

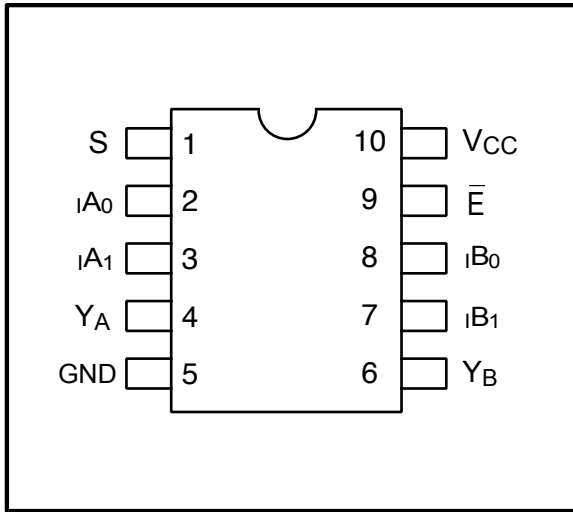


PO3B22A

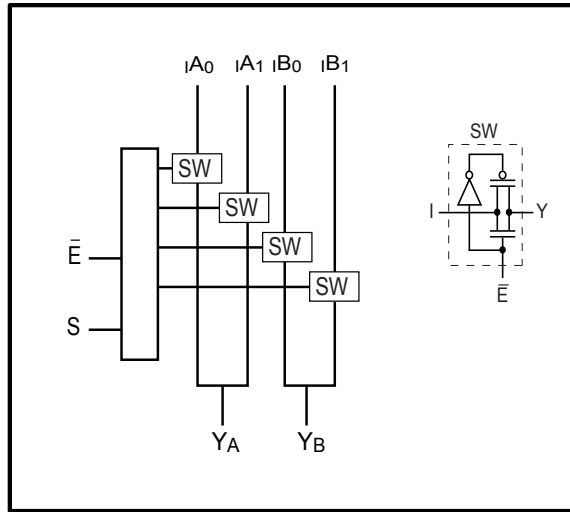
High Bandwidth Potato Chip

| FEATURES: | DESCRIPTION: |
|--|--|
| <ul style="list-style-type: none"> • Patented technology • High signal -3db passing bandwidth at 1.2GHz • 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 10pin wide MSOP package | <p>Potato Semiconductor's PO3B22A is designed for world top performance using submicron CMOS technology to achieve GHz high bandwidth.</p> <p>The PO3B22A is a Wide Bandwidth, Dual 2:1 Mux/DeMux. The switch introduces no additional ground bounce noise or propagation delay.</p> |

Pin Configuration



Block Diagram



Pin Description

| Pin Name | Description |
|----------------------------------|---------------|
| IA _N -IB _N | Data Inputs |
| S | Select Inputs |
| E _{bar} | Enable |
| YA-YB | Data Outputs |
| GND | Ground |
| VCC | Power |

Truth Table

| E _{bar} | S | YA | YB | Function |
|------------------|---|-----------------|-----------------|----------|
| H | X | Hi-Z | Hi-Z | Disable |
| L | L | IA ₀ | IB ₀ | S = 0 |
| L | H | IA ₁ | IB ₁ | S = 1 |

**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 _{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 _n ≤ V _{CC} | | | ±1 | |
| R _{ON} | Switch On-Resistance | V _{CC} = Min., V _{IN} = 0.0V, I _{ON} = -48 mA or -64mA | | 12 | 16 | Ω |
| | | V _{CC} = Min., V _{IN} = V _{CC} , I _{ON} = -15 mA | | 12 | 16 | |

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 _n ≤ V _{CC} | | | ±1 | |
| R _{ON} | Switch On Resistance | V _{CC} = Min., V _{IN} = 0.0V, I _{ON} = -48mA | | 18 | 22 | Ω |
| | | V _{CC} = Min., V _{IN} = 2.25V, I _{ON} = -15mA | | 18 | 22 | |

**High Bandwidth Potato Chip****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 | | 8 | |
| C _{OFFIN} | I _N Capacitance, Switch OFF | | 5 | |
| C _{ON} | I _N /Y _N Capacitance, Switch ON | | 13 | |

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 | 1.2 | GHz |

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 | |

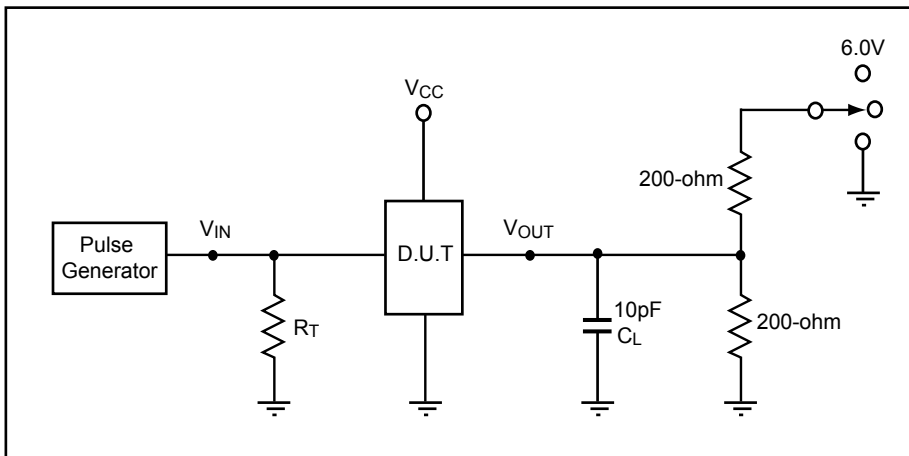


High Bandwidth Potato Chip

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 | |

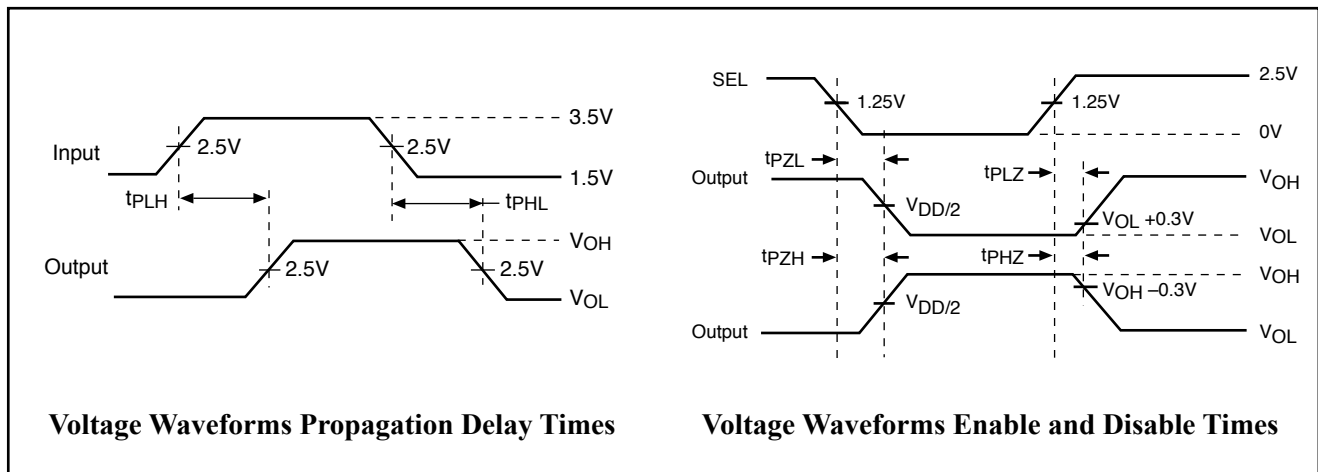
Test Circuit for Electrical Characteristics



Switch Positions

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

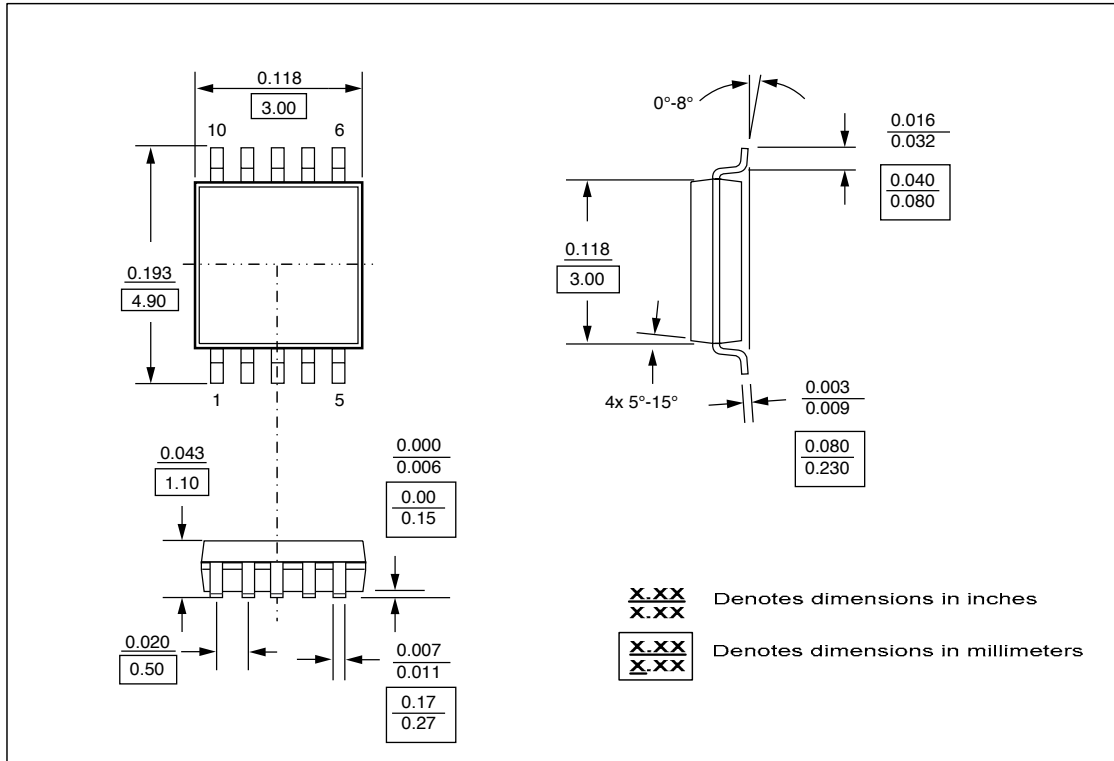
Switching Waveforms





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Packaging Mechanical Drawing: 10 pin MSOP



IC Ordering Information

| Ordering Code | Package | | Top-Marking | T _A |
|---------------------------|---------|-----------------|-------------|----------------|
| PO3B22AMU for Tube | MSOP 10 | Pb-free & Green | PO3B22AM | -40°C to 85°C |
| PO3B22AMR for Tape & Reel | MSOP 10 | Pb-free & Green | PO3B22AM | -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 |
|--------------|--------------|-----------------|-----------------|-----------------|---------------------|--------------|--------------------|--------------|
| M | MSOP 10 | 12 | 8 | Top Left Corner | 39 (12") | 3000 | 64 (20") | 80 |