



## TEST REPORT

No. I18D00226-SRD05

*For*

**Client : Advanced Mobile Payment Inc.**

**Production : AMP 6500**

**Model Name : AMP 6500**

**Brand Name : AMP POS**

**FCC ID: 2AKJB-AMP6500-1**

**Hardware Version: AMP 6500-CD**

**Software Version: V1.0.11**

**Issued date: 2019-02-18**

## NOTE

1. The test results in this test report relate only to the devices specified in this report.
2. This report shall not be reproduced except in full without the written approval of East China Institute of Telecommunications.
3. ANSI/TIA-603-E and KDB 971168 D01 has not been approved by A2LA.
4. For the test results, the uncertainty of measurement is not taken into account when judging the compliance with specification, and the results of measurement or the average value of measurement results are taken as the criterion of the compliance with specification directly.

**Test Laboratory:**

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**Revision Version**

Report Number	Revision	Date	Memo
I18D00226-SRD05	00	2019-01-04	Initial creation of test report
I18D00226-SRD05	01	2019-02-18	Second creation of test report

## CONTENTS

<b>1. TEST LABORATORY .....</b>	<b>6</b>
<b>1.1. TESTING LOCATION .....</b>	<b>6</b>
<b>1.2. TESTING ENVIRONMENT .....</b>	<b>6</b>
<b>1.3. PROJECT DATA .....</b>	<b>6</b>
<b>1.4. SIGNATURE .....</b>	<b>6</b>
<b>2. CLIENT INFORMATION .....</b>	<b>7</b>
<b>2.1. APPLICANT INFORMATION .....</b>	<b>7</b>
<b>2.2. MANUFACTURER INFORMATION .....</b>	<b>7</b>
<b>3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE) .....</b>	<b>8</b>
<b>3.1. ABOUT EUT .....</b>	<b>8</b>
<b>3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST .....</b>	<b>8</b>
<b>3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST .....</b>	<b>8</b>
<b>4. REFERENCE DOCUMENTS .....</b>	<b>9</b>
<b>4.1. REFERENCE DOCUMENTS FOR TESTING .....</b>	<b>9</b>
<b>5. TEST RESULTS .....</b>	<b>10</b>
<b>5.1. SUMMARY OF TEST RESULTS .....</b>	<b>10</b>
<b>5.2. STATEMENTS .....</b>	<b>12</b>
<b>6. TEST EQUIPMENT UTILIZED .....</b>	<b>13</b>
<b>7. TEST ENVIRONMENT .....</b>	<b>15</b>
<b>8. MEASUREMENT UNCERTAINTY .....</b>	<b>16</b>
<b>ANNEX A. MEASUREMENT RESULTS .....</b>	<b>17</b>
<b>ANNEX A.1. OUTPUT POWER .....</b>	<b>17</b>
<b>ANNEX A.2. EMISSION LIMIT .....</b>	<b>44</b>

<b>ANNEX A.3. FREQUENCY STABILITY .....</b>	<b>53</b>
<b>ANNEX A.4. OCCUPIED BANDWIDTH .....</b>	<b>57</b>
<b>ANNEX A.5. EMISSION BANDWIDTH .....</b>	<b>90</b>
<b>ANNEX A.6. BAND EDGE COMPLIANCE .....</b>	<b>123</b>
<b>ANNEX A.7. CONDUCTED SPURIOUS EMISSION .....</b>	<b>138</b>
<b>ANNEX A.8. PEAK-TO-AVERAGE POWER RATIO .....</b>	<b>142</b>
<b>ANNEX B. DEVIATIONS FROM PRESCRIBED TEST METHODS .....</b>	<b>147</b>
<b>ANNEX C. DETAILED TEST RESULTS .....</b>	<b>148</b>
<b>ANNEX C.1. MAIN TERMS .....</b>	<b>148</b>
<b>ANNEX C.2. TERMS USED IN CONDITION COLUMN .....</b>	<b>148</b>
<b>ANNEX C.3. TERMS USED IN VERDICT COLUMN .....</b>	<b>148</b>
<b>ANNEX C.4. TERMS USED IN NOTE COLUMN .....</b>	<b>148</b>
<b>ANNEX D. ACCREDITATION CERTIFICATE .....</b>	<b>149</b>

## 1. Test Laboratory

### 1.1. Testing Location

Company Name:	ECIT Shanghai, East China Institute of Telecommunications
Address:	7-8F, G Area, No. 668, Beijing East Road, Huangpu District, Shanghai, P. R. China
Postal Code:	200001
Telephone:	(+86)-021-63843300
Fax:	(+86)-021-63843301
FCC registration No	958356

### 1.2. Testing Environment

Normal Temperature:	15°C-35°C
Relative Humidity:	25%-75%

### 1.3. Project data

Project Leader	Yu Anlu
Testing Start Date	2018-12-03
Testing End Date	2019-02-14

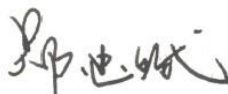
### 1.4. Signature



**Tang Tao**  
(Prepared this test report)



**Shi Hongqi**  
(Reviewed this test report)



**Zheng Zhongbin**  
(Approved this test report)

## 2. Client Information

### 2.1. Applicant Information

Company Name	Advanced Mobile Payment Inc.
Address	Units 401-403, 15 Wertheim Court. Richmond Hill, Ontario L4B 3H7 CAN ADA
Telephone	1 (905) 597 2333
Postcode	L4B 3H7

### 2.2. Manufacturer Information

Company Name	NEW POS TECHNOLOGY LIMITED
Address	Floor, Block A, Financial Technology Building, No.11 Keyuan Rd, Nanshan District, Shenzhen
Telephone	/
Postcode	/

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

#### 3.1. About EUT

Production	AMP 6500
Model name	AMP 6500
FCC ID	2AKJB-AMP6500-1
GSM Frequency Band	GSM1900
UMTS Frequency Band	Band II
CDMA Frequency Band	NA
LTE Frequency Band	LTE 2/4/5/7/25/26
Additional Communication Function	BT4.2, BLE, WiFi 802.11a,b,g,n20,n40
Extreme Temperature	-20/+60°C
Nominal Voltage	12V
Extreme High Voltage	15V
Extreme Low Voltage	10V

Note: Photographs of EUT are shown in ANNEX A of this test report.

#### 3.2. Internal Identification of EUT used during the test

EUT ID*	Model Name	SN or IMEI	HW Version	SW Version	Date of receipt
N01	AMP 6500	/	AMP 6500-CD	V1.0.11	2018-11-26
N03	AMP 6500	/	AMP 6500-CD	V1.0.11	2018-11-26
N05	AMP 6500	/	AMP 6500-CD	V1.0.11	2018-11-26

\*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	RF 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 2	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS	2018/10/1
FCC Part 22	PUBLIC MOBILE SERVICES	2018/10/1
FCC Part 24	PERSONAL COMMUNICATIONS SERVICES	2018/10/1
FCC Part 27	MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES	2018/10/1
FCC Part 90	PRIVATE LAND MOBILE RADIO SERVICES	2017/10/1
ANSI/TIA-603-E	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards	2016
ANSI C63.26	American National Standard of Procedures for Compliance Testing of Licensed Transmitters Used in Licensed Radio	2015
KDB 971168 D01	Measurement Guidance for Certification of Licensed Digital Transmitters	v03r01

## 5. Test Results

### 5.1. Summary of Test Results

#### LTE Band 2

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	24.232(c)	A.1	P
2	Emission Limit	24.238(a), 2.1051	A.2	P
3	Frequency Stability	24.235, 2.1055	A.3	P
4	Occupied Bandwidth	2.1049(h)(i)	A.4	P
5	Emission Bandwidth	24.238(a)	A.5	P
6	Band Edge Compliance	24.238(a)	A.6	P
7	Conducted Spurious Emission	24.238, 2.1057	A.7	P
8	Peak to Average Power Ratio	24.232 (d)	A.8	P

#### LTE Band 4

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	27.50(d)(4)	A.1	P
2	Emission Limit	27.53(h), 2.1051	A.2	P
3	Frequency Stability	27.54, 2.1055	A.3	P
4	Occupied Bandwidth	2.1049(h)(i)	A.4	P
5	Emission Bandwidth	27.53(h)	A.5	P
6	Band Edge Compliance	27.53(h)	A.6	P
7	Conducted Spurious Emission	27.53(h), 2.1057	A.7	P
8	Peak to Average Power Ratio	27.50(a)	A.8	P

#### LTE Band 5

**Note:** LTE Band 5 subset of band 26(Part22), So we only tested 26 band 26(Part22).

#### LTE Band 7

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	27.50(h)(2)	A.1	P
2	Emission Limit	27.53(m), 2.1051	A.2	P
3	Frequency Stability	27.54, 2.1055	A.3	P
4	Occupied Bandwidth	2.1049(h)(i)	A.4	P
5	Emission Bandwidth	27.53(m)	A.5	P
6	Band Edge Compliance	27.53(m)	A.6	P
7	Conducted Spurious Emission	27.53(m), 2.1057	A.7	P

8	Peak to Average Power Ratio	27.50(a)	A.8	P
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#### LTE Band 25

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	2.1046/24.232	A.1	P
2	Emission Limit	2.1053/24.238	A.2	P
3	Frequency Stability	2.1055/24.235	A.3	P
4	Occupied Bandwidth	2.1049/24.238	A.4	P
5	Emission Bandwidth	2.1049/24.238	A.5	P
6	Band Edge Compliance	2.1049/24.238	A.6	P
7	Conducted Spurious Emission	2.1049/24.238	A.7	P
8	Peak to Average Power Ratio	2.1049/24.238	A.8	P

#### LTE Band 26 (Part 22)

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	2.1046/22.913	A.1	P
2	Emission Limit	2.1053/22.917	A.2	P
3	Frequency Stability	2.1055/22.355	A.3	P
4	Occupied Bandwidth	2.1049/22.917	A.4	P
5	Emission Bandwidth	2.1049/22.917	A.5	P
6	Band Edge Compliance	2.1051/22.917	A.6	P
7	Conducted Spurious Emission	2.1046/22.913	A.7	P

#### LTE Band 26 (Part 90)

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	2.1046/90.635	A.1	P
2	Emission Limit	2.1053/90.691	A.2	P
3	Frequency Stability	2.1055/90.213	A.3	P
4	Occupied Bandwidth	2.1049/90.121 5	A.4	P
5	Emission Bandwidth	2.1049/90.121	A.5	P

		5		
6	Band Edge Compliance	2.1051/90.691	A.6	P
7	Conducted Spurious Emission	2.1051/90.691	A.7	P

Note: please refer to Annex C in this test report for the detailed test results.

The following terms are used in the above table.

P	Pass, the EUT complies with the essential requirements in the standard.
NM	Not measure, the test was not measured by ECIT.
NA	Not applicable, the test was not applicable.
F	Fail, the EUT does not comply with the essential requirements in the standard.

## 5.2. Statements

The AMP 6500, support GSM/GPRS/EDGE/WCDMA/LTE/BT/BLE/WLAN, manufactured by NEW POS TECHNOLOGY LIMITED, which is a new product for testing.

ECIT only performed test cases which identified with P/NM/NA/F results in Annex C.

ECIT has verified that the compliance of the tested device specified in section 5 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 5 of this test report.

## 6. Test Equipment Utilized

### Climate chamber

No.	Equipment	Model	Serial Number	Manufacturer	Calibration date	Cal.interval
1	Climate chamber	SH-641	92012011	ESPEC	2017-12-25	2 Years

### Radiated emission test system

The test equipment and ancillaries used are as follows.

No.	Equipment	Model	Serial Number	Manufacturer	Calibration date	Cal.interval
1	Universal Radio Communication Tester	CMW500	104178	R&S	2018-05-11	1 Year
2	Test Receiver	ESU40	100307	R&S	2018-05-11	1 Year
3	TRILOG Broadband Antenna	VULB9163	VULB9163-515	Schwarzbeck	2017-02-25	3 Years
4	Double Ridged Guide Antenna	ETS-3117	135890	ETS	2017-01-11	3 Years
5	2-Line V-Network	ENV216	101380	R&S	2018-05-11	1 Year
6	Substitution Antenna	ETS-3117	00135890	ETS	2017-01-11	3 Year
7	RF Signal Generator	SMF100A	102314	R&S	2018-05-11	1 Year
8	Substitution Antenna	VUBA9117	9117-266	Schwarzbeck	2017-11-18	3 Years
9	Amplifier	SCU08	10146	R&S	2018-05-11	1 Year

### Conducted test system

No.	Name	Type	SN	Manufacture	Calibration date	Cal.interval
1	Vector Signal Analyser	FSQ40	200063	Rohde&Schwarz	2018-12-17	1 Year
2	Wireless communication comprehensive tester	CMW500	148904	Rohde&Schwarz	2018-08-21	1 Year
3	DC Power Supply	ZUP60-14	LOC-220Z006-0007	TDL-Lambda	2018-05-11	1 Year

### Software

Name	Version
Eagle FCC LTE auto test system	V3.0
EMC32	V9.15

## 7. Test Environment

**Shielding Room1** (6.0 meters×3.0 meters×2.7 meters) did not exceed following limits along the conducted RF performance testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 20%, Max. = 75 %
Shielding effectiveness	> 100 dB
Ground system resistance	< 0.5 Ω

**Control room** did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. =25 %, Max. =75 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω

**Fully-anechoic chamber1** (6.9 meters×10.9 meters×5.4 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 25 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
VSWR	Between 0 and 6 dB, from 1GHz to 18GHz
Site Attenuation Deviation	Between -4 and 4 dB,30MHz to 1GHz
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

## 8. Measurement Uncertainty

Measurement uncertainty for all the testing in this report are within the limit specified in ECIT documents. The detailed measurement uncertainty to see the column, k=2

Measurement Items	Range	Confidence Level	Calculated Uncertainty
Maximum Peak Output Power	30MHz-3600MHz	95%	$\pm 0.544\text{dB}$
EBW and VBW	30MHz-3600MHz	95%	$\pm 62.04\text{Hz}$
Transmitter Spurious Emission-Conducted	30MHz-2GHz	95%	$\pm 0.90\text{dB}$
Transmitter Spurious Emission-Conducted	2GHz-3.6GHz	95%	$\pm 0.88\text{dB}$
Transmitter Spurious Emission-Conducted	3.6GHz-8GHz	95%	$\pm 0.96\text{dB}$
Transmitter Spurious Emission-Conducted	8GHz-20GHz	95%	$\pm 0.94\text{dB}$
Transmitter Spurious Emission-Radiated	9KHz-30MHz	95%	$\pm 5.66\text{dB}$
Transmitter Spurious Emission-Radiated	30MHz-1000MHz	95%	$\pm 4.98\text{dB}$
Transmitter Spurious Emission-Radiated	1000MHz -18000MHz	95%	$\pm 5.06\text{dB}$
Transmitter Spurious Emission-Radiated	18000MHz -40000MHz	95%	$\pm 5.20\text{dB}$
Frequency stability	1MHz-16GHz	95%	$\pm 62.04\text{Hz}$



## ANNEX A. MEASUREMENT RESULTS

### ANNEX 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.

CMW500 setting:

1: CMW500 is connected to the DUT

2; Set RX Expected PEP to 30 dbm

#### A.1.2. Conducted

##### A.1.2.1. Method of Measurements

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

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

##### A.1.2.2 Measurement result

###### LTE band 2

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	1850.7	23.05	21.93
		1880.0	23.51	22.71
		1909.3	23.33	22.98
	1 RB low	1850.7	22.99	21.82
		1880.0	23.75	22.84
		1909.3	23.5	22.49
	50% RB mid	1850.7	23.14	21.95
		1880.0	23.59	22.43
		1909.3	23.66	22.48
	100% RB	1850.7	22.3	21.39
		1880.0	22.48	21.48
		1909.3	22.53	21.67
3MHz	1 RB high	1851.5	23.36	22.3
		1880.0	23.52	22.87
		1908.5	23.53	22.84
	1 RB low	1851.5	23.31	22.26
		1880.0	23.44	22.75
		1908.5	23.8	23.2

	50% RB mid	1851.5	22.33	21.53
		1880.0	22.56	21.81
		1908.5	22.62	21.7
	100% RB	1851.5	22.43	21.27
		1880.0	22.53	21.58
		1908.5	22.57	21.6
5MHz	1 RB high	1852.5	23.69	22.64
		1880.0	23.43	22.23
		1907.5	23.59	22.76
	1 RB low	1852.5	23.23	22.63
		1880.0	23.13	22.1
		1907.5	23.94	22.63
	50% RB mid	1852.5	22.38	21.49
		1880.0	22.54	21.46
		1907.5	22.73	21.73
	100% RB	1852.5	22.48	21.39
		1880.0	22.51	21.74
		1907.5	22.68	21.65
10MHz	1 RB high	1855.0	23.66	22.88
		1880.0	23.82	22.84
		1905.0	23.65	22.75
	1 RB low	1855.0	23.38	23.29
		1880.0	23.6	22.79
		1905.0	23.61	23.1
	50% RB mid	1855.0	22.5	21.53
		1880.0	22.61	21.54
		1905.0	22.78	21.52
	100% RB	1855.0	22.65	21.72
		1880.0	22.58	21.63
		1905.0	22.66	21.65
15MHz	1 RB high	1857.5	23.52	22.9
		1880.0	23.79	22.74
		1902.5	23.57	23.38
	1 RB low	1857.5	23.59	22.51
		1880.0	23.49	22.8
		1902.5	23.7	23.47
	50% RB mid	1857.5	22.47	22.46
		1880.0	22.79	22.79
		1902.5	23.47	23.47

20MHz	100% RB	1857.5	22.65	21.69
		1880.0	22.65	21.66
		1902.5	22.57	21.6
	1 RB high	1860.0	23.54	22.77
		1880.0	23.86	23.07
		1900.0	23.68	23.01
	1 RB low	1860.0	23.45	22.81
		1880.0	23.62	23.04
		1900.0	23.87	23.23
	50% RB mid	1860.0	22.77	21.63
		1880.0	22.73	21.71
		1900.0	22.6	21.61
	100% RB	1860.0	22.72	21.6
		1880.0	22.7	21.55
		1900.0	22.53	21.52

**LTE band 4**

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	1710.7	22.9	22.03
		1732.5	23.05	22.21
		1754.3	22.86	22.03
	1 RB low	1710.7	22.96	21.6
		1732.5	23.21	22.36
		1754.3	22.85	22.23
	50% RB mid	1710.7	22.95	21.81
		1732.5	23.17	22.06
		1754.3	22.94	21.91
	100% RB	1710.7	22.06	21.13
		1732.5	22.09	21.19
		1754.3	22.15	21.18
3MHz	1 RB high	1711.5	23.04	22.2
		1732.5	22.99	22.7
		1753.5	23.2	22.33
	1 RB low	1711.5	23.01	22.07
		1732.5	23.23	22.21
		1753.5	23.04	22.46
	50% RB mid	1711.5	22.03	21.17
		1732.5	22.21	21.45
		1753.5	22.08	21.12
	100% RB	1711.5	22.14	20.97
		1732.5	22.17	21.09
		1753.5	22.06	21.21
5MHz	1 RB high	1712.5	23.21	22.23
		1732.5	22.71	21.74
		1752.5	23.15	22.27
	1 RB low	1712.5	23.18	22.38
		1732.5	22.79	21.75
		1752.5	22.63	22.32
	50% RB mid	1712.5	22.1	20.93
		1732.5	22.11	21.26
		1752.5	22.08	21.08
	100% RB	1712.5	22.14	20.91
		1732.5	22.1	21.29
		1752.5	22.08	20.98
10MHz	1 RB high	1715	23.12	22.45

		1732.5	22.99	22.8
		1750	23.14	22.08
	1 RB low	1715	23.05	22.2
		1732.5	23.32	22.43
		1750	22.95	22.13
	50% RB mid	1715	22.15	21.15
		1732.5	22.27	21.21
		1750	22.03	21.11
	100% RB	1715	22.11	21.16
		1732.5	22.06	21.13
		1750	22.04	20.89
15MHz	1 RB high	1717.5	23.12	22.68
		1732.5	23.02	22.24
		1747.5	23.19	22.97
	1 RB low	1717.5	23.29	22.7
		1732.5	23.31	22.35
		1747.5	23.11	22.22
	50% RB mid	1717.5	22.72	22.7
		1732.5	22.36	22.26
		1747.5	22.22	22.4
	100% RB	1717.5	22.27	21.19
		1732.5	22.19	21.27
		1747.5	22.05	21.1
20MHz	1 RB high	1720	23.16	22.3
		1732.5	23.01	22.53
		1745	23.36	22.45
	1 RB low	1720	23.26	22.39
		1732.5	23.47	22.79
		1745	23.25	22.72
	50% RB mid	1720	22.14	21.21
		1732.5	22.27	21.31
		1745	22.12	21.1
	100% RB	1720	22.22	21.16
		1732.5	22.12	21.2
		1745	22.14	21.05

**LTE band 7**

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
5MHz	1 RB high	2502.5	23.16	22.44
		2535	23.13	21.47
		2567.5	23.27	22.43
	1 RB low	2502.5	23.28	22.13
		2535	23.14	21.86
		2567.5	23.47	22.45
	50% RB mid	2502.5	22.41	21.38
		2535	22.33	21.45
		2567.5	22.28	21.42
	100% RB	2502.5	22.32	21.35
		2535	22.38	21.37
		2567.5	22.29	21.29
10MHz	1 RB high	2505	23.47	22.41
		2535	23.37	22.57
		2565	23.21	22.22
	1 RB low	2505	23.5	22.69
		2535	23.32	23.07
		2565	23.16	22.5
	50% RB mid	2505	22.24	21.38
		2535	22.37	21.3
		2565	22.35	21.48
	100% RB	2505	22.36	21.3
		2535	22.36	21.35
		2565	22.3	21.49
15MHz	1 RB high	2507.5	23.03	22.2
		2535	23.19	22.94
		2562.5	23.55	22.72
	1 RB low	2507.5	23.24	22.55
		2535	23.17	22.57
		2562.5	23.48	22.78
	50% RB mid	2507.5	22.53	22.54
		2535	22.46	22.31
		2562.5	22.85	22.86
	100% RB	2507.5	22.21	21.29
		2535	22.28	21.33
		2562.5	22.43	21.45

20MHz	1 RB high	2510	23.11	22.57
		2535	23.14	22.53
		2560	23.35	22.81
	1 RB low	2510	23.47	22.68
		2535	23.38	22.72
		2560	23.43	22.68
	50% RB mid	2510	22.18	21.29
		2535	22.38	21.24
		2560	22.56	21.51
	100% RB	2510	22.16	21.17
		2535	22.25	21.25
		2560	22.51	21.48

**LTE band 25**

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	1850.7	23.59	22.46
		1882.5	23.34	22.72
		1914.3	22.77	21.97
	1 RB low	1850.7	23.47	22.31
		1882.5	23.45	22.72
		1914.3	22.94	22.17
	50% RB mid	1850.7	23.5	22.46
		1882.5	23.32	22.65
		1914.3	22.91	21.96
	100% RB	1850.7	22.55	21.47
		1882.5	22.4	21.42
		1914.3	22.56	21.45
3MHz	1 RB high	1851.5	23.84	22.99
		1882.5	23.38	22.64
		1913.5	22.88	22.06
	1 RB low	1851.5	23.34	22.71
		1882.5	23.22	22.53
		1913.5	23.51	22.76
	50% RB mid	1851.5	22.52	21.58
		1882.5	22.38	21.64
		1913.5	22.37	21.37
	100% RB	1851.5	22.49	21.5
		1882.5	22.41	21.63
		1913.5	22.43	21.34
5MHz	1 RB high	1852.5	23.71	22.35
		1882.5	23.22	22.3
		1912.5	23.08	22.39
	1 RB low	1852.5	23.55	22.75
		1882.5	23.04	21.39
		1912.5	23.58	22.72
	50% RB mid	1852.5	22.52	21.38
		1882.5	22.44	21.31
		1912.5	22.42	21.66
	100% RB	1852.5	22.49	21.43
		1882.5	22.47	21.37
		1912.5	22.52	21.49
10MHz	1 RB high	1855	23.86	23.13



		1882.5	23.67	22.64
		1910	22.58	21.77
	1 RB low	1855	23.64	23.14
		1882.5	23.64	22.9
		1910	23.69	23
	50% RB mid	1855	22.65	21.67
		1882.5	22.4	21.34
		1910	22.58	21.58
	100% RB	1855	22.59	21.67
		1882.5	22.47	21.35
		1910	22.6	21.59
15MHz	1 RB high	1857.5	23.64	22.75
		1882.5	23.48	22.47
		1907.5	23.06	22.28
	1 RB low	1857.5	23.44	23.1
		1882.5	23.57	22.6
		1907.5	23.46	22.48
	50% RB mid	1857.5	23.12	23.11
		1882.5	22.71	22.71
		1907.5	22.49	22.5
	100% RB	1857.5	22.5	21.51
		1882.5	22.35	21.36
		1907.5	22.43	21.44
20MHz	1 RB high	1860	23.56	22.67
		1882.5	23.65	22.7
		1905	22.8	22.02
	1 RB low	1860	23.5	22.74
		1882.5	23.67	22.79
		1905	23.78	22.67
	50% RB mid	1860	22.46	21.53
		1882.5	22.39	21.56
		1905	22.42	21.47
	100% RB	1860	22.51	21.45
		1882.5	22.36	21.38
		1905	22.38	21.36

**LTE band 26 (Part 22)**

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	824.7	23.06	22.36
		836.5	22.99	22.28
		848.3	23.1	21.88
	1 RB low	824.7	22.97	22.26
		836.5	23.13	22.33
		848.3	23.01	22.34
	50% RB mid	824.7	23.1	22.27
		836.5	23.13	22.36
		848.3	23.06	21.9
	100% RB	824.7	21.96	21.44
		836.5	22.15	21.18
		848.3	22.09	21.32
3MHz	1 RB high	825.5	23.21	23.14
		836.5	23.28	22.12
		847.5	23.12	22.16
	1 RB low	825.5	23.22	22.39
		836.5	23.25	22.55
		847.5	23.29	22.86
	50% RB mid	825.5	22.07	21.08
		836.5	22.19	21.53
		847.5	22.3	21.33
	100% RB	825.5	22.14	21.34
		836.5	22.36	21.5
		847.5	22.18	21.25
5MHz	1 RB high	826.5	23.07	22.41
		836.5	22.79	21.82
		846.5	23.12	22.46
	1 RB low	826.5	23.19	22.14
		836.5	23.06	22.3
		846.5	23.5	22.52
	50% RB mid	826.5	21.98	21.12
		836.5	22.36	21.28
		846.5	22.27	21.4
	100% RB	826.5	22.22	21.22
		836.5	22.2	21.44
		846.5	22.26	21.11
10MHz	1 RB high	829	23.1	22.78

		836.5	23.28	23.17
		844	23	22.32
	1 RB low	829	23.33	22.42
		836.5	23.48	22.47
		844	23.43	22.58
	50% RB mid	829	22.12	21.35
		836.5	22.33	21.39
		844	22.31	21.34
	100% RB	829	22.36	21.18
		836.5	22.34	21.35
		844	22.21	21.3
15MHz	1 RB high	831.5	23.15	22.41
		836.5	23.22	22.64
		841.5	23.26	22.51
	1 RB low	831.5	22.91	22.55
		836.5	23.46	22.41
		841.5	23.36	22.94
	50% RB mid	831.5	22.74	22.84
		836.5	22.32	22.32
		841.5	22.94	22.94
	100% RB	831.5	22.13	21.09
		836.5	22.2	21.31
		841.5	22.17	21.4

**LTE band 26(Part 90)**

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	814.7	22.94	22.14
		819.0	23.1	22.24
		823.3	23.2	21.93
	1 RB low	814.7	23.13	22.25
		819.0	23.25	22.18
		823.3	23.25	22.01
	50% RB mid	814.7	23.21	22.31
		819.0	23.24	22.39
		823.3	23.31	22.33
	100% RB	814.7	22.18	21.28
		819.0	22.25	21.38
		823.3	22.28	21.38
3MHz	1 RB high	815.5	23.16	22.55
		819.0	23.28	22.45
		822.5	23.44	22.75
	1 RB low	815.5	23.4	22.92
		819.0	23.29	22.71
		822.5	23.4	23.07
	50% RB mid	815.5	22.26	21.4
		819.0	22.46	21.7
		822.5	22.42	21.5
	100% RB	815.5	22.23	21.17
		819.0	22.38	21.42
		822.5	22.38	21.52
5MHz	1 RB high	816.5	23.24	22.48
		819.0	23.1	22.19
		821.5	23.37	22.45
	1 RB low	816.5	23.36	22.38
		819.0	23.06	22.13
		821.5	23.5	22.59
	50% RB mid	816.5	22.19	21.38
		819.0	22.39	21.48
		821.5	22.5	21.52
	100% RB	816.5	22.25	21.22
		819.0	22.38	21.51
		821.5	22.32	21.4
		/	/	/

10MHz	1 RB high	819.0	23.17	22.29
		/	/	/
	1 RB low	/	/	/
		819.0	23.52	22.6
		/	/	/
	50% RB mid	/	/	/
		819.0	22.36	21.28
		/	/	/
	100% RB	/	/	/
		819.0	22.29	21.26
		/	/	/
15MHz	1 RB high	821.5	23.4	22.75
		/	/	/
		/	/	/
	1 RB low	821.5	23.43	22.6
		/	/	/
		/	/	/
	50% RB mid	821.5	22.59	22.58
		/	/	/
		/	/	/
	100% RB	821.5	22.36	21.44
		/	/	/
		/	/	/

### A.1.3 Radiated

#### A.1.3.1 Description

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

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

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

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

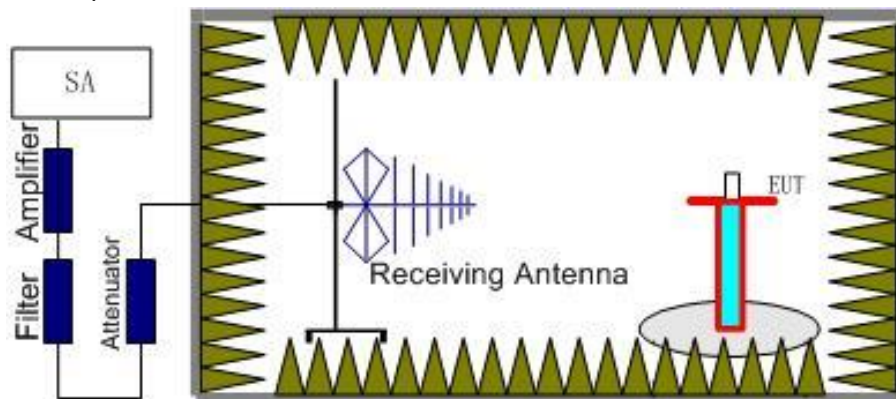
Rule Part 27.50(c) specifies "Portable stations (hand-held de-vices) are limited to 3 watts ERP".

Rule Part 90.637(c)(2) specifies "The output power at the remote site must not exceed 30 watts."

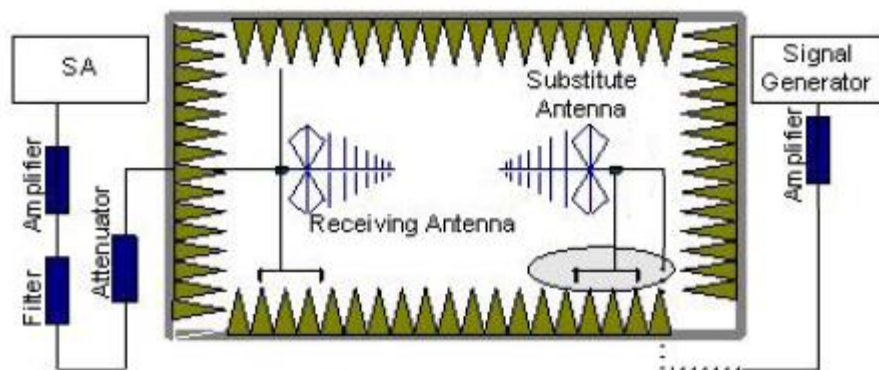
#### A.1.3.2 Method of Measurement

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:

$$\text{Power (EIRP)} = P_{Mea} + P_{Ag} - P_{cl} + G_a$$

5. This value is EIRP since the measurement is calibrated using an antenna of known gain (unit dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole,  $ERP = EIRP - 2.15$ .

### A.1.3.3 Measurement result

#### LTE Band 2- EIRP 24. 232(b)

Limits:  $\leq 33\text{dBm}$  (2W)

#### LTE Band 2\_1.4MHz\_QPSK

Frequency(MHz)	$P_{Mea}(\text{dBm})$	$P_{cl}(\text{dB})$	$P_{Ag}(\text{dB})$	$G_a$ Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1850.70	-10.55	4.6	36.0	2.8	23.65	33.00	9.35	H
1880.00	-9.68	4.6	35.6	2.8	24.12	33.00	8.88	H
1909.30	-10.39	4.7	35.9	2.8	23.61	33.00	9.39	H

#### LTE Band 2\_3MHz\_QPSK

Frequency(MHz)	$P_{Mea}(\text{dBm})$	$P_{cl}(\text{dB})$	$P_{Ag}(\text{dB})$	$G_a$ Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1851.50	-10.38	4.6	36.0	2.8	23.82	33.00	9.18	H
1880.00	-9.16	4.6	35.6	2.8	24.64	33.00	8.36	H
1908.50	-10.11	4.7	35.9	2.8	23.89	33.00	9.11	H

#### LTE Band 2\_5MHz\_QPSK

Frequency(MHz)	$P_{Mea}(\text{dBm})$	$P_{cl}(\text{dB})$	$P_{Ag}(\text{dB})$	$G_a$ Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1852.50	-10.62	4.6	36.0	2.8	23.58	33.00	9.42	H
1880.00	-9.36	4.6	35.6	2.8	24.44	33.00	8.56	H
1907.50	-10.07	4.7	35.9	2.8	23.93	33.00	9.07	H

#### LTE Band 2\_10MHz\_QPSK

Frequency(MHz)	$P_{Mea}(\text{dBm})$	$P_{cl}(\text{dB})$	$P_{Ag}(\text{dB})$	$G_a$ Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1855.00	-10.22	4.6	36.0	2.8	23.98	33.00	9.02	H

1880.00	-9.31	4.6	35.6	2.8	24.49	33.00	8.51	H
1905.00	-9.99	4.7	35.9	2.8	24.01	33.00	8.99	H

#### LTE Band 2\_15MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>ci</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1857.50	-10.05	4.6	36.0	2.8	24.15	33.00	8.85	H
1880.00	-9.24	4.6	35.6	2.8	24.56	33.00	8.44	H
1902.50	-9.91	4.7	36.0	2.8	24.19	33.00	8.81	H

#### LTE Band 2\_20 MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>ci</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1860.00	-10.14	4.6	36.0	2.8	24.06	33.00	8.94	H
1880.00	-9.21	4.6	35.6	2.8	24.59	33.00	8.41	H
1900.00	-10.25	4.7	36.4	2.8	24.25	33.00	8.75	H



### LTE Band 2\_1.4MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1850.70	-10.23	4.6	36.0	2.8	23.97	33.00	9.03	H
1880.00	-9.42	4.6	35.6	2.8	24.38	33.00	8.62	H
1909.30	-10.18	4.7	35.9	2.8	23.82	33.00	9.18	H

### LTE Band 2\_3MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1851.50	-10.1	4.6	36.0	2.8	24.1	33.00	8.9	H
1880.00	-9.37	4.6	35.6	2.8	24.43	33.00	8.57	H
1908.50	-10.11	4.7	35.9	2.8	23.89	33.00	9.11	H

### LTE Band 2\_5MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1852.50	-10.31	4.6	36.0	2.8	23.89	33.00	9.11	H
1880.00	-9.34	4.6	35.6	2.8	24.46	33.00	8.54	H
1907.50	-10.03	4.7	35.9	2.8	23.97	33.00	9.03	H

### LTE Band 2\_10MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1855.00	-9.91	4.6	36.0	2.8	24.29	33.00	8.71	H
1880.00	-9.46	4.6	35.6	2.8	24.34	33.00	8.66	H
1905.00	-9.89	4.7	35.9	2.8	24.11	33.00	8.89	H

### LTE Band 2\_15MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1857.50	-10.02	4.6	36.0	2.8	24.18	33.00	8.82	H
1880.00	-9.47	4.6	35.6	2.8	24.33	33.00	8.67	H
1902.50	-10.27	4.7	36.0	2.8	23.83	33.00	9.17	H

### LTE Band 2\_20 MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1860.00	-10.19	4.6	36.0	2.8	24.01	33.00	8.99	H
1880.00	-9.61	4.6	35.6	2.8	24.19	33.00	8.81	H
1900.00	-10.18	4.7	36.4	2.8	23.92	33.00	9.08	H

Peak EIRP(dBm) = P<sub>Mea</sub>(-10.18dBm) + G<sub>a</sub> (2.8dBi) + P<sub>Ag</sub> (36.4dB) - P<sub>cl</sub> (4.7dB) = 23.92dBm

### LTE Band 4- EIRP 27.50(d)

Limits: ≤30dBm (1W)

#### LTE Band 4\_1.4MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1710.70	-10.83	4.4	36.2	3	23.97	30.00	6.03	H
1732.50	-10.63	4.4	36.1	3	24.07	30.00	5.93	H
1754.30	-10.86	4.5	36.4	2.9	23.94	30.00	6.06	H

#### LTE Band 4\_3MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1711.50	-10.77	4.4	36.2	3	24.03	30.00	5.97	H
1732.50	-10.46	4.4	36.1	3	24.24	30.00	5.76	H
1753.50	-10.78	4.5	36.4	2.9	24.02	30.00	5.98	H

#### LTE Band 4\_5MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1712.50	-11.12	4.4	36.2	3	23.68	30.00	6.32	H
1732.50	-10.68	4.4	36.1	3	24.02	30.00	5.98	H
1752.50	-10.94	4.5	36.5	2.9	23.96	30.00	6.04	H

#### LTE Band 4\_10MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1715.00	-10.83	4.4	36.2	3	23.97	30.00	6.03	H
1732.50	-10.82	4.4	36.1	3	23.88	30.00	6.12	H
1750.50	-10.43	4.5	36.1	2.9	24.07	30.00	5.93	H

#### LTE Band 4\_15MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1717.50	-10.65	4.4	36.2	3	24.15	30.00	5.85	H
1732.50	-10.8	4.4	36.1	3	23.9	30.00	6.1	H
1747.50	-10.57	4.5	36.5	2.9	24.33	30.00	5.67	H

#### LTE Band 4\_20MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1720.00	-10.52	4.4	36.2	3	24.28	30.00	5.72	H
1732.50	-10.85	4.4	36.1	3	23.85	30.00	6.15	H
1745.00	-9.6	4.5	35.8	2.9	24.6	30.00	5.4	H

### LTE Band 4\_1.4MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1710.70	-10.42	4.4	36.2	3	24.38	30.00	5.62	H
1732.50	-10.85	4.4	36.1	3	23.85	30.00	6.15	H
1754.30	-10.47	4.5	36.4	2.9	24.33	30.00	5.67	H

### LTE Band 4\_3MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1711.50	-10.56	4.4	36.2	3	24.24	30.00	5.76	H
1732.50	-10.88	4.4	36.1	3	23.82	30.00	6.18	H
1753.50	-10.35	4.5	36.4	2.9	24.45	30.00	5.55	H

### LTE Band 4\_5MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1712.50	-10.77	4.4	36.2	3	24.03	30.00	5.97	H
1732.50	-10.74	4.4	36.1	3	23.96	30.00	6.04	H
1752.50	-10.58	4.5	36.5	2.9	24.32	30.00	5.68	H

### LTE Band 4\_10MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1715.00	-10.91	4.4	36.2	3	23.89	30.00	6.11	H
1732.50	-10.68	4.4	36.1	3	24.02	30.00	5.98	H
1750.50	-10.01	4.5	36.1	2.9	24.49	30.00	5.51	H

### LTE Band 4\_15MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1717.50	-10.69	4.4	36.2	3	24.11	30.00	5.89	H
1732.50	-10.98	4.4	36.1	3	23.72	30.00	6.28	H
1747.50	-10.39	4.5	36.5	2.9	24.51	30.00	5.49	H

### LTE Band 4\_20MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1720.00	-10.6	4.4	36.2	3	24.2	30.00	5.8	H
1732.50	-11.08	4.4	36.1	3	23.62	30.00	6.38	H
1745.00	-9.82	4.5	35.8	2.9	24.38	30.00	5.62	H

$$\text{Peak EIRP(dBm)} = P_{\text{Mea}}(-9.82\text{dBm}) + G_a (2.9\text{dBi}) + P_{\text{Ag}} (35.8\text{dB}) - P_{\text{cl}} (4.5\text{dB}) = 24.38\text{dBm}$$

### LTE Band 7- EIRP 27.50(h)(2)

Limits: ≤33 dBm (2W)

#### LTE Band 7\_5MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2502.50	-8.63	5.4	34.7	3.7	24.37	33.00	8.63	H
2535.00	-9.16	5.4	35.1	3.8	24.34	33.00	8.66	H
2567.50	-7.37	5.4	34.8	3.8	25.83	33.00	7.17	H

#### LTE Band 7\_10MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2505.00	-8.78	5.4	34.7	3.7	24.22	33.00	8.78	H
2535.00	-8.75	5.4	35.1	3.8	24.75	33.00	8.25	H
2565.00	-8.24	5.4	34.8	3.8	24.96	33.00	8.04	H

#### LTE Band 7\_15MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2507.50	-8.26	5.4	34.7	3.7	24.74	33.00	8.26	H
2535.00	-8.43	5.4	35.1	3.8	25.07	33.00	7.93	H
2562.50	-7.11	5.4	34.8	3.8	26.09	33.00	6.91	H

#### LTE Band 7\_20MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2510.00	-7.92	5.4	34.7	3.7	25.08	33.00	7.92	H
2535.00	-8.49	5.4	35.1	3.8	25.01	33.00	7.99	H
2560.00	-7.12	5.4	34.8	3.8	26.08	33.00	6.92	H

### LTE Band 7\_5MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2502.50	-8.66	5.4	34.7	3.7	24.34	33.00	8.66	H
2535.00	-9.08	5.4	35.1	3.8	24.42	33.00	8.58	H
2567.50	-7.27	5.4	34.8	3.8	25.93	33.00	7.07	H

### LTE Band 7\_10MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2505.00	-8.76	5.4	34.7	3.7	24.24	33.00	8.76	H
2535.00	-8.81	5.4	35.1	3.8	24.69	33.00	8.31	H
2565.00	-8.35	5.4	34.8	3.8	24.85	33.00	8.15	H

### LTE Band 7\_15MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2507.50	-8.41	5.4	34.7	3.7	24.59	33.00	8.41	H
2535.00	-8.9	5.4	35.1	3.8	24.6	33.00	8.4	H
2562.50	-7.65	5.4	34.8	3.8	25.55	33.00	7.45	H

### LTE Band 7\_20MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
2510.00	-8.46	5.4	34.7	3.7	24.54	33.00	8.46	H
2535.00	-9.25	5.4	35.1	3.8	24.25	33.00	8.75	H
2560.00	-7.82	5.4	34.8	3.8	25.38	33.00	7.62	H

Peak EIRP(dBm) = P<sub>Mea</sub>(-7.82dBm) + G<sub>a</sub> (3.8dBi) + P<sub>Ag</sub> (34.8dB) - P<sub>cl</sub> (5.4dB) = 25.38dBm

### LTE Band 25 - ERP 27.50(c)(10)

Limits:  $\leq 34.77\text{dBm}$  (3W)

#### LTE Band 25\_1.4MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>ci</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1850.7	-10.61	4.6	36.0	2.8	23.59	34.77	11.18	H
1882.5	-9.95	4.6	36.1	2.8	24.35	34.77	10.42	H
1914.3	-10.2	4.7	35.9	2.8	23.8	34.77	10.97	H

#### LTE Band 25\_3MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>ci</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1851.5	-10.26	4.6	36.0	2.8	23.94	34.77	10.83	H
1882.5	-10.1	4.6	36.1	2.8	24.2	34.77	10.57	H
1913.5	-10.18	4.7	35.9	2.8	23.82	34.77	10.95	H

#### LTE Band 25\_5MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>ci</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1852.5	-10.93	4.6	36	2.8	23.27	34.77	11.5	H
1882.5	-10.05	4.6	36.1	2.8	24.25	34.77	10.52	H
1912.5	-10.36	4.7	35.9	2.8	23.64	34.77	11.13	H

#### LTE Band 25\_10MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>ci</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1855	-10.33	4.6	36	2.8	23.87	34.77	10.9	H
1882.5	-9.97	4.6	36.1	2.8	24.33	34.77	10.44	H
1910	-10.35	4.7	35.9	2.8	23.65	34.77	11.12	H

#### LTE Band 25\_15MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>ci</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1857.5	-10.03	4.6	36	2.8	24.17	34.77	10.6	H
1882.5	-9.92	4.6	36.1	2.8	24.38	34.77	10.39	H
1907.5	-10.18	4.7	35.9	2.8	23.82	34.77	10.95	H

#### LTE Band 25\_20MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>ci</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1860	-9.97	4.6	36	2.8	24.23	34.77	10.54	H
1882.5	-10.1	4.6	36.1	2.8	24.2	34.77	10.57	H
1905	-10.18	4.7	35.9	2.8	23.82	34.77	10.95	H

### LTE Band 25\_1.4MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1850.7	-10.19	4.6	36.0	2.8	24.01	34.77	10.76	H
1882.5	-9.83	4.6	36.1	2.8	24.47	34.77	10.3	H
1914.3	-9.78	4.7	35.9	2.8	24.22	34.77	10.55	H

### LTE Band 25\_3MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1851.5	-10.33	4.6	36.0	2.8	23.87	34.77	10.9	H
1882.5	-9.9	4.6	36.1	2.8	24.4	34.77	10.37	H
1913.5	-9.92	4.7	35.9	2.8	24.08	34.77	10.69	H

### LTE Band 25\_5MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1852.5	-10.56	4.6	36.0	2.8	23.64	34.77	11.13	H
1882.5	-9.8	4.6	36.1	2.8	24.5	34.77	10.27	H
1912.5	-10.29	4.7	35.9	2.8	23.71	34.77	11.06	H

### LTE Band 25\_10MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1855	-10.04	4.6	36.0	2.8	24.16	34.77	10.61	H
1882.5	-9.71	4.6	36.1	2.8	24.59	34.77	10.18	H
1910	-10.18	4.7	35.9	2.8	23.82	34.77	10.95	H

### LTE Band 25\_15MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1857.5	-10.12	4.6	36.0	2.8	24.08	34.77	10.69	H
1882.5	-10.08	4.6	36.1	2.8	24.22	34.77	10.55	H
1907.5	-10.36	4.7	35.9	2.8	23.64	34.77	11.13	H

### LTE Band 25\_20MHz\_16QAM

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1860	-10.4	4.6	36.0	2.8	23.8	34.77	10.97	H
1882.5	-10.4	4.6	36.1	2.8	23.9	34.77	10.87	H
1905	-10.5	4.7	35.9	2.8	23.5	34.77	11.27	H

Peak ERP(dBm)=P<sub>Mea</sub>(-10.5dBm)+G<sub>a</sub>(2.8dBi)+P<sub>Ag</sub>(35.9dB)-P<sub>cl</sub>(4.7dB) = 23.5dBm

### LTE Band 26(Part 22)- ERP 22.913(a)

Limits:  $\leq 38.45\text{dBm}$  (7W)

#### LTE Band 26(Part 22)\_1.4MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>ci</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBd)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
824.70	-20.31	3.0	37.0	4.7	18.39	38.45	20.06	H
836.50	-20.96	3.1	36.8	4.7	17.44	38.45	21.01	H
848.3	-21.12	3.1	36.9	4.5	17.18	38.45	21.27	H

#### LTE Band 26(Part 22)\_3MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>ci</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBd)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
825.50	-20.41	3.0	36.9	4.7	18.19	38.45	20.26	H
836.50	-20.83	3.1	36.8	4.7	17.57	38.45	20.88	H
847.50	-21.12	3.1	37.0	4.5	17.28	38.45	21.17	H

#### LTE Band 26(Part 22)\_5MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>ci</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBd)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
826.50	-20.33	3.0	36.9	4.7	18.27	38.45	20.18	H
836.50	-20.86	3.1	36.8	4.7	17.54	38.45	20.91	H
846.50	-20.16	3.1	36.0	4.5	17.24	38.45	21.21	H

#### LTE Band 26(Part 22)\_10MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>ci</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBd)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
829.00	-20.65	3.0	37.0	4.7	18.05	38.45	20.4	H
836.50	-21	3.1	36.8	4.7	17.4	38.45	21.05	H
844.00	-21.19	3.1	36.9	4.5	17.11	38.45	21.34	H

#### LTE Band 26(Part 22)\_15MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>ci</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBd)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
831.50	-20.69	3.0	36.9	4.7	17.91	38.45	20.54	H
836.50	-21.35	3.1	36.8	4.7	17.05	38.45	21.4	H
841.50	-21.42	3.1	36.9	4.5	16.88	38.45	21.57	H



**LTE Band 26(Part 22)\_1.4MHz\_16QAM**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBd)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
824.70	-20.57	3.0	37.0	4.7	18.13	38.45	20.32	H
836.50	-20.98	3.1	36.8	4.7	17.42	38.45	21.03	H
848.30	-21.05	3.1	36.9	4.5	17.25	38.45	21.2	H

**LTE Band 26(Part 22)\_3MHz\_16QAM**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBd)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
825.50	-20.08	3.0	36.9	4.7	18.52	38.45	19.93	H
836.50	-20.86	3.1	36.8	4.7	17.54	38.45	20.91	H
847.50	-20.89	3.1	37.0	4.5	17.51	38.45	20.94	H

**LTE Band 26(Part 22)\_5MHz\_16QAM**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBd)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
826.50	-20.42	3.0	36.9	4.7	18.18	38.45	20.27	H
836.50	-20.72	3.1	36.8	4.7	17.68	38.45	20.77	H
846.50	-20.01	3.1	36.0	4.5	17.39	38.45	21.06	H

**LTE Band 26(Part 22)\_10MHz\_16QAM**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBd)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
829.00	-20.56	3.0	37.0	4.7	18.14	38.45	20.31	H
836.50	-20.84	3.1	36.8	4.7	17.56	38.45	20.89	H
844.00	-20.9	3.1	36.9	4.5	17.4	38.45	21.05	H

**LTE Band 26(Part 22)\_15MHz\_16QAM**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dBd)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
831.50	-20.27	3.0	36.9	4.7	18.33	38.45	20.12	H
836.50	-20.91	3.1	36.8	4.7	17.49	38.45	20.96	H
841.50	-21.2	3.1	36.9	4.5	17.1	38.45	21.35	H

Peak ERP(dBm)=P<sub>Mea</sub>(-21.2dBm)+G<sub>a</sub>(4.5dBi)+P<sub>Ag</sub>(36.9dB)-P<sub>cl</sub>(3.1dB) = 17.1dBm

### LTE Band 26(Part 90)- ERP 90.637(c)(2)

Limits: ≤44.77dBm (30W)

#### LTE Band 26(Part 90) \_1.4MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>ci</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
814.70	-20.31	3.0	37.0	4.7	18.39	44.77	26.38	H
819.00	-20.55	3.1	36.8	4.7	17.85	44.77	26.92	H
823.30	-20.32	3.1	36.9	4.5	17.98	44.77	26.79	H

#### LTE Band 26(Part 90) \_3MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>ci</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
815.50	-19.8	3.0	36.9	4.7	18.8	44.77	25.97	H
819.00	-20.5	3.1	36.8	4.7	17.9	44.77	26.87	H
822.50	-20.56	3.1	37.0	4.5	17.84	44.77	26.93	H

#### LTE Band 26(Part 90) \_5MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>ci</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
816.50	-20.24	3.0	36.9	4.7	18.36	44.77	26.41	H
819.00	-20.53	3.1	36.8	4.7	17.87	44.77	26.9	H
821.50	-19.52	3.1	36.0	4.5	17.88	44.77	26.89	H

#### LTE Band 26(Part 90) \_10MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>ci</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
819.00	-20.29	3.0	37.0	4.7	18.41	44.77	26.36	H
819.00	-20.36	3.1	36.8	4.7	18.04	44.77	26.73	H
819.00	-20.11	3.1	36.9	4.5	18.19	44.77	26.58	H

#### LTE Band 26(Part 90) \_15MHz\_QPSK

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>ci</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
821.5	-21.43	3.0	37.0	4.7	17.27	44.77	27.5	H

**LTE Band 26(Part 90) \_1.4MHz\_16QAM**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
814.70	-20.05	3.0	37.0	4.7	18.65	44.77	26.12	H
819.00	-20.58	3.1	36.8	4.7	17.82	44.77	26.95	H
823.30	-20.15	3.1	36.9	4.5	18.15	44.77	26.62	H

**LTE Band 26(Part 90) \_3MHz\_16QAM**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
815.50	-19.73	3.0	36.9	4.7	18.87	44.77	25.9	H
819.00	-20.22	3.1	36.8	4.7	18.18	44.77	26.59	H
822.50	-20.14	3.1	37.0	4.5	18.26	44.77	26.51	H

**LTE Band 26(Part 90) \_5MHz\_16QAM**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
816.50	-20.15	3.0	36.9	4.7	18.45	44.77	26.32	H
819.00	-20.26	3.1	36.8	4.7	18.14	44.77	26.63	H
821.50	-19.35	3.1	36.0	4.5	18.05	44.77	26.72	H

**LTE Band 26(Part 90) \_10MHz\_16QAM**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
819.00	-20.2	3.0	37.0	4.7	18.5	44.77	26.27	H
819.00	-20.45	3.1	36.8	4.7	17.95	44.77	26.82	H
819.00	-20.07	3.1	36.9	4.5	18.23	44.77	26.54	H

**LTE Band 26(Part 90) \_15MHz\_QPSK**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
821.5	-21.57	3.0	37.0	4.7	17.13	44.77	27.64	H

$$\text{Peak ERP(dBm)} = P_{\text{Mea}}(-21.57\text{dBm}) + G_a(4.7\text{dBi}) + P_{\text{Ag}}(37.0\text{dB}) - P_{\text{cl}}(3.0\text{dB}) = 17.13\text{dBm}$$

**ANALYZER SETTINGS:**

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

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

## ANNEX A.2. EMISSION LIMIT

### Reference

FCC: CFR 2.1051, 22.917, 24.238(a), 27.53(g), 27.53(h), 27.53(m), 90.691.

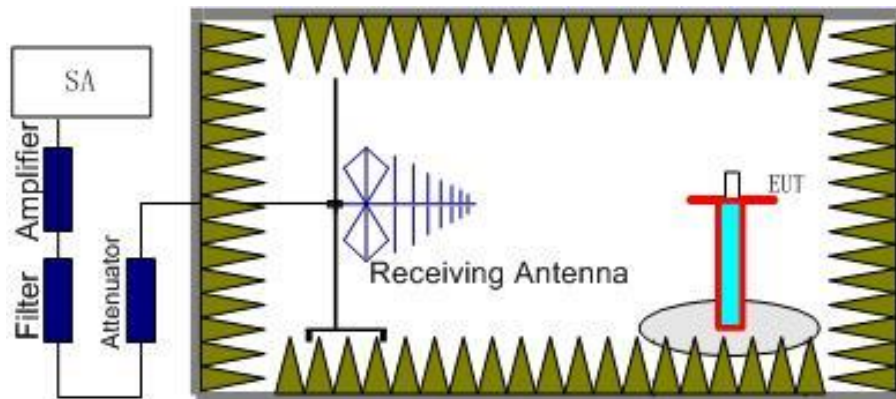
### A.2.1 Measurement Method

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

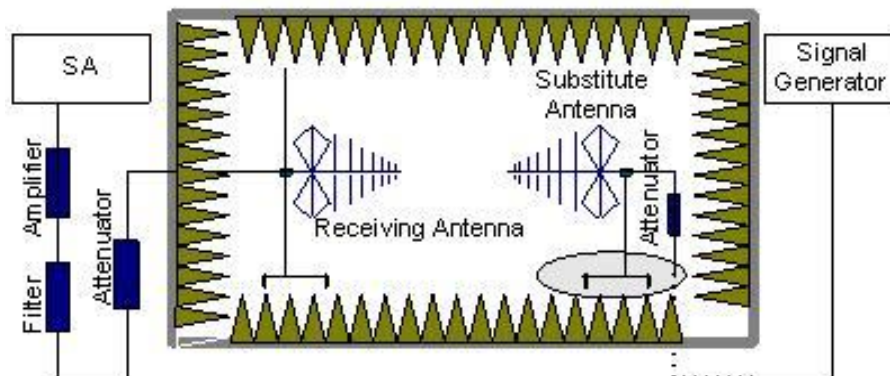
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier. The resolution bandwidth is set 1MHz as outlined in Part 22.917, Part 24.238(a), Part 27.53(g), Part 27.53(h), Part 27.53(m), 90.691. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the LTE Bands 2,4,7,25,26.

### 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:

$$\text{Power (EIRP)} = P_{Mea} - P_{pl} + G_a$$

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,  $ERP = EIRP - 2.15\text{dB}$ .

### A.2.2 Measurement Limit

Part 22.917, Part 24.238(a), Part 27.53(g), Part 27.53(h), Part 27.53(m), 90.691 all 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.

### A.2.3 Measurement Results

7. Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the LTE Bands 2,4,7,25,26. It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the LTE Bands 2,4,7,25,26. into any of the other blocks. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this. The evaluated frequency range is from 30MHz to 26GHz.

#### LTE Band 2, 1.4MHz, QPSK, Channel 18607

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
3700.8	-47.32	6.6	7.7	-46.22	-13	V

5551.2	-39.82	8.2	9.5	-38.52	-13	V
7514.0	-52.95	9.7	14.6	-48.05	-13	V
9445.2	-54.8	10.7	18.6	-46.9	-13	V
11358.4	-50.83	12.1	18.5	-44.43	-13	V
13276.4	-48.66	13.6	21.8	-40.46	-13	H

**LTE Band 2, 1.4MHz, QPSK, Channel 18900**

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
3755.6	-48.96	6.6	7.7	-47.86	-13	V
5633.6	-41.58	8.3	10.5	-39.38	-13	V
7511.2	-52.69	9.7	14.6	-47.79	-13	V
9484.4	-54.87	10.7	18.6	-46.97	-13	H
11312.2	-50.37	12.1	18.5	-43.97	-13	H
13283.4	-48.05	13.6	21.8	-39.85	-13	H

**LTE Band 2, 1.4MHz, QPSK, Channel 19193**

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
3810.4	-49.33	6.7	7.7	-48.33	-13	V
5716.8	-48.27	8.5	10.5	-46.27	-13	H
7446.8	-52.58	9.7	14.6	-47.68	-13	H
9412.4	-54.4	10.7	18.6	-46.5	-13	V
11364.0	-49.64	12.1	18.5	-43.24	-13	H
13238.6	-49.87	13.0	21.8	-41.07	-13	H

**LTE Band 4, 1.4MHz QPSK, Channel 19957**

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
3420.4	-46.46	6.3	4.7	-48.06	-13	V
5131.2	-42.93	7.9	8.7	-42.13	-13	V
6892.8	-53.99	9.3	12.9	-50.39	-13	V
8549.2	-55.82	10.3	18.1	-48.02	-13	V
10321.2	-51.24	11.5	17.4	-45.34	-13	H
12150.8	-47.21	12.6	17.5	-42.31	-13	V

**LTE Band 4, 1.4MHz, QPSK, Channel 20175**

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
3460.4	-45.99	6.4	4.7	-47.69	-13	V
5190.8	-44.16	8.0	8.7	-43.46	-13	V
6888.4	-52.79	9.3	12.9	-49.19	-13	V
8662.8	-56.06	10.3	18.5	-47.86	-13	V
10346.8	-50.94	11.5	17.4	-45.04	-13	H
11995.4	-47.52	12.6	17.1	-43.02	-13	V

**LTE Band 4, 1.4MHz, QPSK, Channel 20393**

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
3500.4	-46.18	6.4	4.7	-47.88	-13	V
5250.8	-43.25	8.0	8.7	-42.55	-13	V
7000.8	-49.23	9.3	12.9	-45.63	-13	V
8818.4	-55.56	10.4	18.5	-47.46	-13	H
10338.4	-50.66	11.5	17.4	-44.76	-13	H
12135.4	-47.26	12.6	17.5	-42.36	-13	H

**LTE Band 7, 5 MHz, QPSK, Channel 20775**

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
3986.8	-49.87	6.9	7.7	-49.07	-13	H
5000.8	-47.08	7.8	9.0	-45.88	-13	V
7500.8	-43.73	9.7	14.6	-38.83	-13	V
10032.8	-47.03	11.2	17.6	-40.63	-13	V
12627.5	-39.65	12.8	19.2	-33.25	-13	V
15446.8	-38.7	14.4	24.2	-28.9	-13	H

**LTE Band 7, 5 MHz, QPSK, Channel 21100**

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
3970.8	-50.05	6.8	7.7	-49.15	-13	H
4951.2	-47.79	7.7	9.0	-46.49	-13	H
5970.0	-49.28	8.5	10.4	-47.38	-13	V
7598.4	-41.57	9.7	14.6	-36.67	-13	V
10059.2	-45.85	11.3	17.6	-39.55	-13	V
12463.0	-42.63	12.7	18.7	-36.63	-13	V

**LTE Band 7, 5 MHz, QPSK, Channel 21425**

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
4053.6	-49.43	6.9	7.7	-48.63	-13	V
4979.2	-48.06	7.8	9.0	-46.86	-13	V
6042.4	-48.69	8.6	10.4	-46.89	-13	V
7695.6	-42.22	9.8	15.3	-36.72	-13	V
10095.6	-46.46	11.3	17.6	-40.16	-13	H
12519.0	-41.6	12.7	18.7	-35.6	-13	V



**LTE Band 25, 1.4MHz, QPSK, Channel 26047**

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
3700.4	-49.28	6.6	7.7	-48.18	-13	V
5550.8	-42.77	8.2	9.5	-41.47	-13	V
7555.2	-52.85	9.7	14.6	-47.95	-13	V
9337.6	-54.7	10.7	18.5	-46.9	-13	V
11334.6	-51.76	12.1	18.5	-45.36	-13	H
13179.8	-50.46	13.0	21.8	-41.66	-13	H

**LTE Band 25, 1.4MHz, QPSK, Channel 26365**

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
3760.4	-48.34	6.6	7.7	-47.24	-13	V
5641.2	-42.27	8.3	10.5	-40.07	-13	V
7521.6	-52.87	9.7	14.6	-47.97	-13	V
9461.6	-53.62	10.7	18.6	-45.72	-13	V
11326.2	-48.9	12.1	18.5	-42.5	-13	H
13256.8	-49.41	13.0	21.8	-40.61	-13	H

**LTE Band 25, 1.4MHz, QPSK, Channel 26683**

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
3820.4	-49.79	6.7	7.7	-48.79	-13	V
5731.2	-43.07	8.5	10.5	-41.07	-13	V
7641.2	-53.18	9.7	15.3	-47.58	-13	V
9517.6	-53.88	10.7	18.6	-45.98	-13	H
11372.4	-50.91	12.1	18.5	-44.51	-13	H
13279.2	-50.01	13.6	21.8	-41.81	-13	H

**LTE Band 26(Part 22), 1.4MHz, QPSK, Channel 27033**

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
1628.6	-47.19	4.3	2.9	-48.59	-13	H
2388.8	-39.49	5.2	3.7	-40.99	-13	H
3313.2	-51.59	6.2	4.7	-53.09	-13	V
3988.0	-53.78	6.9	7.7	-52.98	-13	H
4841.2	-51.09	7.6	7.9	-50.79	-13	V
5588.4	-52.68	8.3	9.5	-51.48	-13	V

**LTE Band 26(Part 22), 1.4MHz, QPSK, Channel 26915**

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
1659.0	-45.21	4.3	2.9	-46.61	-13	H
2749.2	-38.22	5.7	4.1	-39.82	-13	V
3259.6	-51.75	6.1	4.7	-53.15	-13	H
4055.2	-53.97	6.9	7.7	-53.17	-13	V
4918.4	-54.28	7.7	9.0	-52.98	-13	H
5628.0	-55.16	8.3	10.5	-52.96	-13	H

**LTE Band 26(Part 22), 1.4MHz, QPSK, Channel 26797**

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBi)	Peak EIRP (dBm)	Limit (dBm)	Polarization
1688.5	-45.11	4.4	2.9	-46.61	-13	H
2750.8	-36.83	5.7	4.1	-38.43	-13	V
3270.8	-52.37	6.1	4.7	-53.77	-13	H
4049.2	-53.29	6.9	7.7	-52.49	-13	V
4930.4	-51.78	7.7	9.0	-50.48	-13	V
5637.6	-53.34	8.3	10.5	-51.14	-13	V

**LTE Band 26(Part 90), 1.4MHz, QPSK, Channel 26783**

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Polarization
1642.1	-48.13	4.3	2.9	-49.53	-13	H
2421.5	-39.74	5.3	3.7	-41.34	-13	V
3274.4	-52.37	6.1	4.7	-53.77	-13	H
4010.8	-53.62	6.9	7.7	-52.82	-13	V
4814.4	-51.22	7.6	7.9	-50.92	-13	V
5460.8	-52.08	8.1	9.5	-50.68	-13	H

**LTE Band 26(Part 90), 1.4MHz, QPSK, Channel 26740**

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Polarization
1633.8	-45.99	4.3	2.9	-47.39	-13	H
2455.0	-39.03	5.3	3.7	-40.63	-13	V
3304.0	-52.74	6.2	4.7	-54.24	-13	H
3985.6	-54.39	6.9	7.7	-53.59	-13	H
4830.4	-51.4	7.6	7.9	-51.1	-13	V
5636.0	-53.44	8.3	10.5	-51.24	-13	H

**LTE Band 26(Part 90), 1.4MHz, QPSK, Channel 26697**

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Polarization
1638.6	-48.22	4.3	2.9	-49.62	-13	H
2734.2	-37.26	5.7	4.1	-38.86	-13	V
3276.4	-51.91	6.2	4.7	-53.41	-13	H
4025.2	-54.32	6.9	7.7	-53.52	-13	V
4855.2	-50.9	7.6	7.9	-50.6	-13	V
5604.4	-52.73	8.3	9.5	-51.53	-13	H

**LTE Band 26(Part 90), 15MHz, QPSK, Channel 26765**

Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Polarization
1527.8	-47.81	4.2	3.4	-48.61	-13	V

2306.5	-39.63	5.1	3.3	-41.43	-13	V
3575.2	-50.11	6.5	4.7	-51.91	-13	H
4488.8	-50.77	7.3	7.3	-50.77	-13	H
5226.0	-52.15	8.0	8.7	-51.45	-13	H
6396.0	-52.82	8.9	11.5	-50.22	-13	H

## **ANNEX A.3. FREQUENCY STABILITY**

### **Reference**

FCC: CFR Part 2.1055, 22.235, 24.235, 27.54, 90.213.

### **A.3.1 Method of Measurement**

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

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30°C.
3. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on middle channel for LTE band 2,4,7,25,26 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°C increments from -30°C to +50°C. 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°C.
7. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 °C decrements from +50°C to -30°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5°C during the measurement procedure.

### **A.3.2 Measurement Limit**

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. 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 10VDC and 15VDC, with a nominal voltage of 12VDC. 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. For the purposes of measuring frequency stability these voltage limits are to be used.

### A.3.3 Measurement results

#### LTE Band 2, 1.4MHz bandwidth (worst case of all bandwidths)

##### Frequency Error vs Voltage

Voltage (V)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
10	-6.924	7.739	0.004	0.004
12	-4.435	7.353	0.002	0.004
15	-5.865	8.426	0.003	0.004

##### Frequency Error vs Temperature

Temperature (°C)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
50°	-5.107	-6.28	0.003	0.003
40°	-9.542	7.467	0.005	0.004
30°	-4.992	6.766	0.003	0.004
20°	-5.736	7.482	0.003	0.004
10°	-5.98	-6.809	0.003	0.004
0°	-6.137	7.753	0.003	0.004
- 10°	-5.98	9.527	0.003	0.005
- 20°	-9.913	-7.782	0.005	0.004

#### LTE Band 4, 1.4MHz bandwidth (worst case of all bandwidths)

##### Frequency Error vs Voltage

Voltage (V)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
10	8.512	-13.647	0.005	0.008
12	2.446	-13.704	0.001	0.008
15	4.978	-14.319	0.003	0.008

##### Frequency Error vs Temperature

Temperature (°C)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
50°	3.133	-13.39	0.002	0.008
40°	3.333	-14.291	0.002	0.008
30°	4.535	-14.048	0.003	0.008
20°	-8.397	-13.804	0.005	0.008
10°	4.148	-16.365	0.002	0.009
0°	2.818	-13.161	0.002	0.008
- 10°	3.304	-13.118	0.002	0.008
- 20°	-2.317	-15.707	0.001	0.009

### LTE Band 7, 5MHz bandwidth (worst case of all bandwidths)

#### Frequency Error vs Voltage

Voltage (V)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
10	-8.554	9.656	0.003	0.004
12	-8.483	6.995	0.003	0.003
15	-11.773	10.2	0.005	0.004

#### Frequency Error vs Temperature

Temperature (°C)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
50°	-9.699	9.198	0.004	0.004
40°	-8.998	9.313	0.004	0.004
30°	-7.181	7.353	0.003	0.003
20°	-6.709	9.413	0.003	0.004
10°	-7.539	11.644	0.003	0.005
0°	-8.068	7.682	0.003	0.003
- 10°	-7.51	10.3	0.003	0.004
- 20°	-6.351	7.267	0.003	0.003

### LTE Band 25, 10MHz bandwidth (worst case of all bandwidths)

#### Frequency Error vs Voltage

Voltage (V)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
10	2.875	-16.508	0.002	0.009
12	-2.36	-16.394	0.001	0.009
15	3.662	-17.037	0.002	0.009

#### Frequency Error vs Temperature

Temperature (°C)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
50°	3.076	-17.009	0.002	0.009
40°	4.163	-16.937	0.002	0.009
30°	3.104	-16.294	0.002	0.009
20°	-2.804	-17.395	0.001	0.009
10°	2.861	-18.539	0.002	0.01
0°	1.888	-16.437	0.001	0.009
- 10°	-2.646	-16.851	0.001	0.009
- 20°	-3.004	-17.195	0.002	0.009

**LTE Band 26(Part 22), 1.4MHz bandwidth (worst case of all bandwidths)**
**Frequency Error vs Voltage**

Voltage (V)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
10	2.503	-13.733	0.003	0.016
12	2.975	-12.932	0.004	0.015
15	2.747	-13.204	0.003	0.016

**Frequency Error vs Temperature**

Temperature (°C)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
50°	-2.332	-12.36	0.003	0.015
40°	2.804	-13.618	0.003	0.016
30°	3.004	-12.617	0.004	0.015
20°	-1.96	-13.533	0.002	0.016
10°	1.831	-12.231	0.002	0.015
0°	2.589	-13.361	0.003	0.016
- 10°	-2.561	-12.76	0.003	0.015
- 20°	2.174	-13.189	0.003	0.016

**LTE Band 26 (Part 90), 1.4MHz bandwidth (worst case of all bandwidths)**
**Frequency Error vs Voltage**

Voltage (V)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
10	-5.908	-15.049	0.007	0.018
12	-4.635	-15.478	0.006	0.019
15	-6.08	-15.006	0.007	0.018

**Frequency Error vs Temperature**

Temperature (°C)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
50°	-3.262	-15.092	0.004	0.018
40°	-2.275	-15.607	0.003	0.019
30°	-3.033	-14.663	0.004	0.018
20°	-2.332	-14.305	0.003	0.017
10°	-4.063	-14.234	0.005	0.017
0°	-2.818	-14.834	0.003	0.018
- 10°	-3.762	-14.491	0.005	0.018
- 20°	-3.505	-14.019	0.004	0.017



## **ANNEX A.4. OCCUPIED BANDWIDTH**

### **Reference**

FCC: CFR Part 2.1049(h)(i)

#### **A.4.1 Occupied Bandwidth Results**

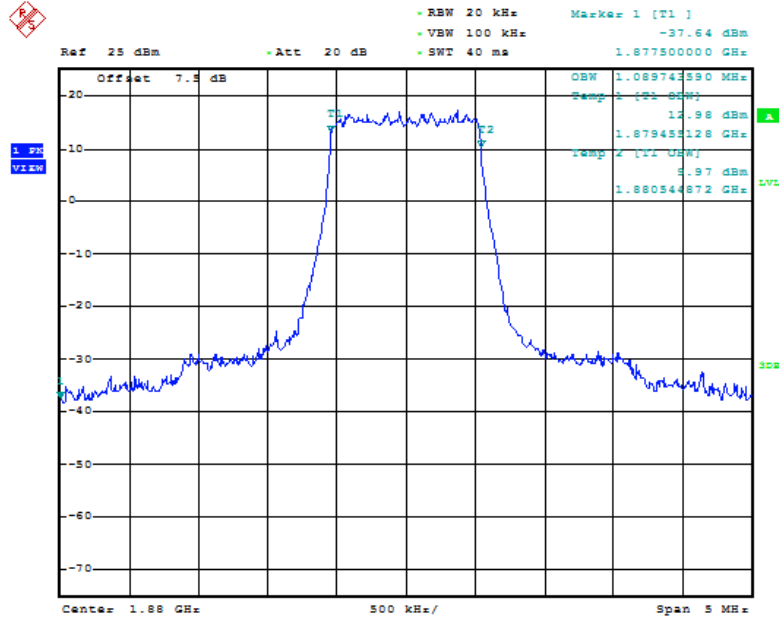
Occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of the US Cellular/PCS frequency bands. The table below lists the measured 99% BW. Spectrum analyzer plots are included on the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

The measurement method is from KDB 971168 4:

- a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (i.e., two to five times the OBW).
- b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
- c) Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least  $10\log(\text{OBW} / \text{RBW})$  below the reference level.
- d) Set the detection mode to peak, and the trace mode to max hold.
- e) Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

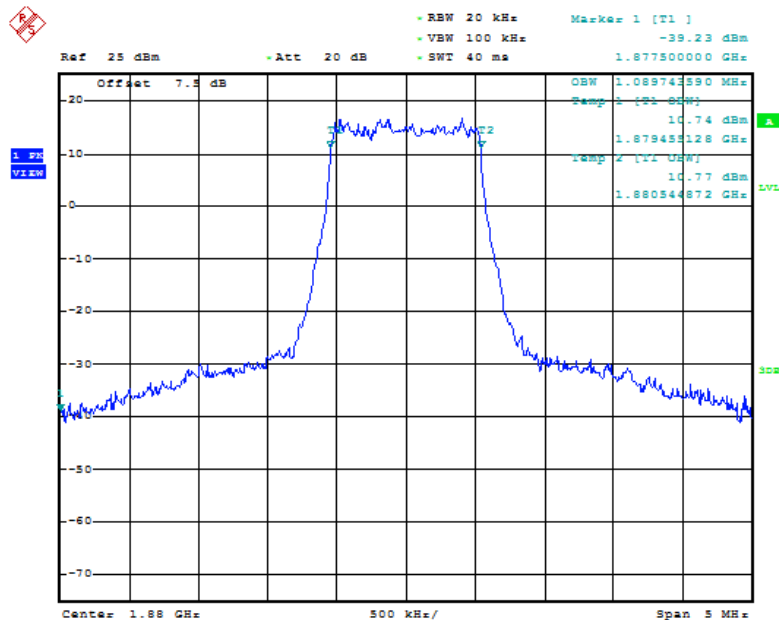
### LTE band 2, 1.4MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
1880.0	QPSK	16QAM
	1.09	1.09



Date: 30.JAN.2019 11:19:58

Fig.1 LTE band 2, 1.4MHz Bandwidth, QPSK (99% BW)

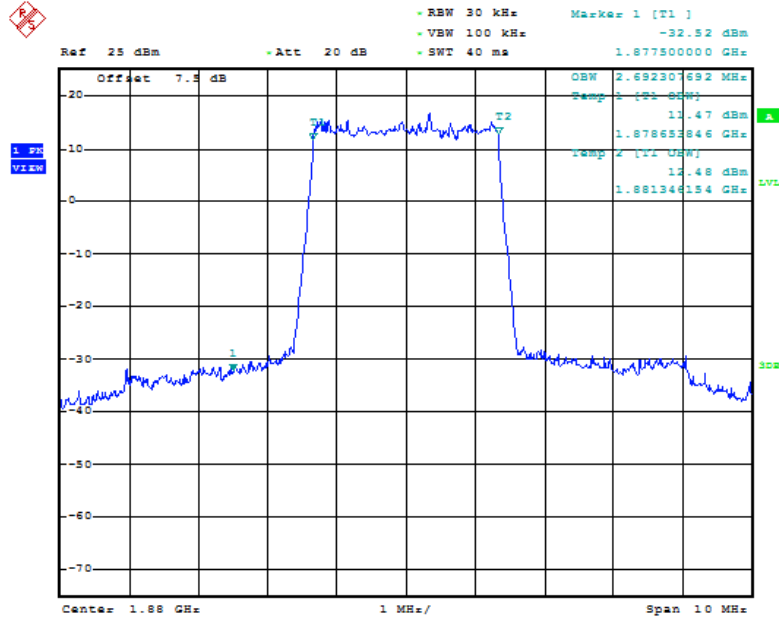


Date: 30.JAN.2019 12:26:12

Fig.2 LTE band 2, 1.4MHz Bandwidth, 16QAM (99% BW)

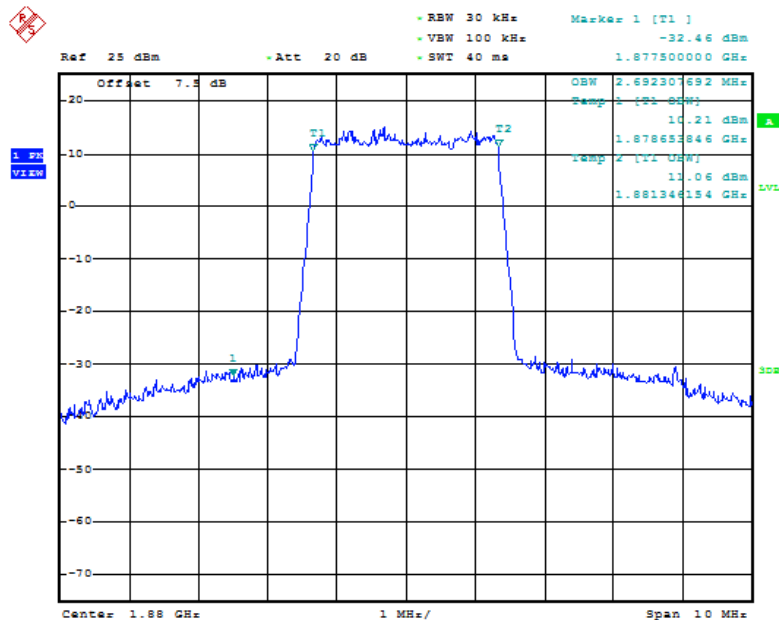
### LTE band 2, 3MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
	QPSK	16QAM
1880.0	2.692	2.692



Date: 30.JAN.2019 11:20:42

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

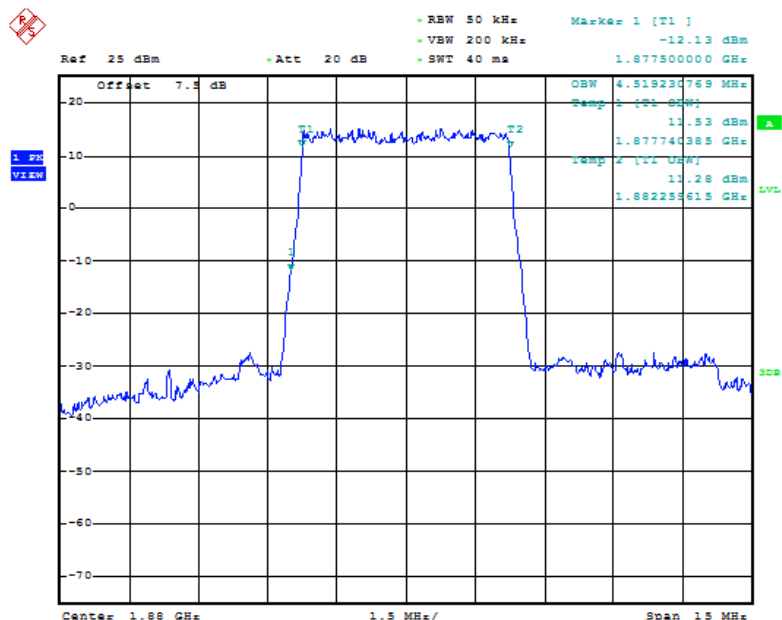


Date: 30.JAN.2019 12:26:56

Fig.4 LTE band 2, 3MHz Bandwidth, 16QAM (99% BW)

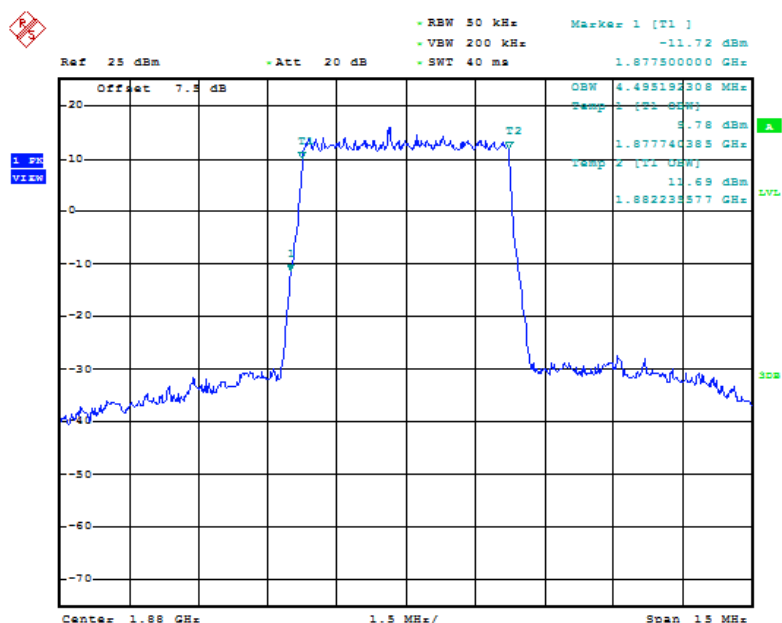
### LTE band 2, 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
1880.0	QPSK	16QAM
	4.519	4.495



Date: 30.JAN.2019 11:21:26

Fig.5 LTE band 2, 5MHz Bandwidth, QPSK (99% BW)

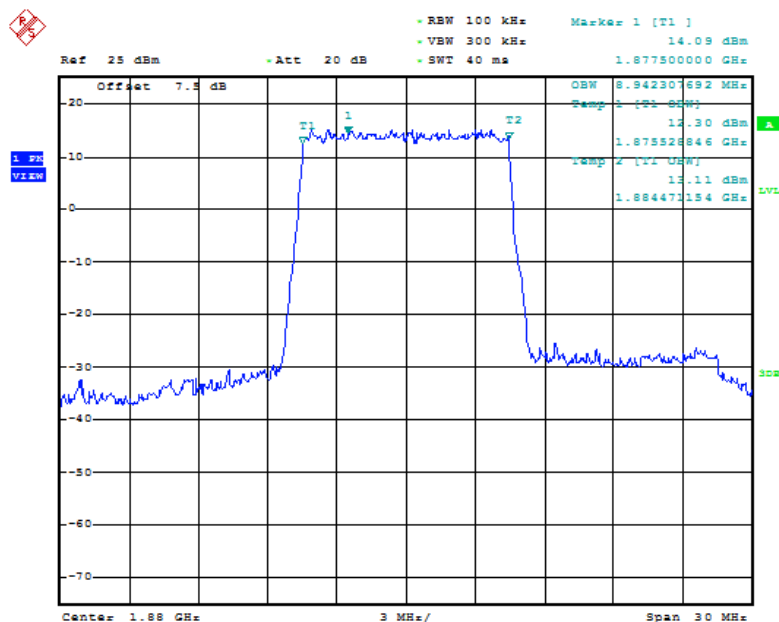


Date: 30.JAN.2019 12:27:41

Fig.6 LTE band 2, 5MHz Bandwidth,16QAM (99% BW)

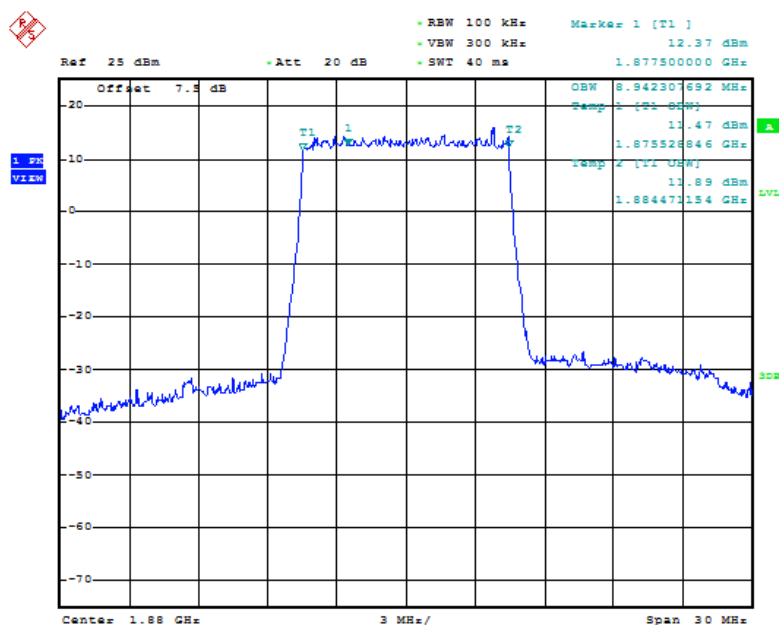
### LTE band 2, 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
	QPSK	16QAM
1880.0	8.942	8.942



Date: 30.JAN.2019 11:22:11

Fig.7 LTE band 2, 10MHz Bandwidth, QPSK (99% BW)



Date: 30.JAN.2019 12:28:26

Fig.8 LTE band 2, 10MHz Bandwidth, 16QAM (99% BW)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
1880.0	QPSK	16QAM
	13.558	13.486

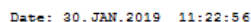


Fig.9 LTE band 2, 15MHz Bandwidth, QPSK (99% BW)

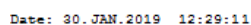
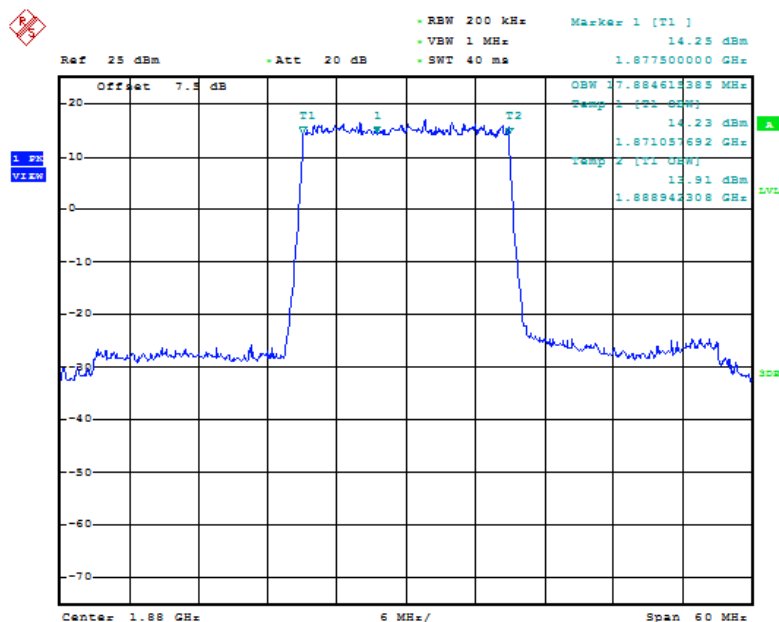


Fig.10 LTE band 2, 15MHz Bandwidth, 16QAM (99% BW)

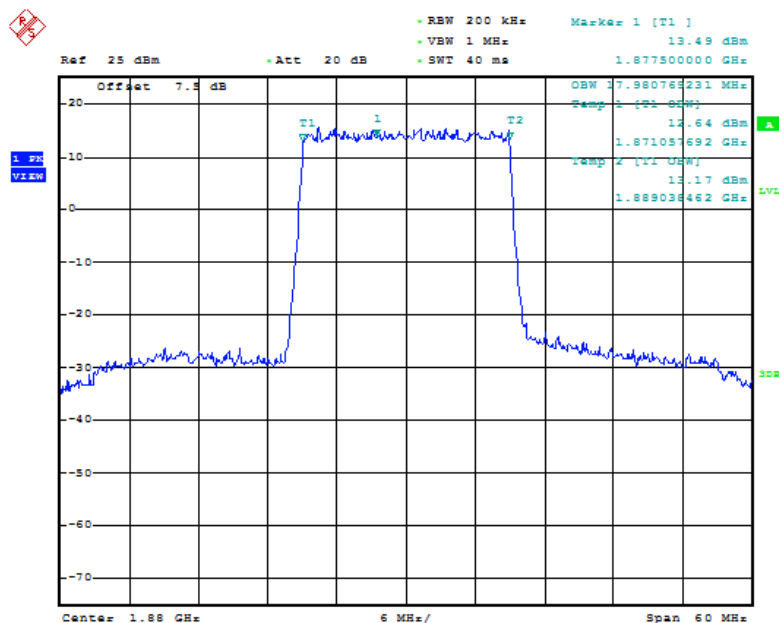
### LTE band 2, 20MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
1880.0	QPSK	16QAM
	17.885	17.981



Date: 30.JAN.2019 11:23:42

Fig.11 LTE band 2, 20MHz Bandwidth, QPSK (99% BW)

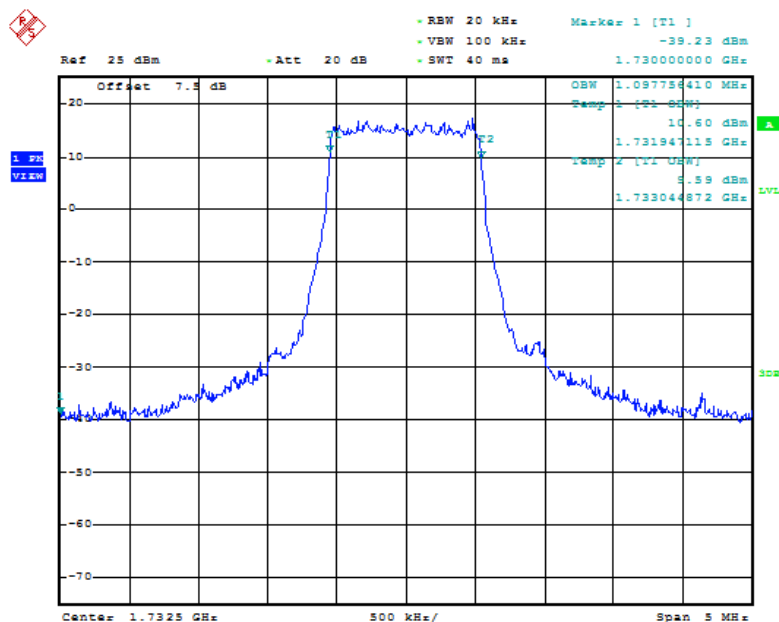


Date: 30.JAN.2019 12:29:56

Fig.12 LTE band 2, 20MHz Bandwidth, 16QAM (99% BW)

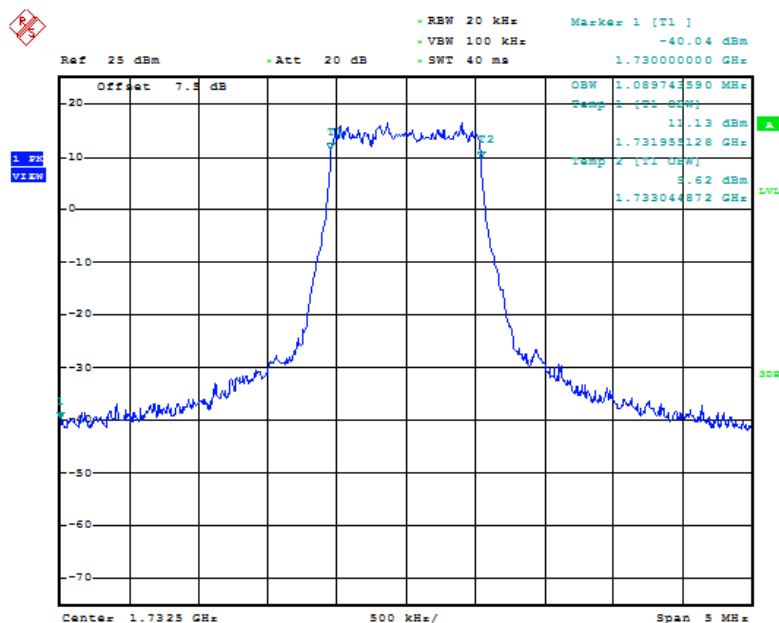
### LTE band 4, 1.4MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
1732.5	QPSK	16QAM
	1.098	1.09



Date: 30.JAN.2019 11:27:44

Fig.13 LTE band 4, 1.4MHz Bandwidth, QPSK (99% BW)



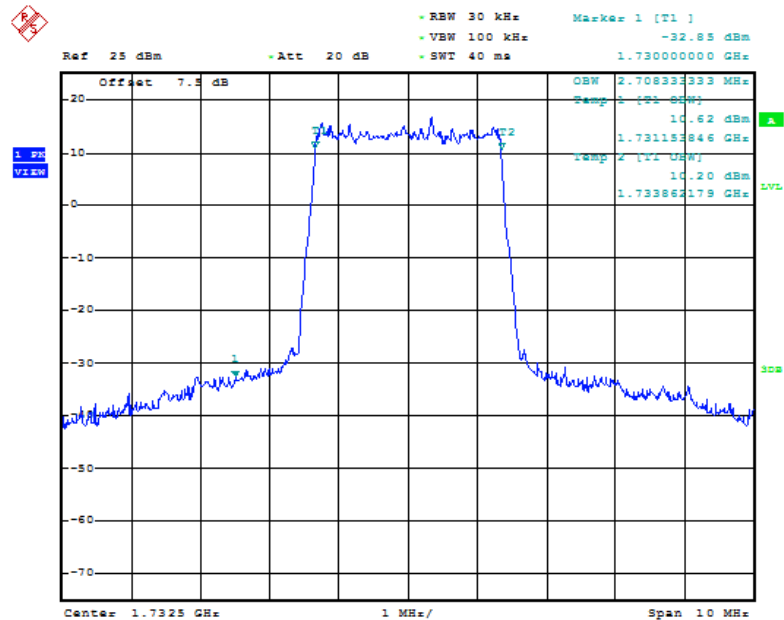
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Fig.14 LTE band 4, 1.4MHz Bandwidth, 16QAM (99% BW)



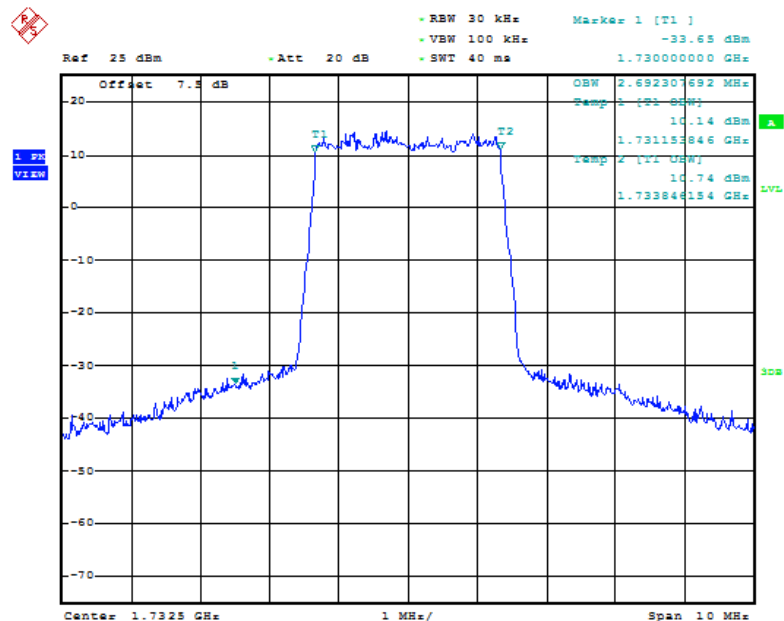
### LTE band 4, 3MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
1732.5	QPSK	16QAM
	2.708	2.692



Date: 30.JAN.2019 11:28:29

Fig.15 LTE band 4, 3MHz Bandwidth, QPSK (99% BW)

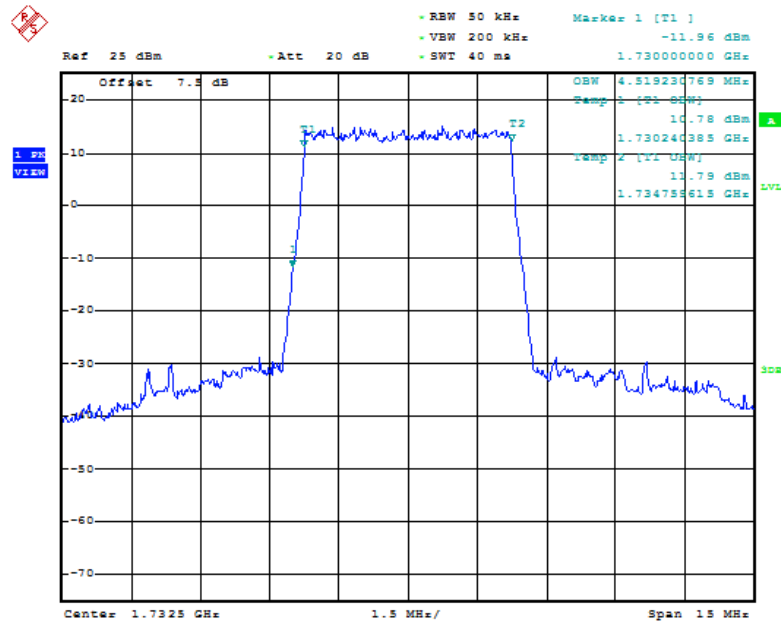


Date: 30.JAN.2019 12:21:55

Fig.16 LTE band 4, 3MHz Bandwidth, 16QAM (99% BW)

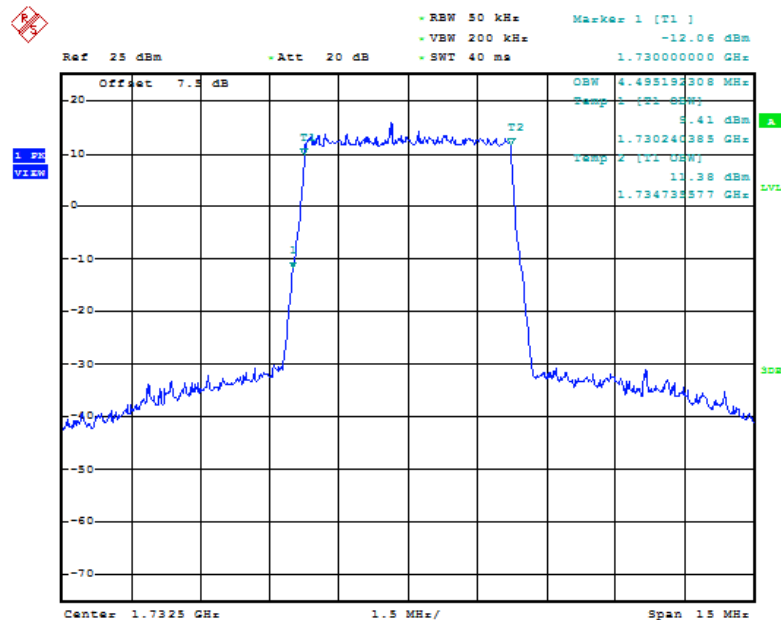
### LTE band 4, 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
1732.5	QPSK	16QAM
	4.519	4.495



Date: 30.JAN.2019 11:29:13

Fig.17 LTE band 4, 5MHz Bandwidth, QPSK (99% BW)

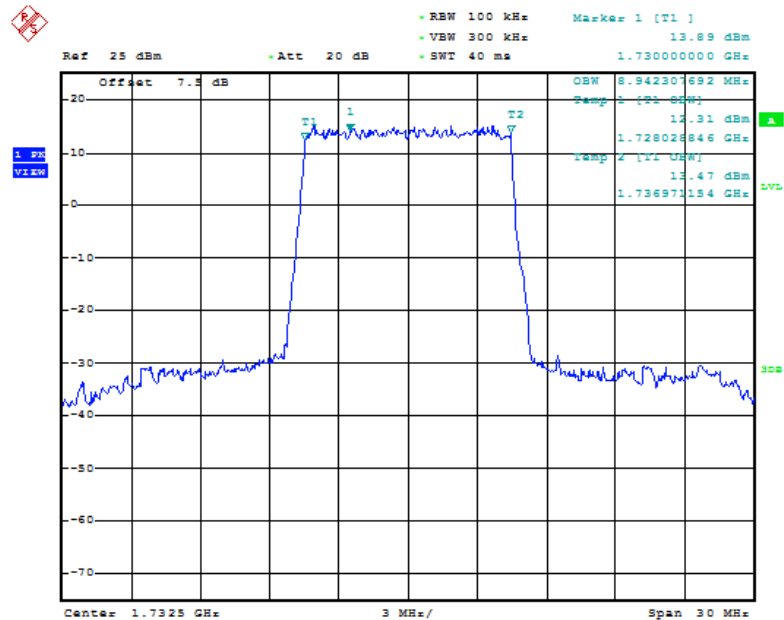


Date: 30.JAN.2019 12:22:40

Fig.18 LTE band 4, 5MHz Bandwidth, 16QAM (99% BW)

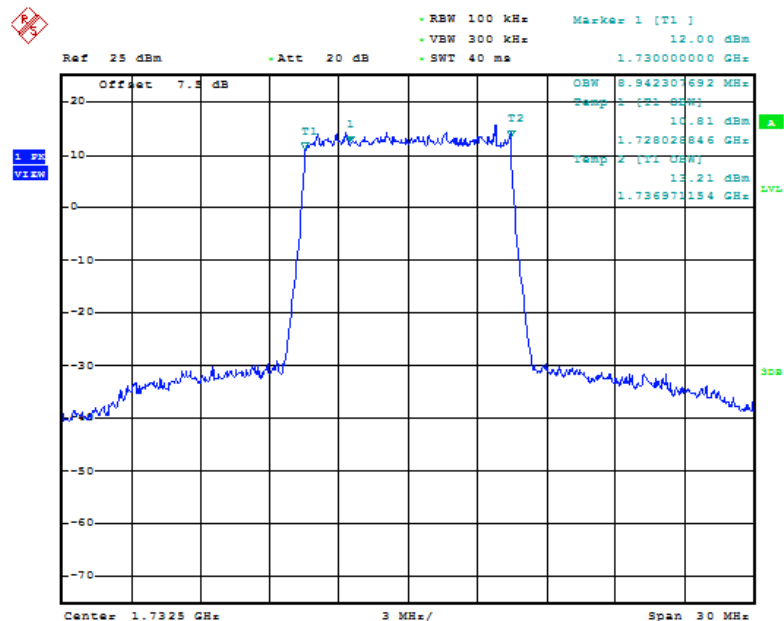
### LTE band 4, 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
1732.5	QPSK	16QAM
	8.942	8.942



Date: 30.JAN.2019 11:29:58

Fig.19 LTE band 4, 10MHz Bandwidth, QPSK (99% BW)

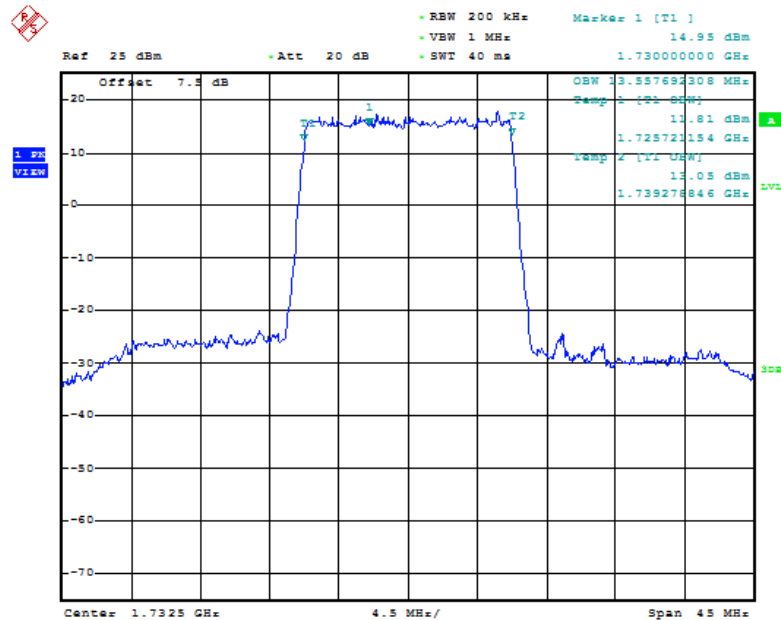


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Fig.20 LTE band 4, 10MHz Bandwidth, 16QAM (99% BW)

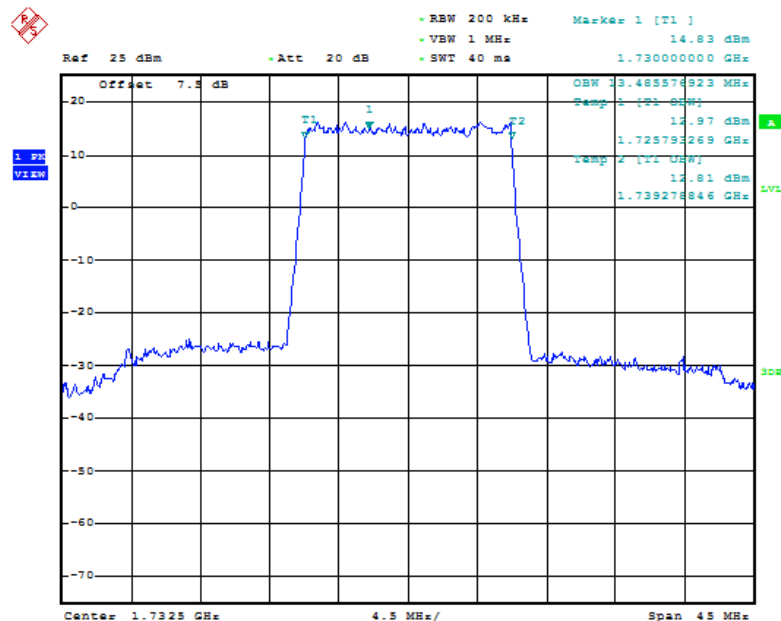
### LTE band 4, 15MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
1732.5	QPSK	16QAM
	13.558	13.486



Date: 30.JAN.2019 11:30:43

Fig.21 LTE band 4, 15MHz Bandwidth, QPSK (99% BW)

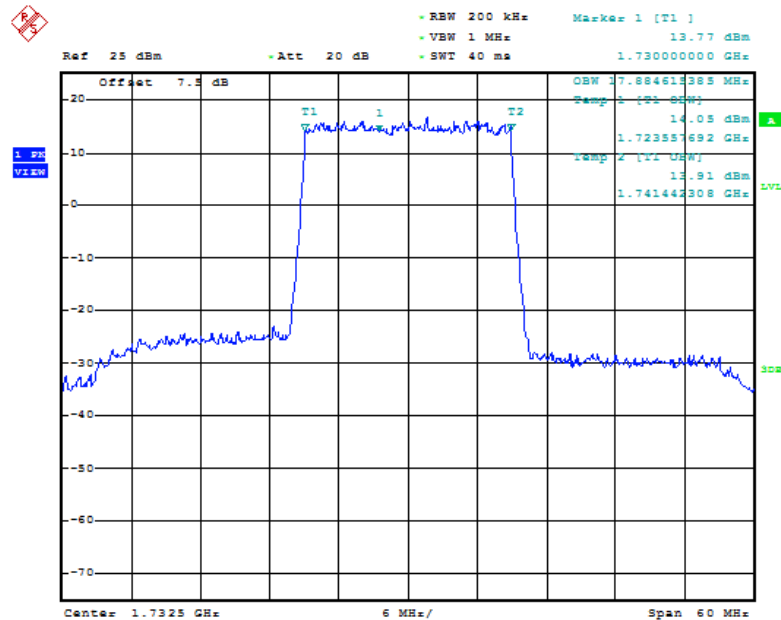


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Fig.22 LTE band 4, 15MHz Bandwidth, 16QAM (99% BW)

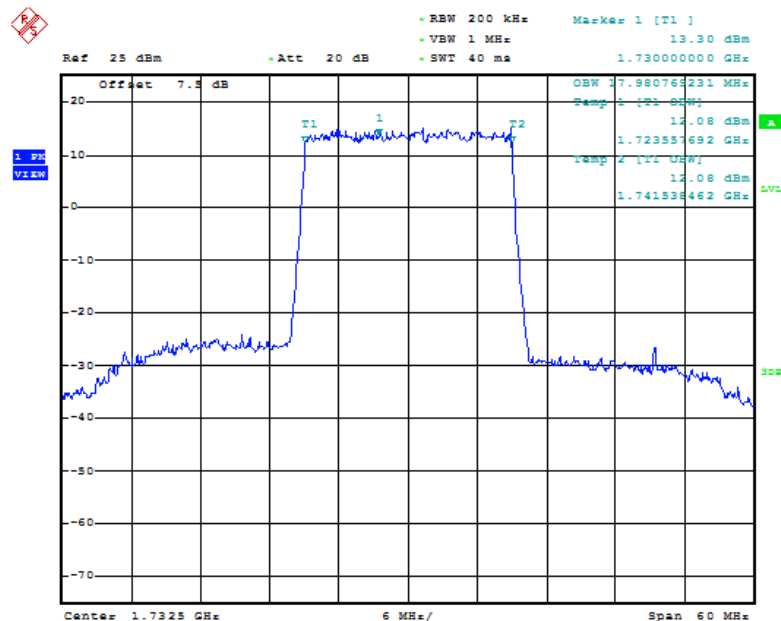
### LTE band 4, 20MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
1732.5	QPSK	16QAM
	17.885	17.981



Date: 30.JAN.2019 11:31:28

Fig.23 LTE band 4, 20MHz Bandwidth, QPSK (99% BW)

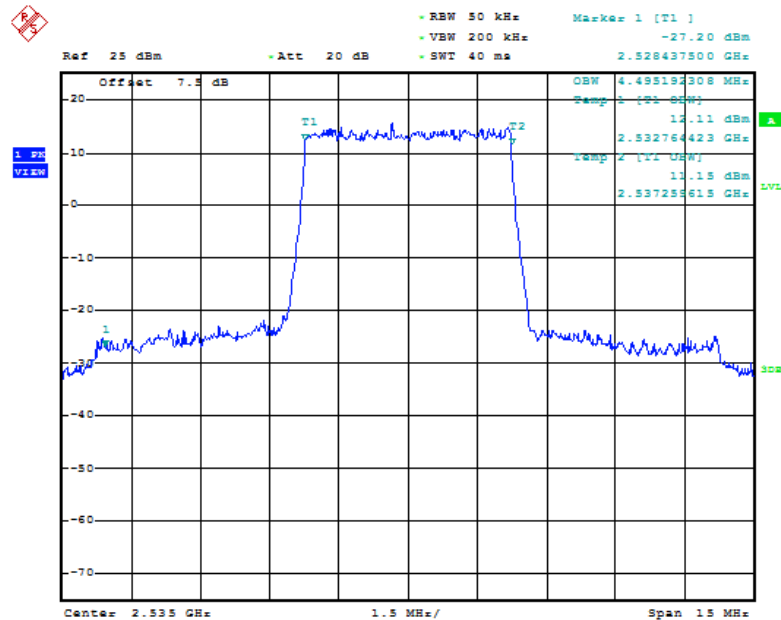


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Fig.24 LTE band 4, 20MHz Bandwidth, 16QAM (99% BW)

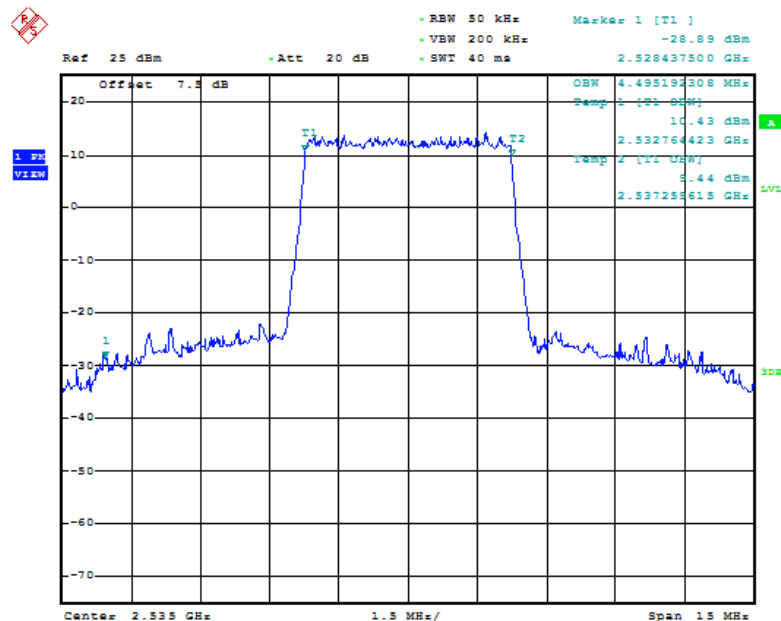
### LTE band 7, 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
2535.0	QPSK	16QAM
	4.495	4.495



Date: 30.JAN.2019 13:10:41

Fig.25 LTE band 7, 5MHz Bandwidth, QPSK (99% BW)

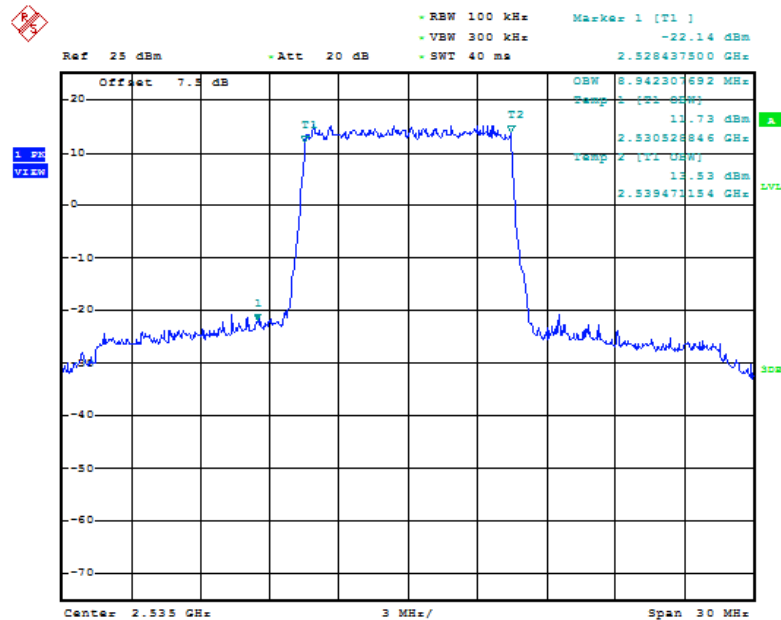


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Fig.26 LTE band 7, 5MHz Bandwidth, 16QAM (99% BW)

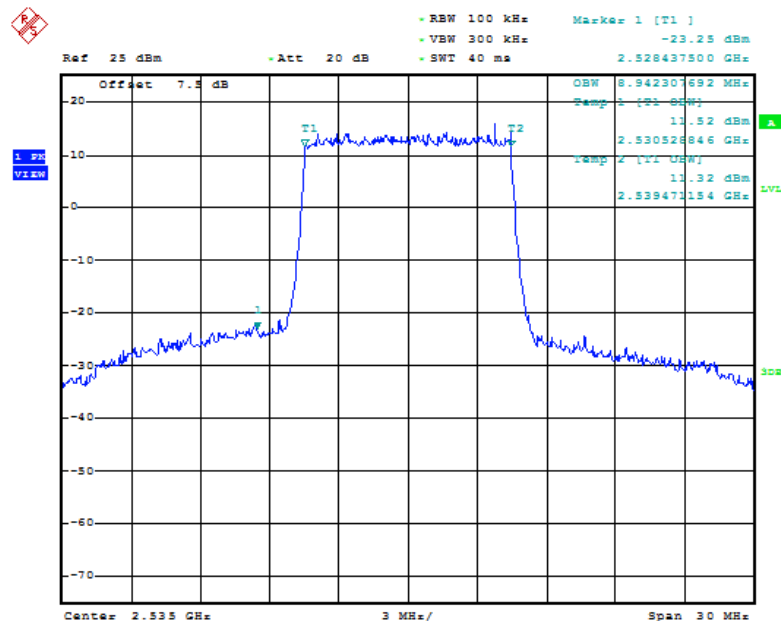
### LTE band 7, 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
2535.0	QPSK	16QAM
	8.942	8.942



Date: 30.JAN.2019 13:12:04

Fig.27 LTE band 7, 10MHz Bandwidth, QPSK (99% BW)

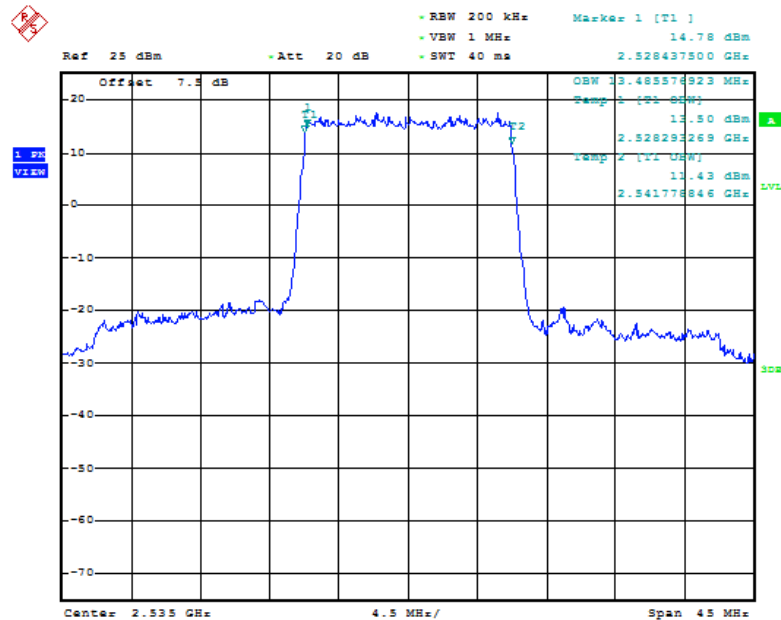


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Fig.28 LTE band 7, 10MHz Bandwidth, 16QAM (99% BW)

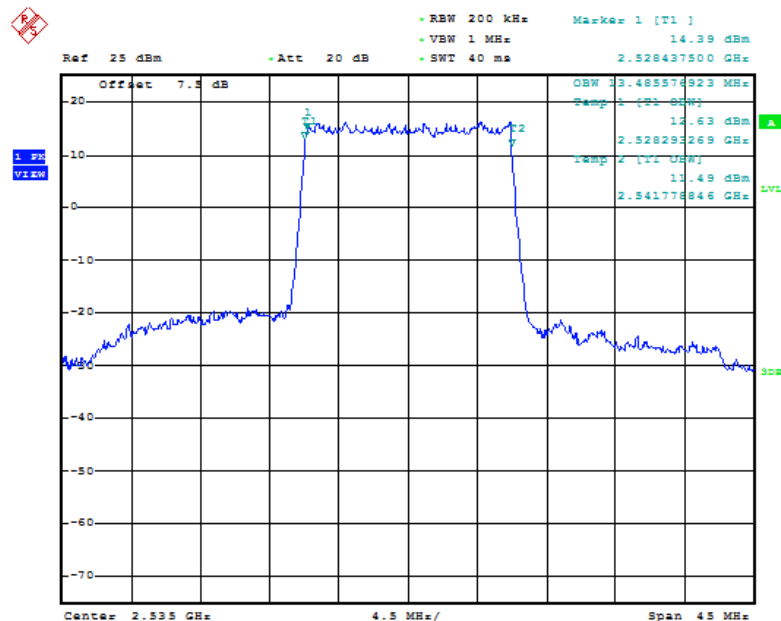
### LTE band 7, 15MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
2535.0	QPSK	16QAM
	13.486	13.486



Date: 30.JAN.2019 13:13:27

Fig.29 LTE band 7, 15MHz Bandwidth, QPSK (99% BW)



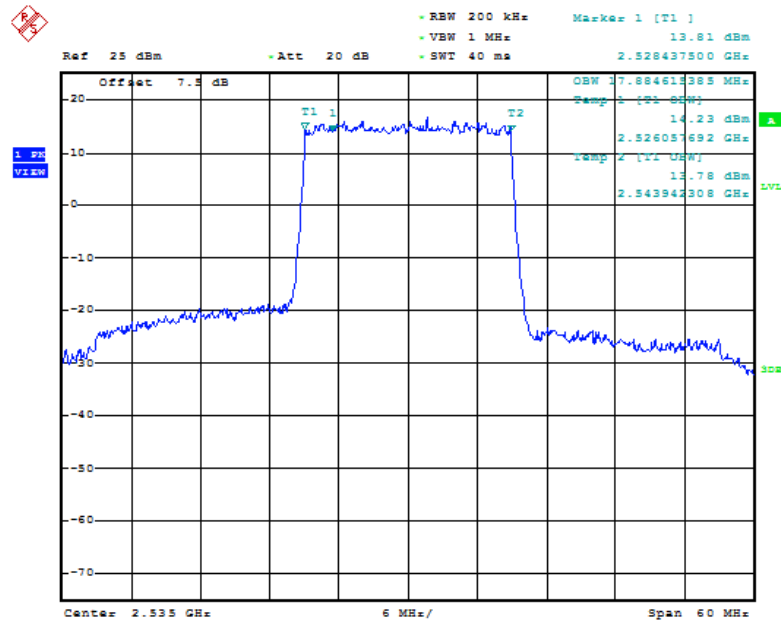
Date: 30.JAN.2019 13:14:05

Fig.30 LTE band 7, 15MHz Bandwidth, 16QAM (99% BW)



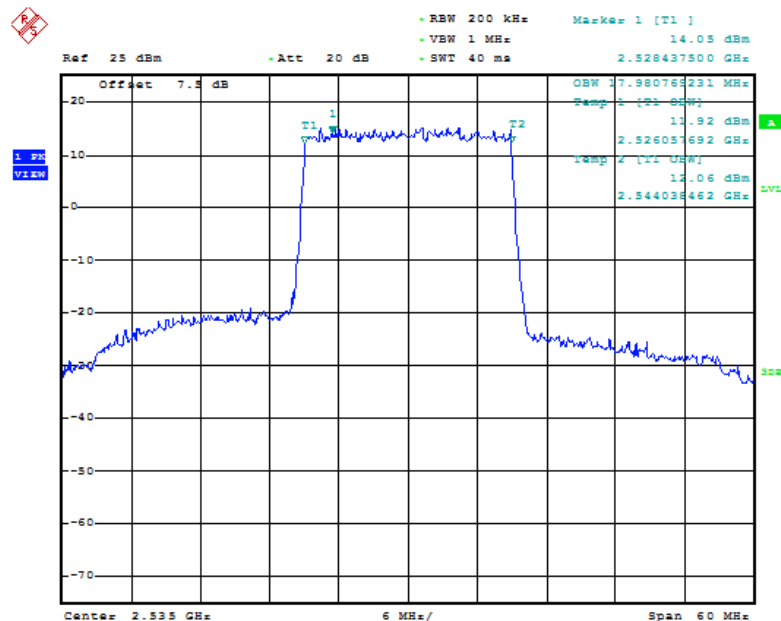
### LTE band 7, 20MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
	QPSK	16QAM
2535.0	17.885	17.981



Date: 30.JAN.2019 13:14:50

Fig.31 LTE band 7, 20MHz Bandwidth, QPSK (99% BW)

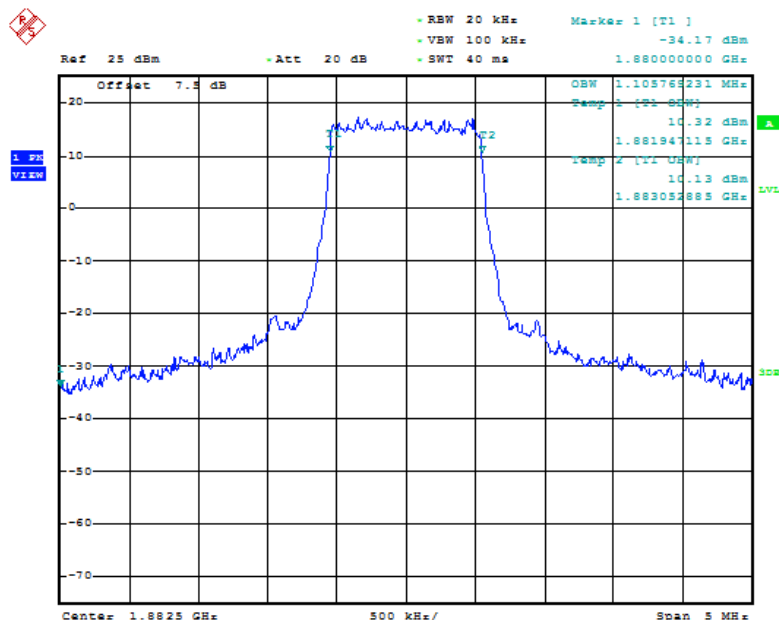


Date: 30.JAN.2019 13:15:28

Fig.32 LTE band 7, 20MHz Bandwidth, 16QAM (99% BW)

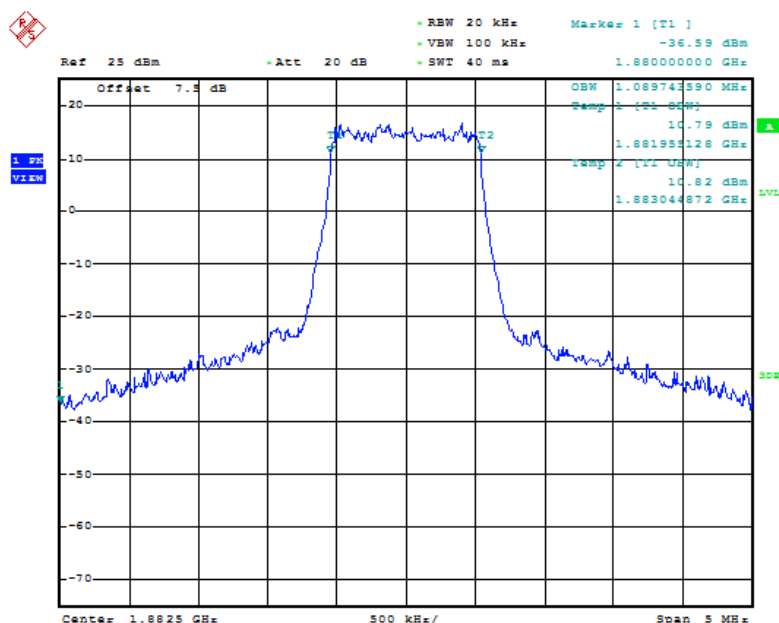
LTE band 25, 1.4MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
1882.5	QPSK	16QAM
	1.106	1.09



Date: 30.JAN.2019 11:11:28

Fig.33 LTE band 25, 1.4MHz Bandwidth, QPSK (99% BW)

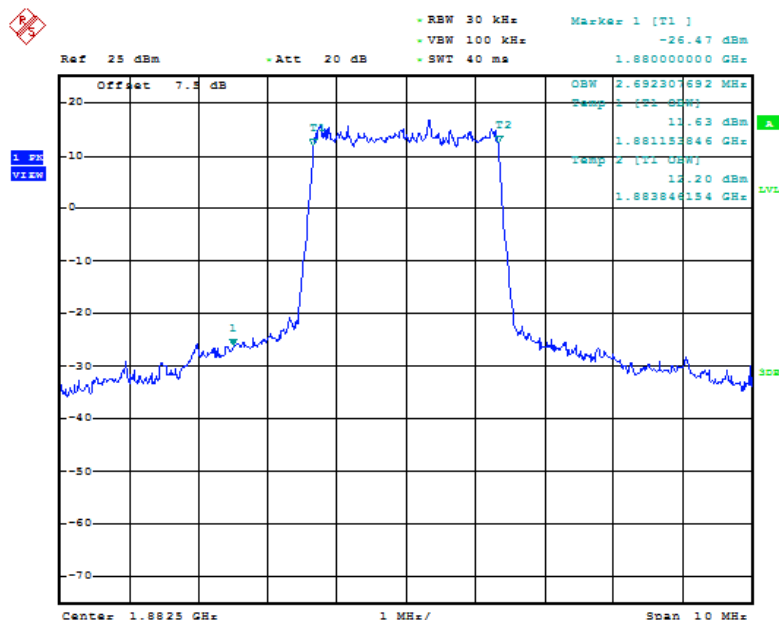


Date: 30.JAN.2019 12:35:44

Fig.34 LTE band 25, 1.4MHz Bandwidth, 16QAM (99% BW)

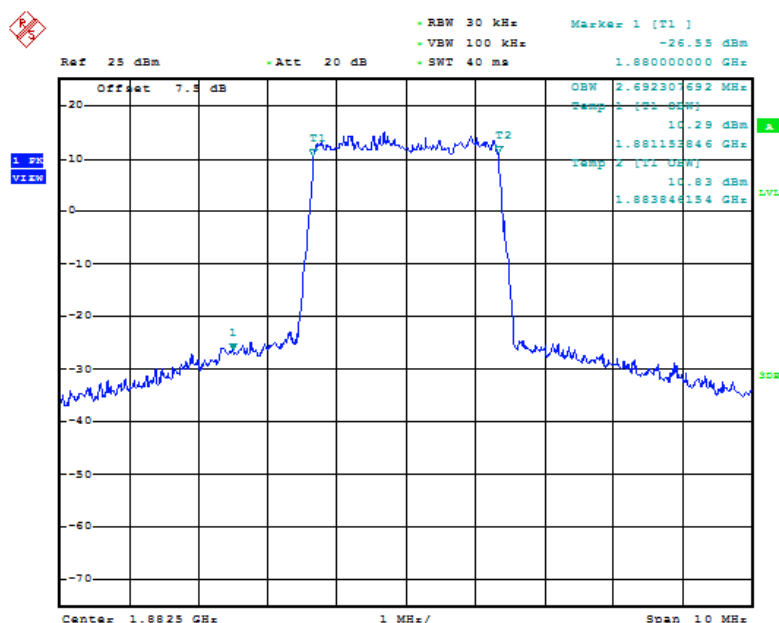
# LTE band 25, 3MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
1882.5	QPSK	16QAM
	2.692	2.692



Date: 30.JAN.2019 11:12:12

Fig.35 LTE band 25, 3MHz Bandwidth, QPSK (99% BW)

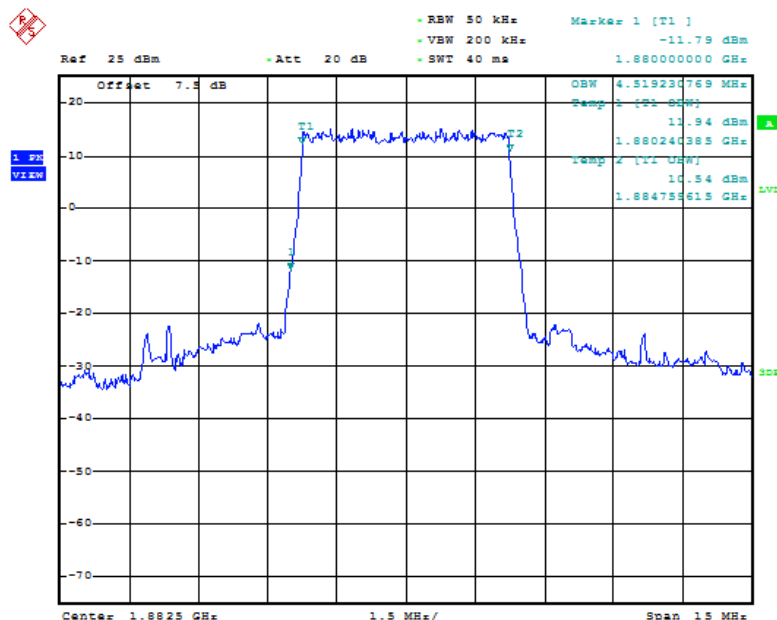


Date: 30.JAN.2019 12:36:28

Fig.36 LTE band 25, 3MHz Bandwidth, 16QAM (99% BW)

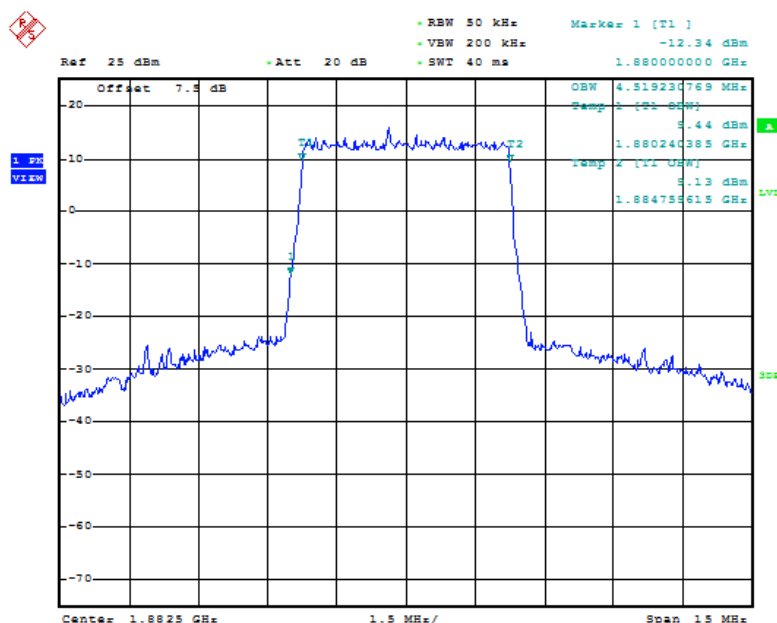
### LTE band 25, 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
1882.5	QPSK	16QAM
	4.519	4.519



Date: 30.JAN.2019 11:12:57

Fig.37 LTE band 25, 5MHz Bandwidth, QPSK (99% BW)

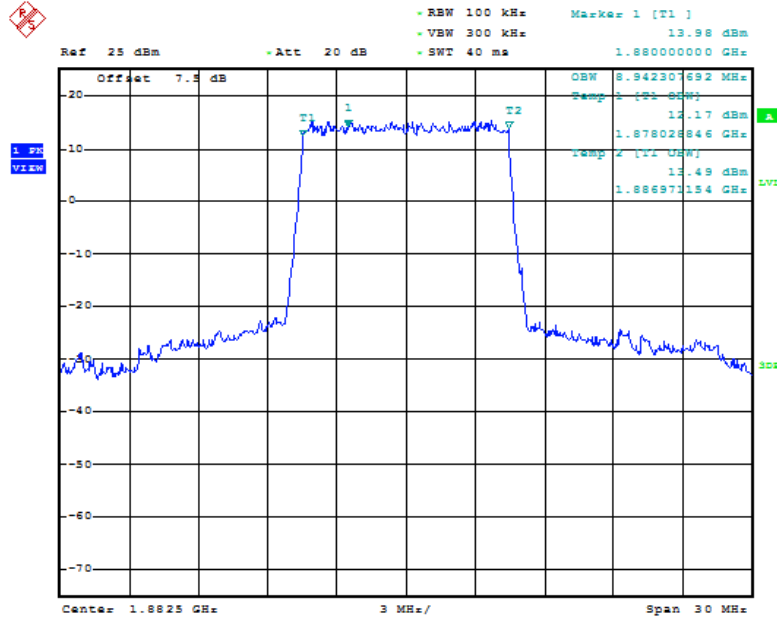


Date: 30.JAN.2019 12:37:13

Fig.38 LTE band 25, 5MHz Bandwidth, 16QAM (99% BW)

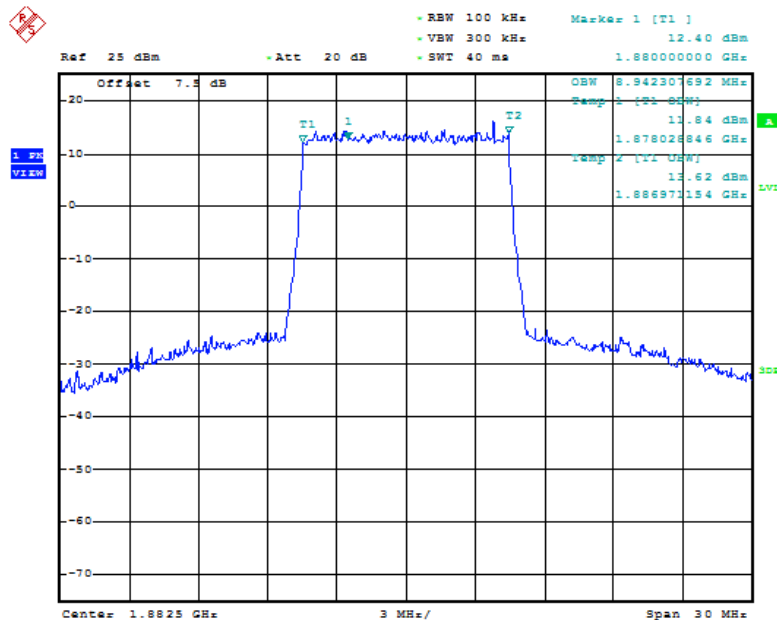
### LTE band 25, 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
1882.5	QPSK	16QAM
	8.942	8.942



Date: 30.JAN.2019 11:13:41

Fig.39 LTE band 25, 10MHz Bandwidth, QPSK (99% BW)

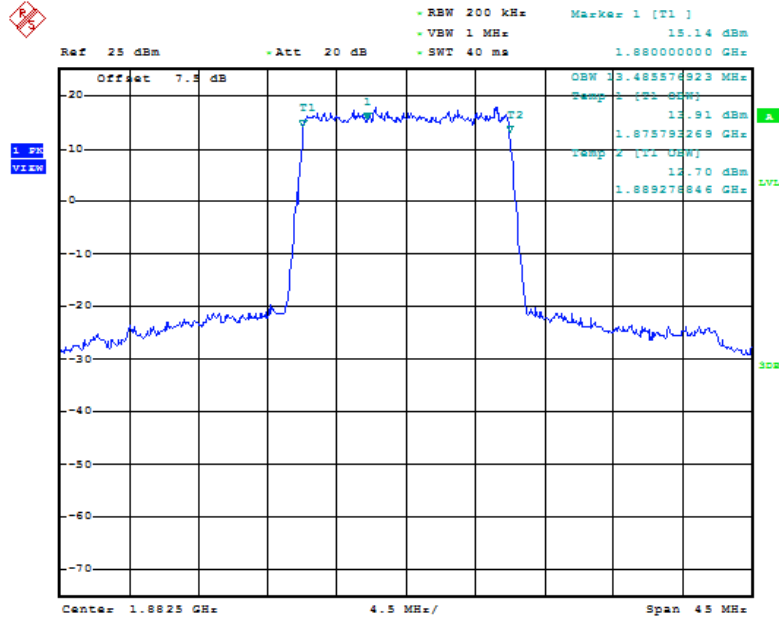


Date: 30.JAN.2019 12:37:58

Fig.40 LTE band 25, 10MHz Bandwidth, 16QAM (99% BW)

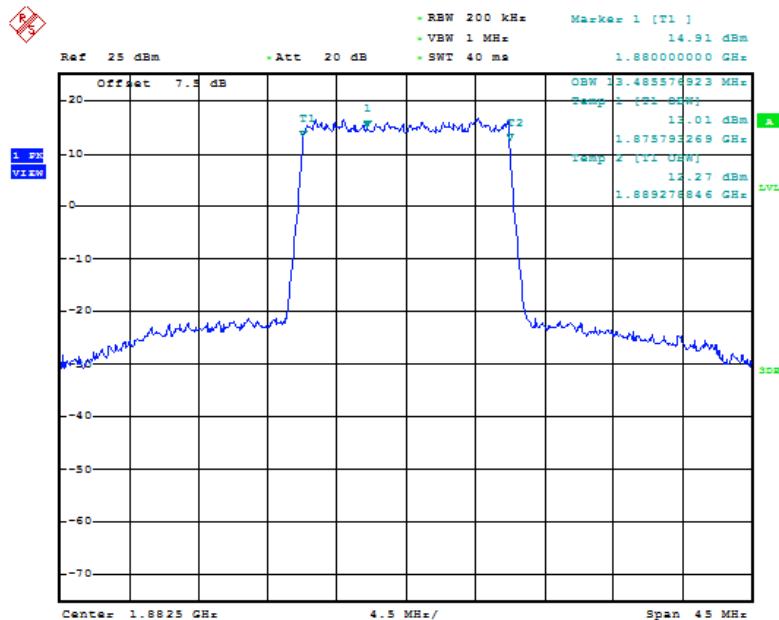
### LTE band 25, 15MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
1882.5	QPSK	16QAM
	13.486	13.486



Date: 30.JAN.2019 11:14:27

Fig.41 LTE band 25, 15MHz Bandwidth, QPSK (99% BW)

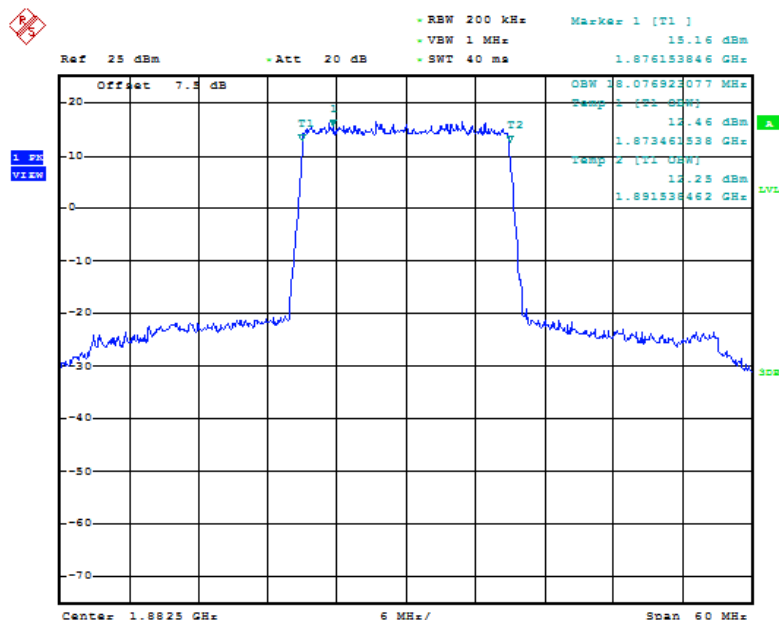


Date: 30.JAN.2019 12:38:43

Fig.42 LTE band 25, 15MHz Bandwidth, 16QAM (99% BW)

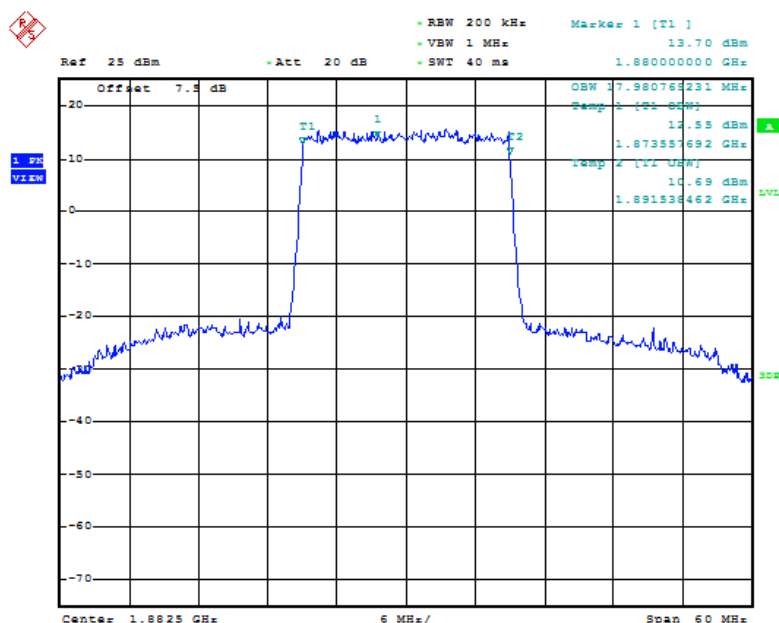
### LTE band 25, 20MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
1882.5	QPSK	16QAM
	18.077	17.981



Date: 30.JAN.2019 11:16:20

Fig.43 LTE band 25, 20MHz Bandwidth, QPSK (99% BW)

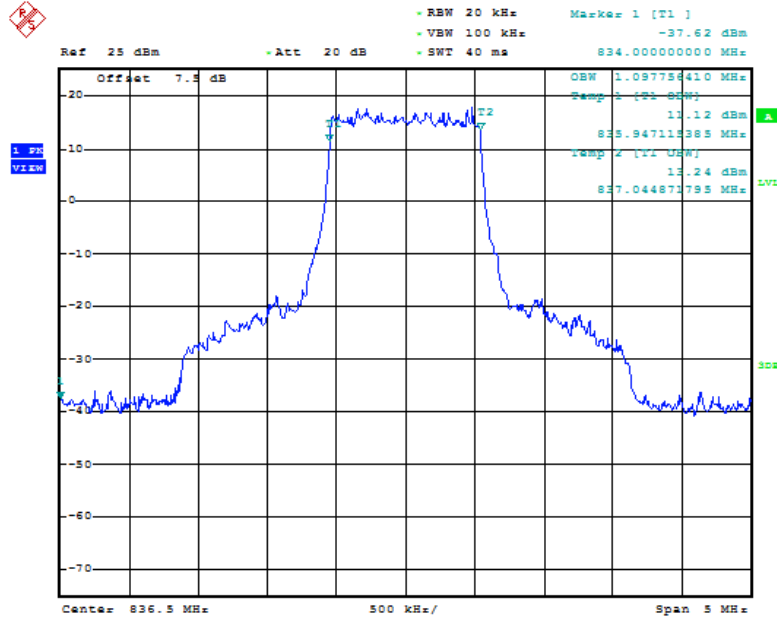


Date: 30.JAN.2019 12:39:27

Fig.44 LTE band 25, 20MHz Bandwidth, 16QAM (99% BW)

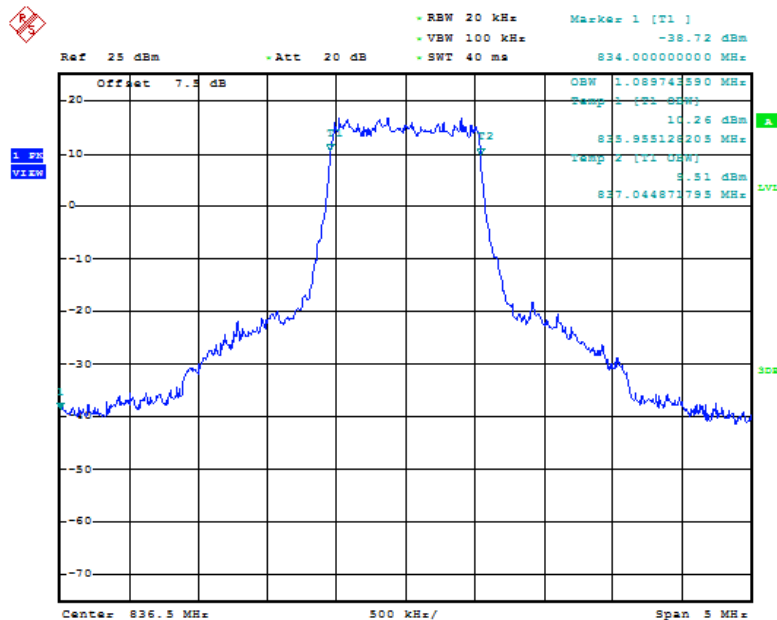
### LTE band 26 (Part 22), 1.4MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
	QPSK	16QAM
836.5	1.098	1.09



Date: 30.JAN.2019 11:06:11

Fig.45 LTE band 26(Part22), 1.4MHz Bandwidth, QPSK (99% BW)



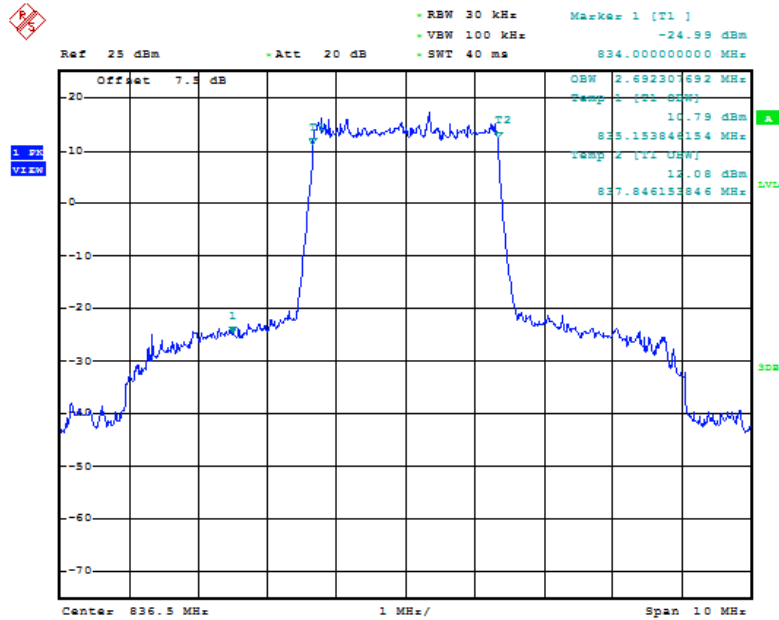
Date: 30.JAN.2019 12:42:59

Fig.46 LTE band 26(Part22), 1.4MHz Bandwidth, 16QAM (99% BW)



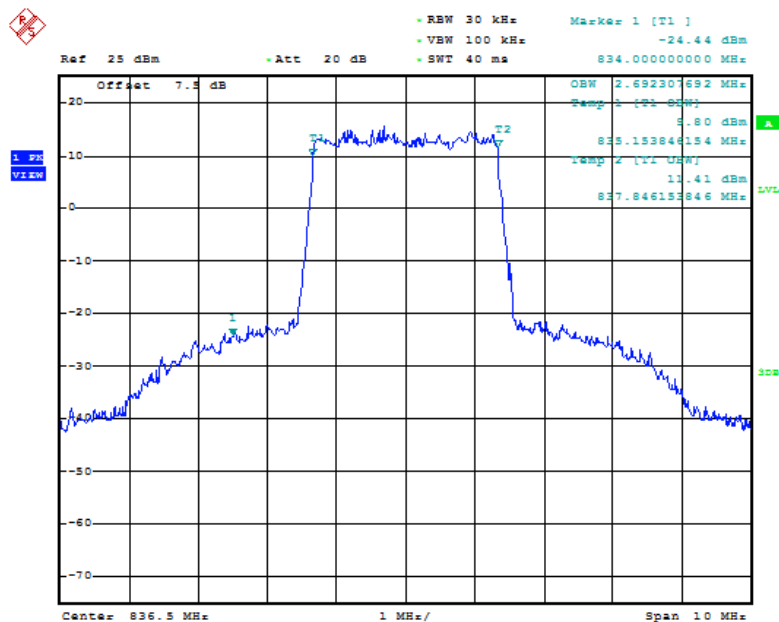
**LTE band 26 (Part 22), 3MHz (99%)**

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
836.5	QPSK	16QAM
	2.692	2.692



Date: 30.JAN.2019 11:06:56

Fig.47 LTE band 26(Part22), 3MHz Bandwidth, QPSK (99% BW)

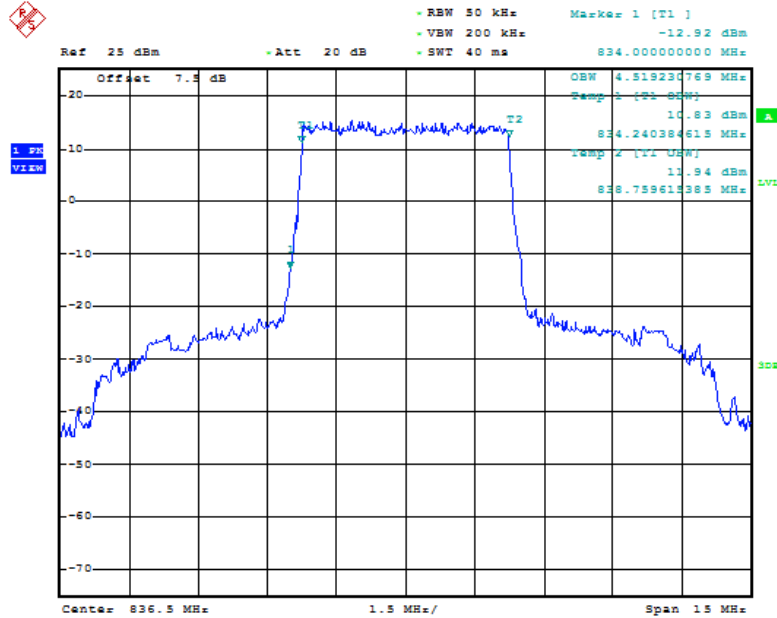


Date: 30.JAN.2019 12:43:44

Fig.48 LTE band 26(Part22), 3MHz Bandwidth, 16QAM (99% BW)

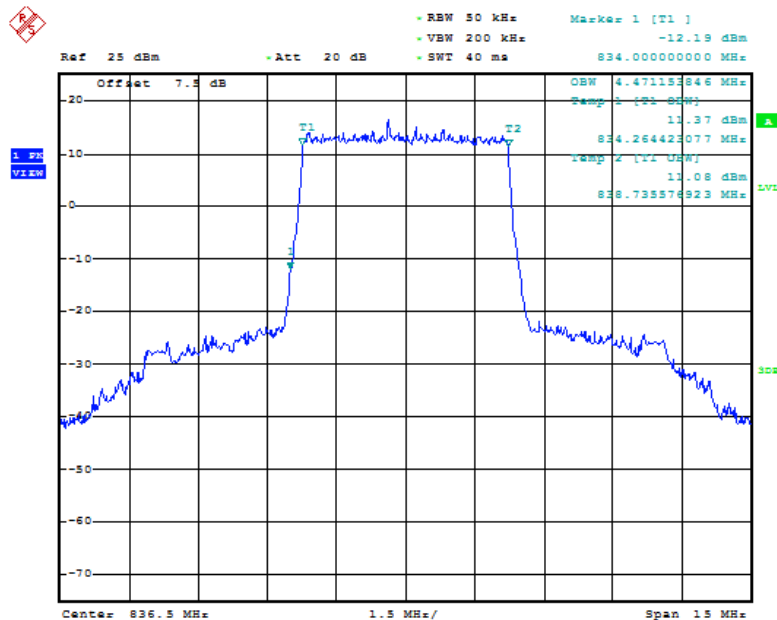
### LTE band 26 (Part 22), 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
	QPSK	16QAM
836.5	4.519	4.471



Date: 30.JAN.2019 11:07:40

Fig.49 LTE band 26(Part22), 5MHz Bandwidth, QPSK (99% BW)

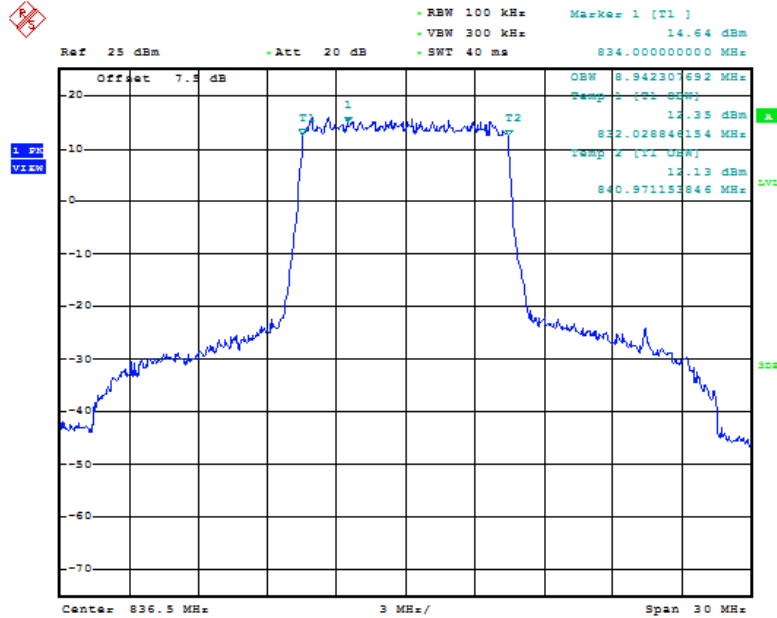


Date: 30.JAN.2019 12:44:28

Fig.50 LTE band 26(Part22), 5MHz Bandwidth, 16QAM (99% BW)

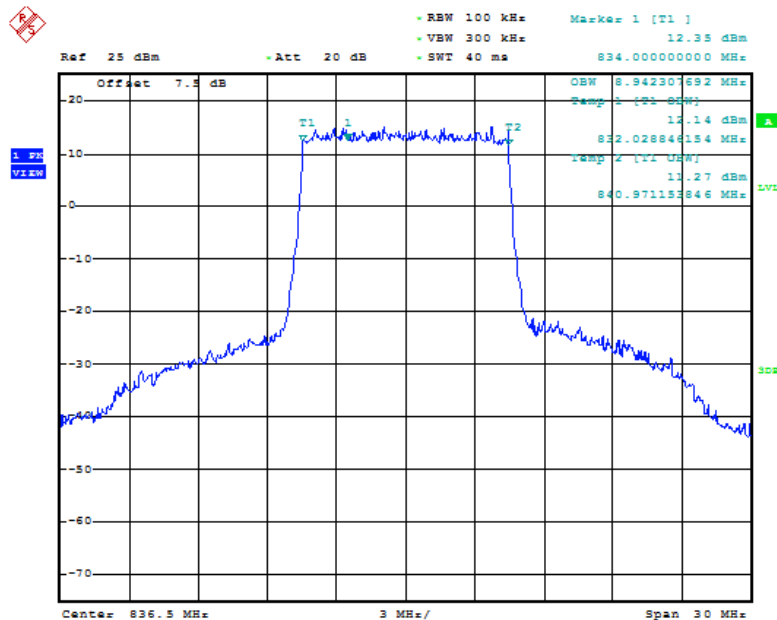
### LTE band 26 (Part 22), 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
836.5	QPSK	16QAM
	8.942	8.942



Date: 30.JAN.2019 11:08:24

Fig.51 LTE band 26(Part22), 10MHz Bandwidth, QPSK (99% BW)

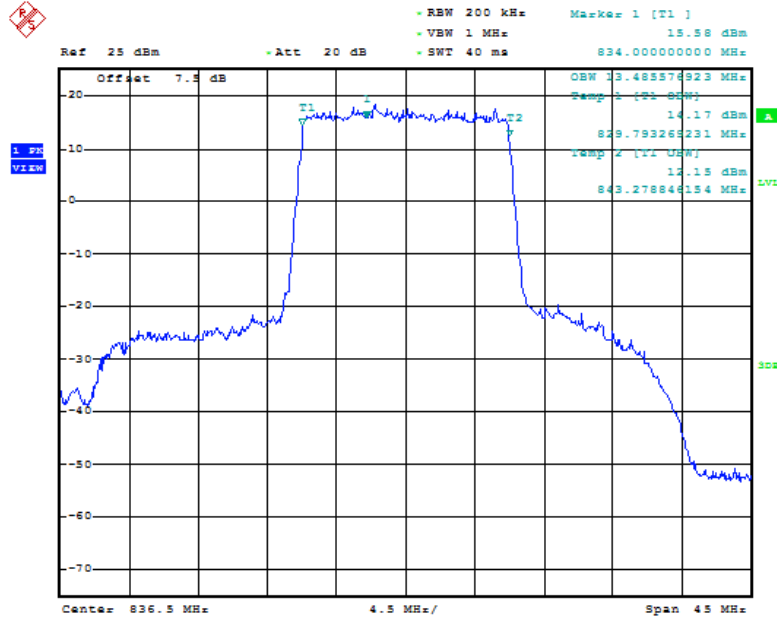


Date: 30.JAN.2019 12:45:13

Fig.52 LTE band 26(Part22), 10MHz Bandwidth, 16QAM (99% BW)

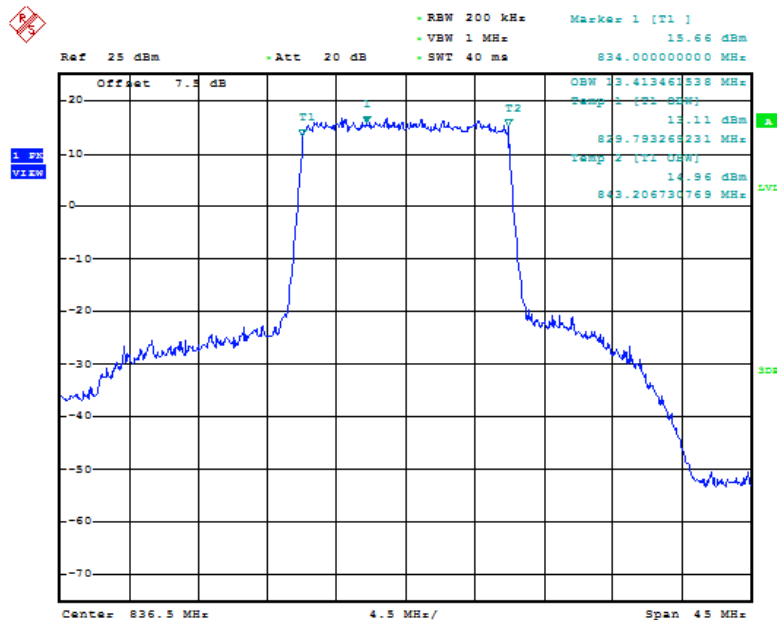
### LTE band 26 (Part 22), 15MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
836.5	QPSK	16QAM
	13.486	13.413



Date: 30.JAN.2019 11:09:09

Fig.53 LTE band 26(Part22), 15MHz Bandwidth, QPSK (99% BW)

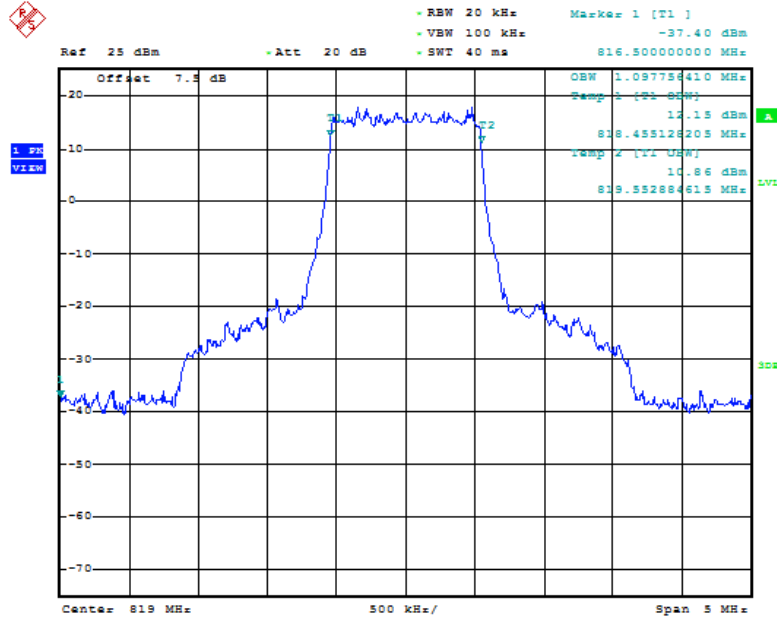


Date: 30.JAN.2019 12:45:58

Fig.54 LTE band 26(Part22), 15MHz Bandwidth, 16QAM (99% BW)

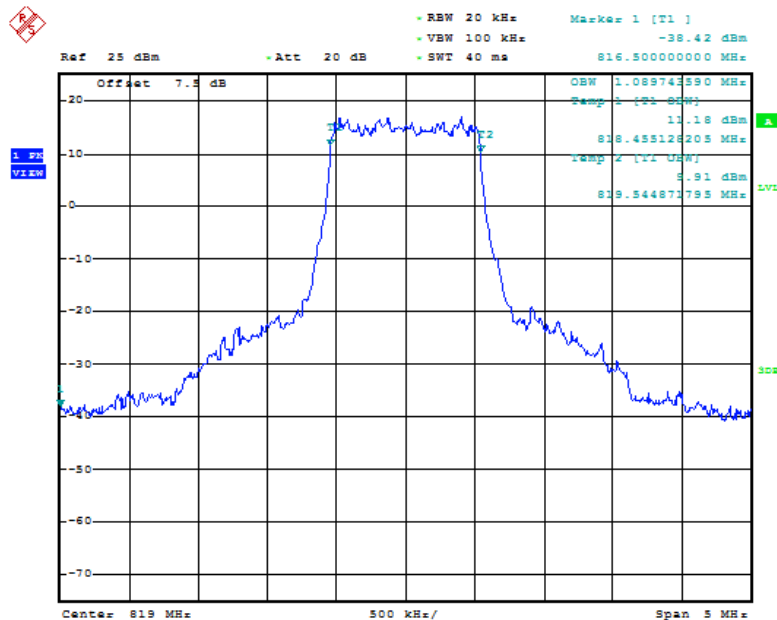
LTE band 26 (Part 90), 1.4MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
	QPSK	16QAM
819	1.098	1.09



Date: 31.JAN.2019 10:47:59

Fig.55 LTE band 26(Part90), 1.4MHz Bandwidth, QPSK (99% BW)

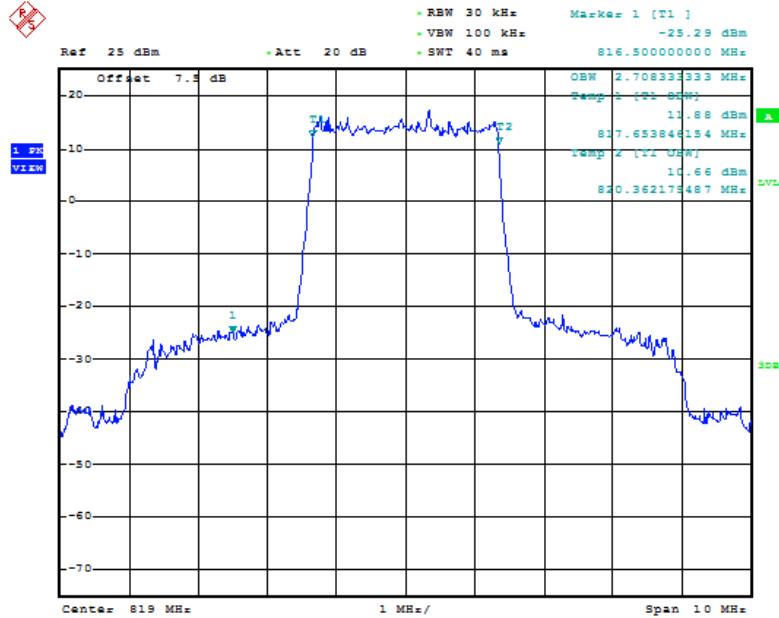


Date: 31.JAN.2019 10:48:38

Fig.56 LTE band 26(Part90), 1.4MHz Bandwidth, 16QAM (99% BW)

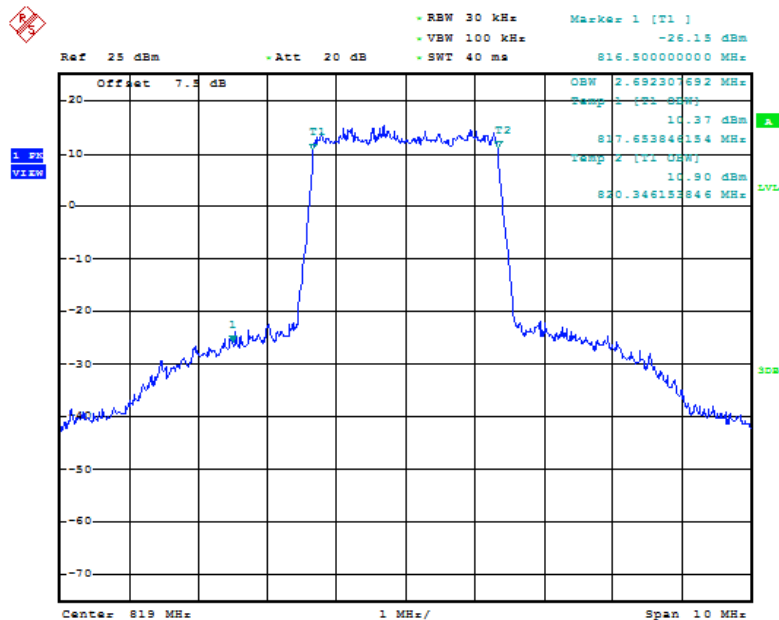
### LTE band 26 (Part 90), 3MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
	QPSK	16QAM
819	2.708	2.692



Date: 31.JAN.2019 10:49:24

Fig.57 LTE band 26(Part90), 3MHz Bandwidth, QPSK (99% BW)

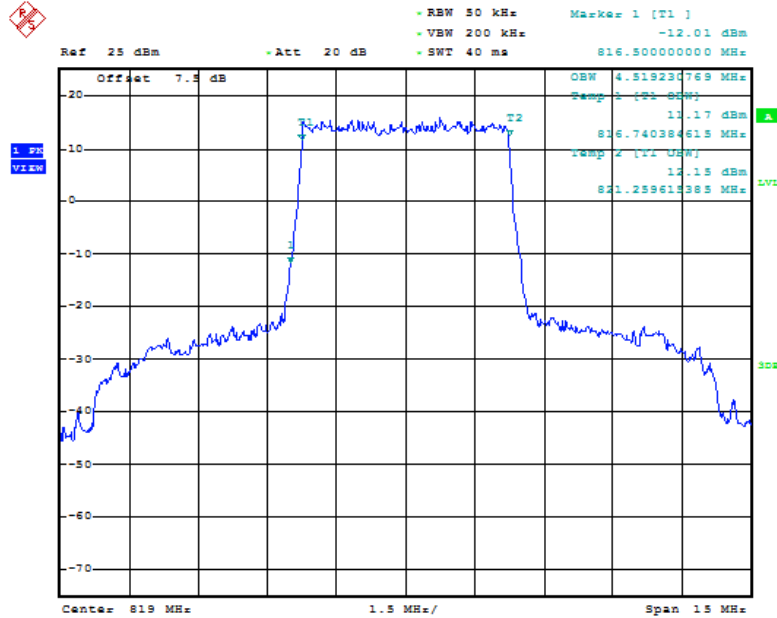


Date: 31.JAN.2019 10:50:02

Fig.58 LTE band 26(Part90), 3MHz Bandwidth, 16QAM (99% BW)

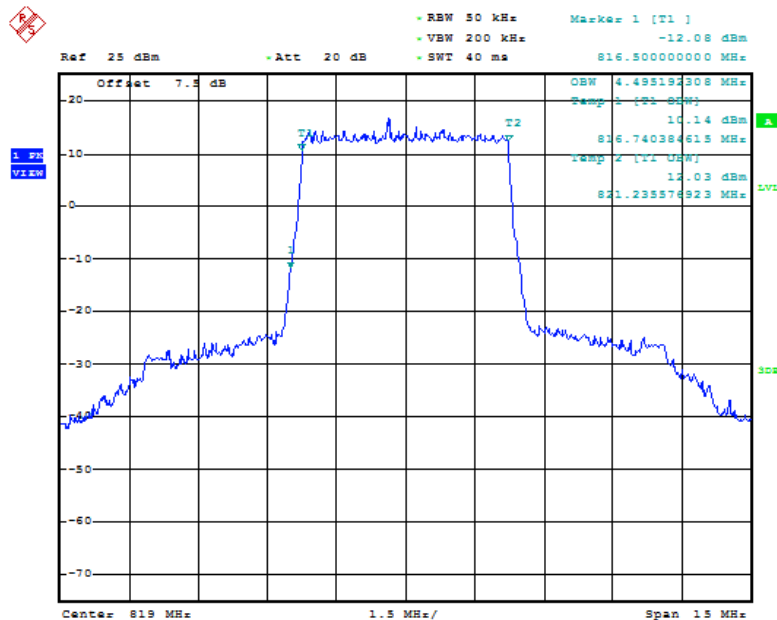
### LTE band 26 (Part 90), 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
819	QPSK	16QAM
	4.519	4.495



Date: 31.JAN.2019 10:50:48

Fig.59 LTE band 26(Part90), 5MHz Bandwidth, QPSK (99% BW)

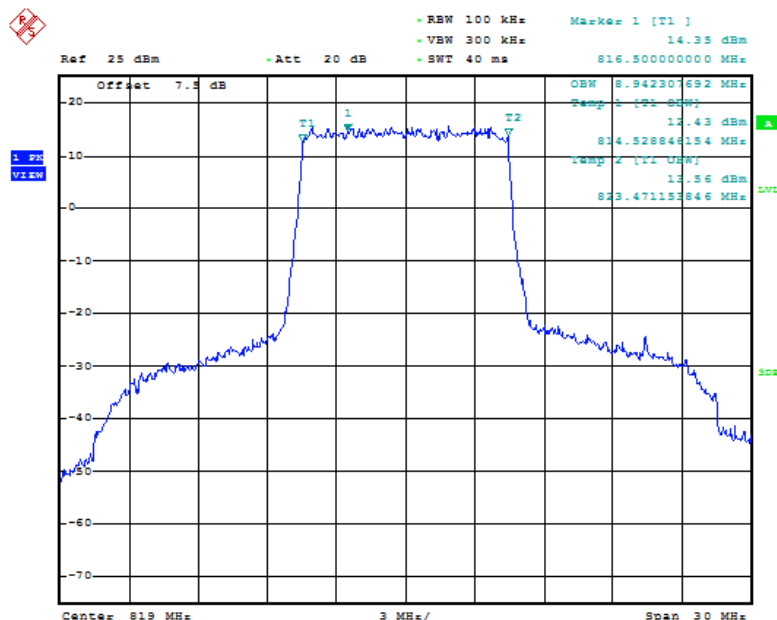


Date: 31.JAN.2019 10:51:27

Fig.60 LTE band 26(Part90), 5MHz Bandwidth, 16QAM (99% BW)

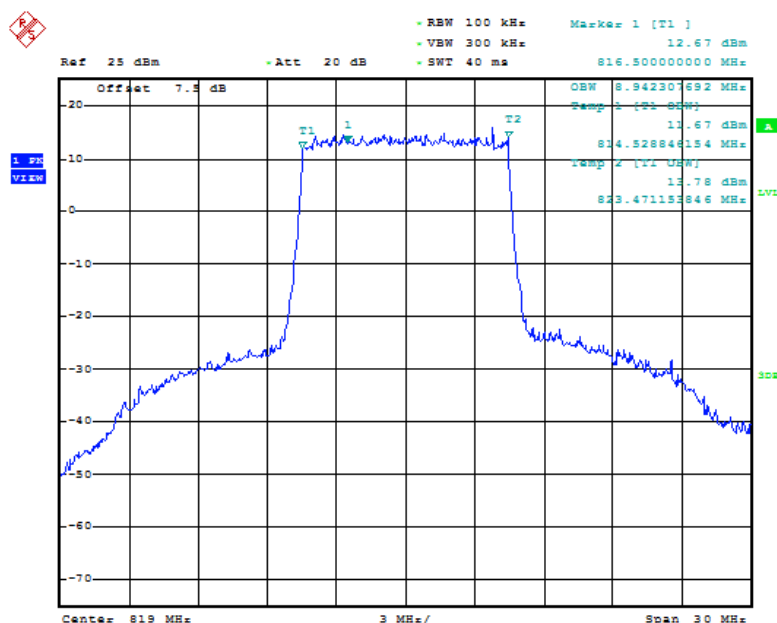
# LTE band 26 (Part 90), 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
819	QPSK	16QAM
	8.942	8.942



Date: 31.JAN.2019 10:52:13

Fig.61 LTE band 26(Part90), 10MHz Bandwidth, QPSK (99% BW)



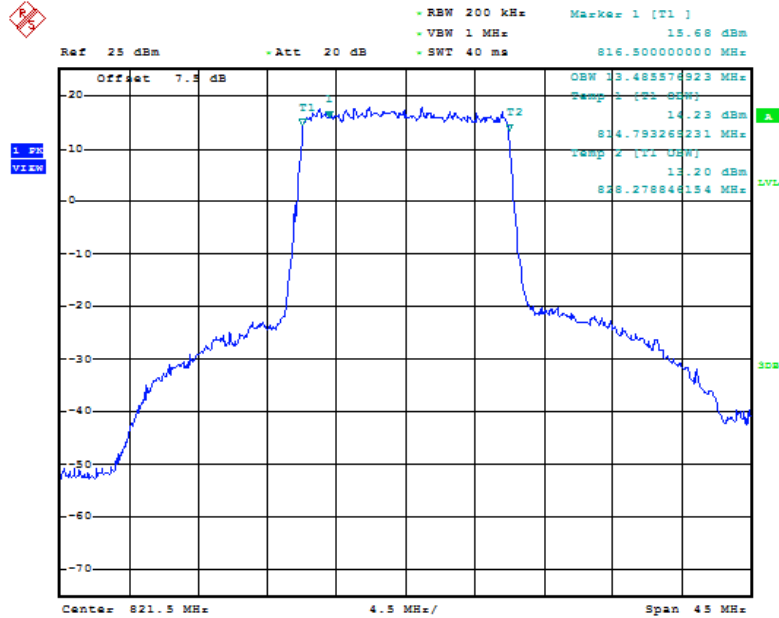
Date: 31.JAN.2019 10:52:52

Fig.62 LTE band 26(Part90), 10MHz Bandwidth, 16QAM (99% BW)



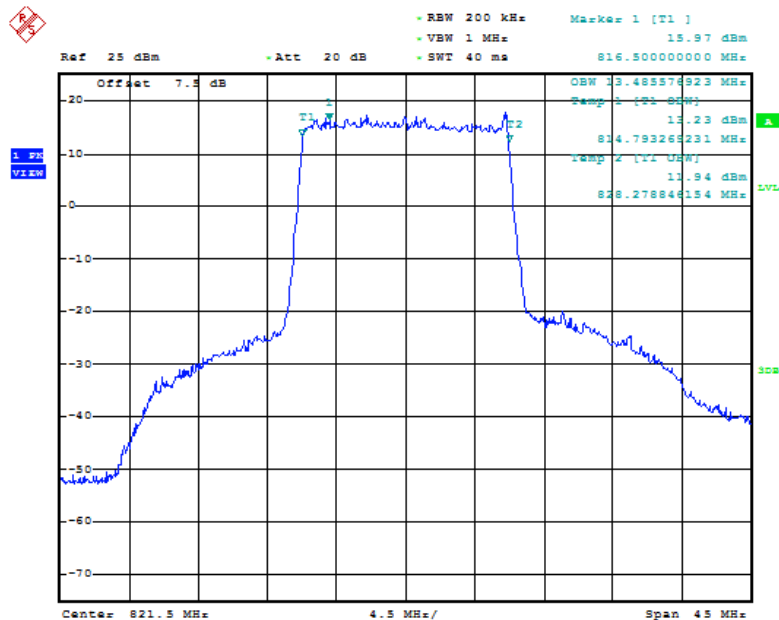
### LTE band 26 (Part 90), 15MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)( MHz)	
	QPSK	16QAM
821.5	13.486	13.486



Date: 31.JAN.2019 10:54:52

Fig.63 LTE band 26(Part90), 1.4MHz Bandwidth, QPSK (99% BW)



Date: 31.JAN.2019 10:55:30

Fig.64 LTE band 26(Part90), 1.4MHz Bandwidth, 16QAM (99% BW)

## **ANNEX A.5. EMISSION BANDWIDTH**

### **Reference**

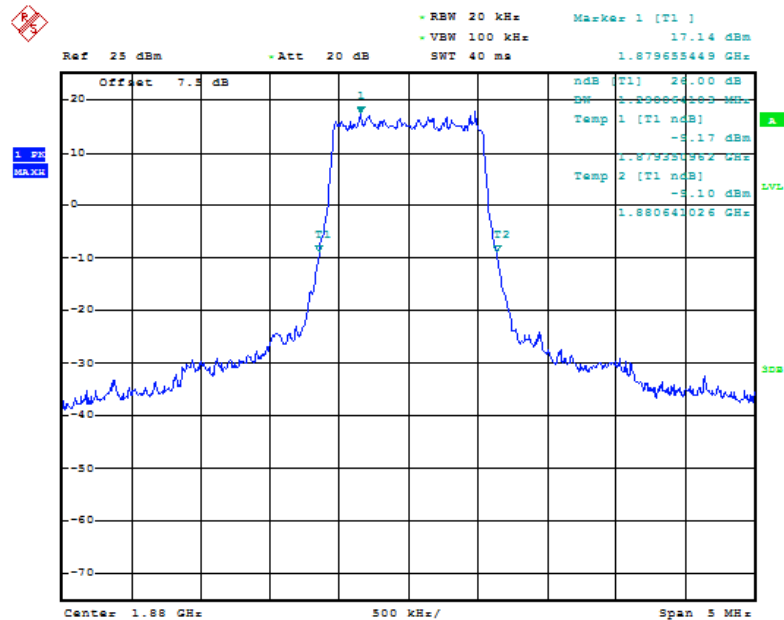
FCC: CFR Part 22.917(b), 24.238(a), 27.53(g), 27.53(h), 27.53(m), 90.1215.

### **A.5.1 Emission Bandwidth Results**

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

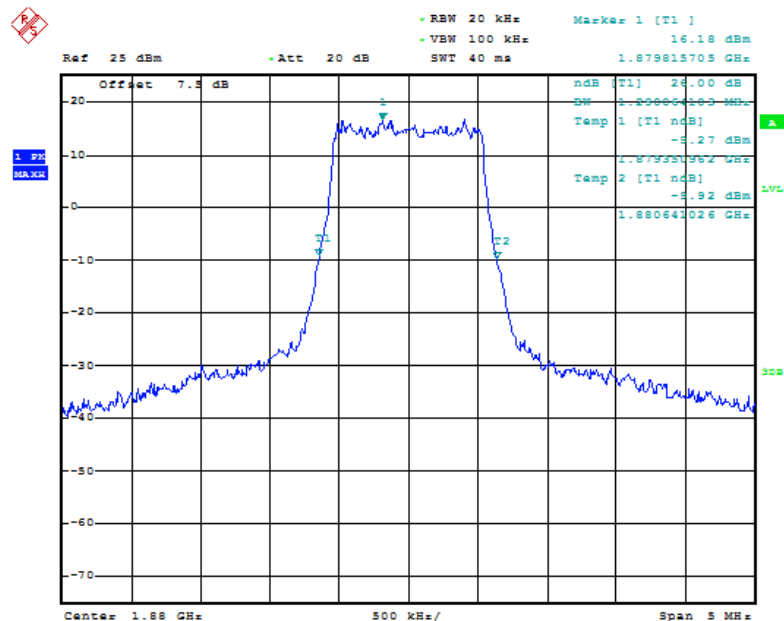
**LTE band 2, 1.4MHz (-26dBc)**

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
1880.0	QPSK	16QAM
	1.290064	1.290064



Date: 30.JAN.2019 09:49:16

Fig.65 LTE band 2, 1.4MHz Bandwidth, QPSK (-26dBc BW)

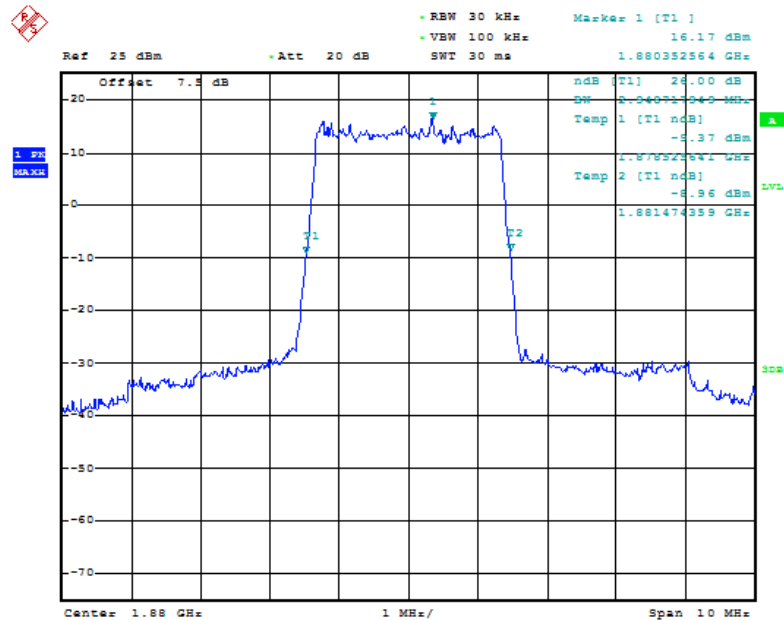


Date: 30.JAN.2019 09:50:20

Fig.66 LTE band 2, 1.4MHz Bandwidth, 16QAM (-26dBc BW)

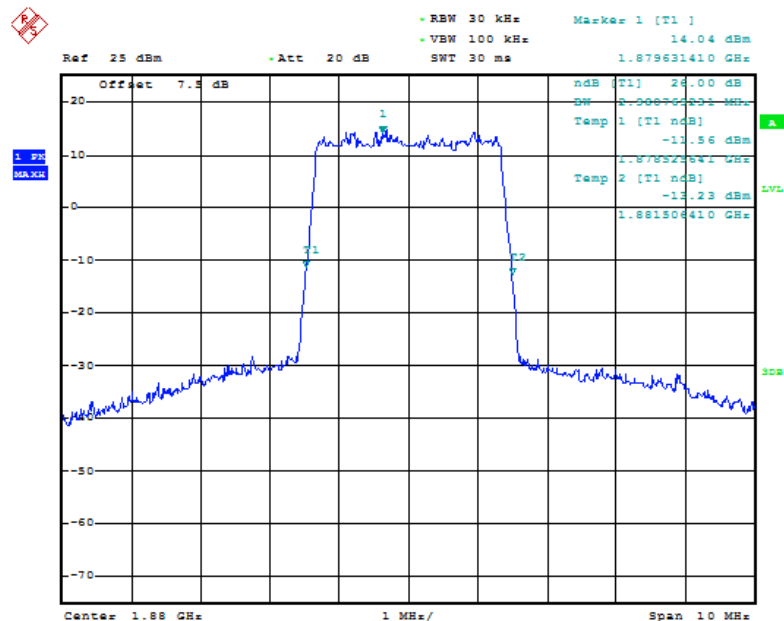
**LTE band 2, 3MHz (-26dBc)**

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
1880.0	QPSK	16QAM
	2.948717949	2.980769



Date: 30.JAN.2019 09:51:32

Fig.67 LTE band 2, 3MHz Bandwidth, QPSK (-26dBc BW)

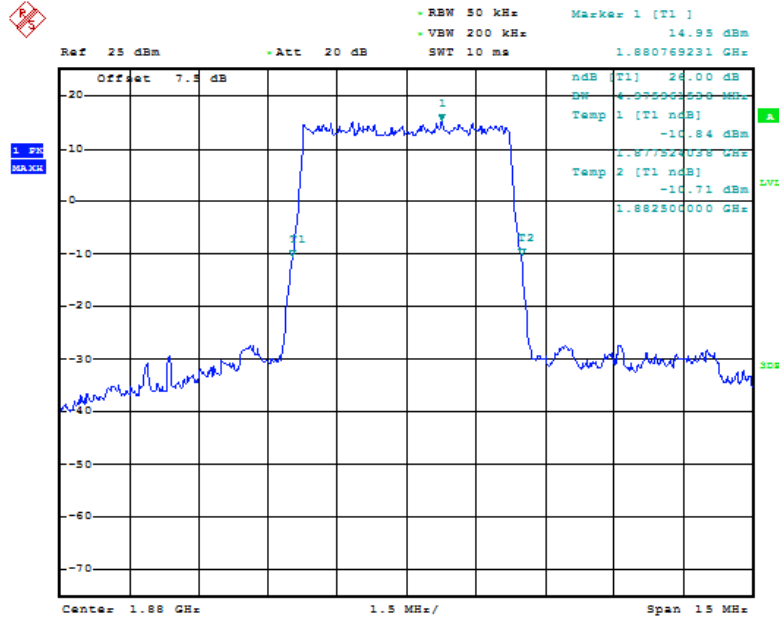


Date: 30.JAN.2019 09:52:36

Fig.68 LTE band 2, 3MHz Bandwidth, 16QAM (-26dBc BW)

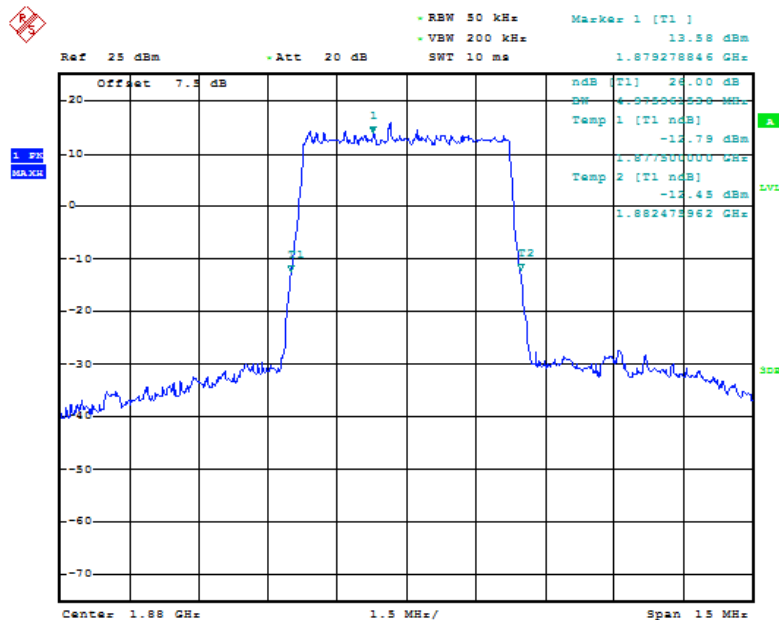
LTE band 2, 5MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
1880.0	QPSK	16QAM
	4.975961538	4.975962



Date: 30.JAN.2019 09:53:48

Fig.69 LTE band 2, 5MHz Bandwidth, QPSK (-26dBc BW)

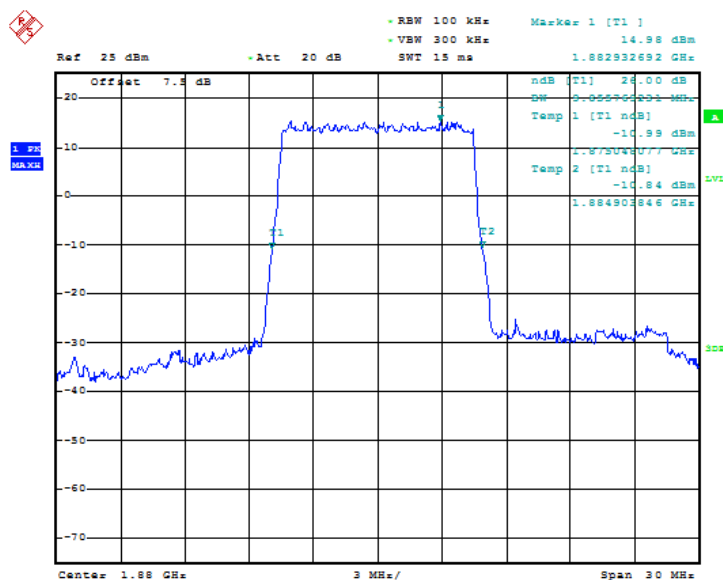


Date: 30.JAN.2019 09:54:52

Fig.70 LTE band 2, 5MHz Bandwidth, 16QAM (-26dBc BW)

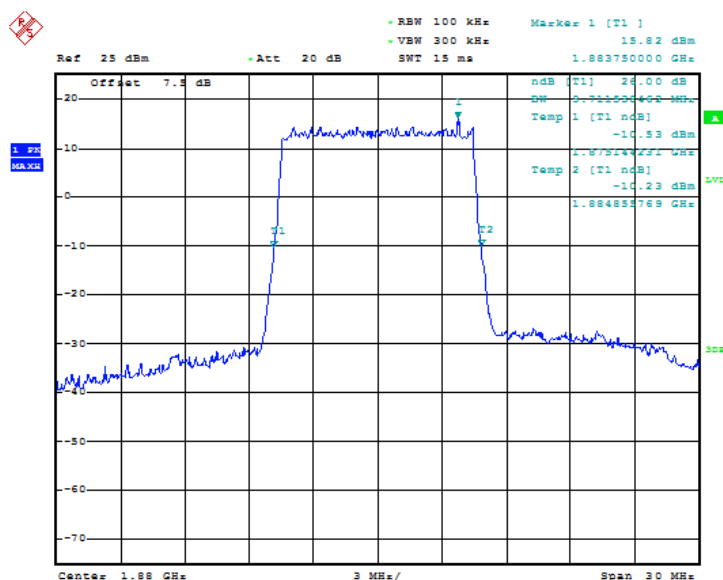
### LTE band 2, 10MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
	QPSK	16QAM
1880.0	9.855769231	9.711538462



Date: 30.JAN.2019 09:56:04

Fig.71 LTE band 2, 10MHz Bandwidth, QPSK (-26dBc BW)

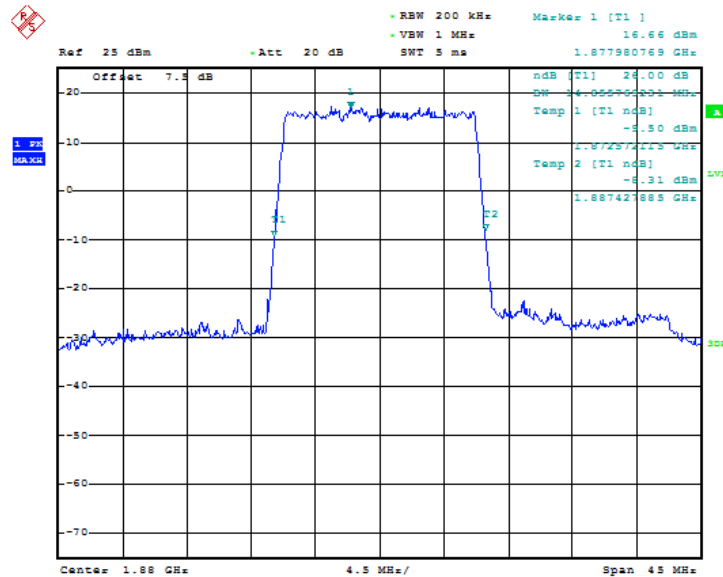


Date: 30.JAN.2019 09:57:08

Fig.72 LTE band 2, 10MHz Bandwidth, 16QAM (-26dBc BW)

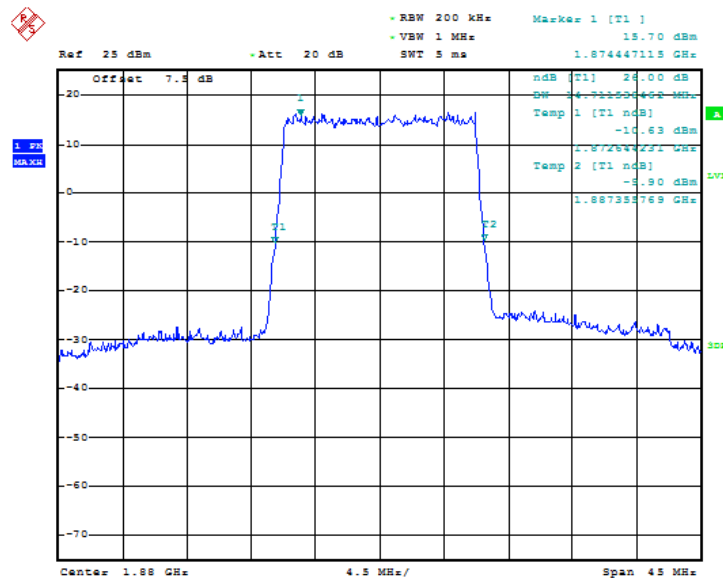
**LTE band 2, 15MHz (-26dBc)**

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
	QPSK	16QAM
1880.0	14.85576923	14.71153846



Date: 30.JAN.2019 09:58:20

Fig.73 LTE band 2, 15MHz Bandwidth, QPSK (-26dBc BW)

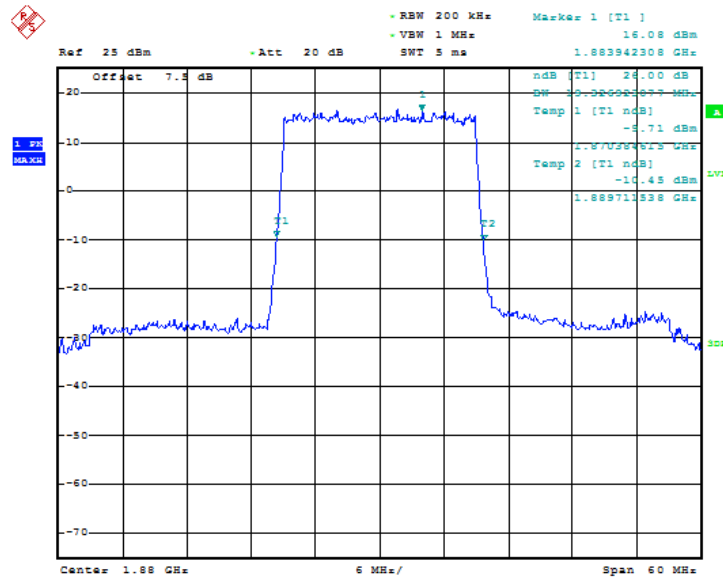


Date: 30.JAN.2019 09:59:24

Fig.74 LTE band 2, 15MHz Bandwidth, 16QAM (-26dBc BW)

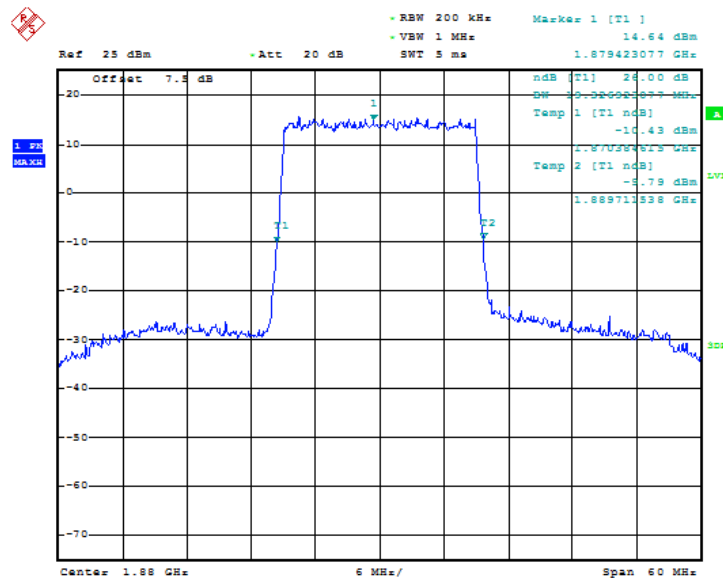
### LTE band 2, 20MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
	QPSK	16QAM
1880.0	19.32692308	19.32692308



Date: 30.JAN.2019 10:00:36

Fig.75 LTE band 2, 20MHz Bandwidth, QPSK (-26dBc BW)



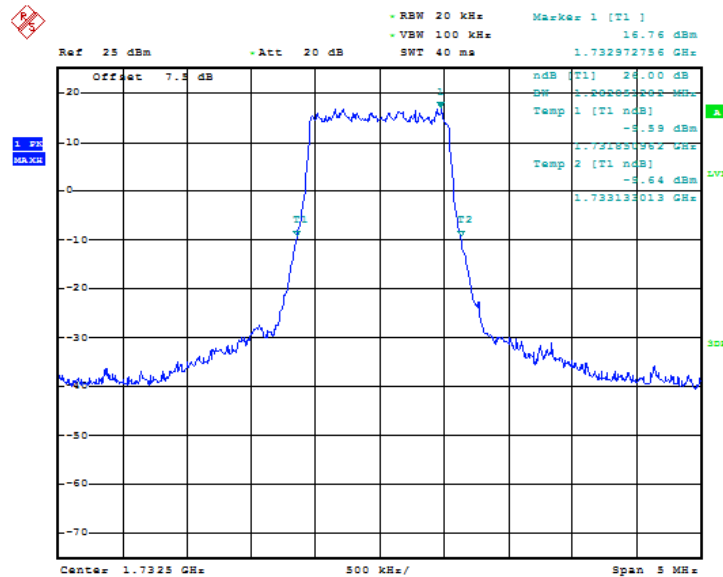
Date: 30.JAN.2019 10:01:41

Fig.76 LTE band 2, 20MHz Bandwidth, 16QAM (-26dBc BW)



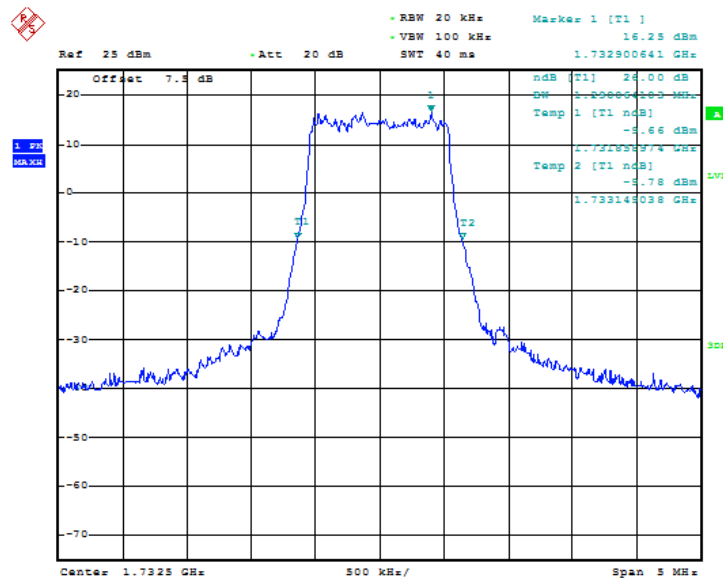
**LTE band 4, 1.4MHz (-26dBc)**

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
	QPSK	16QAM
1732.5	1.282051282	1.282051282



Date: 30.JAN.2019 10:04:27

Fig.77 LTE band 4, 1.4MHz Bandwidth, QPSK (-26dBc BW)

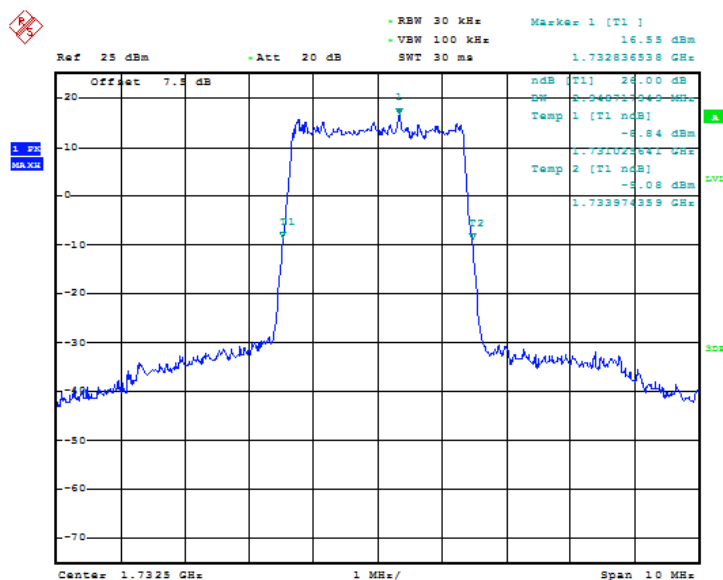


Date: 30.JAN.2019 10:05:31

Fig.78 LTE band 4, 1.4MHz Bandwidth, 16QAM (-26dBc BW)

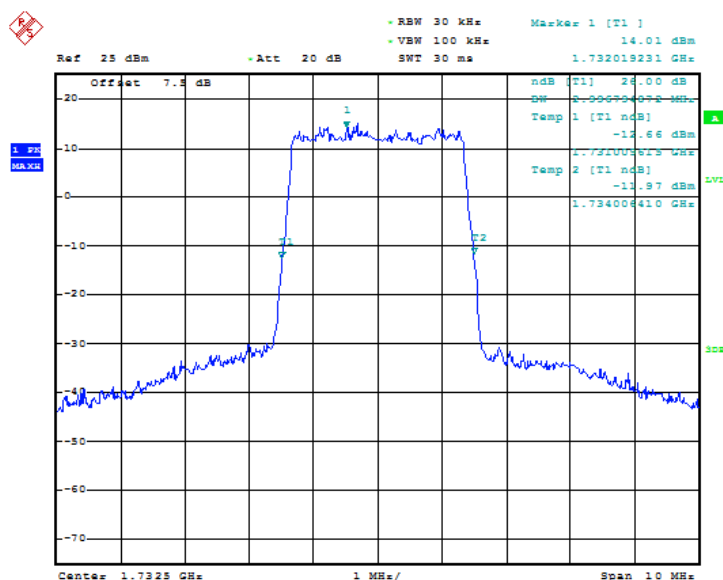
### LTE band 4, 3MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
	QPSK	16QAM
1732.5	2.948717949	2.996794872



Date: 30.JAN.2019 10:06:41

Fig.79 LTE band 4, 3MHz Bandwidth, QPSK (-26dBc BW)

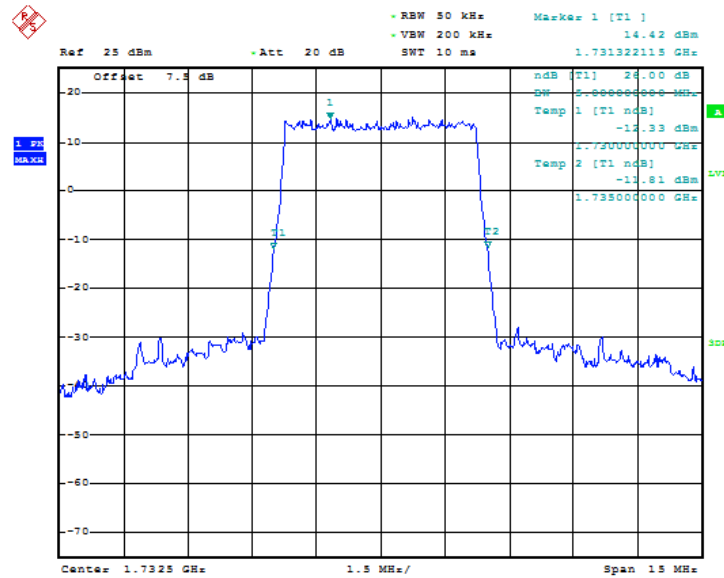


Date: 30.JAN.2019 10:07:45

Fig.80 LTE band 4, 3MHz Bandwidth, 16QAM (-26dBc BW)

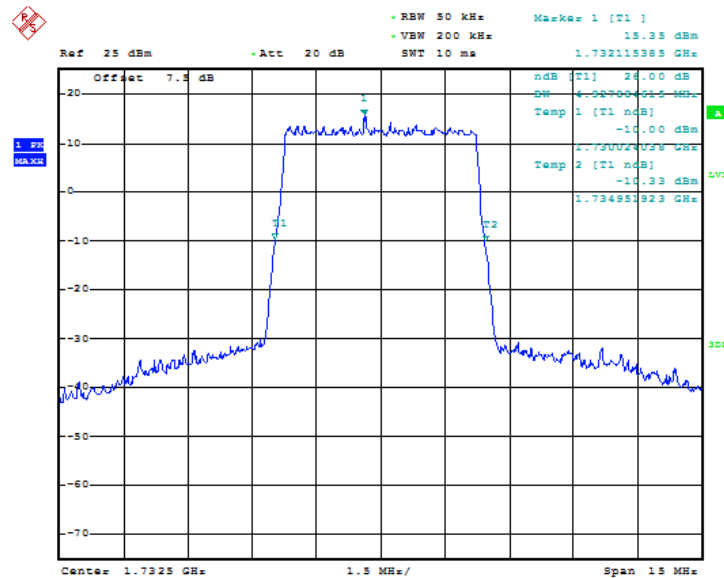
### LTE band 4, 5MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
	QPSK	16QAM
1732.5	5	4.927884615



Date: 30.JAN.2019 10:08:55

Fig.81 LTE band 4, 5MHz Bandwidth, QPSK (-26dBc BW)

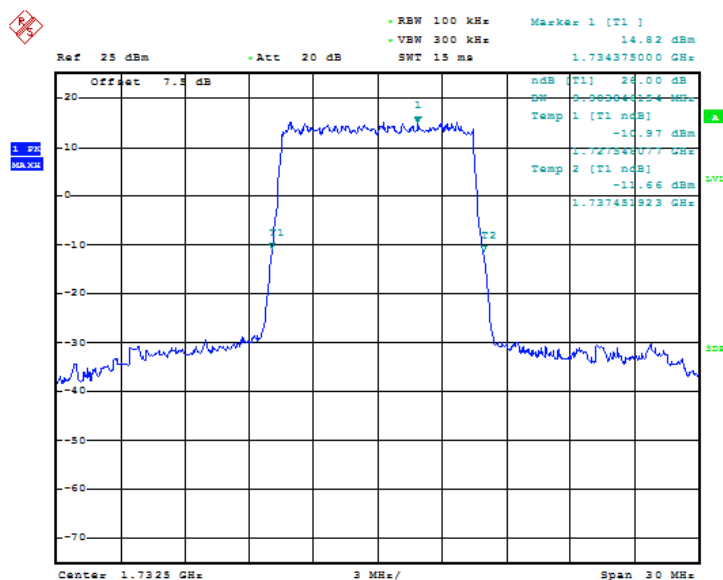


Date: 30.JAN.2019 10:09:59

Fig.82 LTE band 4, 5MHz Bandwidth, 16QAM (-26dBc BW)

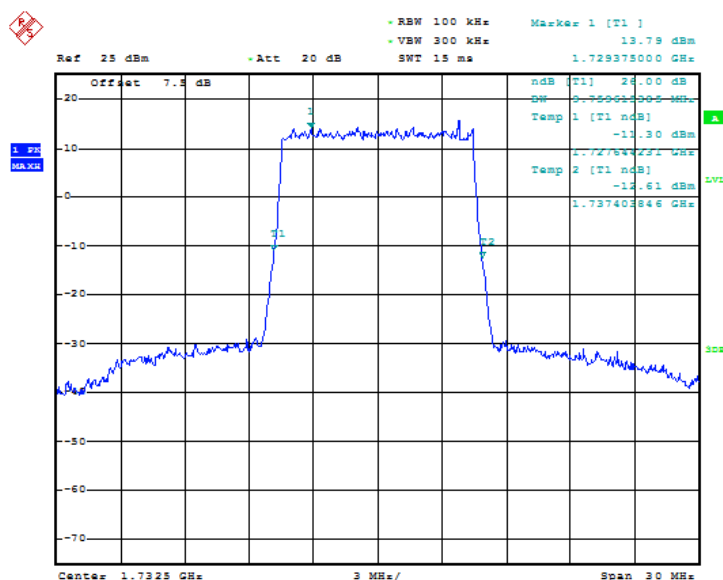
### LTE band 4, 10MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
	QPSK	16QAM
1732.5	9.903846154	9.759615385



Date: 30.JAN.2019 10:11:09

Fig.83 LTE band 4, 10MHz Bandwidth, QPSK (-26dBc BW)

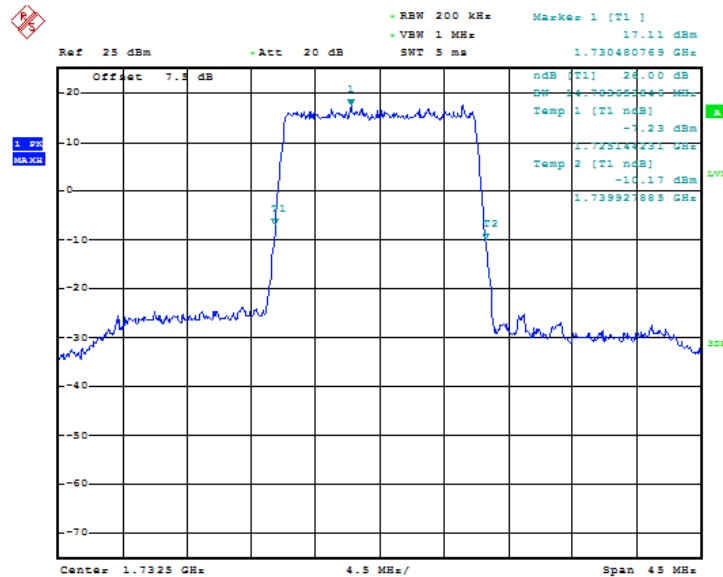


Date: 30.JAN.2019 10:12:13

Fig.84 LTE band 4, 10MHz Bandwidth, 16QAM (-26dBc BW)

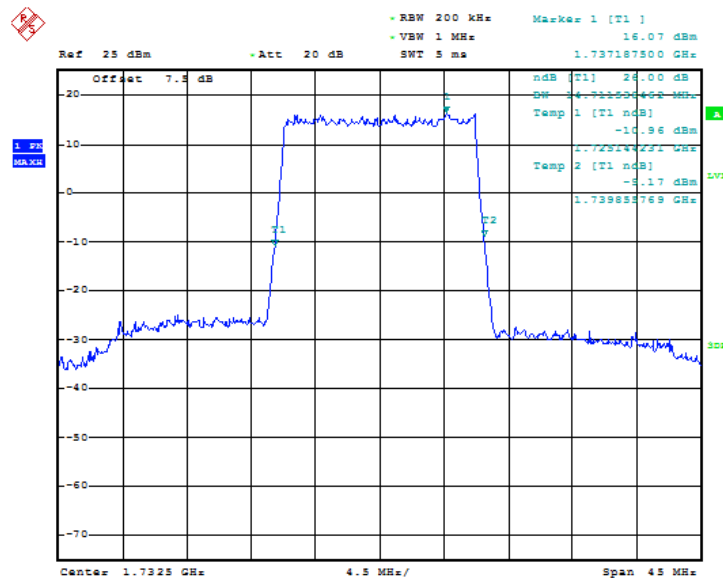
**LTE band 4, 15MHz (-26dBc)**

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
1732.5	QPSK	16QAM
	14.78365385	14.71153846



Date: 30.JAN.2019 10:13:24

Fig.85 LTE band 4, 15MHz Bandwidth, QPSK (-26dBc BW)

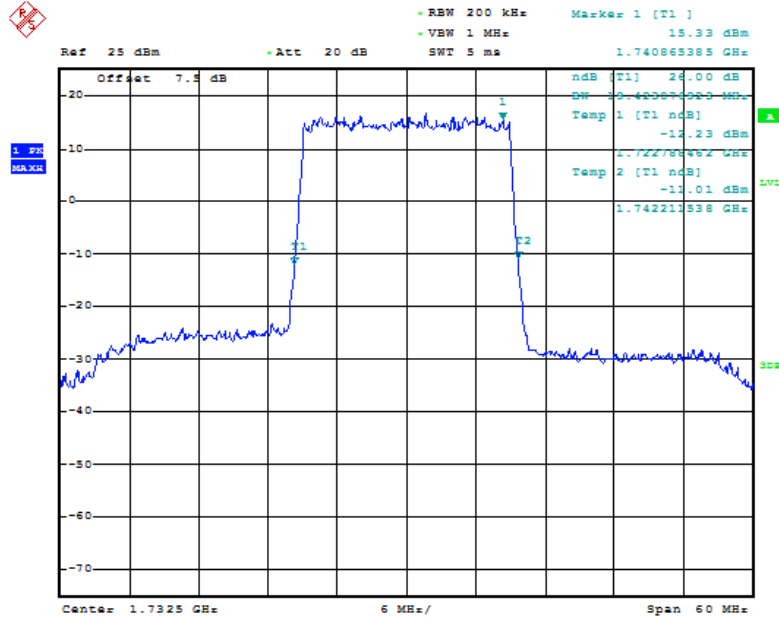


Date: 30.JAN.2019 10:14:27

Fig.86 LTE band 4, 15MHz Bandwidth, 16QAM (-26dBc BW)

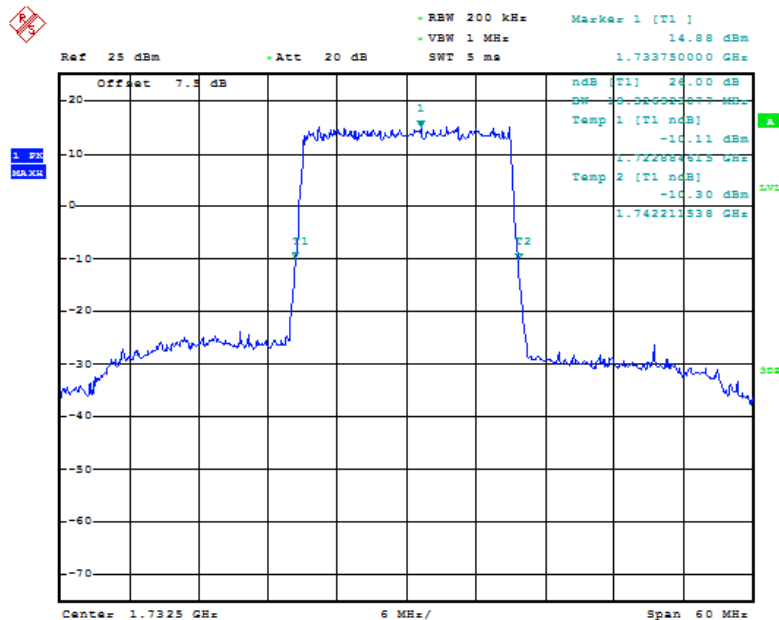
**LTE band 4, 20MHz (-26dBc)**

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
1732.5	QPSK	16QAM
	19.42307692	19.32692308



Date: 30.JAN.2019 10:15:38

Fig.87 LTE band 4, 20MHz Bandwidth, QPSK (-26dBc BW)

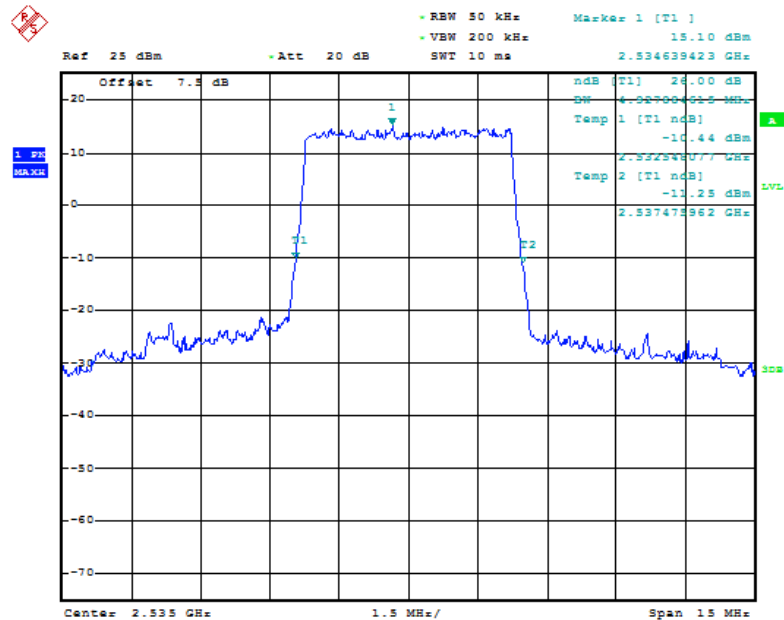


Date: 30.JAN.2019 10:16:42

Fig.88 LTE band 4, 20MHz Bandwidth, 16QAM (-26dBc BW)

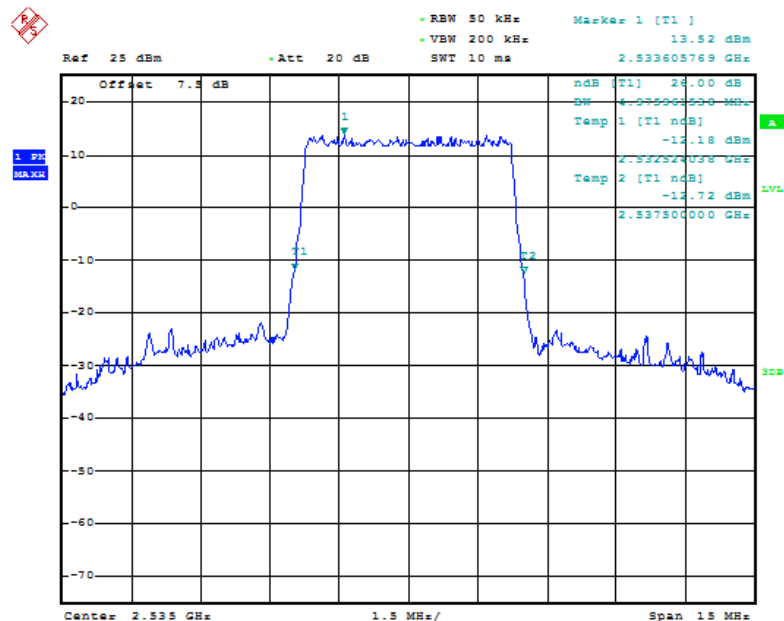
### LTE band 7, 5MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
	QPSK	16QAM
2535.0	4.927884615	4.975961538



Date: 30.JAN.2019 10:27:55

Fig.89 LTE band 7, 5MHz Bandwidth, QPSK (-26dBc BW)

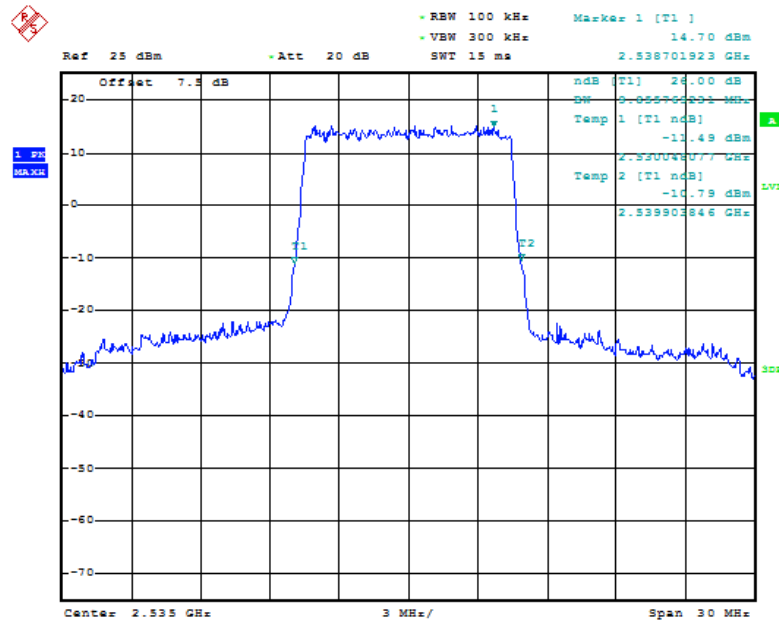


Date: 30.JAN.2019 10:28:59

Fig.90 LTE band 7, 5MHz Bandwidth, 16QAM (-26dBc BW)

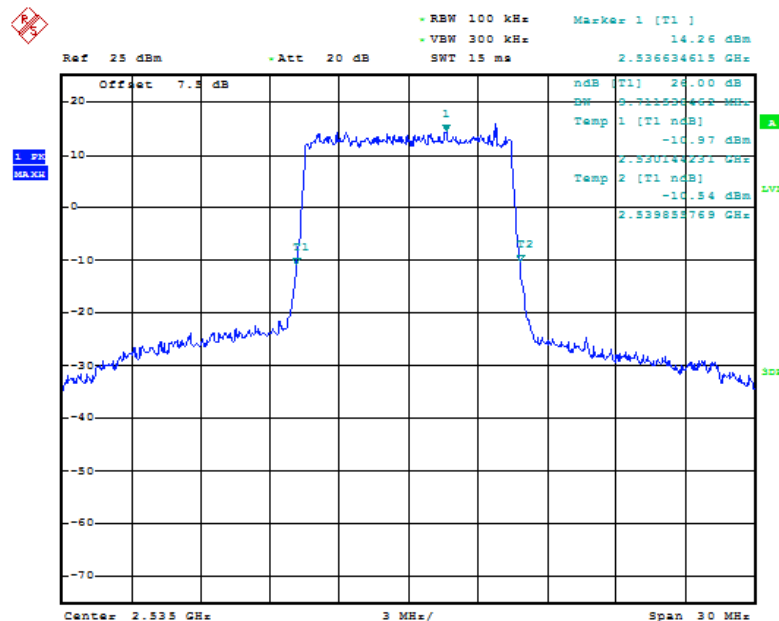
### LTE band 7, 10MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)( kHz)	
2535.0	QPSK	16QAM
	9.855769231	9.711538462



Date: 30.JAN.2019 10:30:10

Fig.91 LTE band 7, 10MHz Bandwidth, QPSK (-26dBc BW)



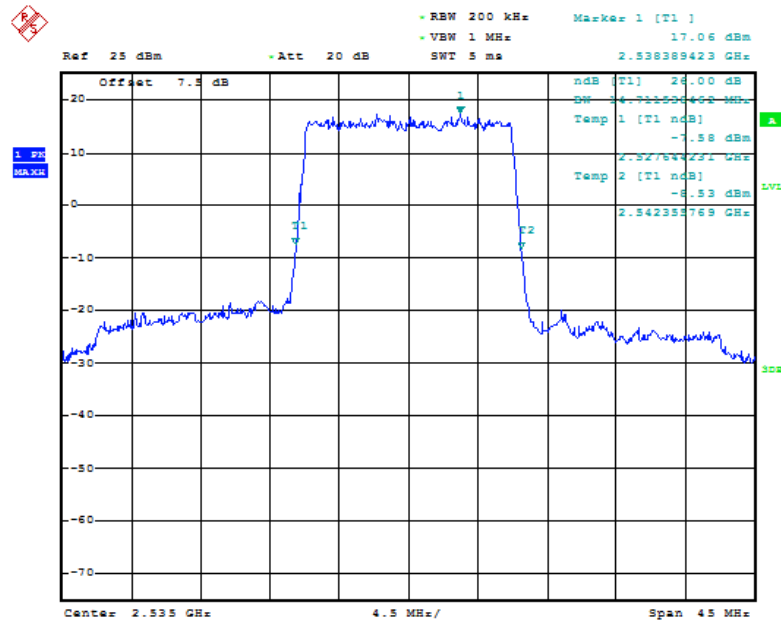
Date: 30.JAN.2019 10:31:13

Fig.92 LTE band 7, 10MHz Bandwidth, 16QAM (-26dBc BW)



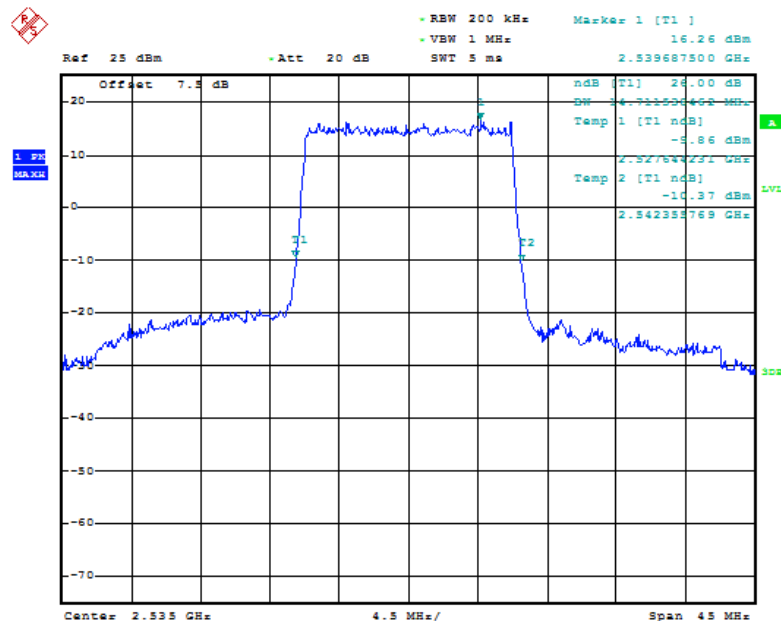
### LTE band 7, 15MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
2535.0	QPSK	16QAM
	14.71153846	14.71153846



Date: 30.JAN.2019 10:32:24

Fig.93 LTE band 7, 15MHz Bandwidth, QPSK (-26dBc BW)

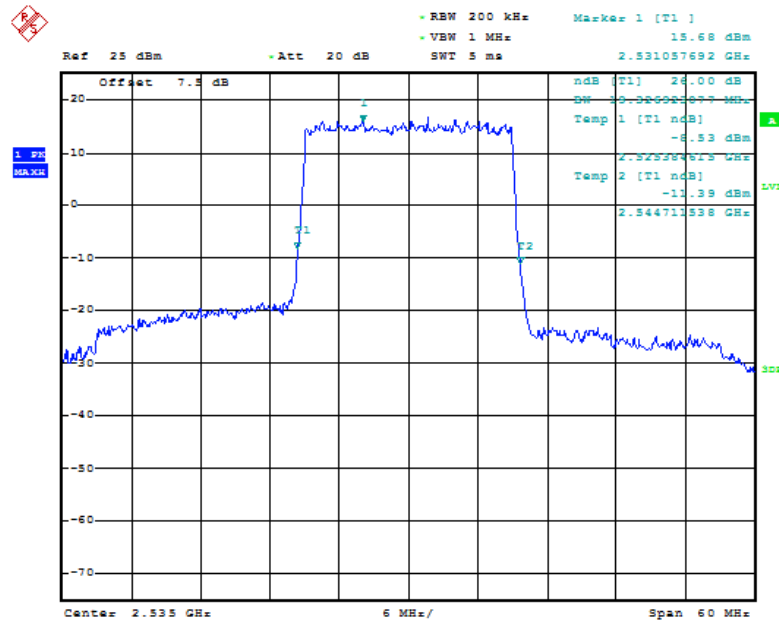


Date: 30.JAN.2019 10:33:28

Fig.94 LTE band 7, 15MHz Bandwidth, 16QAM (-26dBc BW)

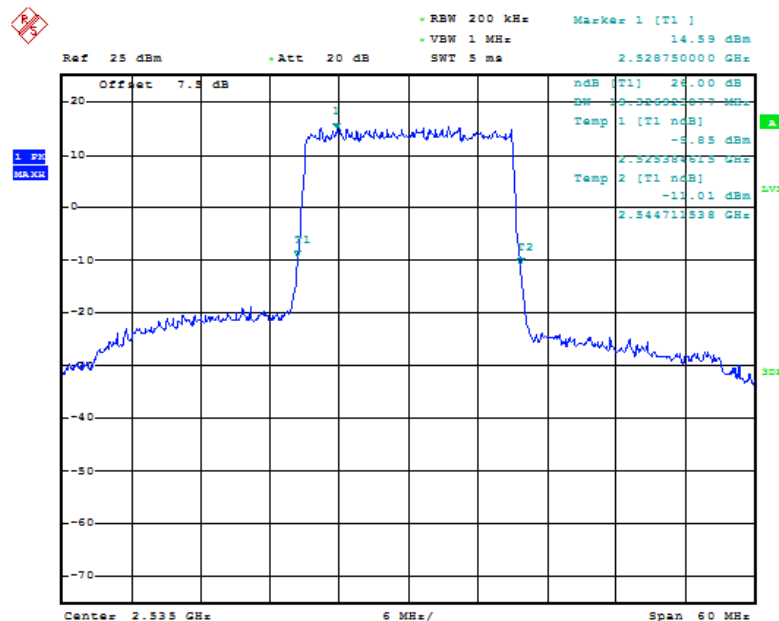
**LTE band 7, 20MHz (-26dBc)**

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
2535.0	QPSK	16QAM
	19.32692308	19.32692308



Date: 30.JAN.2019 10:34:38

Fig.95 LTE band 7, 20MHz Bandwidth, QPSK (-26dBc BW)

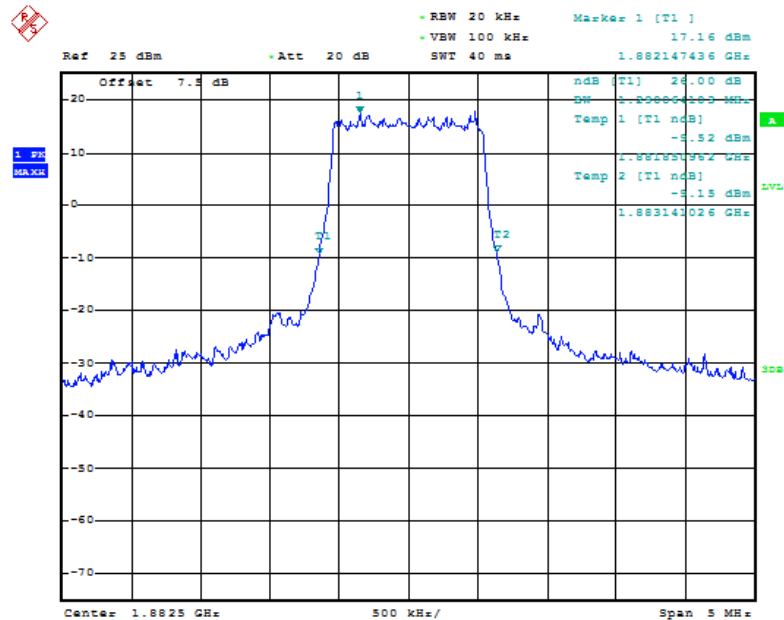


Date: 30.JAN.2019 10:35:42

Fig.96 LTE band 7, 20MHz Bandwidth, 16QAM (-26dBc BW)

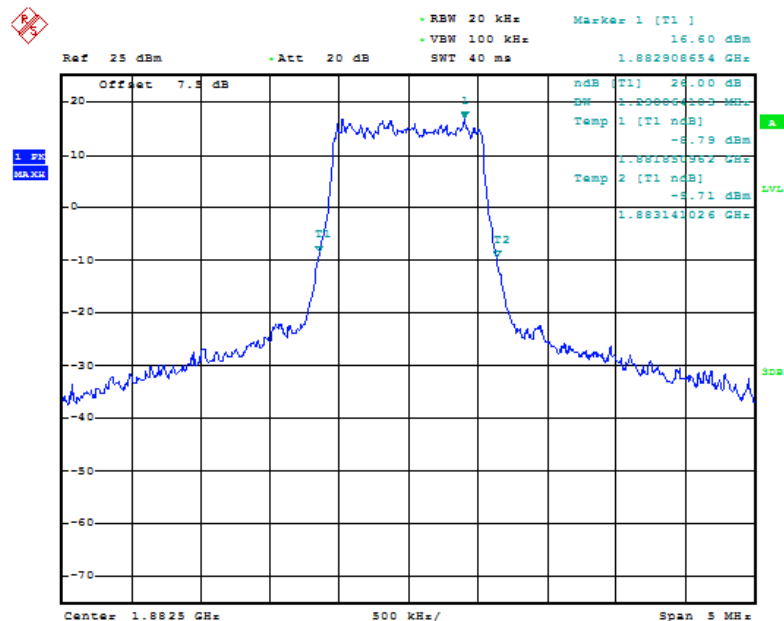
### LTE band 25, 1.4MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
	QPSK	16QAM
1882.5	1.290064103	1.290064103



Date: 30.JAN.2019 10:38:18

Fig.97 LTE band 25, 1.4MHz Bandwidth, QPSK (-26dBc BW)

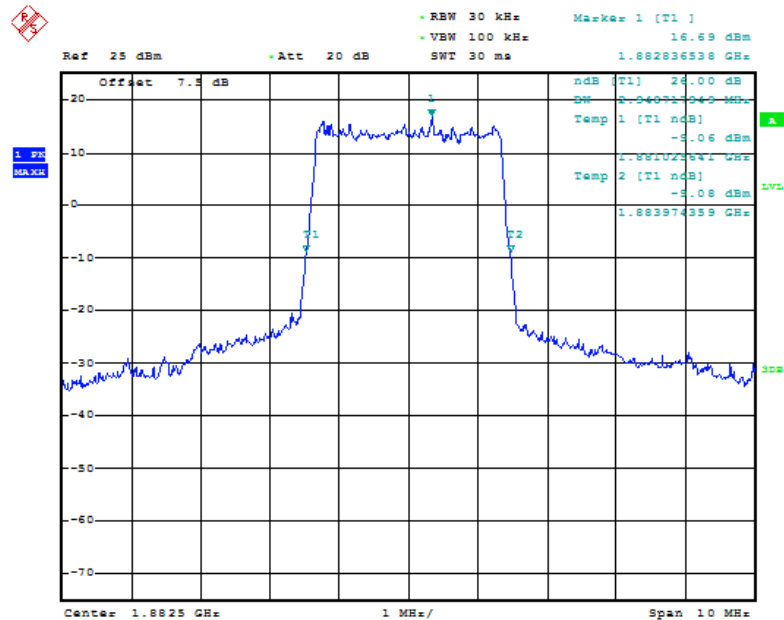


Date: 30.JAN.2019 10:39:22

Fig.98 LTE band 25, 1.4MHz Bandwidth, 16QAM (-26dBc BW)

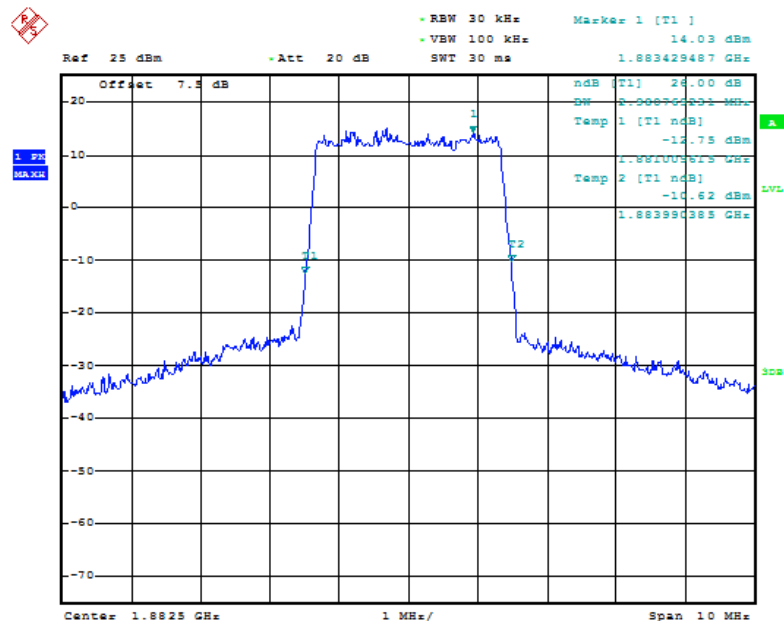
### LTE band 25, 3MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
	QPSK	16QAM
1882.5	2.948717949	2.980769231



Date: 30.JAN.2019 10:40:32

Fig.99 LTE band 25, 3MHz Bandwidth, QPSK (-26dBc BW)



Date: 30.JAN.2019 10:41:36

Fig.100 LTE band 25, 3MHz Bandwidth, 16QAM (-26dBc BW)

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
1882.5	QPSK	16QAM
	5	4.975961538

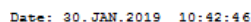


Fig.101 LTE band 25, 5MHz Bandwidth, QPSK (-26dBc BW)

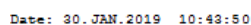
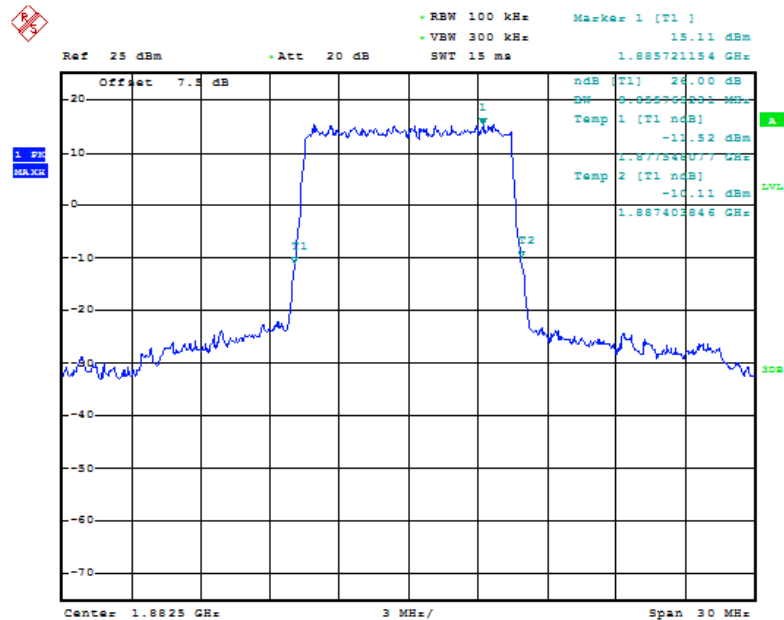


Fig.102 LTE band 25, 5MHz Bandwidth, 16QAM (-26dBc BW)

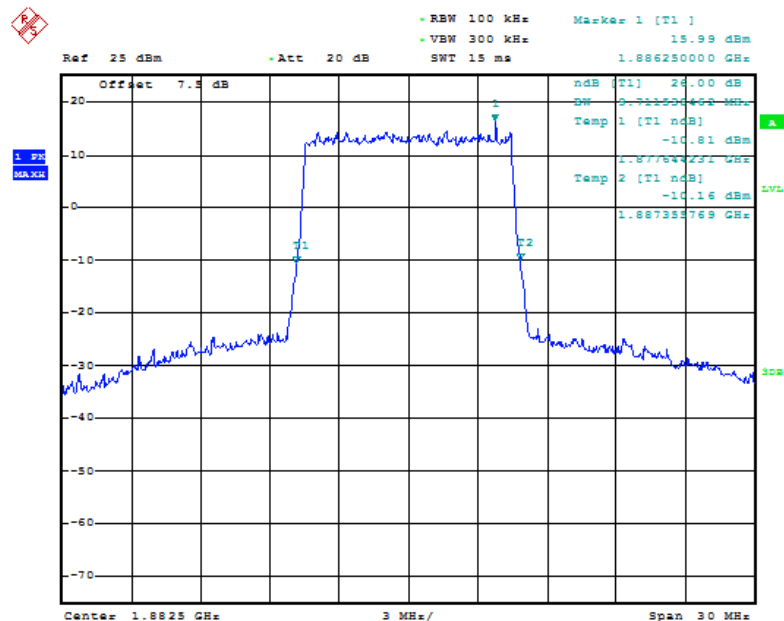
### LTE band 25, 10MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
1882.5	QPSK	16QAM
	9.855769231	9.711538462



Date: 30.JAN.2019 10:45:00

Fig.103 LTE band 25, 10MHz Bandwidth, QPSK (-26dBc BW)

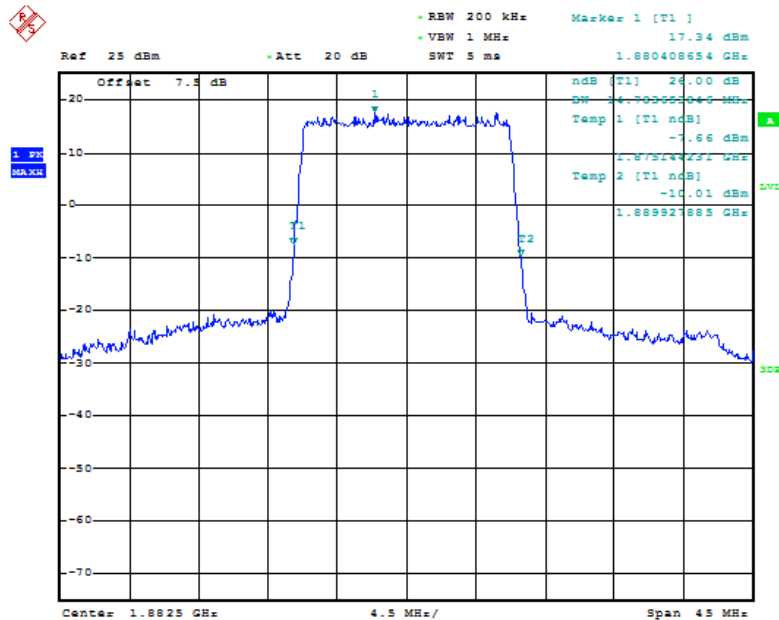


Date: 30.JAN.2019 10:46:04

Fig.104 LTE band 25, 10MHz Bandwidth, 16QAM (-26dBc BW)

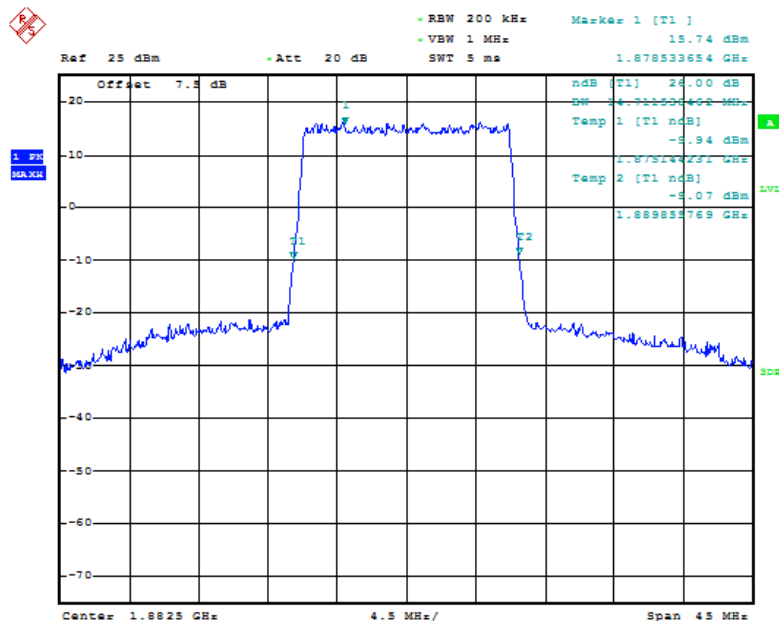
### LTE band 25, 15MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
	QPSK	16QAM
1882.5	14.78365385	14.71153846



Date: 30.JAN.2019 10:47:14

Fig.105 LTE band 25, 15MHz Bandwidth, QPSK (-26dBc BW)

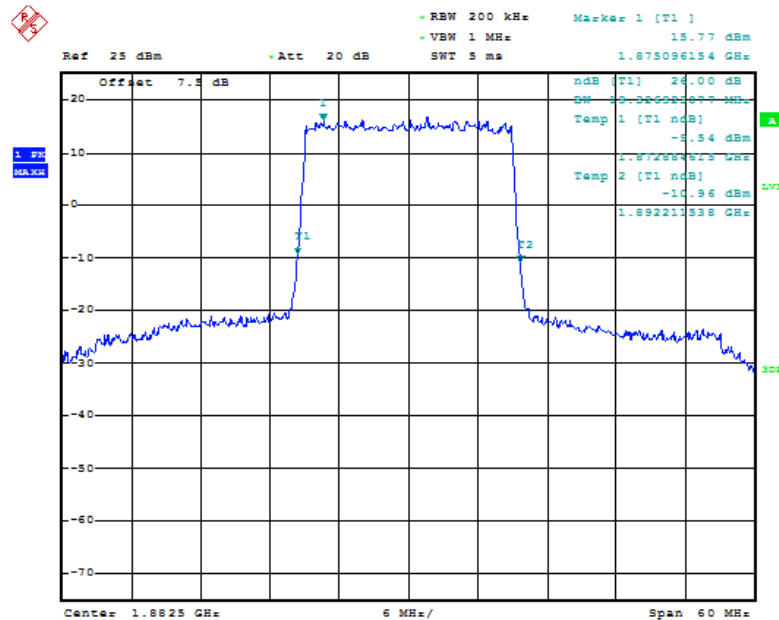


Date: 30.JAN.2019 10:48:18

Fig.106 LTE band 25, 15MHz Bandwidth, 16QAM (-26dBc BW)

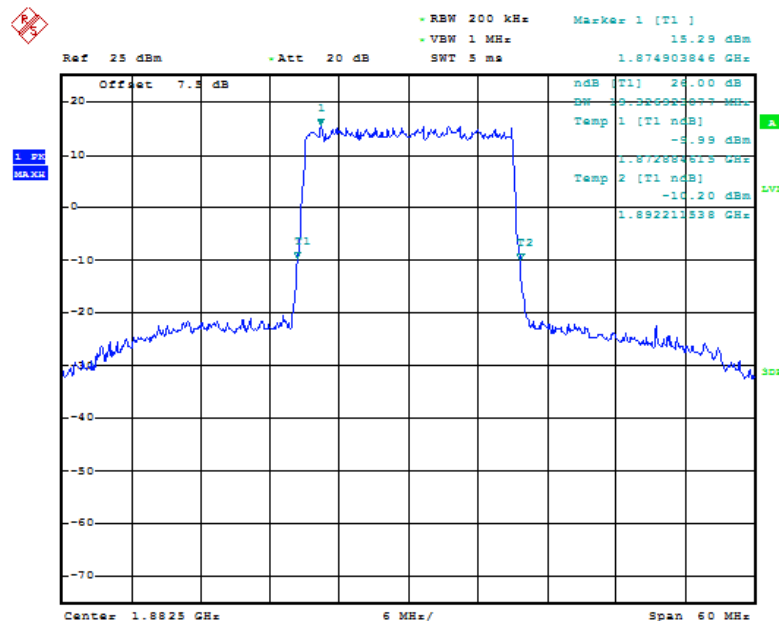
### LTE band 25, 20MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
	QPSK	16QAM
1882.5	19.32692308	19.32692308



Date: 30.JAN.2019 10:49:29

Fig.107 LTE band 25, 20MHz Bandwidth, QPSK (-26dBc BW)



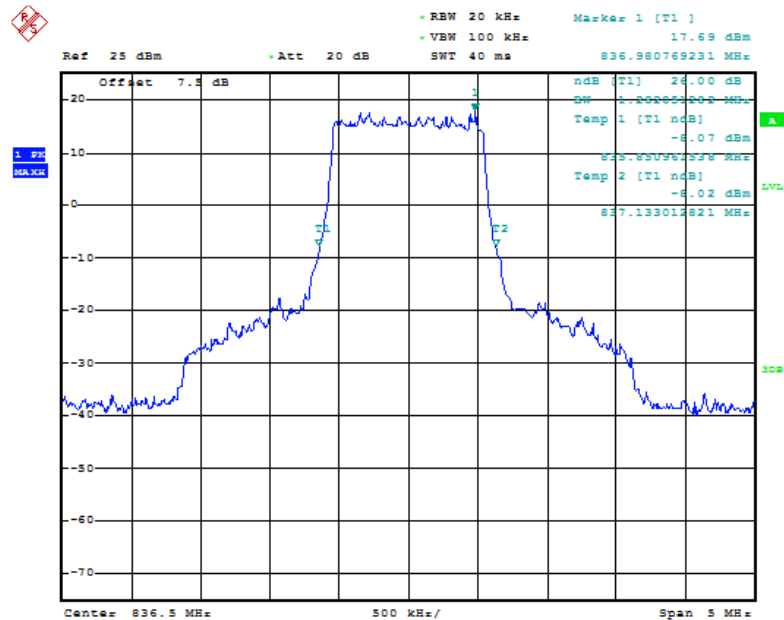
Date: 30.JAN.2019 10:50:33

Fig.108 LTE band 25, 20MHz Bandwidth, 16QAM (-26dBc BW)



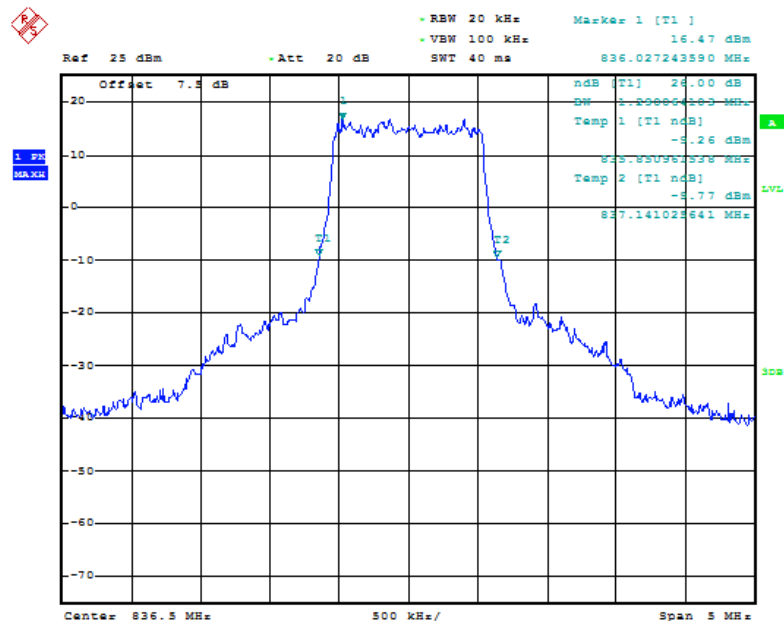
### LTE band 26(Part 22), 1.4MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
	QPSK	16QAM
836.5	1.282051282	1.290064103



Date: 30.JAN.2019 10:52:58

Fig.109 LTE band 26, 1.4MHz Bandwidth, QPSK (-26dBc BW)

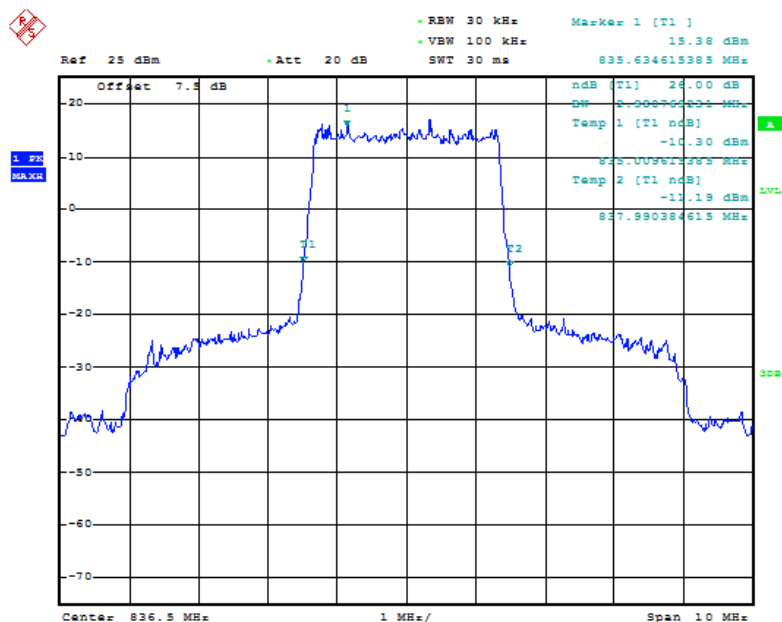


Date: 30.JAN.2019 10:54:02

Fig.110 LTE band 26, 1.4MHz Bandwidth, 16QAM (-26dBc BW)

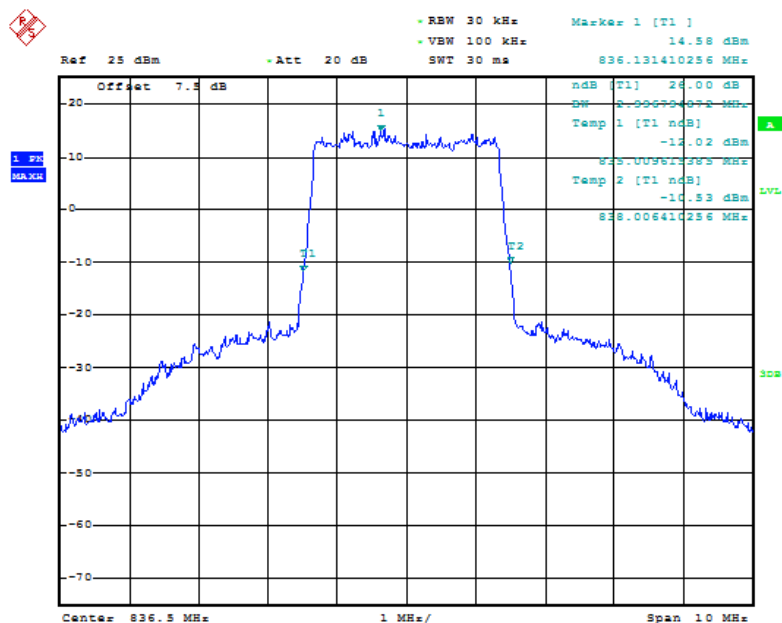
**LTE band 26(Part 22), 3MHz (-26dBc)**

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
836.5	QPSK	16QAM
	2.980769231	2.996794872



Date: 30.JAN.2019 10:55:12

Fig.111 LTE band 26, 3MHz Bandwidth, QPSK (-26dBc BW)

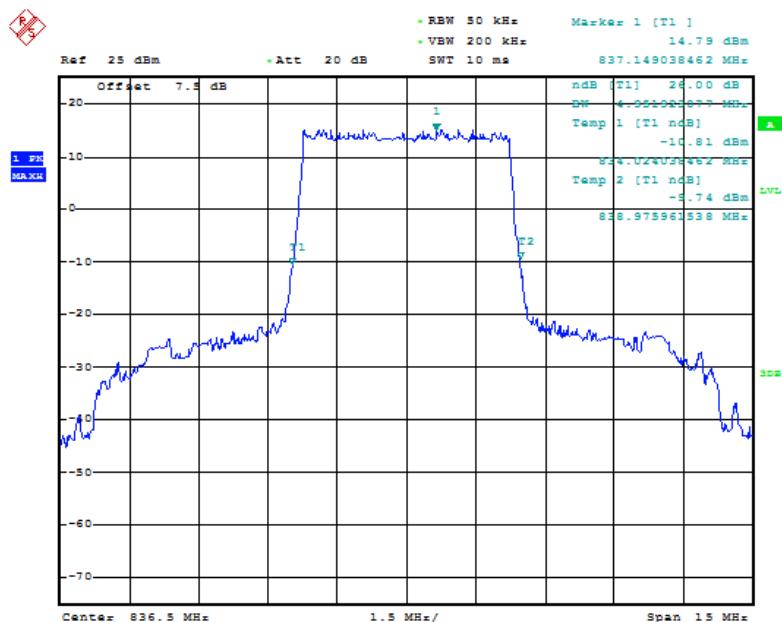


Date: 30.JAN.2019 10:56:16

Fig.112 LTE band 26, 3MHz Bandwidth, 16QAM (-26dBc BW)

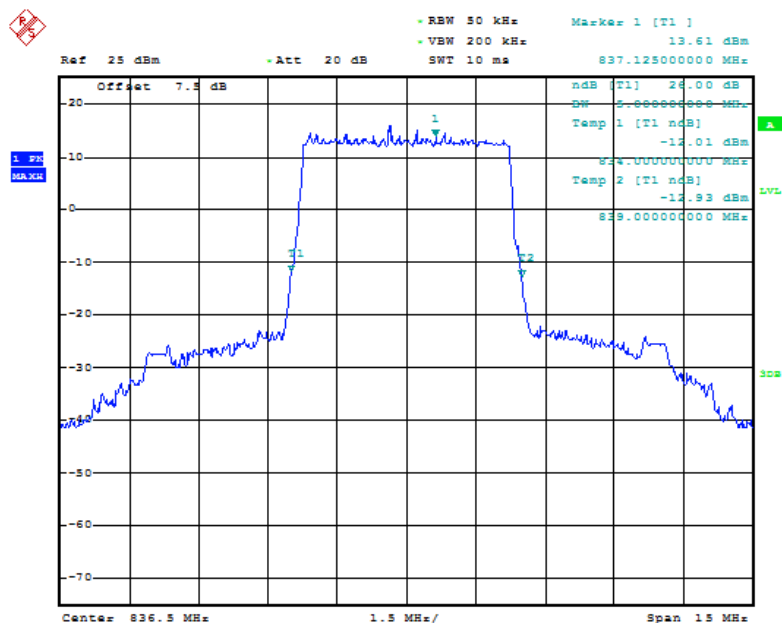
**LTE band 26(Part 22), 5MHz (-26dBc)**

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
836.5	QPSK	16QAM
	4.951923077	5



Date: 30.JAN.2019 10:57:26

Fig.113 LTE band 26, 5MHz Bandwidth, QPSK (-26dBc BW)

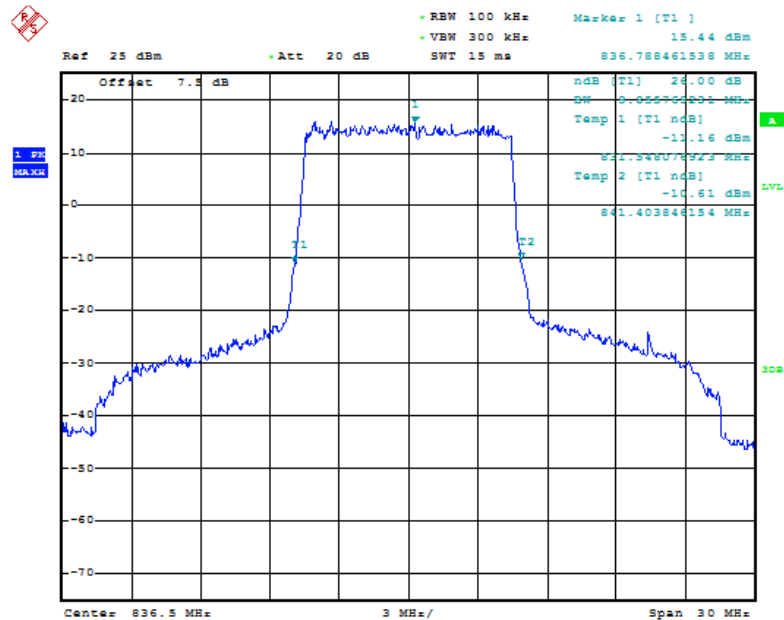


Date: 30.JAN.2019 10:58:30

Fig.114 LTE band 26, 5MHz Bandwidth, 16QAM (-26dBc BW)

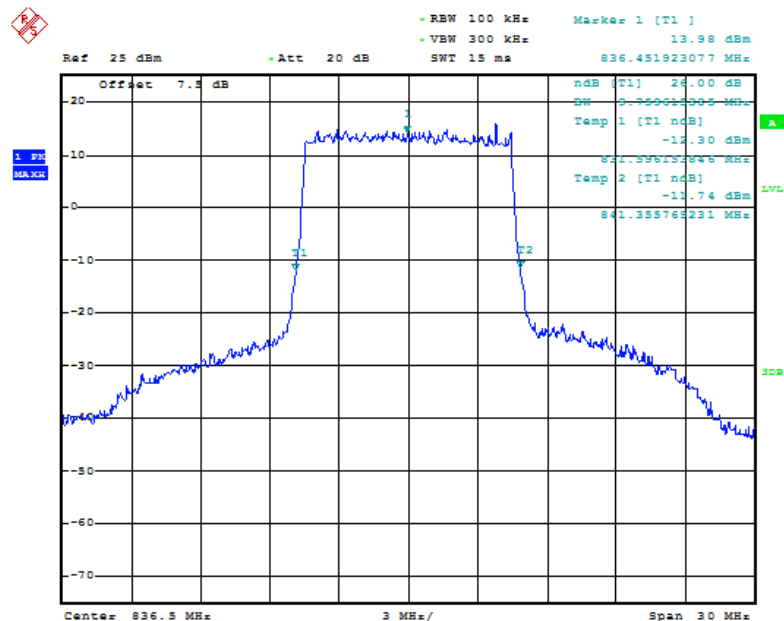
### LTE band 26(Part 22), 10MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
	QPSK	16QAM
836.5	9.855769231	9.759615385



Date: 30.JAN.2019 10:59:41

Fig.115 LTE band 26, 10MHz Bandwidth, QPSK (-26dBc BW)

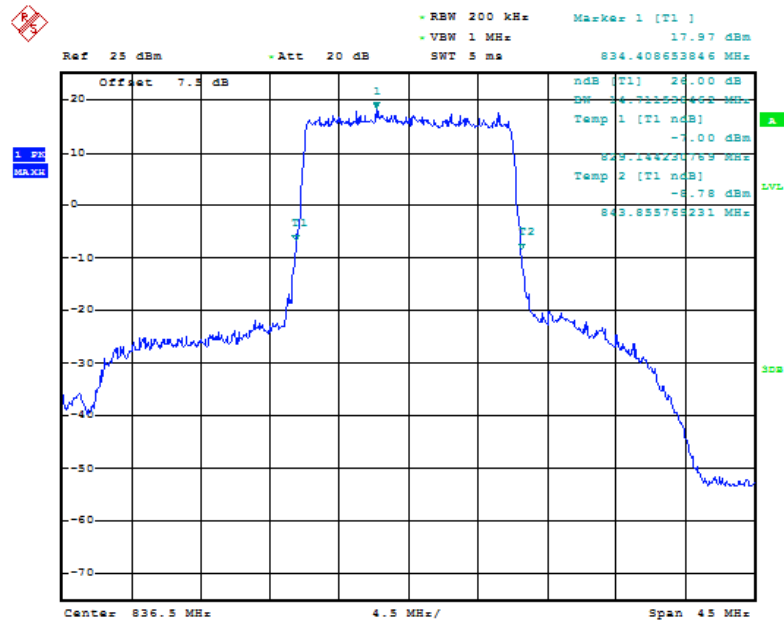


Date: 30.JAN.2019 11:00:45

Fig.116 LTE band 26, 10MHz Bandwidth, 16QAM (-26dBc BW)

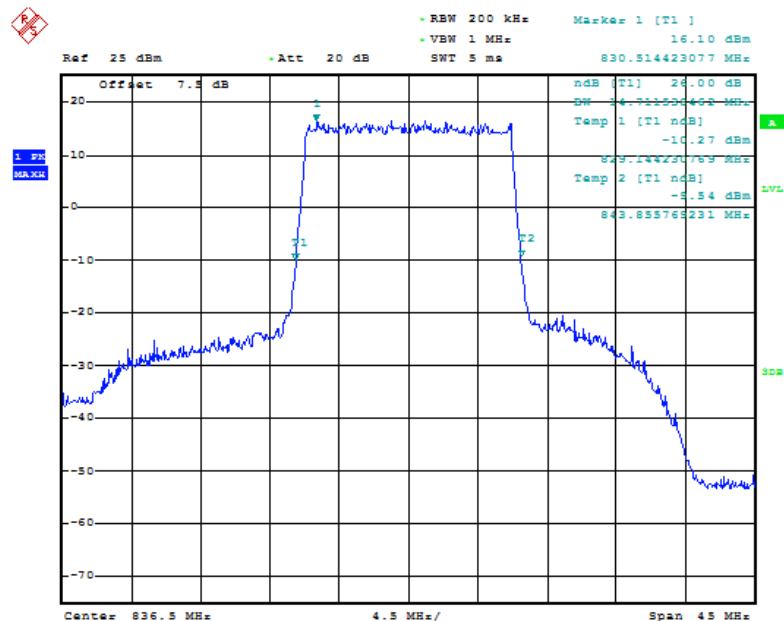
### LTE band 26 (Part 22), 15MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
	QPSK	16QAM
836.5	14.71153846	14.71153846



Date: 30.JAN.2019 11:01:55

Fig.117 LTE band 26, 15MHz Bandwidth, QPSK (-26dBc BW)

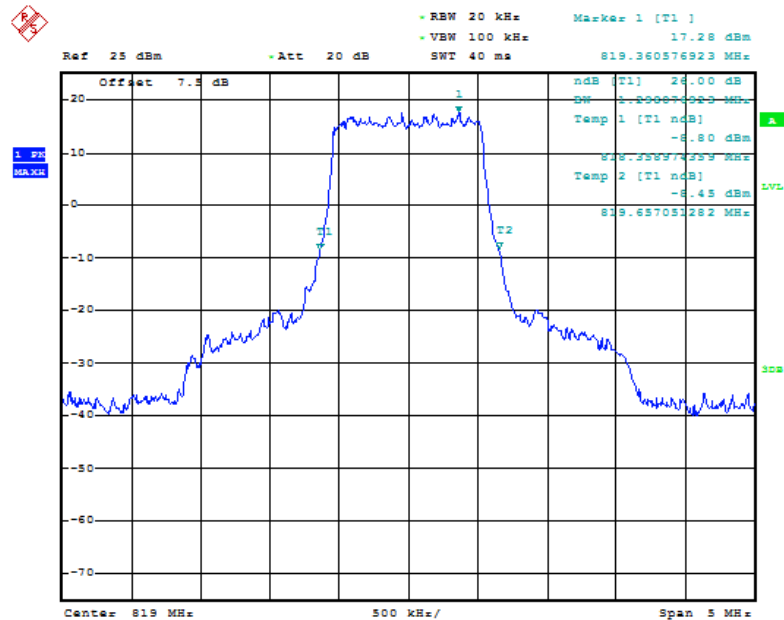


Date: 30.JAN.2019 11:02:59

Fig.118 LTE band 26, 15MHz Bandwidth, 16QAM (-26dBc BW)

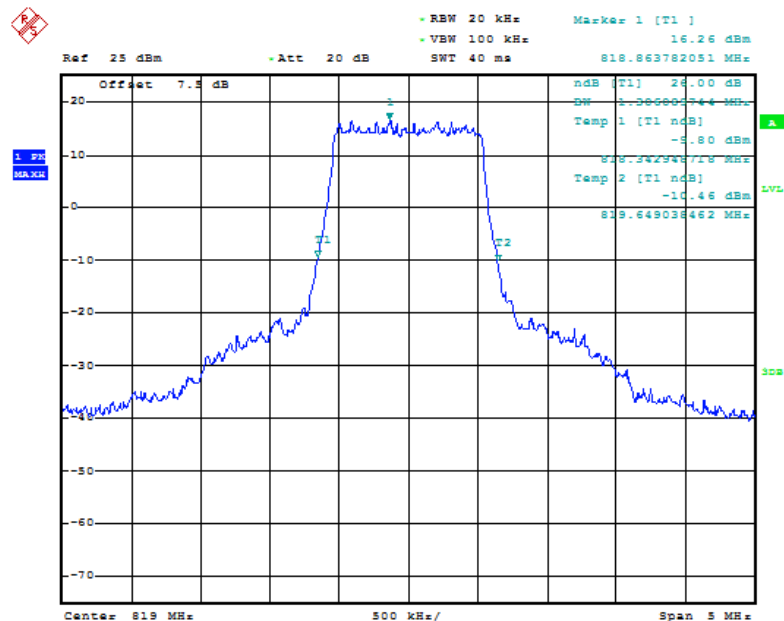
### LTE band 26 (Part 90), 1.4MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
	QPSK	16QAM
	1.298076923	1.306089744



Date: 31.JAN.2019 10:22:42

Fig.119 LTE band 26, 1.4MHz Bandwidth, QPSK (-26dBc BW)

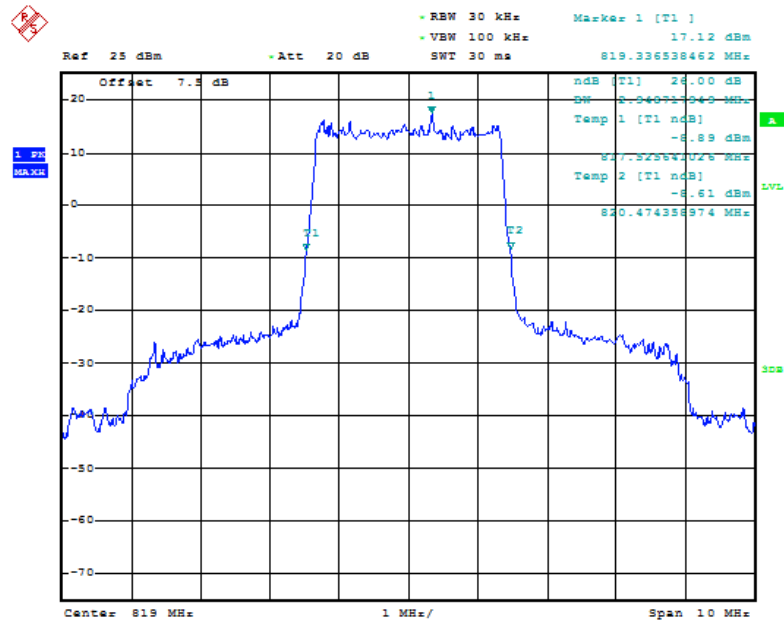


Date: 31.JAN.2019 10:23:47

Fig.120 LTE band 26, 1.4MHz Bandwidth, 16QAM (-26dBc BW)

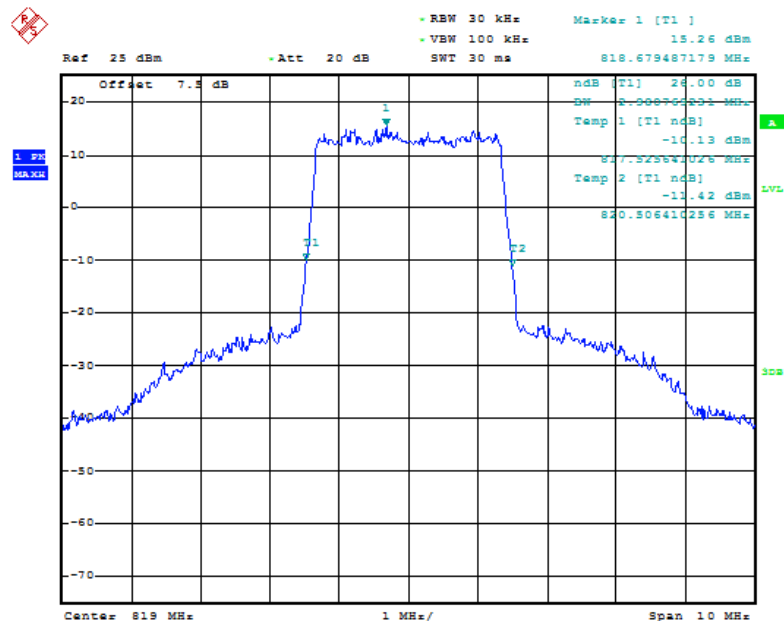
**LTE band 26 (Part 90), 3MHz (-26dBc)**

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
	QPSK	16QAM
	2.948717949	2.980769231



Date: 31.JAN.2019 10:24:59

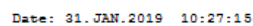
**Fig.121 LTE band 26, 3MHz Bandwidth, QPSK (-26dBc BW)**



Date: 31.JAN.2019 10:26:03

**Fig.122 LTE band 26, 3MHz Bandwidth, 16QAM (-26dBc BW)**

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
819	QPSK	16QAM
	4.975961538	5



Ref 25 dBm      •Att 20 dB      •RBW 50 kHz      Marker 1 [T1]      14.76 dBm  
 •VBW 200 kHz      819.216346154 MHz  
 SWT 10 ms

Offset 7.5 dB

1.75  
 88.44

ndB [T1] 24.00 dB  
 BW 5.00000000 MHz  
 Temp 1 [T1 ndB] -11.75 dBm  
 Temp 2 [T1 ndB] -11.75 dBm  
 821.50000000 MHz

Center 819 MHz      1.5 MHz/      Span 1.5 MHz

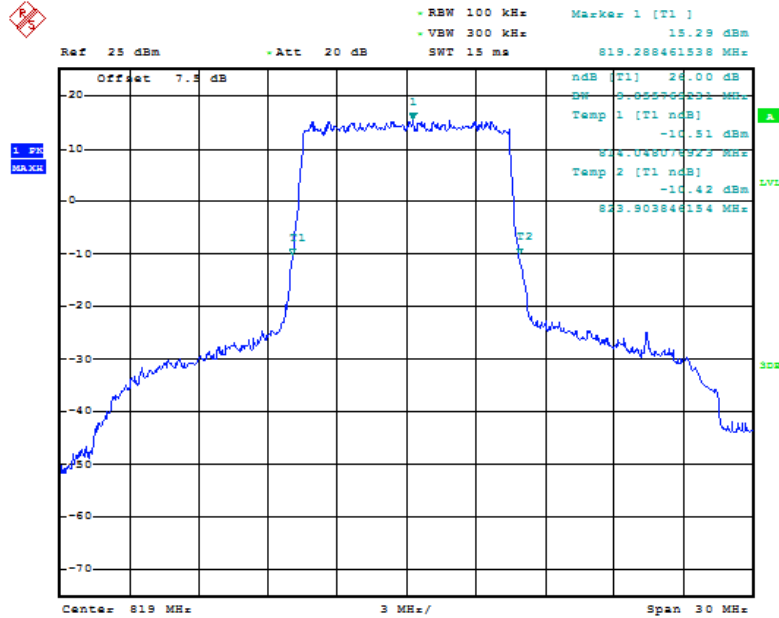
Date: 31.JAN.2019 10:28:19

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TEL: +86 21 63843300 FAX: +86 21 63843301



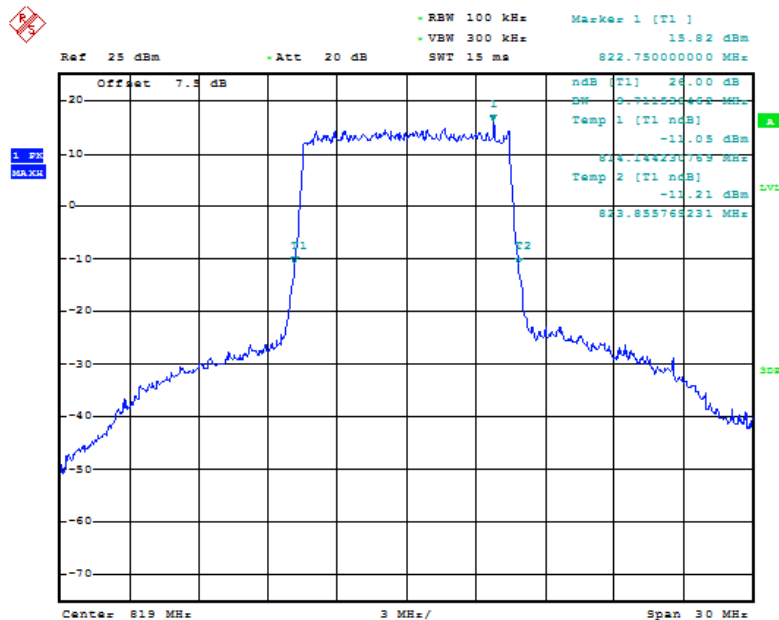
**LTE band 26 (Part 90), 10MHz (-26dBc)**

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
819	QPSK	16QAM
	9.855769231	9.711538462



Date: 31.JAN.2019 10:29:31

Fig.125 LTE band 26, 10MHz Bandwidth, QPSK (-26dBc BW)

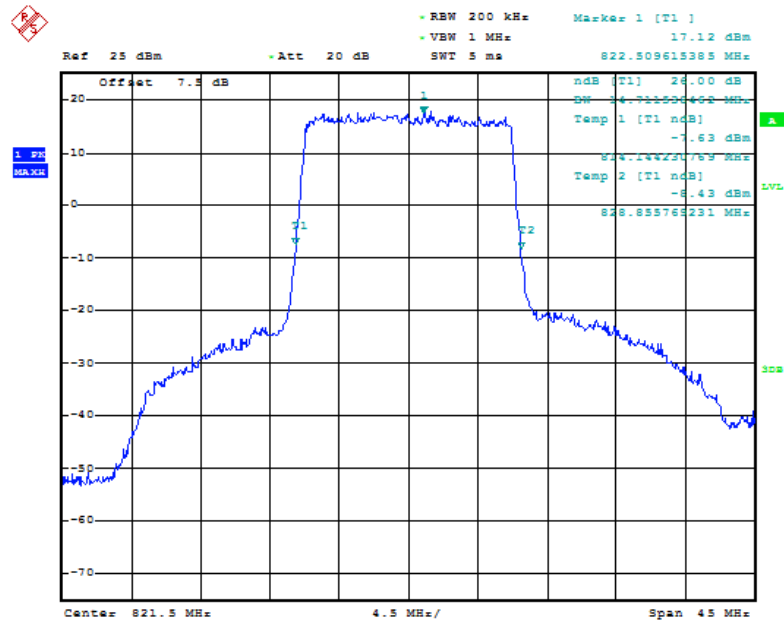


Date: 31.JAN.2019 10:30:36

Fig.126 LTE band 26, 10MHz Bandwidth, 16QAM (-26dBc BW)

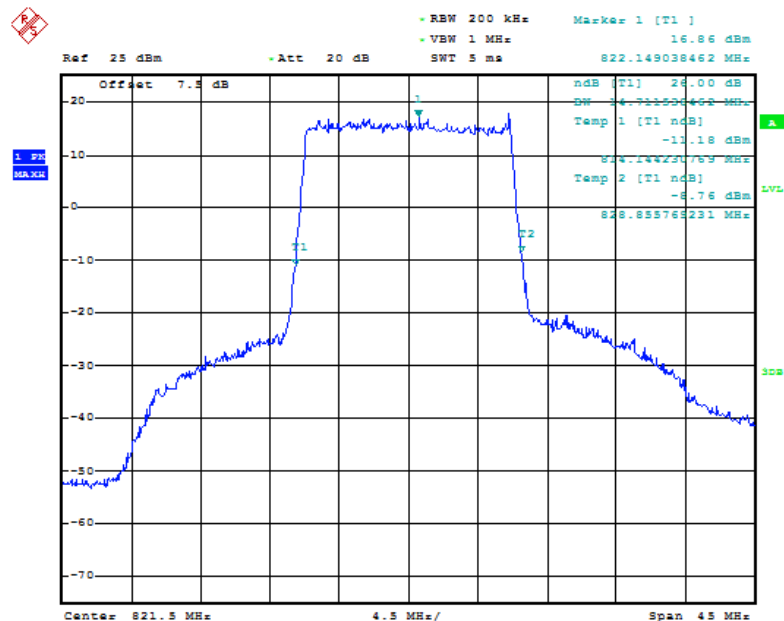
**LTE band 26 (Part 90), 15MHz (-26dBc)**

Frequency(MHz)	Occupied Bandwidth (-26dBc)( MHz)	
821.5	QPSK	16QAM
	14.71153846	14.71153846



Date: 31.JAN.2019 10:33:42

Fig.127 LTE band 26, 15MHz Bandwidth, QPSK (-26dBc BW)



Date: 31.JAN.2019 10:34:46

Fig.128 LTE band 26, 15MHz Bandwidth, 16QAM (-26dBc BW)

## **ANNEX A.6. BAND EDGE COMPLIANCE**

### **Reference**

FCC: CFR Part 22.917(b), 24.238(a), 27.53(g), 27.53(h), 27.53(m), 90.691.

#### **A.6.1 Measurement limit**

Part 22.917(b), 24.238(a), 27.53(g), 27.53(h), 27.53(m), 90.691 state that on any frequency outside frequency band of the US Cellular/PCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least  $43 + 10 \log(P)$  dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

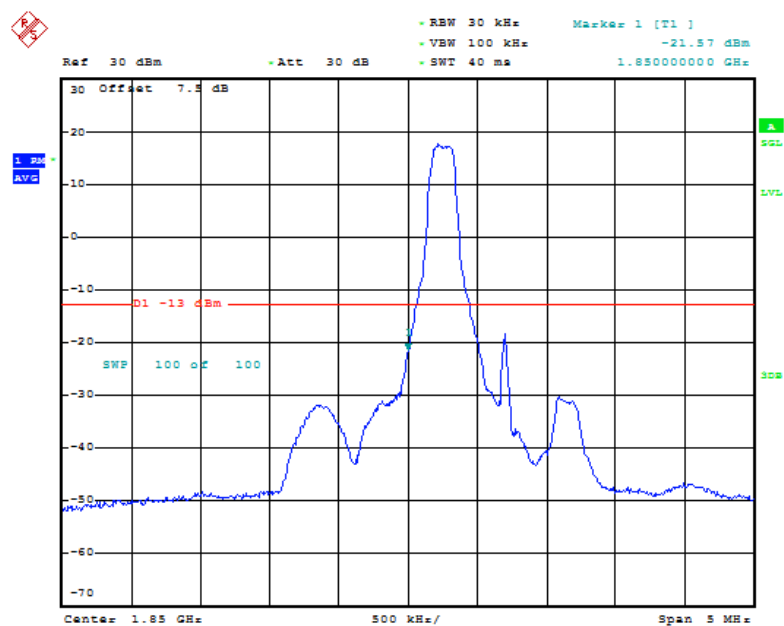
According to KDB 971168 6, a relaxation of the reference bandwidth is often provided for measurements within a specified frequency range at the edge of the authorized frequency block/band. This is often implemented by permitting the use of a narrower RBW (typically limited to a minimum RBW of 1% of the OBW) for measuring the out-of-band emissions without a requirement to integrate the result over the full reference bandwidth.

Part 27.53(m) states that 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 than  $43 + 10 \log(P)$  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.

## A.6.2 Measurement result

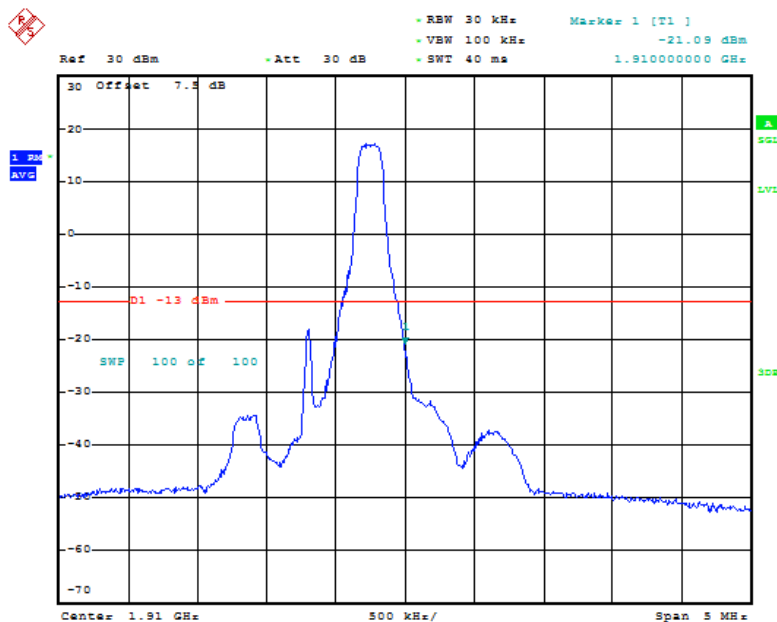
Only worst case result is given below

LTE band 2



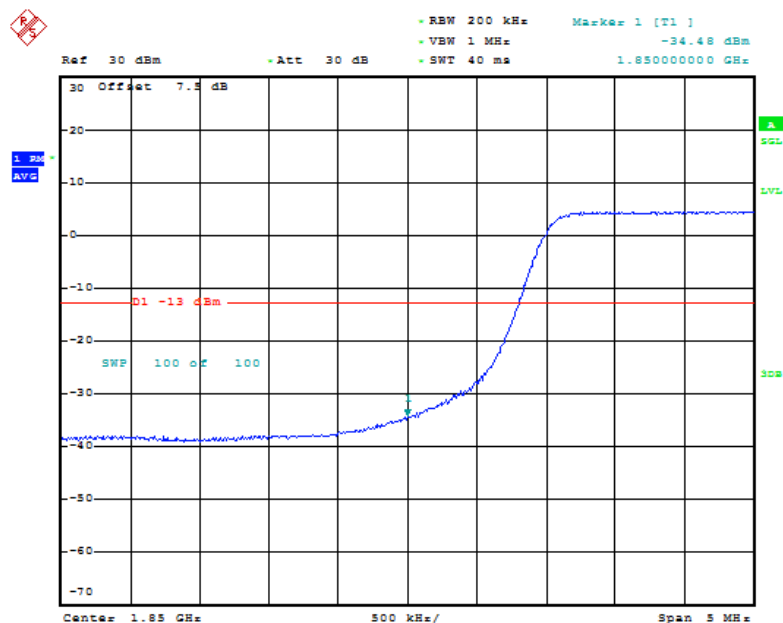
Date: 30.JAN.2019 13:46:19

Fig.129 LOW BAND EDGE BLOCK-1RB-low\_offset



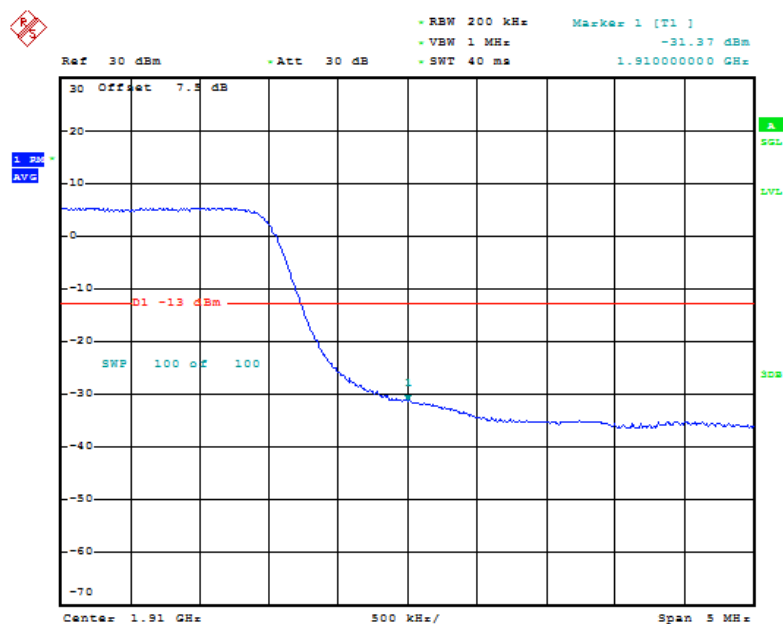
Date: 30.JAN.2019 13:46:53

Fig.130 HIGH BAND EDGE BLOCK-1RB-high\_offset



Date: 30.JAN.2019 13:57:02

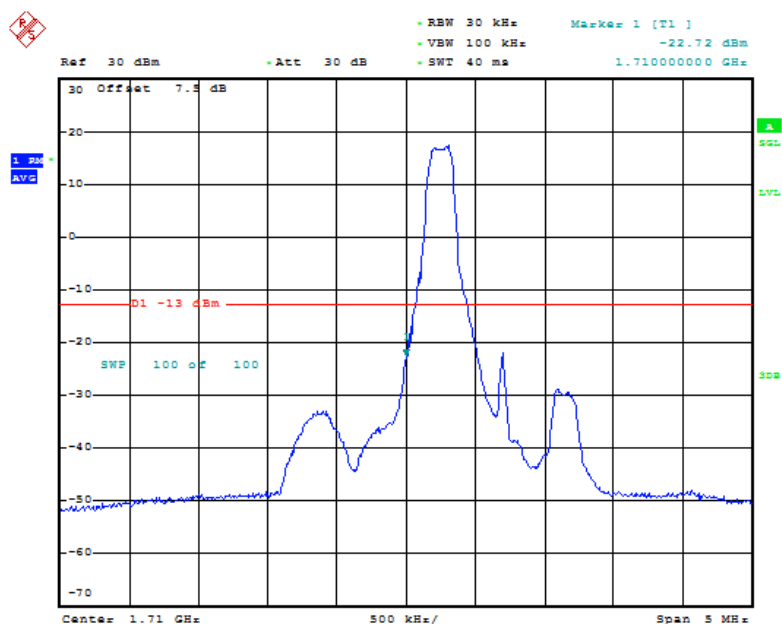
Fig.131 LOW BAND EDGE BLOCK-20MHz-100%RB



Date: 30.JAN.2019 13:57:36

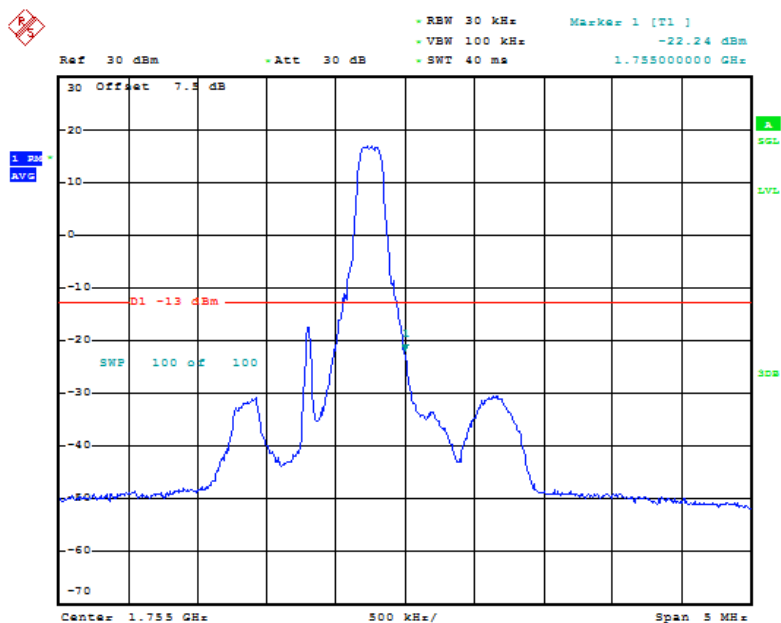
Fig.132 HIGH BAND EDGE BLOCK-20MHz-100%RB

# LTE band 4



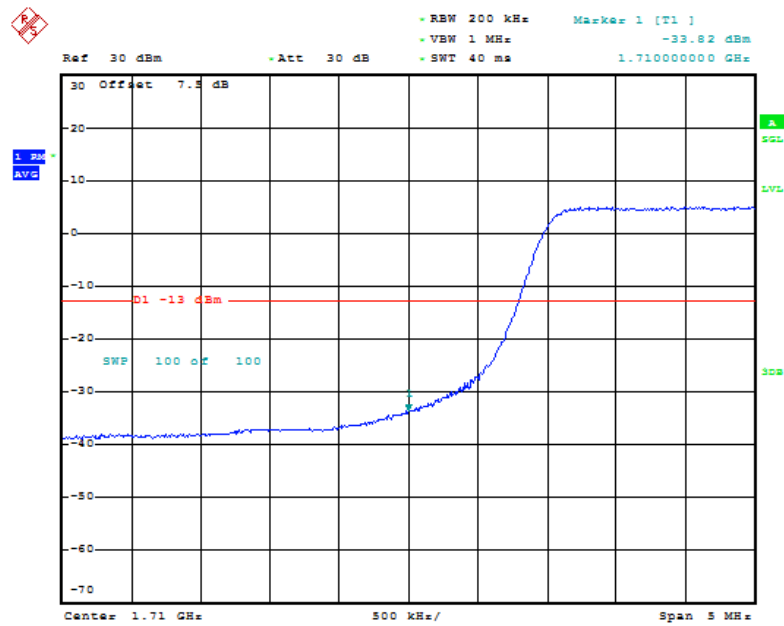
Date: 30.JAN.2019 13:49:14

Fig.133 LOW BAND EDGE BLOCK-1RB-low\_offset



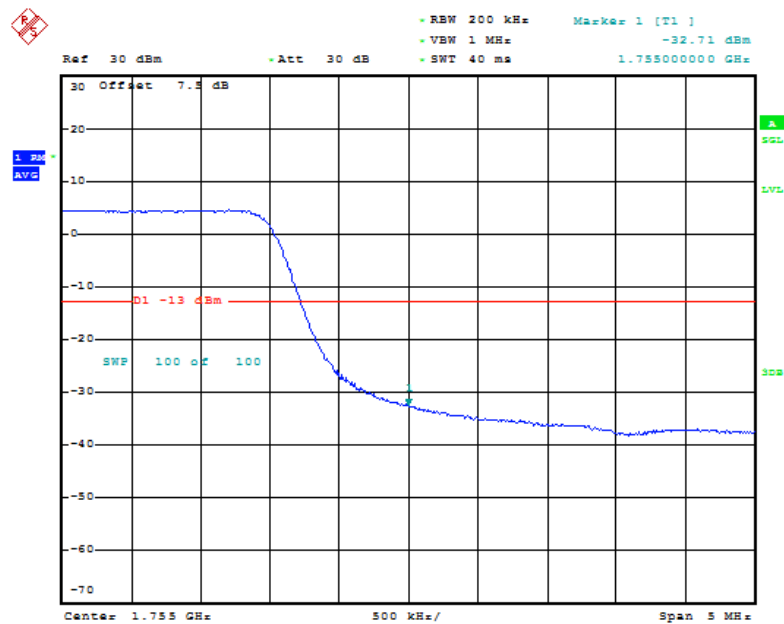
Date: 30.JAN.2019 13:49:48

Fig.134 HIGH BAND EDGE BLOCK-1RB-high\_offset



Date: 30.JAN.2019 13:59:39

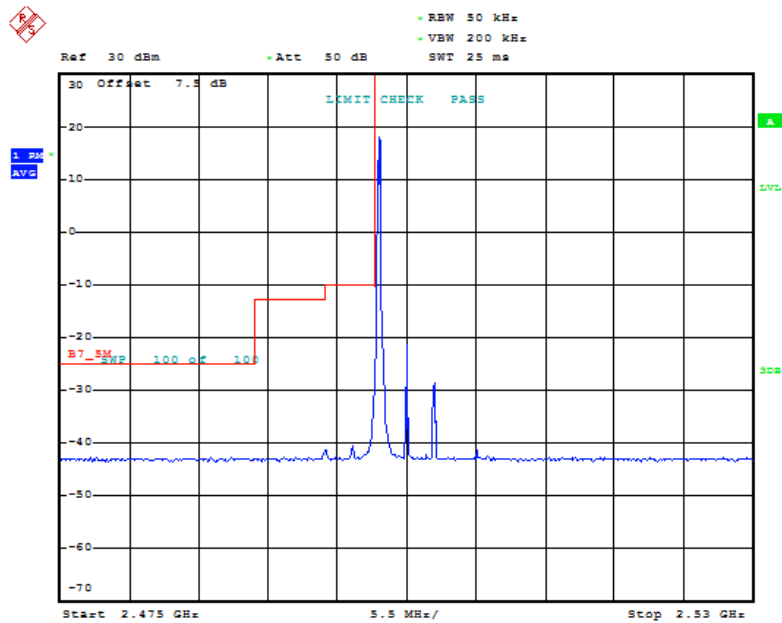
Fig.135 LOW BAND EDGE BLOCK-20MHz-100%RB



Date: 30.JAN.2019 14:00:13

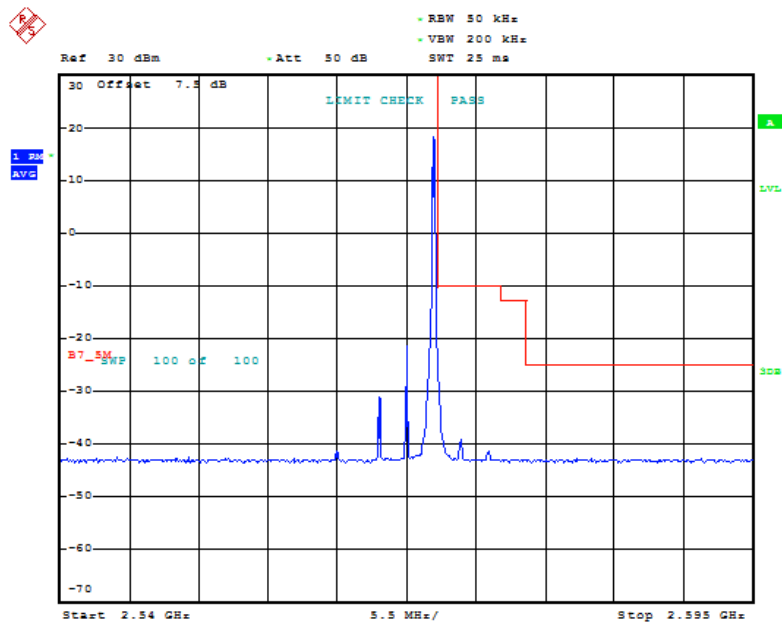
Fig.136 HIGH BAND EDGE BLOCK-20MHz-100%RB

## LTE band 7



Date: 30.JAN.2019 14:39:47

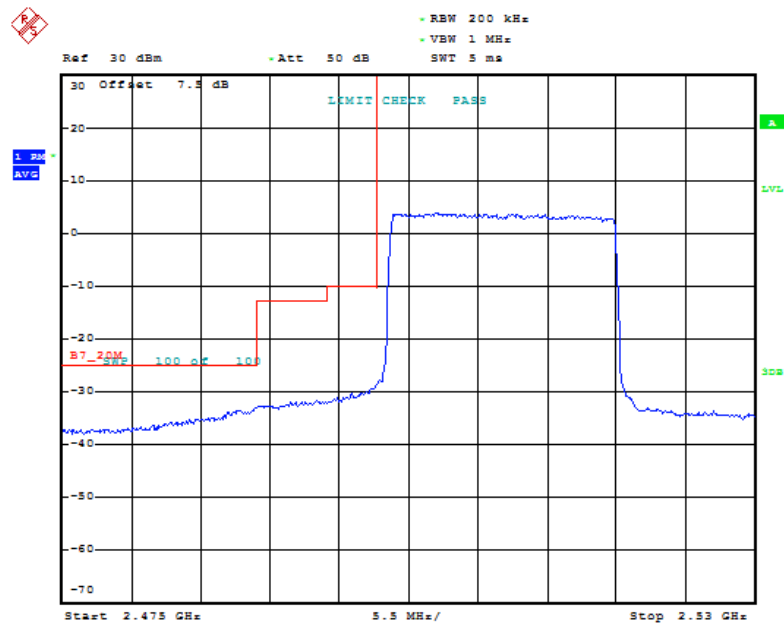
Fig.137 LOW BAND EDGE BLOCK-1RB-low\_offset



Date: 30.JAN.2019 14:41:22

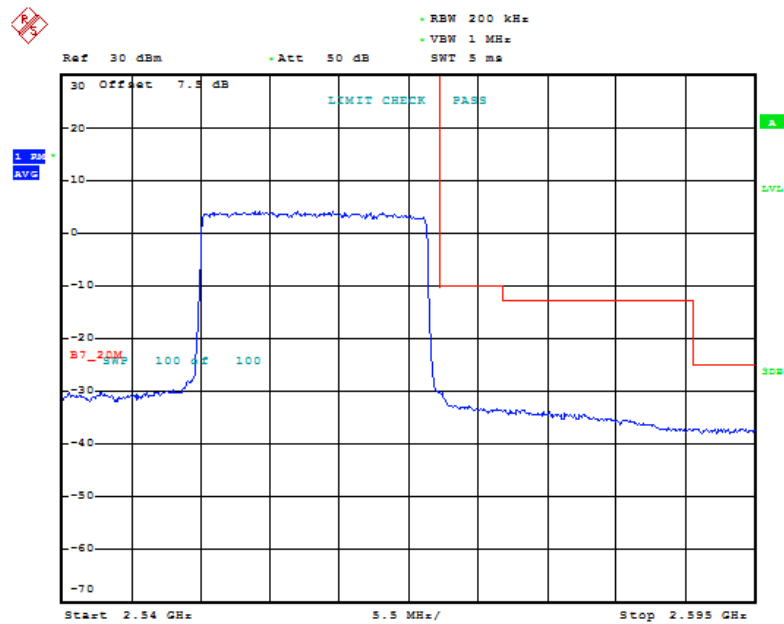
Fig.138 HIGH BAND EDGE BLOCK-1RB-high\_offset





Date: 30.JAN.2019 15:24:28

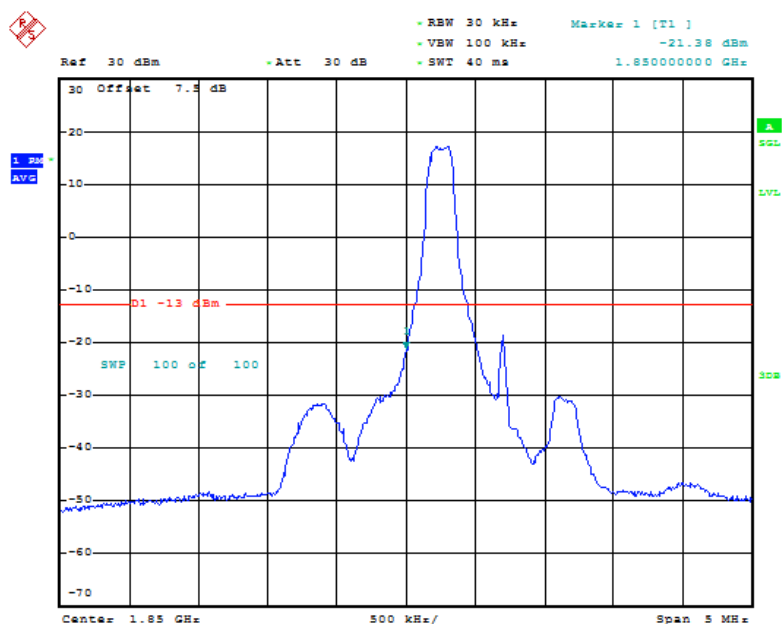
Fig.139 LOW BAND EDGE BLOCK-20MHz-100%RB



Date: 30.JAN.2019 15:27:45

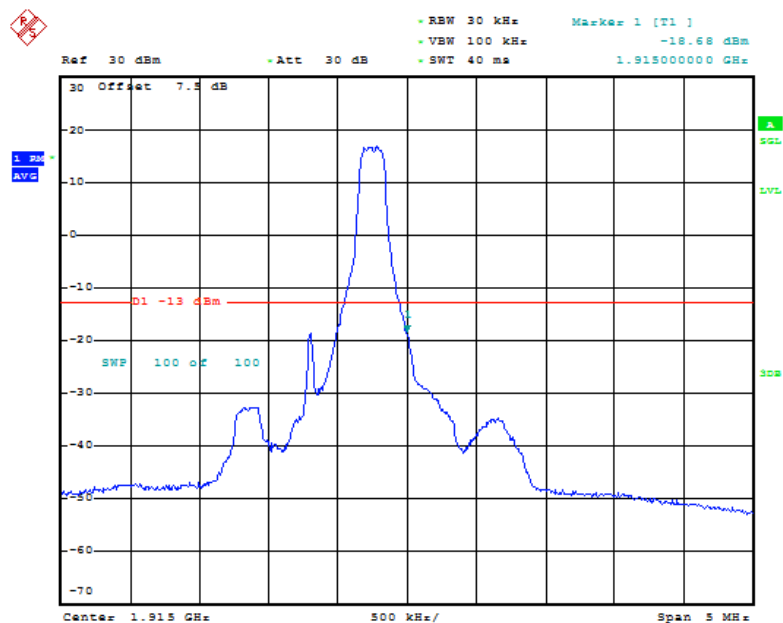
Fig.140 HIGH BAND EDGE BLOCK-20MHz-100%RB

# LTE band 25



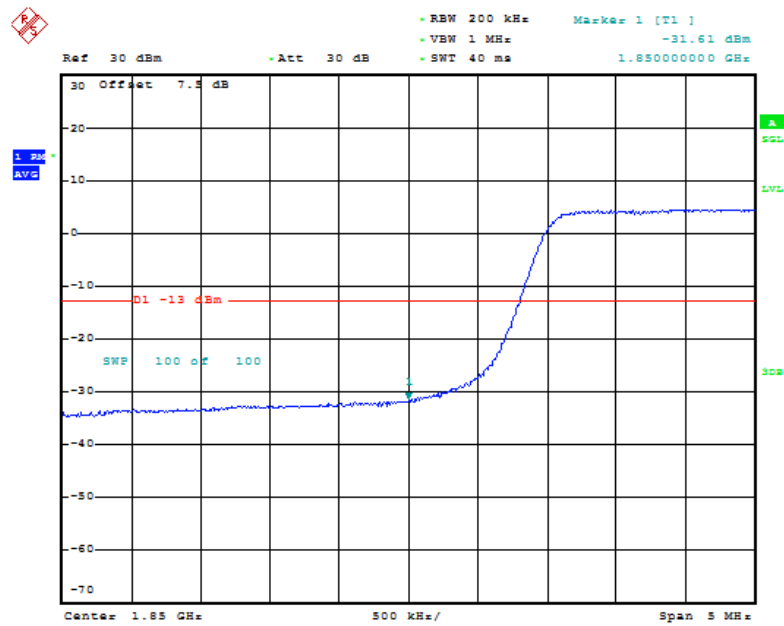
Date: 30.JAN.2019 13:52:55

Fig.141 LOW BAND EDGE BLOCK-1RB-low\_offset



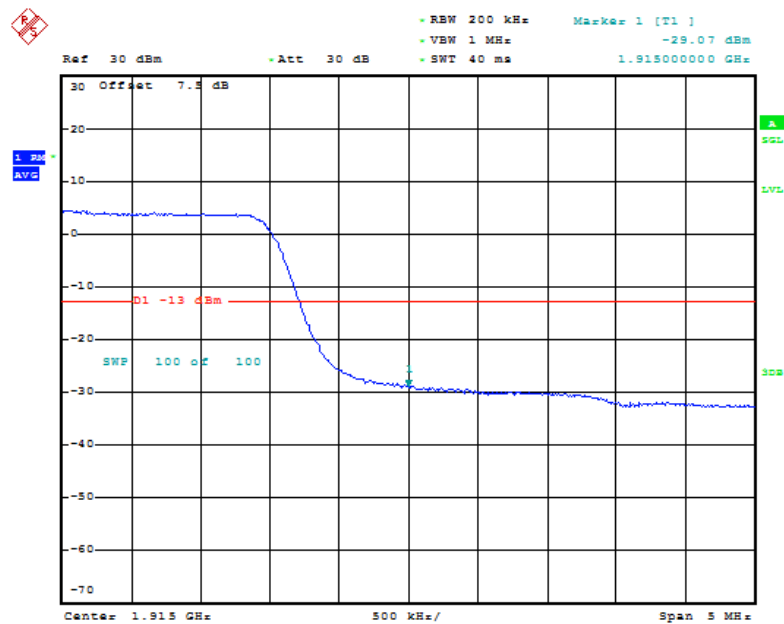
Date: 30.JAN.2019 13:53:29

Fig.142 HIGH BAND EDGE BLOCK-1RB-high\_offset



Date: 30.JAN.2019 14:02:17

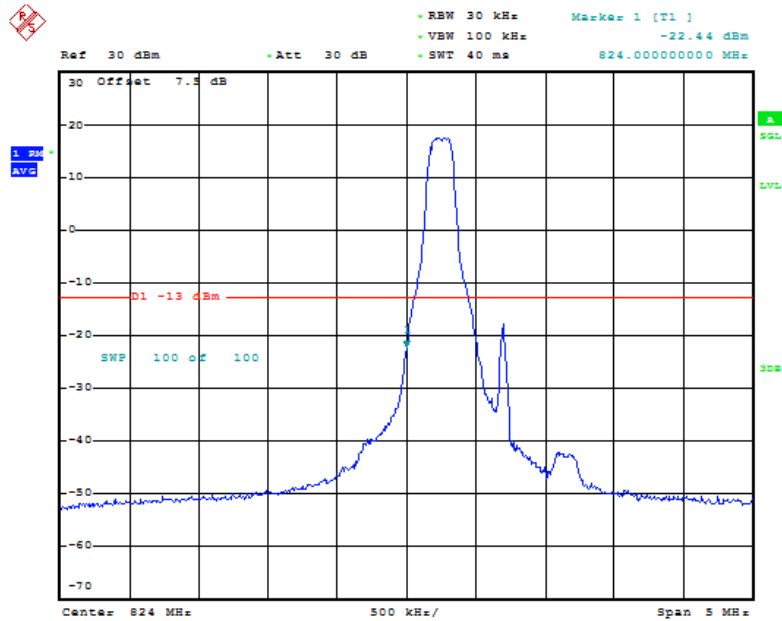
Fig.143 LOW BAND EDGE BLOCK-20MHz-100%RB



Date: 30.JAN.2019 14:02:51

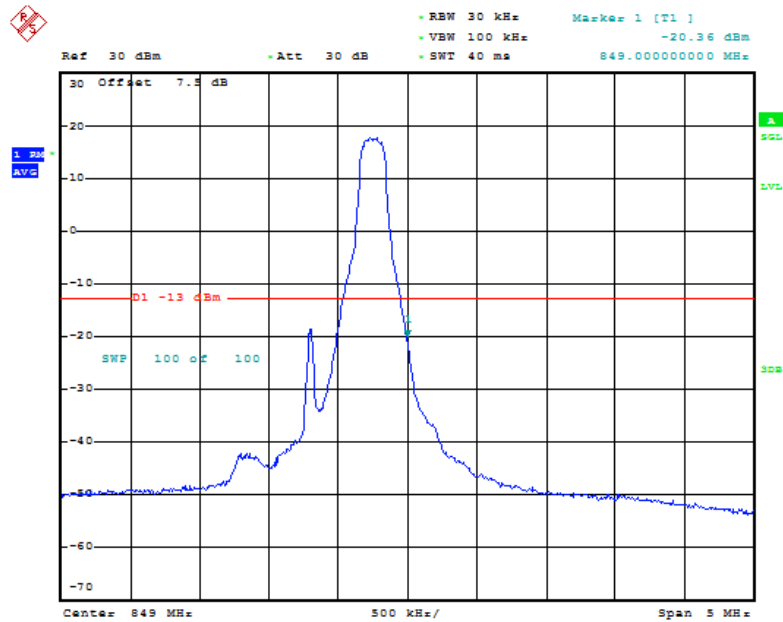
Fig.144 HIGH BAND EDGE BLOCK-20MHz-100%RB

## LTE band 26 (Part 22)



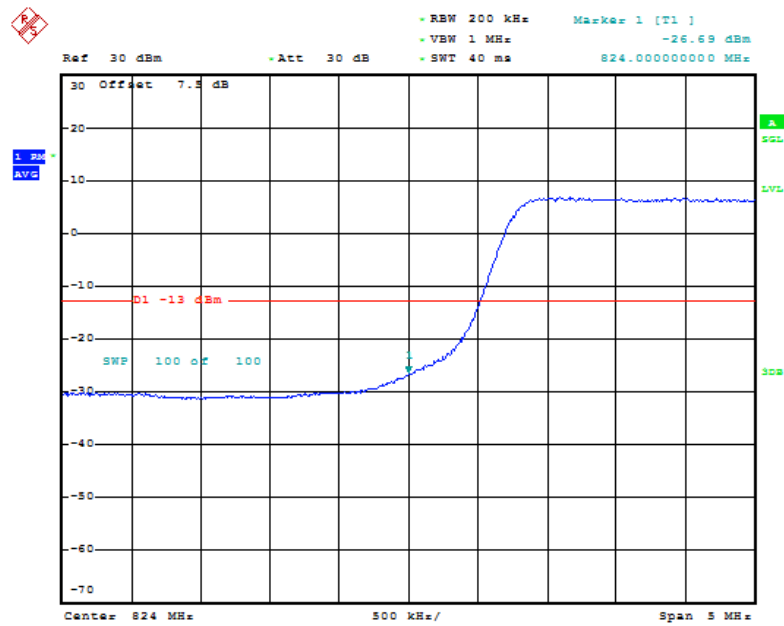
Date: 30.JAN.2019 14:30:56

Fig.145 LOW BAND EDGE BLOCK-1RB-low\_offset



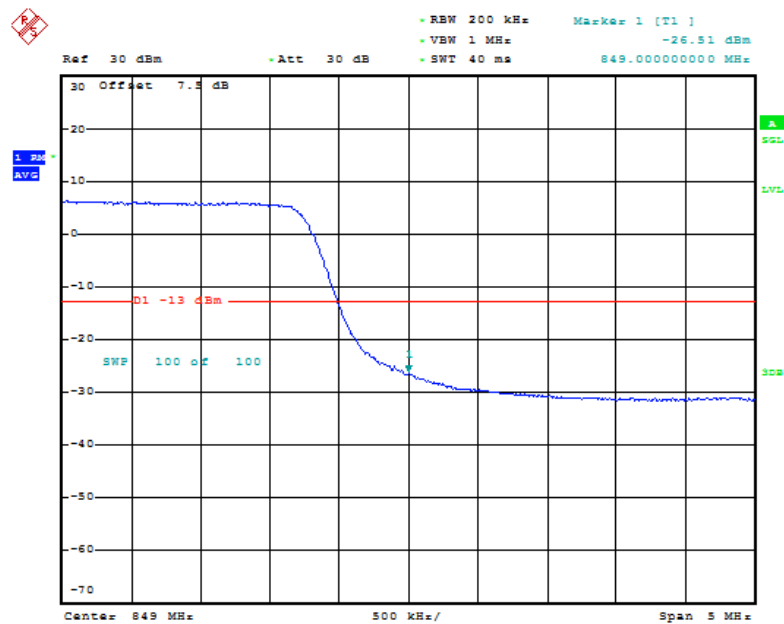
Date: 30.JAN.2019 14:31:30

Fig.146 HIGH BAND EDGE BLOCK-1RB-high\_offset



Date: 30.JAN.2019 14:25:58

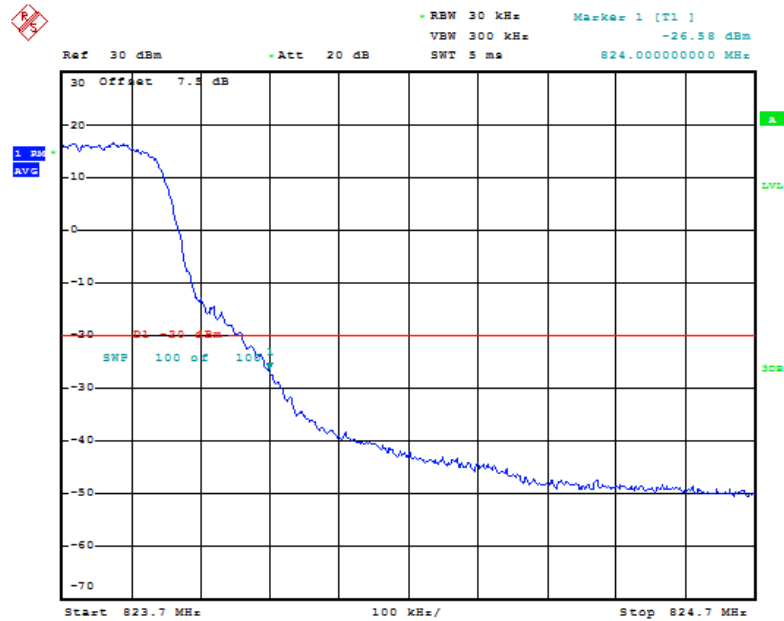
Fig.147 LOW BAND EDGE BLOCK-20MHz-100%RB



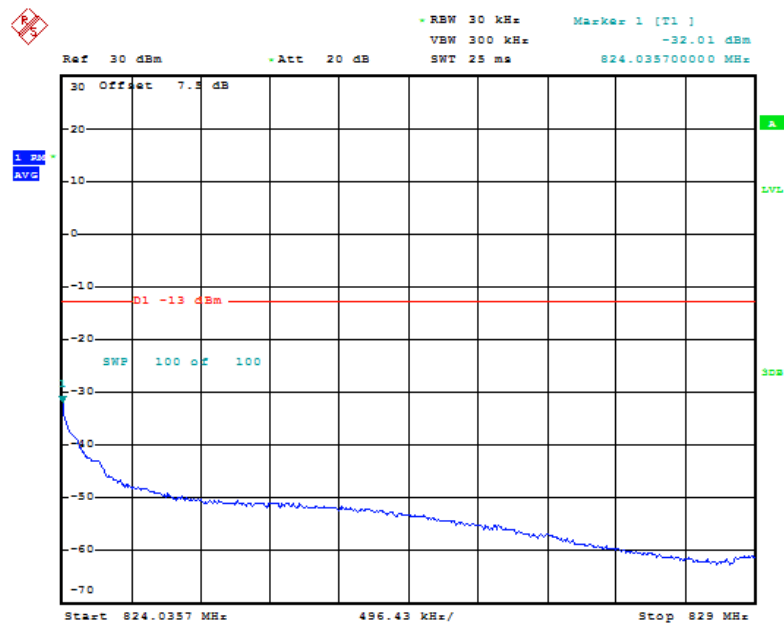
Date: 30.JAN.2019 14:26:31

Fig.148 HIGH BAND EDGE BLOCK-20MHz-100%RB

# LTE band 26 (Part 90)

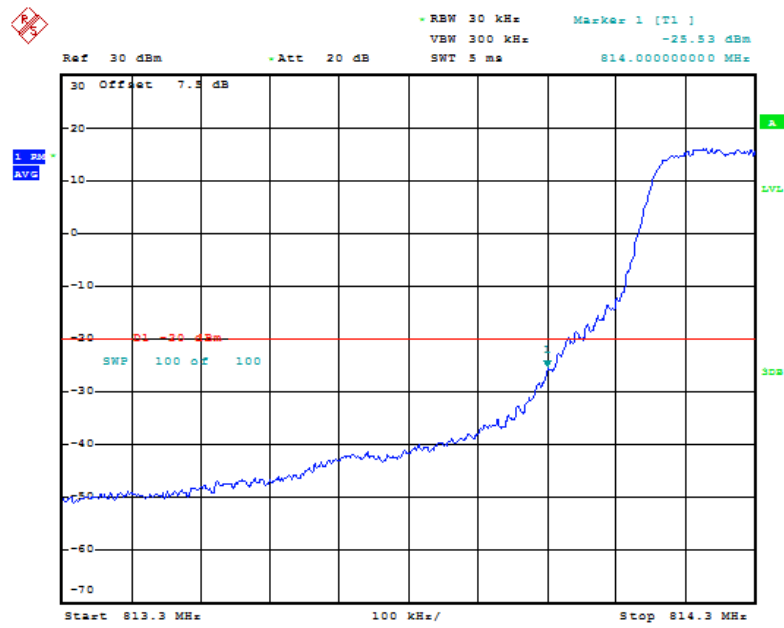


Date: 31.JAN.2019 11:25:27

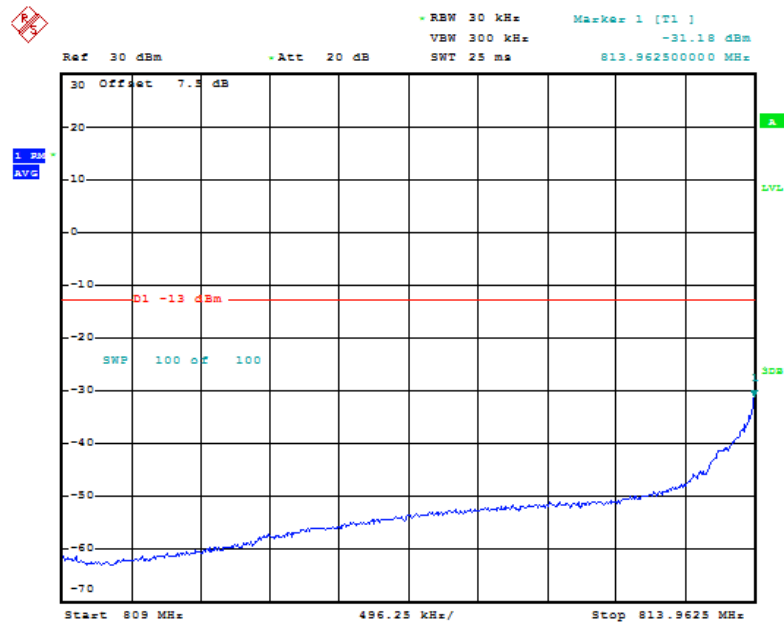


Date: 31.JAN.2019 13:14:40

Fig.149 LOW BAND EDGE BLOCK-1RB-low\_offset

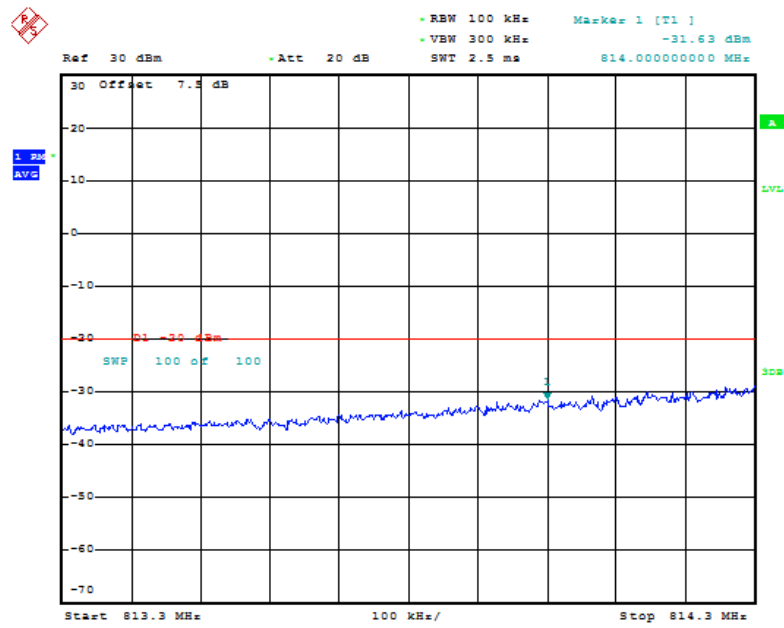


Date: 31.JAN.2019 13:18:39

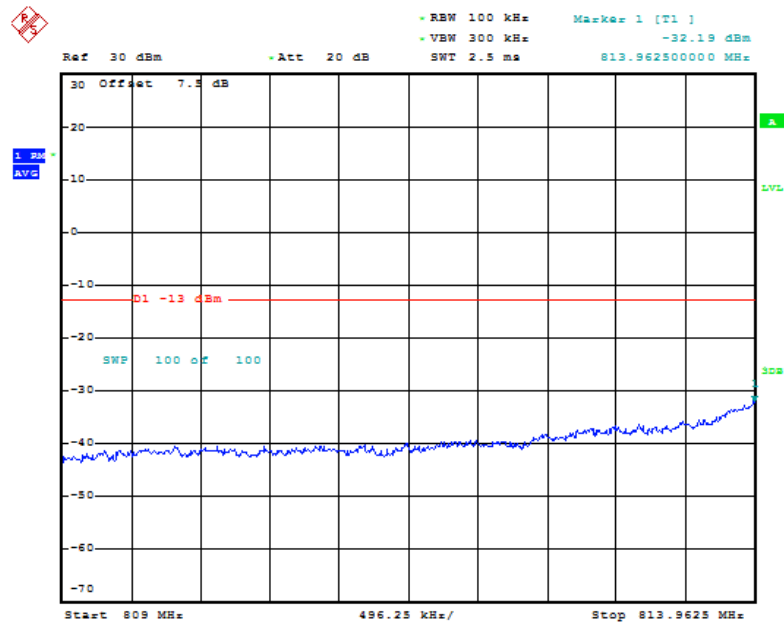


Date: 31.JAN.2019 13:17:12

Fig.150 HIGH BAND EDGE BLOCK-1RB-high\_offset



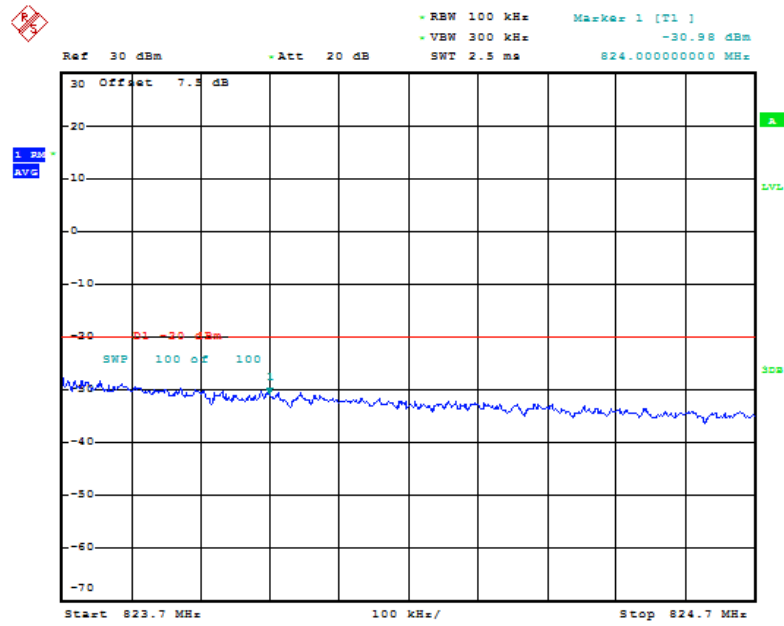
Date: 31.JAN.2019 13:25:18



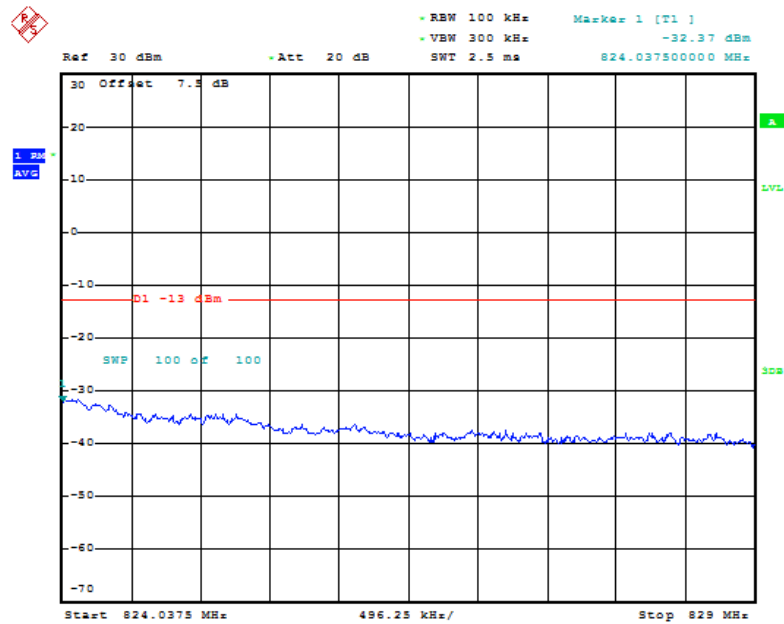
Date: 31.JAN.2019 13:26:00

Fig.151 LOW BAND EDGE BLOCK-10MHz-100%RB





Date: 31.JAN.2019 13:28:39



Date: 31.JAN.2019 13:27:02

Fig.152 HIGH BAND EDGE BLOCK-20MHz-100%RB

## **ANNEX A.7. CONDUCTED SPURIOUS EMISSION**

### **Reference**

FCC: CFR Part 22.917(b), 24.238(a), 27.53(g), 27.53(h), 27.53(m), 90.691.

### **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(b), 24.238(a), 27.53(g), 27.53(h), 27.53(m), 90.691 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.

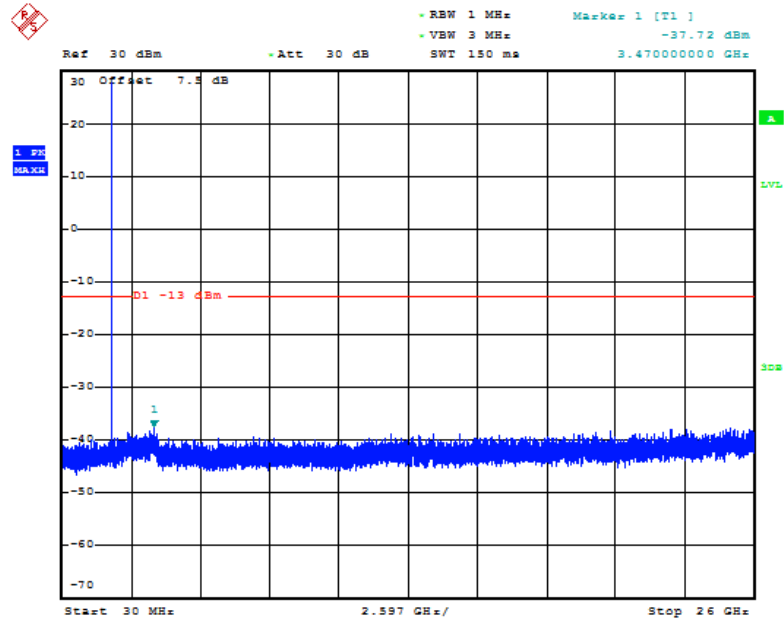
The specification that emissions shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 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 than  $43 + 10 \log(P)$  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.

### A. 7.3 Measurement result

Only worst case result is given below

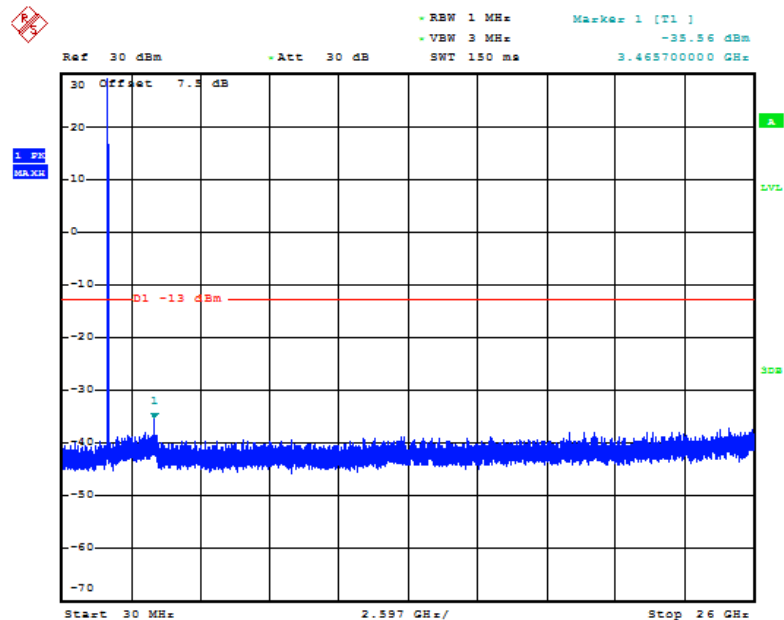
LTE band 2: Spurious emission limit -13dBm.



Date: 30.JAN.2019 15:35:47

Fig.153 LTE band 2: 30MHz – 26GHz

LTE band 4: Spurious emission limit -13dBm.



Date: 30.JAN.2019 15:36:24

Fig.154 LTE band 4: 30MHz – 26GHz

**LTE band 7: Spurious emission limit -25dBm.**

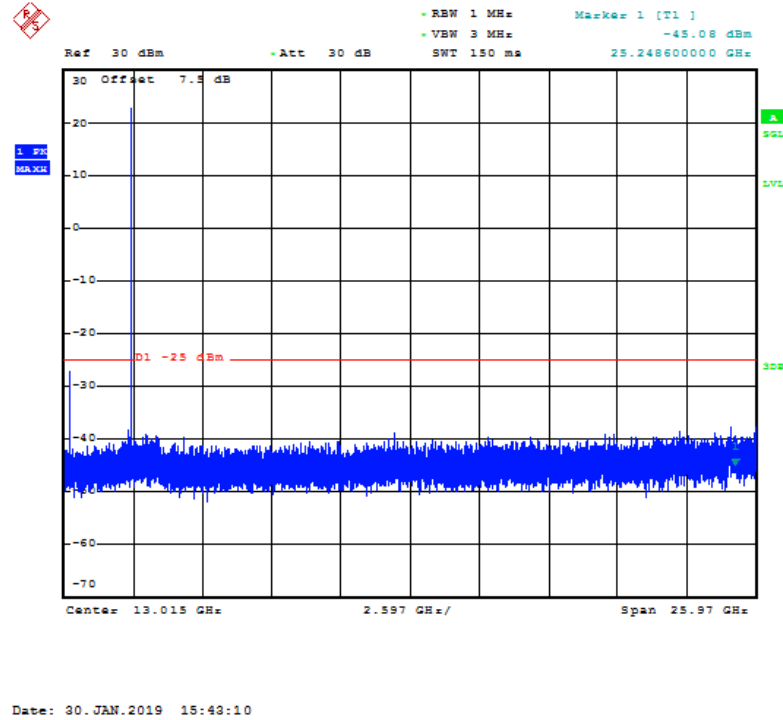


Fig.155 LTE band 7: 30MHz – 26GHz

**LTE band 25: Spurious emission limit -13dBm.**

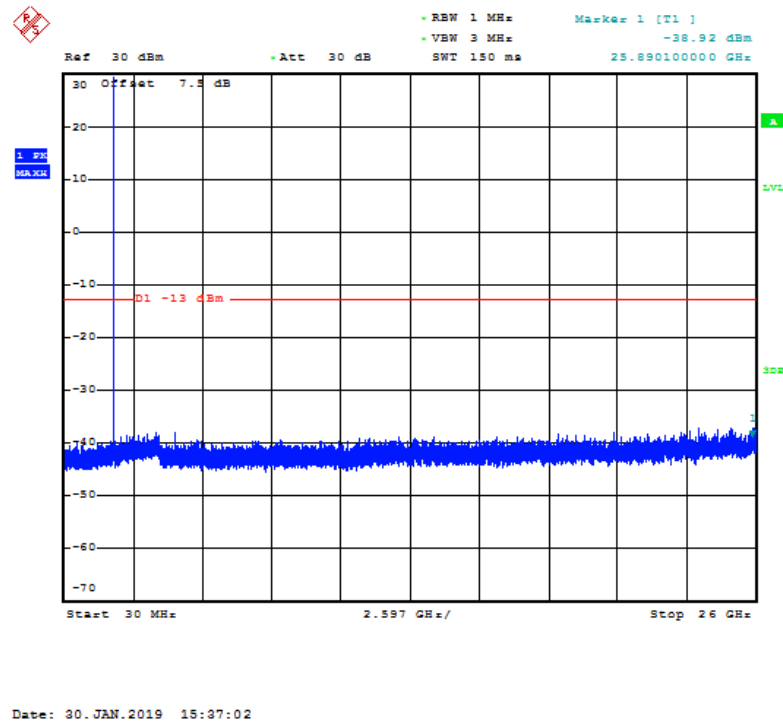
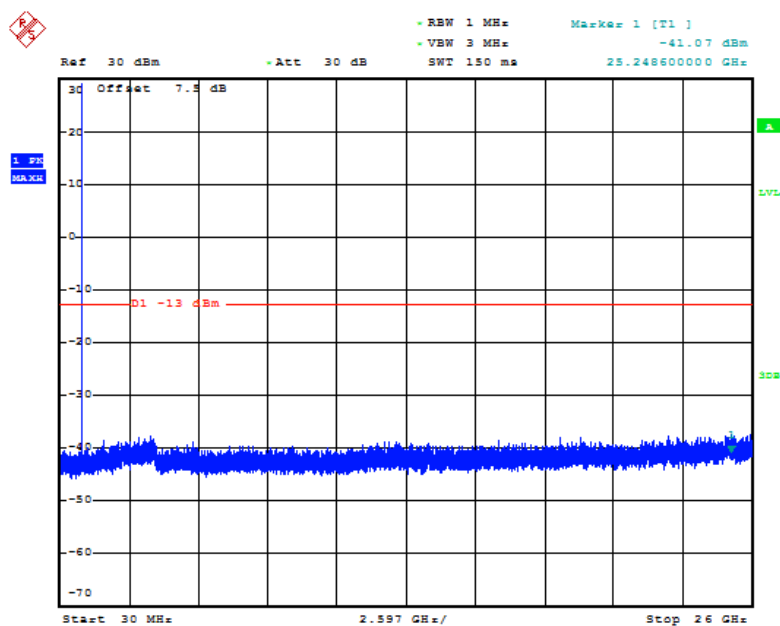


Fig.156 LTE band 25: 30MHz – 26GHz

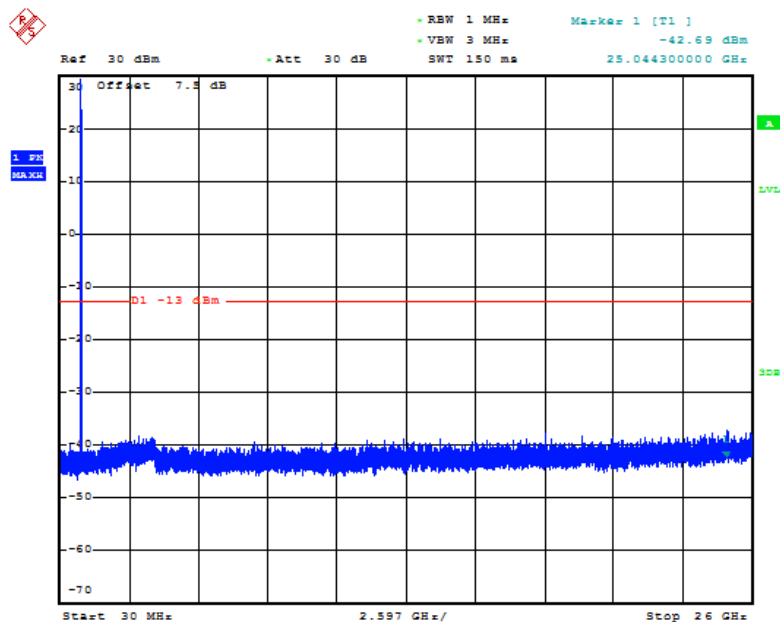
**LTE band 26(Part 22): Spurious emission limit -13dBm.**



Date: 30.JAN.2019 15:38:19

Fig.157 LTE band 26(Part 22): 30MHz – 26GHz

**LTE band 26(Part 90): Spurious emission limit -13dBm.**



Date: 31.JAN.2019 10:40:29

Fig.158 LTE band 26(Part 90): 30MHz – 26GHz

## **ANNEX A.8. PEAK-TO-AVERAGE POWER RATIO**

### **Reference**

FCC: CFR Part 24.232 (d), 27.50(a)

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:

- a) Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;
- b) Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
- c) Set the number of counts to a value that stabilizes the measured CCDF curve;
- d) Set the measurement interval to 1 ms
- e) Record the maximum PAPR level associated with a probability of 0.1%

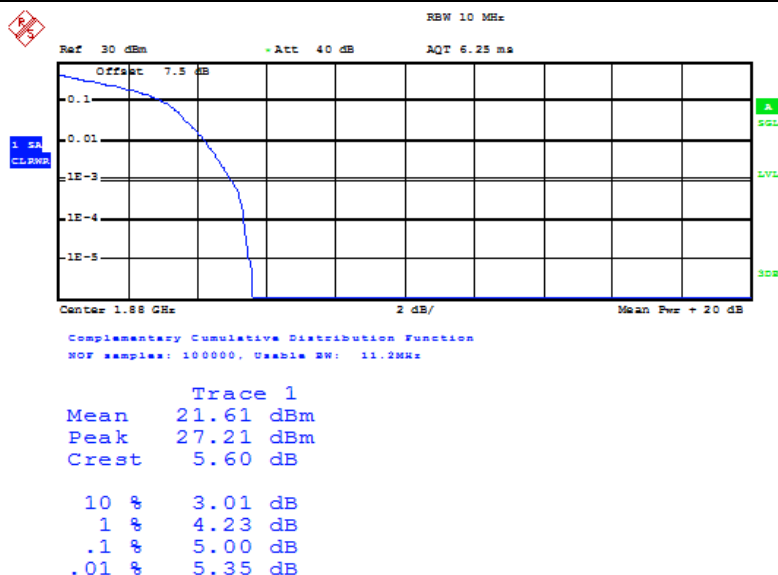
### **A.8.1 Measurement limit**

not exceed 13 dB

### **A.8.2 Measurement results**

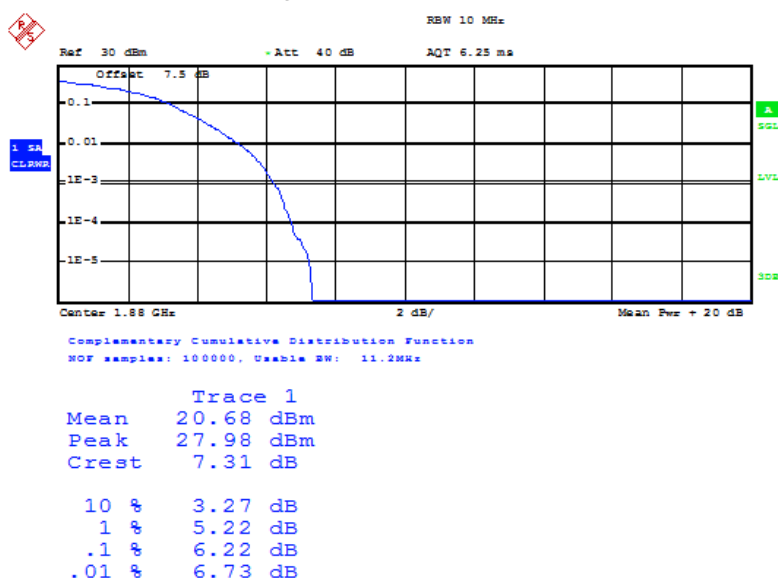
# LTE band 2, 20MHz

Frequency(MHz)	PAPR(dB)	
	QPSK	16QAM
1880.0	5	6.22



Date: 30.JAN.2019 13:21:54

Fig.159 LTE band 2: QPSK

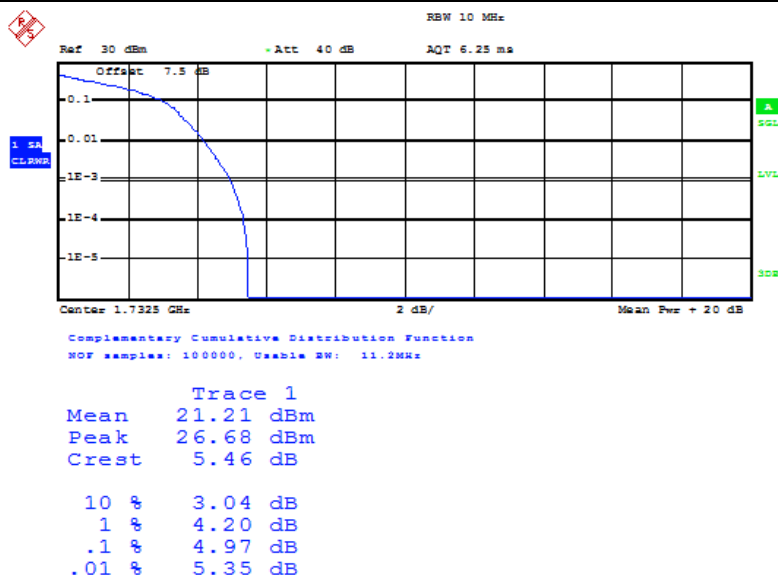


Date: 30.JAN.2019 13:22:19

Fig.160 LTE band 2: 16QAM

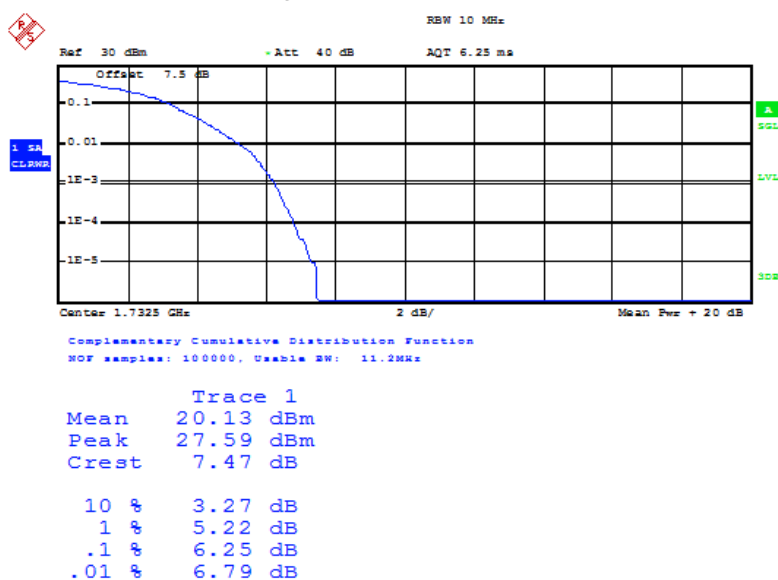
# LTE band 4, 20MHz

Frequency(MHz)	PAPR(dB)	
	QPSK	16QAM
1732.5	4.97	6.25



Date: 30.JAN.2019 13:23:08

Fig.161 LTE band 4: QPSK



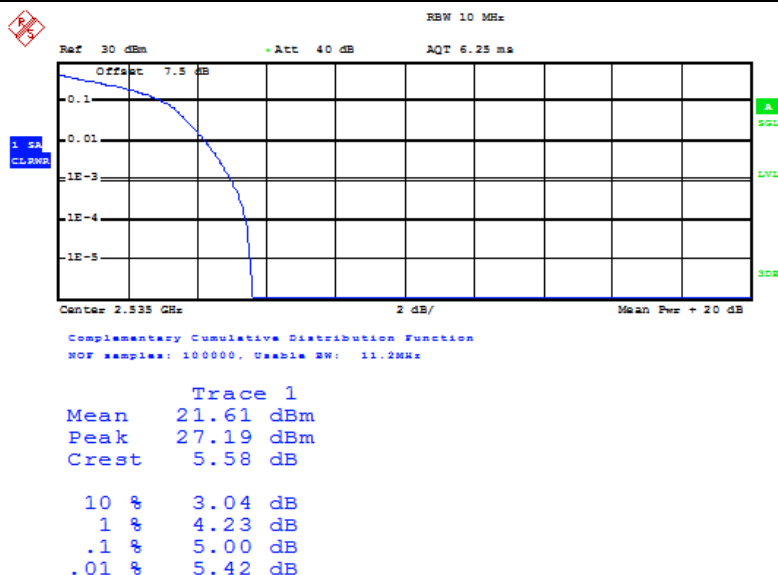
Date: 30.JAN.2019 13:23:33

Fig.162 LTE band 4: 16QAM



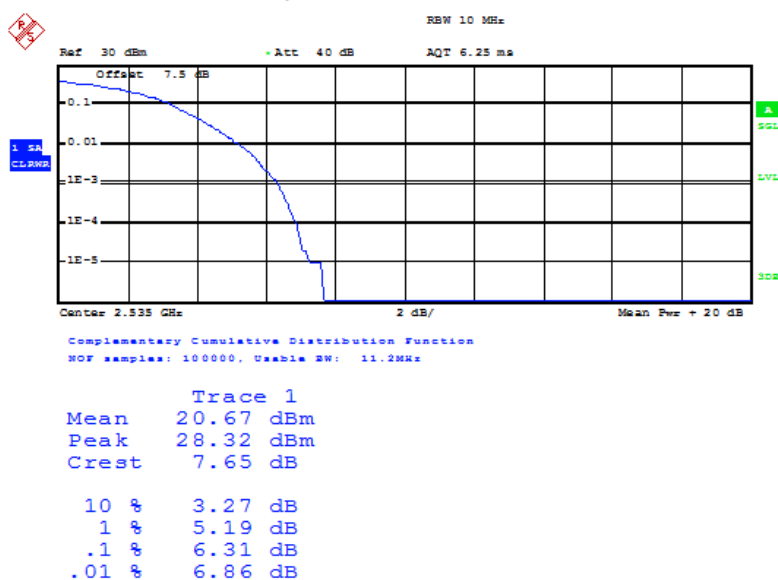
# LTE band 7, 20MHz

Frequency(MHz)	PAPR(dB)	
	QPSK	16QAM
2535.0	5	6.31



Date: 30.JAN.2019 13:29:51

Fig.163 LTE band 7: QPSK

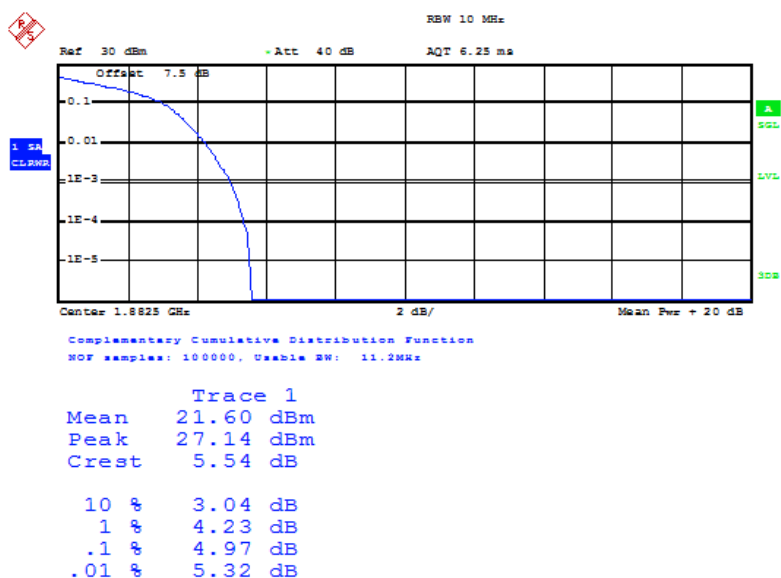


Date: 30.JAN.2019 13:30:17

Fig.164 LTE band 7: 16QAM

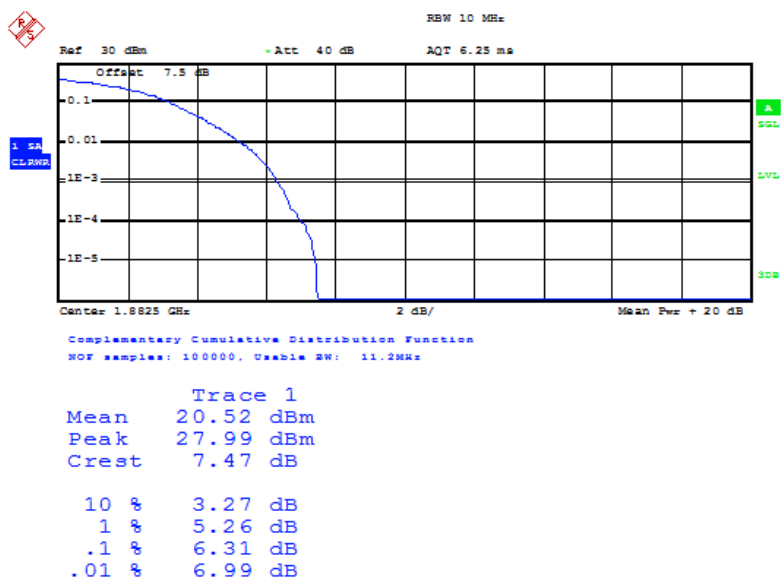
# LTE band 25, 20MHz

Frequency(MHz)	PAPR(dB)	
	QPSK	16QAM
1882.5	4.97	6.31



Date: 30.JAN.2019 13:24:22

## Fig.165 LTE band 25: QPSK



Date: 30.JAN.2019 13:24:47

## Fig.166 LTE band 25: 16QAM

## **ANNEX B. Deviations from Prescribed Test Methods**

No deviation from Prescribed Test Methods.

## **ANNEX C. Detailed Test Results**

### **Annex C.1.Main Terms**

Verdict	Verdict of each test cases.
Test cases	Test cases identification number and description in ETSI EN 300 328 test specification and ETSI specification.

### **Annex C.2.Terms used in Condition column**

Tnom	Normal temperature
Tmin	Low temperature
Tmax	High temperature
Vnom	Normal voltage

### **Annex C.3.Terms used in Verdict column**

P	Pass, the EUT complies with the essential requirements in the standard.
NM	Not measure, the test was not measured by ECIT.
NA	Not applicable, the test was not applicable.
F	Fail, the EUT does not comply with the essential requirements in the standard.

### **Annex C.4.Terms used in Note column**

EUT ID	EUT ID (e.g N01, N02.....) is used to identify the EUT tested used for each test cases as specified in section 3 of this test report.
Lab Code	Lab code is used to identify the subcontracted lab if this test cases is performed in the subcontracted lab.

Subcontracted test lab code: N/A

## ANNEX D. Accreditation Certificate



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