

Product Features

- RON is 9 Ohm Typical
- Pulldown on B Ports
- Low Power: 1mW
- Industrial Operation Temperature: -40°C to 85°C
- Near Zero Propagation Delay
- Switching Speed: 4.5ns max. (for 3.3V operation)
- Channel ON capacitance: 9pF (typ.)
- VCC Operating Range: +2 to +3.6V
- >100 MHz Bandwidth
- Packages: 56-Pin TSSOP

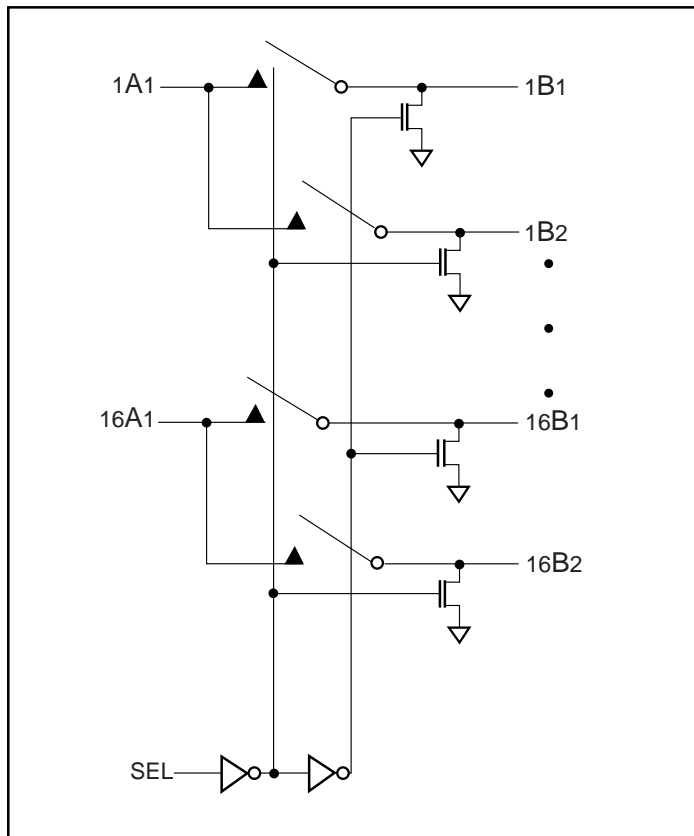
Product Description

Pericom Semiconductor's PI3C series of logic circuits are produced using the Company's advanced submicron CMOS technology.

The PI3C16234 is a 16-bit to 32-bit mux/demux switch. Industry leading advantages include almost zero propagation delay of 500ps because of the 9ohm channel resistance and low I/O capacitance. A1 port demultiplexes to either port B1 or B2 and the switch is bidirectional.

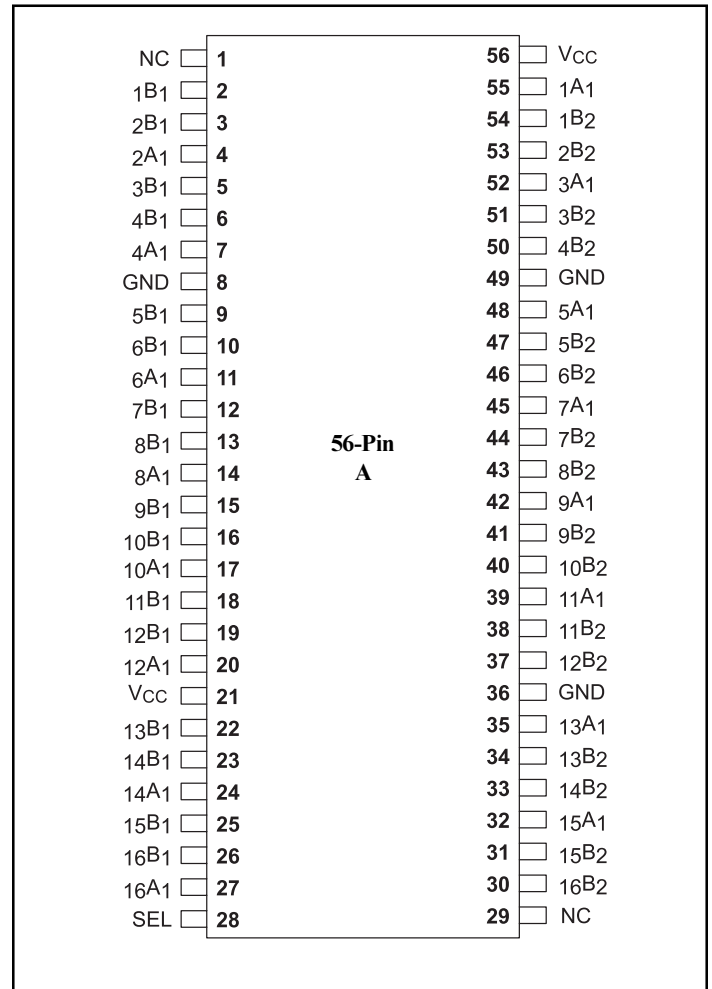
Application

Private Memory Module Switching

Logic Block Diagram

Function Table

| Selection | Function |
|-----------|------------|
| L | nA1 to nB1 |
| H | nA1 to nB2 |

Note: n = 1-16

Product Pin Configuration


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 Range | -0.5V to +4.6V |
| DC I/O Voltage | -0.5V to +5.5V |
| 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 (Over the Operating Range $T_A = -40^\circ\text{C}$ to 85°C $V_{CC} = 3.3\text{V} \pm 10\%$)

| Parameters | Description | Test Conditions ⁽¹⁾ | Min. | Typ ⁽¹⁾ | Max. | Units |
|------------|-------------------------------------|--|------|--------------------|---------|---------------|
| V_{IH} | Input HIGH Voltage | Guaranteed Logic HIGH Level | 2.0 | – | – | V |
| V_{IL} | Input LOW Voltage | Guaranteed Logic LOW Level | -0.5 | – | 0.8 | |
| I_{IH} | Input HIGH Current | $V_{CC} = \text{Max.}, V_{IN} = V_{CC}$ | – | – | ± 1 | μA |
| I_{IL} | Input LOW Current | $V_{CC} = \text{Max.}, V_{IN} = \text{GND}$ | – | – | ± 1 | |
| I_O | B-port Pulldown Current | $V_{CC} = \text{Min.}, V_O = V_{CC}$ SEL = High for B1, SEL = Low for B2 | 2.5 | 3.6 | – | mA |
| V_{IK} | Clamp Diode Voltage | $V_{CC} = \text{Min.}, I_{IN} = -18\text{mA}$ | – | -0.73 | -1.2 | Ω |
| R_{ON} | Switch On Resistance ⁽⁴⁾ | $V_{CC} = \text{Min.}, V_{IN} = 0.0\text{V},$ $I_{ON} = 48\text{mA}$ or 64mA | – | 9 | 12 | |
| | | $V_{CC} = \text{Min.}, V_{IN} = 2.4\text{V},$ $I_{ON} = 15\text{mA}$ | – | 16 | 23 | |

Capacitance ($T_A = 25^\circ\text{C}, f = 1\text{MHz}$)

| Parameters ⁽⁵⁾ | Description | Test Conditions | Typ. | Max. | Units |
|---------------------------|----------------------------|----------------------|------|------|-------|
| C_{IN} | Input Capacitance | $V_{IN} = 0\text{V}$ | 3.5 | – | pF |
| C_{ON} | A/B Capacitance, Switch On | $V_{IN} = 0\text{V}$ | 9.3 | 11 | pF |

Notes:

- For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
- Typical values are at $V_{CC} = 3.3\text{V}$, $T_A = 25^\circ\text{C}$ ambient and maximum loading.
- Not more than one output should be shorted at one time. Duration of the test should not exceed one second.
- Measured by the voltage drop between A and B pins at indicated current through the switch. ON resistance is determined by the lower of the voltages on the two (A & B) pins.
- This parameter is determined by device characterization but is not production tested.

Power Supply Characteristics

| Parameters | Description | Test Conditions ⁽¹⁾ | Min. | Typ. ⁽²⁾ | Max. | Units |
|------------------|-------------------------------------|--|------|---------------------|------|-------|
| I _{CC} | Quiescent Power Supply Current | V _{CC} = Max. V _{IN} = GND or V _{CC} | — | 260 | 850 | μA |
| DI _{CC} | Supply Current per Input @ TTL HIGH | V _{CC} = Max. V _{IN} = 3.0V ⁽³⁾ | — | — | 750 | |

Notes:

- For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device.
- Typical values are at V_{CC} = 3.3V, +25°C ambient.
- Per TTL driven input (control inputs only); A and B pins do not contribute to I_{CC}.
- This current applies to the control inputs only and represent the current required to switch internal capacitance at the specified frequency. The A and B inputs generate no significant AC or DC currents as they transition. This parameter is not tested, but is guaranteed by design.

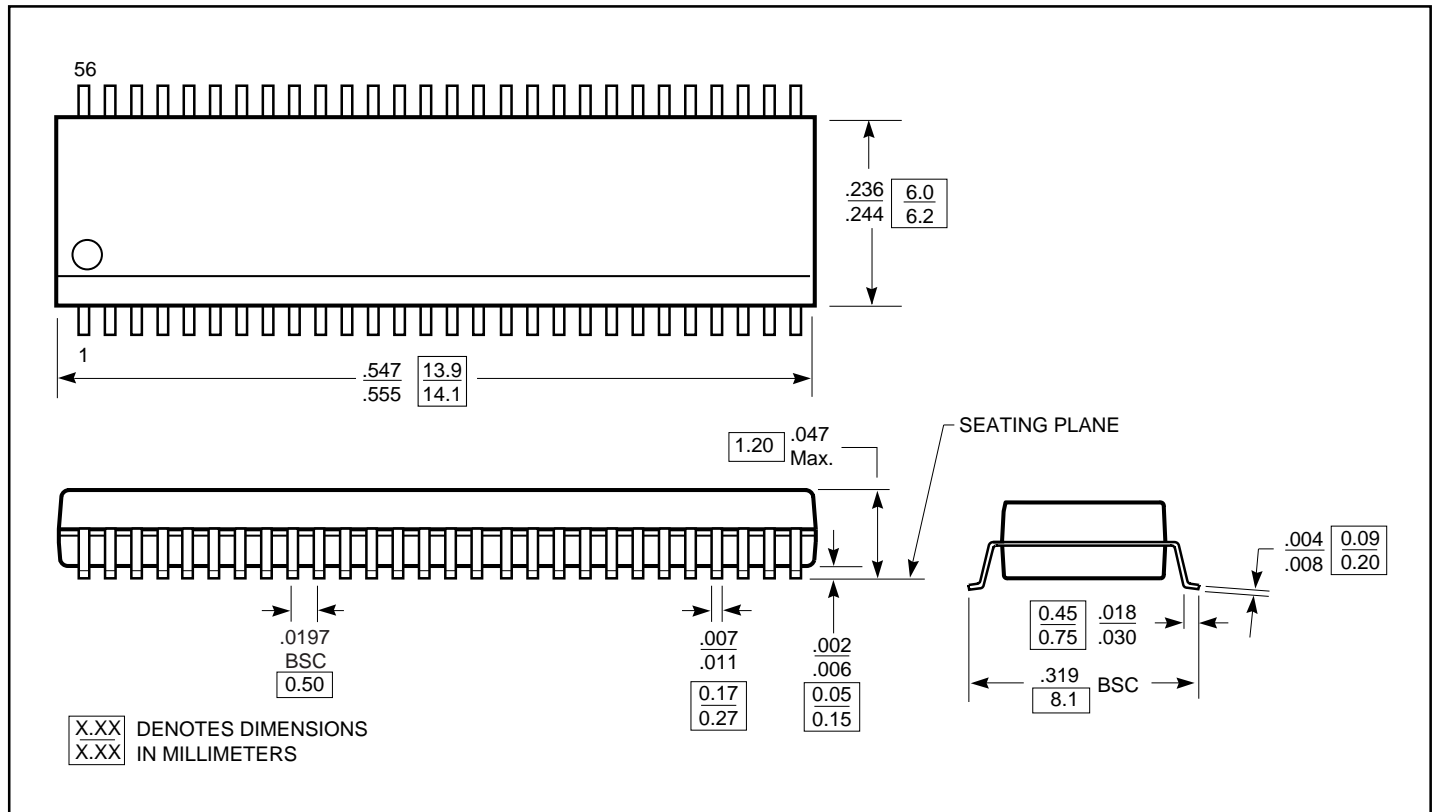
PI3C16234 Switching Characteristics over Operating Range

| Parameters | Description | Conditions ⁽¹⁾ | PI3C16234 | | |
|--------------------------------------|---|--|-----------|------|-------|
| | | | Com | | |
| | | | Min. | Max. | Units |
| t _{PLH} t _{PHL} | Propagation Delay ^(2,3) A _X to B _X , B _X to A _X | C _L = 50pF R _L = 500Ω | — | 0.50 | ns |
| t _{PZH} t _{PZL} | Bus Enable Time \overline{BE}_X to A _X or B _X | C _L = 50pF R _L = 500Ω | 1.5 | 6.5 | |
| t _{PHZ} t _{PLZ} | Bus Disable Time \overline{BE}_X to A _X or B _X | | 1.5 | 5.5 | |

Notes:

- See test circuit and waveforms.
- This parameter is guaranteed but not tested on Propagation Delays.
- The bus switch contributes no propagational delay other than the RC delay of the ON resistance of the switch and the load capacitance. The time constant for the switch alone is of the order of 0.5ns for 25pF load. Since this time constant is much smaller than the rise/fall times of typical driving signals, it adds very little propagational delay to the system. Propagational delay of the bus switch when used in a system is determined by the driving circuit on the driving side of the switch and its interaction with the load on the driven side.

56-Pin TSSOP (A) Package



Ordering Information

| Part | Pin - Package | Width | Temperature |
|------------|----------------|---------|----------------|
| PI3C16234A | 56-TSSOP (A56) | 240-mil | -40°C to +85°C |