



### Pin Description

Pin # (BQSOP)	Pin # (TQFN)	Pin Name	Description
2, 4, 12, 21, 23, 25, 36, 48	2, 8, 16, 18, 20, 30, 40, 42	V <sub>DD</sub>	+ Power supply
1, 3, 5, 8, 11, 14, 17, 20, 22, 24, 26, 31, 37, 42, 47	1, 5, 10, 13, 17, 19, 21, 39, 41	V <sub>SS</sub>	- Power supply
13	9	SEL	Select pin, see truth table
6, 7, 9, 10, 15, 16, 18, 19, 27-30, 32-35, 38-41, 43-36	3, 4, 6, 7, 11, 12, 14, 15, 22-29, 31-38	Dx <sup>+/-x</sup> + CLK <sup>+/-x</sup>	Data + Clk bits for TMDS signal

### Truth Table<sup>(1)</sup>

Function	SEL
Dx to Dx <sup>A</sup>	L
Dx to Dx <sup>B</sup>	H

**Note:**

- x=0,1,2,3

### Maximum Ratings

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

Storage Temperature.....	-65°C to +150°C
Supply Voltage to V <sub>SS</sub> Potential.....	-0.5V to +2.5V
DC Input Voltage .....	0V to V <sub>DD</sub> +0.5V
DC Output Current.....	120mA

**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 Power Supply Characteristics

Parameter	Description	Min.	Max.	Units
V <sub>DD</sub> - V <sub>SS</sub>	Positive to Negative Power Supply	1.5	2.0	V
V <sub>SS</sub>	Negative Power Supply	0	1.6	V

### DC Electrical Characteristics for Switching over Operating Range (T<sub>A</sub> = -40°C to +85°C)

Parameter	Description	Test Conditions <sup>(1)</sup>	Min.	Typ. <sup>(2)</sup>	Max.	Units
V <sub>IH</sub> <sup>(3)</sup>	Input HIGH Voltage	Guaranteed HIGH level	0.65(V <sub>DD</sub> -V <sub>SS</sub> )+V <sub>SS</sub>			V
V <sub>IL</sub> <sup>(3)</sup>	Input LOW Voltage	Guaranteed LOW level	-0.5+V <sub>SS</sub>		0.35(V <sub>DD</sub> -V <sub>SS</sub> )+V <sub>SS</sub>	
V <sub>IK</sub>	Clamp Diode Voltage	V <sub>DD</sub> =Max., I <sub>IN</sub> =-18mA		-0.7+V <sub>SS</sub>	-1.2+V <sub>SS</sub>	μA
I <sub>IH</sub>	Input HIGH Current	V <sub>DD</sub> =Max., V <sub>IN</sub> =V <sub>DD</sub>			±5	
I <sub>IL</sub>	Input LOW Current	V <sub>DD</sub> =Max., V <sub>IN</sub> =V <sub>SS</sub>			±5	

**Notes:**

- For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
- Typical values are at T<sub>A</sub> = 25°C ambient and maximum loading.
- V<sub>IH</sub> & V<sub>IL</sub> are for SEL input only.

### Power Supply Characteristics

Parameters	Description	Test Conditions <sup>(1)</sup>	Min.	Typ. <sup>(2)</sup>	Max.	Units
I <sub>CC</sub>	Quiescent Power Supply Current	V <sub>DD</sub> = Max., V <sub>IN</sub> = V <sub>DD</sub> or V <sub>SS</sub>		300	400	μA

**Notes:**

1. For Max. or Min. conditions, use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at T<sub>A</sub> = 25°C ambient and maximum loading.

### Switching Characteristics (T<sub>A</sub> = -40° to +85°C, V<sub>SS</sub> = 0V, V<sub>DD</sub> = 1.8V ± 10%)

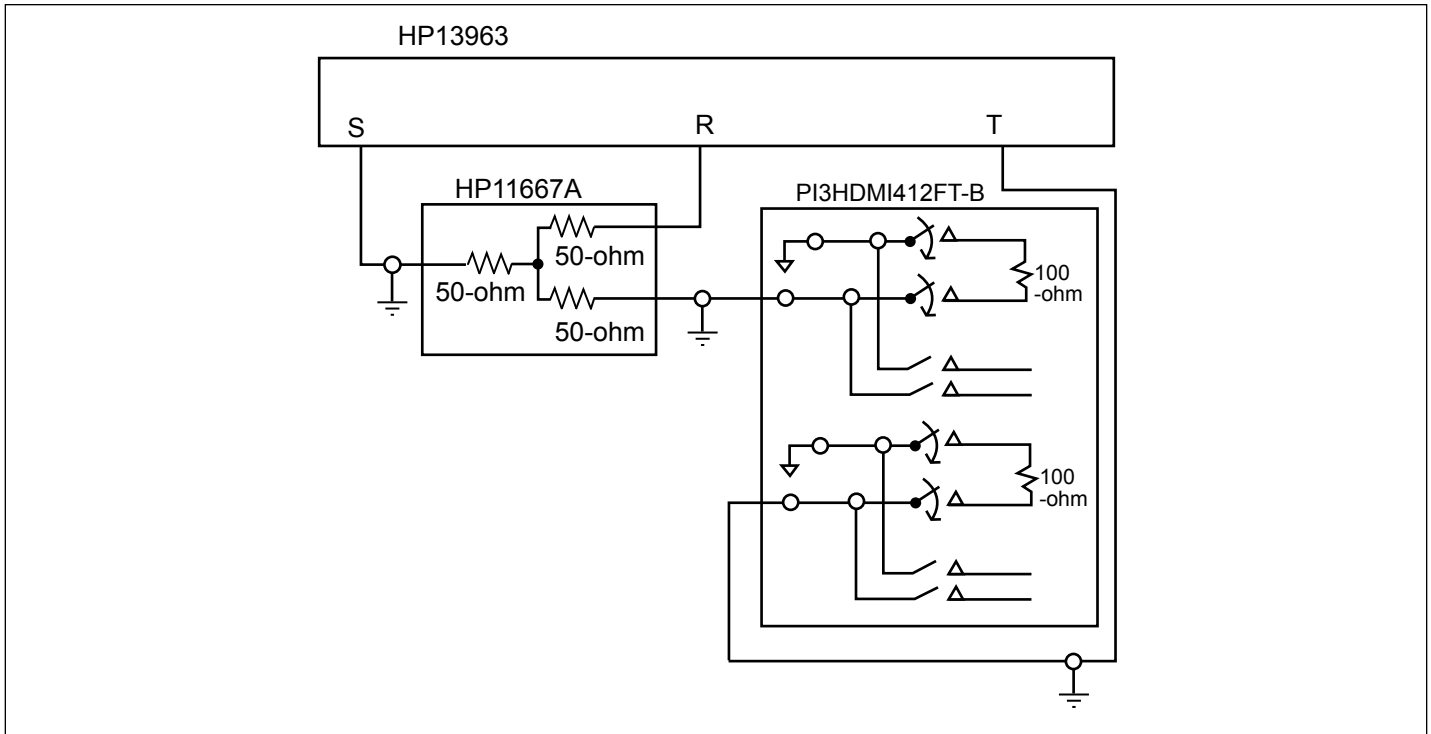
Parameter	Description	Min.	Max.	Units
t <sub>PZH</sub> , t <sub>PZL</sub>	Line Enable Time - SEL to N <sup>A</sup> , N <sup>B(1)</sup>	0.5	8.0	ns
t <sub>PHZ</sub> , t <sub>PLZ</sub>	Line Disable Time - SEL to N <sup>A</sup> , N <sup>B(1)</sup>	0.5	4.0	

**Notes:**

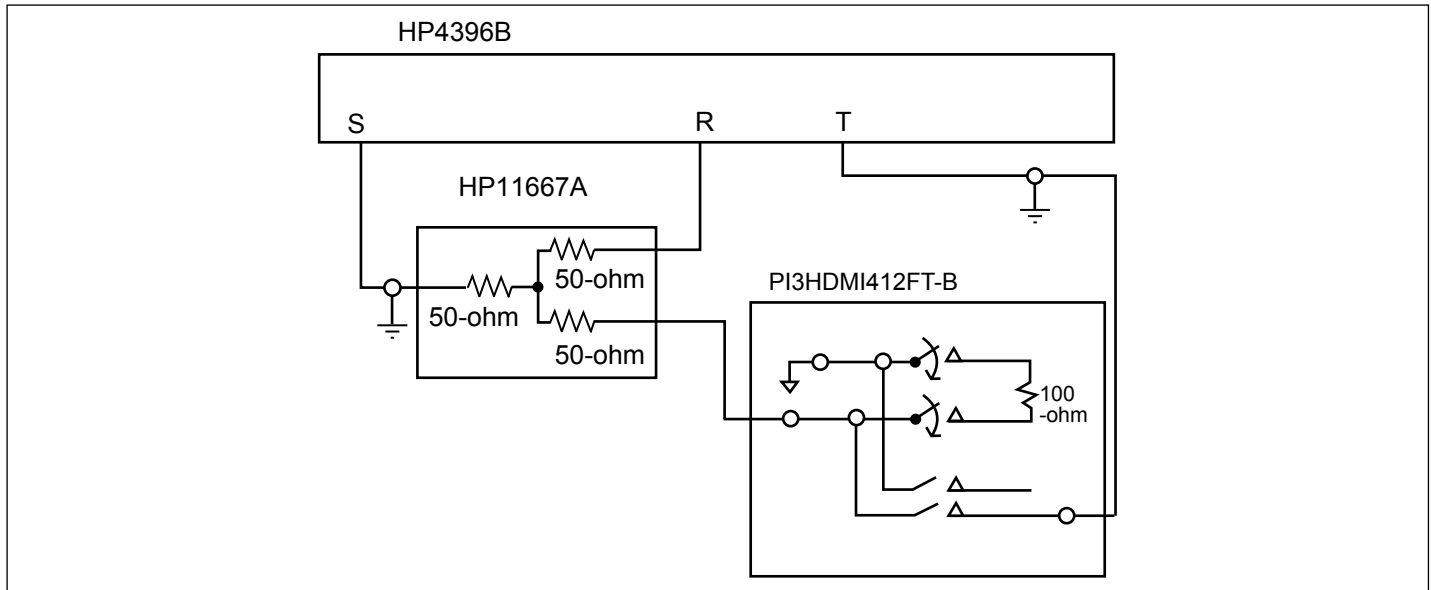
1. For measurement setup, please see “Test Circuit For Electrical Characteristic” on page 8, and “Switching waveforms” on page 9

### Dynamic Electrical Characteristics Over the Operating Range (T<sub>A</sub> = -40° to +85°C)

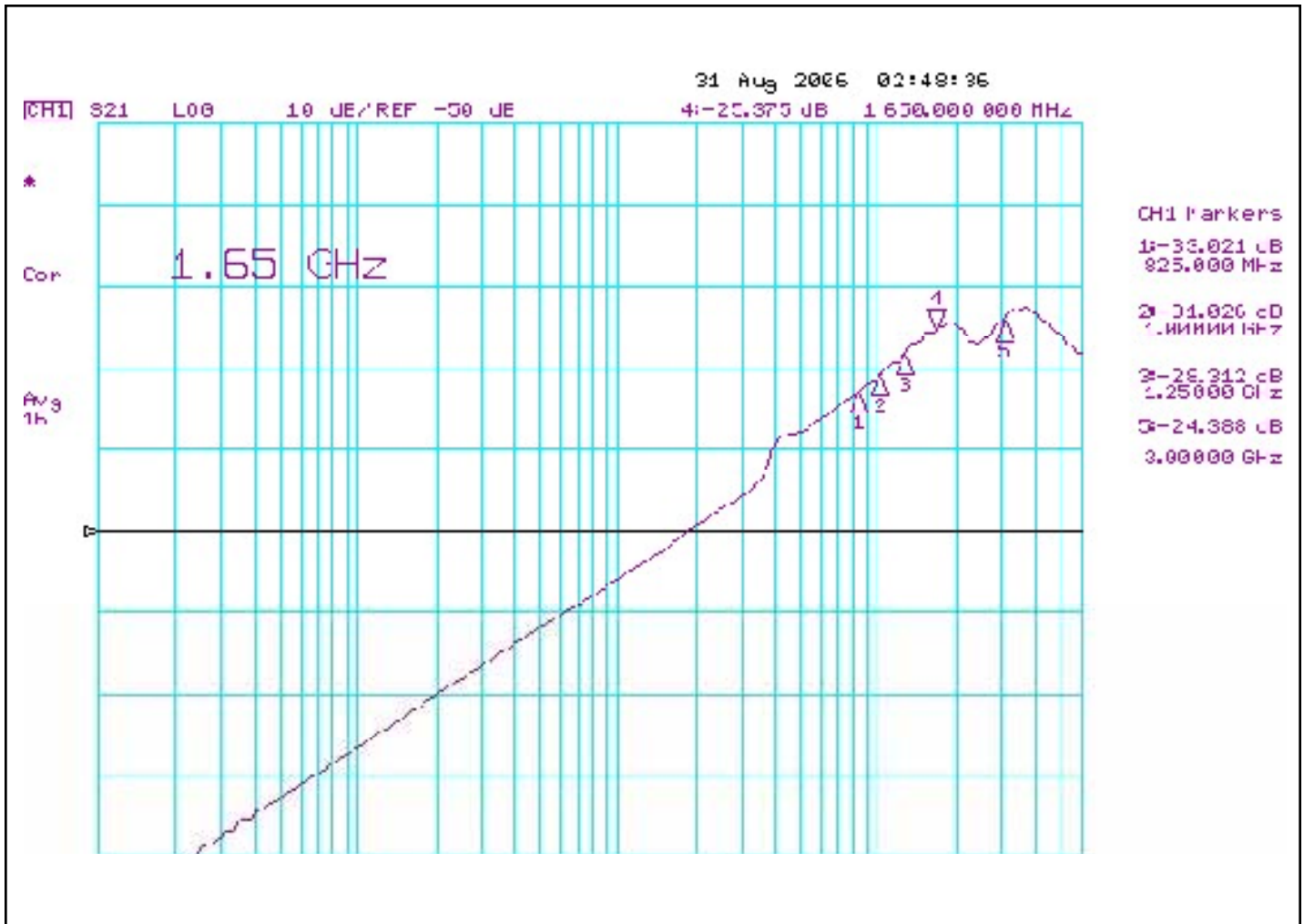
Parameter	Description	Test Conditions	Min.	Typ.	Max.	Units
X <sub>TALK</sub>	Crosstalk	See Fig. 1 for Measurement Setup, @ 2.0 Gbps		-31		dB
O <sub>IRR</sub>	OFF Isolation	See Fig. 2 for Measurement Setup, @ 2.0 Gbps		-40		
BW	-3dB BW			2.7		GHz
Insertion Loss		@ 1.65 Gbps		-0.87		dB
		@ 2.0 Gbps		-0.95		
		@ 2.5 Gbps		-1.18		
		@ 3.3 Gbps		-1.85		



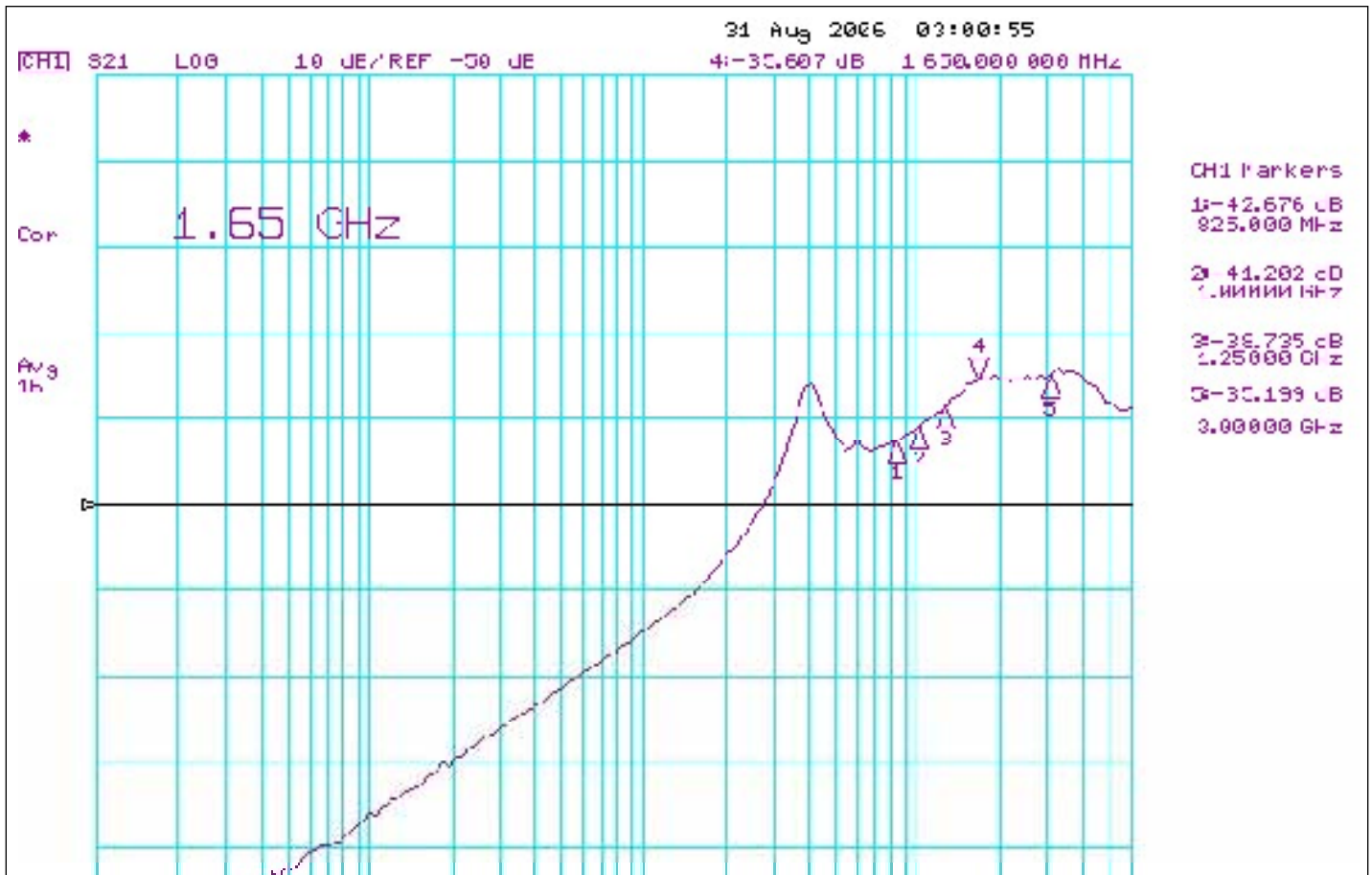
**Fig 1. Crosstalk Setup**



**Fig 2. Off-isolation setup**



**Fig 3. Crosstalk**

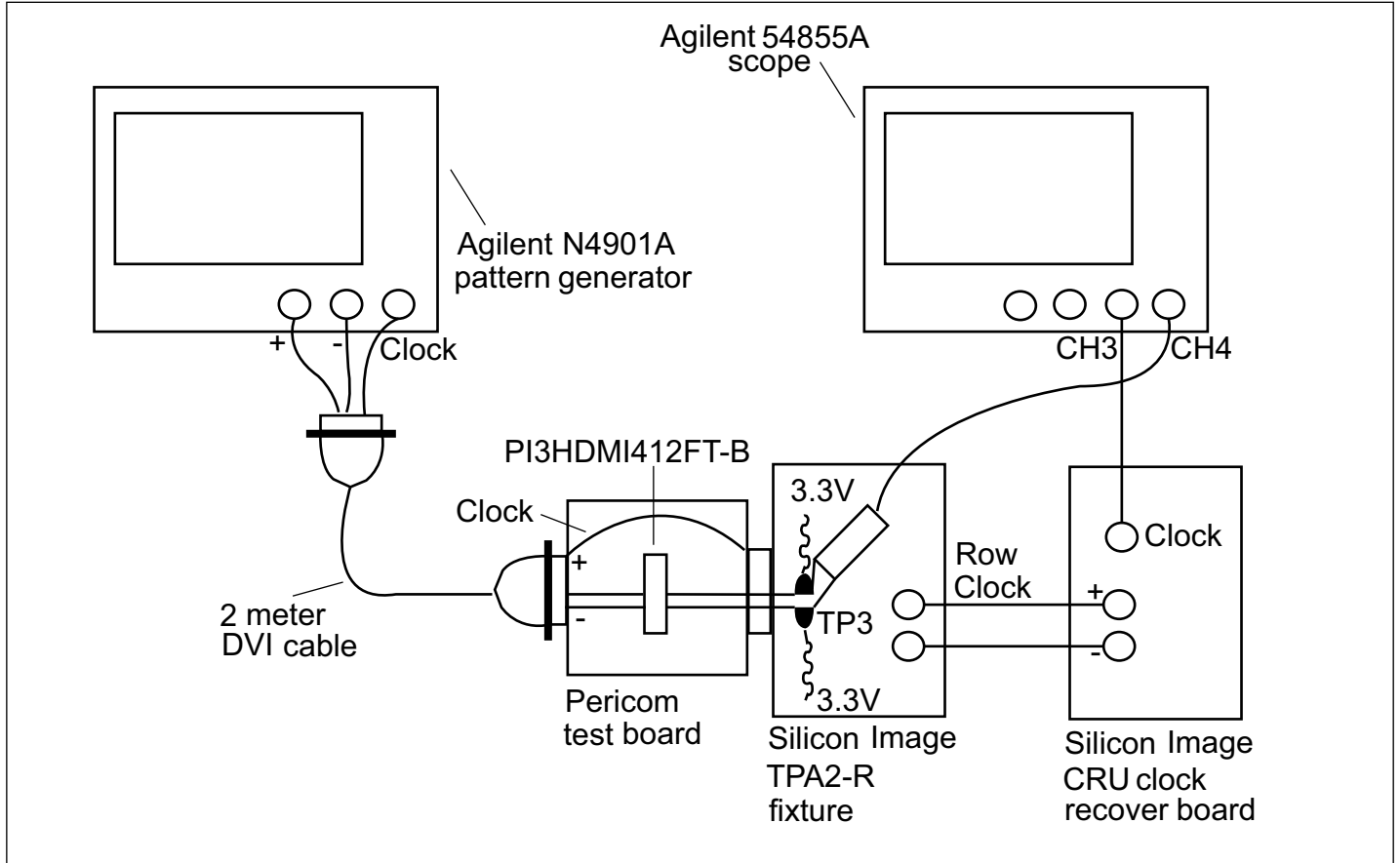


**Fig 4. Off Isolation**



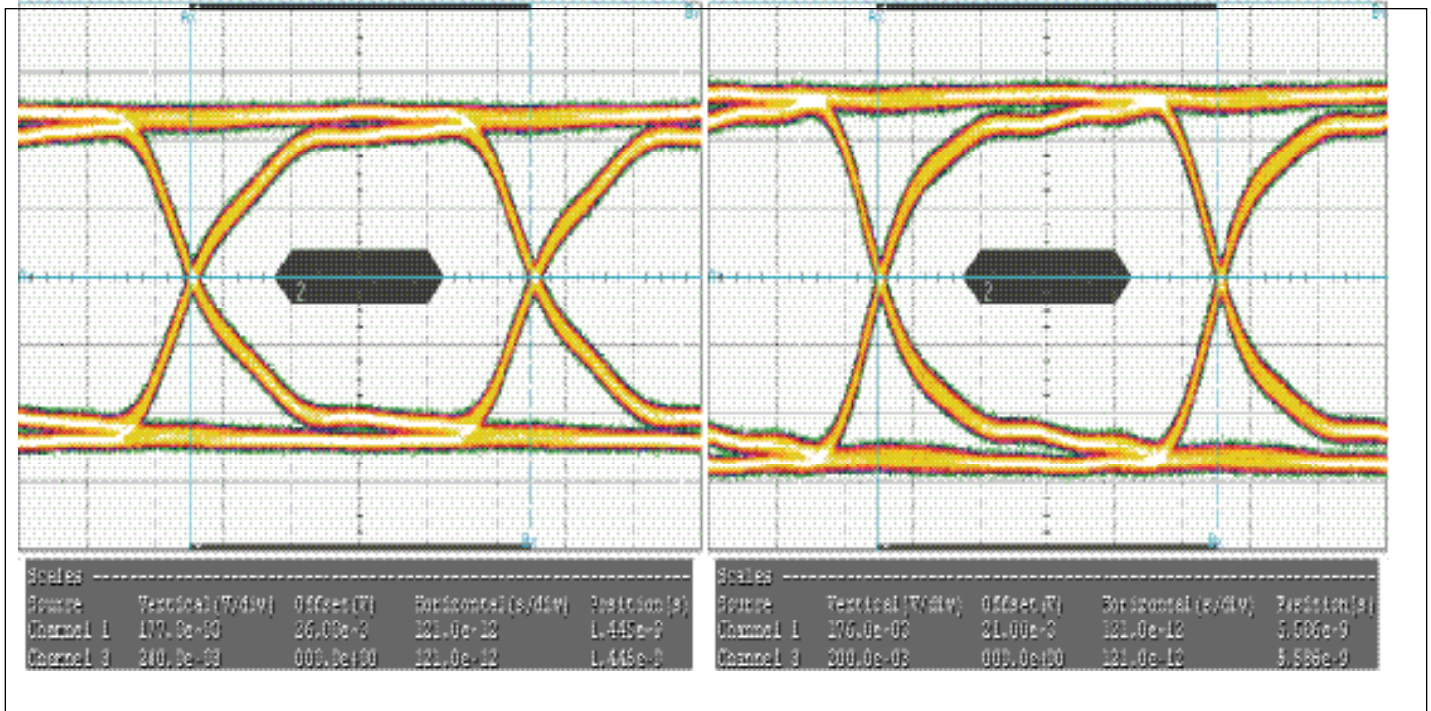
Fig 5. Insertion Loss

**Application Measurements**



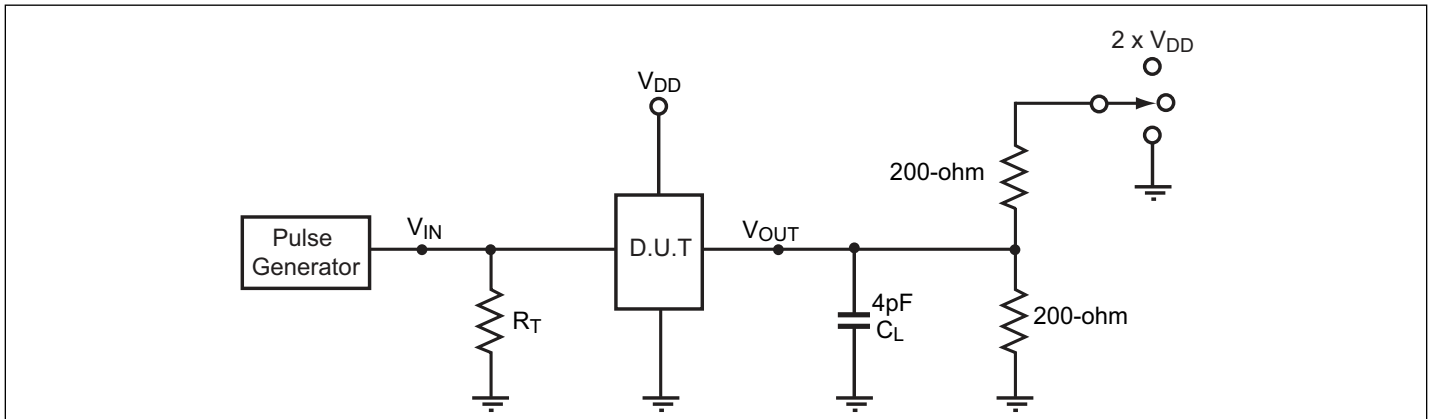
**Fig 6. TMD5 TP3 Rx eye compliance Test Setup**





**Fig 7. TP3 (Rx) with 2-meter cable eye measurements**  
(Right eye is with no switch. Left eye is with switch.)

**Test Circuit for Electrical Characteristics**



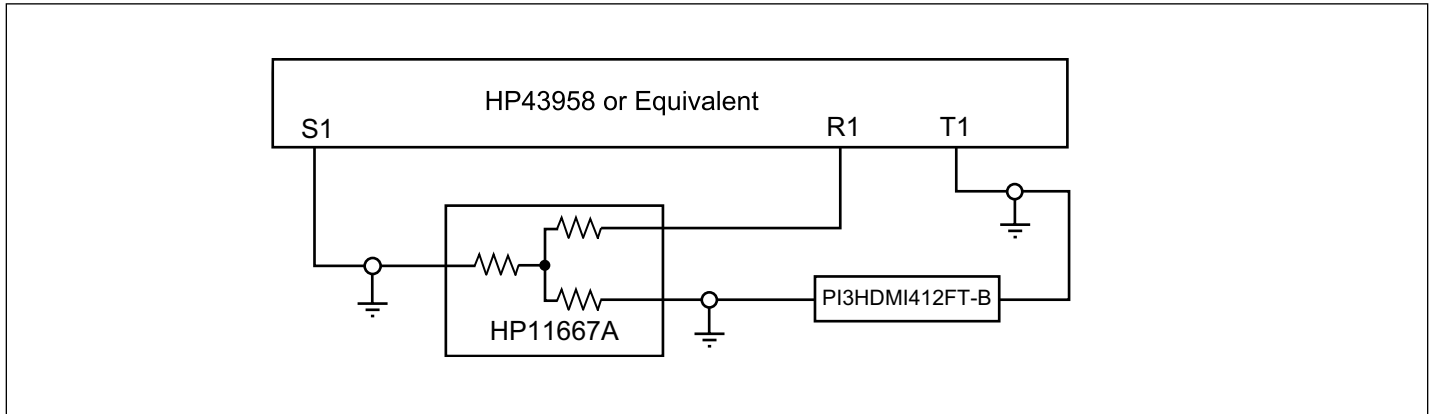
**Notes:**

1. CL = Load capacitance: includes jig and probe capacitance.
2. RT = Termination resistance: should be equal to ZOUT 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 ≤ MHz, ZO = 50Ω, tR ≤ 2.5ns, tF ≤ 2.5ns.
5. The outputs are measured one at a time with one transition per measurement.

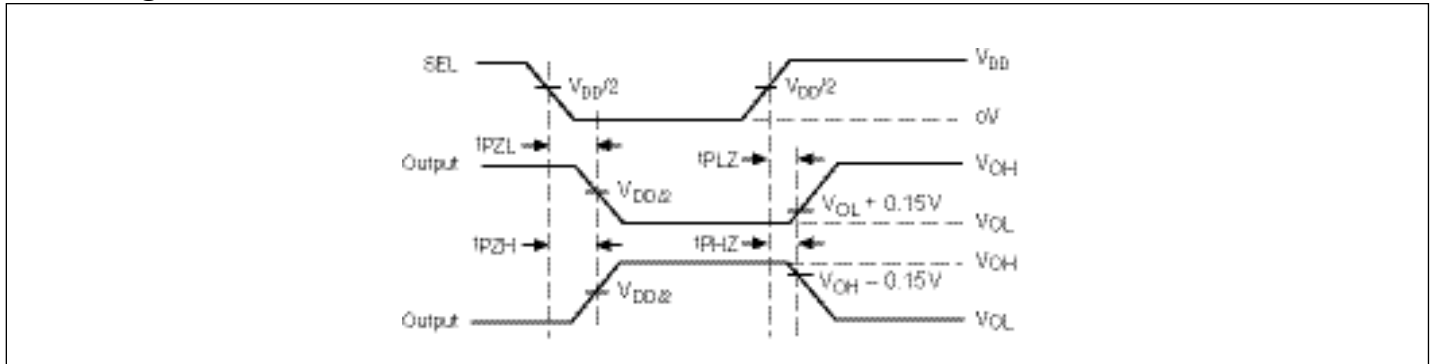
**Switch Positions**

Test	Switch
t <sub>PLZ</sub> , t <sub>PZL</sub>	2 x (V <sub>DD</sub> - V <sub>SS</sub> )
t <sub>PHZ</sub> , t <sub>PZH</sub>	V <sub>SS</sub>
Prop Delay	Open

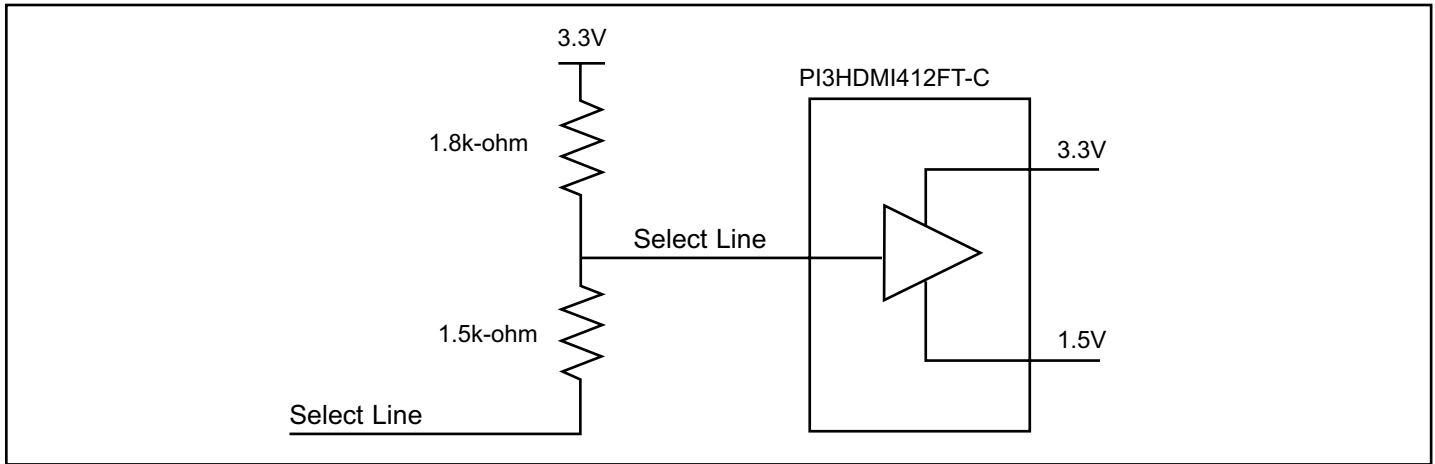
**Test Circuit for Dynamic Electrical Characteristics**



**Switching Waveforms**

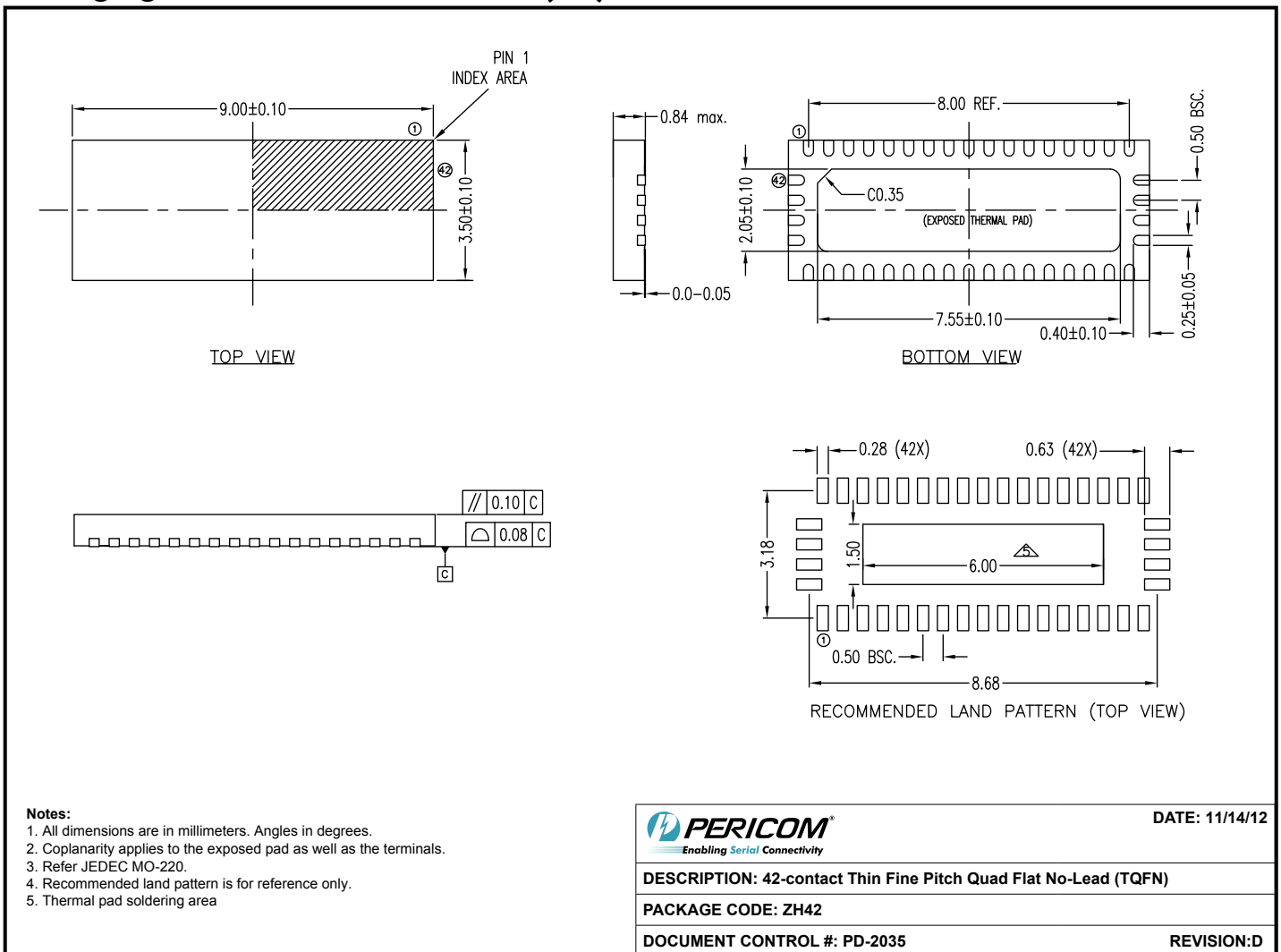


**Voltage Waveforms Enable and Disable Times**



Example of a circuit that also needs to be connected to the select lines of the PI3HDMI412FT-B

**Packaging Mechanical: 42-Pin TQFN (ZH)**



- Notes:**
1. All dimensions are in millimeters. Angles in degrees.
  2. Coplanarity applies to the exposed pad as well as the terminals.
  3. Refer JEDEC MO-220.
  4. Recommended land pattern is for reference only.
  5. Thermal pad soldering area

	DATE: 11/14/12
	DESCRIPTION: 42-contact Thin Fine Pitch Quad Flat No-Lead (TQFN)
	PACKAGE CODE: ZH42
	DOCUMENT CONTROL #: PD-2035
	REVISION: D

Note:

- For latest package info, please check: <http://www.pericom.com/products/packaging/mechanicals.php>

**Packaging Mechanical: 48-Pin BQSOP (B)**

SYMBOL	DIMENSION IN MM		
	MIN.	NOM.	MAX.
A			2.00
A1	0.05		0.25
A2	1.45	1.60	1.75
c	0.09		0.20
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
L	0.50	0.60	0.75
L1	0.25 BASIC		
theta	0		8
b	0.13		0.23
e	0.40 BASIC		
D	9.80	9.90	10.00
R1	0.09		

		DATE: 10/15/08
DESCRIPTION: 48-Pin, 154-Mil Wide BQSOP		
PACKAGE CODE: B48		
DOCUMENT CONTROL #: PD-1210		REVISION: F

**Notes:**  
 1. Controlling Dimension in Millimeters. Angle in Degrees.  
 2. Refer JEDEC MO-154/AB  
 3. Package Outline Exclusive of Mold Flash and Metal Burr

**Note:**

- For latest package info, please check: <http://www.pericom.com/products/packaging/mechanicals.php>

**Ordering Information**

Ordering Code	Package Code	Package Description
PI3HDMI412FT-BZHE	ZH	Pb-free & Green, 42-pin TQFN
PI3HDMI412FT-BBE	B	Pb-free & Green, 48-pin BQSOP

**Notes:**

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

# Mouser Electronics

Authorized Distributor

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