

# TDD Proposal

IEEE 802.3dm

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# Motivation

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- Propose transmit levels for 3 and 6 GBaud TDD proposal sufficient for Automotive Channel Model

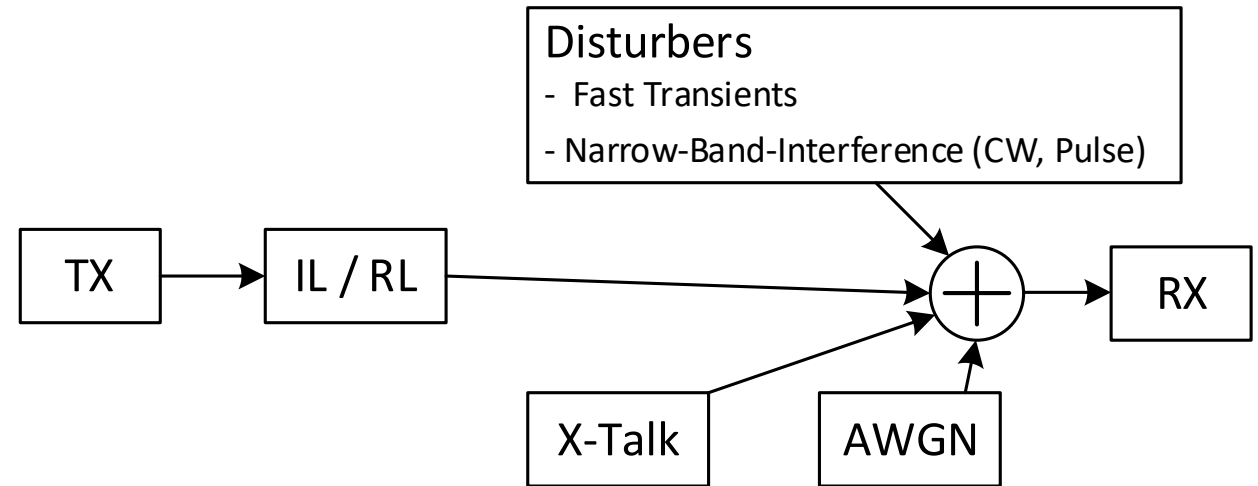
# TDD Proposal - Coding and Data Rates

Dn Line Rate [Gbps]	Up Line Rate [Gbps]	Resync Header [ns]	IBG [ns]	Dn							Up							Target [ns]	Dn [ns]	Up [ns]	Total [ns]	Dn Payload per burst [bits]	Dn Data Rate [Gbps]	Up Payload per burst [bits]	Up Data Rate [Mbps]
				Per RS frame				Burst			Per RS frame														
				64/65 blocks	OAM bits	Payload bytes	Parity bytes	RS frames	Length [bits]	Length [ns]	64/65 blocks	OAM bits	Payload bytes	Parity bytes	RS frames	Length [bits]	Length [ns]								
3	3	189.333	104	15	1	122	8	25	26000	8666.67	15	1	122	8	1	1040	346.67	9600	8856.0	536.0	9600.0	24000	2.500	960	100.0
6	3	189.333	104	15	1	122	8	50	52000	8666.67	15	1	122	8	1	1040	346.67	9600	8856.0	536.0	9600.0	48000	5.000	960	100.0
12	3	189.333	104	15	1	122	8	100	104000	8666.67	15	1	122	8	1	1040	346.67	9600	8856.0	536.0	9600.0	96000	10.000	960	100.0

- All required MAC rates can be achieved with 3 and 6 GBaud
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# Channel Model

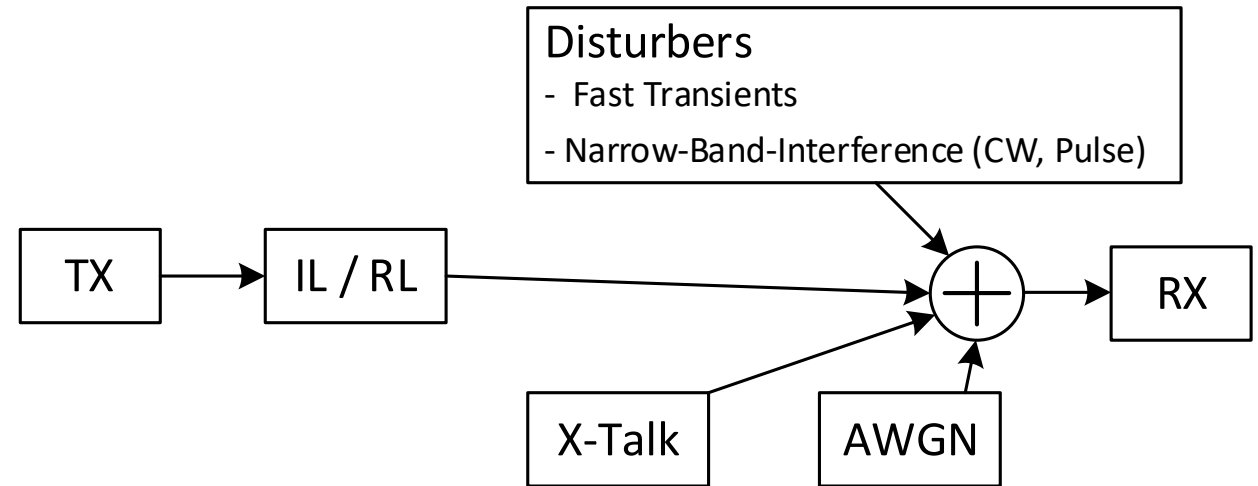
- Channel model
  - IL / RL for cable & MDI
  - Disturbances: X-Talk, Automotive Environment
  - Noise floor (AWGN)
- Disturbances are added at the receiver side (after signal has been attenuated)
  - X-Talk
  - Disturber Fast Transient
  - Disturber NBI
- Disturbances given as signal component
  - STP has also common mode signal, which will show higher X-Talk and disturber levels
  - Coax is single-ended system



	<b>X-Talk</b>	<b>Fast Transients</b>	<b>NBI</b>
Coax	LF higher HF lower	40mVpp Longer tail	LF 80mVpp HF 16mVpp
STP	LF lower HF higher	6mVpp Shorter tail	LF 50mVpp HF 32mVpp

# Channel Model

- NBI:
  - Present over all frequencies
  - Also at / close to half baud rate
- Fast Transients:
  - Lower frequency disturbance
  - For higher baud rate signal 3/6 GBaud, significant suppression by filtering is feasible
- In real-world situations, all disturbances are active concurrently
- Transmit amplitude needs to be large enough for RX to decode error-free in presence of all disturbers
  - Margin for Coax drives the amplitude selection



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# Analog Parameters

	2.5Gbps / 100Mbps	5.0Gbps	10.0Gbps
<b>TX Output Swing STP</b>	0.7Vppdiff	0.9Vppdiff	1.2Vppdiff
<b>TX Output Swing Coax</b>	0.35Vpp	0.45Vpp	0.6Vpp
<b>Line Rate</b>	3 GBaud	6 GBaud	6 GBaud
<b>Modulation</b>	PAM2	PAM2	PAM4

- Multi-MDI PHYs are assumed (which could operate on STP and Coax)
- Coax transmit amplitude is always 50% of STP
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# Summary

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- This presentation presented a baseline proposal for TX levels for all three MAC rates Downstream
  - TX level Upstream is equivalent to TX level 2.5Gbps Downstream

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# Thank You!