EMC TEST REPORT

No. I15Z40385-EMC01

for

Sony Mobile Communications Inc.

GSM/WCDMA/LTE Mobile Phone

FCC ID: PY7-PM0817

with

Hardware Version: A

Software Version: KK-MR1-SHINANO2-DSDS-150114-0317

Issued Date: 2015-04-10

Note:

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

Test Laboratory:

FCC 2.948 Listed: No. 525429

IC O.A.T.S listed: No. 12389A-1

CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I15Z40385-EMC01	Rev.0	1st edition	2015-03-09
I15Z40385-EMC01	Rev.1	2nd edition	2015-04-10

CONTENTS

1. Test Laboratory

1.1. Testing Location

Location 2: CTTL(Shouxiang)

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

1.2. Testing Environment

Normal Temperature: 15-35℃

Relative Humidity: 20-75%

Air pressure 980 - 1040 hPa

The climatic requirements above are general exclude the special requirements for dedicated test environments listed in section 5 and some specific test cases in other parts of this report.

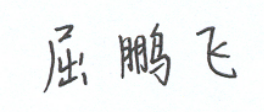
1.3. Project data

Receipt of Sample 2015-02-13

Testing Start Date: 2015-02-15

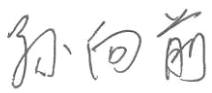
Testing End Date: 2015-04-10

1.4. Signature



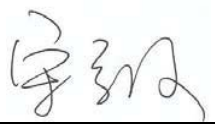
Qu Pengfei

(Prepared this test report)



Sun Xiangqian

(Reviewed this test report)



Song Chongwen

(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Sony Mobile Communications (China) Co. Ltd
Address /Post:	Sony Mobile R&D Center, No. 16, Guangshun South Street, Chaoyang District
City:	Beijing
Postal Code:	100102
Country:	China
Contact Person:	Ma, Gang
Telephone:	+86-10-58656312
Fax:	+86-10-58659049

2.2. Manufacturer Information

Company Name:	Sony Mobile Communications Inc.
Address /Post:	1-8-15 Konan, Minato-ku, Tokyo, 108-0075, Japan
City:	Tokyo
Postal Code:	108-0075
Country:	Japan

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

3.1. About EUT

Description	GSM, GPRS, EDGE, WCDMA, HSDPA, HSUPA, LTE Bluetooth (EDR and BLE), ANT+, WLAN (802.11 a/ac/b/g/n), NFC, FM, GPS mobile phone
FCC ID	PY7-PM0817
Antenna	Internal
Power supply	Battery (charged by travel adapter or vehicle charger)
Extreme vol. Limits	3.6VDC to 4.2VDC (nominal: 3.8VDC)
Extreme temp. Tolerance	-10°C to +55°C

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of Telecommunication Metrology Center of MIIT of People's Republic of China.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN	IMEI	HW Version	SW Version
EUT1	CB5A21E5N5	004402453328522	A	KK-MR1-SHINANO2-D SDS-150114-0317
EUT13	/	004402453328688	A	KK-MR1-SHINANO2-D SDS-150114-0317

*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	Revision
AE21	Embedded Battery	/	/

AE21

Model name	1281-2461
Manufacturer	Sony Mobile
Minimum Capacitance	3100 mAh
Nominal Voltage	3.8 V

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

3.4. General Description

The Equipment Under Test (EUT) is a model of GSM/WCDMA/LTE Mobile Phone with integrated antenna and embedded battery.
The EUT supports GSM, WCDMA and LTE. It supports GPRS service with multi-slots class 33 and EGPRS service with multi-slots class 33. The HSDPA (Cat 24) and HSUPA (Cat 6) features are also supported.
It has MP3, camera, USB memory, FM radio, GPS receiver, NFC, Bluetooth (EDR, BLE), ANT+, WLAN (802.11 a/ac/b/g/n) and Wi-Fi hotspot functions.
It consists of normal options: USB cable and travel charger.
Manual and specifications of the EUT were provided to fulfil the test.
Samples undergoing test were selected by the client.

3.5. EUT set-ups

EUT Set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT1 + AE21	ERP/EIRP/RSE tests
Set.10	EUT13 + AE21	Conducted RF tests

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 27	MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES	10-1-13 Edition
ANSI/TIA-603-C	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards	2004
KDB 971168 D01	Measurement Guidance for Certification of Licensed Digital Transmitters	v02r01

5. LABORATORY ENVIRONMENT

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

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 4000 MHz

6. SUMMARY OF TEST RESULTS

6.1. Summary of test results

Abbreviations used in this clause:		
Verdict Column	P	Pass
	F	Fail
	NA	Not applicable
	NM	Not measured
Location Column	1/2/3/4	The test is performed in test location 1, 2, 3 or 4 which are described in section 1.1 of this report

LTE Band 7

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

LTE Band 41

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

6.2. Statements

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

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

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

7. Test Equipments Utilized

NO.	NAME	TYPE	SERIES NUMBER	PRODUCER	CAL. DUE DATE	CAL. INTERVAL
1.	EMI Antenna	VULB 9163	9163-235	Schwarzbeck	2017-10-29	3 Years
2.	EMI Antenna	3117	00119024	ETS-Lindgren	2016-01-20	3 Years
3.	EMI Antenna	9117	167	Schwarzbeck	2016-04-01	
4.	EMI Antenna	3117	00058888	ETS-Lindgren	2017-04-20	3 Years
5.	Signal Generator	N5183A	MY49060052	Agilent	2016-03-02	1 year
6.	Power Amplifier	5S1G4	0341863	AR	/	1 Year
7.	Universal Radio Communication Tester	CMW500	116588	R&S	2015-10-23	1 Year
8.	Spectrum Analyzer	E4440A	MY49420053	Agilent	2015-12-30	1 Year
9.	Climatic chamber	SH-641	92014694	ESPEC	2015-11-27	1 Year
10.	Universal Radio Communication Tester	CMW500	101675	2015-07-13	2015-07-13	1 Year

ANNEX A: MEASUREMENT RESULTS

A.1 OUTPUT POWER

Reference

FCC: 27.50(h)(2)

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.

This result contains peak output power, ERP/EIRP measurements and peak-to-average power ratio (PAPR) for the EUT.

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

A.1.2 Conducted

A.1.2.1 Method of Measurements

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

The power was measured with spectrum analyzer's RMS detector.

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 7

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
5MHz	1 RB high	2502.5	**23.60**	22.62
		2535	23.32	22.41
		2567.5	23.56	22.63
	1 RB low	2502.5	23.48	22.49
		2535	23.21	22.25
		2567.5	23.41	22.40
	50% RB mid	2502.5	22.66	21.66
		2535	22.35	21.41
		2567.5	22.42	21.54
	100% RB	2502.5	22.60	21.74
		2535	22.31	21.45
		2567.5	22.43	21.63

(Continued)

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
10MHz	1 RB high	2505	23.54	22.91
		2535	23.38	22.79
		2565	23.43	22.77
	1 RB low	2505	23.35	22.76
		2535	23.20	22.65
		2565	23.35	22.67
	50% RB mid	2505	22.56	21.58
		2535	22.38	21.36
		2565	22.46	21.60
	100% RB	2505	22.58	21.57
		2535	22.33	21.36
		2565	22.54	21.57
15MHz	1 RB high	2507.5	23.48	22.84
		2535	23.30	22.71
		2562.5	23.49	22.81
	1 RB low	2507.5	23.33	22.74
		2535	23.13	22.51
		2562.5	23.33	22.70
	50% RB mid	2507.5	22.51	21.49
		2535	22.34	21.35
		2562.5	22.48	21.56
	100% RB	2507.5	22.51	21.52
		2535	22.36	21.39
		2562.5	22.53	21.57

(Continued)

20MHz	1 RB high	2510	23.60	22.69
		2535	23.41	22.46
		2560	23.48	22.58
	1 RB low	2510	23.41	22.57
		2535	23.26	22.39
		2560	23.41	22.44
	50% RB mid	2510	22.41	21.50
		2535	22.26	21.35
		2560	22.41	21.53
	100% RB	2510	22.46	21.48
		2535	22.29	21.37
		2560	22.39	21.55

LTE band 41

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
5MHz	1 RB high	2498.5	23.72	22.76
		2593	23.68	22.87
		2687.5	23.44	22.52
	1 RB low	2498.5	23.83	22.79
		2593	23.67	22.83
		2687.5	23.49	22.54
	50% RB mid	2498.5	22.84	22.10
		2593	22.88	22.19
		2687.5	22.61	21.85
	100% RB	2498.5	22.90	21.87
		2593	22.97	21.87
		2687.5	22.62	21.62
10MHz	1 RB high	2501	23.75	22.89
		2593	23.77	22.93
		2685	23.57	22.79
	1 RB low	2501	23.83	22.94
		2593	23.77	22.94
		2685	23.58	22.78
	50% RB mid	2501	22.90	21.98
		2593	22.92	21.95
		2685	22.55	21.69
	100% RB	2501	22.86	21.89
		2593	22.92	21.90
		2685	22.59	21.57

(Continued)

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
15MHz	1 RB high	2503.5	23.77	22.87
		2593	23.78	22.94
		2682.5	23.59	22.79
	1 RB low	2503.5	**23.95**	22.99
		2593	23.78	22.93
		2682.5	23.53	22.74
	50% RB mid	2503.5	22.97	21.97
		2593	22.98	21.90
		2682.5	22.63	21.67
	100% RB	2503.5	23.00	22.05
		2593	22.92	21.93
		2682.5	22.61	21.69
20MHz	1 RB high	2506	23.86	23.08
		2593	23.71	23.05
		2680	23.59	22.86
	1 RB low	2506	23.92	23.16
		2593	23.74	23.21
		2680	23.55	22.97
	50% RB mid	2506	22.78	21.94
		2593	22.88	21.92
		2680	22.62	21.71
	100% RB	2506	22.91	22.02
		2593	22.94	21.94
		2680	22.62	21.71

Note: Expanded measurement uncertainty is U = 0.83 dB, k = 2.

A.1.3 Radiated

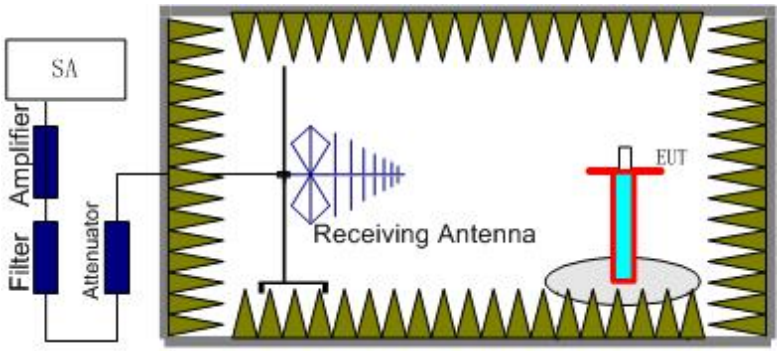
A.1.3.1 Description

This is the test for the maximum radiated power from the EUT.
Rule Part 27.50(h)(2) specifies “Mobile stations are limited to 2.0 watts EIRP.”.

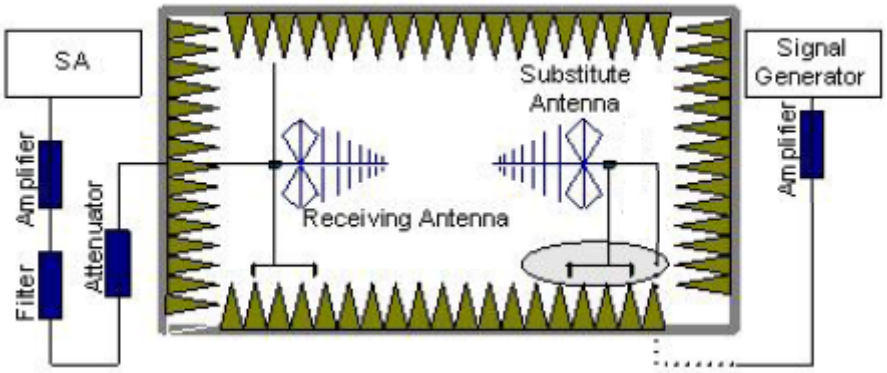
A.1.3.2 Method of Measurement

The measurements procedures in TIA-603C-2004 are used.

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



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



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

The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

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

For test layout photo, please refer to Pic.1 in Annex B.

A.1.3.3 Measurement result

LTE Band 7- ERP 27.50(h)(2)

Limits: ≤33 dBm (2W)

LTE Band 7_5MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	Cable Loss (dB)	P_{Ag} (dB)	Antenna Gain(dBi)	RMS EIRP(dBm)	Polarization
2502.50	-24.70	3.58	-45.68	-5.29	22.69	Horizontal
2535.00	-24.85	3.63	-44.82	-5.37	21.71	Horizontal
2567.50	-24.96	3.65	-44.92	-5.44	21.75	Horizontal

LTE Band 7_10MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	Cable Loss (dB)	P_{Ag} (dB)	Antenna Gain(dBi)	RMS EIRP(dBm)	Polarization
2505.00	-24.62	3.59	-45.64	-5.30	**22.73**	Horizontal
2535.00	-24.95	3.63	-44.82	-5.37	21.61	Horizontal
2565.00	-25.26	3.65	-44.97	-5.43	21.49	Horizontal

LTE Band 7_15MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	Cable Loss (dB)	P_{Ag} (dB)	Antenna Gain(dBi)	RMS EIRP(dBm)	Polarization
2507.50	-24.01	3.59	-44.92	-5.30	22.62	Horizontal
2535.00	-24.94	3.63	-44.82	-5.37	21.62	Horizontal
2562.50	-14.97	3.65	-45.67	5.42	21.63	Horizontal

LTE Band 7_20MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	Cable Loss (dB)	P_{Ag} (dB)	Antenna Gain(dBi)	RMS EIRP(dBm)	Polarization
2510.00	-24.62	3.58	-45.36	-5.31	22.47	Horizontal
2535.00	-24.87	3.63	-44.82	-5.37	21.69	Horizontal
2560.00	-26.05	3.64	-45.98	-5.42	21.71	Horizontal

LTE Band 7_5MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	Cable Loss (dB)	P_{Ag} (dB)	Antenna Gain(dBi)	RMS EIRP(dBm)	Polarization
2502.50	-25.60	3.58	-45.68	-5.29	21.79	Horizontal
2535.00	-25.71	3.63	-44.82	-5.37	20.85	Horizontal
2567.50	-26.08	3.65	-44.92	-5.44	20.63	Horizontal

LTE Band 7_10MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	Cable Loss (dB)	P_{Ag} (dB)	Antenna Gain(dBi)	RMS EIRP(dBm)	Polarization
2505.00	-25.52	3.59	-45.64	-5.30	21.83	Horizontal
2535.00	-26.01	3.63	-44.82	-5.37	20.55	Horizontal
2565.00	-26.02	3.65	-44.97	-5.43	20.73	Horizontal

LTE Band 7_15MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	Cable Loss (dB)	P_{Ag} (dB)	Antenna Gain(dBi)	RMS EIRP(dBm)	Polarization
2507.50	-24.80	3.59	-44.92	-5.30	21.83	Horizontal
2535.00	-25.78	3.63	-44.82	-5.37	20.78	Horizontal
2562.50	-16.14	3.65	-45.67	5.42	20.46	Horizontal

LTE Band 7_20MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	Cable Loss (dB)	P_{Ag} (dB)	Antenna Gain(dBi)	RMS EIRP(dBm)	Polarization
2510.00	-25.67	3.58	-45.36	-5.31	21.42	Horizontal
2535.00	-25.81	3.63	-44.82	-5.37	20.75	Horizontal
2560.00	-26.97	3.64	-45.98	-5.42	20.79	Horizontal

Sample calculation: LTE Band 7, 10 MHz bandwidth, frequency 2505.00 MHz, QPSK

Peak EIRP(dBm) = P_{Mea}(-24.62dBm) - G_a (-5.30dBi) - P_{Ag} (-45.64 dB) - P_{cl} (3.59dB)

= 22.73 dBm

LTE Band 41- ERP 27.50(h)(2)

Limits: ≤33 dBm (2W)

LTE Band 41_5MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	Cable Loss (dB)	P_{Ag} (dB)	Antenna Gain(dBi)	RMS EIRP(dBm)	Polarization
2498.50	-23.00	3.58	-45.59	-5.39	24.40	Horizontal
2593.00	-22.51	3.68	-44.93	-5.64	24.38	Horizontal
2687.50	-24.78	3.73	-44.98	-5.89	22.36	Horizontal

LTE Band 41_10MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	Cable Loss (dB)	P_{Ag} (dB)	Antenna Gain(dBi)	RMS EIRP(dBm)	Polarization
2501.00	-22.98	3.58	-45.65	-5.36	**24.45**	Horizontal
2593.00	-22.68	3.68	-44.93	-5.64	24.21	Horizontal
2685.00	-24.70	3.73	-44.98	-5.88	22.43	Horizontal

LTE Band 41_15MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	Cable Loss (dB)	P_{Ag} (dB)	Antenna Gain(dBi)	RMS EIRP(dBm)	Polarization
2503.50	-23.19	3.58	-45.65	-5.29	24.17	Horizontal
2593.00	-22.67	3.68	-44.93	-5.64	24.22	Horizontal
2682.50	-24.43	3.73	-44.98	-5.87	22.69	Horizontal

LTE Band 41_20MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	Cable Loss (dB)	P_{Ag} (dB)	Antenna Gain(dBi)	RMS EIRP(dBm)	Polarization
2506.00	-22.51	3.59	-45.15	-5.30	24.35	Horizontal
2593.00	-22.70	3.68	-44.93	-5.64	24.19	Horizontal
2680.00	-24.44	3.73	-44.97	-5.87	22.67	Horizontal

LTE Band 41_5MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	Cable Loss (dB)	P_{Ag} (dB)	Antenna Gain(dBi)	RMS EIRP(dBm)	Polarization
2498.50	-23.26	3.58	-45.59	-5.39	24.14	Horizontal
2593.00	-23.10	3.68	-44.93	-5.64	23.79	Horizontal
2687.50	-24.96	3.73	-44.98	-5.89	22.18	Horizontal

LTE Band 41_10MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	Cable Loss (dB)	P_{Ag} (dB)	Antenna Gain(dBi)	RMS EIRP(dBm)	Polarization
2501.00	-23.35	3.58	-45.65	-5.36	24.08	Horizontal
2593.00	-22.86	3.68	-44.93	-5.64	24.03	Horizontal
2685.00	-24.80	3.73	-44.98	-5.88	22.33	Horizontal

LTE Band 41_15MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	Cable Loss (dB)	P_{Ag} (dB)	Antenna Gain(dBi)	RMS EIRP(dBm)	Polarization
2503.50	-23.37	3.58	-45.65	-5.29	23.99	Horizontal
2593.00	-22.85	3.68	-44.93	-5.64	24.04	Horizontal
2682.50	-24.57	3.73	-44.98	-5.87	22.55	Horizontal

LTE Band 41_20MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	Cable Loss (dB)	P_{Ag} (dB)	Antenna Gain(dBi)	RMS EIRP(dBm)	Polarization
2506.00	-23.14	3.59	-45.15	-5.30	23.72	Horizontal
2593.00	-22.68	3.68	-44.93	-5.64	24.21	Horizontal
2680.00	-24.87	3.73	-44.97	-5.87	22.24	Horizontal

Sample calculation: LTE Band 41, 10 MHz bandwidth, frequency 2501.00 MHz, QPSK

Peak EIRP(dBm) = P_{Mea}(-22.98dBm) - G_a (-5.36 dBi) - P_{Ag} (-45.65 dB) - P_{cl} (3.58dB)

= 24.45 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.

Note: Expanded measurement uncertainty is U = 0.96 dB, k = 2.

A.2 EMISSION LIMT

Reference

FCC: CFR 2.1051, Part 27.53(h).

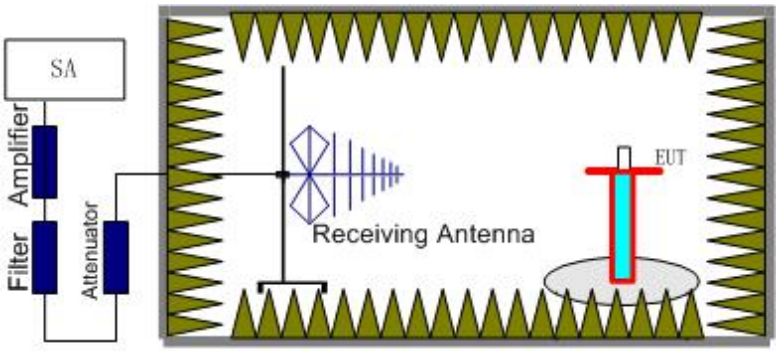
A.2.1 Measurement Method

The measurements procedures in TIA-603C-2004 are used. This measurement is carried out in fully-anechoic chamber FAC-3.

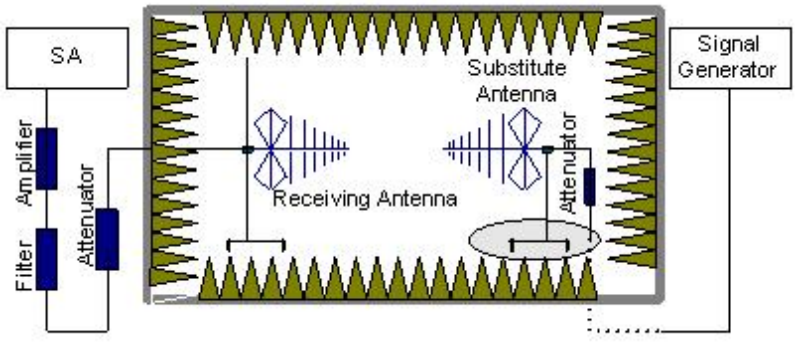
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier. The resolution bandwidth is set 1MHz as outlined in Part 27.53(h). The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the LTE Bands 7 and 41.

The procedure of radiated spurious emissions is as follows:

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



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



In the chamber, an substitution antenna for the frequency band of interest is placed at the

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

4. The Path loss (P_{pl}) between the Signal Source with the Substitution Antenna and the Substitution Antenna Gain (G_a) should be recorded after test.
   An amplifier should be connected in for the test.
   The Path loss (P_{pl}) is the summation of the cable loss and the gain of the amplifier.
   The measurement results are obtained as described below:
   Power (EIRP)=P_{Mea}+ P_{pl} + G_a
5. This value is EIRP since the measurement is calibrated using an antenna of known gain (unit: dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dB.

A.2.2 Measurement Limit

Part 27.53(h) 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

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the LTE Bands 7 and 41. 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 7 and 41 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.

LTE Band 7, 5 MHz, QPSK, Channel 20775, RB=1, RB position=middle.

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit （dBm）	Polarization
5008.67	-58.29	6.26	-9.42	-55.13	-13.00	Vertical
7509.30	-57.42	7.56	-11.24	-53.74	-13.00	Vertical
10010.81	-56.33	8.48	-12.02	-52.79	-13.00	Horizontal
12524.89	-53.42	9.48	-12.39	-50.51	-13.00	Vertical
15027.28	-50.70	10.43	-13.62	-47.51	-13.00	Horizontal
17518.16	-44.68	12.17	-13.00	-43.85	-13.00	Vertical

LTE Band 7, 5 MHz, QPSK, Channel 21100, RB=1, RB position=middle.

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit （dBm）	Polarization
5075.94	-53.56	6.41	-9.51	-50.46	-13.00	Horizontal
7610.23	-55.81	7.41	-11.33	-51.89	-13.00	Vertical
10147.41	-55.17	8.43	-11.95	-51.65	-13.00	Vertical
12666.51	-53.01	9.34	-12.48	-49.87	-13.00	Horizontal
15196.50	-50.16	10.72	-13.41	-47.47	-13.00	Horizontal
17740.14	-49.99	11.42	-13.06	-48.35	-13.00	Vertical

LTE Band 7, 5 MHz, QPSK, Channel 21425, RB=1, RB position=middle.

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit （dBm）	Polarization
5150.09	-58.56	6.35	-9.60	-55.31	-13.00	Vertical
7706.99	-56.70	7.29	-11.42	-52.57	-13.00	Vertical
10270.77	-50.67	8.97	-11.88	-47.76	-13.00	Horizontal
12851.11	-52.08	9.53	-12.61	-49.00	-13.00	Vertical
15420.49	-51.22	10.76	-13.14	-48.84	-13.00	Horizontal
17952.82	-46.99	12.51	-13.13	-46.37	-13.00	Horizontal

LTE Band 7, 5 MHz, 16QAM, Channel 20775, RB=1, RB position=middle.

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit （dBm）	Polarization
5022.86	-58.83	6.24	-9.44	-55.63	-13.00	Vertical
7500.16	-57.38	7.59	-11.23	-53.74	-13.00	Horizontal
10052.28	-54.70	8.76	-12.00	-51.46	-13.00	Vertical
12502.70	-52.53	9.29	-12.37	-49.45	-13.00	Vertical
15026.76	-50.47	10.43	-13.62	-47.28	-13.00	Horizontal
17499.08	-45.62	12.08	-12.99	-44.71	-13.00	Vertical

LTE Band 7, 5 MHz, 16QAM, Channel 21100, RB=1, RB position=middle.

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit （dBm）	Polarization
5076.30	-56.53	6.41	-9.51	-53.43	-13.00	Vertical
7605.68	-54.58	7.40	-11.33	-50.65	-13.00	Horizontal
10122.67	-55.85	8.31	-11.96	-52.20	-13.00	Horizontal
12685.46	-53.62	9.35	-12.50	-50.47	-13.00	Horizontal
15204.62	-49.10	10.70	-13.40	-46.40	-13.00	Vertical
17744.04	-47.57	11.45	-13.06	-45.96	-13.00	Horizontal

LTE Band 7, 5 MHz, 16QAM, Channel 21425, RB=1, RB position=middle.

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit （dBm）	Polarization
5129.78	-58.84	6.44	-9.57	-55.71	-13.00	Vertical
7711.03	-56.23	7.29	-11.42	-52.10	-13.00	Horizontal
10270.59	-52.67	8.97	-11.88	-49.76	-13.00	Horizontal
12855.27	-53.04	9.52	-12.61	-49.95	-13.00	Horizontal
15406.14	-48.98	10.75	-13.15	-46.58	-13.00	Horizontal
17965.12	-48.81	12.56	-13.13	-48.24	-13.00	Vertical

LTE Band 41, 5MHz, QPSK, Channel 39675, RB=1, RB position=middle.

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit （dBm）	Polarization
4997.61	-54.99	6.31	-9.41	-51.89	-13.00	Vertical
7489.88	-51.50	7.50	-11.22	-47.78	-13.00	Horizontal
9994.71	-54.83	8.50	-12.03	-51.30	-13.00	Horizontal
12474.36	-53.68	9.23	-12.37	-50.54	-13.00	Horizontal
14977.49	-49.57	10.78	-13.60	-46.75	-13.00	Horizontal
17499.54	-46.22	12.08	-12.99	-45.31	-13.00	Horizontal

LTE Band 41, 5MHz, QPSK, Channel 40620, RB=1, RB position=middle.

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit （dBm）	Polarization
5186.47	-30.31	6.43	-9.64	-27.10	-13.00	Vertical
7779.57	-44.95	7.19	-11.49	-40.65	-13.00	Vertical
10372.03	-50.93	8.58	-11.82	-47.69	-13.00	Vertical
12973.81	-54.32	9.50	-12.69	-51.13	-13.00	Vertical
15577.04	-51.34	10.64	-13.08	-48.90	-13.00	Vertical
17907.50	-46.40	12.25	-13.11	-45.54	-13.00	Horizontal

LTE Band 41, 5MHz, QPSK, Channel 41565, RB=1, RB position=middle.

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit （dBm）	Polarization
5375.44	-30.13	6.63	-9.88	-26.88	-13.00	Vertical
8062.90	-45.42	7.60	-11.74	-41.28	-13.00	Vertical
10750.72	-51.61	8.80	-11.96	-48.45	-13.00	Vertical
13438.29	-50.76	9.99	-13.44	-47.31	-13.00	Vertical
16126.05	-49.52	11.14	-13.20	-47.46	-13.00	Vertical
17174.98	-45.40	12.17	-12.83	-44.74	-13.00	Horizontal

LTE Band 41, 5MHz, 16QAM, Channel 39675, RB=1, RB position=middle.

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit （dBm）	Polarization
4056.47	-58.66	5.61	-8.31	-55.96	-13.00	Horizontal
5458.70	-59.91	6.67	-9.99	-56.59	-13.00	Vertical
7349.22	-57.74	7.07	-11.11	-53.70	-13.00	Horizontal
8103.86	-56.07	7.43	-11.78	-51.72	-13.00	Horizontal
9648.00	-55.59	8.41	-12.28	-51.72	-13.00	Horizontal
13645.07	-48.61	10.47	-13.63	-45.45	-13.00	Vertical

LTE Band 41, 5MHz, 16QAM, Channel 40620, RB=1, RB position=middle.

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit （dBm）	Polarization
5186.45	-29.89	6.43	-9.64	-26.68	-13.00	Vertical
7779.48	-45.83	7.19	-11.49	-41.53	-13.00	Vertical
10362.65	-55.18	8.42	-11.83	-51.77	-13.00	Horizontal
12965.74	-51.77	9.51	-12.69	-48.59	-13.00	Vertical
15586.27	-48.24	10.67	-13.09	-45.82	-13.00	Horizontal
17904.79	-46.31	12.26	-13.11	-45.46	-13.00	Vertical

LTE Band 41, 5MHz, 16QAM, Channel 41565, RB=1, RB position=middle.

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit （dBm）	Polarization
5375.32	-32.99	6.63	-9.88	-29.74	-13.00	Vertical
8063.09	-47.48	7.59	-11.74	-43.33	-13.00	Vertical
10750.57	-53.42	8.80	-11.96	-50.26	-13.00	Vertical
13438.44	-51.81	9.99	-13.44	-48.36	-13.00	Vertical
16126.10	-47.31	11.14	-13.20	-45.25	-13.00	Vertical
17169.74	-45.37	12.22	-12.82	-44.77	-13.00	Vertical

Note: The maximum value of expanded measurement uncertainty for this test item is U = 4.2 dB, k = 2.

A.3 FREQUENCY STABILITY

Reference

FCC: CFR Part 2.1055, 27.54.

A.4.1 Method of Measurement

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

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30℃.
3. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on middle channel for LTE band 7/41, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10℃ increments from -30℃ to +50℃. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
5. Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1.5 hours unpowered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50℃.
7. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 ℃ increments from +50℃ to -30℃. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

A.4.2 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. 27.54,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 3.6VDC and 4.2VDC, with a nominal voltage of 3.8VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance from -5.4% to 10.8%. For the purposes of measuring frequency stability these voltage limits are to be used.

A.4.3 Measurement results

Room Temperature: 24 ℃

LTE Band 7, 20 MHz bandwidth (worst case of all bandwidths)

Frequency Error vs Voltage

Voltage (V)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
3.8	-6	3	0.002	0.001
4.2	0	5	0.000	0.002
3.6	-5	-4	0.002	0.002

Frequency Error vs Temperature

Temperature (℃)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
50°	-7	-5	0.003	0.002
40°	8	-11	0.003	0.004
30°	-1	-5	0.000	0.002
20°	4	-8	0.002	0.003
10°	4	-7	0.002	0.003
0°	13	-14	0.005	0.006
- 10°	-7	-16	0.003	0.006
- 20°	4	-10	0.001	0.004
- 30°	1	-13	0.000	0.005

LTE Band 41, 15 MHz bandwidth (worst case of all bandwidths)

Frequency Error vs Voltage

Voltage (V)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
3.8	-5	-7	0.002	0.003
4.2	-5	-15	0.002	0.006
3.6	-3	-4	0.001	0.002

Frequency Error vs Temperature

Temperature (℃)	Frequency error (Hz)		Frequency error (ppm)	
	QPSK	16QAM	QPSK	16QAM
50°	-6	-9	0.002	0.003
40°	1	-12	0.000	0.005
30°	5	-12	0.002	0.005
20°	-2	-11	0.001	0.004
10°	1	-12	0.000	0.004
0°	-10	-7	0.004	0.003
- 10°	-2	-11	0.001	0.004
- 20°	-8	-16	0.003	0.006
- 30°	6	-15	0.002	0.006

Expanded measurement uncertainty for this test item is 10 Hz, k = 2.

A.4 OCCUPIED BANDWIDTH

Reference

FCC: CFR Part 2.1049(h)(i)

A.5.1 Occupied Bandwidth Measurement Results

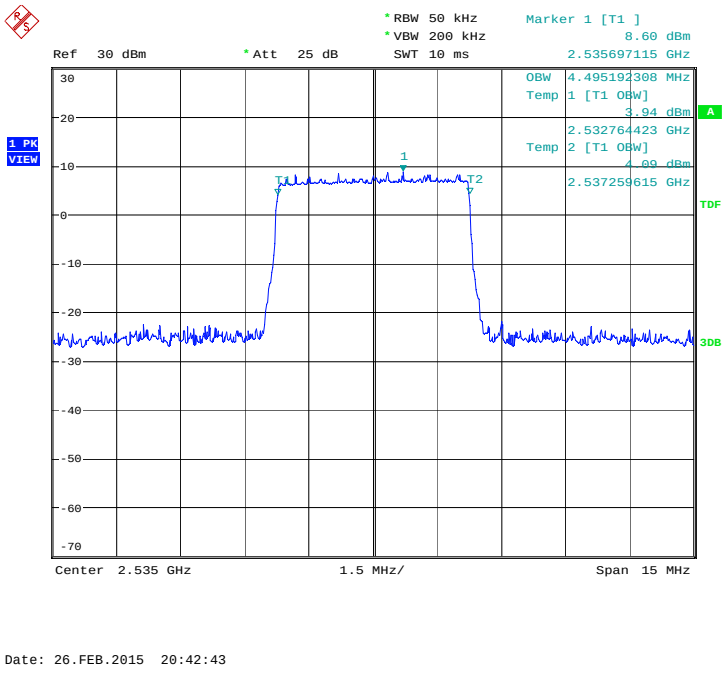
Occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the mid frequencies of the LTE bands 7 and 41. The table below lists the measured 99% BW. Spectrum analyzer plots are included on the following pages.

A.5.1.1 Measurement results per FCC rules

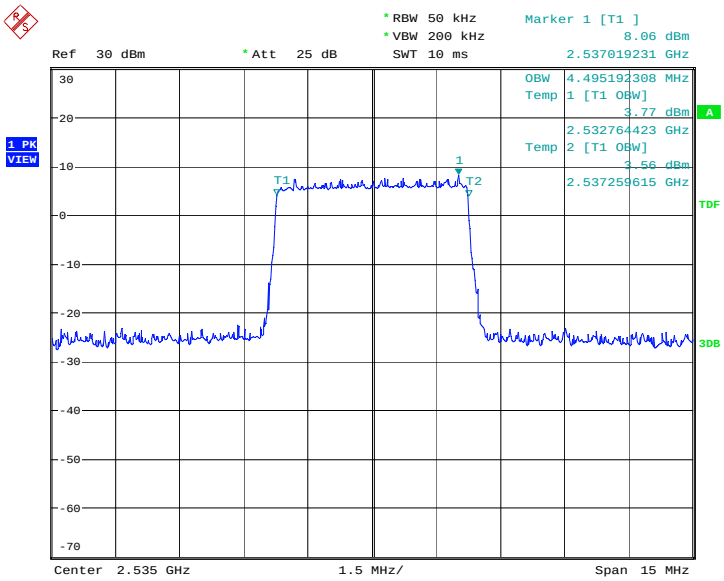
LTE band 7, 5MHz (99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(kHz)	
	QPSK	16QAM
2535	4495.192	4495.192

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



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

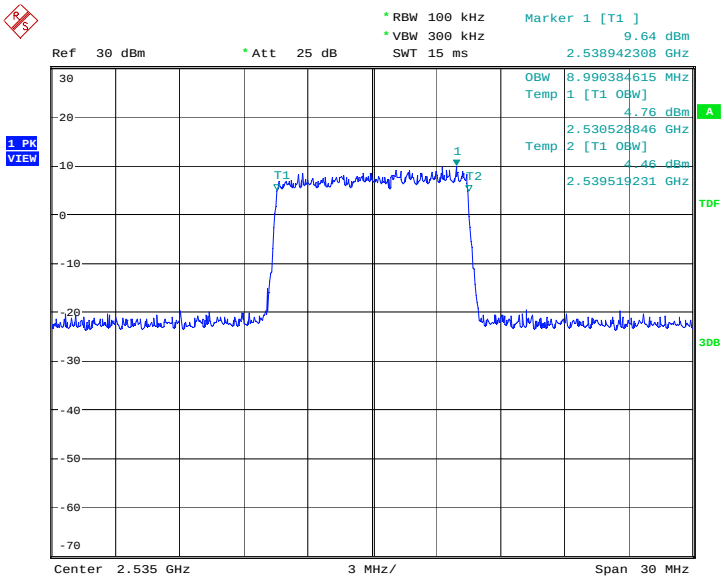


Date: 26.FEB.2015 20:42:58

LTE band 7, 10MHz (99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(kHz)	
	QPSK	16QAM
2535	8990.385	8990.385

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



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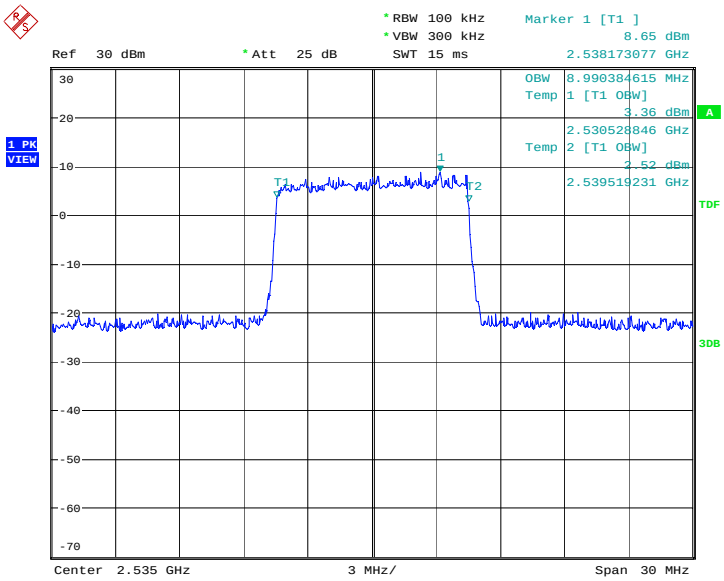
LTE band 7, 10MHz Bandwidth, 16QAM (99% BW)

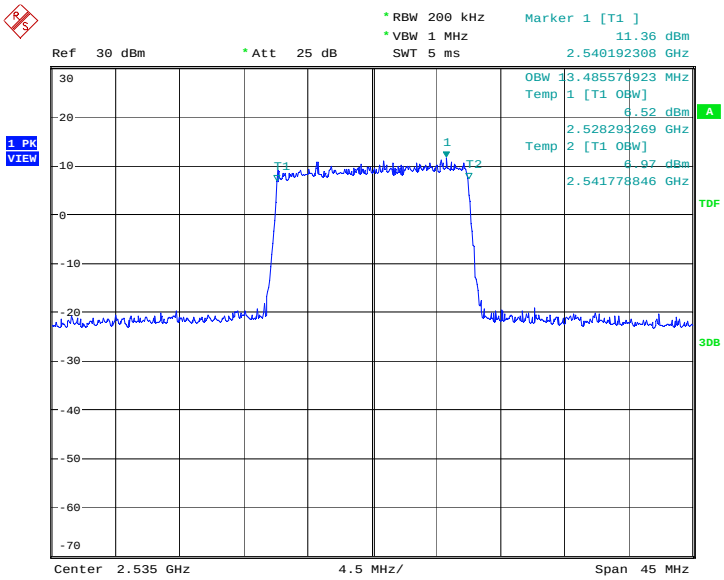


Date: 26.FEB.2015 20:55:20

LTE band 7, 15MHz (99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(kHz)	
	QPSK	16QAM
2535	13485.577	13485.577

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



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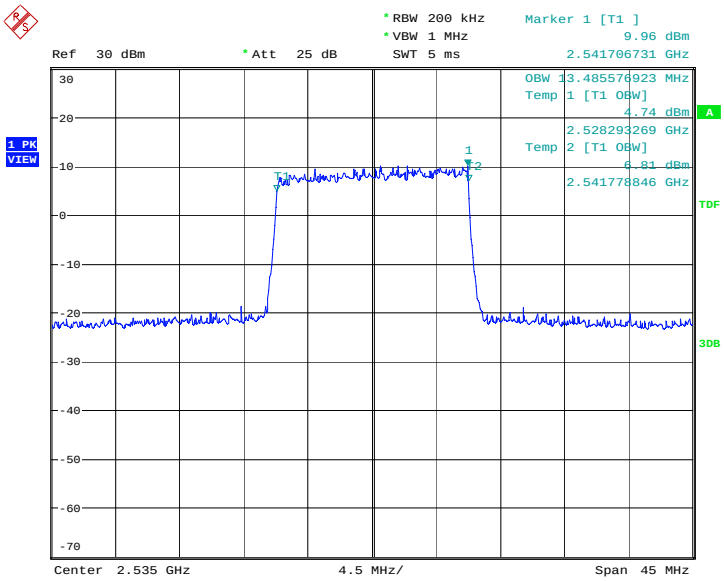
LTE band 7, 15MHz Bandwidth, 16QAM (99% BW)

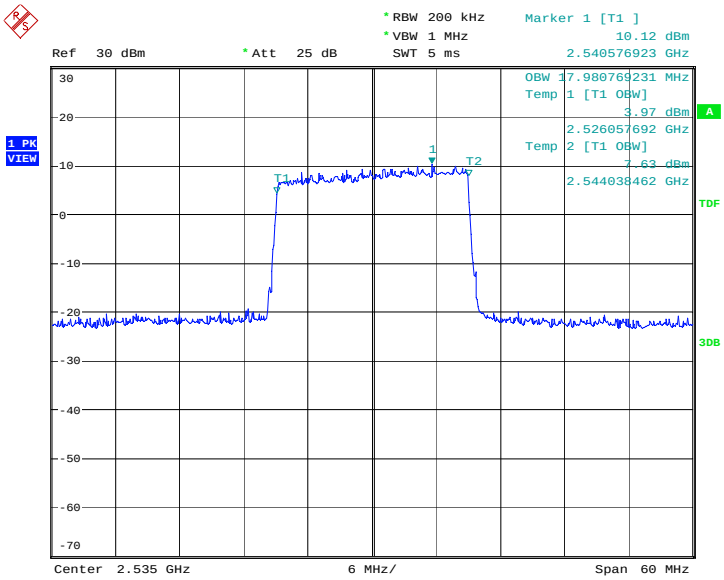


Date: 26.FEB.2015 21:02:38

LTE band 7, 20MHz (99% BW)

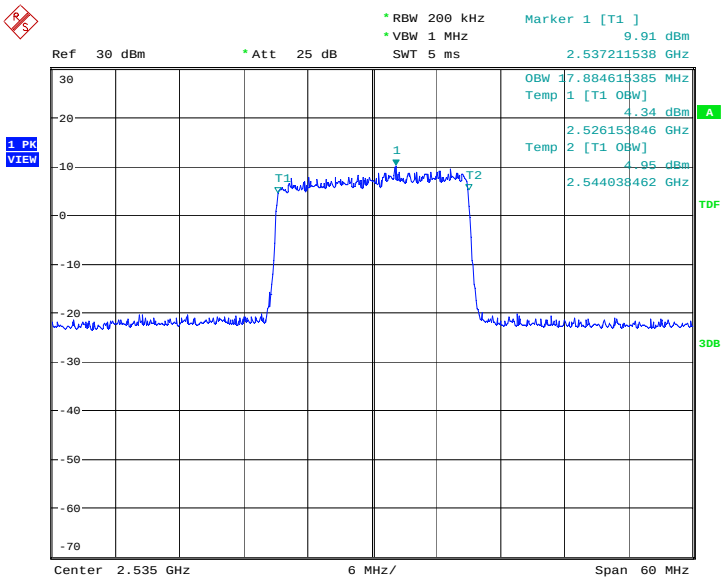
Frequency (MHz)	Occupied Bandwidth (99% BW)(kHz)	
	QPSK	16QAM
2535	17980.769	17884.615

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



Date: 26.FEB.2015 21:09:45

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

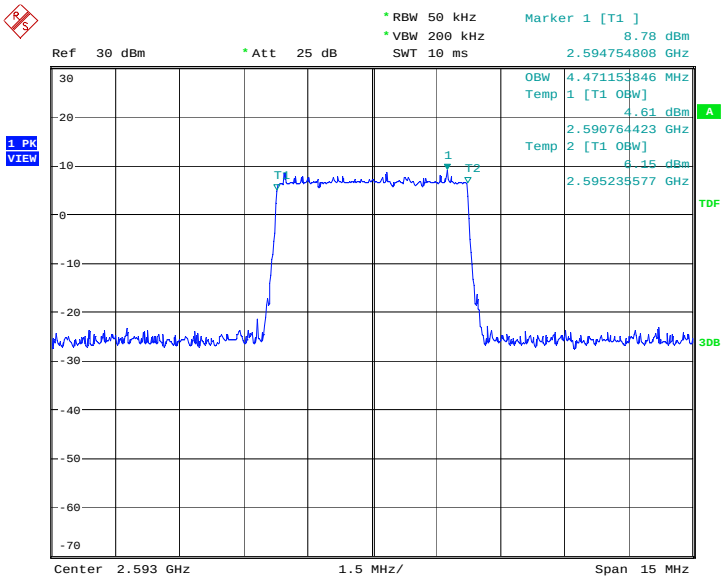


Date: 26.FEB.2015 21:10:00

LTE band 41, 5MHz (99% BW)

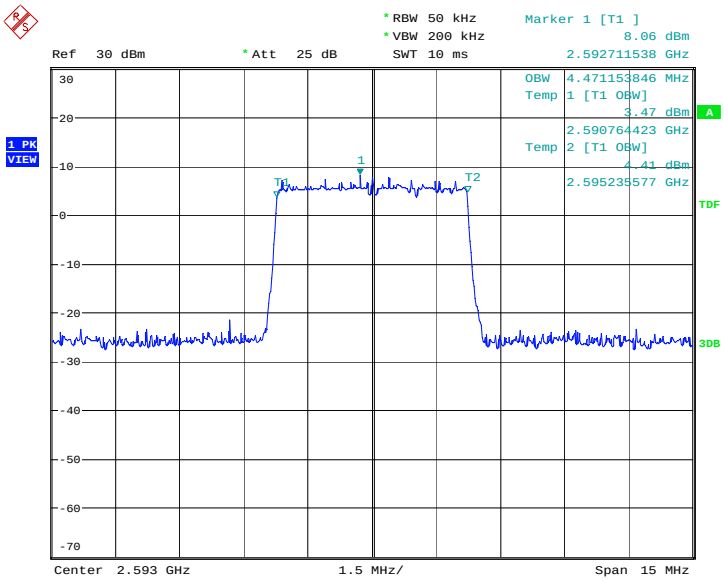
Frequency (MHz)	Occupied Bandwidth (99% BW)(kHz)	
	QPSK	16QAM
2535	4471.154	4471.154

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



Date: 26.FEB.2015 21:17:34

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

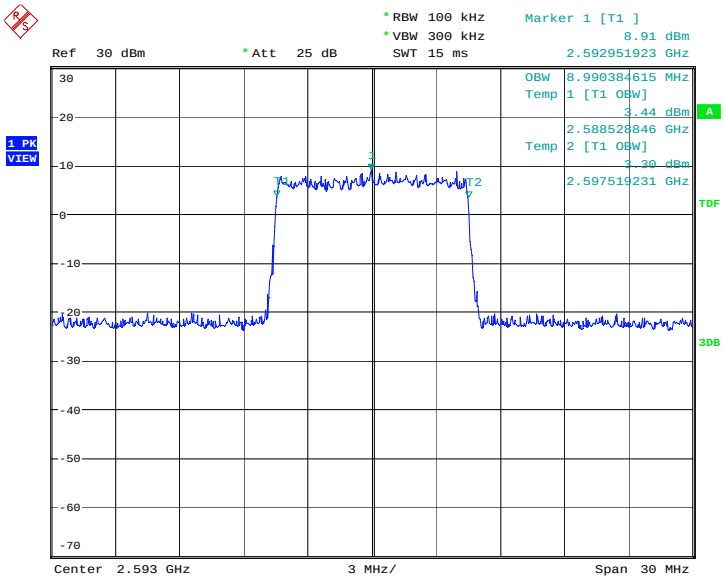


Date: 26.FEB.2015 21:17:49

LTE band 41, 10MHz (99% BW)

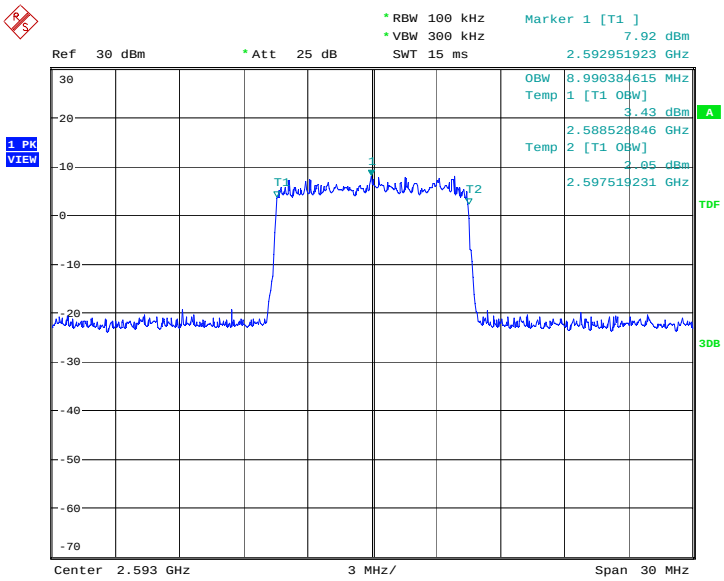
Frequency (MHz)	Occupied Bandwidth (99% BW)(kHz)	
	QPSK	16QAM
2535	8990.385	8990.385

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



Date: 26.FEB.2015 21:24:47

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

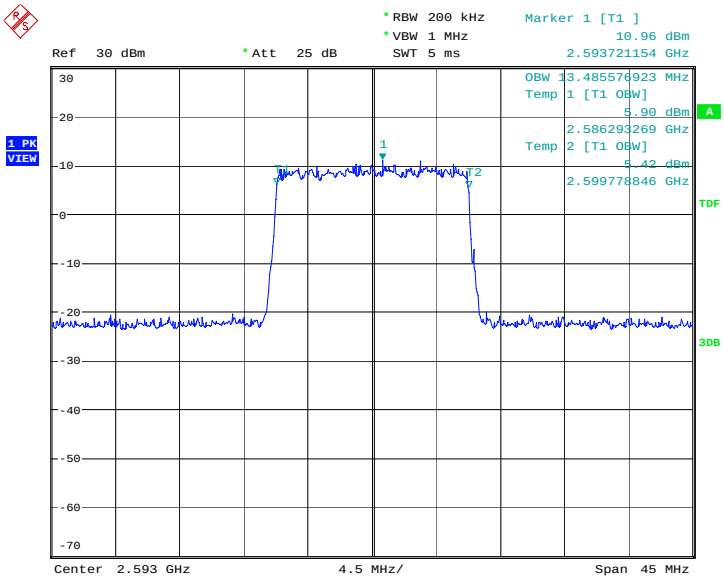


Date: 26.FEB.2015 21:25:02

LTE band 41, 15MHz (99% BW)

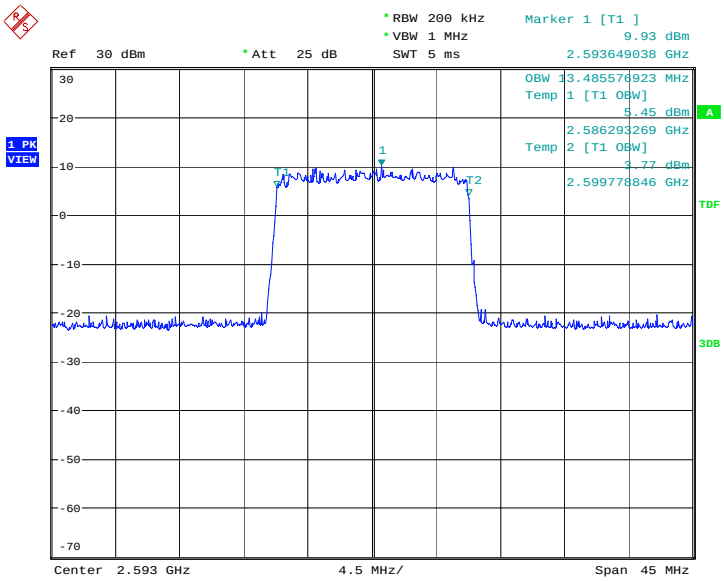
Frequency (MHz)	Occupied Bandwidth (99% BW)(kHz)	
	QPSK	16QAM
2535	13485.577	13485.577

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



Date: 26.FEB.2015 21:37:13

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

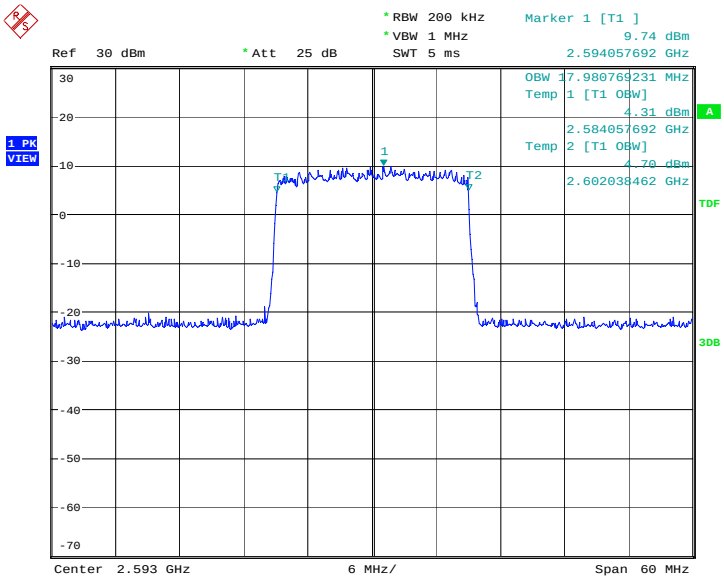


Date: 26.FEB.2015 21:37:28

LTE band 41, 20MHz (99% BW)

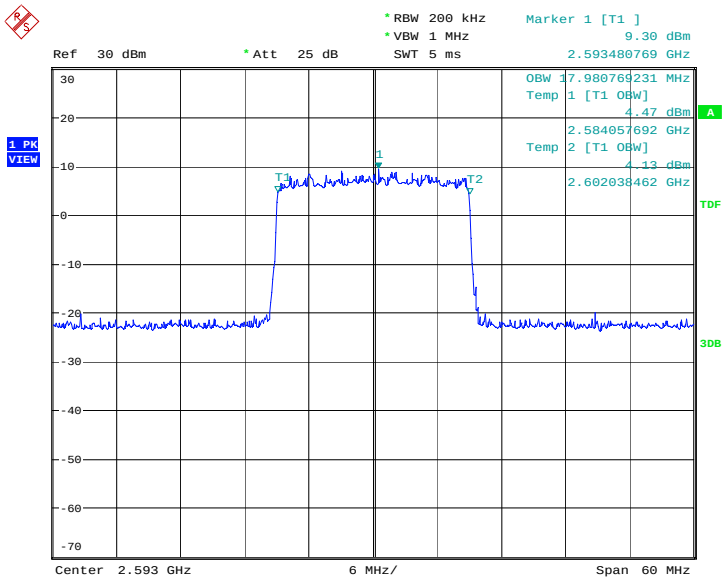
Frequency (MHz)	Occupied Bandwidth (99% BW)(kHz)	
	QPSK	16QAM
2535	17980.769	17980.769

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



Date: 26.FEB.2015 21:49:42

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



Date: 26.FEB.2015 21:49:57

A.6 EMISSION BANDWIDTH

Reference

FCC: CFR Part 27.53(h).

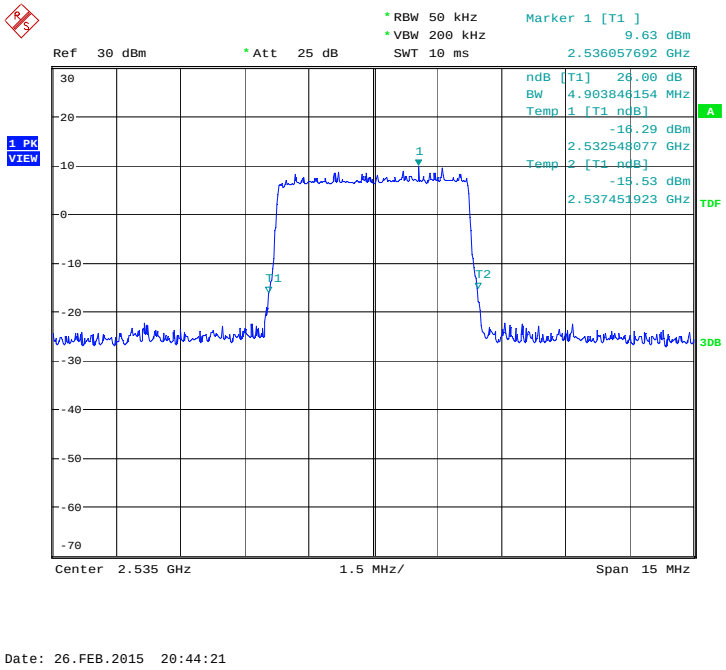
A.6.1Emission Bandwidth Measurement Results

Emission bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the mid frequencies of the LTE bands 7 and 41. Table below lists the measured 100% BW. Spectrum analyzer plots are included on the following pages.

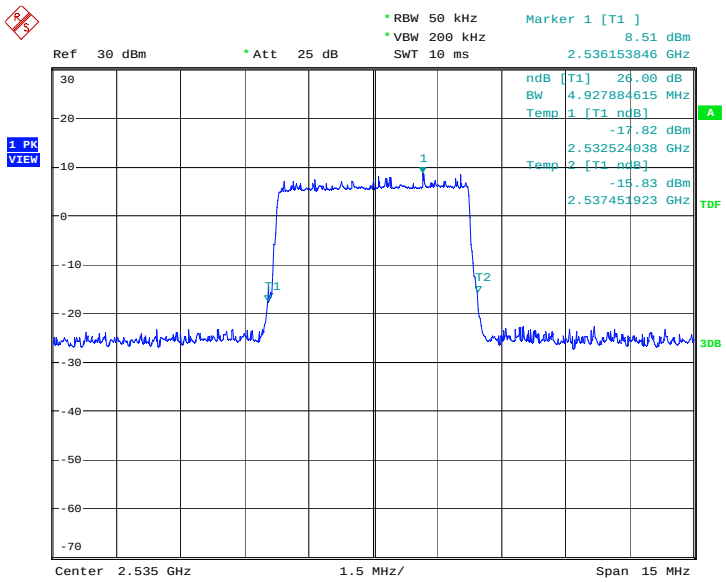
LTE band 7, 5MHz (100% BW)

Frequency (MHz)	Occupied Bandwidth (100% BW)(kHz)	
	QPSK	16QAM
2535	4903.846	4927.885

LTE band 7, 5MHz Bandwidth, QPSK (100% BW)



LTE band 7, 5MHz Bandwidth,16QAM (100% BW)

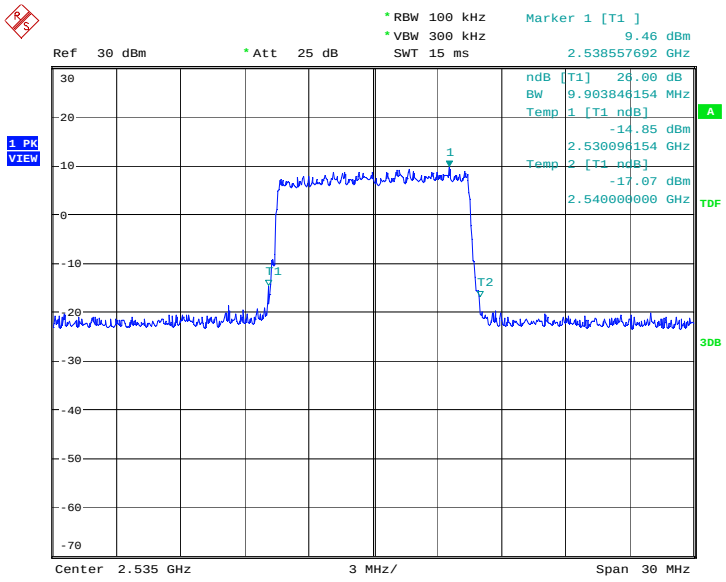


Date: 26.FEB.2015 20:44:38

LTE band 7, 10MHz (100% BW)

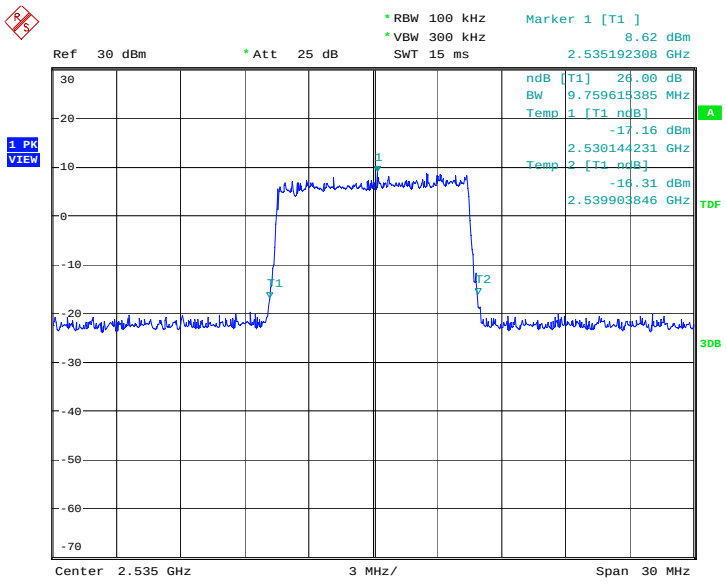
Frequency (MHz)	Occupied Bandwidth (100% BW)(kHz)	
	QPSK	16QAM
2535	9903.846	9759.615

LTE band 7, 10MHz Bandwidth, QPSK (100% BW)



Date: 26.FEB.2015 20:56:43

LTE band 7, 10MHz Bandwidth, 16QAM (100% BW)

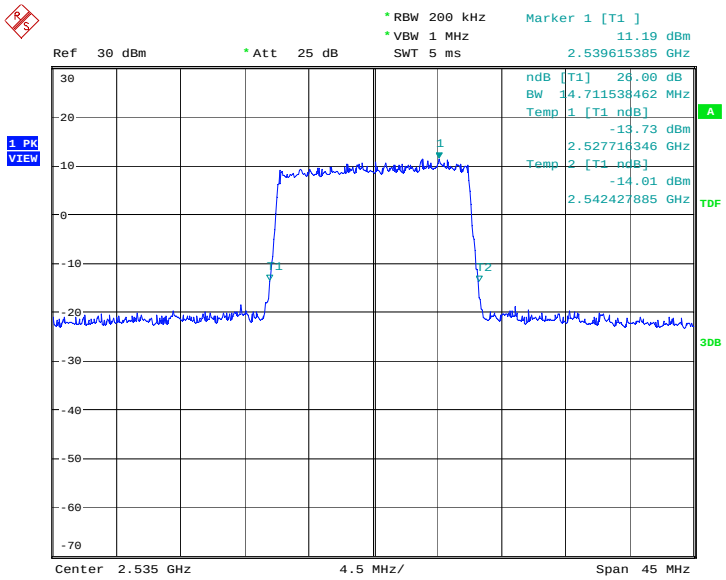


Date: 26.FEB.2015 20:57:00

LTE band 7, 15MHz (100% BW)

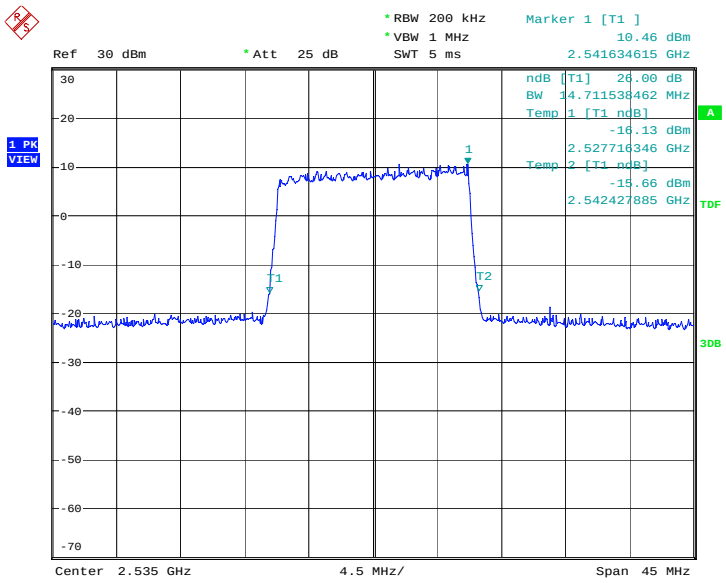
Frequency (MHz)	Occupied Bandwidth (100% BW)(kHz)	
	QPSK	16QAM
2535	14711.538	14711.538

LTE band 7, 15MHz Bandwidth, QPSK (100% BW)



Date: 26.FEB.2015 21:04:01

LTE band 7, 15MHz Bandwidth, 16QAM (100% BW)

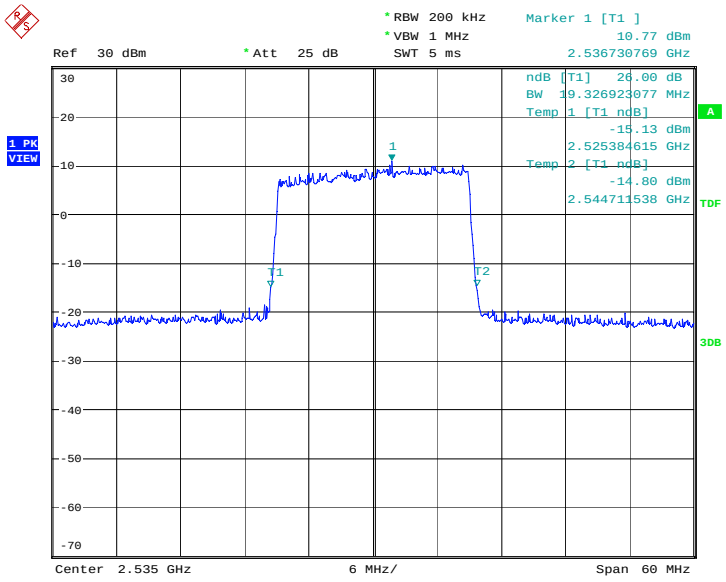


Date: 26.FEB.2015 21:04:19

LTE band 7, 20MHz (100% BW)

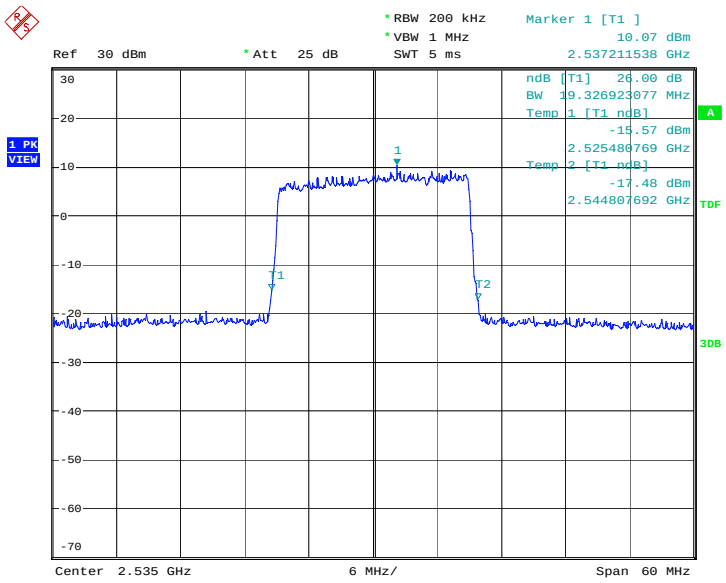
Frequency (MHz)	Occupied Bandwidth (100% BW)(kHz)	
	QPSK	16QAM
2535	19326.923	19326.923

LTE band 7, 20MHz Bandwidth, QPSK (100% BW)



Date: 26.FEB.2015 21:11:24

LTE band 7, 20MHz Bandwidth, 16QAM (100% BW)

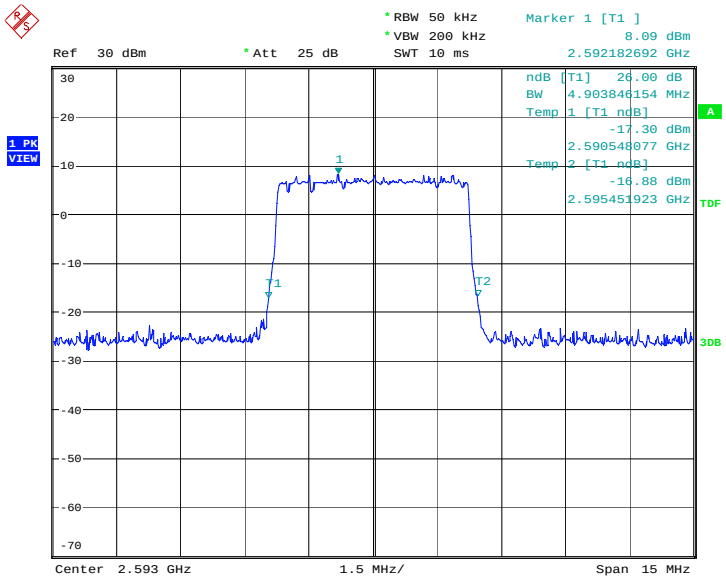


Date: 26.FEB.2015 21:11:41

LTE band 41, 5MHz (100% BW)

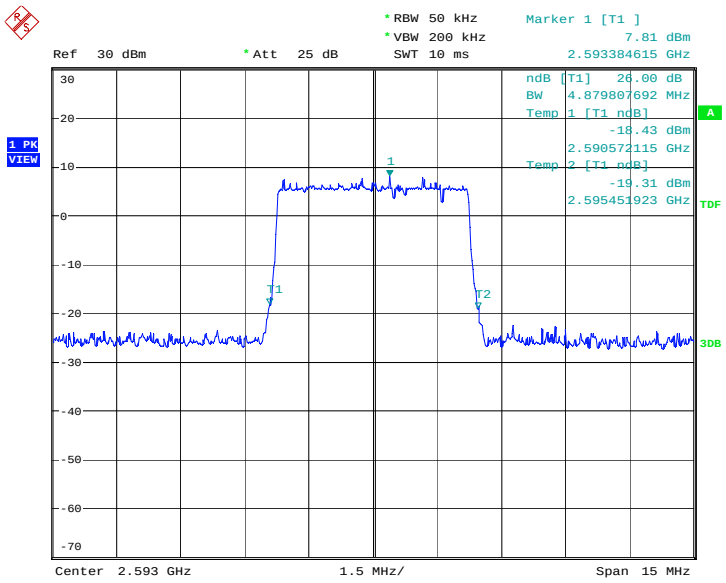
Frequency (MHz)	Occupied Bandwidth (100% BW)(kHz)	
	QPSK	16QAM
2535	4903.846	4879.808

LTE band 41, 5MHz Bandwidth, QPSK (100% BW)



Date: 26.FEB.2015 21:19:12

LTE band 41, 5MHz Bandwidth,16QAM (100% BW)

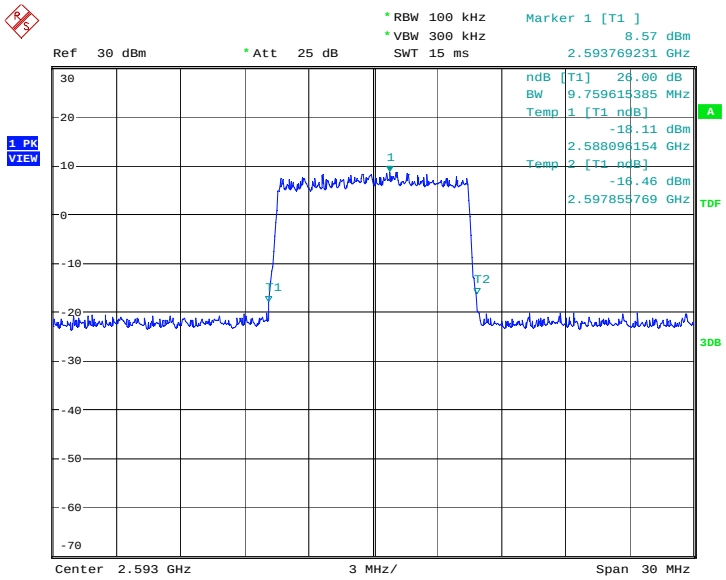


Date: 26.FEB.2015 21:19:29

LTE band 41, 10MHz (100% BW)

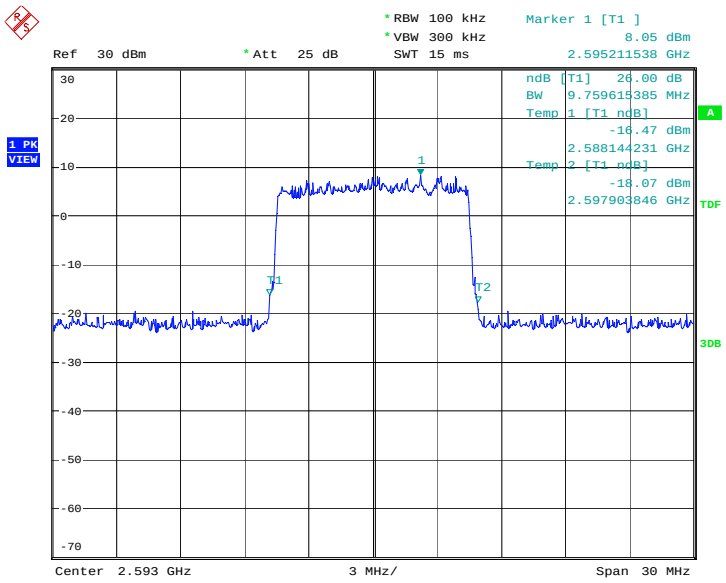
Frequency (MHz)	Occupied Bandwidth (100% BW)(kHz)	
	QPSK	16QAM
2535	9759.615	9759.615

LTE band 41, 10MHz Bandwidth, QPSK (100% BW)



Date: 26.FEB.2015 21:26:26

LTE band 41, 10MHz Bandwidth, 16QAM (100% BW)

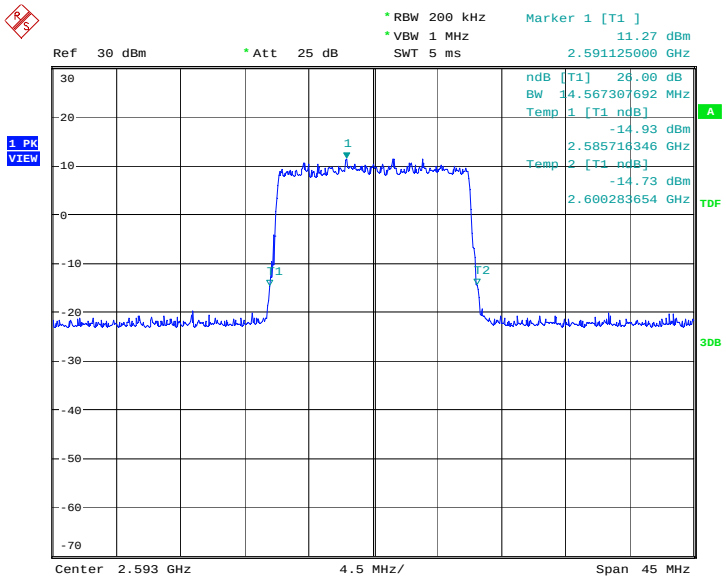


Date: 26.FEB.2015 21:26:43

LTE band 41, 15MHz (100% BW)

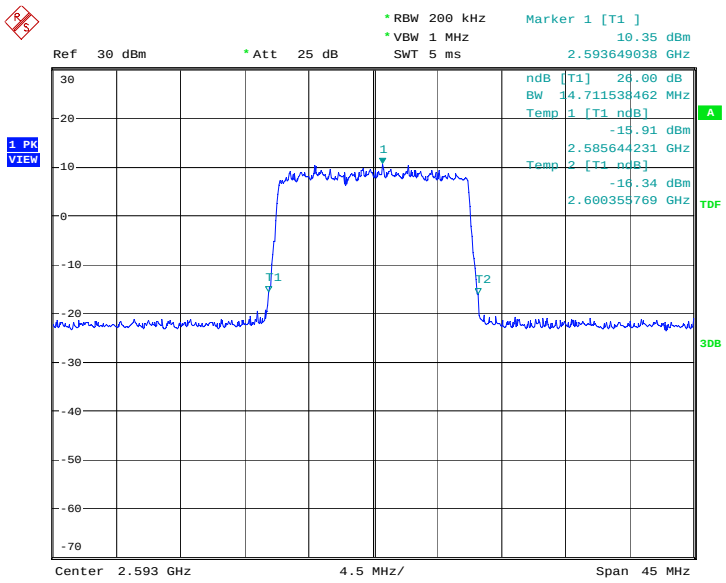
Frequency (MHz)	Occupied Bandwidth (100% BW)(kHz)	
	QPSK	16QAM
2535	14567.308	14711.538

LTE band 41, 15MHz Bandwidth, QPSK (100% BW)



Date: 26.FEB.2015 21:43:58

LTE band 41, 15MHz Bandwidth, 16QAM (100% BW)

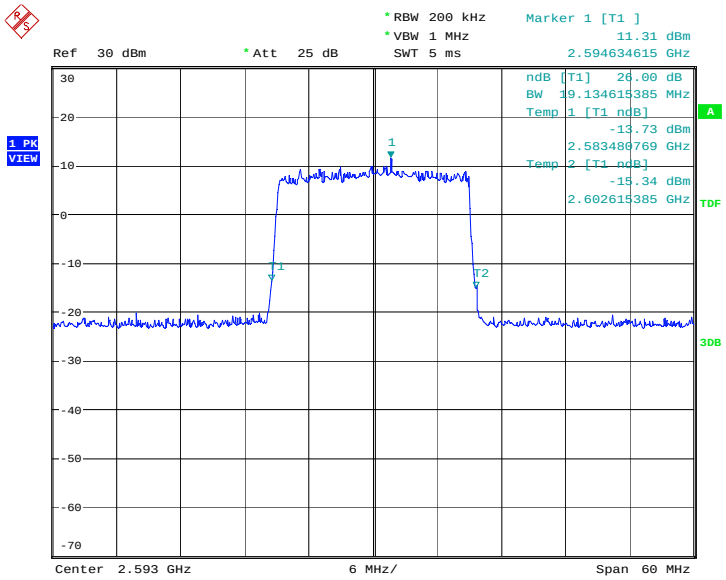


Date: 26.FEB.2015 21:44:15

LTE band 41, 20MHz (100% BW)

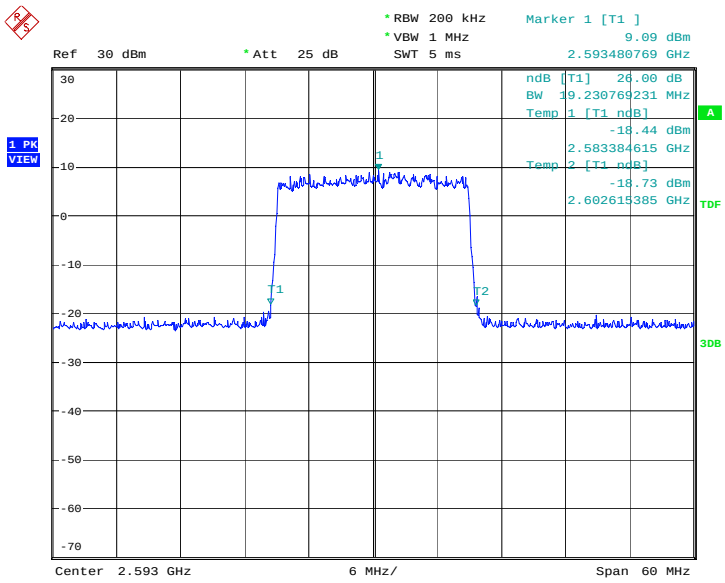
Frequency (MHz)	Occupied Bandwidth (100% BW)(kHz)	
	QPSK	16QAM
2535	19134.615	19230.769

LTE band 41, 20MHz Bandwidth, QPSK (100% BW)



Date: 26.FEB.2015 21:51:20

LTE band 41, 20MHz Bandwidth, 16QAM (100% BW)



Date: 26.FEB.2015 21:51:37

A.6 BAND EDGE COMPLIANCE

Reference

FCC: CFR Part27.53(h).

A.7.1 Measurement limit

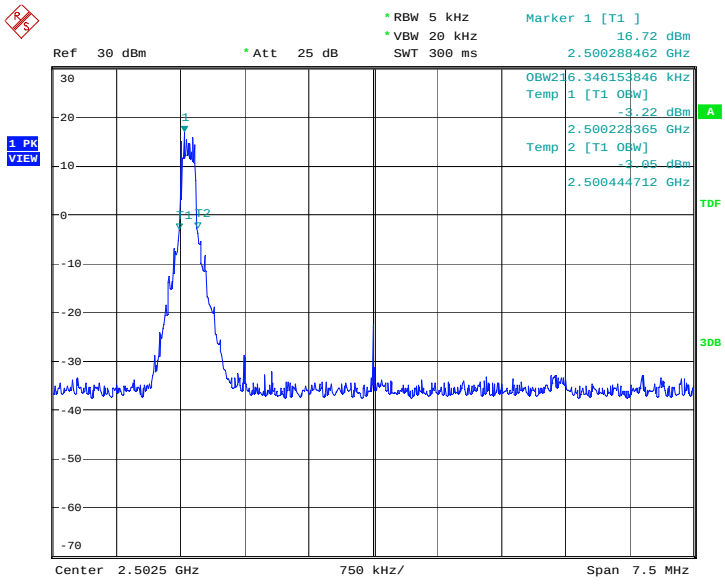
On any frequency outside frequency band of the LTE FDD bands 7 and 41 spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log (P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

A.7.2 Measurement result

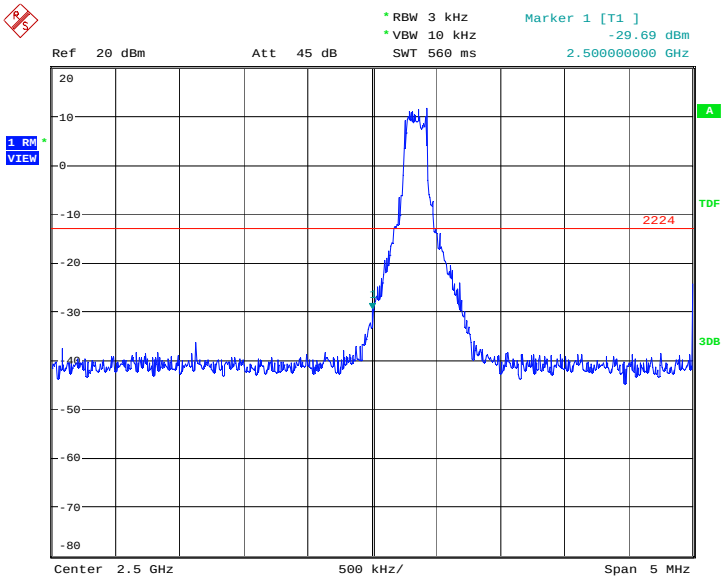
Only worst case result is given below

LTE band 7, 5MHz

OBW: 1RB-low_offset

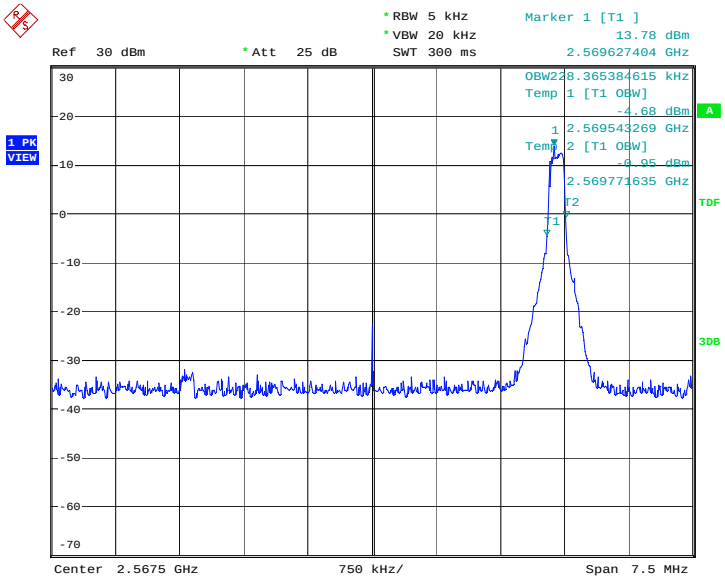


LOW BAND EDGE BLOCK-1RB-low_offset



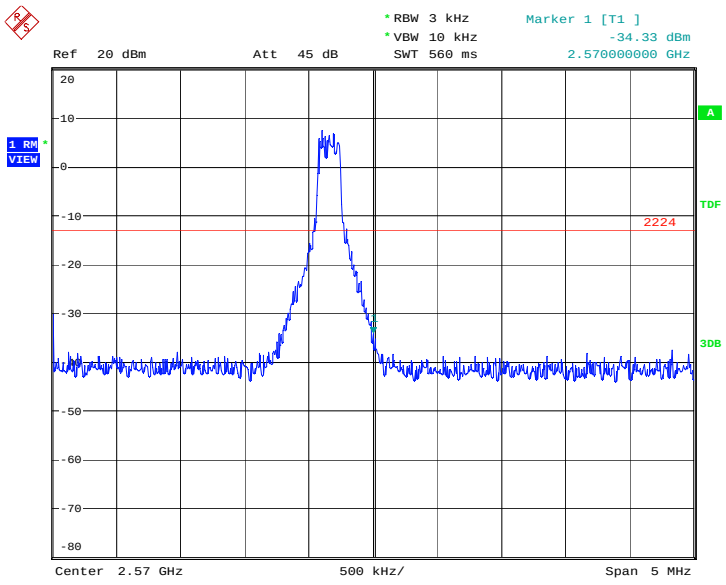
Date: 28.FEB.2015 14:06:57

OBW: 1RB-high_offset



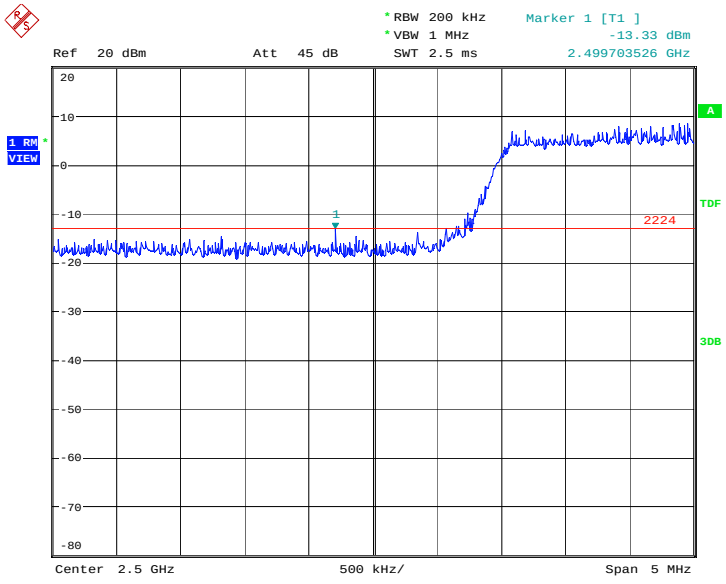
Date: 27.FEB.2015 17:22:23

HIGH BAND EDGE BLOCK-1RB-high_offset



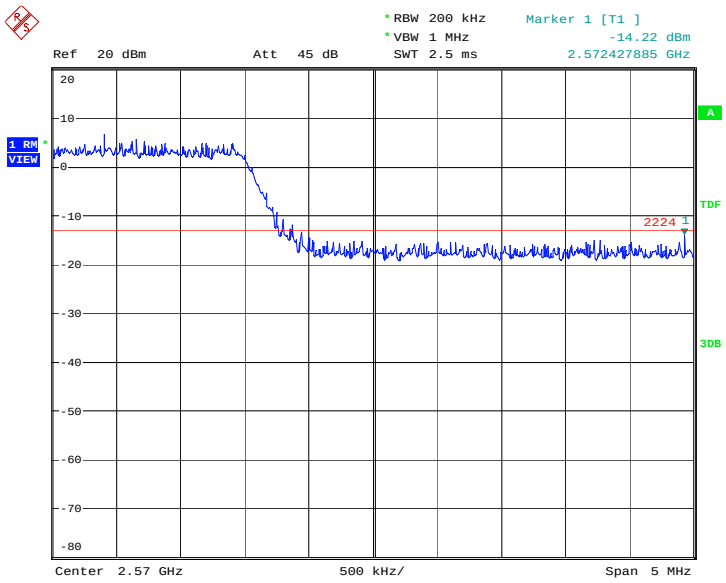
Date: 27.FEB.2015 17:23:39

LOW BAND EDGE BLOCK-20MHz-100%RB



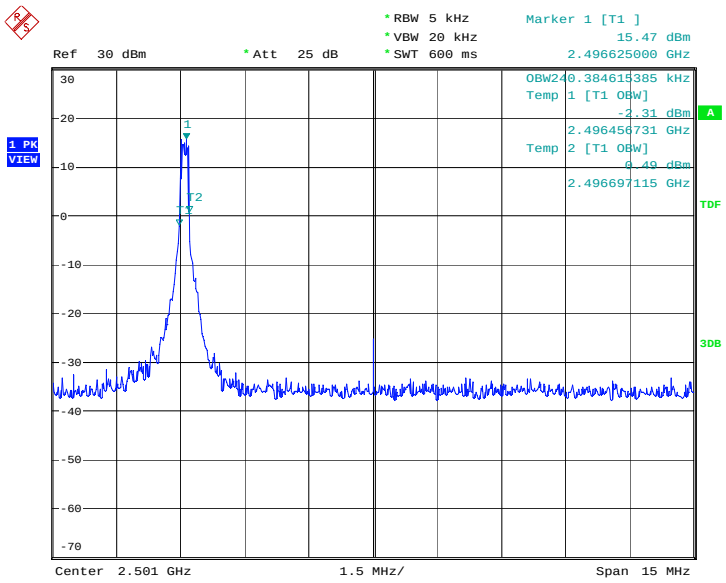
Date: 27.FEB.2015 15:40:11

HIGH BAND EDGE BLOCK-20MHz-100%RB



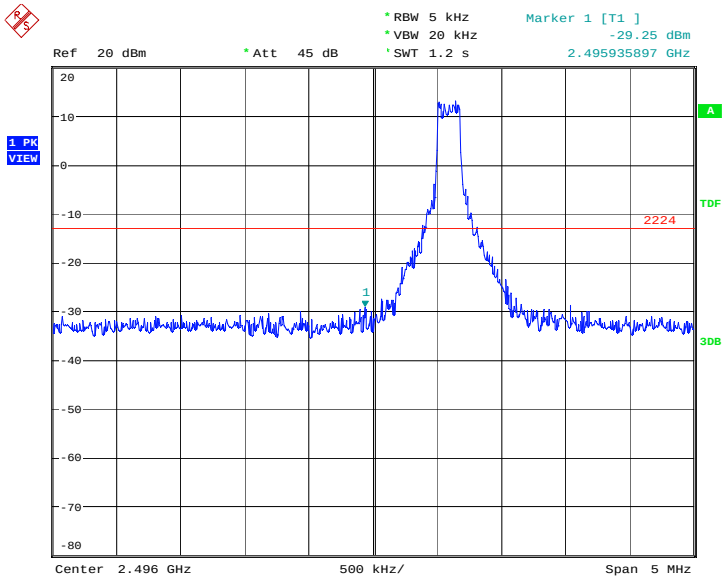
LTE band 41

OBW: 1RB-low_offset



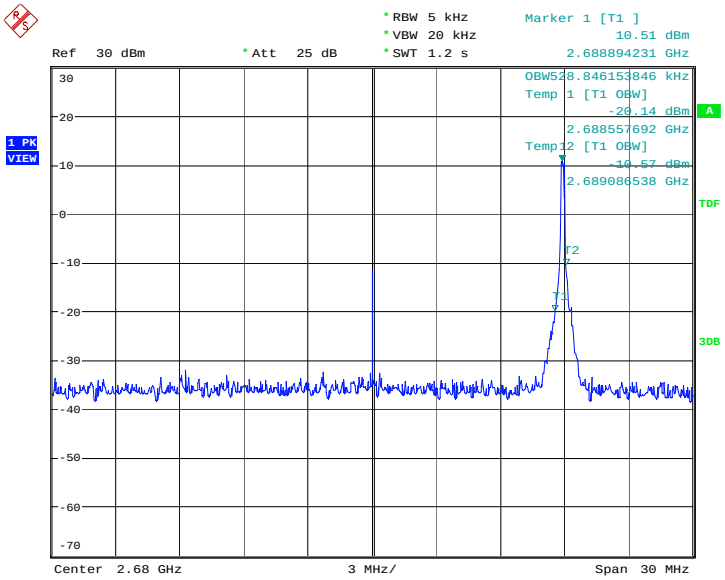
Date: 10.APR.2015 23:12:00

LOW BAND EDGE BLOCK-1RB-low_offset



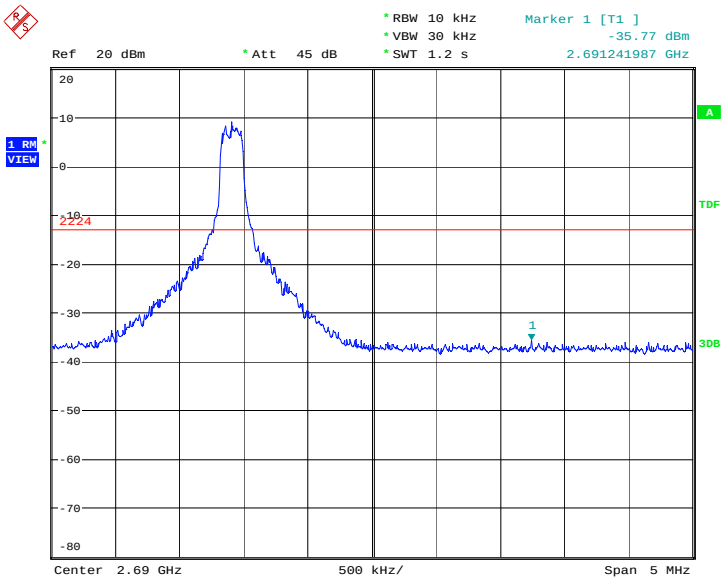
Date: 27.FEB.2015 17:19:40

OBW: 1RB-high_offset



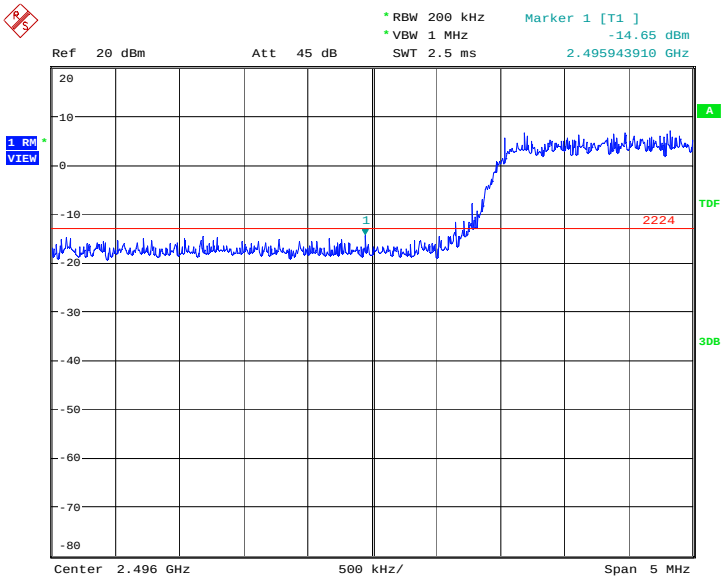
Date: 27.FEB.2015 16:35:03

HIGH BAND EDGE BLOCK-1RB-high_offset



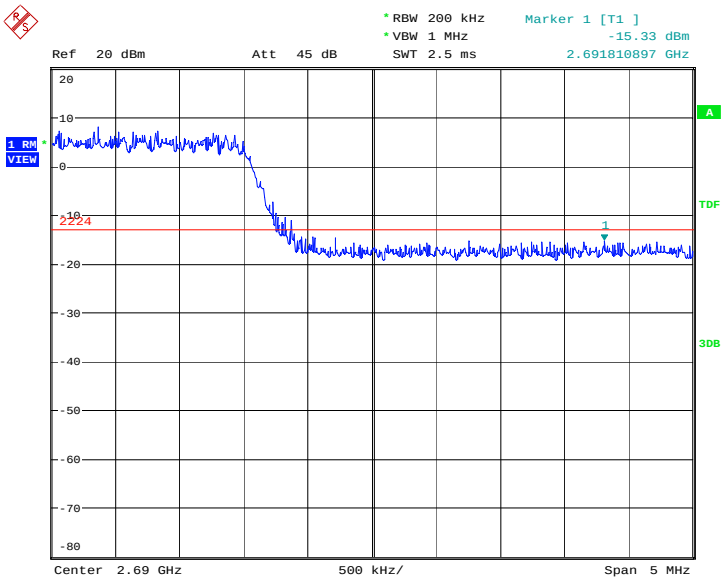
Date: 27.FEB.2015 16:47:54

LOW BAND EDGE BLOCK-20MHz-100%RB



Date: 27.FEB.2015 15:43:49

HIGH BAND EDGE BLOCK-20MHz-100%RB



Date: 27.FEB.2015 15:45:37

A.7 CONDUCTED SPURIOUS EMISSION

Reference

FCC: CFR Part 27.53(h).

A.8.1 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.
2. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.

A. 8.2 Measurement Limit

Part 27.53 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.

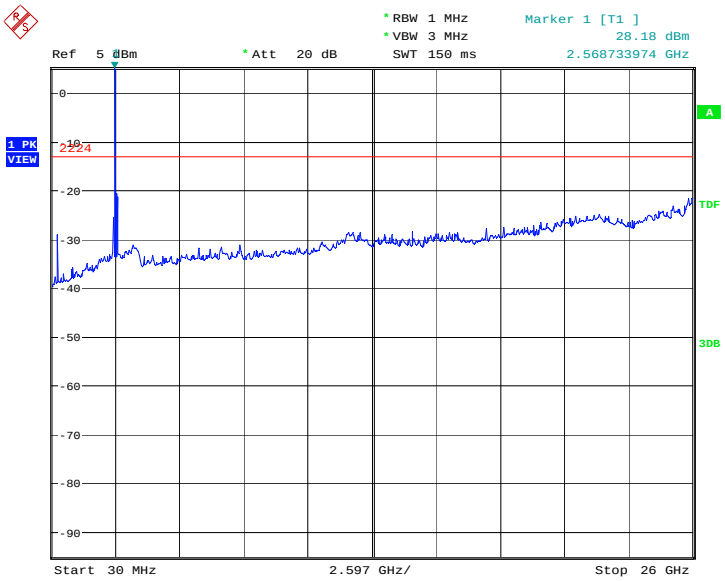
A. 8.3 Measurement result

Only worst case result is given below

Measurement Uncertainty: 0.3dB

LTE band 7: 30MHz – 26GHz

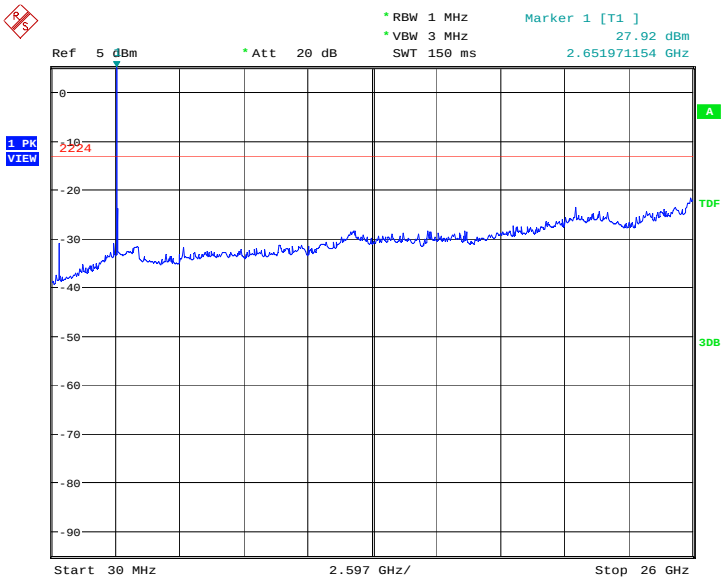
Spurious emission limit –13dBm.



Date: 27.FEB.2015 15:08:20

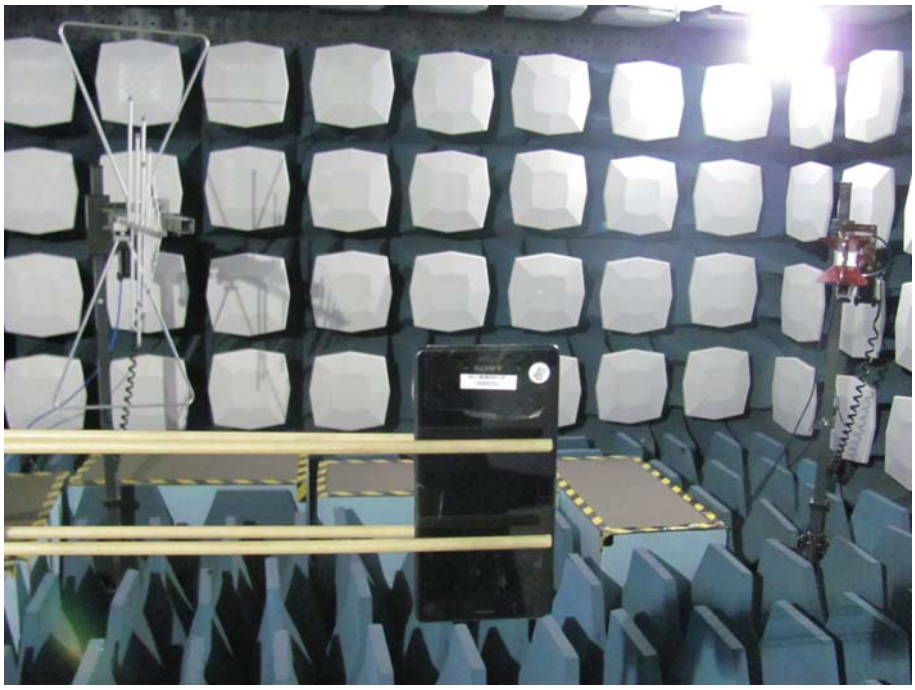
LTE band 41: 30MHz – 26GHz

Spurious emission limit –13dBm.



Date: 27.FEB.2015 15:10:06

ANNEX B: TEST LAYOUT



Pic.1 Radiated spurious emission

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