

# PSE Conformance Test (ver 4.x) 802.3at PICS Coverage

## 802.3at Draft 4.2 PSE PIC's



ITEM	TEST CASE	SECTION REFERENCE IN IEEE 802.3at	PICS Performa Acceptance Criteria	Value/Comment	Sifos PSA-1200, 3000 (PSA Ver 3.3) PSE Conformance Test Suite	Sifos PSA-3000 (PSA Ver 4.x) PSE Conformance Test Suite
PSE1	PSE location	33.2.1	Requirement Spec	Midspan or End point PSE	Conformance Test Declaration	Conformance Test Declaration
PSE2	Alternative B	33.2.1	SIFOS PSA		Implicitly covered by ALT and POLARITY switching in PSA-1200, PSA-3000	Implicitly covered by ALT and POLARITY switching in PSA-3000
PSE3	Alternative A and Alternative B	33.2.1	SIFOS PSA			
PSE4	PSE behavior	33.2.4.1	SIFOS PSA	Covered in PSE5, PSE7, PSE8, PSE9		
PSE5	Backoff Voltage	33.2.4.1	SIFOS PSA	Backoff voltage between ALT B detections must be $\geq 2$ VDC		Test: det_v Vbk_off
PSE6	PSE variable definitions permutations	33.2.4.4	SIFOS PSA	PSE must conform to Type-1 or Type-2 Classification Methods	Test: class_time Event_Count (No LLDP Confirmation)	Test: class_time Event_Count_1, Event_Count_2, class_lldp PSE_LLDP_Type_1, PSE_LLDP_Type_2
PSE7	Type-2 PSE Mutual Identification	33.2.4.6	SIFOS PSA	When powering a Type 2 PD, assigns a value of 2 to parameter_type if mutual identification is complete	Test: class_time Event_Count (No LLDP Confirmation)	Test: class_time Event_Count_2, class_lldp PSE_LLDP_Type_2
PSE8	Type-2 PSE Powering Type-1 PD	33.2.4.6	SIFOS PSA	Meets at least the PI Electrical Requirements of Type-1 PSE with option to meet Type-2 Requirements for Icon, Ilim, Tlim, and Ptype	Test: pwrup_pwracap Pport_Capacity	Test: pwrup_pwracap Pcon_c0
PSE9	Applying power	33.2.5	SIFOS PSA	Not until a PD requesting power has been successfully detected	Test: det_range Rgood_Min, Rgood_Max, Cgood_Max (et. al.)	Test: det_range Rgood_Min, Rgood_Max, Rmid_det, Cgood_Max (et. al.)
PSE10	Power pairs	33.2.5	SIFOS PSA	Power must be supplied on the same pairs as those used for detection.	Test: det_range Rgood_Min, Rgood_Max, Cgood_Max (et. al.)	Test: det_range Rgood_Min, Rgood_Max, Rmid_det, Cgood_Max (et. al.)
PSE11	Detecting PDs	33.2.5.1	SIFOS PSA	Performed via the PSE PI	Test: det_v Voc, Vvalid(Max), Vvalid(Min) (et. al.)	Test: det_v Voc, Vvalid(Max), Vvalid(Min) (et. al.)
PSE12	PSE Presents a Non-Valid Signature	33.2.5.1	SIFOS PSA	As defined in Table 33-15	Test: det_resource Zout, pwrnd_time Rp	Test: det_resource Zout, pwrnd_time Rp
PSE13	Open Circuit Voltage and Short Circuit Current	33.2.5.1	SIFOS PSA	Meet specifications for Voc and Isc in Table 33-4	Test: det_v Voc, det_l, Isc	Test: det_v Voc, det_l, Isc
PSE14	Backdriven current	33.2.5.1		Not be damaged by up to 5 mA over the range of VPort_PSE	Not Tested	Not Tested
PSE15	Output capacitance	33.2.5.1	SIFOS PSA	Cout in Table 33-11	Test: pwrnd_time Cout	Test: pwrnd_time Cout
PSE16	Detection Voltage with a valid PD signature connected	33.2.5.2	SIFOS PSA	Meets Vvalid in Table 33-4	Test: det_v Vvalid(Max), Vvalid(Min)	Test: det_v Vvalid(Max), Vvalid(Min)
PSE17	Detection Voltage Measurements	33.2.5.2	SIFOS PSA	At least two that create at least $\Delta V$ test difference	Test: det_v Vvalid(Max), Vvalid(Min), $\Delta V$ test, Good_Sig_Det_Pulse	Test: det_v Vvalid(Max), Vvalid(Min), $\Delta V$ test, Good_Sig_Det_Pulse
PSE18	Control slew rate when switching detection voltages	33.2.5.2	SIFOS PSA	Less than Vslew in Table 33-4	Test: det_v Detection_Slew	Test: det_v Detection_Slew
PSE19	Accept as a valid signature	33.2.5.3	SIFOS PSA	Rgood and Cgood, with up to Vos max and los max as defined in Table 33-5	Test: det_range Rgood_Min, Rgood_Max, Cgood_Max	Test: det_range Rgood_Min, Rgood_Max, Rmid_det, Cgood_Max
PSE20	Reject as an invalid signature	33.2.5.3	SIFOS PSA	Resistance less than Rbad min, resistance greater than Rbad max or capacitance greater than Cbad min	Test: det_range Rgood_Min, Rgood_Max, Cgood_Max	Test: det_range Rgood_Min, Rgood_Max, Rmid_det, Cgood_Max
PSE21	Classification permutations	3.2.6	SIFOS PSA	Meet one allowable permutation in Table 33-8	Test: class_time Event_Count (no LLDP coverage)	Test: class_time Event_Count_1, Event_Count_2, class_lldp PSE_LLDP_Type_1, PSE_LLDP_Type_2
PSE22	Type 1 PSE does not implement Physical Layer	3.2.6	SIFOS PSA	Assign all PDs to Class 0	Test: pwrup_pwracap Pport_Capacity	Test: pwrup_pwracap Pcon_c0
PSE23	Type 1 PSE failure to complete classification	3.2.6	SIFOS PSA	Return to IDLE state or assign PD to Class 0	Not Tested	Test: class_err Vport_CL_err_1
PSE24	Type 2 PSE failure to complete classification	3.2.6	SIFOS PSA	Return to IDLE state	Not Tested	Test: class_err Vport_CL_err_1
PSE25	Provide VClass for 1-Event Physical Layer classification	33.2.6.1	SIFOS PSA	Limited to IClass_LIM as defined by Table 33-10	Not Tested	Test: class_v Max_Iclass
PSE26	Classification polarity for 1-Event Physical Layer classification	33.2.6.1	SIFOS PSA	Same as VPort	Test: class_v Class_Voltage_Vclass	Test: class_v Vclass_max, Vclass_min
PSE27	Classification timing for 1-Event Physical Layer	33.2.6.1	SIFOS PSA	In accordance with TpdC in Table 33-10	Test: class_time Class_Time_TpdC	Test: class_time TpdC
PSE28	Measurement result of 1-Event Physical Layer classification IClass	33.2.6.1	SIFOS PSA	Classify PD according to observed current based on Table 33-9. <b>Note:</b> Only relevant to PSE's that use classification information for power management purposes.	Test: pwrup_pwracap c N Pport_Capacity, pwrnd_overld c N Class_N_Ovld_Current_Icut, pwrup_pwracap_2 Pport_Capacity	Test: pwrup_pwracap Pcon_c0, Pcon_c1, Pcon_c2, Pcon_c3, Pcon_c4
PSE29	Measurement timing of 1-Event Physical Layer classification IClass	33.2.6.1	SIFOS PSA	Measurement taken after the minimum relevant class event timing in Table 33-10. <b>Note:</b> Only relevant to PSE's that use classification information for power management purposes.	Not Tested	Test: pwrup_pwracap Pcon_c2
PSE30	Class 4 result for 1-Event Physical Layer classification with a Type 1 PSE	33.2.6.1	SIFOS PSA	Assign the PD to Class 0	Not Tested	Test: pwrup_pwracap Pcon_c4
PSE31	Type 1 PSE 1-Event Physical Layer classification if IClass is in the range of IClass_LIM	33.2.6.1	SIFOS PSA	Return to IDLE state or assign PD to Class 0	Not Tested	Test: class_err Vport_CL_lim
PSE32	Type 2 PSE 1-Event Physical Layer classification if IClass is in the range of IClass_LIM	33.2.6.1	SIFOS PSA	Return to IDLE state	Not Tested	Test: class_err Vport_CL_err_2
PSE33	In the CLASS_EV1 and CLASS_EV2 states, provide VClass	33.2.6.2	SIFOS PSA	As defined in Table 33-10	Test: class_v Class_Voltage_Vclass	Test: class_v Vclass_max, Vclass_min
PSE34	Classification timing in CLASS_EV1 state	33.2.6.2	SIFOS PSA	In accordance with TCLE1 in Table 33-10	Test: class_time Event1_Tcle1	Test: class_time Tcle1
PSE35	In the CLASS_EV1 and CLASS_EV2 states, measurement result IClass	33.2.6.2	SIFOS PSA	Classify PD according to Table 33-9. <b>Note:</b> Only relevant to PSE's that use classification information for power management purposes.	Test: pwrup_pwracap c N Pport_Capacity, pwrnd_overld c N Class_N_Ovld_Current_Icut, pwrup_pwracap_2 Pport_Capacity	Test: pwrup_pwracap Pcon_c0, Pcon_c1, Pcon_c2, Pcon_c3, Pcon_c4
PSE36	In the MARK_EV1 and MARK_EV2 states, provide VMark	33.2.6.2	SIFOS PSA	In accordance with Table 33-10	Test: pwrup_pwracap_2 Pport_Capacity Measured but Not Tested to limits	Test: class_v Vmark
PSE37	Classification timing in MARK_EV1	33.2.6.2	SIFOS PSA	In accordance with TME1 in Table 33-10	Test: class_time Event1_Tme1	Test: class_time Tme1
PSE38	Classification timing in CLASS_EV2 state	33.2.6.2	SIFOS PSA	In accordance with TCLE2 in Table 33-10	Test: class_time Event1_Tcle2	Test: class_time Tcle2
PSE39	Classification timing in MARK_EV2 state	33.2.6.2	SIFOS PSA	In accordance with TME2 in Table 33-10	Test: class_time Event1_Tme2	Test: class_time Tme2
PSE40	Type 2 PSE 2-Event Physical Layer classification if IClass is greater than or equal to IClass_LIM min	33.2.6.2	SIFOS PSA	Returns to IDLE state	Not Tested	Test: class_err Vport_CL_lim
PSE41	Current limitation during class events	33.2.6.2	SIFOS PSA	Meet IClass_LIM	Not Tested	Test: class_err Class_lim
PSE42	Current limitation during mark events	33.2.6.2	SIFOS PSA	Meet IMark_LIM	Not Tested	Test: class_err Mark_lim
PSE43	Measurement timing of 2-Event Physical Layer classification IClass	33.2.6.2	SIFOS PSA	Taken after the minimum relevant class event timing in Table. <b>Note:</b> Only relevant to PSE's that use classification information for power management purposes.	Not Tested	Test: pwrup_pwracap Pcon_c2
PSE44	Class event and mark event voltages polarity	33.2.6.2	SIFOS PSA	Same as VPort	Test: class_v Class_Voltage_Vclass	Test: class_v Vclass_max, Vclass_min, Vmark
PSE45	Voltage level at PI when transition to POWER_ON state	33.2.6.2	SIFOS PSA	Completes 2-Event classification and transitions to POWER_ON with PI voltage greater than or equal to VMark min	Not Tested	Test: class_v Vmark_min

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PSE46	Return to IDLE state	33.2.6.2	SIFOS PSA	Maintains PI voltage at VReset for at least TReset min before starting new detection cycle	Not Tested	Test: class_err Treset
PSE47	Power supply output	33.2.7	SIFOS PSA	When the PSE provides power to the PI, conforms with Table 33-11	Many Tests: pwrup_0xxx, mps_0xxx, pwrdrn_0xxx, pwrup_0xxx_2, pwrdrn_0xxx_2	Many Tests: pwrup_0xxx, mps_0xxx, pwrdrn_0xxx
PSE48	Load regulation	33.2.7.1	SIFOS PSA	Met with (IHold max × VPort_PSE min) to PType min load step at a rate of change of at least 15 mA/μs max	Partially Tested in pwrup_overld	Test: pwrup_v Vtrns_min_1, Vtrns_max_1, Vtrns_min_2, Vtrns_max_2
PSE49	Voltage transients	33.2.7.1		Limited to 3.5 V/μs max for load changes up to 35 mA/μs. <b>Note:</b> This is only relevant and measurable in PSE's where changes in load produce significant changes in voltage.	Not Tested	Not Tested
PSE50	Voltage transients (30 μs to 250 μs)	33.2.7.2	SIFOS PSA	No less than KTran_lo below VPort_PSE min and meet requirements of 33.2.7.7.	Not Tested	Test: pwrup_maxi Ktran_lo
PSE51	Voltage transients (greater than 250 μs)	33.2.7.2	SIFOS PSA	Meet VPort_PSE specification	Partially Tested in pwrup_overld	Test: pwrup_overld Vport_lpeak_1, Vport_lpeak_2
PSE52	Power feeding ripple and noise	33.2.7.3	SIFOS PSA	Met for common-mode and/or pair-to-pair noise values for power outputs from (IHold max × VPort_PSE min) to PType min at static operating VPort_PSE	Test: pwrup_v AC_Ripple_Vpp(low), pwrup_noise AC_Ripple_Vpp(noise)	Test: pwrup_v Vpp_ripple_1, Vpp_ripple_2, Vpp_noise_1, Vpp_noise_2
PSE53	AC current waveform parameters	33.2.7.4	SIFOS PSA	I <sub>Peak</sub> minimum equals Equation (33-4) for TCUT minimum and 5% duty cycle minimum.	Indirectly Tested: pwrdrn_overld Class_0_Ovld_Current_Icut, pwrdrn_overld_2 Class_4_Ovld_Current_Icut	Test: pwrup_overld %lpeak_1, %lpeak_2
PSE54	Inrush current limit	33.2.7.5	SIFOS PSA	PSE limits the maximum current sourced at the PI	Test: pwrup_inrush Max_Inrush, Min_Inrush, Tlim_Inrush, Tlim_Inrush_2, Max_Inrush, Min_Inrush, Tlim_Inrush	Test: pwrup_inrush Init_Inrush, Max_Inrush_c0, Max_Inrush_c4, Min_Inrush, Tlinrush
PSE55	Inrush current template	33.2.7.5	SIFOS PSA	Current sourced does not exceed the PSE inrush template in Figure 33-14	Test: pwrup_inrush Init_Inrush, Max_Inrush, pwrup_inrush_2 Init_Inrush, Max_Inrush, Min_Inrush, Tlim_Inrush	Test: pwrup_inrush Init_Inrush, Max_Inrush_c0, Max_Inrush_c4
PSE56	Short circuit condition	33.2.7.7	SIFOS PSA	Remove power from PI before IPSEUT is exceeded. Equation (33-6) and Figure 33-15.	Test: pwrup_maxi Init_Ilim, Max_Current_Limit_Ilim, pwrup_maxi_2 Init_Ilim, Max_Current_Limit_Ilim	Test: pwrup_maxi Ilim_Peak, Ilim_Max_1, Ilim_Max_2
PSE57	Short circuit current and time	33.2.7.7	SIFOS PSA	In accordance with Ilim and Tlim in Table 33-1. <b>Note:</b> Ilim and Tlim within Table 33-1 do not have upper limits, and since port voltage is allowed to drop below Vport_pse_min per 33.2.7.7, there is effectively no lower limit to Tlim since PSE's may remove power with low voltage at any time, according to 3.2.7.1.	Test: pwrup_maxi Min_Current_Limit_Ilim, Short_Cir_Timeout_Tlim, Short_Cir_Timeout_Tlim, pwrup_maxi_2 Min_Current_Limit_Ilim, Short_Cir_Timeout_Tlim, 25_msec_Short_Vport	Test: pwrup_maxi Ilim_Min_1, Ilim_Min_2, Tlim_1, Tlim_2 <b>Note:</b> Ilim_Min_1 and Ilim_Min_2 are assessed using currents only slightly above Ilim_Min to verify that the PSE will produce this transient level for Tlim_Min Per Figure 33-15.
PSE58	Short circuit power removal	33.2.7.7	SIFOS PSA	Begins within Tlim in Table 33-1. <b>Note:</b> Ilim and Tlim within Table 33-1 do not have upper limits, and since port voltage is allowed to drop below Vport_pse_min per 33.2.7.7, there is effectively no lower limit to Tlim since PSE's may remove power with low voltage at any time, according to 3.2.7.1.	Test: pwrup_maxi Short_Cir_Timeout_Tlim, pwrup_maxi_2 Short_Cir_Timeout_Tlim	Test: pwrup_maxi Tlim_1, Tlim_2 <b>Note:</b> Tlim is only tested using Ilim_min to verify that Tlim_min is met and to verify that Tcut_max is met for the Type-2 PSE case.
PSE59	Turn off time	33.2.7.8	SIFOS PSA	Applies to the discharge time from VPort_PSE to VOff with a test resistor of 320 kΩ attached to the PI.	Test: pwrdrn_time Turn-Off_Time_Toff	Test: pwrdrn_time Toff
PSE60	Turn off voltage	33.2.7.9	SIFOS PSA	Applies to the PI voltage in the IDLE state	Test: pwrdrn_v Avg_Idle_Voff	Test: pwrdrn_v Voff
PSE61	Current unbalance	33.2.7.11		Applies to the two conductors of a power pair over the current load range in accordance with Iunb in Table 33-11.	Not Tested	Not Tested
PSE62	Type 2 PSEs in the presence of (Iunb / 2)	33.2.7.11		Meet the requirements of 25.4.4a	Not Tested	Not Tested
PSE63	Power allocation	33.2.8		Not be based solely on historical data of power consumption of the attached PD. <b>Note:</b> Power Allocation usually relates to a process spanning multiple powered PSE Ports. This specification generally defines the behaviors of a single PSE port.	See Sifos Technologies Multi-Port Test Suite.	See Sifos Technologies Multi-Port Test Suite.
PSE64	PSE monitoring AC MPS component	33.2.9.1.1	SIFOS PSA	Meets "AC Signal parameters" and "PSE PI voltage during AC disconnect detection" parameters in Table 33-12	Test: mps_ac_vf AC_MPS_Vopen, AC_MPS_Vopen%, AC_MPS_Frequency, Stew_Rate_Source_Current_Isac	Test: mps_ac_vf V_open, V_open_%Vport, Fp, AC_MPS_SR_Isac
PSE65	PSE AC MPS component present	33.2.9.1.1	SIFOS PSA	When AC impedance at the PI is equal to or lower than  Zac1  in Table 33-12	Test: mps_ac_pwrdrn Power_Down_Time_Tmpdo, DC_Max_Load_Imin1 <i>Implicitly covered by all pwrup_0xxx tests using PSA-1200, 3000.</i>	Test: mps_ac_pwrdrn Tmpdo, I_hold_ac <i>Implicitly covered by all pwrup_0xxx tests using PSA-3000.</i>
PSE66	PSE AC MPS component absent	33.2.9.1.1	SIFOS PSA	When AC impedance at the PI equal to or greater than  Zac2  in Table 33-12	Test: mps_ac_pwrdrn Power_Down_Time_Tmpdo <i>Implicitly covered by all pwrup_0xxx tests using PSA-1200, 3000.</i>	Test: mps_ac_pwrdrn Tmpdo <i>Implicitly covered by all pwrup_0xxx tests using PSA-3000.</i>
PSE67	Power removal	33.2.9.1.1	SIFOS PSA	When AC MPS has been absent for a time duration greater than TMPDO	Test: mps_ac_pwrdrn Power_Down_Time_Tmpdo	Test: mps_ac_pwrdrn Tmpdo
PSE68	PSE DC MPS component present	33.2.9.1.2	SIFOS PSA	I <sub>Port</sub> is greater than or equal to I <sub>Hold</sub> min for at least TMPS min as specified in Table 33-11	Test: mps_dc_valid Min_Valid_Time_Tmps	Test: mps_dc_valid Tmps
PSE69	PSE DC MPS component absent	33.2.9.1.2	SIFOS PSA	I <sub>Port</sub> is less than or equal to I <sub>Hold</sub> min as specified in Table 33-11	Test: mps_dc_valid Minimum_Valid_Imin2, mps_dc_pwrdrn Max_Invalid_Imin1	Test: mps_dc_pwrdrn I_hold
PSE70	Power removal	33.2.9.1.2	SIFOS PSA	When DC MPS has been absent for a time duration greater than TMPDO	Test: mps_dc_pwrdrn Time-to-Shutdown_Tmpdo	Test: mps_dc_pwrdrn Tmpdo
PSE71	Not remove power	33.2.9.1.2	SIFOS PSA	When the DC current is greater than or equal to I <sub>Hold</sub> max continuously for at least TMPS every TMPS + TMPDO	Not Tested	Test: mps_dc_valid Vport_mps_cycle
DLL1	Reserved Fields	33.6	SIFOS PSA	Must parse and analyze TLV framing bytes from received PSE frame	Not Tested	Test: class_lldp PSE_Source_Priority, PSE_MDI_Pwr_Sup
DLL2	Data Link Layer classification standards compliance	33.6.1	SIFOS PSA	LLDP Frames from PSE comply with LLDP structural requirements 802.1AB	Not Tested	Test: class_lldp <i>Implicitly covered by all LLDP measurements and LLDP PD Emulations Utilized in this test and other Type-2 tests.</i>
DLL3	TLV frame definitions	33.6.1	SIFOS PSA	LLDP Frames from PSE comply with PoE TLV structural requirements of 802.3bc	Not Tested	Test: class_lldp <i>Implicitly covered by all LLDP measurements and LLDP PD Emulations Utilized in this test and other Type-2 tests.</i>
DLL4	Control State Diagrams	33.6.1	SIFOS PSA	Power Change Behaviors induced by PSE or PD follow state diagrams in clause 33.6.3	Not Tested	Test: class_lldp PD_Power_Adjust_1, PSE_Adjust_Time_1, class_lldp PD_Power_Adjust_2, PSE_Adjust_Time_2
DLL5	Type 2 PSE LLDP PDU	33.6.2	SIFOS PSA	LLDP Framing transmitted within 10sec of POWER_ON state, or within 10.1 sec of actual power-up.	Not Tested	Test: class_lldp PSE_LLDP_Time_2
DLL6	Type 1 PSE LLDP PDU	33.6.2	SIFOS PSA	LLDP Framing transmitted when PSE activates LLDP subsystem.	Not Tested	Test: class_lldp PSE_LLDP_Time_1 <i>(Soft limit relative to LAN Link since there is no visibility to PSE control variables.)</i>
DLL9	PSE Allocated Power Value Change	33.6.2	SIFOS PSA	LLDP PDU sent within 10 seconds that echo's PD's power request.	Not Tested	Test: class_lldp PSE_Aloc_Time_1, PSE_Aloc_Time_2
DLL10	PSE Power Control State Diagrams	33.6.3	SIFOS PSA	Operate according to state diagrams for power changes in 33.6.3	Not Tested	Test: class_lldp PD_Power_Adjust_1, PSE_Adjust_Time_1, class_lldp PD_Power_Adjust_2, PSE_Adjust_Time_2

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