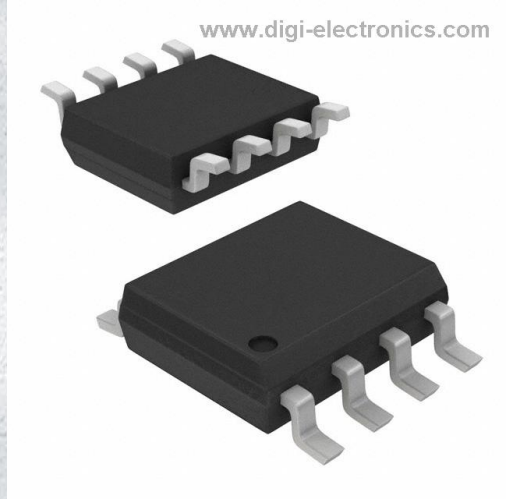
PI6C49X0202WIE Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number	PI6C49X0202WIE-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	PI6C49X0202WIE
Description	IC CLK BUFFER 1:2 250MHZ 8SOIC
Detailed Description	Clock Fanout Buffer (Distribution) IC 1:2 250 MHz 8-SOIC (0.154", 3.90mm Width)

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
PI6C49X0202WIE	Diodes Incorporated
Series:	Product Status:
-	Active
Type:	Number of Circuits:
Fanout Buffer (Distribution)	1
Ratio - Input:Output:	Differential - Input:Output:
1:2	No/No
Input:	Output:
LVCMOS, LVTTL	LVCMOS, LVTTL
Frequency - Max:	Voltage - Supply:
250 MHz	2.375V ~ 3.465V
Operating Temperature:	Mounting Type:
-40°C ~ 85°C	Surface Mount
Package / Case:	Supplier Device Package:
8-SOIC (0.154", 3.90mm Width)	8-SOIC
Base Product Number:	
PI6C49	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8542.39.0001	

A Product Line of
Diodes Incorporated

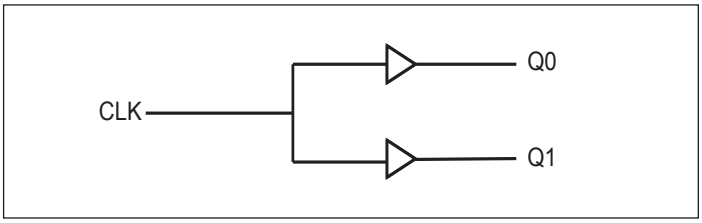
PI6C49X0202

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.

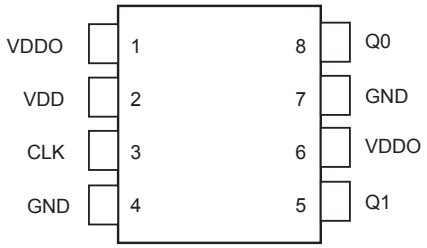
Block Diagram



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 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	LVCMOS/LVTTL clock input.
4, 7	GND	Power		Power supply ground.
5	Q1	Output		Single clock output. LVCMOS/LVTTL interface levels.
8	Q0	Output		Single clock output. LVCMOS/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		kΩ
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.

LVCMOS/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	
tp_{LH}	Propagation Delay, Low-to-High(1)	VDDO = 3.3V, $f \leq 250$MHz	1.4		2.2	ns
		VDDO = 2.5V, $f \leq 250$MHz	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)	$f \leq 133$MHz	48		52	%
		133MHz < $f \leq 200$MHz	47		53	%
		200MHz < $f \leq 250$MHz	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

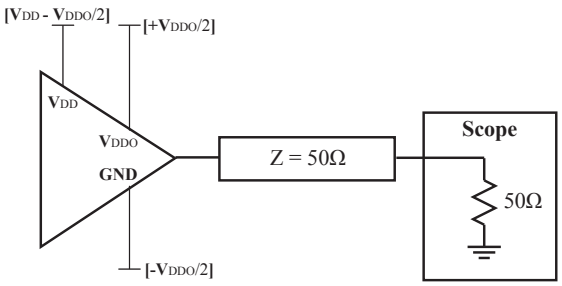
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
f_{MAX}	Output Frequency	VDDO = 2.5V	4		250	MHz
tp_{LH}	Propagation Delay, Low-to-High(1)	VDDO = 2.5V, $f \leq 250$MHz	1.5		2.8	ns
tsk(o)	Output Skew(2)			25	75	ps
tsk(pp)	Part-to-Part Skew(3)			250	800	ps
t_R	Output Rise Time(4)	VDDO = 2.5V	100	350	500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

Note:

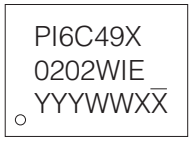
Parameters measured at f_{MAX} unless otherwise noted.

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



Part Marking



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

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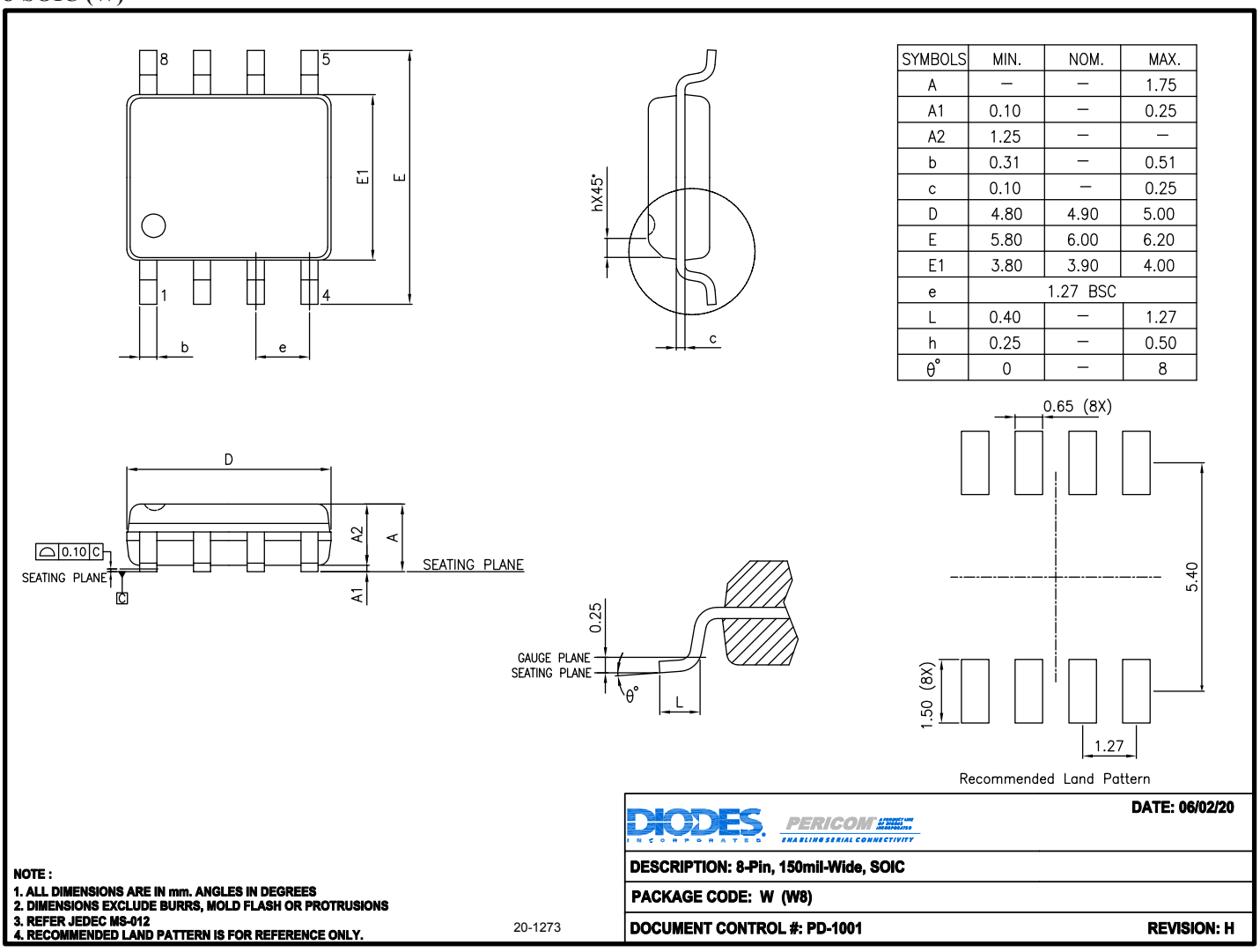
PI6C49X0202

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

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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PI6C49X0202

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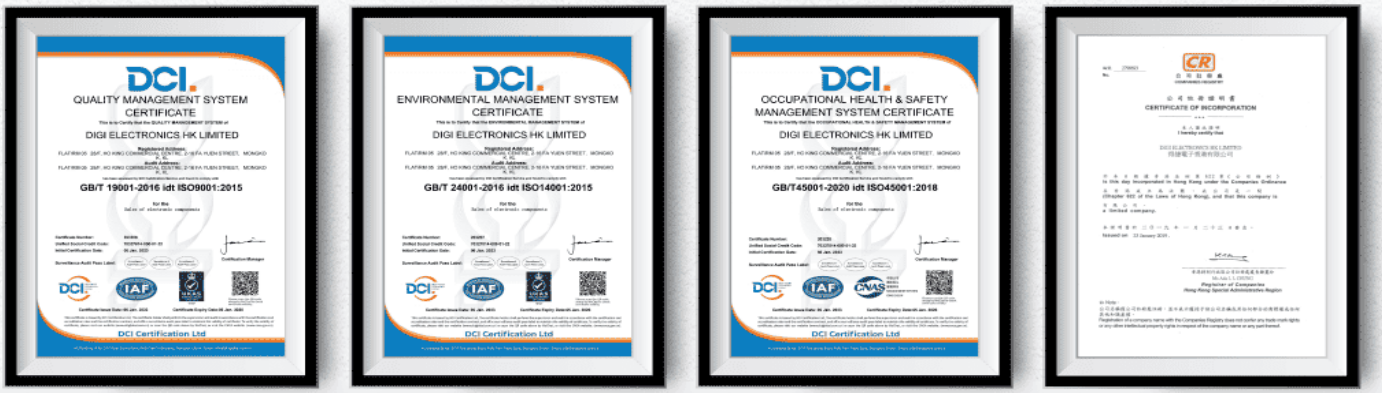

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