

Two Types of STP Automotive Cable Support 10G+

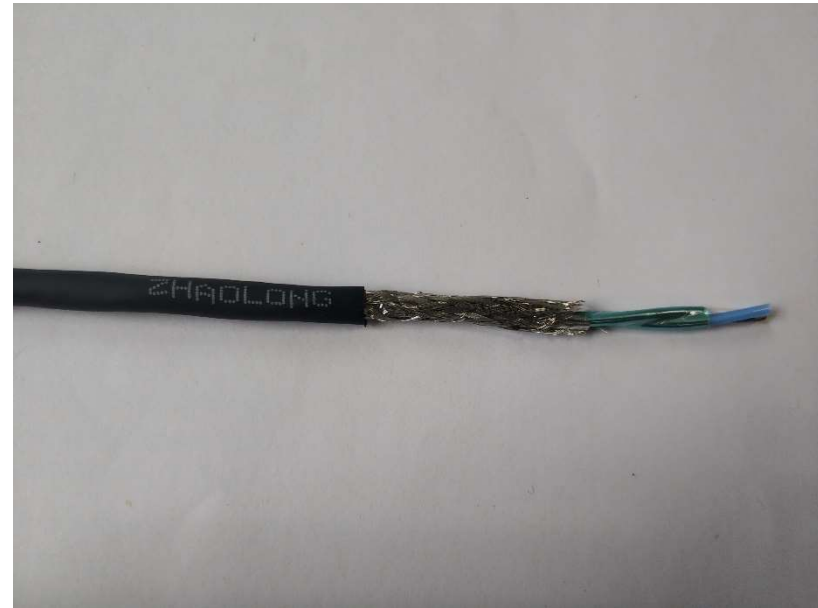
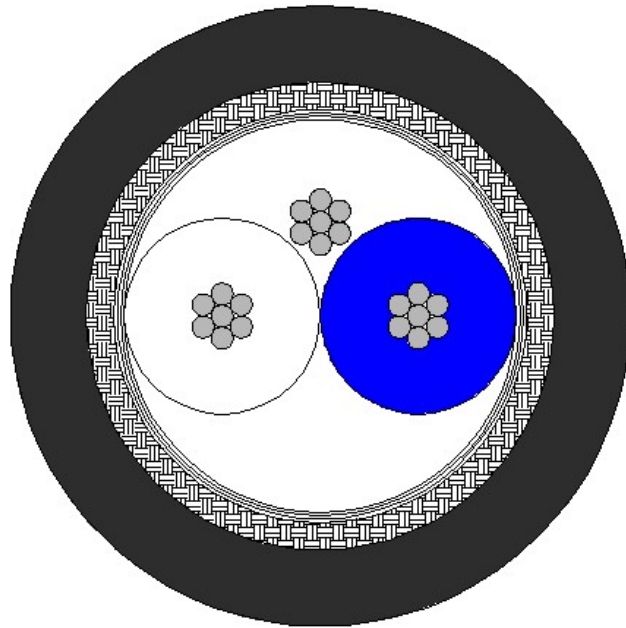
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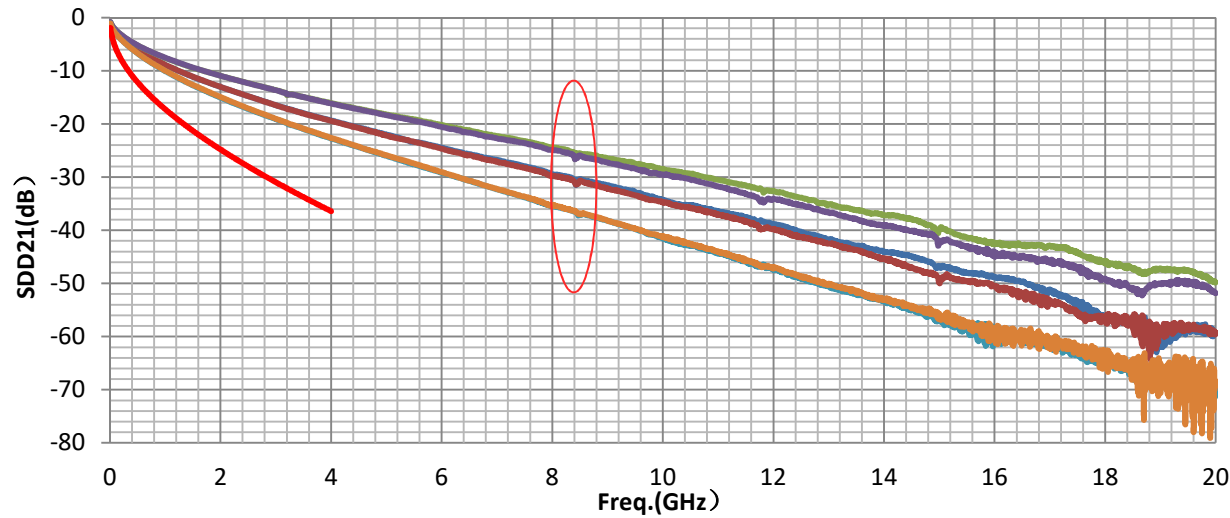
Evan Sun, Huawei

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Silver or Tin Plated (7/0.16) Stranded STP Cable

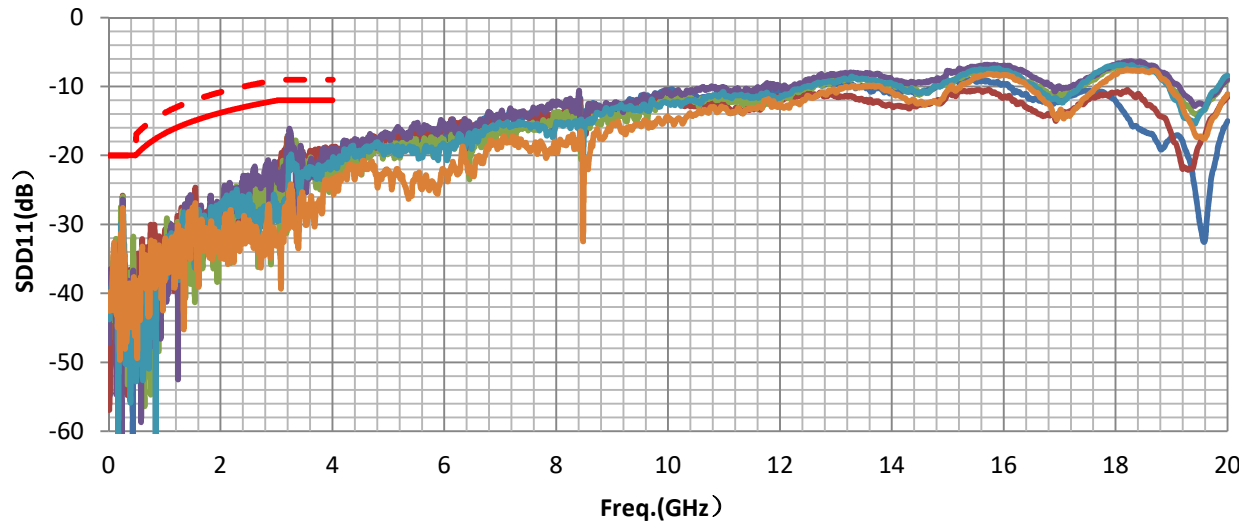


Silver Plated (7/0.16) Stranded STP Cable (10m)



- Sample #1 (22°C)
- Sample #2 (22°C)
- Sample #1 (-40°C)
- Sample #2 (-40°C)
- Sample #1 (100°C)
- Sample #2 (100°C)
- 802.3ch limit

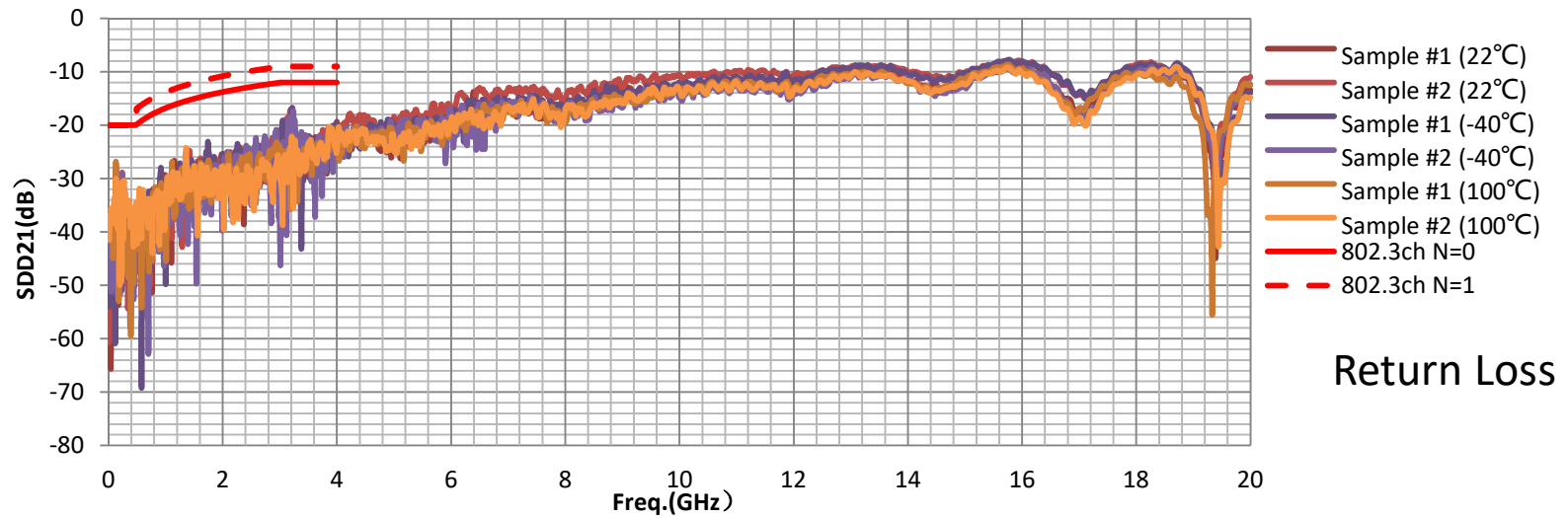
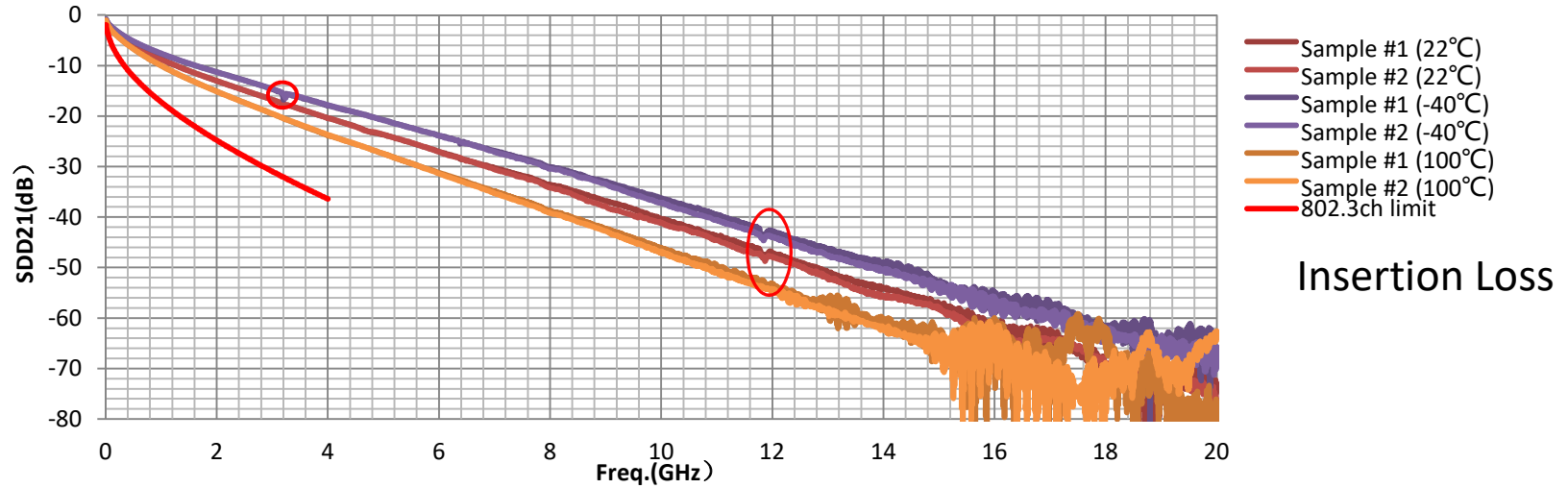
Insertion Loss



- Sample #1 (22°C)
- Sample #2 (22°C)
- Sample #1 (-40°C)
- Sample #2 (-40°C)
- Sample #1 (100°C)
- Sample #2 (100°C)
- 802.3ch N=0
- 802.3ch N=1

Return Loss

Tin Plated (7/0.16) Stranded STP Cable (10m)



Comparison based on the Temperature

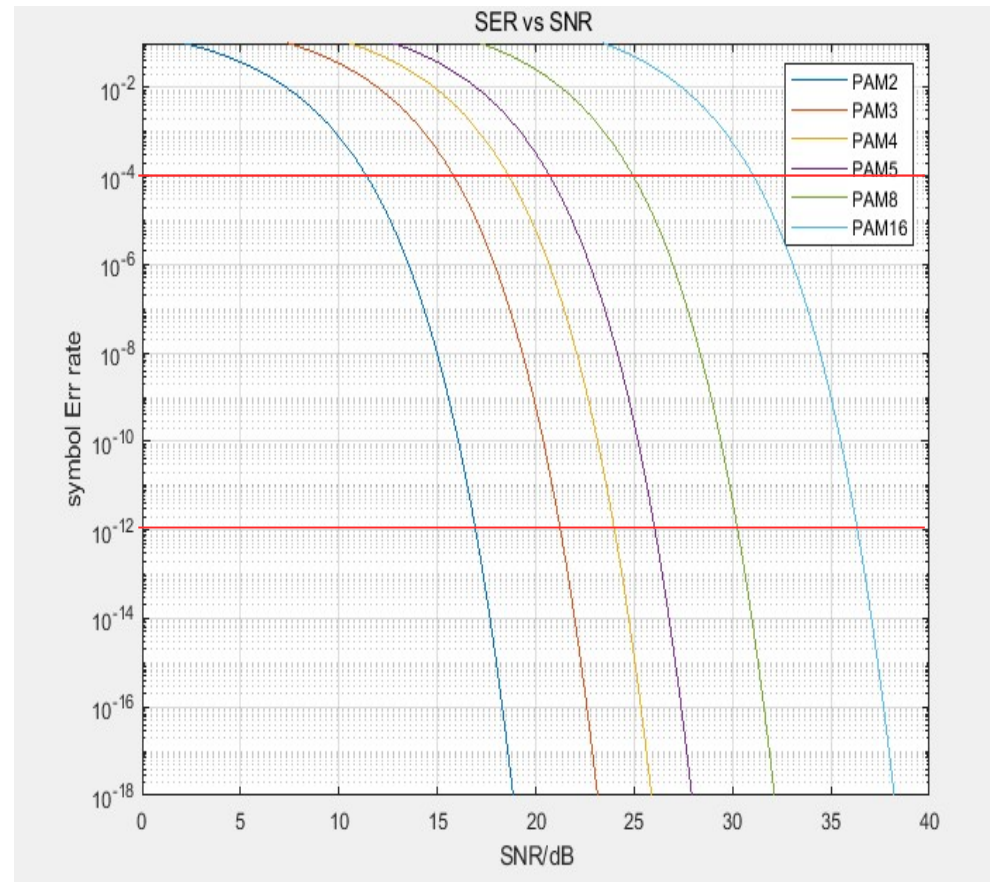
Temperature	Attenuation (dB/10m)					
	2GHz		4GHz		8GHz	
	Silver	Tin	Silver	Tin	Silver	Tin
-40°C	-10.9	-11.3	-16.1	-17.9	-24.4	-30.0
22°C	-13.0	-13.0	-19.4	-20.4	-29.5	-33.7
100°C	-15.1	-15.1	-22.7	-23.8	-35.5	-38.9

Silver plated cable performs better than tin plated, but higher relative cost.

Modulation Compare

Setup:

- 10m Tin plated stranded STP cable
- TX power 0dBm
- SNR margin= Salz_SNR – SNR@SER
- Noise_floor: -150dBm/Hz
- Data rate 28Gbps, un-coded
- SER 1e-4 and 1e-12
- CTLE is not considered in the calculation



SNR Margin

Modulation vs SNR Margin		Salz_SNR	SNR@1e-4	SNR_Margin@1e-4	SNR@1e-12	SNR_Margin@1e-12
PAM2	22°C	19.31	11.40	7.91	16.94	2.37
	100°C	16.14		4.74		-0.80
PAM3	22°C	29.34	15.83	13.51	21.25	8.09
	100°C	26.07		10.24		4.82
PAM4	22°C	33.39	18.63	14.76	24.00	9.39
	100°C	30.66		12.03		6.66
PAM5	22°C	35.50	20.70	14.80	26.05	9.45
	100°C	33.26		12.56		7.21
PAM8	22°C	38.22	24.94	13.28	30.26	7.96
	100°C	37.22		12.28		6.96

- The calculation is based on -150dBm/Hz background noise
- Consider the SNR margin PAM4 and PAM5 are better than others, PAM5 may perform best at 100°C and SER@1e-4

Conclusions

- 10m Silver and Tin plated STP cable both can satisfy 25Gbps requirements.
- Temperature affect the IL and RL.
- PAM4 and PAM5 perform better than other modulation orders.

Thank you

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