



Fast Ethernet Consortium

Clause 25 PMD Conformance Test Suite v3.4 Report

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This report contains the data taken for a study on the effects of source inductance and pre-filtering on the link partner's ability to properly receive frames. In this study 15 new (post 2003) and old (pre 2003) devices were chosen from the UNH-IOL's Fast Ethernet Consortium test bed. These devices are listed anonymously in this report by the designator "DUT" and a number (e.g. DUT 1, DUT 2, etc.). The test performed was #25.2.3 from the Clause 25 PMD Conformance Test Suite. This test was performed over 4 separate test cases, the details of which are described in Appendix A of this report. Please note that these results are strictly informative and conclusions made about their significance are outside the scope of this report.

The test suite referenced in this report is available at the UNH-IOL website:

http://ftp.iol.unh.edu/pub/ethernet/test_suites/CL25_PMD/PMD_Test_Suite_v3.4.pdf

Testing Completed 05/07/2008

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Review Completed 05/07/2008

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Test Setup

All tests in this report were performed using the test setup specified in the 100BASE-TX PMD Test Suite in the Test Setup section of each test.

25.2.3 – Baseline Wander Correction

Requirements:

The receiver shall maintain a bit error rate better than 10^{-8} in the presence of worst-case uni- and bi-directional baseline wander events over test channels representing 0%, 75%, and 100% of the worst-case cable attenuation. This implies that no more than 7 out of 20,000 1,518-byte packets may be received in error.

Results:

Uni-Directional BLW, Rise-time = 3 ns, Attenuation = 0%					
DUT	RX OCL	Packets Received in Error			
		Case 1	Case 2	Case 3	Case 4
OLD (Pre 2003)					
DUT 1	699	0	0	0	0
DUT 2	772	0	0	0	0
DUT 3	559	0	0	0	0
DUT 4	691	0	0	0	0
DUT 5	617	0	13409	0	0
DUT 6	641	0	0	0	0
DUT 7	483	0	0	0	0
NEW (Post 2003)					
DUT 8	762	0	0	0	0
DUT 9	702	0	0	0	0
DUT 10	595	0	0	0	0
DUT 11	598	17378	20000	19472	18733
DUT 12	507	0	0	0	0
DUT 13	614	0	0	0	0
DUT 14	653	0	0	0	0
DUT 15	657	0	0	0	0

Table 1, Results for Uni-Directional BLW with Rise-Time of 3ns and 0% Attenuation

Uni-Directional BLW, Rise-time = 3 ns, Attenuation = 75%					
DUT	RX OCL	Packets Received in Error			
		Case 1	Case 2	Case 3	Case 4
OLD (Pre 2003)					
DUT 1	699	0	0	0	0
DUT 2	772	0	0	0	0
DUT 3	559	0	0	0	0
DUT 4	691	0	0	0	0
DUT 5	617	0	9725	0	0
DUT 6	641	0	1317	0	0
DUT 7	483	0	0	0	0
NEW (Post 2003)					
DUT 8	762	0	0	0	0
DUT 9	702	0	0	0	0
DUT 10	595	0	0	0	0
DUT 11	598	2221	20000	19986	8216
DUT 12	507	0	0	0	0
DUT 13	614	0	0	0	0
DUT 14	653	0	0	0	0
DUT 15	657	0	0	0	0

Table 2, Results for Uni-Directional BLW with Rise-Time of 3ns and 75% Attenuation

Uni-Directional BLW, Rise-time = 3 ns, Attenuation = 100%					
DUT	RX OCL	Packets Received in Error			
		Case 1	Case 2	Case 3	Case 4
OLD (Pre 2003)					
DUT 1	699	0	0	0	0
DUT 2	772	0	0	0	0
DUT 3	559	0	576	0	0
DUT 4	691	0	0	0	0
DUT 5	617	0	10313	0	0
DUT 6	641	296	219	0	0
DUT 7	483	0	0	0	0
NEW (Post 2003)					
DUT 8	762	0	0	0	0
DUT 9	702	0	4	0	0
DUT 10	595	0	0	0	0
DUT 11	598	18180	20000	20000	19710
DUT 12	507	0	0	0	0
DUT 13	614	0	0	0	0
DUT 14	653	0	0	0	0
DUT 15	657	0	0	0	0

Table 3, Results for Uni-Directional BLW with Rise-Time of 3ns and 100% Attenuation

Uni-Directional BLW, Rise-time = 5 ns, Attenuation = 0%					
DUT	RX OCL	Packets Received in Error			
		Case 1	Case 2	Case 3	Case 4
OLD (Pre 2003)					
DUT 1	699	0	0	0	0
DUT 2	772	0	0	0	0
DUT 3	559	0	0	0	0
DUT 4	691	0	0	0	0
DUT 5	617	0	14409	0	0
DUT 6	641	0	13757	0	0
DUT 7	483	0	0	0	0
NEW (Post 2003)					
DUT 8	762	0	0	0	0
DUT 9	702	0	1	0	0
DUT 10	595	0	0	0	0
DUT 11	598	7	20000	5113	7
DUT 12	507	0	0	0	0
DUT 13	614	0	0	0	0
DUT 14	653	0	0	0	0
DUT 15	657	0	0	0	0

Table 4, Results for Uni-Directional BLW with Rise-Time of 5ns and 0% Attenuation

Uni-Directional BLW, Rise-time = 5 ns, Attenuation = 75 %					
DUT	RX OCL	Packets Received in Error			
		Case 1	Case 2	Case 3	Case 4
OLD (Pre 2003)					
DUT 1	699	0	6	0	0
DUT 2	772	0	45	0	0
DUT 3	559	0	0	0	0
DUT 4	691	0	9	0	0
DUT 5	617	0	16447	0	0
DUT 6	641	2809	481	0	0
DUT 7	483	0	0	0	0
NEW (Post 2003)					
DUT 8	762	0	0	0	0
DUT 9	702	0	0	0	0
DUT 10	595	0	0	0	0
DUT 11	598	8541	20000	20000	13478
DUT 12	507	0	0	0	0
DUT 13	614	0	0	0	0
DUT 14	653	0	0	0	0
DUT 15	657	0	0	0	0

Table 5, Results for Uni-Directional BLW with Rise-Time of 5ns and 75% Attenuation

Uni-Directional BLW, Rise-time = 5 ns, Attenuation = 100%					
DUT	RX OCL	Packets Received in Error			
		Case 1	Case 2	Case 3	Case 4
OLD (Pre 2003)					
DUT 1	699	0	11937	0	0
DUT 2	772	0	18888	0	0
DUT 3	559	0	5820	0	0
DUT 4	691	0	11603	0	0
DUT 5	617	0	14997	1	0
DUT 6	641	6331	6627	440	1315
DUT 7	483	0	0	0	0
NEW (Post 2003)					
DUT 8	762	0	0	0	0
DUT 9	702	3	1	3	4
DUT 10	595	0	0	0	0
DUT 11	598	19989	20000	20000	20000
DUT 12	507	0	0	0	0
DUT 13	614	0	0	0	0
DUT 14	653	0	0	0	0
DUT 15	657	0	0	0	0

Table 6, Results for Uni-Directional BLW with Rise-Time of 5ns and 100% Attenuation

Bi-Directional BLW, Rise-time = 3 ns, Attenuation = 0%					
DUT	RX OCL	Packets Received in Error			
		Case 1	Case 2	Case 3	Case 4
OLD (Pre 2003)					
DUT 1	699	0	20000	0	0
DUT 2	772	0	20000	0	0
DUT 3	559	0	19826	0	0
DUT 4	691	0	20000	0	0
DUT 5	617	4051	12047	4908	7141
DUT 6	641	2	20000	20000	15
DUT 7	483	0	0	0	0
NEW (Post 2003)					
DUT 8	762	0	0	0	0
DUT 9	702	0	0	0	0
DUT 10	595	0	0	0	0
DUT 11	598	20000	20000	20000	20000
DUT 12	507	0	0	0	0
DUT 13	614	0	0	0	0
DUT 14	653	0	0	0	0
DUT 15	657	0	0	0	0

Table 7, Results for Bi-Directional BLW with Rise-Time of 3ns and 0% Attenuation

Bi-Directional BLW, Rise-time = 3 ns, Attenuation = 75%					
DUT	RX OCL	Packets Received in Error			
		Case 1	Case 2	Case 3	Case 4
OLD (Pre 2003)					
DUT 1	699	0	20000	0	0
DUT 2	772	0	20000	0	0
DUT 3	559	0	19855	0	0
DUT 4	691	0	20000	0	0
DUT 5	617	7076	10108	6238	566
DUT 6	641	0	20000	19700	0
DUT 7	483	0	0	0	0
NEW (Post 2003)					
DUT 8	762	0	0	0	0
DUT 9	702	0	0	0	0
DUT 10	595	0	0	0	0
DUT 11	598	20000	20000	20000	20000
DUT 12	507	0	0	0	0
DUT 13	614	0	0	0	0
DUT 14	653	0	0	0	0
DUT 15	657	0	0	0	0

Table 8, Results for Bi-Directional BLW with Rise-Time of 3ns and 75% Attenuation

Bi-Directional BLW, Rise-time = 3 ns, Attenuation = 100%					
DUT	RX OCL	Packets Received in Error			
		Case 1	Case 2	Case 3	Case 4
OLD (Pre 2003)					
DUT 1	699	0	20000	0	0
DUT 2	772	0	20000	0	0
DUT 3	559	1	19482	0	0
DUT 4	691	0	20000	0	0
DUT 5	617	9466	7463	7610	152
DUT 6	641	913	20000	20000	0
DUT 7	483	0	0	0	0
NEW (Post 2003)					
DUT 8	762	0	0	0	0
DUT 9	702	0	1	0	0
DUT 10	595	0	0	0	0
DUT 11	598	20000	20000	20000	19710
DUT 12	507	0	0	0	0
DUT 13	614	0	0	0	0
DUT 14	653	0	0	0	0
DUT 15	657	0	0	0	0

Table 9, Results for Bi-Directional BLW with Rise-Time of 3ns and 100% Attenuation

Bi-Directional BLW, Rise-time = 5 ns, Attenuation = 0%					
DUT	RX OCL	Packets Received in Error			
		Case 1	Case 2	Case 3	Case 4
OLD (Pre 2003)					
DUT 1	699	0	20000	0	0
DUT 2	772	0	20000	0	0
DUT 3	559	0	19749	0	0
DUT 4	691	0	20000	0	0
DUT 5	617	4172	12281	3727	8833
DUT 6	641	938	20000	20000	957
DUT 7	483	0	0	0	0
NEW (Post 2003)					
DUT 8	762	0	0	0	0
DUT 9	702	5	0	0	0
DUT 10	595	0	0	0	0
DUT 11	598	20000	20000	20000	20000
DUT 12	507	0	0	0	0
DUT 13	614	0	0	0	0
DUT 14	653	0	0	0	0
DUT 15	657	0	0	0	0

Table 10, Results for Bi-Directional BLW with Rise-Time of 5ns and 0% Attenuation

Bi-Directional BLW, Rise-time = 5 ns, Attenuation = 75%					
DUT	RX OCL	Packets Received in Error			
		Case 1	Case 2	Case 3	Case 4
OLD (Pre 2003)					
DUT 1	699	0	19999	0	0
DUT 2	772	0	20000	0	0
DUT 3	559	0	19808	0	0
DUT 4	691	0	20000	0	0
DUT 5	617	7708	13933	3835	3348
DUT 6	641	400	20000	19969	0
DUT 7	483	0	0	0	0
NEW (Post 2003)					
DUT 8	762	0	0	0	0
DUT 9	702	46	0	0	0
DUT 10	595	0	0	0	0
DUT 11	598	20000	20000	20000	20000
DUT 12	507	0	0	0	0
DUT 13	614	0	0	0	0
DUT 14	653	0	0	0	0
DUT 15	657	0	0	0	0

Table 11, Results for Bi-Directional BLW with Rise-Time of 5ns and 75% Attenuation

Bi-Directional BLW, Rise-time = 5 ns, Attenuation = 100%					
DUT	RX OCL	Packets Received in Error			
		Case 1	Case 2	Case 3	Case 4
OLD (Pre 2003)					
DUT 1	699	0	19999	0	0
DUT 2	772	0	20000	0	0
DUT 3	559	0	19808	0	0
DUT 4	691	0	20000	0	0
DUT 5	617	7708	13933	3835	3348
DUT 6	641	400	20000	19969	0
DUT 7	483	0	0	0	0
NEW (Post 2003)					
DUT 8	762	0	0	0	0
DUT 9	702	46	0	0	0
DUT 10	595	0	0	0	0
DUT 11	598	20000	20000	20000	20000
DUT 12	507	0	0	0	0
DUT 13	614	0	0	0	0
DUT 14	653	0	0	0	0
DUT 15	657	0	0	0	0

Table 12, Results for Bi-Directional BLW with Rise-Time of 5ns and 100% Attenuation

Appendix A: Test Case Information

References:

- [1] UNH-IOL Clause 25 PMD Conformance Test Suite
- [2] Ibid., Appendix 25.C – Link Model
- [3] Ibid., 25.C-1: Link model block diagram

In this study test #25.2.3 of [1] was performed with modifications made to the Link Model described in [2] and shown in [3]. The modification consists of adding a second-order filter block between the “Step Response” and “Baseline Wander” blocks of the Link Model. The filter is of the following form:

$$H(s) = \frac{b_2 s^2 + b_1 s + b_0}{a_2 s^2 + a_1 s + a_0} \quad (\text{Equation A-1})$$

Test cases will consist of varying coefficient values for the filter shown in Equation A-1 and also varying the value of the source open circuit inductance. The parameters used for each case are shown in Table A-1.

Test Case	Filter Parameter						Source OCL
	b_2	b_1	b_0	a_2	a_1	a_0	
Case 1	0	0	1	0	0	1	350 uH
Case 2	0	0	1	0	0	1	40 uH
Case 3	1.896532e-8	0.029083	1.08475e+4	1.896532e-8	0.015299	3050	40 uH
Case 4	2.320516e-8	0.034886	1.264911e+4	2.320516e-8	0.014839	2000	40 uH

Table A-1: Parameters Used in Each Test Case