C2M VEC and EH at TP1a
Update to mellitz_3ck_adhoc_01_010621

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Simulation with COM at TP1a

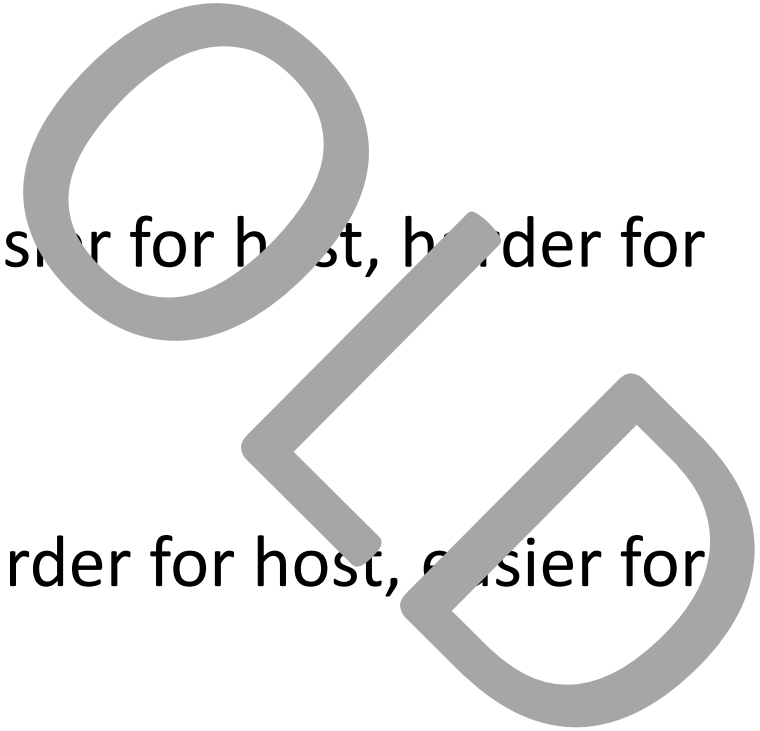
- Method: Using COM compare difference between EH and VEC specification limits in d1.4 to EH and VEC computed with d1.4 window histogram to EH and VEC using specified T_O=50 mUI
  - Multiple variable. 2nd order, linear algebra fitting
    - Considers the dependency of package test case
  - X variables are EH_mV_TO=0, VEC_dB_TO=0, and EH_mV_TO=0
  - Y variable is VEC_dB_TO=50 mU
- Compute EH and VEC for 100+ C2M posted channels with crosstalk for 2 package test cases
- 3 set of simulations
  - T_O = 0 , as in previous version of COM assumed for EH and VEC recommendations
  - T_O = +/- 50 mUI as in d1.4
    - Optimize with VEC only
    - Optimize VEC constrained by EH min limit (first bullet above)

Optimize VEC but constrain EH (VEO)

- As in **mellitz_3ck_adhoc_02_121620 *"COM r3.1 Update for d1.4"***
- **Min_VEO_Test** set to a non-zero value breaks the optimization loop for values of EH less than Min_VEO_Test volts.
  - If 0, the EH in not considered for in the optimization loop.
- New results (3rd set) are with Min_VEO_Test set to .010 V
  - Implies MIN EH at TP1a is 10 mV

Review mellitz_3ck_adhoc_01_062121

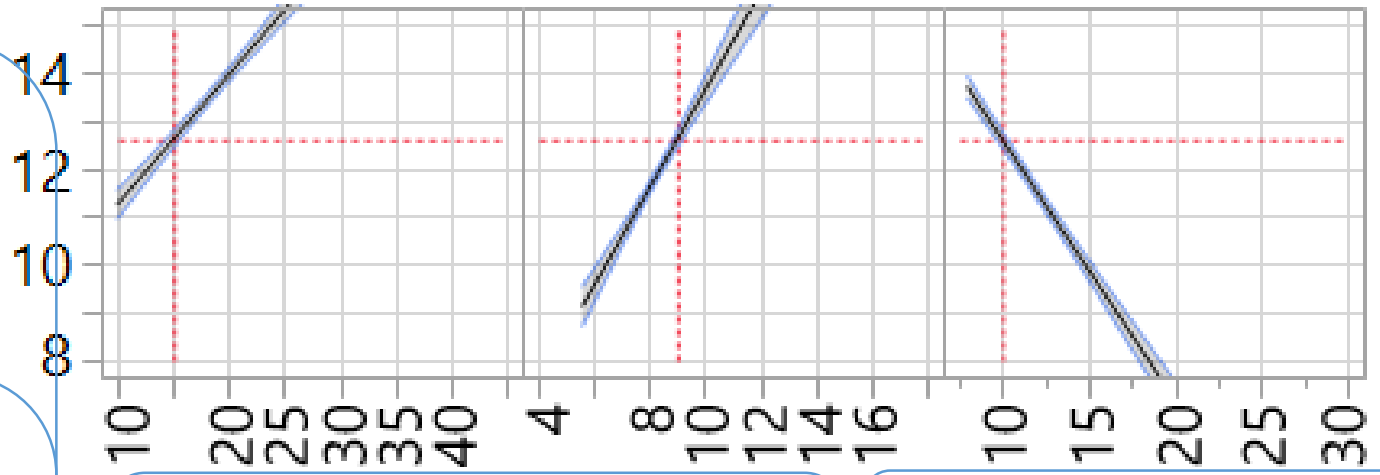
- Option 1 (linear trend fit)
  - Change EH at TP1a form 15 mV to 9.5 mV
  - Change VEC at TPa1 from 9 dB to 13 dB
- Option 2 (worst case linear trend fit, easier for host, harder for module)
  - Change EH at TP1a form 15 mV to 7.9 mV
  - Change VEC at TPa1 from 9 dB to 14 dB
- Option 3 (worst case linear trend fit, harder for host, easier for module)
  - Change EH at TP1a form 15 mV to 11 mV
  - Change VEC at TPa1 from 9 dB to 11.6 dB
- Option 4 something else



Fitting Results > 94% r_squared

VEC dB
T_O=50
12.59954
[12.4251, 12.774]

Red is the resulting VEC.
12.6 dB
VEC min recommended
Black is the VEC with the fitting error



15 9

VEO_mV
T_O=0

VEC dB
T_O=0

D1.4 tp1a specification

10

VEO_mV
T_O=50

10 mV EH min recommended

Thank You!

Recommendation For EH ad VEC at TP1a

- ❑ EH min 10 mV
- ❑ VEC max (dB) 12.6 dB

Backup data

- ❑ Channel file list
- ❑ COM configuration sheet

Channel files

R15 mellitz_3ck_01_0518_C2M--C2M__Z100_IL9_BC-BOR_N_N_N_THRU

R16 mellitz_3ck_01_0518_C2M--C2M__Z100_IL10_WC-BOR_H_L_H_THRU

R17 mellitz_3ck_01_0518_C2M--C2M__Z100_IL11p2_BC-BOR_N_N_N_THRU

R18 mellitz_3ck_01_0518_C2M--C2M__Z100_IL12_WC-BOR_H_L_H_THRU

R19 mellitz_3ck_01_0518_C2M--C2M__Z100_IL13_BC-BOR_N_N_N_THRU

R20 mellitz_3ck_01_0518_C2M--C2M__Z100_IL14_WC-BOR_H_L_H_THRU

R21 bottom normal--CFP2_S_C_bottom_normal_THRU

R22 bottom worst--CFP2_S_C_bottom_worst_THRU

R23 top normal--CFP2_S_C_top_normal_THRU

R24 top worst--CFP2_S_C_top_worst_THRU

R25 bottom normal--CFP8_S_C_bottom_normal_THRU

R26 bottom worst--CFP8_S_C_bottom_worst_THRU

R27 top normal--CFP8_S_C_top_normal_THRU

R28 top worst--CFP8_S_C_top_worst_THRU

R29 bottom normal--DSFP_S_C_bottom_normal_THRU

R30 bottom worst--DSFP_S_C_bottom_worst_THRU

R31 top normal--DSFP_S_C_top_normal_THRU

R32 top worst--DSFP_S_C_top_worst_THRU

R33 bottom normal--OSFP_S_C_bottom_normal_THRU

R34 bottom worst--OSFP_S_C_bottom_worst_THRU

R35 top normal--OSFP_S_C_top_normal_THRU

R36 top worst--OSFP_S_C_top_worst_THRU

R37 bottom normal--QSFP_S_C_bottom_normal_THRU

R38 bottom worst--QSFP_S_C_bottom_worst_THRU

R39 top normal--QSFP_S_C_top_normal_THRU

R40 top worst--QSFP_S_C_top_worst_THRU

R41 1_legacy top normal--QSFPDD_S_C_legacy_top_normal_THRU

R42 2_additional top normal--QSFPDD_S_C_additional_top_normal_THRU

R43 3_additional bottom normal--QSFPDD_S_C_additional_bottom_normal_THRU

R44 4_legacy bottom normal--QSFPDD_S_C_legacy_bottom_normal_THRU

R45 5_legacy top worst--QSFPDD_S_C_legacy_top_worst_THRU

R46 6_additional top worst--QSFPDD_S_C_additional_top_worst_THRU

R47 7_additional bottom worst--QSFPDD_S_C_additional_bottom_worst_THRU

R48 8_legacy bottom worst--QSFPDD_S_C_legacy_bottom_worst_THRU

R49 tracy_100GEL_02_0118--THRU_Host_Tx4_Mod_Tx4_OIF_Long_Barrel

R50 tracy_100GEL_02_0118--THRU_Host_Tx5_Mod_Tx5_OIF_Long_Barrel

R51 tracy_100GEL_02_0118--THRU_Host_Tx6_Mod_Tx6_OIF_Long_Barrel

R52 tracy_100GEL_02_0118--THRU_Host_Tx7_Mod_Tx7_OIF_Long_Barrel

R53 tracy_100GEL_02_0118--THRU_Host_Tx8_Mod_Tx8_OIF_Long_Barrel

R54 tracy_100GEL_02_0118--THRU_Host_Tx3_Mod_Tx3_OIF_Long_Barrel

Channel files, Cont'd 1

R55 tracy_100GEL_06_0118--THRU_Host_Rx3_Mod_Rx3_OIF_microvia

R56 tracy_100GEL_06_0118--THRU_Host_Rx4_Mod_Rx4_OIF_microvia

R57 tracy_100GEL_06_0118--THRU_Host_Rx5_Mod_Rx5_OIF_microvia

R58 tracy_100GEL_06_0118--THRU_Host_Rx6_Mod_Rx6_OIF_microvia

R59 tracy_100GEL_06_0118--THRU_Host_Rx7_Mod_Rx7_OIF_microvia

R60 tracy_100GEL_06_0118--THRU_Host_Rx8_Mod_Rx8_OIF_microvia

R61 Channel5a_Smaller_Pad_2inch_trace--Channel5_thru_small_pad_2inch

R62 Channel5b_Smaller_Pad_3inch_trace--Channel5_thru_small_pad_3inch

R63 Channel5c_Smaller_Pad_4inch_trace--Channel5_thru_small_pad_4inch

R64 Channel5d_Smaller_Pad_9inch_trace--Channel5_thru_small_pad_9inch

R65 C2M_channels_TP0a_93ohms_Intel--C2M_0p0in_95Ohms_thru1

R66 C2M_channels_TP0a_93ohms_Intel--C2M_0p1in_95Ohms_thru1

R67 C2M_channels_TP0a_93ohms_Intel--C2M_0p2in_95Ohms_thru1

R68 C2M_channels_TP0a_93ohms_Intel--C2M_0p3in_95Ohms_thru1

R69 C2M_channels_TP0a_93ohms_Intel--C2M_0p4in_95Ohms_thru1

R70 C2M_channels_TP0a_93ohms_Intel--C2M_0p5in_95Ohms_thru1

R71 C2M_channels_TP0a_93ohms_Intel--C2M_0p6in_95Ohms_thru1

R72 C2M_channels_TP0a_93ohms_Intel--C2M_0p7in_95Ohms_thru1

R73 C2M_channels_TP0a_93ohms_Intel--C2M_0p8in_95Ohms_thru1

R74 C2M_channels_TP0a_93ohms_Intel--C2M_0p9in_95Ohms_thru1

R75 C2M_channels_TP0a_93ohms_Intel--C2M_1p0in_95Ohms_thru1

R76 C2M_channels_TP0a_93ohms_Intel--C2M_1p1in_95Ohms_thru1

R77 C2M_channels_TP0a_93ohms_Intel--C2M_1p2in_95Ohms_thru1

R78 C2M_channels_TP0a_93ohms_Intel--C2M_1p3in_95Ohms_thru1

R79 C2M_channels_TP0a_93ohms_Intel--C2M_1p4in_95Ohms_thru1

R80 C2M_channels_TP0a_93ohms_Intel--C2M_1p5in_95Ohms_thru1

R81 C2M_channels_TP0a_93ohms_Intel--C2M_1p6in_95Ohms_thru1

R82 C2M_channels_TP0a_93ohms_Intel--C2M_1p7in_95Ohms_thru1

R83 C2M_channels_TP0a_93ohms_Intel--C2M_1p8in_95Ohms_thru1

R84 C2M_channels_TP0a_93ohms_Intel--C2M_1p9in_95Ohms_thru1

R85 C2M_channels_TP0a_93ohms_Intel--C2M_2p0in_95Ohms_thru1

R86 C2M_channels_TP0a_93ohms_Intel--C2M_2p1in_95Ohms_thru1

R87 C2M_channels_TP0a_93ohms_Intel--C2M_2p2in_95Ohms_thru1

R88 C2M_channels_TP0a_93ohms_Intel--C2M_2p3in_95Ohms_thru1

R89 C2M_channels_TP0a_93ohms_Intel--C2M_2p4in_95Ohms_thru1

R90 C2M_channels_TP0a_93ohms_Intel--C2M_2p5in_95Ohms_thru1

R91 C2M_channels_TP0a_93ohms_Intel--C2M_2p6in_95Ohms_thru1

R92 C2M_channels_TP0a_93ohms_Intel--C2M_2p7in_95Ohms_thru1

R93 C2M_channels_TP0a_93ohms_Intel--C2M_2p8in_95Ohms_thru1

R94 C2M_channels_TP0a_93ohms_Intel--C2M_2p9in_95Ohms_thru1

Channel files, Cont'd 2

- R94 C2M_channels_TP0a_93ohms_Intel--C2M_2p9in_95Ohms_thru1
- R95 C2M_channels_TP0a_93ohms_Intel--C2M_3p0in_95Ohms_thru1
- R96 C2M_channels_TP0a_93ohms_Intel--C2M_3p1in_95Ohms_thru1
- R97 C2M_channels_TP0a_93ohms_Intel--C2M_3p2in_95Ohms_thru1
- R98 C2M_channels_TP0a_93ohms_Intel--C2M_3p3in_95Ohms_thru1
- R99 C2M_channels_TP0a_93ohms_Intel--C2M_3p4in_95Ohms_thru1
- R100 C2M_channels_TP0a_93ohms_Intel--C2M_3p5in_95Ohms_thru1
- R101 C2M_channels_TP0a_93ohms_Intel--C2M_3p6in_95Ohms_thru1
- R102 C2M_channels_TP0a_93ohms_Intel--C2M_3p7in_95Ohms_thru1
- R103 C2M_channels_TP0a_93ohms_Intel--C2M_3p8in_95Ohms_thru1
- R104 C2M_channels_TP0a_93ohms_Intel--C2M_3p9in_95Ohms_thru1
- R105 C2M_channels_TP0a_93ohms_Intel--C2M_4p0in_95Ohms_thru1

COM 3.1 table for C2M

Parameter	Setting	Units	Information
f_b	53.125	GBd	
f_min	0.05	GHz	
Delta_f	0.01	GHz	
C_d	[1.2e-4 0]	nF	[TX RX]
L_s	[0.12 0]	nH	[TX RX]
C_b	[0.3e-4 0]	nF	[TX RX]
z_p select	[1 2]		[test cases to run]
z_p (TX)	[15 30; 1.8 1.8]	mm	[test cases]
z_p (NEXT)	[0 0 ; 0 0]	mm	[test cases]
z_p (FEXT)	[15 30; 1.8 1.8]	mm	[test cases]
z_p (RX)	[0 0 ; 0 0]	mm	[test cases]
C_p	[0.87e-4 0]	nF	[TX RX]
R_0	50	Ohm	
R_d	[50 50]	Ohm	[TX RX]
A_v	0.415	V	vp/vf=.694
A_fe	0.415	V	vp/vf=.694
A_ne	0.608	V	
L	4		
M	32	Samp/UI	
samples_for_C2M	100	Samp/UI	
T_O	50	mUI	
AC_CM_RMS	0	V	[test cases]
filter and Eq			
f_r	0.75	*fb	
c(0)	0.54		min
c(-1)	[-0.2:0.02:0]		[min:step:max]
c(-2)	[0:0.02:0.1]		[min:step:max]
c(-3)	[0]		[min:step:max]
c(1)	[-0.1:0.02:0]		[min:step:max]
N_b	4	UI	
b_max(1)	0.4		As/dffe1
b_max(2..N_b)	[0.15 0.15 0.1]		As/dfe2..N_b
b_min(1)	0.1		As/dffe1
b_min(2..N_b)	[-0.15 - 0.15 - 0.05]		As/dfe2..N_b
g_DC	[-13:1:-0]	dB	[min:step:max]
f_z	12.58	GHz	
f_p1	20	GHz	
f_p2	28	GHz	
g_DC_HP	[-3:0.5:0]		[min:step:max]
f_HP_PZ	1.328125	GHz	
G_Qual	[-2 -9 ;-2 -12; -4 -12;-6 -13]	dB	ranges
G2_Qual	[0 -1 -2 -3]	dB	ranges

[0.0235 0.0256]

DIAGNOSTICS	1	logical
DISPLAY_WINDOW	1	logical
CSV_REPORT	1	logical
RESULT_DIR	.\results\100GEL_C2M_host_{date}	
SAVE_FIGURES	0	logical
Port Order	[1 3 2 4]	
RUNTAG	C2M_eval_	
COM_CONTRIBUTION	0	logical
Local Search	2	
Operational		
VEC Pass threshold	9	db
EH_min	15	mV
ERL Pass threshold	7.3	dB
DER_0	0.00001	
T_r	0.0075	ns
FORCE_TR	1	5
PMD_type	C2M	
BREAD_CRUMBS	0	logical
SAVE_CONFIG2MAT	1	logical
PLOT_CM	1	logical
TDR and ERL options		
TDR	1	logical
ERL	1	logical
ERL_ONLY	0	logical
TR_TDR	0.01	ns
N	800	
beta_x	0	
rho_x	0.618	
fixture delay time	[0 0.2e-9]	[port1 port2]
TDR_W_TXPKG	1	
N_bx	0	UI
Tukey_Window	1	
Receiver testing		
RX_CALIBRATION	0	logical
Sigma BBN step	5.00E-03	V
Noise, jitter		
sigma_RJ	0.01	UI
A_DD	0.02	UI
eta_0	4.10E-08	V^2/GHz
SNR_TX	32.5	dB
R_LM	0.95	

Parameter	Setting	Units
package_tl_gamma0_a1_a2	[0 0.0009909 0.0002772]	
package_tl_tau	6.141E-03	ns/mm
package_Z_c	[87.5 87.5 ; 92.5 92.5]	Ohm
ICN & FOM_ILD parameters		
f_v	0.594	*Fb
f_f	0.594	GHz f_r specified in first column
f_n	0.594	GHz
f_2	40	GHz
A_ft	0.600	V
A_nt	0.600	V

new

upodated for D1.4