

# 25GBASE-T Technical Feasibility

## IEEE 802.3 – January 2015 Atlanta

Tom Souvignier – Broadcom



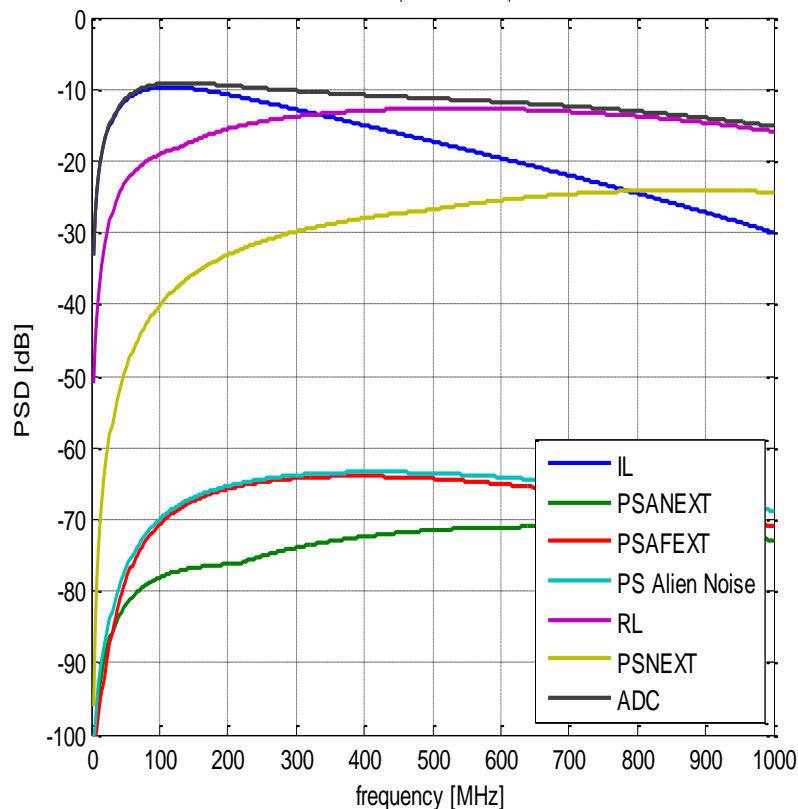
# Supporters



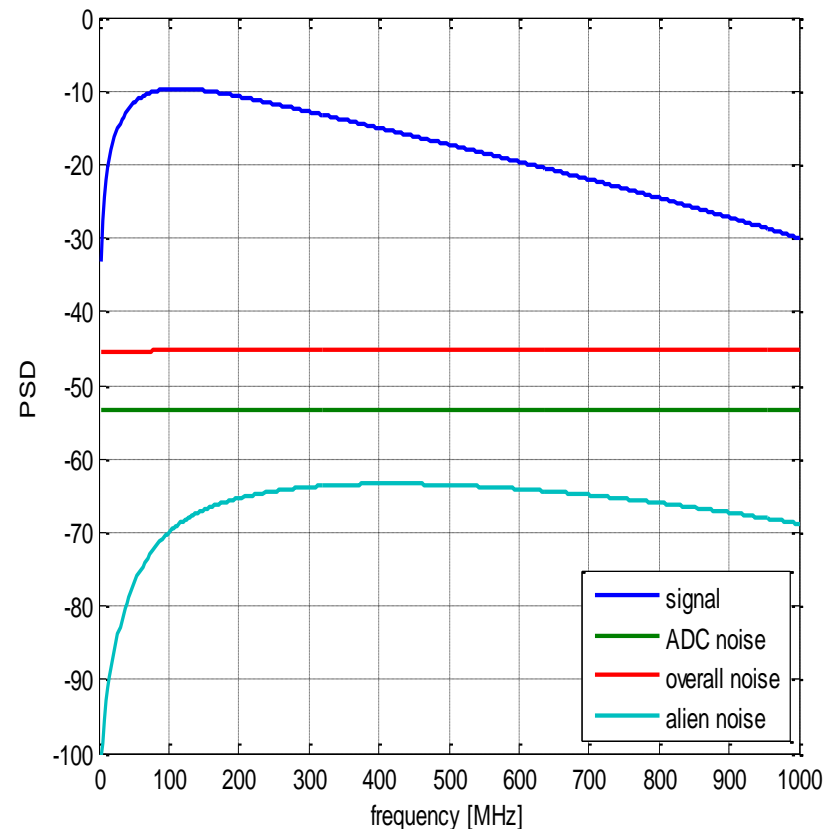
- George Zimmerman: CME Consulting / Commscope
- German Feyh: Broadcom
- Will Bliss: Broadcom
- William Lo: Marvell
- Peter Wu: Marvell

# ADC Feasibility

Salz SNR 48.4dB, 30m CAT8, 25GBASET



6.51ENOB deteriorates Salz SNR from 48.4dB to 27dB



- 25Gb/s, 30m Cat8, 100MHz HPF
- ADC: 6.5 ENOB at 2GS/s

# BASE-T Comparison



	Cable length	Cable type	HPF freq. corner	ENOB	Sampling frequency	Echo taps
10G	100m	CAT6A	40MHz	10	800MHz	800
25G	30m	CAT8	100MHz	6.5	2GHz	600
40G	30m	CAT8	160MHz	7.0	3.2GHz	960

- 25GBASE-T ENOB less than 7:
  - Reduced ADC complexity
  - Smaller, lower-power AFE
- 25GBASE-T reduced complexity DSP
  - Shorter filters
  - Reduced word-length requirements

- Assuming 30m of Cat8 Channel, 25GBASE-T requirements (relative to 40GBASE-T):
  - Reduced baud rate requirement
  - Reduced ADC ENOB requirement
  - Reduced channel insertion loss
  - Increased decision-point SNR margin
  - Reduced power dissipation
  - Reduced digital and analog die area

# 25Gb/s Technical Feasibility



- First order power estimate: comparable to 10GBASE-T
- Relaxed AFE requirements
- Leverages well-understood DSP
- Uses 40GBASE-T channel (30m of Cat8)
- Technical issues understood from 10GBASE-T and 802.3bq