

1.8V, Wide-Bandwidth, 5 Differential Channels, 2:1 Mux/DeMux Switch with Dual Enable

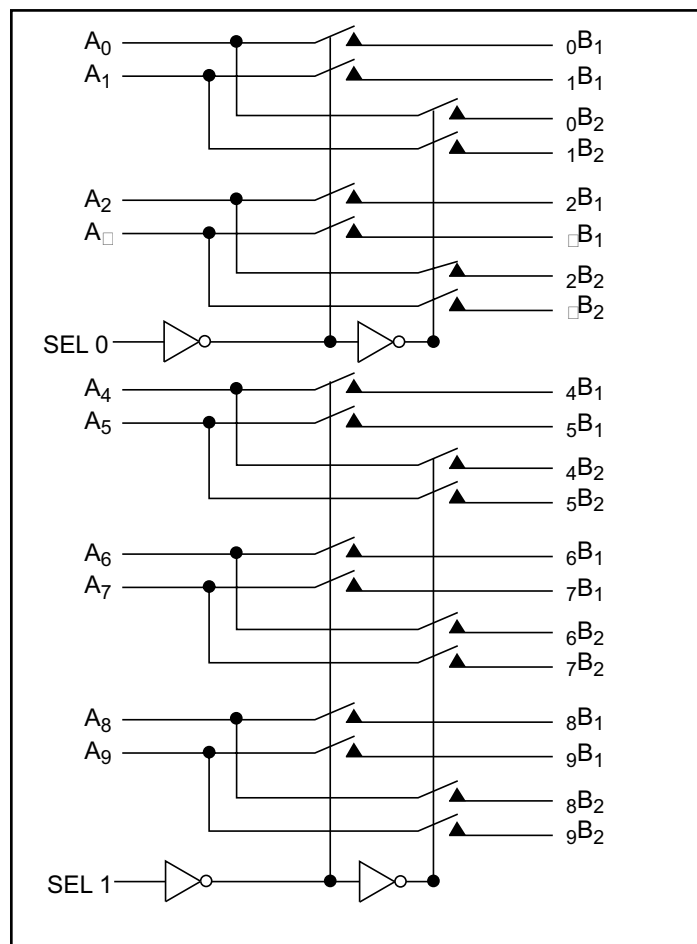
Features

- 5 different channels, 2:1 Mux/DeMux
- LVDS signal switching beyond 2.5Gbps
- Low bit-to-bit skew, 8ps
- Low crosstalk: -70dB @ 10MHz
- Switching speed: 4ns
- V_{CC} Operating Range: +1.5V to +2.0V
- ESD: Data bits @ 8kV HBM, select bits @ 2kV HBM
- Packaging (Pb-free & Green):
- 64-pin TSSOP (A)

Applications

- Routes physical layer signals for high-speed, high bandwidth differential protocols

Block Diagram



Description

Pericom Semiconductor's PI2LVD512 is a 10- to 5-channel multiplexer/demultiplexer Switch. The device multiplexes differential signals to one of two corresponding outputs. The switch is bidirectional. It is designed for low bit-to-bit skew, high channel-to-channel noise isolation and is compatible with various differential standards such as LVDS

Pin Description 64-TSSOP

GND	1	64	V _{DD}
V _{DD}	2	63	GND
GND	3	62	GND
GND	4	61	0B ₁
GND	5	60	1B ₁
A ₀	6	59	0B ₂
A ₁	7	58	1B ₂
V _{DD}	8	57	GND
GND	9	56	V _{DD}
SEL ₀	10	55	2B ₁
V _{DD}	11	54	3B ₁
A ₂	12	53	2B ₂
A ₃	13	52	3B ₂
GND	14	51	GND
V _{DD}	15	50	GND
V _{DD}	16	49	4B ₁
GND	17	48	5B ₁
A ₄	18	47	4B ₂
A ₅	19	46	5B ₂
V _{DD}	20	45	6B ₁
A ₆	21	44	7B ₁
A ₇	22	43	6B ₂
GND	23	42	7B ₂
V _{DD}	24	41	GND
SEL ₁	25	40	V _{DD}
V _{DD}	26	39	8B ₁
A ₈	27	38	9B ₁
A ₉	28	37	8B ₂
GND	29	36	9B ₂
GND	30	35	GND
V _{DD}	31	34	GND
GND	32	33	V _{DD}

Maximum Ratings

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

Storage Temperature.....	–65°C to +150°C
Supply Voltage to Ground Potential.....	–0.5V to +2.5V
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.

Truth Table

Function	SEL ₀	SEL ₁
A _N to N _B 1, N = 0, 1, 2, 3	L	X
A _N to N _B 2, N = 0, 1, 2, 3	H	X
A _N to N _B 1, N = 4, 5, 6, 7, 8, 9	X	L
A _N to N _B 2, N = 4, 5, 6, 7, 8, 9	X	H

DC Electrical Characteristics for Switching over Operating Range (T_A = –40°C to +85°C, V_{CC} = 1.5V to 2.0V)

Parameter	Description	Test Conditions ⁽¹⁾	Min.	Typ. ⁽²⁾	Max.	Units
V _{IH}	Input HIGH Voltage	Guaranteed HIGH level	0.65 x V _{CC}	-	-	V
V _{IL}	Input LOW Voltage	Guaranteed LOW level	–0.5	-	0.35 x V _{CC}	
V _{IK}	Clamp Diode Voltage	V _{CC} = Max., I _{IN} = –18mA	-	–0.7	–1.2	
I _{IH}	Input HIGH Current	V _{CC} = Max., V _{IN} = V _{CC}	-	-	±5	μA
I _{IL}	Input LOW Current	V _{CC} = Max., V _{IN} = GND	-	-	±5	

Notes:

- For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
- Typical values are at V_{CC} = 1.8V, T_A = 25°C ambient and maximum loading.

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}		400		μA

Notes:

- For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
- Typical values are at V_{CC} = 1.8V, T_A = 25°C ambient and maximum loading.

Dynamic Electrical Characteristics Over the Operating Range (T_A = -40° to +85°C, V_{CC} = 1.8V±10%, GND=0V)

Parameter	Description	Test Conditions	Min.	Typ.	Max.	Units
X _{TALK} ⁽¹⁾	Crosstalk	See Fig. 1 for Measurement Setup, f = 10 MHz		-70		dB
O _{IRR} ⁽¹⁾	OFF Isolation	See Fig. 2 for Measurement Setup, f = 10 MHz		-65		
BW	-3dB Bandwidth			1.26		GHz

Note:

- Guaranteed by design.

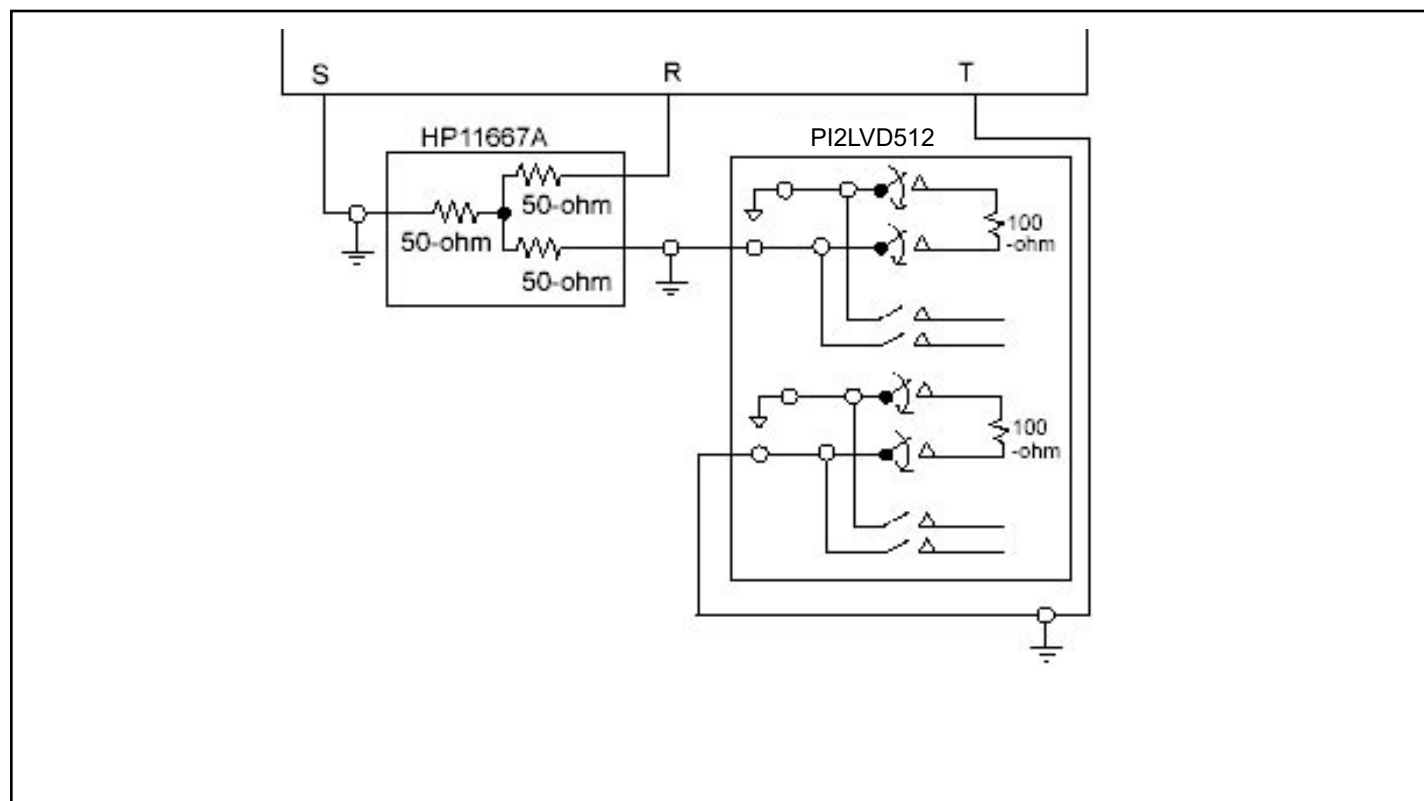


Fig 1. Crosstalk Setup

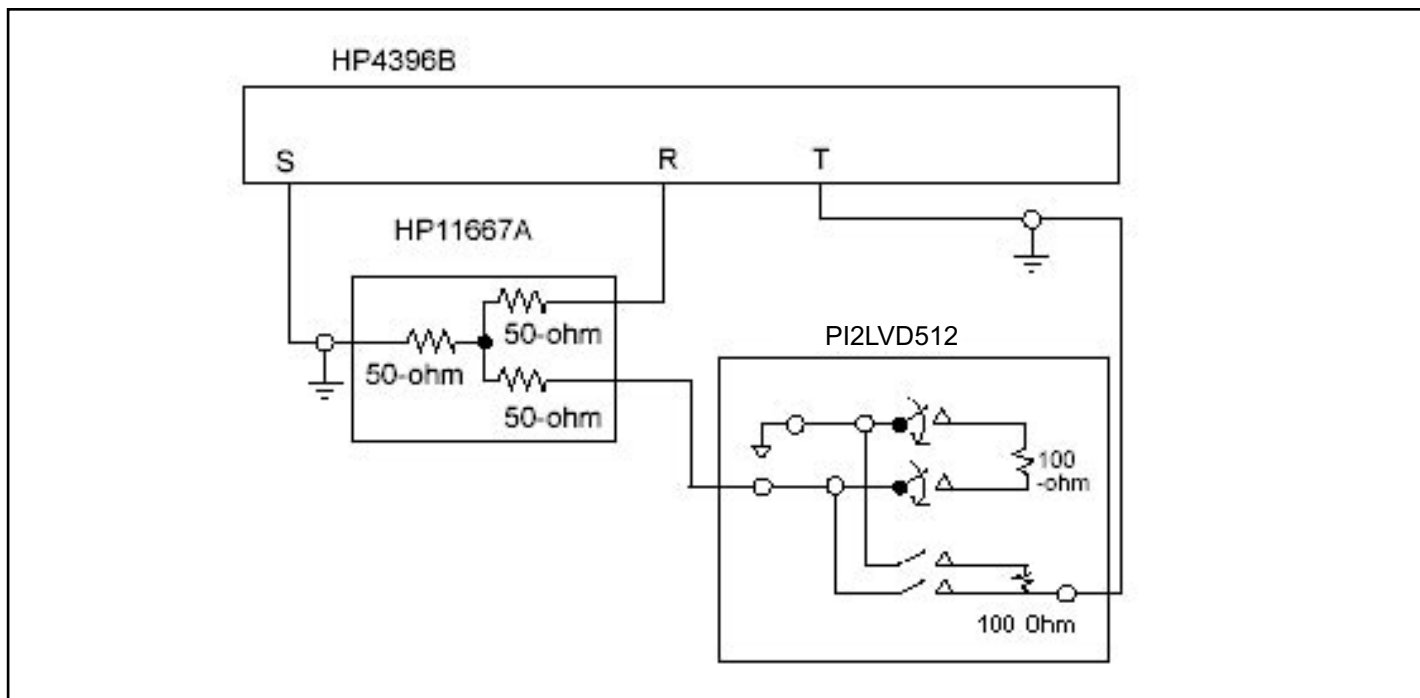


Fig 2. Off-isolation setup

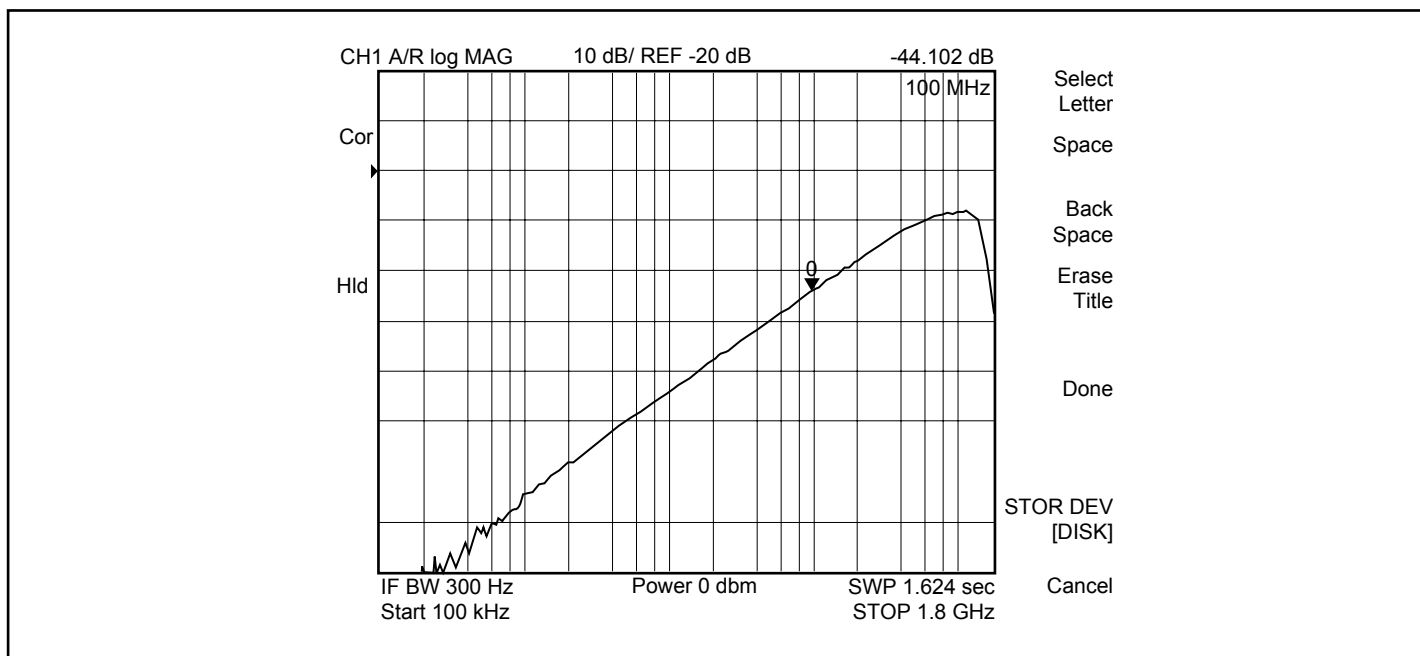


Fig 3. Crosstalk

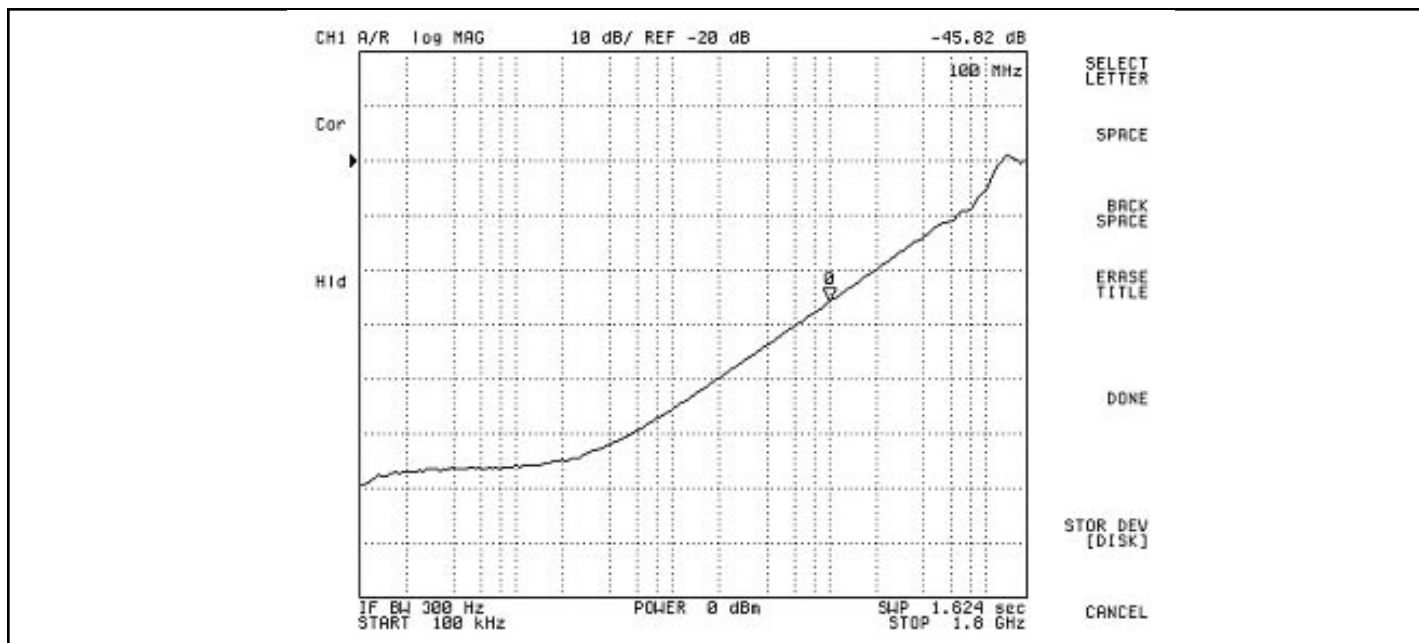


Fig 4. Off Isolation

Switching Characteristics ($T_A = -40^\circ$ to $+85^\circ\text{C}$, $V_{CC} = 1.8\text{V} \pm 10\%$)

Parameter	Description	Min.	Typ. ⁽²⁾	Max.	Units
tpZH, tpZL	Line Enable Time - SEL to A _N , B _N	0.5	-	8.0	
tPHZ, tPLZ	Line Disable Time - SEL to A _N , B _N	0.5	-	4.0	
tb-b	Bit-to-bit skew		8		ps
tch-ch	Channel-to-channel skew		45		ps

Note:

- For max. or min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.

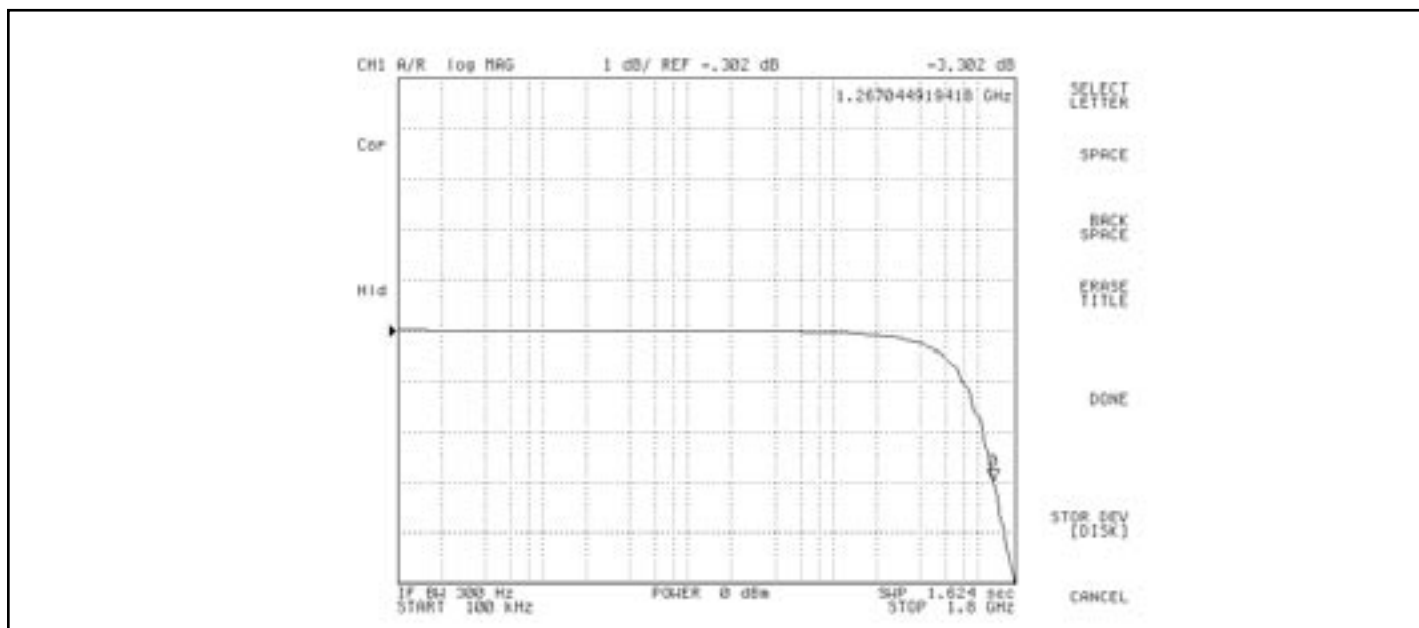


Fig 5. Bandwidth, $V_{CC} = 1.8\text{V}$, 25°C

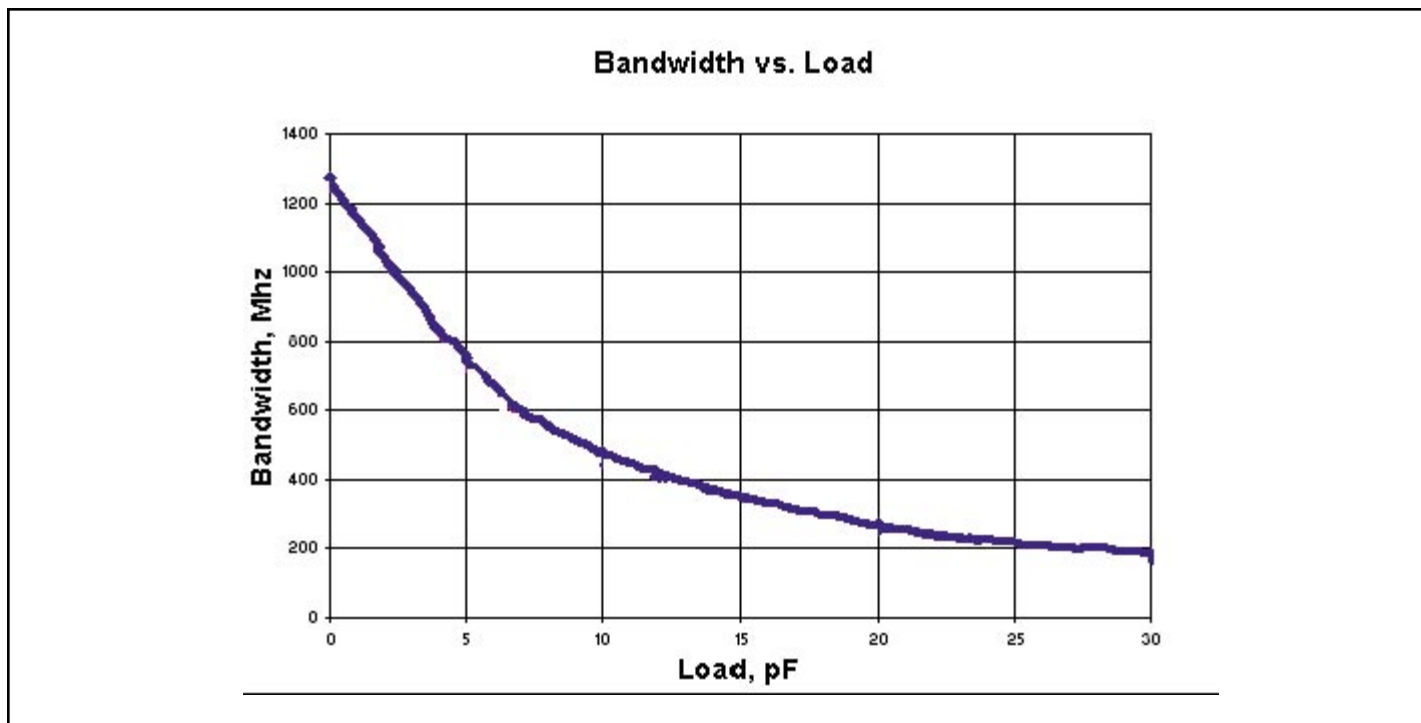
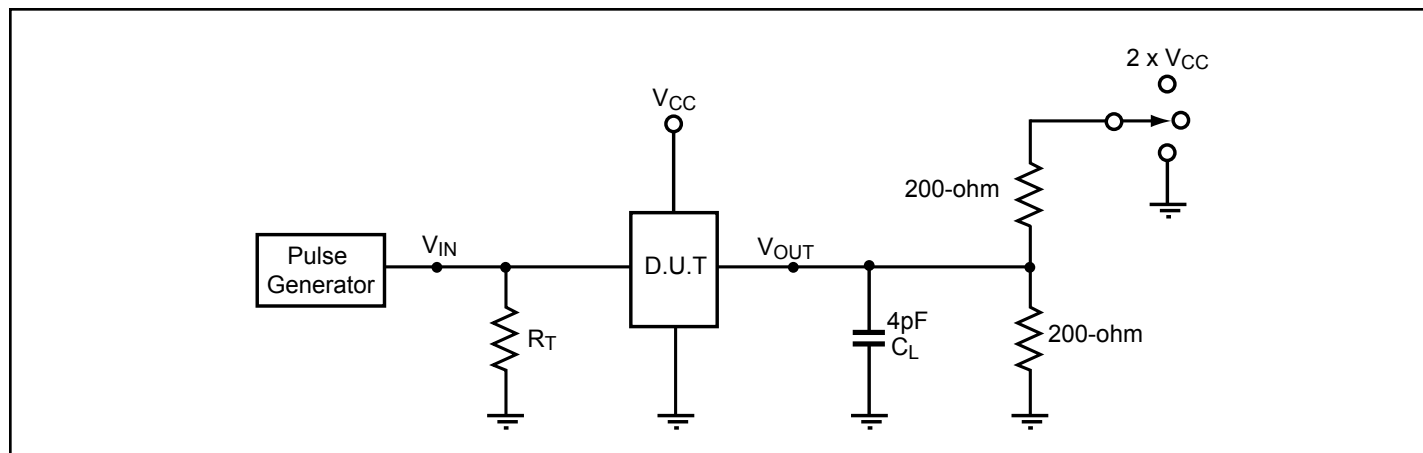


Fig 6. Bandwidth vs. Load

Test Circuit for Electrical Characteristics⁽¹⁾



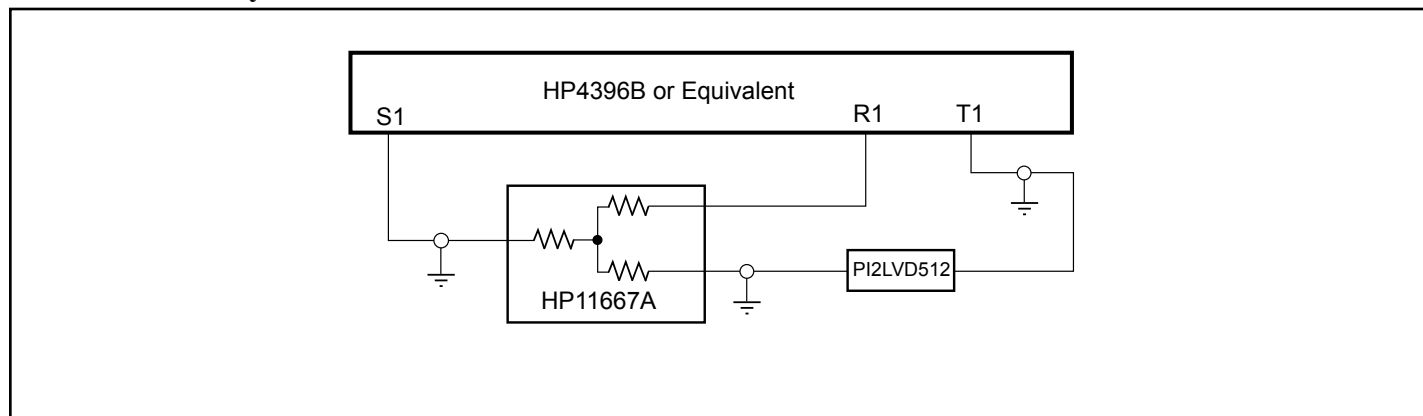
Notes:

1. C_L = Load capacitance: includes jig and probe capacitance.
2. R_T = Termination resistance: should be equal to Z_{OUT} of the Pulse Generator
3. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control.
Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
4. All input impulses are supplied by generators having the following characteristics: $PRR \leq \text{MHz}$, $Z_O = 50\Omega$, $t_R \leq 2.5\text{ns}$, $t_F \leq 2.5\text{ns}$.
5. The outputs are measured one at a time with one transition per measurement.

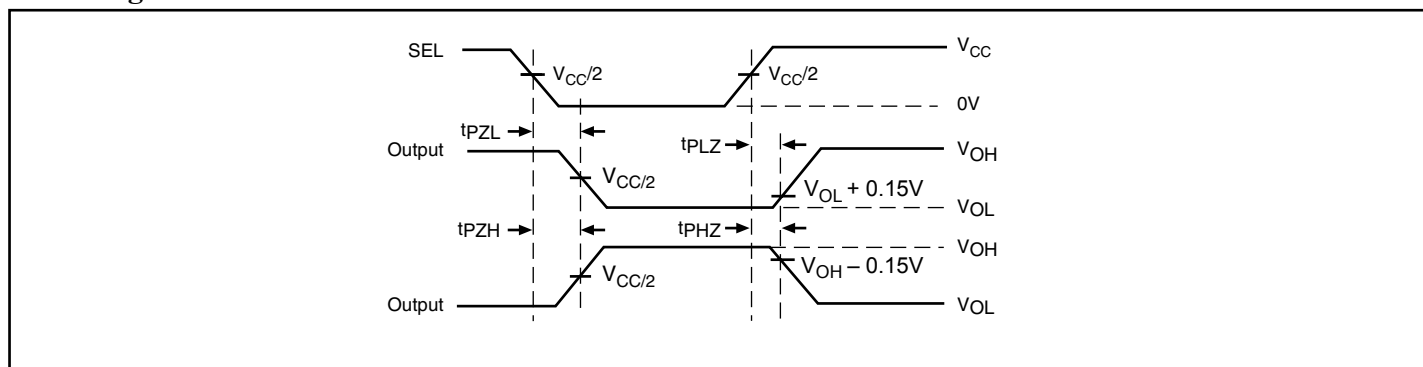
Switch Positions

Test	Switch
t_{PLZ} , t_{PZL} (output on B-side)	$2 \times V_{CC}$
t_{PHZ} , t_{PZH} (output on B-side)	GND

Test Circuit for Dynamic Electrical Characteristics

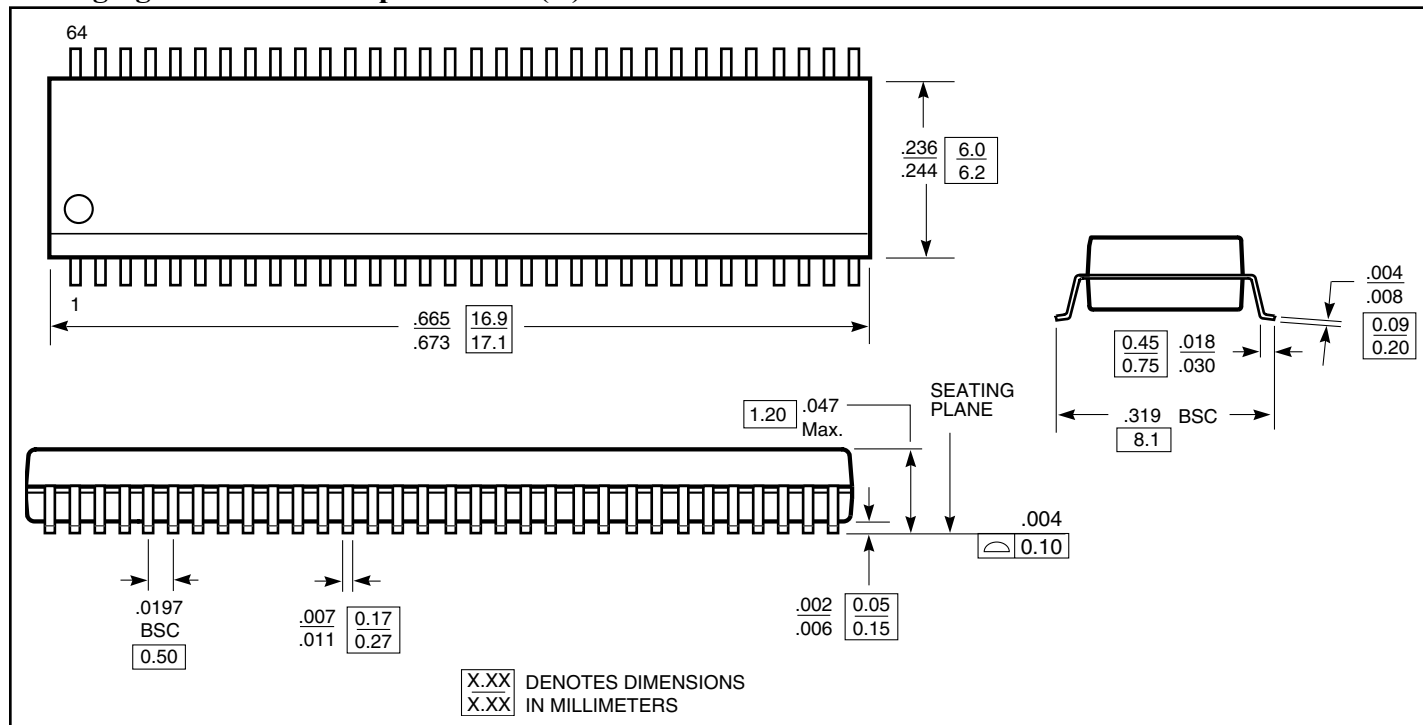


Switching Waveforms



Voltage Waveforms Enable and Disable Times

Packaging Mechanical: 64-pin TSSOP (A)



Ordering Information

Ordering Code	Package Code	Package Description
PI2LVD512AE	AE	Pb-free and Green, 64-Pin TSSOP

Notes:

- Thermal characteristics can be found on the company web site at www.pericom.com/packaging/
- E = Pb-free and Green
- X suffix = Tape/Reel