# TekExpress USB 3.1 Report

## Test Report

### Execution and Setup Information

| | | | |
|---|---|---|---|
| DUT ID | DUT001 | DUT Type | Host |
| Date/Time | 2019-01-20 19:48:57 | Scope Model | DSA71604C |
| Test Point | Compliance (TP1) - Far End | Scope Serial Numer | C130125 |
| Connector Type | Standard | Scope F/W Version | 10.5.1 Build 24 |
| Channel Type | Both Long & Short | SPC Factory:S/W Calibration | PASS;PASS |
| Toggle Tool | Do not use | TekExpress Version | USB:10.3.1.21 Framework:4.2.7.301 |
| Acquisition Mode | Live | DPOJET Version | "10.0.2.1" |
| SigTest Version | 3.2.11(Gen1) | CTS Version | v1.0 |
| Total Acquisition Time | 2 Minutes 34 Seconds | | |
| Total Analysis Time | 1 Minute 55 Seconds | | |
| Over All Test Result | Pass | | |
| DUT COMMENT: | General Comment - USB3.1 DUT | | |

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### UI-Unit Interval

| Measurement Details | Lane | Channel | Generation | Method | Measured Value | Test Result | Margin | Low Limit | High Limit |
|---|---|---|---|---|---|---|---|---|---|
| UI-Unit Interval | Lane1 | Short | Gen1 | SigTest | 200.459 ps | Pass | 518.740 fs & 601.260 fs | 199.94 ps | 201.06 ps |
| UI-Unit Interval | Lane1 | Long | Gen1 | SigTest | 200.451 ps | Pass | 511.173 fs & 608.827 fs | 199.94 ps | 201.06 ps |
| COMMENTS | USB 3.1 Specification, Rev 1.0, Table 6-17 | | | | | | | | |

### Rj-Tx random jitter-Dual Dirac

| Measurement Details | Lane | Channel | Generation | Method | Measured Value | Test Result | Margin | Low Limit | High Limit |
|---|---|---|---|---|---|---|---|---|---|
| Rj-Tx random jitter-Dual Dirac | Lane1 | Short | Gen1 | SigTest | 1.502 ps | Informative | 1.502 ps & 1.768 ps | 0 s | 3.27 ps |
| Rj-Tx random jitter-Dual Dirac | Lane1 | Long | Gen1 | SigTest | 1.509 ps | Informative | 1.509 ps & 1.761 ps | 0 s | 3.27 ps |
| COMMENTS | USB 3.1 Specification, Rev 1.0, Table 6-19 | | | | | | | | |

### Mask Hits

| Measurement Details | Lane | Channel | Generation | Method | Measured Value | Test Result | Margin | Low Limit | High Limit |
|---|---|---|---|---|---|---|---|---|---|
| Mask Hits | Lane1 | Short | Gen1 | SigTest | 0.000 | Pass | 0.000 | N.A | 0 |
| Mask Hits | Lane1 | Long | Gen1 | SigTest | 0.000 | Pass | 0.000 | N.A | 0 |
| COMMENTS | USB 3.1 Specification, Rev 1.0, Table 6-18 | | | | | | | | |

### TSSC-Freq-Dev-Max

| Measurement Details | Lane | Channel | Generation | Method | Measured Value | Test Result | Margin | Low Limit | High Limit |
|---|---|---|---|---|---|---|---|---|---|
| TSSC-Freq-Dev-Max (Max) | Lane1 | Short | Gen1 | DPOJET | -4.682 kppm (Max) | Pass | 617.998 ppm & 982.002 ppm | -5.3 kppm | -3.7 kppm |
| TSSC-Freq-Dev-Max (Min) | Lane1 | Short | Gen1 | DPOJET | -4.744 kppm (Min) | Pass | 556.390 ppm & 1.044 kppm | -5.3 kppm | -3.7 kppm |
| TSSC-Freq-Dev-Max (Max) | Lane1 | Long | Gen1 | DPOJET | -4.692 kppm (Max) | Pass | 607.927 ppm & 992.073 ppm | -5.3 kppm | -3.7 kppm |
| TSSC-Freq-Dev-Max (Min) | Lane1 | Long | Gen1 | DPOJET | -4.783 kppm (Min) | Pass | 516.967 ppm & 1.083 kppm | -5.3 kppm | -3.7 kppm |
| COMMENTS | USB 3.1 Specification, Rev 1.0, Table 6-16 | | | | | | | | |

### TSSC-Freq-Dev-Min

| Measurement Details | Lane | Channel | Generation | Method | Measured Value | Test Result | Margin | Low Limit | High Limit |
|---|---|---|---|---|---|---|---|---|---|
| TSSC-Freq-Dev-Min | Lane1 | Short | Gen1 | DPOJET | 103.621 ppm (Max) | Pass | 403.621 ppm & 196.379 | -300.0 ppm | 300.0 ppm |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| (Max) | | | | | | | ppm | | |
| TSSC-Freq-Dev-Min (Min) | Lane1 | Short | Gen1 | DPOJET | 36.179 ppm (Min) | Pass | 336.179 ppm & 263.821 ppm | -300.0 ppm | 300.0 ppm |
| TSSC-Freq-Dev-Min (Max) | Lane1 | Long | Gen1 | DPOJET | 119.810 ppm (Max) | Pass | 419.810 ppm & 180.190 ppm | -300.0 ppm | 300.0 ppm |
| TSSC-Freq-Dev-Min (Min) | Lane1 | Long | Gen1 | DPOJET | 54.616 ppm (Min) | Pass | 354.616 ppm & 245.384 ppm | -300.0 ppm | 300.0 ppm |
| COMMENTS | USB 3.1 Specification, Rev 1.0, Table 6-16 | | | | | | | | |

TSSC-Mod-Rate - SSC Modulation rate

| Measurement Details | Lane | Channel | Generation | Method | Measured Value | Test Result | Margin | Low Limit | High Limit |
|---|---|---|---|---|---|---|---|---|---|
| TSSC-Mod-Rate - SSC Modulation rate | Lane1 | Short | Gen1 | DPOJET | 31.250 kHz | Pass | 1.250 kHz & 1.750 kHz | 30.0 kHz | 33.0 kHz |
| TSSC-Mod-Rate - SSC Modulation rate | Lane1 | Long | Gen1 | DPOJET | 31.238 kHz | Pass | 1.238 kHz & 1.762 kHz | 30.0 kHz | 33.0 kHz |
| COMMENTS | USB 3.1 Specification, Rev 1.0, Table 6-16 | | | | | | | | |

DJ-Tx deterministic Jitter-Dual Dirac

| Measurement Details | Lane | Channel | Generation | Method | Measured Value | Test Result | Margin | Low Limit | High Limit |
|---|---|---|---|---|---|---|---|---|---|
| DJ-Tx deterministic Jitter-Dual Dirac | Lane1 | Short | Gen1 | SigTest | 37.896 ps | Pass | 37.896 ps & 48.104 ps | 0 s | 86.0 ps |
| DJ-Tx deterministic Jitter-Dual Dirac | Lane1 | Long | Gen1 | SigTest | 45.976 ps | Pass | 45.976 ps & 40.024 ps | 0 s | 86.0 ps |
| COMMENTS | USB 3.1 Specification, Rev 1.0, Table 6-19 | | | | | | | | |

TJ-Tx total jitter-Dual Dirac at 1E-12 BER

| Measurement Details | Lane | Channel | Generation | Method | Measured Value | Test Result | Margin | Low Limit | High Limit |
|---|---|---|---|---|---|---|---|---|---|
| TJ-Tx total jitter-Dual Dirac at 1E-12 BER | Lane1 | Short | Gen1 | SigTest | 59.008 ps | Pass | 59.008 ps & 72.992 ps | 0 s | 132.0 ps |
| TJ-Tx total jitter-Dual Dirac at 1E-12 BER | Lane1 | Long | Gen1 | SigTest | 67.188 ps | Pass | 67.188 ps & 64.812 ps | 0 s | 132.0 ps |
| COMMENTS | USB 3.1 Specification, Rev 1.0, Table 6-19 | | | | | | | | |

Eye Height - Transmitter Eye Mask

| Measurement Details | Lane | Channel | Generation | Method | Measured Value | Test Result | Margin | Low Limit | High Limit |
|---|---|---|---|---|---|---|---|---|---|
| Eye Height - Transmitter Eye Mask | Lane1 | Short | Gen1 | SigTest | 218.620 mV | Pass | 118.620 mV & 981.380 mV | 100.0 mV | 1.2 V |
| Eye Height - Transmitter Eye Mask | Lane1 | Long | Gen1 | SigTest | 100.072 mV | Pass | 72.369 uV & 1.100 V | 100.0 mV | 1.2 V |
| COMMENTS | USB 3.1 Specification, Rev 1.0, Table 6-19 | | | | | | | | |

Eye Width @ 1E-12 BER

| Measurement Details | Lane | Channel | Generation | Method | Measured Value | Test Result | Margin | Low Limit | High Limit |
|---|---|---|---|---|---|---|---|---|---|
| Width@BER | Lane1 | Short | Gen1 | SigTest | 140.992 ps | Pass | 72.992 ps | 68.0 ps | N.A |
| Width@BER | Lane1 | Long | Gen1 | SigTest | 132.812 ps | Pass | 64.812 ps | 68.0 ps | N.A |
| COMMENTS | USB 3.1 Specification, Rev 1.0, Table 6-18 | | | | | | | | |

LFPS Duty Cycle

| Measurement | Lane | Channel | Generation | Method | Measured | Test Result | Margin | Low Limit | High Limit |
|---|---|---|---|---|---|---|---|---|---|

| Details | | | | | Value | | | | |
|---|---|---|---|---|---|---|---|---|---|
| LFPS Duty Cycle (Max) | Lane1 | Short | Gen1 | SigTest | 50.016 % (Max) | Pass | 10.016 % & 9.984 % | 40.0 % | 60.0 % |
| LFPS Duty Cycle (Min) | Lane1 | Short | Gen1 | SigTest | 49.987 % (Min) | Pass | 9.987 % & 10.013 % | 40.0 % | 60.0 % |
| COMMENTS | USB 3.1 Specification, Rev 1.0, Table 6-28 | | | | | | | | |

| LFPS Fall Time | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Measurement Details | Lane | Channel | Generation | Method | Measured Value | Test Result | Margin | Low Limit | High Limit |
| LFPS Fall Time | Lane1 | Short | Gen1 | SigTest | 949.682 ps | Pass | 3.050 ns | N.A | 4.0 ns |
| COMMENTS | USB 3.1 Specification, Rev 1.0, Table 6-28 | | | | | | | | |

| LFPS Rise Time | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Measurement Details | Lane | Channel | Generation | Method | Measured Value | Test Result | Margin | Low Limit | High Limit |
| LFPS Rise Time | Lane1 | Short | Gen1 | SigTest | 970.441 ps | Pass | 3.030 ns | N.A | 4.0 ns |
| COMMENTS | USB 3.1 Specification, Rev 1.0, Table 6-28 | | | | | | | | |

| LFPS TPeriod | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Measurement Details | Lane | Channel | Generation | Method | Measured Value | Test Result | Margin | Low Limit | High Limit |
| LFPS TPeriod (Max) | Lane1 | Short | Gen1 | SigTest | 64.289 ns (Max) | Pass | 44.289 ns & 35.711 ns | 20.0 ns | 100.0 ns |
| LFPS TPeriod (Min) | Lane1 | Short | Gen1 | SigTest | 64.067 ns (Min) | Pass | 44.067 ns & 35.933 ns | 20.0 ns | 100.0 ns |
| COMMENTS | USB 3.1 Specification, Rev 1.0, Table 6-28 | | | | | | | | |

| LFPS Vcm-AC | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Measurement Details | Lane | Channel | Generation | Method | Measured Value | Test Result | Margin | Low Limit | High Limit |
| LFPS Vcm-AC | Lane1 | Short | Gen1 | SigTest | 34.000 mV | Pass | 66.000 mV | N.A | 100.0 mV |
| COMMENTS | USB 3.1 Specification, Rev 1.0, Table 6-28 | | | | | | | | |

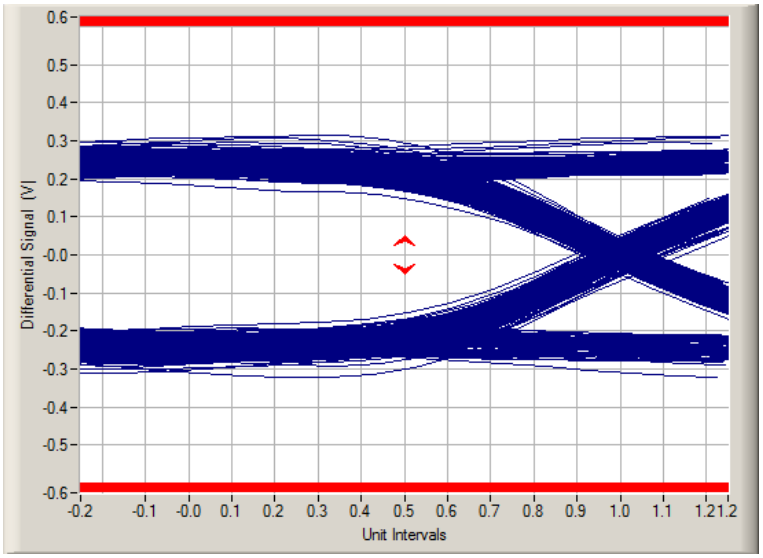
| LFPS Vtx-DIFF-PP | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Measurement Details | Lane | Channel | Generation | Method | Measured Value | Test Result | Margin | Low Limit | High Limit |
| LFPS Vtx-DIFF-PP (Max) | Lane1 | Short | Gen1 | SigTest | 1.164 V (Max) | Pass | 364.000 mV & 36.000 mV | 800.0 mV | 1.2 V |
| LFPS Vtx-DIFF-PP (Min) | Lane1 | Short | Gen1 | SigTest | 1.140 V (Min) | Pass | 340.000 mV & 60.000 mV | 800.0 mV | 1.2 V |
| COMMENTS | USB 3.1 Specification, Rev 1.0, Table 6-28 | | | | | | | | |

| LFPS TBurst | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Measurement Details | Lane | Channel | Generation | Method | Measured Value | Test Result | Margin | Low Limit | High Limit |
| LFPS TBurst (Max) | Lane1 | Short | Gen1 | SigTest | 1.142 us (Max) | Pass | 541.560 ns & 258.440 ns | 600.0 ns | 1.4 us |
| LFPS TBurst (Min) | Lane1 | Short | Gen1 | SigTest | 1.012 us (Min) | Pass | 412.340 ns & 387.660 ns | 600.0 ns | 1.4 us |
| COMMENTS | USB 3.1 Specification, Rev 1.0, Table 6-29 | | | | | | | | |

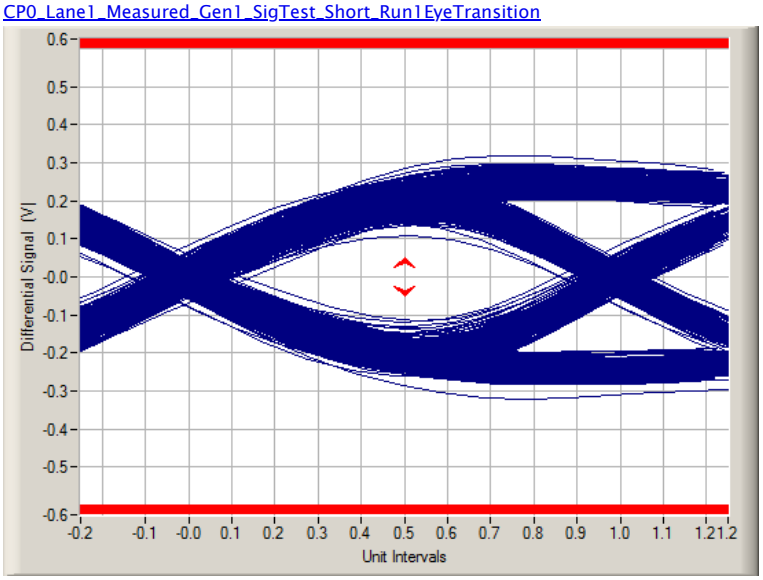
| LFPS TRepeat | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Measurement Details | Lane | Channel | Generation | Method | Measured Value | Test Result | Margin | Low Limit | High Limit |
| LFPS TRepeat (Max) | Lane1 | Short | Gen1 | SigTest | 12.040 us (Max) | Pass | 6.040 us & 1.960 us | 6.0 us | 14.0 us |
| LFPS TRepeat (Min) | Lane1 | Short | Gen1 | SigTest | 7.022 us (Min) | Pass | 1.022 us & 6.978 us | 6.0 us | 14.0 us |
| COMMENTS | USB 3.1 Specification, Rev 1.0, Table 6-29 | | | | | | | | |

Back to Setup Information

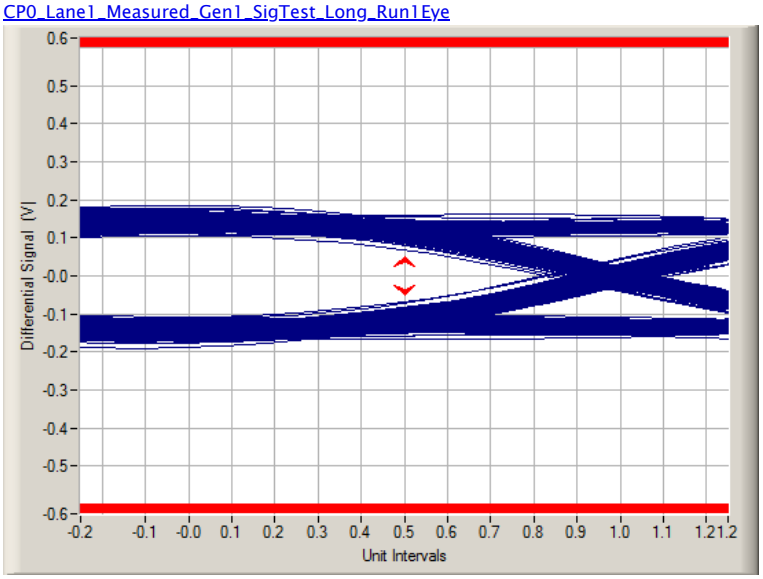
| Mask Hits |
|---|
| CP0_Lane1_Measured_Gen1_SigTest_Short_Run1Eye |



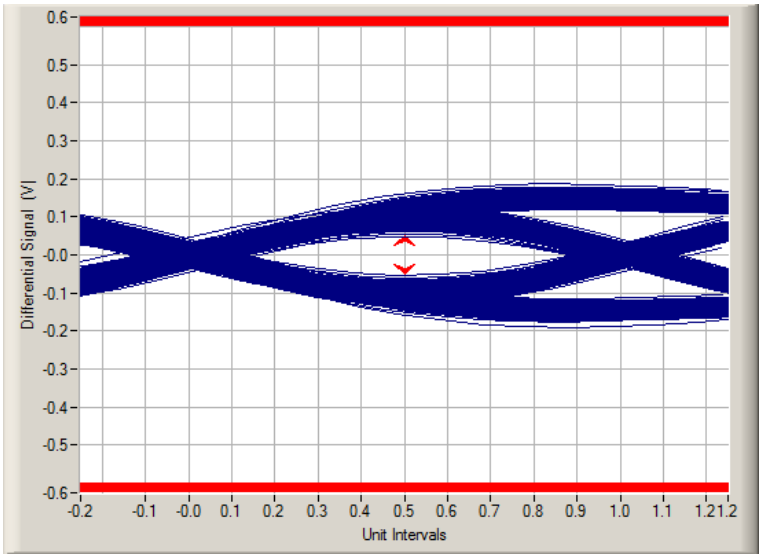

CP0_Lane1_Measured_Gen1_SigTest_Short_Run1EyeTransition




CP0_Lane1_Measured_Gen1_SigTest_Long_Run1Eye

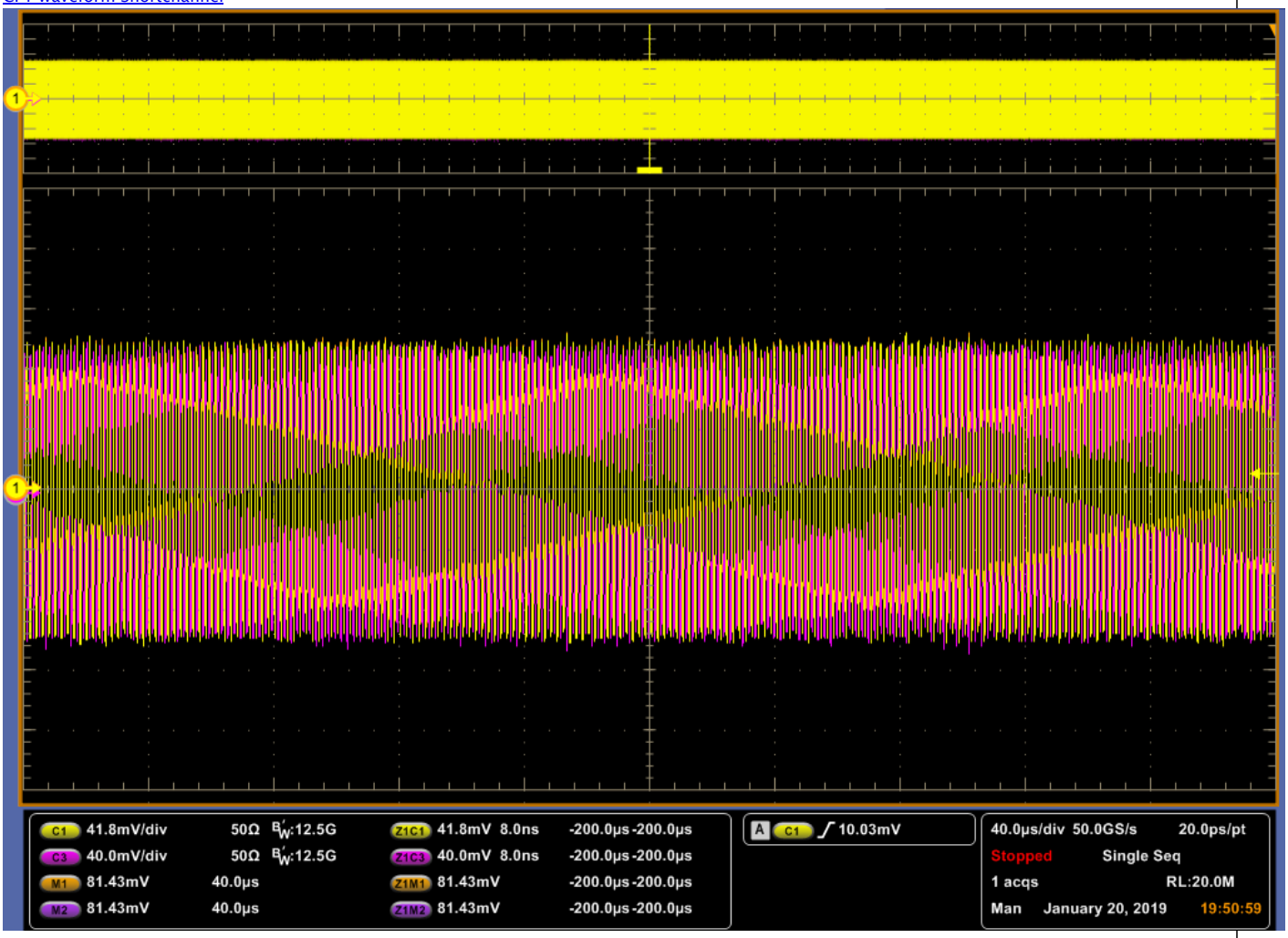



CP0_Lane1_Measured_Gen1_SigTest_Long_Run1EyeTransition

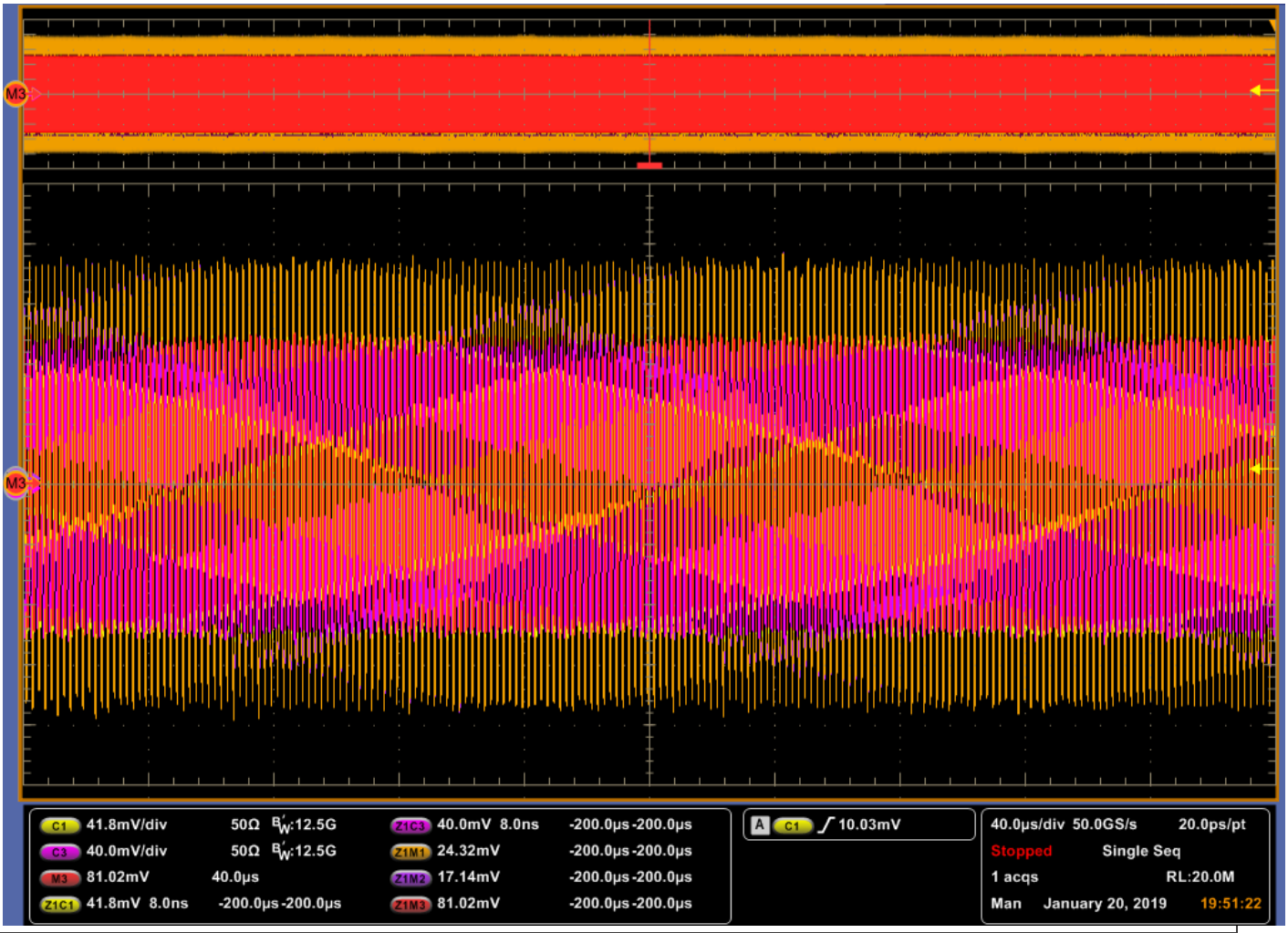



TSSC-Mod-Rate - SSC Modulation rate

CP1 waveform Shortchannel

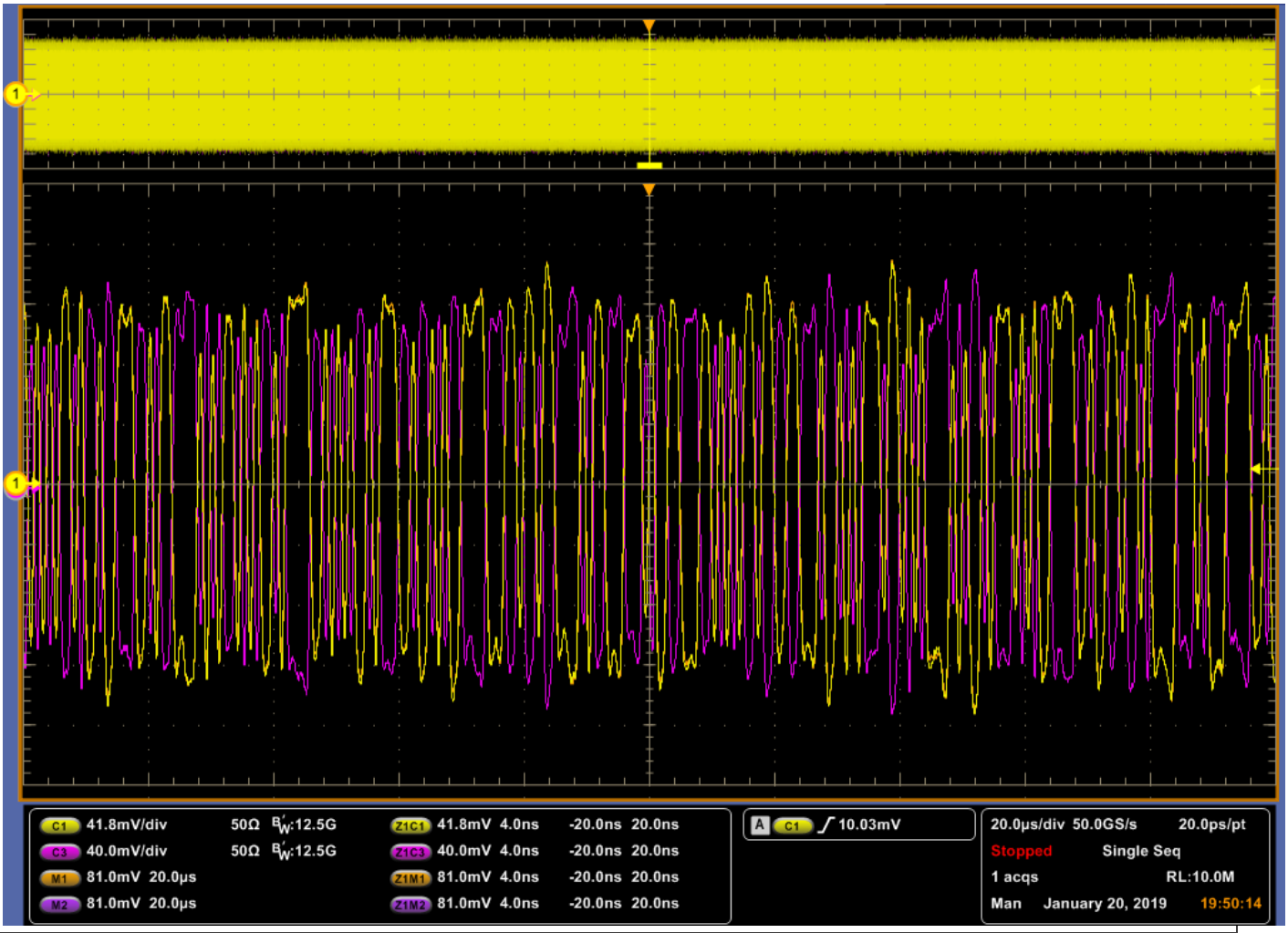



CP1 waveform Longchannel




Eye Width @ 1E-12 BER

CP0 waveform Shortchannel




CP0 waveform Longchannel

LFPS Duty Cycle

LFPS waveform Shortchannel