



10 Gigabit Ethernet Consortium Reconciliation Sublayer Test Suite version 1.0

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Vendor X
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December 27, 2004
Report Rev. 1.0

Enclosed are the results from the Clause 46 Reconciliation Sublayer testing performed on:

Device Under Test (DUT): 10 Gigabit Ethernet Switch
Hardware Version: N/A
Firmware Version: N/A
Software Version: N/A
Miscellaneous: Tested on port 1

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

ftp://ftp.iol.unh.edu/pub/ethernet/test_suites/MAC/MAC_Test_Suite_v4.3.pdf

Issues Observed While Testing

46.2.5: Assertion of DATA_VALID_STATUS – The DUT improperly responded to a frame preceded by S/D21.2/D21.2/D21.2.

For specific details regarding issues please see the corresponding test result.

Testing Completed 12/27/2004

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Review Completed 12/27/2004

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SHA-1 Fingerprint: BF96 86A2 E723 9795 C8EA B9F8 1E10 BF22 1D61 3CE4

Result Key

The following table contains possible results and their meanings:

Result	Interpretation
PASS	The Device Under Test (DUT) was observed to exhibit conformant behavior.
PASS with Comments	The DUT was observed to exhibit conformant behavior however an additional explanation of the situation is included, such as due to time limitations only a portion of the testing was performed.
FAIL	The DUT was observed to exhibit non-conformant behavior.
Warning	The DUT was observed to exhibit behavior that is not recommended.
Informative	Results are for informative purposes only and are not judged on a pass or fail basis.
Refer to Comments	From the observations, a valid pass or fail could not be determined. An additional explanation of the situation is included.
Not Applicable	The DUT does not support the technology required to perform these tests.
Not Available	Due to testing station or time limitations, the tests could not be performed.
Borderline	The observed values of the specified parameters are valid at one extreme, and invalid at the other.
Not Tested	Not tested due to the time constraints of the test period.

Test Setup

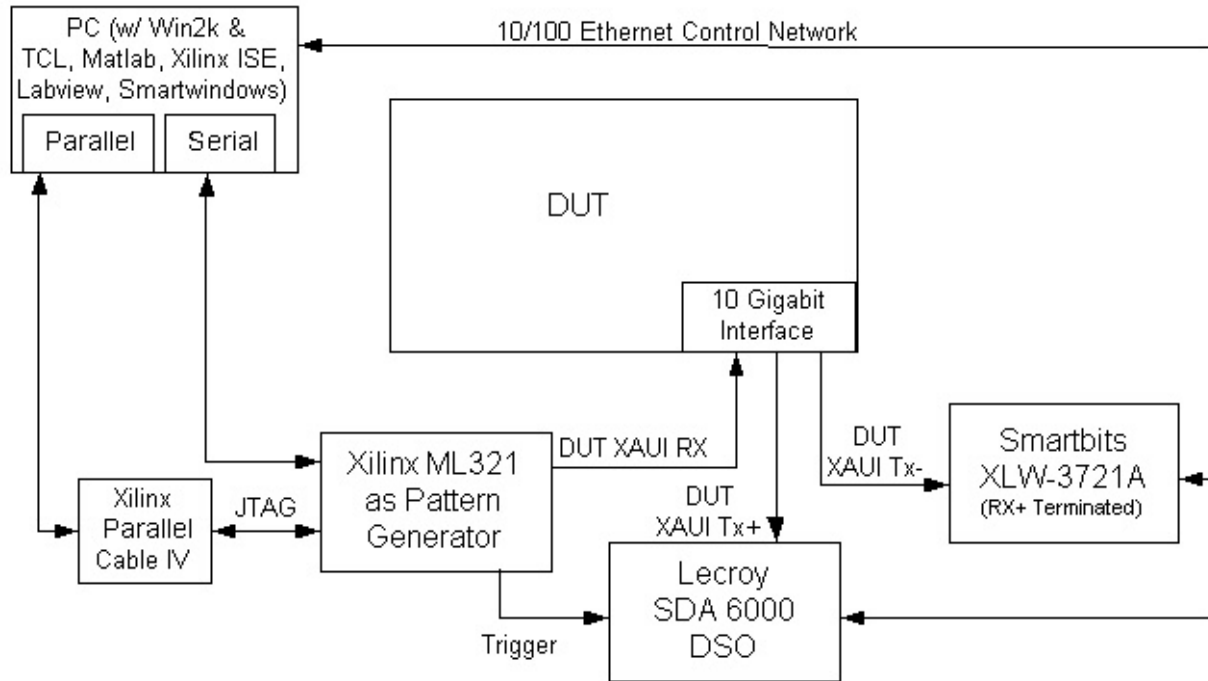


Figure 1 –Test Configuration for RS Testing

Figure 1 above depicts the test setup employed throughout the testing process. Port 1 of the Device Under Test (DUT) was used to provide access to the DUT in all test cases. Control access to the DUT was provided via a serial port interface. The test system consists of the PC, Lecroy SDA 6000, Xilinx ML321 and the Spirent Smartbits interfaces.

- XAUI signaling is generated by the “Xilinx ML321” Testing Station. This system continuously sends valid (though not truly randomized) XAUI Idle when not instructed to send a programmable transmit pattern. When the transmit pattern is sent, a trigger signal is sent to the DSO to capture the response of the DUT.
- Labview software controls the generation of the test vectors and programming of the ML321. Labview and Matlab software control the downloading and analysis of the signaling captured on the Lecroy SDA 6000.
- The 4-channel XAUI signaling from the DUT is captured single-endedly on a Lecroy SDA 6000. The positive signals (Tx+) are driven into the 50ohm terminations of the DSO, while the negative signals (Tx-) are driven into negative receive signals of the Smartbits XLW-3721A, with 50ohm terminations on the positive receive signals of the Smartbits.
- A PC is used for four purposes:
 - via a serial port to control the DUT
 - via the network to control the DSO and download and process the waveforms in Matlab
 - via the USB/JTAG interface to download the firmware for the Xilinx ML321
 - via a Serial port to control transmissions from the Xilinx ML321

Detailed Description of Test Results

Group 1: Transmission

Test # and Label	Part(s)	Result(s)
46.1.1: Start control character creation and alignment	a	PASS
Comments on Test Procedure		
<p>Purpose: To verify that upon reception of the first byte of preamble from the MAC, the RS replaces the preamble byte with a start control character and aligns it on lane 0.</p> <p>a. The DUT should reply to all frames with a Start control character aligned to lane 0 and an SFD aligned to lane 3.</p> <p>Procedure:</p> <ol style="list-style-type: none"> During the testing progress, received frames were examined by column and the position of the /S/ character was observed. 		
Comments on Test Results		
<p>a. Throughout the testing process the /S/ character was observed to always be in lane 0.</p>		

Test # and Label	Part(s)	Result(s)
46.1.2: Terminate control character creation and alignment	a, b	PASS
Comments on Test Procedure		
<p>Purpose: To verify that the DUT inserts a Terminate control character at the end of any frames it transmits, and that the Terminate control character can be aligned to any of the 4 lanes.</p> <p>a. All frames received by the testing station should contain a valid Terminate control character following the last byte of the CRC</p> <p>b. The terminate control character should be observed on all four lanes.</p> <p>Procedure:</p> <ol style="list-style-type: none"> During the testing process, received frames were examined by column and the position of the /T/ character was observed. 		
Comments on Test Results		
<p>a. Throughout the testing process, the DUT was observed to always transmit frames with a valid Terminate control character following the 4 bytes of CRC.</p> <p>b. Throughout the testing process, the DUT was observed to properly generate frames with Terminate control character aligned on any of the four lanes as needed.</p>		

Test # and Label	Part(s)	Result(s)																																
46.1.3 Deficit Idle Count	a - p	PASS																																
Comments on Test Procedure																																		
<p>Purpose: To verify that the DUT properly implements Deficit Idle Count.</p> <p>Procedure: The testing station sends the following test sequences to the DUT and the responses of the DUT are observed so that the IPG between frames can be measured.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr><td>Test case a</td><td>64 byte frame, 12 bytes IPG, 64 byte frame, 12 bytes IPG, 512 byte frame</td></tr> <tr><td>Test case b</td><td>65 byte frame, 11 bytes IPG, 64 byte frame, 12 bytes IPG, 515 byte frame</td></tr> <tr><td>Test case c</td><td>66 byte frame, 12 bytes IPG, 64 byte frame, 12 bytes IPG, 514 byte frame</td></tr> <tr><td>Test case d</td><td>67 byte frame, 9 bytes IPG, 64 byte frame, 12 bytes IPG, 513 byte frame</td></tr> <tr><td>Test case e</td><td>64 byte frame, 12 bytes IPG, 65 byte frame, 11 bytes IPG, 515 byte frame</td></tr> <tr><td>Test case f</td><td>65 byte frame, 11 bytes IPG, 65 byte frame, 11 bytes IPG, 514 byte frame</td></tr> <tr><td>Test case g</td><td>66 byte frame, 10 bytes IPG, 65 byte frame, 11 bytes IPG, 513 byte frame</td></tr> <tr><td>Test case h</td><td>67 byte frame, 9 bytes IPG, 65 byte frame, 15 bytes IPG, 512 byte frame</td></tr> <tr><td>Test case I</td><td>64 byte frame, 12 bytes IPG, 66 byte frame, 10 bytes IPG, 514 byte frame</td></tr> <tr><td>Test case j</td><td>65 byte frame, 11 bytes IPG, 66 byte frame, 10 bytes IPG, 513 byte frame</td></tr> <tr><td>Test case k</td><td>66 byte frame, 10 bytes IPG, 66 byte frame, 14 bytes IPG, 512 byte frame</td></tr> <tr><td>Test case l</td><td>67 byte frame, 9 bytes IPG, 66 byte frame, 14 bytes IPG, 515 byte frame</td></tr> <tr><td>Test case m</td><td>64 byte frame, 12 bytes IPG, 67 byte frame, 9 bytes IPG, 513 byte frame</td></tr> <tr><td>Test case n</td><td>65 byte frame, 11 bytes IPG, 67 byte frame, 13 bytes IPG, 512 byte frame</td></tr> <tr><td>Test case o</td><td>66 byte frame, 10 bytes IPG, 67 byte frame, 13 bytes IPG, 515 byte frame</td></tr> <tr><td>Test case p</td><td>67 byte frame, 9 bytes IPG, 67 byte frame, 13 bytes IPG, 514 byte frame</td></tr> </tbody> </table>			Test case a	64 byte frame, 12 bytes IPG, 64 byte frame, 12 bytes IPG, 512 byte frame	Test case b	65 byte frame, 11 bytes IPG, 64 byte frame, 12 bytes IPG, 515 byte frame	Test case c	66 byte frame, 12 bytes IPG, 64 byte frame, 12 bytes IPG, 514 byte frame	Test case d	67 byte frame, 9 bytes IPG, 64 byte frame, 12 bytes IPG, 513 byte frame	Test case e	64 byte frame, 12 bytes IPG, 65 byte frame, 11 bytes IPG, 515 byte frame	Test case f	65 byte frame, 11 bytes IPG, 65 byte frame, 11 bytes IPG, 514 byte frame	Test case g	66 byte frame, 10 bytes IPG, 65 byte frame, 11 bytes IPG, 513 byte frame	Test case h	67 byte frame, 9 bytes IPG, 65 byte frame, 15 bytes IPG, 512 byte frame	Test case I	64 byte frame, 12 bytes IPG, 66 byte frame, 10 bytes IPG, 514 byte frame	Test case j	65 byte frame, 11 bytes IPG, 66 byte frame, 10 bytes IPG, 513 byte frame	Test case k	66 byte frame, 10 bytes IPG, 66 byte frame, 14 bytes IPG, 512 byte frame	Test case l	67 byte frame, 9 bytes IPG, 66 byte frame, 14 bytes IPG, 515 byte frame	Test case m	64 byte frame, 12 bytes IPG, 67 byte frame, 9 bytes IPG, 513 byte frame	Test case n	65 byte frame, 11 bytes IPG, 67 byte frame, 13 bytes IPG, 512 byte frame	Test case o	66 byte frame, 10 bytes IPG, 67 byte frame, 13 bytes IPG, 515 byte frame	Test case p	67 byte frame, 9 bytes IPG, 67 byte frame, 13 bytes IPG, 514 byte frame
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Comments on Test Results																																		
<p>a-p. The DUT was observed to transmit reply to all frames with the proper IFG.</p>																																		

Group 2: Reception

Test # and Label	Part(s)	Result(s)								
46.2.1: Reception of Start control character	a	PASS								
Comments on Test Procedure										
<p>Purpose: To verify that the DUT only accepts frames with proper Start control character alignment.</p> <p>a. The DUT must discard all the frames that are received with start character on a lane other than lane 0.</p> <p>Procedure:</p> <ol style="list-style-type: none"> The testing station transmitted a sequence of three ICMP request frames containing 64 bytes, 68 bytes and 72 bytes in size, with a minimum IPG between each frame. The 68-byte frame was modified such that the Start control character (/S/) did not appear in lane 0. This was done one of two ways, either by “shifting” the entire frame (through the CRC and /T/) to the “right”, or by shortening the preamble, leaving the SFD properly aligned on lane 3. 6 cases were attempted as described in the table below: <table border="1" data-bbox="367 747 1243 905"> <tbody> <tr> <td data-bbox="367 747 659 842">3 Cases: Frame Shifted “right”</td> <td data-bbox="659 747 849 842">R/S/P/P P/P/P/P SFD/D/D/D</td> <td data-bbox="849 747 1052 842">R/R/S/P P/P/P/P P/SFD/D/D</td> <td data-bbox="1052 747 1243 842">R/R/R/S P/P/P/P P/P/SFD/D</td> </tr> <tr> <td data-bbox="367 842 659 905">3 Cases: Preamble shortened</td> <td data-bbox="659 842 849 905">R/S/P/P P/P/P/SFD</td> <td data-bbox="849 842 1052 905">R/R/S/P P/P/P/SFD</td> <td data-bbox="1052 842 1243 905">R/R/R/S P/P/P/SFD</td> </tr> </tbody> </table> <p>P = Preamble byte (55), SFD = Start Frame Delimiter (D5), D = Data byte of frame, R = Idle character</p> The transmissions from the DUT were observed in all cases. 			3 Cases: Frame Shifted “right”	R/S/P/P P/P/P/P SFD/D/D/D	R/R/S/P P/P/P/P P/SFD/D/D	R/R/R/S P/P/P/P P/P/SFD/D	3 Cases: Preamble shortened	R/S/P/P P/P/P/SFD	R/R/S/P P/P/P/SFD	R/R/R/S P/P/P/SFD
3 Cases: Frame Shifted “right”	R/S/P/P P/P/P/P SFD/D/D/D	R/R/S/P P/P/P/P P/SFD/D/D	R/R/R/S P/P/P/P P/P/SFD/D							
3 Cases: Preamble shortened	R/S/P/P P/P/P/SFD	R/R/S/P P/P/P/SFD	R/R/R/S P/P/P/SFD							
Comments on Test Results										
<p>a. The DUT was not observed to accept frames with a misaligned /S/ character and has only been observed to accept frames with an /S/ on lane 0. All the frames with the Start control character aligned on lane 1, lane 2 or lane 3 were discarded.</p>										

Test # and Label	Part(s)	Result(s)
46.2.2: Reception of Preamble and SFD	a	PASS
	b	Informative
Comments on Test Procedure		
<p>Purpose: To verify if the DUT is insensitive to preamble shrinkage or growth.</p> <p>a. The DUT should accept all frames containing a properly aligned Start control character in lane 0, 6 bytes of preamble, and an SFD in lane 3.</p> <p>b. The DUT may accept frames with preamble variations other than listed in part a.</p> <p>Procedure:</p> <ol style="list-style-type: none"> 1. A 64-byte ICMP request frame was sent to the DUT with only an /S/ character followed by SFD preceding the frame. 2. Step 1 was repeated inserting additional preamble between the Start Control character and the SFD until the length of the Start, preamble and SFD was 16 bytes long. 3. The output from the DUT was observed in all the cases. 		
Comments on Test Results		
<p>a. The DUT was observed to accept the 64 byte frame containing properly aligned Start control character in lane 0, 6 bytes of preamble, and an SFD in lane 3.</p> <p>b. The DUT was observed to not accept any frames with preamble lengths other than 6 bytes (not counting /S/ or SFD), regardless of the position of the SFD.</p>		

Test # and Label	Part(s)	Result(s)
46.2.3: Reception of Terminate Control Character	a	PASS
Comments on Test Procedure		
<p>Purpose: To verify that the DUT receives frames with Terminate control character in any lane.</p> <p>a. The DUT should receive frames containing Terminate control character in any lane.</p> <p>Procedure:</p> <ol style="list-style-type: none"> 1. The testing station was instructed to send 4 valid ICMP request frames, 64 to 67 bytes in length, to the DUT. 2. Transmissions and statistics of the DUT were monitored. 		
Comments on Test Results		
<p>a. The DUT was observed to be insensitive to the reception of frames with Terminate control characters on any lane. The statistics observed on the DUT via the CLI properly incremented for all received frames.</p>		

Test # and Label	Part(s)	Result(s)
46.2.4: Receive IFG Tolerance	a	PASS
Comments on Test Procedure		
<p>Purpose: To verify that the DUT can properly receive frames with an Inter Frame Gap (IFG) between 5 and 12 bytes in length.</p> <p>a. The DUT should receive frames with IFG between 5 and 12 bytes in length.</p> <p>Procedure:</p> <ol style="list-style-type: none">Three ICMP request frames were sent to the DUT, with an IFG of 1 byte between the first two frames and a valid 12 Byte IFG between the last two frames.Step 1 was repeated, altering the IFG between the first and second until all values between 1 and 12 bytes were attemptedThe transmissions from the DUT were observed in all the cases.		
Comments on Test Results		
<p>The DUT properly responded to only the third frame when the IFG was 1, 2, or 3 bytes. When the IFG was 4 bytes the DUT properly responded to the first and third frames. For an IFG between 5 and 12 bytes the DUT properly responded to all 3 frames.</p> <p>Note, for any conformant device, IFG's of 1, 2 or 3 bytes correspond to a violation of the PCS check_end function and should result in the frame immediately prior to the IFG to be corrupted (and thus reported as an FCS error). An IFG of 4 bytes should not satisfy the requirements to assert DATA_VALID_STATUS (Refer to test 46.2.5), and should discard the second frame.</p>		

Test # and Label	Part(s)	Result(s)																		
46.2.5: Assertion of DATA_VALID_STATUS	a-e, g, h	PASS																		
	f	FAIL																		
Comments on Test Procedure																				
<p>Purpose: To verify that the DUT accepts only frames that are preceded by a full column of Idle or a sequence ordered set before the Start column.</p> <p>The DUT sets the DATA_VALID_STATUS to DATA_VALID if the column preceding the Start column is a sequence ordered set or a column of IDLE otherwise the DATA_VALID_STATUS is set to DATA_NOT_VALID.</p> <p>Procedure:</p> <ol style="list-style-type: none"> The testing station transmitted a 64 byte ICMP request, 12 bytes of Idle, the pattern described in Test Case a, a 68 byte ICMP request, 12 bytes of Idle, and a 72 byte ICMP request. Step 1 was repeated for all the Test Cases listed in the table below. 																				
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Label</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Test Case a</td> <td>A full column of IDLE. A/A/A/A, K/K/K/K, and R/R/R/R were each used</td> </tr> <tr> <td>Test Case b</td> <td>A sequence ordered set corresponding to Local Fault. – Q/D0.0/D0.0/D1.0</td> </tr> <tr> <td>Test Case c</td> <td>A sequence ordered set corresponding to Remote Fault. – Q/D0.0/D0.0/D2.0</td> </tr> <tr> <td>Test Case d</td> <td>A sequence ordered set corresponding to a Reserved value. Q/D0.0/D0.0/D0.0</td> </tr> <tr> <td>Test Case e</td> <td>A column containing Terminate control character. T/K/K/K</td> </tr> <tr> <td>Test Case f</td> <td>A column containing Start control character -- S/D21.2/D21.2/D21.2</td> </tr> <tr> <td>Test Case g</td> <td>A column containing an Error control character. E/E/E/E</td> </tr> <tr> <td>Test Case h</td> <td>A column containing Data code groups. D21.2/D21.2/D21.2/D21.2</td> </tr> </tbody> </table>			Label	Description	Test Case a	A full column of IDLE. A/A/A/A, K/K/K/K, and R/R/R/R were each used	Test Case b	A sequence ordered set corresponding to Local Fault. – Q/D0.0/D0.0/D1.0	Test Case c	A sequence ordered set corresponding to Remote Fault. – Q/D0.0/D0.0/D2.0	Test Case d	A sequence ordered set corresponding to a Reserved value. Q/D0.0/D0.0/D0.0	Test Case e	A column containing Terminate control character. T/K/K/K	Test Case f	A column containing Start control character -- S/D21.2/D21.2/D21.2	Test Case g	A column containing an Error control character. E/E/E/E	Test Case h	A column containing Data code groups. D21.2/D21.2/D21.2/D21.2
Label	Description																			
Test Case a	A full column of IDLE. A/A/A/A, K/K/K/K, and R/R/R/R were each used																			
Test Case b	A sequence ordered set corresponding to Local Fault. – Q/D0.0/D0.0/D1.0																			
Test Case c	A sequence ordered set corresponding to Remote Fault. – Q/D0.0/D0.0/D2.0																			
Test Case d	A sequence ordered set corresponding to a Reserved value. Q/D0.0/D0.0/D0.0																			
Test Case e	A column containing Terminate control character. T/K/K/K																			
Test Case f	A column containing Start control character -- S/D21.2/D21.2/D21.2																			
Test Case g	A column containing an Error control character. E/E/E/E																			
Test Case h	A column containing Data code groups. D21.2/D21.2/D21.2/D21.2																			
Comments on Test Results																				
<p>Test case a-d: The DUT properly received all the frames preceded by an Idle, Local Fault, Remote Fault, or Reserved Sequence ordered set.</p> <p>Test cases e, g, h: The DUT properly did not respond to a frame preceded by T/K/K/K, E/E/E/E, or D21.2/D21.2/D21.2/D21.2.</p> <p>Test case f: The DUT improperly responded to a frame preceded by S/D21.2/D21.2/D21.2</p>																				

Test # and Label	Part(s)	Result(s)
46.2.6: De-assertion of DATA_VALID_STATUS	a, b, c	PASS
Comments on Test Procedure		
<p>Purpose: To verify that the DUT properly discards frames when DATA_VALID_STATUS changes from DATA_VALID to DATA_NOT_VALID before the reception of a Terminate control character when receiving a frame.</p> <p>a. The DUT should discard frames with the /T/ character replaced with a /K/ character. b. The DUT should discard frames with the T column replaced by a reserved ordered set. c. The DUT should discard fames with the /T/ character replaced with an /S/ character.</p> <p>Procedure:</p> <ol style="list-style-type: none"> 1. A 64 byte ICMP request was sent to the DUT, which was followed by 68 byte ICMP request with the Terminate control character replaced by an Idle control character, followed by a 72 byte ICMP request. 2. Step 1 was repeated with the Terminate control character replaced with an ordered set and a Start control character. 3. The DUT's counters and transmissions were observed in all the cases. 		
Comments on Test Results		
<ol style="list-style-type: none"> a. When the DUT received 68 through 71 byte frames with the Terminate control character replaced with a /K/ in lanes 0-3 the DUT was observed to reply to the 64 and 72-byte frames. b. When the DUT received a 68-byte frame with T replaced with K28.4/D0.0/D0.0/D0.0 (a reserved ordered set), the DUT was observed to reply to the 64 and 72-byte frames. c. When the DUT received a 68-byte frame with /T/ replaced with /S/, the DUT was observed to reply to the 64 and 72-byte frames. 		

Test # and Label	Part(s)	Result(s)												
46.2.7: Reception of /E/ during DATA_VALID_STATUS	a-e	PASS												
Comments on Test Procedure														
<p>Purpose: To verify that the DUT properly discards frames that are received with errors and increments its CRC error counters.</p> <p>a-e. The DUT should discard frames received with errors and increment the error counters.</p> <p>Procedure:</p> <ol style="list-style-type: none"> 1. A 64 byte ICMP request frame was sent to the DUT, which was followed by a 68 byte ICMP request test frame with an /E/ placed at different points in the frame following the table below, followed by a 72 byte echo request frame. 2. The DUT's counters and transmissions were observed in all the cases. <table border="1"> <thead> <tr> <th>Label</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Test Case a</td> <td>/S/E/H55/H55... valid frame</td> </tr> <tr> <td>Test Case b</td> <td>/S/H55/H55/H55/H55/H55/E... valid frame, (/E/ replacing SFD)</td> </tr> <tr> <td>Test Case c</td> <td>8 byte preamble+SFD, /E/, a valid 67byte frame(from after /E/ to the CRC), T </td> </tr> <tr> <td>Test Case d</td> <td>a valid 67 byte frame with an /E/ inserted after the CRC but before the /T/ (/E/ on lane 3, /T/ on lane 0),</td> </tr> <tr> <td>Test Case e</td> <td>a valid 67 byte frame with an /E/ replacing the /T/ in lane 3</td> </tr> </tbody> </table> <ol style="list-style-type: none"> 3. The DUT's MAC counters were observed. 			Label	Description	Test Case a	/S/E/H55/H55... valid frame	Test Case b	/S/H55/H55/H55/H55/H55/E... valid frame, (/E/ replacing SFD)	Test Case c	8 byte preamble+SFD, /E/, a valid 67byte frame(from after /E/ to the CRC), T	Test Case d	a valid 67 byte frame with an /E/ inserted after the CRC but before the /T/ (/E/ on lane 3, /T/ on lane 0),	Test Case e	a valid 67 byte frame with an /E/ replacing the /T/ in lane 3
Label	Description													
Test Case a	/S/E/H55/H55... valid frame													
Test Case b	/S/H55/H55/H55/H55/H55/E... valid frame, (/E/ replacing SFD)													
Test Case c	8 byte preamble+SFD, /E/, a valid 67byte frame(from after /E/ to the CRC), T													
Test Case d	a valid 67 byte frame with an /E/ inserted after the CRC but before the /T/ (/E/ on lane 3, /T/ on lane 0),													
Test Case e	a valid 67 byte frame with an /E/ replacing the /T/ in lane 3													
Comments on Test Results														
<p>Test Case a: The DUT replied to the 64 and 72 Byte frames. Test Case b: The DUT replied to the 64 and 72 Byte frames. Test Case c: The DUT replied to the 64 and 72 Byte frames. Test Case d: The DUT replied to the 64 and 72 Byte frames. Test Case e: The DUT replied to the 64 and 72 Byte frames.</p>														

Group 3: Fault

Test # and Label	Part(s)	Result(s)
46.3.1: Continuous Reception of Fault Sequences	a-c	PASS
Comments on Test Procedure		
<p>Purpose: To verify that the DUT properly reacts upon the continuous reception of either Local Fault or Remote Fault ordered_sets.</p> <ol style="list-style-type: none"> a. Upon reception of the Local Fault Sequences, the DUT should cease transmission of frames and commence continuous transmission of Remote Fault Sequences. b. Upon reception of the Remote Fault sequences, the DUT should cease transmission of the frames and commence continuous transmission of Idle. c. Upon reception of the reserved sequences, the DUT should not cease transmission of the frames. <p>Procedure:</p> <ol style="list-style-type: none"> 1. ICMP requests and fault sequences (RF, LF, and Reserved fault) were continuously sent to the DUT 2. Transmissions from the DUT were monitored 		
Comments on Test Results		
<ol style="list-style-type: none"> a. The DUT continued to properly transmit frames when only 1-3 Local Faults are received from the testing station. The DUT properly ceased frame transmission and sent Remote Fault after receiving only 4 Local Faults from the testing station. b. The DUT continued to properly transmit frames when only 1-3 Remote Faults are received from the testing station. The DUT properly ceased frame transmission and sent Idle after receiving only 4 Remote Faults from the testing station. c. The DUT did not inhibit frame transmissions and continuously sent frames in response to the sequence of Reserved ordered sets from the testing station. Reserved ordered sets of K28.4/D0.0/D0.0/D0.0 and K28.4/D0.0/D0.0/D3.0 were sent. 		

Test # and Label	Part(s)	Result(s)
46.3.2: Reception of identical fault_sequences	a-c	PASS
Comments on Test Procedure		
<p>Purpose: To determine the number of identical fault_sequences that the DUT needs to receive before acknowledging the reception of Local or Remote fault.</p> <ol style="list-style-type: none"> Upon reception of n Local Fault Sequences where n is greater than 3, the DUT should cease transmission of the frames and commence continuous transmission of Remote Fault Sequences. Upon reception of n Remote Fault sequences, where n is greater than 3, the DUT should cease transmission of the frames and commence continuous transmission of Idle. Upon reception of n Reserved sequences, regardless of the value of n, the DUT should not cease transmission of the frames. <p>Procedure:</p> <ol style="list-style-type: none"> The DUT was instructed to transmit frames continuously. The testing station was instructed to inject 1 local fault ordered sets in the stream to the DUT. The number of ordered sets in part 2 was increased until the DUT interrupted the linerate transmission of frames and this count was noted as <i>n</i>. Parts 1 – 3 were repeated with remote fault ordered sets. The above test was repeated with <i>n</i> reserved ordered sets. The transmissions from the DUT were observed in all the cases. 		
Comments on Test Results		
<ol style="list-style-type: none"> The DUT continued to properly transmit frames when only 1-3 Local Faults or Remote Faults are received from the testing station. The DUT properly ceased frame transmission and sent Remote Fault after receiving 4 Local Faults from the testing station. The DUT properly ceased frame transmission and transmitted Idle after receiving 4 Remote Faults from the testing station. The DUT did not cease transmission of frames on receiving 4 Reserved Sequences (K28.4/0/0/0) from the testing station. 		

Test # and Label	Part(s)	Result(s)
46.3.3: Reception of non-identical fault sequences	a-f	PASS
Comments on Test Procedure		
<p>Purpose: To verify that the DUT properly resets the seq_cnt variable to 0 upon reception of non-identical ordered_sets.</p> <p>Procedure:</p> <ol style="list-style-type: none"> The DUT was instructed to transmit frames continuously. The Fault Sequences identified in the table below are sent to the DUT. If 4 consecutive identical Fault sequences are received, these frame transmissions should be momentarily interrupted. Receipt of reserved sequences should not interfere with the detection of 4 consecutive identical fault sequences, provided col_cnt is not violated Transmissions from the DUT are observed at the time the Fault Sequences are being sent. 		
Comments on Test Results		
Test Part	Fault Sequences sent by the Testing Station	Response of the DUT
a	3LF + 1RF+1LF	DUT did not cease normal frame transmission.
a	3LF+ 2RF + 1LF	DUT did not cease normal frame transmission.
a	3LF+ 3RF + 1LF	DUT did not cease normal frame transmission
b	3LF + 4RF + 1LF	DUT inhibited frame transmission and transmitted idle sequences.
a	3RF + 3LF + 1RF	DUT did not cease normal frame transmission.
b	3RF + 4LF + 1RF	DUT inhibited frame transmission and transmitted Remote fault ordered sets.
c	3LF + 3 RsvdOS + 1LF RsvdOS = K28.4/D0.0/D0.0/D0.0	DUT inhibited frame transmission and transmitted Remote fault ordered sets.
c	3LF + 4 RsvdOS + 1LF RsvdOS = K28.4/D0.0/D0.0/D0.0	DUT inhibited frame transmission and transmitted Remote fault ordered sets.
d	3RF + 3 RsvdOS + 1RF RsvdOS = K28.4/D0.0/D0.0/D0.0	DUT inhibited frame transmission and transmitted idle sequences.
d	3RF + 4 RsvdOS + 1RF RsvdOS = K28.4/D0.0/D0.0/D0.0	DUT inhibited frame transmission and transmitted idle sequences.
e	4x (LF + RF)	DUT did not cease normal frame transmission.
f	4x (LF + K28.4/D0.0/D0.0/D0.0)	DUT inhibited frame transmission and transmitted Remote fault ordered sets.
f	4x (RF + K28.4/D0.0/D0.0/D0.0)	DUT inhibited frame transmission and transmitted idle sequences.

Test # and Label	Part(s)	Result(s)																											
46.3.4: Setting of col_cnt	a-h	PASS																											
Comments on Test Procedure																													
<p>Purpose: To verify that the DUT properly uses the col_cnt variable.</p> <p>Procedure:</p> <ol style="list-style-type: none"> 1. The DUT was instructed to transmit frames continuously. 2. The Fault Sequences identified in the table below are sent to the DUT. If 4 consecutive identical Fault sequences are received each within 128 columns, frame transmissions should be momentarily interrupted. If a Fault Sequence has been detected, and 128 columns are received without receiving a new Fault Sequence, then the current fault state should be cleared, and frame transmission from the DUT may resume <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <thead> <tr style="background-color: #D3D3D3;"> <th style="width: 5%;">#</th> <th style="width: 40%;">Continuous Test Sequence Pattern</th> <th style="width: 55%;">One-shot Test Sequence Pattern</th> </tr> </thead> <tbody> <tr> <td>a</td> <td>64 byte frames with minimum IPG</td> <td>1LF, 127 I , 1LF, 127 I , 1LF, 127 I , 1LF, 127 I </td> </tr> <tr> <td>b</td> <td>64 byte frames with minimum IPG</td> <td>1LF, 128 I , 1LF, 128 I , 1LF, 128 I , 1LF, 128 I </td> </tr> <tr> <td>c</td> <td>64 byte frames with minimum IPG</td> <td>1RF, 127 I , 1RF, 127 I , 1RF, 127 I , 1RF, 127 I </td> </tr> <tr> <td>d</td> <td>64 byte frames with minimum IPG</td> <td>1RF, 128 I , 1RF, 128 I , 1RF, 128 I , 1RF, 128 I </td> </tr> <tr> <td>e</td> <td>19 I , LF</td> <td>108 I </td> </tr> <tr> <td>f</td> <td>20 I , LF</td> <td>108 I </td> </tr> <tr> <td>g</td> <td>19 I , RF</td> <td>108 I </td> </tr> <tr> <td>h</td> <td>20 I , RF</td> <td>108 I </td> </tr> </tbody> </table> <p style="text-align: center; margin-left: 20px;">LF=Local Fault Sequence RF=Remote Fault Sequence I =A column of valid idle</p> <p>Note: For error-free operation, the one-shot sequence is transmitted when the looping sequence is at its end. Upon completion of the one-shot, the testing station resumes transmission at the beginning of the loop.</p> <ol style="list-style-type: none"> 3. Transmissions from the DUT are observed at the time the Fault Sequences are being sent 			#	Continuous Test Sequence Pattern	One-shot Test Sequence Pattern	a	64 byte frames with minimum IPG	1LF, 127 I , 1LF, 127 I , 1LF, 127 I , 1LF, 127 I	b	64 byte frames with minimum IPG	1LF, 128 I , 1LF, 128 I , 1LF, 128 I , 1LF, 128 I	c	64 byte frames with minimum IPG	1RF, 127 I , 1RF, 127 I , 1RF, 127 I , 1RF, 127 I	d	64 byte frames with minimum IPG	1RF, 128 I , 1RF, 128 I , 1RF, 128 I , 1RF, 128 I	e	19 I , LF	108 I	f	20 I , LF	108 I	g	19 I , RF	108 I	h	20 I , RF	108 I
#	Continuous Test Sequence Pattern	One-shot Test Sequence Pattern																											
a	64 byte frames with minimum IPG	1LF, 127 I , 1LF, 127 I , 1LF, 127 I , 1LF, 127 I																											
b	64 byte frames with minimum IPG	1LF, 128 I , 1LF, 128 I , 1LF, 128 I , 1LF, 128 I																											
c	64 byte frames with minimum IPG	1RF, 127 I , 1RF, 127 I , 1RF, 127 I , 1RF, 127 I																											
d	64 byte frames with minimum IPG	1RF, 128 I , 1RF, 128 I , 1RF, 128 I , 1RF, 128 I																											
e	19 I , LF	108 I																											
f	20 I , LF	108 I																											
g	19 I , RF	108 I																											
h	20 I , RF	108 I																											
Comments on Test Results																													
<ol style="list-style-type: none"> a. The DUT properly interrupts transmission and sources RF. b. The DUT does not interrupt transmission. c. The DUT properly interrupts transmission and sources Idle. d. The DUT does not interrupt transmission. e. The DUT constantly sources RF, which is not interrupted when the 127 I gap is received. f. The DUT constantly sources RF, until the one-shot test pattern is sent resulting in the receipt of a 128 I by the DUT. Upon reception of 128 I , the DUT was observed to cease transmission of RF and begin transmission of frames. g. The DUT constantly sources Idle. When the 127 I gap is received, the DUT was observed to continue to source Idle. h. The DUT constantly sources Idle, until the one-shot test pattern is sent resulting in the receipt of a 128 I by the DUT. Upon reception of 128 I , the DUT was observed to source frames. 																													