

Extended power Class 6 and Class 8 unbalance requirements- TDL #44 D2.1

This comment addresses TDL#44 from D2.1 and new comment for D2.2 Regarding PSE supporting P2PRunb for extended power.

TDL#44 D2.1 Action item:

ACCEPT IN PRINCIPLE. Add TDL (Yair): To add to the spec the equations for extended power for class 6 and 8 and modify the above text accordingly.

New comment for D2.2:

Currently PSE has no unbalance requirements for extended power class 5-8 that will guarantee interoperability as we did for the class 5-8 non-extended power case. **As a result, we have to add to Equation 15, the class 6 and 8 extended case.**

Existing D2.2 Extended power class 6 and 8 rules to meet unbalance requirements.

- To meet existing I_{con-2P_unb} for class 6 and 8 for the extended power case as well. This is the current concept.

✓	No increase in I_{con-2P_unb} min capacity
✓	Total current over 4-pairs is kept $=P_{class}/V_{port_PSE-2P}$
✓	No change in magnetic components for PSE and PD that supports extended power compare to PDs that doesn't support extended power
✓	No changes in I_{peak} and $I_{peak-2P_unb}$ requirements
❖	Requires PSE and PDs to meet tighter R_{pse_min} , R_{pse_max} , $R_{pair_PD_min}$ and $R_{pair_PD_max}$ requirements. See Annex A.

Proposed base line for extended power class 6 and class 8.

1. Add the following lines to Equation 33-15:

$$R_{PSE_max} \leq \left\{ \begin{array}{l} 1.309 \times R_{PSE_min} + 0.011 \quad \text{for Class 6 per 33.3.8.2.1} \\ 1.166 \times R_{PSE_min} + 0.015 \quad \text{for Class 8 per 33.3.8.2.1} \end{array} \right\}$$

2. Add the following lines to Table 33-B1a. Editor to merge Table 33B1a with Table 33-B1.

PSE Class	RCH_min , [Ω]	RCH_max , [Ω]	RPair_PD_min , [Ω]	RPair_PD_max , [Ω]	Rload_min , [Ω]	Rload_max , [Ω]	Additional Information
Extended Class 6 per 33.3.8.2.1	0.089	0.101	0.646	0.851	0.735	0.951	Rload is at low channel resistance conditions
Extended Class 8 per 33.3.8.2.1			0.540	0.618	0.629	0.718	
Extended Class 6 per 33.3.8.2.1	5.513	6.250	0.683	0.811	6.196	7.061	Rload is at high channel resistance conditions
Extended Class 8 per 33.3.8.2.1			0.552	0.620	6.065	6.870	

3. Add the following lines to Equation 33A-4.

$$R_{Pair_PD_max} = \left\{ \begin{array}{ll} 1.309 \times R_{Pair_PD_min} + 0.005 & \text{for PD Type 4, Class 7} \\ 1.166 \times R_{Pair_PD_min} - 0.011 & \text{for PD Type 4, Class 8} \end{array} \right\}_{\Omega}$$

End of Base Line

❖ Annex A: What if we loosen PD P2P_{Runb} requirements in the extended power case by allowing higher I_{con-2P_unb}?

❖	Increase I _{con-2P_unb} min capacity for extended power case
✓	Total current over 4-pairs is kept = $P_{class}/V_{port_PSE-2P}$
❖	Magnetics components for PSE and PD that supports extended power will have to be bigger by 10%.
❖	I _{peak} and I _{peak-2P_unb} will be higher. <i>Class 8 will have smaller margin from 100W and from 1A maximum current wire target.</i>
✓	Same R _{pse_min} , R _{pse_max} R _{pair_PD_min} and R _{pair_PD_max} requirements as in the non-extended power case

-Most of the applications will not use extended power therefore no need to add burden on PSE.

-PDs job is to ensure that their implementation specifics of their design will ensure that PD meets I_{con-2P_unb} as is in the current standard.