TEST REPORT
No.I19Z62252-WMD03

for

TCL Communication Ltd.

LTE Mobile WiFi Router

Model Name: MW43TM

FCC ID: 2ACCJB117

with

Hardware Version: 03

Software Version: MW43_ZZ_02.00_01

Issued Date: 2020-02-14

Note:

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The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S.Government.

Test Laboratory:

CTTL, Telecommunication Technology Labs, CAICT

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I19Z62252-WMD03	Rev.0	1st edition	2020-02-14

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

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

1.3. Testing Environment

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

1.4. Project data

Testing Start Date: 2019-12-20
Testing End Date: 2020-02-12

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:	TCL Communication Ltd.
Address /Post:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
Contact:	Gong Zhizhou
Email:	zhizhou.gong@tcl.com
Telephone:	0086-755-36611722
Fax:	0086-755-36612000-81722

2.2. Manufacturer Information

Company Name:	TCL Communication Ltd.
Address /Post:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
Contact:	Gong Zhizhou
Email:	zhizhou.gong@tcl.com
Telephone:	0086-755-36611722
Fax:	0086-755-36612000-81722

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

3.1. About EUT

Description	LTE Mobile WiFi Router
Model Name	MW43TM
FCC ID	2ACCJB117
Antenna	Embedded
Output power	27.70dBm maximum EIRP measured for LTE Band 66
Extreme vol. Limits	3.6VDC to 4.2VDC (nominal: 3.8VDC)
Extreme temp. Tolerance	0°C to +55°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
UT15a	015659000001517	03	MW43_ZZ_02.00_01	2019-12-23
UT49a	015659000001145	03	MW43_ZZ_02.00_01	2019-12-27

*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	LI-ION Battery
Manufacturer	Shenzhen BYD Lithium Battery Company Limited
Capacitance	4400mAh

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

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 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 $^\circ$C, Max. = 35 $^\circ$C
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

6. SUMMARY OF TEST RESULT

6.1. Summary of test results

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 25

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 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 41

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 66

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 71

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 Performed. 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.

Explanation of worst-case configuration

The worst-case scenario for all measurements is based on the conducted output power measurement investigation results. Output power was measured on QPSK and 16QAM modulations. It was found that QPSK was the worst case. All testing was performed using QPSK modulations to represent the worst case unless otherwise stated. The test results shown in the following sections represent the worst case emission.

7. Test Equipment Utilized

NO.	Description	Type	Series Number	Manufacture	Cal Due Date	Calibration Interval
1	Universal Radio Communication Tester	CMW500	159082	R&S	2020-12-24	1 year
2	Spectrum Analyzer	FSU26	200030	R&S	2020-06-03	1 year
3	Climate chamber	SH-242	93008556	ESPEC	2020-12-21	3 year
4	EMI Antenna	VULB9163	9163-235	Schwarzbeck	2020-11-20	1 year
5	EMI Antenna	3117	00119024	ETS-Lindgren	2020-02-25	1 year
6	EMI Antenna	9117	167	Schwarzbeck	2020-05-27	1 year
7	Signal Generator	N5183A	MY49060052	R&S	2020-06-24	1 year
8	Test Receiver	E4440A	MY48250642	Agilent	2020-03-18	1 year
9	Universal Radio Communication Tester	CMW500	143008	R&S	2020-11-26	1 year

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 12

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	715.3	23.00	22.17
		707.5	23.00	22.12
		699.7	23.21	22.06
	1 RB low	715.3	22.79	21.61
		707.5	23.00	21.88
		699.7	22.97	22.10
	50% RB mid	715.3	23.21	22.05
		707.5	22.99	21.69
		699.7	23.06	21.91
	100% RB	715.3	21.95	21.09
		707.5	21.90	20.89
		699.7	22.11	20.72
3MHz	1 RB high	714.5	23.27	22.12
		707.5	22.86	21.92
		700.5	22.86	22.07
	1 RB low	714.5	23.25	22.16
		707.5	23.03	22.06
		700.5	22.81	22.15
	50% RB mid	714.5	22.06	21.07
		707.5	21.99	21.33
		700.5	22.07	20.91

		714.5	22.03	20.97
	100% RB	707.5	21.96	21.20
		700.5	22.09	21.05
5MHz	1 RB high	713.5	22.92	21.89
		707.5	22.69	21.74
		701.5	22.96	22.01
	1 RB low	713.5	22.99	21.41
		707.5	22.71	21.68
		701.5	22.68	21.13
	50% RB mid	713.5	22.02	20.94
		707.5	21.98	20.71
		701.5	22.13	21.09
	100% RB	713.5	21.94	21.03
		707.5	21.90	20.87
		701.5	22.06	20.86
10MHz	1 RB high	711.0	22.74	21.96
		707.5	22.70	21.90
		704.0	23.27	21.86
	1 RB low	711.0	22.72	21.37
		707.5	22.76	22.00
		704.0	23.13	21.86
	50% RB mid	711.0	21.92	20.96
		707.5	21.89	20.93
		704.0	21.98	20.84
	100% RB	711.0	21.96	20.78
		707.5	21.89	20.74
		704.0	21.91	20.87

LTE band 25

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	1914.3	22.91	21.91
		1882.5	22.49	21.83
		1850.7	22.61	21.51
	1 RB low	1914.3	22.90	22.09
		1882.5	22.63	21.59
		1850.7	22.75	21.72
	50% RB mid	1914.3	22.81	22.13
		1882.5	22.59	21.58
		1850.7	22.66	21.50
	100% RB	1914.3	21.73	21.02
		1882.5	21.60	20.54
		1850.7	21.72	20.96
3MHz	1 RB high	1913.5	22.71	21.86
		1882.5	22.65	21.79
		1851.5	22.70	21.83
	1 RB low	1913.5	22.83	21.79
		1882.5	22.50	21.51
		1851.5	22.63	21.77
	50% RB mid	1913.5	21.71	21.12
		1882.5	21.72	20.67
		1851.5	21.81	20.53
	100% RB	1913.5	21.92	21.11
		1882.5	21.70	20.70
		1851.5	21.83	20.63
5MHz	1 RB high	1912.5	22.91	21.45
		1882.5	22.37	21.83
		1852.5	22.55	21.67
	1 RB low	1912.5	22.95	21.85
		1882.5	22.31	21.81
		1852.5	22.49	21.33
	50% RB mid	1912.5	21.96	20.94
		1882.5	21.69	20.81
		1852.5	21.72	20.63
	100% RB	1912.5	21.76	20.93
		1882.5	21.74	20.78
		1852.5	21.77	20.84
10MHz	1 RB high	1910.0	22.92	22.09
		1882.5	22.87	21.73

		1855.0	22.64	21.91
	1 RB low	1910.0	22.56	21.46
		1882.5	22.66	21.79
		1855.0	22.66	21.23
	50% RB mid	1910.0	21.72	20.94
		1882.5	21.73	20.74
		1855.0	21.80	20.80
	100% RB	1910.0	21.69	20.74
		1882.5	21.79	20.81
		1855.0	21.77	20.71
15MHz	1 RB high	1907.5	23.01	21.94
		1882.5	22.69	21.78
		1857.5	22.80	22.47
	1 RB low	1907.5	22.77	21.74
		1882.5	22.54	21.30
		1857.5	22.64	22.39
	50% RB mid	1907.5	21.66	20.80
		1882.5	21.76	20.62
		1857.5	21.77	20.55
	100% RB	1907.5	21.76	20.77
		1882.5	21.75	20.70
		1857.5	21.80	20.68
20MHz	1 RB high	1905.0	22.90	21.67
		1882.5	22.60	21.40
		1860.0	22.45	21.79
	1 RB low	1905.0	22.74	21.22
		1882.5	22.35	21.33
		1860.0	22.48	21.35
	50% RB mid	1905.0	21.72	20.75
		1882.5	21.75	20.80
		1860.0	21.87	20.99
	100% RB	1905.0	21.77	20.69
		1882.5	21.72	20.76
		1860.0	21.83	20.80

LTE band 26(814MHz~824MHz)

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	823.3	23.02	22.01
		819.0	22.98	21.98
		814.7	23.25	22.40
	1 RB low	823.3	22.81	22.08
		819.0	23.04	22.02
		814.7	23.24	22.37
	50% RB mid	823.3	22.86	22.56
		819.0	22.98	21.55
		814.7	23.14	22.20
	100% RB	823.3	22.06	21.34
		819.0	21.89	20.72
		814.7	22.02	20.99
3MHz	1 RB high	822.5	22.99	22.33
		819.0	22.76	22.22
		815.5	23.46	22.16
	1 RB low	822.5	22.95	22.26
		819.0	22.92	22.31
		815.5	23.14	21.74
	50% RB mid	822.5	21.85	21.10
		819.0	21.79	20.91
		815.5	21.88	20.93
	100% RB	822.5	21.82	20.85
		819.0	21.82	20.94
		815.5	21.91	21.01
5MHz	1 RB high	821.5	22.76	22.17
		819.0	22.74	22.07
		816.5	22.77	22.09
	1 RB low	821.5	22.87	21.96
		819.0	22.91	22.12
		816.5	22.64	22.47
	50% RB mid	821.5	21.90	20.85
		819.0	21.84	20.92
		816.5	21.89	20.88
	100% RB	821.5	21.90	20.81
		819.0	21.87	20.84
		816.5	21.82	20.82
10MHz	1 RB high	819.0	22.67	22.48
	1 RB low	819.0	22.67	22.48

	50% RB mid	819.0	22.80	22.50
	100% RB	819.0	22.98	22.40

LTE band 26(824MHz~849MHz)

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	848.3	23.01	22.17
		836.5	23.10	22.31
		824.7	23.26	22.47
	1 RB low	848.3	23.01	22.18
		836.5	23.00	22.20
		824.7	23.35	22.28
	50% RB mid	848.3	23.23	22.60
		836.5	22.94	21.64
		824.7	23.08	22.18
	100% RB	848.3	21.97	21.09
		836.5	21.96	20.90
		824.7	21.88	20.74
3MHz	1 RB high	847.5	22.92	22.19
		836.5	22.78	22.36
		825.5	22.70	22.06
	1 RB low	847.5	23.07	22.33
		836.5	22.96	22.44
		825.5	22.72	21.99
	50% RB mid	847.5	21.96	21.03
		836.5	21.92	21.15
		825.5	21.88	20.87
	100% RB	847.5	21.90	20.90
		836.5	21.92	20.86
		825.5	21.86	20.99
5MHz	1 RB high	846.5	22.56	22.66
		836.5	22.78	22.65
		826.5	22.83	22.51
	1 RB low	846.5	22.74	22.29
		836.5	22.74	22.52
		826.5	22.76	22.43
	50% RB mid	846.5	21.94	20.96
		836.5	21.81	20.90
		826.5	21.92	20.88
	100% RB	846.5	21.88	21.09
		836.5	21.79	20.71
		826.5	21.81	21.00
10MHz	1 RB high	844.0	23.01	22.60
		836.5	22.94	22.52

		829.0	22.98	22.35
	1 RB low	844.0	22.98	22.50
		836.5	22.94	22.45
		829.0	22.79	22.28
	50% RB mid	844.0	22.10	21.05
		836.5	21.82	20.84
		829.0	21.82	20.87
	100% RB	844.0	22.03	21.06
		836.5	21.84	20.81
		829.0	21.79	20.78
15MHz	1 RB high	841.5	22.87	22.63
		836.5	22.85	22.26
		831.5	23.02	22.34
	1 RB low	841.5	22.74	22.43
		836.5	22.77	22.37
		831.5	22.64	21.88
	50% RB mid	841.5	22.03	21.08
		836.5	21.88	20.93
		831.5	21.82	20.85
	100% RB	841.5	21.91	20.86
		836.5	21.93	20.91
		831.5	21.98	20.98

LTE band 41

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
5MHz	1 RB high	2687.5	23.96	22.76
		2593.0	23.76	22.56
		2498.5	23.98	23.05
	1 RB low	2687.5	23.79	22.61
		2593.0	23.81	22.54
		2498.5	24.31	22.79
	50% RB mid	2687.5	23.02	22.12
		2593.0	23.25	22.43
		2498.5	23.43	22.48
	100% RB	2687.5	23.04	22.08
		2593.0	23.26	22.29
		2498.5	23.37	22.35
10MHz	1 RB high	2685.0	23.94	22.61
		2593.0	24.08	23.58
		2501.0	24.13	23.96
	1 RB low	2685.0	23.96	22.55
		2593.0	24.01	23.55
		2501.0	24.02	23.97
	50% RB mid	2685.0	22.93	21.86
		2593.0	23.19	22.49
		2501.0	23.27	22.45
	100% RB	2685.0	22.99	22.02
		2593.0	23.24	22.27
		2501.0	23.21	22.32
15MHz	1 RB high	2682.5	23.94	22.79
		2593.0	24.21	23.96
		2503.5	24.22	23.08
	1 RB low	2682.5	23.92	22.65
		2593.0	24.16	23.64
		2503.5	24.00	23.11
	50% RB mid	2682.5	23.10	22.12
		2593.0	23.29	22.23
		2503.5	23.22	22.24
	100% RB	2682.5	23.09	22.14
		2593.0	23.16	22.43
		2503.5	23.20	22.27

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		2680.0	24.11	22.68
20MHz	1 RB high	2593.0	23.94	23.40
		2506.0	24.11	22.37
	1 RB low	2680.0	24.20	22.66
		2593.0	23.86	23.58
		2506.0	23.95	22.06
	50% RB mid	2680.0	23.05	22.07
		2593.0	23.37	22.33
		2506.0	23.23	22.27
	100% RB	2680.0	23.01	22.05
		2593.0	23.20	22.32
		2506.0	23.15	22.10

LTE band 66

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	1779.3	22.31	21.51
		1745.0	22.46	22.08
		1710.7	22.69	21.72
	1 RB low	1779.3	22.57	21.48
		1745.0	22.39	21.44
		1710.7	22.66	21.68
	50% RB mid	1779.3	22.59	21.54
		1745.0	22.52	21.39
		1710.7	22.67	21.56
	100% RB	1779.3	21.70	20.55
		1745.0	21.48	20.39
		1710.7	21.74	20.81
3MHz	1 RB high	1778.5	22.47	21.36
		1745.0	22.49	21.72
		1711.5	22.51	21.54
	1 RB low	1778.5	22.77	21.51
		1745.0	22.47	21.68
		1711.5	22.56	21.80
	50% RB mid	1778.5	21.59	20.76
		1745.0	21.64	20.61
		1711.5	21.73	20.74
	100% RB	1778.5	21.57	20.68
		1745.0	21.62	20.66
		1711.5	21.69	20.73
5MHz	1 RB high	1777.5	22.56	21.76
		1745.0	22.40	21.76
		1712.5	22.54	21.57
	1 RB low	1777.5	22.52	21.65
		1745.0	22.40	21.72
		1712.5	22.64	21.56
	50% RB mid	1777.5	21.63	20.72
		1745.0	21.52	20.63
		1712.5	21.53	20.55
	100% RB	1777.5	21.60	20.66
		1745.0	21.50	20.70
		1712.5	21.60	20.81
10MHz	1 RB high	1775.0	22.52	21.63
		1745.0	22.58	21.20

		1715.0	22.61	21.63
	1 RB low	1775.0	22.77	21.62
		1745.0	22.54	21.34
		1715.0	22.66	21.76
	50% RB mid	1775.0	21.80	20.76
		1745.0	21.67	21.02
		1715.0	21.62	20.87
	100% RB	1775.0	21.67	20.57
		1745.0	21.60	20.62
		1715.0	21.57	20.58
15MHz	1 RB high	1772.5	22.85	21.60
		1745.0	22.56	21.55
		1717.5	22.56	22.38
	1 RB low	1772.5	22.77	21.58
		1745.0	22.60	21.28
		1717.5	22.57	22.42
	50% RB mid	1772.5	21.79	20.78
		1745.0	21.65	20.65
		1717.5	21.53	20.57
	100% RB	1772.5	21.62	20.58
		1745.0	21.59	20.61
		1717.5	21.48	20.63
20MHz	1 RB high	1770.0	22.55	21.56
		1745.0	22.36	21.32
		1720.0	22.18	21.18
	1 RB low	1770.0	22.67	21.26
		1745.0	22.33	21.36
		1720.0	22.26	21.19
	50% RB mid	1770.0	21.63	20.70
		1745.0	21.65	20.72
		1720.0	21.51	20.74
	100% RB	1770.0	21.67	20.63
		1745.0	21.52	20.61
		1720.0	21.58	20.60

LTE band 71

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
5MHz	1 RB high	695.5	22.05	21.15
		680.5	22.44	21.30
		665.5	22.49	21.30
	1 RB low	695.5	22.15	21.40
		680.5	22.20	21.42
		665.5	22.35	21.19
	50% RB mid	695.5	21.42	20.25
		680.5	21.46	20.30
		665.5	21.38	20.55
	100% RB	695.5	21.38	20.44
		680.5	21.41	20.46
		665.5	21.50	20.61
10MHz	1 RB high	693	22.21	21.11
		680.5	22.30	21.60
		668	22.81	22.26
	1 RB low	693	22.30	21.01
		680.5	22.46	21.44
		668	22.66	21.24
	50% RB mid	693	21.44	20.46
		680.5	21.48	20.56
		668	21.46	20.49
	100% RB	693	21.46	20.39
		680.5	21.43	20.55
		668	21.45	20.42
15MHz	1 RB high	690.5	22.36	21.15
		680.5	22.29	22.00
		670.5	22.74	21.63
	1 RB low	690.5	22.22	20.94
		680.5	22.31	22.15
		670.5	22.69	21.05
	50% RB mid	690.5	21.43	20.45
		680.5	21.44	20.49
		670.5	21.52	20.73
	100% RB	690.5	21.37	20.26
		680.5	21.38	20.53
		670.5	21.36	20.54

		688	22.11	21.20
20MHz	1 RB high	680.5	22.36	20.77
		673	22.40	21.33
	1 RB low	688	22.37	20.91
		680.5	22.32	20.91
		673	22.02	21.19
	50% RB mid	688	21.37	20.55
		680.5	21.43	20.62
		673	21.62	20.60
	100% RB	688	21.36	20.35
		680.5	21.35	20.35
		673	21.46	20.47

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.".
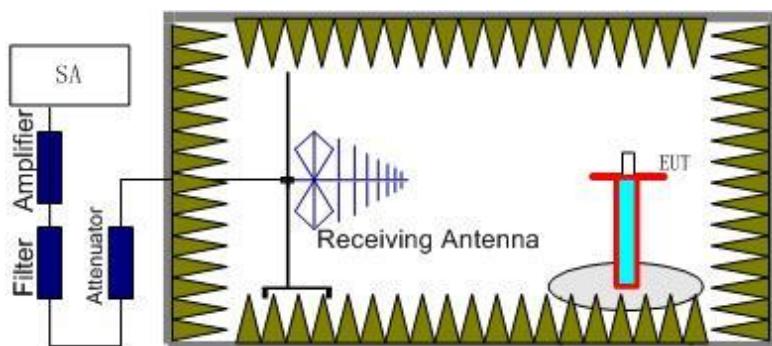
Rule Part 27.50(c) specifies "Portable stations (hand-held de-vices) are limited to 3 watts ERP.".

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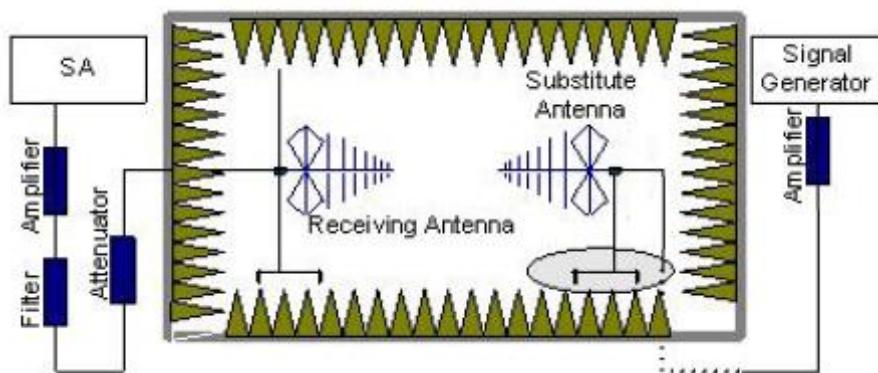
A.1.3.2 Method of Measurement

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 RMS 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 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	-19.65	1.90	44.66	0.77	2.15	21.73	34.77	13.04	H
707.50	-18.99	1.91	44.94	0.62	2.15	22.51	34.77	12.26	H
715.30	-19.24	1.92	45.26	0.50	2.15	22.45	34.77	12.32	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	-19.19	1.90	44.68	0.76	2.15	22.20	34.77	12.57	H
707.50	-19.35	1.91	44.94	0.62	2.15	22.15	34.77	12.62	H
714.50	-19.07	1.92	45.26	0.50	2.15	22.62	34.77	12.15	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	-19.41	1.90	44.81	0.74	2.15	22.09	34.77	12.68	H
707.50	-19.47	1.91	44.94	0.62	2.15	22.03	34.77	12.74	H
713.50	-19.13	1.92	45.22	0.50	2.15	22.52	34.77	12.25	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	-19.04	1.91	44.93	0.70	2.15	22.53	34.77	12.24	H
707.50	-19.20	1.91	44.94	0.62	2.15	22.30	34.77	12.47	H
711.00	-18.81	1.92	45.19	0.53	2.15	22.84	34.77	11.93	H

LTE Band 25- EIRP

Limits: ≤33dBm (2W)

LTE Band 25_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	-19.76	2.92	43.75	4.87	25.94	33.00	7.06	H
1882.50	-19.00	3.13	43.75	4.81	26.43	33.00	6.57	H
1914.30	-17.97	2.89	43.78	4.75	27.67	33.00	5.33	H

LTE Band 25_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	-20.02	2.87	43.75	4.87	25.73	33.00	7.27	H
1882.50	-19.18	3.13	43.75	4.81	26.25	33.00	6.75	H
1913.50	-18.16	2.88	43.78	4.76	27.50	33.00	5.50	H

LTE Band 25_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	-20.16	2.87	43.75	4.87	25.59	33.00	7.41	H
1882.50	-19.30	3.13	43.75	4.81	26.13	33.00	6.87	H
1912.50	-18.19	2.86	43.77	4.76	27.48	33.00	5.52	H

LTE Band 25_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	-20.06	2.88	43.74	4.86	25.66	33.00	7.34	H
1882.50	-19.28	3.13	43.75	4.81	26.15	33.00	6.85	H
1910.00	-18.32	2.88	43.77	4.76	27.33	33.00	5.67	H

LTE Band 25_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	-20.17	2.87	43.75	4.86	25.57	33.00	7.43	H
1882.50	-19.44	3.13	43.75	4.81	25.99	33.00	7.01	H
1907.50	-18.47	2.84	43.77	4.77	27.23	33.00	5.77	H

LTE Band 25_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	-20.00	2.86	43.75	4.85	25.74	33.00	7.26	H
1882.50	-19.52	3.13	43.75	4.81	25.91	33.00	7.09	H
1905.00	-18.49	2.87	43.77	4.77	27.18	33.00	5.82	H

LTE Band 25_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	-20.37	2.92	43.75	4.87	25.33	33.00	7.67	H
1882.50	-19.64	3.13	43.75	4.81	25.79	33.00	7.21	H
1914.30	-18.74	2.89	43.78	4.75	26.90	33.00	6.10	H

LTE Band 25_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	-20.45	2.87	43.75	4.87	25.30	33.00	7.70	H
1882.50	-20.26	3.13	43.75	4.81	25.17	33.00	7.83	H
1913.50	-19.02	2.88	43.78	4.76	26.64	33.00	6.36	H

LTE Band 25_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	-20.62	2.87	43.75	4.87	25.13	33.00	7.87	H
1882.50	-20.03	3.13	43.75	4.81	25.40	33.00	7.60	H
1912.50	-18.88	2.86	43.77	4.76	26.79	33.00	6.21	H

LTE Band 25_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	-20.68	2.88	43.74	4.86	25.04	33.00	7.96	H
1882.50	-20.00	3.13	43.75	4.81	25.43	33.00	7.57	H
1910.00	-19.60	2.88	43.77	4.76	26.05	33.00	6.95	H

LTE Band 25_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	-21.06	2.87	43.75	4.86	24.68	33.00	8.32	H
1882.50	-20.26	3.13	43.75	4.81	25.17	33.00	7.83	H
1907.50	-19.47	2.84	43.77	4.77	26.23	33.00	6.77	H

LTE Band 25_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	-21.34	2.86	43.75	4.85	24.40	33.00	8.60	H
1882.50	-19.95	3.13	43.75	4.81	25.48	33.00	7.52	H
1905.00	-19.25	2.87	43.77	4.77	26.42	33.00	6.58	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	-20.78	2.13	45.86	0.89	2.15	21.69	50.00	28.31	H
819.00	-21.14	2.19	45.84	1.05	2.15	21.41	50.00	28.59	H
823.30	-20.27	2.24	45.79	0.55	2.15	21.68	50.00	28.32	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	-21.11	2.14	45.87	0.93	2.15	21.40	50.00	28.60	H
819.00	-20.83	2.19	45.84	1.05	2.15	21.72	50.00	28.28	H
822.50	-20.13	2.23	45.81	0.33	2.15	21.63	50.00	28.37	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	-21.28	2.16	45.88	0.98	2.15	21.27	50.00	28.73	H
819.00	-21.34	2.19	45.84	1.05	2.15	21.21	50.00	28.79	H
821.50	-20.93	2.22	45.82	0.71	2.15	21.23	50.00	28.77	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	-21.21	2.19	45.84	1.05	2.15	21.34	50.00	28.66	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	-21.60	2.13	45.86	0.89	2.15	20.87	50.00	29.13	H
819.00	-21.58	2.19	45.84	1.05	2.15	20.97	50.00	29.03	H
823.30	-21.22	2.24	45.79	0.55	2.15	20.73	50.00	29.27	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	-21.65	2.14	45.87	0.93	2.15	20.86	50.00	29.14	H
819.00	-21.92	2.19	45.84	1.05	2.15	20.63	50.00	29.37	H
822.50	-21.19	2.23	45.81	0.33	2.15	20.57	50.00	29.43	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	-22.32	2.16	45.88	0.98	2.15	20.23	50.00	29.77	H
819.00	-22.54	2.19	45.84	1.05	2.15	20.01	50.00	29.99	H
821.50	-21.40	2.22	45.82	0.71	2.15	20.76	50.00	29.24	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	-21.86	2.19	45.84	1.05	2.15	20.69	50.00	29.31	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	-20.52	2.26	45.79	0.95	2.15	21.81	38.45	16.64	H
836.50	-19.44	2.26	45.66	0.82	2.15	22.63	38.45	15.82	H
848.30	-18.54	2.27	45.55	0.80	2.15	23.39	38.45	15.06	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	-20.77	2.26	45.79	0.94	2.15	21.55	38.45	16.90	H
836.50	-19.63	2.26	45.66	0.82	2.15	22.44	38.45	16.01	H
847.50	-18.98	2.27	45.56	0.81	2.15	22.97	38.45	15.48	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	-21.00	2.25	45.77	0.93	2.15	21.30	38.45	17.15	H
836.50	-19.69	2.26	45.66	0.82	2.15	22.38	38.45	16.07	H
846.50	-19.15	2.26	45.56	0.82	2.15	22.82	38.45	15.63	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	-20.50	2.13	45.74	0.90	2.15	21.86	38.45	16.59	H
836.50	-19.49	2.26	45.66	0.82	2.15	22.58	38.45	15.87	H
844.00	-19.50	2.26	45.59	0.82	2.15	22.50	38.45	15.95	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	-20.66	2.12	45.71	0.87	2.15	21.65	38.45	16.80	H
836.50	-19.54	2.26	45.66	0.82	2.15	22.53	38.45	15.92	H
841.50	-19.87	2.26	45.61	0.82	2.15	22.15	38.45	16.30	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	-21.16	2.26	45.79	0.95	2.15	21.17	38.45	17.28	H
836.50	-20.14	2.26	45.66	0.82	2.15	21.93	38.45	16.52	H
848.30	-19.66	2.27	45.55	0.80	2.15	22.27	38.45	16.18	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	-21.57	2.26	45.79	0.94	2.15	20.75	38.45	17.70	H
836.50	-20.61	2.26	45.66	0.82	2.15	21.46	38.45	16.99	H
847.50	-20.03	2.27	45.56	0.81	2.15	21.92	38.45	16.53	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	-21.28	2.25	45.77	0.93	2.15	21.02	38.45	17.43	H
836.50	-20.68	2.26	45.66	0.82	2.15	21.39	38.45	17.06	H
846.50	-19.79	2.26	45.56	0.82	2.15	22.18	38.45	16.27	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	-21.75	2.13	45.74	0.90	2.15	20.61	38.45	17.84	H
836.50	-20.17	2.26	45.66	0.82	2.15	21.90	38.45	16.55	H
844.00	-19.93	2.26	45.59	0.82	2.15	22.07	38.45	16.38	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	-20.98	2.12	45.71	0.87	2.15	21.33	38.45	17.12	H
836.50	-20.72	2.26	45.66	0.82	2.15	21.35	38.45	17.10	H
841.50	-20.65	2.26	45.61	0.82	2.15	21.37	38.45	17.08	H

LTE Band 41- EIRP

Limits: ≤33dBm (2W)

LTE Band 41_5MHz_QPSK

Frequency (MHz)	P_Mea (dBm)	P_cl (dB)	P_Ag (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2498.50	-24.30	3.58	45.59	6.10	23.81	33.00	9.19	H
2593.00	-21.63	3.69	44.93	6.27	25.88	33.00	7.12	H
2687.50	-21.69	3.73	44.98	6.44	26.00	33.00	7.00	H

LTE Band 41_10MHz_QPSK

Frequency (MHz)	P_Mea (dBm)	P_cl (dB)	P_Ag (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2501.00	-24.53	3.58	45.65	6.10	23.64	33.00	9.36	H
2593.00	-21.40	3.69	44.93	6.27	26.11	33.00	6.89	H
2685.00	-22.67	3.73	44.98	6.43	25.01	33.00	7.99	H

LTE Band 41_15MHz_QPSK

Frequency (MHz)	P_Mea (dBm)	P_cl (dB)	P_Ag (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2503.50	-24.50	3.58	45.65	6.11	23.68	33.00	9.32	H
2593.00	-22.41	3.69	44.93	6.27	25.10	33.00	7.90	H
2682.50	-22.32	3.73	44.98	6.43	25.36	33.00	7.64	H

LTE Band 41_20MHz_QPSK

Frequency (MHz)	P_Mea (dBm)	P_cl (dB)	P_Ag (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2506.00	-22.72	3.59	45.15	6.11	24.95	33.00	8.05	H
2593.00	-21.37	3.69	44.93	6.27	26.14	33.00	6.86	H
2680.00	-21.45	3.73	44.97	6.42	26.21	33.00	6.79	H

LTE Band 41_5MHz_16QAM

Frequency (MHz)	P_Mea (dBm)	P_cl (dB)	P_Ag (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2498.50	-24.25	3.58	45.59	6.10	23.86	33.00	9.14	H
2593.00	-21.07	3.69	44.93	6.27	26.44	33.00	6.56	H
2687.50	-20.78	3.73	44.98	6.44	26.91	33.00	6.09	H

LTE Band 41_10MHz_16QAM

Frequency (MHz)	P_Mea (dBm)	P_cl (dB)	P_Ag (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2501.00	-24.42	3.58	45.65	6.10	23.75	33.00	9.25	H
2593.00	-21.55	3.69	44.93	6.27	25.96	33.00	7.04	H
2685.00	-21.75	3.73	44.98	6.43	25.93	33.00	7.07	H

LTE Band 41_15MHz_16QAM

Frequency (MHz)	P_Mea (dBm)	P_cl (dB)	P_Ag (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2503.50	-24.48	3.58	45.65	6.11	23.70	33.00	9.30	H
2593.00	-22.36	3.69	44.93	6.27	25.15	33.00	7.85	H
2682.50	-22.36	3.73	44.98	6.43	25.32	33.00	7.68	H

LTE Band 41_20MHz_16QAM

Frequency (MHz)	P_Mea (dBm)	P_cl (dB)	P_Ag (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2506.00	-23.05	3.59	45.15	6.11	24.62	33.00	8.38	H
2593.00	-20.82	3.69	44.93	6.27	26.69	33.00	6.31	H
2680.00	-20.98	3.73	44.97	6.42	26.68	33.00	6.32	H

LTE Band 66- EIRP

Limits: ≤30dBm (1W)

LTE Band 66_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	-26.49	3.17	44.10	5.12	25.90	30.00	4.10	H
1745.00	-26.37	3.68	44.16	5.06	26.53	30.00	3.47	H
1779.30	-24.37	3.04	44.03	5.00	27.70	30.00	2.30	H

LTE Band 66_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	-26.72	3.40	44.10	5.12	25.90	30.00	4.10	H
1745.00	-26.42	3.68	44.16	5.06	26.48	30.00	3.52	H
1778.50	-24.70	3.04	44.03	5.00	27.37	30.00	2.63	H

LTE Band 66_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	-19.82	3.66	44.10	5.12	25.74	30.00	4.26	H
1745.00	-19.56	3.68	44.16	5.06	25.98	30.00	4.02	H
1777.50	-18.76	3.04	44.04	5.00	27.24	30.00	2.76	H

LTE Band 66_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	-19.75	3.56	44.10	5.11	25.90	30.00	4.10	H
1745.00	-19.33	3.68	44.16	5.06	26.21	30.00	3.79	H
1775.00	-18.74	3.05	44.05	5.01	27.26	30.00	2.74	H

LTE Band 66_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	-19.89	3.47	44.11	5.11	25.86	30.00	4.14	H
1745.00	-19.23	3.68	44.16	5.06	26.31	30.00	3.69	H
1772.50	-18.91	3.05	44.06	5.01	27.11	30.00	2.89	H

LTE Band 66_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	-20.12	3.37	44.11	5.10	25.72	30.00	4.28	H
1745.00	-19.01	3.68	44.16	5.06	26.53	30.00	3.47	H
1770.00	-18.63	3.05	44.07	5.01	27.41	30.00	2.59	H

LTE Band 66_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	-27.05	3.17	44.10	5.12	25.34	30.00	4.66	H
1745.00	-27.10	3.68	44.16	5.06	25.80	30.00	4.20	H
1779.30	-25.56	3.04	44.03	5.00	26.51	30.00	3.49	H

LTE Band 66_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	-27.27	3.40	44.10	5.12	25.35	30.00	4.65	H
1745.00	-27.21	3.68	44.16	5.06	25.69	30.00	4.31	H
1778.50	-25.69	3.04	44.03	5.00	26.38	30.00	3.62	H

LTE Band 66_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	-20.58	3.66	44.10	5.12	24.98	30.00	5.02	H
1745.00	-20.01	3.68	44.16	5.06	25.53	30.00	4.47	H
1777.50	-19.50	3.04	44.04	5.00	26.50	30.00	3.50	H

LTE Band 66_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	-20.46	3.56	44.10	5.11	25.19	30.00	4.81	H
1745.00	-20.06	3.68	44.16	5.06	25.48	30.00	4.52	H
1775.00	-19.63	3.05	44.05	5.01	26.37	30.00	3.63	H

LTE Band 66_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	-20.59	3.47	44.11	5.11	25.16	30.00	4.84	H
1745.00	-20.12	3.68	44.16	5.06	25.42	30.00	4.58	H
1772.50	-19.85	3.05	44.06	5.01	26.17	30.00	3.83	H

LTE Band 66_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	-20.99	3.37	44.11	5.10	24.85	30.00	5.15	H
1745.00	-19.59	3.68	44.16	5.06	25.95	30.00	4.05	H
1770.00	-19.89	3.05	44.07	5.01	26.15	30.00	3.85	H

LTE Band 71- ERP

Limits: ≤34.77 dBm (3W)

LTE Band 71_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
665.50	-22.10	1.87	44.73	0.78	2.15	19.39	34.77	15.38	V
680.50	-21.65	1.88	44.72	0.78	2.15	19.82	34.77	14.95	V
695.50	-21.48	1.89	44.67	0.77	2.15	19.92	34.77	14.85	V

LTE Band 71_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
668.00	-22.09	1.87	44.75	0.78	2.15	19.43	34.77	15.34	V
680.50	-21.44	1.88	44.72	0.78	2.15	20.03	34.77	14.74	V
693.00	-21.47	1.89	44.67	0.77	2.15	19.93	34.77	14.84	V

LTE Band 71_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
670.50	-21.70	1.88	44.75	0.78	2.15	19.80	34.77	14.97	V
680.50	-21.57	1.88	44.72	0.78	2.15	19.90	34.77	14.87	V
690.50	-21.22	1.89	44.73	0.77	2.15	20.25	34.77	14.52	V

LTE Band 71_20MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
673.00	-22.04	1.88	44.71	0.78	2.15	19.42	34.77	15.35	V
680.50	-21.33	1.88	44.72	0.78	2.15	20.14	34.77	14.63	V
688.00	-21.27	1.89	44.72	0.77	2.15	20.19	34.77	14.58	V

LTE Band 71_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
665.50	-22.87	1.87	44.73	0.78	2.15	18.62	34.77	16.15	V
680.50	-22.53	1.88	44.72	0.78	2.15	18.94	34.77	15.83	V
695.50	-22.42	1.89	44.67	0.77	2.15	18.98	34.77	15.79	V

LTE Band 71_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
668.00	-22.84	1.87	44.75	0.78	2.15	18.68	34.77	16.09	V
680.50	-22.55	1.88	44.72	0.78	2.15	18.92	34.77	15.85	V
693.00	-22.14	1.89	44.67	0.77	2.15	19.26	34.77	15.51	V

LTE Band 71_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
670.50	-22.54	1.88	44.75	0.78	2.15	18.96	34.77	15.81	V
680.50	-22.52	1.88	44.72	0.78	2.15	18.95	34.77	15.82	V
690.50	-21.99	1.89	44.73	0.77	2.15	19.48	34.77	15.29	V

LTE Band 71_20MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
673.00	-22.88	1.88	44.71	0.78	2.15	18.58	34.77	16.19	V
680.50	-21.90	1.88	44.72	0.78	2.15	19.57	34.77	15.20	V
688.00	-22.06	1.89	44.72	0.77	2.15	19.40	34.77	15.37	V

Frequency: 680.50MHz

ERP(dBm) = P_{Mea}(-21.90dBm) - G_a (-0.78dBi) - P_{Ag} (-44.72dB) - P_{cl} (1.88dB) -2.15= 19.57dBm

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

A.2   EMISSION LIMIT
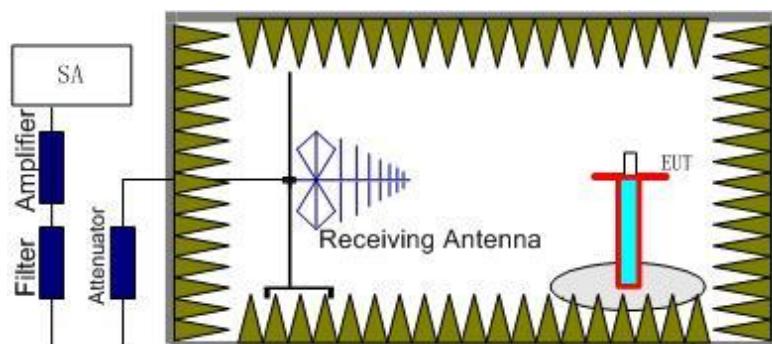
A.2.1 Measurement Method

The measurements procedures in TIA-603E-2016 are used. This measurement is carried out in fully-anechoic chamber FAC-3.
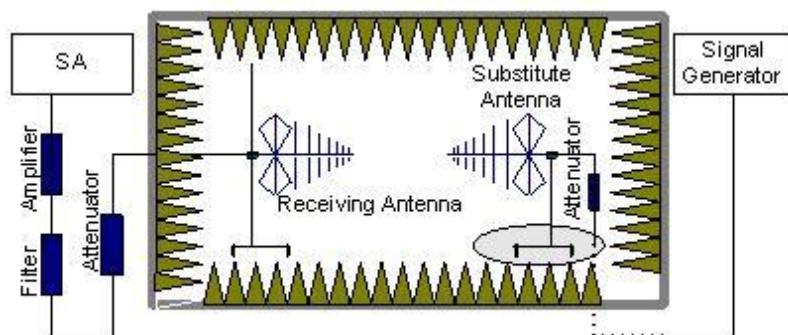
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier. The resolution bandwidth is set 1MHz. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the LTE Bands 12,25,26,41,66,71.

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 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 $116Log_{10}(f/6.1)$ 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 + $10Log_{10}(P)$ 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 12,25,26,41,66,71. 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 12,25,26,41,66,71 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 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	-57.84	3.24	4.98	2.15	-58.25	-13.00	45.25	H
2099.00	-53.93	4.19	4.90	2.15	-55.37	-13.00	42.37	H
2788.00	-51.18	4.90	6.62	2.15	-51.61	-13.00	38.61	H
3499.02	-50.98	5.52	8.20	2.15	-50.45	-13.00	37.45	V
4211.02	-54.93	6.23	9.11	2.15	-54.20	-13.00	41.20	V
4910.01	-55.89	6.73	9.81	2.15	-54.96	-13.00	41.96	V

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	-54.79	3.25	5.06	2.15	-55.13	-13.00	42.13	H
2123.00	-52.75	4.21	4.97	2.15	-54.14	-13.00	41.14	H
2821.00	-51.21	4.94	6.68	2.15	-51.62	-13.00	38.62	H
3538.02	-49.74	5.70	8.25	2.15	-49.34	-13.00	36.34	V
4258.02	-55.88	6.23	9.16	2.15	-55.10	-13.00	42.10	V
4954.01	-54.96	6.68	9.85	2.15	-53.94	-13.00	40.94	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	-51.18	3.28	5.14	2.15	-51.47	-13.00	38.47	V
2146.00	-48.31	4.24	5.04	2.15	-49.66	-13.00	36.66	V
2862.00	-49.31	4.96	6.75	2.15	-49.67	-13.00	36.67	H
3577.02	-48.83	6.10	8.31	2.15	-48.77	-13.00	35.77	V
4278.02	-55.49	6.21	9.18	2.15	-54.67	-13.00	41.67	H
5006.01	-55.78	6.59	9.91	2.15	-54.61	-13.00	41.61	V

LTE Band 25, 1.4MHz, QPSK, Channel 26047

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
7843.01	-53.99	8.35	12.47	-49.87	-13.00	36.87	H
9146.01	-53.83	8.93	13.19	-49.57	-13.00	36.57	H
11649.01	-50.50	9.71	13.07	-47.14	-13.00	34.14	H
13625.01	-47.74	10.78	14.28	-44.24	-13.00	31.24	V
14916.00	-45.24	11.19	14.07	-42.36	-13.00	29.36	H
17274.00	-41.25	12.37	14.40	-39.22	-13.00	26.22	V

LTE Band 25, 1.4MHz, QPSK, Channel 26365

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
7548.01	-54.90	8.19	12.24	-50.85	-13.00	37.85	H
9413.01	-54.60	9.10	13.35	-50.35	-13.00	37.35	V
11253.01	-51.21	9.72	13.15	-47.78	-13.00	34.78	V
13181.01	-47.46	10.58	13.75	-44.29	-13.00	31.29	V
15079.00	-45.45	11.32	13.95	-42.82	-13.00	29.82	H
16967.00	-42.01	12.25	13.79	-40.47	-13.00	27.47	V

LTE Band 25, 1.4MHz, QPSK, Channel 26683

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
7628.01	-54.93	8.10	12.30	-50.73	-13.00	37.73	V
9532.01	-53.84	9.43	13.37	-49.90	-13.00	36.90	H
11507.01	-50.71	9.81	13.10	-47.42	-13.00	34.42	H
13432.01	-48.17	10.59	14.10	-44.66	-13.00	31.66	V
15339.00	-45.31	11.32	13.80	-42.83	-13.00	29.83	V
17219.00	-42.74	12.35	14.28	-40.81	-13.00	27.81	V

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
1630.01	-36.84	3.55	5.27	2.15	-37.27	-13.00	24.27	V
2444.00	-24.96	4.57	5.93	2.15	-25.75	-13.00	12.75	H
3259.02	-40.39	5.28	7.62	2.15	-40.20	-13.00	27.20	V
4075.02	-34.70	6.04	8.98	2.15	-33.91	-13.00	20.91	V
5705.01	-31.38	7.29	10.56	2.15	-30.26	-13.00	17.26	V
7334.01	-36.49	8.11	12.00	2.15	-34.75	-13.00	21.75	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	-37.70	3.56	5.25	2.15	-38.16	-13.00	25.16	V
2457.00	-26.57	4.58	5.97	2.15	-27.33	-13.00	14.33	H
3277.02	-40.48	5.28	7.66	2.15	-40.25	-13.00	27.25	V
4097.02	-34.41	6.04	9.00	2.15	-33.60	-13.00	20.60	V
4917.01	-44.90	6.73	9.82	2.15	-43.96	-13.00	30.96	V
5735.01	-31.24	7.29	10.55	2.15	-30.13	-13.00	17.13	V

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
1647.01	-37.42	3.56	5.24	2.15	-37.89	-13.00	24.89	V
2470.00	-25.85	4.59	6.01	2.15	-26.58	-13.00	13.58	H
3294.02	-41.29	5.29	7.71	2.15	-41.02	-13.00	28.02	V
4118.02	-34.15	6.04	9.02	2.15	-33.32	-13.00	20.32	V
5765.01	-32.34	7.24	10.55	2.15	-31.18	-13.00	18.18	V
7412.01	-38.75	8.15	12.09	2.15	-36.96	-13.00	23.96	V

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
1650.01	-37.39	3.57	5.23	2.15	-37.88	-13.00	24.88	V
2475.00	-26.26	4.60	6.03	2.15	-26.98	-13.00	13.98	H
3299.02	-40.89	5.29	7.72	2.15	-40.61	-13.00	27.61	V
4125.02	-33.52	6.04	9.03	2.15	-32.68	-13.00	19.68	V
4951.01	-44.81	6.69	9.85	2.15	-43.80	-13.00	30.80	V
5775.01	-31.53	7.23	10.54	2.15	-30.37	-13.00	17.37	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	-36.39	3.58	5.19	2.15	-36.93	-13.00	23.93	V
2510.00	-28.04	4.63	6.12	2.15	-28.70	-13.00	15.70	H
3346.02	-39.13	5.31	7.83	2.15	-38.76	-13.00	25.76	V
4184.02	-31.06	6.17	9.08	2.15	-30.30	-13.00	17.30	V
5022.01	-46.27	6.57	9.93	2.15	-45.06	-13.00	32.06	V
5857.01	-31.52	7.26	10.53	2.15	-30.40	-13.00	17.40	V

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	-54.20	3.60	5.15	2.15	-54.80	-13.00	41.80	V
2545.00	-50.26	4.66	6.18	2.15	-50.89	-13.00	37.89	H
3390.02	-55.82	5.35	7.94	2.15	-55.38	-13.00	42.38	V
4254.02	-55.70	6.24	9.15	2.15	-54.94	-13.00	41.94	H
5099.01	-55.84	6.77	10.04	2.15	-54.72	-13.00	41.72	H
5948.01	-54.03	7.47	10.51	2.15	-53.14	-13.00	40.14	H

LTE Band 41, 5MHz, QPSK, Channel 39675

Frequency (MHz)	P$_{Mea}$ (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5001.02	-50.99	6.60	9.90	-47.69	-25.00	22.69	H
7499.01	-56.43	8.39	12.20	-52.62	-25.00	27.62	H
9998.01	-53.88	9.18	12.90	-50.16	-25.00	25.16	H
12493.01	-50.57	10.19	13.20	-47.56	-25.00	22.56	V
14994.00	-45.41	11.21	14.00	-42.62	-25.00	17.62	V
17486.00	-44.53	12.69	14.87	-42.35	-25.00	17.35	H

LTE Band 41, 5MHz, QPSK, Channel 40620

Frequency (MHz)	P$_{Mea}$ (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5190.02	-53.55	6.94	10.17	-50.32	-25.00	25.32	V
7761.01	-55.53	8.34	12.41	-51.46	-25.00	26.46	H
10363.01	-51.18	9.74	13.05	-47.87	-25.00	22.87	H
12976.01	-50.77	10.48	13.49	-47.76	-25.00	22.76	V
15529.00	-45.79	11.52	13.70	-43.61	-25.00	18.61	H
16832.00	-41.88	12.08	13.73	-40.23	-25.00	15.23	H

LTE Band 41, 5MHz, QPSK, Channel 41565

Frequency (MHz)	P$_{Mea}$ (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5366.02	-57.35	6.90	10.41	-53.84	-25.00	28.84	H
8047.01	-55.51	8.32	12.64	-51.19	-25.00	26.19	V
10726.01	-52.85	9.37	13.15	-49.07	-25.00	24.07	H
13441.01	-47.75	10.60	14.12	-44.23	-25.00	19.23	V
16128.00	-46.34	11.82	13.67	-44.49	-25.00	19.49	H
17483.00	-43.13	12.69	14.86	-40.96	-25.00	15.96	H

LTE Band 66, 1.4MHz QPSK, Channel 131979

Frequency (MHz)	P$_{Mea}$ (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3422.02	-55.66	5.38	8.01	-53.03	-13.00	40.03	V
5131.02	-57.18	6.85	10.08	-53.95	-13.00	40.95	V
6838.01	-55.84	7.84	11.41	-52.27	-13.00	39.27	H
8551.01	-55.79	8.58	13.01	-51.36	-13.00	38.36	H
10262.01	-53.37	9.51	13.00	-49.88	-13.00	36.88	V
11977.01	-51.15	10.16	13.00	-48.31	-13.00	35.31	H

LTE Band 66, 1.4MHz, QPSK, Channel 132322

Frequency (MHz)	P$_{Mea}$ (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3490.02	-57.43	5.50	8.18	-54.75	-13.00	41.75	V
5234.02	-57.64	7.00	10.23	-54.41	-13.00	41.41	H
6984.01	-55.09	8.17	11.58	-51.68	-13.00	38.68	V
8726.01	-54.04	8.44	13.05	-49.43	-13.00	36.43	H
10474.01	-53.03	9.69	13.09	-49.63	-13.00	36.63	V
12219.01	-51.03	10.05	13.09	-47.99	-13.00	34.99	V

LTE Band 66, 1.4MHz, QPSK, Channel 132665

Frequency (MHz)	P$_{Mea}$ (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3555.02	-58.65	5.87	8.28	-56.24	-13.00	43.24	V
5342.02	-57.64	6.95	10.38	-54.21	-13.00	41.21	H
7113.01	-56.41	8.16	11.74	-52.83	-13.00	39.83	V
8892.01	-55.18	8.83	13.08	-50.93	-13.00	37.93	H
10671.01	-52.24	9.30	13.13	-48.41	-13.00	35.41	H
12457.01	-50.42	10.29	13.18	-47.53	-13.00	34.53	V

LTE Band 71, 5MHz, QPSK, Channel 133147

Frequency (MHz)	P_Mea (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1331.01	-50.54	3.15	4.62	2.15	-51.22	-13.00	38.22	H
1997.01	-53.01	4.04	4.61	2.15	-54.59	-13.00	41.59	H
2669.00	-52.06	4.76	6.40	2.15	-52.57	-13.00	39.57	H
3349.02	-54.77	5.32	7.84	2.15	-54.40	-13.00	41.40	H
4009.02	-55.62	6.06	8.91	2.15	-54.92	-13.00	41.92	H
4660.02	-55.05	6.47	9.56	2.15	-54.11	-13.00	41.11	V

LTE Band 71, 5MHz, QPSK, Channel 133297

Frequency (MHz)	P_Mea (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1362.01	-54.35	3.19	4.78	2.15	-54.91	-13.00	41.91	H
2042.00	-53.90	4.14	4.73	2.15	-55.46	-13.00	42.46	H
2725.00	-52.67	4.81	6.51	2.15	-53.12	-13.00	40.12	H
3391.02	-56.57	5.35	7.94	2.15	-56.13	-13.00	43.13	V
4084.02	-55.64	6.04	8.98	2.15	-54.85	-13.00	41.85	H
4752.01	-55.71	6.58	9.65	2.15	-54.79	-13.00	41.79	H

LTE Band 71, 5MHz, QPSK, Channel 133447

Frequency (MHz)	P_Mea (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1393.01	-55.74	3.23	4.94	2.15	-56.18	-13.00	43.18	V
2087.00	-54.18	4.18	4.86	2.15	-55.65	-13.00	42.65	H
2811.00	-52.61	4.93	6.66	2.15	-53.03	-13.00	40.03	V
3450.02	-56.12	5.43	8.08	2.15	-55.62	-13.00	42.62	H
4146.02	-55.53	6.08	9.05	2.15	-54.71	-13.00	41.71	H
4872.01	-55.36	6.72	9.77	2.15	-54.46	-13.00	41.46	H

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 -30℃.
3. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on middle channel for LTE Bands 12,25,26,41,66,71, 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 -30℃ 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 center 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 -30℃ 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 3.6VDC and 4.2VDC, 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 12, 10MHz bandwidth QPSK (worst case of all bandwidths)
Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20					
50				-0.35	0.0005
40				-0.62	0.0009
30				-1.56	0.0022
10	3.8	699.497	715.503	0.21	0.0003
0				0.48	0.0007
-10				-1.96	0.0028
-20				0.25	0.0004
-30				0.23	0.0003

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	699.497	715.503	-0.78	0.0011
4.4				0.27	0.0004

LTE Band 25, 20MHz bandwidth QPSK (worst case of all bandwidths)
Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20					
50				0.18	0.0001
40				0.00	0.0000
30				0.81	0.0004
10	3.8	1850.881	1914.119	0.23	0.0001
0				-9.20	0.0049
-10				-0.65	0.0003
-20				-11.10	0.0059
-30				2.37	0.0013

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	1850.881	1914.119	-11.02	0.0059
4.4				0.77	0.0004

LTE Band 26(814MHz~824MHz), 10MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F$_L$(MHz)	F$_H$(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	814.433	823.567		
50				0.32	0.0004
40				0.64	0.0008
30				0.55	0.0007
10				0.28	0.0003
0				0.80	0.0010
-10				0.41	0.0005
-20				1.98	0.0024
-30				1.07	0.0013

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F$_L$(MHz)	F$_H$(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	814.433	823.567	0.80	0.0010
4.4				0.98	0.0012

LTE Band 26(824MHz~849MHz), 15MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F$_L$(MHz)	F$_H$(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	824.593	848.391		
50				-1.29	0.0015
40				-0.53	0.0006
30				0.44	0.0005
10				-0.34	0.0004
0				-0.67	0.0008
-10				-0.13	0.0002
-20				-0.96	0.0011
-30				-0.26	0.0003

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F$_L$(MHz)	F$_H$(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	824.593	848.391	-0.56	0.0007
4.4				-0.87	0.0010

LTE Band 41, 20MHz bandwidth QPSK (worst case of all bandwidths)
Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F$_L$(MHz)	F$_H$(MHz)	Offset(Hz)	Frequency error(ppm)
20					
50				-3.13	0.0012
40				-2.78	0.0011
30				-2.03	0.0008
10	3.8	2496.288	2689.647	-7.52	0.0029
0				-3.72	0.0014
-10				-0.04	0.0000
-20				-4.94	0.0019
-30				-4.15	0.0016

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F$_L$(MHz)	F$_H$(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	2496.288	2689.647	-3.13	0.0012
4.4				-2.03	0.0008

LTE Band 66, 20MHz bandwidth QPSK (worst case of all bandwidths)
Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F$_L$(MHz)	F$_H$(MHz)	Offset(Hz)	Frequency error(ppm)
20					
50				1.07	0.0006
40				0.37	0.0002
30				0.80	0.0005
10	3.8	1710.865	1779.135	-2.23	0.0013
0				-0.64	0.0004
-10				-0.64	0.0004
-20				1.20	0.0007
-30				-1.29	0.0007

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F$_L$(MHz)	F$_H$(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	1710.865	1779.135	1.07	0.0006
4.4				0.80	0.0005

LTE Band 71, 20MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20					
50				-0.29	0.0004
40				-0.36	0.0005
30				0.23	0.0003
10	3.8	664.010	696.990	0.77	0.0011
0				-0.37	0.0005
-10				-1.27	0.0019
-20				-1.23	0.0018
-30				0.41	0.0006

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	664.010	696.990	0.26	0.0004
4.4				-0.02	0.0000

A.4   OCCUPIED BANDWIDTH

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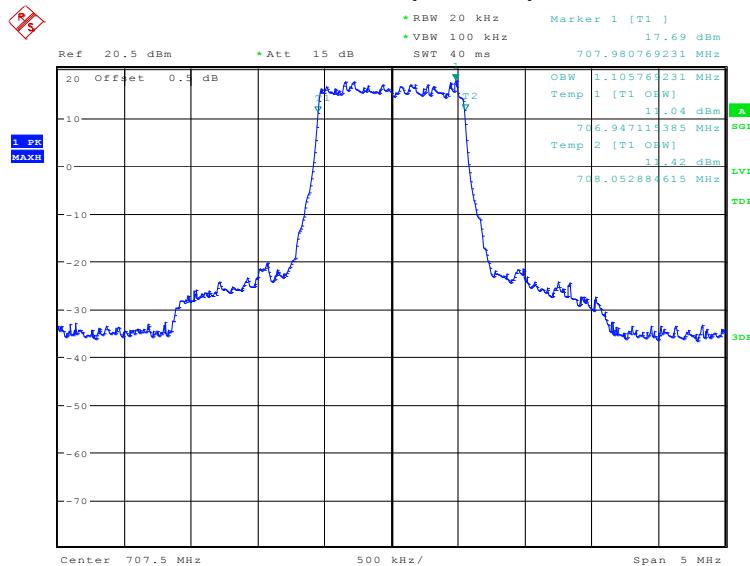
Occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of the US Cellular/PCS frequency bands. The table below lists the measured 99% BW. Spectrum analyzer plots are included on the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

The measurement method is from ANSI C63.26:
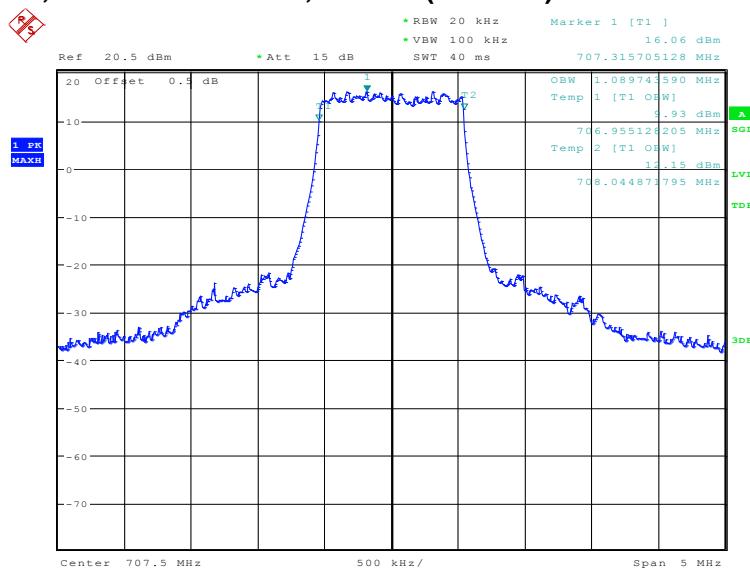
a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts.

b) The nominal IF filter 3 dB bandwidth (RBW) shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set ≥ 3 × RBW.

c) Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation.

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

LTE band 12, 1.4MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
	QPSK	16QAM
707.5	1105.77	1089.74

LTE band 12, 1.4MHz Bandwidth, QPSK (99% BW)
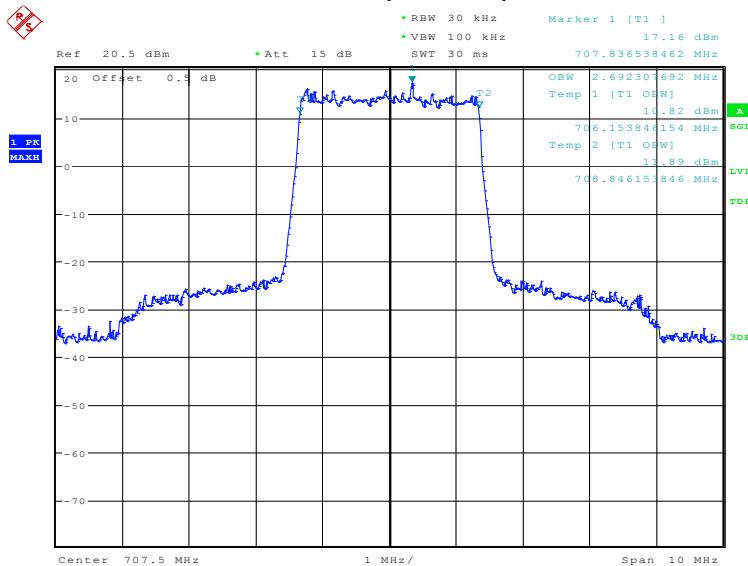
Date: 23.DEC.2019 22:31:23

LTE band 12, 1.4MHz Bandwidth, 16QAM (99% BW)
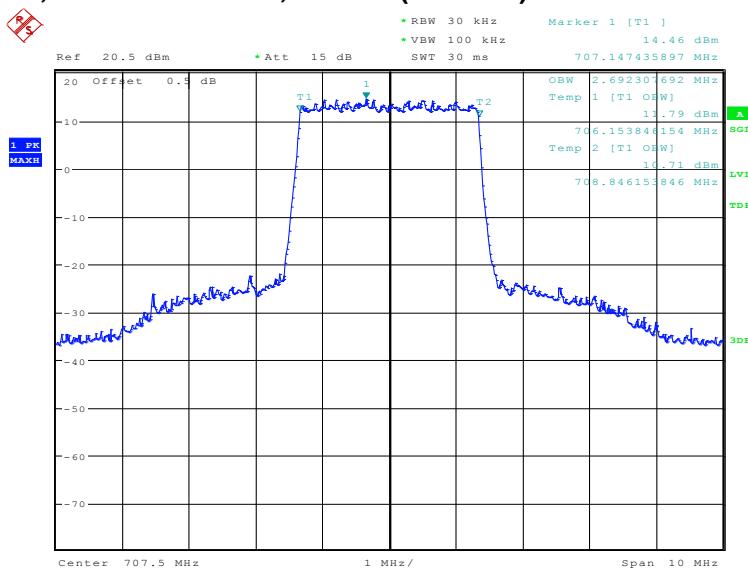
Date: 23.DEC.2019 22:32:48

**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)
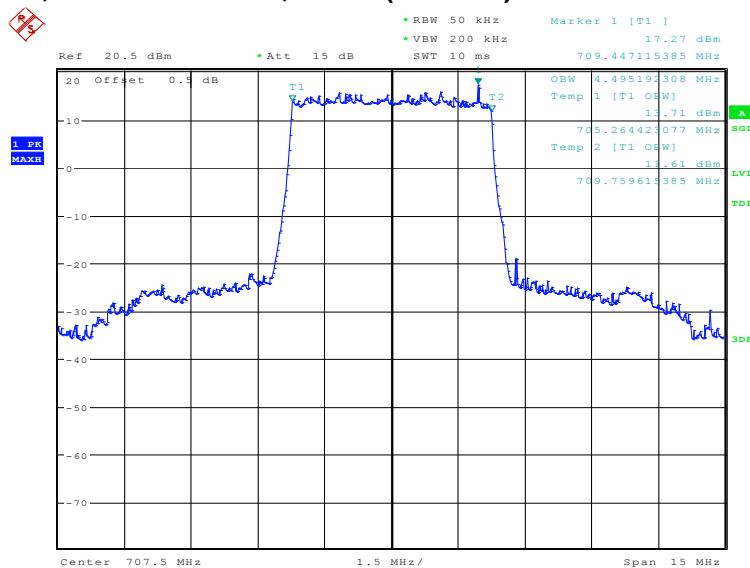
Date: 23.DEC.2019 22:34:14

LTE band 12, 3MHz Bandwidth, 16QAM (99% BW)
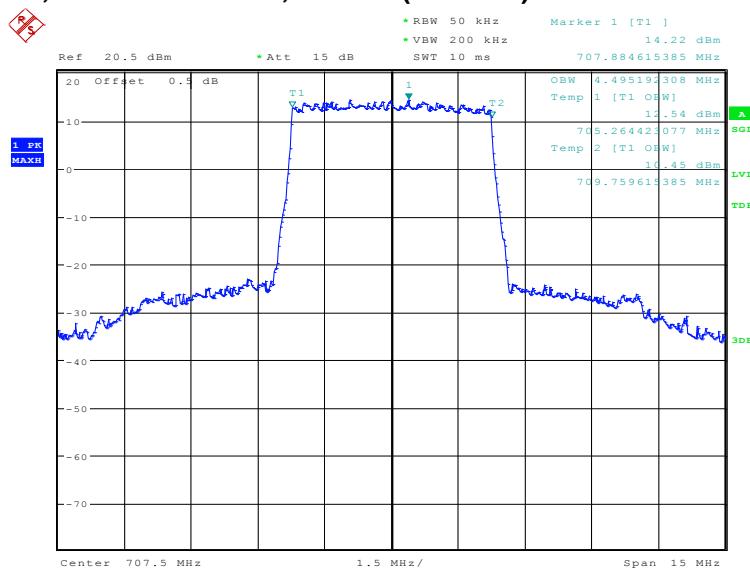
Date: 23.DEC.2019 22:35:39

LTE band 12, 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
	QPSK	16QAM
707.5	4495.19	4495.19

LTE band 12, 5MHz Bandwidth, QPSK (99% BW)
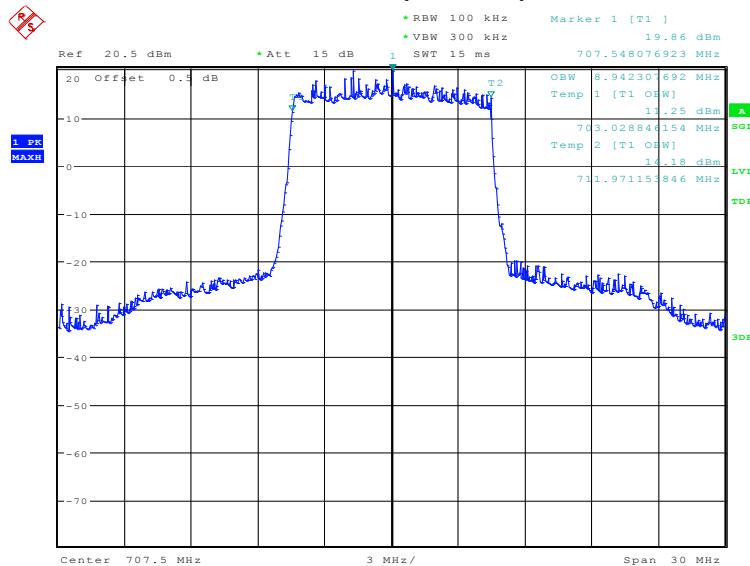
Date: 23.DEC.2019 22:37:05

LTE band 12, 5MHz Bandwidth, 16QAM (99% BW)
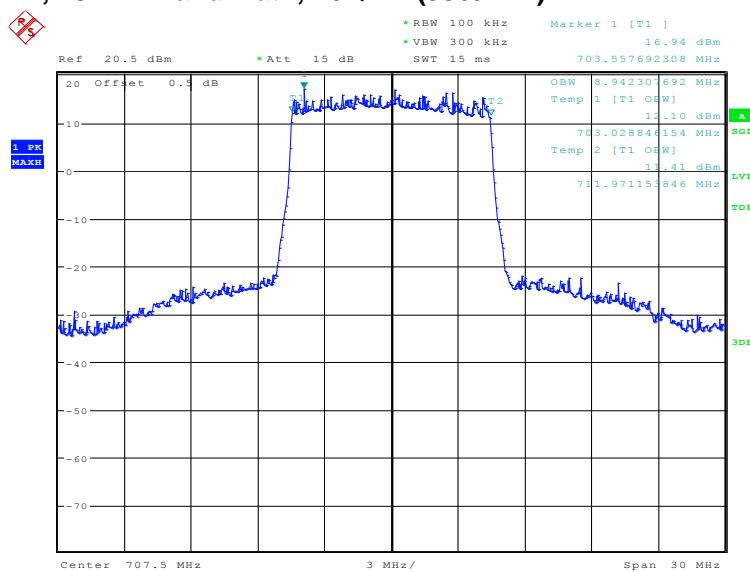
Date: 23.DEC.2019 22:38:30

LTE band 12, 10MHz (99%)

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

LTE band 12, 10MHz Bandwidth, QPSK (99% BW)
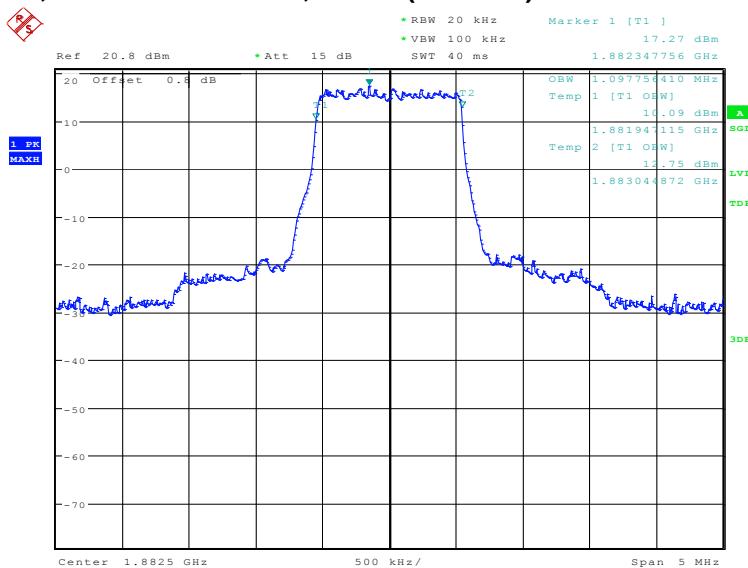
Date: 23.DEC.2019 22:39:56

LTE band 12, 10MHz Bandwidth, 16QAM (99% BW)
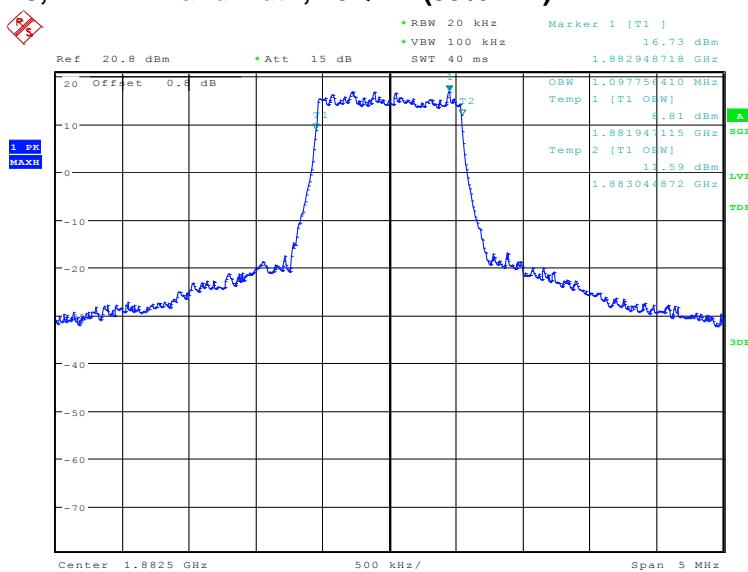
Date: 23.DEC.2019 22:41:20

LTE band 25, 1.4MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
1882.5	QPSK	16QAM
	1097.76	1097.76

LTE band 25, 1.4MHz Bandwidth, QPSK (99% BW)
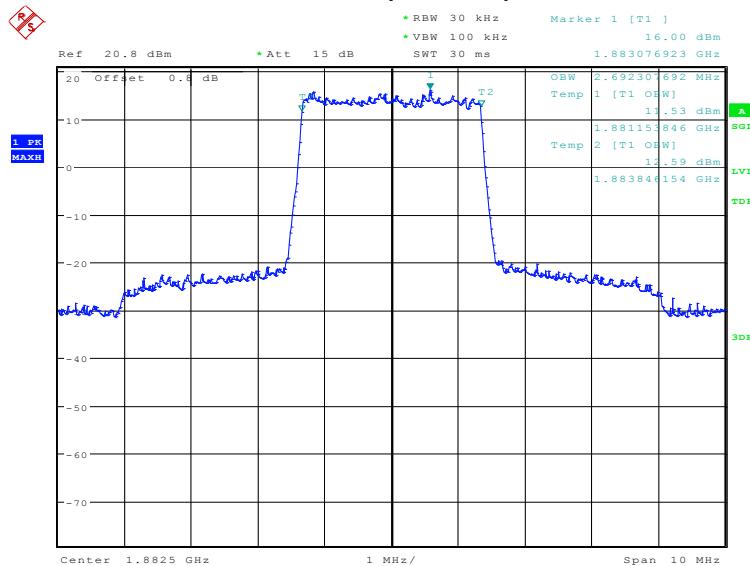
Date: 23.DEC.2019 22:42:53

LTE band 25, 1.4MHz Bandwidth, 16QAM (99% BW)
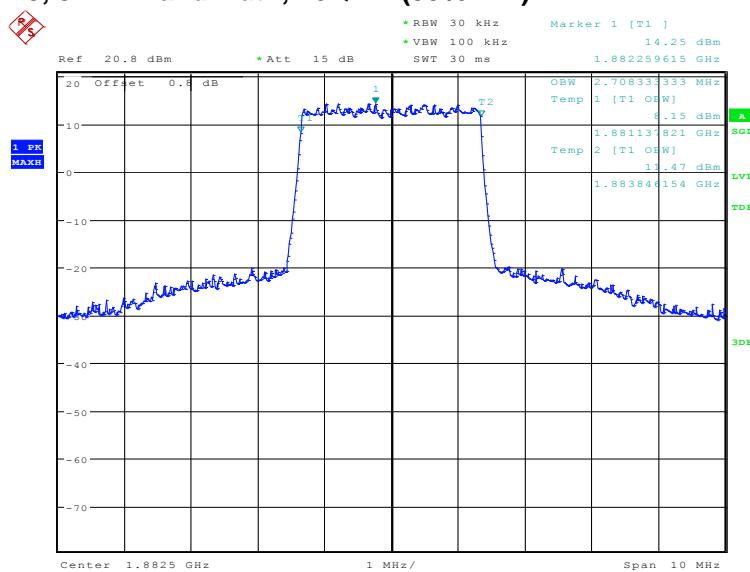
Date: 23.DEC.2019 22:44:17

LTE band 25, 3MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
	QPSK	16QAM
1882.5	2692.31	2708.33

LTE band 25, 3MHz Bandwidth, QPSK (99% BW)
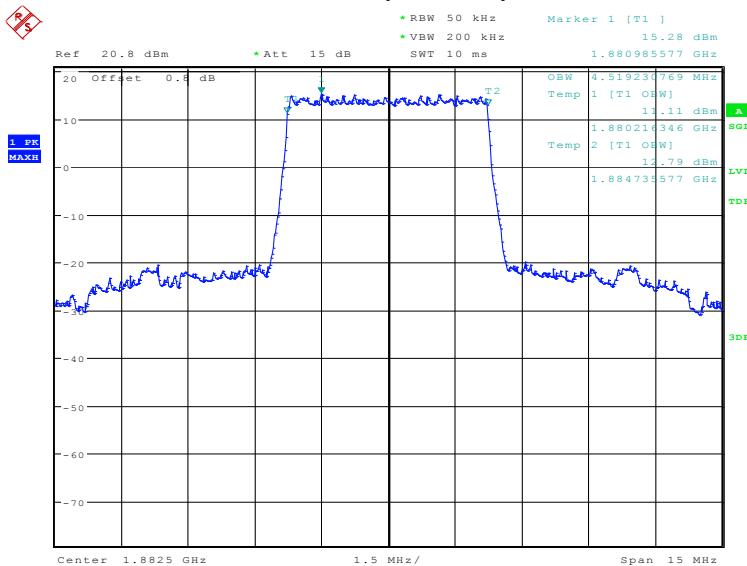
Date: 23.DEC.2019 22:45:43

LTE band 25, 3MHz Bandwidth, 16QAM (99% BW)
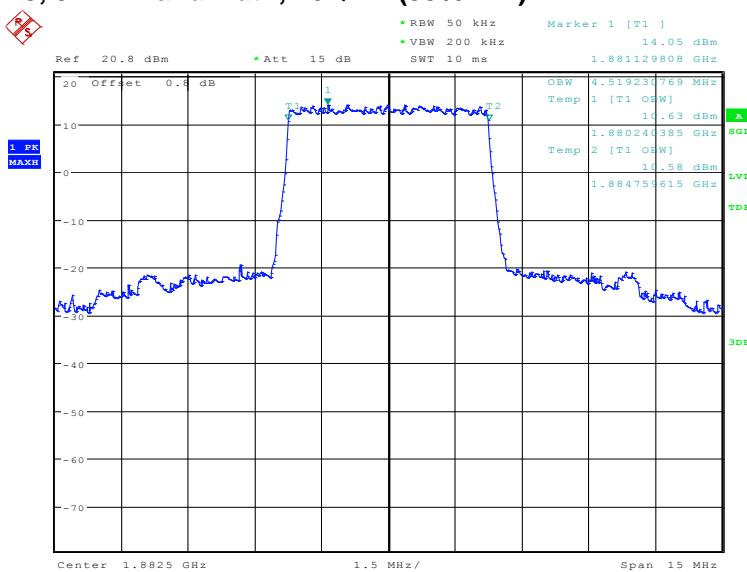
Date: 23.DEC.2019 22:47:08

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LTE band 25, 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
	QPSK	16QAM
1882.5	4519.23	4519.23

LTE band 25, 5MHz Bandwidth, QPSK (99% BW)
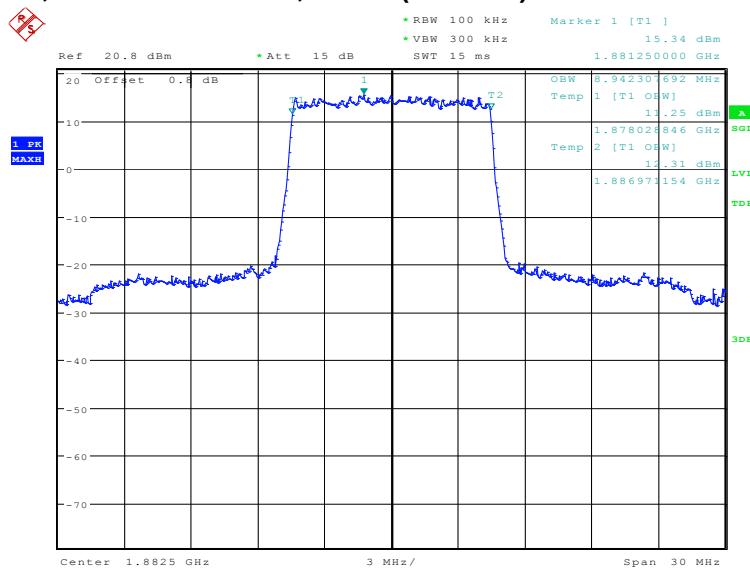
Date: 23.DEC.2019 22:48:34

LTE band 25, 5MHz Bandwidth, 16QAM (99% BW)
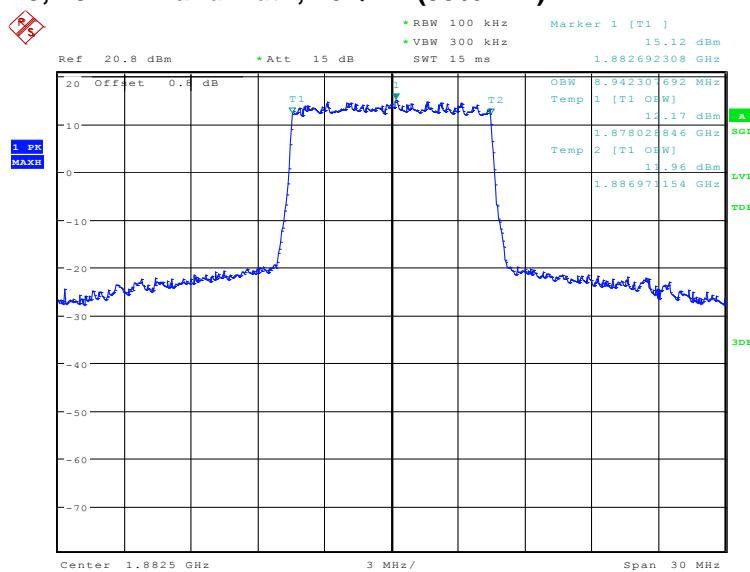
Date: 23.DEC.2019 22:49:59

LTE band 25, 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
1882.5	QPSK	16QAM
	8942.31	8942.31

LTE band 25, 10MHz Bandwidth, QPSK (99% BW)
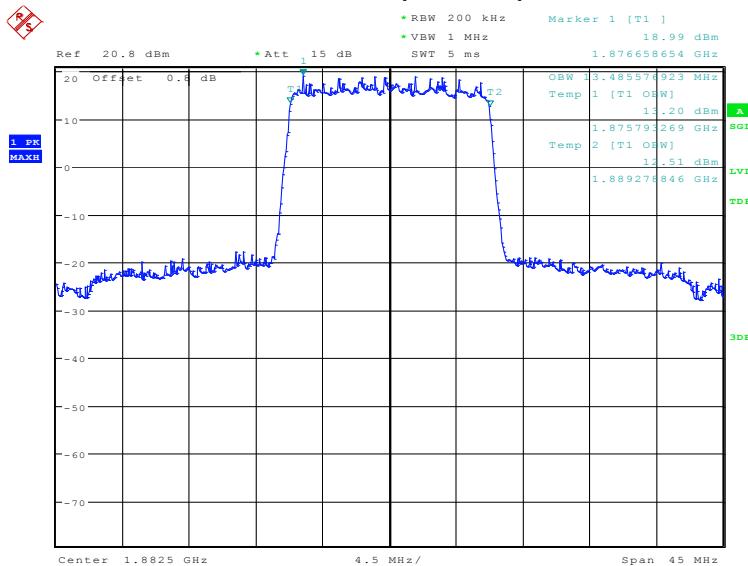
Date: 23.DEC.2019 22:51:25

LTE band 25, 10MHz Bandwidth, 16QAM (99% BW)
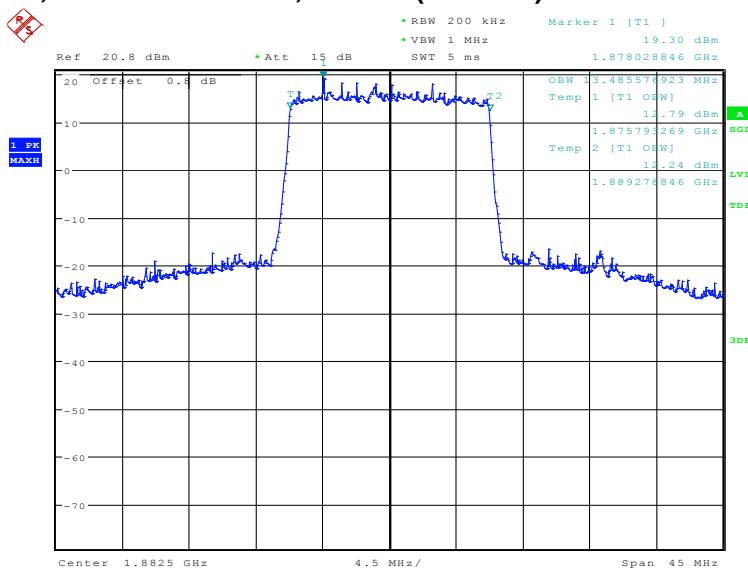
Date: 23.DEC.2019 22:52:50

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LTE band 25, 15MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
	QPSK	16QAM
1882.5	13485.58	13485.58

LTE band 25, 15MHz Bandwidth, QPSK (99% BW)
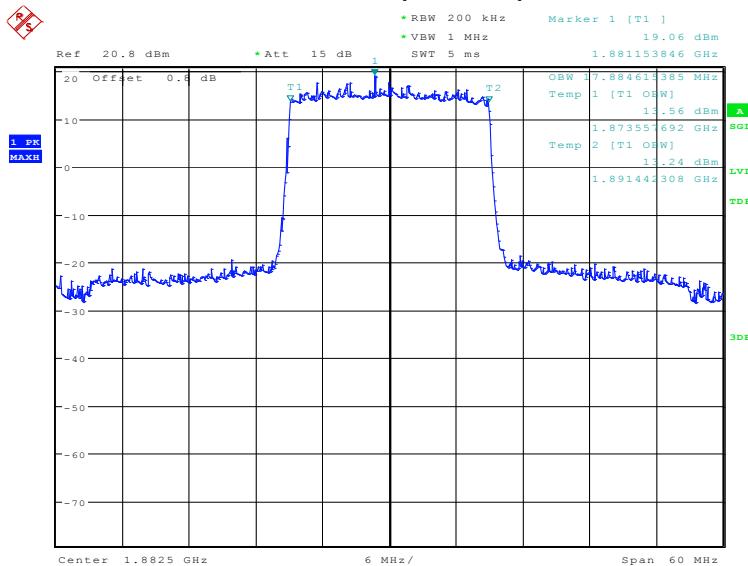
Date: 23.DEC.2019 22:54:16

LTE band 25, 15MHz Bandwidth, 16QAM (99% BW)
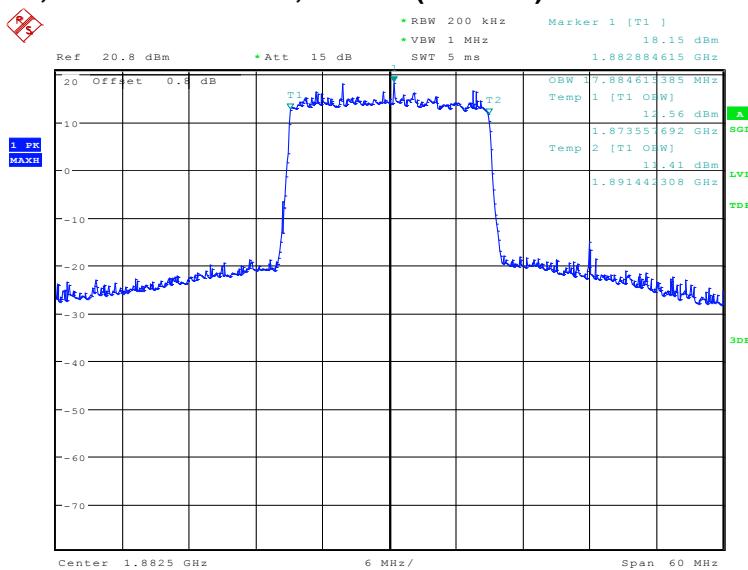
Date: 23.DEC.2019 22:55:41

LTE band 25, 20MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
1882.5	QPSK	16QAM
	17884.62	17884.62

LTE band 25, 20MHz Bandwidth, QPSK (99% BW)
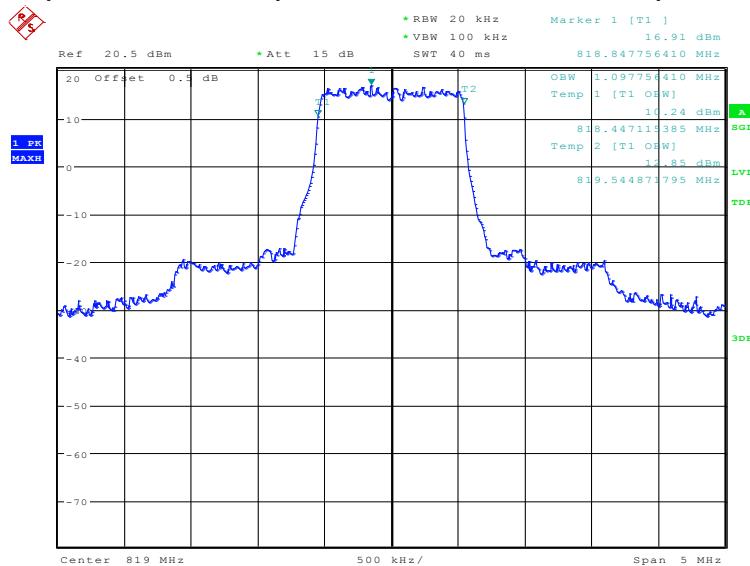
Date: 23.DEC.2019 22:57:08

LTE band 25, 20MHz Bandwidth, 16QAM (99% BW)
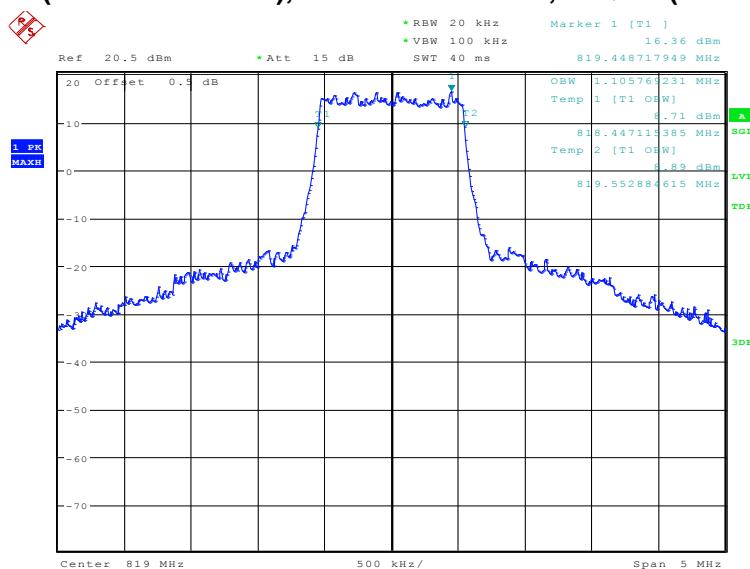
Date: 23.DEC.2019 22:58:32

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)
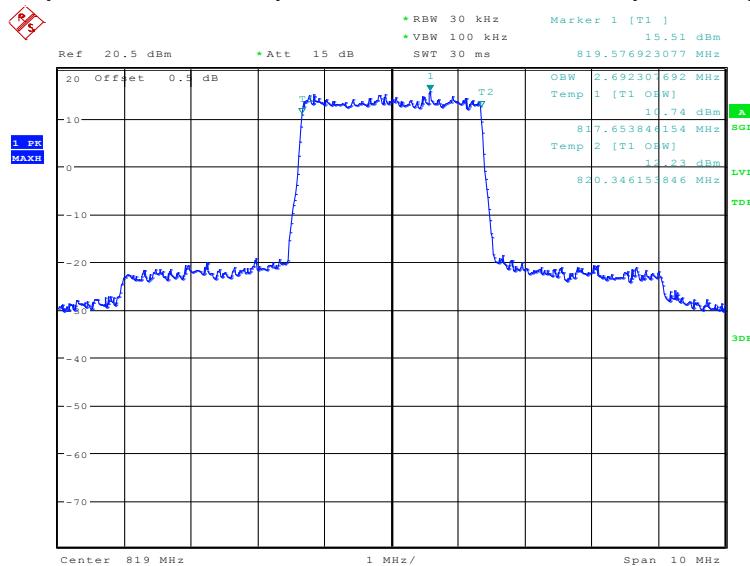
Date: 23.DEC.2019 23:15:52

LTE band 26(814MHz~824MHz), 1.4MHz Bandwidth, 16QAM (99% BW)
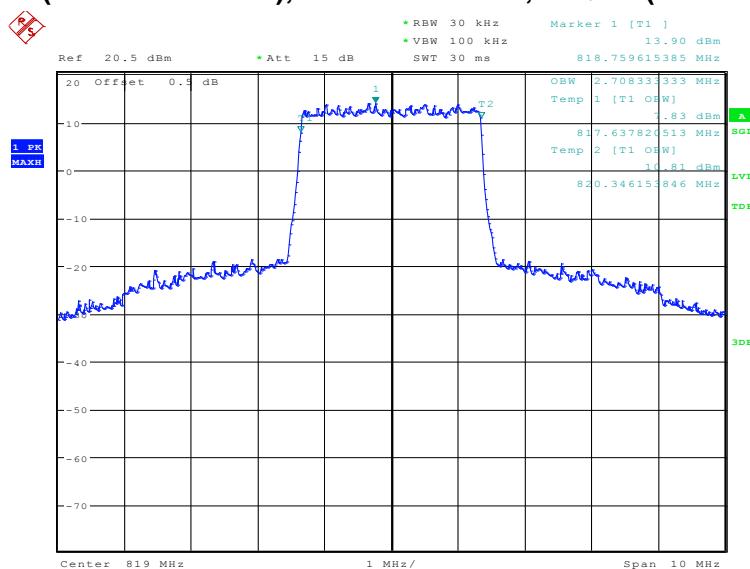
Date: 23.DEC.2019 23:17:17

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

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
	QPSK	16QAM
819.0	2692.31	2708.33

LTE band 26(814MHz~824MHz), 3MHz Bandwidth, QPSK (99% BW)
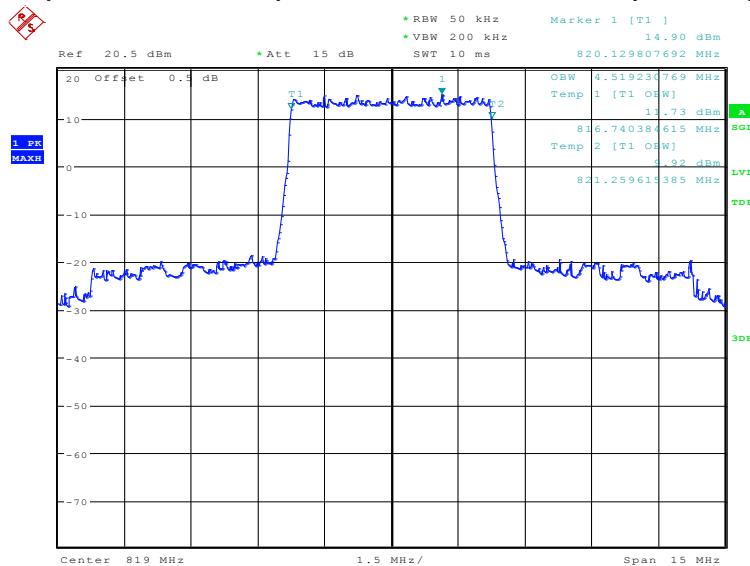
Date: 23.DEC.2019 23:18:44

LTE band 26(814MHz~824MHz), 3MHz Bandwidth, 16QAM (99% BW)
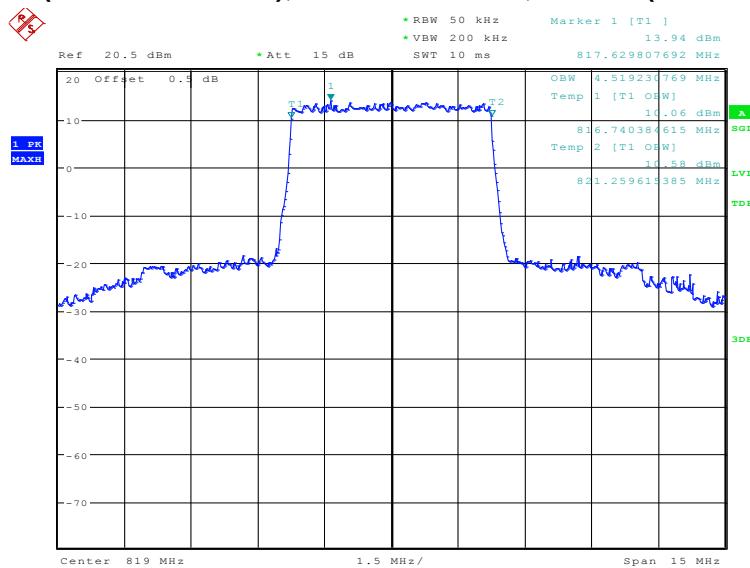
Date: 23.DEC.2019 23:20:09

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

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
	QPSK	16QAM
819.0	4519.23	4519.23

LTE band 26(814MHz~824MHz), 5MHz Bandwidth, QPSK (99% BW)
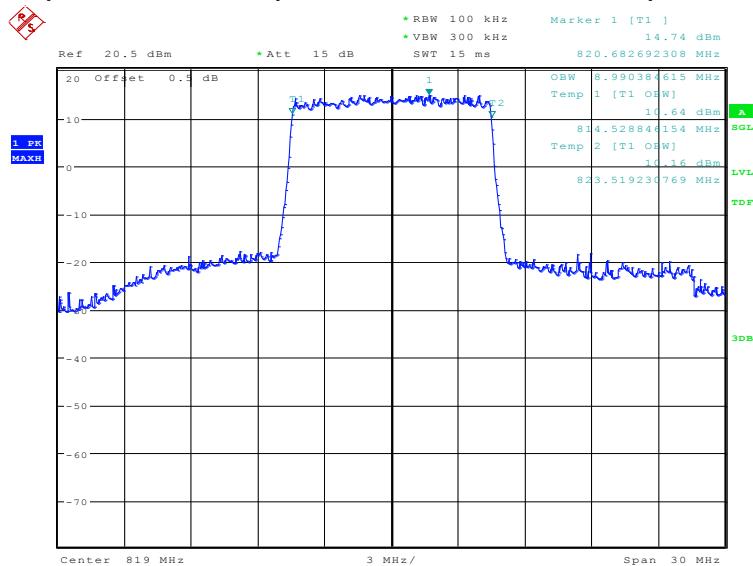
Date: 23.DEC.2019 23:21:35

LTE band 26(814MHz~824MHz), 5MHz Bandwidth, 16QAM (99% BW)
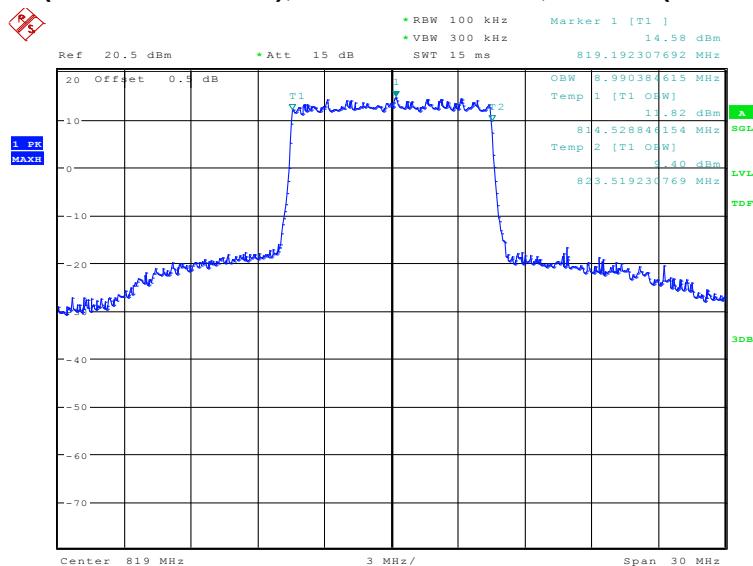
Date: 23.DEC.2019 23:23:00

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)
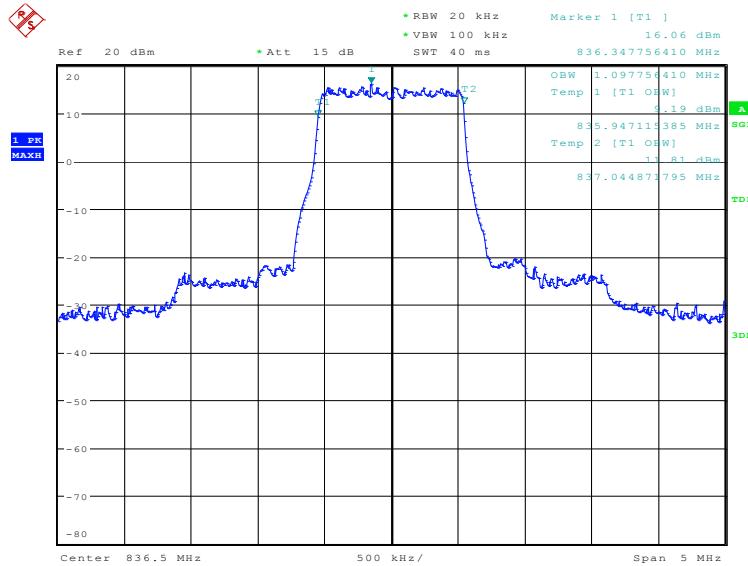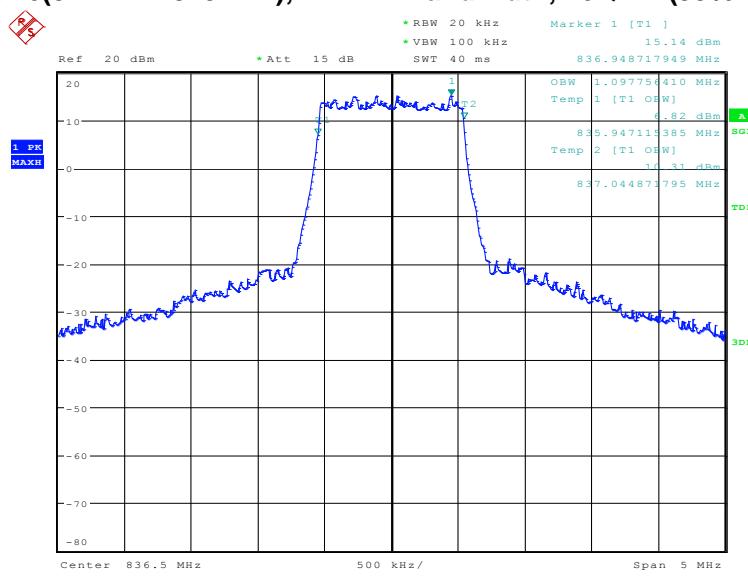
Date: 23.DEC.2019 23:24:26

LTE band 26(814MHz~824MHz), 10MHz Bandwidth, 16QAM (99% BW)

Date: 23.DEC.2019 23:25:51
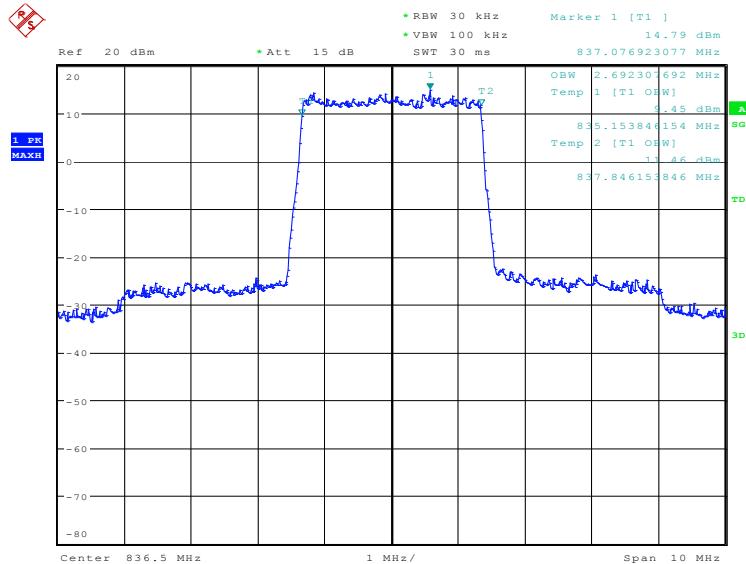
LTE band 26(824MHz~849MHz), 1.4MHz (99%)

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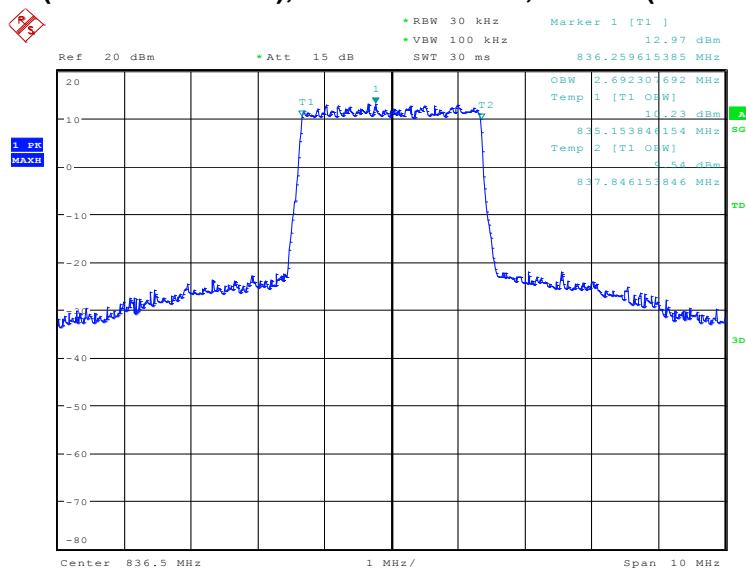
LTE band 26(824MHz~849MHz), 1.4MHz Bandwidth, QPSK (99% BW)

Date: 23.DEC.2019 23:00:52

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

Date: 23.DEC.2019 23:02:17

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)
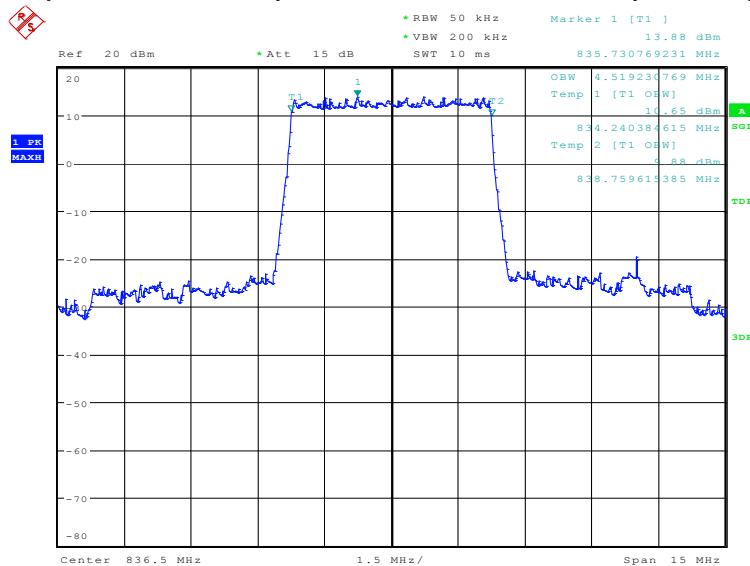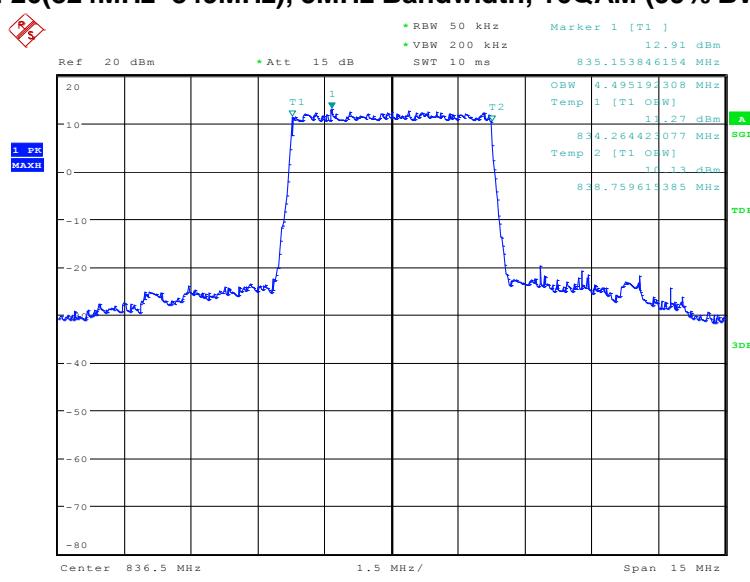
Date: 23.DEC.2019 23:03:43

LTE band 26(824MHz~849MHz), 3MHz Bandwidth, 16QAM (99% BW)

Date: 23.DEC.2019 23:05:07
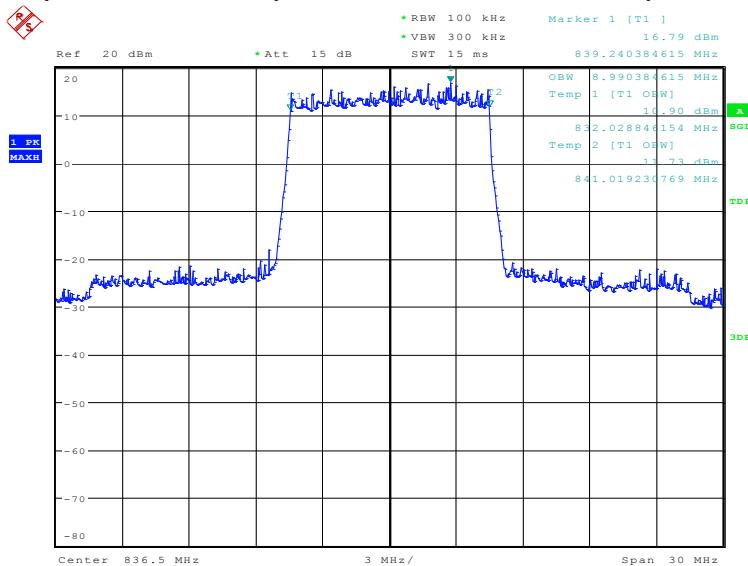
LTE band 26(824MHz~849MHz), 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
836.5	QPSK	16QAM
	4519.23	4495.19
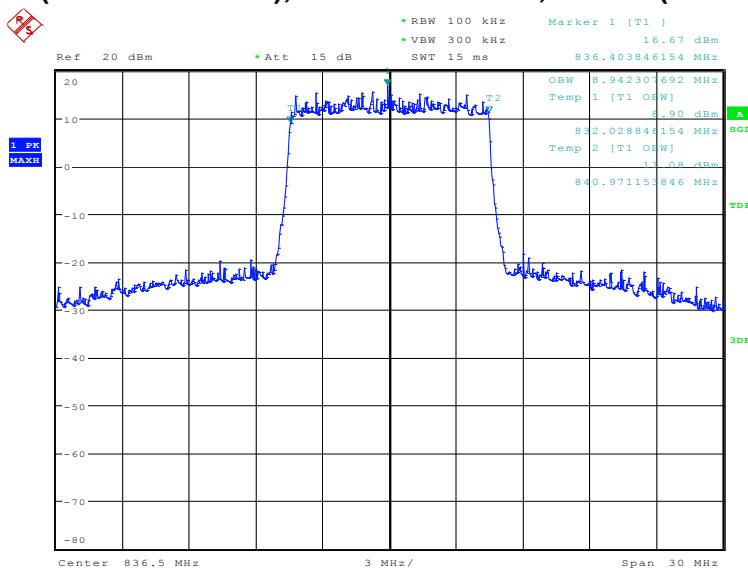
LTE band 26(824MHz~849MHz), 5MHz Bandwidth, QPSK (99% BW)

Date: 23.DEC.2019 23:06:34

LTE band 26(824MHz~849MHz), 5MHz Bandwidth, 16QAM (99% BW)

Date: 23.DEC.2019 23:07:59

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

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
	QPSK	16QAM
836.5	8990.38	8942.31

LTE band 26(824MHz~849MHz), 10MHz Bandwidth, QPSK (99% BW)
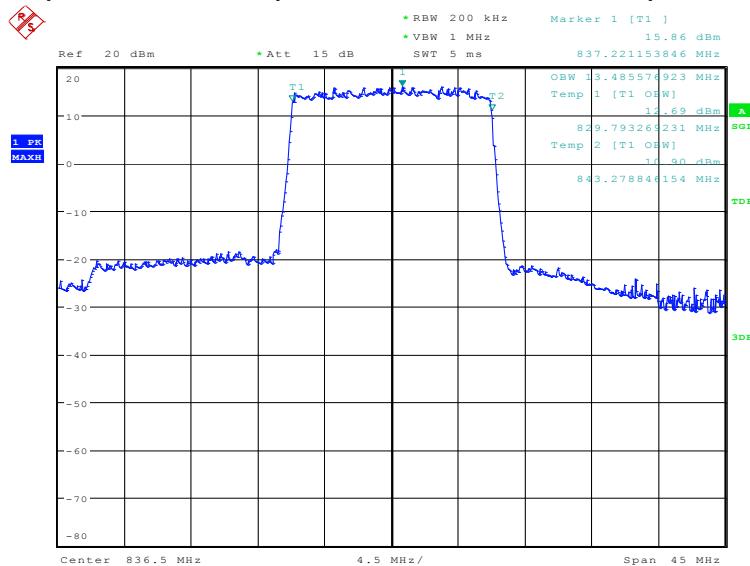
Date: 23.DEC.2019 23:09:25

LTE band 26(824MHz~849MHz), 10MHz Bandwidth, 16QAM (99% BW)
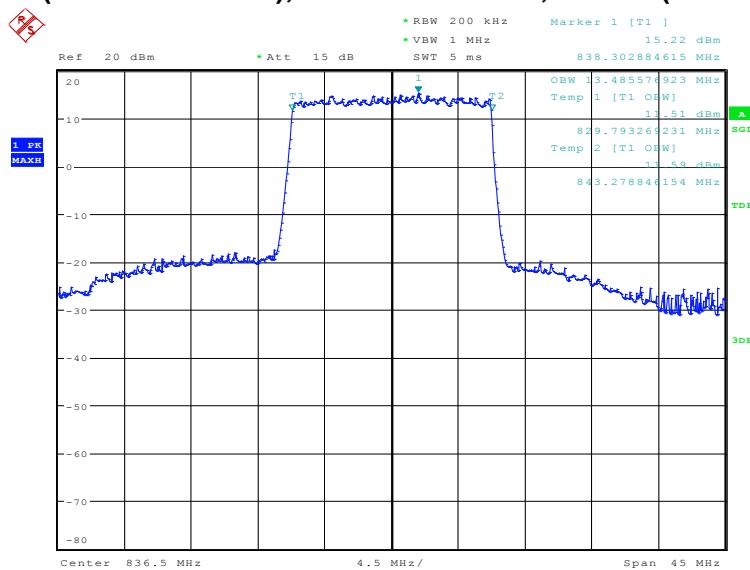
Date: 23.DEC.2019 23:10:50

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

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

LTE band 26(824MHz~849MHz), 15MHz Bandwidth, QPSK (99% BW)
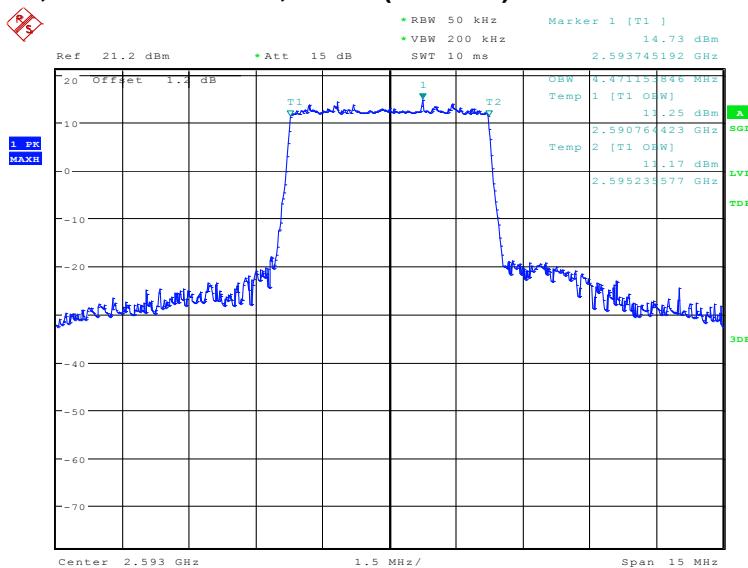
Date: 23.DEC.2019 23:12:16

LTE band 26(824MHz~849MHz), 15MHz Bandwidth, 16QAM (99% BW)
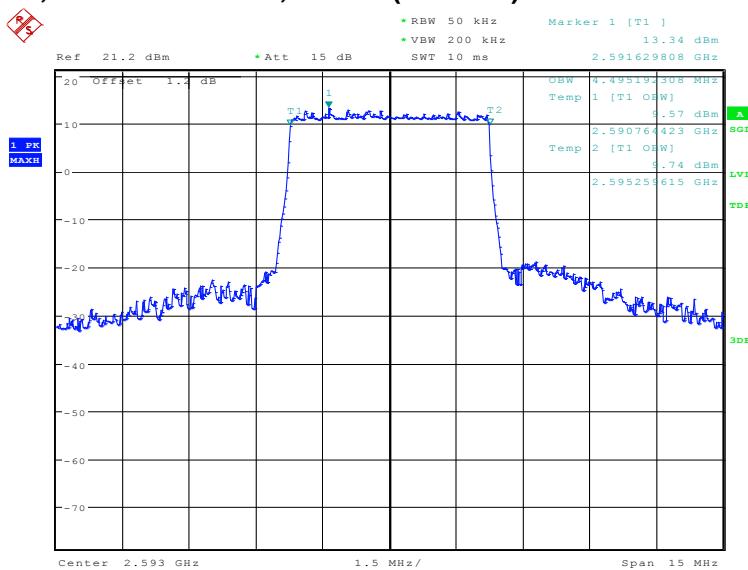
Date: 23.DEC.2019 23:13:41

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LTE band 41, 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
	QPSK	16QAM
2593.0	4471.15	4495.19

LTE band 41, 5MHz Bandwidth, QPSK (99% BW)
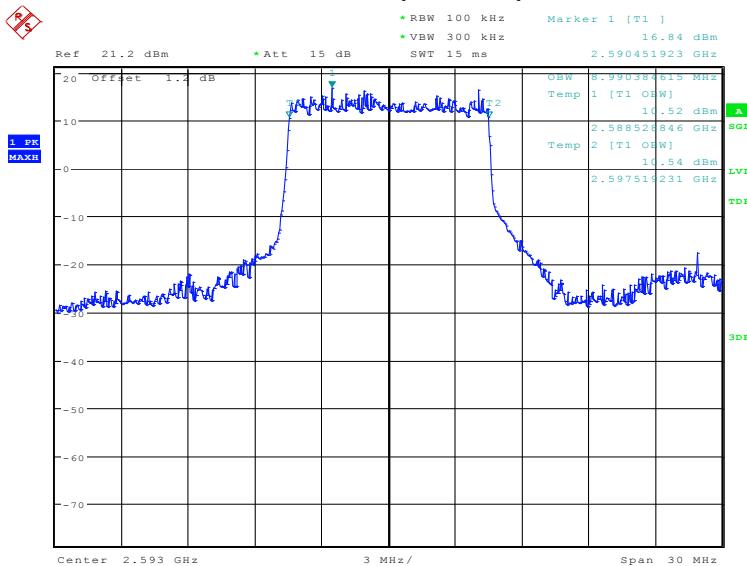
Date: 3.JAN.2020 16:50:20

LTE band 41, 5MHz Bandwidth,16QAM (99% BW)
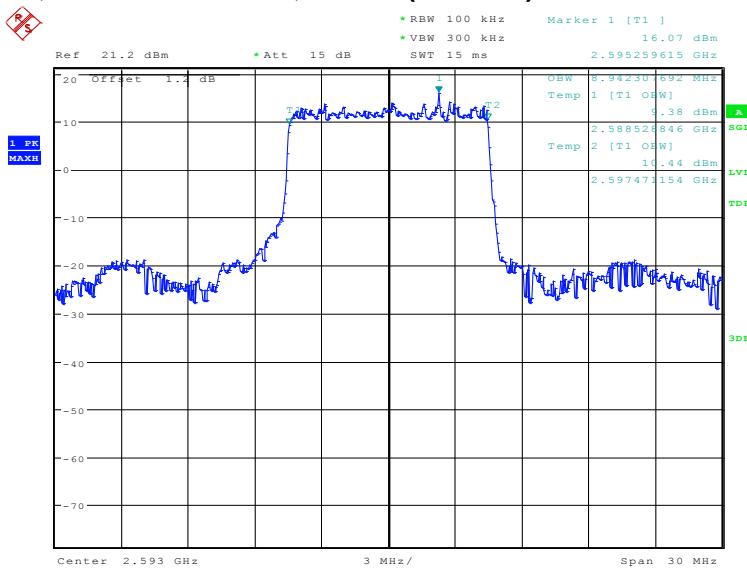
Date: 3.JAN.2020 16:51:46

LTE band 41, 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
2593.0	QPSK	16QAM
	8990.38	8942.31

LTE band 41, 10MHz Bandwidth, QPSK (99% BW)
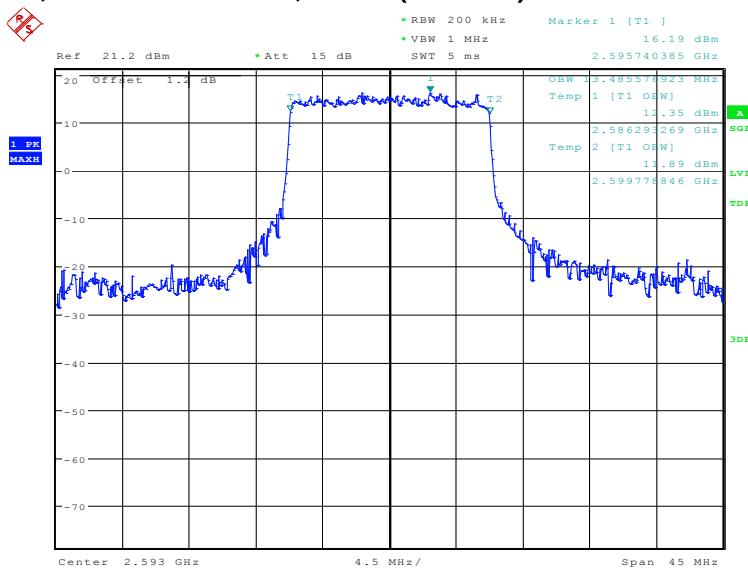
Date: 3.JAN.2020 16:53:18

LTE band 41, 10MHz Bandwidth,16QAM (99% BW)
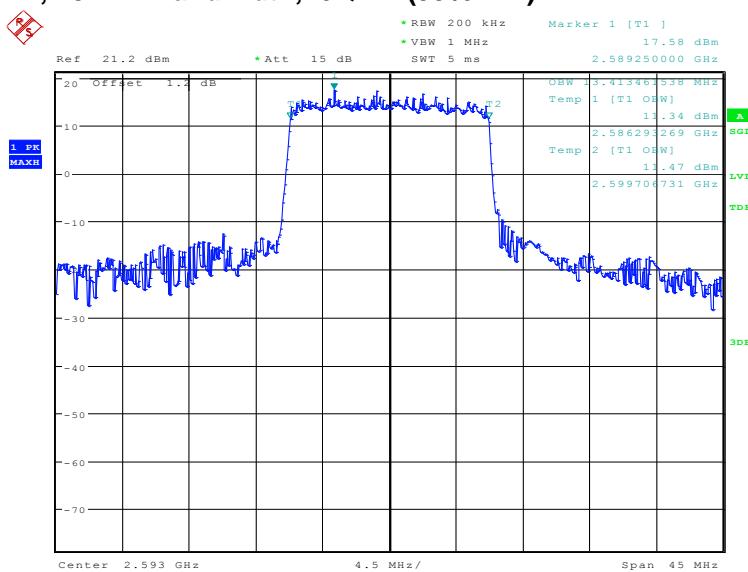
Date: 3.JAN.2020 16:54:50

LTE band 41, 15MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
2593.0	QPSK	16QAM
	13485.58	13413.46

LTE band 41, 15MHz Bandwidth, QPSK (99% BW)
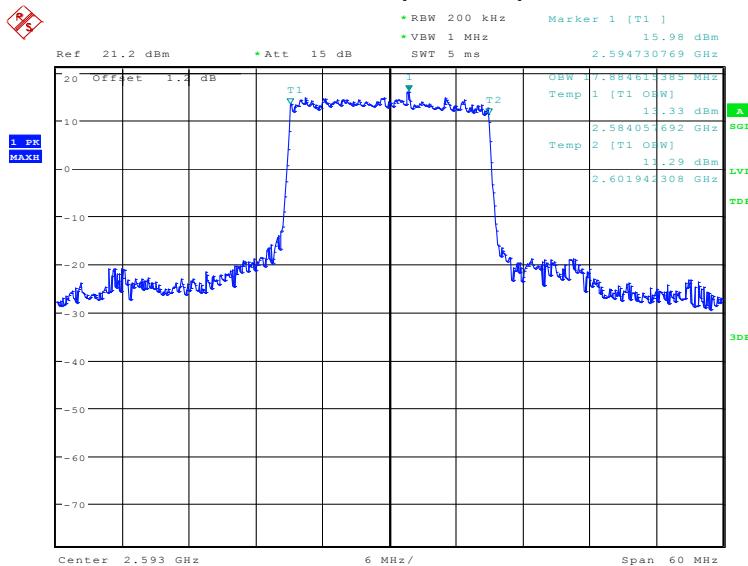
Date: 3.JAN.2020 16:56:23

LTE band 41, 15MHz Bandwidth,16QAM (99% BW)
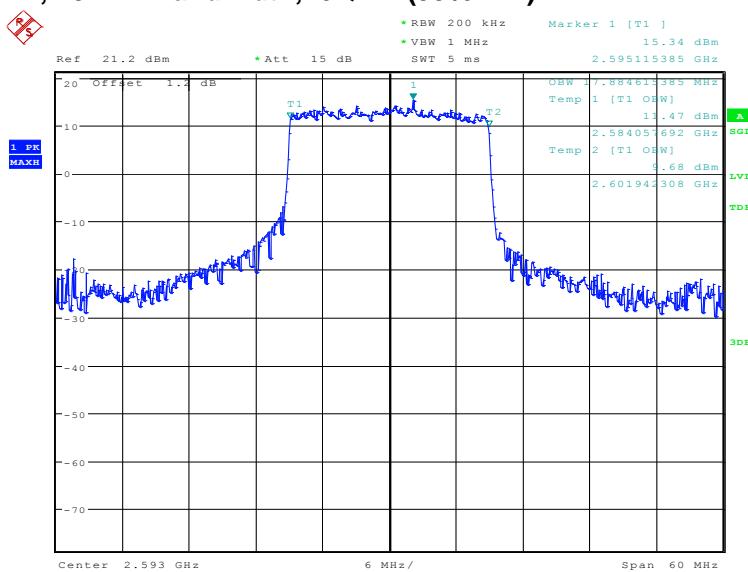
Date: 3.JAN.2020 16:57:56

LTE band 41, 20MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
	QPSK	16QAM
2593.0	17884.62	17884.62

LTE band 41, 20MHz Bandwidth, QPSK (99% BW)
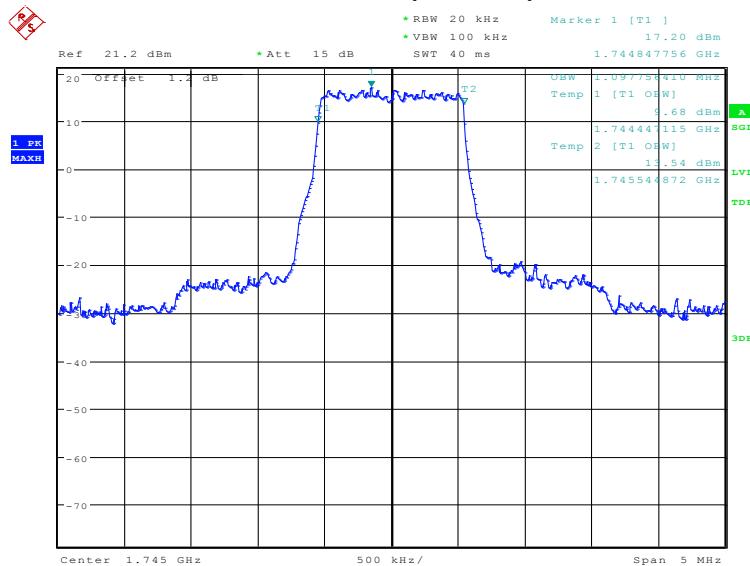
Date: 3.JAN.2020 16:59:30

LTE band 41, 20MHz Bandwidth,16QAM (99% BW)
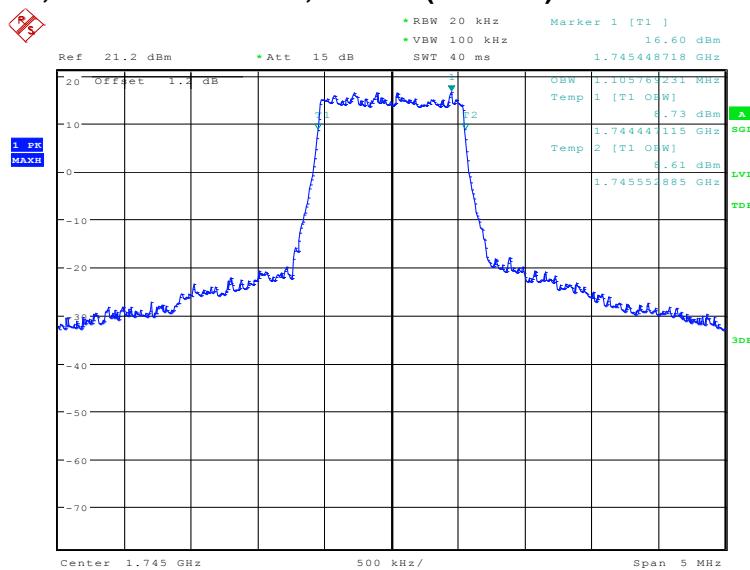
Date: 3.JAN.2020 17:01:03

LTE band 66, 1.4MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
1745.0	QPSK	16QAM
	1097.76	1105.77

LTE band 66, 1.4MHz Bandwidth, QPSK (99% BW)
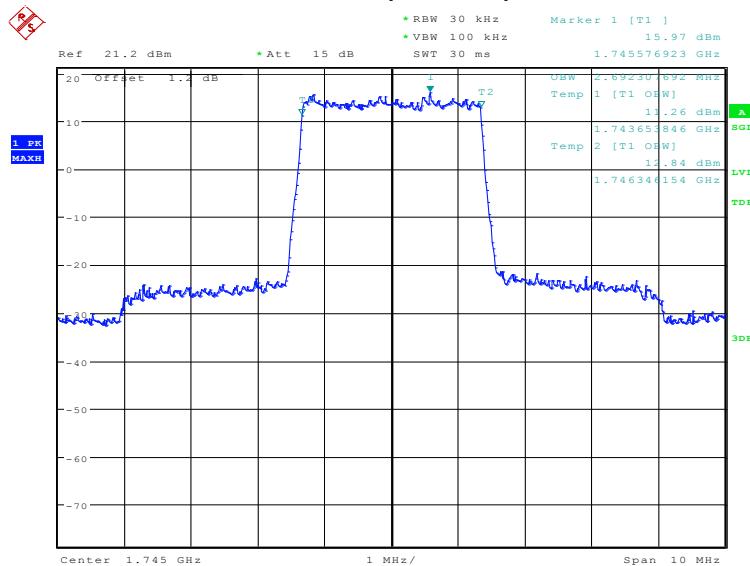
Date: 23.DEC.2019 23:27:20

LTE band 66, 1.4MHz Bandwidth, 16QAM (99% BW)
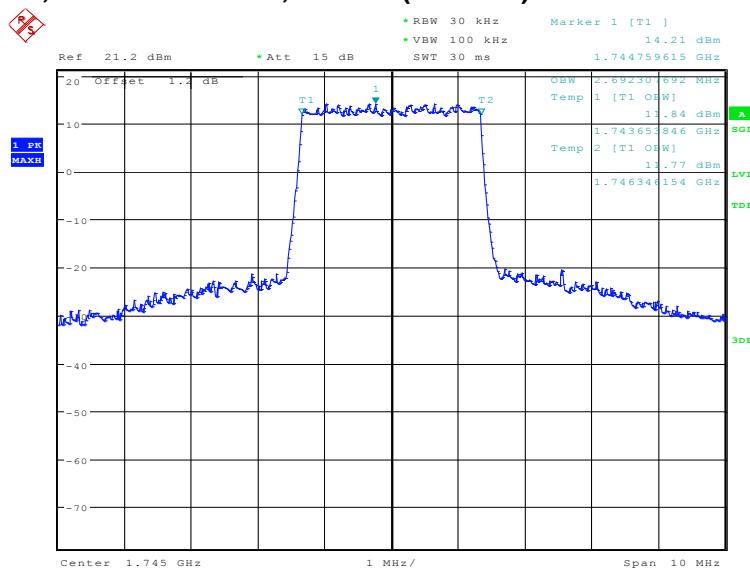
Date: 23.DEC.2019 23:28:45

LTE band 66, 3MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
	QPSK	16QAM
1745.0	2692.31	2692.31

LTE band 66, 3MHz Bandwidth, QPSK (99% BW)
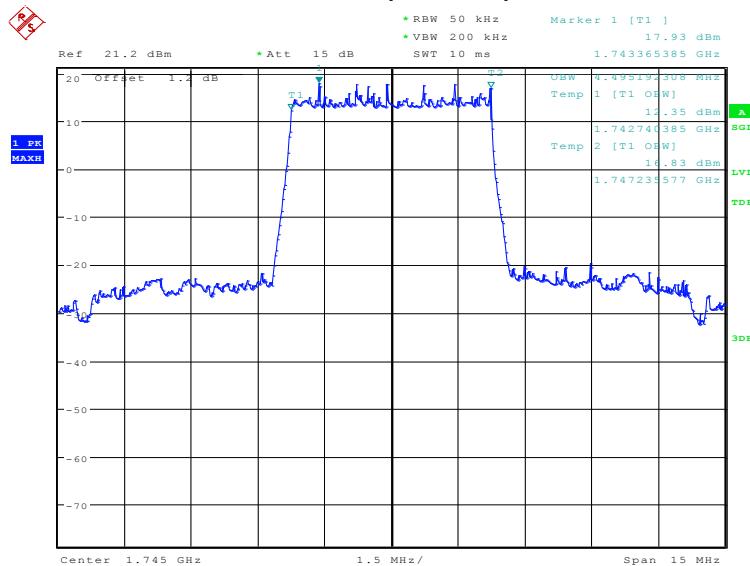
Date: 23.DEC.2019 23:30:11

LTE band 66, 3MHz Bandwidth, 16QAM (99% BW)
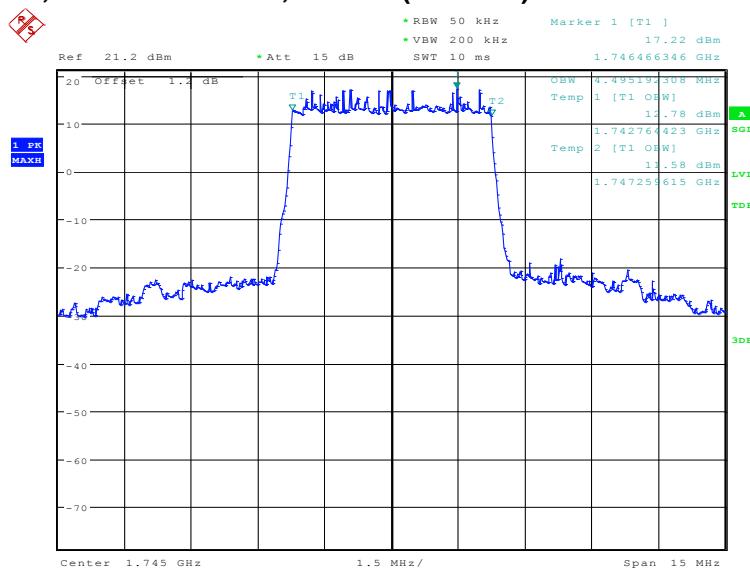
Date: 23.DEC.2019 23:31:36

LTE band 66, 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
	QPSK	16QAM
1745.0	4495.19	4495.19

LTE band 66, 5MHz Bandwidth, QPSK (99% BW)
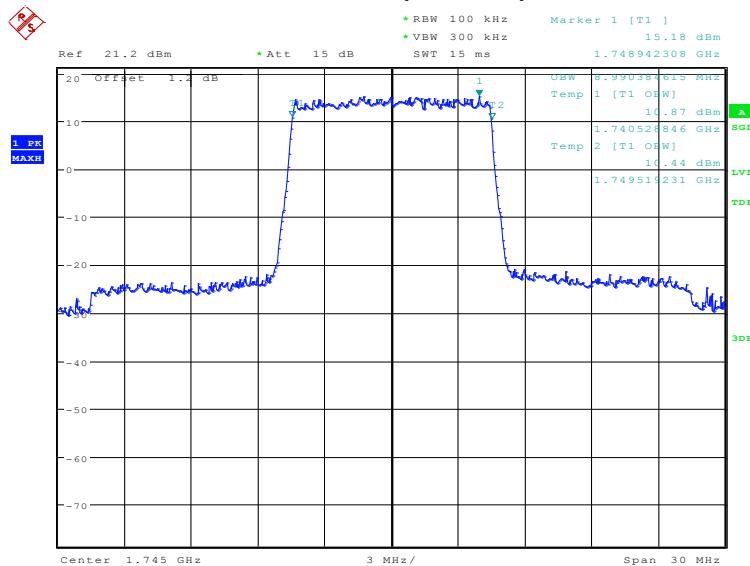
Date: 23.DEC.2019 23:33:02

LTE band 66, 5MHz Bandwidth, 16QAM (99% BW)
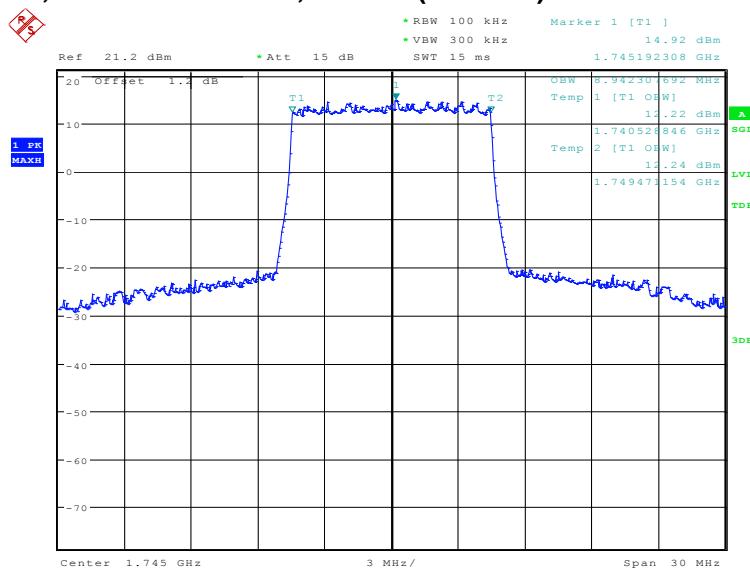
Date: 23.DEC.2019 23:34:27

LTE band 66, 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
	QPSK	16QAM
1745.0	8990.38	8942.31

LTE band 66, 10MHz Bandwidth, QPSK (99% BW)
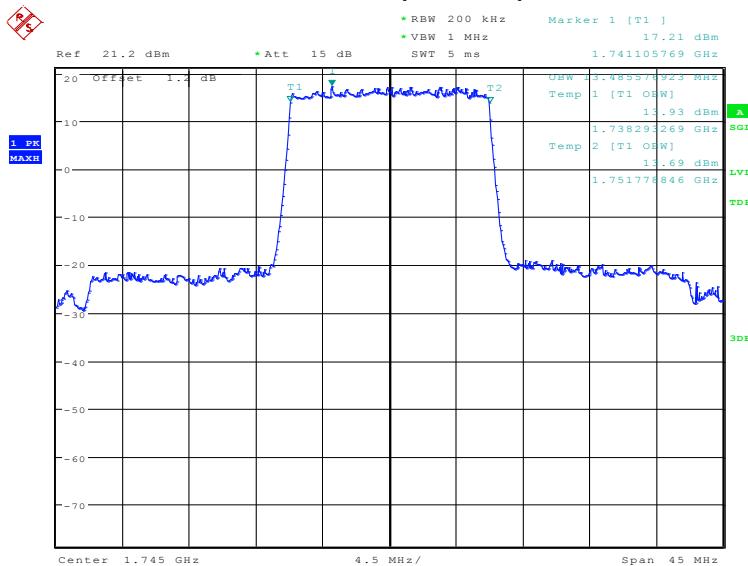
Date: 23.DEC.2019 23:35:54

LTE band 66, 10MHz Bandwidth, 16QAM (99% BW)
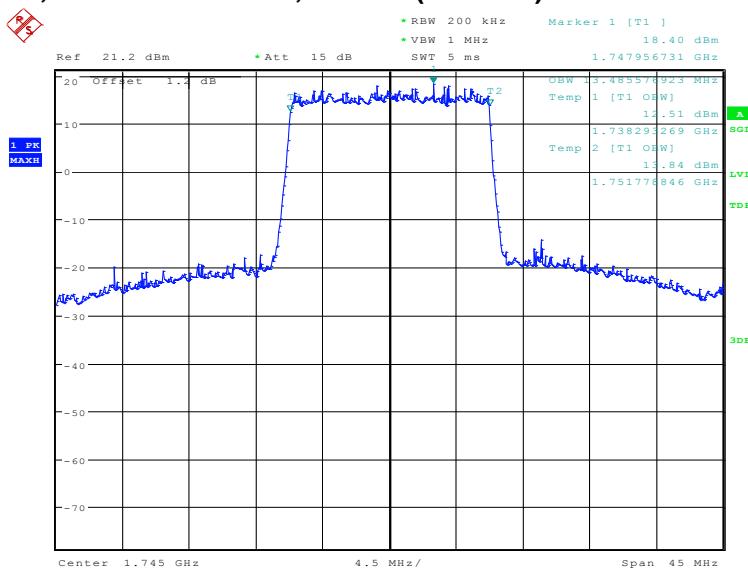
Date: 23.DEC.2019 23:37:19

LTE band 66, 15MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
1745.0	QPSK	16QAM
	13485.58	13485.58

LTE band 66, 15MHz Bandwidth, QPSK (99% BW)
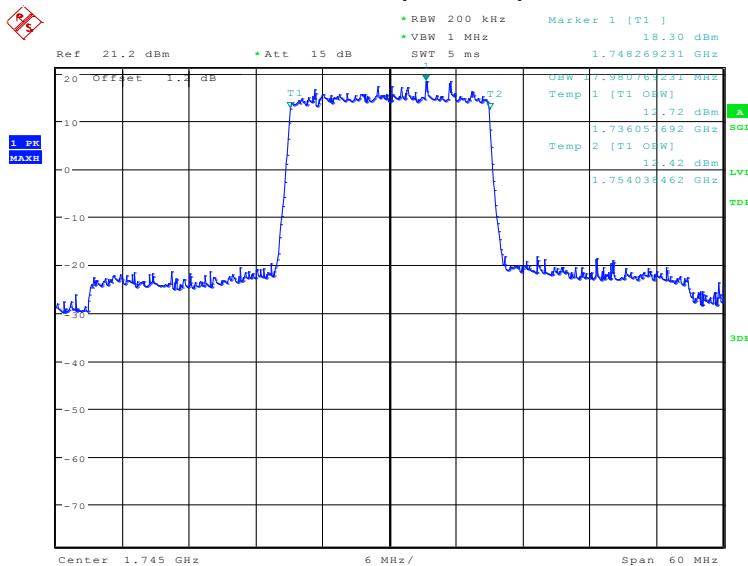
Date: 23.DEC.2019 23:38:45

LTE band 66, 15MHz Bandwidth, 16QAM (99% BW)
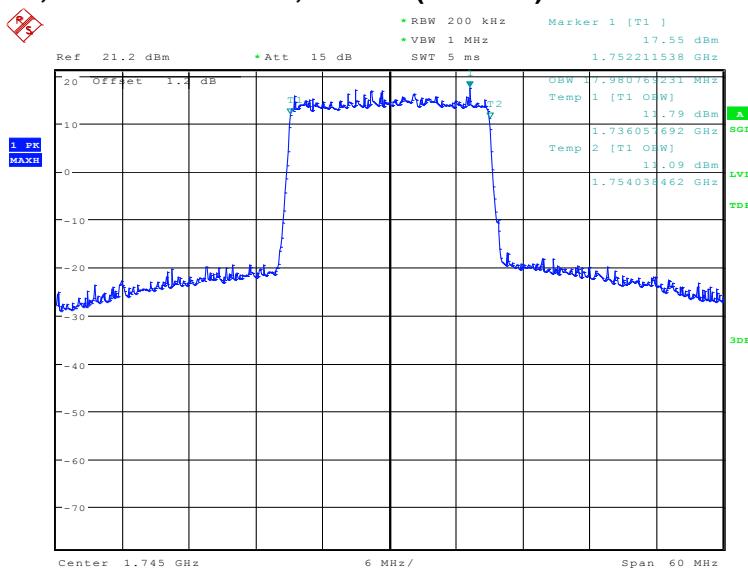
Date: 23.DEC.2019 23:40:10

LTE band 66, 20MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
	QPSK	16QAM
1745.0	17980.77	17980.77

LTE band 66, 20MHz Bandwidth, QPSK (99% BW)
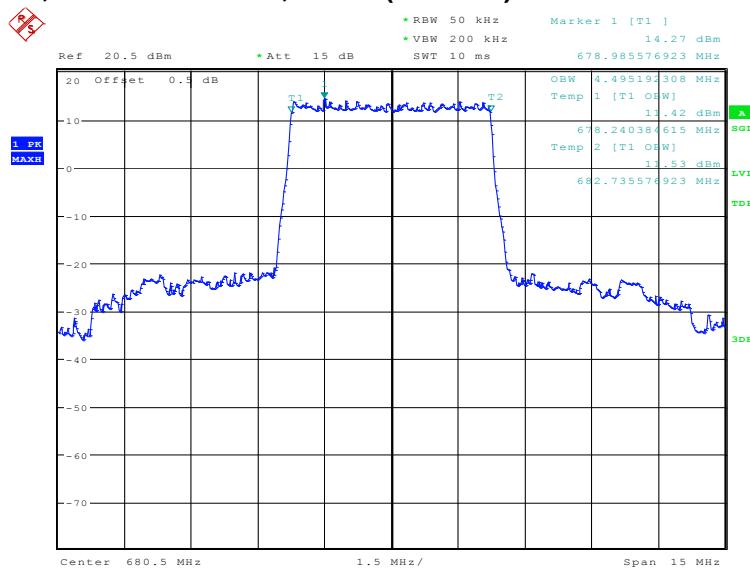
Date: 23.DEC.2019 23:41:37

LTE band 66, 20MHz Bandwidth, 16QAM (99% BW)
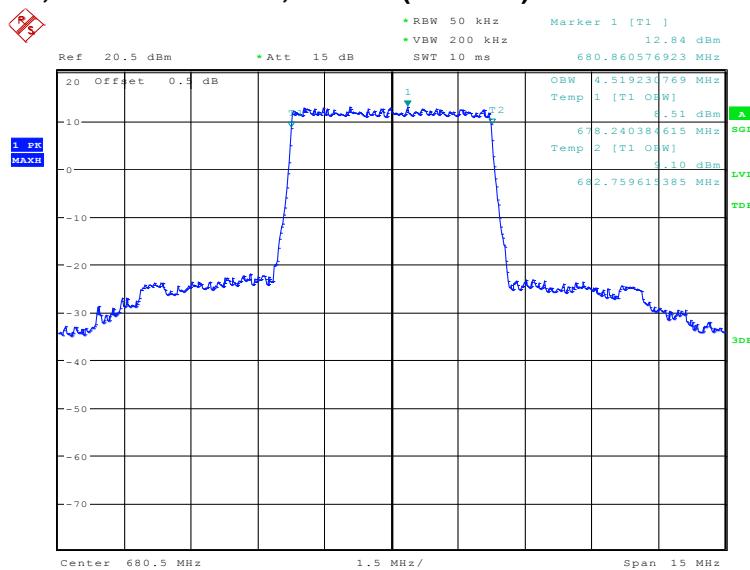
Date: 23.DEC.2019 23:43:02

LTE band 71, 5MHz (99%)

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

LTE band 71, 5MHz Bandwidth, QPSK (99% BW)
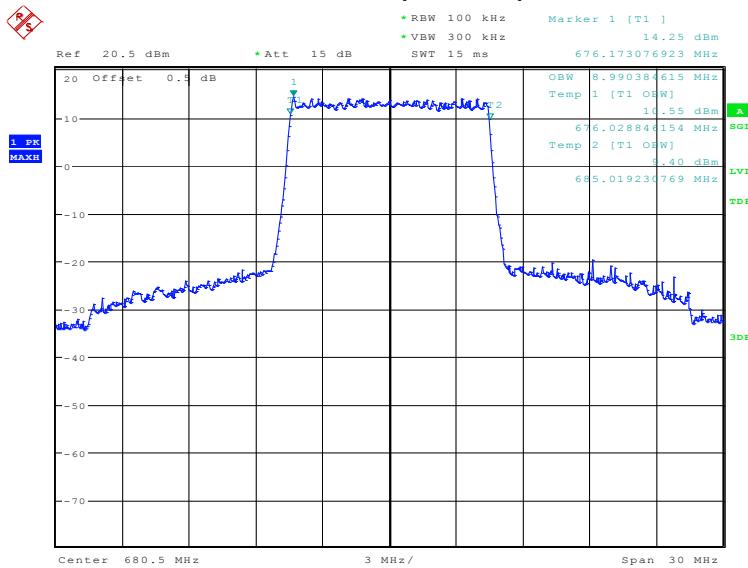
Date: 23.DEC.2019 23:45:09

LTE band 71, 5MHz Bandwidth, 16QAM (99% BW)
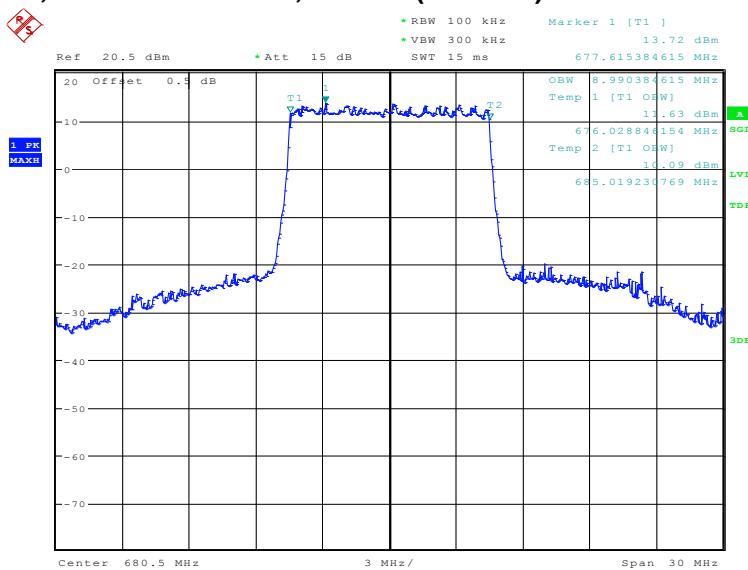
Date: 23.DEC.2019 23:46:34

LTE band 71, 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
	QPSK	16QAM
680.5	8990.38	8990.38

LTE band 71, 10MHz Bandwidth, QPSK (99% BW)
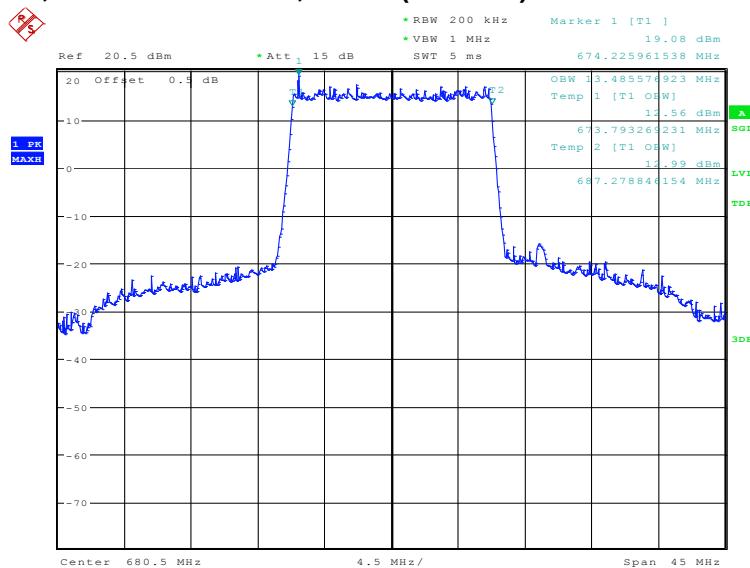
Date: 23.DEC.2019 23:48:01

LTE band 71, 10MHz Bandwidth, 16QAM (99% BW)
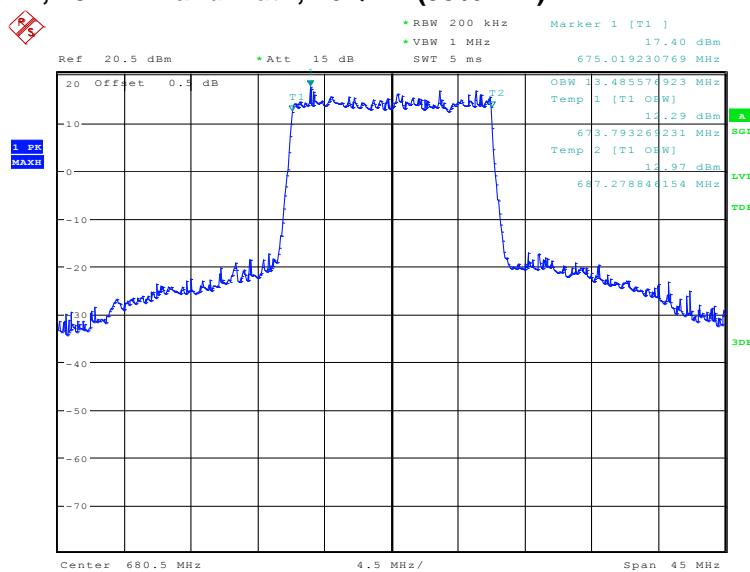
Date: 23.DEC.2019 23:49:26

LTE band 71, 15MHz (99%)

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

LTE band 71, 15MHz Bandwidth, QPSK (99% BW)
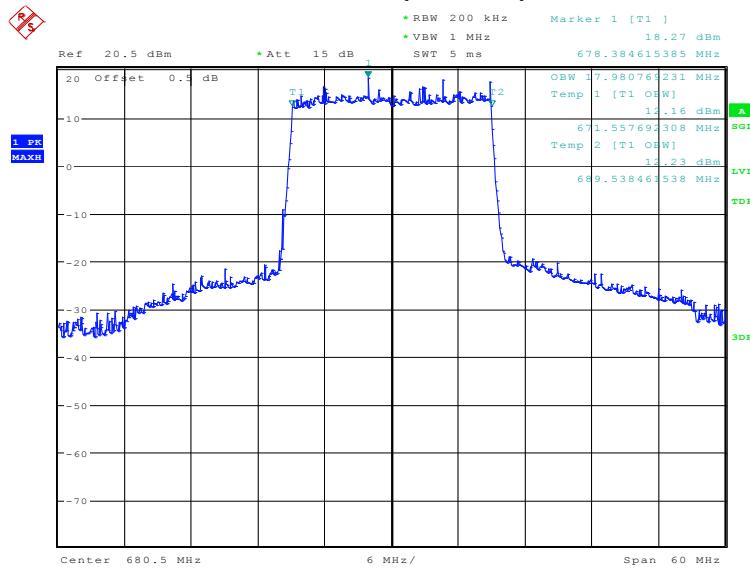
Date: 23.DEC.2019 23:50:54

LTE band 71, 15MHz Bandwidth, 16QAM (99% BW)
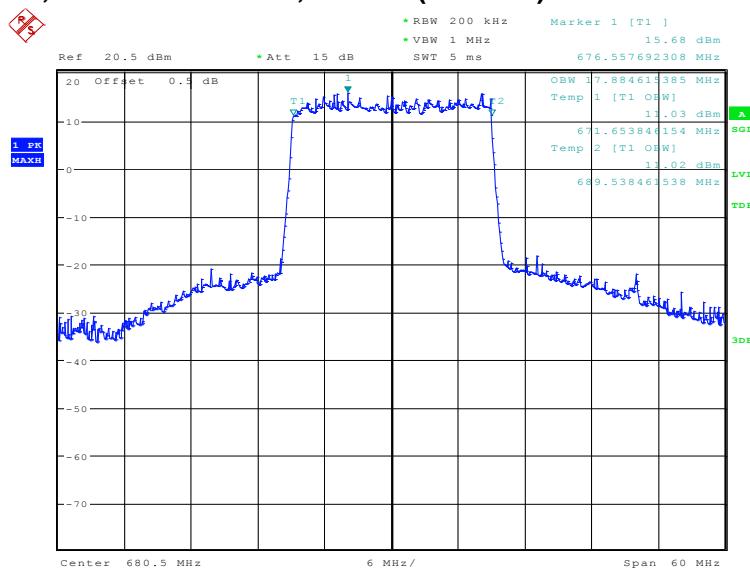
Date: 23.DEC.2019 23:52:19

LTE band 71, 20MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
	QPSK	16QAM
680.5	17980.77	17884.62

LTE band 71, 20MHz Bandwidth, QPSK (99% BW)

Date: 23.DEC.2019 23:53:46

LTE band 71, 20MHz Bandwidth, 16QAM (99% BW)

Date: 23.DEC.2019 23:55:11

A.5 EMISSION BANDWIDTH

A.5.1Emission Bandwidth Results
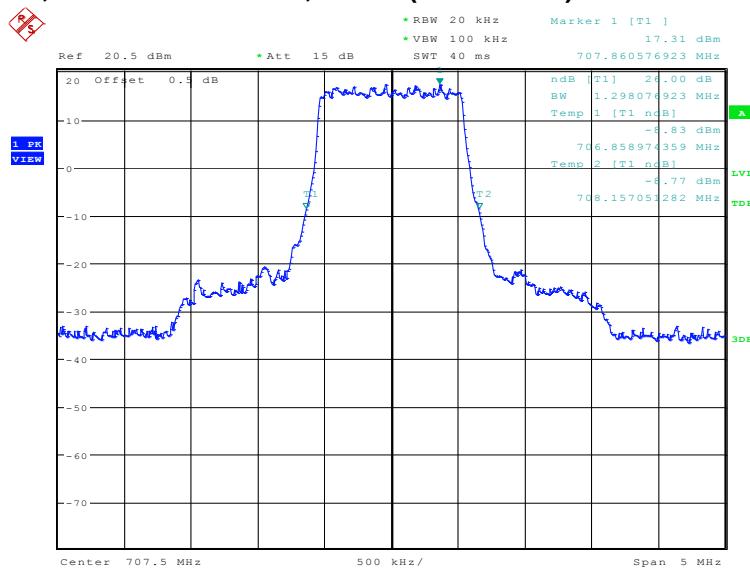
The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. Table below lists the measured -26dBc BW. Spectrum analyzer plots are included on the following pages.

The measurement method is from ANSI C63.26:
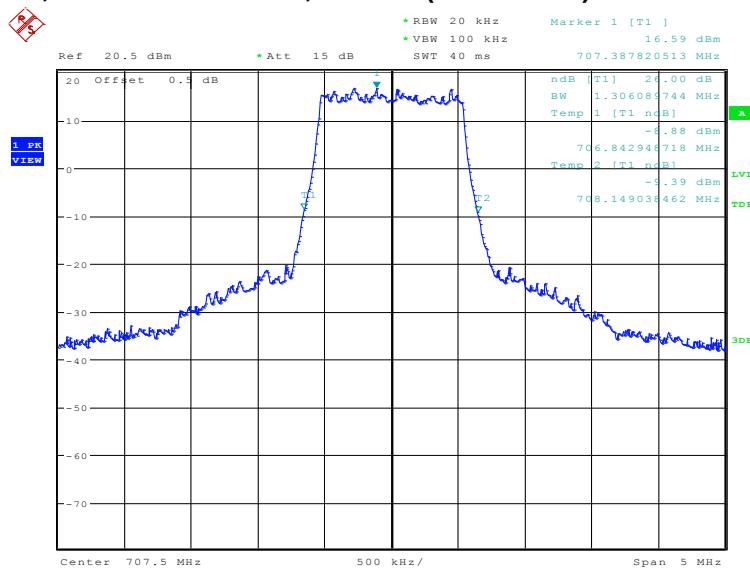
a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.

b) The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set ≥ 3 × RBW.

c) Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation.

d) The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target "−X dB" requirement, i.e., if the requirement calls for measuring the −26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference level.

e) Set spectrum analyzer detection mode to peak, and the trace mode to max hold.

LTE band 12, 1.4MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
707.5	1298.08	1306.09

LTE band 12, 1.4MHz Bandwidth, QPSK (-26dBc BW)
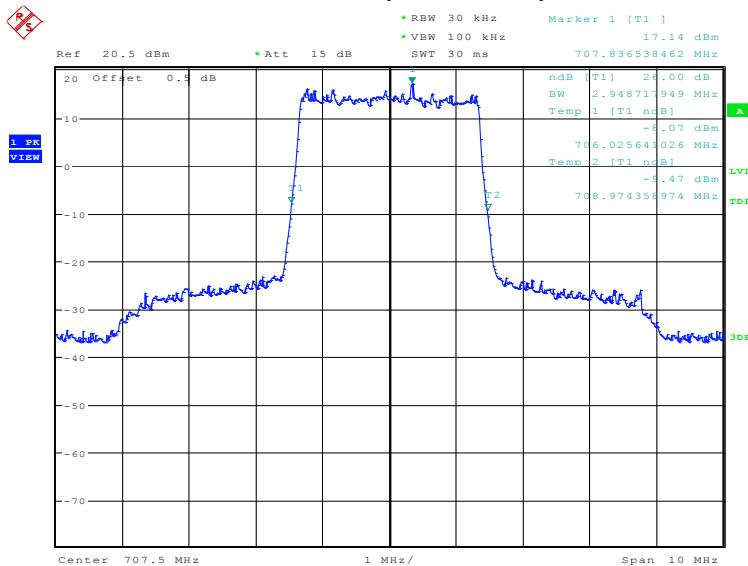
Date: 23.DEC.2019 23:57:16

LTE band 12, 1.4MHz Bandwidth, 16QAM (-26dBc BW)
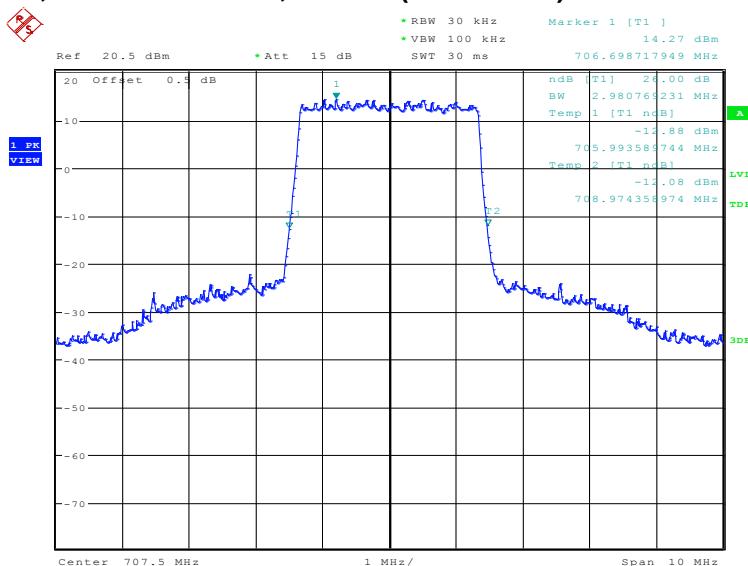
Date: 23.DEC.2019 23:58:41

LTE band 12, 3MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
707.5	2948.72	2980.77

LTE band 12, 3MHz Bandwidth, QPSK (-26dBc BW)
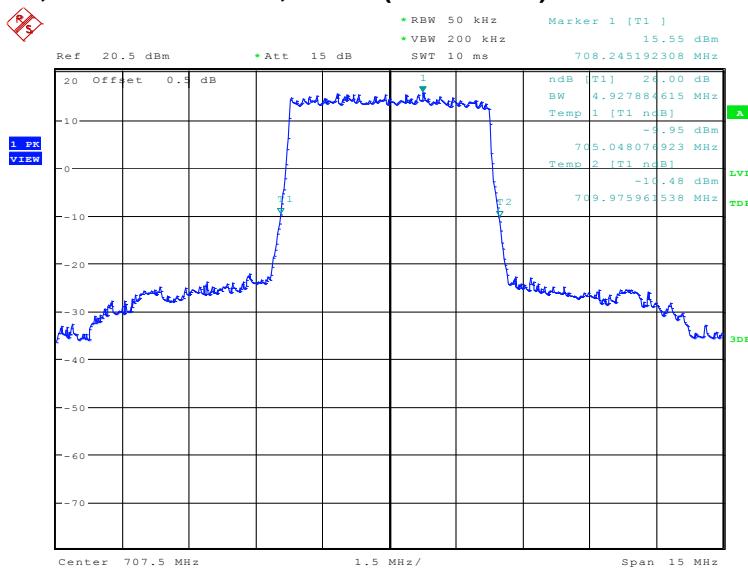
Date: 24.DEC.2019 00:00:08

LTE band 12, 3MHz Bandwidth, 16QAM (-26dBc BW)
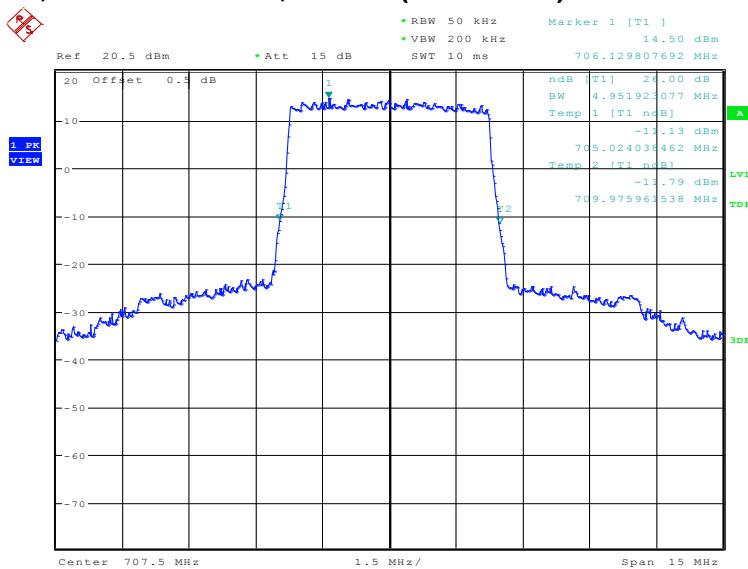
Date: 24.DEC.2019 00:01:34

LTE band 12, 5MHz (-26dBc)

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

LTE band 12, 5MHz Bandwidth, QPSK (-26dBc BW)
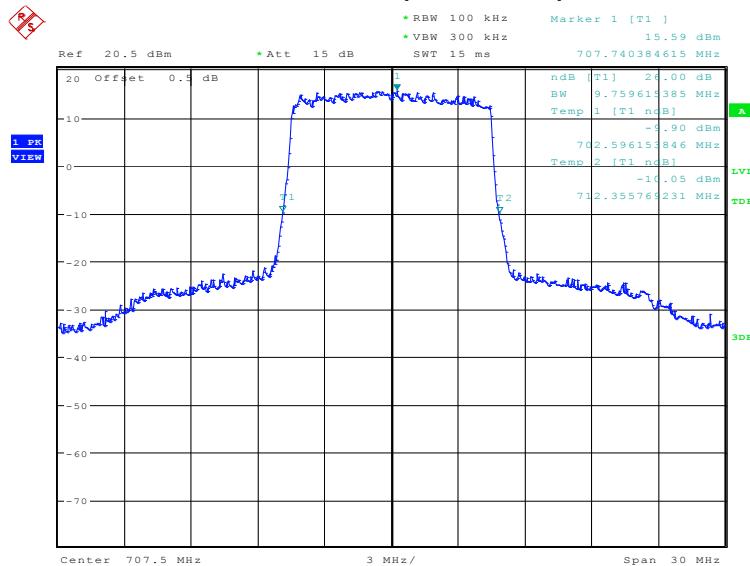
Date: 24.DEC.2019 00:03:01

LTE band 12, 5MHz Bandwidth, 16QAM (-26dBc BW)
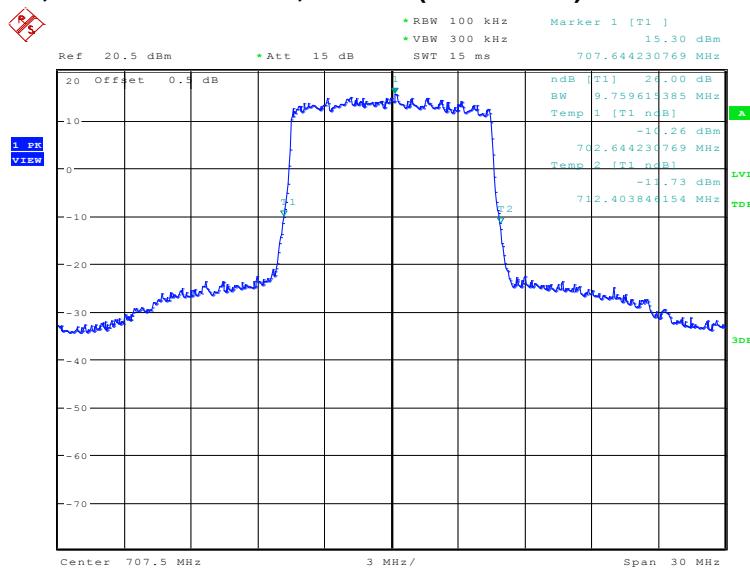
Date: 24.DEC.2019 00:04:27

LTE band 12, 10MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
707.5	9759.62	9759.62

LTE band 12, 10MHz Bandwidth, QPSK (-26dBc BW)
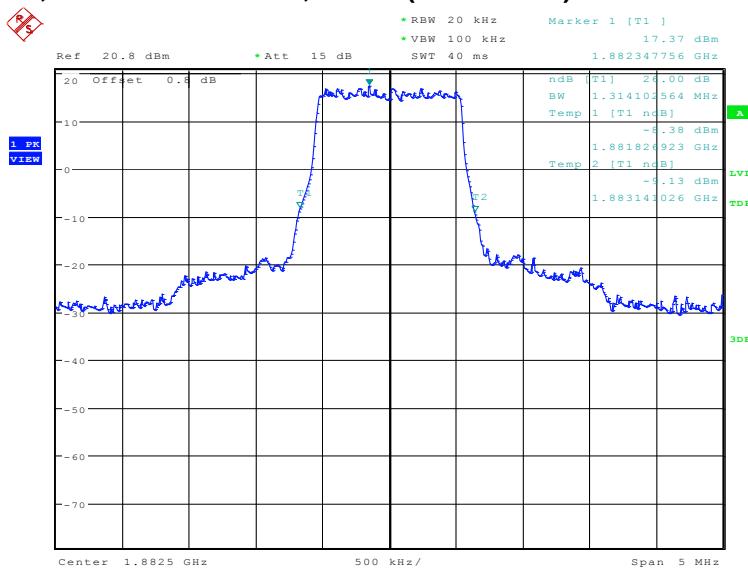
Date: 24.DEC.2019 00:05:54

LTE band 12, 10MHz Bandwidth, 16QAM (-26dBc BW)
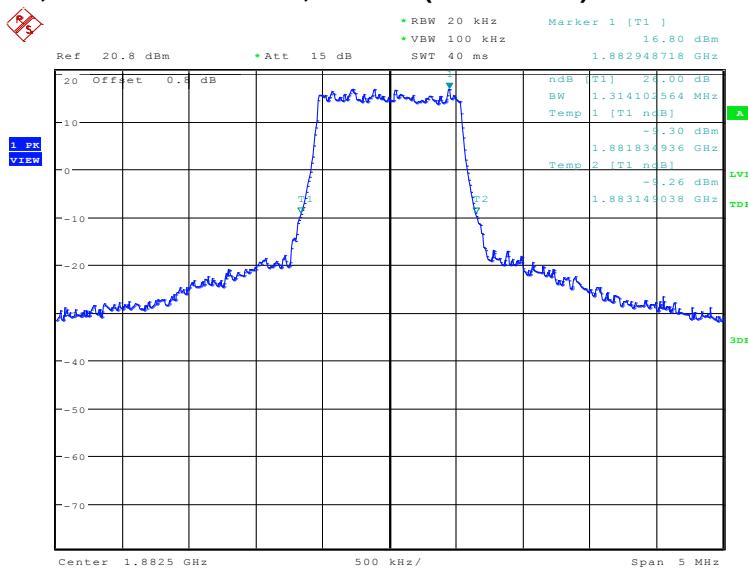
Date: 24.DEC.2019 00:07:19

LTE band 25, 1.4MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
1882.5	1314.10	1314.10

LTE band 25, 1.4MHz Bandwidth, QPSK (-26dBc BW)
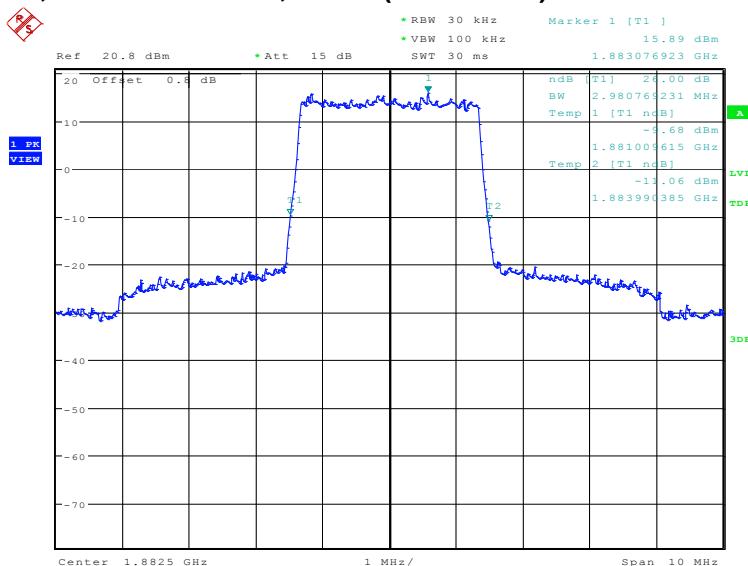
Date: 24.DEC.2019 00:08:48

LTE band 25, 1.4MHz Bandwidth, 16QAM (-26dBc BW)
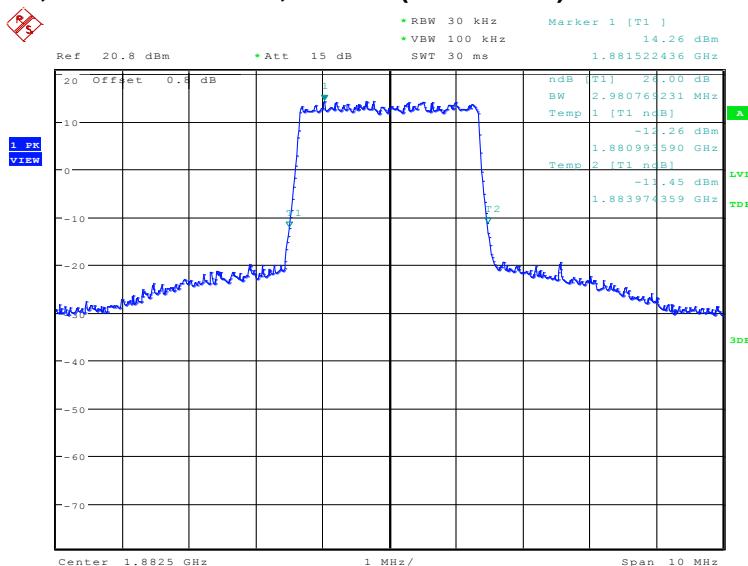
Date: 24.DEC.2019 00:10:14

LTE band 25, 3MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
1882.5	2980.77	2980.77

LTE band 25, 3MHz Bandwidth, QPSK (-26dBc BW)
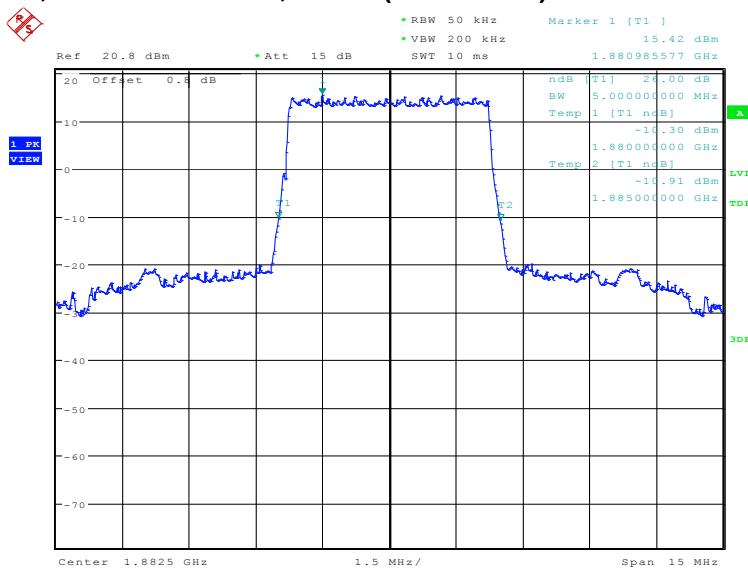
Date: 24.DEC.2019 00:11:41

LTE band 25, 3MHz Bandwidth, 16QAM (-26dBc BW)
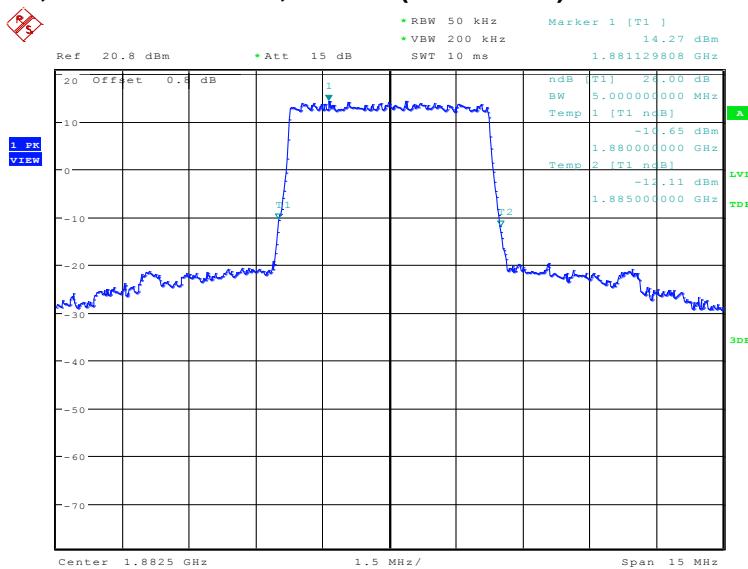
Date: 24.DEC.2019 00:13:07

LTE band 25, 5MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
1882.5	5000.00	5000.00

LTE band 25, 5MHz Bandwidth, QPSK (-26dBc BW)
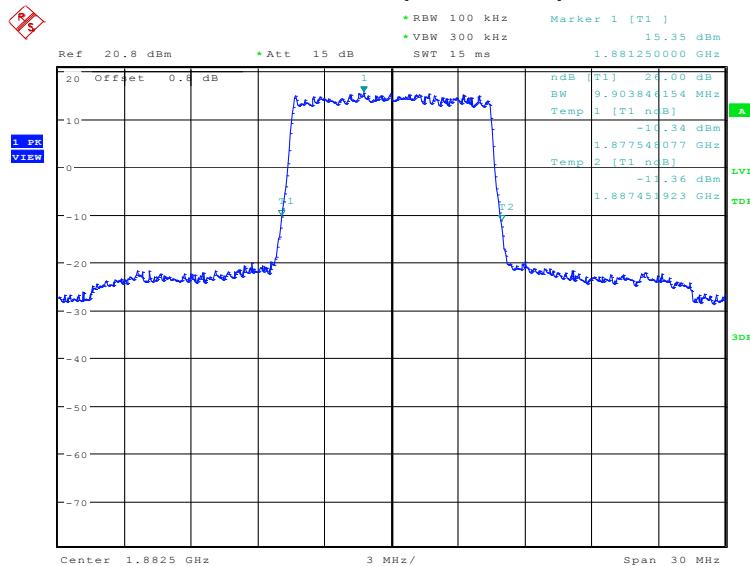
Date: 24.DEC.2019 00:14:34

LTE band 25, 5MHz Bandwidth, 16QAM (-26dBc BW)
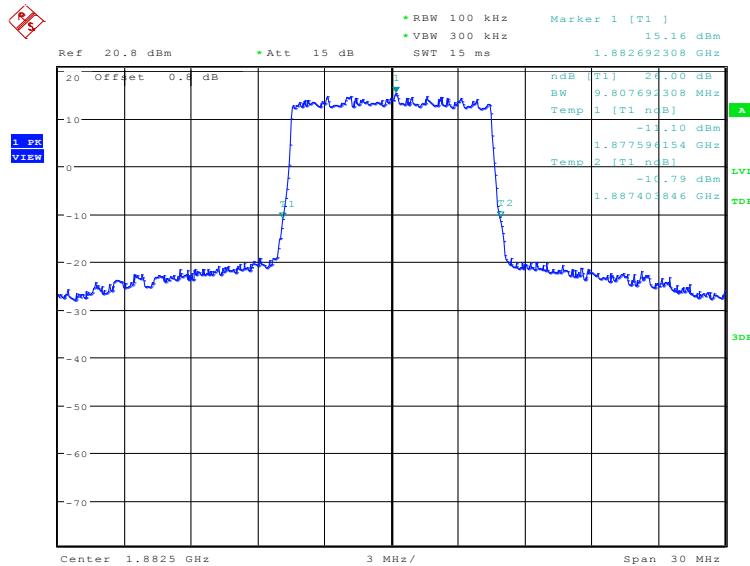
Date: 24.DEC.2019 00:15:59

LTE band 25, 10MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
1882.5	9903.85	9807.69

LTE band 25, 10MHz Bandwidth, QPSK (-26dBc BW)
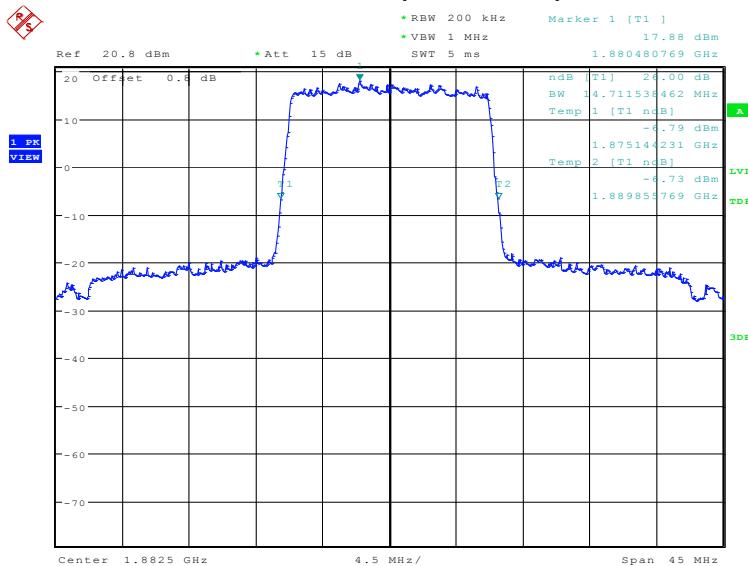
Date: 24.DEC.2019 00:17:27

LTE band 25, 10MHz Bandwidth, 16QAM (-26dBc BW)
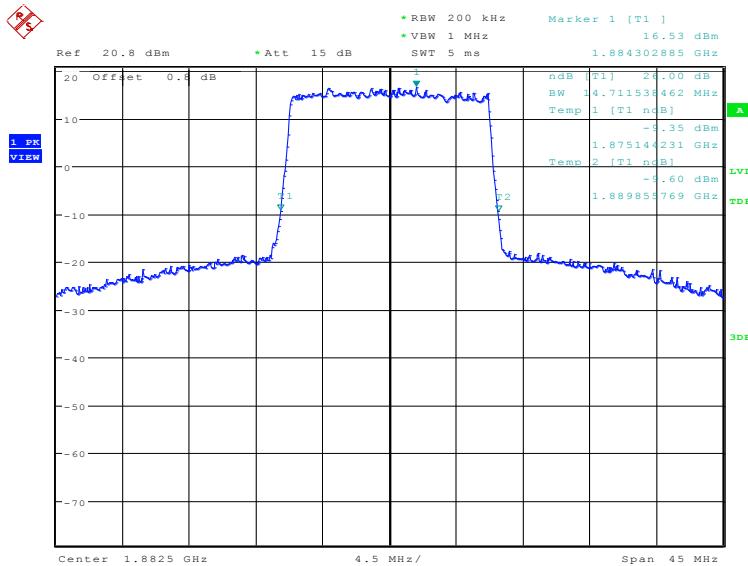
Date: 24.DEC.2019 00:18:52

LTE band 25, 15MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
1882.5	14711.54	14711.54

LTE band 25, 15MHz Bandwidth, QPSK (-26dBc BW)
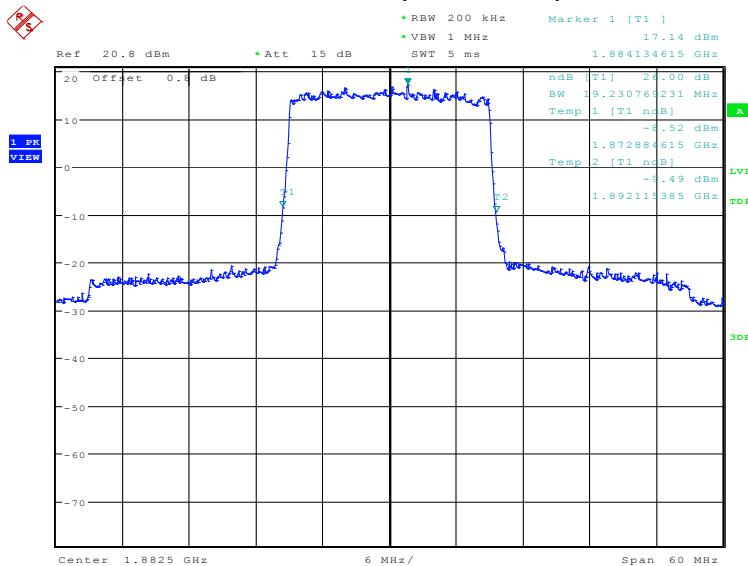
Date: 24.DEC.2019 00:20:19

LTE band 25, 15MHz Bandwidth, 16QAM (-26dBc BW)
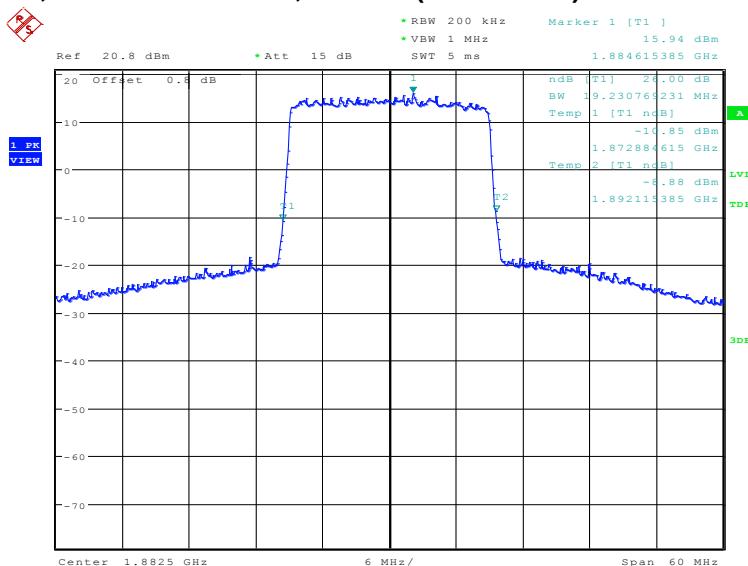
Date: 24.DEC.2019 00:21:45

LTE band 25, 20MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
1882.5	19230.77	19230.77

LTE band 25, 20MHz Bandwidth, QPSK (-26dBc BW)
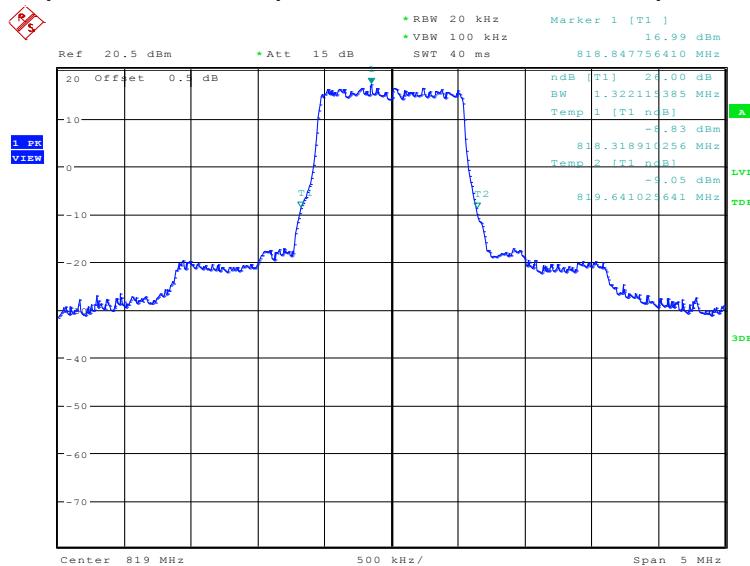
Date: 24.DEC.2019 00:23:12

LTE band 25, 20MHz Bandwidth, 16QAM (-26dBc BW)
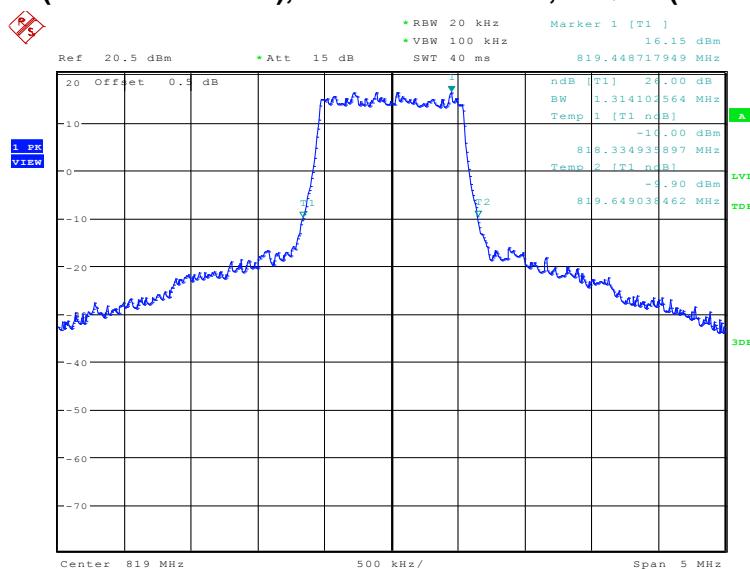
Date: 24.DEC.2019 00:24:38

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

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
819.0	1322.12	1314.10

LTE band 26(814MHz~824MHz), 1.4MHz Bandwidth, QPSK (-26dBc BW)
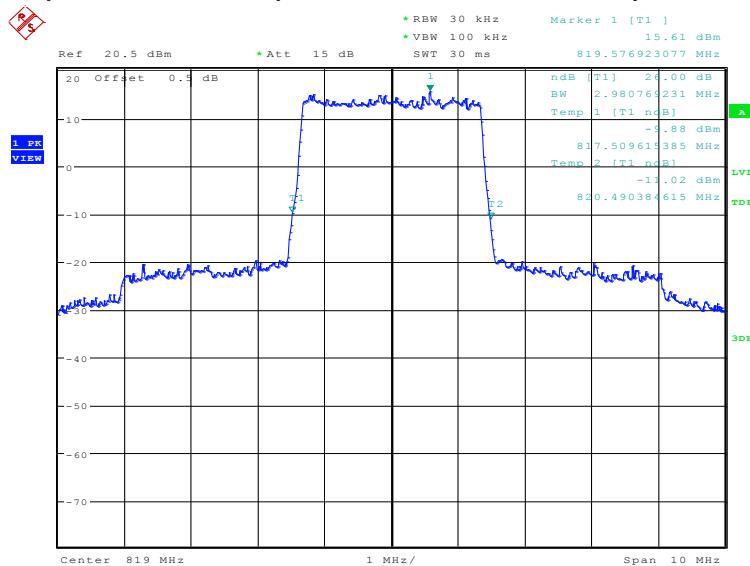
Date: 24.DEC.2019 00:42:09

LTE band 26(814MHz~824MHz), 1.4MHz Bandwidth, 16QAM (-26dBc BW)
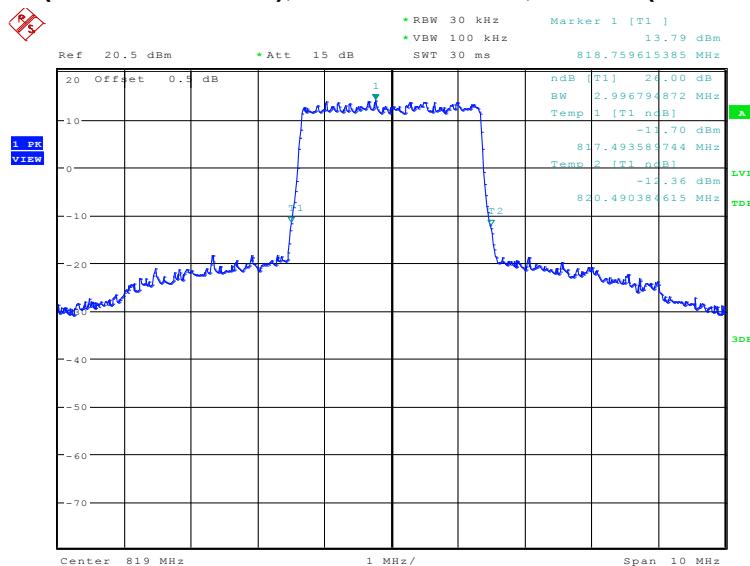
Date: 24.DEC.2019 00:43:35

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

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
819.0	2980.77	2996.79

LTE band 26(814MHz~824MHz), 3MHz Bandwidth, QPSK (-26dBc BW)
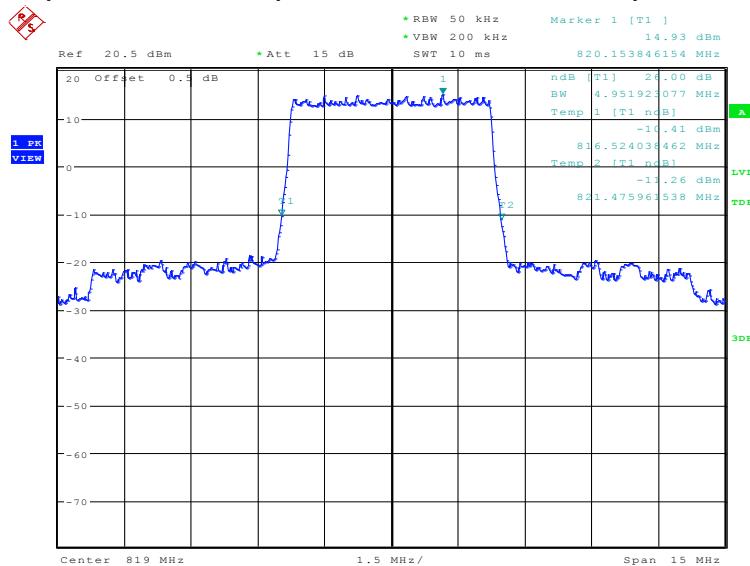
Date: 24.DEC.2019 00:45:02

LTE band 26(814MHz~824MHz), 3MHz Bandwidth, 16QAM (-26dBc BW)
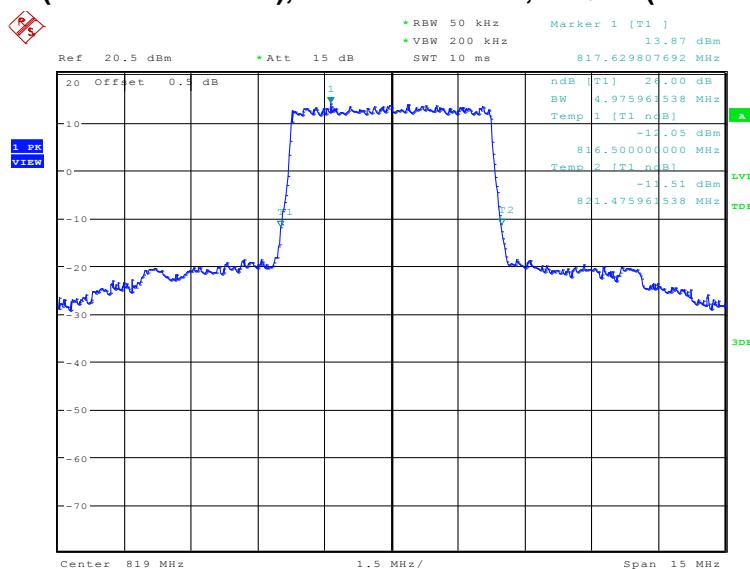
Date: 24.DEC.2019 00:46:27

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

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

LTE band 26(814MHz~824MHz), 5MHz Bandwidth, QPSK (-26dBc BW)
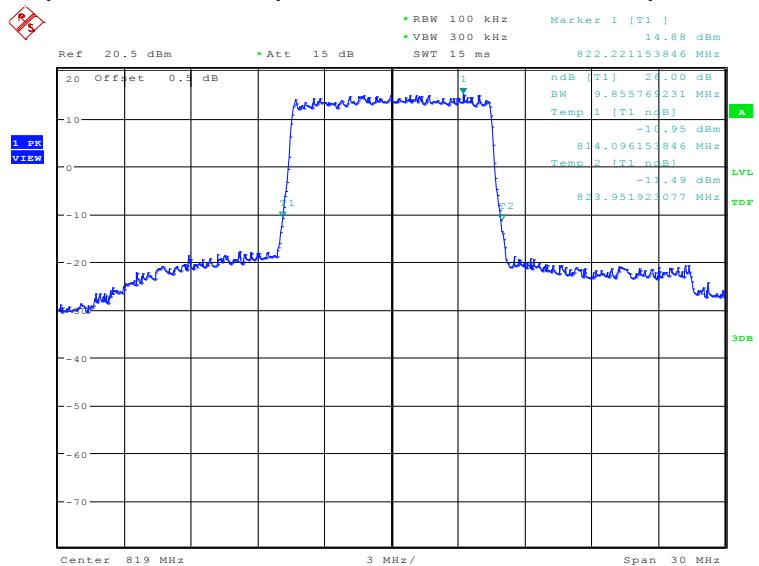
Date: 24.DEC.2019 00:47:55

LTE band 26(814MHz~824MHz), 5MHz Bandwidth, 16QAM (-26dBc BW)
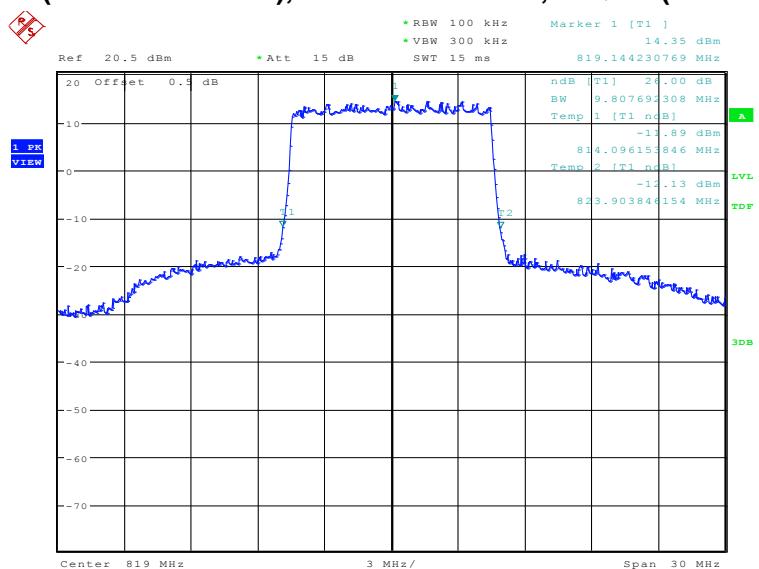
Date: 24.DEC.2019 00:49:20

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

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
819.0	9855.77	9807.69

LTE band 26(814MHz~824MHz), 10MHz Bandwidth, QPSK (-26dBc BW)
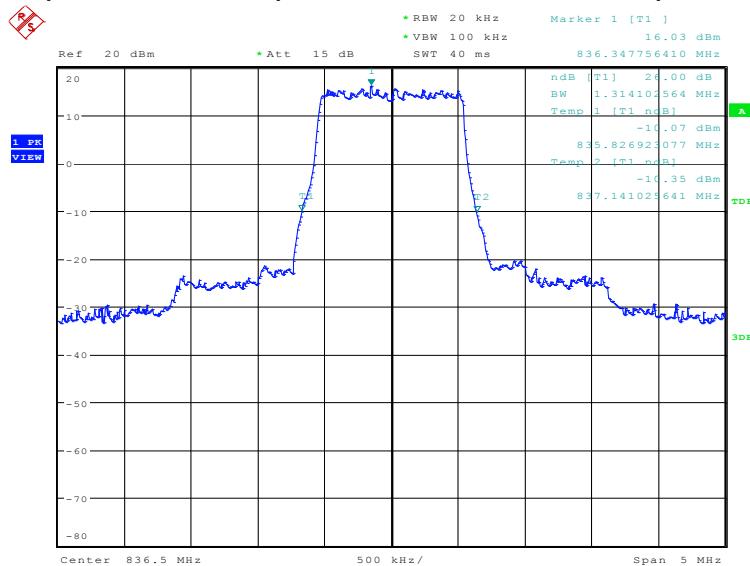
Date: 24.DEC.2019 00:50:47

LTE band 26(814MHz~824MHz), 10MHz Bandwidth, 16QAM (-26dBc BW)
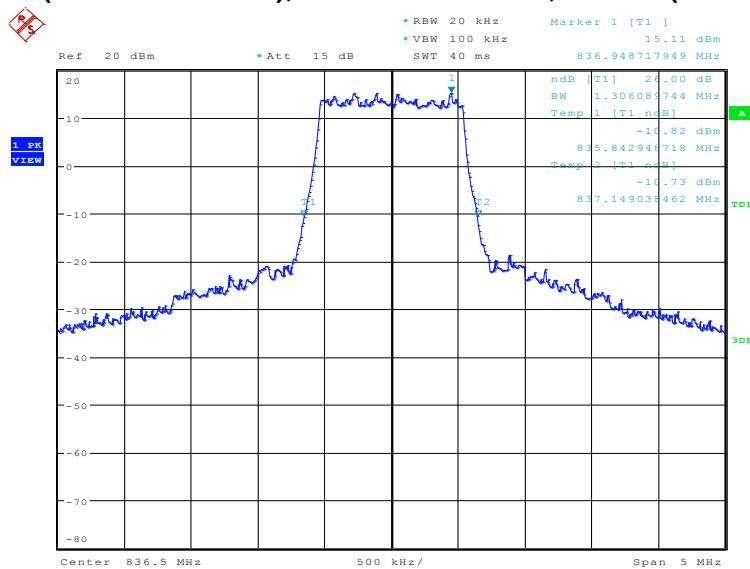
Date: 24.DEC.2019 00:52:13

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)
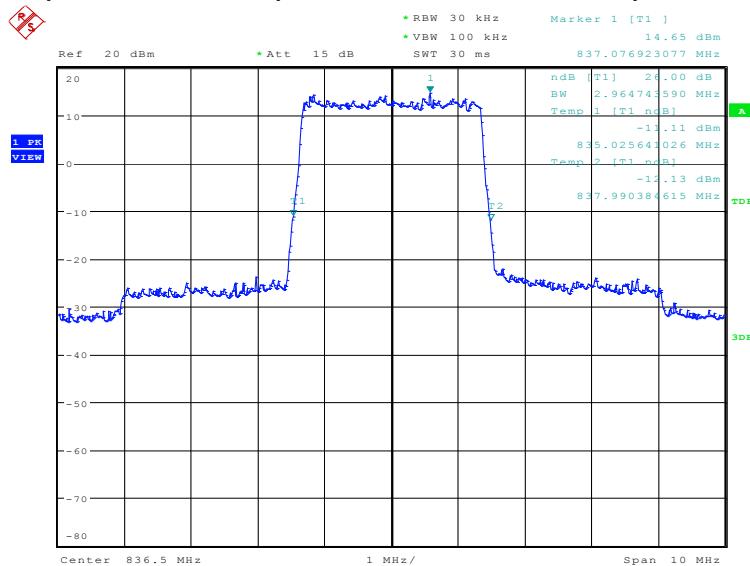
Date: 24.DEC.2019 00:26:58

LTE band 26(824MHz~849MHz), 1.4MHz Bandwidth, 16QAM (-26dBc BW)
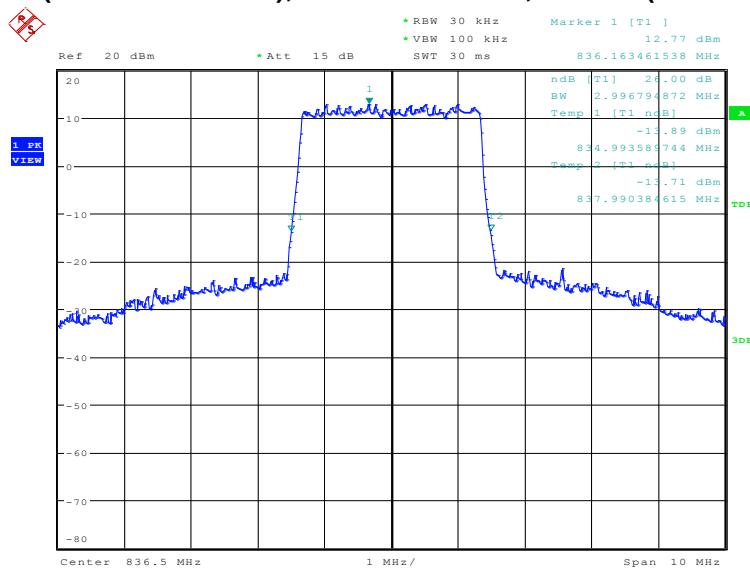
Date: 24.DEC.2019 00:28:24

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

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
836.5	2964.74	2996.79

LTE band 26(824MHz~849MHz), 3MHz Bandwidth, QPSK (-26dBc BW)
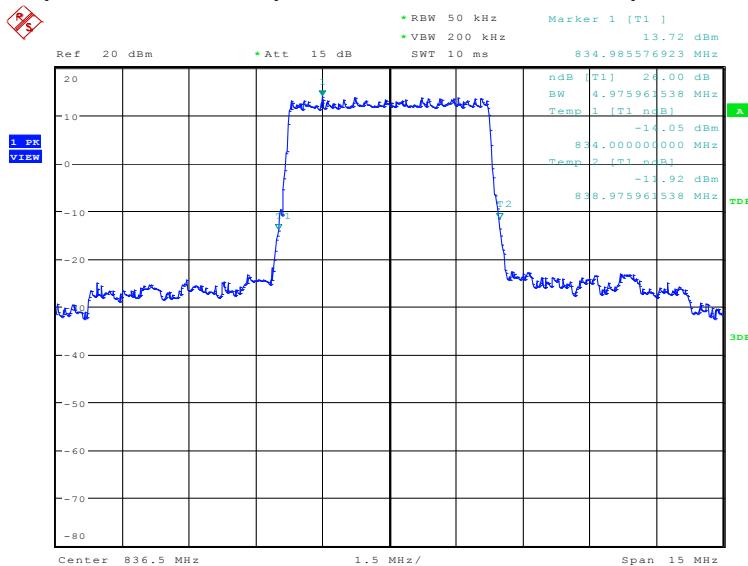
Date: 24.DEC.2019 00:29:51

LTE band 26(824MHz~849MHz), 3MHz Bandwidth, 16QAM (-26dBc BW)
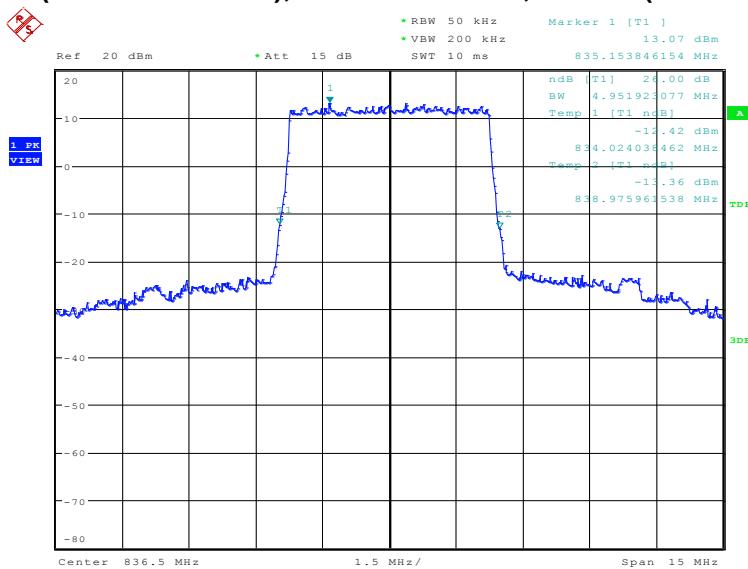
Date: 24.DEC.2019 00:31:16

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

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

LTE band 26(824MHz~849MHz), 5MHz Bandwidth, QPSK (-26dBc BW)
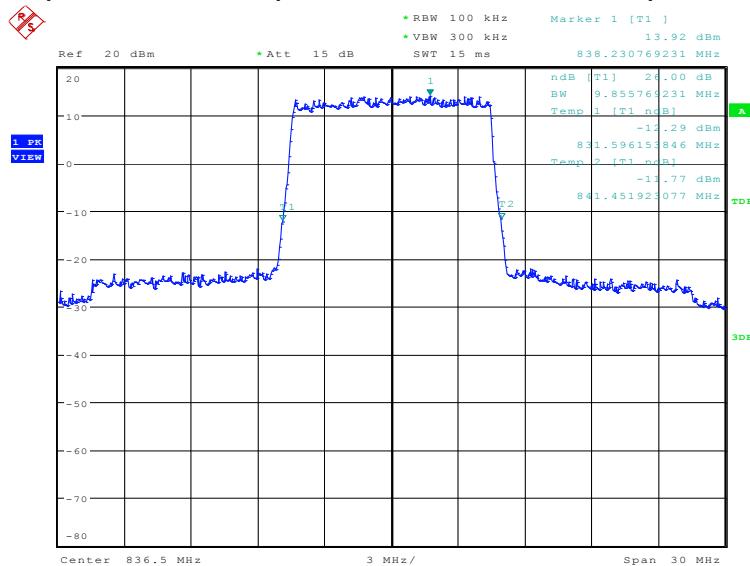
Date: 24.DEC.2019 00:32:43

LTE band 26(824MHz~849MHz), 5MHz Bandwidth, 16QAM (-26dBc BW)
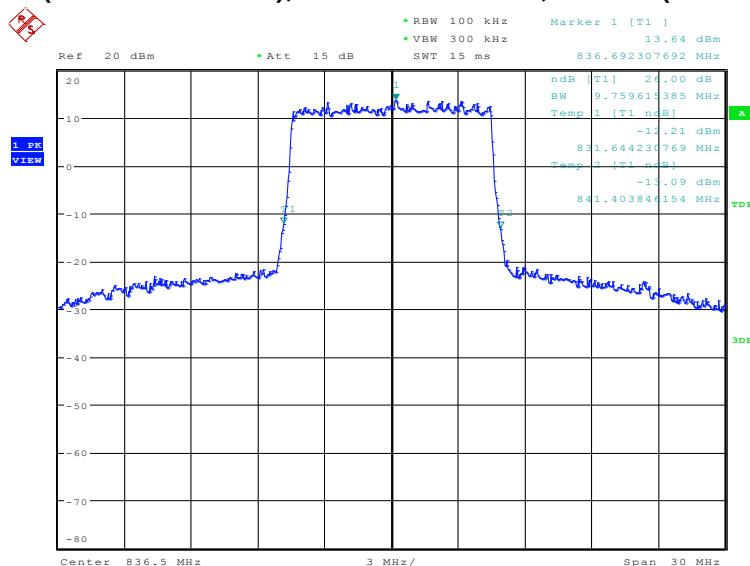
Date: 24.DEC.2019 00:34:09

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

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

LTE band 26(824MHz~849MHz), 10MHz Bandwidth, QPSK (-26dBc BW)
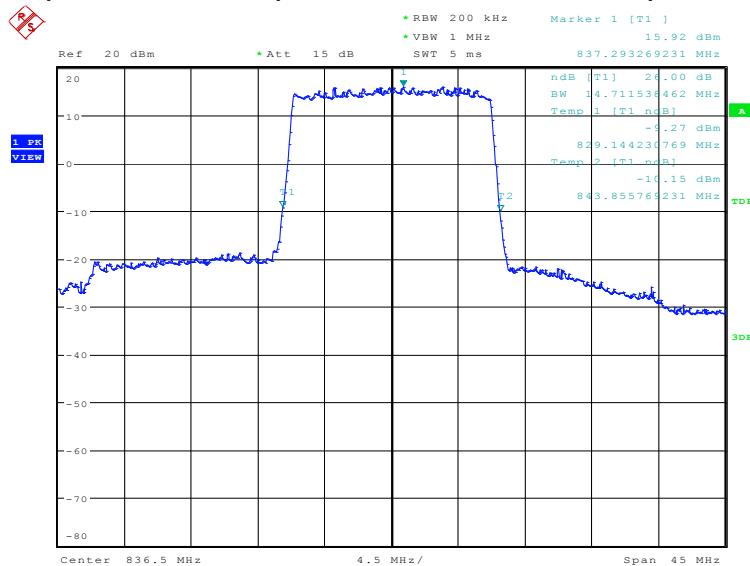
Date: 24.DEC.2019 00:35:36

LTE band 26(824MHz~849MHz), 10MHz Bandwidth, 16QAM (-26dBc BW)
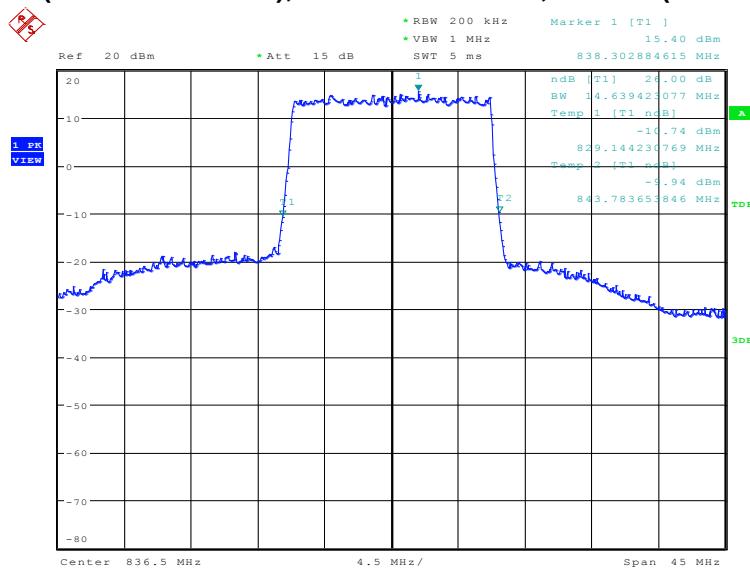
Date: 24.DEC.2019 00:37:02

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

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
836.5	QPSK	16QAM
	14711.54	14639.42

LTE band 26(824MHz~849MHz), 15MHz Bandwidth, QPSK (-26dBc BW)
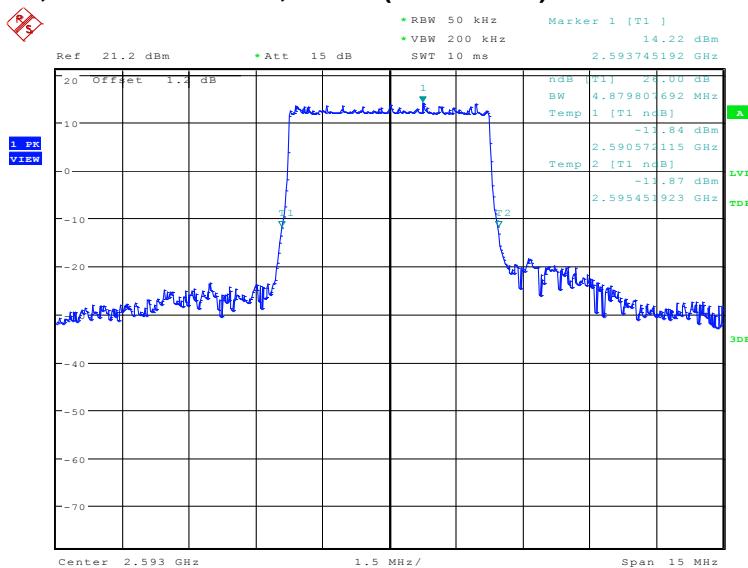
Date: 24.DEC.2019 00:38:29

LTE band 26(824MHz~849MHz), 15MHz Bandwidth, 16QAM (-26dBc BW)
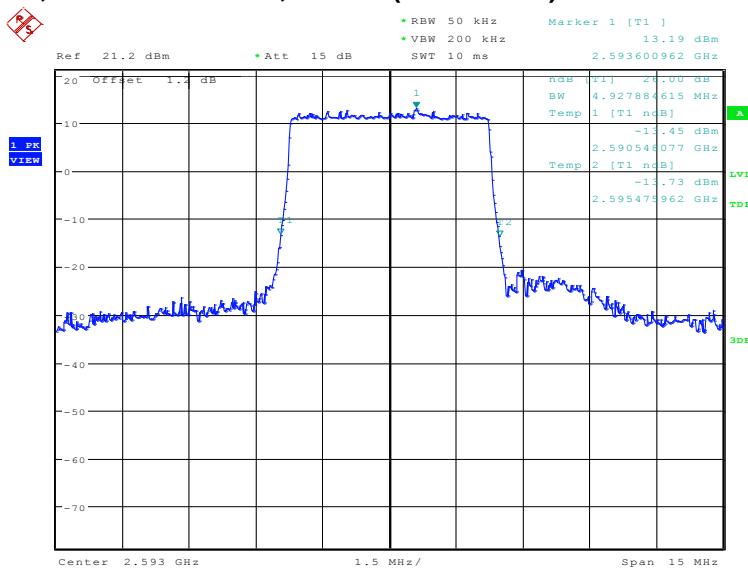
Date: 24.DEC.2019 00:39:55

LTE band 41, 5MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
2593.0	QPSK	16QAM
	4879.81	4927.88

LTE band 41, 5MHz Bandwidth, QPSK (-26dBc BW)
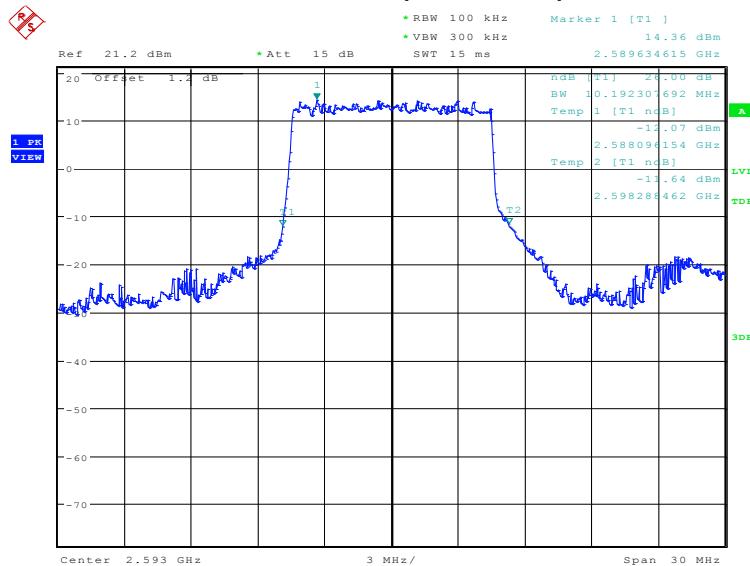
Date: 6.JAN.2020 13:52:01

LTE band 41, 5MHz Bandwidth,16QAM (-26dBc BW)
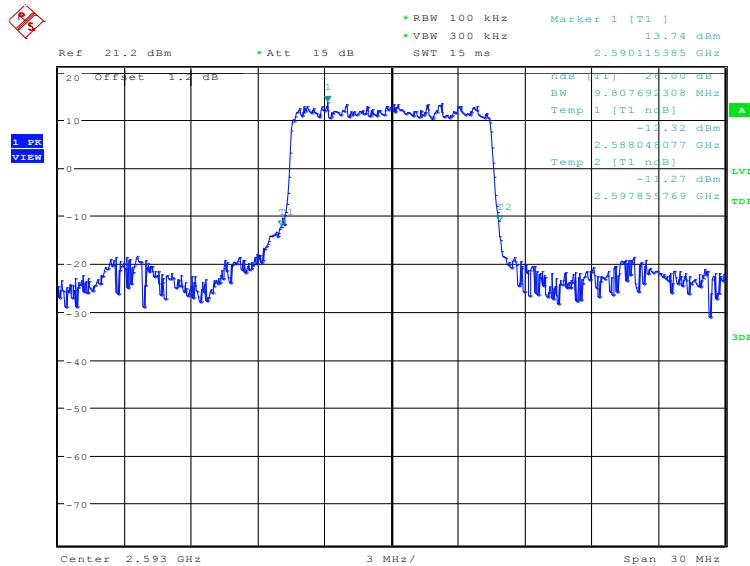
Date: 6.JAN.2020 13:53:26

LTE band 41, 10MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
2593.0	10192.31	9807.69

LTE band 41, 10MHz Bandwidth, QPSK (-26dBc BW)
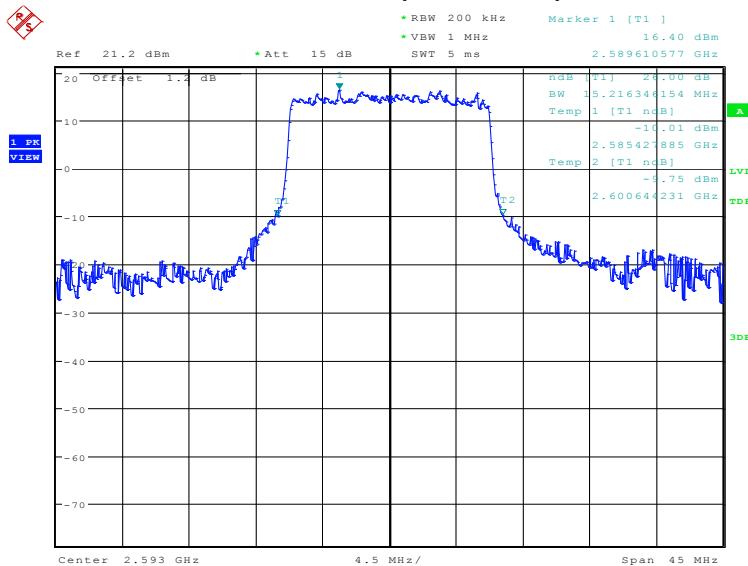
Date: 6.JAN.2020 13:54:52

LTE band 41, 10MHz Bandwidth,16QAM (-26dBc BW)
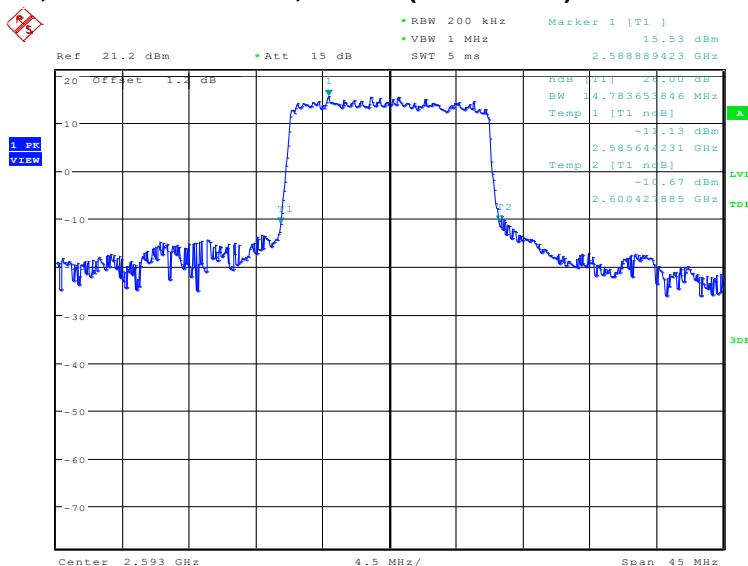
Date: 6.JAN.2020 13:56:16

LTE band 41, 15MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
2593.0	15216.35	14783.65

LTE band 41, 15MHz Bandwidth, QPSK (-26dBc BW)
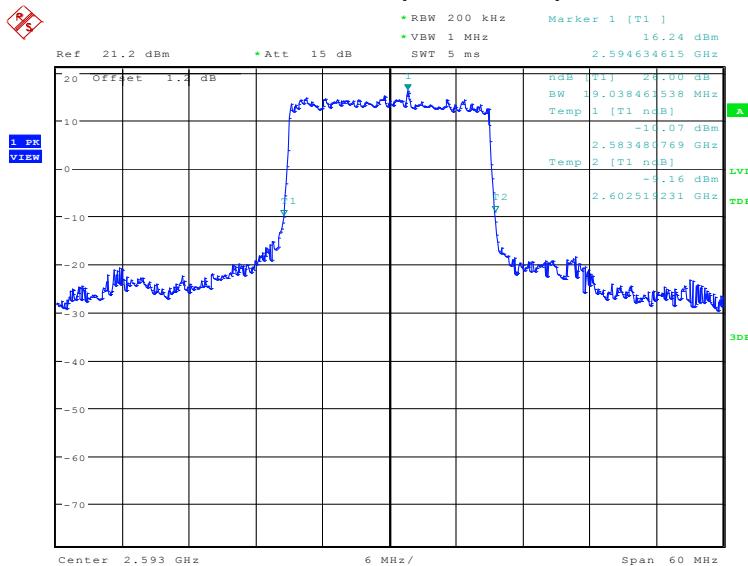
Date: 6.JAN.2020 13:57:43

LTE band 41, 15MHz Bandwidth,16QAM (-26dBc BW)
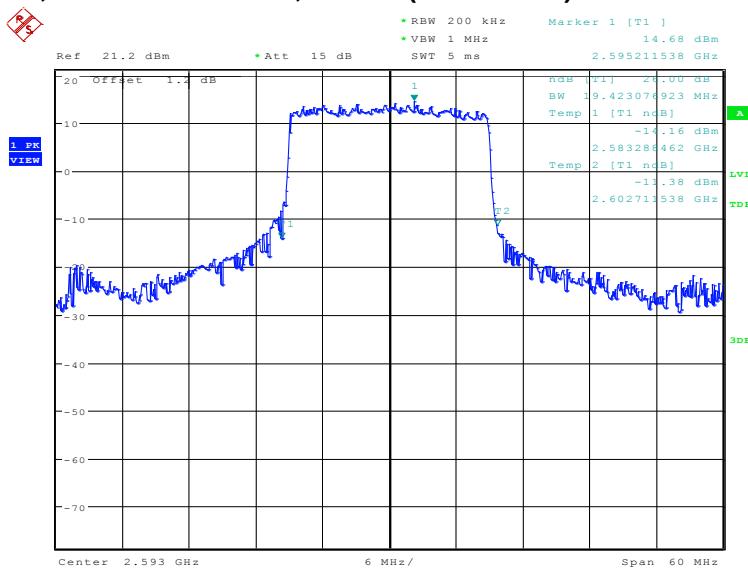
Date: 6.JAN.2020 13:59:07

LTE band 41, 20MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
2593.0	19038.46	19423.08

LTE band 41, 20MHz Bandwidth, QPSK (-26dBc BW)
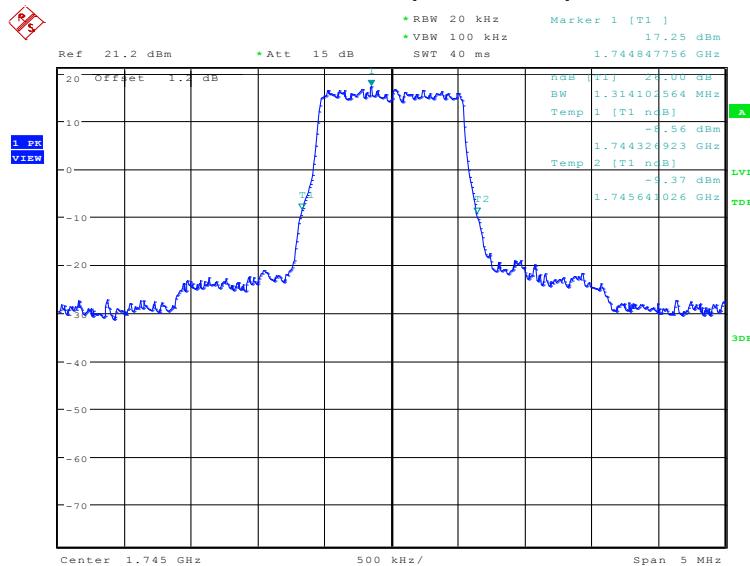
Date: 6.JAN.2020 14:00:33

LTE band 41, 20MHz Bandwidth,16QAM (-26dBc BW)
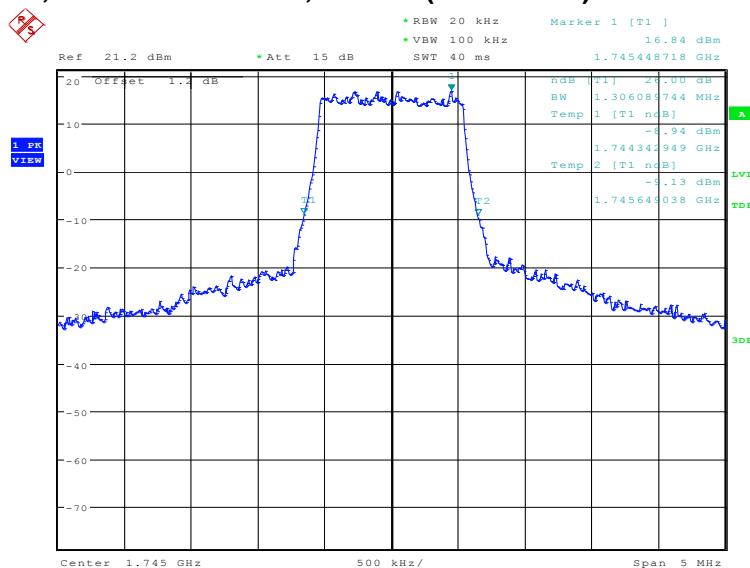
Date: 6.JAN.2020 14:01:58

LTE band 66, 1.4MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
1745.0		
	1314.10	1306.09

LTE band 66, 1.4MHz Bandwidth, QPSK (-26dBc BW)
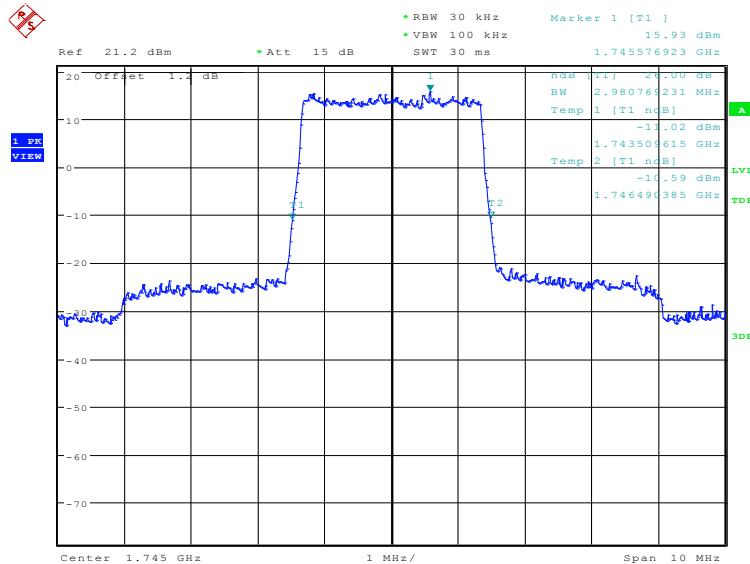
Date: 24.DEC.2019 00:53:46

LTE band 66, 1.4MHz Bandwidth, 16QAM (-26dBc BW)
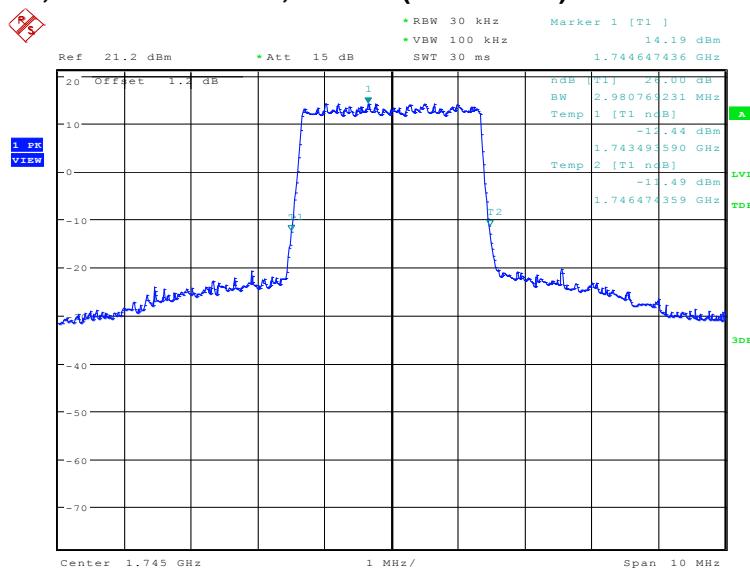
Date: 24.DEC.2019 00:55:12

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LTE band 66, 3MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
1745.0	2980.77	2980.77

LTE band 66, 3MHz Bandwidth, QPSK (-26dBc BW)
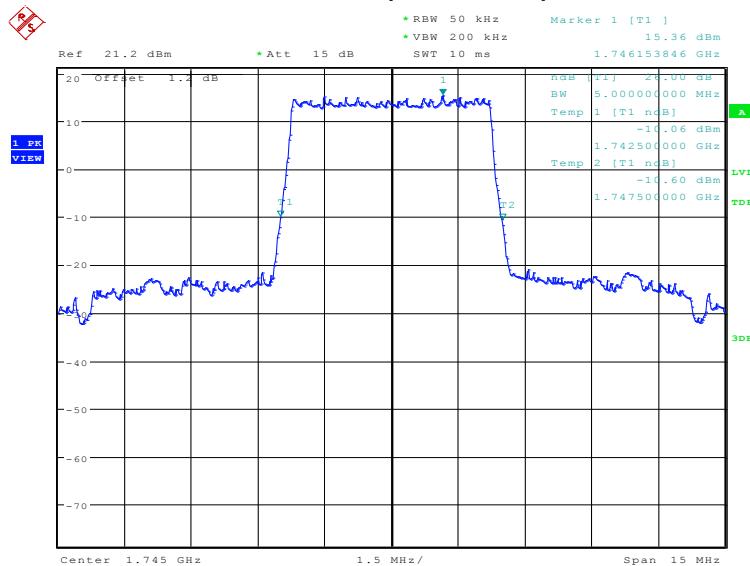
Date: 24.DEC.2019 00:56:39

LTE band 66, 3MHz Bandwidth, 16QAM (-26dBc BW)
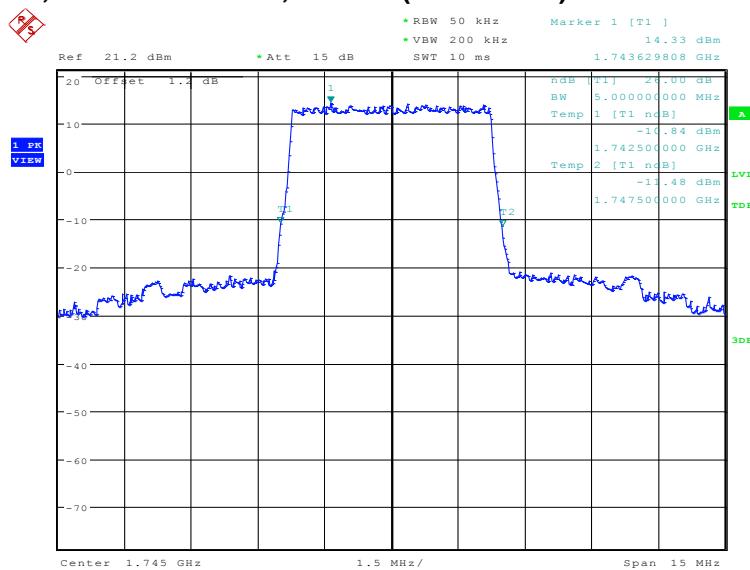
Date: 24.DEC.2019 00:58:05

LTE band 66, 5MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
1745.0	5000.00	5000.00

LTE band 66, 5MHz Bandwidth, QPSK (-26dBc BW)
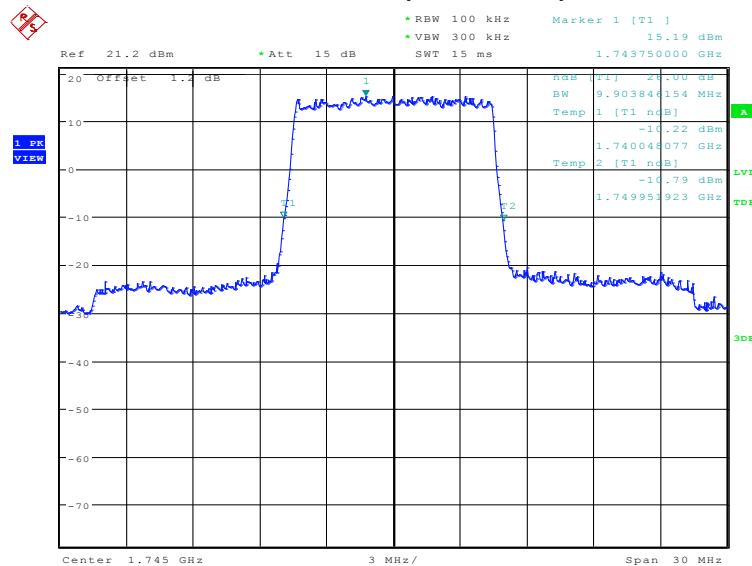
Date: 24.DEC.2019 00:59:32

LTE band 66, 5MHz Bandwidth, 16QAM (-26dBc BW)
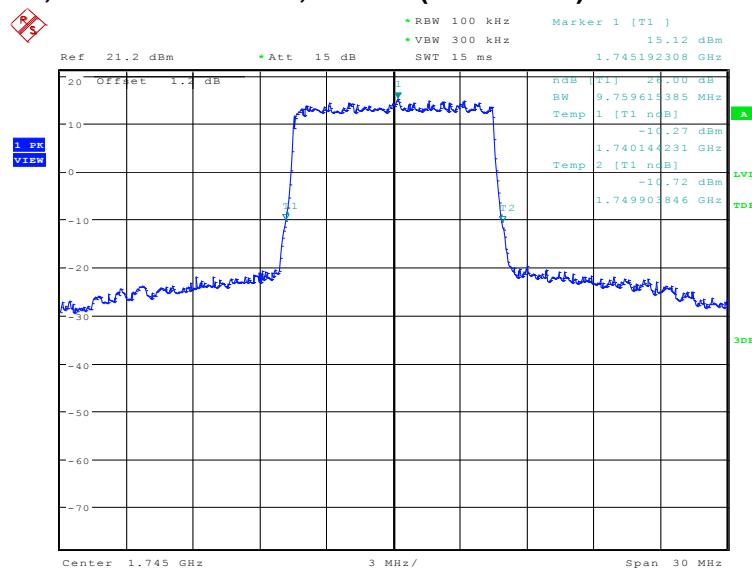
Date: 24.DEC.2019 01:00:57

LTE band 66, 10MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
1745.0	9903.85	9759.62

LTE band 66, 10MHz Bandwidth, QPSK (-26dBc BW)
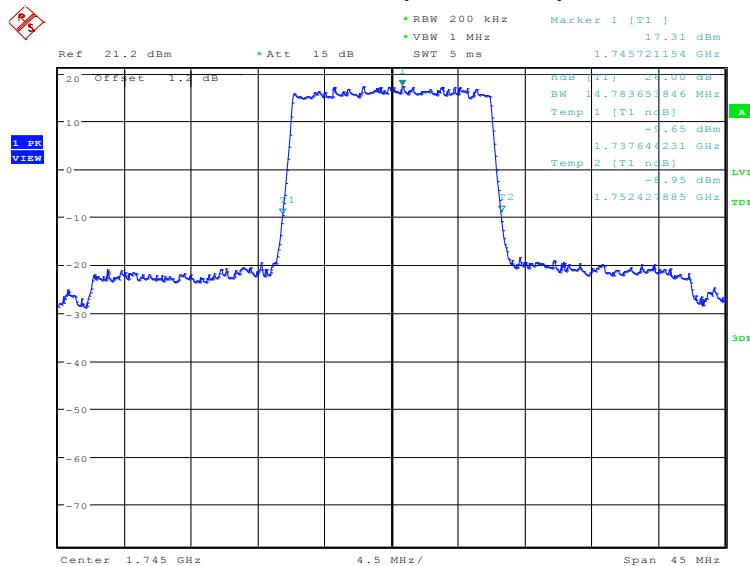
Date: 24.DEC.2019 01:02:25

LTE band 66, 10MHz Bandwidth, 16QAM (-26dBc BW)
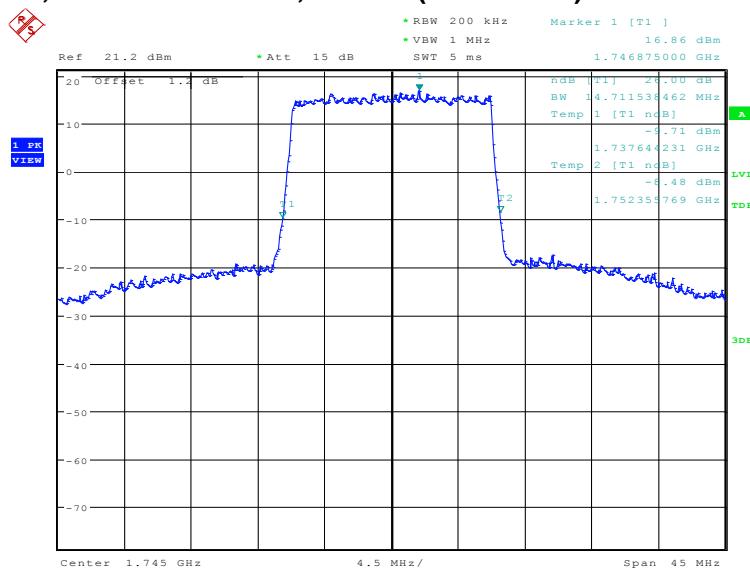
Date: 24.DEC.2019 01:03:51

LTE band 66, 15MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
1745.0	14783.65	14711.54

LTE band 66, 15MHz Bandwidth, QPSK (-26dBc BW)
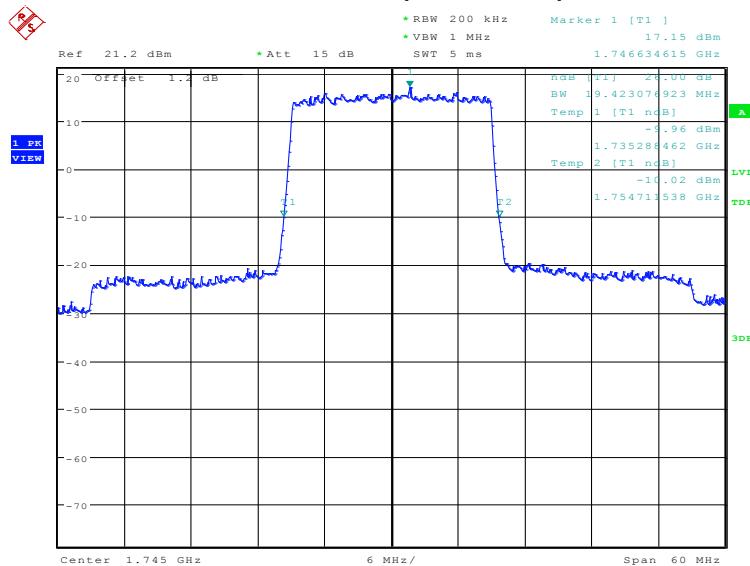
Date: 24.DEC.2019 01:05:18

LTE band 66, 15MHz Bandwidth, 16QAM (-26dBc BW)
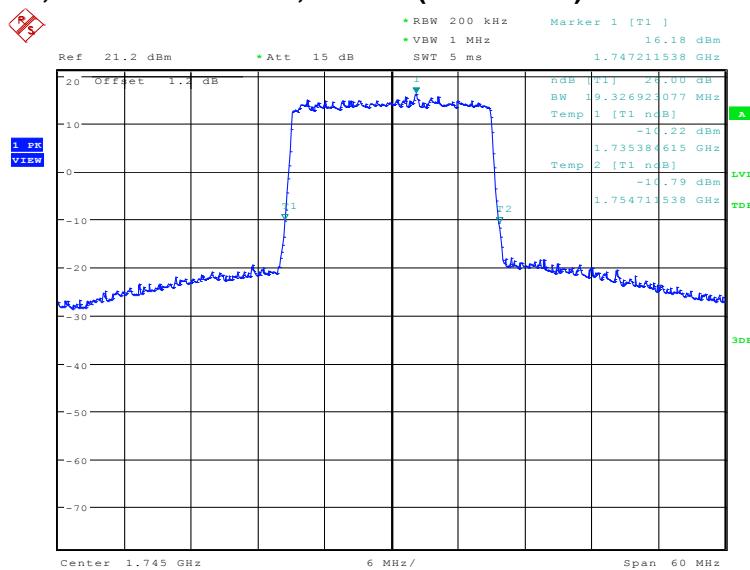
Date: 24.DEC.2019 01:06:43

LTE band 66, 20MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
1745.0	19423.08	19326.92

LTE band 66, 20MHz Bandwidth, QPSK (-26dBc BW)
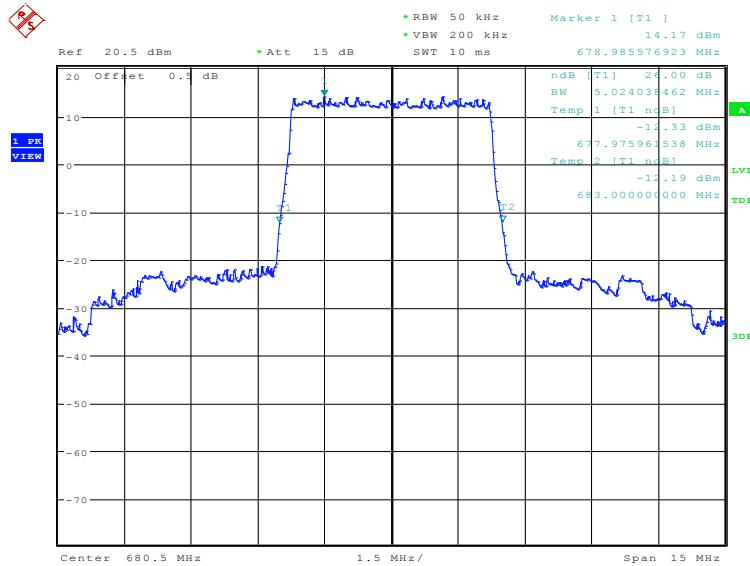
Date: 24.DEC.2019 01:08:11

LTE band 66, 20MHz Bandwidth, 16QAM (-26dBc BW)
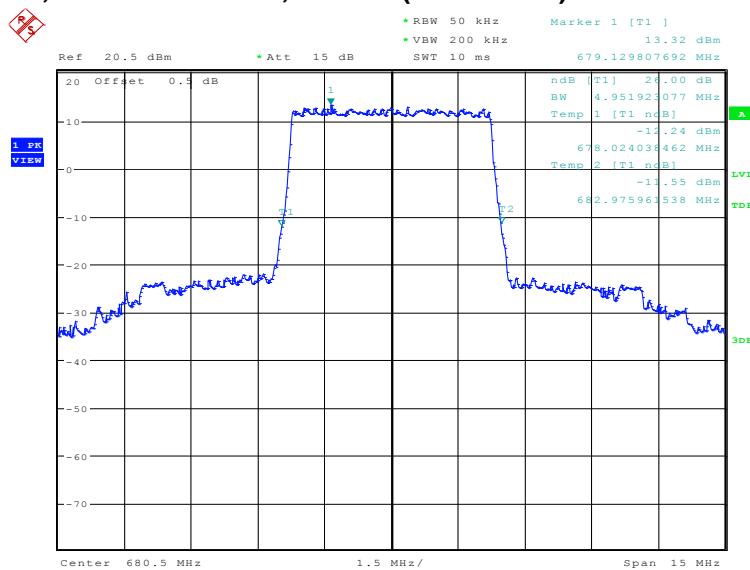
Date: 24.DEC.2019 01:09:36

LTE band 71, 5MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
680.5	QPSK	16QAM
	5024.04	4951.92

LTE band 71, 5MHz Bandwidth, QPSK (-26dBc BW)
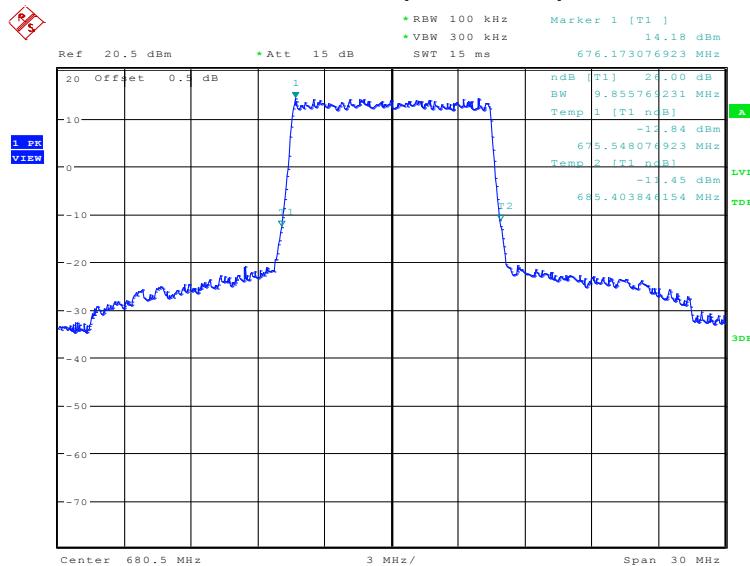
Date: 24.DEC.2019 01:11:45

LTE band 71, 5MHz Bandwidth, 16QAM (-26dBc BW)
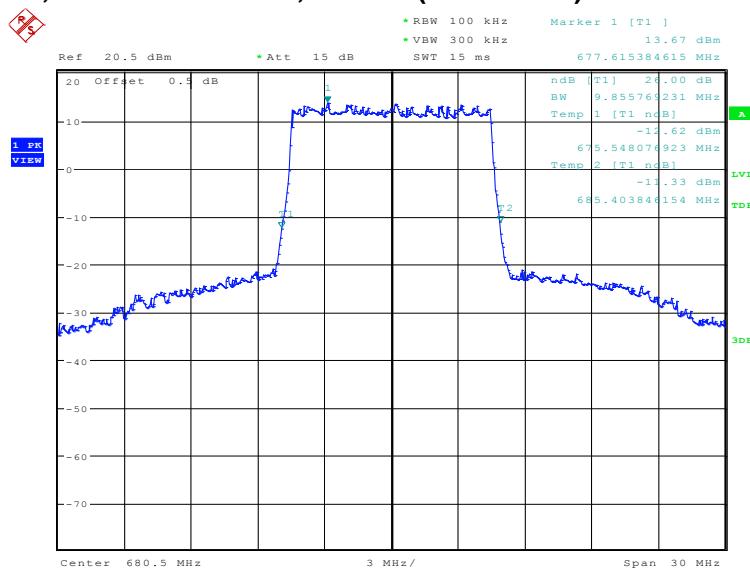

Date: 24.DEC.2019 01:13:11

LTE band 71, 10MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
680.5	9855.77	9855.77

LTE band 71, 10MHz Bandwidth, QPSK (-26dBc BW)
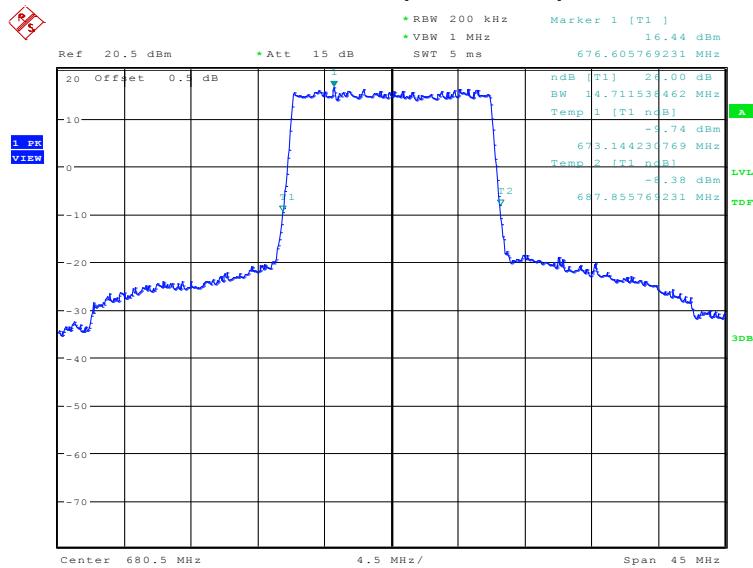
Date: 24.DEC.2019 01:14:38

LTE band 71, 10MHz Bandwidth, 16QAM (-26dBc BW)
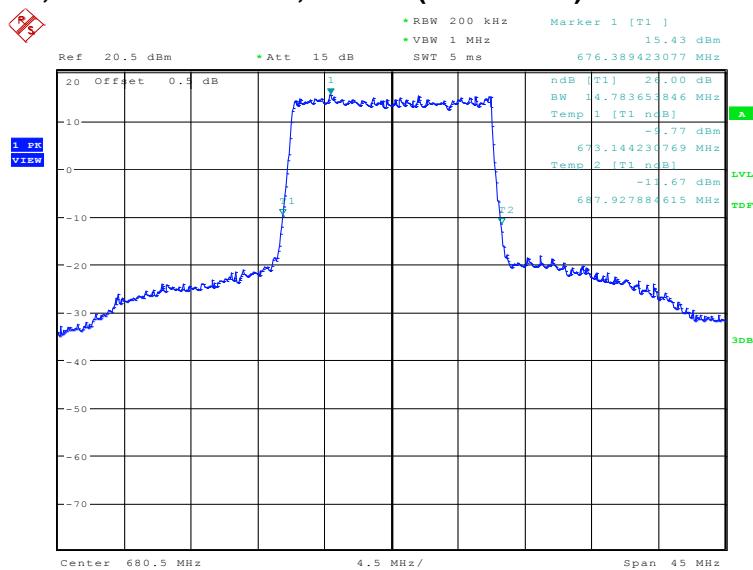
Date: 24.DEC.2019 01:16:04

LTE band 71, 15MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
680.5	14711.54	14783.65

LTE band 71, 15MHz Bandwidth, QPSK (-26dBc BW)
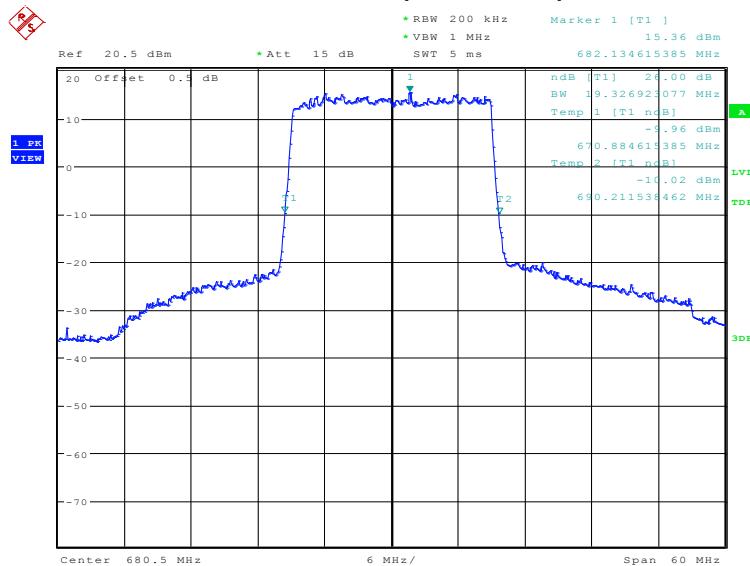
Date: 24.DEC.2019 01:17:31

LTE band 71, 15MHz Bandwidth, 16QAM (-26dBc BW)
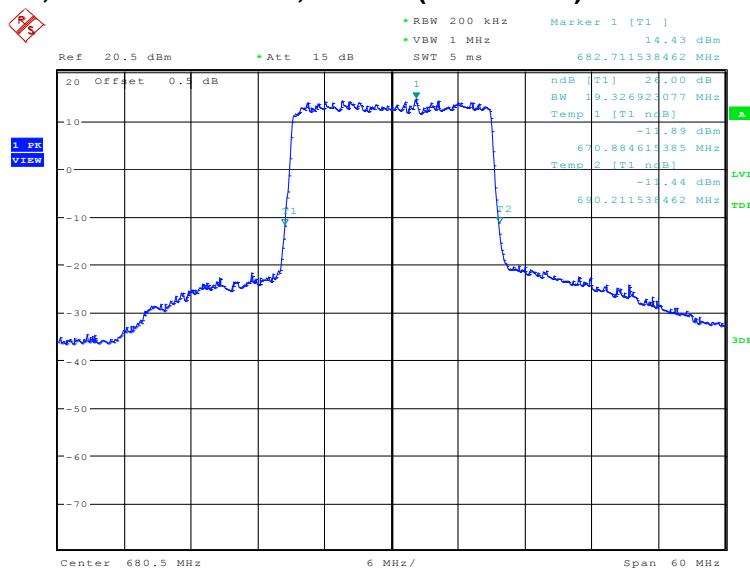
Date: 24.DEC.2019 01:18:57

LTE band 71, 20MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
680.5	19326.92	19326.92

LTE band 71, 20MHz Bandwidth, QPSK (-26dBc BW)

Date: 24.DEC.2019 01:20:24

LTE band 71, 20MHz Bandwidth, 16QAM (-26dBc BW)

Date: 24.DEC.2019 01:21:50

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, 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 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 116Log10(f/6.1) decibels or 50 + 10 Log10(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 $43 + 10Log_{10}(P)$ 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
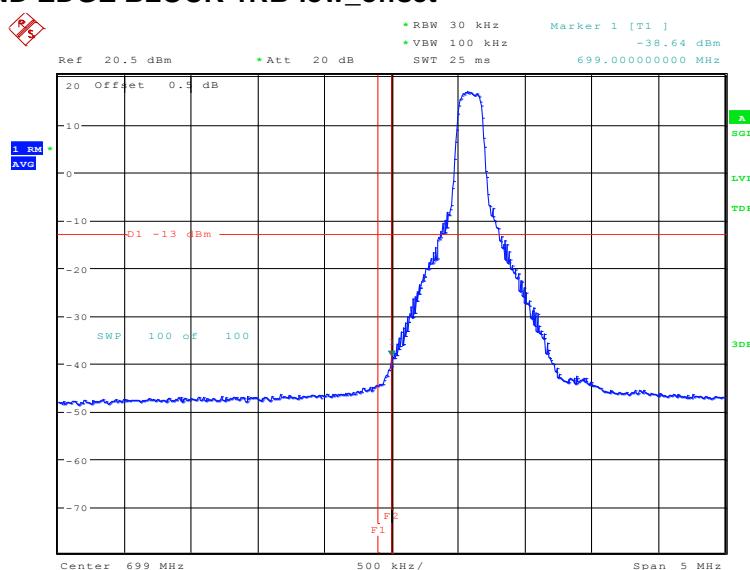
Only the worst case result is given below
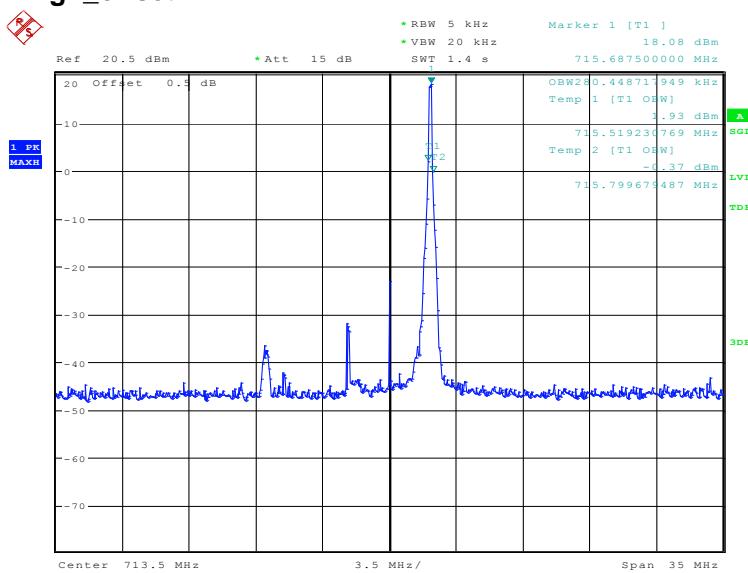
**LTE band 12**

OBW: 1RB-low_offset

Date: 9.JAN.2020 15:59:49

LOW BAND EDGE BLOCK-1RB-low_offset
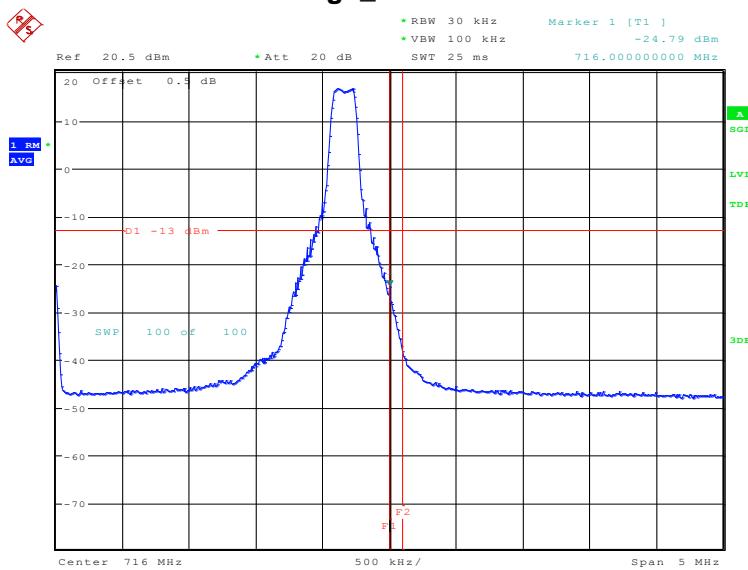

Date: 9.JAN.2020 16:01:27
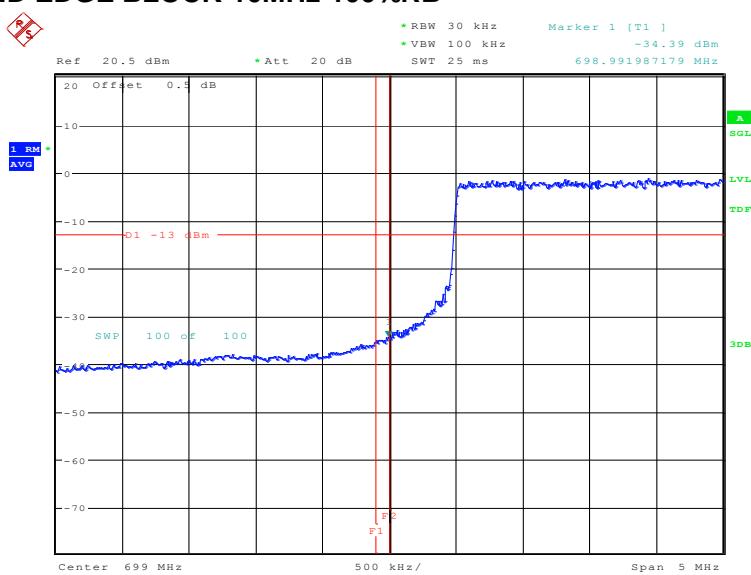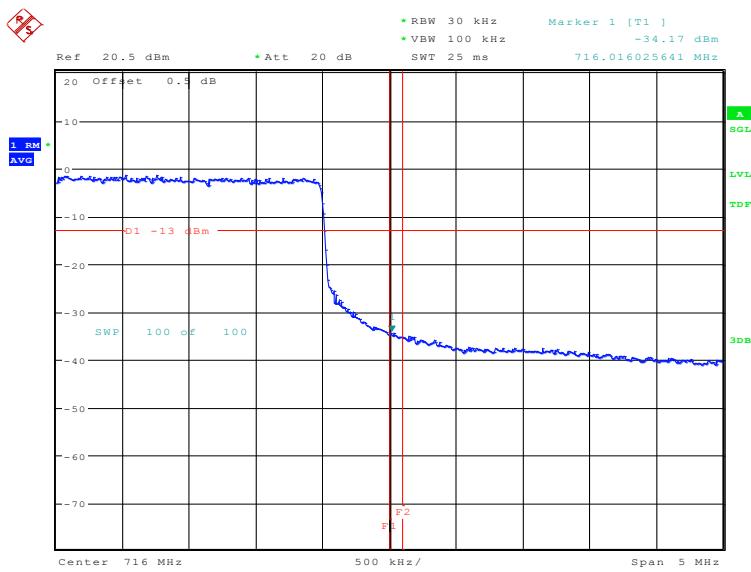
OBW: 1RB-high_offset

Date: 9.JAN.2020 16:05:19

## HIGH BAND EDGE BLOCK-1RB-high_offset

Date: 9.JAN.2020 16:06:57

LOW BAND EDGE BLOCK-10MHz-100%RB


```
                                        * RBW  30 kHz        Marker 1 [T1 ]
                                        * VBW  100 kHz              -34.39 dBm
      Ref  20.5 dBm      * Att  20 dB   SWT  25 ms          698.991987179 MHz
      20  Offset   0.5  dB                                                        A
     -10                                                                         SGL
   1 RM *
   AVG
      -0                                                                         LVL
     -10                                                                         TDF
          D1 -13 dBm
     -20
     -30
          SWP   100 of  100                                                      3DB
     -40
     -50
     -60
     -70
                                         F2
                                         F1
      Center  699 MHz          500 kHz/                      Span  5 MHz
```
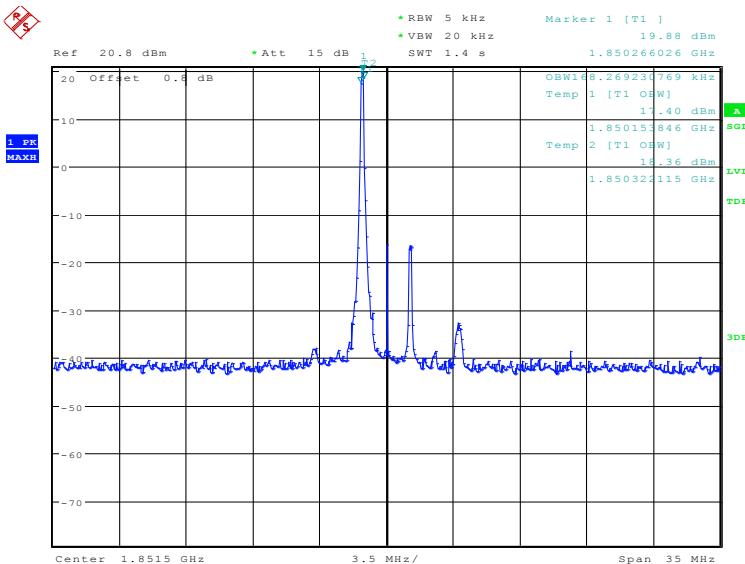
Date: 9.JAN.2020 16:03:20

HIGH BAND EDGE BLOCK-10MHz-100%RB


```
                                        * RBW  30 kHz        Marker 1 [T1 ]
                                        * VBW  100 kHz              -34.17 dBm
      Ref  20.5 dBm      * Att  20 dB   SWT  25 ms          716.016025641 MHz
      20  Offset   0.5  dB                                                        A
     -10                                                                         SGL
   1 RM *
   AVG
      -0                                                                         LVL
     -10                                                                         TDF
          D1 -13 dBm
     -20
     -30
          SWP   100 of  100                                                      3DB
     -40
     -50
     -60
     -70
                                         F2
                                         F1
      Center  716 MHz          500 kHz/                      Span  5 MHz
```

Date: 9.JAN.2020 16:08:52
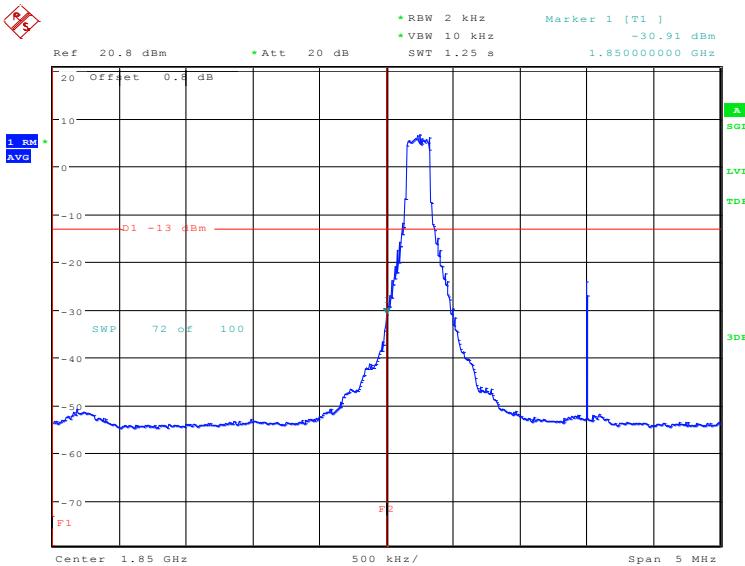
LTE band 25
OBW: 1RB-low_offset

* RBW 5 kHz	Marker 1 [T1]
* VBW 20 kHz	19.88 dBm
Ref 20.8 dBm * Att 15 dB	SWT 1.4 s 1.850266026 GHz

20 Offset 0.8 dB

OBW168.269230769 kHz
Temp 1 [T1 OBW]
17.40 dBm
1.850153846 GHz
Temp 2 [T1 OBW]
18.36 dBm
1.850322115 GHz

1 PK
MAXH

A
SGL
LVL
TDF

3DB

Center 1.8515 GHz   3.5 MHz/   Span 35 MHz
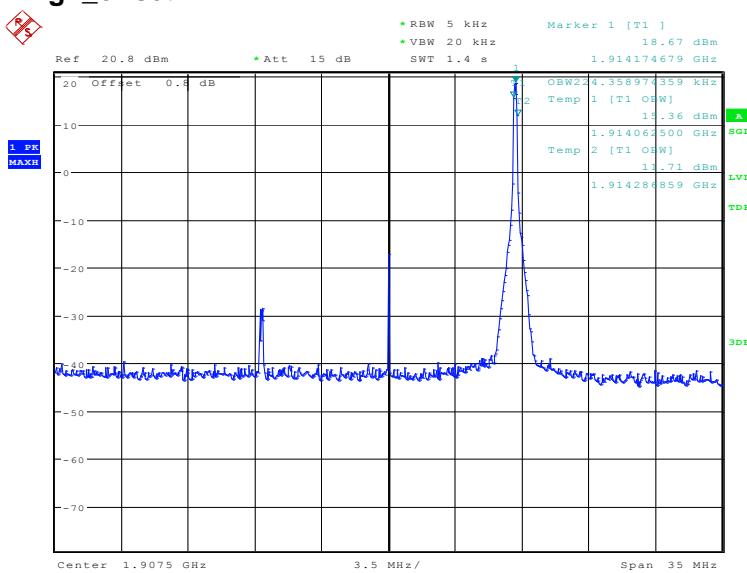
Date: 9.JAN.2020 16:10:52

LOW BAND EDGE BLOCK-1RB-low_offset

* RBW 2 kHz	Marker 1 [T1]
* VBW 10 kHz	-30.91 dBm
Ref 20.8 dBm * Att 20 dB	SWT 1.25 s 1.850000000 GHz

20 Offset 0.8 dB

1 RM
AVG

D1 -13 dBm

SWP   72 of   100

A
SGL
LVL
TDF

3DB

F1
F2

Center 1.85 GHz   500 kHz/   Span 5 MHz
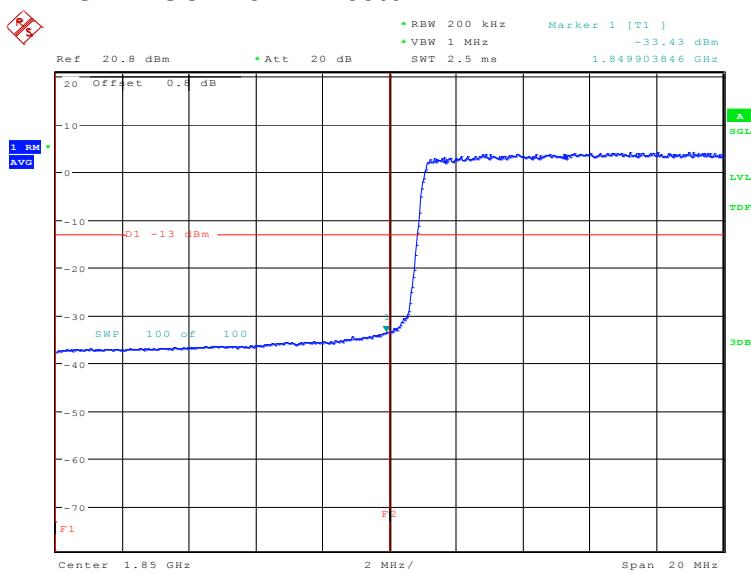
Date: 9.JAN.2020 16:12:31

OBW: 1RB-high_offset
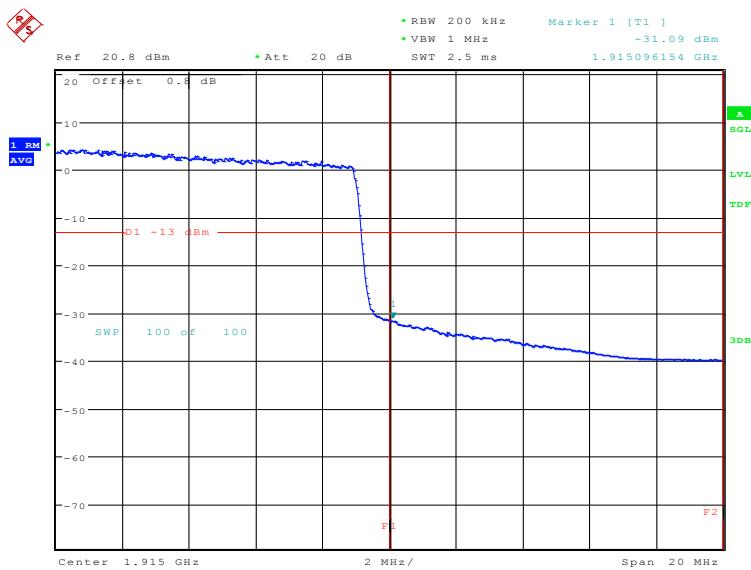
Date: 9.JAN.2020 16:16:24

HIGH BAND EDGE BLOCK-1RB-high_offset

Date: 9.JAN.2020 16:18:03

LOW BAND EDGE BLOCK-20MHz-100%RB
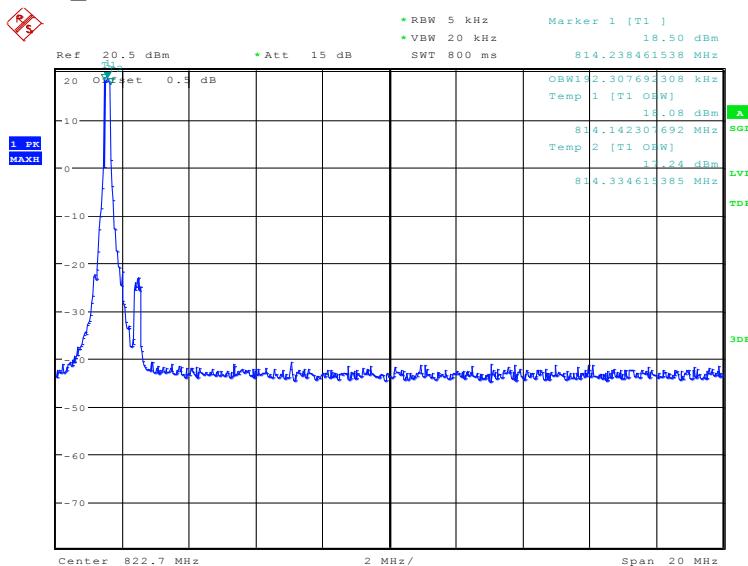
Date: 9.JAN.2020 16:14:25

HIGH BAND EDGE BLOCK-20MHz-100%RB

Date: 9.JAN.2020 16:19:58
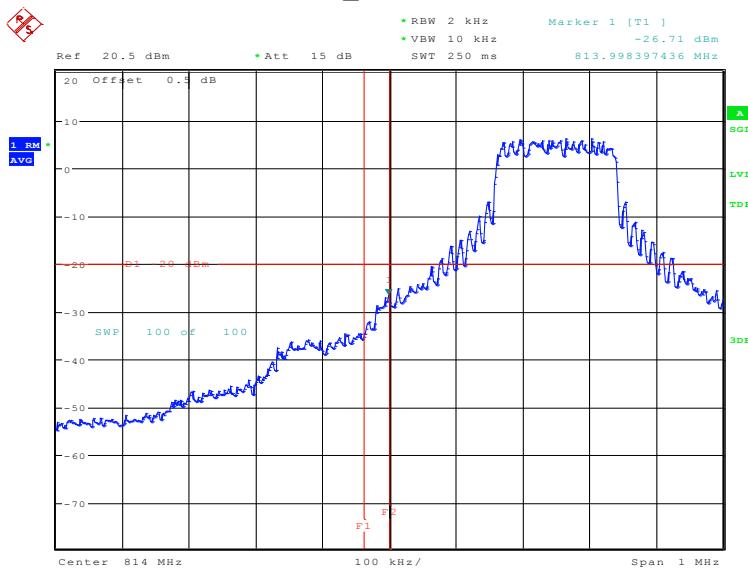
LTE band 26(814MHz~824MHz)

OBW: 1RB-low_offset
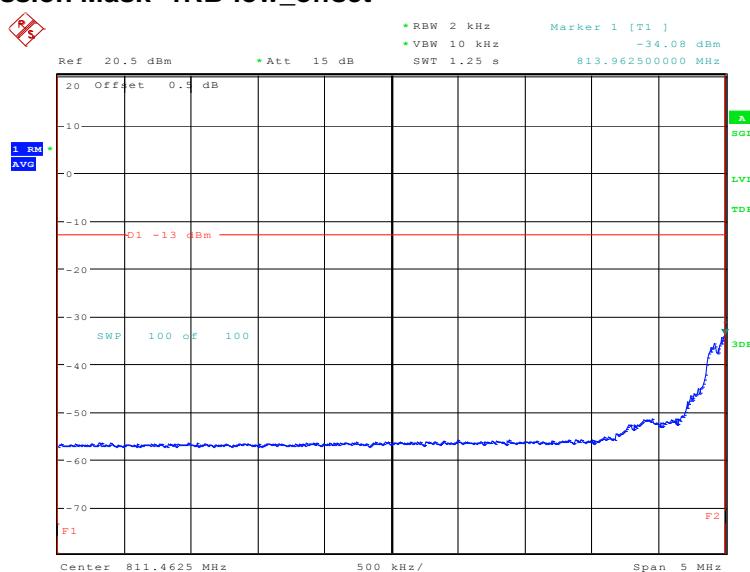
Date: 9.JAN.2020 17:09:45

LOW BAND EDGE BLOCK-1RB-low_offset
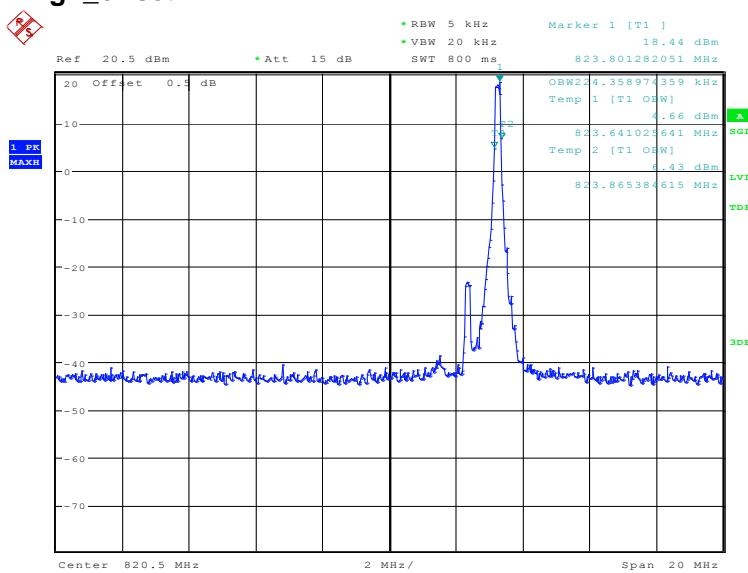

Date: 9.JAN.2020 17:11:55
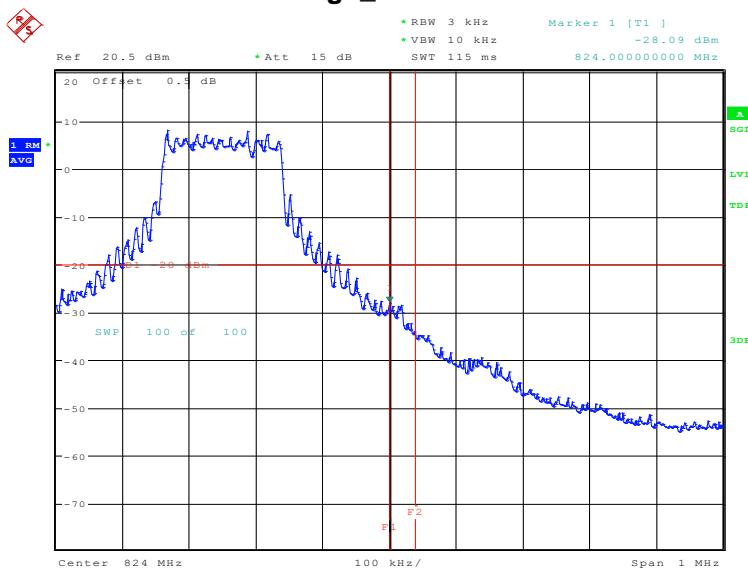
LOW Emission Mask -1RB-low_offset

Date: 9.JAN.2020 17:15:45

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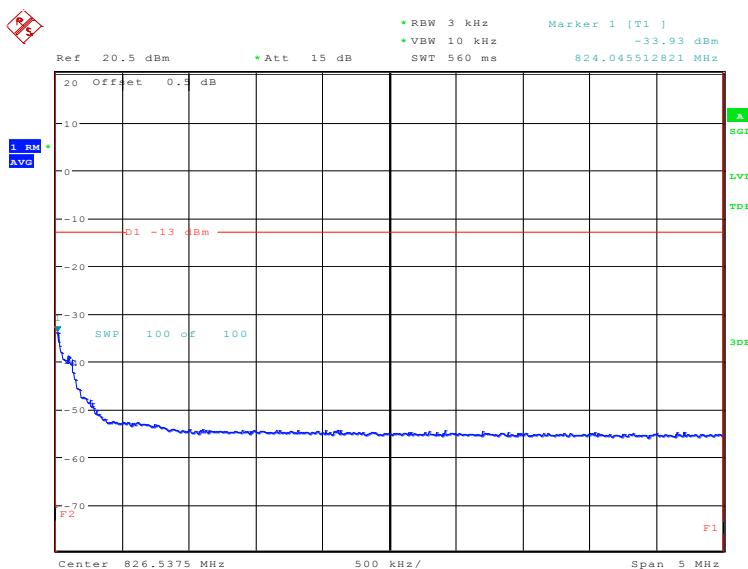
OBW: 1RB-high_offset

Date: 9.JAN.2020 17:29:28

HIGH BAND EDGE BLOCK-1RB-high_offset
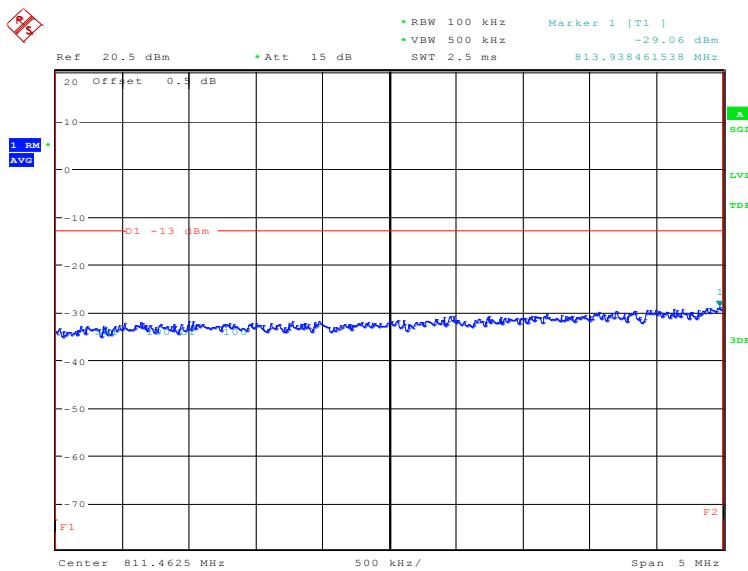
Date: 9.JAN.2020 17:31:24

HIGH Emission Mask -1RB-high_offset

* RBW 3 kHz   Marker 1 [T1]
* VBW 10 kHz   -33.93 dBm
Ref 20.5 dBm   * Att 15 dB   SWT 560 ms   824.045512821 MHz

20 Offset 0.5 dB

A
SGL

LVL

TDF

D1 -13 dBm

1 RM
AVG

SWP 100 of 100

3DB

F2

F1

Center 826.5375 MHz   500 kHz/   Span 5 MHz
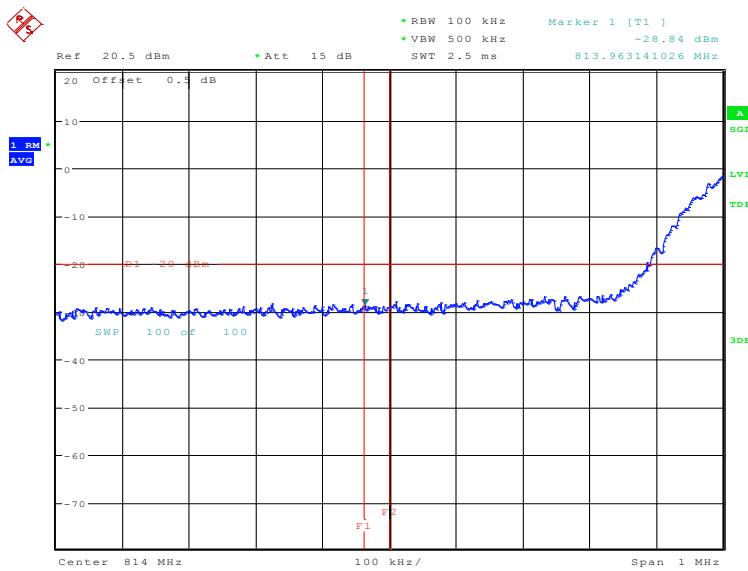
Date: 9.JAN.2020 17:34:07

LOW Emission Mask -10MHz-100%RB
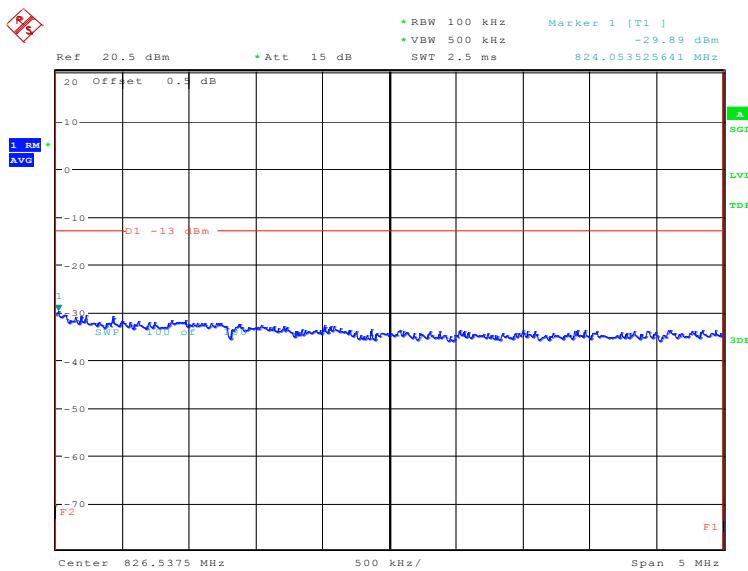
Date: 9.JAN.2020 17:28:01

## LOW BAND EDGE BLOCK-10MHz-100%RB
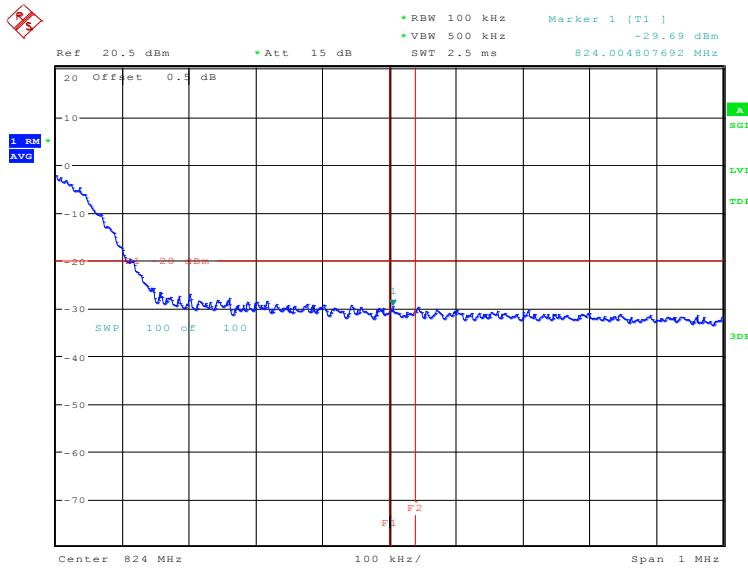
Date: 9.JAN.2020 17:26:12

HIGH Emission Mask -10MHz-100%RB

Date: 9.JAN.2020 17:37:55
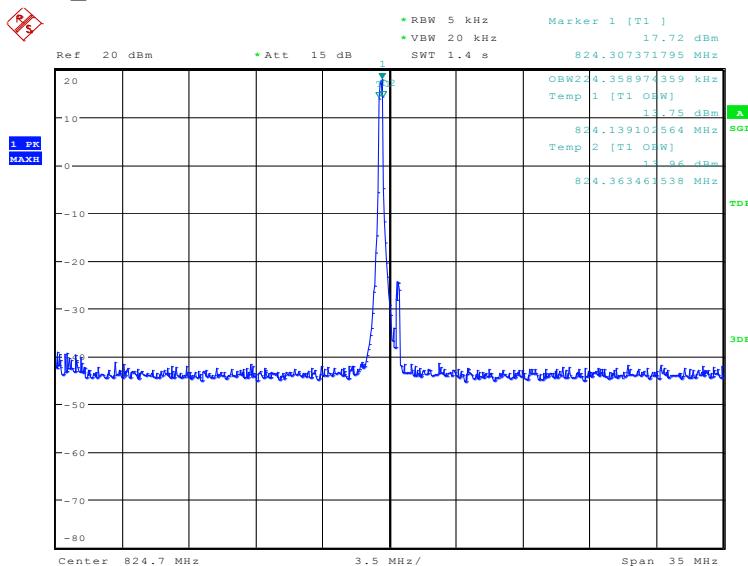
HIGH BAND EDGE BLOCK-10MHz-100%RB

Date: 9.JAN.2020 17:36:08
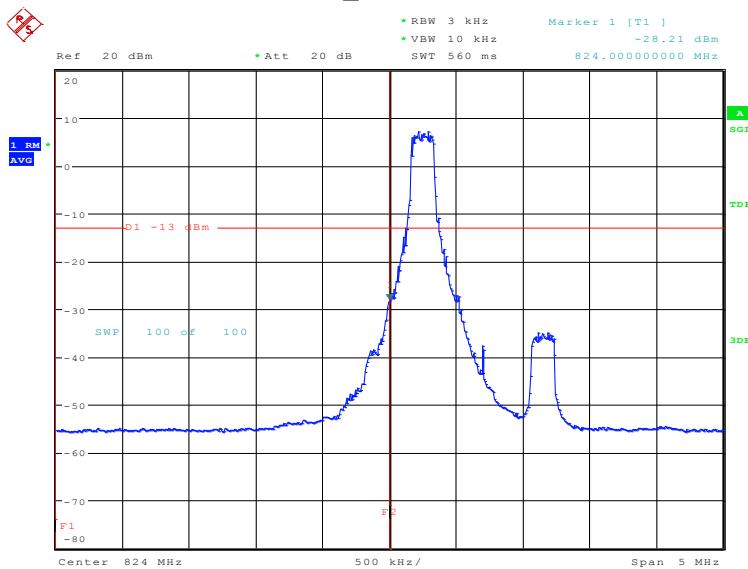
LTE band 26(824MHz~849MHz)

OBW: 1RB-low_offset
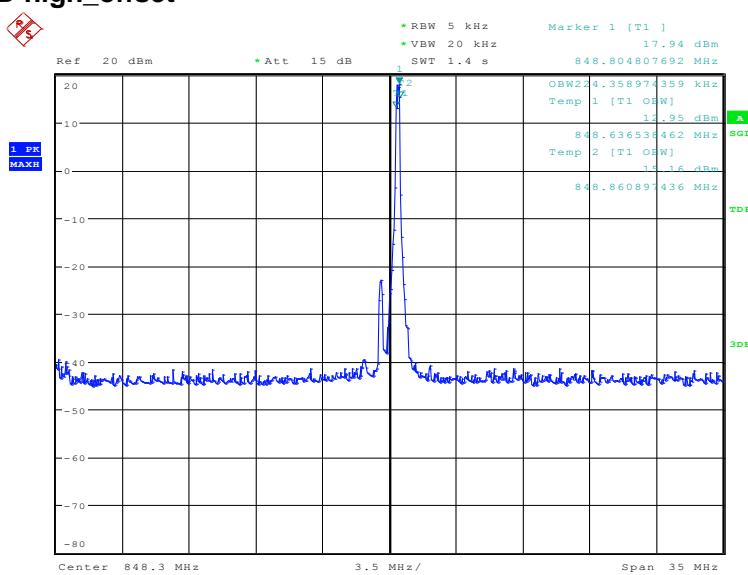
Date: 9.JAN.2020 16:56:25
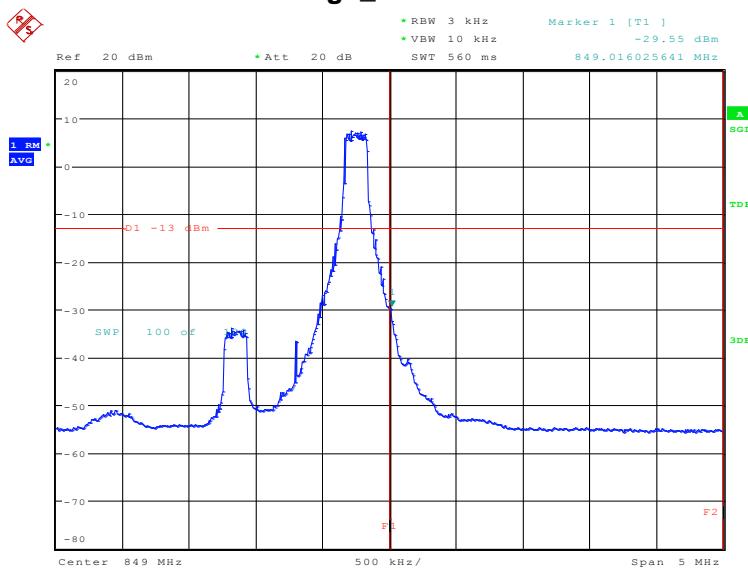
LOW BAND EDGE BLOCK-1RB-low_offset
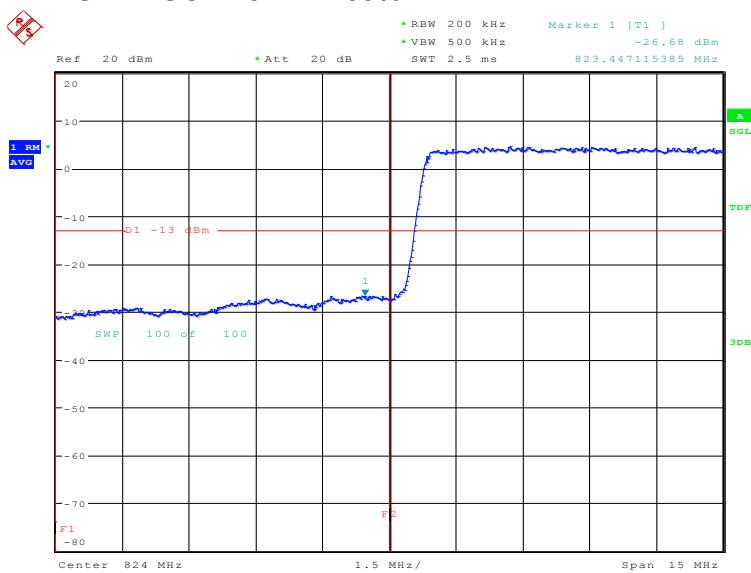
Date: 9.JAN.2020 16:58:04

OBW: 1RB-high_offset
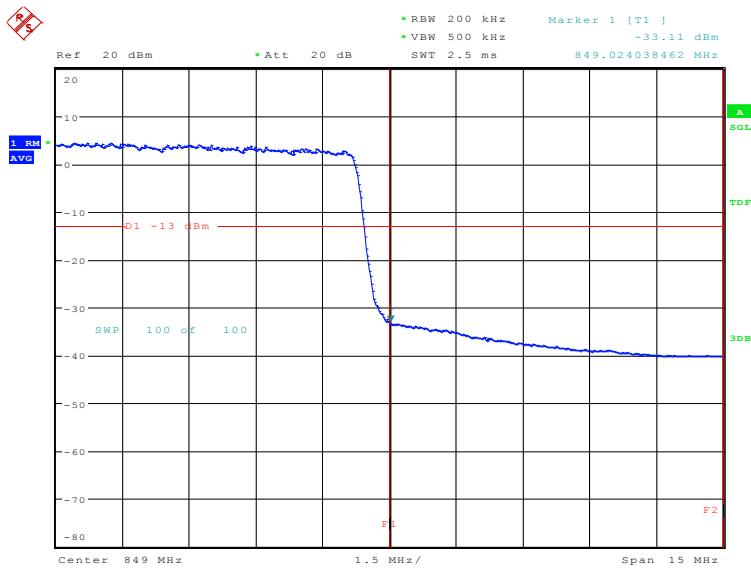
Date: 9.JAN.2020 17:02:02

HIGH BAND EDGE BLOCK-1RB-high_offset

Date: 9.JAN.2020 17:03:41

LOW BAND EDGE BLOCK-15MHz-100%RB
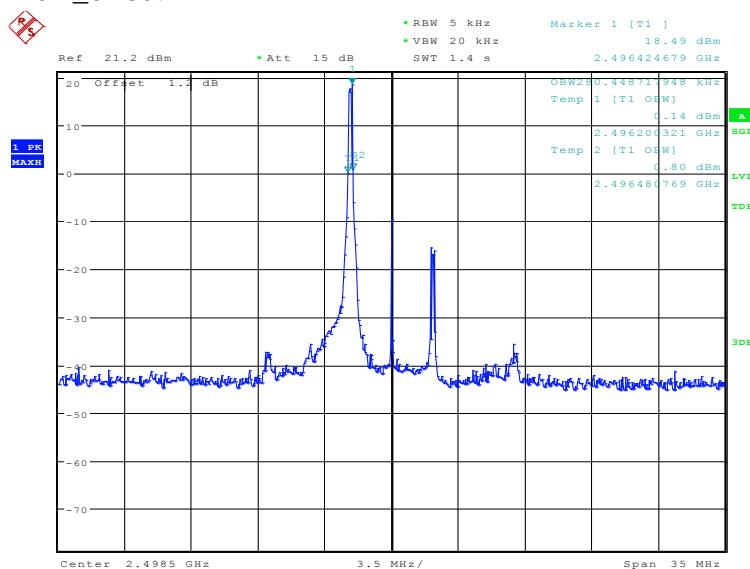
Date: 9.JAN.2020 17:00:00

HIGH BAND EDGE BLOCK-15MHz-100%RB
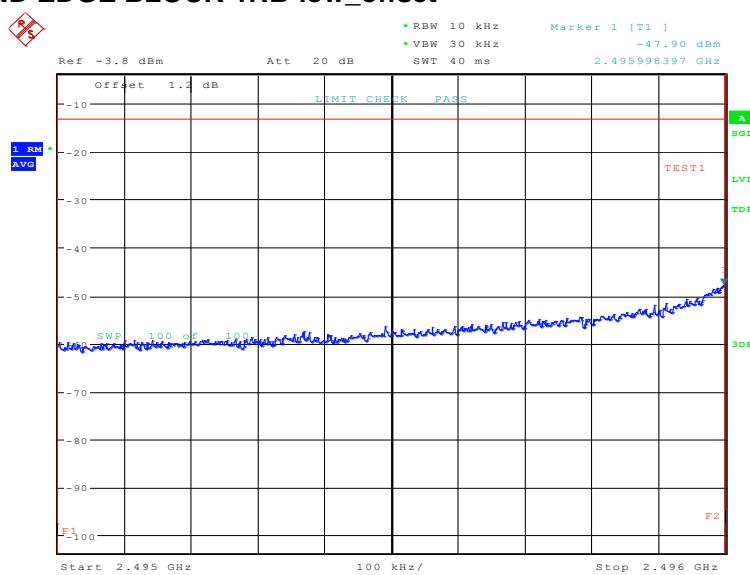
Date: 9.JAN.2020 17:05:35
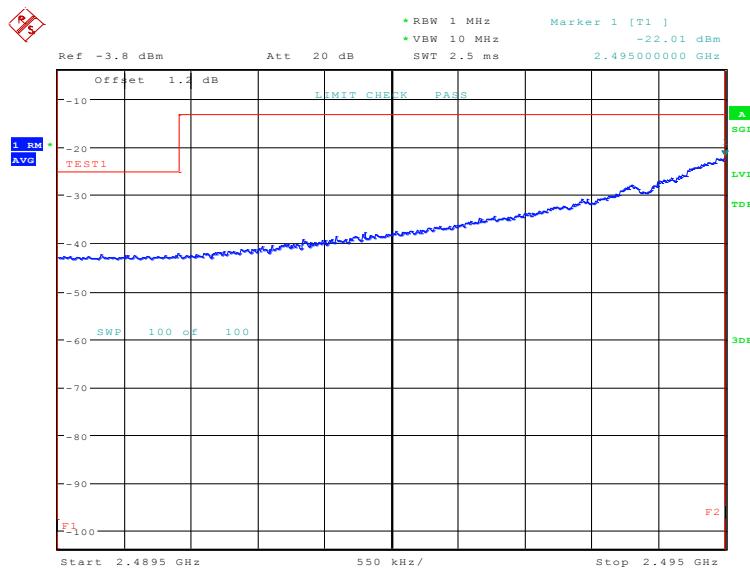
LTE band 41
OBW: 1RB-low_offset
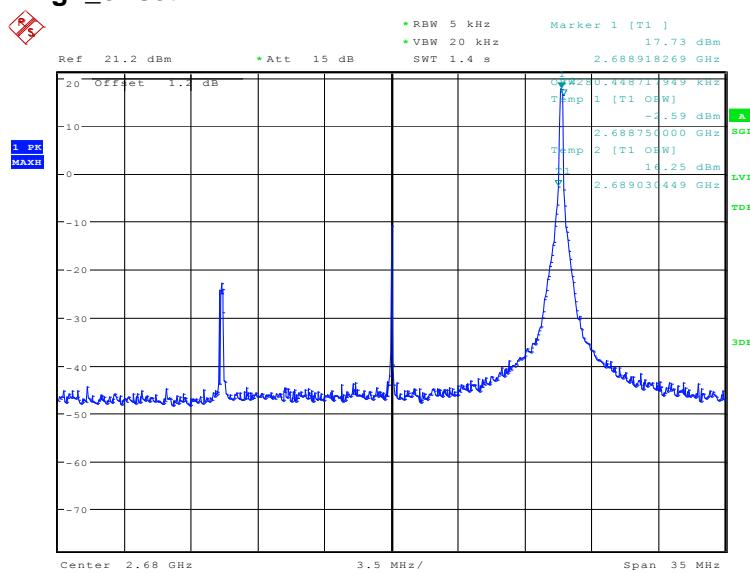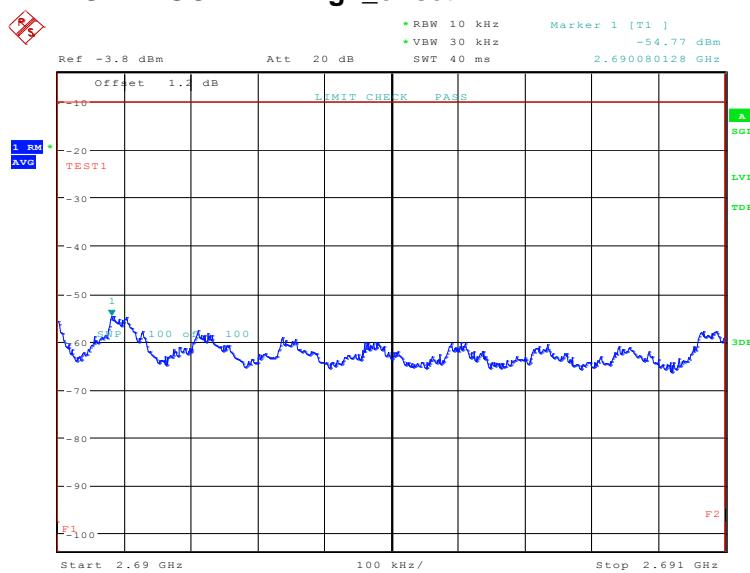

Date: 23.JAN.2020 09:30:15
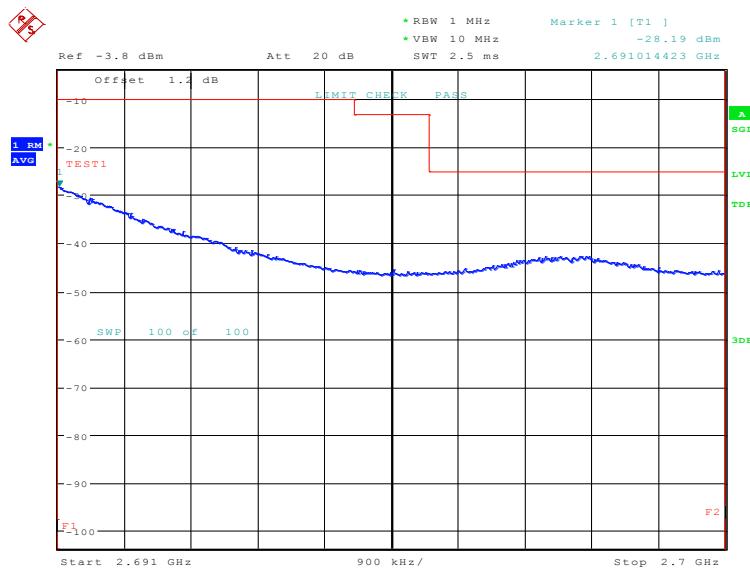
OBW: 1RB-high_offset

Date: 23.JAN.2020 09:41:08
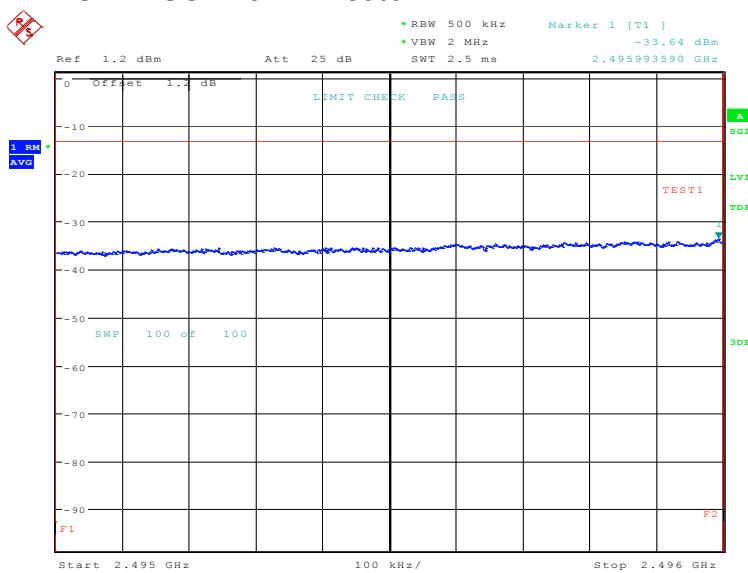
HIGH BAND EDGE BLOCK-1RB-high_offset
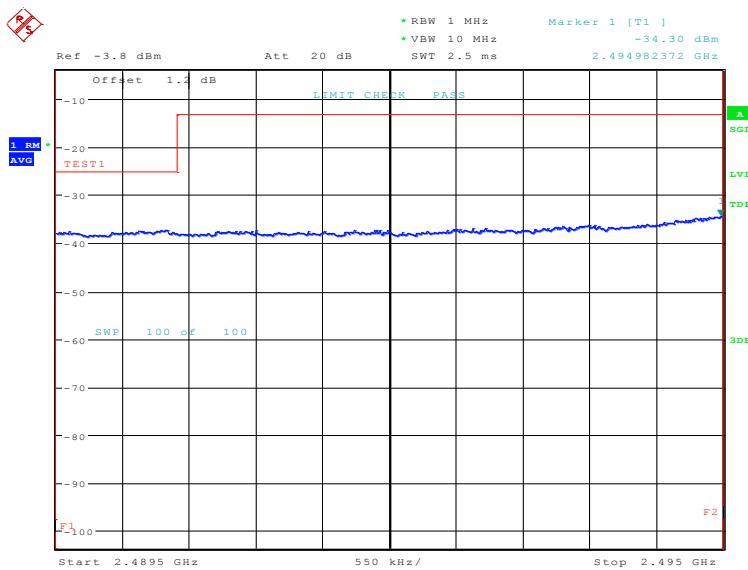
Date: 23.JAN.2020 09:42:53

Date: 23.JAN.2020 09:44:34

LOW BAND EDGE BLOCK-20MHz-100%RB


```
                                    * RBW 500 kHz      Marker 1 [T1 ]
                                    * VBW 2 MHz                 -33.64 dBm
      Ref  1.2 dBm        Att  25 dB   SWT 2.5 ms           2.495993590 GHz
      0   Offset  1.2 dB
                                       LIMIT CHECK   PASS                    A
      -10                                                                    SGL
  1 RM
      -20                                                          TEST1      LVL
  AVG                                                                         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: 23.JAN.2020 09:49:52


```
                                    * RBW 1 MHz       Marker 1 [T1 ]
                                    * VBW 10 MHz               -34.30 dBm
      Ref -3.8 dBm        Att  20 dB   SWT 2.5 ms           2.494982372 GHz
          Offset  1.2 dB
      -10                                LIMIT CHECK   PASS                   A
                                                                             SGL
  1 RM
      -20      TEST1                                                          LVL
  AVG                                                                         TDF
      -30
      -40
      -50
      -60   SWP   100 of   100                                               3DB
      -70
      -80
      -90
      F1                                                               F2
      -100
      Start 2.4895 GHz          550 kHz/           Stop 2.495 GHz
```

Date: 23.JAN.2020 09:51:32

HIGH BAND EDGE BLOCK-20MHz-100%RB

```
                                          * RBW  500 kHz     Marker 1 [T1 ]
                                          * VBW  2 MHz                -34.94 dBm
    Ref  1.2 dBm              Att  25 dB   SWT 2.5 ms          2.690006410 GHz
     0  Offset  1.2 dB
                                           LIMIT CHECK   PASS                     A
    -10                                                                           SGL

    -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: 23.JAN.2020 09:55:59

```
                                          * RBW  1 MHz      Marker 1 [T1 ]
                                          * VBW  10 MHz              -35.64 dBm
    Ref  -3.8 dBm             Att  20 dB   SWT 2.5 ms         2.691038462 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

    F1                                                                       F2
    -100

    Start 2.691 GHz              2.4 MHz/             Stop  2.715 GHz
```

Date: 23.JAN.2020 09:57:39

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LTE band 66
OBW: 1RB-low_offset
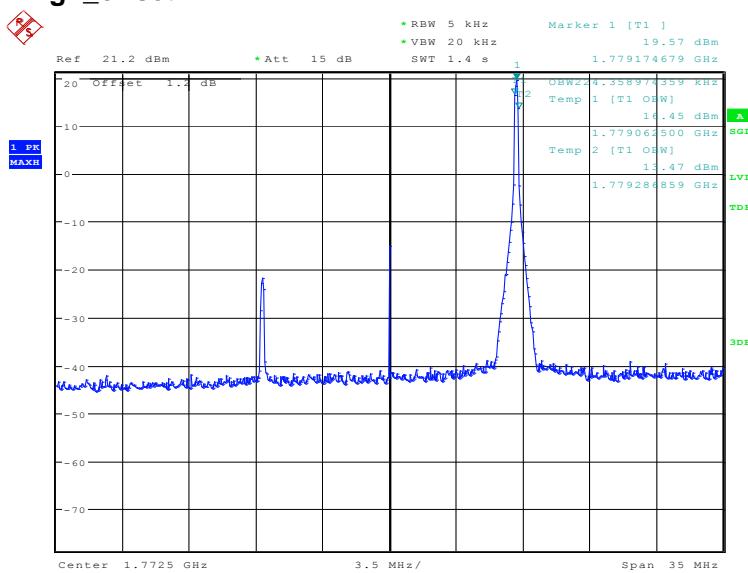
Date: 9.JAN.2020 16:21:58
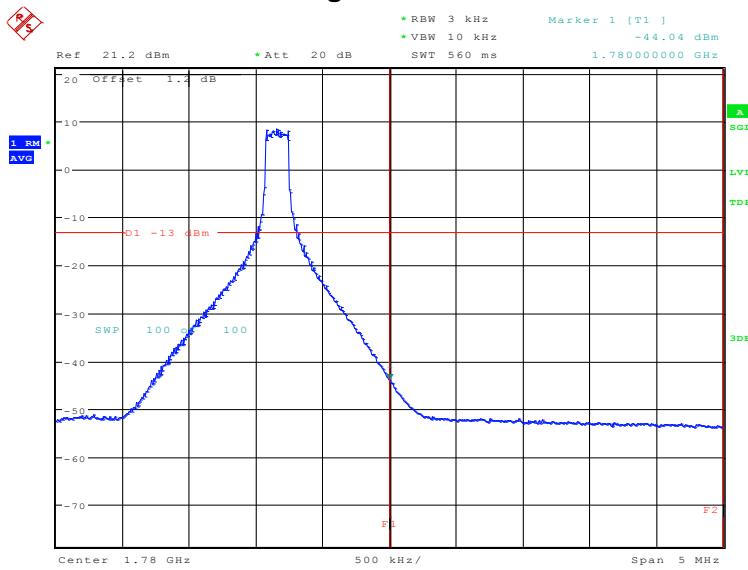
LOW BAND EDGE BLOCK-1RB-low_offset
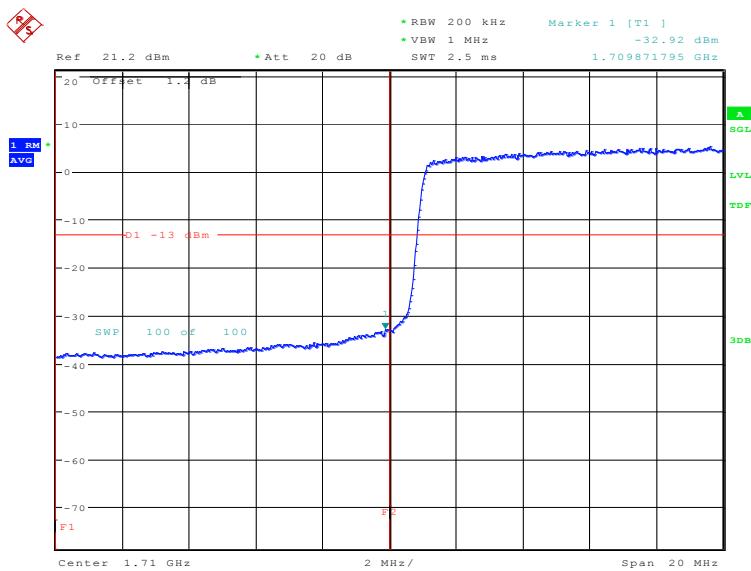
Date: 9.JAN.2020 16:23:36

OBW: 1RB-high_offset
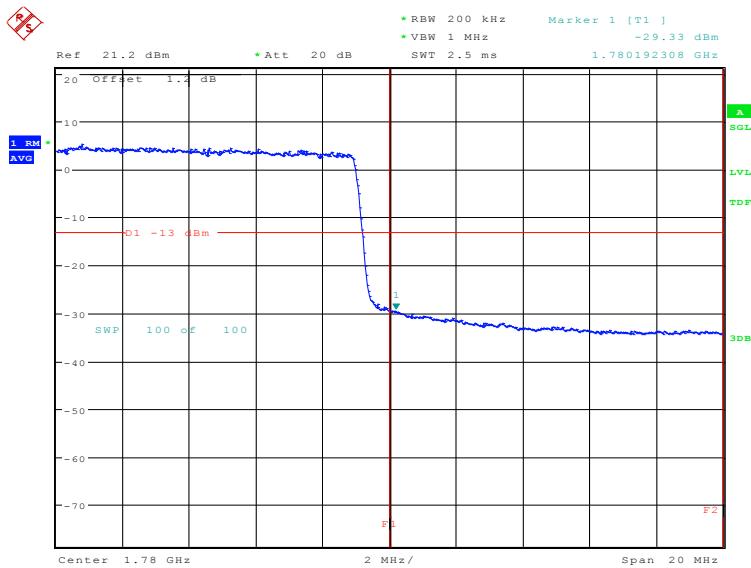
Date: 9.JAN.2020 16:35:24

HIGH BAND EDGE BLOCK-1RB-high_offset

Date: 9.JAN.2020 16:37:03

LOW BAND EDGE BLOCK-20MHz-100%RB
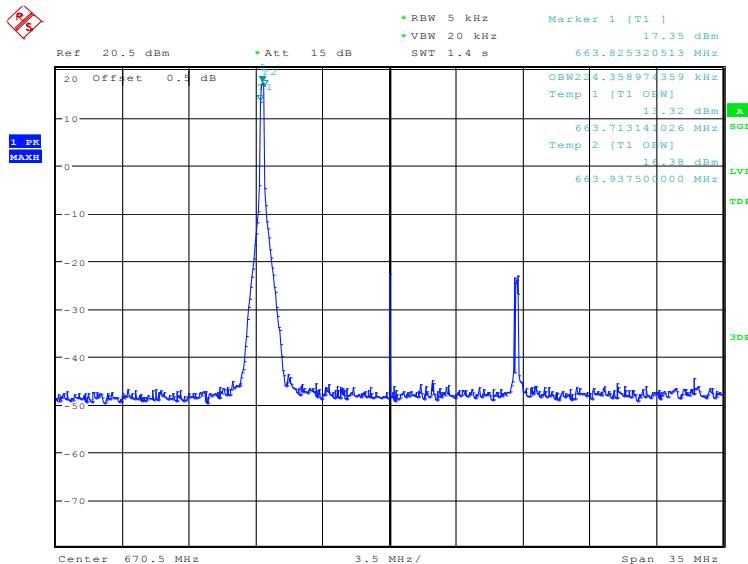
Date: 9.JAN.2020 16:25:31

HIGH BAND EDGE BLOCK-20MHz-100%RB

Date: 9.JAN.2020 16:38:57
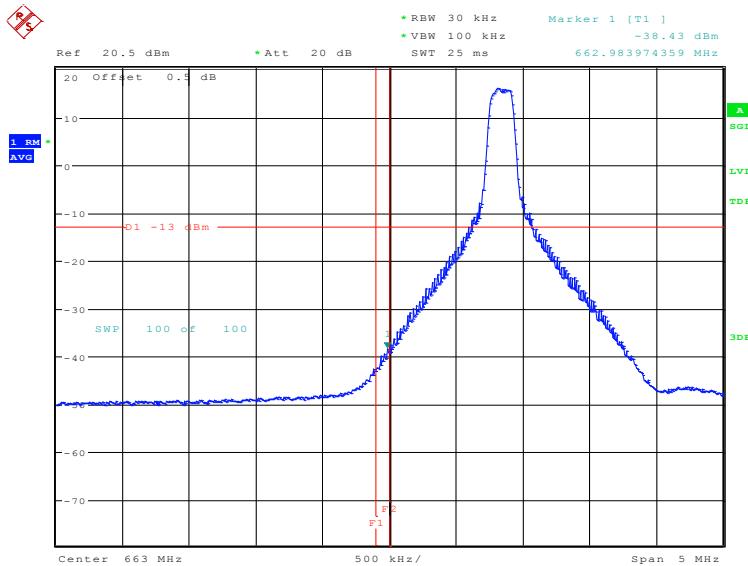
LTE band 71
**OBW: 1RB-low_offset**
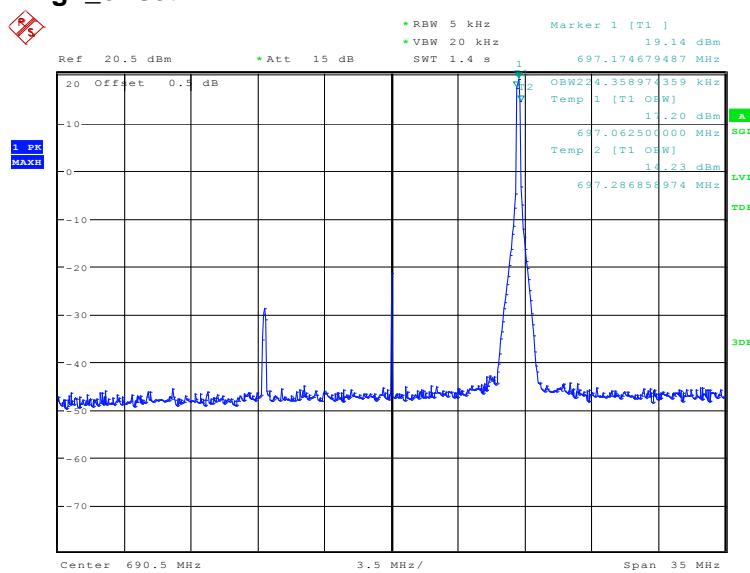
Date: 9.JAN.2020 16:41:11
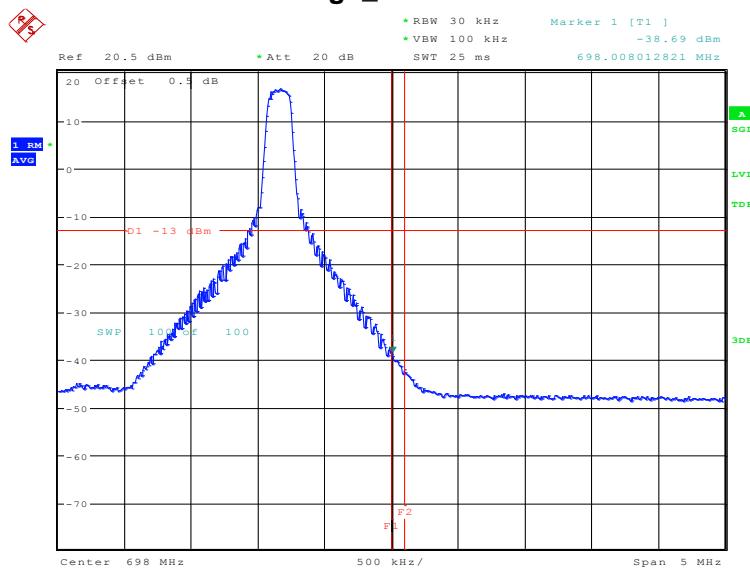
**LOW BAND EDGE BLOCK-1RB-low_offset**
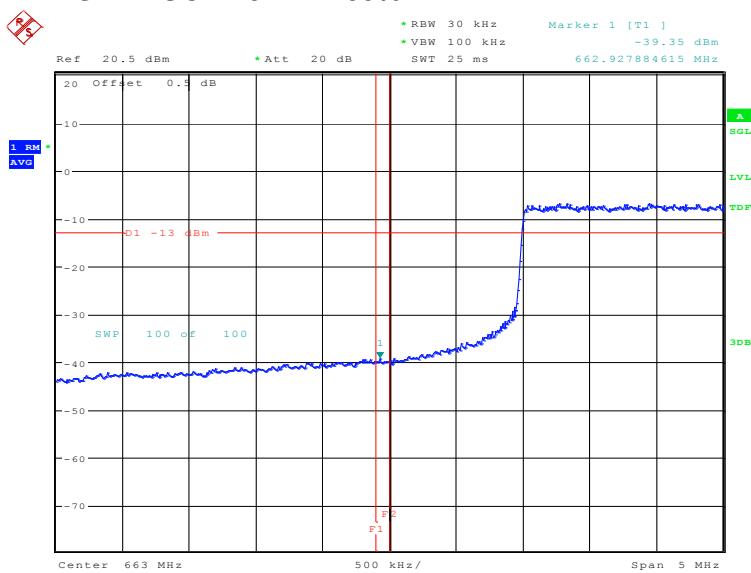

Date: 9.JAN.2020 16:42:50

OBW: 1RB-high_offset
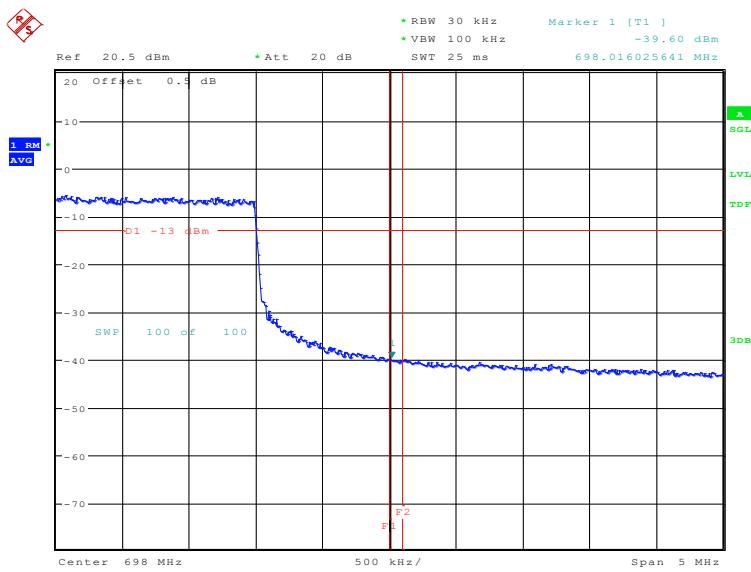
Date: 9.JAN.2020 16:46:52

## HIGH BAND EDGE BLOCK-1RB-high_offset

Date: 9.JAN.2020 16:48:31

LOW BAND EDGE BLOCK-20MHz-100%RB

```
                                    *RBW  30 kHz      Marker 1 [T1 ]
                                    *VBW 100 kHz              -39.35 dBm
      Ref  20.5 dBm      *Att  20 dB   SWT 25 ms      662.927884615 MHz
      20  Offset  0.5  dB                                              A
    -10                                                                SGL
1 RM
AVG
      0                                                                LVL
    -10                                                                TDF
        D1 -13 dBm
    -20
    -30
      SWP  100 of  100
                                        1                              3DB
    -40
    -50
    -60
    -70
                                      F2
                                      F1
      Center  663 MHz          500 kHz/              Span  5 MHz
```

Date: 9.JAN.2020 16:44:45

HIGH BAND EDGE BLOCK-20MHz-100%RB

```
                                    *RBW  30 kHz      Marker 1 [T1 ]
                                    *VBW 100 kHz              -39.60 dBm
      Ref  20.5 dBm      *Att  20 dB   SWT 25 ms      698.016025641 MHz
      20  Offset  0.5  dB                                              A
    -10                                                                SGL
1 RM
AVG
      0                                                                LVL
    -10                                                                TDF
        D1 -13 dBm
    -20
    -30
      SWP  100 of  100
                                                                       3DB
    -40
    -50
    -60
    -70
                                      F2
                                      F1
      Center  698 MHz          500 kHz/              Span  5 MHz
```

Date: 9.JAN.2020 16:50:26

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. In measuring unwanted emissions, the spectrum shall be investigated from 30 MHz or the lowest radio frequency signal generated in the equipment, whichever is lower, without going below 9 kHz, up to at least the frequency given below:
   (a) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
   (b) If the equipment operates at or above 10 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.
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 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 $116Log_{10}(f/6.1)$ 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 $43 + 10Log_{10}(P)$ 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
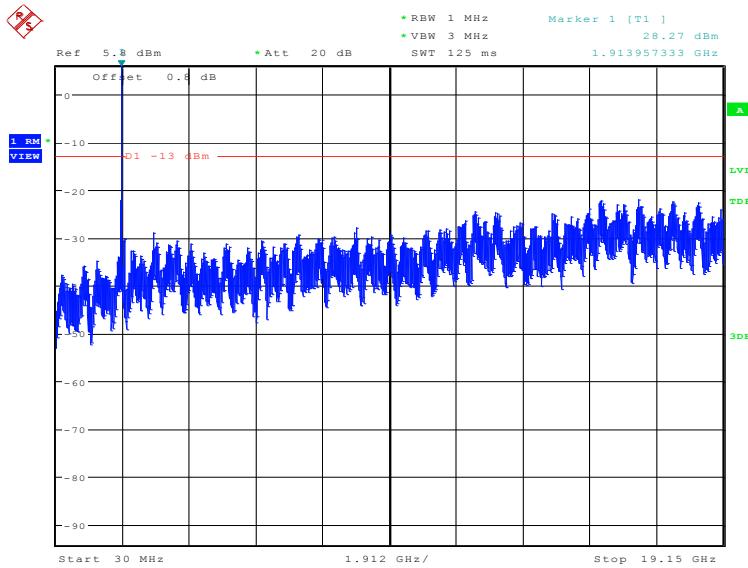
### Only the worst case result is given below

LTE band 12: 30MHz – 7.16GHz


```
                                    *RBW  100 kHz    Marker 1 [T1 ]
                                    *VBW  300 kHz              23.55 dBm
Ref  5.5 dBm        *Att  20 dB     SWT  720 ms        715.668333333 MHz
```
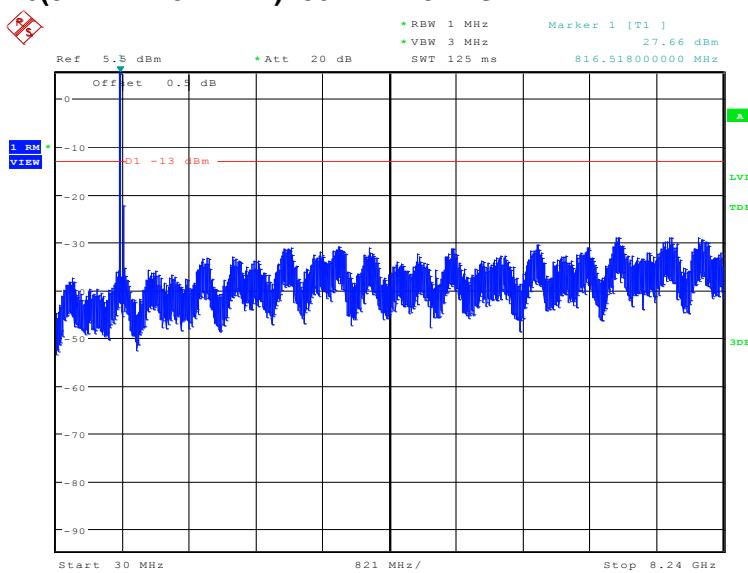
Date: 9.JAN.2020 16:51:33
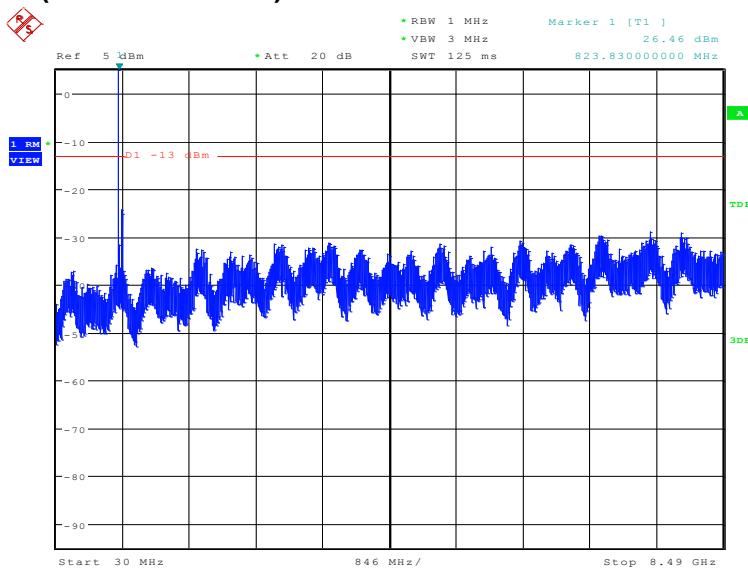
LTE band 25: 30MHz – 19.15GHz


```
                                    *RBW  1 MHz      Marker 1 [T1 ]
                                    *VBW  3 MHz               28.27 dBm
Ref  5.B dBm        *Att  20 dB     SWT  125 ms        1.913957333 GHz
```
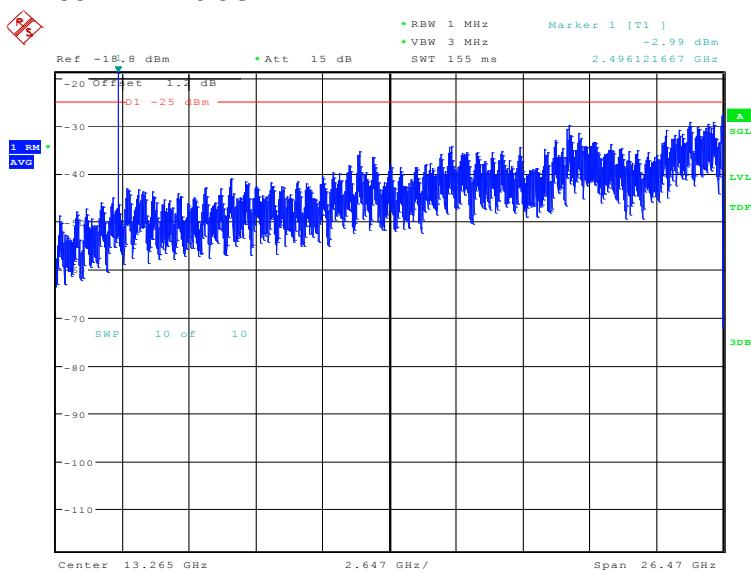
Date: 9.JAN.2020 16:52:04

## LTE band 26(814MHz~824MHz): 30MHz – 8.24GHz
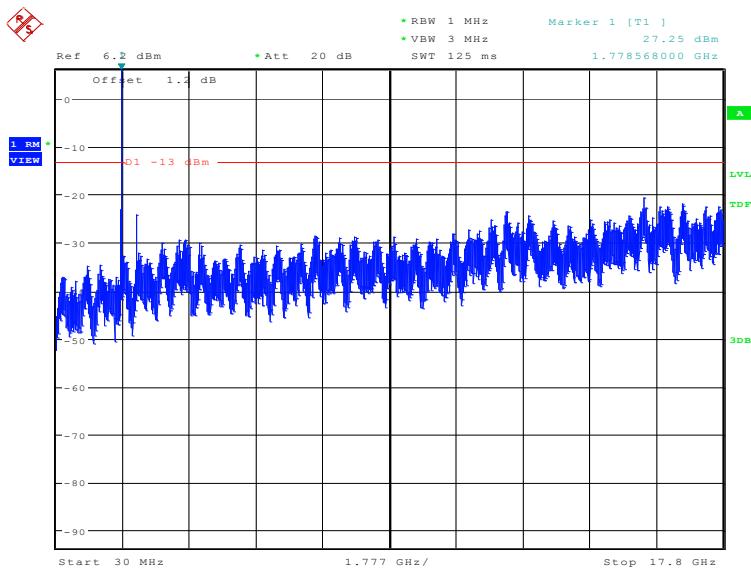
Date: 9.JAN.2020 17:07:08

## LTE band 26(824MHz~849MHz): 30MHz – 8.49GHz
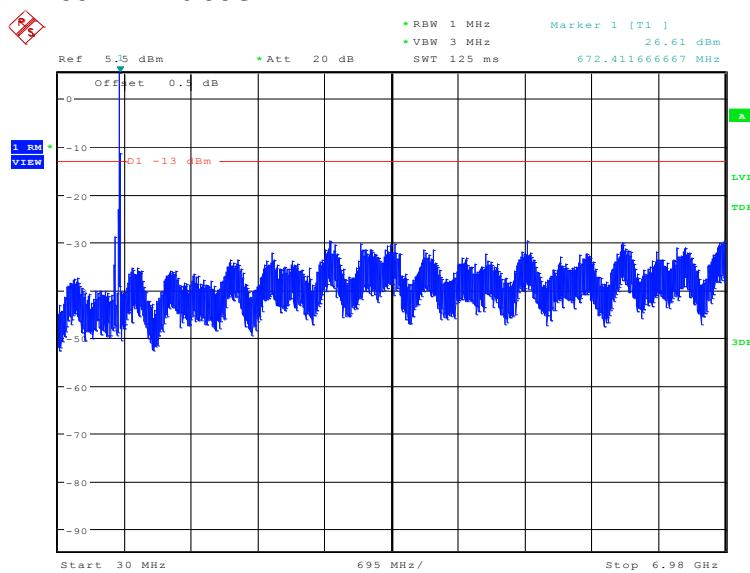
Date: 9.JAN.2020 17:06:37

LTE band 41: 30MHz – 26.5GHz

Date: 23.JAN.2020 10:01:15

LTE band 66: 30MHz – 17.8GHz

Date: 9.JAN.2020 16:52:31

LTE band 71: 30MHz – 6.98GHz

Date: 9.JAN.2020 16:53:54

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:

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

b) Set resolution/measurement bandwidth $\geq$ 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 12, 10MHz

Frequency(MHz)	PAPR(dB)	
707.5	QPSK	16QAM
	5.06	5.99

LTE band 25, 20MHz

Frequency(MHz)	PAPR(dB)	
1882.5	QPSK	16QAM
	6.63	7.37

LTE band 41, 20MHz

Frequency(MHz)	PAPR(dB)	
2593.0	QPSK	16QAM
	8.14	8.94

LTE band 66, 20MHz

Frequency(MHz)	PAPR(dB)	
1745.0	QPSK	16QAM
	6.54	7.18

LTE band 71, 20MHz

Frequency(MHz)	PAPR(dB)	
	QPSK	16QAM
680.5	6.38	7.15

ANNEX B: Accreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology

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).

2019-09-26 through 2020-09-30
Effective Dates

For the National Voluntary Laboratory Accreditation Program

END OF REPORT