

FCC Part 24&27 Canada RSS130&133&139 Test Report

Product Name : module

Trade Name : 

Model No. : NE910C1-NA

FCC ID : RI7NE910C1NA

IC ID : 5131A-NE910C1NA

Applicant : Telit communications Spa

Address : Via Stazione di Prosecco 5/B
34010 Sgonico
Trieste-Italy

Date of Receipt : Apr. 08, 2018

Issued Date : Apr. 30, 2018

Report No. : 1840048R-HPUSP40V00

Report Version : V2.0



The test results relate only to the samples tested.

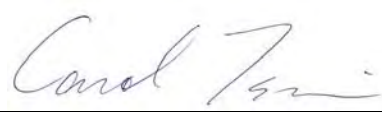
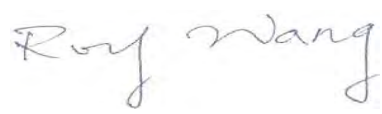
The test report shall not be reproduced except in full without the written approval of DEKRA Testing and Certification Co., Ltd..

Test Report Certification

Issued Date : Apr. 30, 2018

Report No. : 1840048R-HPUSP40V00



Product Name : module
Applicant : Telit communications Spa
Address : Via Stazione di Prosecco 5/B
34010 Sgonico
Trieste-Italy
Manufacturer : TELIT WIRELESS SOLUTIONS CO., LTD
Model No. : NE910C1-NA
FCC ID : RI7NE910C1NA
IC ID : 5131A-NE910C1NA
EUT Voltage : DC 3.8V
Testing Voltage : DC 3.8V
Trade Name : 
Applicable Standard : FCC Part 24 Subpart E
FCC CFR Title 47 Part 27 Subpart C & Part 2
ANSI C63.26-2015
KDB 971168 D01 Power Meas License Digital Systems v03
Industry Canada RSS-133, Issue 6
ANSI/TIA-603-D-2010
RSS Gen Issue 4
Industry Canada RSS 130 Issue 1
Industry Canada RSS 139 Issue 3
Test Lab : Hsin Chu Laboratory
Address : No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu
County 310, Taiwan, R.O.C.
TEL: +886-3-582-8001 / FAX: +886-3-582-8958
Test Result : Complied
Documented By : 
(Carol Tsai / Senior Engineering Adm. Specialist)
Tested By : 
(Ricky Lee / Senior Engineer)
Approved By : 
(Roy Wang / Director)

Revision History

Report No.	Version	Description	Issued Date
1840048R-HPUSP40V00	V2.0	Initial issue of report	Apr. 30, 2018

TABLE OF CONTENTS

Description	Page
1. General Information	6
1.1. EUT Description	6
1.2. Mode of Operation	7
1.3. Tested System Details	8
1.4. Configuration of Tested System	8
1.5. EUT Exercise Software	9
2. Technical Test	10
2.1. Summary of Test Result	10
2.2. List of Test Equipment	12
2.3. Measurement Uncertainty	14
2.4. Test Environment	15
3. RF Output Power	16
3.1. Test Setup	16
3.2. Test Procedure	16
3.3. Test Method	16
3.4. Test Result	17
4. Occupied Bandwidth	21
4.1. Test Setup	21
4.2. Test Procedure	21
4.3. Test Method	21
4.4. Test Result	22
5. Peak To Average Ratio	50
5.1. Test Setup	50
5.2. Test Procedure	50
5.3. Test Method	50
5.4. Test Result	51

6. Spurious Emissions	59
6.1. Test Setup	59
6.2. Test Procedure.....	61
6.3. Test Method	61
6.4. Test Result	62
7. Spurious Emissions at Antenna Terminals	90
7.1. Test Setup	90
7.2. Test Procedure.....	90
7.3. Test Method	90
7.4. Test Result	91
8. Frequency Stability	107
8.1. Test Setup	107
8.2. Test Procedure.....	108
8.3. Test Method	108
8.4. Test Result	109
Attachment 1.....	157
Test Setup Photograph	157

1. General Information

1.1. EUT Description

Product Name	module
Model No.	NE910C1-NA
Trade Name	
Tx Frequency Range/ Channel number	LTE_NB-IOT_Band 2:1850~1910MHz LTE_NB-IOT_Band 4:1710~1755MHz LTE_NB-IOT_Band 12:699~716MHz LTE_NB-IOT_Band 13:777~787MHz
Rx Frequency Range/ Channel number	LTE_NB-IOT_Band 2:1930~1990MHz LTE_NB-IOT_Band 4:2110~2155MHz LTE_NB-IOT_Band 12:729~746MHz LTE_NB-IOT_Band 13:746~756MHz
IMEI No.	355154080214824
HW	0.0
SW	M0B.150003

Note:

1. Regarding frequency band operation, the lowest, middle and highest frequency of channel were selected to perform the test, and the details were shown on this report.

1.2. Mode of Operation

DEKRA has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

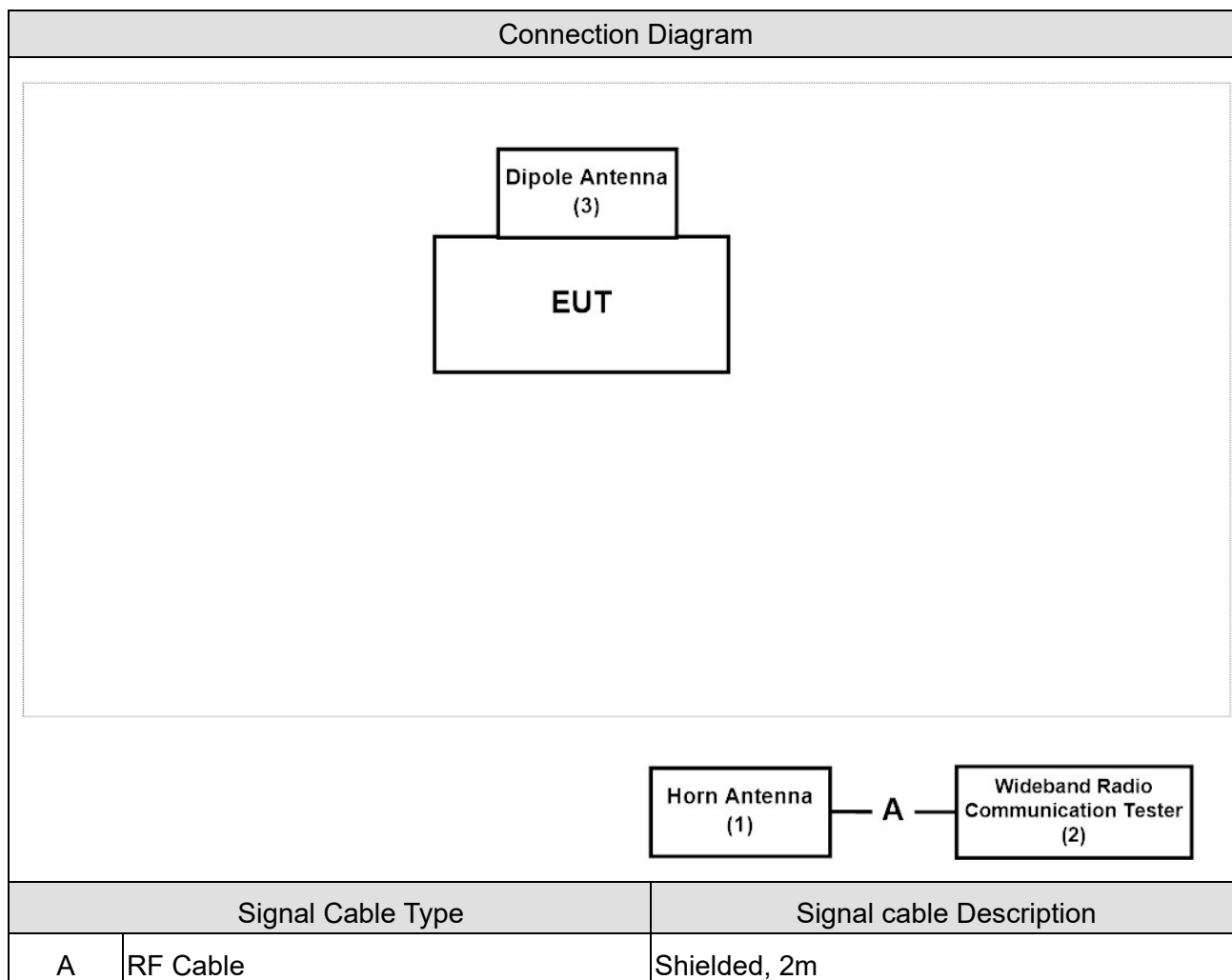
Test Mode
Mode 1: LTE_NB-IOT_Band 2_Link
Mode 2: LTE_NB-IOT_Band 4_Link
Mode 3: LTE_NB-IOT_Band 12_Link
Mode 4: LTE_NB-IOT_Band 13_Link

1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	Power Cord
1 Horn Antenna	Schwarzbeck	BBHA 9120D	639	--
2 Wideband Radio Communication Tester	R&S	CMW500	150246	--
3 Dipole Antenna (2.14dBi)	ATEL-CAB	T-AT305	--	--

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on 1.4.
2	Turn on the power of all equipment.
3	The EUT will continue receive the signal from LTE NB-IOT function.
4	Repeat the above procedure (3)

2. Technical Test

2.1. Summary of Test Result

- ☒ No deviations from the test standards
- ☐ Deviations from the test standards as below description:

For GPRS1900/EGPRS1900/WCDMA Band2

(FCC Part 24 Subpart E, Industry Canada RSS-133, Industry Canada RSS-GEN)

Performed Item	FCC Rule	IC Rule	Limit	Result	Test Site
Maximum Output Power	§2.1033 §2.1046 §24.232	RSS-133 §6.4	< 2 Watts	Pass	2/3
Occupied Bandwidth	§2.1049	RSS-GEN §4.2	N/A	Pass	2
Peak To Average Ratio	§24.232	RSS-133 §6.4	<13dB	Pass	2
Spurious Emission	§27.238	RSS-133 §6.5	< -13dBm	Pass	3
Spurious Emission at Antenna Terminals	§2.1053 §24.238	RSS-133 §6.5	< -13dBm	Pass	3
Frequency Stability	§2.1055 §24.235	RSS-133 §6.3	< 2.5 ppm	Pass	2

Note: Test site information refers to Laboratory Information.

(FCC CFR Title 47 Part 27, Industry Canada RSS 130, RSS 139, Industry Canada RSS-GEN)

Performed Item	FCC Rule	IC Rule	Limit	Result	Test Site
Maximum Output Power	§2.1046 §27.50(C)(10)	RSS -139 §6.5 RSS -130 §4.4	< 3 Watts	Pass	2/3
Occupied Bandwidth	§2.1049 §27.53(l)(6)	RSS - Gen §6.6	N/A	Pass	2
Peak To Average Ratio	§27.50	RSS -139 §6.5 RSS -130 §4.4	<13dB	Pass	2
Spurious Emission	§2.1051 §27.53(l)(4)(6)	RSS - 139 §6.6 RSS -130 §4.6	< -13dBm	Pass	3
Spurious Emission at Antenna Terminals	§27.53	RSS - 139 §6.6 RSS -130 §4.4	< -13dBm	Pass	3
Frequency Stability	§2.1055(a)(l) §27.54	RSS - 139 §6.4 RSS -130 §4.3	< 2.5 ppm	Pass	2

Note: Test site information refers to Laboratory Information.

2.2. List of Test Equipment

RF Output Power / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
High Speed Peak Power Meter Dual Input	Anritsu	ML2496A	1602004	2018/01/02	2019/01/01
Wideband Radio Communication Tester	R&S	CMW500	150246	2018/03/30	2019/03/29
Directional Coupler	Agilent	778D	20402	2017/09/25	2018/09/24
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2018/03/05	2019/03/04

Occupied Bandwidth / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal Analyzer	R&S	FSVA40	101455	2017/11/21	2018/11/20
Wideband Radio Communication Tester	R&S	CMW500	150246	2018/03/30	2019/03/29
Directional Coupler	Agilent	778D	20402	2017/09/25	2018/09/24
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2018/03/05	2019/03/04

Peak To Average Ratio / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal Analyzer	R&S	FSVA40	101455	2017/11/21	2018/11/20
Wideband Radio Communication Tester	R&S	CMW500	150246	2018/03/30	2019/03/29
Directional Coupler	Agilent	778D	20402	2017/09/25	2018/09/24
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2018/03/05	2019/03/04

Conducted Band Edge Emissions / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal Analyzer	R&S	FSVA40	101455	2017/11/21	2018/11/20
Wideband Radio Communication Tester	R&S	CMW500	150246	2018/03/30	2019/03/29
Directional Coupler	Agilent	778D	20402	2017/09/25	2018/09/24
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2018/03/05	2019/03/04

Spurious Emission / CB4-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal Analyzer	R&S	FSVA40	101455	2017/11/21	2018/11/20
Signal & Spectrum Analyzer	R&S	FSV40	101049	2018/01/10	2019/01/09
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2018/03/05	2019/03/04
Bilog Antenna	Teseq	CBL6112D	23191	2017/06/28	2018/06/27
Horn Antenna	Schwarzbeck	BBHA 9120D	639	2017/06/14	2018/06/13
Horn Antenna	Schwarzbeck	BBHA 9170	202	2018/01/31	2019/01/30
Pre-Amplifier	Dekra	AP-025C	201801236	2018/02/26	2019/02/25
Pre-Amplifier	EMCI	EMC11830I	980366	2018/01/08	2019/01/07
Pre-Amplifier	Dekra	AP-400C	201801231	2017/12/13	2018/12/12
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2018/03/05	2019/03/04

Spurious Emissions at Antenna Terminals / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal Analyzer	R&S	FSVA40	101455	2017/11/21	2018/11/20
Wideband Radio Communication Tester	R&S	CMW500	150246	2018/03/30	2019/03/29
Directional Coupler	Agilent	778D	20402	2017/09/25	2018/09/24
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2018/03/05	2019/03/04

Frequency Stability Under Temperature & Voltage Variations / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal Analyzer	R&S	FSVA40	101455	2017/11/21	2018/11/20
Wideband Radio Communication Tester	R&S	CMW500	150246	2018/03/30	2019/03/29
Directional Coupler	Agilent	778D	20402	2017/09/25	2018/09/24
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2018/03/05	2019/03/04

2.3. Measurement Uncertainty

RF Output Power	± 1.27 dB.
Occupied Bandwidth	± 10 Hz
Peak To Average Ratio	not exceed 13 dB.
Spurious Emission	± 1.27 dB for Conducted Measurement. ± 3.20 dB for Radiated Measurement.
Spurious Emissions at Antenna Terminals	± 3.2 dB.
Frequency Stability	± 10 Hz.

2.4. Test Environment

Items	Test Item	Required (IEC 68-1)	Actual	Test Site
Temperature (°C)	RF Output Power	15 - 35	25	3
Humidity (%RH)		20 - 75	50	
Barometric pressure (mbar)		860 - 1060	950-1000	
Temperature (°C)	Occupied Bandwidth	15 - 35	25	3
Humidity (%RH)		20 - 75	50	
Barometric pressure (mbar)		860 - 1060	950-1000	
Temperature (°C)	Peak To Average Ratio	15 - 35	25	3
Humidity (%RH)		20 - 75	50	
Barometric pressure (mbar)		860 - 1060	950-1000	
Temperature (°C)	Spurious Emission	15 - 35	25	2/3
Humidity (%RH)		20 - 75	50	
Barometric pressure (mbar)		860 - 1060	950-1000	
Temperature (°C)	Spurious Emissions at Antenna Terminals	15 - 35	25	3
Humidity (%RH)		20 - 75	50	
Barometric pressure (mbar)		860 - 1060	950-1000	
Temperature (°C)	Frequency Stability	15 - 35	25	3
Humidity (%RH)		20 - 75	50	
Barometric pressure (mbar)		860 - 1060	950-1000	

Note: Test site information refers to Laboratory Information.

USA : FCC, Registration Number: TW3024

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:

<http://www.dekra.com.tw/english/about/certificates.aspx?bval=5>

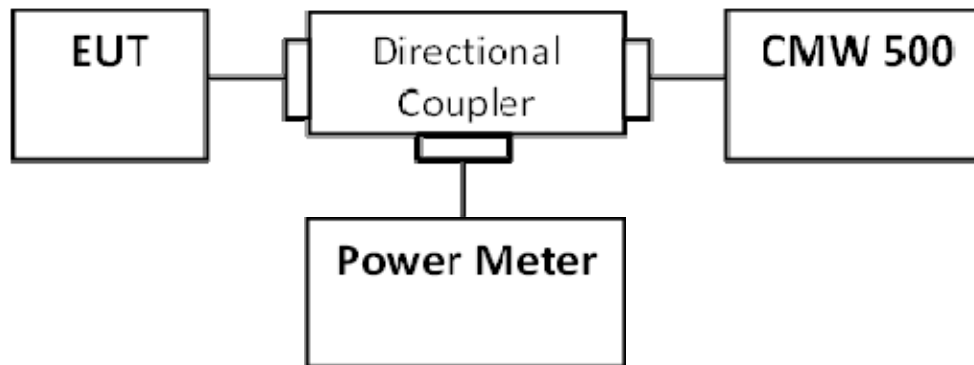
The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site : http://www.dekra.com.tw/index_en.aspx

If you have any comments, Please don't hesitate to contact us. Our test sites as below:

- 1 No. 75-2, 3rd Lin, WangYe Keng, Yonghxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan (R.O.C.)
TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : info.tw@dekra.com
- 2 No.372, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C.
TEL: +886-3-582-8001 / FAX: +886-3-582-8958 E-Mail : info.tw@dekra.com
- 3 No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C.
TEL: +886-3-582-8001 / FAX: +886-3-582-8958 E-Mail : info.tw@dekra.com

3. RF Output Power

3.1. Test Setup



3.2. Test Procedure

- The RF output of the transmitter was connected to base station simulator.
- The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement..
- Set EUT at maximum average power by base station emulator.
- Measure lowest, middle, and highest channels for each bandwidth and different modulation.

Effective Isotropic Radiated Power = Conducted Power(dBm) + Antenna Gain(dBi)

Effective Radiated Power = Conducted Power(dBm) + Antenna Gain(dBi) - 2.15dB

3.3. Test Method

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause 5.2.4

ANSI C63.26-2015 Sub-clause 5.2.4.2

3.4. Test Result

Test Mode	Mode 1: LTE_NB-IOT_Band 2_Link (Conducted)		
Date of Test	2018/04/30	Test Site	SR10-H

CH	Freq. (MHz)	Mod	BW (kHz)	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
18601	1850.1	BPSK	3.75	1	0	22.53	0.294	2
				1	47	22.64	0.301	2
			15	1	0	23.47	0.365	2
				1	11	23.57	0.373	2
		QPSK	3.75	1	0	22.77	0.310	2
				1	47	22.60	0.299	2
			15	1	0	23.42	0.361	2
				1	11	23.30	0.351	2
				12	0	23.10	0.335	2
18900	1880	BPSK	3.75	1	0	22.45	0.288	2
				1	47	22.74	0.308	2
			15	1	0	23.67	0.382	2
				1	11	23.71	0.385	2
		QPSK	3.75	1	0	22.75	0.309	2
				1	47	22.56	0.296	2
			15	1	0	23.78	0.392	2
				1	11	23.27	0.348	2
				12	0	23.22	0.344	2
19199	1909.9	BPSK	3.75	1	0	22.93	0.322	2
				1	47	22.90	0.320	2
			15	1	0	23.56	0.372	2
				1	11	23.38	0.357	2
		QPSK	3.75	1	0	22.11	0.267	2
				1	47	22.70	0.305	2
			15	1	0	23.58	0.374	2
				1	11	23.55	0.372	2
				12	0	23.68	0.383	2

Note:

1. Measure Level (EIRP) = Reading Level (dBm) + Antenna Gain (dBi)
2. The usable maximum antenna gain is 2.15dBi.

Test Mode	Mode 2: LTE_NB-IOT_Band 4_Link (Conducted)		
Date of Test	2018/04/30	Test Site	SR10-H

CH	Freq. (MHz)	Mod	BW (kHz)	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
19951	1710.1	BPSK	3.75	1	0	23.27	0.348	1
				1	47	23.97	0.409	1
			15	1	0	23.67	0.382	1
				1	11	23.64	0.379	1
		QPSK	3.75	1	0	23.06	0.332	1
				1	47	23.96	0.408	1
			15	1	0	23.74	0.388	1
				1	11	23.75	0.389	1
				12	0	23.39	0.358	1
20175	1732.5	BPSK	3.75	1	0	23.74	0.388	1
				1	47	23.86	0.399	1
			15	1	0	23.43	0.361	1
				1	11	23.35	0.355	1
		QPSK	3.75	1	0	23.12	0.337	1
				1	47	23.61	0.377	1
			15	1	0	23.17	0.340	1
				1	11	23.63	0.378	1
				12	0	23.79	0.393	1
20399	1754.9	BPSK	3.75	1	0	23.58	0.374	1
				1	47	23.50	0.367	1
			15	1	0	23.46	0.364	1
				1	11	23.71	0.385	1
		QPSK	3.75	1	0	23.58	0.374	1
				1	47	23.76	0.390	1
			15	1	0	23.28	0.349	1
				1	11	23.02	0.329	1
				12	0	23.82	0.395	1

Note:

1. Measure Level (EIRP) = Reading Level (dBm) + Antenna Gain (dBi)
2. The usable maximum antenna gain is 2.15dBi.

Test Mode	Mode 3: LTE_NB-IOT_Band 12_Link(Conducted)		
Date of Test	2018/04/30	Test Site	SR10-H

CH	Freq. (MHz)	Mod	BW (kHz)	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP
23011	699.1	BPSK	3.75	1	0	22.06	0.161	3
				1	47	22.91	0.195	3
			15	1	0	23.25	0.211	3
				1	11	23.24	0.211	3
		QPSK	3.75	1	0	22.66	0.185	3
				1	47	22.82	0.191	3
			15	1	0	23.92	0.247	3
				1	11	23.43	0.220	3
				12	0	23.02	0.200	3
23095	707.5	BPSK	3.75	1	0	22.02	0.159	3
				1	47	22.81	0.191	3
			15	1	0	23.32	0.215	3
				1	11	23.31	0.214	3
		QPSK	3.75	1	0	22.38	0.173	3
				1	47	22.72	0.187	3
			15	1	0	23.38	0.218	3
				1	11	23.34	0.216	3
				12	0	23.65	0.232	3
23179	715.9	BPSK	3.75	1	0	22.59	0.182	3
				1	47	22.90	0.195	3
			15	1	0	23.59	0.229	3
				1	11	23.57	0.228	3
		QPSK	3.75	1	0	22.18	0.165	3
				1	47	22.66	0.185	3
			15	1	0	23.68	0.233	3
				1	11	23.62	0.230	3
				12	0	23.81	0.240	3

Note:

1. Measure Level (ERP) = Reading Level (dBm) + Antenna Gain (dBi) - 2.15dB
2. The usable maximum antenna gain is 2.15dBi.

Test Mode	Mode 4: LTE_NB-IOT_Band 13_Link(Radiated)		
Date of Test	2018/04/30	Test Site	SR10-H

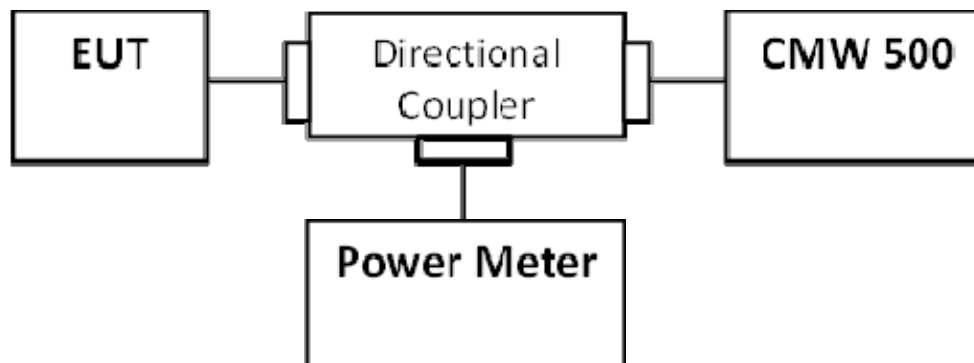
CH	Freq. (MHz)	Mod	BW (kHz)	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP
23181	777.1	BPSK	3.75	1	0	22.65	0.184	3
				1	47	22.78	0.190	3
			15	1	0	23.54	0.226	3
				1	11	23.34	0.216	3
		QPSK	3.75	1	0	22.48	0.177	3
				1	47	22.68	0.185	3
			15	1	0	23.69	0.234	3
				1	11	23.48	0.223	3
				12	0	23.89	0.245	3
23230	782	BPSK	3.75	1	0	22.22	0.167	3
				1	47	22.05	0.160	3
			15	1	0	23.47	0.222	3
				1	11	23.68	0.233	3
		QPSK	3.75	1	0	22.97	0.198	3
				1	47	22.13	0.163	3
			15	1	0	23.34	0.216	3
				1	11	23.56	0.227	3
				12	0	23.43	0.220	3
23279	786.9	BPSK	3.75	1	0	22.12	0.163	3
				1	47	22.55	0.180	3
			15	1	0	23.47	0.222	3
				1	11	23.57	0.228	3
		QPSK	3.75	1	0	22.74	0.188	3
				1	47	22.73	0.187	3
			15	1	0	23.66	0.232	3
				1	11	23.58	0.228	3
				12	0	23.79	0.239	3

Note:

1. Measure Level (ERP) = Reading Level (dBm) + Antenna Gain (dBi) - 2.15dB
2. The usable maximum antenna gain is 2.15dBi.

4. Occupied Bandwidth

4.1. Test Setup



4.2. Test Procedure

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The 26 dB bandwidth and 99% occupied bandwidth of the low & middle & high channel for the highest RF powers were measured.

4.3. Test Method

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause 4.2 & 4.3
ANSI C63.26-2015 Sub-clause 5.4.3 & 5.4.4

4.4. Test Result

Test Mode	Mode 1: LTE_NB-IOT_Band 2_Link		
Date of Test	2018/04/26	Test Site	SR10-H

NB-IOT Band 2_3.75K_BPSK_1RB0

Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
1850.1	41.11	66.375	N/A
1880	36.17	62.982	N/A
1909.9	44.39	65.314	N/A

NB-IOT Band 2_3.75K_BPSK_1RB47

Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
1850.1	40.01	58.755	N/A
1880	39.27	60.741	N/A
1909.9	40.19	62.160	N/A

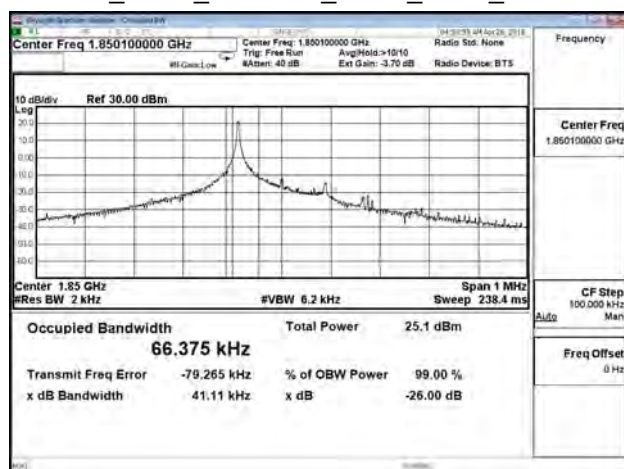
NB-IOT Band 2_3.75K_QPSK_1RB0

Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
1850.1	39.84	68.849	N/A
1880	40.00	68.268	N/A
1909.9	35.21	61.795	N/A

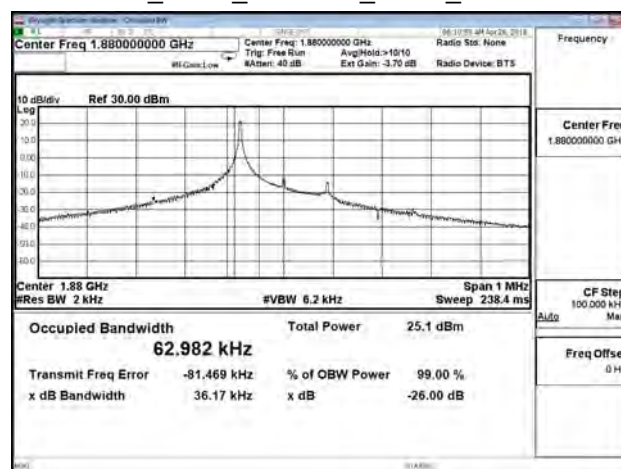
NB-IOT Band 2_3.75K_QPSK_1RB47

Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
1850.1	39.28	66.818	N/A
1880	38.99	67.159	N/A
1909.9	39.42	69.968	N/A

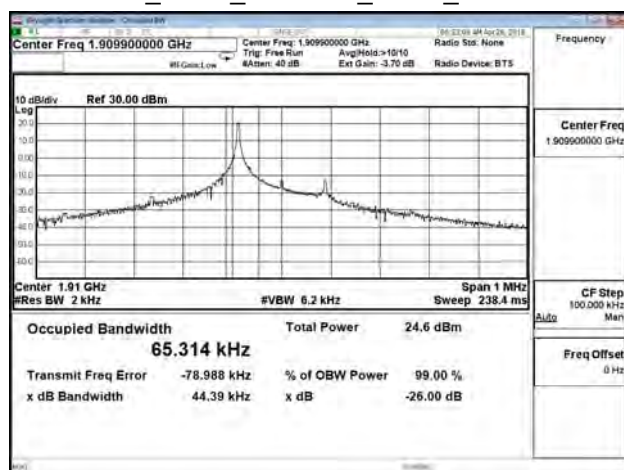
B2_3.75K_CH18601_BPSK_1RB0_OCB



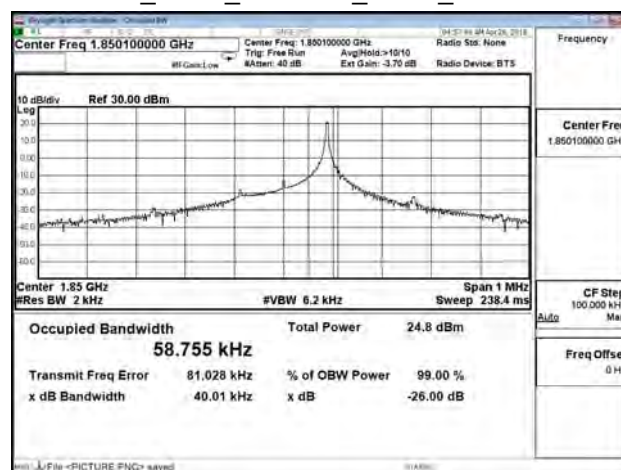
B2_3.75K_CH18900_BPSK_1RB0



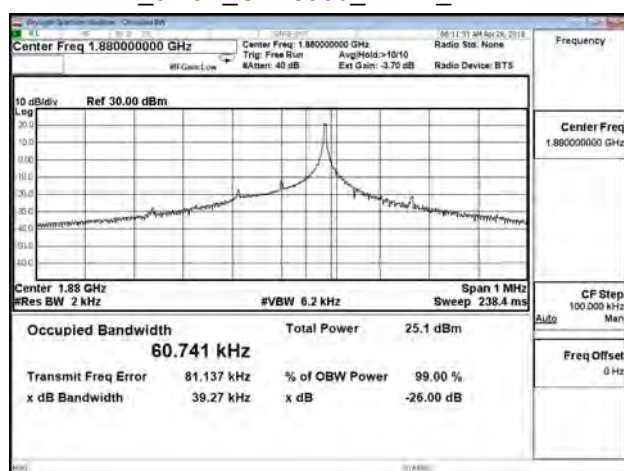
B2_3.75K_CH19199_BPSK_1RB0



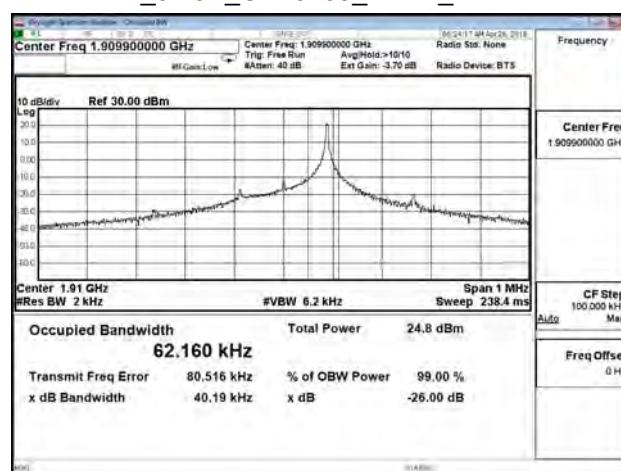
B2_3.75K_CH18601_BPSK_1RB47



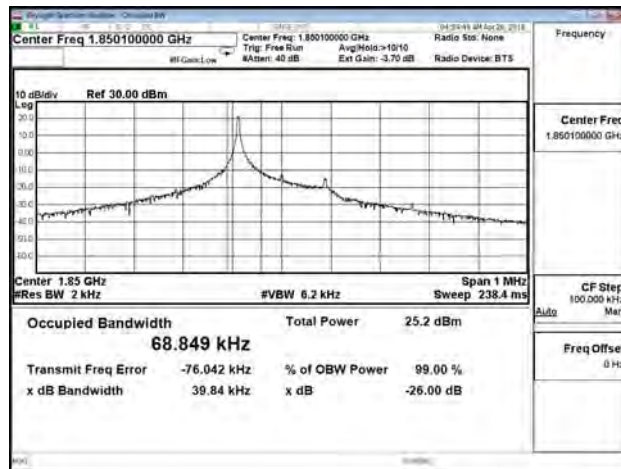
B2_3.75K_CH18900_BPSK_1RB47



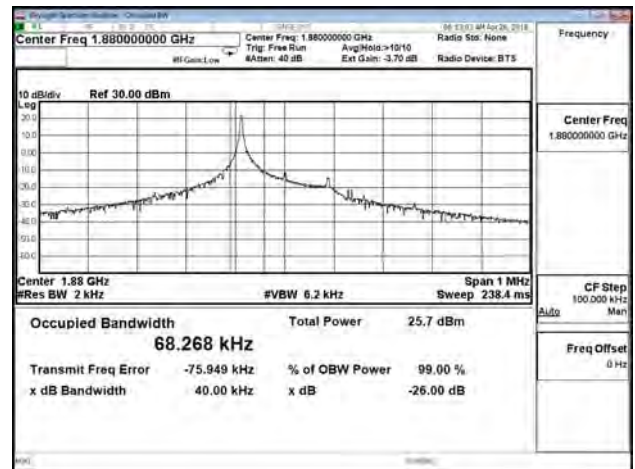
B2_3.75K_CH19199_BPSK_1RB47



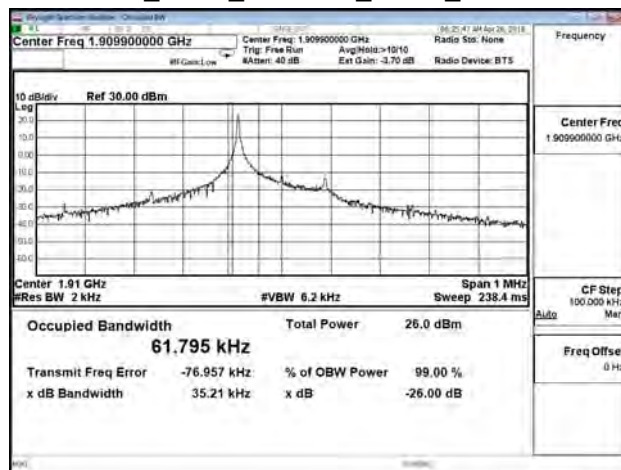
B2_3.75K_CH18601_QPSK_1RB0



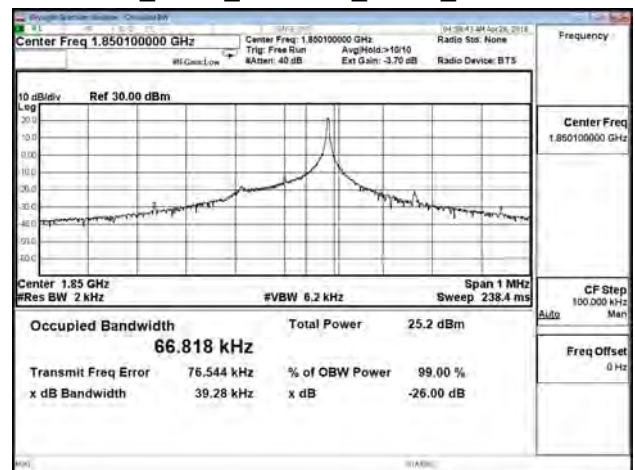
B2_3.75K_CH18900_QPSK_1RB0



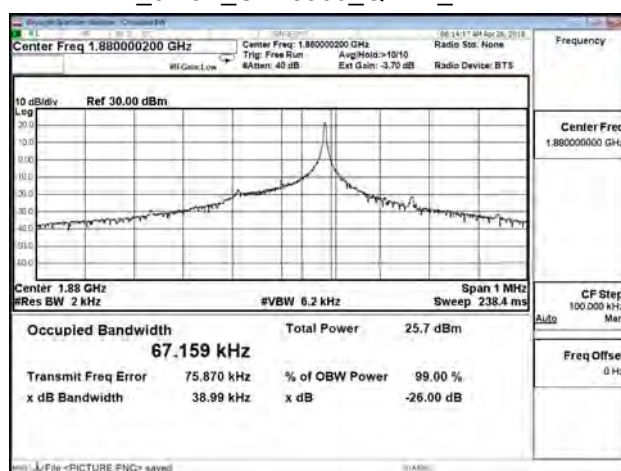
B2_3.75K_CH19199_QPSK_1RB0



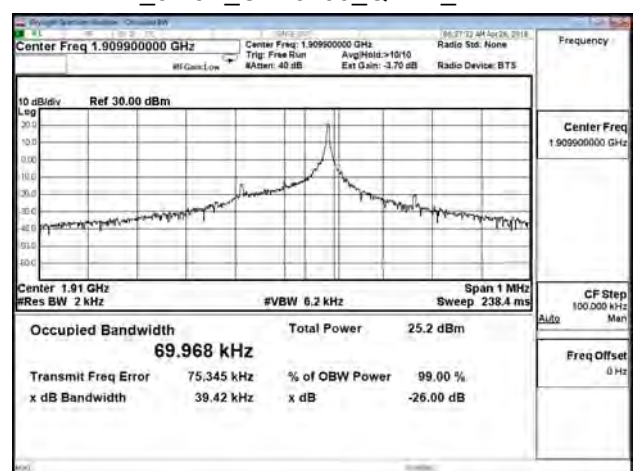
B2_3.75K_CH18601_QPSK_1RB47



B2_3.75K_CH18900_QPSK_1RB47



B2_3.75K_CH19199_QPSK_1RB47



NB-IOT Band 2_15K_BPSK_1RB0			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
1850.1	104.2	117.21	N/A
1880	101.3	124.77	N/A
1909.9	100.9	128.13	N/A

NB-IOT Band 2_15K_BPSK_1RB11			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
1850.1	104.8	130.68	N/A
1880	113.6	122.58	N/A
1909.9	125.8	128.91	N/A

NB-IOT Band 2_15K_QPSK_1RB0			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
1850.1	118.4	124.82	N/A
1880	129.0	125.87	N/A
1909.9	104.7	118.86	N/A

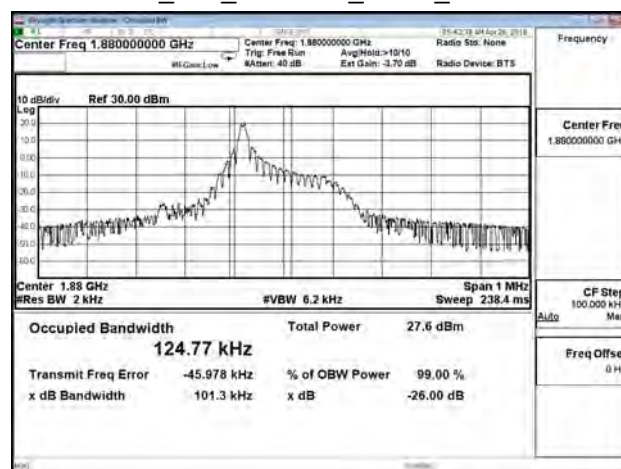
NB-IOT Band 2_15K_QPSK_1RB11			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
1850.1	126.7	130.95	N/A
1880	130.8	125.59	N/A
1909.9	100.9	117.34	N/A

NB-IOT Band 2_15K_QPSK_12RB0			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
1850.1	241.8	191.19	N/A
1880	258.3	191.70	N/A
1909.9	245.8	188.30	N/A

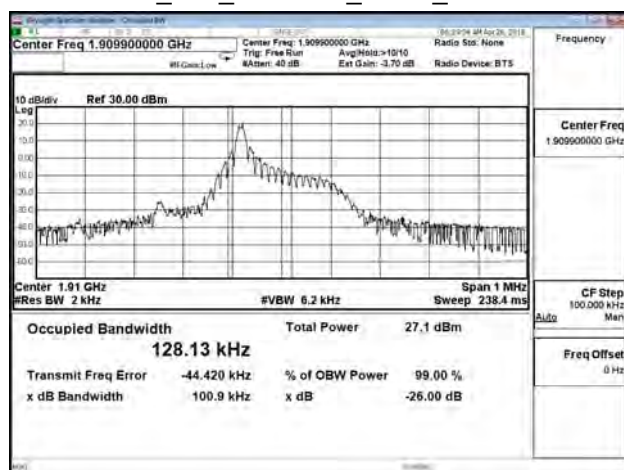
B2_15K_CH18601_BPSK_1RB0



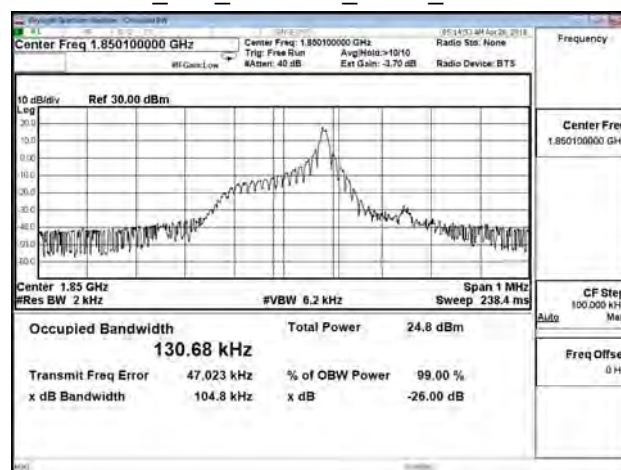
B2_15K_CH18900_BPSK_1RB0



B2_15K_CH19199_BPSK_1RB0



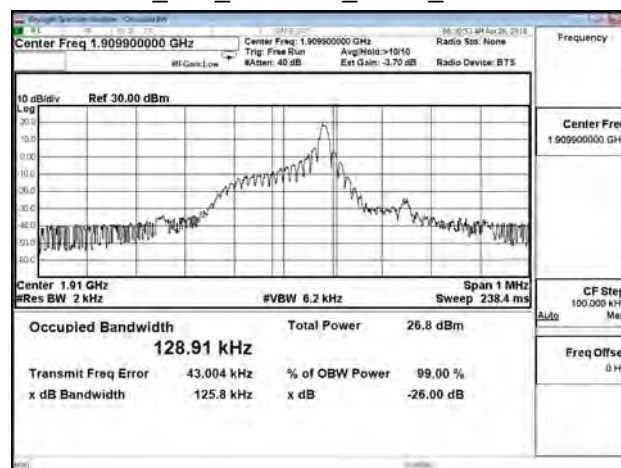
B2_15K_CH18601_BPSK_1RB11



B2_15K_CH18900_BPSK_1RB11



B2_15K_CH19199_BPSK_1RB11



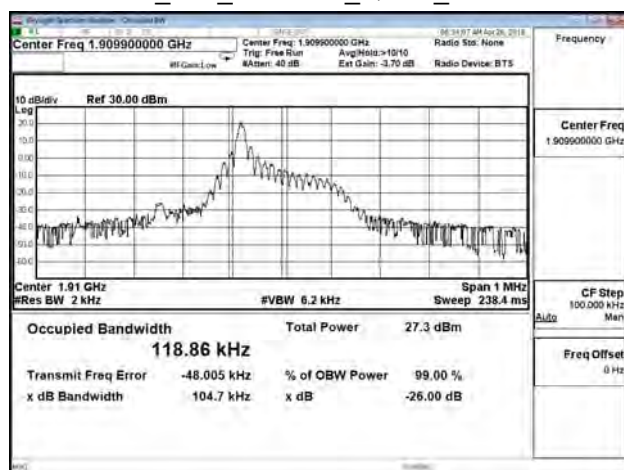
B2_15K_CH18601_QPSK_1RB0



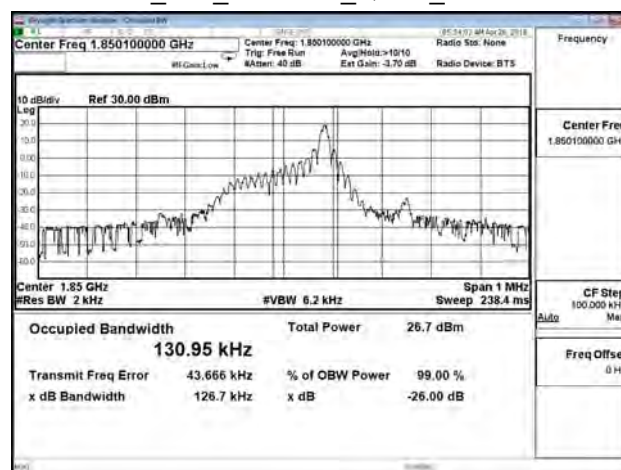
B2_15K_CH18900_QPSK_1RB0



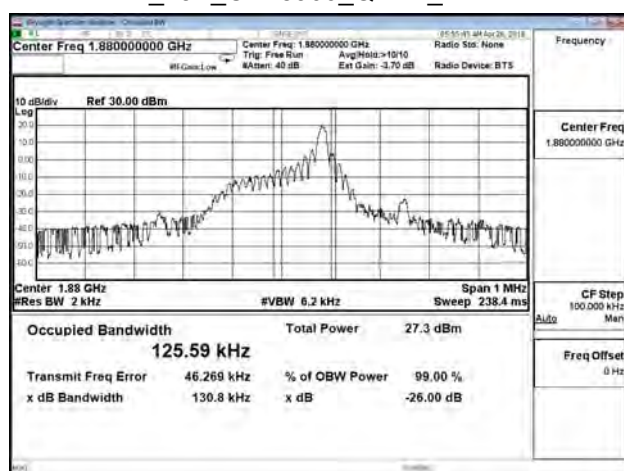
B2_15K_CH19199_QPSK_1RB0



B2_15K_CH18601_QPSK_1RB11



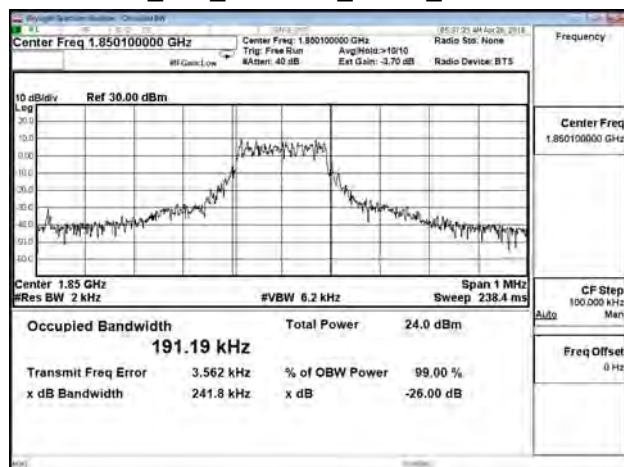
B2_15K_CH18900_QPSK_1RB11



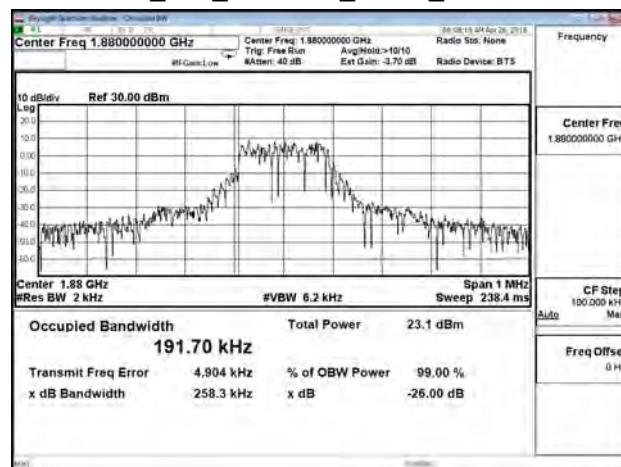
B2_15K_CH19199_QPSK_1RB11



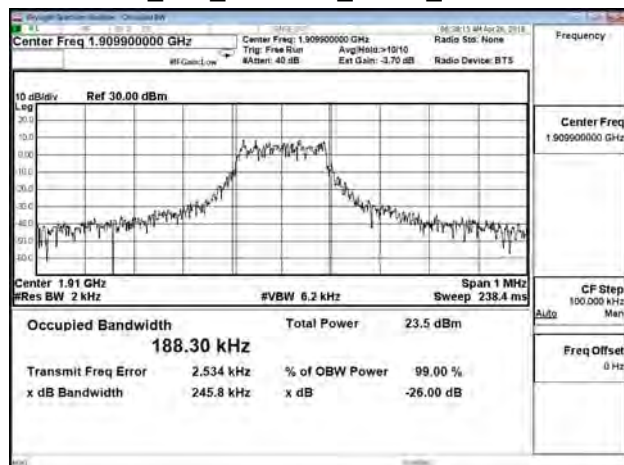
B2_15K_CH18601_QPSK_12RB0



B2_15K_CH18900_QPSK_12RB0



B2_15K_CH19199_QPSK_12RB0



Test Mode	Mode 2: LTE_NB-IOT_Band 4_Link		
Date of Test	2018/04/26	Test Site	SR10-H

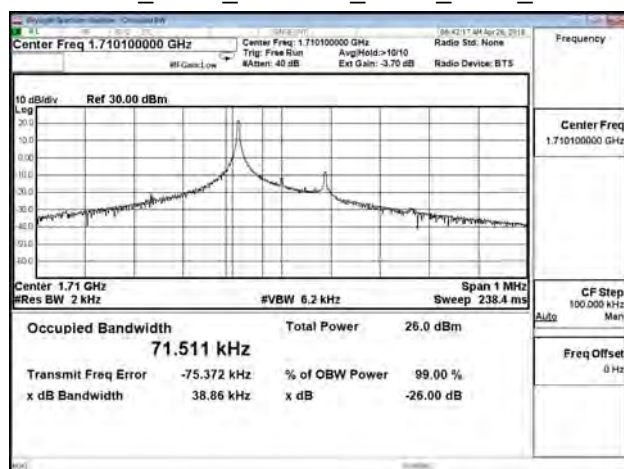
NB-IOT Band 4_3.75K_BPSK_1RB0			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
1710.1	38.86	71.511	N/A
1732.5	39.95	69.800	N/A
1754.9	37.11	72.929	N/A

NB-IOT Band 4_3.75K_BPSK_1RB47			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
1710.1	38.89	70.262	N/A
1732.5	37.46	66.510	N/A
1754.9	38.75	66.590	N/A

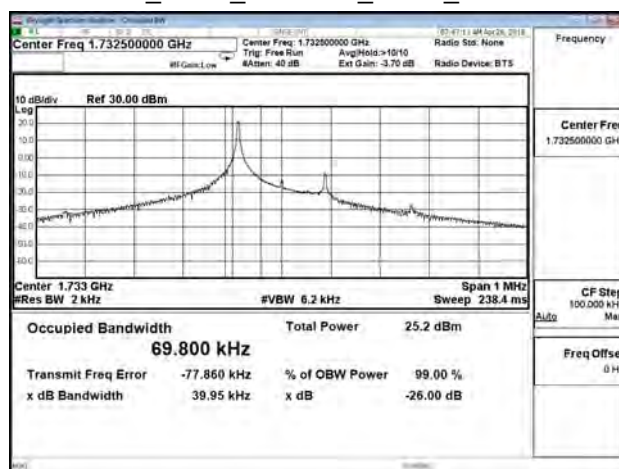
NB-IOT Band 4_3.75K_QPSK_1RB0			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
1710.1	39.70	73.684	N/A
1732.5	40.29	75.432	N/A
1754.9	40.17	75.874	N/A

NB-IOT Band 4_3.75K_QPSK_1RB47			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
1710.1	39.24	74.931	N/A
1732.5	38.86	71.538	N/A
1754.9	38.98	66.911	N/A

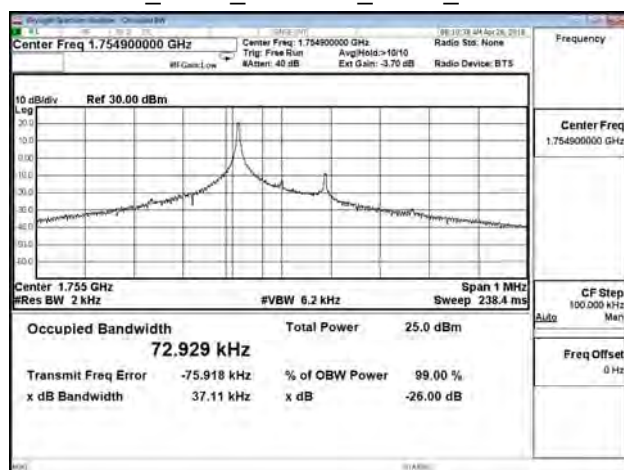
B4_3.75K_CH19951_BPSK_1RB0_



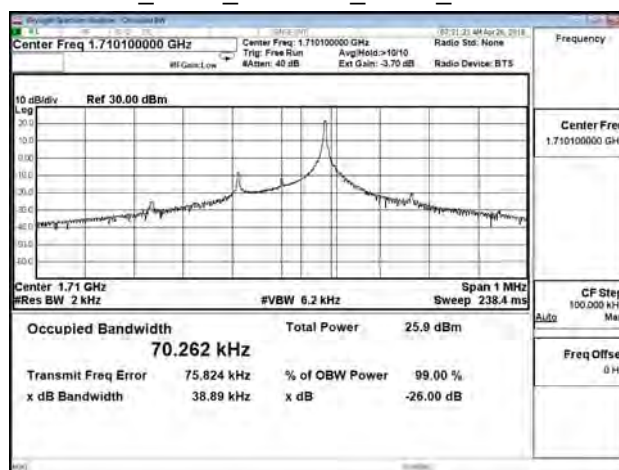
B4_3.75K_CH20175_BPSK_1RB0



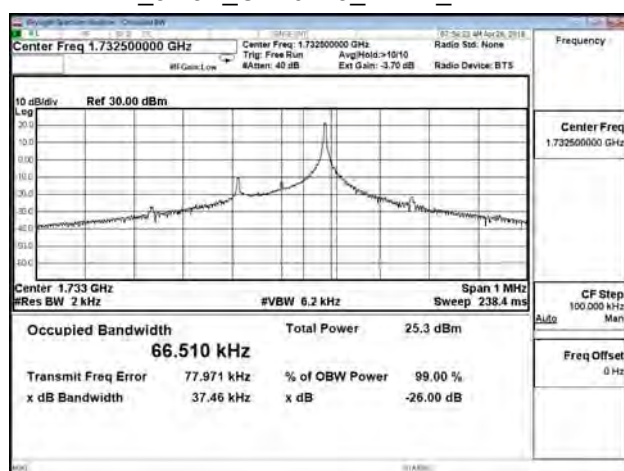
B4_3.75K_CH20399_BPSK_1RB0



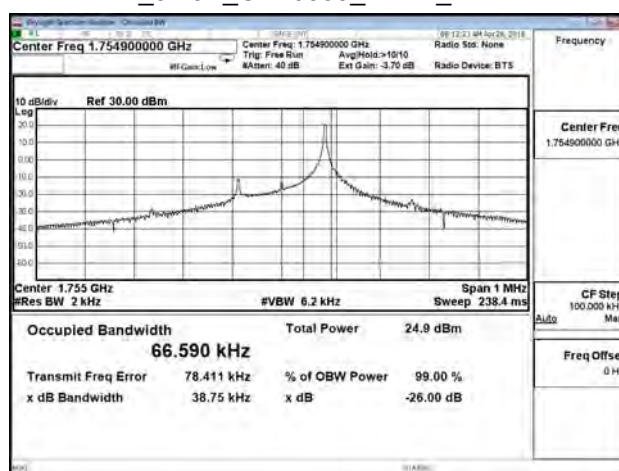
B4_3.75K_CH19951_BPSK_1RB47



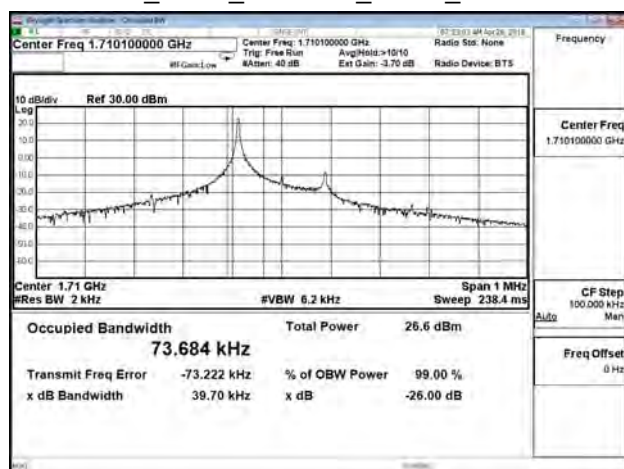
B4_3.75K_CH20175_BPSK_1RB47



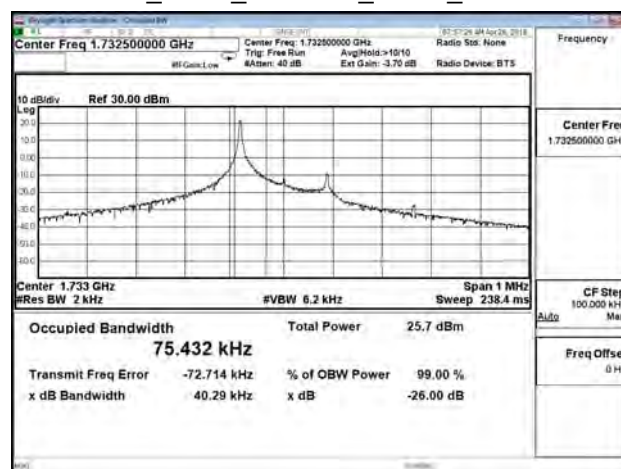
B4_3.75K_CH20399_BPSK_1RB47



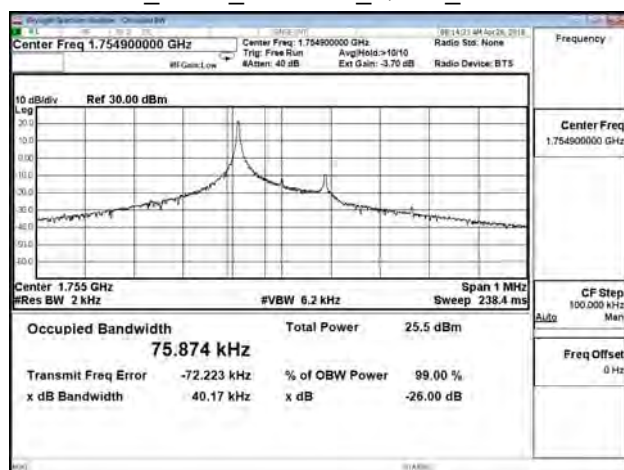
B4_3.75K_CH19951_QPSK_1RB0



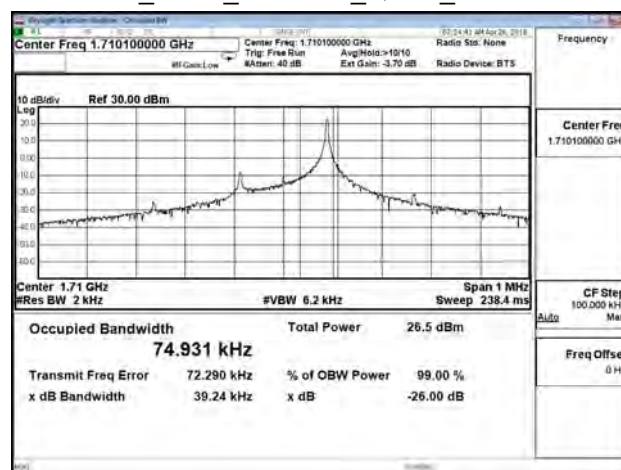
B4_3.75K_CH20175_QPSK_1RB0



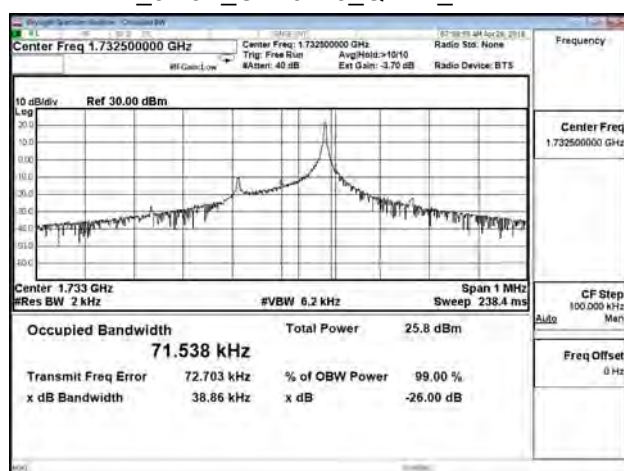
B4_3.75K_CH20399_QPSK_1RB0



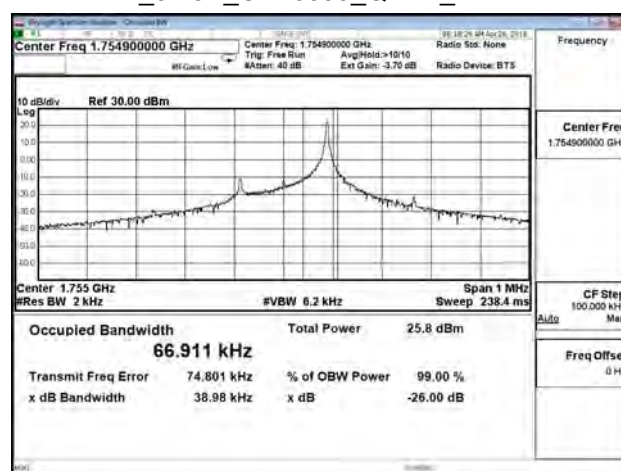
B4_3.75K_CH19951_QPSK_1RB47



B4_3.75K_CH20175_QPSK_1RB47



B4_3.75K_CH20399_QPSK_1RB47



NB-IOT Band 4_15K_BPSK_1RB0			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
1710.1	109.2	129.26	N/A
1732.5	102.9	138.54	N/A
1754.9	101.9	132.84	N/A

NB-IOT Band 4_15K_BPSK_1RB11			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
1710.1	99.55	127.77	N/A
1732.5	99.22	128.31	N/A
1754.9	101.8	130.53	N/A

NB-IOT Band 4_15K_QPSK_1RB0			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
1710.1	115.4	129.12	N/A
1732.5	116.3	129.29	N/A
1754.9	102.9	126.04	N/A

NB-IOT Band 4_15K_QPSK_1RB11			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
1710.1	113.3	118.94	N/A
1732.5	114.0	127.63	N/A
1754.9	113.9	120.30	N/A

NB-IOT Band 4_15K_QPSK_12RB0			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
1710.1	251.2	192.50	N/A
1732.5	251.9	195.93	N/A
1754.9	258.2	193.11	N/A

B4_15K_CH19951_BPSK_1RB0



B4_15K_CH20175_BPSK_1RB0



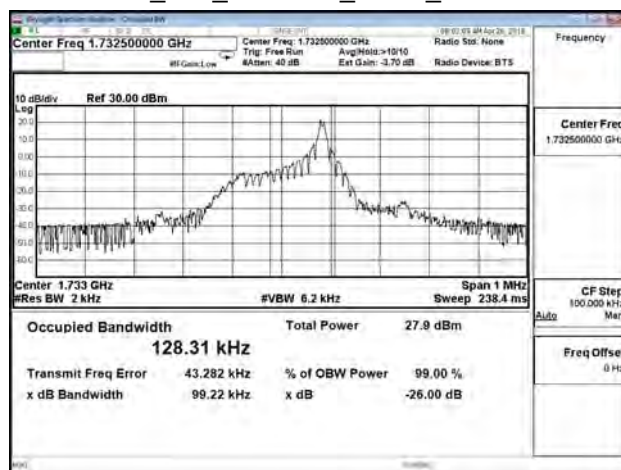
B4_15K_CH20399_BPSK_1RB0



B4_15K_CH19951_BPSK_1RB11



B4_15K_CH20175_BPSK_1RB11



B4_15K_CH20399_BPSK_1RB11



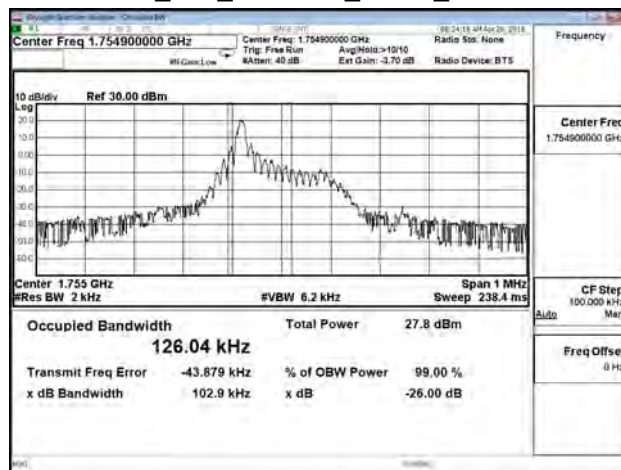
B4_15K_CH19951_QPSK_1RB0



B4_15K_CH20175_QPSK_1RB0



B4_15K_CH20399_QPSK_1RB0



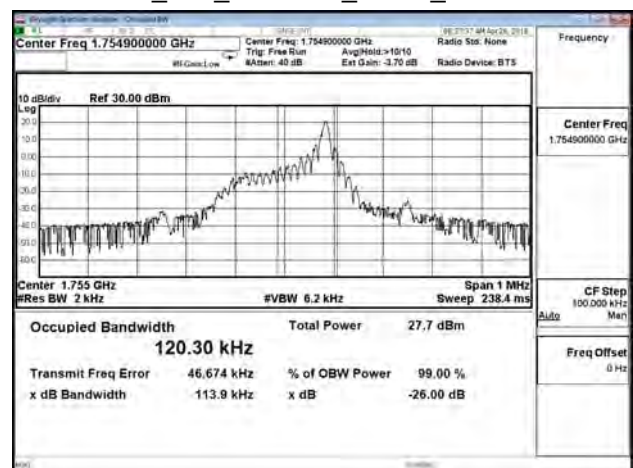
B4_15K_CH19951_QPSK_1RB11



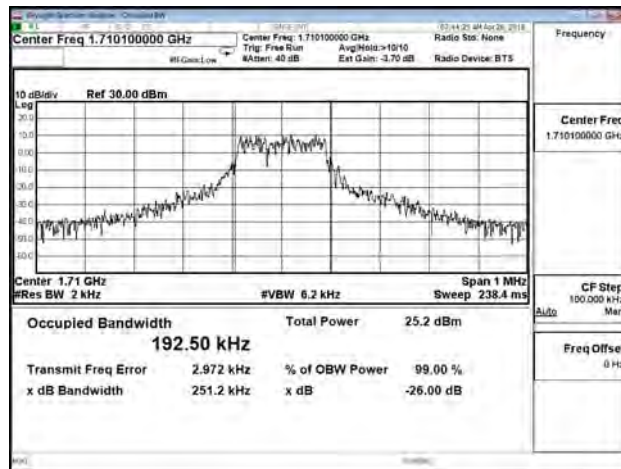
B4_15K_CH20175_QPSK_1RB11



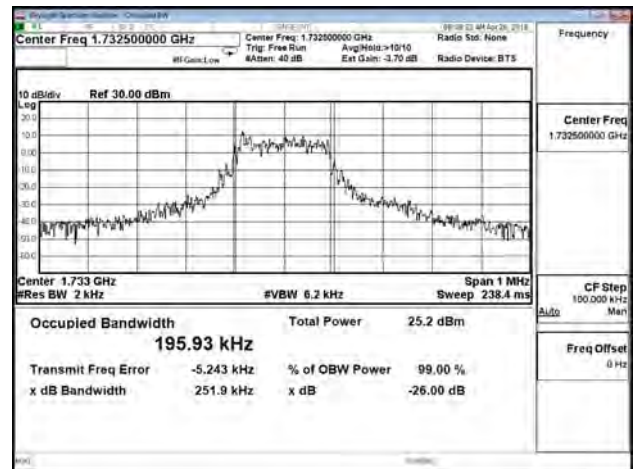
B4_15K_CH20399_QPSK_1RB11



B4_15K_CH19951_QPSK_12RB0



B4_15K_CH20175_QPSK_12RB0



B4_15K_CH20399_QPSK_12RB0



Test Mode	Mode 3: LTE_NB-IOT_Band 12_Link		
Date of Test	2018/04/26	Test Site	SR10-H

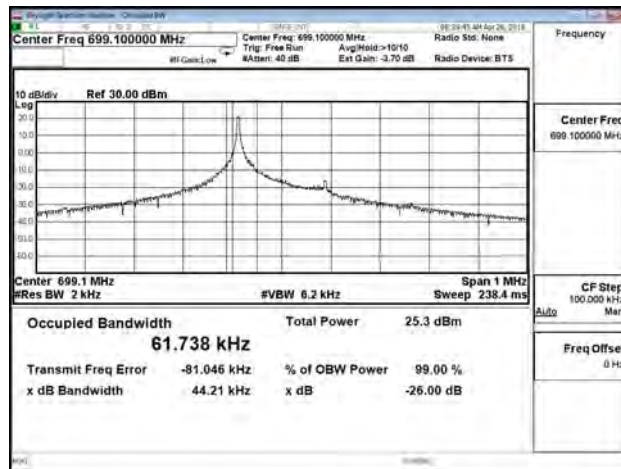
NB-IOT Band 12_3.75K_BPSK_1RB0			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
699.1	44.21	61.738	N/A
707.5	38.91	55.667	N/A
715.9	37.35	54.946	N/A

NB-IOT Band 12_3.75K_BPSK_1RB47			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
699.1	34.04	55.139	N/A
707.5	39.00	58.167	N/A
715.9	35.86	54.498	N/A

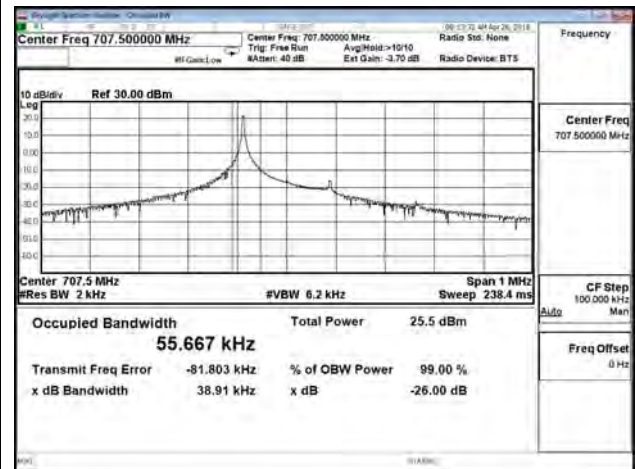
NB-IOT Band 12_3.75K_QPSK_1RB0			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
699.1	42.15	63.905	N/A
707.5	39.93	63.354	N/A
715.9	39.27	64.927	N/A

NB-IOT Band 12_3.75K_QPSK_1RB47			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
699.1	39.09	62.600	N/A
707.5	41.85	64.037	N/A
715.9	39.59	64.065	N/A

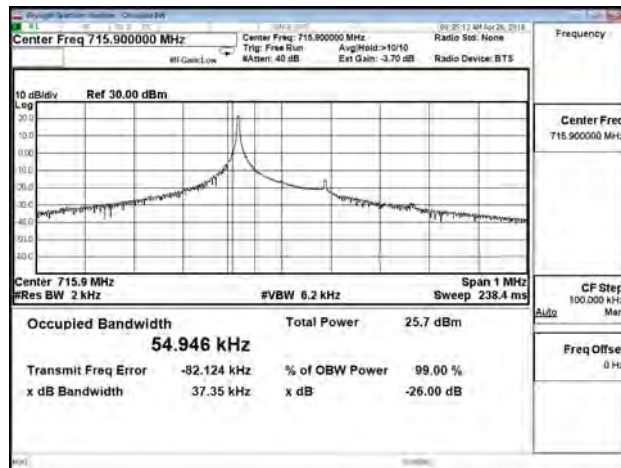
B12_3.75K_CH23011_BPSK_1RB0



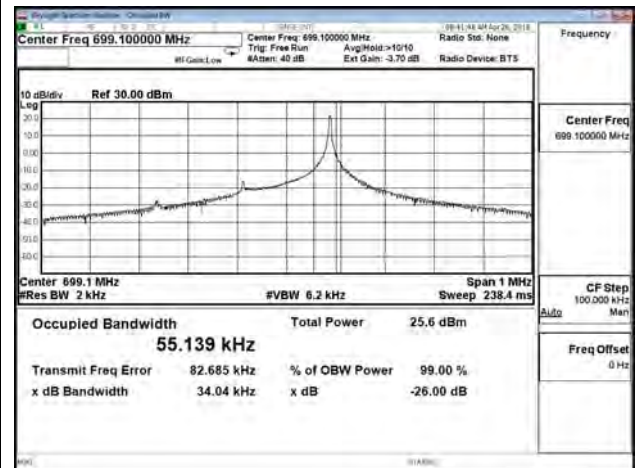
B12_3.75K_CH23095_BPSK_1RB0



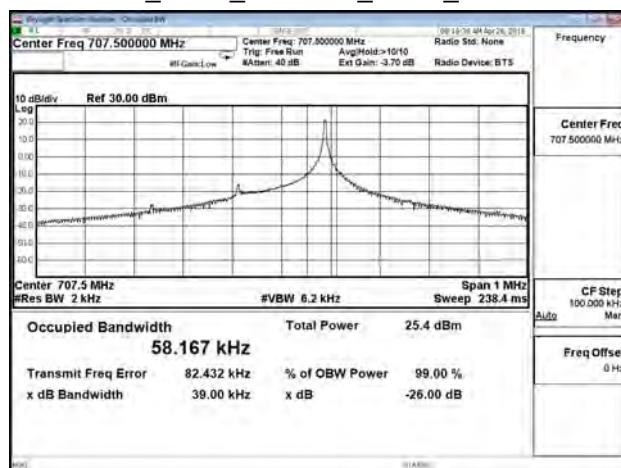
B12_3.75K_CH23179_BPSK_1RB0



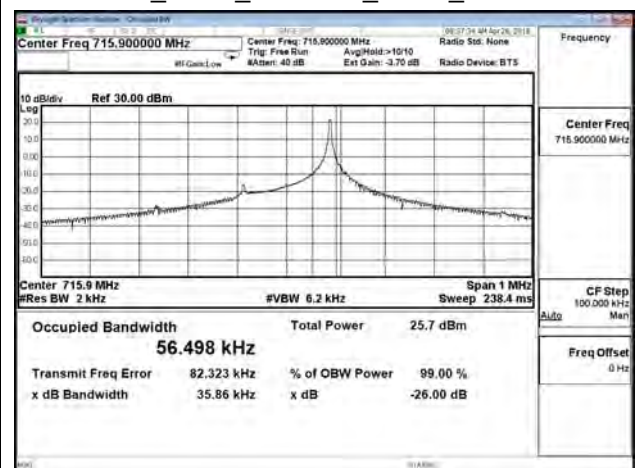
B12_3.75K_CH23011_BPSK_1RB47



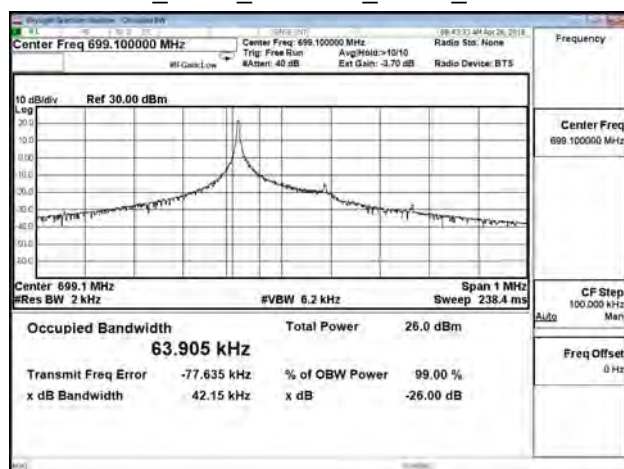
B12_3.75K_CH23095_BPSK_1RB47



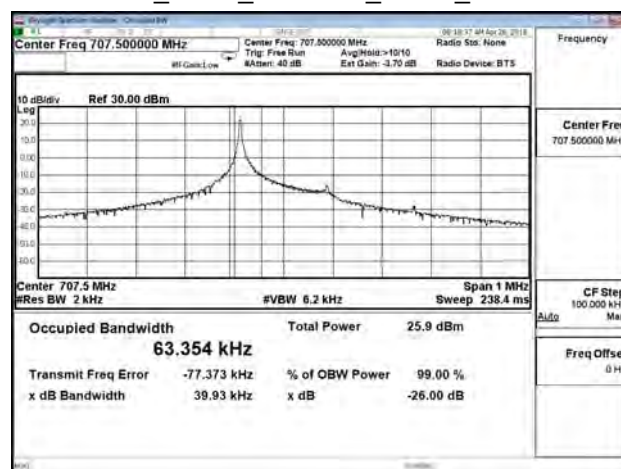
B12_3.75K_CH23179_BPSK_1RB47



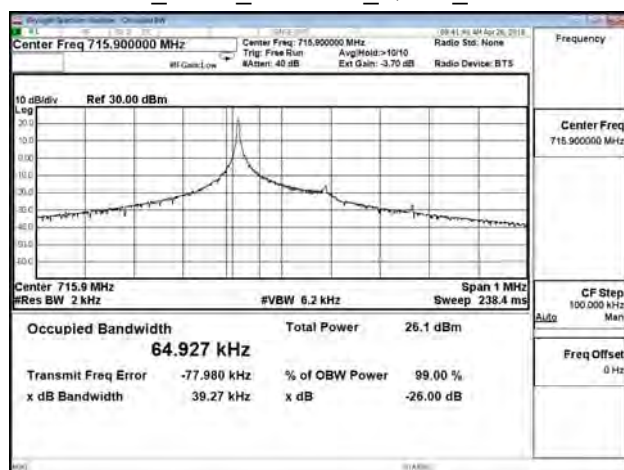
B12_3.75K_CH23011_QPSK_1RB0



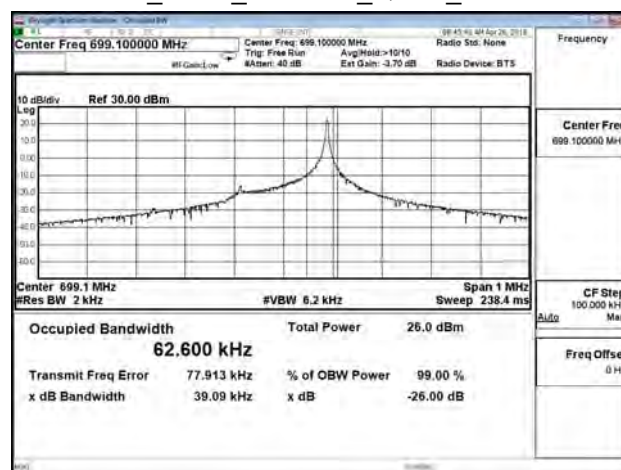
B12_3.75K_CH23095_QPSK_1RB0



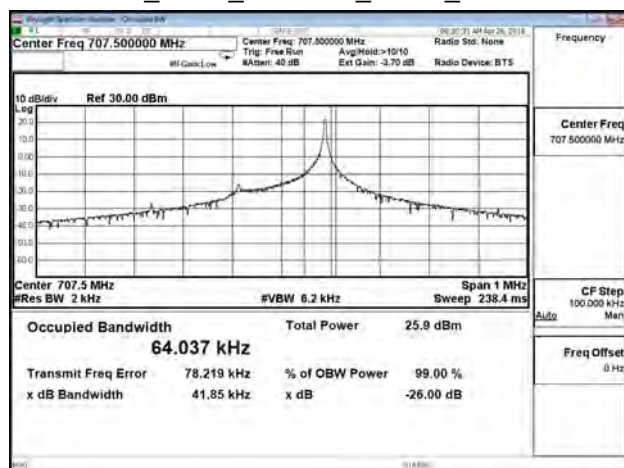
B12_3.75K_CH23179_QPSK_1RB0



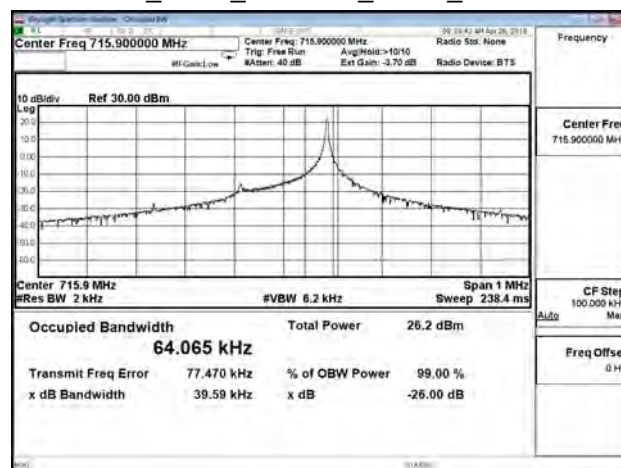
B12_3.75K_CH23011_QPSK_1RB47



B12_3.75K_CH23095_QPSK_1RB47



B12_3.75K_CH23179_QPSK_1RB47



NB-IOT Band 12_15K_BPSK_1RB0			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
699.1	99.31	118.57	N/A
707.5	102.7	115.69	N/A
715.9	104.5	117.98	N/A

NB-IOT Band 12_15K_BPSK_1RB11			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
699.1	99.32	124.29	N/A
707.5	118.2	131.10	N/A
715.9	125.8	130.09	N/A

NB-IOT Band 12_15K_QPSK_1RB0			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
699.1	117.3	127.21	N/A
707.5	130.5	112.81	N/A
715.9	115.9	115.50	N/A

NB-IOT Band 12_15K_QPSK_1RB11			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
699.1	115.4	128.09	N/A
707.5	117.1	125.21	N/A
715.9	115.5	119.45	N/A

NB-IOT Band 12_15K_QPSK_12RB0			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
699.1	249.3	190.87	N/A
707.5	247.5	187.17	N/A
715.9	247.6	188.34	N/A

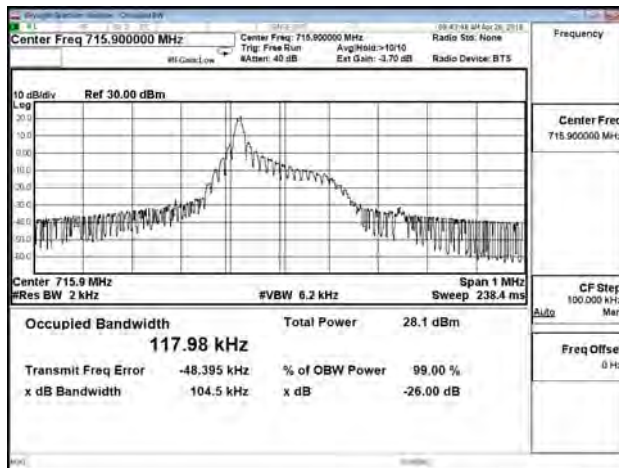
B12_15K_CH23011_BPSK_1RB0



B12_15K_CH23095_BPSK_1RB0



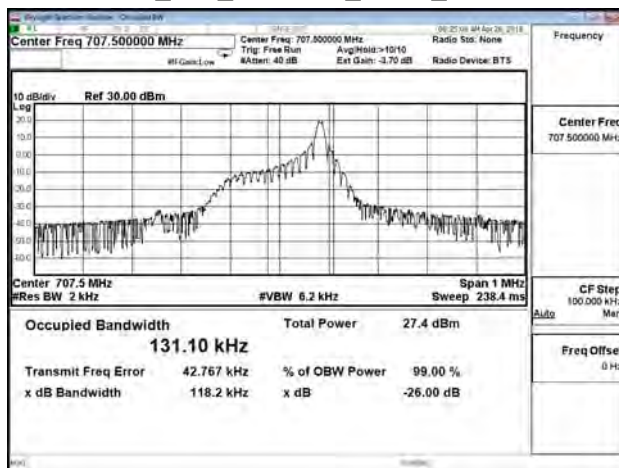
B12_15K_CH23179_BPSK_1RB0



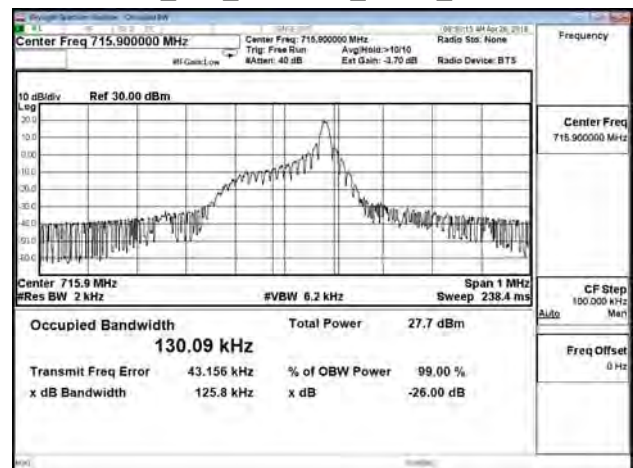
B12_15K_CH23011_BPSK_1RB11



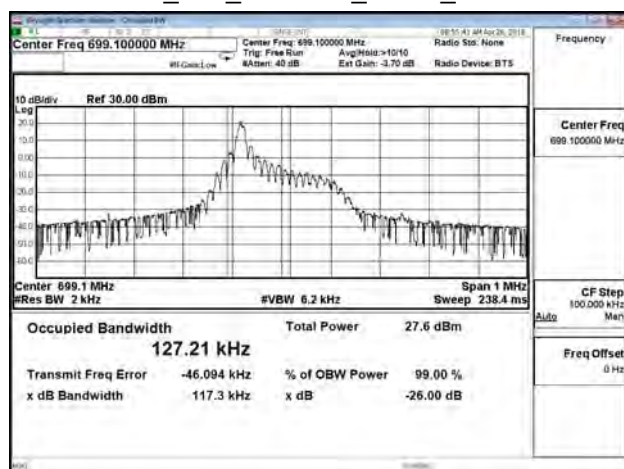
B12_15K_CH23095_BPSK_1RB11



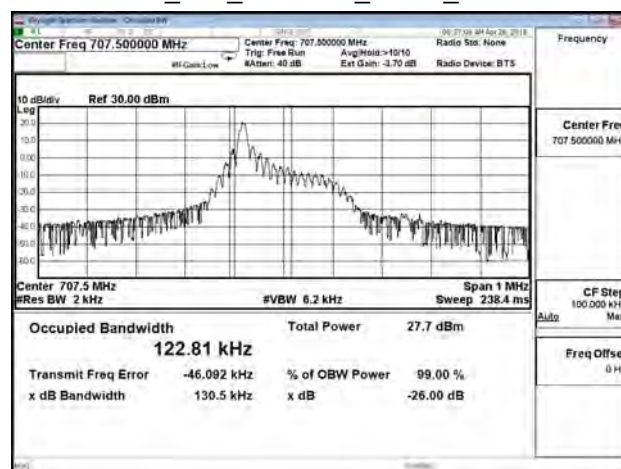
B12_15K_CH23179_BPSK_1RB11



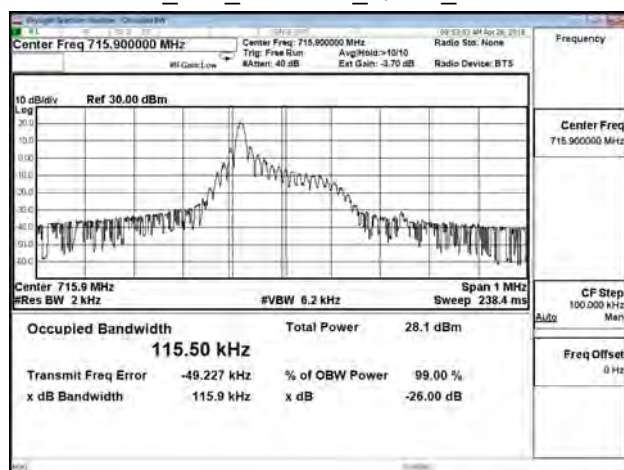
B12_15K_CH23011_QPSK_1RB0



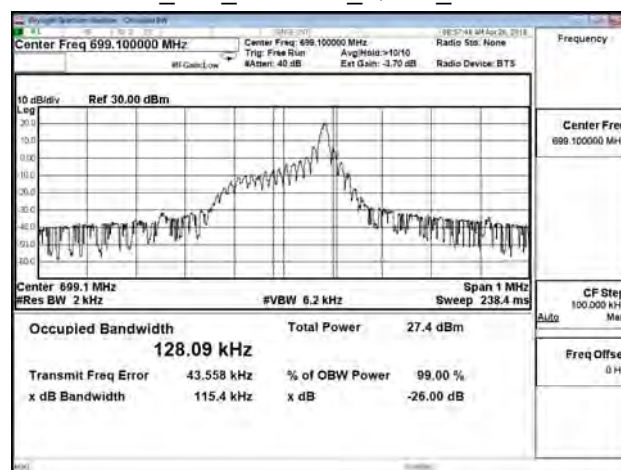
B12_15K_CH23095_QPSK_1RB0



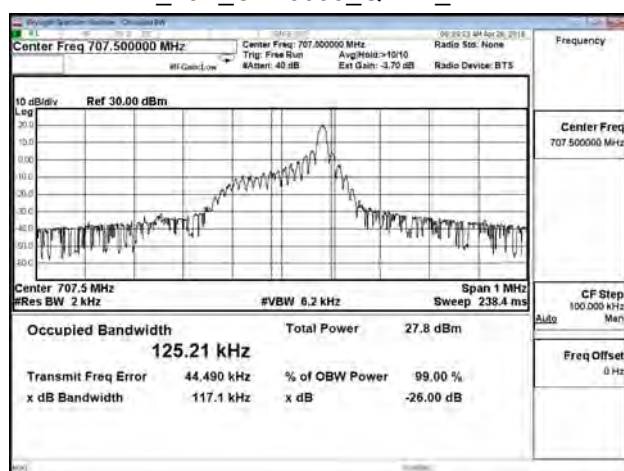
B12_15K_CH23179_QPSK_1RB0



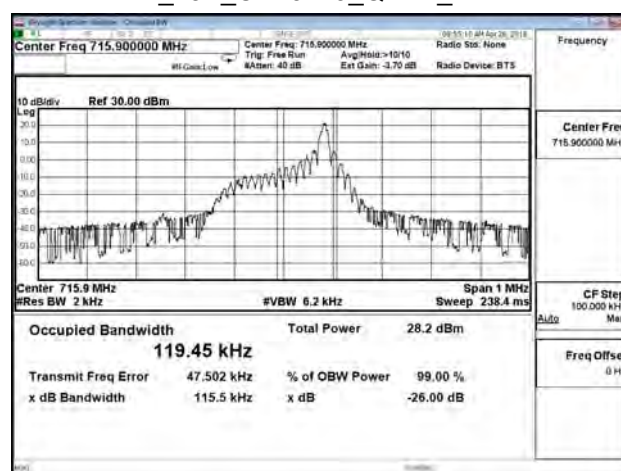
B12_15K_CH23011_QPSK_1RB11



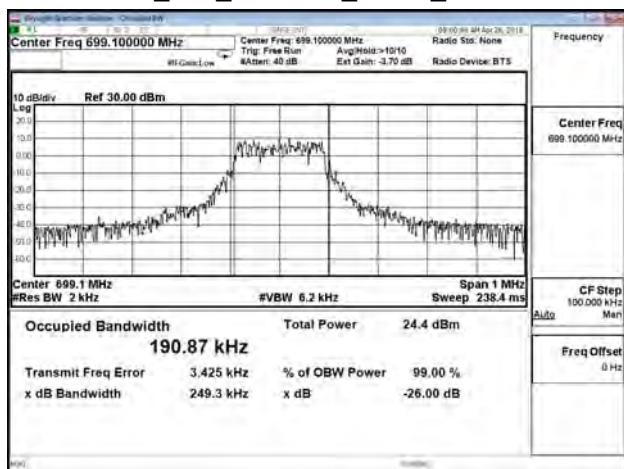
B12_15K_CH23095_QPSK_1RB11



B12_15K_CH23179_QPSK_1RB11



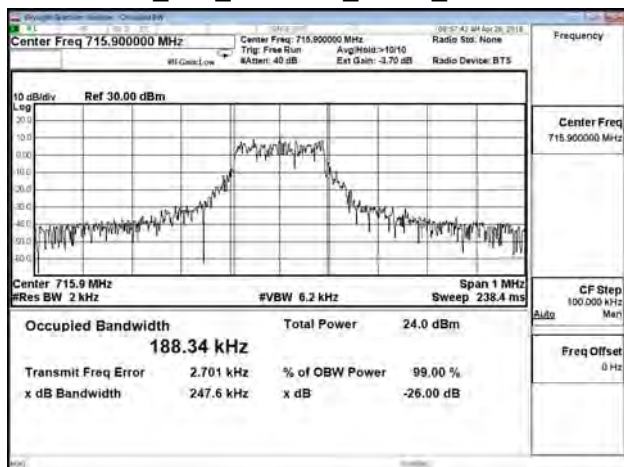
B12_15K_CH23011_QPSK_12RB0



B12_15K_CH23095_QPSK_12RB0



B12_15K_CH23179_QPSK_12RB0



Test Mode	Mode 4: LTE_NB-IOT_Band 13_Link		
Date of Test	2018/04/26	Test Site	SR10-H

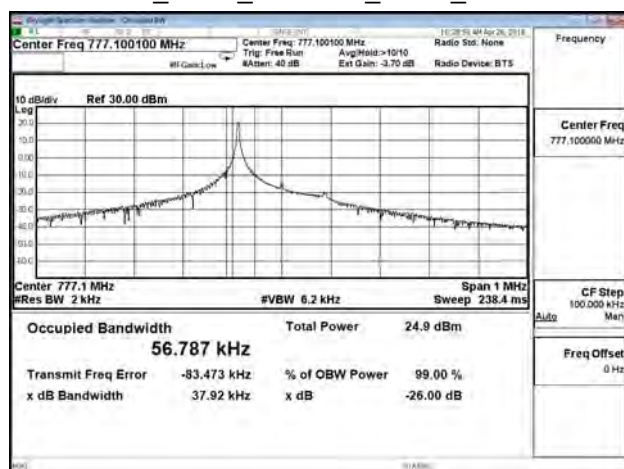
NB-IOT Band 13_3.75K_BPSK_1RB0			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
777.1	37.92	56.787	N/A
782	35.86	55.950	N/A
786.9	40.87	58.531	N/A

NB-IOT Band 13_3.75K_BPSK_1RB47			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
777.1	37.29	56.333	N/A
782	35.41	55.516	N/A
786.9	37.18	57.743	N/A

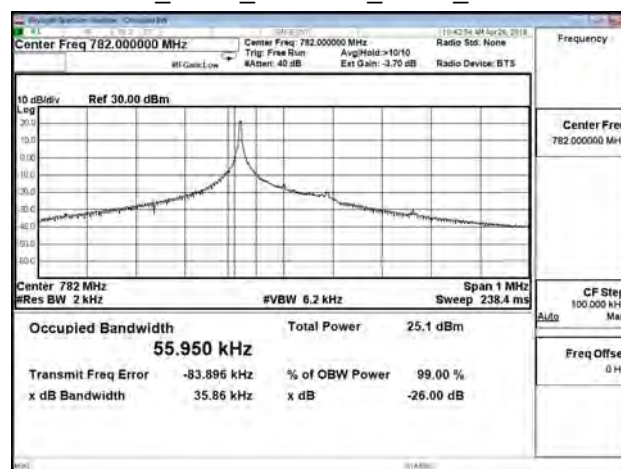
NB-IOT Band 13_3.75K_QPSK_1RB0			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
777.1	40.03	66.487	N/A
782	38.72	60.109	N/A
786.9	42.22	66.796	N/A

NB-IOT Band 13_3.75K_QPSK_1RB47			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
777.1	38.82	65.798	N/A
782	39.15	62.593	N/A
786.9	38.31	62.747	N/A

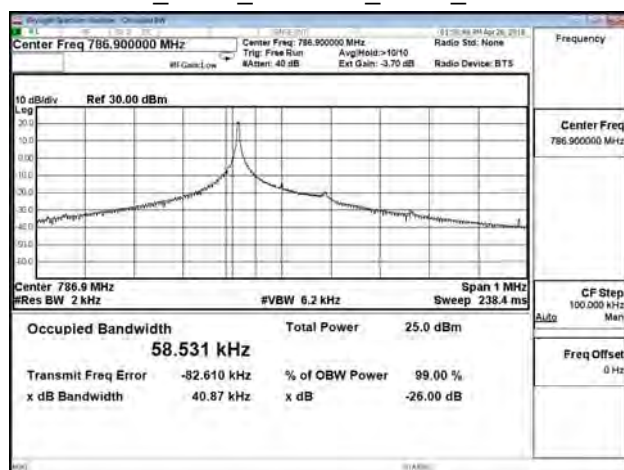
B13_3.75K_CH23181_BPSK_1RB0



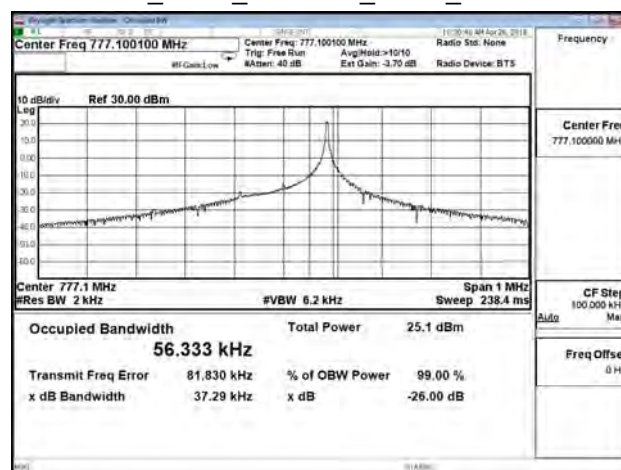
B13_3.75K_CH23230_BPSK_1RB0



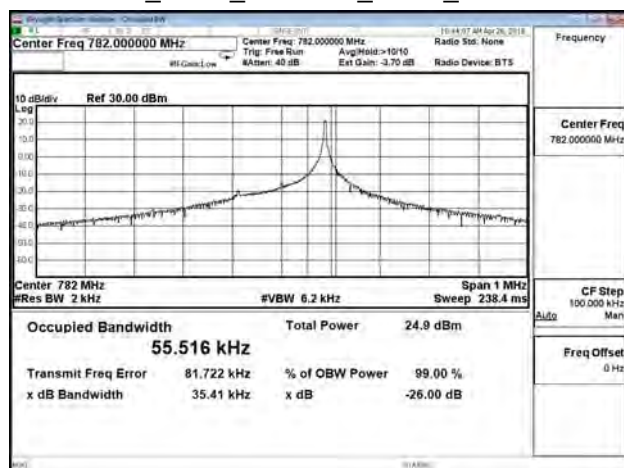
B13_3.75K_CH23279_BPSK_1RB0



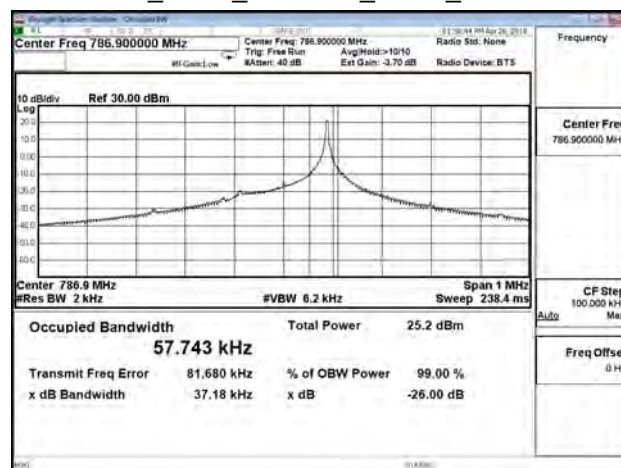
B13_3.75K_CH23181_BPSK_1RB47



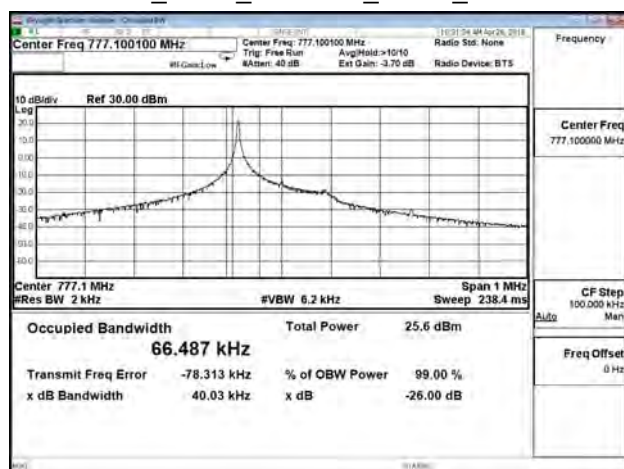
B13_3.75K_CH23230_BPSK_1RB47



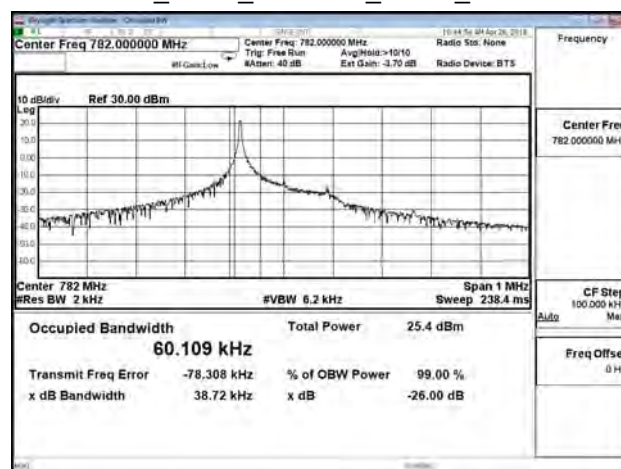
B13_3.75K_CH23279_BPSK_1RB47



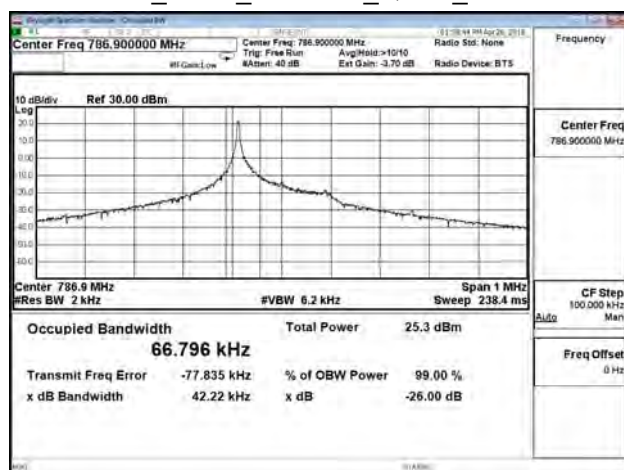
B13_3.75K_CH23181_QPSK_1RB0



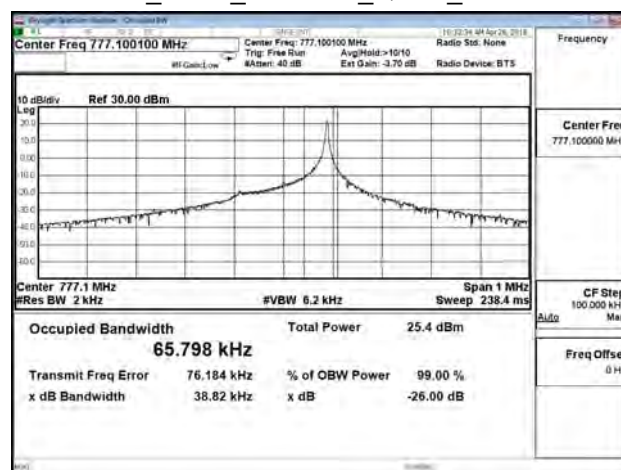
B13_3.75K_CH23230_QPSK_1RB0



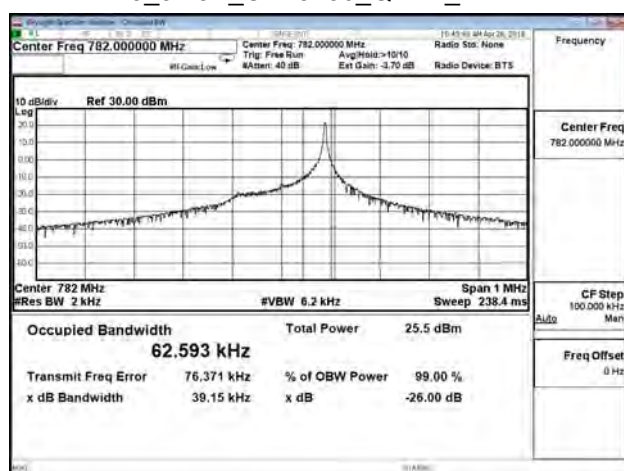
B13_3.75K_CH23279_QPSK_1RB0



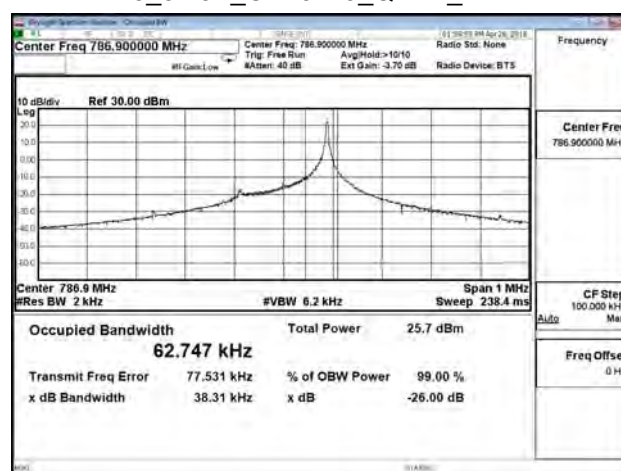
B13_3.75K_CH23181_QPSK_1RB47



B13_3.75K_CH23230_QPSK_1RB47



B13_3.75K_CH23279_QPSK_1RB47



NB-IOT Band 13_15K_BPSK_1RB0			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
777.1	120.3	127.38	N/A
782	105.6	118.05	N/A
786.9	101.2	119.25	N/A

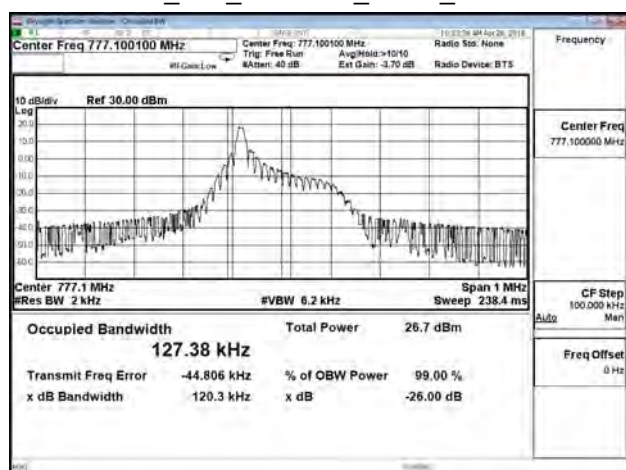
NB-IOT Band 13_15K_BPSK_1RB11			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
777.1	100.3	118.26	N/A
782	101.9	120.16	N/A
786.9	104.6	119.84	N/A

NB-IOT Band 13_15K_QPSK_1RB0			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
777.1	117.1	122.80	N/A
782	116.6	118.78	N/A
786.9	117.2	119.37	N/A

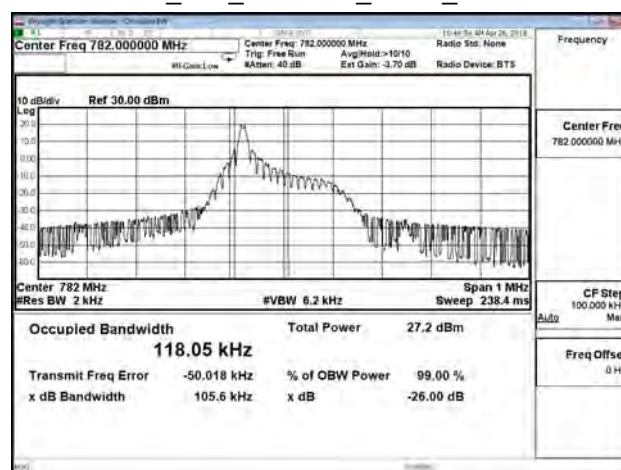
NB-IOT Band 13_15K_QPSK_1RB11			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
777.1	127.9	120.30	N/A
782	115.9	127.31	N/A
786.9	116.4	122.67	N/A

NB-IOT Band 13_15K_QPSK_12RB0			
Frequency (MHz)	-26dB BW Measure Level (kHz)	99% BW Measure Level (kHz)	Limit (MHz)
777.1	247.2	190.68	N/A
782	247.4	186.35	N/A
786.9	235.4	186.35	N/A

B13_15K_CH23181_BPSK_1RB0



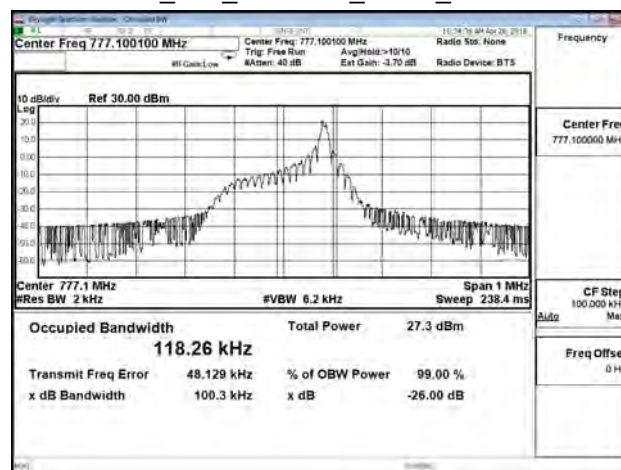
B13_15K_CH23230_BPSK_1RB0



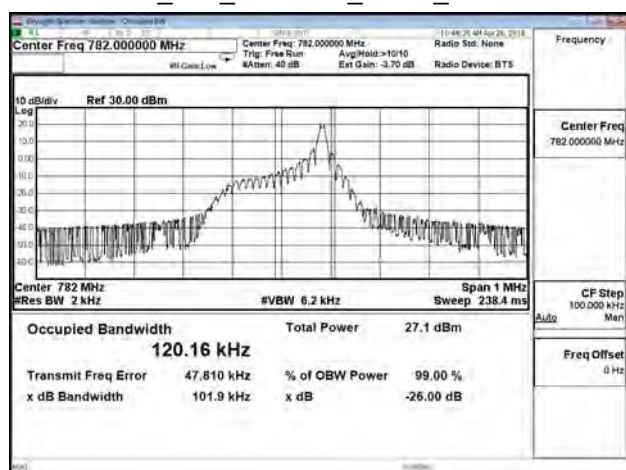
B13_15K_CH23279_BPSK_1RB0



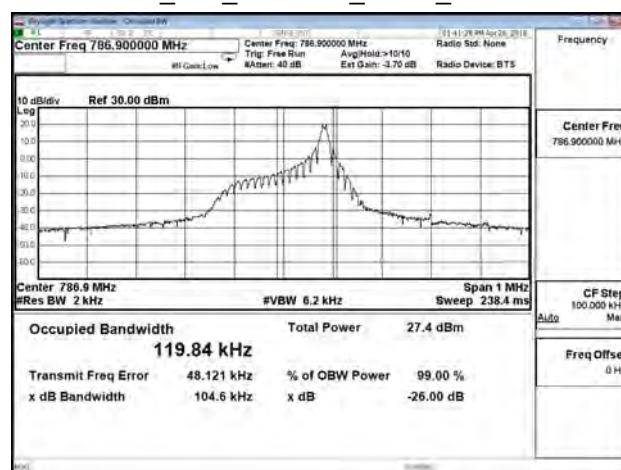
B13_15K_CH23181_BPSK_1RB11



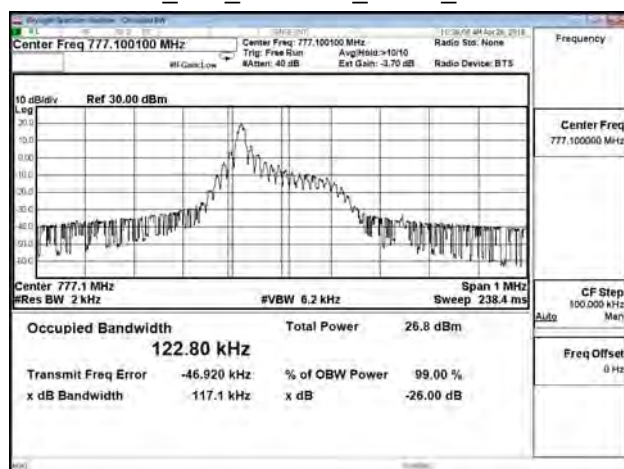
B13_15K_CH23230_BPSK_1RB11



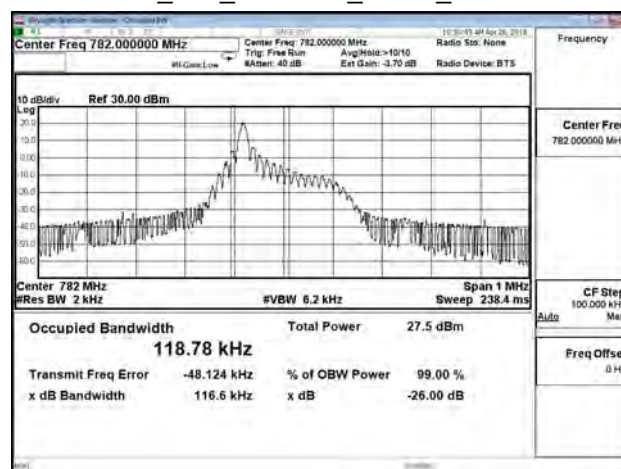
B13_15K_CH23279_BPSK_1RB11



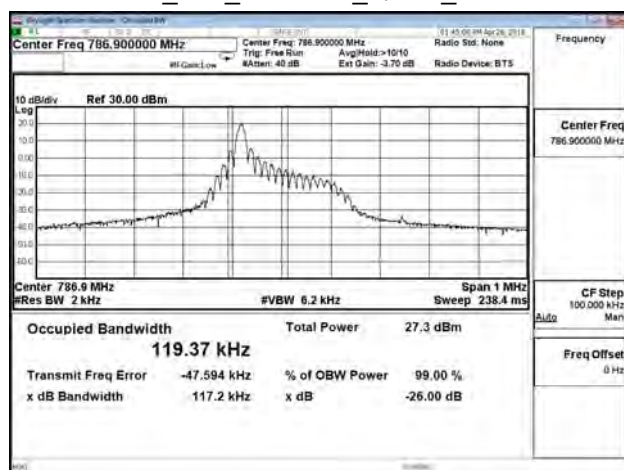
B13_15K_CH23181_QPSK_1RB0



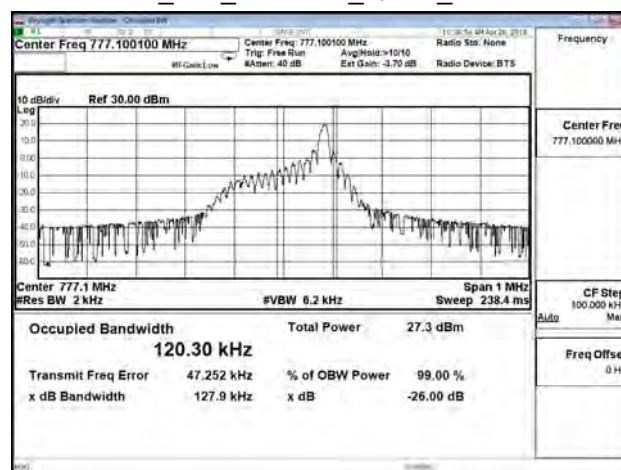
B13_15K_CH23181_QPSK_12RB0



B13_15K_CH23279_QPSK_1RB0



B13_15K_CH23181_QPSK_1RB11



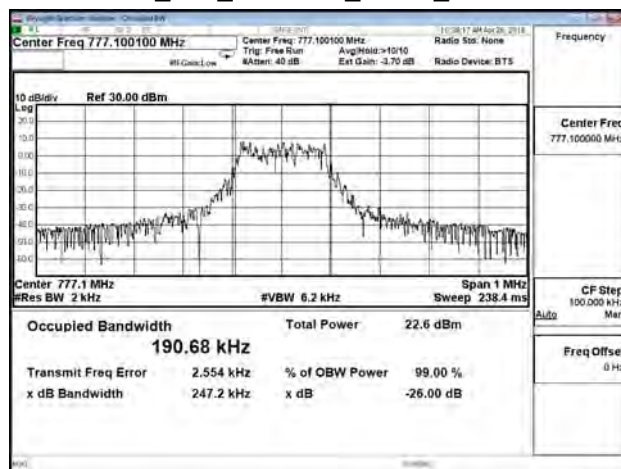
B13_15K_CH23230_QPSK_1RB11



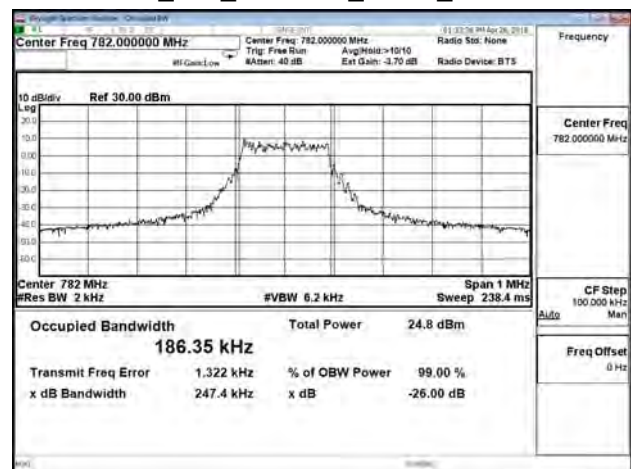
B13_15K_CH23279_QPSK_1RB11



B13_15K_CH23181_QPSK_12RB0



B13_15K_CH23230_QPSK_12RB0

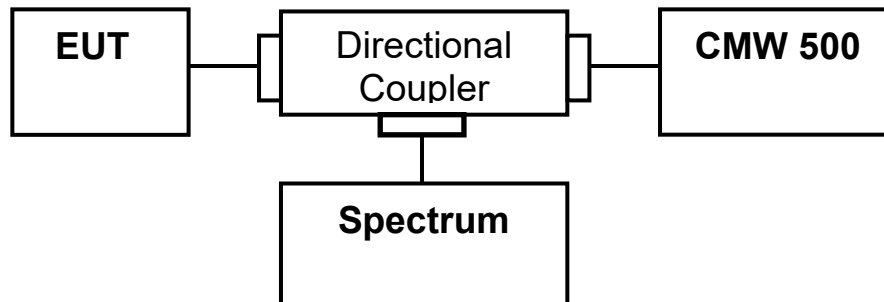


B13_15K_CH23279_QPSK_12RB0



5. Peak To Average Ratio

5.1. Test Setup



5.2. Test Procedure

1. Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth.
2. Set the number of counts to a value that stabilizes the measured CCDF curve.
3. Record the maximum PAPR level associated with a probability of 0.1 %.

5.3. Test Method

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause 5.7.2
ANSI C63.26-2015 Sub-clause 5.2.3.4

5.4. Test Result

Test Mode	Mode 1: LTE_NB-IOT_Band 2_Link		
Date of Test	2018/04/30	Test Site	SR10-H

NB-IOT Band 2_3.75K_BPSK_1RB0			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
1850.1	24.81	22.53	2.28
1880	25.00	22.45	2.55
1909.9	24.53	22.93	1.60

NB-IOT Band 2_3.75K_BPSK_1RB47			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
1850.1	24.83	22.64	2.19
1880	25.10	22.74	2.36
1909.9	25.35	22.90	2.45

NB-IOT Band 2_3.75K_QPSK_1RB0			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
1850.1	24.59	22.77	1.82
1880	25.08	22.75	2.33
1909.9	24.42	22.11	2.31

NB-IOT Band 2_3.75K_QPSK_1RB47			
Frequency (dB)	Peak (dBm)	AVERAGE (dBm)	PAPR (dB)
1850.1	24.48	22.60	1.88
1880	24.99	22.56	2.43
1909.9	25.14	22.70	2.44

NB-IOT Band 2_15K_BPSK_1RB0			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
1850.1	25.09	23.47	1.62
1880	25.44	23.67	1.77
1909.9	25.34	23.56	1.78

NB-IOT Band 2_15K_BPSK_1RB11			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
1850.1	25.07	23.57	1.50
1880	25.48	23.71	1.77
1909.9	25.15	23.38	1.77

NB-IOT Band 2_15K_QPSK_1RB0			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
1850.1	24.95	23.42	1.53
1880	24.94	23.78	1.16
1909.9	25.56	23.58	1.98

NB-IOT Band 2_15K_QPSK_1RB11			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
1850.1	24.88	23.30	1.58
1880	25.48	23.27	2.21
1909.9	25.29	23.55	1.74

NB-IOT Band 2_15K_QPSK_12RB0			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
1850.1	29.51	23.10	6.41
1880	29.43	23.22	6.21
1909.9	29.11	23.68	5.43

Test Mode	Mode 2: LTE_NB-IOT_Band 4_Link		
Date of Test	2018/04/30	Test Site	SR10-H

NB-IOT Band 4_3.75K_BPSK_1RB0			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
1710.1	26.17	23.27	2.90
1732.5	26.62	23.74	2.88
1754.9	25.94	23.58	2.36

NB-IOT Band 4_3.75K_BPSK_1RB47			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
1710.1	26.13	23.97	2.16
1732.5	26.60	23.86	2.74
1754.9	26.60	23.50	3.10

NB-IOT Band 4_3.75K_QPSK_1RB0			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
1710.1	26.08	23.06	3.02
1732.5	26.12	23.12	3.00
1754.9	26.64	23.58	3.06

NB-IOT Band 4_3.75K_QPSK_1RB47			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
1710.1	26.75	23.96	2.79
1732.5	26.72	23.61	3.11
1754.9	26.71	23.76	2.95

NB-IOT Band 4_15K_BPSK_1RB0			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
1710.1	25.58	23.67	1.91
1732.5	24.58	23.43	1.15
1754.9	24.67	23.46	1.21

NB-IOT Band 4_15K_BPSK_1RB11			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
1710.1	25.61	23.64	1.97
1732.5	24.58	23.43	1.15
1754.9	24.67	23.46	1.21

NB-IOT Band 4_15K_QPSK_1RB0			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
1710.1	25.65	23.74	1.91
1732.5	24.04	23.17	0.87
1754.9	24.66	23.28	1.38

NB-IOT Band 4_15K_QPSK_1RB11			
Frequency (MHz)	Peak (dBm)	AVERAGE (dBm)	PAPR (dB)
1710.1	25.33	23.75	1.58
1732.5	23.58	23.63	0.05
1754.9	24.03	23.02	1.01

NB-IOT Band 4_15K_QPSK_12RB0			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
1710.1	28.30	23.39	4.91
1732.5	28.70	23.79	4.91
1754.9	28.42	23.82	4.60

Test Mode	Mode 3: LTE_NB-IOT_Band 12_Link		
Date of Test	2018/04/30	Test Site	SR10-H

NB-IOT Band 12_3.75K_BPSK_1RB0			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
699.1	24.28	22.06	2.22
707.5	24.46	22.02	2.44
715.9	24.66	22.59	2.07

NB-IOT Band 12_3.75K_BPSK_1RB47			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
699.1	25.13	23.91	1.22
707.5	24.75	22.81	1.94
715.9	25.02	22.90	2.12

NB-IOT Band 12_3.75K_QPSK_1RB0			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
699.1	24.50	22.66	1.84
707.5	24.82	22.38	2.44
715.9	24.47	22.18	2.29

NB-IOT Band 12_3.75K_QPSK_1RB47			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
699.1	24.61	22.82	1.79
707.5	24.95	22.72	2.23
715.9	24.80	22.66	2.14

NB-IOT Band 12_15K_BPSK_1RB0			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
699.1	24.77	23.25	1.52
707.5	24.89	23.32	1.57
715.9	25.13	23.59	1.54

NB-IOT Band 12_15K_BPSK_1RB11			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
699.1	24.46	23.24	1.22
707.5	24.67	23.31	1.36
715.9	25.09	23.57	1.52

NB-IOT Band 12_15K_QPSK_1RB0			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
699.1	24.91	23.92	0.99
707.5	24.93	23.38	1.55
715.9	25.22	23.68	1.54

NB-IOT Band 12_15K_QPSK_1RB11			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
699.1	24.75	23.43	1.32
707.5	24.79	23.34	1.45
715.9	25.06	23.62	1.44

NB-IOT Band 12_15K_QPSK_12RB0			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
699.1	29.38	23.02	6.36
707.5	29.20	23.65	5.55
715.9	29.22	23.81	5.41

Test Mode	Mode 4: LTE_NB-IOT_Band 13_Link		
Date of Test	2018/04/30	Test Site	SR10-H

NB-IOT Band 13_3.75K_BPSK_1RB0			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
777.1	24.39	22.65	1.74
782	24.62	22.22	2.40
786.9	24.76	22.12	2.64

NB-IOT Band 13_3.75K_BPSK_1RB47			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
777.1	24.99	22.78	2.21
782	24.62	22.05	2.57
786.9	25.16	22.55	2.61

NB-IOT Band 13_3.75K_QPSK_1RB0			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
777.1	25.23	22.48	2.75
782	25.31	22.97	2.34
786.9	24.69	22.74	1.95

NB-IOT Band 13_3.75K_QPSK_1RB47			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
777.1	24.43	22.68	1.75
782	24.95	22.13	2.82
786.9	24.76	22.73	2.03

NB-IOT Band 13_15K_BPSK_1RB0			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
777.1	24.67	23.54	1.13
782	24.81	23.47	1.34
786.9	24.78	23.47	1.31

NB-IOT Band 13_15K_BPSK_1RB11			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
777.1	24.91	23.34	1.57
782	24.54	23.68	0.86
786.9	24.89	23.57	1.32

NB-IOT Band 13_15K_QPSK_1RB0			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
777.1	24.53	23.69	0.84
782	24.89	23.34	1.55
786.9	24.73	23.66	1.07

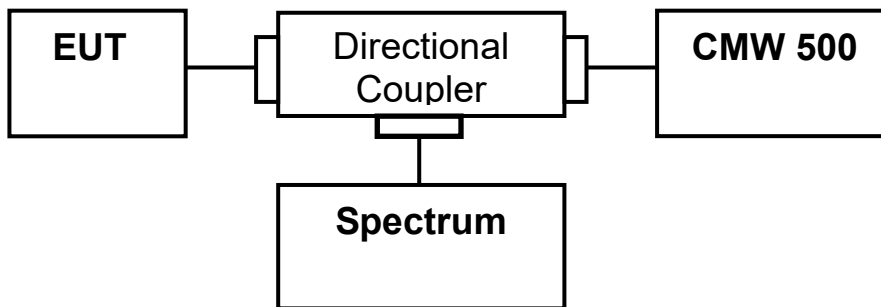
NB-IOT Band 13_15K_QPSK_1RB11			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
777.1	24.64	23.48	1.16
782	24.44	23.56	0.88
786.9	24.97	23.58	1.39

NB-IOT Band 13_15K_QPSK_12RB0			
Frequency (MHz)	Peak (dBm)	Average (dBm)	PAPR (dB)
777.1	29.69	23.89	5.80
782	29.50	23.43	6.07
786.9	29.70	23.79	5.91

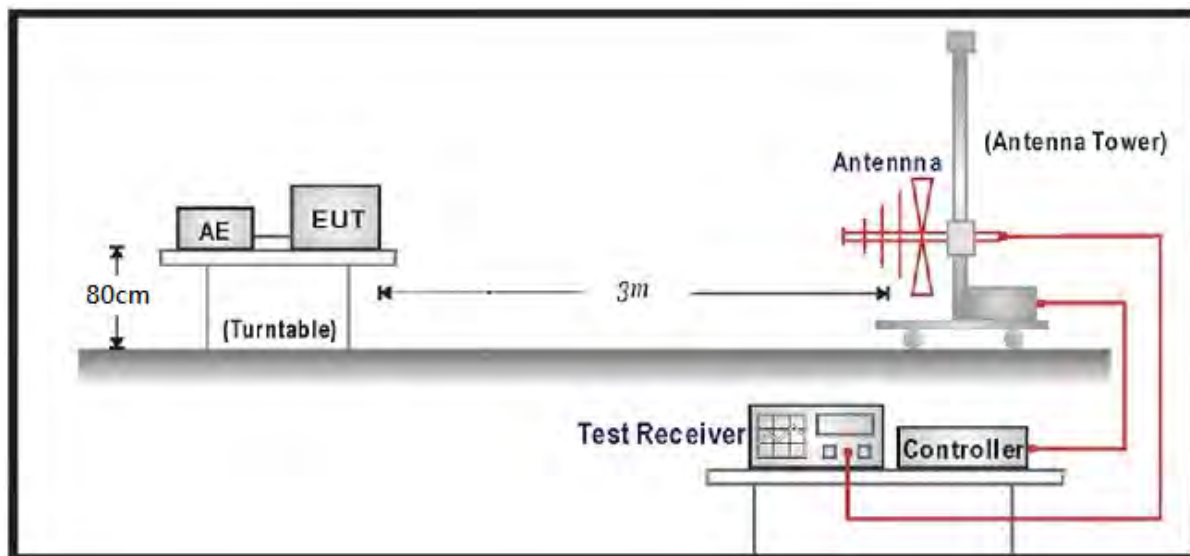
6. Spurious Emissions

6.1. Test Setup

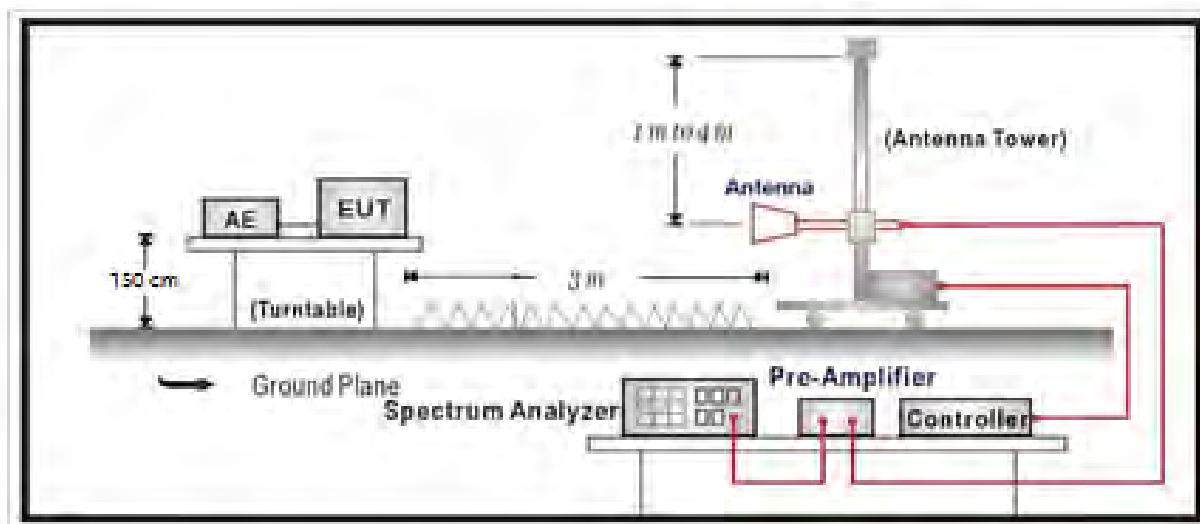
Conducted Spurious Measurement: below 1GHz



Radiated Spurious Measurement: below 1GHz



Radiated Spurious Measurement: above 1GHz



6.2. Test Procedure

Conducted Spurious Measurement:

- a) Place the EUT on a bench and set it in transmitting mode.
- b) Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Couple.
- c) EUT Communicate with CMW500, then select a channel for testing.
- d) Add a correction factor to the display of spectrum, and then test.
- e) The resolution bandwidth of the spectrum analyzer was set at 1 MHz, sufficient scans were taken to show the out of band Emission if any up to 10th harmonic.

Radiated Spurious Measurement:

- a) The EUT was placed on a rotatable wooden table with 1.5 meter above ground.
- b) The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
- c) The table was rotated 360 degrees to determine the position of the highest spurious emission.
- d) The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
- e) Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 1MHz, Sweep 500ms, Taking the record of maximum spurious emission.
- f) A horn antenna was substituted in place of the EUT and was driven by a signal generator.
- g) Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
- h) Taking the record of output power at antenna port.
- i) Repeat step 7 to step 8 for another polarization.
- j) $EIRP = SG - \text{Cable loss} + \text{Antenna Gain}$

6.3. Test Method

Conducted Spurious Measurement:

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause6.1
ANSI C63.26-2015 Sub-clause 5.7

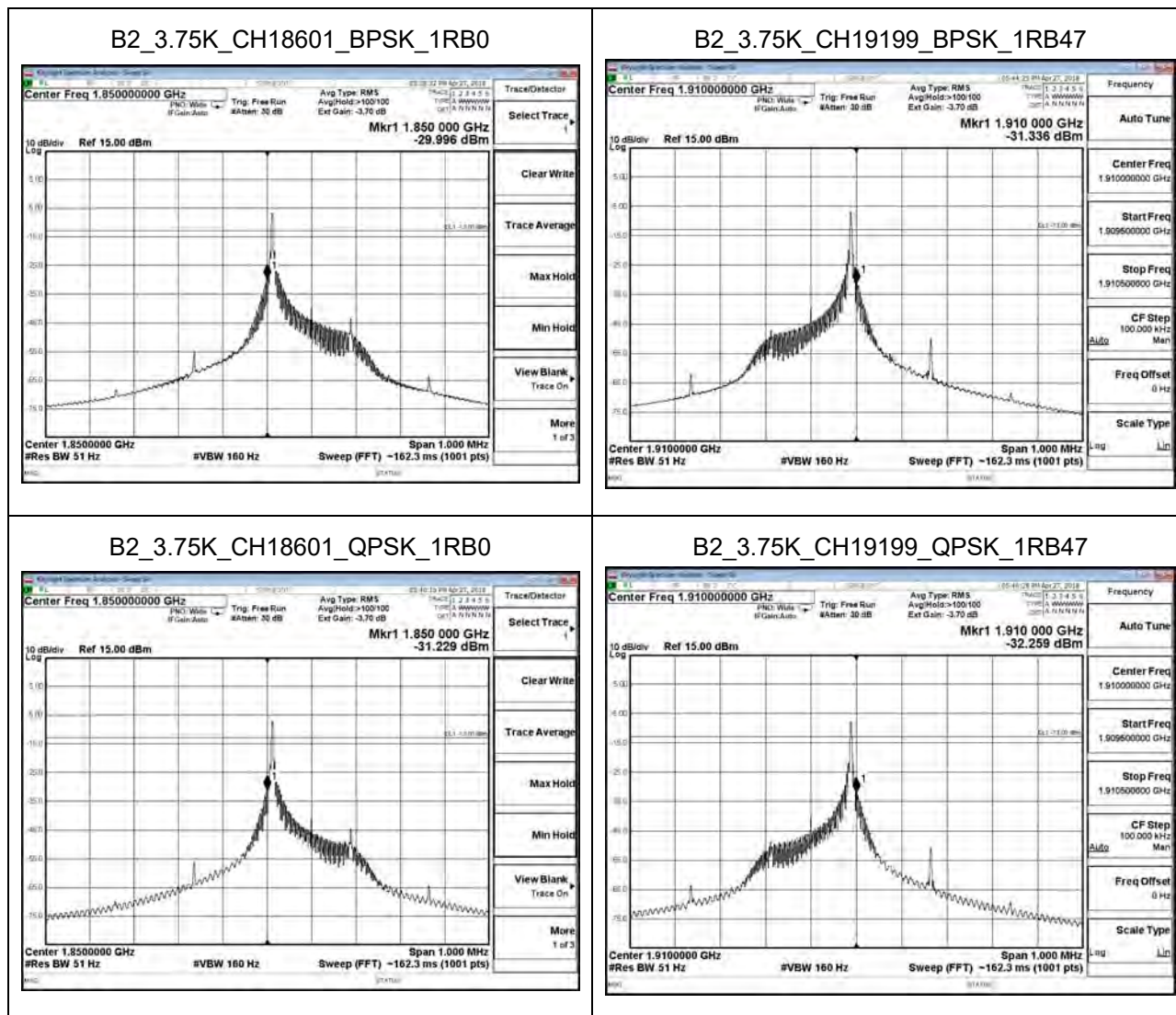
Radiated Spurious Measurement:

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause5.8
ANSI C63.26-2015 Sub-clause 5.5.3.2

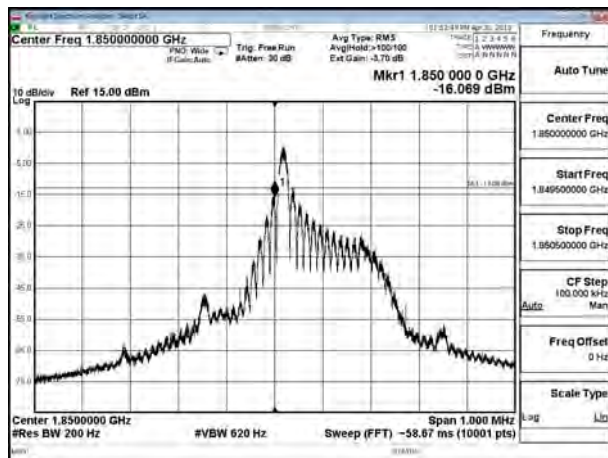
6.4. Test Result

Conducted Spurious Emission

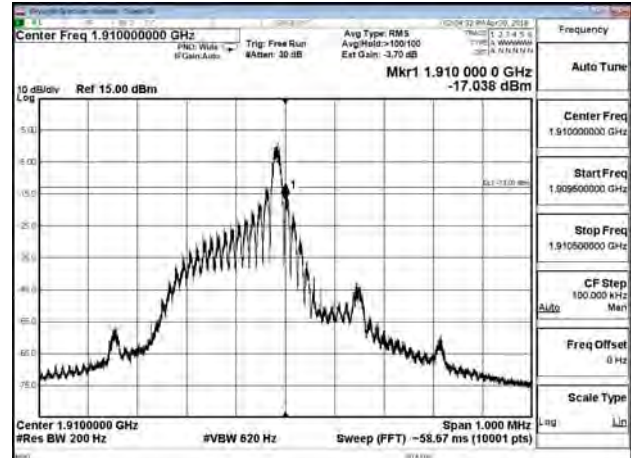
Test Mode	Mode 1: LTE_NB-IOT_Band 2_Link		
Date of Test	2018/04/30	Test Site	SR10-H



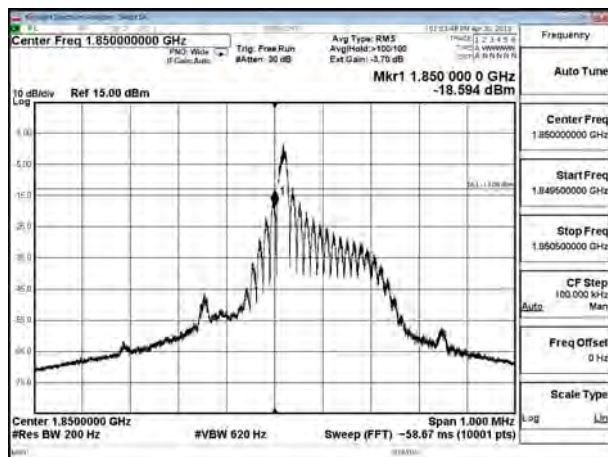
B2_15K_CH18601_BPSK_1RB0_



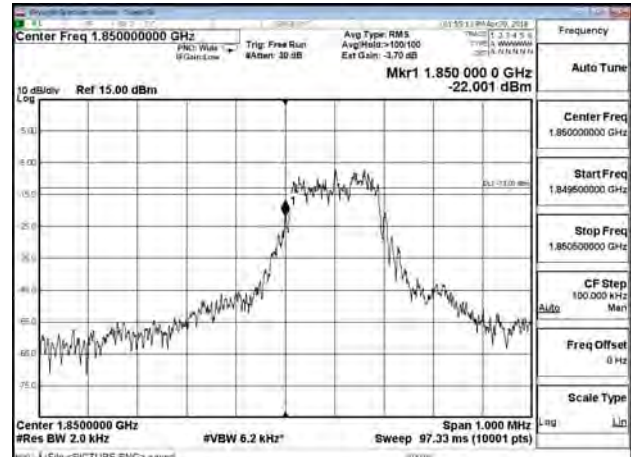
B2_15K_CH19199_BPSK_1RB11



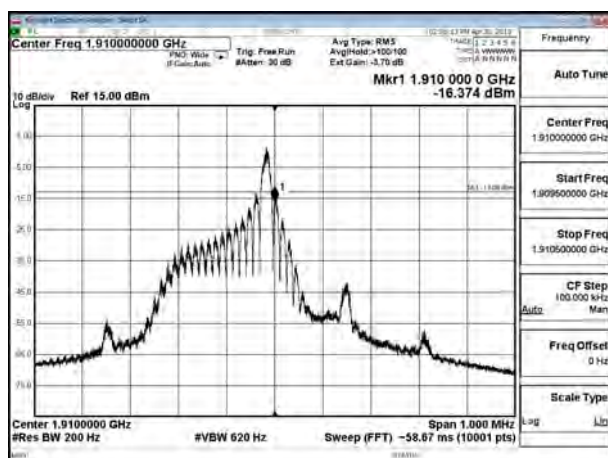
B2_15K_CH18601_QPSK_1RB0



B2_15K_CH18601_QPSK_12RB0



B2_15K_CH19199_QPSK_1RB11

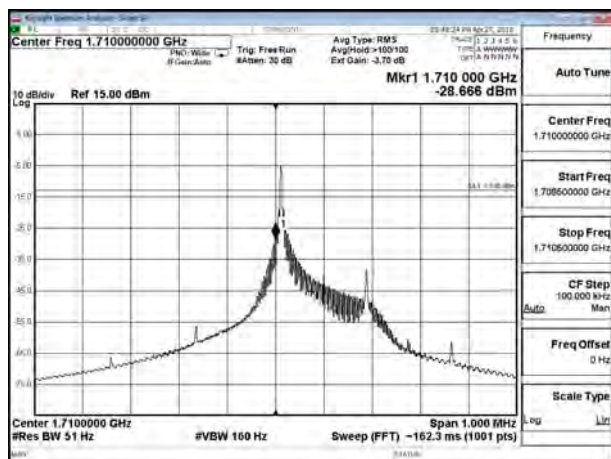


B2_15K_CH19199_QPSK_12RB0

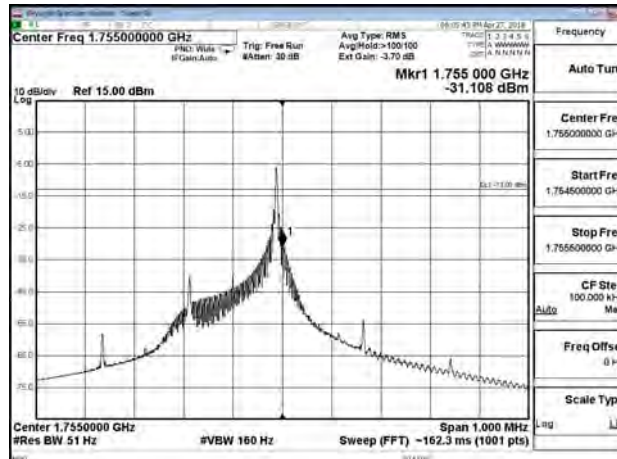


Test Mode	Mode 2: LTE_NB-IOT_Band 4_Link		
Date of Test	2018/04/30	Test Site	SR10-H

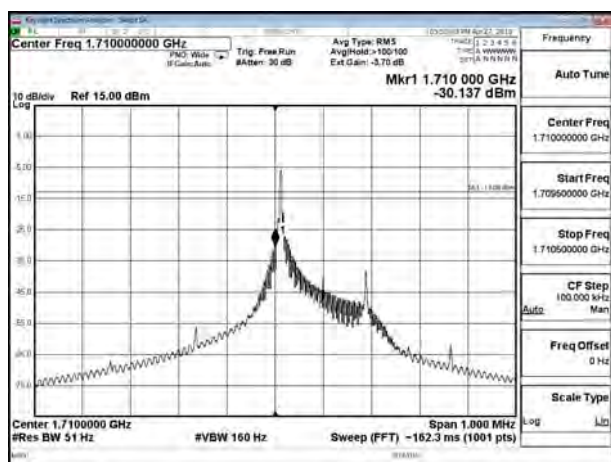
B4_3.75K_CH19951_BPSK_1RB0



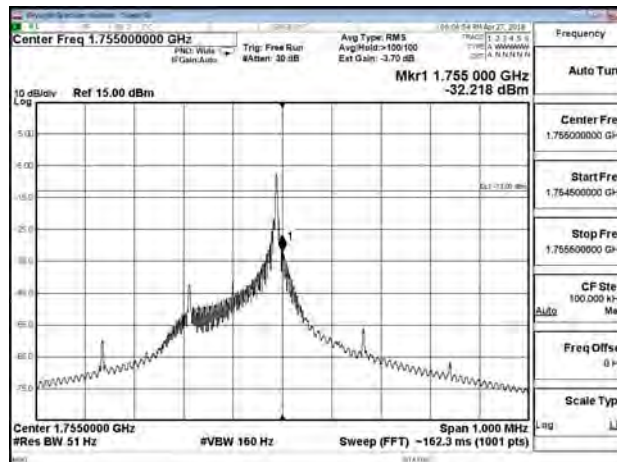
B4_3.75K_CH20399_BPSK_1RB47



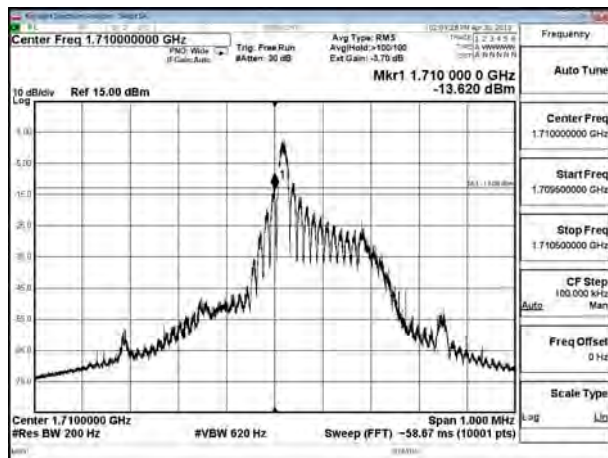
B4_3.75K_CH19951_QPSK_1RB0



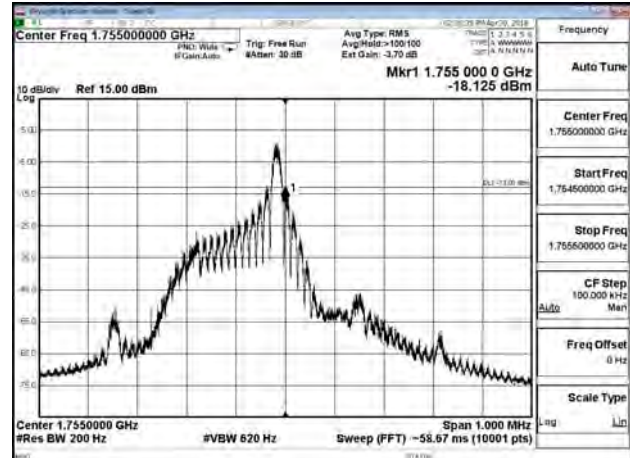
B4_3.75K_CH20399_QPSK_1RB47



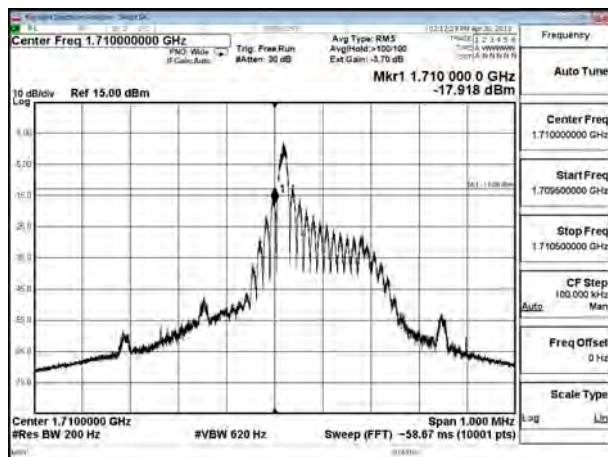
B4_15K_CH19951_BPSK_1RB0



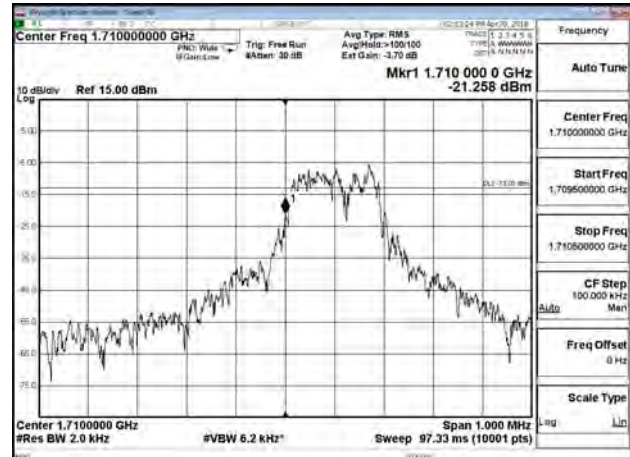
B4_15K_CH20399_BPSK_1RB11



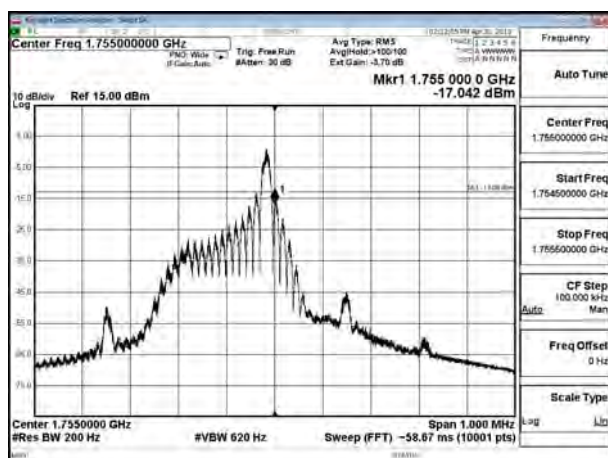
B4_15K_CH19951_QPSK_1RB0



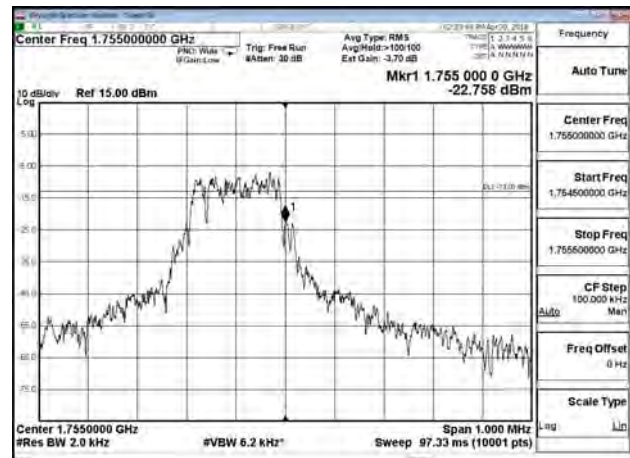
B4_15K_CH19951_QPSK_12RB0



B4_15K_CH20399_QPSK_1RB11

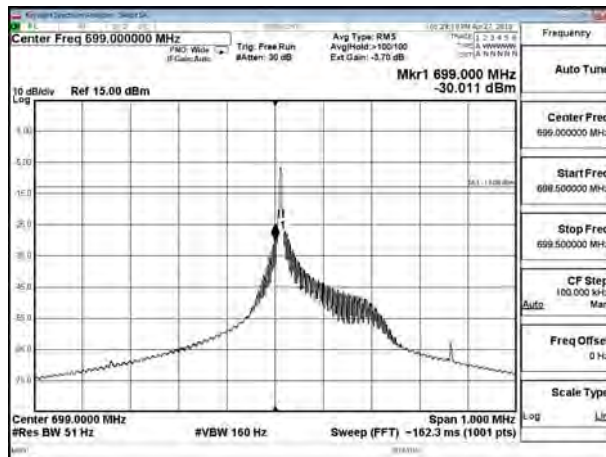


B4_15K_CH20399_QPSK_12RB0

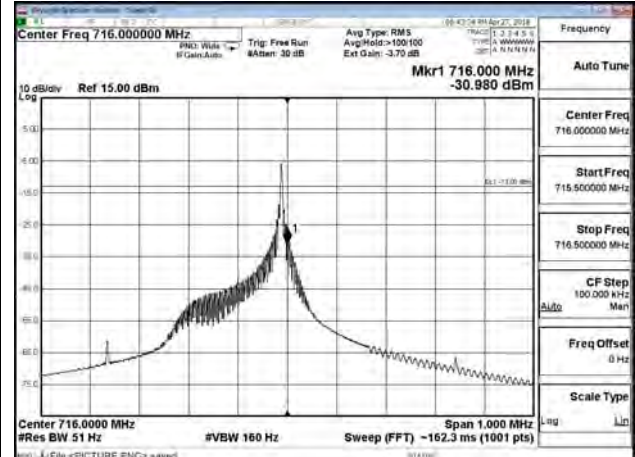


Test Mode	Mode 3: LTE_NB-IOT_Band 12_Link		
Date of Test	2018/04/30	Test Site	SR10-H

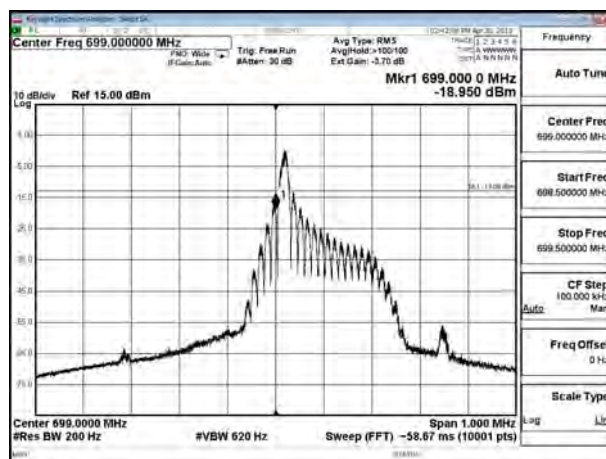
B12_3.75K_CH23011_BPSK_1RB0



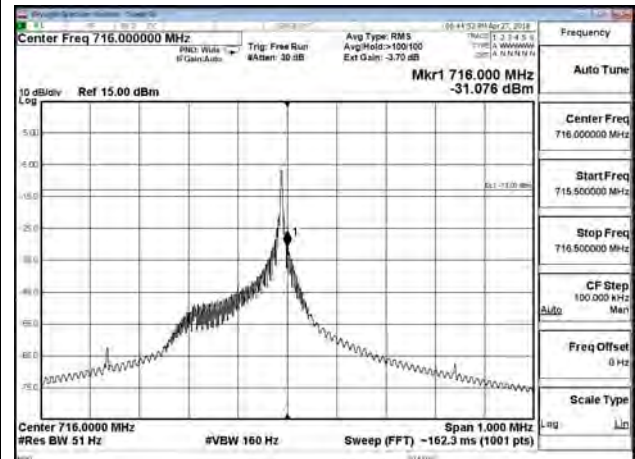
B12_3.75K_CH23179_BPSK_1RB47



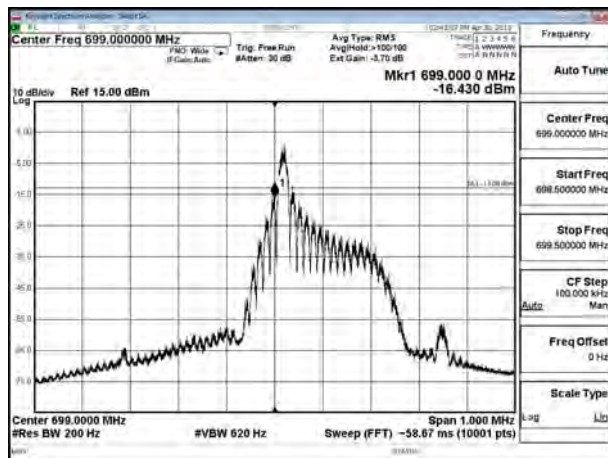
B12_3.75K_CH23011_QPSK_1RB0



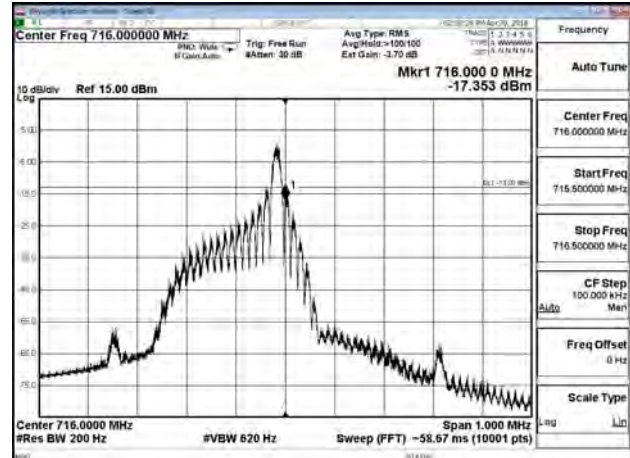
B12_3.75K_CH23179_QPSK_1RB47



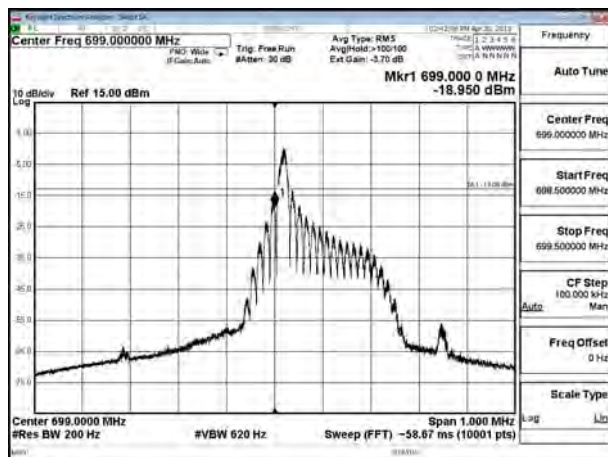
B12_15K_CH23011_BPSK_1RB0_



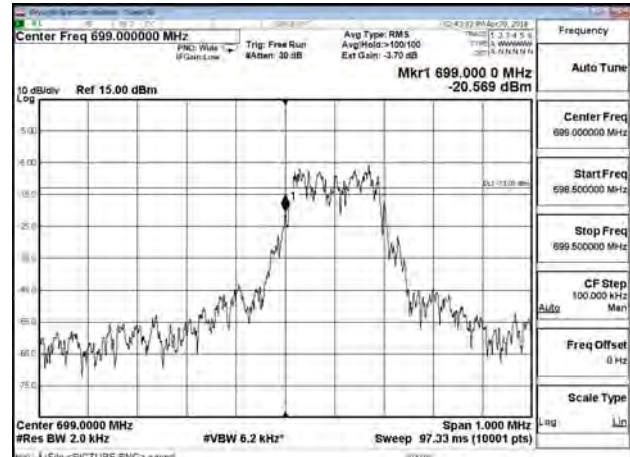
B12_15K_CH23179_BPSK_1RB11



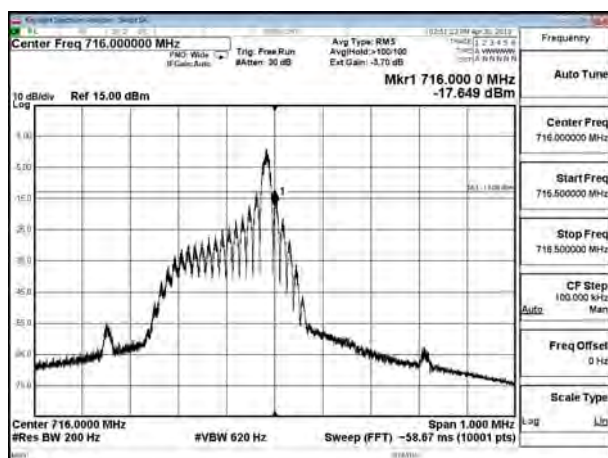
B12_15K_CH23011_QPSK_1RB0



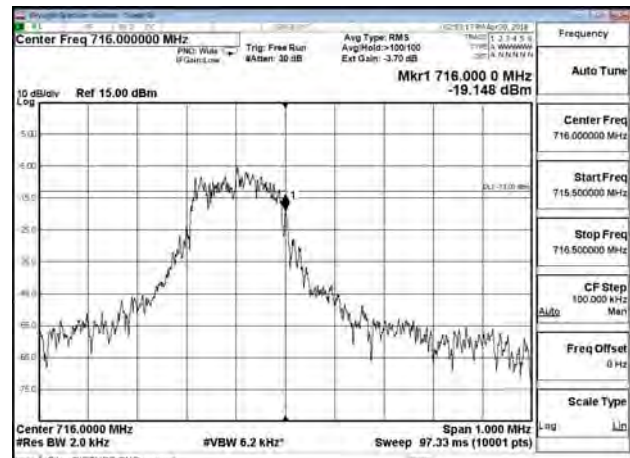
B12_15K_CH23011_QPSK_12RB0



B12_15K_CH23179_QPSK_1RB11

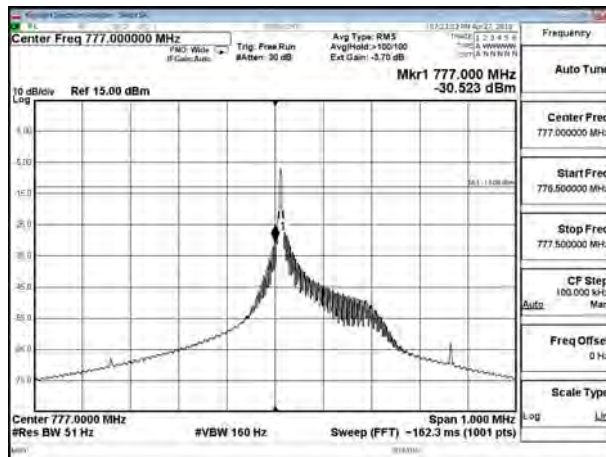


B12_15K_CH23179_QPSK_12RB0

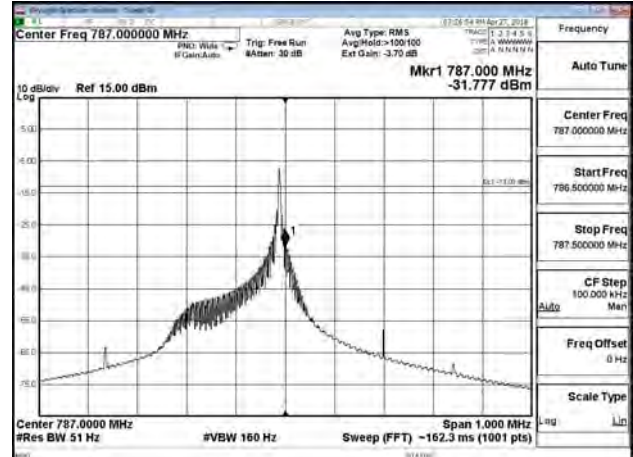


Test Mode	Mode 4: LTE_NB-IOT_Band 13_Link		
Date of Test	2018/04/30	Test Site	SR10-H

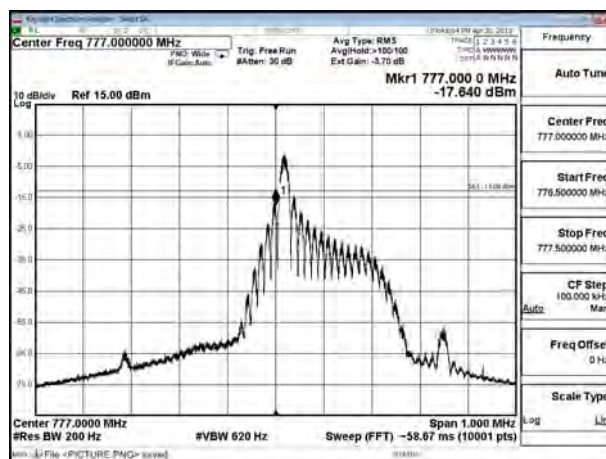
B13_3.75K_CH23181_BPSK_1RB0



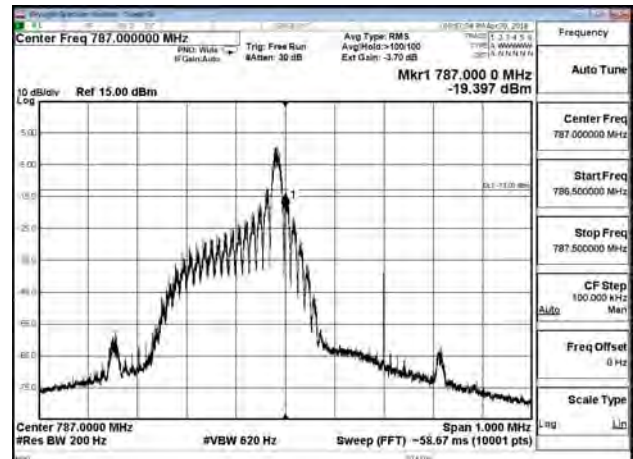
B13_3.75K_CH23279_BPSK_1RB47



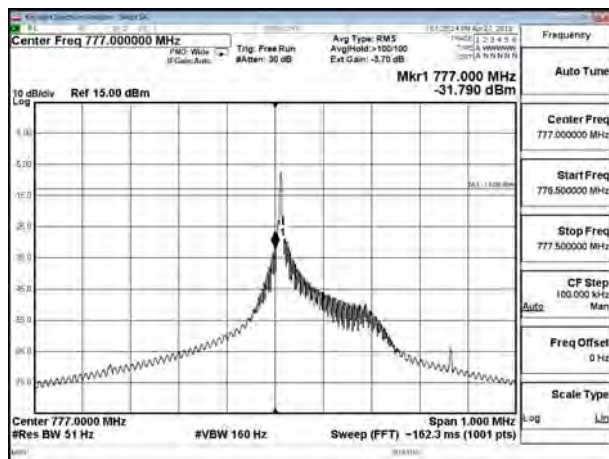
B13_15K_CH23181_BPSK_1RB0



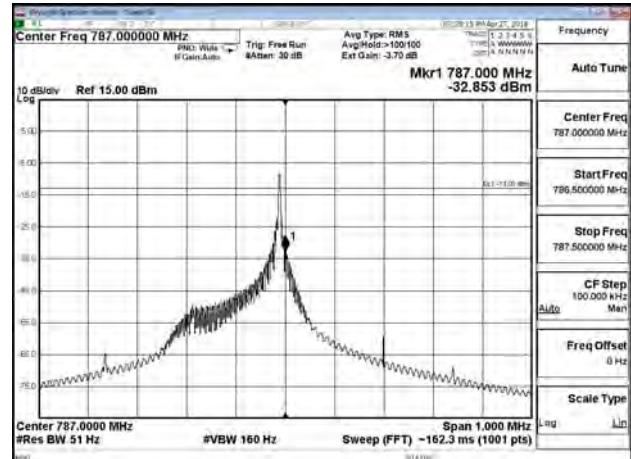
B13_15K_CH23279_BPSK_1RB11



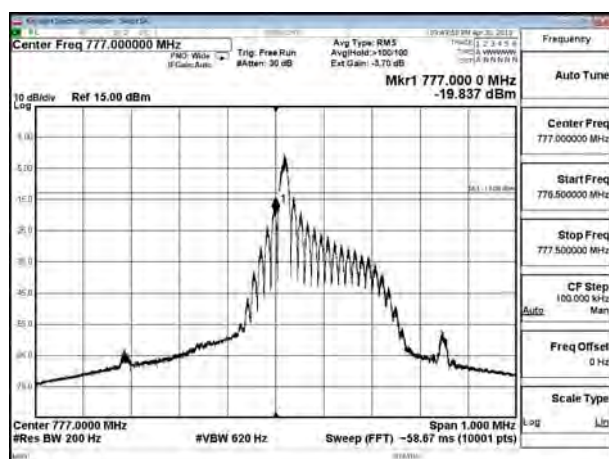
B13_3.75K_CH23181_QPSK_1RB0



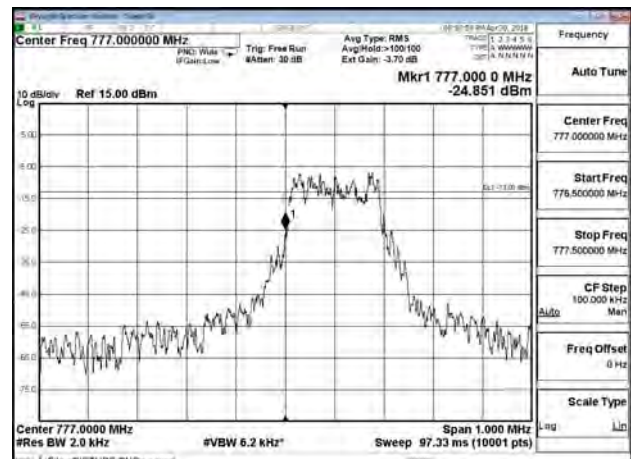
B13_3.75K_CH23279_QPSK_1RB47



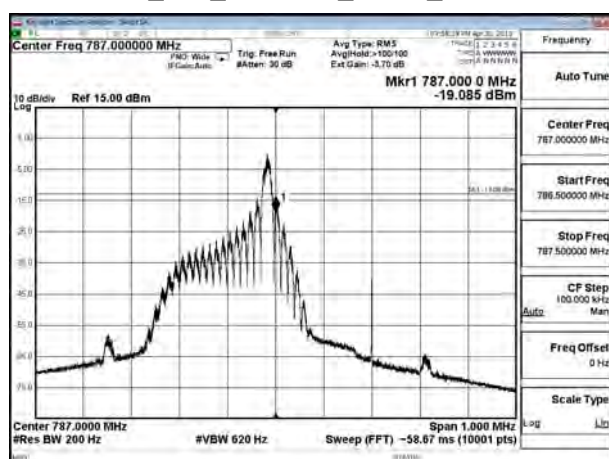
B13_15K_CH23181_QPSK_1RB0



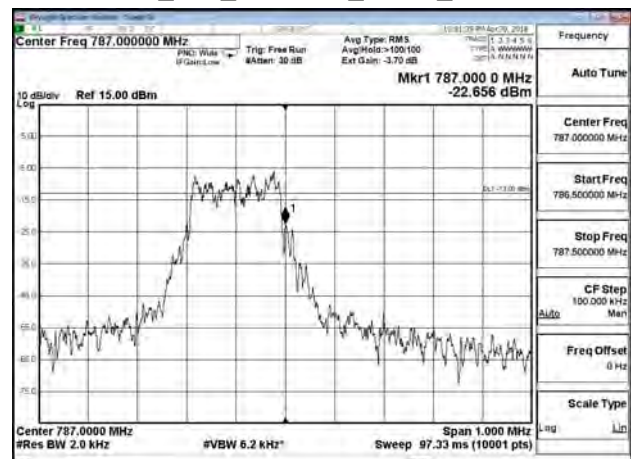
B13_15K_CH23181_QPSK_12RB0



B13_15K_CH23279_QPSK_1RB11



B13_15K_CH23279_QPSK_12RB0



Test Mode	Mode 1: LTE_NB-IOT_Band 2_Link		
Date of Test	2018/04/26	Test Site	CB4-H

NB-IOT B2_15K_BPSK_1RB0_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 18601 (1850.10MHz)								
3700.20	-70.270	H	-61.581	4.283	11.940	-53.925	-13	-40.925
5550.30	-66.420	H	-52.624	5.201	12.900	-44.925	-13	-31.925
3700.20	-71.810	V	-63.199	4.283	11.940	-55.543	-13	-42.543
5550.30	-64.620	V	-50.738	5.201	12.900	-43.039	-13	-30.039
Middle Channel 18900 (1880.50MHz)								
3760.00	-70.390	H	-61.439	4.335	11.832	-53.942	-13	-40.942
5640.00	-68.640	H	-54.568	5.235	12.900	-46.903	-13	-33.903
3760.00	-68.400	V	-59.563	4.335	11.832	-52.066	-13	-39.066
5640.00	-63.040	V	-48.944	5.235	12.900	-41.279	-13	-28.279
High Channel 19199 (1909.9MHz)								
3819.80	-67.870	H	-58.594	4.386	11.724	-51.256	-13	-38.256
5729.70	-66.860	H	-52.513	5.270	12.900	-44.883	-13	-31.883
3819.80	-66.460	V	-57.558	4.386	11.724	-50.220	-13	-37.220
5729.70	-62.980	V	-48.669	5.270	12.900	-41.039	-13	-28.039

NB-IOT B2_15K_BPSK_1RB11_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 18601 (1850.10MHz)								
3700.20	-71.350	H	-62.661	4.283	11.940	-55.005	-13	-42.005
5550.30	-69.610	H	-55.814	5.201	12.900	-48.115	-13	-35.115
3700.20	-71.270	V	-62.659	4.283	11.940	-55.003	-13	-42.003
5550.30	-65.220	V	-51.338	5.201	12.900	-43.639	-13	-30.639
Middle Channel 18900 (1880.50MHz)								
3760.00	-71.270	H	-62.319	4.335	11.832	-54.822	-13	-41.822
5640.00	-68.740	H	-54.668	5.235	12.900	-47.003	-13	-34.003
3760.00	-68.860	V	-60.023	4.335	11.832	-52.526	-13	-39.526
5640.00	-63.080	V	-48.984	5.235	12.900	-41.319	-13	-28.319
High Channel 19199 (1909.9MHz)								
3819.80	-68.220	H	-58.944	4.386	11.724	-51.606	-13	-38.606
5729.70	-67.270	H	-52.923	5.270	12.900	-45.293	-13	-32.293
3819.80	-66.220	V	-57.318	4.386	11.724	-49.980	-13	-36.980
5729.70	-62.490	V	-48.179	5.270	12.900	-40.549	-13	-27.549

NB-IOT B2_15K_QPSK_1RB0_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 18601 (1850.10MHz)								
3700.20	-70.680	H	-61.991	4.283	11.940	-54.335	-13	-41.335
5550.30	-69.720	H	-55.924	5.201	12.900	-48.225	-13	-35.225
3700.20	-70.690	V	-62.079	4.283	11.940	-54.423	-13	-41.423
5550.30	-65.480	V	-51.598	5.201	12.900	-43.899	-13	-30.899
Middle Channel 18900 (1880.50MHz)								
3760.00	-70.200	H	-61.249	4.335	11.832	-53.752	-13	-40.752
5640.00	-68.650	H	-54.578	5.235	12.900	-46.913	-13	-33.913
3760.00	-69.040	V	-60.203	4.335	11.832	-52.706	-13	-39.706
5640.00	-62.890	V	-48.794	5.235	12.900	-41.129	-13	-28.129
High Channel 19199 (1909.9MHz)								
3819.80	-68.050	H	-58.774	4.386	11.724	-51.436	-13	-38.436
5729.70	-67.630	H	-53.283	5.270	12.900	-45.653	-13	-32.653
3819.80	-67.320	V	-58.418	4.386	11.724	-51.080	-13	-38.080
5729.70	-62.810	V	-48.499	5.270	12.900	-40.869	-13	-27.869

NB-IOT B2_15K_QPSK_1RB11_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 18601 (1850.10MHz)								
3700.20	-70.780	H	-62.091	4.283	11.940	-54.435	-13	-41.435
5550.30	-69.030	H	-55.234	5.201	12.900	-47.535	-13	-34.535
3700.20	-71.120	V	-62.509	4.283	11.940	-54.853	-13	-41.853
5550.30	-65.260	V	-51.378	5.201	12.900	-43.679	-13	-30.679
Middle Channel 18900 (1880.50MHz)								
3760.00	-69.560	H	-60.609	4.335	11.832	-53.112	-13	-40.112
5640.00	-68.500	H	-54.428	5.235	12.900	-46.763	-13	-33.763
3760.00	-68.900	V	-60.063	4.335	11.832	-52.566	-13	-39.566
5640.00	-62.870	V	-48.774	5.235	12.900	-41.109	-13	-28.109
High Channel 19199 (1909.9MHz)								
3819.80	-68.410	H	-59.134	4.386	11.724	-51.796	-13	-38.796
5729.70	-67.570	H	-53.223	5.270	12.900	-45.593	-13	-32.593
3819.80	-66.790	V	-57.888	4.386	11.724	-50.550	-13	-37.550
5729.70	-63.490	V	-49.179	5.270	12.900	-41.549	-13	-28.549

NB-IOT B2_15K_QPSK_12RB0_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 18601 (1850.10MHz)								
3700.20	-70.990	H	-62.301	4.283	11.940	-54.645	-13	-41.645
5550.30	-62.790	H	-48.994	5.201	12.900	-41.295	-13	-28.295
3700.20	-67.210	V	-58.599	4.283	11.940	-50.943	-13	-37.943
5550.30	-54.300	V	-40.418	5.201	12.900	-32.719	-13	-19.719
Middle Channel 18900 (1880.50MHz)								
3760.00	-69.600	H	-60.649	4.335	11.832	-53.152	-13	-40.152
5640.00	-64.100	H	-50.028	5.235	12.900	-42.363	-13	-29.363
3760.00	-64.510	V	-55.673	4.335	11.832	-48.176	-13	-35.176
5640.00	-55.850	V	-41.754	5.235	12.900	-34.089	-13	-21.089
High Channel 19199 (1909.9MHz)								
3819.80	-69.040	H	-59.764	4.386	11.724	-52.426	-13	-39.426
5729.70	-70.470	H	-56.123	5.270	12.900	-48.493	-13	-35.493
3819.80	-66.710	V	-57.808	4.386	11.724	-50.470	-13	-37.470
5729.70	-56.240	V	-41.929	5.270	12.900	-34.299	-13	-21.299

Test Mode	Mode 2: LTE_NB-IOT_Band 4_Link		
Date of Test	2018/04/26	Test Site	CB4-H

NB-IOT B4_15K_BPSK_1RB0_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 19951 (1710.10MHz)								
3420.20	-57.430	H	-49.743	4.064	12.093	-41.714	-13	-28.714
5130.30	-62.470	H	-49.387	5.075	12.235	-42.227	-13	-29.227
3420.20	-55.290	V	-47.639	4.064	12.093	-39.610	-13	-26.610
5130.30	-68.350	V	-55.257	5.075	12.235	-48.097	-13	-35.097
Middle Channel 20175 (1732.50MHz)								
3464.89	-63.640	H	-55.897	4.090	12.209	-47.778	-13	-34.778
5199.10	-70.830	H	-57.992	5.094	12.358	-50.728	-13	-37.728
3465.08	-63.910	V	-56.244	4.090	12.209	-48.125	-13	-35.125
5197.40	-70.650	V	-57.862	5.094	12.355	-50.601	-13	-37.601
High Channel 20399 (1754.90MHz)								
3509.69	-66.460	H	-58.642	4.119	12.283	-50.479	-13	-37.479
5264.39	-69.230	H	-56.481	5.113	12.476	-49.118	-13	-36.118
3509.80	-60.490	V	-52.780	4.119	12.282	-44.617	-13	-31.617
5264.57	-67.330	V	-54.676	5.113	12.476	-47.313	-13	-34.313

NB-IOT B4_15K_BPSK_1RB11_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 19951 (1710.10MHz)								
3420.20	-60.290	H	-52.603	4.064	12.093	-44.574	-13	-31.574
5130.30	-67.160	H	-54.077	5.075	12.235	-46.917	-13	-33.917
3420.20	-55.120	V	-47.469	4.064	12.093	-39.440	-13	-26.440
5130.30	-61.970	V	-48.877	5.075	12.235	-41.717	-13	-28.717
Middle Channel 20175 (1732.50MHz)								
3465.13	-64.190	H	-56.446	4.090	12.209	-48.327	-13	-35.327
5197.61	-70.750	H	-57.906	5.094	12.356	-50.644	-13	-37.644
3465.06	-62.000	V	-54.334	4.090	12.209	-46.215	-13	-33.215
5197.64	-64.280	V	-51.494	5.094	12.356	-44.232	-13	-31.232
High Channel 20399 (1754.90MHz)								
3509.83	-66.290	H	-58.471	4.119	12.282	-50.308	-13	-37.308
5264.68	-69.880	H	-57.129	5.113	12.476	-49.766	-13	-36.766
3509.79	-60.210	V	-52.500	4.119	12.282	-44.337	-13	-31.337
5264.80	-67.080	V	-54.425	5.113	12.477	-47.062	-13	-34.062

NB-IOT B4_15K_QPSK_1RB0_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 19951 (1710.10MHz)								
3420.20	-60.270	H	-52.583	4.064	12.093	-44.554	-13	-31.554
5130.30	-66.730	H	-53.647	5.075	12.235	-46.487	-13	-33.487
3420.20	-55.030	V	-47.379	4.064	12.093	-39.350	-13	-26.350
5130.30	-62.970	V	-49.877	5.075	12.235	-42.717	-13	-29.717
Middle Channel 20175 (1732.50MHz)								
3466.34	-69.610	H	-61.866	4.091	12.212	-53.745	-13	-40.745
5195.88	-71.390	H	-58.538	5.093	12.353	-51.279	-13	-38.279
3464.98	-62.560	V	-54.894	4.090	12.209	-46.775	-13	-33.775
5197.36	-65.080	V	-52.292	5.094	12.355	-45.031	-13	-32.031
High Channel 20399 (1754.90MHz)								
3509.50	-65.870	H	-58.054	4.119	12.283	-49.890	-13	-36.890
5263.84	-69.940	H	-57.192	5.113	12.475	-49.830	-13	-36.830
3509.73	-60.490	V	-52.780	4.119	12.282	-44.617	-13	-31.617
5264.80	-66.900	V	-54.245	5.113	12.477	-46.882	-13	-33.882

NB-IOT B4_15K_QPSK_1RB11_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 19951 (1710.10MHz)								
3420.20	-63.880	H	-56.193	4.064	12.093	-48.164	-13	-35.164
5130.30	-63.440	H	-50.357	5.075	12.235	-43.197	-13	-30.197
3420.20	-55.090	V	-47.439	4.064	12.093	-39.410	-13	-26.410
5130.30	-59.810	V	-46.717	5.075	12.235	-39.557	-13	-26.557
Middle Channel 20175 (1732.50MHz)								
3465.15	-65.160	H	-57.416	4.090	12.209	-49.297	-13	-36.297
5199.41	-71.360	H	-58.524	5.094	12.359	-51.259	-13	-38.259
3464.82	-64.660	V	-56.994	4.090	12.209	-48.876	-13	-35.876
5197.86	-70.620	V	-57.835	5.094	12.356	-50.573	-13	-37.573
High Channel 20399 (1754.90MHz)								
3509.84	-66.360	H	-58.541	4.119	12.282	-50.378	-13	-37.378
5264.54	-69.700	H	-56.950	5.113	12.476	-49.587	-13	-36.587
3509.79	-60.380	V	-52.670	4.119	12.282	-44.507	-13	-31.507
5264.79	-67.170	V	-54.515	5.113	12.477	-47.152	-13	-34.152

NB-IOT B4_15K_QPSK_12RB0_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 19951 (1710.10MHz)								
3420.20	-56.050	H	-48.363	4.064	12.093	-40.334	-13	-27.334
5130.30	-67.280	H	-54.197	5.075	12.235	-47.037	-13	-34.037
3420.20	-51.720	V	-44.069	4.064	12.093	-36.040	-13	-23.040
5130.30	-57.990	V	-44.897	5.075	12.235	-37.737	-13	-24.737
Middle Channel 20175 (1732.50MHz)								
3464.83	-63.880	H	-56.136	4.090	12.209	-48.018	-13	-35.018
5198.82	-70.800	H	-57.961	5.094	12.358	-50.697	-13	-37.697
3464.94	-60.910	V	-53.244	4.090	12.209	-45.125	-13	-32.125
5197.52	-61.790	V	-49.003	5.094	12.356	-41.741	-13	-28.741
High Channel 20399 (1754.90MHz)								
3509.58	-61.240	H	-53.423	4.119	12.283	-45.259	-13	-32.259
5264.55	-66.300	H	-53.550	5.113	12.476	-46.187	-13	-33.187
3509.72	-57.670	V	-49.960	4.119	12.283	-41.797	-13	-28.797
5264.57	-60.950	V	-48.296	5.113	12.476	-40.933	-13	-27.933

Test Mode	Mode 3: LTE_NB-IOT_Band 12_Link		
Date of Test	2018/04/26	Test Site	CB4-H

NB-IOT B12_15K_BPSK_1RB0_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 20311 (699.10MHz)								
1397.98	-60.780	H	-57.645	2.571	7.810	-52.406	-13	-39.406
2096.67	-69.470	H	-64.885	3.177	9.955	-58.107	-13	-45.107
1398.17	-53.470	V	-50.589	2.571	7.811	-45.349	-13	-32.349
2098.93	-68.320	V	-63.546	3.178	9.958	-56.766	-13	-43.766
Middle Channel 23095 (707.50MHz)								
1416.35	-68.340	H	-65.295	2.586	7.898	-59.983	-13	-46.983
2121.90	-68.140	H	-63.212	3.194	9.995	-56.411	-13	-43.411
1414.78	-58.480	V	-55.711	2.585	7.891	-50.405	-13	-37.405
2122.75	-65.610	V	-60.460	3.195	9.996	-53.659	-13	-40.659
High Channel 20399 (715.90MHz)								
1431.77	-51.490	H	-48.503	2.599	7.973	-43.129	-13	-30.129
2150.07	-69.590	H	-64.262	3.214	10.040	-57.436	-13	-44.436
1431.77	-53.350	V	-50.678	2.599	7.972	-45.304	-13	-32.304
2148.27	-69.350	V	-63.783	3.213	10.037	-56.958	-13	-43.958

NB-IOT B12_15K_BPSK_1RB11_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 20311 (699.10MHz)								
1398.17	-59.290	H	-56.157	2.571	7.811	-50.917	-13	-37.917
2098.67	-69.630	H	-65.017	3.178	9.958	-58.237	-13	-45.237
1398.21	-53.570	V	-50.689	2.571	7.811	-45.449	-13	-32.449
2098.53	-68.750	V	-63.982	3.178	9.958	-57.203	-13	-44.203
Middle Channel 23095 (707.50MHz)								
1415.06	-59.960	H	-56.909	2.585	7.892	-51.602	-13	-38.602
2121.75	-66.870	H	-61.944	3.194	9.995	-55.143	-13	-42.143
1415.05	-56.120	V	-53.353	2.585	7.892	-48.046	-13	-35.046
2121.68	-65.190	V	-60.057	3.194	9.995	-53.257	-13	-40.257
High Channel 20399 (715.90MHz)								
1415.03	-58.760	H	-55.709	2.585	7.892	-50.402	-13	-37.402
2120.66	-68.100	H	-63.189	3.193	9.993	-56.389	-13	-43.389
1431.78	-51.760	V	-48.773	2.599	7.973	-43.399	-13	-30.399
2145.94	-69.310	V	-64.044	3.211	10.034	-57.221	-13	-44.221

NB-IOT B12_15K_QPSK_1RB0_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 20311 (699.10MHz)								
1398.23	-60.700	H	-57.567	2.571	7.812	-52.327	-13	-39.327
2097.03	-68.990	H	-64.399	3.177	9.955	-57.621	-13	-44.621
1397.98	-53.550	V	-50.668	2.571	7.810	-45.429	-13	-32.429
2095.94	-69.480	V	-64.753	3.176	9.954	-57.976	-13	-44.976
Middle Channel 23095 (707.50MHz)								
1414.98	-55.200	H	-52.433	2.585	7.892	-47.126	-13	-34.126
2121.07	-68.240	H	-63.117	3.194	9.994	-56.317	-13	-43.317
1431.69	-51.390	V	-48.402	2.599	7.972	-43.029	-13	-30.029
2148.02	-69.690	V	-64.392	3.212	10.037	-57.568	-13	-44.568
High Channel 20399 (715.90MHz)								
1431.69	-53.080	H	-50.407	2.599	7.972	-45.034	-13	-32.034
2148.05	-68.950	H	-63.386	3.212	10.037	-56.562	-13	-43.562
1431.69	-53.080	V	-50.407	2.599	7.972	-45.034	-13	-32.034
2148.05	-68.950	V	-63.386	3.212	10.037	-56.562	-13	-43.562

NB-IOT B12_15K_QPSK_1RB11_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 20311 (699.10MHz)								
1398.29	-60.580	H	-57.447	2.571	7.812	-52.207	-13	-39.207
2096.22	-69.500	H	-64.920	3.177	9.954	-58.143	-13	-45.143
1398.34	-53.570	V	-50.691	2.571	7.812	-45.450	-13	-32.450
2097.88	-68.930	V	-64.173	3.178	9.957	-57.394	-13	-44.394
Middle Channel 23095 (707.50MHz)								
1415.07	-59.120	H	-56.069	2.585	7.892	-50.762	-13	-37.762
2123.57	-68.440	H	-63.489	3.196	9.998	-56.687	-13	-43.687
1415.20	-55.170	V	-52.404	2.585	7.893	-47.096	-13	-34.096
2122.62	-67.820	V	-62.672	3.195	9.996	-55.871	-13	-42.871
High Channel 20399 (715.90MHz)								
1432.05	-51.650	H	-48.664	2.599	7.974	-43.289	-13	-30.289
2147.76	-69.140	H	-63.847	3.212	10.036	-57.023	-13	-44.023
1431.99	-53.070	V	-50.398	2.599	7.974	-45.024	-13	-32.024
2148.90	-69.280	V	-63.702	3.213	10.038	-56.877	-13	-43.877

NB-IOT B12_15K_QPSK_12RB0_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 20311 (699.10MHz)								
1398.24	-56.170	H	-53.037	2.571	7.812	-47.797	-13	-34.797
2098.87	-69.310	H	-64.694	3.178	9.958	-57.914	-13	-44.914
1398.83	-49.390	V	-46.515	2.572	7.814	-41.272	-13	-28.272
2095.89	-69.480	V	-64.754	3.176	9.953	-57.977	-13	-44.977
Middle Channel 23095 (707.50MHz)								
1415.00	-52.780	H	-49.729	2.585	7.892	-44.422	-13	-31.422
2124.20	-69.110	H	-64.150	3.196	9.999	-57.347	-13	-44.347
1415.01	-50.630	V	-47.863	2.585	7.892	-42.556	-13	-29.556
2122.22	-67.610	V	-62.468	3.195	9.996	-55.667	-13	-42.667
High Channel 20399 (715.90MHz)								
1431.80	-48.390	H	-45.403	2.599	7.973	-40.029	-13	-27.029
2147.88	-69.150	H	-63.855	3.212	10.037	-57.031	-13	-44.031
1431.85	-49.070	V	-46.398	2.599	7.973	-41.024	-13	-28.024
2147.76	-69.620	V	-64.062	3.212	10.036	-57.238	-13	-44.238

Test Mode	Mode 4: LTE_NB-IOT_Band 13_Link		
Date of Test	2018/04/26	Test Site	CB4-H

NB-IOT B13_15K_BPSK_1RB0_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 23181 (777.10MHz)								
1554.20	-55.470	H	-52.895	2.704	8.463	-47.137	-13	-34.137
2331.30	-67.310	H	-60.969	3.339	10.330	-53.978	-13	-40.978
1554.20	-59.820	V	-57.631	2.704	8.463	-51.873	-13	-38.873
2331.30	-69.210	V	-62.536	3.339	10.330	-55.545	-13	-42.545
Middle Channel 23230 (782.00MHz)								
1564.00	-58.920	H	-56.362	2.713	8.492	-50.583	-13	-37.583
2346.00	-69.620	H	-63.347	3.349	10.354	-56.343	-13	-43.343
1564.00	-59.780	V	-57.598	2.713	8.492	-51.819	-13	-38.819
2346.00	-65.080	V	-58.502	3.349	10.354	-51.498	-13	-38.498
High Channel 23279 (786.90MHz)								
1573.80	-60.230	H	-57.702	2.722	8.521	-51.903	-13	-38.903
2360.70	-67.510	H	-61.326	3.360	10.377	-54.308	-13	-41.308
1573.80	-61.860	V	-59.698	2.722	8.521	-53.899	-13	-40.899
2360.70	-64.720	V	-58.258	3.360	10.377	-51.240	-13	-38.240

NB-IOT B13_15K_BPSK_1RB11_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 23181 (777.10MHz)								
1554.20	-54.970	H	-52.395	2.704	8.463	-46.637	-13	-33.637
2331.30	-69.340	H	-62.999	3.339	10.330	-56.008	-13	-43.008
1554.20	-57.570	V	-55.381	2.704	8.463	-49.623	-13	-36.623
2331.30	-64.970	V	-58.296	3.339	10.330	-51.305	-13	-38.305
Middle Channel 23230 (782.00MHz)								
1564.00	-58.640	H	-56.082	2.713	8.492	-50.303	-13	-37.303
2346.00	-69.660	H	-63.387	3.349	10.354	-56.383	-13	-43.383
1564.00	-60.040	V	-57.858	2.713	8.492	-52.079	-13	-39.079
2346.00	-64.800	V	-58.222	3.349	10.354	-51.218	-13	-38.218
High Channel 23279 (786.90MHz)								
1573.80	-58.590	H	-56.062	2.722	8.521	-50.263	-13	-37.263
2360.70	-69.280	H	-63.096	3.360	10.377	-56.078	-13	-43.078
1573.80	-61.130	V	-58.968	2.722	8.521	-53.169	-13	-40.169
2360.70	-65.630	V	-59.168	3.360	10.377	-52.150	-13	-39.150

NB-IOT B13_15K_QPSK_1RB0_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 23181 (777.10MHz)								
1554.20	-55.470	H	-52.895	2.704	8.463	-47.137	-13	-34.137
2331.30	-67.150	H	-60.809	3.339	10.330	-53.818	-13	-40.818
1554.20	-57.510	V	-55.321	2.704	8.463	-49.563	-13	-36.563
2331.30	-65.110	V	-58.436	3.339	10.330	-51.445	-13	-38.445
Middle Channel 23230 (782.00MHz)								
1564.00	-59.630	H	-57.072	2.713	8.492	-51.293	-13	-38.293
2346.00	-68.220	H	-61.947	3.349	10.354	-54.943	-13	-41.943
1564.00	-60.030	V	-57.848	2.713	8.492	-52.069	-13	-39.069
2346.00	-65.090	V	-58.512	3.349	10.354	-51.508	-13	-38.508
High Channel 23279 (786.90MHz)								
1573.80	-59.870	H	-57.342	2.722	8.521	-51.543	-13	-38.543
2360.70	-69.590	H	-63.406	3.360	10.377	-56.388	-13	-43.388
1573.80	-61.300	V	-59.138	2.722	8.521	-53.339	-13	-40.339
2360.70	-65.810	V	-59.348	3.360	10.377	-52.330	-13	-39.330

NB-IOT B13_15K_QPSK_1RB11_Link

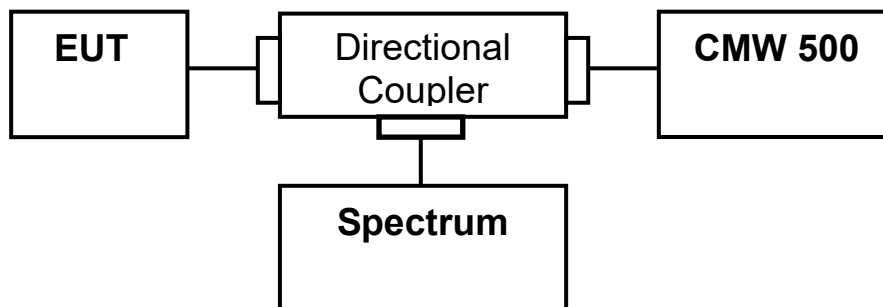
Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 23181 (777.10MHz)								
1554.20	-55.160	H	-52.585	2.704	8.463	-46.827	-13	-33.827
2331.30	-69.550	H	-63.209	3.339	10.330	-56.218	-13	-43.218
1554.20	-57.780	V	-55.591	2.704	8.463	-49.833	-13	-36.833
2331.30	-64.690	V	-58.016	3.339	10.330	-51.025	-13	-38.025
Middle Channel 23230 (782.00MHz)								
1564.00	-58.940	H	-56.382	2.713	8.492	-50.603	-13	-37.603
2346.00	-68.530	H	-62.257	3.349	10.354	-55.253	-13	-42.253
1564.00	-59.980	V	-57.798	2.713	8.492	-52.019	-13	-39.019
2346.00	-64.630	V	-58.052	3.349	10.354	-51.048	-13	-38.048
High Channel 23279 (786.90MHz)								
1573.80	-58.690	H	-56.162	2.722	8.521	-50.363	-13	-37.363
2360.70	-69.030	H	-62.846	3.360	10.377	-55.828	-13	-42.828
1573.80	-60.800	V	-58.638	2.722	8.521	-52.839	-13	-39.839
2360.70	-65.570	V	-59.108	3.360	10.377	-52.090	-13	-39.090

NB-IOT B13_15K_QPSK_12RB0_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 23181 (777.10MHz)								
1554.20	-46.970	H	-44.395	2.704	8.463	-38.637	-13	-25.637
2331.30	-69.370	H	-63.029	3.339	10.330	-56.038	-13	-43.038
1554.20	-53.480	V	-51.291	2.704	8.463	-45.533	-13	-32.533
2331.30	-62.350	V	-55.676	3.339	10.330	-48.685	-13	-35.685
Middle Channel 23230 (782.00MHz)								
1564.00	-49.390	H	-46.832	2.713	8.492	-41.053	-13	-28.053
2346.00	-63.850	H	-57.577	3.349	10.354	-50.573	-13	-37.573
1564.00	-53.420	V	-51.238	2.713	8.492	-45.459	-13	-32.459
2346.00	-60.970	V	-54.392	3.349	10.354	-47.388	-13	-34.388
High Channel 23279 (786.90MHz)								
1573.80	-50.080	H	-47.552	2.722	8.521	-41.753	-13	-28.753
2360.70	-63.600	H	-57.416	3.360	10.377	-50.398	-13	-37.398
1573.80	-52.020	V	-49.858	2.722	8.521	-44.059	-13	-31.059
2360.70	-60.850	V	-54.388	3.360	10.377	-47.370	-13	-34.370

7. Spurious Emissions at Antenna Terminals

7.1. Test Setup



7.2. Test Procedure

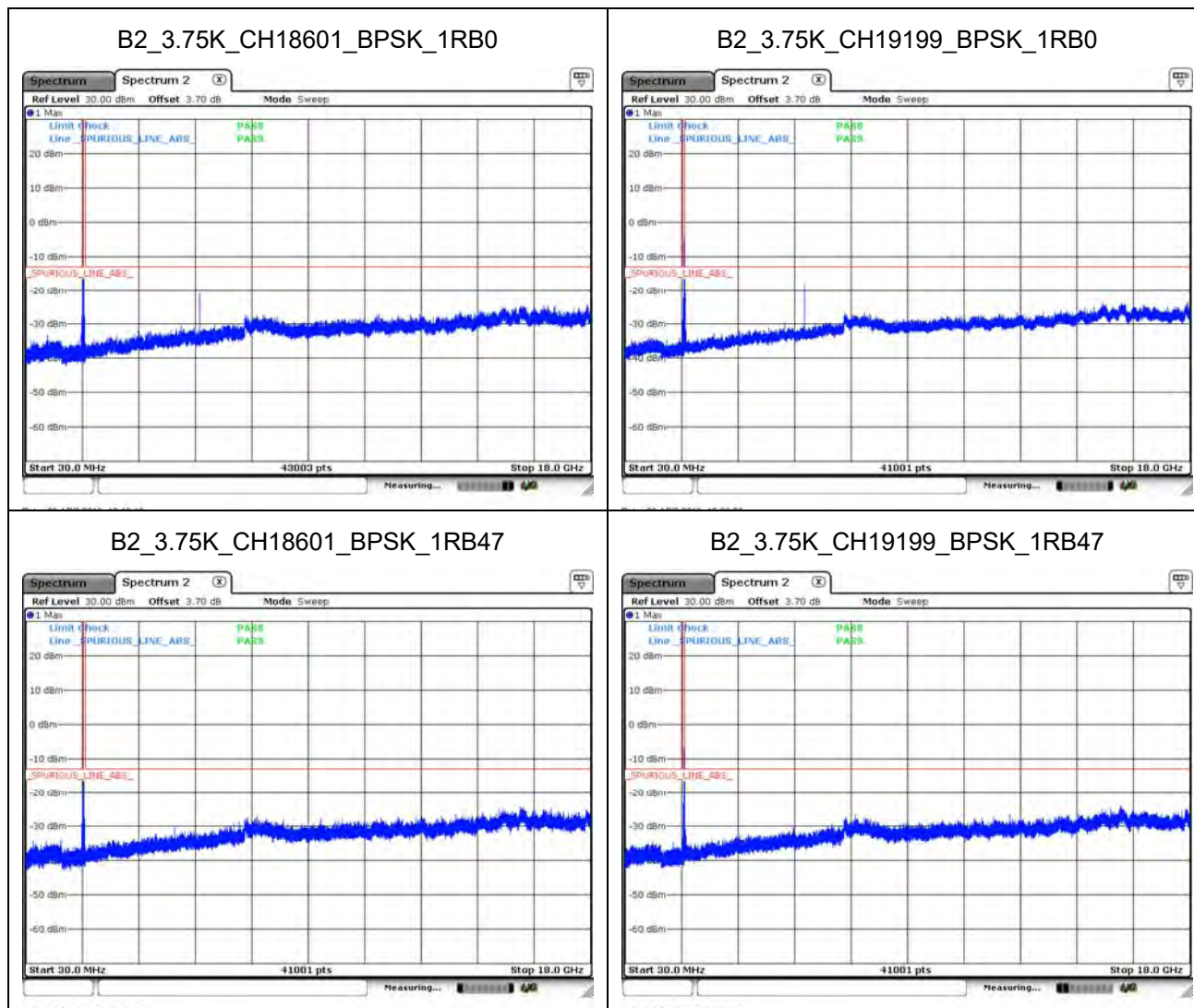
- Place the EUT on a bench and set it in transmitting mode.
- Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Coupler.
- EUT Communicate with CMW500, then select a channel for testing.
- Add a correction factor to the display of spectrum, and then test.
- The resolution bandwidth of the spectrum analyzer was set at 1 MHz, sufficient scans were taken to show the out of band Emission if any up to 10th harmonic.

7.3. Test Method

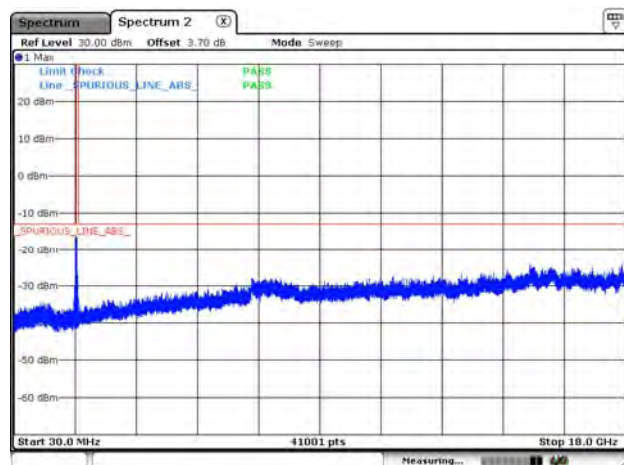
KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause 6.1
ANSI C63.26-2015 Sub-clause 5.7

7.4. Test Result

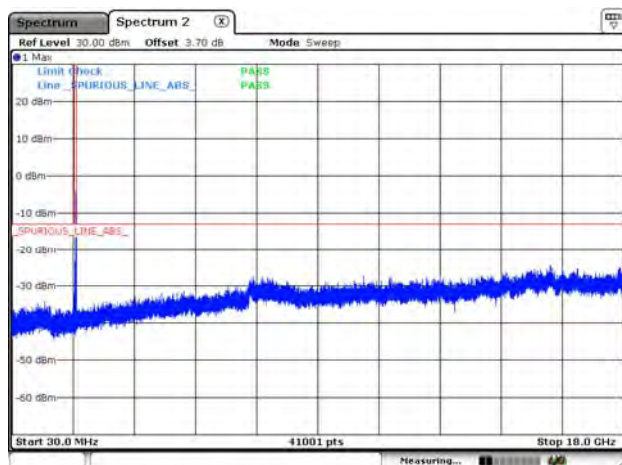
Test Mode	Mode 1: LTE_NB-IOT_Band 2_Link		
Date of Test	2018/04/26	Test Site	SR10-H



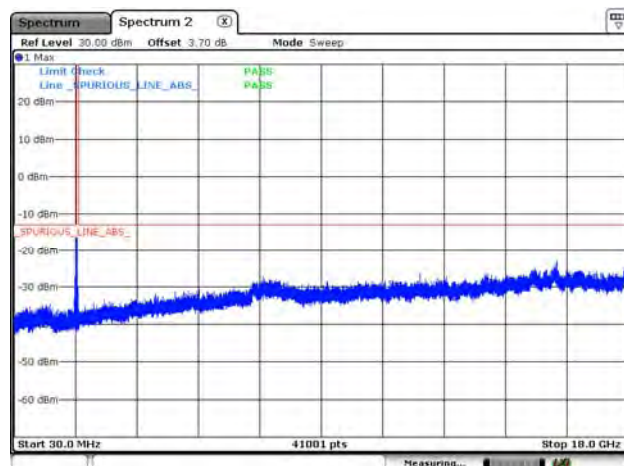
B2_3.75K_CH18601_QPSK_1RB0



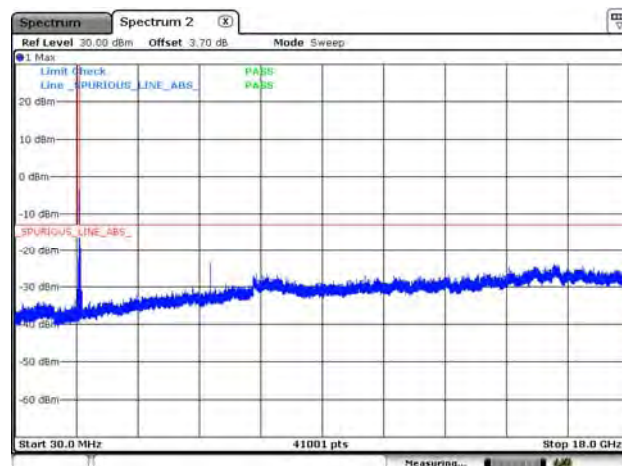
B2_3.75K_CH19199_QPSK_1RB0



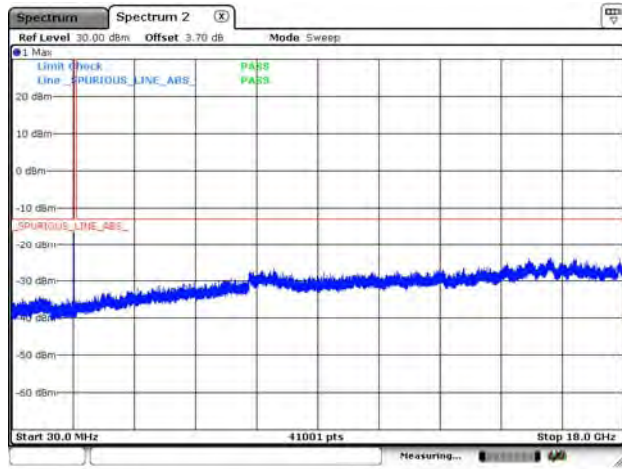
B2_3.75K_CH18601_QPSK_1RB47



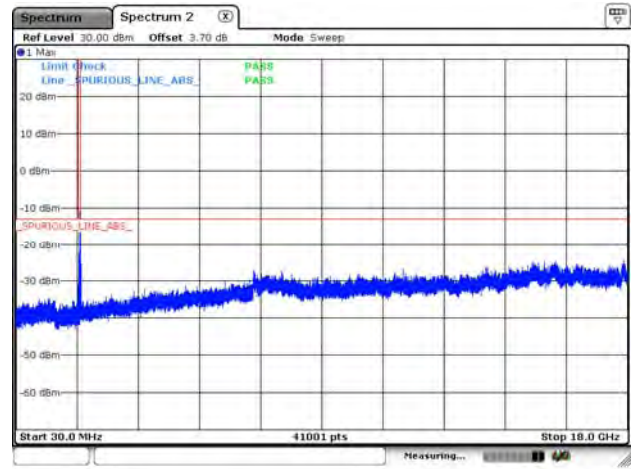
B2_3.75K_CH19199_QPSK_1RB47



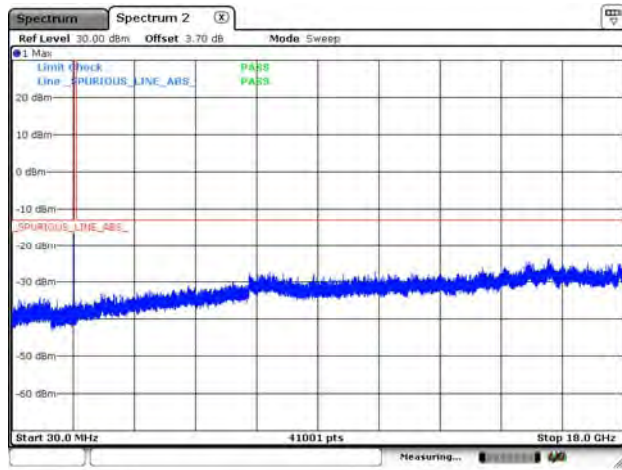
B2_15K_CH18601_BPSK_1RB0



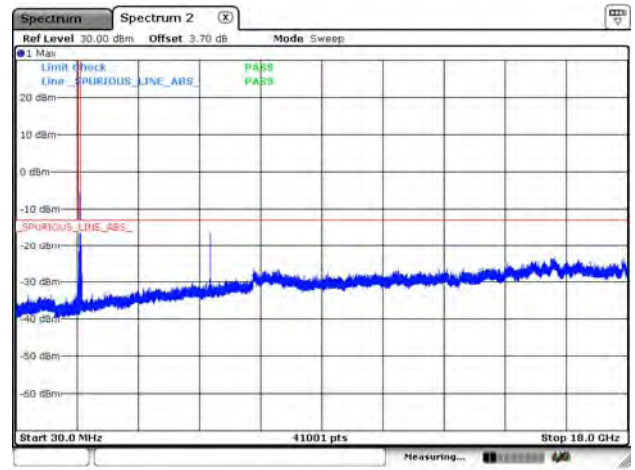
B2_15K_CH19199_BPSK_1RB0

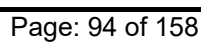


B2_15K_CH18601_BPSK_1RB11



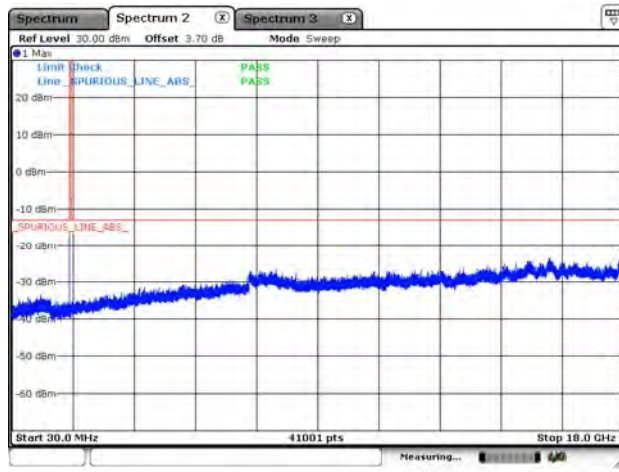
B2_15K_CH19199_BPSK_1RB11



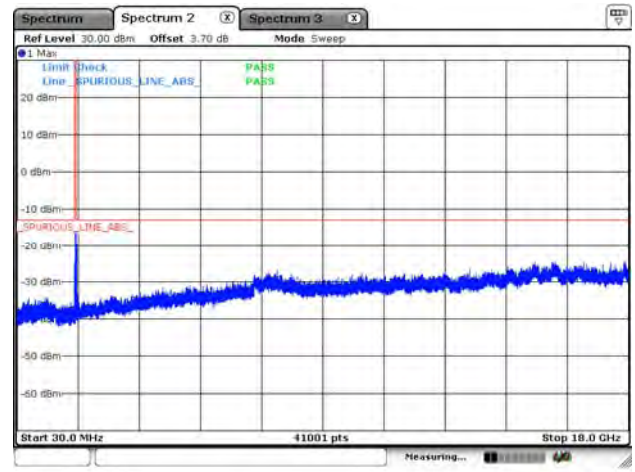


Test Mode	Mode 2: LTE_NB-IOT_Band 4_Link		
Date of Test	2018/04/26	Test Site	SR10-H

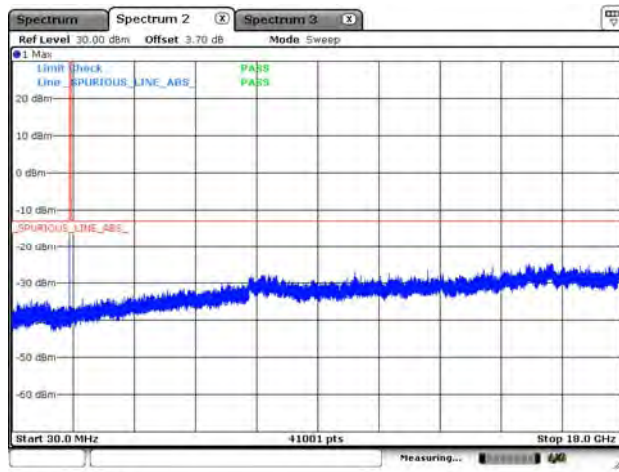
B4_3.75K_CH19951_BPSK_1RB0



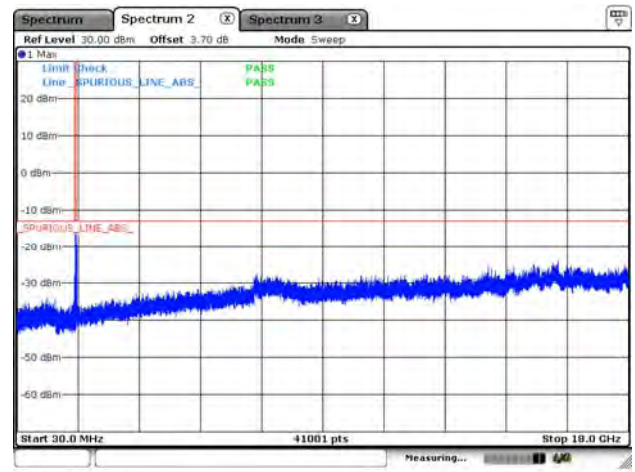
B4_3.75K_CH20399_BPSK_1RB0

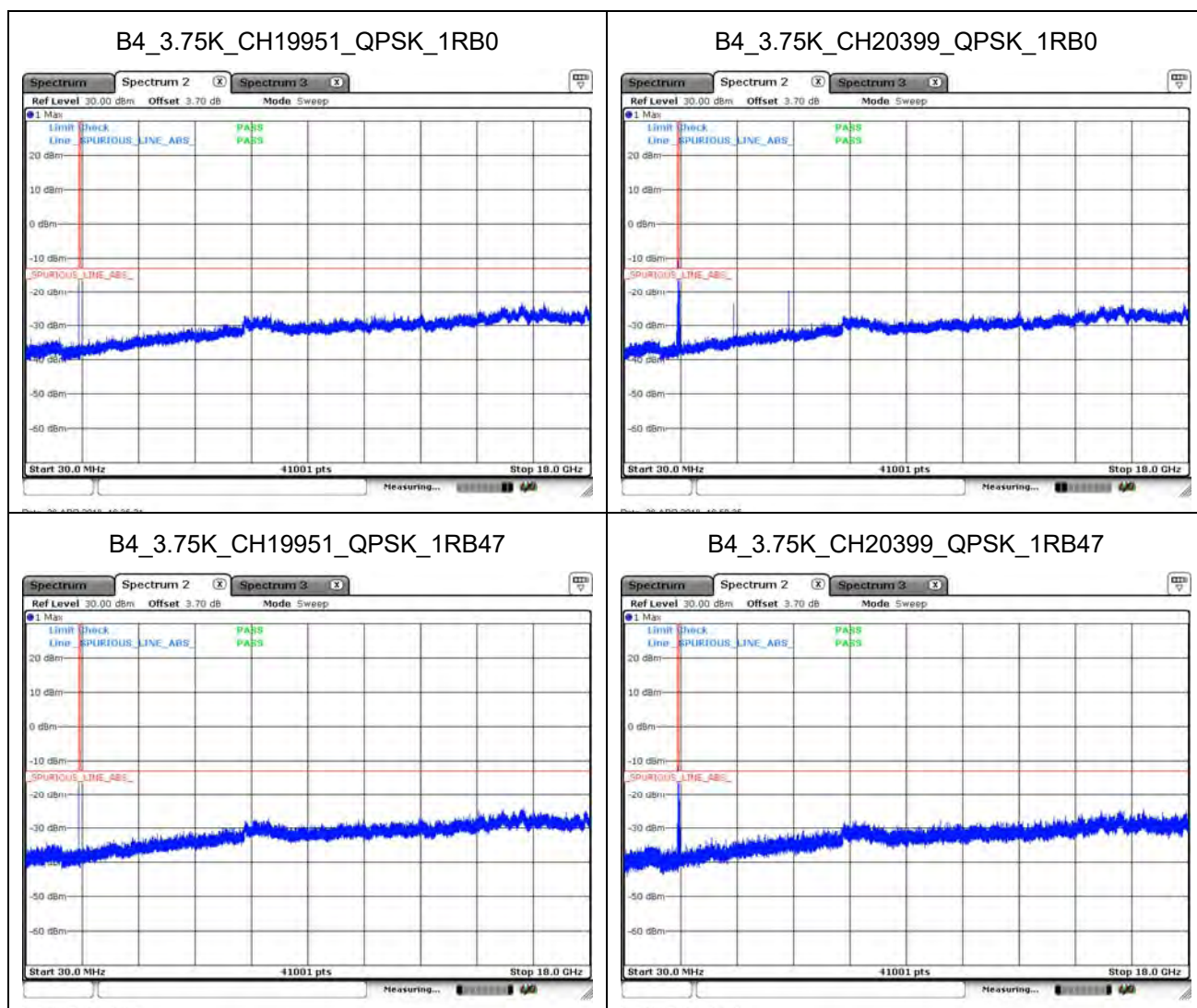


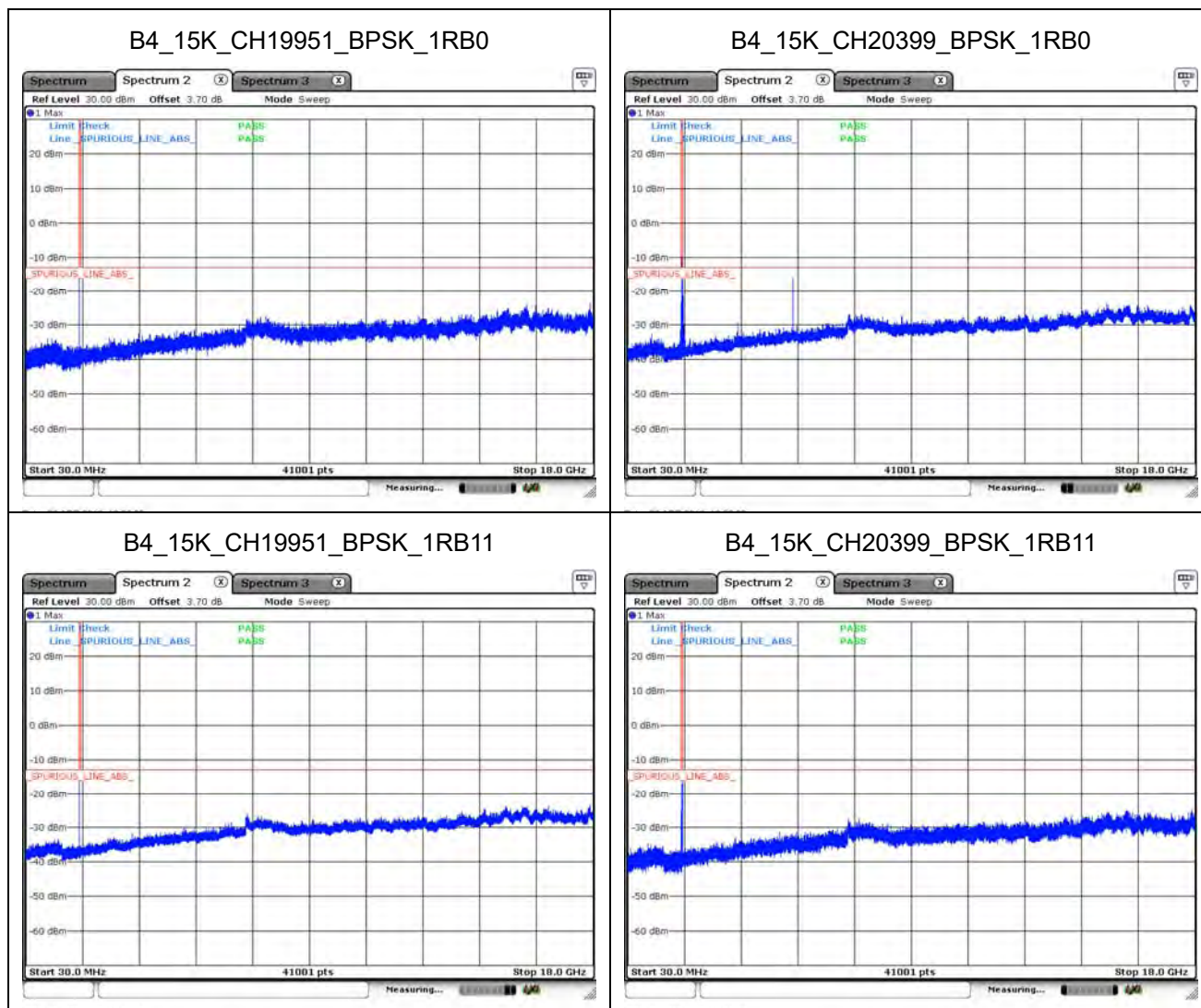
B4_3.75K_CH19951_BPSK_1RB47



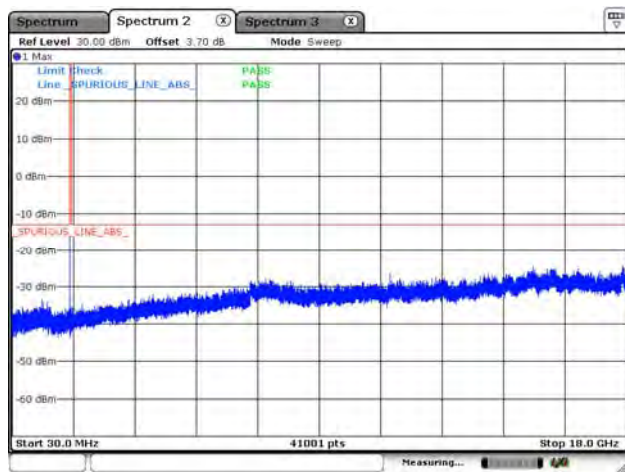
B4_3.75K_CH20399_BPSK_1RB47



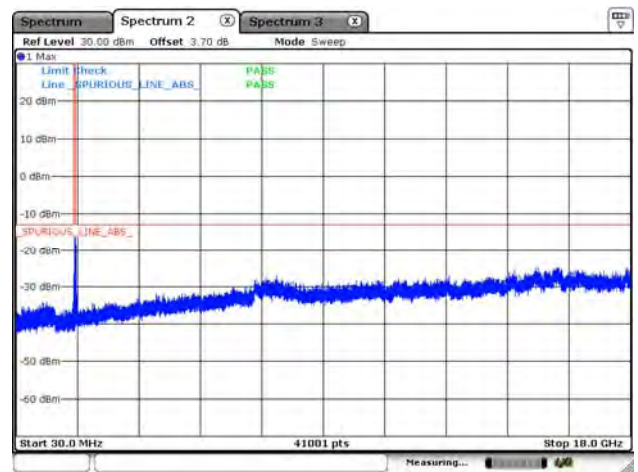




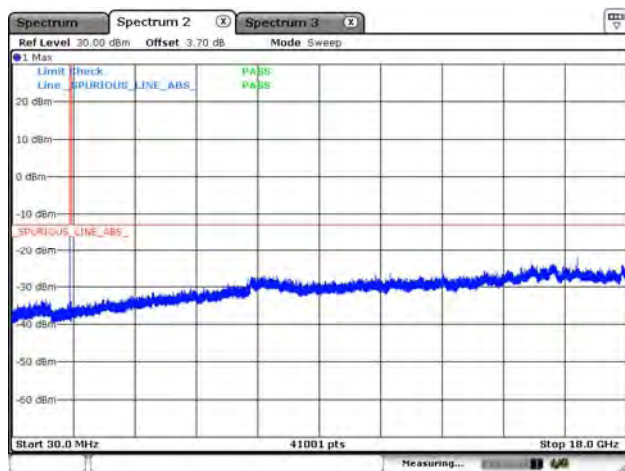
B4_15K_CH19951_QPSK_1RB0



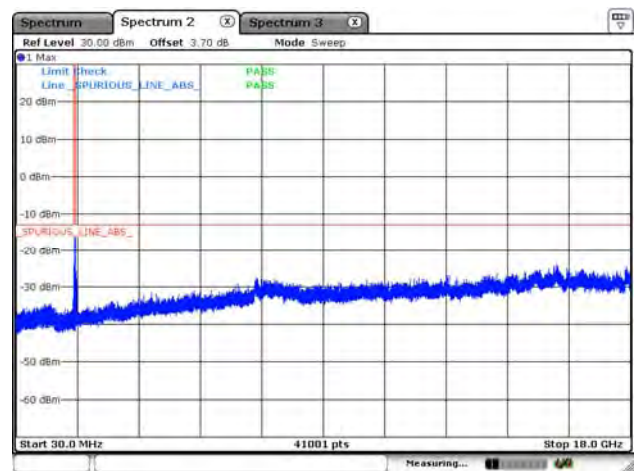
B4_15K_CH20399_QPSK_1RB0



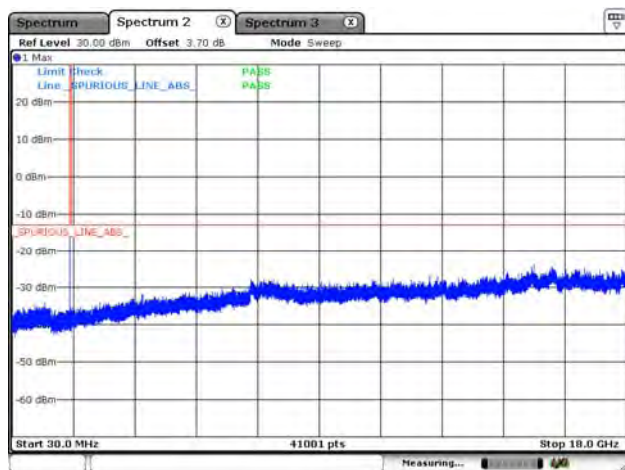
B4_15K_CH19951_QPSK_1RB11



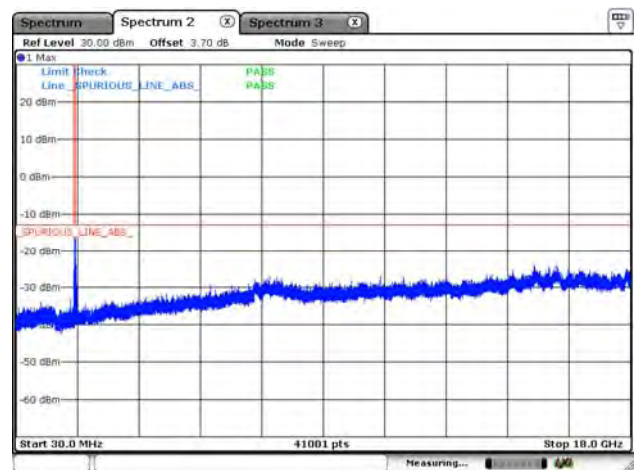
B4_15K_CH20399_QPSK_1RB11



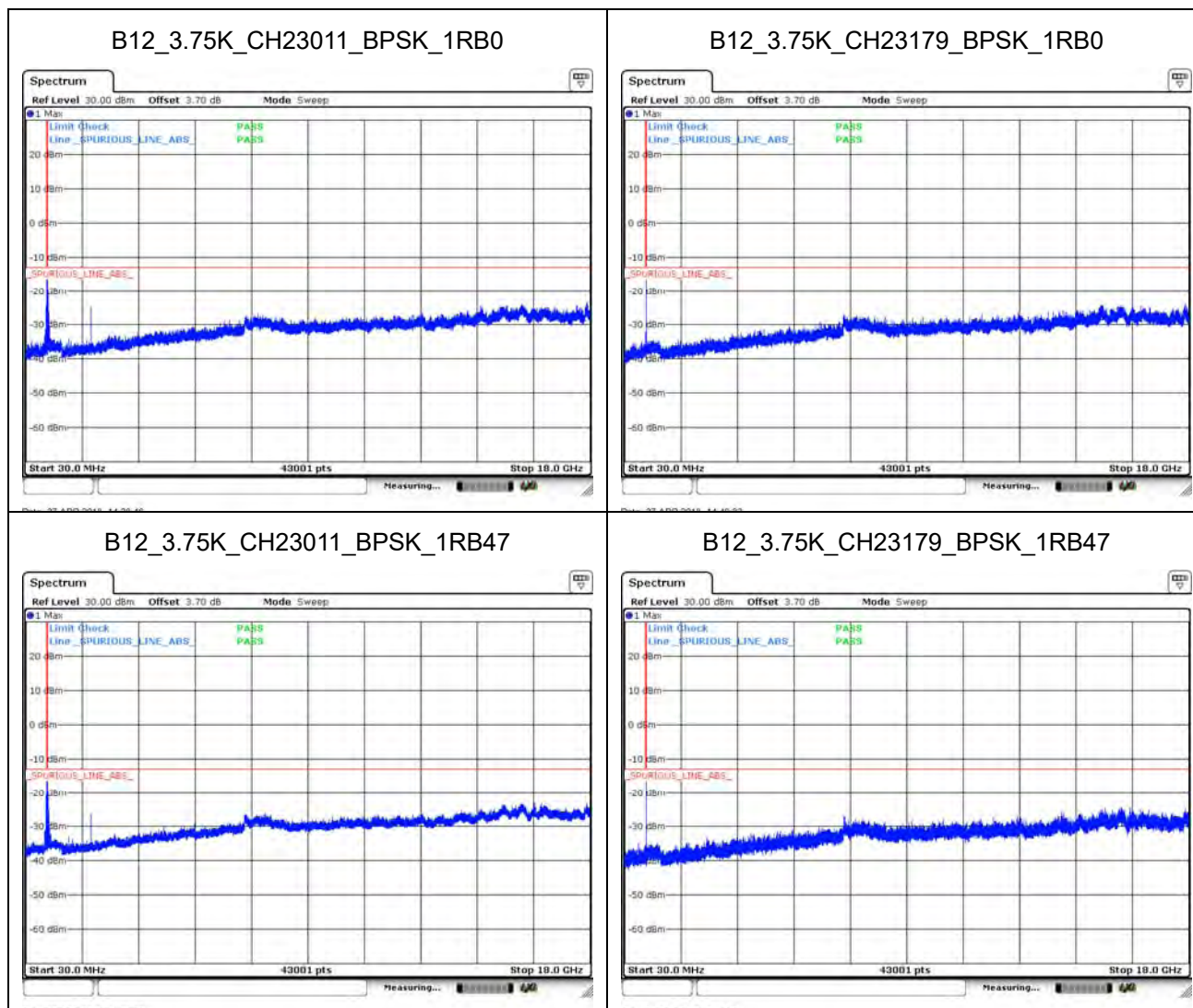
B4_15K_CH19951_QPSK_12RB0



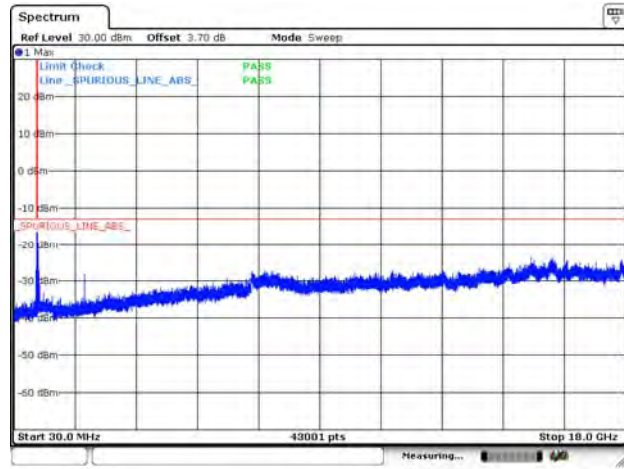
B4_15K_CH20399_QPSK_12RB0



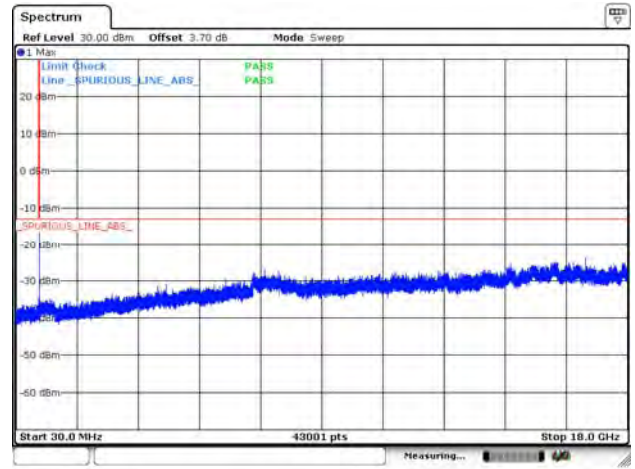
Test Mode	Mode 3: LTE_NB-IOT_Band 12_Link		
Date of Test	2018/04/26	Test Site	SR10-H



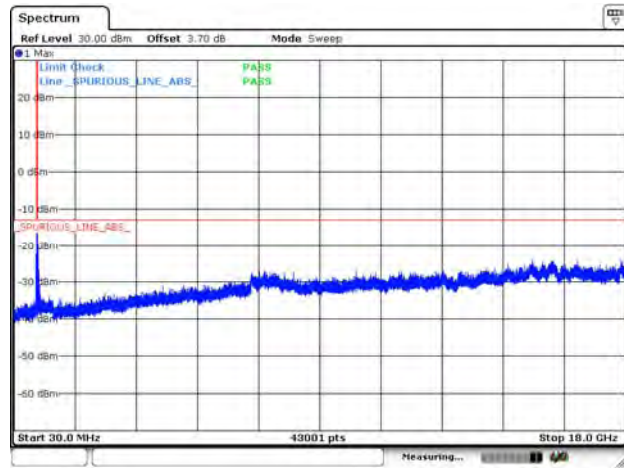
B12_3.75K_CH23011_QPSK_1RB0



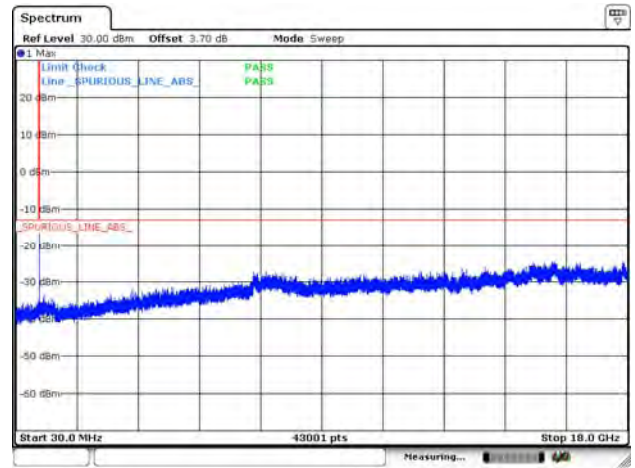
B12_3.75K_CH23179_QPSK_1RB0

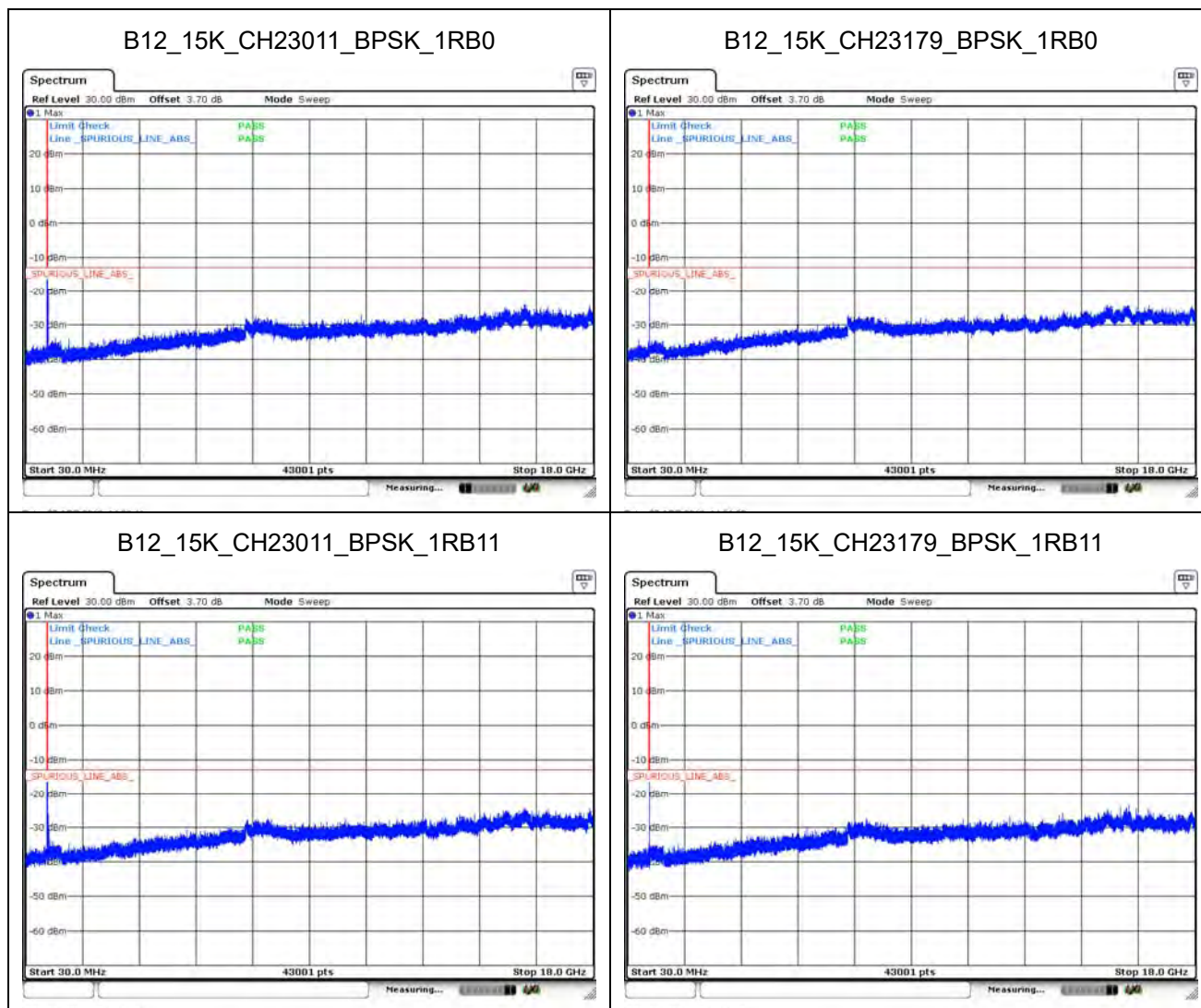


B12_3.75K_CH23011_QPSK_1RB47

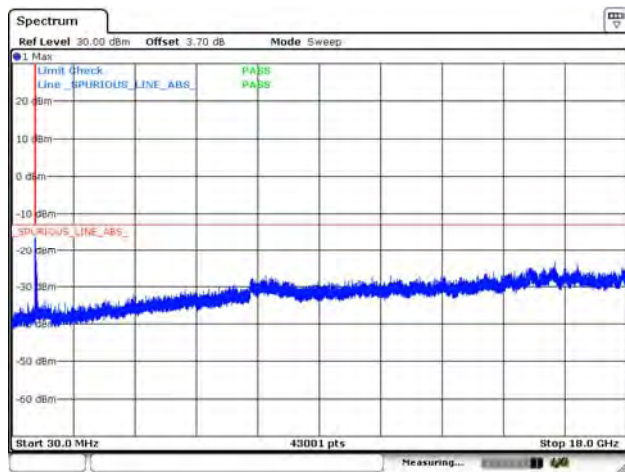


B12_3.75K_CH23179_QPSK_1RB47

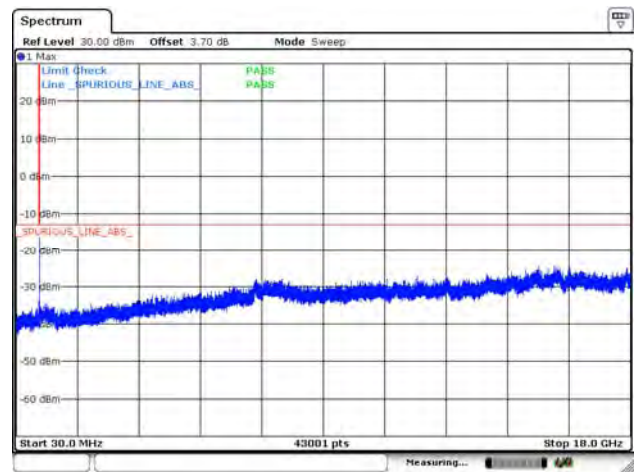




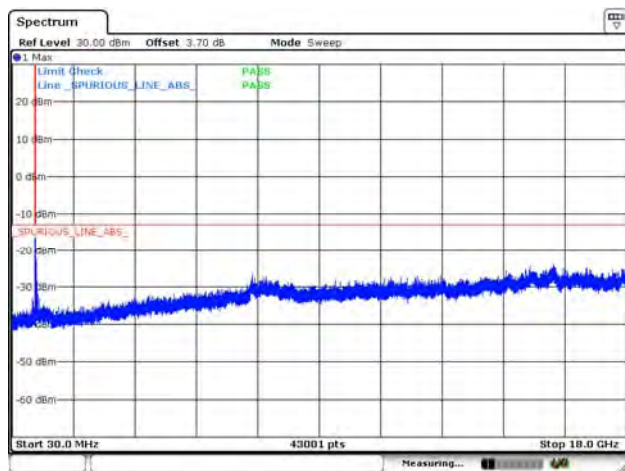
B12_15K_CH23011_QPSK_1RB0



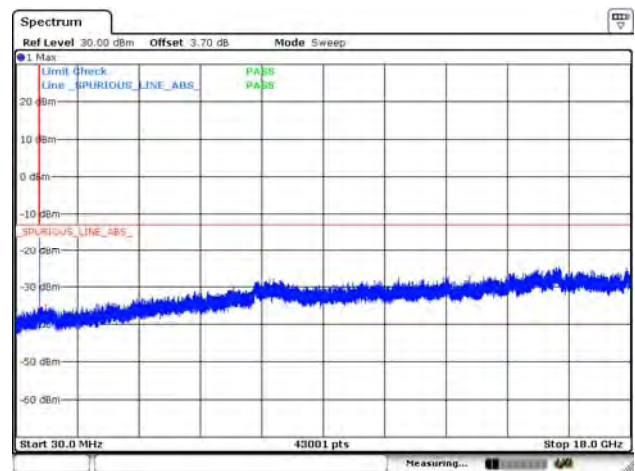
B12_15K_CH23179_QPSK_1RB0



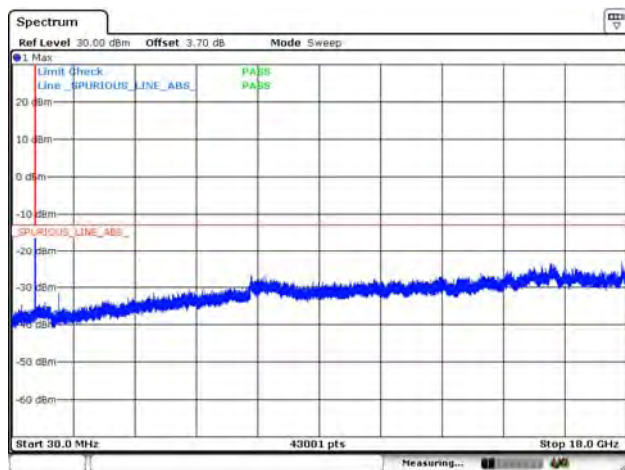
B12_15K_CH23011_QPSK_1RB11



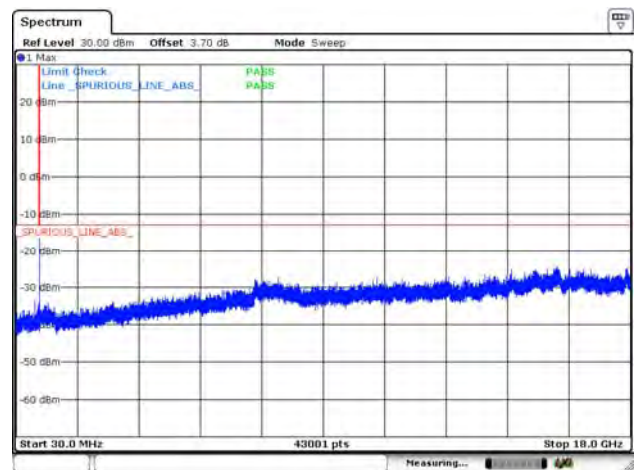
B12_15K_CH23179_QPSK_1RB11



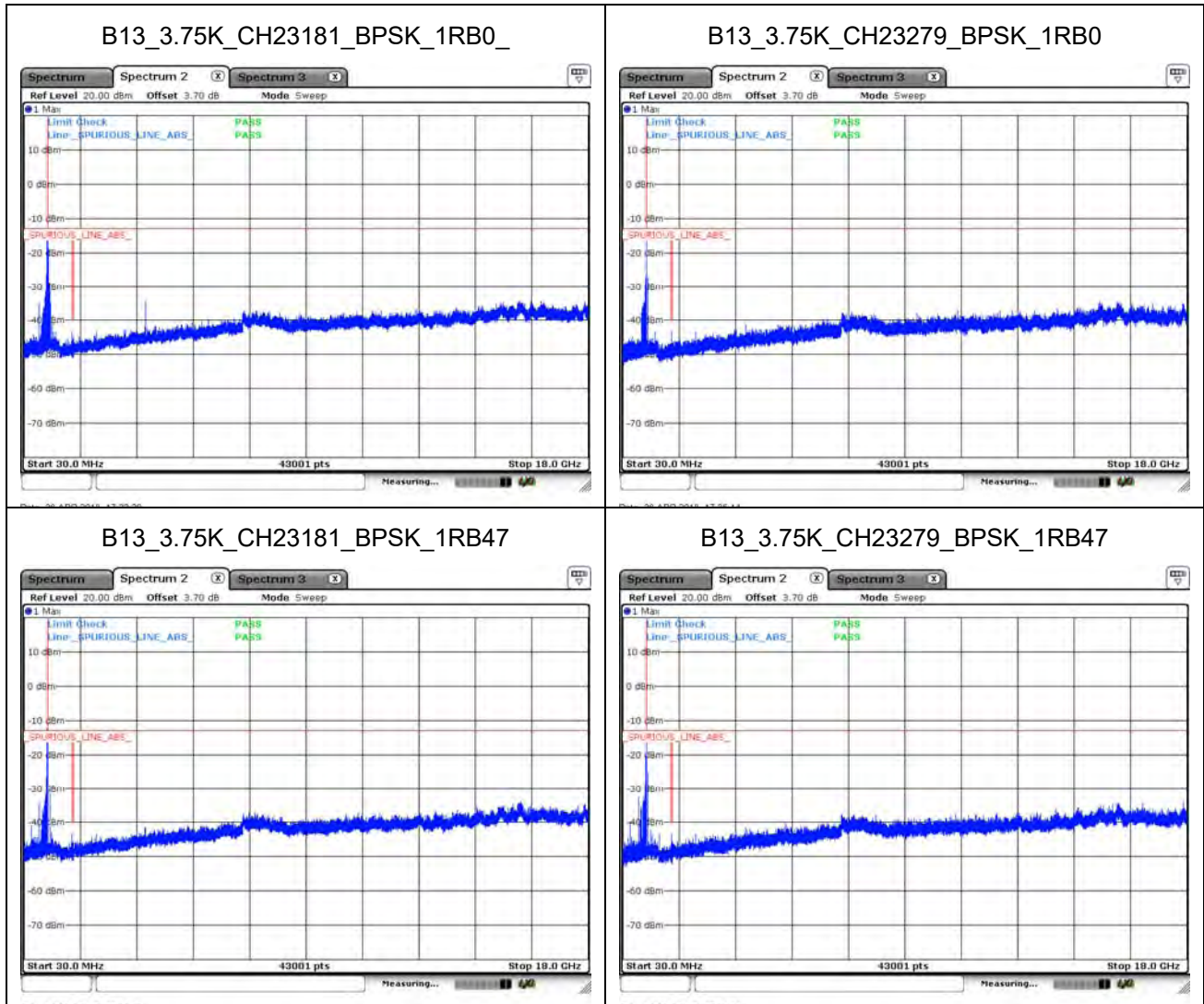
B12_15K_CH23011_QPSK_12RB0

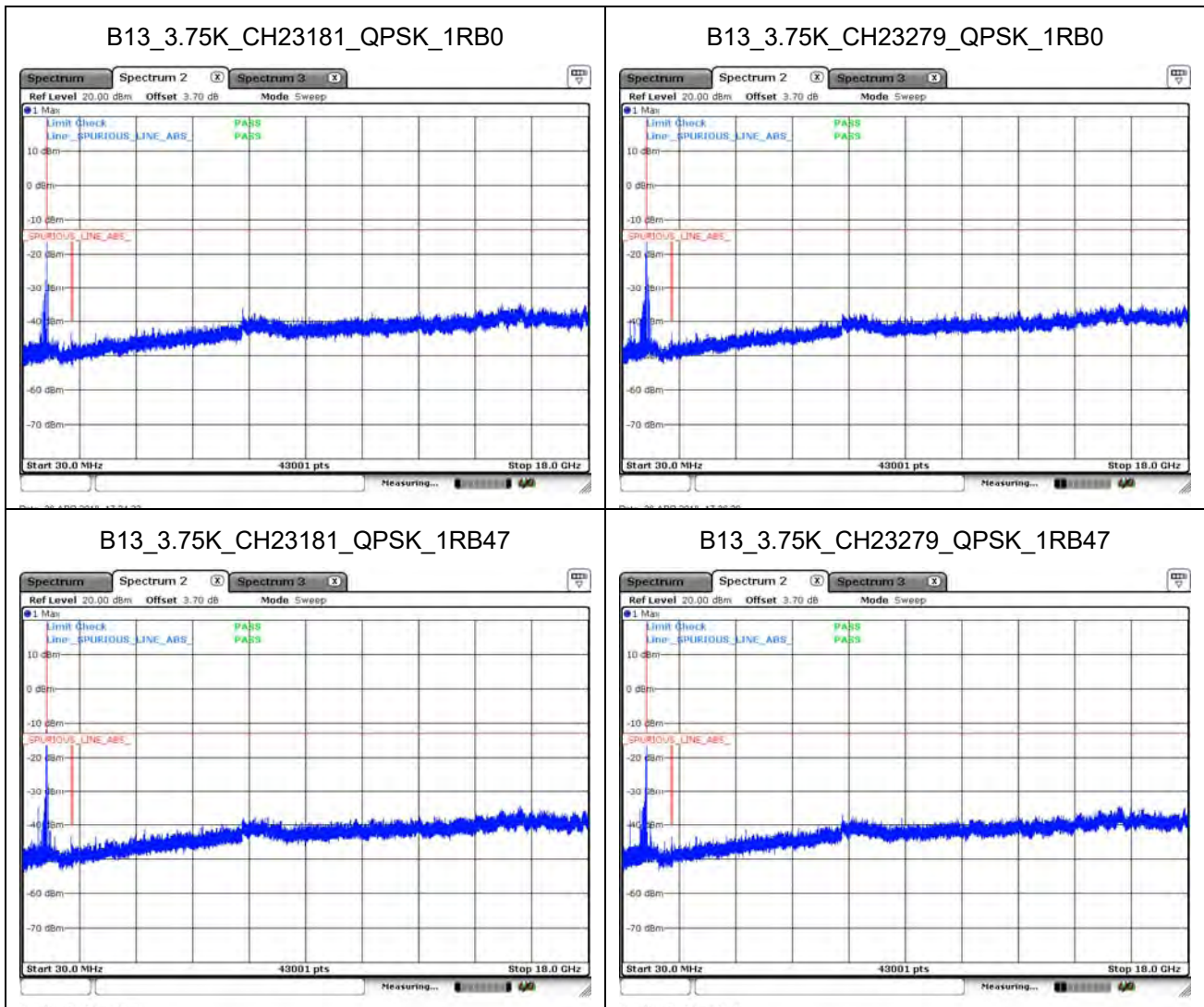


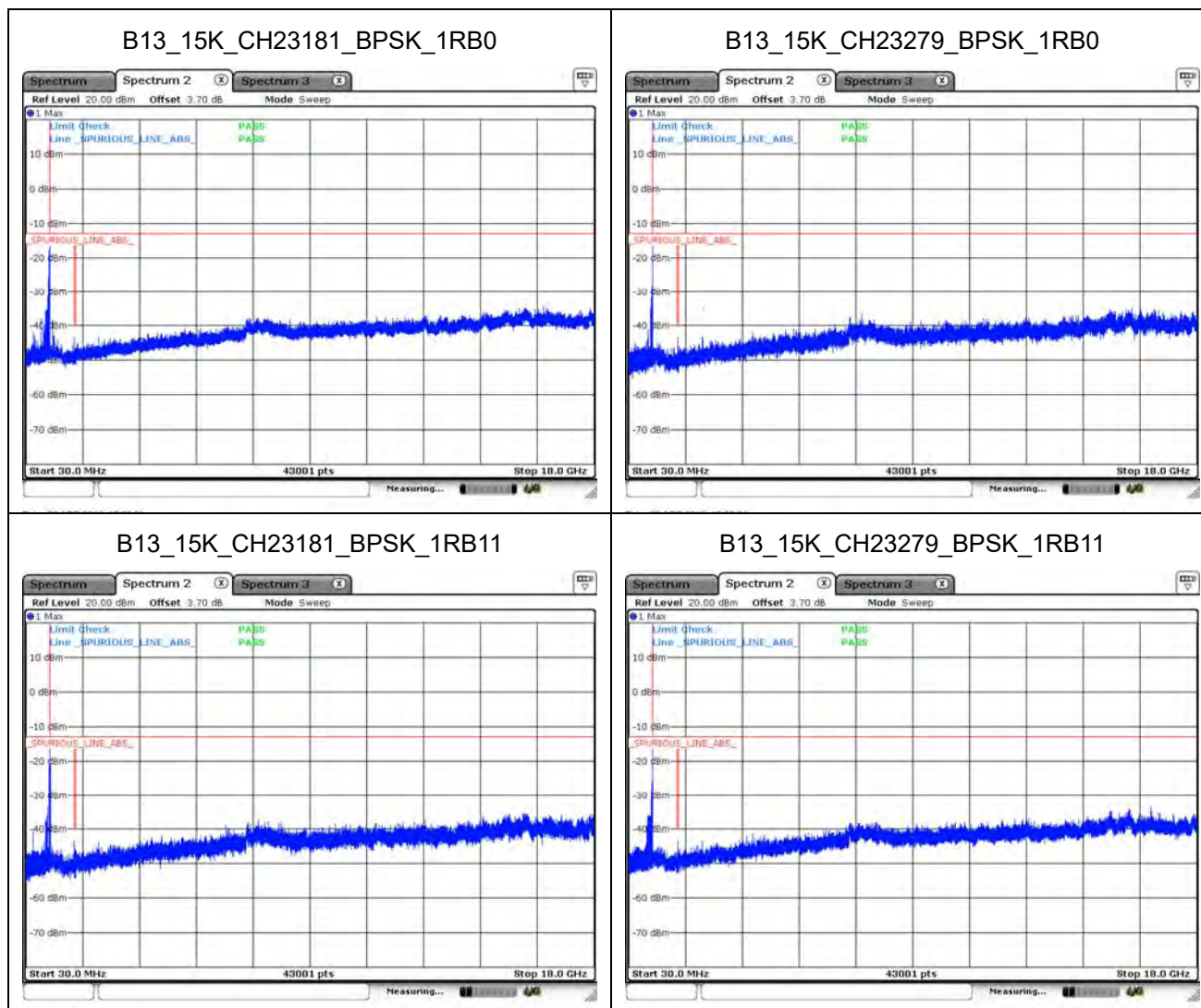
B12_15K_CH23179_QPSK_12RB0



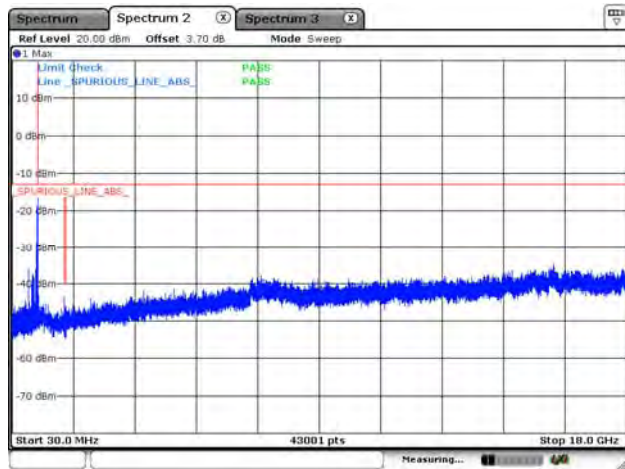
Test Mode	Mode 4: LTE_NB-IOT_Band 13_Link		
Date of Test	2018/04/26	Test Site	SR10-H



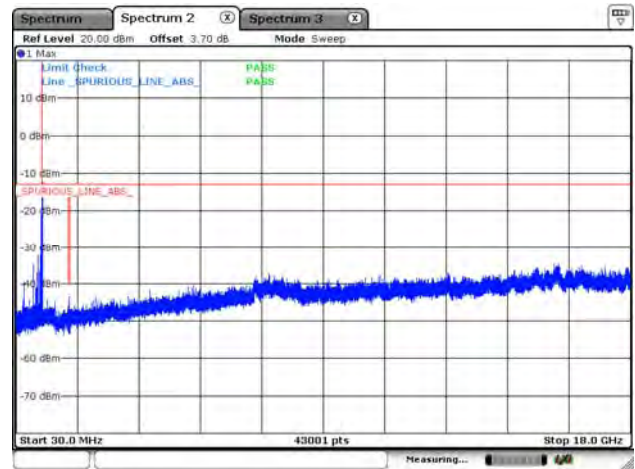




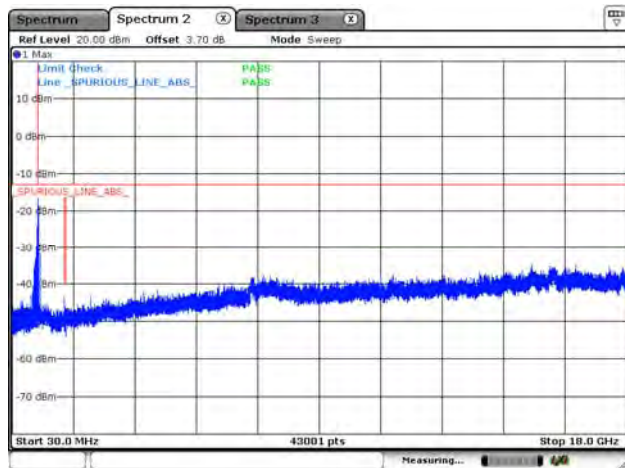
B13_15K_CH23181_QPSK_1RB0



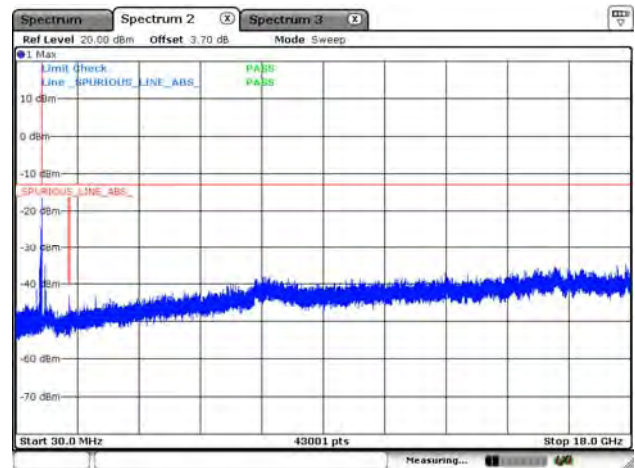
B13_15K_CH23279_QPSK_1RB0



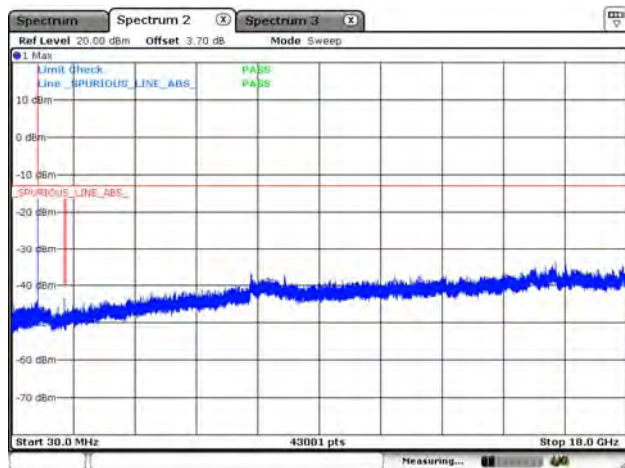
B13_15K_CH23181_QPSK_1RB11



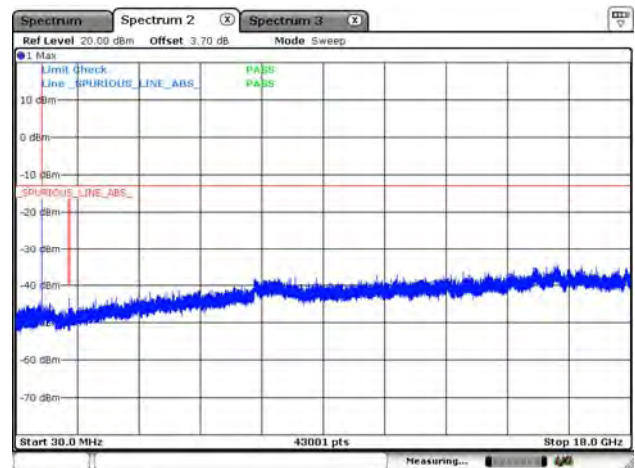
B13_15K_CH23279_QPSK_1RB11



B13_15K_CH23181_QPSK_12RB0

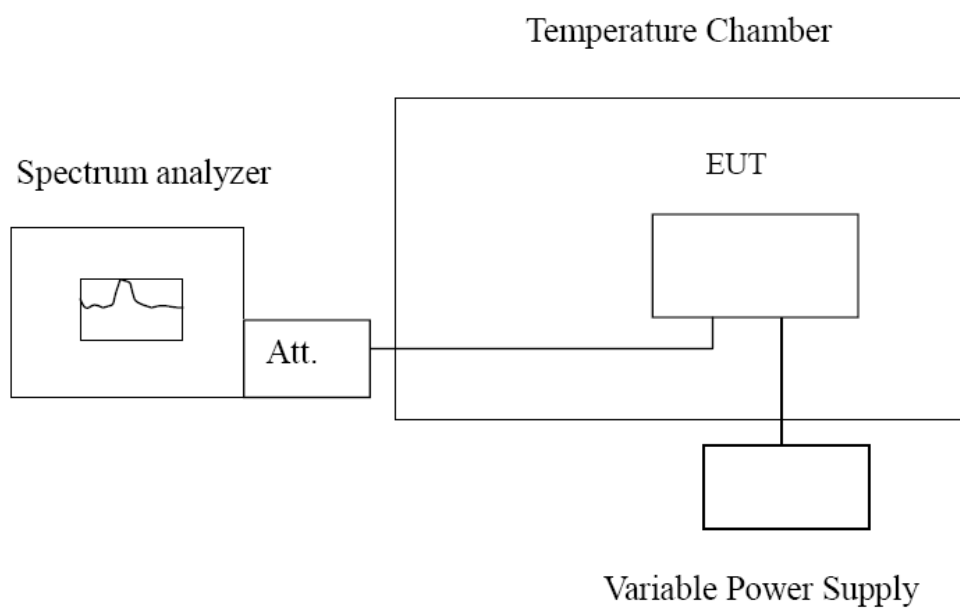


B13_15K_CH23279_QPSK_12RB0



8. Frequency Stability

8.1. Test Setup



8.2. Test Procedure

Frequency Stability Under Temperature Variations:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation ($\pm 15\%$) and endpoint, record the maximum frequency change.

8.3. Test Method

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause 9

ANSI C63.26-2015 Sub-clause 5.6

8.4. Test Result

Test Mode	Mode 1: LTE_NB-IOT_Band 2_Link		
Date of Test	2018/04/27	Test Site	SR10-H

NB-IOT Band 2_1850.1MHz_3.75k_BPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-15	0.0079
3.8	-14	0.0077
3.4	-21	0.0114

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-15	0.0083
-30	-18	0.0099
-20	-17	0.0090
-10	-18	0.0095
0	-19	0.0104
+10	-21	0.0112
+20	-14	0.0077
+30	-21	0.0113
+40	-16	0.0088
+50	-20	0.0110
+60	-18	0.0097
+70	-19	0.0103
+80	-20	0.0105
+85	-14	0.0076

NB-IOT Band 2_1850.1MHz_3.75k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-15	0.0081
3.8	-17	0.0090
3.4	-17	0.0090

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-20	0.0108
-30	-18	0.0099
-20	-20	0.0107
-10	-19	0.0104
0	-15	0.0080
+10	-15	0.0084
+20	-17	0.0090
+30	-15	0.0081
+40	-19	0.0100
+50	-14	0.0076
+60	-16	0.0084
+70	-15	0.0081
+80	-17	0.0093
+85	-14	0.0077

NB-IOT Band 2_1880MHz_3.75k_BPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-18	0.0096
3.8	-16	0.0087
3.4	-15	0.0078

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-16	0.0087
-30	-14	0.0076
-20	-18	0.0093
-10	-19	0.0101
0	-17	0.0090
+10	-17	0.0093
+20	-16	0.0087
+30	-20	0.0106
+40	-15	0.0079
+50	-16	0.0083
+60	-15	0.0080
+70	-15	0.0079
+80	-18	0.0098
+85	-19	0.0103

NB-IOT Band 2_1880MHz_3.75k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-19	0.0099
3.8	-18	0.0098
3.4	-16	0.0085

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-19	0.0101
-30	-14	0.0076
-20	-17	0.0093
-10	-20	0.0104
0	-16	0.0087
+10	-19	0.0103
+20	-18	0.0098
+30	-16	0.0084
+40	-21	0.0111
+50	-15	0.0082
+60	-18	0.0098
+70	-17	0.0090
+80	-16	0.0083
+85	-19	0.0099

NB-IOT Band 2_1909.9MHz_3.75k_BPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-18	0.0095
3.8	-17	0.0087
3.4	-16	0.0085

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-19	0.0099
-30	-19	0.0099
-20	-17	0.0090
-10	-19	0.0098
0	-17	0.0089
+10	-19	0.0097
+20	-17	0.0087
+30	-19	0.0100
+40	-19	0.0100
+50	-20	0.0107
+60	-16	0.0085
+70	-16	0.0085
+80	-20	0.0105
+85	-21	0.0109

NB-IOT Band 2_1909.9MHz_3.75k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-18	0.0093
3.8	-18	0.0095
3.4	-21	0.0109

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-16	0.0082
-30	-17	0.0090
-20	-20	0.0102
-10	-21	0.0109
0	-17	0.0090
+10	-18	0.0092
+20	-18	0.0095
+30	-20	0.0104
+40	-19	0.0100
+50	-18	0.0095
+60	-18	0.0092
+70	-16	0.0085
+80	-16	0.0083
+85	-19	0.0100

NB-IOT Band 2_1850.1MHz_15k_BPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-20	0.0110
3.8	-15	0.0082
3.4	-18	0.0096

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-21	0.0113
-30	-14	0.0076
-20	-16	0.0088
-10	-16	0.0088
0	-16	0.0085
+10	-18	0.0095
+20	-15	0.0082
+30	-17	0.0090
+40	-14	0.0077
+50	-17	0.0090
+60	-20	0.0108
+70	-14	0.0076
+80	-19	0.0102
+85	-19	0.0104

NB-IOT Band 2_1850.1MHz_15k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-14	0.0078
3.8	-18	0.0095
3.4	-16	0.0087

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-20	0.0106
-30	-18	0.0099
-20	-15	0.0082
-10	-16	0.0088
0	-19	0.0105
+10	-16	0.0088
+20	-18	0.0095
+30	-19	0.0104
+40	-19	0.0105
+50	-15	0.0078
+60	-19	0.0102
+70	-14	0.0076
+80	-17	0.0090
+85	-15	0.0082

NB-IOT Band 2_1880MHz_15k_BPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-14	0.0076
3.8	-20	0.0106
3.4	-17	0.0091

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-18	0.0093
-30	-18	0.0094
-20	-17	0.0089
-10	-17	0.0089
0	-19	0.0099
+10	-17	0.0090
+20	-20	0.0106
+30	-19	0.0100
+40	-19	0.0100
+50	-17	0.0089
+60	-14	0.0075
+70	-19	0.0099
+80	-19	0.0099
+85	-19	0.0101

NB-IOT Band 2_1880MHz_15k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-19	0.0099
3.8	-18	0.0098
3.4	-16	0.0085

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-19	0.0101
-30	-14	0.0076
-20	-17	0.0093
-10	-20	0.0104
0	-16	0.0087
+10	-19	0.0103
+20	-18	0.0098
+30	-16	0.0084
+40	-21	0.0111
+50	-15	0.0082
+60	-18	0.0098
+70	-17	0.0090
+80	-16	0.0083
+85	-19	0.0099

NB-IOT Band 2_1909.9MHz_15k_BPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-20	0.0107
3.8	-17	0.0090
3.4	-20	0.0103

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-15	0.0079
-30	-14	0.0075
-20	-17	0.0087
-10	-15	0.0080
0	-20	0.0107
+10	-19	0.0098
+20	-17	0.0090
+30	-18	0.0095
+40	-14	0.0075
+50	-20	0.0106
+60	-16	0.0083
+70	-21	0.0108
+80	-16	0.0082
+85	-18	0.0094

NB-IOT Band 2_1909.9MHz_15k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-16	0.0081
3.8	-20	0.0105
3.4	-20	0.0105

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-18	0.0093
-30	-16	0.0082
-20	-20	0.0106
-10	-19	0.0101
0	-17	0.0091
+10	-18	0.0092
+20	-20	0.0105
+30	-15	0.0080
+40	-17	0.0091
+50	-17	0.0087
+60	-21	0.0109
+70	-15	0.0078
+80	-20	0.0104
+85	-17	0.0087

Test Mode	Mode 2: LTE_NB-IOT_Band 4_Link		
Date of Test	2018/04/27	Test Site	SR10-H

NB-IOT Band 4_1710.1MHz_3.75k_BPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-21	0.0121
3.8	-18	0.0103
3.4	-20	0.0116

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-18	0.0105
-30	-19	0.0112
-20	-18	0.0108
-10	-21	0.0122
0	-21	0.0121
+10	-20	0.0115
+20	-18	0.0103
+30	-17	0.0100
+40	-17	0.0099
+50	-21	0.0121
+60	-21	0.0122
+70	-19	0.0113
+80	-18	0.0104
+85	-17	0.0099

NB-IOT Band 4_1710.1MHz_3.75k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-17	0.0101
3.8	-17	0.0099
3.4	-15	0.0090

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-16	0.0092
-30	-20	0.0114
-20	-15	0.0088
-10	-15	0.0090
0	-16	0.0096
+10	-21	0.0121
+20	-17	0.0099
+30	-19	0.0112
+40	-16	0.0095
+50	-18	0.0106
+60	-20	0.0115
+70	-17	0.0100
+80	-18	0.0105
+85	-16	0.0091

NB-IOT Band 4_1732.5MHz_3.75k_BPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-21	0.0121
3.8	-19	0.0112
3.4	-19	0.0112

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-18	0.0102
-30	-19	0.0108
-20	-18	0.0105
-10	-17	0.0100
0	-17	0.0100
+10	-15	0.0089
+20	-19	0.0112
+30	-20	0.0117
+40	-19	0.0112
+50	-20	0.0116
+60	-15	0.0087
+70	-20	0.0115
+80	-16	0.0095
+85	-19	0.0108

NB-IOT Band 4_1732.5MHz_3.75k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-19	0.0107
3.8	-17	0.0095
3.4	-17	0.0101

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-15	0.0089
-30	-20	0.0115
-20	-17	0.0098
-10	-17	0.0099
0	-18	0.0104
+10	-18	0.0102
+20	-17	0.0095
+30	-20	0.0117
+40	-15	0.0088
+50	-17	0.0098
+60	-20	0.0113
+70	-18	0.0106
+80	-19	0.0112
+85	-19	0.0112

NB-IOT Band 4_1754.9MHz_3.75k_BPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-19	0.0111
3.8	-16	0.0093
3.4	-21	0.0118

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-20	0.0114
-30	-16	0.0092
-20	-15	0.0087
-10	-18	0.0100
0	-15	0.0088
+10	-17	0.0096
+20	-16	0.0093
+30	-19	0.0108
+40	-19	0.0111
+50	-20	0.0113
+60	-20	0.0115
+70	-18	0.0102
+80	-17	0.0098
+85	-20	0.0116

NB-IOT Band 4_1754.9MHz_3.75k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-18	0.0101
3.8	-17	0.0097
3.4	-16	0.0088

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-15	0.0086
-30	-21	0.0119
-20	-16	0.0094
-10	-20	0.0113
0	-16	0.0093
+10	-15	0.0086
+20	-17	0.0097
+30	-18	0.0101
+40	-19	0.0107
+50	-20	0.0115
+60	-16	0.0091
+70	-19	0.0106
+80	-16	0.0092
+85	-19	0.0109

NB-IOT Band 4_1710.1MHz_15k_BPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-21	0.0120
3.8	-18	0.0107
3.4	-21	0.0122

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-20	0.0118
-30	-21	0.0123
-20	-19	0.0113
-10	-21	0.0120
0	-18	0.0105
+10	-18	0.0106
+20	-18	0.0107
+30	-18	0.0105
+40	-20	0.0115
+50	-16	0.0094
+60	-17	0.0102
+70	-19	0.0112
+80	-17	0.0099
+85	-21	0.0121

NB-IOT Band 4_1710.1MHz_15k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-16	0.0096
3.8	-19	0.0109
3.4	-16	0.0094

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-19	0.0112
-30	-16	0.0094
-20	-17	0.0097
-10	-20	0.0119
0	-15	0.0088
+10	-17	0.0100
+20	-19	0.0109
+30	-17	0.0098
+40	-20	0.0116
+50	-16	0.0093
+60	-20	0.0119
+70	-16	0.0091
+80	-20	0.0120
+85	-16	0.0091

NB-IOT Band 4_1732.5MHz_15k_BPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-17	0.0098
3.8	-18	0.0105
3.4	-15	0.0087

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-20	0.0118
-30	-18	0.0106
-20	-21	0.0119
-10	-21	0.0121
0	-17	0.0100
+10	-21	0.0118
+20	-18	0.0105
+30	-20	0.0115
+40	-19	0.0112
+50	-17	0.0097
+60	-18	0.0103
+70	-19	0.0112
+80	-18	0.0101
+85	-19	0.0108

NB-IOT Band 4_1732.5MHz_15k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-18	0.0107
3.8	-16	0.0094
3.4	-20	0.0117

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-16	0.0090
-30	-16	0.0092
-20	-17	0.0096
-10	-18	0.0105
0	-16	0.0092
+10	-19	0.0112
+20	-16	0.0094
+30	-19	0.0110
+40	-16	0.0091
+50	-16	0.0091
+60	-18	0.0106
+70	-20	0.0117
+80	-16	0.0090
+85	-15	0.0087

NB-IOT Band 4_1754.9MHz_15k_BPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-19	0.0106
3.8	-20	0.0114
3.4	-15	0.0086

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-19	0.0107
-30	-17	0.0100
-20	-20	0.0112
-10	-19	0.0107
0	-16	0.0091
+10	-19	0.0106
+20	-20	0.0114
+30	-17	0.0097
+40	-18	0.0100
+50	-18	0.0102
+60	-18	0.0102
+70	-18	0.0102
+80	-17	0.0098
+85	-20	0.0116

NB-IOT Band 4_1754.9MHz_15k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-18	0.0105
3.8	-20	0.0112
3.4	-17	0.0097

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-17	0.0098
-30	-19	0.0108
-20	-19	0.0109
-10	-21	0.0120
0	-20	0.0116
+10	-16	0.0094
+20	-20	0.0112
+30	-20	0.0114
+40	-20	0.0114
+50	-21	0.0118
+60	-17	0.0097
+70	-18	0.0101
+80	-16	0.0093
+85	-19	0.0106

Test Mode	Mode 3: LTE_NB-IOT_Band 12_Link		
Date of Test	2018/04/27	Test Site	SR10-H

NB-IOT Band 12_699.1MHz_3.75k_BPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-15	0.0221
3.8	-20	0.0282
3.4	-18	0.0259

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-17	0.0246
-30	-16	0.0223
-20	-21	0.0300
-10	-17	0.0242
0	-21	0.0296
+10	-18	0.0258
+20	-20	0.0282
+30	-17	0.0250
+40	-15	0.0220
+50	-19	0.0277
+60	-16	0.0226
+70	-20	0.0288
+80	-16	0.0224
+85	-19	0.0267

NB-IOT Band 12_699.1MHz_3.75k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-18	0.0263
3.8	-21	0.0294
3.4	-18	0.0260

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-20	0.0289
-30	-20	0.0284
-20	-16	0.0223
-10	-21	0.0297
0	-19	0.0274
+10	-16	0.0223
+20	-21	0.0294
+30	-17	0.0236
+40	-21	0.0297
+50	-19	0.0268
+60	-18	0.0251
+70	-16	0.0226
+80	-20	0.0291
+85	-16	0.0230

NB-IOT Band 12_707.5MHz_3.75k_BPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-20	0.0278
3.8	-20	0.0283
3.4	-19	0.0268

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-19	0.0272
-30	-19	0.0275
-20	-19	0.0264
-10	-19	0.0274
0	-16	0.0223
+10	-20	0.0281
+20	-20	0.0283
+30	-18	0.0258
+40	-21	0.0293
+50	-19	0.0273
+60	-16	0.0219
+70	-16	0.0231
+80	-18	0.0247
+85	-16	0.0224

NB-IOT Band 12_707.5MHz_3.75k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-16	0.0224
3.8	-19	0.0269
3.4	-21	0.0296

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-15	0.0212
-30	-17	0.0244
-20	-18	0.0251
-10	-19	0.0266
0	-19	0.0263
+10	-20	0.0279
+20	-19	0.0269
+30	-20	0.0278
+40	-21	0.0294
+50	-21	0.0291
+60	-16	0.0233
+70	-19	0.0270
+80	-16	0.0231
+85	-18	0.0253

NB-IOT Band 12_715.9MHz_3.75k_BPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-20	0.0276
3.8	-16	0.0224
3.4	-21	0.0293

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-20	0.0277
-30	-16	0.0219
-20	-17	0.0235
-10	-18	0.0251
0	-19	0.0268
+10	-18	0.0246
+20	-16	0.0224
+30	-19	0.0266
+40	-17	0.0235
+50	-16	0.0226
+60	-21	0.0288
+70	-18	0.0245
+80	-20	0.0279
+85	-20	0.0286

NB-IOT Band 12_715.9MHz_3.75k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-16	0.0224
3.8	-19	0.0269
3.4	-21	0.0296

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-15	0.0212
-30	-17	0.0244
-20	-18	0.0251
-10	-19	0.0266
0	-19	0.0263
+10	-20	0.0279
+20	-19	0.0269
+30	-20	0.0278
+40	-21	0.0294
+50	-21	0.0291
+60	-16	0.0233
+70	-19	0.0270
+80	-16	0.0231
+85	-18	0.0253

NB-IOT Band 12_699.1MHz_BPSK_15k

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-21	0.0294
3.8	-15	0.0220
3.4	-20	0.0286

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-19	0.0276
-30	-17	0.0246
-20	-18	0.0252
-10	-19	0.0270
0	-19	0.0274
+10	-20	0.0292
+20	-15	0.0220
+30	-17	0.0245
+40	-20	0.0281
+50	-16	0.0225
+60	-16	0.0234
+70	-18	0.0263
+80	-16	0.0235
+85	-20	0.0288

NB-IOT Band 12_699.1MHz_15k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-20	0.0288
3.8	-20	0.0292
3.4	-18	0.0251

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-15	0.0218
-30	-17	0.0240
-20	-18	0.0264
-10	-18	0.0261
0	-19	0.0269
+10	-19	0.0268
+20	-20	0.0292
+30	-17	0.0239
+40	-20	0.0281
+50	-21	0.0294
+60	-20	0.0289
+70	-20	0.0292
+80	-20	0.0284
+85	-19	0.0279

NB-IOT Band 12_707.5MHz_BPSK_15k

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-16	0.0231
3.8	-18	0.0251
3.4	-21	0.0295

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-21	0.0297
-30	-19	0.0272
-20	-17	0.0245
-10	-18	0.0259
0	-21	0.0293
+10	-19	0.0271
+20	-18	0.0251
+30	-16	0.0223
+40	-19	0.0264
+50	-21	0.0292
+60	-19	0.0269
+70	-17	0.0235
+80	-17	0.0244
+85	-15	0.0213

NB-IOT Band 12_707.5MHz_15k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-16	0.0226
3.8	-18	0.0252
3.4	-16	0.0225

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-17	0.0241
-30	-21	0.0296
-20	-16	0.0219
-10	-20	0.0282
0	-20	0.0278
+10	-18	0.0261
+20	-18	0.0252
+30	-19	0.0272
+40	-16	0.0227
+50	-16	0.0225
+60	-18	0.0250
+70	-17	0.0247
+80	-19	0.0272
+85	-17	0.0239

NB-IOT Band 12_715.9MHz_BPSK_15k

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-20	0.0281
3.8	-17	0.0241
3.4	-19	0.0271

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-18	0.0245
-30	-19	0.0263
-20	-18	0.0257
-10	-20	0.0276
0	-18	0.0258
+10	-20	0.0281
+20	-17	0.0241
+30	-18	0.0255
+40	-18	0.0255
+50	-21	0.0290
+60	-19	0.0270
+70	-18	0.0253
+80	-17	0.0234
+85	-17	0.0244

NB-IOT Band 12_715.9MHz_15k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-17	0.0231
3.8	-18	0.0254
3.4	-20	0.0282

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-19	0.0264
-30	-21	0.0289
-20	-20	0.0282
-10	-18	0.0246
0	-18	0.0249
+10	-18	0.0253
+20	-18	0.0254
+30	-18	0.0249
+40	-19	0.0268
+50	-15	0.0213
+60	-16	0.0223
+70	-16	0.0219
+80	-16	0.0217
+85	-17	0.0231

Test Mode	Mode 4: LTE_NB-IOT_Band 13_Link		
Date of Test	2018/04/27	Test Site	SR10-H

NB-IOT Band 13_777.1MHz_3.75k_BPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-20	0.0256
3.8	-20	0.0260
3.4	-20	0.0256

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-22	0.0283
-30	-21	0.0271
-20	-21	0.0275
-10	-21	0.0267
0	-21	0.0271
+10	-21	0.0273
+20	-20	0.0260
+30	-20	0.0253
+40	-22	0.0277
+50	-21	0.0269
+60	-21	0.0275
+70	-21	0.0276
+80	-21	0.0271
+85	-21	0.0272

NB-IOT Band 13_777.1MHz_3.75k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-20	0.0253
3.8	-20	0.0252
3.4	-21	0.0270

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-22	0.0280
-30	-21	0.0264
-20	-22	0.0278
-10	-21	0.0268
0	-21	0.0269
+10	-21	0.0276
+20	-20	0.0252
+30	-20	0.0254
+40	-22	0.0282
+50	-21	0.0274
+60	-21	0.0274
+70	-21	0.0273
+80	-21	0.0270
+85	-22	0.0282

NB-IOT Band 13_782MHz_3.75k_BPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-20	0.0251
3.8	-19	0.0246
3.4	-18	0.0236

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-22	0.0276
-30	-21	0.0271
-20	-22	0.0275
-10	-21	0.0263
0	-20	0.0259
+10	-22	0.0280
+20	-19	0.0246
+30	-20	0.0253
+40	-21	0.0271
+50	-21	0.0263
+60	-21	0.0268
+70	-21	0.0264
+80	-21	0.0269
+85	-22	0.0280

NB-IOT Band 13_782MHz_3.75k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-20	0.0253
3.8	-19	0.0248
3.4	-18	0.0236

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-22	0.0279
-30	-21	0.0268
-20	-21	0.0270
-10	-21	0.0273
0	-20	0.0261
+10	-22	0.0277
+20	-19	0.0248
+30	-20	0.0257
+40	-22	0.0280
+50	-21	0.0270
+60	-21	0.0274
+70	-21	0.0265
+80	-21	0.0266
+85	-21	0.0274

NB-IOT Band 13_786.9MHz_3.75k_BPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-20	0.0254
3.8	-20	0.0255
3.4	-17	0.0212

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-22	0.0274
-30	-21	0.0269
-20	-22	0.0274
-10	-21	0.0261
0	-21	0.0262
+10	-21	0.0272
+20	-20	0.0255
+30	-19	0.0246
+40	-21	0.0273
+50	-21	0.0269
+60	-21	0.0273
+70	-21	0.0269
+80	-21	0.0262
+85	-22	0.0274

NB-IOT Band 13_786.9MHz_3.75k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-20	0.0253
3.8	-19	0.0248
3.4	-18	0.0236

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-22	0.0279
-30	-21	0.0268
-20	-21	0.0270
-10	-21	0.0273
0	-20	0.0261
+10	-22	0.0277
+20	-19	0.0248
+30	-20	0.0257
+40	-22	0.0280
+50	-21	0.0270
+60	-21	0.0274
+70	-21	0.0265
+80	-21	0.0266
+85	-21	0.0274

NB-IOT Band 13_777.1MHz_15k_BPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-21	0.0275
3.8	-20	0.0256
3.4	-20	0.0256

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-22	0.0277
-30	-21	0.0269
-20	-21	0.0275
-10	-21	0.0268
0	-21	0.0268
+10	-21	0.0271
+20	-20	0.0256
+30	-19	0.0248
+40	-22	0.0282
+50	-21	0.0267
+60	-21	0.0274
+70	-21	0.0265
+80	-21	0.0270
+85	-21	0.0272

NB-IOT Band 13_777.1MHz_15k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-21	0.0269
3.8	-19	0.0249
3.4	-20	0.0256

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-22	0.0280
-30	-21	0.0271
-20	-21	0.0268
-10	-21	0.0270
0	-21	0.0269
+10	-21	0.0276
+20	-19	0.0249
+30	-19	0.0248
+40	-21	0.0275
+50	-21	0.0268
+60	-21	0.0273
+70	-21	0.0268
+80	-21	0.0269
+85	-21	0.0274

NB-IOT Band 13_782MHz_15k_BPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-21	0.0274
3.8	-20	0.0252
3.4	-20	0.0251

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-22	0.0277
-30	-20	0.0261
-20	-22	0.0276
-10	-21	0.0267
0	-21	0.0269
+10	-22	0.0278
+20	-20	0.0252
+30	-20	0.0249
+40	-22	0.0277
+50	-21	0.0266
+60	-21	0.0266
+70	-21	0.0267
+80	-21	0.0265
+85	-21	0.0272

NB-IOT Band 13_782MHz_15k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-21	0.0272
3.8	-20	0.0255
3.4	-20	0.0257

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-21	0.0273
-30	-20	0.0262
-20	-21	0.0274
-10	-21	0.0266
0	-20	0.0260
+10	-21	0.0272
+20	-20	0.0255
+30	-20	0.0253
+40	-21	0.0270
+50	-21	0.0271
+60	-21	0.0268
+70	-21	0.0274
+80	-20	0.0260
+85	-21	0.0274

NB-IOT Band 13_786.9MHz_15k_BPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-22	0.0277
3.8	-20	0.0251
3.4	-19	0.0246

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-22	0.0278
-30	-21	0.0268
-20	-22	0.0273
-10	-21	0.0265
0	-21	0.0263
+10	-22	0.0274
+20	-20	0.0251
+30	-20	0.0249
+40	-21	0.0268
+50	-21	0.0263
+60	-21	0.0266
+70	-21	0.0265
+80	-21	0.0268
+85	-22	0.0278

NB-IOT Band 13_786.9MHz_15k_QPSK

Voltage

Voltage (VDC)	Frequency Error(Hz)	Frequency Error(ppm)
4.2	-21	0.0273
3.8	-19	0.0246
3.4	-19	0.0245

Temperature

TEMPERATURE	Frequency Error(Hz)	Frequency Error (ppm)
-40	-22	0.0275
-30	-21	0.0268
-20	-21	0.0265
-10	-21	0.0261
0	-21	0.0261
+10	-21	0.0268
+20	-19	0.0246
+30	-20	0.0252
+40	-21	0.0273
+50	-21	0.0266
+60	-22	0.0277
+70	-21	0.0270
+80	-20	0.0260
+85	-21	0.0272