



# FCC RF Test Report

**APPLICANT** : ZTE CORPORATION  
**EQUIPMENT** : LTE/WCDMA FWT  
**BRAND NAME** : ZTE  
**MODEL NAME** : MF28B  
**FCC ID** : Q78-MF28B  
**STANDARD** : 47 CFR Part 2, 27(M)  
**CLASSIFICATION** : PCS Licensed Transmitter (PCB)  
**TX FREQUENCY RANGE** : 2502.5 MHz ~ 2567.5 MHz  
**RX FREQUENCY RANGE** : 2622.5 MHz ~ 2687.5 MHz  
**MAX. EIRP POWER** : 0.3141 W (LTE Band 7, QPSK, BW 5MHz)  
0.3690 W (LTE Band 7, 16QAM, BW 5MHz)  
0.3034 W (LTE Band 7, QPSK, BW 10MHz)  
0.3388 W (LTE Band 7, 16QAM, BW 10MHz)  
0.2877 W (LTE Band 7, QPSK, BW 15MHz)  
0.2388 W (LTE Band 7, 16QAM, BW 15MHz)  
0.3396 W (LTE Band 7, QPSK, BW 20MHz)  
0.2661 W (LTE Band 7, 16QAM, BW 20MHz)  
**EMISSION DESIGNATOR** : 4M52 G7D (LTE Band 7, QPSK, BW 5MHz)  
4M52 D7W (LTE Band 7, 16QAM, BW 5MHz)  
9M16 G7D (LTE Band 7, QPSK, BW 10MHz)  
9M08 D7W (LTE Band 7, 16QAM, BW 10MHz)  
13M6 G7D (LTE Band 7, QPSK, BW 15MHz)  
13M5 D7W (LTE Band 7, 16QAM, BW 15MHz)  
17M9 G7D (LTE Band 7, QPSK, BW 20MHz)  
17M9 D7W (LTE Band 7, 16QAM, BW 20MHz)



The product was received on May 15, 2012 and completely tested on Jun. 21, 2012. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and 47 CFR FCC Part 27 Subpart M 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:

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Jones Tsai / Manager



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



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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	Maximum Output Power	N/A	PASS	-
3.1	§27.50	RSS-199 4.4	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
3.2	§2.1049 §27.53	RSS-199 4.5	Emissions Bandwidth	N/A	PASS	-
3.3	§2.1033 §2.1046 §27.50	RSS-199 4.5	Conducted Band Edge Emissions and Spurious Emissions	< 5.5MHz: -13 dBm ≥5.5MHz: -25 dBm	PASS	-
3.4	§2.1053 §27.53	RSS-199 4.5	Field Strength of Spurious Radiation	-25 dBm	PASS	Under limit 17.11 dB at 7695.000 MHz
3.5	§2.1055 §27.54	RSS-199 4.3	Frequency Stability for 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 & Specification	
Equipment	LTE/WCDMA FWT
Brand Name	ZTE
Model Name	MF28B
FCC ID	Q78-MF28B
Tx Frequency	2502.5 MHz ~ 2567.5 MHz
Rx Frequency	2622.5 MHz ~ 2687.5 MHz
Maximum Output Average Power to Antenna	23.43 dBm
Antenna Type	Monopole Antenna
HW Version	dw8A&dm4A
SW Version	CR_MF28BV1.0.0B01&BD_ROG_MF28BV1.0.0B01
EUT Stage	Production Unit

**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 Emission Designator and Maximum EIRP Power

FCC Rule	System	Type of Modulation	BW	Emission Designator	Maximum EIRP
Part 27	LTE Band 7	QPSK	5MHz	4M52G7D	0.3141 W
Part 27	LTE Band 7	16QAM	5MHz	4M52D7W	0.3690 W
Part 27	LTE Band 7	QPSK	10MHz	9M16G7D	0.3034 W
Part 27	LTE Band 7	16QAM	10MHz	9M08D7W	0.3388 W
Part 27	LTE Band 7	QPSK	15MHz	13M6G7D	0.2877 W
Part 27	LTE Band 7	16QAM	15MHz	13M5D7W	0.2388 W
Part 27	LTE Band 7	QPSK	20MHz	17M9G7D	0.3396 W
Part 27	LTE Band 7	16QAM	20MHz	17M9D7W	0.2661 W

## 1.5 Testing Site

<b>Test Site</b>	SPORTON INTERNATIONAL (KUNSHAN) INC.		
<b>Test Site Location</b>	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958		
<b>Test Site No.</b>	<b>Sporton Site No.</b>		<b>FCC/IC Registration No.</b>
	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)
- RSS-199 issue 1
- ANSI C63.4-2003
- ANSI TIA-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.

## 1.7 Ancillary Equipment List

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.	AC Power Source	Chroma	61602	N/A	N/A	Unshielded, 1.8 m



## 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.

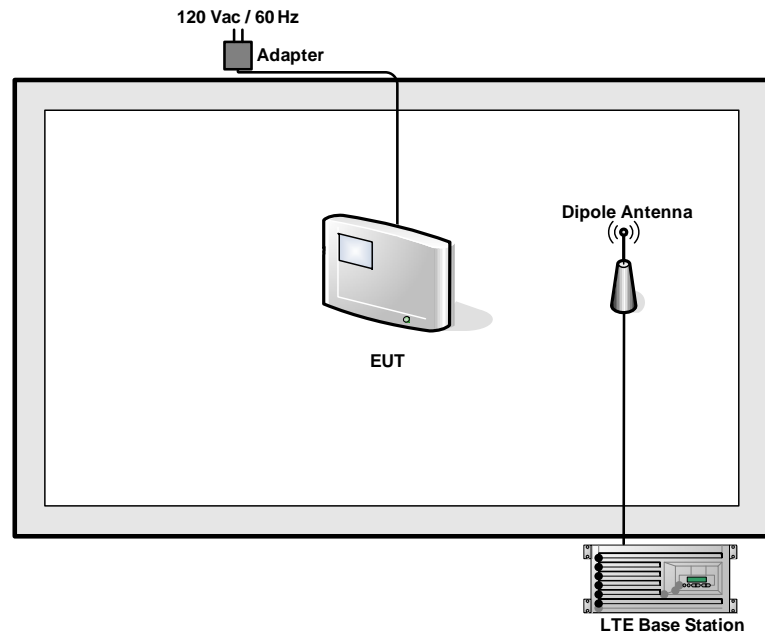
Frequency range investigated for radiated emission: 30MHz to 26000 MHz.

Test Modes			
Band			
		Radiated TCs	
		Conducted TCs	
LTE Band 7	BW 5MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 24) QPSK Link</li> </ul>	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 0)Link</li> <li>■ LTE (RB Size 1, RB Offset 24)Link</li> <li>■ LTE (RB Size 12, RB Offset 6)Link</li> <li>■ LTE (RB Size 25, RB Offset 0)Link</li> </ul>
	BW 10MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 49) QPSK Link</li> </ul>	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 0)Link</li> <li>■ LTE (RB Size 1, RB Offset 49)Link</li> <li>■ LTE (RB Size 25, RB Offset 13)Link</li> <li>■ LTE (RB Size 50, RB Offset 0)Link</li> </ul>
	BW 15MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 74) QPSK Link</li> </ul>	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 0)Link</li> <li>■ LTE (RB Size 1, RB Offset 74)Link</li> <li>■ LTE (RB Size 36, RB Offset 18)Link</li> <li>■ LTE (RB Size 75, RB Offset 0)Link</li> </ul>
	BW 20MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 99) QPSK Link</li> </ul>	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 0) Link</li> <li>■ LTE (RB Size 1, RB Offset 99) Link</li> <li>■ LTE (RB Size 50, RB Offset 25) Link</li> <li>■ LTE (RB Size 100, RB Offset 0) Link</li> </ul>

**Note:**

1. For conducted test, both two Modulations (QPSK and 16QAM) are tested. For RSE, only the maximum RF output power level is chosen.
2. 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



### 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:

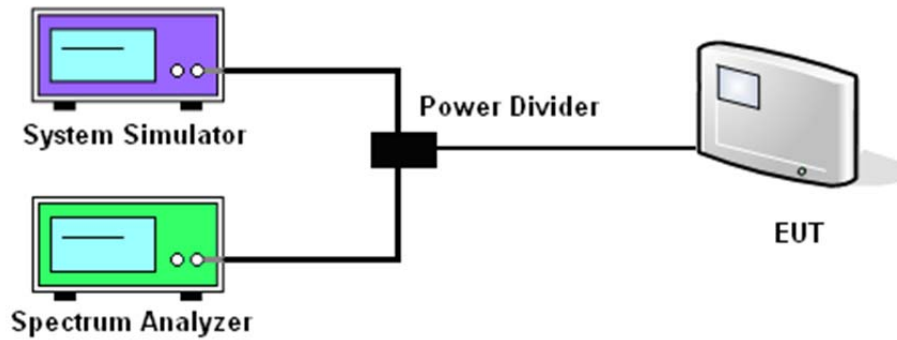
1. The RF output of the transmitter was connected to base station simulator.
2. Set EUT at maximum average power by base station simulator.
3. Measure lowest, middle, and highest channels for each bandwidth and different modulation.

###### For Effective Isotropic Radiated Power Measurement:

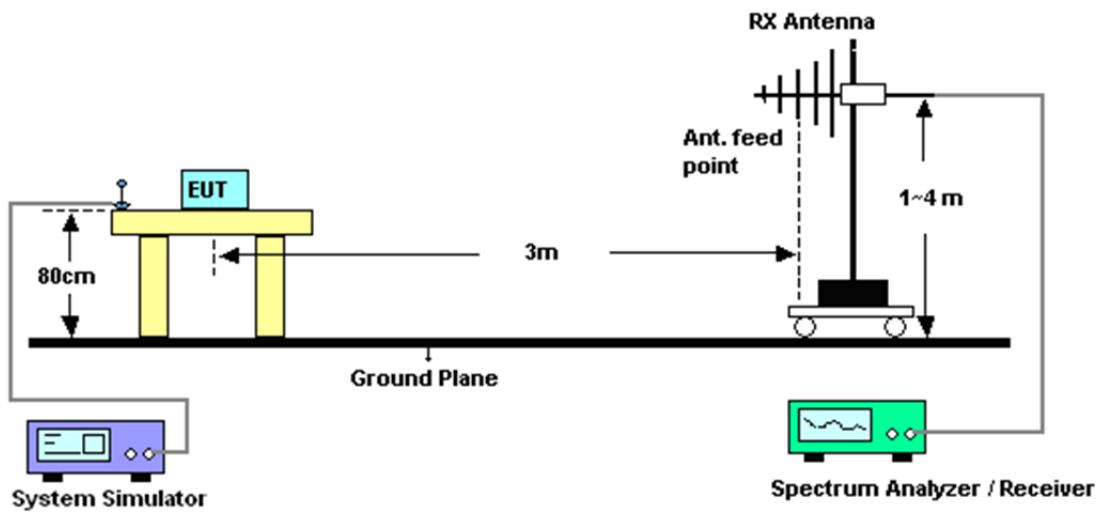
1. The EUT was placed on an non-conductive rotating platform with 0.8 meter height in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m.
2. During the measurement, the EUT was enforced in maximum power. The highest emission was recorded from analyzer power 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 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	Bandwidth	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 7	5MHz	20775	2502.5	QPSK	1	0	23.08	0.2032
					1	24	23.04	0.2014
					12	6	22.25	0.1679
					25	0	22.03	0.1596
				16-QAM	1	0	22.20	0.1660
					1	24	22.07	0.1611
					12	6	21.56	0.1432
					25	0	21.30	0.1349
		21100	2535	QPSK	1	0	22.93	0.1963
					1	24	23.05	0.2018
					12	6	21.91	0.1552
					25	0	21.98	0.1578
				16-QAM	1	0	22.21	0.1663
					<b>1</b>	<b>24</b>	<b>22.32</b>	<b>0.1706</b>
					12	6	21.03	0.1268
					25	0	21.35	0.1365
		21425	2567.5	QPSK	1	0	22.89	0.1945
					<b>1</b>	<b>24</b>	<b>23.10</b>	<b>0.2042</b>
					12	6	22.15	0.1641
					25	0	22.05	0.1603
				16-QAM	1	0	22.08	0.1614
					1	24	21.99	0.1581
					12	6	21.26	0.1337
					25	0	21.15	0.1303



Mode	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 7	10MHz	20800	2505	QPSK	1	0	23.01	0.2000
					1	49	23.05	0.2018
					25	13	21.90	0.1549
					50	0	21.84	0.1528
				16-QAM	<b>1</b>	<b>0</b>	<b>22.33</b>	<b>0.1710</b>
					1	49	22.30	0.1698
					25	13	21.19	0.1315
					50	0	20.99	0.1256
		21100	2535	QPSK	1	0	22.95	0.1972
					1	49	22.81	0.1910
					25	13	21.99	0.1581
					50	0	21.97	0.1574
				16-QAM	1	0	22.18	0.1652
					1	49	22.10	0.1622
					25	13	21.28	0.1343
					50	0	21.13	0.1297
		21400	2565	QPSK	1	0	23.05	0.2018
					<b>1</b>	<b>49</b>	<b>23.08</b>	<b>0.2032</b>
					25	13	22.05	0.1603
					50	0	21.97	0.1574
				16-QAM	1	0	22.20	0.1660
					1	49	22.18	0.1652
					25	13	21.16	0.1306
					50	0	21.07	0.1279



Mode	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 7	15MHz	20825	2507.5	QPSK	1	0	23.07	0.2028
					1	74	23.19	0.2084
					36	18	22.05	0.1603
				16-QAM	75	0	22.04	0.1600
					1	0	22.19	0.1656
					1	74	22.38	0.1730
		21100	2535	QPSK	36	18	21.17	0.1309
					75	0	21.03	0.1268
					1	0	23.05	0.2018
				16-QAM	1	74	23.02	0.2004
					36	18	22.12	0.1629
					75	0	22.09	0.1618
	21375	2562.5	QPSK	1	0	22.17	0.1648	
				1	74	22.17	0.1648	
				36	18	21.31	0.1352	
				16-QAM	75	0	21.11	0.1291
					1	0	22.85	0.1928
					1	74	22.93	0.1963
			QPSK	36	18	21.97	0.1574	
				75	0	22.04	0.1600	
				16-QAM	1	0	21.98	0.1578
					1	74	21.75	0.1496
					36	18	21.06	0.1276
				75	0	20.97	0.1250	



Mode	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 7	20MHz	20850	2510	QPSK	1	0	23.22	0.2099
					<b>1</b>	<b>99</b>	<b>23.43</b>	<b>0.2203</b>
					50	25	22.08	0.1614
					100	0	22.16	0.1644
				16-QAM	1	0	22.42	0.1746
					<b>1</b>	<b>99</b>	<b>22.50</b>	<b>0.1778</b>
					50	25	21.27	0.1340
					100	0	21.22	0.1324
		21100	2535	QPSK	1	0	23.06	0.2023
					1	99	23.12	0.2051
					50	25	22.04	0.1600
					100	0	22.05	0.1603
				16-QAM	1	0	22.36	0.1722
					1	99	22.27	0.1687
					50	25	21.24	0.1330
					100	0	21.22	0.1324
		21350	2560	QPSK	1	0	22.88	0.1941
					1	99	22.56	0.1803
					50	25	22.01	0.1589
					100	0	21.96	0.1570
				16-QAM	1	0	22.10	0.1622
					1	99	21.61	0.1449
					50	25	21.09	0.1285
					100	0	21.11	0.1291



3.1.6 Test Result of Effective Isotropic Radiated Power

LTE Band 7 Radiated Power EIRP for BW 5MHz (QPSK)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
2502.5	-18.22	43.19	24.97	0.3141
2535.0	-17.29	42.05	24.76	0.2992
2567.5	-17.53	41.69	24.16	0.2606
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
2502.5	-22.32	45.08	22.76	0.1888
2535.0	-23.88	45.26	21.38	0.1374
2567.5	-23.36	44.63	21.27	0.1340

LTE Band 7 Radiated Power EIRP for BW 5MHz (16QAM)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
2502.5	-17.52	43.19	25.67	0.3690
2535.0	-17.83	42.05	24.22	0.2642
2567.5	-17.65	41.69	24.04	0.2535
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
2502.5	-23.26	45.08	21.82	0.1521
2535.0	-24.26	45.26	21	0.1259
2567.5	-23.86	44.63	20.77	0.1194



LTE Band 7 Radiated Power EIRP for BW 10MHz (QPSK)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
2505.0	-18.37	43.19	24.82	0.3034
2535.0	-17.71	42.05	24.34	0.2716
2565.0	-17.46	41.69	24.23	0.2649
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
2505.0	-24.70	45.08	20.38	0.1091
2535.0	-23.36	45.26	21.9	0.1549
2565.0	-25.11	44.63	19.52	0.0895

LTE Band 7 Radiated Power EIRP for BW 10MHz (16QAM)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
2505.0	-17.89	43.19	25.3	0.3388
2535.0	-18.69	42.05	23.36	0.2168
2565.0	-18.81	41.69	22.88	0.1941
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
2505.0	-23.80	45.08	21.28	0.1343
2535.0	-23.34	45.26	21.92	0.1556
2565.0	-24.03	44.63	20.6	0.1148



LTE Band 7 Radiated Power EIRP for BW 15MHz (QPSK)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
2507.5	-18.60	43.19	24.59	0.2877
2535.0	-18.61	42.05	23.44	0.2208
2562.5	-18.60	41.69	23.09	0.2037
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
2507.5	-24.50	45.08	20.58	0.1143
2535.0	-23.31	45.26	21.95	0.1567
2562.5	-23.12	44.63	21.51	0.1416

LTE Band 7 Radiated Power EIRP for BW 15MHz (16QAM)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
2507.5	-19.41	43.19	23.78	0.2388
2535.0	-18.94	42.05	23.11	0.2046
2562.5	-18.91	41.69	22.78	0.1897
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
2507.5	-24.48	45.08	20.6	0.1148
2535.0	-23.82	45.26	21.44	0.1393
2562.5	-24.06	44.63	20.57	0.1140



LTE Band 7 Radiated Power EIRP for BW 20MHz (QPSK)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
2510.0	-17.88	43.19	25.31	0.3396
2535.0	-19.16	42.05	22.89	0.1945
2560.0	-19.08	41.69	22.61	0.1824
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
2510.0	-22.03	45.08	23.05	0.2018
2535.0	-22.28	45.26	22.98	0.1986
2560.0	-23.77	44.63	20.86	0.1219

LTE Band 7 Radiated Power EIRP for BW 20MHz (16QAM)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
2510.0	-18.94	43.19	24.25	0.2661
2535.0	-19.64	42.05	22.41	0.1742
2560.0	-20.36	41.69	21.33	0.1358
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
2510.0	-24.14	45.08	20.94	0.1242
2535.0	-24.02	45.26	21.24	0.1330
2560.0	-25.16	44.63	19.47	0.0885

## 3.2 Emission Bandwidth

### 3.2.1 Description of Emission Bandwidth Measurement

The 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.

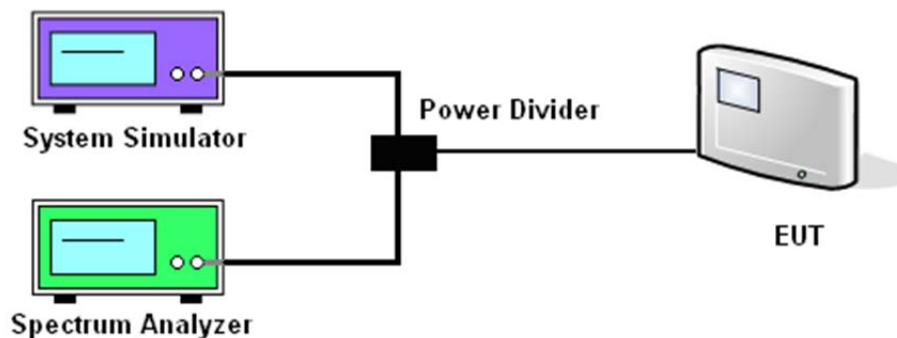
### 3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.2.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and 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.

### 3.2.4 Test Setup





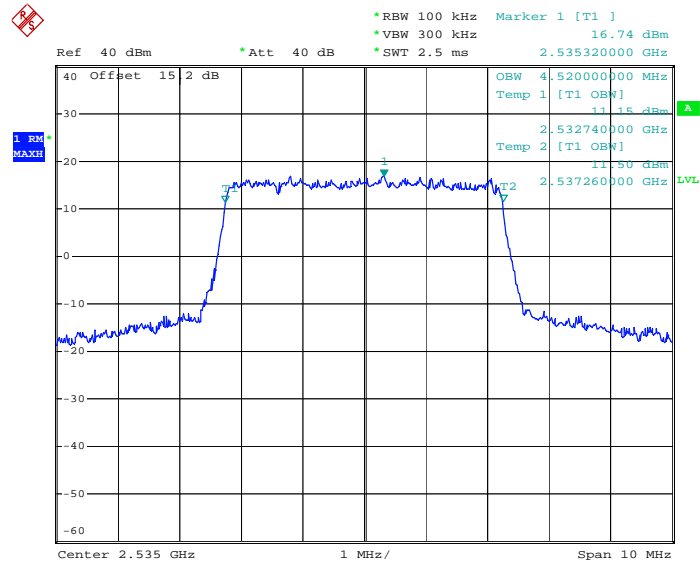
3.2.6 Test Result of 99% Occupied Bandwidth and 26dB Bandwidth

Band	Band Width	Channel	Frequency (MHz)	Modulation	99%Bandwidth (MHz)	26dB Bandwidth (MHz)
LTE Band 7	5MHz	21100	2535	QPSK	4.52	5.14
				16-QAM	4.52	5.08
	10MHz	21100	2535	QPSK	9.16	10.08
				16-QAM	9.08	10.04
	15MHz	21100	2535	QPSK	13.62	14.70
				16-QAM	13.50	14.70
	20MHz	21100	2535	QPSK	17.92	19.36
				16-QAM	17.92	19.20

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

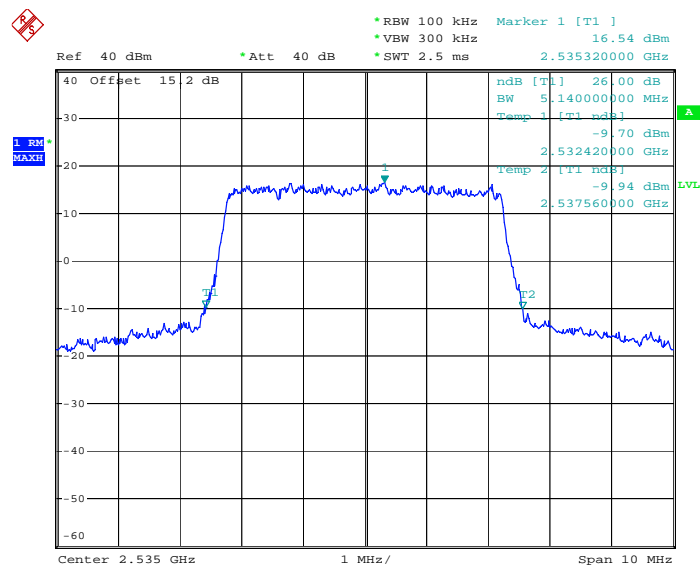
Band :	LTE Band 7	BW / Mod. :	5MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 21100



Date: 8.JUN.2012 15:07:49

26dB Bandwidth Plot on Channel 21100

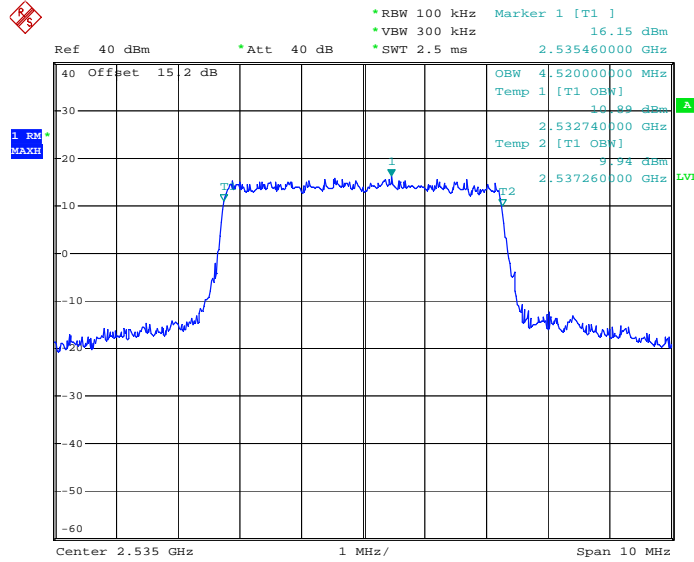


Date: 8.JUN.2012 13:45:07



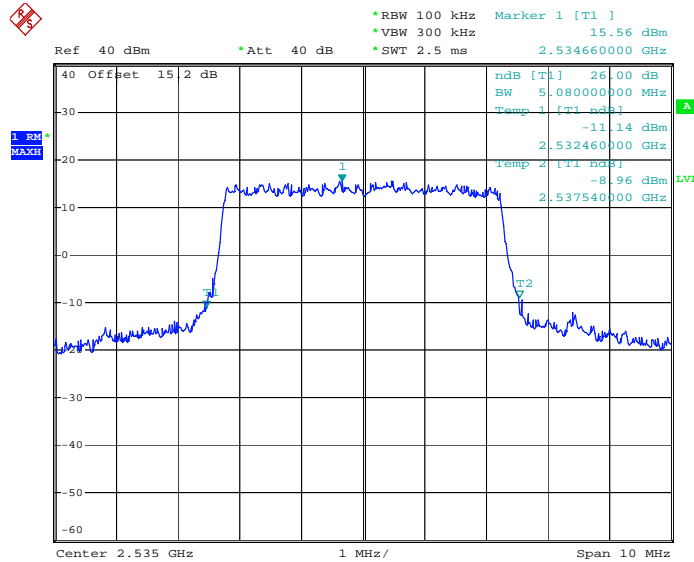
Band :	LTE Band 7	BW / Mod. :	5MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 21100



Date: 8.JUN.2012 15:08:38

26dB Bandwidth Plot on Channel 21100



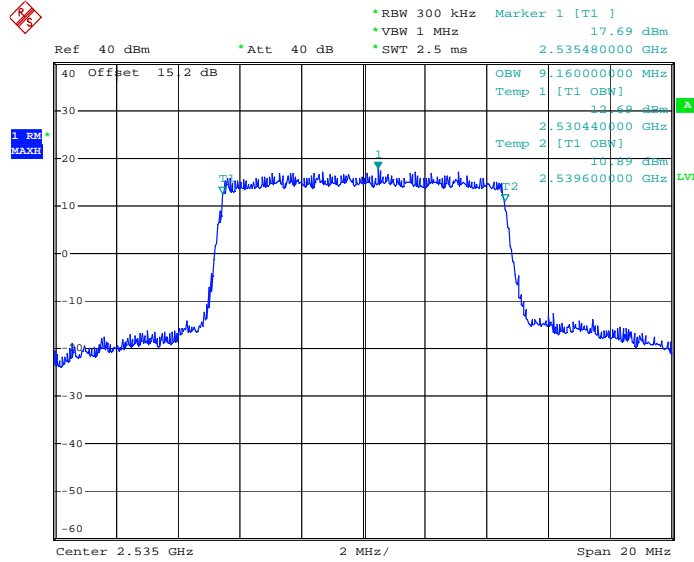
Date: 8.JUN.2012 13:46:01





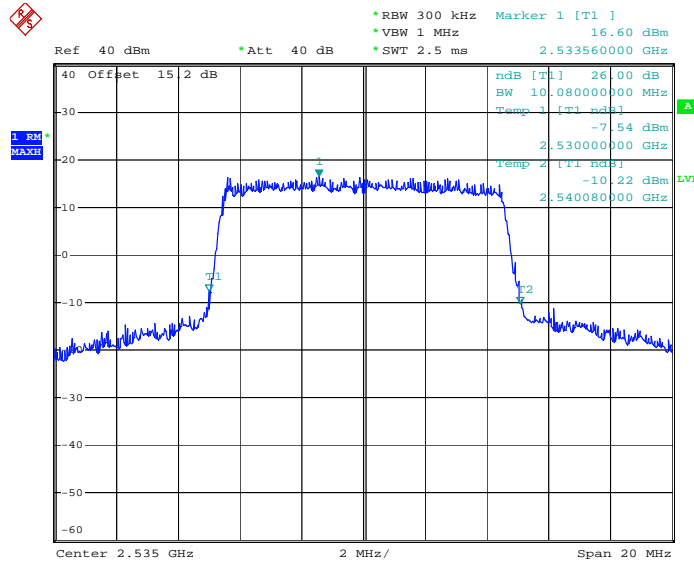
Band :	LTE Band 7	BW / Mod. :	10MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 21100



Date: 8.JUN.2012 14:42:34

26dB Bandwidth Plot on Channel 21100

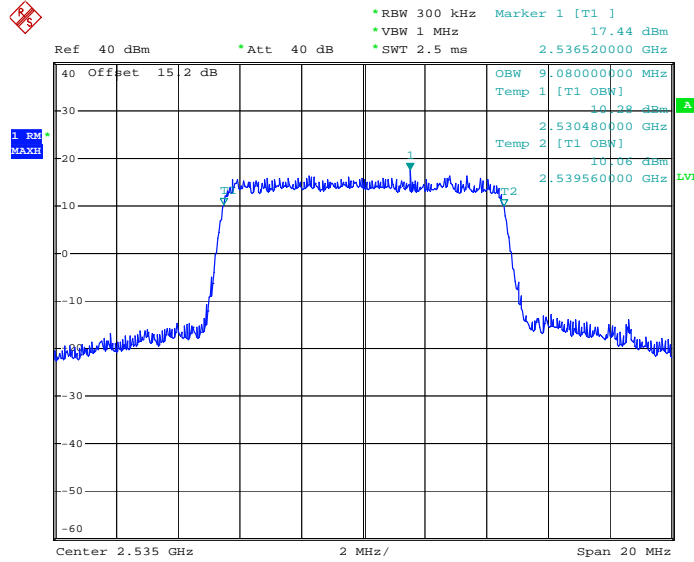


Date: 8.JUN.2012 13:52:44



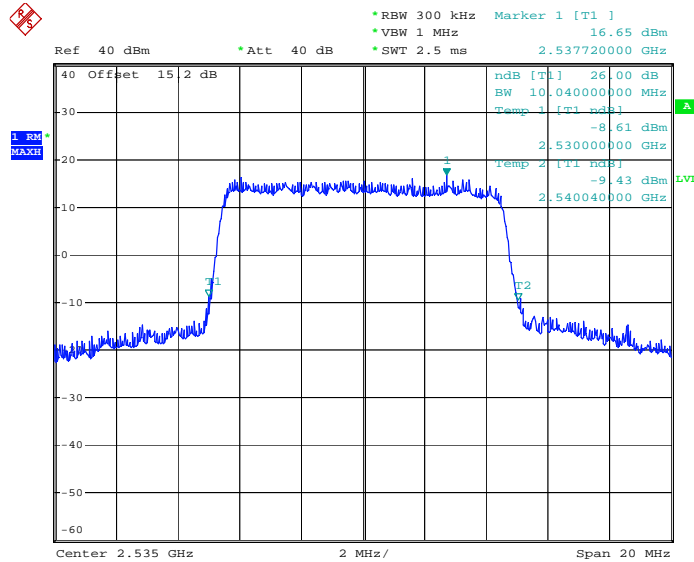
Band :	LTE Band 7	BW / Mod. :	10MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 21100



Date: 8.JUN.2012 14:43:32

26dB Bandwidth Plot on Channel 21100

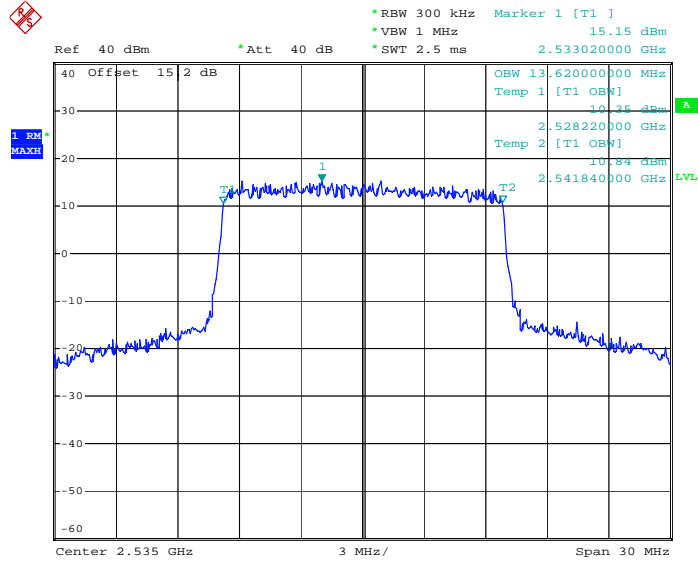


Date: 8.JUN.2012 13:51:59



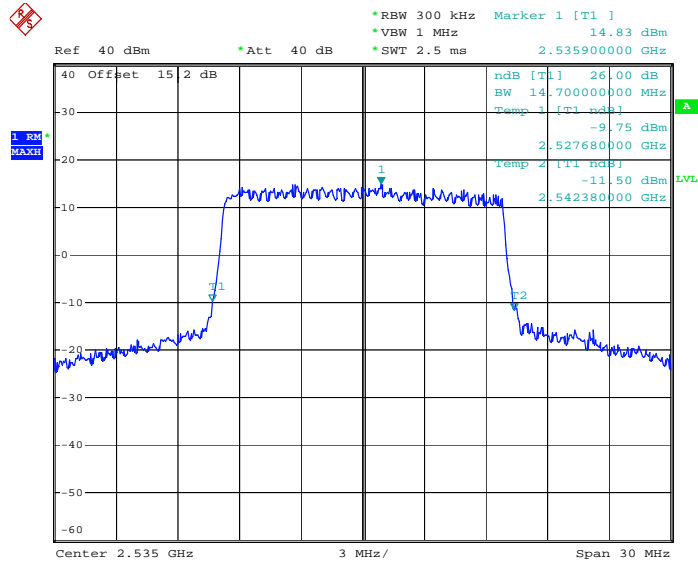
Band :	LTE Band 7	BW / Mod. :	15MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 21100



Date: 8.JUN.2012 14:28:04

26dB Bandwidth Plot on Channel 21100

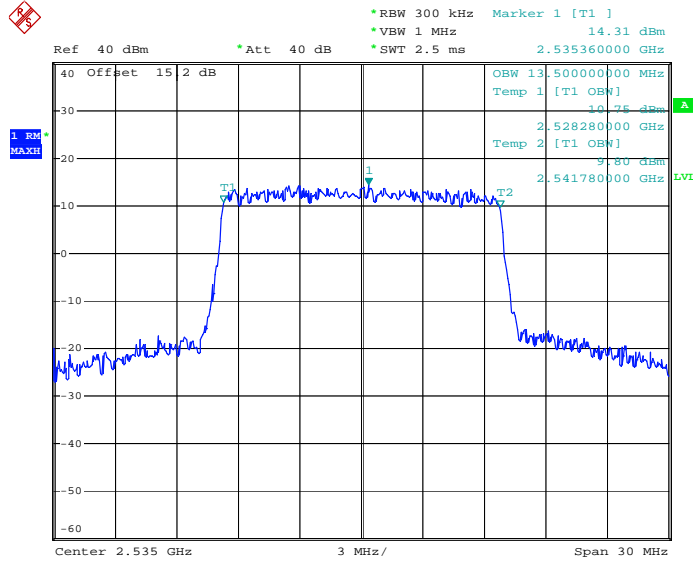


Date: 8.JUN.2012 13:59:21



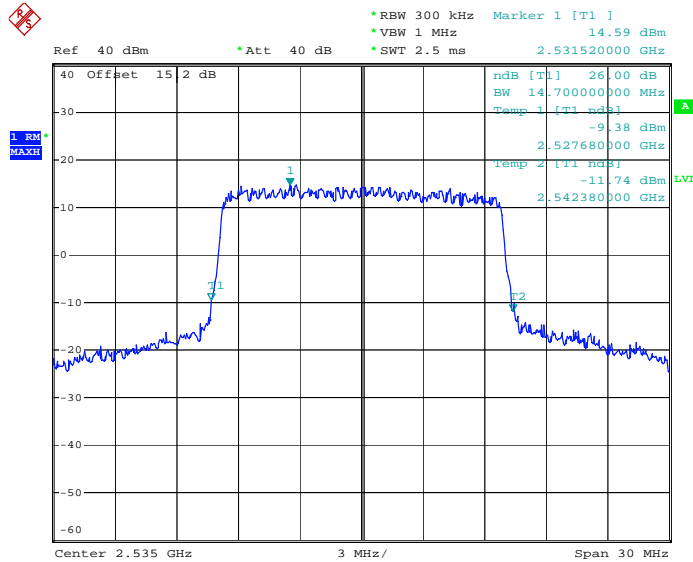
Band :	LTE Band 7	BW / Mod. :	15MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 2100



Date: 8.JUN.2012 14:27:21

26dB Bandwidth Plot on Channel 2100

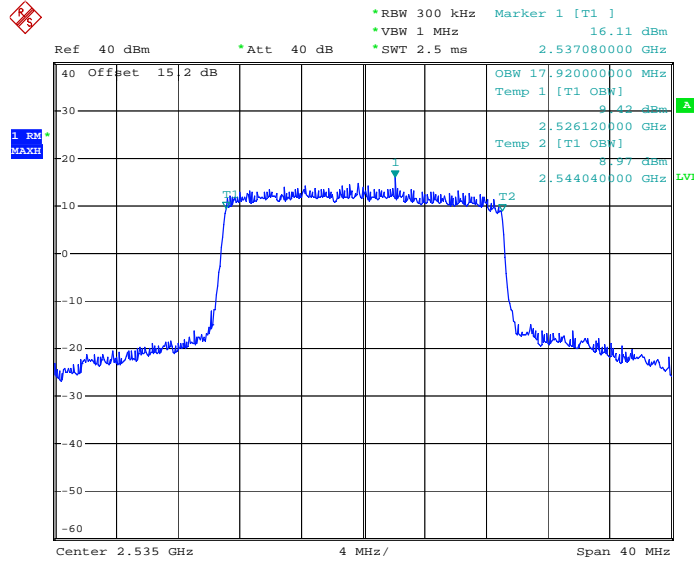


Date: 8.JUN.2012 13:56:42



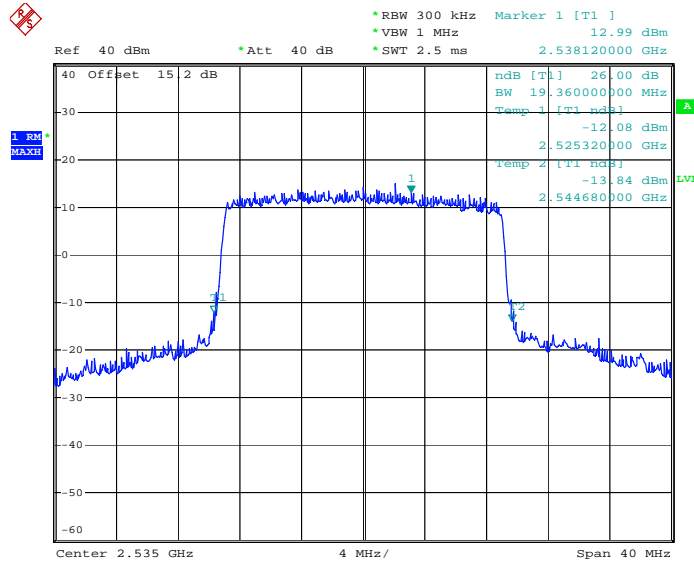
<b>Band :</b>	LTE Band 7	<b>BW / Mod. :</b>	20MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 21100



Date: 8.JUN.2012 14:09:17

26dB Bandwidth Plot on Channel 21100

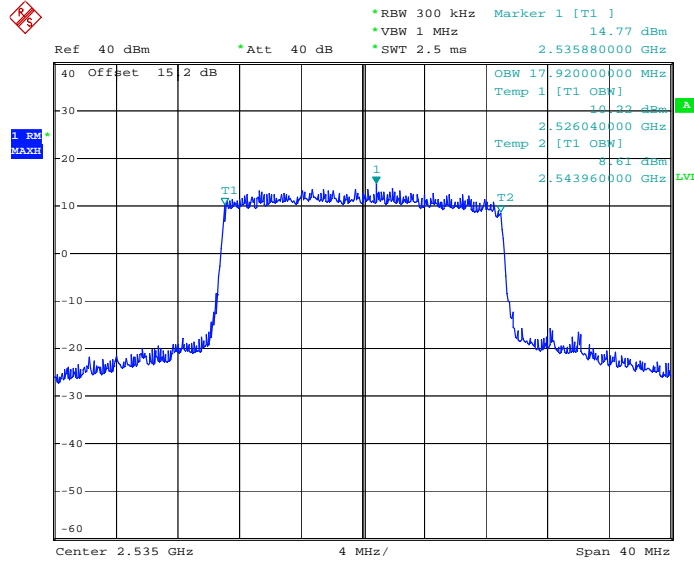


Date: 8.JUN.2012 14:02:49



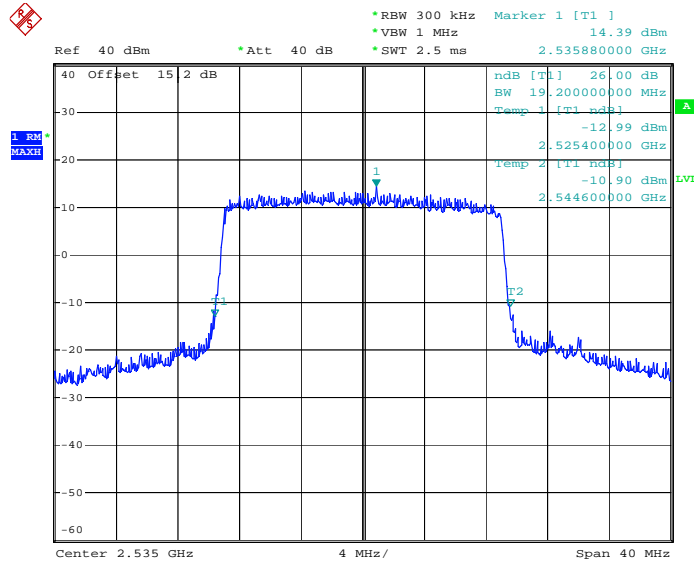
Band :	LTE Band 7	BW / Mod. :	20MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 21100



Date: 8.JUN.2012 14:08:24

26dB Bandwidth Plot on Channel 21100



Date: 8.JUN.2012 14:04:31

### 3.3 Conducted Band Edge and Spurious Emission Measurement

#### 3.3.1 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 10<sup>th</sup> harmonic.

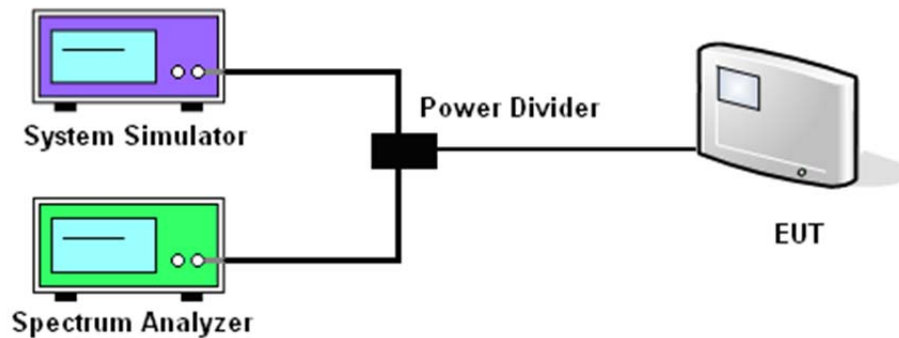
#### 3.3.2 Measuring Instruments

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 conducted spurious emission for the whole frequency range was taken.

#### 3.3.4 Test Setup

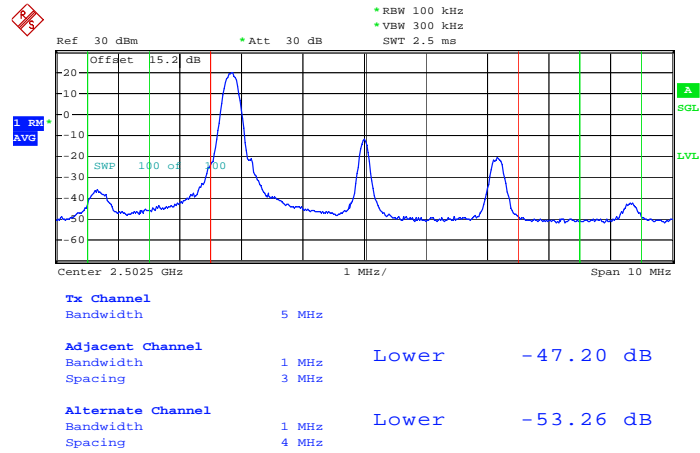




### 3.3.5 Test Plots of Conducted Band-Edge Emission

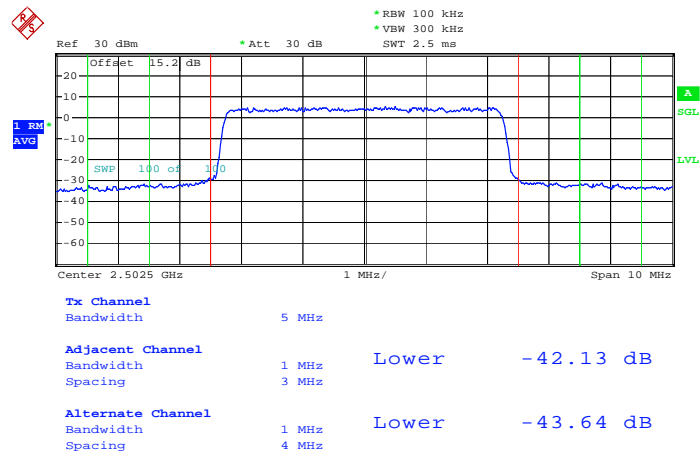
<b>Band :</b>	LTE Band 7	<b>Band Width</b>	5MHz / QPSK
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 16.JUN.2012 13:43:32

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

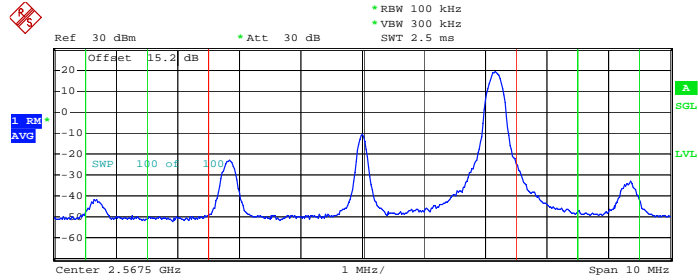


Date: 16.JUN.2012 13:48:28





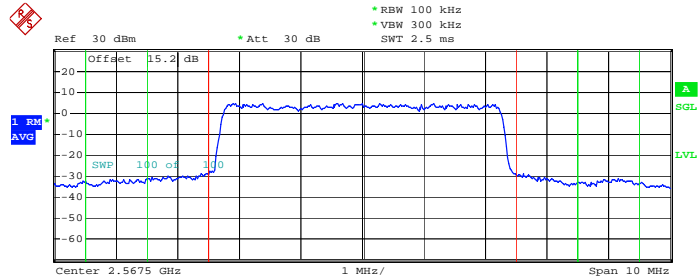
Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24



<b>Tx Channel</b>			
Bandwidth	5 MHz		
<b>Adjacent Channel</b>			
Bandwidth	1 MHz		
Spacing	3 MHz	Upper	-46.64 dB
<b>Alternate Channel</b>			
Bandwidth	1 MHz		
Spacing	4 MHz	Upper	-51.07 dB

Date: 16.JUN.2012 14:36:25

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



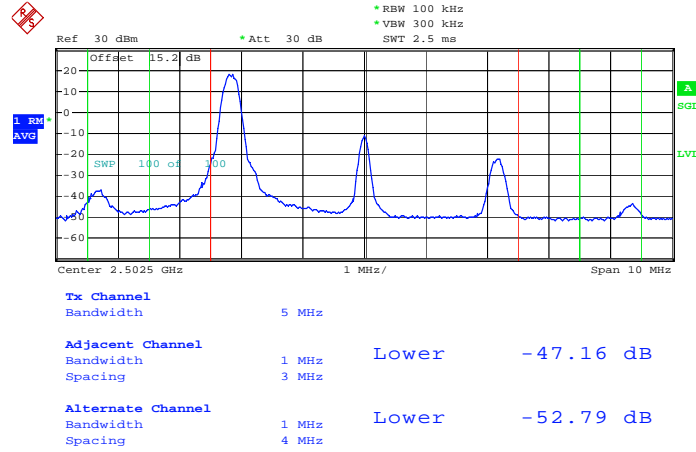
<b>Tx Channel</b>			
Bandwidth	5 MHz		
<b>Adjacent Channel</b>			
Bandwidth	1 MHz		
Spacing	3 MHz	Upper	-41.09 dB
<b>Alternate Channel</b>			
Bandwidth	1 MHz		
Spacing	4 MHz	Upper	-42.43 dB

Date: 16.JUN.2012 14:03:43



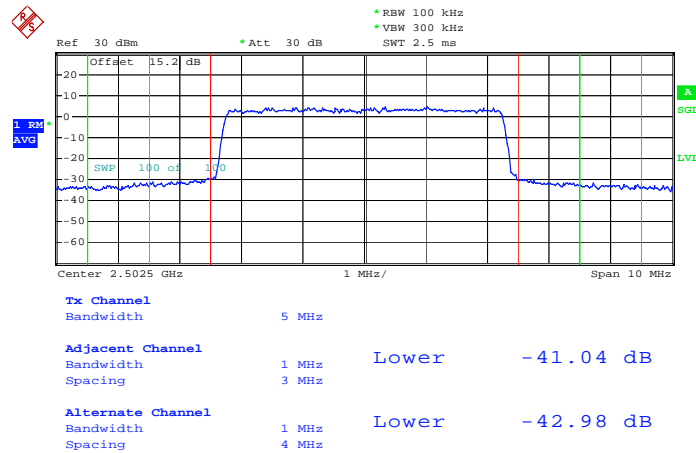
Band :	LTE Band 7	Band Width	5MHz / 16QAM
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Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



Date: 16.JUN.2012 13:44:16

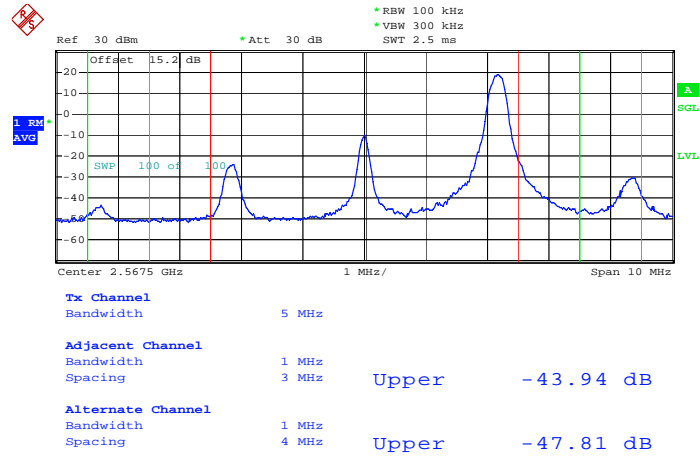
Lower Band Edge Plot for 16QAM -RB Size 25, RB Offset 0



Date: 16.JUN.2012 13:47:26

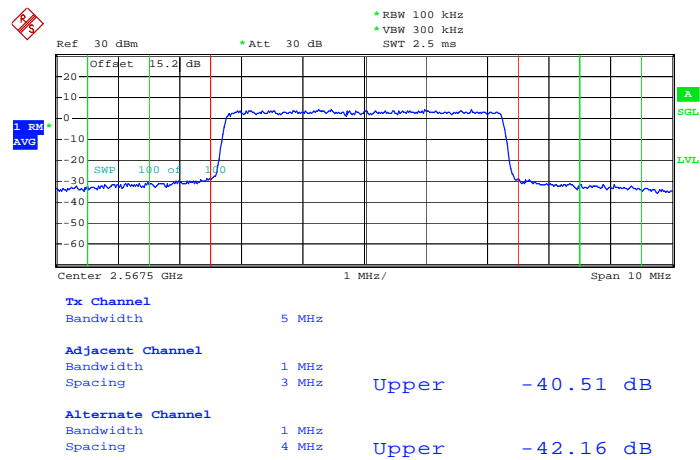


Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 24



Date: 16.JUN.2012 14:06:29

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

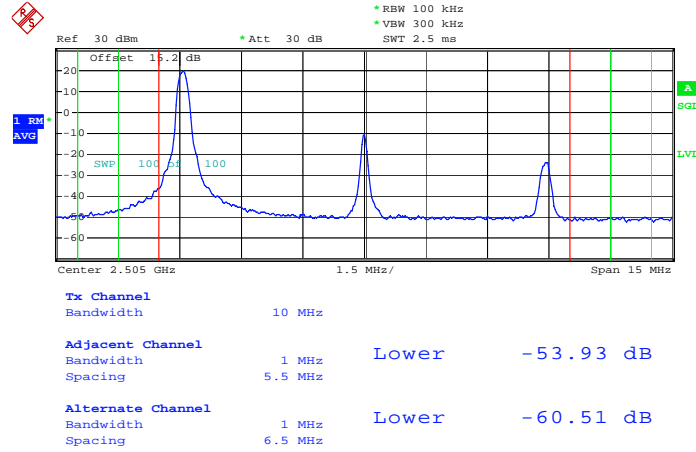


Date: 16.JUN.2012 14:05:51



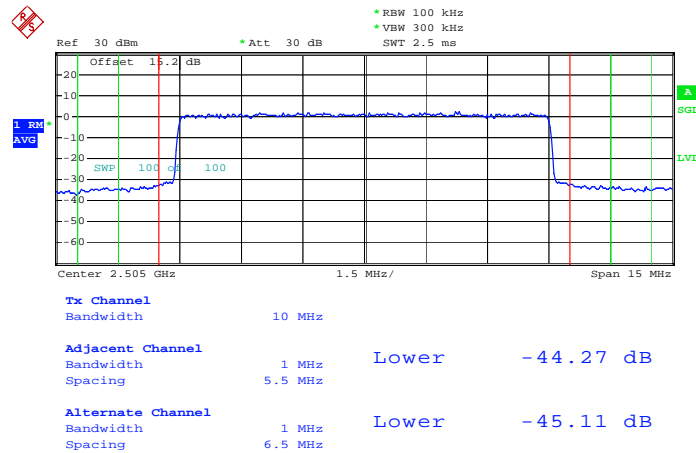
Band :	LTE Band 7	Band Width	10MHz / QPSK
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 16.JUN.2012 14:44:01

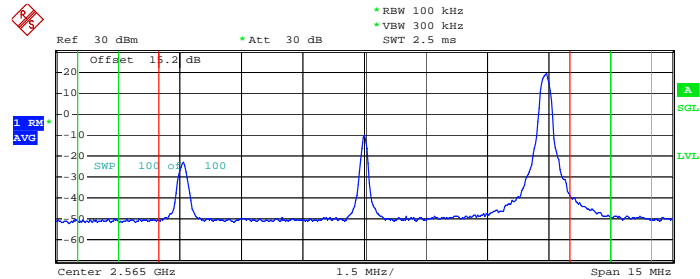
Lower Band Edge Plot for QPSK-RB Size 50, RB Offset 0



Date: 16.JUN.2012 14:45:18



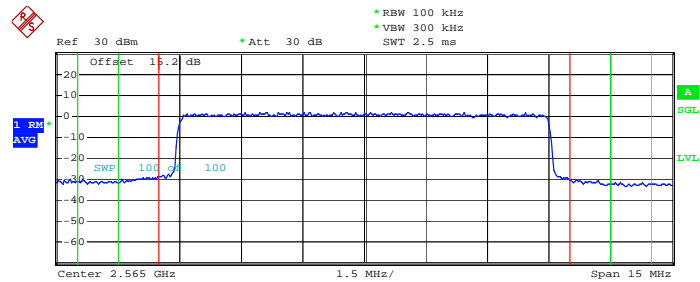
Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 49



<b>Tx Channel</b>			
Bandwidth	10 MHz		
<b>Adjacent Channel</b>			
Bandwidth	1 MHz		
Spacing	5.5 MHz	Upper	-55.05 dB
<b>Alternate Channel</b>			
Bandwidth	1 MHz		
Spacing	6.5 MHz	Upper	-60.61 dB

Date: 16.JUN.2012 14:42:30

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



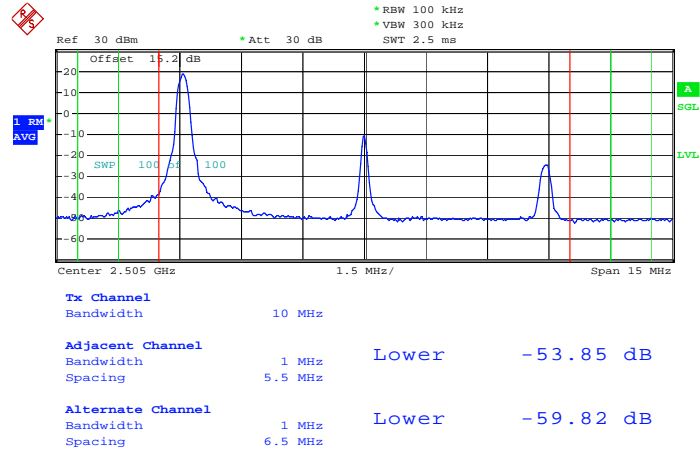
<b>Tx Channel</b>			
Bandwidth	10 MHz		
<b>Adjacent Channel</b>			
Bandwidth	1 MHz		
Spacing	5.5 MHz	Upper	-41.53 dB
<b>Alternate Channel</b>			
Bandwidth	1 MHz		
Spacing	6.5 MHz	Upper	-42.59 dB

Date: 16.JUN.2012 14:40:25



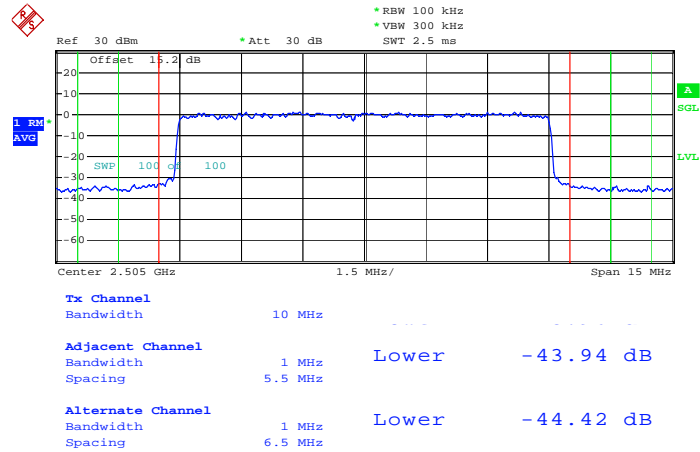
<b>Band :</b>	LTE Band 7	<b>Band Width</b>	10MHz / 16QAM
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Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



Date: 16.JUN.2012 14:44:33

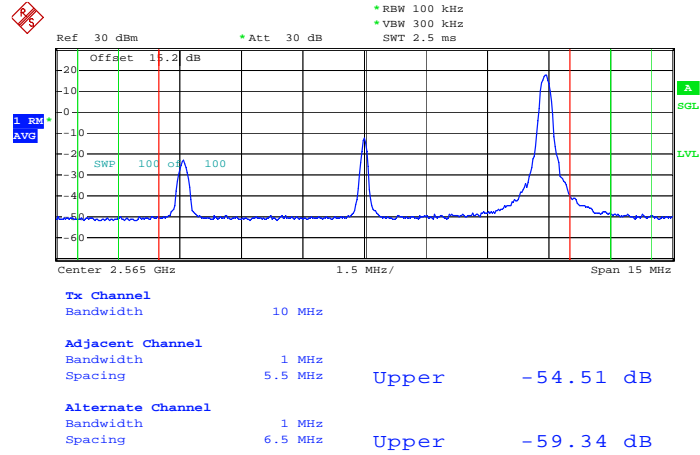
Lower Band Edge Plot for 16QAM -RB Size 50, RB Offset 0



Date: 16.JUN.2012 14:44:56

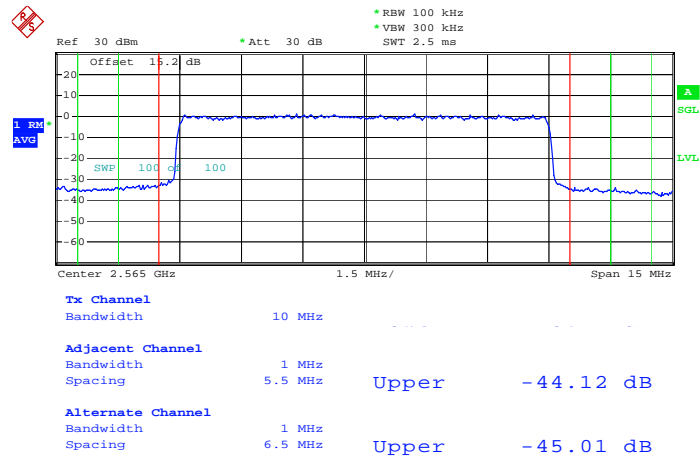


Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 49



Date: 16.JUN.2012 14:42:11

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

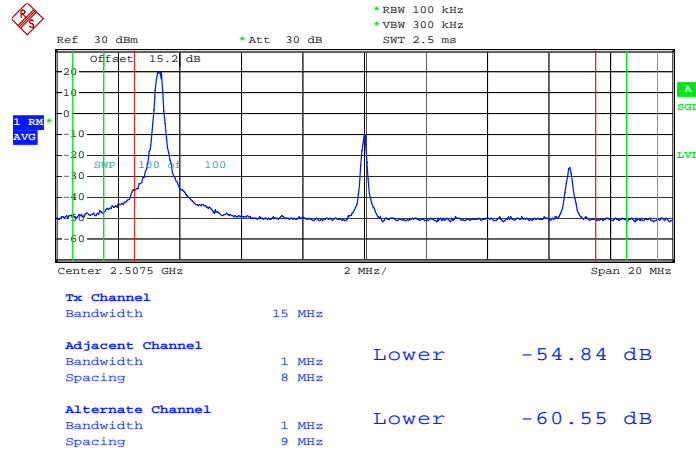


Date: 16.JUN.2012 14:41:25



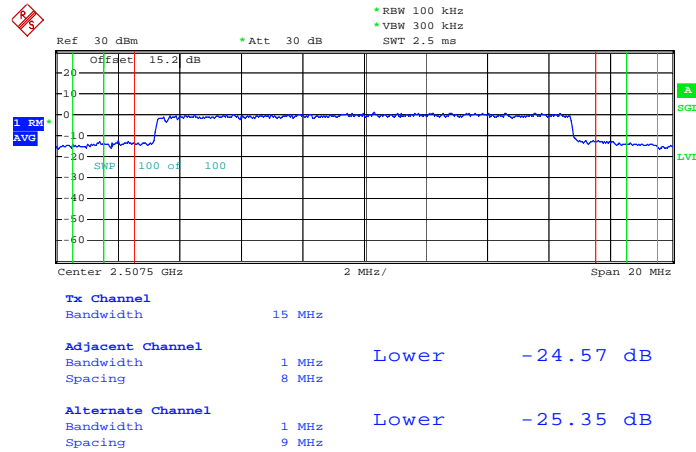
<b>Band :</b>	LTE Band 7	<b>Band Width</b>	15MHz / QPSK
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**Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0**



Date: 16.JUN.2012 15:05:37

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

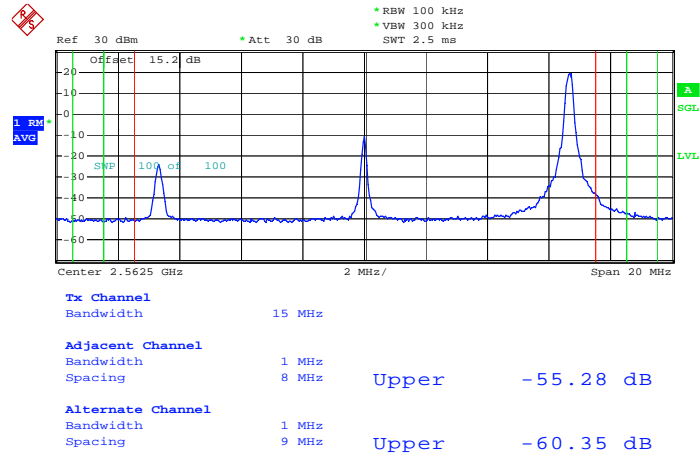


Date: 16.JUN.2012 14:56:58



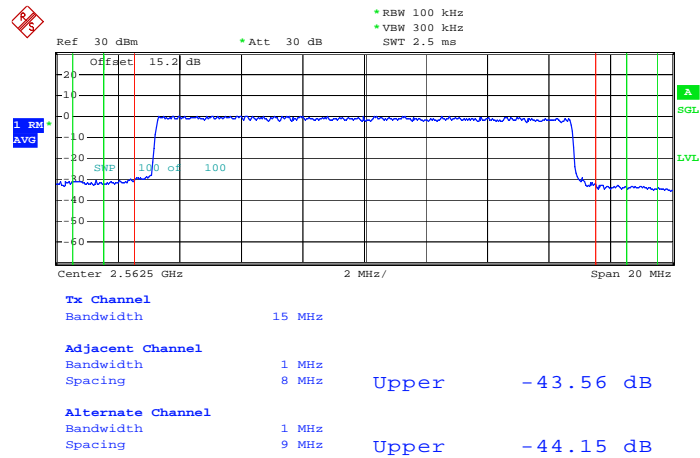


### Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 74



Date: 16.JUN.2012 14:53:24

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

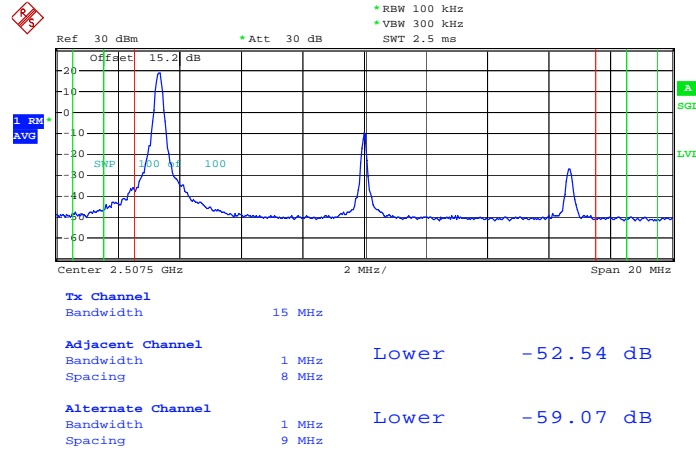


Date: 16.JUN.2012 14:50:51



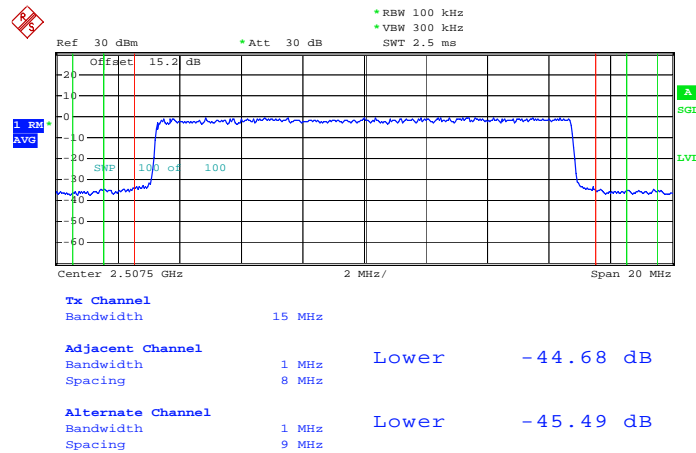
<b>Band :</b>	LTE Band 7	<b>Band Width</b>	15MHz / 16QAM
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Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



Date: 16.JUN.2012 15:05:04

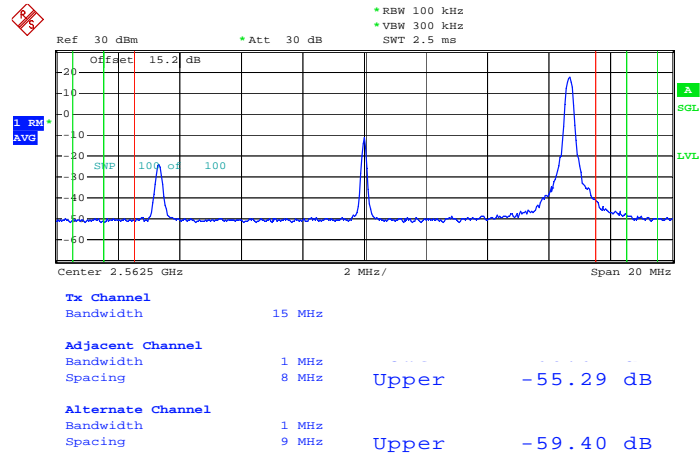
Lower Band Edge Plot for 16QAM -RB Size 75, RB Offset 0



Date: 16.JUN.2012 14:55:23

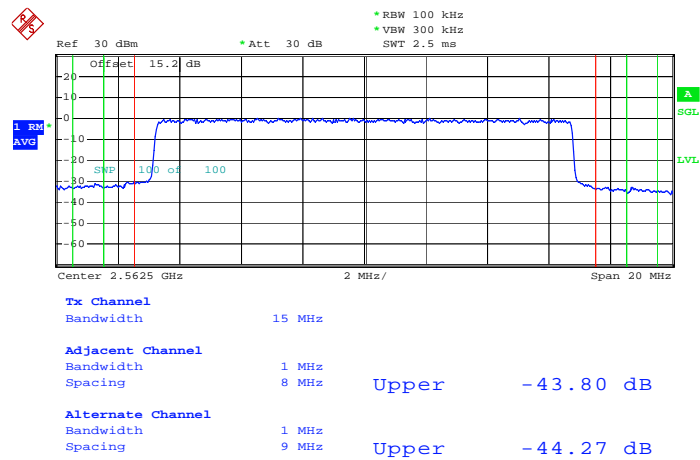


Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 74



Date: 16.JUN.2012 14:53:49

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

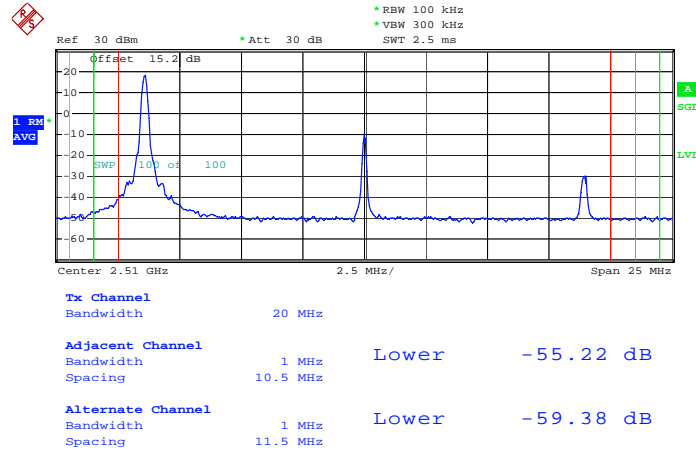


Date: 16.JUN.2012 14:51:06



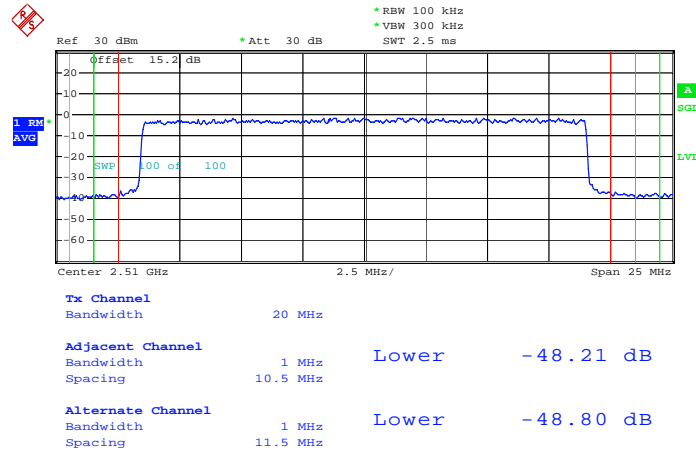
<b>Band :</b>	LTE Band 7	<b>Band Width</b>	20MHz / QPSK
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 16.JUN.2012 15:15:05

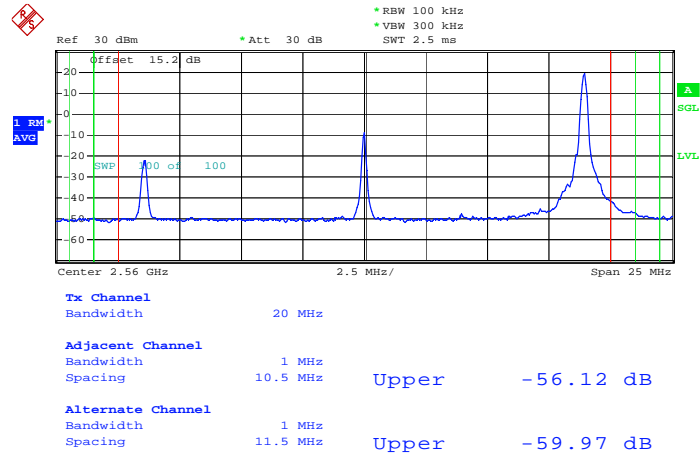
Lower Band Edge Plot for QPSK-RB Size 100, RB Offset 0



Date: 16.JUN.2012 15:12:50

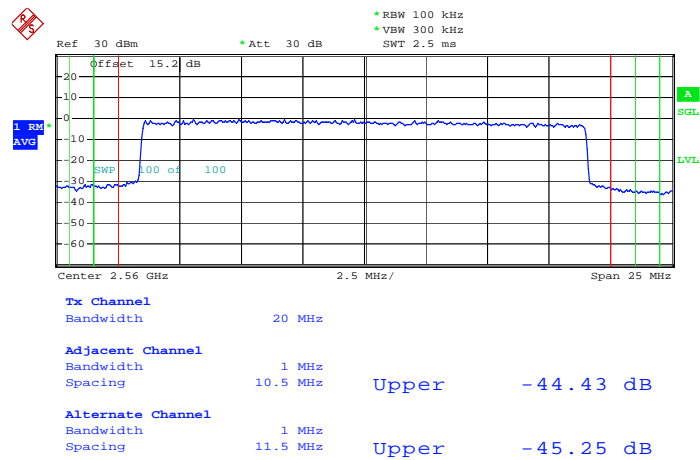


### Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 99



Date: 16.JUN.2012 15:11:41

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

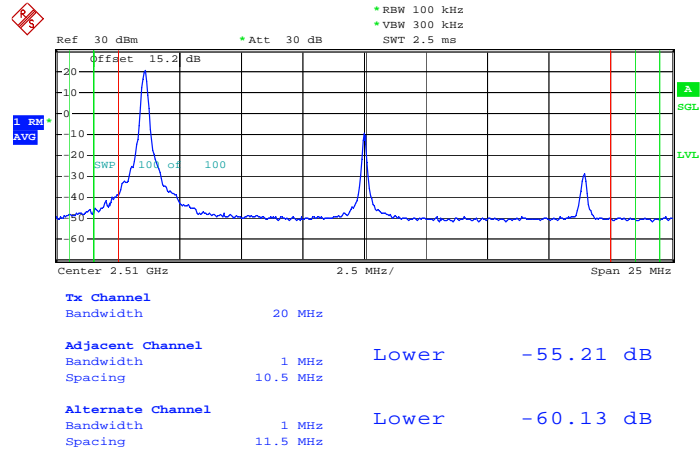


Date: 16.JUN.2012 15:09:38



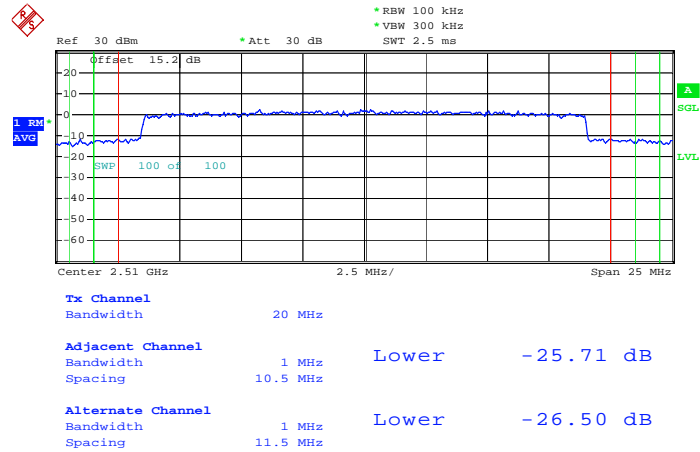
<b>Band :</b>	LTE Band 7	<b>Band Width</b>	20MHz / 16QAM
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Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



Date: 16.JUN.2012 15:14:42

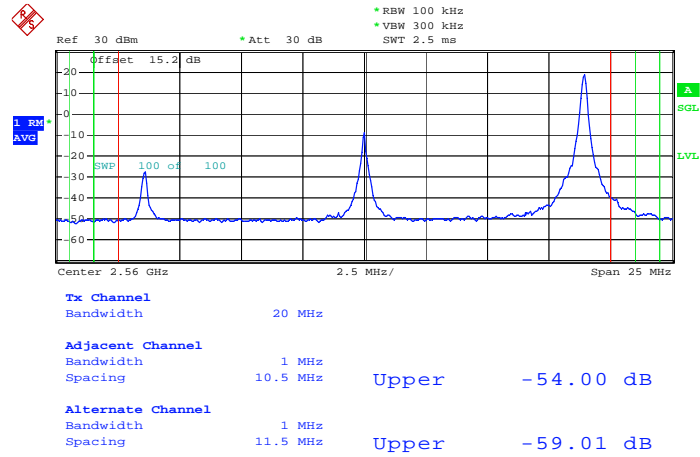
Lower Band Edge Plot for 16QAM -RB Size 100, RB Offset 0



Date: 16.JUN.2012 15:14:05

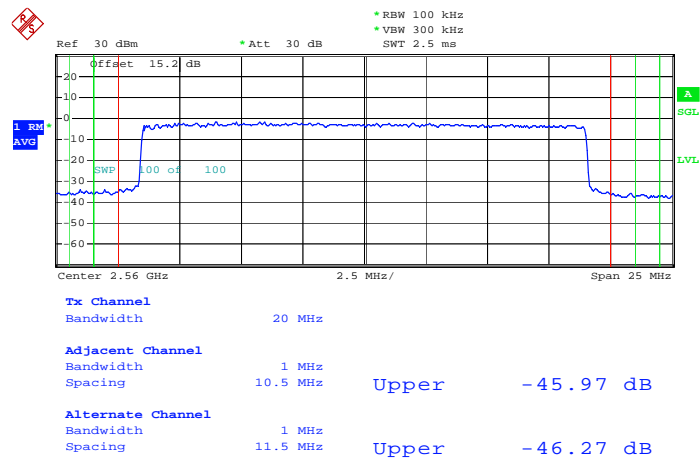


### Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 99



Date: 16.JUN.2012 15:11:09

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

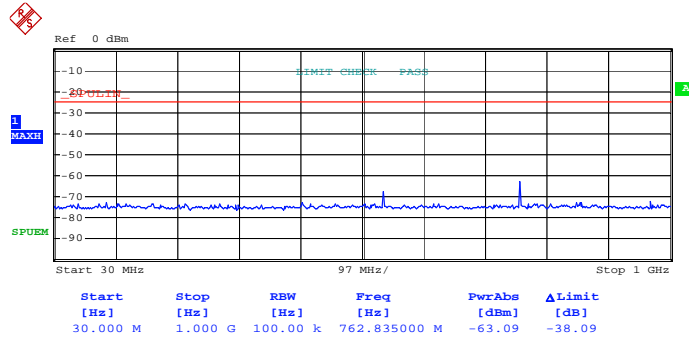


Date: 16.JUN.2012 15:10:04

### 3.3.6 Test Plots of Spurious Emission

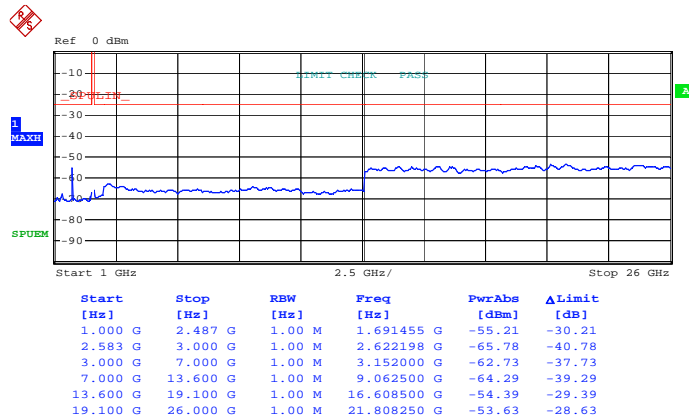
Band :	LTE Band 7	Bandwidth :	5MHz / QPSK
Frequency :	2502.5	Channel :	20775

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



Date: 21.JUN.2012 17:09:50

Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 24)



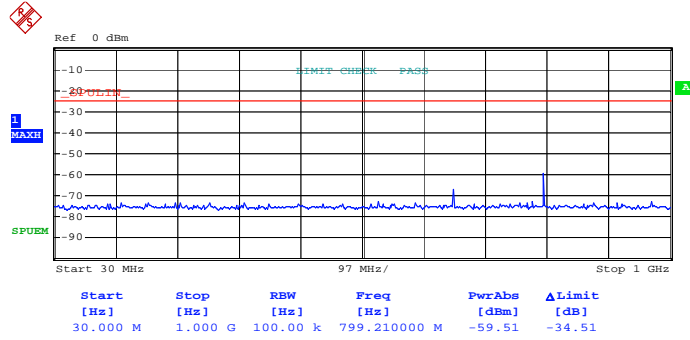
Date: 21.JUN.2012 18:26:02





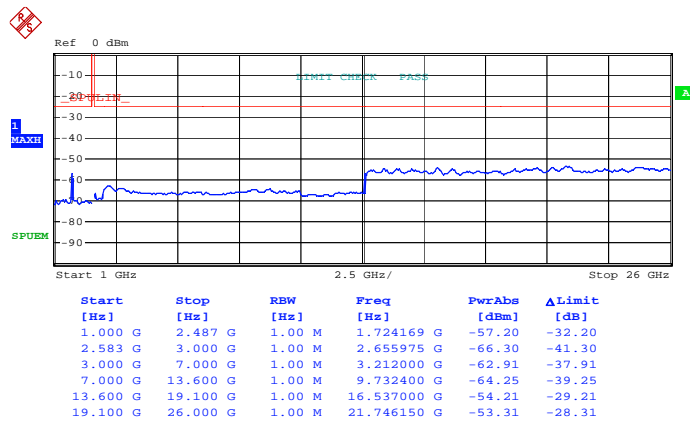
<b>Band :</b>	LTE Band 7	<b>Bandwidth :</b>	5MHz / QPSK
<b>Frequency :</b>	2535	<b>Channel :</b>	21100

**Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 24)**



Date: 21.JUN.2012 17:05:09

**Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 24)**

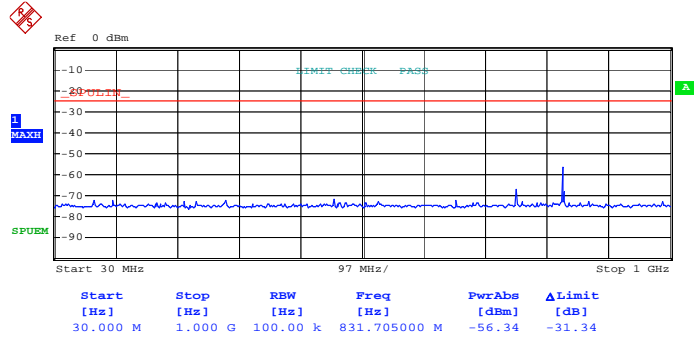


Date: 21.JUN.2012 18:24:48



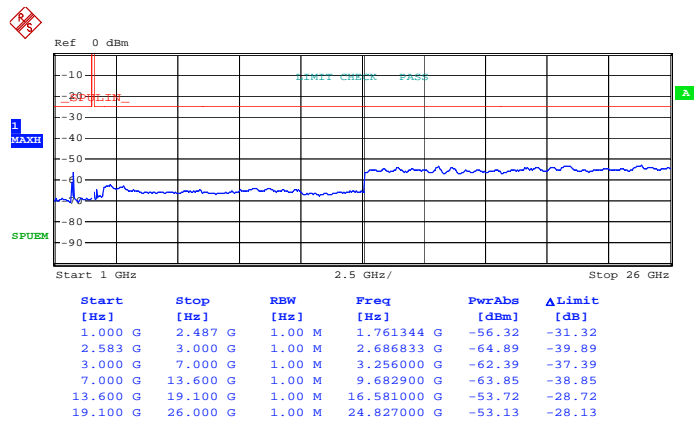
<b>Band :</b>	LTE Band 7	<b>Bandwidth :</b>	5MHz / QPSK
<b>Frequency :</b>	2567.5	<b>Channel :</b>	21425

**Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 24)**



Date: 21.JUN.2012 17:04:11

**Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 24)**

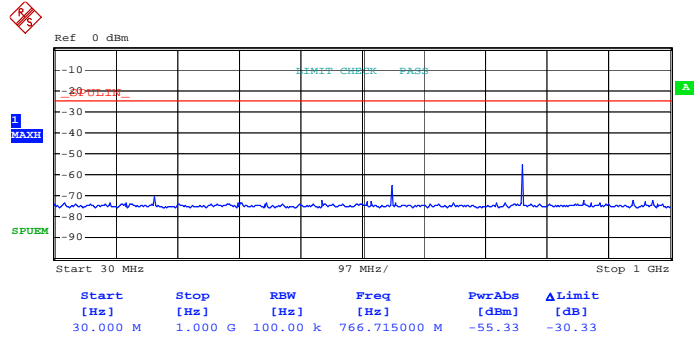


Date: 21.JUN.2012 18:22:43



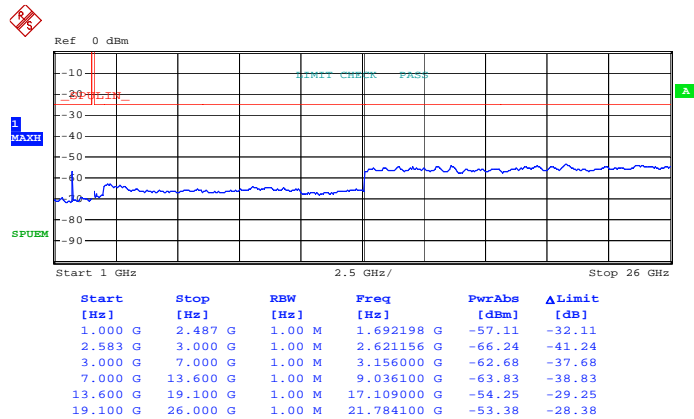
<b>Band :</b>	LTE Band 7	<b>Bandwidth :</b>	5MHz / 16QAM
<b>Frequency :</b>	2502.5	<b>Channel :</b>	20775

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



Date: 21.JUN.2012 17:08:08

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

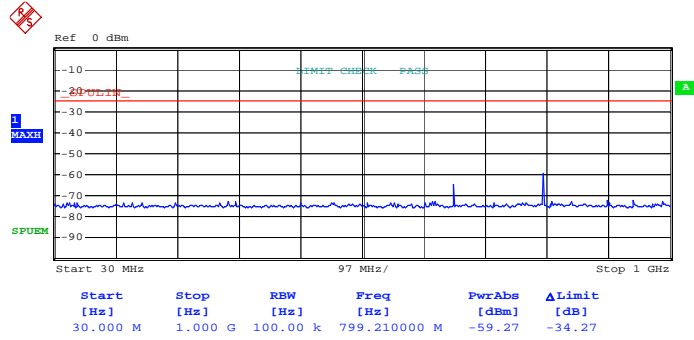


Date: 21.JUN.2012 18:26:33



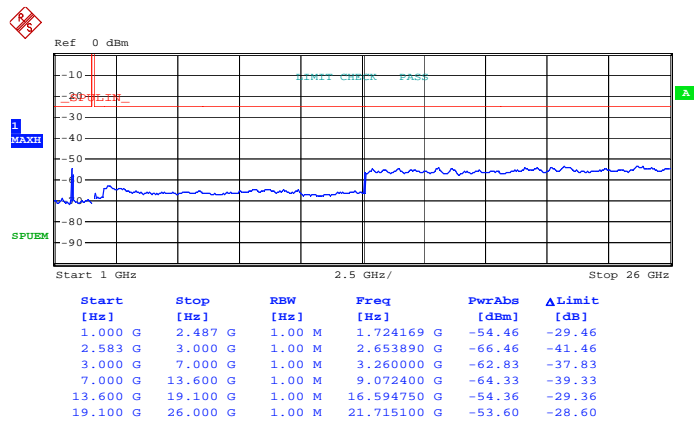
<b>Band :</b>	LTE Band 7	<b>Bandwidth :</b>	5MHz / 16QAM
<b>Frequency :</b>	2535	<b>Channel :</b>	21100

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



Date: 21.JUN.2012 17:06:47

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

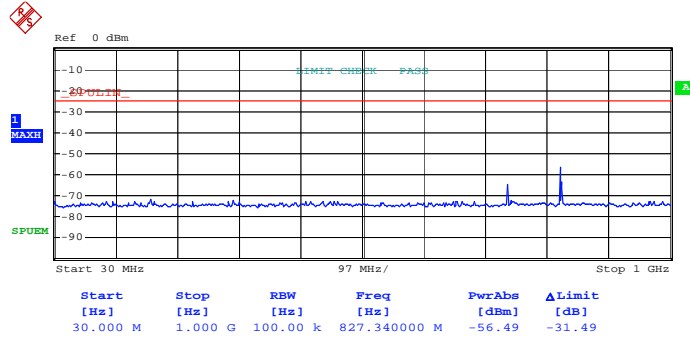


Date: 21.JUN.2012 18:24:22



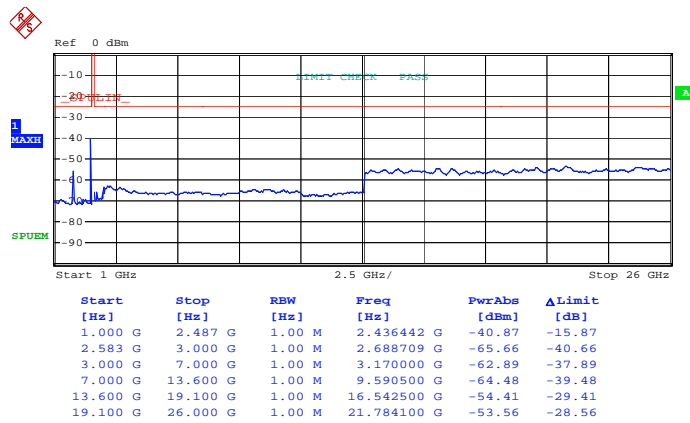
<b>Band :</b>	LTE Band 7	<b>Bandwidth :</b>	5MHz / 16QAM
<b>Frequency :</b>	2567.5	<b>Channel :</b>	21425

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



Date: 21.JUN.2012 17:02:21

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

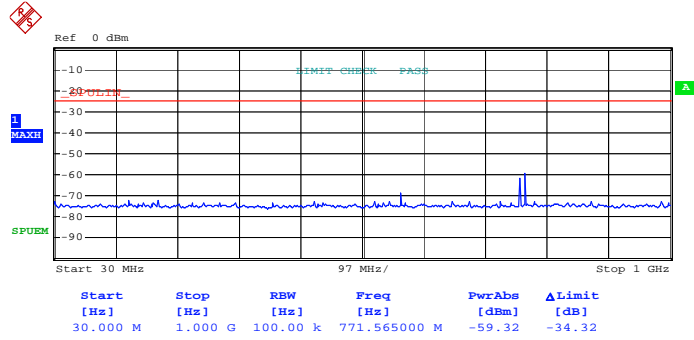


Date: 21.JUN.2012 18:23:20



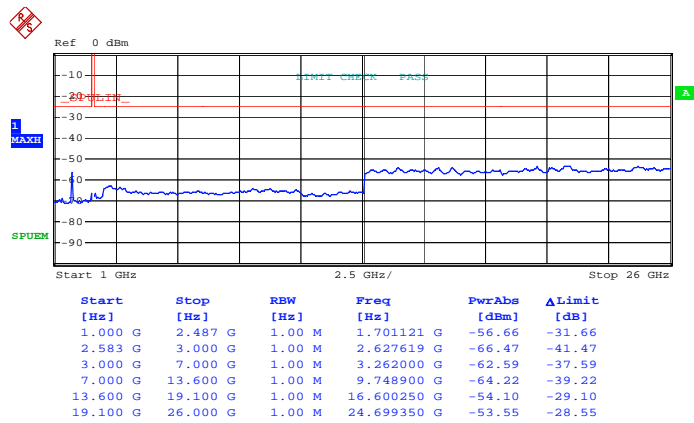
<b>Band :</b>	LTE Band 7	<b>Bandwidth:</b>	10MHz / QPSK
<b>Frequency :</b>	2505	<b>Channel :</b>	20800

**Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 49)**



Date: 21.JUN.2012 16:57:01

**Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 49)**

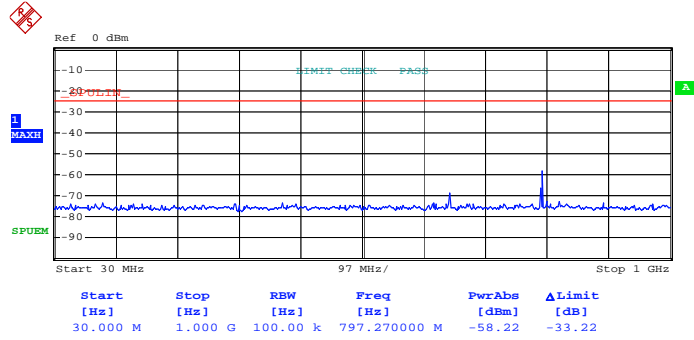


Date: 21.JUN.2012 18:33:49



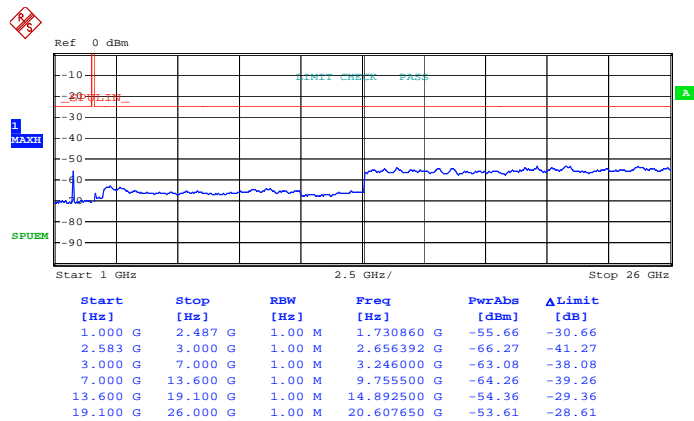
<b>Band :</b>	LTE Band 7	<b>Bandwidth:</b>	10MHz / QPSK
<b>Frequency :</b>	2535	<b>Channel :</b>	21100

**Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 49)**



Date: 21.JUN.2012 16:48:49

**Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 49)**

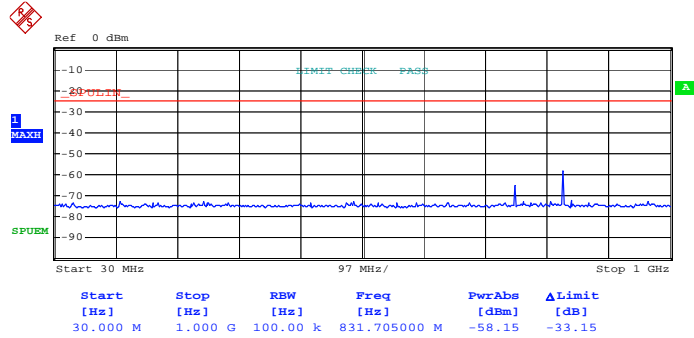


Date: 21.JUN.2012 18:31:41



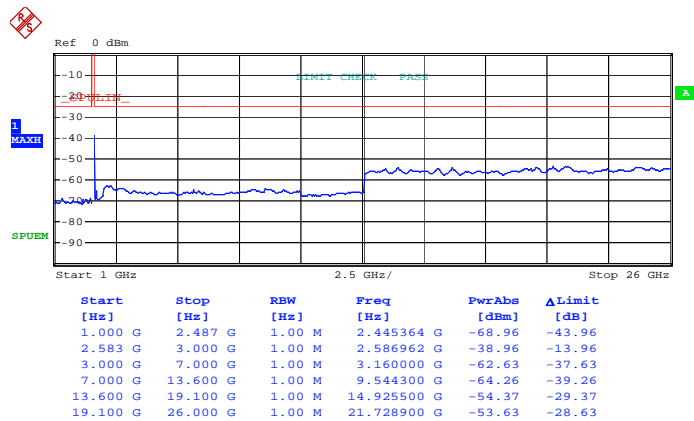
<b>Band :</b>	LTE Band 7	<b>Bandwidth:</b>	10MHz / QPSK
<b>Frequency :</b>	2565	<b>Channel :</b>	21400

**Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 49)**



Date: 21.JUN.2012 16:58:12

**Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 49)**



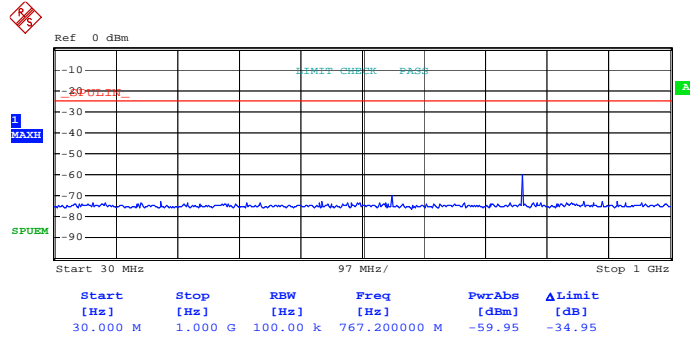
Date: 21.JUN.2012 18:30:27





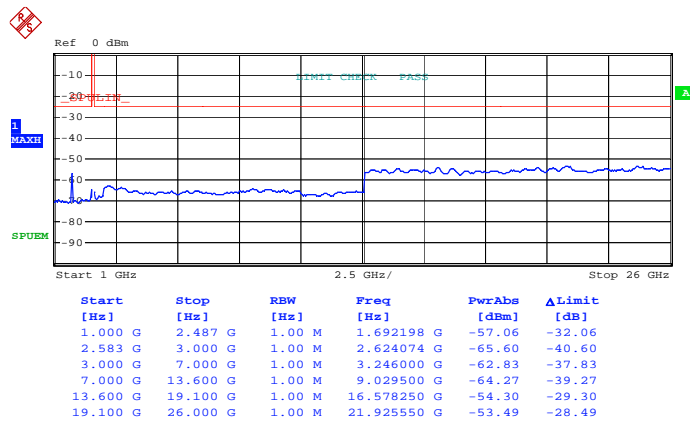
<b>Band :</b>	LTE Band 7	<b>Bandwidth:</b>	10MHz / 16QAM
<b>Frequency :</b>	2505	<b>Channel :</b>	20800

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



Date: 21.JUN.2012 16:53:17

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

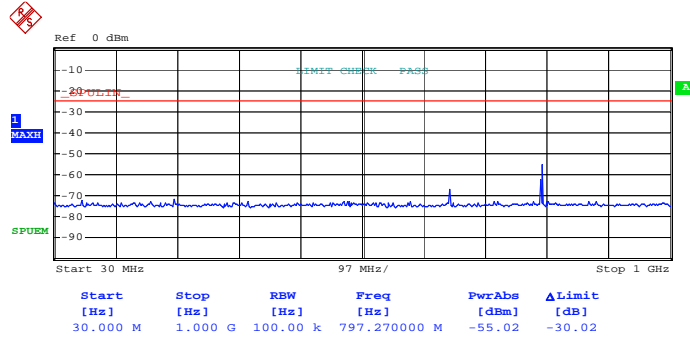


Date: 21.JUN.2012 18:33:13



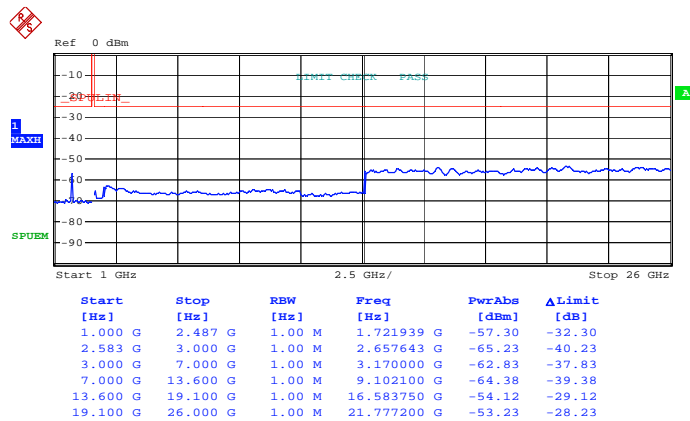
<b>Band :</b>	LTE Band 7	<b>Bandwidth:</b>	10MHz / 16QAM
<b>Frequency :</b>	2535	<b>Channel :</b>	21100

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



Date: 21.JUN.2012 16:51:16

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

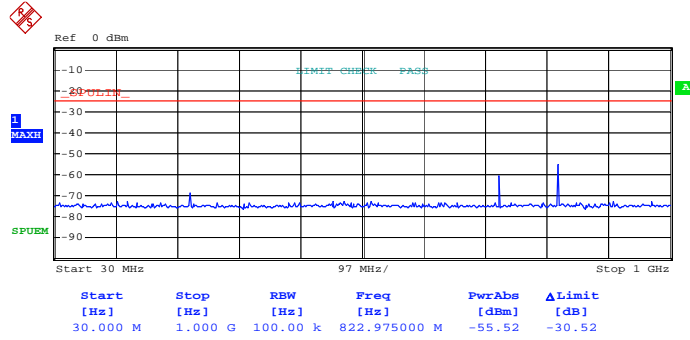


Date: 21.JUN.2012 18:32:09



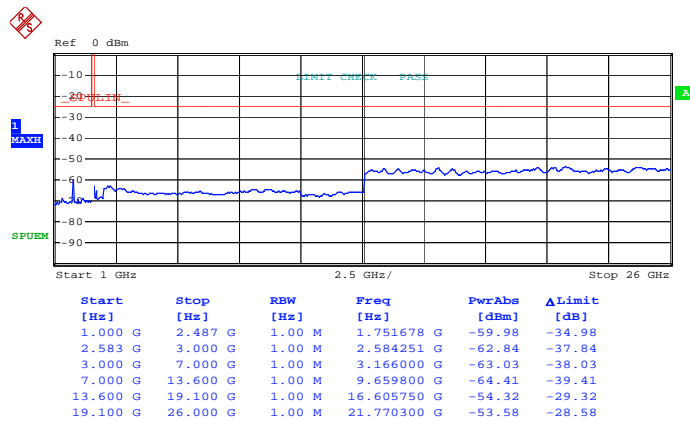
<b>Band :</b>	LTE Band 7	<b>Bandwidth:</b>	10MHz / 16QAM
<b>Frequency :</b>	2565	<b>Channel :</b>	21400

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



Date: 21.JUN.2012 17:00:07

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

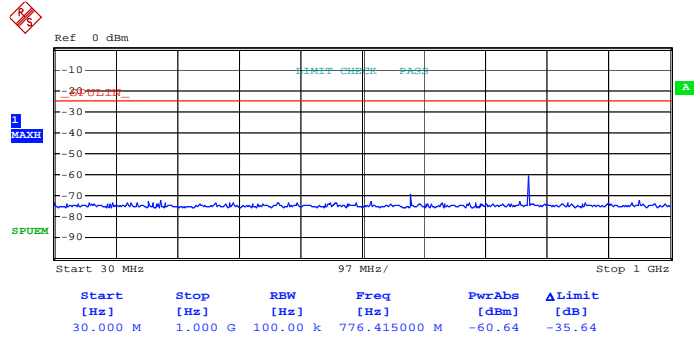


Date: 21.JUN.2012 18:29:55



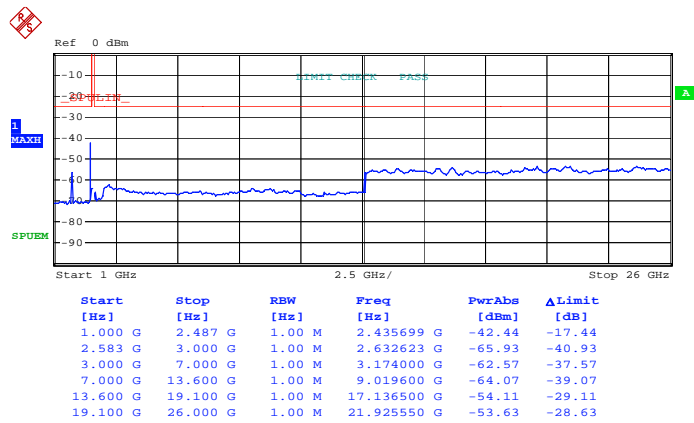
<b>Band :</b>	LTE Band 7	<b>Bandwidth:</b>	15MHz / QPSK
<b>Frequency :</b>	2507.5	<b>Channel :</b>	20825

**Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 74)**



Date: 21.JUN.2012 17:17:10

**Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 74)**

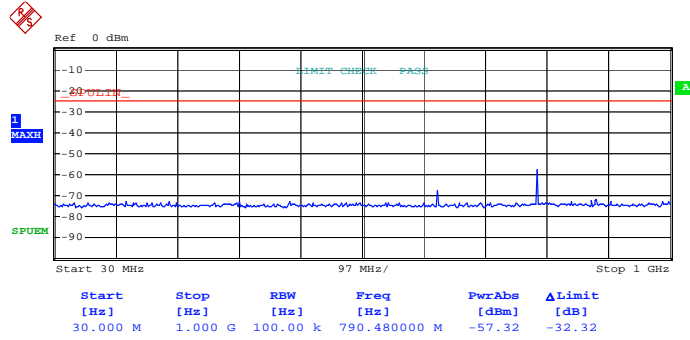


Date: 21.JUN.2012 18:41:56



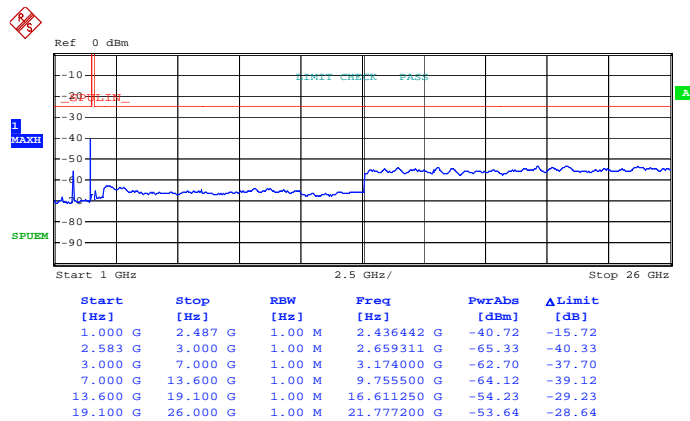
<b>Band :</b>	LTE Band 7	<b>Bandwidth:</b>	15MHz / QPSK
<b>Frequency :</b>	2535	<b>Channel :</b>	21100

**Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 74)**



Date: 21.JUN.2012 17:22:23

**Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 74)**

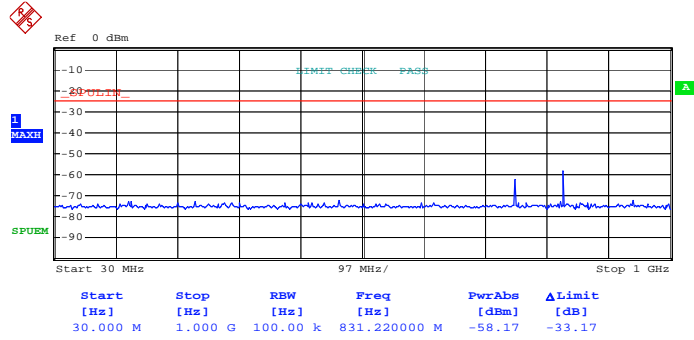


Date: 21.JUN.2012 18:38:59



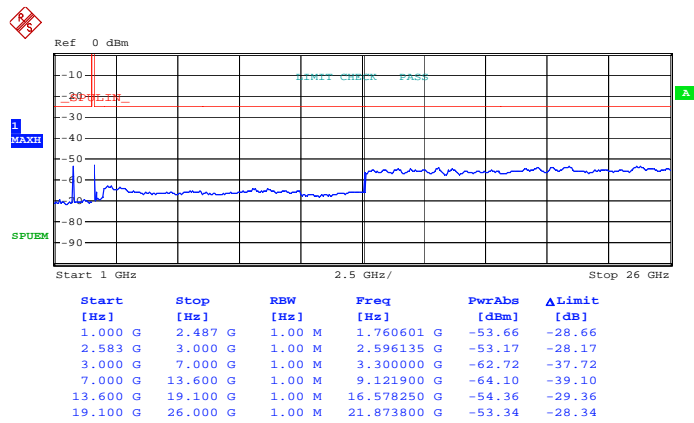
<b>Band :</b>	LTE Band 7	<b>Bandwidth:</b>	15MHz / QPSK
<b>Frequency :</b>	2562.5	<b>Channel :</b>	21375

**Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 74)**



Date: 21.JUN.2012 17:25:12

**Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 74)**

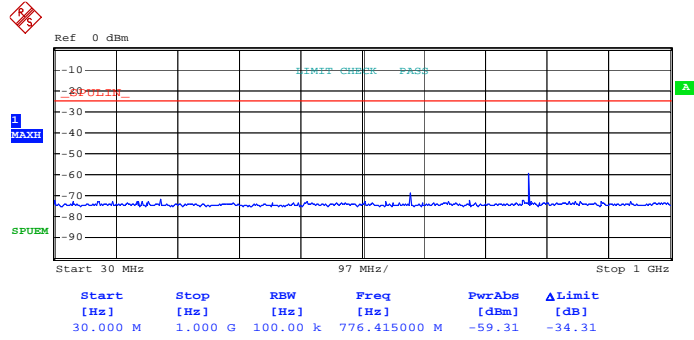


Date: 21.JUN.2012 18:36:35



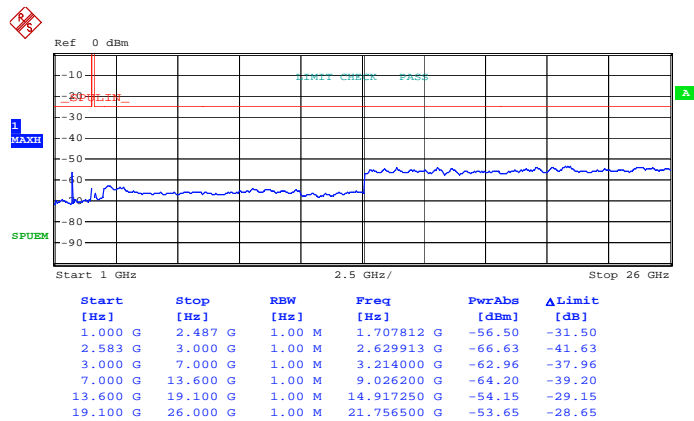
<b>Band :</b>	LTE Band 7	<b>Bandwidth:</b>	15MHz / 16QAM
<b>Frequency :</b>	2507.5	<b>Channel :</b>	20825

**Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 74)**



Date: 21.JUN.2012 17:54:52

**Conducted Emission Plot (1GHz ~ 26GHz) for 16-QAM (RB Size 1, RB Offset 74)**

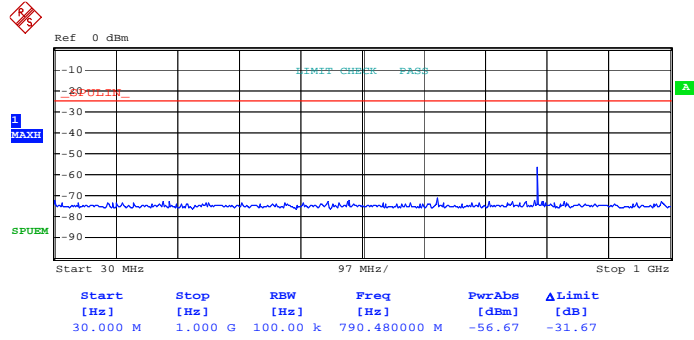


Date: 21.JUN.2012 18:41:24



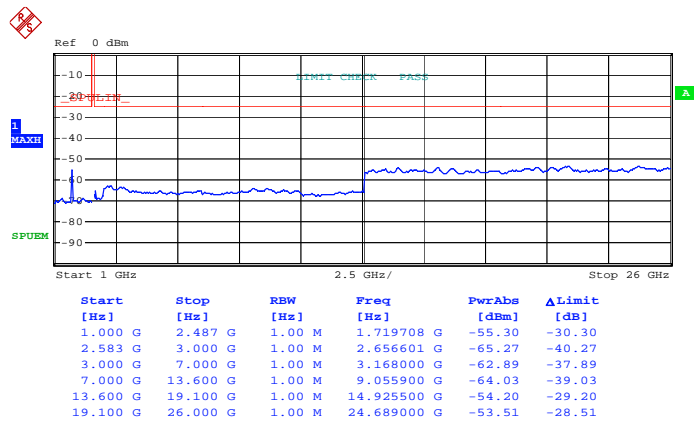
<b>Band :</b>	LTE Band 7	<b>Bandwidth:</b>	15MHz / 16QAM
<b>Frequency :</b>	2535	<b>Channel :</b>	21100

**Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 74)**



Date: 21.JUN.2012 17:20:27

**Conducted Emission Plot (1GHz ~ 26GHz) for 16-QAM (RB Size 1, RB Offset 74)**



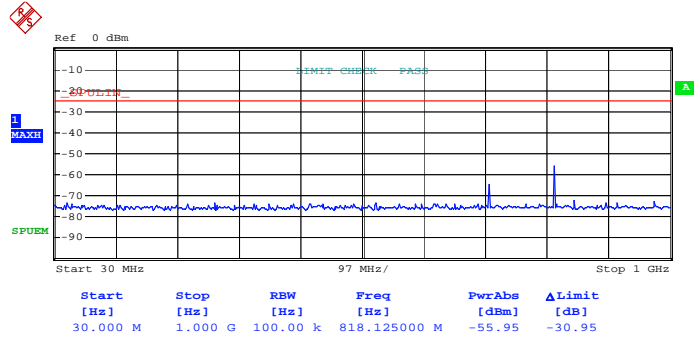
Date: 21.JUN.2012 18:38:03





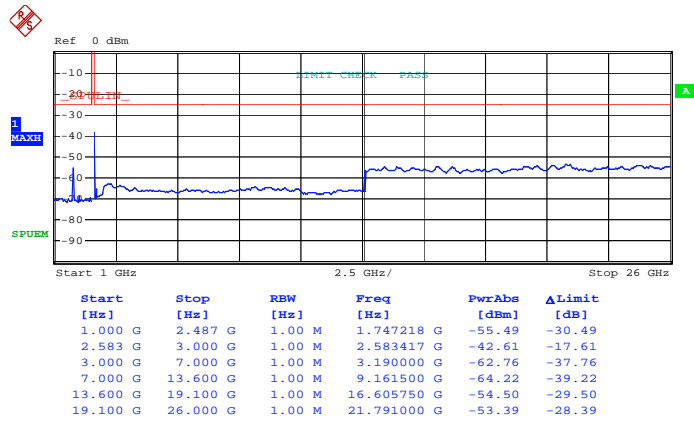
<b>Band :</b>	LTE Band 7	<b>Bandwidth:</b>	15MHz / 16QAM
<b>Frequency :</b>	2562.5	<b>Channel :</b>	21375

**Conducted Emission Plot (30MHz ~ 1GHz) for  
16-QAM (RB Size 1, RB Offset 74)**



Date: 21.JUN.2012 17:23:32

**Conducted Emission Plot (1GHz ~ 26GHz) for  
16-QAM (RB Size 1, RB Offset 74)**

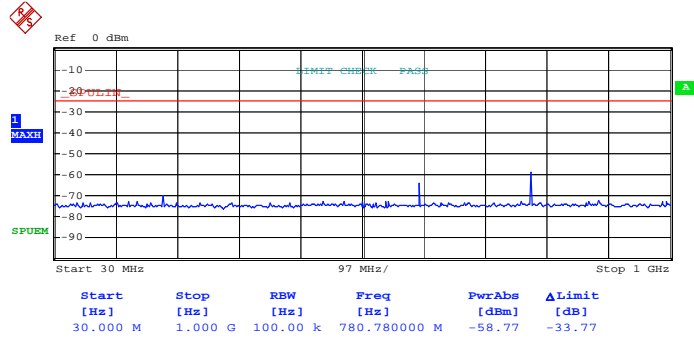


Date: 21.JUN.2012 18:37:18



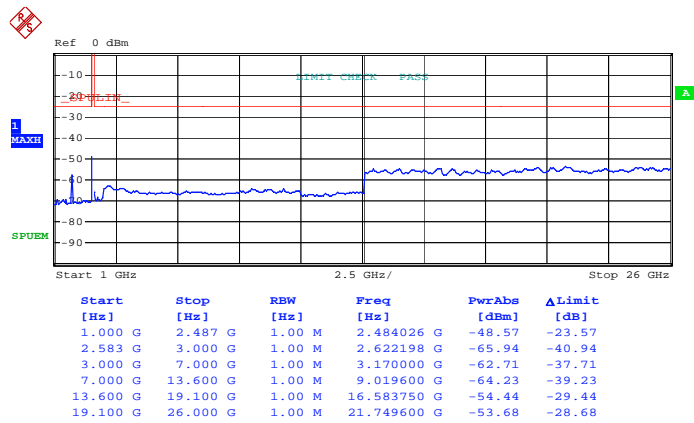
<b>Band :</b>	LTE Band 7	<b>Bandwidth:</b>	20MHz / QPSK
<b>Frequency :</b>	2510	<b>Channel :</b>	20850

**Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 99)**



Date: 21.JUN.2012 17:32:40

**Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 99)**

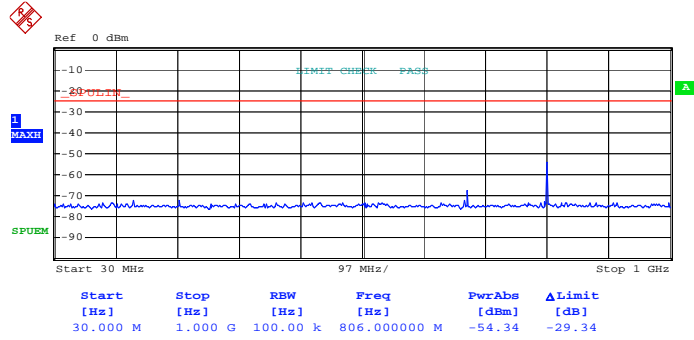


Date: 21.JUN.2012 18:49:53



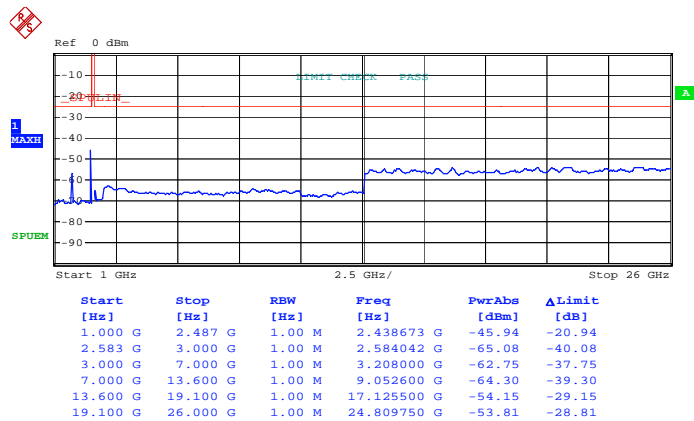
<b>Band :</b>	LTE Band 7	<b>Bandwidth:</b>	20MHz / QPSK
<b>Frequency :</b>	2535	<b>Channel :</b>	21100

**Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 99)**



Date: 21.JUN.2012 17:31:46

**Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 99)**

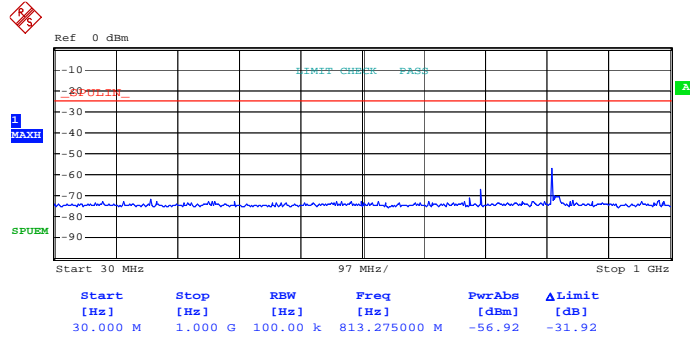


Date: 21.JUN.2012 18:47:39



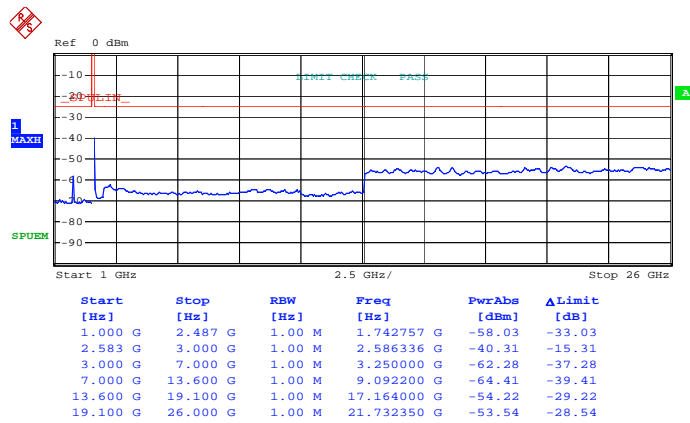
<b>Band :</b>	LTE Band 7	<b>Bandwidth:</b>	20MHz / QPSK
<b>Frequency :</b>	2560	<b>Channel :</b>	21350

**Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 99)**



Date: 21.JUN.2012 17:27:37

**Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 99)**

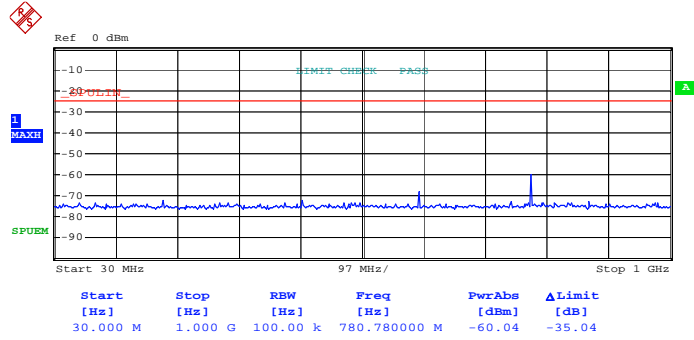


Date: 21.JUN.2012 18:46:02



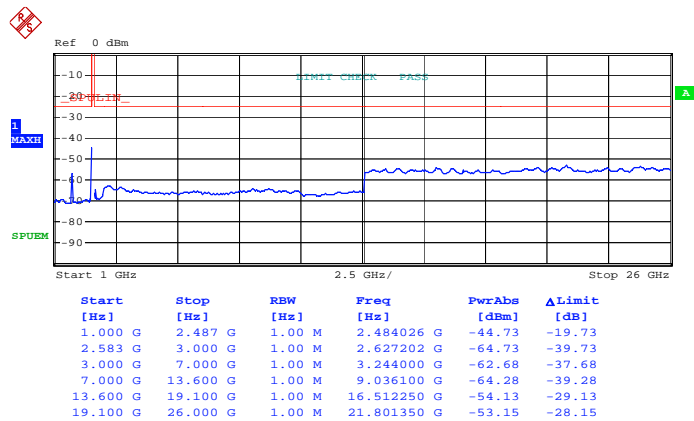
<b>Band :</b>	LTE Band 7	<b>Bandwidth:</b>	20MHz / 16QAM
<b>Frequency :</b>	2510	<b>Channel :</b>	20850

**Conducted Emission Plot (30MHz ~ 1GHz) for  
16-QAM (RB Size 1, RB Offset 99)**



Date: 21.JUN.2012 17:33:59

**Conducted Emission Plot (1GHz ~ 26GHz) for  
16-QAM (RB Size 1, RB Offset 99)**

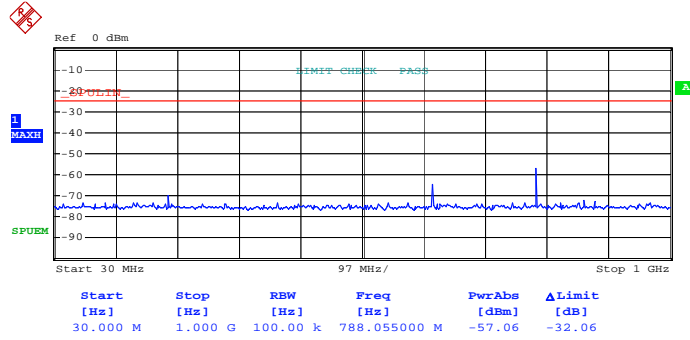


Date: 21.JUN.2012 18:49:29



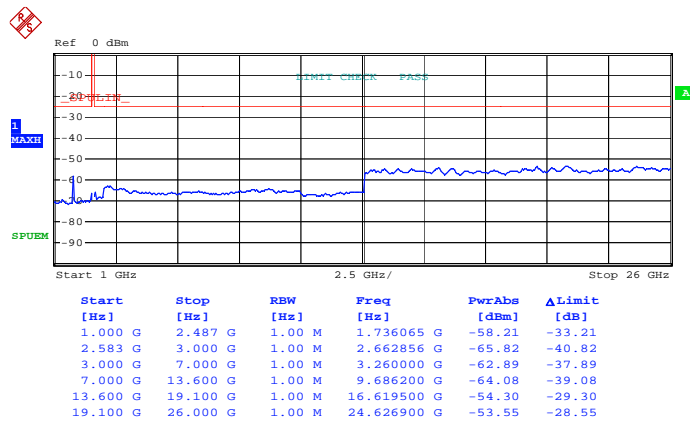
<b>Band :</b>	LTE Band 7	<b>Bandwidth:</b>	20MHz / 16QAM
<b>Frequency :</b>	2535	<b>Channel :</b>	21100

**Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 99)**



Date: 21.JUN.2012 17:29:53

**Conducted Emission Plot (1GHz ~ 26GHz) for 16-QAM (RB Size 1, RB Offset 99)**

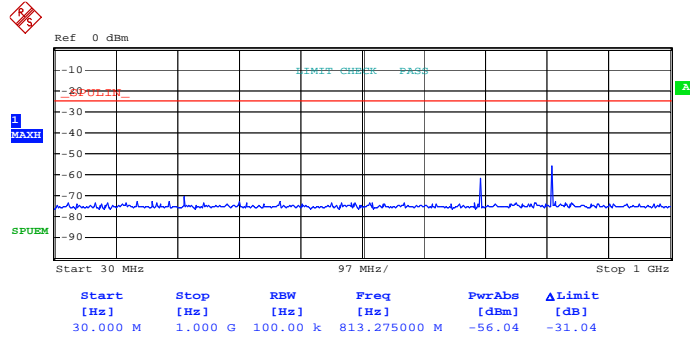


Date: 21.JUN.2012 18:48:21



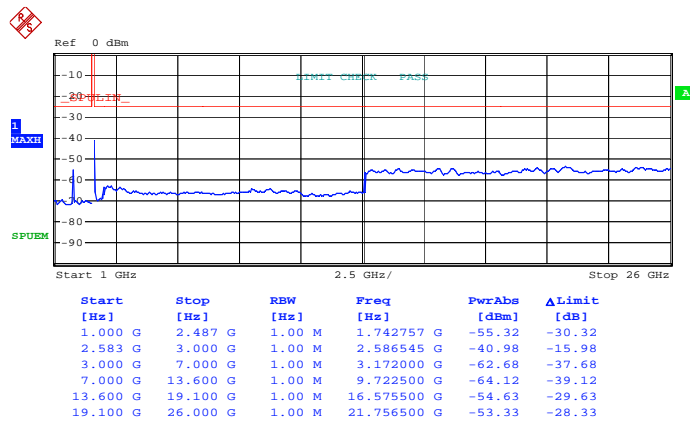
<b>Band :</b>	LTE Band 7	<b>Bandwidth:</b>	20MHz / 16QAM
<b>Frequency :</b>	2560	<b>Channel :</b>	21350

**Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 99)**



Date: 21.JUN.2012 17:28:56

**Conducted Emission Plot (1GHz ~ 26GHz) for 16-QAM (RB Size 1, RB Offset 99)**



Date: 21.JUN.2012 18:45:34

## 3.4 Radiated Emissions Measurement

### 3.4.1 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 10<sup>th</sup> harmonic.

### 3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

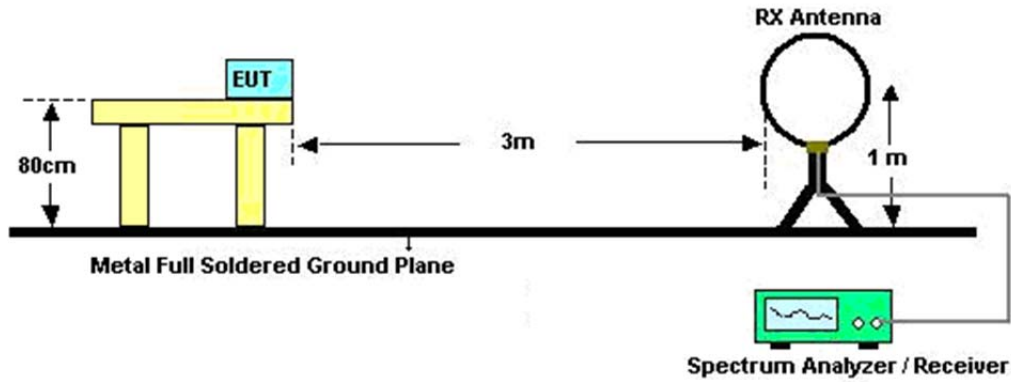
### 3.4.3 Test Procedures

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.

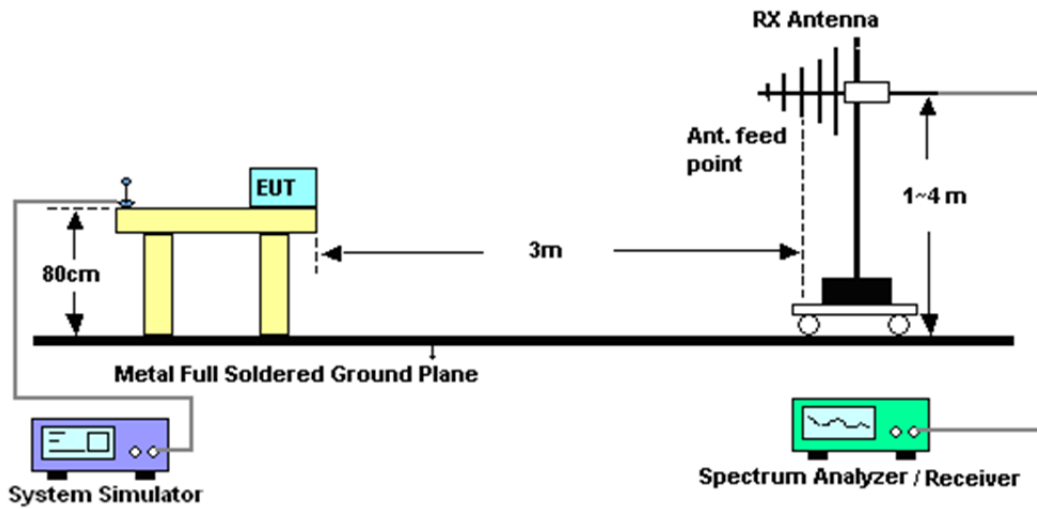


### 3.4.4 Test Setup

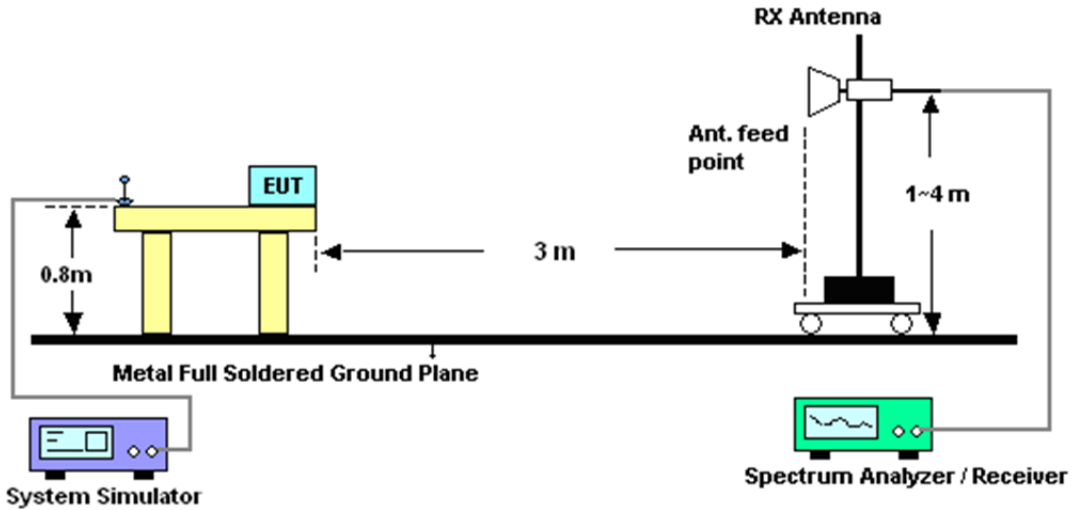
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



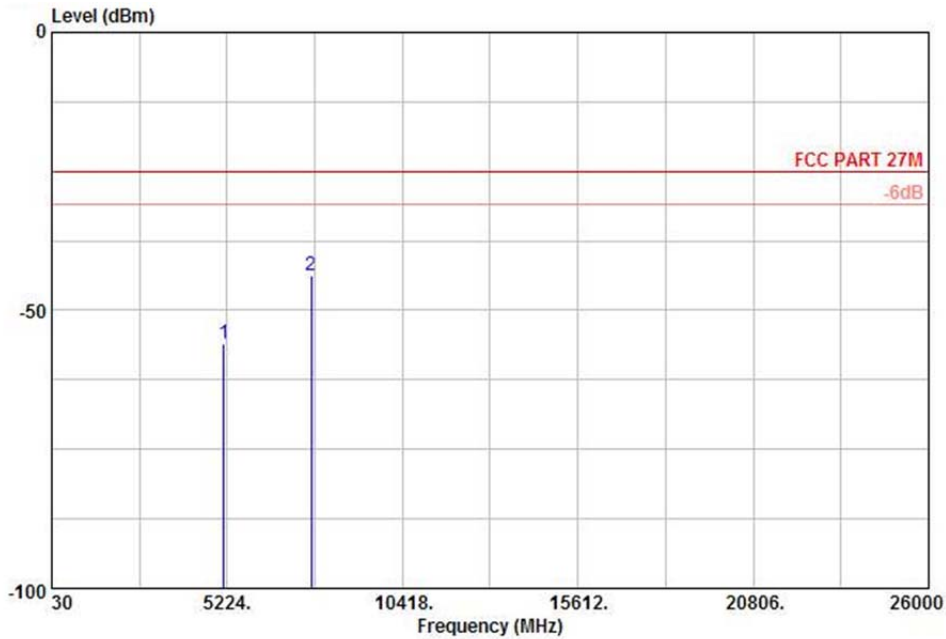
### 3.4.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

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.



3.4.6 Test Result of Radiated Emissions

<b>Band :</b>	LTE Band 7	<b>Temperature :</b>	23~25°C
<b>Test Mode :</b>	5MHz, QPSK, RB Size 1, RB Offset 24	<b>Relative Humidity :</b>	43~45%
<b>Test Engineer :</b>	Steven Hao	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

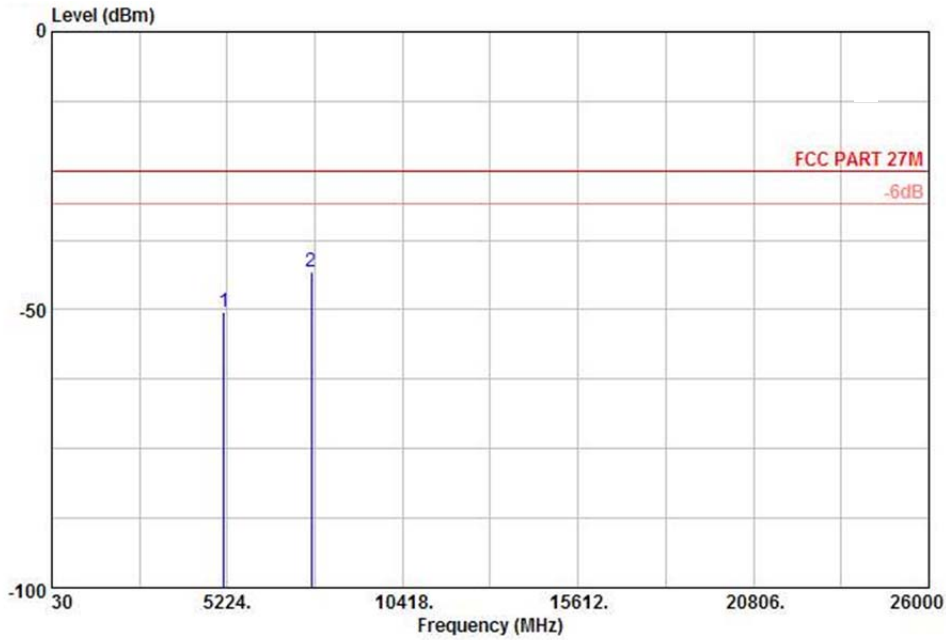


Site : 03CH01-KS  
 Condition: FCC PART 27M HF EIRP FACTOR-09020 HORIZONTAL

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
5135	-56.04	-25	-31.04	-63.07	-64.00	1.88	9.84	H	pass
7702	-43.63	-25	-18.63	-64.10	-51.18	2.29	9.84	H	pass



<b>Band :</b>	LTE Band 7	<b>Temperature :</b>	23~25°C
<b>Test Mode :</b>	5MHz, QPSK, RB Size 1, RB Offset 24	<b>Relative Humidity :</b>	43~45%
<b>Test Engineer :</b>	Steven Hao	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

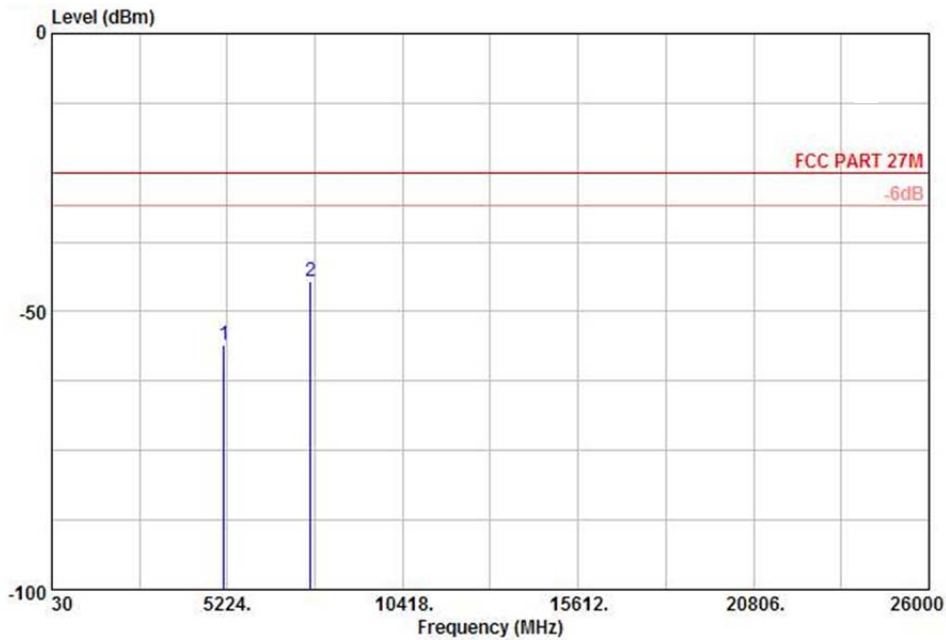


Site : 03CH01-KS  
 Condition: FCC PART 27M HF EIRP FACTOR-09020 VERTIICAL

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
5135	-50.5	-25	-25.50	-64.29	-60.28	1.88	11.66	V	pass
7702	-43.16	-25	-18.16	-65.20	-52.53	2.29	11.66	V	pass



<b>Band :</b>	LTE Band 7	<b>Temperature :</b>	23~25°C
<b>Test Mode :</b>	10MHz, QPSK, RB Size 1, RB Offset 49	<b>Relative Humidity :</b>	43~45%
<b>Test Engineer :</b>	Steven Hao	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

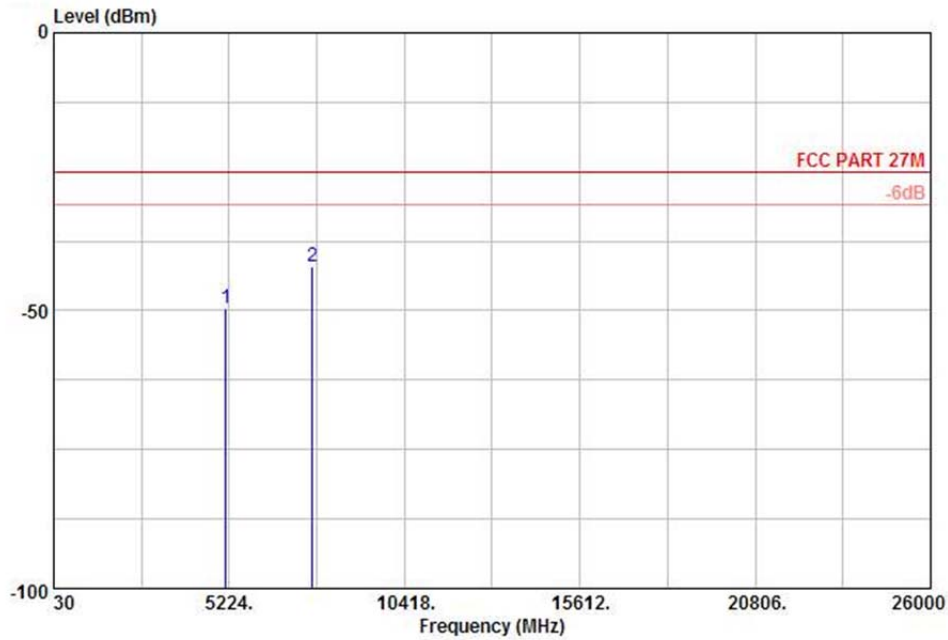


Site : 03CH01-KS  
 Condition: FCC PART 27M HF EIRP FACTOR-09020 HORIZONTAL

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
5130	-55.93	-25	-30.93	-64.1	-63.89	1.88	9.84	H	pass
7695	-44.57	-25	-19.57	-64.29	-52.12	2.29	9.84	H	pass



<b>Band :</b>	LTE Band 7	<b>Temperature :</b>	23~25°C
<b>Test Mode :</b>	10MHz, QPSK, RB Size 1, RB Offset 49	<b>Relative Humidity :</b>	43~45%
<b>Test Engineer :</b>	Steven Hao	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

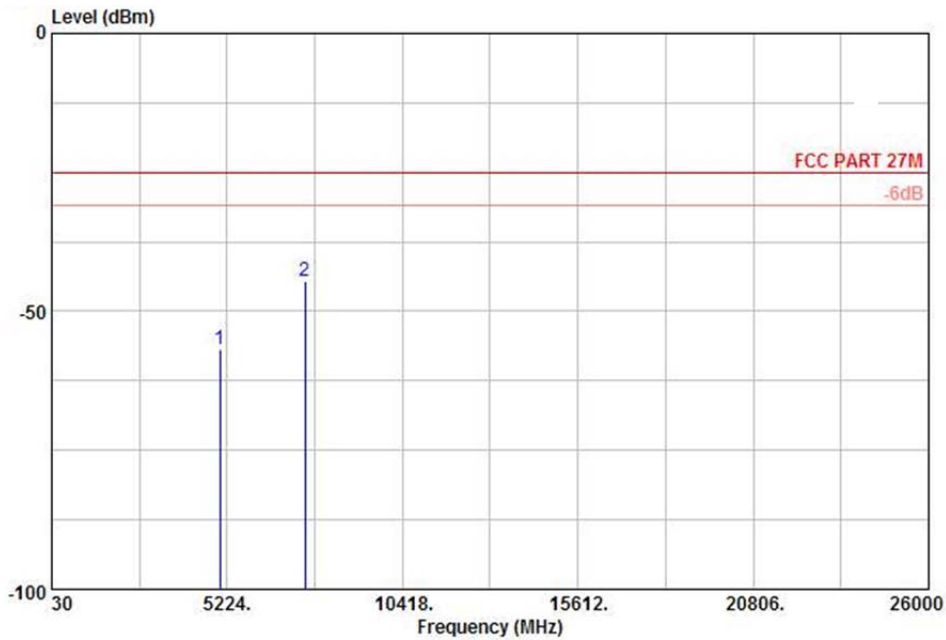


Site : 03CH01-KS  
 Condition: FCC PART 27M HF EIRP FACTOR-09020 VERTIICAL

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
5130	-49.52	-25	-24.52	-63.87	-59.30	1.88	11.66	V	pass
7695	-42.11	-25	-17.11	-64.27	-51.48	2.29	11.66	V	pass



<b>Band :</b>	LTE Band 7	<b>Temperature :</b>	23~25°C
<b>Test Mode :</b>	15MHz, QPSK, RB Size 1, RB Offset 74	<b>Relative Humidity :</b>	43~45%
<b>Test Engineer :</b>	Steven Hao	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

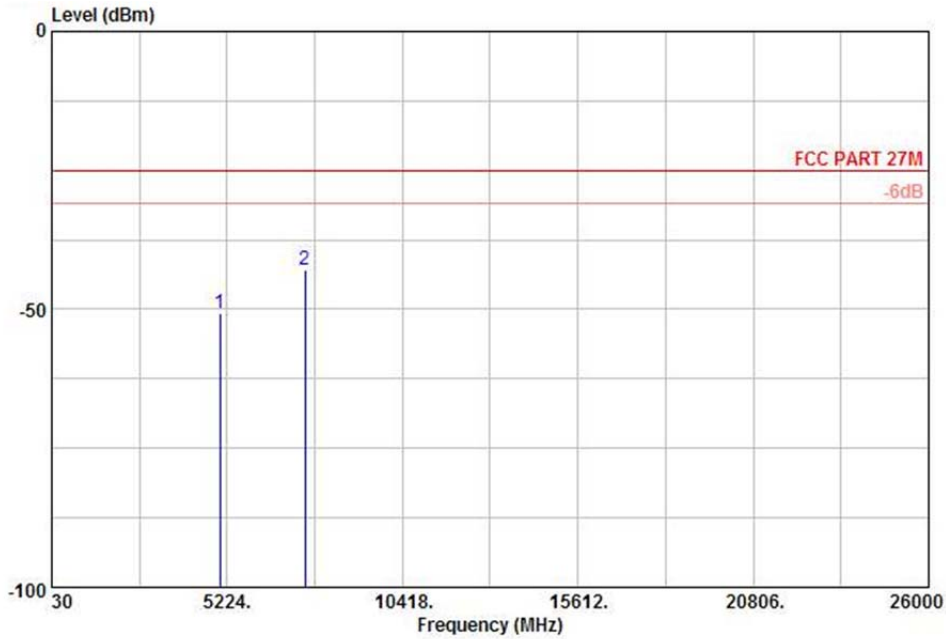


Site : 03CH01-KS  
 Condition: FCC PART 27M HF EIRP FACTOR-09020 HORIZONTAL

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
5015	-56.89	-25	-31.89	-64.22	-64.85	1.88	9.84	H	PASS
7522.5	-44.48	-25	-19.48	-64.94	-52.03	2.29	9.84	H	PASS



<b>Band :</b>	LTE Band 7	<b>Temperature :</b>	23~25°C
<b>Test Mode :</b>	15MHz, QPSK, RB Size 1, RB Offset 74	<b>Relative Humidity :</b>	43~45%
<b>Test Engineer :</b>	Steven Hao	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



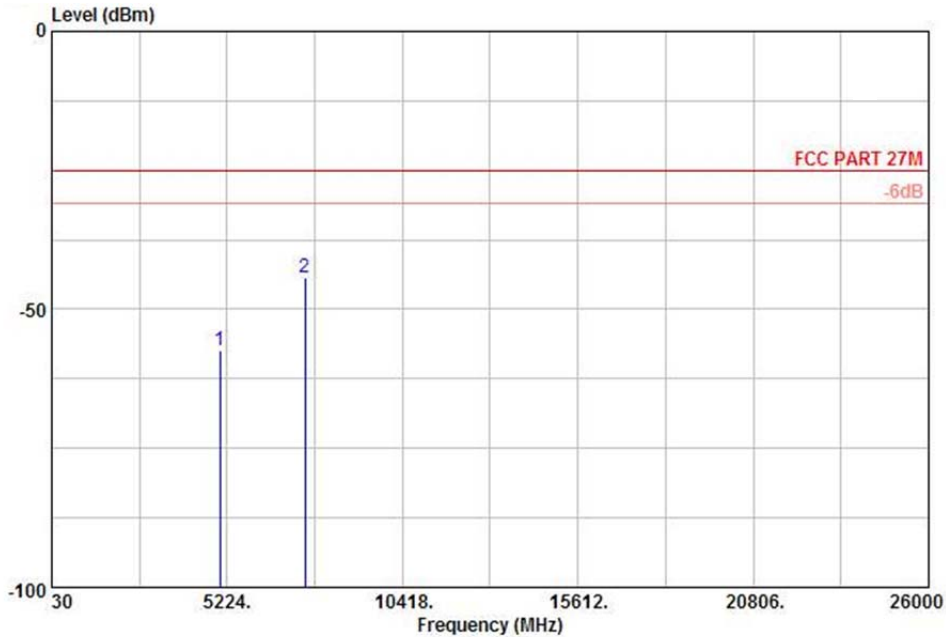
Site : 03CH01-KS  
 Condition: FCC PART 27M HF EIRP FACTOR-09020 VERTICAL

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
5015	-50.8	-25	-25.80	-64.89	-60.58	1.88	11.66	V	PASS
7522.5	-42.99	-25	-17.99	-64.43	-52.36	2.29	11.66	V	PASS





<b>Band :</b>	LTE Band 7	<b>Temperature :</b>	23~25°C
<b>Test Mode :</b>	20MHz, QPSK, RB Size 1, RB Offset 99	<b>Relative Humidity :</b>	43~45%
<b>Test Engineer :</b>	Steven Hao	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

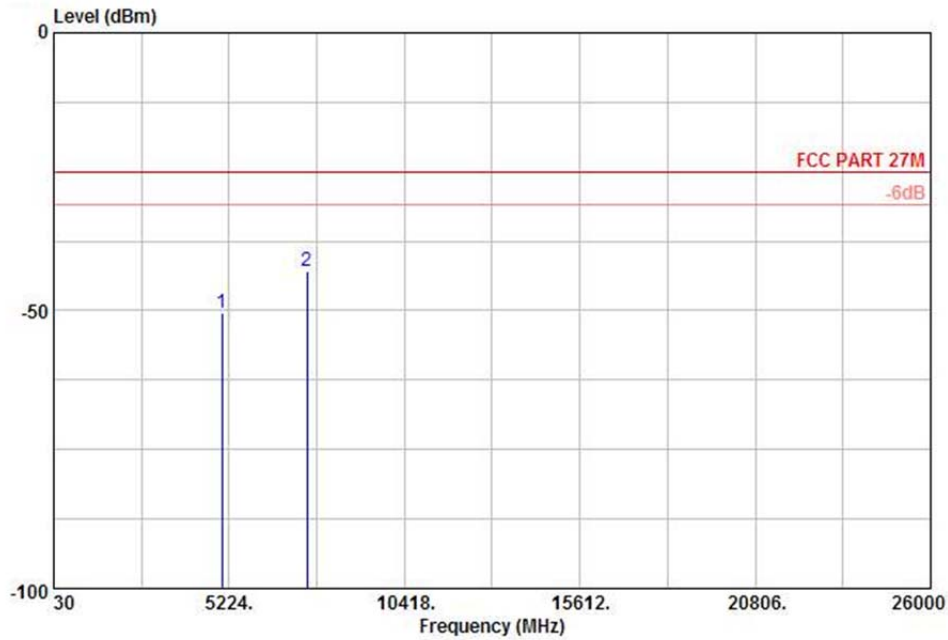


Site : 03CH01-KS  
 Condition: FCC PART 27M HF EIRP FACTOR-09020 HORIZONTAL

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
5020	-57.28	-25	-32.28	-64.31	-65.24	1.88	9.84	H	PASS
7530	-44.28	-25	-19.28	-64.77	-51.83	2.29	9.84	H	PASS



<b>Band :</b>	LTE Band 7	<b>Temperature :</b>	23~25°C
<b>Test Mode :</b>	20MHz, QPSK, RB Size 1, RB Offset 99	<b>Relative Humidity :</b>	43~45%
<b>Test Engineer :</b>	Steven Hao	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH01-KS  
 Condition: FCC PART 27M HF EIRP FACTOR-09020 VERTICAL

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
5020	-50.3	-25	-25.30	-63.89	-60.08	1.88	11.66	V	PASS
7530	-42.99	-25	-17.99	-65.22	-52.36	2.29	11.66	V	PASS

## 3.5 Frequency Stability Measurement

### 3.5.1 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.

### 3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

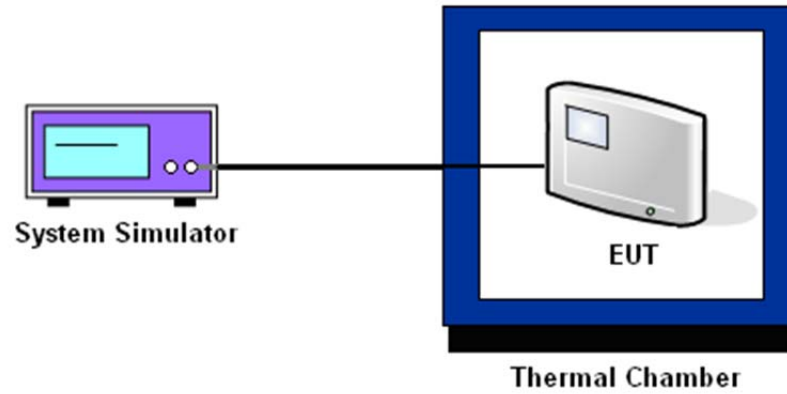
### 3.5.3 Test Procedures for Temperature Variation

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  $-30^{\circ}\text{C}$  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  $10^{\circ}\text{C}$  step up to  $50^{\circ}\text{C}$ . 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  $-30^{\circ}\text{C}$ , the testing lowest temperature will be raised in  $10^{\circ}\text{C}$  step until the EUT can be turned on.

### 3.5.4 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.

### 3.5.5 Test Setup



3.5.6 Test Result of Temperature Variation

Band :	LTE Band 7			Limit (ppm) :	2.5
Temperature (°C)	5MHz		10MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-2.5	-0.004	0.5	0.001	PASS
-20	-0.1	0.000	-0.4	-0.001	
-10	-4.7	-0.007	-1.9	-0.003	
0	-0.8	-0.001	0.3	0.000	
10	-0.2	0.000	-0.6	-0.001	
20	-2.0	-0.003	-1.9	-0.003	
30	-0.7	-0.001	1.2	0.002	
40	-4.2	-0.006	-0.4	-0.001	
50	1.3	0.002	1.7	0.002	

Band :	LTE Band 7			Limit (ppm) :	2.5
Temperature (°C)	15MHz		20MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	1.7	0.002	7.3	0.010	PASS
-20	-5.7	-0.008	-1.1	-0.002	
-10	1.5	0.002	1.4	0.002	
0	0.6	0.001	1.5	0.002	
10	-4.1	-0.006	-1.2	-0.002	
20	-1.3	-0.002	-2.6	-0.004	
30	-3.9	-0.005	4.9	0.007	
40	-6.3	-0.009	0.4	0.001	
50	-1.1	-0.002	1.1	0.002	



3.5.7 Test Result of Voltage Variation

Band	Band Width & Channel	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 7	5MHz	120	-3.8	-0.005	2.5	PASS
		102	2.9	0.004		
		138	-2.1	-0.003		
	10MHz	120	-1.7	-0.002		
		102	4.4	0.006		
		138	0.3	0.000		
	15MHz	120	-4.2	-0.006		
		102	-2.7	-0.004		
		138	-1.8	-0.003		
	20MHz	120	1.8	0.003		
		102	2.5	0.004		
		138	2.2	0.003		

Remark: Normal Voltage = 120.0V.

**3.5.8 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. 30, 2011	Jun. 08, 2012~ Jun. 21, 2012	Dec. 29, 2012	Conducted (TH01-KS)
AC Power Source	Chroma	61602	ABP000000811	N/A	Nov. 16, 2011	Jun. 08, 2012~ Jun. 21, 2012	Nov. 15, 2012	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 30, 2011	Jun. 08, 2012~ Jun. 21, 2012	Dec. 29, 2012	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 09, 2011	Jun. 20, 2012	Nov. 08, 2012	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	Jun. 20, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 08, 2011	Jun. 20, 2012	Dec. 07, 2012	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 06, 2012	Jun. 20, 2012	Jan. 05, 2013	Radiation (03CH01-KS)
Amplifier	Wireless	FPA-6592G	060007	30MHz~2GHz	Dec. 30, 2011	Jun. 20, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Dec. 30, 2011	Jun. 20, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
SHE-EHF Horn	Schwarzbeck	BBHA9170	BBHA170249	15GHz~40GHz	Oct. 11, 2011	Jun. 20, 2012	Oct. 10, 2012	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	860004/00	9kHz~30 MHz	Jul. 28, 2011	Jun. 20, 2012	Jul. 27, 2012	Radiation (03CH01-KS)
LTE Base Station	Anritsu	MT8820C	6201074414	N/A	Jan. 05, 2012	Jun. 08, 2012~ Jun. 20, 2012	Jan. 04, 2013	-



## 4 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 EP251501 as below.