



FCC RF Test Report

APPLICANT : ZTE CORPORATION
EQUIPMENT : Vodafone Mobile Wi-Fi
BRAND NAME : ZTE
MODEL NAME : R212
FCC ID : Q78-R212
STANDARD : 47 CFR Part 2, 27(M)
CLASSIFICATION : PCS Licensed Transmitter (PCB)

The product was received on Jan. 23, 2013 and completely tested on Apr. 24, 2013. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI / TIA / EIA-603-C-2004 and shown 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:

Jones Tsai / Manager



SPORTON INTERNATIONAL (KUNSHAN) INC.
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SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	§2.1033 §2.1046 §27.50	RSS-199 4.4	Conducted Output Power	NA	PASS	-
3.1	§27.50	RSS-199 4.4	Equivalent Isotropic Radiated Power	< 2 Watt	PASS	-
3.2	§27.50	-	Peak-to-Average Ratio	<13 dB	PASS	-
3.3	§2.1049 §27.53	RSS-199 4.5	Occupied Bandwidth	NA	PASS	-
3.4	§2.1049 §27.53	RSS-199 4.5	Conducted Band Edge	< 5.5MHz: -13 dBm ≥5.5MHz: -25 dBm	PASS	-
3.4	§2.1049 §27.53	RSS-199 4.5	Conducted Spurious Emission	< 5.5MHz: -13 dBm ≥5.5MHz: -25 dBm	PASS	-
3.5	§2.1053 §27.53	RSS-199 4.5	Field Strength of Spurious Radiation	-25 dBm	PASS	Under limit 15.81 dB at 10108.000 MHz
3.6	§2.1055 §27.54	RSS-199 4.3	Frequency Stability Temperature & Voltage	< 2.5 ppm	PASS	-

1 General Description

1.1 Applicant

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

1.2 Manufacturer

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Vodafone Mobile Wi-Fi
Brand Name	ZTE
Model Name	R212
FCC ID	Q78-R212
EUT supports Radios application	GPRS/EGPRS/WCDMA/HSPA/HSPA+(Downlink Only)/DC-HSDPA/LTE/WLAN 11abgn
HW Version	T3
SW Version	BD_R212V2.0
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.

Product Specification subjective to this standard	
Tx Frequency	2506.5 MHz ~ 2534.5 MHz, 2562.5 MHz ~ 2567.5 MHz
Rx Frequency	2626.5 MHz ~ 2654.5 MHz, 2666.5 MHz ~ 2697.5 MHz
Bandwidth	5MHz/10MHz/15MHz/20MHz
Maximum Output Power to Antenna	21.57 dBm
Antenna Type	Monopole Antenna
Type of Modulation	QPSK / 16QAM

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 Maximum EIRP Power, Frequency Tolerance, and Emission Designator

FCC Rule	System	Type of Modulation	BW	Maximum EIRP (W)	Frequency Tolerance (% , Hz, ppm)	Emission Designator
Part 27M	LTE Band 7	QPSK	5MHz	0.2636 W	0.005	4M50G7D
Part 27M	LTE Band 7	16QAM	5MHz	0.2017 W	0.007	4M52D7W
Part 27M	LTE Band 7	QPSK	10MHz	0.2238 W	0.004	9M16G7D
Part 27M	LTE Band 7	16QAM	10MHz	0.1746 W	0.004	9M12D7W
Part 27M	LTE Band 7	QPSK	15MHz	0.2165 W	0.020	13M5G7D
Part 27M	LTE Band 7	16QAM	15MHz	0.1552 W	0.016	13M6D7W
Part 27M	LTE Band 7	QPSK	20MHz	0.2040 W	0.008	17M9G7D
Part 27M	LTE Band 7	16QAM	20MHz	0.1594 W	0.005	17M9D7W

1.5 Testing Site

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.		
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	TH01-KS	03CH01-KS	149928/4086E-1

1.6 Applied 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 v01

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

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

Frequency range investigated for radiated emission is: 30 MHz to 26000 MHz.

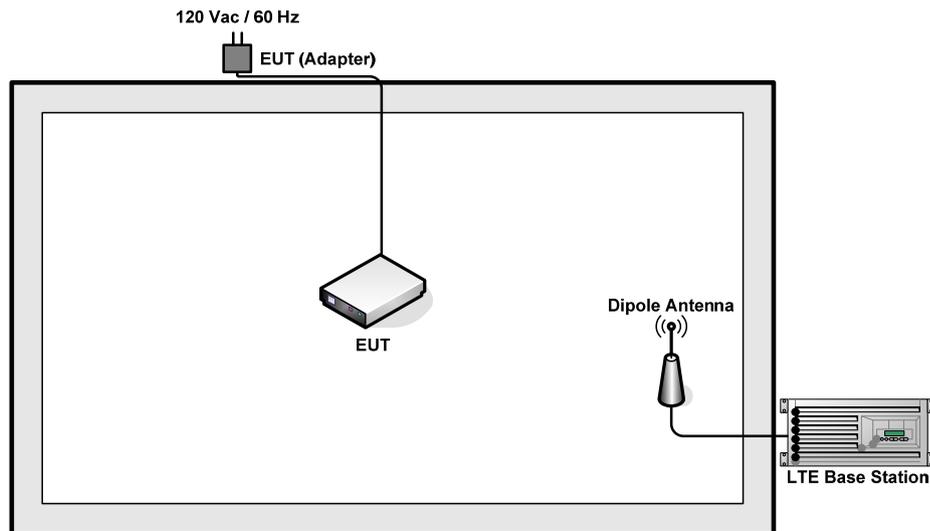
Test Modes			
Band	Radiated TCs	Conducted TCs	
LTE Band 7	BW 5MHz	<ul style="list-style-type: none"> ■ LTE (RB Size 1, RB Offset 0) QPSK Link 	<ul style="list-style-type: none"> ■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 12) Link ■ LTE (RB Size 1, RB Offset 24) Link ■ LTE (RB Size 12, RB Offset 0) Link ■ LTE (RB Size 12, RB Offset 6) Link ■ LTE (RB Size 12, RB Offset 11) Link ■ LTE (RB Size 25, RB Offset 0) Link
	BW 10MHz	<ul style="list-style-type: none"> ■ LTE (RB Size 1, RB Offset 0) QPSK Link 	<ul style="list-style-type: none"> ■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 24) Link ■ LTE (RB Size 1, RB Offset 49) Link ■ LTE (RB Size 25, RB Offset 0) Link ■ LTE (RB Size 25, RB Offset 12) Link ■ LTE (RB Size 25, RB Offset 24) Link ■ LTE (RB Size 50, RB Offset 0) Link
	BW 15MHz	<ul style="list-style-type: none"> ■ LTE (RB Size 1, RB Offset 0) QPSK Link 	<ul style="list-style-type: none"> ■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 37) Link ■ LTE (RB Size 1, RB Offset 74) Link ■ LTE (RB Size 36, RB Offset 0) Link ■ LTE (RB Size 36, RB Offset 18) Link ■ LTE (RB Size 36, RB Offset 37) Link ■ LTE (RB Size 75, RB Offset 0) Link
	BW 20MHz	<ul style="list-style-type: none"> ■ LTE (RB Size 1, RB Offset 0) QPSK Link 	<ul style="list-style-type: none"> ■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 49) Link ■ LTE (RB Size 1, RB Offset 99) Link ■ LTE (RB Size 50, RB Offset 0) Link ■ LTE (RB Size 50, RB Offset 24) Link ■ LTE (RB Size 50, RB Offset 49) Link ■ LTE (RB Size 100, RB Offset 0) Link

Note:

1. For conducted test, both two Modulations (QPSK and 16QAM) are tested. For RSE, only the maximum RF output power level is chosen.

- From conducted spurious emission measurement, the modulation related spurious emission out of the band is not identified. Since MPR is implemented, 1RB-QPSK results in highest RF power, therefore it's chosen for RSE measurement.

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	GWINSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and 10dB attenuator 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 and 10dB attenuator factor.

Offset = RF cable loss + attenuator factor.

Following table shows an offset computation example with cable loss 5.2 dB.

Example :

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\ &= 5.2 + 10 = 15.2 \text{ (dB)} \end{aligned}$$

3 Test Result

3.1 Maximum Output Power and Effective Isotropic Radiated Power Measurement

3.1.1 Limit

Effective 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 v01. Mobile and portable (hand-held) stations operating in the BRS and EBS band are limited to a peak EIRP of 2 watts.

3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

For Conducted Power Measurement:

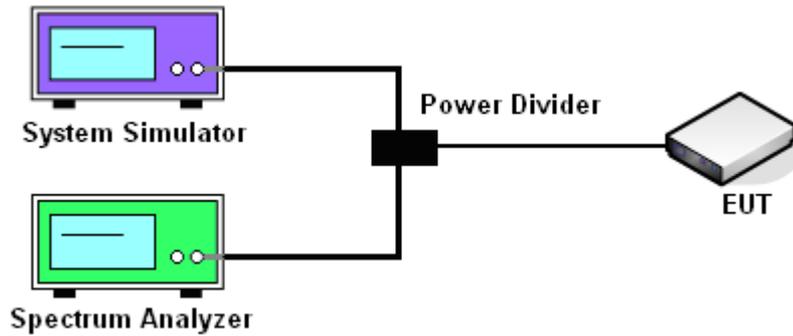
1. The RF output of the transmitter was connected to base station simulator.
2. Set EUT at maximum average power by base station simulator.
3. Measure lowest, middle, and highest channels for each bandwidth and different modulation.

For Effective Isotropic Radiated Power Measurement:

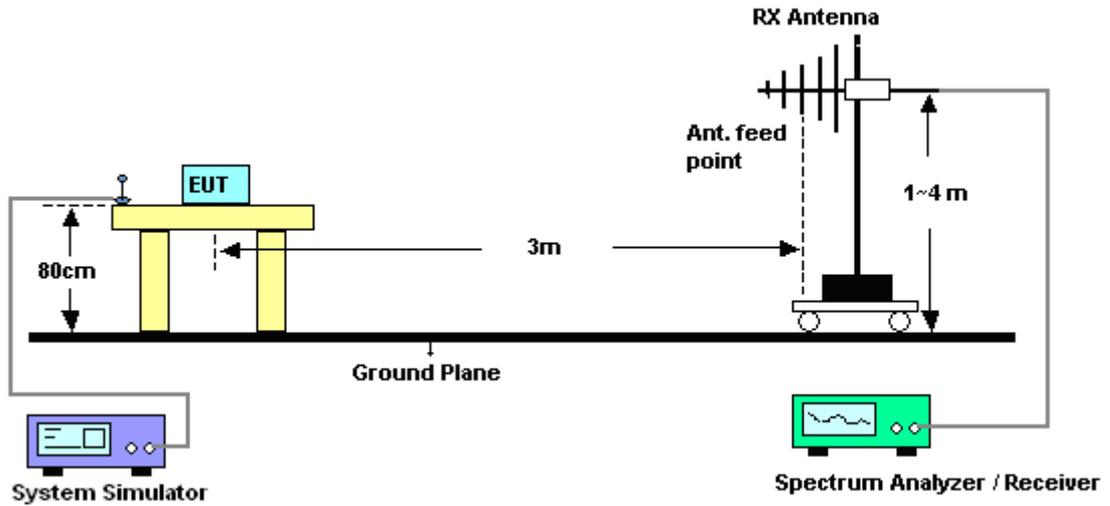
1. The EUT was placed on a non-conductive rotating platform with 0.8 meter height in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m.
2. During the measurement, the EUT was enforced in maximum power. The highest emission was recorded from analyzer power 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 Radiated Power (ERP) and 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, $EIRP = LVL + \text{Correction factor}$.

3.1.4 Test Setup

<Conducted Power and Band Edge Measurement>



<Effective Isotropic Radiated Power Measurement>





3.1.5 Test Result of Conducted Output Power

Mode	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 7	5MHz	20815	2506.5	QPSK	1	0	21.43	0.1390
					1	12	21.36	0.1368
					1	24	21.34	0.1361
					12	0	20.43	0.1104
					12	6	20.46	0.1112
					12	11	20.46	0.1112
					25	0	20.34	0.1081
		16-QAM	1	0	20.64	0.1159		
			1	12	20.55	0.1135		
			1	24	20.55	0.1135		
			12	0	19.50	0.0891		
			12	6	19.38	0.0867		
			12	11	19.55	0.0902		
			25	0	19.26	0.0843		
	21095	2534.5	QPSK	1	0	21.49	0.1409	
				1	12	21.42	0.1387	
				1	24	21.42	0.1387	
				12	0	20.50	0.1122	
				12	6	20.52	0.1127	
				12	11	20.51	0.1125	
				25	0	20.36	0.1086	
	16-QAM	1	0	20.52	0.1127			
		1	12	20.43	0.1104			
		1	24	20.49	0.1119			
		12	0	19.50	0.0891			
		12	6	19.60	0.0912			
		12	11	19.70	0.0933			
		25	0	19.45	0.0881			
21425	2567.5	QPSK	1	0	21.40	0.1380		
			1	12	21.35	0.1365		
			1	24	21.36	0.1368		
			12	0	20.42	0.1102		
			12	6	20.51	0.1125		
			12	11	20.52	0.1127		
			25	0	20.31	0.1074		
	16-QAM	1	0	20.48	0.1117			
		1	12	20.43	0.1104			
		1	24	20.44	0.1107			
		12	0	19.52	0.0895			
		12	6	19.51	0.0893			
		12	11	19.53	0.0897			
		25	0	19.34	0.0859			



Mode	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 7	10MHz	20840	2509	QPSK	1	0	20.46	0.1112
					1	24	20.33	0.1079
					1	49	20.40	0.1096
					25	0	19.25	0.0841
					25	12	19.32	0.0855
					25	24	19.30	0.0851
		50	0	19.17	0.0826			
		16-QAM	1	0	19.61	0.0914		
			1	24	19.39	0.0869		
			1	49	19.35	0.0861		
			25	0	18.24	0.0667		
			25	12	18.43	0.0697		
			25	24	18.32	0.0679		
		50	0	18.18	0.0658			
		21070	2532	QPSK	1	0	20.69	0.1172
	1				24	20.60	0.1148	
	1				49	20.53	0.1130	
	25				0	19.40	0.0871	
	25				12	19.43	0.0877	
	25				24	19.42	0.0875	
	50	0	19.23	0.0838				
	16-QAM	1	0	19.63	0.0918			
		1	24	19.37	0.0865			
		1	49	19.54	0.0899			
		25	0	18.50	0.0708			
		25	12	18.48	0.0705			
		25	24	18.36	0.0685			
50	0	18.25	0.0668					
21400	2565	QPSK	1	0	20.49	0.1119		
			1	24	20.46	0.1112		
			1	49	20.42	0.1102		
			25	0	19.19	0.0830		
			25	12	19.24	0.0839		
			25	24	19.45	0.0881		
50	0	19.13	0.0818					
16-QAM	1	0	19.55	0.0902				
	1	24	19.31	0.0853				
	1	49	19.44	0.0879				
	25	0	18.29	0.0675				
	25	12	18.31	0.0678				
	25	24	18.40	0.0692				
50	0	18.19	0.0659					



Mode	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 7	15MHz	20865	2511.5	QPSK	1	0	21.45	0.1396
					1	37	21.42	0.1387
					1	74	21.40	0.1380
					36	0	20.32	0.1076
					36	18	20.18	0.1042
					36	37	20.16	0.1038
					75	0	19.96	0.0991
		16-QAM	1	0	20.38	0.1091		
			1	37	19.95	0.0989		
			1	74	20.05	0.1012		
			36	0	19.32	0.0855		
			36	18	19.07	0.0807		
			36	37	19.34	0.0859		
			75	0	19.18	0.0828		
	21045	2529.5	QPSK	1	0	21.52	0.1419	
				1	37	21.39	0.1377	
				1	74	21.42	0.1387	
				36	0	20.26	0.1062	
				36	18	20.29	0.1069	
				36	37	20.34	0.1081	
				75	0	20.25	0.1059	
		16-QAM	1	0	20.77	0.1194		
			1	37	20.06	0.1014		
			1	74	20.44	0.1107		
			36	0	19.20	0.0832		
			36	18	19.34	0.0859		
			36	37	19.28	0.0847		
			75	0	19.28	0.0847		
21375	2562.5	QPSK	1	0	21.57	0.1435		
			1	37	21.35	0.1365		
			1	74	21.49	0.1409		
			36	0	20.34	0.1081		
			36	18	20.25	0.1059		
			36	37	20.23	0.1054		
			75	0	20.21	0.1050		
	16-QAM	1	0	20.67	0.1167			
		1	37	20.19	0.1045			
		1	74	20.47	0.1114			
		36	0	19.21	0.0834			
		36	18	19.16	0.0824			
		36	37	19.27	0.0845			
		75	0	19.33	0.0857			



Mode	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 7	20MHz	20890	2514	QPSK	1	0	21.38	0.1374
					1	49	21.27	0.1340
					1	99	21.25	0.1334
					50	0	20.15	0.1035
					50	24	20.03	0.1007
					50	49	20.19	0.1045
		100	0	20.20	0.1047			
		16-QAM	1	0	20.63	0.1156		
			1	49	20.53	0.1130		
			1	99	20.51	0.1125		
			50	0	19.01	0.0796		
			50	24	19.28	0.0847		
	50		49	19.17	0.0826			
	100	0	19.06	0.0805				
	21020	2527	QPSK	1	0	21.43	0.1390	
				1	49	21.28	0.1343	
				1	99	21.36	0.1368	
				50	0	20.08	0.1019	
				50	24	20.14	0.1033	
				50	49	20.08	0.1019	
		100	0	20.07	0.1016			
		16-QAM	1	0	20.49	0.1119		
			1	49	20.47	0.1114		
			1	99	20.45	0.1109		
50			0	18.98	0.0791			
50			24	19.10	0.0813			
50	49		19.18	0.0828				
100	0	19.07	0.0807					



3.1.6 Test Result of EIRP

LTE Band 7 Radiated Power EIRP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	EIRP (W)	H/V
			RB Size	RB Offset				
7	5	QPSK	1	0	2506.5	22.62	0.1828	H
7	5	QPSK	1	0	2534.5	24.21	0.2636	H
7	5	QPSK	1	0	2567.5	23.10	0.2040	H
7	5	QPSK	1	0	2506.5	22.39	0.1732	V
7	5	QPSK	1	0	2534.5	23.95	0.2486	V
7	5	QPSK	1	0	2567.5	23.13	0.2055	V
7	5	16QAM	1	0	2506.5	21.60	0.1447	H
7	5	16QAM	1	0	2534.5	23.05	0.2017	H
7	5	16QAM	1	0	2567.5	21.93	0.1560	H
7	5	16QAM	1	0	2506.5	21.36	0.1369	V
7	5	16QAM	1	0	2534.5	22.63	0.1833	V
7	5	16QAM	1	0	2567.5	21.74	0.1494	V
7	10	QPSK	1	0	2509	21.82	0.1519	H
7	10	QPSK	1	0	2532	23.50	0.2238	H
7	10	QPSK	1	0	2565	22.94	0.1966	H
7	10	QPSK	1	0	2509	22.17	0.1649	V
7	10	QPSK	1	0	2532	23.18	0.2079	V
7	10	QPSK	1	0	2565	22.53	0.1789	V
7	10	16QAM	1	0	2509	21.26	0.1337	H
7	10	16QAM	1	0	2532	22.23	0.1672	H
7	10	16QAM	1	0	2565	21.15	0.1304	H
7	10	16QAM	1	0	2509	20.86	0.1219	V
7	10	16QAM	1	0	2532	22.42	0.1746	V
7	10	16QAM	1	0	2565	21.31	0.1353	V



LTE Band 7 Radiated Power EIRP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	EIRP (W)	H/V
			RB Size	RB Offset				
7	15	QPSK	1	0	2511.5	21.98	0.1576	H
7	15	QPSK	1	0	2529.5	23.35	0.2165	H
7	15	QPSK	1	0	2562.5	22.99	0.1993	H
7	15	QPSK	1	0	2511.5	21.70	0.1479	V
7	15	QPSK	1	0	2529.5	22.92	0.1961	V
7	15	QPSK	1	0	2562.5	22.28	0.1690	V
7	15	16QAM	1	0	2511.5	21.32	0.1354	H
7	15	16QAM	1	0	2529.5	21.91	0.1552	H
7	15	16QAM	1	0	2562.5	21.15	0.1302	H
7	15	16QAM	1	0	2511.5	20.84	0.1214	V
7	15	16QAM	1	0	2529.5	21.45	0.1397	V
7	15	16QAM	1	0	2562.5	21.19	0.1314	V
7	20	QPSK	1	0	2514	22.38	0.1730	H
7	20	QPSK	1	0	2527	23.10	0.2040	H
7	20	QPSK	1	0	2514	22.09	0.1616	V
7	20	QPSK	1	0	2527	22.53	0.1789	V
7	20	16QAM	1	0	2514	20.82	0.1209	H
7	20	16QAM	1	0	2527	22.02	0.1594	H
7	20	16QAM	1	0	2514	20.95	0.1245	V
7	20	16QAM	1	0	2527	21.83	0.1525	V

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. The following guidelines are offered for performing a CCDF measurement.

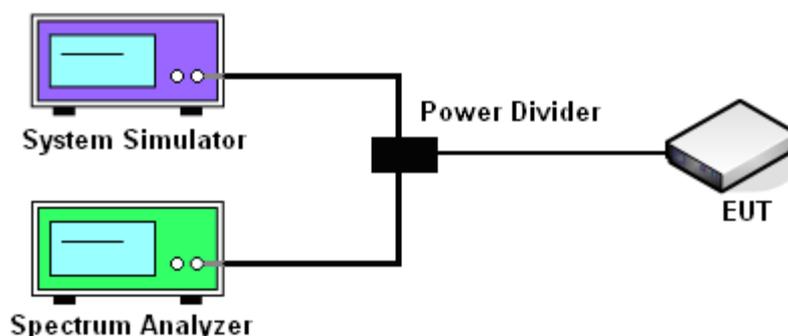
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The CCDF (Complementary Cumulative Distribution Function) of the middle channel for the highest RF powers were measured.

3.2.4 Test Setup





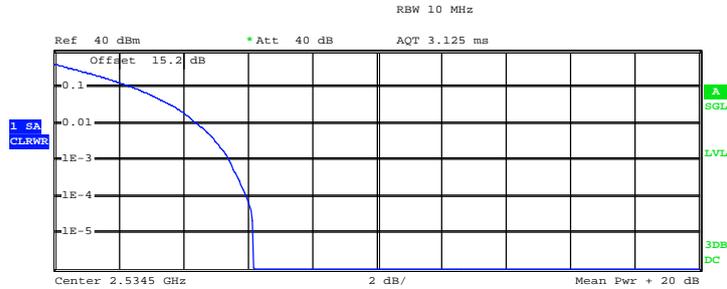
3.2.5 Test Result of Peak-to-Average Ratio

Band	Band Width	Channel	Frequency (MHz)	Modulation	PAR (dB)
LTE Band 7	5MHz	21095	2534.5	QPSK	5.44
				16-QAM	6.12
	10MHz	21070	2532	QPSK	5.32
				16-QAM	6.20
	15MHz	21045	2529.5	QPSK	5.60
				16-QAM	6.72
	20MHz	21020	2527	QPSK	6.44
				16-QAM	7.16



Band:	LTE Band 7	Bandwidth:	5MHz
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**Peak-to-Average Ratio on Channel 21095
for QPSK-RB Size 25, RB Offset 0**



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 20.62 dBm
Peak 26.81 dBm
Crest 6.19 dB

10 % 2.52 dB
1 % 4.48 dB
.1 % 5.44 dB
.01 % 5.96 dB

Date: 13.APR.2013 12:59:52

**Peak-to-Average Ratio on Channel 21095
for 16QAM-RB Size 25, RB Offset 0**



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 19.65 dBm
Peak 26.52 dBm
Crest 6.87 dB

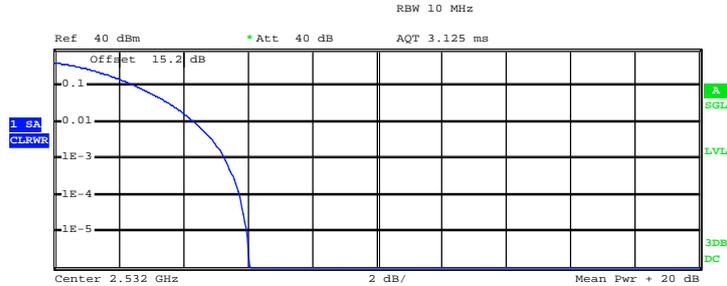
10 % 3.08 dB
1 % 5.08 dB
.1 % 6.12 dB
.01 % 6.72 dB

Date: 13.APR.2013 13:00:02



Band:	LTE Band 7	Bandwidth:	10MHz
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**Peak-to-Average Ratio on Channel 21070
for QPSK-RB Size 50, RB Offset 0**



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 20.20 dBm
Peak 26.24 dBm
Crest 6.05 dB

10 % 2.56 dB
1 % 4.36 dB
.1 % 5.32 dB
.01 % 5.76 dB

Date: 13.APR.2013 13:01:11

**Peak-to-Average Ratio on Channel 21070
for 16QAM-RB Size 50, RB Offset 0**



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 19.20 dBm
Peak 26.59 dBm
Crest 7.39 dB

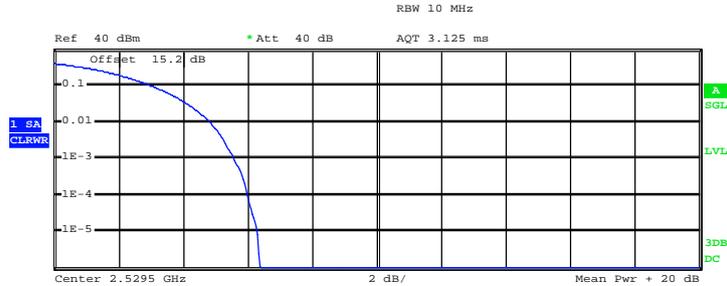
10 % 3.08 dB
1 % 5.04 dB
.1 % 6.20 dB
.01 % 6.84 dB

Date: 13.APR.2013 13:00:57



Band:	LTE Band 7	Bandwidth:	15MHz
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**Peak-to-Average Ratio on Channel 21045
for QPSK-RB Size 75, RB Offset 0**



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 18.89 dBm
Peak 25.25 dBm
Crest 6.37 dB

10 % 3.08 dB
1 % 4.84 dB
.1 % 5.60 dB
.01 % 6.00 dB

Date: 13.APR.2013 13:01:56

**Peak-to-Average Ratio on Channel 21045
for 16QAM-RB Size 75, RB Offset 0**



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 17.74 dBm
Peak 25.68 dBm
Crest 7.93 dB

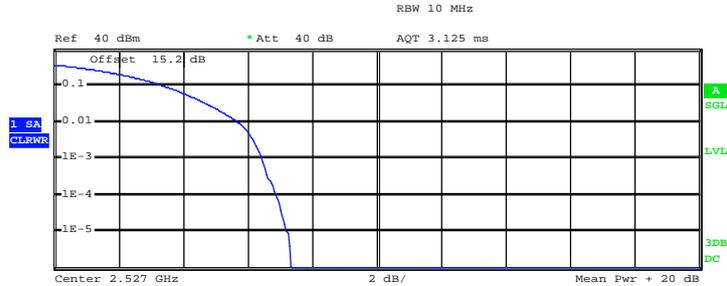
10 % 3.40 dB
1 % 5.48 dB
.1 % 6.72 dB
.01 % 7.52 dB

Date: 13.APR.2013 13:02:35



Band:	LTE Band 7	Bandwidth:	20MHz
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**Peak-to-Average Ratio on Channel 21020
for QPSK-RB Size 100, RB Offset 0**



Complementary Cumulative Distribution Function (100000 samples)

Trace 1
 Mean 17.50 dBm
 Peak 24.83 dBm
 Crest 7.33 dB

10 %	3.48 dB
1 %	5.72 dB
.1 %	6.44 dB
.01 %	6.92 dB

Date: 13.APR.2013 13:03:33

**Peak-to-Average Ratio on Channel 21020
for 16QAM-RB Size 100, RB Offset 0**



Complementary Cumulative Distribution Function (100000 samples)

Trace 1
 Mean 16.48 dBm
 Peak 24.83 dBm
 Crest 8.35 dB

10 %	3.56 dB
1 %	6.00 dB
.1 %	7.16 dB
.01 %	7.96 dB

Date: 13.APR.2013 13:03:18

3.3 99% Occupied Bandwidth and 26dB Bandwidth Measurement

3.3.1 Description of 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 emission bandwidth is defined as the width of the signal between two points, located at the 2 sides of the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

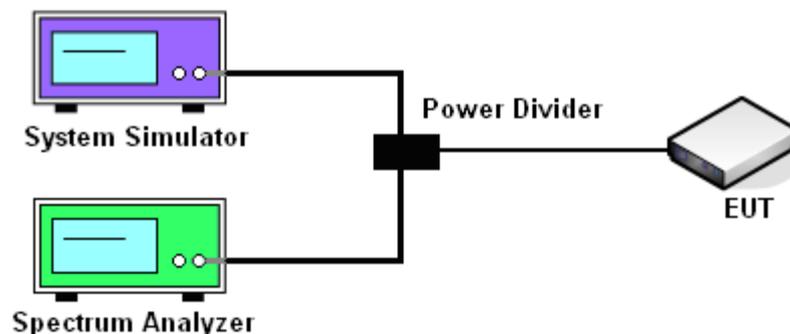
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and System Simulator via power divider.
2. The 99% occupied bandwidth and 26 dB bandwidth of the middle channel for the highest RF powers were measured.

3.3.4 Test Setup



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

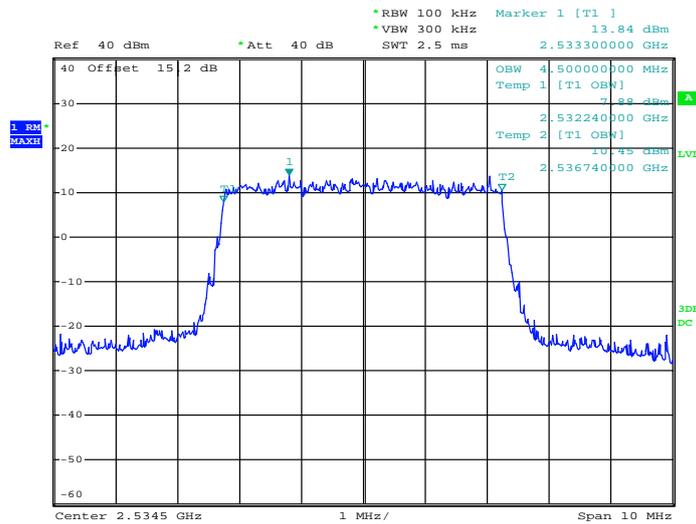
Band	Band Width	Channel	Frequency (MHz)	Modulation	99%Bandwidth (MHz)	26dB Bandwidth (MHz)
LTE Band 7	5MHz	21095	2534.5	QPSK	4.50	5.00
				16-QAM	4.52	4.96
	10MHz	21070	2532	QPSK	9.16	10.04
				16-QAM	9.12	9.96
	15MHz	21045	2529.5	QPSK	13.50	14.70
				16-QAM	13.56	14.64
	20MHz	21020	2527	QPSK	17.92	21.04
				16-QAM	17.92	21.28



3.3.7 Test Result (Plots) of 99% Occupied Bandwidth and 26dB Bandwidth

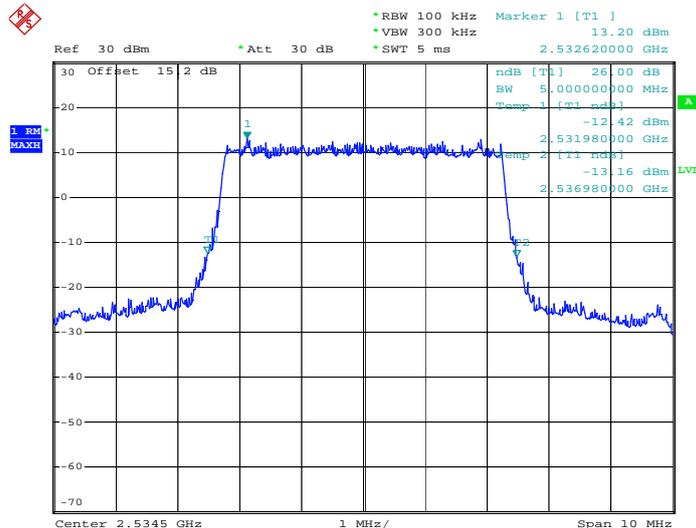
Band :	LTE Band 7	BW / Mod. :	5MHz / QPSK
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**99% Occupied Bandwidth Plot on Channel 21095
for RB Size 25, RB Offset 0**



Date: 13.APR.2013 12:37:24

**26dB Bandwidth Plot on Channel 21095
for RB Size 25, RB Offset 0**

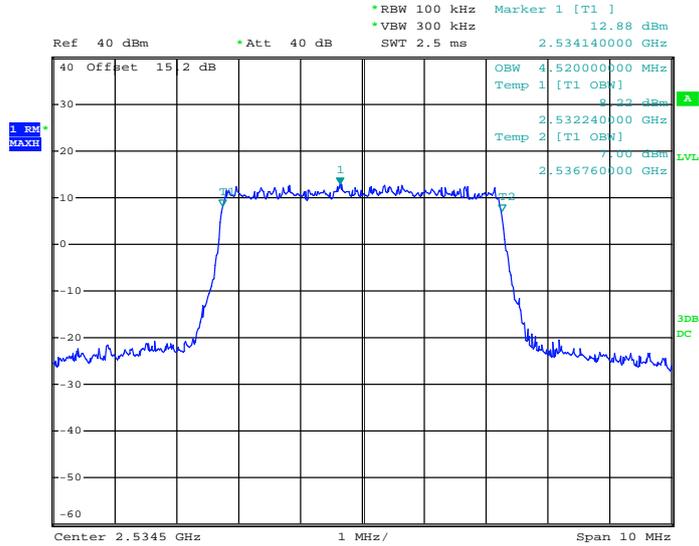


Date: 21.APR.2013 10:27:29



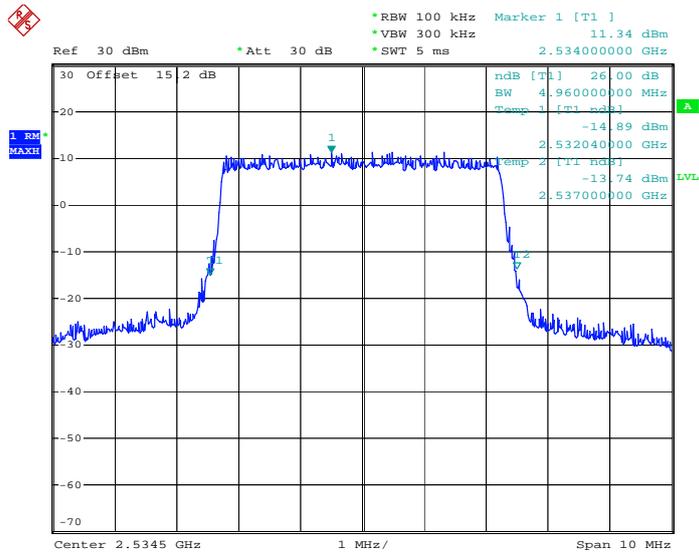
Band :	LTE Band 7	BW / Mod. :	5MHz / 16QAM
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**99% Occupied Bandwidth Plot on Channel 21095
for RB Size 25, RB Offset 0**



Date: 13.APR.2013 12:37:12

**26dB Bandwidth Plot on Channel 21095
for RB Size 25, RB Offset 0**

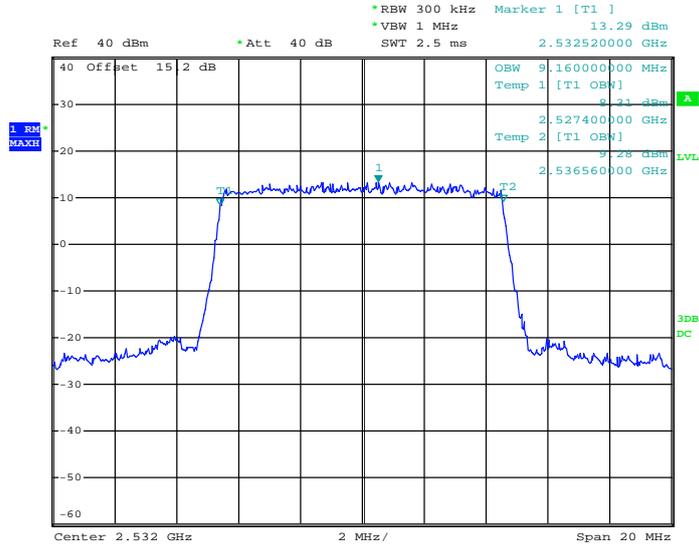


Date: 21.APR.2013 10:32:36



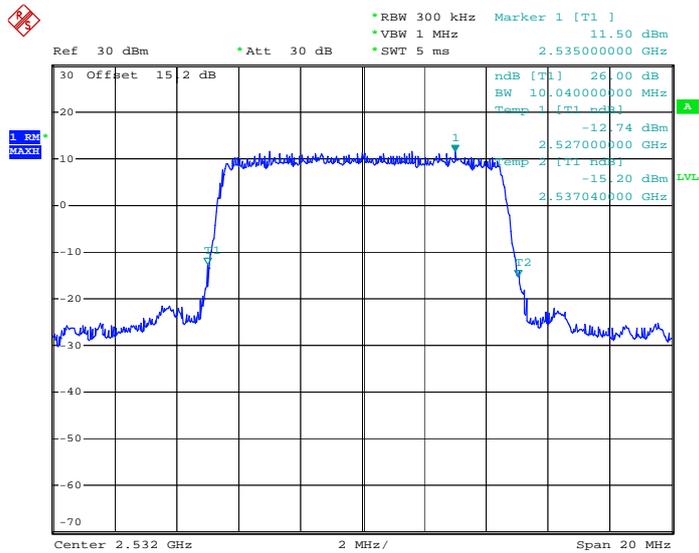
Band :	LTE Band 7	BW / Mod. :	10MHz / QPSK
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**99% Occupied Bandwidth Plot on Channel 21070
for RB Size 50, RB Offset 0**



Date: 13.APR.2013 12:41:49

**26dB Bandwidth Plot on Channel 21070
for RB Size 50, RB Offset 0**

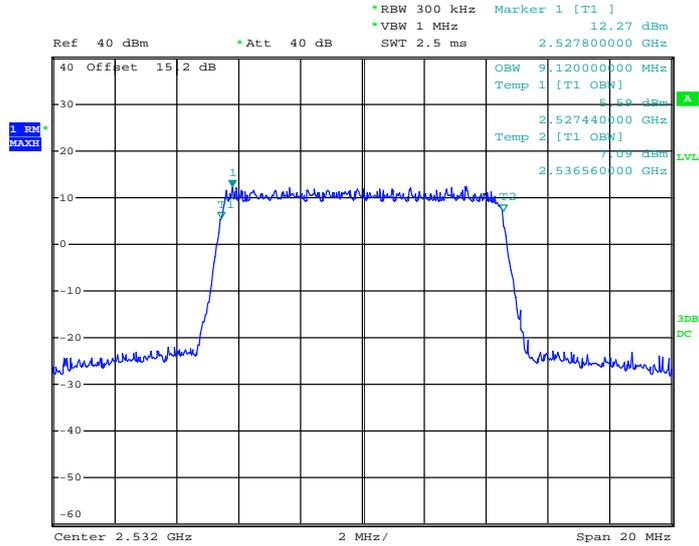


Date: 21.APR.2013 10:33:55



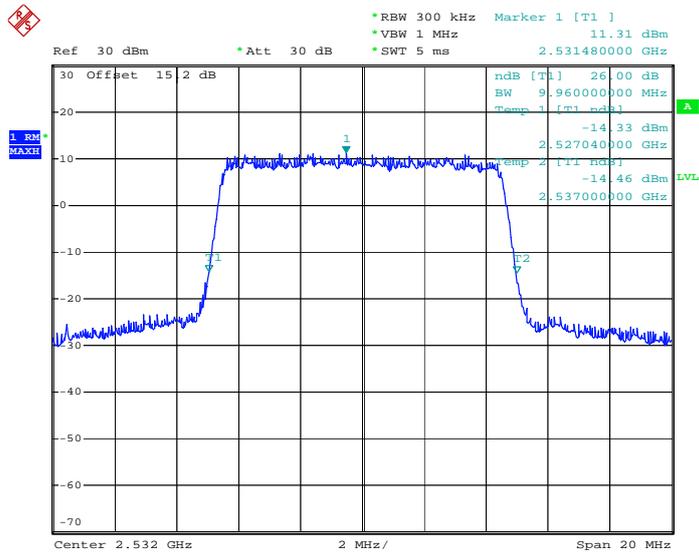
Band :	LTE Band 7	BW / Mod. :	10MHz / 16QAM
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**99% Occupied Bandwidth Plot on Channel 21070
for RB Size 50, RB Offset 0**



Date: 13.APR.2013 12:41:15

**26dB Bandwidth Plot on Channel 21070
for RB Size 50, RB Offset 0**

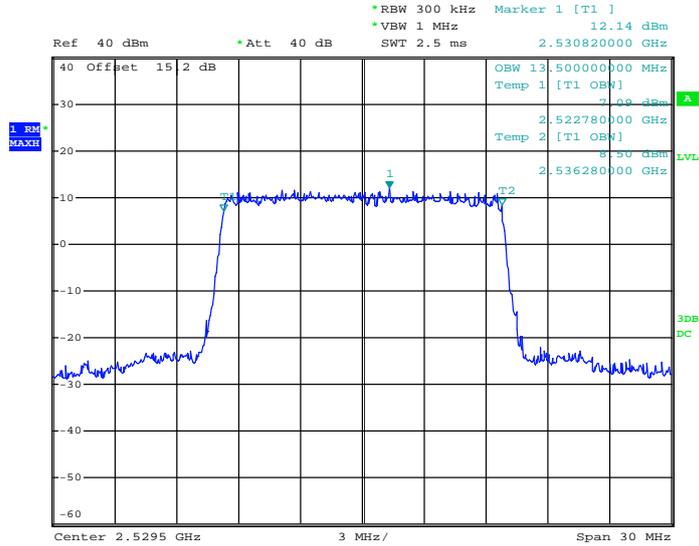


Date: 21.APR.2013 10:33:37



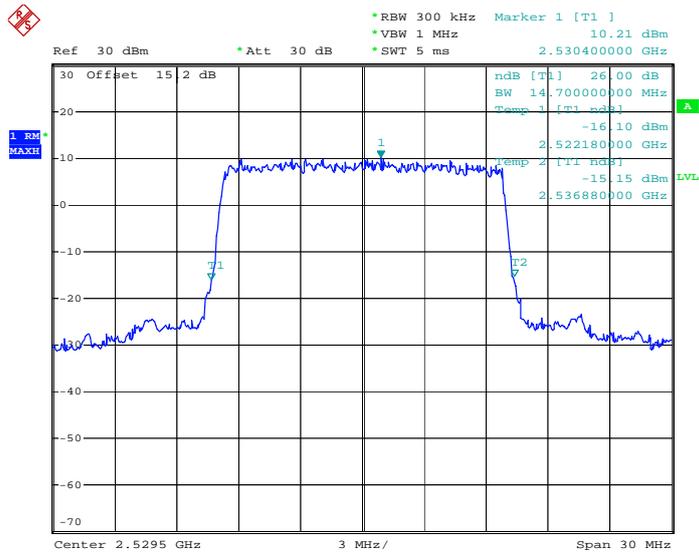
Band :	LTE Band 7	BW / Mod. :	15MHz / QPSK
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**99% Occupied Bandwidth Plot on Channel 21045
for RB Size 75, RB Offset 0**



Date: 13.APR.2013 12:46:06

**26dB Bandwidth Plot on Channel 21045
for RB Size 75, RB Offset 0**

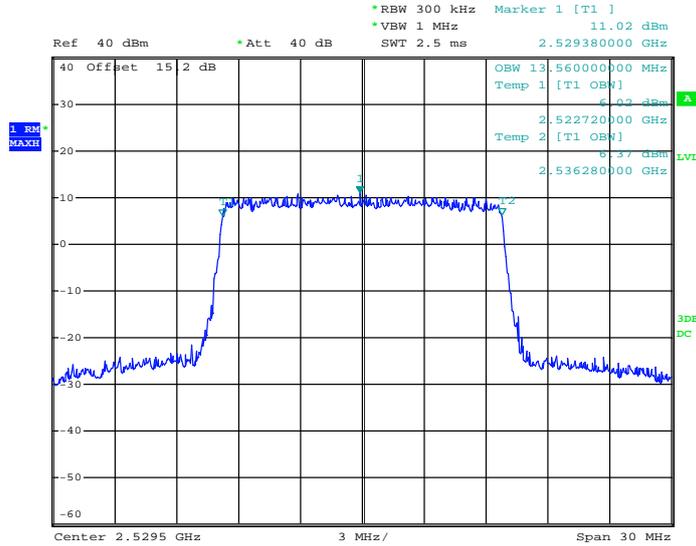


Date: 21.APR.2013 10:35:12



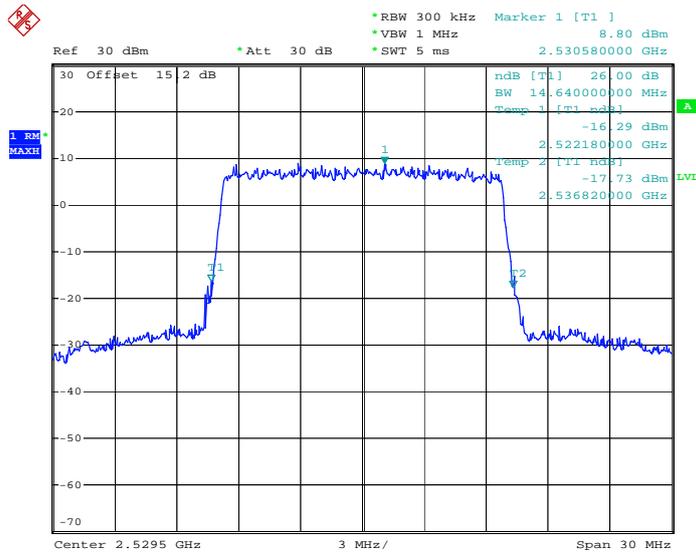
Band :	LTE Band 7	BW / Mod. :	15MHz / 16QAM
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**99% Occupied Bandwidth Plot on Channel 21045
for RB Size 75, RB Offset 0**



Date: 13.APR.2013 12:45:46

**26dB Bandwidth Plot on Channel 21045
for RB Size 75, RB Offset 0**

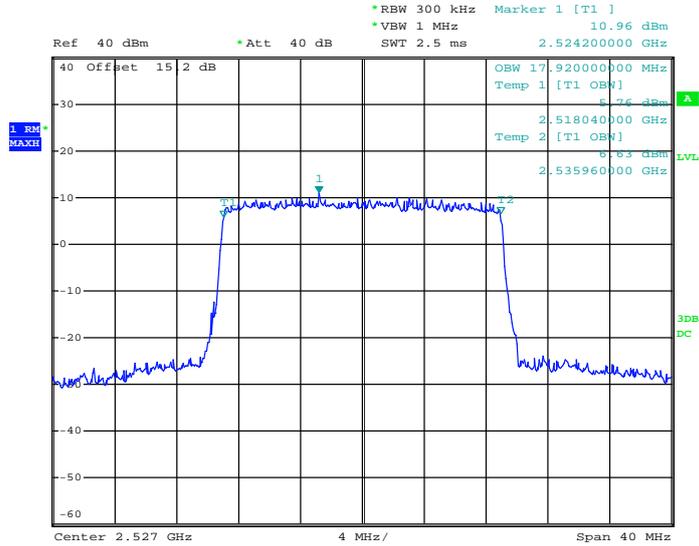


Date: 21.APR.2013 10:35:27



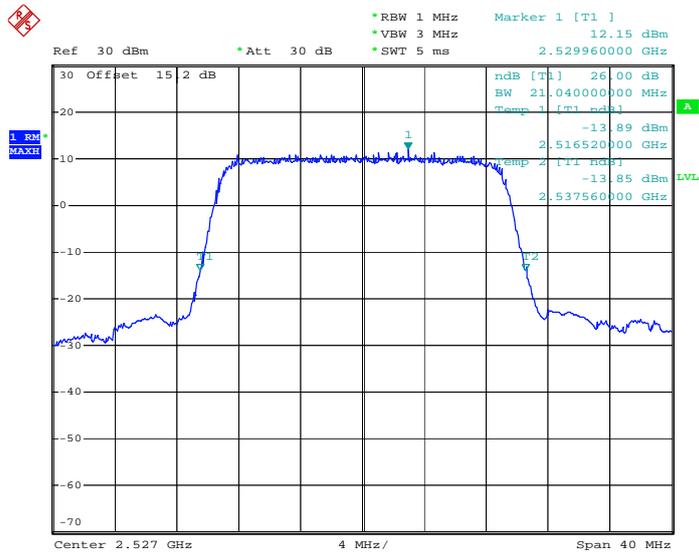
Band :	LTE Band 7	BW / Mod. :	20MHz / QPSK
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**99% Occupied Bandwidth Plot on Channel 21020
for RB Size 100, RB Offset 0**



Date: 13.APR.2013 12:56:03

**26dB Bandwidth Plot on Channel 21020
for RB Size 100, RB Offset 0**

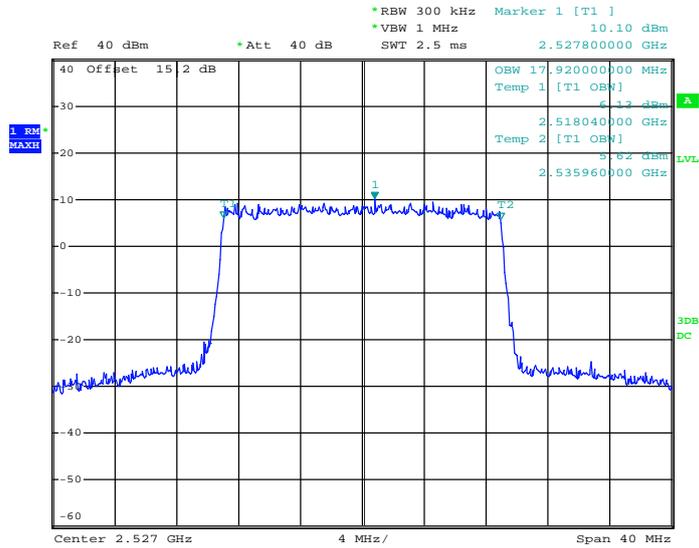


Date: 21.APR.2013 10:36:28



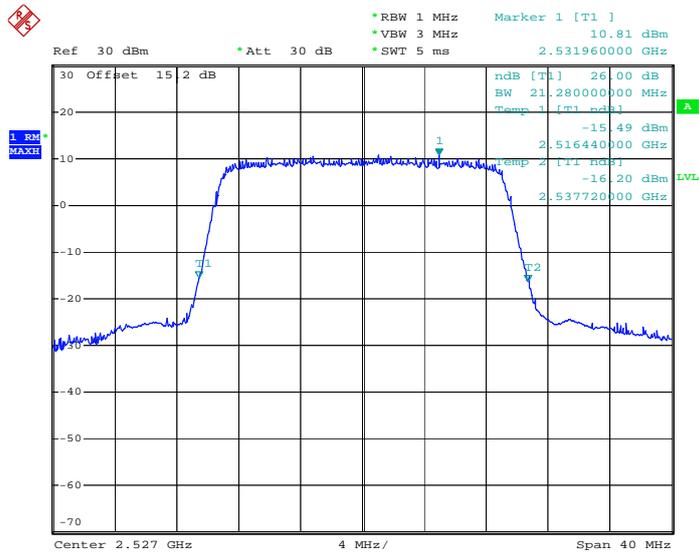
Band :	LTE Band 7	BW / Mod. :	20MHz / 16QAM
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**99% Occupied Bandwidth Plot on Channel 21020
for RB Size 100, RB Offset 0**



Date: 13.APR.2013 12:55:47

**26dB Bandwidth Plot on Channel 21020
for RB Size 100, RB Offset 0**



Date: 21.APR.2013 10:36:14

3.4 Conducted Band Edge and Spurious Emission Measurement

3.4.1 Description of Conducted Band Edge and 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 mobile digital stations, the attenuation factor shall be not less than $43 + 10 \log (P)$ dB at the channel edge and $55 + 10 \log (P)$ dB at 5.5 MHz from the channel edges. It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

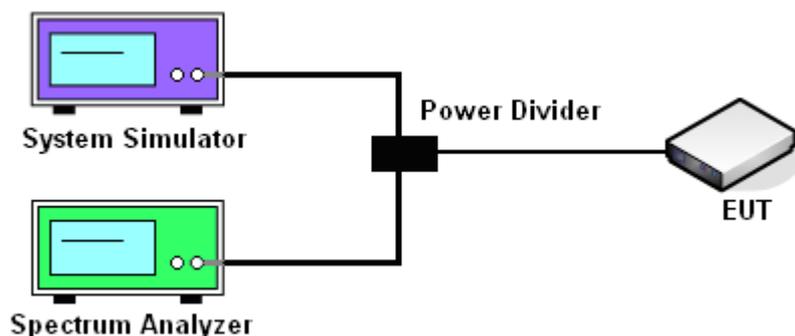
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via power divider.
2. The conducted spurious emission for the whole frequency range was taken.

3.4.4 Test Setup

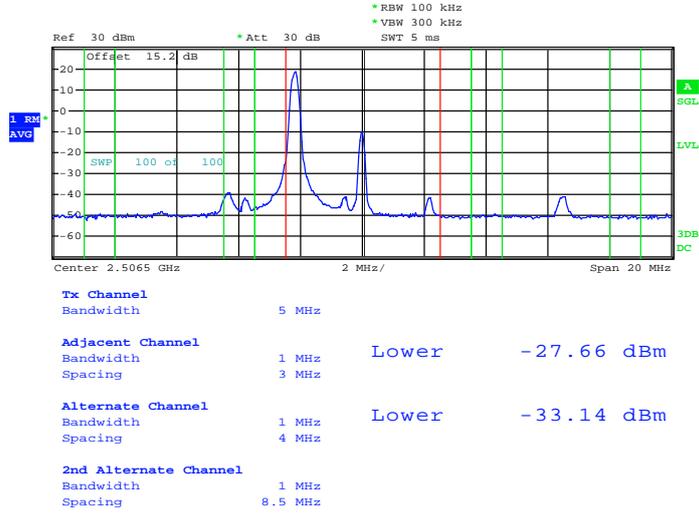




3.4.5 Test Plots of Conducted Band-Edge Emission

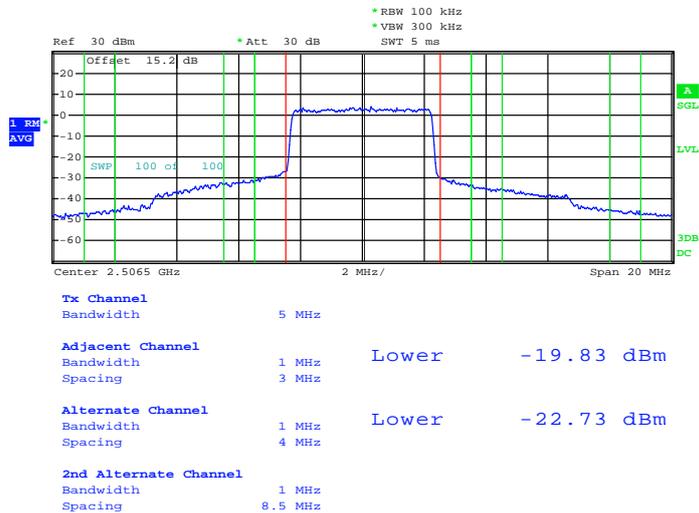
Band :	LTE Band 7	BW / Mod. :	5MHz / QPSK
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 13.APR.2013 13:12:18

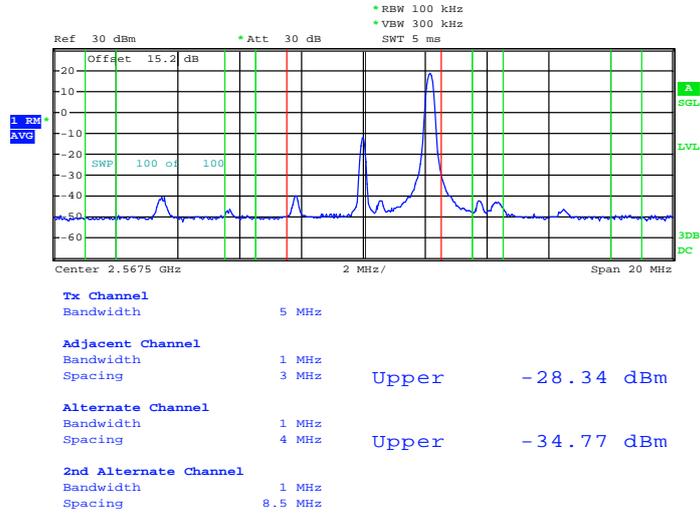
Lower Band Edge Plot for QPSK-RB Size 25, RB Offset 0



Date: 13.APR.2013 13:13:21

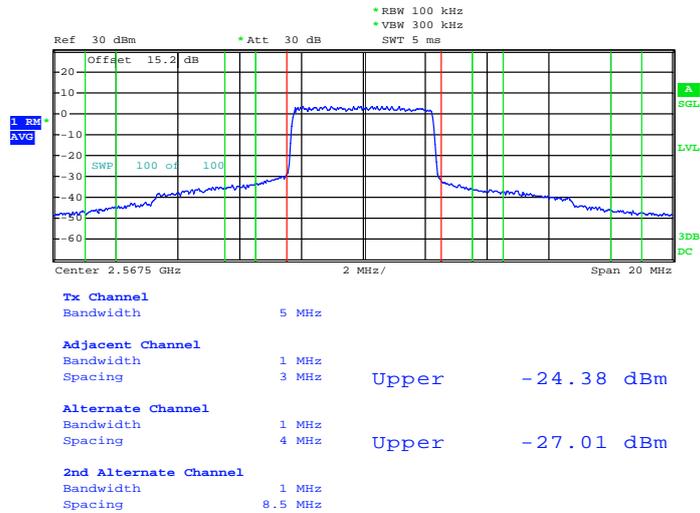


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24



Date: 13.APR.2013 13:21:02

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

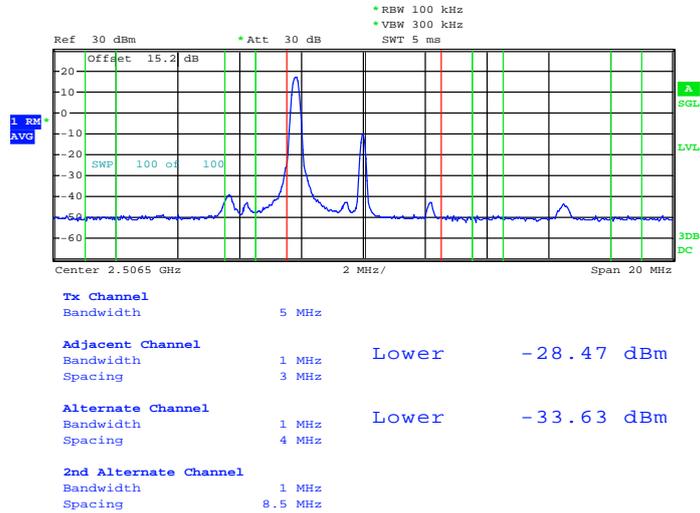


Date: 13.APR.2013 13:19:55



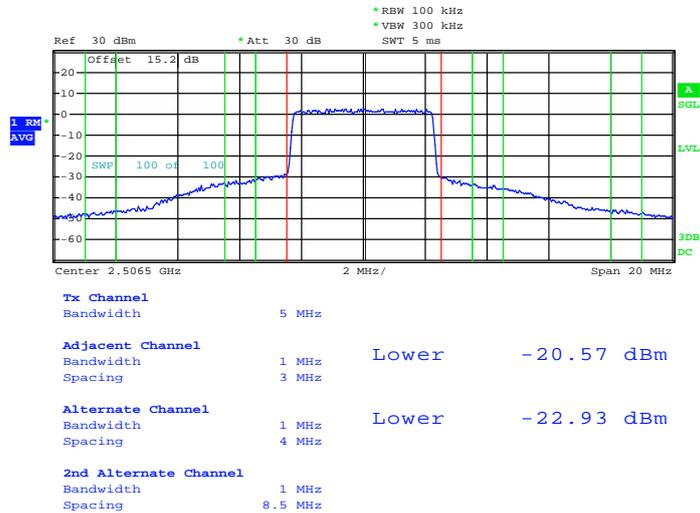
Band :	LTE Band 7	BW / Mod. :	5MHz / 16QAM
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Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



Date: 13.APR.2013 13:12:30

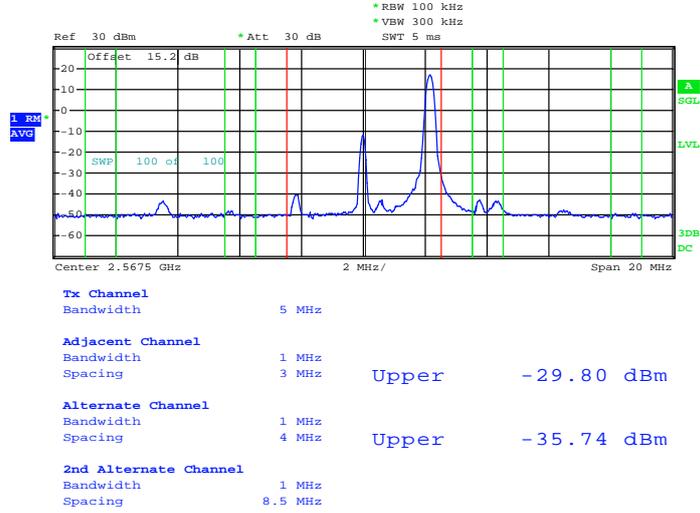
Lower Band Edge Plot for 16QAM -RB Size 25, RB Offset 0



Date: 13.APR.2013 13:13:08

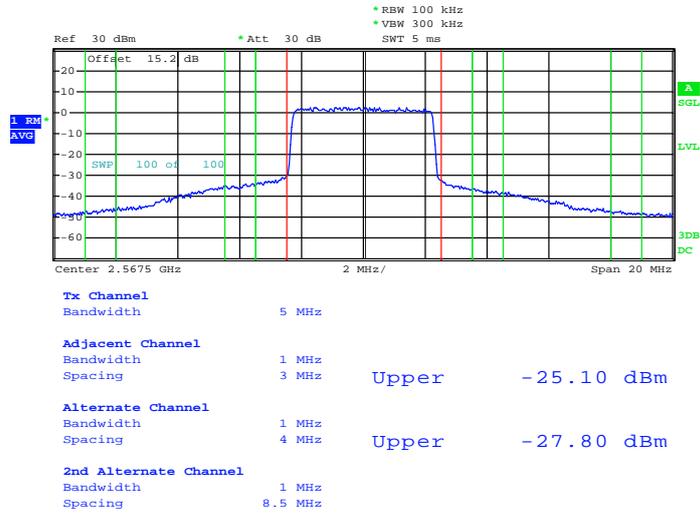


Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 24



Date: 13.APR.2013 13:20:25

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

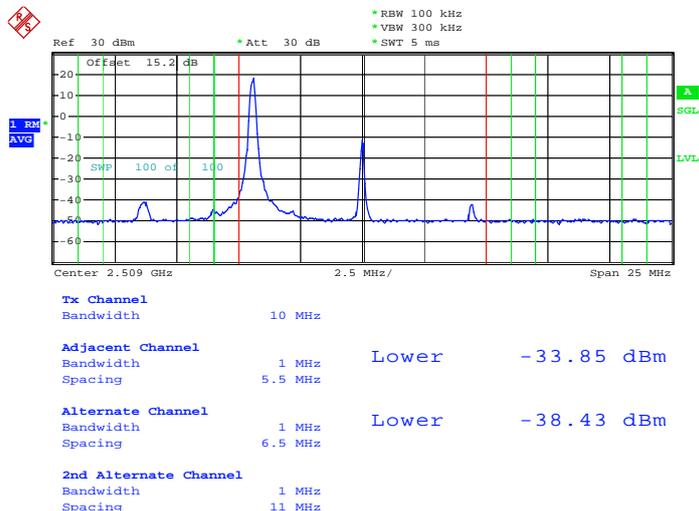


Date: 13.APR.2013 13:20:09



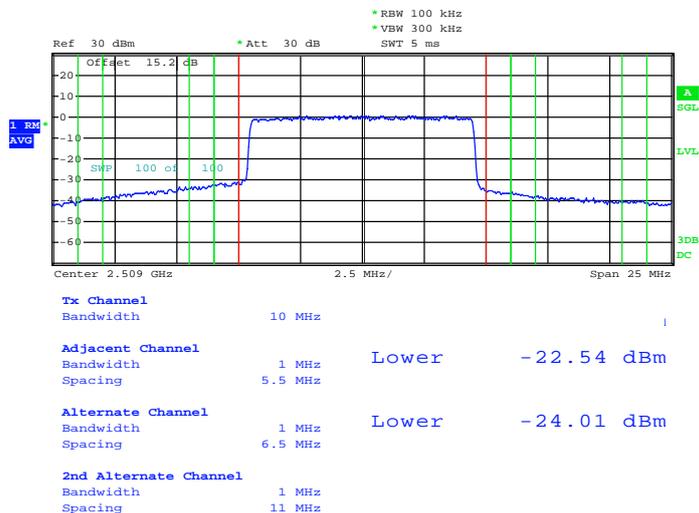
Band :	LTE Band 7	BW / Mod. :	10MHz / QPSK
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 23.APR.2013 18:04:54

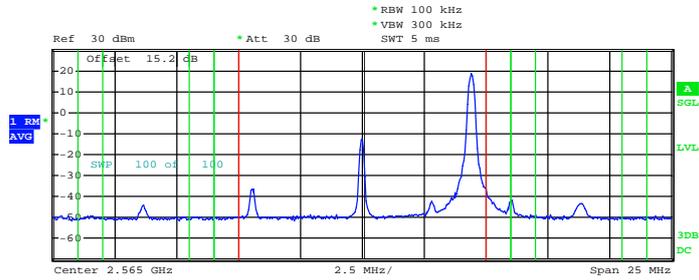
Lower Band Edge Plot for QPSK-RB Size 50, RB Offset 0



Date: 13.APR.2013 13:26:05



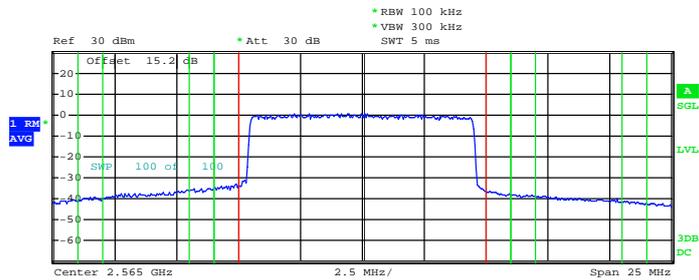
Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 49



Tx Channel	Bandwidth	10 MHz		
Adjacent Channel	Bandwidth	1 MHz		
	Spacing	5.5 MHz	Upper	-33.42 dBm
Alternate Channel	Bandwidth	1 MHz		
	Spacing	6.5 MHz	Upper	-37.74 dBm
2nd Alternate Channel	Bandwidth	1 MHz		
	Spacing	11 MHz		

Date: 13.APR.2013 13:27:46

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



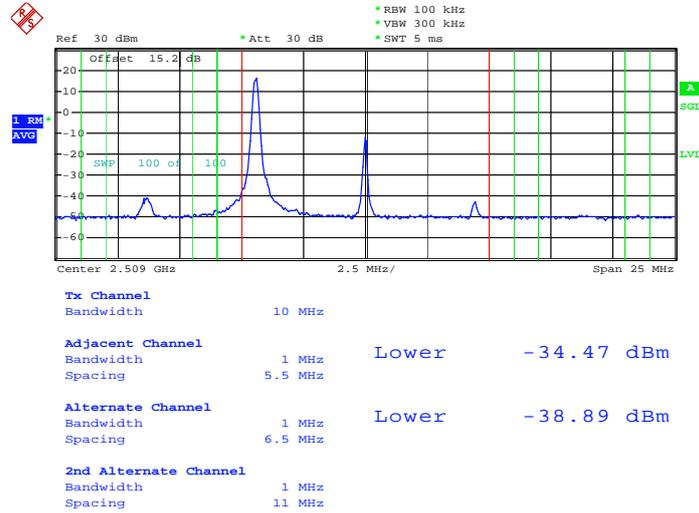
Tx Channel	Bandwidth	10 MHz		
Adjacent Channel	Bandwidth	1 MHz		
	Spacing	5.5 MHz	Upper	-27.54 dBm
Alternate Channel	Bandwidth	1 MHz		
	Spacing	6.5 MHz	Upper	-28.61 dBm
2nd Alternate Channel	Bandwidth	1 MHz		
	Spacing	11 MHz		

Date: 13.APR.2013 13:27:02



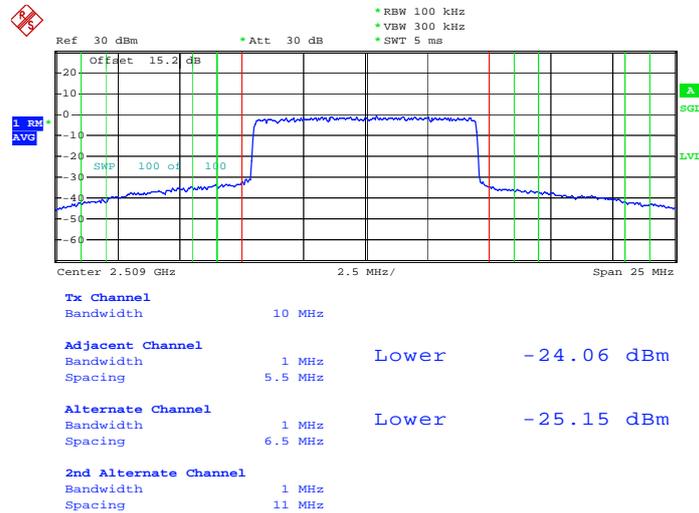
Band :	LTE Band 7	BW / Mod. :	10MHz / 16QAM
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Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



Date: 23.APR.2013 18:05:11

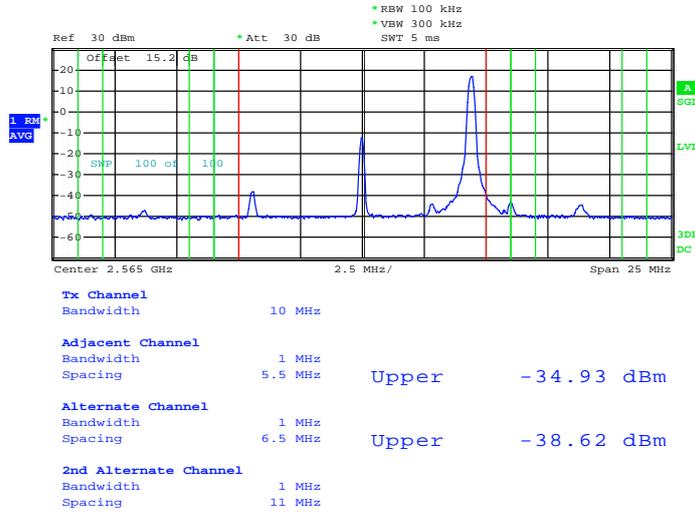
Lower Band Edge Plot for 16QAM -RB Size 50, RB Offset 0



Date: 23.APR.2013 18:10:39

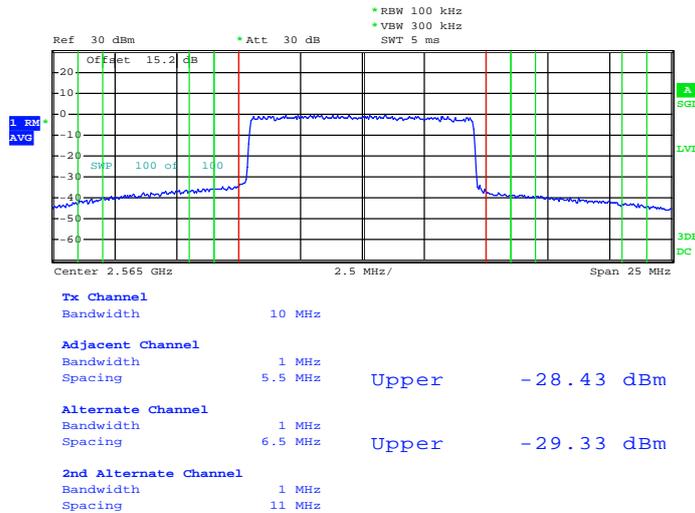


Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 49



Date: 13.APR.2013 13:27:33

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

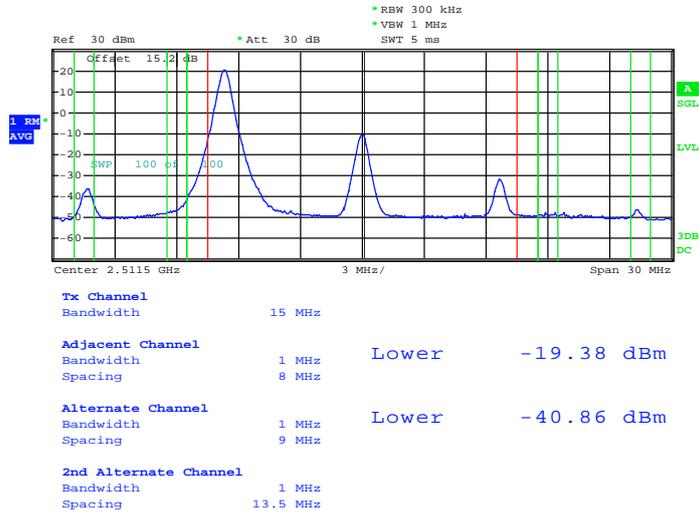


Date: 13.APR.2013 13:27:16



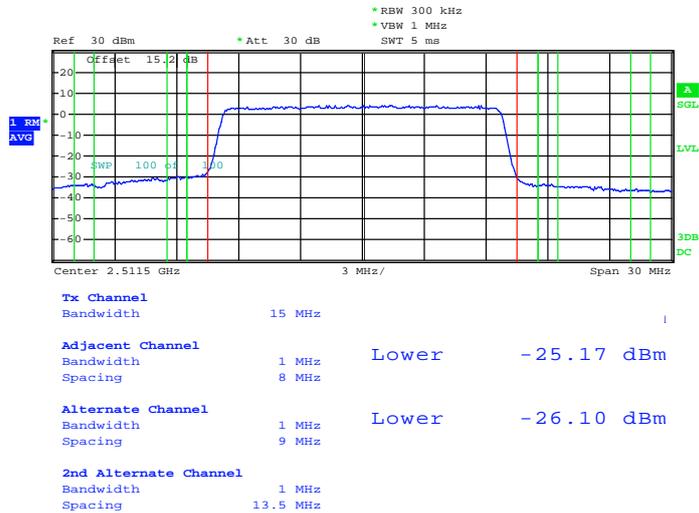
Band :	LTE Band 7	BW / Mod. :	15MHz / QPSK
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 13.APR.2013 13:35:52

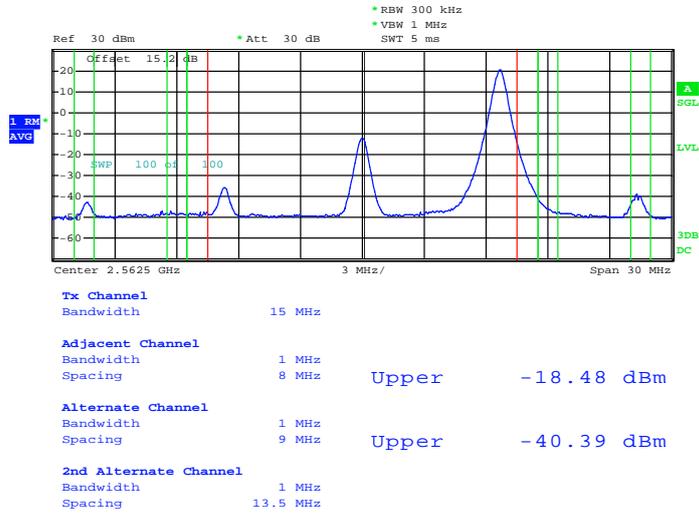
Lower Band Edge Plot for QPSK-RB Size 75, RB Offset 0



Date: 13.APR.2013 13:36:25

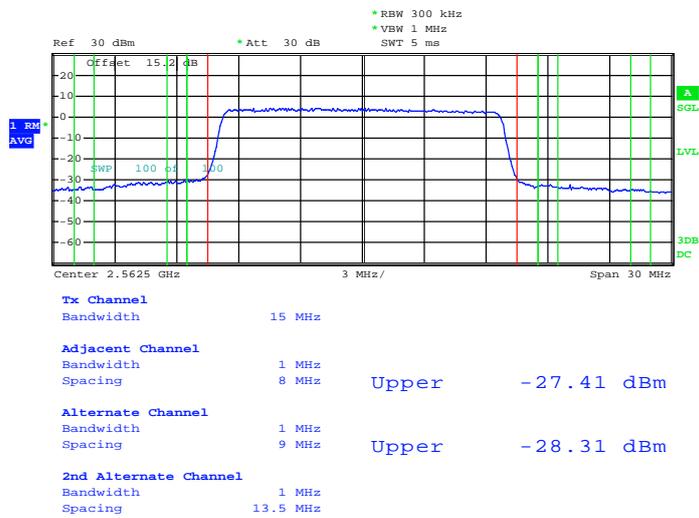


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 74



Date: 13.APR.2013 13:38:16

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

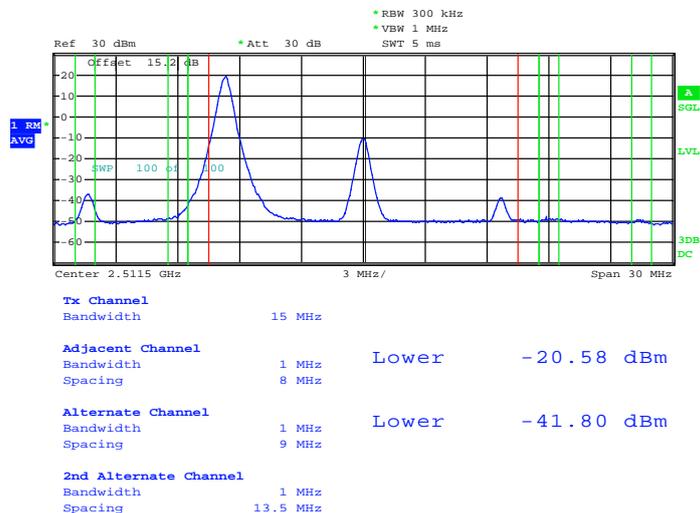


Date: 13.APR.2013 13:38:31



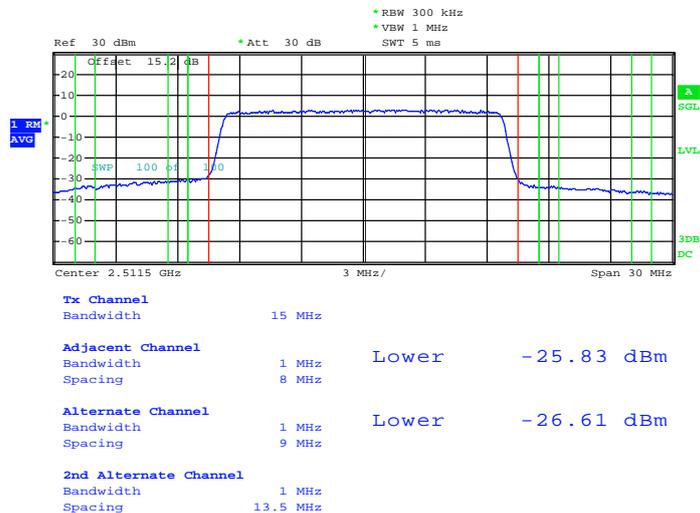
Band :	LTE Band 7	BW / Mod. :	15MHz / 16QAM
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Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



Date: 13.APR.2013 13:35:38

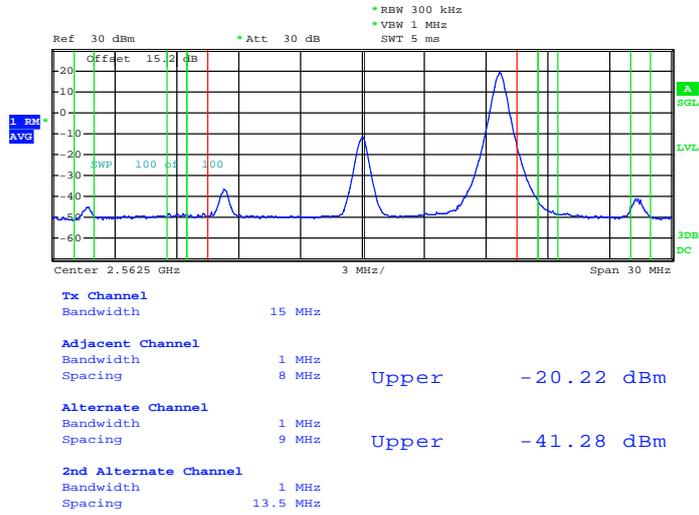
Lower Band Edge Plot for 16QAM -RB Size 75, RB Offset 0



Date: 13.APR.2013 13:36:39

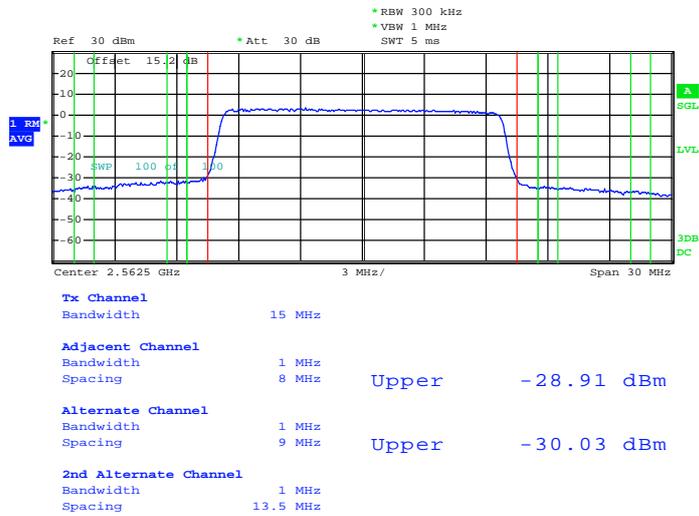


Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 74



Date: 13.APR.2013 13:37:57

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

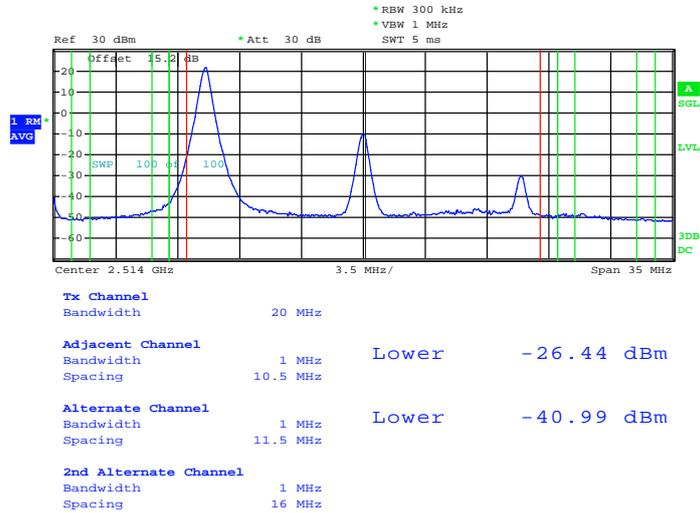


Date: 13.APR.2013 13:38:43



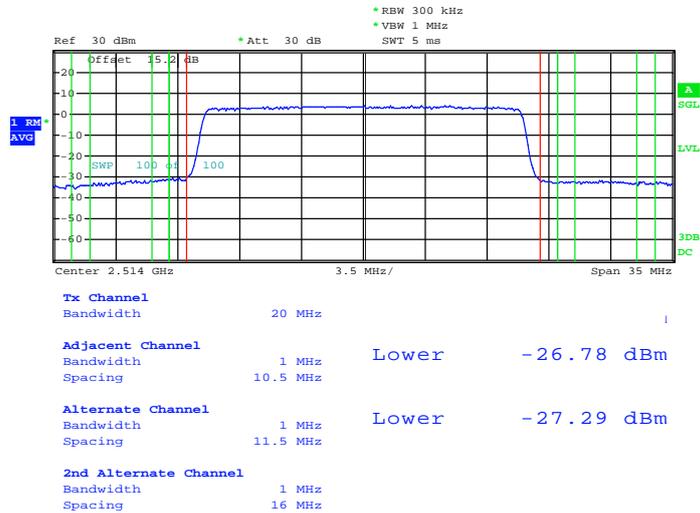
Band :	LTE Band 7	BW / Mod. :	20MHz / QPSK
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 13.APR.2013 13:42:20

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

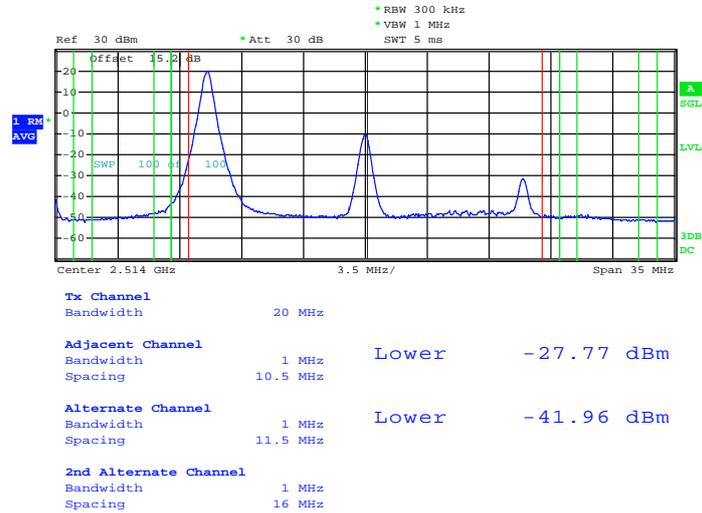


Date: 13.APR.2013 13:42:01



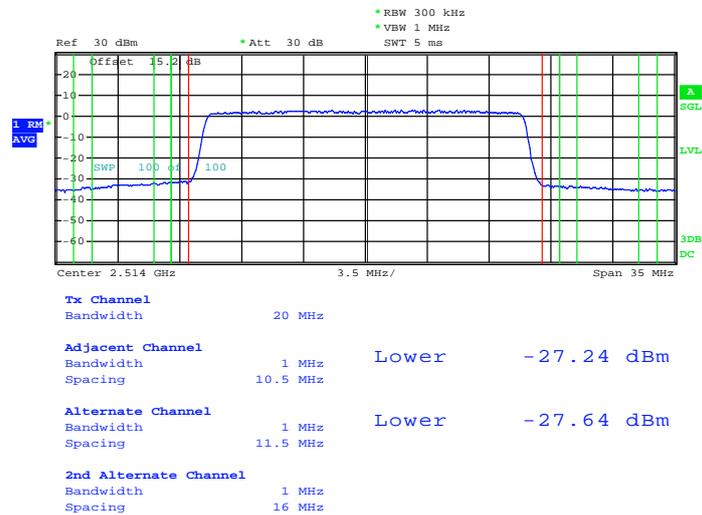
Band :	LTE Band 7	BW / Mod. :	20MHz / 16QAM
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Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



Date: 13.APR.2013 13:42:35

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

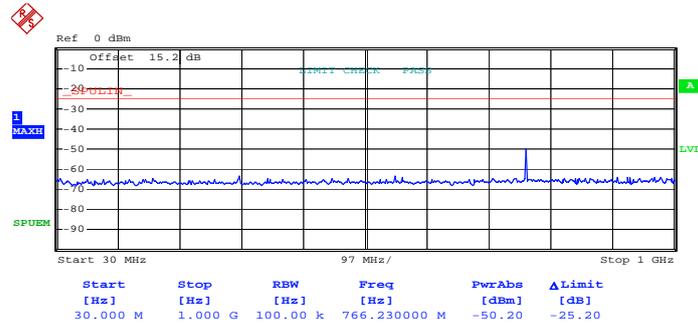


Date: 13.APR.2013 13:41:47

3.4.6 Test Plots of Spurious Emission

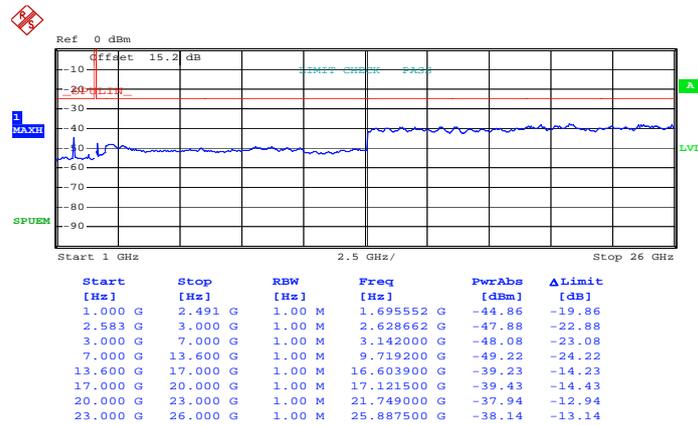
Band :	LTE Band 7	BW / Mod. :	5MHz / QPSK
Frequency :	2506.5	Channel :	20815

Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 22.APR.2013 09:53:06

Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 0)

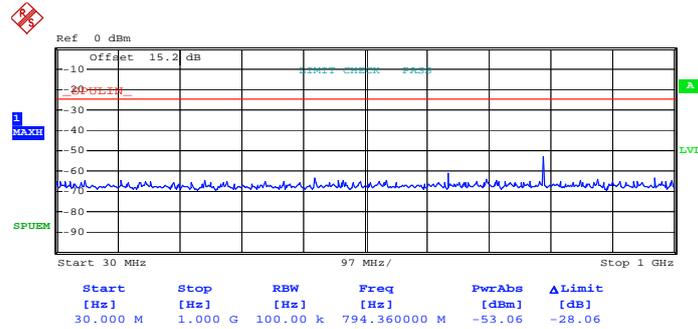


Date: 22.APR.2013 09:54:26



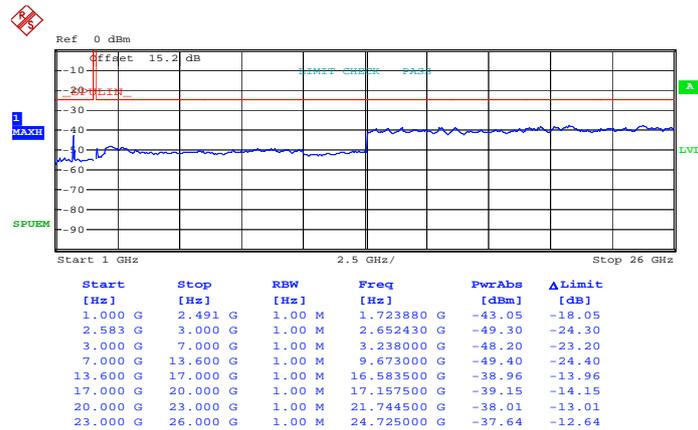
Band :	LTE Band 7	BW / Mod. :	5MHz / QPSK
Frequency :	2534.5	Channel :	21095

Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 22.APR.2013 09:56:23

Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 0)

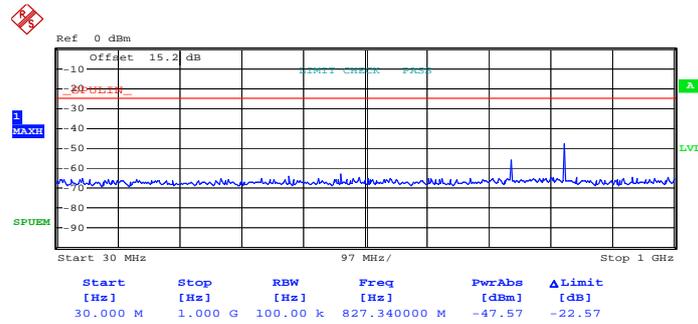


Date: 22.APR.2013 09:55:14



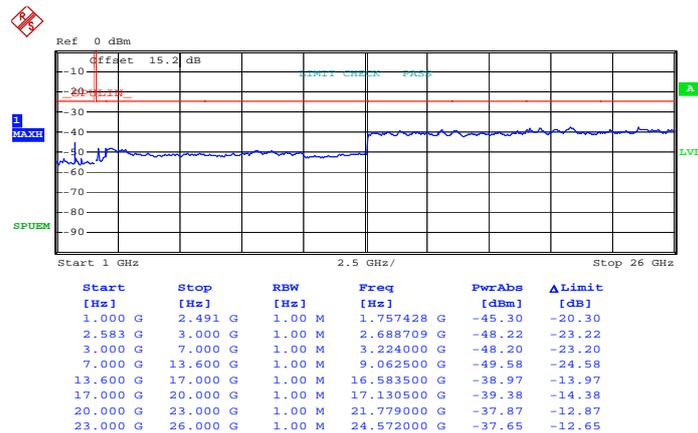
Band :	LTE Band 7	BW / Mod. :	5MHz / QPSK
Frequency :	2567.5	Channel :	21425

Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 22.APR.2013 09:57:51

Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 0)

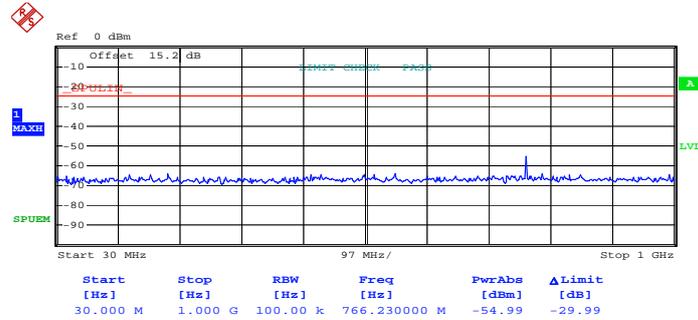


Date: 22.APR.2013 09:58:56



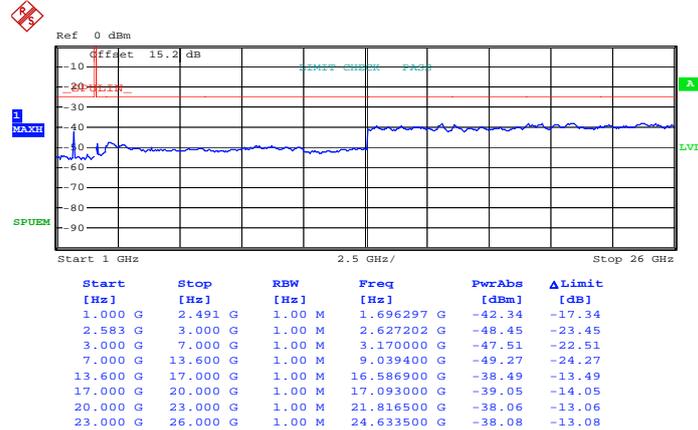
Band :	LTE Band 7	BW / Mod. :	5MHz / 16QAM
Frequency :	2506.5	Channel :	20815

Conducted Emission Plot (30MHz ~ 1GHz) for 16QAM (RB Size 1, RB Offset 0)



Date: 22.APR.2013 09:53:28

Conducted Emission Plot (1GHz ~ 26GHz) for 16QAM (RB Size 1, RB Offset 0)

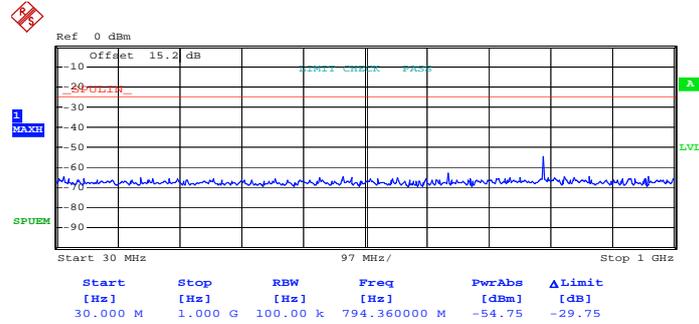


Date: 22.APR.2013 09:54:12



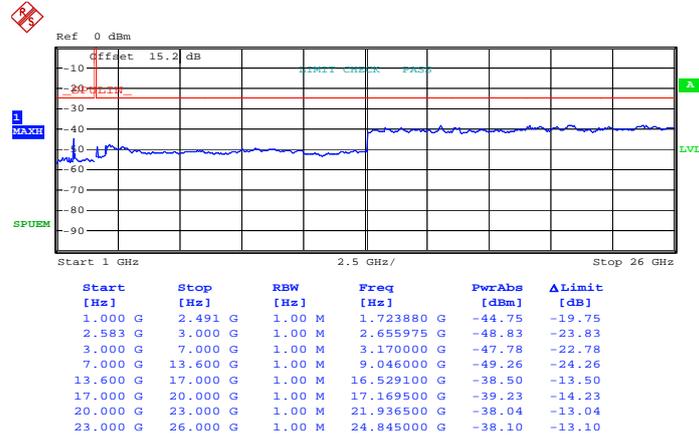
Band :	LTE Band 7	BW / Mod. :	5MHz / 16QAM
Frequency :	2534.5	Channel :	21095

Conducted Emission Plot (30MHz ~ 1GHz) for 16QAM (RB Size 1, RB Offset 0)



Date: 22.APR.2013 09:56:08

Conducted Emission Plot (1GHz ~ 26GHz) for 16QAM (RB Size 1, RB Offset 0)

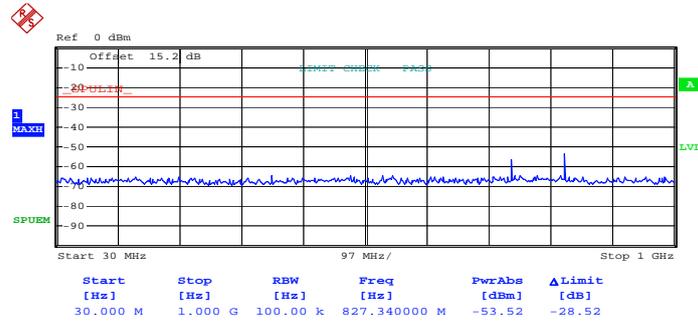


Date: 22.APR.2013 09:55:37



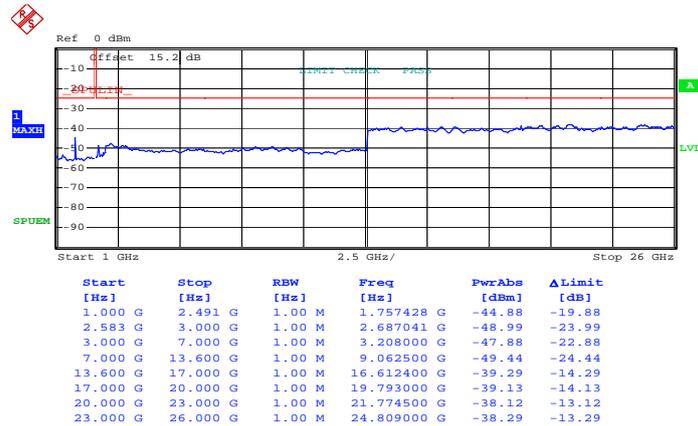
Band :	LTE Band 7	BW / Mod. :	5MHz / 16QAM
Frequency :	2567.5	Channel :	21425

Conducted Emission Plot (30MHz ~ 1GHz) for 16QAM (RB Size 1, RB Offset 0)



Date: 22.APR.2013 09:58:05

Conducted Emission Plot (1GHz ~ 26GHz) for 16QAM (RB Size 1, RB Offset 0)

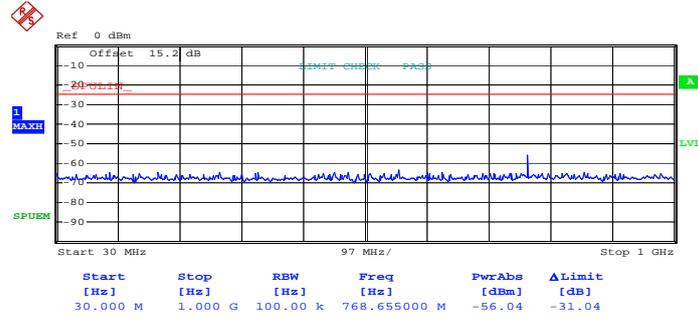


Date: 22.APR.2013 09:58:40



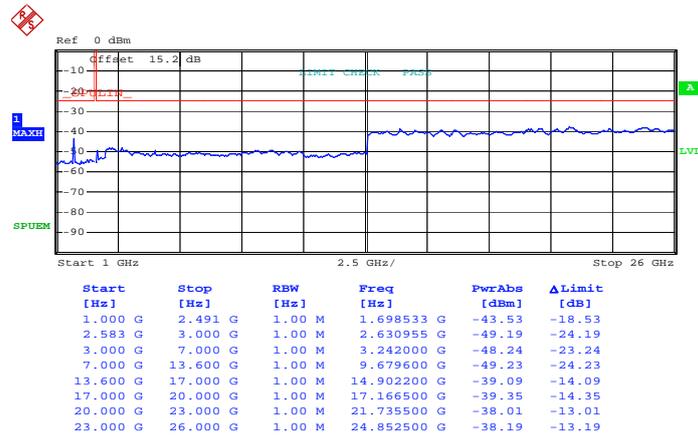
Band :	LTE Band 7	BW / Mod. :	10MHz / QPSK
Frequency :	2509	Channel :	20840

Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 22.APR.2013 10:01:15

Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 0)

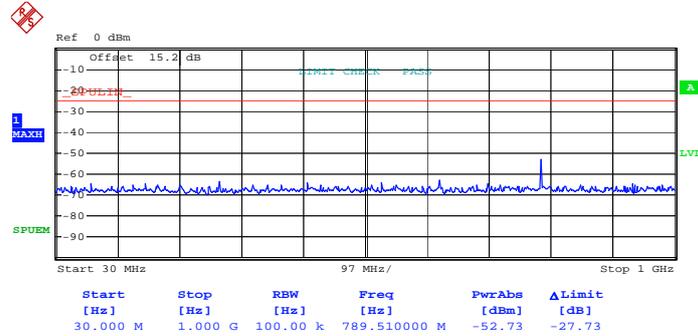


Date: 22.APR.2013 10:00:45



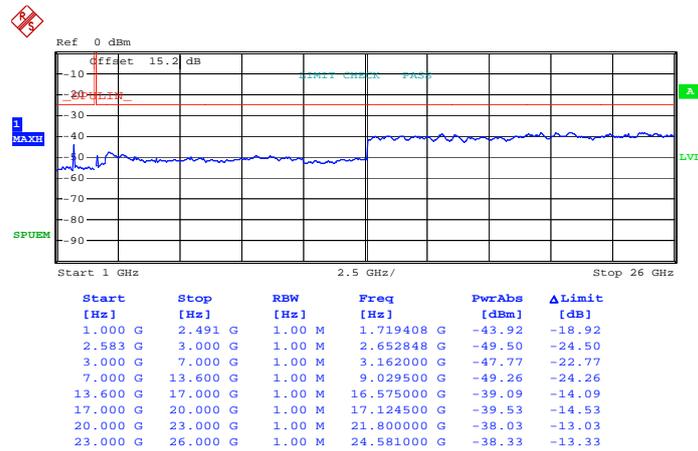
Band :	LTE Band 7	BW / Mod. :	10MHz / QPSK
Frequency :	2532	Channel :	21070

Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 22.APR.2013 10:02:38

Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 0)

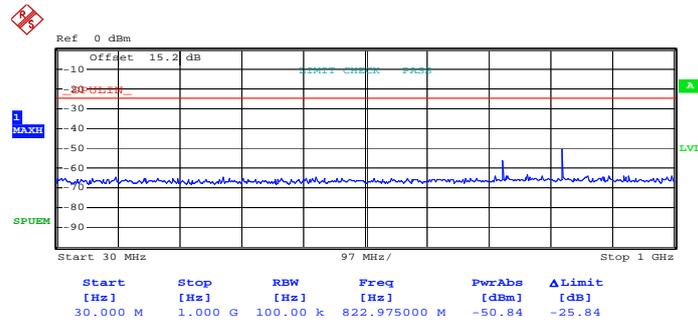


Date: 22.APR.2013 10:03:04



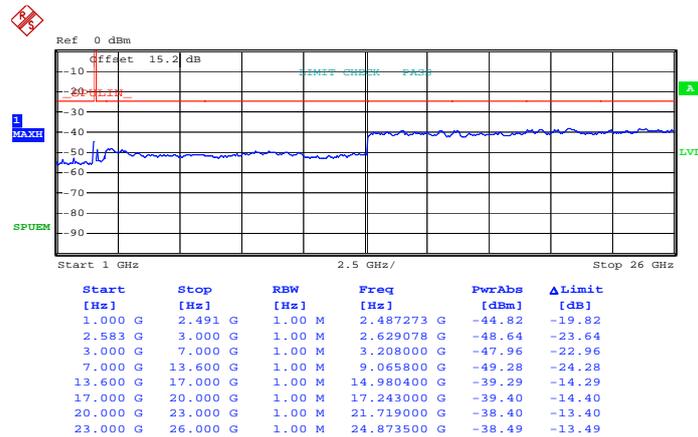
Band :	LTE Band 7	BW / Mod. :	10MHz / QPSK
Frequency :	2565	Channel :	21400

Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 22.APR.2013 10:06:17

Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 0)

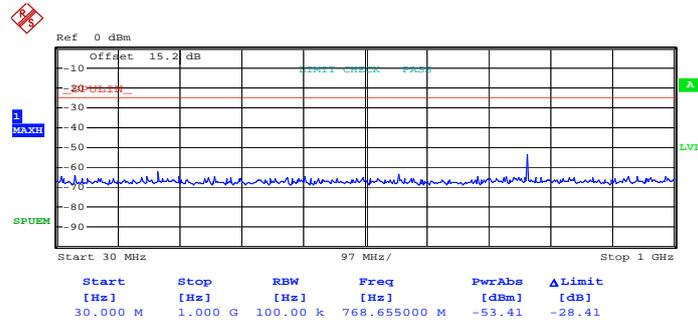


Date: 22.APR.2013 10:10:57



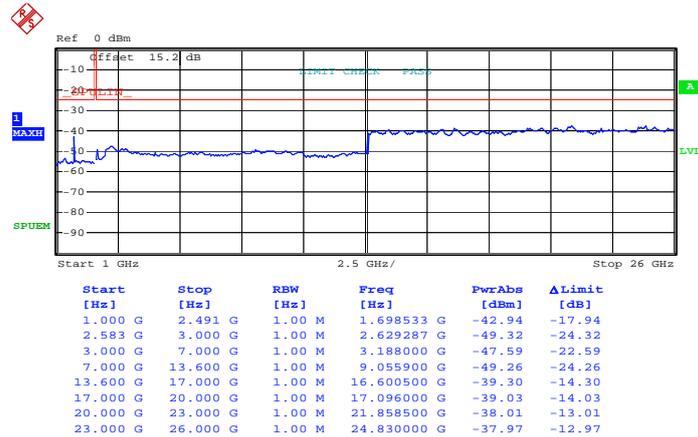
Band :	LTE Band 7	BW / Mod. :	10MHz / 16QAM
Frequency :	2509	Channel :	20840

Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 0)



Date: 22.APR.2013 10:01:41

Conducted Emission Plot (1GHz ~ 26GHz) for 16-QAM (RB Size 1, RB Offset 0)

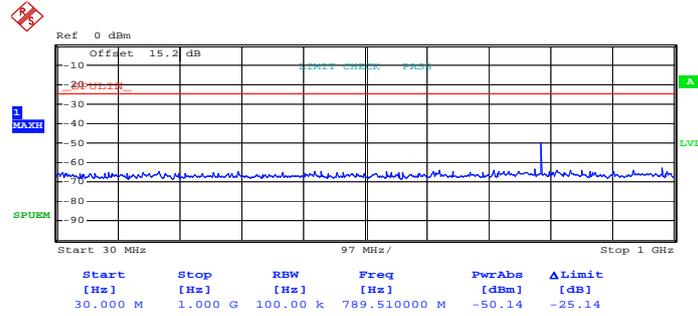


Date: 22.APR.2013 10:00:29



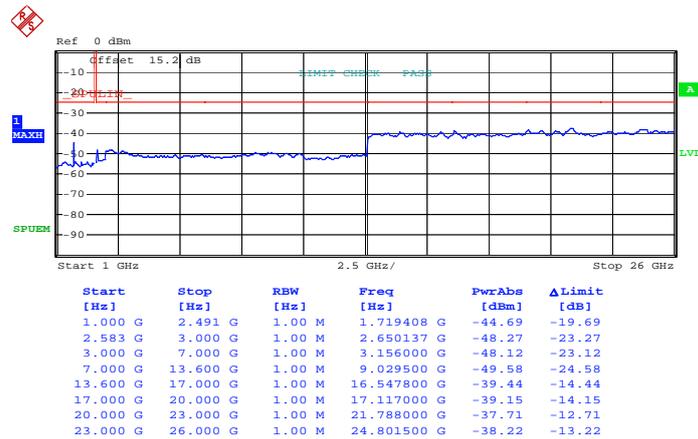
Band :	LTE Band 7	BW / Mod. :	10MHz / 16QAM
Frequency :	2532	Channel :	21070

Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 0)



Date: 22.APR.2013 10:02:17

Conducted Emission Plot (1GHz ~ 26GHz) for 16-QAM (RB Size 1, RB Offset 0)

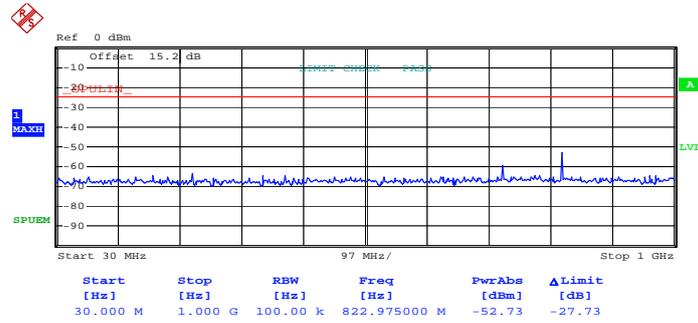


Date: 22.APR.2013 10:03:25



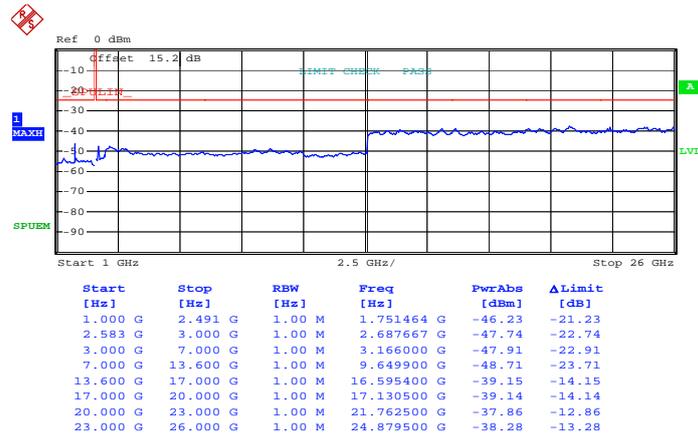
Band :	LTE Band 7	BW / Mod. :	10MHz / 16QAM
Frequency :	2565	Channel :	21400

Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 0)



Date: 22.APR.2013 10:04:57

Conducted Emission Plot (1GHz ~ 26GHz) for 16-QAM (RB Size 1, RB Offset 0)

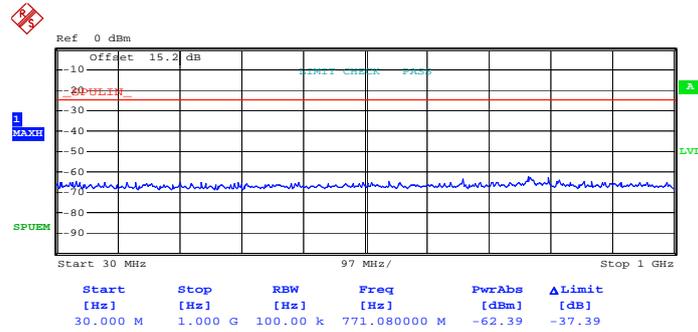


Date: 22.APR.2013 10:04:38



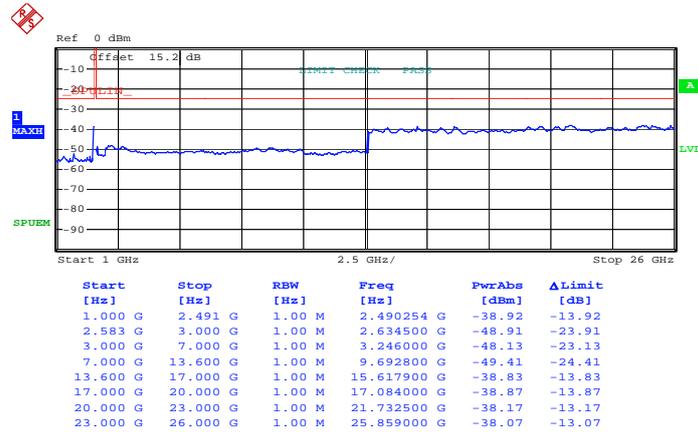
Band :	LTE Band 7	BW / Mod. :	15MHz / QPSK
Frequency :	2511.5	Channel :	20865

Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 22.APR.2013 10:12:05

Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 0)

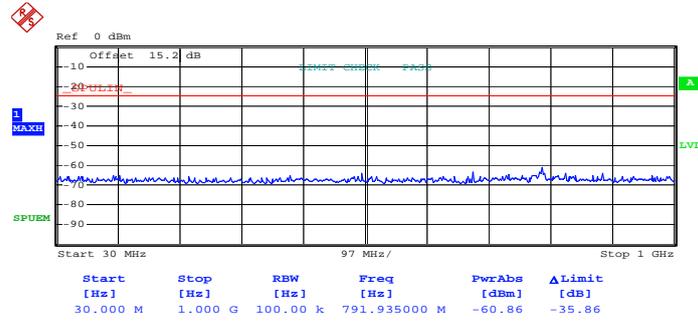


Date: 22.APR.2013 10:11:40



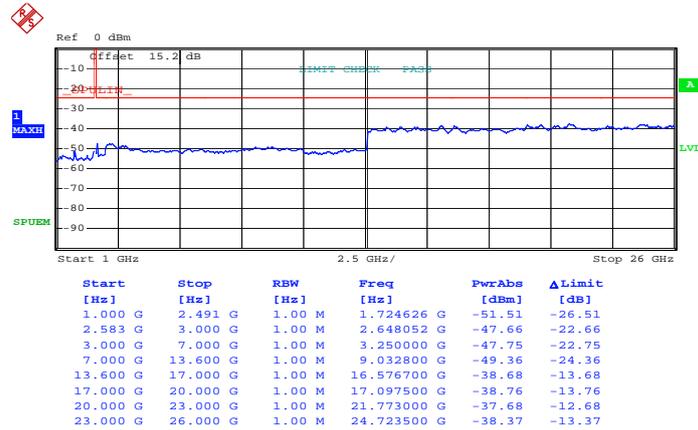
Band :	LTE Band 7	BW / Mod. :	15MHz / QPSK
Frequency :	2529.5	Channel :	21045

Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 22.APR.2013 10:13:20

Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 0)

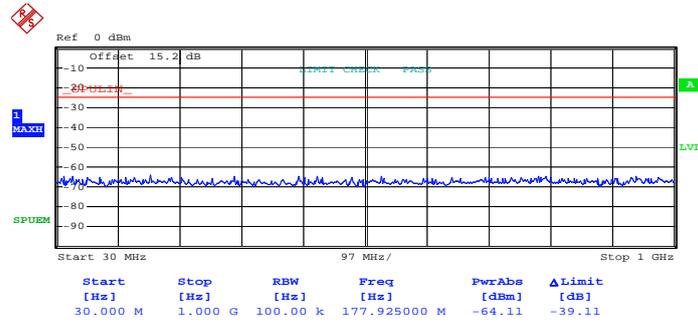


Date: 22.APR.2013 10:13:46



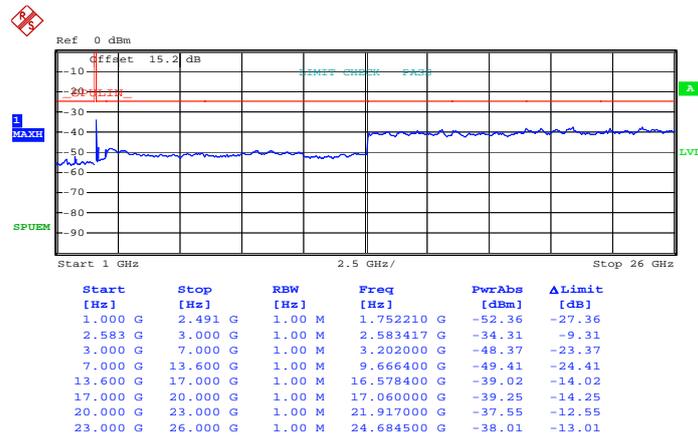
Band :	LTE Band 7	BW / Mod. :	15MHz / QPSK
Frequency :	2562.5	Channel :	21375

Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 22.APR.2013 10:15:54

Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 0)

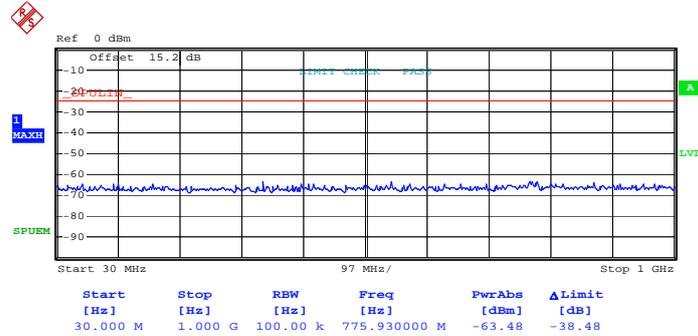


Date: 22.APR.2013 10:15:20



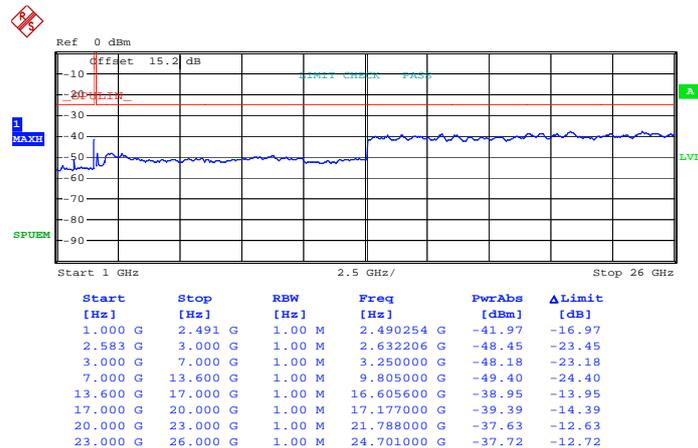
Band :	LTE Band 7	BW / Mod. :	15MHz / 16QAM
Frequency :	2511.5	Channel :	20865

Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 0)



Date: 22.APR.2013 10:12:34

Conducted Emission Plot (1GHz ~ 26GHz) for 16-QAM (RB Size 1, RB Offset 0)

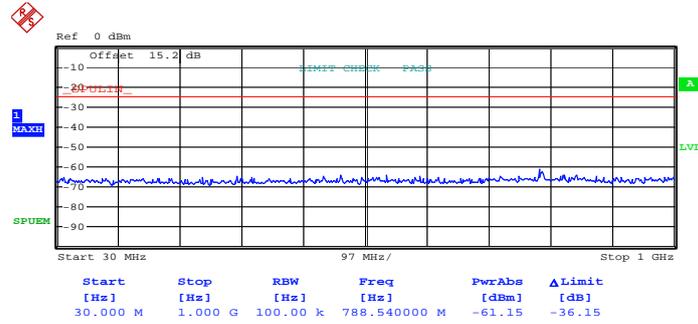


Date: 22.APR.2013 10:11:25



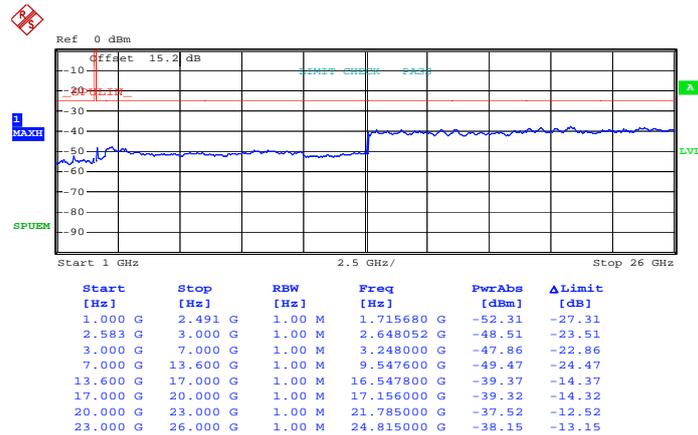
Band :	LTE Band 7	BW / Mod. :	15MHz / 16QAM
Frequency :	2529.5	Channel :	21045

Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 0)



Date: 22.APR.2013 10:13:06

Conducted Emission Plot (1GHz ~ 26GHz) for 16-QAM (RB Size 1, RB Offset 0)

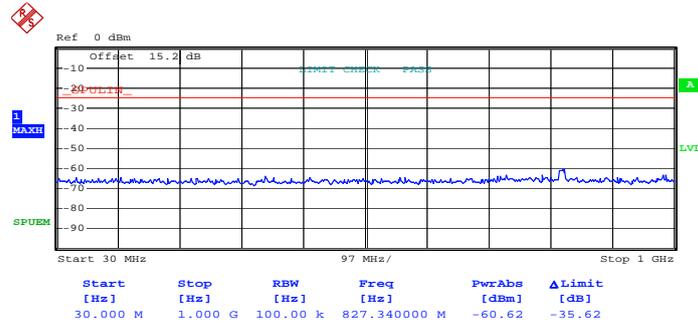


Date: 22.APR.2013 10:14:18



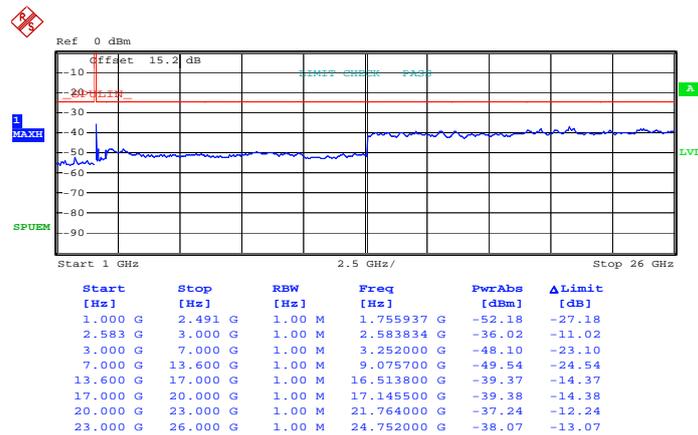
Band :	LTE Band 7	BW / Mod. :	15MHz / 16QAM
Frequency :	2562.5	Channel :	21375

Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 0)



Date: 22.APR.2013 10:16:29

Conducted Emission Plot (1GHz ~ 26GHz) for 16-QAM (RB Size 1, RB Offset 0)

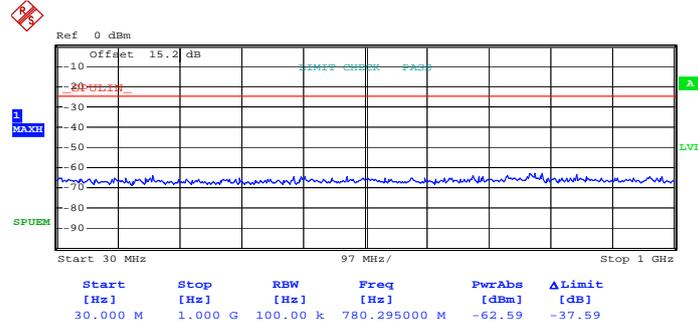


Date: 22.APR.2013 10:15:05



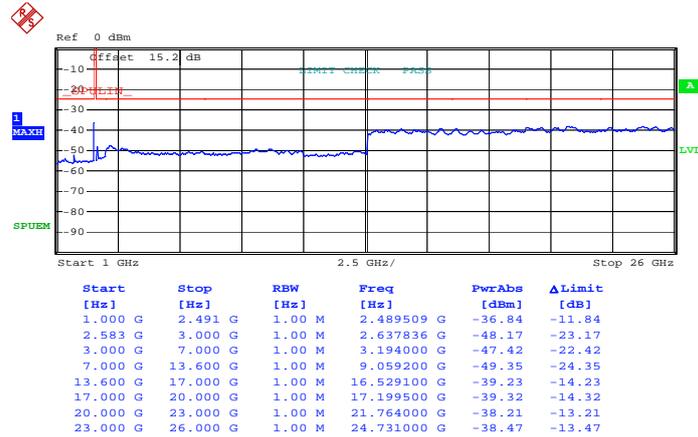
Band :	LTE Band 7	BW / Mod. :	20MHz / QPSK
Frequency :	2514	Channel :	20890

Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 22.APR.2013 10:17:45

Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 0)

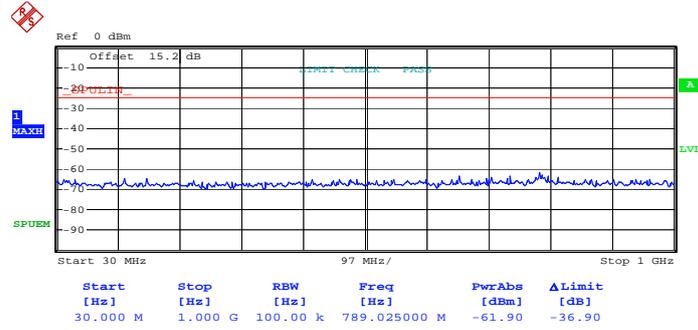


Date: 22.APR.2013 10:18:46



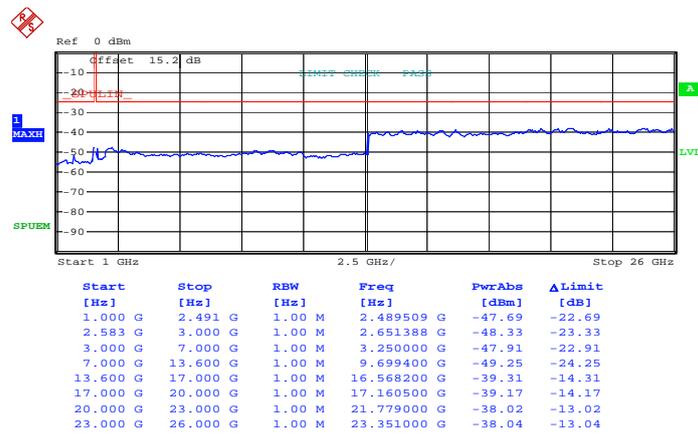
Band :	LTE Band 7	BW / Mod. :	20MHz / QPSK
Frequency :	2527	Channel :	21020

Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 22.APR.2013 10:20:24

Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 0)

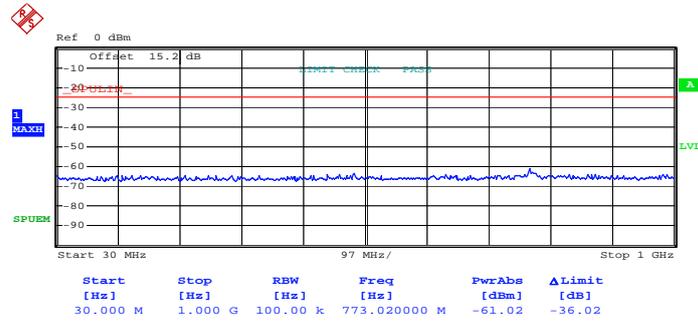


Date: 22.APR.2013 10:19:18



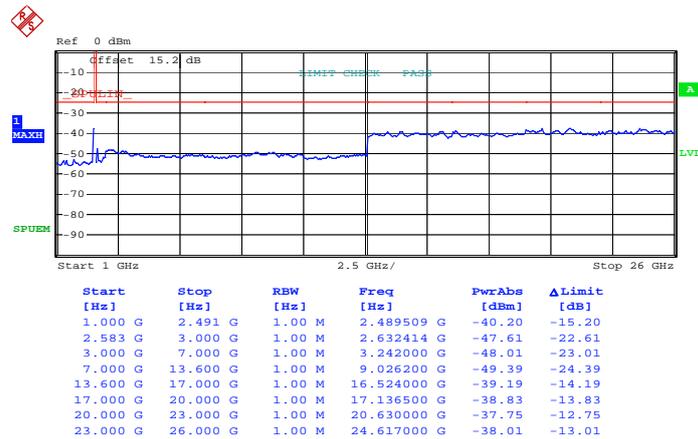
Band :	LTE Band 7	BW / Mod. :	20MHz / 16QAM
Frequency :	2514	Channel :	20890

Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 24)



Date: 22.APR.2013 10:17:15

Conducted Emission Plot (1GHz ~ 26GHz) for 16-QAM (RB Size 1, RB Offset 24)

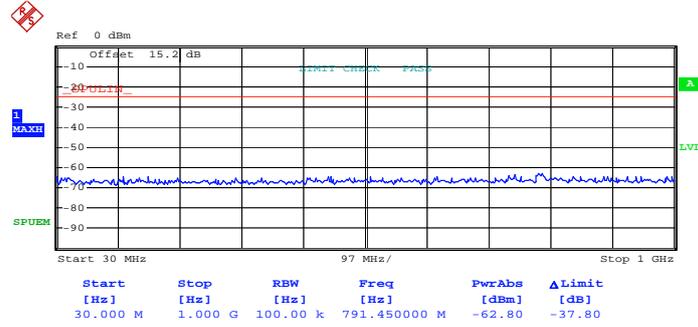


Date: 22.APR.2013 10:18:25



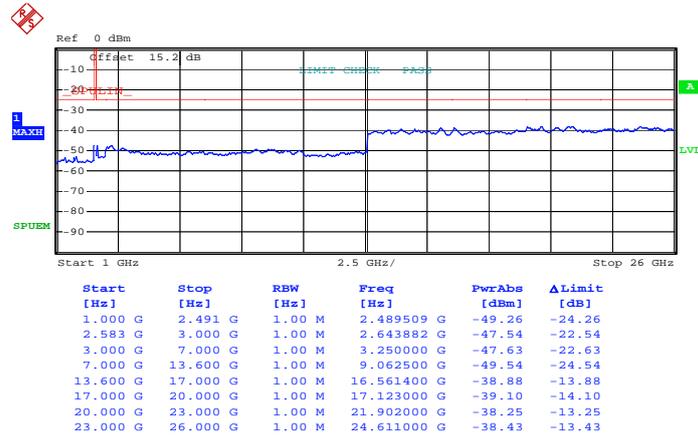
Band :	LTE Band 7	BW / Mod. :	20MHz / 16QAM
Frequency :	2527	Channel :	21020

Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 0)



Date: 22.APR.2013 10:20:10

Conducted Emission Plot (1GHz ~ 26GHz) for 16-QAM (RB Size 1, RB Offset 0)



Date: 22.APR.2013 10:19:41

3.5 Radiated Emissions Measurement

3.5.1 Description of Radiated Emissions 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 mobile digital stations, the attenuation factor shall be not less than $55 + 10 \log (P)$ dB at 5.5 MHz from the channel edges. It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

3.5.2 Measuring Instruments

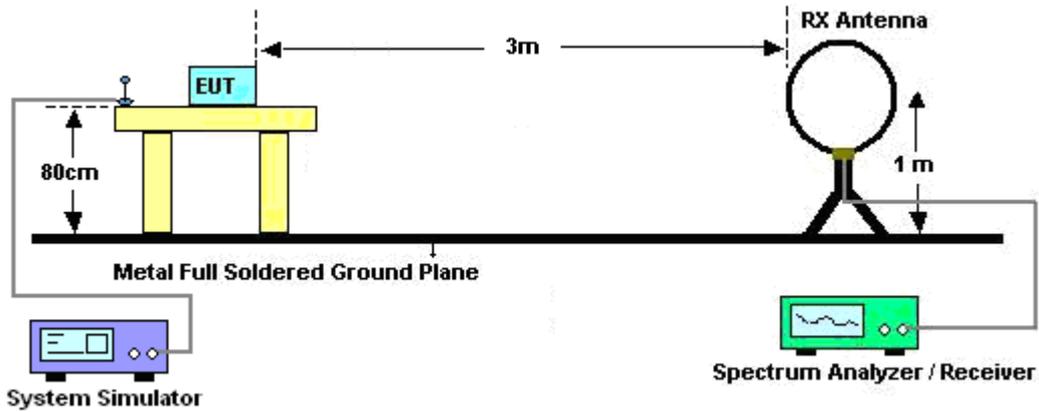
See list of measuring instruments of this test report.

3.5.3 Test Procedures

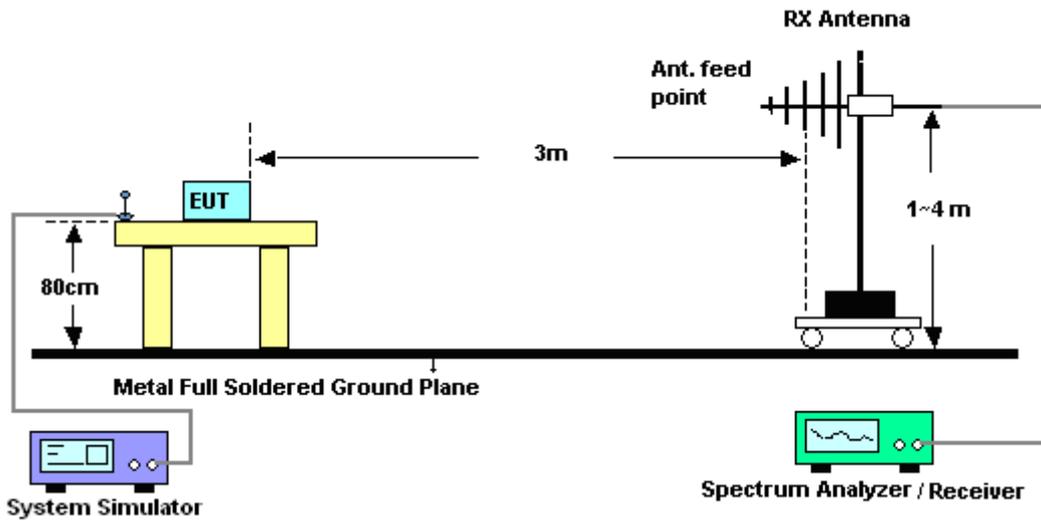
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving 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 = 1MHz, Sweep = 500ms, 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. Emission level (dBm) = output power + substitution Gain.

3.5.4 Test Setup

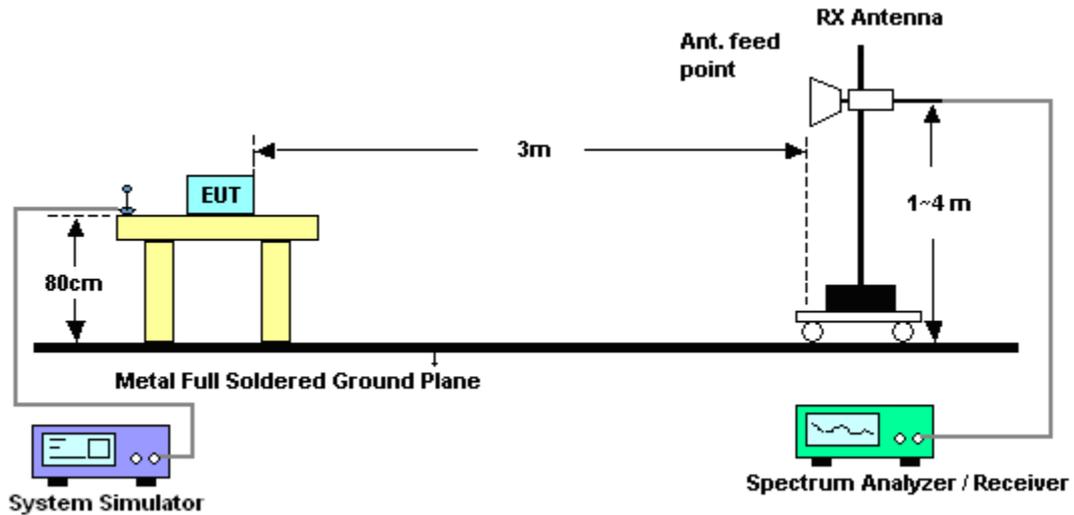
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



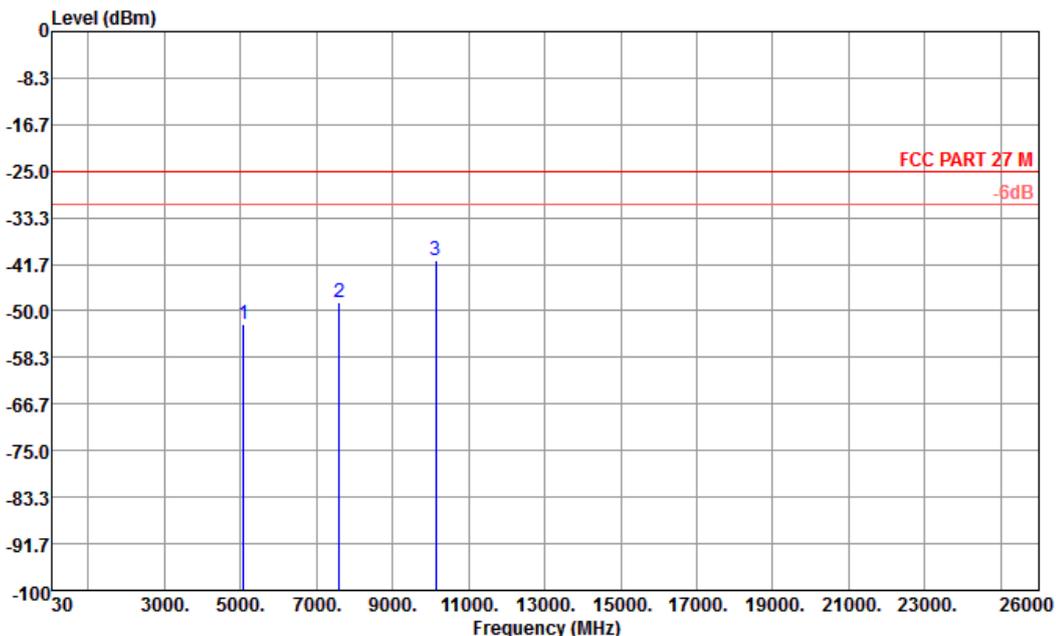
3.5.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.



3.5.6 Test Result of Radiated Emissions

Band :	LTE Band 7	Temperature :	22~23°C
Test Mode :	5MHz, QPSK, RB Size 1, RB Offset 0	Relative Humidity :	41~42%
Test Engineer :	Steven Hao	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



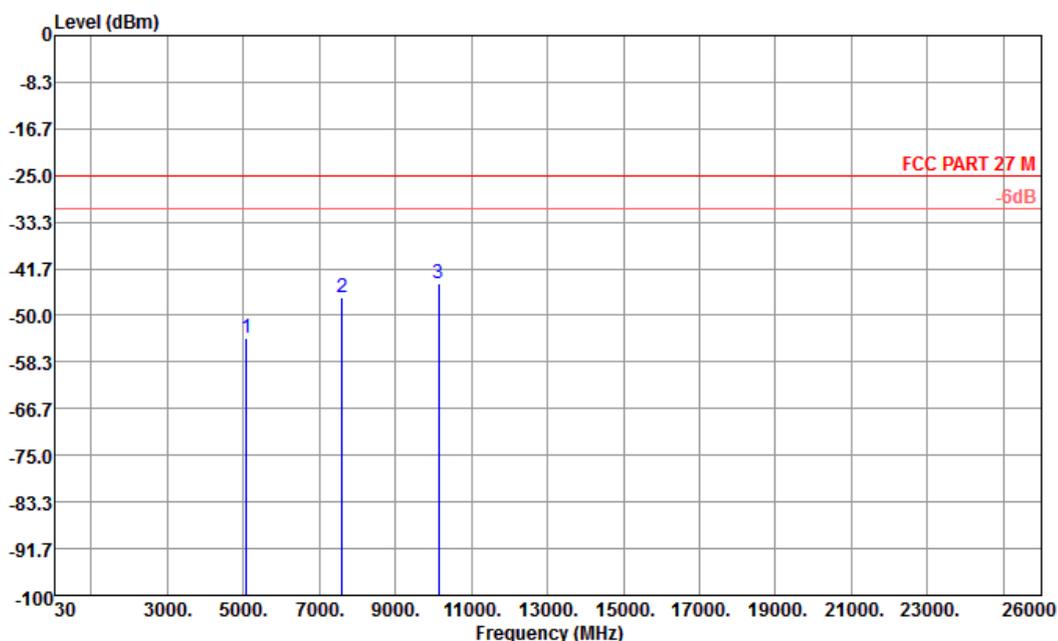
Site : 03CH01-KS
 Condition : FCC PART 27 M HF EIRP FACTOR HORIZONTAL

Plane : E1

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
5069	-52.49	-25	-27.49	-64.01	-53.14	0.57	3.37	H	Pass
7603.5	-48.51	-25	-23.51	-63.61	-50.74	0.78	5.16	H	Pass
10138	-40.91	-25	-15.91	-64.57	-44.55	0.87	6.66	H	Pass



Band :	LTE Band 7	Temperature :	22~23°C
Test Mode :	5MHz, QPSK, RB Size 1, RB Offset 0	Relative Humidity :	41~42%
Test Engineer :	Steven Hao	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



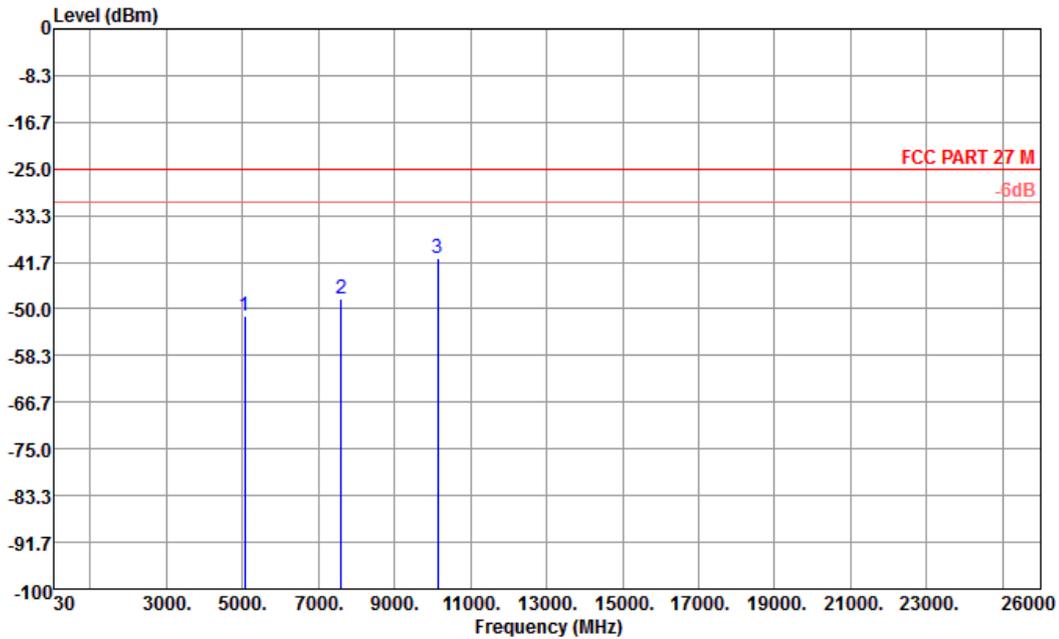
Site : 03CH01-KS
 Condition : FCC PART 27 M HF EIRP FACTOR VERTICAL

Plane : E1

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
5069	-53.93	-25	-28.93	-61.75	-54.58	0.57	3.37	V	Pass
7603.5	-46.75	-25	-21.75	-63.96	-48.98	0.78	5.16	V	Pass
10138	-44.26	-25	-19.26	-64.75	-47.90	0.87	6.66	V	Pass



Band :	LTE Band 7	Temperature :	22~23°C
Test Mode :	10MHz, QPSK, RB Size 1, RB Offset 0	Relative Humidity :	41~42%
Test Engineer :	Steven Hao	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



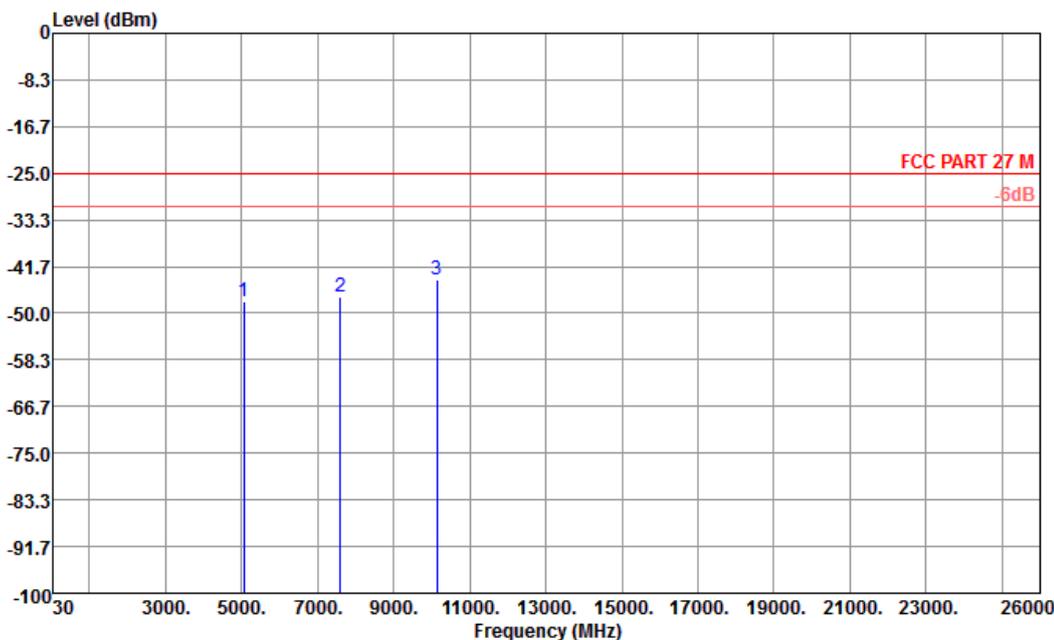
Site : 03CH01-KS
 Condition : FCC PART 27 M HF EIRP FACTOR HORIZONTAL

Plane : E1

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
5064	-51.29	-25	-26.29	-62.81	-51.94	0.57	3.37	H	Pass
7596	-48.27	-25	-23.27	-63.37	-50.50	0.78	5.16	H	Pass
10128	-40.94	-25	-15.94	-64.60	-44.58	0.87	6.66	H	Pass



Band :	LTE Band 7	Temperature :	22~23°C
Test Mode :	10MHz, QPSK, RB Size 1, RB Offset 0	Relative Humidity :	41~42%
Test Engineer :	Steven Hao	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



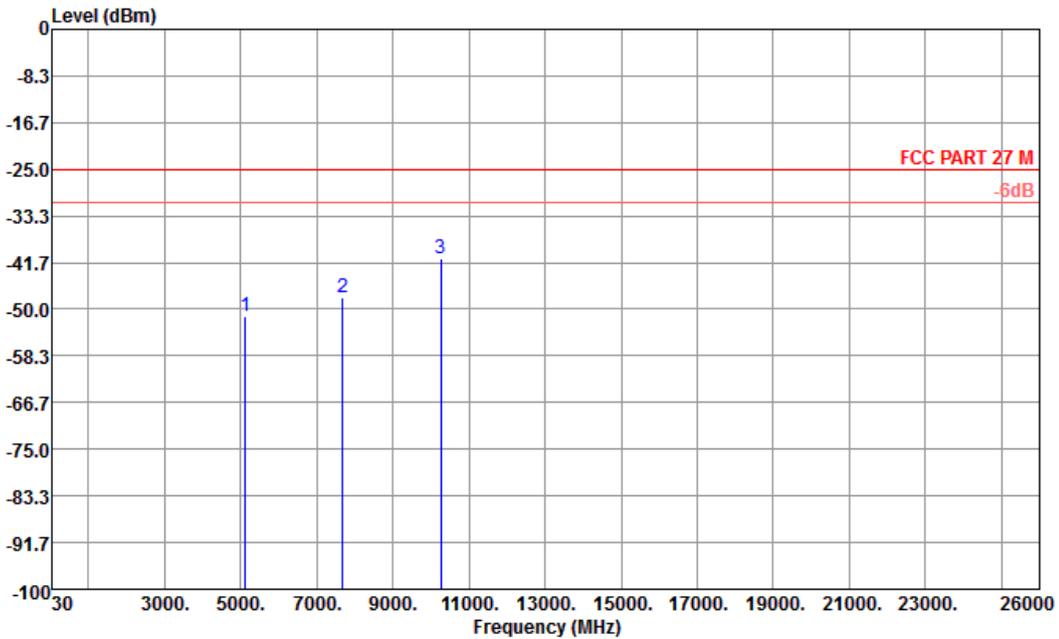
Site : 03CH01-KS
 Condition : FCC PART 27 M HF EIRP FACTOR VERTICAL

Plane : E1

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
5064	-47.91	-25	-22.91	-61.10	-48.56	0.57	3.37	V	Pass
7596	-47.21	-25	-22.21	-64.42	-49.44	0.78	5.16	V	Pass
10128	-43.89	-25	-18.89	-64.38	-47.53	0.87	6.66	V	Pass



Band :	LTE Band 7	Temperature :	22~23°C
Test Mode :	15MHz, QPSK, RB Size 1, RB Offset 0	Relative Humidity :	41~42%
Test Engineer :	Steven Hao	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



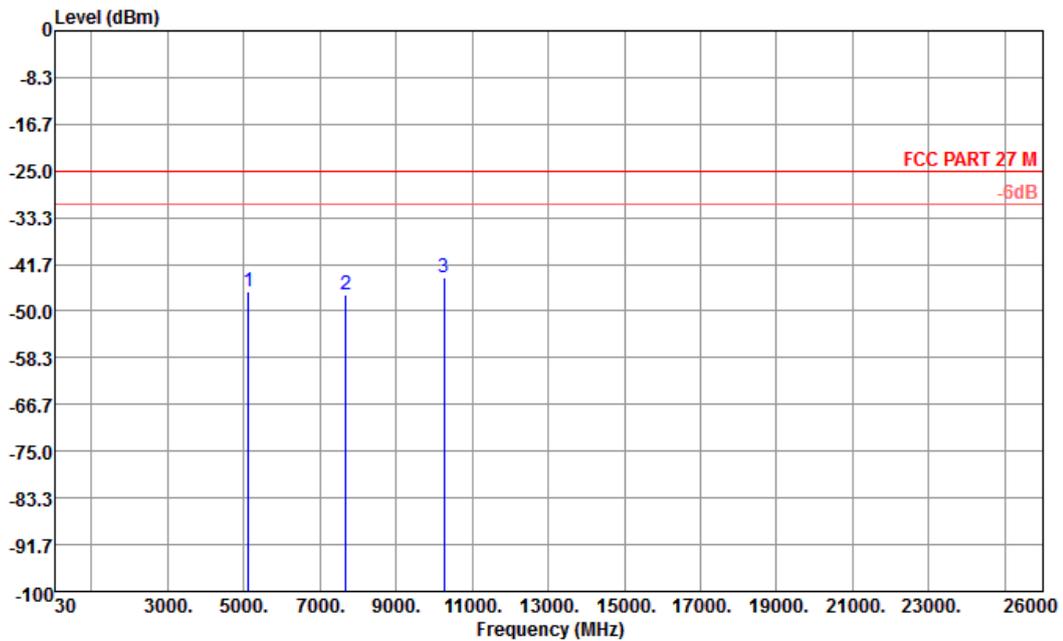
Site : 03CH01-KS
 Condition : FCC PART 27 M HF EIRP FACTOR HORIZONTAL

Plane : E1

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
5125	-51.22	-25	-26.22	-62.85	-51.87	0.57	3.37	H	Pass
7687	-47.90	-25	-22.90	-63.62	-50.13	0.78	5.16	H	Pass
10250	-40.83	-25	-15.83	-64.59	-44.47	0.87	6.66	H	Pass



Band :	LTE Band 7	Temperature :	22~23°C
Test Mode :	15MHz, QPSK, RB Size 1, RB Offset 0	Relative Humidity :	41~42%
Test Engineer :	Steven Hao	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



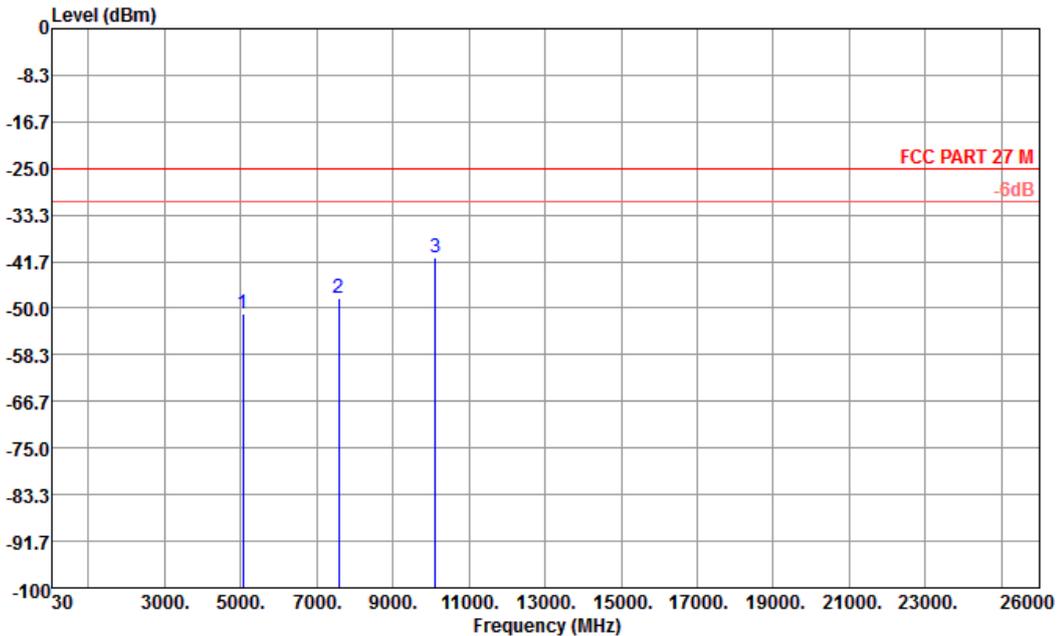
Site : 03CH01-KS
 Condition : FCC PART 27 M HF EIRP FACTOR VERTICAL

Plane : E1

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
5125	-46.41	-25	-21.41	-60.29	-47.06	0.57	3.37	V	Pass
7687	-47.17	-25	-22.17	-64.56	-49.40	0.78	5.16	V	Pass
10250	-43.90	-25	-18.90	-63.70	-47.54	0.87	6.66	V	Pass



Band :	LTE Band 7	Temperature :	22~23°C
Test Mode :	20MHz, QPSK, RB Size 1, RB Offset 0	Relative Humidity :	41~42%
Test Engineer :	Steven Hao	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



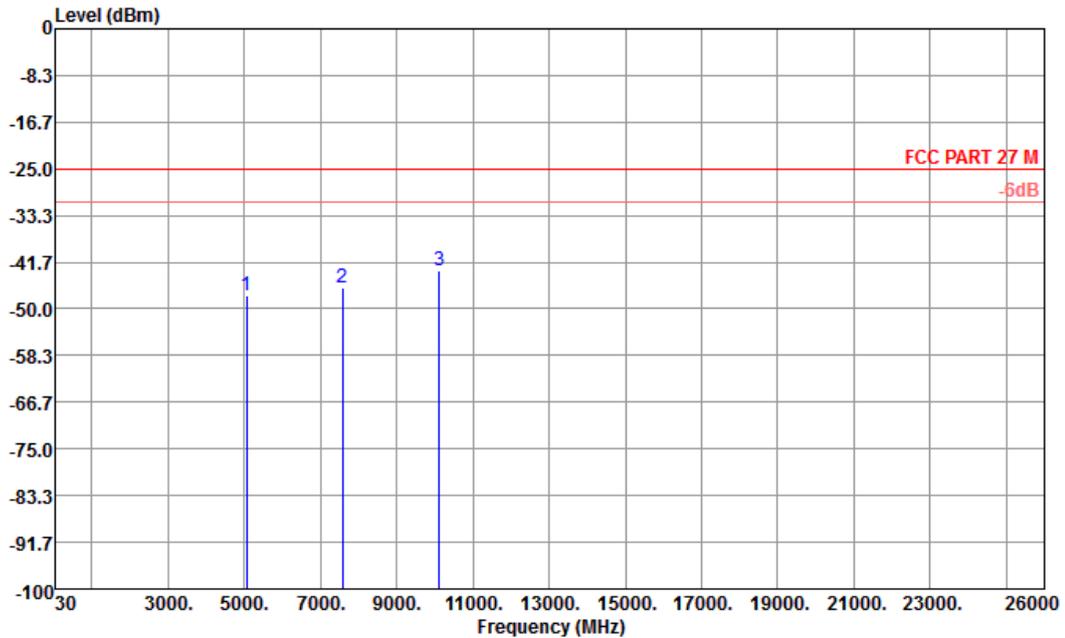
Site : 03CH01-KS
 Condition : FCC PART 27 M HF EIRP FACTOR HORIZONTAL

Plane : E1

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
5054	-51.10	-25	-26.10	-62.62	-51.75	0.57	3.37	H	Pass
7581	-48.20	-25	-23.20	-63.30	-50.43	0.78	5.16	H	Pass
10108	-40.81	-25	-15.81	-64.47	-44.45	0.87	6.66	H	Pass



Band :	LTE Band 7	Temperature :	22~23°C
Test Mode :	20MHz, QPSK, RB Size 1, RB Offset 0	Relative Humidity :	41~42%
Test Engineer :	Steven Hao	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH01-KS
 Condition : FCC PART 27 M HF EIRP FACTOR VERTICAL

Plane : E1

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
5054	-47.73	-25	-22.73	-60.92	-48.38	0.57	3.37	V	Pass
7581	-46.18	-25	-21.18	-63.39	-48.41	0.78	5.16	V	Pass
10108	-43.27	-25	-18.27	-63.76	-46.91	0.87	6.66	V	Pass

3.6 Frequency Stability Measurement

3.6.1 Description of Frequency Stability Measurement

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency band. For equipment authorization purposes, this is a reporting requirement only.

3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

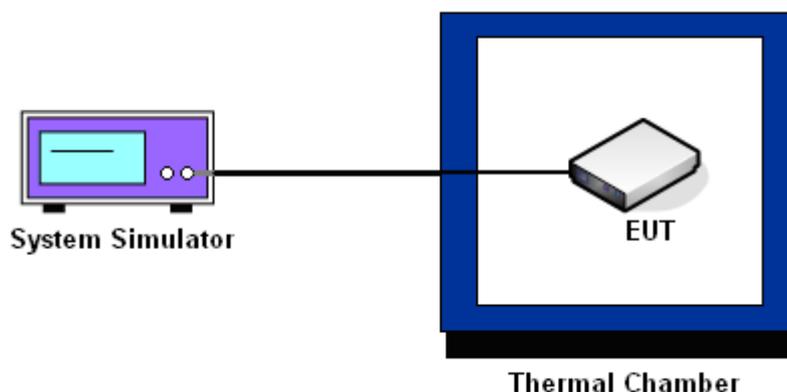
3.6.3 Test Procedures for Temperature Variation

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.
4. If the EUT cannot be turned on at -30°C , the testing lowest temperature will be raised in 10°C step until the EUT can be turned on.

3.6.4 Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at $25\pm 5^{\circ}\text{C}$ 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

3.6.5 Test Setup



3.6.6 Test Result of Temperature Variation

Band :	LTE Band 7	Limit (ppm) :	2.5
Mode :	QPSK		

Temperature (°C)	5MHz		10MHz		15MHz		20MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)							
-30	-9.8	-0.004	5.9	0.002	-8.6	-0.012	19.8	0.008	PASS
-20	-12.0	-0.005	6.2	0.002	10.3	0.015	11.9	0.005	
-10	9.5	0.004	7.5	0.003	-11.0	-0.015	-6.1	-0.002	
0	7.5	0.003	-6.5	-0.003	-8.6	-0.012	6.5	0.003	
10	-9.5	-0.004	-6.9	-0.003	10.3	0.015	8.7	0.003	
20	-6.8	-0.003	7.5	0.003	9.1	0.013	7.4	0.003	
30	-7.3	-0.003	7.7	0.003	10.3	0.015	9.0	0.004	
40	-8.6	-0.003	9.6	0.004	9.8	0.014	8.8	0.003	
50	7.7	0.003	7.5	0.003	-7.5	-0.011	8.1	0.003	
55	10.2	0.004	-6.5	-0.003	-14.2	-0.020	-6.4	-0.003	

Note: The manufacturer declared that the EUT could work properly at temperature 55°C.

Band :	LTE Band 7	Limit (ppm) :	2.5
Mode :	16QAM		

Temperature (°C)	5MHz		10MHz		15MHz		20MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)							
-30	-18.1	-0.007	-7.0	-0.003	8.6	0.012	12.3	0.005	PASS
-20	8.5	0.003	-6.5	-0.003	6.6	0.009	11.5	0.005	
-10	-9.2	-0.004	-6.9	-0.003	-7.1	-0.010	-8.6	-0.003	
0	7.5	0.003	-9.2	-0.004	-9.9	-0.014	10.3	0.004	
10	-16.9	-0.007	7.5	0.003	-8.2	-0.012	9.1	0.004	
20	-8.4	-0.003	8.1	0.003	-10.1	-0.014	7.2	0.003	
30	-16.9	-0.007	7.0	0.003	5.6	0.008	8.5	0.003	
40	8.5	0.003	-9.5	-0.004	7.6	0.011	9.2	0.004	
50	6.2	0.002	-6.8	-0.003	8.2	0.012	8.6	0.003	
55	6.5	0.003	6.2	0.002	11.1	0.016	8.5	0.003	

Note: The manufacturer declared that the EUT could work properly at temperature 55°C.



3.6.7 Test Result of Voltage Variation

Band	Mode	Band Width	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 7	QPSK	5MHz	4.2	-11.6	-0.005	2.5	PASS
			3.7	-9.8	-0.004		
			BEP	-13.4	-0.005		
		10MHz	4.2	-9.6	-0.004		
			3.7	-5.6	-0.002		
			BEP	5.8	0.002		
		15MHz	4.2	-8.7	-0.003		
			3.7	-7.2	-0.003		
			BEP	-4.3	-0.002		
		20MHz	4.2	7.8	0.003		
			3.7	-7.0	-0.003		
			BEP	-10.6	-0.004		
	16QAM	5MHz	4.2	8.5	0.003		
			3.7	6.9	0.003		
			BEP	-7.9	-0.003		
		10MHz	4.2	-8.8	-0.003		
			3.7	6.5	0.003		
			BEP	-7.1	-0.003		
		15MHz	4.2	-11.0	-0.004		
			3.7	9.2	0.004		
			BEP	7.3	0.003		
		20MHz	4.2	-13.0	-0.005		
			3.7	-13.2	-0.005		
			BEP	10.5	0.004		

Remark:

1. Normal Voltage = 3.7V.
2. Battery End Point (BEP) = 3.5 V.



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 29, 2012	Apr. 12, 2013~ Apr. 23, 2013	Dec. 28, 2013	Conducted (TH01-KS)
DC Power Supply	GWINSTEK	GPS-3030D	E1884515	N/A	Aug. 22, 2012	Apr. 12, 2013~ Apr. 23, 2013	Aug. 21, 2013	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 29, 2012	Apr. 12, 2013~ Apr. 23, 2013	Dec. 28, 2013	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 08, 2012	Apr. 24, 2013	Nov. 07, 2013	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	100400	9kHz~30GHz	Jun. 01, 2012	Apr. 24, 2013	May 31, 2013	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 07, 2012	Apr. 24, 2013	Dec. 06, 2013	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 06, 2013	Apr. 24, 2013	Jan. 05, 2014	Radiation (03CH01-KS)
Amplifier	com-power	PA-103A	161069	1MHz~1GHz	Jun. 01, 2012	Apr. 24, 2013	May 31, 2013	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Dec. 29, 2012	Apr. 24, 2013	Dec. 28, 2013	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	9170249	15GHz~40GHz	Nov. 23, 2012	Apr. 24, 2013	Nov. 22, 2013	Radiation (03CH01-KS)
HFH2-Z2 Loop Antenna	R&S	HFH2-Z2	100321	9KHZ-30MHZ	Oct. 22, 2012	Apr. 24, 2013	Oct. 21, 2013	Radiation (03CH01-KS)
Signal Generator	R&S	SMR40	100455	10MHz-40GHz	Dec. 29, 2012	Apr. 24, 2013	Dec. 28, 2013	Radiation (03CH01-KS)
LTE Base Station	Anritsu	MT8820C	6201074235	LTE_FDD full band	Dec. 29, 2012	Apr. 12, 2013~ Apr. 24, 2013	Dec. 28, 2013	-



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))	2.54
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95%(U = 2Uc(y))	4.72
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Appendix A. Photographs of EUT

Please refer to Sporton report number EP312313 as below.