TEST REPORT

No. I19Z61825-WMD03

for

TCL Communication Ltd.

LTE/UMTS/GSM mobile phone

Model Name: A507DL

FCC ID: 2ACCJH111

with

Hardware Version: PIO

Software Version: vD41

Issued Date: 2019-11-12

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

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Test Laboratory:

CTTL, Telecommunication Technology Labs, CAICT

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

Tel: +86(0)10-62304633-2512, Fax: +86(0)10-62304633-2504

Email: cttl_terminals@caict.ac.cn, website: www.caict.ac.cn

REPORT HISTORY

Report Number	Revision	Description	Issue Date
I19Z61825-WMD03	Rev.0	1st edition	2019-11-04
I19Z61825-WMD03	Rev.1	2nd edition Updated Clause in FCC rules in 6.1	2019-11-12

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: 2019-10-14

Testing End Date: 2019-11-04

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

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

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

3.1. About EUT

Description	LTE/UMTS/GSM mobile phone
Model Name	A507DL
FCC ID	2ACCJH111
Antenna	Embedded
Output power	24.23dBm maximum EIRP measured for LTE Band 66
Extreme vol. Limits	3.5VDC to 4.4VDC (nominal: 3.8VDC)
Extreme temp. Tolerance	-10C 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
UT37a	015591000213182	PIO	vD41	2019-10-10
UT38a	015591000213190	PIO	vD41	2019-10-10

*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	SN
AE1	battery	---
AE2	Travel charger	---
AE3	USB Cable	

AE1

Model	CAC2900019C1
Manufacturer	BYD
Capacitance	3000mAh
Nominal voltage	\

AE2

Model	CBA0059AGAC5
Manufacturer	PUAN
Length of cable	\

AE3

Model	CDA0000024C8
Manufacturer	PUAN
Length of cable	\

*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/TIA-102.CAAA-E	DIGITAL C4FMCQPSK TRANSCEIVER MEASUREMENT METHODS	2016
ANSI C63.26	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services	2015
KDB 971168 D01	MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS	v03r01

5. LABORATORY ENVIRONMENT

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

Temperature	Min. = 15 ˚C, Max. = 35 ˚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	2.1051/27.53	P
3	Frequency Stability	2.1055	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	27.53	P
6	Band Edge Compliance	27.53	P
7	Conducted Spurious Emission	27.53	P
8	Peak-to-Average Power Ratio	27.50	P

LTE Band 13

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	27.50	P
2	Emission Limit	2.1051/27.53	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	2.1051/24.238	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	2.1051/90.691	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	2.1051/27.53	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(PC2)

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	27.50	P
2	Emission Limit	2.1051/27.53	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 41(PC3)

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	27.50	P
2	Emission Limit	2.1051/27.53	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	2.1051/27.53	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	2.1051/27.53	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.

7. Test Equipment Utilized

NO.	Description	TYPE	series number	MANUFACTURE	CAL DUE DATE	Calibration interval
1	Universal Radio Communication Tester	CMW500	143008	R&S	2019-11-26	1 year
2	Test Receiver	E4440A	MY48250642	Agilent	2020-03-18	1 year
3	EMI Antenna	VULB9163	9163-235	Schwarzbeck	2019-11-20	1 year
4	Universal Radio Communication Tester	CMW500	159082	R&S	2019-12-25	1 year
5	Spectrum Analyzer	FSU26	200030	R&S	2020-06-03	1 year
6	EMI Antenna	3117	00058889	ETS-Lindgren	2020-01-02	1 year
7	EMI Antenna	3117	00119024	ETS-Lindgren	2020-02-25	1 year
8	Climate chamber	SH-242	93008556	ESPEC	2019-12-21	2 year
9	EMI Antenna	9117	167	Schwarzbeck	2020-05-27	1 year
10	Wireless Communication Test Set	E5515E	MY53211012	Agilent	2020-08-06	1 year
11	Signal Generator	N5183A	MY49060052	Agilent	2020-06-24	1 year
12	Power Amplifier	5S1G4	0341863	AR	/	/

ANNEX A: MEASUREMENT RESULTS

A.1 OUTPUT POWER

A.1.1 Summary

During the process of testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication tester (CMW500) to ensure max power transmission and proper modulation.
In all cases, output power is within the specified limits.

A.1.2 Conducted

A.1.2.1 Method of Measurements

The EUT was set up for the max output power with pseudo random data modulation.
These measurements were done at 3 frequencies (bottom, middle and top of operational frequency range) for each bandwidth.

A.1.2.2 Measurement result

LTE band 12

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	715.3	22.58	21.67
		707.5	22.65	21.80
		699.7	22.68	22.01
	1 RB low	715.3	22.63	21.68
		707.5	22.72	21.80
		699.7	22.73	22.08
	50% RB mid	715.3	22.75	21.95
		707.5	22.76	21.80
		699.7	22.83	21.94
	100% RB	715.3	21.74	20.90
		707.5	21.76	20.90
		699.7	21.72	20.68
3MHz	1 RB high	714.5	22.64	21.65
		707.5	22.73	21.62
		700.5	22.79	22.03
	1 RB low	714.5	22.65	21.73
		707.5	22.68	21.64
		700.5	22.76	22.08
	50% RB mid	714.5	21.75	20.83
		707.5	21.82	20.92
		700.5	21.74	20.88

	100% RB	714.5	21.68	20.69
		707.5	21.74	20.78
		700.5	21.70	20.79
5MHz	1 RB high	713.5	22.61	21.65
		707.5	22.67	21.76
		701.5	22.64	22.10
	1 RB low	713.5	22.59	21.69
		707.5	22.66	21.75
		701.5	22.61	22.12
	50% RB mid	713.5	21.78	20.86
		707.5	21.77	20.87
		701.5	21.79	20.92
	100% RB	713.5	21.70	20.70
		707.5	21.71	20.78
		701.5	21.74	20.85
10MHz	1 RB high	711.0	22.69	21.99
		707.5	22.65	21.69
		704.0	22.77	21.59
	1 RB low	711.0	22.69	22.00
		707.5	22.62	21.59
		704.0	22,57	21.52
	50% RB mid	711.0	21.75	20.82
		707.5	21.78	20.92
		704.0	21.79	20.82
	100% RB	711.0	21.76	20.78
		707.5	21.81	20.85
		704.0	21.79	20.81

LTE band 13

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
5MHz	1 RB high	784.5	22.59	21.70
		782	22.59	21.71
		779.5	22.59	22.07
	1 RB low	784.5	22.57	21.69
		782	22.60	21.65
		779.5	22.56	21.90
	50% RB mid	784.5	21.74	20.83
		782	21.72	20.81
		779.5	21.67	20.89
	100% RB	784.5	21.65	20.62
		782	21.63	20.69
		779.5	21.62	20.72
10MHz	1 RB high	782.0	22.70	22.00
	1 RB low	782.0	22.67	21.89
	50% RB mid	782.0	21.75	20.83
	100% RB	782.0	21.65	20.72

LTE band 25

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	1914.3	22.52	21.43
		1882.5	22.45	21.58
		1850.7	22.42	21.77
	1 RB low	1914.3	22.51	21.43
		1882.5	22.46	21.60
		1850.7	22.44	21.77
	50% RB mid	1914.3	22.57	21.67
		1882.5	22.54	21.58
		1850.7	22.54	21.67
	100% RB	1914.3	21.66	20.72
		1882.5	21.52	20.63
		1850.7	21.49	20.38
3MHz	1 RB high	1913.5	22.64	21.49
		1882.5	22.61	21.50
		1851.5	22.59	21.88
	1 RB low	1913.5	22.65	21.60
		1882.5	22.56	21.53
		1851.5	22.58	21.84
	50% RB mid	1913.5	21.73	20.70
		1882.5	21.65	20.77
		1851.5	21.62	20.68
	100% RB	1913.5	21.61	20.54
		1882.5	21.58	20.63
		1851.5	21.55	20.54
5MHz	1 RB high	1912.5	22.55	21.54
		1882.5	22.54	21.65
		1852.5	22.42	21.91
	1 RB low	1912.5	22.54	21.60
		1882.5	22.55	21.64
		1852.5	22.38	21.88
	50% RB mid	1912.5	21.66	20.67
		1882.5	21.62	20.71
		1852.5	21.56	20.70
	100% RB	1912.5	21.59	20.51
		1882.5	21.56	20.61
		1852.5	21.53	20.58
10MHz	1 RB high	1910.0	22.62	21.50
		1882.5	22.54	21.47

		1855.0	22.58	21.88
	1 RB low	1910.0	22.54	21.61
		1882.5	22.54	21.46
		1855.0	22.55	21.85
	50% RB mid	1910.0	21.68	20.75
		1882.5	21.64	20.71
		1855.0	21.57	20.64
	100% RB	1910.0	21.63	20.65
		1882.5	21.63	20.65
		1855.0	21.60	20.62
15MHz	1 RB high	1907.5	22.55	21.77
		1882.5	22.49	21.45
		1857.5	22.53	21.84
	1 RB low	1907.5	22.53	21.91
		1882.5	22.49	21.37
		1857.5	22.51	21.78
	50% RB mid	1907.5	21.71	20.67
		1882.5	21.65	20.62
		1857.5	21.57	20.63
	100% RB	1907.5	21.72	20.69
		1882.5	21.65	20.67
		1857.5	21.61	20.60
20MHz	1 RB high	1905.0	22.36	21.71
		1882.5	22.40	21.92
		1860.0	22.37	21.83
	1 RB low	1905.0	22.28	21.84
		1882.5	22.35	21.90
		1860.0	22.33	21.81
	50% RB mid	1905.0	21.52	20.65
		1882.5	21.56	20.62
		1860.0	21.52	20.62
	100% RB	1905.0	21.53	20.67
		1882.5	21.58	20.63
		1860.0	21.52	20.55

LTE band 26(814MHz~824MHz)

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	823.3	22.56	21.58
		819.0	22.66	21.68
		814.7	22.62	21.65
	1 RB low	823.3	22.58	21.57
		819.0	22.66	21.65
		814.7	22.63	21.62
	50% RB mid	823.3	22.71	21.81
		819.0	22.76	21.91
		814.7	22.77	21.88
	100% RB	823.3	21.62	20.58
		819.0	21.75	20.88
		814.7	21.71	20.60
3MHz	1 RB high	822.5	22.65	21.59
		819.0	22.64	21.77
		815.5	22.72	21.71
	1 RB low	822.5	22.67	21.63
		819.0	22.69	21.83
		815.5	22.73	21.75
	50% RB mid	822.5	21.67	20.74
		819.0	21.75	20.82
		815.5	21.72	20.82
	100% RB	822.5	21.60	20.64
		819.0	21.63	20.70
		815.5	21.65	20.69
5MHz	1 RB high	821.5	22.54	21.61
		819.0	22.60	21.83
		816.5	22.68	21.95
	1 RB low	821.5	22.62	21.67
		819.0	22.60	21.90
		816.5	22.64	21.92
	50% RB mid	821.5	21.72	20.83
		819.0	21.72	20.85
		816.5	21.74	20.84
	100% RB	821.5	21.64	20.73
		819.0	21.68	20.74
		816.5	21.69	20.75
10MHz	1 RB high	819.0	22.68	21.79
	1 RB low	819.0	22.68	21.80

	50% RB mid	819.0	22.71	21.80
	100% RB	819.0	22.70	21.86

LTE band 26(824MHz~849MHz)

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	848.3	22.63	21.59
		836.5	22.61	21.67
		824.7	22.66	21.63
	1 RB low	848.3	22.64	21.48
		836.5	22.61	21.61
		824.7	22.61	21.62
	50% RB mid	848.3	22.66	21.73
		836.5	22.67	21.84
		824.7	22.71	21.79
	100% RB	848.3	21.64	20.50
		836.5	21.66	20.78
		824.7	21.64	20.77
3MHz	1 RB high	847.5	22.61	21.70
		836.5	22.61	21.75
		825.5	22.66	21.79
	1 RB low	847.5	22.61	21.73
		836.5	22.64	21.78
		825.5	22.66	21.80
	50% RB mid	847.5	21.64	20.73
		836.5	21.69	20.75
		825.5	21.66	20.75
	100% RB	847.5	21.58	20.60
		836.5	21.64	20.61
		825.5	21.57	20.63
5MHz	1 RB high	846.5	22.56	21.59
		836.5	22.55	21.77
		826.5	22.57	21.63
	1 RB low	846.5	22.49	21.55
		836.5	22.56	21.80
		826.5	22.56	21.62
	50% RB mid	846.5	21.66	20.76
		836.5	21.69	20.81
		826.5	21.70	20.80
	100% RB	846.5	21.56	20.62
		836.5	21.63	20.67
		826.5	21.63	20.68
10MHz	1 RB high	844.0	22.66	21.77
		836.5	22.68	21.81

		829.0	22.63	21.77
	1 RB low	844.0	22.65	21.75
		836.5	22.63	21.75
		829.0	22.64	21.80
	50% RB mid	844.0	21.67	20.71
		836.5	21.69	20.71
		829.0	21.70	20.73
	100% RB	844.0	21.64	20.65
		836.5	21.67	20.69
		829.0	21.70	20.73
15MHz	1 RB high	841.5	22.63	21.87
		836.5	22.55	21.69
		831.5	22.55	21.68
	1 RB low	841.5	22.58	21.93
		836.5	22.55	21.69
		831.5	22.62	21.71
	50% RB mid	841.5	21.75	20.75
		836.5	21.76	20.73
		831.5	21.68	20.72
	100% RB	841.5	21.78	20.72
		836.5	21.69	20.67
		831.5	21.67	20.69

LTE band 41 (PC2)

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
5MHz	1 RB high	2687.5	25.98	25.20
		2593.0	25.96	25.13
		2498.5	25.85	25.19
	1 RB low	2687.5	25.99	25.20
		2593.0	25.98	25.11
		2498.5	25.82	25.14
	50% RB mid	2687.5	25.09	24.05
		2593.0	25.10	24.10
		2498.5	25.00	24.09
	100% RB	2687.5	25.04	24.09
		2593.0	25.03	24.04
		2498.5	24.92	23.96
10MHz	1 RB high	2685.0	26.00	25.26
		2593.0	26.07	25.15
		2501.0	25.87	25.25
	1 RB low	2685.0	26.00	25.27
		2593.0	26.08	25.14
		2501.0	25.83	25.20
	50% RB mid	2685.0	25.07	24.08
		2593.0	25.07	24.04
		2501.0	24.99	24.02
	100% RB	2685.0	25.06	24.07
		2593.0	25.03	24.02
		2501.0	25.00	24.05
15MHz	1 RB high	2682.5	25.89	25.27
		2593.0	25.97	25.16
		2503.5	25.84	25.17
	1 RB low	2682.5	25.96	25.29
		2593.0	25.91	25.21
		2503.5	25.84	25.11
	50% RB mid	2682.5	25.10	24.06
		2593.0	25.04	24.01
		2503.5	24.98	23.98
	100% RB	2682.5	25.08	24.08
		2593.0	25.03	24.05
		2503.5	25.01	23.98

20MHz	1 RB high	2680.0	25.97	25.14
		2593.0	25.93	25.36
		2506.0	25.99	25.00
	1 RB low	2680.0	25.97	25.19
		2593.0	25.93	25.29
		2506.0	25.96	24.97
	50% RB mid	2680.0	25.02	24.05
		2593.0	24.98	24.05
		2506.0	24.93	23.93
	100% RB	2680.0	25.00	24.01
		2593.0	24.98	23.99
		2506.0	24.95	23.95

LTE band 41 (PC3)

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
5MHz	1 RB high	2687.5	22.97	21.98
		2593.0	23.08	21.98
		2498.5	22.86	21.97
	1 RB low	2687.5	22.98	22.01
		2593.0	23.08	22.01
		2498.5	22.83	21.99
	50% RB mid	2687.5	22.03	20.97
		2593.0	22.04	21.03
		2498.5	21.93	21.00
	100% RB	2687.5	22.01	21.04
		2593.0	21.97	20.98
		2498.5	21.91	20.88
10MHz	1 RB high	2685.0	22.92	21.98
		2593.0	23.07	21.99
		2501.0	22.96	22.09
	1 RB low	2685.0	22.95	21.99
		2593.0	23.07	22.00
		2501.0	22.95	22.06
	50% RB mid	2685.0	22.00	21.00
		2593.0	22.02	20.85
		2501.0	21.92	20.93
	100% RB	2685.0	22.00	21.01
		2593.0	21.97	20.96
		2501.0	21.88	20.93
15MHz	1 RB high	2682.5	22.90	21.96
		2593.0	22.99	21.94
		2503.5	22.83	21.97
	1 RB low	2682.5	23.00	22.02
		2593.0	23.08	22.00
		2503.5	22.81	21.95
	50% RB mid	2682.5	22.01	20.96
		2593.0	21.98	20.94
		2503.5	21.87	20.88
	100% RB	2682.5	22.00	20.97
		2593.0	21.96	20.95
		2503.5	21.88	20.87

20MHz	1 RB high	2680.0	22.90	21.91
		2593.0	22.96	22.09
		2506.0	22.92	21.82
	1 RB low	2680.0	22.95	21.96
		2593.0	22.99	22.08
		2506.0	22.90	21.75
	50% RB mid	2680.0	21.94	20.93
		2593.0	21.87	20.97
		2506.0	21.82	20.83
	100% RB	2680.0	21.92	20.89
		2593.0	21.90	20.92
		2506.0	21.82	20.85

LTE band 66

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	1779.3	22.46	21.60
		1745.0	22.56	21.91
		1710.7	22.57	21.65
	1 RB low	1779.3	22.47	21.58
		1745.0	22.58	21.95
		1710.7	22.58	21.67
	50% RB mid	1779.3	22.64	21.60
		1745.0	22.73	21.84
		1710.7	22.80	21.91
	100% RB	1779.3	21.58	20.72
		1745.0	21.63	20.55
		1710.7	21.71	20.87
3MHz	1 RB high	1778.5	22.49	21.44
		1745.0	22.66	21.98
		1711.5	22.57	21.63
	1 RB low	1778.5	22.44	21.45
		1745.0	22.61	21.99
		1711.5	22.73	21.72
	50% RB mid	1778.5	21.57	20.70
		1745.0	21.60	20.71
		1711.5	21.72	20.74
	100% RB	1778.5	21.52	20.53
		1745.0	21.57	20.61
		1711.5	21.67	20.59
5MHz	1 RB high	1777.5	22.41	21.56
		1745.0	22.51	21.99
		1712.5	22.53	21.59
	1 RB low	1777.5	22.45	21.58
		1745.0	22.49	21.99
		1712.5	22.62	21.67
	50% RB mid	1777.5	21.55	20.61
		1745.0	21.63	20.77
		1712.5	21.72	20.69
	100% RB	1777.5	21.51	20.51
		1745.0	21.58	20.65
		1712.5	21.66	20.59
10MHz	1 RB high	1775.0	22.43	21.40
		1745.0	22.56	21.88

		1715.0	22.53	21.58
	1 RB low	1775.0	22.45	21.43
		1745.0	22.57	21.94
		1715.0	22.60	21.65
	50% RB mid	1775.0	21.56	20.58
		1745.0	21.64	20.67
		1715.0	21.67	20.75
	100% RB	1775.0	21.55	20.53
		1745.0	21.61	20.63
		1715.0	21.69	20.70
15MHz	1 RB high	1772.5	22.37	21.37
		1745.0	22.46	21.80
		1717.5	22.55	21.92
	1 RB low	1772.5	22.42	21.36
		1745.0	22.54	21.90
		1717.5	22.62	21.96
	50% RB mid	1772.5	21.59	20.57
		1745.0	21.60	20.65
		1717.5	21.68	20.61
	100% RB	1772.5	21.60	20.60
		1745.0	21.62	20.62
		1717.5	21.68	20.65
20MHz	1 RB high	1770.0	22.32	21.79
		1745.0	22.40	21.83
		1720.0	22.47	22.05
	1 RB low	1770.0	22.29	21.80
		1745.0	22.39	21.88
		1720.0	22.51	22.04
	50% RB mid	1770.0	21.48	20.53
		1745.0	21.61	20.58
		1720.0	21.60	20.63
	100% RB	1770.0	21.48	20.50
		1745.0	21.59	20.58
		1720.0	21.55	20.56

LTE band 71

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
5MHz	1 RB high	695.5	22.73	21.79
		680.5	22.73	21.84
		665.5	22.70	22.21
	1 RB low	695.5	22.71	21.79
		680.5	22.74	21.83
		665.5	22.72	22.16
	50% RB mid	695.5	21.80	20.85
		680.5	21.79	20.86
		665.5	21.85	20.94
	100% RB	695.5	21.77	20.73
		680.5	21.80	20.84
		665.5	21.74	20.85
10MHz	1 RB high	693	22.71	22.12
		680.5	22.71	21.78
		668	22.81	21.66
	1 RB low	693	22.67	22.07
		680.5	22.68	21.73
		668	22.78	21.62
	50% RB mid	693	21.86	20.89
		680.5	21.78	20.95
		668	21.81	20.90
	100% RB	693	21.86	20.96
		680.5	21.86	20.89
		668	21.92	20.94
15MHz	1 RB high	690.5	22.64	22.04
		680.5	22.63	21.57
		670.5	22.74	22.03
	1 RB low	690.5	22.66	22.04
		680.5	22.63	21.57
		670.5	22.73	21.97
	50% RB mid	690.5	21.75	20.78
		680.5	21.82	20.79
		670.5	21.85	20.90
	100% RB	690.5	21.73	20.78
		680.5	21.84	20.80
		670.5	21.90	20.92

20MHz	1 RB high	688	22.46	22.09
		680.5	22.52	22.06
		673	22.58	21.97
	1 RB low	688	22.53	22.01
		680.5	22.48	22.03
		673	22.59	21.90
	50% RB mid	688	21.72	20.81
		680.5	21.76	20.82
		673	21.73	20.77
	100% RB	688	21.73	20.80
		680.5	21.83	20.89
		673	21.69	20.69

A.1.3 Radiated

A.1.3.1 Description

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

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

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

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

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

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

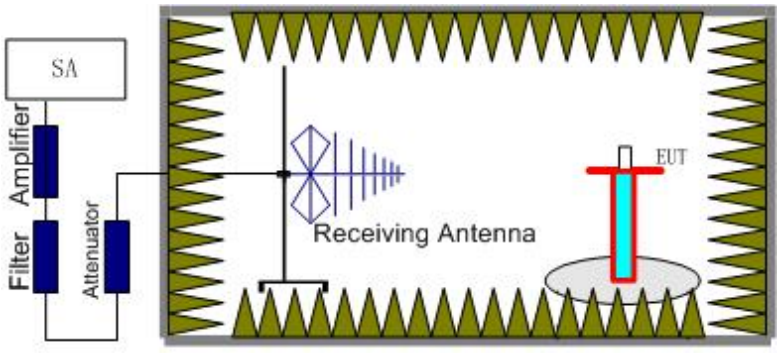
Rule Part 27.50(a)(3) specifies "For mobile and portable stations transmitting in the 2305–2315 MHz band or the 2350–2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards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

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

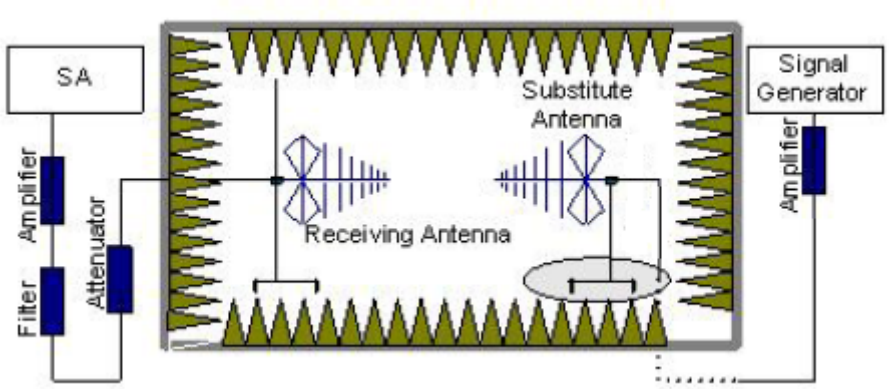
A.1.3.2 Method of Measurement

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

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



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



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

4. An amplifier should be connected to the Signal Source output port. And the cable should be connected between the amplifier and the substitution antenna.
   The cable loss (P_{cl}), the substitution antenna Gain (G_a) and the amplifier Gain (P_{Ag}) should be recorded after test.
   The measurement results are obtained as described below:
   Power (EIRP) = P_{Mea} - P_{Ag} - P_{cl} - G_a
5. This value is EIRP since the measurement is calibrated using an antenna of known gain (unit dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP - 2.15 .

A.1.3.3 Measurement result

TE 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	-23.58	1.90	44.66	0.77	2.15	17.80	34.77	16.97	V
707.50	-23.77	1.91	44.94	0.62	2.15	17.73	34.77	17.04	H
715.30	-22.98	1.92	45.26	0.50	2.15	18.71	34.77	16.06	V

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	-23.63	1.90	44.68	0.76	2.15	17.76	34.77	17.01	V
707.50	-23.39	1.91	44.94	0.62	2.15	18.11	34.77	16.66	V
714.50	-23.21	1.92	45.26	0.50	2.15	18.48	34.77	16.29	V

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	-23.60	1.90	44.81	0.74	2.15	17.90	34.77	16.87	V
707.50	-23.38	1.91	44.94	0.62	2.15	18.12	34.77	16.65	V
713.50	-23.20	1.92	45.22	0.50	2.15	18.45	34.77	16.32	V

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	-23.43	1.91	44.93	0.70	2.15	18.14	34.77	16.63	V
707.50	-23.30	1.91	44.94	0.62	2.15	18.20	34.77	16.57	V
711.00	-23.33	1.92	45.19	0.53	2.15	18.32	34.77	16.45	V

LTE Band 12_1.4MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
699.70	-24.55	1.90	44.66	0.77	2.15	16.83	34.77	17.94	V
707.50	-24.75	1.91	44.94	0.62	2.15	16.75	34.77	18.02	H
715.30	-24.00	1.92	45.26	0.50	2.15	17.69	34.77	17.08	V

LTE Band 12_3MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
700.50	-24.51	1.90	44.68	0.76	2.15	16.88	34.77	17.89	V
707.50	-24.22	1.91	44.94	0.62	2.15	17.28	34.77	17.49	V
714.50	-24.20	1.92	45.26	0.50	2.15	17.49	34.77	17.28	V

LTE Band 12_5MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
701.50	-24.44	1.90	44.81	0.74	2.15	17.06	34.77	17.71	V
707.50	-24.31	1.91	44.94	0.62	2.15	17.19	34.77	17.58	V
713.50	-23.96	1.92	45.22	0.50	2.15	17.69	34.77	17.08	V

LTE Band 12_10MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
704.00	-24.45	1.91	44.93	0.70	2.15	17.12	34.77	17.65	V
707.50	-24.23	1.91	44.94	0.62	2.15	17.27	34.77	17.50	V
711.00	-24.12	1.92	45.19	0.53	2.15	17.53	34.77	17.24	V

LTE Band 13- ERP

Limits: ≤34.77 dBm (3W)

LTE Band 13_5MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
779.50	-22.14	2.01	45.64	0.04	2.15	19.38	34.77	15.39	V
782.00	-22.22	2.01	45.65	0.09	2.15	19.36	34.77	15.41	V
784.50	-22.31	2.01	45.67	0.16	2.15	19.36	34.77	15.41	V

LTE Band 13_10MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
782.00	-22.15	2.01	45.65	0.09	2.15	19.43	34.77	15.34	V

LTE Band 13_5MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
779.50	-23.06	2.01	45.64	0.04	2.15	18.46	34.77	16.31	V
782.00	-22.96	2.01	45.65	0.09	2.15	18.62	34.77	16.15	V
784.50	-23.14	2.01	45.67	0.16	2.15	18.53	34.77	16.24	V

LTE Band 13_10MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
782.00	-22.97	2.01	45.65	0.09	2.15	18.61	34.77	16.16	V

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	-24.82	2.92	43.75	4.87	20.88	33.00	12.12	V
1882.50	-23.85	3.13	43.75	4.81	21.58	33.00	11.42	V
1914.30	-23.70	2.89	43.78	4.75	21.94	33.00	11.06	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	-25.06	2.87	43.75	4.87	20.69	33.00	12.31	H
1882.50	-24.03	3.13	43.75	4.81	21.40	33.00	11.60	V
1913.50	-23.91	2.88	43.78	4.76	21.75	33.00	11.25	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	-25.07	2.87	43.75	4.87	20.68	33.00	12.32	H
1882.50	-24.13	3.13	43.75	4.81	21.30	33.00	11.70	V
1912.50	-23.87	2.86	43.77	4.76	21.80	33.00	11.20	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	-24.88	2.88	43.74	4.86	20.84	33.00	12.16	H
1882.50	-23.89	3.13	43.75	4.81	21.54	33.00	11.46	V
1910.00	-23.70	2.88	43.77	4.76	21.95	33.00	11.05	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	-25.06	2.87	43.75	4.86	20.68	33.00	12.32	H
1882.50	-24.00	3.13	43.75	4.81	21.43	33.00	11.57	V
1907.50	-24.14	2.84	43.77	4.77	21.56	33.00	11.44	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	-24.89	2.86	43.75	4.85	20.85	33.00	12.15	H
1882.50	-23.93	3.13	43.75	4.81	21.50	33.00	11.50	V
1905.00	-24.23	2.87	43.77	4.77	21.44	33.00	11.56	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	-25.76	2.92	43.75	4.87	19.94	33.00	13.06	V
1882.50	-24.81	3.13	43.75	4.81	20.62	33.00	12.38	V
1914.30	-24.84	2.89	43.78	4.75	20.80	33.00	12.20	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	-25.95	2.87	43.75	4.87	19.80	33.00	13.20	V
1882.50	-24.97	3.13	43.75	4.81	20.46	33.00	12.54	V
1913.50	-25.02	2.88	43.78	4.76	20.64	33.00	12.36	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	-25.86	2.87	43.75	4.87	19.89	33.00	13.11	H
1882.50	-24.92	3.13	43.75	4.81	20.51	33.00	12.49	V
1912.50	-24.98	2.86	43.77	4.76	20.69	33.00	12.31	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	-25.89	2.88	43.74	4.86	19.83	33.00	13.17	H
1882.50	-24.77	3.13	43.75	4.81	20.66	33.00	12.34	V
1910.00	-24.71	2.88	43.77	4.76	20.94	33.00	12.06	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	-26.05	2.87	43.75	4.86	19.69	33.00	13.31	V
1882.50	-24.94	3.13	43.75	4.81	20.49	33.00	12.51	V
1907.50	-24.96	2.84	43.77	4.77	20.74	33.00	12.26	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	-25.91	2.86	43.75	4.85	19.83	33.00	13.17	V
1882.50	-24.86	3.13	43.75	4.81	20.57	33.00	12.43	V
1905.00	-25.02	2.87	43.77	4.77	20.65	33.00	12.35	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	-22.85	2.13	45.86	0.89	2.15	19.62	50.00	30.38	H
819.00	-22.63	2.19	45.84	1.05	2.15	19.92	50.00	30.08	H
823.30	-21.70	2.24	45.79	0.55	2.15	20.25	50.00	29.75	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	-22.97	2.14	45.87	0.93	2.15	19.54	50.00	30.46	H
819.00	-22.74	2.19	45.84	1.05	2.15	19.81	50.00	30.19	H
822.50	-21.73	2.23	45.81	0.33	2.15	20.03	50.00	29.97	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	-22.98	2.16	45.88	0.98	2.15	19.57	50.00	30.43	H
819.00	-22.77	2.19	45.84	1.05	2.15	19.78	50.00	30.22	H
821.50	-22.27	2.22	45.82	0.71	2.15	19.89	50.00	30.11	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	-22.58	2.19	45.84	1.05	2.15	19.97	50.00	30.03	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	-23.80	2.13	45.86	0.89	2.15	18.67	50.00	31.33	H
819.00	-23.56	2.19	45.84	1.05	2.15	18.99	50.00	31.01	H
823.30	-22.78	2.24	45.79	0.55	2.15	19.17	50.00	30.83	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	-23.80	2.14	45.87	0.93	2.15	18.71	50.00	31.29	H
819.00	-23.69	2.19	45.84	1.05	2.15	18.86	50.00	31.14	H
822.50	-22.79	2.23	45.81	0.33	2.15	18.97	50.00	31.03	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	-23.78	2.16	45.88	0.98	2.15	18.77	50.00	31.23	H
819.00	-23.72	2.19	45.84	1.05	2.15	18.83	50.00	31.17	H
821.50	-23.13	2.22	45.82	0.71	2.15	19.03	50.00	30.97	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	-23.50	2.19	45.84	1.05	2.15	19.05	50.00	30.95	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	-22.06	2.26	45.79	0.95	2.15	20.27	38.45	18.18	H
836.50	-21.70	2.26	45.66	0.82	2.15	20.37	38.45	18.08	H
848.30	-22.49	2.27	45.55	0.80	2.15	19.44	38.45	19.01	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	-22.22	2.26	45.79	0.94	2.15	20.10	38.45	18.35	H
836.50	-21.85	2.26	45.66	0.82	2.15	20.22	38.45	18.23	H
847.50	-22.62	2.27	45.56	0.81	2.15	19.33	38.45	19.12	H

LTE Band 26_5MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
826.50	-22.21	2.25	45.77	0.93	2.15	20.09	38.45	18.36	H
836.50	-21.87	2.26	45.66	0.82	2.15	20.20	38.45	18.25	H
846.50	-22.60	2.26	45.56	0.82	2.15	19.37	38.45	19.08	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	-22.36	2.13	45.74	0.90	2.15	20.00	38.45	18.45	H
836.50	-21.88	2.26	45.66	0.82	2.15	20.19	38.45	18.26	H
844.00	-22.58	2.26	45.59	0.82	2.15	19.42	38.45	19.03	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	-22.32	2.12	45.71	0.87	2.15	19.99	38.45	18.46	H
836.50	-21.90	2.26	45.66	0.82	2.15	20.17	38.45	18.28	H
841.50	-22.56	2.26	45.61	0.82	2.15	19.46	38.45	18.99	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	-23.11	2.26	45.79	0.95	2.15	19.22	38.45	19.23	H
836.50	-22.69	2.26	45.66	0.82	2.15	19.38	38.45	19.07	H
848.30	-23.57	2.27	45.55	0.80	2.15	18.36	38.45	20.09	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	-23.24	2.26	45.79	0.94	2.15	19.08	38.45	19.37	H
836.50	-22.72	2.26	45.66	0.82	2.15	19.35	38.45	19.10	H
847.50	-23.63	2.27	45.56	0.81	2.15	18.32	38.45	20.13	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	-23.04	2.25	45.77	0.93	2.15	19.26	38.45	19.19	H
836.50	-22.80	2.26	45.66	0.82	2.15	19.27	38.45	19.18	H
846.50	-23.48	2.26	45.56	0.82	2.15	18.49	38.45	19.96	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	-23.27	2.13	45.74	0.90	2.15	19.09	38.45	19.36	H
836.50	-22.68	2.26	45.66	0.82	2.15	19.39	38.45	19.06	H
844.00	-23.38	2.26	45.59	0.82	2.15	18.62	38.45	19.83	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	-23.12	2.12	45.71	0.87	2.15	19.19	38.45	19.26	H
836.50	-22.85	2.26	45.66	0.82	2.15	19.22	38.45	19.23	H
841.50	-23.46	2.26	45.61	0.82	2.15	18.56	38.45	19.89	H

LTE Band 41I(PC2)- 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	-31.10	3.58	45.59	6.10	17.01	33.00	15.99	H
2593.00	-30.16	3.69	44.93	6.27	17.35	33.00	15.65	H
2687.50	-30.76	3.73	44.98	6.44	16.93	33.00	16.07	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	-31.09	3.58	45.65	6.10	17.08	33.00	15.92	H
2593.00	-30.03	3.69	44.93	6.27	17.48	33.00	15.52	V
2685.00	-31.02	3.73	44.98	6.43	16.66	33.00	16.34	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	-31.26	3.58	45.65	6.11	16.92	33.00	16.08	H
2593.00	-30.21	3.69	44.93	6.27	17.30	33.00	15.70	H
2682.50	-31.43	3.73	44.98	6.43	16.25	33.00	16.75	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	-30.52	3.59	45.15	6.11	17.15	33.00	15.85	H
2593.00	-30.05	3.69	44.93	6.27	17.46	33.00	15.54	H
2680.00	-31.39	3.73	44.97	6.42	16.27	33.00	16.73	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	-30.90	3.58	45.59	6.10	17.21	33.00	15.79	H
2593.00	-29.95	3.69	44.93	6.27	17.56	33.00	15.44	H
2687.50	-30.56	3.73	44.98	6.44	17.13	33.00	15.87	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	-31.11	3.58	45.65	6.10	17.06	33.00	15.94	H
2593.00	-29.89	3.69	44.93	6.27	17.62	33.00	15.38	V
2685.00	-30.93	3.73	44.98	6.43	16.75	33.00	16.25	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	-31.24	3.58	45.65	6.11	16.94	33.00	16.06	H
2593.00	-30.08	3.69	44.93	6.27	17.43	33.00	15.57	H
2682.50	-31.26	3.73	44.98	6.43	16.42	33.00	16.58	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	-30.45	3.59	45.15	6.11	17.22	33.00	15.78	H
2593.00	-29.97	3.69	44.93	6.27	17.54	33.00	15.46	H
2680.00	-31.20	3.73	44.97	6.42	16.46	33.00	16.54	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	-29.86	3.17	44.10	5.12	22.53	33.00	10.47	H
1745.00	-29.08	3.68	44.16	5.06	23.82	33.00	9.18	H
1779.30	-27.84	3.04	44.03	5.00	24.23	33.00	8.77	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	-30.27	3.40	44.10	5.12	22.35	33.00	10.65	H
1745.00	-29.22	3.68	44.16	5.06	23.68	33.00	9.32	H
1778.50	-27.89	3.04	44.03	5.00	24.18	33.00	8.82	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	-23.24	3.66	44.10	5.12	22.32	33.00	10.68	H
1745.00	-21.87	3.68	44.16	5.06	23.67	33.00	9.33	H
1777.50	-21.79	3.04	44.04	5.00	24.21	33.00	8.79	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	-23.35	3.56	44.10	5.11	22.30	33.00	10.70	H
1745.00	-21.82	3.68	44.16	5.06	23.72	33.00	9.28	H
1775.00	-21.79	3.05	44.05	5.01	24.21	33.00	8.79	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	-23.58	3.47	44.11	5.11	22.17	33.00	10.83	H
1745.00	-21.88	3.68	44.16	5.06	23.66	33.00	9.34	H
1772.50	-22.19	3.05	44.06	5.01	23.83	33.00	9.17	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	-23.58	3.37	44.11	5.10	22.26	33.00	10.74	H
1745.00	-21.80	3.68	44.16	5.06	23.74	33.00	9.26	H
1770.00	-21.88	3.05	44.07	5.01	24.16	33.00	8.84	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	-30.78	3.17	44.10	5.12	21.61	33.00	11.39	H
1745.00	-29.99	3.68	44.16	5.06	22.91	33.00	10.09	H
1779.30	-28.77	3.04	44.03	5.00	23.30	33.00	9.70	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	-31.23	3.40	44.10	5.12	21.39	33.00	11.61	H
1745.00	-30.01	3.68	44.16	5.06	22.89	33.00	10.11	H
1778.50	-28.78	3.04	44.03	5.00	23.29	33.00	9.71	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	-24.07	3.66	44.10	5.12	21.49	33.00	11.51	H
1745.00	-22.75	3.68	44.16	5.06	22.79	33.00	10.21	H
1777.50	-22.53	3.04	44.04	5.00	23.47	33.00	9.53	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	-24.31	3.56	44.10	5.11	21.34	33.00	11.66	H
1745.00	-22.58	3.68	44.16	5.06	22.96	33.00	10.04	H
1775.00	-22.66	3.05	44.05	5.01	23.34	33.00	9.66	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	-24.55	3.47	44.11	5.11	21.20	33.00	11.80	H
1745.00	-22.67	3.68	44.16	5.06	22.87	33.00	10.13	H
1772.50	-23.00	3.05	44.06	5.01	23.02	33.00	9.98	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	-24.50	3.37	44.11	5.10	21.34	33.00	11.66	H
1745.00	-22.56	3.68	44.16	5.06	22.98	33.00	10.02	H
1770.00	-22.83	3.05	44.07	5.01	23.21	33.00	9.79	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	-23.89	1.87	44.73	0.78	2.15	17.60	34.77	17.17	V
680.50	-23.63	1.88	44.72	0.78	2.15	17.83	34.77	16.94	V
695.50	-24.49	1.89	44.67	0.77	2.15	16.91	34.77	17.86	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	-23.73	1.87	44.75	0.78	2.15	17.79	34.77	16.98	V
680.50	-23.52	1.88	44.72	0.78	2.15	17.94	34.77	16.83	V
693.00	-24.00	1.89	44.67	0.77	2.15	17.40	34.77	17.37	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	-23.53	1.88	44.75	0.78	2.15	17.97	34.77	16.80	V
680.50	-23.59	1.88	44.72	0.78	2.15	17.87	34.77	16.90	V
690.50	-23.77	1.89	44.73	0.77	2.15	17.69	34.77	17.08	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	-23.63	1.88	44.71	0.78	2.15	17.83	34.77	16.94	V
680.50	-23.49	1.88	44.72	0.78	2.15	17.97	34.77	16.80	V
688.00	-23.58	1.89	44.72	0.77	2.15	17.88	34.77	16.89	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	-24.85	1.87	44.73	0.78	2.15	16.64	34.77	18.13	V
680.50	-24.65	1.88	44.72	0.78	2.15	16.81	34.77	17.96	V
695.50	-25.31	1.89	44.67	0.77	2.15	16.09	34.77	18.68	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	-24.74	1.87	44.75	0.78	2.15	16.78	34.77	17.99	V
680.50	-24.61	1.88	44.72	0.78	2.15	16.85	34.77	17.92	V
693.00	-24.92	1.89	44.67	0.77	2.15	16.48	34.77	18.29	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	-24.37	1.88	44.75	0.78	2.15	17.13	34.77	17.64	V
680.50	-24.58	1.88	44.72	0.78	2.15	16.88	34.77	17.89	V
690.50	-24.56	1.89	44.73	0.77	2.15	16.90	34.77	17.87	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	-24.56	1.88	44.71	0.78	2.15	16.90	34.77	17.87	V
680.50	-24.46	1.88	44.72	0.78	2.15	17.00	34.77	17.77	V
688.00	-24.56	1.89	44.72	0.77	2.15	16.90	34.77	17.87	V

Peak EIRP(dBm) = P_{Mea}(-27.84dBm) - G_a (-5.00dBi) - P_{Ag} (-44.03dB) - P_{cl} (3.04dB) = 24.23dBm

ANALYZER SETTINGS:

RBW = VBW = 8MHz for occupied bandwdiths equal to or less than 5MHz.

RBW = VBW = 20MHz for occupied bandwidths equal to or greater than 10MHz.

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

A.2 EMISSION LIMIT

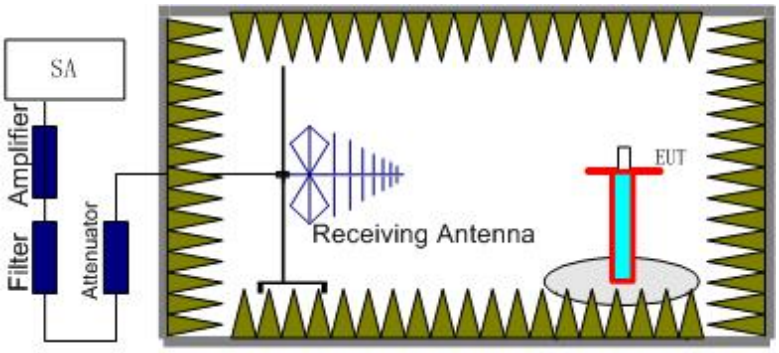
A.2.1 Measurement Method

The measurements procedures in TIA-603E-2016 are used. This measurement is carried out in fully-anechoic chamber FAC-3.

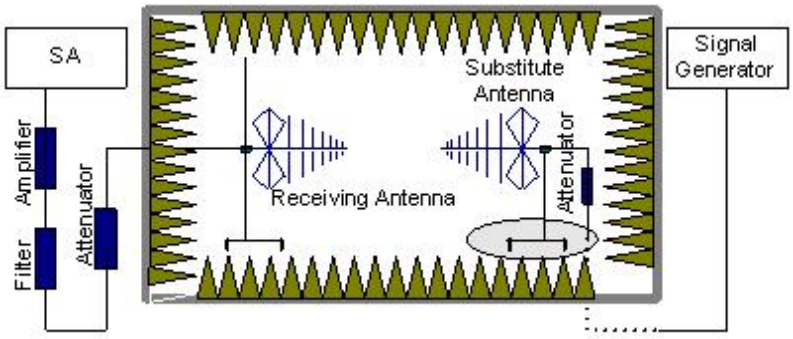
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier. The resolution bandwidth is set 1MHz. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the LTE Bands 12 13 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 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.2.3 Measurement Results

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the LTE Bands 12 13 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 13 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	-53.43	3.24	4.98	2.15	-53.84	-13.00	40.84	H
2104.00	-55.50	4.20	4.91	2.15	-56.94	-13.00	43.94	H
2799.00	-47.53	4.91	6.64	2.15	-47.95	-13.00	34.95	V
3486.02	-56.13	5.49	8.17	2.15	-55.60	-13.00	42.60	V
4190.02	-54.24	6.18	9.09	2.15	-53.48	-13.00	40.48	V
4891.01	-55.18	6.73	9.79	2.15	-54.27	-13.00	41.27	H

LTE Band 12, 1.4MHz, QPSK, Channel 23095

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1415.01	-53.47	3.25	5.06	2.15	-53.81	-13.00	40.81	V
2133.00	-54.92	4.23	5.00	2.15	-56.30	-13.00	43.30	H
2830.00	-50.69	4.95	6.69	2.15	-51.10	-13.00	38.10	H
3529.02	-55.61	5.61	8.24	2.15	-55.13	-13.00	42.13	V
4251.02	-55.68	6.24	9.15	2.15	-54.92	-13.00	41.92	H
4955.01	-54.92	6.68	9.86	2.15	-53.89	-13.00	40.89	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	-56.80	3.28	5.14	2.15	-57.09	-13.00	44.09	V
2137.00	-55.51	4.23	5.01	2.15	-56.88	-13.00	43.88	V
2862.00	-45.84	4.96	6.75	2.15	-46.20	-13.00	33.20	V
3573.02	-55.92	6.06	8.30	2.15	-55.83	-13.00	42.83	V
4296.02	-53.96	6.20	9.20	2.15	-53.11	-13.00	40.11	H
5011.01	-54.95	6.58	9.92	2.15	-53.76	-13.00	40.76	H

LTE Band 13, 5MHz, QPSK, Channel 23205

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1549.01	-62.01	3.46	5.41	2.15	-62.21	-13.00	49.21	H
2339.00	-54.11	4.44	5.62	2.15	-55.08	-13.00	42.08	V
3104.02	-54.20	5.33	7.25	2.15	-54.43	-13.00	41.43	H
3899.02	-55.99	6.11	8.76	2.15	-55.49	-13.00	42.49	H
4666.02	-54.91	6.48	9.57	2.15	-53.97	-13.00	40.97	V
5447.01	-55.54	6.86	10.53	2.15	-54.02	-13.00	41.02	V

LTE Band 13, 5MHz, QPSK, Channel 23230

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1555.01	-61.53	3.47	5.40	2.15	-61.75	-13.00	48.75	H
2346.00	-31.18	4.45	5.64	2.15	-32.14	-13.00	19.14	V
3128.02	-53.90	5.40	7.31	2.15	-54.14	-13.00	41.14	H
3905.02	-55.49	6.11	8.77	2.15	-54.98	-13.00	41.98	H
4691.02	-55.08	6.50	9.59	2.15	-54.14	-13.00	41.14	V
5479.01	-55.02	6.98	10.57	2.15	-53.58	-13.00	40.58	V

LTE Band 13, 5MHz, QPSK, Channel 23255

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1569.01	-61.71	3.48	5.38	2.15	-61.96	-13.00	48.96	V
2353.00	-54.01	4.46	5.66	2.15	-54.96	-13.00	41.96	V
3134.02	-54.21	5.39	7.32	2.15	-54.43	-13.00	41.43	H
3922.02	-55.10	6.12	8.79	2.15	-54.58	-13.00	41.58	H
4705.02	-55.43	6.51	9.61	2.15	-54.48	-13.00	41.48	H
5504.01	-55.16	7.08	10.60	2.15	-53.79	-13.00	40.79	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
7883.01	-53.83	8.40	12.51	-49.72	-13.00	36.72	H
9755.01	-53.02	8.94	13.14	-48.82	-13.00	35.82	V
11635.01	-49.76	9.73	13.07	-46.42	-13.00	33.42	V
13108.01	-46.67	10.90	13.65	-43.92	-13.00	30.92	H
14821.00	-38.16	11.14	14.14	-35.16	-13.00	22.16	V
16949.00	-41.27	12.18	13.78	-39.67	-13.00	26.67	H

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
7534.01	-54.70	8.25	12.23	-50.72	-13.00	37.72	V
9417.01	-51.69	9.12	13.35	-47.46	-13.00	34.46	H
11314.01	-49.92	10.00	13.14	-46.78	-13.00	33.78	H
13205.01	-43.06	10.50	13.79	-39.77	-13.00	26.77	H
15077.00	-37.91	11.32	13.95	-35.28	-13.00	22.28	V
16971.00	-40.05	12.26	13.79	-38.52	-13.00	25.52	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
7610.01	-54.09	8.02	12.29	-49.82	-13.00	36.82	V
9578.01	-50.58	9.26	13.32	-46.52	-13.00	33.52	V
11515.01	-50.15	9.81	13.10	-46.86	-13.00	33.86	V
13431.01	-44.88	10.59	14.10	-41.37	-13.00	28.37	H
15332.00	-39.96	11.31	13.80	-37.47	-13.00	24.47	V
17270.00	-42.11	12.37	14.39	-40.09	-13.00	27.09	H

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

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2438.00	-37.42	4.56	5.91	2.15	-38.22	-13.00	25.22	V
6523.01	-53.12	7.50	11.03	2.15	-51.74	-13.00	38.74	V
7328.01	-52.69	8.10	11.99	2.15	-50.95	-13.00	37.95	H
8137.01	-52.75	8.39	12.71	2.15	-50.58	-13.00	37.58	H
8965.00	-51.64	9.08	13.09	2.15	-49.78	-13.00	36.78	V
9761.00	-51.65	8.95	13.14	2.15	-49.61	-13.00	36.61	H

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
1650.01	-62.90	3.57	5.23	2.15	-63.39	-13.00	50.39	H
2438.00	-52.42	4.56	5.91	2.15	-53.22	-13.00	40.22	H
3269.02	-55.36	5.28	7.65	2.15	-55.14	-13.00	42.14	V
4078.02	-55.46	6.04	8.98	2.15	-54.67	-13.00	41.67	V
4930.01	-55.39	6.72	9.83	2.15	-54.43	-13.00	41.43	V
5740.01	-53.91	7.28	10.55	2.15	-52.79	-13.00	39.79	H

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

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2410.00	-39.53	4.53	5.83	2.15	-40.38	-13.00	27.38	V
6433.01	-52.14	7.56	10.93	2.15	-50.92	-13.00	37.92	H
7591.01	-52.56	8.01	12.27	2.15	-50.45	-13.00	37.45	H
8090.01	-51.62	8.32	12.67	2.15	-49.42	-13.00	36.42	H
9120.00	-50.89	8.93	13.17	2.15	-48.80	-13.00	35.80	V
9956.00	-50.32	9.14	12.94	2.15	-48.67	-13.00	35.67	H

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

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1650.01	-60.93	3.57	5.23	2.15	-61.42	-13.00	48.42	H
2456.00	-48.84	4.58	5.97	2.15	-49.60	-13.00	36.60	H
3315.02	-55.12	5.29	7.76	2.15	-54.80	-13.00	41.80	H
4130.02	-55.85	6.05	9.03	2.15	-55.02	-13.00	42.02	H
4943.01	-54.89	6.70	9.84	2.15	-53.90	-13.00	40.90	H
5762.01	-53.44	7.25	10.55	2.15	-52.29	-13.00	39.29	H

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

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1673.01	-55.89	3.58	5.19	2.15	-56.43	-13.00	43.43	H
2510.00	-49.75	4.63	6.12	2.15	-50.41	-13.00	37.41	H
3357.02	-54.45	5.32	7.86	2.15	-54.06	-13.00	41.06	H
4177.02	-54.77	6.15	9.08	2.15	-53.99	-13.00	40.99	V
5021.01	-55.11	6.57	9.93	2.15	-53.90	-13.00	40.90	H
5851.01	-53.56	7.24	10.53	2.15	-52.42	-13.00	39.42	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	-60.85	3.60	5.15	2.15	-61.45	-13.00	48.45	H
2545.00	-47.49	4.66	6.18	2.15	-48.12	-13.00	35.12	H
3385.02	-54.72	5.35	7.92	2.15	-54.30	-13.00	41.30	V
4260.02	-55.80	6.23	9.16	2.15	-55.02	-13.00	42.02	H
5076.01	-55.09	6.70	10.01	2.15	-53.93	-13.00	40.93	V
5919.01	-52.83	7.45	10.52	2.15	-51.91	-13.00	38.91	H

LTE Band 41(PC2), 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	-51.92	6.60	9.90	-48.62	-25.00	23.62	H
7492.01	-54.36	8.37	12.19	-50.54	-25.00	25.54	H
9989.01	-53.97	9.17	12.91	-50.23	-25.00	25.23	V
12492.01	-50.42	10.19	13.20	-47.41	-25.00	22.41	V
14993.00	-46.63	11.21	14.01	-43.83	-25.00	18.83	H
17491.00	-42.78	12.70	14.88	-40.60	-25.00	15.60	H

LTE Band 41(PC2), 5MHz, QPSK, Channel 40620

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
6477.02	-55.11	7.53	10.98	-51.66	-25.00	26.66	V
7780.01	-51.11	8.31	12.42	-47.00	-25.00	22.00	H
9080.01	-53.34	8.99	13.15	-49.18	-25.00	24.18	H
10388.01	-47.54	9.78	13.06	-44.26	-25.00	19.26	H
11660.01	-48.95	9.69	13.07	-45.57	-25.00	20.57	H
12971.01	-46.49	10.48	13.48	-43.49	-25.00	18.49	H

LTE Band 41(PC2), 5MHz, QPSK, Channel 41565

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
4039.02	-56.67	6.05	8.94	-53.78	-25.00	28.78	H
5381.02	-56.85	6.87	10.43	-53.29	-25.00	28.29	H
6738.02	-54.61	7.98	11.29	-51.30	-25.00	26.30	V
8066.01	-47.16	8.32	12.65	-42.83	-25.00	17.83	H
9384.01	-54.64	9.05	13.33	-50.36	-25.00	25.36	H
10760.01	-46.95	9.45	13.15	-43.25	-25.00	18.25	V

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	-56.26	5.38	8.01	-53.63	-13.00	40.63	H
5135.02	-57.31	6.86	10.09	-54.08	-13.00	41.08	H
6846.01	-54.73	7.83	11.42	-51.14	-13.00	38.14	V
8555.01	-53.51	8.57	13.01	-49.07	-13.00	36.07	H
10265.01	-52.70	9.52	13.01	-49.21	-13.00	36.21	V
11974.01	-49.48	10.17	13.01	-46.64	-13.00	33.64	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	-55.52	5.50	8.18	-52.84	-13.00	39.84	H
5236.02	-57.30	7.00	10.23	-54.07	-13.00	41.07	H
6979.01	-55.02	8.14	11.57	-51.59	-13.00	38.59	V
8721.01	-54.20	8.42	13.04	-49.58	-13.00	36.58	V
10470.01	-52.29	9.70	13.09	-48.90	-13.00	35.90	H
12218.01	-49.30	10.05	13.09	-46.26	-13.00	33.26	H

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
3559.02	-56.79	5.92	8.28	-54.43	-13.00	41.43	H
5338.02	-56.16	6.96	10.37	-52.75	-13.00	39.75	H
7114.01	-55.13	8.16	11.74	-51.55	-13.00	38.55	V
8901.01	-54.43	8.85	13.08	-50.20	-13.00	37.20	H
10675.01	-51.57	9.30	13.14	-47.73	-13.00	34.73	V
12455.01	-49.95	10.29	13.18	-47.06	-13.00	34.06	H

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	-55.30	3.15	4.62	2.15	-55.98	-13.00	42.98	V
1997.01	-50.02	4.04	4.61	2.15	-51.60	-13.00	38.60	V
2636.00	-51.55	4.73	6.34	2.15	-52.09	-13.00	39.09	V
3356.02	-54.73	5.32	7.85	2.15	-54.35	-13.00	41.35	H
4019.02	-54.47	6.05	8.92	2.15	-53.75	-13.00	40.75	V
4641.02	-53.89	6.46	9.54	2.15	-52.96	-13.00	39.96	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
1361.01	-57.20	3.19	4.78	2.15	-57.76	-13.00	44.76	V
2055.00	-56.03	4.15	4.77	2.15	-57.56	-13.00	44.56	V
2723.00	-51.66	4.81	6.50	2.15	-52.12	-13.00	39.12	V
3388.02	-55.07	5.35	7.93	2.15	-54.64	-13.00	41.64	V
4074.02	-55.51	6.04	8.97	2.15	-54.73	-13.00	41.73	H
4765.01	-55.39	6.60	9.67	2.15	-54.47	-13.00	41.47	V

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
1391.01	-57.67	3.22	4.93	2.15	-58.11	-13.00	45.11	V
2087.00	-55.60	4.18	4.86	2.15	-57.07	-13.00	44.07	H
2799.00	-51.95	4.91	6.64	2.15	-52.37	-13.00	39.37	V
3493.02	-54.67	5.51	8.18	2.15	-54.15	-13.00	41.15	H
4186.02	-54.67	6.17	9.09	2.15	-53.90	-13.00	40.90	V
4866.01	-54.67	6.72	9.77	2.15	-53.77	-13.00	40.77	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 -10℃.
3. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on middle channel for LTE Bands 12 13 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 -10℃ 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 -10℃ to +50℃. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.5VDC and 4.4VDC, 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, 5MHz bandwidth (worst case of all bandwidths)

Frequency Error vs Voltage

Voltage (V)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
3.5	-13.53	-21.54	0.0191	0.0304
3.8	-9.27	-17.04	0.0131	0.0241
4.4	-11.09	-17.05	0.0157	0.0241

Frequency Error vs Temperature

Temperature (℃)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
50	-11.94	-19.90	0.0169	0.0281
40	-12.97	-16.42	0.0183	0.0232
30	-11.70	-18.48	0.0165	0.0261
20	-14.19	-19.05	0.0201	0.0269
10	-11.47	-15.81	0.0162	0.0223
0	-9.76	-18.91	0.0138	0.0267
-10	-7.17	-20.18	0.0101	0.0285
-20	-7.50	-21.83	0.0106	0.0309
-30	-9.01	-20.79	0.0127	0.0294

LTE Band 13, 5MHz bandwidth (worst case of all bandwidths)

Frequency Error vs Voltage

Voltage (V)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
3.5	-11.34	-20.86	0.0145	0.0267
3.8	-13.70	-24.00	0.0175	0.0307
4.4	-12.95	-23.23	0.0166	0.0297

Frequency Error vs Temperature

Temperature (℃)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
50	-11.16	-18.47	0.0143	0.0236
40	-13.22	-22.02	0.0169	0.0282
30	-11.23	-19.31	0.0144	0.0247
20	-9.88	-22.69	0.0126	0.0290
10	-12.46	-23.96	0.0159	0.0306
0	-8.71	-19.07	0.0111	0.0244
-10	-13.83	-27.62	0.0177	0.0353
-20	-14.33	-18.75	0.0183	0.0240
-30	-15.05	-19.50	0.0192	0.0249

LTE Band 25, 1.4MHz bandwidth (worst case of all bandwidths)

Frequency Error vs Voltage

Voltage (V)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
3.5	-17.62	-35.48	0.0094	0.0188
3.8	-17.29	-37.61	0.0092	0.0200
4.4	-17.92	-35.68	0.0095	0.0190

Frequency Error vs Temperature

Temperature (℃)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
50	-16.58	-34.86	0.0088	0.0185
40	-14.66	-29.44	0.0078	0.0156
30	-13.85	-35.48	0.0074	0.0188
20	-10.97	-35.72	0.0058	0.0190
10	-13.18	-36.01	0.0070	0.0191
0	-17.27	-37.45	0.0092	0.0199
-10	-16.98	-36.49	0.0090	0.0194
-20	-12.06	-36.61	0.0064	0.0194
-30	-15.69	-33.42	0.0083	0.0178

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

Frequency Error vs Voltage

Voltage (V)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
3.5	-11.69	-33.77	0.0143	0.0412
3.8	-14.65	-33.80	0.0179	0.0413
4.4	-11.47	-31.81	0.0140	0.0388

Frequency Error vs Temperature

Temperature (℃)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
50	-10.54	-33.82	0.0129	0.0413
40	-9.26	-34.28	0.0113	0.0419
30	-10.53	-31.63	0.0129	0.0386
20	-10.01	-32.07	0.0122	0.0392
10	-14.08	-35.10	0.0172	0.0429
0	-13.92	-34.17	0.0170	0.0417
-10	-11.03	-32.73	0.0135	0.0400
-20	-11.56	-30.24	0.0141	0.0369
-30	-11.12	-24.91	0.0136	0.0304

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

Frequency Error vs Voltage

Voltage (V)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
3.5	-11.80	-29.14	0.0141	0.0348
3.8	-11.13	-26.64	0.0133	0.0318
4.4	-12.35	-28.07	0.0148	0.0336

Frequency Error vs Temperature

Temperature (℃)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
50	-11.63	-28.60	0.0139	0.0342
40	-9.61	-28.10	0.0115	0.0336
30	-13.12	-35.56	0.0157	0.0425
20	-12.26	-28.35	0.0147	0.0339
10	-13.96	-30.94	0.0167	0.0370
0	-9.80	-29.35	0.0117	0.0351
-10	-12.79	-30.78	0.0153	0.0368
-20	-9.07	-33.67	0.0108	0.0403
-30	-11.37	-29.47	0.0136	0.0352

LTE Band 41(PC2), 5MHz bandwidth (worst case of all bandwidths)

Frequency Error vs Voltage

Voltage (V)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
3.5	-22.49	-11.34	0.0087	0.0044
3.8	-17.21	12.42	0.0066	0.0048
4.4	-19.73	-15.08	0.0076	0.0058

Frequency Error vs Temperature

Temperature (℃)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
50	-22.49	-11.34	0.0087	0.0044
40	-17.21	12.42	0.0066	0.0048
30	-19.73	-15.08	0.0076	0.0058
20	-17.92	-10.91	0.0069	0.0042
10	-22.06	-13.88	0.0085	0.0054
0	-19.43	-11.13	0.0075	0.0043
-10	-17.78	-15.32	0.0069	0.0059
-20	-17.48	-12.70	0.0067	0.0049
-30	-19.37	-14.10	0.0075	0.0054

LTE Band 66, 1.4MHz bandwidth (worst case of all bandwidths)

Frequency Error vs Voltage

Voltage (V)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
3.5	-16.54	-26.39	0.0095	0.0151
3.8	-11.17	-34.93	0.0064	0.0200
4.4	-14.59	-26.94	0.0084	0.0154

Frequency Error vs Temperature

Temperature (℃)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
50	-16.54	-26.39	0.0095	0.0151
40	-11.17	-34.93	0.0064	0.0200
30	-14.59	-26.94	0.0084	0.0154
20	-11.86	-31.57	0.0068	0.0181
10	-14.91	-25.71	0.0085	0.0147
0	-9.73	-30.83	0.0056	0.0177
-10	-11.36	-35.12	0.0065	0.0201
-20	-9.38	-28.42	0.0054	0.0163
-30	-10.14	-31.27	0.0058	0.0179

LTE Band 71, 10MHz bandwidth (worst case of all bandwidths)

Frequency Error vs Voltage

Voltage (V)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
3.5	-11.70	-15.99	0.0172	0.0235
3.8	-13.38	-8.38	0.0197	0.0123
4.4	-15.23	-8.70	0.0224	0.0128

Frequency Error vs Temperature

Temperature (℃)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
50	-11.90	-13.63	0.0175	0.0200
40	-10.17	-15.75	0.0149	0.0231
30	-12.46	-9.80	0.0183	0.0144
20	-14.93	-14.76	0.0219	0.0217
10	-13.42	-16.54	0.0197	0.0243
0	-16.22	-13.43	0.0238	0.0197
-10	-12.06	-14.88	0.0177	0.0219
-20	-11.64	-18.70	0.0171	0.0275
-30	-14.13	-13.85	0.0208	0.0204

A.4 OCCUPIED BANDWIDTH

A.4.1 Occupied Bandwidth Results

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

The measurement method is from KDB 971168 4.2:

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

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

c) Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least 10log (OBW / RBW) below the reference level.

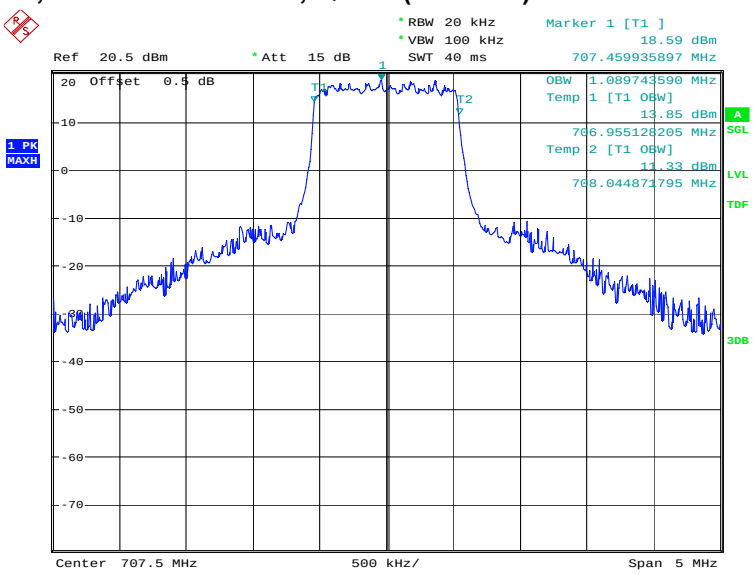
d) Set the detection mode to peak, and the trace mode to max hold.

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

LTE band 12, 1.4MHz (99%)

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

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



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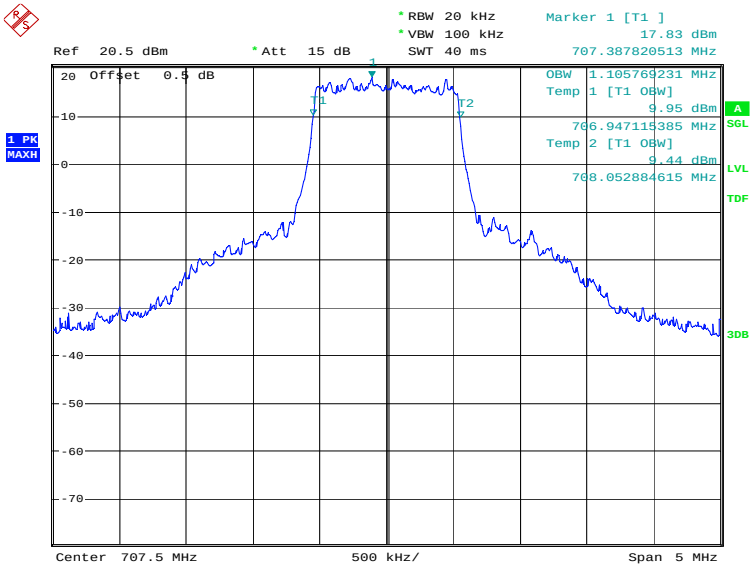
LTE band 12, 1.4MHz Bandwidth, 16QAM (99% BW)



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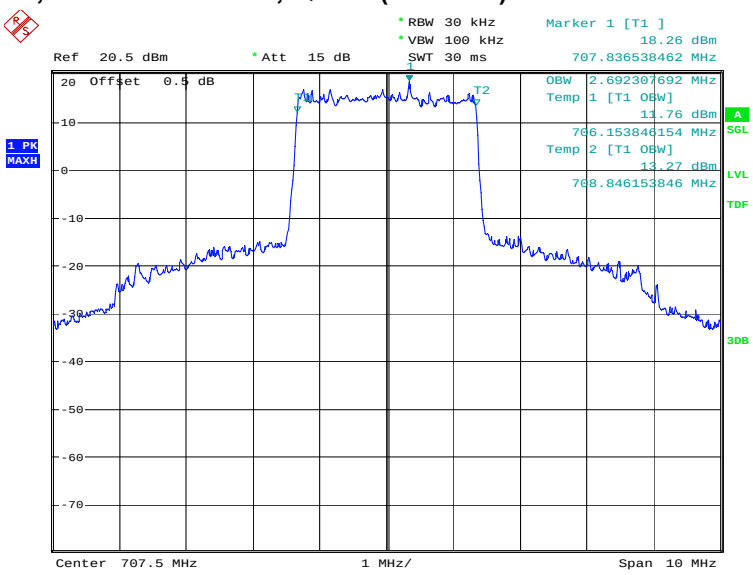
LTE band 12, 3MHz (99%)

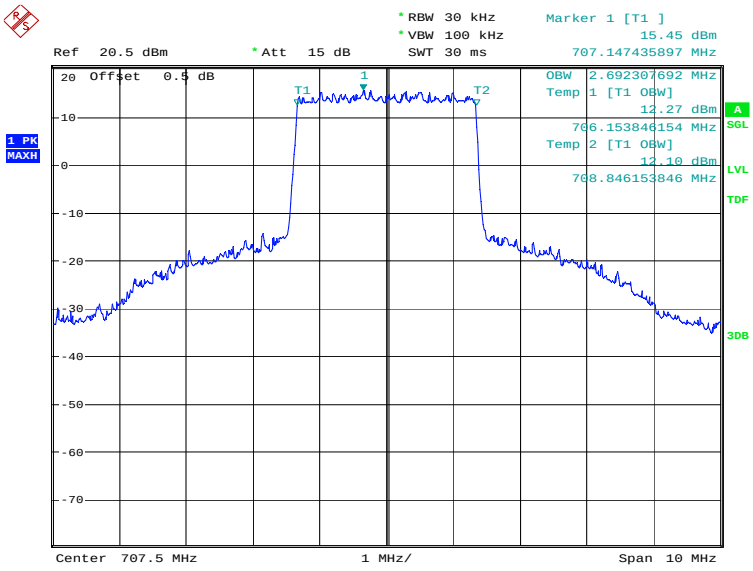
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
707.5	QPSK	16QAM
	2692.31	2692.31

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



Date: 14.OCT.2019 23:53:13

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

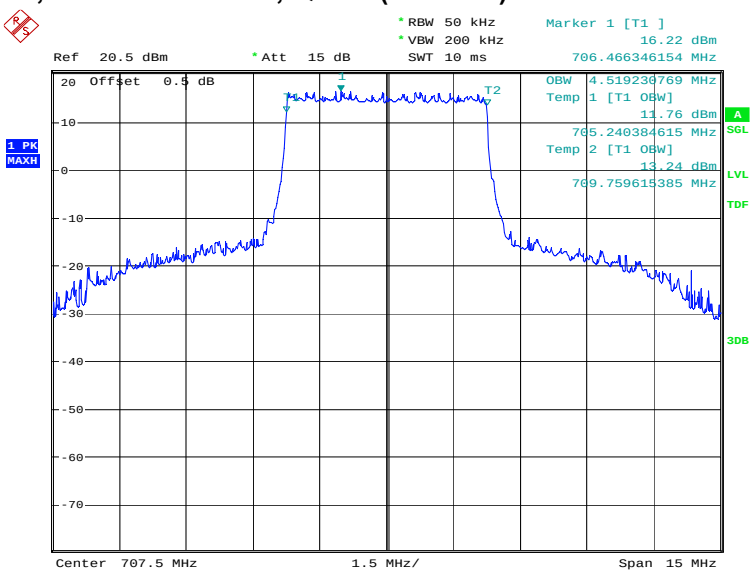


Date: 14.OCT.2019 23:54:39

LTE band 12, 5MHz (99%)

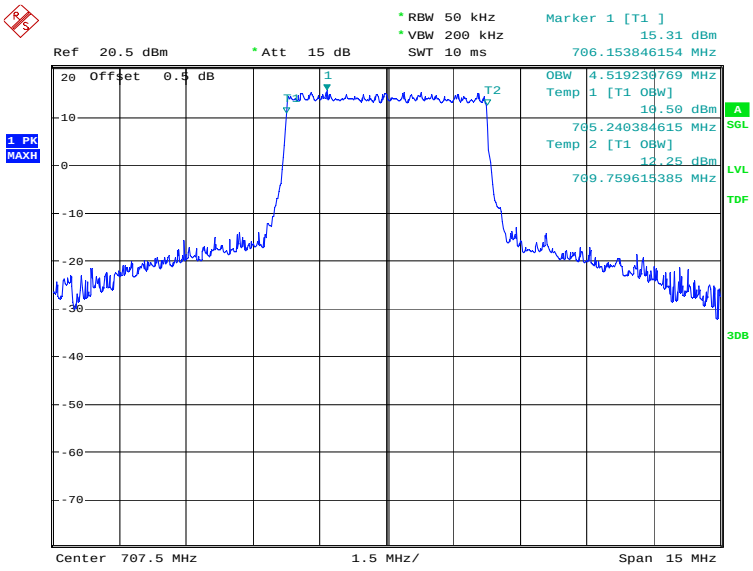
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
707.5	QPSK	16QAM
	4519.23	4519.23

LTE band 12, 5MHz Bandwidth, QPSK (99% BW)



Date: 14.OCT.2019 23:56:54

LTE band 12, 5MHz Bandwidth, 16QAM (99% BW)

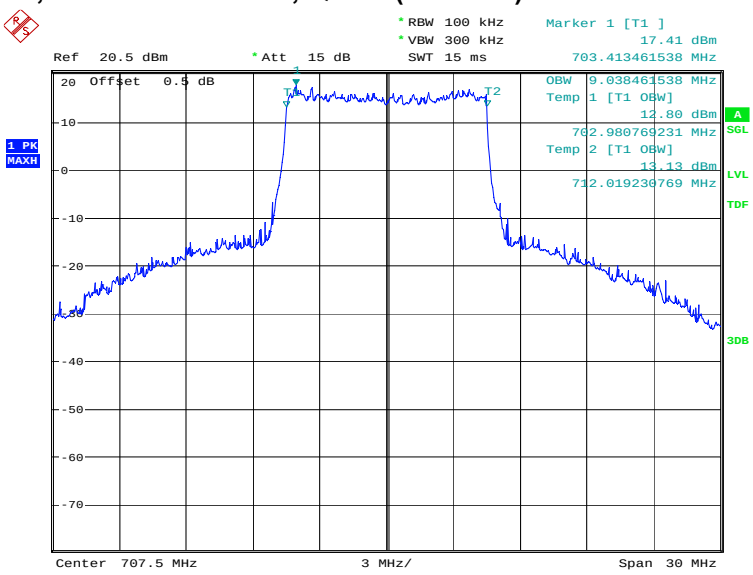


Date: 14.OCT.2019 23:58:20

LTE band 12, 10MHz (99%)

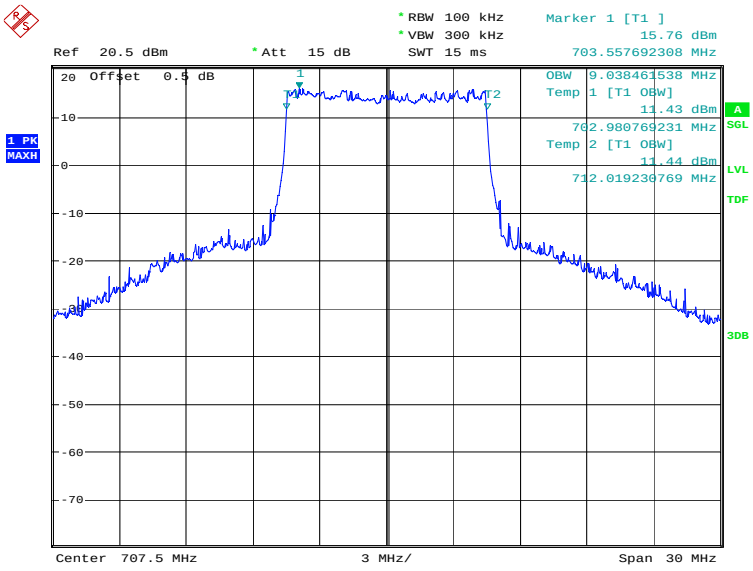
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
707.5	QPSK	16QAM
	9038.46	9038.46

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



Date: 15.OCT.2019 00:00:35

LTE band 12, 10MHz Bandwidth, 16QAM (99% BW)

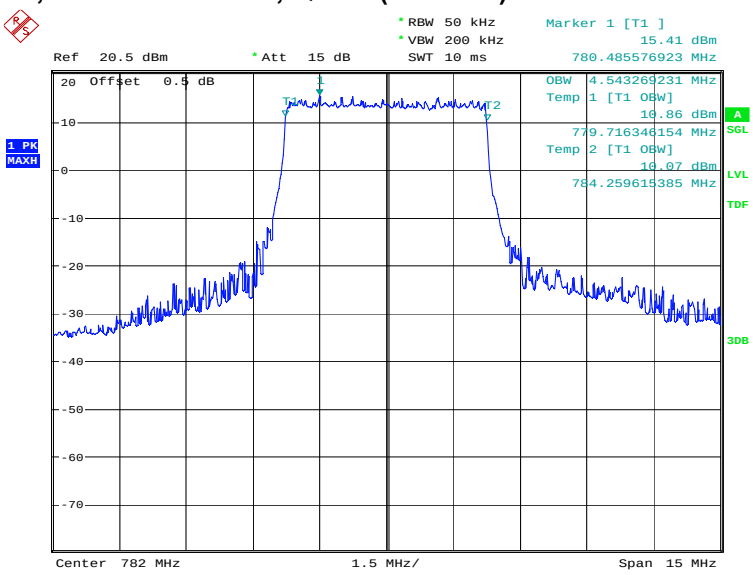


Date: 15.OCT.2019 00:02:01

LTE band 13, 5MHz (99%)

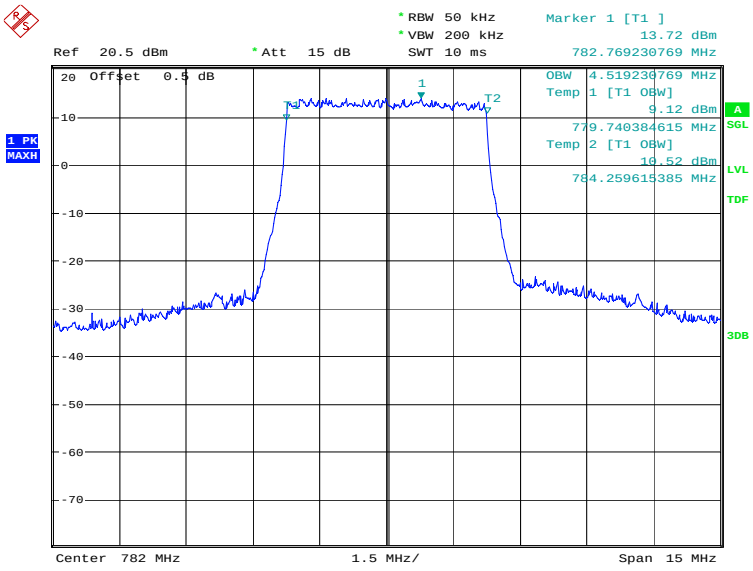
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
782.0	QPSK	16QAM
	4543.27	4519.23

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



Date: 15.OCT.2019 00:04:17

LTE band 13, 5MHz Bandwidth,16QAM (99% BW)

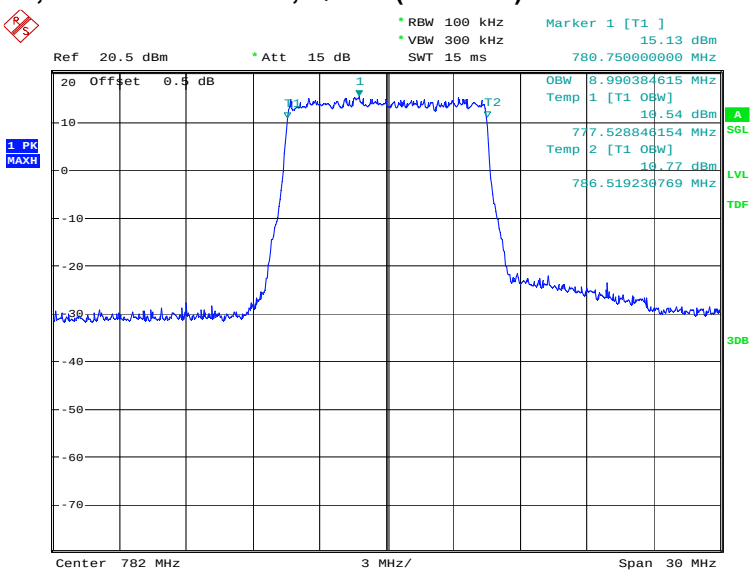


Date: 15.OCT.2019 00:05:43

LTE band 13, 10MHz (99%)

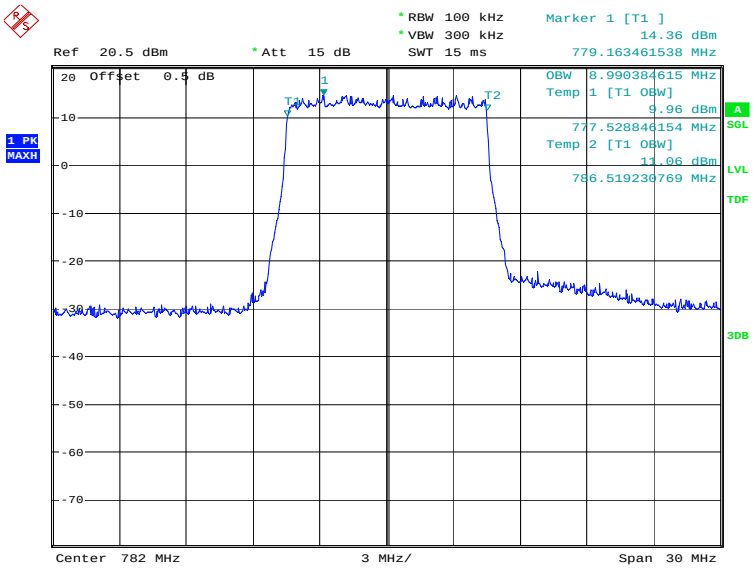
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
782.0	QPSK	16QAM
	8990.38	8990.38

LTE band 13, 10MHz Bandwidth, QPSK (99% BW)



Date: 15.OCT.2019 00:07:58

LTE band 13, 10MHz Bandwidth,16QAM (99% BW)

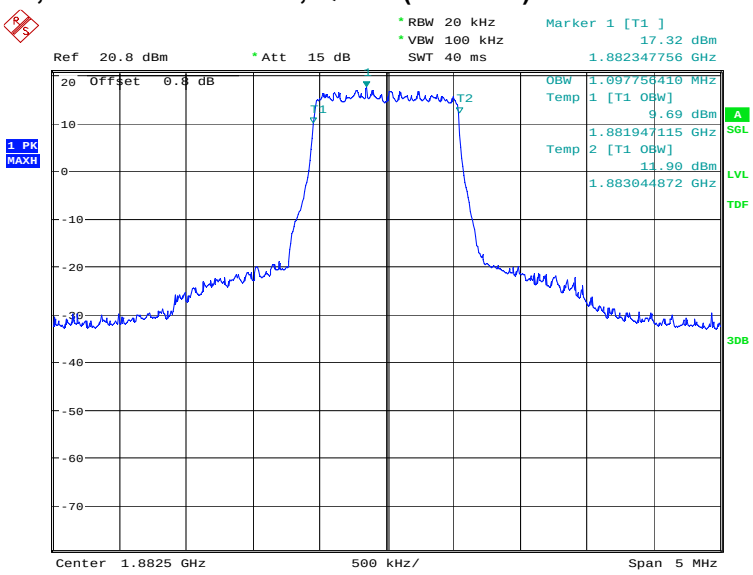


Date: 15.OCT.2019 00:09:24

LTE band 25, 1.4MHz (99%)

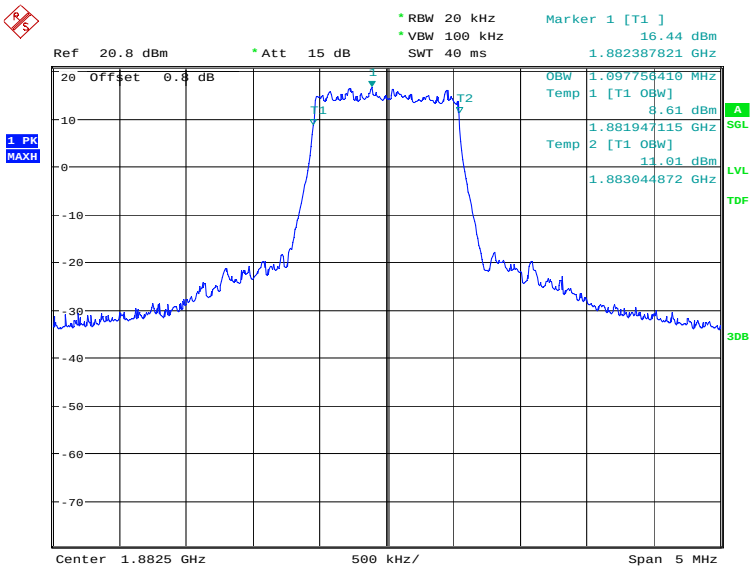
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
1882.5	QPSK	16QAM
	1097.76	1097.76

LTE band 25, 1.4MHz Bandwidth, QPSK (99% BW)



Date: 15.OCT.2019 00:11:40

LTE band 25, 1.4MHz Bandwidth, 16QAM (99% BW)

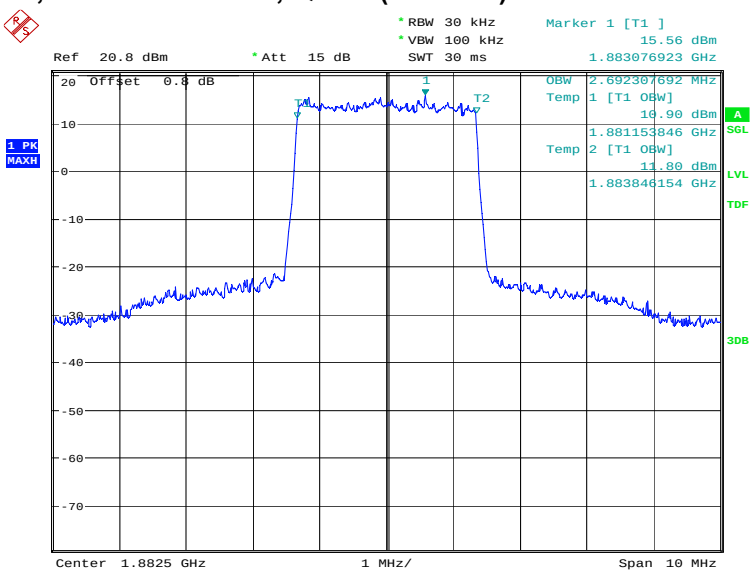


Date: 15.OCT.2019 00:13:06

LTE band 25, 3MHz (99%)

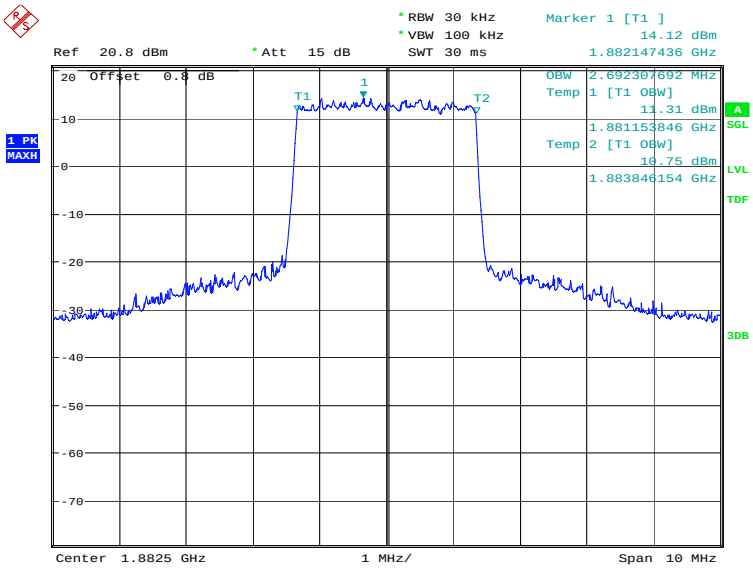
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
1882.5	QPSK	16QAM
	2692.31	2692.31

LTE band 25, 3MHz Bandwidth, QPSK (99% BW)



Date: 15.OCT.2019 00:15:20

LTE band 25, 3MHz Bandwidth, 16QAM (99% BW)

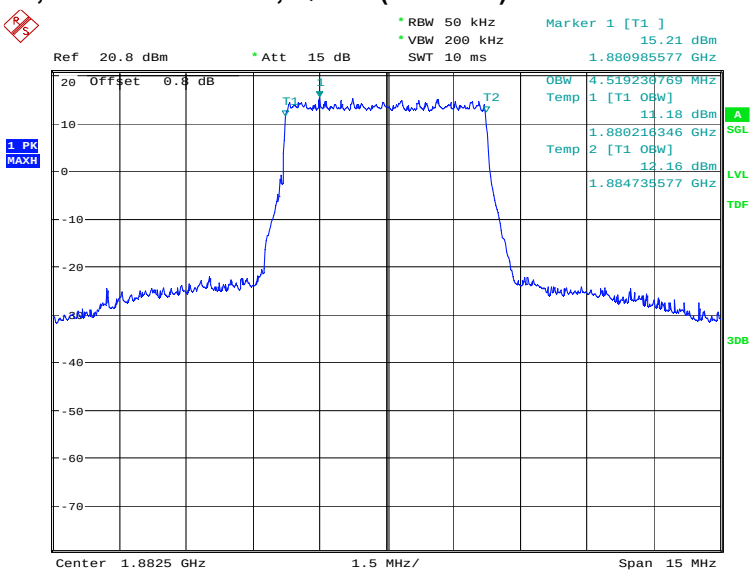


Date: 15.OCT.2019 00:16:46

LTE band 25, 5MHz (99%)

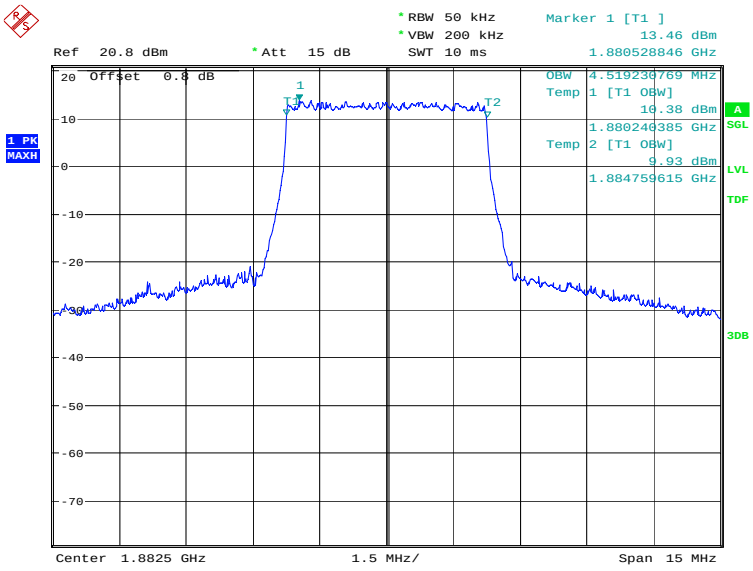
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
1882.5	QPSK	16QAM
	4519.23	4519.23

LTE band 25, 5MHz Bandwidth, QPSK (99% BW)



Date: 15.OCT.2019 00:19:02

LTE band 25, 5MHz Bandwidth, 16QAM (99% BW)

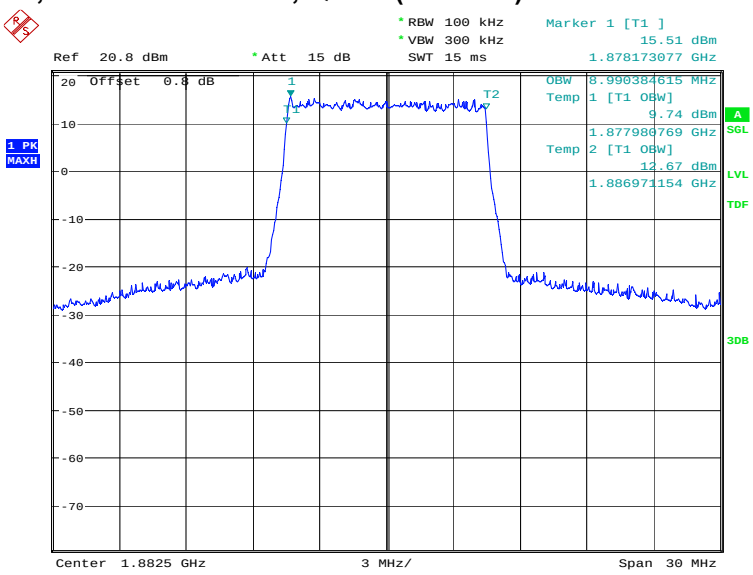


Date: 15.OCT.2019 00:20:27

LTE band 25, 10MHz (99%)

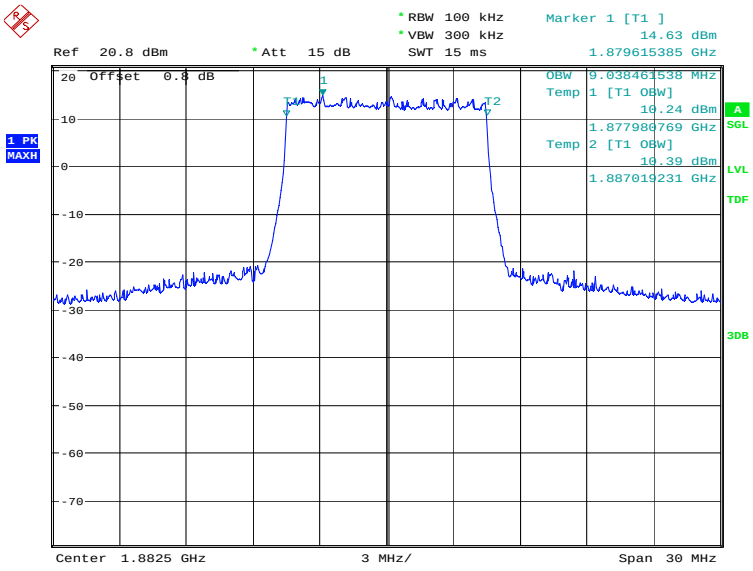
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
1882.5	QPSK	16QAM
	8990.38	9038.46

LTE band 25, 10MHz Bandwidth, QPSK (99% BW)



Date: 15.OCT.2019 00:22:42

LTE band 25, 10MHz Bandwidth, 16QAM (99% BW)

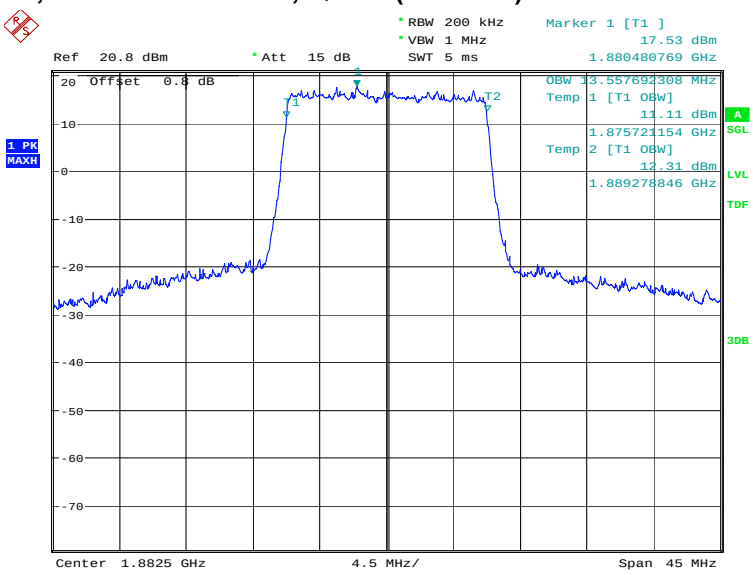


Date: 15.OCT.2019 00:24:08

LTE band 25, 15MHz (99%)

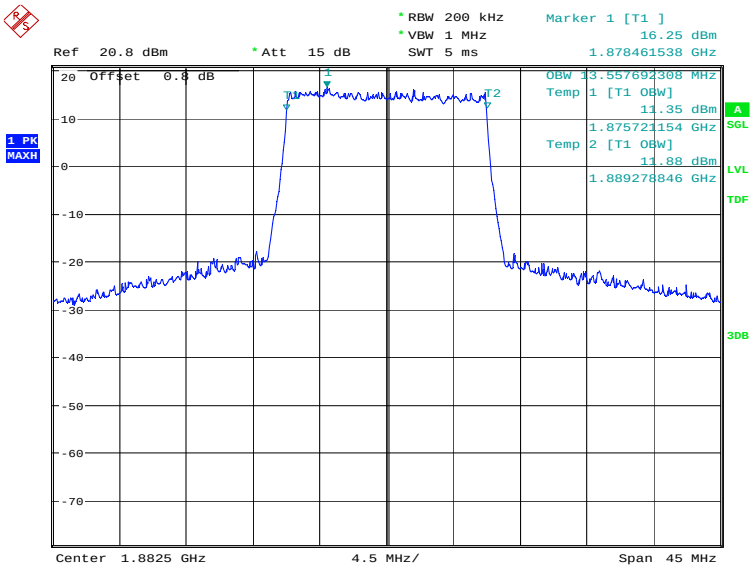
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
1882.5	QPSK	16QAM
	13557.69	13557.69

LTE band 25, 15MHz Bandwidth, QPSK (99% BW)



Date: 15.OCT.2019 00:26:23

LTE band 25, 15MHz Bandwidth, 16QAM (99% BW)

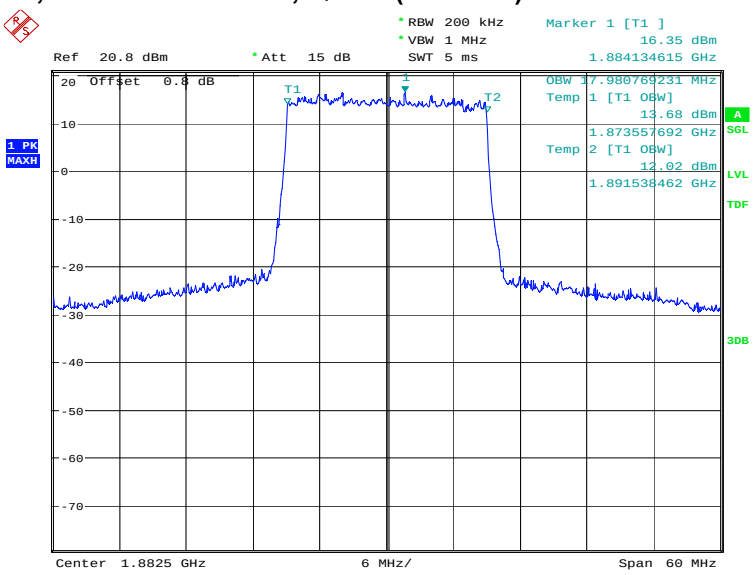


Date: 15.OCT.2019 00:27:49

LTE band 25, 20MHz (99%)

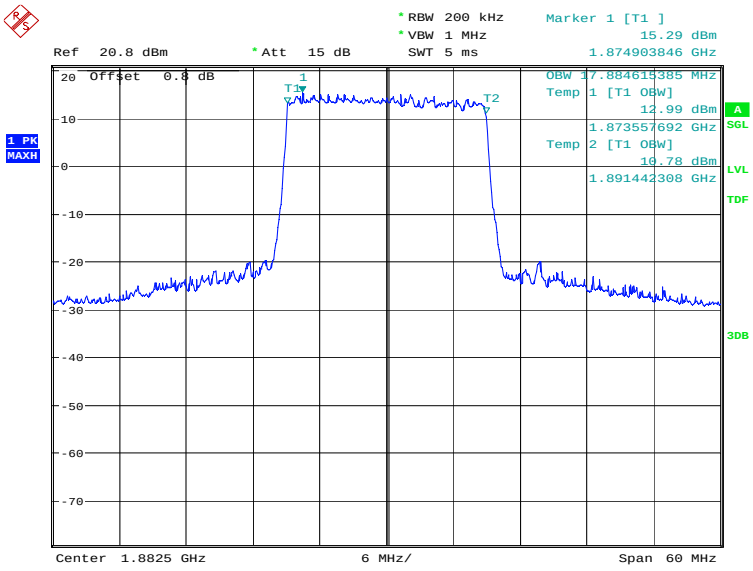
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
1882.5	QPSK	16QAM
	17980.77	17884.62

LTE band 25, 20MHz Bandwidth, QPSK (99% BW)



Date: 15.OCT.2019 00:30:04

LTE band 25, 20MHz Bandwidth, 16QAM (99% BW)

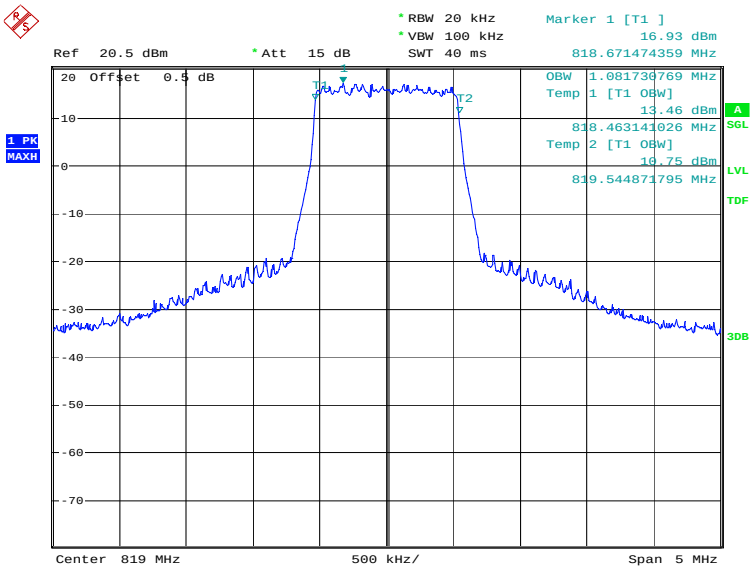


Date: 15.OCT.2019 00:31:30

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

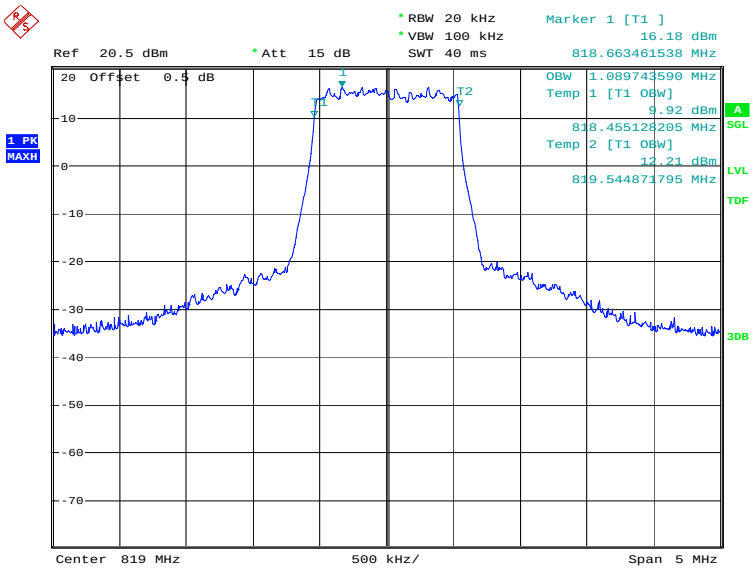
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
819.0	QPSK	16QAM
	1081.73	1089.74

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



Date: 15.OCT.2019 00:51:27

LTE band 26(814MHz~824MHz), 1.4MHz Bandwidth, 16QAM (99% BW)

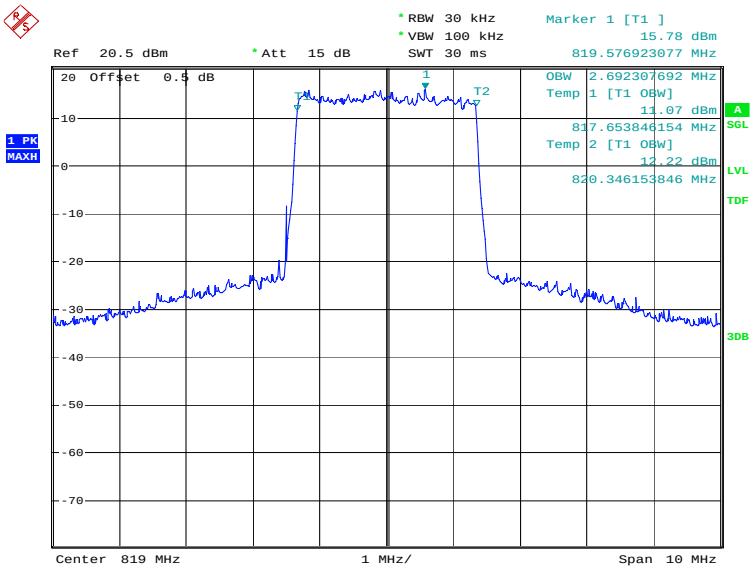


Date: 15.OCT.2019 00:52:53

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

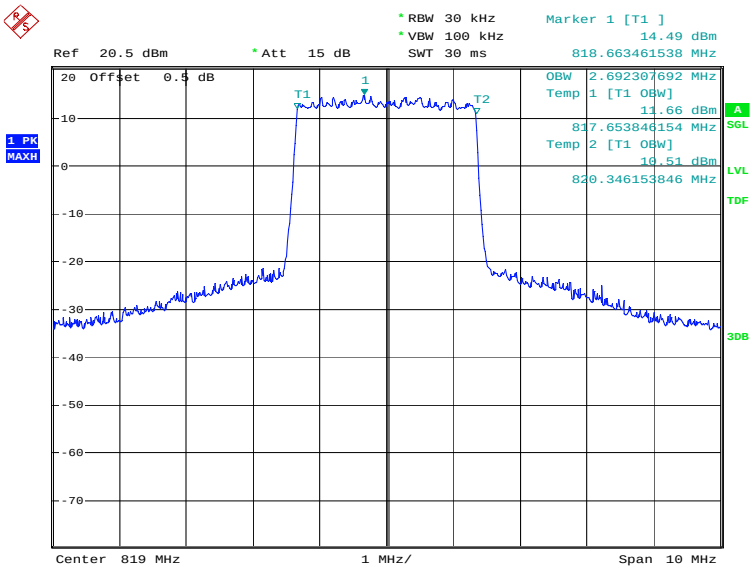
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
819.0	QPSK	16QAM
	2692.31	2692.31

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



Date: 15.OCT.2019 00:55:08

LTE band 26(814MHz~824MHz), 3MHz Bandwidth, 16QAM (99% BW)

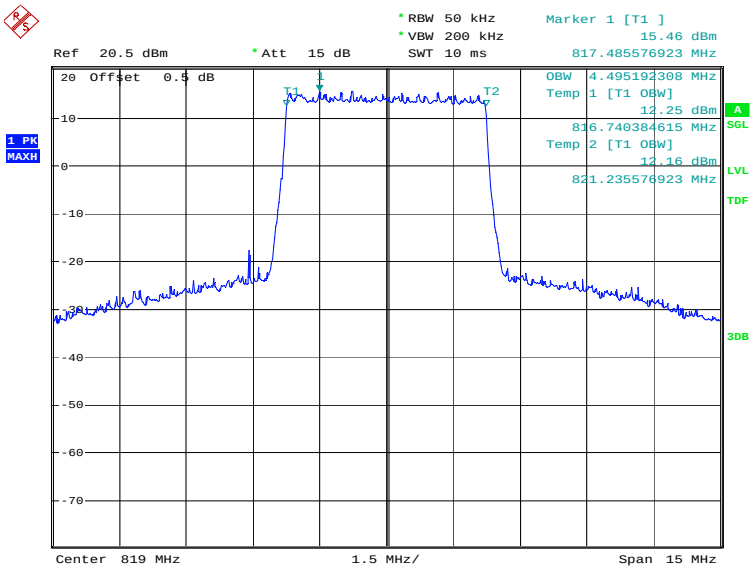


Date: 15.OCT.2019 00:56:34

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

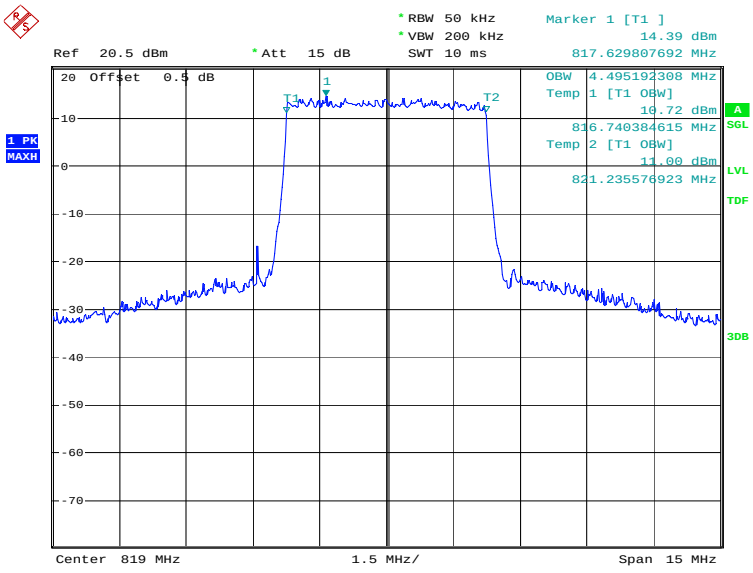
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
819.0	QPSK	16QAM
	4495.19	4495.19

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



Date: 15.OCT.2019 00:58:50

LTE band 26(814MHz~824MHz), 5MHz Bandwidth, 16QAM (99% BW)

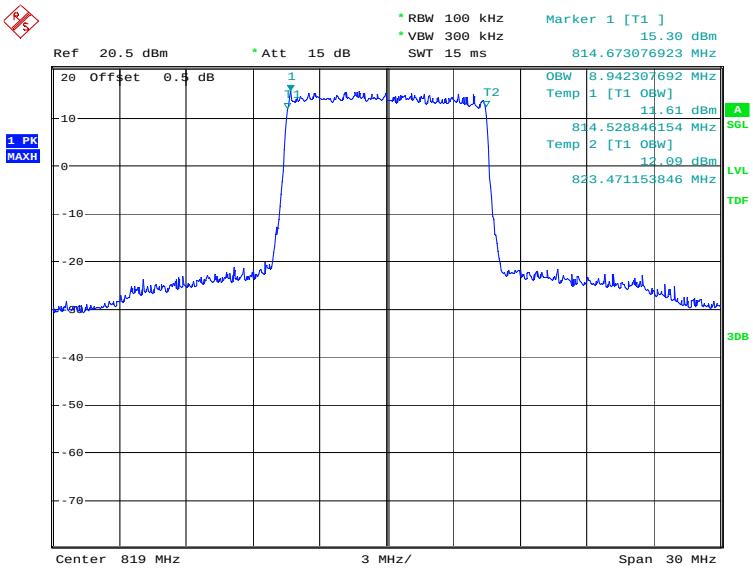


Date: 15.OCT.2019 01:00:16

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

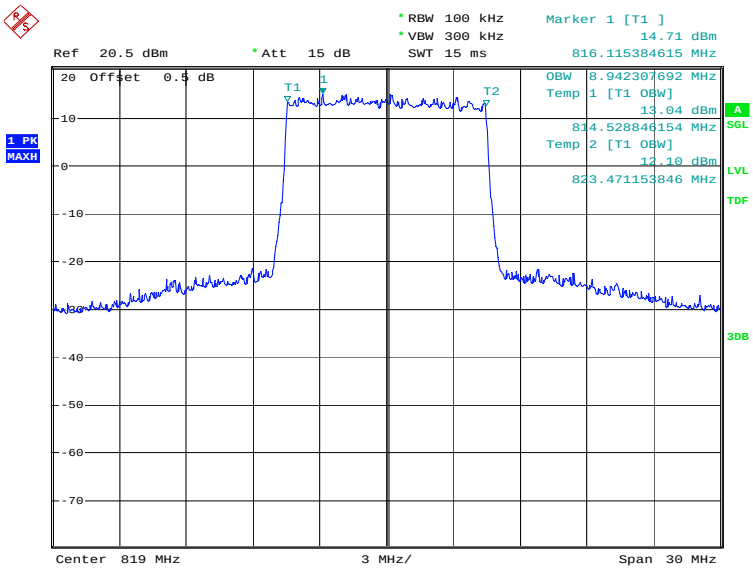
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
819.0	QPSK	16QAM
	8942.31	8942.31

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



Date: 15.OCT.2019 01:02:31

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

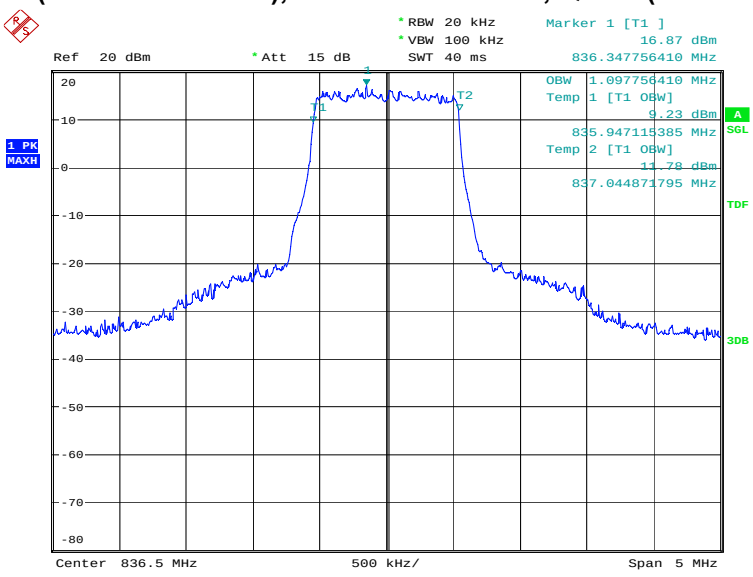


Date: 15.OCT.2019 01:03:57

LTE band 26(824MHz~849MHz), 1.4MHz (99%)

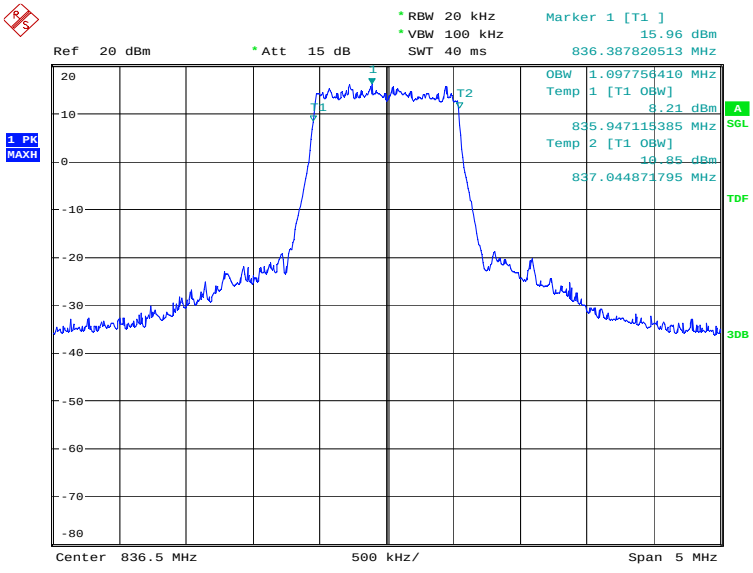
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
836.5	QPSK	16QAM
	1097.76	1097.76

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



Date: 15.OCT.2019 00:33:09

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

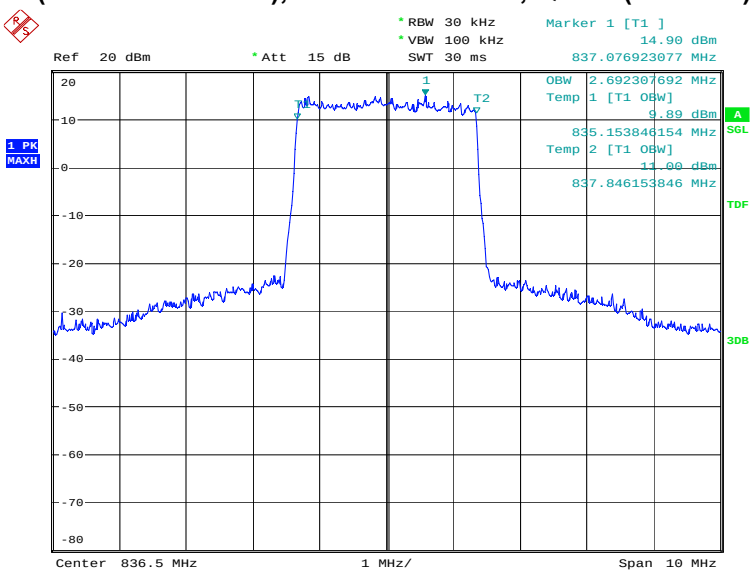


Date: 15.OCT.2019 00:34:35

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

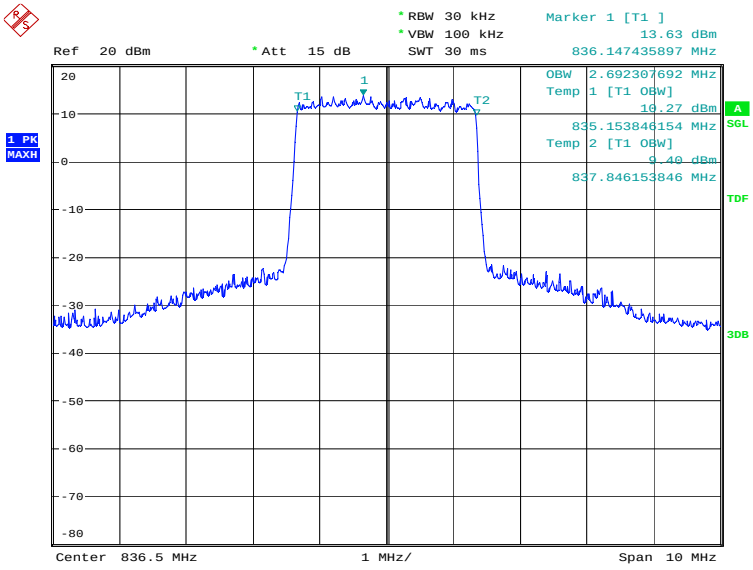
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
836.5	QPSK	16QAM
	2692.31	2692.31

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



Date: 15.OCT.2019 00:36:50

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

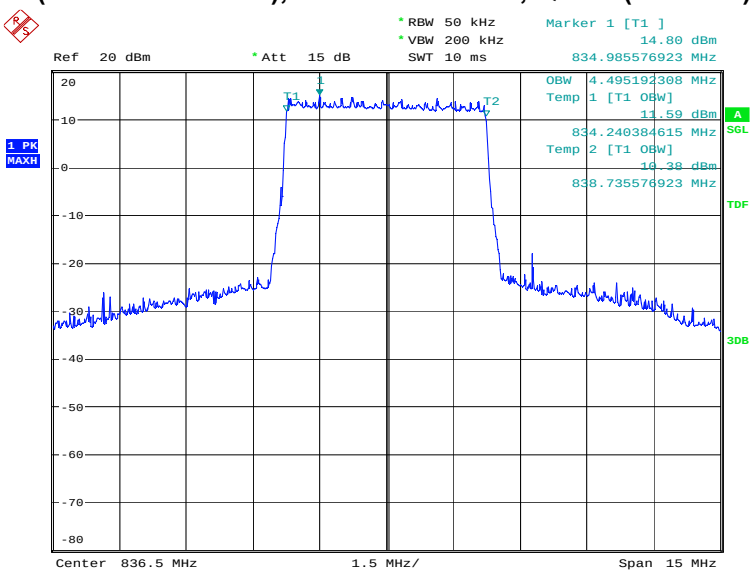


Date: 15.OCT.2019 00:38:16

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

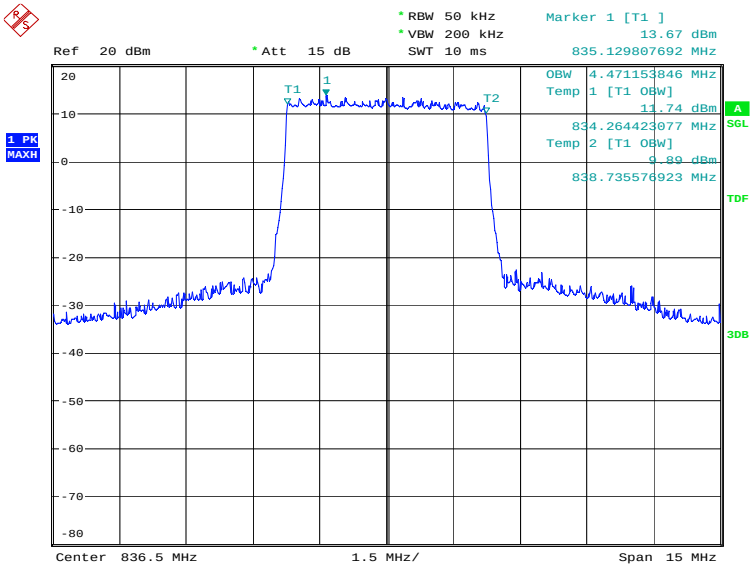
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
836.5	QPSK	16QAM
	4495.19	4471.15

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



Date: 15.OCT.2019 00:40:32

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

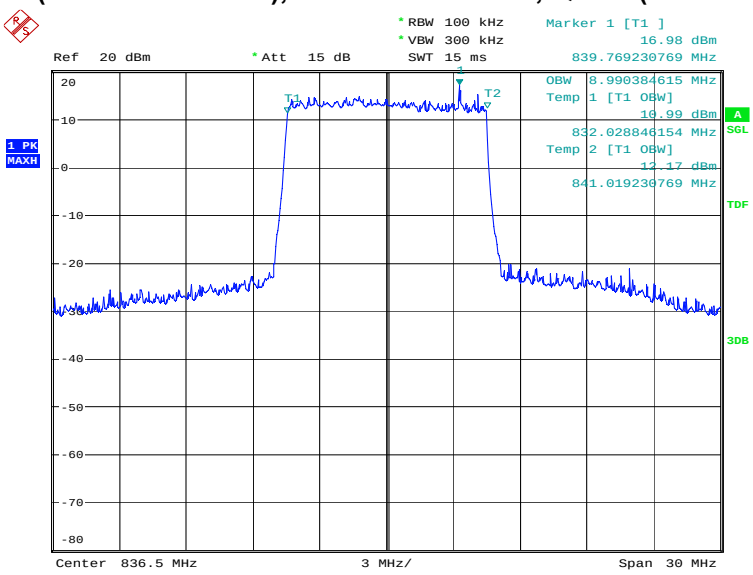


Date: 15.OCT.2019 00:41:58

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

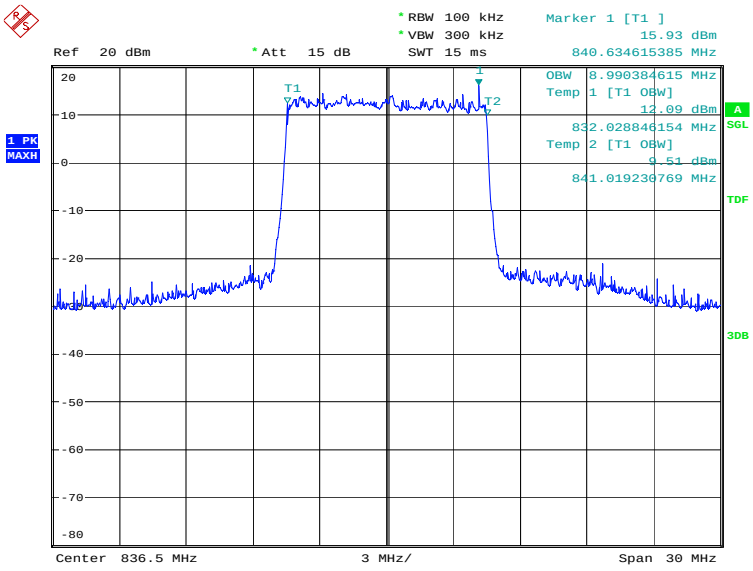
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
836.5	QPSK	16QAM
	8990.38	8990.38

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



Date: 15.OCT.2019 00:44:13

LTE band 26(824MHz~849MHz), 10MHz Bandwidth, 16QAM (99% BW)

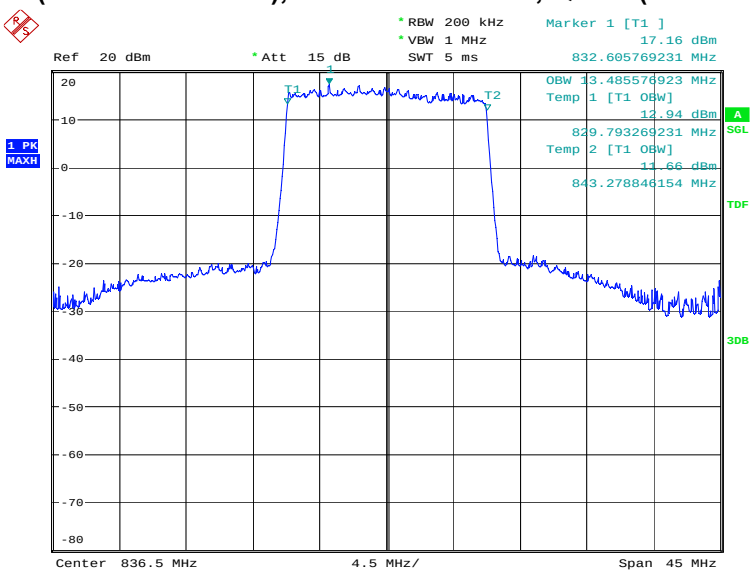


Date: 15.OCT.2019 00:45:39

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

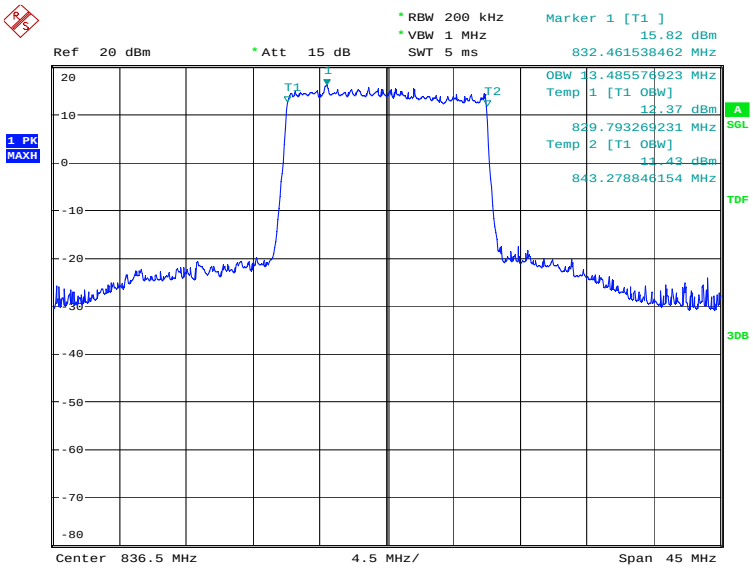
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
836.5	QPSK	16QAM
	13485.58	13485.58

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



Date: 15.OCT.2019 00:47:55

LTE band 26(824MHz~849MHz), 15MHz Bandwidth, 16QAM (99% BW)

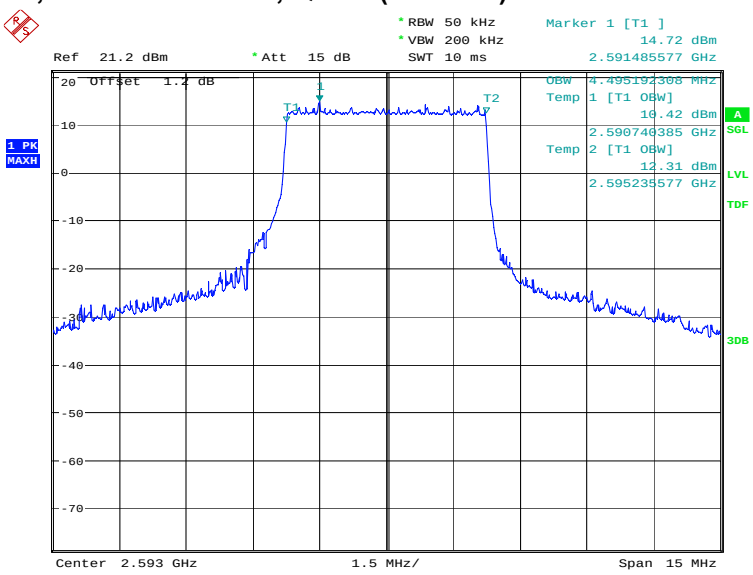


Date: 15.OCT.2019 00:49:21

LTE band 41(PC2), 5MHz (99%)

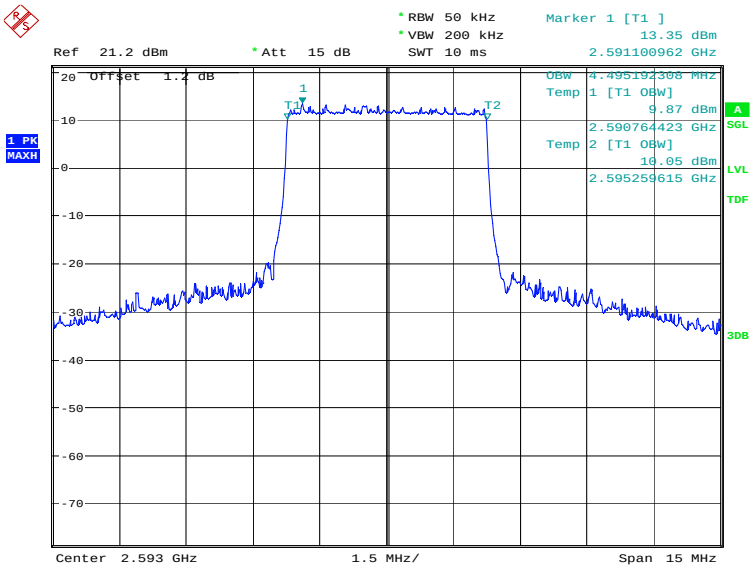
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
2593.0	QPSK	16QAM
	4495.19	4495.19

LTE band 41, 5MHz Bandwidth, QPSK (99% BW)



Date: 15.OCT.2019 01:28:30

LTE band 41, 5MHz Bandwidth,16QAM (99% BW)

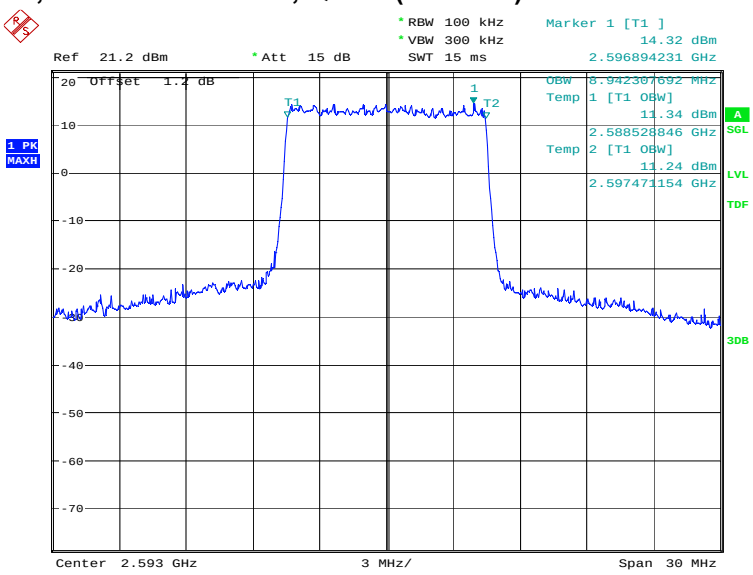


Date: 15.OCT.2019 01:29:57

LTE band 41(PC2), 10MHz (99%)

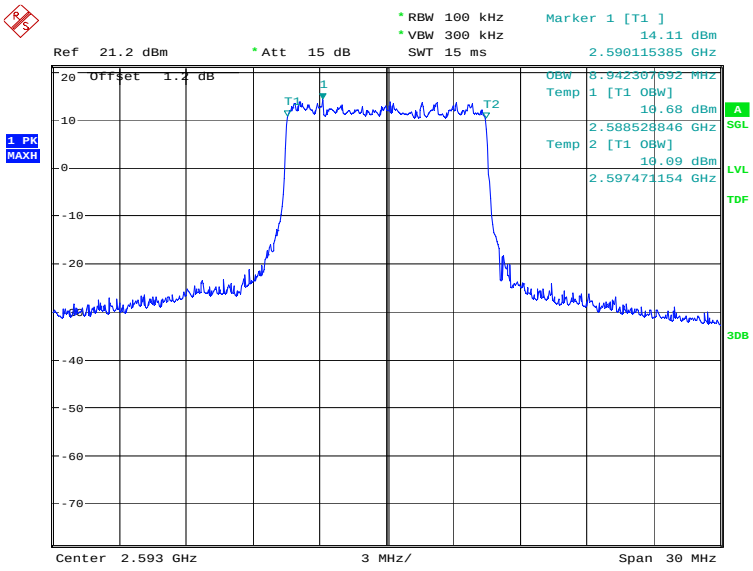
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
2593.0	QPSK	16QAM
	8942.31	8942.31

LTE band 41, 10MHz Bandwidth, QPSK (99% BW)



Date: 15.OCT.2019 01:31:24

LTE band 41, 10MHz Bandwidth,16QAM (99% BW)

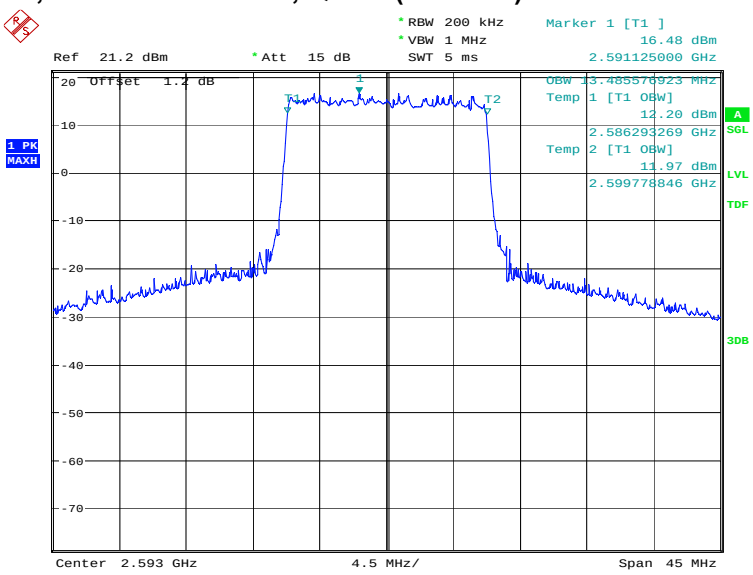


Date: 15.OCT.2019 01:32:51

LTE band 41(PC2), 15MHz (99%)

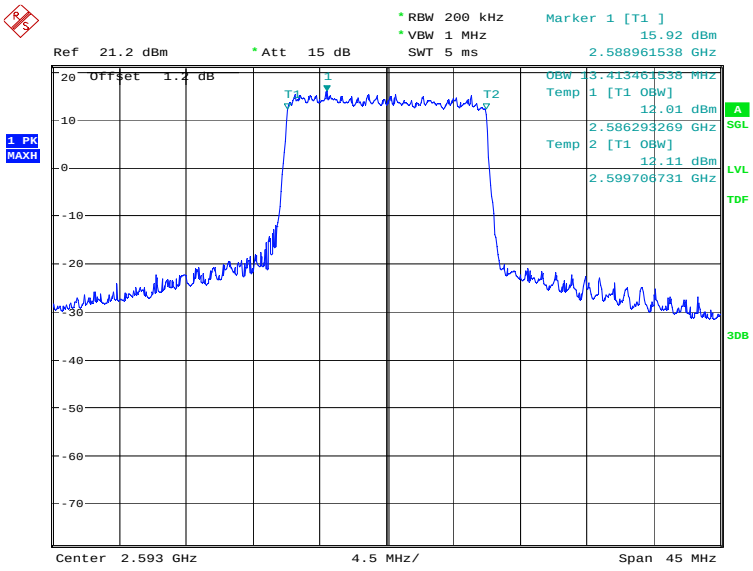
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
2593.0	QPSK	16QAM
	13485.58	13413.46

LTE band 41, 15MHz Bandwidth, QPSK (99% BW)



Date: 15.OCT.2019 01:35:06

LTE band 41, 15MHz Bandwidth,16QAM (99% BW)

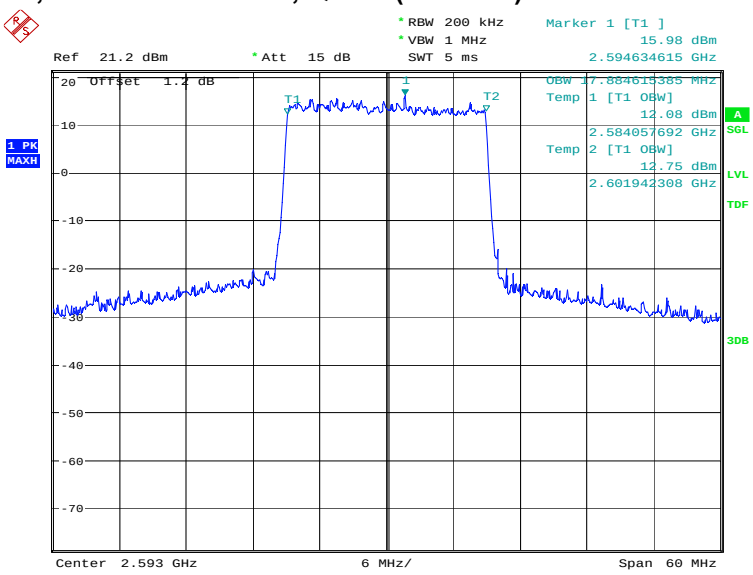


Date: 15.OCT.2019 01:36:33

LTE band 41(PC2), 20MHz (99%)

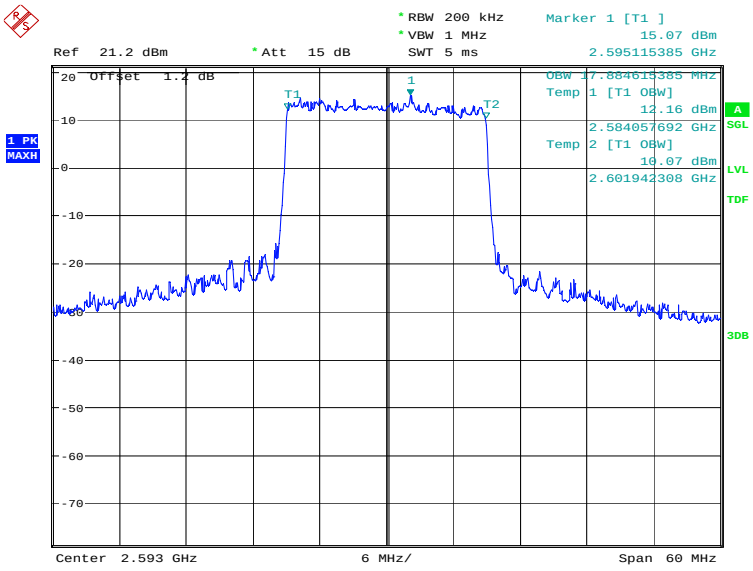
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
2593.0	QPSK	16QAM
	17884.62	17884.62

LTE band 41, 20MHz Bandwidth, QPSK (99% BW)



Date: 15.OCT.2019 01:38:01

LTE band 41, 20MHz Bandwidth,16QAM (99% BW)

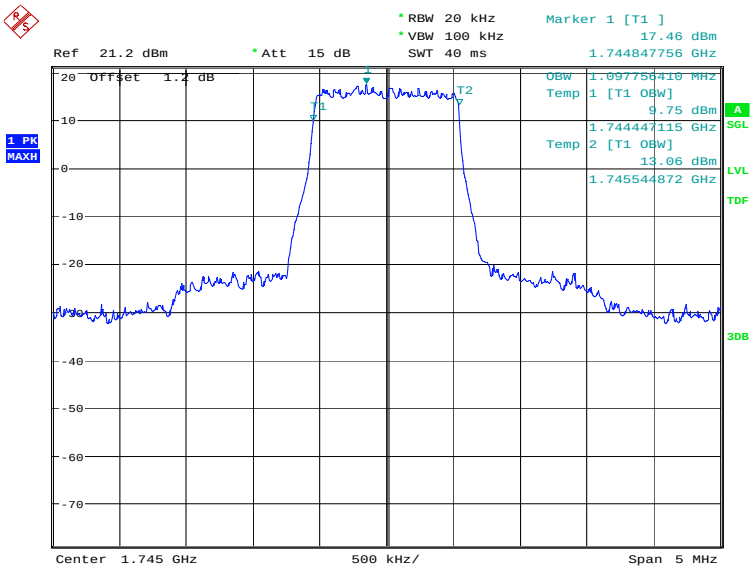


Date: 15.OCT.2019 01:39:27

LTE band 66, 1.4MHz (99%)

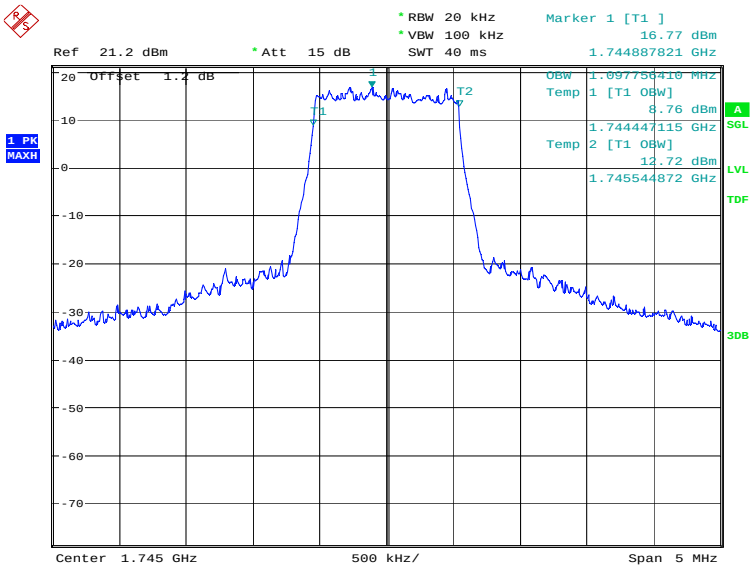
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
1745.0	QPSK	16QAM
	1097.76	1097.76

LTE band 66, 1.4MHz Bandwidth, QPSK (99% BW)



Date: 15.OCT.2019 01:06:13

LTE band 66, 1.4MHz Bandwidth, 16QAM (99% BW)

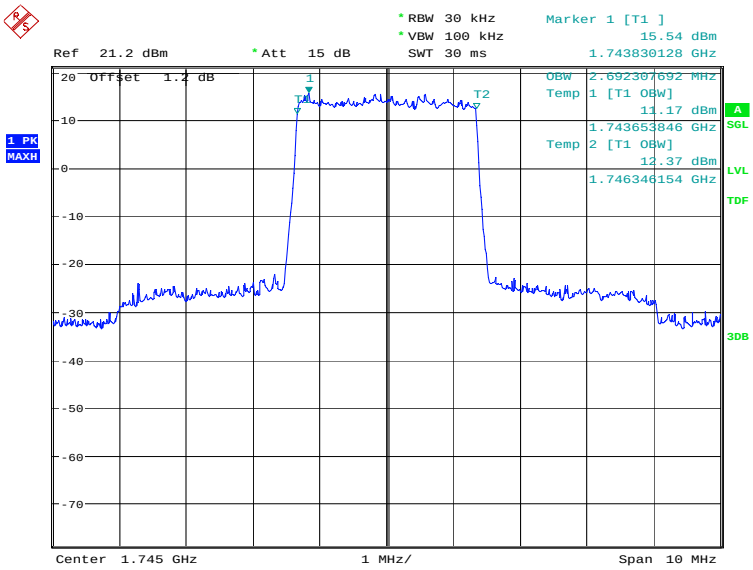


Date: 15.OCT.2019 01:07:40

LTE band 66, 3MHz (99%)

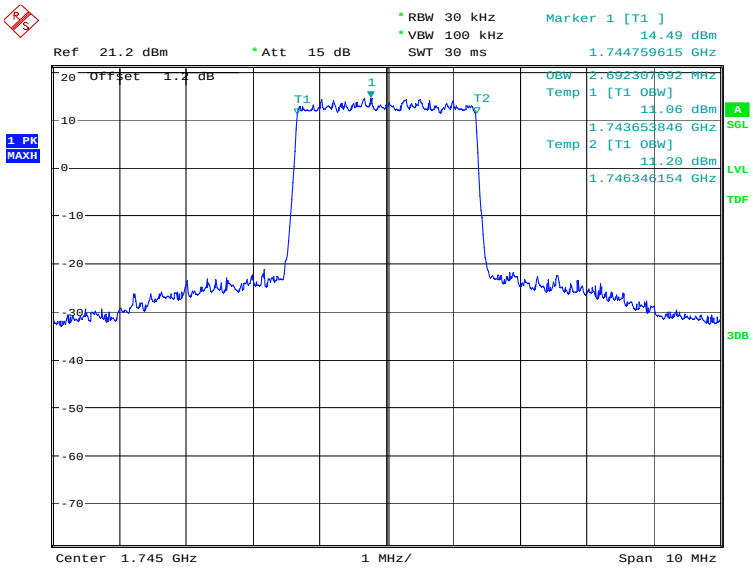
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
1745.0	QPSK	16QAM
	2692.31	2692.31

LTE band 66, 3MHz Bandwidth, QPSK (99% BW)



Date: 15.OCT.2019 01:09:55

LTE band 66, 3MHz Bandwidth, 16QAM (99% BW)

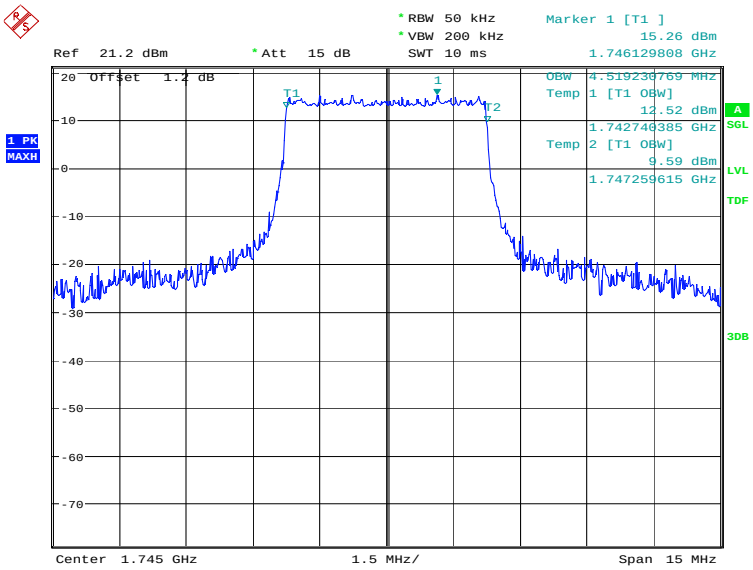


Date: 15.OCT.2019 01:11:21

LTE band 66, 5MHz (99%)

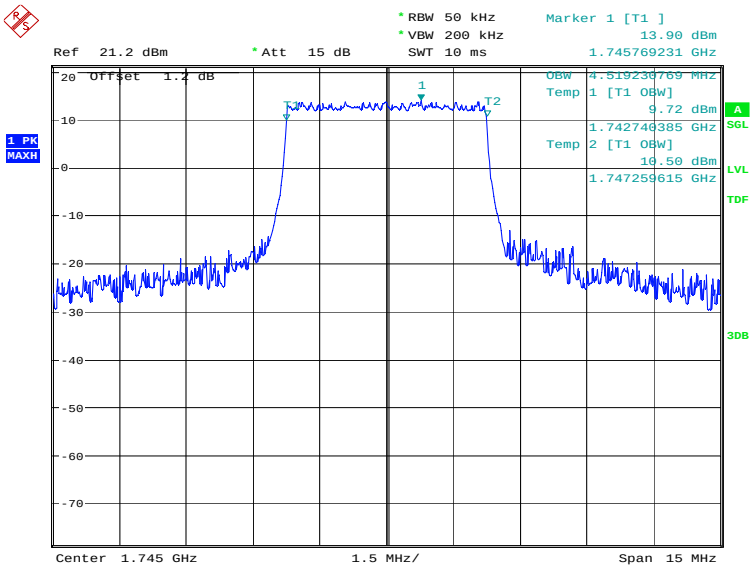
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
1745.0	QPSK	16QAM
	4519.23	4519.23

LTE band 66, 5MHz Bandwidth, QPSK (99% BW)



Date: 15.OCT.2019 01:13:36

LTE band 66, 5MHz Bandwidth, 16QAM (99% BW)

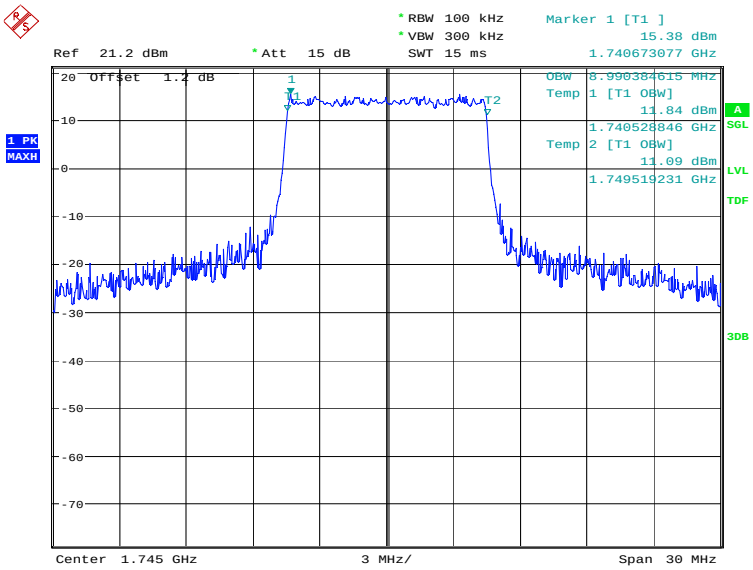


Date: 15.OCT.2019 01:15:02

LTE band 66, 10MHz (99%)

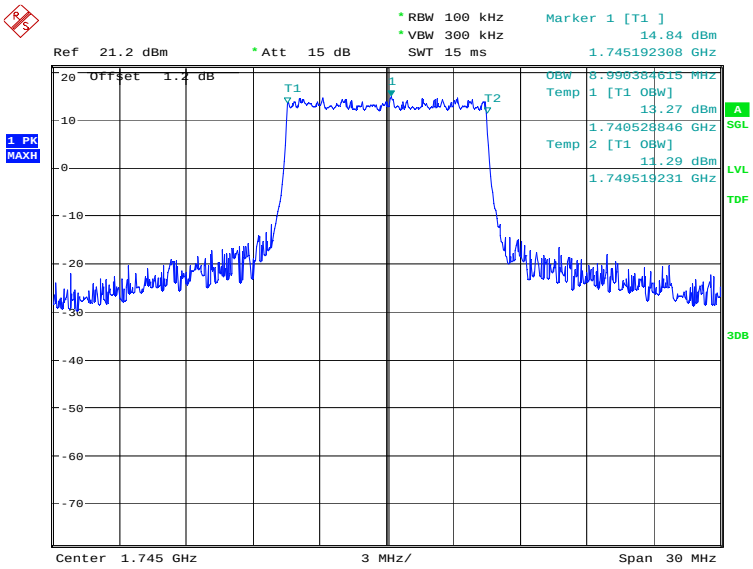
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
1745.0	QPSK	16QAM
	8990.38	8990.38

LTE band 66, 10MHz Bandwidth, QPSK (99% BW)



Date: 15.OCT.2019 01:17:18

LTE band 66, 10MHz Bandwidth, 16QAM (99% BW)

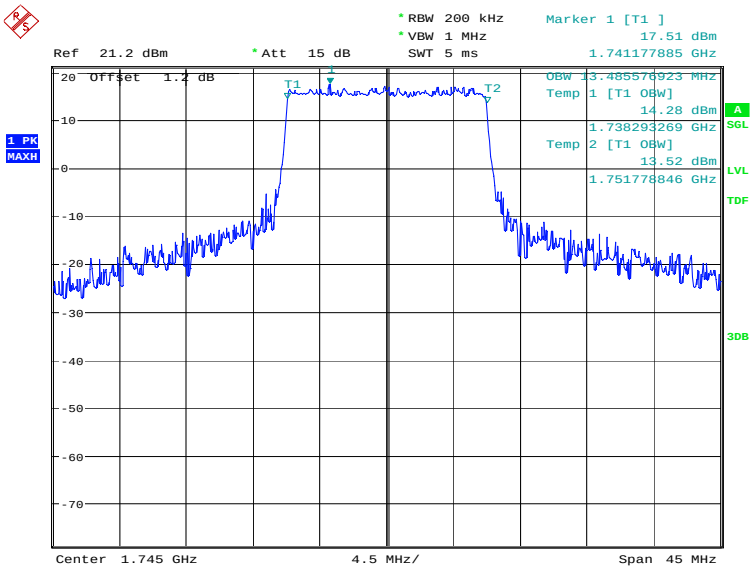


Date: 15.OCT.2019 01:18:44

LTE band 66, 15MHz (99%)

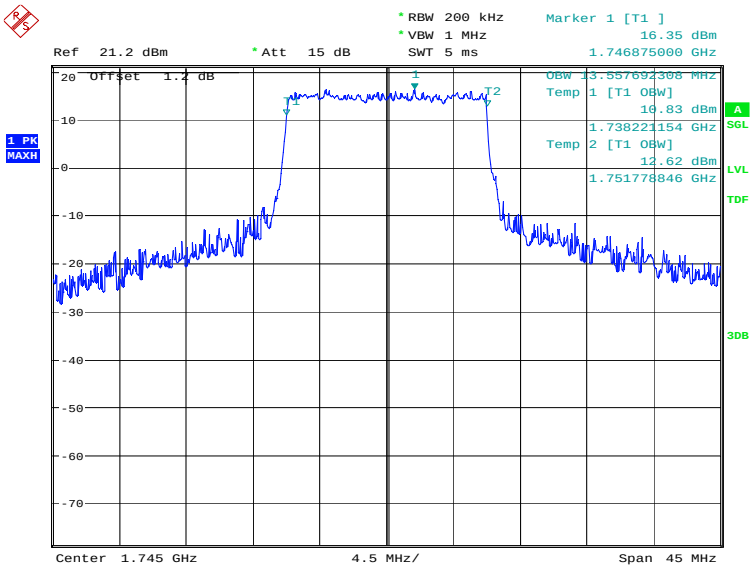
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
1745.0	QPSK	16QAM
	13485.58	13557.69

LTE band 66, 15MHz Bandwidth, QPSK (99% BW)



Date: 15.OCT.2019 01:20:59

LTE band 66, 15MHz Bandwidth, 16QAM (99% BW)

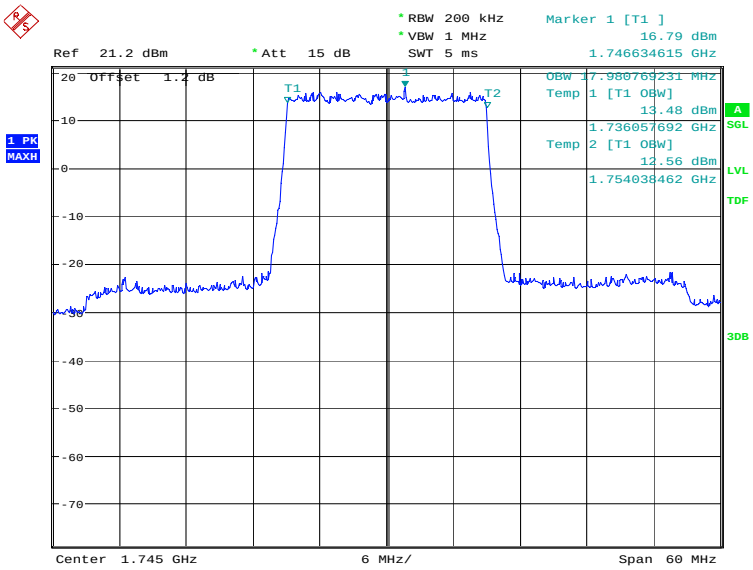


Date: 15.OCT.2019 01:22:25

LTE band 66, 20MHz (99%)

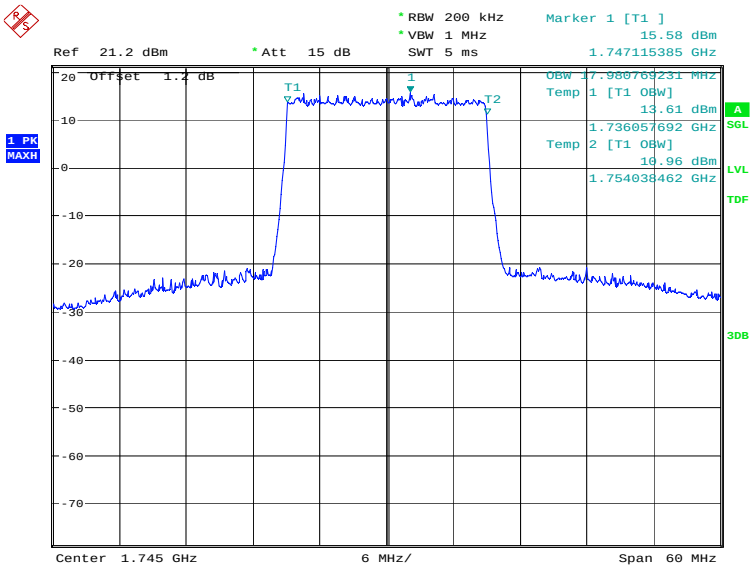
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
1745.0	QPSK	16QAM
	17980.77	17980.77

LTE band 66, 20MHz Bandwidth, QPSK (99% BW)



Date: 15.OCT.2019 01:24:41

LTE band 66, 20MHz Bandwidth, 16QAM (99% BW)

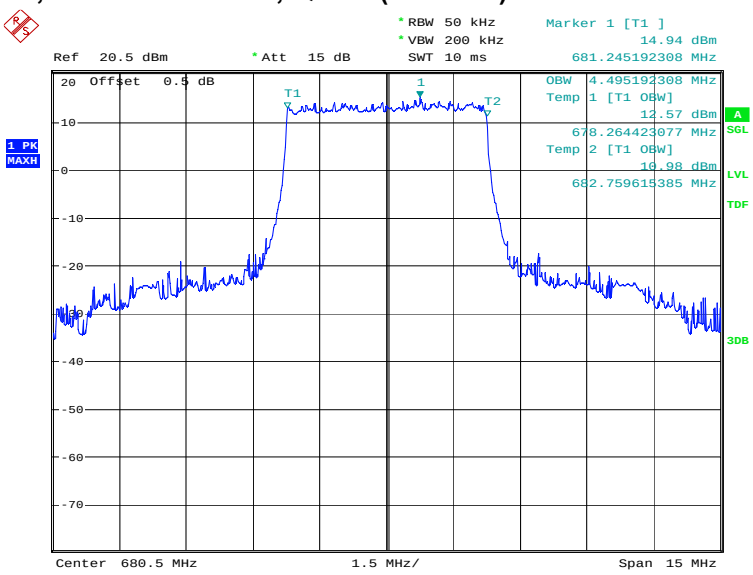


Date: 15.OCT.2019 01:26:08

LTE band 71, 5MHz (99%)

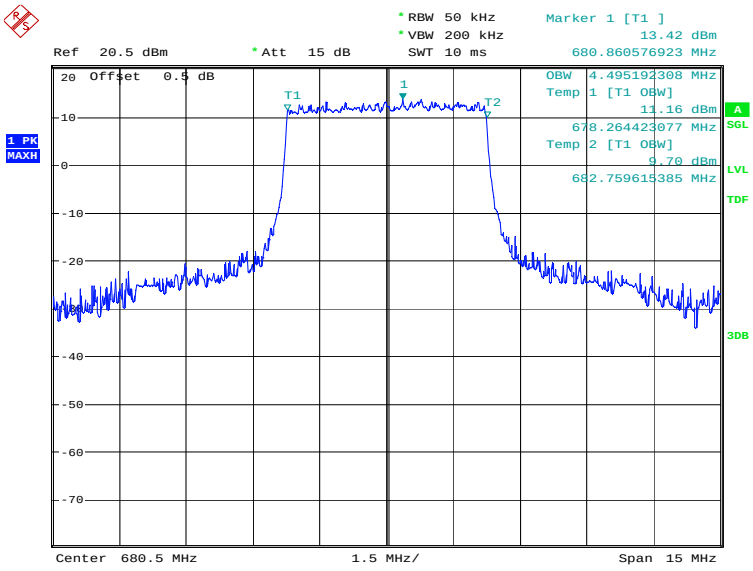
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
680.5	QPSK	16QAM
	4495.19	4495.19

LTE band 71, 5MHz Bandwidth, QPSK (99% BW)



Date: 17.OCT.2019 14:59:05

LTE band 71, 5MHz Bandwidth, 16QAM (99% BW)

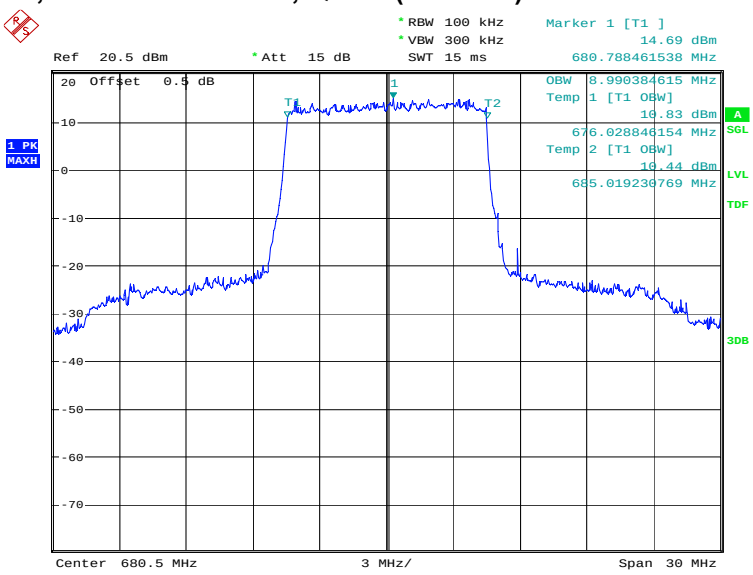


Date: 17.OCT.2019 15:00:29

LTE band 71, 10MHz (99%)

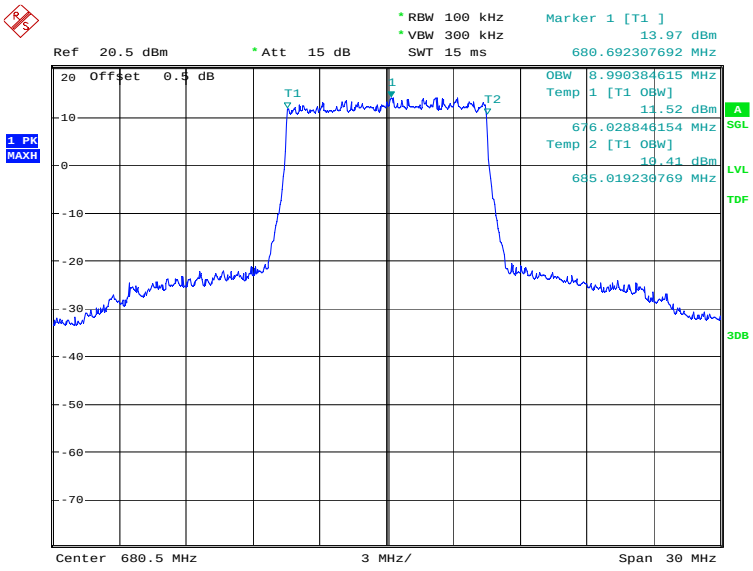
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
680.5	QPSK	16QAM
	8990.38	8990.38

LTE band 71, 10MHz Bandwidth, QPSK (99% BW)



Date: 17.OCT.2019 15:02:42

LTE band 71, 10MHz Bandwidth, 16QAM (99% BW)

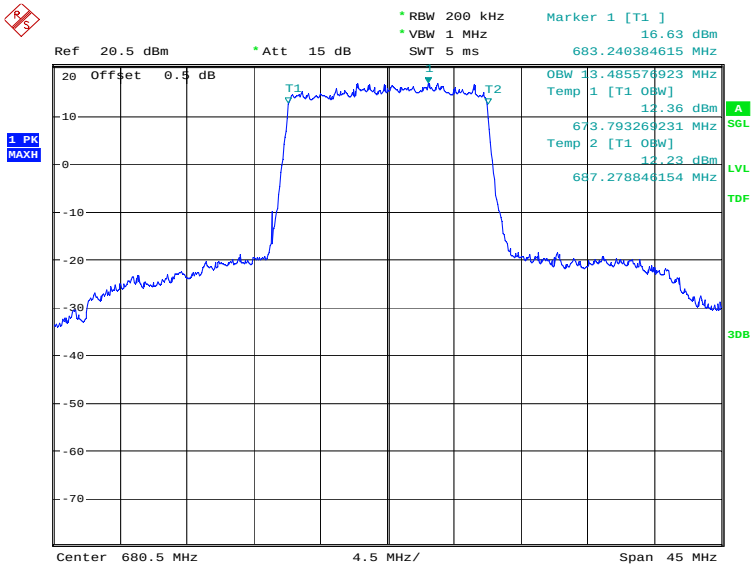


Date: 17.OCT.2019 15:04:06

LTE band 71, 15MHz (99%)

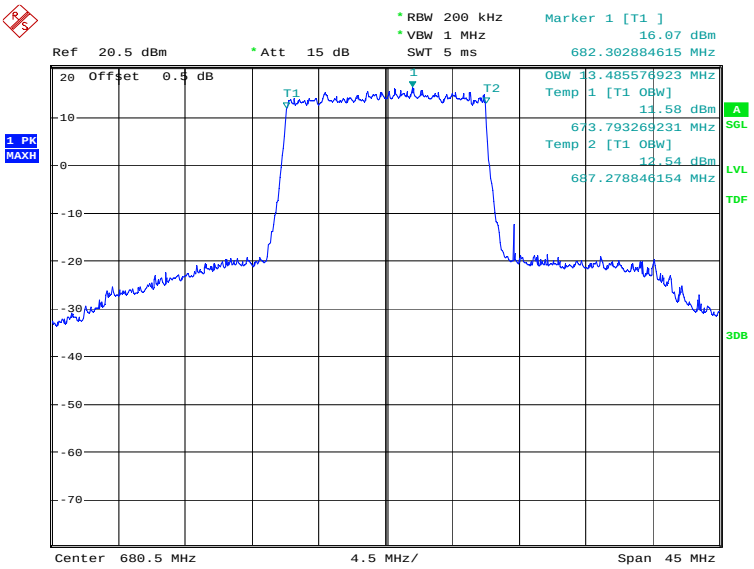
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
680.5	QPSK	16QAM
	13485.58	13485.58

LTE band 71, 15MHz Bandwidth, QPSK (99% BW)



Date: 17.OCT.2019 15:06:20

LTE band 71, 15MHz Bandwidth, 16QAM (99% BW)

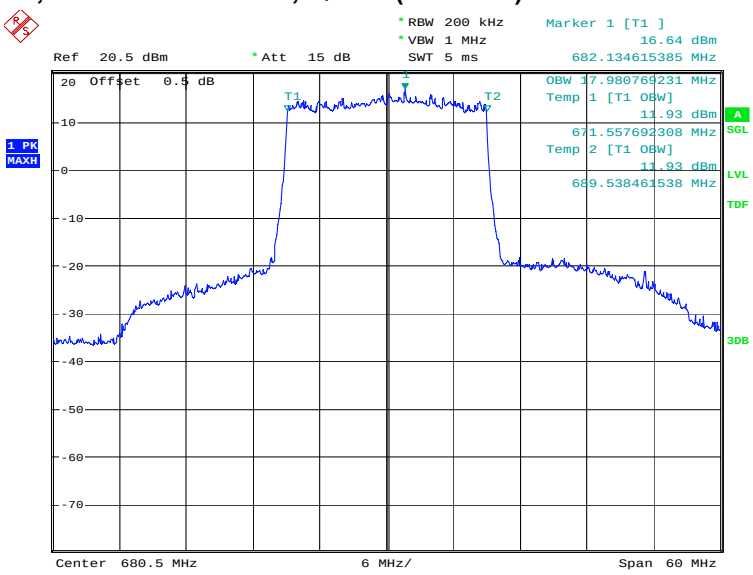


Date: 17.OCT.2019 15:07:44

LTE band 71, 20MHz (99%)

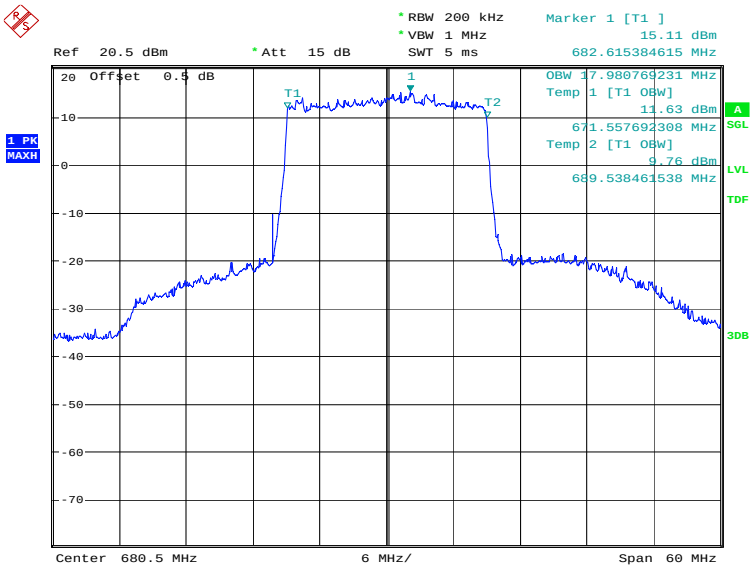
Frequency(MHz)	Occupied Bandwidth (99%) (kHz)	
680.5	QPSK	16QAM
	17980.77	17980.77

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



Date: 17.OCT.2019 15:09:57

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



Date: 17.OCT.2019 15:11:21

A.5 EMISSION BANDWIDTH

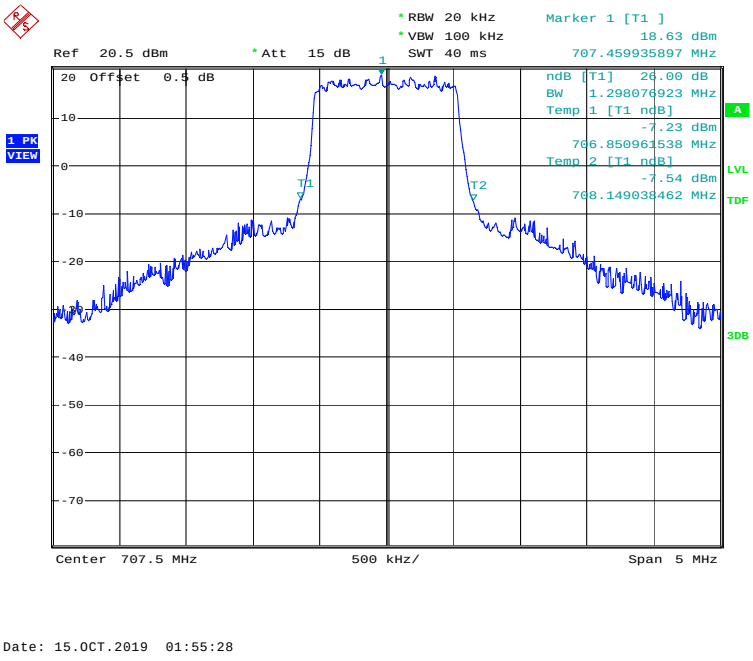
A.5.1Emission Bandwidth Results

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.

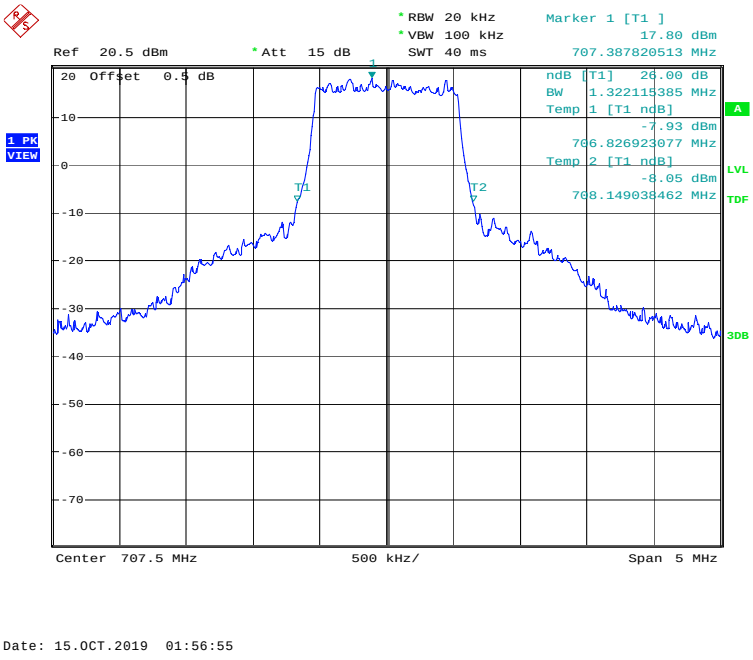
LTE band 12, 1.4MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
707.5	QPSK	16QAM
	1298.08	1322.12

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



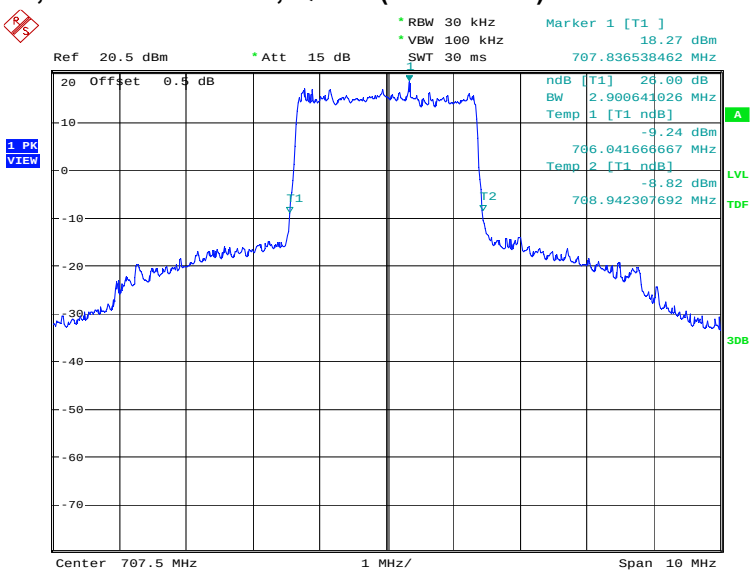
LTE band 12, 1.4MHz Bandwidth, 16QAM (-26dBc BW)



LTE band 12, 3MHz (-26dBc)

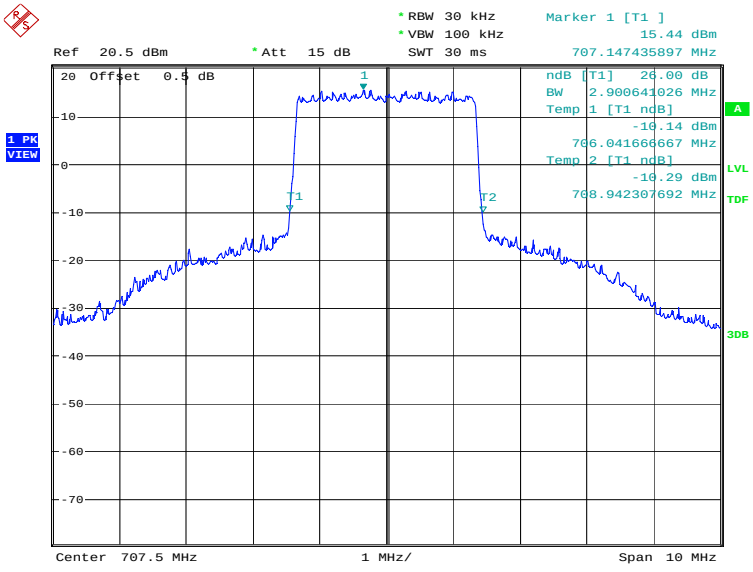
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
707.5	QPSK	16QAM
	2900.64	2900.64

LTE band 12, 3MHz Bandwidth, QPSK (-26dBc BW)



Date: 15.OCT.2019 01:59:10

LTE band 12, 3MHz Bandwidth, 16QAM (-26dBc BW)

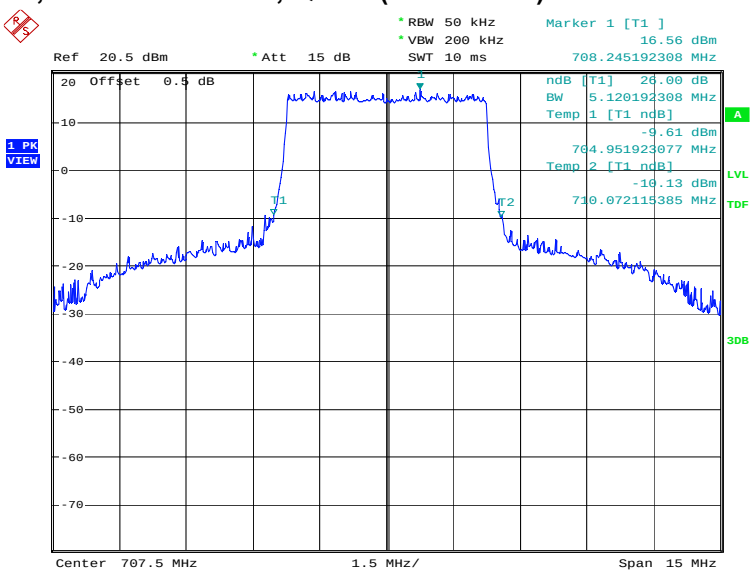


Date: 15.OCT.2019 02:00:37

LTE band 12, 5MHz (-26dBc)

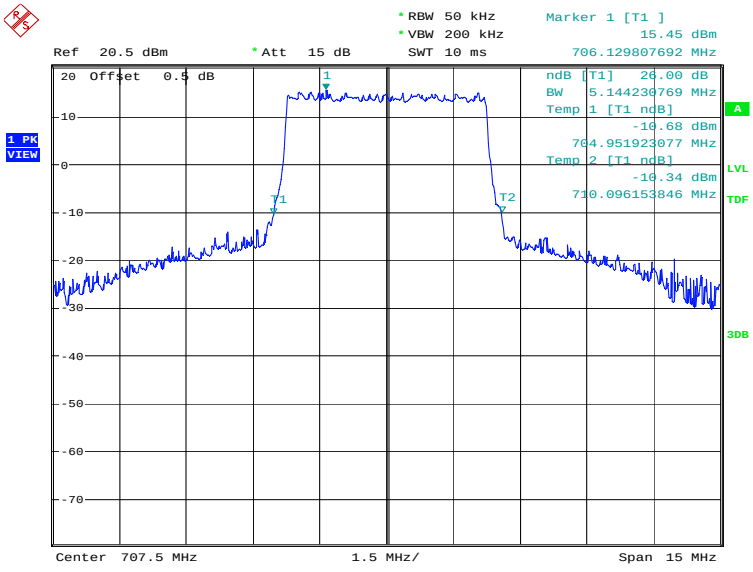
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
707.5	QPSK	16QAM
	5120.19	5144.23

LTE band 12, 5MHz Bandwidth, QPSK (-26dBc BW)



Date: 15.OCT.2019 02:02:53

LTE band 12, 5MHz Bandwidth, 16QAM (-26dBc BW)

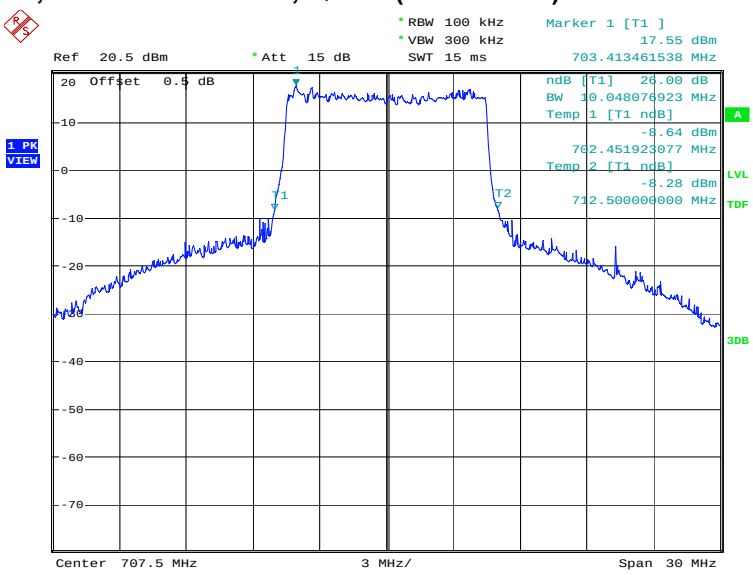


Date: 15.OCT.2019 02:04:19

LTE band 12, 10MHz (-26dBc)

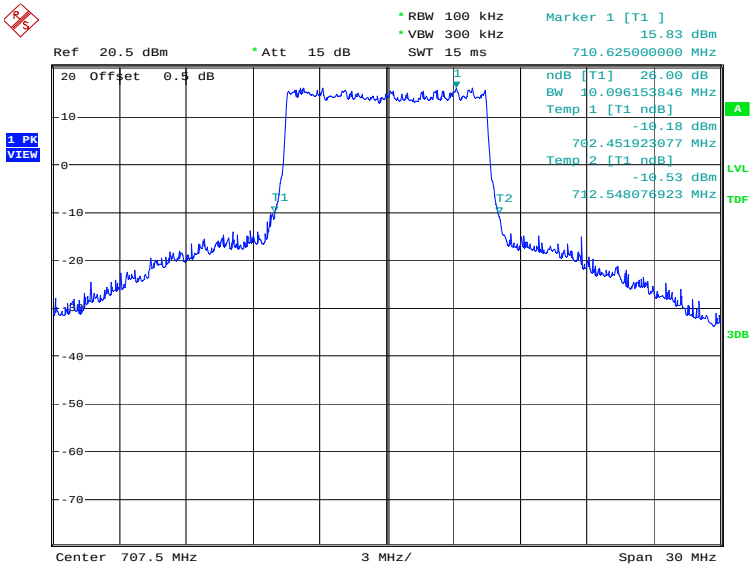
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
707.5	QPSK	16QAM
	10048.08	10096.15

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



Date: 15.OCT.2019 02:06:35

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

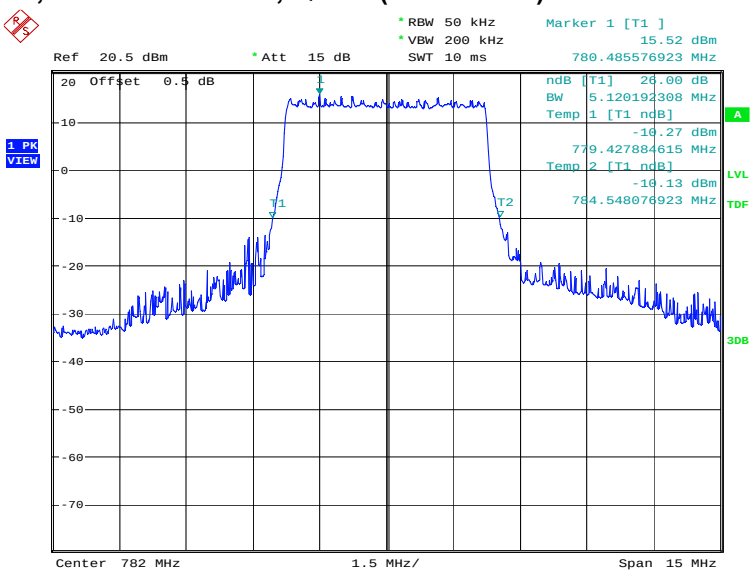


Date: 15.OCT.2019 02:08:02

LTE band 13, 5MHz (-26dBc)

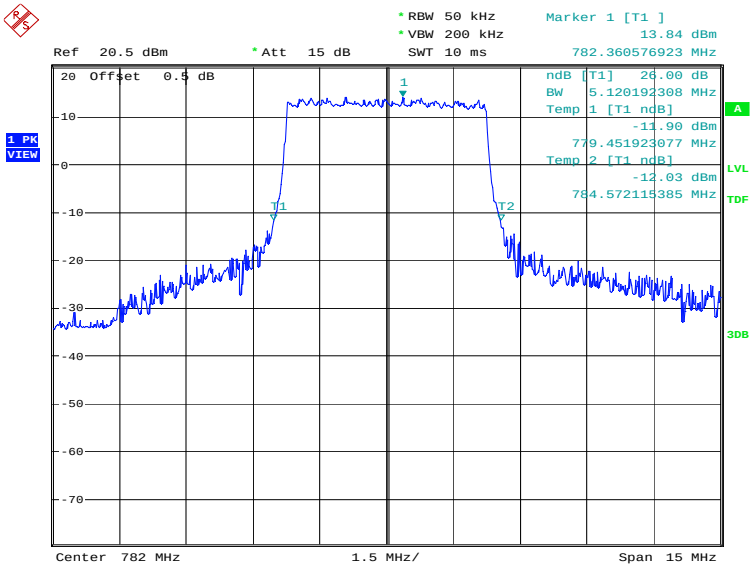
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
782.0	QPSK	16QAM
	5120.19	5120.19

LTE band 13, 5MHz Bandwidth, QPSK (-26dBc BW)



Date: 15.OCT.2019 02:10:18

LTE band 13, 5MHz Bandwidth,16QAM (-26dBc BW)

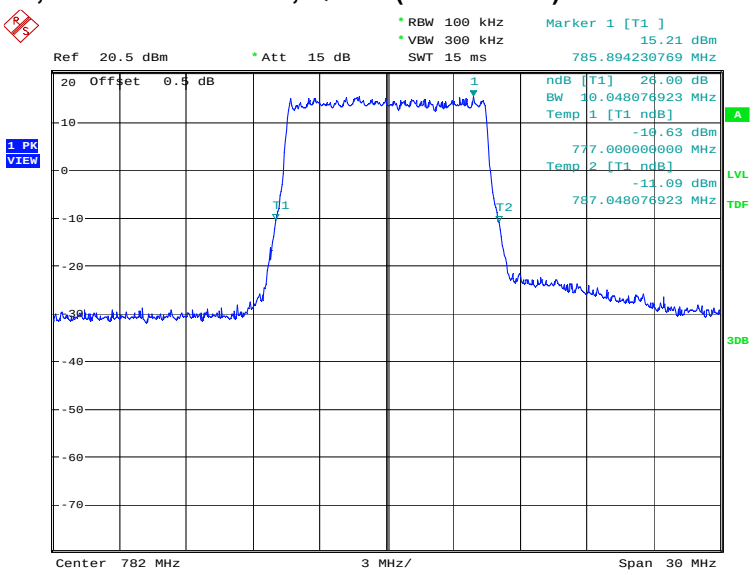


Date: 15.OCT.2019 02:11:45

LTE band 13, 10MHz (-26dBc)

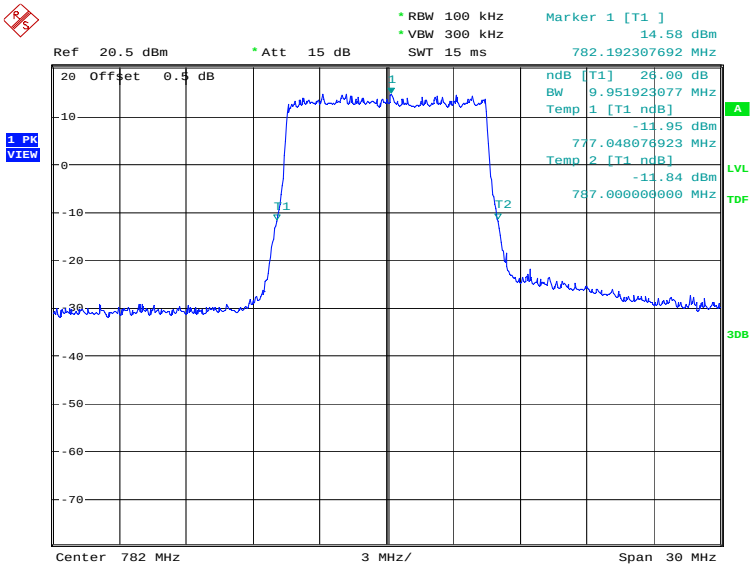
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
782.0	QPSK	16QAM
	10048.08	9951.92

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



Date: 15.OCT.2019 02:14:00

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

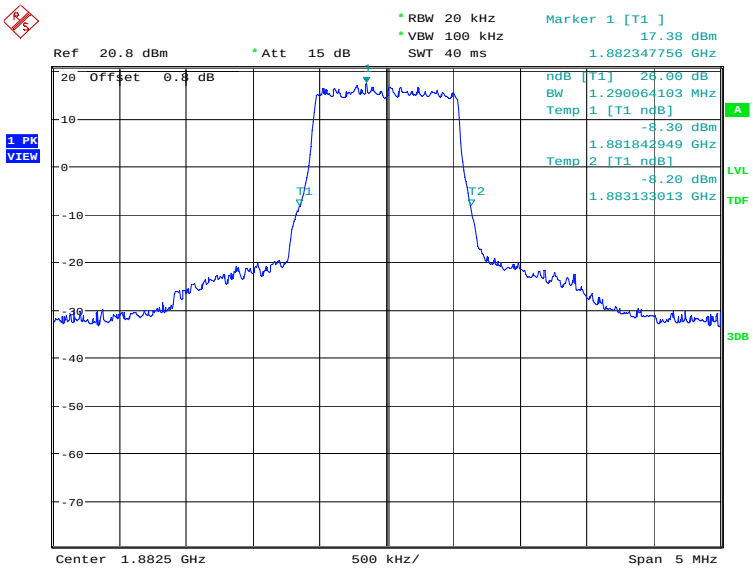


Date: 15.OCT.2019 02:15:27

LTE band 25, 1.4MHz (-26dBc)

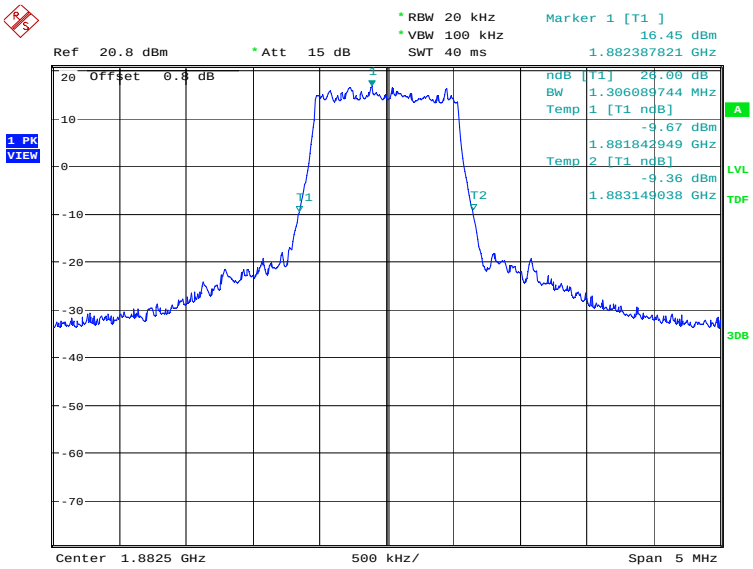
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
1882.5	QPSK	16QAM
	1290.06	1306.09

LTE band 25, 1.4MHz Bandwidth, QPSK (-26dBc BW)



Date: 15.OCT.2019 02:17:44

LTE band 25, 1.4MHz Bandwidth, 16QAM (-26dBc BW)

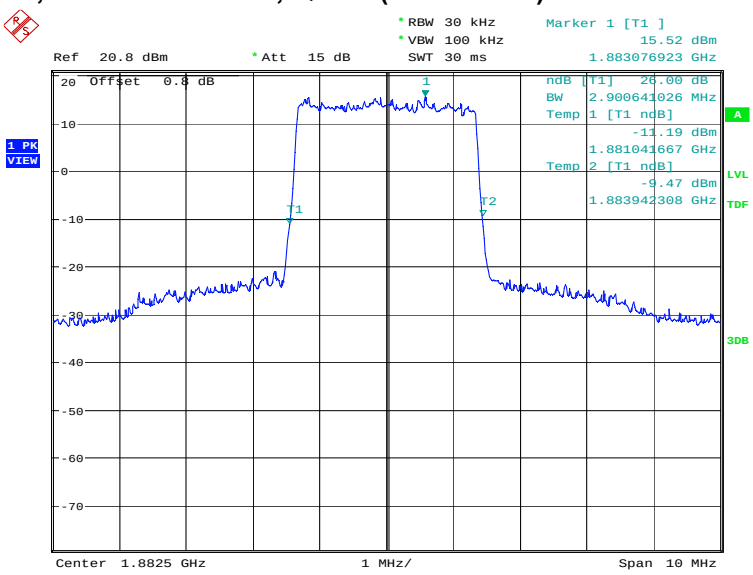


Date: 15.OCT.2019 02:19:10

LTE band 25, 3MHz (-26dBc)

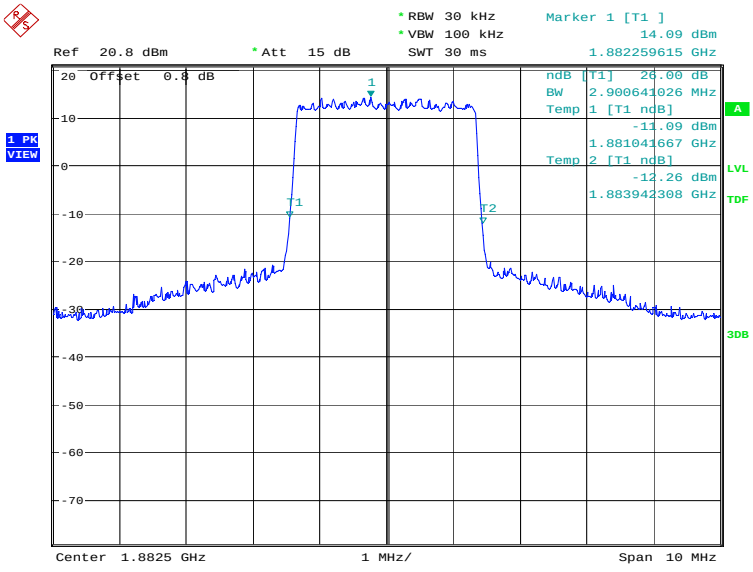
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
1882.5	QPSK	16QAM
	2900.64	2900.64

LTE band 25, 3MHz Bandwidth, QPSK (-26dBc BW)



Date: 15.OCT.2019 02:21:26

LTE band 25, 3MHz Bandwidth, 16QAM (-26dBc BW)

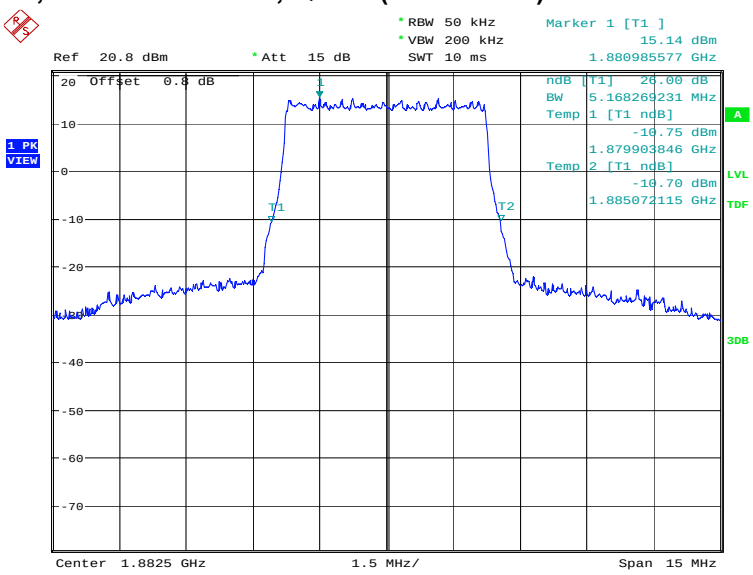


Date: 15.OCT.2019 02:22:53

LTE band 25, 5MHz (-26dBc)

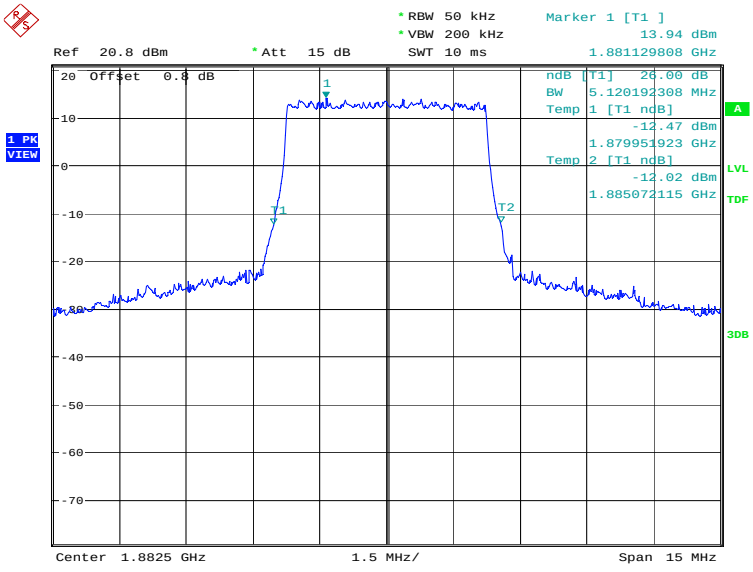
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
1882.5	QPSK	16QAM
	5168.27	5120.19

LTE band 25, 5MHz Bandwidth, QPSK (-26dBc BW)



Date: 15.OCT.2019 02:25:09

LTE band 25, 5MHz Bandwidth, 16QAM (-26dBc BW)

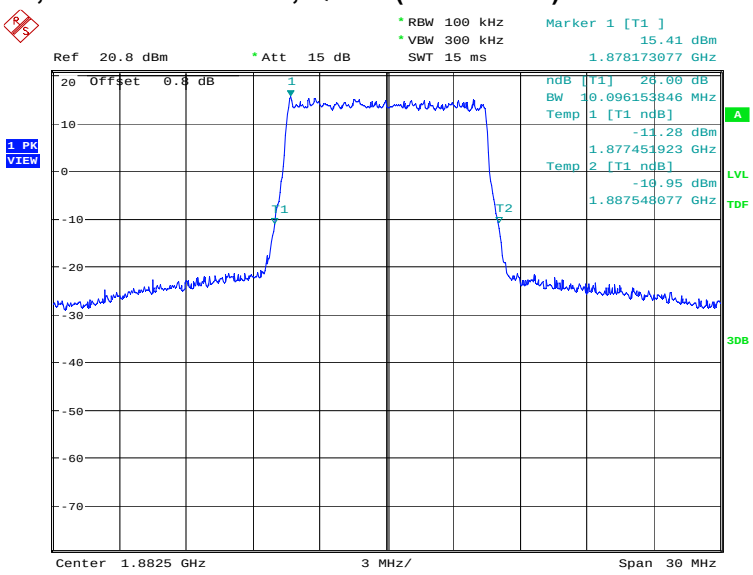


Date: 15.OCT.2019 02:26:36

LTE band 25, 10MHz (-26dBc)

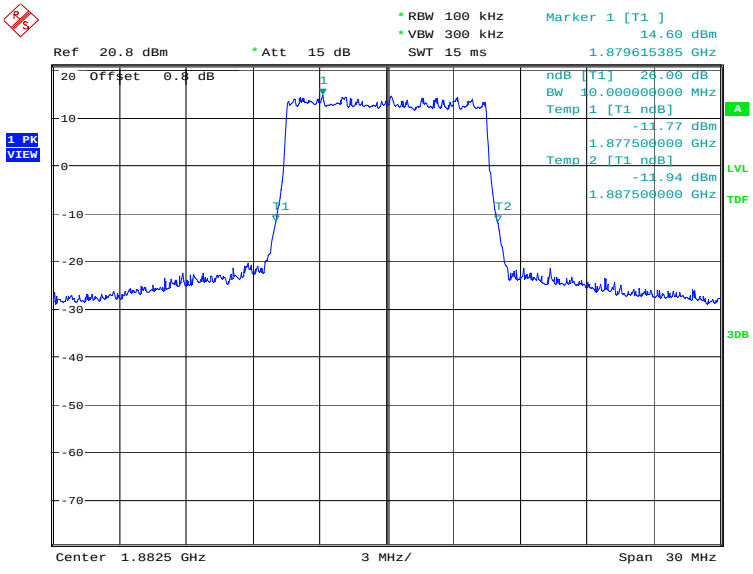
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
1882.5	QPSK	16QAM
	10096.15	10000.00

LTE band 25, 10MHz Bandwidth, QPSK (-26dBc BW)



Date: 15.OCT.2019 02:28:51

LTE band 25, 10MHz Bandwidth, 16QAM (-26dBc BW)

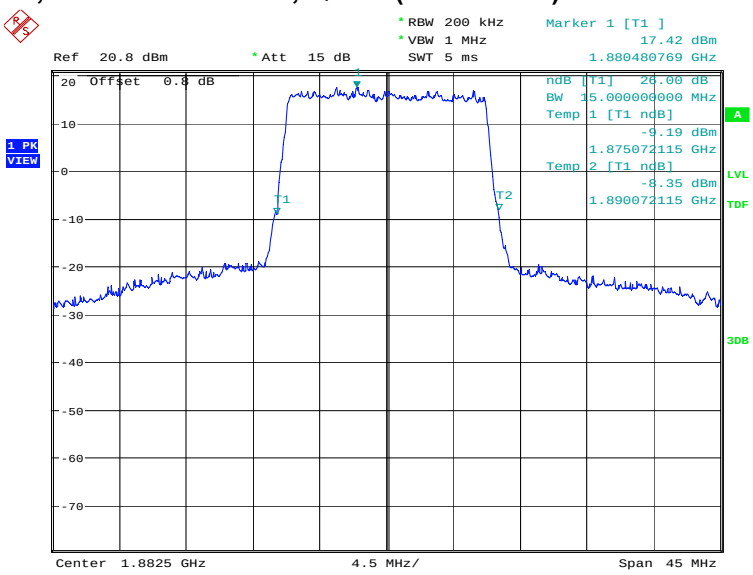


Date: 15.OCT.2019 02:30:18

LTE band 25, 15MHz (-26dBc)

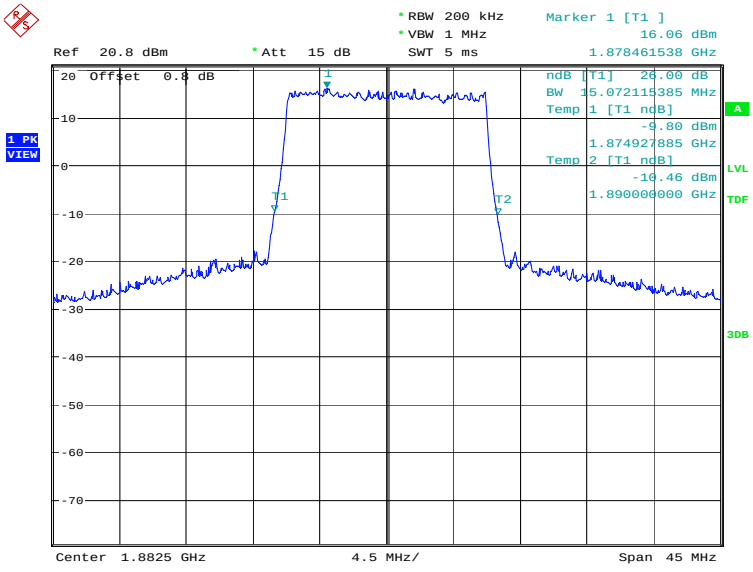
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
1882.5	QPSK	16QAM
	15000.00	15072.12

LTE band 25, 15MHz Bandwidth, QPSK (-26dBc BW)



Date: 15.OCT.2019 02:32:34

LTE band 25, 15MHz Bandwidth, 16QAM (-26dBc BW)

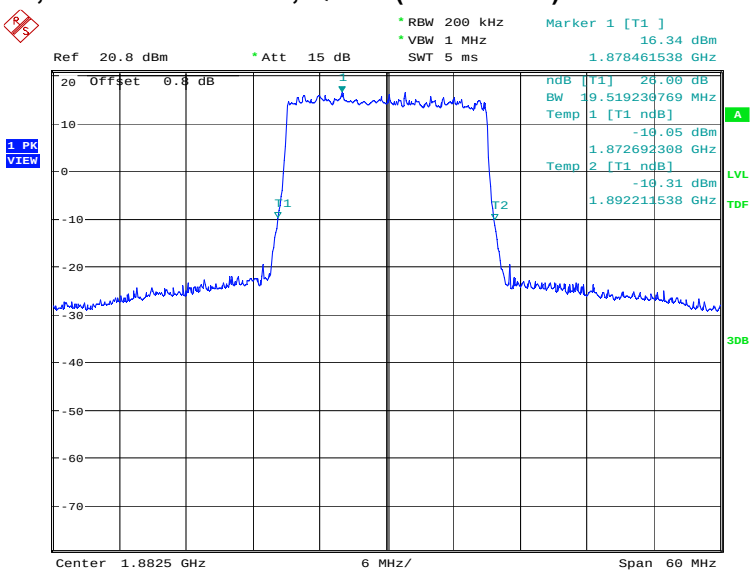


Date: 15.OCT.2019 02:34:01

LTE band 25, 20MHz (-26dBc)

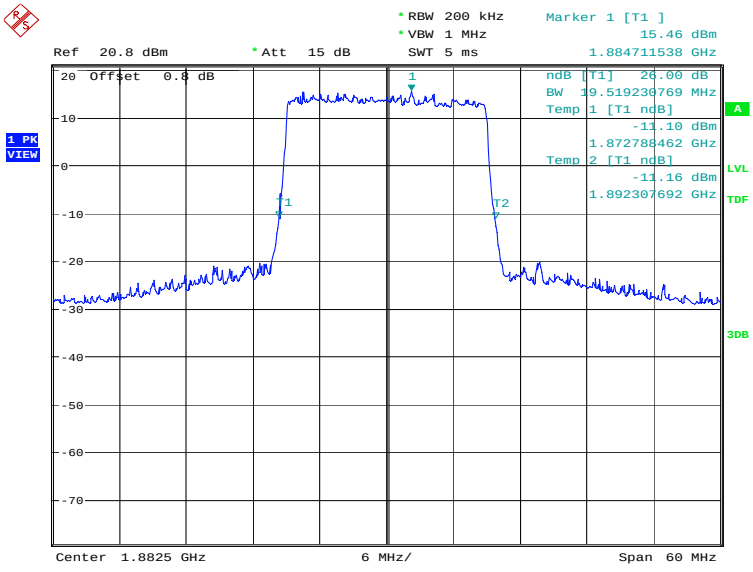
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
1882.5	QPSK	16QAM
	19519.23	19519.23

LTE band 25, 20MHz Bandwidth, QPSK (-26dBc BW)



Date: 15.OCT.2019 02:36:17

LTE band 25, 20MHz Bandwidth, 16QAM (-26dBc BW)

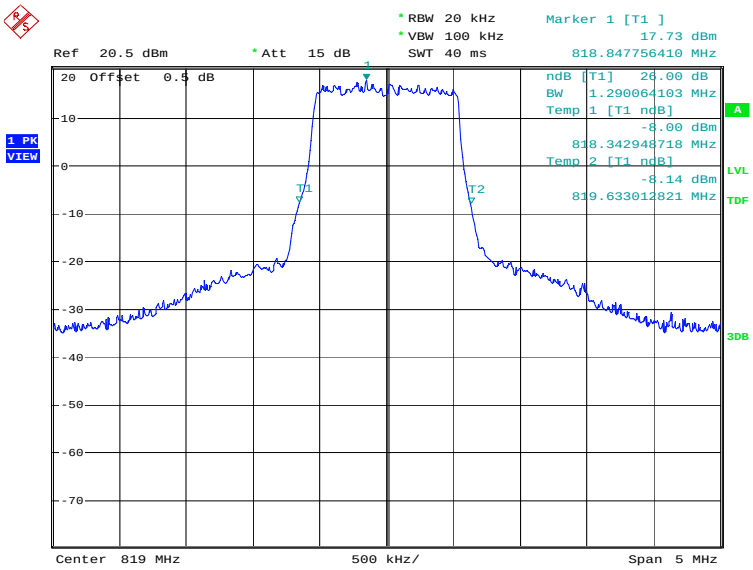


Date: 15.OCT.2019 02:37:44

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

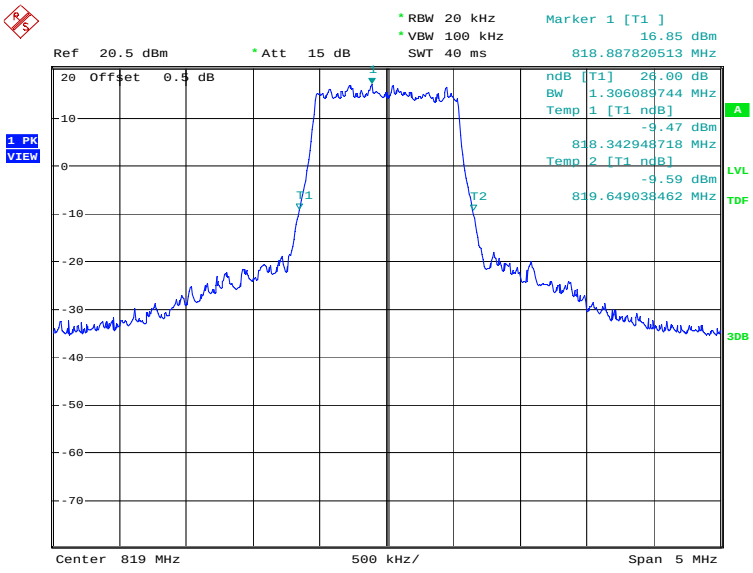
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
819.0	QPSK	16QAM
	1290.06	1306.09

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



Date: 15.OCT.2019 02:57:47

LTE band 26(814MHz~824MHz), 1.4MHz Bandwidth, 16QAM (-26dBc BW)

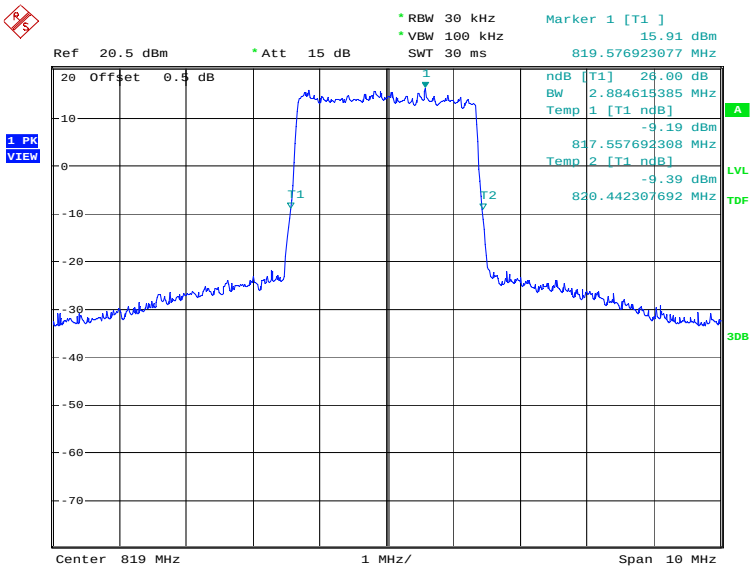


Date: 15.OCT.2019 02:59:14

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

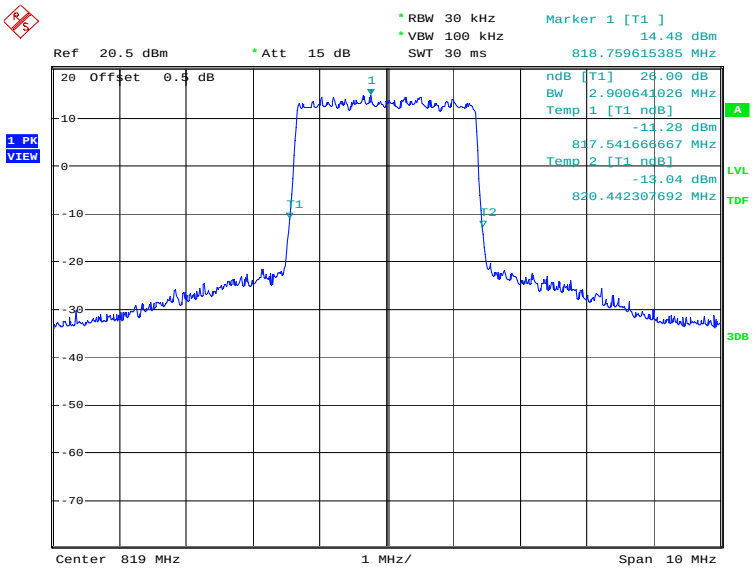
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
819.0	QPSK	16QAM
	2884.62	2900.64

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



Date: 15.OCT.2019 03:01:30

LTE band 26(814MHz~824MHz), 3MHz Bandwidth, 16QAM (-26dBc BW)

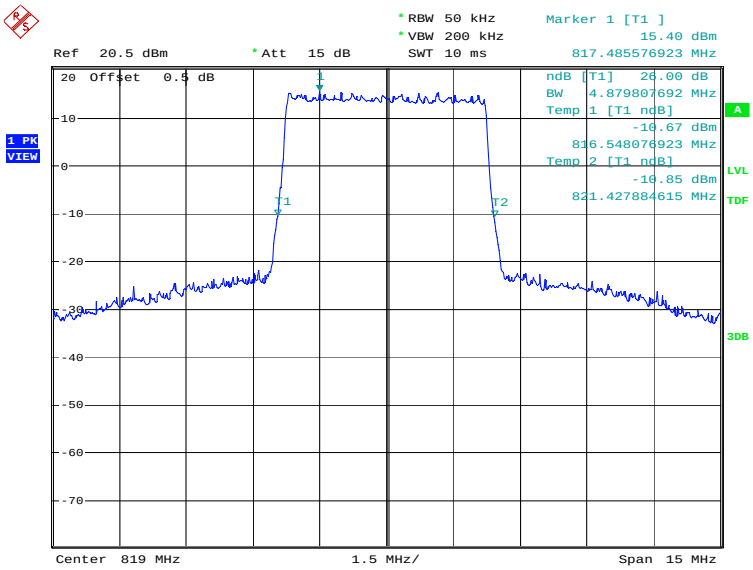


Date: 15.OCT.2019 03:02:57

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

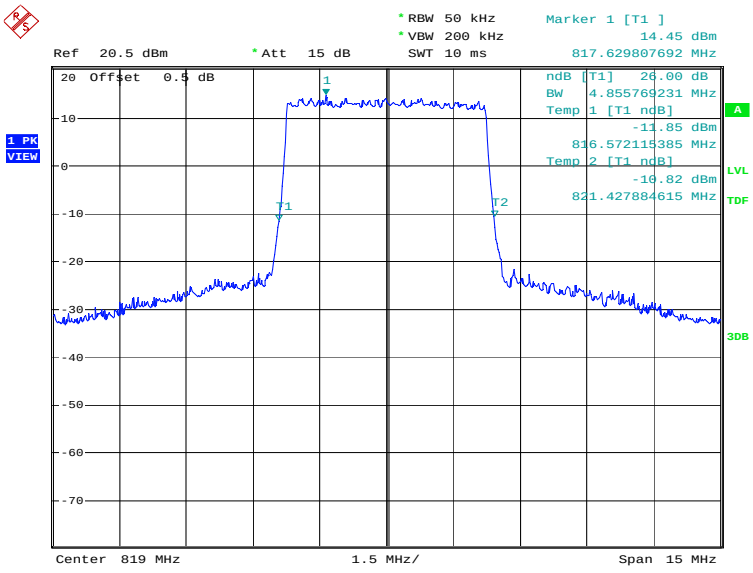
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
819.0	QPSK	16QAM
	4879.81	4855.77

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



Date: 15.OCT.2019 03:05:14

LTE band 26(814MHz~824MHz), 5MHz Bandwidth, 16QAM (-26dBc BW)

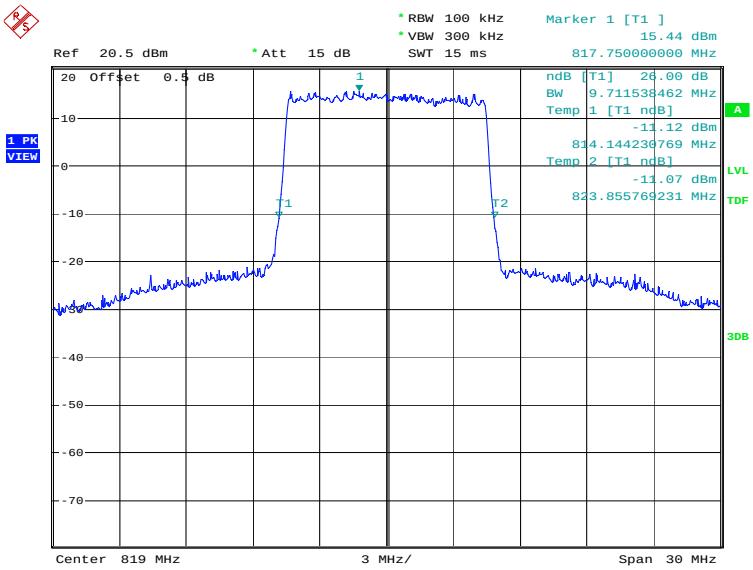


Date: 15.OCT.2019 03:06:41

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

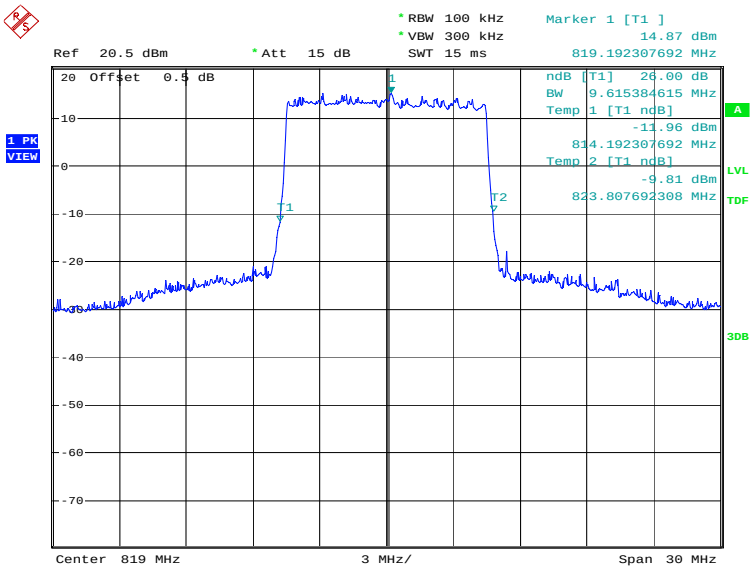
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
819.0	QPSK	16QAM
	9711.54	9615.38

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



Date: 15.OCT.2019 03:08:57

LTE band 26(814MHz~824MHz), 10MHz Bandwidth, 16QAM (-26dBc BW)

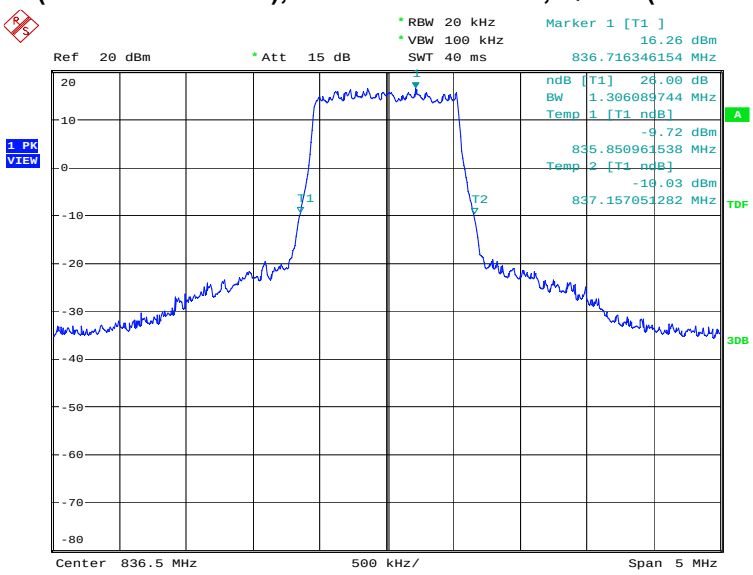


Date: 15.OCT.2019 03:10:24

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

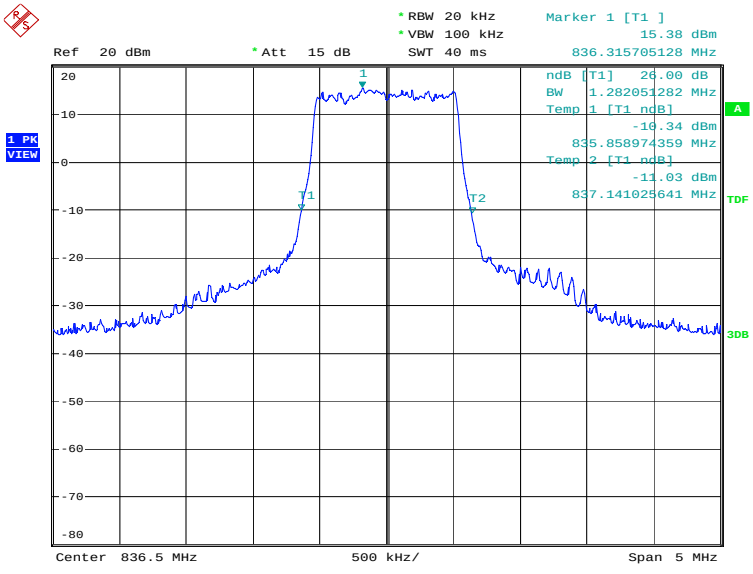
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
836.5	QPSK	16QAM
	1306.09	1282.05

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



Date: 15.OCT.2019 02:39:21

LTE band 26(824MHz~849MHz), 1.4MHz Bandwidth, 16QAM (-26dBc BW)

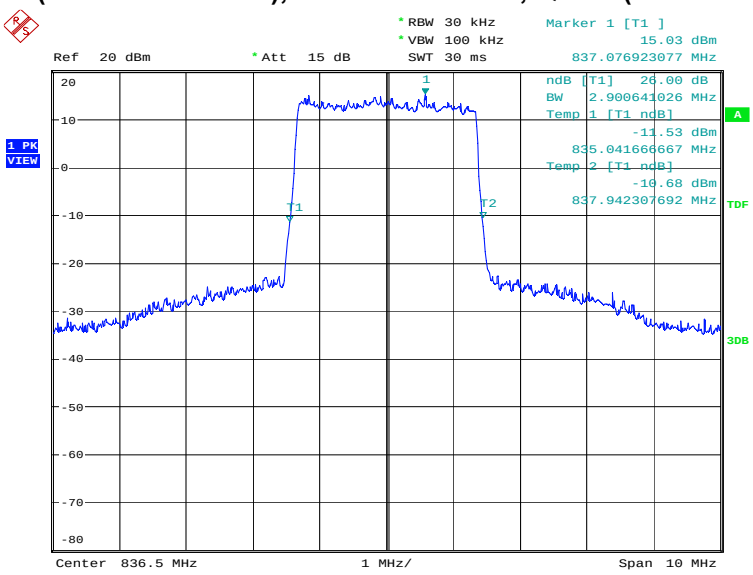


Date: 15.OCT.2019 02:40:48

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

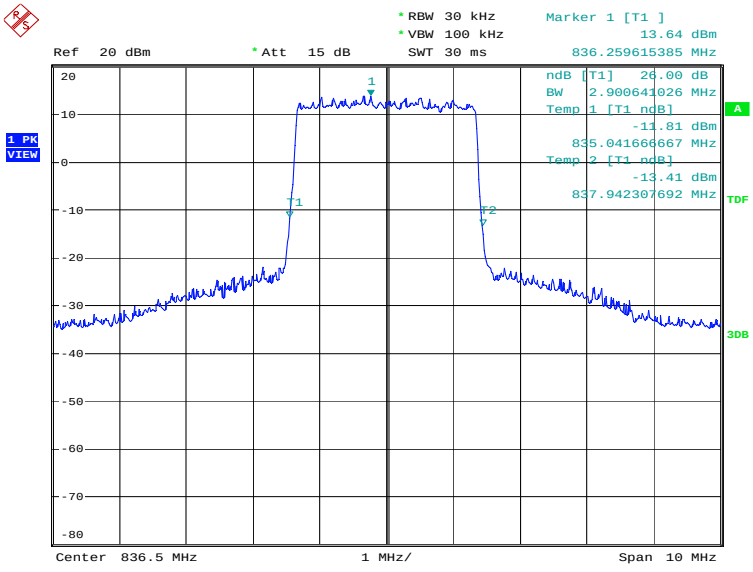
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
836.5	QPSK	16QAM
	2900.64	2900.64

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



Date: 15.OCT.2019 02:43:04

LTE band 26(824MHz~849MHz), 3MHz Bandwidth, 16QAM (-26dBc BW)

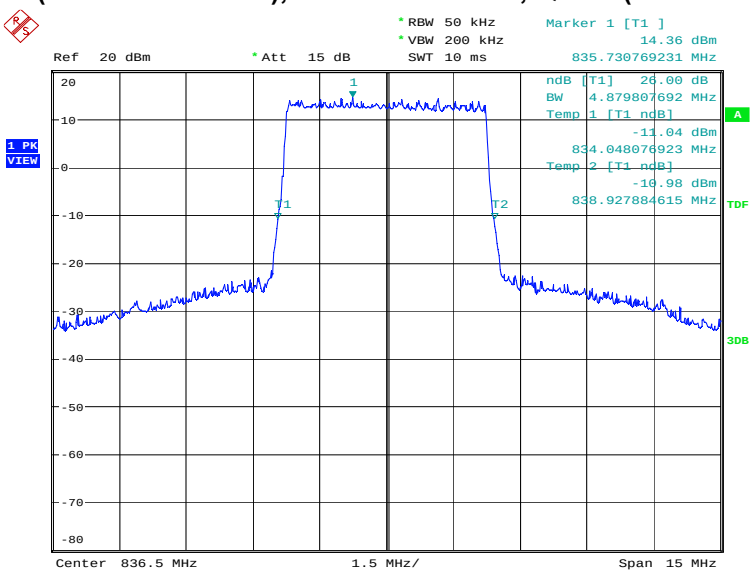


Date: 15.OCT.2019 02:44:31

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

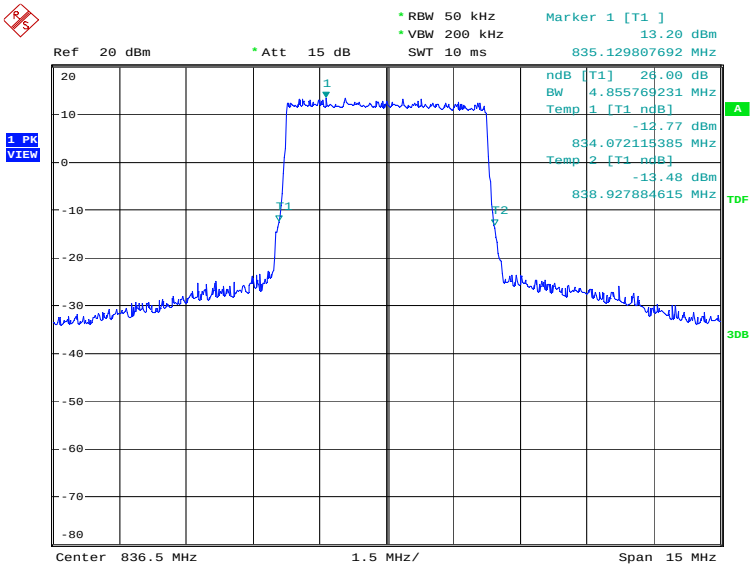
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
836.5	QPSK	16QAM
	4879.81	4855.77

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



Date: 15.OCT.2019 02:46:46

LTE band 26(824MHz~849MHz), 5MHz Bandwidth, 16QAM (-26dBc BW)

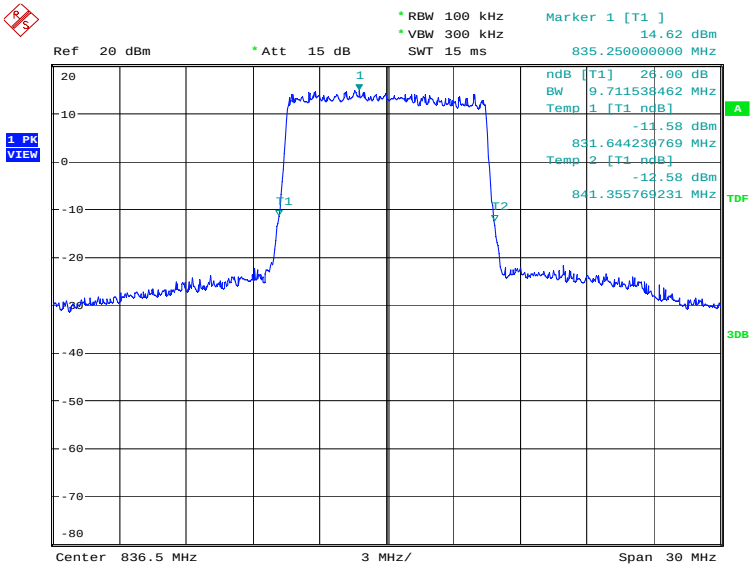


Date: 15.OCT.2019 02:48:13

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

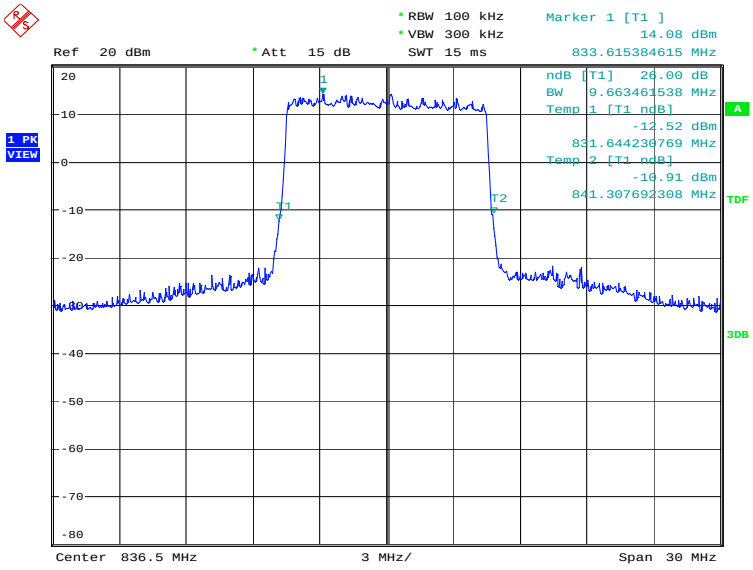
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
836.5	QPSK	16QAM
	9711.54	9663.46

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



Date: 15.OCT.2019 02:50:29

LTE band 26(824MHz~849MHz), 10MHz Bandwidth, 16QAM (-26dBc BW)

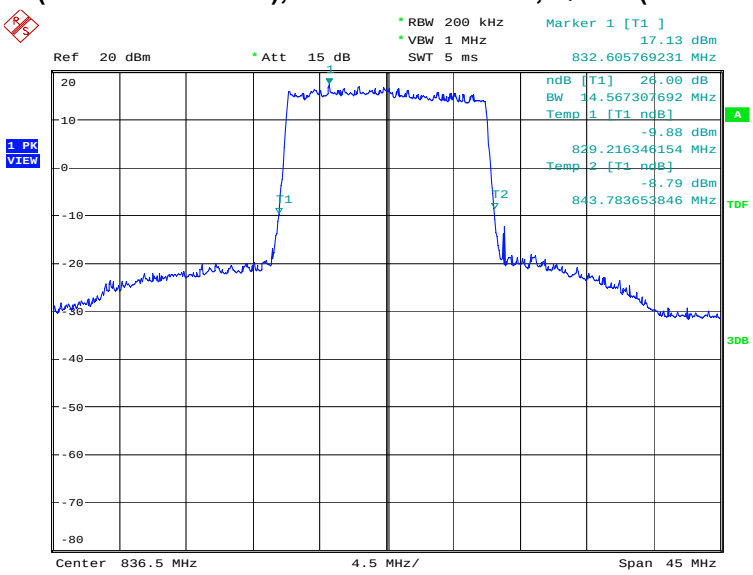


Date: 15.OCT.2019 02:51:56

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

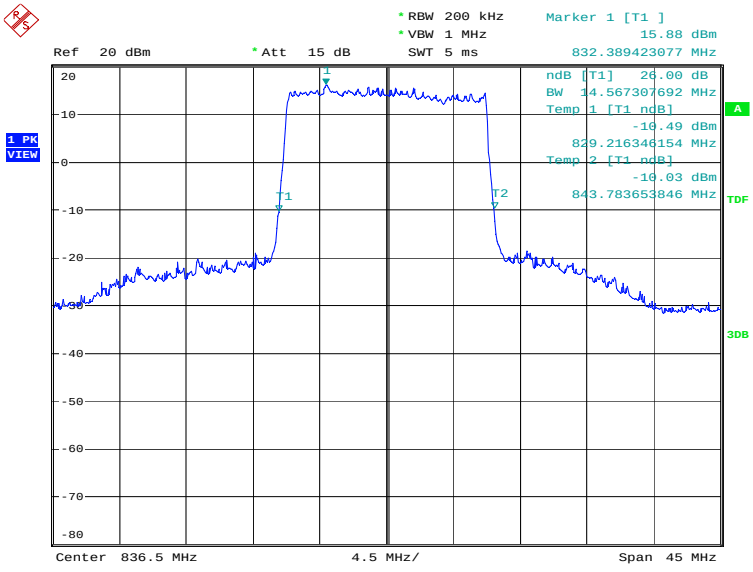
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
836.5	QPSK	16QAM
	14567.31	14567.31

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



Date: 15.OCT.2019 02:54:12

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

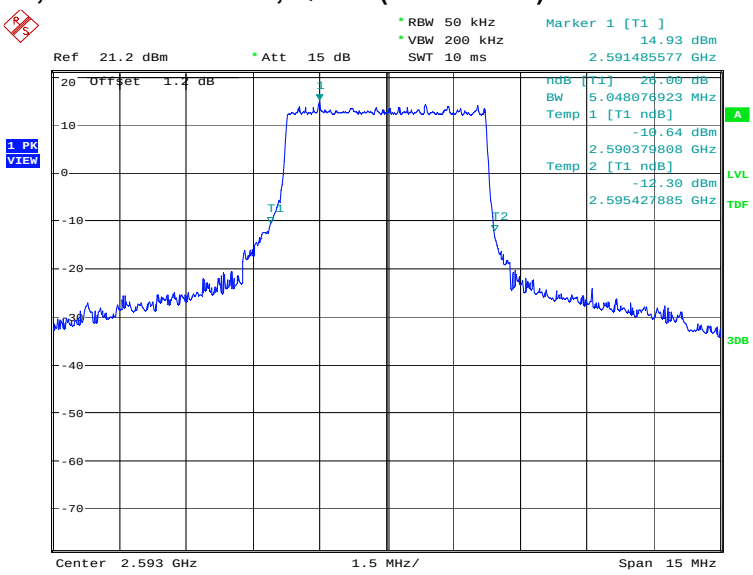


Date: 15.OCT.2019 02:55:40

LTE band 41(PC2), 5MHz (-26dBc)

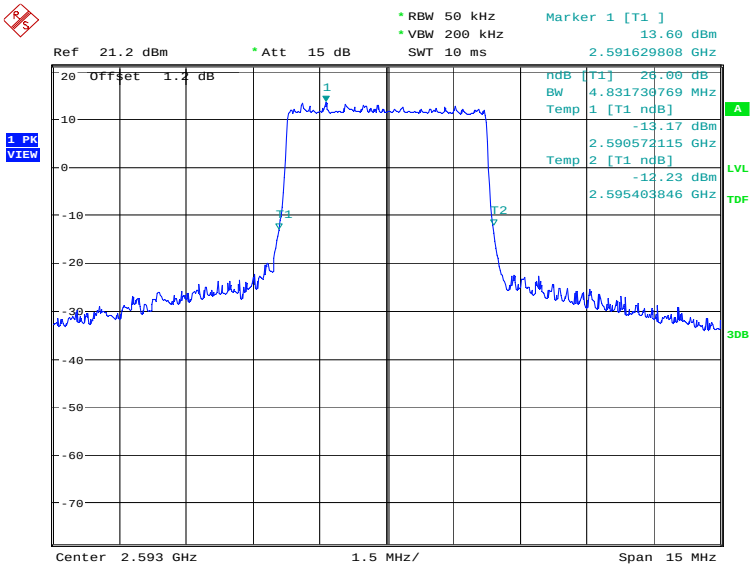
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
	QPSK	16QAM
2593.0	5048.08	4831.73

LTE band 41, 5MHz Bandwidth, QPSK (-26dBc BW)



Date: 15.OCT.2019 03:35:08

LTE band 41, 5MHz Bandwidth,16QAM (-26dBc BW)

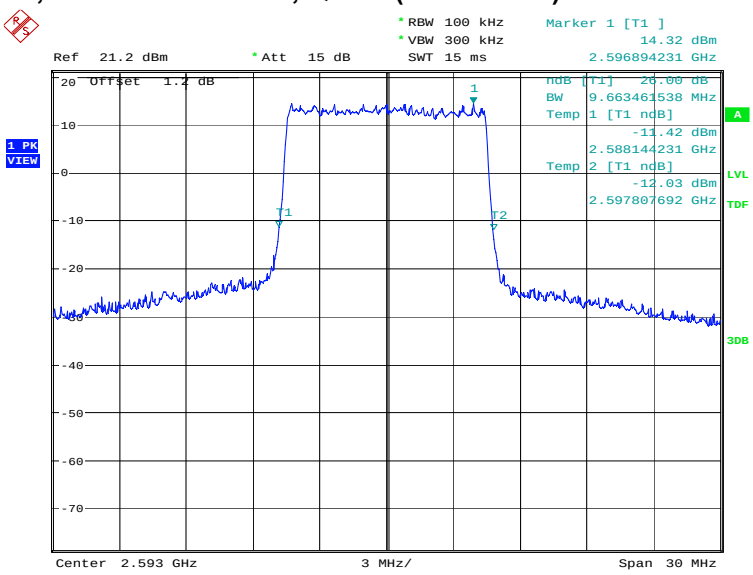


Date: 15.OCT.2019 03:36:35

LTE band 41(PC2), 10MHz (-26dBc)

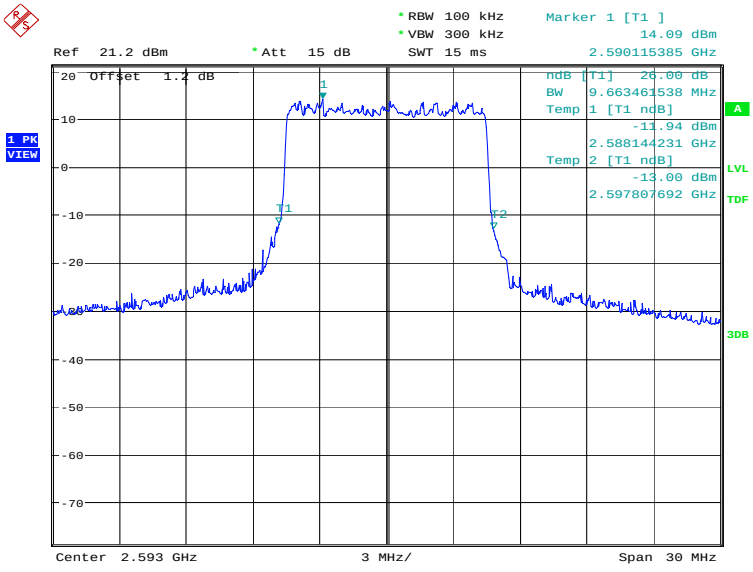
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
2593.0	QPSK	16QAM
	9663.46	9663.46

LTE band 41, 10MHz Bandwidth, QPSK (-26dBc BW)



Date: 15.OCT.2019 03:38:52

LTE band 41, 10MHz Bandwidth,16QAM (-26dBc BW)

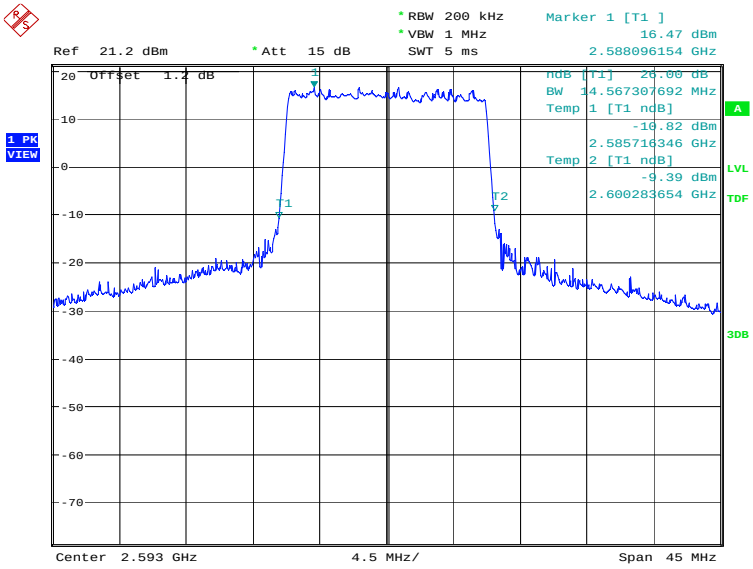


Date: 15.OCT.2019 03:40:19

LTE band 41(PC2), 15MHz (-26dBc)

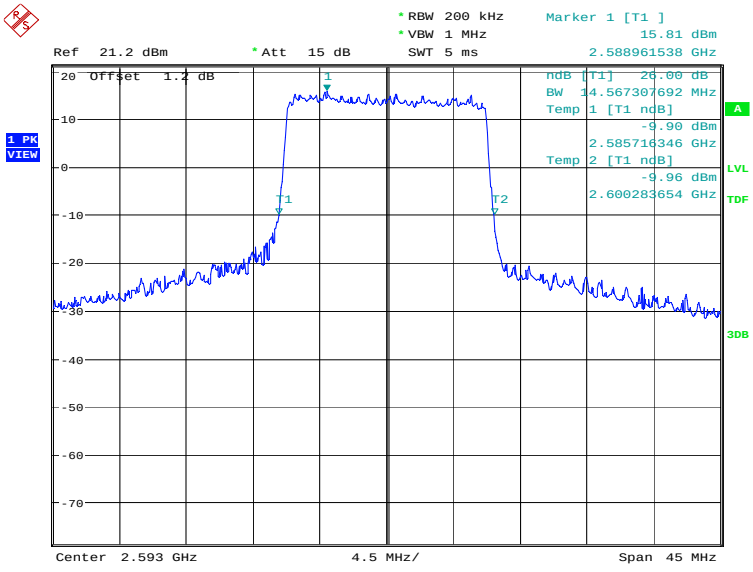
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
2593.0	QPSK	16QAM
	14567.31	14567.31

LTE band 41, 15MHz Bandwidth, QPSK (-26dBc BW)



Date: 15.OCT.2019 03:42:36

LTE band 41, 15MHz Bandwidth,16QAM (-26dBc BW)

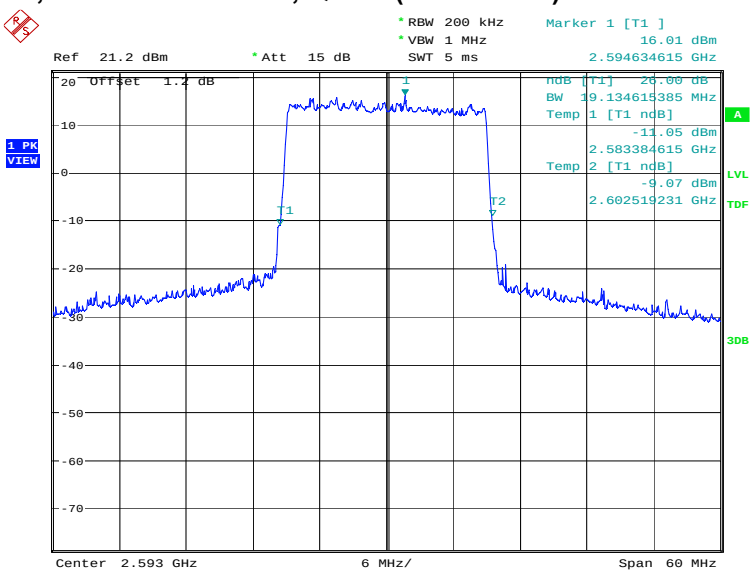


Date: 15.OCT.2019 03:44:03

LTE band 41(PC2), 20MHz (-26dBc)

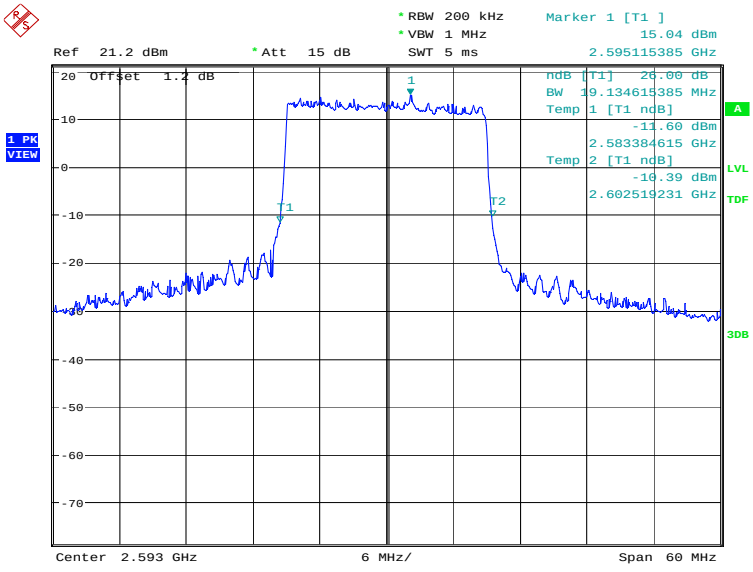
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
2593.0	QPSK	16QAM
	19134.62	19134.62

LTE band 41, 20MHz Bandwidth, QPSK (-26dBc BW)



Date: 15.OCT.2019 03:46:20

LTE band 41, 20MHz Bandwidth,16QAM (-26dBc BW)

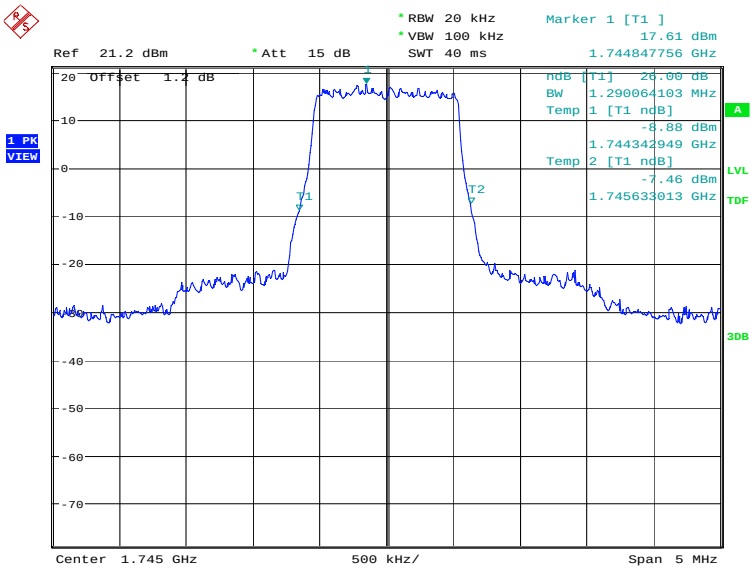


Date: 15.OCT.2019 03:47:47

LTE band 66, 1.4MHz (-26dBc)

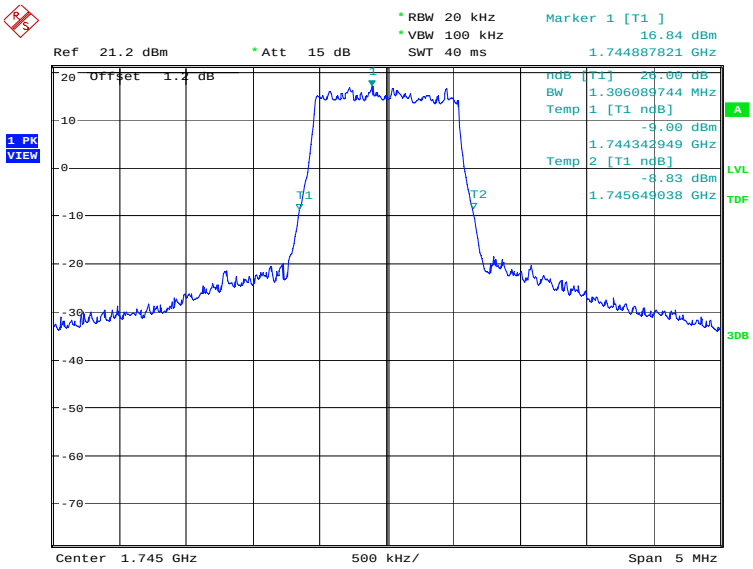
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
1745.0	QPSK	16QAM
	1290.06	1306.09

LTE band 66, 1.4MHz Bandwidth, QPSK (-26dBc BW)



Date: 15.OCT.2019 03:12:41

LTE band 66, 1.4MHz Bandwidth, 16QAM (-26dBc BW)

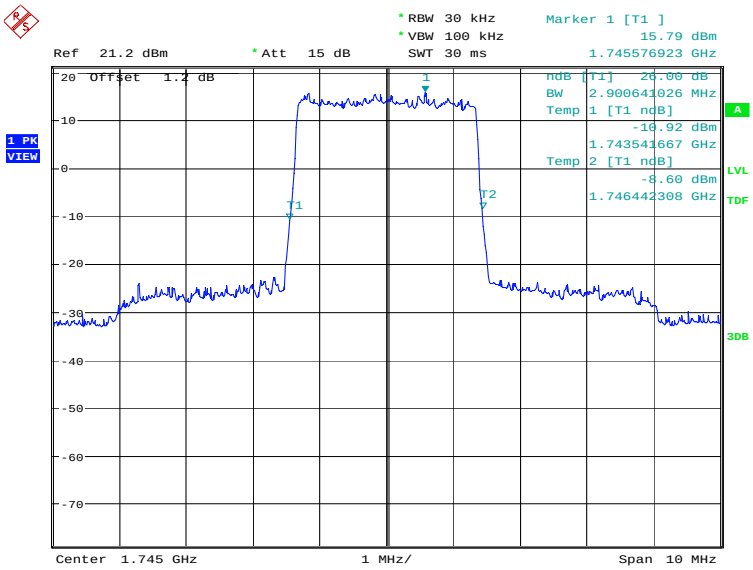


Date: 15.OCT.2019 03:14:09

LTE band 66, 3MHz (-26dBc)

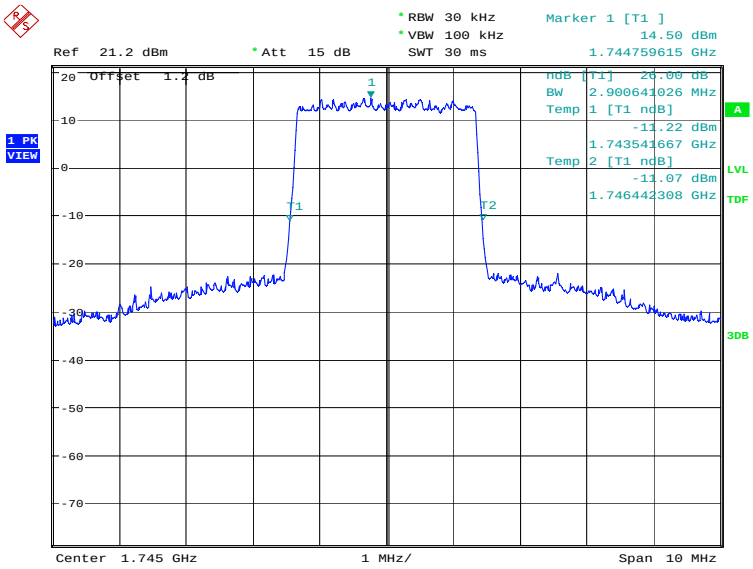
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
1745.0	QPSK	16QAM
	2900.64	2900.64

LTE band 66, 3MHz Bandwidth, QPSK (-26dBc BW)



Date: 15.OCT.2019 03:16:25

LTE band 66, 3MHz Bandwidth, 16QAM (-26dBc BW)

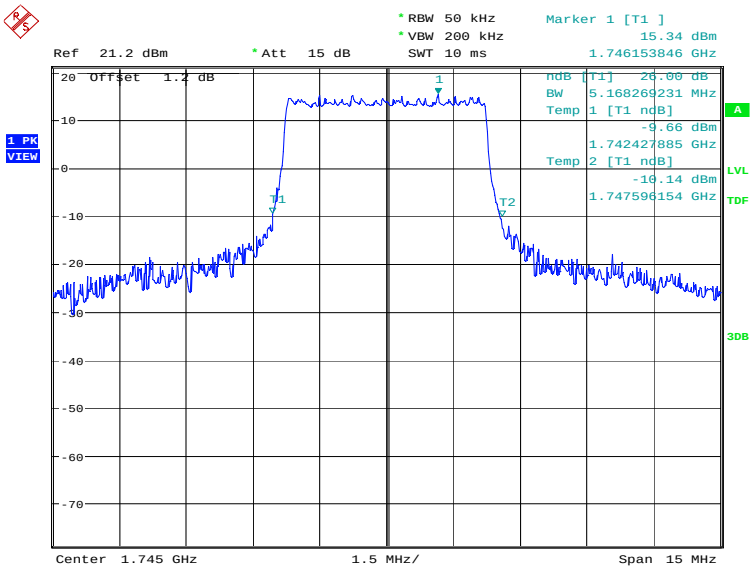


Date: 15.OCT.2019 03:17:51

LTE band 66, 5MHz (-26dBc)

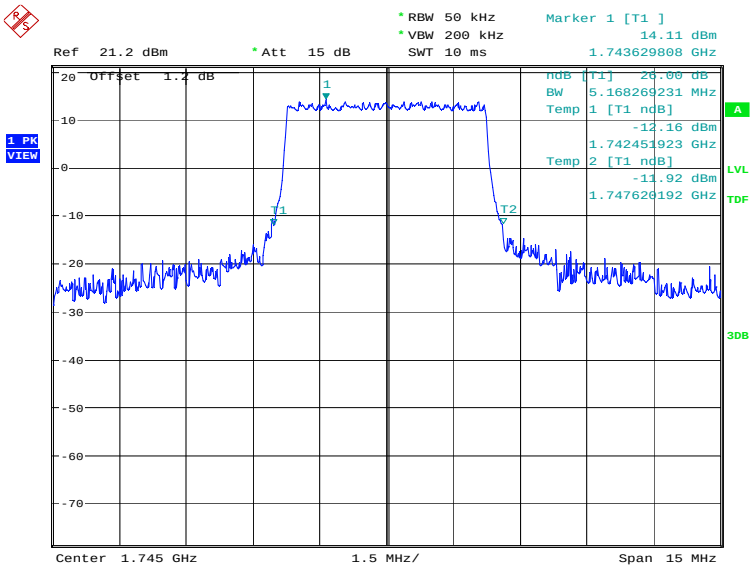
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
1745.0	QPSK	16QAM
	5168.27	5168.27

LTE band 66, 5MHz Bandwidth, QPSK (-26dBc BW)



Date: 15.OCT.2019 03:20:07

LTE band 66, 5MHz Bandwidth, 16QAM (-26dBc BW)

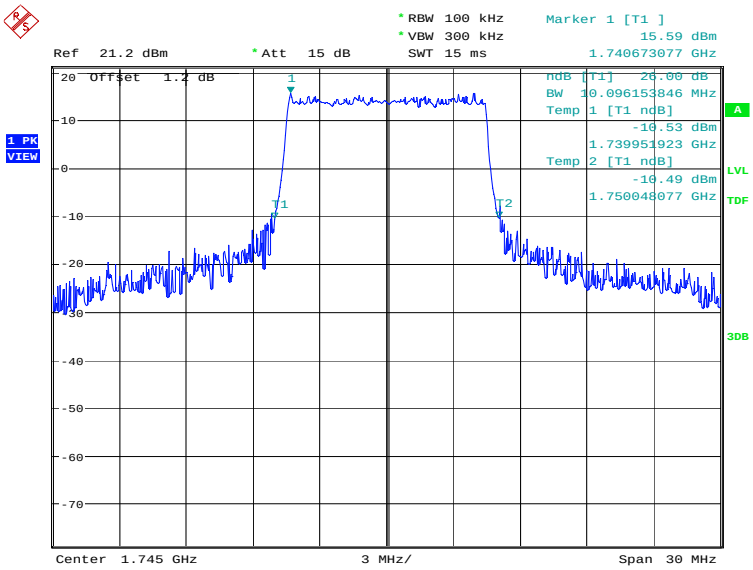


Date: 15.OCT.2019 03:21:34

LTE band 66, 10MHz (-26dBc)

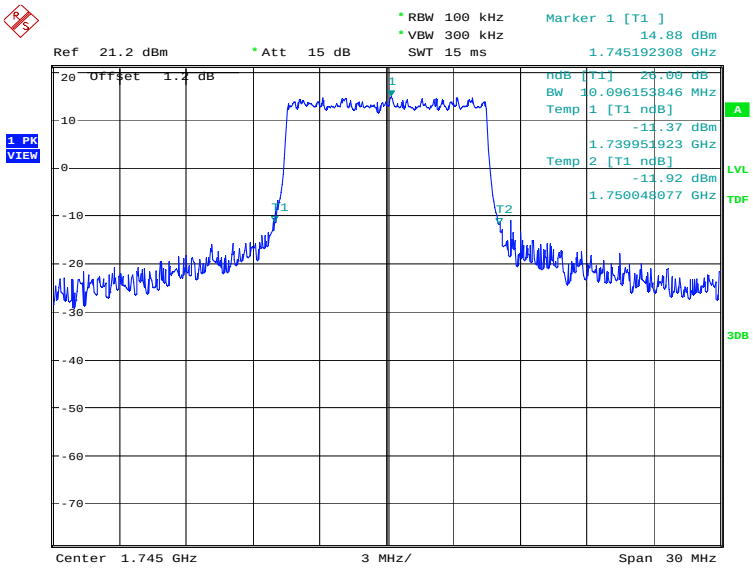
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
1745.0	QPSK	16QAM
	10096.15	10096.15

LTE band 66, 10MHz Bandwidth, QPSK (-26dBc BW)



Date: 15.OCT.2019 03:23:51

LTE band 66, 10MHz Bandwidth, 16QAM (-26dBc BW)

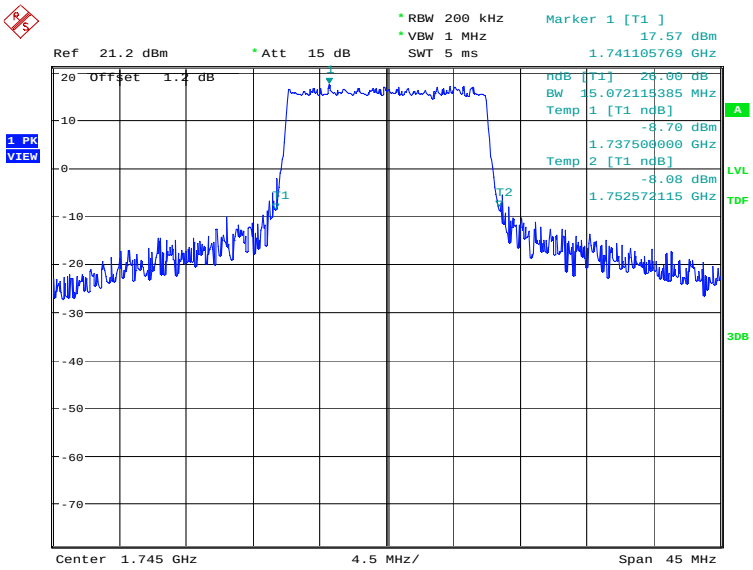


Date: 15.OCT.2019 03:25:18

LTE band 66, 15MHz (-26dBc)

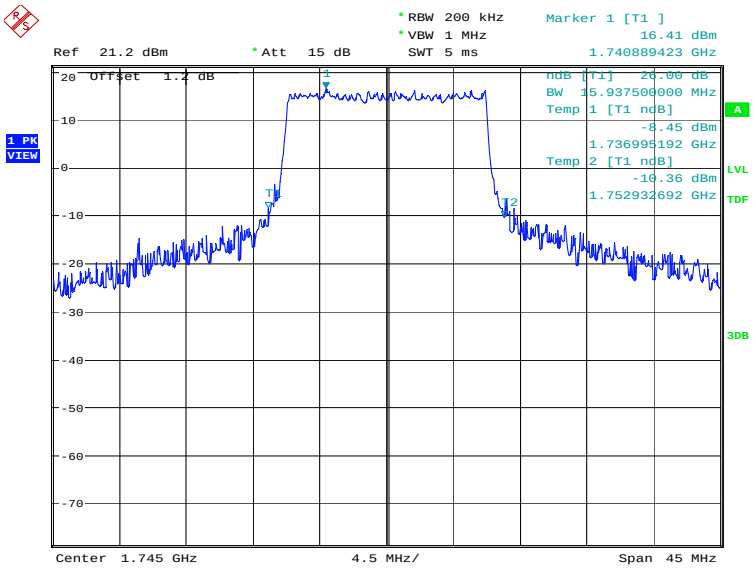
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
1745.0	QPSK	16QAM
	15072.12	15937.50

LTE band 66, 15MHz Bandwidth, QPSK (-26dBc BW)



Date: 15.OCT.2019 03:27:34

LTE band 66, 15MHz Bandwidth, 16QAM (-26dBc BW)

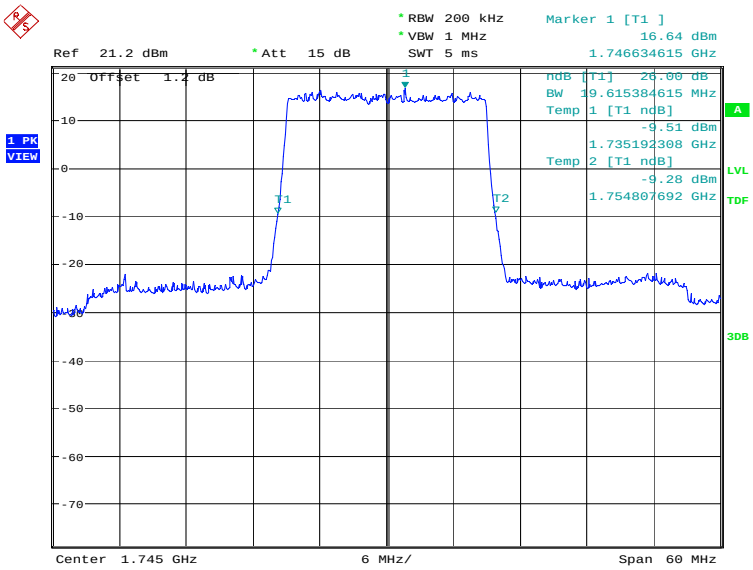


Date: 15.OCT.2019 03:29:01

LTE band 66, 20MHz (-26dBc)

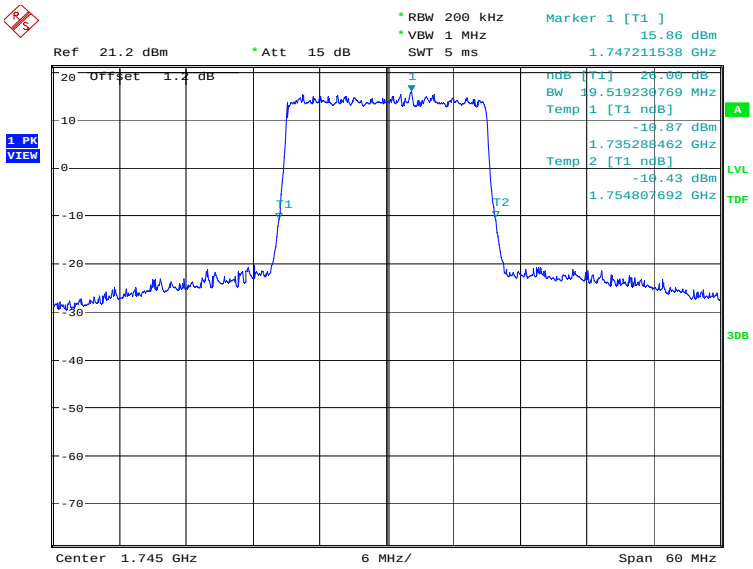
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
1745.0	QPSK	16QAM
	19615.38	19519.23

LTE band 66, 20MHz Bandwidth, QPSK (-26dBc BW)



Date: 15.OCT.2019 03:31:18

LTE band 66, 20MHz Bandwidth, 16QAM (-26dBc BW)

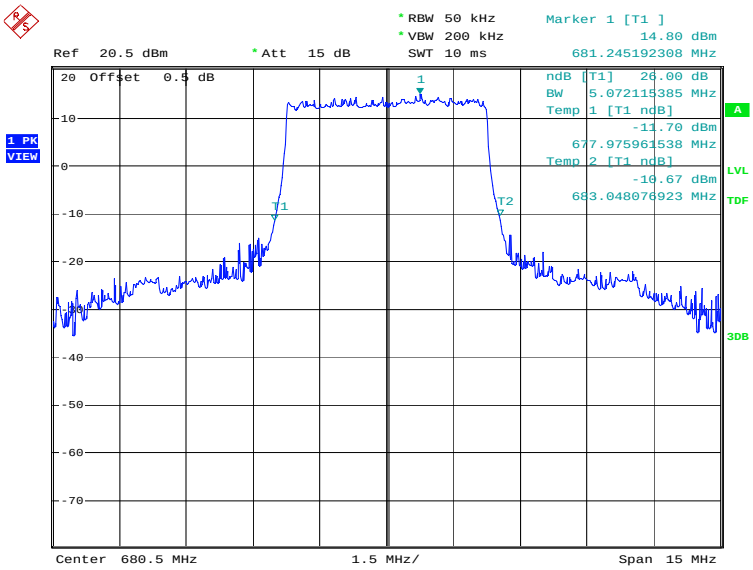


Date: 15.OCT.2019 03:32:45

LTE band 71, 5MHz (-26dBc)

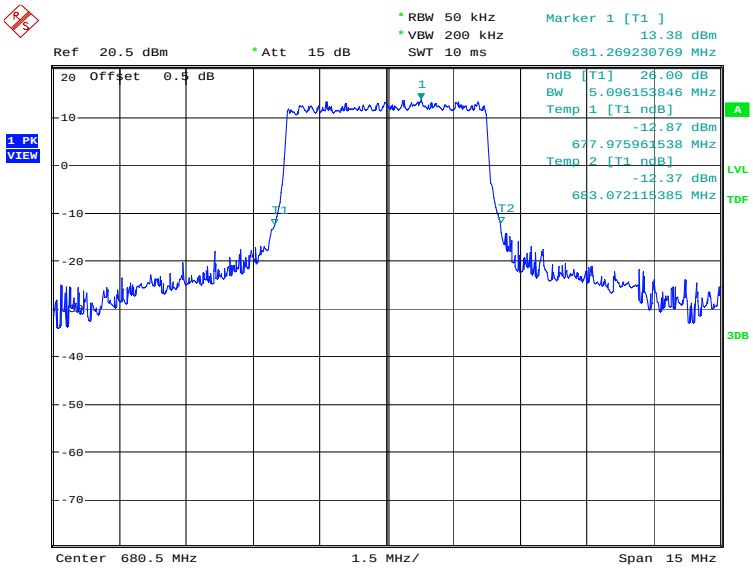
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
680.5	QPSK	16QAM
	5072.12	5096.15

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



Date: 17.OCT.2019 15:13:49

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

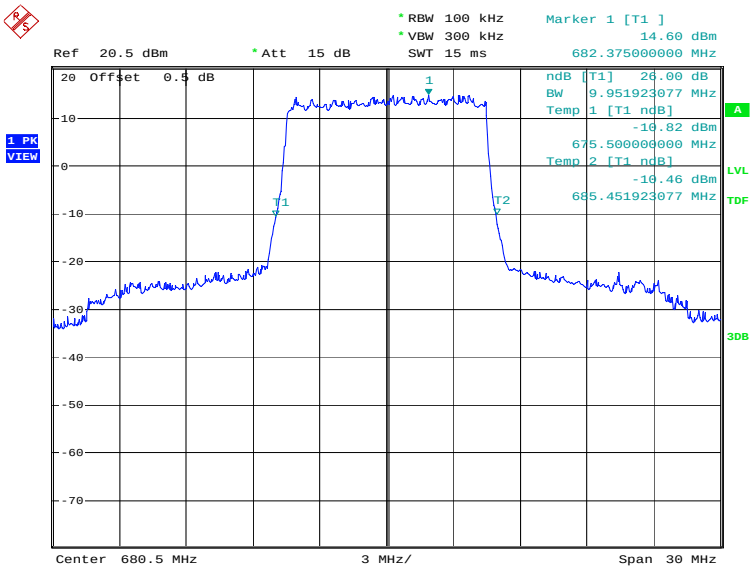


Date: 17.OCT.2019 15:15:14

LTE band 71, 10MHz (-26dBc)

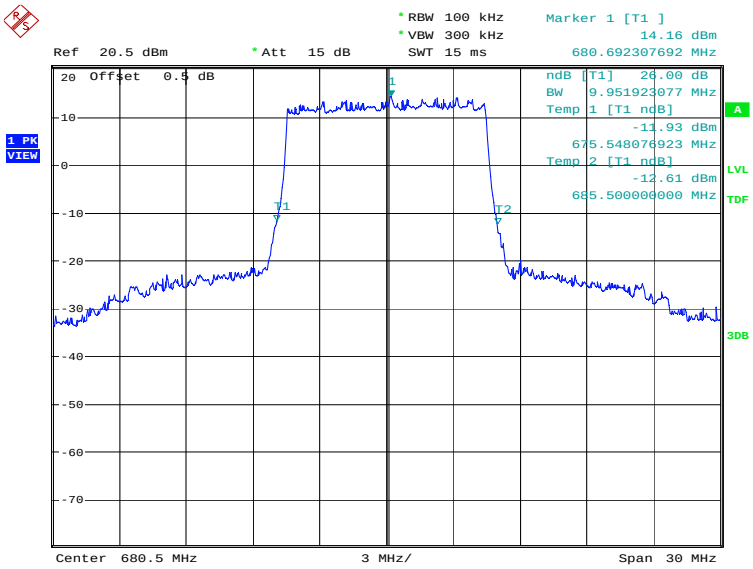
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
680.5	QPSK	16QAM
	9951.92	9951.92

LTE band 71, 10MHz Bandwidth, QPSK (-26dBc BW)



Date: 17.OCT.2019 15:17:27

LTE band 71, 10MHz Bandwidth, 16QAM (-26dBc BW)

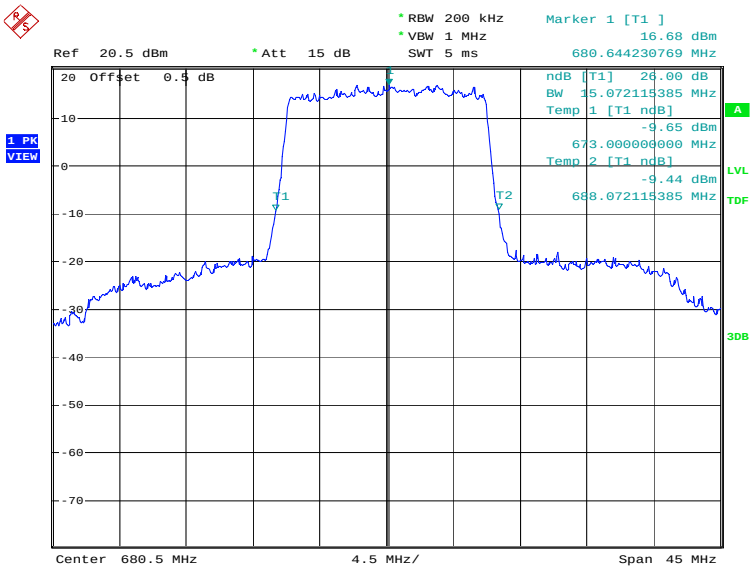


Date: 17.OCT.2019 15:18:52

LTE band 71, 15MHz (-26dBc)

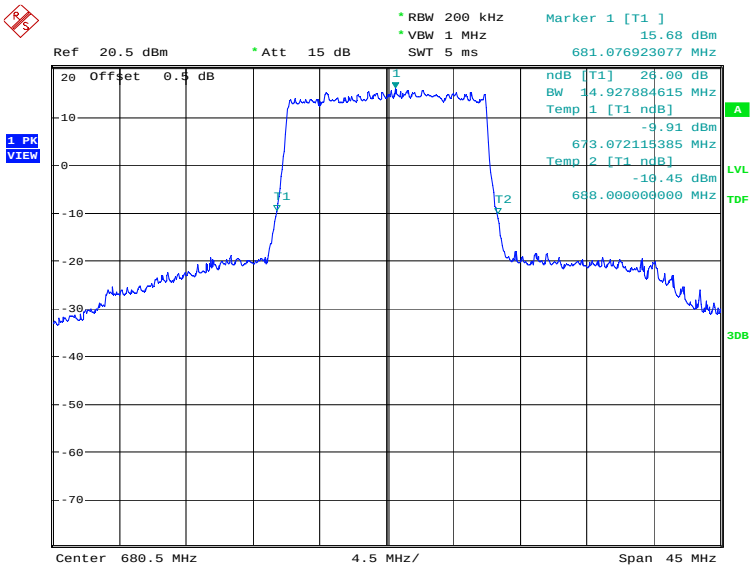
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
680.5	QPSK	16QAM
	15072.12	14927.88

LTE band 71, 15MHz Bandwidth, QPSK (-26dBc BW)



Date: 17.OCT.2019 15:21:05

LTE band 71, 15MHz Bandwidth, 16QAM (-26dBc BW)

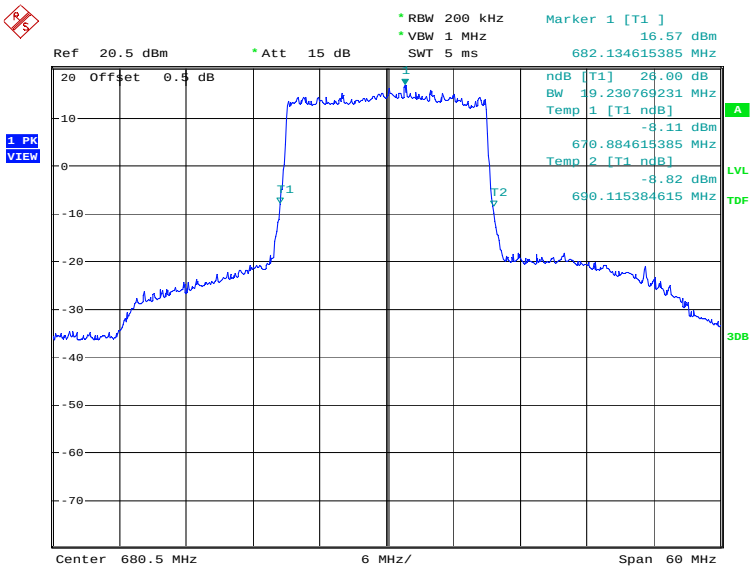


Date: 17.OCT.2019 15:22:30

LTE band 71, 20MHz (-26dBc)

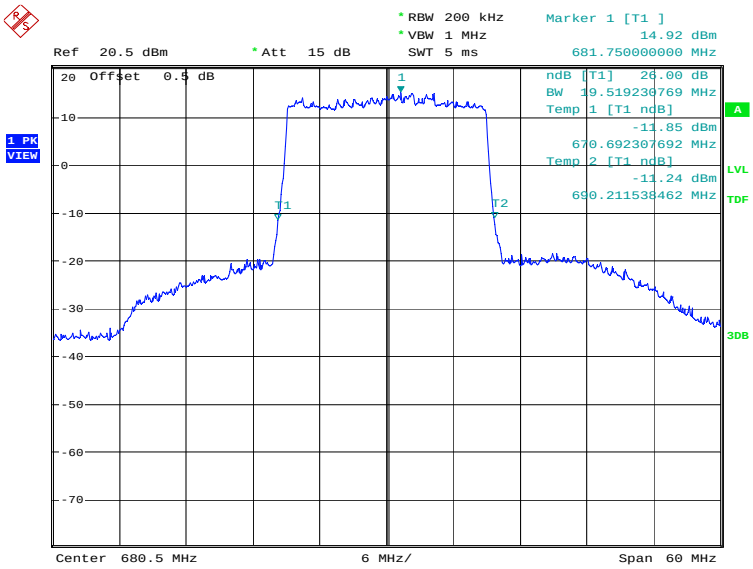
Frequency(MHz)	Occupied Bandwidth (-26dBc) (kHz)	
680.5	QPSK	16QAM
	19230.77	19519.23

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



Date: 17.OCT.2019 15:24:43

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



Date: 17.OCT.2019 15:26:08

A.6 BAND EDGE COMPLIANCE

A.6.1 Measurement limit

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

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

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

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

Part 27.53(c) states for operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

Part 90.691 states that out-of-band emission requirement shall apply only to the ‘‘outer’’ channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:For any frequency removed from the EA licensee’s frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116\text{Log}_{10}(f/6.1)$ decibels or $50 + 10\ \text{Log}_{10}(P)$

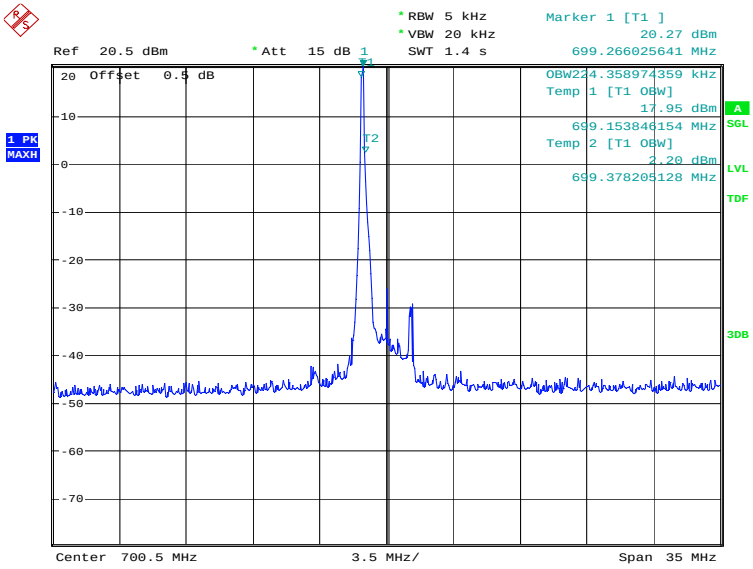
decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz. For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any 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.6.2 Measurement result

Only the worst case result is given below

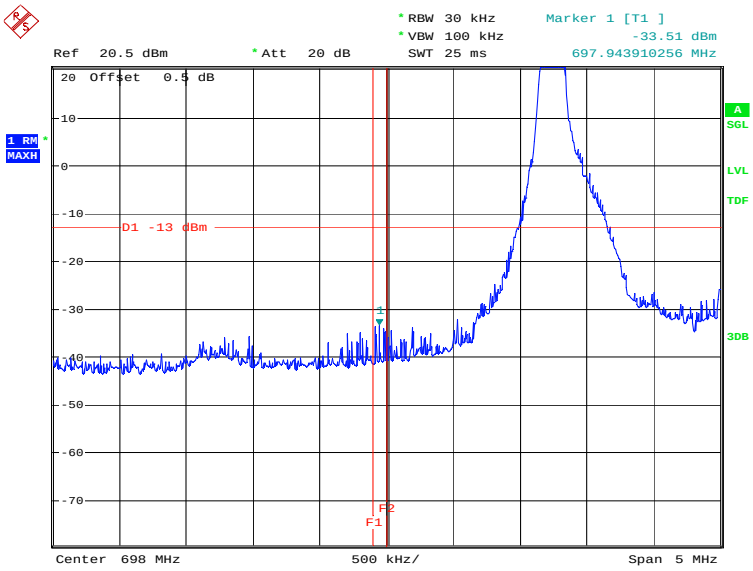
LTE band 12

OBW: 1RB-low_offset



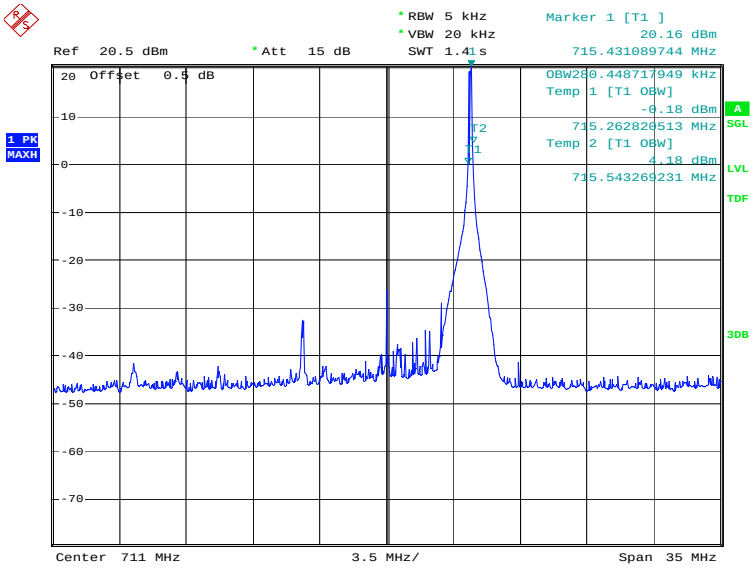
Date: 31.OCT.2019 10:01:47

LOW BAND EDGE BLOCK-1RB-low_offset



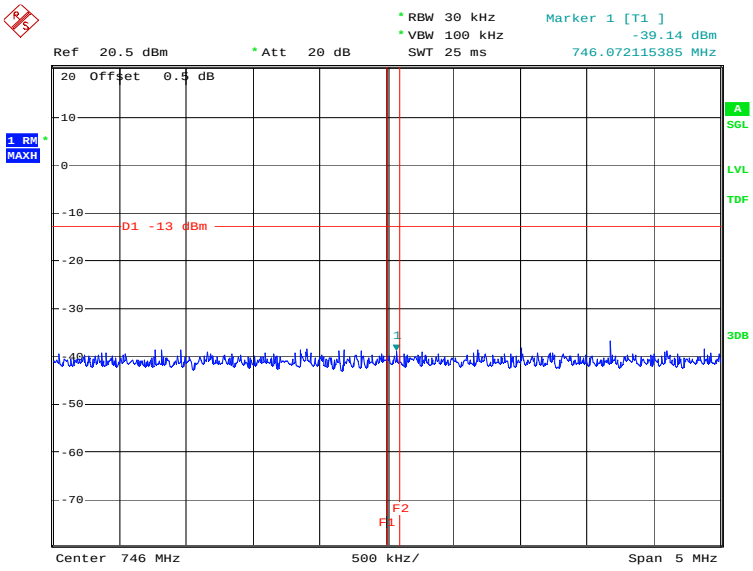
Date: 31.OCT.2019 10:02:02

OBW: 1RB-high_offset



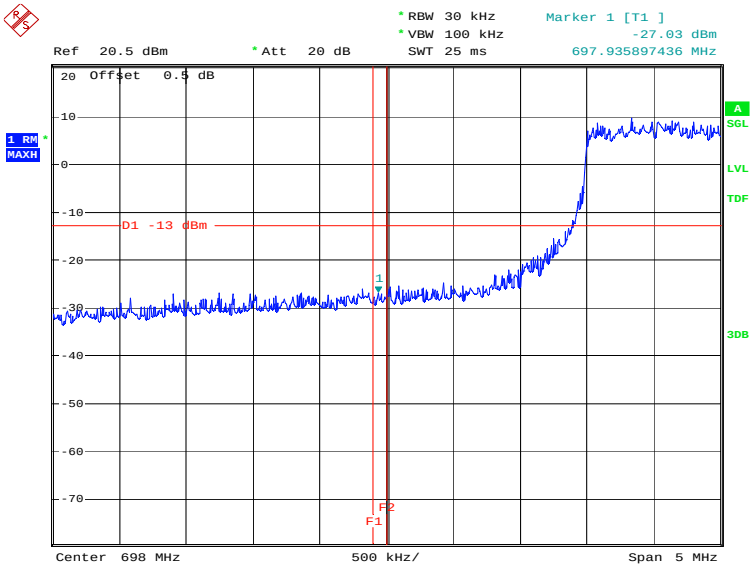
Date: 31.OCT.2019 10:03:58

HIGH BAND EDGE BLOCK-1RB-high_offset



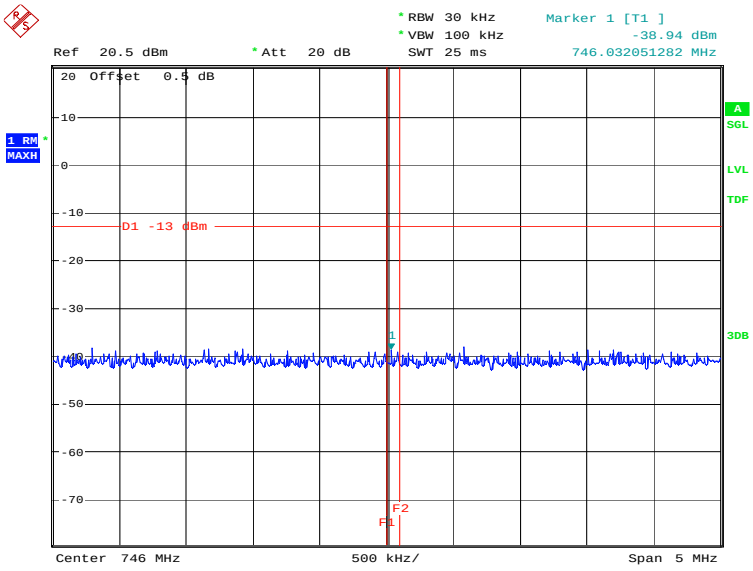
Date: 31.OCT.2019 10:04:13

LOW BAND EDGE BLOCK-10MHz-100%RB



Date: 31.OCT.2019 10:02:39

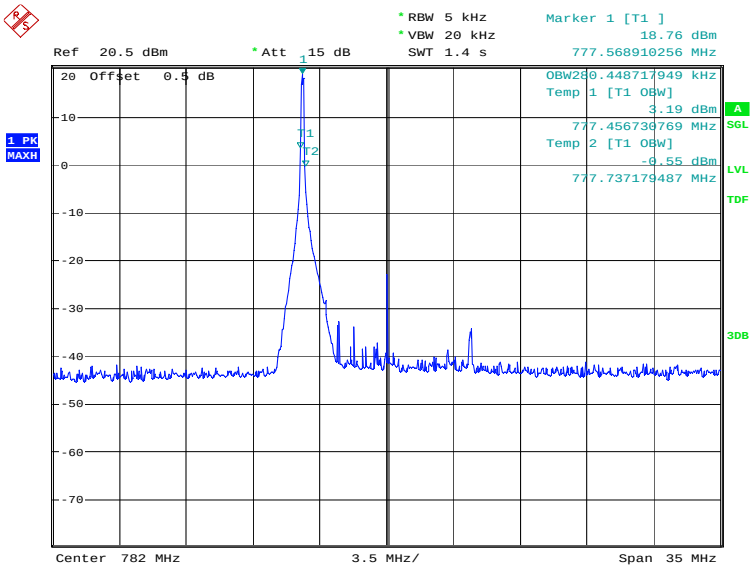
HIGH BAND EDGE BLOCK-10MHz-100%RB



Date: 31.OCT.2019 10:04:43

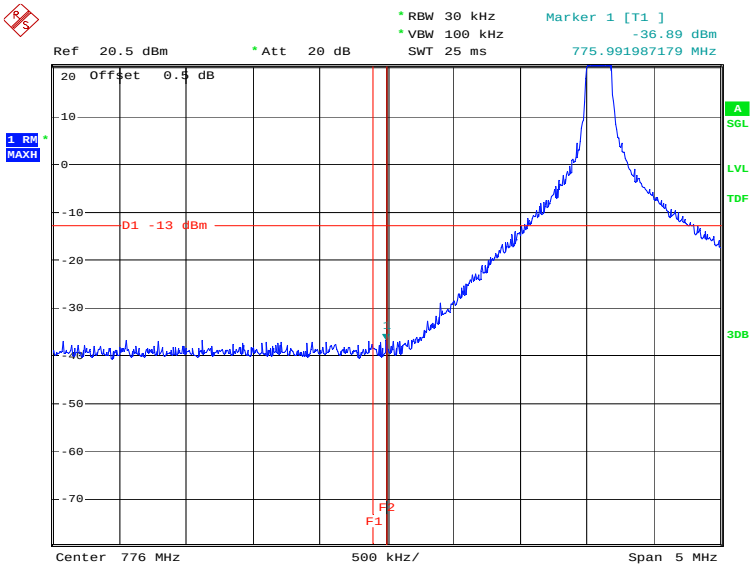
LTE band 13

OBW: 1RB-low_offset

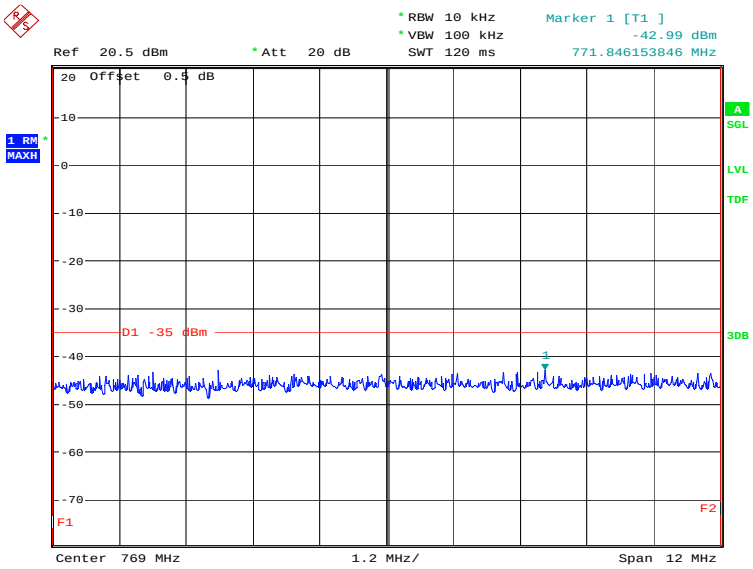


Date: 31.OCT.2019 10:08:14

LOW BAND EDGE BLOCK-1RB-low_offset

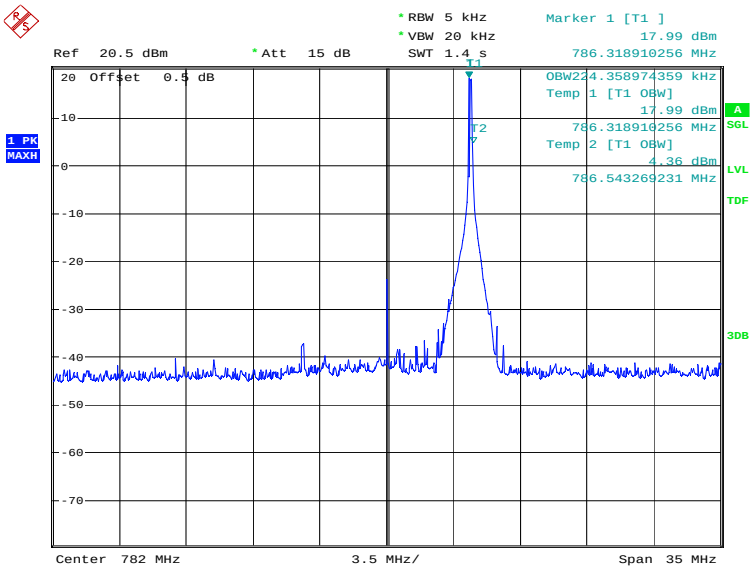


Date: 31.OCT.2019 10:08:30



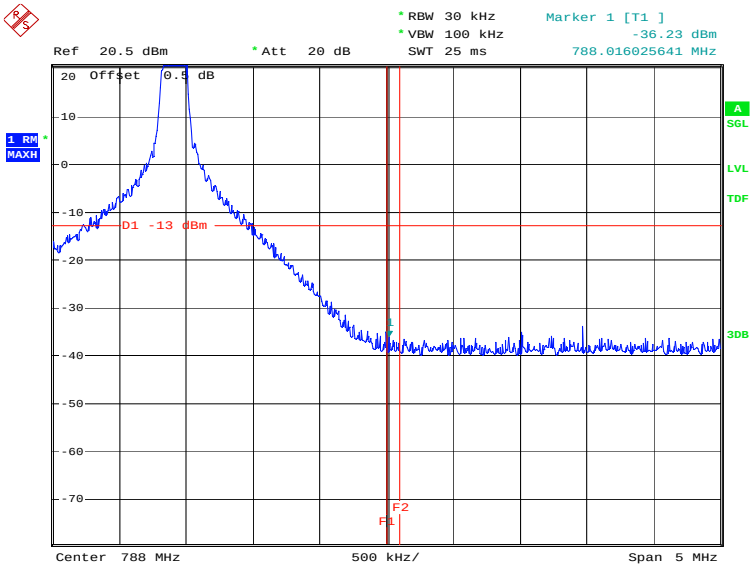
Date: 31.OCT.2019 10:08:45

OBW: 1RB-high_offset

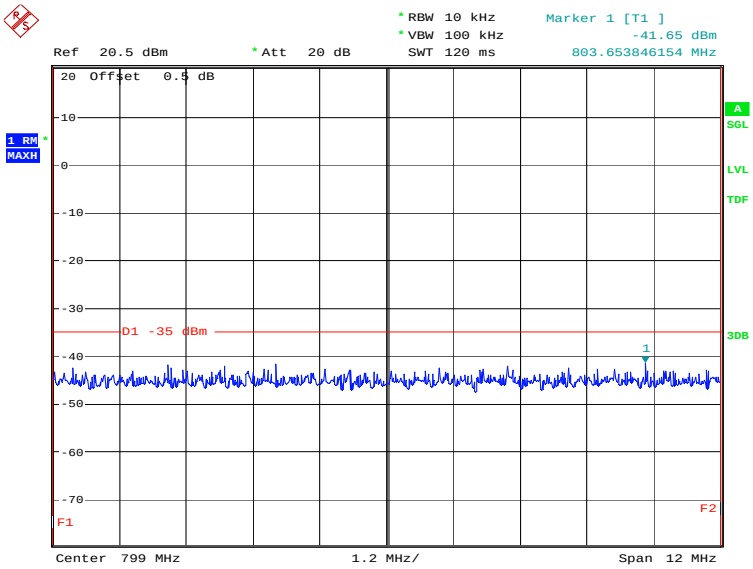


Date: 31.OCT.2019 10:10:47

HIGH BAND EDGE BLOCK-1RB-high_offset

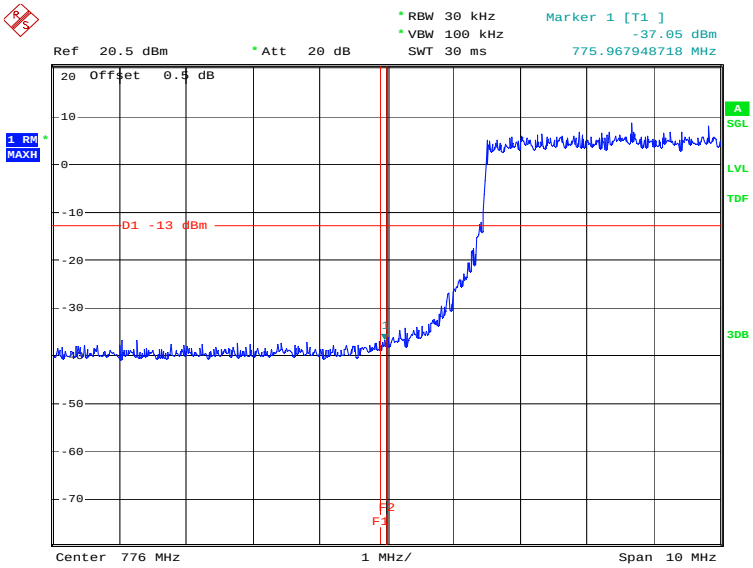


Date: 31.OCT.2019 10:11:03

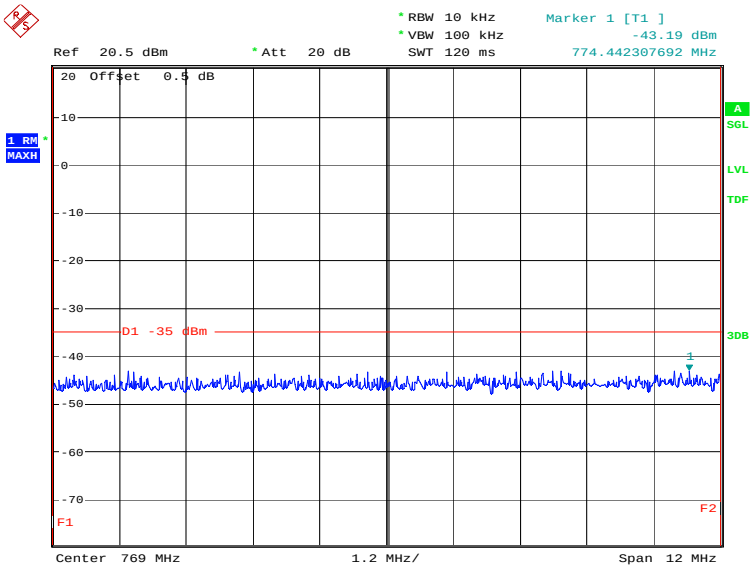


Date: 31.OCT.2019 10:11:18

LOW BAND EDGE BLOCK-10MHz-100%RB

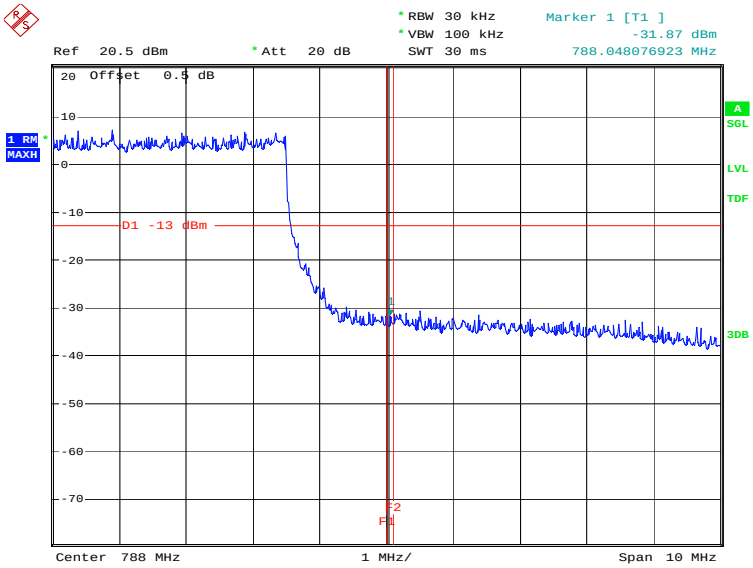


Date: 31.OCT.2019 10:09:14

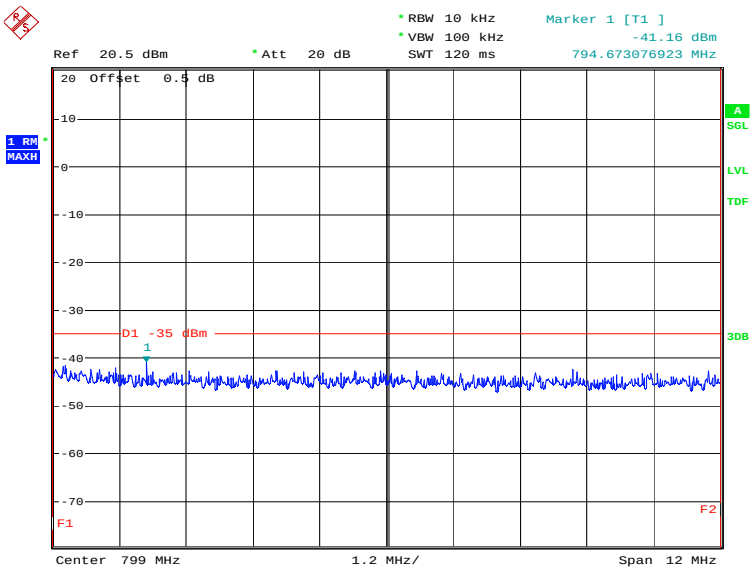


Date: 31.OCT.2019 10:09:28

HIGH BAND EDGE BLOCK-10MHz-100%RB



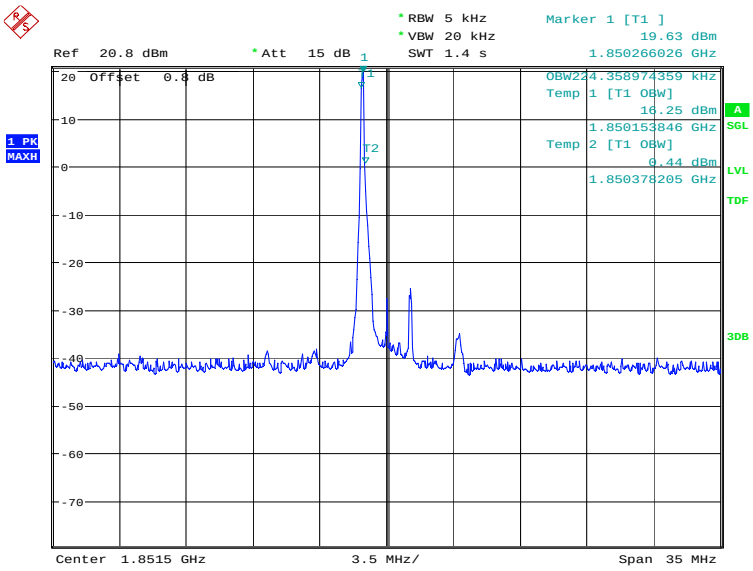
Date: 31.OCT.2019 10:11:47



Date: 31.OCT.2019 10:12:01

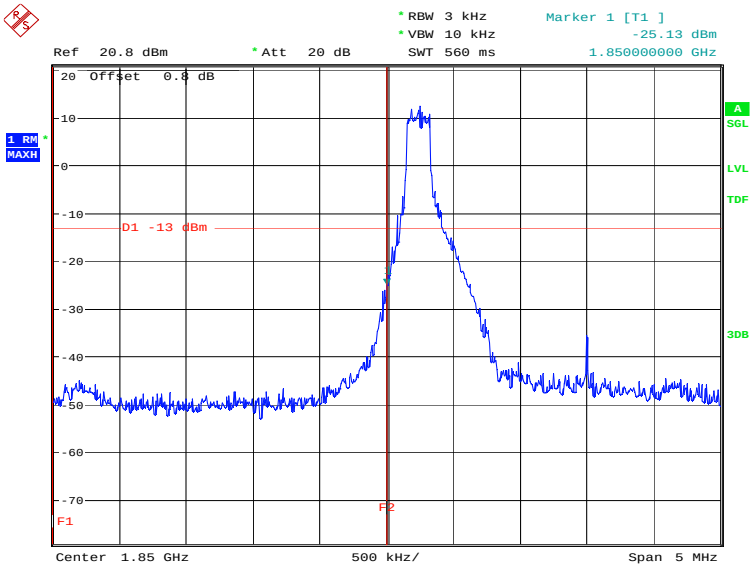
LTE band 25

OBW: 1RB-low_offset



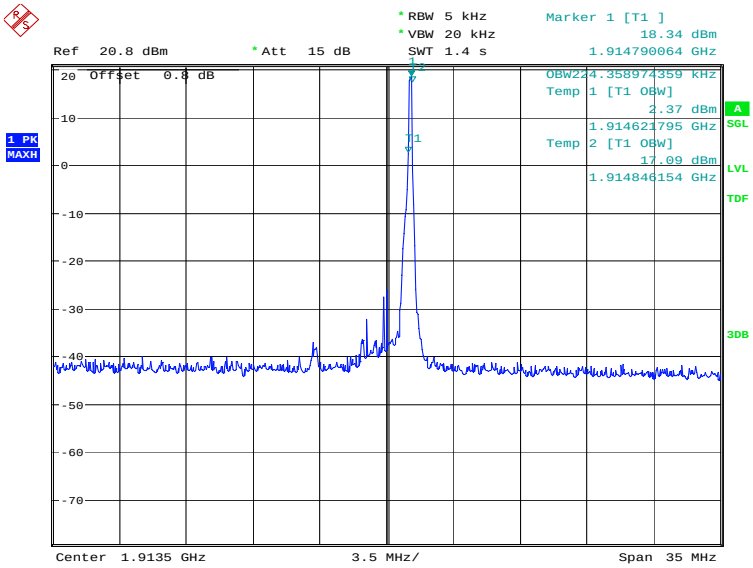
Date: 31.OCT.2019 10:16:00

LOW BAND EDGE BLOCK-1RB-low_offset



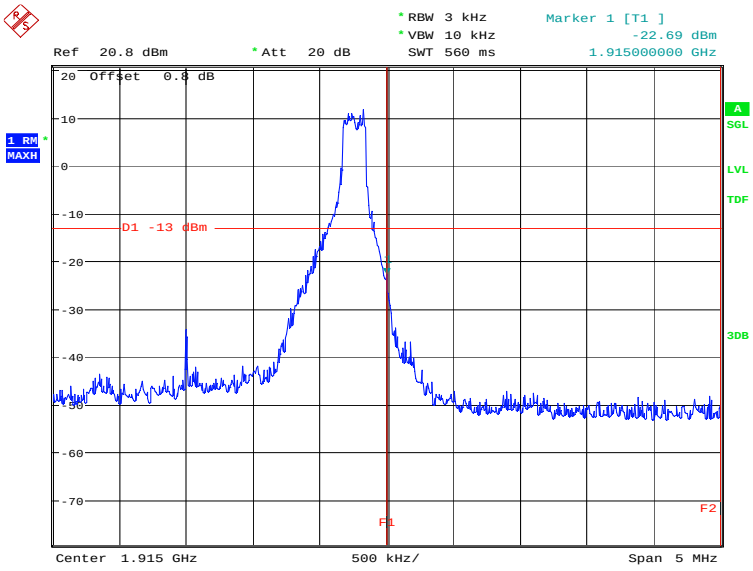
Date: 31.OCT.2019 10:16:16

OBW: 1RB-high_offset



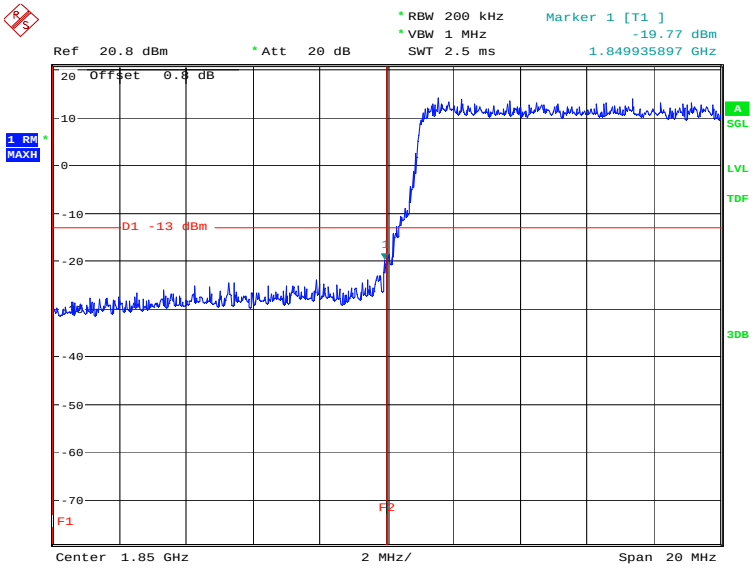
Date: 31.OCT.2019 10:18:51

HIGH BAND EDGE BLOCK-1RB-high_offset



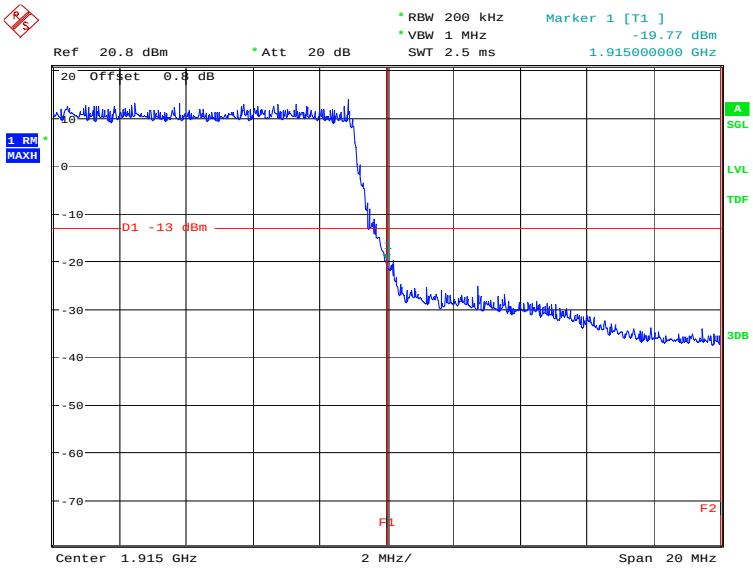
Date: 31.OCT.2019 10:19:07

LOW BAND EDGE BLOCK-20MHz-100%RB



Date: 31.OCT.2019 10:16:53

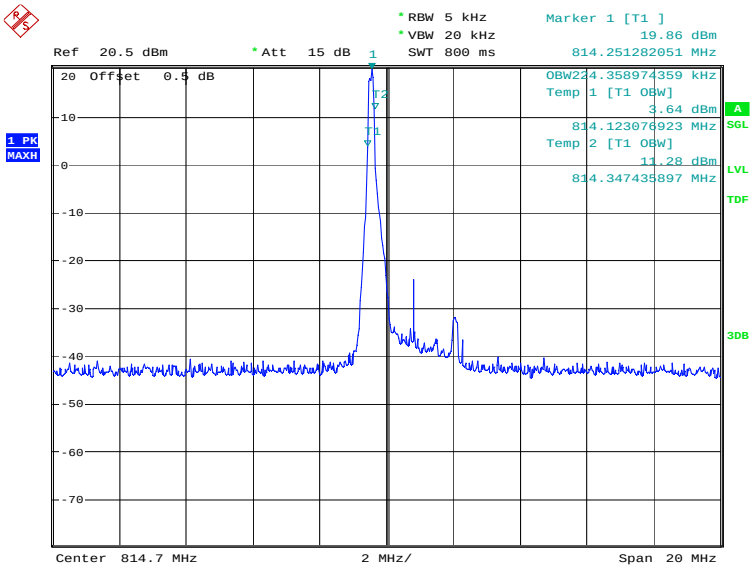
HIGH BAND EDGE BLOCK-20MHz-100%RB



Date: 31.OCT.2019 10:19:43

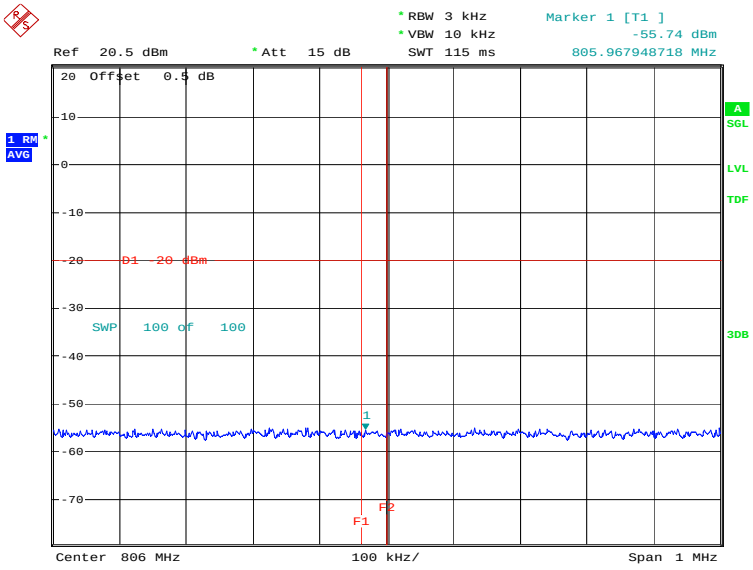
LTE band 26(814MHz~824MHz)

OBW: 1RB-low_offset



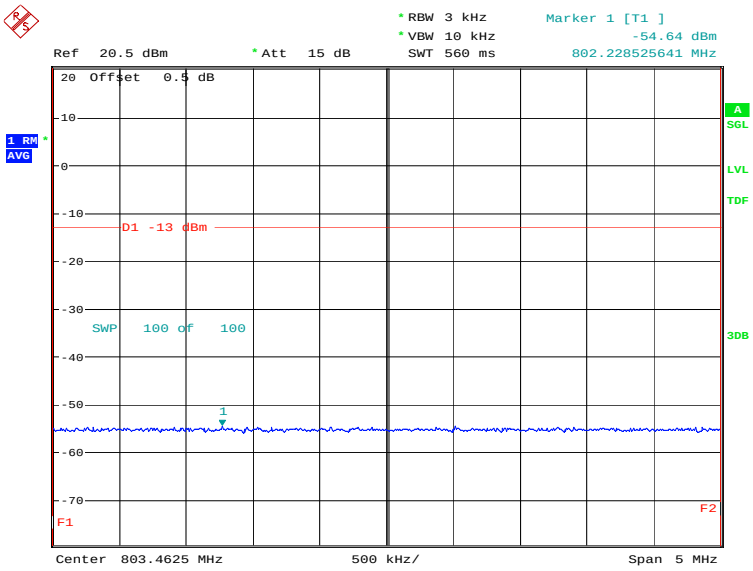
Date: 31.OCT.2019 11:09:49

LOW BAND EDGE BLOCK-1RB-low_offset



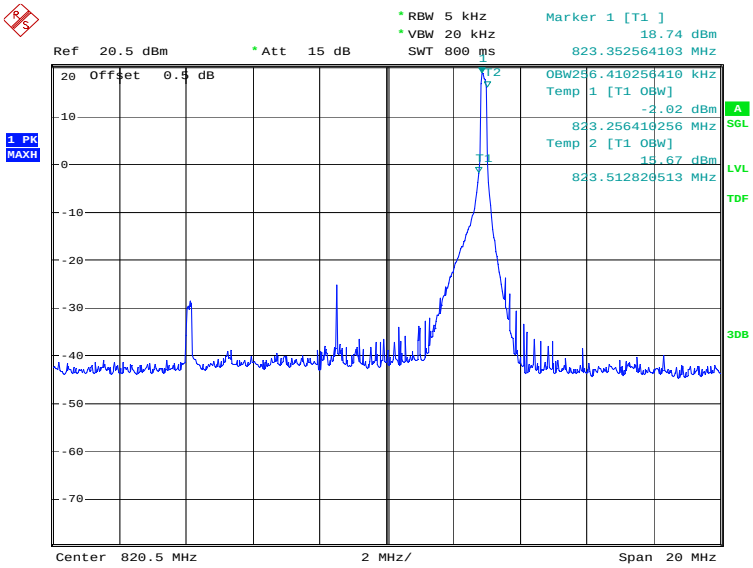
Date: 31.OCT.2019 11:10:15

LOW Emission Mask -1RB-low_offset



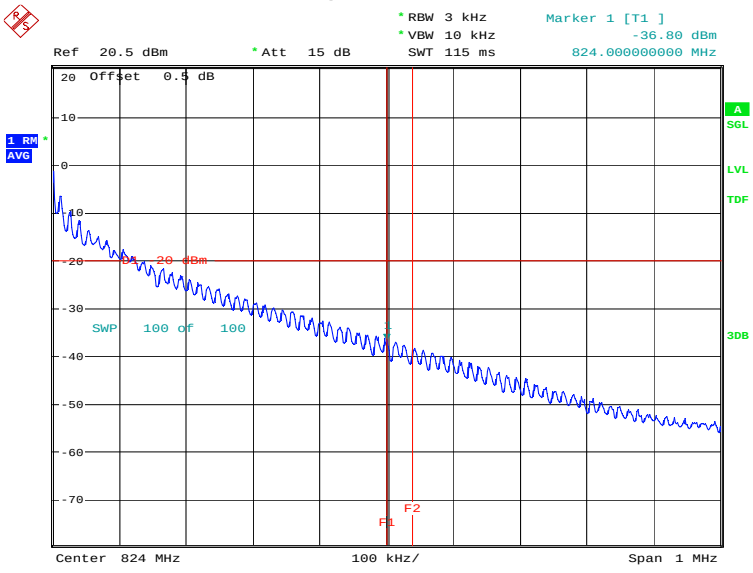
Date: 31.OCT.2019 11:11:28

OBW: 1RB-high_offset



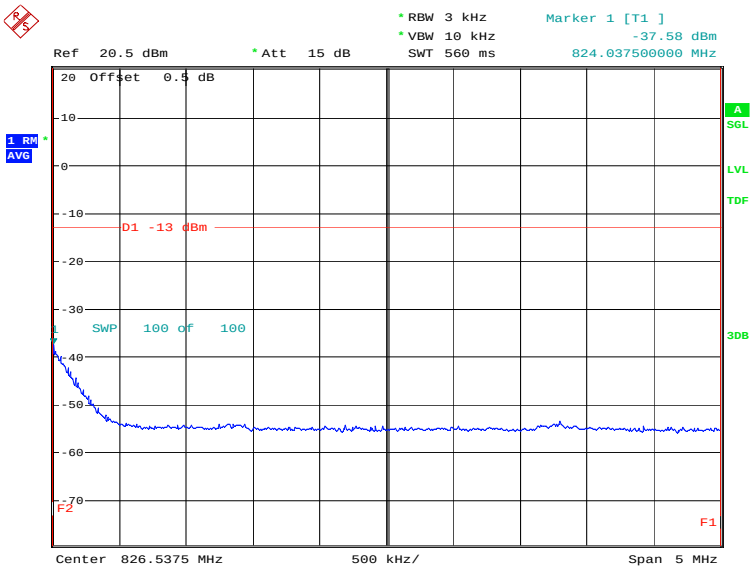
Date: 31.OCT.2019 11:13:43

HIGH BAND EDGE BLOCK-1RB-high_offset



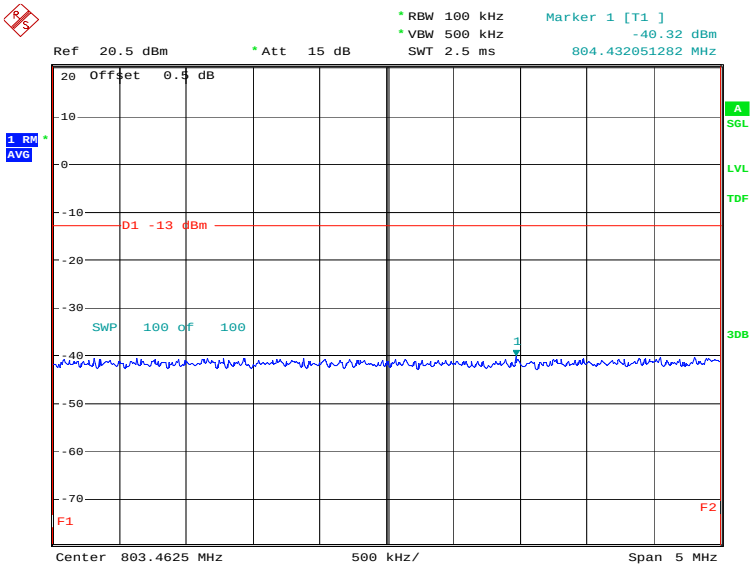
Date: 31.OCT.2019 11:14:09

HIGH Emission Mask -1RB-high_offset



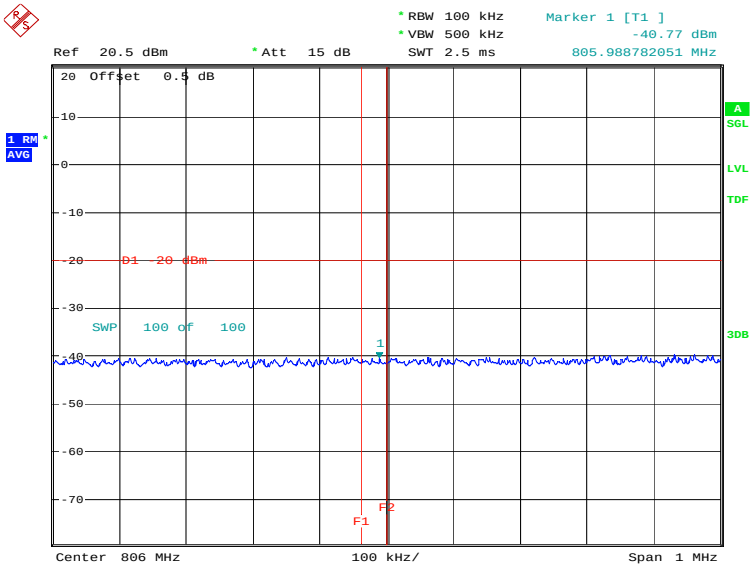
Date: 31.OCT.2019 11:15:20

LOW Emission Mask -10MHz-100%RB



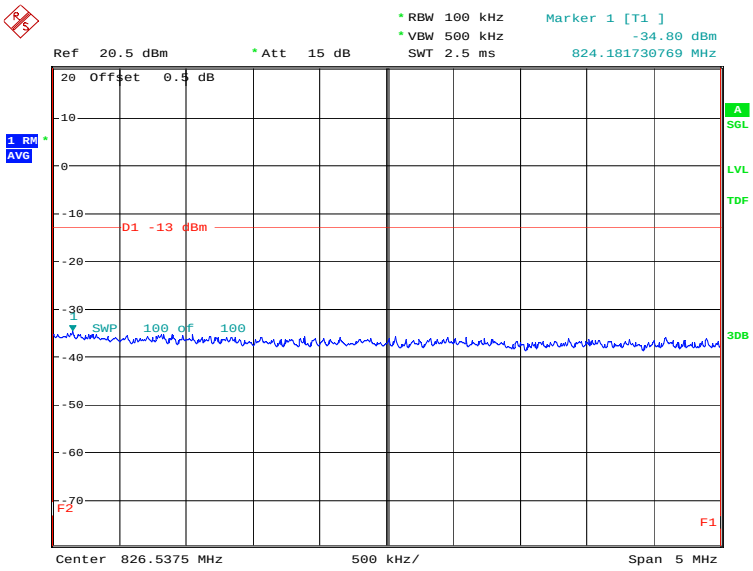
Date: 31.OCT.2019 11:12:24

LOW BAND EDGE BLOCK-10MHz-100%RB



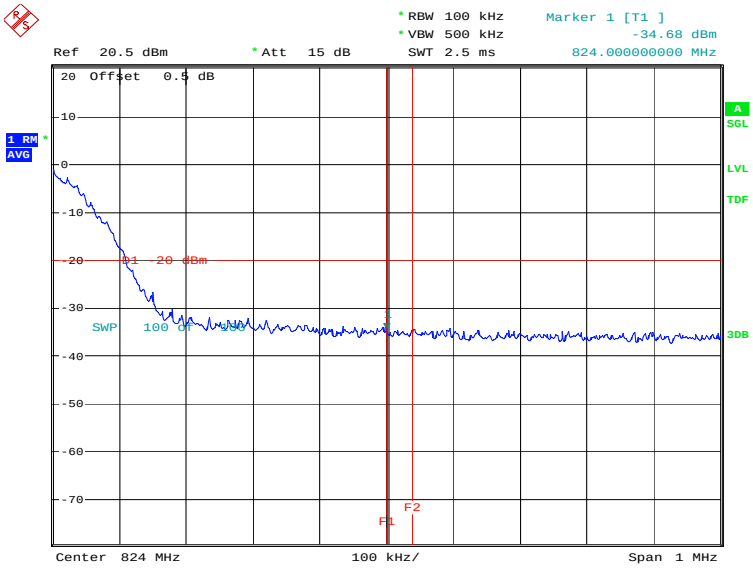
Date: 31.OCT.2019 11:12:05

HIGH Emission Mask -10MHz-100%RB



Date: 31.OCT.2019 11:16:06

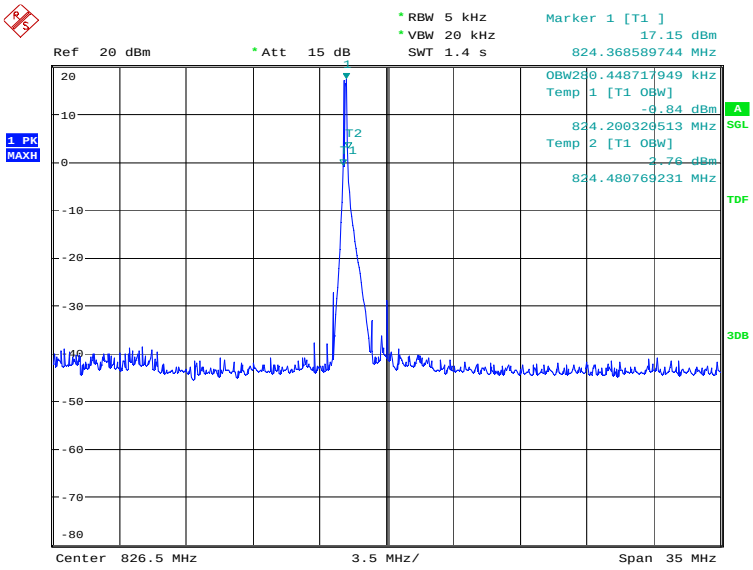
HIGH BAND EDGE BLOCK-10MHz-100%RB



Date: 31.OCT.2019 11:15:49

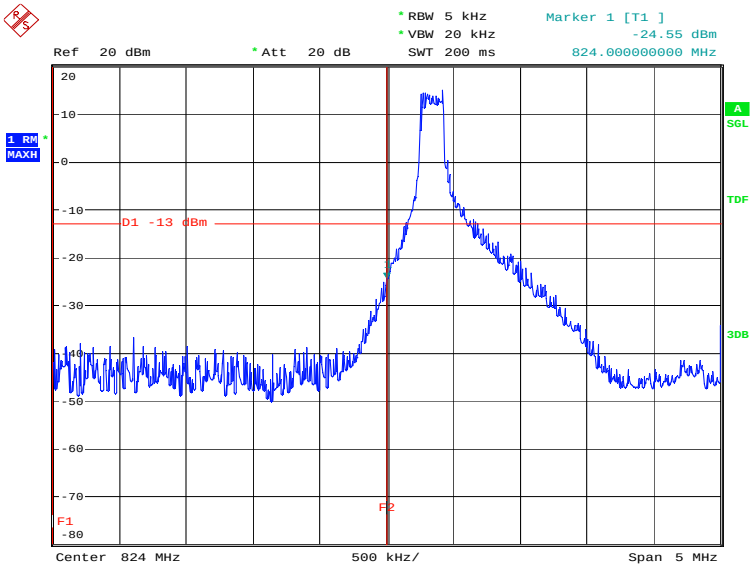
LTE band 26(824MHz~849MHz)

OBW: 1RB-low_offset



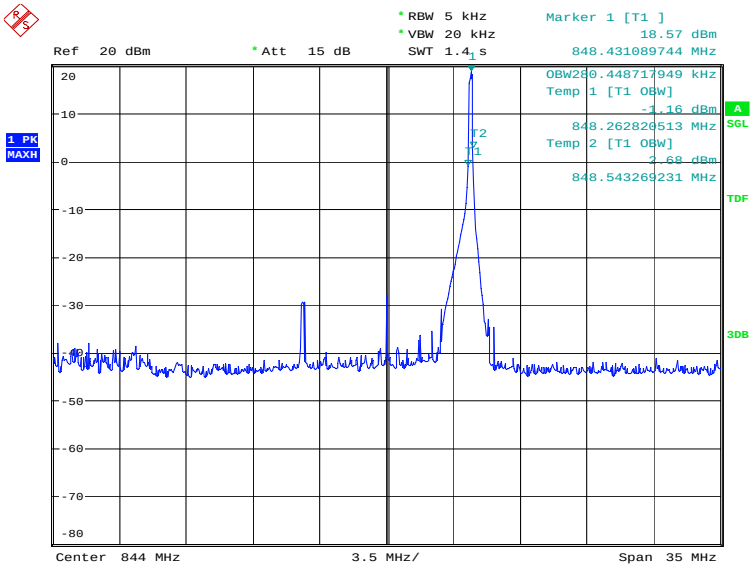
Date: 31.OCT.2019 10:58:16

LOW BAND EDGE BLOCK-1RB-low_offset



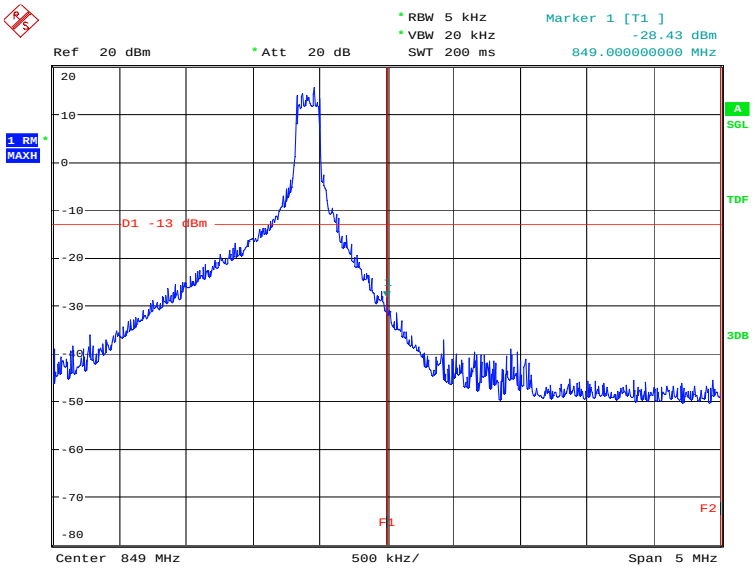
Date: 31.OCT.2019 10:58:32

OBW: 1RB-high_offset



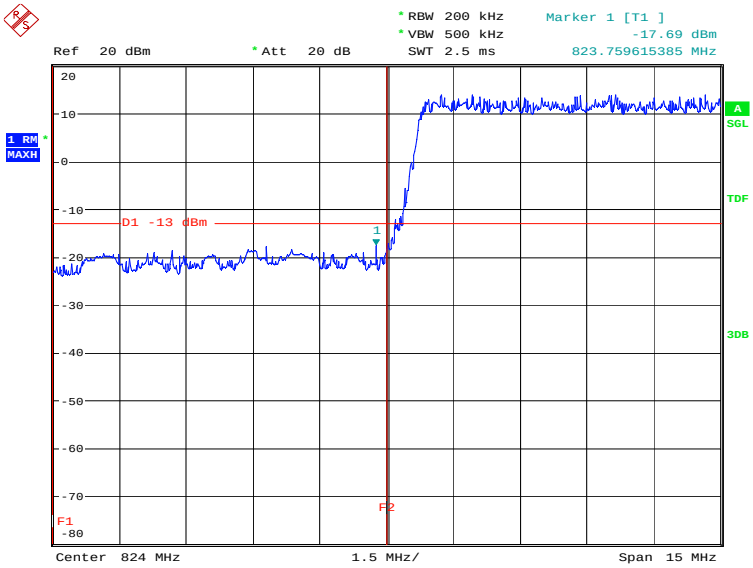
Date: 31.OCT.2019 11:01:08

HIGH BAND EDGE BLOCK-1RB-high_offset



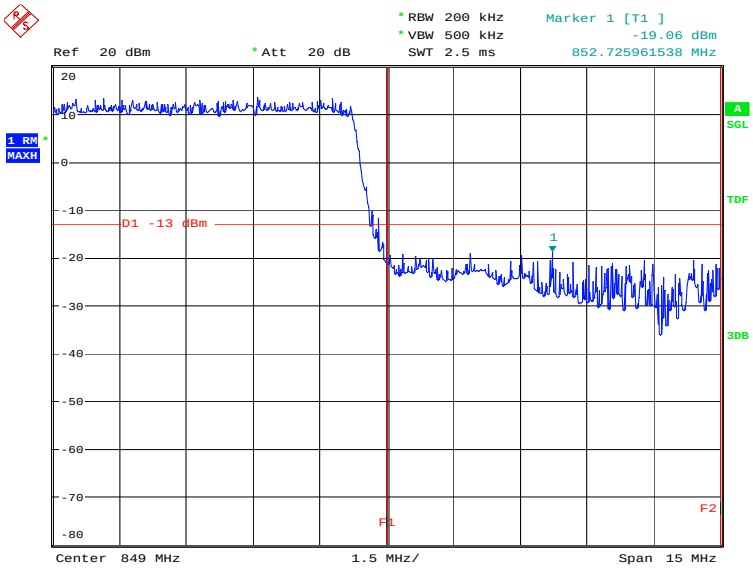
Date: 31.OCT.2019 11:01:23

LOW BAND EDGE BLOCK-15MHz-100%RB



Date: 31.OCT.2019 10:59:09

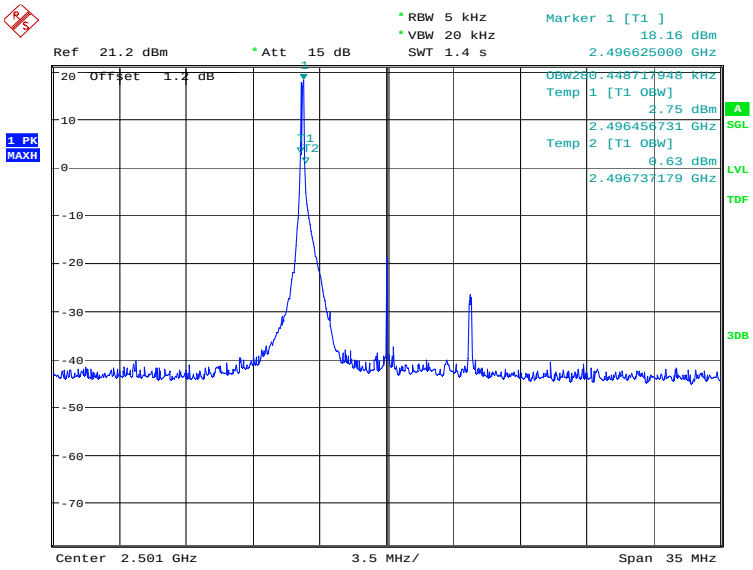
HIGH BAND EDGE BLOCK-15MHz-100%RB



Date: 31.OCT.2019 11:02:00

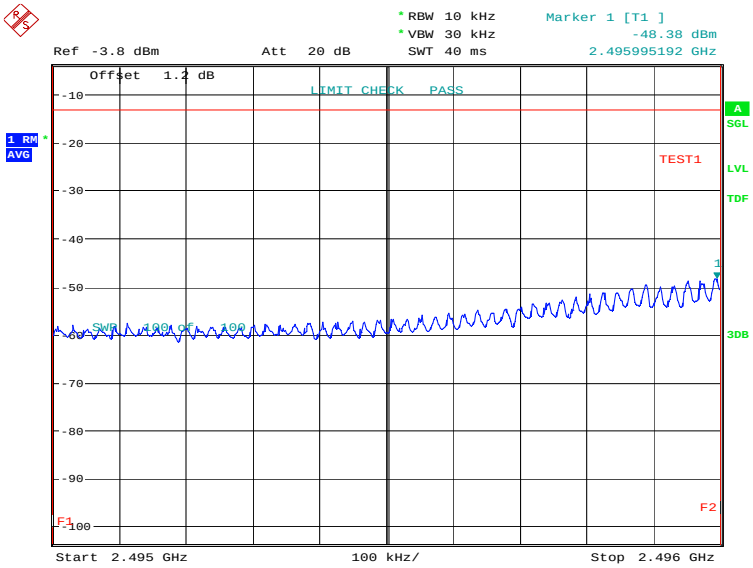
LTE band 41(PC2)

OBW: 1RB-low_offset

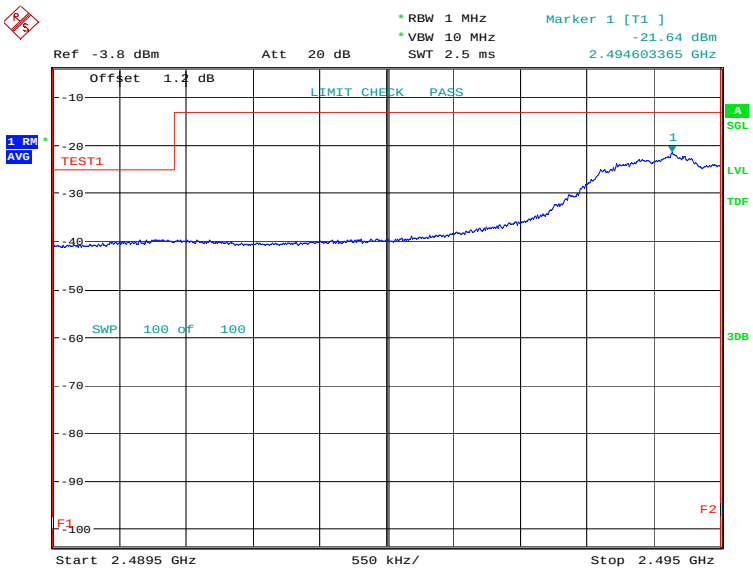


Date: 31.OCT.2019 10:23:51

LOW BAND EDGE BLOCK-1RB-low_offset

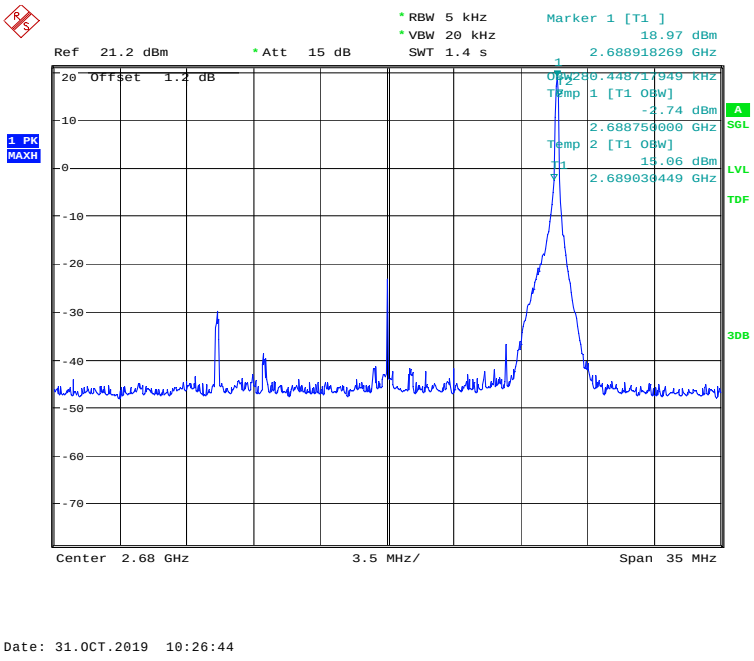


Date: 31.OCT.2019 10:24:11

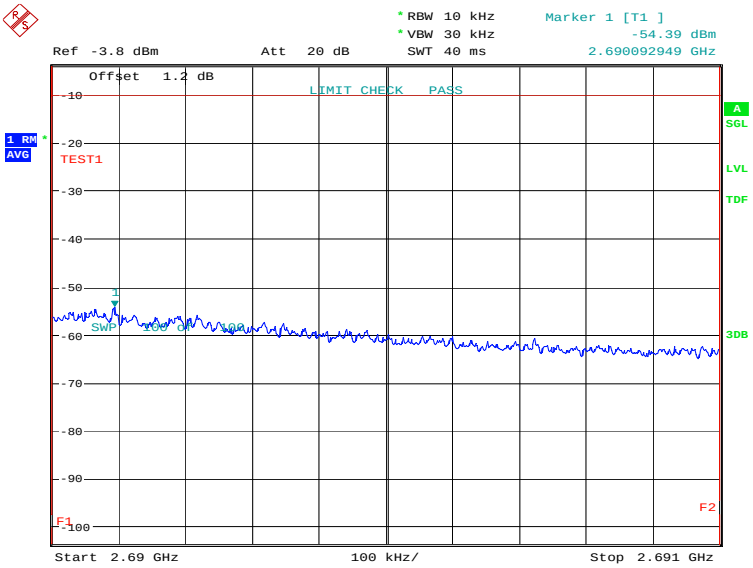


Date: 31.OCT.2019 10:24:26

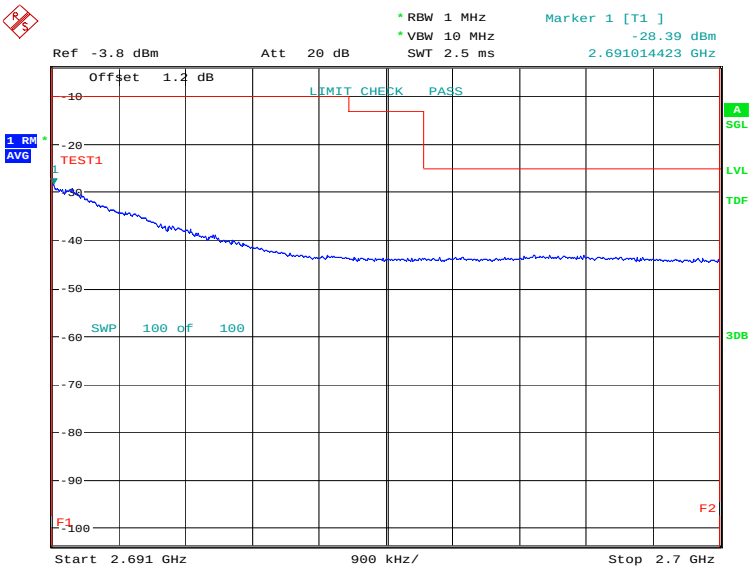
OBW: 1RB-high_offset



HIGH BAND EDGE BLOCK-1RB-high_offset

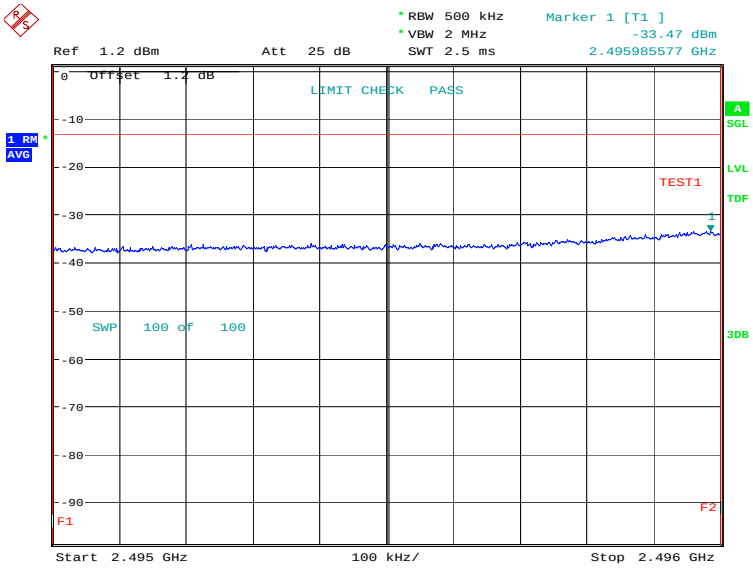


Date: 31.OCT.2019 10:27:04

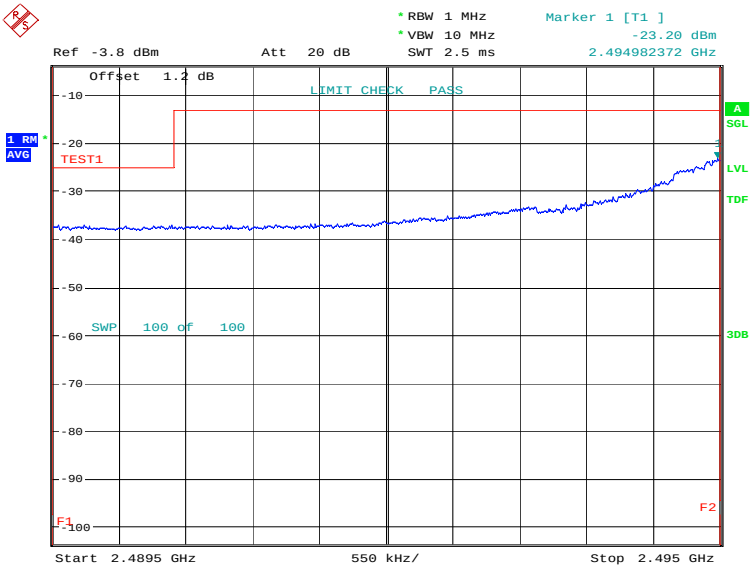


Date: 31.OCT.2019 10:27:20

LOW BAND EDGE BLOCK-20MHz-100%RB

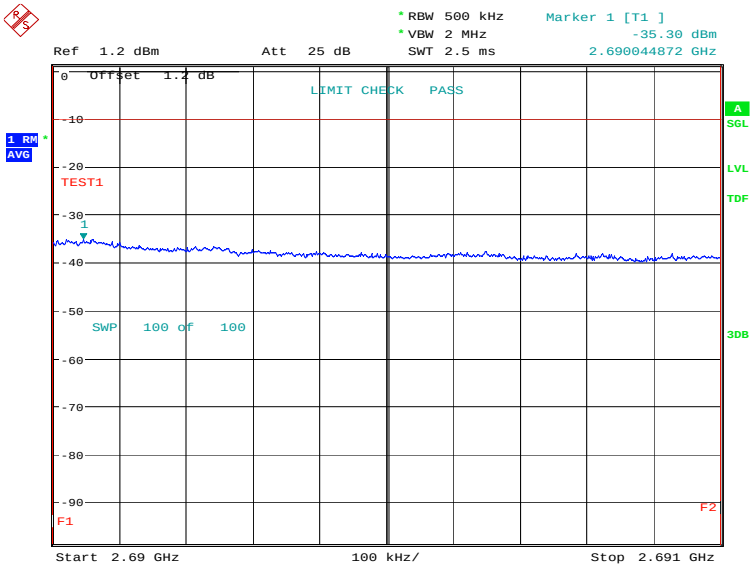


Date: 31.OCT.2019 10:25:07

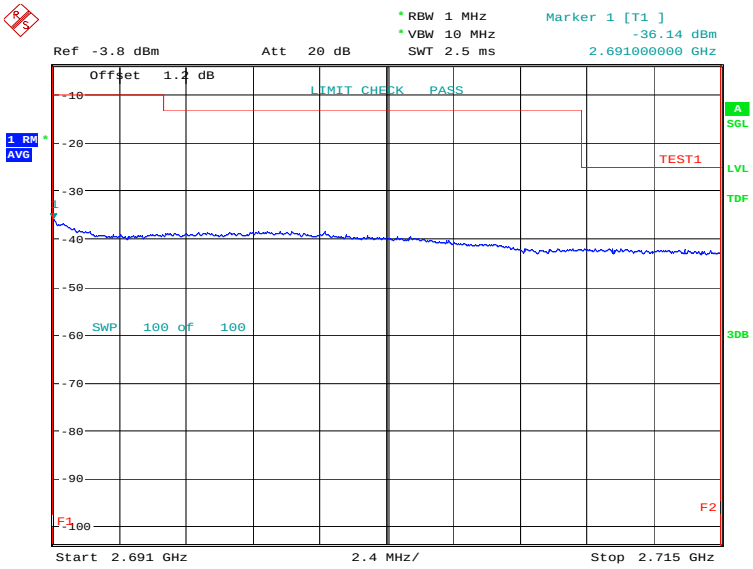


Date: 30.OCT.2019 13:40:41

HIGH BAND EDGE BLOCK-20MHz-100%RB



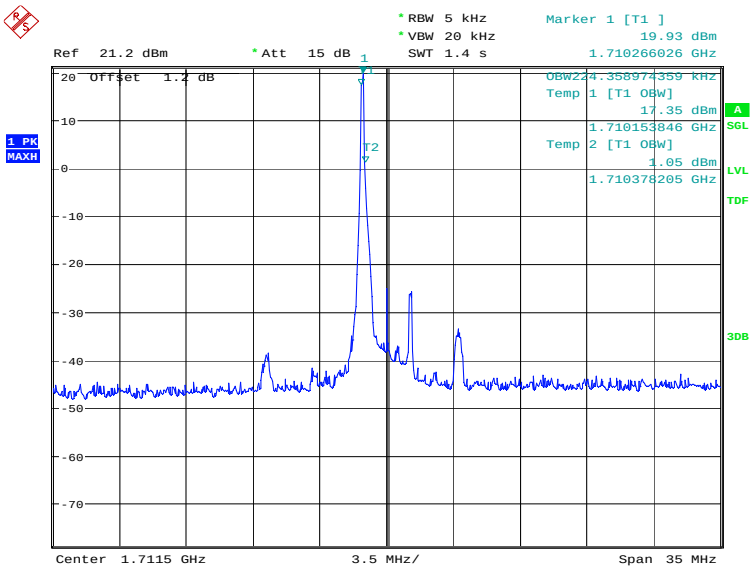
Date: 31.OCT.2019 10:27:53



Date: 31.OCT.2019 10:28:08

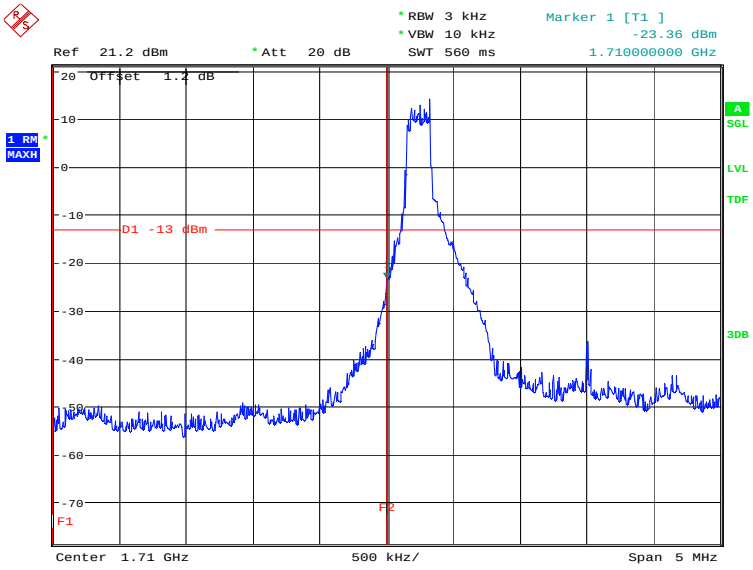
LTE band 66

OBW: 1RB-low_offset



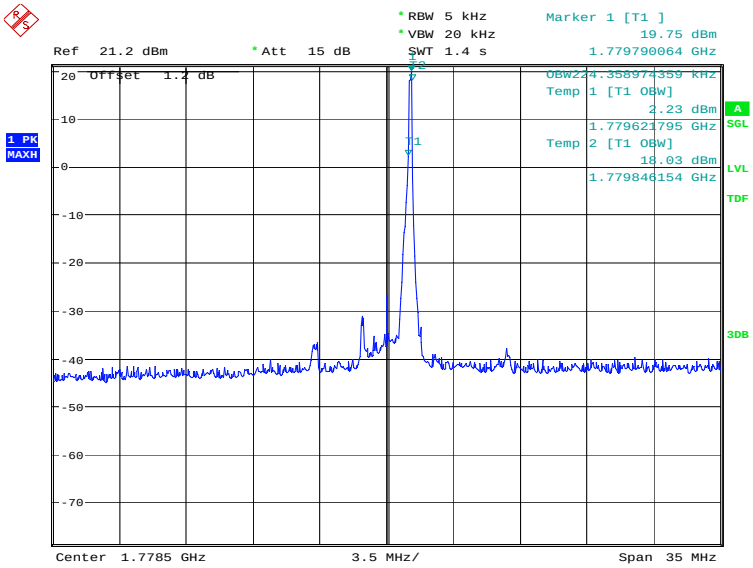
Date: 31.OCT.2019 10:33:11

LOW BAND EDGE BLOCK-1RB-low_offset



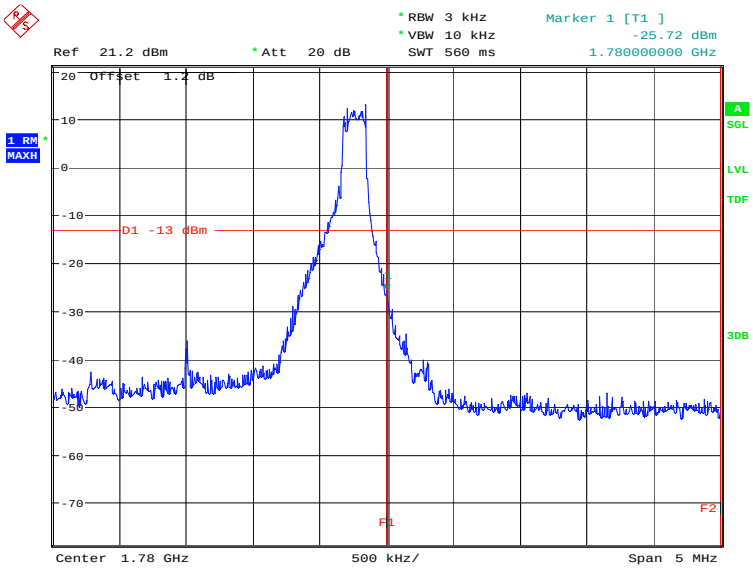
Date: 31.OCT.2019 10:33:26

OBW: 1RB-high_offset



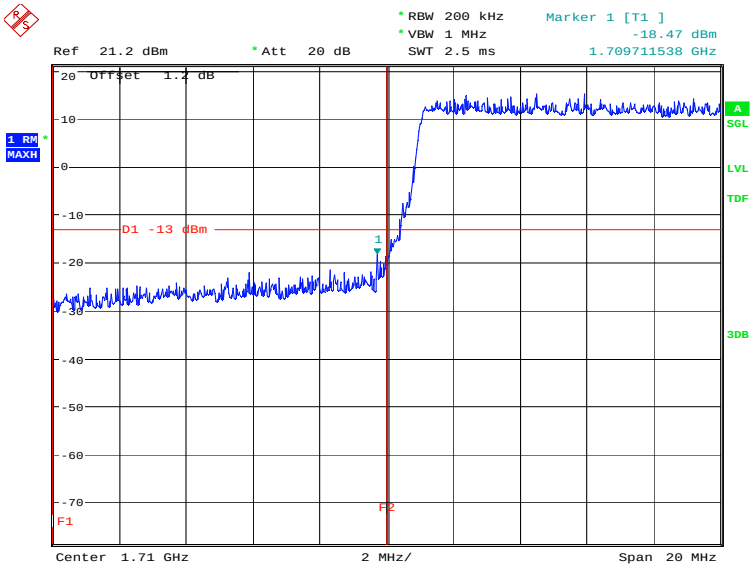
Date: 31.OCT.2019 10:35:24

HIGH BAND EDGE BLOCK-1RB-high_offset



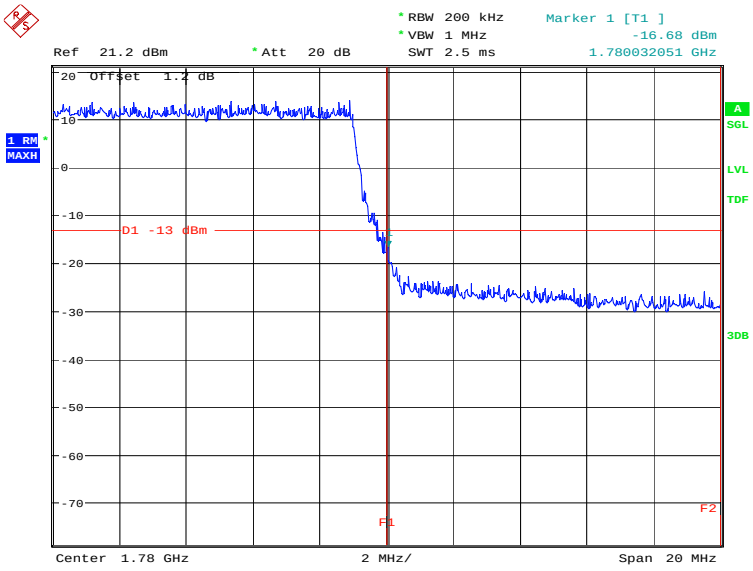
Date: 31.OCT.2019 10:35:40

LOW BAND EDGE BLOCK-20MHz-100%RB



Date: 31.OCT.2019 10:34:03

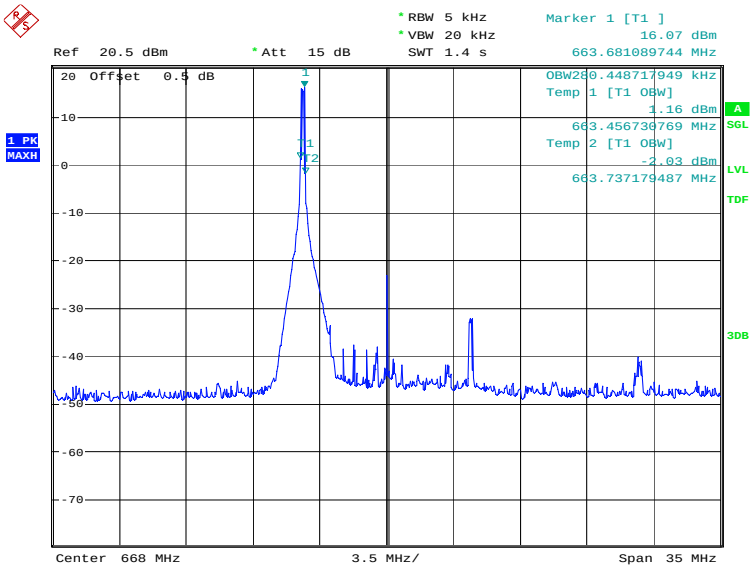
HIGH BAND EDGE BLOCK-20MHz-100%RB



Date: 31.OCT.2019 10:36:17

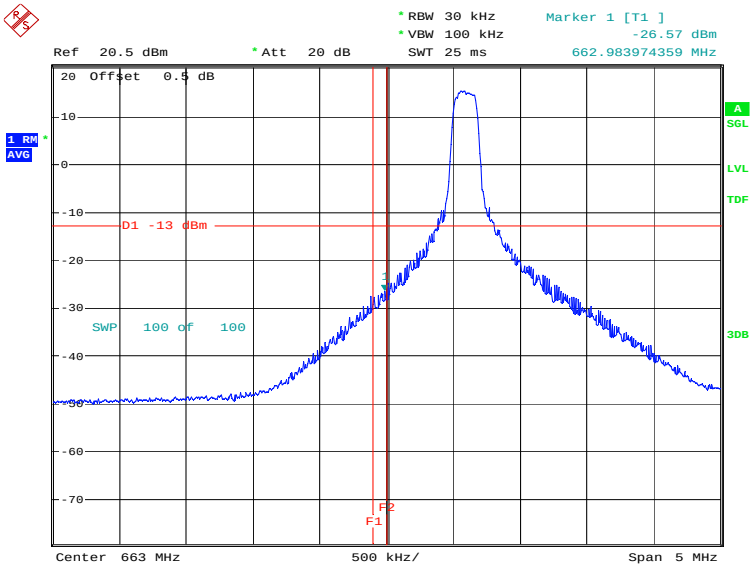
LTE band 71

OBW: 1RB-low_offset



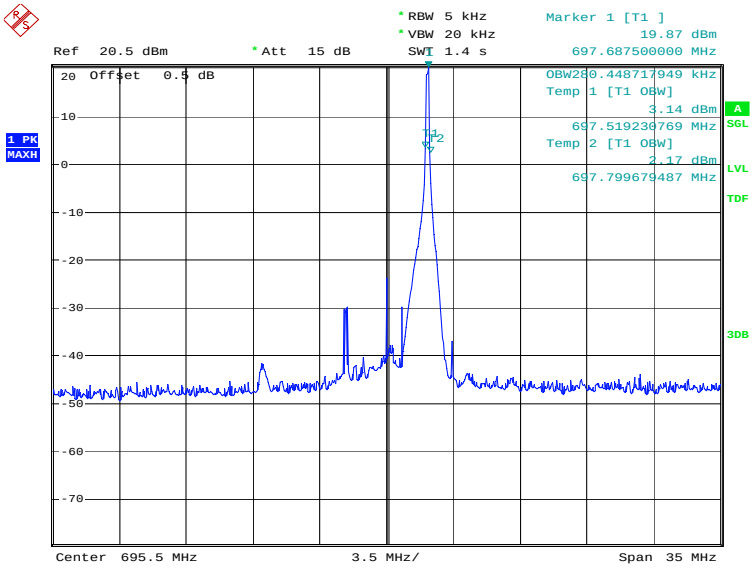
Date: 31.OCT.2019 10:51:24

LOW BAND EDGE BLOCK-1RB-low_offset



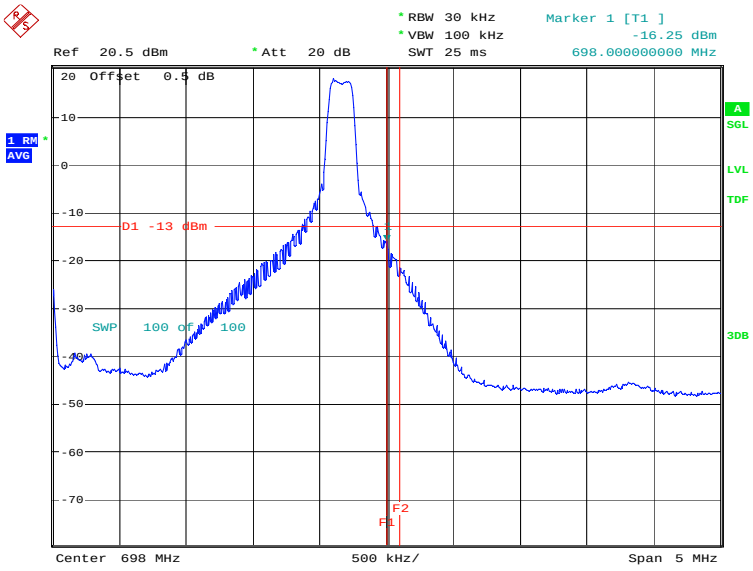
Date: 31.OCT.2019 10:52:03

OBW: 1RB-high_offset



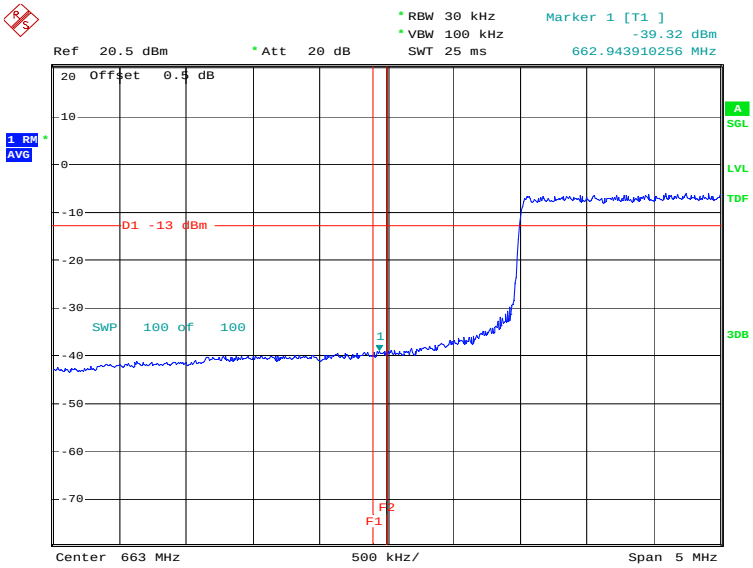
Date: 31.OCT.2019 10:48:10

HIGH BAND EDGE BLOCK-1RB-high_offset



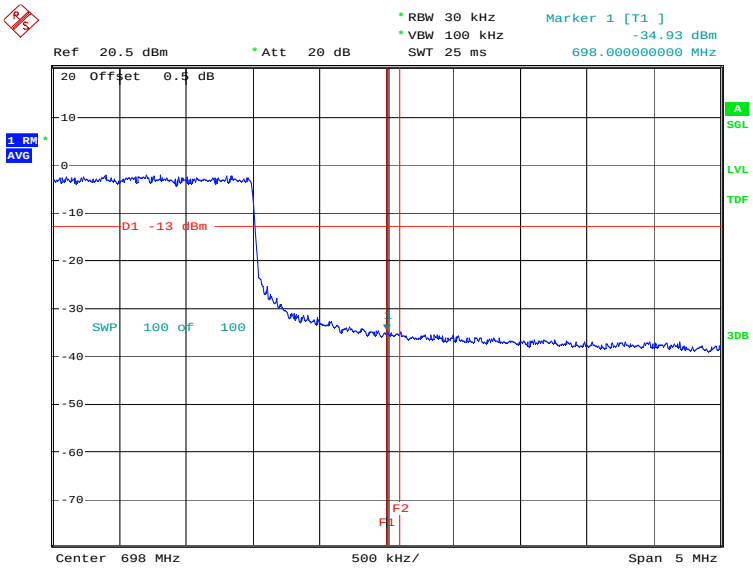
Date: 31.OCT.2019 10:48:48

LOW BAND EDGE BLOCK-20MHz-100%RB



Date: 31.OCT.2019 10:52:57

HIGH BAND EDGE BLOCK-20MHz-100%RB



Date: 31.OCT.2019 10:53:49

A.7 CONDUCTED SPURIOUS EMISSION

A.7.1 Measurement Method

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

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

A. 7.2 Measurement Limit

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

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

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

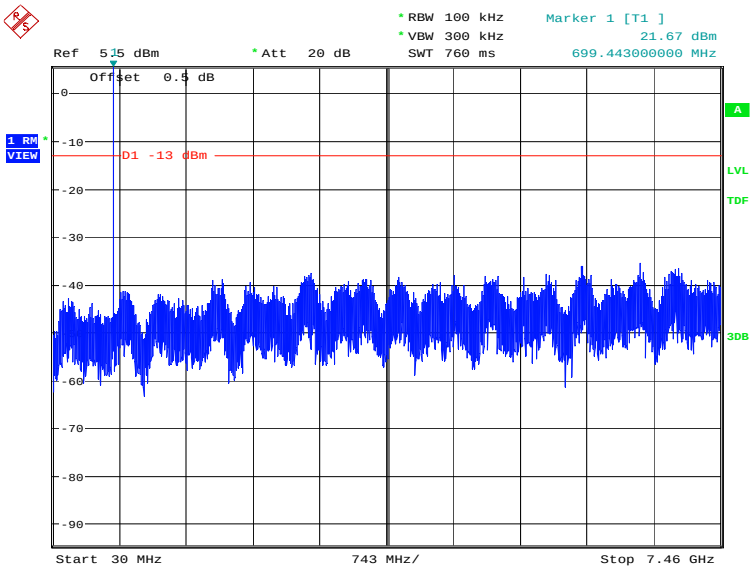
Part 27.53(c) states for operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 +

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

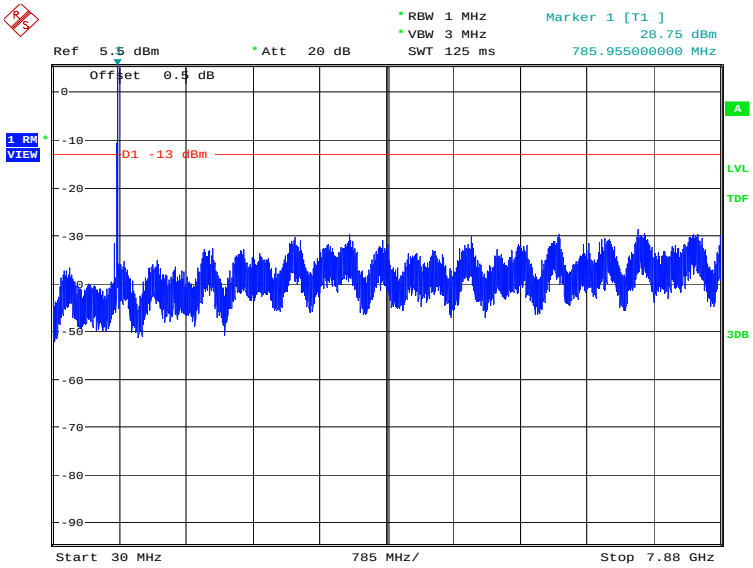
Only the worst case result is given below

LTE band 12: 30MHz – 7.46GHz



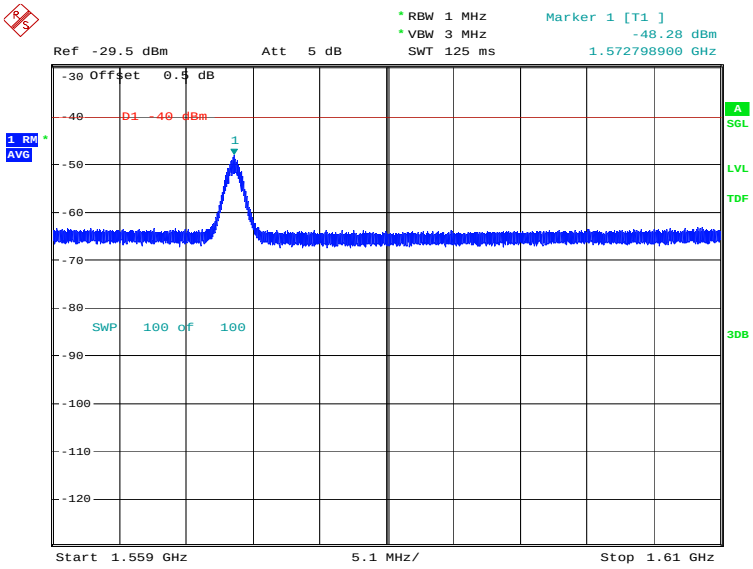
Date: 31.OCT.2019 10:05:43

LTE band 13: 30MHz – 7.88GHz



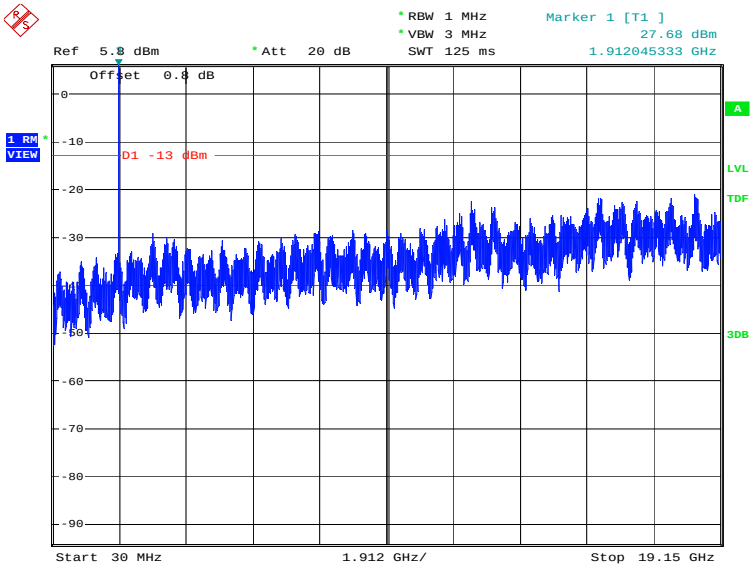
Date: 31.OCT.2019 10:13:02

LTE band 13: 1559MHz – 1610MHz



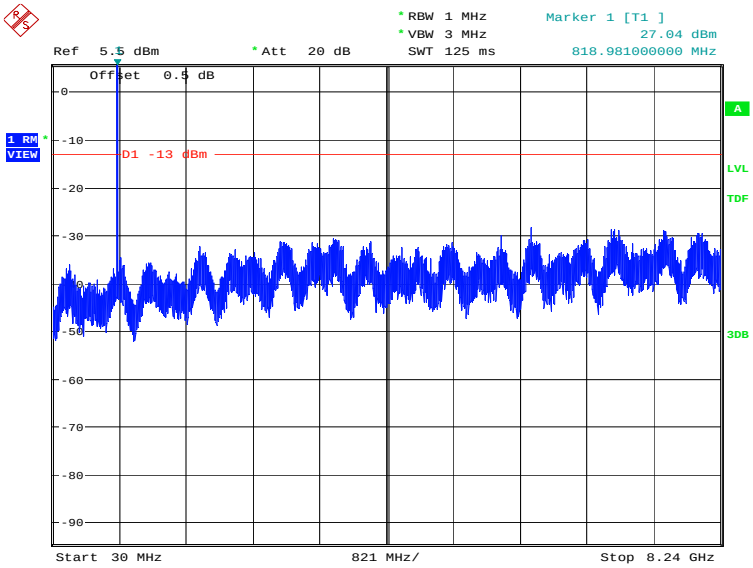
Date: 31.OCT.2019 10:13:37

LTE band 25: 30MHz – 19.15GHz



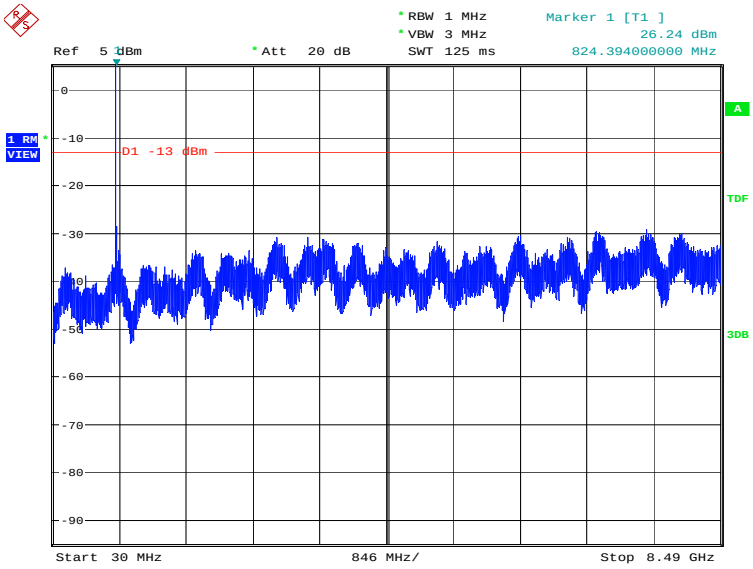
Date: 31.OCT.2019 10:20:44

LTE band 26(814MHz~824MHz): 30MHz – 8.24GHz



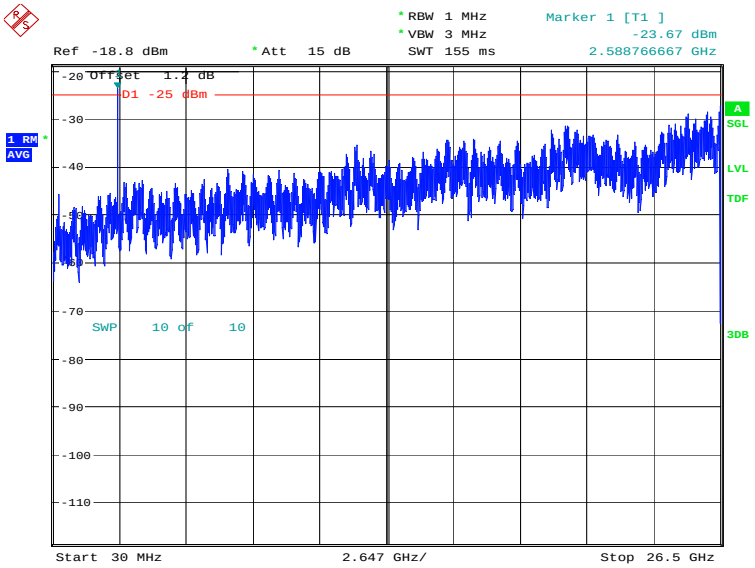
Date: 31.OCT.2019 11:07:54

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



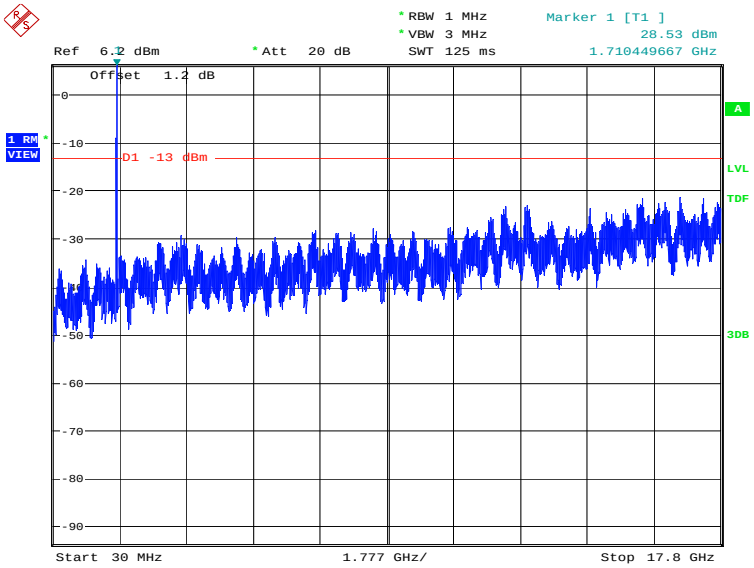
Date: 31.OCT.2019 11:03:01

LTE band 41(PC2): 30MHz – 26.5GHz



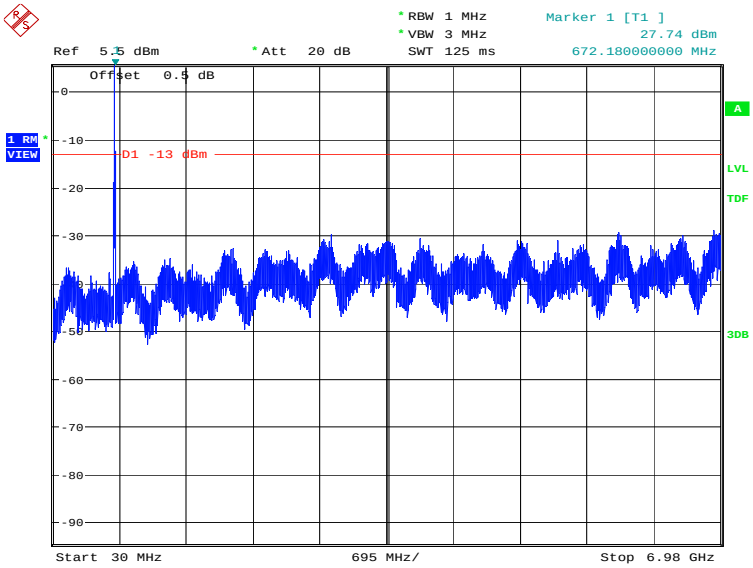
Date: 31.OCT.2019 10:29:21

LTE band 66: 30MHz – 17.8GHz



Date: 31.OCT.2019 10:37:18

LTE band 71: 30MHz – 6.98GHz



Date: 31.OCT.2019 10:45:21

A.8 PEAK-TO-AVERAGE POWER RATIO

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

According to KDB 971168 5.7.1:

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

b) Set resolution/measurement bandwidth ≥ 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
	5.45	6.12

LTE band 13, 10MHz

Frequency(MHz)	PAPR(dB)	
782.0	QPSK	16QAM
	5.64	6.35

LTE band 25, 20MHz

Frequency(MHz)	PAPR(dB)	
1882.5	QPSK	16QAM
	6.76	7.37

LTE band 41(PC2), 20MHz

Frequency(MHz)	PAPR(dB)	
2593.0	QPSK	16QAM
	8.11	8.75

LTE band 66, 20MHz

Frequency(MHz)	PAPR(dB)	
1745.0	QPSK	16QAM
	6.57	7.21

LTE band 71, 20MHz

Frequency(MHz)	PAPR(dB)	
680.5	QPSK	16QAM
	6.44	7.15

ANNEX B: Accreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 600118-0

Telecommunication Technology Labs, CAICT
Beijing
China

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

Electromagnetic Compatibility & Telecommunications

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

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

DEPARTMENT OF COMMERCE * UNITED STATES OF AMERICA *

For the National Voluntary Laboratory Accreditation Program

*****END OF REPORT*****