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

Addressing comment 90# and #112 in D2.2

**TDL#44 D2.1 Action item (Comment #112 in D2.2):**

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.

## Comment #90 D2.2:

Currently PSE has no unbalance requirements for extended power class 6 and 8 that will guarantee interoperability as we did for the class 5-8 non-extended power case.

## Proposed Remedy:

Update equations for the extended power case for Equation 33-15 and Equation 33A-4.

See more comments in darshan_07_0117PartB.pdf regarding extended power.

# The following is the current rules in D2.2 to support extended power class 6 and 8 to meet unbalance requirements.

| | |
|---|---|
| ✓ | No increase in Icon-2P_unb min capacity |
| ✓ | Total current over 4-pairs is kept =Pclass/Vport_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 Ipeak and Ipeak-2P_unb requirements |
| ❖ | Requires PSE and PDs to meet tighter Rpse_min, Rpse_max Rpair_PD_min and Rpair_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:

$$R_{PSE\_\max} \le \begin{cases} \\ 1.318 \times R_{PSE\_\min} + 0.010 \quad for \quad Class\ 6\ \ per\ 33.3.8.2.1 \\ 1.172 \times R_{PSE\_\min} + 0.014 \quad for \quad Class\ 8\ \ per\ 33.3.8.2.1 \end{cases}$$

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

$$R_{Pair\_PD\_\max} = \begin{cases} \\ 1.318 \times R_{Pair\_PD\_\min} + 0.004 \quad for\ Class\ 6\ \ per\ 33.3.8.2.1 \\ 1.172 \times R_{Pair\_PD\_\min} - 0.013 \quad for\ Class\ 8\ \ per\ 33.3.8.2.1 \end{cases}_{\Omega}$$

3. Delete the text in page 261 lines 1-2:

"Smaller constants α and β in the equation RPair_PD_max = α × RPair_PD_min + β ensure that ICon-2P-unb is not exceeded for PD power consumption above the values in Table 33–26."

4. 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 | 0.087 | 0.101 | 0.645 | 0.854 | 0.732 | 0.955 | Rload is at low channel resistance conditions |
| Extended Class 8 per 33.3.8.2.1 | | | 0.538 | 0.619 | 0.626 | 0.719 | |
| Extended Class 6 per 33.3.8.2.1 | 5.405 | 6.250 | 0.663 | 0.799 | 6.068 | 7.049 | Rload is at high channel resistance conditions |
| Extended Class 8 per 33.3.8.2.1 | | | 0.541 | 0.616 | 5.945 | 6.865 | |

End of Base Line

## ❖ Annex A: What if we loosen PD P2PRunb requirements in the extended power case by allowing higher Icon-2P_unb?

| | |
|---|---|
| ❖ | Increase Icon-2P_unb min capacity for extended power case |
| ✓ | Total current over 4-pairs is kept =Pclass/Vport_PSE-2P |
| ❖ | Magnetics components for PSE and PD that supports extended power will have to be bigger by 10%. |
| ❖ | Ipeak and Ipeak-2P_unb will be higher. *Class 8 will have smaller margin from 100W and from 1A maximum current wire target.* |
| ✓ | Same Rpse_min, Rpse_max Rpair_PD_min and Rpair_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 Icon-2P_unb as is in the current standard.