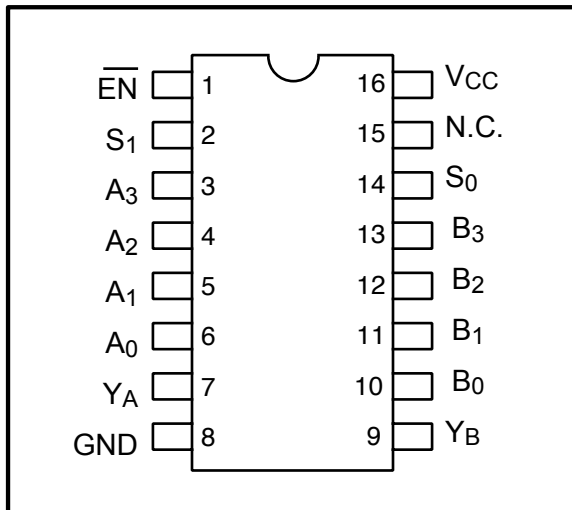


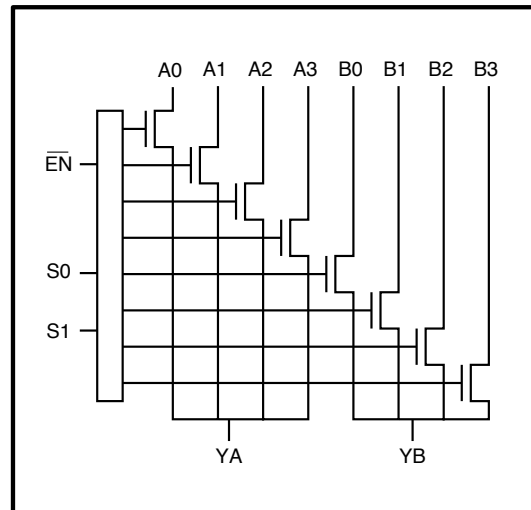
## High Bandwidth Potato Chip

FEATURES:	DESCRIPTION:
<ul style="list-style-type: none"> <li>• Patented technology</li> <li>• High signal -3db passing bandwidth at 1.2GHz</li> <li>• Near-Zero propagation delay</li> <li>• VCC = 1.65V to 3.6V</li> <li>• Ultra-Low Quiescent Power: 0.1μA typical</li> <li>• Ideally suited for low power applications</li> <li>• Industrial operating temperature: -40°C to +85°C</li> <li>• Available in 16pin 150mil wide QSOP package</li> <li>• Available in 16pin 173mil wide TSSOP package</li> </ul>	<p>Potato Semiconductor's PO3B14A is designed for world top performance using submicron CMOS technology to achieve GHz high bandwidth.</p> <p>The PO3B14A is a 2-channel, 4:1 Multiplexer / Demultiplexer with 3-state outputs. The switch introduces no additional ground bounce noise or propagation delay.</p>

### Pin Configuration



### Block Diagram



### Pin Description

Pin Name	Description
A <sub>N</sub> , B <sub>N</sub>	Data Inputs
S <sub>0-1</sub>	Select Inputs
$\overline{EN}$	Enable
Y <sub>A</sub> to Y <sub>B</sub>	Data Outputs
GND	Ground
VCC	Power

### Truth Table

Enable	Select		Y	Function
$\overline{EN}$	S <sub>1</sub>	S <sub>0</sub>	Y	Function
H	X	X	Hi-Z	Disable
L	L	L	I0	S1-0 = 0
L	L	H	I1	S1-0 = 1
L	H	L	I2	S1-0 = 2
L	H	H	I3	S1-0 = 3

## High Bandwidth Potato Chip

### 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 <sub>CC</sub>
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<sub>A</sub> = -40°C to +85°C, V<sub>CC</sub> = 3.3V ±10%)

Parameters	Description	Test Conditions	Min.	Typ.	Max.	Units
V <sub>IH</sub>	Input HIGH Voltage	Guaranteed Logic HIGH Level	2.0			V
V <sub>IL</sub>	Input LOW Voltage	Guaranteed Logic LOW Level			0.8	
I <sub>IH</sub>	Input HIGH Current	V <sub>CC</sub> = Max., V <sub>IN</sub> = V <sub>CC</sub>			±1	μA
I <sub>IL</sub>	Input LOW Current	V <sub>CC</sub> = Max., V <sub>IN</sub> = GND			±1	
I <sub>OZH</sub>	High Impedance Output Current	0 ≤ Y, I <sub>n</sub> ≤ V <sub>CC</sub>			±1	
R <sub>ON</sub>	Switch On-Resistance	V <sub>CC</sub> = Min., V <sub>IN</sub> = 0.0V, I <sub>ON</sub> = -48 mA or -64mA		14	18	Ω
		V <sub>CC</sub> = Min., V <sub>IN</sub> = V <sub>CC</sub> , I <sub>ON</sub> = -15 mA		16	20	

### DC Electrical Characteristics, 2.5V Supply

(Over Operating Range, T<sub>A</sub> = -40°C to +85°C, V<sub>CC</sub> = 2.5V ± 10%)

Parameters	Description	Test Conditions	Min.	Typ.	Max.	Units
V <sub>IH</sub>	Input HIGH Voltage	Guaranteed Logic HIGH Level	1.8		V <sub>CC</sub> + 0.3	V
V <sub>IL</sub>	Input LOW Voltage	Guaranteed Logic LOW Level	-0.3		0.8	
I <sub>IH</sub>	Input HIGH Current	V <sub>CC</sub> = Max., V <sub>IN</sub> = V <sub>CC</sub>			±1	μA
I <sub>IL</sub>	Input LOW Current	V <sub>CC</sub> = Max., V <sub>IN</sub> = GND			±1	
I <sub>OZH</sub>	High Impedance Current	0 ≤ Y, I <sub>n</sub> ≤ V <sub>CC</sub>			±1	
R <sub>ON</sub>	Switch On Resistance	V <sub>CC</sub> = Min., V <sub>IN</sub> = 0.0V, I <sub>ON</sub> = -48mA		18	22	Ω
		V <sub>CC</sub> = Min., V <sub>IN</sub> = 2.25V, I <sub>ON</sub> = -15mA		18	22	

## High Bandwidth Potato Chip

### Power Supply Characteristics

Symbol	Description	Test Conditions (1)	Min	Typ	Max	Unit
<b>I<sub>CC</sub></b>	Quiescent Power Supply Current	V <sub>CC</sub> =Max, V <sub>IN</sub> =V <sub>CC</sub> or GND	-	<b>0.1</b>	<b>3</b>	<b>uA</b>

**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<sub>CC</sub> = 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<sub>OH</sub> = V<sub>CC</sub> - 0.6V at rated current

### Capacitance (T<sub>A</sub> = 25°C f = 1 MHz)

Parameters	Description	Test Conditions	Typ.	Units
C <sub>IN</sub>	Input Capacitance	V <sub>IN</sub> = 0V	3.0	pF
C <sub>OFF(IN)</sub>	In Capacitance, Switch Off		3.5	
C <sub>OFF(Y)</sub>	Y Capacitance, Switch Off		6.5	
C <sub>ON</sub>	Y/In Capacitance, Switch On		10.0	

**Notes:**

- 1 This parameter is determined by device characterization but not production tested.

### Dynamic Electrical Characteristics Over the Operating Range

(T<sub>A</sub> = -40° to +85°, V<sub>CC</sub> = 3.3V ± 10%)

Parameter	Description	Test Condition	Typ.	Units
X <sub>TALK</sub>	Crosstalk	R <sub>L</sub> = 100Ω	-60	dB
O <sub>IRR</sub>	Off-Isolation	R <sub>L</sub> = 100Ω	-60	
BW	-3dB Bandwidth	R <sub>L</sub> = 100Ω	1.2	GHz

### Switching Characteristics over 3.3V Operating Range

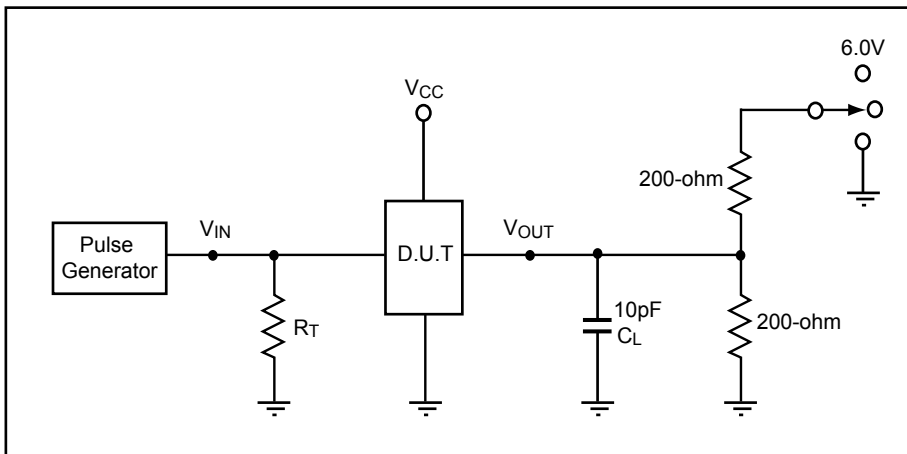
Parameters	Description	Conditions	Max.	Units
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay	See Test Diagram	0.3	ns
t <sub>PZH</sub> t <sub>PZL</sub>	Bus Enable Time	See Test Diagram	2.0	
t <sub>PHZ</sub> t <sub>PLZ</sub>	Bus Disable Time		3.0	

## 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	

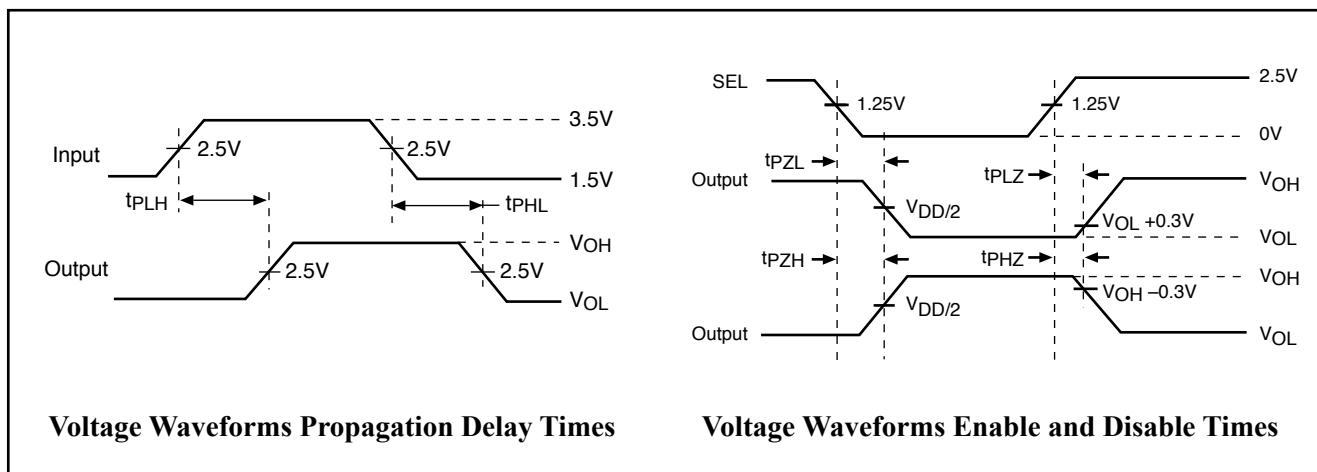
### Test Circuit for Electrical Characteristics



### Switch Positions

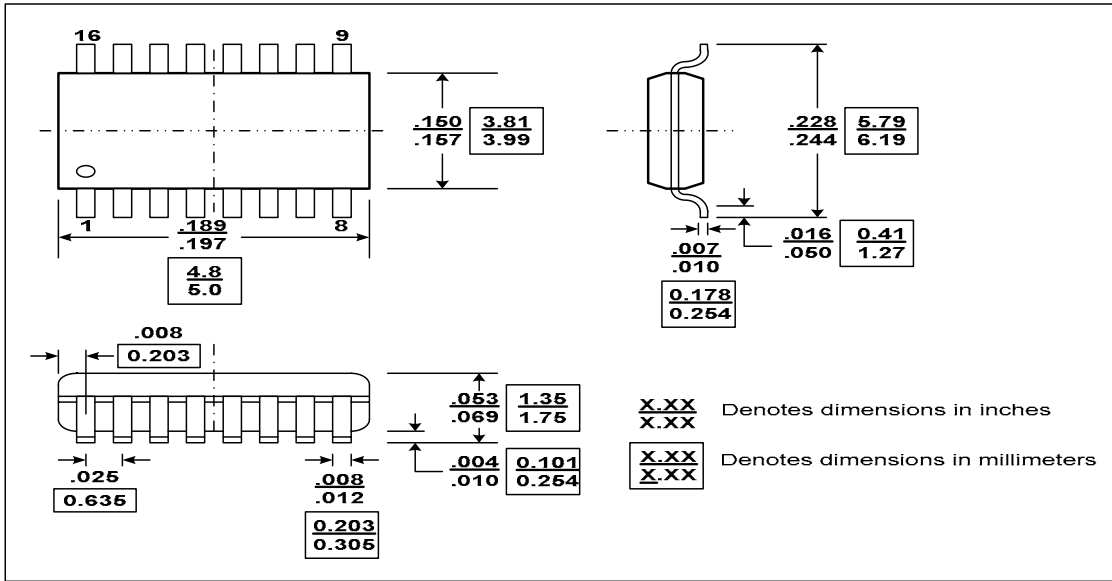
Test	Switch
$t_{PLZ}$ , $t_{PZL}$	6.0V
$t_{PHZ}$ , $t_{PZH}$	GND
Prop Delay	Open

### Switching Waveforms

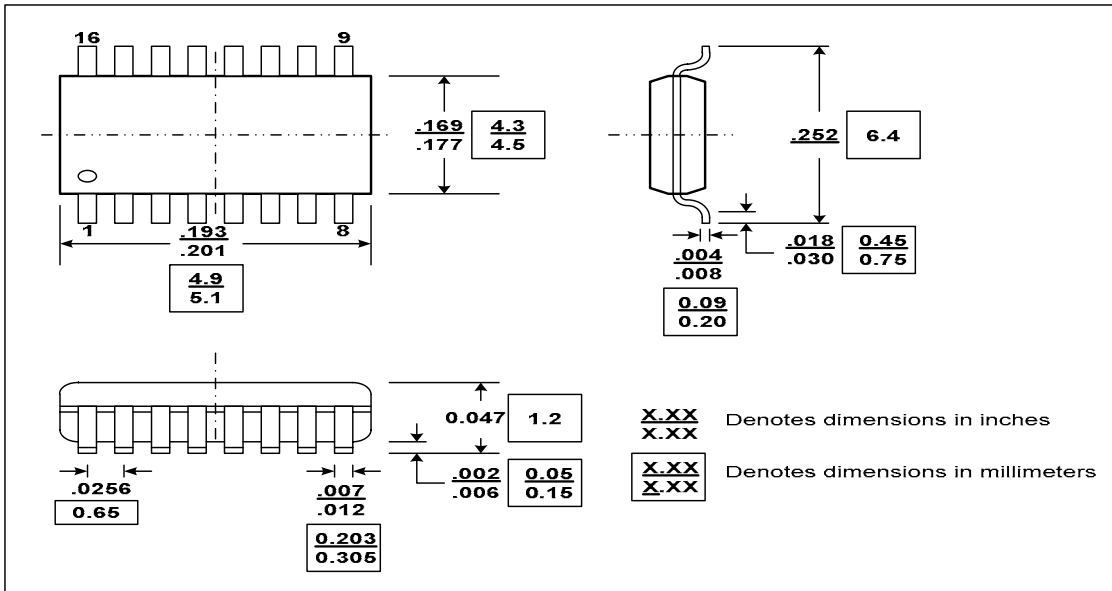


**High Bandwidth Potato Chip**

**Packaging Mechanical Drawing: 16 pin QSOP**



**Packaging Mechanical Drawing: 16 pin TSSOP**



## High Bandwidth Potato Chip

### Ordering Information

Ordering Code	Package			Top-Marking	T <sub>A</sub>
PO3B14AQU	16-pin QSOP	Tube	Pb-free & Green	PO3B14AQ	-40°C to 85°C
PO3B14AQR	16-pin QSOP	Tape and reel	Pb-free & Green	PO3B14AQ	-40°C to 85°C
PO3B14ATU	16-pin TSSOP	Tube	Pb-free & Green	PO3B14AT	-40°C to 85°C
PO3B14ATR	16-pin TSSOP	Tape and reel	Pb-free & Green	PO3B14AT	-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
Q	QSOP 16	12	8	Top Left Corner	39 (12")	3000	64 (20")	97
T	TSSOP 16	12	8	Top Left Corner	39 (12")	3000	64 (20")	96