



TEST REPORT

No. I19Z61379-WMD01

for

Ericsson AB Radio 2203 B14 KRC161838/1

Remote Radio Unit

FCC ID: TA8AKRC161838-1

In accordance with FCC CFR 47 Part 90

Issued Date: 2019-11-04

Note:

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I19Z61379-WMD01	Rev.0	1 st edition	2019-11-04

Note: the latest revision of the test report supersedes all previous version.

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1. Test Laboratory

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2005 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0, and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (CN0066). The detail accreditation scope can be found on NVLAP website.

1.2. Testing Location

Location 1: CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing,
P. R. China 100191

Location 2: CTTL(Shouxian)

Address: No. 51 Shouxian Science Building, Xueyuan Road,
Haidian District, Beijing, P. R. China 100191

1.3. Project date

Testing Start Date: 2019-09-04

Testing End Date: 2019-11-04

1.4. Signature



Dong Yuan

(Prepared this test report)



Zhou Yu

(Reviewed this test report)



Liu Baodian

(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name: Ericsson (China) Communications Company Ltd.
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P.R.China
Contact: Zheng Zhao
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2.2. Manufacturer Information

Company Name: Ericsson AB
Address /Post: Isafjordsgatan 10, 164 80 Stockholm
Sweden
Contact: /
Email: /
Telephone: /

3. Equipment Under Test (EUT)

3.1. About EUT

Description	Remote Radio Unit
Product Name	Radio 2203 B14
Product Number	KRC 161 838/1
FCC ID	TA8AKRC161838-1
Integrated Antenna	KRE 101 2198/1
External Antenna	KRE 101 2275/1
Antenna Gain	Integrated Antenna: 5±1 dBi External Antenna: 2±1 dBi
Maximum Output Power per Port	Maximum 37.0 dBm(5W) per port
Power source	36V DC
Serial Number	TD3R174227
Hardware Version	R1B
Software Version	CXP9017316%2_R77MJ
Frequency range	B14 (UL: 788~798MHz, DL: 758~768MHz)
TX/RX configuration	2 TX / RX
Maximum RF bandwidth (IBW)	10 MHz
Total number of supported carriers per port	Maximum 2 carriers
Supported modulations	QPSK, 16QAM, 64QAM, 256QAM
Date of receipt	2019-09-04

3.2. **General Description**

The Equipment Under Test (EUT) is an Ericsson Remote Radio Unit working in the wireless communications services 758-768MHz band which provides communication connections to network in LTE and NB-IoT mode. The Radio 2203 B14 KRC 161 838/1 operates from a -48V DC power supply.

The EUT includes 2 TX/RX ports and it can be configured to transmit in MIMO mode, and MIMO mode was used for measurements as the worst configuration. The complete testing was performed with the EUT transmitting at maximum RF power unless otherwise stated.

The Equipment Under Test (EUT) is shown in the photograph below. A full technical description can be found in the Manufacturer's documentation.



Equipment Under Test

3.3. Configuration Description

The following settings were used to representative for all traffic scenarios when settings with different modulations, channel bandwidths, number for carriers and RF configurations have been tested to find the worst case setting. The settings below were used for all measurements unless otherwise noted:

LTE

Configuration	Carrier	Carrier Bandwidth	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
LTE-MIMO-1C	1 Carrier	5MHz	760.5	763.0	765.5
		10MHz	-	763.0	-
LTE-MIMO-2C	2 Carrier	5MHz	-	760.5+765.5	-
LTE-MIMO-1C-BE	1 Carrier	5MHz	760.5	N/A	765.5
		10MHz	763.0	N/A	763.0
LTE-MIMO-2C-BE	2 Carrier	5MHz	760.5+765.5	N/A	760.5+765.5

NB-IoT

Configuration	Carrier	Carrier Bandwidth	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
NB-IoT-InBand-5.0M-1C	1 Carrier	5MHz	760.5	763.0	765.5
NB-IoT-InBand-10.0M-1C	1 Carrier	10MHz	-	763.0	-
NB-IoT-GuardBand-1 0.0M-1C	1 Carrier	10MHz	763.0	763.0	763.0
NB-IoT-InBand-5.0M-1C-BE	1 Carrier	5MHz	760.5	N/A	765.5
NB-IoT-InBand-10.0M-1C-BE	1 Carrier	10MHz	763.0	N/A	763.0
NB-IoT-GuardBand-1 0.0M-1C-BE	1 Carrier	10MHz	763.0	N/A	763.0

N/A – Not Applicable

4. Reference Documents

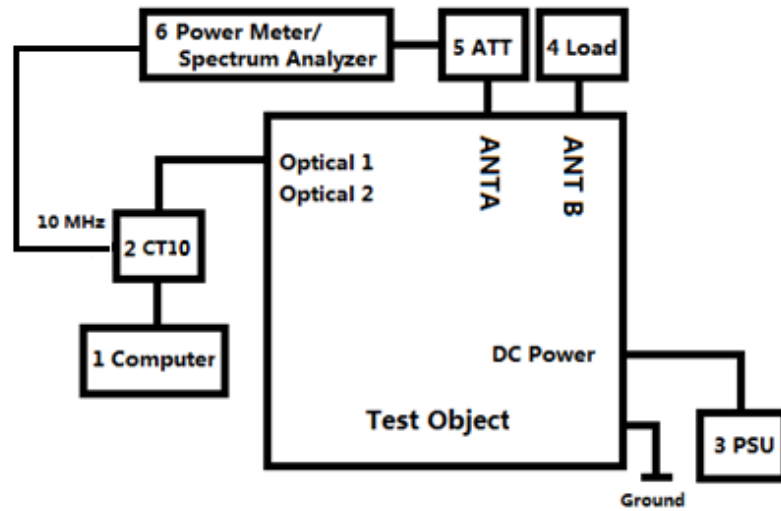
4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 90	PRIVATE LAND MOBILE RADIO SERVICES	10-1-18 Edition
FCC Part 2	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS	10-1-18 Edition
ANSI/TIA-603-E	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards	2016
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 KHz to 40 GHz	2014
ANSI 63.26	IEEE/ANSI Standard for Compliance Testing of Transmitters Used in Licensed Radio Services	2015
TIA 102.CAAA-E	Project 25 Digital C4FM/CQPSK Transceiver Measurement Methods	2016
KDB 971168 D01	MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS	v03r01
KDB 662911 D01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band	v02r01

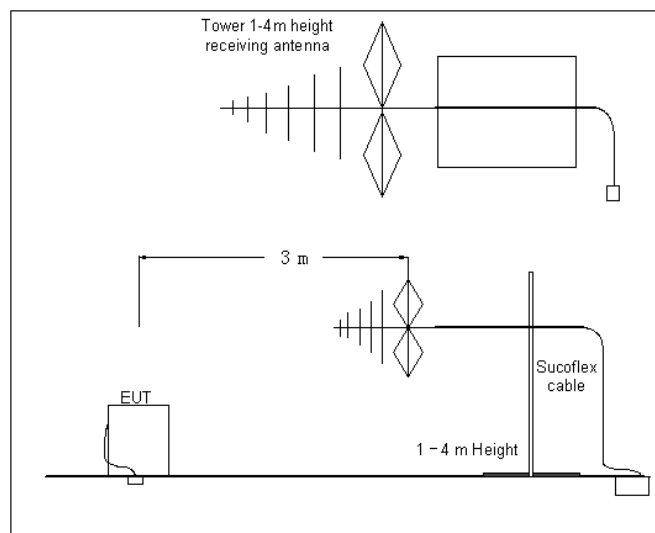
5. TEST SETUP

Test Setup, Conducted Measurement:



No.	Auxilliary Equipment	Model Type	Version
1	Computer	Dell Optiplex 3050	-
2	CT10	LPC 102 487/1	R1C
3	Power supply unit	-	-
4	Load	TF150	-
5	40dB Attenuator	Aeroflex / Weinschel	-

Test Setup, Radiated Measurement:



6. LABORATORY ENVIRONMENT

Control room / conducted chamber did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 20 %, Max. = 80 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2 M Ω
Ground system resistance	< 0.5 Ω

Semi-anechoic chamber (10 meters×6.7 meters×6.15 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 2 M Ω
Ground system resistance	< 0.5 Ω
Normalised site attenuation (NSA)	< ± 3.5 dB, 3 m distance
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

7. SUMMARY OF TEST RESULTS

Items	Test Name	Clause in FCC rules	Verdict
1	Maximum Output Power and Peak-to-Average Power Ratio	90.542	Pass
2	Equivalent Isotropically Radiated Power (EIRP)	90.542	Pass
3	Occupied Bandwidth	2.1049	Pass
4	Spurious Emissions at Band Edge	90.543	Pass
5	Conducted Spurious Emission	90.543	Pass
6	Radiated Spurious Emission	90.543	Pass
7	Frequency Stability	90.213, 90.539	Pass
8	Receiver Spurious Emission	-	N/A

N/A – Not Applicable

8. Test Equipments Utilized

NO.	Description	TYPE	series number	MANUFACTURE	CAL DUE DATE
1	Power Supply	PCR2000M	PJ000583	Kikusui	2020-02-22
2	40dB Attenuator	66-40-33	CD4019	Aeroflex / Weinschel	-
3	40dB Attenuator	TSG150R-4-40N11	1511040001	Nanjing Jiexi Technologies	-
4	Spectrum Analyzer	N9030	MY57142378	Keysight	2020-02-02
5	EMI Antenna	3115	00167250	ETS-LINDGREN	2020-05-21
6	EMI Antenna	3116	2661	ETS-LINDGREN	2020-07-27
7	EMI Antenna	VULB 9163	9163-514	SCHWARZBECK	2021-01-03
8	Test Receiver	ESU26	100376	Rohde & Schwarz	2019-11-27
9	Climate Chamber	SH-241	92001145	ESPEC	2019-12-21

9. MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:

Test Discipline	Measurement Uncertainty
Conducted Maximum Peak Output Power	0.5dB
Occupied Bandwidth	1.1Hz
Conducted Spurious Emissions	2.3dB
Band Edge	2.3dB
Radiated Spurious Emissions	5.4dB
Frequency Stability	$<\pm 1 \times 10^{-7}$

ANNEX A: MEASUREMENT RESULTS

A.1 Maximum Output Power and Peak-to-Average Power Ratio

A.1.1 Reference

FCC CFR 47 Part 2, Clause 2.1046

FCC CFR 47 Part 90, Clause 90.542

A.1.2 Method of Measurements

During the process of testing, the EUT was configured to transmit on maximum power and proper modulation. The transmitter power shall be measured in terms of a root-mean-square (RMS) average value. In case of the EUT was configured to MIMO mode, since the EUT transmits on all antennas simultaneously in the same frequency range, using the Measure-and-Sum approach, the output power at all antennas were tested, and the total output power were then summed mathematically in linear power units according to FCC KDB 662911 D01. Integrated antenna gain was used as the worst case to calculate the ERP result.

A peak to average ratio measurement is performed at the conducted ports of the EUT for single carrier for single RAT mode. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) was used and 0.1% probability value recorded.

A.1.3 Limit

Fixed and base stations located in a county with population density of 100 or fewer persons per square mile, based upon the most recently available population statistics from the Bureau of the Census, and transmitting a signal in the 758–768 MHz band with an emission bandwidth greater than 1 MHz must not exceed an ERP of 2000 watts/MHz and an antenna height of 305 m HAAT, except that antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 2000watts/MHz ERP.

Peak to Average Ratio: <13dB

A.1.4 Measurement result

Configuration LTE-MIMO-1C

Maximum Output Power 37.0dBm per port

Antenna	Modulation/ Carrier	Output Power / Peak to Average Ratio (PAR)								
		Channel position B			Channel position M			Channel position T		
	Bandwidth (MHz)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)
A	QPSK/5.0	37.00	-	7.09	37.01	-	7.10	36.91	-	7.17
B		36.93	-	7.12	36.90	-	7.12	36.93	-	7.20
Total		39.98	-	-	39.97	-	-	39.93	-	-
Total Power+5dBi		44.98	-	-	44.97	-	-	44.93	-	-
ERP (Total Power+5dBi-2.15dB)		42.83	-	-	42.82	-	-	42.78	-	-

Antenna	Modulation/ Carrier Bandwidth (MHz)	Output Power / Peak to Average Ratio (PAR)								
		Channel position B			Channel position M			Channel position T		
		POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)
A	16QAM/5.0	37.04	-	7.10	36.99	-	7.10	36.95	-	7.17
B		36.99	-	7.11	36.94	-	7.10	36.91	-	7.17
Total		40.03	-	-	39.98	-	-	39.94	-	-
Total Power+5dBi		45.03	-	-	44.98	-	-	44.94	-	-
ERP (Total Power+5dBi-2.15dB)		42.88	-	-	42.83	-	-	42.79	-	-

Antenna	Modulation/ Carrier Bandwidth (MHz)	Output Power / Peak to Average Ratio (PAR)								
		Channel position B			Channel position M			Channel position T		
		POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)
A	64QAM/5.0	37.01	-	7.09	37.00	-	7.10	36.96	-	7.17
B		36.95	-	7.10	36.93	-	7.12	36.90	-	7.19
Total		39.99	-	-	39.98	-	-	39.94	-	-
Total Power+5dBi		44.99	-	-	44.98	-	-	44.94	-	-
ERP (Total Power+5dBi-2.15dB)		42.84	-	-	42.83	-	-	42.79	-	-

Antenna	Modulation/ Carrier Bandwidth (MHz)	Output Power / Peak to Average Ratio (PAR)								
		Channel position B			Channel position M			Channel position T		
		POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)
A	256QAM	36.97	-	7.12	36.99	-	7.12	36.91	-	7.19
B	/5.0	36.95	-	7.12	36.94	-	7.13	36.88	-	7.21
Total		39.97	-	-	39.98	-	-	39.91	-	-
Total Power+5dBi		44.97	-	-	44.98	-	-	44.91	-	-
ERP (Total Power+5dBi-2.15dB)		42.82	-	-	42.83	-	-	42.76	-	-

Maximum Output Power 37.0dBm per port

Antenna	Modulation/ Carrier Bandwidth (MHz)	Output Power / Peak to Average Ratio (PAR)								
		Channel position B			Channel position M			Channel position T		
		POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)
A	QPSK/10.0	-	-	-	36.82	-	7.24	-	-	-
B		-	-	-	36.77	-	7.23	-	-	-
Total		-	-	-	39.81	-	-	-	-	-
Total Power+5dBi		-	-	-	44.81	-	-	-	-	-
ERP (Total Power+5dBi-2.15dB)		-	-	-	42.66	-	-	-	-	-

Antenna	Modulation/ Carrier Bandwidth (MHz)	Output Power / Peak to Average Ratio (PAR)								
		Channel position B			Channel position M			Channel position T		
		POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)
A	16QAM/	-	-	-	36.82	-	7.21	-	-	-
B	10.0	-	-	-	36.76	-	7.23	-	-	-
Total		-	-	-	39.80	-	-	-	-	-
Total Power+5dBi		-	-	-	44.80	-	-	-	-	-
ERP (Total Power+5dBi-2.15dB)		-	-	-	42.65	-	-	-	-	-

Antenna	Modulation/ Carrier Bandwidth (MHz)	Output Power / Peak to Average Ratio (PAR)								
		Channel position B			Channel position M			Channel position T		
		POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)
A	64QAM/	-	-	-	36.79	-	7.19	-	-	-
B	10.0	-	-	-	36.77	-	7.22	-	-	-
Total		-	-	-	39.79	-	-	-	-	-
Total Power+5dBi		-	-	-	44.79	-	-	-	-	-
ERP (Total Power+5dBi-2.15dB)		-	-	-	42.64	-	-	-	-	-

Antenna	Modulation/ Carrier Bandwidth (MHz)	Output Power / Peak to Average Ratio (PAR)								
		Channel position B			Channel position M			Channel position T		
		POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)
A	256QAM /10.0	-	-	-	36.83	-	7.22	-	-	-
B		-	-	-	36.76	-	7.22	-	-	-
Total		-	-	-	39.81	-	-	-	-	-
Total Power+5dBi		-	-	-	44.81	-	-	-	-	-
ERP (Total Power+5dBi-2.15dB)		-	-	-	42.66	-	-	-	-	-

Configuration LTE-MIMO-2C

Maximum Output Power 37.0dBm per port

Antenna	Modulation/ Carrier Bandwidth (MHz)	Output Power / Peak to Average Ratio (PAR)								
		Channel position B			Channel position M			Channel position T		
		POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)
A	QPSK/ 5.0	-	-	-	36.80	-	7.26	-	-	-
B		-	-	-	36.77	-	7.27	-	-	-
Total		-	-	-	39.80	-	-	-	-	-
Total Power+5dBi		-	-	-	44.80	-	-	-	-	-
ERP (Total Power+5dBi-2.15dB)		-	-	-	42.65	-	-	-	-	-

Antenna	Modulation/ Carrier Bandwidth (MHz)	Output Power / Peak to Average Ratio (PAR)								
		Channel position B			Channel position M			Channel position T		
		POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)
A	16QAM/	-	-	-	36.82	-	7.25	-	-	-
B	5.0	-	-	-	36.74	-	7.28	-	-	-
Total		-	-	-	39.79	-	-	-	-	-
Total Power+5dBi		-	-	-	44.79	-	-	-	-	-
ERP (Total Power+5dBi-2.15dB)		-	-	-	42.64	-	-	-	-	-

Antenna	Modulation/ Carrier Bandwidth (MHz)	Output Power / Peak to Average Ratio (PAR)								
		Channel position B			Channel position M			Channel position T		
		POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)
A	64QAM/	-	-	-	36.79	-	7.27	-	-	-
B	5.0	-	-	-	36.77	-	7.26	-	-	-
Total		-	-	-	39.79	-	-	-	-	-
Total Power+5dBi		-	-	-	44.79	-	-	-	-	-
ERP (Total Power+5dBi-2.15dB)		-	-	-	42.64	-	-	-	-	-

Antenna	Modulation/ Carrier Bandwidth (MHz)	Output Power / Peak to Average Ratio (PAR)								
		Channel position B			Channel position M			Channel position T		
		POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)
A	256QAM	-	-	-	36.76	-	7.28	-	-	-
B	/5.0	-	-	-	36.73	-	7.27	-	-	-
Total		-	-	-	39.76	-	-	-	-	-
Total Power+5dBi		-	-	-	44.76	-	-	-	-	-
ERP (Total Power+5dBi-2.15dB)		-	-	-	42.61	-	-	-	-	-

Configuration NB-IoT-InBand-1C

Maximum Output Power 37.0dBm per port

Antenna	Modulation/ Carrier Bandwidth (MHz)	Output Power / Peak to Average Ratio (PAR)								
		Channel position B			Channel position M			Channel position T		
		POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)
A	QPSK/5.0	37.03	-	7.11	37.00	-	7.10	36.96	-	7.17
B	QPSK/5.0	37.00	-	7.10	36.99	-	7.11	37.00	-	7.17
Total		40.03	-	-	40.01	-	-	39.99	-	-
Total Power+5dBi		45.03	-	-	45.01	-	-	44.99	-	-
ERP (Total Power+5dBi-2.15dB)		42.88	-	-	42.86	-	-	42.84	-	-

Antenna	Modulation/ Carrier Bandwidth (MHz)	Output Power / Peak to Average Ratio (PAR)								
		Channel position B			Channel position M			Channel position T		
		POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)
A	QPSK/10.0	-	-	-	36.82	-	7.24	-	-	-
B	QPSK/10.0	-	-	-	36.75	-	7.25	-	-	-
Total		-	-	-	39.80	-	-	-	-	-
Total Power+5dBi		-	-	-	44.80	-	-	-	-	-
ERP (Total Power+5dBi-2.15dB)		-	-	-	42.65	-	-	-	-	-

Configuration NB-IoT-GuardBand-1C

Maximum Output Power 37.0dBm per port

Antenna	Modulation/ Carrier Bandwidth (KHz)	Output Power / Peak to Average Ratio (PAR)								
		Channel position B			Channel position M			Channel position T		
		POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)	POWER (dBm)	POWER (dBm/MHz)	PAR (db)
A	QPSK/ 10.0	-	-	-	36.64	-	7.38	-	-	-
B	QPSK/ 10.0	-	-	-	36.60	-	7.35	-	-	-
Total		-	-	-	39.63	-	-	-	-	-
Total Power+5dBi		-	-	-	44.63	-	-	-	-	-
ERP (Total Power+5dBi-2.15dB)		-	-	-	42.48	-	-	-	-	-

A.2 Occupied Bandwidth

A.2.1 Reference

FCC CFR 47 Part 2, Clause 2.1049

A.2.2 Method of Measurements

The EUT was set to transmit at maximum power and testing was carried out on bottom, middle and top channels. Using the Occupied Bandwidth measurement function in the spectrum analyzer, the 26dB bandwidth was measured in accordance with FCC KDB 971168 D01 Clause 4.2.

The measurement method is from KDB 971168 4.2:

- a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (i.e., two to five times the OBW).
- b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
- c) Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least $10\log (OBW / RBW)$ below the reference level.

A.2.3 Measurement result

Configuration LTE-MIMO-1C

-26dBc Occupied Bandwidth

Modulation/ Bandwidth	Occupied Bandwidth (MHz)		
	Channel position B	Channel position M	Channel position T
QPSK/ 5.0MHz	4.743	4.738	4.736
QPSK/ 10.0MHz	-	9.389	-

-26dBc Occupied Bandwidth

Bandwidth	Occupied Bandwidth (MHz)		
	Modulation 16QAM/ Channel position M	Modulation 64QAM/ Channel position M	Modulation 256QAM/ Channel position M
5.0MHz	4.715	4.733	4.733
10.0MHz	9.325	9.378	9.366

99% Occupied Bandwidth

Modulation/ Bandwidth	Occupied Bandwidth (MHz)		
	Channel position B	Channel position M	Channel position T
QPSK/ 5.0MHz	4.4772	4.4773	4.4766
QPSK/ 10.0MHz	-	8.9310	-

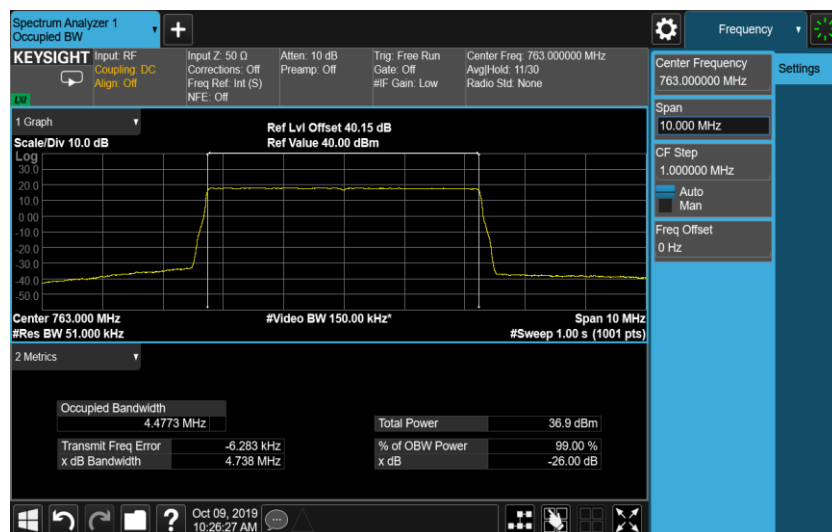
99% Occupied Bandwidth

Bandwidth	Occupied Bandwidth (MHz)		
	Modulation 16QAM/ Channel position M	Modulation 64QAM/ Channel position M	Modulation 256QAM/ Channel position M
5.0MHz	4.4608	4.4768	4.4769
10.0MHz	8.9276	8.9290	8.9313

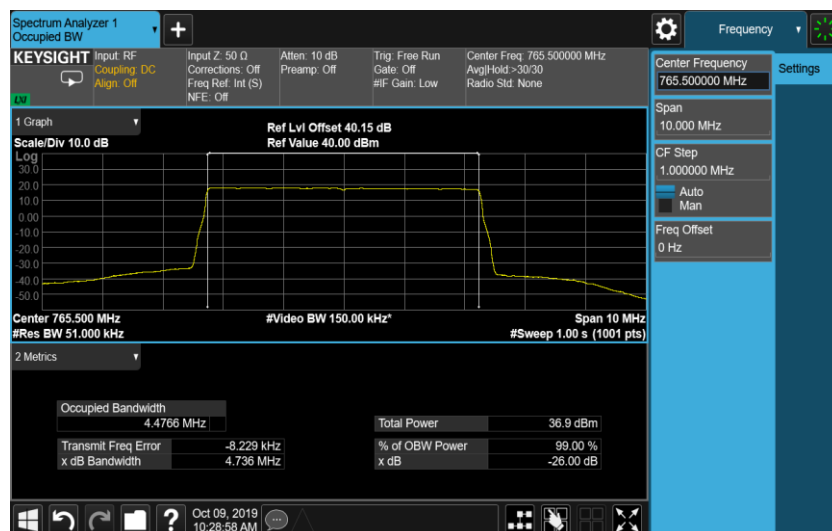
Port A, QPSK/5.0MHz Channel Position B



Port A, QPSK/5.0MHz Channel Position M



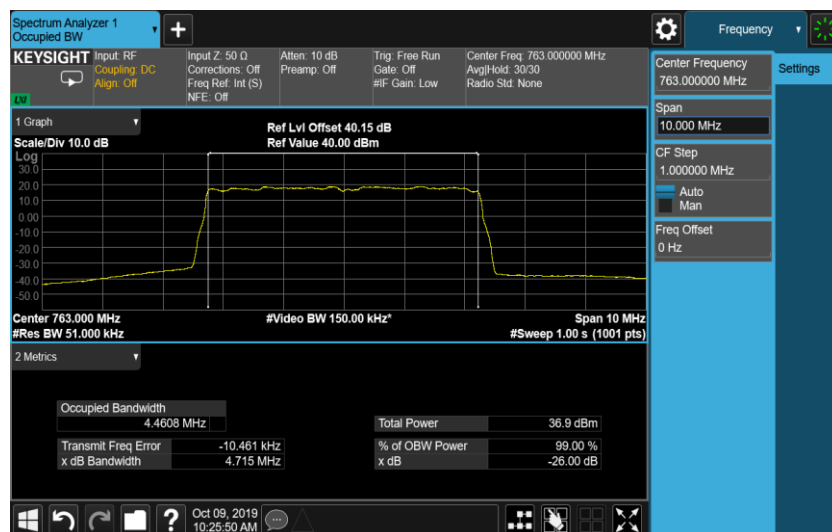
Port A, QPSK/5.0MHz Channel Position T



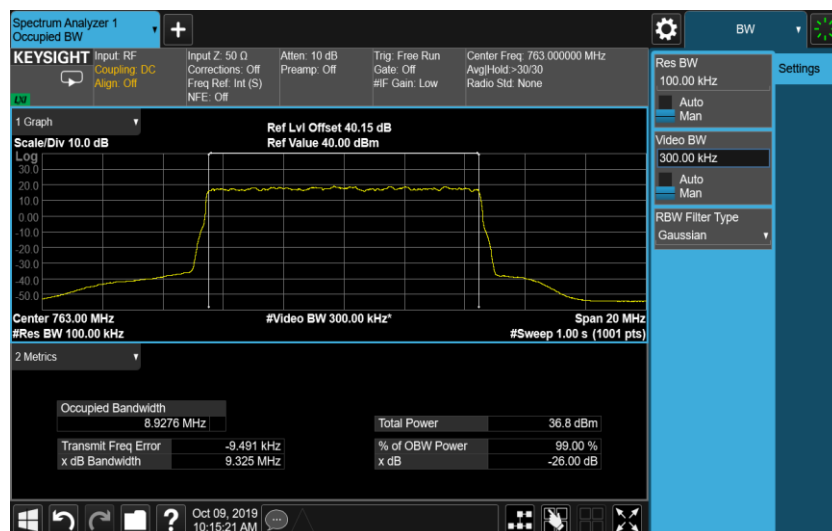
Port A, QPSK/10.0MHz Channel Position M



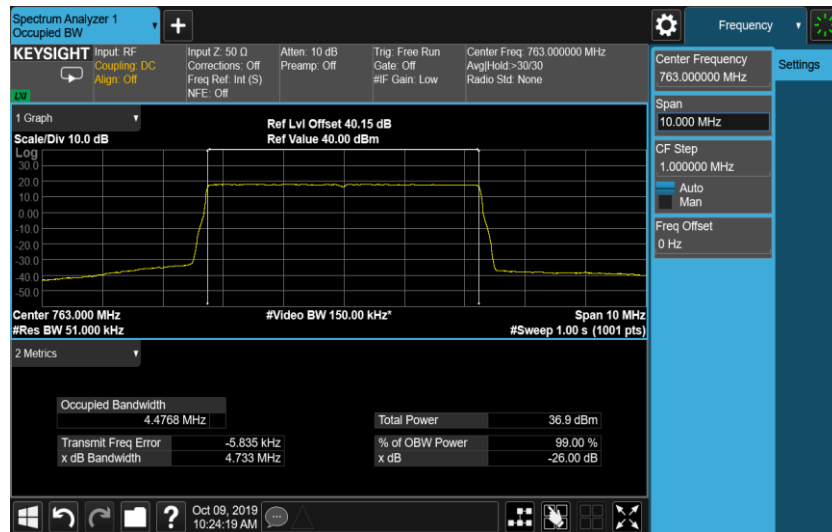
Port A, 16QAM/5.0MHz Channel Position M



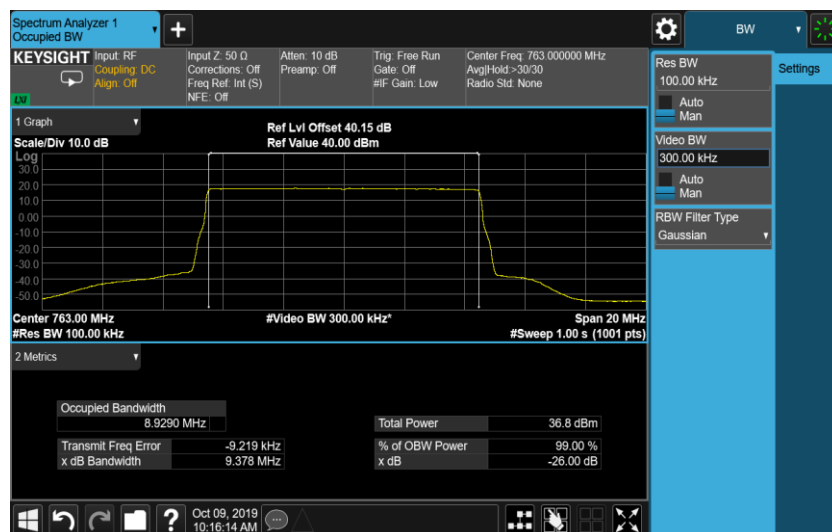
Port A, 16QAM/10.0MHz Channel Position M



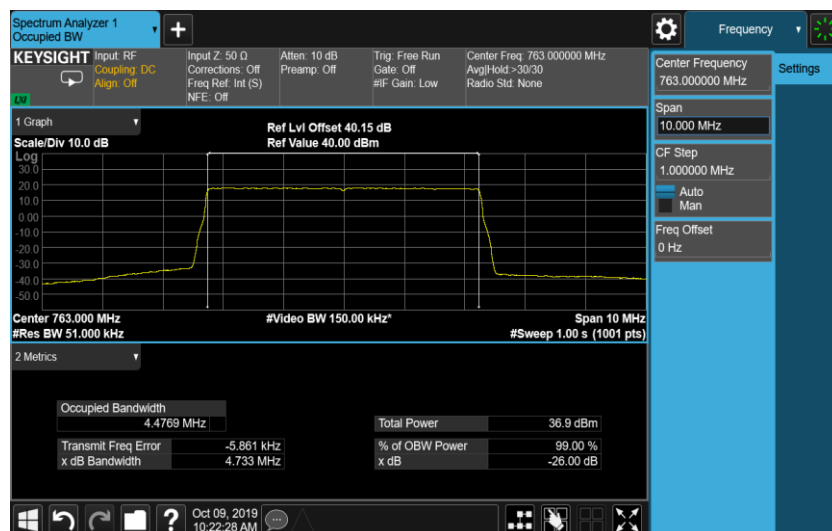
Port A, 64QAM/5.0MHz Channel Position M



Port A, 64QAM/10.0MHz Channel Position M



Port A, 256QAM/5.0MHz Channel Position M



Port A, 256QAM/10.0MHz Channel Position M



Configuration NB-IoT-InBand-1C

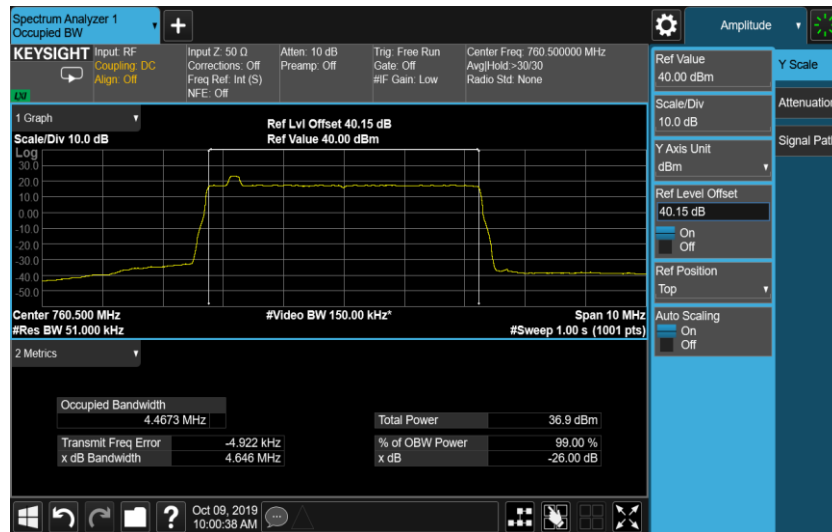
-26dBc Occupied Bandwidth

Modulation/ Bandwidth	Occupied Bandwidth (MHz)		
	Channel position B	Channel position M	Channel position T
QPSK/ 5.0MHz	4.646	4.644	4.642
QPSK/ 10.0MHz	-	9.253	-

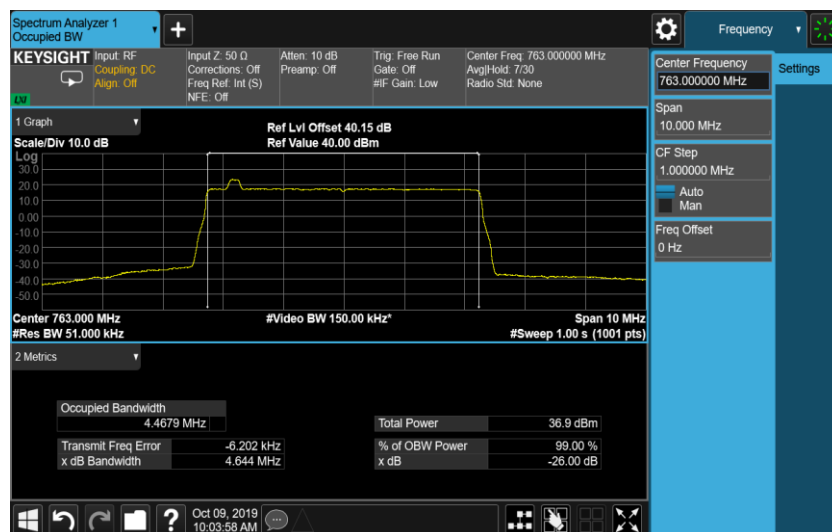
99% Occupied Bandwidth

Modulation/ Bandwidth	Occupied Bandwidth (MHz)		
	Channel position B	Channel position M	Channel position B
QPSK/ 5.0MHz	4.4673	4.4679	4.4658
QPSK/ 10.0MHz	-	8.9273	-

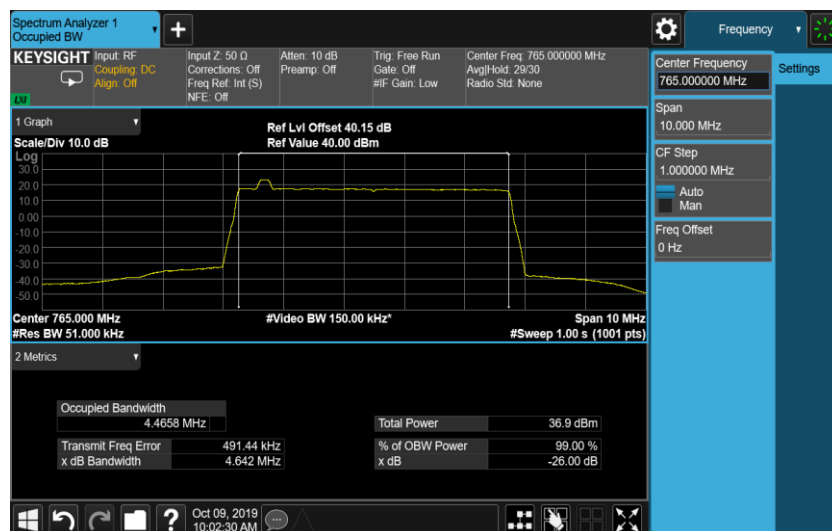
Port A, QPSK/5.0MHz Channel Position B



Port A, QPSK/5.0MHz Channel Position M



Port A, QPSK/5.0MHz Channel Position T



Port A, QPSK/10.0MHz Channel Position M



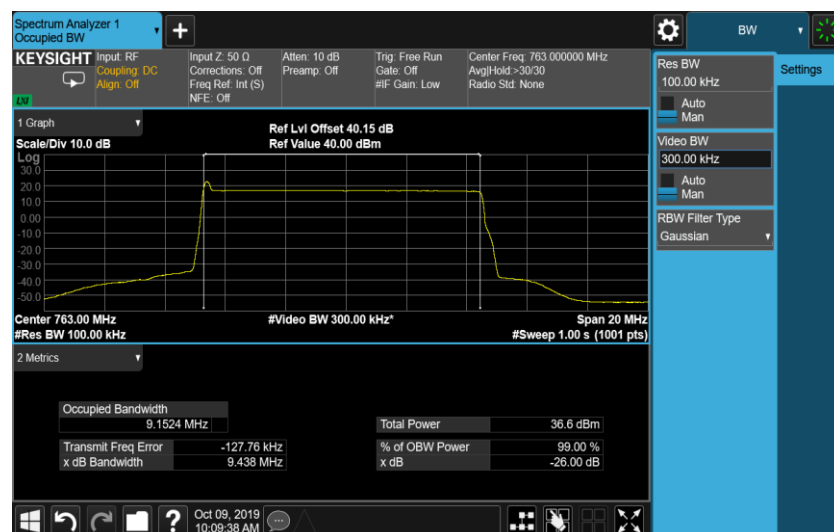
Configuration NB-IoT-GuardBand-1C -26dBc Occupied Bandwidth

Modulation/ Bandwidth	Occupied Bandwidth (MHz)		
	Channel position B	Channel position M	Channel position T
QPSK/ 10.0MHz	-	9.438	-

99% Occupied Bandwidth

Modulation/ Bandwidth	Occupied Bandwidth (MHz)		
	Channel position B	Channel position M	Channel position B
QPSK/ 10.0MHz	-	9.1524	-

Port A, QPSK/10.0MHz Channel Position M



A.3 Spurious Emissions at Band Edge

A.3.1 Reference

FCC CFR 47 Part 2, Clause 2.1051

FCC CFR 47 Part 90, Clause 90.543

A.3.2 Method of measurement

The measurements were made per definition in CFR 47 part 90.543. The test object was connected to a spectrum analyzer with the RMS detector activated. The spectrum analyzer was connected to an external 10MHz reference standard during the measurements.

For MIMO mode configurations, the limit was adjusted with a correction of -3.01dB [10Log2] by using the Measure and Add 10Log(N) dB technique according to FCC KDB 662911 D01 Multiple Transmitter Output accounting for simultaneous transmission from antenna ports RF A and B.

A.3.3 Measurement limit

(e) For operations in the 758–768 MHz and the 788–798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On all frequencies between 769–775MHz and 799–805 MHz, by a factor not less than $76 + 10 \log (P)$ dB in a 6.25 kHz band segment, for base and fixed stations.

(3) On any frequency between 775–788MHz, above 805 MHz, and below 758MHz, by at least $43 + 10 \log (P)$ dB.

(4) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

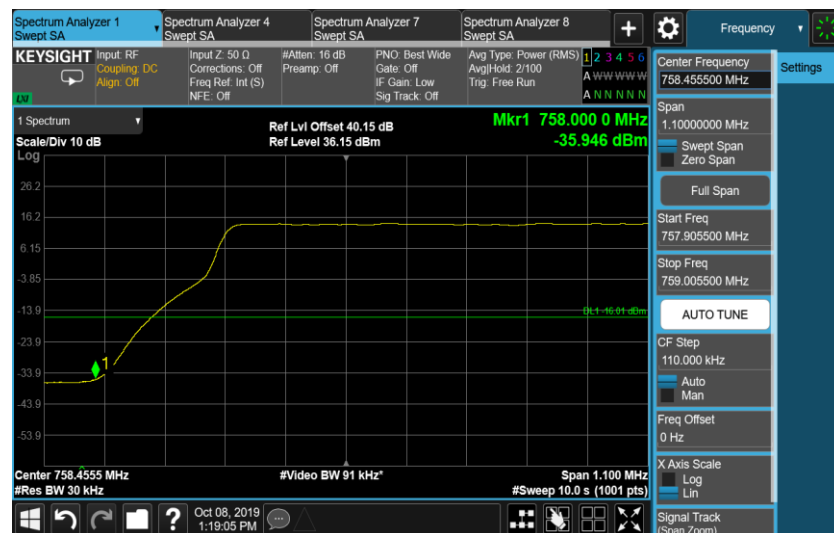
(5) Compliance with the provisions of paragraph (e)(3) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 30 kHz may be employed.

A.3.4 Measurement result

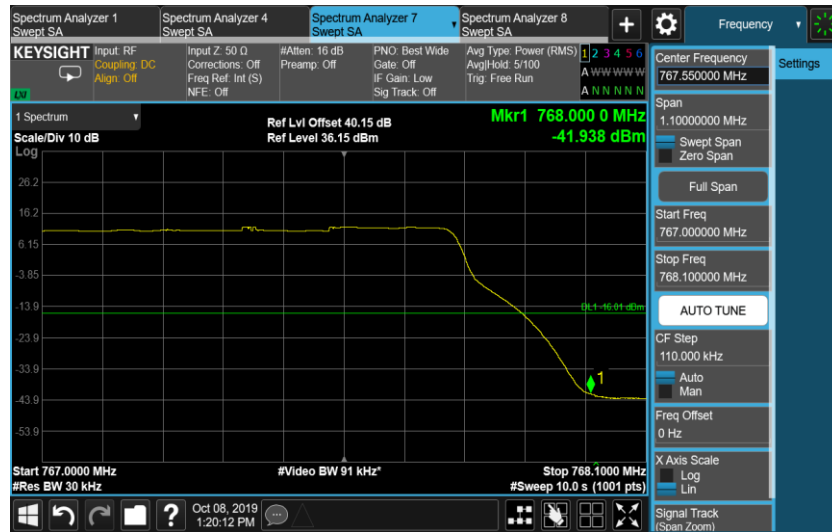
Configuration LTE-MIMO-1C, QPSK

Band Edge Frequency	Channel Bandwidth	RBW(KHz)	Limit(dBm)
Channel Position B 758MHz	5.0 MHz	30/100	-16.01
	10.0 MHz	30/100	-16.01
Channel Position T 768MHz	5.0 MHz	30/100	-16.01
	10.0 MHz	30/100	-16.01

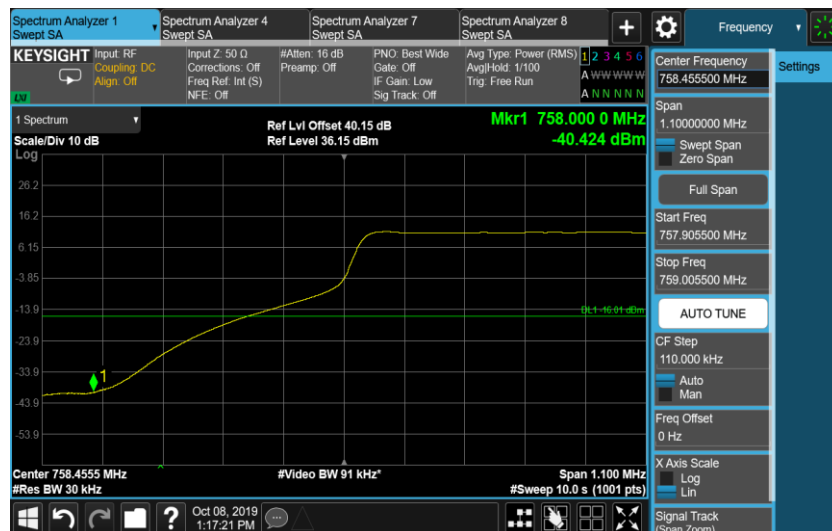
Port A , Channel Position B, 5.0MHz



Port A , Channel Position T, 5.0MHz

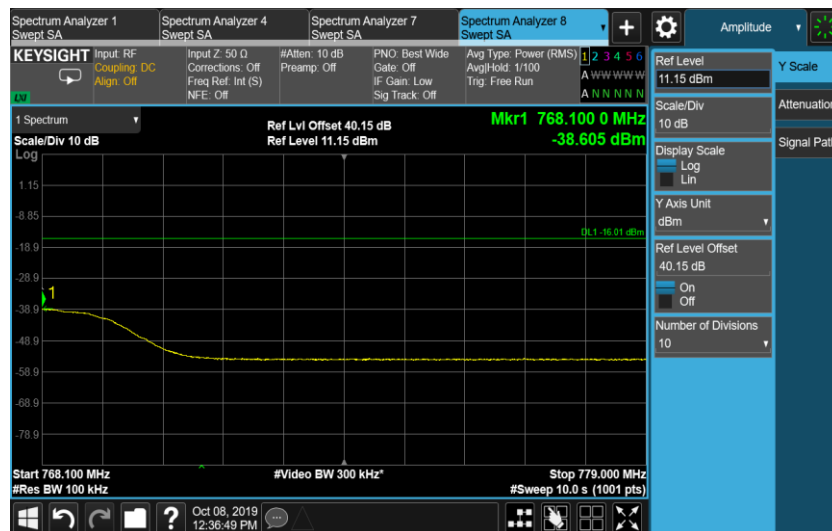


Port A , Channel Position B, 10.0MHz





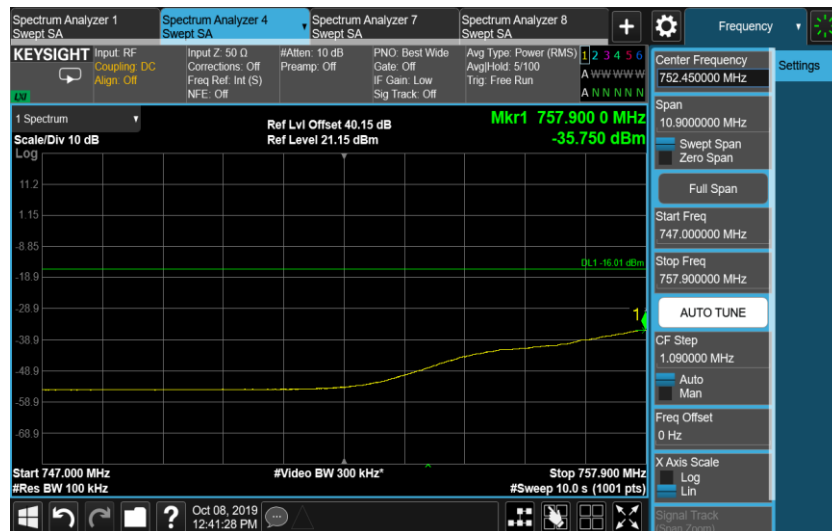
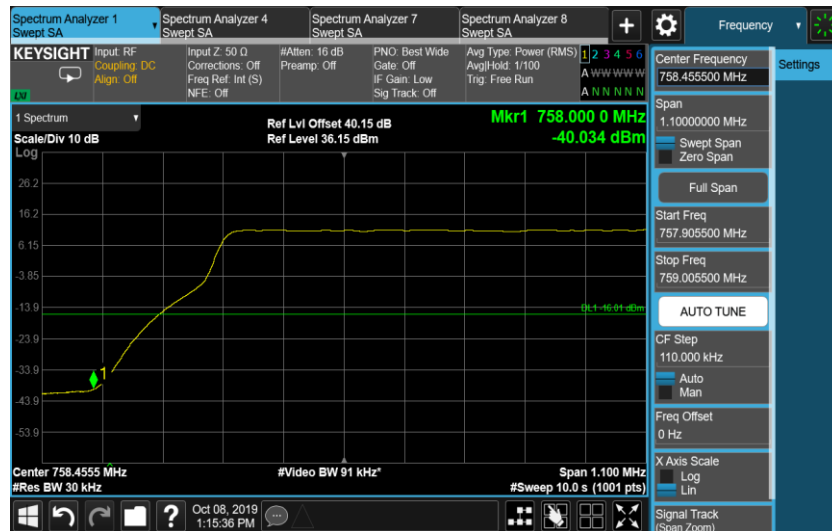
Port A , Channel Position T, 10.0MHz



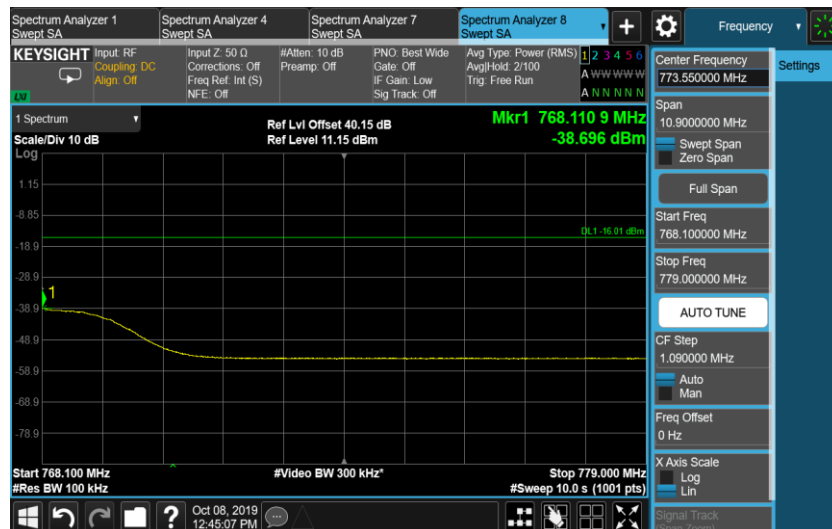
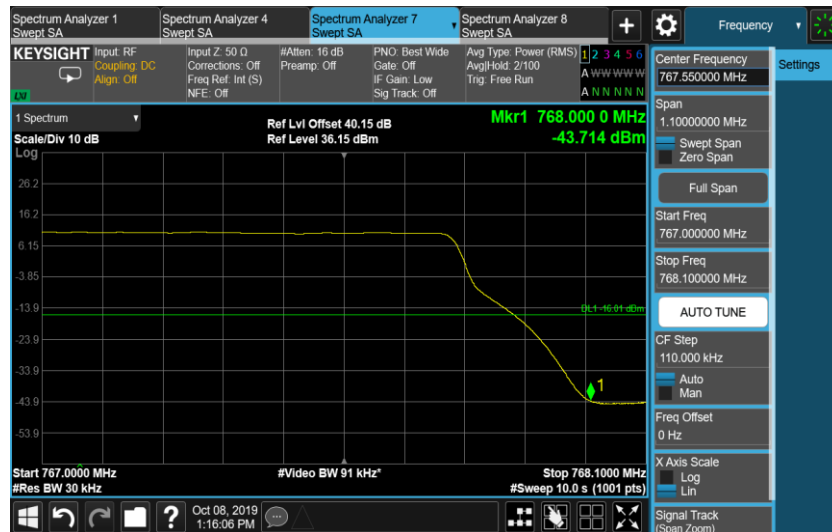
Configuration LTE-MIMO-2C-BE, QPSK

Band Edge Frequency	Channel Bandwidth	RBW(KHz)	Limit(dBm)
Channel Position B 758MHz	5.0 MHz	30/100	-16.01
Channel Position T 768MHz	5.0 MHz	30/100	-16.01

Port A , Channel Position B, 5.0MHz



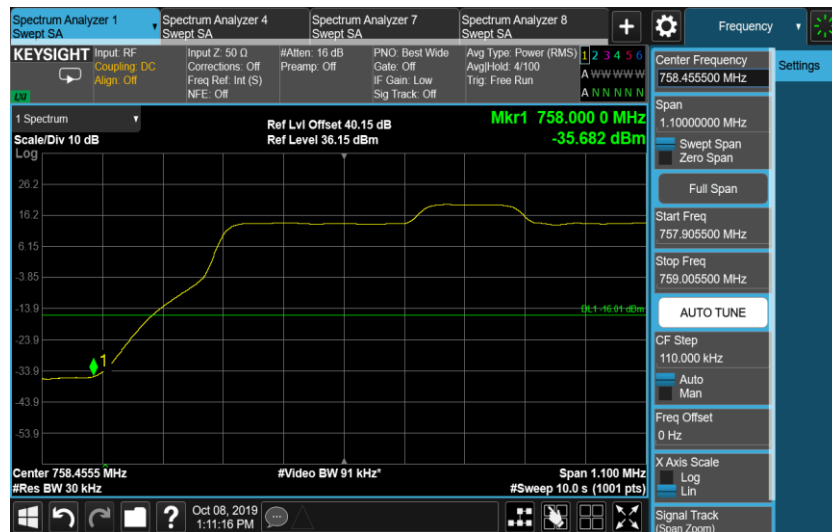
Port A , Channel Position T, 5.0MHz



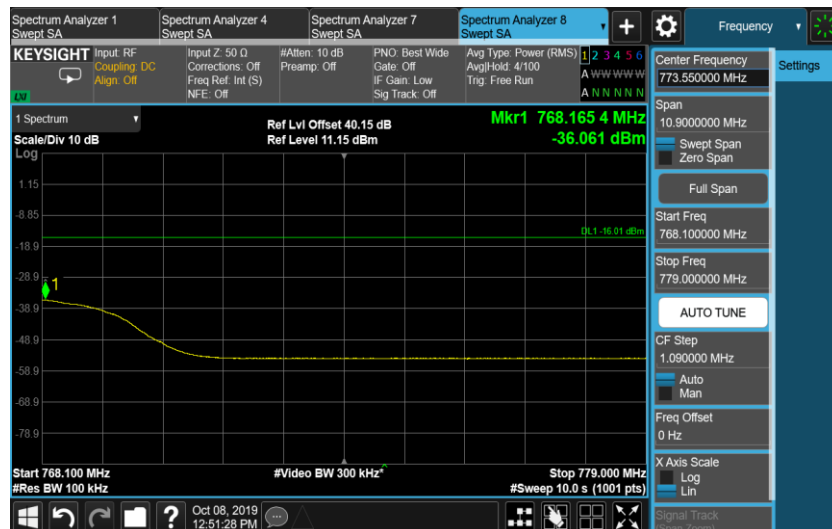
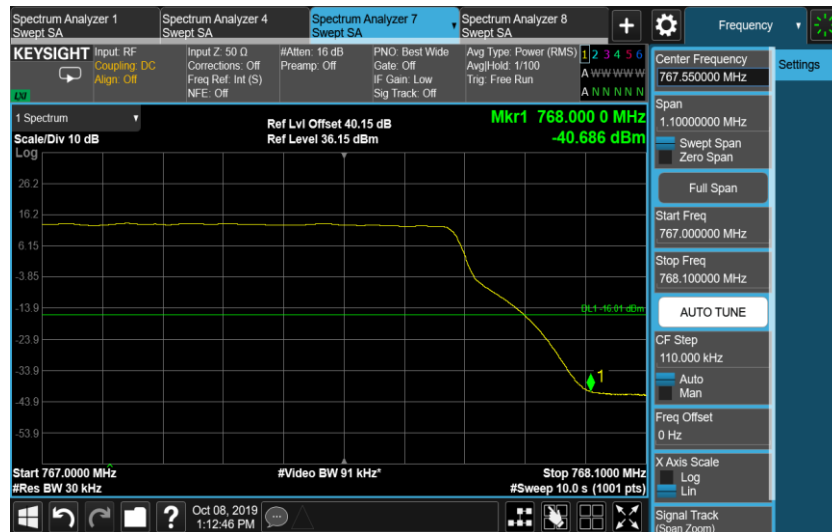
Configuration NB-IoT-InBand-1C-BE, QPSK

Band Edge Frequency	Channel Bandwidth	RBW(KHz)	Limit(dBm)
Channel Position B 758MHz	5.0 MHz	30/100	-16.01
	10.0 MHz	30/100	-16.01
Channel Position T 768MHz	5.0 MHz	30/100	-16.01
	10.0 MHz	30/100	-16.01

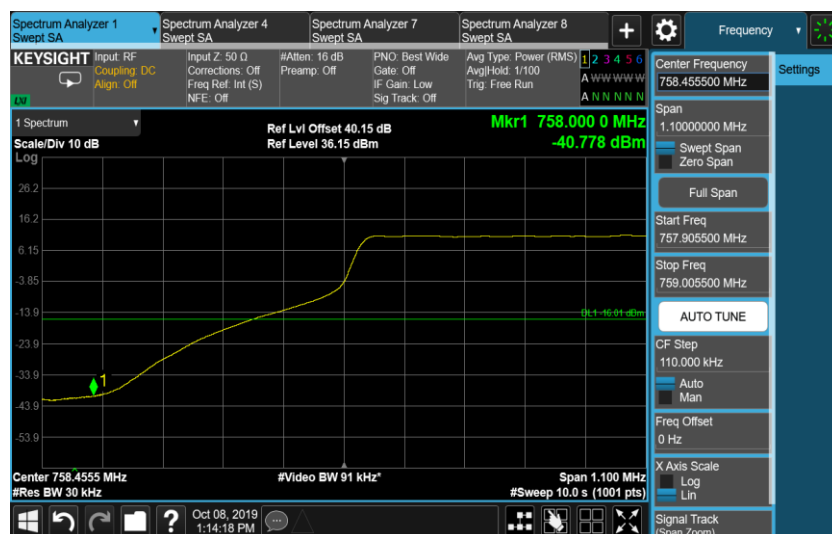
Port A , Channel Position B, 5.0MHz



Port A , Channel Position T, 5.0MHz

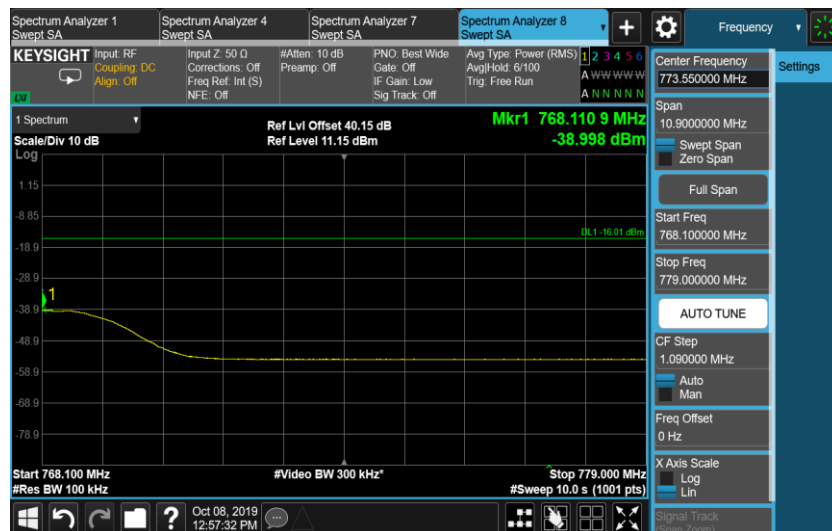


Port A , Channel Position B, 10.0MHz





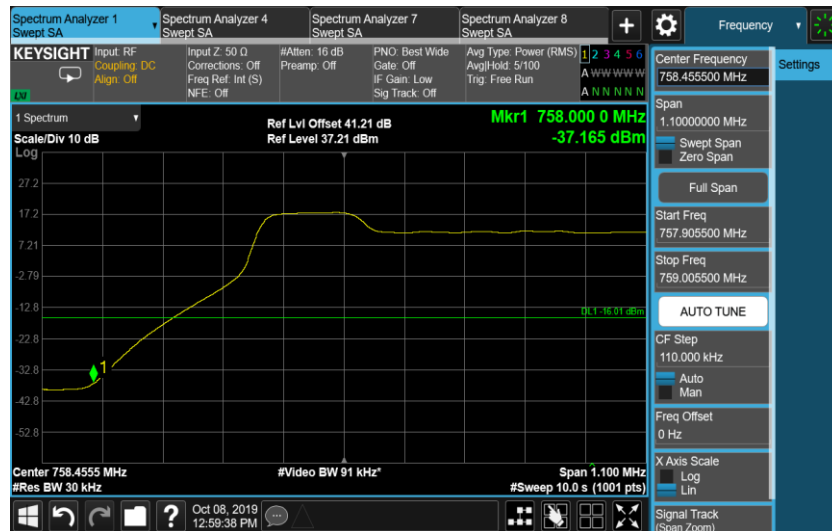
Port A , Channel Position T, 10.0MHz



Configuration NB-IoT-GuardBand-1C-BE, QPSK

Band Edge Frequency	Channel Bandwidth	RBW(KHz)	Limit(dBm)
Channel Position B 758MHz	10.0 MHz	30/100	-16.01
Channel Position T 768MHz	10.0 MHz	30/100	-16.01

Port A , Channel Position B, 10.0MHz



Port A , Channel Position T, 10.0MHz

