Presentation Purpose

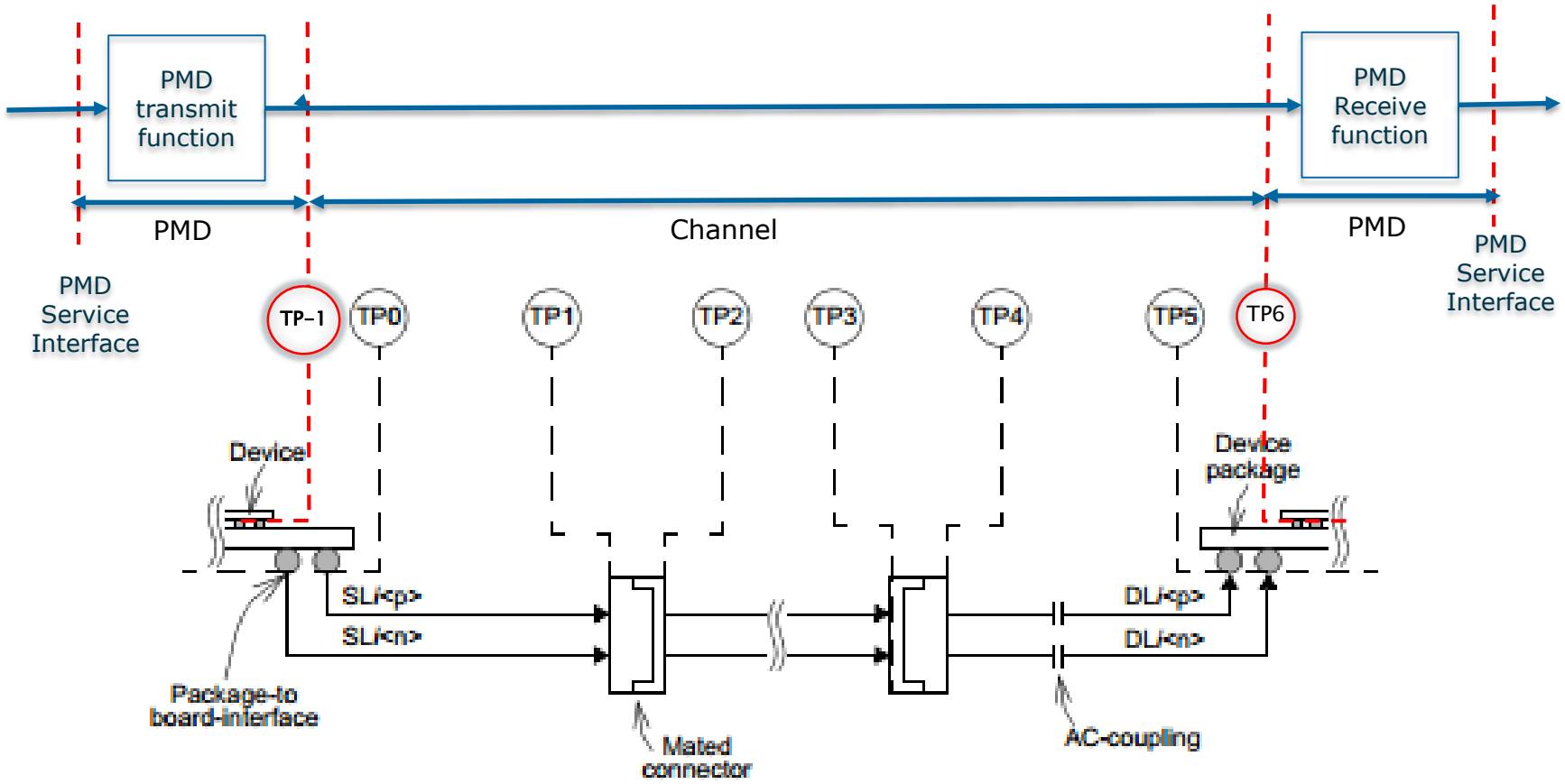
- Foster a healthy discussion on novel thinking to remove, at least in some cases, large margin impact from packages for 50Gbs and higher specifications
- Not to tear down all the previous IEEE802.3 work, but to build upon it

Market Proposition – Some Thoughts to Start

- Recouping 2dB of COM margin is attractive
- Packages are a large chunk of the channel operating margin (COM).
  - For example the channel, PAM4_2conn_MP_v2_85ohm_30dB_Nom_thru, has a COM or 1.26 dB for package 2, 2.48 dB for package 1, and 3.3 dB with no package.
- Deployments of engineered or vendor qualified list (QVL) systems are accelerating
  - Desire is to manage total interconnect to gain market advantage
- Chip providers reliance on IP developed by IP centers and vendors is on the rise
- The market for die level integration seems to be growing to address power and targeted performance
- Semiconductors design and interconnect design require different skills
  - A die level spec allows for IP to focus on semiconductors and interconnect to be a separate focus

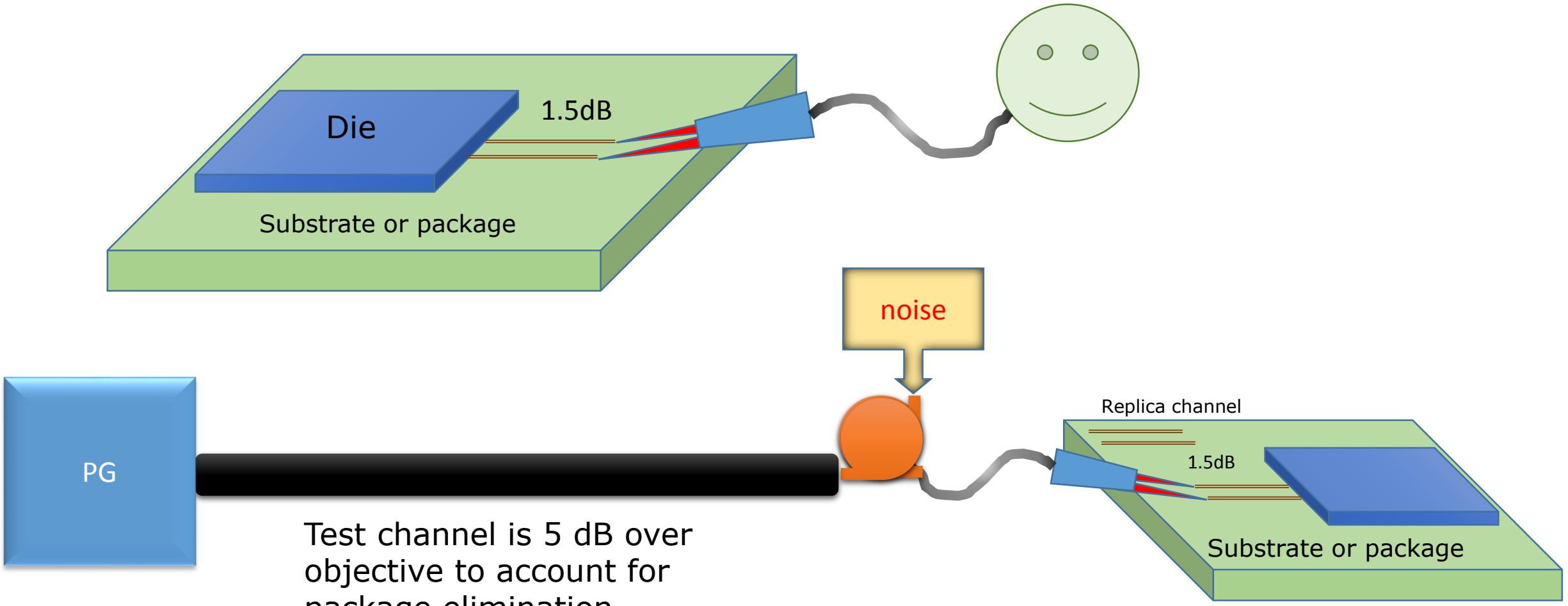
Add a PMD Annex for KR operation with test points at the die pad.

- XXXa.n PMD functional specifications
  - xxx.7.1 Link block diagram



Test fixture is a substrate or package

*Tx and Rx compliance test is similar to KR for '*by



Test channel is 5 dB over objective to account for package elimination

Potential COM table

- This is only a starting point
- Contribution may change parameters

Table 93A-1 parameters			
Parameter	**Setting**	**Units**	**Information**
f_b	26.5625	GBd	
f_min	0.05	GHz	
Delta_f	0.01	GHz	
C_d	[2.8e-4 2.8e-4]	nF	[TX RX]
z_p select	[1]		[test cases to run]
z_p (TX)	0	mm	[test cases]
z_p (NEXT)	0	mm	[test cases]
z_p (FEXT)	0	mm	[test cases]
z_p (RX)	0	mm	[test cases]
C_p	0.00E+00	nF	[TX RX]
R_0	50	Ohm	
R_d	[55 55]	Ohm	[TX RX]
f_r	0.75	*fb	
c(0)	0.6		min
c(-1)	[-0.15:0.05:0]		[min:step:max]
c(-2)	[0:0.05:0.15]		
c(1)	[-0.35:0.05:0]		[min:step:max]
g_DC	[-15:1:0]	dB	[min:step:max]
f_z	10.625	GHz	
f_p1	10.625	GHz	
f_p2	1.00E+99	GHz	
A_v	0.45	V	
A_fe	0.45	V	
A_ne	0.65	V	
L	4		
M	32		
N_b	16	UI	
b_max(1)	0.5		
b_max(2..N_b)	0.2		
sigma_RJ	0.01	UI	
A_DD	0.02	UI	
eta_0	2.60E-08	V^2/GHz	
SNR_TX	34	dB	
R_LM	0.95		
DER_0	1.00E-04		
Operational control			
COM Pass threshold	3	dB	
Include PCB	0	Value	0, 1, 2

g_DC_HP	[-4:1:0]		[min:step:max]
f_HP_PZ	0.6640625	GHz	

Summary

- Adding an ANNEX for a KR PMD at the die can
  - make available up to 2dB COM for applications such as IP to IP.
  - address package margin impact concerns raised many time before
- Opens for discussion:
  - Normative/informative
  - IEEE or MSA
  - Application to CAUI
  - Application to CR