
25GBASE-T Considerations

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Purpose

- **Review of 40GBASE-T required SNR and margin**
- **25GBASE-T required SNR and margin**

Goals for 25GBASE-T

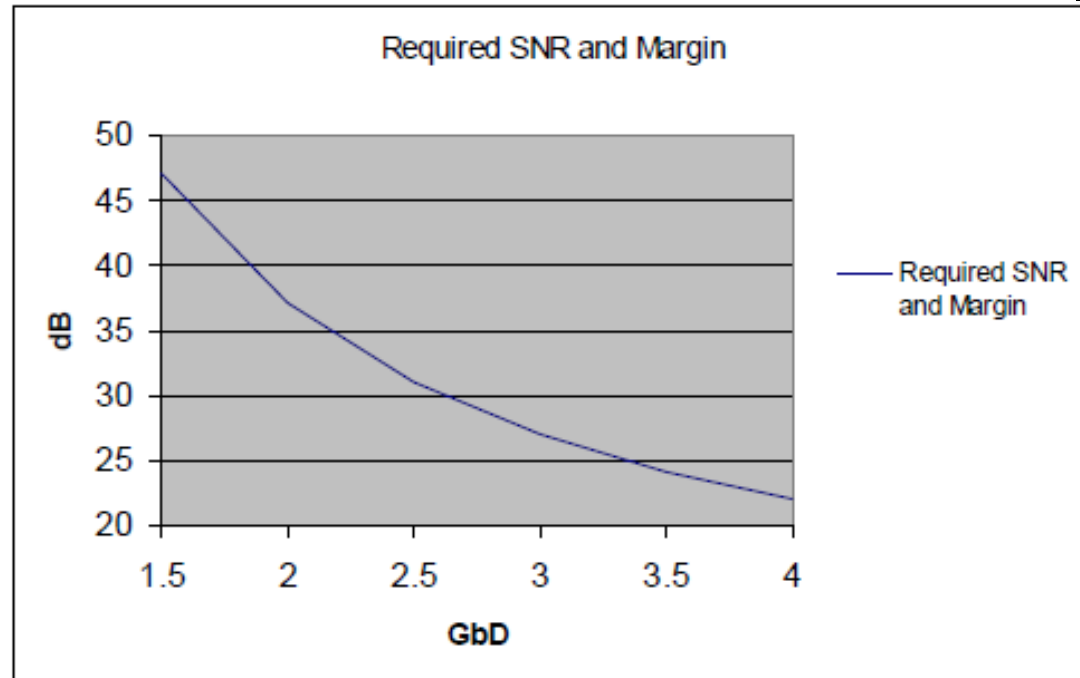
- Power <3W / port
- Backwards compatible with 10GBASE-T MDI
- Forward compatibility to 40GBASE-T
- 30m reach (EoR, MoR, ToR)
- Utilize analysis and spec work from 40GBASE-T
- Alignment with objectives and 5 criteria of 40GBASE-T

25GBASE-T Power

- Power and complexity were the biggest factors as to why 10GBASE-T did not initially take off. Recommend focusing on reducing power rather than extending length for 25GBASE-T.

Required 40GBASE-T SNR and Margin

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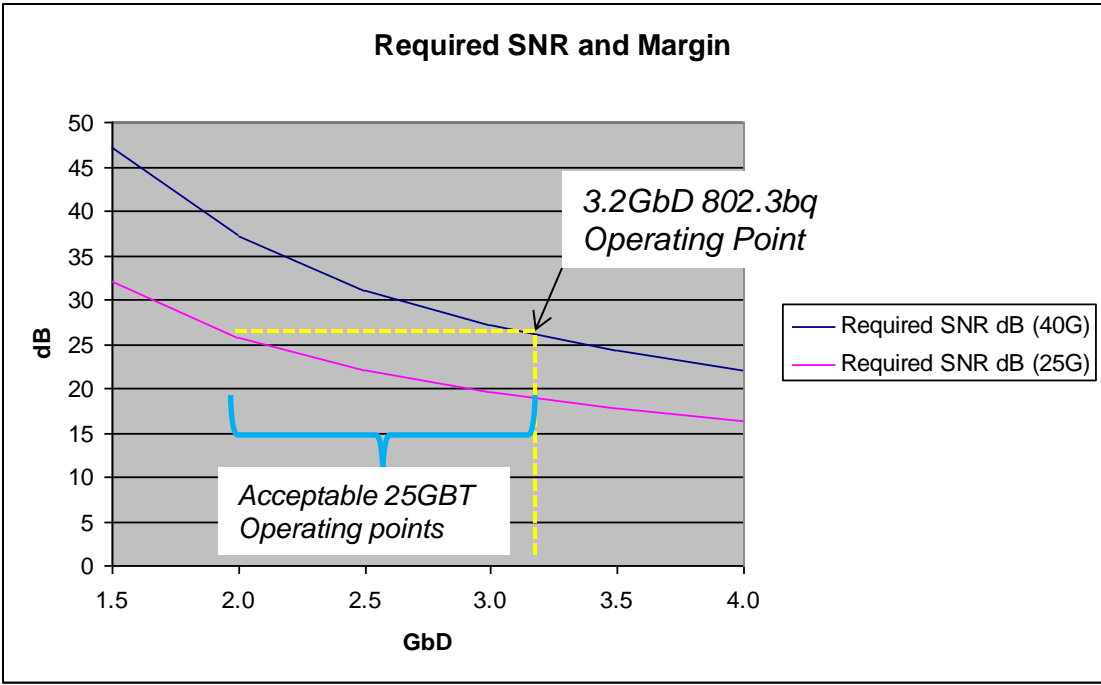
Combining the gap to capacity and the link margin in one variable, g , the required SNR is computed as: $g + 10 \cdot \log_2(2^{2 \cdot \text{capacity}(\text{GbD})} / \text{GbD})$

With gap to capacity = 4, Link margin = 3, $g=7$, $\text{capacity}(\text{GbD})=10$

SNR Required = ~ 22 dB

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Required SNR and Margin



GbD	Required SNR dB (40G)	Required SNR dB (25G)
1.50	47.14	32.09
2.00	37.10	25.81
2.50	31.08	22.05
3.00	27.07	19.54
3.50	24.20	17.75
4.00	22.05	16.41

Required SNR is computed as: $g + 10 \cdot \text{LOG}(2^{(2 \cdot \text{capacity}(\text{GbD})/\text{GbD})})$
 With gap to capacity = 4, Link margin = 3, $g=7$, $\text{capacity}(\text{GbD})=6.25$ and 10

Conclusions

- Get ~30% reduction in required SNR from 40GBASE-T
- Keep the same Cat 8 30m channel as 40GBASE-T to minimize market confusion and barriers to upgrade.
- Focus on driving power below 3W
 - (below 2W would be ideal)