Precision Wide Bandwidth LanSwitch
Quad 2:1 Mux/DeMux

Features

- Single 3.3V/5V supply operation
- Rail-To-Rail Operation
- Very Low Distortion: 2%
- Replaces mechanical relays
- High-performance, low-cost solution for switching between different LAN signals
- Low crosstalk: –70dB @ 30 Mbps
- Low insertion loss and On-Resistance: 6-ohms typical
- Off isolation: –55dB @ 30 Mbps
- Wide bandwidth data rates >135 Mbps
- Low Quiescent Supply Current (100nA typical)
- Packaging (Pb-free & Green available):
  - 16-pin 150-mil wide plastic SOIC (W)
  - 16-pin 150-mil wide plastic QSOP (Q)
 - 16-pin 173-mil wide plastic TSSOP (L)

Description

Pericom Semiconductor's PI5L200 is a Rail-to-Rail Quad 2:1 multiplexer/demultiplexer LanSwitch with 3-state outputs. The On-Resistance typically varies from 5 ohms to 7 ohms with data inputs of 0V to 5V. Generally, this part can be used to replace mechanical relays in low voltage (3.3V/5V systems) LAN applications.

With a wide bandwidth of 135 MHz, the PI5L200 can switch Fast Ethernet and ATM25 signals. Into 100-ohm UTP cables, the switch distortion is typically less than two percent. Crosstalk @30 MHz is –70dB. The PI5L200 operates from a single 3.3V/5V supply and interface to TTL logic.
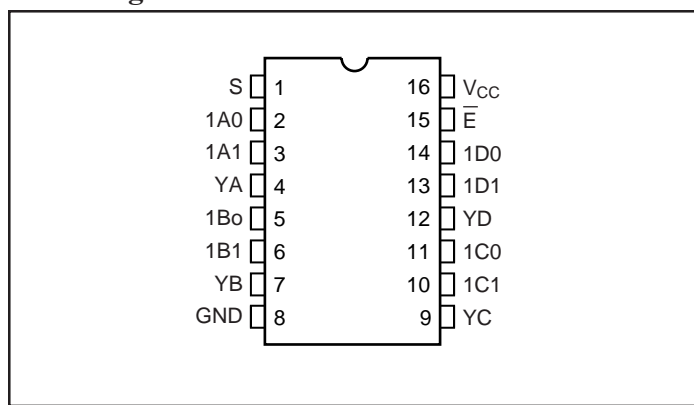
Applications

- 10/100 Base-TX/T4
- 100VG-AnyLAN
- Token Ring 4/16 Mbps
- ATM25
- NIC Adapter and Hubs
- SONET OCI 51.8Mbps
- T1/E1

Block Diagram
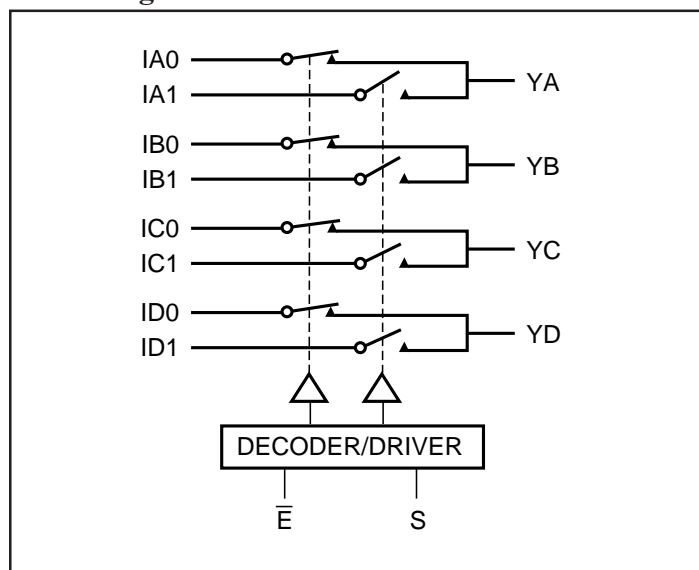
Pin Configuration

Truth Table[1]

$\overline{E}$	S	YA	YB	YC	YD	Function
H	X	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Disable
L	L	IA0	IB0	IC0	ID0	S = 0
L	H	IA1	IB1	IC1	ID1	S = 1

Note:
1. H = High Voltage Level
   L = Low Voltage Level
   Switches are shown with logic "0" input (Select and Enable)

Pin Description

Pin Name	Description
IAn-IDn	Data Inputs
S	Select Inputs
$\overline{E}$	Enable
YA-YD	Data Outputs
GND	Ground
V_{CC}	Power

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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 +7.0V
DC Input Voltage	–0.5V to V_{CC} +0.5V
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.

Single 5.0V Supply

DC Electrical Characteristics (Over the Operating Range, $T_A = -40°C$ to $+85°C$, $V_{CC} = 5V \pm 10\%$, GND = 0V)

Parameters	Description	Test Conditions[1]	Min.	Typ.[2]	Max.	Units
V_{ANALOG}	Analog Signal Range		0	—	V_{CC}	V
R_{ON}	ON-Resistance	I_{ON} = 10mA to 30mA	—	6	12	
ΔR_{ON}	Match Between Channels		—	0.4	2	Ω
$R_{FLAT(ON)}$	R_{ON} Flatness	I_{ON} = 1mA, V_{NO}, V_{NC} = 0V to 5V	—	3	5	
$I_{NO(OFF)}$, $I_{NO(ON)}$	On/Off Leakage Current	V_{NO}, V_{NC} = 4.5V	–100	—	100	nA
I_{CC}	Quiescent Supply Current	V_{CC} = 5.5V, V_{IN} = 0V or V_{CC}	—	—	1	µA
I_O	Output Current	V_{NO}, V_{NC} or V_{COM} = 0V to 5V	100	—	—	mA
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} = Max., V_{IN} = V_{CC}	—	—	±1	µA
I_{IL}	Input LOW Current	V_{CC} = Max., V_{IN} = GND	—	—	±1	

Dynamic Electrical Characteristics (Over the Operating Range, $T_A = -40°C$ to $+85°C$, $V_{CC} = 5V \pm 10\%$, GND = 0V)

Parameters	Description	Test Conditions[1]	Min.	Typ.[2]	Max.	Units
t_{ON}	Turn-on Time	V_{NO} or V_{NC} = 3.0V, see Figure 2	—	10	20	ns
t_{OFF}	Turn-off Time	V_{NO} or V_{NC} = 3.0V, see Figure 2	—	5	10	
X_{TALK}	Crosstalk	R_L = 100 ohms, f = 30 MHz, see Figure 4	—	–70	—	dB
$C_{(OFF)}$	NC or NO Capacitance	f = 1kHz	—	13	—	pF
O_{IRR}	Off Isolation	R_L = 100 ohms, f = 30 MHz, see Figure 5	—	–55	—	dB
BW	Bandwidth –3 dB	R_L = 100 ohms, see Figure 3	—	137	—	MHz
D	Distortion DR_{ON}/RL	R_L = 100 ohms	—	2	—	%

Notes:

1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for applicable device type.
2. Guaranteed by design.

2

Single 3.3V Supply

DC Electrical Characteristics (Over the Operating Range, T_A = –40°C to +85°C, V_{CC} = 3.3V ±10%, GND = 0V)

Parameters	Description	Test Conditions[1]	Min.	Typ.[2]	Max.	Units
V_{ANALOG}	Analog Signal Range		0	—	V_{CC}	V
R_{ON}	ON-Resistance	I_{ON} = 10mA to 30mA	—	15	22	
ΔR_{ON}	Match Between Channels		—	1	3	Ω
$R_{FLAT(ON)}$	R_{ON} Flatness	I_{ON} = 1mA, V_{NO}, V_{NC} = 0V to 5V	—	7	12	
$I_{NO(OFF)}$, $I_{NO(ON)}$	On/Off Leakage Current	V_{NO}, V_{NC} = 3.0V	–100	—	100	nA
$I_{COM(ON)}$	On Leakage Current	V_{NO}, V_{NC} = 3.0V	–100	—	100	μA
I_O	Output Current	V_{NO}, V_{NC} or V_{COM} = 0V	80	—	—	mA
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} = Max., V_{IN} = V_{CC}	—	—	±1	μA
I_{IL}	Input LOW Current	V_{CC} = Max., V_{IN} = GND	—	—	±1	

Dynamic Electrical Characteristics (Over the Operating Range, T_A = –40°C to +85°C, V_{CC} = 3.3V ±10%, GND = 0V)

Parameters	Description	Test Conditions[1]	Min.	Typ.[2]	Max.	Units
t_{ON}	Turn-on Time	V_{NO} or V_{NC} = 1.5V, see Figure 2	—	28	40	ns
t_{OFF}	Turn-off Time	V_{NO} or V_{NC} = 1.5V, see Figure 2	—	4	20	
X_{TALK}	Crosstalk	R_L = 50 ohms, f = 1MHz, see Figure 4	—	–75	—	dB
$C_{(OFF)}$	NC or NO Capacitance	f = 1kHz	—	15	—	pF
$C_{COM(OFF)}$	COM Off Capacitance	f = 1kHz	—	30	—	
O_{IRR}	Off Isolation	R_L = 50 ohms, f = 1 MHz, see Figure 5	—	–75	—	dB
BW	Bandwidth –3 dB	R_L = 50 ohms, see Figure 3	—	110	—	MHz
D	Distortion	R_L = 100 ohms	—	4	—	%

DC Electrical Characteristics (Over the Operating Range, T_A = –40°C to +85°C, V_{CC} = 3.3V ±10%, GND = 0V)

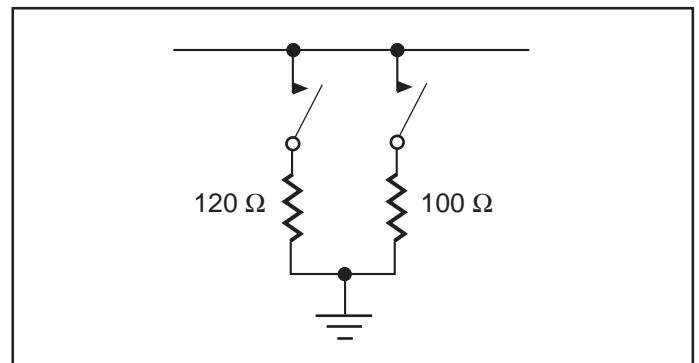| Parameters	Description	Test Conditions[1]	Min.	Typ[2]	Max.	Units
I_{CC}	Quiescent Positive Power Supply Current	V_{CC} = 3.6V, V_{IN} = 0V or V_{CC} All Channels On or OFF	—	—	1	μA

Notes:
1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for applicable device type.
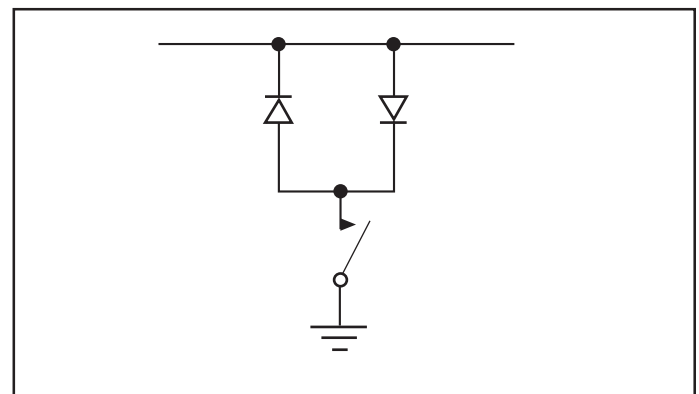2. Guaranteed by design.
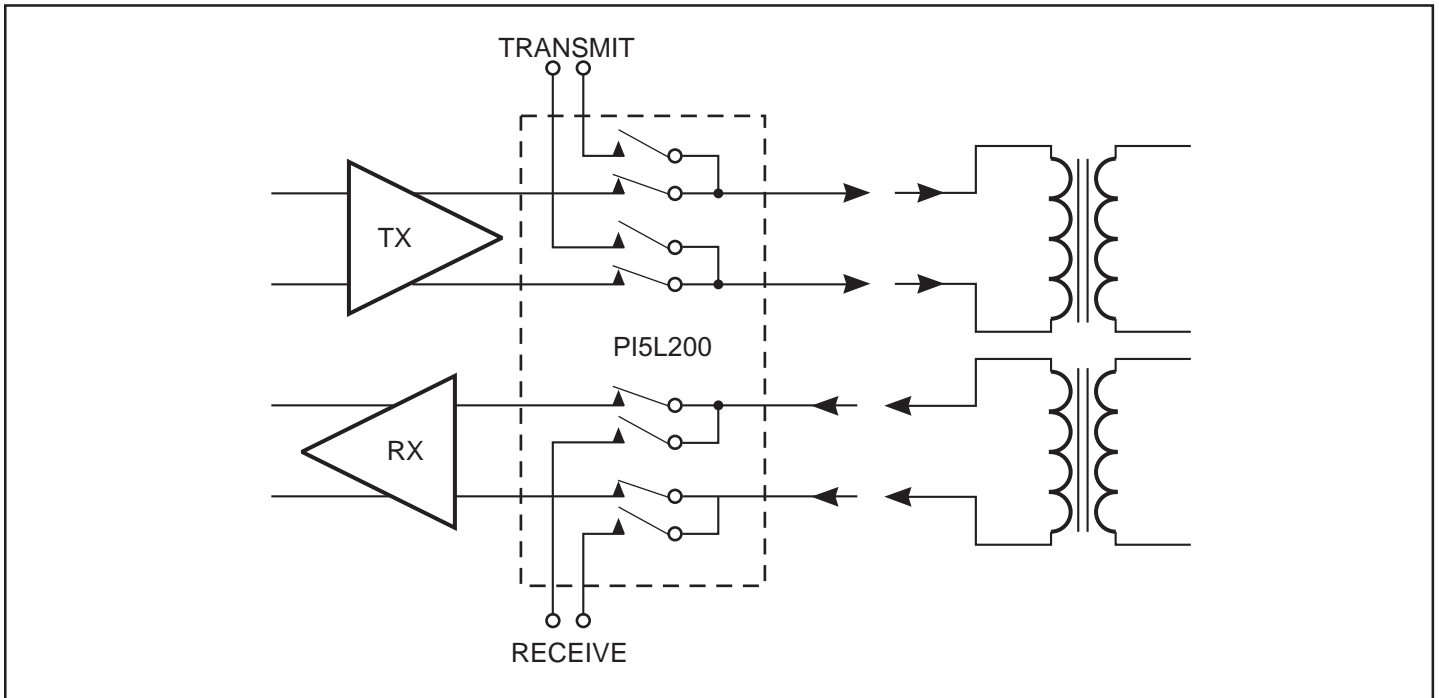
Figure 1a. Full Duplex Transceiver
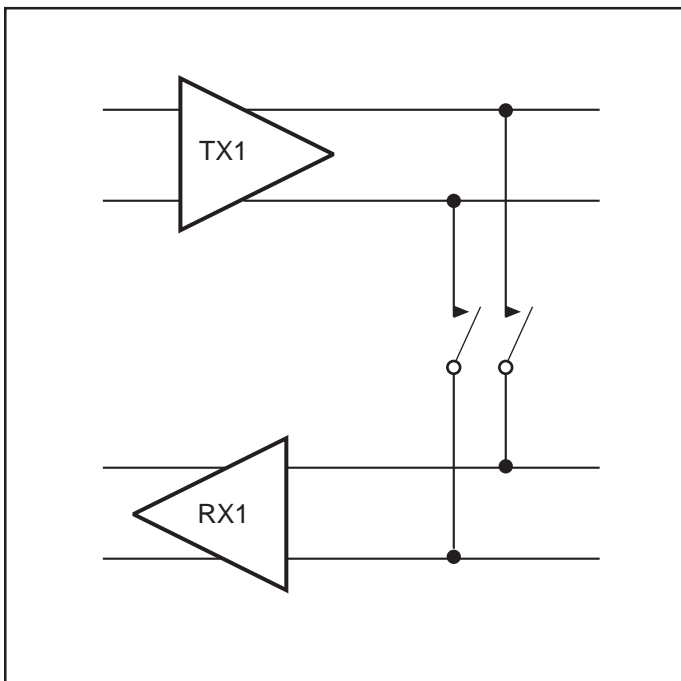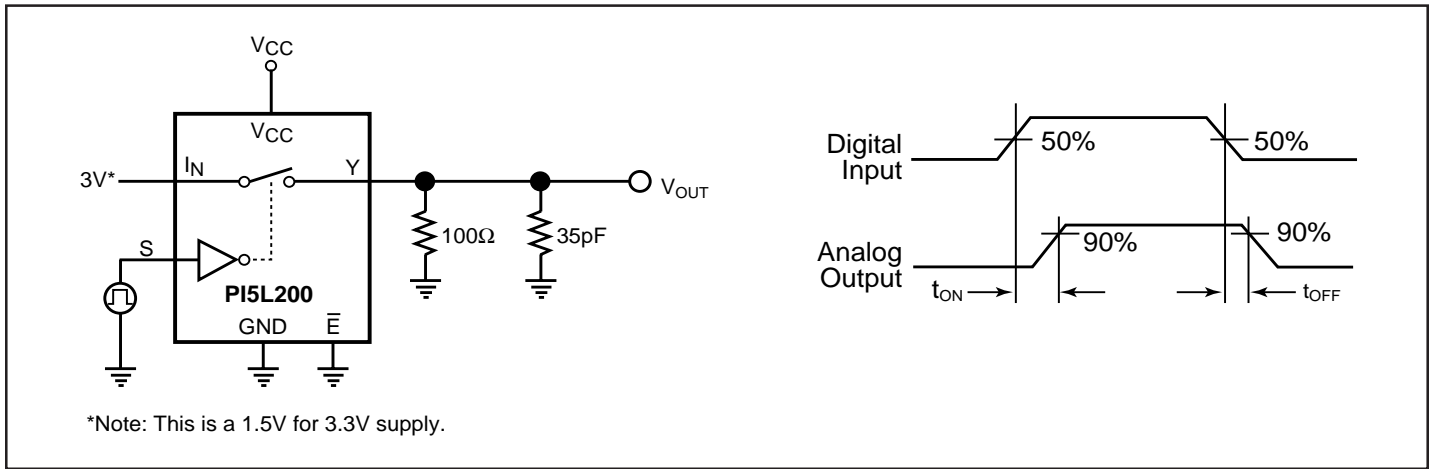

Figure 1b. Loop Back
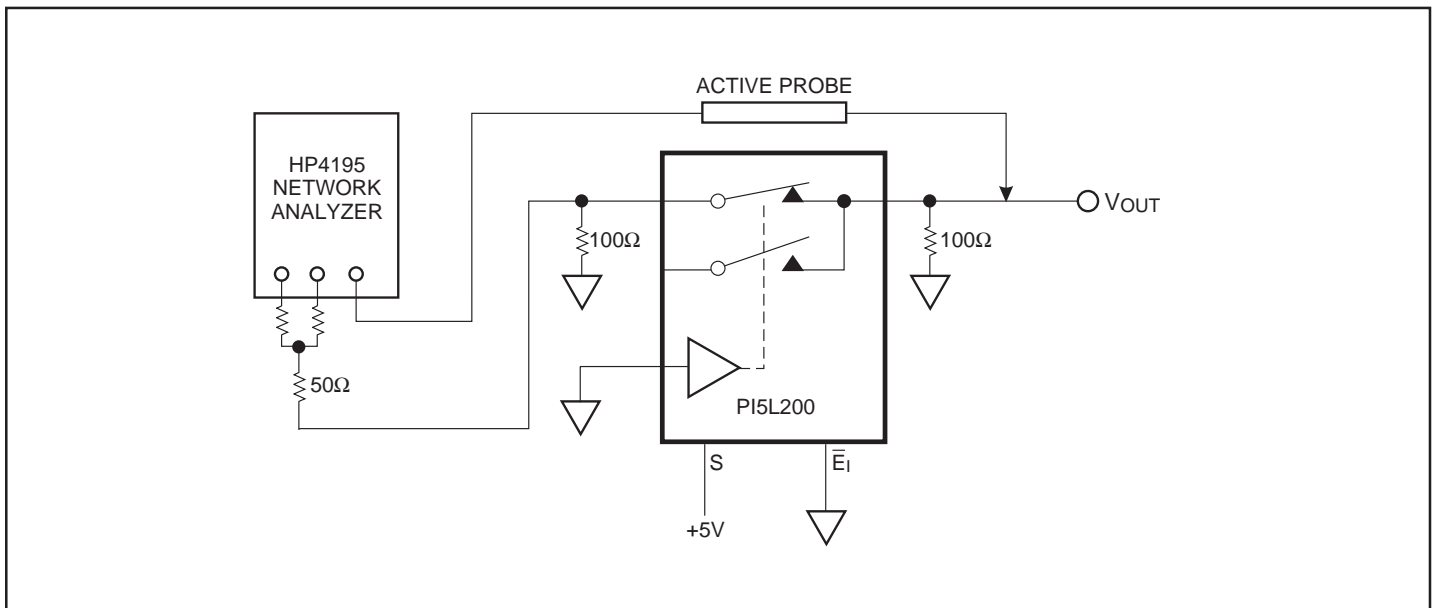

Figure 1c. Line Termination

Figure 1d. Line Clamp

Test Circuits
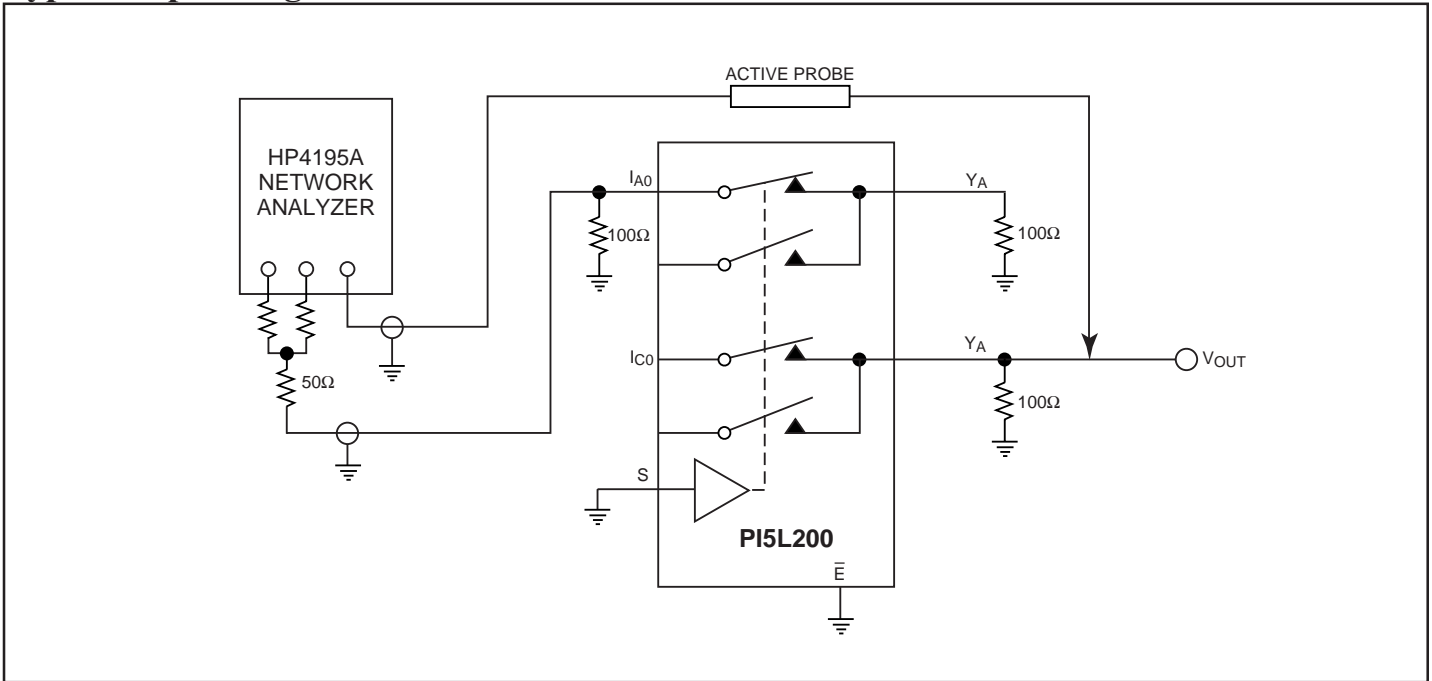

Figure 2. Switching Time

*Note: This is a 1.5V for 3.3V supply.
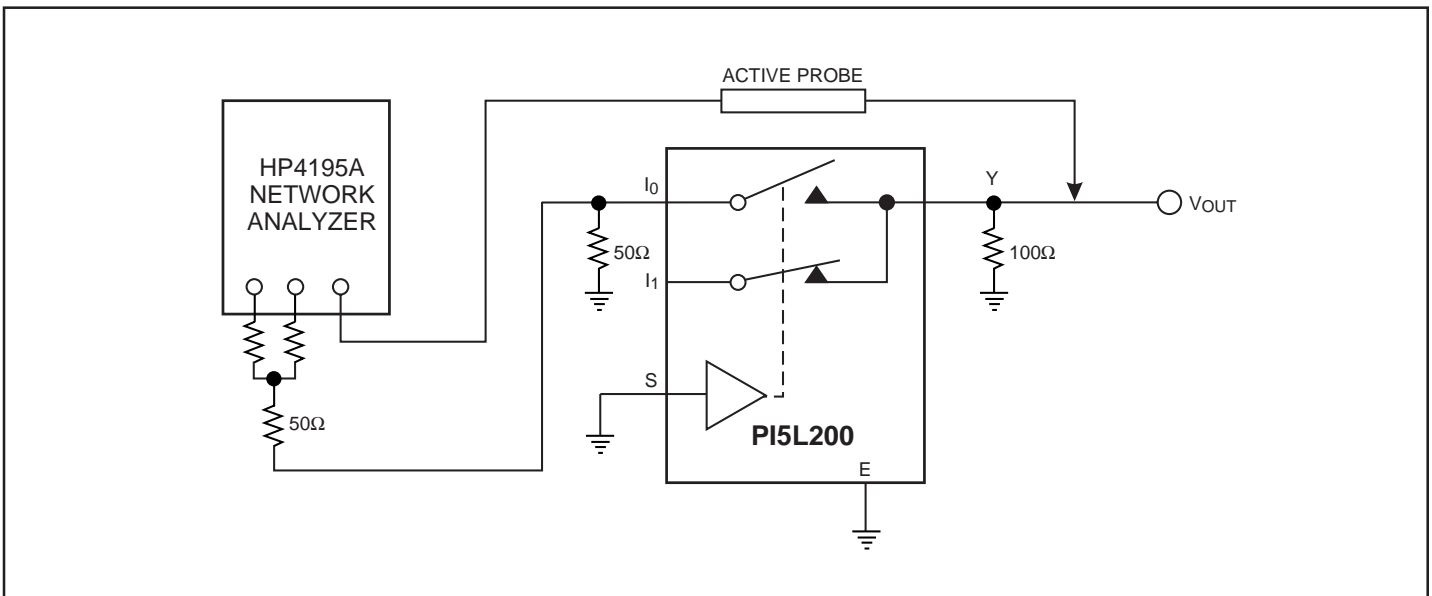

Figure 3. Bandwidth

Typical Operating Characteristics

Figure 4. Crosstalk

Figure 5. Off Isolation

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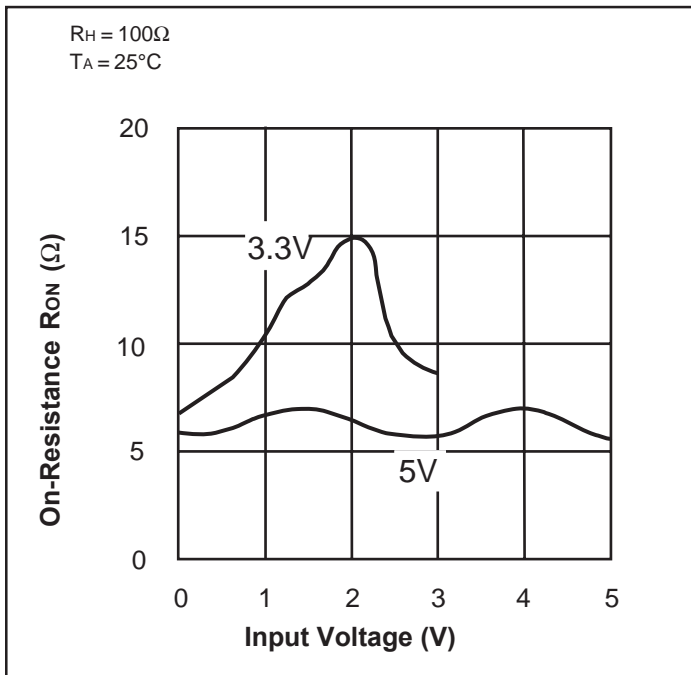
Figure 6. On-Resistance vs. Input Voltage

$R_H = 100\Omega$
$T_A = 25°C$

On-Resistance R_{ON} (Ω)

Input Voltage (V)

3.3V

5V
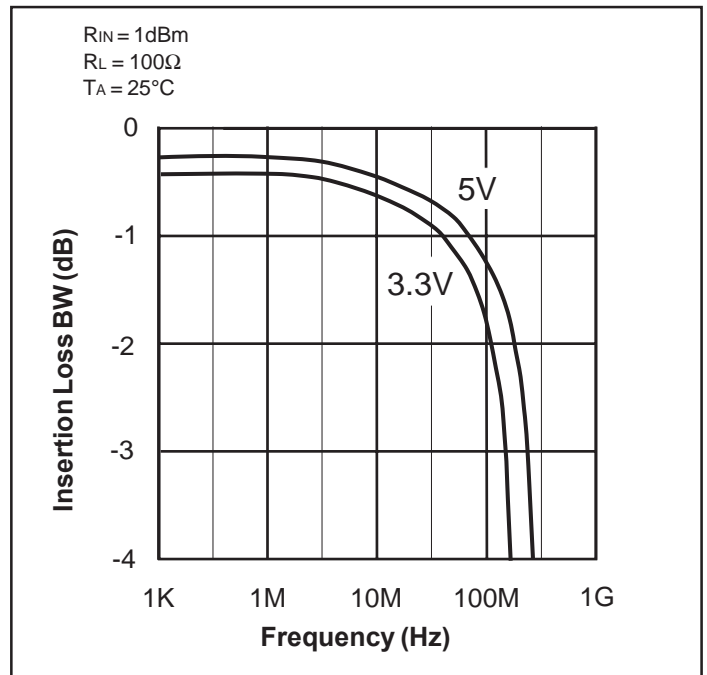
Figure 7. Insertion Loss vs. Frequency

$R_{IN} = 1dBm$
$R_L = 100\Omega$
$T_A = 25°C$

Insertion Loss BW (dB)

Frequency (Hz)

5V

3.3V
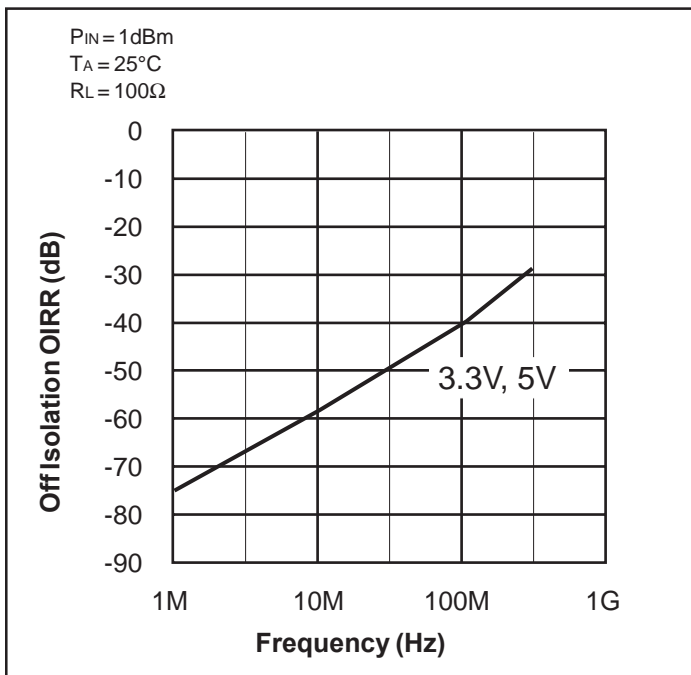
Figure 8. Off Isolation vs. Frequency

$P_{IN} = 1dBm$
$T_A = 25°C$
$R_L = 100\Omega$

Off Isolation OIRR (dB)

Frequency (Hz)

3.3V, 5V
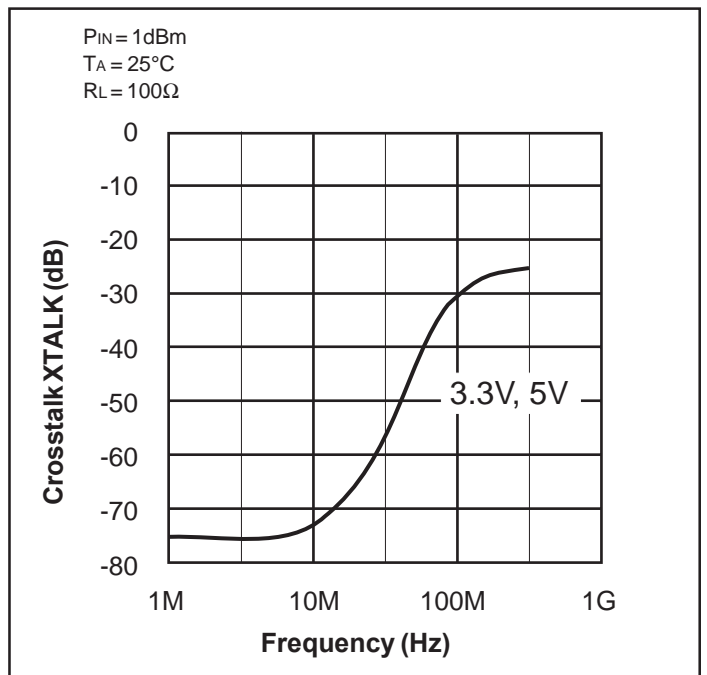
Figure 9. Crosstalk vs. Frequency

$P_{IN} = 1dBm$
$T_A = 25°C$
$R_L = 100\Omega$

Crosstalk XTALK (dB)

Frequency (Hz)

3.3V, 5V

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Packaging Mechanical: 16-Pin SOIC (W)

16

1

| .149 | 3.78 |
| .157 | 3.99 |

| .386 | | 9.80 |
| .393 | | 10.00 |

.0155 / .0260
0.393 / 0.660 REF

| .053 | 1.35 |
| .068 | 1.75 |

SEATING PLANE

.050 BSC
1.27

.013 / .020
0.330 / 0.508

| .0040 | 0.10 |
| .0098 | 0.25 |

| .0099 | 0.25 | x 45°
| .0196 | 0.50 |

0-8°

| .0075 | 0.19 |
| .0098 | 0.25 |

0.41 / 1.27

.016 / .050

| .2284 | 5.80 |
| .2440 | 6.20 |

| X.XX | DENOTES DIMENSIONS |
| X.XX | IN MILLIMETERS |

Packaging Mechanical: 16-Pin QSOP (Q)

16

1

| .150 | 3.81 |
| .157 | 3.99 |

| .189 | | 4.80 |
| .197 | | 5.00 |

.008 / 0.203 REF

| .053 | 1.35 |
| .069 | 1.75 |

SEATING PLANE

.025 BSC
0.635

.008 / .012
0.203 / 0.305

| .004 | 0.101 |
| .010 | 0.254 |

15° MAX.

.008 / 0.20 MIN.

.008 / .013
0.20 / 0.33

Guage Plane

.010 / 0.254

15° MAX.

0°-6°

.016 / .035
0.41 / 0.89

.041 / 1.04 REF

Detail A

.015 x 45°   0.38

Detail A

.007 / .010
0.178 / 0.254

0.41 / 1.27

.016 / .050

| .228 | 5.79 |
| .244 | 6.19 |

| X.XX | DENOTES DIMENSIONS IN MILLIMETERS |
| X.XX | |

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Packaging Mechanical: 16-Pin TSSOP (L)
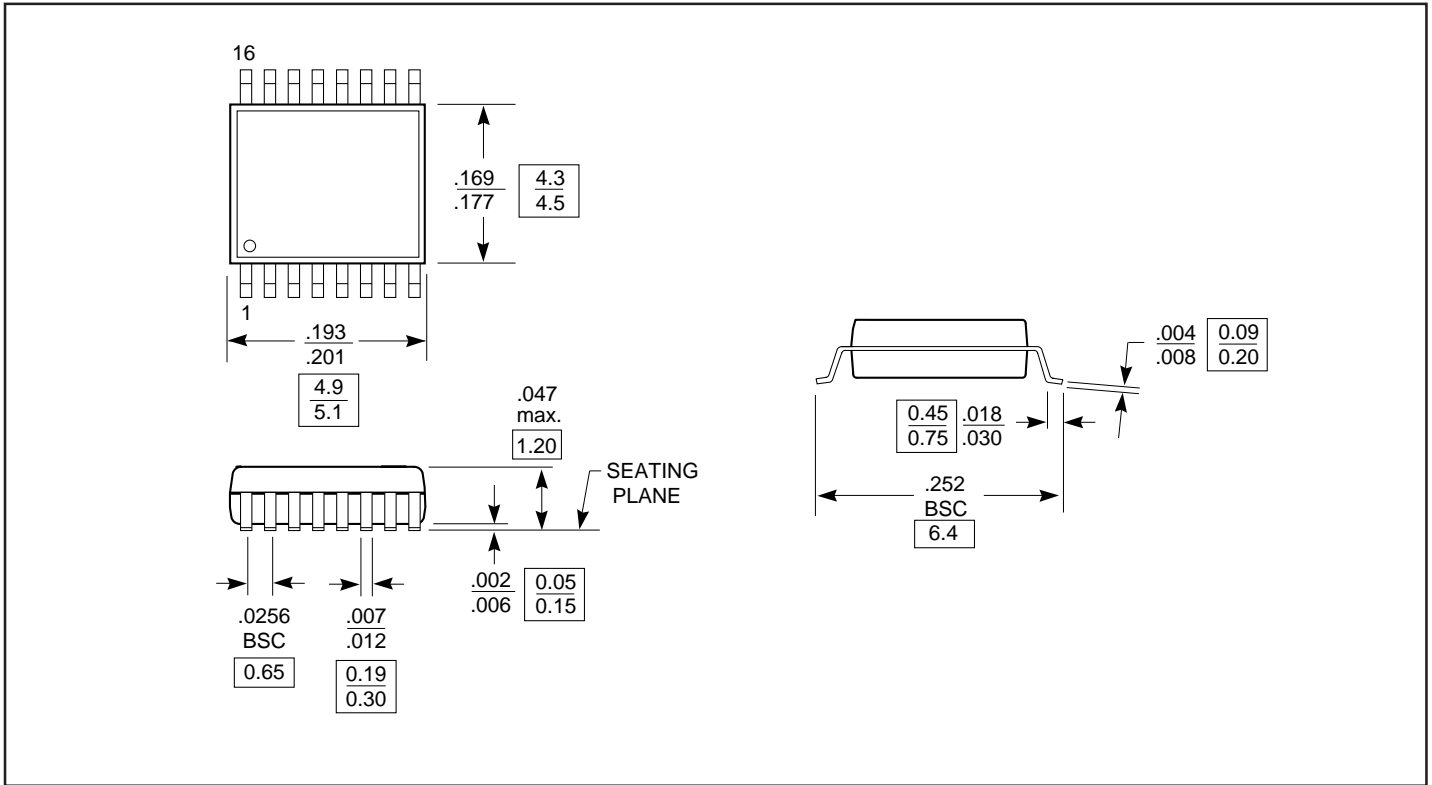
Ordering Information

Ordering Code	Package Code	Package Type
PI5L200L	L	16-pin TSSOP
PI5L200LE	L	Pb-free & Green, 16-pin TSSOP
PI5L200Q	Q	16-pin QSOP
PI5L200QE	Q	Pb-free & Green, 16-pin QSOP
PI5L200W	W	16-pin SOIC
PI5L200WE	W	Pb-free & Green, 16-pin SOIC

Notes:
1. Thermal characteristics can be found on the company web site at www.pericom.com/packaging/

单击下面可查看定价，库存，交付和生命周期等信息