Extended Power baseline proposal

v260

lennart.yseboodt@philips.com
matthias.wendt@philips.com
ydarshan@microsemi.com

Supporters: [Cristian Beia, Rick Frosch, Jean Picard]

ors: [Cristian Beia, Rick Frosch, Jean Picard]

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Goal

Objective: $P_{Class} - P_{Class\_PD}$ is power reserved for cable losses. The goal is to make this power available to the PD if it has additional information about actual channel losses. The amount of power available depends on actual channel losses & PSE power allocation policy.

Two things are needed:
- Table 33-18 Item 4 forbids PDs from exceeding P_{class_PD}
- PD may not cause PSE to source $> P_{Class}$

PD classes with extended power

PSE Class events

PD Class		15W\n1 event	30W\n2 event	30W\n3 event	60W\n4 event	90W\n5 event
15W	Class 0	Extended forbidden	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4W	Class 1	Extended forbidden	Not Applicable	Not Applicable	Not Applicable	Not Applicable
7W	Class 2	Extended forbidden	Not Applicable	Not Applicable	Not Applicable	Not Applicable
15W	Class 3	Extended forbidden	Not Applicable	Not Applicable	Not Applicable	Not Applicable
30W	Class 4	Extended forbidden	Extended forbidden	Extended forbidden	Not Applicable	Not Applicable
45W	Class 5	Extended forbidden	Extended forbidden	Extended forbidden	Extended forbidden	Not Applicable
60W	Class 6	Extended forbidden	Extended forbidden	Extended forbidden	Extended possible	Not Applicable
75W	Class 7	Extended forbidden	Extended forbidden	Extended forbidden	Extended by power demotion	Extended forbidden
90W	Class 8	Extended forbidden	Extended forbidden	Extended forbidden	Extended by power demotion	Extended possible

Legend:
- Grey — Not Applicable
- Red — Extended forbidden
- Green — Extended possible
- Yellow — Extended by power demotion

Table 33-18 -- PD power supply limits

Change in Table 33-18

Item 4	Parameter	Symbol Pclass_PD	Unit W	Min	Max	PD Type	Additional information See 33.3.7.2, Table 33-1
	Input average power, Class 0 and Class 3				13	1	
	Input average power, Class 1				3.84	1	
	Input average power, Class 2				6.49	1	
	Input average power, Class 4				25.5	2	
	Input average power, Class 5				TBD	3	
	Input guaranteed available average power, Class 6				TBD	3	
	Input average power, Class 7				TBD	4	
	Input guaranteed available average power, Class 8				TBD	4	

33.3.7.2 Input average power

Add to section 33.3.7.2

33.3.7.2 Input average power

The maximum average power, P_{Class_PD} in Table 33–18 or PDMaxPowerValue in 33.6.3.3, is calculated over a 1 second interval. PDs may dynamically adjust their maximum required operating power below P_{Class_PD} as described in 33.6.

NOTE—Average power is calculated using any sliding window with a width of 1 s.

For Type 3 and 4 PDs that presented a Class 6, 7 or 8 signature and observed 4 classification events, or presented a Class 8 signature and observed 5 classification events, the input guaranteed available average power is the maximum power the PD may consume when no additional information is available to the PD regarding actual channel DC resistance. If such a PD has additional information and does not cause the PSE to source more than P_{class} it may exceed the maximum input guaranteed average power.

33.3.7.5 Peak transient current

Replace Figure 33-18
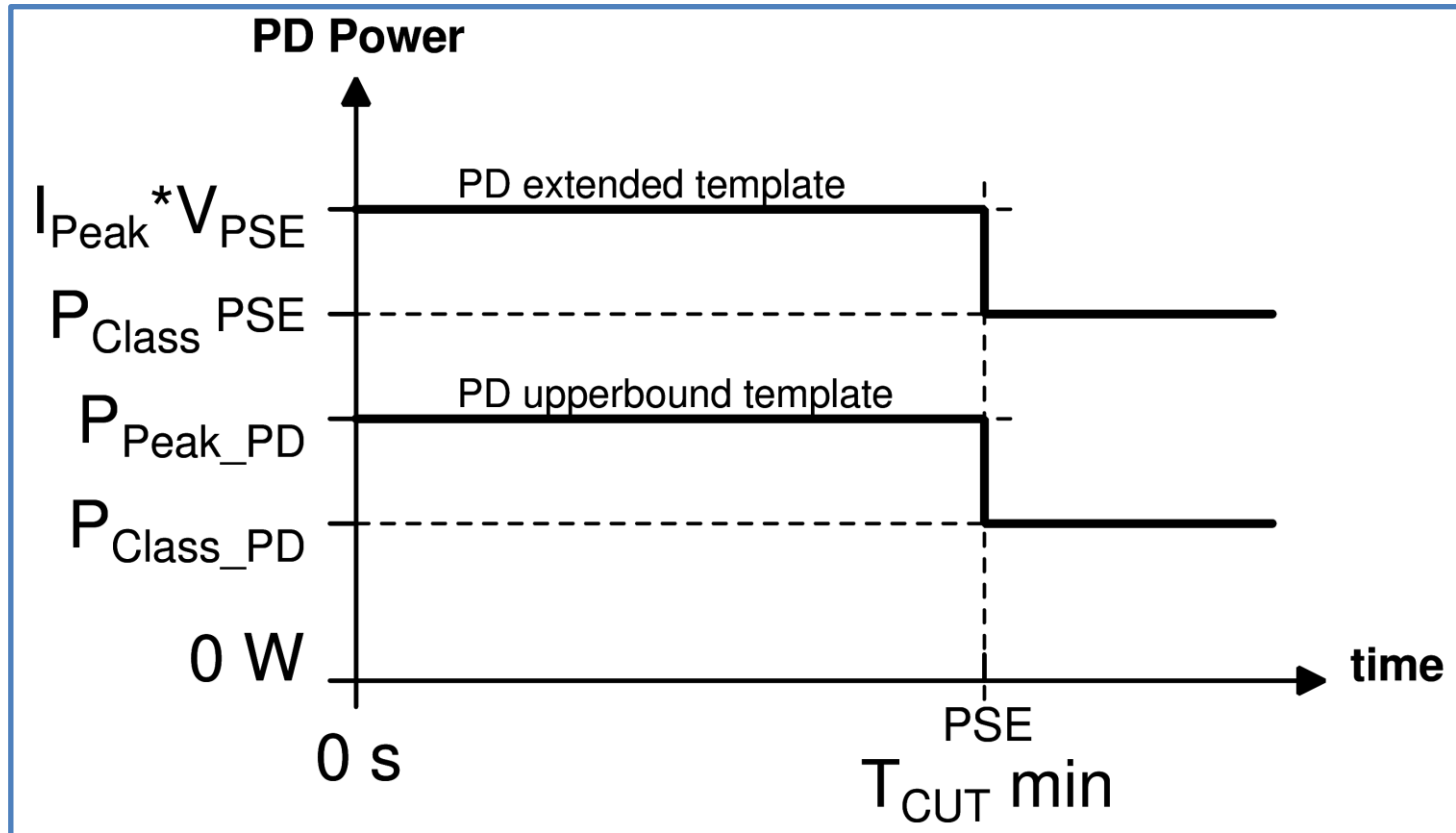
Info: The extended template is based on PSE PI parameters. At Rchan = Rch the extended and upperbound template lines are fully overlapping.

33.3.7.5 Peak transient current

Replace:

Under normal operating conditions when there are no transients applied at the PD PI, the PD shall operate below the PD upperbound template defined in Figure 33–18.

By:

Under normal operating conditions when there are no transients applied at the PD PI, Type 3 and Type 4 PDs that observed 4 classification events and presented a Class 6, 7 or 8 signature, or observed 5 classification events and presented a Class 8 signature shall operate below the PD extended template defined in Figure 33-18. Type 1 and Type 2 PDs, Type 3 and Type 4 PDs in Class 5 or 7, or PDs that cannot guarantee that the PSE will source less than P_{Class} shall operate below the PD upperbound template defined in Figure 33-18.

Clarification: this text & figure do not allow the PD the exceed the upperbound template unconditionally. The condition is that the PSE shall not be caused to source more than P_{class}. This restriction is handled in section 33.3.7.2.

33.3.7.5 Peak transient current

Add after description of $P_{PDUT}(t)$ in 33.3.7.5

The PD extended template in Figure 33-18, P_{PDET}, is described by Equation (33-xx):

$$P_{\text{PDET}}(t) = \begin{cases} I_{Peak} \times V_{PSE} \text{ for } (0 \le t \le T_{cut\,min}) \\ P_{\text{Class}} \text{ for } (T_{cut\,min} \le t) \end{cases} \text{W}$$

where

t	is the duration in seconds that the PD sinks I_{port}
P_{Peak_PD}	is the peak operating power, P_{peak_Pd}max, as defined in Table 33-18
P_{Class_PD}	is the maximum power, P_{class_Pd}max, as defined in Table 33-18
P_{Class}	is the minimum power output by the PSE, as defined in Table 33-7 and section 33.2.6