Transceiver Reliability
TEST Report

Model name : QSFP28-SR4-100G

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KEY WORDS: FS PHOTONICS 100G SR4 , RELIABILITY

1、INTRODUCTION

This report describes the general characteristics (See Table 1) and gives reliability test results of the SFP28 transceiver 100G SR4 . The qualification program is fully compliant with the Telcordia GR-468-CORE reliability requirements.

Table 1: Specifications according to datasheets for products

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	TC	0		+70	℃
Power Supply Voltage	Vcc	3.13	3.3	3.47	V
Data Rate	BR1	-	10.3125	--	Gbps
Transmitter					
Centre Wavelength Range	λ	840	-	860	nm
Average Launch Power	POUT	-8.4	-	2.4	dBm
Extinction Ratio	ER	2	-	-	dB
Receiver					
Centre Wavelength Range	λ	840	-	860	nm
Receiver Sensitivity(OMA)	--	--	--	-5.2	dBm

2、Related Documentation

All testing (internal and external) was conducted under the supervision of the FS Photonics Reliability Department.

2.1SUMMARY AND TEST CONCLUSION

The qualification testing is completed. No failure was noted on the 100G SR4 transceiver subjected to the mechanical integrity and endurance testing. We sum up the test condition, sample size and test result in table 3.

Table 2: Test Condition, Sample Size and Results Summary

Heading	Test Item	Reference	Conditions	Sample	Test

				Size	result
Mechanical Integrity	Mechanical Shock	MIL-STD-883 Method2002	Condition B, 5 times/axis 500G,1.0 ms	11	All Passed
	Vibration	MIL-STD-883 Method 2007	Condition A, 20G, 20-2,000Hz, 4 mins per cycle,4 cycles per axis	11	All Passed
	Thermal Shock	MIL-STD-883 Method 1011	-40° C to 85° C,20 cycles	11	All Passed
Endurance	Accelerated Aging	Telcordia GR-468-CORE Section 5.18	+85° C, 2000 hours Power on	11	All Passed
	High Temp. Storage	Telcordia GR-468-CRE Section 4.4	85°C, 2000hours	11	All Passed
	Temperature Cycling	MIL-STD-883 Method 1010	-40°C to +85°C, 500 cycles	11	All Passed
	Damp Heat	MIL-STD-202G Method 103B	+85°C/85% RH, 500 hours	11	All Passed
	Powered Damp Heat	MIL-STD-202G Method 103B	+85°C/85% RH, 2000 hours, Powered	11	All Passed
	Cycle Moisture Resistance	MIL-STD-883E Method 1004.7	20 continuous cycles	11	All Passed
EMC	Non-Operational ESD	MIL-STD-883	HBM class 1, 2000volts Contact discharge on Golden Finger	6	All Passed
	Operational ESD	IEC 61000-4-2	Contact discharge 8000volts and air discharge 15000volts on faceplate	6	All Passed

2.2PASS CRITERIA

- Characteristic parameters do not exceed product specification.
- Receiver Sensitivity variation≤1 dB, Average Optical Power variation≤1 dB.
- Test Pattern: Measured with a PRBS 231-1 test pattern @25.78125Gbps, BER≤5x10-5, 25℃.

3、RELIABILITY TEST

3.1TEST RESULT

3.1.1Mechanical Shock Test

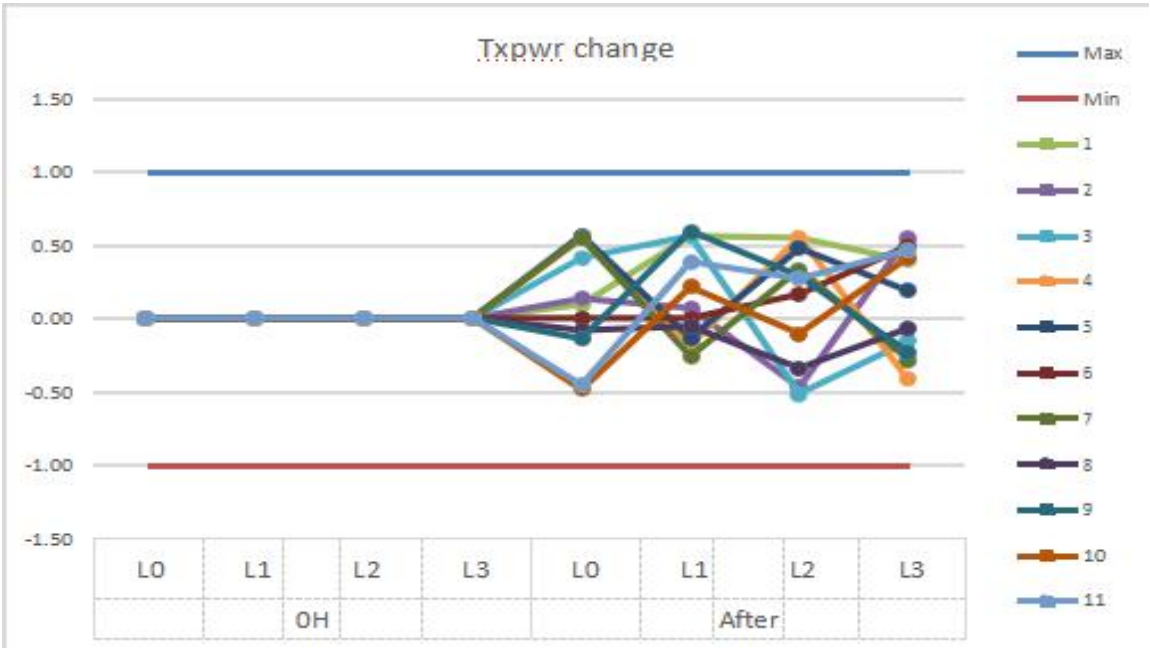
3.1.1.1Test Condition & Result

Product Name: 100G SR4 Result: Pass

Test Condition: Axes: X1、X2、Y1、Y2、Z1 and Z2, 5 times/axis; Acceleration pulse: halt-sine waveform, 500G; Pulse duration: 1.0 ms

3.1.1.2Test Data

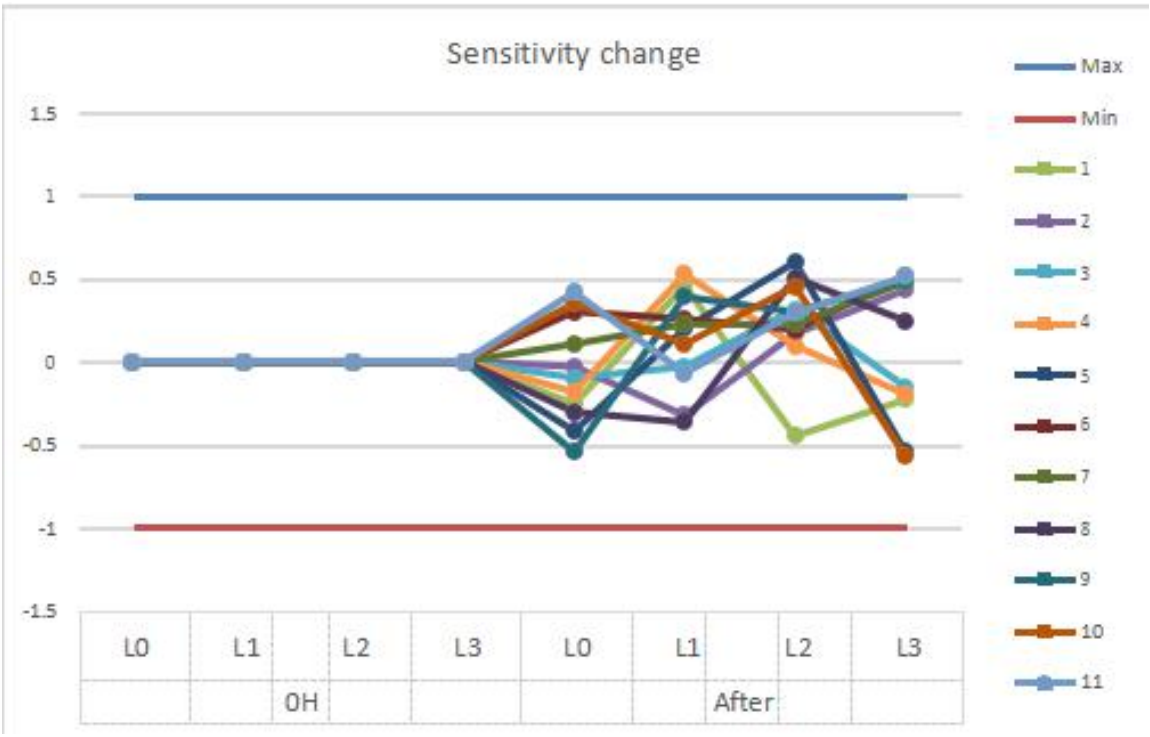
- **Tx_Power Change (dB)**



NO	SN	0H	After MS	After MS Change

.		TxPower: -2~1.8				TxPower: -2~1.8				Txpwr <1dB			
		L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
1	F000701211N00164	-0.09	-0.12	0.80	0.48	0.00	0.44	1.35	0.87	0.09	0.56	0.55	0.39
2	F000701211N00036	-0.35	0.41	0.87	0.46	-0.21	0.48	0.40	1.01	0.14	0.07	-0.47	0.55
3	F000701211N00038	-0.61	-0.68	0.65	0.23	-0.20	-0.12	0.13	0.07	0.41	0.56	-0.51	-0.16
4	F000701211N00046	0.16	0.39	0.30	-0.18	0.70	0.21	0.85	-0.60	0.54	-0.18	0.55	-0.42
5	F000701211N00052	0.80	0.78	1.22	0.49	1.37	0.64	1.69	0.68	0.57	-0.13	0.48	0.19
6	F000701211N00055	-0.13	-0.10	0.66	0.29	-0.14	-0.10	0.82	0.79	0.00	0.01	0.16	0.49
7	F000701211N00059	-0.46	0.32	0.61	0.25	0.09	0.06	0.94	-0.03	0.55	-0.26	0.33	-0.28
8	F000701211N00065	-0.06	0.33	0.15	0.26	-0.14	0.28	-0.19	0.19	-0.08	-0.06	-0.34	-0.07
9	F000701211N00091	0.23	-0.10	0.03	-0.41	0.09	0.50	0.32	-0.64	-0.14	0.60	0.29	-0.23
10	F000701211N00092	0.05	0.34	0.76	0.40	-0.43	0.55	0.65	0.81	-0.49	0.21	-0.10	0.42
11	F000701211N00105	-0.03	0.30	0.13	-0.31	-0.49	0.69	0.40	0.16	-0.45	0.39	0.27	0.46

- **Sensitivity Change (dB)**



NO.	SN	0H				After MS				After MS Change			
		TxPower: -2~1.8				TxPower: -2~1.8				Txpwr <1dB			
		L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
1	F000701211N00164	-8.40	-8.50	-8.00	-8.20	-8.66	-8.05	-8.45	-8.43	-0.26	0.45	-0.45	-0.23
2	F000701211N00036	-9.00	-8.70	-8.20	-8.60	-9.03	-9.03	-8.03	-8.17	-0.03	-0.33	0.17	0.43
3	F000701211N00038	-8.40	-7.40	-7.50	-8.00	-8.50	-7.43	-7.19	-8.15	-0.10	-0.03	0.31	-0.15
4	F000701211N00046	-9.90	-9.50	-9.50	-9.00	-10.09	-8.98	-9.41	-9.20	-0.19	0.52	0.09	-0.20
5	F000701211N00052	-9.40	-9.50	-9.50	-9.00	-9.82	-9.31	-8.90	-9.55	-0.42	0.19	0.60	-0.55
6	F000701211N00055	-9.70	-9.50	-9.60	-9.50	-9.40	-9.24	-9.41	-8.98	0.30	0.26	0.19	0.52
7	F000701211N00059	-10.00	-10.10	-9.50	-9.70	-9.90	-9.88	-9.28	-9.22	0.10	0.22	0.22	0.48

8	F000701211N00065	-7.40	-7.30	-7.50	-8.30	-7.71	-7.67	-7.00	-8.06	-0.31	-0.37	0.50	0.24
9	F000701211N00091	0.23	-0.10	0.03	-0.41	0.09	0.50	0.32	-0.64	-0.14	0.60	0.29	-0.23
10	F000701211N00092	0.05	0.34	0.76	0.40	-0.43	0.55	0.65	0.81	-0.49	0.21	-0.10	0.42
11	F000701211N00105	-0.03	0.30	0.13	-0.31	-0.49	0.69	0.40	0.16	-0.45	0.39	0.27	0.46

3.1.2Vibration Test

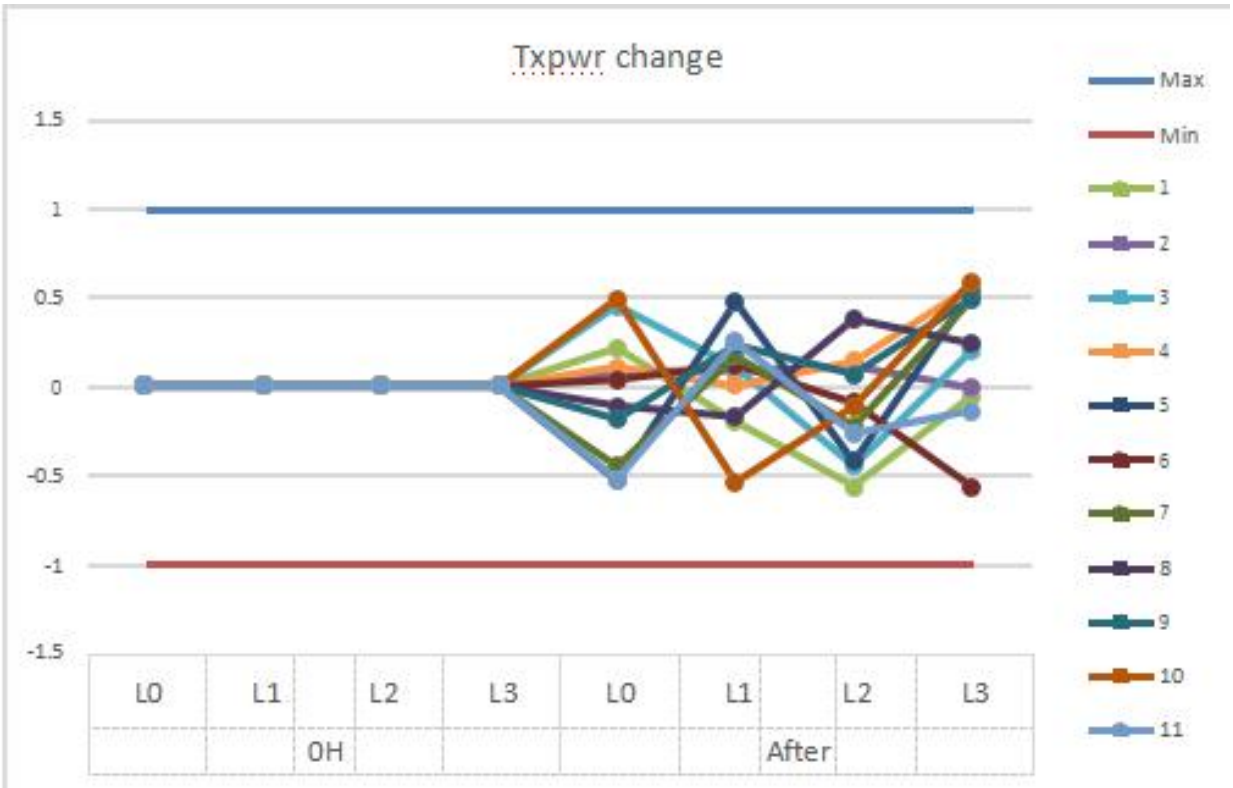
3.1.2.1Test Condition & Result

Product Name: 100G SR4 Result: Pass

Test Condition: Swept sine vibration, 20G; 20Hz-2,000Hz-20Hz (1cycle), 4 mins per cycle, 4 cycles per axis.

3.1.2.2Test Data

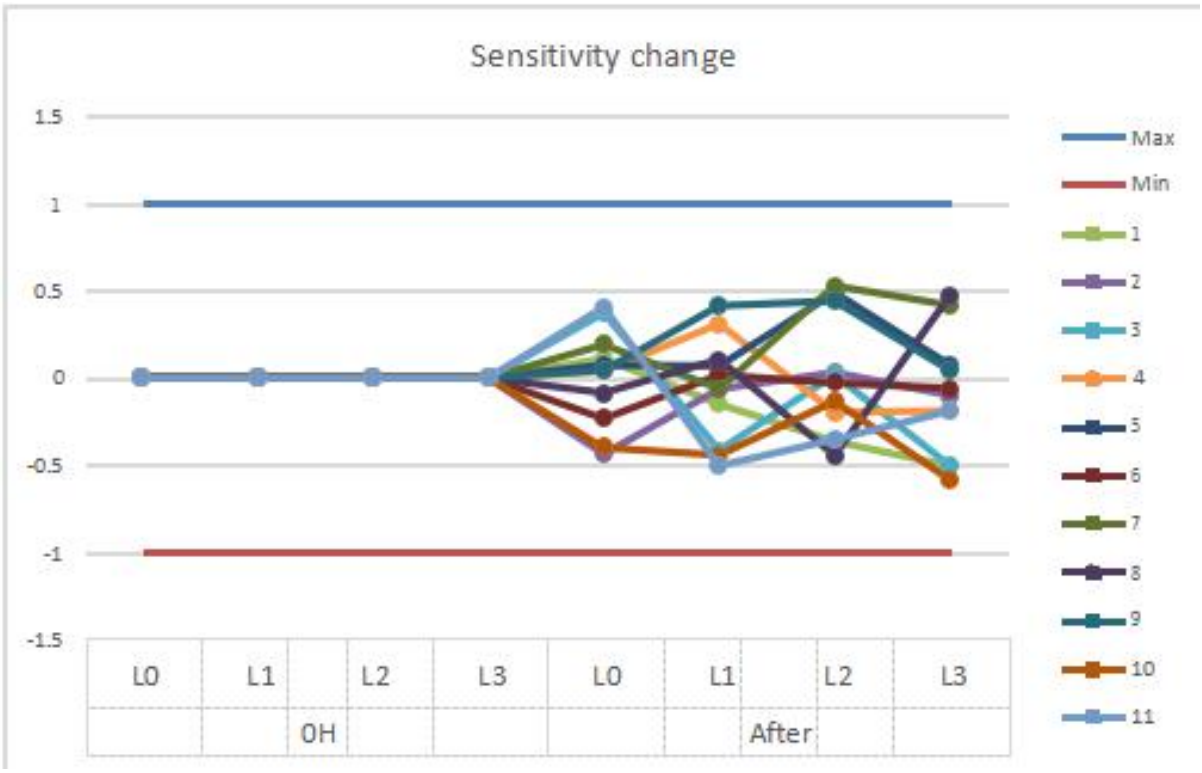
- **Tx_Power Change (dB)**



N	SN	0H	After MV	After MV Change

O.		TxPower: -2~1.8				TxPower: -2~1.8				Txpwr <1dB			
		L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
1	F000701211N00113	0.00	0.89	0.66	0.31	0.21	0.69	0.10	0.26	0.21	-0.20	-0.56	-0.05
2	F000701211N00118	-0.10	0.27	0.15	-0.08	-0.02	0.36	0.26	-0.09	0.08	0.09	0.11	-0.01
3	F000701211N00123	-0.20	-0.03	-0.04	-0.23	0.25	0.07	-0.49	-0.03	0.45	0.11	-0.45	0.20
4	F000701211N00124	0.46	0.26	0.10	0.38	0.56	0.26	0.24	0.94	0.11	0.00	0.14	0.56
5	F000701211N00125	0.57	0.36	-0.04	-0.19	0.03	0.83	-0.46	0.34	-0.53	0.47	-0.42	0.53
6	F000701211N00135	0.54	0.29	0.30	0.35	0.58	0.41	0.21	-0.22	0.04	0.12	-0.09	-0.56
7	F000701211N00144	0.45	0.34	0.70	0.38	0.00	0.50	0.48	0.87	-0.45	0.17	-0.22	0.49
8	F000701211N00155	0.26	0.12	-0.30	0.52	0.15	-0.05	0.07	0.76	-0.11	-0.17	0.38	0.24
9	F000701211N00158	0.85	0.53	0.16	0.02	0.67	0.76	0.22	0.52	-0.18	0.23	0.07	0.49
10	F000701211N00160	-0.20	-0.58	-0.15	-0.16	0.29	-1.12	-0.26	0.43	0.49	-0.54	-0.11	0.59
11	F000701211N00165	0.92	0.32	0.37	0.15	0.39	0.57	0.10	0.01	-0.52	0.25	-0.27	-0.14

- **Sensitivity Change (dB)**



NO.	SN	0H				After MV				After MV Change			
		TxPower: -2~1.8				TxPower: -2~1.8				Txpwr <1dB			
		L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
1	F000701211N00113	-8.90	-9.10	-8.60	-9.00	-8.79	-9.25	-8.96	-9.51	0.11	-0.15	-0.36	-0.51
2	F000701211N00118	-8.40	-8.20	-8.60	-8.50	-8.84	-8.27	-8.57	-8.60	-0.44	-0.07	0.03	-0.10
3	F000701211N00123	-9.60	-9.50	-9.00	-9.00	-9.23	-9.92	-8.98	-9.51	0.37	-0.42	0.02	-0.51
4	F000701211N00124	-8.50	-9.10	-9.50	-8.50	-8.46	-8.79	-9.70	-8.69	0.04	0.31	-0.20	-0.19
5	F000701211N00125	-9.90	-10.10	-10.00	-9.10	-9.83	-10.03	-9.51	-9.03	0.07	0.07	0.49	0.07
6	F000701211N00135	-8.10	-8.00	-8.00	-8.70	-8.33	-7.98	-8.03	-8.76	-0.23	0.02	-0.03	-0.06
7	F000701211N00144	-9.40	-10.00	-9.50	-9.50	-9.21	-10.06	-8.97	-9.08	0.19	-0.06	0.53	0.42

8	F000701211N00155	-8.00	-7.50	-7.00	-7.50	-8.08	-7.39	-7.45	-7.03	-0.08	0.11	-0.45	0.47
9	F000701211N00158	-7.90	-8.10	-7.00	-8.00	-7.86	-7.69	-6.56	-7.96	0.04	0.41	0.44	0.04
10	F000701211N00160	-7.10	-7.40	-7.50	-7.50	-7.50	-7.84	-7.63	-8.09	-0.40	-0.44	-0.13	-0.59
11	F000701211N00165	-7.50	-7.50	-7.00	-7.60	-7.09	-8.00	-7.35	-7.79	0.41	-0.50	-0.35	-0.19

3.1.3Thermal Shock Test

3.1.3.1Test Condition & Result

Product Name: 100G SR4 Result: Pass

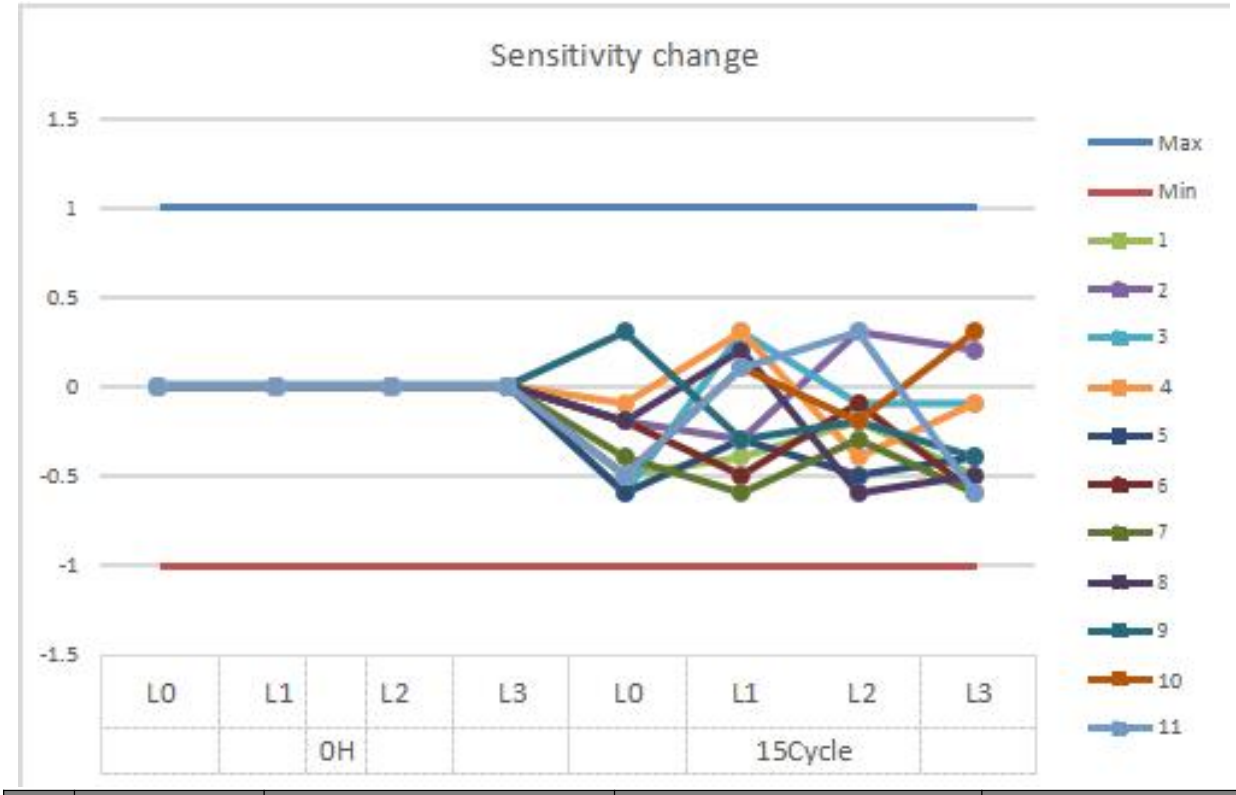
Test Condition: 0°C to 100°C,15 cycles.

3.1.3.2Test Data

- **Tx_Power Change (dB)**

NO.	SN	0H				After MV				After MV Change			
		TxPower：-2~1.8				TxPower：-2~1.8				Txpwr <1dB			
		L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
1	F000701211N00077	0.59	0.72	0.79	1.12	1.00	0.93	1.06	0.67	0.41	0.21	0.28	-0.45
2	F000701211N00140	0.81	0.19	0.34	0.71	0.87	0.44	0.70	0.56	0.05	0.25	0.36	-0.16
3	F000701211N00102	1.08	1.37	0.32	0.17	1.05	1.10	0.72	0.63	-0.03	-0.26	0.40	0.47
4	F000701211N00197	0.41	0.82	0.07	0.17	0.88	1.21	0.54	0.63	0.47	0.39	0.46	0.46
5	F000701211N00178	0.96	0.42	0.16	0.86	0.68	0.87	0.69	0.48	-0.28	0.45	0.53	-0.38
6	F000701211N00049	1.39	0.94	0.78	0.76	1.04	0.88	1.00	0.57	-0.35	-0.05	0.22	-0.19
7	F000701211N00069	0.83	0.78	0.57	0.14	0.86	0.90	1.05	0.46	0.03	0.12	0.48	0.33
8	F000701211N00064	0.08	-0.22	-0.13	0.35	-0.27	-0.41	-0.58	0.46	-0.35	-0.19	-0.45	0.11
9	F000701211N00072	1.26	1.18	0.31	0.56	0.87	0.92	-0.06	0.04	-0.39	-0.26	-0.37	-0.53
10	F000701211N00054	1.54	1.40	0.82	0.83	0.99	1.08	0.62	0.80	-0.54	-0.32	-0.20	-0.03
11	F000701211N00159	0.51	0.39	0.20	0.84	0.24	0.30	0.15	0.96	-0.27	-0.09	-0.05	0.11

- **Sensitivity Change (dB)**



NO.	SN	0H				15 Cycle				15 Cycle Change			
		SEN:<-0.72				SEN:<-0.72				SEN <1dB			
		L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
1	F000701211N00077	-8.90	-9.40	-8.50	-8.60	-9.40	-9.80	-8.70	-9.10	-0.50	-0.40	-0.20	-0.50
2	F000701211N00140	-9.00	-8.20	-8.50	-8.80	-9.20	-8.50	-8.20	-8.60	-0.20	-0.30	0.30	0.20
3	F000701211N00102	-8.80	-8.50	-8.50	-9.00	-9.40	-8.20	-8.60	-9.10	-0.60	0.30	-0.10	-0.10
4	F000701211N00197	-9.90	-9.60	-8.90	-9.90	-10.00	-9.30	-9.30	-10.00	-0.10	0.30	-0.40	-0.10
5	F000701211N00178	-8.90	-8.90	-9.00	-9.10	-9.50	-9.20	-9.50	-9.50	-0.60	-0.30	-0.50	-0.40
6	F000701211N00049	-8.40	-8.60	-8.40	-9.30	-8.60	-9.10	-8.50	-9.90	-0.20	-0.50	-0.10	-0.60
7	F000701211N00069	-8.10	-8.00	-7.90	-9.10	-8.50	-8.60	-8.20	-9.70	-0.40	-0.60	-0.30	-0.60

8	F000701211N00064	-9.00	-8.70	-8.00	-9.00	-9.20	-8.50	-8.60	-9.50	-0.20	0.20	-0.60	-0.50
9	F000701211N00072	-7.90	-8.70	-8.50	-8.50	-7.60	-9.00	-8.70	-8.90	0.30	-0.30	-0.20	-0.40
10	F000701211N00054	-7.90	-9.10	-8.50	-8.60	-8.40	-9.00	-8.70	-8.30	-0.50	0.10	-0.20	0.30
11	F000701211N00159	-8.50	-7.50	-7.60	-8.50	-9.00	-7.40	-7.30	-9.10	-0.50	0.10	0.30	-0.60

3.1.4Accelerated Aging Test

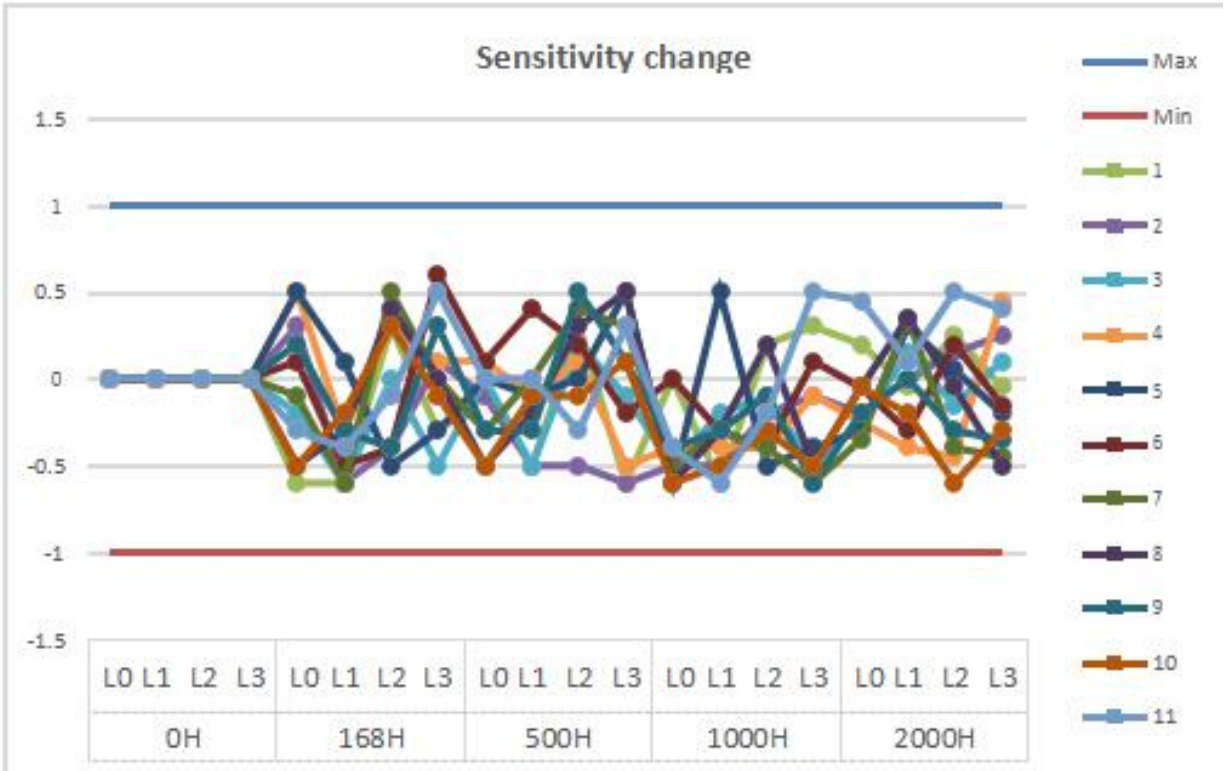
3.1.4.1Test Condition & Result

Product Name: 100G SR4 Result: Pass

Test Condition: Case temperature 70°C, 2000 hours, power on

3.1.4.2Test Data

- **Sensitivity Change (dB)**

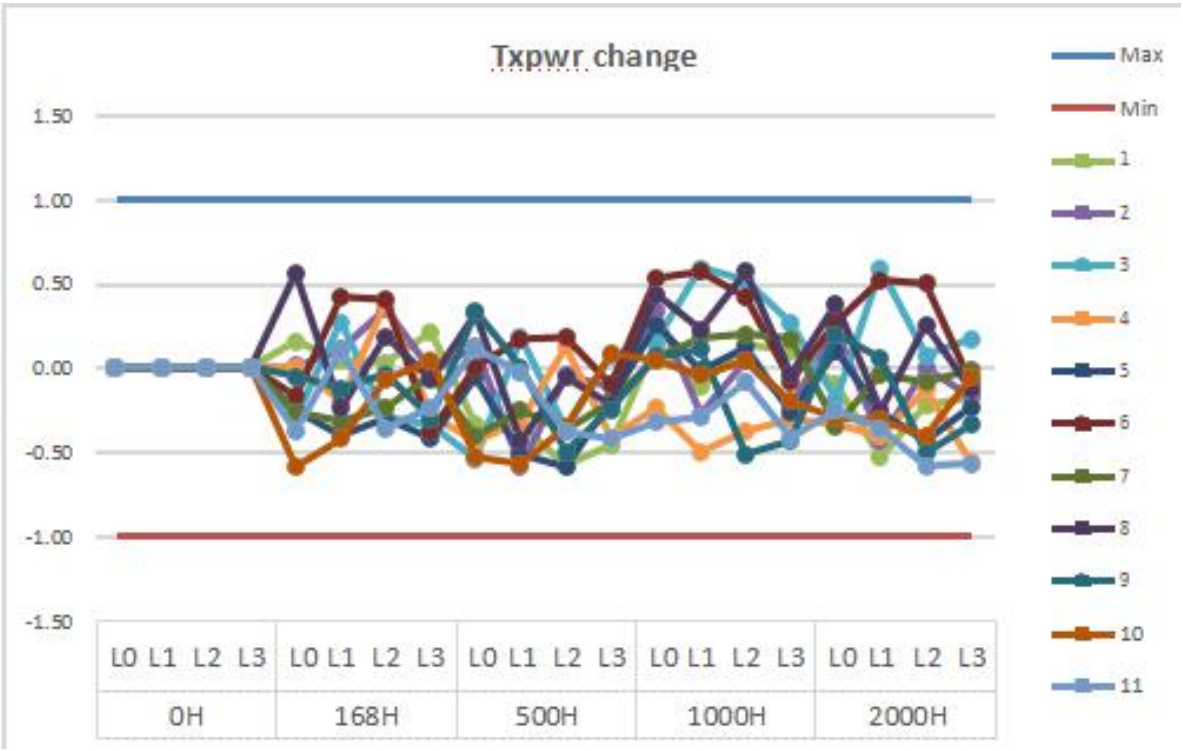


NO.	SN	OH				168H				168H Change				500H				500H Change			
		SEN:<-0.72				SEN:<-0.72				SEN <1dB				SEN:<-0.72				SEN <1dB			
		L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
1	F000701211N00120	-8.40	-8.50	-8.70	-8.80	-9.00	-9.10	-8.40	-9.10	-0.60	-0.60	0.30	-0.30	-8.50	-9.00	-8.40	-9.40	-0.10	-0.50	0.30	-0.60
2	F000701211N00168	-8.40	-8.00	-8.00	-8.40	-8.10	-8.60	-8.40	-8.30	0.30	-0.60	-0.40	0.10	-8.50	-8.50	-8.50	-9.00	-0.10	-0.50	-0.50	-0.60
3	F000701211N00051	-9.00	-8.90	-9.20	-9.00	-9.20	-9.50	-9.20	-9.50	-0.20	-0.60	0.00	-0.50	-9.00	-9.40	-9.00	-9.10	0.00	-0.50	0.20	-0.10
4	F000701211N00154	-8.00	-7.70	-7.70	-8.00	-7.50	-8.00	-7.40	-7.90	0.50	-0.30	0.30	0.10	-7.90	-7.80	-7.60	-8.50	0.10	-0.10	0.10	-0.50
5	F000701211N00190	-8.90	-8.50	-8.80	-9.10	-8.40	-8.40	-9.30	-9.40	0.50	0.10	-0.50	-0.30	-8.90	-8.60	-8.80	-8.60	0.00	-0.10	0.00	0.50
6	F000701211N00146	-8.00	-8.00	-8.30	-8.50	-7.90	-8.50	-8.70	-7.90	0.10	-0.50	-0.40	0.60	-7.90	-7.60	-8.10	-8.70	0.10	0.40	0.20	-0.20
7	F000701211N00061	-8.60	-8.50	-9.10	-9.00	-8.70	-9.10	-8.60	-9.00	-0.10	-0.60	0.50	0.00	-8.90	-8.50	-8.70	-8.70	-0.30	0.00	0.40	0.30
8	F000701211N00035	-8.00	-7.90	-8.40	-8.70	-8.50	-8.20	-8.00	-8.70	-0.50	-0.30	0.40	0.00	-8.50	-8.10	-8.10	-8.20	-0.50	-0.20	0.30	0.50
9	F000701211N00090	-7.70	-7.20	-8.10	-8.40	-7.50	-7.50	-8.50	-8.10	0.20	-0.30	-0.40	0.30	-8.00	-7.50	-7.60	-8.30	-0.30	-0.30	0.50	0.10
10	F000701211N00039	-8.50	-8.00	-8.40	-8.50	-9.00	-8.20	-8.10	-8.60	-0.50	-0.20	0.30	-0.10	-9.00	-8.10	-8.50	-8.40	-0.50	-0.10	-0.10	0.10
11	F000701211N00205	-8.50	-9.00	-8.70	-8.90	-8.80	-9.40	-8.80	-8.40	-0.30	-0.40	-0.10	0.50	-8.50	-9.00	-9.00	-8.60	0.00	0.00	-0.30	0.30

					1000H				1000H Change				2000H				2000H Change			
					SEN:<-0.72				SEN <1dB				SEN:<-0.72				SEN <1dB			
					L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
					-8.40	-9.10	-8.50	-8.50	0.00	-0.60	0.20	0.30	-8.20	-8.55	-8.45	-8.85	0.20	-0.05	0.25	-0.05
					-8.	-8.	-8.	-8.	-0.	-0.	-0.	-0.	-8.	-8.	-7.	-8.	-0.	0.0	0.1	0.2

90	50	20	50	50	50	20	10	60	00	85	15	20	0	5	5
-9.50	-9.10	-9.30	-9.50	-0.50	-0.20	-0.10	-0.50	-9.25	-8.75	-9.35	-8.90	-0.25	0.15	-0.15	0.10
-8.40	-8.10	-8.10	-8.10	-0.40	-0.40	-0.40	-0.10	-8.25	-8.10	-8.15	-7.55	-0.25	-0.40	-0.45	0.45
-9.50	-8.00	-9.30	-9.50	-0.60	0.50	-0.50	-0.40	-9.20	-8.20	-8.75	-9.30	-0.30	0.30	0.05	-0.20
-8.00	-8.30	-8.70	-8.40	0.00	-0.30	-0.40	0.10	-8.05	-8.30	-8.10	-8.65	-0.05	-0.30	0.20	-0.15
-9.10	-8.80	-9.50	-9.60	-0.50	-0.30	-0.40	-0.60	-8.95	-8.15	-9.50	-9.45	-0.35	0.35	-0.40	-0.45
-8.60	-8.20	-8.20	-9.20	-0.60	-0.30	0.20	-0.50	-8.05	-7.55	-8.45	-9.20	-0.05	0.35	-0.05	-0.50
-8.10	-7.50	-8.20	-9.00	-0.40	-0.30	-0.10	-0.60	-7.90	-7.20	-8.40	-8.75	-0.20	0.00	-0.30	-0.35
-9.10	-8.50	-8.70	-9.00	-0.60	-0.50	-0.30	-0.50	-8.55	-8.20	-9.00	-8.80	-0.05	-0.20	-0.60	-0.30
-8.90	-9.60	-8.90	-8.40	-0.40	-0.60	-0.20	0.50	-8.05	-8.90	-8.20	-8.50	0.45	0.10	0.50	0.40

- **Tx_Power Change (dB)**



NO.	SN	OH				168H				168H Change				500H				500H Change			
		TxPower: -2~1.8				TxPower: -2~1.8				Txpwr <1dB				TxPower: -2~1.8				Txpwr <1dB			
		L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
1	F000701211N00120	1.03	0.92	0.58	0.52	1.19	0.97	0.61	0.73	0.16	0.04	0.03	0.21	0.69	0.59	0.00	0.06	-0.34	-0.33	-0.58	-0.46
2	F000701211N00168	-0.51	0.02	0.13	0.66	-0.50	0.12	0.48	0.64	0.01	0.11	0.35	-0.02	-0.39	-0.57	0.08	0.55	0.12	-0.59	-0.05	-0.11
3	F000701211N00051	0.91	0.91	0.53	0.56	0.61	1.18	0.23	0.21	-0.30	0.27	-0.30	-0.34	0.36	1.09	0.16	0.63	-0.54	0.18	-0.37	0.07
4	F000701211N00154	-0.03	-0.04	-0.01	-0.25	-0.03	-0.23	0.38	-0.54	0.00	-0.20	0.38	-0.29	-0.46	-0.35	0.12	-0.67	-0.44	-0.32	0.12	-0.41
5	F000701211N00190	0.51	1.14	0.82	0.58	0.25	0.74	0.52	0.16	-0.26	-0.40	-0.30	-0.42	0.45	0.63	0.23	0.38	-0.06	-0.52	-0.59	-0.20
6	F000701211N00146	0.67	0.55	-0.16	0.48	0.50	0.97	0.25	0.10	-0.17	0.42	0.41	-0.38	0.67	0.72	0.02	0.38	0.00	0.17	0.18	-0.10
7	F000701211N00061	0.58	0.50	0.58	0.55	0.31	0.18	0.34	0.50	-0.27	-0.32	-0.24	-0.05	0.17	0.25	0.21	0.34	-0.41	-0.26	-0.37	-0.21

8	F000701211N00035	-0.36	1.25	0.47	0.50	0.20	1.00	0.65	0.42	0.56	-0.24	0.19	-0.07	-0.05	0.81	0.41	0.28	0.32	-0.44	-0.06	-0.22
9	F000701211N00090	0.53	0.45	1.20	1.28	0.48	0.32	1.16	0.98	-0.05	-0.12	-0.04	-0.30	0.86	0.45	0.70	1.03	0.33	0.00	-0.50	-0.25
10	F000701211N00039	0.59	1.17	1.02	0.79	0.00	0.74	0.95	0.83	-0.59	-0.43	-0.07	0.04	0.06	0.60	0.66	0.87	-0.53	-0.57	-0.36	0.08
11	F000701211N00205	1.31	1.27	1.04	1.02	0.93	1.37	0.68	0.78	-0.38	0.10	-0.36	-0.24	1.42	1.24	0.66	0.60	0.11	-0.03	-0.38	-0.42

	1000H				1000H Change				2000H				2000H Change			
	TxPower: -2~1.8				Txpwr <1dB				TxPower: -2~1.8				Txpwr <1dB			
	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
	1.18	0.81	0.71	0.62	0.15	-0.12	0.14	0.10	0.93	0.39	0.36	0.34	-0.10	-0.53	-0.22	-0.18
	-0.17	-0.26	0.17	0.43	0.34	-0.28	0.04	-0.23	-0.28	-0.42	0.12	0.49	0.23	-0.43	-0.01	-0.17
	1.06	1.50	1.04	0.82	0.16	0.59	0.52	0.26	0.71	1.49	0.60	0.72	-0.19	0.59	0.08	0.17
	-0.27	-0.54	-0.39	-0.56	-0.24	-0.50	-0.38	-0.31	-0.37	-0.44	-0.14	-0.81	-0.34	-0.41	-0.13	-0.56
	0.77	1.13	0.94	0.31	0.26	-0.02	0.12	-0.27	0.61	0.88	0.39	0.35	0.10	-0.27	-0.44	-0.23
	1.20	1.12	0.26	0.40	0.53	0.57	0.42	-0.08	0.94	1.07	0.34	0.39	0.27	0.52	0.50	-0.09
	0.63	0.68	0.78	0.72	0.06	0.18	0.20	0.17	0.23	0.46	0.49	0.53	-0.34	-0.04	-0.09	-0.02
	0.08	1.47	1.03	0.46	0.44	0.23	0.57	-0.04	0.02	0.99	0.72	0.37	0.38	-0.26	0.25	-0.13
	0.59	0.55	0.69	0.84	0.06	0.11	-0.52	-0.44	0.73	0.50	0.69	0.94	0.20	0.05	-0.51	-0.34
	0.63	1.12	1.06	0.59	0.04	-0.05	0.04	-0.20	0.29	0.86	0.61	0.73	-0.30	-0.31	-0.41	-0.06
	0.9	0.9	0.9	0.6	-0.	-0.	-0.	-0.	1.0	0.9	0.4	0.4	-0.	-0.	-0.	-0.

	9	7	5	0	33	30	09	42	5	1	6	5	26	36	58	57

3.1.5High Temperature Storage Test

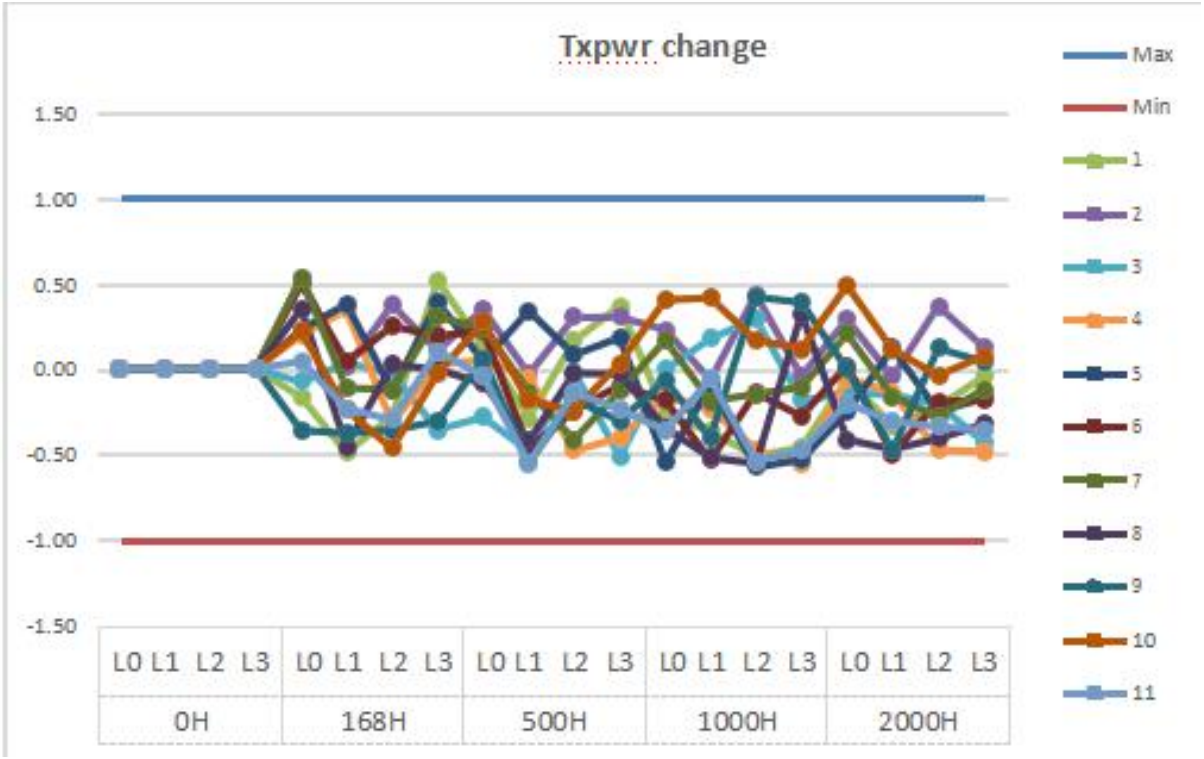
3.1.5.1Test Condition & Result

Product Name: 100G SR4 Result: Pass

Test Condition: +85°C, 2000hours.

3.1.5.2Test Data

- **Tx_Power Change (dB)**



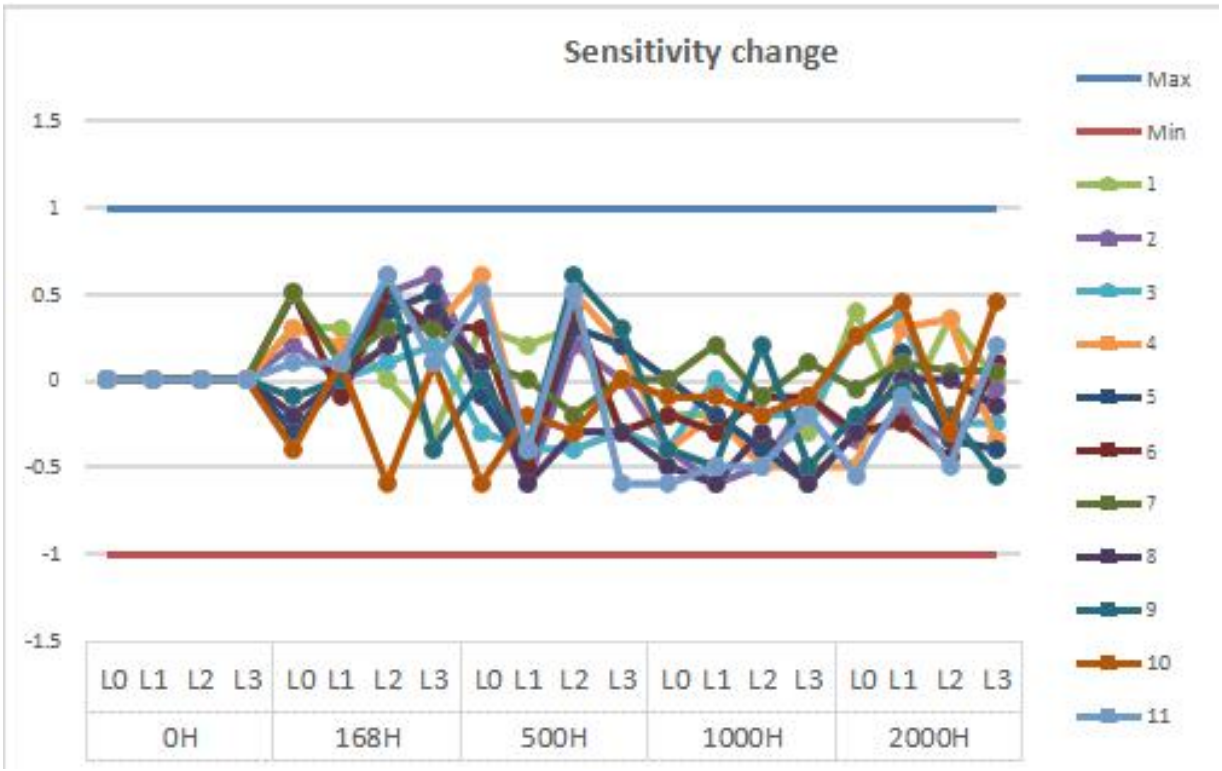
NO.	SN	OH				168H				168H Change				500H				500H Change			
		TxPower: -2~1.8				TxPower: -2~1.8				Txpwr <1dB				TxPower: -2~1.8				Txpwr <1dB			
		L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
1	F000701211N00180	-0.21	0.26	0.11	-0.22	-0.38	-0.23	-0.17	0.30	-0.17	-0.49	-0.28	0.51	-0.07	-0.03	0.27	0.15	0.14	-0.29	0.16	0.37
2	F000701211N	0.4	0.	0.	0.3	1.0	0.5	0.5	0.4	0.5	0.0	0.3	0.1	0.8	0.4	0.4	0.6	0.3	-0.	0.3	0.3

	00137	7	52	18	6	0	3	6	7	3	1	8	1	2	9	8	6	5	03	0	0
3	F000701211N00042	0.87	1.14	0.79	0.69	0.79	1.18	0.76	0.33	-0.08	0.03	-0.03	-0.36	0.59	0.66	0.77	0.17	-0.29	-0.48	-0.02	-0.52
4	F000701211N00103	1.07	1.03	0.99	1.11	1.27	1.37	0.67	1.13	0.20	0.34	-0.32	0.02	1.12	0.98	0.51	0.70	0.05	-0.05	-0.48	-0.41
5	F000701211N00066	1.09	1.11	1.00	0.62	1.32	1.49	0.88	1.02	0.23	0.38	-0.13	0.39	1.13	1.45	1.09	0.81	0.04	0.34	0.08	0.18
6	F000701211N00114	1.14	1.34	1.24	0.54	1.64	1.38	1.49	0.73	0.50	0.04	0.25	0.19	1.36	0.87	1.00	0.44	0.22	-0.47	-0.25	-0.10
7	F000701211N00141	0.88	1.19	0.83	0.81	1.42	1.08	0.71	1.11	0.54	-0.12	-0.12	0.30	1.12	1.06	0.42	0.68	0.24	-0.14	-0.42	-0.13
8	F000701211N00067	-0.01	0.20	0.67	0.15	0.34	-0.26	0.70	0.15	0.35	-0.46	0.02	0.00	-0.10	-0.22	0.65	0.12	-0.09	-0.42	-0.03	-0.03
9	F000701211N00099	0.89	1.28	0.55	0.16	0.53	0.90	0.19	-0.15	-0.36	-0.38	-0.36	-0.31	0.95	0.73	0.37	-0.15	0.06	-0.55	-0.18	-0.31
10	F000701211N00148	0.21	0.70	0.40	0.12	0.43	0.46	-0.07	0.09	0.22	-0.24	-0.47	-0.03	0.48	0.52	0.15	0.16	0.27	-0.19	-0.25	0.03
11	F000701211N00053	1.25	1.31	0.84	1.09	1.29	1.08	0.54	1.20	0.04	-0.23	-0.30	0.10	1.21	0.75	0.70	0.86	-0.04	-0.56	-0.14	-0.24

	1000H				1000H Change				2000H				2000H Change			
	TxPower: -2~1.8				Txpwr <1dB				TxPower: -2~1.8				Txpwr <1dB			
	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
	-0.48	-0.11	-0.40	-0.68	-0.27	-0.37	-0.51	-0.46	-0.27	-0.07	-0.12	-0.26	-0.06	-0.33	-0.22	-0.05
	0.70	0.45	0.62	0.32	0.23	-0.07	0.44	-0.04	0.76	0.47	0.55	0.49	0.29	-0.05	0.37	0.13
	0.86	1.32	1.08	0.50	-0.01	0.18	0.29	-0.19	0.72	0.99	0.58	0.26	-0.15	-0.15	-0.21	-0.43
	0.91	0.79	0.52	0.55	-0.16	-0.23	-0.47	-0.57	1.01	0.89	0.51	0.62	-0.05	-0.14	-0.48	-0.49
	0.54	1.01	0.43	0.09	-0.55	-0.10	-0.58	-0.53	0.83	1.23	0.76	0.45	-0.25	0.12	-0.25	-0.17
	0.9	0.8	1.1	0.2	-0.	-0.	-0.	-0.	1.1	0.8	1.0	0.3	0.0	-0.	-0.	-0.

5	0	0	6	19	54	14	28	6	4	5	5	2	50	19	19
1.05	1.00	0.68	0.70	0.17	-0.19	-0.15	-0.11	1.09	1.03	0.55	0.69	0.20	-0.16	-0.28	-0.12
-0.36	-0.32	0.12	0.47	-0.35	-0.52	-0.56	0.32	-0.43	-0.27	0.26	-0.18	-0.42	-0.47	-0.41	-0.33
0.83	0.88	0.97	0.55	-0.07	-0.41	0.42	0.39	0.89	0.81	0.67	0.20	0.00	-0.48	0.12	0.04
0.61	1.12	0.56	0.24	0.40	0.41	0.17	0.12	0.70	0.82	0.36	0.20	0.49	0.11	-0.04	0.07
0.89	1.25	0.30	0.61	-0.36	-0.06	-0.54	-0.48	1.05	1.00	0.50	0.73	-0.20	-0.31	-0.34	-0.36

- **Sensitivity Change (dB)**



NO.	SN	OH	168H	168H Change	500H	500H Change
		SEN:<-0.72	SEN:<-0.72	SEN <1dB	SEN:<-0.72	SEN <1dB

		L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
1	F000701211N00180	-7.70	-8.70	-8.40	-8.90	-7.40	-8.40	-8.40	-9.20	0.30	0.30	0.00	-0.30	-7.40	-8.50	-8.10	-9.20	0.30	0.20	0.30	-0.30
2	F000701211N00137	-8.40	-8.00	-8.70	-9.00	-8.20	-8.00	-8.20	-8.40	0.20	0.00	0.50	0.60	-8.40	-8.60	-8.50	-9.00	0.00	-0.60	0.20	0.00
3	F000701211N00042	-7.00	-7.00	-7.00	-7.90	-7.30	-7.00	-6.90	-7.70	-0.30	0.00	0.10	0.20	-7.30	-7.40	-7.40	-8.20	-0.30	-0.40	-0.40	-0.30
4	F000701211N00103	-8.50	-7.90	-8.40	-9.20	-8.20	-7.70	-8.10	-8.90	0.30	0.20	0.30	0.30	-7.90	-8.30	-7.90	-9.00	0.60	-0.40	0.50	0.20
5	F000701211N00066	-8.20	-8.50	-8.80	-9.40	-8.50	-8.50	-8.40	-8.90	-0.30	0.00	0.40	0.50	-8.30	-9.00	-8.50	-9.20	-0.10	-0.50	0.30	0.20
6	F000701211N00114	-9.10	-8.10	-9.00	-8.70	-8.60	-8.20	-8.50	-8.40	0.50	-0.10	0.50	0.30	-8.80	-8.60	-8.60	-9.00	0.30	-0.50	0.40	-0.30
7	F000701211N00141	-9.00	-9.50	-8.20	-9.60	-8.50	-9.40	-7.90	-9.30	0.50	0.10	0.30	0.30	-8.90	-9.50	-8.40	-9.60	0.10	0.00	-0.20	0.00
8	F000701211N00067	-8.60	-8.40	-8.80	-8.80	-8.80	-8.40	-8.60	-8.40	-0.20	0.00	0.20	0.40	-8.50	-9.00	-9.10	-9.10	0.10	-0.60	-0.30	-0.30
9	F000701211N00099	-9.00	-9.00	-9.10	-9.00	-9.10	-9.00	-8.50	-9.40	-0.10	0.00	0.60	-0.40	-9.00	-9.40	-8.50	-8.70	0.00	-0.40	0.60	0.30
10	F000701211N00148	-8.80	-8.50	-8.90	-8.50	-9.20	-8.40	-9.50	-8.40	-0.40	0.10	-0.60	0.10	-9.40	-8.70	-9.20	-8.50	-0.60	-0.20	-0.30	0.00
11	F000701211N00053	-9.10	-8.20	-8.50	-8.40	-9.00	-8.10	-7.90	-8.30	0.10	0.10	0.60	0.10	-8.60	-8.60	-8.00	-9.00	0.50	-0.40	0.50	-0.60

	1000H				1000H Change				2000H				2000H Change			
	SEN:<-0.72				SEN <1dB				SEN:<-0.72				SEN <1dB			
	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
	-7.90	-8.90	-8.80	-9.20	-0.20	-0.20	-0.40	-0.30	-7.30	-8.90	-8.05	-8.90	0.40	-0.20	0.35	0.00
	-8.80	-8.60	-9.20	-9.10	-0.40	-0.60	-0.50	-0.10	-8.75	-8.20	-9.05	-9.05	-0.35	-0.20	-0.35	-0.05
	-7.40	-7.00	-7.20	-8.10	-0.40	0.00	-0.20	-0.20	-6.75	-6.65	-7.25	-8.15	0.25	0.35	-0.25	-0.25
	-8.	-8.	-8.	-9.7	-0.	-0.	-0.	-0.	-9.	-7.	-8.	-9.	-0.	0.3	0.3	-0.

90	10	90	0	40	20	50	50	00	60	05	55	50	0	5	35	
-8. 20	-8. 70	-9. 20	### ##	0.0 0	-0. 20	-0. 40	-0. 60	-8. 50	-8. 35	-9. 15	-9. 80	-0. 30	0.1 5	-0. 35	-0. 40	
-9. 30	-8. 40	-9. 10	-8.8 0	-0. 20	-0. 30	-0. 10	-0. 10	-9. 40	-8. 35	-9. 45	-8. 60	-0. 30	-0. 25	-0. 45	0.1 0	
-9. 00	-9. 30	-8. 30	-9.5 0	0.0 0	0.2 0	-0. 10	0.1 0	-9. 05	-9. 40	-8. 15	-9. 55	-0. 05	0.1 0	0.0 5	0.0 5	
-9. 10	-9. 00	-9. 10	-9.4 0	-0. 50	-0. 60	-0. 30	-0. 60	-8. 90	-8. 40	-8. 80	-8. 95	-0. 30	0.0 0	0.0 0	-0. 15	
-9. 40	-9. 50	-8. 90	-9.5 0	-0. 40	-0. 50	0.2 0	-0. 50	-9. 20	-9. 05	-9. 30	-9. 55	-0. 20	-0. 05	-0. 20	-0. 55	
-8. 90	-8. 60	-9. 10	-8.6 0	-0. 10	-0. 10	-0. 20	-0. 10	-8. 55	-8. 05	-9. 20	-8. 05	0.2 5	0.4 5	-0. 30	0.4 5	
-9. 70	-8. 70	-9. 00	-8.6 0	-0. 60	-0. 50	-0. 50	-0. 20	-9. 65	-8. 30	-9. 00	-8. 20	-0. 55	-0. 10	-0. 50	0.2 0	

3.1.6Temperature Cycling Test

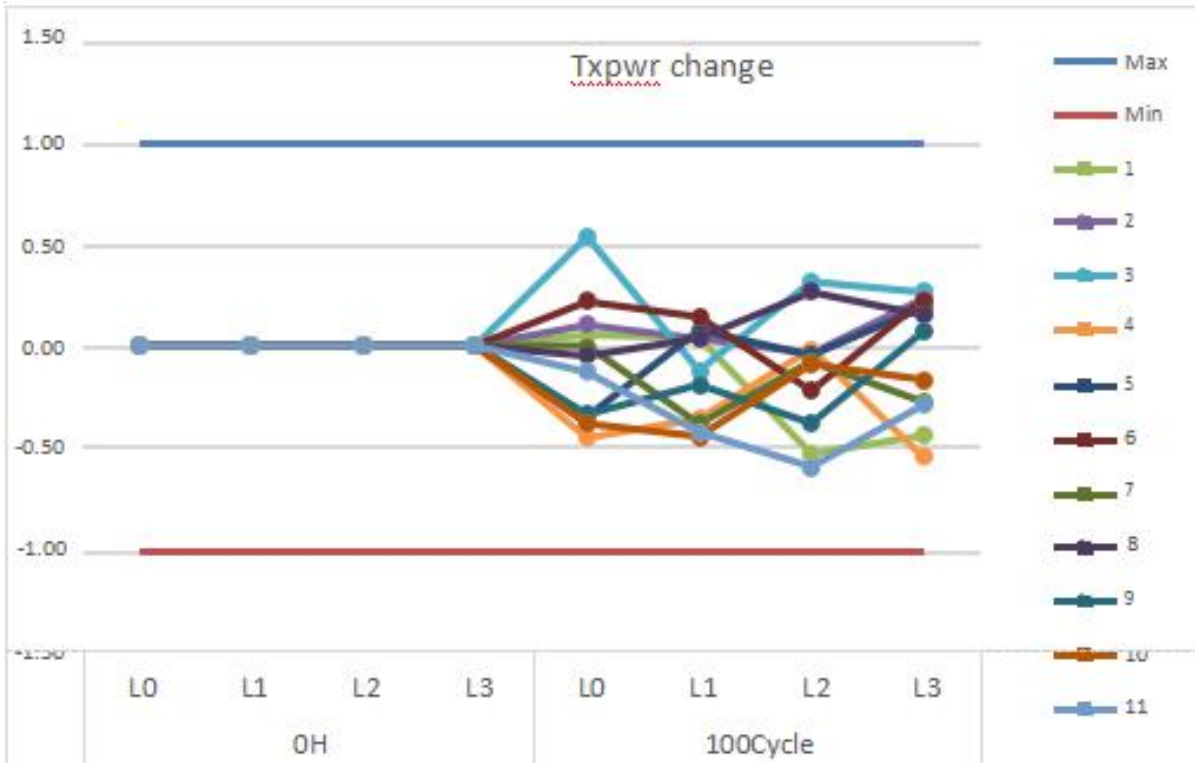
3.1.6.1Test Condition & Result

Product Name: 100G SR4 Result: Pass

Test Condition: -40°C to +85°C, 500 cycles; Dwell time: 30min; Temperature change rate: 10°C/min

3.1.6.2Test Data

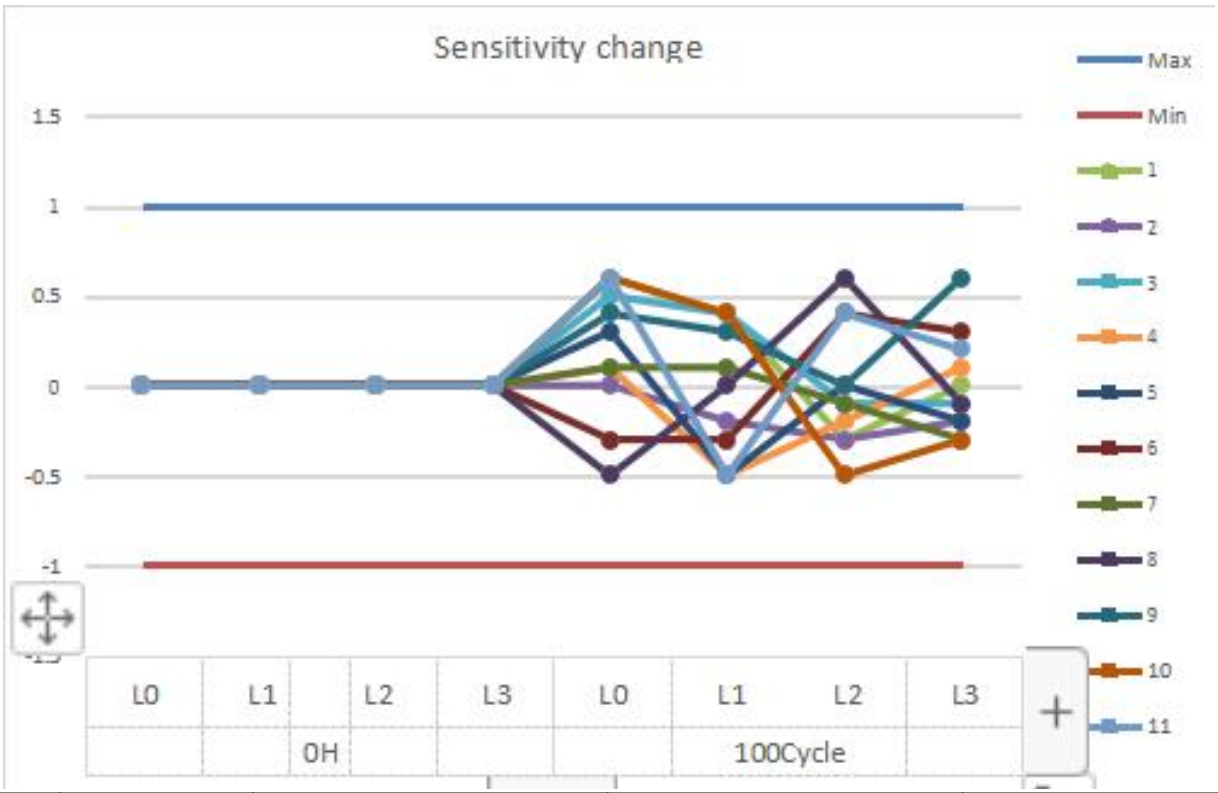
- **Tx_Power Change (dB)**



NO.	SN	0H				100 Cycle				100 Cycle Change			
		TxPower: -2~1.8				TxPower: -2~1.8				Txpwr <1dB			
		L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
1	F000701211N00136	0.82	1.04	0.81	0.75	0.88	1.08	0.27	0.31	0.05	0.04	-0.53	-0.45
2	F000701211N00127	-0.23	0.07	0.29	0.13	-0.13	0.11	0.25	0.36	0.10	0.04	-0.04	0.23
3	F000701211N00108	-0.15	0.38	0.70	-0.20	0.39	0.26	1.02	0.06	0.54	-0.12	0.32	0.27
4	F000701211N00073	0.68	0.57	0.37	0.65	0.22	0.20	0.35	0.10	-0.46	-0.36	-0.02	-0.55
5	F000701211N00194	1.78	1.85	1.58	0.90	1.43	1.93	1.53	1.09	-0.35	0.08	-0.05	0.19
6	F000701211N00206	0.66	1.09	0.59	1.02	0.87	1.24	0.37	1.25	0.22	0.14	-0.22	0.23
7	F000701211N00075	0.36	0.57	0.85	0.55	0.35	0.19	0.77	0.27	-0.01	-0.39	-0.08	-0.28

8	F000701211N00032	1.55	1.44	1.13	1.32	1.50	1.48	1.39	1.48	-0.05	0.04	0.26	0.15
9	F000701211N00043	0.27	0.38	0.44	0.66	-0.07	0.18	0.05	0.73	-0.34	-0.20	-0.39	0.07
10	F000701211N00167	0.38	-0.10	0.05	-0.17	-0.01	-0.55	-0.04	-0.34	-0.39	-0.45	-0.09	-0.17
11	F000701211N00192	1.23	1.42	1.15	0.82	1.10	0.99	0.55	0.53	-0.13	-0.43	-0.60	-0.29

- **Sensitivity Change (dB)**



NO.	SN	0H				100 Cycle				100 Cycle Change			
		SEN:<-0.72				SEN:<-0.72				SEN <1dB			
		L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
1	F000701211N00136	-9.20	-9.00	-8.90	-8.90	-8.60	-8.60	-9.20	-8.90	0.60	0.40	-0.30	0.00
2	F000701211N0	-8.	-9.	-8.	-8.	-8.	-9.	-8.	-9.	0.0	-0.	-0.	-0.

	0127	00	00	10	90	00	20	40	10	0	20	30	20
3	F000701211N00108	-8.50	-8.80	-8.40	-8.40	-8.00	-8.40	-8.50	-8.50	0.50	0.40	-0.10	-0.10
4	F000701211N00073	-7.00	-7.00	-8.40	-8.00	-6.90	-7.50	-8.60	-7.90	0.10	-0.50	-0.20	0.10
5	F000701211N00194	-8.80	-7.50	-9.10	-8.90	-8.50	-8.00	-9.10	-9.10	0.30	-0.50	0.00	-0.20
6	F000701211N00206	-7.80	-7.60	-8.40	-8.10	-8.10	-7.90	-8.00	-7.80	-0.30	-0.30	0.40	0.30
7	F000701211N00075	-8.50	-7.90	-8.40	-8.00	-8.40	-7.80	-8.50	-8.30	0.10	0.10	-0.10	-0.30
8	F000701211N00032	-8.00	-8.00	-8.00	-8.80	-8.50	-8.00	-7.40	-8.90	-0.50	0.00	0.60	-0.10
9	F000701211N00043	-8.90	-7.70	-8.40	-9.00	-8.50	-7.40	-8.40	-8.40	0.40	0.30	0.00	0.60
10	F000701211N00167	-8.70	-8.10	-8.40	-8.10	-8.10	-7.70	-8.90	-8.40	0.60	0.40	-0.50	-0.30
11	F000701211N00192	-9.00	-9.00	-9.00	-9.20	-8.40	-9.50	-8.60	-9.00	0.60	-0.50	0.40	0.20

3.1.7Damp Heat Test

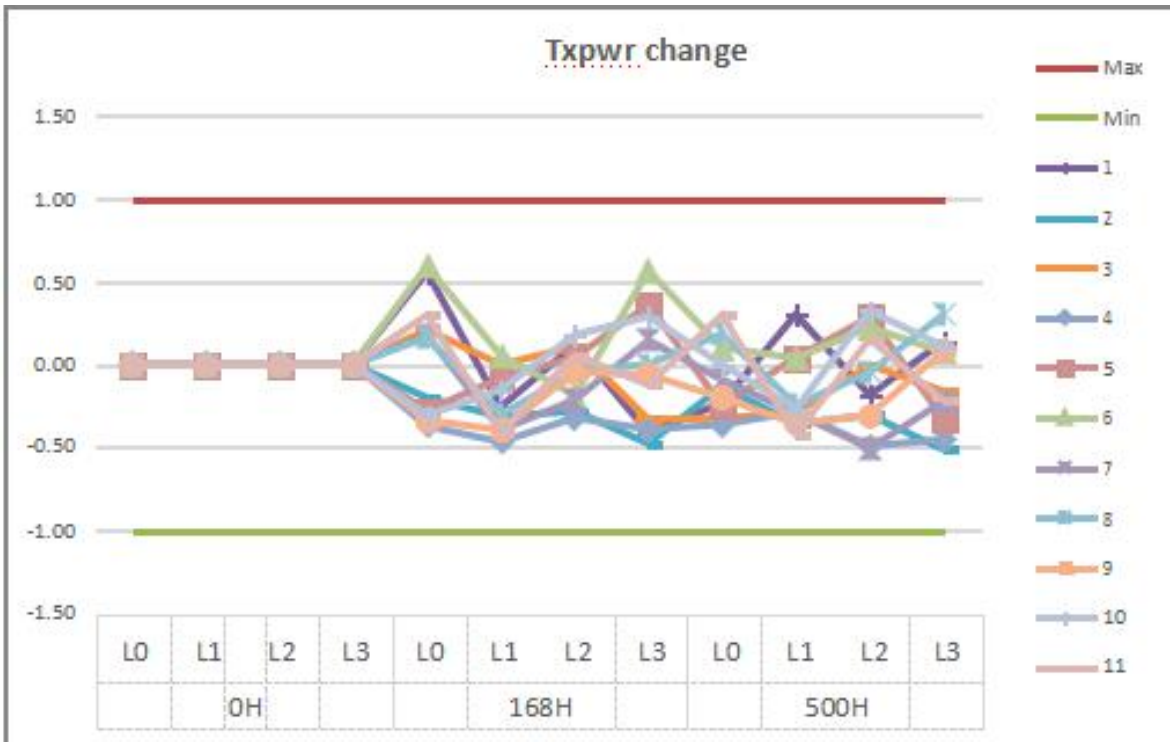
3.1.7.1Test Condition & Result

Product Name: 100G SR4 Result: Pass

Test Condition: +85°C/85% RH, 500 hours,

3.1.7.2Test Data

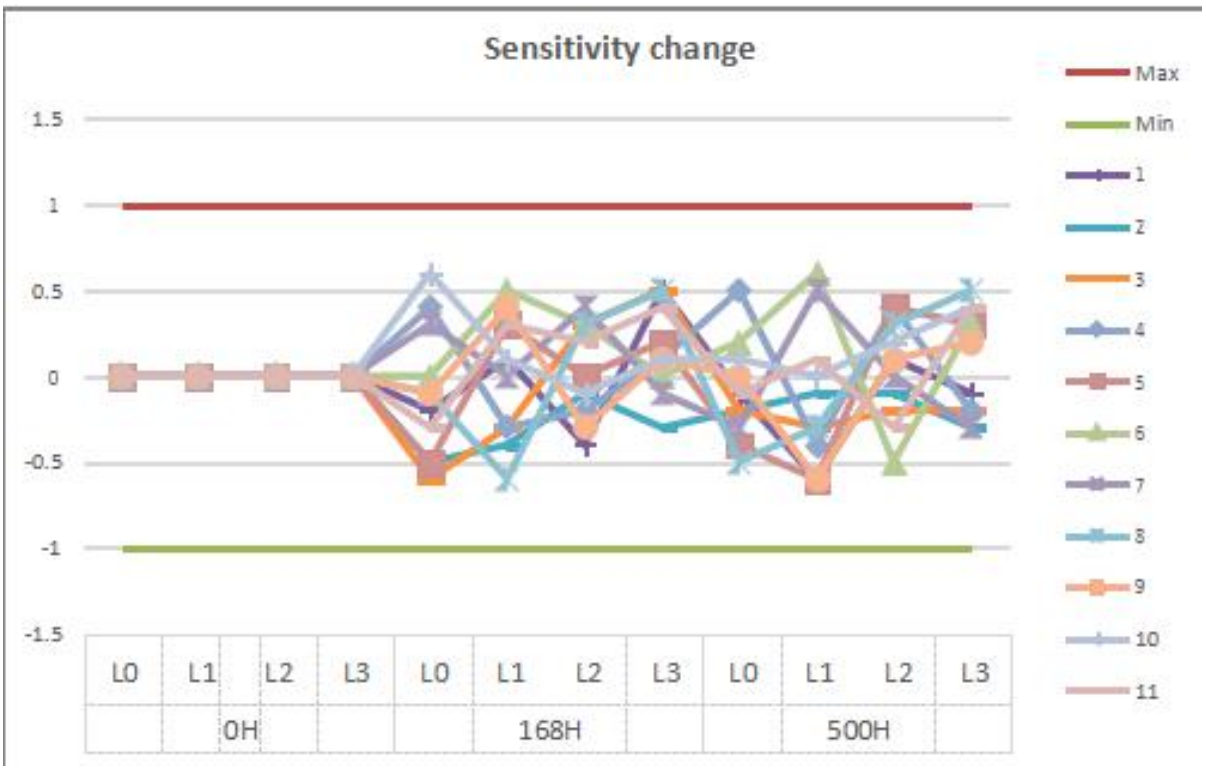
- **Tx_Power Change (dB)**



NO.	SN	0H				168H				168H Change				500H				500H Change			
		TxPower: -2~1.8				TxPower: -2~1.8				Txpwr <1DB				TxPower: -2~1.8				Txpwr <1DB			
		L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
1	F000701211N00115	0.45	0.61	0.71	0.59	1.01	0.35	0.82	0.18	0.56	-0.25	0.12	-0.41	0.22	0.91	0.52	0.73	-0.23	0.30	-0.18	0.14
2	F000701211N00047	0.19	0.37	0.41	0.81	-0.01	0.05	0.13	0.33	-0.20	-0.32	-0.28	-0.48	0.06	0.01	0.10	0.30	-0.13	-0.36	-0.31	-0.51
3	F000701211N00203	0.44	0.36	0.80	0.73	0.65	0.36	0.90	0.40	0.21	0.00	0.11	-0.33	0.12	0.07	0.79	0.57	-0.32	-0.30	0.00	-0.16
4	F000701211N00037	1.19	1.02	1.25	1.32	0.82	0.56	0.92	0.93	-0.37	-0.47	-0.32	-0.39	0.83	0.74	0.75	0.87	-0.36	-0.29	-0.49	-0.45
5	F000701211N00132	1.08	1.04	0.60	0.78	0.80	0.96	0.64	1.14	-0.28	-0.08	0.04	0.36	0.83	1.08	0.88	0.46	-0.25	0.04	0.28	-0.33
6	F000701211N00094	1.20	1.33	1.51	1.14	1.79	1.38	1.32	1.70	0.59	0.05	-0.18	0.56	1.30	1.36	1.73	1.21	0.10	0.04	0.23	0.07
7	F000701211N00112	1.13	1.28	0.56	0.63	1.30	0.89	0.34	0.77	0.18	-0.40	-0.21	0.15	1.03	0.99	0.05	0.40	-0.09	-0.29	-0.51	-0.22

8	F000701211N00104	0.85	1.00	0.84	0.48	1.01	0.70	0.79	0.48	0.16	-0.30	-0.05	0.00	1.03	0.76	0.79	0.78	0.18	-0.24	-0.05	0.30
9	F000701211N00201	-0.22	0.02	-0.02	-0.20	-0.56	-0.37	-0.07	-0.26	-0.34	-0.39	-0.05	-0.06	-0.42	-0.33	-0.33	-0.11	-0.20	-0.36	-0.31	0.08
10	F000701211N00153	1.48	1.65	0.45	0.39	1.17	1.49	0.63	0.68	-0.31	-0.15	0.18	0.29	1.48	1.38	0.77	0.50	0.00	-0.27	0.32	0.11
11	F000701211N00176	-0.37	-0.14	0.02	-0.02	-0.07	-0.55	0.07	-0.15	0.30	-0.40	0.05	-0.12	-0.07	-0.56	0.17	-0.25	0.30	-0.42	0.15	-0.22

- **Sensitivity Change (dB)**



NO.	SN	OH				168H				168H Change				500H				500H Change			
		SEN:<-0.72				SEN:<-0.72				SEN <1dB				SEN:<-0.72				SEN <1dB			
		L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
1	F000701211N00115	-8.90	-8.90	-8.60	-9.40	-9.10	-8.80	-9.00	-8.90	-0.20	0.10	-0.40	0.50	-9.00	-9.50	-8.50	-9.50	-0.10	-0.60	0.10	-0.10

2	F000701211N00047	-8.00	-8.70	-8.90	-8.80	-8.50	-9.10	-9.00	-9.10	-0.50	-0.40	-0.10	-0.30	-8.20	-8.80	-9.00	-9.10	-0.20	-0.10	-0.10	-0.30
3	F000701211N00203	-8.50	-8.70	-9.20	-8.90	-9.10	-9.00	-8.90	-8.40	-0.60	-0.30	0.30	0.50	-8.70	-9.00	-9.40	-9.10	-0.20	-0.30	-0.20	-0.20
4	F000701211N00037	-9.40	-8.60	-8.90	-8.50	-9.00	-8.90	-9.10	-8.40	0.40	-0.30	-0.20	0.10	-8.90	-9.00	-8.50	-8.70	0.50	-0.40	0.40	-0.20
5	F000701211N00132	-8.50	-8.40	-8.40	-8.50	-9.00	-8.10	-8.40	-8.30	-0.50	0.30	0.00	0.20	-8.90	-9.00	-8.00	-8.20	-0.40	-0.60	0.40	0.30
6	F000701211N00094	-8.60	-8.50	-7.60	-8.40	-8.60	-8.00	-7.30	-8.40	0.00	0.50	0.30	0.00	-8.40	-7.90	-8.10	-8.10	0.20	0.60	-0.50	0.30
7	F000701211N00112	-7.60	-8.00	-7.90	-7.90	-7.30	-8.00	-7.50	-8.00	0.30	0.00	0.40	-0.10	-7.90	-7.50	-7.90	-8.20	-0.30	0.50	0.00	-0.30
8	F000701211N00104	-8.60	-7.90	-9.00	-8.90	-8.70	-8.50	-8.70	-8.40	-0.10	-0.60	0.30	0.50	-9.10	-8.20	-8.70	-8.40	-0.50	-0.30	0.30	0.50
9	F000701211N00201	-8.50	-8.40	-8.60	-8.40	-8.60	-8.00	-8.90	-8.30	-0.10	0.40	-0.30	0.10	-8.50	-9.00	-8.50	-8.20	0.00	-0.60	0.10	0.20
10	F000701211N00153	-8.60	-7.90	-8.90	-8.90	-8.00	-7.80	-9.00	-8.80	0.60	0.10	-0.10	0.10	-8.50	-7.90	-8.70	-8.50	0.10	0.00	0.20	0.40
11	F000701211N00176	-8.80	-9.00	-8.40	-8.80	-9.10	-8.70	-8.20	-8.40	-0.30	0.30	0.20	0.40	-8.90	-8.90	-8.70	-8.40	-0.10	0.10	-0.30	0.40

3.1.8Powered Damp Heat Test

3.1.8.1Test Condition & Result

Product Name: 100G SR4 Result: Pass

Test Condition: +85°C/85% RH, 1000 hours, Powered

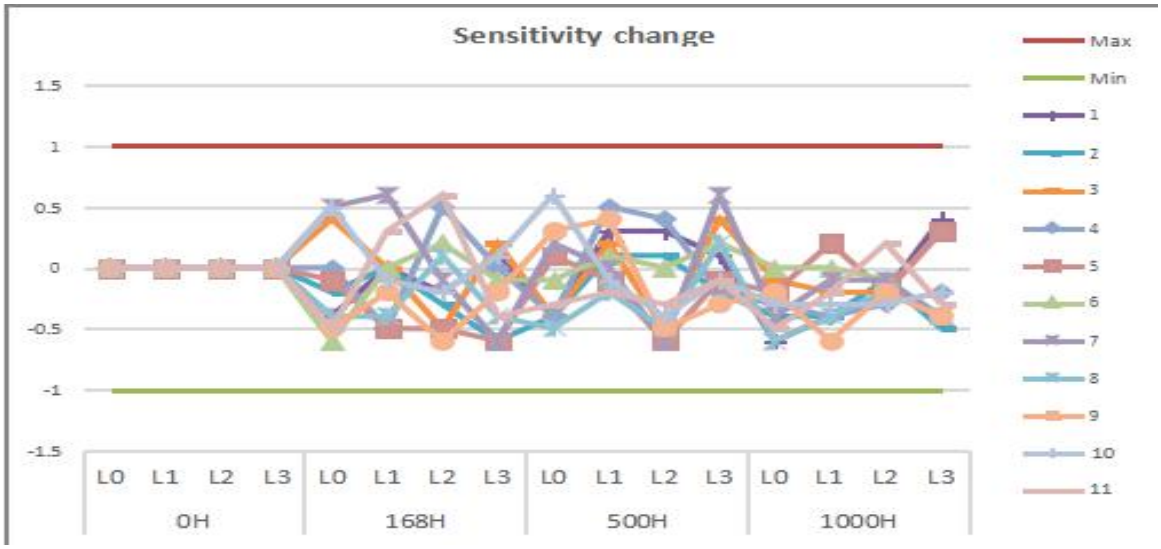
3.1.8.2Test Data

- **Tx_Power Change (dB)**

NO.	SN	OH				168H				168H Change				500H				500H Change				1000H				1000H Change			
		TxPower: -2~1.8				TxPower: -2~1.8				Txpwr <1DB				TxPower: -2~1.8				Txpwr <1DB				TxPower: -2~1.8				Txpwr <1DB			
		L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
1	F00070121 1N00175	0.53	0.58	0.46	0.40	0.44	0.32	0.01	0.58	-0.09	-0.26	-0.45	0.18	0.34	0.52	0.13	0.68	-0.19	-0.06	-0.33	0.28	0.64	0.62	0.31	0.88	0.12	0.04	-0.15	0.48
2	F00070121 1N00068	0.98	1.06	0.70	0.90	0.83	1.05	0.58	0.58	-0.15	-0.01	-0.12	-0.32	0.95	1.15	0.57	0.50	-0.03	0.09	-0.13	-0.40	0.55	0.64	0.23	0.41	-0.43	-0.43	-0.47	-0.49
3	F00070121 1N00131	-0.21	-0.01	0.21	0.19	-0.44	0.04	0.07	0.33	-0.23	0.05	-0.14	-0.52	0.11	0.11	0.07	-0.27	0.32	0.12	-0.14	-0.46	-0.37	-0.44	-0.23	-0.32	-0.16	-0.42	-0.44	-0.50

4	F00070121 1N00143	0. 64	0. 49	0. 72	0. 92	0. 24	- 0. 02	0. 17	0. 34	- 0. 40	- 0. 51	- 0. 55	- 0. 58	0. 64	0. 54	0. 40	0. 47	0. 00	0. 05	- 0. 32	- 0. 45	0. 57	0. 67	1. 02	0. 87	- 0. 07	0. 18	0. 30	- 0. 05
5	F00070121 1N00057	0. 82	0. 99	0. 81	0. 64	0. 92	0. 45	0. 36	0. 07	0. 10	- 0. 54	- 0. 44	- 0. 56	1. 02	0. 89	0. 35	0. 65	0. 20	- 0. 09	- 0. 46	0. 02	1. 03	1. 00	0. 86	0. 65	0. 21	0. 02	0. 05	0. 02
6	F00070121 1N00056	1. 15	1. 06	0. 38	0. 27	0. 92	0. 78	0. 28	- 0. 07	- 0. 23	- 0. 29	- 0. 10	- 0. 33	1. 29	0. 93	0. 34	0. 13	0. 14	- 0. 14	- 0. 04	- 0. 13	1. 37	1. 34	- 0. 07	- 0. 19	0. 22	0. 28	- 0. 46	- 0. 46
7	F00070121 1N00191	0. 37	0. 77	0. 65	0. 92	0. 61	0. 61	0. 05	0. 50	0. 24	- 0. 17	- 0. 60	- 0. 42	0. 50	0. 43	0. 21	0. 57	0. 14	- 0. 34	- 0. 44	- 0. 35	0. 95	0. 87	0. 79	0. 81	0. 58	0. 09	0. 14	- 0. 11
8	F00070121 1N00156	0. 45	0. 29	- 0. 05	0. 16	0. 01	- 0. 12	- 0. 04	- 0. 22	- 0. 44	- 0. 41	0. 01	- 0. 37	0. 11	- 0. 24	- 0. 39	- 0. 22	- 0. 34	- 0. 53	- 0. 34	- 0. 37	0. 01	- 0. 12	- 0. 04	- 0. 22	- 0. 44	- 0. 41	0. 01	- 0. 37
9	F00070121 1N00145	0. 78	1. 51	1. 26	1. 67	0. 95	1. 58	1. 31	1. 74	0. 17	0. 07	0. 05	0. 06	1. 05	1. 69	1. 07	1. 54	0. 28	0. 18	- 0. 19	- 0. 14	0. 32	1. 72	1. 33	1. 75	- 0. 45	0. 21	0. 07	0. 07
10	F00070121 1N00157	- 0. 71	- 0. 51	- 0. 66	- 0. 70	- 0. 63	- 0. 90	- 0. 32	- 0. 60	0. 09	- 0. 38	0. 34	0. 10	- 0. 77	- 0. 97	- 0. 72	- 0. 83	- 0. 06	- 0. 45	- 0. 06	- 0. 13	- 0. 31	- 0. 03	- 0. 12	- 0. 30	0. 40	0. 48	0. 54	0. 40
11	F00070121 1N00171	0. 03	0. 42	0. 06	0. 67	0. 39	- 0. 03	- 0. 25	0. 58	0. 36	- 0. 44	- 0. 30	- 0. 09	- 0. 02	- 0. 13	- 0. 40	0. 52	- 0. 05	- 0. 54	- 0. 45	- 0. 15	0. 60	0. 88	0. 54	0. 82	0. 57	0. 46	0. 49	0. 15

- **Sensitivity Change (dB)**



NO.	SN	OH				168H				168H Change				500H				500H Change				1000H				1000H Change			
		SEN:<-0.72				SEN:<-0.72				SEN <1dB				SEN:<-0.72				SEN <1dB				SEN:<-0.72				SEN <1dB			
		L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
1	F00070121 1N00175	-7.00	-7.00	-7.20	-7.90	-7.40	-7.00	-7.40	-7.80	-0.40	0.00	-0.20	0.10	-7.40	-6.70	-6.90	-7.80	-0.40	0.30	0.30	0.10	-7.60	-7.40	-7.40	-7.50	-0.60	-0.40	-0.20	0.40
2	F00070121 1N00068	-8.20	-9.10	-8.60	-8.90	-8.40	-9.10	-8.90	-9.50	-0.20	0.00	-0.30	-0.60	-8.60	-9.00	-8.50	-9.10	-0.40	0.10	0.10	-0.20	-8.60	-9.50	-8.70	-9.40	-0.40	-0.40	-0.10	-0.50
3	F00070121 1N00131	-8.50	-8.60	-9.00	-8.90	-8.10	-8.60	-9.50	-8.70	-0.40	0.00	-0.50	-0.20	-8.90	-8.40	-9.50	-8.50	-0.40	-0.20	-0.50	-0.40	-8.60	-8.80	-9.20	-8.60	-0.10	-0.20	-0.20	-0.30
4	F00070121 1N00143	-7.10	-8.00	-8.90	-9.00	-7.10	-8.50	-8.40	-9.00	-0.00	-0.50	-0.50	-0.00	-7.50	-7.50	-8.50	-9.20	-0.40	-0.50	-0.40	-0.20	-7.40	-8.40	-9.20	-9.20	-0.30	-0.40	-0.30	-0.20
5	F00070121 1N00057	-8.	-9.	-8.	-8.	-8.	-9.	-9.	-9.	-0.	-0.	-0.	-0.	-8.	-9.	-9.	-9.	-0.1	-0.	-0.	-0.	-8.	-8.	-9.	-8.	-0.	-0.2	-0.	-0.3

		70	00	90	90	80	50	40	50	10	50	50	60	60	10	50	00	0	10	60	10	90	80	10	60	20	0	20	0
6	F00070121 1N00056	- 8. 40	- 8. 50	- 8. 60	- 9. 10	- 9. 00	- 8. 50	- 8. 40	- 9. 20	- 0. 60	0. 00	0. 20	- 0. 10	- 8. 50	- 8. 40	- 8. 60	- 8. 90	- 0. 10	0. 10	0. 00	0. 20	- 8. 40	- 8. 50	- 8. 70	- 9. 50	0. 00	0. 00	- 0. 10	- 0. 40
7	F00070121 1N00191	- 8. 10	- 8. 00	- 8. 00	- 8. 10	- 7. 60	- 7. 40	- 8. 10	- 8. 70	0. 50	0. 60	- 0. 10	- 0. 60	- 7. 90	- 8. 00	- 8. 60	- 7. 50	0. 20	0. 00	- 0. 60	0. 60	- 8. 50	- 8. 10	- 8. 10	- 8. 50	- 0. 40	- 0. 10	- 0. 10	- 0. 40
8	F00070121 1N00156	- 7. 00	- 7. 10	- 6. 90	- 7. 50	- 7. 40	- 7. 50	- 6. 80	- 7. 90	- 0. 40	- 0. 40	0. 10	- 0. 40	- 7. 50	- 7. 30	- 7. 40	- 7. 30	- 0. 50	- 0. 20	- 0. 50	0. 20	- 7. 60	- 7. 50	- 7. 10	- 7. 90	- 0. 60	- 0. 40	- 0. 20	- 0. 40
9	F00070121 1N00145	- 7. 70	- 7. 40	- 8. 00	- 8. 20	- 8. 20	- 7. 60	- 8. 60	- 8. 40	- 0. 50	- 0. 20	- 0. 60	- 0. 20	- 7. 40	- 7. 00	- 8. 50	- 8. 50	0. 30	0. 40	- 0. 50	- 0. 30	- 7. 90	- 8. 00	- 8. 20	- 8. 60	- 0. 20	- 0. 60	- 0. 20	- 0. 40
10	F00070121 1N00157	- 8. 50	- 8. 90	- 9. 30	- 8. 90	- 8. 00	- 9. 00	- 9. 50	- 8. 80	0. 50	- 0. 10	- 0. 20	0. 10	- 7. 90	- 9. 00	- 9. 70	- 9. 00	0. 60	- 0. 10	- 0. 40	- 0. 10	- 8. 80	- 9. 20	- 9. 60	- 9. 10	- 0. 30	- 0. 30	- 0. 30	- 0. 20
11	F00070121 1N00171	- 7. 40	- 8. 40	- 8. 90	- 9. 00	- 7. 90	- 8. 10	- 8. 30	- 9. 40	- 0. 50	0. 30	0. 60	- 0. 40	- 7. 70	- 8. 60	- 9. 20	- 9. 10	- 0. 30	- 0. 20	- 0. 30	- 0. 10	- 7. 90	- 8. 60	- 8. 70	- 9. 30	- 0. 50	- 0. 20	0. 20	- 0. 30

3.1.9Non-Operational ESD

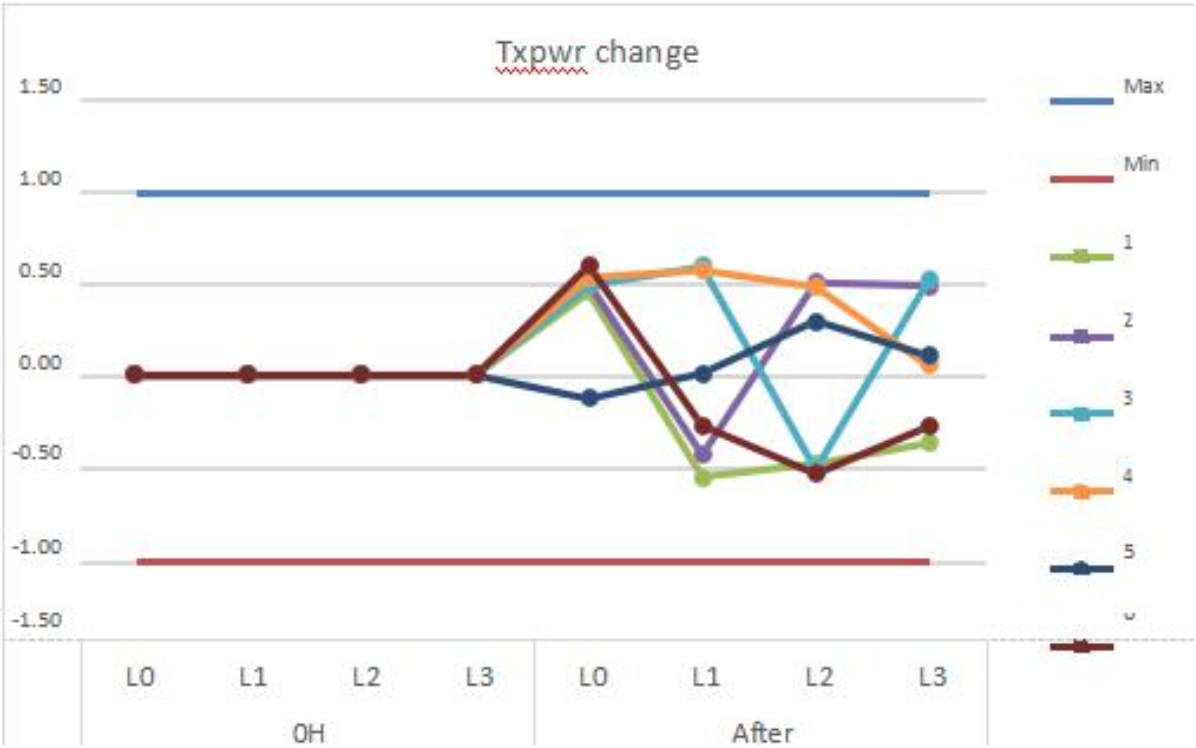
3.1.9.1Test Condition & Result

Product Name: 100G SR4 Result: Pass

Test Condition: HBM class 1, Contact discharge on Golden Finger

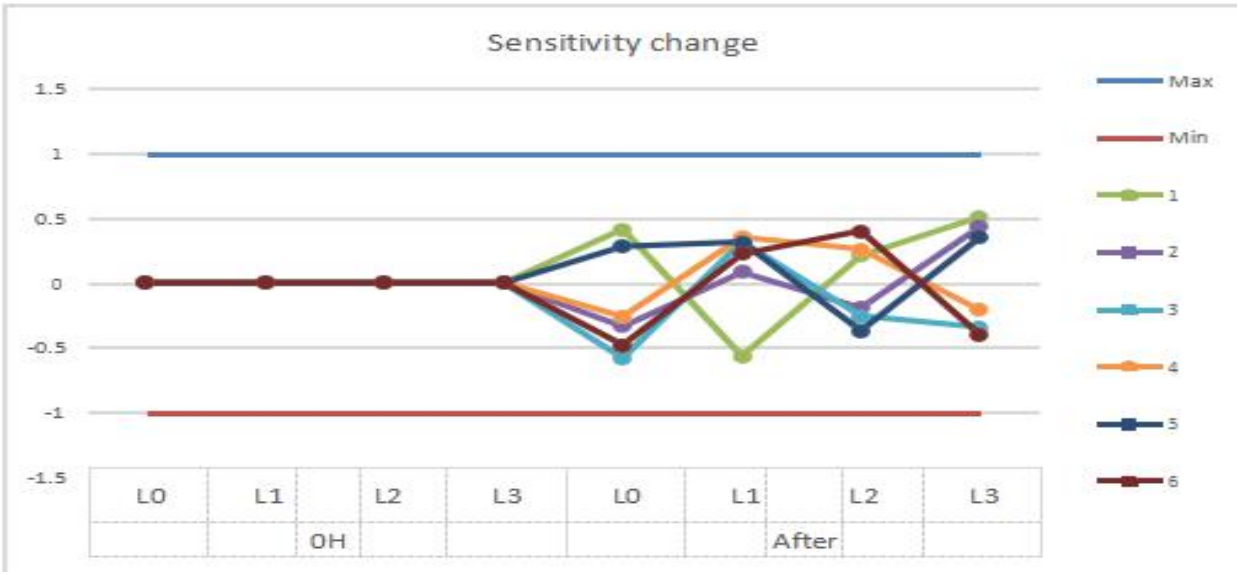
3.1.9.2Test Data

- **Tx_Power Change (dB)**



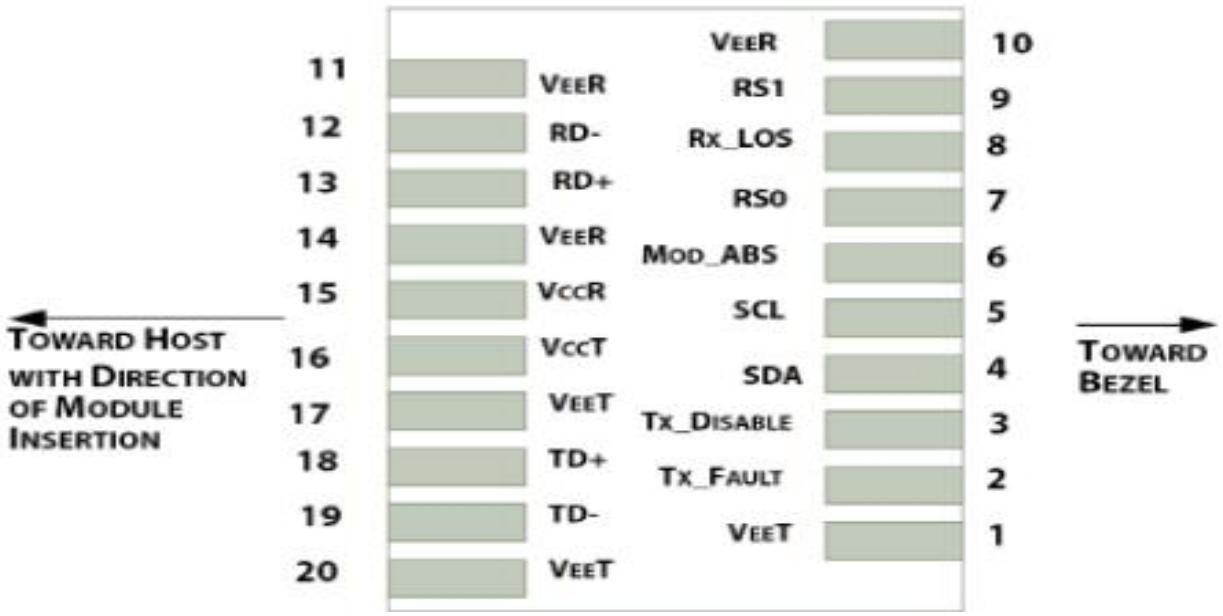
NO.	SN	0H				After ESD HBM				After ESD HBM Change			
		TxPower: -2~1.8				TxPower: -2~1.8				Txpwr <1dB			
		L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
1	F000701211N00173	0.35	0.20	0.19	-0.32	0.80	-0.36	-0.30	-0.69	0.45	-0.55	-0.48	-0.37
2	F000701211N00175	-0.11	-0.06	0.41	0.16	0.39	-0.50	0.92	0.65	0.50	-0.43	0.50	0.49
3	F000701211N00181	-0.15	-0.03	0.25	-0.48	0.34	0.56	-0.27	0.03	0.49	0.59	-0.51	0.52
4	F000701211N00183	0.13	0.53	0.66	0.69	0.66	1.10	1.14	0.74	0.53	0.57	0.48	0.05
5	F000701211N00189	0.63	-0.14	0.32	0.00	0.50	-0.13	0.62	0.11	-0.13	0.01	0.30	0.11
6	F000701211N00196	-0.06	0.60	0.46	-0.03	0.54	0.32	-0.08	-0.30	0.60	-0.28	-0.54	-0.28

- **Sensitivity Change (dB)**



NO.	SN	0H				After ESD HBM				After ESD HBM Change			
		TxPower: -2~1.8				TxPower: -2~1.8				Txpwr <1dB			
		L0	L1	L2	L3	L0	L1	L2	L3	L0	L1	L2	L3
1	F000701211N00173	-7.90	-7.90	-8.00	-8.50	-7.48	-8.46	-7.79	-7.99	0.42	-0.56	0.21	0.51
2	F000701211N00175	-8.00	-8.20	-8.20	-8.20	-8.34	-8.12	-8.39	-7.77	-0.34	0.08	-0.19	0.43
3	F000701211N00181	-8.60	-7.50	-7.80	-7.60	-9.18	-7.18	-8.06	-7.94	-0.58	0.32	-0.26	-0.34
4	F000701211N00183	-9.40	-9.50	-9.50	-9.30	-9.66	-9.15	-9.24	-9.51	-0.26	0.35	0.26	-0.21
5	F000701211N00189	-6.90	-7.50	-7.00	-7.50	-6.62	-7.18	-7.37	-7.15	0.28	0.32	-0.37	0.35
6	F000701211N00196	-8.00	-7.70	-7.00	-8.10	-8.48	-7.48	-6.60	-8.50	-0.48	0.22	0.40	-0.40

Pin Definitions



Contacts	Logic	Symbol	Description
case		case	Module case
1		VEET	Module Transmitter Ground
2	LVTTL-O	TX_FAULT	Module Transmitter Fault
3	LVTTL-I	TX_DISABLE	Transmitter Disable; Turns off transmitter laser output
4	LVTTL-I/O	SDA	2-wire Serial Interface Data Line(Same as MOD-DEF2 in INF-8074i)
5	LVTTL-I/O	SCL	2-wire Serial Interface Clock (Same as MOD-DEF1 in INF-8074i)
6		MOD_ABS	Module Absent, connected to VEET or VEER in the module
7	LVTTL-I	RS0	Rate Select 0, optionally controls SFP+ module receiver.
8	LVTTL-O	RX_LOS	Receiver Loss of Signal Indication(In FC designated as Rx_LOS and in Ethernet designated as Signal Detect)

9	LVTTL-I	RS1	Rate Select 1, optionally controls SFP+ module transmitter
10		VEER	Module Receiver Ground
11		VEER	Module Receiver Ground
12	CML-O	RD-	Receiver Inverted Data Output
13	CML-O	RD+	Receiver Non-Inverted Data Output
14		VEER	Module Receiver Ground
15		VCCR	Module Receiver 3.3 V Supply
16		VCCT	Module Transmitter 3.3 V Supply
17		VEET	Module Transmitter Ground
18	CML-I	TD+	Transmitter Non-Inverted Data Input
19	CML-I	TD-	Transmitter Inverted Data Input
20		VEET	Module Transmitter Ground

3.1.10Operating ESD Test

3.1.10.1Test Condition & Result

Product Name: 100G SR4

Table 3: Test Conclusion

	Test Type	Discharge Level	Test Result
a)	Contact Discharge	±2kV	Can meet IEC 61000-4-2 Operational Test, Condition A
		±4kV	Can meet IEC 61000-4-2 Operational Test, Condition A
		±6kV	Can meet IEC 61000-4-2 Operational Test, Condition A
		±8kV	Can meet IEC 61000-4-2 Operational Test, Condition A
b)	Air Discharge	±2kV	Can meet IEC 61000-4-2 Operational Test, Condition A
		±4kV	Can meet IEC 61000-4-2 Operational Test, Condition A
		±8kV	Can meet IEC 61000-4-2 Operational Test, Condition A
		±15kV	Can meet IEC 61000-4-2 Operational Test, Condition A

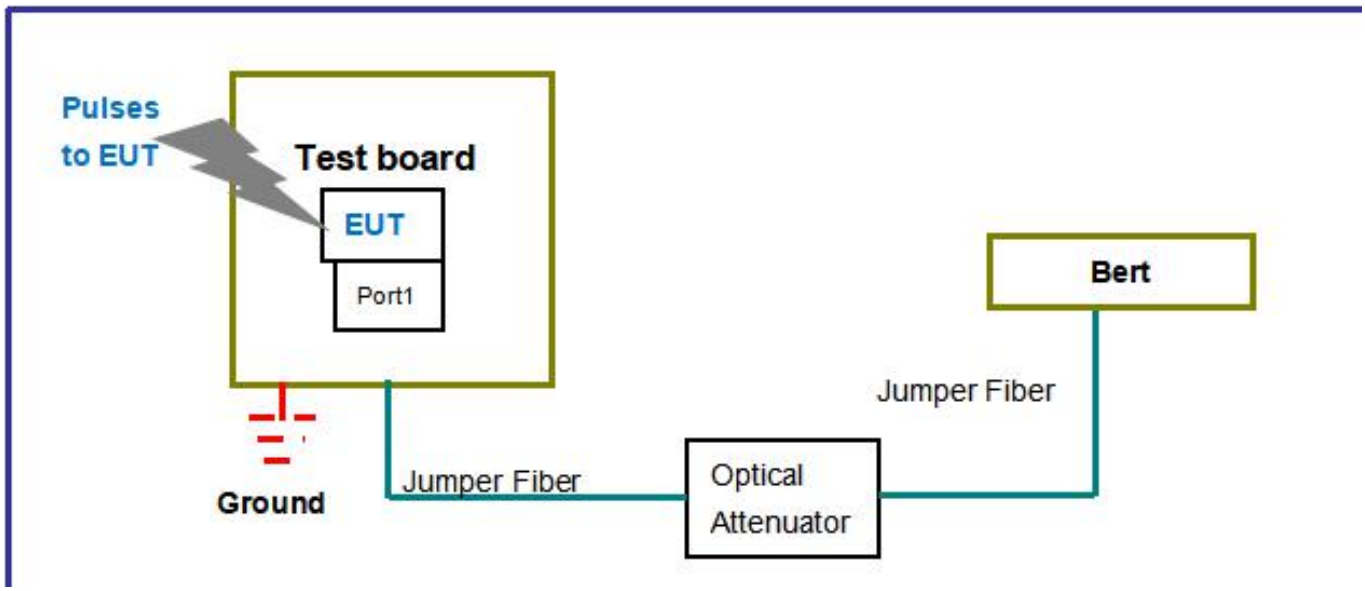
3.1.10.2Primary Test Equipments

Table 4: The Primary Test Equipments

No.	Serial No.	Equipment	Manufacturer	Model No.
1	297	ESD Simulator	Schaffner	NSG 438

Figure 1: ESD Simulator Photo

Figure 2: ESD Test Set Up



3.1.10.3Test Procedure

Discharges applied to the faceplate of the functioning transceiver. The unit under test was inserted into the test board which is connected to a ground. Each device shall be tested by 10 positive and 10 negative pulseson every test point. At least 1 second interval time shall separate the pulses. 4 test points was chosen from faceplate of the unit under test.

Discharges were applied to functioning transceivers at the fiber optic connector position. When contact

discharge up to ±2KV, ±4KV, ±6KV, ±8KV air discharge up to ±15KV, we monitored all the bit errors from PC monitor. Please refer to Figure 26 test set up.