TEST REPORT
No. I19Z60700-WMD03

for

Hytera Communications Corporation Limited

Smart LTE Terminal

Model Name: PNC550

FCC ID: YAMPNC550B9

with

Hardware Version: 1.01

Software Version: V1.0.01.001.01

Issued Date: 2019-07-17

TESTING
NVLAP LAB CODE 600118-0

Note:

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Test Laboratory:

CTTL, Telecommunication Technology Labs, CAICT

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I19Z60700-WMD03	Rev.0	1st edition	2019-07-05
I19Z60700-WMD03	Rev.1	2nd edition Removed the results of Band 5	2019-07-17

CONTENTS

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 (Shouxiang)

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

Location 3:CTTL (BDA)

   Address: No.18A, Kangding Street, Beijing Economic-Technology Development Area, Beijing, P. R. China 100176

1.3. Testing Environment

   Normal Temperature: 15-35℃
   Relative Humidity: 20-75%

1.4. Project data

   Testing Start Date: 2019-04-18
   Testing End Date: 2019-07-05

1.5. Signature

Dong Yuan
(Prepared this test report)

Zhou Yu
(Reviewed this test report)

Zhao Hui Lin
Deputy Director of the laboratory
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Hytera Communications Corporation Limited
Address /Post:	Hytera Tower, Hi-Tech Industrial Park North, 9108# Beihuan Road, Nanshan District, Shenzhen, People's Republic of China
Contact:	licheng
Email:	cheng.li@hytera.com
Telephone:	13717055929

2.2. Manufacturer Information

Company Name:	Hytera Communications Corporation Limited
Address /Post:	Hytera Tower, Hi-Tech Industrial Park North, 9108# Beihuan Road, Nanshan District, Shenzhen, People's Republic of China
Contact:	licheng
Email:	cheng.li@hytera.com
Telephone:	13717055929

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	Smart LTE Terminal
Model Name	PNC550
FCC ID	YAMPNC550B9
Antenna	Embedded
Output power	27.63dBm maximum EIRP measured for LTE Band 7
Extreme vol. Limits	3.5VDC to 4.35VDC (nominal: 3.8VDC)
Extremetemp. Tolerance	-20°C to +60°C

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of CTTL.

3.2. Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version	Date of receipt
UT06a	864608040026143/ 864608040026150	1.01	V1.0.01.001.01	2019-04-17
UT08a	864608040026044/ 864608040026051	1.01	V1.0.01.001.01	2019-04-17
UT01a	864608040026119/ 864608040026101	1.01	V1.0.01.001.01	2019-04-17

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

AE ID*	Description
AE1	Battery

AE1

Model	BP4003
Manufacturer	FPR Connectivity Technology Inc.
Capacitance	4000mAh(rated)

*AE ID: is used to identify the test sample in the lab internally.

3.4. General Description

The Equipment Under Test (EUT) is a model of Smart LTE Terminal with embedded antenna. Manual and specifications of the EUT were provided to fulfil the test.

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 24	PERSONAL COMMUNICATIONS SERVICES	10-1-18 Edition
FCC Part 22	PUBLIC MOBILE SERVICES	10-1-18 Edition
FCC Part 27	MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES	10-1-18 Edition
FCC Part 90	PRIVATE LAND MOBILE RADIO SERVICES	10-1-18 Edition
ANSI/TIA-603-E	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards	2016
ANSI/TIA-102.CAAA-E	DIGITAL C4FMCQPSK TRANSCEIVER MEASUREMENT METHODS	2016
ANSI C63.26	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services	2015
KDB 971168 D01	MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS	v03r01

5. **LABORATORY ENVIRONMENT**

Fully-anechoic chamber FAC-3 (9 meters×6.5 meters×4 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω
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 4000 MHz

Semi-anechoic chamber SAC-2 (10 meters×6.7meters×6.1meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4Ω
Normalized site attenuation (NSA)	< ± 4 dB, 3m/10m distance, from 30 to 1000 MHz
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

6. SUMMARY OF TEST RESULT

6.1. Summary of test results

LTE Band 2

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	24.232	P
2	Emission Limit	24.238	P
3	Frequency Stability	2.1055	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	24.238	P
6	Band Edge Compliance	24.238	P
7	Conducted Spurious Emission	24.238	P
8	Peak-to-Average Power Ratio	24.232	P

LTE Band 4

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	27.50	P
2	Emission Limit	27.53	P
3	Frequency Stability	2.1055	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	27.53	P
6	Band Edge Compliance	27.53	P
7	Conducted Spurious Emission	27.53	P
8	Peak-to-Average Power Ratio	27.50	P

LTE Band 7

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	27.50	P
2	Emission Limit	27.53	P
3	Frequency Stability	2.1055	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	27.53	P
6	Band Edge Compliance	27.53	P
7	Conducted Spurious Emission	27.53	P
8	Peak-to-Average Power Ratio	27.50	P

LTE Band 12

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	27.50	P
2	Emission Limit	27.53	P
3	Frequency Stability	2.1055	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	27.53	P
6	Band Edge Compliance	27.53	P
7	Conducted Spurious Emission	27.53	P
8	Peak-to-Average Power Ratio	27.50	P

LTE Band 13

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	27.50	P
2	Emission Limit	27.53	P
3	Frequency Stability	2.1055	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	27.53	P
6	Band Edge Compliance	27.53	P
7	Conducted Spurious Emission	27.53	P
8	Peak-to-Average Power Ratio	27.50	P

LTE Band 26(814MHz~824MHz)

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	90.635	P
2	Emission Limit	90.691	P
3	Frequency Stability	2.1055	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	2.1049	P
6	Band Edge Compliance	90.691	P
7	Conducted Spurious Emission	90.691	P

LTE Band 26(824MHz~849MHz)

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	22.913	P
2	Emission Limit	22.917	P
3	Frequency Stability	2.1055	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	22.917	P
6	Band Edge Compliance	22.917	P
7	Conducted Spurious Emission	22.917	P

LTE Band 38

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	27.50	P
2	Emission Limit	27.53	P
3	Frequency Stability	2.1055	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	27.53	P
6	Band Edge Compliance	27.53	P
7	Conducted Spurious Emission	27.53	P
8	Peak-to-Average Power Ratio	27.50	P

Terms used in Verdict column

P	Pass, The EUT complies with the essential requirements in the standard.
NP	Not Perform, The test was not performed by CTTL
NA	Not Applicable,The test was not applicable
BR	Re-use test data from basic model report.
F	Fail, The EUT does not comply with the essential requirements in the standard

6.2. <u>Statements</u>

The test cases listed in section 6.1 of this report for the EUT specified in section 3 were performed by CTTL according to the standards or reference documents in section 4.1

The EUT met all applicable requirements of the standards or reference documents in section 4.1.

This report only deals with the LTE functions among the features described in section 3.

7. Test Equipments Utilized

NO.	Description	TYPE	series number	MANUFACTURE	CAL DUE DATE	Calibration interval
1	Universal Radio Communication Tester	CMW500	159082	R&S	2019-12-25	1 year
2	Spectrum Analyzer	FSU26	200030	R&S	2020-06-03	1 year
3	Climate chamber	SH-242	93008556	ESPEC	2019-12-21	2 year
4	EMI Antenna	VULB9163	9163-235	Schwarzbeck	2019-11-20	1 year
5	EMI Antenna	3117	00058889	ETS-Lindgren	2020-02-02	1 year
6	EMI Antenna	3117	00119024	ETS-Lindgren	2020-02-25	1 year
7	EMI Antenna	9117	177	Schwarzbeck	2019-08-22	1 year
8	Signal Generator	SMF100A	101295	R&S	2019-11-27	1 year
9	Test Receiver	E4440A	MY48250642	Agilent	2020-03-18	1 year
10	Universal Radio Communication Tester	CMW500	143008	R&S	2019-11-26	1 year
11	Power Amplifier	5S1G4	0341863	AR	/	/

ANNEX A: MEASUREMENT RESULTS

A.1 OUTPUT POWER

A.1.1 Summary

During the process of testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication tester (CMW500) to ensure max power transmission and proper modulation.

In all cases, output power is within the specified limits.

A.1.2 Conducted

A.1.2.1 Method of Measurements

The EUT was set up for the max output power with pseudo random data modulation.

These measurements were done at 3 frequencies (bottom, middle and top of operational frequency range) for each bandwidth.

A.1.2.2 Measurement result

LTE band 2

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	1909.3	21.81	20.37
		1880.0	21.84	20.45
		1850.7	21.95	20.51
	1 RB low	1909.3	21.94	20.43
		1880.0	21.88	20.53
		1850.7	21.90	20.22
	50% RB mid	1909.3	22.07	20.47
		1880.0	22.05	20.63
		1850.7	22.05	20.94
	100% RB	1909.3	20.84	19.88
		1880.0	20.88	19.85
		1850.7	20.91	19.87
3MHz	1 RB high	1908.5	21.91	20.29
		1880.0	22.00	20.62
		1851.5	21.98	20.51
	1 RB low	1908.5	21.69	20.41
		1880.0	21.87	20.40
		1851.5	22.09	20.79
	50% RB mid	1908.5	20.90	19.94
		1880.0	20.92	19.88
		1851.5	20.93	19.89
	100% RB	1908.5	20.93	19.94

		1880.0	20.84	20.05
		1851.5	21.02	20.21
5MHz	1 RB high	1907.5	21.97	19.94
		1880.0	21.96	20.71
		1852.5	21.81	20.20
	1 RB low	1907.5	21.95	20.35
		1880.0	21.84	20.66
		1852.5	21.84	20.15
	50% RB mid	1907.5	20.93	19.79
		1880.0	20.88	20.01
		1852.5	20.95	19.99
	100% RB	1907.5	20.90	19.84
		1880.0	20.91	19.95
		1852.5	20.95	19.98
10MHz	1 RB high	1905.0	21.93	20.12
		1880.0	22.22	20.49
		1855.0	22.10	20.16
	1 RB low	1905.0	22.08	20.18
		1880.0	22.02	20.28
		1855.0	22.11	20.29
	50% RB mid	1905.0	20.95	20.00
		1880.0	20.93	20.07
		1855.0	20.96	20.30
	100% RB	1905.0	20.98	20.03
		1880.0	20.91	19.97
		1855.0	20.97	20.18
15MHz	1 RB high	1902.5	21.80	20.08
		1880.0	21.92	19.88
		1857.5	21.87	20.29
	1 RB low	1902.5	21.97	20.17
		1880.0	22.03	20.66
		1857.5	22.02	20.05
	50% RB mid	1902.5	20.96	20.02
		1880.0	20.88	19.87
		1857.5	20.93	20.07
	100% RB	1902.5	20.94	19.99
		1880.0	21.01	19.99
		1857.5	21.01	19.98
20MHz	1 RB high	1900.0	21.89	20.09

		1880.0	21.93	20.40
		1860.0	22.01	20.15
	1 RB low	1900.0	21.83	19.81
		1880.0	22.11	20.18
		1860.0	22.01	20.19
	50% RB mid	1900.0	21.01	19.99
		1880.0	20.92	20.09
		1860.0	20.84	19.90
	100% RB	1900.0	21.00	20.05
		1880.0	21.01	20.01
		1860.0	21.01	20.06

LTE band 4

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	1754.3	19.79	18.83
		1732.5	19.37	18.53
		1710.7	19.67	18.36
	1 RB low	1754.3	19.72	18.56
		1732.5	20.00	18.65
		1710.7	19.54	17.97
	50% RB mid	1754.3	19.74	18.85
		1732.5	19.66	18.42
		1710.7	19.72	18.54
	100% RB	1754.3	18.64	17.61
		1732.5	18.58	17.60
		1710.7	18.63	17.28
3MHz	1 RB high	1753.5	19.71	18.58
		1732.5	19.94	18.45
		1711.5	19.78	18.49
	1 RB low	1753.5	19.56	18.46
		1732.5	19.55	18.55
		1711.5	19.84	18.54
	50% RB mid	1753.5	18.64	17.53
		1732.5	18.69	18.12
		1711.5	18.77	17.66
	100% RB	1753.5	18.68	17.59
		1732.5	18.82	17.62
		1711.5	18.78	17.68
5MHz	1 RB high	1752.5	19.81	18.52
		1732.5	19.44	18.73
		1712.5	19.58	18.15
	1 RB low	1752.5	19.61	18.03
		1732.5	19.26	18.08
		1712.5	19.49	17.84
	50% RB mid	1752.5	18.87	17.75
		1732.5	18.78	17.46
		1712.5	18.83	17.64
	100% RB	1752.5	18.81	17.93
		1732.5	18.76	17.75
		1712.5	18.77	17.60
10MHz	1 RB high	1750	19.88	18.68
		1732.5	19.78	18.50

		1715	19.79	18.75
	1 RB low	1750	19.75	18.55
		1732.5	19.70	17.95
		1715	19.58	18.60
	50% RB mid	1750	18.74	17.75
		1732.5	18.62	17.68
		1715	18.81	17.73
	100% RB	1750	18.81	17.71
		1732.5	18.74	17.52
		1715	18.77	17.63
15MHz	1 RB high	1747.5	19.82	18.61
		1732.5	19.88	18.32
		1717.5	19.64	19.43
	1 RB low	1747.5	19.86	18.79
		1732.5	19.77	18.63
		1717.5	19.46	19.32
	50% RB mid	1747.5	18.69	17.61
		1732.5	18.63	17.77
		1717.5	18.72	17.64
	100% RB	1747.5	18.70	17.67
		1732.5	18.70	17.74
		1717.5	18.67	17.68
20MHz	1 RB high	1745	19.90	19.33
		1732.5	19.94	18.48
		1720	19.40	18.42
	1 RB low	1745	20.02	18.55
		1732.5	19.84	18.39
		1720	19.19	18.23
	50% RB mid	1745	18.88	17.83
		1732.5	18.82	17.65
		1720	18.79	17.81
	100% RB	1745	18.86	17.73
		1732.5	18.82	17.74
		1720	18.81	17.72

LTE band 7

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
5MHz	1 RB high	2567.5	19.58	18.34
		2535	19.58	17.95
		2502.5	19.61	17.81
	1 RB low	2567.5	19.58	18.35
		2535	19.69	18.37
		2502.5	19.19	17.94
	50% RB mid	2567.5	18.73	17.59
		2535	18.72	17.44
		2502.5	18.52	17.21
	100% RB	2567.5	18.66	17.65
		2535	18.71	17.64
		2502.5	18.49	17.34
10MHz	1 RB high	2565	19.89	18.10
		2535	19.91	18.02
		2505	19.61	17.89
	1 RB low	2565	19.75	17.94
		2535	19.81	18.11
		2505	19.16	18.03
	50% RB mid	2565	18.82	17.71
		2535	18.79	17.69
		2505	18.64	17.55
	100% RB	2565	18.81	17.79
		2535	18.78	17.75
		2505	18.67	17.57
15MHz	1 RB high	2562.5	19.88	18.11
		2535	19.87	18.10
		2507.5	19.75	17.96
	1 RB low	2562.5	19.69	18.08
		2535	19.74	18.30
		2507.5	19.24	17.76
	50% RB mid	2562.5	18.78	17.78
		2535	18.71	17.71
		2507.5	18.67	17.43
	100% RB	2562.5	18.86	17.78
		2535	18.79	17.69
		2507.5	18.67	17.52
20MHz	1 RB high	2560	19.86	18.32

		2535	19.71	18.10
		2510	19.63	17.86
	1 RB low	2560	19.70	18.08
		2535	19.72	18.14
		2510	18.61	17.56
	50% RB mid	2560	18.81	17.71
		2535	18.75	17.72
		2510	18.66	17.60
	100% RB	2560	18.86	17.79
		2535	18.81	17.64
		2510	18.70	17.56

LTE band 12

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	715.3	23.71	22.80
		707.5	23.91	23.06
		699.7	24.07	22.73
	1 RB low	715.3	23.91	22.55
		707.5	23.97	22.97
		699.7	23.84	22.19
	50% RB mid	715.3	24.03	22.94
		707.5	24.26	22.99
		699.7	24.09	22.84
	100% RB	715.3	22.92	21.31
		707.5	23.16	22.00
		699.7	23.17	22.46
3MHz	1 RB high	714.5	23.99	22.76
		707.5	24.10	22.69
		700.5	24.02	22.64
	1 RB low	714.5	23.71	22.44
		707.5	24.13	22.86
		700.5	23.70	22.16
	50% RB mid	714.5	22.93	22.27
		707.5	23.24	22.04
		700.5	23.03	22.31
	100% RB	714.5	22.91	22.19
		707.5	23.16	22.18
		700.5	23.13	22.21
5MHz	1 RB high	713.5	23.81	22.18
		707.5	23.95	22.30
		701.5	23.94	22.57
	1 RB low	713.5	23.71	22.20
		707.5	23.95	22.80
		701.5	23.89	22.46
	50% RB mid	713.5	22.88	21.84
		707.5	23.10	22.15
		701.5	23.07	21.81
	100% RB	713.5	22.86	21.93
		707.5	23.04	22.00
		701.5	22.99	22.16
10MHz	1 RB high	711.0	23.91	22.60
		707.5	23.88	22.56

		704.0	24.22	22.74
	1 RB low	711.0	23.96	22.73
		707.5	23.96	22.24
		704.0	23.80	22.69
	50% RB mid	711.0	22.99	22.08
		707.5	22.98	22.05
		704.0	23.13	22.02
	100% RB	711.0	23.01	22.08
		707.5	23.10	22.26
		704.0	23.12	22.25

LTE band 13

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
5MHz	1 RB high	784.5	23.35	22.05
		782	23.28	21.89
		779.5	23.21	21.86
	1 RB low	784.5	23.25	21.51
		782	23.20	22.03
		779.5	23.23	22.07
	50% RB mid	784.5	22.42	21.18
		782	22.39	21.19
		779.5	22.27	21.06
	100% RB	784.5	22.36	21.30
		782	22.34	21.34
		779.5	22.25	21.25
10MHz	1 RB high	782.0	23.38	22.05
	1 RB low	782.0	23.06	21.41
	50% RB mid	782.0	22.34	21.36
	100% RB	782.0	22.41	21.33

LTE band 26(814MHz~824MHz)

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	823.3	22.35	20.98
		819.0	22.48	21.15
		814.7	22.46	21.24
	1 RB low	823.3	22.27	21.09
		819.0	22.35	21.01
		814.7	22.39	21.58
	50% RB mid	823.3	22.42	21.43
		819.0	22.38	21.25
		814.7	22.25	21.36
	100% RB	823.3	21.40	20.20
		819.0	21.23	20.28
		814.7	21.17	20.25
3MHz	1 RB high	822.5	22.22	21.85
		819.0	22.30	21.23
		815.5	22.34	21.76
	1 RB low	822.5	22.72	22.06
		819.0	22.46	21.91
		815.5	22.30	21.31
	50% RB mid	822.5	21.28	20.77
		819.0	21.28	20.51
		815.5	21.13	20.35
	100% RB	822.5	21.31	20.43
		819.0	21.32	20.28
		815.5	21.16	20.08
5MHz	1 RB high	821.5	21.91	21.38
		819.0	21.92	21.68
		816.5	22.41	21.72
	1 RB low	821.5	22.40	21.74
		819.0	22.06	21.16
		816.5	22.31	21.44
	50% RB mid	821.5	21.45	20.38
		819.0	21.27	20.10
		816.5	21.13	20.12
	100% RB	821.5	21.38	20.30
		819.0	21.18	20.25
		816.5	21.10	20.24
10MHz	1 RB high	819.0	22.44	21.56
	1 RB low	819.0	22.29	21.82

| | 50% RB mid | 819.0 | 21.32 | 20.35 |
| | 100% RB | 819.0 | 21.29 | 20.16 |

LTE band 26(824MHz~849MHz)

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	848.3	22.24	21.52
		836.5	22.08	21.25
		824.7	22.55	21.42
	1 RB low	848.3	22.25	21.26
		836.5	22.19	20.85
		824.7	22.39	21.49
	50% RB mid	848.3	22.32	20.98
		836.5	22.45	21.34
		824.7	22.25	21.46
	100% RB	848.3	21.40	20.18
		836.5	21.20	20.29
		824.7	21.30	20.11
3MHz	1 RB high	847.5	22.28	21.45
		836.5	22.48	21.87
		825.5	22.22	22.04
	1 RB low	847.5	22.35	21.18
		836.5	22.34	21.23
		825.5	22.68	21.83
	50% RB mid	847.5	21.25	20.67
		836.5	21.23	20.42
		825.5	21.26	20.48
	100% RB	847.5	21.31	20.32
		836.5	21.30	20.15
		825.5	21.23	20.15
5MHz	1 RB high	846.5	22.18	21.09
		836.5	22.21	20.98
		826.5	21.91	21.46
	1 RB low	846.5	22.21	21.28
		836.5	22.14	21.26
		826.5	22.28	21.55
	50% RB mid	846.5	21.31	20.26
		836.5	21.17	20.06
		826.5	21.36	20.25
	100% RB	846.5	21.37	20.31
		836.5	21.14	20.18
		826.5	21.29	20.31
10MHz	1 RB high	844.0	22.14	21.57
		836.5	22.19	21.63

		829.0	22.40	21.45
	1 RB low	844.0	22.24	21.27
		836.5	22.26	21.73
		829.0	22.40	21.40
	50% RB mid	844.0	21.27	20.25
		836.5	21.22	20.14
		829.0	21.26	20.01
	100% RB	844.0	21.26	20.24
		836.5	21.18	20.21
		829.0	21.21	20.23
15MHz	1 RB high	841.5	22.24	21.30
		836.5	22.43	21.80
		831.5	22.16	21.42
	1 RB low	841.5	22.07	21.04
		836.5	22.30	21.67
		831.5	22.25	21.48
	50% RB mid	841.5	21.20	20.32
		836.5	21.15	20.22
		831.5	21.26	20.41
	100% RB	841.5	21.17	20.13
		836.5	21.14	20.29
		831.5	21,19	20.18

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Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
5MHz	1 RB high	2617.5	18.87	18.15
		2595.0	18.88	17.66
		2572.5	18.79	17.09
	1 RB low	2617.5	19.02	18.06
		2595.0	18.84	17.63
		2572.5	18.79	17.18
	50% RB mid	2617.5	18.06	17.14
		2595.0	18.06	16.88
		2572.5	17.78	16.89
	100% RB	2617.5	18.02	16.96
		2595.0	18.01	17.06
		2572.5	17.86	16.78
10MHz	1 RB high	2615.0	18.75	17.27
		2595.0	18.90	19.09
		2575.0	18.82	18.04
	1 RB low	2615.0	18.91	17.28
		2595.0	18.88	19.03
		2575.0	18.83	18.23
	50% RB mid	2615.0	18.07	16.92
		2595.0	17.93	16.98
		2575.0	17.78	16.86
	100% RB	2615.0	18.06	16.99
		2595.0	18.00	16.93
		2575.0	17.82	16.93
15MHz	1 RB high	2612.5	19.00	17.32
		2595.0	19.18	18.24
		2577.5	18.77	18.34
	1 RB low	2612.5	19.06	17.49
		2595.0	19.27	18.24
		2577.5	18.83	18.31
	50% RB mid	2612.5	17.99	16.93
		2595.0	17.96	16.83
		2577.5	17.84	16.63
	100% RB	2612.5	17.94	16.98
		2595.0	17.93	17.03
		2577.5	17.80	16.80
20MHz	1 RB high	2610.0	18.76	17.16

		2595.0	19.00	18.13
		2580.0	19.01	17.46
	1 RB low	2610.0	18.92	17.32
		2595.0	19.36	18.18
		2580.0	18.92	17.45
	50% RB mid	2610.0	17.94	16.99
		2595.0	17.93	16.92
		2580.0	17.88	16.88
	100% RB	2610.0	17.94	16.86
		2595.0	18.01	16.95
		2580.0	17.89	16.86

A.1.3 Radiated

A.1.3.1 Description

This is the test for the maximum radiated power from the EUT.

Rule Part 22.913(a) specifies "Mobile stations are limited to 2.0 watts EIRP.".

Rule Part 24.232(b) specifies, "Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power" and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage."

Rule Part 27.50(d) specifies "Fixed, mobile, and portable (handheld) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP".

Rule Part 27.50(h)(2) specifies "Mobile stations are limited to 2.0 watts EIRP.".

Rule Part 27.50(c) specifies "Portable stations (hand-held de-vices) are limited to 3 watts ERP.".
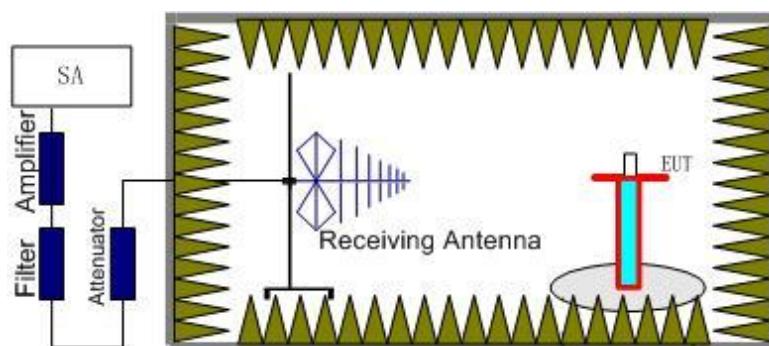
Rule Part 27.50(a)(3) specifies "For mobile and portable stations transmitting in the 2305–2315 MHz band or the 2350–2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth."

Rule Part 90.635(b) specifies "The maximum output power of the transmitter for mobile stations is 100 watts(50dBm)".
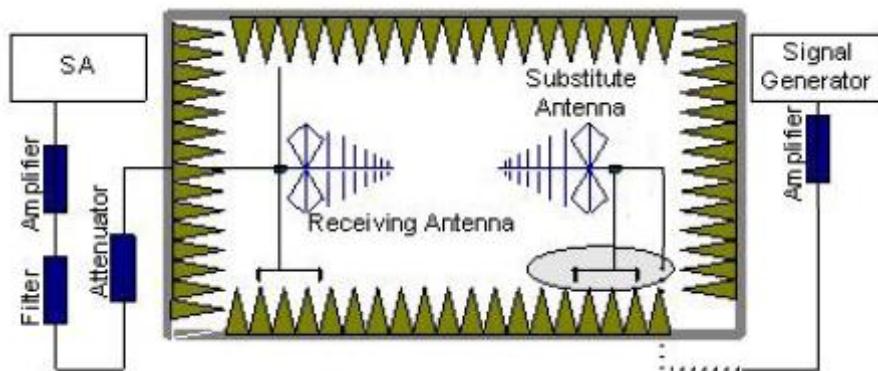
A.1.3.2 Method of Measurement

The measurements procedures in TIA-603E-2016 are used.

1. EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.

2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).
3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.

In the chamber, a substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna. Adjust the level of the signal generator output until the value of the receiver reaches the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. An amplifier should be connected to the Signal Source output port. And the cable should be connected between the amplifier and the substitution antenna.

   The cable loss (P_{cl}), the substitution antenna Gain (G_a) and the amplifier Gain (P_{Ag}) should be recorded after test.

   The measurement results are obtained as described below:

   Power (EIRP) = P_{Mea} - P_{Ag} - P_{cl} - G_a

5. This value is EIRP since the measurement is calibrated using an antenna of known gain (unit dBi) and known input power.

6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15.

A.1.3.3 Measurement result

LTE Band 2- EIRP

Limits: ≤33dBm (2W)

LTE Band 2_1.4MHz_QPSK

Frequency(MHz)	P$_{Mea}$(dBm)	P$_{cl}$(dB)	P$_{Ag}$(dB)	G$_a$ (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1850.70	-22.82	2.92	43.75	4.87	22.88	33.00	10.12	H
1880.00	-22.73	2.85	43.75	4.82	22.99	33.00	10.01	H
1909.30	-21.52	2.87	43.77	4.76	24.14	33.00	8.86	H

LTE Band 2_3MHz_QPSK

Frequency(MHz)	P$_{Mea}$(dBm)	P$_{cl}$(dB)	P$_{Ag}$(dB)	G$_a$ (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1851.50	-22.88	2.87	43.75	4.87	22.87	33.00	10.13	H
1880.00	-22.74	2.85	43.75	4.82	22.98	33.00	10.02	H
1908.50	-21.72	2.89	43.78	4.76	23.93	33.00	9.07	H

LTE Band 2_5MHz_QPSK

Frequency(MHz)	P$_{Mea}$(dBm)	P$_{cl}$(dB)	P$_{Ag}$(dB)	G$_a$ (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1852.50	-23.25	2.87	43.75	4.87	22.50	33.00	10.50	H
1880.00	-22.72	2.85	43.75	4.82	23.00	33.00	10.00	H
1907.50	-22.01	2.84	43.77	4.77	23.69	33.00	9.31	H

LTE Band 2_10MHz_QPSK

Frequency(MHz)	P$_{Mea}$(dBm)	P$_{cl}$(dB)	P$_{Ag}$(dB)	G$_a$ (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1855.00	-23.20	2.88	43.74	4.86	22.52	33.00	10.48	H
1880.00	-22.88	2.85	43.75	4.82	22.84	33.00	10.16	V
1905.00	-22.21	2.87	43.77	4.77	23.46	33.00	9.54	H

LTE Band 2_15MHz_QPSK

Frequency(MHz)	P$_{Mea}$(dBm)	P$_{cl}$(dB)	P$_{Ag}$(dB)	G$_a$ (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1857.50	-23.28	2.87	43.75	4.86	22.46	33.00	10.54	H
1880.00	-22.66	2.85	43.75	4.82	23.06	33.00	9.94	H
1902.50	-22.23	2.86	43.77	4.78	23.46	33.00	9.54	H

LTE Band 2_20 MHz_QPSK

Frequency(MHz)	P$_{Mea}$(dBm)	P$_{cl}$(dB)	P$_{Ag}$(dB)	G$_a$ (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1860.00	-23.24	2.86	43.75	4.85	22.50	33.00	10.50	H
1880.00	-22.78	2.85	43.75	4.82	22.94	33.00	10.06	H
1900.00	-22.11	2.87	43.77	4.78	23.57	33.00	9.43	H

LTE Band 2_1.4MHz_16QAM

Frequency(MHz)	P_Mea(dBm)	P_cl(dB)	P_Ag(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1850.70	-23.77	2.92	43.75	4.87	21.93	33.00	11.07	H
1880.00	-23.61	2.85	43.75	4.82	22.11	33.00	10.89	H
1909.30	-22.27	2.87	43.77	4.76	23.39	33.00	9.61	H

LTE Band 2_3MHz_16QAM

Frequency(MHz)	P_Mea(dBm)	P_cl(dB)	P_Ag(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1851.50	-23.80	2.87	43.75	4.87	21.95	33.00	11.05	H
1880.00	-23.62	2.85	43.75	4.82	22.10	33.00	10.90	H
1908.50	-22.48	2.89	43.78	4.76	23.17	33.00	9.83	H

LTE Band 2_5MHz_16QAM

Frequency(MHz)	P_Mea(dBm)	P_cl(dB)	P_Ag(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1852.50	-24.39	2.87	43.75	4.87	21.36	33.00	11.64	H
1880.00	-23.53	2.85	43.75	4.82	22.19	33.00	10.81	H
1907.50	-22.87	2.84	43.77	4.77	22.83	33.00	10.17	H

LTE Band 2_10MHz_16QAM

Frequency(MHz)	P_Mea(dBm)	P_cl(dB)	P_Ag(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1855.00	-24.04	2.88	43.74	4.86	21.68	33.00	11.32	H
1880.00	-23.51	2.85	43.75	4.82	22.21	33.00	10.79	V
1905.00	-23.35	2.87	43.77	4.77	22.32	33.00	10.68	H

LTE Band 2_15MHz_16QAM

Frequency(MHz)	P_Mea(dBm)	P_cl(dB)	P_Ag(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1857.50	-24.40	2.87	43.75	4.86	21.34	33.00	11.66	H
1880.00	-24.10	2.85	43.75	4.82	21.62	33.00	11.38	H
1902.50	-23.08	2.86	43.77	4.78	22.61	33.00	10.39	H

LTE Band 2_20 MHz_16QAM

Frequency(MHz)	P_Mea(dBm)	P_cl(dB)	P_Ag(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1860.00	-24.20	2.86	43.75	4.85	21.54	33.00	11.46	H
1880.00	-23.61	2.85	43.75	4.82	22.11	33.00	10.89	H
1900.00	-22.89	2.87	43.77	4.78	22.79	33.00	10.21	H

LTE Band 4- EIRP

Limits: ≤30dBm (1W)

LTE Band 4_1.4MHz_QPSK

Frequency(MHz)	P$_{Mea}$(dBm)	P$_{cl}$(dB)	P$_{Ag}$(dB)	G$_a$ (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1710.70	-24.95	3.17	44.10	5.12	21.10	30.00	8.90	H
1732.50	-25.19	3.33	44.14	5.08	20.70	30.00	9.30	H
1754.30	-22.73	3.76	44.14	5.04	22.69	30.00	7.31	H

LTE Band 4_3MHz_QPSK

Frequency(MHz)	P$_{Mea}$(dBm)	P$_{cl}$(dB)	P$_{Ag}$(dB)	G$_a$ (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1711.50	-25.33	3.40	44.10	5.12	20.49	30.00	9.51	H
1732.50	-25.23	3.33	44.14	5.08	20.66	30.00	9.34	H
1753.50	-23.08	3.80	44.13	5.04	22.29	30.00	7.71	H

LTE Band 4_5MHz_QPSK

Frequency(MHz)	P$_{Mea}$(dBm)	P$_{cl}$(dB)	P$_{Ag}$(dB)	G$_a$ (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1712.50	-24.95	3.66	44.10	5.12	20.61	30.00	9.39	H
1732.50	-25.32	3.33	44.14	5.08	20.57	30.00	9.43	H
1752.50	-22.84	3.82	44.14	5.05	22.53	30.00	7.47	H

LTE Band 4_10MHz_QPSK

Frequency(MHz)	P$_{Mea}$(dBm)	P$_{cl}$(dB)	P$_{Ag}$(dB)	G$_a$ (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1715.00	-25.00	3.56	44.10	5.11	20.65	30.00	9.35	H
1732.50	-25.21	3.33	44.14	5.08	20.68	30.00	9.32	H
1750.00	-24.07	3.00	44.15	5.05	22.13	30.00	7.87	H

LTE Band 4_15MHz_QPSK

Frequency(MHz)	P$_{Mea}$(dBm)	P$_{cl}$(dB)	P$_{Ag}$(dB)	G$_a$ (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1717.50	-25.06	3.47	44.11	5.11	20.69	30.00	9.31	H
1732.50	-24.96	3.33	44.14	5.08	20.93	30.00	9.07	H
1747.50	-24.05	3.34	44.15	5.05	21.81	30.00	8.19	H

LTE Band 4_20MHz_QPSK

Frequency(MHz)	P$_{Mea}$(dBm)	P$_{cl}$(dB)	P$_{Ag}$(dB)	G$_a$ (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1720.00	-25.04	3.37	44.11	5.10	20.80	30.00	9.20	H
1732.50	-24.91	3.33	44.14	5.08	20.98	30.00	9.02	H
1745.00	-23.80	3.68	44.16	5.06	21.74	30.00	8.26	H

LTE Band 4_1.4MHz_16QAM

Frequency(MHz)	P_Mea(dBm)	P_cl(dB)	P_Ag(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1710.70	-25.93	3.17	44.10	5.12	20.12	30.00	9.88	H
1732.50	-25.94	3.33	44.14	5.08	19.95	30.00	10.05	H
1754.30	-23.54	3.76	44.14	5.04	21.88	30.00	8.12	H

LTE Band 4_3MHz_16QAM

Frequency(MHz)	P_Mea(dBm)	P_cl(dB)	P_Ag(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1711.50	-26.17	3.40	44.10	5.12	19.65	30.00	10.35	H
1732.50	-26.49	3.33	44.14	5.08	19.40	30.00	10.60	H
1753.50	-23.74	3.80	44.13	5.04	21.63	30.00	8.37	H

LTE Band 4_5MHz_16QAM

Frequency(MHz)	P_Mea(dBm)	P_cl(dB)	P_Ag(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1712.50	-25.74	3.66	44.10	5.12	19.82	30.00	10.18	H
1732.50	-26.19	3.33	44.14	5.08	19.70	30.00	10.30	H
1752.50	-23.71	3.82	44.14	5.05	21.66	30.00	8.34	H

LTE Band 4_10MHz_16QAM

Frequency(MHz)	P_Mea(dBm)	P_cl(dB)	P_Ag(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1715.00	-25.84	3.56	44.10	5.11	19.81	30.00	10.19	H
1732.50	-26.08	3.33	44.14	5.08	19.81	30.00	10.19	H
1750.00	-25.03	3.00	44.15	5.05	21.17	30.00	8.83	H

LTE Band 4_15MHz_16QAM

Frequency(MHz)	P_Mea(dBm)	P_cl(dB)	P_Ag(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1717.50	-25.70	3.47	44.11	5.11	20.05	30.00	9.95	H
1732.50	-26.37	3.33	44.14	5.08	19.52	30.00	10.48	H
1747.50	-25.59	3.34	44.15	5.05	20.27	30.00	9.73	H

LTE Band 4_20MHz_16QAM

Frequency(MHz)	P_Mea(dBm)	P_cl(dB)	P_Ag(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1720.00	-26.63	3.37	44.11	5.10	19.21	30.00	10.79	H
1732.50	-25.86	3.33	44.14	5.08	20.03	30.00	9.97	H
1745.00	-24.84	3.68	44.16	5.06	20.70	30.00	9.30	H

LTE Band 7- EIRP

Limits: ≤33 dBm (2W)

LTE Band 7_5MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2502.50	-21.99	3.58	45.68	6.10	26.21	33.00	6.79	H
2535.00	-20.45	3.63	44.82	6.16	26.90	33.00	6.10	H
2567.50	-20.15	3.65	44.92	6.22	27.34	33.00	5.66	H

LTE Band 7_10MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2505.00	-21.89	3.59	45.64	6.11	26.27	33.00	6.73	H
2535.00	-20.59	3.63	44.82	6.16	26.76	33.00	6.24	H
2565.00	-19.91	3.65	44.97	6.22	27.63	33.00	5.37	H

LTE Band 7_15MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2507.50	-21.16	3.59	44.92	6.11	26.28	33.00	6.72	H
2535.00	-20.60	3.63	44.82	6.16	26.75	33.00	6.25	H
2562.50	-20.78	3.65	45.67	6.21	27.45	33.00	5.55	H

LTE Band 7_20MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2510.00	-21.12	3.58	45.36	6.12	26.78	33.00	6.22	H
2535.00	-20.48	3.63	44.82	6.16	26.87	33.00	6.13	H
2560.00	-21.34	3.64	45.98	6.21	27.21	33.00	5.79	H

LTE Band 7_5MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2502.50	-23.40	3.58	45.68	6.10	24.80	33.00	8.20	H
2535.00	-21.35	3.63	44.82	6.16	26.00	33.00	7.00	H
2567.50	-21.74	3.65	44.92	6.22	25.75	33.00	7.25	H

LTE Band 7_10MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2505.00	-22.40	3.59	45.64	6.11	25.76	33.00	7.24	H
2535.00	-21.42	3.63	44.82	6.16	25.93	33.00	7.07	H
2565.00	-21.30	3.65	44.97	6.22	26.24	33.00	6.76	H

LTE Band 7_15MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2507.50	-21.56	3.59	44.92	6.11	25.88	33.00	7.12	H
2535.00	-21.69	3.63	44.82	6.16	25.66	33.00	7.34	H
2562.50	-22.05	3.65	45.67	6.21	26.18	33.00	6.82	H

LTE Band 7_20MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2510.00	-22.47	3.58	45.36	6.12	25.43	33.00	7.57	H
2535.00	-21.03	3.63	44.82	6.16	26.32	33.00	6.68	H
2560.00	-21.40	3.64	45.98	6.21	27.15	33.00	5.85	H

LTE Band 12 - ERP

Limits: ≤34.77dBm (3W)

LTE Band 12_1.4MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
699.70	-30.71	1.90	44.66	0.77	2.15	10.67	34.77	24.10	H
707.50	-31.08	1.91	44.94	0.62	2.15	10.42	34.77	24.35	H
715.30	-31.30	1.92	45.26	0.50	2.15	10.39	34.77	24.38	H

LTE Band 12_3MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
700.50	-30.36	1.90	44.68	0.76	2.15	11.03	34.77	23.74	H
707.50	-31.33	1.91	44.94	0.62	2.15	10.17	34.77	24.60	H
714.50	-31.21	1.92	45.26	0.50	2.15	10.48	34.77	24.29	H

LTE Band 12_5MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
701.50	-30.93	1.90	44.81	0.74	2.15	10.57	34.77	24.20	H
707.50	-31.47	1.91	44.94	0.62	2.15	10.03	34.77	24.74	H
713.50	-31.49	1.92	45.22	0.50	2.15	10.16	34.77	24.61	H

LTE Band 12_10MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
704.00	-30.67	1.91	44.93	0.70	2.15	10.90	34.77	23.87	H
707.50	-31.30	1.91	44.94	0.62	2.15	10.20	34.77	24.57	H
711.00	-31.57	1.92	45.19	0.53	2.15	10.08	34.77	24.69	H

LTE Band 12_1.4MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
699.70	-31.27	1.90	44.66	0.77	2.15	10.11	34.77	24.66	H
707.50	-31.93	1.91	44.94	0.62	2.15	9.57	34.77	25.20	H
715.30	-32.82	1.92	45.26	0.50	2.15	8.87	34.77	25.90	H

LTE Band 12_3MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
700.50	-31.34	1.90	44.68	0.76	2.15	10.05	34.77	24.72	H
707.50	-32.38	1.91	44.94	0.62	2.15	9.12	34.77	25.65	H
714.50	-32.51	1.92	45.26	0.50	2.15	9.18	34.77	25.59	H

LTE Band 12_5MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
701.50	-31.59	1.90	44.81	0.74	2.15	9.91	34.77	24.86	H
707.50	-32.60	1.91	44.94	0.62	2.15	8.90	34.77	25.87	H
713.50	-32.17	1.92	45.22	0.50	2.15	9.48	34.77	25.29	H

LTE Band 12_10MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
704.00	-31.60	1.91	44.93	0.70	2.15	9.97	34.77	24.80	H
707.50	-32.37	1.91	44.94	0.62	2.15	9.13	34.77	25.64	H
711.00	-32.44	1.92	45.19	0.53	2.15	9.21	34.77	25.56	H

LTE Band 13- ERP

Limits: ≤34.77 dBm (3W)

LTE Band 13_5MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
779.50	-28.80	2.01	45.64	0.04	2.15	12.72	34.77	22.05	H
782.00	-28.51	2.01	45.65	0.09	2.15	13.07	34.77	21.70	H
784.50	-28.57	2.01	45.67	0.16	2.15	13.10	34.77	21.67	H

LTE Band 13_10MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
782.00	-28.66	2.01	45.65	0.09	2.15	12.92	34.77	21.85	H

LTE Band 13_5MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
779.50	-29.79	2.01	45.64	0.04	2.15	11.73	34.77	23.04	V
782.00	-29.14	2.01	45.65	0.09	2.15	12.44	34.77	22.33	H
784.50	-29.37	2.01	45.67	0.16	2.15	12.30	34.77	22.47	H

LTE Band 13_10MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
782.00	-29.42	2.01	45.65	0.09	2.15	12.16	34.77	22.61	H

LTE Band 26(814MHz~824MHz)- ERP

Limits: ≤50dBm (100W)

LTE Band 26_1.4MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
814.70	-25.11	2.13	45.86	0.89	2.15	17.36	50.00	32.64	H
819.00	-24.34	2.19	45.84	1.05	2.15	18.21	50.00	31.79	H
823.30	-23.50	2.24	45.79	0.55	2.15	18.45	50.00	31.55	H

LTE Band 26_3MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
815.50	-25.42	2.14	45.87	0.93	2.15	17.09	50.00	32.91	H
819.00	-24.79	2.19	45.84	1.05	2.15	17.76	50.00	32.24	H
822.50	-23.50	2.23	45.81	0.33	2.15	18.26	50.00	31.74	H

LTE Band 26_5MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
816.50	-25.05	2.16	45.88	0.98	2.15	17.50	50.00	32.50	H
819.00	-24.72	2.19	45.84	1.05	2.15	17.83	50.00	32.17	H
821.50	-23.98	2.22	45.82	0.71	2.15	18.18	50.00	31.82	H

LTE Band 26_10MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
819.00	-24.50	2.19	45.84	1.05	2.15	18.05	50.00	31.95	H

LTE Band 26_1.4MHz_16QAM

Frequency(MHz)	P$_{Mea}$(dBm)	P$_{cl}$(dB)	P$_{Ag}$(dB)	G$_a$ (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
814.70	-26.09	2.13	45.86	0.89	2.15	16.38	50.00	33.62	H
819.00	-25.52	2.19	45.84	1.05	2.15	17.03	50.00	32.97	H
823.30	-24.25	2.24	45.79	0.55	2.15	17.70	50.00	32.30	H

LTE Band 26_3MHz_16QAM

Frequency(MHz)	P$_{Mea}$(dBm)	P$_{cl}$(dB)	P$_{Ag}$(dB)	G$_a$ (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
815.50	-26.55	2.14	45.87	0.93	2.15	15.96	50.00	34.04	H
819.00	-25.75	2.19	45.84	1.05	2.15	16.80	50.00	33.20	H
822.50	-23.80	2.23	45.81	0.33	2.15	17.96	50.00	32.04	H

LTE Band 26_5MHz_16QAM

Frequency(MHz)	P$_{Mea}$(dBm)	P$_{cl}$(dB)	P$_{Ag}$(dB)	G$_a$ (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
816.50	-25.93	2.16	45.88	0.98	2.15	16.62	50.00	33.38	H
819.00	-26.22	2.19	45.84	1.05	2.15	16.33	50.00	33.67	H
821.50	-25.21	2.22	45.82	0.71	2.15	16.95	50.00	33.05	H

LTE Band 26_10MHz_16QAM

Frequency(MHz)	P$_{Mea}$(dBm)	P$_{cl}$(dB)	P$_{Ag}$(dB)	G$_a$ (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
819.00	-25.38	2.19	45.84	1.05	2.15	17.17	50.00	32.83	H

LTE Band 26(824MHz~849MHz)- ERP

Limits: ≤38.45dBm (7W)

LTE Band 26_1.4MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
824.70	-23.57	2.26	45.79	0.95	2.15	18.76	38.45	19.69	H
836.50	-22.55	2.26	45.66	0.82	2.15	19.52	38.45	18.93	H
848.30	-23.91	2.27	45.55	0.80	2.15	18.02	38.45	20.43	H

LTE Band 26_3MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
825.50	-23.85	2.26	45.79	0.94	2.15	18.47	38.45	19.98	H
836.50	-23.10	2.26	45.66	0.82	2.15	18.97	38.45	19.48	H
847.50	-23.62	2.27	45.56	0.81	2.15	18.33	38.45	20.12	H

LTE Band 26_5MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
826.50	-23.83	2.25	45.77	0.93	2.15	18.47	38.45	19.98	H
836.50	-22.91	2.26	45.66	0.82	2.15	19.16	38.45	19.29	H
846.50	-23.41	2.26	45.56	0.82	2.15	18.56	38.45	19.89	H

LTE Band 26_10MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
829.00	-23.46	2.13	45.74	0.90	2.15	18.90	38.45	19.55	H
836.50	-22.85	2.26	45.66	0.82	2.15	19.22	38.45	19.23	H
844.00	-23.67	2.26	45.59	0.82	2.15	18.33	38.45	20.12	H

LTE Band 26_15MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
831.50	-23.45	2.12	45.71	0.87	2.15	18.86	38.45	19.59	H
836.50	-23.11	2.26	45.66	0.82	2.15	18.96	38.45	19.49	H
841.50	-23.71	2.26	45.61	0.82	2.15	18.31	38.45	20.14	H

LTE Band 26_1.4MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
824.70	-24.50	2.26	45.79	0.95	2.15	17.83	38.45	20.62	H
836.50	-23.74	2.26	45.66	0.82	2.15	18.33	38.45	20.12	H
848.30	-24.72	2.27	45.55	0.80	2.15	17.21	38.45	21.24	H

LTE Band 26_3MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
825.50	-24.39	2.26	45.79	0.94	2.15	17.93	38.45	20.52	H
836.50	-24.21	2.26	45.66	0.82	2.15	17.86	38.45	20.59	H
847.50	-24.77	2.27	45.56	0.81	2.15	17.18	38.45	21.27	H

LTE Band 26_5MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
826.50	-24.99	2.25	45.77	0.93	2.15	17.31	38.45	21.14	H
836.50	-24.37	2.26	45.66	0.82	2.15	17.70	38.45	20.75	H
846.50	-24.21	2.26	45.56	0.82	2.15	17.76	38.45	20.69	H

LTE Band 26_10MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
829.00	-24.53	2.13	45.74	0.90	2.15	17.83	38.45	20.62	H
836.50	-24.01	2.26	45.66	0.82	2.15	18.06	38.45	20.39	H
844.00	-24.86	2.26	45.59	0.82	2.15	17.14	38.45	21.31	H

LTE Band 26_15MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
831.50	-24.66	2.12	45.71	0.87	2.15	17.65	38.45	20.80	H
836.50	-23.76	2.26	45.66	0.82	2.15	18.31	38.45	20.14	H
841.50	-24.90	2.26	45.61	0.82	2.15	17.12	38.45	21.33	H

LTE Band 38- EIRP

Limits: ≤33dBm (2W)

LTE Band 38_5MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2572.50	-29.37	3.66	44.92	6.23	18.12	33.00	14.88	H
2595.00	-28.72	3.69	44.91	6.27	18.77	33.00	14.23	H
2617.50	-28.89	3.68	44.94	6.31	18.68	33.00	14.32	H

LTE Band 38_10MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2575.00	-29.18	3.66	44.92	6.23	18.31	33.00	14.69	H
2595.00	-28.68	3.69	44.91	6.27	18.81	33.00	14.19	H
2615.00	-29.05	3.68	44.94	6.31	18.52	33.00	14.48	H

LTE Band 38_15MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2577.50	-29.35	3.66	44.92	6.23	18.14	33.00	14.86	H
2595.00	-28.59	3.69	44.91	6.27	18.90	33.00	14.10	H
2612.50	-29.19	3.68	44.94	6.30	18.37	33.00	14.63	H

LTE Band 38_20MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2580.00	-29.21	3.67	44.92	6.24	18.28	33.00	14.72	H
2595.00	-28.46	3.69	44.91	6.27	19.03	33.00	13.97	H
2610.00	-29.13	3.68	44.94	6.30	18.43	33.00	14.57	H

LTE Band 38_5MHz_16QAM

Frequency(MHz)	P_Mea(dBm)	P_cl(dB)	P_Ag(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2572.50	-30.34	3.66	44.92	6.23	17.15	33.00	15.85	H
2595.00	-29.68	3.69	44.91	6.27	17.81	33.00	15.19	H
2617.50	-29.46	3.68	44.94	6.31	18.11	33.00	14.89	H

LTE Band 38_10MHz_16QAM

Frequency(MHz)	P_Mea(dBm)	P_cl(dB)	P_Ag(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2575.00	-29.57	3.66	44.92	6.23	17.92	33.00	15.08	H
2595.00	-29.55	3.69	44.91	6.27	17.94	33.00	15.06	H
2615.00	-29.34	3.68	44.94	6.31	18.23	33.00	14.77	H

LTE Band 38_15MHz_16QAM

Frequency(MHz)	P_Mea(dBm)	P_cl(dB)	P_Ag(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2577.50	-29.77	3.66	44.92	6.23	17.72	33.00	15.28	H
2595.00	-29.87	3.69	44.91	6.27	17.62	33.00	15.38	H
2612.50	-30.22	3.68	44.94	6.30	17.34	33.00	15.66	H

LTE Band 38_20MHz_16QAM

Frequency(MHz)	P_Mea(dBm)	P_cl(dB)	P_Ag(dB)	G_a (dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2580.00	-30.01	3.67	44.92	6.24	17.48	33.00	15.52	H
2595.00	-29.11	3.69	44.91	6.27	18.38	33.00	14.62	H
2610.00	-29.63	3.68	44.94	6.30	17.93	33.00	15.07	H

Peak EIRP(dBm) = P_{Mea}(-19.91dBm) - G_a (-6.22dBi) - P_{Ag} (-44.97dB) - P_{cl} (3.65dB) = 27.63dBm

Note: Expanded measurement uncertainty is U = 2.84 dB, k = 2.

A.2 EMISSION LIMIT
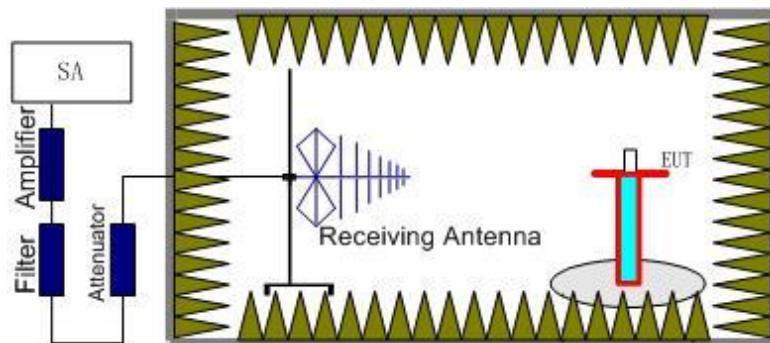
A.2.1 Measurement Method

The measurements procedures in TIA-603E-2016 are used. This measurement is carried out in fully-anechoic chamber FAC-3.
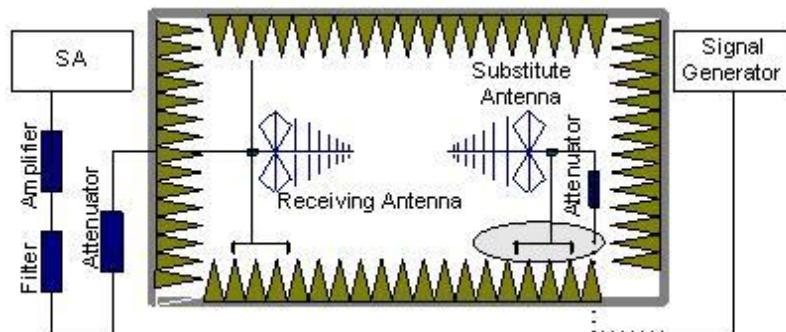
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier. The resolution bandwidth is set 1MHz. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the LTE Bands 2 4 5 7 12 13 26 38.

The procedure of radiated spurious emissions is as follows:

1. EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector.

2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).

3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.

In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna. Adjust the level of the signal generator output until the value of the

receiver reaches the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. The Path loss (P_{pl}) between the Signal Source with the Substitution Antenna and the Substitution Antenna Gain (G_a) should be recorded after test.

   An amplifier should be connected in for the test.

   The Path loss (P_{pl}) is the summation of the cable loss and the gain of the amplifier.

   The measurement results are obtained as described below:

   Power (EIRP)=P_{Mea}+ P_{pl} + G_a

5. This value is EIRP since the measurement is calibrated using an antenna of known gain (unit: dBi) and known input power.

6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dB.

A.2.2 Measurement Limit

Part 22.917, Part 24.238 and Part 27.53(h) specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

Part 27.53(m)(4) specifies for mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Part 27.53(c) states for operations in the 746-758 MHz band and the 776-788 MHz band, 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 any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

Part 27.53(a) states for mobile and portable stations operating in the 2305–2315 MHz and 2350–2360 MHz bands: By a factor of not less than: 43 +10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337MHz; By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296 MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292 MHz, and 70 + 10 log (P) dB below 2288 MHz; By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.

Part 90.691 states that out-of-band emission requirement shall apply only to the ''outer'' channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 Log_{10}(f/6.1)$ decibels or $50 + 10 Log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz. For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 Log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

A.2.3 Measurement Results

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the LTE Bands 2 4 5 7 12 13 26 38. It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the LTE Bands 2 4 5 7 12 13 26 38 into any of the other blocks. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.The evaluated frequency range is from 30MHz to 26GHz.

LTE Band 2, 1.4MHz, QPSK, Channel 18607

Frequency(MHz)	P_{Mea}(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
3702.02	-47.96	6.42	8.48	-45.90	-13.00	32.90	V
5556.02	-45.43	7.19	10.59	-42.03	-13.00	29.03	H
7407.01	-38.04	8.14	12.09	-34.09	-13.00	21.09	V
9264.01	-53.82	9.07	13.26	-49.63	-13.00	36.63	H
11139.01	-51.96	9.67	13.17	-48.46	-13.00	35.46	V
12977.01	-49.07	10.48	13.49	-46.06	-13.00	33.06	V

LTE Band 2, 1.4MHz, QPSK, Channel 18900

Frequency(MHz)	P_{Mea}(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
3760.02	-44.35	6.26	8.56	-42.05	-13.00	29.05	H
5643.02	-41.14	7.27	10.57	-37.84	-13.00	24.84	H
7525.01	-37.75	8.29	12.22	-33.82	-13.00	20.82	V
9411.01	-53.68	9.09	13.35	-49.42	-13.00	36.42	H
11230.01	-50.87	9.58	13.15	-47.30	-13.00	34.30	H
13149.01	-47.98	10.72	13.71	-44.99	-13.00	31.99	H

LTE Band 2, 1.4MHz, QPSK, Channel 19193

Frequency(MHz)	P_{Mea}(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
3819.02	-46.27	6.08	8.65	-43.70	-13.00	30.70	V
5731.02	-41.14	7.29	10.55	-37.88	-13.00	24.88	H
7642.01	-37.38	8.16	12.31	-33.23	-13.00	20.23	H
9557.01	-49.48	9.34	13.34	-45.48	-13.00	32.48	H
11472.01	-50.67	9.88	13.11	-47.44	-13.00	34.44	H
13412.01	-48.20	10.58	14.08	-44.70	-13.00	31.70	V

LTE Band 4, 1.4MHz QPSK, Channel 19957

Frequency(MHz)	P_{Mea}(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
3422.02	-56.21	5.38	8.01	-53.58	-13.00	40.58	V
5136.02	-50.35	6.86	10.09	-47.12	-13.00	34.12	H
6846.01	-34.43	7.83	11.42	-30.84	-13.00	17.84	V
8557.01	-51.34	8.57	13.01	-46.90	-13.00	33.90	V
10273.01	-51.37	9.55	13.01	-47.91	-13.00	34.91	V
11943.01	-49.96	10.32	13.01	-47.27	-13.00	34.27	H

LTE Band 4, 1.4MHz, QPSK, Channel 20175

Frequency(MHz)	P_{Mea}(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
3465.02	-54.85	5.46	8.12	-52.19	-13.00	39.19	V
5202.02	-50.71	6.96	10.18	-47.49	-13.00	34.49	H
6934.01	-28.63	7.79	11.52	-24.90	-13.00	11.90	V
8666.01	-55.12	8.40	13.03	-50.49	-13.00	37.49	H
10365.01	-51.39	9.75	13.05	-48.09	-13.00	35.09	H
12154.01	-49.68	10.19	13.06	-46.81	-13.00	33.81	V

LTE Band 4, 1.4MHz, QPSK, Channel 20393

Frequency(MHz)	P_{Mea}(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
3509.02	-53.98	5.54	8.21	-51.31	-13.00	38.31	V
5266.02	-47.96	6.99	10.27	-44.68	-13.00	31.68	H
7017.01	-27.24	8.27	11.62	-23.89	-13.00	10.89	V
8771.01	-51.81	8.57	13.05	-47.33	-13.00	34.33	V
10487.01	-51.13	9.67	13.09	-47.71	-13.00	34.71	V
12232.01	-49.11	10.04	13.09	-46.06	-13.00	33.06	H

LTE Band 7, 5 MHz, QPSK, Channel 20775

Frequency(MHz)	P_{Mea}(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
5009.02	-40.26	6.59	9.91	-36.94	-25.00	11.94	H
7514.01	-40.87	8.34	12.21	-37.00	-25.00	12.00	V
10020.01	-46.25	9.24	12.91	-42.58	-25.00	17.58	V
12532.01	-49.08	10.27	13.22	-46.13	-25.00	21.13	H
15009.00	-46.18	11.23	13.99	-43.42	-25.00	18.42	V
17532.00	-43.53	12.85	14.94	-41.44	-25.00	16.44	V

LTE Band 7, 5 MHz, QPSK, Channel 21100

Frequency(MHz)	P_{Mea}(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
5073.02	-43.64	6.70	10.00	-40.34	-25.00	15.34	H
7612.01	-42.48	8.03	12.29	-38.22	-25.00	13.22	V
10150.01	-46.74	9.38	12.96	-43.16	-25.00	18.16	V
12680.01	-48.92	10.33	13.31	-45.94	-25.00	20.94	V
15218.00	-46.50	11.38	13.87	-44.01	-25.00	19.01	H
17737.00	-44.44	12.39	15.23	-41.60	-25.00	16.60	V

LTE Band 7, 5 MHz, QPSK, Channel 21425

Frequency(MHz)	P_{Mea}(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
5139.02	-42.46	6.86	10.09	-39.23	-25.00	14.23	H
7709.01	-40.07	8.41	12.37	-36.11	-25.00	11.11	V
10280.01	-45.40	9.57	13.01	-41.96	-25.00	16.96	V
12857.01	-49.08	10.62	13.41	-46.29	-25.00	21.29	V
15392.00	-45.63	11.38	13.76	-43.25	-25.00	18.25	H
17992.00	-44.09	12.90	15.59	-41.40	-25.00	16.40	H

LTE Band 12, 1.4MHz, QPSK, Channel 23017

Frequency(MHz)	P_Mea(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Margin(dB)	Polarization
1400.01	-43.48	3.24	4.98	2.15	-43.89	-13.00	30.89	V
2106.00	-55.76	4.20	4.92	2.15	-57.19	-13.00	44.19	H
2793.00	-52.19	4.90	6.63	2.15	-52.61	-13.00	39.61	H
3492.02	-55.81	5.51	8.18	2.15	-55.29	-13.00	42.29	H
4184.02	-55.94	6.17	9.08	2.15	-55.18	-13.00	42.18	V
4900.01	-55.74	6.73	9.80	2.15	-54.82	-13.00	41.82	H

LTE Band 12, 1.4MHz, QPSK, Channel 23095

Frequency(MHz)	P_Mea(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Margin(dB)	Polarization
1415.01	-45.50	3.25	5.06	2.15	-45.84	-13.00	32.84	V
2136.00	-55.54	4.23	5.01	2.15	-56.91	-13.00	43.91	V
2824.00	-51.97	4.95	6.68	2.15	-52.39	-13.00	39.39	V
3535.02	-56.56	5.67	8.25	2.15	-56.13	-13.00	43.13	H
4259.02	-55.69	6.23	9.16	2.15	-54.91	-13.00	41.91	H
4944.01	-55.81	6.70	9.84	2.15	-54.82	-13.00	41.82	H

LTE Band 12, 1.4MHz, QPSK, Channel 23173

Frequency(MHz)	P_Mea(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Margin(dB)	Polarization
1431.01	-39.85	3.28	5.14	2.15	-40.14	-13.00	27.14	V
2146.00	-54.36	4.24	5.04	2.15	-55.71	-13.00	42.71	V
2855.00	-52.28	4.96	6.74	2.15	-52.65	-13.00	39.65	V
3573.02	-55.57	6.06	8.30	2.15	-55.48	-13.00	42.48	V
4304.02	-55.76	6.19	9.20	2.15	-54.90	-13.00	41.90	H
5016.01	-55.62	6.58	9.92	2.15	-54.43	-13.00	41.43	H

LTE Band 13, 5MHz, QPSK, Channel 23205

Frequency(MHz)	P$_{Mea}$(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Margin(dB)	Polarization
1559.01	-57.71	3.47	5.39	2.15	-57.94	-13.00	44.94	V
2339.00	-54.49	4.44	5.62	2.15	-55.46	-13.00	42.46	V
3109.02	-54.69	5.35	7.26	2.15	-54.93	-13.00	41.93	V
3908.02	-56.39	6.11	8.77	2.15	-55.88	-13.00	42.88	V
4664.02	-55.27	6.48	9.56	2.15	-54.34	-13.00	41.34	H
5464.01	-55.37	6.92	10.55	2.15	-53.89	-13.00	40.89	V

LTE Band 13, 5MHz, QPSK, Channel 23230

Frequency(MHz)	P$_{Mea}$(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Margin(dB)	Polarization
1565.01	-54.24	3.48	5.38	2.15	-54.49	-13.00	41.49	V
2346.00	-53.75	4.45	5.64	2.15	-54.71	-13.00	41.71	V
3134.02	-54.66	5.39	7.32	2.15	-54.88	-13.00	41.88	H
3915.02	-55.69	6.12	8.78	2.15	-55.18	-13.00	42.18	H
4682.02	-55.51	6.49	9.58	2.15	-54.57	-13.00	41.57	H
5469.01	-55.89	6.94	10.56	2.15	-54.42	-13.00	41.42	V

LTE Band 13, 5MHz, QPSK, Channel 23255

Frequency(MHz)	P$_{Mea}$(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Margin(dB)	Polarization
1569.01	-58.61	3.48	5.38	2.15	-58.86	-13.00	45.86	H
2361.00	-54.72	4.47	5.68	2.15	-55.66	-13.00	42.66	V
3126.02	-55.04	5.40	7.30	2.15	-55.29	-13.00	42.29	H
3919.02	-55.58	6.12	8.79	2.15	-55.06	-13.00	42.06	V
4712.02	-55.60	6.51	9.61	2.15	-54.65	-13.00	41.65	H
5502.01	-55.58	7.07	10.60	2.15	-54.20	-13.00	41.20	H

LTE Band 26(814MHz~824MHz), 1.4MHz, QPSK, Channel 26697

Frequency(MHz)	P_Mea(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Margin(dB)	Polarization
5695.01	-54.50	7.29	10.56	2.15	-53.38	-13.00	40.38	H
6525.01	-54.41	7.50	11.03	2.15	-53.03	-13.00	40.03	V
7327.01	-52.20	8.10	11.99	2.15	-50.46	-13.00	37.46	H
8143.01	-52.54	8.40	12.71	2.15	-50.38	-13.00	37.38	H
8953.00	-51.53	9.03	13.09	2.15	-49.62	-13.00	36.62	H
9777.00	-52.02	8.98	13.12	2.15	-50.03	-13.00	37.03	V

LTE Band 26(814MHz~824MHz), 1.4MHz, QPSK, Channel 26740

Frequency(MHz)	P_Mea(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Margin(dB)	Polarization
1638.01	-60.16	3.56	5.25	2.15	-60.62	-13.00	47.62	V
2439.00	-52.78	4.56	5.92	2.15	-53.57	-13.00	40.57	H
3291.02	-53.72	5.29	7.70	2.15	-53.46	-13.00	40.46	H
4110.02	-56.15	6.04	9.01	2.15	-55.33	-13.00	42.33	V
4913.01	-55.79	6.73	9.81	2.15	-54.86	-13.00	41.86	V
5752.01	-55.17	7.26	10.55	2.15	-54.03	-13.00	41.03	H

LTE Band 26(814MHz~824MHz), 1.4MHz, QPSK, Channel 26783

Frequency(MHz)	P_Mea(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Margin(dB)	Polarization
2488.00	-49.77	4.61	6.06	2.15	-50.47	-13.00	37.47	V
3427.02	-47.68	5.39	8.02	2.15	-47.20	-13.00	34.20	H
7585.01	-52.83	8.04	12.27	2.15	-50.75	-13.00	37.75	V
8376.00	-51.71	8.64	12.90	2.15	-49.60	-13.00	36.60	H
8960.00	-51.64	9.06	13.09	2.15	-49.76	-13.00	36.76	H
9995.00	-50.70	9.18	12.90	2.15	-49.13	-13.00	36.13	H

LTE Band 26(824MHz~849MHz), 1.4MHz, QPSK, Channel 26797

Frequency(MHz)	P_{Mea}(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Margin(dB)	Polarization
1667.01	-59.79	3.58	5.20	2.15	-60.32	-13.00	47.32	H
2474.00	-50.40	4.60	6.02	2.15	-51.13	-13.00	38.13	V
3318.02	-55.01	5.29	7.76	2.15	-54.69	-13.00	41.69	H
4132.02	-55.09	6.05	9.03	2.15	-54.26	-13.00	41.26	V
4929.01	-54.64	6.73	9.83	2.15	-53.69	-13.00	40.69	H
5777.01	-54.43	7.22	10.54	2.15	-53.26	-13.00	40.26	V

LTE Band 26(824MHz~849MHz), 1.4MHz, QPSK, Channel 26915

Frequency(MHz)	P_{Mea}(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Margin(dB)	Polarization
1673.01	-55.96	3.58	5.19	2.15	-56.50	-13.00	43.50	H
2518.00	-52.71	4.64	6.13	2.15	-53.37	-13.00	40.37	H
3344.02	-55.07	5.31	7.83	2.15	-54.70	-13.00	41.70	H
4180.02	-54.97	6.16	9.08	2.15	-54.20	-13.00	41.20	V
5037.01	-55.37	6.59	9.95	2.15	-54.16	-13.00	41.16	H
5849.01	-53.84	7.23	10.53	2.15	-52.69	-13.00	39.69	H

LTE Band 26(824MHz~849MHz), 1.4MHz, QPSK, Channel 27033

Frequency(MHz)	P_{Mea}(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Margin(dB)	Polarization
1697.01	-55.39	3.60	5.15	2.15	-55.99	-13.00	42.99	V
2545.00	-52.03	4.66	6.18	2.15	-52.66	-13.00	39.66	V
3401.02	-55.44	5.36	7.96	2.15	-54.99	-13.00	41.99	V
4243.02	-56.00	6.25	9.14	2.15	-55.26	-13.00	42.26	H
5077.01	-54.60	6.71	10.01	2.15	-53.45	-13.00	40.45	H
5935.01	-53.45	7.47	10.51	2.15	-52.56	-13.00	39.56	H

LTE Band 38, 5MHz, QPSK, Channel 37775

Frequency(MHz)	P_Mea(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
5148.02	-45.10	6.88	10.11	-41.87	-25.00	16.87	H
7722.01	-49.86	8.40	12.38	-45.88	-25.00	20.88	H
10286.01	-51.98	9.60	13.01	-48.57	-25.00	23.57	H
12849.01	-49.63	10.64	13.41	-46.86	-25.00	21.86	H
15455.00	-45.73	11.47	13.73	-43.47	-25.00	18.47	V
17975.00	-43.33	12.90	15.57	-40.66	-25.00	15.66	H

LTE Band 38, 5MHz, QPSK, Channel 38000

Frequency(MHz)	P_Mea(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
5190.02	-47.11	6.94	10.17	-43.88	-25.00	18.88	H
7787.01	-49.73	8.31	12.43	-45.61	-25.00	20.61	H
9071.01	-54.25	9.01	13.14	-50.12	-25.00	25.12	H
10352.01	-51.47	9.73	13.04	-48.16	-25.00	23.16	V
11644.01	-50.62	9.72	13.07	-47.27	-25.00	22.27	V
13001.01	-49.06	10.47	13.50	-46.03	-25.00	21.03	V

LTE Band 38, 5MHz, QPSK, Channel 38225

Frequency(MHz)	P_Mea(dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
5237.02	-47.09	7.00	10.23	-43.86	-25.00	18.86	H
7858.01	-47.91	8.37	12.49	-43.79	-25.00	18.79	H
9128.01	-54.04	8.93	13.18	-49.79	-25.00	24.79	H
10477.01	-50.79	9.69	13.09	-47.39	-25.00	22.39	V
11807.01	-50.56	10.14	13.04	-47.66	-25.00	22.66	H
13116.01	-48.05	10.87	13.66	-45.26	-25.00	20.26	V

Note: The maximum value of expanded measurement uncertainty for this test item is U = 5.16 dB, k = 2.

A.3   FREQUENCY STABILITY

A.3.1 Method of Measurement

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a "call mode". This is accomplished with the use of R&S CMW500 DIGITAL RADIO COMMUNICATION TESTER.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -20℃.
3. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on middle channel for LTE band 2 4 5 7 12 13 26 38, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10℃ increments from -20℃ to +50℃. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
5. Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1.5 hours unpowered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50℃.
7. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 ℃increments from -20℃ to +50℃. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.   As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.5VDC and 4.35VDC, with a nominal voltage of 3.8VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress.

A.3.2 Measurement results

LTE Band 2, 1.4MHz bandwidth (worst case of all bandwidths)
Frequency Error vs Voltage

Voltage	Frequency error (Hz)		Frequency error (ppm)	
(V)	QPSK	16QAM	QPSK	16QAM
3.5	-9.01	16.04	0.0048	0.0085
3.8	-8.88	15.62	0.0047	0.0083
4.35	-8.05	16.09	0.0043	0.0086

Frequency Error vs Temperature

Temperature (℃)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
50	-9.06	15.54	0.0048	0.0083
40	-8.33	16.04	0.0044	0.0085
30	-7.90	15.74	0.0042	0.0084
20	-9.10	14.66	0.0048	0.0078
10	-8.85	16.68	0.0047	0.0089
0	-6.54	15.75	0.0035	0.0084
-10	-7.48	15.76	0.0040	0.0084
-20	-9.01	15.56	0.0048	0.0083

LTE Band 4, 1.4MHz bandwidth (worst case of all bandwidths)
Frequency Error vs Voltage

Voltage	Frequency error (Hz)		Frequency error (ppm)	
(V)	QPSK	16QAM	QPSK	16QAM
3.5	5.28	-24.33	0.0030	0.0140
3.8	4.18	-23.36	0.0024	0.0135
4.35	4.58	-23.36	0.0026	0.0135

Frequency Error vs Temperature

Temperature (℃)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
50	6.88	-23.43	0.0040	0.0135
40	5.35	-23.39	0.0031	0.0135
30	4.68	-21.70	0.0027	0.0125
20	4.25	22.90	0.0025	0.0132
10	3.45	23.53	0.0020	0.0136
0	3.79	-24.98	0.0022	0.0144
-10	4.51	-23.49	0.0026	0.0136
-20	-4.36	-23.30	0.0025	0.0134

LTE Band 7, 10MHz bandwidth (worst case of all bandwidths)

Frequency Error vs Voltage

Voltage	Frequency error (Hz)		Frequency error (ppm)	
(V)	QPSK	16QAM	QPSK	16QAM
3.5	-6.97	-13.29	0.0027	0.0052
3.8	-8.63	-10.41	0.0034	0.0041
4.35	-6.79	-10.84	0.0027	0.0043

Frequency Error vs Temperature

Temperature	Frequency error (Hz)		Frequency error (ppm)	
(℃)	QPSK	16QAM	QPSK	16QAM
50	-10.14	-13.00	0.0040	0.0051
40	-7.12	-9.70	0.0028	0.0038
30	-5.68	-10.93	0.0022	0.0043
20	-9.44	-9.96	0.0037	0.0039
10	-9.08	-10.23	0.0036	0.0040
0	-8.23	-8.08	0.0032	0.0032
-10	-7.70	-12.79	0.0030	0.0050
-20	-7.61	-11.37	0.0030	0.0045

LTE Band 12, 5MHz bandwidth (worst case of all bandwidths)
Frequency Error vs Voltage

Voltage	Frequency error (Hz)		Frequency error (ppm)	
(V)	QPSK	16QAM	QPSK	16QAM
3.5	-3.23	-11.46	0.0046	0.0162
3.8	-2.83	-11.32	0.0040	0.0160
4.35	-3.29	-11.04	0.0047	0.0156

Frequency Error vs Temperature

Temperature	Frequency error (Hz)		Frequency error (ppm)	
(℃)	QPSK	16QAM	QPSK	16QAM
50	-3.32	-11.06	0.0047	0.0156
40	-2.20	-9.47	0.0031	0.0134
30	-1.86	-10.70	0.0026	0.0151
20	-1.75	-10.30	0.0025	0.0146
10	2.19	-10.06	0.0031	0.0142
0	-2.95	-10.06	0.0042	0.0142
-10	-3.76	-12.06	0.0053	0.0170
-20	-3.69	-12.36	0.0052	0.0175

LTE Band 13, 5MHz bandwidth (worst case of all bandwidths)
Frequency Error vs Voltage

Voltage	Frequency error (Hz)		Frequency error (ppm)	
(V)	QPSK	16QAM	QPSK	16QAM
3.5	2.79	-9.66	0.0036	0.0124
3.8	2.73	-10.61	0.0035	0.0136
4.35	3.13	-10.49	0.0040	0.0134

Frequency Error vs Temperature

Temperature	Frequency error (Hz)		Frequency error (ppm)	
(℃)	QPSK	16QAM	QPSK	16QAM
50	3.32	-9.70	0.0042	0.0124
40	4.75	-9.74	0.0061	0.0125
30	4.92	-9.70	0.0063	0.0124
20	3.99	-9.16	0.0051	0.0117
10	4.78	-10.69	0.0061	0.0137
0	4.55	-9.73	0.0058	0.0124
-10	3.49	-10.40	0.0045	0.0133
-20	3.36	-8.64	0.0043	0.0110

LTE Band 26(814MHz~824MHz), 1.4MHz bandwidth (worst case of all bandwidths)

Frequency Error vs Voltage

Voltage	Frequency error (Hz)		Frequency error (ppm)	
(V)	QPSK	16QAM	QPSK	16QAM
3.5	-3.76	-25.63	0.0046	0.0313
3.8	-4.46	-25.49	0.0054	0.0311
4.35	-4.26	-24.52	0.0052	0.0299

Frequency Error vs Temperature

Temperature	Frequency error (Hz)		Frequency error (ppm)	
(℃)	QPSK	16QAM	QPSK	16QAM
50	-4.71	-25.43	0.0058	0.0311
40	-4.06	-24.53	0.0050	0.0300
30	-3.98	-26.21	0.0049	0.0320
20	-4.26	-25.78	0.0052	0.0315
10	-3.45	-24.02	0.0042	0.0293
0	-2.93	-25.56	0.0036	0.0312
-10	-4.22	-25.86	0.0052	0.0316
-20	-2.72	-25.36	0.0033	0.0310

LTE Band 26(824MHz~849MHz), 1.4MHz bandwidth (worst case of all bandwidths)
Frequency Error vs Voltage

Voltage	Frequency error (Hz)		Frequency error (ppm)	
(V)	QPSK	16QAM	QPSK	16QAM
3.5	-2.99	-23.86	0.0036	0.0285
3.8	-3.02	-23.05	0.0036	0.0276
4.35	-4.01	-24.53	0.0048	0.0293

Frequency Error vs Temperature

Temperature	Frequency error (Hz)		Frequency error (ppm)	
(℃)	QPSK	16QAM	QPSK	16QAM
50	2.23	-22.90	0.0027	0.0274
40	-3.46	-21.89	0.0041	0.0262
30	-2.93	-23.33	0.0035	0.0279
20	-2.56	-23.46	0.0031	0.0280
10	-2.90	-22.85	0.0035	0.0273
0	-2.76	-23.66	0.0033	0.0283
-10	-5.26	-23.76	0.0063	0.0284
-20	-3.10	-24.38	0.0037	0.0291

LTE Band 38, 5MHz bandwidth (worst case of all bandwidths)
Frequency Error vs Voltage

Voltage	Frequency error (Hz)		Frequency error (ppm)	
(V)	QPSK	16QAM	QPSK	16QAM
3.5	14.69	73.20	0.0057	0.0282
3.8	14.16	68.29	0.0055	0.0263
4.35	15.06	17.57	0.0058	0.0068

Frequency Error vs Temperature

Temperature	Frequency error (Hz)		Frequency error (ppm)	
(℃)	QPSK	16QAM	QPSK	16QAM
50	14.55	16.65	0.0056	0.0064
40	13.12	19.73	0.0051	0.0076
30	11.37	17.57	0.0044	0.0068
20	51.86	18.40	0.0200	0.0071
10	16.85	17.21	0.0065	0.0066
0	16.67	11.47	0.0064	0.0044
-10	13.95	64.20	0.0054	0.0247
-20	14.49	17.21	0.0056	0.0066

A.4   OCCUPIED BANDWIDTH

A.4.1 Occupied Bandwidth Results
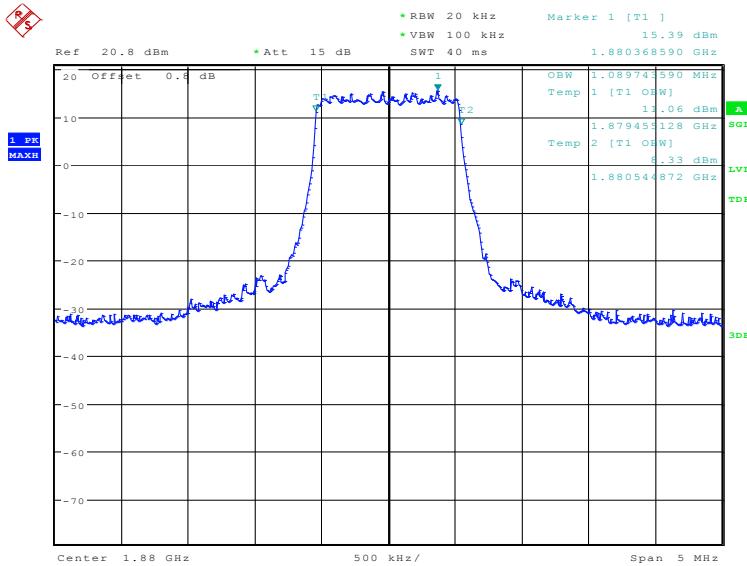
Occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of the US Cellular/PCS frequency bands. The table below lists the measured 99% BW. Spectrum analyzer plots are included on the following pages.

The measurement method is from KDB 971168 4.2:
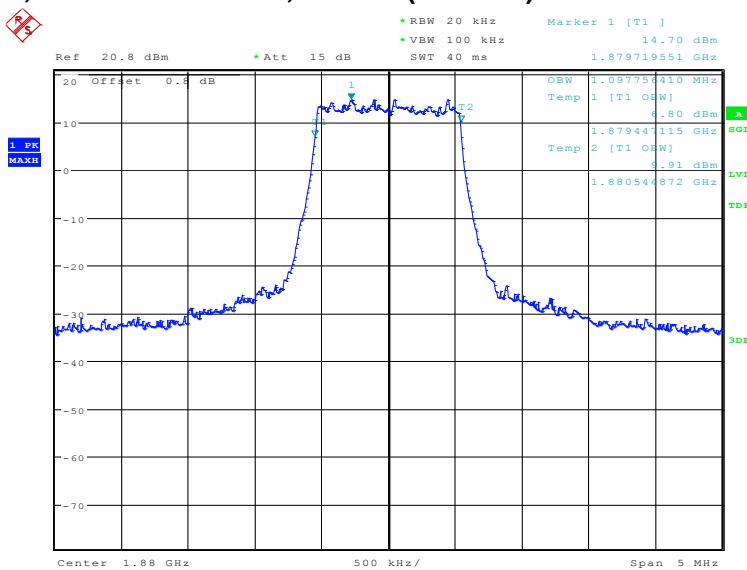
a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (i.e., two to five times the OBW).

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 10log (OBW / RBW) below the reference level.

d) Set the detection mode to peak, and the trace mode to max hold.

e) Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

LTE band 2, 1.4MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	1089.74	1097.76

LTE band 2, 1.4MHz Bandwidth, QPSK (99% BW)

Date: 28.MAY.2019 12:40:04
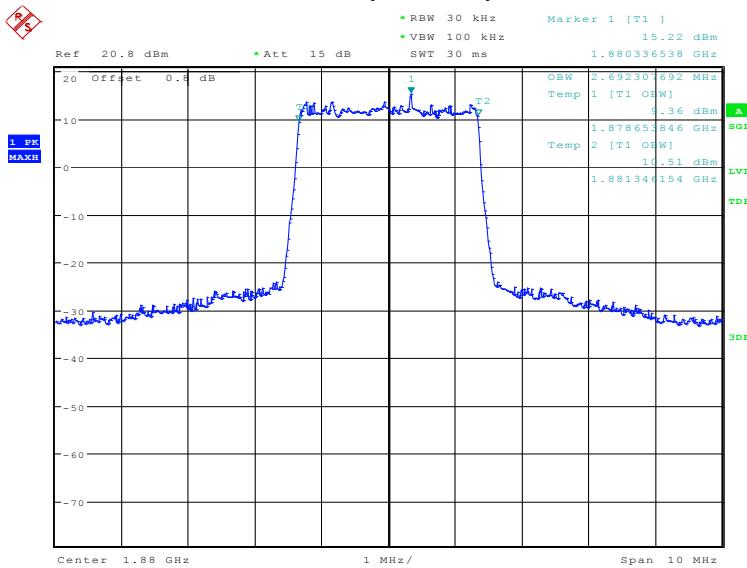
LTE band 2, 1.4MHz Bandwidth, 16QAM (99% BW)

Date: 28.MAY.2019 12:41:29

LTE band 2, 3MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
1880.0	2692.31	2708.33

LTE band 2, 3MHz Bandwidth, QPSK (99% BW)

Date: 28.MAY.2019 12:42:55
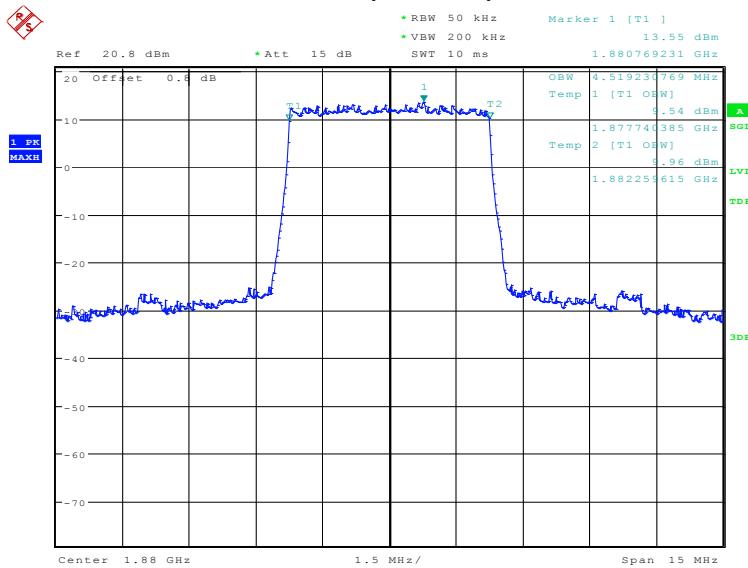
LTE band 2, 3MHz Bandwidth, 16QAM (99% BW)
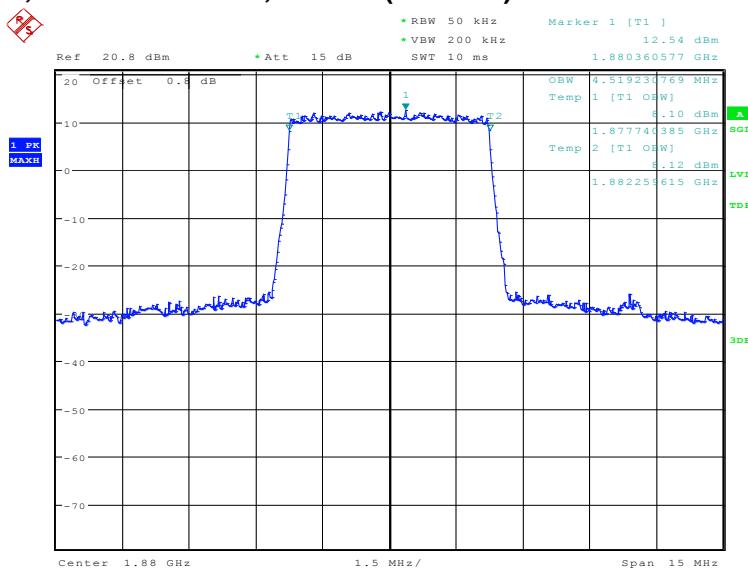
Date: 28.MAY.2019 12:44:19

LTE band 2, 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
1880.0	4519.23	4519.23

LTE band 2, 5MHz Bandwidth, QPSK (99% BW)
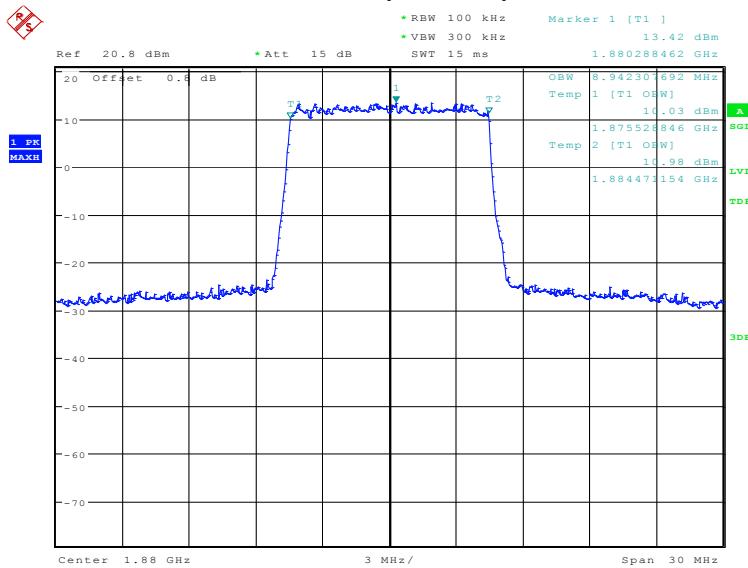
Date: 28.MAY.2019 12:45:45

LTE band 2, 5MHz Bandwidth, 16QAM (99% BW)
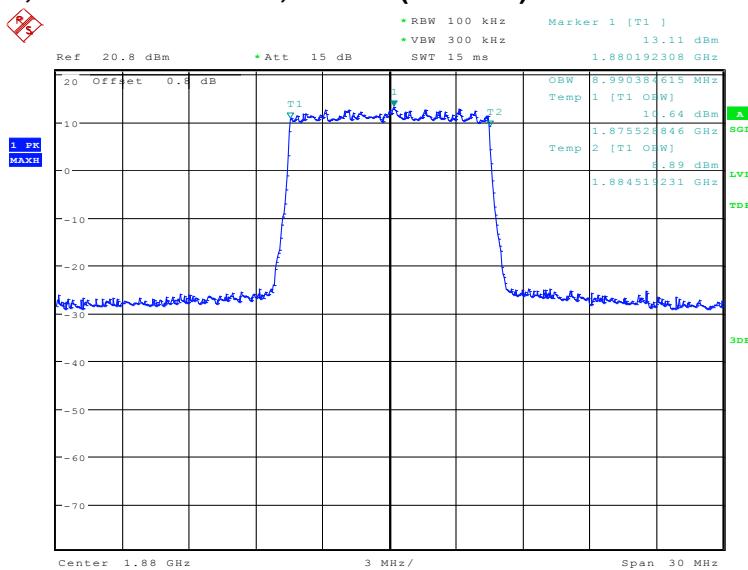
Date: 28.MAY.2019 12:47:09

LTE band 2, 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
1880.0	8942.31	8990.38

LTE band 2, 10MHz Bandwidth, QPSK (99% BW)
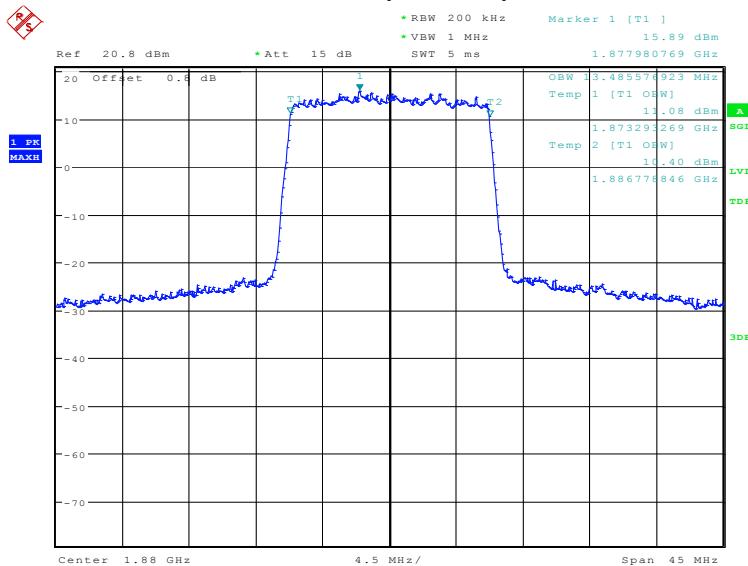
Date: 28.MAY.2019 12:48:35

LTE band 2, 10MHz Bandwidth, 16QAM (99% BW)
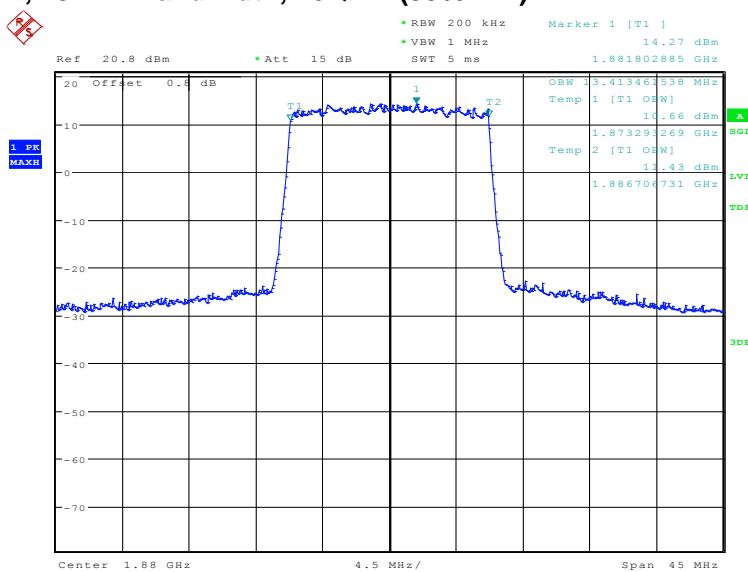
Date: 28.MAY.2019 12:50:00

LTE band 2, 15MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
1880.0	13485.58	13413.46

LTE band 2, 15MHz Bandwidth, QPSK (99% BW)
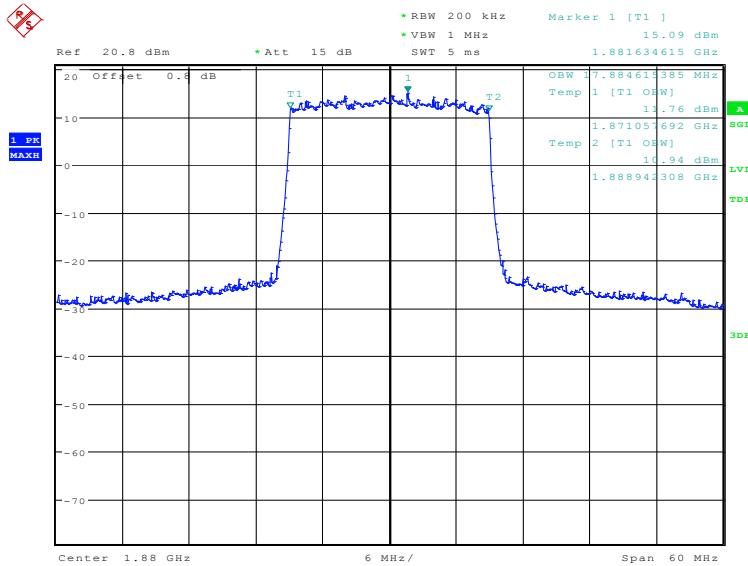
Date: 28.MAY.2019 12:51:26

LTE band 2, 15MHz Bandwidth, 16QAM (99% BW)
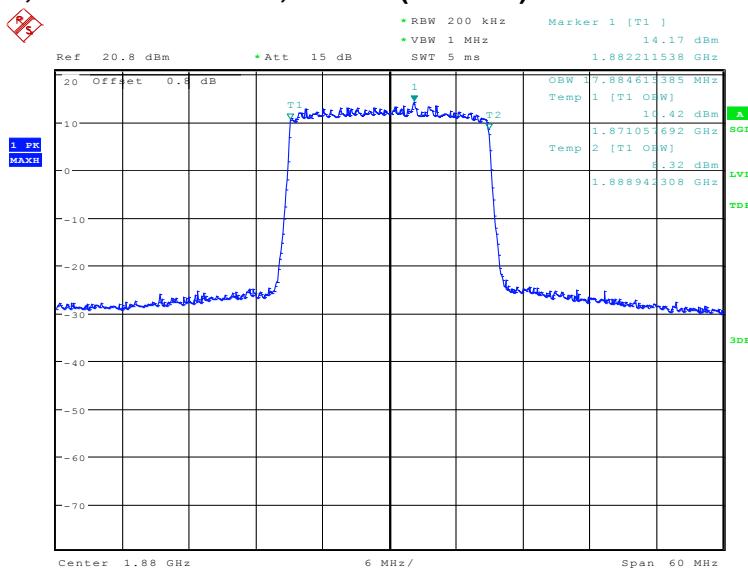
Date: 28.MAY.2019 12:52:50

LTE band 2, 20MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
1880.0	17884.62	17884.62

LTE band 2, 20MHz Bandwidth, QPSK (99% BW)
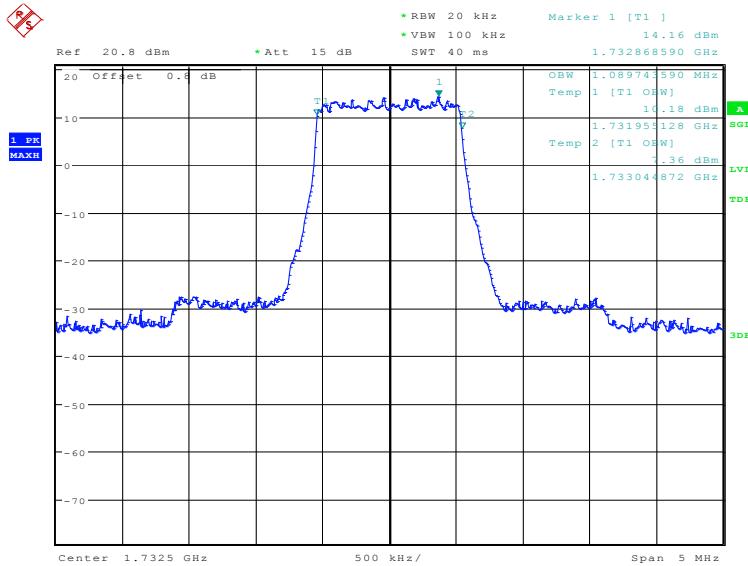
Date: 28.MAY.2019 12:54:16

LTE band 2, 20MHz Bandwidth, 16QAM (99% BW)
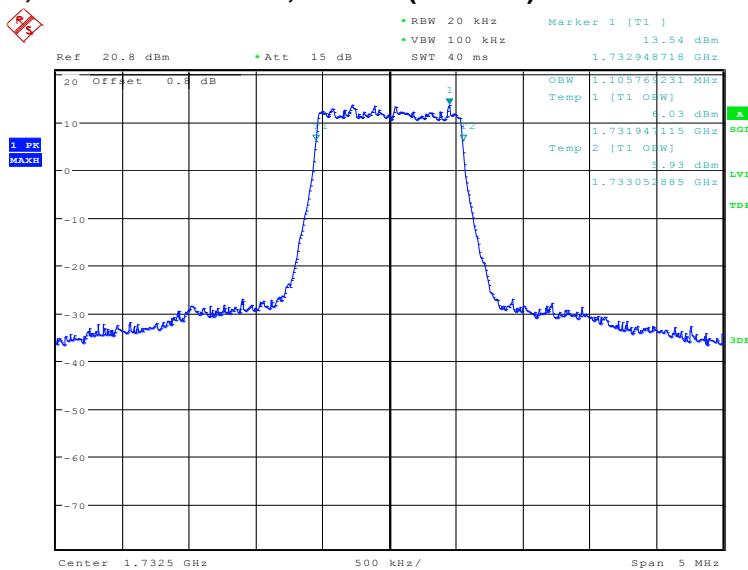
Date: 28.MAY.2019 12:55:41

LTE band 4, 1.4MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
1732.5	1089.74	1105.77

LTE band 4, 1.4MHz Bandwidth, QPSK (99% BW)
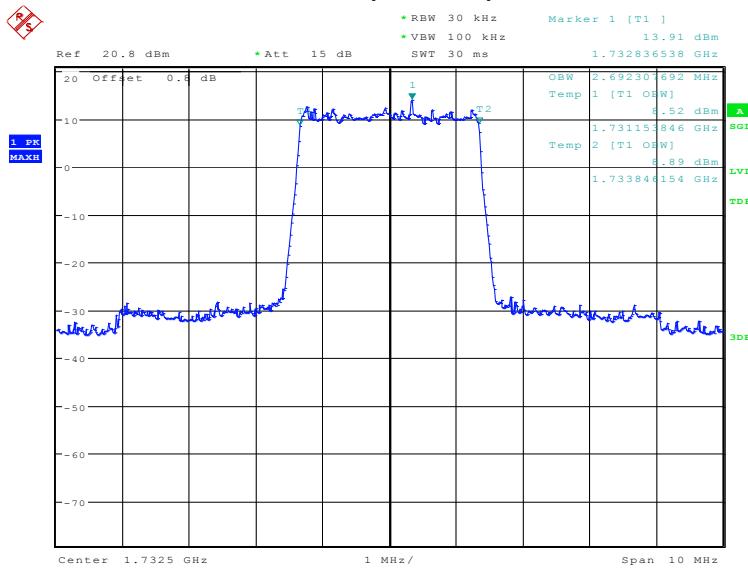
Date: 26.JUN.2019 12:22:26

LTE band 4, 1.4MHz Bandwidth, 16QAM (99% BW)
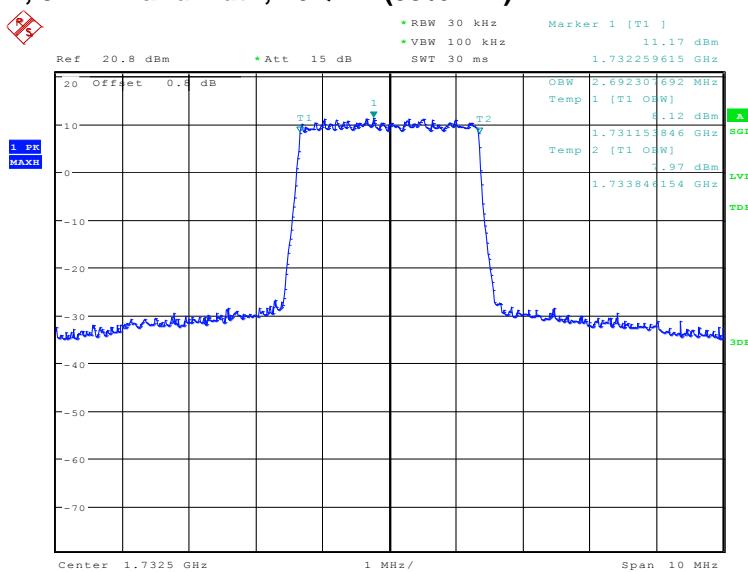
Date: 26.JUN.2019 12:23:50

LTE band 4, 3MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
1732.5	2692.31	2692.31

LTE band 4, 3MHz Bandwidth, QPSK (99% BW)
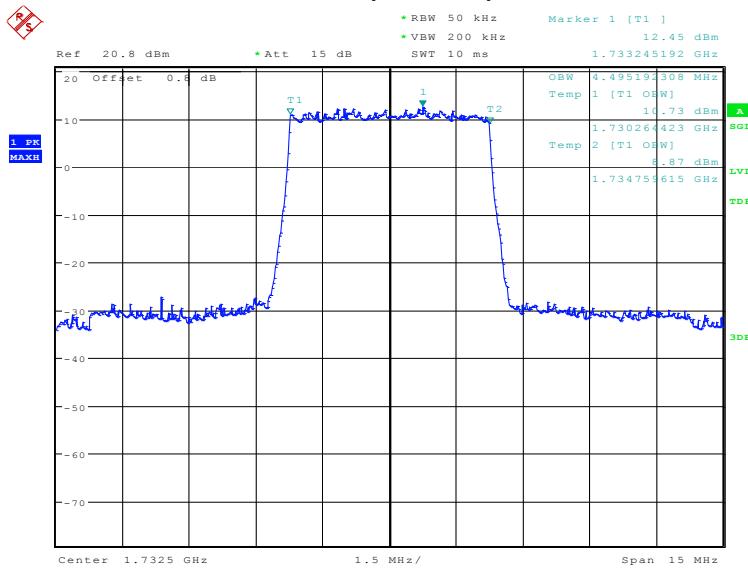
Date: 26.JUN.2019 12:25:15

LTE band 4, 3MHz Bandwidth, 16QAM (99% BW)
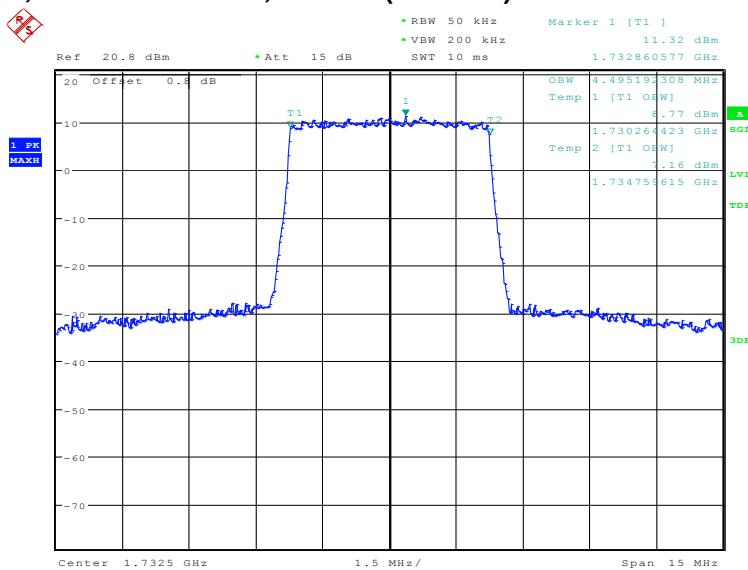
Date: 26.JUN.2019 12:26:39

LTE band 4, 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1732.5	QPSK	16QAM
	4495.19	4495.19

LTE band 4, 5MHz Bandwidth, QPSK (99% BW)
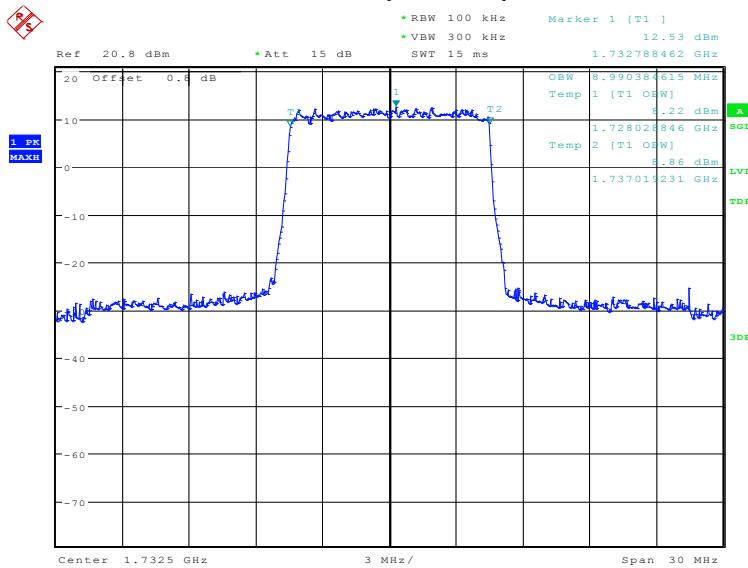
Date: 26.JUN.2019 12:28:04

LTE band 4, 5MHz Bandwidth, 16QAM (99% BW)
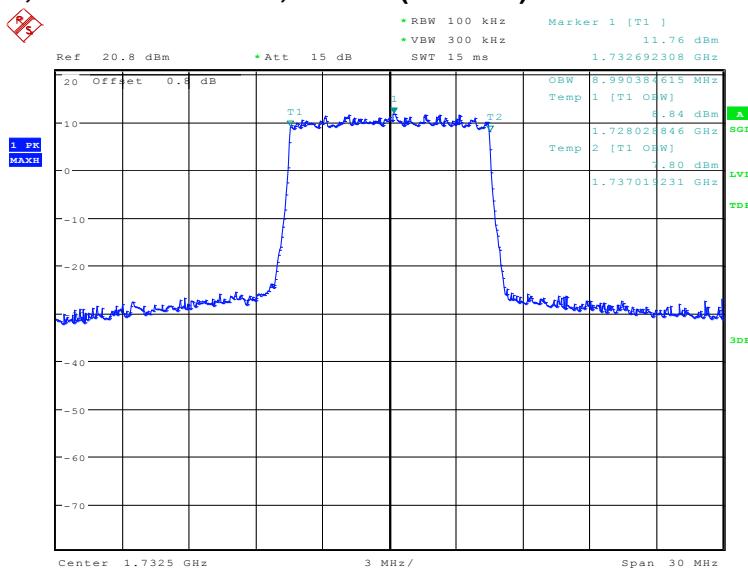
Date: 26.JUN.2019 12:29:28

LTE band 4, 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1732.5	QPSK	16QAM
	8990.38	8990.38

LTE band 4, 10MHz Bandwidth, QPSK (99% BW)
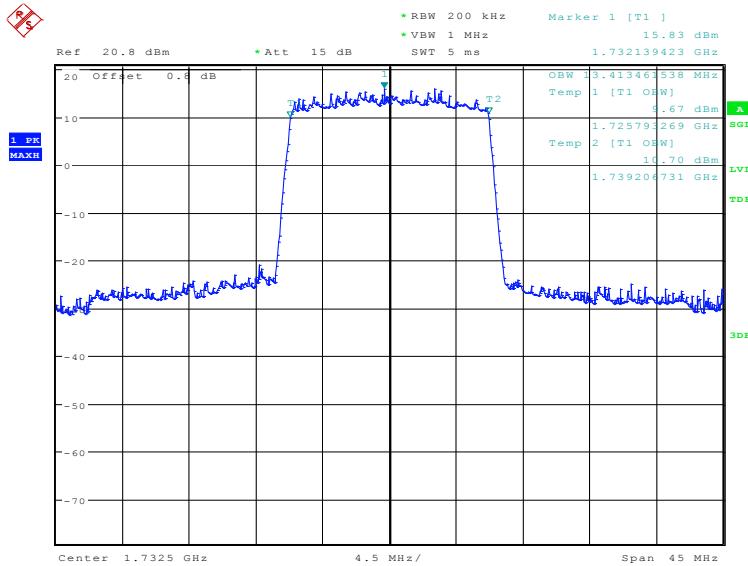
Date: 26.JUN.2019 12:30:53

LTE band 4, 10MHz Bandwidth, 16QAM (99% BW)
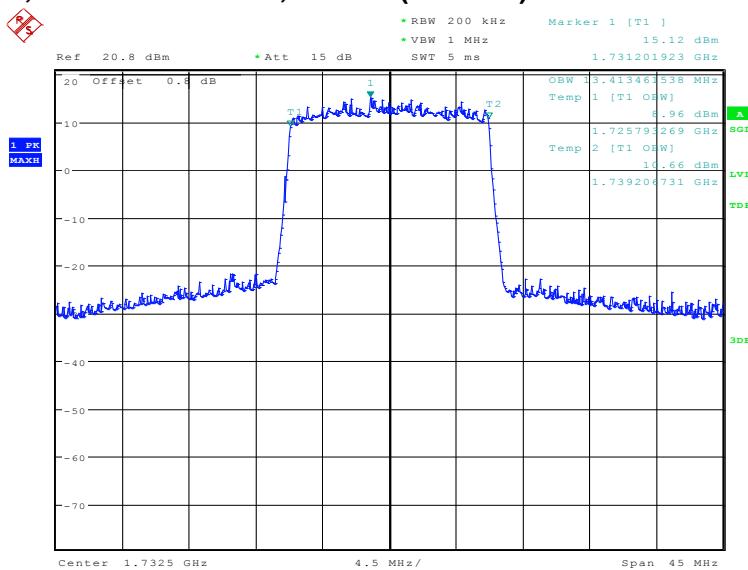
Date: 26.JUN.2019 12:32:17

LTE band 4, 15MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
1732.5	13413.46	13413.46

LTE band 4, 15MHz Bandwidth, QPSK (99% BW)
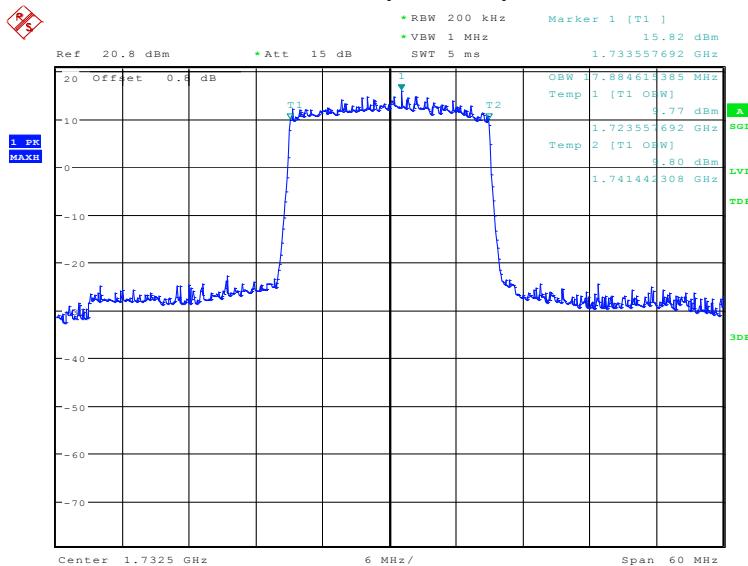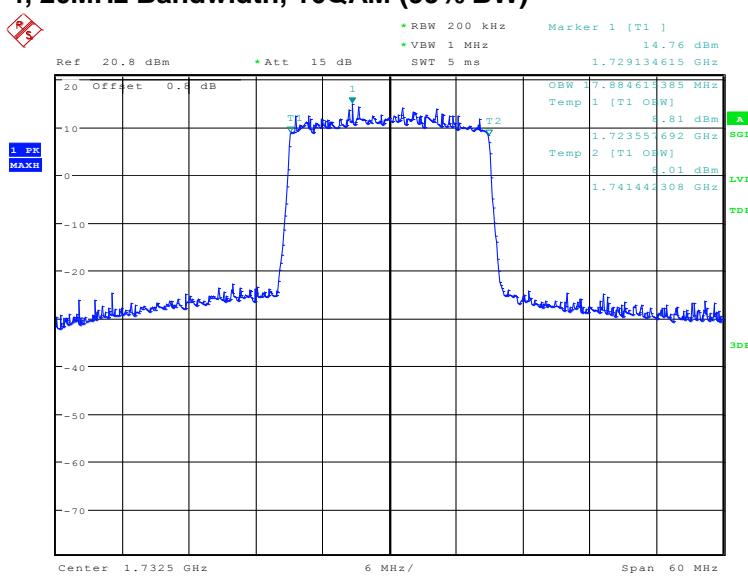
Date: 26.JUN.2019 12:33:42

LTE band 4, 15MHz Bandwidth, 16QAM (99% BW)

Date: 26.JUN.2019 12:35:06

LTE band 4, 20MHz (99%)
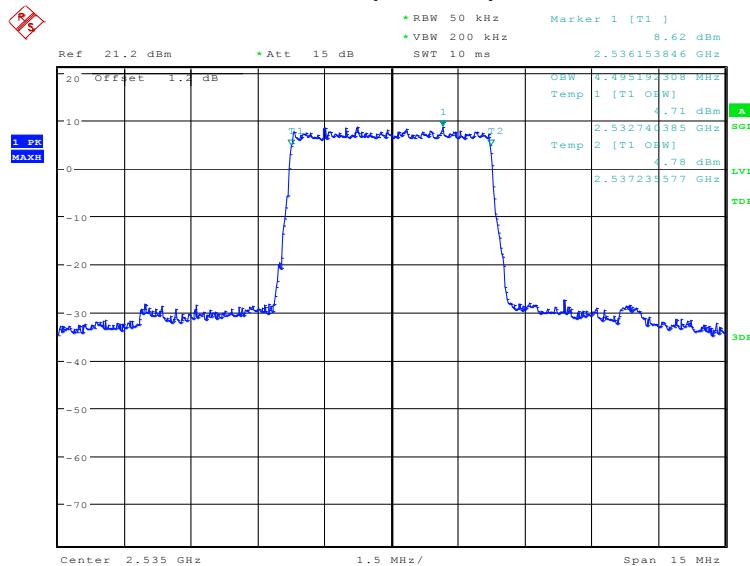
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
1732.5	17884.62	17884.62

LTE band 4, 20MHz Bandwidth, QPSK (99% BW)

Date: 26.JUN.2019 12:36:31

LTE band 4, 20MHz Bandwidth, 16QAM (99% BW)

Date: 26.JUN.2019 12:37:55
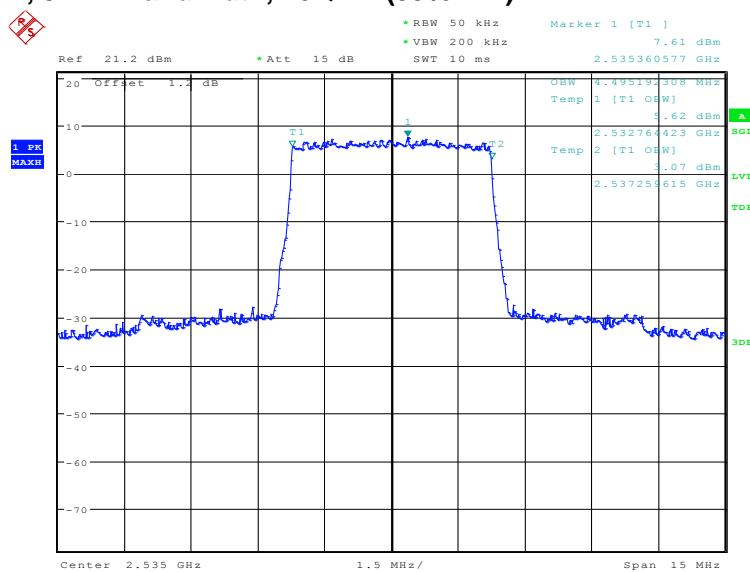
LTE band 7, 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
2535.0	4495.19	4495.19

LTE band 7, 5MHz Bandwidth, QPSK (99% BW)

Date: 28.MAY.2019 13:14:14
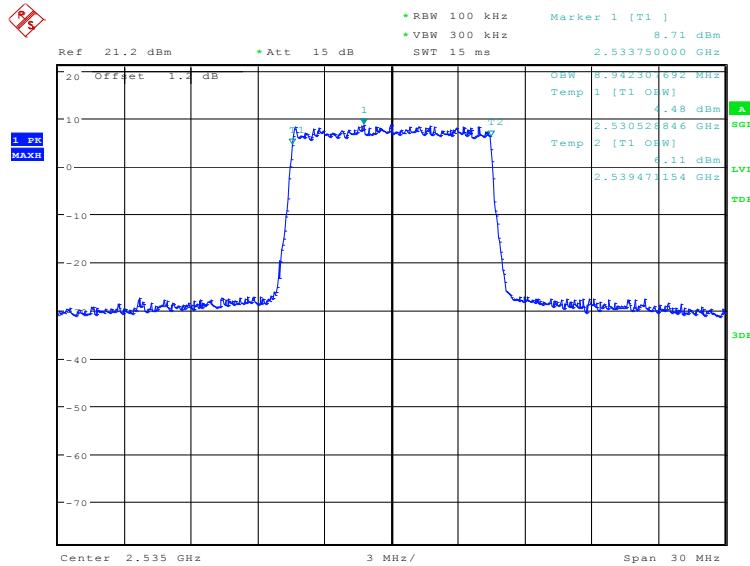
LTE band 7, 5MHz Bandwidth, 16QAM (99% BW)
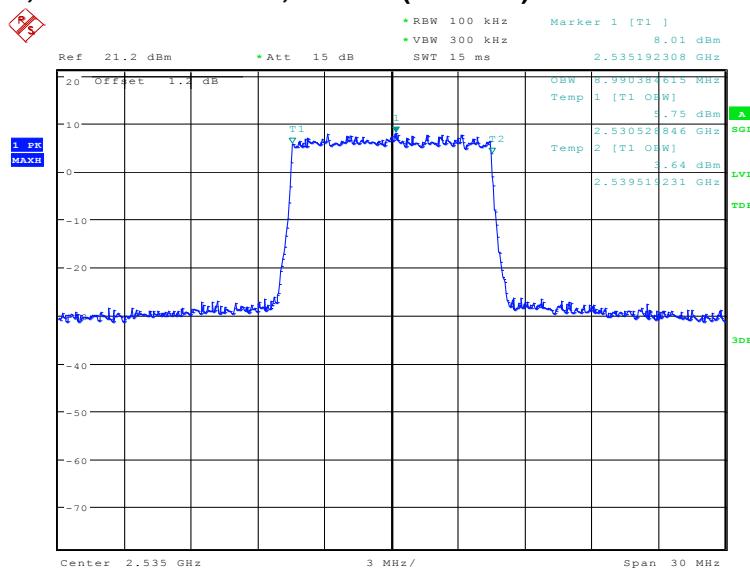
Date: 28.MAY.2019 13:15:38

LTE band 7, 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
2535.0	8942.31	8990.38

LTE band 7, 10MHz Bandwidth, QPSK (99% BW)
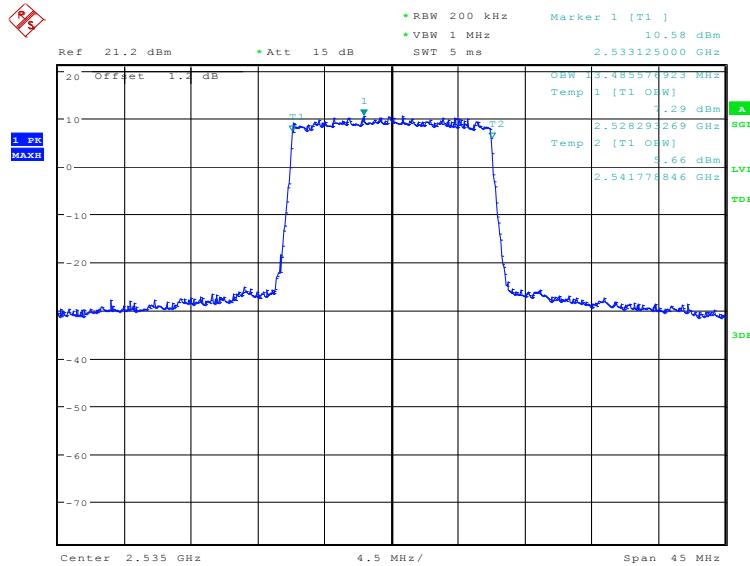
Date: 28.MAY.2019 13:17:05

LTE band 7, 10MHz Bandwidth, 16QAM (99% BW)
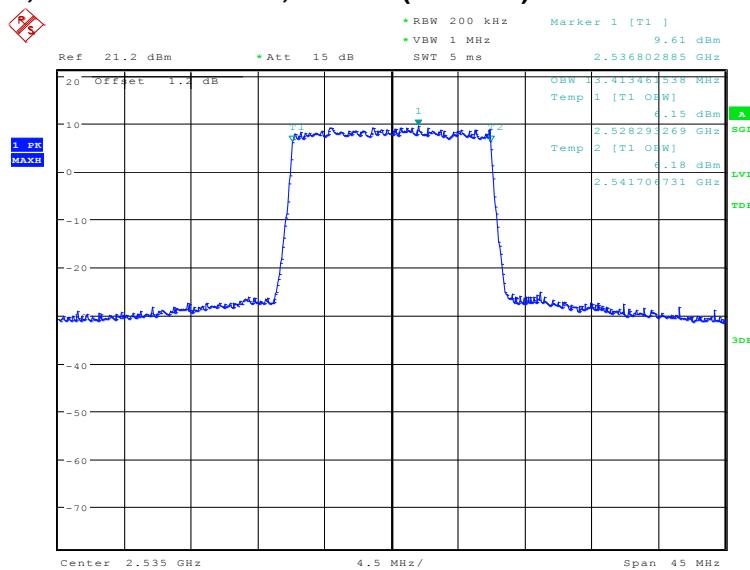
Date: 28.MAY.2019 13:18:29

LTE band 7, 15MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
2535.0	13485.58	13413.46

LTE band 7, 15MHz Bandwidth, QPSK (99% BW)
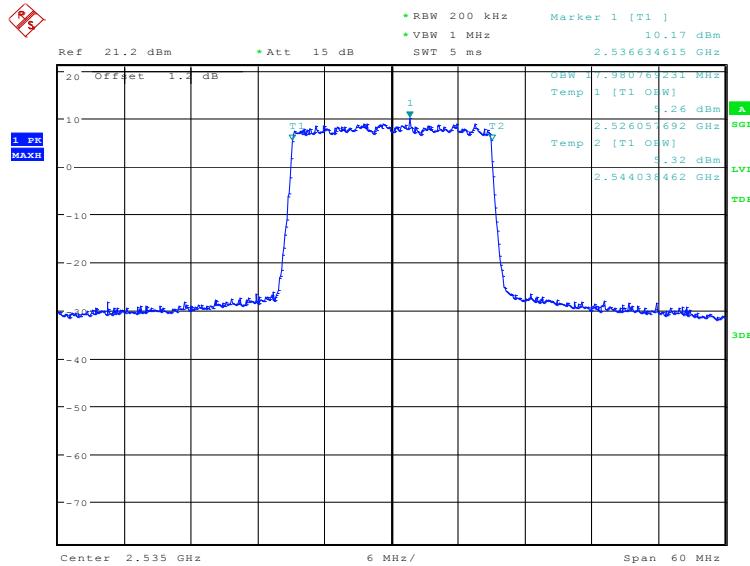
Date: 28.MAY.2019 13:19:55

LTE band 7, 15MHz Bandwidth, 16QAM (99% BW)
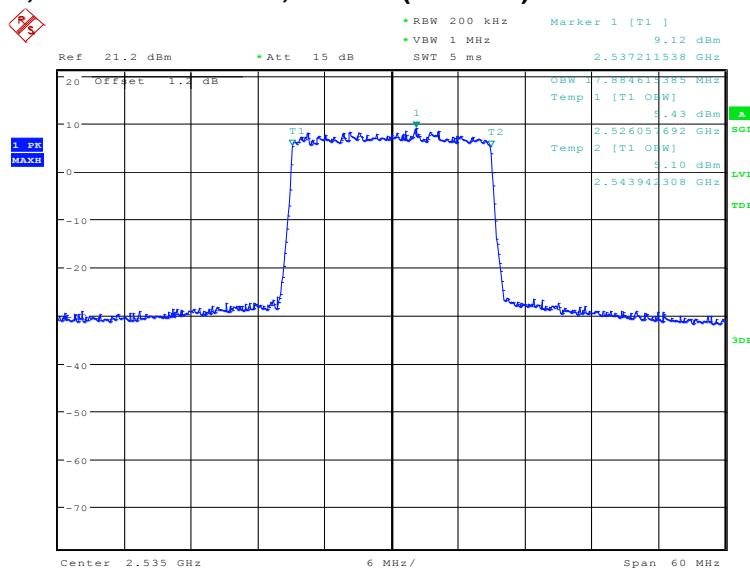
Date: 28.MAY.2019 13:21:20

LTE band 7, 20MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
2535.0	17980.77	17884.62

LTE band 7, 20MHz Bandwidth, QPSK (99% BW)
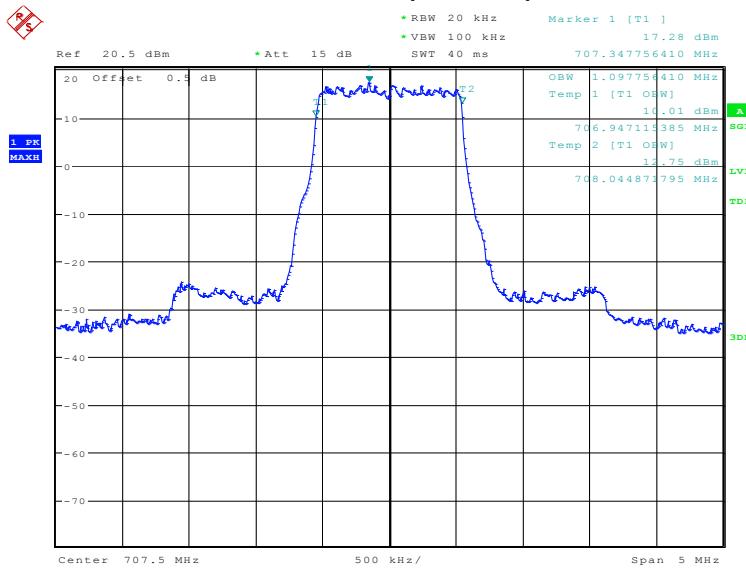
Date: 28.MAY.2019 13:22:46

LTE band 7, 20MHz Bandwidth, 16QAM (99% BW)
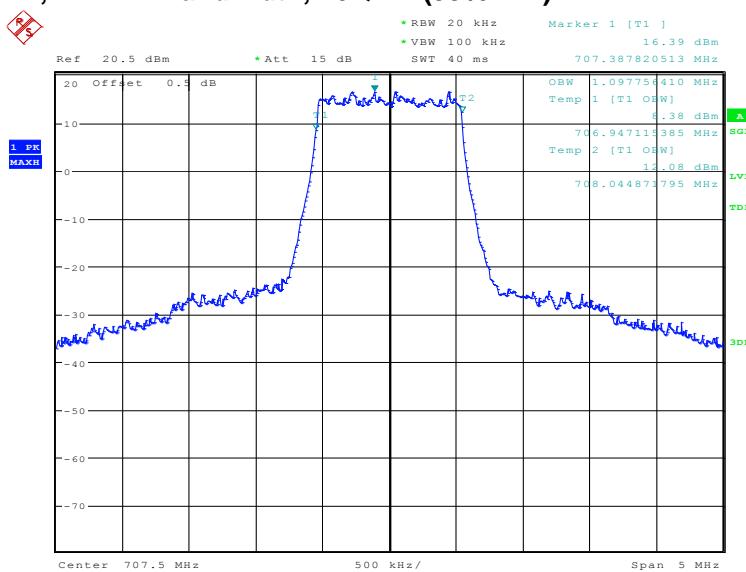
Date: 28.MAY.2019 13:24:11

LTE band 12, 1.4MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
707.5	1097.76	1097.76

LTE band 12, 1.4MHz Bandwidth, QPSK (99% BW)
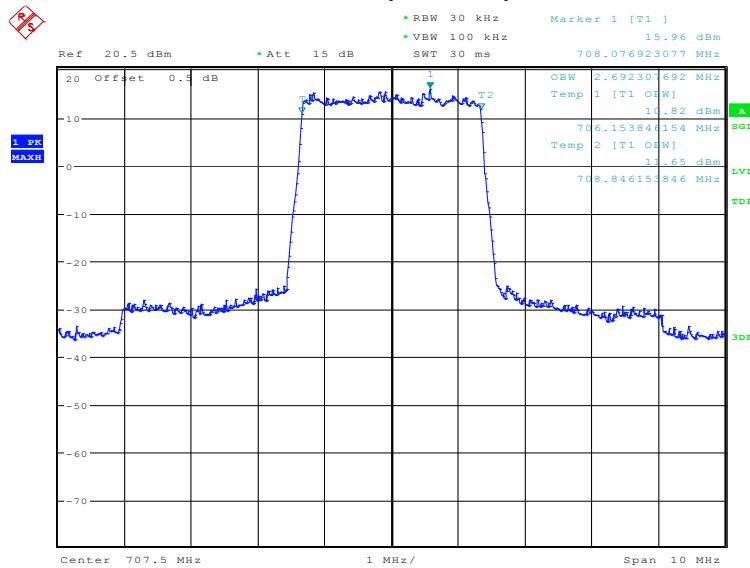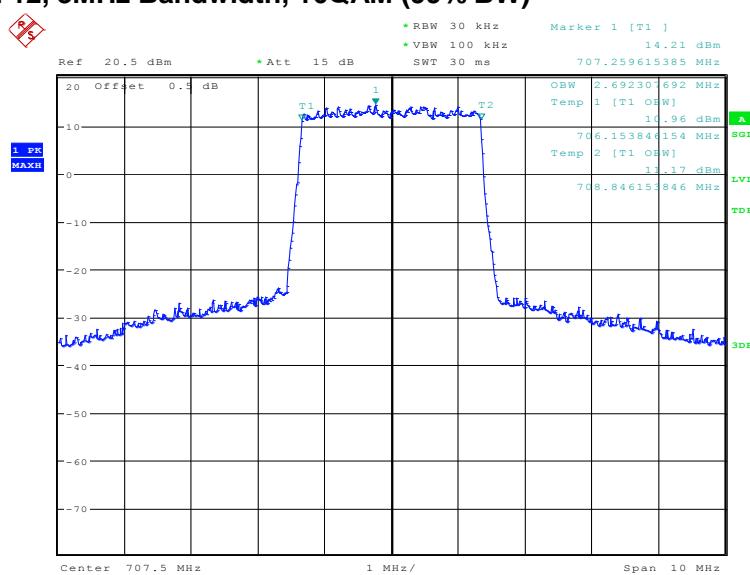
Date: 22.APR.2019 13:23:03

LTE band 12, 1.4MHz Bandwidth, 16QAM (99% BW)

Date: 22.APR.2019 13:24:28
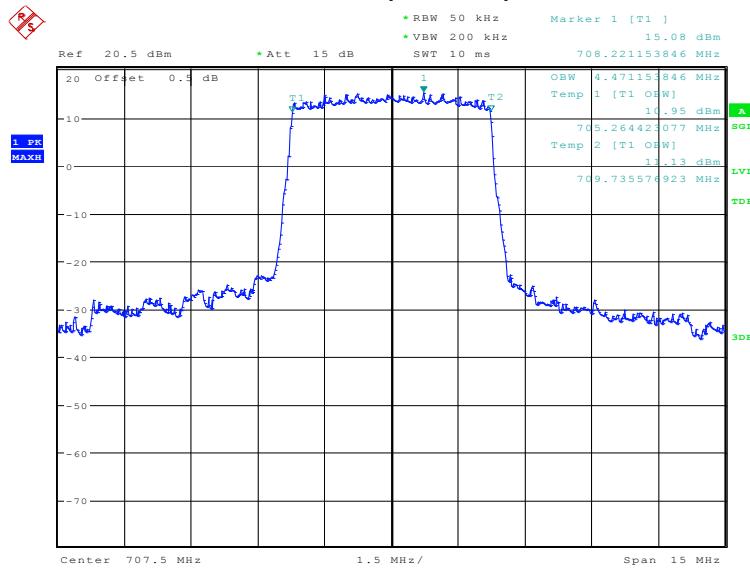
LTE band 12, 3MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
707.5	2692.31	2692.31
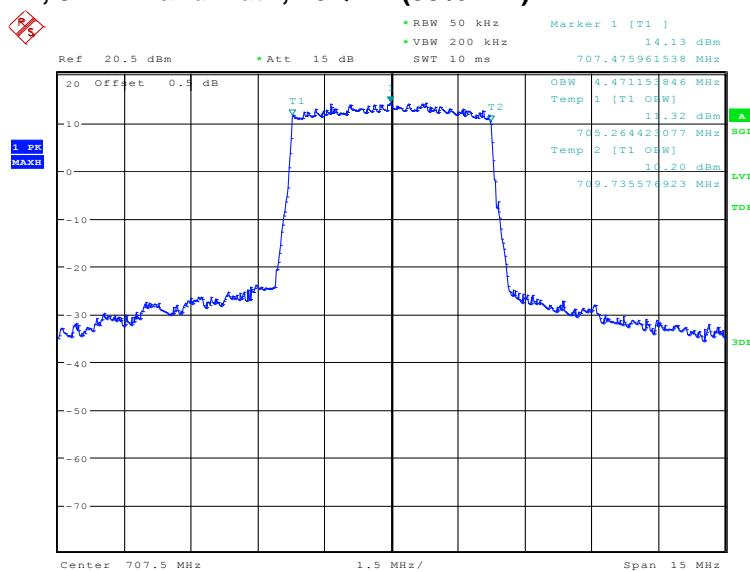
LTE band 12, 3MHz Bandwidth, QPSK (99% BW)

Date: 22.APR.2019 13:25:55

LTE band 12, 3MHz Bandwidth, 16QAM (99% BW)

Date: 22.APR.2019 13:27:20

LTE band 12, 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
707.5	4471.15	4471.15

LTE band 12, 5MHz Bandwidth, QPSK (99% BW)
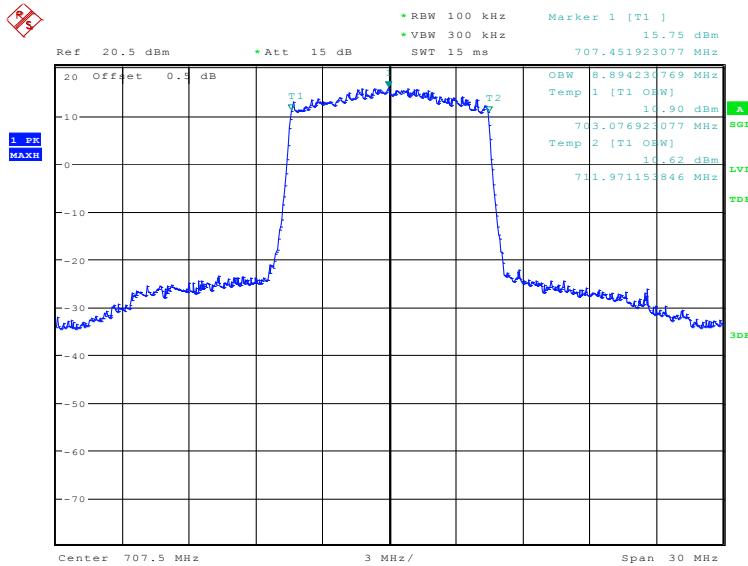
Date: 22.APR.2019 13:28:47

LTE band 12, 5MHz Bandwidth, 16QAM (99% BW)
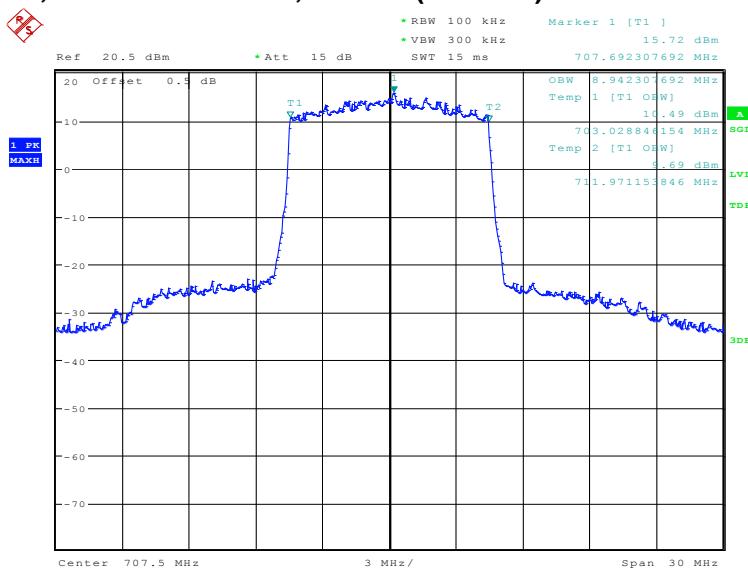
Date: 22.APR.2019 13:30:12

LTE band 12, 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
707.5	QPSK	16QAM
	8894.23	8942.31

LTE band 12, 10MHz Bandwidth, QPSK (99% BW)

Date: 22.APR.2019 13:31:38
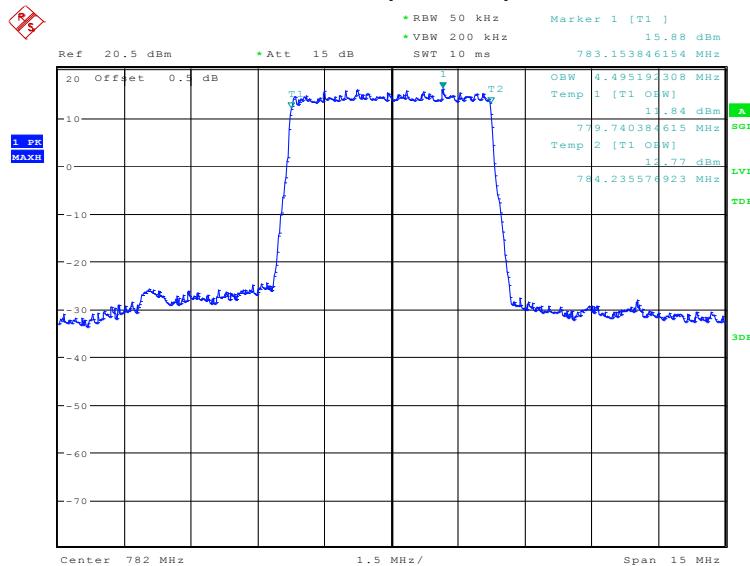
LTE band 12, 10MHz Bandwidth, 16QAM (99% BW)

Date: 22.APR.2019 13:33:03

LTE band 13, 5MHz (99%)
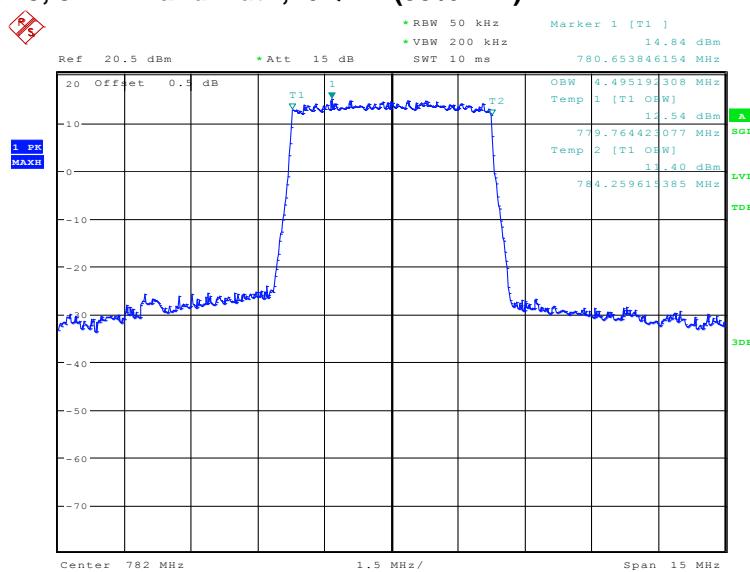
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
782.0	QPSK	16QAM
	4495.19	4495.19

LTE band 13, 5MHz Bandwidth, QPSK (99% BW)

Date: 22.APR.2019 13:34:31
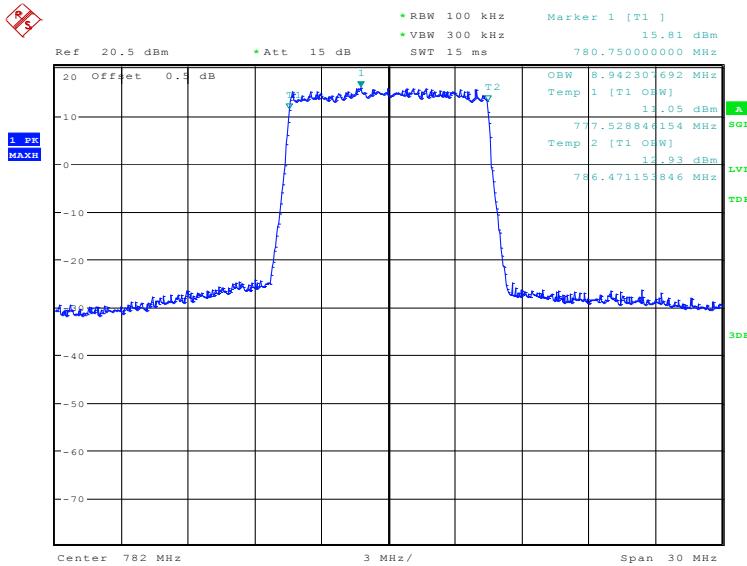
LTE band 13, 5MHz Bandwidth,16QAM (99% BW)
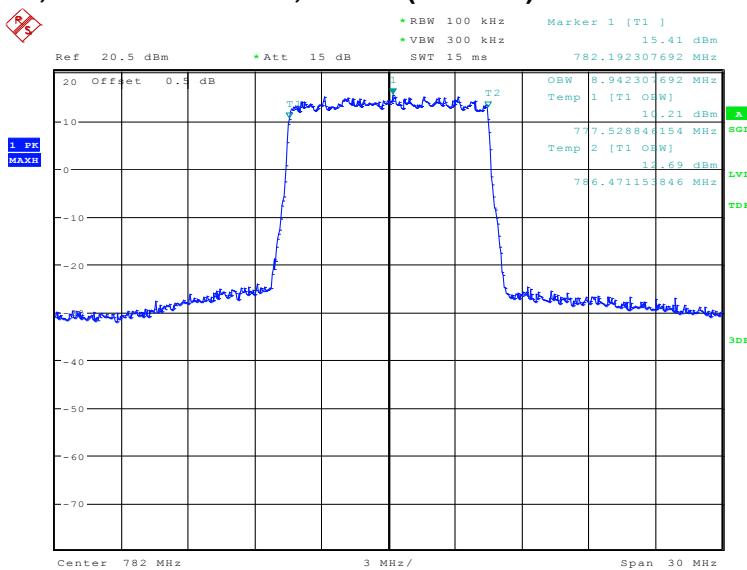
Date: 22.APR.2019 13:35:56

LTE band 13, 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
782.0	8942.31	8942.31

LTE band 13, 10MHz Bandwidth, QPSK (99% BW)
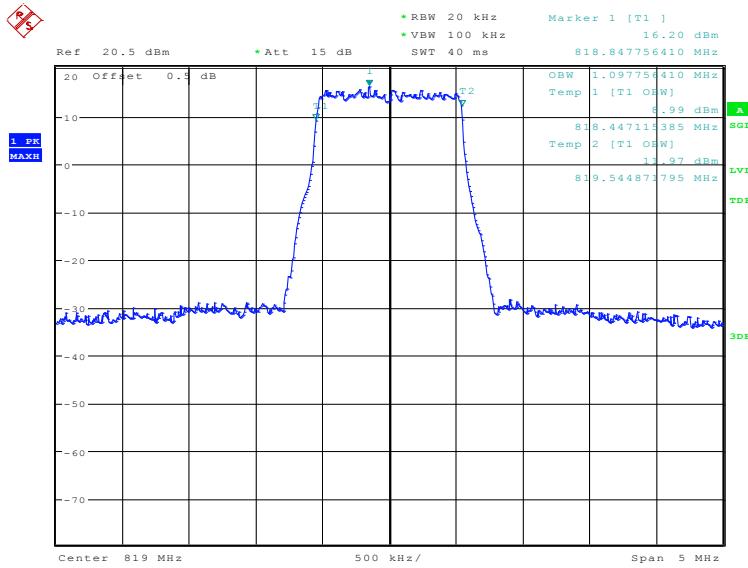
Date: 22.APR.2019 13:37:23

LTE band 13, 10MHz Bandwidth,16QAM (99% BW)
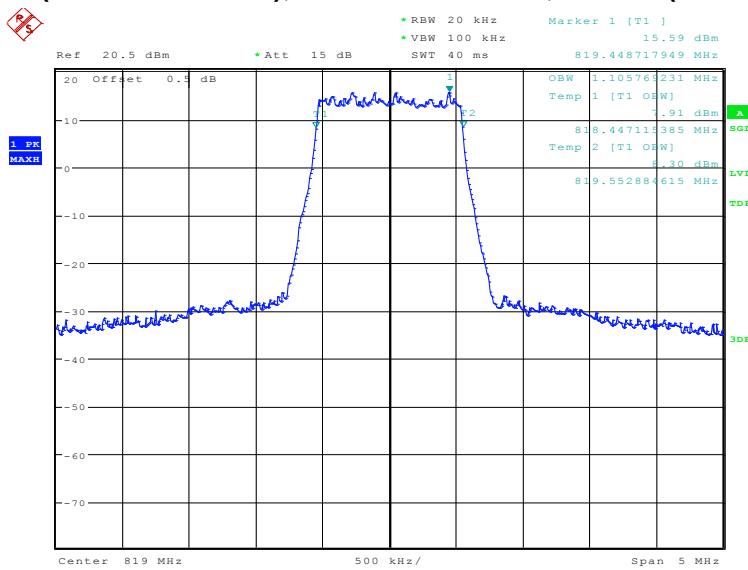
Date: 22.APR.2019 13:38:48

LTE band 26(814MHz~824MHz), 1.4MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
819.0	1097.76	1105.77

LTE band 26(814MHz~824MHz), 1.4MHz Bandwidth, QPSK (99% BW)
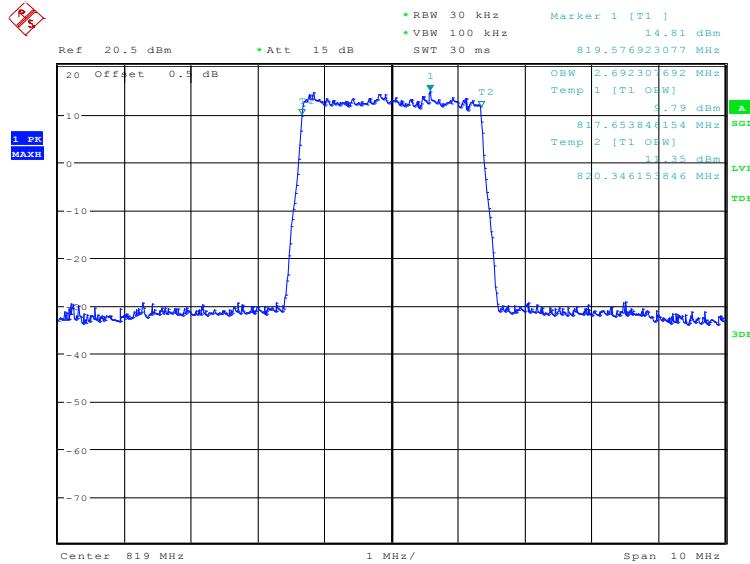
Date: 22.APR.2019 13:55:09

LTE band 26(814MHz~824MHz), 1.4MHz Bandwidth, 16QAM (99% BW)
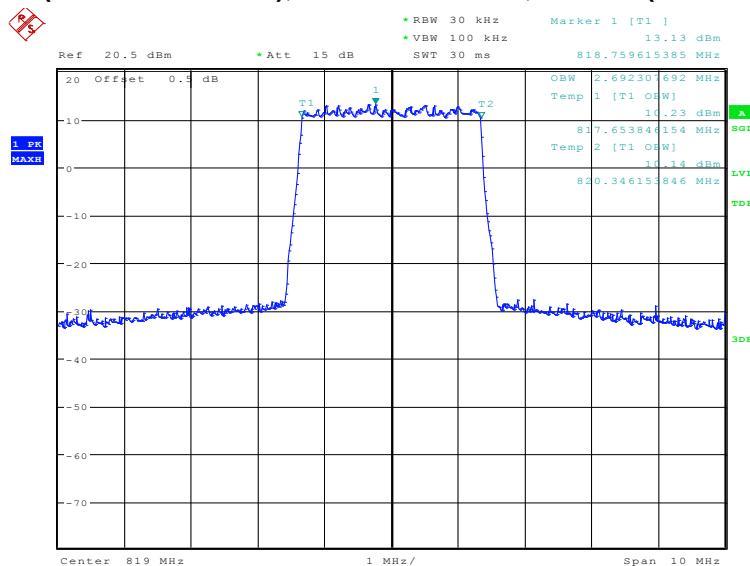
Date: 22.APR.2019 13:56:33

LTE band 26(814MHz~824MHz), 3MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
819.0	2692.31	2692.31

LTE band 26(814MHz~824MHz), 3MHz Bandwidth, QPSK (99% BW)
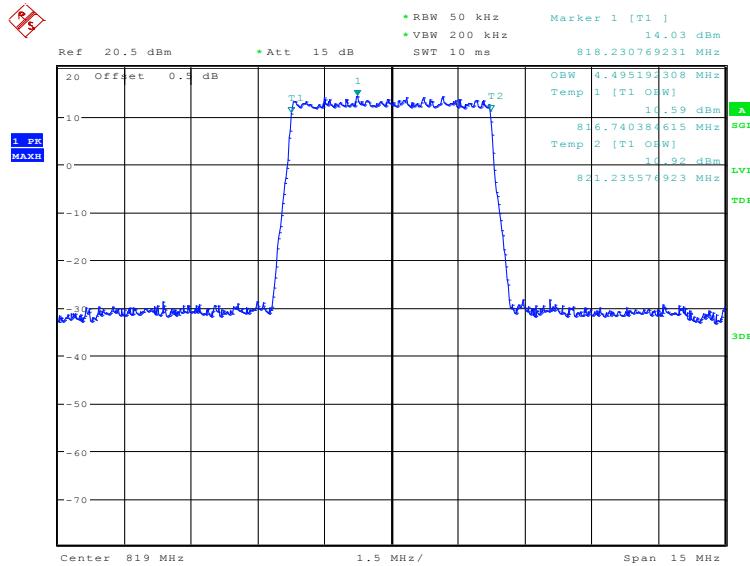
Date: 22.APR.2019 13:57:59

LTE band 26(814MHz~824MHz), 3MHz Bandwidth, 16QAM (99% BW)
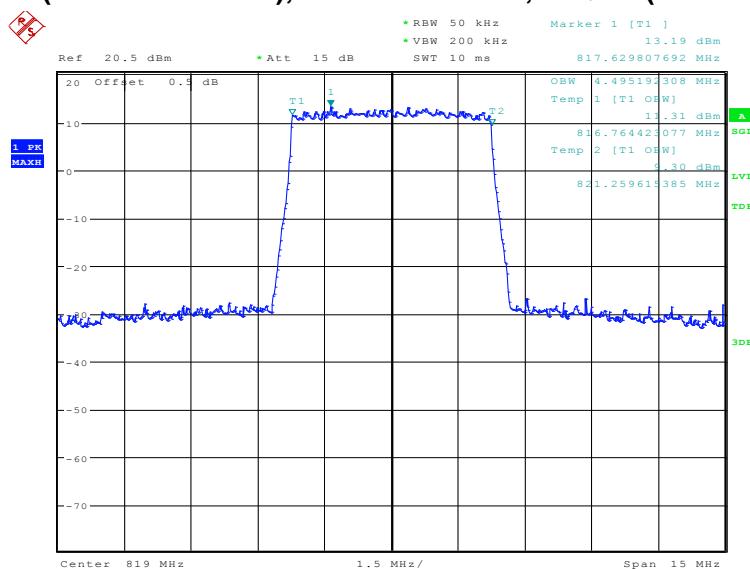
Date: 22.APR.2019 13:59:23

LTE band 26(814MHz~824MHz), 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
819.0	4495.19	4495.19

LTE band 26(814MHz~824MHz), 5MHz Bandwidth, QPSK (99% BW)

Date: 22.APR.2019 14:00:49
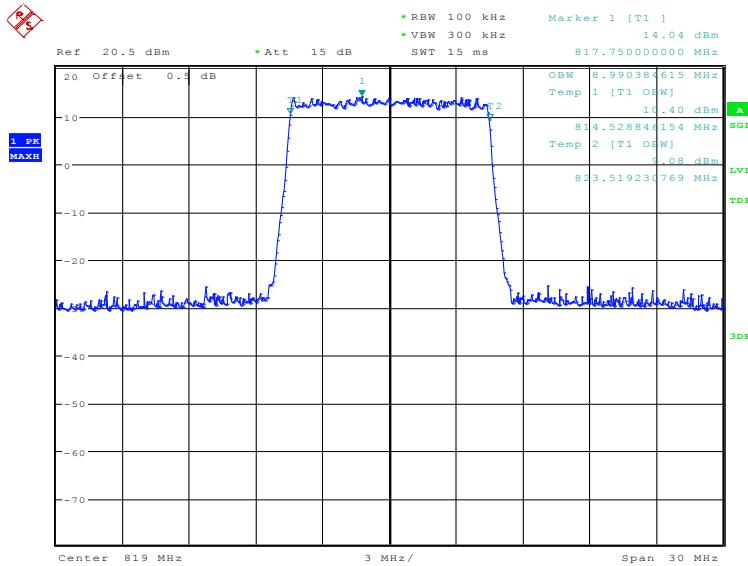
LTE band 26(814MHz~824MHz), 5MHz Bandwidth, 16QAM (99% BW)

Date: 22.APR.2019 14:02:14

LTE band 26(814MHz~824MHz), 10MHz (99%)
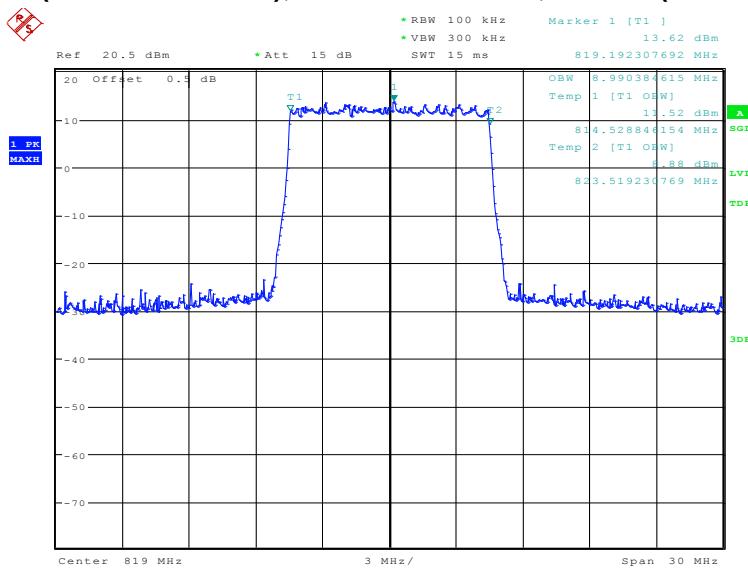
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
819.0	QPSK	16QAM
	8990.38	8990.38

LTE band 26(814MHz~824MHz), 10MHz Bandwidth, QPSK (99% BW)

Date: 22.APR.2019 14:03:40
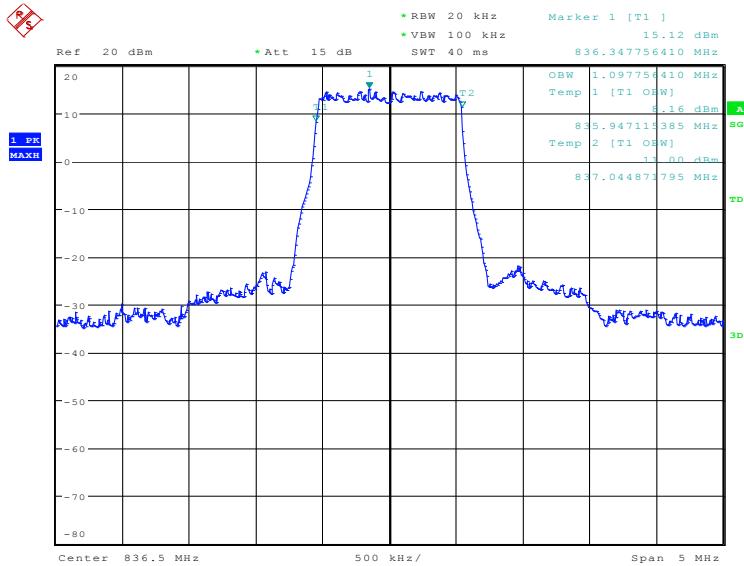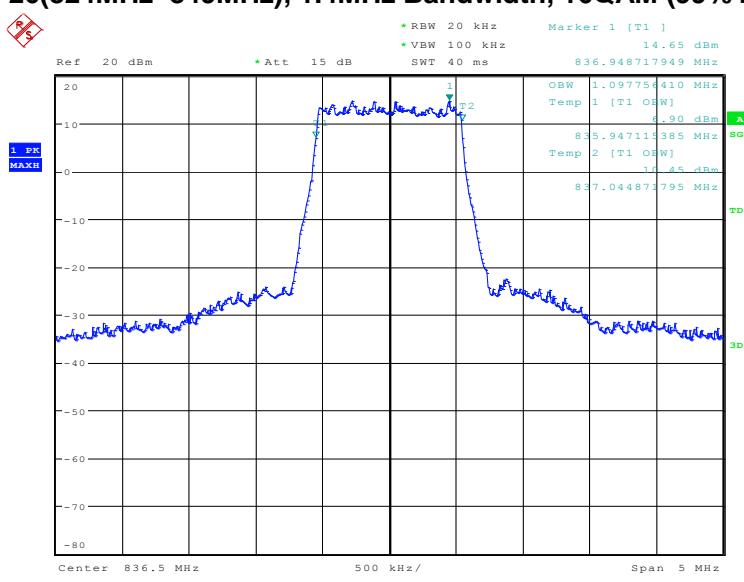
LTE band 26(814MHz~824MHz), 10MHz Bandwidth, 16QAM (99% BW)

Date: 22.APR.2019 14:05:04
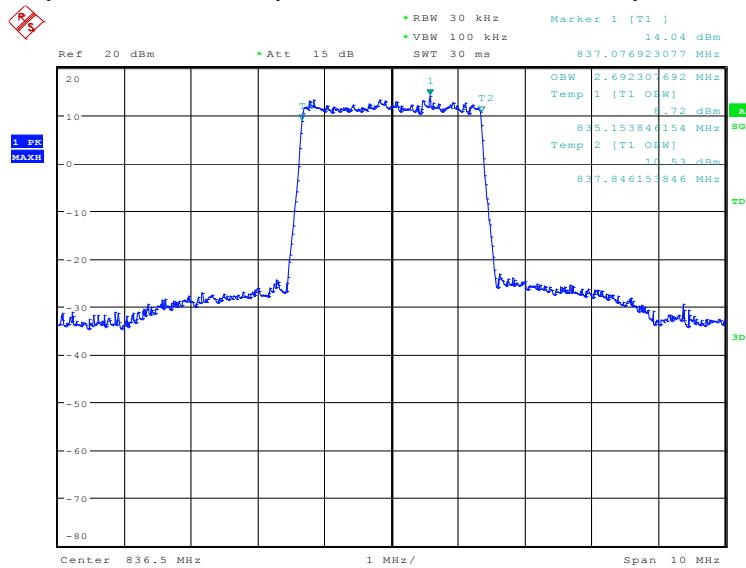
LTE band 26(824MHz~849MHz), 1.4MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
836.5	1097.76	1097.76
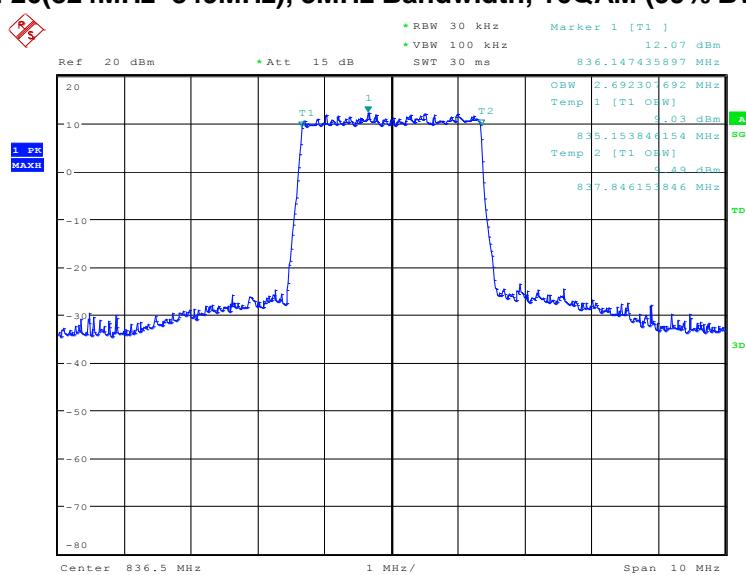
LTE band 26(824MHz~849MHz), 1.4MHz Bandwidth, QPSK (99% BW)

Date: 22.APR.2019 13:40:20

LTE band 26(824MHz~849MHz), 1.4MHz Bandwidth, 16QAM (99% BW)

Date: 22.APR.2019 13:41:44

LTE band 26(824MHz~849MHz), 3MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
836.5	2692.31	2692.31

LTE band 26(824MHz~849MHz), 3MHz Bandwidth, QPSK (99% BW)
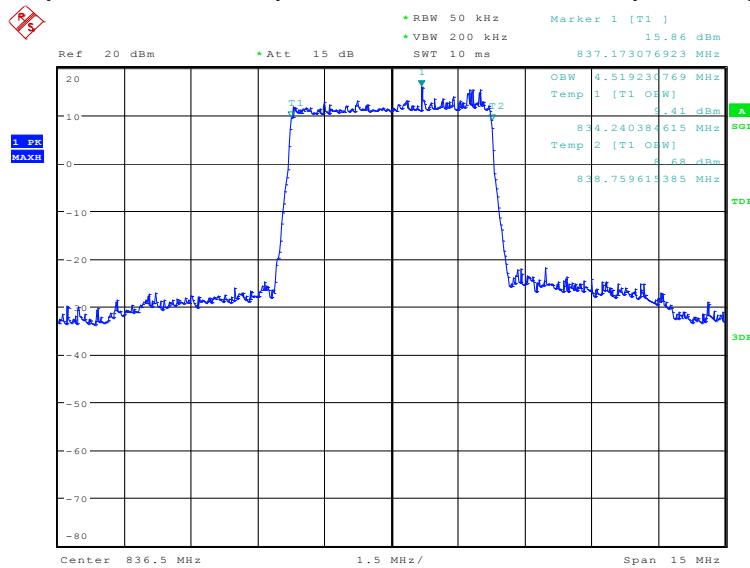
Date: 22.APR.2019 13:43:10

LTE band 26(824MHz~849MHz), 3MHz Bandwidth, 16QAM (99% BW)
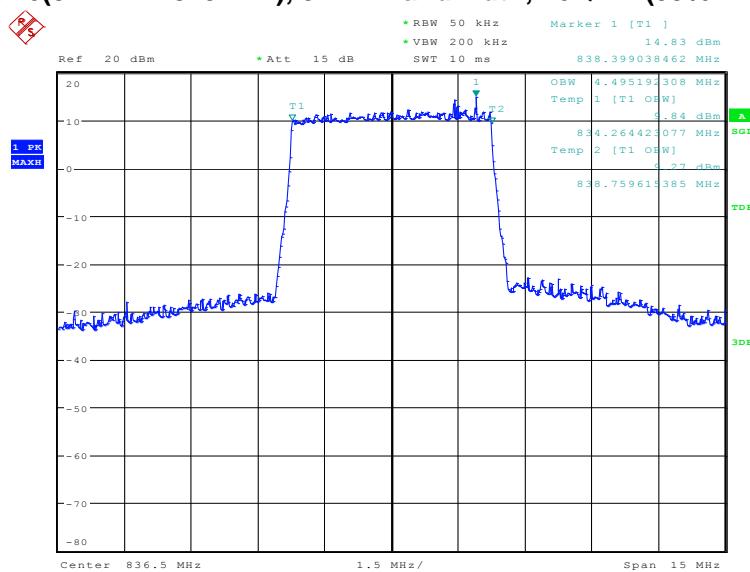
Date: 22.APR.2019 13:44:34

LTE band 26(824MHz~849MHz), 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
836.5	4519.23	4495.19

LTE band 26(824MHz~849MHz), 5MHz Bandwidth, QPSK (99% BW)
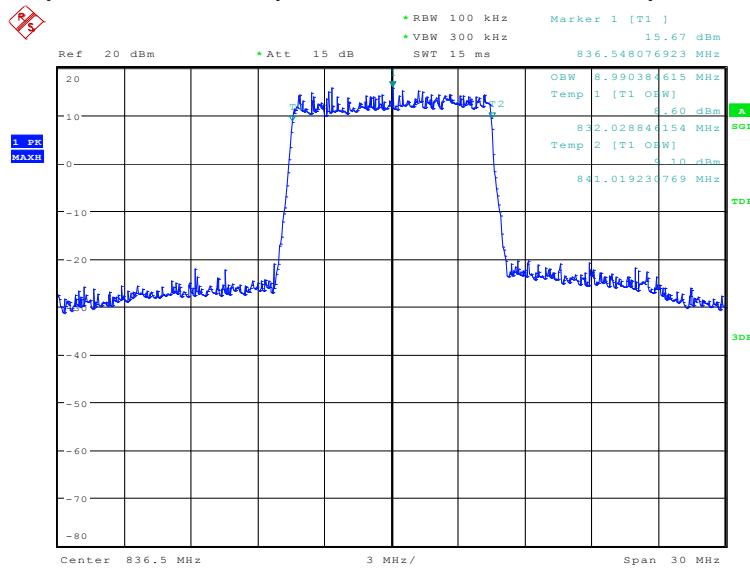
Date: 22.APR.2019 13:46:00

LTE band 26(824MHz~849MHz), 5MHz Bandwidth, 16QAM (99% BW)
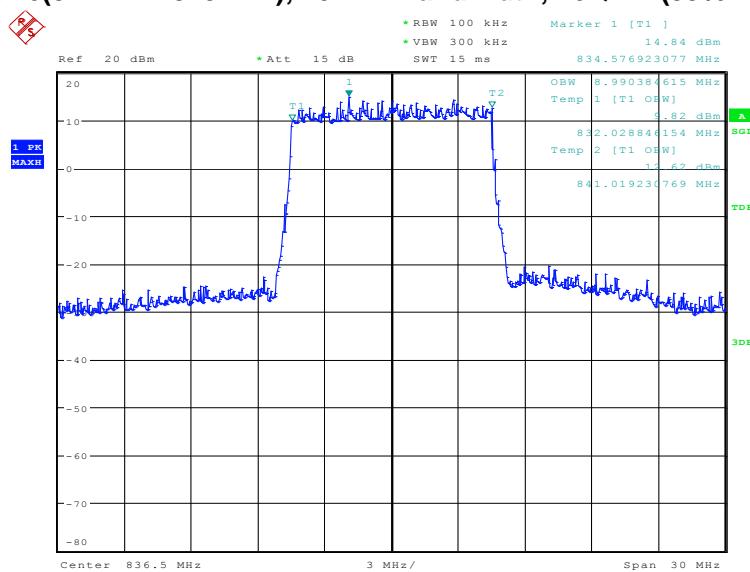
Date: 22.APR.2019 13:47:24

LTE band 26(824MHz~849MHz), 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
836.5	8990.38	8990.38

LTE band 26(824MHz~849MHz), 10MHz Bandwidth, QPSK (99% BW)
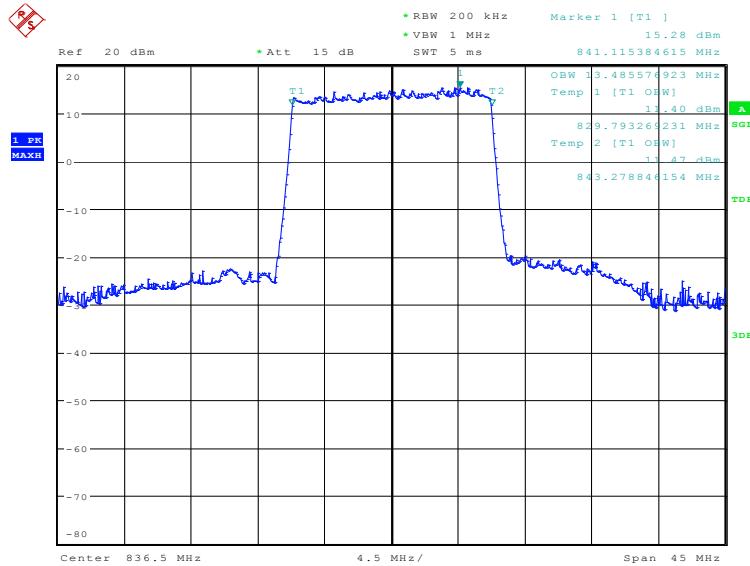
Date: 22.APR.2019 13:48:50

LTE band 26(824MHz~849MHz), 10MHz Bandwidth, 16QAM (99% BW)
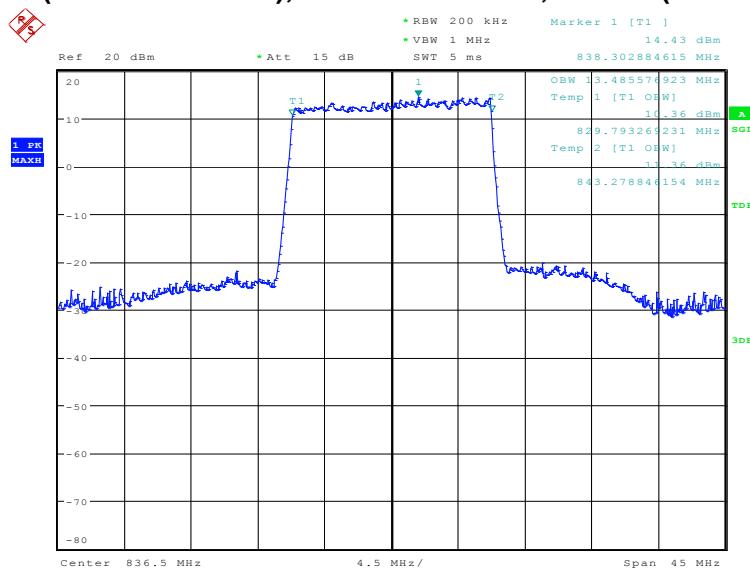
Date: 22.APR.2019 13:50:15

LTE band 26(824MHz~849MHz), 15MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
836.5	13485.58	13485.58

LTE band 26(824MHz~849MHz), 15MHz Bandwidth, QPSK (99% BW)
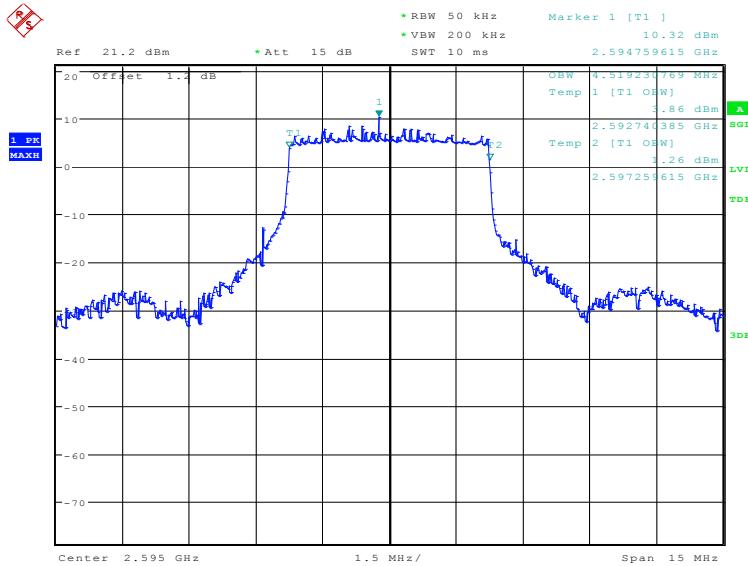
Date: 22.APR.2019 13:51:41

LTE band 26(824MHz~849MHz), 15MHz Bandwidth, 16QAM (99% BW)
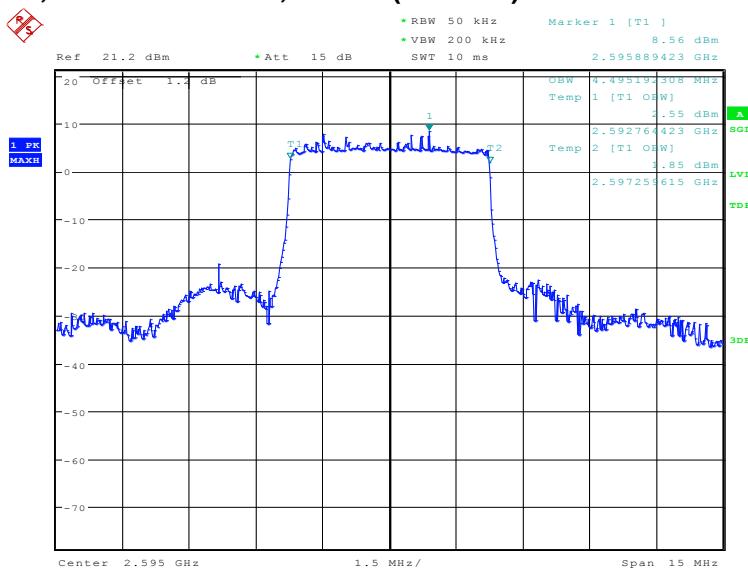
Date: 22.APR.2019 13:53:05

LTE band 38, 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
	QPSK	16QAM
2595.0	4519.23	4495.19

LTE band 38, 5MHz Bandwidth, QPSK (99% BW)
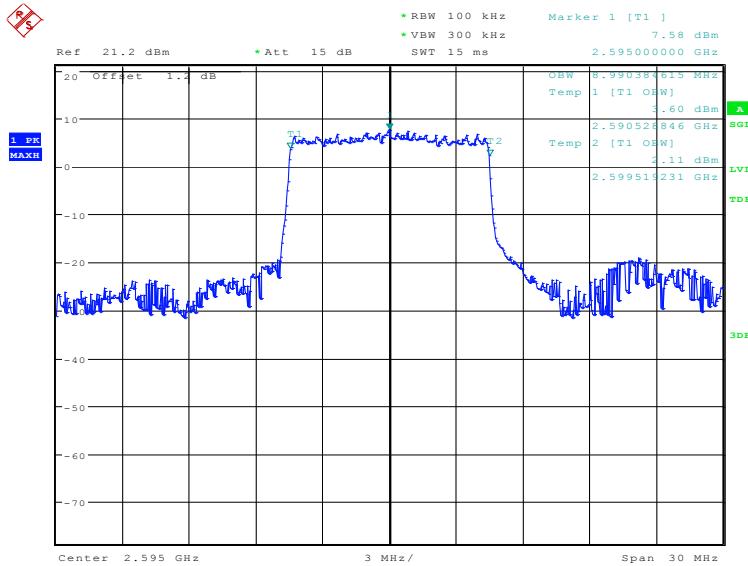
Date: 26.JUN.2019 12:39:58

LTE band 38, 5MHz Bandwidth,16QAM (99% BW)
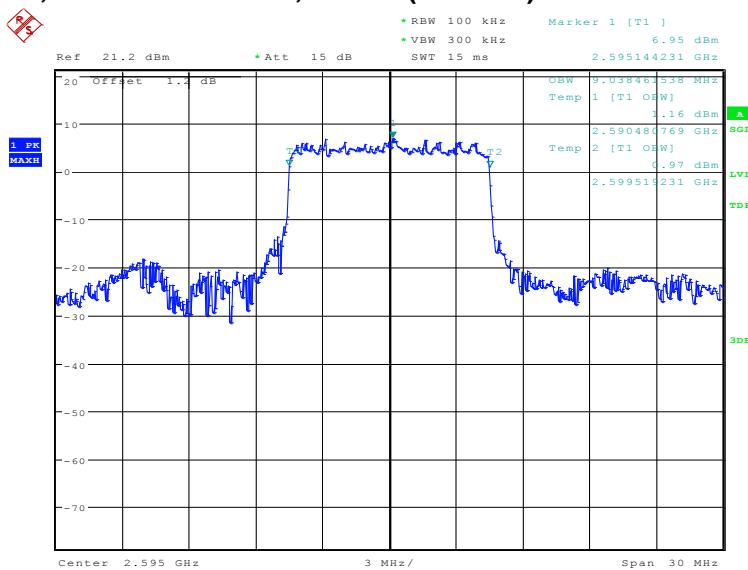
Date: 26.JUN.2019 12:41:22

LTE band 38, 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2595.0	QPSK	16QAM
	8990.38	9038.46

LTE band 38, 10MHz Bandwidth, QPSK (99% BW)
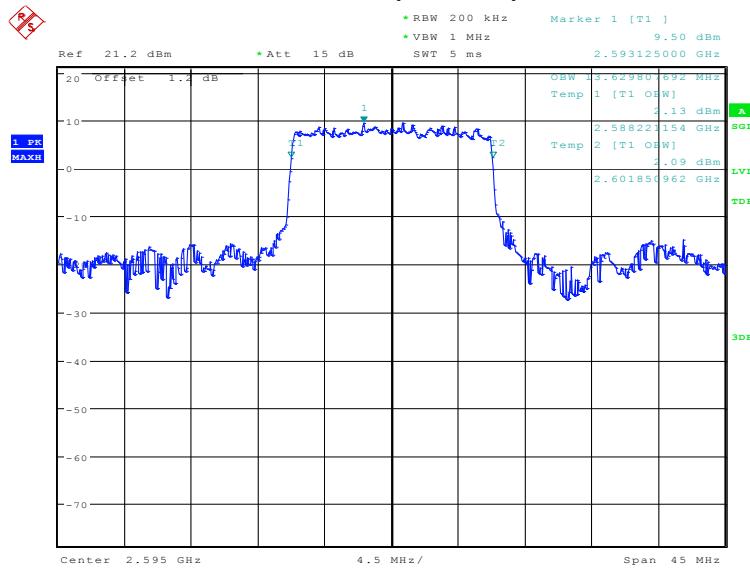
Date: 26.JUN.2019 12:42:48

LTE band 38, 10MHz Bandwidth,16QAM (99% BW)
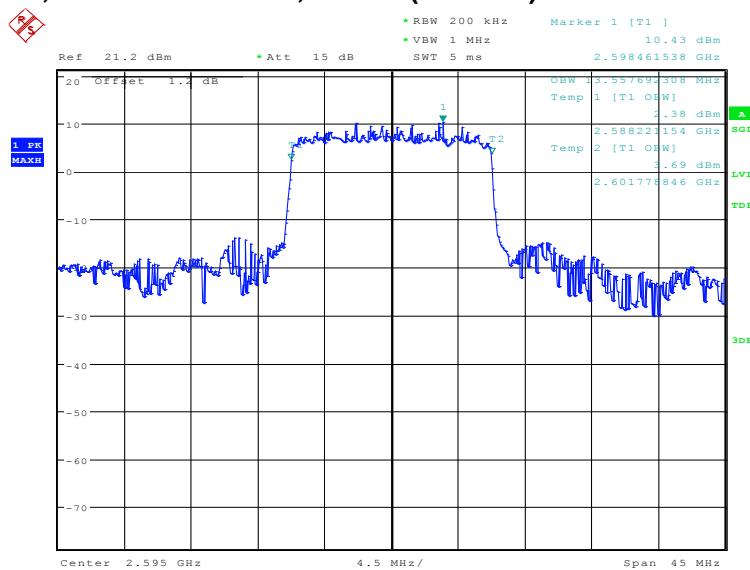
Date: 26.JUN.2019 12:44:11

LTE band 38,15MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2595.0	QPSK	16QAM
	13629.81	13557.69

LTE band 38,15MHz Bandwidth, QPSK (99% BW)
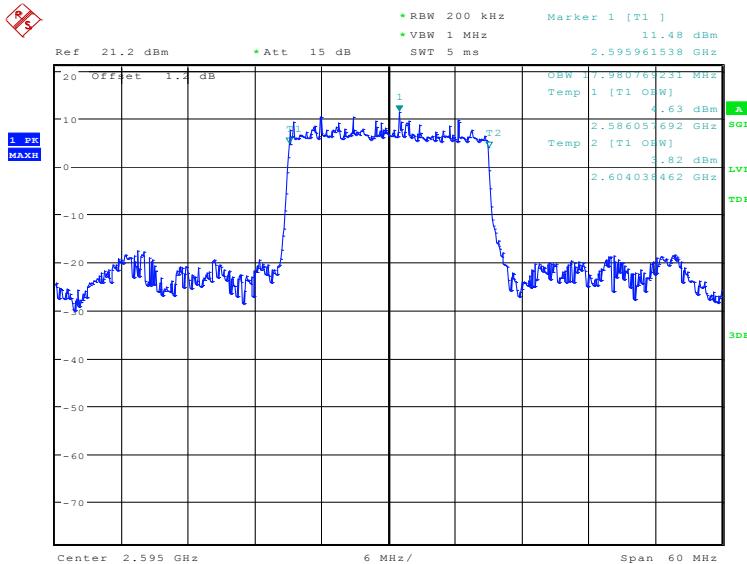
Date: 26.JUN.2019 12:45:37

LTE band 38, 15MHz Bandwidth,16QAM (99% BW)
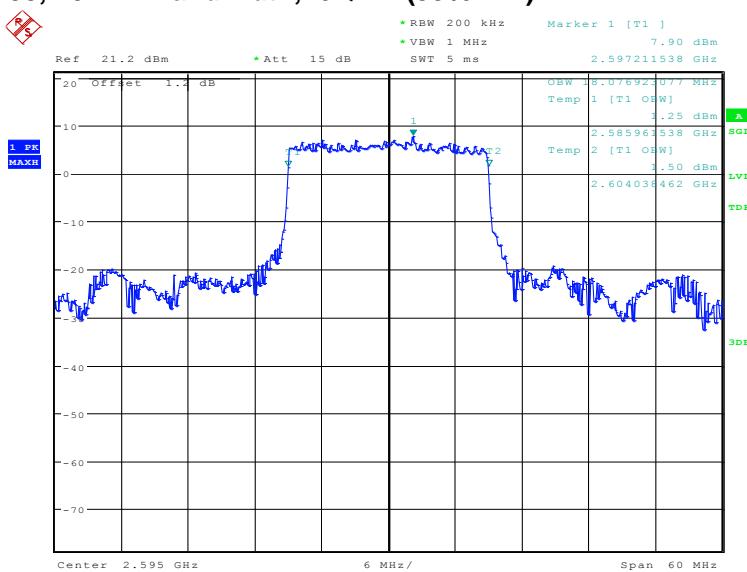
Date: 26.JUN.2019 12:47:01

LTE band 38, 20MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2595.0	QPSK	16QAM
	17980.77	18076.92

LTE band 38, 20MHz Bandwidth, QPSK (99% BW)

Date: 26.JUN.2019 12:48:26

LTE band 38, 20MHz Bandwidth,16QAM (99% BW)

Date: 26.JUN.2019 12:49:50

A.5   EMISSION BANDWIDTH
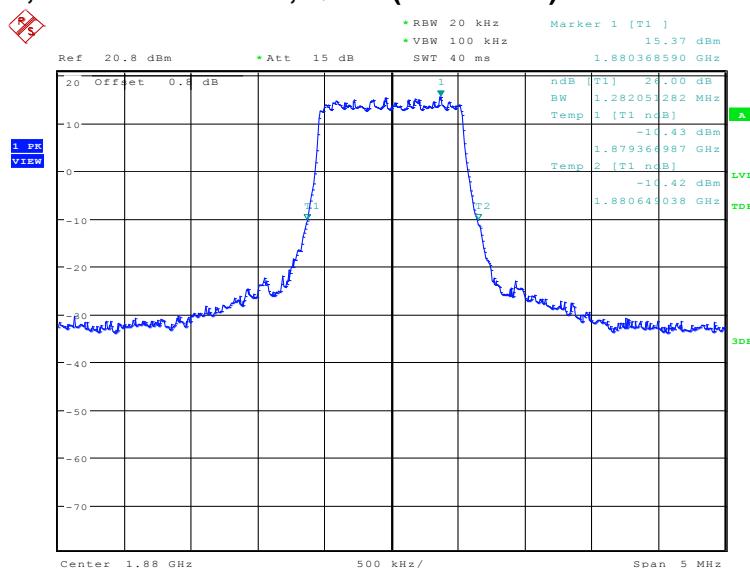
A.5.1 Emission Bandwidth Results

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. Table below lists the measured -26dBc BW. Spectrum analyzer plots are included on the following pages.

LTE band 2, 1.4MHz (-26dBc)
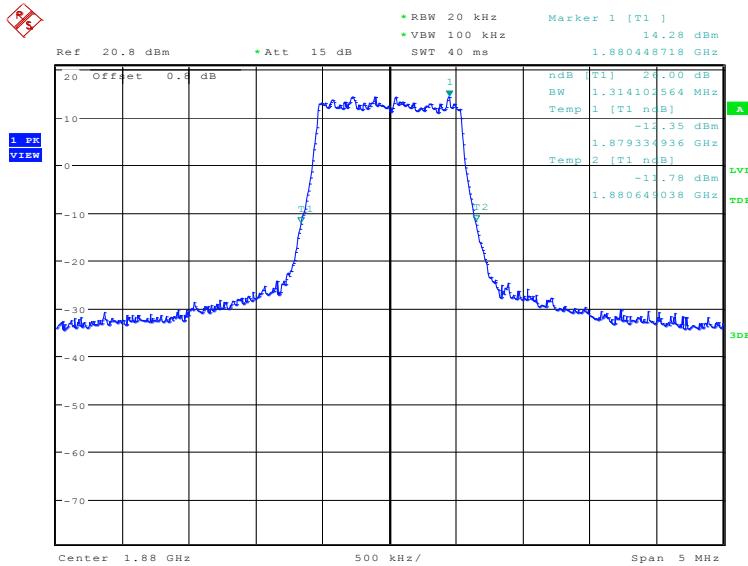
Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
1880.0		
	1282.05	1314.10

LTE band 2, 1.4MHz Bandwidth, QPSK (-26dBc BW)

Date: 28.MAY.2019 13:26:11

LTE band 2, 1.4MHz Bandwidth, 16QAM (-26dBc BW)

```
                                    * RBW  20 kHz        Marker 1 [T1 ]
                                    * VBW  100 kHz                 14.28 dBm
     Ref   20.8 dBm      * Att  15 dB    SWT 40 ms        1.880448718 GHz
     20  Offset  0.8  dB                           ndB [T1]    26.00 dB
                                                   BW   1.314102564 MHz
        10                                         Temp 1 [T1 ndB]
                                                            -12.35 dBm
         0                                          1.879334936 GHz
                                                   Temp 2 [T1 ndB]
       -10                                                  -11.78 dBm
                                                    1.880649038 GHz
       -20
       -30
       -40
       -50
       -60
       -70

     Center  1.88 GHz          500 kHz/              Span 5 MHz
```
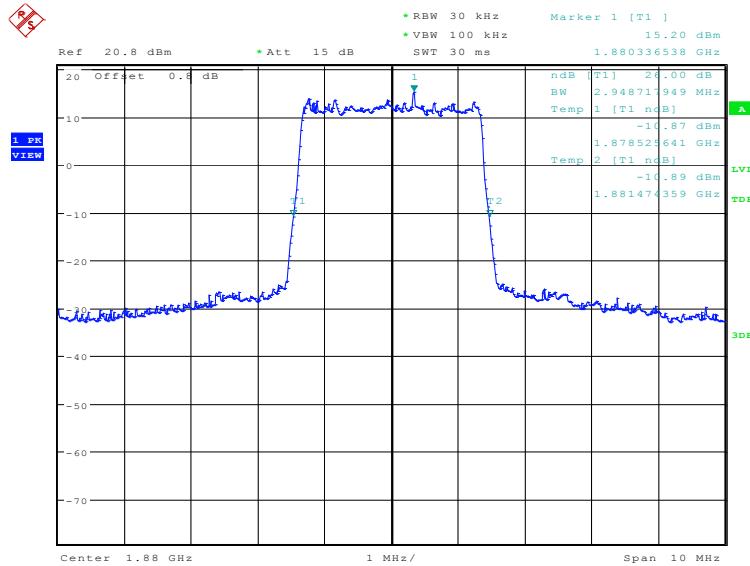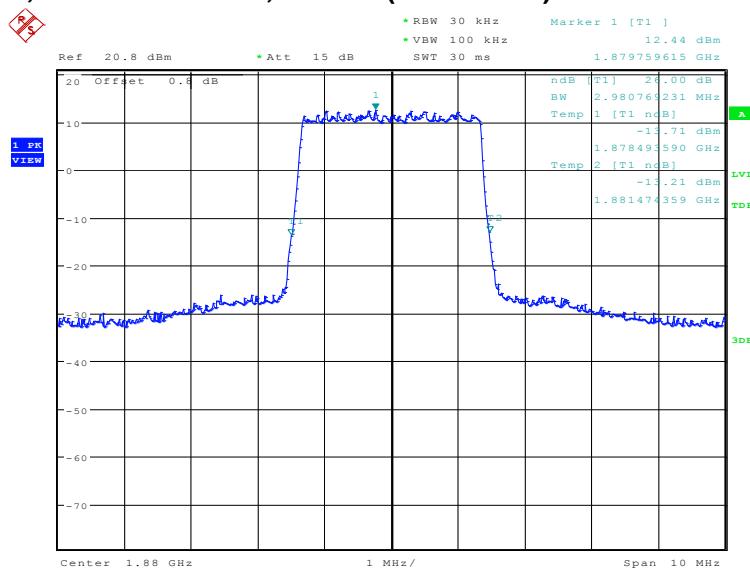
Date: 28.MAY.2019 13:27:35

LTE band 2, 3MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
1880.0	2948.72	2980.77

LTE band 2, 3MHz Bandwidth, QPSK (-26dBc BW)
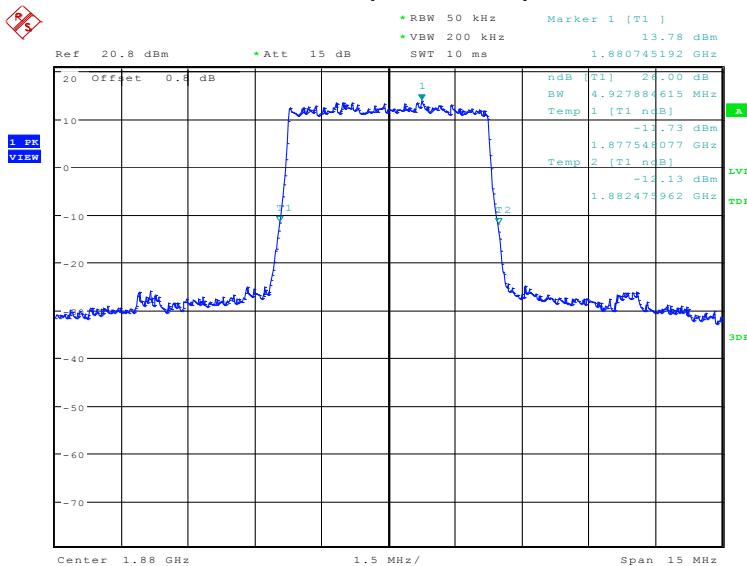
Date: 28.MAY.2019 13:29:02

LTE band 2, 3MHz Bandwidth, 16QAM (-26dBc BW)
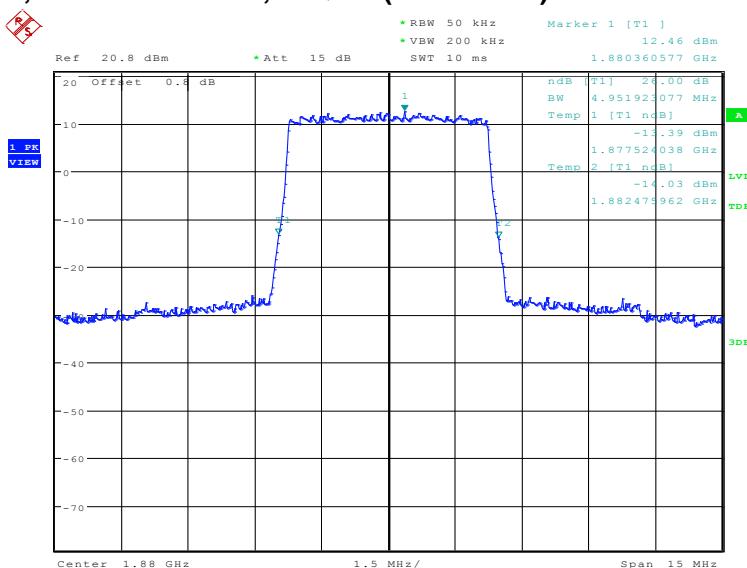
Date: 28.MAY.2019 13:30:26

LTE band 2, 5MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
1880.0	4927.88	4951.92

LTE band 2, 5MHz Bandwidth, QPSK (-26dBc BW)
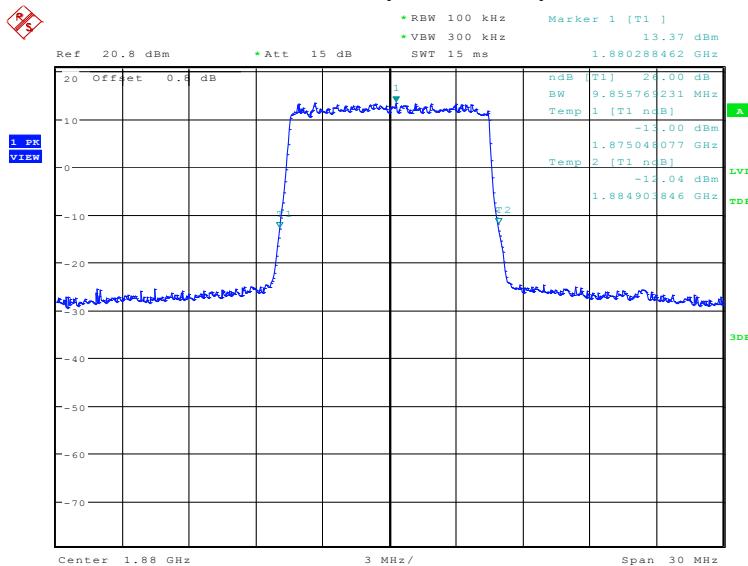
Date: 28.MAY.2019 13:31:53

LTE band 2, 5MHz Bandwidth, 16QAM (-26dBc BW)
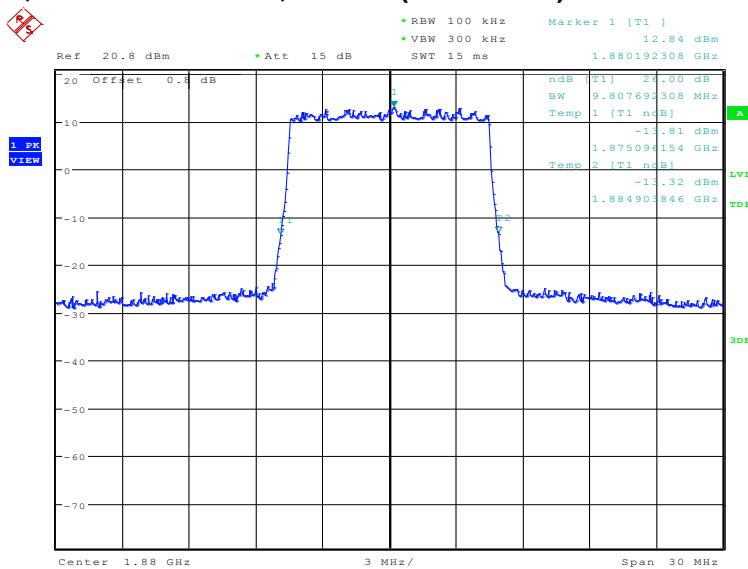
Date: 28.MAY.2019 13:33:18

LTE band 2, 10MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
1880.0	9855.77	9807.69

LTE band 2, 10MHz Bandwidth, QPSK (-26dBc BW)
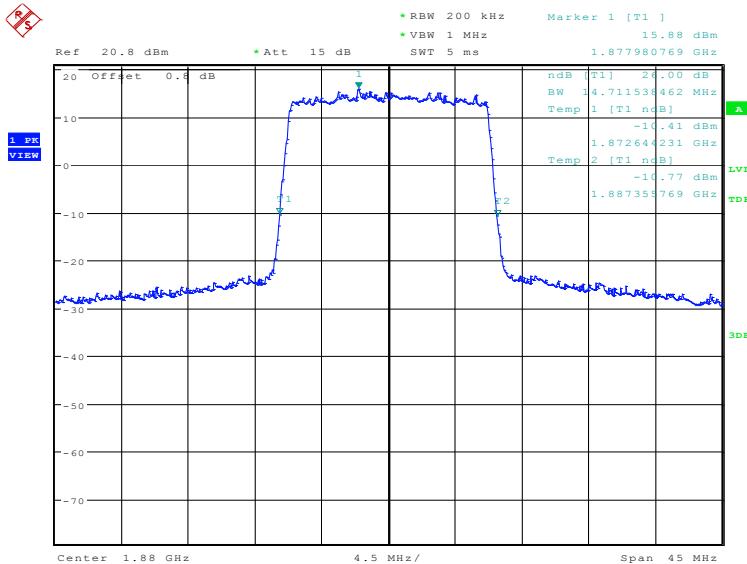
Date: 28.MAY.2019 13:34:44

LTE band 2, 10MHz Bandwidth, 16QAM (-26dBc BW)
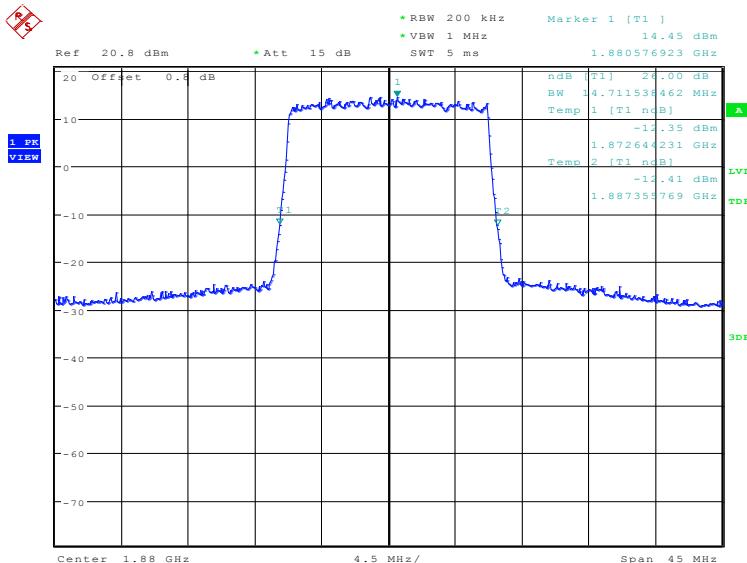
Date: 28.MAY.2019 13:36:09

LTE band 2, 15MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
1880.0	14711.54	14711.54

LTE band 2, 15MHz Bandwidth, QPSK (-26dBc BW)
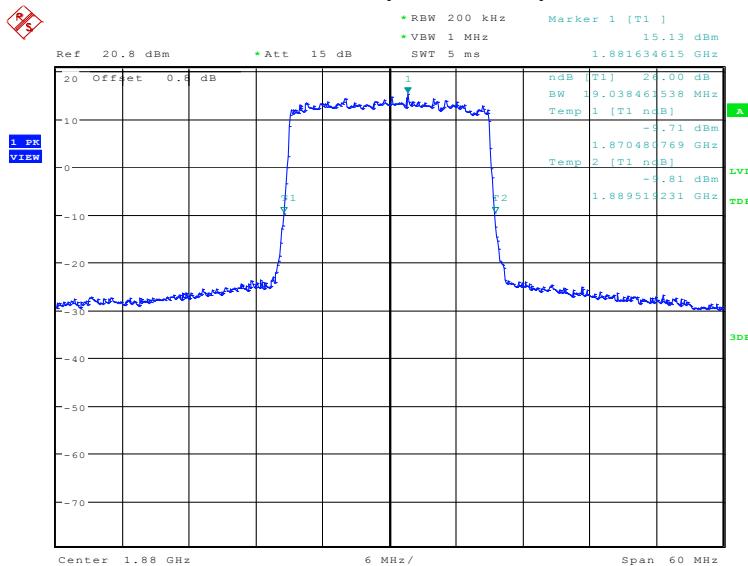
Date: 28.MAY.2019 13:37:35

LTE band 2, 15MHz Bandwidth, 16QAM (-26dBc BW)
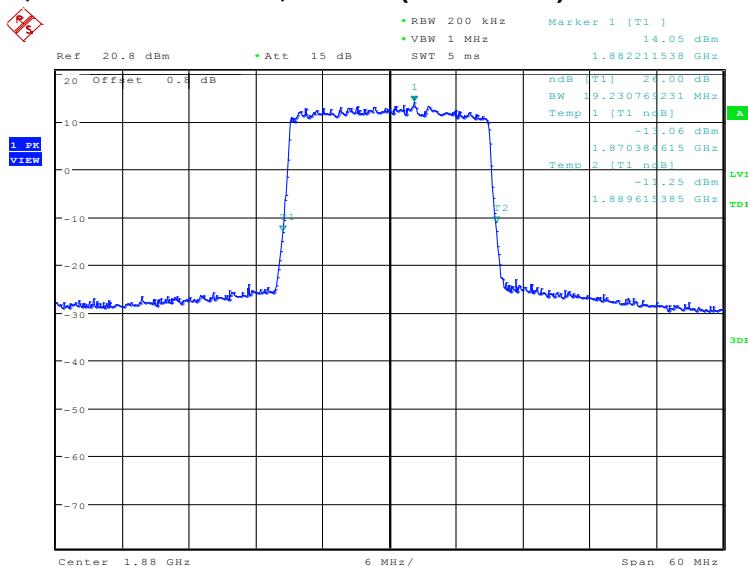
Date: 28.MAY.2019 13:39:00

LTE band 2, 20MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
1880.0	19038.46	19230.77

LTE band 2, 20MHz Bandwidth, QPSK (-26dBc BW)
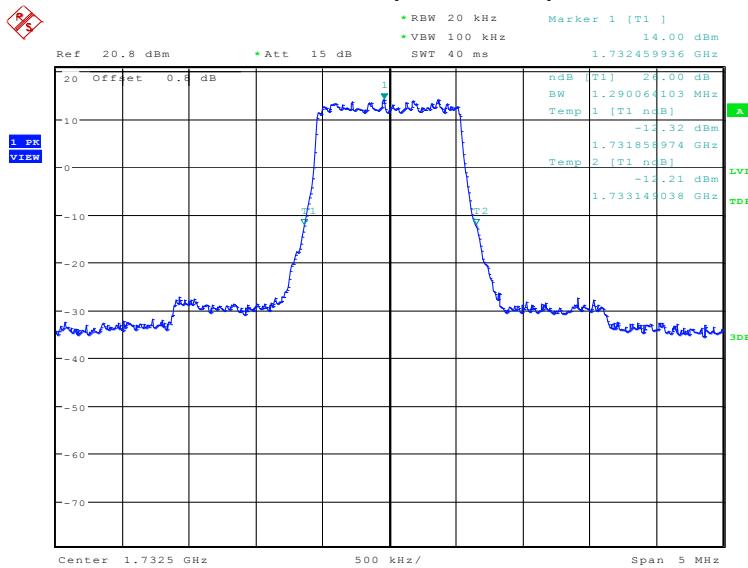
Date: 28.MAY.2019 13:40:27

LTE band 2, 20MHz Bandwidth, 16QAM (-26dBc BW)
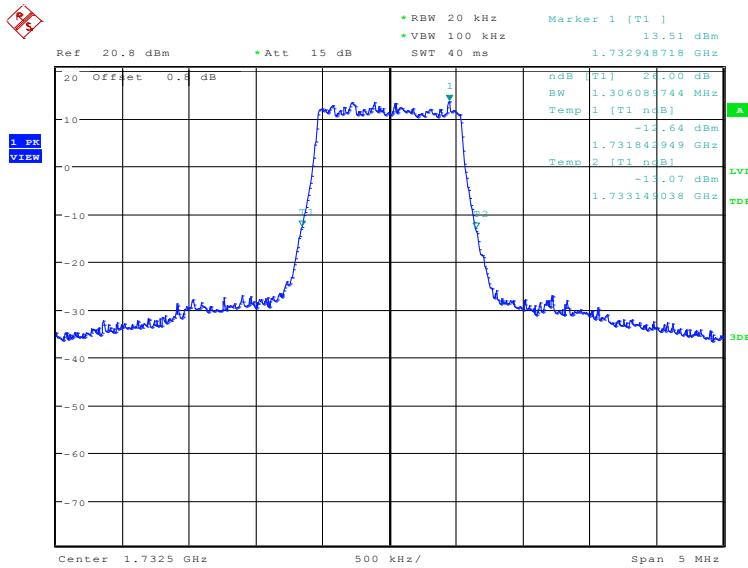
Date: 28.MAY.2019 13:41:51

LTE band 4, 1.4MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
1732.5	QPSK	16QAM
	1290.06	1306.09

LTE band 4, 1.4MHz Bandwidth, QPSK (-26dBc BW)
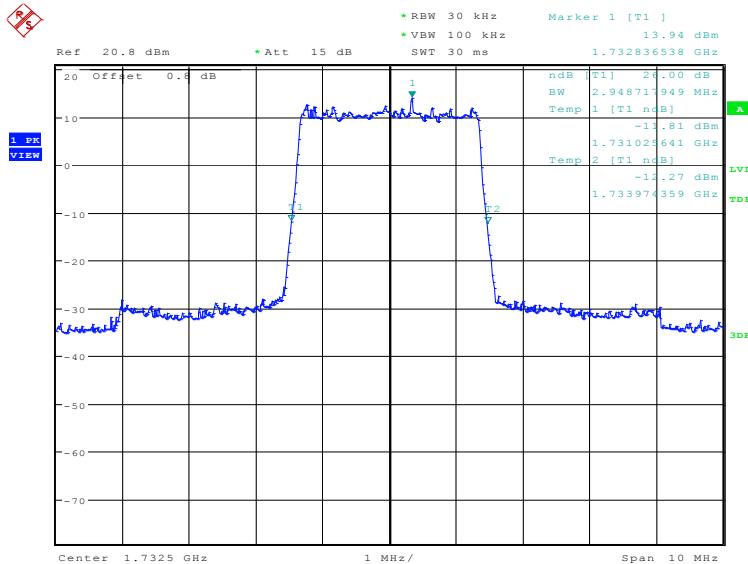
Date: 26.JUN.2019 12:51:49

LTE band 4, 1.4MHz Bandwidth, 16QAM (-26dBc BW)
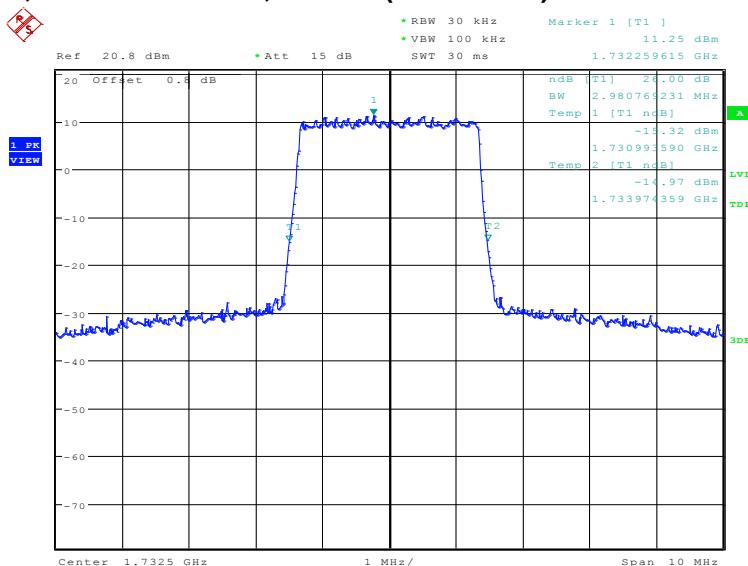
Date: 26.JUN.2019 12:53:13

LTE band 4, 3MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
1732.5	2948.72	2980.77

LTE band 4, 3MHz Bandwidth, QPSK (-26dBc BW)
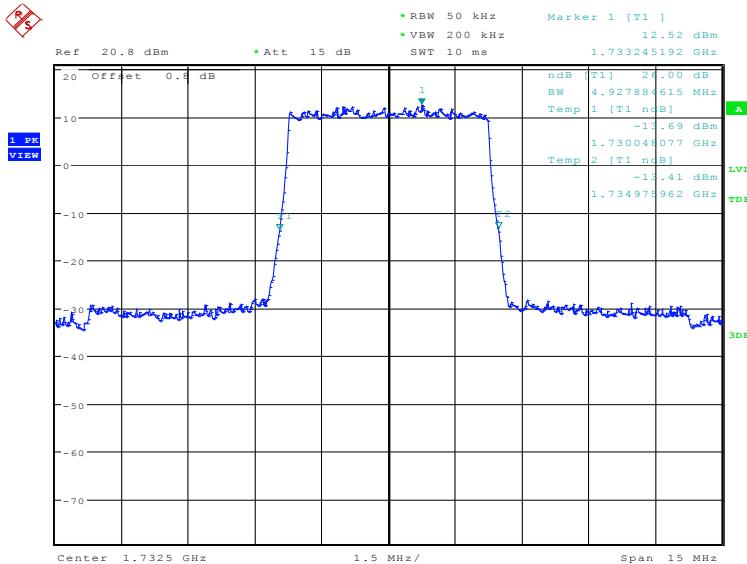
Date: 26.JUN.2019 12:54:39

LTE band 4, 3MHz Bandwidth, 16QAM (-26dBc BW)
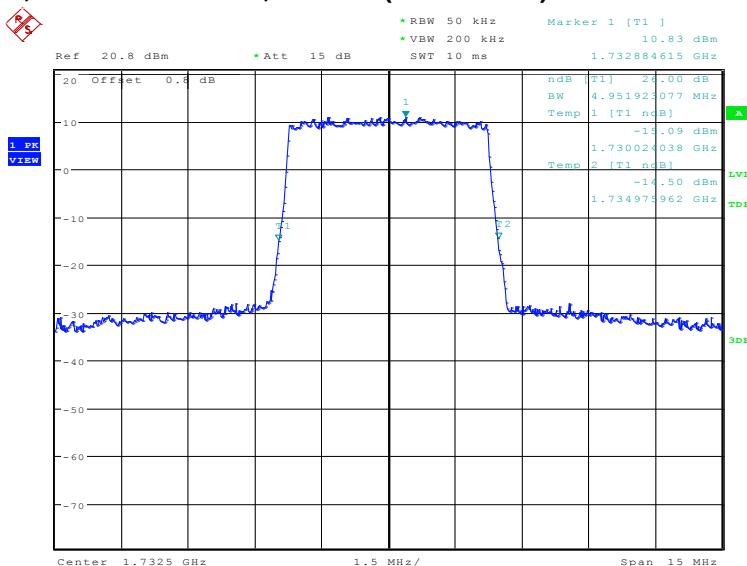
Date: 26.JUN.2019 12:56:03

LTE band 4, 5MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
1732.5	4927.88	4951.92

LTE band 4, 5MHz Bandwidth, QPSK (-26dBc BW)
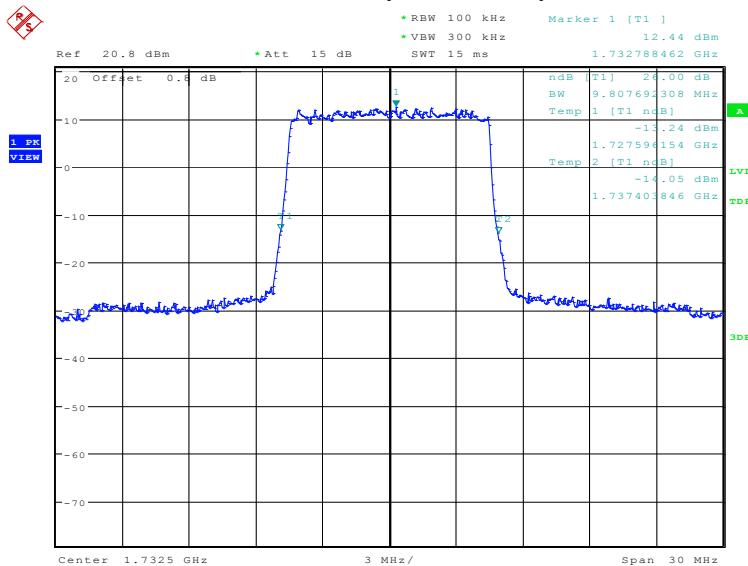
Date: 26.JUN.2019 12:57:29

LTE band 4, 5MHz Bandwidth, 16QAM (-26dBc BW)
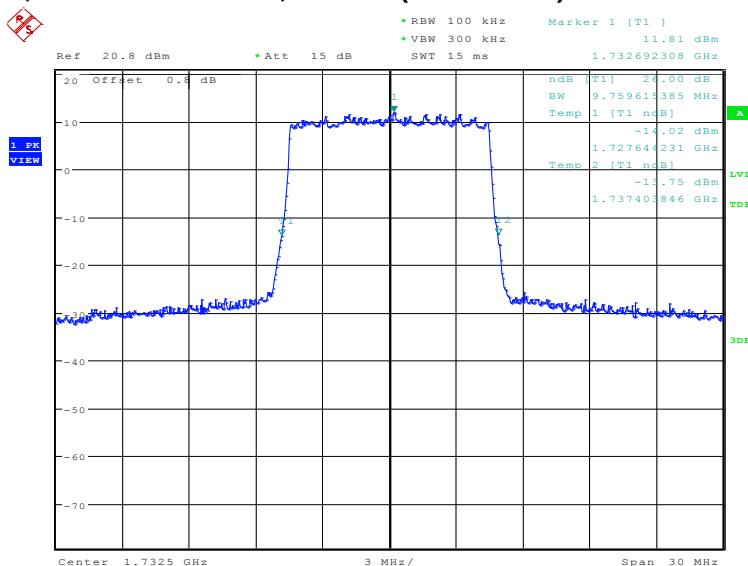
Date: 26.JUN.2019 12:58:53

LTE band 4, 10MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
1732.5	9807.69	9759.62

LTE band 4, 10MHz Bandwidth, QPSK (-26dBc BW)

Date: 26.JUN.2019 13:00:19
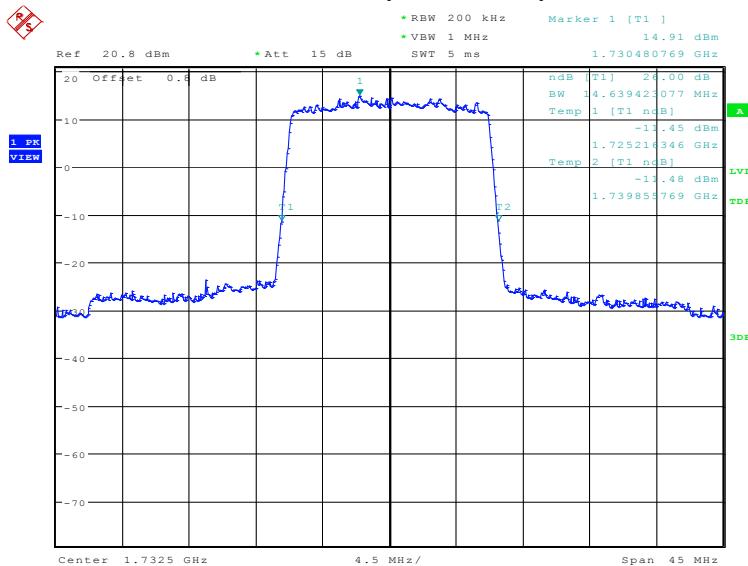
LTE band 4, 10MHz Bandwidth, 16QAM (-26dBc BW)

Date: 26.JUN.2019 13:01:43

LTE band 4, 15MHz (-26dBc)
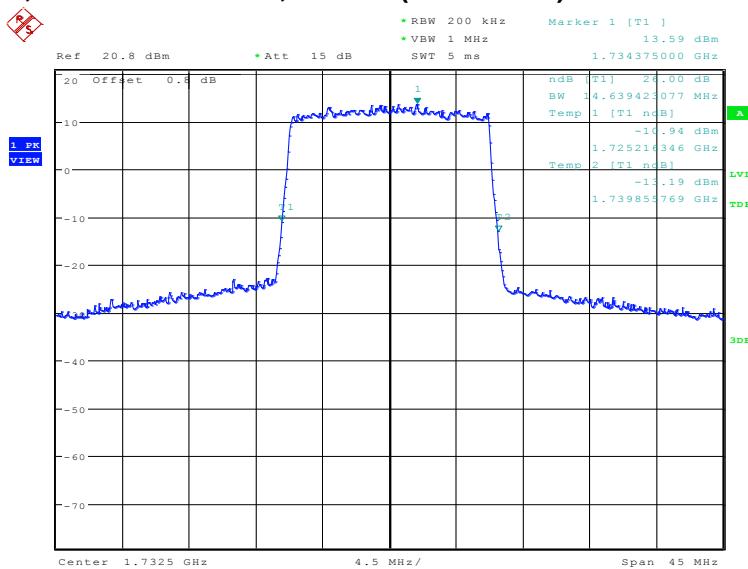
Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
1732.5	14639.42	14639.42

LTE band 4, 15MHz Bandwidth, QPSK (-26dBc BW)

Date: 26.JUN.2019 13:03:09
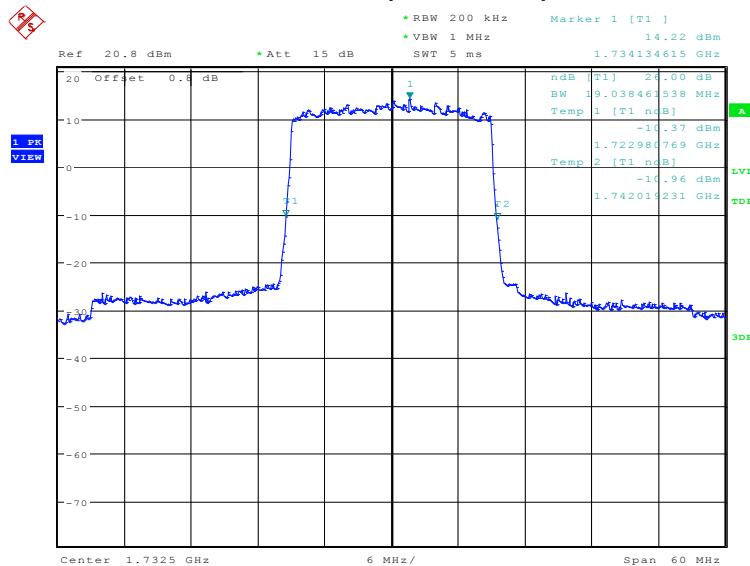
LTE band 4, 15MHz Bandwidth, 16QAM (-26dBc BW)
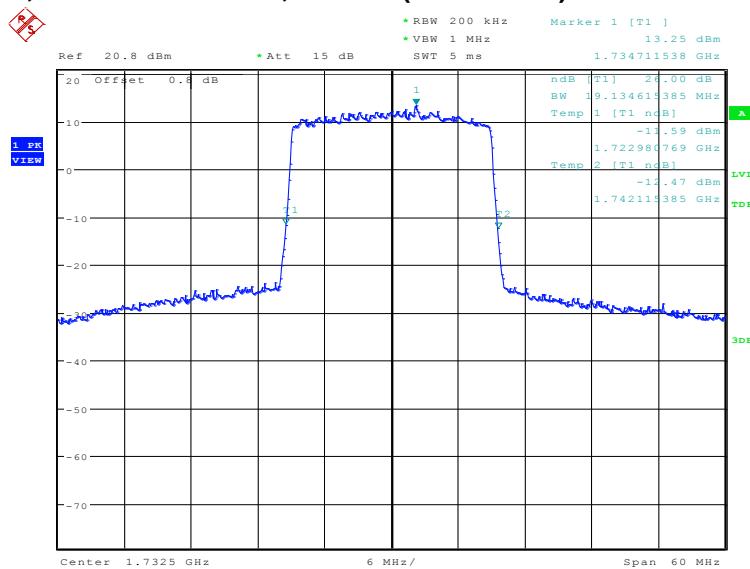
Date: 26.JUN.2019 13:04:34

LTE band 4, 20MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
1732.5	19038.46	19134.62

LTE band 4, 20MHz Bandwidth, QPSK (-26dBc BW)
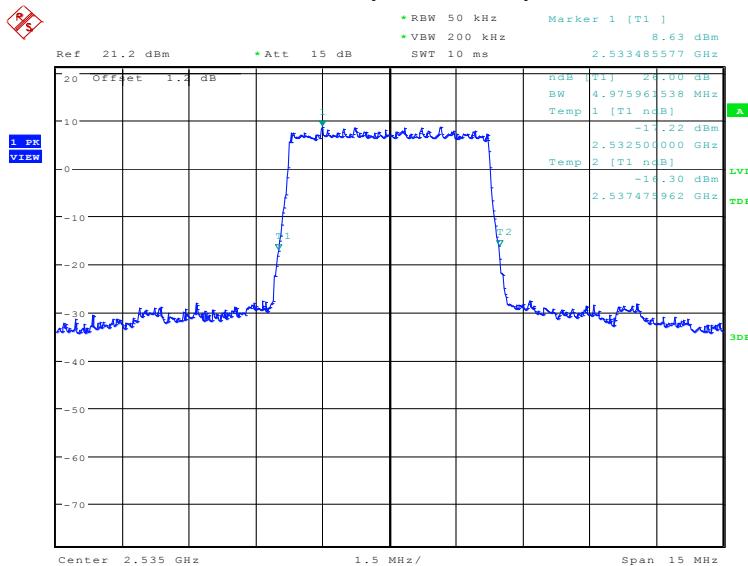
Date: 26.JUN.2019 13:06:00

LTE band 4, 20MHz Bandwidth, 16QAM (-26dBc BW)
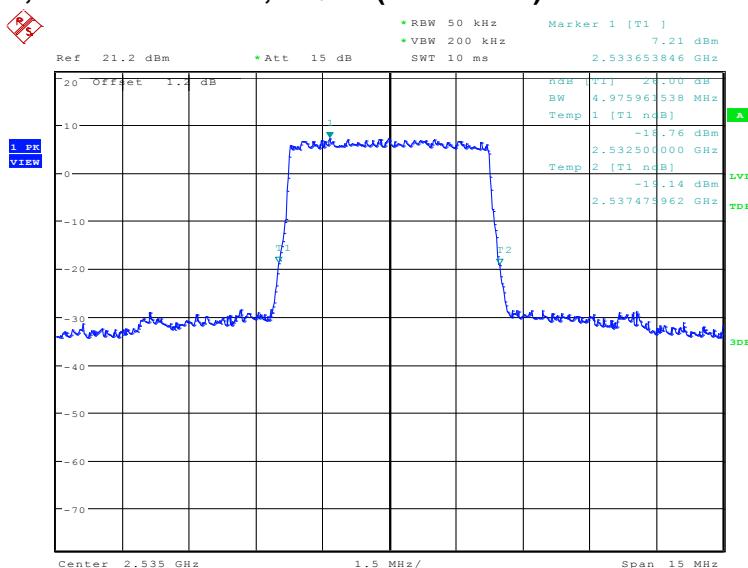
Date: 26.JUN.2019 13:07:24

LTE band 7, 5MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
2535.0	4975.96	4975.96

LTE band 7, 5MHz Bandwidth, QPSK (-26dBc BW)
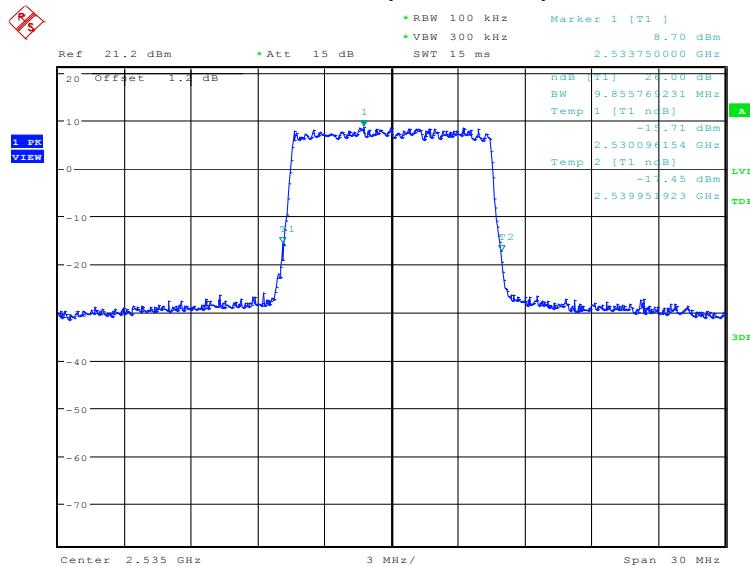
Date: 28.MAY.2019 14:00:33

LTE band 7, 5MHz Bandwidth,16QAM (-26dBc BW)
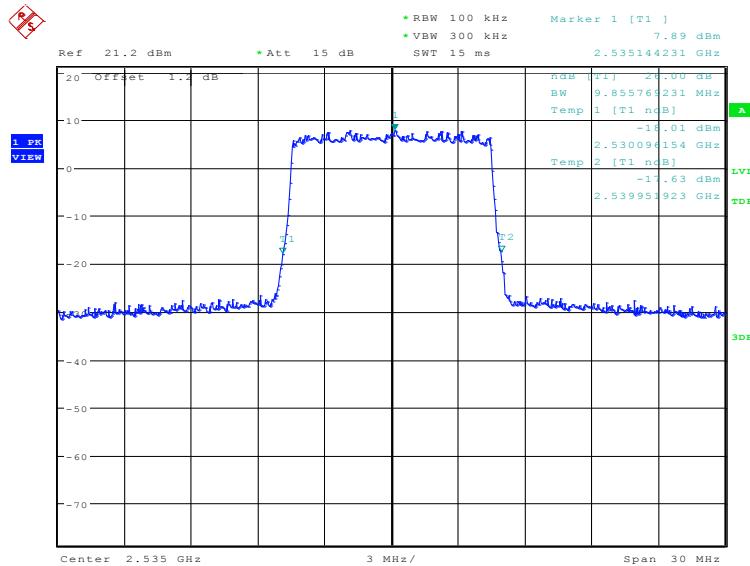
Date: 28.MAY.2019 14:01:58

LTE band 7, 10MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
2535.0	9855.77	9855.77

LTE band 7, 10MHz Bandwidth, QPSK (-26dBc BW)
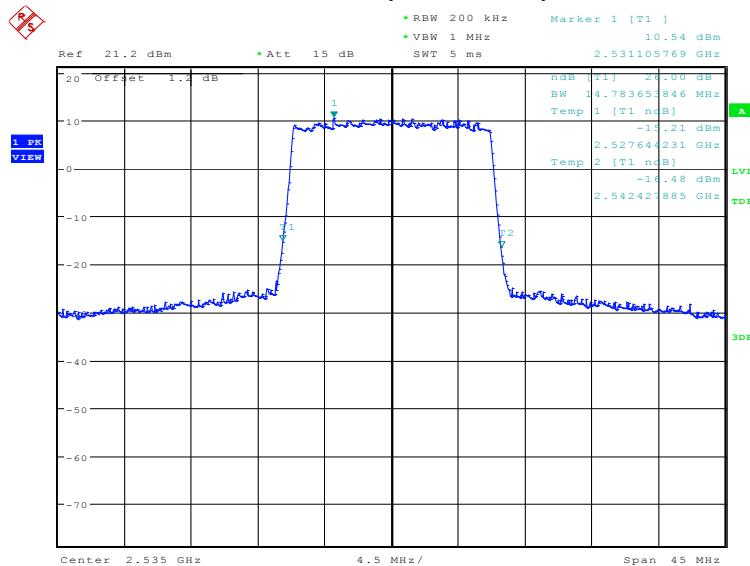
Date: 28.MAY.2019 14:03:25

LTE band 7, 10MHz Bandwidth,16QAM (-26dBc BW)
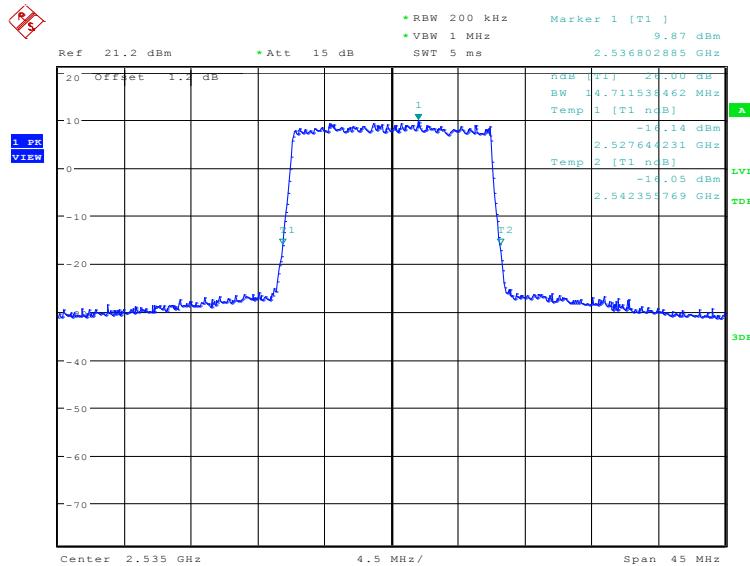
Date: 28.MAY.2019 14:04:50

LTE band 7, 15MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
2535.0	14783.65	14711.54

LTE band 7, 15MHz Bandwidth, QPSK (-26dBc BW)
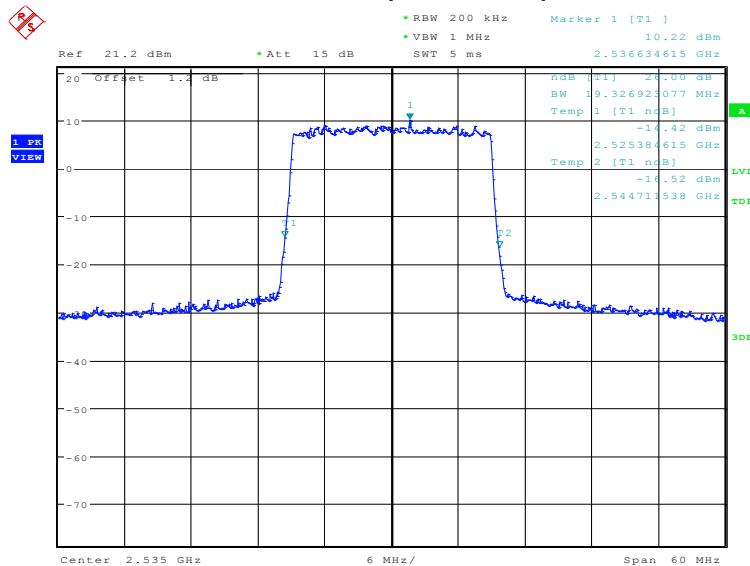
Date: 28.MAY.2019 14:06:16

LTE band 7, 15MHz Bandwidth,16QAM (-26dBc BW)
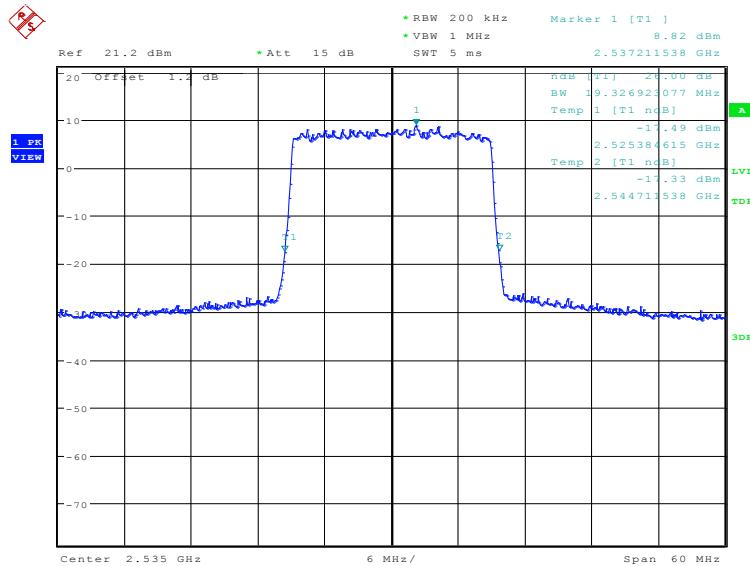
Date: 28.MAY.2019 14:07:41

LTE band 7, 20MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
2535.0	19326.92	19326.92

LTE band 7, 20MHz Bandwidth, QPSK (-26dBc BW)

Date: 28.MAY.2019 14:09:08
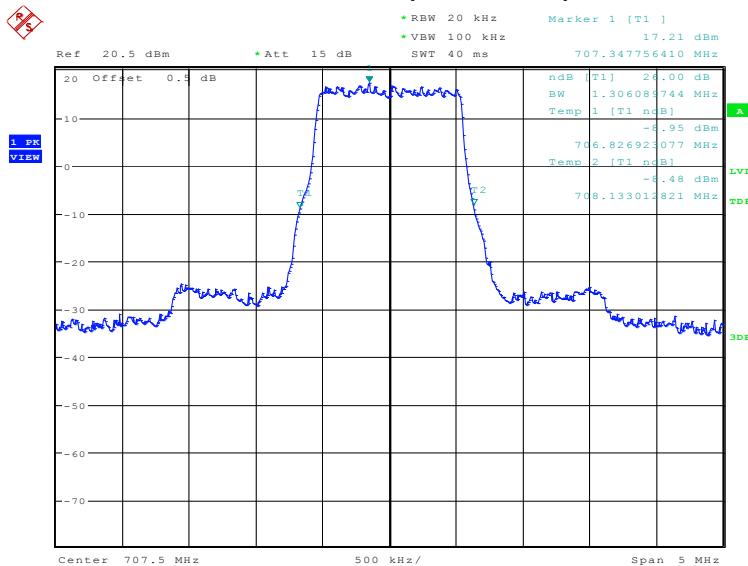
**LTE band 7, 20MHz Bandwidth,16QAM (-26dBc BW)**

Date: 28.MAY.2019 14:10:33

LTE band 12, 1.4MHz (-26dBc)
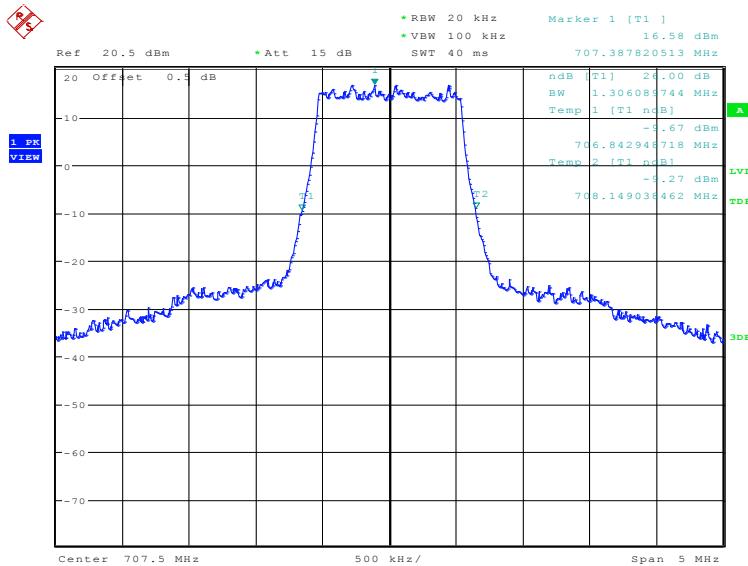
Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
707.5	1306.09	1306.09

LTE band 12, 1.4MHz Bandwidth, QPSK (-26dBc BW)

Date: 22.APR.2019 15:29:46
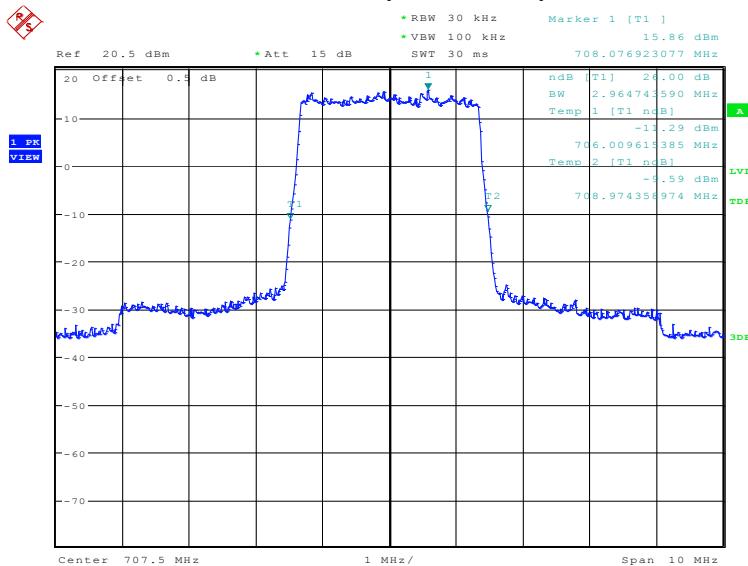
LTE band 12, 1.4MHz Bandwidth, 16QAM (-26dBc BW)
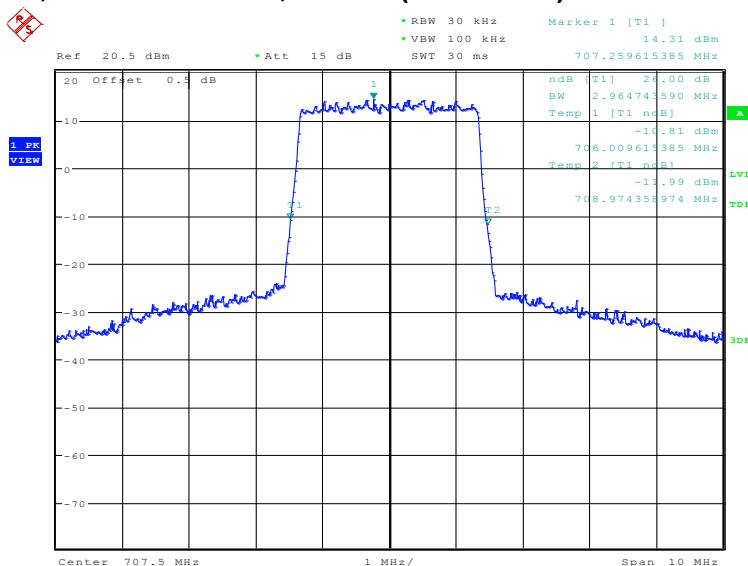
Date: 22.APR.2019 15:31:12

LTE band 12, 3MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
707.5	2964.74	2964.74

LTE band 12, 3MHz Bandwidth, QPSK (-26dBc BW)
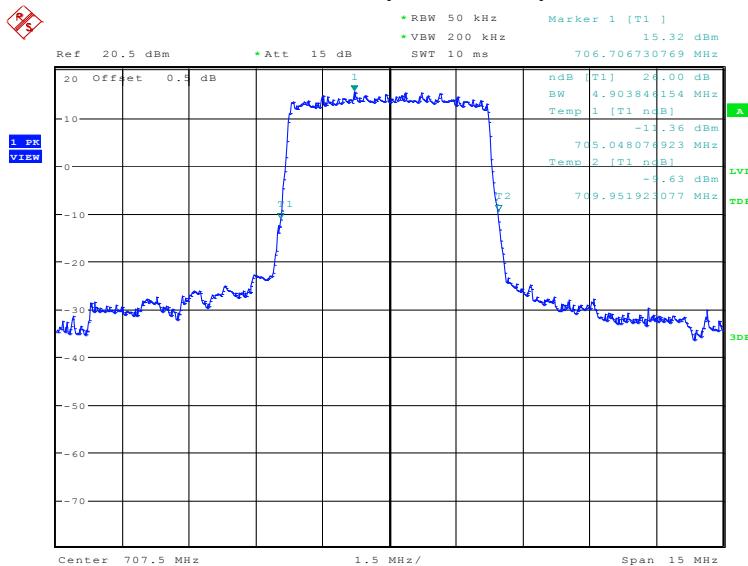
Date: 22.APR.2019 15:32:39

**LTE band 12, 3MHz Bandwidth, 16QAM (-26dBc BW)**
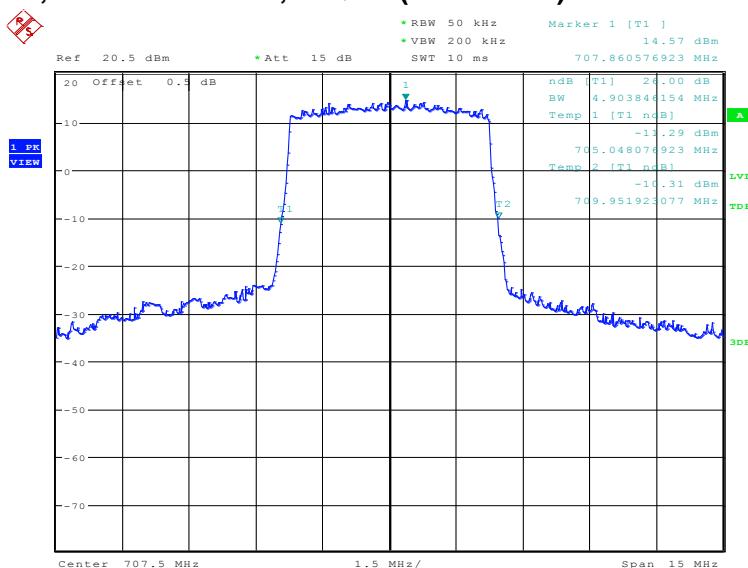
Date: 22.APR.2019 15:34:05

LTE band 12, 5MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
707.5	4903.85	4903.85

LTE band 12, 5MHz Bandwidth, QPSK (-26dBc BW)
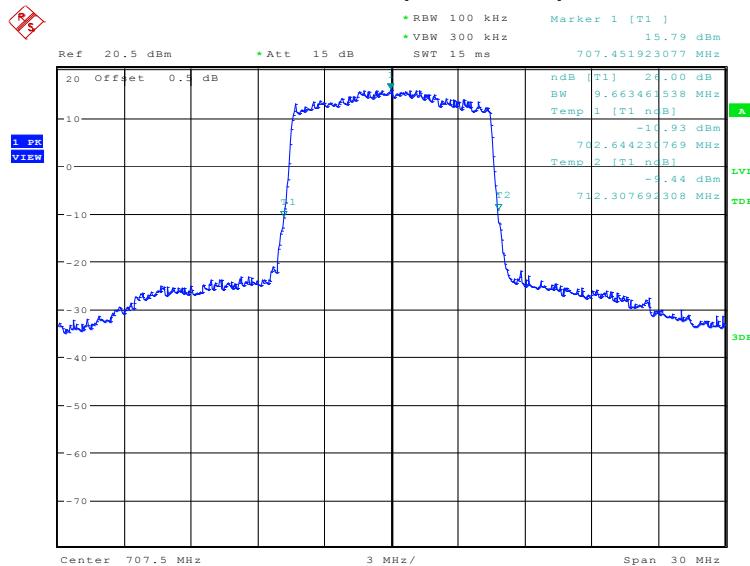
Date: 22.APR.2019 15:35:32

LTE band 12, 5MHz Bandwidth, 16QAM (-26dBc BW)
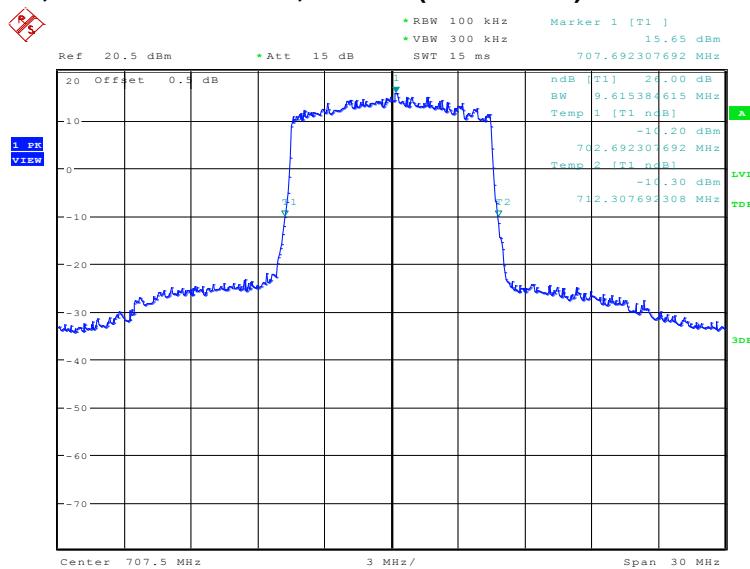
Date: 22.APR.2019 15:36:57

LTE band 12, 10MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
707.5	9663.46	9615.38

LTE band 12, 10MHz Bandwidth, QPSK (-26dBc BW)
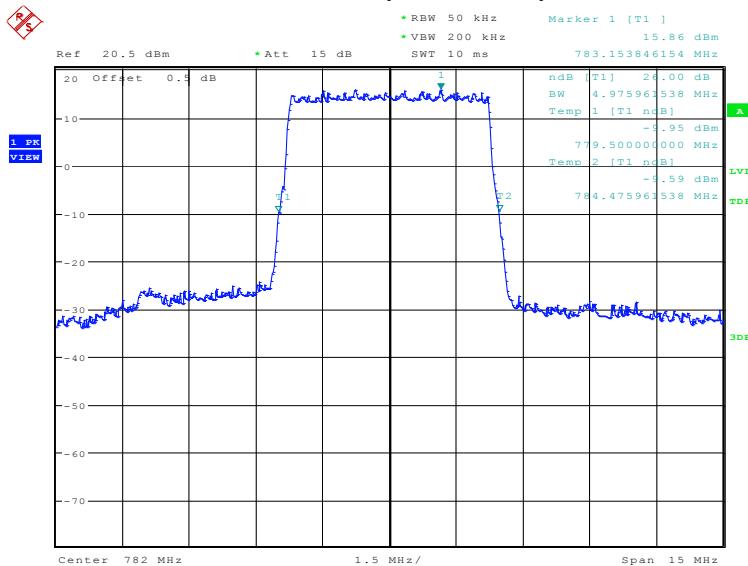
Date: 22.APR.2019 15:38:25

LTE band 12, 10MHz Bandwidth, 16QAM (-26dBc BW)
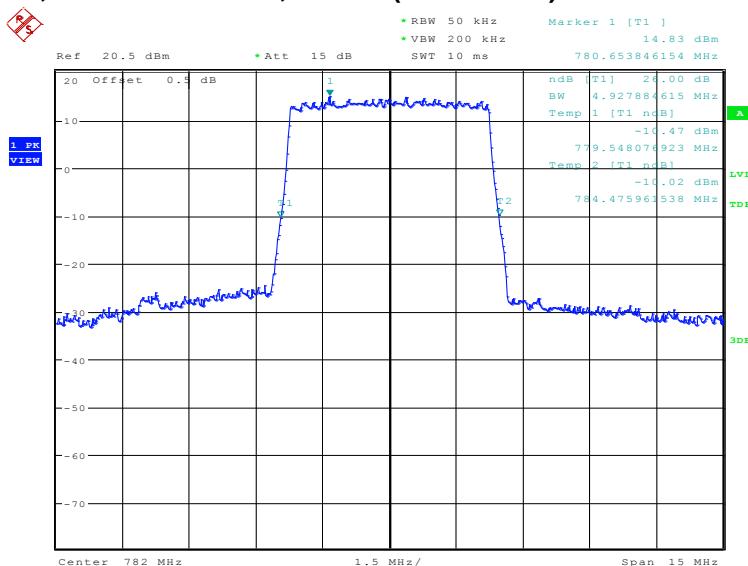

Date: 22.APR.2019 15:39:50

LTE band 13, 5MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
782.0	4975.96	4927.88

LTE band 13, 5MHz Bandwidth, QPSK (-26dBc BW)
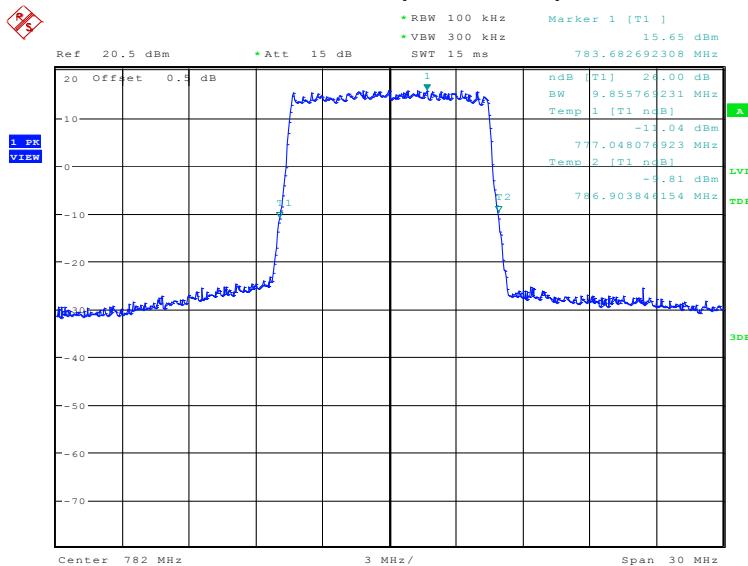
Date: 22.APR.2019 15:41:19

LTE band 13, 5MHz Bandwidth,16QAM (-26dBc BW)
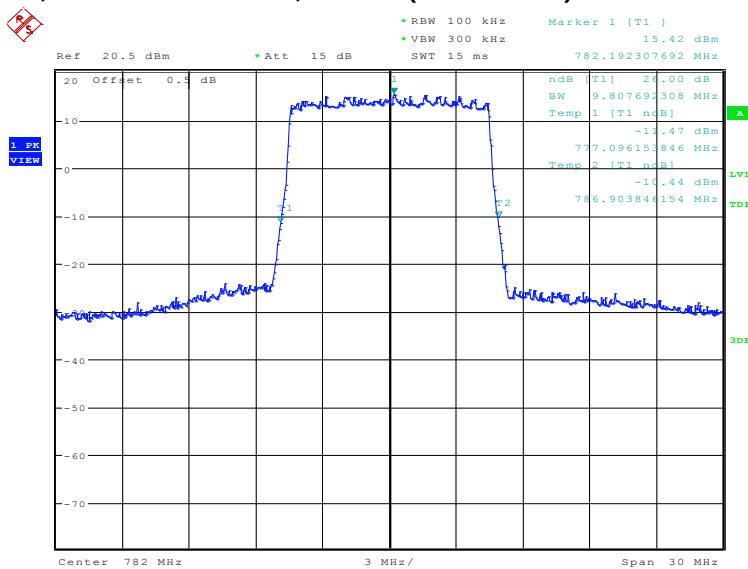
Date: 22.APR.2019 15:42:44

LTE band 13, 10MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
782.0	9855.77	9807.69

LTE band 13, 10MHz Bandwidth, QPSK (-26dBc BW)
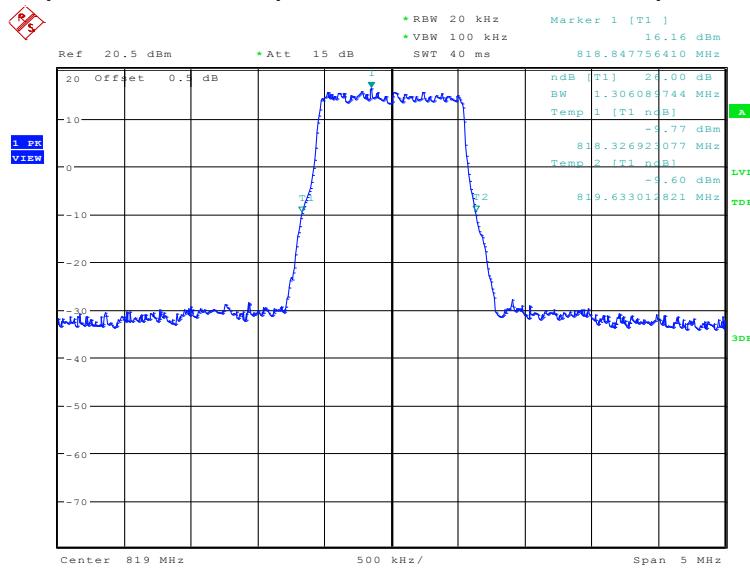
Date: 22.APR.2019 15:44:12

LTE band 13, 10MHz Bandwidth,16QAM (-26dBc BW)
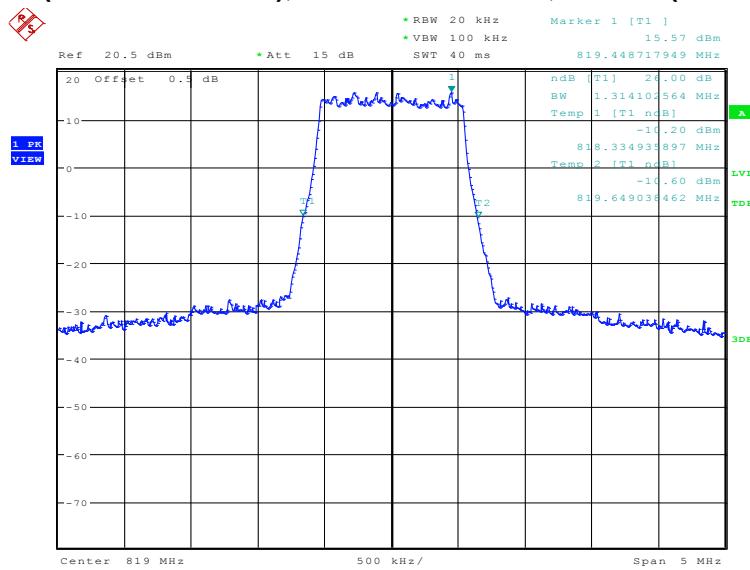

Date: 22.APR.2019 15:45:38

LTE band 26(814MHz~824MHz), 1.4MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
819.0	1306.09	1314.10

LTE band 26(814MHz~824MHz), 1.4MHz Bandwidth, QPSK (-26dBc BW)
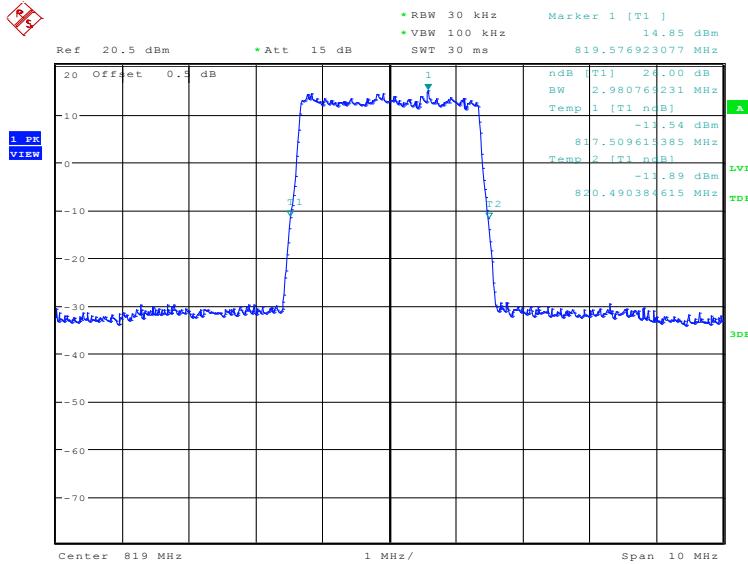
Date: 22.APR.2019 16:02:11

LTE band 26(814MHz~824MHz), 1.4MHz Bandwidth, 16QAM (-26dBc BW)
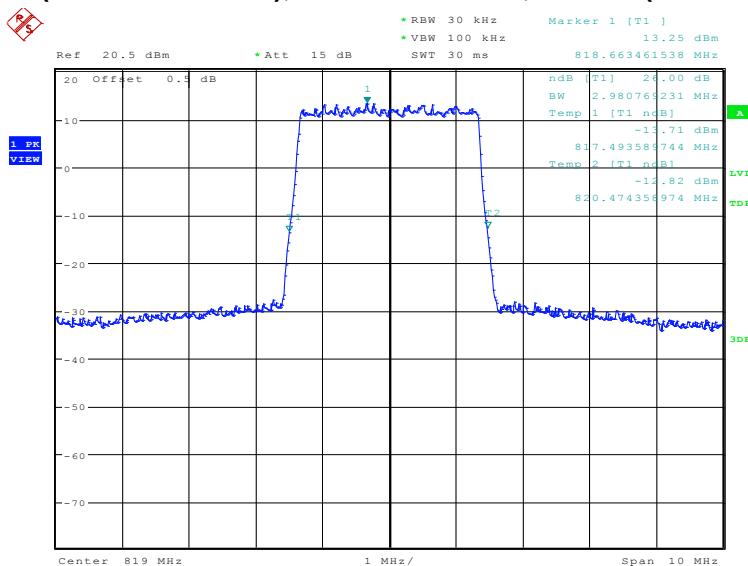
Date: 22.APR.2019 16:03:37

LTE band 26(814MHz~824MHz), 3MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
819.0	2980.77	2980.77

LTE band 26(814MHz~824MHz), 3MHz Bandwidth, QPSK (-26dBc BW)
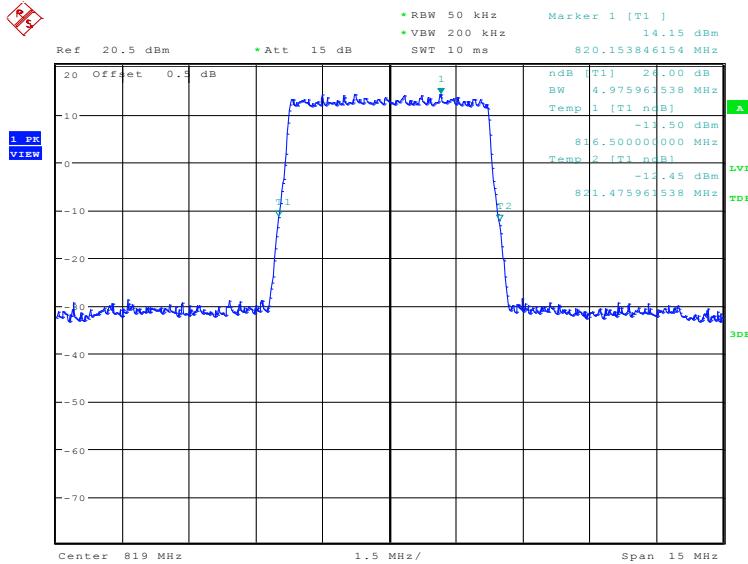
Date: 22.APR.2019 16:05:04

LTE band 26(814MHz~824MHz), 3MHz Bandwidth, 16QAM (-26dBc BW)
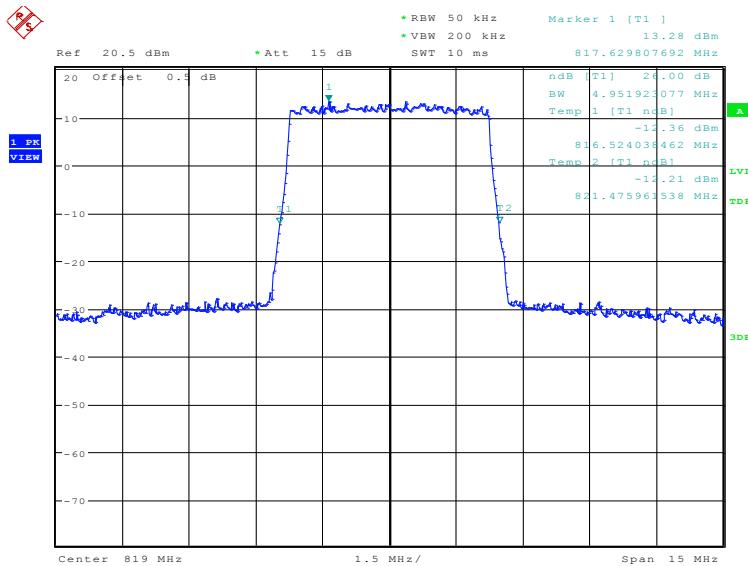
Date: 22.APR.2019 16:06:30

LTE band 26(814MHz~824MHz), 5MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
819.0	4975.96	4951.92

LTE band 26(814MHz~824MHz), 5MHz Bandwidth, QPSK (-26dBc BW)
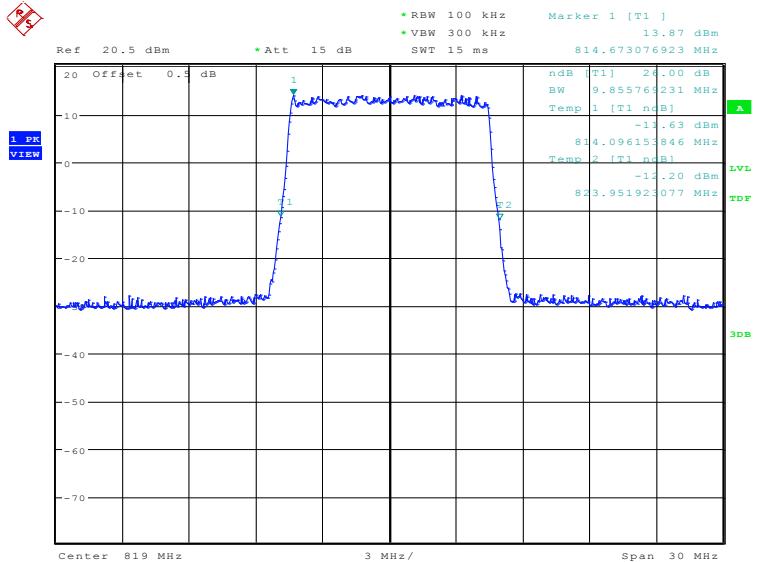
Date: 22.APR.2019 16:07:57

LTE band 26(814MHz~824MHz), 5MHz Bandwidth, 16QAM (-26dBc BW)
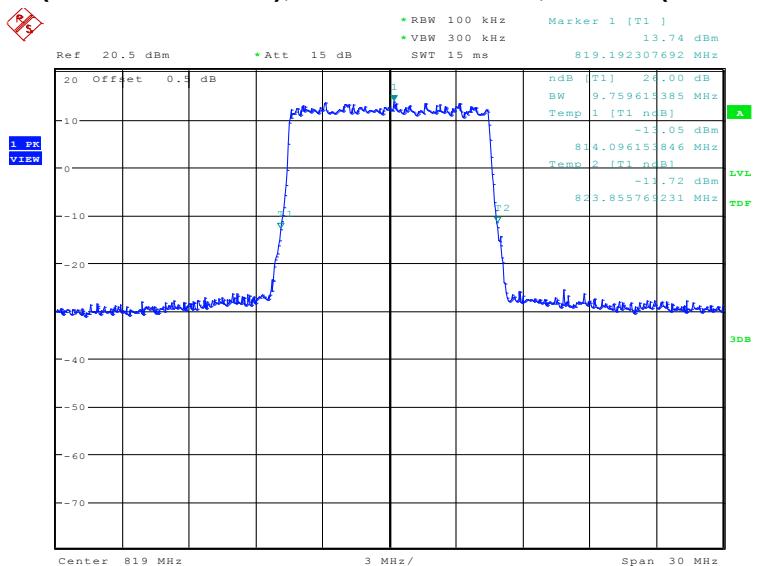
Date: 22.APR.2019 16:09:23

LTE band 26(814MHz~824MHz), 10MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
819.0	9855.77	9759.62

LTE band 26(814MHz~824MHz), 10MHz Bandwidth, QPSK (-26dBc BW)
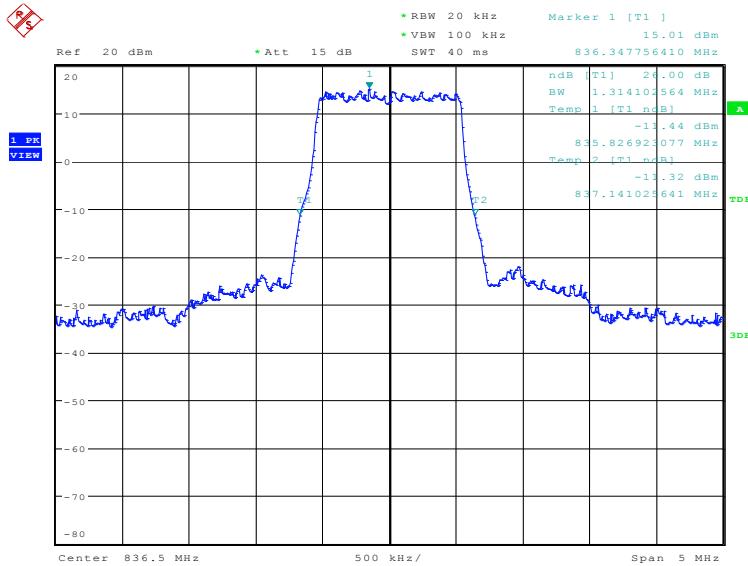
Date: 22.APR.2019 16:10:50

LTE band 26(814MHz~824MHz), 10MHz Bandwidth, 16QAM (-26dBc BW)
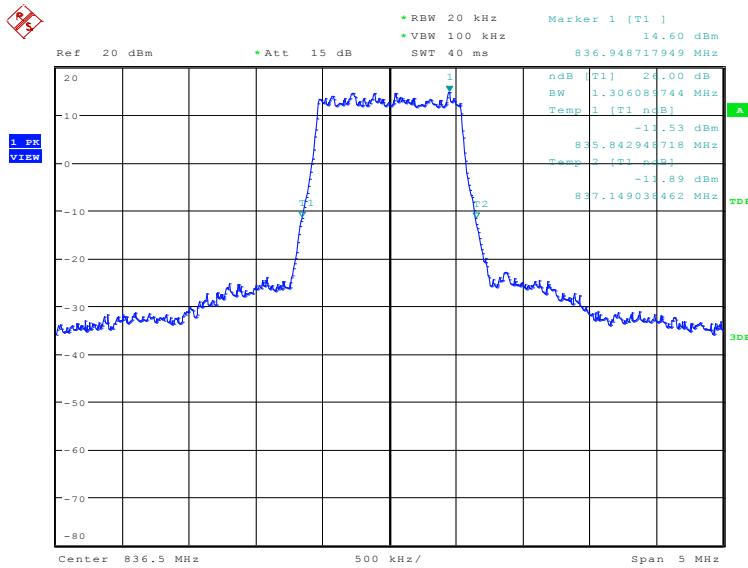
Date: 22.APR.2019 16:12:16

LTE band 26(824MHz~849MHz), 1.4MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
836.5	1314.10	1306.09

LTE band 26(824MHz~849MHz), 1.4MHz Bandwidth, QPSK (-26dBc BW)
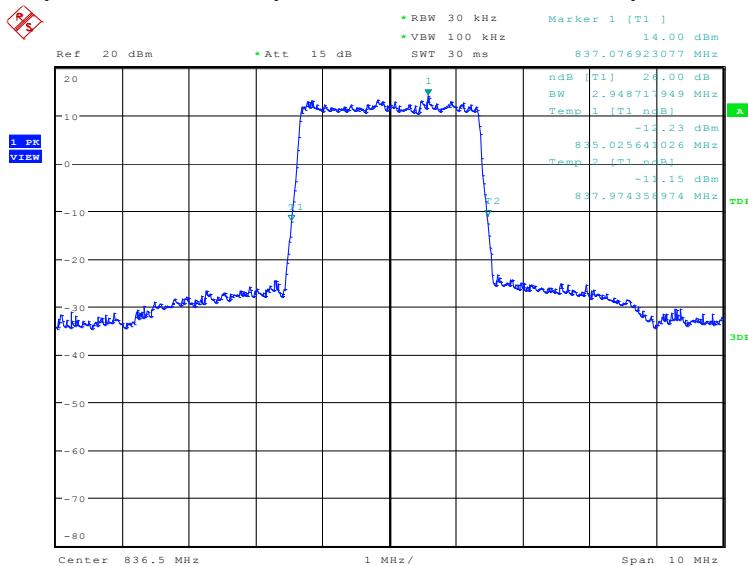
Date: 22.APR.2019 15:47:07

LTE band 26(824MHz~849MHz), 1.4MHz Bandwidth, 16QAM (-26dBc BW)
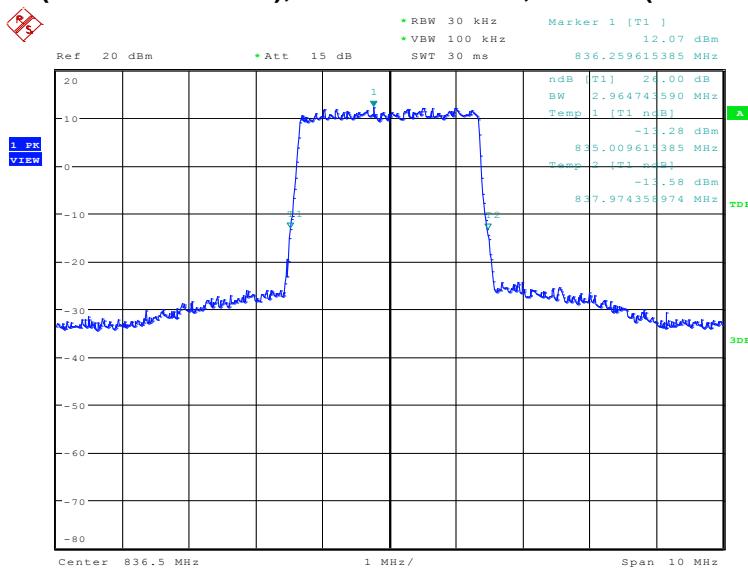
Date: 22.APR.2019 15:48:33

LTE band 26(824MHz~849MHz), 3MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
836.5	QPSK	16QAM
	2948.72	2964.74

LTE band 26(824MHz~849MHz), 3MHz Bandwidth, QPSK (-26dBc BW)
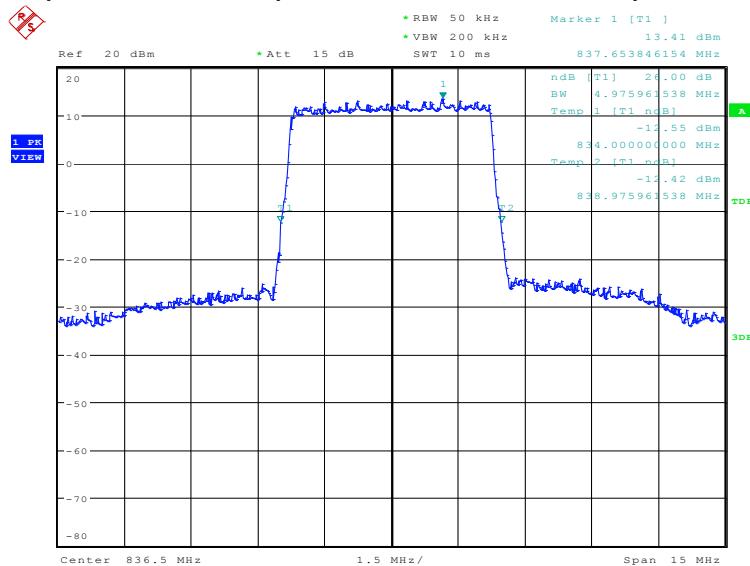
Date: 22.APR.2019 15:50:01

LTE band 26(824MHz~849MHz), 3MHz Bandwidth, 16QAM (-26dBc BW)
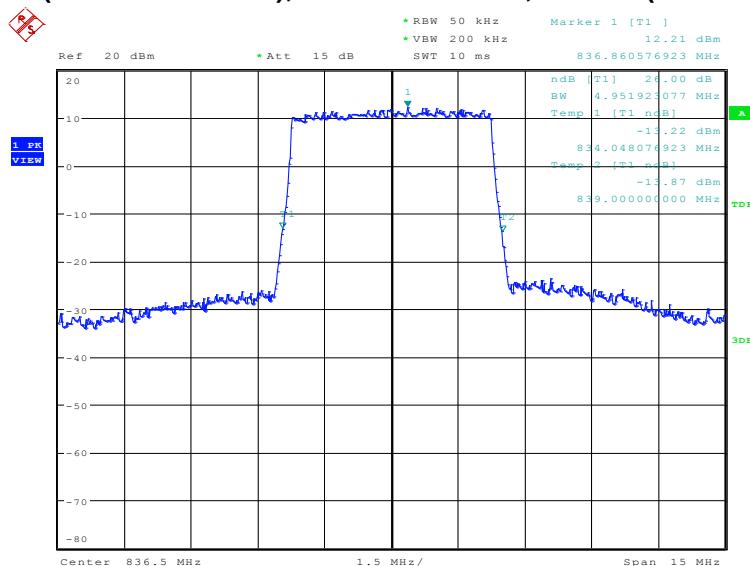
Date: 22.APR.2019 15:51:26

LTE band 26(824MHz~849MHz), 5MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
	QPSK	16QAM
836.5	4975.96	4951.92

LTE band 26(824MHz~849MHz), 5MHz Bandwidth, QPSK (-26dBc BW)
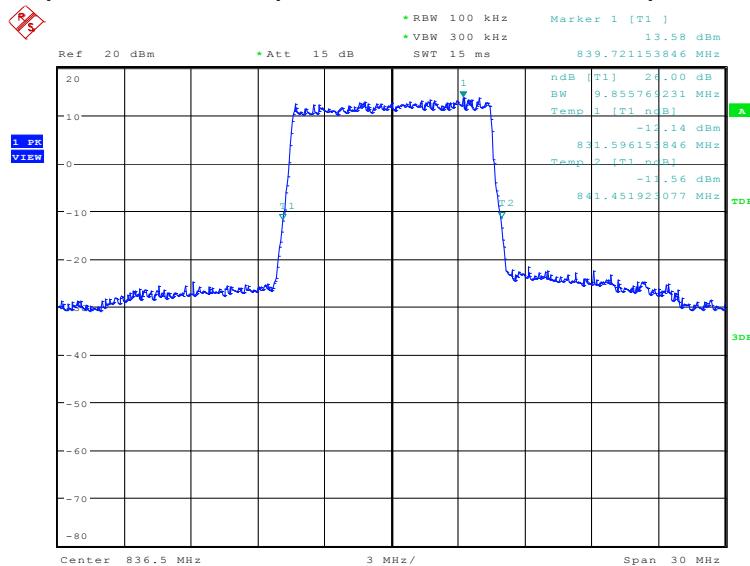
Date: 22.APR.2019 15:52:54

**LTE band 26(824MHz~849MHz), 5MHz Bandwidth, 16QAM (-26dBc BW)**
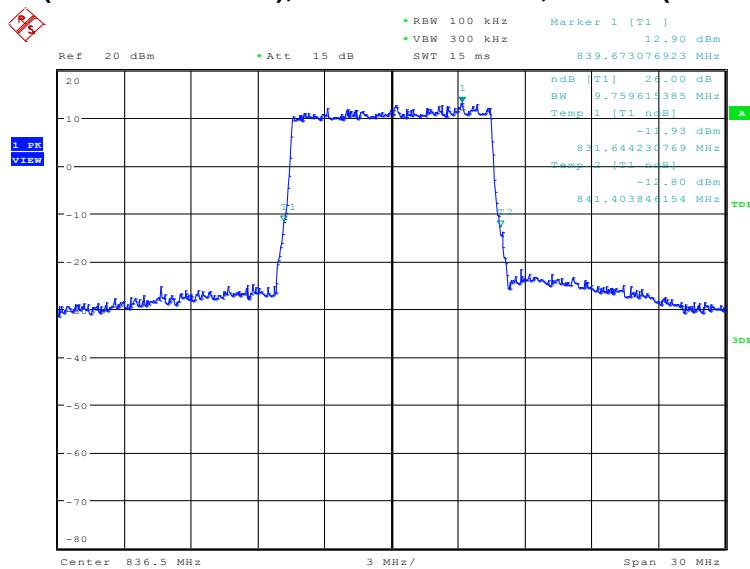
Date: 22.APR.2019 15:54:19

LTE band 26(824MHz~849MHz), 10MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
836.5	QPSK	16QAM
	9855.77	9759.62

LTE band 26(824MHz~849MHz), 10MHz Bandwidth, QPSK (-26dBc BW)
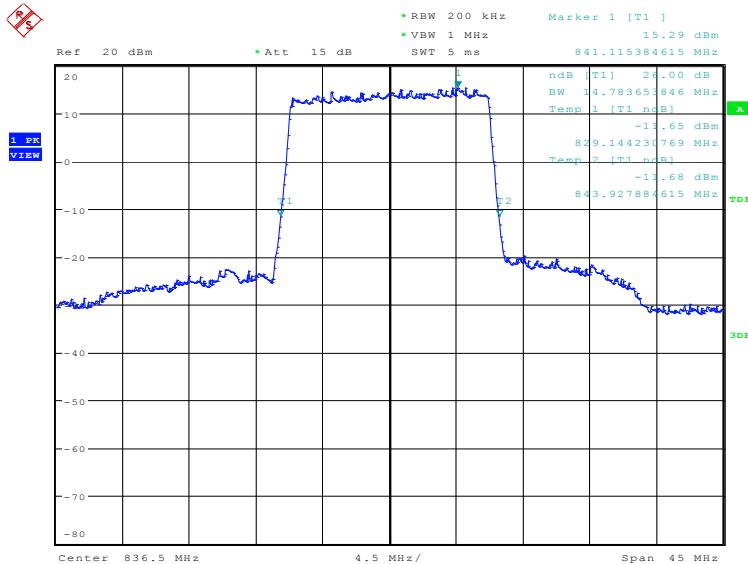
Date: 22.APR.2019 15:55:47

LTE band 26(824MHz~849MHz), 10MHz Bandwidth, 16QAM (-26dBc BW)
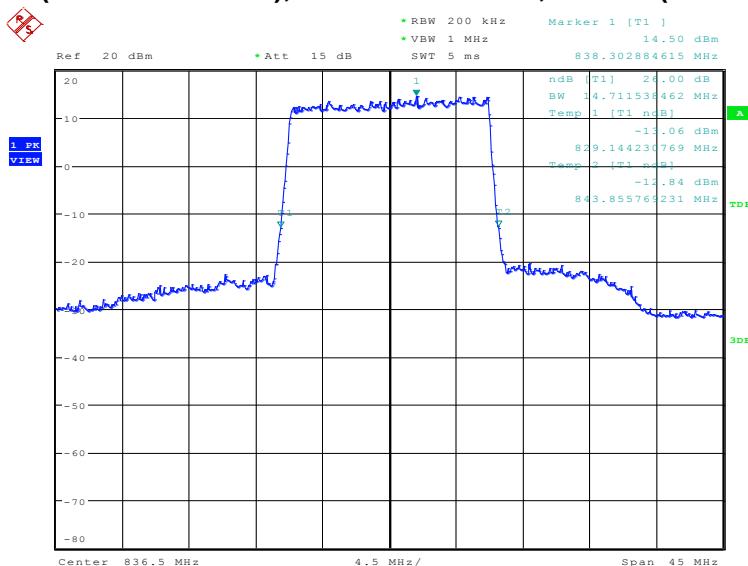
Date: 22.APR.2019 15:57:13

LTE band 26(824MHz~849MHz), 15MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(kHz)	
836.5	QPSK	16QAM
	14783.65	14711.54

LTE band 26(824MHz~849MHz), 15MHz Bandwidth, QPSK (-26dBc BW)
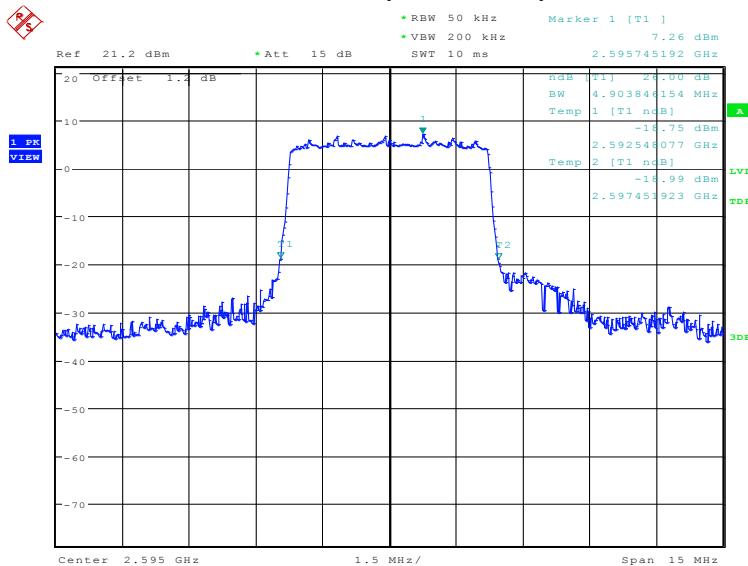
Date: 22.APR.2019 15:58:40

**LTE band 26(824MHz~849MHz), 15MHz Bandwidth, 16QAM (-26dBc BW)**
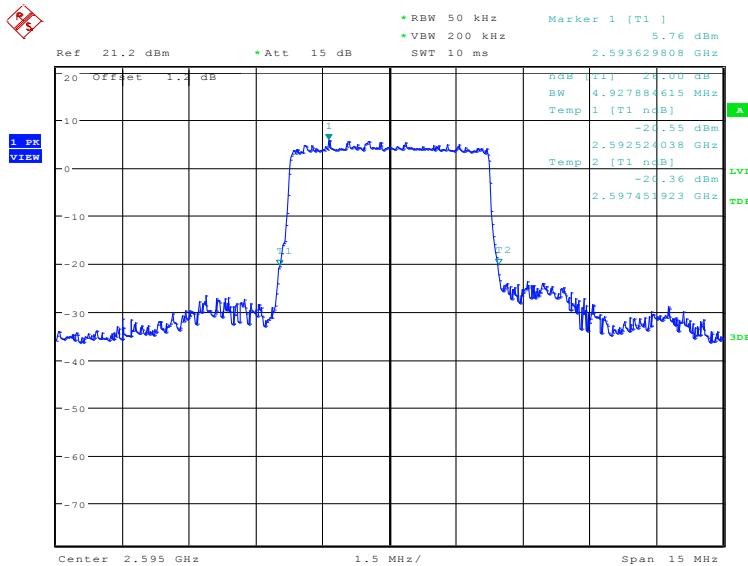

Date: 22.APR.2019 16:00:05

LTE band 38, 5MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
2595.0	QPSK	16QAM
	4903.85	4927.88

LTE band 38, 5MHz Bandwidth, QPSK (-26dBc BW)
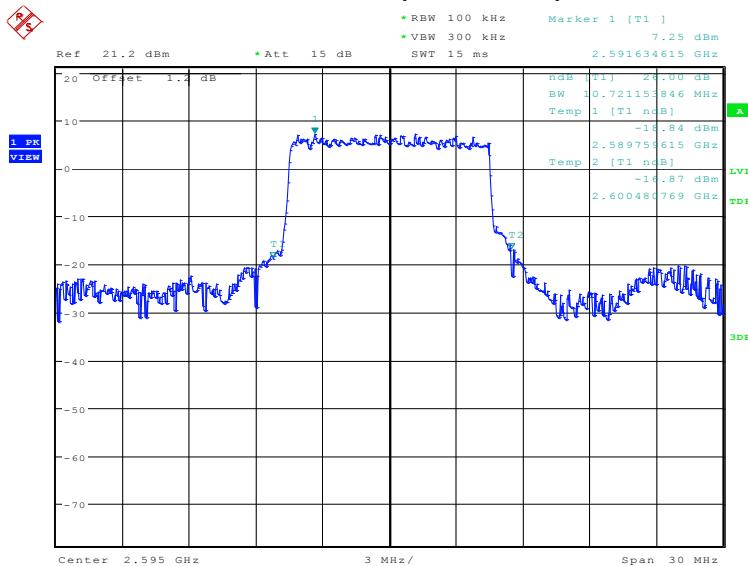
Date: 5.JUL.2019 09:48:02

LTE band 38, 5MHz Bandwidth,16QAM (-26dBc BW)
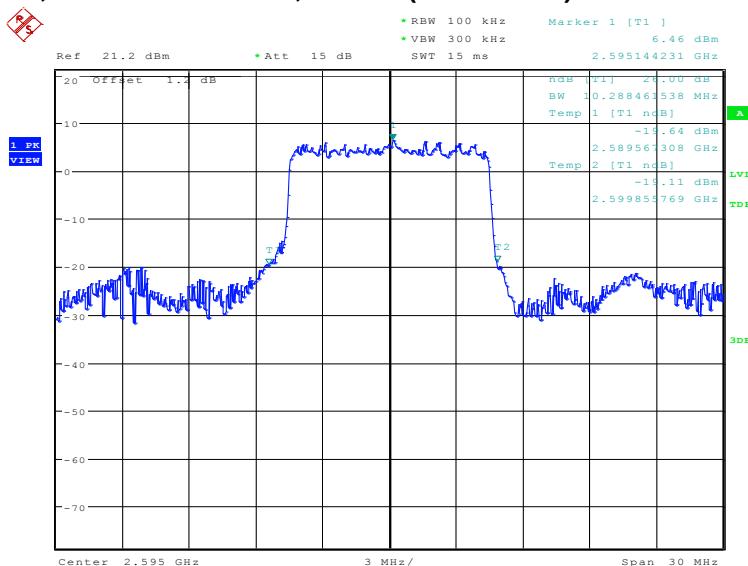
Date: 5.JUL.2019 09:49:26

LTE band 38, 10MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
2595.0	10721.15	10288.46

LTE band 38, 10MHz Bandwidth, QPSK (-26dBc BW)
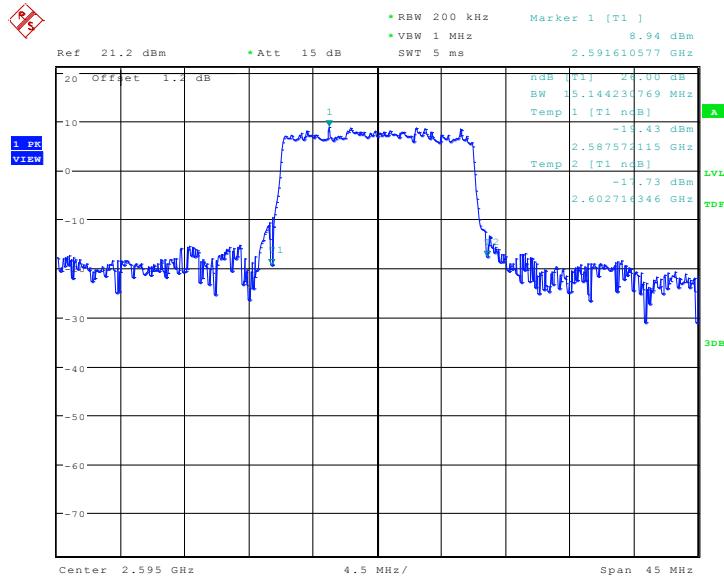
Date: 5.JUL.2019 10:32:16

LTE band 38, 10MHz Bandwidth,16QAM (-26dBc BW)
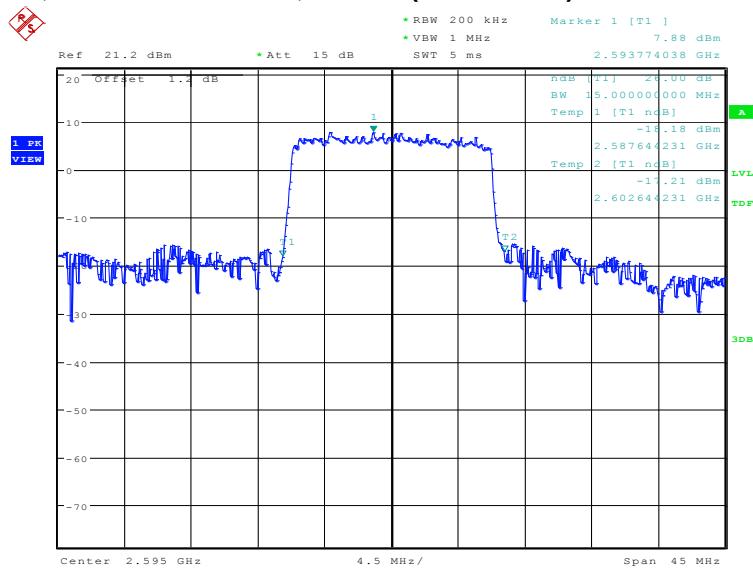
Date: 5.JUL.2019 09:52:17

LTE band 38, 15MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
2595.0	15144.23	15000.00

LTE band 38, 15MHz Bandwidth, QPSK (-26dBc BW)
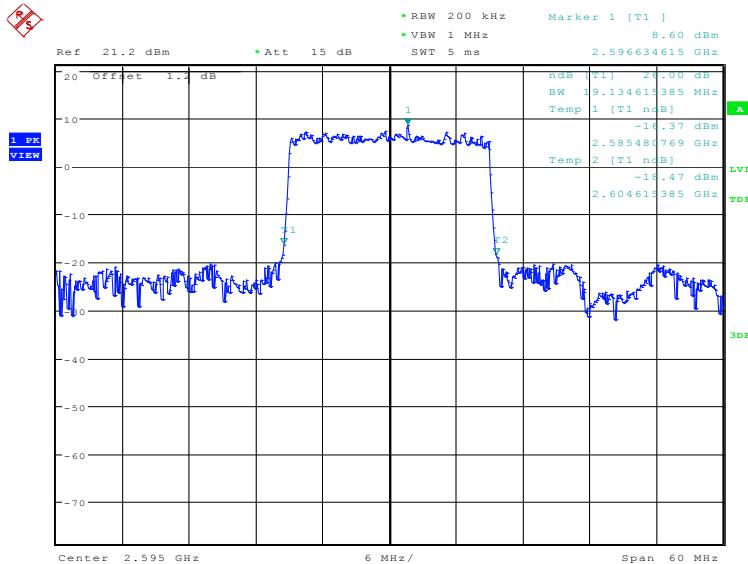
Date: 5.JUL.2019 09:53:43

LTE band 38, 15MHz Bandwidth,16QAM (-26dBc BW)
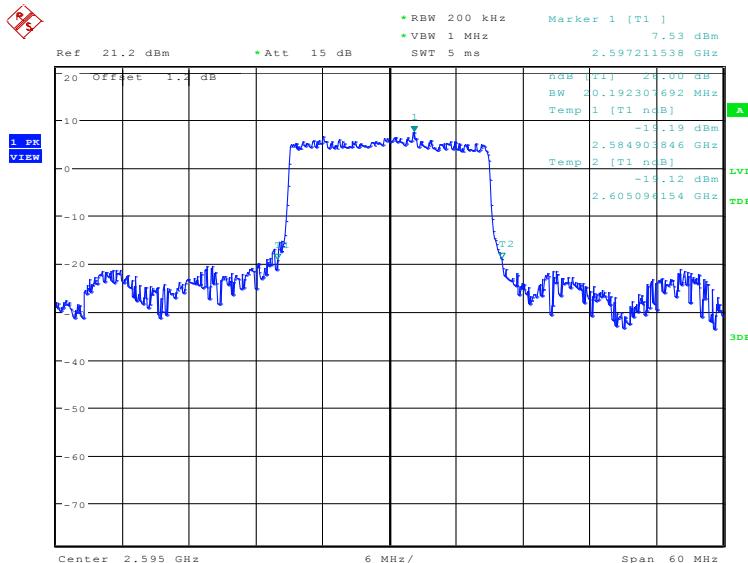
Date: 5.JUL.2019 09:55:07

LTE band 38, 20MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
2595.0	19134.62	20192.31

LTE band 38, 20MHz Bandwidth, QPSK (-26dBc BW)

Date: 5.JUL.2019 09:56:33

LTE band 38, 20MHz Bandwidth,16QAM (-26dBc BW)

Date: 5.JUL.2019 10:02:07

A.6   BAND EDGE COMPLIANCE

A.6.1 Measurement limit

Part 22.917, Part 24.238 and Part 27.53(h) specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

According to KDB 971168 6.0, a relaxation of the reference bandwidth is often provided for measurements within a specified frequency range at the edge of the authorized frequency block/band. This is often implemented by permitting the use of a narrower RBW (typically limited to a minimum RBW of 1% of the OBW) for measuring the out-of-band emissions without a requirement to integrate the result over the full reference bandwidth.

The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

Part 27.53(m)(4) specifies for mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Part 27.53(c) states for operations in the 746-758 MHz band and the 776-788 MHz band, 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 any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

Part 27.53(a) states for mobile and portable stations operating in the 2305–2315 MHz and 2350–2360 MHz bands: By a factor of not less than: 43 +10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337MHz;

By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296 MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292 MHz, and 70 + 10 log (P) dB below 2288 MHz; By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.

Part 90.691 states that out-of-band emission requirement shall apply only to the ''outer'' channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 Log_{10}(f/6.1)$ decibels or $50 + 10 Log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz. For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 Log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

A.6.2 Measurement result

Only worst case result is given below
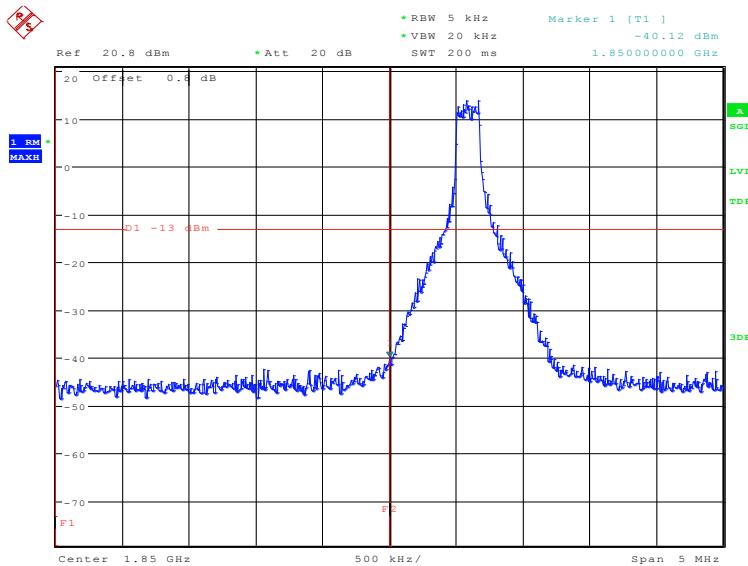
LTE band 2

OBW: 1RB-low_offset
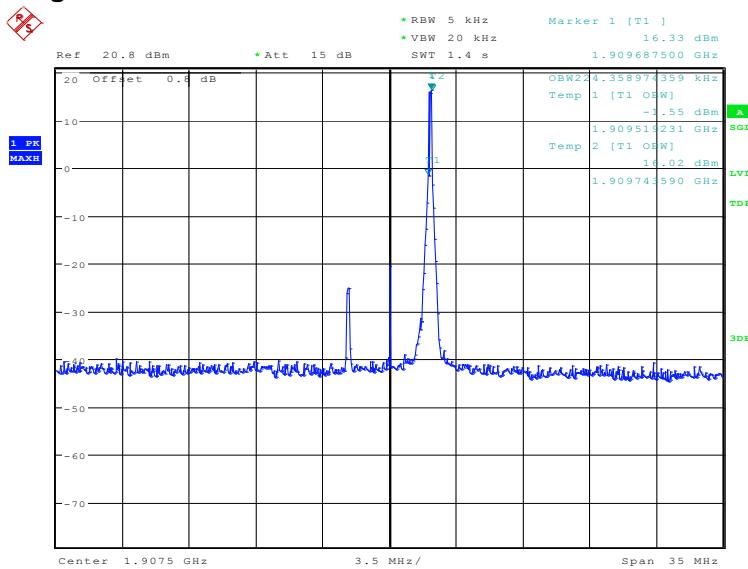
Date: 29.MAY.2019 11:01:55

LOW BAND EDGE BLOCK-1RB-low_offset
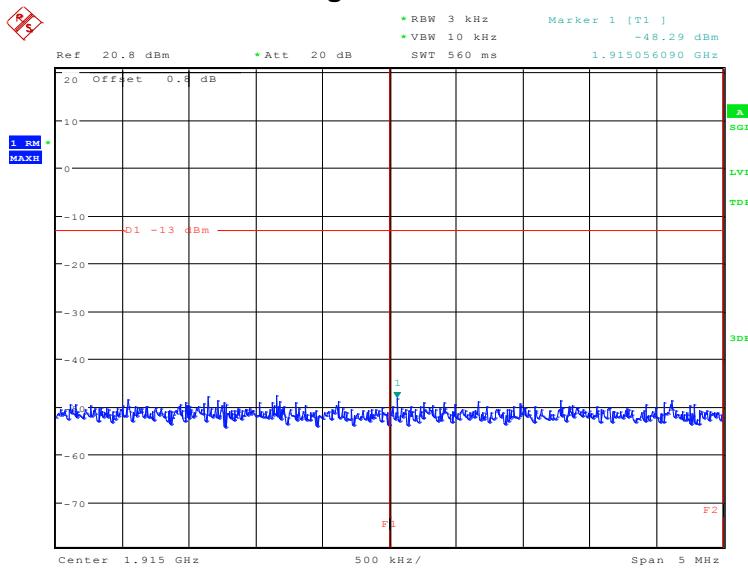
Date: 29.MAY.2019 11:02:11

OBW: 1RB-high_offset
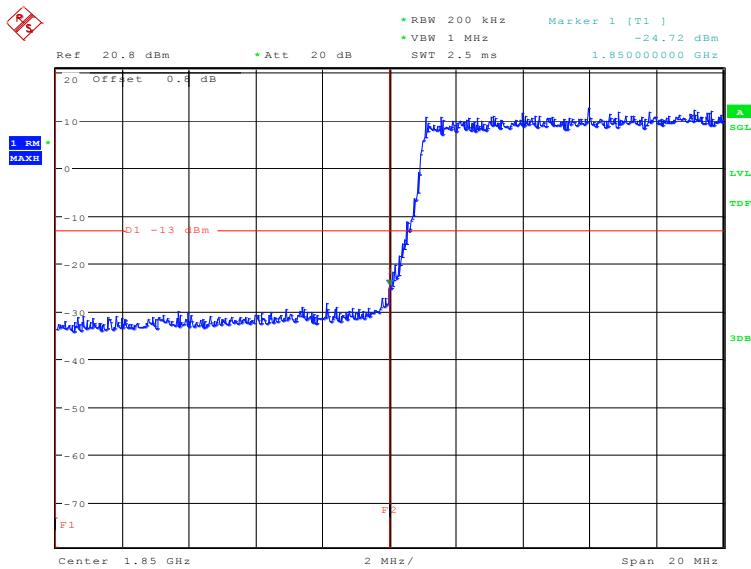
Date: 29.MAY.2019 11:04:46

HIGH BAND EDGE BLOCK-1RB-high_offset
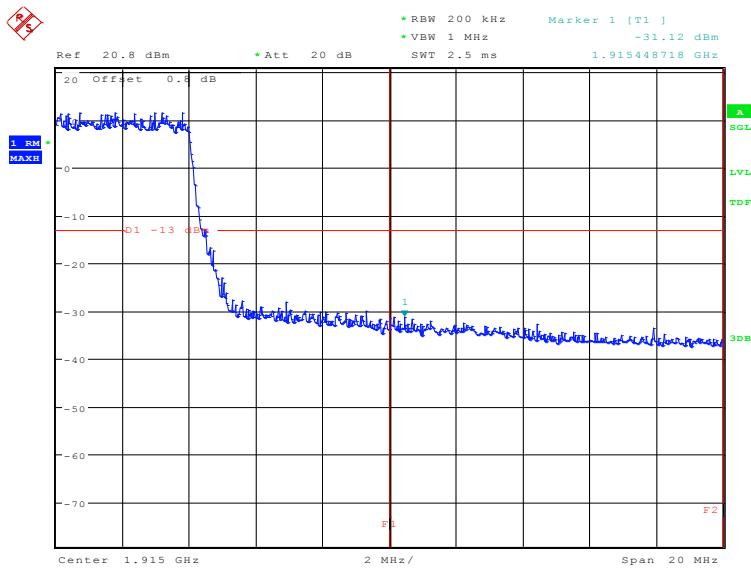
Date: 29.MAY.2019 11:05:01

LOW BAND EDGE BLOCK-20MHz-100%RB
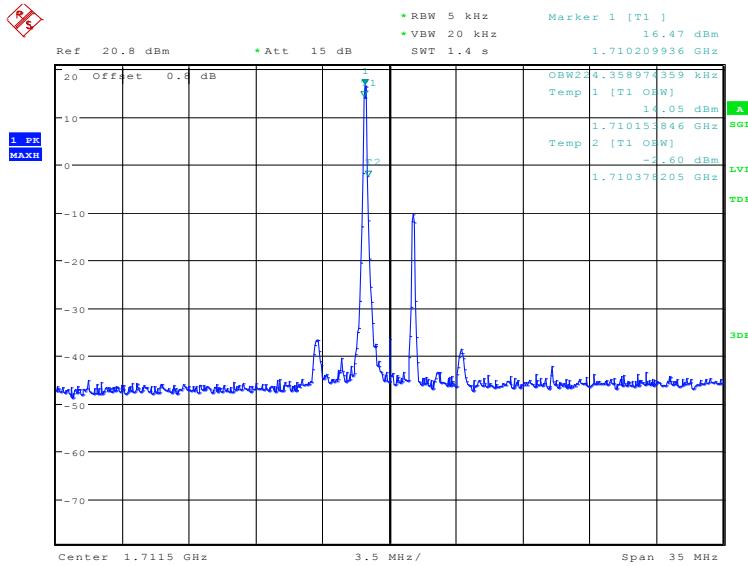
Date: 29.MAY.2019 11:02:45

HIGH BAND EDGE BLOCK-20MHz-100%RB
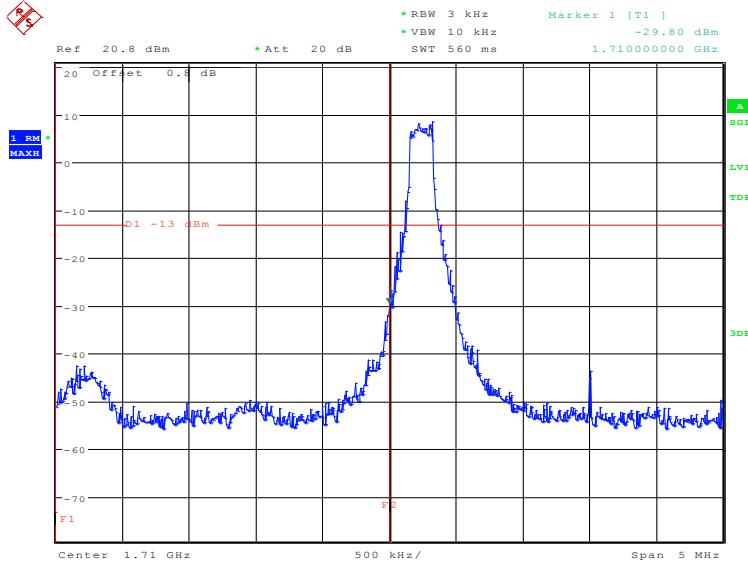
Date: 29.MAY.2019 11:05:35

LTE band 4
OBW: 1RB-low_offset
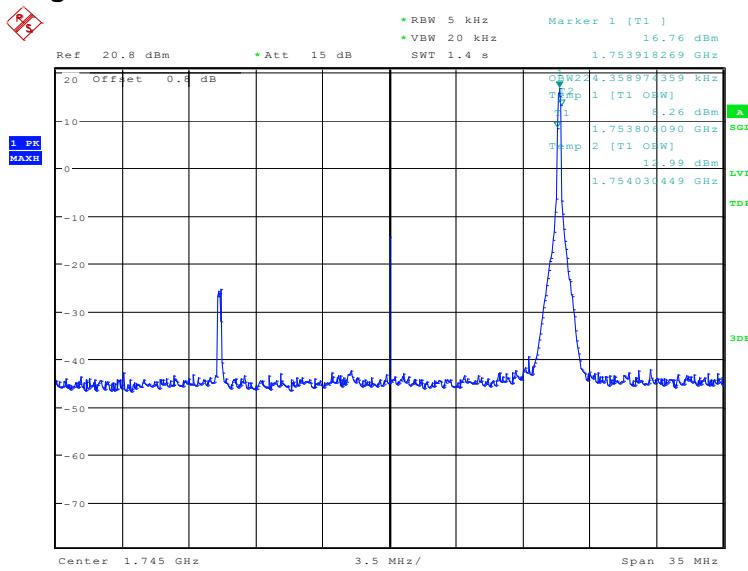
Date: 26.JUN.2019 15:46:44

LOW BAND EDGE BLOCK-1RB-low_offset
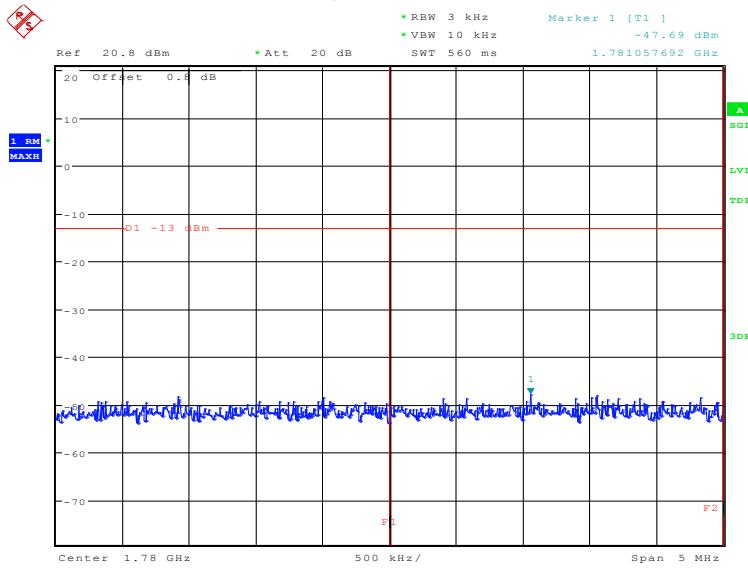
Date: 26.JUN.2019 15:47:00

OBW: 1RB-high_offset

```
                                            * RBW  5 kHz       Marker 1 [T1 ]
                                            * VBW  20 kHz               16.76 dBm
     Ref   20.8 dBm        * Att  15 dB     SWT  1.4 s         1.753918269 GHz
     20  Offset  0.8 dB                              OBW 224.358974359 kHz
                                                     Temp 1 [T1 OBW]
     -10                                                      6.26 dBm
                                                     T1     1.753806090 GHz
     0                                               Temp 2 [T1 OBW]
                                                             12.99 dBm
                                                     1.754030449 GHz
     -10
     -20
     -30
     -40
     -50
     -60
     -70

     Center  1.745 GHz          3.5 MHz/              Span  35 MHz
```
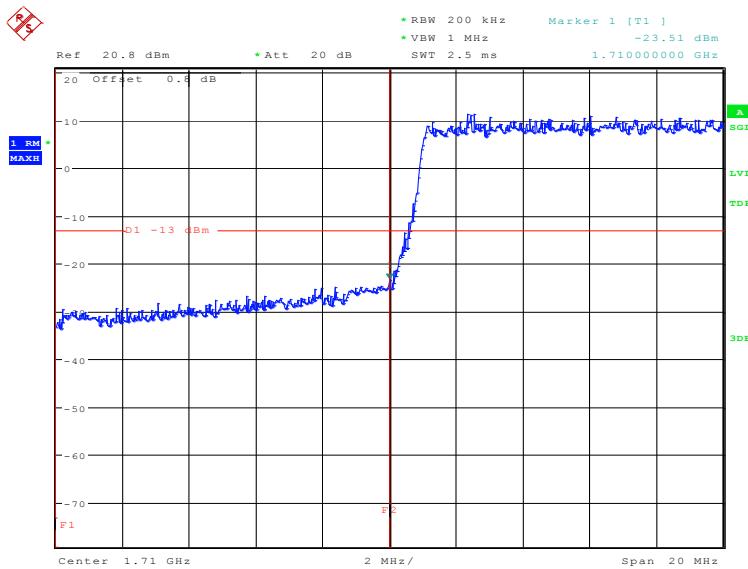
Date: 26.JUN.2019 15:48:54

HIGH BAND EDGE BLOCK-1RB-high_offset

```
                                            * RBW  3 kHz       Marker 1 [T1 ]
                                            * VBW  10 kHz               -47.69 dBm
     Ref   20.8 dBm        * Att  20 dB     SWT  560 ms        1.781057692 GHz
     20  Offset  0.8 dB

     10

     0

     -10
           D1 -13 dBm
     -20

     -30

     -40

     -50

     -60

     -70
              F1                                              F2

     Center  1.78 GHz           500 kHz/              Span  5 MHz
```

Date: 26.JUN.2019 15:49:09

LOW BAND EDGE BLOCK-20MHz-100%RB

```
                              * RBW  200 kHz      Marker 1 [T1 ]
                              * VBW  1 MHz                  -23.51 dBm
  Ref   20.8 dBm    * Att  20 dB   SWT  2.5 ms    1.710000000 GHz
   20  Offset  0.8  dB
       10
        0
      -10    D1 -13 dBm
      -20
      -40
      -50
      -60
      -70
   F1                    F2
  Center  1.71 GHz          2 MHz/              Span  20 MHz
```
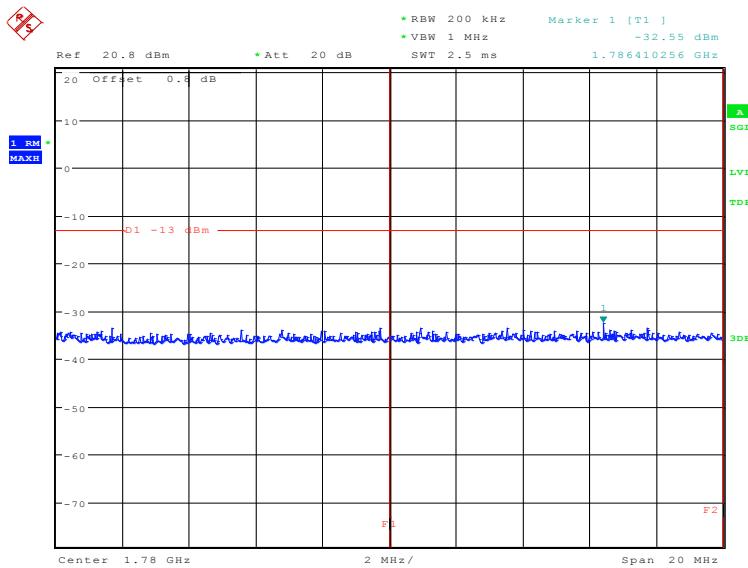
Date: 26.JUN.2019 15:47:32

HIGH BAND EDGE BLOCK-20MHz-100%RB

```
                              * RBW  200 kHz      Marker 1 [T1 ]
                              * VBW  1 MHz                  -32.55 dBm
  Ref   20.8 dBm    * Att  20 dB   SWT  2.5 ms    1.786410256 GHz
   20  Offset  0.8  dB
       10
        0
      -10    D1 -13 dBm
      -20
      -30
      -40
      -50
      -60
      -70
                    F1                              F2
  Center  1.78 GHz          2 MHz/              Span  20 MHz
```
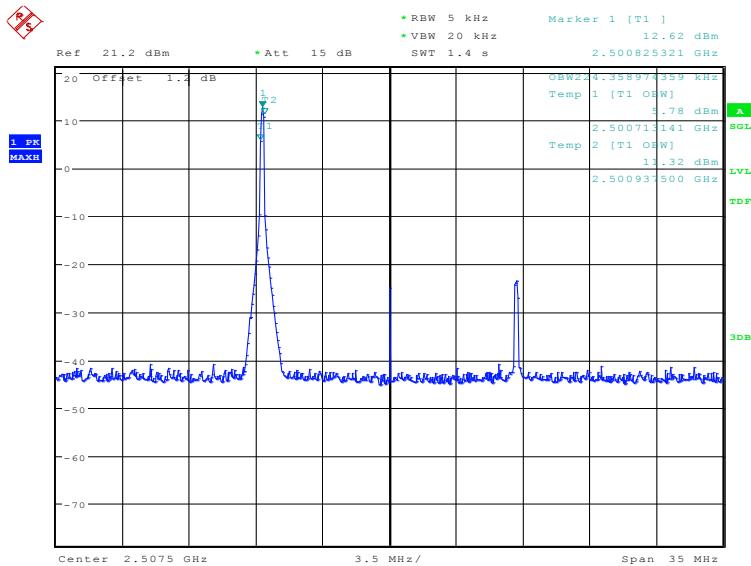
Date: 26.JUN.2019 15:49:40
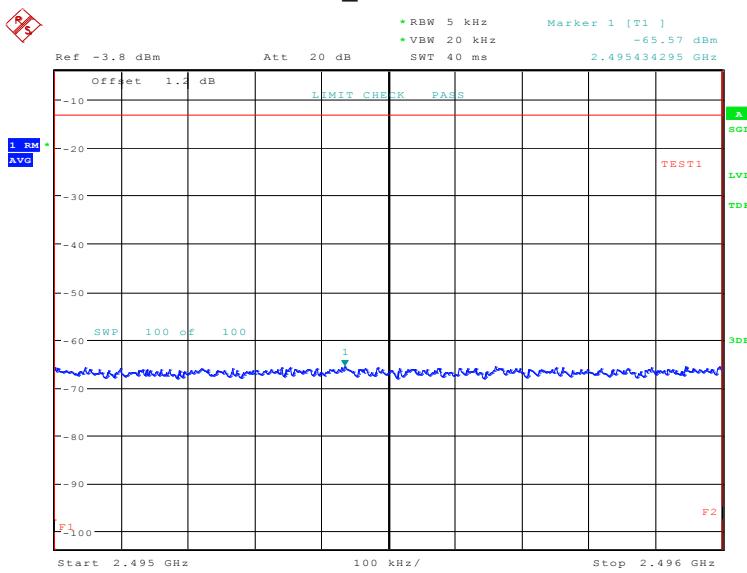
LTE band 7

OBW: 1RB-low_offset


```
                                          *RBW  5 kHz       Marker 1 [T1 ]
                                          *VBW  20 kHz                  12.62 dBm
        Ref   21.2 dBm       *Att  15 dB   SWT 1.4 s         2.500825321 GHz
  20   Offset   1.2 dB                              OBW  24.358970359 kHz
                                                    Temp 1 [T1 OBW]
  10                                                         5.78 dBm
                                                    2.500713141 GHz
   0                                                Temp 2 [T1 OBW]
                                                            11.32 dBm
 -10                                                2.500937500 GHz
 -20
 -30
 -40
 -50
 -60
 -70

   Center  2.5075 GHz           3.5 MHz/              Span  35 MHz
```
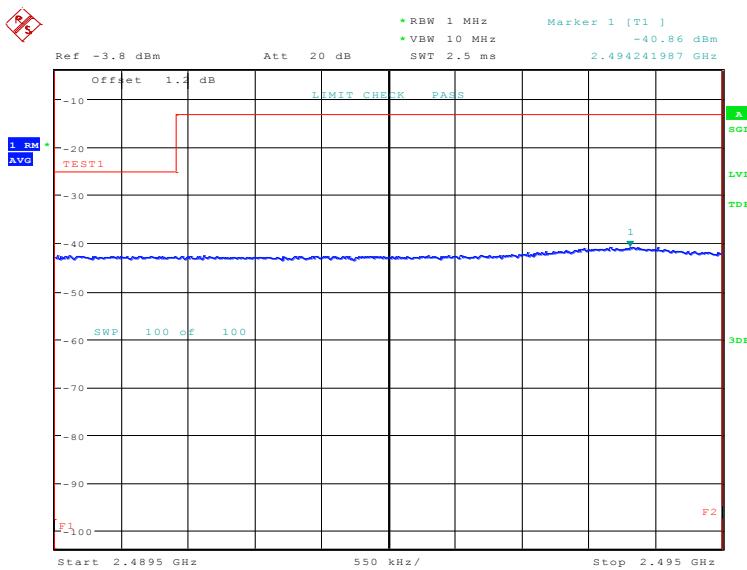
Date: 29.MAY.2019 11:13:28

LOW BAND EDGE BLOCK-1RB-low_offset

```
* RBW  5 kHz        Marker 1 [T1 ]
* VBW  20 kHz              -65.57 dBm
Ref -3.8 dBm        Att  20 dB    SWT 40 ms        2.495434295 GHz

Offset  1.2 dB
-10                          LIMIT CHECK    PASS

1 RM                                              TEST1
AVG

SWP  100 of  100

-70

Start 2.495 GHz            100 kHz/            Stop 2.496 GHz
```

Date: 29.MAY.2019 11:13:48

```
* RBW  1 MHz        Marker 1 [T1 ]
* VBW  10 MHz             -40.86 dBm
Ref -3.8 dBm        Att  20 dB    SWT 2.5 ms       2.494241987 GHz

Offset  1.2 dB
-10                          LIMIT CHECK    PASS

1 RM
AVG     TEST1

SWP  100 of  100

Start 2.4895 GHz           550 kHz/            Stop 2.495 GHz
```
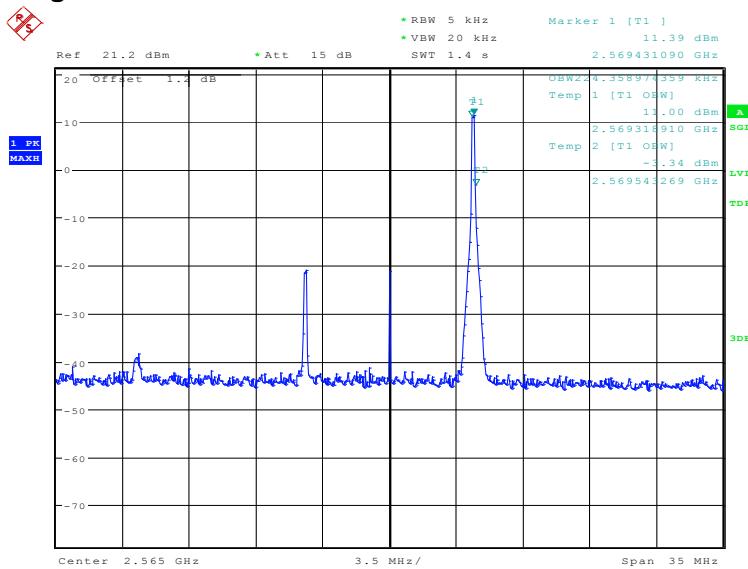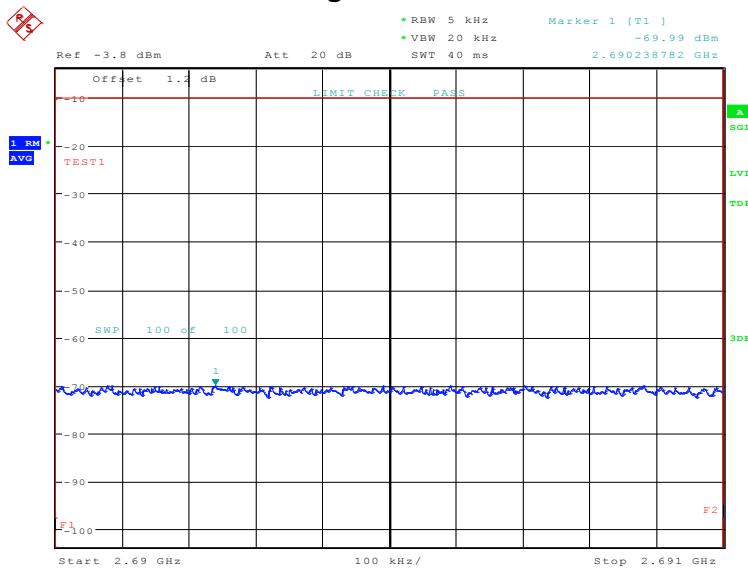
Date: 29.MAY.2019 11:14:06

OBW: 1RB-high_offset
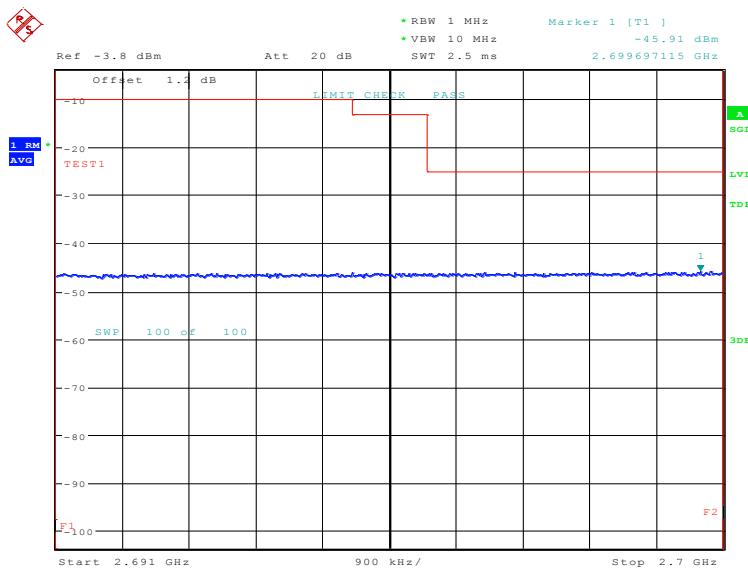
Date: 29.MAY.2019 11:17:05

HIGH BAND EDGE BLOCK-1RB-high_offset

```
                                              * RBW  5 kHz      Marker 1 [T1 ]
                                              * VBW  20 kHz                -69.99 dBm
        Ref -3.8 dBm          Att  20 dB      SWT  40 ms        2.690238782 GHz
          Offset  1.2 dB
        -10                          LIMIT CHECK    PASS                        A
                                                                               SGL
  1 RM -20
  AVG   TEST1                                                                  LVL

        -30                                                                    TDF

        -40

        -50

              SWP  100 of  100                                                 3DB
        -60

        -70        1

        -80

        -90
                                                                              F2
     F1 -100
        Start 2.69 GHz              100 kHz/              Stop 2.691 GHz
```

Date: 29.MAY.2019 11:17:25

```
                                              * RBW  1 MHz      Marker 1 [T1 ]
                                              * VBW  10 MHz               -45.91 dBm
        Ref -3.8 dBm          Att  20 dB      SWT  2.5 ms       2.699697115 GHz
          Offset  1.2 dB
        -10              LIMIT CHECK    PASS                                    A
                                                                               SGL
  1 RM -20
  AVG   TEST1                                                                  LVL

        -30                                                                    TDF

        -40
                                                                       1
        -50

        -60                                                                    3DB

        -70

        -80

        -90
                                                                              F2
     F1 -100
        Start 2.691 GHz             900 kHz/              Stop 2.7 GHz
```

Date: 29.MAY.2019 11:17:43

LOW BAND EDGE BLOCK-20MHz-100%RB

```
                                    * RBW  500 kHz    Marker 1 [T1 ]
                                    * VBW  2 MHz             -37.90 dBm
 Ref  1.2 dBm          Att  25 dB   SWT 2.5 ms       2.495402244 GHz
    0  Offset  1.2 dB                                              A
                                    LIMIT CHECK   PASS
  -10                                                            SGL

  -20                                                    TEST1   LVL
                                                                 TDF
  -30

  -40

  -50  SWP   100 of   100                                        3DB

  -60

  -70

  -80

  -90
  F1                                                             F2
 Start 2.495 GHz            100 kHz/            Stop 2.496 GHz
```

Date: 29.MAY.2019 11:14:44

```
                                    * RBW  1 MHz     Marker 1 [T1 ]
                                    * VBW  10 MHz            -37.47 dBm
 Ref -3.8 dBm         Att  20 dB    SWT 2.5 ms       2.494991186 GHz
     Offset  1.2 dB
  -10                               LIMIT CHECK   PASS             A
                                                                 SGL
  -20                                                    TEST1
                                                                 LVL
  -30                                                             TDF

  -40

  -50

  -60  SWP   100 of   100                                        3DB

  -70

  -80

  -90
                                                                 F2
  F1
 -100
 Start 2.4895 GHz           550 kHz/            Stop 2.495 GHz
```

Date: 29.MAY.2019 11:15:01

HIGH BAND EDGE BLOCK-20MHz-100%RB
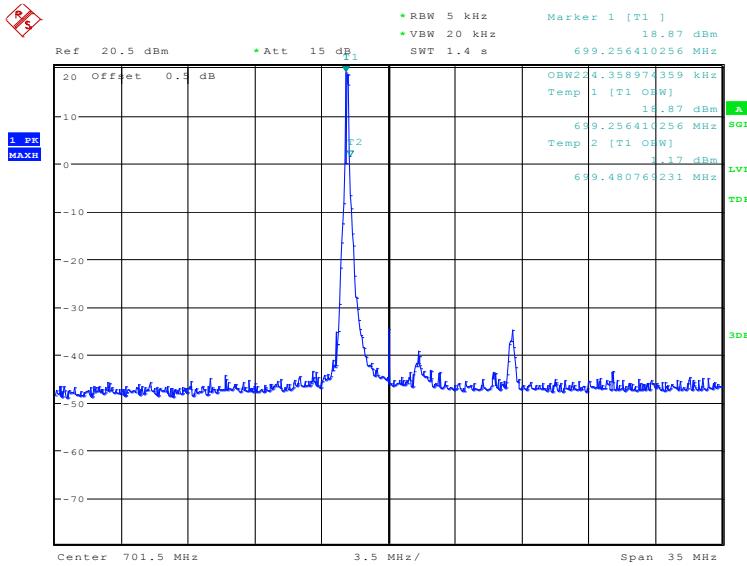
Date: 29.MAY.2019 11:18:21
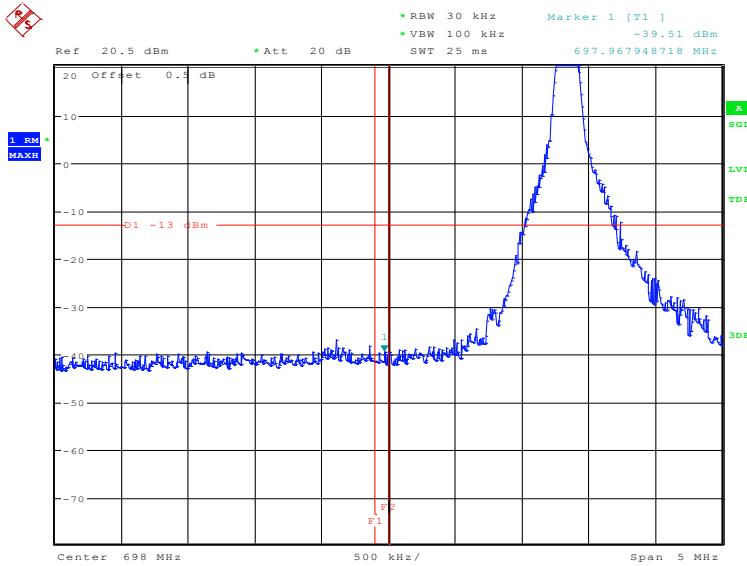
Date: 29.MAY.2019 11:18:39

LTE band 12
OBW: 1RB-low_offset
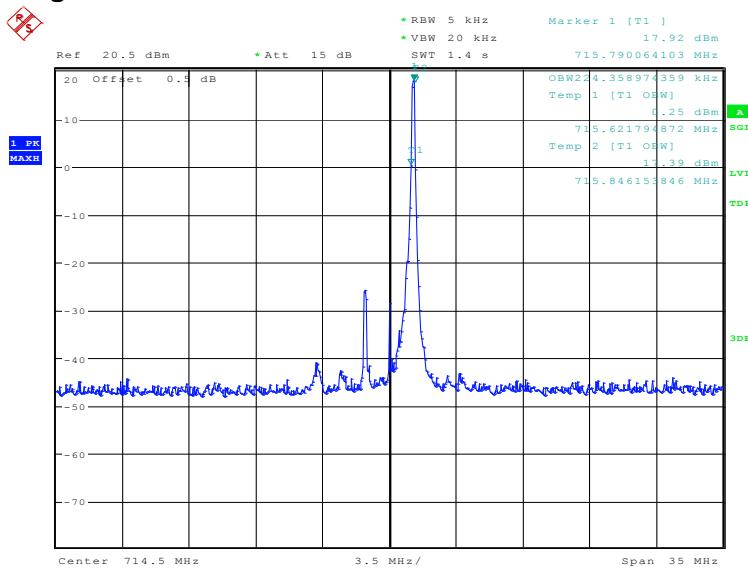
Date: 10.MAY.2019 09:49:03

LOW BAND EDGE BLOCK-1RB-low_offset
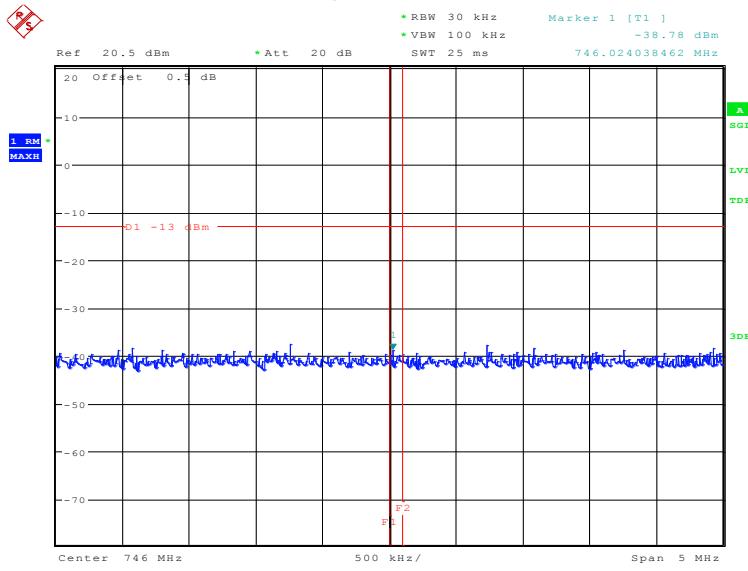
Date: 10.MAY.2019 09:49:18

OBW: 1RB-high_offset
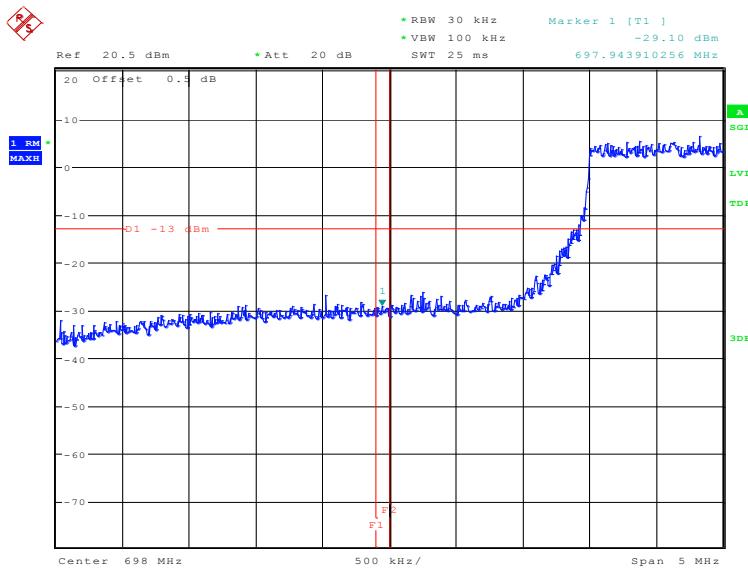
Date: 10.MAY.2019 09:51:48

HIGH BAND EDGE BLOCK-1RB-high_offset
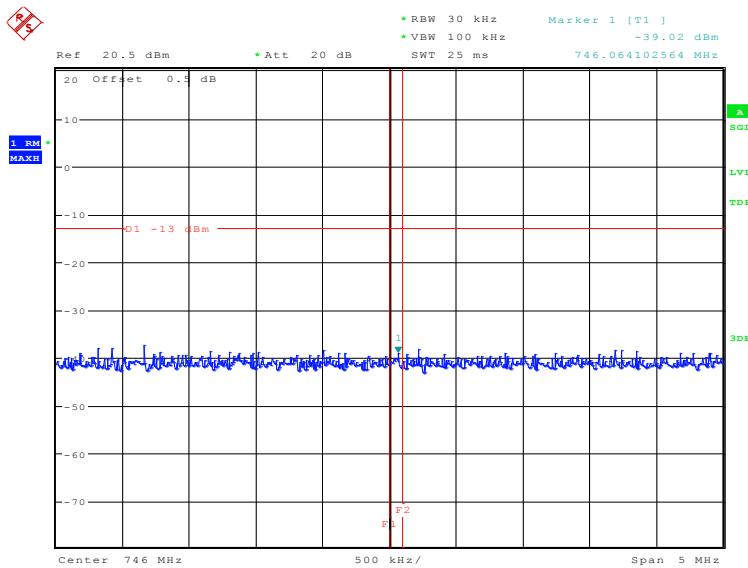
Date: 10.MAY.2019 09:52:04

LOW BAND EDGE BLOCK-10MHz-100%RB

```
                                        * RBW  30 kHz        Marker 1 [T1 ]
                                        * VBW  100 kHz             -29.10 dBm
        Ref   20.5 dBm      * Att  20 dB   SWT  25 ms       697.943910256 MHz
        20  Offset   0.5  dB
                                                                              A
          10                                                                  SGL
        1 RM
        MAXH   0                                                              LVL
         -10                                                                  TDF
              D1 -13 dBm
         -20
         -30                                                                  3DB
         -40

         -50

         -60

         -70
                                  F2
                                  F1
        Center  698 MHz          500 kHz/                    Span  5 MHz
```
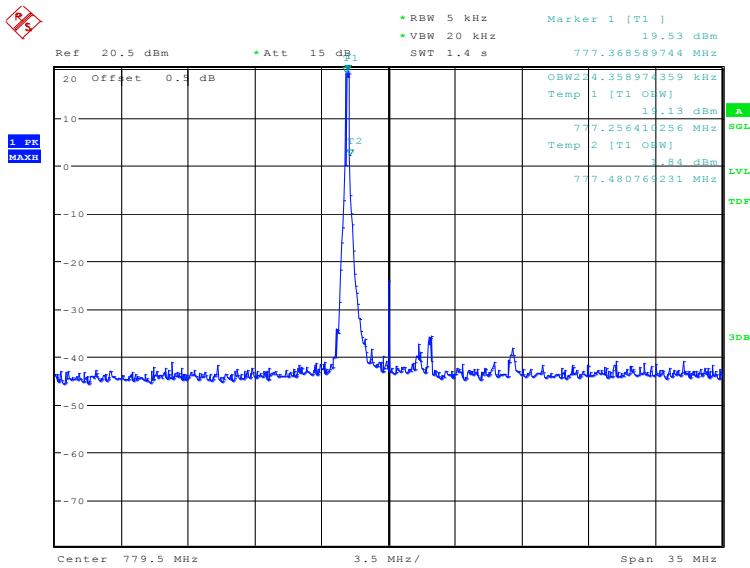
Date: 10.MAY.2019 09:49:50

HIGH BAND EDGE BLOCK-10MHz-100%RB

```
                                        * RBW  30 kHz        Marker 1 [T1 ]
                                        * VBW  100 kHz             -39.02 dBm
        Ref   20.5 dBm      * Att  20 dB   SWT  25 ms       746.064102564 MHz
        20  Offset   0.5  dB
                                                                              A
          10                                                                  SGL
        1 RM
        MAXH   0                                                              LVL
         -10                                                                  TDF
              D1 -13 dBm
         -20
         -30
                                                                             3DB
         -50

         -60

         -70
                                  F2
                                  F1
        Center  746 MHz          500 kHz/                    Span  5 MHz
```
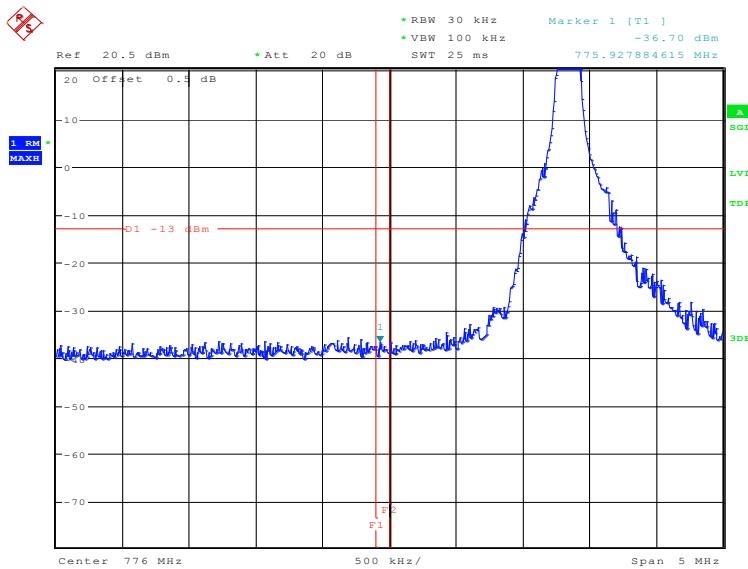
Date: 10.MAY.2019 09:52:35

LTE band 13
OBW: 1RB-low_offset
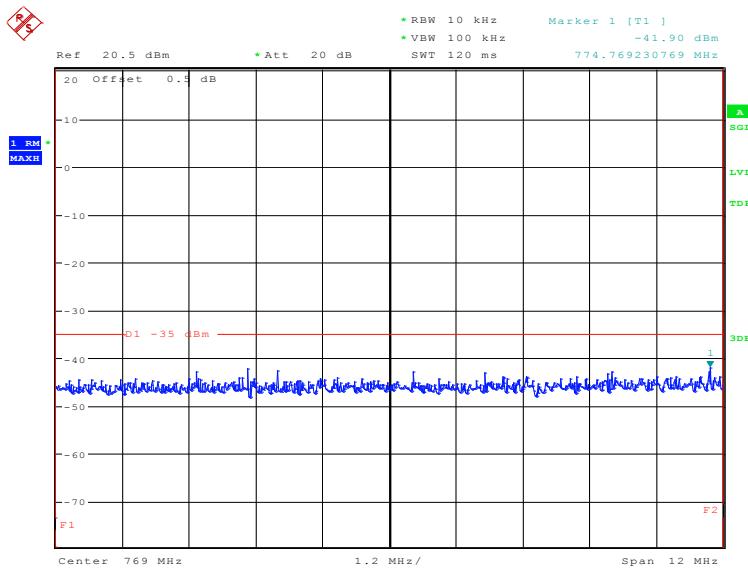
Date: 10.MAY.2019 09:56:05

LOW BAND EDGE BLOCK-1RB-low_offset
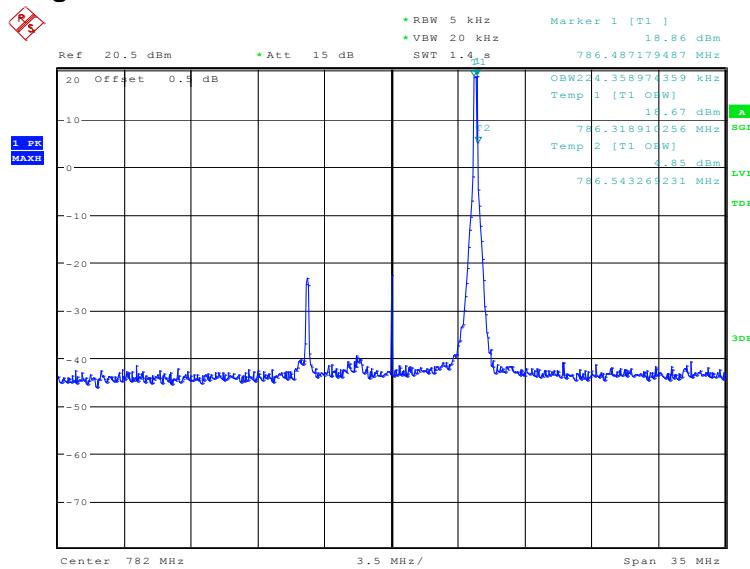
Date: 10.MAY.2019 09:56:21
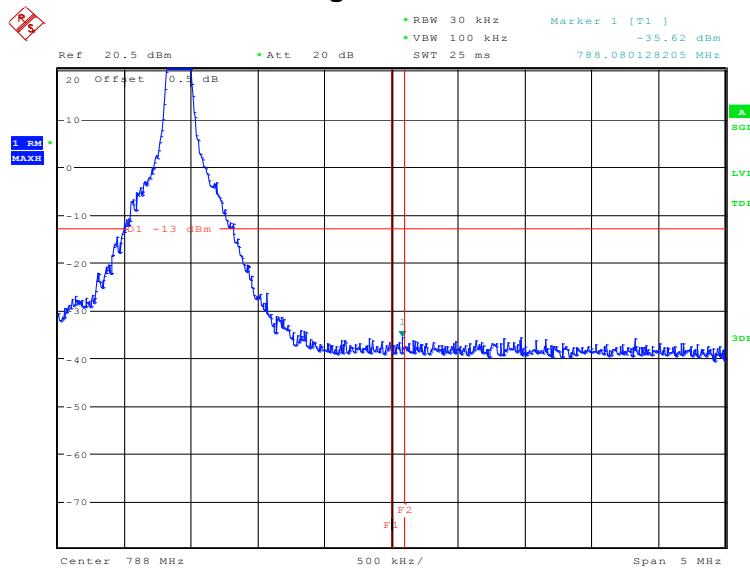
Date: 10.MAY.2019 09:56:35

OBW: 1RB-high_offset
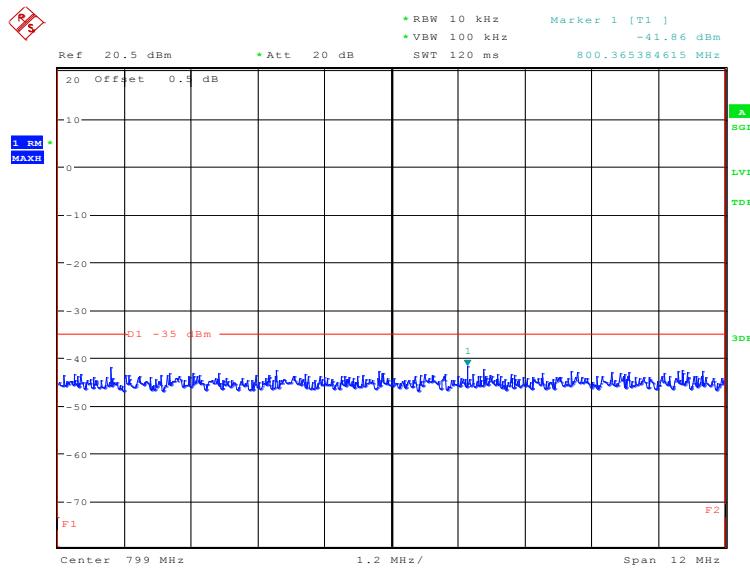
Date: 10.MAY.2019 09:58:41

HIGH BAND EDGE BLOCK-1RB-high_offset
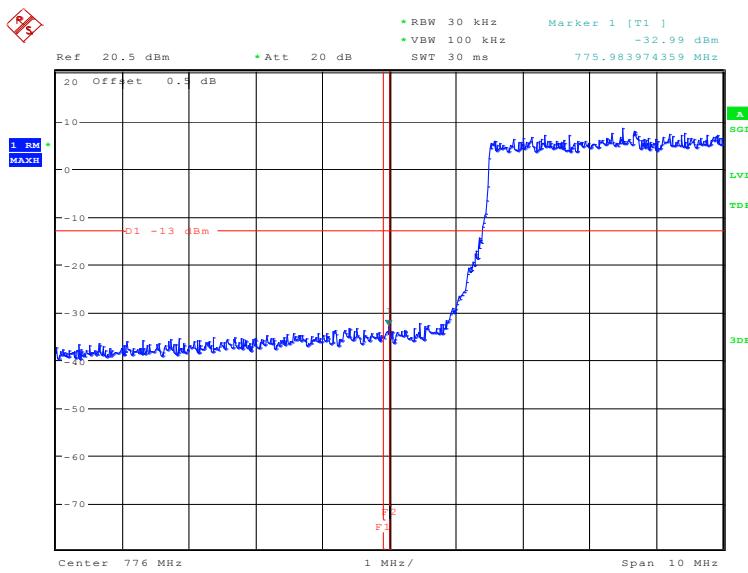
Date: 10.MAY.2019 09:58:56
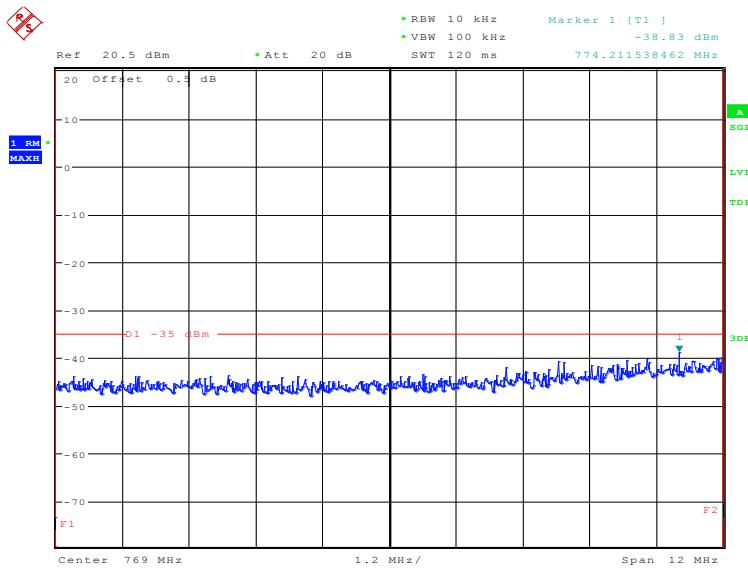
Date: 10.MAY.2019 09:59:11

LOW BAND EDGE BLOCK-10MHz-100%RB
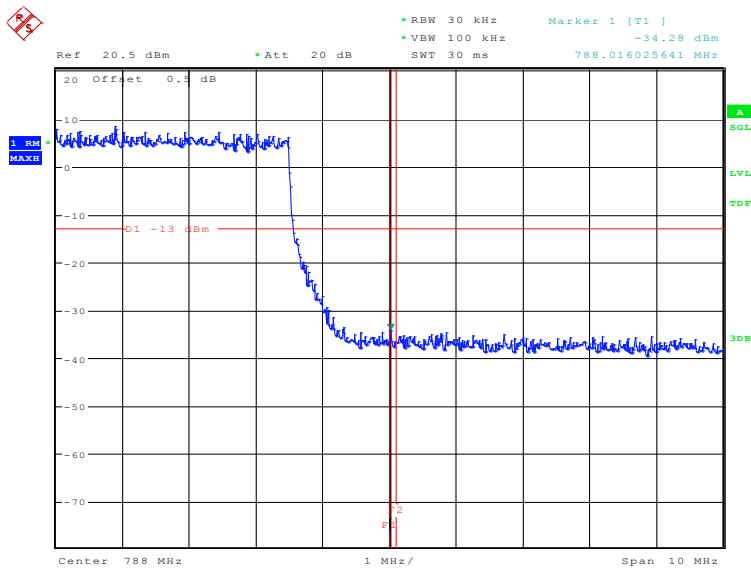
Date: 10.MAY.2019 09:57:07
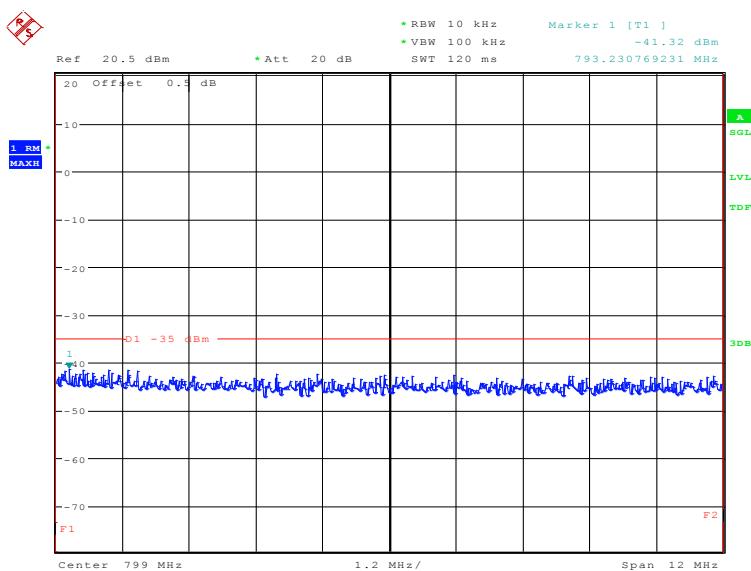
Date: 10.MAY.2019 09:57:22

HIGH BAND EDGE BLOCK-10MHz-100%RB

```
                                    *RBW 30 kHz        Marker 1 [T1 ]
                                    *VBW 100 kHz              -34.28 dBm
        Ref  20.5 dBm      *Att 20 dB   SWT 30 ms      788.016025641 MHz
        20  Offset  0.5 dB                                                      A
         -10                                                                   SGL
1 RM                                                                           LVL
MAXH       0                                                                   TDF
         -10
              D1 -13 dBm
         -20
         -30                                                                   3DB
         -40
         -50
         -60
         -70
                                        F2
                                        F1
        Center 788 MHz        1 MHz/              Span 10 MHz
```

Date: 10.MAY.2019 09:59:40

```
                                    *RBW 10 kHz        Marker 1 [T1 ]
                                    *VBW 100 kHz              -41.32 dBm
        Ref  20.5 dBm      *Att 20 dB   SWT 120 ms     793.230769231 MHz
        20  Offset  0.5 dB                                                      A
         -10                                                                   SGL
1 RM                                                                           LVL
MAXH       0                                                                   TDF
         -10
         -20
         -30
              D1 -35 dBm                                                       3DB
         -40
         -50
         -60
         -70                                                              F2
        F1
        Center 799 MHz        1.2 MHz/            Span 12 MHz
```
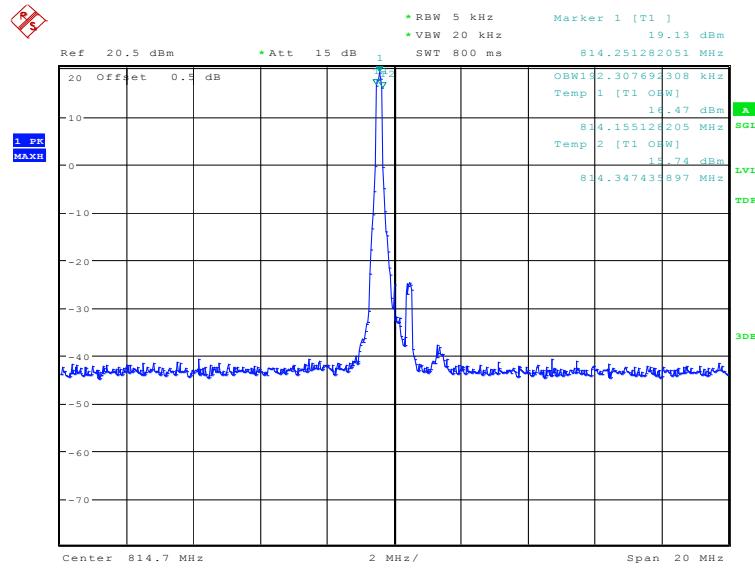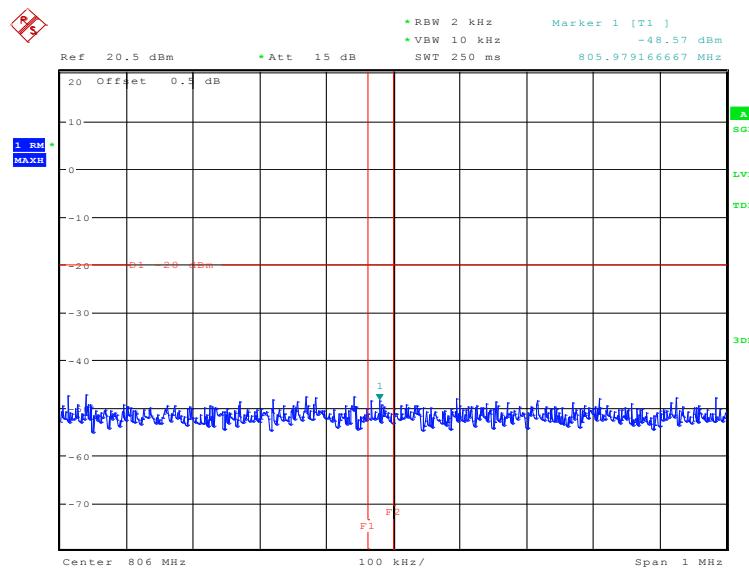
Date: 10.MAY.2019 09:59:55

LTE band 26(814MHz~824MHz)
OBW: 1RB-low_offset

Date: 10.MAY.2019 13:24:07
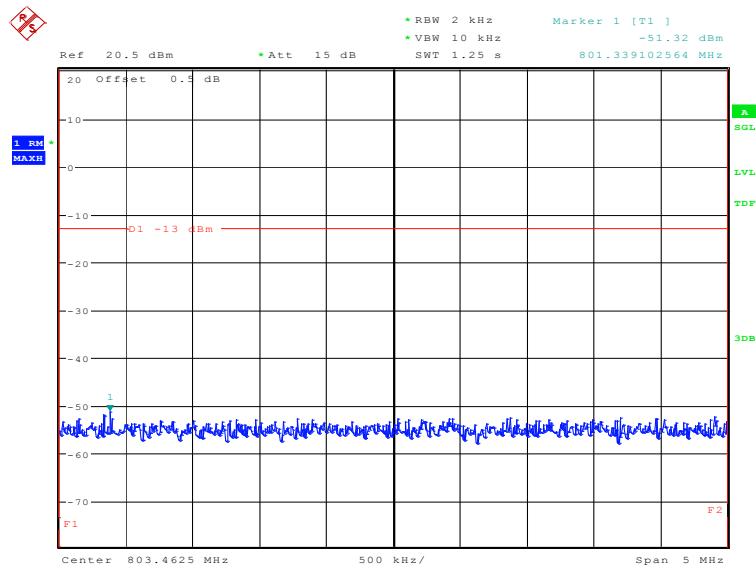
LOW BAND EDGE BLOCK-1RB-low_offset
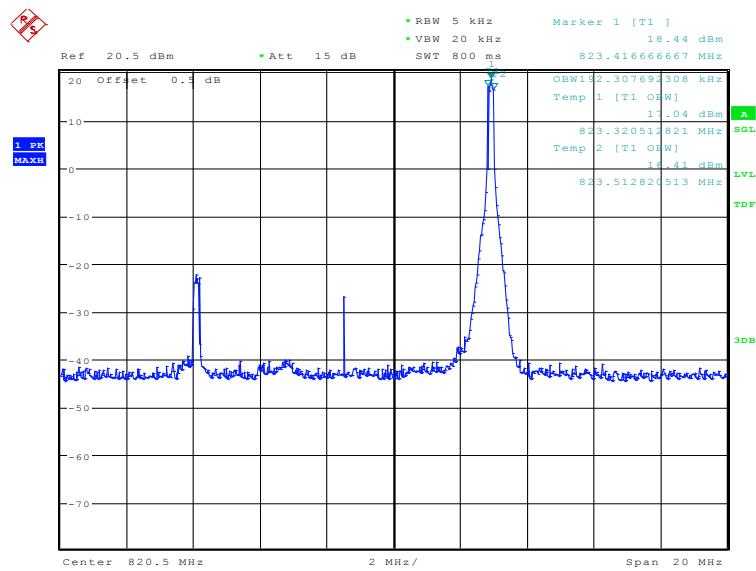
Date: 10.MAY.2019 13:24:21
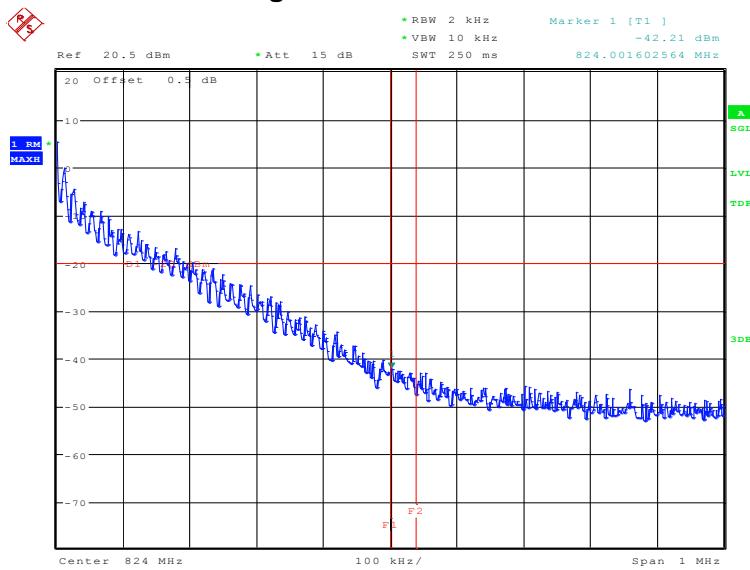
LOW Emission Mask -1RB-low_offset

```
                                        * RBW  2 kHz        Marker 1 [T1 ]
                                        * VBW  10 kHz             -51.32 dBm
        Ref   20.5 dBm      * Att  15 dB    SWT 1.25 s       801.339102564 MHz

        20  Offset  0.5  dB                                                    A
                                                                              SGL
       -10

                                                                              LVL
   1 RM
   MAXH    0
                                                                              TDF
       -10
              D1 -13 dBm

       -20

       -30
                                                                              3DB
       -40

       -50
          1
       -60

       -70
        F1                                                               F2

        Center  803.4625 MHz         500 kHz/              Span  5 MHz
```

Date: 10.MAY.2019 13:24:35
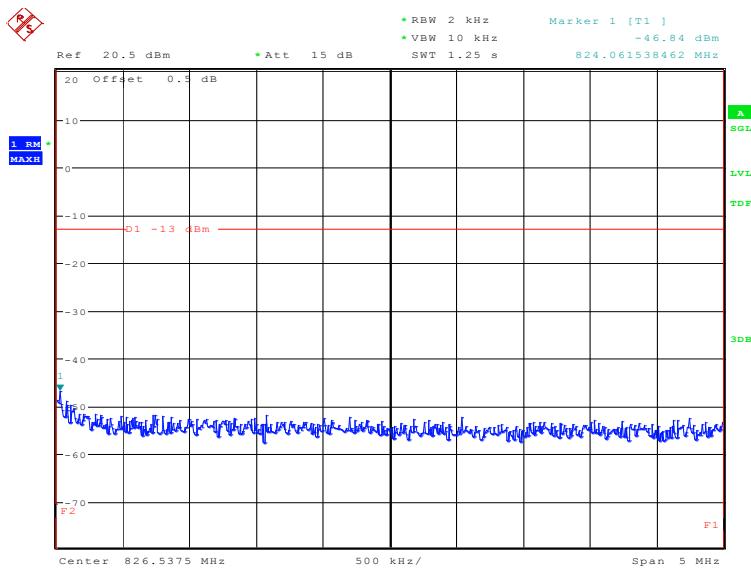
OBW: 1RB-high_offset

Date: 10.MAY.2019 13:26:39

HIGH BAND EDGE BLOCK-1RB-high_offset
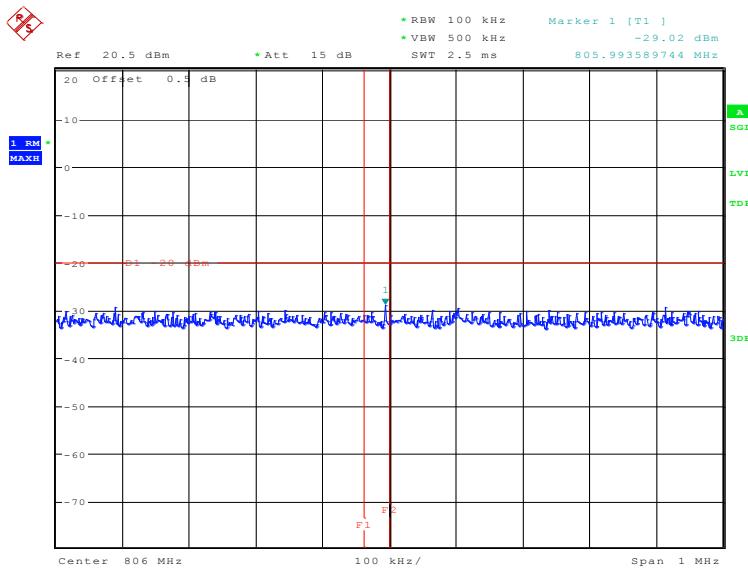
Date: 10.MAY.2019 13:26:52

HIGH Emission Mask -1RB-high_offset
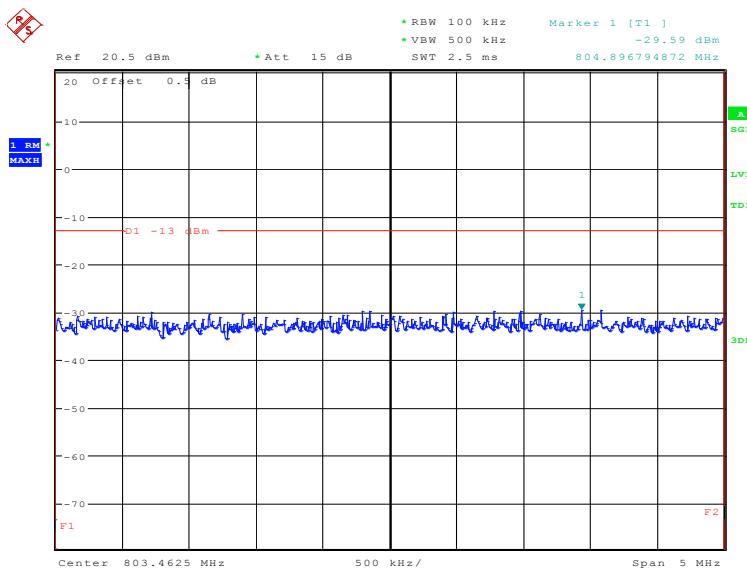
Date: 10.MAY.2019 13:27:07

LOW Emission Mask -10MHz-100%RB
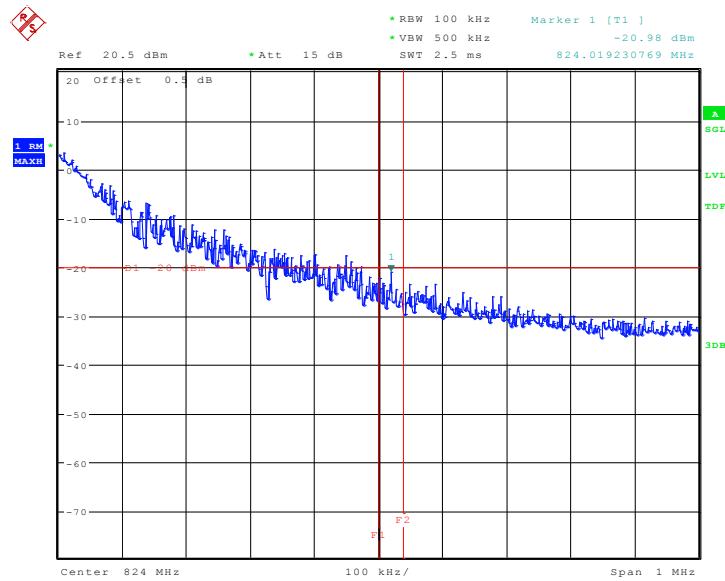
Date: 10.MAY.2019 13:25:05

LOW BAND EDGE BLOCK-10MHz-100%RB
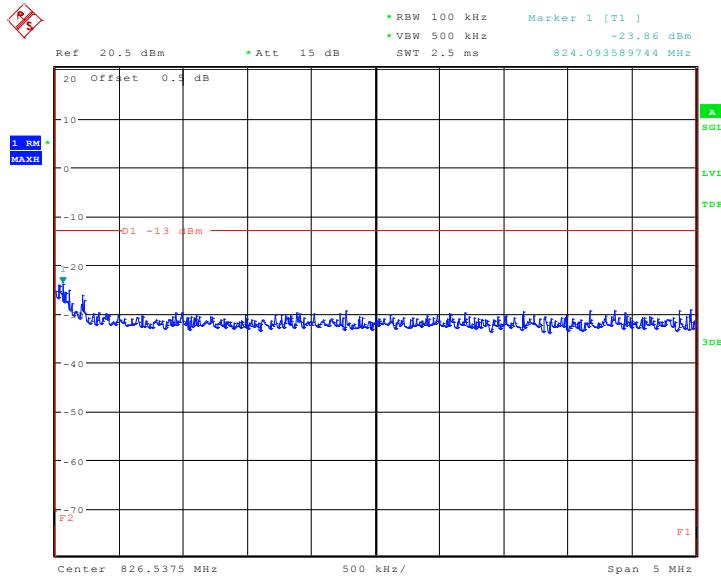
Date: 10.MAY.2019 13:25:20

HIGH Emission Mask -10MHz-100%RB
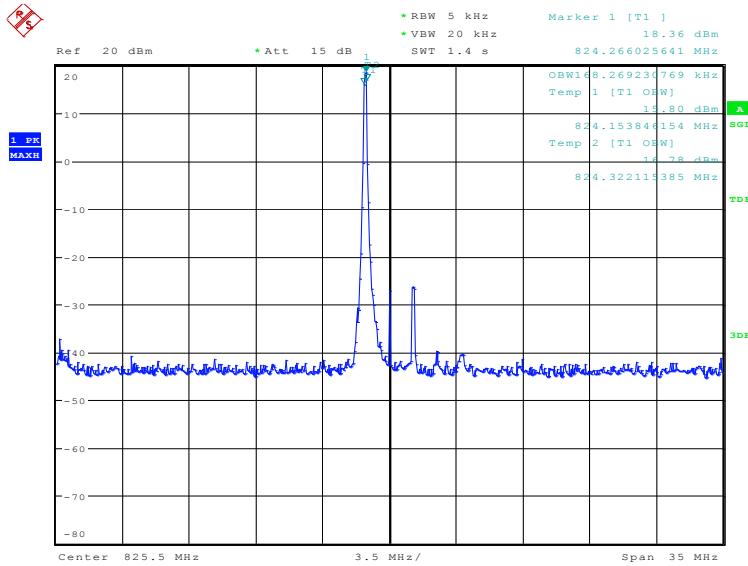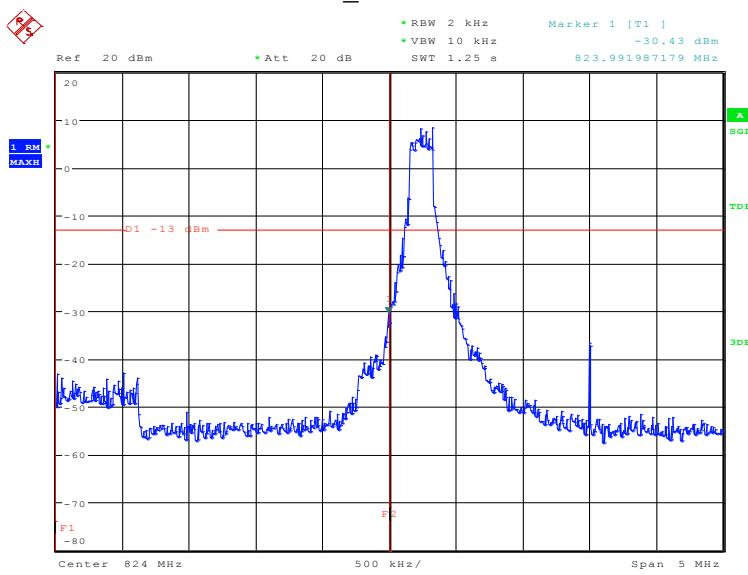

Date: 15.MAY.2019 13:39:29
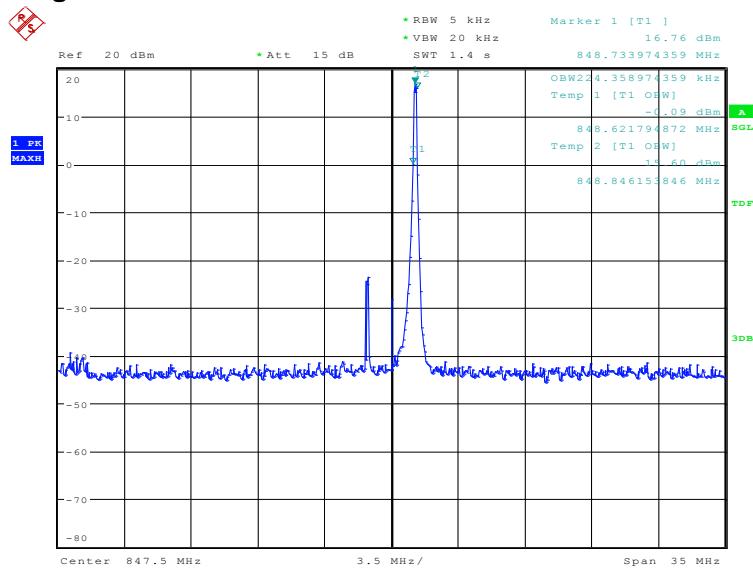
HIGH BAND EDGE BLOCK-10MHz-100%RB

Date: 15.MAY.2019 13:39:44
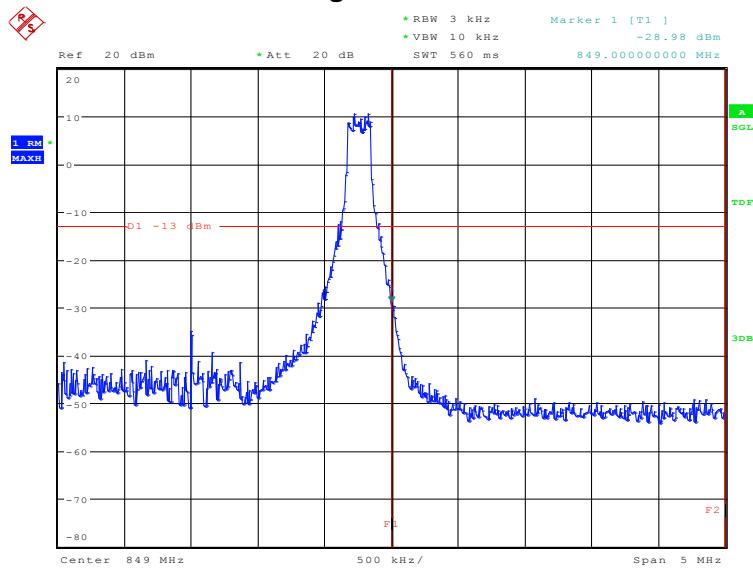
LTE band 26(824MHz~849MHz)

OBW: 1RB-low_offset

Date: 10.MAY.2019 13:15:59

LOW BAND EDGE BLOCK-1RB-low_offset

Date: 10.MAY.2019 13:16:15
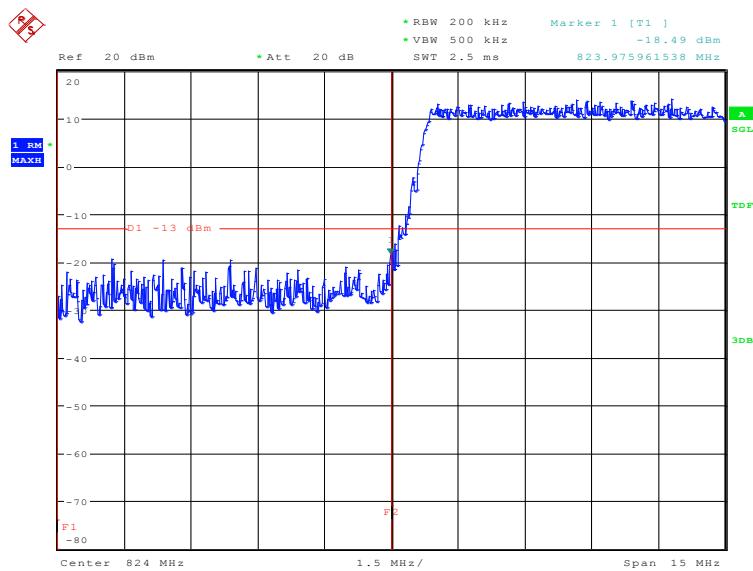
OBW: 1RB-high_offset

Date: 10.MAY.2019 13:18:44

## HIGH BAND EDGE BLOCK-1RB-high_offset
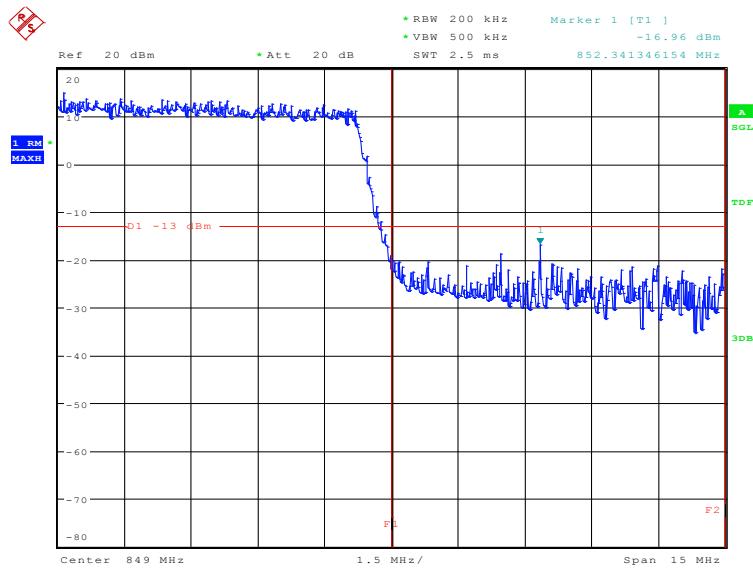
Date: 10.MAY.2019 13:19:00

LOW BAND EDGE BLOCK-15MHz-100%RB

Date: 10.MAY.2019 13:16:46
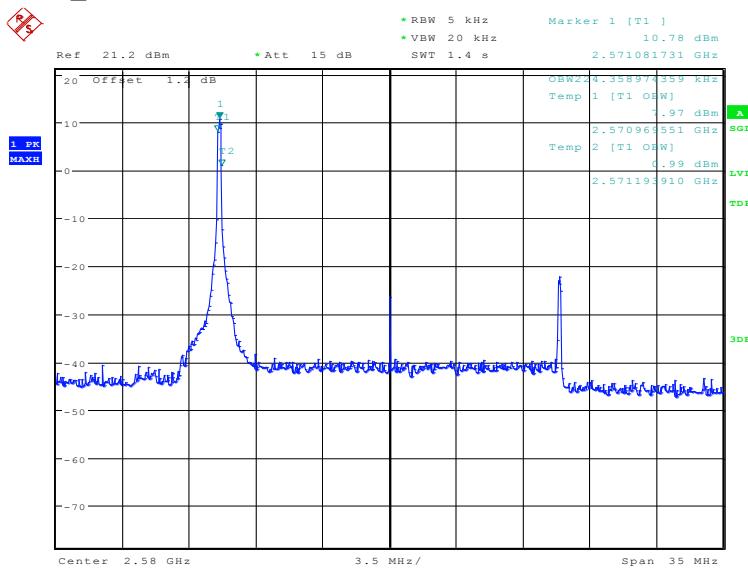
HIGH BAND EDGE BLOCK-15MHz-100%RB

Date: 10.MAY.2019 13:19:31
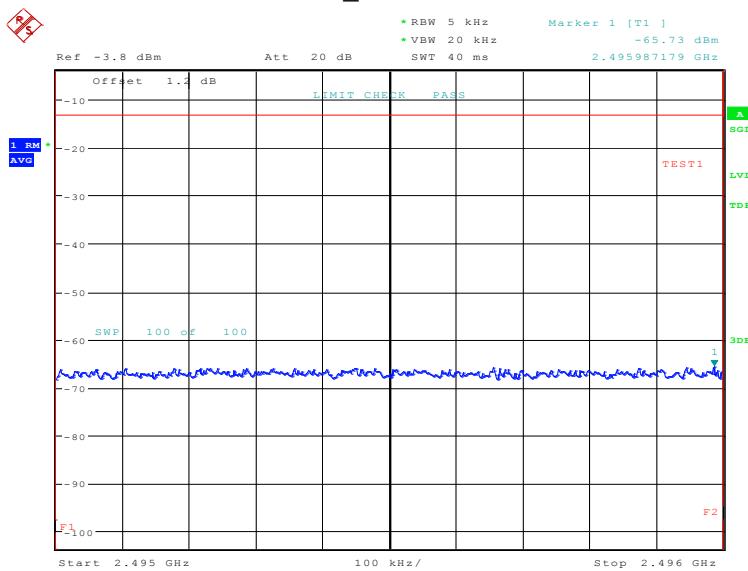
LTE band 38

OBW: 1RB-low_offset
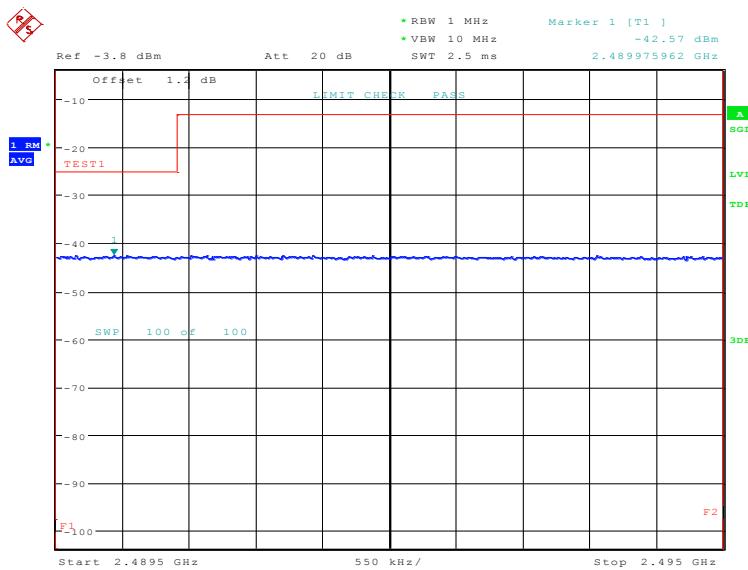
Date: 26.JUN.2019 15:36:39

LOW BAND EDGE BLOCK-1RB-low_offset

```
                                          *RBW  5 kHz        Marker 1 [T1 ]
                                          *VBW  20 kHz                -65.73 dBm
        Ref  -3.8 dBm          Att  20 dB  SWT  40 ms        2.495987179 GHz

             Offset  1.2 dB
          -10                          LIMIT CHECK   PASS                    A
                                                                            SGL
          -20                                              TEST1
    1 RM                                                                    LVL
    AVG
          -30                                                              TDF

          -40

          -50

             SWP   100 of  100                                             3DB
          -60                                                               1
          -70

          -80

          -90
        F1                                                              F2
          -100
        Start 2.495 GHz              100 kHz/               Stop 2.496 GHz
```

Date: 26.JUN.2019 15:36:59

```
                                          *RBW  1 MHz        Marker 1 [T1 ]
                                          *VBW  10 MHz               -42.57 dBm
        Ref  -3.8 dBm          Att  20 dB  SWT  2.5 ms       2.489975962 GHz

             Offset  1.2 dB
          -10                          LIMIT CHECK   PASS                    A
                                                                            SGL
          -20
    1 RM                                                                    LVL
    AVG    TEST1
          -30                                                              TDF

          -40   1

          -50

          -60   SWP   100 of  100                                          3DB

          -70

          -80

          -90
        F1                                                              F2
          -100
        Start 2.4895 GHz             550 kHz/               Stop 2.495 GHz
```

Date: 26.JUN.2019 15:37:16

OBW: 1RB-high_offset

Date: 26.JUN.2019 15:40:10

HIGH BAND EDGE BLOCK-1RB-high_offset

```
         *RBW  5 kHz          Marker 1 [T1 ]
         *VBW  20 kHz                  -69.99 dBm
Ref -3.8 dBm      Att  20 dB   SWT  40 ms      2.690692308 GHz

    Offset  1.2 dB
  -10                    LIMIT CHECK    PASS                      A
                                                                 SGL
1 RM
AVG  -20                                                         LVL
  TEST1
  -30                                                            TDF

  -40

  -50

  -60  SWP   100 of  100                                         3DB

  -70

  -80

  -90
                                                                 F2
 F1
 -100
Start 2.69 GHz           100 kHz/           Stop 2.691 GHz
```

Date: 26.JUN.2019 15:40:30

```
         *RBW  1 MHz          Marker 1 [T1 ]
         *VBW  10 MHz                 -45.88 dBm
Ref -3.8 dBm      Att  20 dB   SWT  2.5 ms     2.698716346 GHz

    Offset  1.2 dB
  -10            LIMIT CHECK    PASS                             A
                                                                 SGL
1 RM
AVG  -20                                                         LVL
  TEST1
  -30                                                            TDF

  -40
                                        1
  -50

  -60  SWP   100 of  100                                         3DB

  -70

  -80

  -90
                                                                 F2
 F1
 -100
Start 2.691 GHz          900 kHz/           Stop 2.7 GHz
```

Date: 26.JUN.2019 15:40:47

LOW BAND EDGE BLOCK-20MHz-100%RB


```
                                          * RBW  500 kHz      Marker 1 [T1 ]
                                          * VBW  2 MHz                -40.21 dBm
     Ref   1.2 dBm          Att  25 dB    SWT 2.5 ms          2.495113782 GHz
      0   Offset  1.2 dB                 LIMIT CHECK   PASS                        A
     -10                                                                          SGL
                                                                     TEST1        LVL
     -20                                                                          TDF
     -30
     -40     1
     -50  SWP   100 of  100
     -60                                                                          3DB
     -70
     -80
     -90
      F1                                                                F2
     Start 2.495 GHz          100 kHz/              Stop 2.496 GHz
```

Date: 26.JUN.2019 15:37:51


```
                                          * RBW  1 MHz       Marker 1 [T1 ]
                                          * VBW  10 MHz             -42.43 dBm
     Ref  -3.8 dBm           Att  20 dB    SWT 2.5 ms         2.489579327 GHz
          Offset  1.2 dB                  LIMIT CHECK   PASS
     -10
     -20                                                                          SGL
      TEST1                                                                       LVL
     -30                                                                          TDF
     -40     1
     -50
     -60  SWP   100 of  100                                                       3DB
     -70
     -80
     -90
      F1                                                                F2
    -100
     Start 2.4895 GHz         550 kHz/              Stop 2.495 GHz
```

Date: 26.JUN.2019 15:38:07

HIGH BAND EDGE BLOCK-20MHz-100%RB

```
                                    * RBW  500 kHz     Marker 1 [T1 ]
                                    * VBW  2 MHz                -44.24 dBm
      Ref  1.2 dBm        Att  25 dB   SWT 2.5 ms      2.690504808 GHz
      0   Offset  1.2 dB
                                       LIMIT CHECK    PASS              A
     -10                                                               SGL
1 RM *
AVG  -20                                                               LVL
      TEST1                                                            TDF
     -30

     -40

     -50
      SWP   100 of  100                                                3DB
     -60

     -70

     -80

     -90                                                               F2
      F1
      Start 2.69 GHz            100 kHz/           Stop 2.691 GHz
```

Date: 26.JUN.2019 15:42:13

```
                                    * RBW  1 MHz      Marker 1 [T1 ]
                                    * VBW  10 MHz              -44.74 dBm
      Ref -3.8 dBm        Att  20 dB   SWT 2.5 ms      2.714884615 GHz
        Offset  1.2 dB
                                       LIMIT CHECK    PASS
     -10                                                               A
                                                                       SGL
1 RM *
AVG  -20                                              TEST1            LVL
                                                                      TDF
     -30

     -40

     -50

     -60                                                               3DB
      SWP   100 of  100

     -70

     -80

     -90
      F1                                                               F2
     -100
      Start 2.691 GHz           2.4 MHz/            Stop 2.715 GHz
```

Date: 26.JUN.2019 15:42:30

A.7 CONDUCTED SPURIOUS EMISSION

A.7.1 Measurement Method

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the mobile station equipment tested, this equates to a frequency range of 13 MHz to 9 GHz, data taken from 10 MHz to 25 GHz.
2. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.
3. The number of sweep points of spectrum analyzer is set to 30001 which is greater than span/RBW.

A. 7.2 Measurement Limit

Part 22.917, Part 24.238 and Part 27.53(h) specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

Part 27.53(m)(4) specifies for mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Part 27.53(c) states for operations in the 746-758 MHz band and the 776-788 MHz band, 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 any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 +

10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

Part 27.53(a) states for mobile and portable stations operating in the 2305–2315 MHz and 2350–2360 MHz bands: By a factor of not less than: 43 +10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337MHz; By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296 MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292 MHz, and 70 + 10 log (P) dB below 2288 MHz; By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.

Part 90.691 states that out-of-band emission requirement shall apply only to the "outer" channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 Log_{10}(f/6.1)$ decibels or $50 + 10 Log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz. For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 Log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

A. 7.2 Measurement result
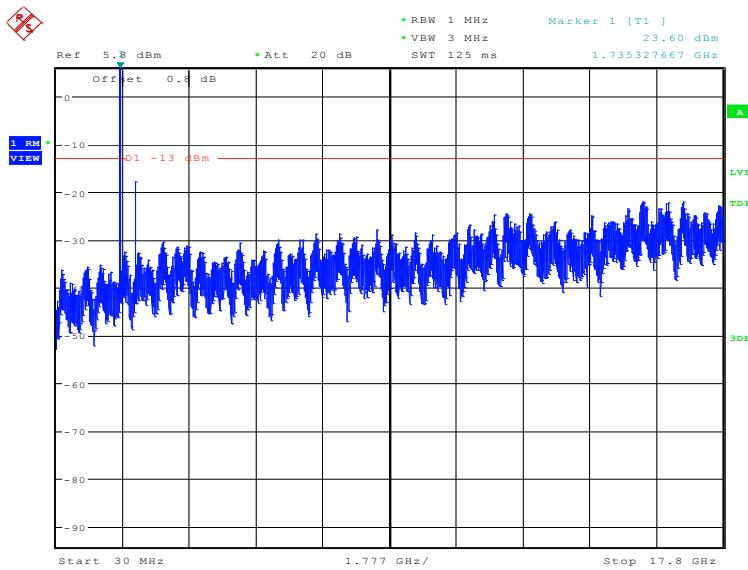
Only worst case result is given below

LTE band 2: 30MHz – 19.15GHz
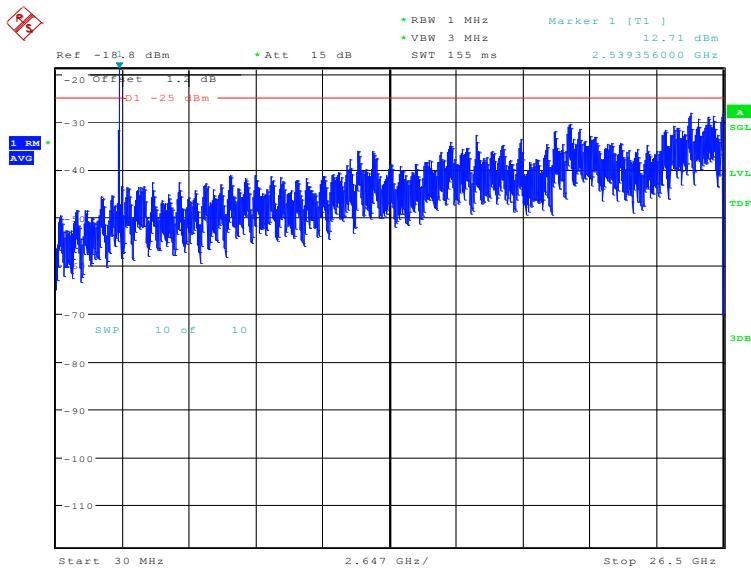


Date: 29.MAY.2019 11:19:44

**LTE band 4: 30MHz – 17.8GHz**
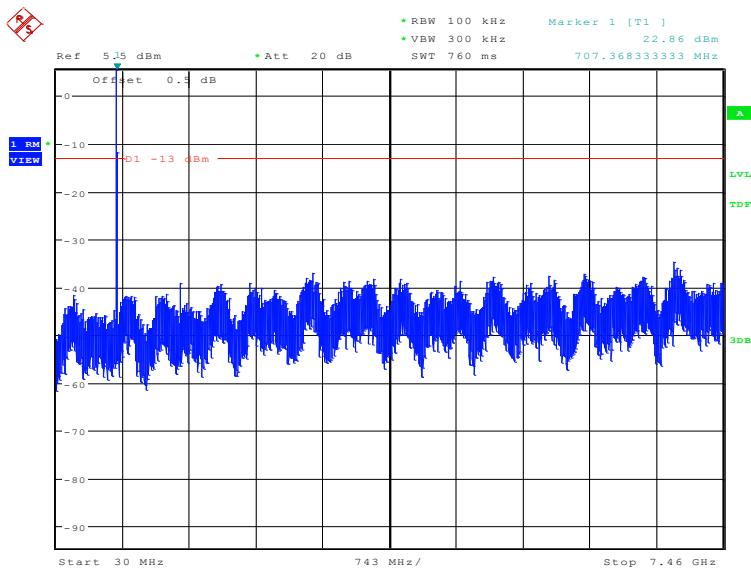
Date: 26.JUN.2019 15:52:09

LTE band 7: 30MHz – 26.5GHz
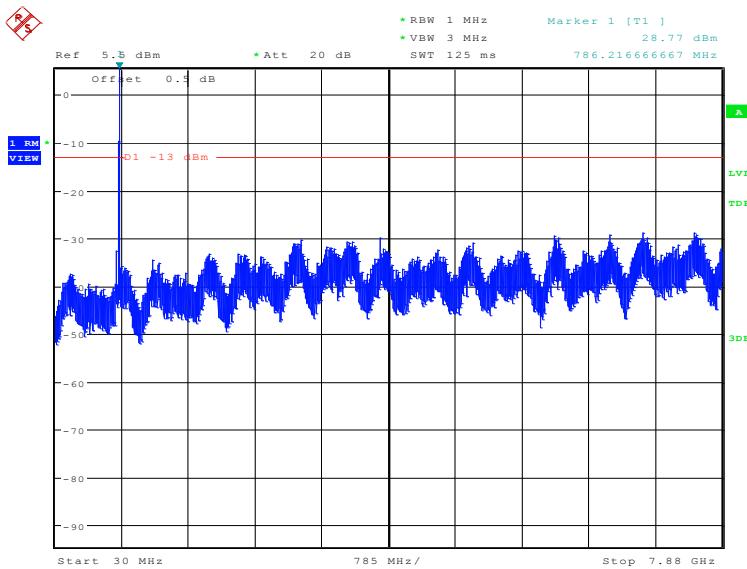
Date: 29.MAY.2019 11:20:45

LTE band 12: 30MHz – 7.46GHz
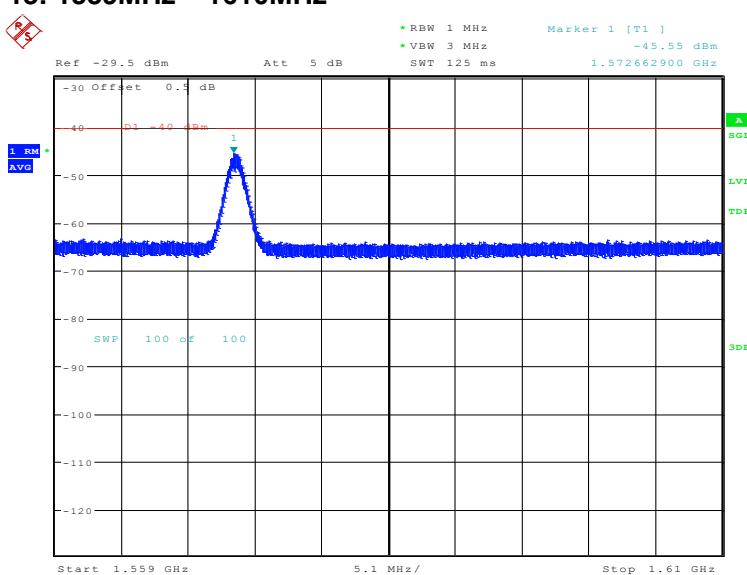
Date: 10.MAY.2019 10:20:21
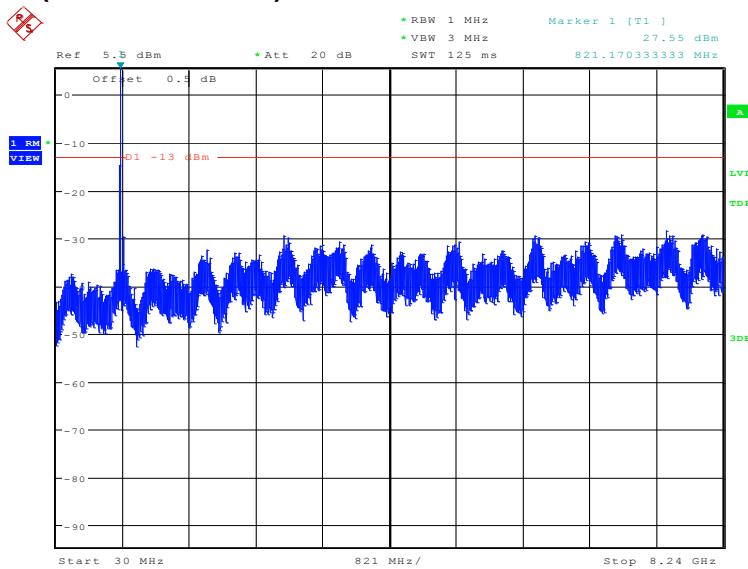
## LTE band 13: 30MHz – 7.88GHz

Date: 10.MAY.2019 10:21:46

LTE band 13: 1559MHz – 1610MHz

Date: 10.MAY.2019 10:22:20
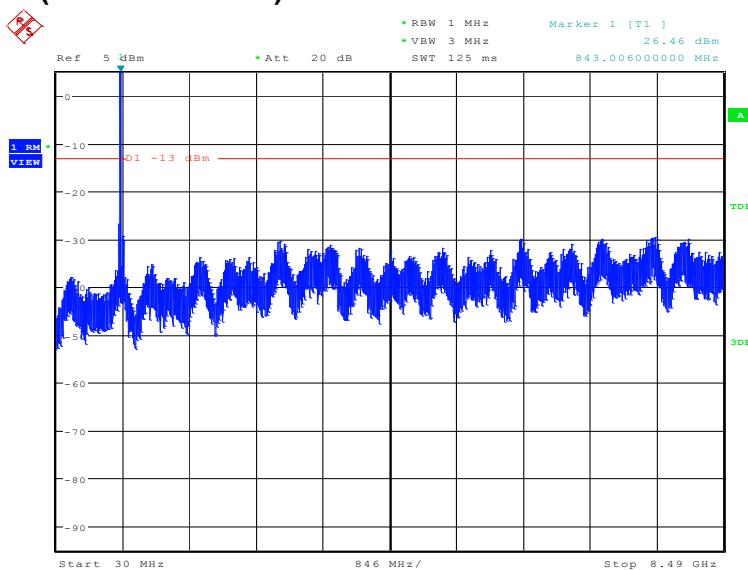
**LTE band 26(814MHz~824MHz): 30MHz – 8.24GHz**
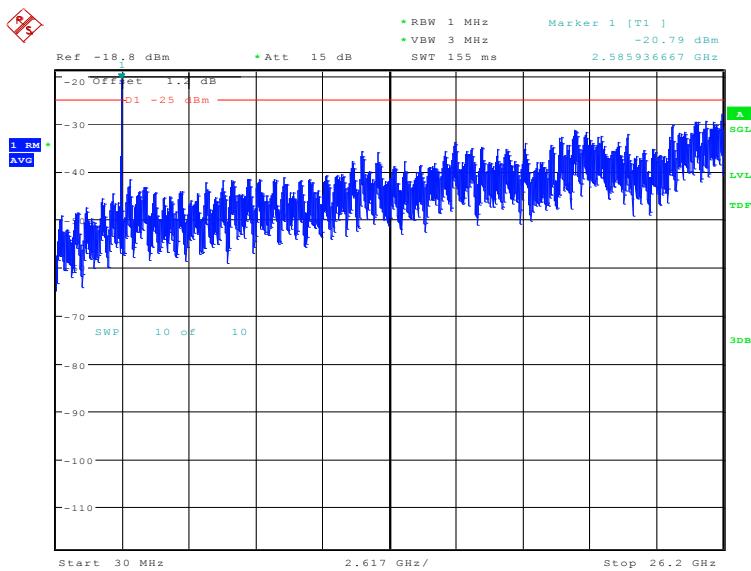
Date: 10.MAY.2019 13:30:13

LTE band 26(824MHz~849MHz): 30MHz – 8.49GHz

Date: 10.MAY.2019 13:32:04

LTE band 38: 30MHz – 26.2GHz


```
                                              * RBW  1 MHz        Marker 1 [T1 ]
                                              * VBW  3 MHz                -20.79 dBm
        Ref  -18.8 dBm        * Att   15 dB    SWT 155 ms         2.585936667 GHz
        -20 Offset   1.1 dB
            D1 -25 dBm                                                          A
        -30                                                                     SGL

  1 RM
  AVG -40                                                                       LVL
                                                                               TDF

        -70
            SWP    10 of    10                                                  3DB
        -80

        -90

       -100

       -110

        Start  30 MHz            2.617 GHz/           Stop  26.2 GHz
```

Date: 26.JUN.2019 15:55:40

A.8 PEAK-TO-AVERAGE POWER RATIO

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

According to KDB 971168 5.7.1:

a)Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;

b) Set resolution/measurement bandwidth $\geqslant$ signal's occupied bandwidth;

c) Set the number of counts to a value that stabilizes the measured CCDF curve;

d) Set the measurement interval to 1 ms

e)Record the maximum PAPR level associated with a probability of 0.1%

A.8.1 Measurement limit
not exceed 13 dB

A.8.2 Measurement results
LTE band 2, 20MHz

Frequency(MHz)	PAPR(dB)	
	QPSK	16QAM
1860.0	6.92	7.40

LTE band 4, 20MHz

Frequency(MHz)	PAPR(dB)	
	QPSK	16QAM
1745.0	6.73	7.44

LTE band 7, 20MHz

Frequency(MHz)	PAPR(dB)	
	QPSK	16QAM
2510.0	7.02	7.37

LTE band 12,10MHz

Frequency(MHz)	PAPR(dB)	
	QPSK	16QAM
707.5	4.97	6.06

LTE band 13,10MHz

Frequency(MHz)	PAPR(dB)	
782.0	QPSK	16QAM
	5.42	6.31

LTE band 38, 20MHz

Frequency(MHz)	PAPR(dB)	
2595.0	QPSK	16QAM
	8.17	8.75

ANNEX B: Accreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 600118-0

Telecommunication Technology Labs, CAICT
Beijing
China

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Electromagnetic Compatibility & Telecommunications

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2018-09-28 through 2019-09-30
Effective Dates

For the National Voluntary Laboratory Accreditation Program

END OF REPORT