



High Bandwidth Potato Chip

FEATURES:

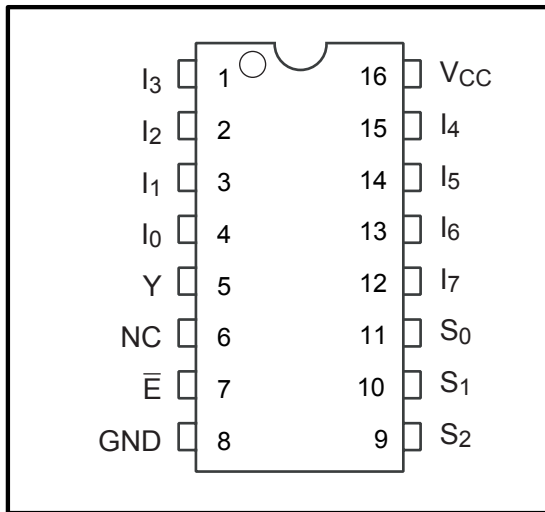
- Patented technology
- High signal -3db passing bandwidth at 750 MHz
- Near-Zero propagation delay
- VCC = 1.65V to 3.6V
- Ultra-Low Quiescent Power: 0.1μA typical
- Ideally suited for low power applications
- Industrial operating temperature: -40°C to +85°C
- Available in 16pin 173mil wide TSSOP package
- Available in 16pin 150mil wide SOIC package
- Available in 16pin 150mil wide QSOP package

DESCRIPTION:

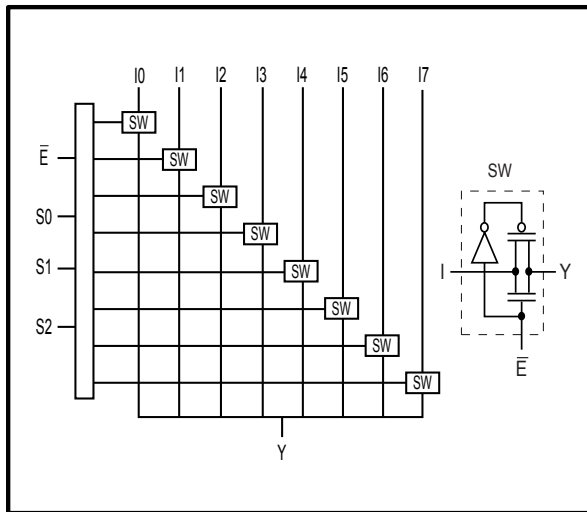
Potato Semiconductor's PO3B3251A is designed for world top performance using submicron CMOS technology to achieve 750 MHz high bandwidth.

The PO3B3251A is a 8:1 Multiplexer / Demultiplexer with 3-state outputs. The switch introduces no additional ground bounce noise or propagation delay.

Pin Configuration



Block Diagram



Pin Description

Pin Name	Description
I ₀₋₇	Data Inputs
S ₀₋₂	Select Inputs
$\bar{E}$	Enable
Y	Data Outputs
GND	Ground
VCC	Power

Truth Table

$\bar{E}$	Select			Y	Function
	S2	S1	S0		
H	X	X	X	Hi-Z	Disable
L	L	L	L	I ₀	S2-0 = 0
L	L	L	H	I ₁	S2-0 = 1
L	L	H	L	I ₂	S2-0 = 2
L	L	H	H	I ₃	S2-0 = 3
L	H	L	L	I ₄	S2-0 = 4
L	H	L	H	I ₅	S2-0 = 5
L	H	H	L	I ₆	S2-0 = 6
L	H	H	H	I ₇	S2-0 = 7



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Maximum Ratings

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

Storage Temperature	-65°C to +150°C
Ambient Temperature with Power Applied	-40°C to +85°C
Supply Voltage to Ground Potential	-0.5V to +4.6V
DC Input Voltage	-0.5V to +V _{CC}
DC Output Current.....	120mA
Power Dissipation.....	0.5W

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.

DC Electrical Characteristics, 3.3V Supply

(Over the Operating Range, T_A = -40°C to +85°C, V_{CC} = 3.3V ±10%)

Parameters	Description	Test Conditions	Min.	Typ.	Max.	Units
V _{IH}	Input HIGH Voltage	Guaranteed Logic HIGH Level	2.0			V
V _{IL}	Input LOW Voltage	Guaranteed Logic LOW Level			0.8	
I _{IH}	Input HIGH Current	V _{CC} = Max., V _{IN} = V _{CC}			±1	μA
I _{IL}	Input LOW Current	V _{CC} = Max., V _{IN} = GND			±1	
I _{OZH}	High Impedance Output Current	0 ≤ Y, I _{in} ≤ V _{CC}			±1	
R _{ON}	Switch On-Resistance	V _{CC} = Min., V _{IN} = 0.0V, I _{ON} = -48 mA or -64mA		17	22	Ω
		V _{CC} = Min., V _{IN} = V _{CC} , I _{ON} = -15 mA		17	22	

DC Electrical Characteristics, 2.5V Supply

(Over Operating Range, T_A = -40°C to +85°C, V_{CC} = 2.5V ± 10%)

Parameters	Description	Test Conditions	Min.	Typ.	Max.	Units
V _{IH}	Input HIGH Voltage	Guaranteed Logic HIGH Level	1.8		V _{CC} + 0.3	V
V _{IL}	Input LOW Voltage	Guaranteed Logic LOW Level	-0.3		0.8	
I _{IH}	Input HIGH Current	V _{CC} = Max., V _{IN} = V _{CC}			±1	μA
I _{IL}	Input LOW Current	V _{CC} = Max., V _{IN} = GND			±1	
I _{OZH}	High Impedance Current	0 ≤ Y, I _{in} ≤ V _{CC}			±1	
R _{ON}	Switch On Resistance	V _{CC} = Min., V _{IN} = 0.0V, I _{ON} = -48mA		18	25	Ω
		V _{CC} = Min., V _{IN} = 2.25V, I _{ON} = -15mA		18	25	



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Power Supply Characteristics

Symbol	Description	Test Conditions (1)	Min	Typ	Max	Unit
I_{cc}	Quiescent Power Supply Current	V _{cc} =Max, V _{in} =V _{cc} or GND	-	0.1	3	uA

Notes:

1. For conditions shown as Max. or Min., use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at V_{cc} = 3.3V, 25°C ambient.
3. This parameter is guaranteed but not tested.
4. Not more than one output should be shorted at one time. Duration of the test should not exceed one second.
5. V_{oH} = V_{cc} - 0.6V at rated current

Capacitance (T_A = 25°C f = 1 MHz)

Parameters	Description	Test Conditions	Typical	Units
C _{IN}	Input Capacitance	V _{IN} = 0V	3	pF
C _{OFFYN}	Y _N Capacitance, Switch OFF		6.4	
C _{OFFIN}	I _N Capacitance, Switch OFF		3.3	
C _{ON}	I _N /Y _N Capacitance, Switch ON		9.7	

Dynamic Electrical Characteristics Over the Operating Range

(T_A = -40° to +85°, V_{CC} = 3.3V ± 10%)

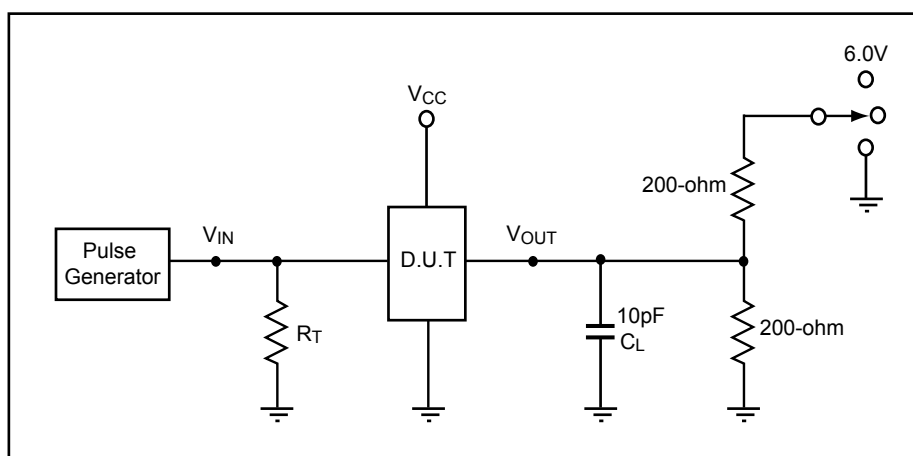
Parameter	Description	Test Condition	Typ.	Units
X _{TALK}	Crosstalk	R _L = 100Ω	-60	dB
O _{IRR}	Off-Isolation	R _L = 100Ω	-60	
BW	-3dB Bandwidth	R _L = 100Ω	750	MHz

Switching Characteristics over 3.3V Operating Range

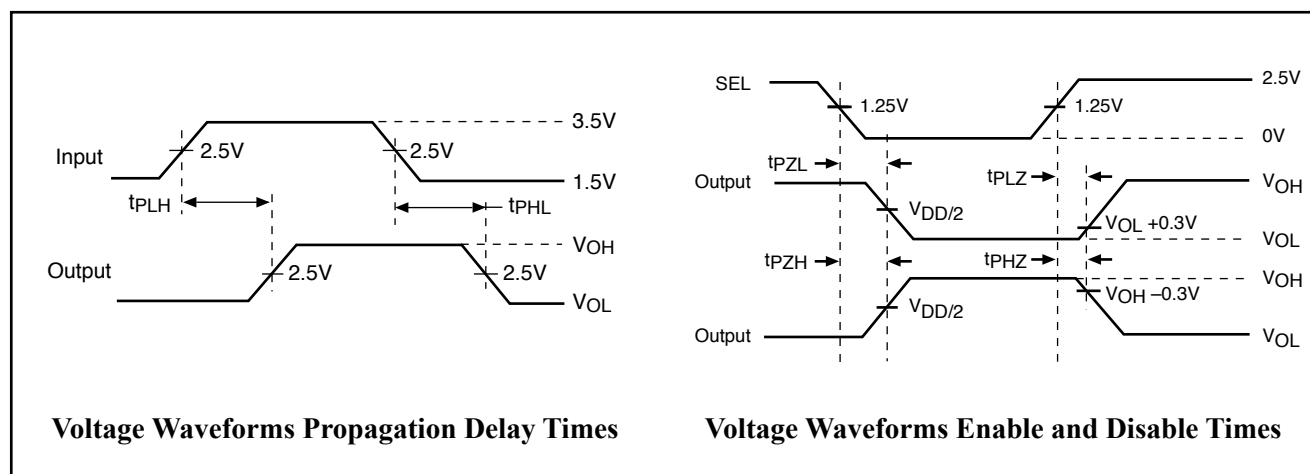
Parameters	Description	Conditions	Max.	Units
t _{PLH} t _{PHL}	Propagation Delay	See Test Diagram	0.3	ns
t _{PZH} t _{PZL}	Bus Enable Time	See Test Diagram	2.0	
t _{PHZ} t _{PLZ}	Bus Disable Time		3.0	

**High Bandwidth Potato Chip****Switching Characteristics over 2.5V Operating Range**

Parameters	Description	Conditions	Max.	Units
t_{PLH} t_{PHL}	Propagation Delay	See Test Diagram	0.3	ns
t_{PZH} t_{PZL}	Bus Enable Time	See Test Diagram	2.0	
t_{PHZ} t_{PLZ}	Bus Disable Time		3.0	

Test Circuit for Electrical Characteristics**Switch Positions**

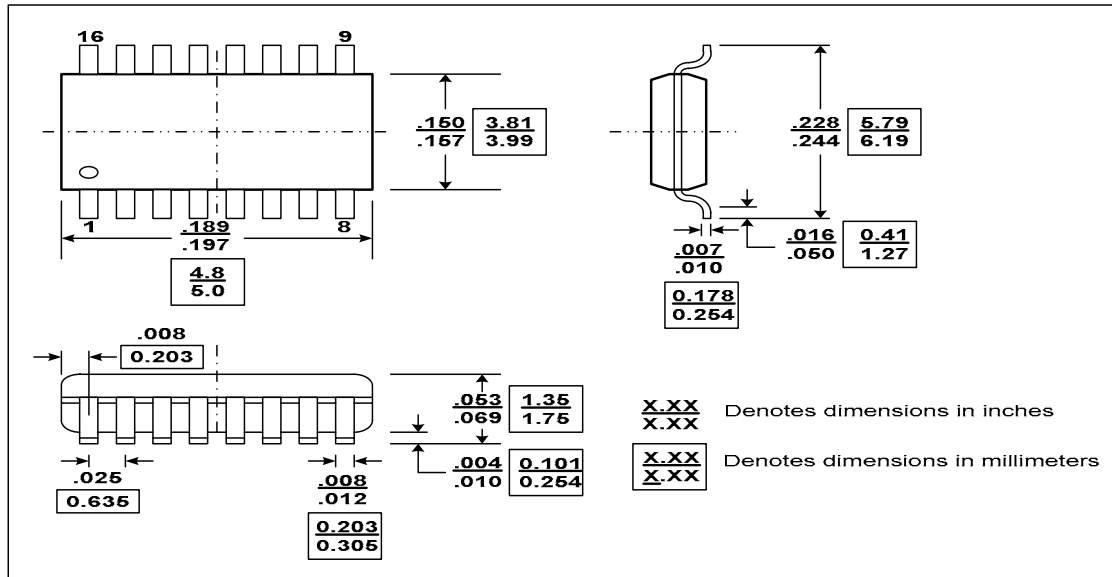
Test	Switch
t_{PLZ} , t_{PZL}	6.0V
t_{PHZ} , t_{PZH}	GND
Prop Delay	Open

Switching Waveforms

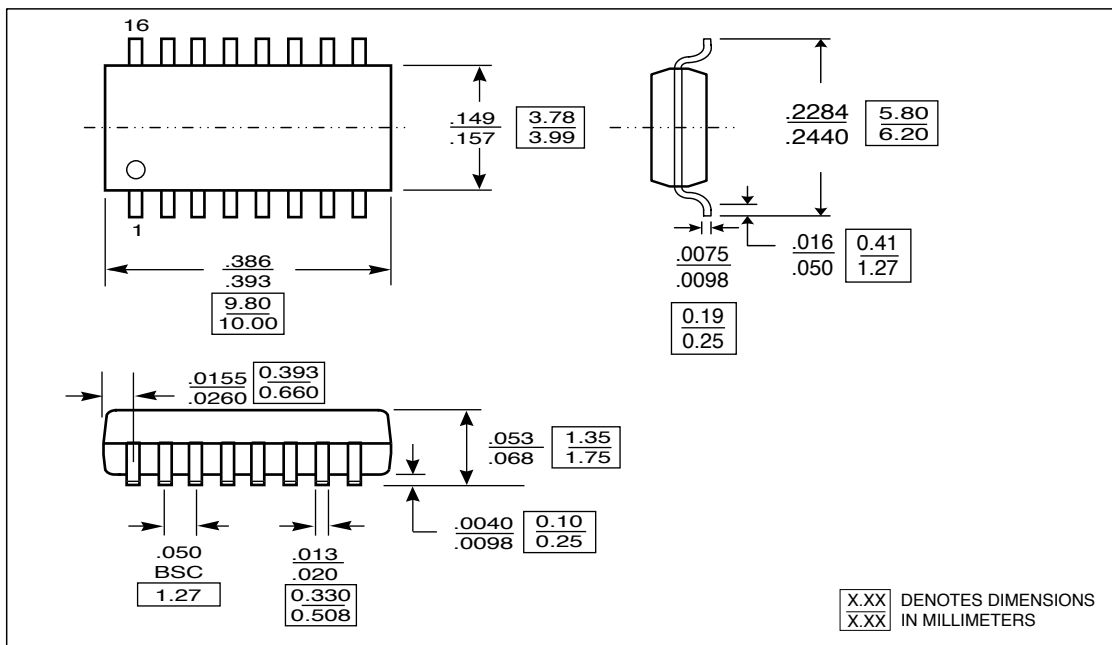


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Packaging Mechanical Drawing: 16 pin QSOP



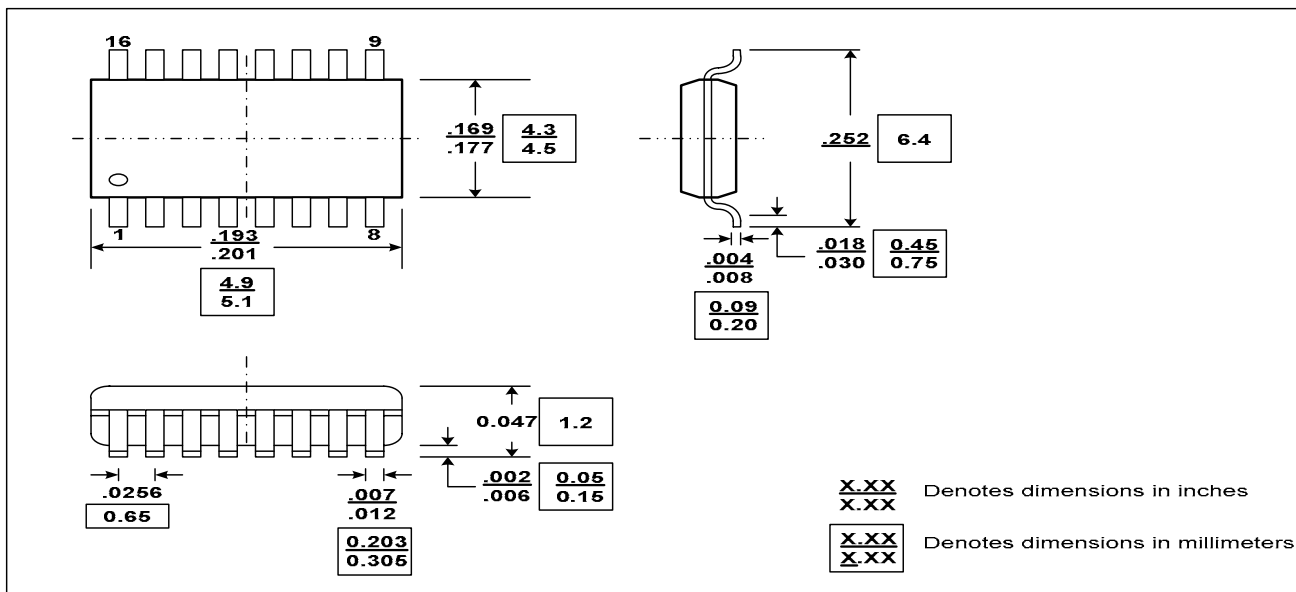
Packaging Mechanical Drawing: 16 pin SOIC





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Packaging Mechanical Drawing: 16 pin TSSOP



IC Ordering Information

Ordering Code	Package		Top-Marking	T _A
PO3B3251ATU for Tube	16-pin TSSOP	Pb-free & Green	PO3B3251AT	-40°C to 85°C
PO3B3251ATR for Tape & Reel	16-pin TSSOP	Pb-free & Green	PO3B3251AT	-40°C to 85°C
PO3B3251ASU for Tube	16-pin SOIC	Pb-free & Green	PO3B3251AS	-40°C to 85°C
PO3B3251ASR for Tape & Reel	16-pin SOIC	Pb-free & Green	PO3B3251AS	-40°C to 85°C
PO3B3251AQU for Tube	16-pin QSOP	Pb-free & Green	PO3B3251AQ	-40°C to 85°C
PO3B3251AQR for Tape & Reel	16-pin QSOP	Pb-free & Green	PO3B3251AQ	-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 16	12	8	Top Left Corner	39 (12")	3000	64 (20")	96
S	SOIC 16	16	8	Top Left Corner	39 (12")	3000	64 (20")	48
Q	QSOP 16	12	8	Top Left Corner	39 (12")	3000	64 (20")	97