# 200 Gbps/lane CR & KR Channel Selection Criteria for Reference RX Analysis

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# Outline

- Background and Introduction
- Update to CR & KR Link Performance
- Channel Selection Criteria for Reference Receiver Analysis
- Proposal

# Background and Introduction

- This is an update to "Choosing an Optimum Ref RX for 200G/L KR and CR" from May 2024
  - Simulator: COM 4.5beta3 → COM 4.6beta4, major difference is MLSD gain
  - Update parameters based on the upcoming 802.3dj D1.1
- 100+ CR & KR channels with various assumptions and differing levels of maturity and complexity are available for study
  - Selection of representative channels for analysis in order to focus D1.1 review and proposal development efforts
- A wide range of reference receiver parameters were used in recent contributions
  - This contribution starts discussion on which posted channels should pass versus which should fail

| | # Fixed-position taps | # Floating taps | Eta_0 | MLSD |
|---|---|---|---|---|
| lim_3dj_01_2405 | 6 + 1 + 24 | 4*5 (span to 60UI) | 5E-9 | 1 |
| Kareti_3dj_01_2407 | 6 + 1 + 8 | 3*4 (span to 100UI) | 1E-8 | 1 |

# Test Channel List

- **Channel source: Tools & Channels**

| Interface | CR/KR Channel Source |
|---|---|
| CR | shanbhag_3dj_01_2305 |
| | kocsis_3dj_02_2305 |
| | lim_3dj_03_230629 |
| | lim_3dj_04_230629 |
| | lim_3dj_07_2309 |
| | akinwale_3dj_02_2311 |
| | weaver_3dj_02_2311 |
| KR | mellitz_3dj_02_elec_230504 |
| | weaver_3dj_02_2305 |
| | shanbhag_3dj_02_2305 |
| | weaver_3dj_elec_01_230622 |
| | akinwale_3dj_01_2310 |

| z_p select | [1 2] |
|---|---|
| .START | PKG_LowR_CLASSA |
| Table 93A–3 parameters | |
| Parameter | **Setting** |
| package_tl_gamma0_a1_a2 | [ 0.0005 0.00089 0.0002 ] |
| package_tl_tau | 0.006141 |
| package_Z_c | [87.5 87.5 ; 92.5 92.5 ; 100 100; 100 100] |
| R_d | [ 46.25 46.25] |
| z_p (TX) | [ 12 33 33 33 ; 1.8 1.8 1.8 1.8 ; 0 0 0 0 ; 0 0 0 0 ] |
| z_p (NEXT) | [ 12 33 33 33 ; 1.8 1.8 1.8 1.8 ; 0 0 0 0 ; 0 0 0 0 ] |
| z_p (FEXT) | [ 12 33 33 33 ; 1.8 1.8 1.8 1.8 ; 0 0 0 0 ; 0 0 0 0 ] |
| z_p (RX) | [ 12 33 33 33 ; 1.8 1.8 1.8 1.8 ; 0 0 0 0 ; 0 0 0 0 ] |
| C_p | [0.4e-4 0.4e-4] |
| A_v | [ 0.413 0.413] |
| A_fe | [ 0.413 0.413] |
| A_ne | [ 0.608 0.608] |
| .END | |

| z_p select | [3 4] |
|---|---|
| .START | PKG_HiR_CLASSB |
| Table 93A–3 parameters | |
| Parameter | **Setting** |
| package_tl_gamma0_a1_a2 | [ 0.0005 0.00065 0.000293 ] |
| package_tl_tau | 0.006141 |
| package_Z_c | [87.5 87.5 ; 95 95 ; 100 100; 78 78] |
| R_d | [ 46.25 46.24] |
| z_p (TX) | [ 8 24 30 45 ; 2 2 2 2; 1.3 1.3 1.3 1.3 ; 1.5 1.5 1.5 1.5 ] |
| z_p (NEXT) | [ 8 24 29 44 ; 2 2 2 2; 1.3 1.3 1.3 1.3 ; 1.5 1.5 1.5 1.5 ] |
| z_p (FEXT) | [ 8 24 30 45 ; 2 2 2 2; 1.3 1.3 1.3 1.3 ; 1.5 1.5 1.5 1.5 ] |
| z_p (RX) | [ 8 24 29 44 ; 2 2 2 2; 1.3 1.3 1.3 1.3 ; 1.5 1.5 1.5 1.5 ] |
| C_p | [0.4e-4 0.4e-4] |
| A_v | [ 0.413 0.413] |
| A_fe | [ 0.413 0.413] |
| A_ne | [ 0.608 0.608] |
| .END | |

# COM Configuration

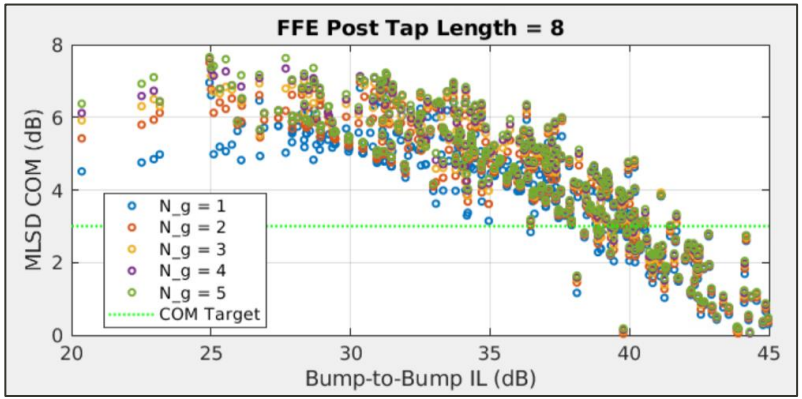
| Table 93A-1 parameters | | | |
|---|---|---|---|
| **Parameter** | **Setting** | **Units** | **Information** |
| f_b | 106.25 | GBd | |
| f_min | 0.05 | GHz | |
| Delta_f | 0.01 | GHz | |
| C_d | [0.4e-4 0.9e-4 1.1e-4 ;0.4e-4 0.9e-4 1.1e-4 ] | nF | [TX RX] |
| L_s | [0.13 0.15 0.14; 0.13 0.15 0.14 ] | nH | [TX RX] |
| C_b | [0.3e-4 0.3e-4 ] | nF | [TX RX] |
| R_0 | 50 | Ohm | [TX RX] |
| R_d | [ 46.25 46.25 ] | Ohm | [TX RX] |
| PKG_NAME | **PKG_HiR_CLASSB PKG_HiR_CLASSB** | | TX RX |
| A_v | 0.413 | V | |
| A_fe | 0.413 | V | |
| A_ne | 0.608 | V | |
| z_p select | [ 3 4] | | |
| L | 4 | | |
| M | 32 | | |
| **filter and Eq** | | | |
| f_r | 0.565 | *fb | |
| c(0) | 1 | | min |
| c(-1) | 0 | [-0.34:0.02:0 | [min:step:max] |
| c(-2) | 0 | [0:.02:0.14] | [min:step:max] |
| c(-3) | 0 | 0 | [min:step:max] |
| c(-4) | 0 | 0 | [min:step:max] |
| c(1) | 0 | [-0.2:0.02:0] | [min:step:max] |
| N_b | 1 | UI | |
| b_max(1) | 0.85 | | As/dffe1 |
| b_max(2..N_b) | 0 | | As/dfe2..N_b |
| b_min(1) | 0 | | As/dffe1 |
| b_min(2..N_b) | -0.15 | UI | NA if Nb=1 |
| g_DC | [-20:1:0] | dB | [min:step:max] |
| f_z | 42.50 | GHz | |
| f_p1 | 42.50 | GHz | |
| f_p2 | 106.25 | GHz | |
| g_DC_HP | [-6:1:0] | | [min:step:max] |
| f_HP_PZ | 1.328125 | GHz | |
| Butterworth | 1 | logical | include in fr |

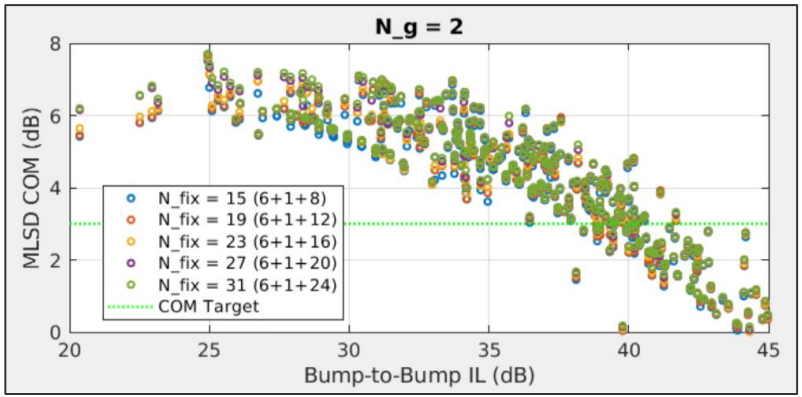
| I/O control | | |
|---|---|---|
| DIAGNOSTICS | 0 | logical |
| DISPLAY_WINDOW | 0 | logical |
| CSV_REPORT | 0 | logical |
| RESULT_DIR | .\results\CRKR_{date}\ | |
| SAVE_FIGURES | 0 | logical |
| Port Order | [ 1 3 2 4 ] | input fi |
| RUNTAG | CRKR_ | |
| COM_CONTRIBUTION | 1 | logical |
| **TDR and ERL options** | | |
| TDR | 1 | logical |
| ERL | 1 | logical |
| ERL_ONLY | 0 | logical |
| TR_TDR | 0.005 | ns |
| N | 7000 | UI |
| TDR_Butterworth | 1 | |
| beta_x | 0 | |
| rho_x | 0.618 | |
| TDR_W_TXPKG | 0 | UI |
| N_bx | 16 | UI |
| fixture delay time | [ 0 0 ] | S |
| Tukey_Window | 1 | |
| **Noise, jitter** | | |
| sigma_RJ | 0.01 | UI |
| A_DD | 0.02 | UI |
| eta_0 | 1.00E-08 | V^2/GHz |
| SNR_TX | 33 | dB |
| R_LM | 0.95 | |

| ICN parameters | | |
|---|---|---|
| f_v | 0.565 | Fb |
| f_f | 0.565 | Fb |
| f_n | 0.565 | Fb |
| f_2 | 60.000 | GHz |
| A_ft | 0.600 | V |
| **A_nt** | 0.600 | V |

| Table 93A–3 parameters | | | |
|---|---|---|---|
| Parameter | **Setting** | **Units** | Information |
| package_tl_gamma0_a1_a2 | [5e-4 0.00065 0.0003] | | |
| package_tl_tau | 0.006141 | ns/mm | |
| package_Z_c | 2 92 ; 70 70; 80 80; 100 10 | Ohm | |
| z_p (TX) | ; 1 1 11; 1 1 1 1 ; 0.5 0. | mm | [test cases to run] |
| z_p (NEXT) | ; 1 1 11; 1 1 1 1 ; 0.5 0. | mm | [test cases] |
| z_p (FEXT) | ; 1 1 11; 1 1 1 1 ; 0.5 0. | mm | [test cases] |
| z_p (RX) | ; 1 1 11; 1 1 1 1 ; 0.5 0. | mm | [test cases] |
| C_p | [0.4e-4 0.4e-4] | nF | [test cases] |
| **Operational** | | | |
| ERL Pass threshold | 10 | dB | |
| COM Pass threshold | 3 | db | |
| DER_0 | 2.00E-04 | | |
| T_r | 0.00400 | ns | |
| FORCE_TR | 1 | logical | required for backw |
| PMD_type | C2C | | |
| EW | 1 | | |
| MLSE | 1 | logical | |
| ts_anchor | 1 | | |
| sample_adjustment | [ -16 16] | | |
| Local Search | 0 | | if set to 2 validate r |
| **Filter: Rx FFE** | | | |
| ffe_pre_tap_len | 6 | UI | |
| ffe_post_tap_len | 8 | UI | |
| ffe_pre_tap1_max | 1 | interpreted as +/- | COM to change to V |
| ffe_post_tap1_max | 1 | interpreted as +/- | COM to change to V |
| ffe_tapn_max | 1 | interpreted as +/- | COM to change to V |
| FFE_OPT_METHOD | MMSE | | FV-LMS or MMSE |
| num_ui_RXFF_noise | 4096 | | |
| **Floating Tap Control** | | | |
| N_bg | 2 | 0 1 2 or 3 groups | |
| N_bf | 4 | taps per group | |
| N_f | 80 | UI span for floating taps | |
| bmaxg | 0.2 | max DFE value for floating taps | |
| B_float_RSS_MAX | 1 | rss tail tap limit | |
| N_tail_start | 9 | (UI) start of tail taps limit | |

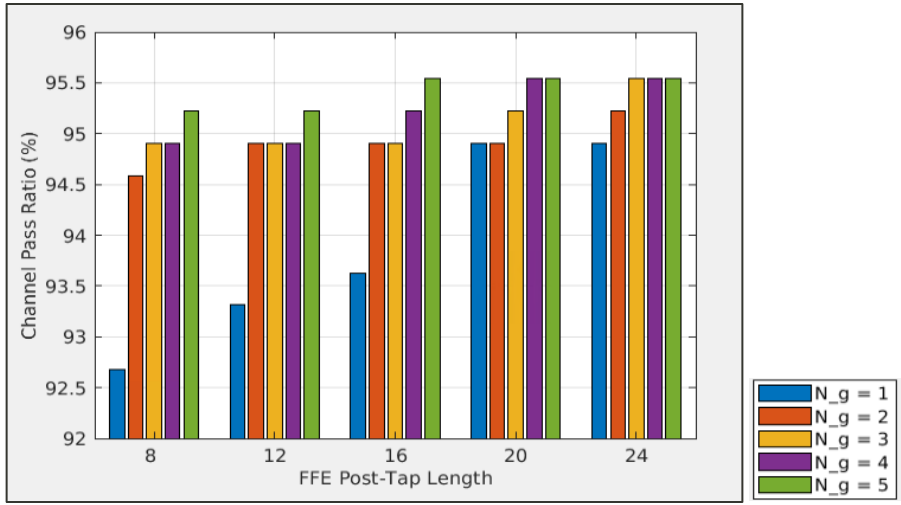
# Update to CR & KR Link Performance




| | # Fixed-position taps | # Floating taps |
|---|---|---|
| lim_3dj_01_2405 | 6 + 1 + 24* | 4x5* (span to 60UI) |
| Kareti_3dj_01_2407 | 6 + 1 + 8 | 3x4* (span to 100UI) |
| Proposal | 6 + 1 + 8 | 2*4 (span to 80UI) |

** Insignificant performance gain compared to the proposed RxFFE length*



# A Relative Comparison of Channel Characteristics: CR

- PKG A: Test 1 ~2.4dB, Test 2 ~5.7dB
- PKG B: Test 1 ~6.7dB, Test 2 ~9.4dB

| | # Fixed-position taps | # Floating taps |
|---|---|---|
| Proposal | 6 + 1 + 8 | 2*4 (span to 80UI) |

COM > 3dB
COM < 3dB
ILdd > 40dB

| Channel Contribution | Channel | IL (dB) | ERL (dB) | ICN (mV) | ICR (dB) | PKG A, Test 1 | PKG A, Test 2 | PKG B, Test 1 | PKG B, Test 2 |
|---|---|---|---|---|---|---|---|---|---|
| shanbhag_3dj_01_2305 | CR_1mOSFPDAC_TP0TP5_28p4dB_CabledHost_7p85dB | 28.94 | 13.74 | 1.02 | 16.73 | | | | |
| | CR_1mOSFPDAC_TP0TP5_23p5dB_PCBHost_3p7dB | 23.26 | 12.97 | 1.43 | 23.02 | | | | |
| | CR_1mOSFPDAC_TP0TP5_25p9dB_PCBHost_4p9dB | 25.66 | 13.88 | 1.24 | 23.18 | | | | |
| | CR_1mOSFPDAC_TP0TP5_28p7dB_PCBHost_6p1dB | 28.06 | 14.70 | 1.09 | 22.87 | | | | |
| | CR_1mOSFPDAC_TP0TP5_30p8dB_PCBHost_7p3dB | 30.46 | 15.08 | 0.96 | 23.18 | | | | |
| | CR_1mOSFPDAC_TP0TP5_33p6dB_PCBHost_8p5dB | 32.86 | 16.14 | 0.86 | 22.95 | | | | |
| kocsis_3dj_02_2305 | KR-CR_CH01_8dBHost_1m26AWG | 31.70 | 16.44 | 1.87 | 18.12 | | | | |
| | KR-CR_CH02_10dBHost_1m26AWG | 35.31 | 17.38 | 1.46 | 17.45 | | | | |
| | KR-CR_CH03_4dBHost_1p5m26AWG | 27.66 | 13.29 | 2.57 | 17.93 | | | | |
| | KR-CR_CH04_3dBHost_1m26AWG | 27.84 | 12.21 | 2.56 | 17.40 | | | | |
| | KR-CR_CH05_9dBHost_1m26AWG | 27.84 | 12.21 | 2.56 | 17.40 | | | | |
| lim_3dj_03_230629 | li_dj_CR_Design_A | 28.45 | 15.49 | 3.01 | 17.22 | | | | |
| lim_3dj_04_230629 | li_dj_CR_Design_B | 27.78 | 15.58 | 1.20 | 22.29 | | | | |
| lim_3dj_07_2309 | li_dj_CR_Design_C | 28.20 | 15.98 | 1.27 | 21.36 | | | | |
| akinwale_3dj_02_2311 | Tx_PCB_4dB_OSFP_22dB_OSFP_4dB_PCB_Rx_VendorX | 29.28 | 10.15 | 1.71 | 15.85 | | | | |
| | Tx_PCB_4dB_OSFP_27dB_OSFP_4dB_PCB_Rx_VendorX | 33.08 | 10.18 | 1.41 | 16.16 | | | | |
| | Tx_PCB_4dB_OSFP_22dB_OSFP_4dB_PCB_Rx_VendorY | 29.13 | 9.31 | 2.15 | 17.34 | | | | |
| | Tx_PCB_4dB_OSFP_27dB_OSFP_4dB_PCB_Rx_VendorY | 34.56 | 9.34 | 1.95 | 10.18 | | | | |
| weaver_3dj_02_2311 | HH_5in_DAC_X_0p5m_HN_3in | 25.04 | 14.18 | 1.33 | 23.85 | | | | |
| | HH_5in_DAC_X_1p0m_HL_2in | 27.66 | 13.40 | 1.40 | 19.94 | | | | |
| | HN_3in_DAC_X_1p0m_HN_3in | 28.28 | 13.48 | 1.69 | 22.64 | | | | |
| | HN_3in_DAC_X_1p5m_HL_2in | 30.18 | 12.57 | 1.61 | 18.78 | | | | |
| | HH_5in_DAC_Y_0p5m_HN_3in | 24.32 | 14.15 | 2.72 | 21.81 | | | | |
| | HH_5in_DAC_Y_1p0m_HL_2in | 27.61 | 13.50 | 2.12 | 21.63 | | | | |
| | HN_3in_DAC_Y_1p0m_HN_3in | 26.24 | 13.92 | 2.29 | 21.84 | | | | |
| | HN_3in_DAC_Y_1p5m_HL_2in | 29.52 | 13.69 | 1.81 | 21.53 | | | | |
| | HH_5in_DAC_Z_0p5m_HN_3in | 25.55 | 15.03 | 1.36 | 26.48 | | | | |
| | HH_5in_DAC_Z_1p0m_HL_2in | 28.37 | 14.20 | 1.14 | 25.36 | | | | |
| | HN_3in_DAC_Z_1p0m_HN_3in | 29.01 | 13.64 | 2.12 | 24.92 | | | | |
| | HN_3in_DAC_Z_1p5m_HL_2in | 31.83 | 12.84 | 1.85 | 21.36 | | | | |

# A Relative Comparison of Channel Characteristics: KR

- PKG A: Test 1 ~2.4dB, Test 2 ~5.7dB
- PKG B: Test 1 ~6.7dB, Test 2 ~9.4dB

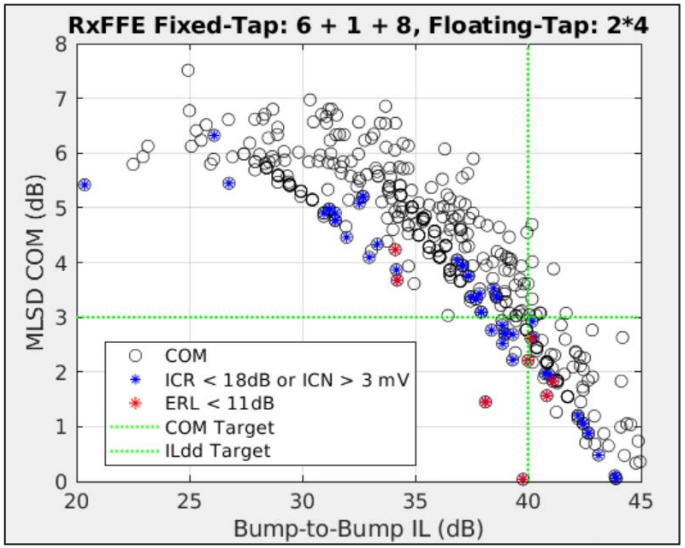
| | # Fixed-position taps | # Floating taps |
|---|---|---|
| Proposal | 6 + 1 + 8 | 2*4 (span to 80UI) |

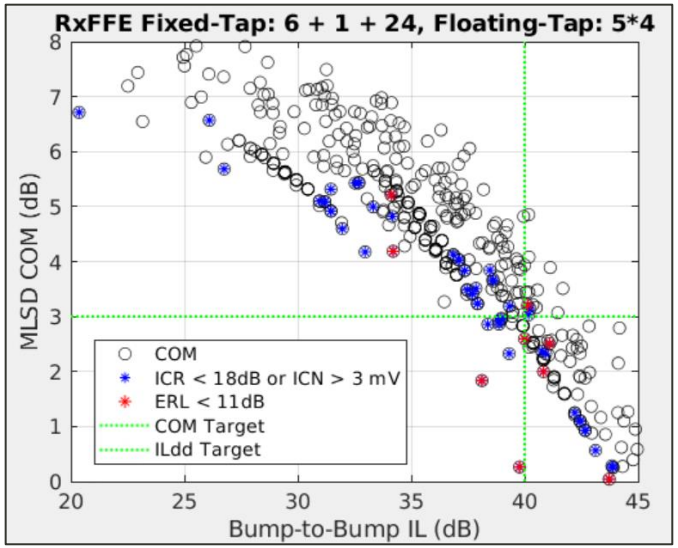
COM > 3dB
COM < 3dB
ILdd > 40dB

| Channel Contribution | Channel | IL (dB) | ERL (dB) | ICN (mV) | ICR (dB) | PKG A, Test 1 | PKG A, Test 2 | PKG B, Test 1 | PKG B, Test 2 |
|---|---|---|---|---|---|---|---|---|---|
| mellitz_3dj_02_elec_230504 | MX_1_PCB-25-25_mm_FO-100-100_mm_CA-200_mm | 16.07 | 11.36 | 3.59 | 19.33 | | | | |
| | MX_3_PCB-75-75_mm_FO-100-100_mm_CA-200_mm | 21.58 | 15.26 | 2.06 | 20.76 | | | | |
| | MX_7_PCB-25-25_mm_FO-300-300_mm_CA-200_mm | 21.20 | 12.07 | 2.07 | 19.55 | | | | |
| | MX_9_PCB-75-75_mm_FO-300-300_mm_CA-200_mm | 26.68 | 16.02 | 1.23 | 18.82 | | | | |
| | MX_10_PCB-25-25_mm_FO-100-100_mm_CA-500_mm | 18.21 | 11.64 | 2.85 | 19.35 | | | | |
| | MX_12_PCB-75-75_mm_FO-100-100_mm_CA-500_mm | 23.71 | 15.55 | 1.66 | 20.75 | | | | |
| | MX_16_PCB-25-25_mm_FO-300-300_mm_CA-500_mm | 23.32 | 12.17 | 1.67 | 19.43 | | | | |
| | MX_18_PCB-75-75_mm_FO-300-300_mm_CA-500_mm | 28.81 | 16.13 | 1.00 | 18.75 | | | | |
| | MX_19_PCB-25-25_mm_FO-100-100_mm_CA-1000_mm | 21.75 | 11.86 | 1.97 | 20.11 | | | | |
| | MX_21_PCB-75-75_mm_FO-100-100_mm_CA-1000_mm | 27.25 | 15.79 | 1.17 | 21.44 | | | | |
| | MX_25_PCB-25-25_mm_FO-300-300_mm_CA-1000_mm | 26.86 | 12.25 | 1.17 | 20.02 | | | | |
| | MX_27_PCB-75-75_mm_FO-300-300_mm_CA-1000_mm | 32.36 | 16.22 | 0.72 | 19.29 | | | | |
| weaver_3dj_02_2305 | 3in_PCB_NPC_150mm_29AWG_BP_800mm_27AWG_NPC_200mm | 22.54 | 15.38 | 2.51 | 21.93 | | | | |
| | 3in_PCB_NPC_150mm_29AWG_BP_800mm_27AWG_NPC_300mm | 23.56 | 15.41 | 2.50 | 20.57 | | | | |
| | 3in_PCB_NPC_150mm_29AWG_BP_800mm_27AWG_NPC_400mm | 24.59 | 15.43 | 2.49 | 19.58 | | | | |
| | 3in_PCB_NPC_200mm_29AWG_BP_800mm_27AWG_NPC_200mm | 23.04 | 15.50 | 2.50 | 21.44 | | | | |
| | 3in_PCB_NPC_200mm_29AWG_BP_800mm_27AWG_NPC_300mm | 24.06 | 15.51 | 2.49 | 20.03 | | | | |
| | 3in_PCB_NPC_200mm_29AWG_BP_800mm_27AWG_NPC_400mm | 25.09 | 15.53 | 2.48 | 19.08 | | | | |
| | 3in_PCB_NPC_250mm_29AWG_BP_800mm_27AWG_NPC_300mm | 24.57 | 15.60 | 2.49 | 19.45 | | | | |
| | 3in_PCB_NPC_250mm_29AWG_BP_800mm_27AWG_NPC_400mm | 25.60 | 15.62 | 2.48 | 18.45 | | | | |
| | 3in_PCB_NPC_300mm_29AWG_BP_800mm_27AWG_NPC_300mm | 25.08 | 15.75 | 2.48 | 19.11 | | | | |
| | 3in_PCB_NPC_300mm_29AWG_BP_800mm_27AWG_NPC_400mm | 26.11 | 15.77 | 2.47 | 18.14 | | | | |
| | 3in_PCB_NPC_350mm_29AWG_BP_800mm_27AWG_NPC_400mm | 26.62 | 15.90 | 2.47 | 17.59 | | | | |
| | 3in_PCB_NPC_400mm_29AWG_BP_800mm_27AWG_NPC_400mm | 27.13 | 15.97 | 2.47 | 17.00 | | | | |
| shanbhag_3dj_02_2305 | KR_1mCabledBP_TP0TP5_27p4dB_CabledHost_7p85dB | 27.27 | 17.05 | 0.24 | 35.25 | | | | |
| | KR_1mCabledBP_TP0TP5_19p3dB_PCBHost_3p8dB | 19.81 | 15.67 | 0.33 | 41.57 | | | | |
| | KR_1mCabledBP_TP0TP5_28dB_PCBHost_8dB | 28.30 | 17.41 | 0.21 | 38.77 | | | | |
| | KR_1mCabledBP_TP0TP5_31p4dB_PCBHost_9p8dB | 32.00 | 17.34 | 0.17 | 38.71 | | | | |
| weaver_3dj_elec_01_230622 | 3in_PCB_80C_NPC_150mm_29AWG_70C_BP_800mm_27AWG_70C_NPC_150mm_29AWG_70C | 24.55 | 16.09 | 2.46 | 19.62 | | | | |
| | 3in_PCB_80C_NPC_150mm_29AWG_70C_BP_800mm_27AWG_70C_NPC_300mm_29AWG_70C | 26.35 | 16.13 | 2.45 | 17.94 | | | | |
| | 3in_PCB_80C_NPC_300mm_29AWG_70C_BP_800mm_27AWG_70C_NPC_150mm_29AWG_70C | 26.35 | 16.13 | 2.45 | 17.79 | | | | |
| | 3in_PCB_80C_NPC_300mm_29AWG_70C_BP_800mm_27AWG_70C_NPC_300mm_29AWG_70C | 28.15 | 16.50 | 2.44 | 16.12 | | | | |
| akinwale_3dj_01_2310 | Tx_NPC_250mm_32AWG_BPK_100mm_27AWG_BPK_250mm_32AWG_NPC_Rx | 20.56 | 11.21 | 2.32 | 25.05 | | | | |
| | Tx_NPC_250mm_32AWG_BPK_300mm_27AWG_BPK_250mm_32AWG_NPC_Rx | 22.23 | 11.32 | 2.12 | 24.45 | | | | |
| | Tx_NPC_250mm_32AWG_BPK_500mm_27AWG_BPK_250mm_32AWG_NPC_Rx | 23.94 | 11.40 | 1.95 | 23.53 | | | | |
| | Tx_NPC_250mm_32AWG_BPK_700mm_27AWG_BPK_250mm_32AWG_NPC_Rx | 25.65 | 11.46 | 1.82 | 22.72 | | | | |
| | Tx_NPC_250mm_32AWG_BPK_900mm_27AWG_BPK_250mm_32AWG_NPC_Rx | 27.34 | 11.51 | 1.71 | 21.71 | | | | |
| | Tx_NPC_250mm_32AWG_BPK_1200mm_27AWG_BPK_250mm_32AWG_NPC_Rx | 29.86 | 11.55 | 1.59 | 19.64 | | | | |
| | Tx_NPC_250mm_32AWG_BPK_1400mm_27AWG_BPK_250mm_32AWG_NPC_Rx | 31.53 | 11.58 | 1.53 | 18.25 | | | | |

# Link Performance vs Channel Impairments

- **Failed channels have relatively worse reflections and crosstalk**
  - **Even with increasing number of RxFFE post-tap (from 8 to 24) and using additional 3 groups of floating-tap, it's still challenging to let those channels work**



# Proposal of COM Parameter Values

- **Proposed COM parameter values to Table 178-13 and Table 179-16**

| Parameter | Symbol | Upcoming D1.1 | Proposal |
|---|---|---|---|
| Receiver 3 dB bandwidth | f_r | 0.55 | 0.565 (per D1.0 comment #60) |
| Receiver singled-sided input referred noise | Eta_0 | TBD | 1e-8 |
| Number of pre-cursor taps | d_w | TBD | 6 |
| Number of fixed-position taps | N_fix | TBD | 15 (6+1+8) |
| Number of floating tap groups | N_g | TBD | 2 |
| Number of taps per floating tap group | N_f | TBD | 4 |
| Highest allowed tap index | N_max | TBD | 80 |
| Maximum likelihood sequence detection | MLSD | TBD | 1 (Implementation penalty TBD) |
| Normalized upper limit on feedback coefficient | bmax(1) | TBD | 0.85 |

- **Proposed ERL parameter values to Table 178-14 and Table 179-14**

| Parameter | Symbol | Upcoming D1.1 | Proposal |
|---|---|---|---|
| Equalizer length associated with reflection signal | N_bx | TBD | 16 |

# Thank you

## Questions and Discussions