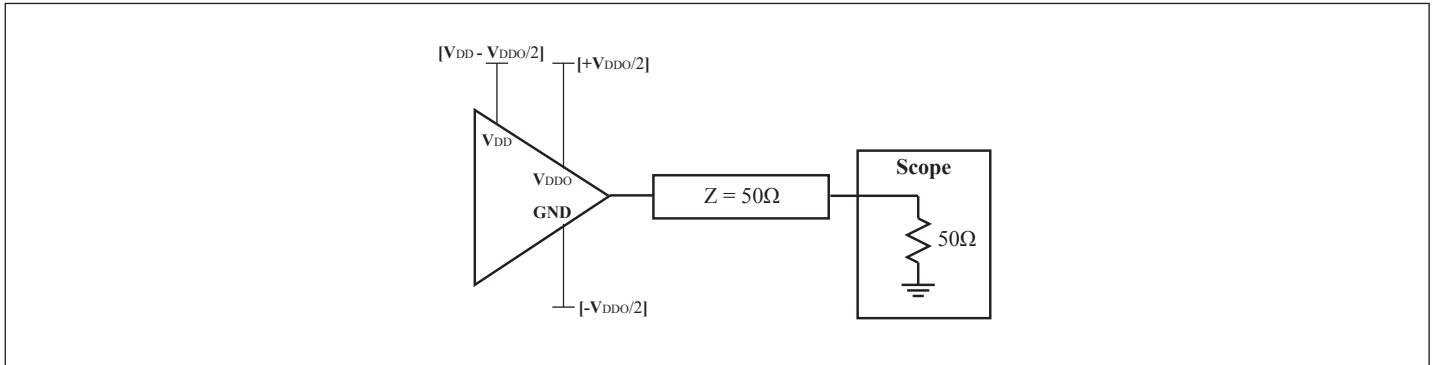
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
f _{MAX}	Output Frequency	VDDO = 2.5V	4		250	MHz
t _{PLH}	Propagation Delay, Low-to-High ⁽¹⁾	VDDO = 2.5V, f ≤ 250MHz	1.5		2.8	ns
tsk(o)	Output Skew ⁽²⁾			25	75	ps
tsk(pp)	Part-to-Part Skew ⁽³⁾			250	800	ps
t _R	Output Rise Time ⁽⁴⁾	VDDO = 2.5V	100	350	500	ps
t _F	Output Fall Time ⁽⁴⁾	VDDO = 2.5V	100	350	500	ps
odc	Output Duty Cycle ⁽⁵⁾	f ≤ 133MHz	48		52	%
		133MHz < f ≤ 200MHz	47		53	%
		200MHz < f ≤ 250MHz	42		58	%
t _{jit}	Additive RMS Jitter	156.25MHz (@12kHz to 20MHz)		0.1		ps
		125MHz (@12kHz to 20MHz)		0.07		ps

Note:

Parameters measured at f_{MAX} unless otherwise noted.

1. Measured from VDD / 2 of the input to VDDO / 2 of the output.
2. Defined as skew between outputs at the same supply voltage and with equal load conditions. Measured at VDDO / 2.
3. Defined as skew between outputs on different devices operating at the same supply voltages and with equal load conditions. Using the same type of inputs on each device, the outputs are measured at VDDO / 2.
4. Defined from 20% to 80%
5. Measured at VDDO / 2

AC Test Circuit Load



PI6C49X0202

Part Marking

PI6C49X
0202WIE
YYYWWX^X
○

Y: Die Rev
YY: Year
WW: Workweek
1st X: Assembly Code
2nd X: Fab Code

Packaging Mechanical

8-SOIC (W)

SYMBOLS	MIN.	NOM.	MAX.
A	—	—	1.75
A1	0.10	—	0.25
A2	1.25	—	—
b	0.31	—	0.51
c	0.10	—	0.25
D	4.80	4.90	5.00
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
e	1.27 BSC		
L	0.40	—	1.27
h	0.25	—	0.50
θ°	0	—	8

Recommended Land Pattern

NOTE :
 1. ALL DIMENSIONS ARE IN mm. ANGLES IN DEGREES
 2. DIMENSIONS EXCLUDE BURRS, MOLD FLASH OR PROTRUSIONS
 3. REFER JEDEC MS-012
 4. RECOMMENDED LAND PATTERN IS FOR REFERENCE ONLY.

20-1273

		DATE: 06/02/20
DESCRIPTION: 8-Pin, 150mil-Wide, SOIC		
PACKAGE CODE: W (W8)		
DOCUMENT CONTROL #: PD-1001		REVISION: H

For latest package info.

please check: <http://www.diodes.com/design/support/packaging/pericom-packaging/packaging-mechanicals-and-thermal-characteristics/>

Ordering Information

Ordering Code	Package Code	Package Description
PI6C49X0202WIEX	W	8-pin, 150mil-Wide (SOIC)

Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. I = Industrial
5. E = Pb-free and Green
6. X suffix = Tape/Reel

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