



Test Report

Report No. RES3005

Client: Senko Advanced Components

Address: 225 Cedar Hill Street
Marlboro, MA 01752

Phone: 508-481-9999

Product Tested: Q-XP MSOC 900m

Test Dates: April 2010 – October 2010

Prepared By:

A handwritten signature in black ink, appearing to read "Sean Grenon", is written over a horizontal line.

Sean Grenon – Lab Manager

Issue Date: February 22, 2011

Samples Tested:

Q-XP SC/APC 900micron Mechanical Splice on Connector

Summary

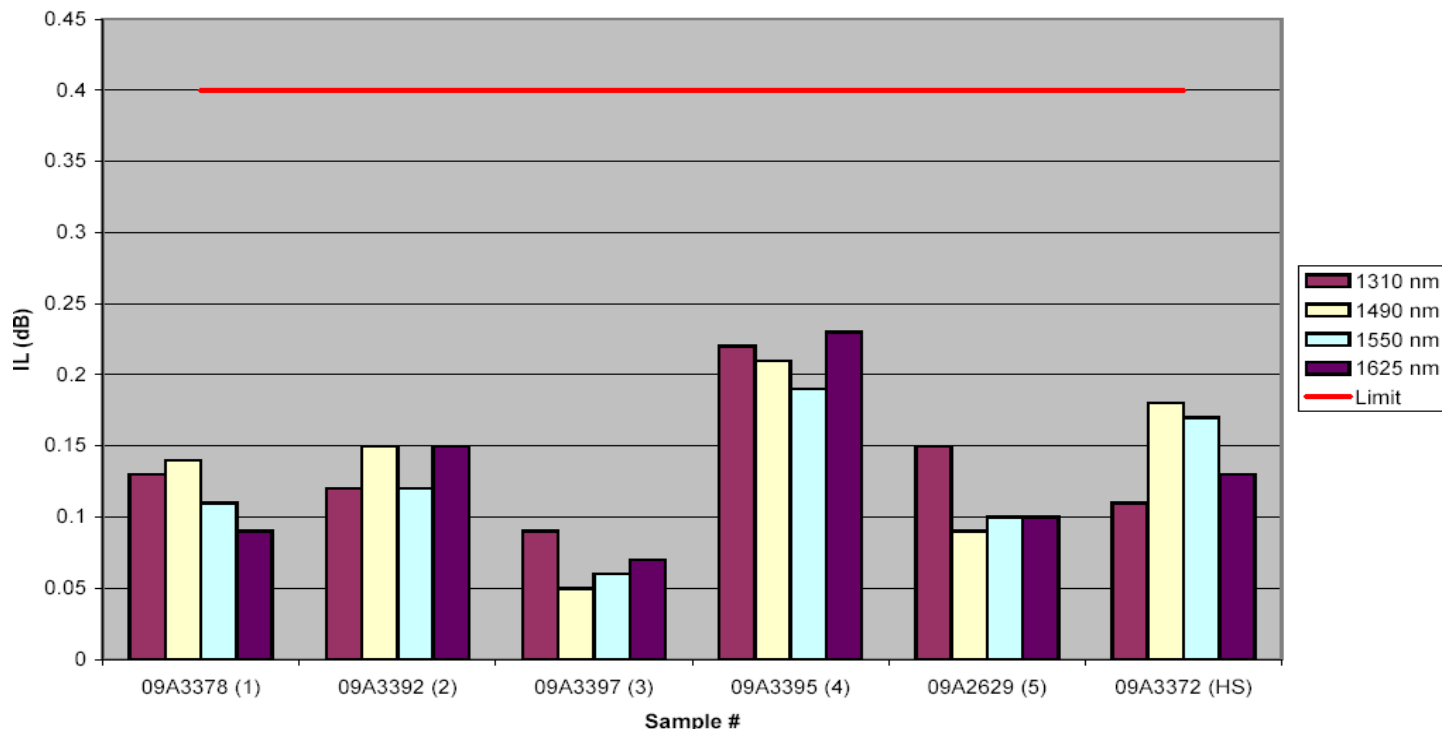
Testing was performed in accordance with Telcordia standard GR-1081-CORE *Generic Requirements for Field Mountable Optical Fiber Connectors* Issue 1 January 1995. The samples represented in this report were tested at Resolute Technologies under a third party witness program by Underwriters Laboratories. The full results from this testing program are represented in UL report number 10CA14846 rev 2, this report is meant to be a summary of those test results.

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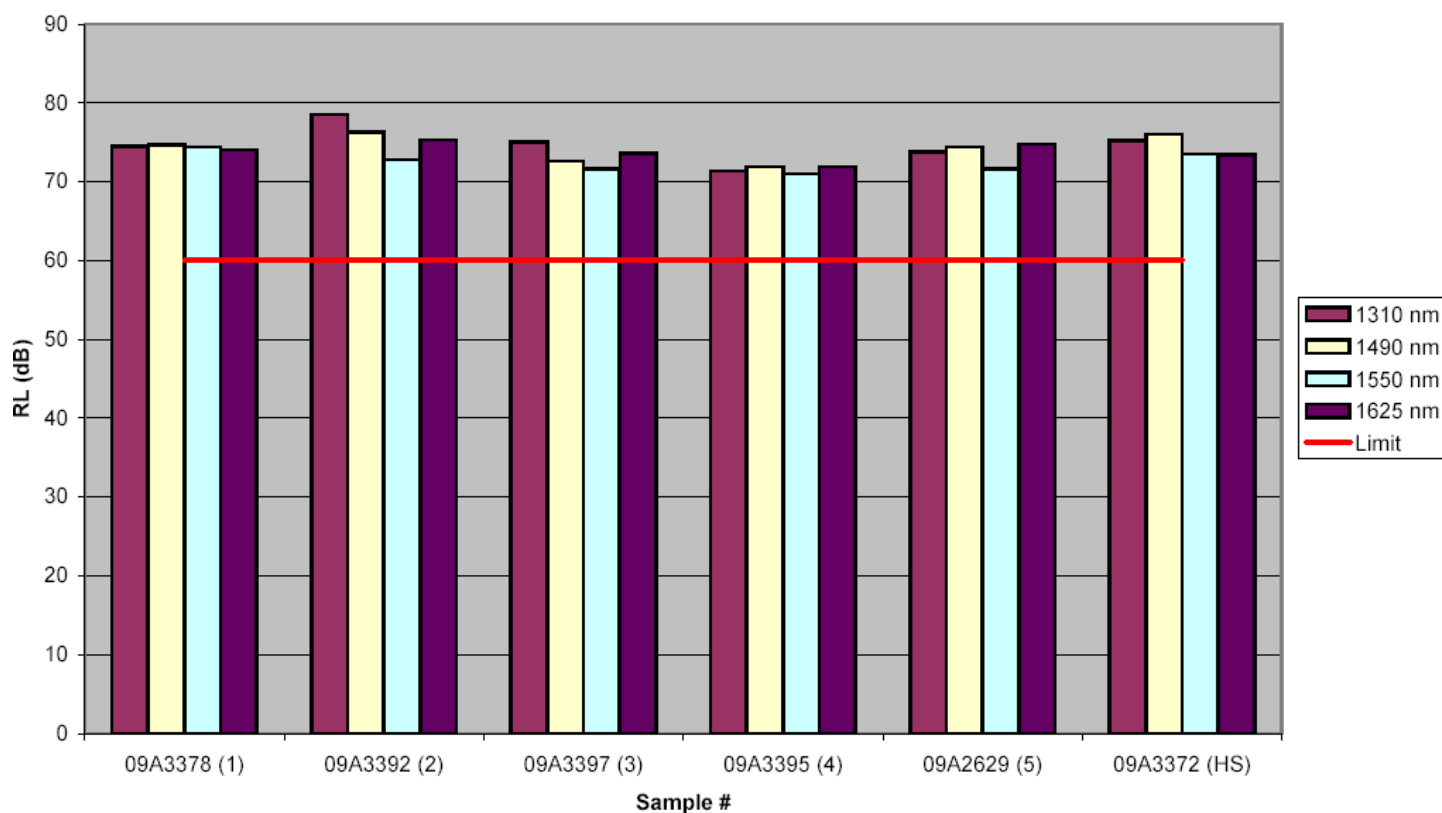
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New Product Measurements:

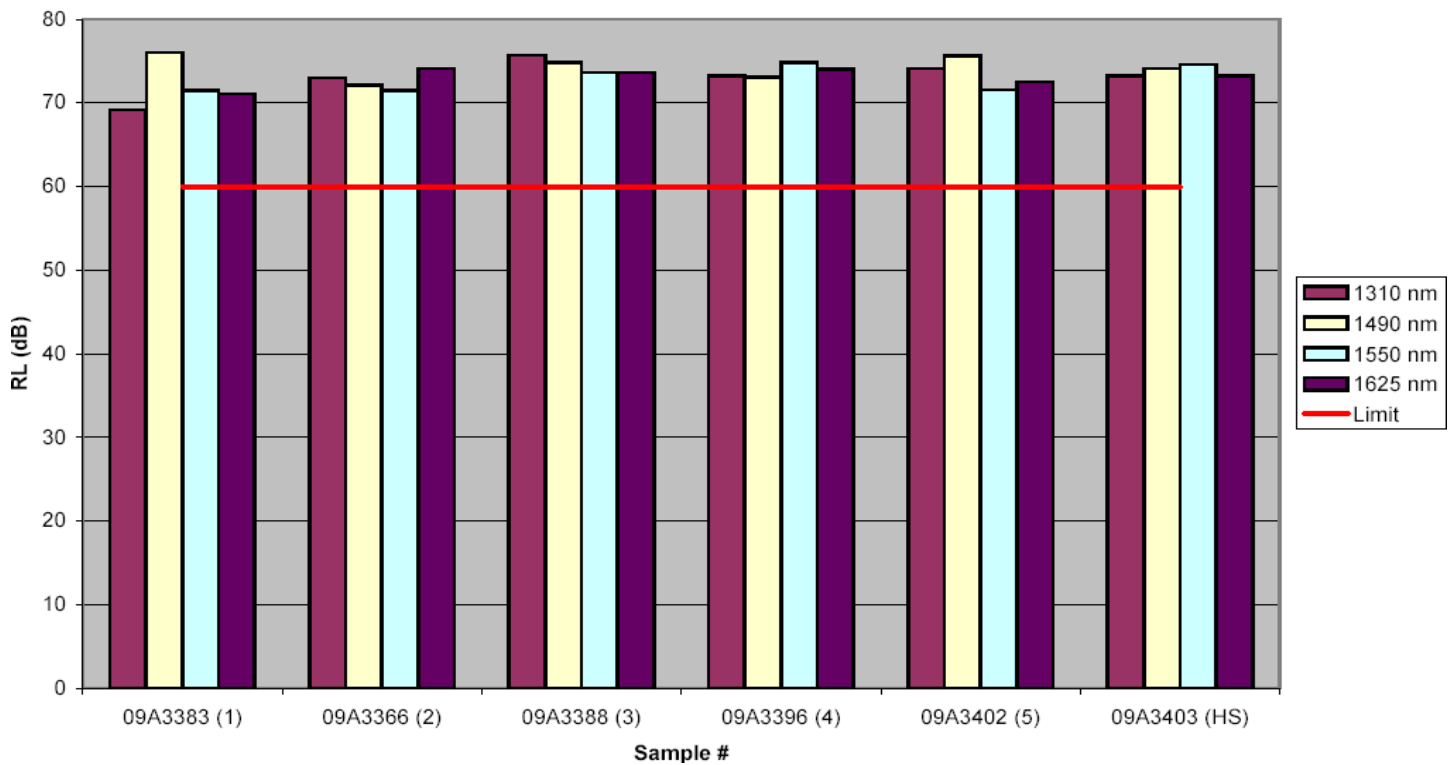
Resolute 900 um SC/APC Mechanical Connector
Initial Service Life IL New Product Measurements
Mated Pair G.657B3 Samples



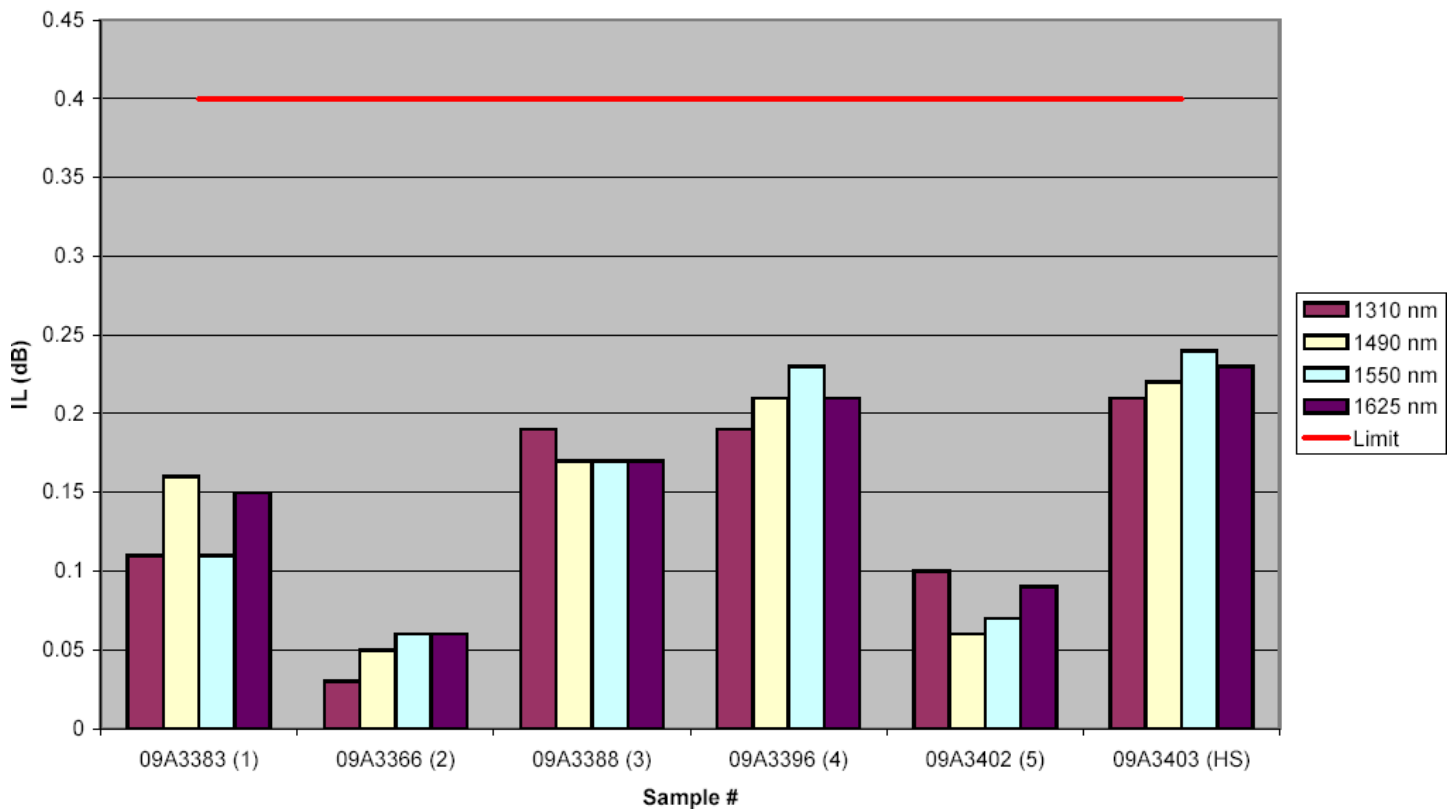
Resolute 900 um SC/APC Mechanical Connector
Initial Service Life RL New Product Measurements
Mated Pair G.657B3 Samples



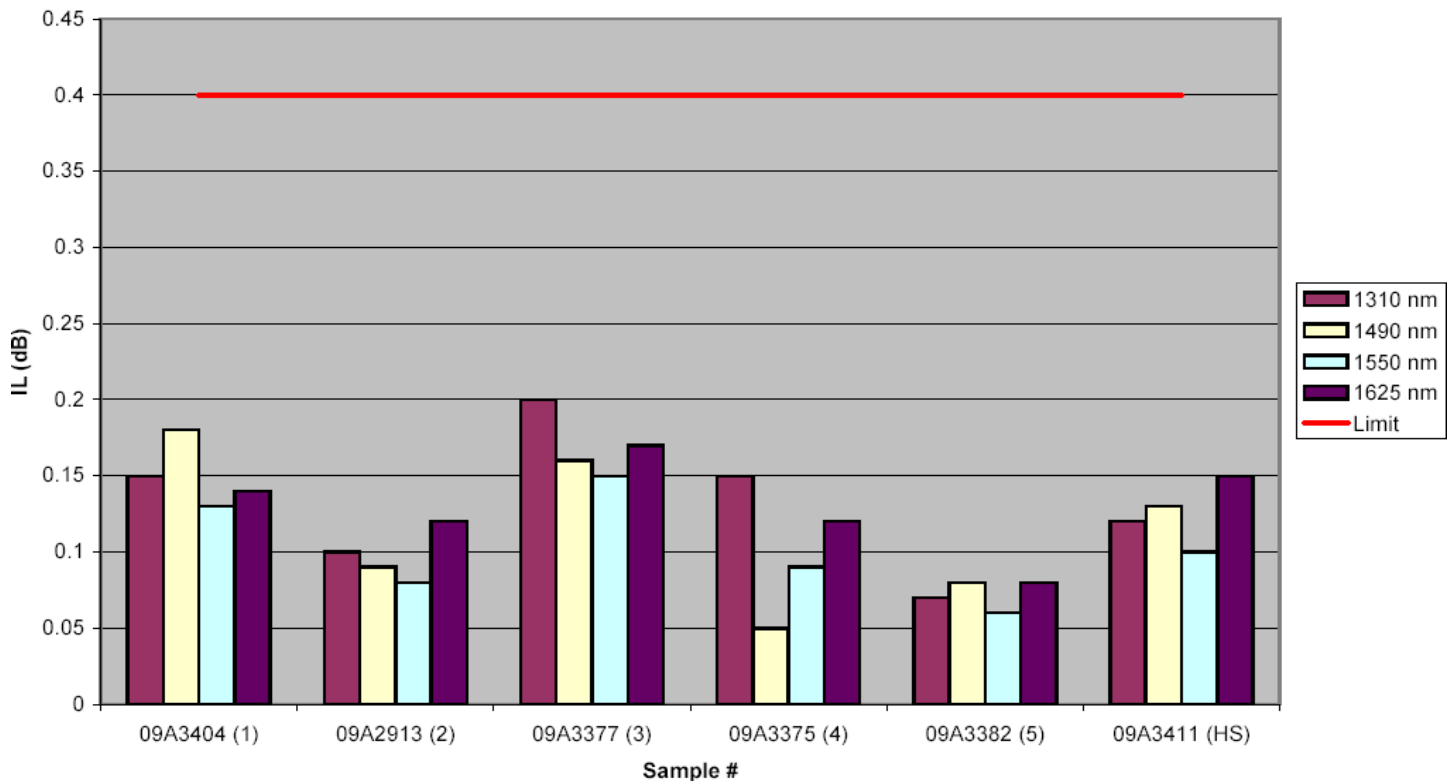
Resolute 900 um SC/APC Mechanical Connector
Initial Service Life RL New Product Measurements
Mated Pair G.657B Samples



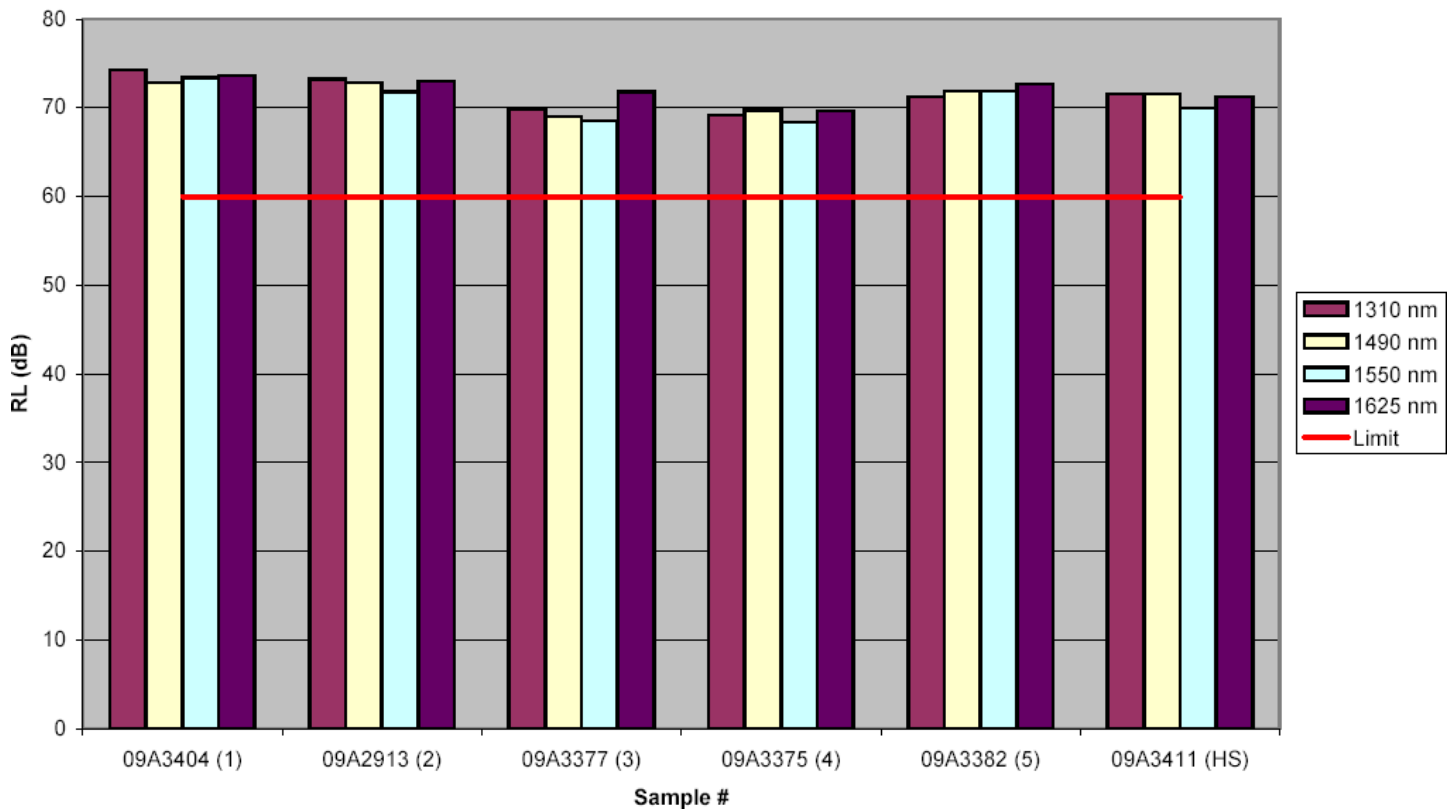
Resolute 900 um SC/APC Mechanical Connector
Initial Service Life IL New Product Measurements
Mated Pair G.657B Samples



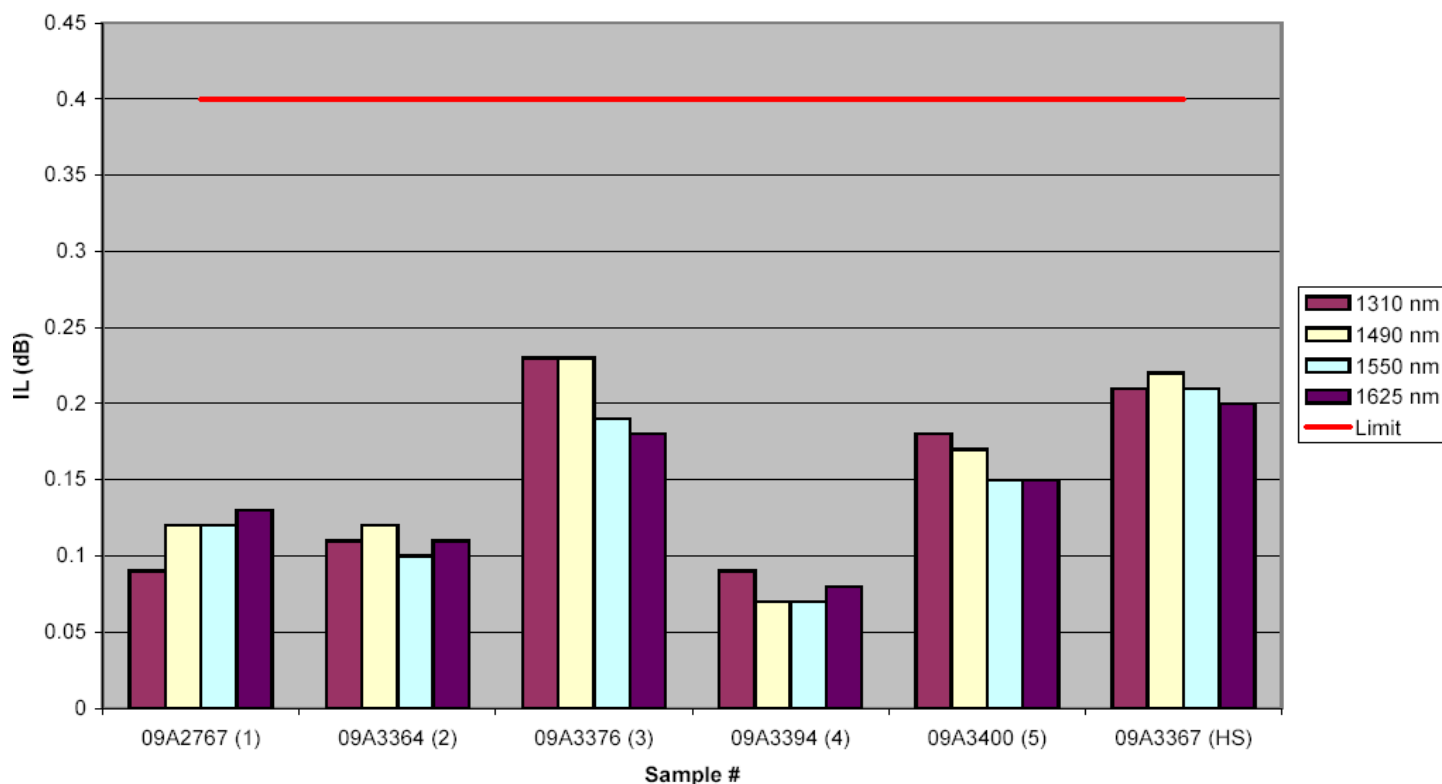
Resolute 900 um SC/APC Mechanical Connector
Initial Service Life IL New Product Measurements
Mated Pair G.657A Samples



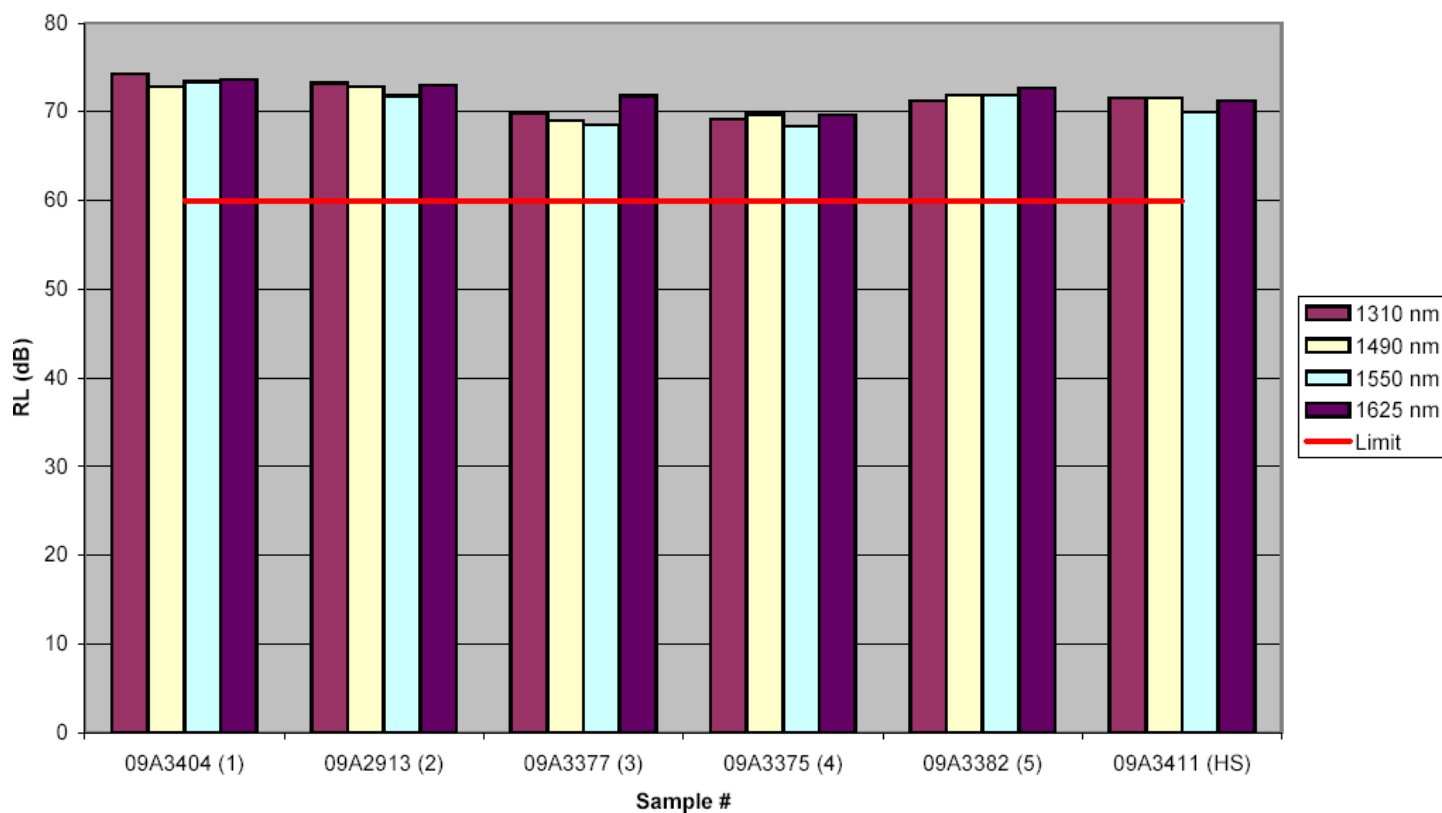
Resolute 900 um SC/APC Mechanical Connector
Initial Service Life RL New Product Measurements
Mated Pair G.657A Samples



Resolute 900 um SC/APC Mechanical Connector
Initial Service Life IL New Product Measurements
Mated Pair G.652D Samples

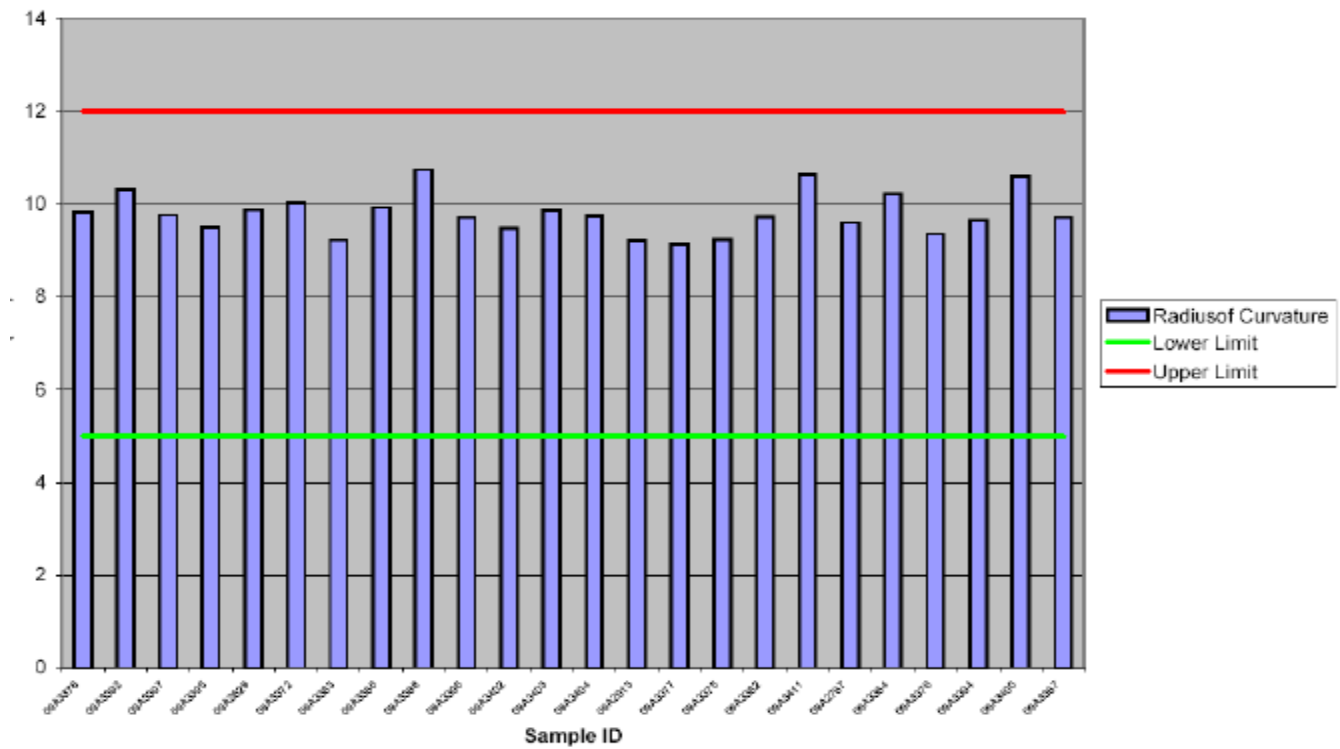


Resolute 900 um SC/APC Mechanical Connector
Initial Service Life RL New Product Measurements
Mated Pair G.652D Samples

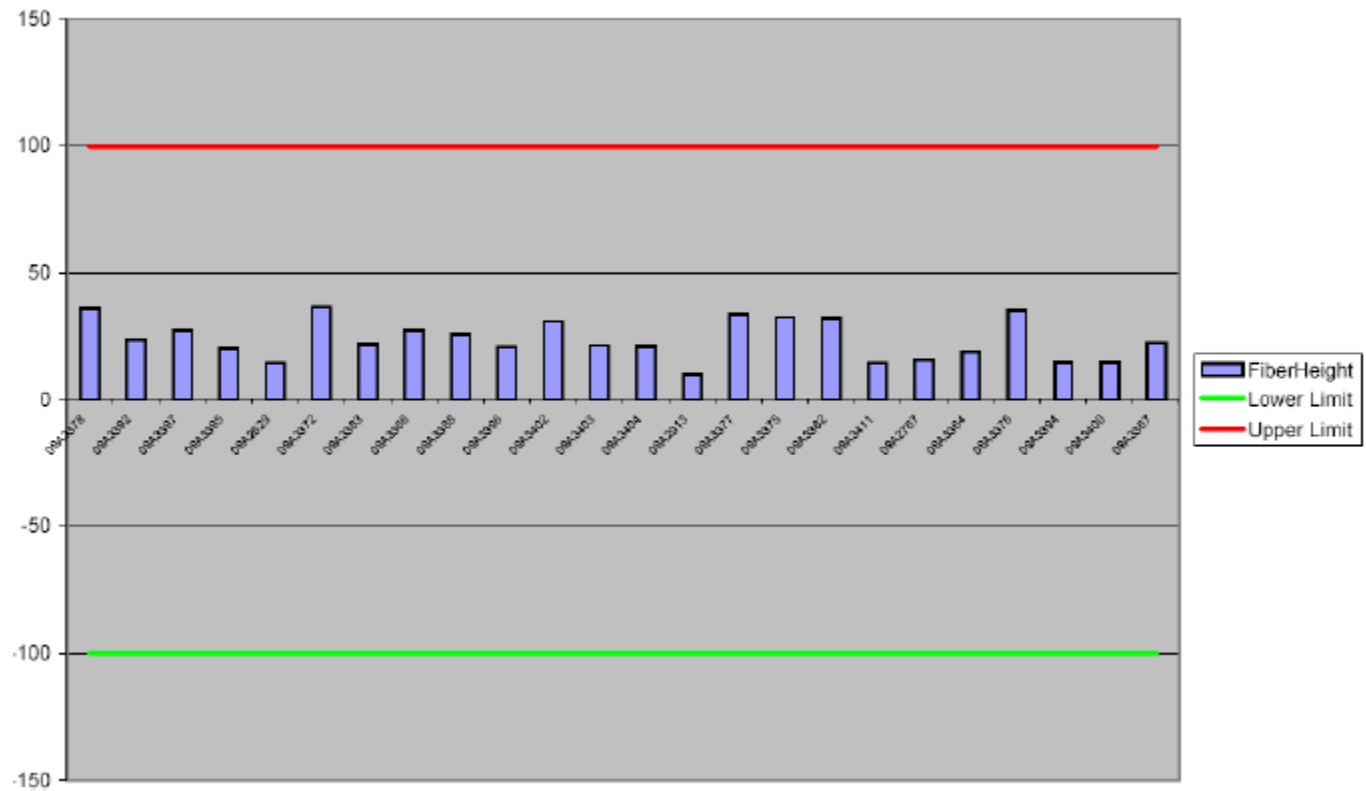


New Product Geometry

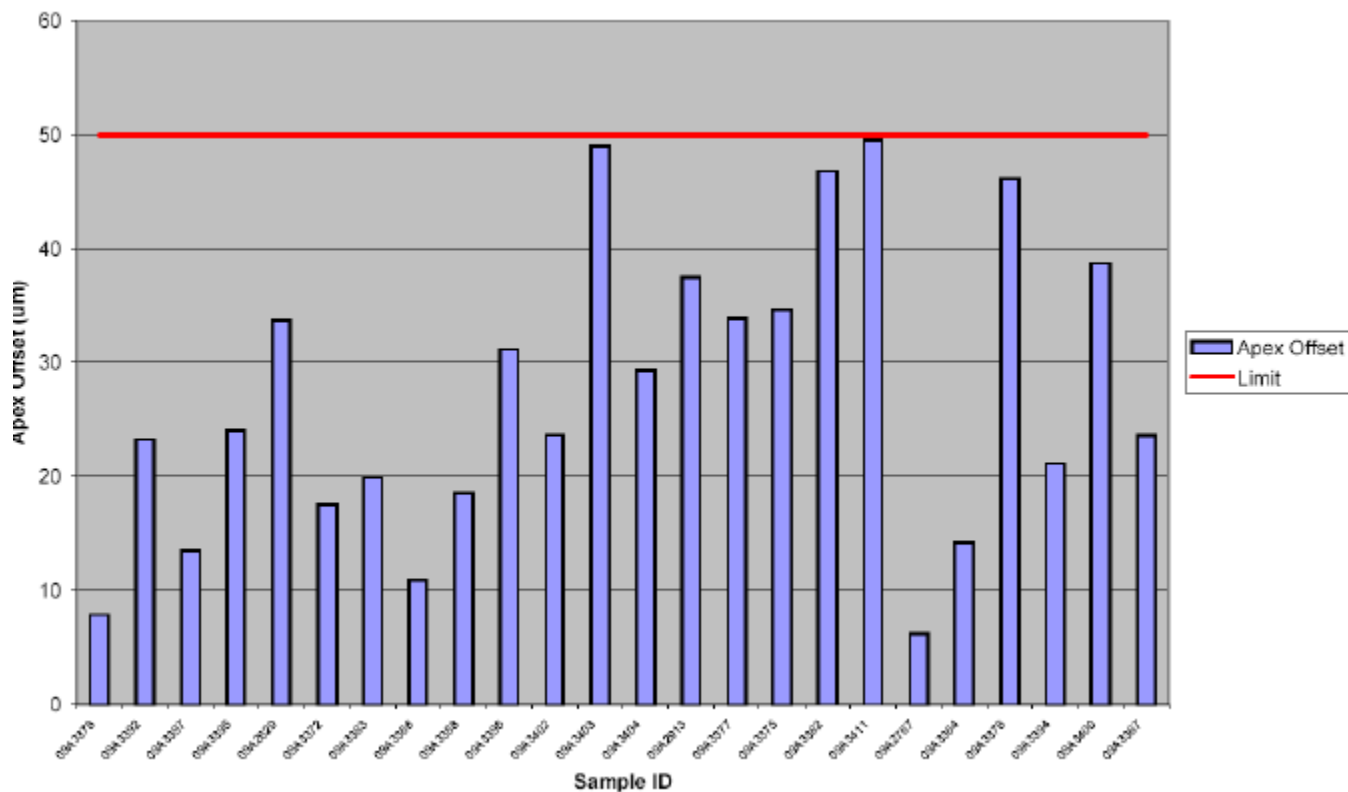
Radius of Curvature:



Fiber Height:



Apex Offset:

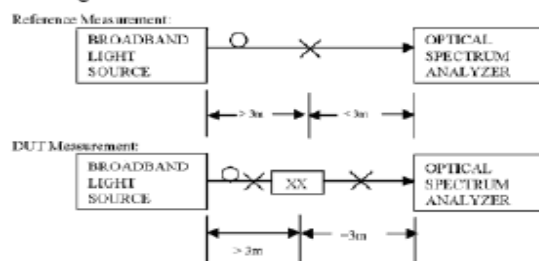


GR-1081section 4.2 -Wavelength Dependency Testing

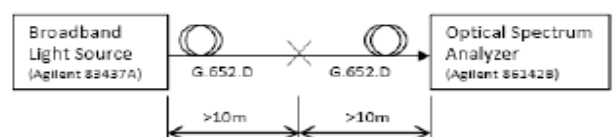
1. Summary of Test results at ITL
3 of 20 were failed due to larger IL change than 0.4dB.

#	Standard Conn. (Transmit Side)	DUT Fiber Type	DUT Conn.	Peak- Peak (dB)	Result ≤0.4dB
1	E100406255A	G.657.B3	QXP09A2016	0.34dB	Yes
2	E100406103A	G.657.B3	QXP09A2926	0.44dB	No
3	E100406297A	G.657.B3	QXP09A2852	0.50dB	No
4	E100406067A	G.657.B3	QXP09A2962	0.25dB	Yes
5	E100406105A	G.657.B3	QXP09A2013	0.15dB	Yes
6	E100406259A	G.657.B2	QXP09A2182	0.40dB	Yes
7	E100406347A	G.657.B2	QXP09A2180	0.34dB	Yes
8	E100406570A	G.657.B2	QXP09A2942	0.22dB	Yes
9	E100406414A	G.657.B2	QXP09A2146	0.47dB	No
10	E100406459A	G.657.B2	QXP09A2749	0.28dB	Yes
11	E100406602A	G.657.A1	QXP09A2839	0.30dB	Yes
12	E100406603A	G.657.A1	QXP09A2761	0.27dB	Yes
13	E100406568A	G.657.A1	QXP09A2271	0.18dB	Yes
14	E100406201A	G.657.A1	QXP09A2624	0.23dB	Yes
15	E100406371A	G.657.A1	QXP09A2093	0.18dB	Yes
16	E100406277A	G.652.D	QXP09A2638	0.25dB	Yes
17	E100406461A	G.652.D	QXP09A2619	0.25dB	Yes
18	E100406493A	G.652.D	QXP09A2630	0.23dB	Yes
19	E100406597A	G.652.D	QXP09A2635	0.18dB	Yes
20	E100406443A	G.652.D	QXP09A2691	0.22dB	Yes

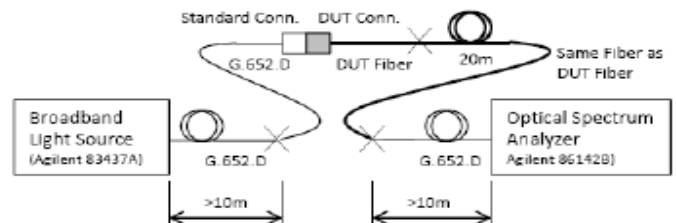
Test Configuration



Reference Measurement



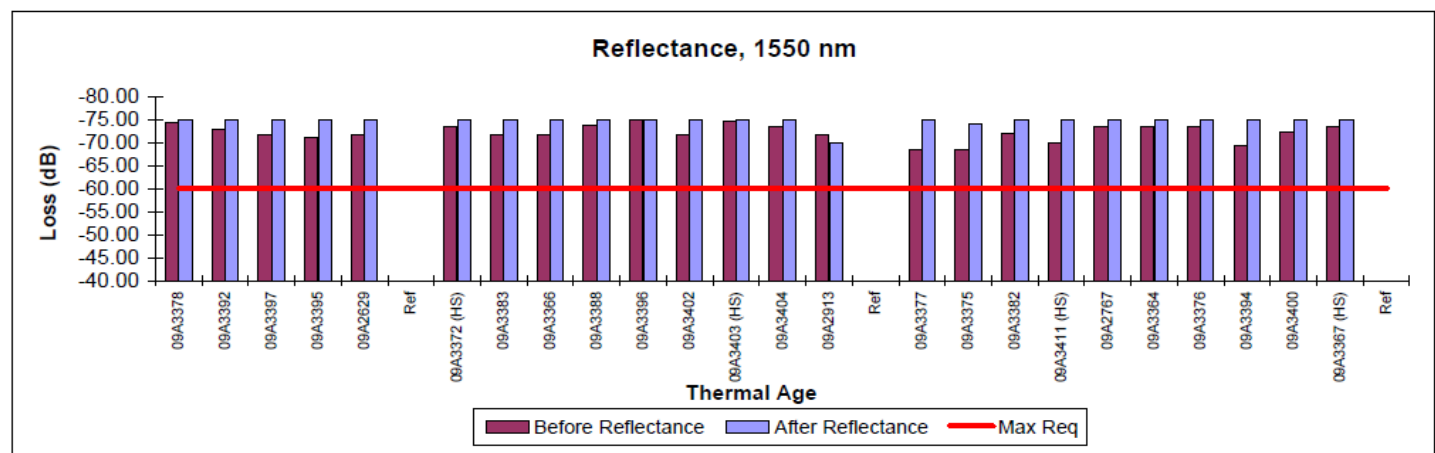
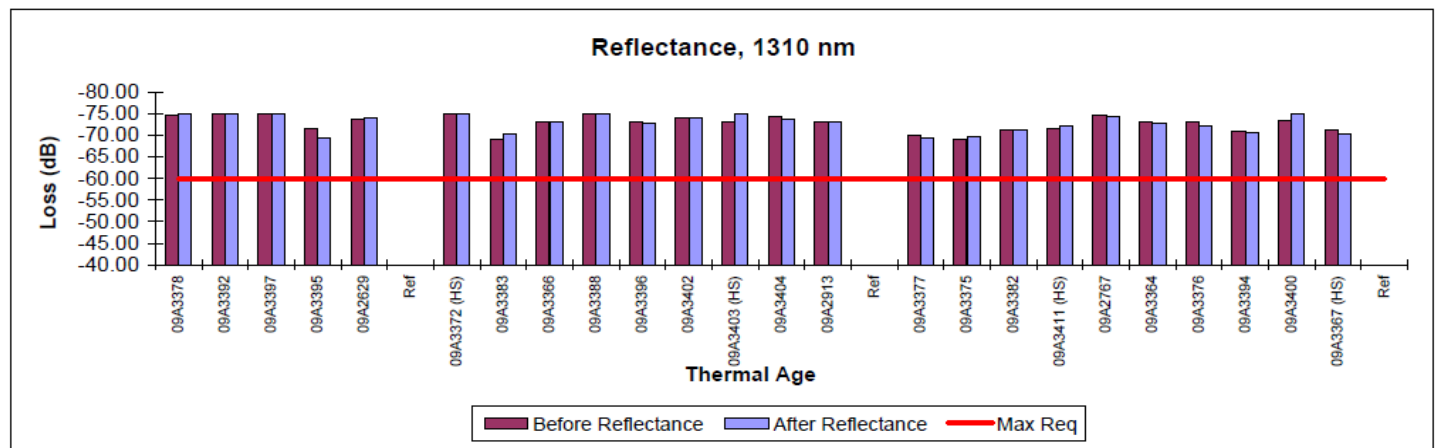
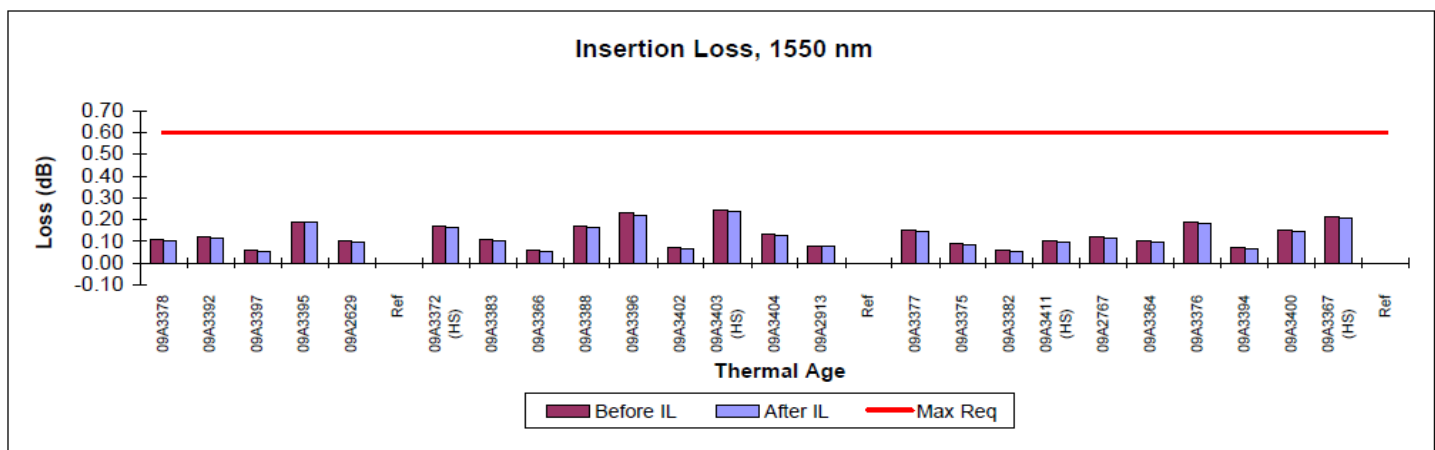
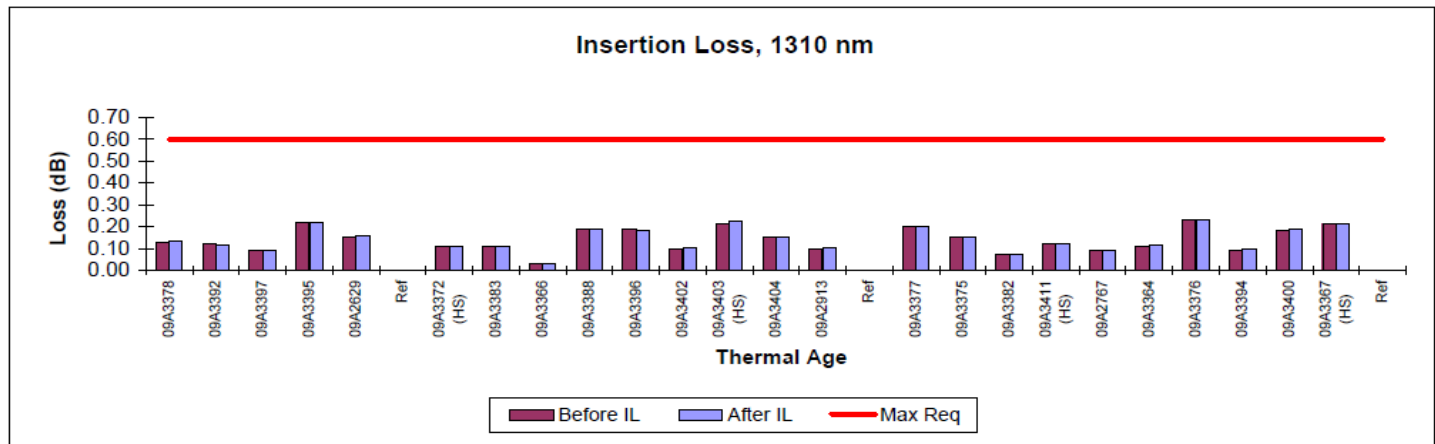
DUT Measurement



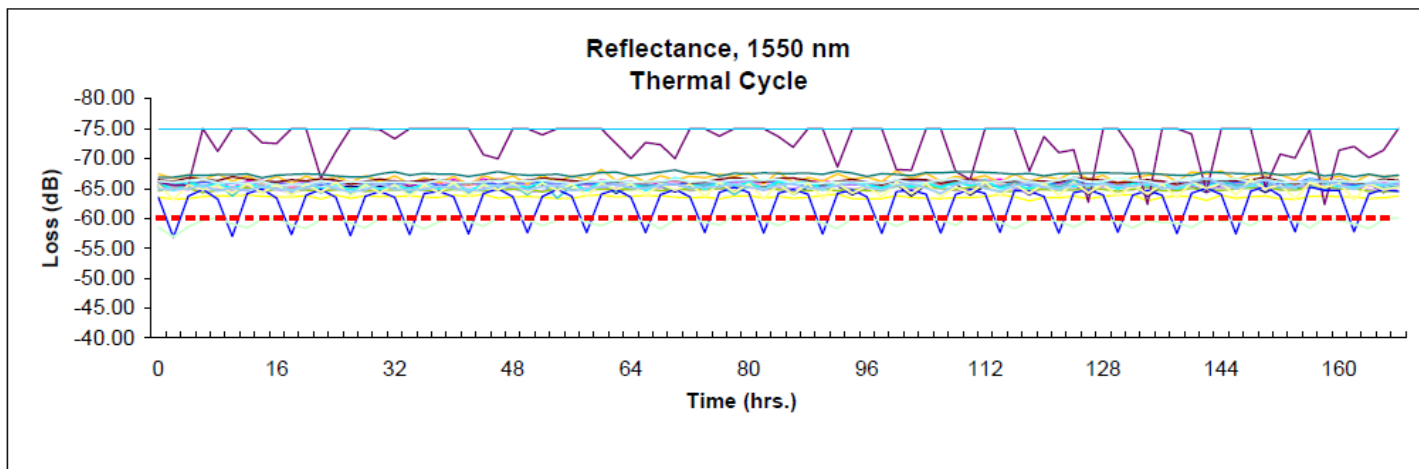
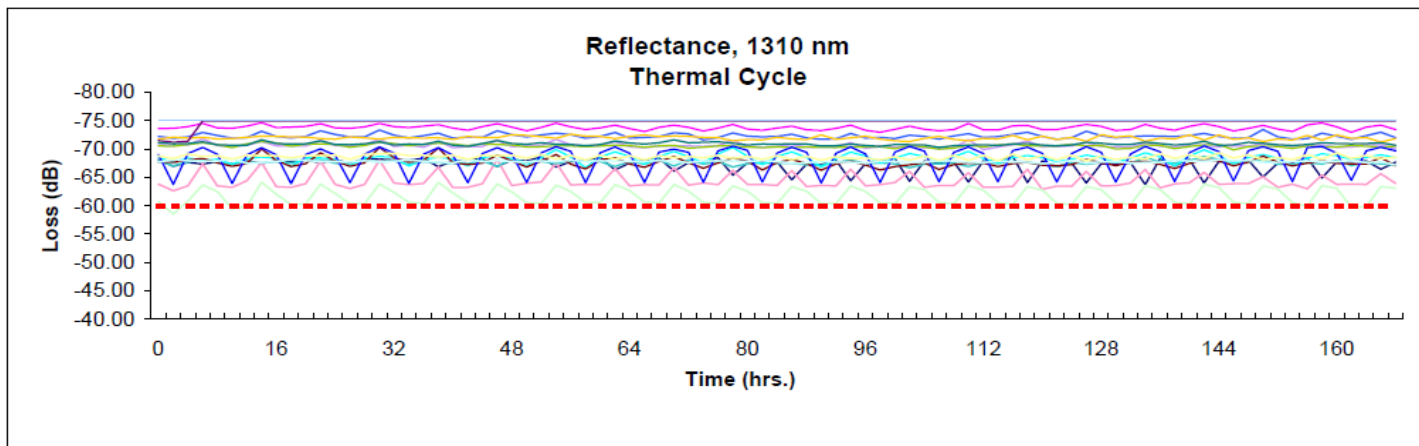
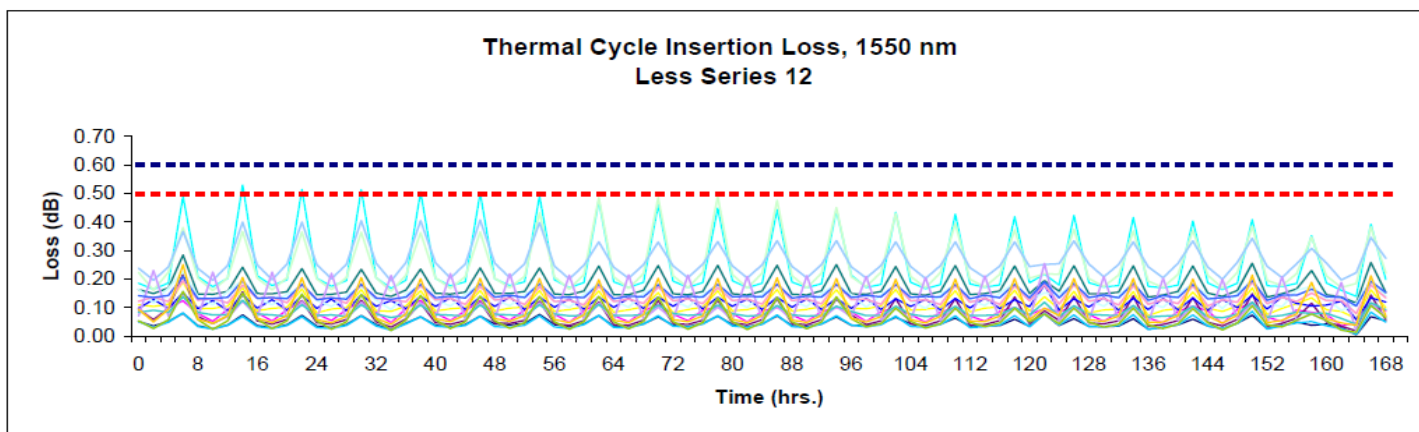
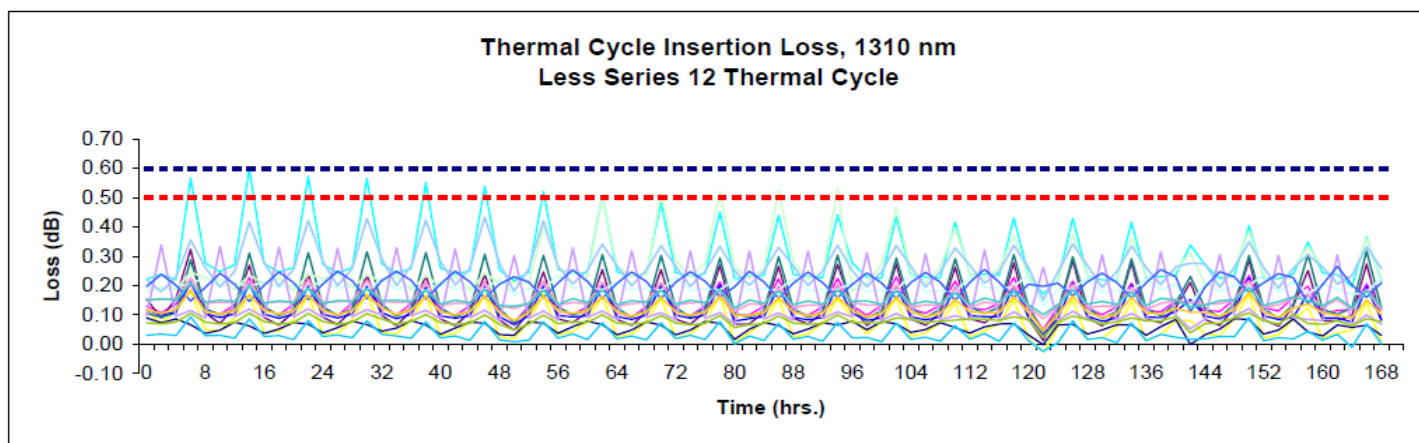
Due to the short DUT Fiber, 20m of the same fiber as DUT Fiber is spliced.

DUT Measurement is carried out at 20m, 15m, 10m and 5m of extended DUT Fiber. The purpose of the measurement is to confirm if the IL change depends on the fiber length or not.

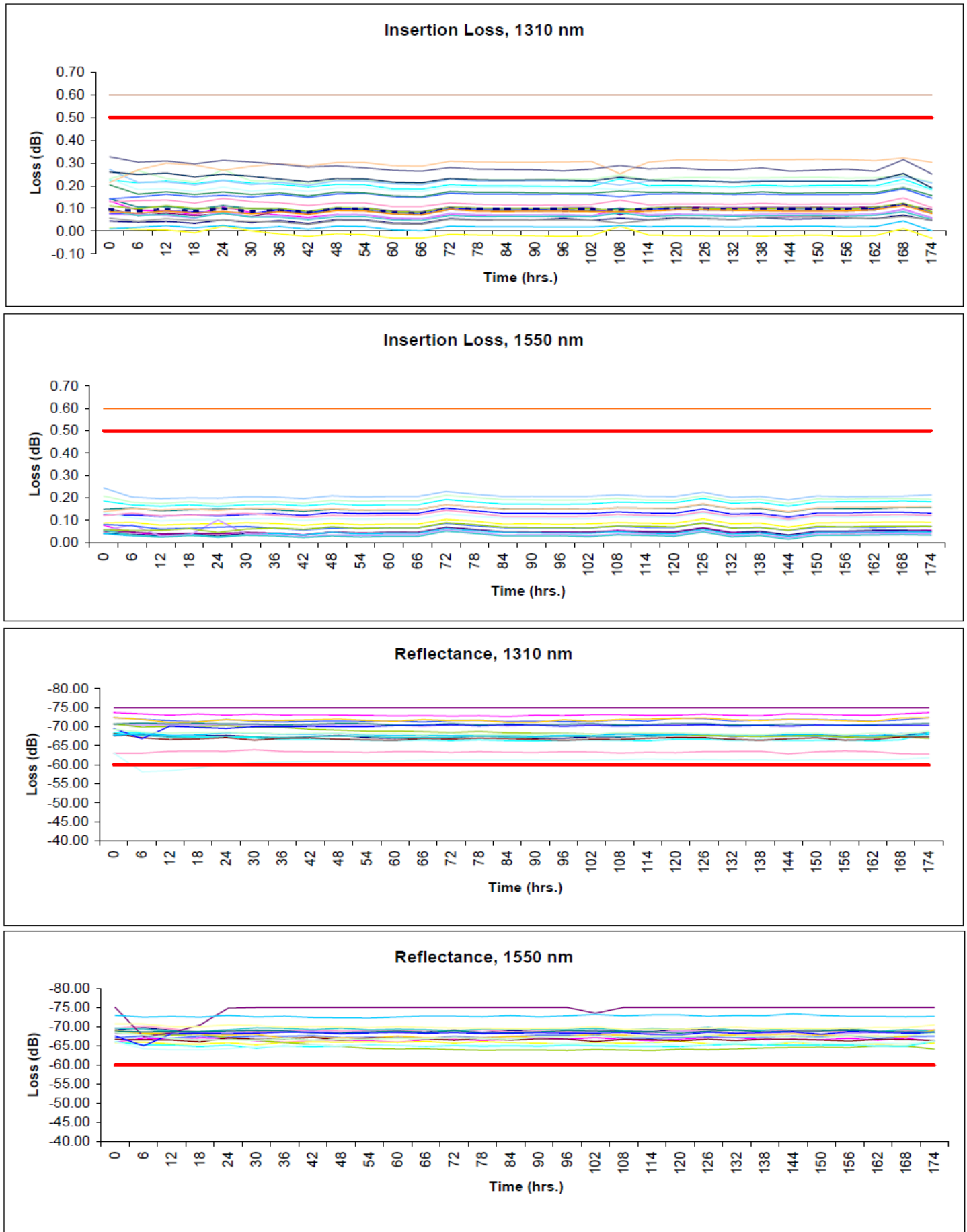
GR-1081 Section 4.4.2.1 – Thermal Age, 85°C uncontrolled Humidity 168 hours



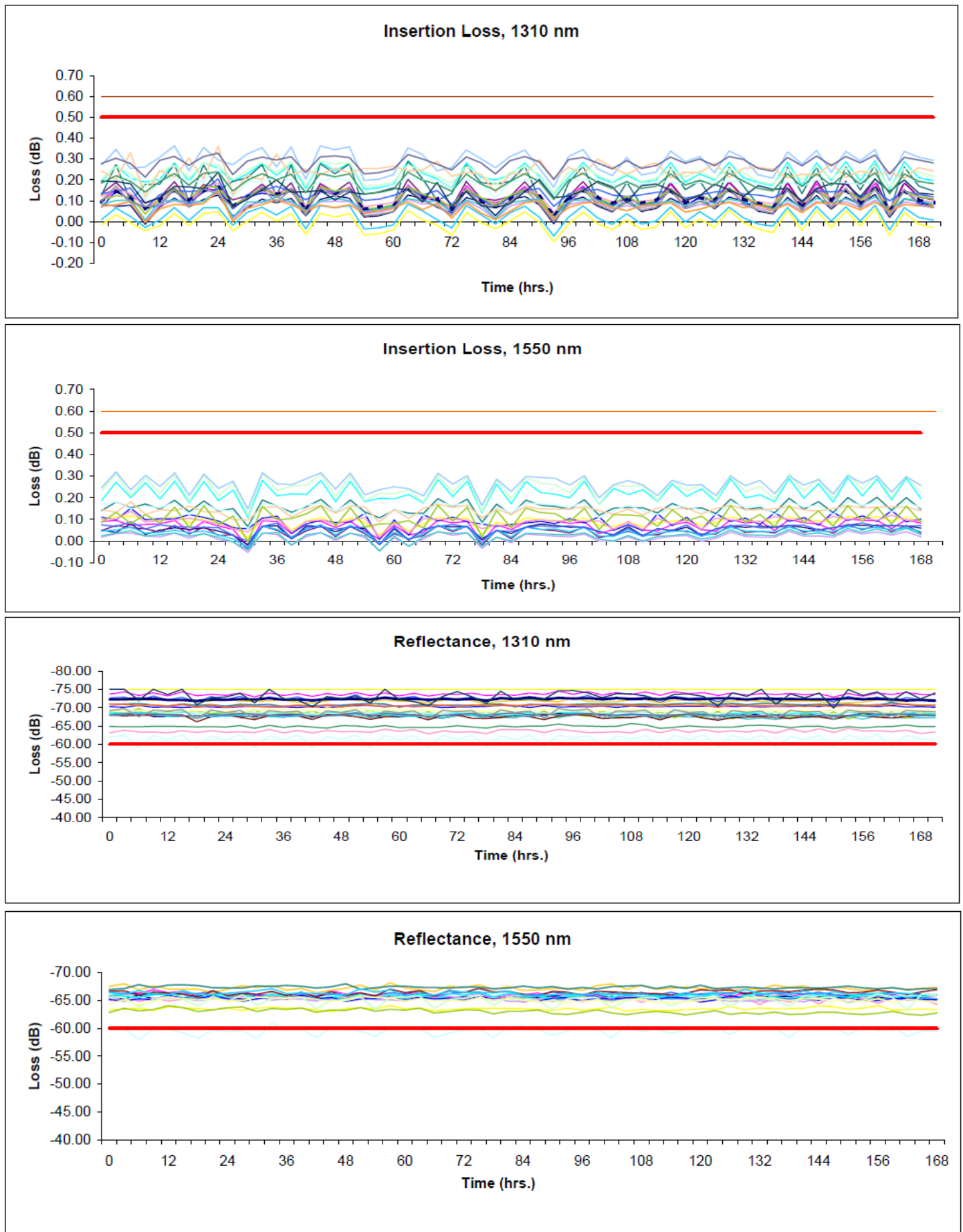
GR-1081 Section 4.4.2.2 – Thermal Cycle, 75°C to -40°C uncontrolled Humidity 168 hours



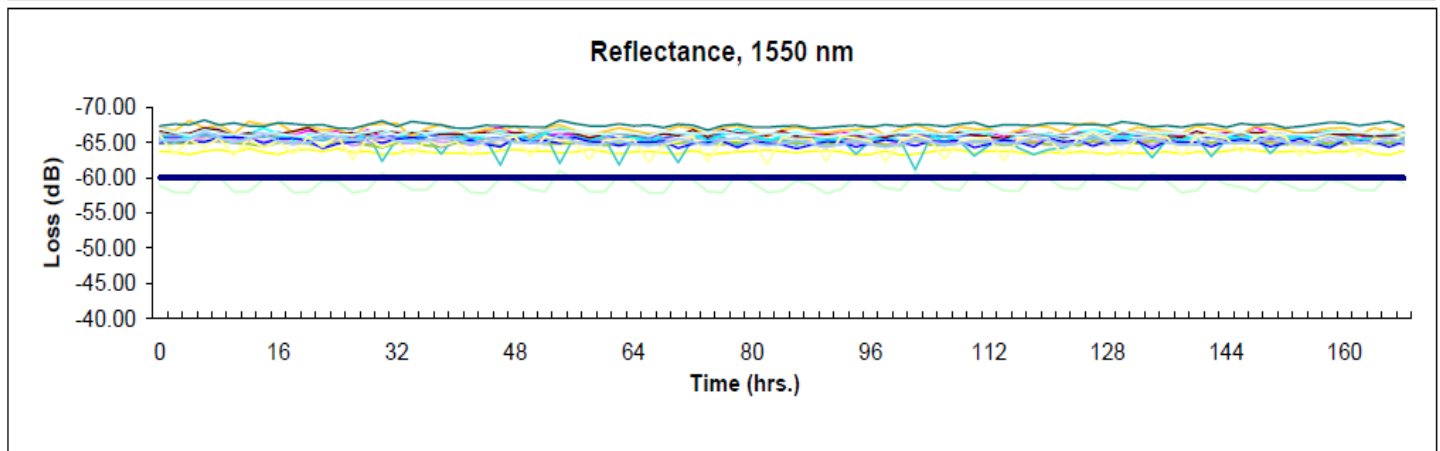
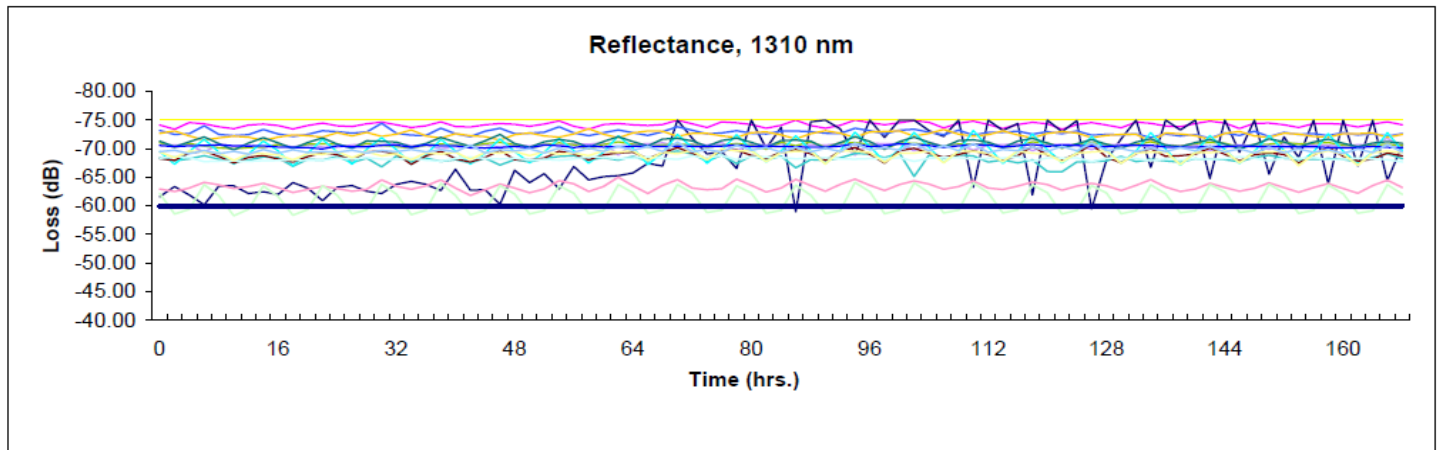
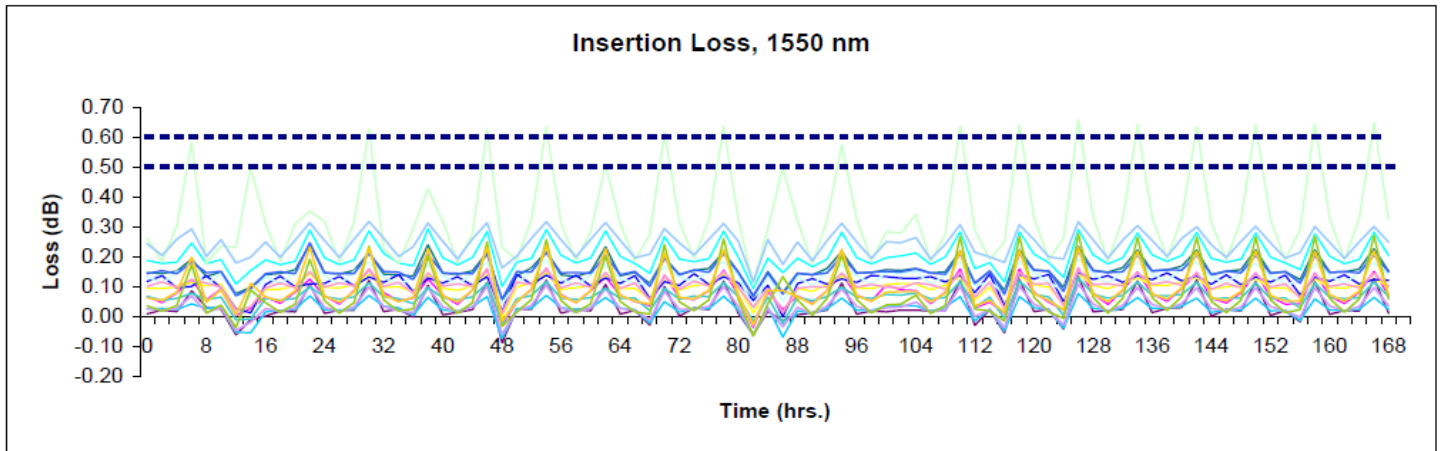
GR-1081 Section 4.4.2.3– Humidity Age, 75°C with 95% RH 168 hours



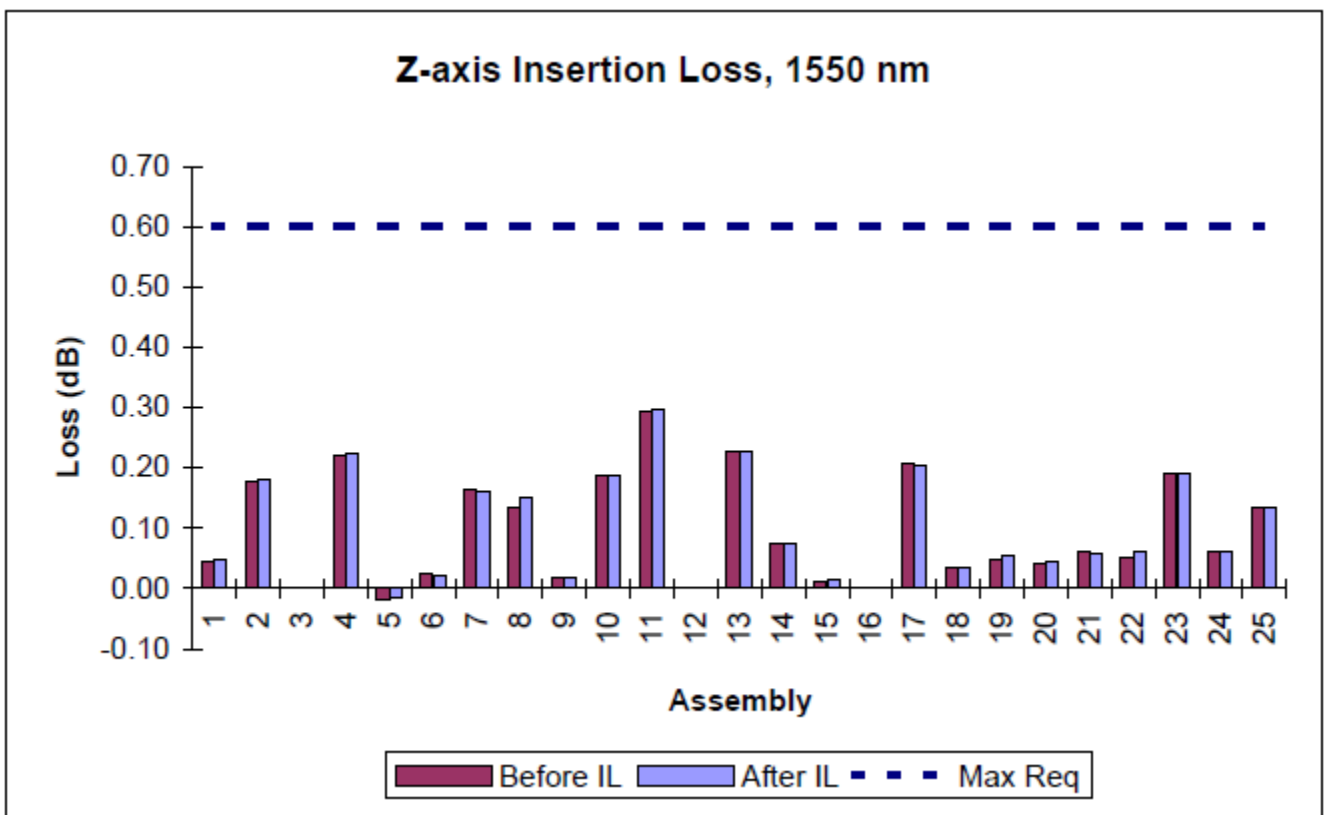
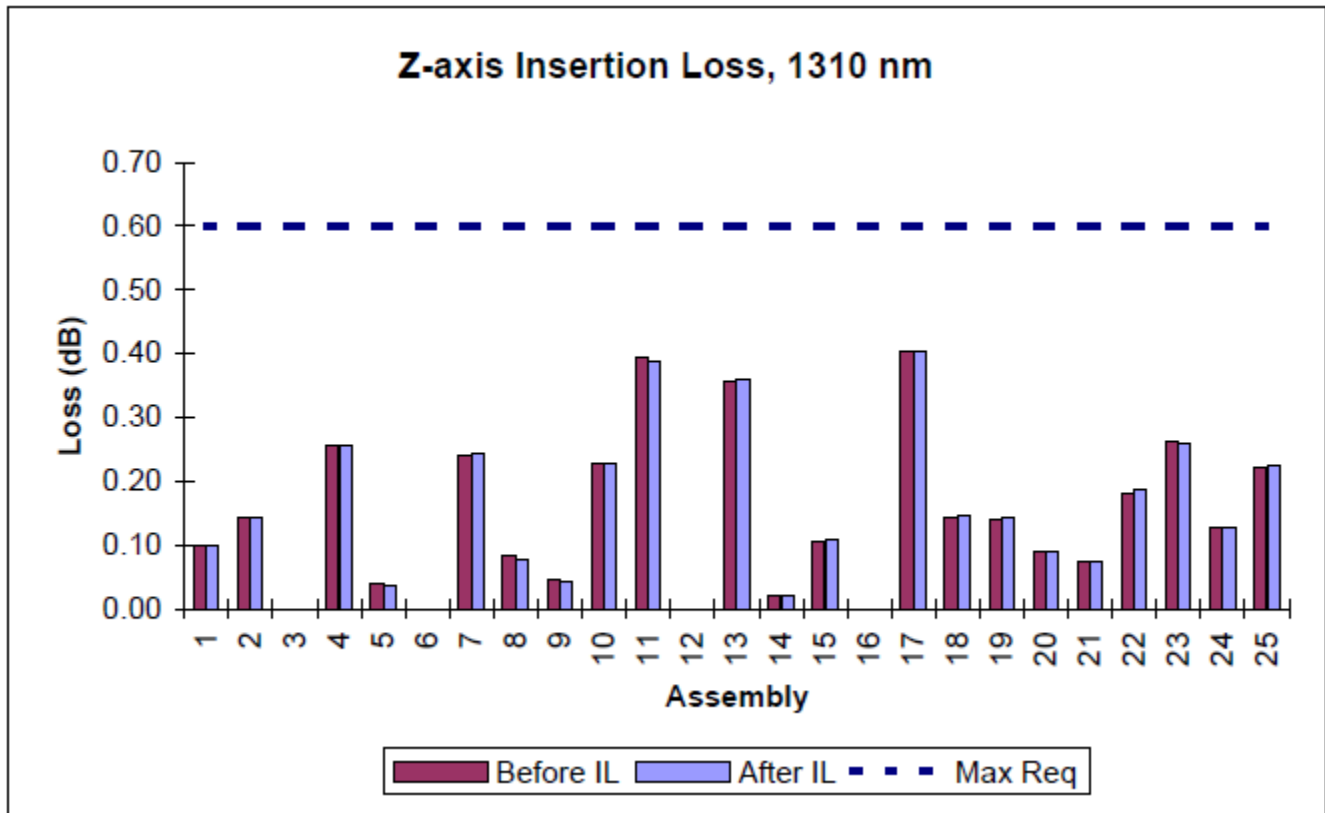
GR-1081 Section 4.4.2.4– Humidity Condensation Cycle, -10°C to 65°C 168 hours

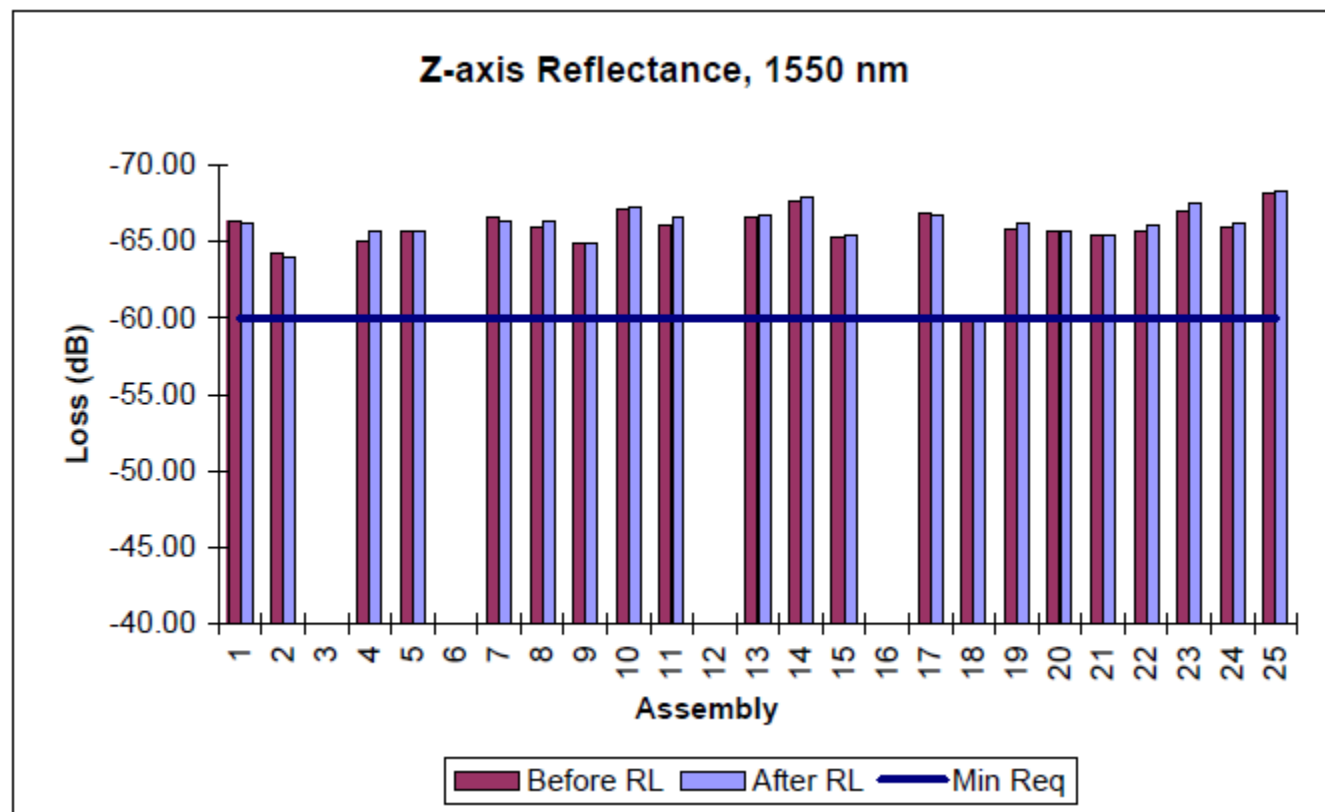
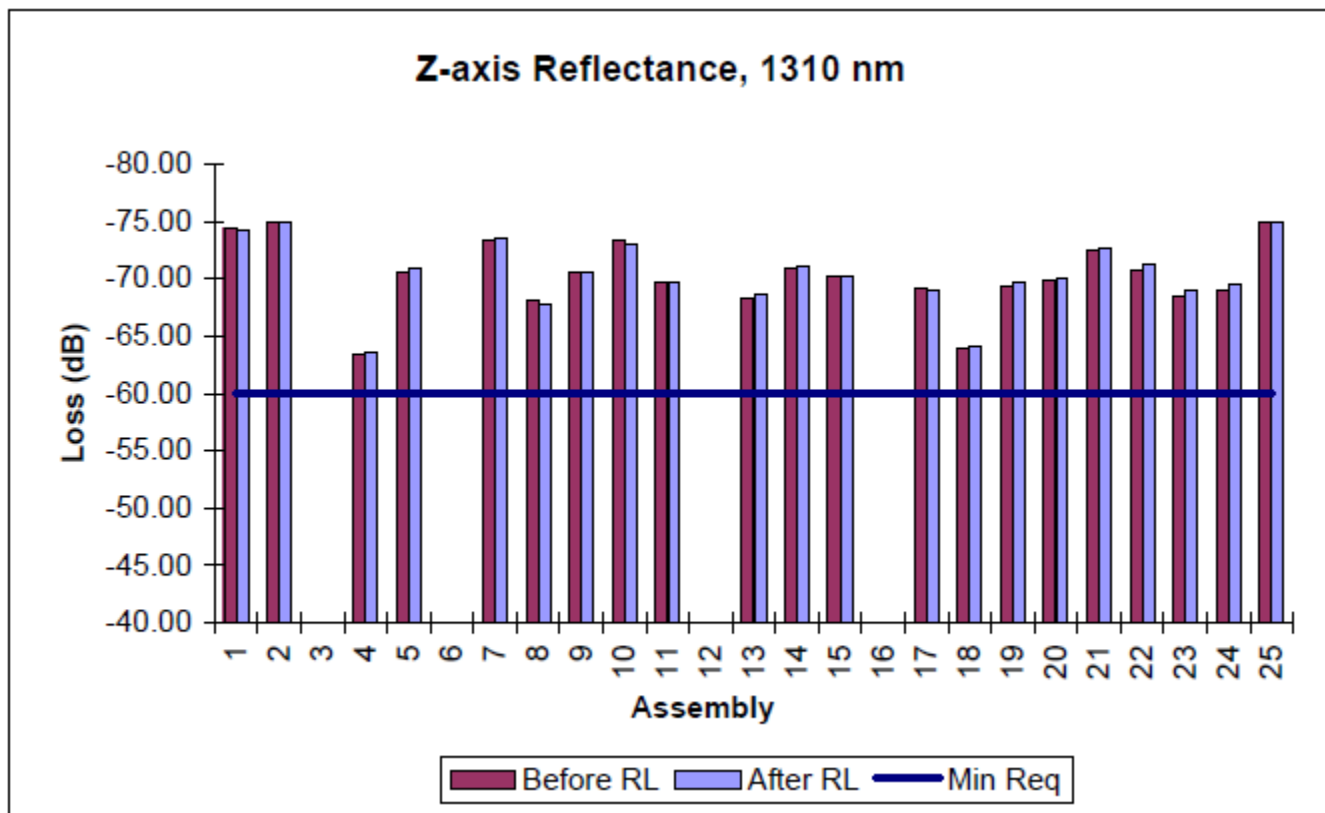


GR-1081 Section 4.4.2.6– Post Condensation Thermal Cycle, 75°C to -40°C 168 hours

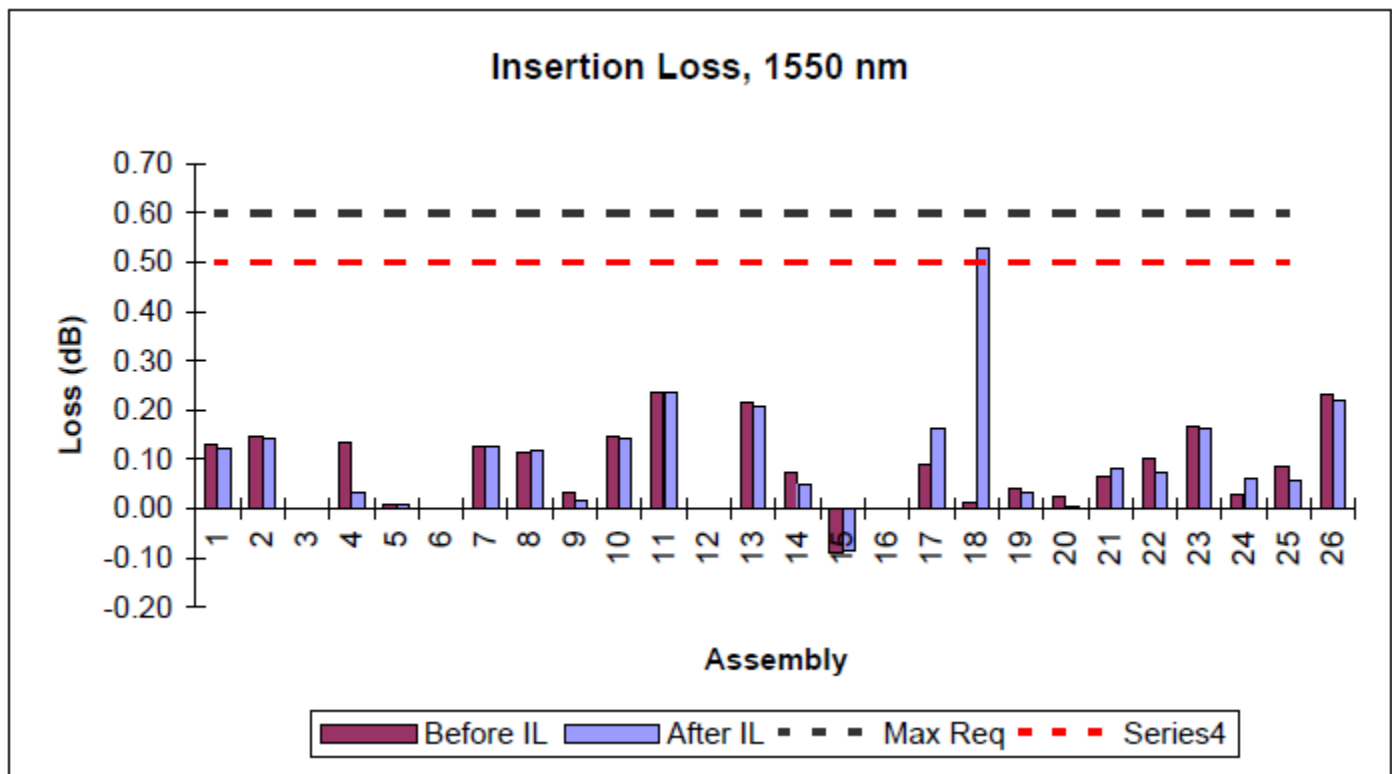
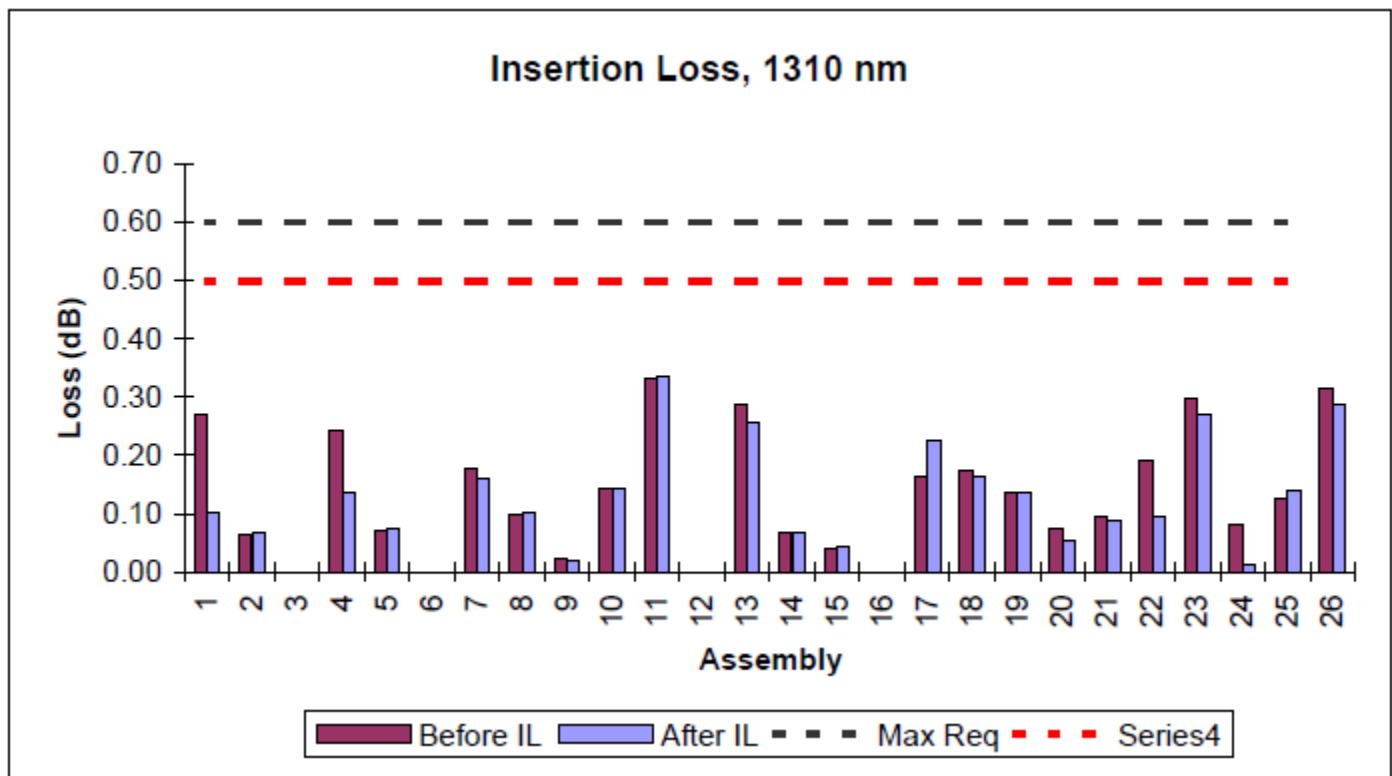


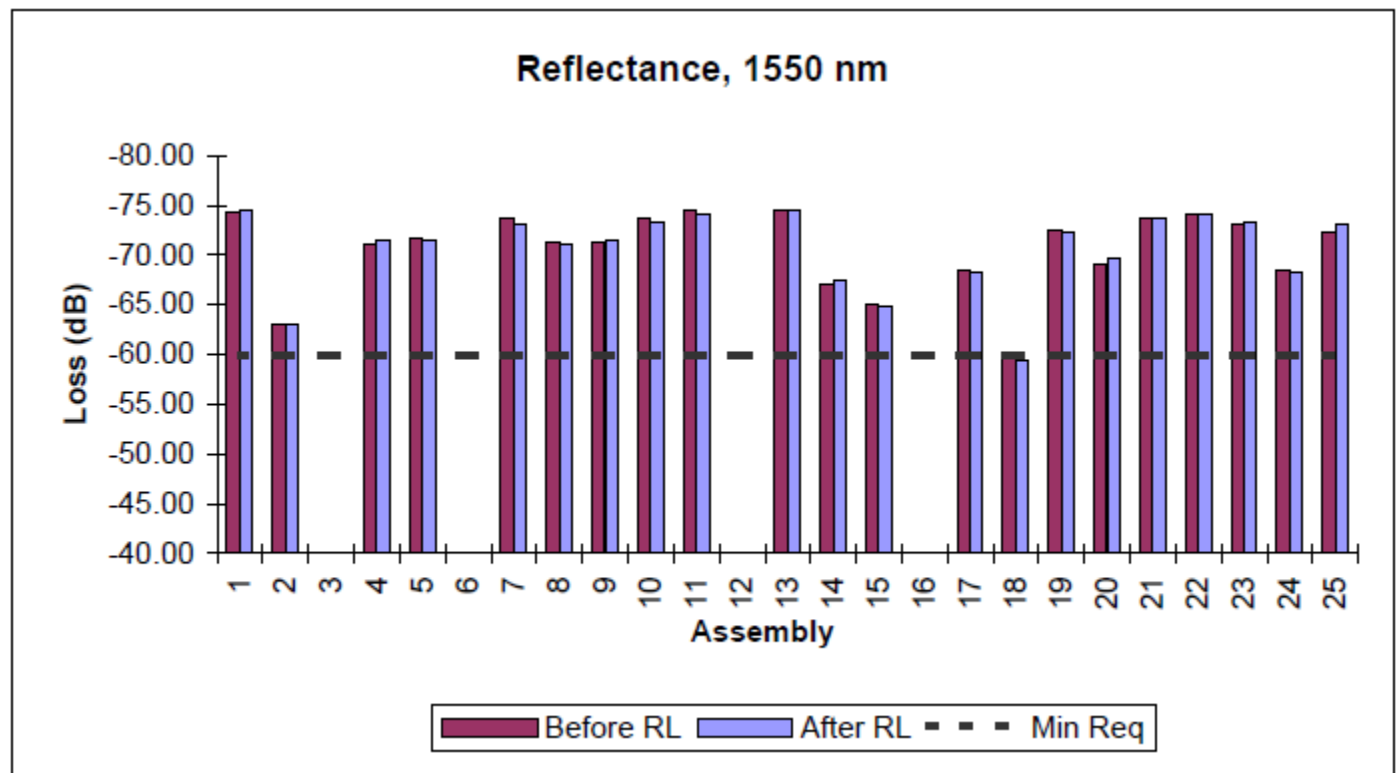
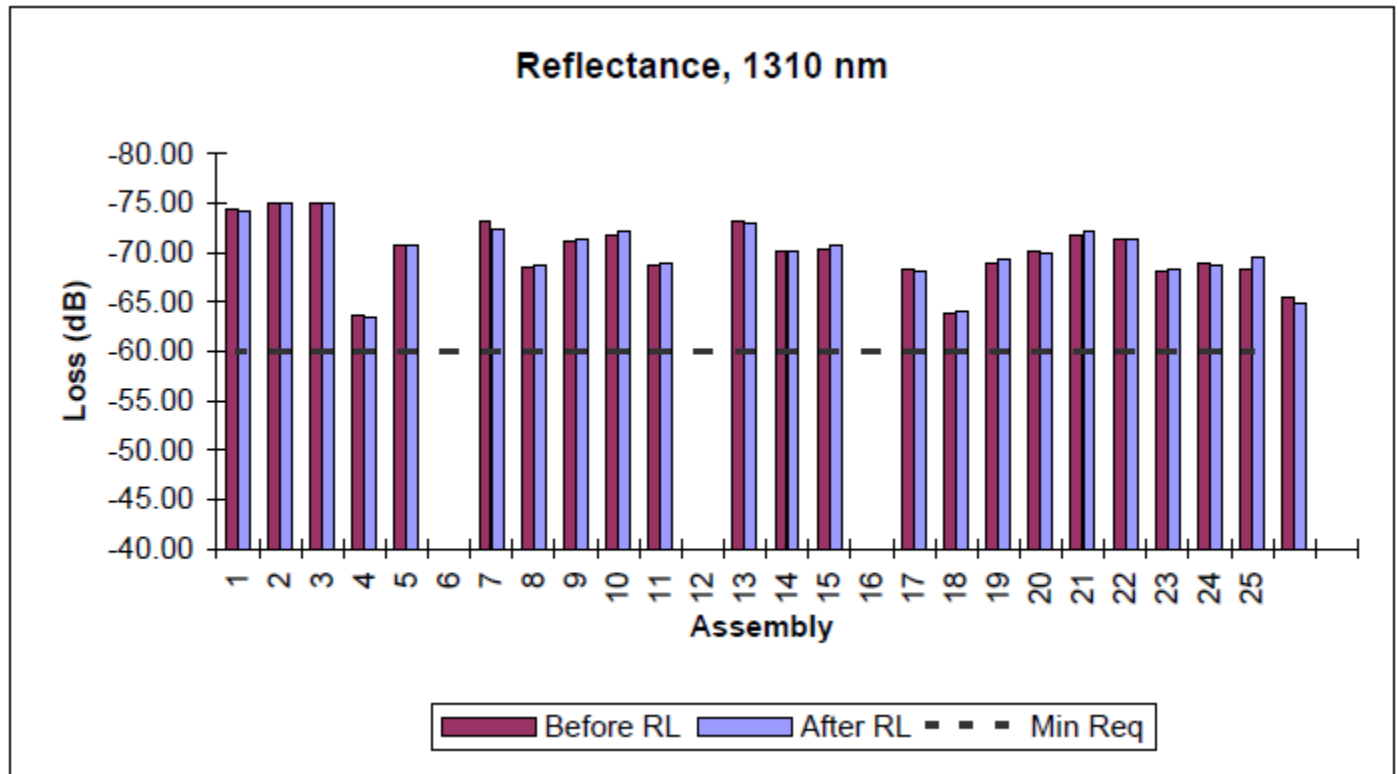
GR-1081 Section 4.4.3.1– Vibration Summary, Final Reading Z-Axis





GR-1081 Section 4.4.3.3– Twist Test





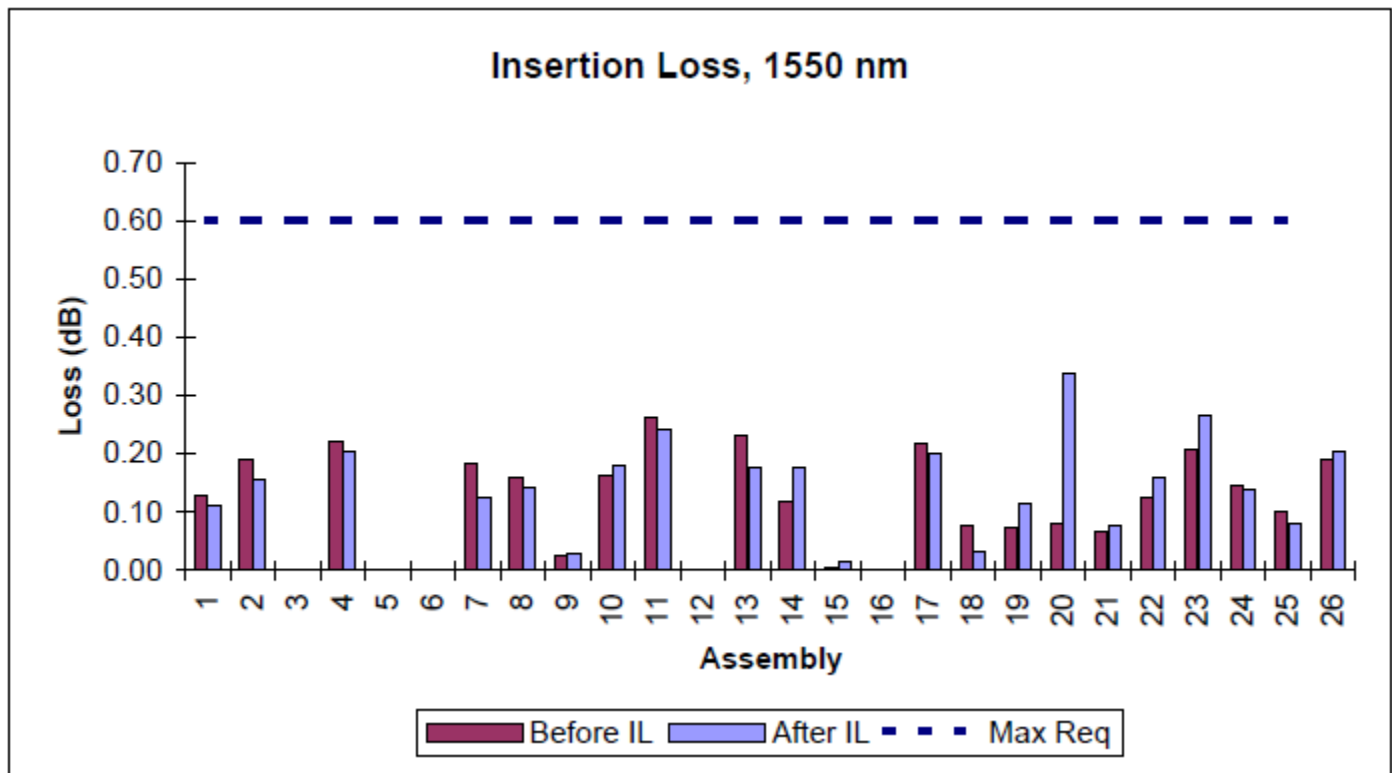
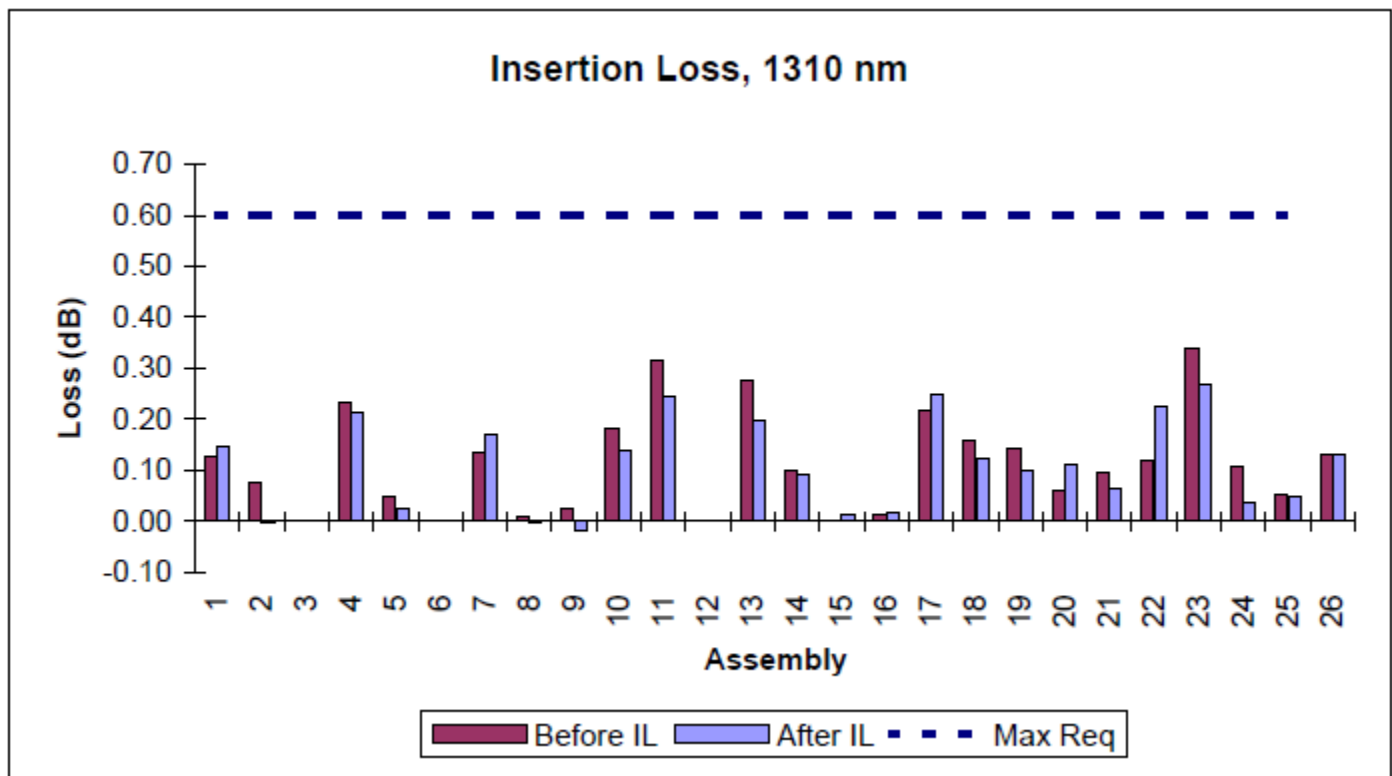
GR-1081 Section 4.4.3.5– Transmission with Applied Load Test Summary

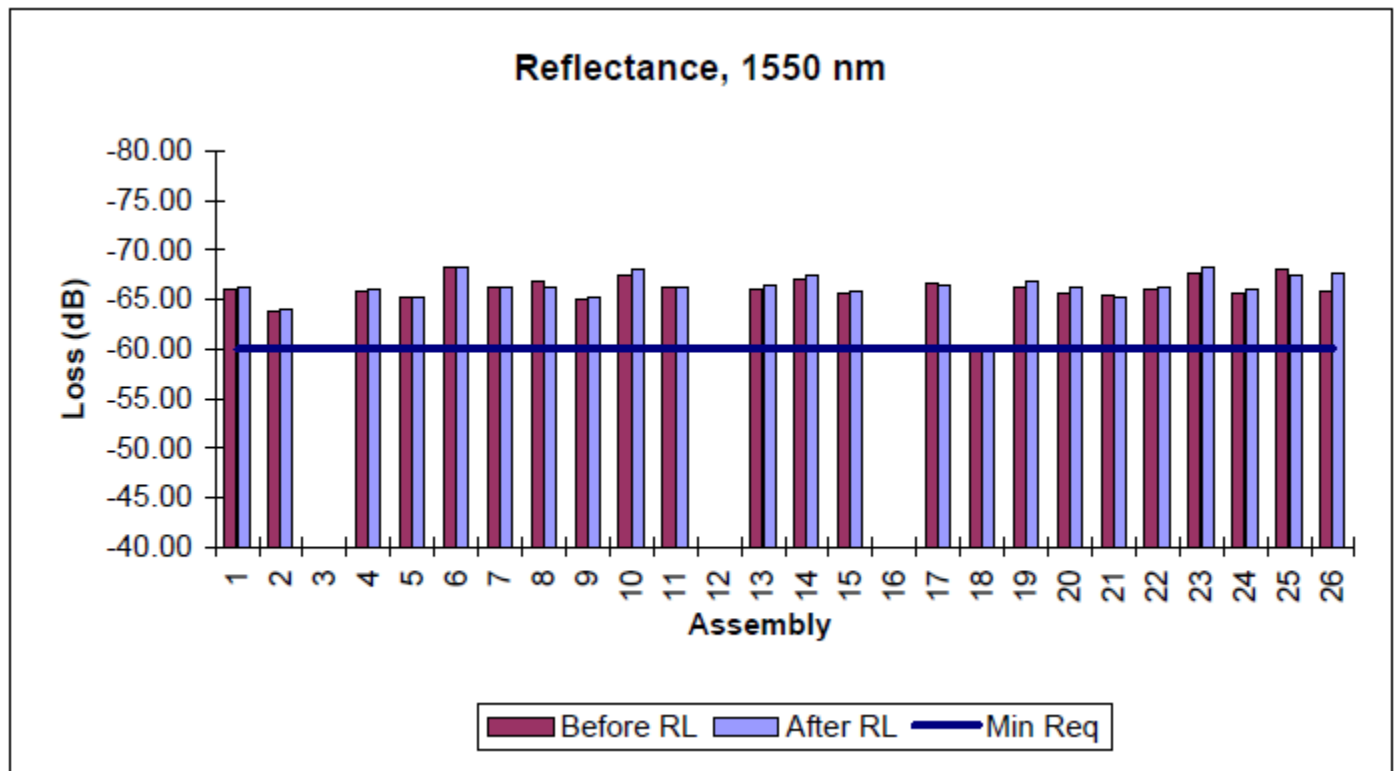
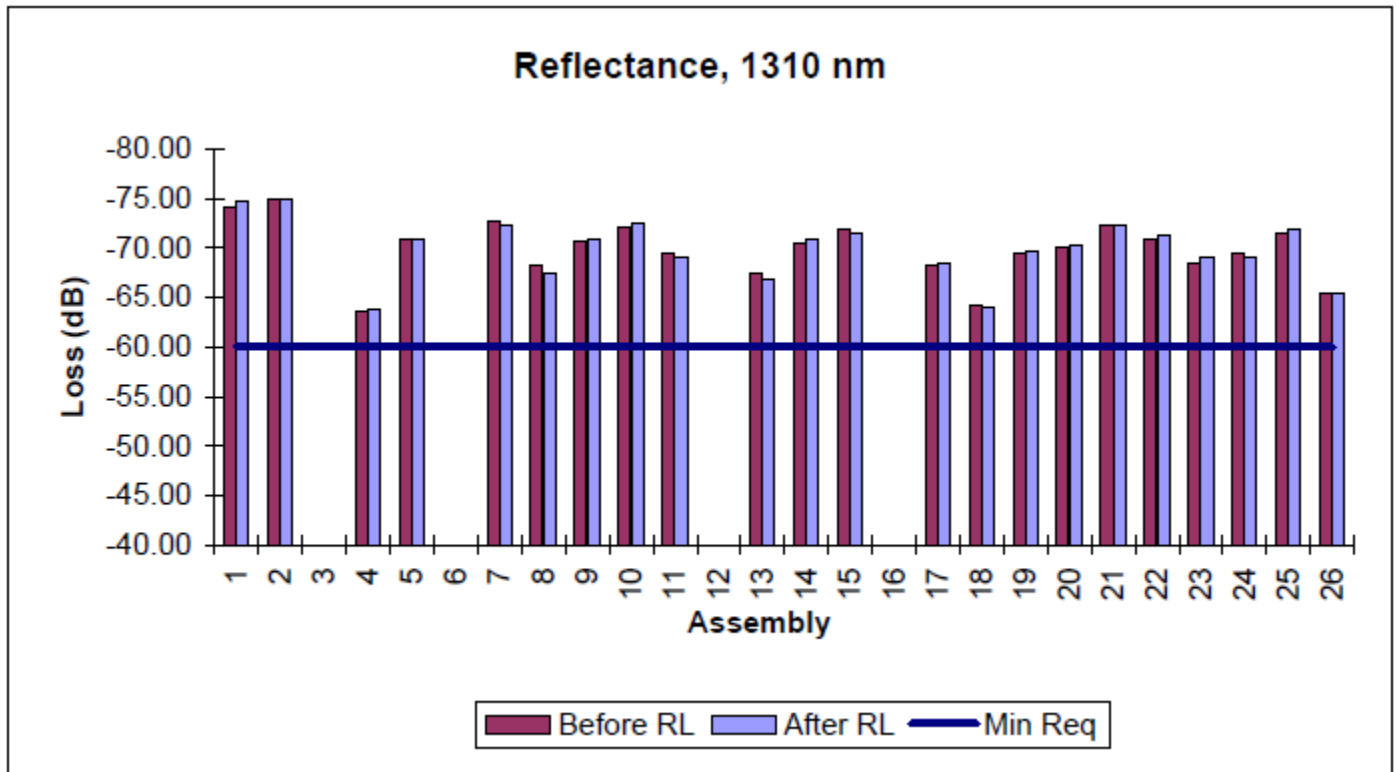
Note: Summary shows non compliances with R30 fiber type.
Fiber types R15, R7.5 and R5 were compliant.

Data Sheet Summary

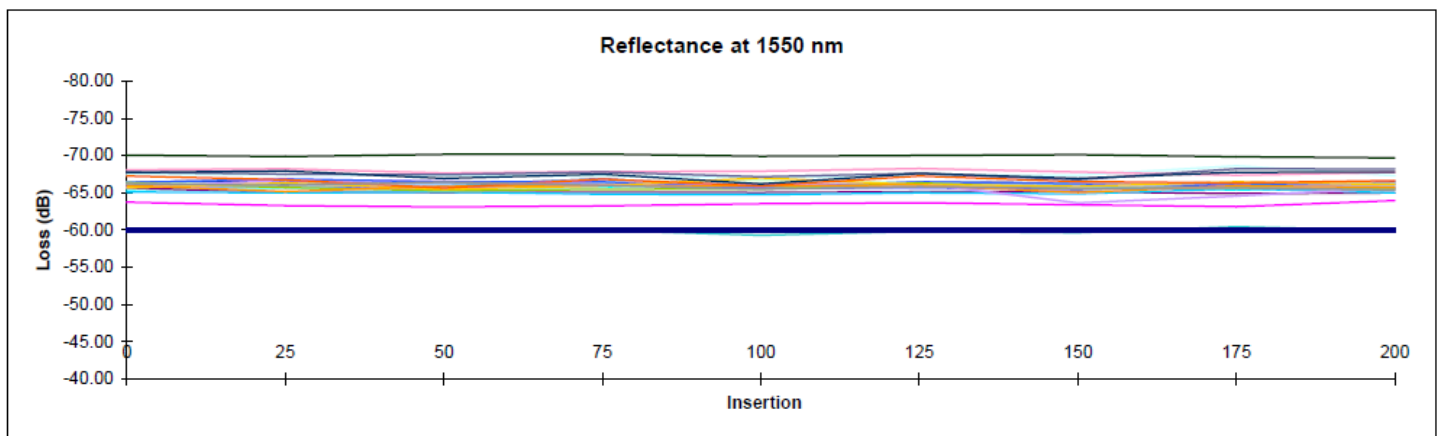
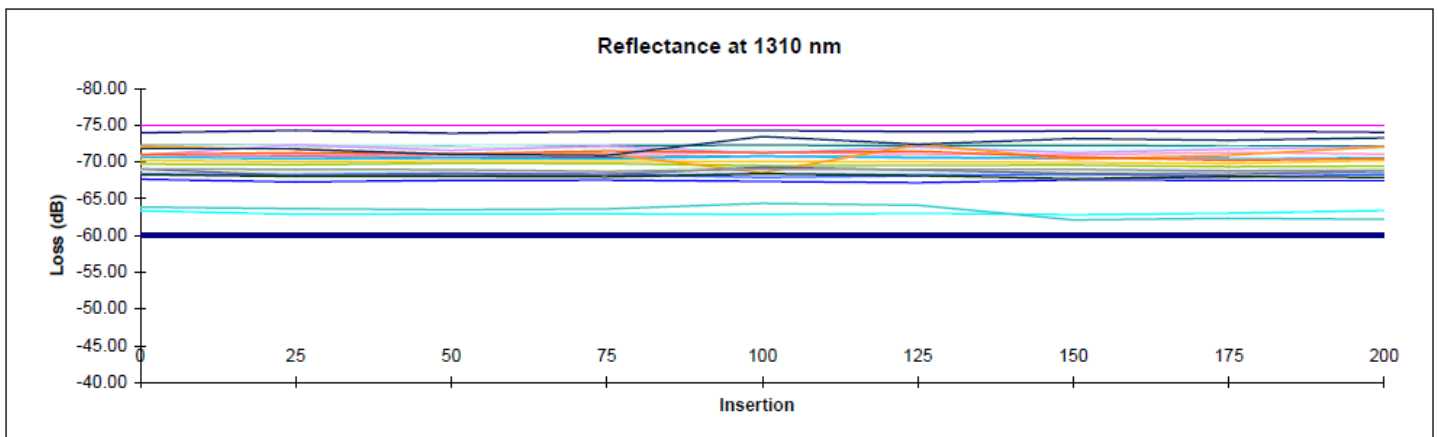
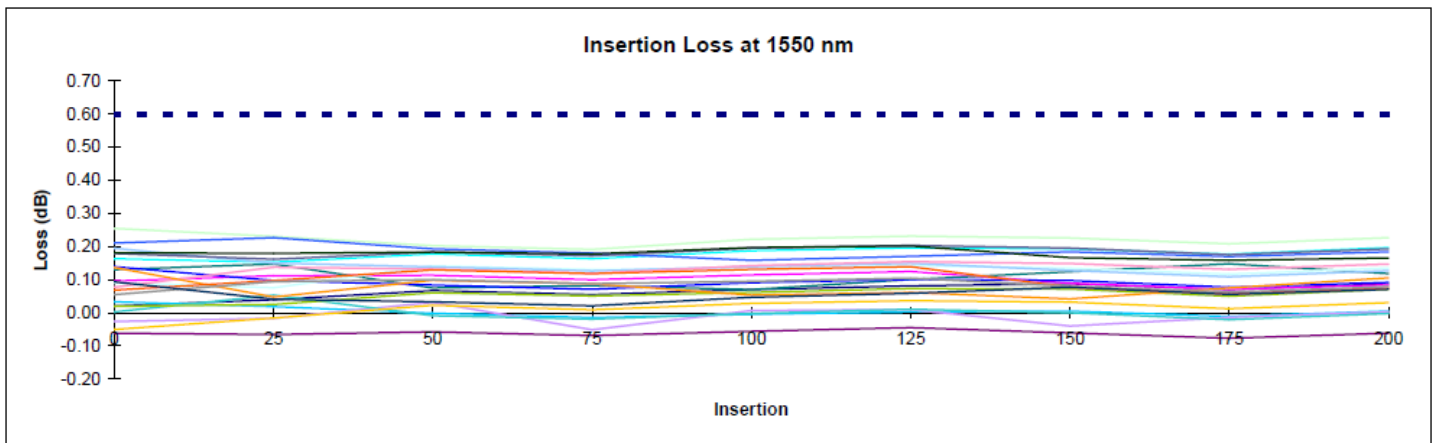
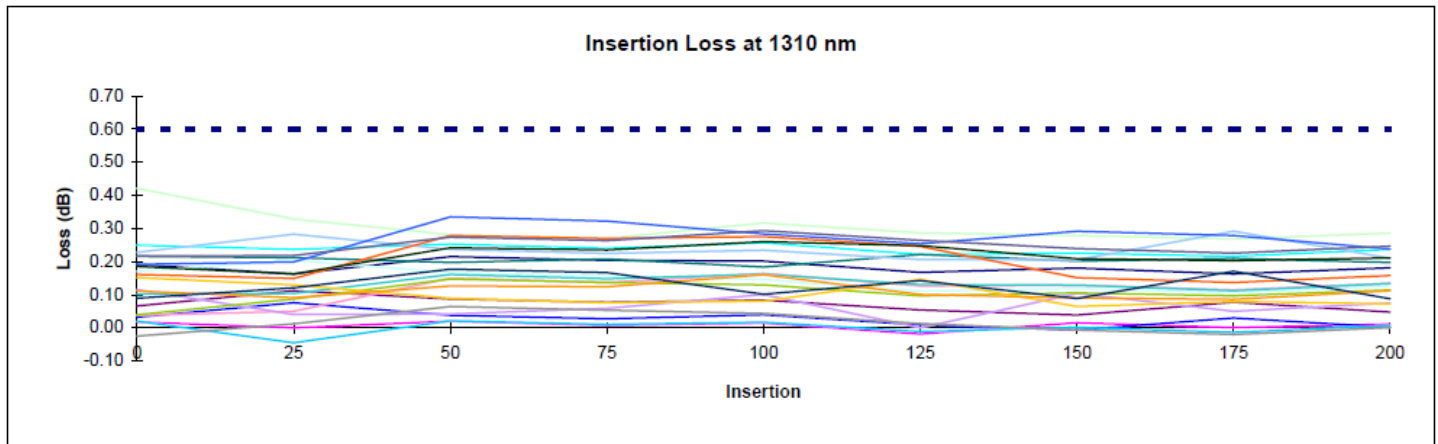
1310 nm				1490 nm			
Max IL Inc	0	90	135	Max IL Inc	0	90	135
0.25	0.17	0.25	0.56	0.25	0.08	0.44	0.70
0.70	0.10	1.23	////	0.70	0.08	1.14	////
1.50	////	////	////	1.50	////	////	////
2.00	////	////	////	2.00	////	////	////
Max RL	0	90	135	Max RL	0	90	135
0.25	-63.47	-63.47	-63.71	0.25	-61.71	-61.98	-61.49
0.70	-63.76	-63.60	////	0.70	-61.52	-61.54	////
1.50	////	////	////	1.50	////	////	////
2.00	////	////	////	2.00	////	////	////
Max RL Inc	0	90	135	Max RL Inc	0	90	135
0.25	0.40	0.28	0.45	0.25	0.67	0.90	0.48
0.70	0.49	1.15	////	0.70	0.94	1.58	////
1.50	////	////	////	1.50	////	////	////
2.00	////	////	////	2.00	////	////	////
1550 nm				1625 nm			
Max IL Inc	0	90	135	Max IL Inc	0	90	135
0.25	0.11	0.13	0.83	0.25	0.07	0.35	1.30
0.70	0.11	1.01	////	0.70	0.07	1.08	////
1.50	////	////	////	1.50	////	////	////
2.00	////	////	////	2.00	////	////	////
Max RL	0	90	135	Max RL	0	90	135
0.25	-63.24	-63.29	-63.51	0.25	-61.46	-61.62	-61.94
0.70	-63.35	-63.23	////	0.70	-61.43	-61.73	////
1.50	////	////	////	1.50	////	////	////
2.00	////	////	////	2.00	////	////	////
Max RL Inc	0	90	135	Max RL Inc	0	90	135
0.25	0.79	0.94	0.31	0.25	0.33	0.55	0.24
0.70	0.92	0.38	////	0.70	0.36	0.32	////

GR-1081 Section 4.4.3.7– Impact Test

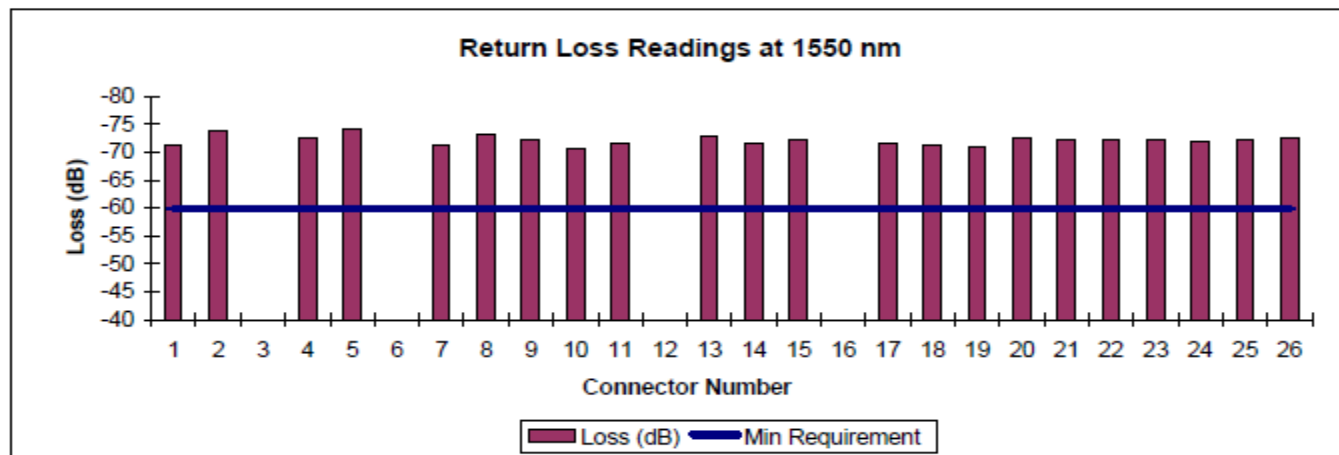
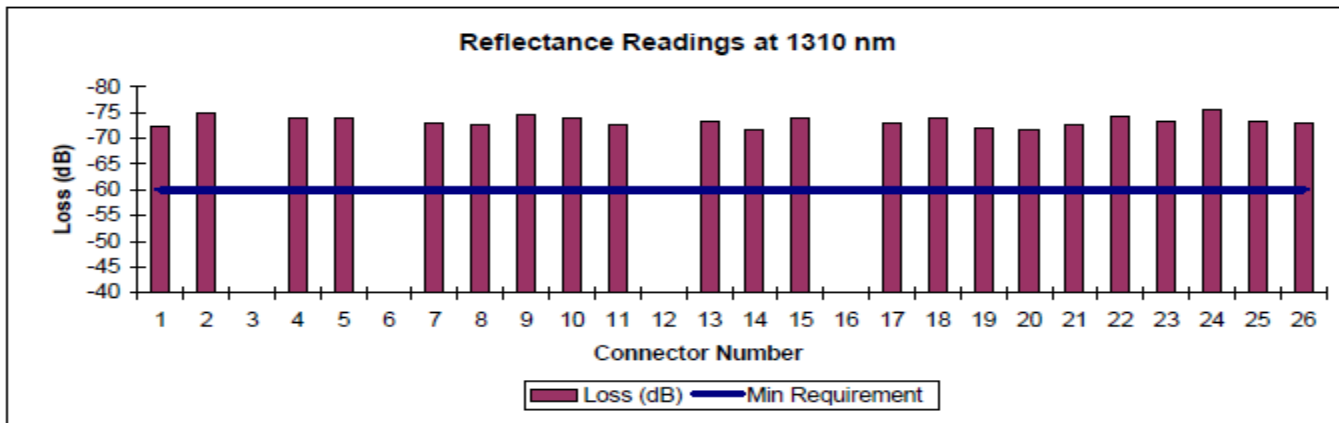
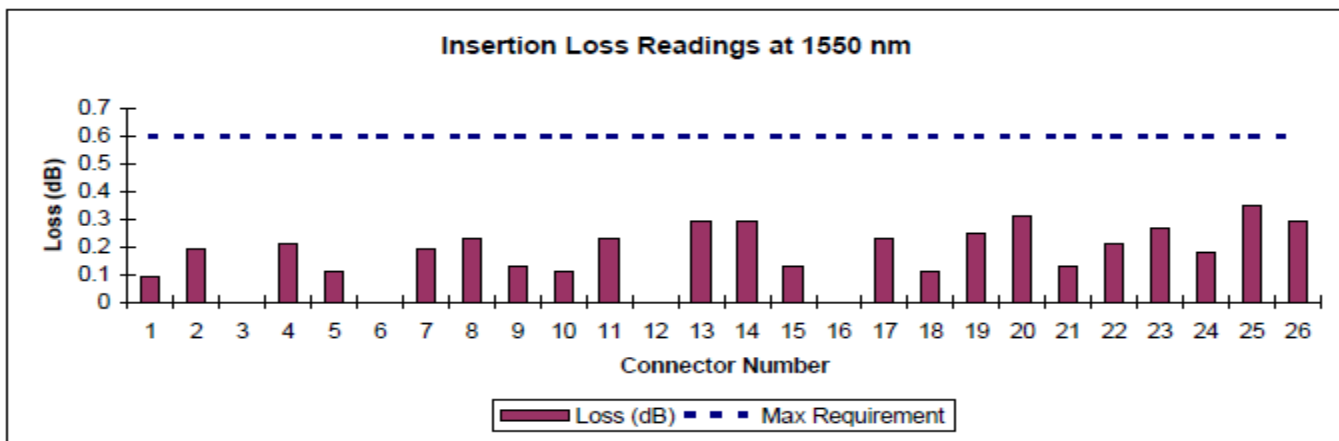
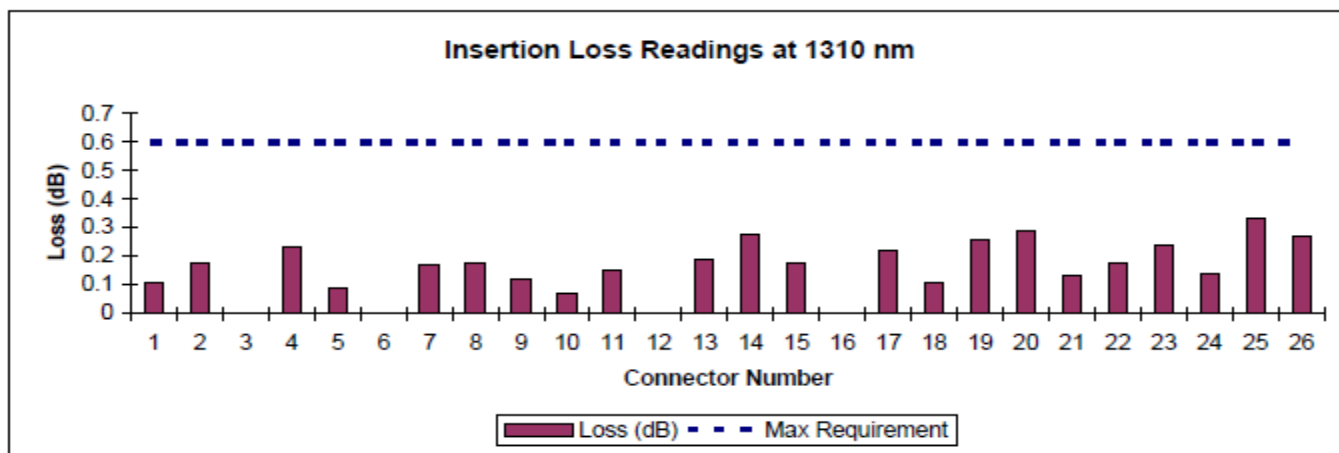


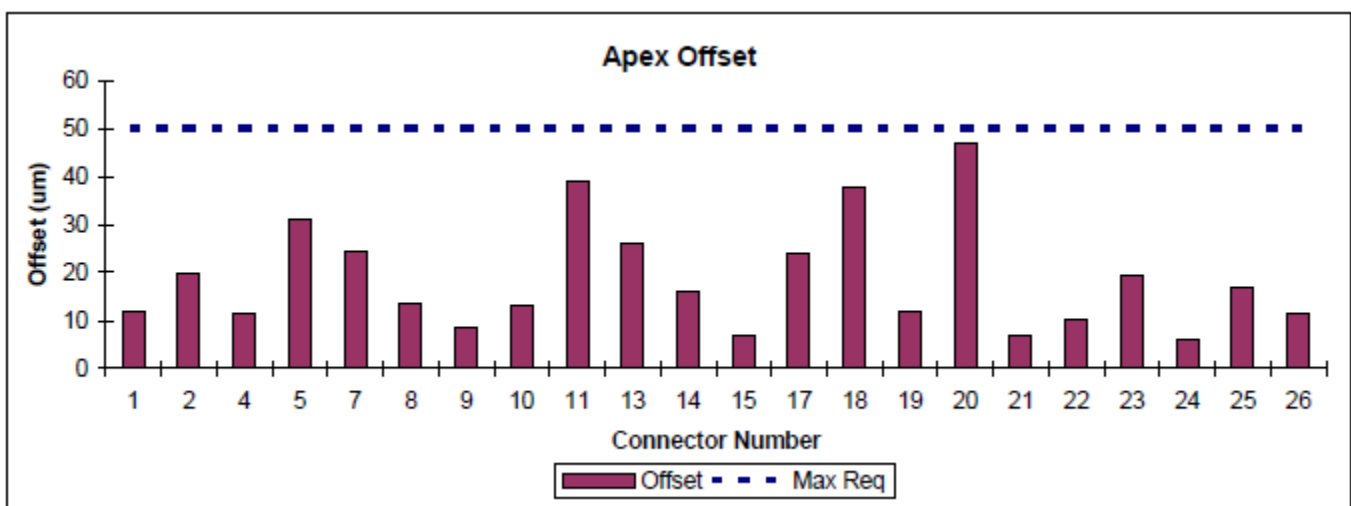
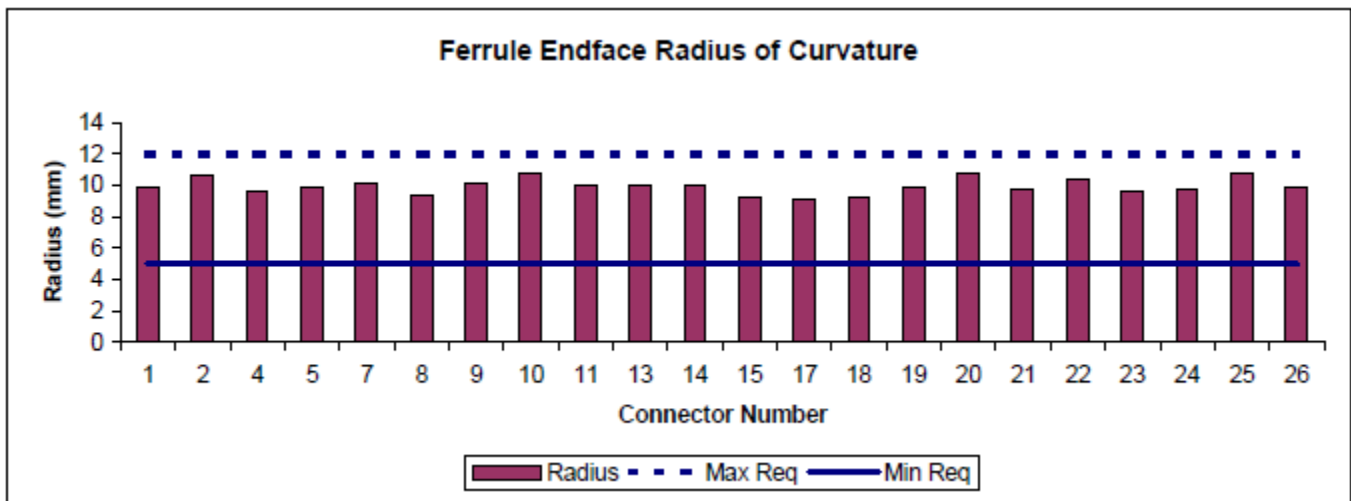
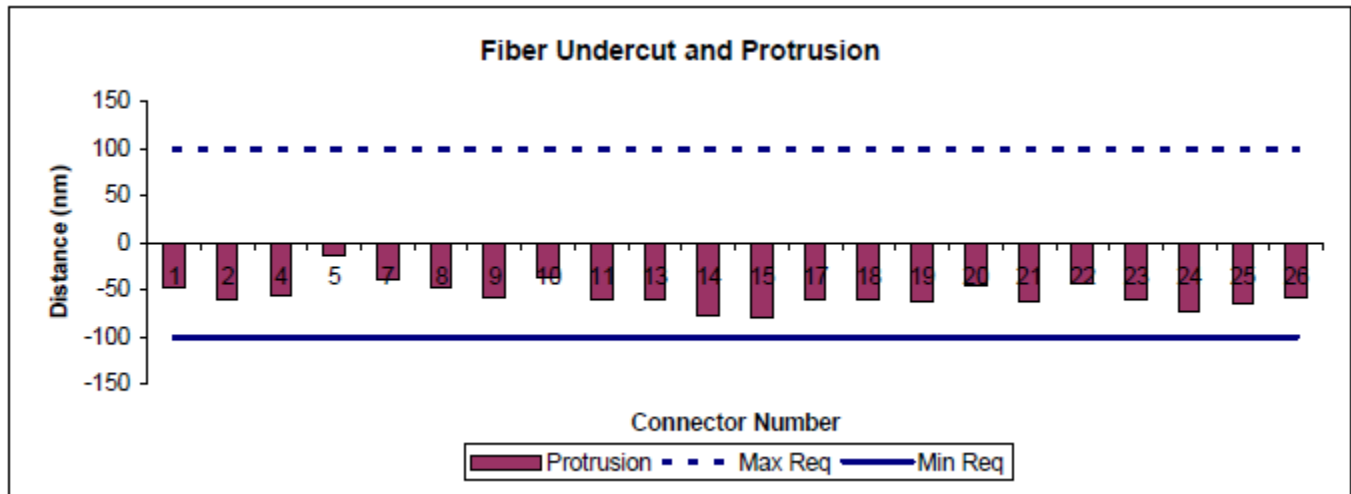


GR-1081 Section 4.4.3.8– Durability

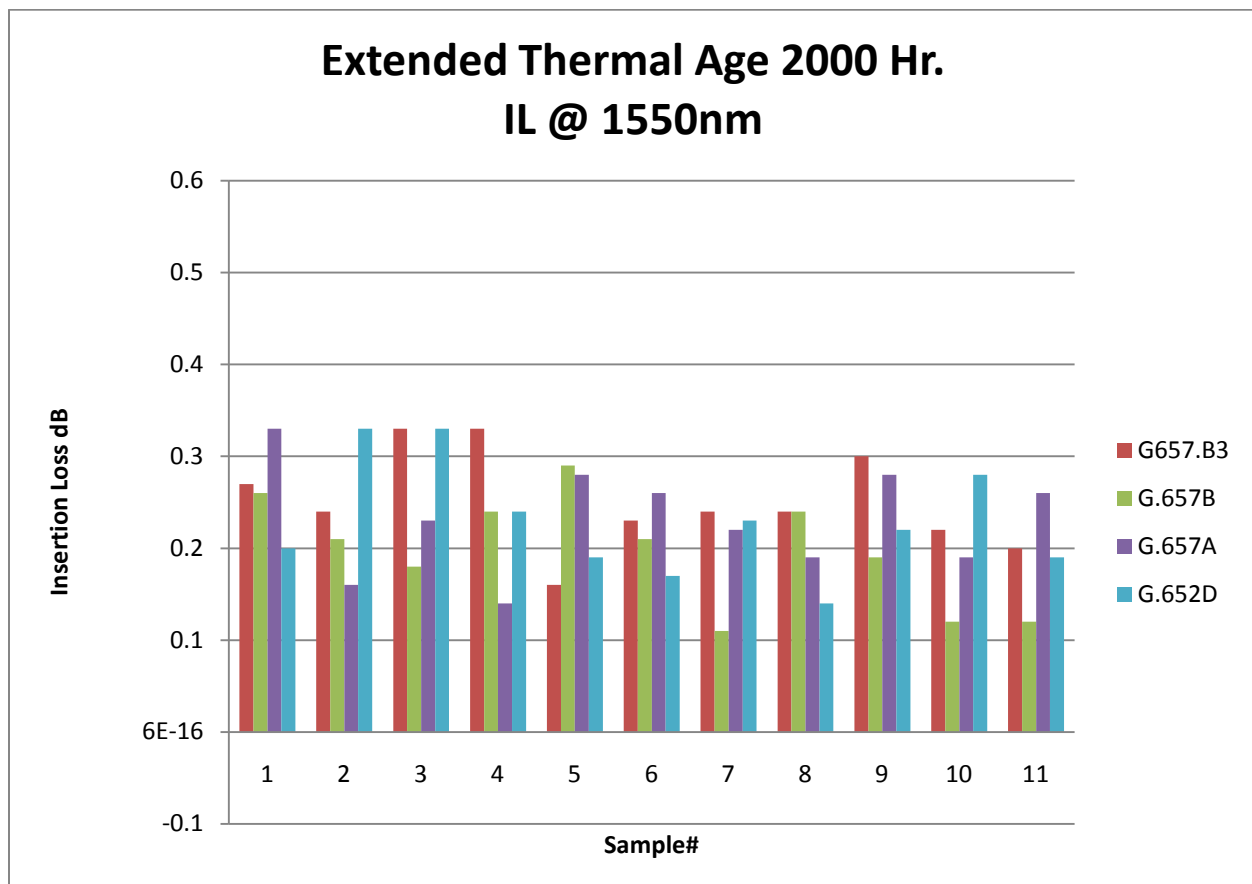
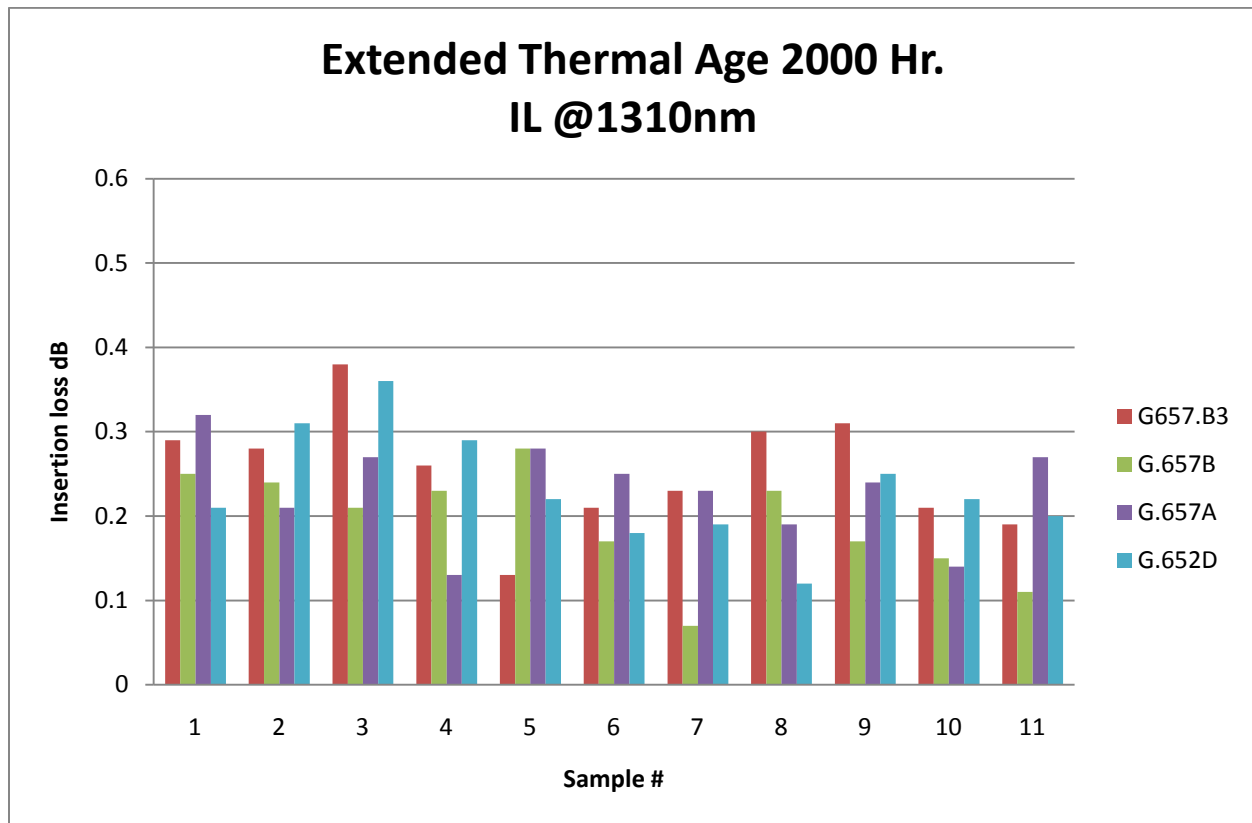


End of Test Criteria: IL, RL and Geometry

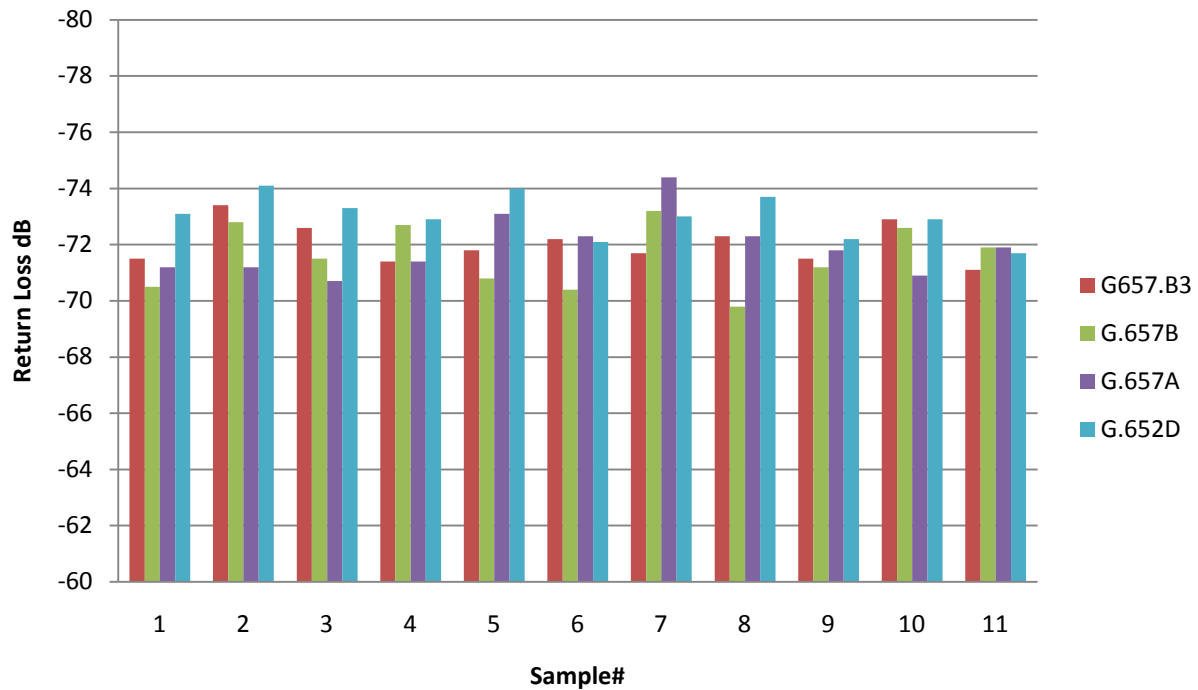




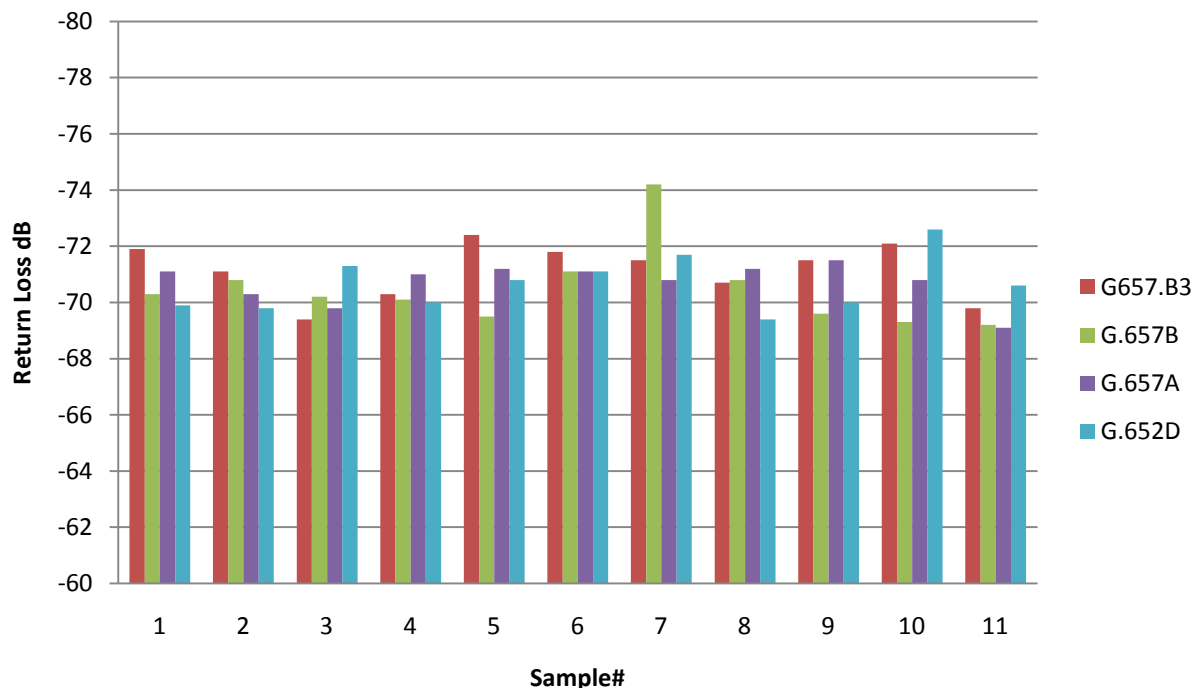
Ext Thermal Age (GR1221-6.2.4) - 85°C Uncontrolled Humidity, Duration: 2000 Hrs.



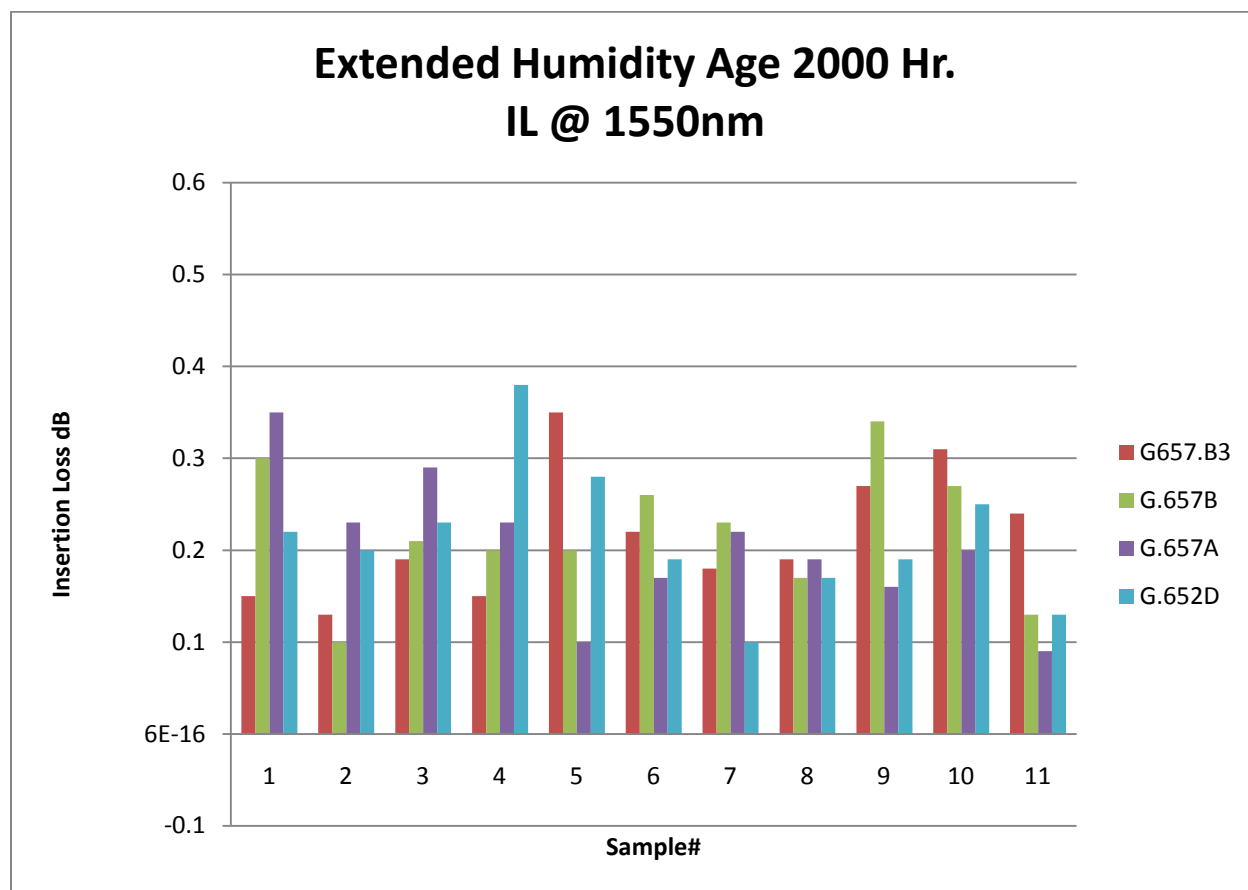
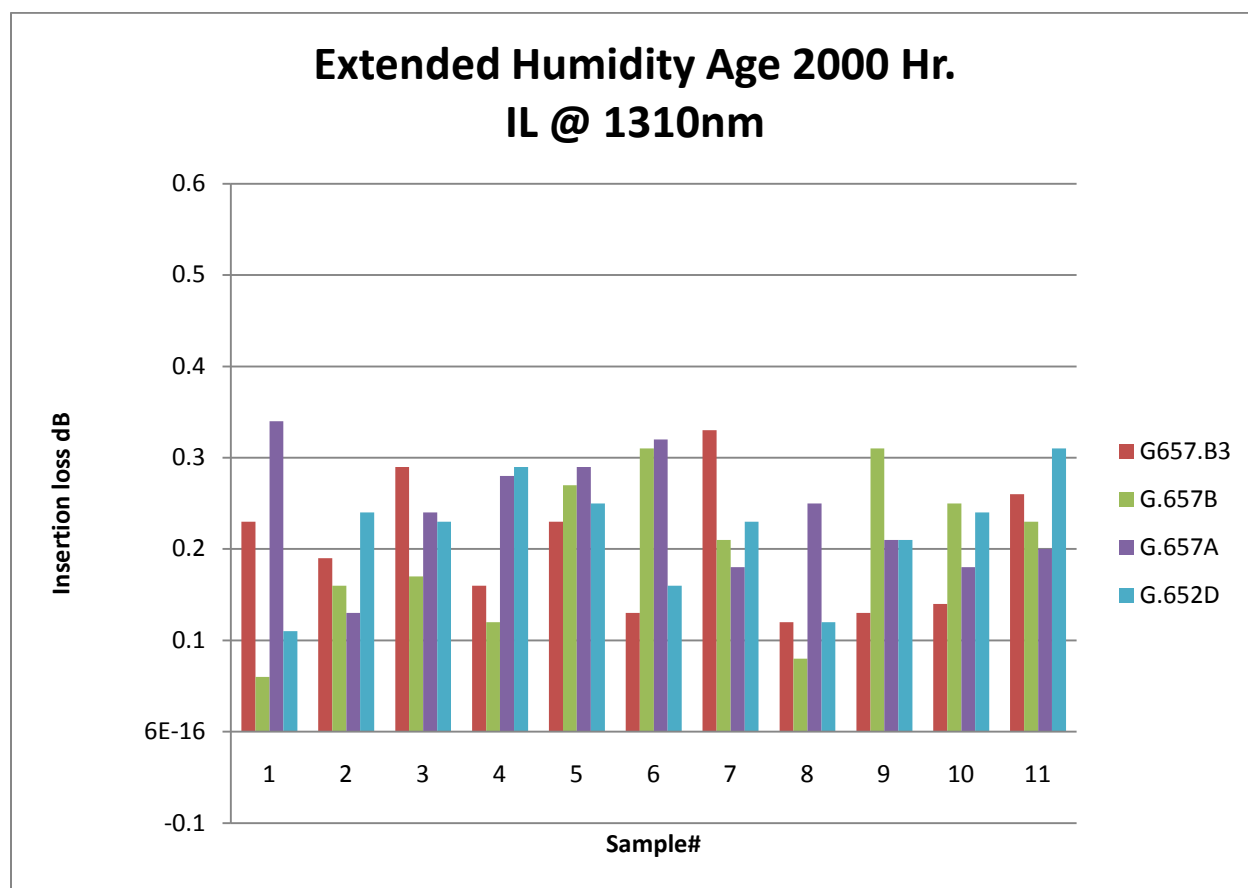
Extended Thermal Age 2000 hr. RL@1310nm



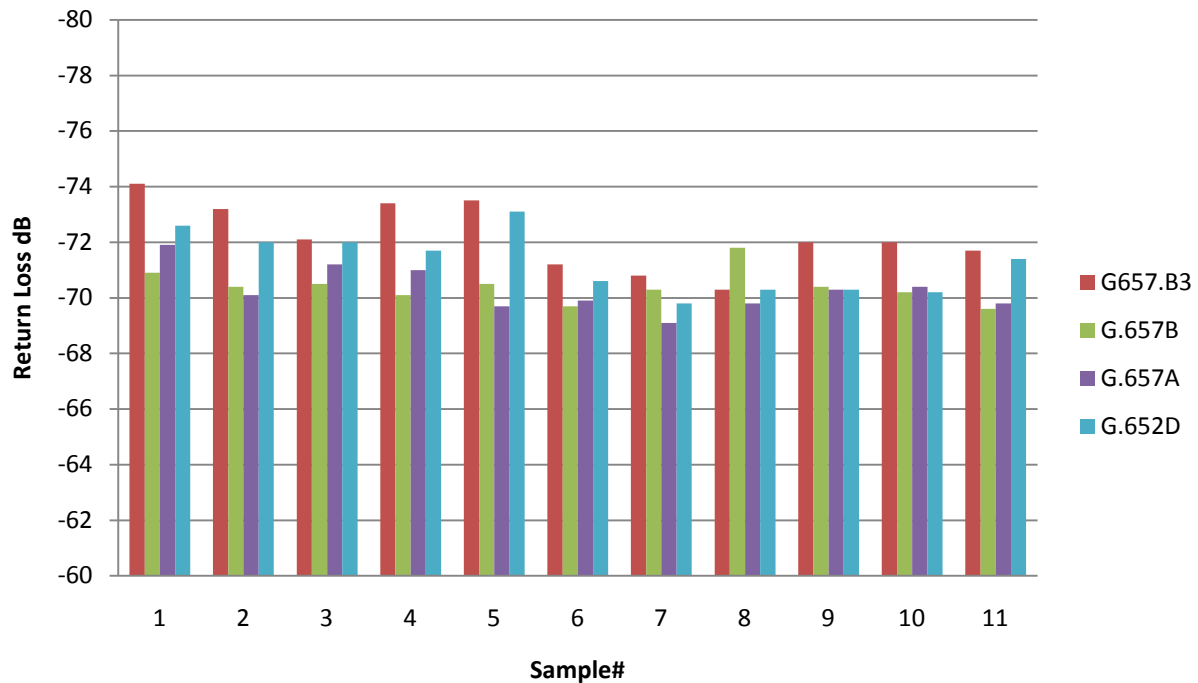
Extended Thermal Age 2000 Hr. RL @ 1550nm



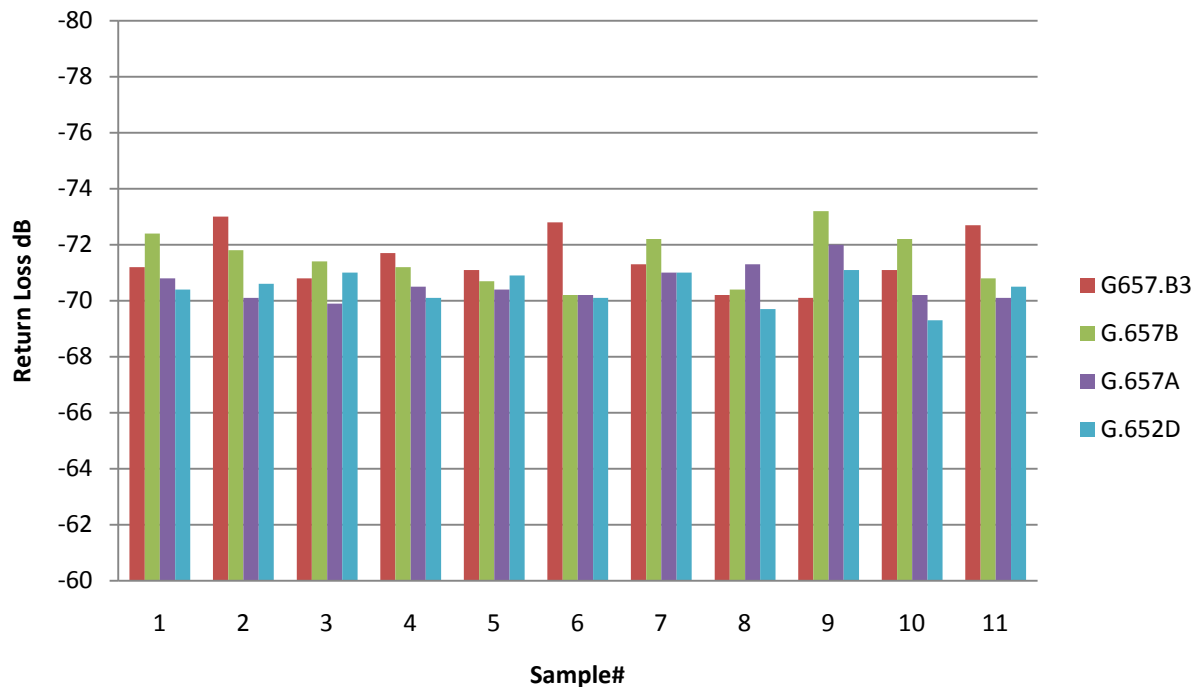
Ext Humidity Age (GR1221-6.2.5) - 75°C with 95% RH, Duration: 2000 Hrs.



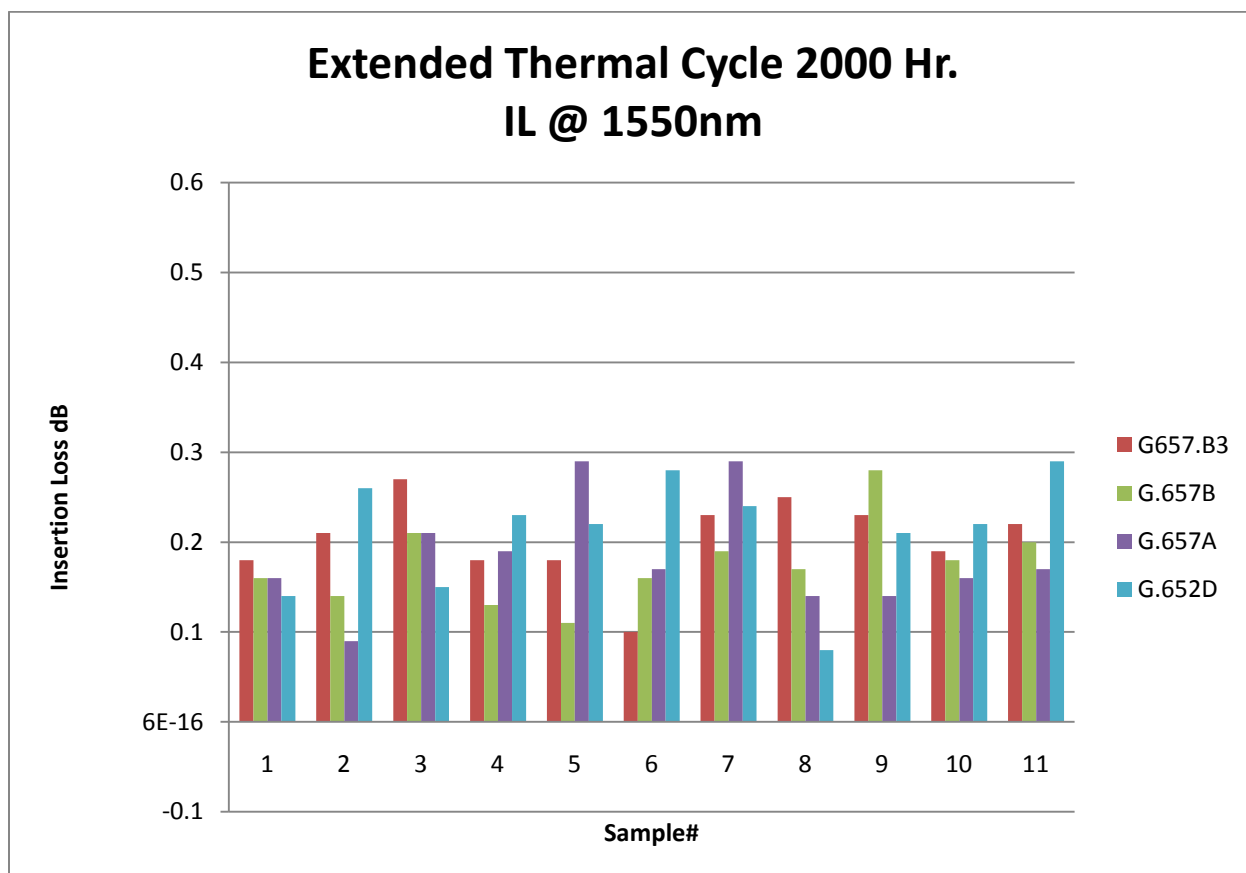
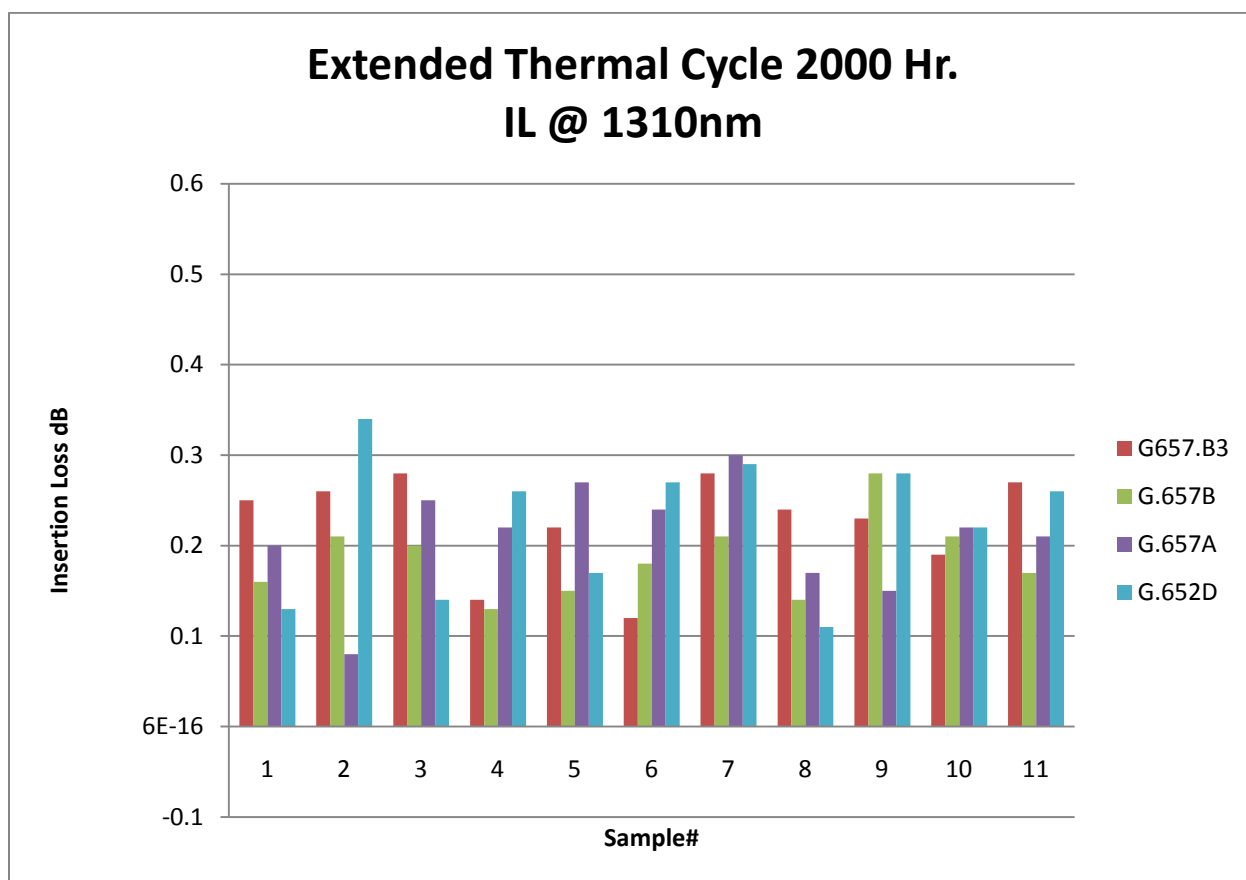
Extended Humidity Age 2000 Hr. RL @ 1310nm



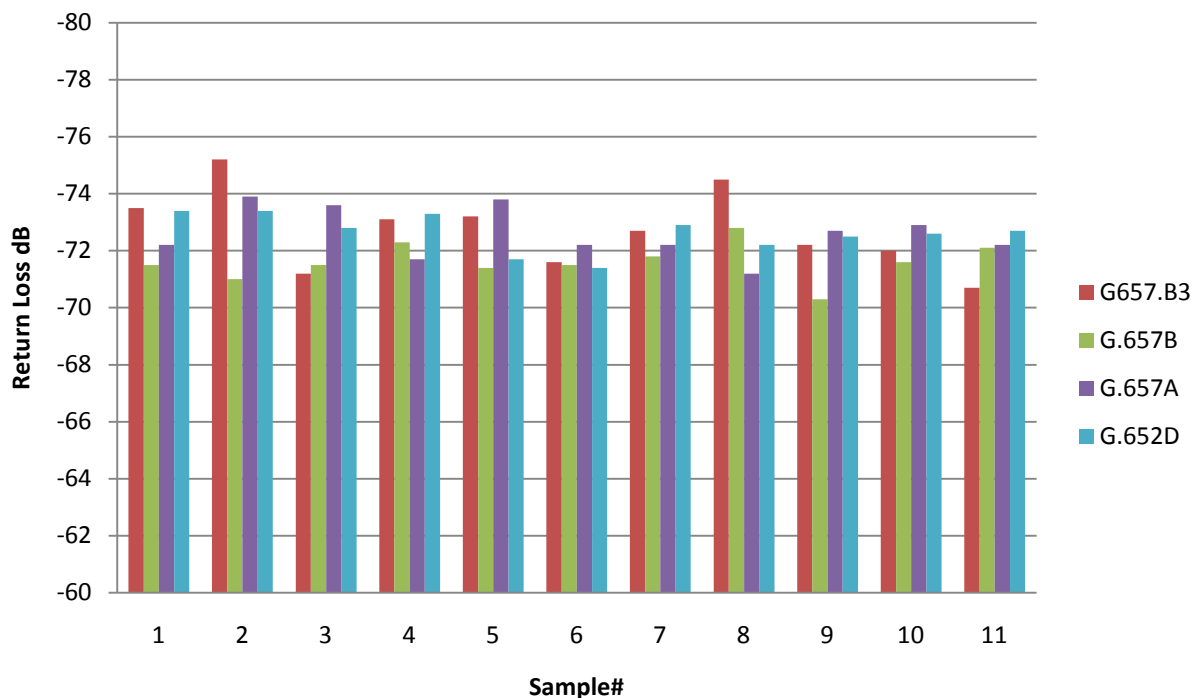
Extended Humidity Age 2000 Hr. RL @ 1550nm



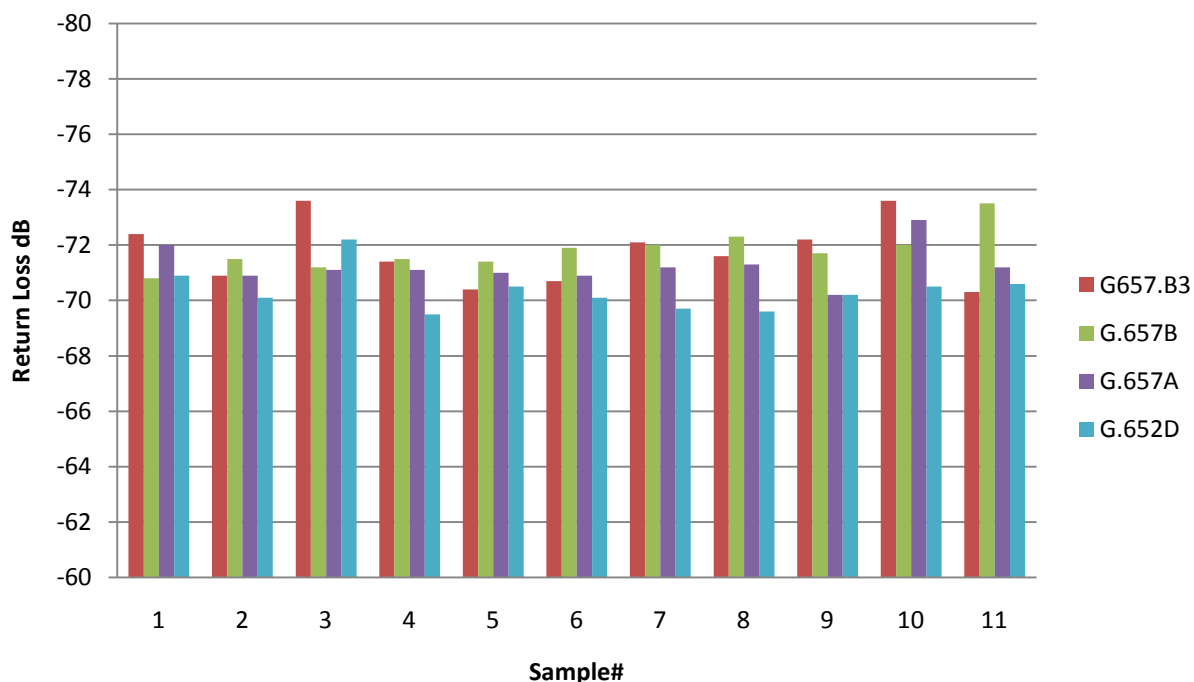
Ext Thermal Cycle (GR1221-6.2.7) - 75°C to -40°C Uncontrolled Humidity, Duration: 2000 Hrs.



Extended Thermal Cycle 2000 Hr. RL @ 1310nm



Extended Thermal Cycle 2000 Hr. RL @ 1550nm



Airborne Contaminants Test GR-326 section 4.4.4.3

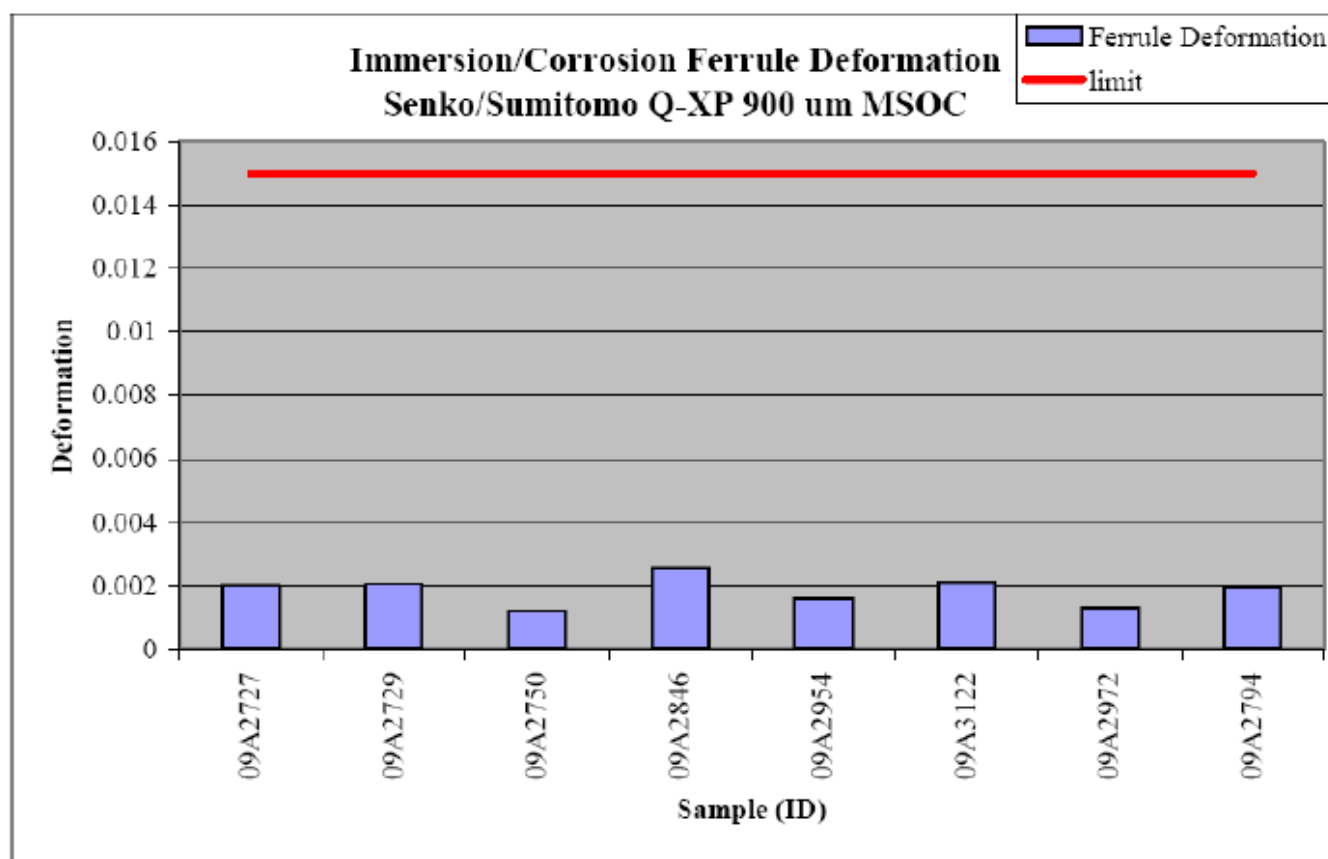
Test Performed by			Test Witnessed by			Dates			
Sean Grenon			Jeff Eberlin, Robert Grimm			9/17/10 10/28/10			
Criteria Category	Max Value (dB)	Client Specification	Client Criteria Met? (Y/N)	Verizon Specified Req.	Verizon Criteria Met? (Y/N)	Requirement		Objective/Cond. Obj.	
						Criteria (dB)	Criteria Met?	Criteria (dB)	Criteria Met?
Max Loss	0.42	0.60	Y	0.60	Y	0.70	Y	0.50	N/A
Mean Loss	0.26	0.40	Y	0.40	Y	0.50	Y	0.40	N/A
Loss Increase	0.3	0.30	Y	0.30	Y	0.30	Y	0.20	N/A
Max Reflectance	-68.4	-60.0	Y	-60.0	Y	-40.0	Y	-60.0	N/A
Reflectance Change	6.1	---		5.0	Y	5.0	Y ⁶⁸	2.0	N/A
Corrosion	No Corrosion Visible	---	---	No Corrosion Visible	Y	No Corrosion Visible	Y	---	N/A

Salt Spray Test GR-326 section 4.4.4.4

Test Performed by			Test Witnessed by			Dates			
UL Melville			----			11/11/2010			
Criteria Category	Max Value (dB)	Client Specified Req.	Client Criteria Met? (Y/N)	Verizon Specified Req.	Verizon Criteria Met? (Y/N)	Requirement		Objective/Cond. Obj.	
						Criteria (dB)	Criteria Met?	Criteria (dB)	Criteria Met?
Max Loss	0.43	###	Y	0.60	Y	0.70	Y	0.50	N/A
Mean Loss	0.21	###	Y	0.40	Y	0.50	Y	0.40	N/A
Loss Increase	0.27	---	Y	0.30	Y	0.30	Y	0.2	N/A
Max Reflectance	-61.01	###.###	Y	-60.0	Y	-40.0	Y	-60.0	N/A
Reflectance Change	6.48	---	---	2.0	N	5.0	Y ⁶⁹	2.0	N/A

Immersion/Corrosion Test GR-326 section 4.4.4.5

Sean Grenon			Jeffery Eberlin			8/31/10			
Category	Max. Value	Client Specified Requirement	Client Criteria Met? (Y/N)	Verizon Specified Req.	Verizon Criteria Met? (Y/N)	Req.	Comply? (Y/N)	Obj. (dB)	Comply? (Y/N)
Degradation Factor	0.00256	---	---	0.015	Y	0.015	Yes	---	---
Fiber Core Recess	No core recess discernable	---	---	---	??	---	??	10 nm	---



Groundwater Immersion Test GR-326 section 4.4.4.6

Test Performed by		Test Witnessed by		Dates			
Sean Grenon		Jeff Eberlin		8/31/10			
Category	Max. Value (dB)	Client Specified Req.	Client Criteria Met? (Y/N)	Verizon Specified Req.	Verizon Criteria Met? (Y/N)	CR4-65 (dB)	Comply? (Y/N)
Max Loss (CR4-65)	0.38	0.60	Y	0.60	Yes	0.70	Yes
Mean Loss (CR4-65)	0.3	0.40	Y	0.40	Yes	0.50	Yes
Loss Increase (CR4-65)	0.29	0.30	Y	0.30	Yes	0.30	Yes
Max Reflectance (CR4-65)	-65.5	-60.0	Y	-60.0	Yes	-40.00	Yes
Reflectance Change (CD4-65)	8.7	---	---	2.0	Yes	5.00	Yes

Initial IL Immersion Corrosion Data Sheet Summary

	Fuel	Bleach	Detergent	Ammonia		Fuel	Bleach	Detergent	Ammonia
Max IL	0.32	0.29	0.28	0.29	Max RL	-66.30	-69.00	-70.00	-69.80
Min IL	0.09	0.14	0.05	0.12	Min RL	-77.30	-74.40	-74.50	-75.30
Avge	0.22	0.22	0.19	0.19					

24-Hour IL Immersion Corrosion Data Sheet Summary

	Fuel	Bleach	Detergent	Ammonia		Fuel	Bleach	Detergent	Ammonia
Max IL	0.31	0.36	0.34	0.37	Max IL Inc	0.08	0.18	0.23	0.22
Avge IL	0.2	0.2	0.2	0.2	# IL In >0.2	0	0	1	1

7-Day IL Immersion Corrosion Data Sheet Summary

	Fuel	Bleach	Detergent	Ammonia		Fuel	Bleach	Detergent	Ammonia
Max IL	0.38	0.36	0.38	0.38	Max IL Inc	0.15	0.20	0.29	0.22
Avge IL	0.2	0.3	0.3	0.3	# IL In >0.2	0	0	8	1

24-Hour RL Immersion Corrosion Data Sheet Summary

	Fuel	Bleach	Detergent	Ammonia		Fuel	Bleach	Detergent	Ammonia
Max RL	-68.60	-70.80	-70.30	-70.40	Max BR Inc	8.70	2.00	2.10	1.30
					# BR In >2.0	7	0	1	0
					# BR In >5.0	2	0	0	0

7-Day RL Immersion Corrosion Data Sheet Summary

	Fuel	Bleach	Detergent	Ammonia		Fuel	Bleach	Detergent	Ammonia
Max RL	-70.70	-69.90	-65.50	-68.80	Max BR Inc	5.40	2.90	8.70	2.50
					# BR In >2.0	7	3	13	2
					# BR In >5.0	1	0	4	0