



PO74G16245B

1.2v-3.6v, 16-bit Bidirectional Transceiver with 3 state outputs

74 Series Noise Cancellation GHz Logic

FEATURES:

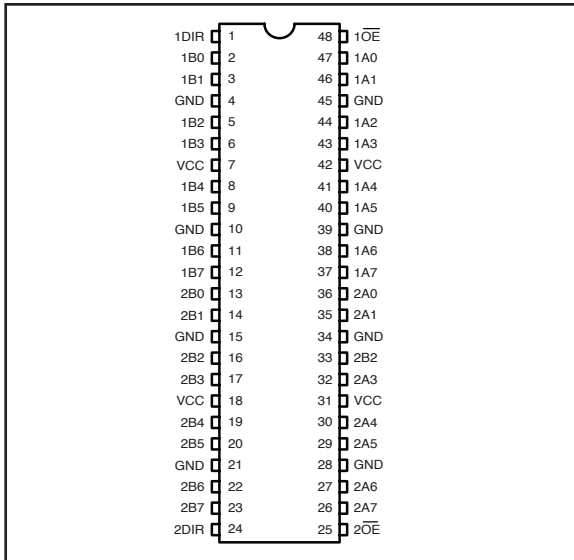
- . Patented technology
- . Operating frequency up to 1GHz with 2pf load
- . Operating frequency up to 730MHz with 5pf load
- . Operating frequency up to 320MHz with 15pf load
- . Operating frequency up to 75MHz with 50pf load
- . VCC Operates from 1.2V to 3.6V
- . Propagation delay < 1.65ns max with 15pf load
- . Low input capacitance: 5pf typical
- . Available in 48pin TSSOP package

DESCRIPTION:

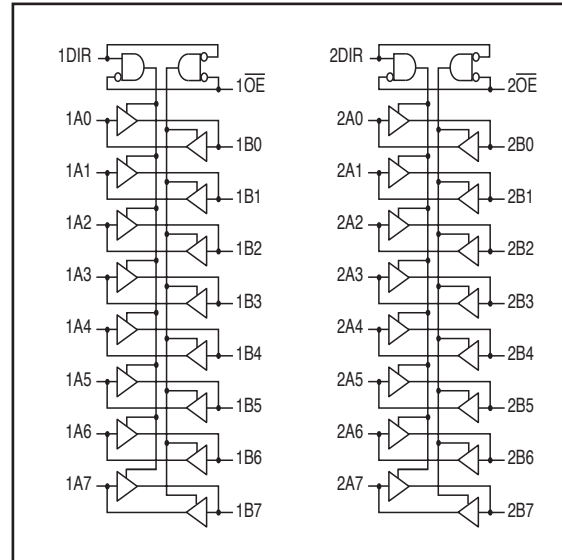
Potato Semiconductor's PO74G16245B is designed for world top performance using submicron CMOS technology to achieve 1GHz TTL /CMOS output frequency with less than 1.65ns propagation delay. This Octal bus buffer gate is designed for 1.2-V to 3.6-V VCC operation.

The PO74G16245B features independent 16-bit Bidirectional Transceiver with 3 state outputs. Each output is disabled when the associated output-enable(OE) input is high.

Pin Configuration



Logic Block Diagram



Pin Description

Pin Name	Description
$\overline{xOE}$	3-State Output Enable Inputs (Active LOW)
xDIR	Direction Control Input
xAx	Side A Inputs or 3-State Inputs
xBx	Side B Outputs or 3-State Outputs
GND	Ground
VCC	Power

Truth Table

Inputs		Outputs
$\overline{xOE}$	xDIR	
L	L	Bus B Data to Bus A
L	H	Bus A Data to Bus B
H	X	Z

**74 Series Noise Cancellation GHz Logic****Maximum Ratings**

Description	Max	Unit
Storage Temperature	-65 to 150	°C
Operation Temperature	-40 to 85	°C
Operation Voltage	-0.5 to +4.6	V
Input Voltage	-0.5 to +V _{CC}	V
Output Voltage	-0.5 to V _{CC} +0.5	V

Note:

stresses greater than 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 specification is not implied.

DC Electrical Characteristics (Over the Operating Range, T_A = -40°C+85°C)

			Min.	Max.	Units
V _{CC}	Supply Voltage	Operating	1.4	3.6	V
		Data retention only	1.2		
V _{IH}	High-level Input Voltage	V _{CC} = 1.2V	V _{CC}		
		V _{CC} = 1.4V to 1.6V	0.65 x V _{CC}		
		V _{CC} = 1.65V to 1.95V	0.65 x V _{CC}		
		V _{CC} = 2.3V to 2.7V	1.7		
		V _{CC} = 3V to 3.6V	2		
V _{IL}	Low-level Input Voltage	V _{CC} = 1.2V		GND	
		V _{CC} = 1.4V to 1.6V		0.35 x V _{CC}	
		V _{CC} = 1.65V to 1.95V		0.35 x V _{CC}	
		V _{CC} = 2.3V to 2.7V		0.7	
		V _{CC} = 3V to 3.6V		0.8	
V _I	Input Voltage		0	3.6	
V _O	Output Voltage	Active State	0	V _{CC}	
		3-State	0	3.6	
I _{OH}	High-level output current	V _{CC} = 1.4V to 1.6V		-4	mA
		V _{CC} = 1.65V to 1.95V		-6	
		V _{CC} = 2.3V to 2.7V		-12	
		V _{CC} = 3V to 3.6V		-24	
I _{OL}	Low-level output current	V _{CC} = 1.4V to 1.6V		4	
		V _{CC} = 1.65V to 1.95V		6	
		V _{CC} = 2.3V to 2.7V		12	
		V _{CC} = 3V to 3.6V		24	
ΔtΔv	Input transition rise or fall rate	V _{CC} = 1.4V to 3.6V		5	ns/V
T _A	Operating free-air temperature		-40	85	°C

**74 Series Noise Cancellation GHz Logic****DC Electrical Characteristics** (Over the Operating Range, $T_A = -40^{\circ}\text{C} + 85^{\circ}\text{C}$)

Parameters		Test Conditions ⁽¹⁾	V_{CC}	Min.	Typ.	Max.	Units
V_{OH}		$I_{OHS} = -4\text{mA}$ $V_{IH} = 0.91\text{V}$	1.4V	1.05			V
		$I_{OHS} = -6\text{mA}$ $V_{IH} = 1.07\text{V}$	1.65V	1.2			
		$I_{OHS} = -12\text{mA}$ $V_{IH} = 1.7\text{V}$	2.3V	1.75			
		$I_{OHS} = -24\text{mA}$ $V_{IH} = 2\text{V}$	3V	2.0			
V_{OL}		$I_{OLS} = 4\text{mA}$ $V_{IL} = 0.49\text{V}$	1.4V			0.4	
		$I_{OLS} = 6\text{mA}$ $V_{IL} = 0.57\text{V}$	1.65V			0.45	
		$I_{OLS} = 12\text{mA}$ $V_{IL} = 0.7\text{V}$	2.3V			0.55	
		$I_{OLS} = 24\text{mA}$ $V_{IL} = 0.8\text{V}$	3V			0.8	
I_I		$V_I = V_{CC}$ or GND	3.6V			± 2.5	μA
I_{OZ}		$V_O = V_{CC}$ or GND	3.6V			± 10	
I_{CC}		$V_I = V_{CC}$ or GND $I_O = 0$	3.6V			± 350	
C_I	Control Inputs	$V_I = V_{CC}$ or GND			3.5		pF
	Data Inputs				5		
C_O	Outputs	$V_O = V_{CC}$ or GND			5		

Notes:1. Typical values are measured at $T_A = 25^{\circ}\text{C}$.



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Switching Characteristics

Parameters	From (Input)	To (Output)	V _{CC} = 1.2V	V _{CC} = 1.5V ± 0.1V	V _{CC} = 1.8V ± 0.15V	V _{CC} = 2.5V ± 0.2V	V _{CC} = 3.3V ± 0.3V	Units
			Typ.	Max	Max	Max	Max	
t _{pd}	A or B	B or A	3.5	3.5	2.9	1.85	1.65	ns
t _{en}	$\overline{\text{OE}}$	B or A	8.4	9.6	7.0	4.3	3.5	
t _{dis}	$\overline{\text{OE}}$	B or A	8.4	9.6	7.0	4.3	3.5	
f _{max} CL=2pf	A or B	B or A		270	300	685	1000	Mhz
f _{max} CL=5pf	A or B	B or A		150	150	390	730	
f _{max} CL=15pf	A or B	B or A		100	130	220	320	
f _{max} CL=50pf	A or B	B or A		45	50	70	75	

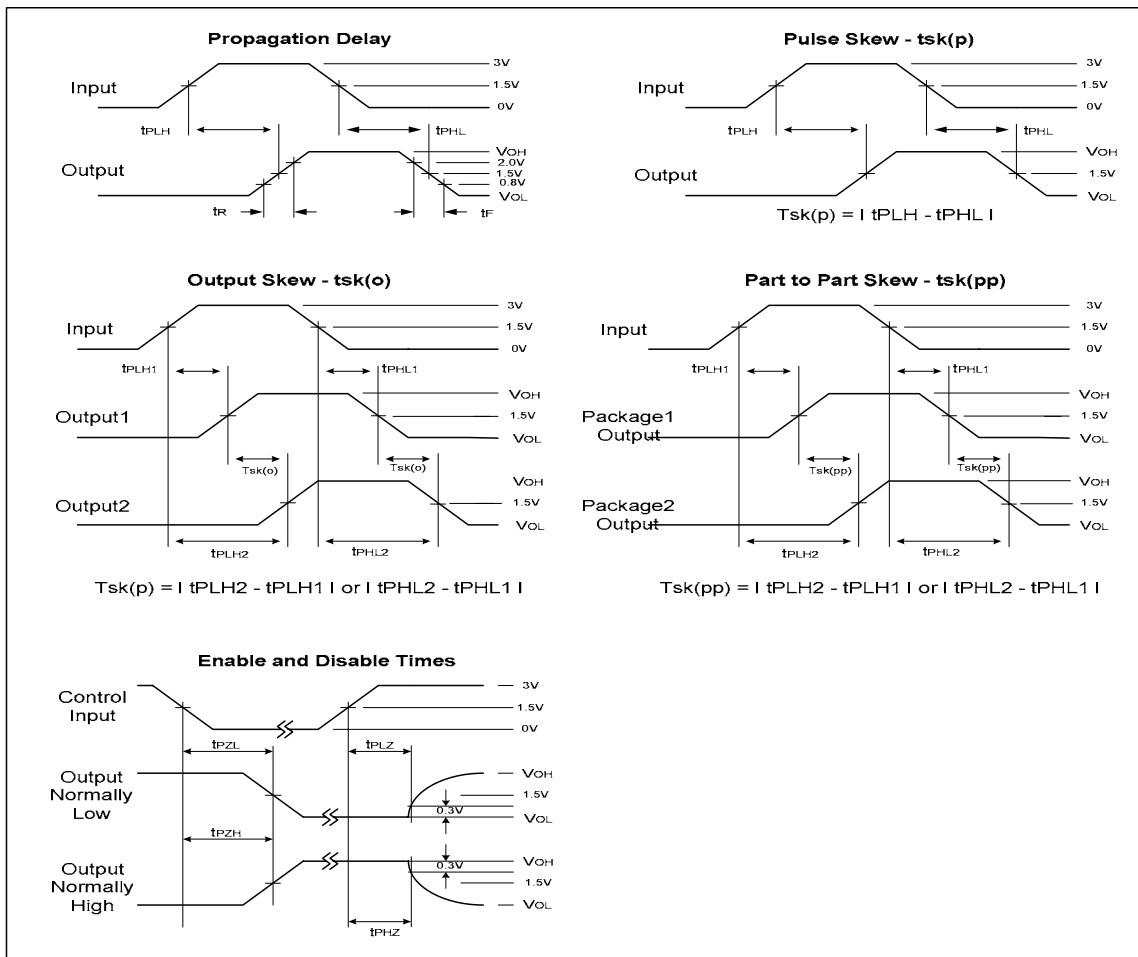
Operating Characteristics, T_A=25°C

Parameters	Test Conditions	V _{CC} = 1.2V	V _{CC} = 1.8V ±0.15V	V _{CC} = 2.5V ±0.2V	V _{CC} = 3.3V ±0.3V	Units
		Typical	Typical	Typical	Typical	
C _{pd} Power Dissipation Capacitance	C _L = 0pF, f = 10 MHz	18.5	20	22	26	pF

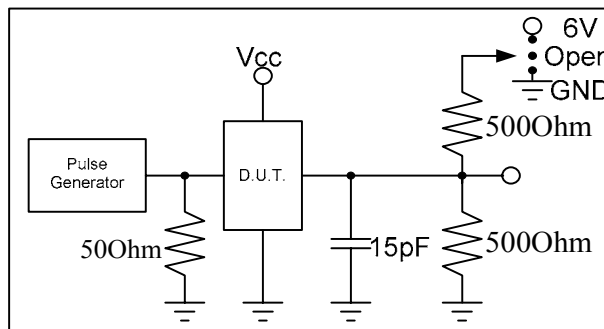
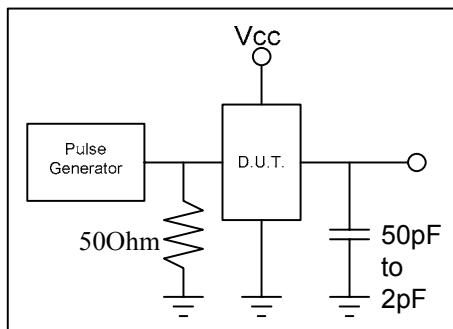


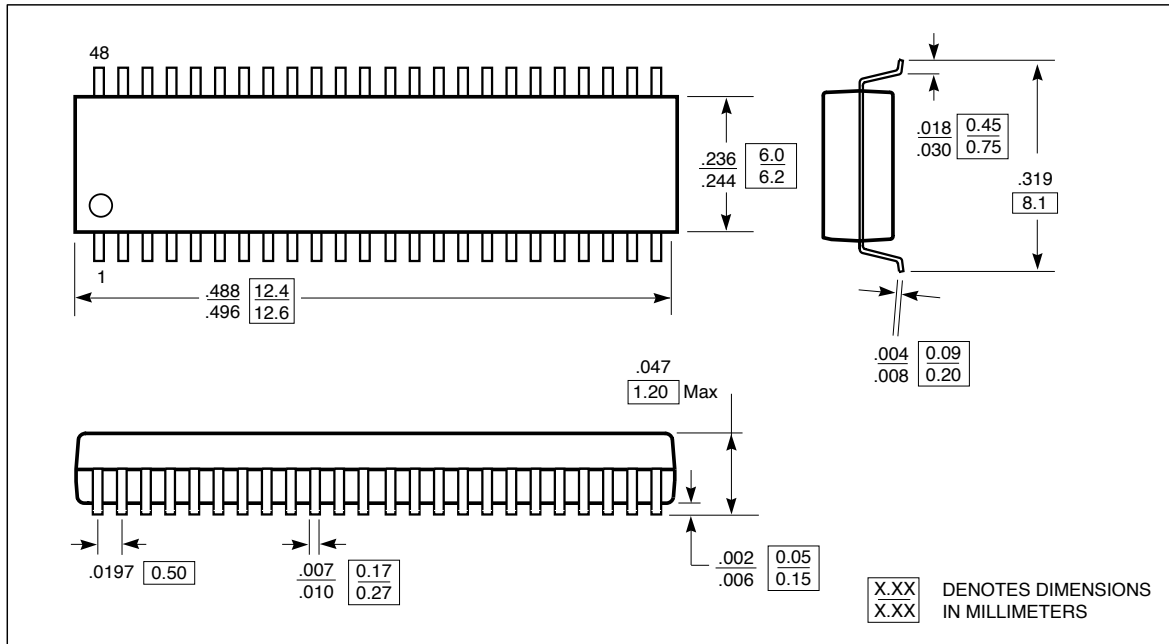
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Test Waveforms



Test Circuit



**74 Series Noise Cancellation GHz Logic****Packaging Mechanical Drawing: 48 pin TSSOP****IC Ordering Information**

Ordering Code	Package		Top-Marking	T _A
PO74G16245BSU for Tube	48pin TSSOP	Pb-free & Green	POTATO74G16245BS	-40°C to 85°C
PO74G16245BSR for Tape & Reel	48pin TSSOP	Pb-free & Green	POTATO74G16245BS	-40°C to 85°C

IC Package Information

PACKAGE CODE	PACKAGE TYPE	TAPE WIDTH (mm)	TAPE PITCH (mm)	PIN 1 LOCATION	TAPE TRAILER LENGTH	QTY PER REEL	TAPE LEADER LENGTH	QTY PER TUBE
T	TSSOP 48	24	12	Top Left Corner	26 (12")	1500	43 (20")	39