

# 200G/lane AUI C2M IL target

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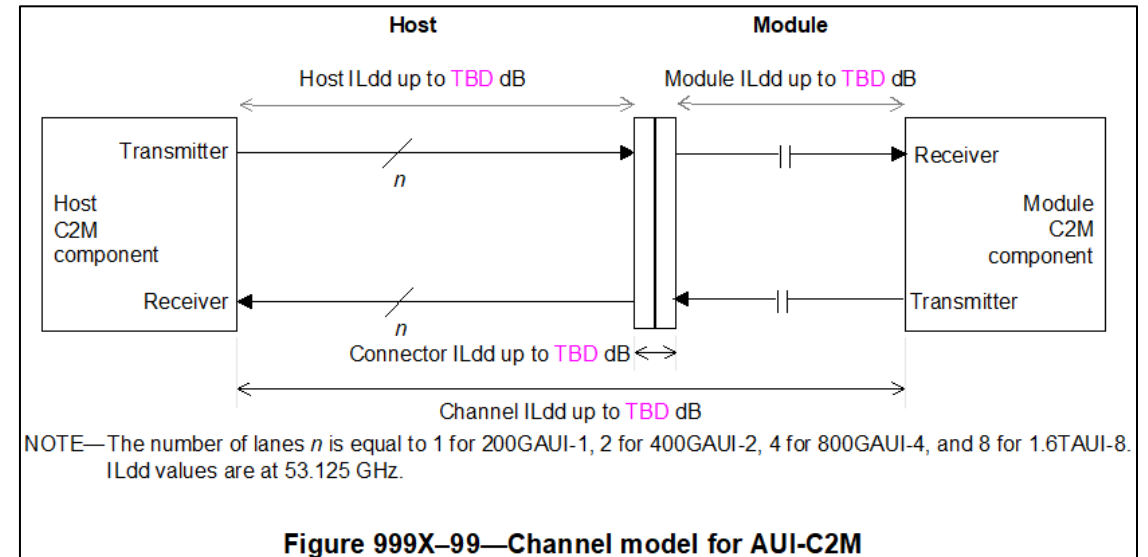
# Contributors

Contributors:

- Tobey P.-R. Li

# Goals

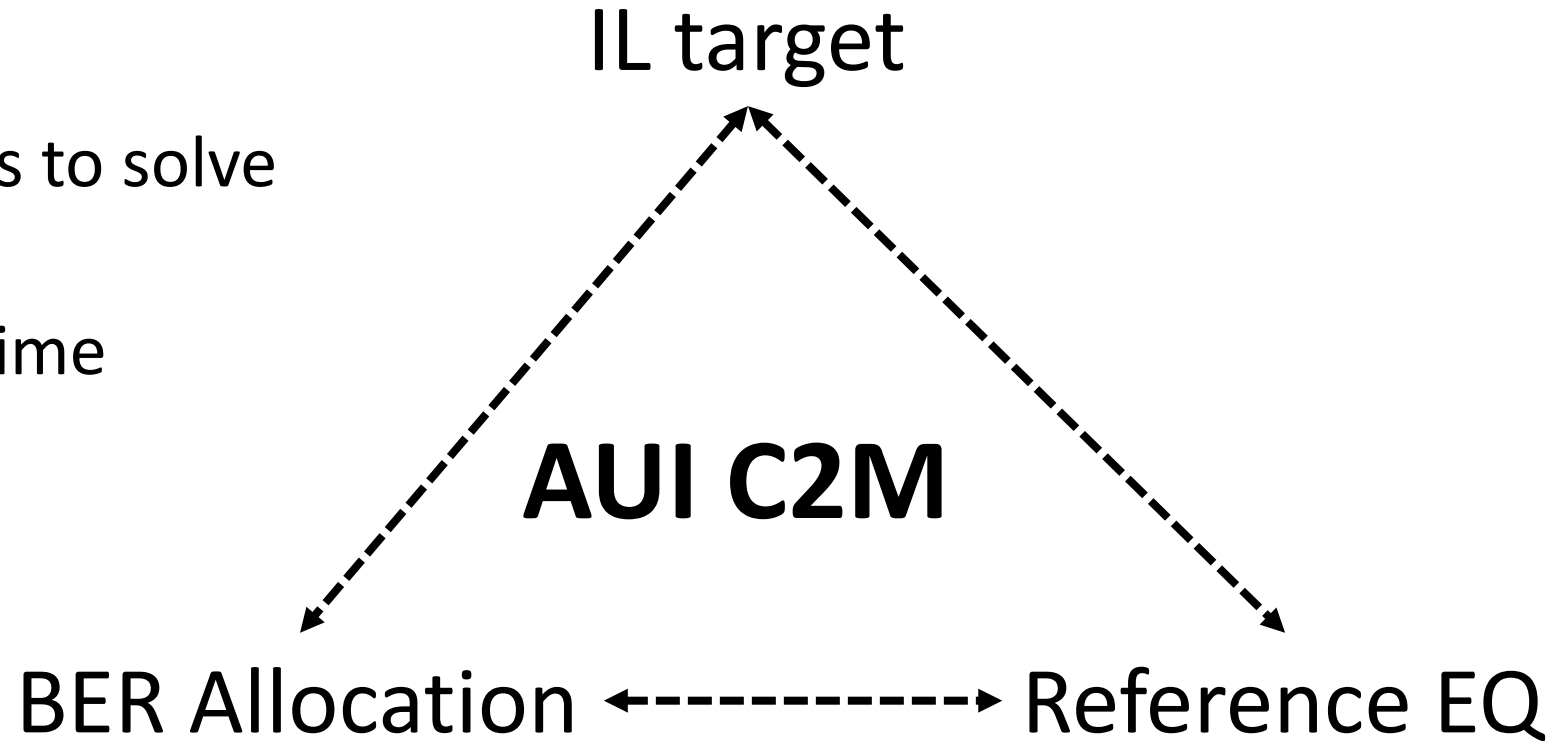
- The goal of this contribution is to help the Task Force identify a AUI C2M ILdd target
- For convenience, I will use ILdd from host die to module die
  - (ILdd die-die or ILdd bump-bump)



ran\_3dj\_01\_2309

# Dependencies

- All related
- Selecting two enables us to solve for the remaining one
- Refine as needed over time



# 802.3dj C2M Channel Contributions

Contribution	Channel List	Host Type
akinwale_3dj_02_2307 (28x)	C2M_PCB_85ohms_XpYin_20230620_v3_thru1	CONV PCB
akinwale_3dj_03_2307 (27x)	C2M_PCB_93ohms_XpYin_20230620_v3_thru1	CONV PCB
akinwale_3dj_04_2307 (28x)	C2M_PCB_100ohms_XpYin_20230620_v3_thru1	CONV PCB
rabinovich_3df_01_2209 (3x) rabinovich_3dj_02_230116 (1x)	Rabinovich_C2M_200G_Ortho_[19, 67, 93]mil_092122_Thru.s4p Rabinovich_C2M_200G_Ortho_135mil_011723_Thru.s4p	CONV PCB
rabinovich_3df_02_2209 (3x) rabinovich_3dj_03_230116 (1x)	Rabinovich_C2M_200G_Paral_[19, 67, 93]mil_092122_Thru.s4p Rabinovich_C2M_200G_Paral_135mil_011723_Thru.s4p	CONV PCB
shanbhag_3dj_03_2305 (6x)	C2M_TP0TP1a_XpYdB_PCBHost_3p7dB_THRU	CONV PCB
	C2M_TP0TP1a_XpYdB_CabledHost_7p85dB_THRU	NCC
lim_3dj_01_2307 (1x)	li_dj_C2M_DesignA_Rev1_THRU	CONV PCB
lim_3dj_02_2307 (1x)	li_dj_C2M_DesignB_Rev1_THRU	CONV PCB
Weaver_3dj_elec_02_230831	C2M_A_OSFP224_Bin_host_PCB_25C_thru_TP0_....s4p	CONV PCB

<https://www.ieee802.org/3/df/public/tools/index.html>

# A Relative Comparison: Part 1

IL (dB)	<= 16	16 < X <= 28	> 28
COM (dB)	>= 3.5	2.5 <= X < 3.5	< 2.5

IL in these columns includes Class A pkg

Shifted down to align the bump-bump IL numbers

Channel sorted by Channel IL

Channel	IL (dB)	Fit IL (dB)	ILD (dB)	ERL (dB)	ICN (mV)	ICR (dB)	Bump-Bump IL (PKG A)	COM (DER = 1.33E-5, PKG A)			COM (DER = 2E-5, PKG A)			COM (DER = 2.67E-5, PKG A)			
								I	II	III	I	II	III	I	II	III	
akinwale_3dj_02_2307/C2M_PCB_93ohms_0p5in	6.34	7.17	0.23	14.14	4.47	27.07	13.18										
akinwale_3dj_02_2307/C2M_PCB_100ohms_0p5in	6.44	7.16	0.25	13.51	4.48	26.73	13.63										
akinwale_3dj_02_2307/C2M_PCB_85ohms_0p5in	6.78	7.15	0.25	12.75	4.47	27.39	13.09										
weaver/egress/C2M_X_OSF224_3in_host_PCB_25C	6.90	7.51	0.18	13.98	5.31	28.05	12.87										
weaver/egress/C2M_X_OSF224_3in_host_PCB_25C	7.21	7.79	0.40	14.32	3.15	32.35	14.43										
weaver/egress/C2M_X_OSF224_3in_host_PCB_80C	7.32	7.91	0.18	14.04	5.12	27.99	13.33										
akinwale_3dj_02_2307/C2M_PCB_100ohms_1p0in	7.33	7.96	0.25	14.09	4.16	26.70	14.43										
weaver/egress/C2M_X_OSF224_3in_host_PCB_80C	7.63	8.19	0.40	14.38	3.05	32.28	14.76										
akinwale_3dj_02_2307/C2M_PCB_93ohms_1p0in	7.64	7.96	0.25	14.89	4.17	27.30	14.00										
akinwale_3dj_02_2307/C2M_PCB_100ohms_1p5in	8.21	8.76	0.24	14.64	3.88	26.63	15.25										
shanhbag/C2M_TP0TP1a_8p4dB_PCBHost_3p7dB	8.35	8.83	0.30	17.05	2.48	36.64	14.43										
akinwale_3dj_02_2307/C2M_PCB_85ohms_1p0in	8.51	7.97	0.26	13.34	4.17	27.13	14.33										
akinwale_3dj_02_2307/C2M_PCB_93ohms_1p5in	8.95	8.78	0.24	15.83	3.90	27.18	15.06										
akinwale_3dj_02_2307/C2M_PCB_85ohms_1p5in	9.05	8.84	0.24	13.85	3.91	26.48	15.15										
akinwale_3dj_02_2307/C2M_PCB_100ohms_2p0in	9.09	9.57	0.23	15.15	3.65	26.53	16.07										
akinwale_3dj_02_2307/C2M_PCB_85ohms_2p0in	9.26	9.68	0.23	14.29	3.88	26.22	16.24										
weaver/egress/C2M_X_OSF224_5in_host_PCB_25C	9.39	10.04	0.17	14.22	4.29	28.09	16.35										
weaver/egress/C2M_X_OSF224_5in_host_PCB_25C	9.64	10.30	0.41	14.56	2.64	32.24	17.17										
akinwale_3dj_02_2307/C2M_PCB_100ohms_2p5in	9.97	10.38	0.23	15.62	3.44	26.40	16.89										
akinwale_3dj_02_2307/C2M_PCB_93ohms_2p0in	10.00	9.60	0.23	16.16	3.67	26.86	16.06										
weaver/egress/C2M_X_OSF224_5in_host_PCB_80C	10.08	10.73	0.17	14.30	4.05	28.01	16.97										
weaver/egress/C2M_X_OSF224_5in_host_PCB_80C	10.34	10.99	0.41	14.63	2.52	32.05	17.80										
akinwale_3dj_02_2307/C2M_PCB_85ohms_2p5in	10.35	10.52	0.23	14.74	3.49	26.41	17.84										
akinwale_3dj_02_2307/C2M_PCB_93ohms_2p5in	10.77	10.42	0.23	16.29	3.47	26.45	16.92										
akinwale_3dj_02_2307/C2M_PCB_100ohms_3p0in	10.84	11.17	0.23	15.67	3.27	26.25	17.71										
akinwale_3dj_02_2307/C2M_PCB_93ohms_3p0in	11.36	11.24	0.23	16.33	3.30	26.05	17.74										
akinwale_3dj_02_2307/C2M_PCB_85ohms_3p0in	11.57	11.35	0.23	15.01	3.33	26.18	19.01										
li_dj_C2M_Design_B_Rev1_THRU.s4p	11.57	11.59	0.38	15.48	2.46	27.78	17.75										
li_dj_C2M_Design_A_Rev1_THRU.s4p	11.61	11.69	0.18	14.75	4.06	24.23	18.09										
shanhbag/C2M_TP0TP1a_11p7dB_CabledHost_7p8dB	11.68	12.10	0.15	14.21	1.65	23.34	18.89										
akinwale_3dj_02_2307/C2M_PCB_100ohms_3p5in	11.69	11.97	0.23	15.69	3.11	26.08	18.54										
weaver/egress/C2M_X_OSF224_7in_host_PCB_25C	11.93	12.54	0.17	14.40	3.53	27.65	19.39										
akinwale_3dj_02_2307/C2M_PCB_93ohms_3p5in	11.94	12.05	0.22	16.35	3.16	25.75	18.64										
shanhbag/C2M_TP0TP1a_12p1dB_PCBHost_7p3dB	12.13	12.53	0.30	17.43	1.72	37.22	19.83										
weaver/egress/C2M_X_OSF224_7in_host_PCB_25C	12.19	12.79	0.41	14.73	2.28	31.44	19.70										
akinwale_3dj_02_2307/C2M_PCB_85ohms_3p5in	12.21	12.18	0.23	15.07	3.19	25.65	19.45										
Rabinovich_C2M_200G_Paral_19mil	12.27	13.16	0.47	15.04	2.35	26.93	18.20										
Rabinovich_C2M_200G_Ortho_19mil	12.38	13.57	0.70	15.80	1.79	28.68	18.30										
akinwale_3dj_02_2307/C2M_PCB_100ohms_4p0in	12.54	12.76	0.23	15.70	2.98	25.90	19.36										
akinwale_3dj_02_2307/C2M_PCB_93ohms_4p0in	12.64	12.86	0.23	16.36	3.03	25.58	19.64										
akinwale_3dj_02_2307/C2M_PCB_85ohms_4p0in	12.78	13.01	0.23	15.11	3.07	25.38	19.69										
weaver/egress/C2M_X_OSF224_7in_host_PCB_80C	12.91	13.53	0.17	14.48	3.27	27.53	20.28										
Rabinovich_C2M_200G_Paral_135mil	12.93	14.44	0.49	13.49	3.78	22.23	18.96										
weaver/egress/C2M_X_OSF224_7in_host_PCB_80C	13.17	13.77	0.42	14.80	2.16	31.10	20.64										
Rabinovich_C2M_200G_Paral_67mil	13.32	13.91	0.50	15.41	2.87	26.79	19.31										
Rabinovich_C2M_200G_Ortho_135mil	13.35	14.99	0.96	13.13	3.39	22.24	19.46										
akinwale_3dj_02_2307/C2M_PCB_100ohms_4p5in	13.39	13.56	0.23	15.72	2.86	25.70	20.19										
Rabinovich_C2M_200G_Paral_93mil	13.44	14.12	0.67	12.03	3.17	24.32	19.66										
akinwale_3dj_02_2307/C2M_PCB_93ohms_4p5in	13.49	13.67	0.23	16.37	2.92	25.46	20.70										
akinwale_3dj_02_2307/C2M_PCB_85ohms_4p5in	13.76	13.84	0.23	15.15	2.97	25.32	20.29										
Rabinovich_C2M_200G_Ortho_93mil	14.17	14.81	0.95	12.96	2.83	24.90	20.46										
akinwale_3dj_02_2307/C2M_PCB_100ohms_5p0in	14.22	14.35	0.23	15.73	2.76	25.48	21.01										
weaver/egress/C2M_X_OSF224_9in_host_PCB_25C	14.42	15.03	0.17	14.52	2.96	27.06	22.02										
akinwale_3dj_02_2307/C2M_PCB_93ohms_5p0in	14.43	14.47	0.23	16.38	2.83	25.31	21.72										
shanhbag/C2M_TP0TP1a_14p6dB_PCBHost_9p8dB	14.61	14.99	0.31	17.58	1.39	37.43	21.39										
Rabinovich_C2M_200G_Ortho_67mil	14.70	14.87	0.69	15.53	2.71	27.00	20.66										
weaver/egress/C2M_X_OSF224_9in_host_PCB_25C	14.70	15.25	0.43	14.85	2.02	30.29	21.97										
akinwale_3dj_02_2307/C2M_PCB_85ohms_5p0in	14.75	14.66	0.23	15.19	2.89	25.05	21.15										
akinwale_3dj_02_2307/C2M_PCB_100ohms_5p5in	15.05	15.14	0.23	15.73	2.67	25.25	21.83										
akinwale_3dj_02_2307/C2M_PCB_93ohms_5p5in	15.34	15.28	0.23	16.40	2.75	25.07	22.65										
akinwale_3dj_02_2307/C2M_PCB_85ohms_5p5in	15.48	15.48	0.24	15.24	2.81	24.61	22.09										
weaver/egress/C2M_X_OSF224_9in_host_PCB_80C	15.71	15.31	0.18	14.60	2.72	26.74	23.23										
akinwale_3dj_02_2307/C2M_PCB_100ohms_6p0in	15.87	15.92	0.23	15.74	2.59	25.02	22.64										
weaver/egress/C2M_X_OSF224_9in_host_PCB_80C	15.99	16.53	0.43	14.92	1.92	29.66	23.26										

Bump-Bump IL (PKG B)	COM (DER = 1.33E-5, PKG B)			COM (DER = 2E-5, PKG B)			COM (DER = 2.67E-5, PKG B)		
	I	II	III	I	II	III	I	II	III
15.86									
16.10									
15.93									
15.87									
17.00									
16.28									
16.93									
17.35									
16.80									
17.76									
17.26									
17.05									
17.82									
17.55									
18.59									
18.35									
19.08									
19.47									
18.64									
19.83									
18.71									
19.70									
20.14									
19.91									
19.44									
20.25									
20.12									
21.16									
20.32									
20.54									
21.17									
21.07									
21.87									
20.89									
22.06									
21.93									
21.72									
20.63									
20.86									
21.89									
21.83									
22.14									
22.78									
21.82									
22.89									
21.60									

# A Relative Comparison: Part 2

IL (dB)	<= 16	16 < X <= 28	> 28
COM (dB)	>= 3.5	2.5 <= X < 3.5	< 2.5

Channel sorted by Channel IL

Channel	IL (dB)	Fit IL (dB)	ILD (dB)	ERL (dB)	ICN (mV)	ICR (dB)	Bump-Bump IL (PKG A)	COM (DER = 1.33E-5, PKG A)			COM (DER = 2E-5, PKG A)			COM (DER = 2.67E-5, PKG A)			
								I	II	III	I	II	III	I	II	III	
akinwale_3dj_02_2307/C2M_PCB_93ohms_6p0in	16.19	16.08	0.23	16.40	2.67	24.76	23.45										
akinwale_3dj_02_2307/C2M_PCB_85ohms_6p0in	16.20	16.30	0.24	15.27	2.74	24.33	23.16										
akinwale_3dj_02_2307/C2M_PCB_100ohms_6p5in	16.69	16.71	0.24	15.75	2.52	24.76	23.46										
akinwale_3dj_02_2307/C2M_PCB_93ohms_6p5in	16.97	16.88	0.24	16.41	2.61	24.41	24.16										
akinwale_3dj_02_2307/C2M_PCB_85ohms_6p5in	17.11	17.12	0.24	15.30	2.68	24.13	24.28										
shanhbag/C2M_TP0TP1a_17p1dB_PCBHost_12p2dB	17.12	17.43	0.31	17.70	1.14	37.48	24.68										
akinwale_3dj_02_2307/C2M_PCB_100ohms_7p0in	17.51	17.49	0.24	15.76	2.45	24.50	24.27										
akinwale_3dj_02_2307/C2M_PCB_93ohms_7p0in	17.73	17.68	0.24	16.43	2.55	24.08	24.82										
akinwale_3dj_02_2307/C2M_PCB_85ohms_7p0in	18.01	17.94	0.25	15.34	2.63	23.82	25.17										
akinwale_3dj_02_2307/C2M_PCB_100ohms_7p5in	18.32	18.28	0.24	15.76	2.40	24.23	25.08										
akinwale_3dj_02_2307/C2M_PCB_93ohms_7p5in	18.49	18.47	0.24	16.43	2.50	23.78	25.48										
akinwale_3dj_02_2307/C2M_PCB_85ohms_7p5in	18.78	18.75	0.25	15.36	2.58	23.43	25.81										
akinwale_3dj_02_2307/C2M_PCB_100ohms_8p0in	19.12	19.06	0.25	15.77	2.35	23.95	25.90										
akinwale_3dj_02_2307/C2M_PCB_93ohms_8p0in	19.29	19.27	0.25	16.44	2.45	23.50	26.17										
akinwale_3dj_02_2307/C2M_PCB_85ohms_8p0in	19.57	19.56	0.26	15.39	2.54	23.12	26.41										
shanhbag/C2M_TP0TP1a_19p6dB_PCBHost_14p6dB	19.60	19.87	0.32	17.79	0.95	37.60	26.70										
akinwale_3dj_02_2307/C2M_PCB_100ohms_8p5in	19.93	19.84	0.25	15.77	2.30	23.65	26.71										
akinwale_3dj_02_2307/C2M_PCB_93ohms_8p5in	20.12	20.06	0.2														
akinwale_3dj_02_2307/C2M_PCB_85ohms_8p5in	20.44	20.38	0.2														
akinwale_3dj_02_2307/C2M_PCB_100ohms_9p0in	20.73	20.62	0.2														
akinwale_3dj_02_2307/C2M_PCB_93ohms_9p0in	20.96	20.86	0.2														
akinwale_3dj_02_2307/C2M_PCB_85ohms_9p0in	21.30	21.19	0.27	15.44	2.46	22.50	27.98										
akinwale_3dj_02_2307/C2M_PCB_100ohms_9p5in	21.53	21.39	0.26	15.77	2.22	23.02	28.32										
akinwale_3dj_02_2307/C2M_PCB_93ohms_9p5in	21.79	21.65	0.26	16.46	2.33	22.58	28.51										
akinwale_3dj_02_2307/C2M_PCB_85ohms_9p5in	22.10	21.99	0.27	15.46	2.43	22.10	28.89										
akinwale_3dj_02_2307/C2M_PCB_100ohms_10p0in	22.33	22.17	0.27	15.76	2.18	22.69	29.13										
akinwale_3dj_02_2307/C2M_PCB_93ohms_10p0in	22.61	22.44	0.2			30	29.34										
akinwale_3dj_02_2307/C2M_PCB_85ohms_10p0in	22.92	22.80	0.2			39	29.86										
akinwale_3dj_02_2307/C2M_PCB_100ohms_10p5in	23.13	22.94	0.2			15	29.94										
akinwale_3dj_02_2307/C2M_PCB_93ohms_10p5in	23.41	23.23	0.26														
akinwale_3dj_02_2307/C2M_PCB_85ohms_10p5in	23.77	23.61	0.29	15.51	2.36	21.39	30.79										
akinwale_3dj_02_2307/C2M_PCB_100ohms_11p0in	23.93	23.72	0.28	15.78	2.12	21.98	30.74										
akinwale_3dj_02_2307/C2M_PCB_93ohms_11p0in	24.21	24.01	0.2			24	31.05										
akinwale_3dj_02_2307/C2M_PCB_85ohms_11p0in	24.61	24.41	0.3			33	31.62										
akinwale_3dj_02_2307/C2M_PCB_100ohms_11p5in	24.73	24.49	0.2			09	31.55										
akinwale_3dj_02_2307/C2M_PCB_93ohms_11p5in	25.01	24.80	0.2			21	31.82										
akinwale_3dj_02_2307/C2M_PCB_85ohms_11p5in	25.43	25.22	0.30	15.55	2.30	20.57	32.36										
akinwale_3dj_02_2307/C2M_PCB_100ohms_12p0in	25.52	25.26	0.29	15.78	2.06	21.20	32.35										
akinwale_3dj_02_2307/C2M_PCB_93ohms_12p0in	25.82	25.58	0.30	16.48	2.18	20.68	32.78										
akinwale_3dj_02_2307/C2M_PCB_85ohms_12p0in	26.25	26.02	0.31	15.57	2.27	20.20	33.10										
akinwale_3dj_02_2307/C2M_PCB_100ohms_12p5in	26.32	26.03	0.3			03	33.16										
akinwale_3dj_02_2307/C2M_PCB_93ohms_12p5in	26.64	26.37	0.3			15	33.63										
akinwale_3dj_02_2307/C2M_PCB_85ohms_12p5in	27.10	26.82	0.3			25	33.88										
akinwale_3dj_02_2307/C2M_PCB_100ohms_13p0in	27.12	26.80	0.3			01	33.96										
akinwale_3dj_02_2307/C2M_PCB_93ohms_13p0in	27.46	27.15	0.31	16.49	2.13	19.82	34.47										
akinwale_3dj_02_2307/C2M_PCB_100ohms_13p5in	27.91	27.56	0.31	15.79	1.99	19.90	34.77										
akinwale_3dj_02_2307/C2M_PCB_85ohms_13p0in	27.93	27.62	0.3			22	34.72										
akinwale_3dj_02_2307/C2M_PCB_93ohms_13p5in	28.27	27.93	0.3			10	35.28										
akinwale_3dj_02_2307/C2M_PCB_100ohms_14p0in	28.71	28.33	0.3			96	35.57										
akinwale_3dj_02_2307/C2M_PCB_85ohms_13p5in	28.76	28.42	0.3			13	35.61										
akinwale_3dj_02_2307/C2M_PCB_93ohms_14p0in	29.59	29.21	0.34	15.62	2.17	18.26	36.50										

Shifted down to align the bump-bump IL numbers

Bump-Bump IL (PKG B)	COM (DER = 1.33E-5, PKG B)			COM (DER = 2E-5, PKG B)			COM (DER = 2.67E-5, PKG B)		
	I	II	III	I	II	III	I	II	III
25.68									
25.39									
25.94									
26.44									
26.49									
27.06									
26.75									
27.15									
27.42									
27.55									
27.85									
28.14									
28.35									
28.58									
28.82									
29.18									
29.15									
29.35									
29.57									
30.13									
30.37									
30.75									
30.93									
31.22									
31.55									
31.74									
32.14									
32.35									
32.55									
33.07									
33.15									
33.39									
33.93									
33.95									
34.23									
34.71									
34.75									
35.08									
35.55									
35.93									
36.26									
36.35									
36.77									
37.15									
37.08									
37.59									

Taken from: Lusted\_3dj\_02\_2309

# Summary

- Recommend the TF chooses an *initial* AUI C2M ILdd target
- Refine as needed over time
- Straw polls on ILdd (die-die) target were requested



Thanks!