IEEE 802.3af

PROPOSAL

PSE Feeding Port output specification

Yair Darshan
PowerDesine

Jan. 01, 2001

Revision log.

Date	Page	Issue	
Nov/2/2000		1st Draft	Arlane Anderson,Yair Darshan, Scott Burton, Larry Miler.
Dec/1/2000		Updating voltage range, for all ENV types A and B	Yair Darshan
Dec/1/2000		Polarity of pins1, 2 –3,6 specified.	Yair Darshan
Dec/28/2000		Polarity of pins1, 2 –3,6 updates.	Yair Darshan
Dec/28/2000		Updating table 1	Yair Darshan
Dec/28/2000		Paragraph 6.4 deleted.	Yair Darshan
Jan/01/2001		Updating table 1 and adding test procedure and setup (paragraph 8) according to last week response.	Yair Darshan
March/2001		Updating Polarity table	Yair Darshan
March/2001		Updating Requirements table	Yair Darshan

1. Document Overview

1.1 Scope
This specification establishes the performance requirements for PSE feeding output port. The feeding output voltage is used to operate a device located at office environment.

2. Safety and Compliance Requirements

2.1 Must comply with IEEE 802, IEC1950.

3. Environmental Requirements

3.1 Operating Temperature: (*)
3.2 Storage Temperature: (*)
3.3 Operating Relative Humidity: (*)
3.4 Storage Relative Humidity: (*)
3.5 Operating Altitude: (*)
3.6 Storage Altitude: (*)
3.6 Cooling: (*)

(*) As defined by system manufacturer specification (Midspan or Switch etc.)

4. Electrical requirements (measured on output connector)

Table 1

#	Parameter		Unit	Min.	Typ.	Max.	Notes
	Output Voltage						
1	Output voltage	Vport	Vdc	44		57	Include line, Load, Temperature variations. See paragraph 8 for test setup.
2	Load Regulation		%			±5%	20% load step, 0.2A/uSec. See paragraph 8 for test setup.
	Settling Time		MSec			TBD	To 1% of nominal value See paragraph 8 for test setup.
4	Deleted						
5	Deleted						
6	**Feeding through spare pairs**						
	Ripple and noise, 0 < f < 500Hz.		Vpp			0.5	Differential noise. See paragraph 8 for test setup.
	Ripple and noise, 20KHz - 150kHz.		MVpp	Ripple and noise levels (Differential and Common mode) will be determined by the worst case requirements specified to meet EMI standards and keeping data integrity with out performance degradation.			Applicable when feeding through non-signal carrying pairs.
	Ripple and noise, 150KHz-500KHz.		MVpp				
	Ripple and noise, 500KHz-5MHz.		MVpp				
	Ripple and noise, 5MHz-30MHz.		MVpp				
	Ripple and noise, 30MHz-100MHz.		MVpp				
7	**Feeding through data pairs**						
	Ripple and noise, 0 < f < 500Hz.		Vpp			0.5	Differential noise. See paragraph 8 for test setup.
	Ripple and noise, 20KHz - 150kHz.		MVpp	Ripple and noise levels (Differential and Common mode) will be determined by the worst case requirements specified to meet EMI standards and keeping data integrity with out performance degradation.			Applicable when feeding through signal carrying pairs.
	Ripple and noise, 150KHz-500KHz.		mVpp				
	Ripple and noise, 500KHz-5MHz.		mVpp				
	Ripple and noise, 5MHz-30MHz.		mVpp				
	Ripple and noise, 30MHz-100MHz.		mVpp				
9	**Output Current - Startup**						
	Inrush current	Inrsh	mA			500	For t=100mSec, Cload=470uF max.
	Output Current - Normal operation						
10	Output Current operating range	Iport	mA	10		350	-Continuous operation averaged over 100mSec. -See paragraph 8 for test setup.
11	Off mode current	Imin1	mA	0		5	-must disconnect for t > T_{UVL} -See paragraph 8 for test setup.
		Imin2	mA	5		10	-may or may not disconnect for t > T_{UVL} -See paragraph 8 for test setup.
12	Under load time limit	T_{UVL1}	mSec		100		To handle transitions
		T_{UVL2}	Sec			TBD	For Vport change due to Battery backup operation.
11	Over Load current detection range	Icut	mA	350		500	Time limited to T_{OVL}. Load capacitance 470uF max.
12	Over load time limit	T_{OVL}	mSec	TBD	100	TBD	
13	Max output current	I_{LIM}	mA	500		550	-Time limited by thermal constrains.
	Timings						
20	Turn on time after successful detection	Ton	mSec			50	Includes Trise
21	Turn on rise time	Trise	mSec	1			-From 10% to 90% of Vport -Specified for PD load consist of 100uF capacitor in parallel to 200Ω
22	Turn Off time	Toff	mSec			500	From Vport to 5Vdc average.
	Isolation						
30	Port to Port	Vacrms		NA			ENV A
31	Port to Port	Vacrms		1500			ENV B
32	Port to chassis ground	Vacrms		1500			ENV A
33	Port to chassis ground	Vacrms		1500			ENV B
34	Port to mains (when applicable)	Vacrms	As defined by IEC950 safety requirements				

5. Monitoring signals (for each port)

5.1 The signals will be defined according to MIB definitions/requirements document.

6. Protection

6.1 Output shall be internally protected against overload or short circuit conditions according to the requirements of UL/CSA/IEC 60950 AND EN60950. No damage shall result to the power supply internal circuits or equipment connected as the result of either short term or long-term short circuits of the output to its return. Upon removal of the fault condition, the port shall recover automatically by starting from signature detection.

6.2 Output shall be energy limited according to UL/CSA/IEC/EN 60950.

6.3 Over voltage
Output shall be over voltage protected to remain in compliance with UL/CSA/IEC/EN 60950.

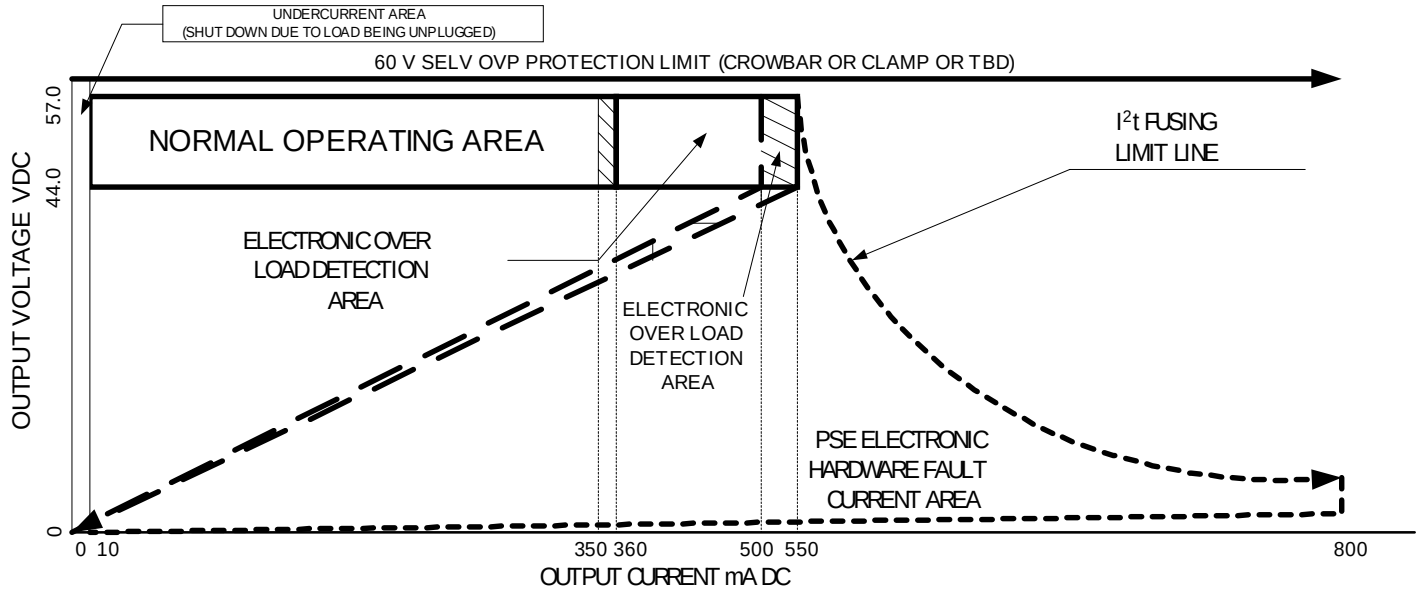
7. Polarity **(Assuming PD does not offer auto-polarity correction)**

Straight Cable		Cross Over Cable	
MDIX PSE	**MDI PD**	**MDI PSE**	**MDI PD**
Non-signal carrying pairs			
4,5 = +48V	4,5 = +48V	7,8 = +48V	4,5 = +48V
7,8=48V RTN	7,8=48V RTN	4,5 = 48V RTN	7,8 = 48V RTN
Signal carrying pairs			
3,6 = +48V	3,6 = +48V	1,2=+48V	3,6 = +48V
1,2 = 48V RTN	1,2 = 48V RTN	3,6= 48V RTN	1,2 = 48V RTN

8. Test procedure and test setup.

8.1 Output Voltage: TBD
8.2 Load regulation and settling time: TBD
8.3 Differential ripple at line frequency and it harmonics up to 500Hz:TBD
8.4 Output Current operating range:TBD
8.5 Off mode current and timings:TBD
8.6 Overload condition and timings:TBD
8.7 Short load condition:TBD
8.8 Turn on time after successful detection:TBD
8.9 Turn on rise time:TBD
8.10 Turn Off time

DTE POWER PSE
IEEE 802.3af STANDARD OPERATING AREA



RULES :

LOW CURRENT AREA **(2mA < I_{LOAD} < 10 mA):**

PSE must turn off if load current remains less than 10mA for more than 100mS (unplug operation)

NORMAL OPERATING AREA **(10 mA < I_{LOAD} < 350 mA)** :

PSE must provide at least 44 VDC and no more than 57 VDC; Current limit MUST NOT activate (shut down or show overcurrent status).

ELECTRONIC CURRENT LIMIT AREA **(350 mA < I_{LOAD} < 500 mA):**

PSE must remain on and provide at least 44 VDC AND NO MORE THAN 57 VDC during turn-on of constant-power device load with Iload<500mA for up to 100mSec. If I_{LOAD} > 500mA during the 100mSec time frame, PSE voltage aloud to be at the range of 0 - 44Vdc.

If 350mA < I_{LOAD} < 500mA for t > 100mS PSE will shutdown within 10mS.

PSE Must not re-attempt powering for at least 5 seconds.

PSE ELECTRONIC HARDWARE FAULT CURRENT AREA

In case of Electronic Current Limit HARDWARE fault, PSE must interrupt power with positive fusing device sized for I^2t curve intersecting point 57VDC, 500 mA and 30 seconds.

OVERVOLTAGE LIMIT **(SELV LIMIT =60 VDC)**

PSE must limit output voltage to less than 60 VDC under all conditions.

L D MILLER - 08/14/2000
Revised: Yair Darshan 30/10/200, proposal of different numbers, to be discussed with the working groop
Revised: Yair Darshan 29/10/2000, Specifying How to protect infrastructure in case of Electronic Hardware fault in PSE and updating voltage range
Revised: Yair Darshan 31/12/2000, Updating according to comments recieved.