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6.5 Gbps SAS2, SATA3, XAUI
2 Differential Channel, 2:1 Mux/DeMux Switch

Features

- SAS2, SATA3, XAUI switch
- 2 Differential Channel, 2:1 Mux/DeMux
- 6.5 Gbps performance
- Bi-directional operation
- Low Bit-to-Bit Skew, 6ps max
- Low Insertion Loss: -2.3dB@3GHz(6Gbps)
- Low Crosstalk: -43dB@3GHz (6.0Gbps)
- Low Off Isolation: -21dB@3GHz (6.0Gbps)
- V_{DD} Operating Range: 1.5V to 1.8V ±10%
- ESD Tolerance 2KV HBM I/O
- Packaging: – 28 contact TQFN (ZH, 3.5 × 5.5mm)

Description

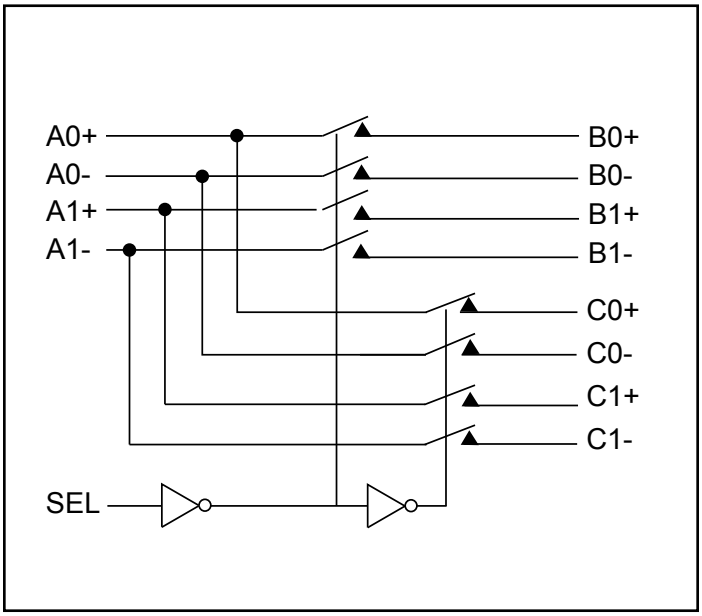
Pericom Semiconductor's PI2DBS6212 is a 4 to 2 bi-directional differential channel multiplexer/demultiplexer switch supporting 6.5 Gbps applications. Due to its low bit-to-bit skew, high channel-to-channel noise isolation and high bandwidth, this product is ideal for switching two sources to a single receiver, or alternatively, one source to two receivers.

Application

- SAS2, SATA3, XAUI, Infiniband, Hype Transport, Rapid I/O

- Computers, servers, storage, instrumentation, telecom, networking.

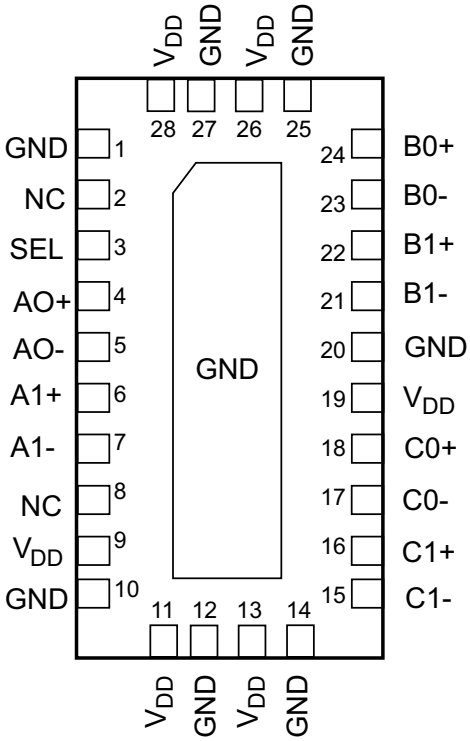
Block Diagram



Truth Table

Function	SEL
A to B	L
A to C	H

Pin Description



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_{DD}
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.

Power Supply Characteristics

Parameters	Description	Test Conditions[1]	Min.	Typ.[2]	Max.	Units
I_{DD}	Quiescent Power Supply Current	V_{DD} = Max., V_{IN} = GND or V_{DD}			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 V_{DD} = 1.8V, T_A = 25°C ambient and maximum loading.

DC Electrical Characteristics for Switching over Operating Range

(T_A = –40°C to +85°C, V_{DD} = 1.5V to 1.8V ±10%)

Parameter	Description	Test Conditions	Min.	Typ.	Max.	Units
V_{IH}	Input HIGH Voltage, SEL input	Guaranteed HIGH level	0.65 x V_{DD}	-	-	V
V_{IL}	Input LOW Voltage, SEL input	Guaranteed LOW level	-0.5	-	0.35 x V_{DD}	
V_{IK}	Clamp Diode Voltage, SEL input	V_{DD} = Max., I_{IN} = –18mA	-	-0.7	-1.2	
I_{IH}	Input HIGH Current for SEL	V_{DD} = Max., V_{IN} = V_{DD}	-10	-	+10	µA
I_{OZ}	Channel Leakage Current	V_{DD} = Max., V_{IN} = 1.8V	-10	-	+10	
I_{IL}	Input LOW Current	V_{DD} = Max., V_{IN} = GND	-20	-	+10	
V_{IDC}	DC Signal Voltage Range	V_O/V_I > 95%, R_L = 10K	-0.5		2.5	V
		V_O/V_I > 80%, R_L = 50-Ohms	-0.4		1.2	

Switching Characteristics

(T_A= -40º to +85ºC, V_{DD} = 1.5V to 1.8V ±10%)

Parameter	Description	Min.	Typ.	Max.	Units
t_{PZH}, t_{PZL}	Line Enable Time - SEL to A_N, B_N, C_N	0.5	-	9.0	ns
t_{PHZ}, t_{PLZ}	Line Disable Time - SEL to A_N, B_N, C_N	0.5	-	9.0	
t_{b-b}	Bit-to-bit skew within the same differential pair			10	ps
t_{ch-ch}	Channel-to-channel skew			15	
t_{diff}	Differential delay - A_N to B_N or C_N			20	

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

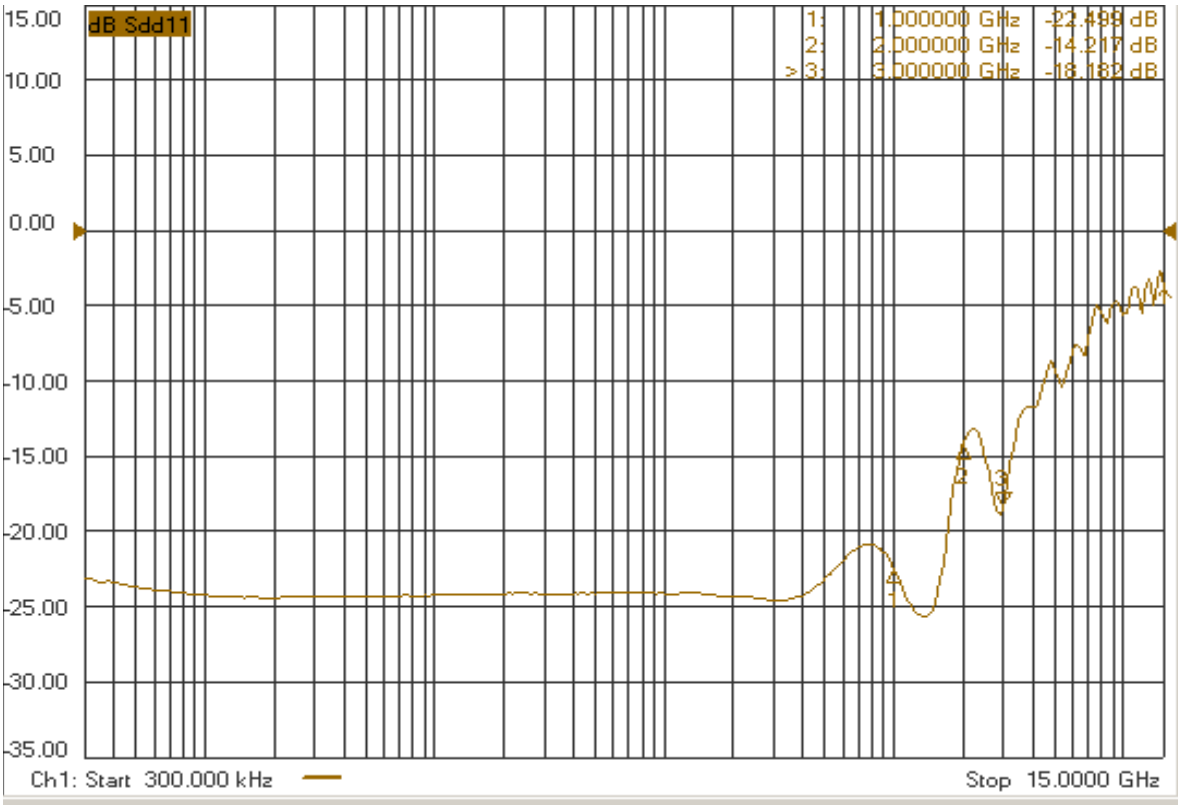
Dynamic Electrical Characteristics Over the Operating Range

(T_A= -40º to +85ºC, V_{DD} = 1.5V to 1.8V ±10%)

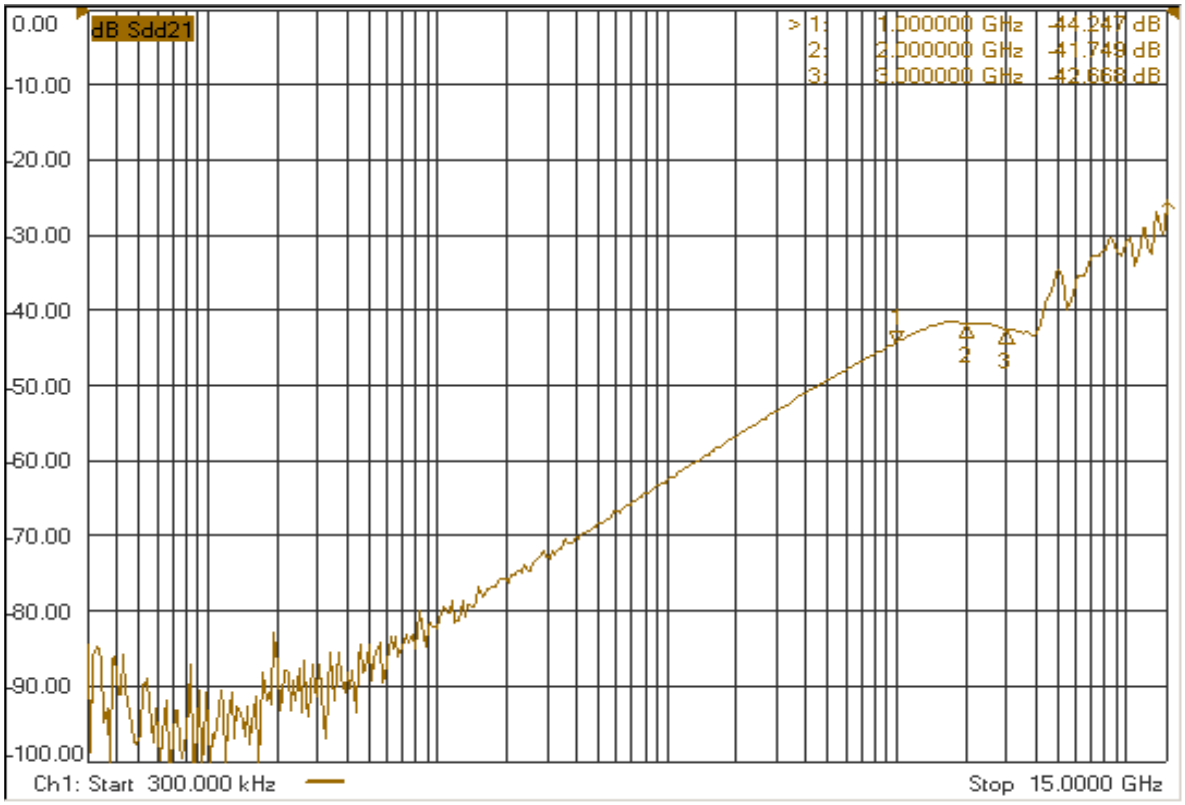
Parameter	Description	Test Conditions	Min.	Typ.	Max.	Units
BW	Bandwidth -3dB			4.1		GHz
$V_{I F}$	Max Signal Frequency Range	Insertion loss 1.5dB, V_{IN}=0.8Vpp, DC=0V	2.5			
		Insertion loss 1.5dB, V_{IN}=0.6Vpp, DC=0.9V	2.5			
		Insertion loss 3dB, V_{IN}=0.8Vpp, DC=0V	4.0			
		Insertion loss 3dB, V_{IN}=0.6Vpp, DC=0.9V	4.0			
P-1dB	1 dB Compression Input Signal	R_L = 50, f=375MHz, sin wave, DC=0V	1.2			Vpp
		R_L = 50, f=375MHz, sin wave, DC=0.45V	2.0			
		R_L = 50, f=375MHz, sin wave, DC=0.9V	2.4			
R_{LOSS}	Return Loss	f = 3 GHz		-18		dB
X_{TALK}	Crosstalk	f = 3.0 GHz		-43		
O_{IRR}	OFF Isolation	f = 3.0 GHz		-21		
I_{LOSS}	Differential Insertion Loss	f= 3 GHz		-2.3		

Notes:

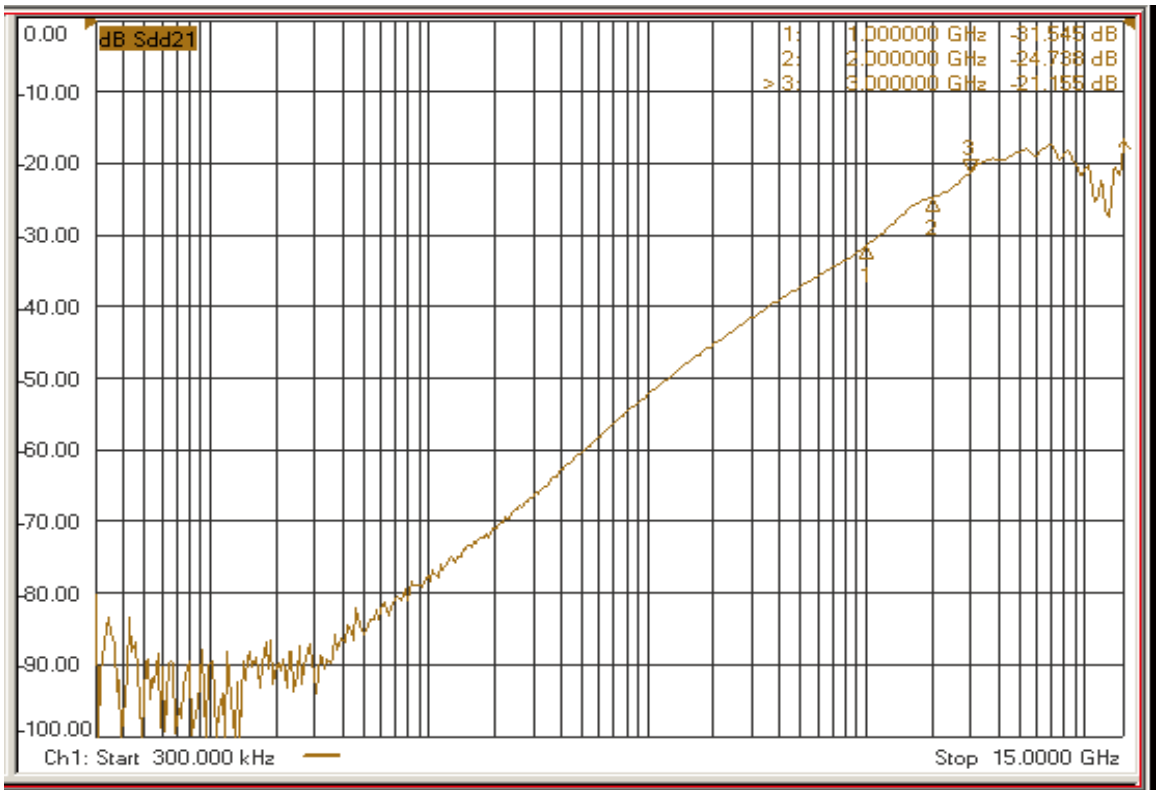
1. Guaranteed by design.



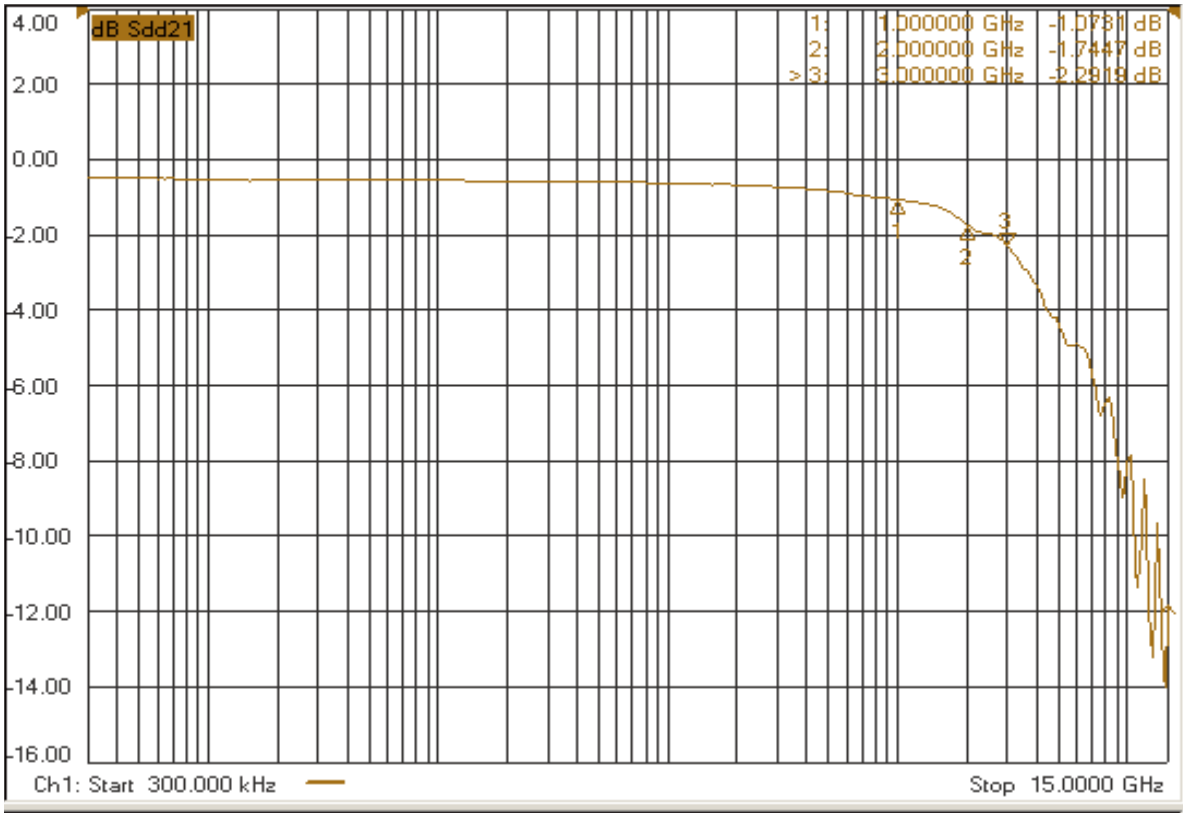
Return Loss



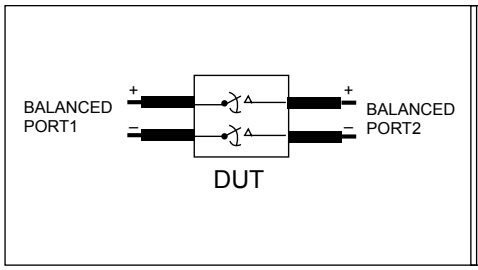
Crosstalk



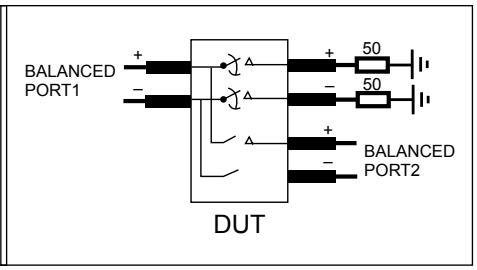
Off Isolation



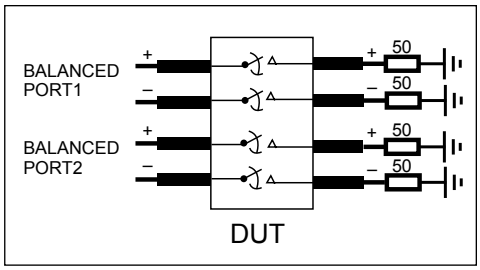
Insertion Loss



Diff. Insertion Loss and Return Test Circuit

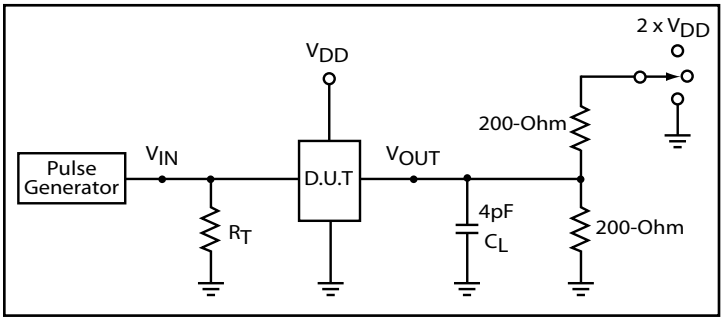


Diff. Off Isolation Test Circuit



Diff. Near End Xtalk Test Circuit

Test Circuit for Electrical Characteristics(1-5)



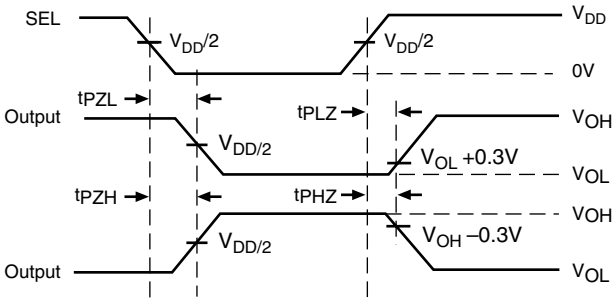
Switch Positions

Test	Switch
t_{PLZ}, t_{PZL}	2 x V_{DD}
t_{PHZ}, t_{PZH}	GND
Prop Delay	Open

Notes:

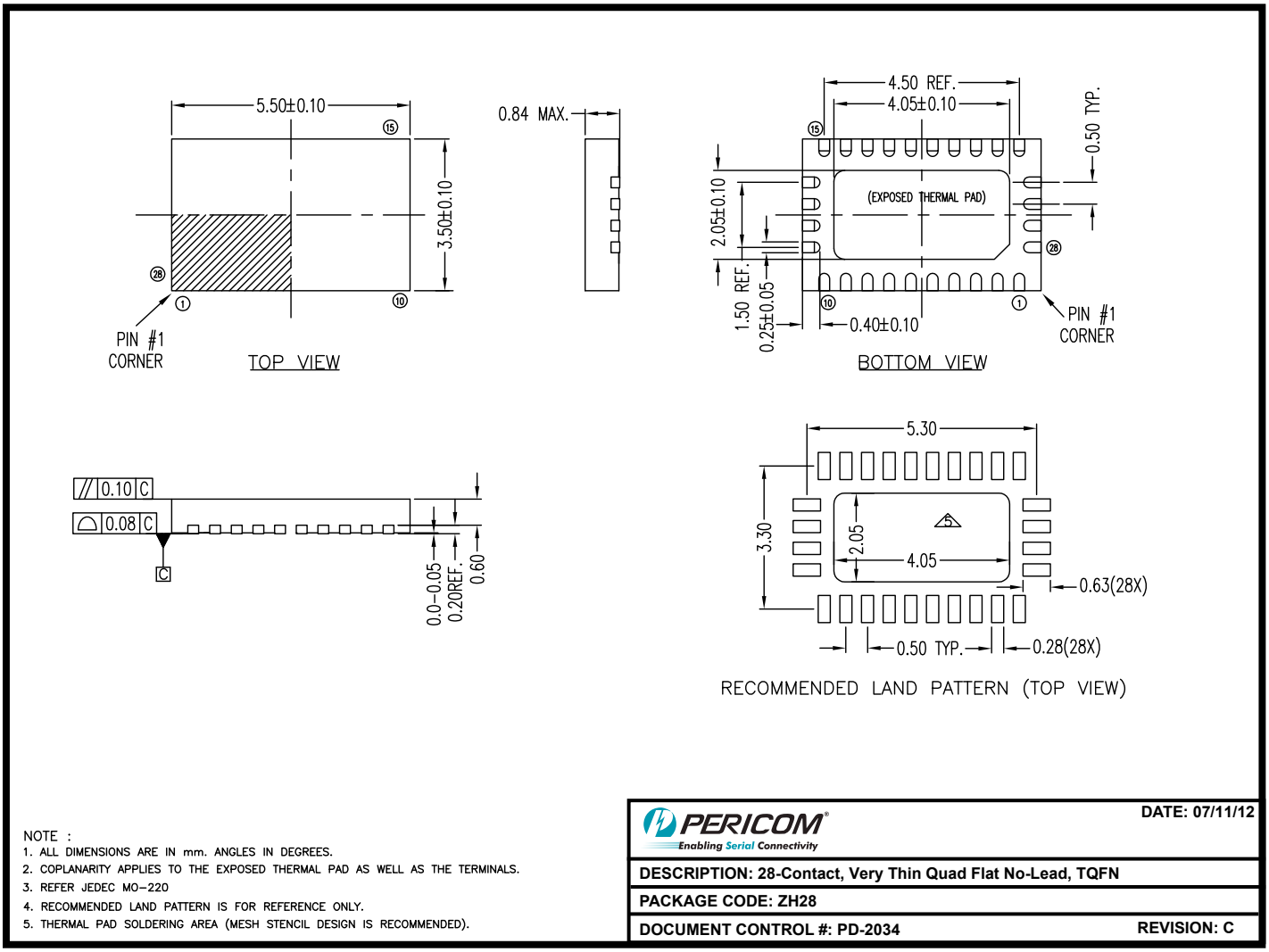
1. C_L = Load capacitance: includes jig and probe capacitance.
2. R_T = Termination resistance: should be equal to Z_{OUT} of the Pulse Generator
3. Output 1 is for an output with internal conditions such that the output is low except when disabled by the output control. output 2 is for an output with 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, Z_O = 50Ω, t_R ≤ 2.5ns, t_F ≤ 2.5ns.
5. The outputs are measured one at a time with one transition per measurement.

Switching Waveforms



Voltage Waveforms Enable and Disable Times

Packaging Mechanical: 28-Pin TQFN (ZH)



NOTE :
1. ALL DIMENSIONS ARE IN mm. ANGLES IN DEGREES.
2. COPLANARITY APPLIES TO THE EXPOSED THERMAL PAD AS WELL AS THE TERMINALS.
3. REFER JEDEC MO-220
4. RECOMMENDED LAND PATTERN IS FOR REFERENCE ONLY.
5. THERMAL PAD SOLDERING AREA (MESH STENCIL DESIGN IS RECOMMENDED).

PERICOM Enabling Serial Connectivity	DATE: 07/11/12
DESCRIPTION: 28-Contact, Very Thin Quad Flat No-Lead, TQFN	
PACKAGE CODE: ZH28	
DOCUMENT CONTROL #: PD-2034	REVISION: C

12-0419

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

Ordering Information

Ordering Code	Package Code	Package Type
PI2DBS6212ZHEX	ZH	28-contact, Very Thin Quad Flat No-Lead (TQFN)

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