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ABSTRACT

This test report presents the conformity of TPS23882B using the TPS23882B1EVM-008 in combination with Sifos Technologies, which have established themselves as first and third-party houses for PoE suite testing. This test is per IEEE802.3bt compliance which is the foundation of interoperability and safety for the PoE enabled system.

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Trademarks

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1 Introduction

IEEE 802.3bt Compliance and PoE Interoperability

IEEE802.3bt compliance is the foundation of interoperability and safety for any PoE enabled system. The use of non-compliant Power Sourcing Equipment (PSE) increases the risk that equipment connected to the system might not operate correctly or can even be damaged. This scenario is further intensified with the release of the new 802.3bt standard expanding the array of equipment using PoE and the increased available power levels of up to 90W (sourced).

Sifos Technologies and UNH-IOL have established themselves as first and third-party houses for PoE suite testing.

Note

Sifos Technologies

Sifos Technologies provides a one-box solution to facilitate complete first-party testing and analysis of Power Sourcing Equipment (PSE) behaviors and overall compliance based on the IEEE 802.3bt specification. Sifos test coverage exceeds 95% of 802.3bt PSE PICS.

Ethernet Alliance

The Ethernet Alliance (EA) is a consortium of leading industry experts, university, and government professionals, and component vendors that has created a PoE Certification Program. This program is aimed specifically at simplifying the certification and identification of PoE products that are compliant to the IEEE802.3bt PoE standard through the use of logos that can be affixed to PoE equipment and a Certified Product Registry.

Table 1-1. Summary Table of PoE Compliance Terminology

Brand /Acronym	IEEE Standard	Clause	Clause Title	Types	Classes	EA Cert Logo
PoE 1	802.3af	33	Power over Ethernet over 2-pair	1	0-3	Gen 1
	802.3at			2	0-4	
PoE 2	802.3bt	145	Power over Ethernet	3	1-6 or 1-4 DS ⁽¹⁾	Gen 2
				4	7-8 or 5 DS ⁽¹⁾	

(1) DS is used to denote Dual Signature PDs

2 Test Conditions

In addition to just running the basic conformance testing on an individual port and to better recreate the system-level environment, TI individually tests all ports of the PSE controller devices while having the background ports running under various other PoE-application conditions. TI further, repeats testing conditions over extended periods of time to make sure performance is consistent after multiple hours, days and or continued operation.

Sifos HW: PSA-3000 Chassis with PSA-3202 Test Blades

Sifos SW: PSA v5.3.04

PSE HW: [TPS23882B1EVM-008](#) + [BOOST-PSEMTHR-007](#) with $V_{pwr} = 48\text{ V}$

PSE SRAM: v07

PSE Config: AUTO mode (pin resistor being set to 62 k Ω , 2-pair 30 W)

For more information please refer to the FAQ on [TI's E2E™](#) design support forum.

3 Sifos Test Results

TPS23882B1EVM-008

PSA Conformance Test Suite		February 2 2023 12:44 PM		Sifos Technologies		802.3bt 2Pr Conformance Report				
Port Count..... 1		Loop Count..... 1		PSE Tested: Unspecified Type-3 30W		Test Mode: 30 Watt PHY		version 5.3.04		
				Sifos Interop Index*: 100%		report version 5.3.02		Error Log: None		
Chassis ID: 192.168.221.105	PSA-3000 Ports		Min	Max	Average	Low Limit	P/F	High Limit	P/F	
TestLoop: 1	5-2	UNITS								
Test: det v										
Open Circuit Det Voc=	24.43	V	24.43	24.43	24.43	2.8	Pass	30	Pass	
Peak Det Vvalid=	7.09	V	7.09	7.09	7.1	3.8	Pass	10	Pass	
Min Det Vvalid=	4.54	V	4.54	4.54	4.5	2.8	Pass	9	Pass	
Det Volt Step dVtest=	2.55	V	2.55	2.55	2.6	1	Pass	7.2	Pass	
Detection Slew=	0	V/usec	0	0	0	0	Pass	0.1	Pass	
Good Sig Det Pulse=	3	edges	3	3	3	1	Pass	9	Pass	
Backoff Voltage=	0.5	V	0.5	0.5	0.5	0	Pass	2.8	Pass	
Non 802 Discr ?=	0	****	0	0	0	0	Pass	0	Pass	
Detect Strategy=	0	****	0	0	0	0	Pass	2	Pass	
Test: det i										
Init Current Isc=	0.19	mA	0.19	0.19	0.19	0	Pass	5	Pass	
Det Current Isc=	0.2	mA	0.2	0.2	0.2	0	Pass	5	Pass	
Test: det_range										
Rgood Max=	30	Kohm	30	30	30	26	Pass	32	Pass	
Rgood Min=	17	Kohm	17	17	17	16	Pass	19	Pass	
Rmid det=	30	Kohm	30	30	30	26	Pass	33	Pass	
Cgood Max=	0.1	uF	0.1	0.1	0.1	0	Pass	10	Pass	
Rbad Cbad Stat=	0	****	0	0	0	0	Pass	0	Pass	
Test: det_time										
Backoff Time Tdbo=	63	msec	63	63	63	-1	Pass	1500	Pass	
Eff Backoff Tdbo eff=	63	msec	63	63	63	-1	Pass	1500	Pass	
Backoff Type=	0	****	0	0	0	0	Pass	0	Pass	
Detection Time Tdet=	301	msec	301	301	301	5	Pass	500	Pass	
Total Det Time=	305	msec	305	305	305	5	Pass	1000	Pass	
Test: det_rsource										
PSE Detect Source=	1	****	1	1	1	0	Pass	1	Pass	
Output Impedance Zout=	450	Kohm	450	450	450	45	Pass	2000	Pass	
Test: class_v										
Vclass Max=	18.4	V	18.4	18.4	18.4	15.5	Pass	20.5	Pass	
Vclass Min=	18.3	V	18.3	18.3	18.3	15.5	Pass	20.5	Pass	
Mark Voltage Vmark=	8.7	V	8.7	8.7	8.7	7	Pass	10	Pass	
Mark Voltage Min=	8.6	V	8.6	8.6	8.6	7	Pass	10	Pass	
Class Reset V=	-1	V	-1	-1	-1	-1	Pass	2.8	Pass	
Test: class_time										
Class 0 Count=	1	****	1	1	1	1	Pass	1	Pass	
Class Time Tpd=	97.5	msec	97.5	97.5	97.5	88	Pass	105	Pass	
Class 4 Count=	3	****	3	3	3	2	Pass	3	Pass	
Event1 Tcle=	97.5	msec	97.5	97.5	97.5	88	Pass	105	Pass	
Event2 Tcle2=	9.4	msec	9.4	9.4	9.4	5.6	Pass	20.4	Pass	
Mark Tme1=	7.4	msec	7.4	7.4	7.4	5.6	Pass	12.4	Pass	
Mark Tme2=	7.4	msec	7.4	7.4	7.4	5.6	Pass	376	Pass	
Class Reset Time=	10000	msec	10000	10000	10000	15	Pass	10000	Pass	
Class Probe Events=	0	****	0	0	0	0	Pass	3	Pass	
Test: class_err										
Class lim=	77	mA	77	77	77	51	Pass	100	Pass	
Pwr Cl lim=	0	****	0	0	0	0	Pass	0	Pass	
Pwr Cl 55=	0	****	0	0	0	0	Pass	0	Pass	
Mark lim=	6	mA	6	6	6	5	Pass	100	Pass	
Pwr Cl Uneven=	0	****	0	0	0	0	Pass	0	Pass	
Treset=	76	msec	76	76	76	15	Pass	10000	Pass	
Test: pwrup_time										
Power-On Trise c0=	23	usec	23	23	23	15	Pass	50000	Pass	
Power-On Tpon c0=	105.5	msec	105.5	105.5	105.5	0	Pass	400	Pass	
Power-On Trise c4=	24	usec	24	24	24	15	Pass	50000	Pass	
Power-On Tpon c4=	138.7	msec	138.7	138.7	138.7	0	Pass	400	Pass	
Test: pwrup_inrush										
Init Iinrush=	421.75	mA	421.75	421.75	421.8	400	Pass	450	Pass	
Max Iinrush c0=	421.25	mA	421.25	421.25	421.3	400	Pass	450	Pass	
Max Iinrush c4=	421.25	mA	421.25	421.25	421.3	400	Pass	450	Pass	
Min Iinrush=	420.63	mA	420.63	420.63	420.6	400	Pass	450	Pass	
Tinrush=	60	msec	60	60	60	50	Pass	75	Pass	

Inrush 45m=	54.9	V	54.9	54.9	54.9	50	Pass	57	Pass
Inrush Voltage=	31	V	31	31	31	30	Pass	57	Pass
Inrush Strategy c0=	0	****	0	0	0	0	Pass	0	Pass
Inrush Strategy c4=	0	****	0	0	0	0	Pass	0	Pass
Test: pwrn_v									
Vport min=	54.4	V	54.4	54.4	54.4	50	Pass	57	Pass
Vport max=	55	V	55	55	55	50	Pass	57	Pass
Vport ripple=	6	mVpp	6	6	6	0	Pass	500	Pass
Vport noise=	7	mVpp	7	7	7	0	Pass	200	Pass
Vtrans min=	54.3	V	54.3	54.3	54.3	50	Pass	57	Pass
Vtrans max=	55	V	55	55	55	50	Pass	57	Pass
Test: pwrn_pwracap									
Pcon c0=	15.6	W	15.6	15.6	15.6	14.2	Pass	22.7	Pass
Icon % c0=	113.5	%	113.5	113.5	113.5	100	Pass	9999	Pass
Pcon c1=	4	W	4	4	4	3.9	Pass	22.7	Pass
Icon % c1=	102.5	%	102.5	102.5	102.5	100	Pass	9999	Pass
Pcon c2=	7.1	W	7.1	7.1	7.1	6.8	Pass	22.7	Pass
Icon % c2=	106	%	106	106	106	100	Pass	9999	Pass
Pcon c3=	15.6	W	15.6	15.6	15.6	14.2	Pass	22.7	Pass
Icon % c3=	113.5	%	113.5	113.5	113.5	100	Pass	9999	Pass
Pcon c4=	30.4	W	30.4	30.4	30.4	28.7	Pass	38.9	Pass
Icon % c4=	104.7	%	104.7	104.7	104.7	100	Pass	9999	Pass
Type-2 Enable=	1	****	1	1	1	1	Pass	1	Pass
Test: pwrn_maxi									
Ilim Peak 1=	193.3	mA	193.3	193.3	193.3	0	Pass	1750	Pass
Ilim Min 1=	401.5	mA	401.5	401.5	401.5	400	Pass	1750	Pass
Tlim Min 1=	60.5	msec	60.5	60.5	60.5	10	Pass	9999	Pass
Tlim Max 1=	59.4	msec	59.4	59.4	59.4	0	Pass	75	Pass
Vlim 1=	54.5	V	54.5	54.5	54.5	50	Pass	57	Pass
Ilim Max 1=	315.3	mA	315.3	315.3	315.3	400	Info	1750	Pass
Ktran lo 1=	109	%	109	109	109	92.4	Pass	115	Pass
Ilim Peak 2=	192.8	mA	192.8	192.8	192.8	0	Pass	1750	Pass
Ilim Min 2=	685.5	mA	685.5	685.5	685.5	683	Pass	1750	Pass
Tlim Min 2=	62.5	msec	62.5	62.5	62.5	10	Pass	9999	Pass
Tlim Max 2=	60.5	msec	60.5	60.5	60.5	0	Pass	75	Pass
Vlim 2=	54.1	V	54.1	54.1	54.1	50	Pass	57	Pass
Ilim Max 2=	949.8	mA	949.8	949.8	949.8	683	Pass	1750	Pass
Ktran lo 2=	108.2	%	108.2	108.2	108.2	92.4	Pass	115	Pass
Test: pwrn_overld									
%Ipeak 1=	125	%	125	125	125	100	Pass	125	Pass
Vport Ipeak 1=	54.6	V	54.6	54.6	54.6	50	Pass	57	Pass
Vport 5%DC 1=	54.6	V	54.6	54.6	54.6	50	Pass	57	Pass
%Ipeak 2=	125	%	125	125	125	100	Pass	125	Pass
Vport Ipeak 2=	54.2	V	54.2	54.2	54.2	50	Pass	57	Pass
Vport 5%DC 2=	54.2	V	54.2	54.2	54.2	50	Pass	57	Pass
Test: mps_dc_valid									
Min Valid Time Tmps=	4	msec	4	4	4	1	Pass	6	Pass
Duty Cycle tol=	1	****	1	1	1	1	Pass	1	Pass
Test: mps_dc_pwrn									
Min Valid I hold=	6	mA	6	6	6	4	Pass	9	Pass
Time-to-Shutdown Tmpdo=	362	msec	362	362	362	320	Pass	400	Pass
Test: pwrn_overld									
Icut 1=	295	mA	295	295	295	-1	Pass	1750	Pass
Tcut 1=	62.6	msec	62.6	62.6	62.6	50	Pass	9999	Pass
Isoft 1=	-1	mA	-1	-1	-1	-1	Pass	683	Pass
Tsoft 1=	-1	msec	-1	-1	-1	-1	Pass	2000	Pass
Icut 2=	567	mA	567	567	567	-1	Pass	1750	Pass
Tcut 2=	62.1	msec	62.1	62.1	62.1	10	Pass	9999	Pass
Isoft 2=	-1	mA	-1	-1	-1	-1	Pass	683	Pass
Tsoft 2=	-1	msec	-1	-1	-1	-1	Pass	2000	Pass
Test: pwrn_time									
Turn-Off Time Toff=	24.4	msec	24.4	24.4	24.4	0	Pass	500	Pass
Output Cap Cout=	0.1012	uF	0.1012	0.1012	0.1	-1	Pass	0.52	Pass
Output Load Rp=	113.6	Kohm	113.6	113.6	114	45	Pass	50000	Pass
Test: pwrn_v									
Avg Idle Voff=	0.1	V	0.1	0.1	0.1	0	Pass	2.8	Pass
Error Delay Ted=	1453.1	msec	1453.1	1453.1	1453	750	Pass	10000	Pass
Peak Error Delay Ved=	0.7	V	0.7	0.7	0.7	0	Pass	20.5	Pass
Test Port Model Number:	3202								
Test Port Hardware Version:	8								
Test Port Firmware Version:	4.17 lc18								

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