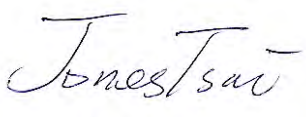
FCC RF Test Report

APPLICANT	: Lenovo (Shanghai) Electronics Technology Co., Ltd.
EQUIPMENT	: Portable Tablet Computer
BRAND NAME	: lenovo
MODEL NAME	: 501LV, 502LV
MARKETING NAME	: Lenovo TAB2
FCC ID	: O57TAB2A8
STANDARD	: 47 CFR Part 2, 27(M)
CLASSIFICATION	: PCS Licensed Transmitter (PCB)

The product was completed on Jul. 05, 2015. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA / EIA-603-C-2004 and the testing has shown the tested sample to be in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager

SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China

TABLE OF CONTENTS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG550402B	Rev. 01	Initial issue of report	Jul. 23, 2015

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Power	Reporting Only	PASS	-
3.2	N/A	Peak-to-Average Ratio	Reporting Only	PASS	-
3.3	§27.50(h)(2)	Equivalent Isotropic Radiated Power (Band 41)	EIRP < 2Watt	PASS	-
3.4	§2.1049 §27.53(m)(6)	99% Occupied Bandwidth and 26dB Bandwidth	Reporting Only	PASS	-
3.5	§2.1051 §27.53(m)(4)	Conducted Band Edge Measurement (Band 41)	< 5MHz: -10 dBm 5 MHz~6MHz or 26dB(BW): -13 dBm ≥6MHz or 26dB(BW): -25 dBm	PASS	-
3.6	§2.1051 §27.53(m)(4)	Conducted Spurious Emission (Band 41)	< 55+10log10(P[Watts])	PASS	-
3.7	§2.1053 §27.53(m)(4)	Radiated Spurious Emission (Band 41)	< 55+10log10(P[Watts])	PASS	Under limit 5.58 dB at 7775.000 MHz
3.8	2.1055 §27.54	Frequency Stability Temperature & Voltage	Within Authorized Band	PASS	

1 General Description

1.1 Applicant

Lenovo (Shanghai) Electronics Technology Co., Ltd.
No. 68 Building, 199 Fenju Road, Wai Gao Qiao FTZ, Shanghai, China

1.2 Manufacturer

Lenovo PC HK Limited
23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Portable Tablet Computer
Brand Name	lenovo
Model Name	501LV, 502LV
Marketing Name	Lenovo TAB2
FCC ID	O57TAB2A8
EUT supports Radios application	GPRS/EGPRS/LTE/ WLAN 2.4GHz 802.11b/g/n HT20/ Bluetooth v3.0 + EDR/Bluetooth v4.0 LE
HW Version	LenovoPad A8-50F
SW Version	A8-50F_150520
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification subjective to this standard

Product Specification subjective to this standard	
Tx Frequency	LTE Band 41 : 2547.5 MHz ~ 2652.5 MHz
Rx Frequency	LTE Band 41 : 2547.5 MHz ~ 2652.5 MHz
Bandwidth	5MHz / 10MHz / 15MHz / 20MHz
Maximum Output Power to Antenna	21.96 dBm
Antenna Type	PIFA Antenna
Type of Modulation	QPSK / 16QAM

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Maximum EIRP Power, Frequency Tolerance, and Emission Designator

FCC Rule	System	Type of Modulation	BW	Maximum EIRP	Frequency Tolerance (ppm)	Emission Designator
Part27M	LTE Band 41	QPSK	5 MHz	0.1384 W	-	4M50G7D
Part27M	LTE Band 41	16QAM	5 MHz	0.1265 W	-	4M50W7D
Part27M	LTE Band 41	QPSK	10 MHz	0.1285 W	0.0227 ppm	9M06G7D
Part27M	LTE Band 41	16QAM	10 MHz	0.1352 W	-	9M06W7D
Part27M	LTE Band 41	QPSK	15 MHz	0.1219 W	-	13M5G7D
Part27M	LTE Band 41	16QAM	15 MHz	0.1151 W	-	13M5W7D
Part27M	LTE Band 41	QPSK	20 MHz	0.1517 W	-	18M5G7D
Part27M	LTE Band 41	16QAM	20 MHz	0.1164 W	-	18M4W7D

1.7 Component List

Note: There are two types of EUT, the difference between sample 1 and sample 2 are for LCM/back camera. The details refer the following table. We only choose sample 1 to perform full tests.

Component	Sample 1	Sample 2
LCM	TFT_8"_1280X800_TTV080WXM-NL0 (BOE)	TFT_8"_1280X800_D0800CS00 (Dongshan)
Back_camera	Camera_500W_AF_L545A00 (O-Film)	Camera_500W-AF_BTB_30PIN_FH545AB (Q-tech)

1.8 Testing Location

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958
Test Site No.	**Sporton Site No.**
	TH01-KS

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.	
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958	
Test Site No.	**Sporton Site No.**	**FCC Registration No.**
	03CH02-KS	418269

1.9 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 2, 27(M)
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v02r02

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

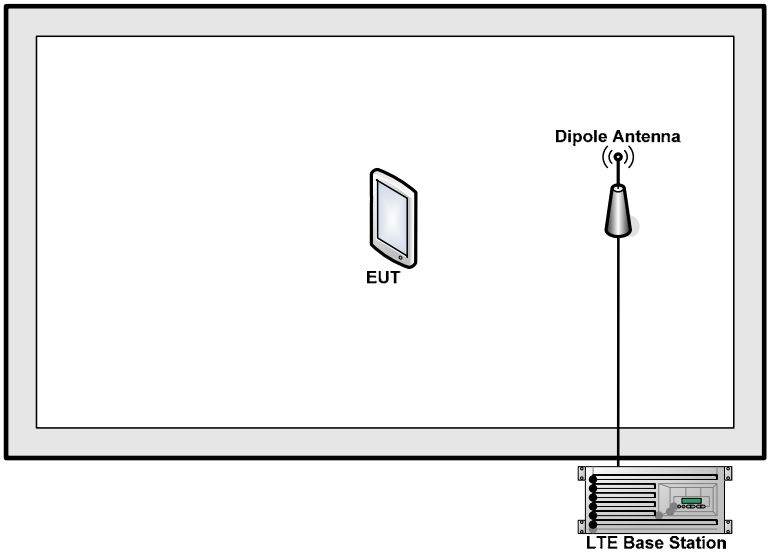
2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r02 with maximum output power.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission.

Test Items	Band	Bandwidth (MHz)						Modulation		RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Max. Output Power	41	-	-	v	v	v	v	v	v	v	v	v	v	v	v
Peak-to-Average Ratio	41	-	-				v	v	v	v		v	v	v	v
26dB and 99% Bandwidth	41	-	-	v	v	v	v	v	v			v		v	
Conducted Band Edge	41	-	-	v	v	v	v	v	v	v		v	v		v
Conducted Spurious Emission	41	-	-	v	v	v	v	v	v	v			v	v	v
Frequency Stability	41	-	-		v			v				v		v	
E.I.R.P.	41	-	-	v	v	v	v	v	v	v			v	v	v
Radiated Spurious Emission	41	-	-	v	v	v	v	v		v				v	
Note	1. The mark "v" means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.														

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	DC Power Supply	GW INSTEK	GPD-2303S	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss.

Offset = RF cable loss.

Following shows an offset computation example with cable loss 6.00 dB.

Example :

Offset(dB) = RF cable loss(dB) = 6.00 (dB)

3 Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power Measurement

A system simulator was used to establish communication with the EUT. Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

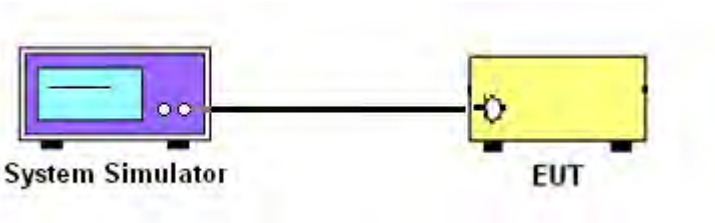
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through the system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the system simulator.

3.1.4 Test Setup



3.1.5 Test Result of Conducted Output Power

<LTE Band 41 Conducted Power>

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				**40240**	**40690**	**41140**
Frequency (MHz)				**2555.0**	**2600.0**	**2645.0**
20	QPSK	1	0	21.56	21.84	21.72
20	QPSK	1	49	21.66	21.94	21.79
20	QPSK	1	99	21.73	**21.96**	21.82
20	QPSK	50	0	20.67	20.92	20.86
20	QPSK	50	24	20.61	20.95	20.88
20	QPSK	50	49	20.72	20.97	20.90
20	QPSK	100	0	20.64	20.93	20.86
20	16QAM	1	0	20.77	20.96	20.86
20	16QAM	1	49	20.64	20.93	20.82
20	16QAM	1	99	20.49	20.93	20.75
20	16QAM	50	0	19.82	20.01	19.84
20	16QAM	50	24	19.74	20.04	19.86
20	16QAM	50	49	19.68	20.04	19.91
20	16QAM	100	0	19.71	20.00	19.85
Channel				**40215**	**40690**	**41165**
Frequency (MHz)				**2552.5**	**2600.0**	**2647.5**
15	QPSK	1	0	21.90	21.72	21.84
15	QPSK	1	37	21.93	21.67	21.89
15	QPSK	1	74	21.87	21.55	21.85
15	QPSK	36	0	20.95	20.67	20.94
15	QPSK	36	18	20.98	20.66	20.93
15	QPSK	36	37	21.02	20.62	20.95
15	QPSK	75	0	21.00	20.67	20.92
15	16QAM	1	0	20.87	20.74	20.80
15	16QAM	1	37	20.91	20.65	20.90
15	16QAM	1	74	20.97	20.52	20.96
15	16QAM	36	0	19.96	19.71	19.82
15	16QAM	36	18	19.99	19.67	19.84
15	16QAM	36	37	20.00	19.61	19.87
15	16QAM	75	0	20.06	19.75	19.92

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				**40190**	**40690**	**41190**
Frequency (MHz)				**2550.0**	**2600.0**	**2650.0**
10	QPSK	1	0	21.87	21.65	21.84
10	QPSK	1	24	21.92	21.64	21.89
10	QPSK	1	49	21.82	21.36	21.65
10	QPSK	25	0	20.91	20.67	20.94
10	QPSK	25	12	20.94	20.63	20.95
10	QPSK	25	24	20.98	20.62	20.95
10	QPSK	50	0	20.97	20.67	20.97
10	16QAM	1	0	20.87	20.71	20.87
10	16QAM	1	24	20.93	20.63	20.93
10	16QAM	1	49	20.97	20.53	20.87
10	16QAM	25	0	19.96	19.75	19.93
10	16QAM	25	12	20.00	19.71	19.92
10	16QAM	25	24	20.03	19.71	19.99
10	16QAM	50	0	20.02	19.75	19.97
Channel				**40165**	**40690**	**41215**
Frequency (MHz)				**2547.5**	**2600.0**	**2652.5**
5	QPSK	1	0	21.85	21.64	21.86
5	QPSK	1	12	21.91	21.63	21.91
5	QPSK	1	24	21.85	21.54	21.84
5	QPSK	12	0	20.90	20.66	21.01
5	QPSK	12	6	20.90	20.65	21.11
5	QPSK	12	11	20.94	20.64	21.00
5	QPSK	25	0	20.89	20.62	20.99
5	16QAM	1	0	20.83	20.67	20.91
5	16QAM	1	12	20.90	20.64	21.00
5	16QAM	1	24	20.88	20.55	20.91
5	16QAM	12	0	19.91	19.71	19.92
5	16QAM	12	6	19.92	19.69	19.92
5	16QAM	12	11	19.96	19.67	19.93
5	16QAM	25	0	19.94	19.70	19.95

Note: Maximum average power for LTE.

3.2 Peak-to-Average Ratio

3.2.1 Description of the PAR Measurement

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

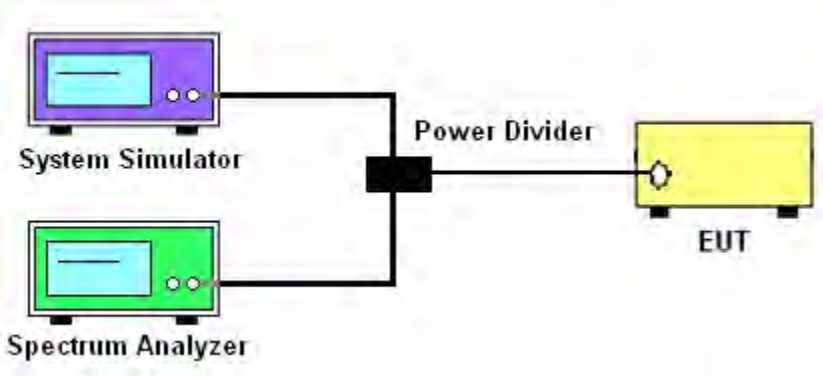
3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

1. The EUT was connected to spectrum and system simulator via a power divider.
2. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
3. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
4. Record the deviation as Peak to Average Ratio.

3.2.4 Test Setup



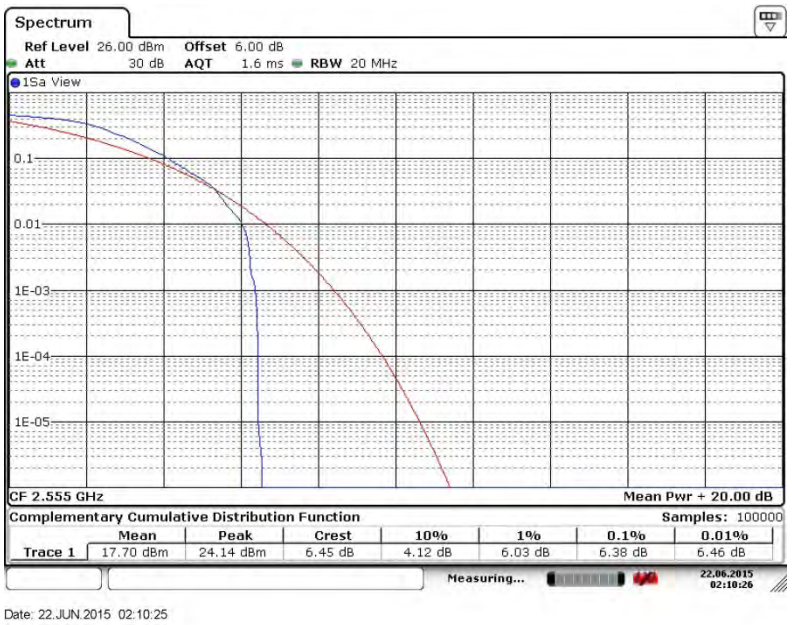
3.2.5 Test Result of Peak-to-Average Ratio

LTE Band 41						
BW [MHz]	Modulation	RB Size	RB Offset	Peak-to-Average Ratio (dB) Low Ch. / Freq.	Peak-to-Average Ratio (dB) Middle Ch. / Freq.	Peak-to-Average Ratio (dB) High Ch. / Freq.
Channel				40240	40690	41140
Frequency (MHz)				2555.0	2600.0	2645.0
20	QPSK	1	0	6.38	5.86	5.77
20	QPSK	100	0	5.28	6.70	7.16
20	16QAM	1	0	6.87	5.91	5.57
20	16QAM	100	0	6.52	6.38	7.01

3.2.6 Peak to Average Power Ratio

Peak-to-Average Ratio on LTE Band 41

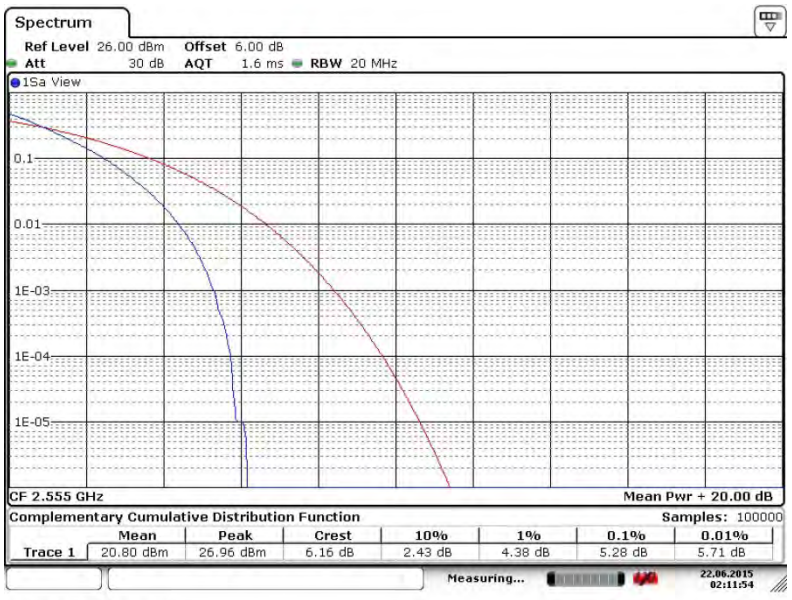
20MHz / QPSK in Ch. 40240 (1RB Size)



Date: 22.JUN.2015 02:10:25

Peak-to-Average Ratio on LTE Band 41

20MHz / QPSK in Ch. 40240 (100RB Size)



Date: 22.JUN.2015 02:11:54

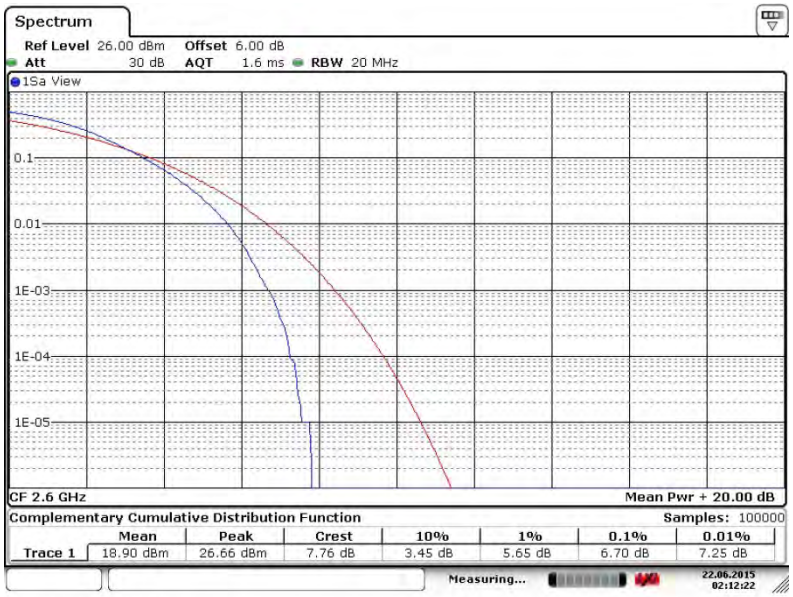
Peak-to-Average Ratio on LTE Band 41

20MHz / QPSK in Ch. 40690 (1RB Size)

Date: 22.JUN.2015 02:14:01

Peak-to-Average Ratio on LTE Band 41

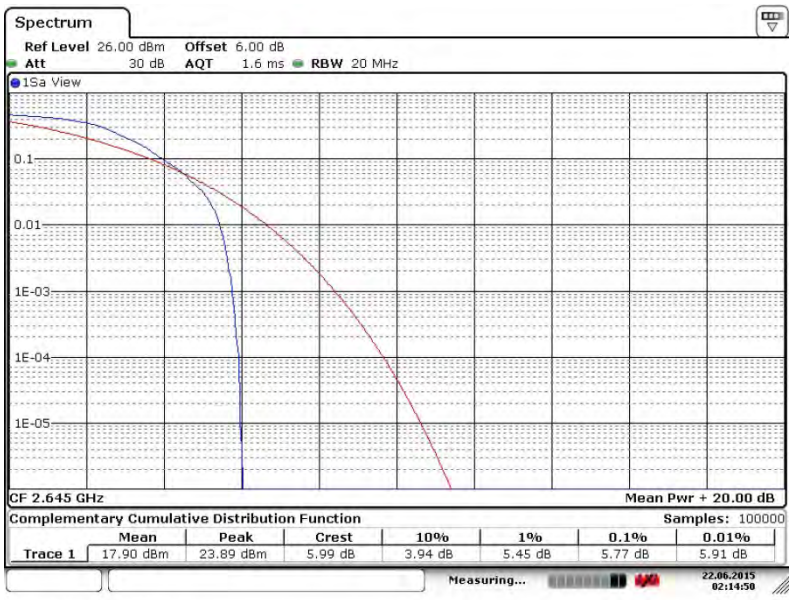
20MHz / QPSK in Ch. 40690 (100RB Size)



Date: 22.JUN.2015 02:12:23

Peak-to-Average Ratio on LTE Band 41

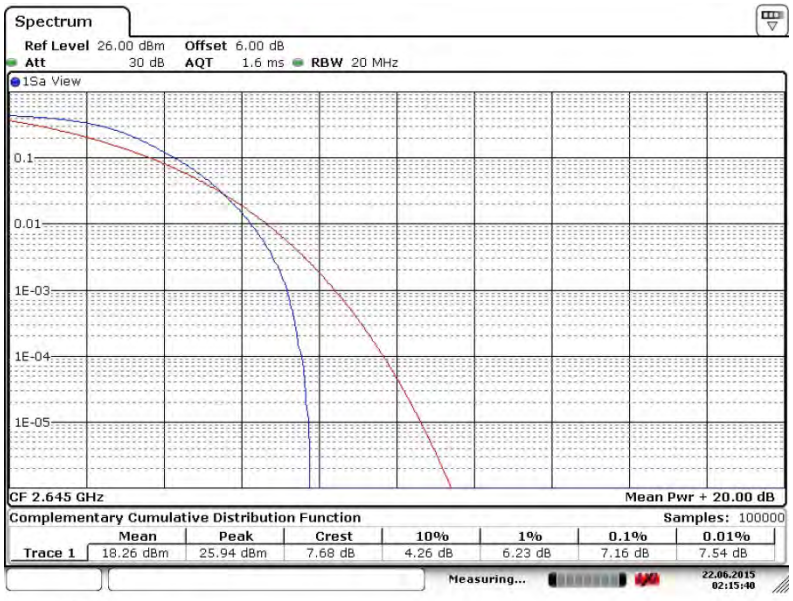
20MHz / QPSK in Ch. 41140 (1RB Size)



Date: 22.JUN.2015 02:14:50

Peak-to-Average Ratio on LTE Band 41

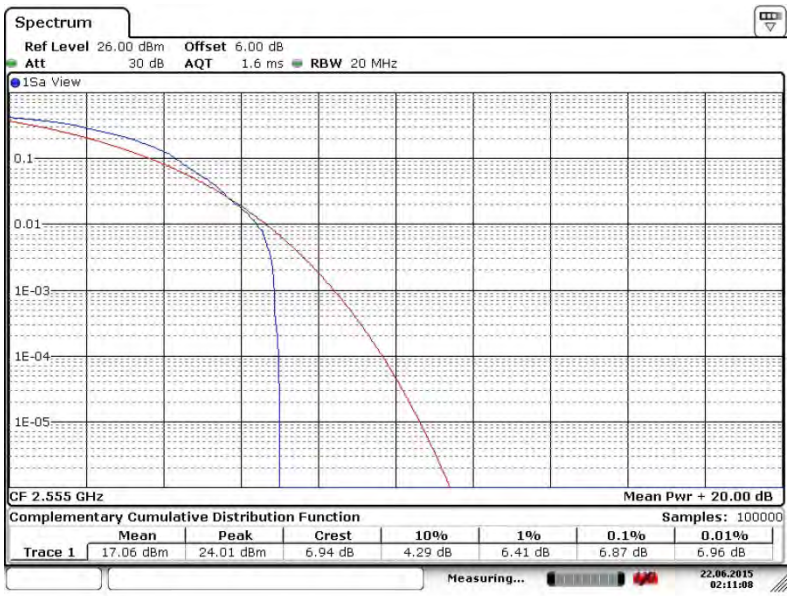
20MHz / QPSK in Ch. 41140 (100RB Size)



Date: 22.JUN.2015 02:15:40

Peak-to-Average Ratio on LTE Band 41

20MHz / 16QAM in Ch. 40240 (1RB Size)



Date: 22.JUN.2015 02:11:08

Peak-to-Average Ratio on LTE Band 41

20MHz / 16QAM in Ch. 40240 (100RB Size)

Date: 22.JUN.2015 02:11:33

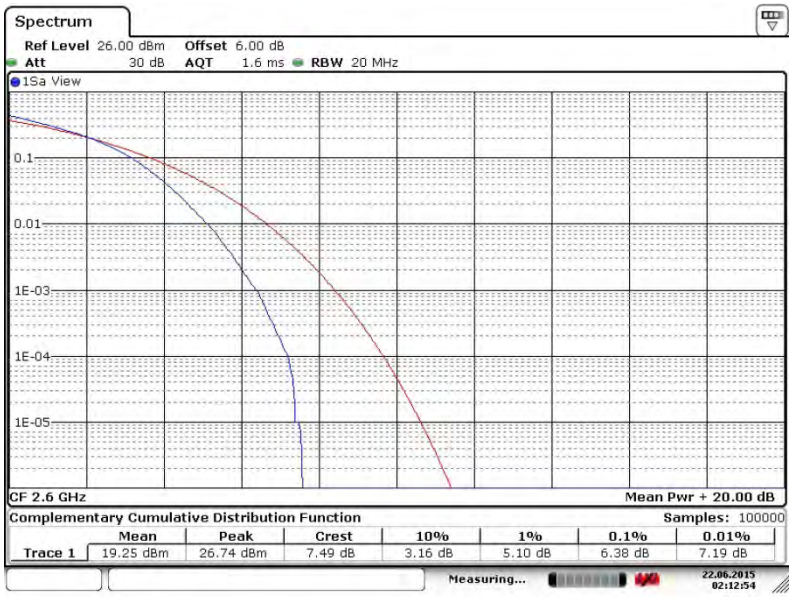
Peak-to-Average Ratio on LTE Band 41

20MHz / 16QAM in Ch. 40690 (1RB Size)

Date: 22.JUN.2015 02:13:15

Peak-to-Average Ratio on LTE Band 41

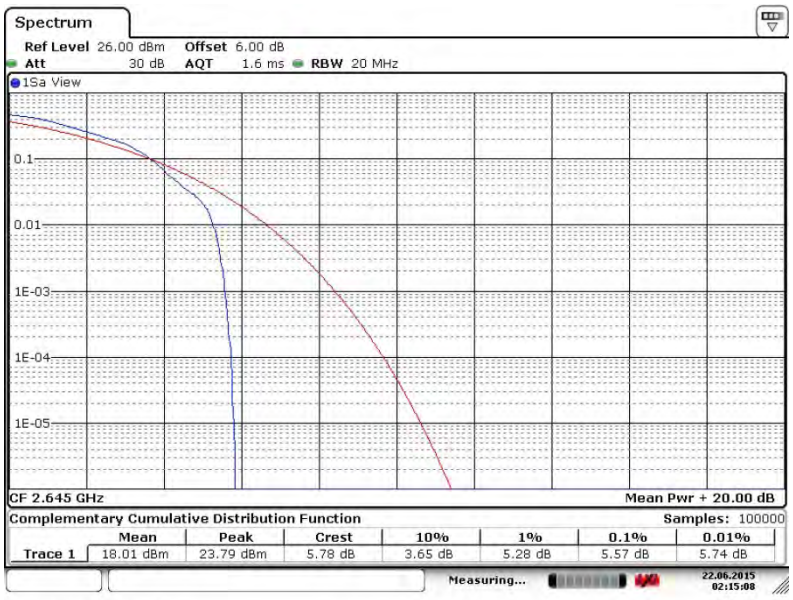
20MHz / 16QAM in Ch. 40690 (100RB Size)



Date: 22.JUN.2015 02:12:54

Peak-to-Average Ratio on LTE Band 41

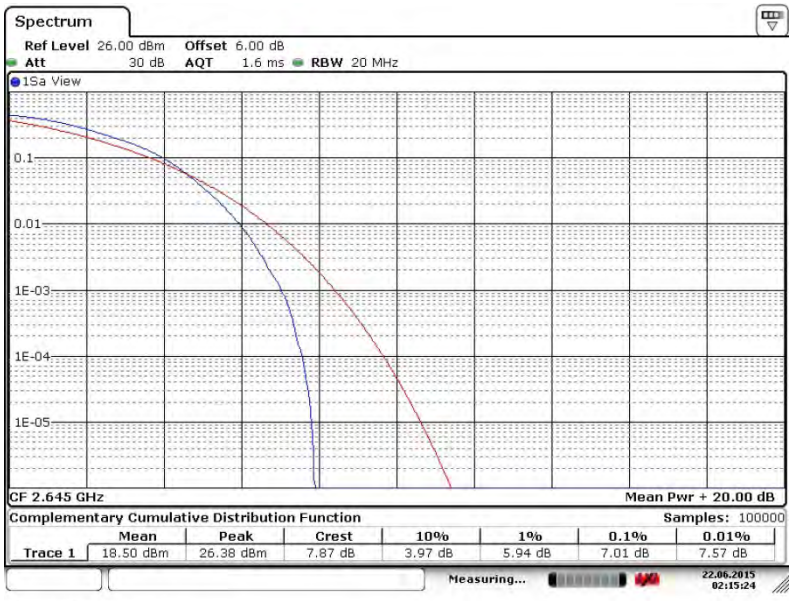
20MHz / 16QAM in Ch. 41140 (1RB Size)



Date: 22.JUN.2015 02:15:08

Peak-to-Average Ratio on LTE Band 41

20MHz / 16QAM in Ch. 41140 (100RB Size)



Date: 22.JUN.2015 02:15:24

3.3 Equivalent Isotropic Radiated Power Measurement

3.3.1 Description of the EIRP Measurement

Equivalent isotropic radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-C-2004, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r02. Mobile and portable (hand-held) stations operating are limited to average EIRP of 2 watts with LTE band 41.

3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedures

1. The EUT was placed on a non-conductive rotating platform 0.8 meters high in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RMS detector.
2. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power. The maximum emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
3. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (substitution antenna) at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain - Analyzer reading. Then the EUT's EIRP was calculated with the correction factor, EIRP= LVL + Correction factor and ERP = EIRP – 2.15.

	LTE					
LTE BW	1.4M	3M	5M	10M	15M	20M
Span	3MHz	6MHz	10MHz	20MHz	30MHz	40MHz
RBW	30kHz	100kHz	100kHz	300kHz	300kHz	300kHz
VBW	100kHz	300kHz	300kHz	1MHz	1MHz	1MHz
Detector	RMS	RMS	RMS	RMS	RMS	RMS
Trace	Average	Average	Average	Average	Average	Average
Average Type	Power	Power	Power	Power	Power	Power
Sweep Count	100	100	100	100	100	100

3.3.4 Test Result of EIRP

LTE Band 41 / 5MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	12	20.55	0.1135	21.21	0.1321
Middle		1	0	19.80	0.0955	21.41	0.1384
Highest		1	12	19.48	0.0887	20.79	0.1199
Lowest	16QAM	1	12	20.35	0.1084	21.02	0.1265
Middle		1	0	19.37	0.0865	20.91	0.1233
Highest		1	12	19.11	0.0815	20.41	0.1099
Limit	EIRP < 2W			Result		PASS	

LTE Band 41 / 10MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	24	20.09	0.1021	21.09	0.1285
Middle		1	0	19.05	0.0804	20.60	0.1148
Highest		1	24	18.73	0.0746	20.07	0.1016
Lowest	16QAM	1	49	20.40	0.1096	21.31	0.1352
Middle		1	0	18.57	0.0719	20.07	0.1016
Highest		1	24	18.34	0.0682	19.68	0.0929
Limit	EIRP < 2W			Result		PASS	

LTE Band 41 / 15MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	37	19.88	0.0973	20.84	0.1213
Middle		1	0	19.47	0.0885	20.86	0.1219
Highest		1	37	18.27	0.0671	19.59	0.0910
Lowest	16QAM	1	74	19.94	0.0986	20.61	0.1151
Middle		1	0	18.95	0.0785	20.35	0.1084
Highest		1	74	19.52	0.0895	20.60	0.1148
Limit	EIRP < 2W			Result		PASS	

LTE Band 41 / 20MHz							
Channel	Modulation	RB		Horizontal		Vertical	
		Size	Offset	EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	QPSK	1	99	19.86	0.0968	20.52	0.1127
Middle		1	99	20.28	0.1067	21.81	0.1517
Highest		1	99	19.97	0.0993	20.99	0.1256
Lowest	16QAM	1	0	19.83	0.0962	20.66	0.1164
Middle		1	0	19.07	0.0807	20.29	0.1069
Highest		1	0	17.93	0.0621	19.34	0.0859
Limit	EIRP < 2W			Result		PASS	

3.4 99% Occupied Bandwidth and 26dB Bandwidth Measurement

3.4.1 Description of 99% Occupied Bandwidth and 26dB Bandwidth Measurement

The 99% occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

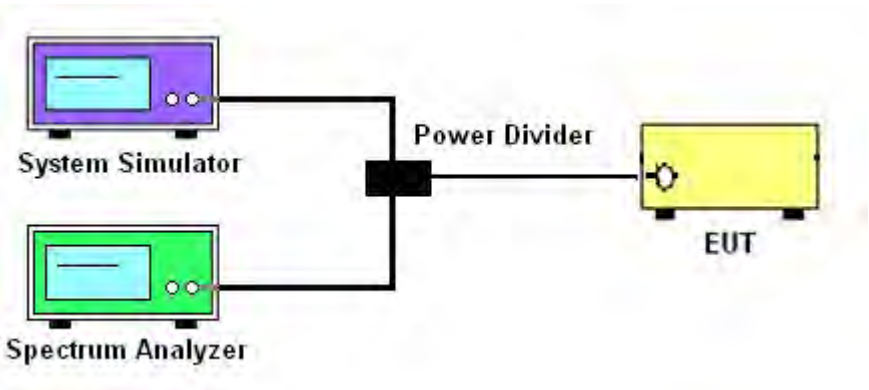
3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.4.3 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The 26dB and 99% occupied bandwidth (BW) of the middle channel for the highest RF power with full RB sizes were measured.

3.4.4 Test Setup



3.4.5 Test Result of 99% Occupied Bandwidth and 26dB Bandwidth

Modes	LTE Band 41			
BW / Mod.	**5MHz / QPSK**	**5MHz / 16QAM**	**10MHz / QPSK**	**10MHz / 16QAM**
99% OBW (MHz)	4.501	4.501	9.059	9.059
26dB BW (MHz)	5.007	5.080	9.899	10.014
BW / Mod.	**15MHz / QPSK**	**15MHz / 16QAM**	**20MHz / QPSK**	**20MHz / 16QAM**
99% OBW (MHz)	13.546	13.546	18.524	18.350
26dB BW (MHz)	14.631	14.805	20.260	20.434

Note:

The maximum RB configurations of the 99% Occupied Bandwidth and 26dB Bandwidth summary as below:

BW5.0MHz RB setting：RB Size 25, RB offset 0

BW10MHz RB setting：RB Size 50, RB offset 0

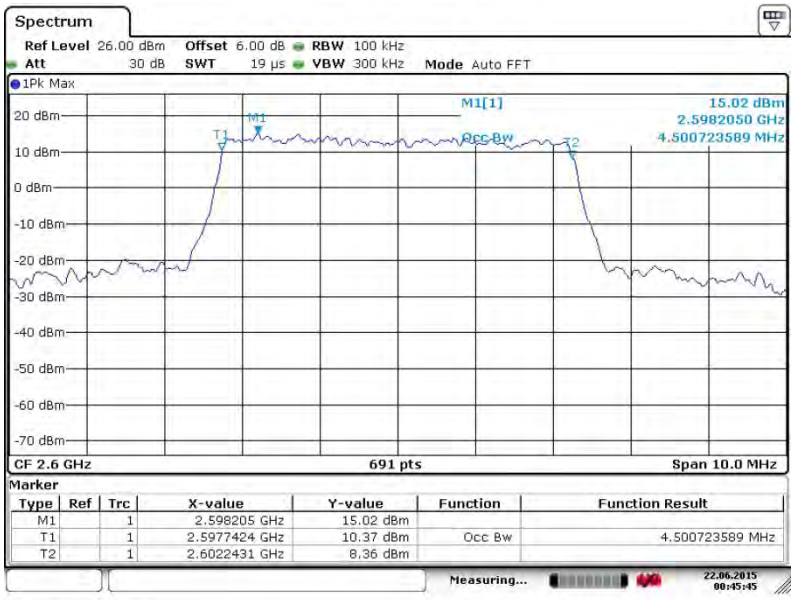
BW15MHz RB setting：RB Size 75, RB offset 0

BW20MHz RB setting：RB Size 100, RB offset 0

3.4.6 Test Result (Plots) of 99% Occupied Bandwidth

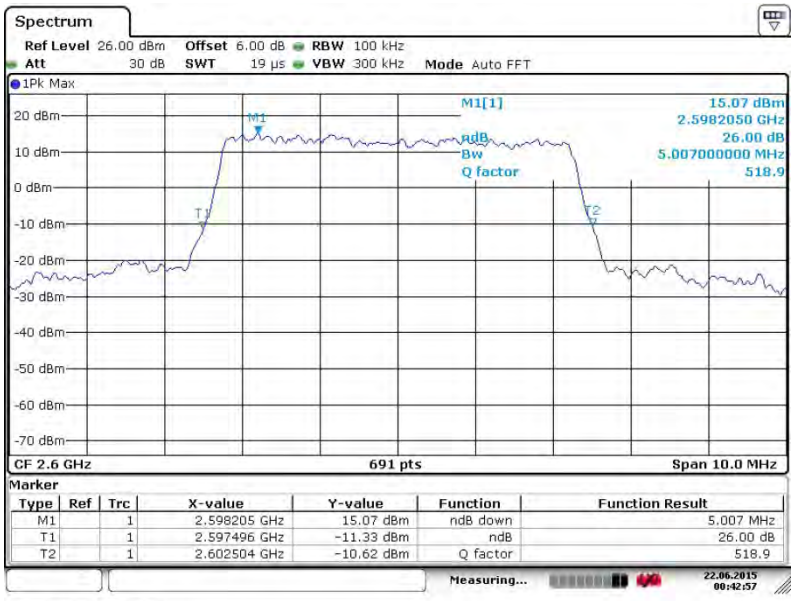
Band :	LTE Band 41	BW / Mod. :	5MHz / QPSK

99% Occupied Bandwidth Plot on Channel 40690



Date: 22.JUN.2015 00:45:46

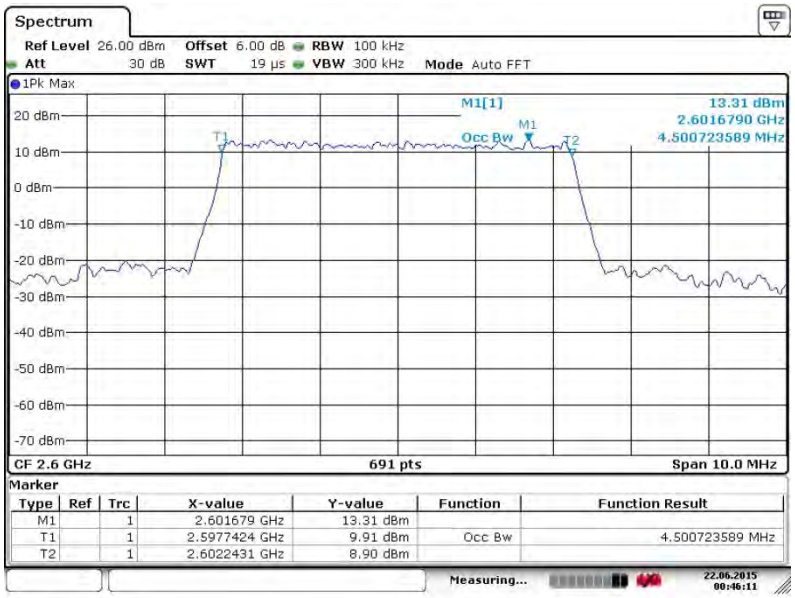
26dB Bandwidth Plot on Channel 40690



Date: 22.JUN.2015 00:42:57

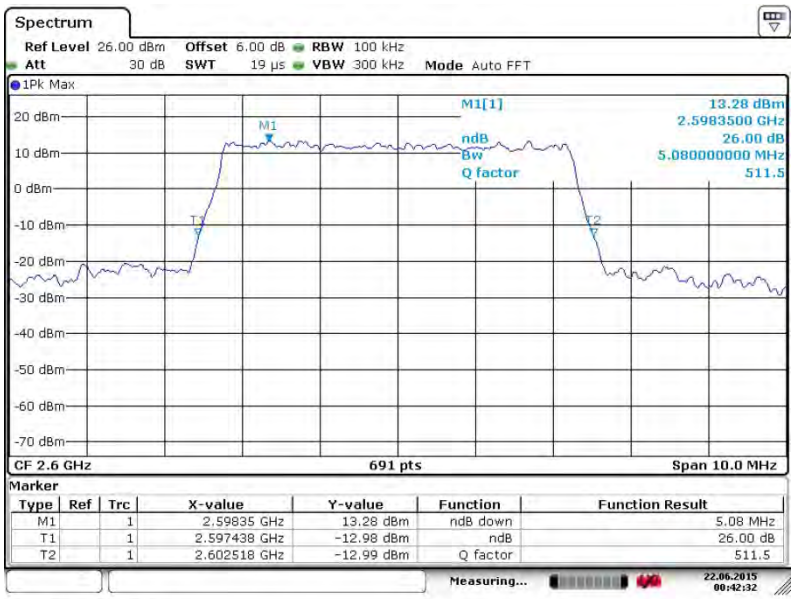
Band :	LTE Band 41	BW / Mod. :	5MHz / 16QAM

99% Occupied Bandwidth Plot on Channel 40690



Date: 22.JUN.2015 00:46:11

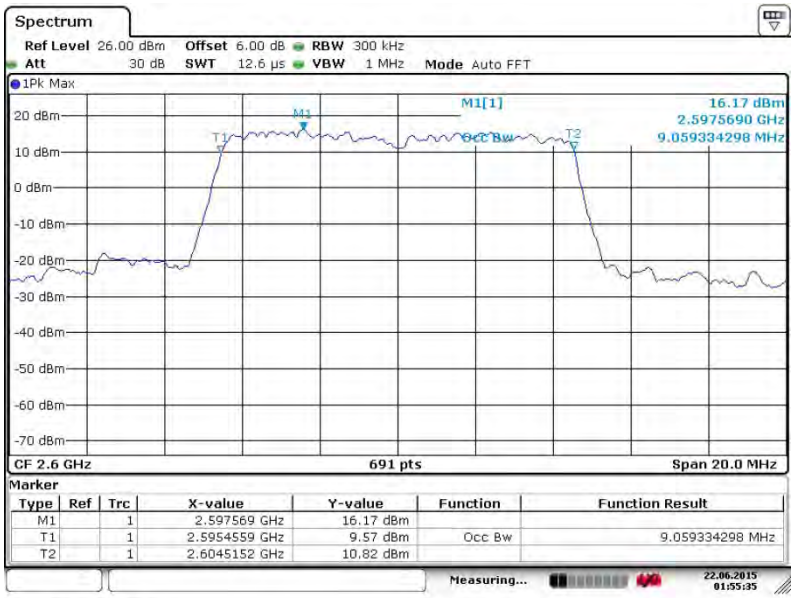
26dB Bandwidth Plot on Channel 40690



Date: 22.JUN.2015 00:42:31

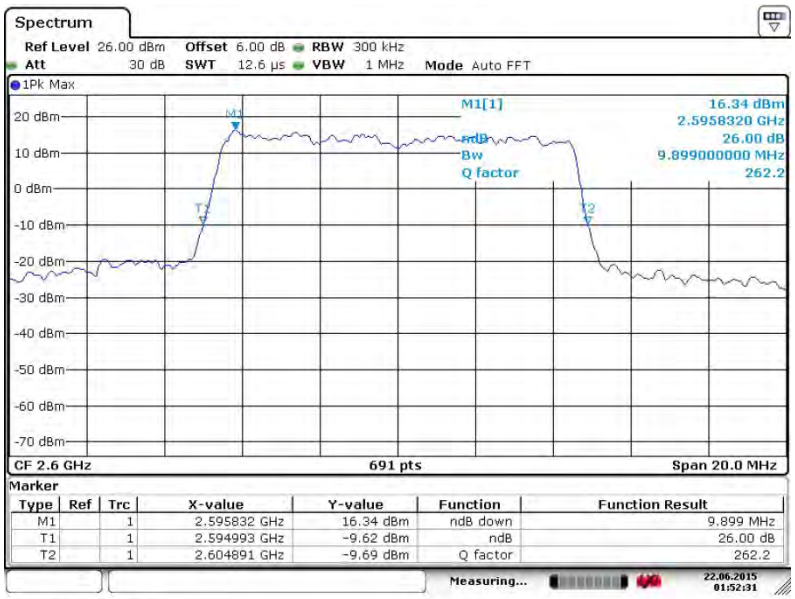
Band :	LTE Band 41	BW / Mod. :	10MHz / QPSK

99% Occupied Bandwidth Plot on Channel 40690



Date: 22.JUN.2015 01:55:36

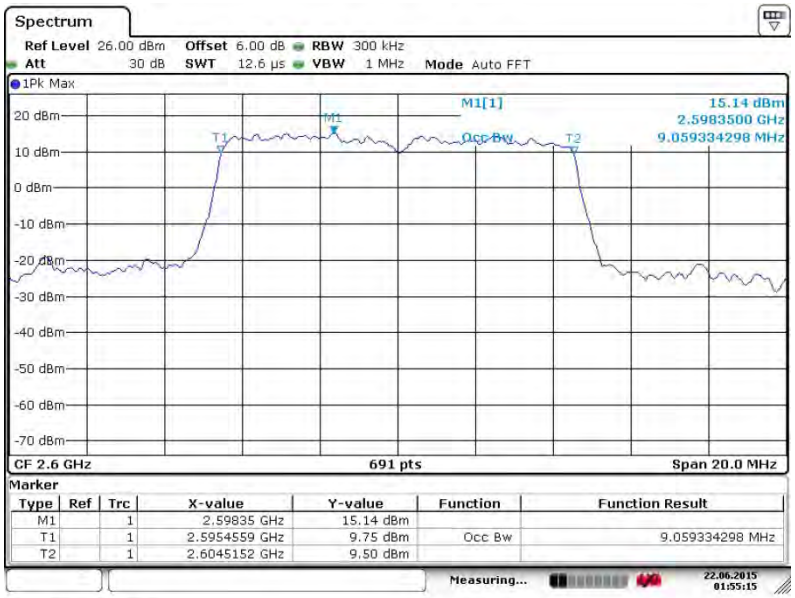
26dB Bandwidth Plot on Channel 40690



Date: 22.JUN.2015 01:52:31

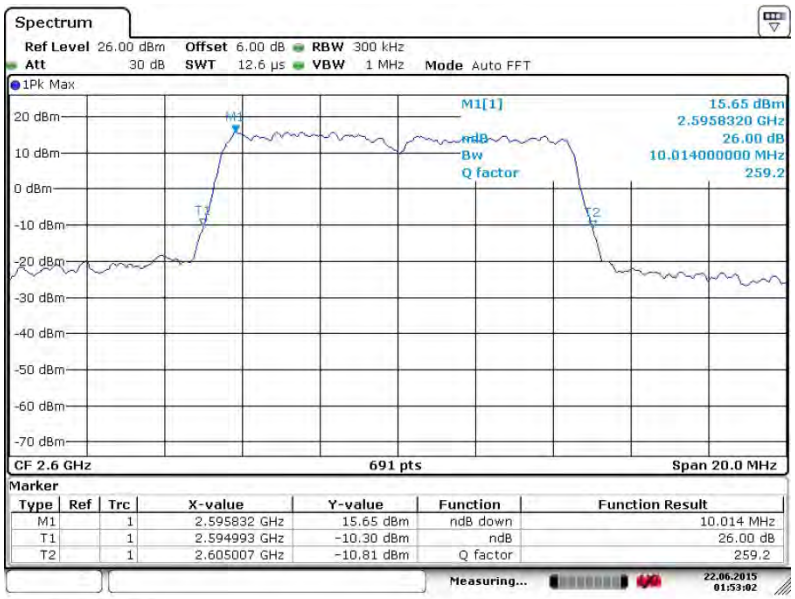
Band :	LTE Band 41	BW / Mod. :	10MHz / 16QAM

99% Occupied Bandwidth Plot on Channel 40690



Date: 22.JUN.2015 01:55:15

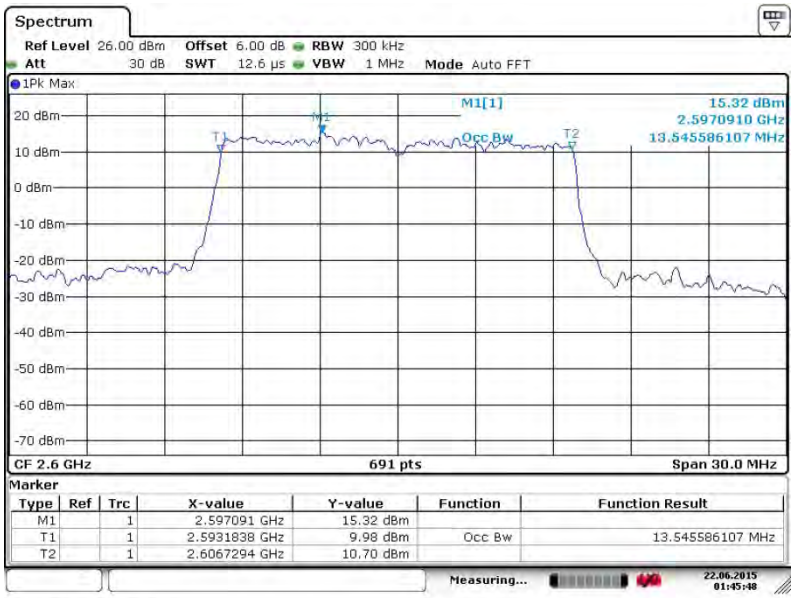
26dB Bandwidth Plot on Channel 40690



Date: 22.JUN.2015 01:53:02

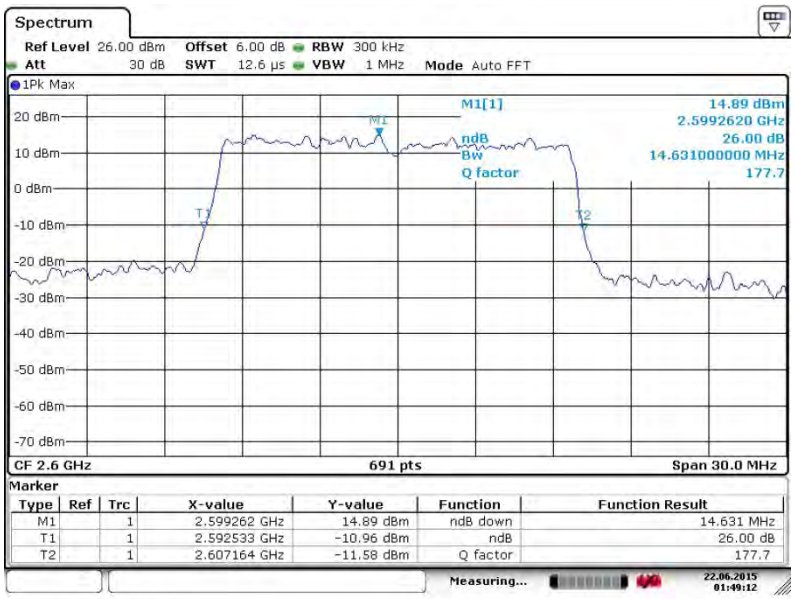
Band :	LTE Band 41	BW / Mod. :	15MHz / QPSK

99% Occupied Bandwidth Plot on Channel 40690



Date: 22.JUN.2015 01:45:49

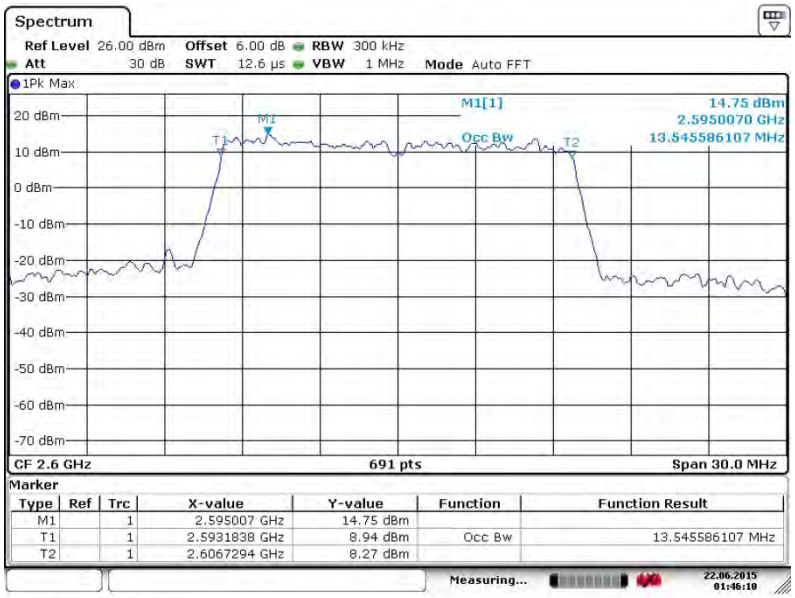
26dB Bandwidth Plot on Channel 40690



Date: 22.JUN.2015 01:49:12

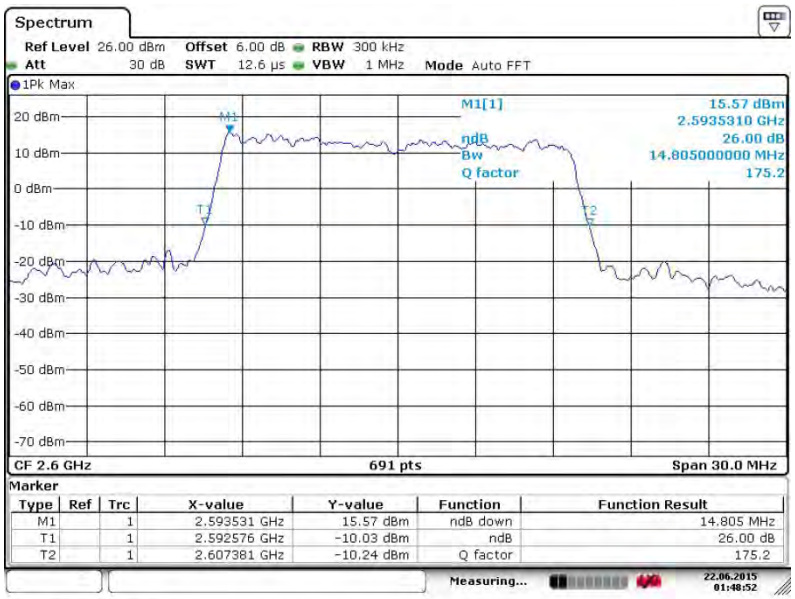
Band :	LTE Band 41	BW / Mod. :	15MHz / 16QAM

99% Occupied Bandwidth Plot on Channel 40690



Date: 22.JUN.2015 01:46:11

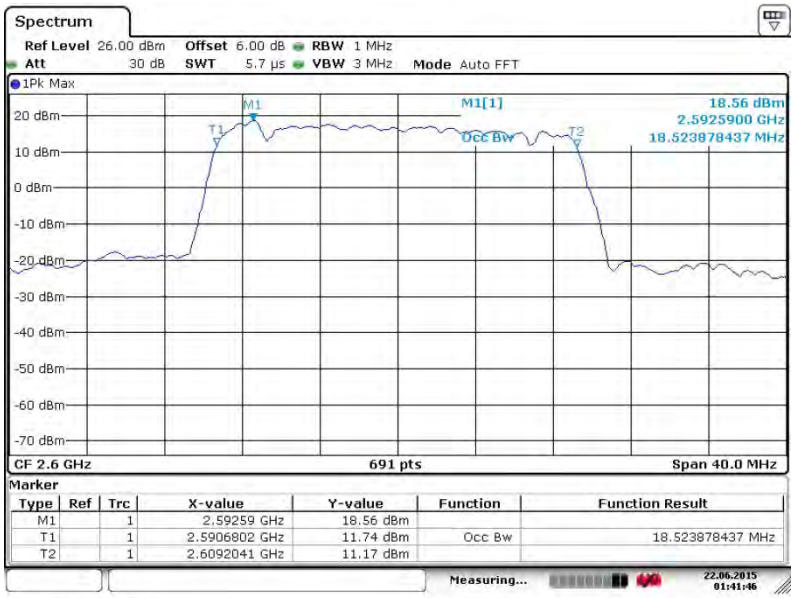
26dB Bandwidth Plot on Channel 40690



Date: 22.JUN.2015 01:48:52

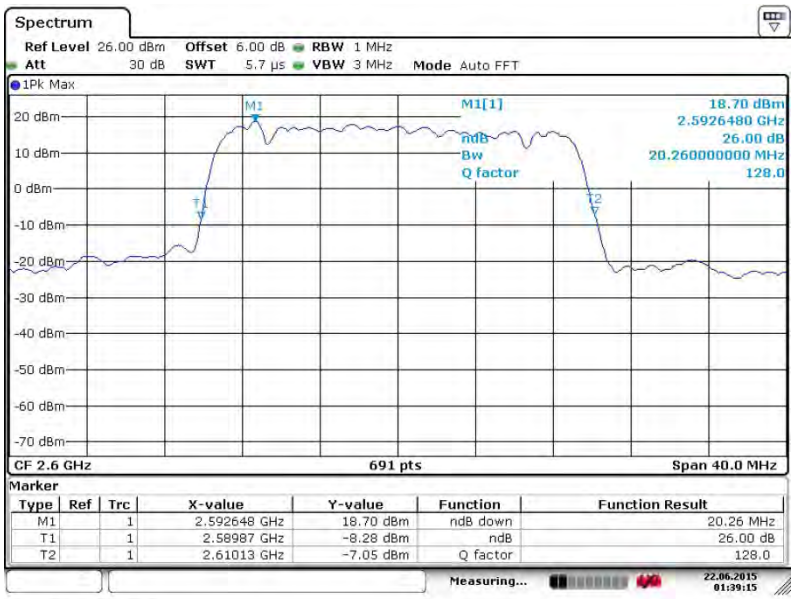
Band :	LTE Band 41	BW / Mod. :	20MHz / QPSK

99% Occupied Bandwidth Plot on Channel 40690



Date: 22.JUN.2015 01:41:46

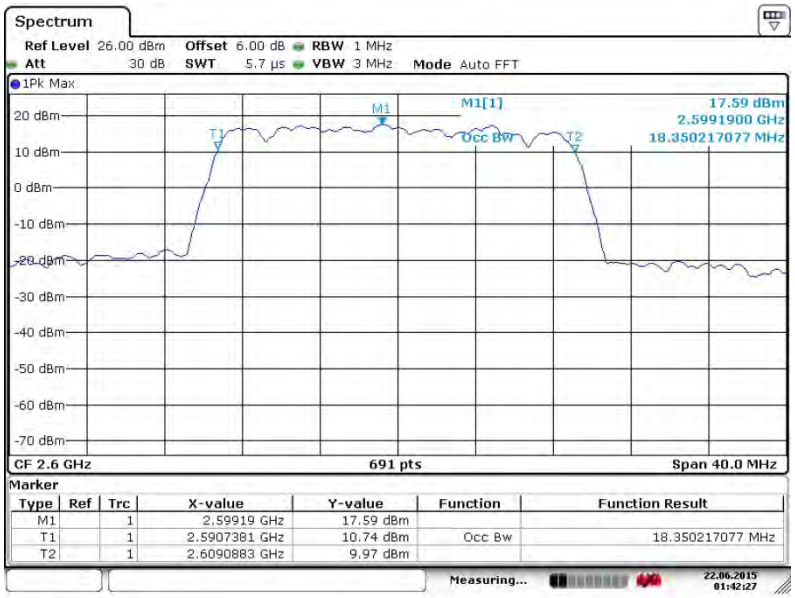
26dB Bandwidth Plot on Channel 40690



Date: 22.JUN.2015 01:39:15

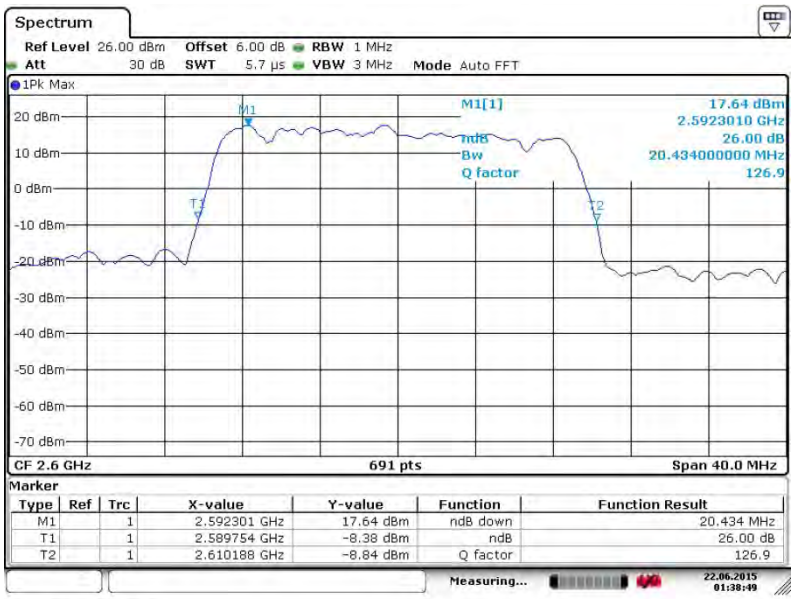
Band :	LTE Band 41	BW / Mod. :	20MHz / 16QAM

99% Occupied Bandwidth Plot on Channel 40690



Date: 22.JUN.2015 01:42:27

26dB Bandwidth Plot on Channel 40690



Date: 22.JUN.2015 01:38:50

3.5 Conducted Band Edge Measurement

3.5.1 Description of Conducted Band Edge Measurement

27.53(m)(4):

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

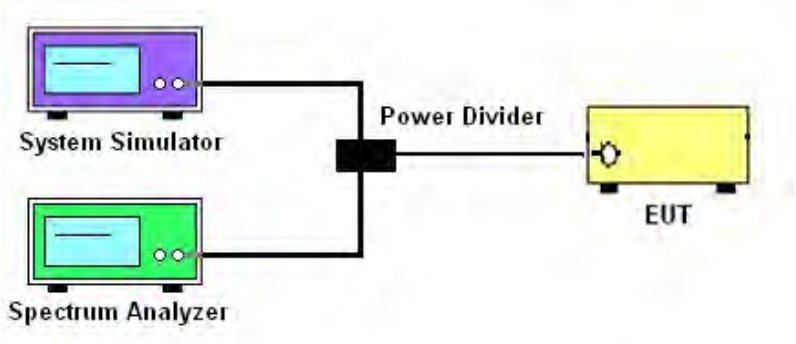
3.5.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured. Set RBW >= 2% EBW in the 1MHz band immediately outside and adjacent to the band edge.
3. Set spectrum analyzer with RMS detector.
4. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
5. Offset has included the duty factor . Duty factor =10 log (1/x), where x is the measured duty cycle.

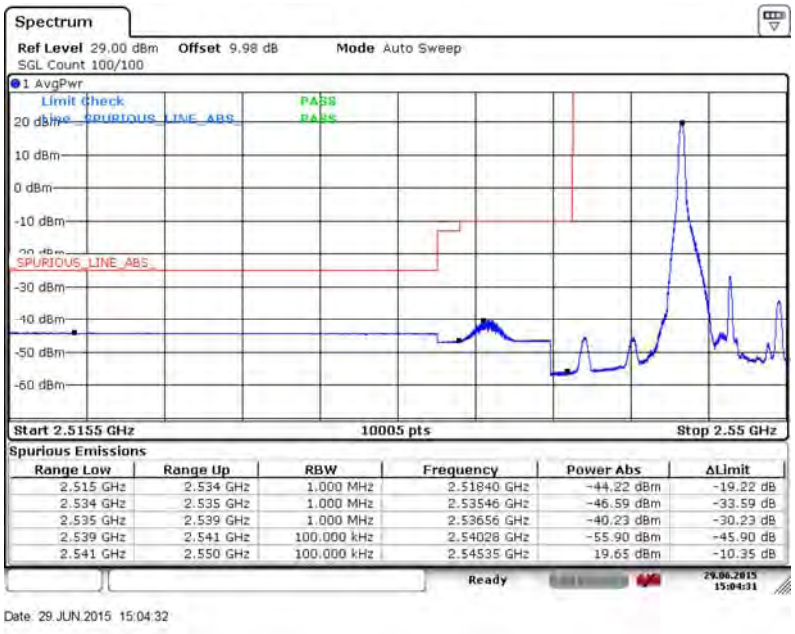
3.5.4 Test Setup



3.5.5 Test Result (Plots) of Conducted Band Edge

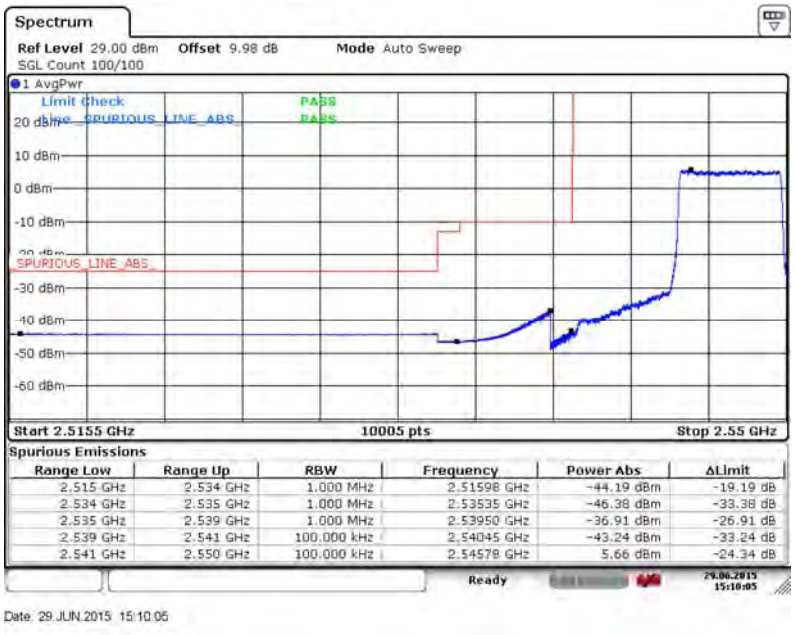
Band :	LTE Band 41	Band Width :	5MHz / QPSK

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



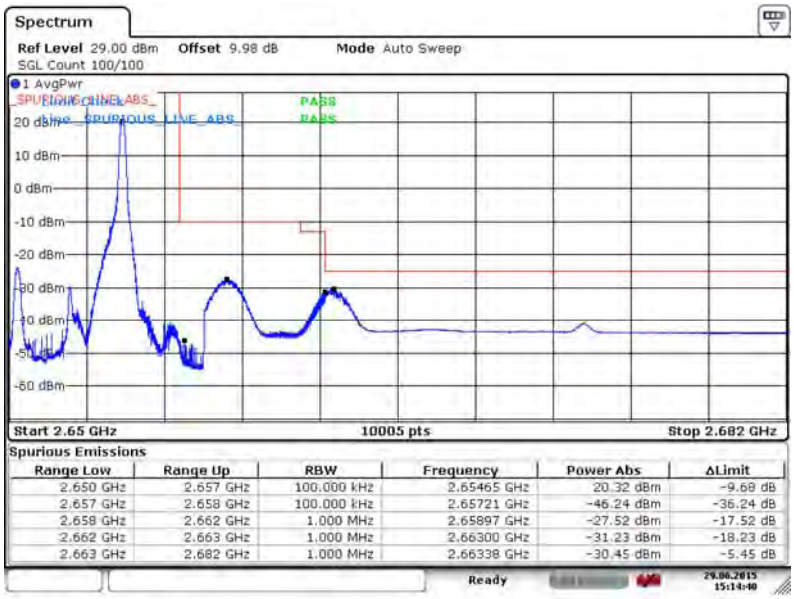
Date: 29.JUN.2015 15:04:32

Lower Band Edge Plot for QPSK-RB Size 25, RB Offset 0



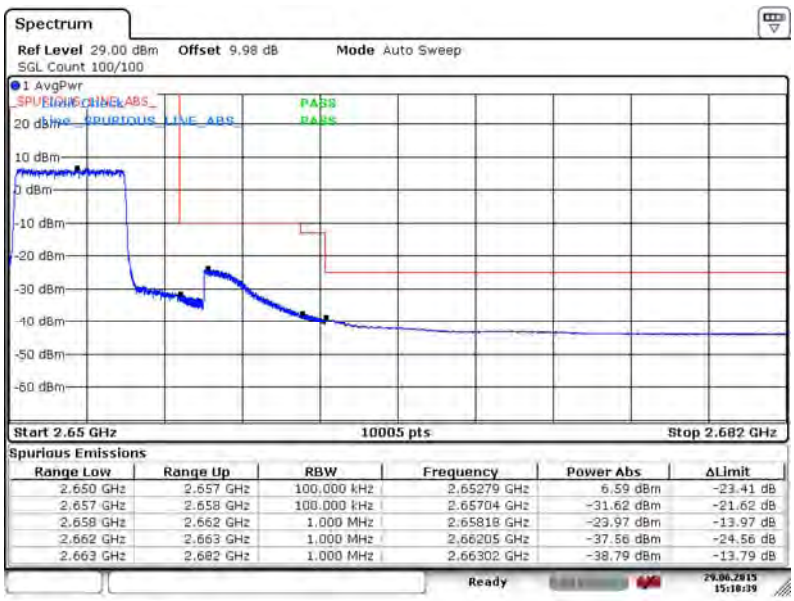
Date: 29.JUN.2015 15:10:05

Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24



Date: 29.JUN.2015 15:14:39

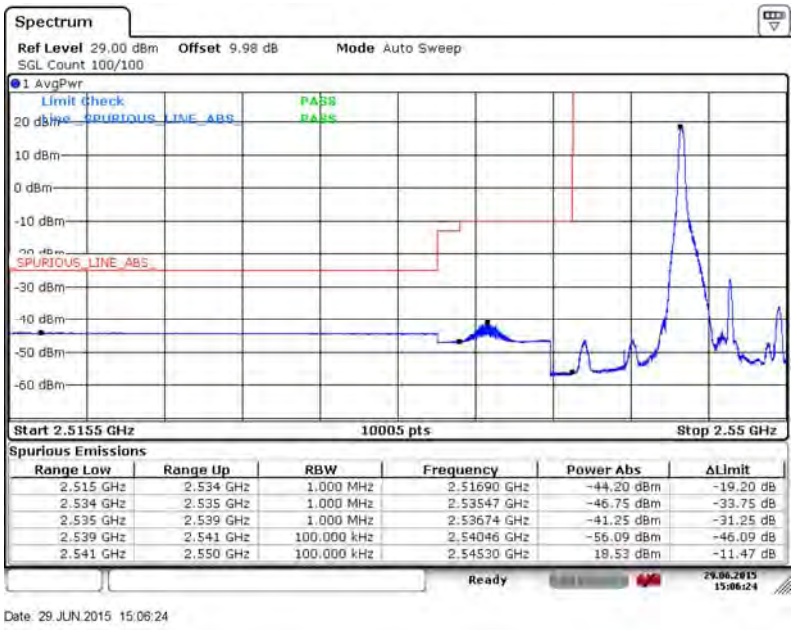
Higher Band Edge Plot for QPSK-RB Size 25, RB Offset 0



Date: 29.JUN.2015 15:18:39

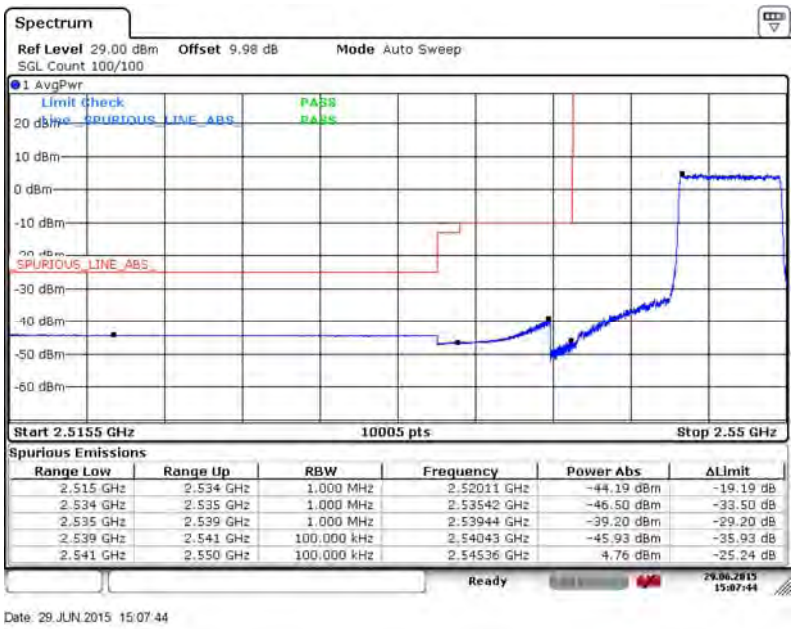
Band :	LTE Band 41	Band Width :	5MHz / 16QAM

Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



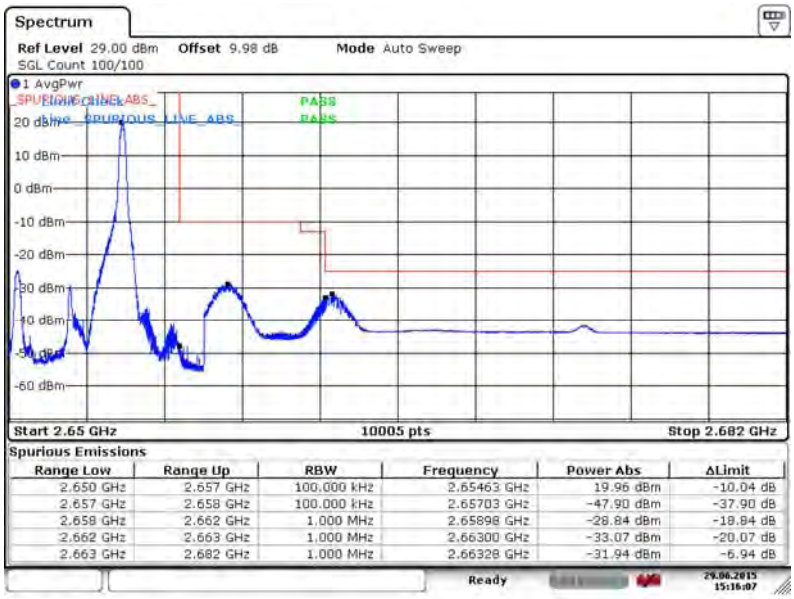
Date: 29.JUN.2015 15:06:24

Lower Band Edge Plot for 16QAM-RB Size 25, RB Offset 0



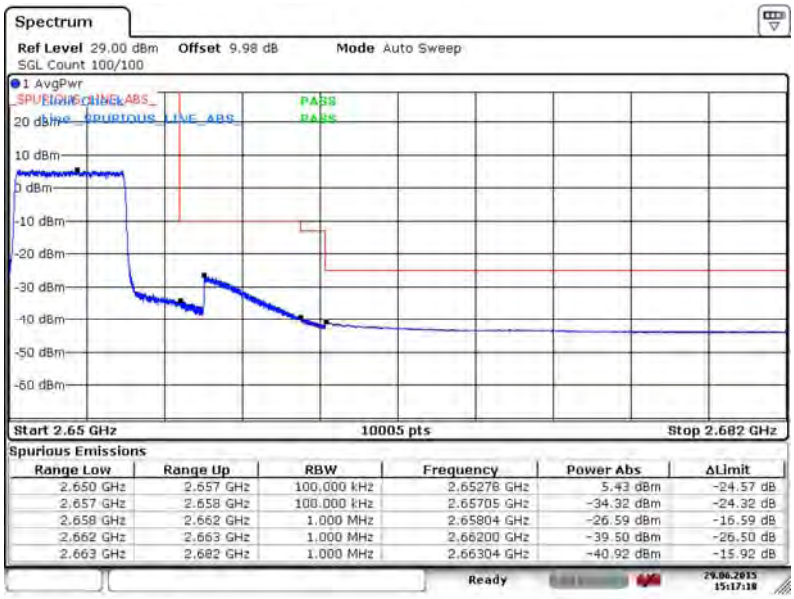
Date: 29.JUN.2015 15:07:44

Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 24



Date: 29.JUN.2015 15:16:06

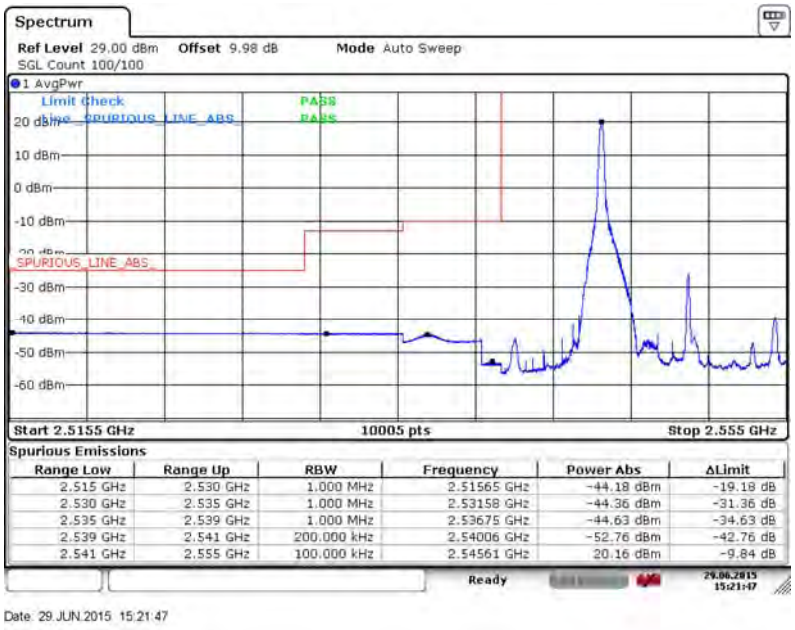
Higher Band Edge Plot for 16QAM-RB Size 25, RB Offset 0



Date: 29.JUN.2015 15:17:18

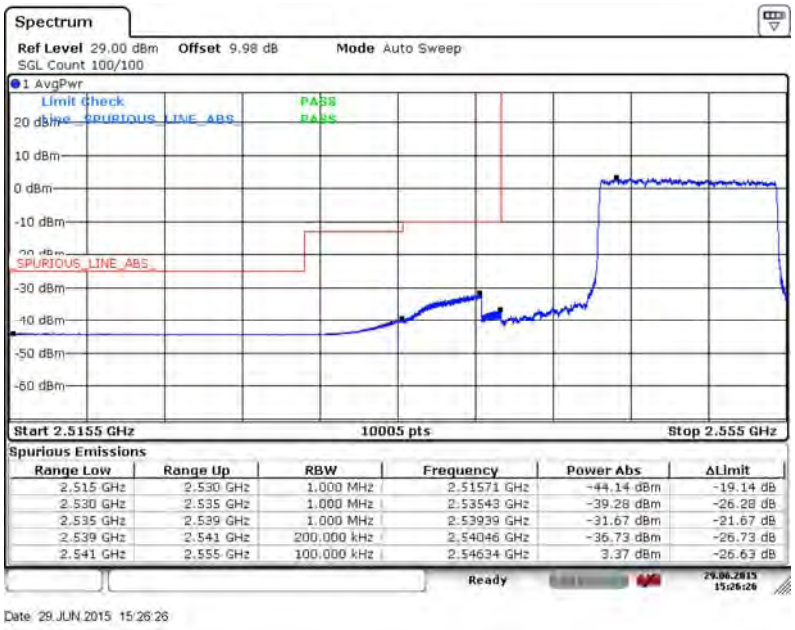
Band :	LTE Band 41	Band Width :	10MHz / QPSK

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



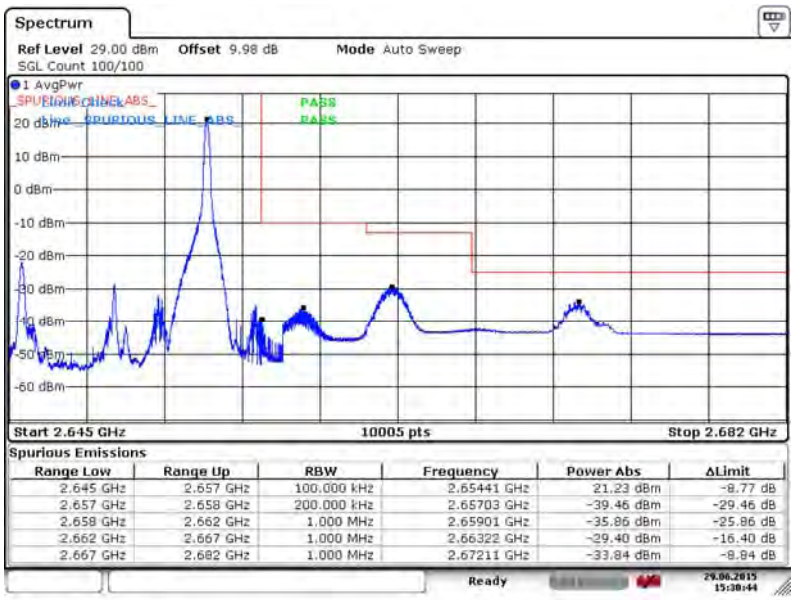
Date: 29.JUN.2015 15:21:47

Lower Band Edge Plot for QPSK-RB Size 50, RB Offset 0



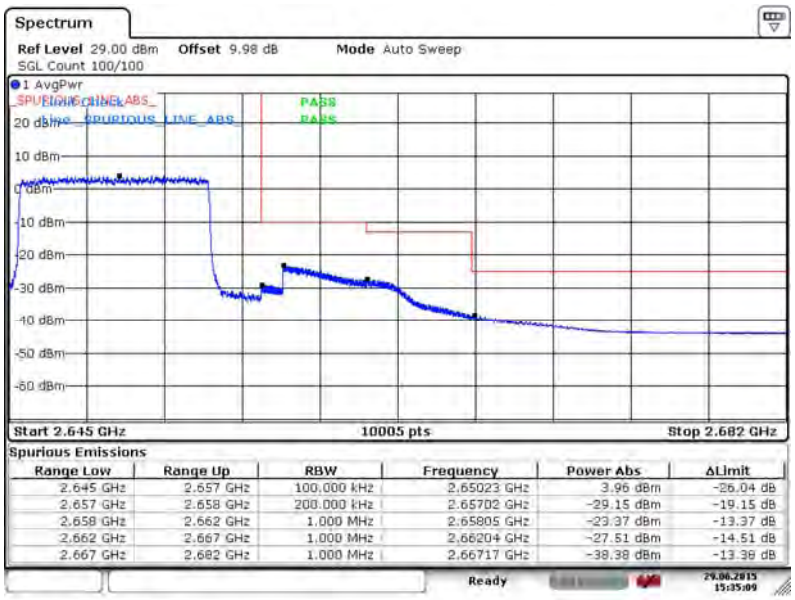
Date: 29.JUN.2015 15:26:26

Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 49



Date: 29.JUN.2015 15:30:44

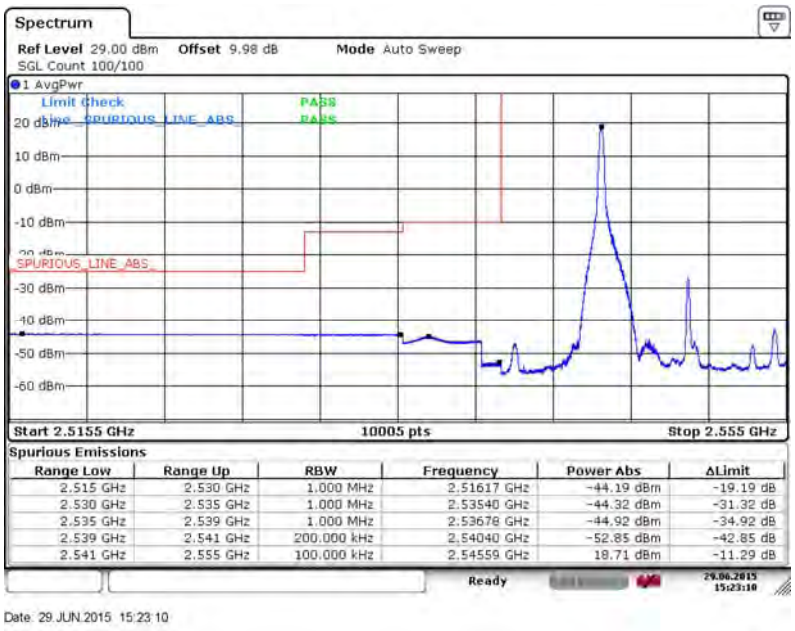
Higher Band Edge Plot for QPSK-RB Size 50, RB Offset 0



Date: 29.JUN.2015 15:35:09

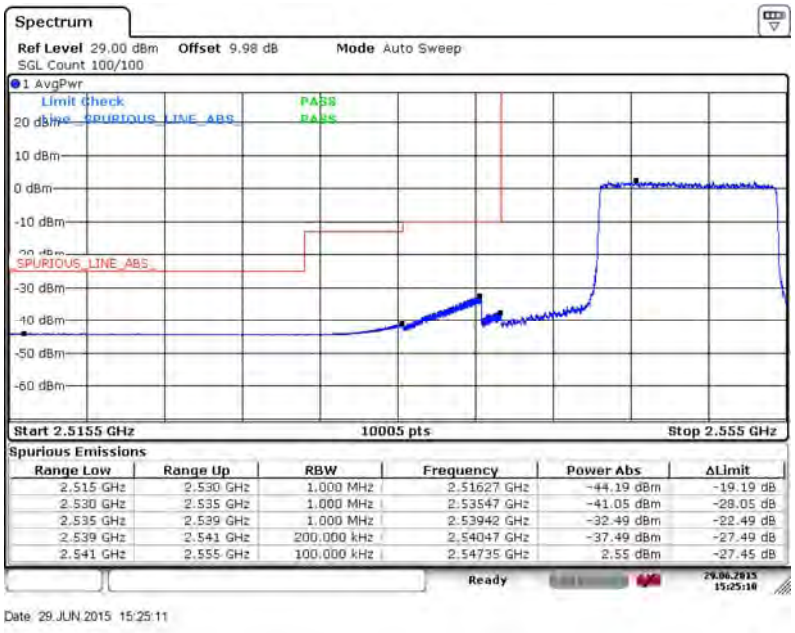
Band :	LTE Band 41	Band Width :	10MHz / 16QAM

Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



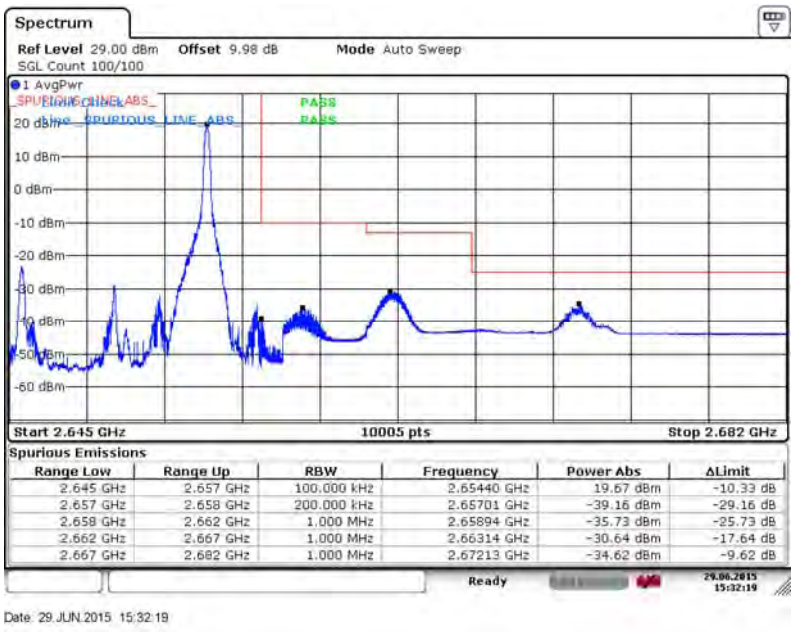
Date: 29.JUN.2015 15:23:10

Lower Band Edge Plot for 16QAM -RB Size 50, RB Offset 0



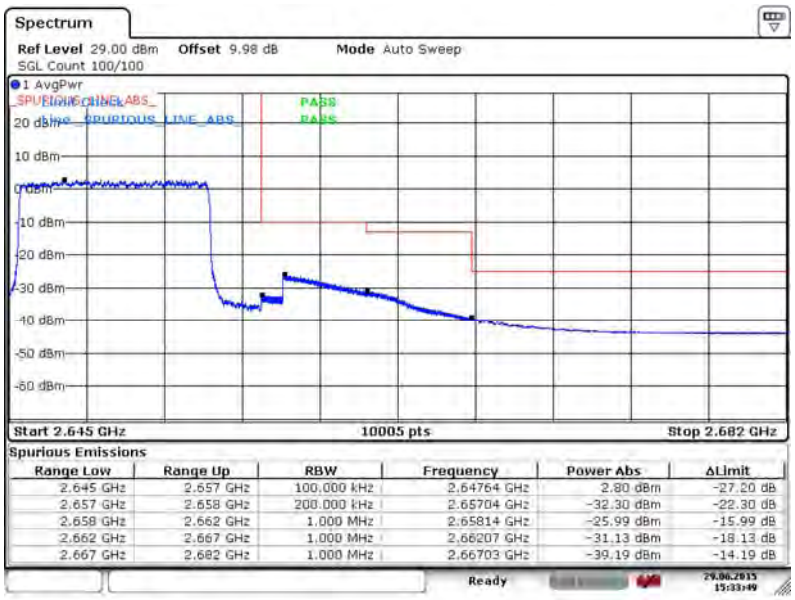
Date: 29.JUN.2015 15:25:11

Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 49



Date: 29.JUN.2015 15:32:19

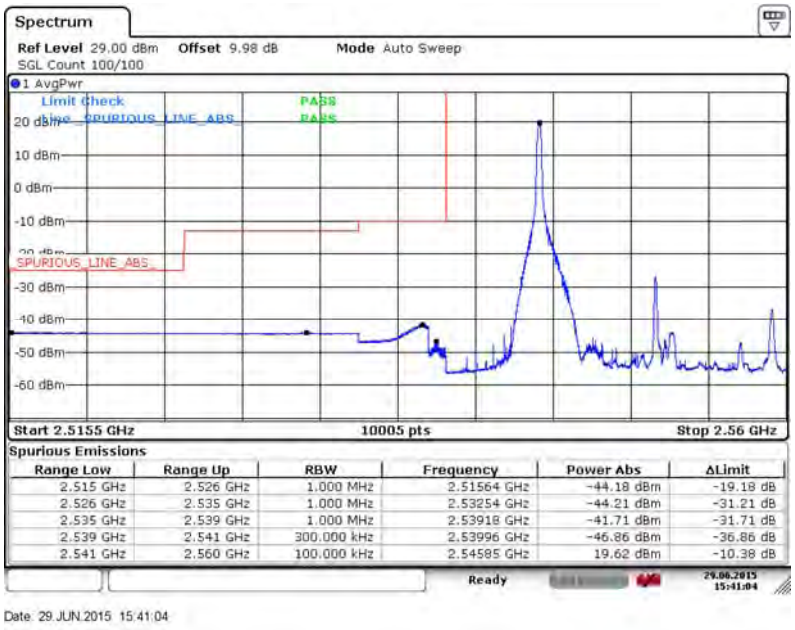
Higher Band Edge Plot for 16QAM -RB Size 50, RB Offset 0



Date: 29.JUN.2015 15:33:50

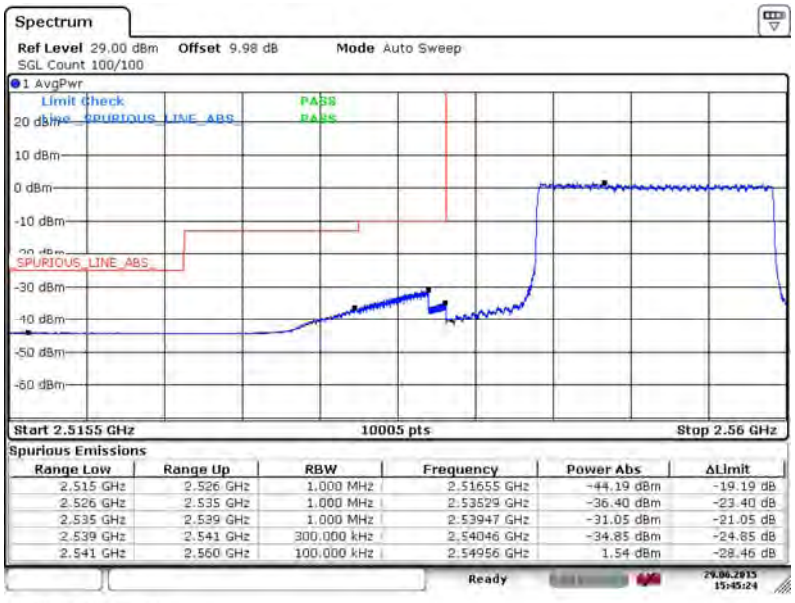
Band :	LTE Band 41	Band Width :	15MHz / QPSK

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



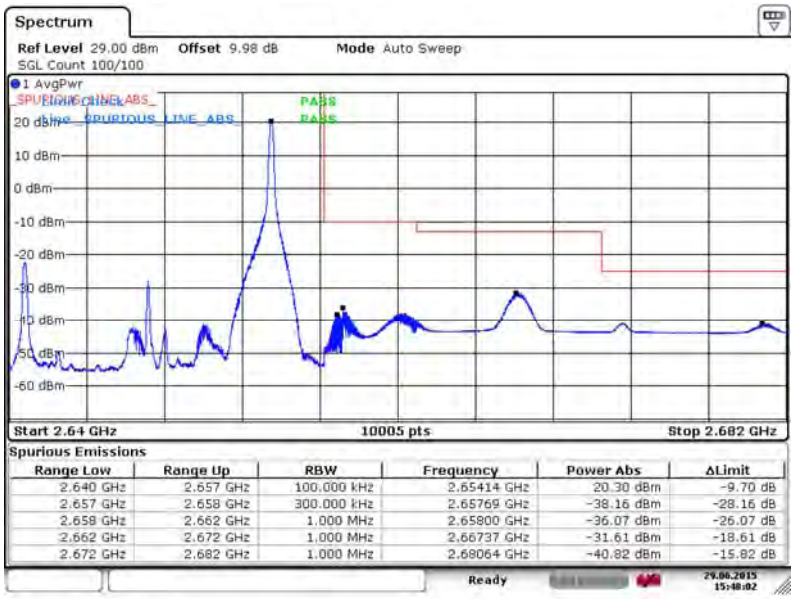
Date: 29.JUN.2015 15:41:04

Lower Band Edge Plot for QPSK-RB Size 75, RB Offset 0



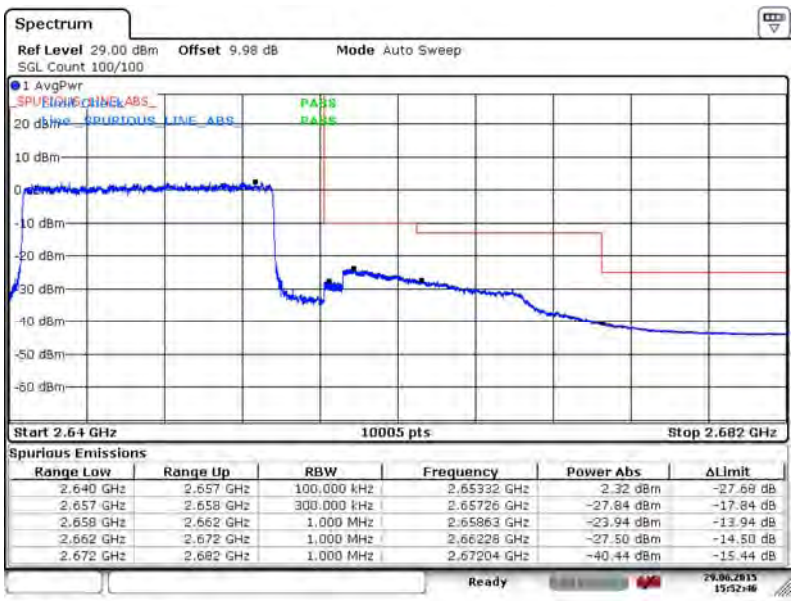
Date: 29.JUN.2015 15:45:24

Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 74



Date: 29.JUN.2015 15:48:02

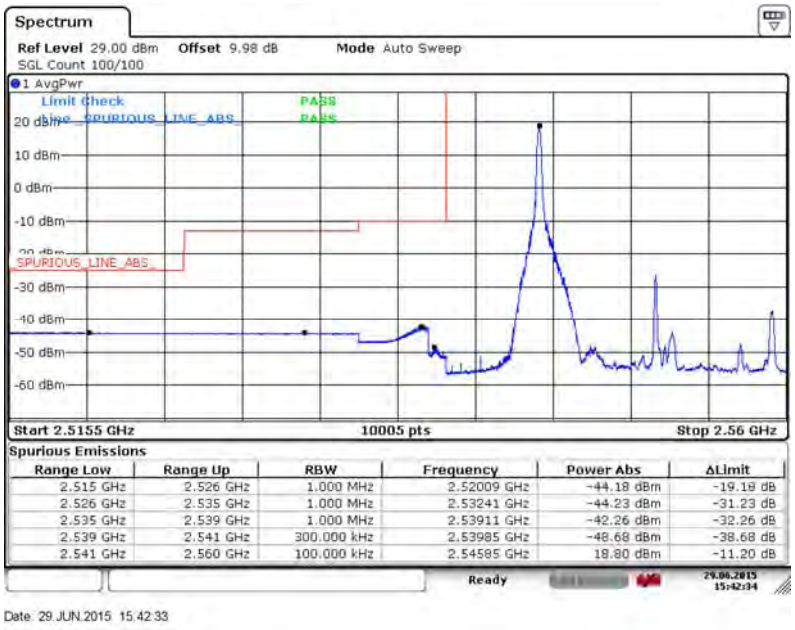
Higher Band Edge Plot for QPSK-RB Size 75, RB Offset 0



Date: 29.JUN.2015 15:52:46

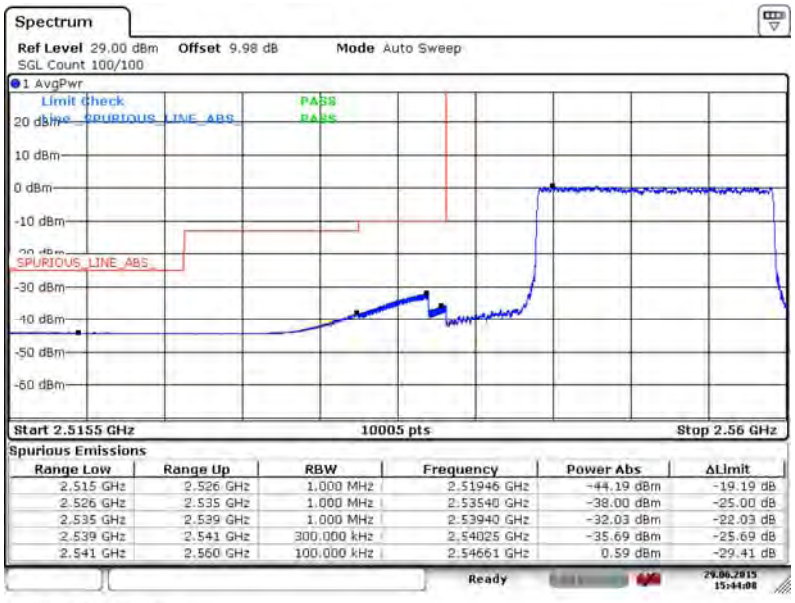
Band :	LTE Band 41	Band Width :	15MHz / 16QAM

Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



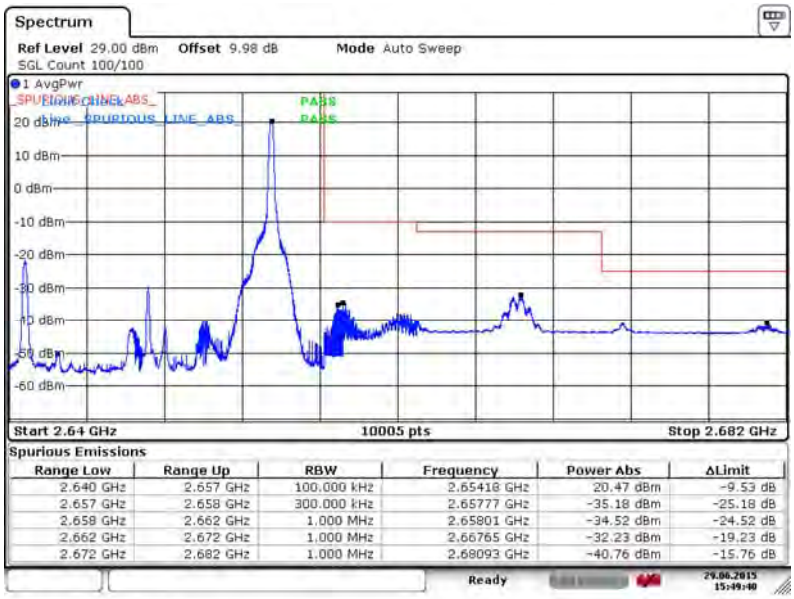
Date: 29.JUN.2015 15:42:33

Lower Band Edge Plot for 16QAM-RB Size 75, RB Offset 0



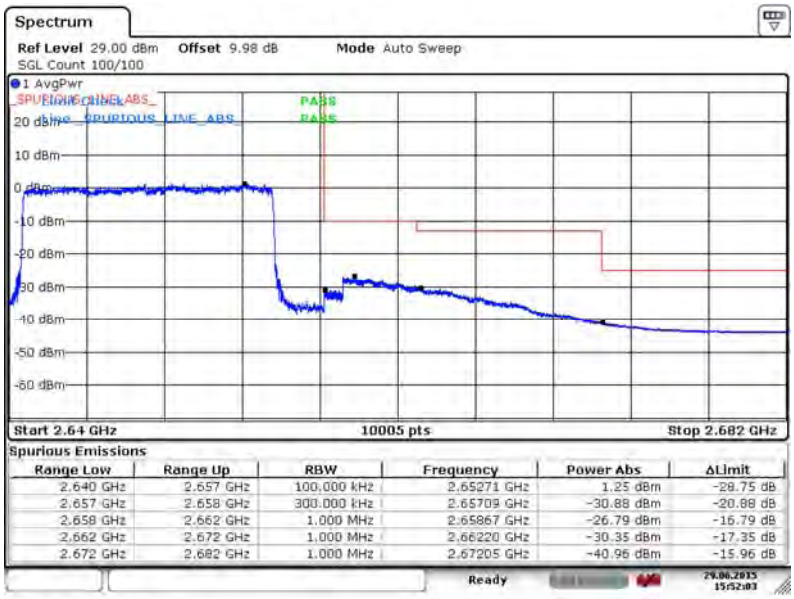
Date: 29.JUN.2015 15:44:08

Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 74



Date: 29.JUN.2015 15:49:39

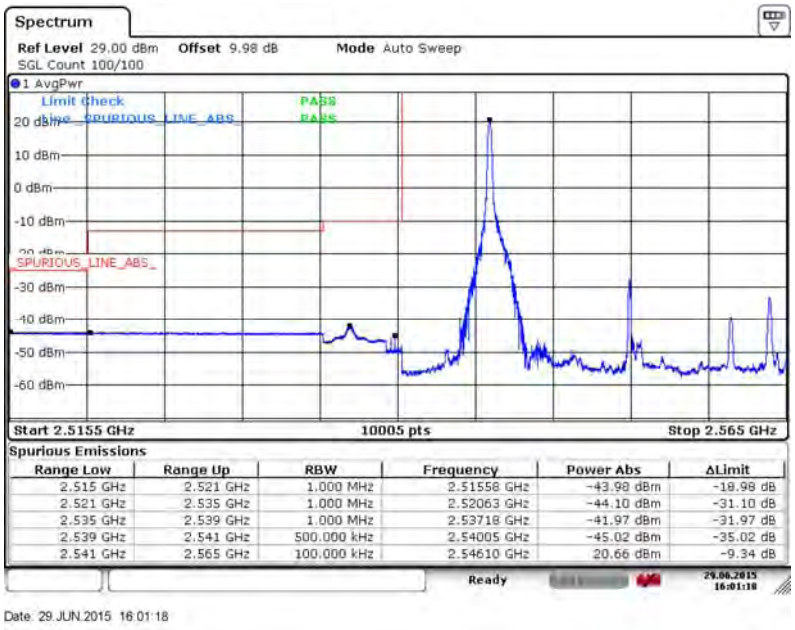
Higher Band Edge Plot for 16QAM-RB Size 75, RB Offset 0



Date: 29.JUN.2015 15:52:02

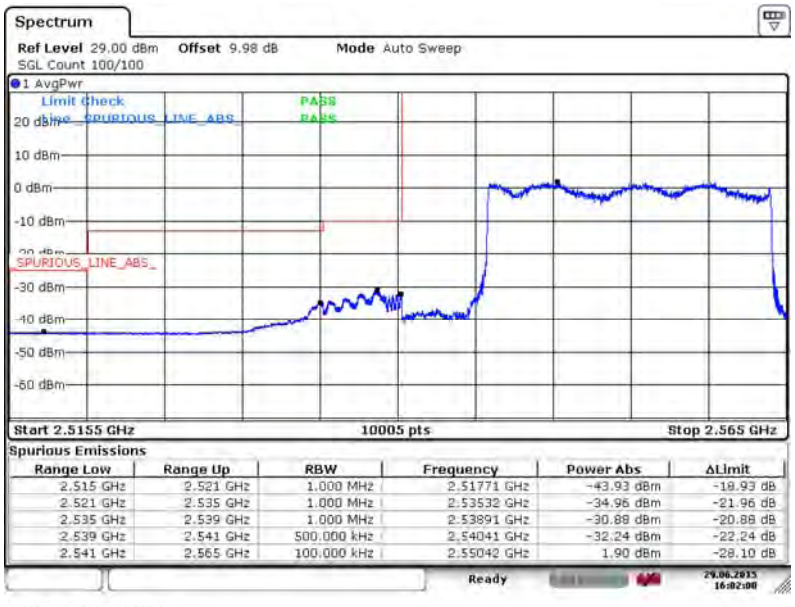
Band :	LTE Band 41	Band Width :	20MHz / QPSK

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



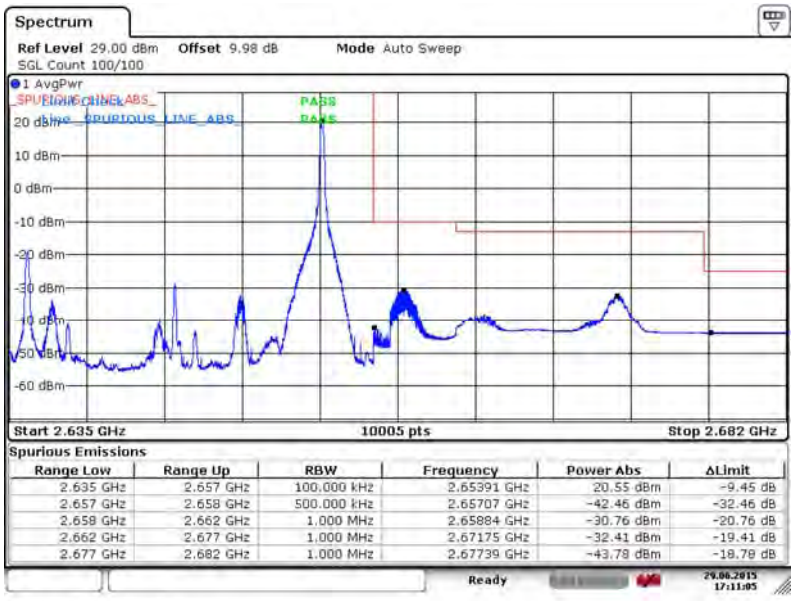
Date: 29.JUN.2015 16:01:18

Lower Band Edge Plot for QPSK-RB Size 100, RB Offset 0



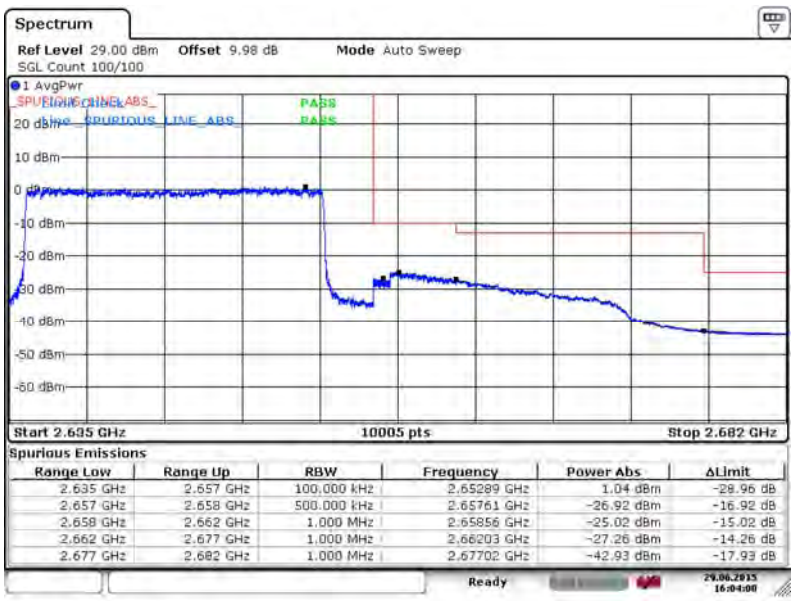
Date: 29.JUN.2015 16:02:00

Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 99



Date: 29.JUN.2015 17:11:05

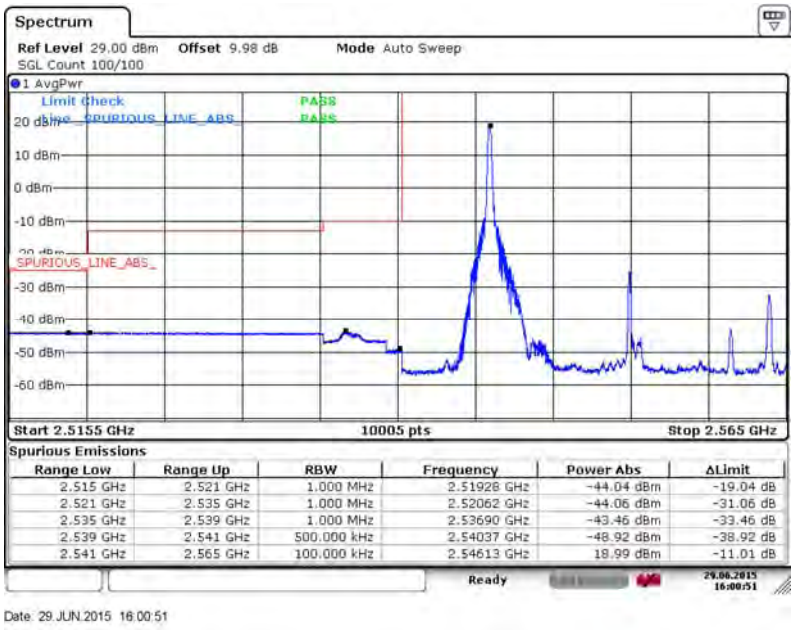
Higher Band Edge Plot for QPSK-RB Size 100, RB Offset 0



Date: 29.JUN.2015 16:04:00

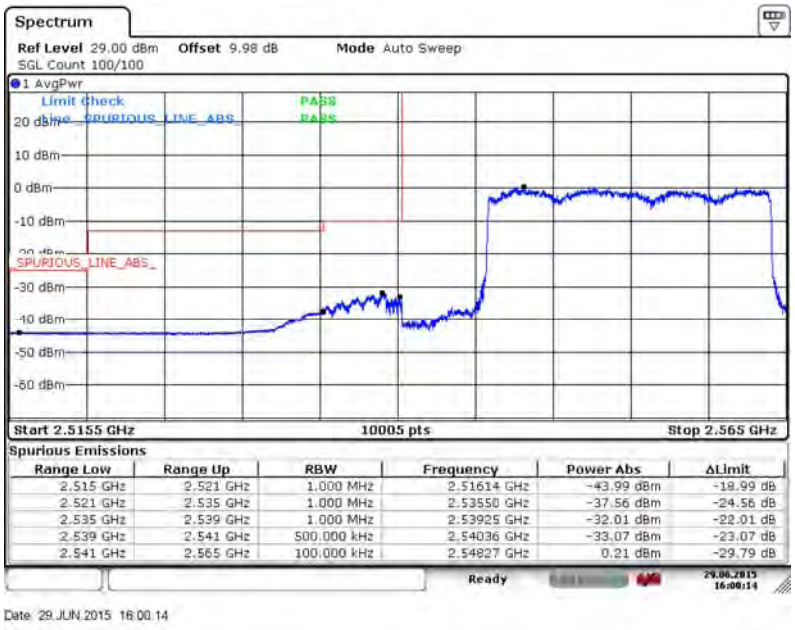
Band :	LTE Band 41	Band Width :	20MHz / 16QAM

Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



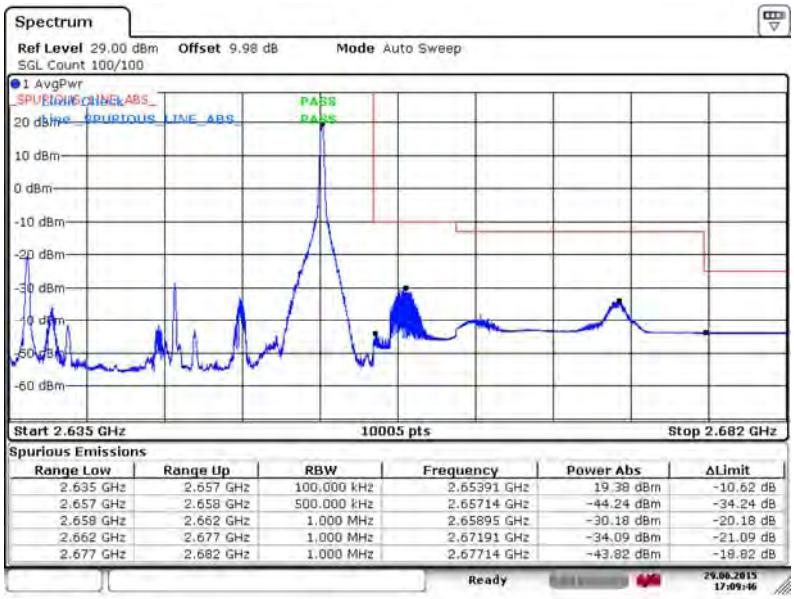
Date: 29.JUN.2015 16:00:51

Lower Band Edge Plot for 16QAM-RB Size 100, RB Offset 0



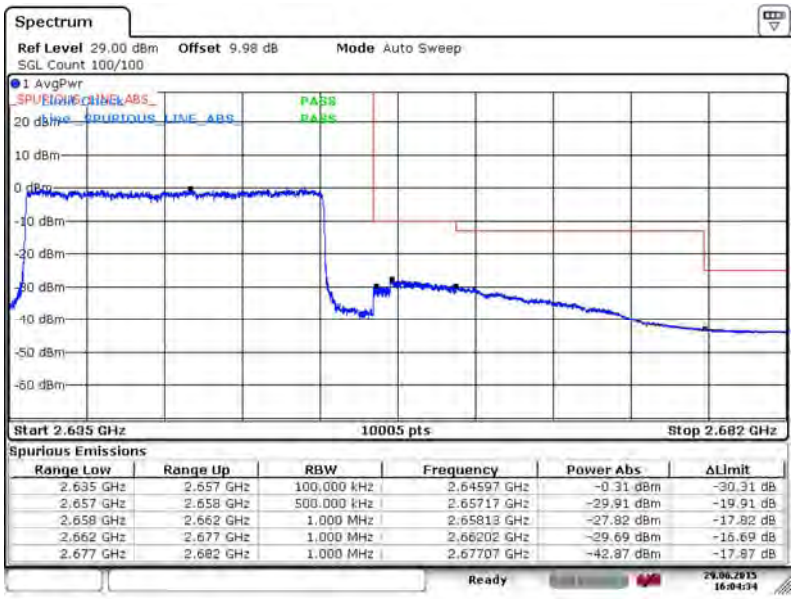
Date: 29.JUN.2015 16:00:14

Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 99



Date: 29.JUN.2015 17:09:46

Higher Band Edge Plot for 16QAM-RB Size 100, RB Offset 0



Date: 29.JUN.2015 16:04:34

3.6 Conducted Spurious Emission Measurement

3.6.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 55 + 10 log (P) dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30MHz up to a frequency including its 10^{th} harmonic.

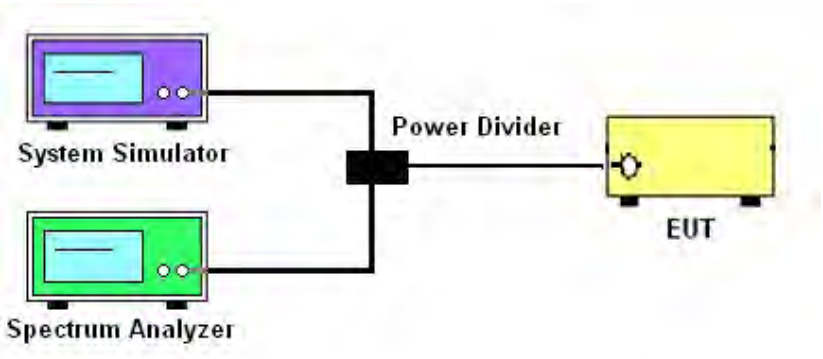
3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.6.3 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. Offset has included the duty factor . Duty factor =10 log (1/x), where x is the measured duty cycle.
8. The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)
   = P(W)- [55 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [55 + 10log(P)] (dB)
   = -25dBm.

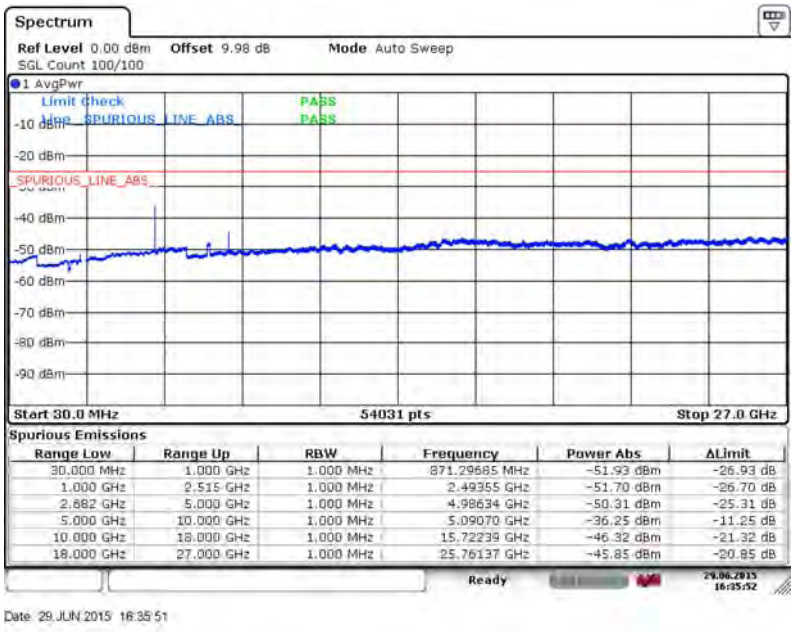
3.6.4 Test Setup



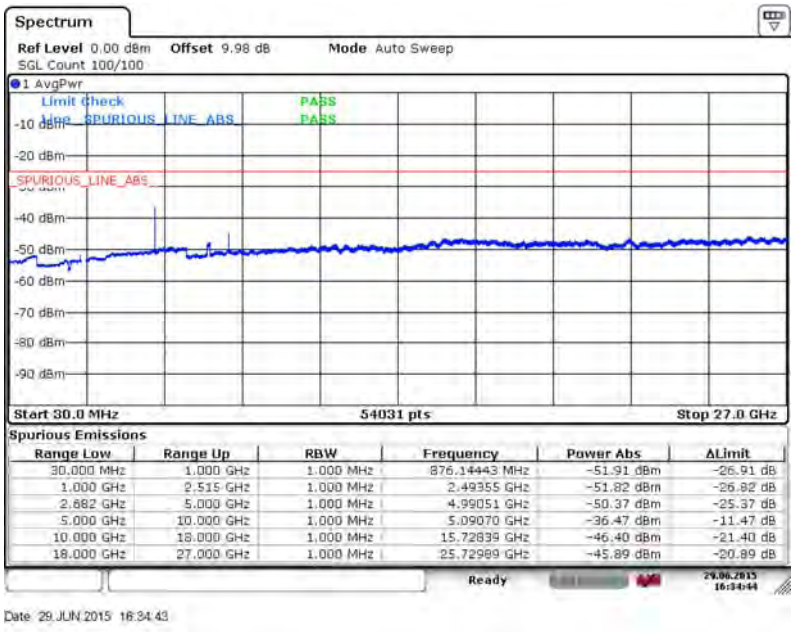
3.6.5 Test Result (Plots) of Conducted Spurious Emission

Band :	LTE Band 41	Channel :	CH40165 (Low)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 12)

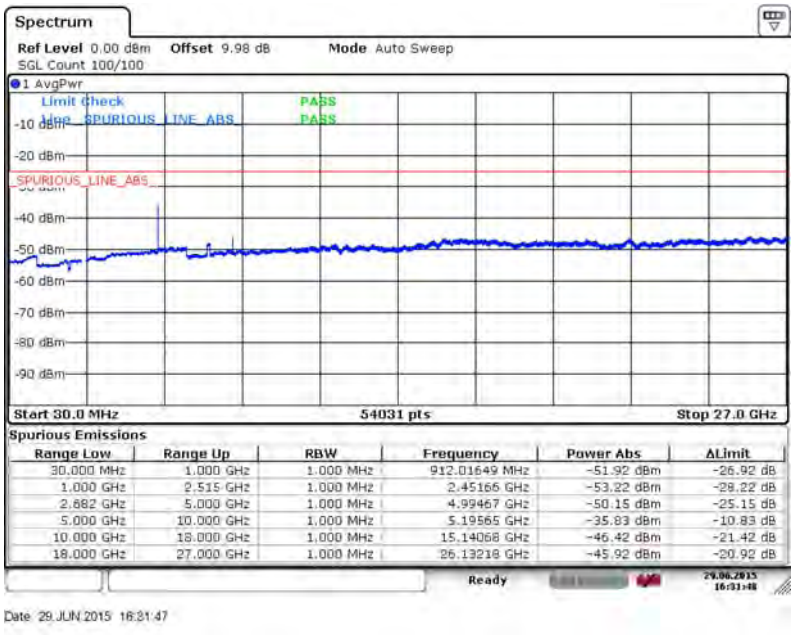


16QAM (RB Size 1, RB Offset 12)

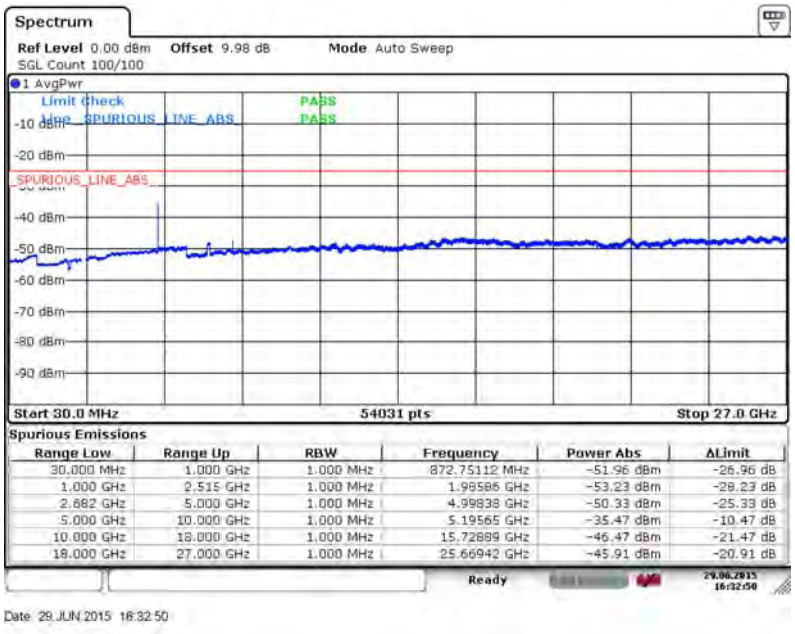


Band :	LTE Band 41	Channel :	CH40690 (Middle)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 0)

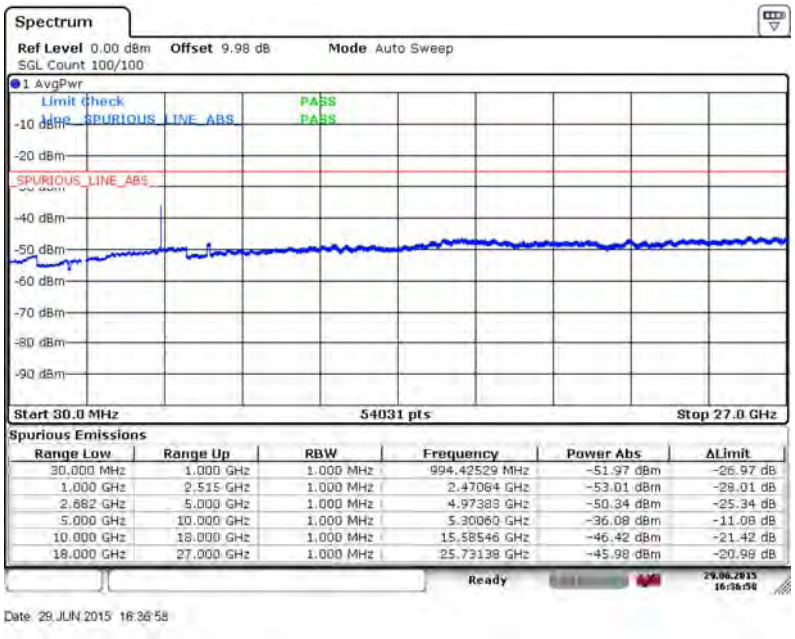


16QAM (RB Size 1, RB Offset 0)

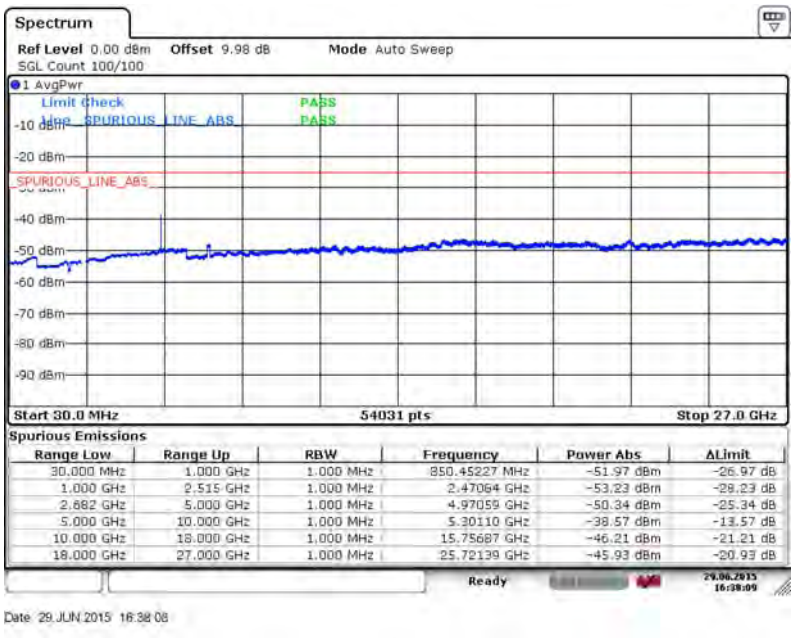


Band :	LTE Band 41	Channel :	CH41215 (High)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 12)

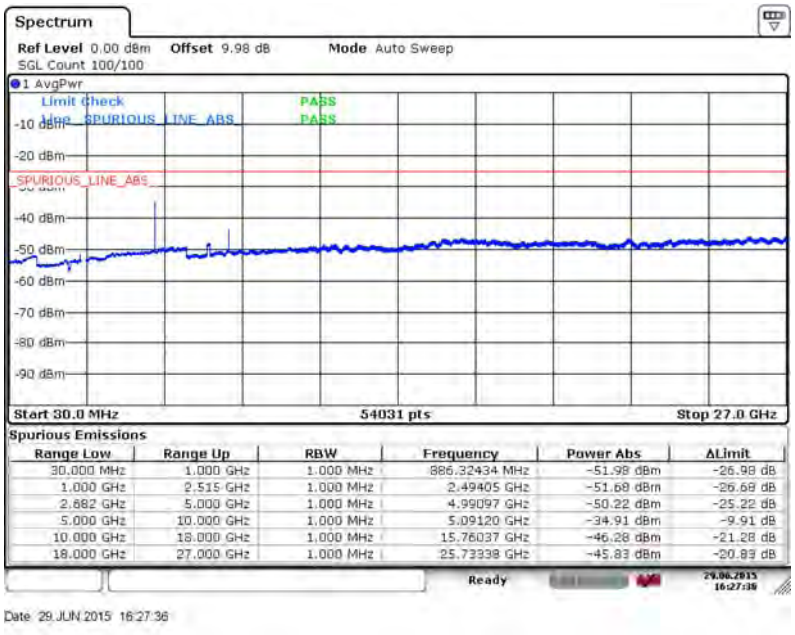


16QAM (RB Size 1, RB Offset 12)

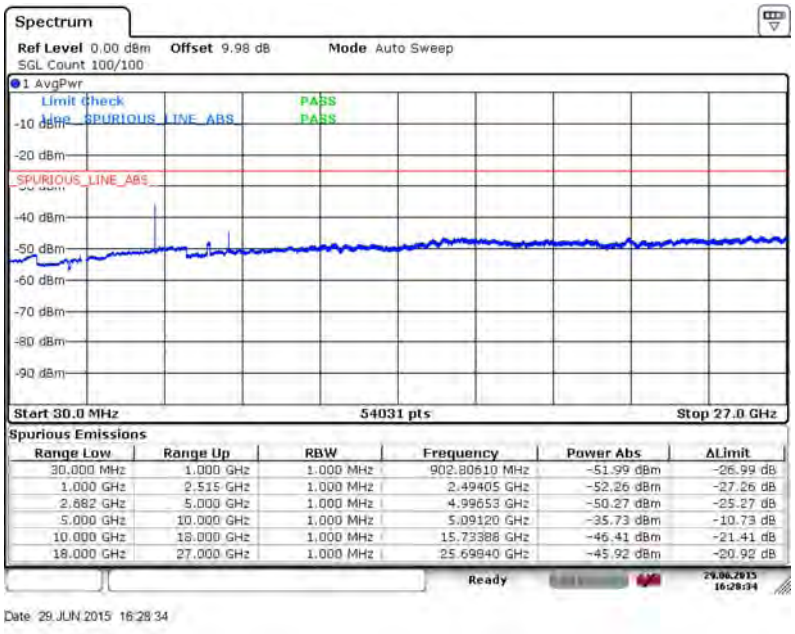


Band :	LTE Band 41	Channel :	CH40190 (Low)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 24)

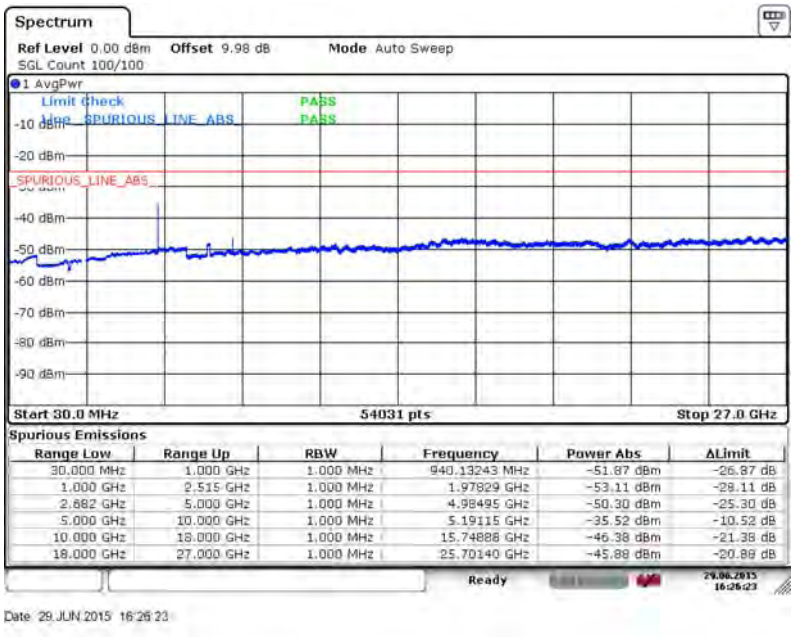


16QAM (RB Size 1, RB Offset 49)

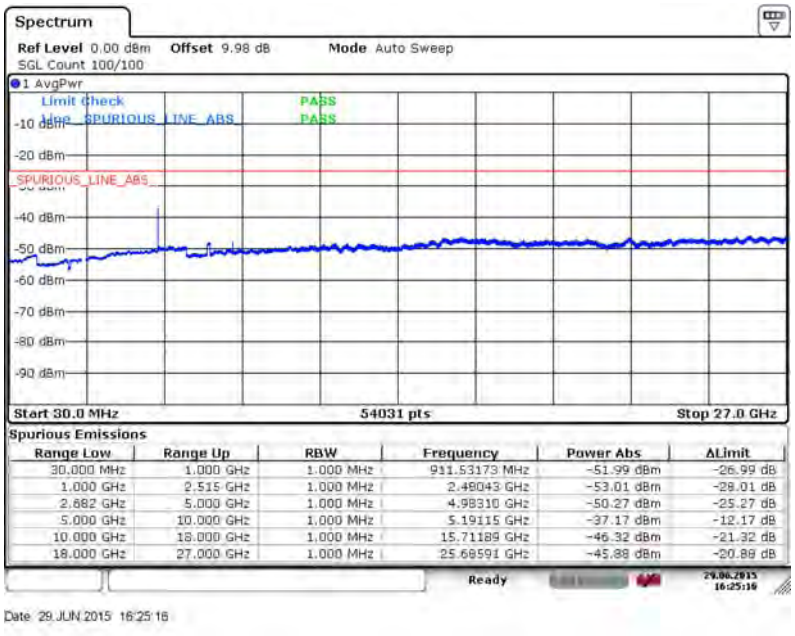


Band :	LTE Band 41	Channel :	CH40690 (Middle)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 0)

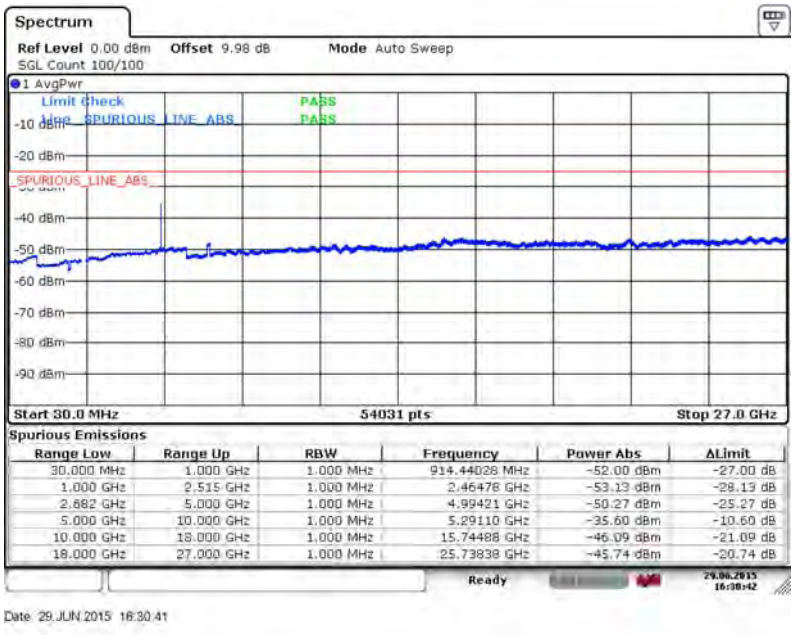


16QAM (RB Size 1, RB Offset 0)

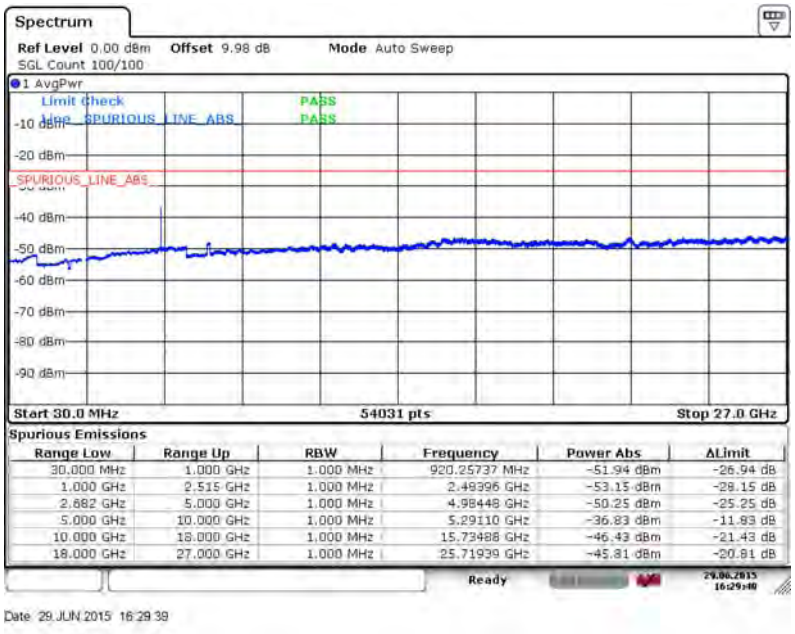


Band :	LTE Band 41	Channel :	CH41190 (High)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 24)

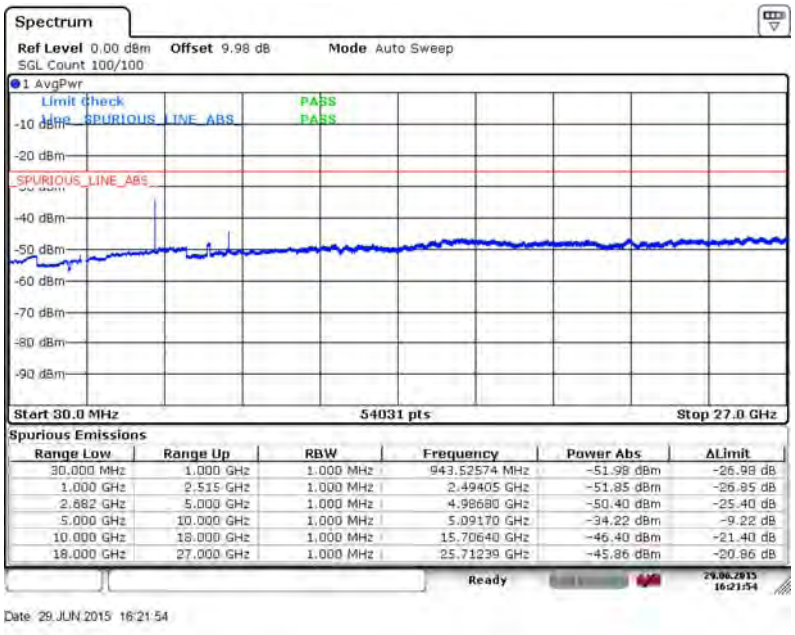


16QAM (RB Size 1, RB Offset 24)



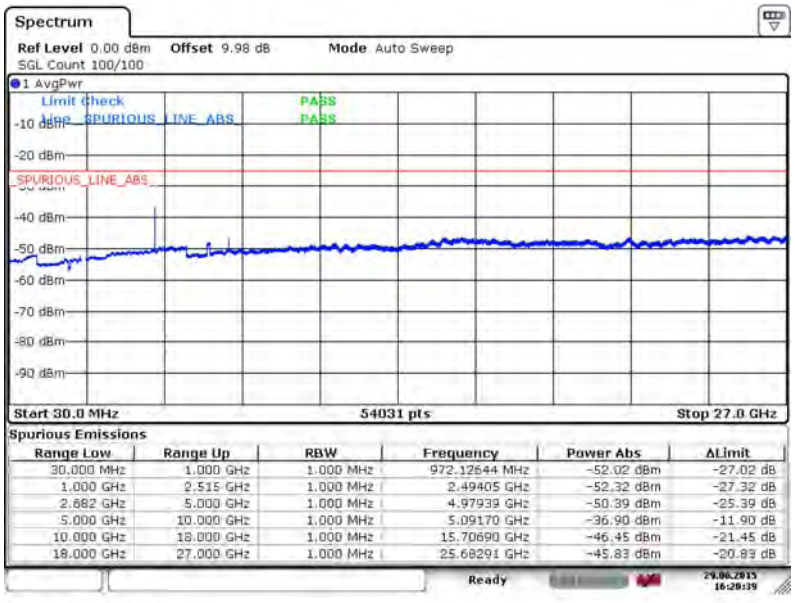
Band :	LTE Band 41	Channel :	CH40215 (Low)
Band Width :	15MHz		

QPSK (RB Size 1, RB Offset 37)



Date: 29.JUN.2015 16:21:54

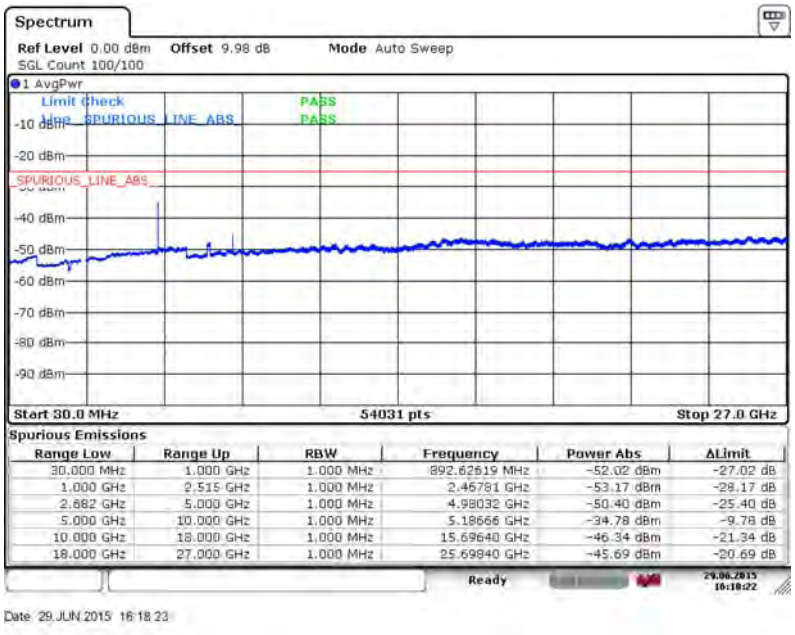
16QAM (RB Size 1, RB Offset 74)



Date: 29.JUN.2015 16:20:39

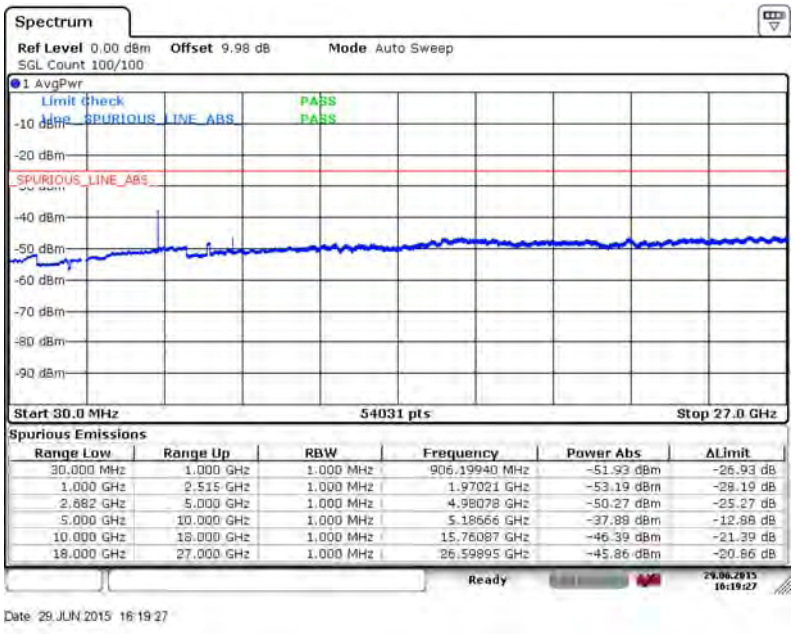
Band :	LTE Band 41	Channel :	CH40690 (Middle)
Band Width :	15MHz		

QPSK (RB Size 1, RB Offset 0)



Date: 29.JUN.2015 16:18:23

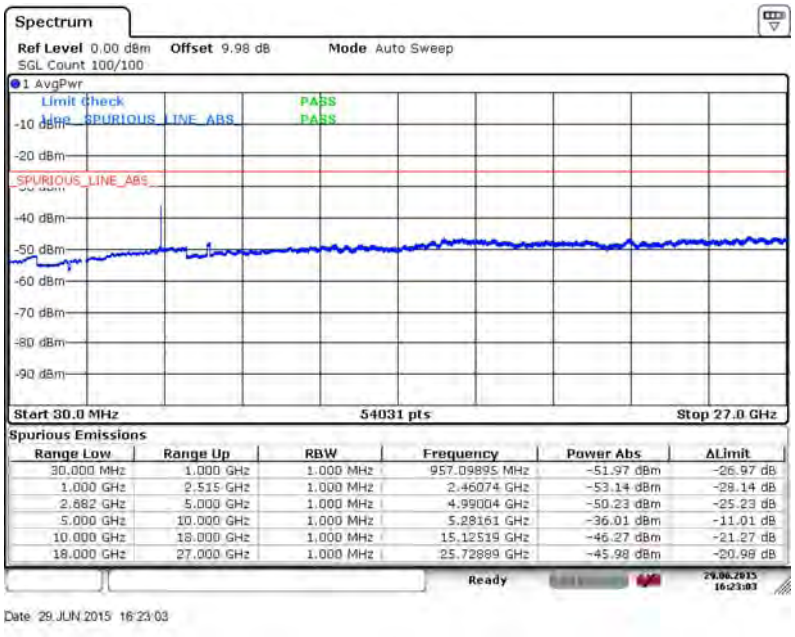
16QAM (RB Size 1, RB Offset 0)



Date: 29.JUN.2015 16:19:27

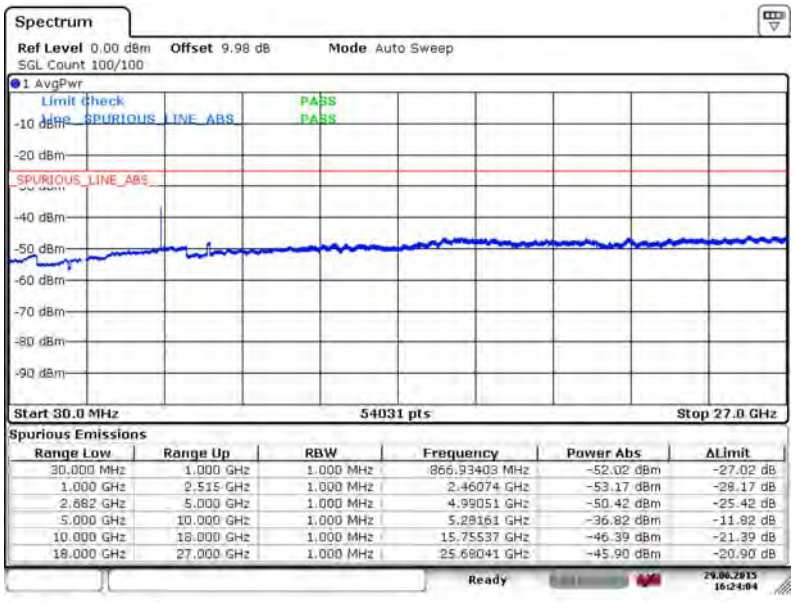
Band :	LTE Band 41	Channel :	CH41165 (High)
Band Width :	15MHz		

QPSK (RB Size 1, RB Offset 37)



Date: 29.JUN.2015 16:23:03

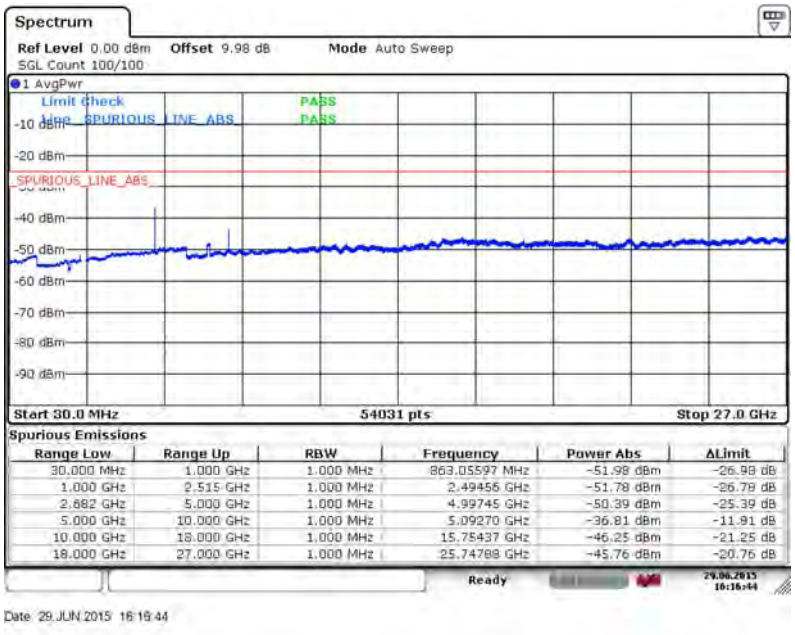
16QAM (RB Size 1, RB Offset 74)



Date: 29.JUN.2015 16:24:04

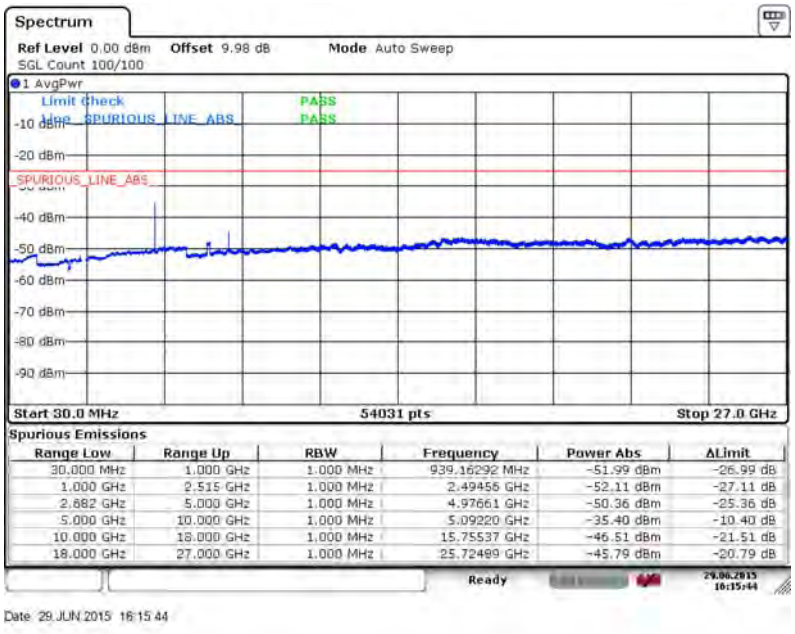
Band :	LTE Band 41	Channel :	CH40240 (Low)
Band Width :	20MHz		

QPSK (RB Size 1, RB Offset 99)



Date: 29.JUN.2015 16:16:44

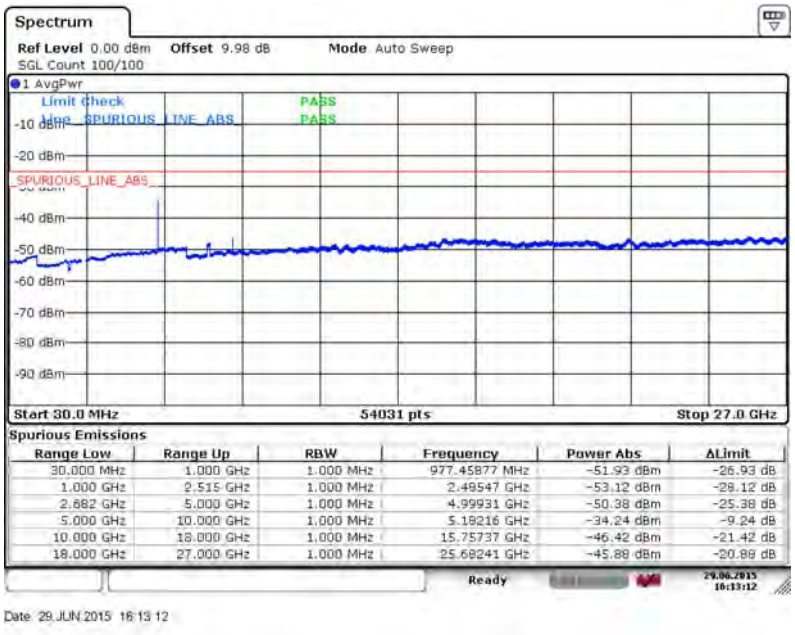
16QAM (RB Size 1, RB Offset 0)



Date: 29.JUN.2015 16:15:44

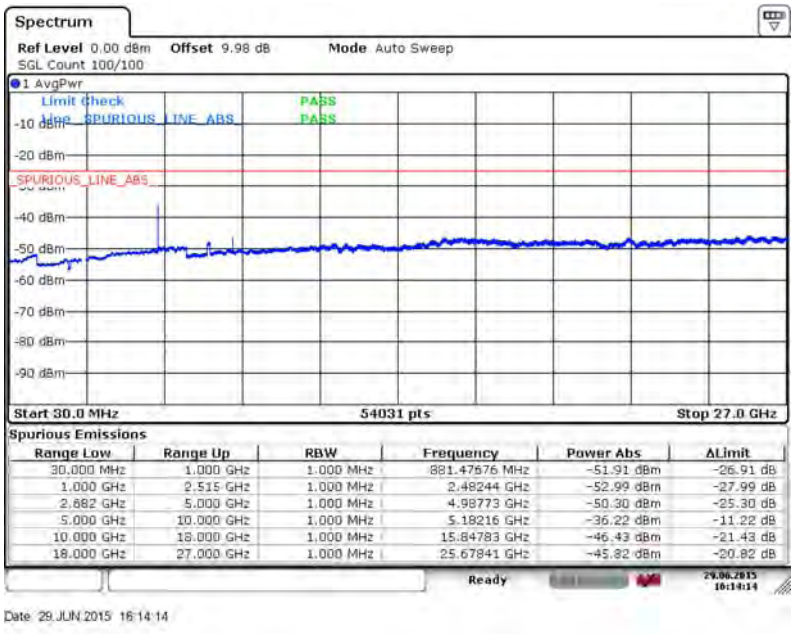
Band :	LTE Band 41	Channel :	CH40690 (Middle)
Band Width :	20MHz		

QPSK (RB Size 1, RB Offset 99)



Date: 29.JUN.2015 16:13:12

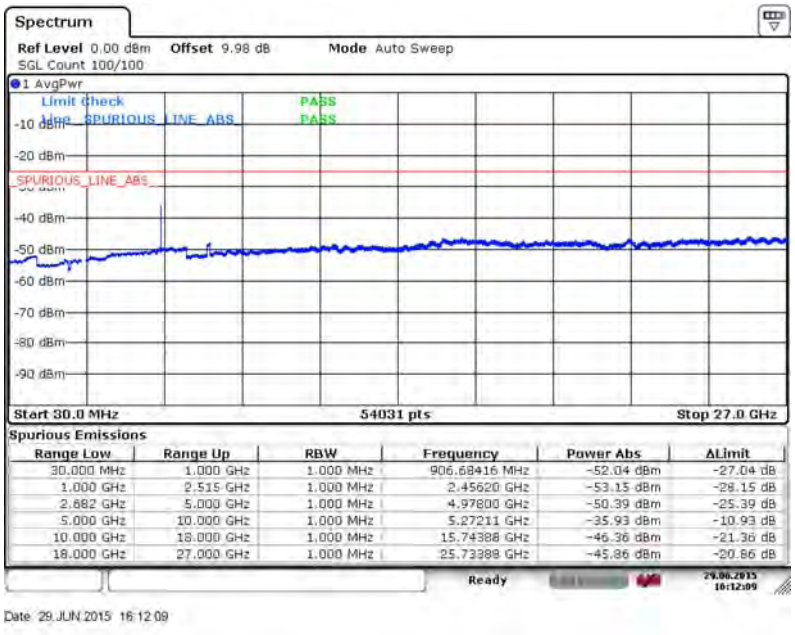
16QAM (RB Size 1, RB Offset 0)



Date: 29.JUN.2015 16:14:14

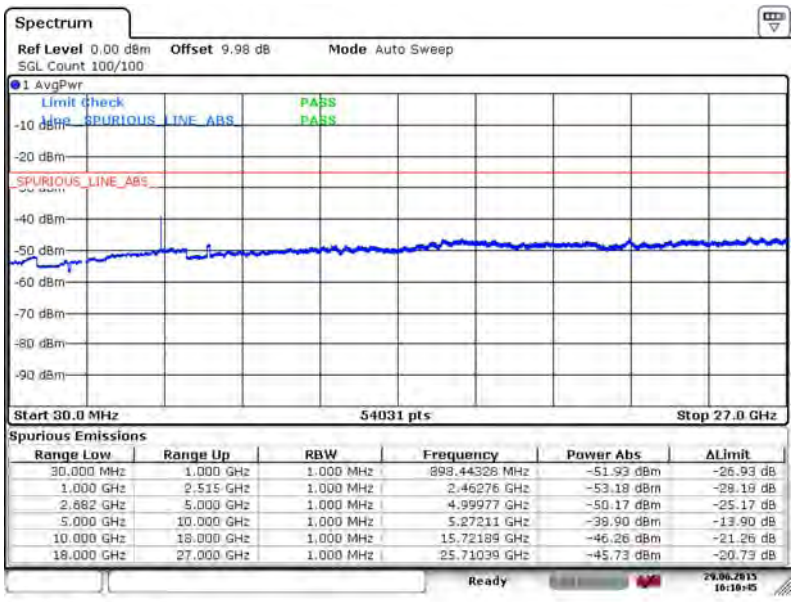
Band :	LTE Band 41	Channel :	CH41140 (High)
Band Width :	20MHz		

QPSK (RB Size 1, RB Offset 99)



Date: 29.JUN.2015 16:12:09

16QAM (RB Size 1, RB Offset 0)



Date: 29.JUN.2015 16:10:45

3.7 Radiated Spurious Emission Measurement

3.7.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 55 + 10 log (P) dB.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

3.7.2 Measuring Instruments

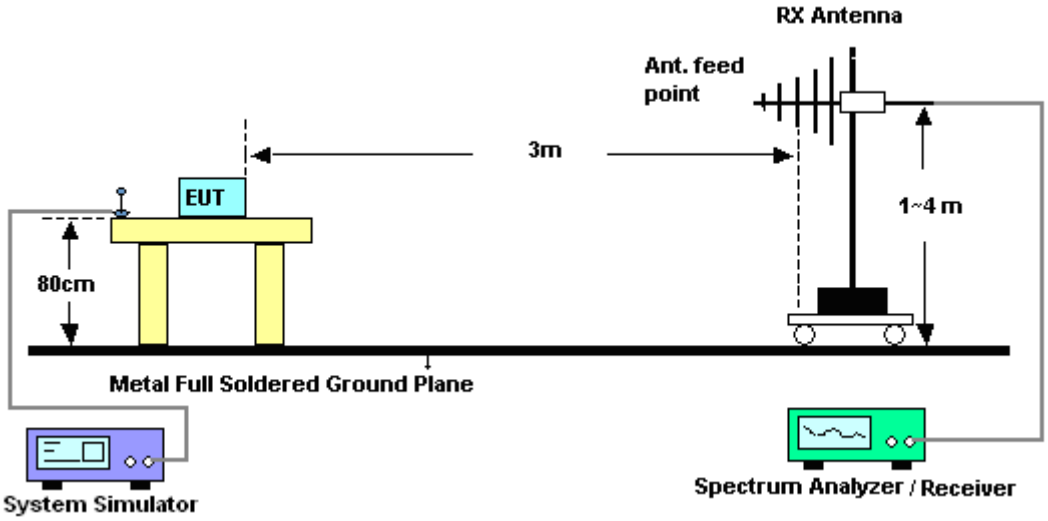
The measuring equipment is listed in the section 4 of this test report.

3.7.3 Test Procedures

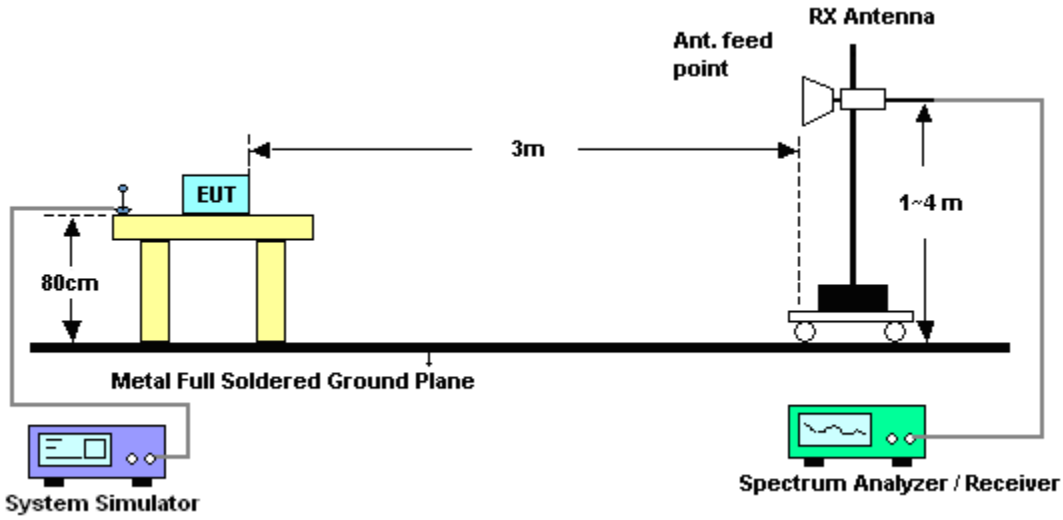
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
    The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [55 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [55 + 10log(P)] (dB)
    = -25dBm.
11. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
12. ERP (dBm) = EIRP - 2.15

3.7.4 Test Setup

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.7.5 Test Result of Field Strength of Spurious Radiated

Band :	LTE Band 41	**Temperature :**	21~22°C
Test Mode :	5MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	41~42%
Test Engineer :	Jack Wang	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5195	-36.97	-25	-11.97	-54.29	-42.75	3.49	9.27	H	Pass
7796	-35.29	-25	-10.29	-55.31	-43.08	4.28	12.07	H	Pass
10392	-40.61	-25	-15.61	-62.00	-47.91	5.1	12.40	H	Pass

Band :	LTE Band 41	**Temperature :**	21~22°C
Test Mode :	5MHz QPSK RB Size 1 Offset 0	**Relative Humidity :**	41~42%
Test Engineer :	Jack Wang	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5195	-36.91	-25	-11.91	-54.44	-42.69	3.49	9.27	V	Pass
7796	-34.51	-25	-9.51	-54.86	-42.30	4.28	12.07	V	Pass
10392	-42.12	-25	-17.12	-63.22	-49.42	5.1	12.40	V	Pass

Band :	LTE Band 41	Temperature :	21~22°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	Relative Humidity :	41~42%
Test Engineer :	Jack Wang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5189	-36.62	-25	-11.62	-53.99	-42.40	3.49	9.27	H	Pass
7787	-37.18	-25	-12.18	-56.18	-44.97	4.28	12.07	H	Pass
10384	-41.49	-25	-16.49	-62.88	-48.79	5.1	12.40	H	Pass

Band :	LTE Band 41	Temperature :	21~22°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	Relative Humidity :	41~42%
Test Engineer :	Jack Wang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5189	-36.94	-25	-11.94	-54.46	-42.72	3.49	9.27	V	Pass
7790	-34.93	-25	-9.93	-55.28	-42.72	4.28	12.07	V	Pass
10384	-41.11	-25	-16.11	-62.21	-48.41	5.1	12.40	V	Pass

Band :	LTE Band 41	Temperature :	21~22°C
Test Mode :	15MHz QPSK RB Size 1 Offset 0	Relative Humidity :	41~42%
Test Engineer :	Jack Wang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5186	-36.29	-25	-11.29	-53.71	-42.07	3.49	9.27	H	Pass
7781	-35.16	-25	-10.16	-55.24	-42.95	4.28	12.07	H	Pass
10376	-40.95	-25	-15.95	-62.34	-48.25	5.1	12.40	H	Pass

Band :	LTE Band 41	Temperature :	21~22°C
Test Mode :	15MHz QPSK RB Size 1 Offset 0	Relative Humidity :	41~42%
Test Engineer :	Jack Wang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5186	-36.82	-25	-11.82	-54.39	-42.60	3.49	9.27	V	Pass
7781	-33.05	-25	-8.05	-53.67	-40.84	4.28	12.07	V	Pass
10376	-41.90	-25	-16.90	-63	-49.20	5.1	12.40	V	Pass

Band :	LTE Band 41	Temperature :	21~22°C
Test Mode :	20MHz QPSK RB Size 1 Offset 0	Relative Humidity :	41~42%
Test Engineer :	Jack Wang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5180	-36.20	-25	-11.20	-53.63	-41.98	3.49	9.27	H	Pass
7775	-31.90	-25	-6.90	-53.71	-39.69	4.28	12.07	H	Pass
10364	-39.90	-25	-14.90	-61.29	-47.20	5.1	12.40	H	Pass

Band :	LTE Band 41	Temperature :	21~22°C
Test Mode :	20MHz QPSK RB Size 1 Offset 0	Relative Humidity :	41~42%
Test Engineer :	Jack Wang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5180	-39.10	-25	-14.10	-55.69	-44.88	3.49	9.27	V	Pass
7775	-30.58	-25	-5.58	-52.28	-38.37	4.28	12.07	V	Pass
10364	-42.26	-25	-17.26	-63.36	-49.56	5.1	12.40	V	Pass

3.8 Frequency Stability Measurement

3.8.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.

3.8.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

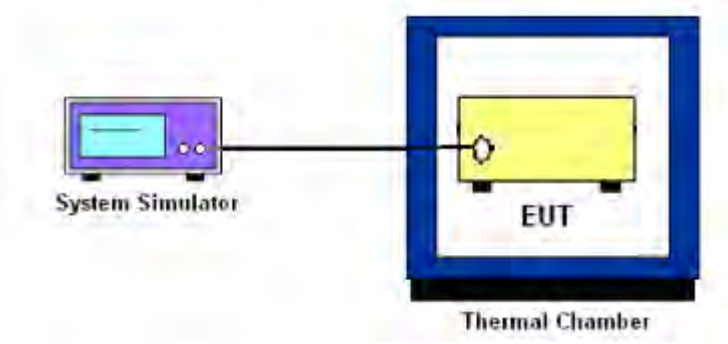
3.8.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the system simulator.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.8.4 Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at 25±5° C and connected with the system simulator.
2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

3.8.5 Test Setup



3.8.6 Test Result of Temperature Variation (FCC)

Band :	LTE Band 41 (QPSK)	Limit (ppm) :	within authorized band

Temperature (°C)	BW 10MHz	Result
	Deviation (ppm)	
50	0.0192	PASS
40	0.0215	
30	0.0146	
20(Ref.)	0.0000	
10	0.0031	
0	0.0050	
-10	0.0077	
-20	0.0142	
-30	0.0227	

Note: The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

3.8.7 Test Result of Voltage Variation (FCC)

Band	Bandwidth	Voltage (Volt)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 41 (QPSK)	10M	4.35	0.0100	Note 3	PASS
		Normal	0.0115		
		3.6	0.0112		

Remark:

1. Normal Voltage = 3.8V.
2. The manufacturer declared that the EUT could work properly between voltage 3.6V ~ 4.35V.
3. The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV30	101338	9kHz~30GHz	May 04, 2015	Jun. 22, 2015~ Jun. 29, 2015	May 03, 2016	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Oct. 25, 2014	Jun. 22, 2015~ Jun. 29, 2015	Oct. 24, 2015	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz; Max 30dBm	Sep. 29, 2014	Jul. 05, 2015	Sep. 28, 2015	Radiation (03CH02-KS)
Spectrum Analyzer	R&S	FSV40	101040	10kHz~40GHz;Max 30dBm	Sep. 25, 2014	Jul. 05, 2015	Sep. 24, 2015	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6112D	37879	30MHz~2GHz	Sep. 13, 2014	Jul. 05, 2015	Sep. 12, 2015	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Nov. 08, 2014	Jul. 05, 2015	Nov. 07, 2015	Radiation (03CH02-KS)
Active Horn Antenna	com-power	AHA-118	701030	1GHz~18GHz	Nov. 08, 2014	Jul. 05, 2015	Nov. 07, 2015	Radiation (03CH02-KS)
SHF-EHF Horn	com-power	AH-840	101070	18GHz~40GHz	Sep. 04, 2014	Jul. 05, 2015	Sep. 03, 2015	Radiation (03CH02-KS)
Amplifier	com-power	PA-103A	161069	1kHz~1000MHz / 32 dB	May 04, 2015	Jul. 05, 2015	May 03, 2016	Radiation (03CH02-KS)
Amplifier	Agilent	8449B	3008A02384	1GHz~26.5GHz Gain 30dB	Oct. 28, 2014	Jul. 05, 2015	Oct. 27, 2015	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	6160100024 73	N/A	NCR	Jul. 05, 2015	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Jul. 05, 2015	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Jul. 05, 2015	NCR	Radiation (03CH02-KS)

5 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.1 dB**