MPoE System Power

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Process

- Made a spreadsheet that calculated the cable loss for each node
- Allowed 16 PDs with one PSE
- Used 12 ohms as loop resistance, 0.2ohms per T-connector
- Calculated three operating points:
  - Worst case, all PDs clumped at the far end of the cable
  - Best case: all PDs clumped at the near end of the cable
  - Typical: PDs equally spaced
- This assumed uniform PDs each pulling the same power
- Used “goal seek” to find the max PD power and cable loss

45V, worst case

- 16 PDs clumped at far end
- 9 ohms of cable, then 0.2 ohms per T, total of 12 ohms
- MPSE power: 45V, 0.94A (42.3W)
- Average MPD power: 2.09W/PD
- 8.82W cable loss

45V, best case

- 16 PDs clumped at near end
- 0.2 ohms per T, total of 3.2 ohms
- MPSE power: 45V, 0.94A (42.3W)
- Average MPD power: 2.58W/PD
- 1.04W cable loss

45V, typical case

- 16 PDs equally spaced
- 0.75 ohms between PDs, total of 12 ohms
- MPSE power: 45V, 0.94A (42.3W)
- Average MPD power: 2.39W/PD
- 4.0W cable loss

26V, worst case

- 16 PDs clumped at far end
- 9 ohms of cable, then 0.2 ohms per T, total of 12 ohms
- MPSE power: 26V, 0.89A (23.14W)
- Average MPD power: 0.95W/PD
- 7.92W cable loss

26V, best case

- 16 PDs clumped at near end
- 0.2 ohms per T, total of 3.2 ohms
- MPSE power: 26V, 0.89A (23.14W)
- Average MPD power: 1.39W/PD
- 0.94W cable loss

26V, typical case

- 16 PDs equally spaced
- 0.75 ohms between PDs, total of 12 ohms
- MPSE power: 26V, 0.89A (23.14W)
- Average MPD power: 1.22W/PD
- 3.68W cable loss

Summary

	Power per PD (W)	Cable loss (W)	Available Power (W)
45 V worst case	2.09	8.82	33.5
45 V typical	2.39	4.0	38
45 V best case	2.58	1.04	41
26 V worst case	0.95	7.92	15
26 V typical	1.22	3.68	19.5
26 V best case	1.39	0.94	22

Question

- What value do we quote in our specification table?
  - History has shown that worst case is impossible to achieve unless a contrived test is set up
  - Too lenient could lead to systems that aren't "plug and play"
- How much latitude do we give the system designer to squeeze out all the power they can get based on their design?
- Suggest we quote the "typical number" and give further guidance in text

See accompanying mark up of 169-3