



# FCC RF Test Report

**APPLICANT** : Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd.

**EQUIPMENT** : cdma2000/LTE dual-mode Mobile Phone

**BRAND NAME** : Coolpad

**MODEL NAME** : Coolpad 5860E

**FCC ID** : R38YL5860E

**STANDARD** : 47 CFR Part 2, 24E, 27L

**CLASSIFICATION** : PCS Licensed Transmitter (PCB)

**TX FREQUENCY RANGE** : LTE Band 2 : 1850.7 MHz ~ 1909.3 MHz  
LTE Band 4 : 1710.7MHz ~ 1754.3 MHz

**RX FREQUENCY RANGE** : LTE Band 2 : 1930.7 MHz ~ 1989.3 MHz  
LTE Band 4 : 2110.7 MHz ~ 2154.3 MHz

**MAX. EIRP POWER** : 0.18 W (LTE Band 2, QPSK, BW 1.4MHz)  
0.15 W (LTE Band 2, 16QAM, BW 1.4MHz)  
0.17 W (LTE Band 2, QPSK, BW 3MHz)  
0.16 W (LTE Band 2, 16QAM, BW 3MHz)  
0.17 W (LTE Band 2, QPSK, BW 5MHz)  
0.16 W (LTE Band 2, 16QAM, BW 5MHz)  
0.14 W (LTE Band 2, QPSK, BW 10MHz)  
0.16 W (LTE Band 2, 16QAM, BW 10MHz)  
0.14 W (LTE Band 4, QPSK, BW 1.4MHz)  
0.14 W (LTE Band 4, 16QAM, BW 1.4MHz)  
0.14 W (LTE Band 4, QPSK, BW 3MHz)  
0.13 W (LTE Band 4, 16QAM, BW 3MHz)  
0.09 W (LTE Band 4, QPSK, BW 5MHz)  
0.11 W (LTE Band 4, 16QAM, BW 5MHz)  
0.14 W (LTE Band 4, QPSK, BW 10MHz)  
0.16 W (LTE Band 4, 16QAM, BW 10MHz)

EMISSION DESIGNATOR : 1M10G7D (LTE Band 2, QPSK, BW 1.4MHz)  
1M10D7W (LTE Band 2, 16QAM, BW 1.4MHz)  
2M74G7D (LTE Band 2, QPSK, BW 3MHz)  
2M74D7W (LTE Band 2, 16QAM, BW 3MHz)  
4M50G7D (LTE Band 2, QPSK, BW 5MHz)  
4M50D7W (LTE Band 2, 16QAM, BW 5MHz)  
9M12G7D (LTE Band 2, QPSK, BW 10MHz)  
9M08D7W (LTE Band 2, 16QAM, BW 10MHz)  
1M10G7D (LTE Band 4, QPSK, BW 1.4MHz)  
1M10D7W (LTE Band 4, 16QAM, BW 1.4MHz)  
2M72G7D (LTE Band 4, QPSK, BW 3MHz)  
2M72D7W (LTE Band 4, 16QAM, BW 3MHz)  
4M50G7D (LTE Band 4, QPSK, BW 5MHz)  
4M50D7W (LTE Band 4, 16QAM, BW 5MHz)  
9M16G7D (LTE Band 4, QPSK, BW 10MHz)  
9M12D7W (LTE Band 4, 16QAM, BW 10MHz)

The product was received on Mar. 09, 2011 and completely tested on May 07, 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 / 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 (KUNSHA) INC.**  
**No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.**



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## SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Average Power	NA	PASS	-
3.2	§24.232(d) §27.50(d)(5)	Peak-to-Average Ratio	< 13dB	PASS	-
3.3	§24.232(c) §27.50(d)(4)	Equivalent Isotropic Radiated Power	< 2 Watts (Band 2) < 1 Watt (Band 4)	PASS	-
3.4	§2.1049 §24.238(a)	Occupied Bandwidth	NA	PASS	-
3.5	§2.1051 §24.238(a) §27.53(g)(h)	Band Edge Measurement	< $43+10\log_{10}(P[\text{Watts}])$	PASS	-
3.6	§2.1051 §24.238(a) §27.53(g)(h)	Conducted Emission	< $43+10\log_{10}(P[\text{Watts}])$	PASS	-
3.7	§2.1053 §24.238(a) §27.53(h) (g)	Field Strength of Spurious Radiation	< $43+10\log_{10}(P[\text{Watts}])$	PASS	Under limit 27.50 dB at 7520 MHz
3.8	§2.1055 §24.235 §27.54	Frequency Stability Temperature & Voltage	< 2.5 ppm	PASS	-



# **1 General Description**

## **1.1 Applicant**

**Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd.**

Hi-Tech Industry Park(North), Nanshan District, Shenzhen City, Guangdong Province, P.R.C

## **1.2 Manufacturer**

**Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd.**

Hi-Tech Industry Park(North), Nanshan District, Shenzhen City, Guangdong Province, P.R.C

### 1.3 Feature of Equipment Under Test

Product Feature & Specification	
<b>Equipment</b>	cdma2000/LTE dual-mode Mobile Phone
<b>Brand Name</b>	Coolpad
<b>Model Name</b>	Coolpad 5860E
<b>FCC ID</b>	R38YL5860E
<b>Tx Frequency</b>	LTE Band 2 : 1850.7 MHz ~ 1909.3 MHz LTE Band 4 : 1710.7MHz ~ 1754.3 MHz
<b>Rx Frequency</b>	LTE Band 2 : 1930.7 MHz ~ 1989.3 MHz LTE Band 4 : 2110.7 MHz ~ 2154.3 MHz
<b>Maximum Output Average Power to Antenna</b>	LTE Band 2 : 21.36 dBm LTE Band 4 : 21.73 dBm
<b>Antenna Type</b>	PIFA Antenna
<b>HW Version</b>	P4
<b>SW Version</b>	CP5860E-user 2.3.7 GWK74 2.3.027.P3.120220.5860E release-keys
<b>EUT Stage</b>	Identical Prototype

## 1.4 Emission Designator

FCC Rule	System	Type of Modulation	BW	Emission Designator	Maximum EIRP
Part 24	LTE Band 2	QPSK	1.4 MHz	1M10G7D	0.18 W
Part 24	LTE Band 2	16QAM	1.4 MHz	1M10D7W	0.15 W
Part 24	LTE Band 2	QPSK	3 MHz	2M74G7D	0.17 W
Part 24	LTE Band 2	16QAM	3 MHz	2M74D7W	0.16 W
Part 24	LTE Band 2	QPSK	5MHz	4M50G7D	0.17 W
Part 24	LTE Band 2	16QAM	5MHz	4M50D7W	0.16 W
Part 24	LTE Band 2	QPSK	10MHz	9M12G7D	0.14 W
Part 24	LTE Band 2	16QAM	10MHz	9M08D7W	0.16 W
Part 27	LTE Band 4	QPSK	1.4 MHz	1M10G7D	0.14 W
Part 27	LTE Band 4	16QAM	1.4 MHz	1M10D7W	0.14 W
Part 27	LTE Band 4	QPSK	3 MHz	2M72G7D	0.14 W
Part 27	LTE Band 4	16QAM	3 MHz	2M72D7W	0.13 W
Part 27	LTE Band 4	QPSK	5MHz	4M50G7D	0.09 W
Part 27	LTE Band 4	16QAM	5MHz	4M50D7W	0.11 W
Part 27	LTE Band 4	QPSK	10MHz	9M16G7D	0.14 W
Part 27	LTE Band 4	16QAM	10MHz	9M12D7W	0.16 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	149928/4086E-1

<b>Test Site</b>	SPORTON INTERNATIONAL INC.	
<b>Test Site Location</b>	No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978	
<b>Test Site No.</b>	<b>Sporton Site No.</b>	<b>FCC/IC Registration No.</b>
	TH02-HY	03CH07-HY

### 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, 24E, 27L
- ♦ ANSI / TIA / EIA-603-C-2004

**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.	Radio communication analyzer	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
3.	DC Power Supply	GWINSTEK	GPS-3030D	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 19000 MHz.

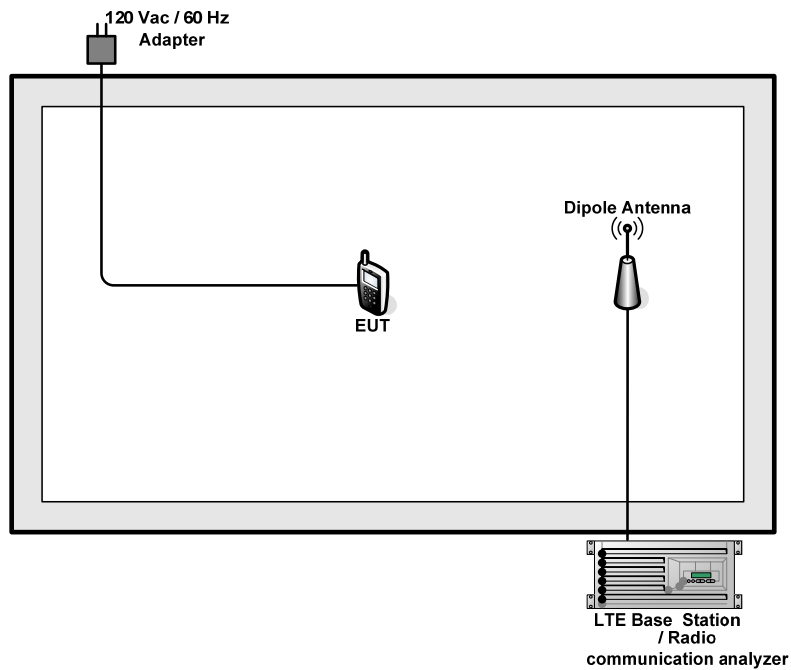
Test Modes			
Band		Radiated TCs	Conducted TCs
LTE Band 2	BW 1.4MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 0) 16QAM Link</li> </ul>	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 0)Link</li> <li>■ LTE (RB Size 1, RB Offset 5)Link</li> <li>■ LTE (RB Size 3, RB Offset 2)Link</li> <li>■ LTE (RB Size 6, RB Offset 0)Link</li> </ul>
	BW 3MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 0) 16QAM 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 14)Link</li> <li>■ LTE (RB Size 8, RB Offset 4)Link</li> <li>■ LTE (RB Size 15, RB Offset 0)Link</li> </ul>
	BW 5MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 0) 16QAM 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 0) 16QAM 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>

Test Modes			
Band			
		Radiated TCs	
		Conducted TCs	
LTE Band 4	BW 1.4MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 0) 16QAM 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 5)Link</li> <li>■ LTE (RB Size 3, RB Offset 2)Link</li> <li>■ LTE (RB Size 6, RB Offset 0)Link</li> </ul>
	BW 3MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 14) 16QAM 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 14)Link</li> <li>■ LTE (RB Size 8, RB Offset 4)Link</li> <li>■ LTE (RB Size 15, RB Offset 0)Link</li> </ul>
	BW 5MHz	<ul style="list-style-type: none"> <li>■ LTE (RB Size 1, RB Offset 24) 16QAM 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) 16QAM 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>

**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 Conducted Output Average Power Measurement

##### 3.1.1 Description of the Conducted Output Average Power Measurement

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum average power on the EUT. The measured average power in the radio frequency on the transmitter output terminals shall be reported.

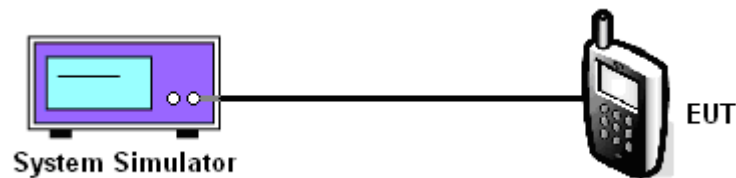
##### 3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

##### 3.1.3 Test Procedures

1. The transmitter output port was connected to base station.
2. Set EUT at maximum average power through base station.
3. Select lowest, middle, and highest channels for each band and different modulation.

##### 3.1.4 Test Setup



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 2	1.4MHz	18607	1850.7	QPSK	1	0	20.31	0.107
					1	5	20.50	0.112
					3	2	20.44	0.111
					6	0	20.11	0.103
				16-QAM	<b>1</b>	<b>0</b>	<b>20.88</b>	<b>0.122</b>
					1	5	20.78	0.120
		3	2		20.55	0.114		
		6	0		19.37	0.086		
		18900	1880	QPSK	<b>1</b>	<b>0</b>	<b>20.85</b>	<b>0.122</b>
					1	5	20.64	0.116
					3	2	20.59	0.115
					6	0	20.45	0.111
	16-QAM			1	0	20.86	0.122	
				1	5	20.76	0.119	
		3	2	20.65	0.116			
		6	0	20.18	0.104			
	19193	1909.3	QPSK	1	0	20.12	0.103	
				1	5	19.84	0.096	
				3	2	19.57	0.091	
				6	0	19.38	0.087	
			16-QAM	1	0	20.25	0.106	
				1	5	20.00	0.100	
				3	2	19.57	0.091	
				6	0	19.05	0.080	



Mode	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 2	3MHz	18615	1851.5	QPSK	1	0	20.43	0.110
					<b>1</b>	<b>14</b>	<b>20.93</b>	<b>0.124</b>
					8	4	20.42	0.110
					15	0	20.29	0.107
				16-QAM	1	0	20.71	0.118
					1	14	21.21	0.132
					8	4	19.47	0.089
					15	0	19.26	0.084
		18900	1880	QPSK	1	0	20.73	0.118
					1	14	20.57	0.114
					8	4	20.19	0.105
					15	0	20.18	0.104
				16-QAM	<b>1</b>	<b>0</b>	<b>21.22</b>	<b>0.132</b>
					1	14	20.90	0.123
					8	4	19.31	0.085
					15	0	19.24	0.084
		19185	1908.5	QPSK	1	0	20.21	0.105
					1	14	19.86	0.097
					8	4	19.55	0.090
					15	0	19.58	0.091
				16-QAM	1	0	20.68	0.117
					1	14	19.97	0.099
					8	4	18.74	0.075
					15	0	18.60	0.072





Mode	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 2	5MHz	18625	1852.5	QPSK	1	0	20.62	0.115
					1	24	20.85	0.122
					12	6	20.46	0.111
					25	0	20.44	0.111
				16-QAM	1	0	20.90	0.123
					1	24	21.27	0.134
		12	6		19.65	0.092		
		25	0		19.61	0.091		
		18900	1880	QPSK	<b>1</b>	<b>0</b>	<b>20.91</b>	<b>0.123</b>
					1	24	20.42	0.110
					12	6	20.30	0.107
					25	0	20.21	0.105
	16-QAM			<b>1</b>	<b>0</b>	<b>21.30</b>	<b>0.135</b>	
				1	24	20.80	0.120	
		12	6	19.35	0.086			
	19175	1907.5	QPSK	1	0	20.77	0.119	
				1	24	20.55	0.114	
				12	6	19.90	0.098	
				25	0	19.80	0.095	
			16-QAM	1	0	21.25	0.133	
				1	24	20.35	0.108	
		12		6	19.32	0.086		
		25		0	19.37	0.086		



Mode	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 2	10MHz	18650	1855	QPSK	1	0	20.64	0.116
					1	49	20.58	0.114
					25	13	20.36	0.109
					50	0	20.28	0.107
				16-QAM	1	0	20.76	0.119
					1	49	21.12	0.129
					25	13	19.38	0.087
					50	0	19.46	0.088
		18900	1880	QPSK	<b>1</b>	<b>0</b>	<b>21.22</b>	<b>0.132</b>
					1	49	20.79	0.120
					25	13	20.36	0.109
					50	0	20.45	0.111
				16-QAM	<b>1</b>	<b>0</b>	<b>21.36</b>	<b>0.137</b>
					1	49	20.98	0.125
					25	13	19.74	0.094
					50	0	19.51	0.089
		19150	1905	QPSK	1	0	20.65	0.116
					1	49	20.47	0.111
					25	13	20.29	0.107
					50	0	20.07	0.102
				16-QAM	1	0	21.11	0.129
					1	49	20.23	0.105
					25	13	19.58	0.091
					50	0	19.39	0.087



Mode	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 4	1.4MHz	19957	1710.7	QPSK	1	0	20.83	0.121
					1	5	20.85	0.122
					<b>3</b>	<b>2</b>	<b>20.97</b>	<b>0.125</b>
					6	0	20.23	0.105
				16-QAM	1	0	21.31	0.135
					1	5	21.28	0.134
					3	2	20.78	0.120
					6	0	19.33	0.086
		20175	1732.5	QPSK	1	0	20.95	0.125
					1	5	20.86	0.122
					3	2	20.61	0.115
					6	0	20.63	0.116
				16-QAM	<b>1</b>	<b>0</b>	<b>21.33</b>	<b>0.136</b>
					1	5	21.04	0.127
					3	2	20.99	0.126
					6	0	19.30	0.085
		20393	1754.3	QPSK	1	0	20.75	0.119
					1	5	20.52	0.113
					3	2	20.30	0.107
					6	0	20.22	0.105
				16-QAM	1	0	21.01	0.126
					1	5	20.60	0.115
					3	2	20.53	0.113
					6	0	19.28	0.085



Mode	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 4	3MHz	19965	1711.5	QPSK	1	0	20.85	0.122
					<b>1</b>	<b>14</b>	<b>21.03</b>	<b>0.127</b>
					8	4	20.46	0.112
					15	0	20.30	0.107
				16-QAM	1	0	21.15	0.130
					<b>1</b>	<b>14</b>	<b>21.35</b>	<b>0.137</b>
					8	4	19.22	0.084
					15	0	19.15	0.082
		20175	1732.5	QPSK	1	0	20.97	0.125
					1	14	20.54	0.113
					8	4	20.26	0.106
					15	0	20.27	0.106
				16-QAM	1	0	21.34	0.136
					1	14	21.21	0.132
					8	4	19.31	0.085
					15	0	19.33	0.086
		20385	1753.5	QPSK	1	0	20.71	0.118
					1	14	20.64	0.116
					8	4	20.23	0.105
					15	0	20.31	0.107
				16-QAM	1	0	21.18	0.131
					1	14	21.11	0.129
					8	4	19.21	0.083
					15	0	19.31	0.085



Mode	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 4	5MHz	19975	1712.5	QPSK	1	0	20.90	0.123
					<b>1</b>	<b>24</b>	<b>21.15</b>	<b>0.130</b>
					12	6	20.55	0.114
					25	0	20.36	0.109
				16-QAM	1	0	21.24	0.133
					<b>1</b>	<b>24</b>	<b>21.64</b>	<b>0.146</b>
					12	6	19.37	0.087
					25	0	19.58	0.091
		20175	1732.5	QPSK	1	0	20.96	0.125
					1	24	20.48	0.112
					12	6	20.42	0.110
					25	0	20.33	0.108
				16-QAM	1	0	21.41	0.138
					1	24	21.14	0.130
					12	6	19.14	0.082
					25	0	19.25	0.084
		20375	1752.5	QPSK	1	0	20.71	0.118
					1	24	20.57	0.114
					12	6	20.31	0.107
					25	0	20.20	0.105
				16-QAM	1	0	21.13	0.130
					1	24	21.02	0.127
					12	6	19.42	0.088
					25	0	19.30	0.085



Mode	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 4	10MHz	20000	1715	QPSK	1	0	20.92	0.124
					<b>1</b>	<b>49</b>	<b>21.23</b>	<b>0.133</b>
					25	13	20.64	0.116
					50	0	20.70	0.118
				16-QAM	1	0	21.23	0.133
					<b>1</b>	<b>49</b>	<b>21.73</b>	<b>0.149</b>
					25	13	19.65	0.092
					50	0	19.55	0.090
		20175	1732.5	QPSK	1	0	20.99	0.126
					1	49	20.52	0.113
					25	13	20.25	0.106
					50	0	20.36	0.109
				16-QAM	1	0	21.46	0.140
					1	49	21.03	0.127
					25	13	19.14	0.082
					50	0	19.27	0.085
		20350	1750	QPSK	1	0	20.73	0.118
					1	49	20.59	0.115
					25	13	20.11	0.103
					50	0	20.36	0.109
				16-QAM	1	0	21.19	0.132
					1	49	21.15	0.130
					25	13	19.33	0.086
					50	0	19.46	0.088

## 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.

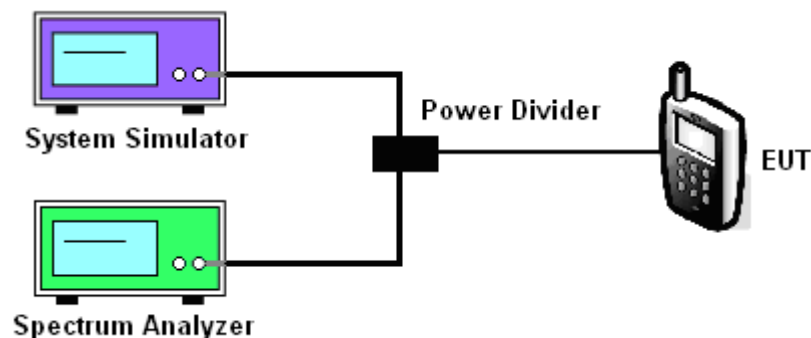
### 3.2.2 Measuring Instruments

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

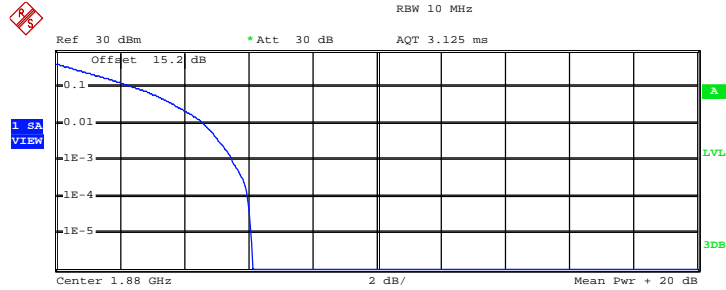
Band	Band Width	Channel	Frequency (MHz)	Modulation	PAR (dB)
LTE Band 2	1.4MHz	18900	1880	QPSK	5.52
				16-QAM	5.80
	3MHz	18900	1880	QPSK	5.48
				16-QAM	5.88
	5MHz	18900	1880	QPSK	5.64
				16-QAM	6.04
10MHz	18900	1880	QPSK	5.56	
			16-QAM	6.28	
LTE Band 4	1.4MHz	20175	1732.5	QPSK	5.68
				16-QAM	6.12
	3MHz	20175	1732.5	QPSK	5.60
				16-QAM	6.08
	5MHz	20175	1732.5	QPSK	5.68
				16-QAM	6.20
10MHz	20175	1732.5	QPSK	5.60	
			16-QAM	6.20	





<b>Band:</b>	LTE Band 2	<b>Bandwidth:</b>	1.4MHz
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**Peak-to-Average Ratio for QPSK-RB Size 6, RB Offset 0**

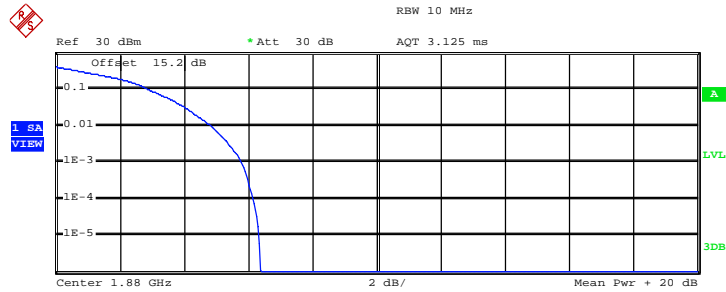


Complementary Cumulative Distribution Function (100000 samples)  
 Trace 1  
 Mean 21.23 dBm  
 Peak 27.37 dBm  
 Crest 6.15 dB

10 %	2.52 dB
1 %	4.60 dB
.1 %	5.52 dB
.01 %	6.00 dB

Date: 18.APR.2012 05:01:52

**Peak-to-Average Ratio for 16QAM-RB Size 6, RB Offset 0**



Complementary Cumulative Distribution Function (100000 samples)  
 Trace 1  
 Mean 21.29 dBm  
 Peak 27.65 dBm  
 Crest 6.37 dB

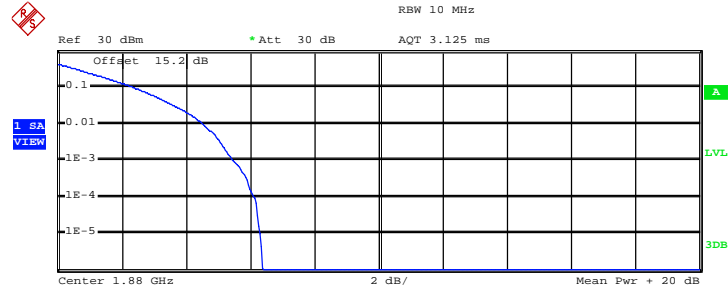
10 %	2.96 dB
1 %	4.84 dB
.1 %	5.80 dB
.01 %	6.16 dB

Date: 18.APR.2012 05:02:13



<b>Band:</b>	LTE Band 2	<b>Bandwidth:</b>	3MHz
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Peak-to-Average Ratio for QPSK-RB Size 15, RB Offset 0



Complementary Cumulative Distribution Function (100000 samples)

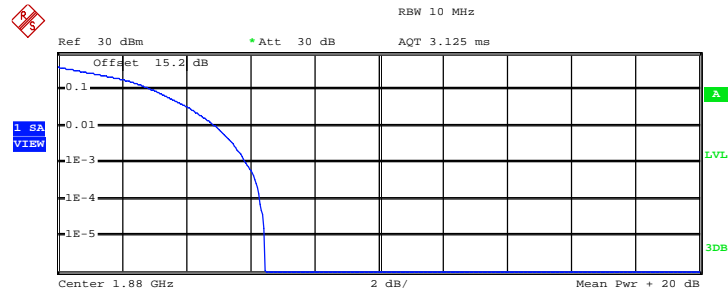
Trace 1

Mean 21.13 dBm  
 Peak 27.51 dBm  
 Crest 6.38 dB

10 % 2.44 dB  
 1 % 4.56 dB  
 .1 % 5.48 dB  
 .01 % 6.16 dB

Date: 18.APR.2012 05:00:06

Peak-to-Average Ratio for 16QAM-RB Size 15, RB Offset 0



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 21.20 dBm  
 Peak 27.65 dBm  
 Crest 6.46 dB

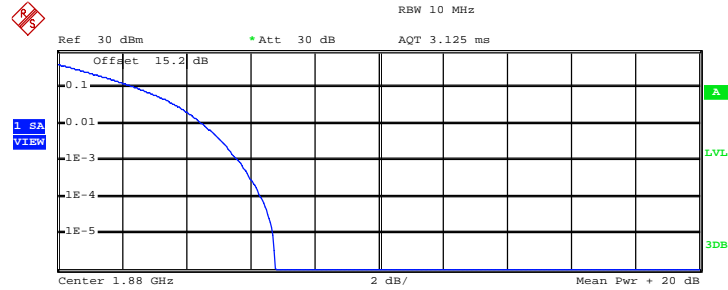
10 % 3.00 dB  
 1 % 4.92 dB  
 .1 % 5.88 dB  
 .01 % 6.32 dB

Date: 18.APR.2012 04:59:37



<b>Band:</b>	LTE Band 2	<b>Bandwidth:</b>	5MHz
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Peak-to-Average Ratio for QPSK-RB Size 25, RB Offset 0



Complementary Cumulative Distribution Function (100000 samples)

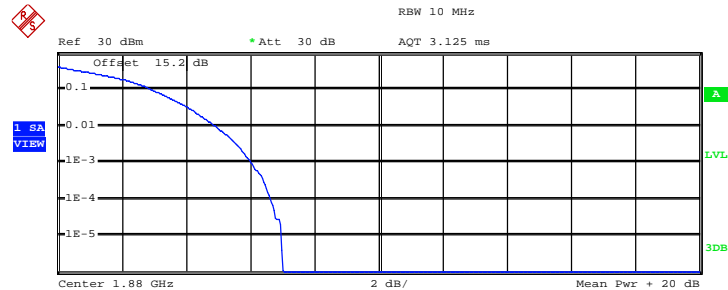
Trace 1

Mean 20.88 dBm  
 Peak 27.65 dBm  
 Crest 6.77 dB

10 % 2.52 dB  
 1 % 4.56 dB  
 .1 % 5.64 dB  
 .01 % 6.36 dB

Date: 18.APR.2012 04:57:38

Peak-to-Average Ratio for 16QAM-RB Size 25, RB Offset 0



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 20.94 dBm  
 Peak 27.94 dBm  
 Crest 7.00 dB

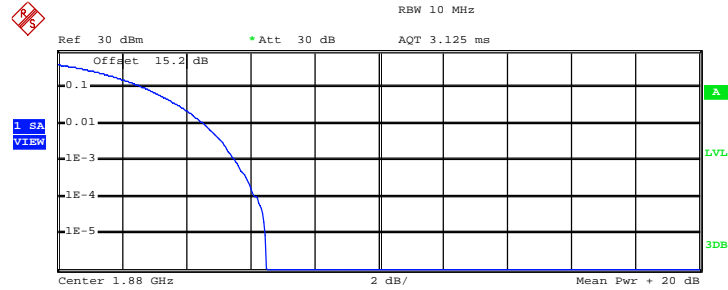
10 % 3.00 dB  
 1 % 4.96 dB  
 .1 % 6.04 dB  
 .01 % 6.64 dB

Date: 18.APR.2012 04:58:01



<b>Band:</b>	LTE Band 2	<b>Bandwidth:</b>	10MHz
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Peak-to-Average Ratio for QPSK-RB Size 50, RB Offset 0



Complementary Cumulative Distribution Function (100000 samples)

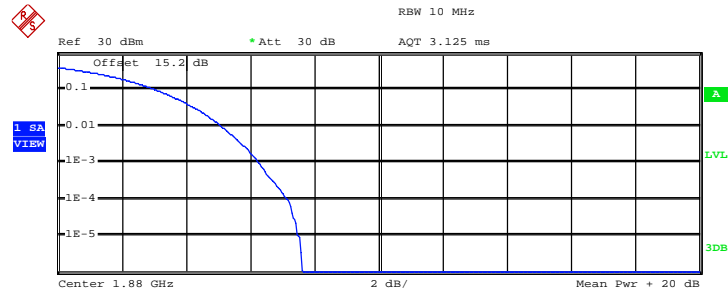
Trace 1

Mean 20.73 dBm  
 Peak 27.23 dBm  
 Crest 6.50 dB

10 % 2.72 dB  
 1 % 4.56 dB  
 .1 % 5.56 dB  
 .01 % 6.20 dB

Date: 18.APR.2012 04:53:36

Peak-to-Average Ratio for 16QAM-RB Size 50, RB Offset 0



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 20.82 dBm  
 Peak 28.43 dBm  
 Crest 7.61 dB

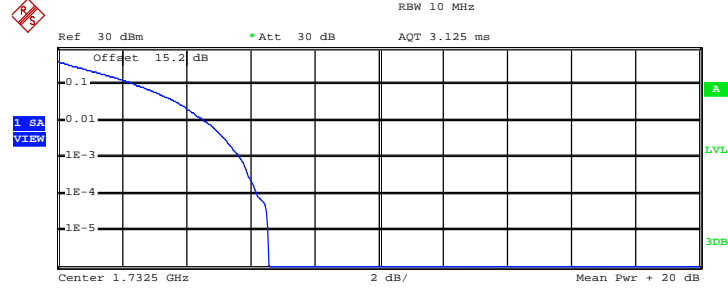
10 % 3.12 dB  
 1 % 5.12 dB  
 .1 % 6.28 dB  
 .01 % 7.20 dB

Date: 18.APR.2012 04:53:17



<b>Band:</b>	LTE Band 4	<b>Bandwidth:</b>	1.4MHz
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Peak-to-Average Ratio for QPSK-RB Size 6, RB Offset 0



Complementary Cumulative Distribution Function (100000 samples)

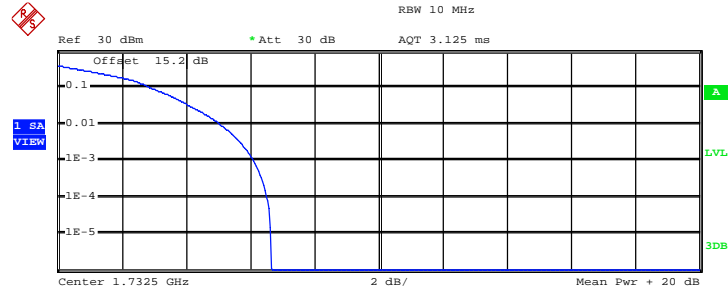
Trace 1

Mean 20.87 dBm  
 Peak 27.44 dBm  
 Crest 6.57 dB

10 % 2.48 dB  
 1 % 4.60 dB  
 .1 % 5.68 dB  
 .01 % 6.20 dB

Date: 18.APR.2012 05:20:36

Peak-to-Average Ratio for 16QAM-RB Size 6, RB Offset 0



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 21.29 dBm  
 Peak 27.94 dBm  
 Crest 6.64 dB

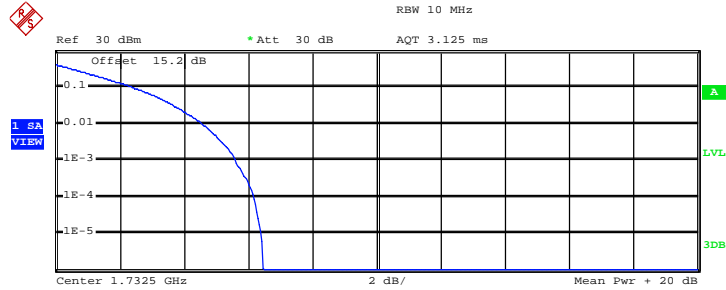
10 % 2.96 dB  
 1 % 5.08 dB  
 .1 % 6.12 dB  
 .01 % 6.52 dB

Date: 18.APR.2012 05:20:15



<b>Band:</b>	LTE Band 4	<b>Bandwidth:</b>	3MHz
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Peak-to-Average Ratio for QPSK-RB Size 15, RB Offset 0



Complementary Cumulative Distribution Function (100000 samples)

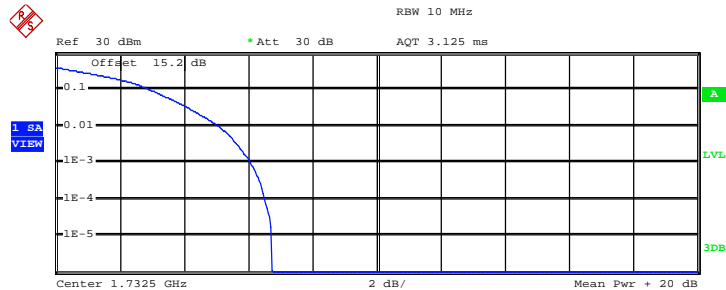
Trace 1

Mean 20.83 dBm  
 Peak 27.30 dBm  
 Crest 6.47 dB

10 % 2.48 dB  
 1 % 4.60 dB  
 .1 % 5.60 dB  
 .01 % 6.20 dB

Date: 18.APR.2012 05:21:04

Peak-to-Average Ratio for 16QAM-RB Size 15, RB Offset 0



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 21.05 dBm  
 Peak 27.80 dBm  
 Crest 6.75 dB

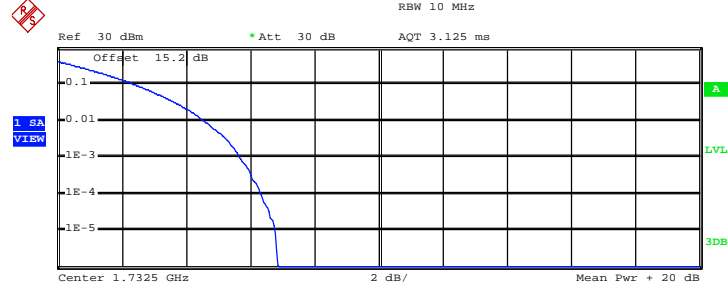
10 % 3.00 dB  
 1 % 5.08 dB  
 .1 % 6.08 dB  
 .01 % 6.52 dB

Date: 18.APR.2012 05:21:22



Band:	LTE Band 4	Bandwidth:	5MHz
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Peak-to-Average Ratio for QPSK-RB Size 25, RB Offset 0



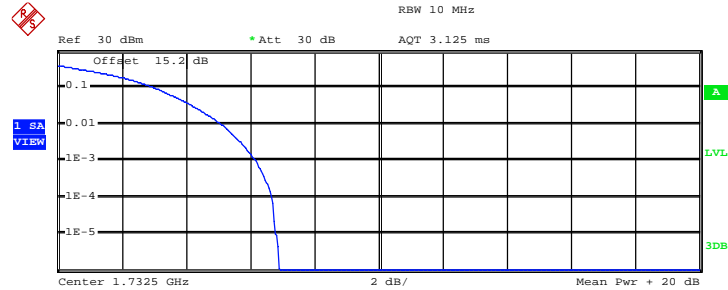
Complementary Cumulative Distribution Function (100000 samples)  
Trace 1

Mean 20.88 dBm  
 Peak 27.72 dBm  
 Crest 6.85 dB

10 % 2.48 dB  
 1 % 4.60 dB  
 .1 % 5.68 dB  
 .01 % 6.36 dB

Date: 18.APR.2012 05:26:00

Peak-to-Average Ratio for 16QAM-RB Size 25, RB Offset 0



Complementary Cumulative Distribution Function (100000 samples)  
Trace 1

Mean 20.90 dBm  
 Peak 27.80 dBm  
 Crest 6.90 dB

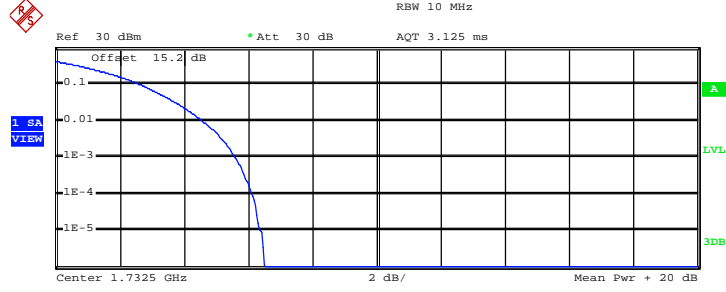
10 % 3.08 dB  
 1 % 5.12 dB  
 .1 % 6.20 dB  
 .01 % 6.68 dB

Date: 18.APR.2012 05:25:39



<b>Band:</b>	LTE Band 4	<b>Bandwidth:</b>	10MHz
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Peak-to-Average Ratio for QPSK-RB Size 50, RB Offset 0



Complementary Cumulative Distribution Function (100000 samples)

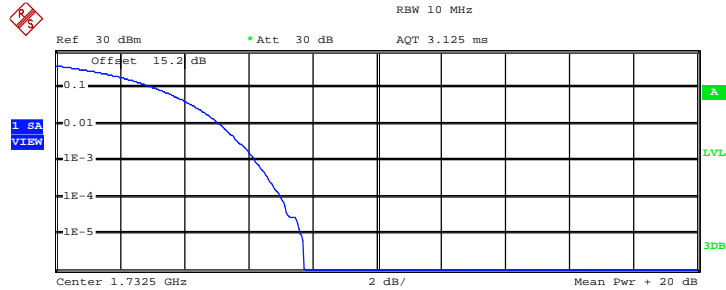
Trace 1

Mean 20.67 dBm  
 Peak 27.16 dBm  
 Crest 6.49 dB

10 % 2.68 dB  
 1 % 4.60 dB  
 .1 % 5.60 dB  
 .01 % 6.12 dB

Date: 18.APR.2012 05:30:41

Peak-to-Average Ratio for 16QAM-RB Size 50, RB Offset 0



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 20.68 dBm  
 Peak 28.43 dBm  
 Crest 7.75 dB

10 % 3.12 dB  
 1 % 5.12 dB  
 .1 % 6.20 dB  
 .01 % 7.04 dB

Date: 18.APR.2012 05:30:58





### **3.3 Equivalent Isotropic Radiated Power Measurement**

#### **3.3.1 Description of the EIRP Measurement**

Equivalent isotropic radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-C-2004. Mobile and portable (hand-held) stations operating in each channel are limited to average EIRP of 2 watts with band 2 and EIRP of 1 watt with band 4.

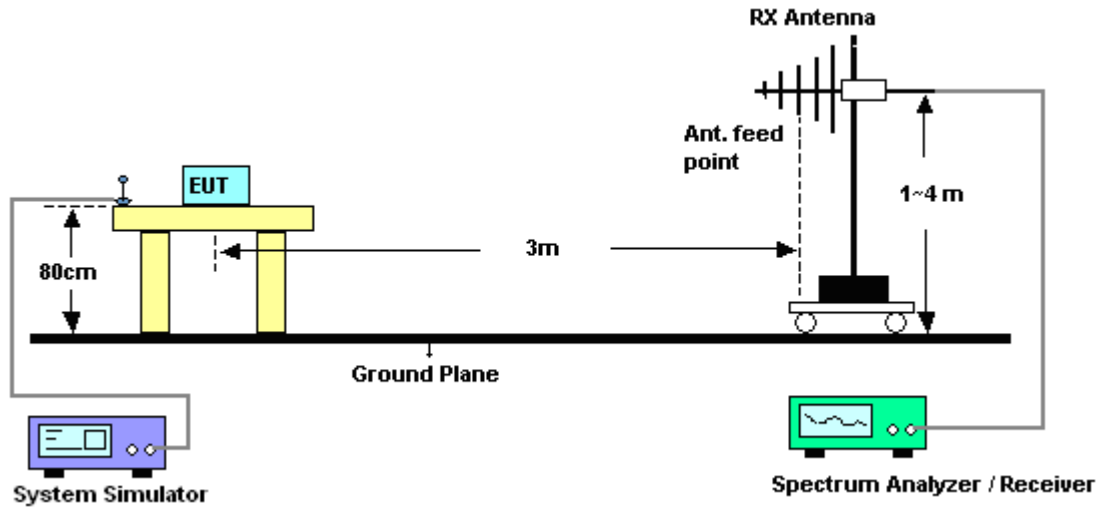
#### **3.3.2 Measuring Instruments**

See list of measuring instruments of this test report.

#### **3.3.3 Test Procedures**

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 with a test antenna and a spectrum analyzer with RBW=3M VBW=3\*RBW RMS Detector and used Channel Power function with measurement bandwidth = 5M/10MHz.
2. During the measurement, the EUT was enforced in maximum power and linked with a base station. 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,  $EIRP = LVL + \text{Correction factor}$ .

### 3.3.4 Test Setup



3.3.5 Test Result of EIRP

LTE Band 2 Radiated Power EIRP for BW 1.4MHz (QPSK)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1850.7	-21.22	43.69	22.47	0.18
1880.0	-22.15	44.79	22.64	0.18
1909.3	-22.49	43.59	21.10	0.13
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1850.7	-25.18	45.72	20.54	0.11
1880.0	-24.25	46.78	22.53	0.18
1909.3	-25.61	46.77	21.16	0.13

LTE Band 2 Radiated Power EIRP for BW 1.4MHz (16QAM)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1850.7	-22.53	43.69	21.16	0.13
1880.0	-23.36	44.79	21.43	0.14
1909.3	-23.71	43.59	19.88	0.10
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1850.7	-24.51	45.72	21.21	0.13
1880.0	-25.08	46.78	21.70	0.15
1909.3	-25.80	46.77	20.97	0.13



LTE Band 2 Radiated Power EIRP for BW 3MHz (QPSK)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1851.5	-21.56	43.69	22.13	0.16
1880.0	-22.51	44.79	22.28	0.17
1908.5	-22.06	43.59	21.53	0.14
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1851.5	-25.23	45.72	20.49	0.11
1880.0	-25.43	46.78	21.35	0.14
1908.5	-26.52	46.77	20.25	0.11

LTE Band 2 Radiated Power EIRP for BW 3MHz (16QAM)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1851.5	-21.96	43.69	21.73	0.15
1880.0	-22.76	44.79	22.03	0.16
1908.5	-22.45	43.59	21.14	0.13
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1851.5	-25.81	45.72	19.91	0.10
1880.0	-25.94	46.78	20.84	0.12
1908.5	-26.82	46.77	19.95	0.10



LTE Band 2 Radiated Power EIRP for BW 5MHz (QPSK)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1852.5	-21.46	43.69	22.23	0.17
1880.0	-22.62	44.79	22.17	0.16
1907.5	-22.21	43.59	21.38	0.14
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1852.5	-25.62	45.72	20.10	0.10
1880.0	-25.94	46.78	20.84	0.12
1907.5	-26.75	46.77	20.02	0.10

LTE Band 2 Radiated Power EIRP for BW 5MHz (16QAM)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1852.5	-22.96	43.69	20.73	0.12
1880.0	-22.87	44.79	21.92	0.16
1907.5	-22.64	43.59	20.95	0.12
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1852.5	-25.99	45.72	19.73	0.09
1880.0	-26.43	46.78	20.35	0.11
1907.5	-27.09	46.77	19.68	0.09



LTE Band 2 Radiated Power EIRP for BW 10MHz (QPSK)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1855.0	-22.18	43.69	21.51	0.14
1880.0	-23.48	44.79	21.31	0.14
1905.0	-22.47	43.59	21.12	0.13
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1855.0	-25.55	45.72	20.17	0.10
1880.0	-25.22	46.78	21.56	0.14
1905.0	-26.85	46.77	19.92	0.10

LTE Band 2 Radiated Power EIRP for BW 10MHz (16QAM)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1855.0	-21.80	43.69	21.89	0.15
1880.0	-22.72	44.79	22.07	0.16
1905.0	-22.86	43.59	20.73	0.12
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1855.0	-26.43	45.72	19.29	0.08
1880.0	-25.56	46.78	21.22	0.13
1905.0	-26.93	46.77	19.84	0.10



LTE Band 4 Radiated Power EIRP for BW 1.4MHz (QPSK)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1710.70	-19.24	41.65	20.26	0.11
1732.50	-19.24	42.95	21.56	0.14
1754.30	-19.40	42.28	20.73	0.12
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1710.70	-23.93	43.57	17.49	0.06
1732.50	-23.65	45.94	20.14	0.10
1754.30	-24.91	45.2	18.14	0.07

LTE Band 4 Radiated Power EIRP for BW 1.4MHz (16QAM)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1710.70	-19.56	41.65	19.94	0.10
1732.50	-19.41	42.95	21.39	0.14
1754.30	-19.95	42.28	20.18	0.10
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1710.70	-23.94	43.57	17.48	0.06
1732.50	-24.12	45.94	19.67	0.09
1754.30	-24.98	45.2	18.07	0.06



LTE Band 4 Radiated Power EIRP for BW 3MHz (QPSK)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1711.50	-19.31	41.58	20.12	0.10
1732.50	-19.46	42.95	21.34	0.14
1753.50	-21.04	42.12	18.93	0.08
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1711.50	-24.81	43.49	16.53	0.04
1732.50	-25.12	45.94	18.67	0.07
1753.50	-26.42	44.94	16.37	0.04

LTE Band 4 Radiated Power EIRP for BW 3MHz (16QAM)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1711.50	-19.80	41.58	19.63	0.09
1732.50	-19.51	42.95	21.29	0.13
1753.50	-20.58	42.12	19.39	0.09
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1711.50	-25.14	43.49	16.20	0.04
1732.50	-25.39	45.94	18.40	0.07
1753.50	-25.79	44.94	17.00	0.05





LTE Band 4 Radiated Power EIRP for BW 5MHz (QPSK)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1712.50	-19.93	41.62	19.54	0.09
1732.50	-20.16	42.06	19.75	0.09
1752.50	-20.23	41.73	19.35	0.09
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1712.50	-25.33	43.45	15.97	0.04
1732.50	-25.42	45.68	18.11	0.06
1752.50	-28.32	44.88	14.41	0.03

LTE Band 4 Radiated Power EIRP for BW 5MHz (16QAM)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1712.50	-19.67	41.62	19.80	0.10
1732.50	-19.42	42.06	20.49	0.11
1752.50	-19.02	41.73	20.56	0.11
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1712.50	-25.21	43.45	16.09	0.04
1732.50	-25.24	45.68	18.29	0.07
1752.50	-26.67	44.88	16.06	0.04



LTE Band 4 Radiated Power EIRP for BW 10MHz (QPSK)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1715.00	-18.66	42.12	21.31	0.14
1732.50	-18.65	42.06	21.26	0.13
1750.00	-19.17	41.57	20.25	0.11
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1715.00	-27.43	44.81	15.23	0.03
1732.50	-25.96	45.68	17.57	0.06
1750.00	-28.47	44.74	14.12	0.03

LTE Band 4 Radiated Power EIRP for BW 10MHz (16QAM)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1715.00	-18.06	42.12	21.91	0.16
1732.50	-17.85	42.06	22.06	0.16
1750.00	-18.55	41.57	20.87	0.12
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1715.00	-26.97	44.81	15.69	0.04
1732.50	-25.22	45.68	18.31	0.07
1750.00	-27.71	44.74	14.88	0.03

### 3.4 Occupied Bandwidth and 26dB Bandwidth Measurement

#### 3.4.1 Description of Occupied Bandwidth and 26dB 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.

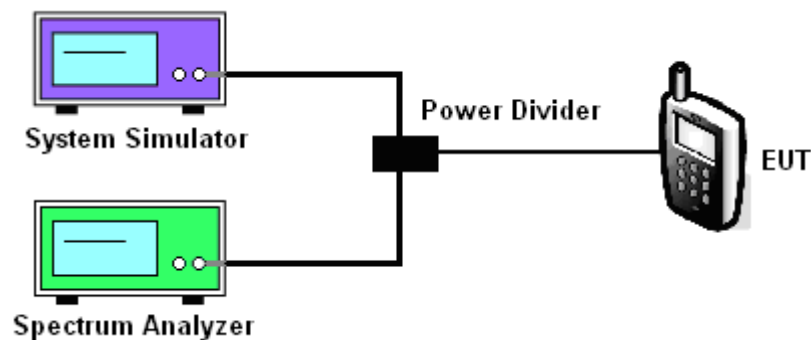
#### 3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.4.3 Test Procedures

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

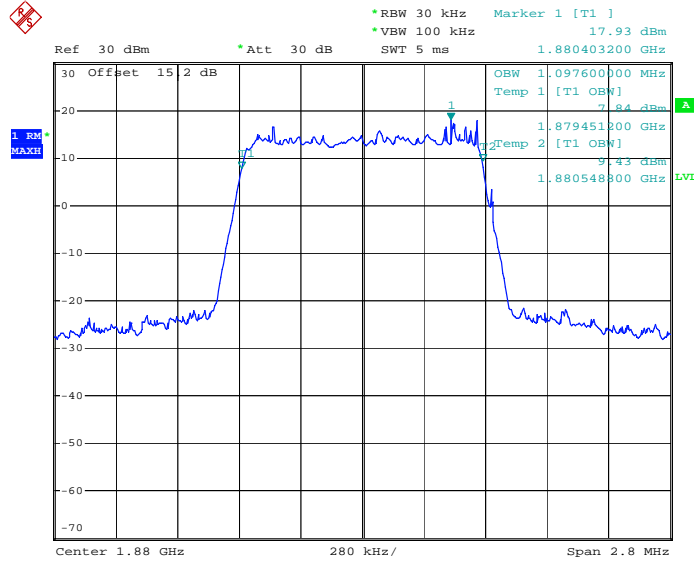
#### 3.4.4 Test Setup



### 3.4.5 Test Result (Plots) of Occupied Bandwidth

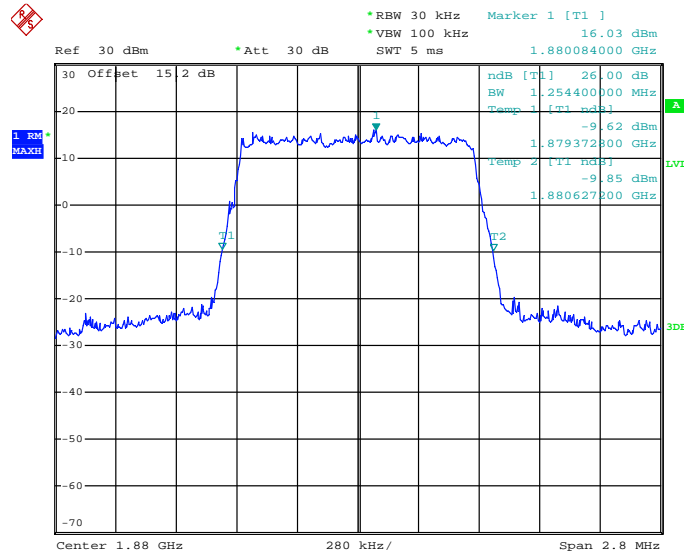
Band :	LTE Band 2	BW / Mod. :	1.4MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 18900



Date: 17.APR.2012 17:34:39

26dB Bandwidth Plot on Channel 18900

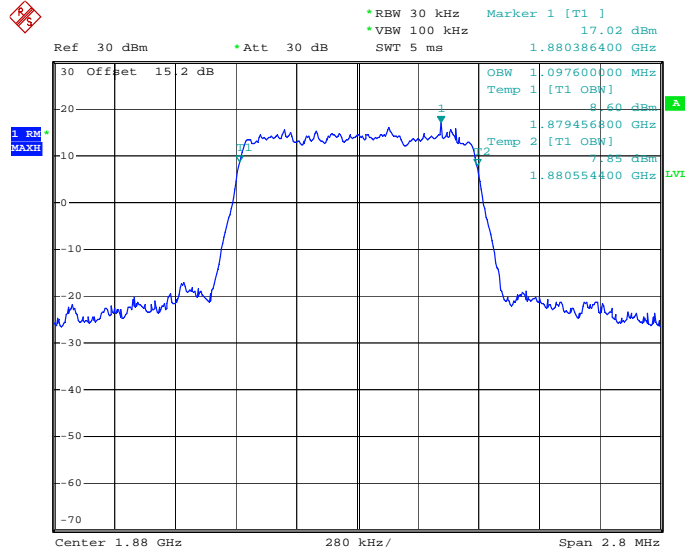


Date: 18.APR.2012 07:43:30



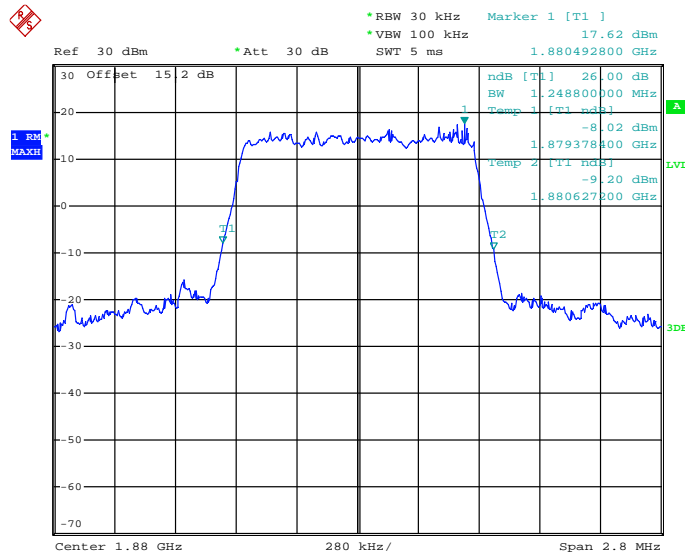
<b>Band :</b>	LTE Band 2	<b>BW / Mod. :</b>	1.4MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 18900



Date: 17.APR.2012 17:49:58

26dB Bandwidth Plot on Channel 18900

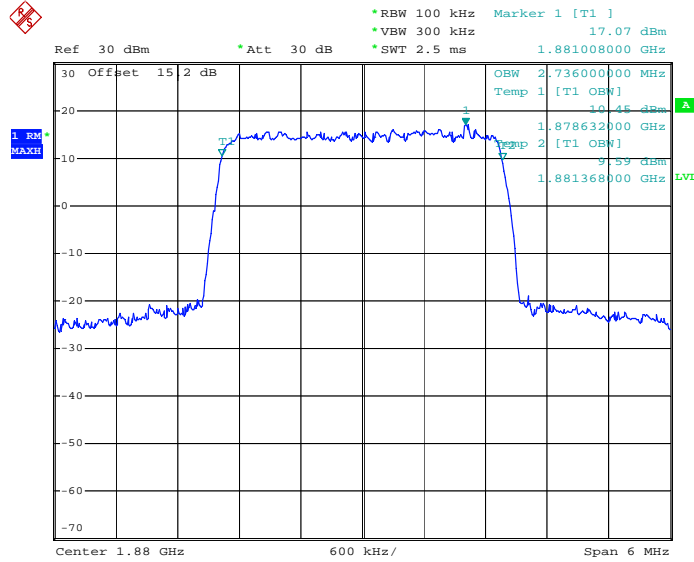


Date: 18.APR.2012 07:43:01



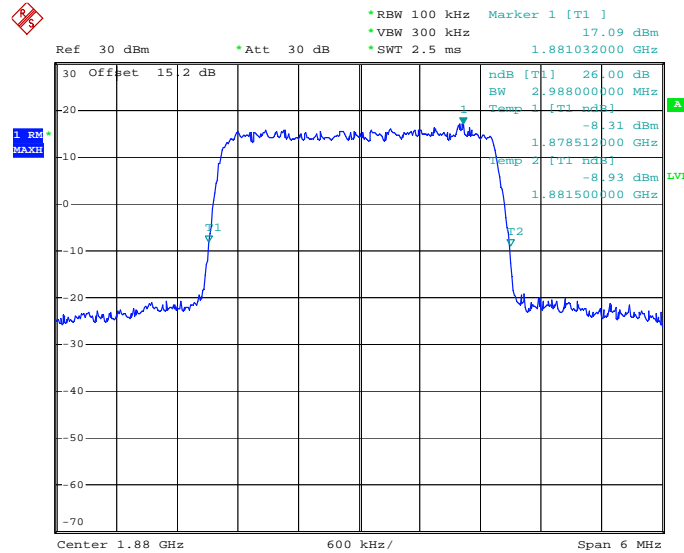
Band :	LTE Band 2	BW / Mod. :	3MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 18900



Date: 17.APR.2012 18:06:51

26dB Bandwidth Plot on Channel 18900

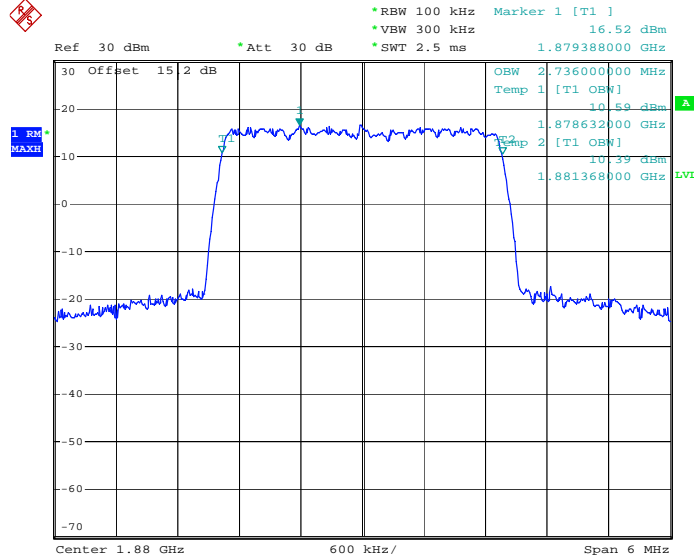


Date: 17.APR.2012 19:28:04



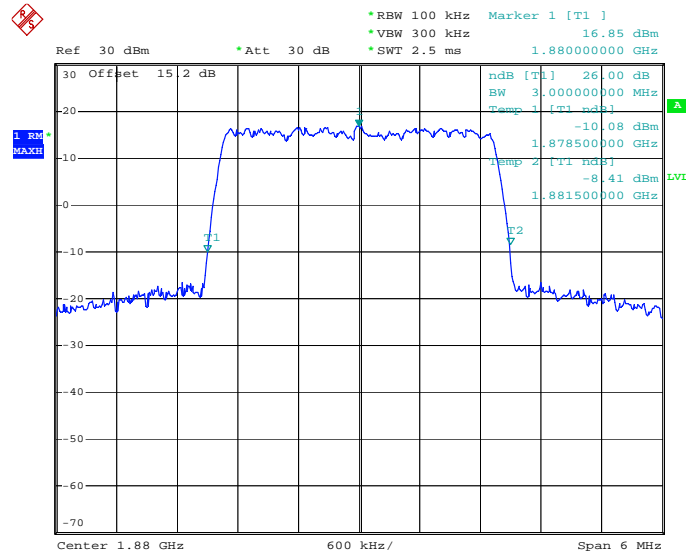
Band :	LTE Band 2	BW / Mod. :	3MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 18900



Date: 17.APR.2012 18:08:12

26dB Bandwidth Plot on Channel 18900

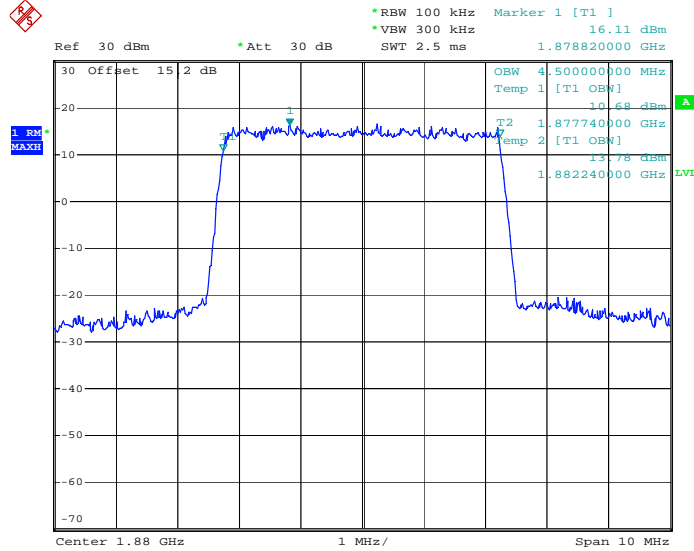


Date: 17.APR.2012 19:27:11



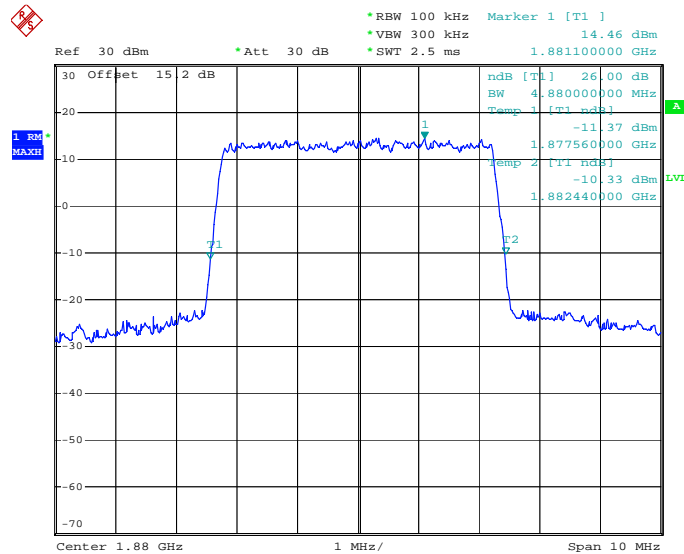
Band :	LTE Band 2	BW / Mod. :	5MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 18900



Date: 17.APR.2012 18:19:36

26dB Bandwidth Plot on Channel 18900



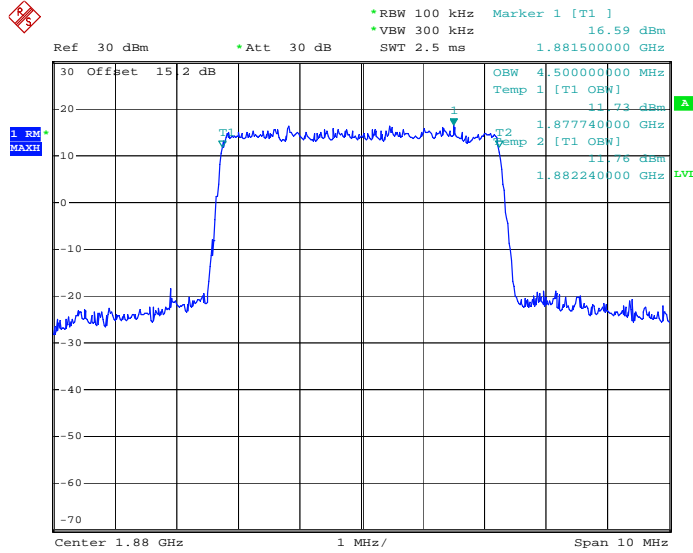
Date: 17.APR.2012 19:23:40





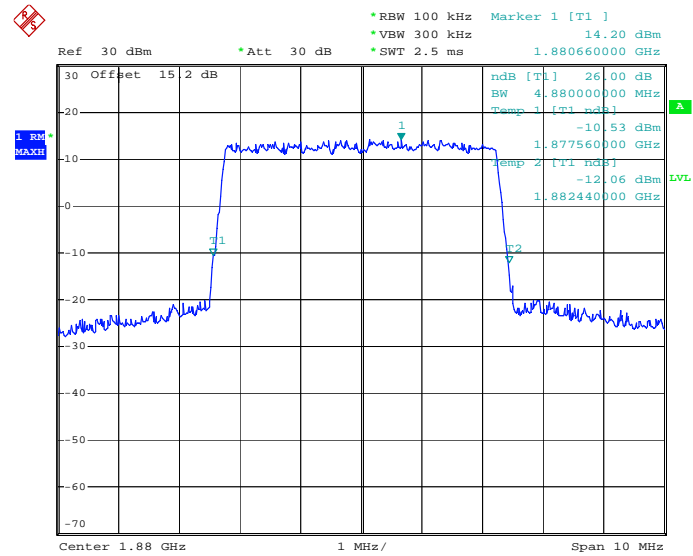
Band :	LTE Band 2	BW / Mod. :	5MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 18900



Date: 17.APR.2012 18:20:01

26dB Bandwidth Plot on Channel 18900

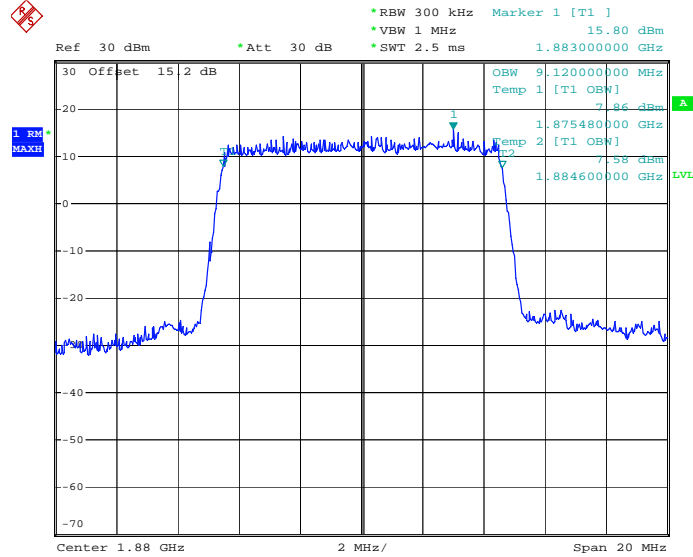


Date: 17.APR.2012 19:24:32



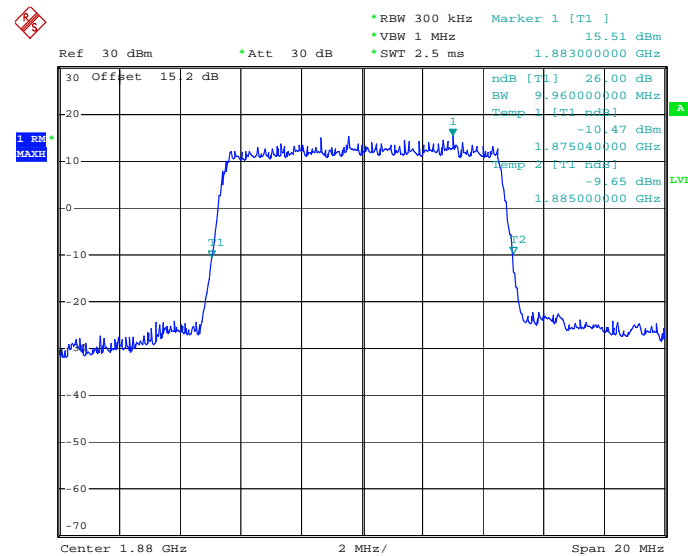
Band :	LTE Band 2	BW / Mod. :	10MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 18900



Date: 17.APR.2012 18:29:08

26dB Bandwidth Plot on Channel 18900

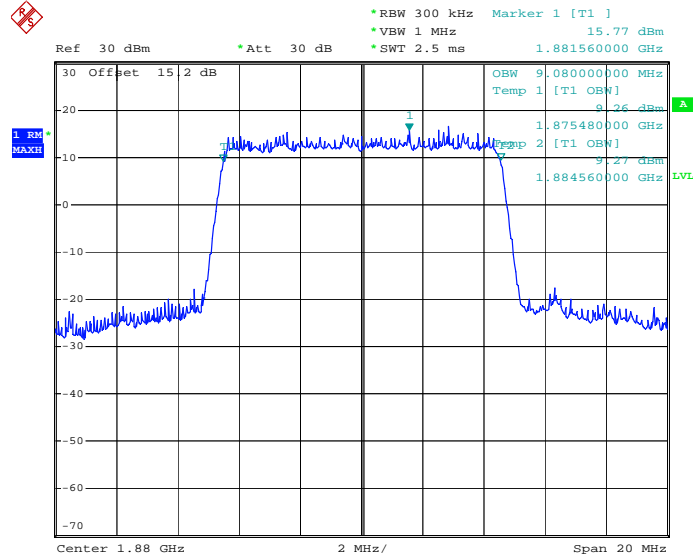


Date: 17.APR.2012 19:12:45



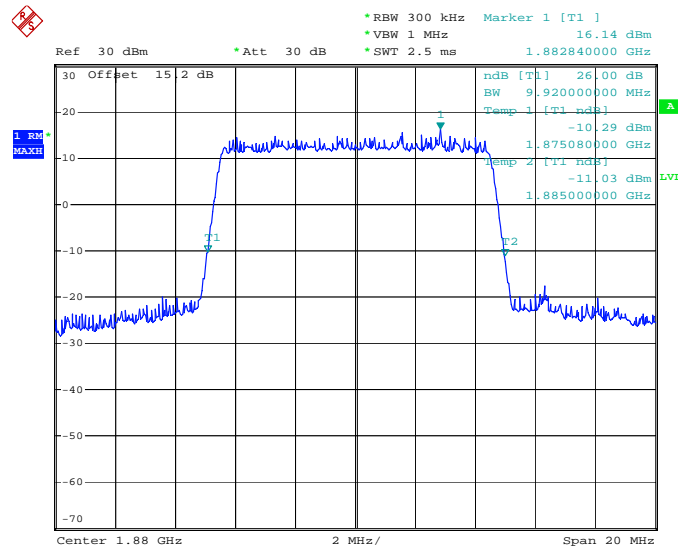
Band :	LTE Band 2	BW / Mod. :	10MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 18900



Date: 17.APR.2012 18:35:58

26dB Bandwidth Plot on Channel 18900

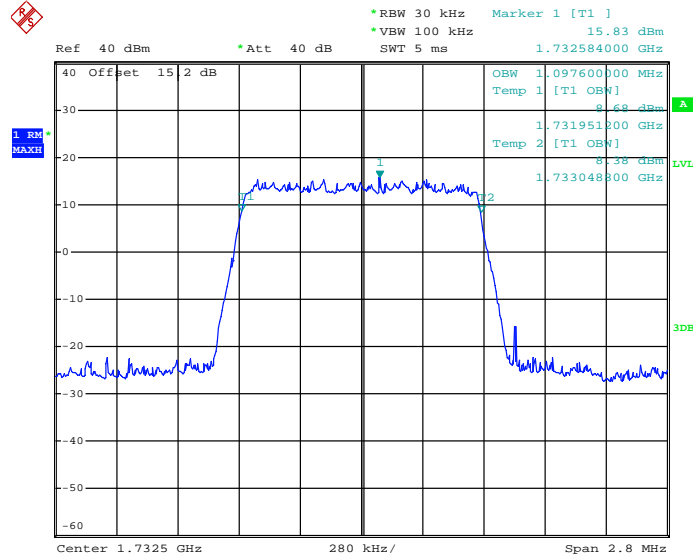


Date: 17.APR.2012 18:43:33



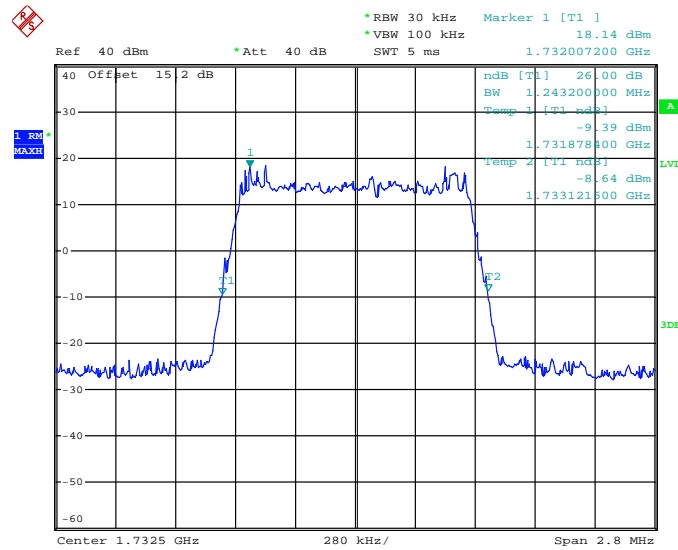
Band :	LTE Band 4	BW / Mod. :	1.4MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 20175



Date: 18.APR.2012 06:03:28

26dB Bandwidth Plot on Channel 20175

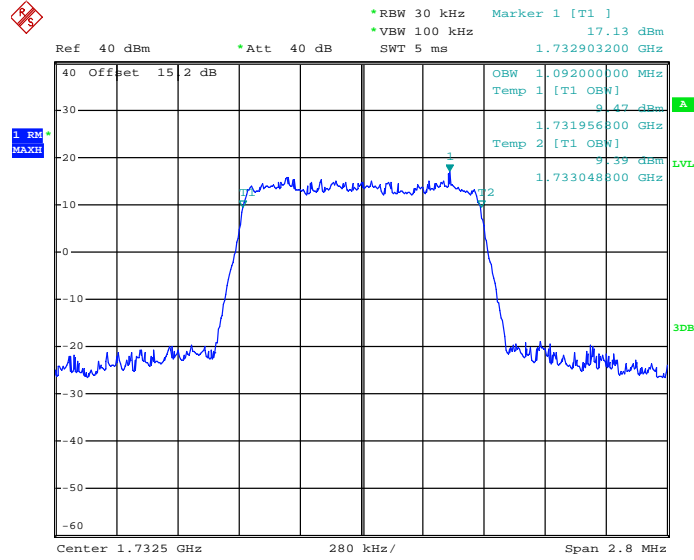


Date: 18.APR.2012 05:46:39



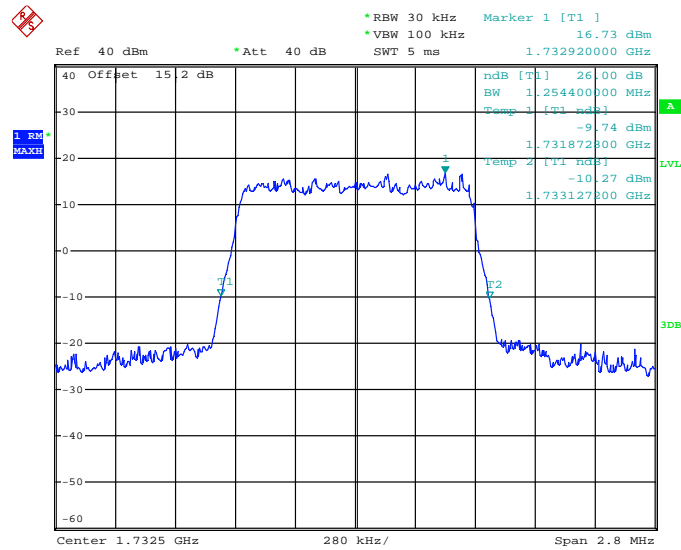
Band :	LTE Band 4	BW / Mod. :	1.4MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 20175



Date: 18.APR.2012 06:02:46

26dB Bandwidth Plot on Channel 20175

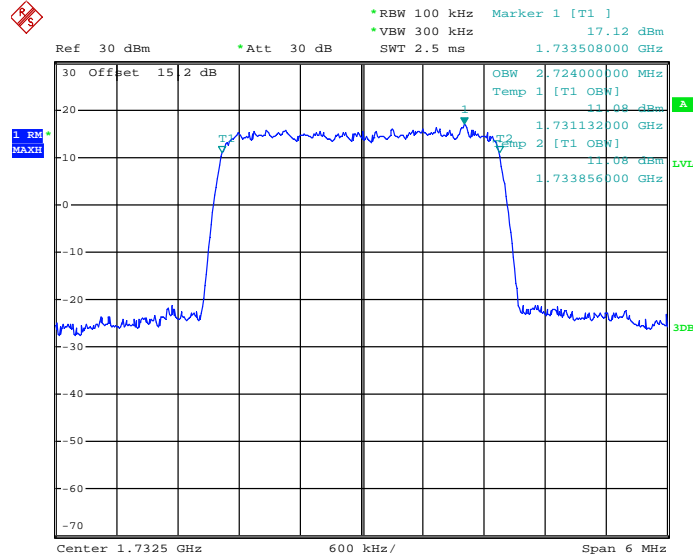


Date: 18.APR.2012 05:47:22



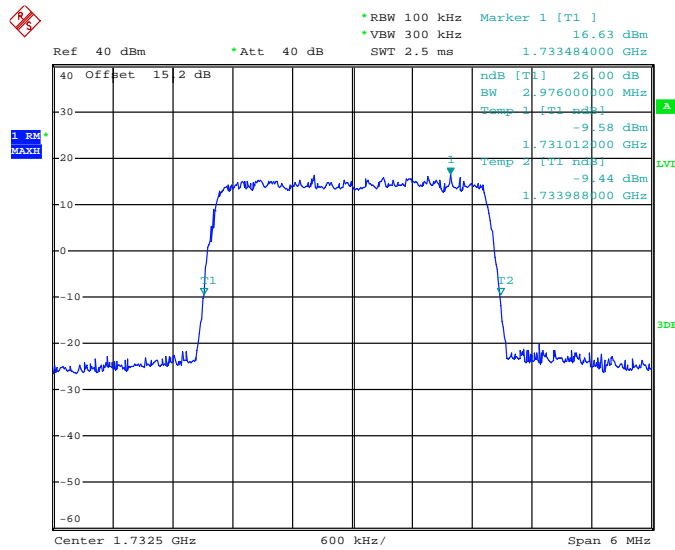
Band :	LTE Band 4	BW / Mod. :	3MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 20175



Date: 18.APR.2012 07:33:49

26dB Bandwidth Plot on Channel 20175

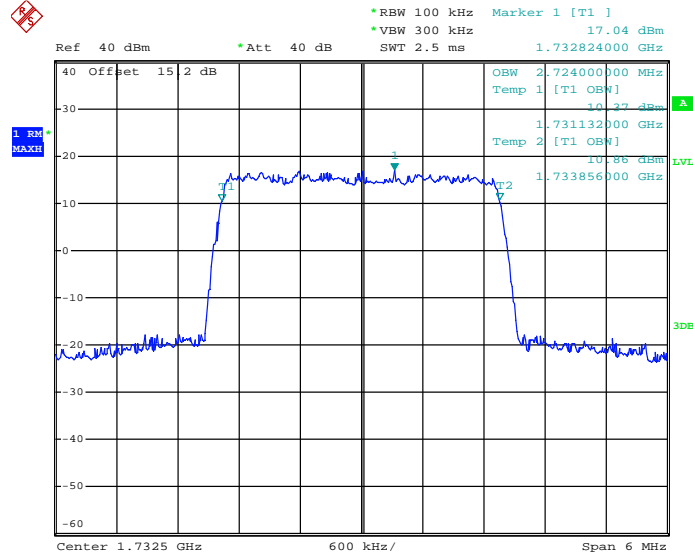


Date: 18.APR.2012 05:44:44



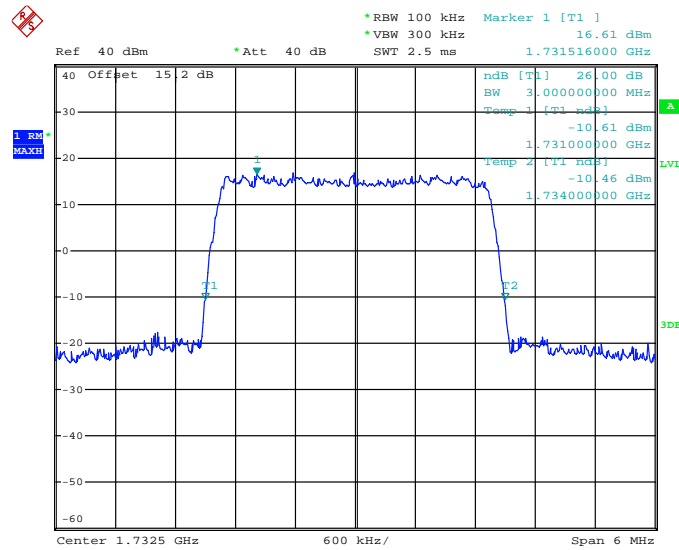
Band :	LTE Band 4	BW / Mod. :	3MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 20175



Date: 18.APR.2012 06:13:56

26dB Bandwidth Plot on Channel 20175

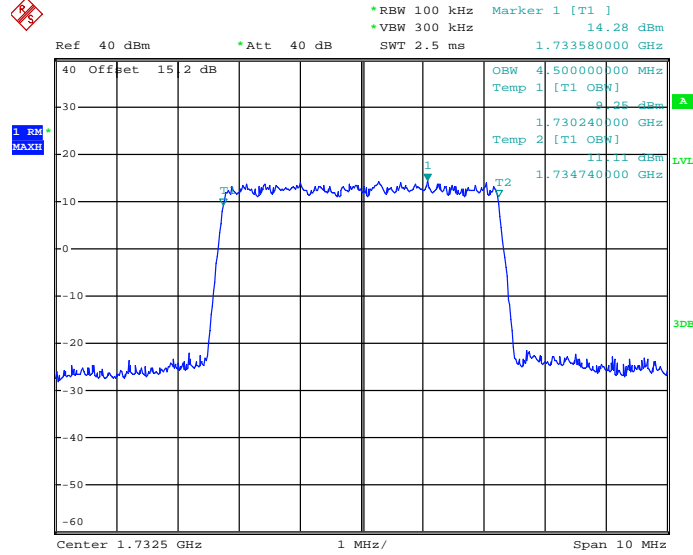


Date: 18.APR.2012 05:44:22



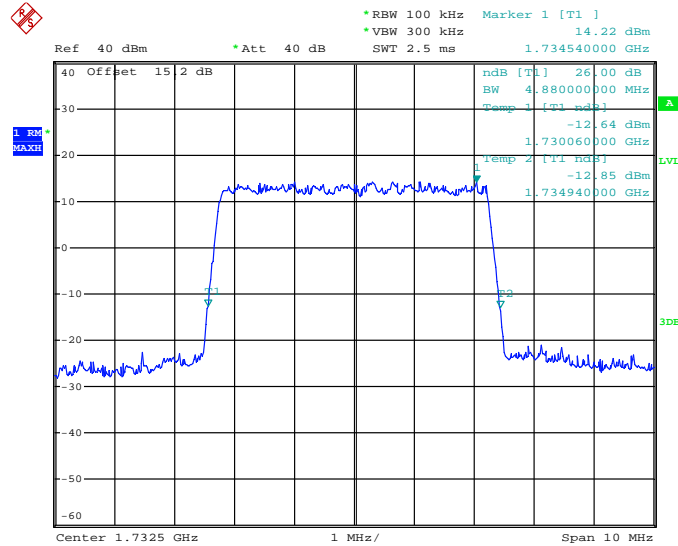
Band :	LTE Band 4	BW / Mod. :	5MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 20175



Date: 18.APR.2012 06:23:33

26dB Bandwidth Plot on Channel 20175



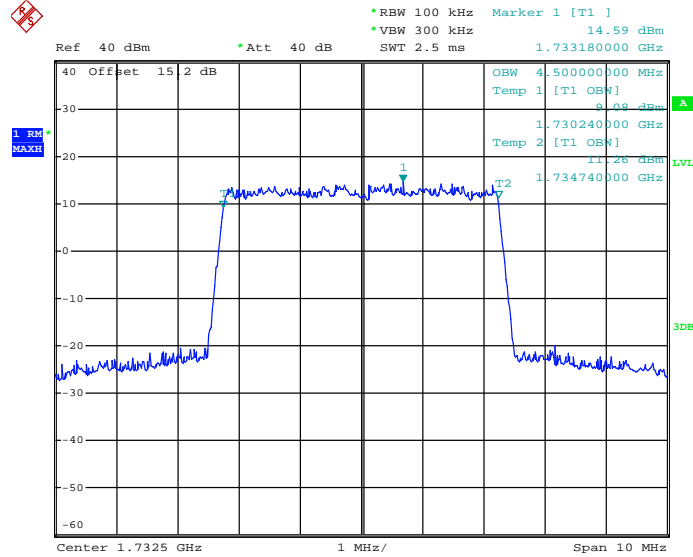
Date: 18.APR.2012 05:39:49





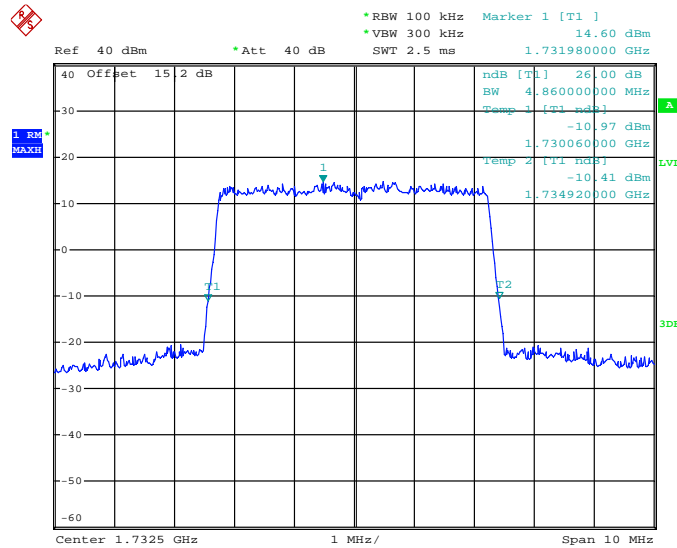
Band :	LTE Band 4	BW / Mod. :	5MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 20175



Date: 18.APR.2012 06:14:57

26dB Bandwidth Plot on Channel 20175

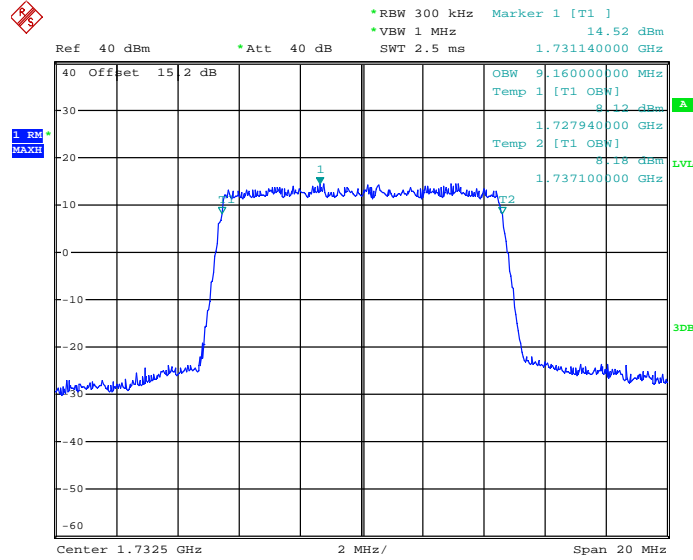


Date: 18.APR.2012 05:40:41



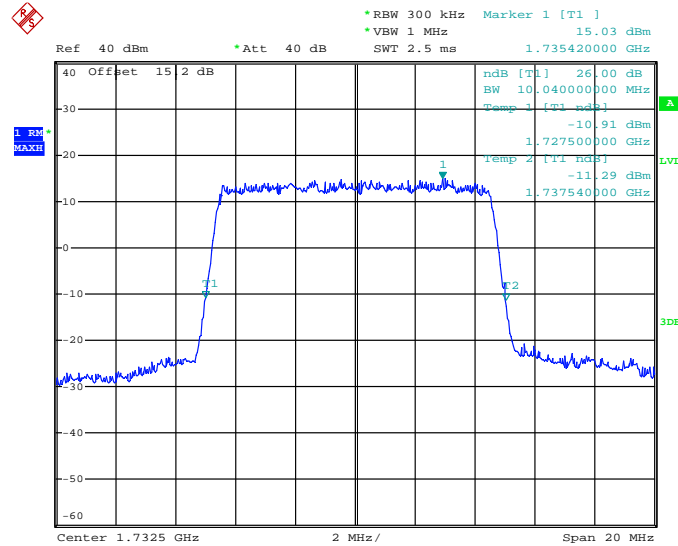
Band :	LTE Band 4	BW / Mod. :	10MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 20175



Date: 18.APR.2012 06:27:12

26dB Bandwidth Plot on Channel 20175

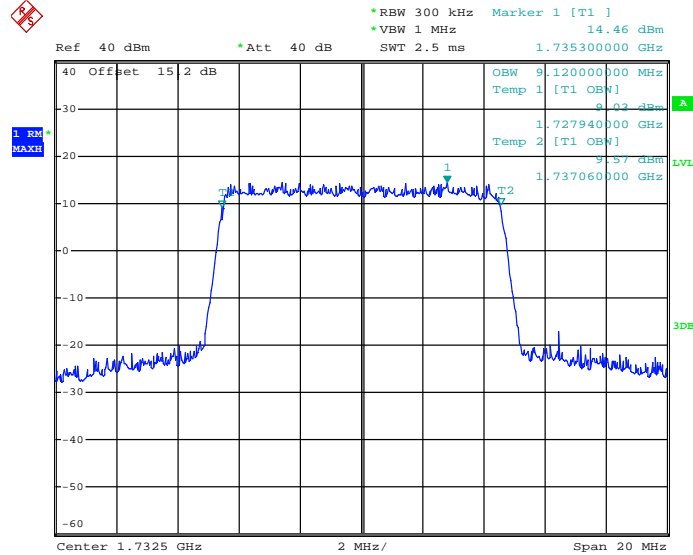


Date: 18.APR.2012 05:34:34



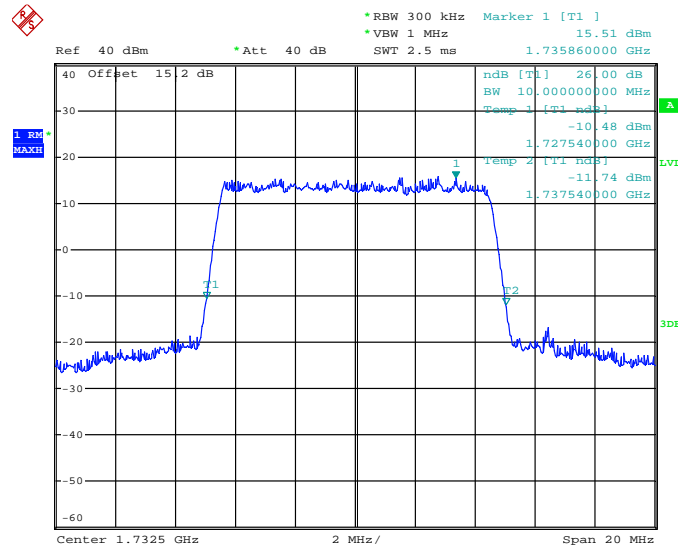
Band :	LTE Band 4	BW / Mod. :	10MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 20175



Date: 18.APR.2012 06:30:46

26dB Bandwidth Plot on Channel 20175



Date: 18.APR.2012 05:33:58

## 3.5 Band Edge and Emission Mask Measurement

### 3.5.1 Limit

For operations in the PCS and 1710 – 1755 MHz bands , the FCC limit is  $43 + 10\log_{10}(P[\text{Watts}])$  dB = -13 dBm in a 1 MHz bandwidth.

### 3.5.2 Measuring Instruments

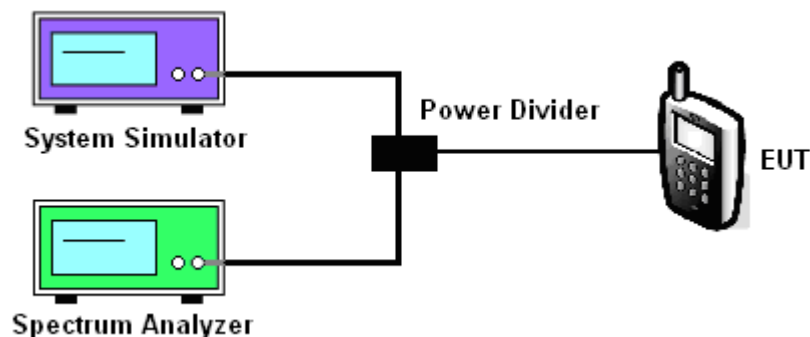
See list of measuring instruments of this test report.

### 3.5.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The band edges of low and high channels for the highest RF powers were measured. The RBW is set larger than 1% of 26dB bandwidth.

For LTE bandwidth 1.4MHz ~ 10MHz, RBW=100 kHz; for LTE bandwidth 15MHz ~ 20MHz, RBW=300 kHz.

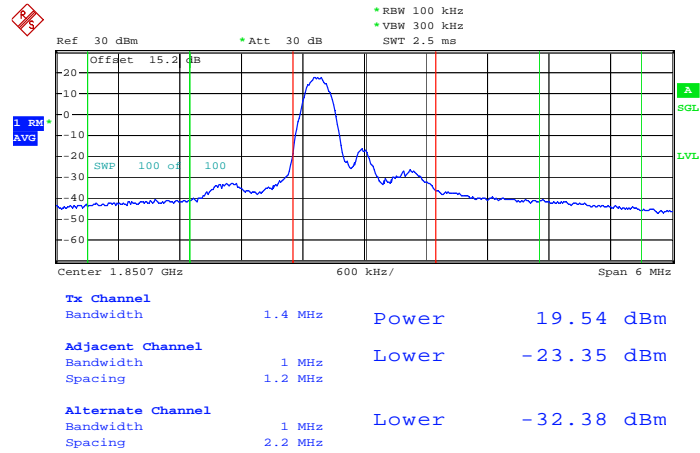
### 3.5.4 Test Setup



### 3.5.5 Test Result (Plots) of Conducted Band Edge

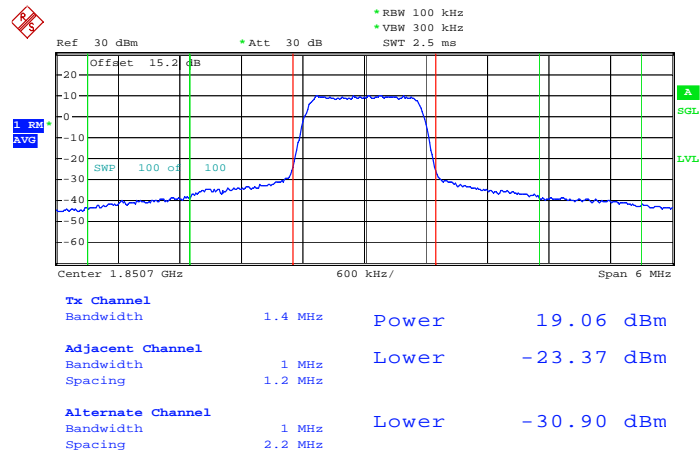
<b>Band :</b>	LTE Band 2	<b>Bandwidth:</b>	1.4MHz
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 19.APR.2012 15:09:22

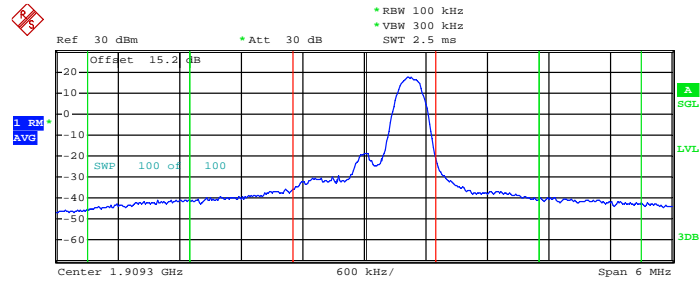
Lower Band Edge Plot for QPSK-RB Size 6, RB Offset 0



Date: 19.APR.2012 15:06:16



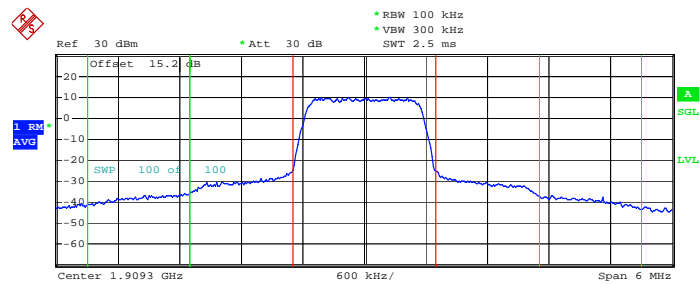
### Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 5



<b>Tx Channel</b>			
Bandwidth	1.4 MHz	Power	19.55 dBm
<b>Adjacent Channel</b>			
Bandwidth	1 MHz	Upper	-23.69 dBm
Spacing	1.2 MHz		
<b>Alternate Channel</b>			
Bandwidth	1 MHz	Upper	-31.76 dBm
Spacing	2.2 MHz		

Date: 18.APR.2012 08:53:43

### Higher Band Edge Plot for QPSK-RB Size 6, RB Offset 0



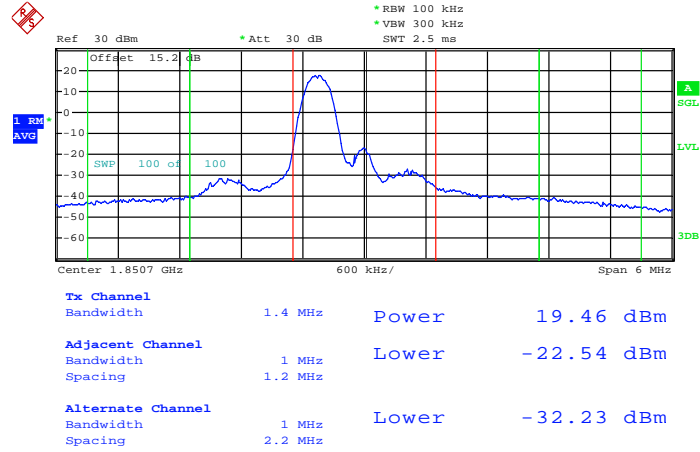
<b>Tx Channel</b>			
Bandwidth	1.4 MHz	Power	18.84 dBm
<b>Adjacent Channel</b>			
Bandwidth	1 MHz	Upper	-20.96 dBm
Spacing	1.2 MHz		
<b>Alternate Channel</b>			
Bandwidth	1 MHz	Upper	-29.39 dBm
Spacing	2.2 MHz		

Date: 19.APR.2012 14:58:43



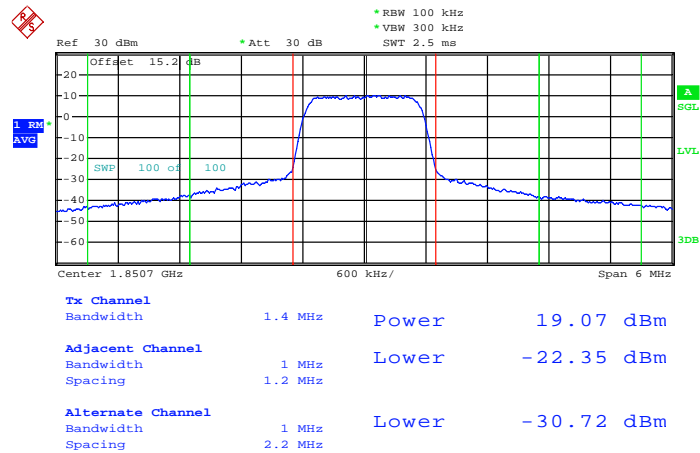
<b>Band :</b>	LTE Band 2	<b>Bandwidth:</b>	1.4MHz
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Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



Date: 18.APR.2012 08:16:01

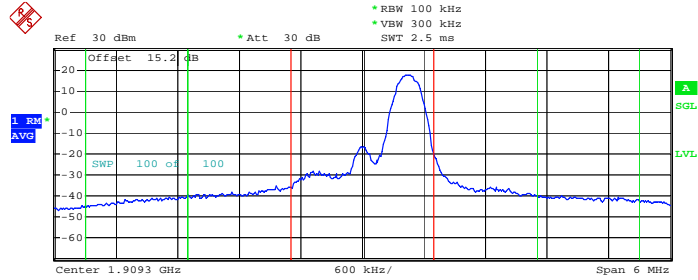
Lower Band Edge Plot for 16QAM -RB Size 6, RB Offset 0



Date: 18.APR.2012 11:57:46



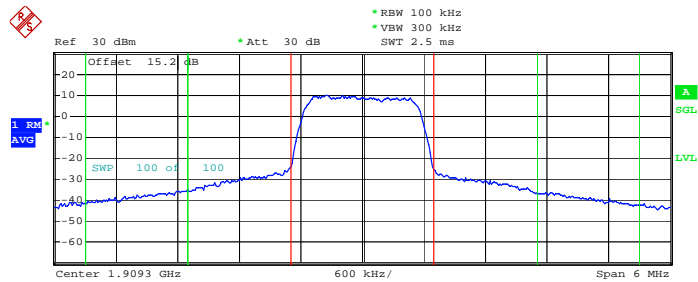
Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 5



<b>Tx Channel</b>	Bandwidth	1.4 MHz	Power	19.62 dBm
<b>Adjacent Channel</b>	Bandwidth	1 MHz	Upper	-22.78 dBm
	Spacing	1.2 MHz		
<b>Alternate Channel</b>	Bandwidth	1 MHz	Upper	-31.38 dBm
	Spacing	2.2 MHz		

Date: 19.APR.2012 15:11:46

Higher Band Edge Plot for 16QAM -RB Size 6, RB Offset 0



<b>Tx Channel</b>	Bandwidth	1.4 MHz	Power	18.61 dBm
<b>Adjacent Channel</b>	Bandwidth	1 MHz	Upper	-21.01 dBm
	Spacing	1.2 MHz		
<b>Alternate Channel</b>	Bandwidth	1 MHz	Upper	-29.28 dBm
	Spacing	2.2 MHz		

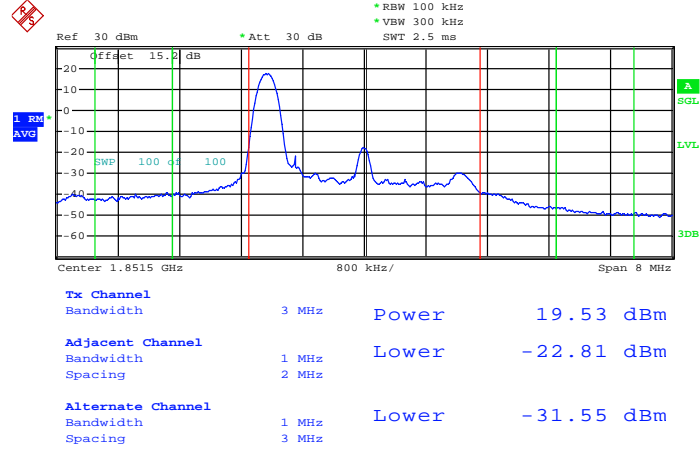
Date: 19.APR.2012 15:19:09





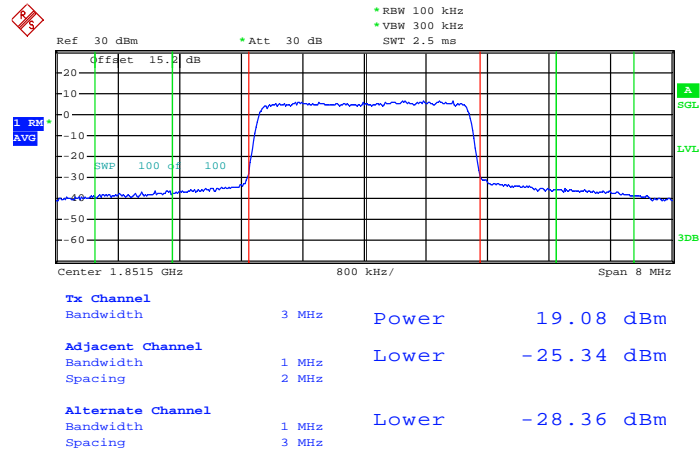
<b>Band :</b>	LTE Band 2	<b>Bandwidth:</b>	3MHz
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 18.APR.2012 09:27:33

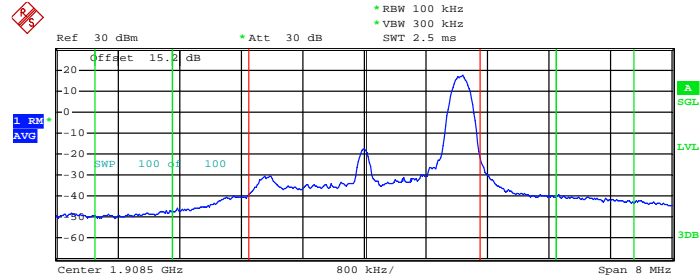
Lower Band Edge Plot for QPSK-RB Size 15, RB Offset 0



Date: 18.APR.2012 09:11:41



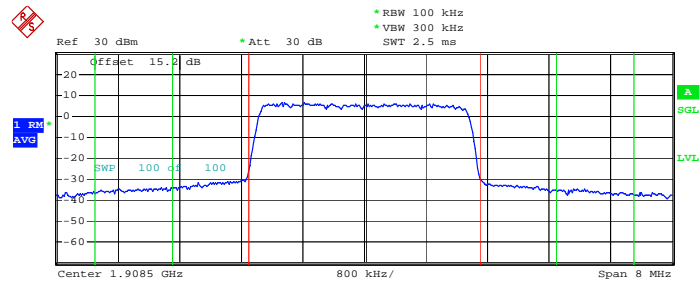
Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 14



<b>Tx Channel</b>			
Bandwidth	3 MHz	Power	19.16 dBm
<b>Adjacent Channel</b>			
Bandwidth	1 MHz	Upper	-22.94 dBm
Spacing	2 MHz		
<b>Alternate Channel</b>			
Bandwidth	1 MHz	Upper	-31.61 dBm
Spacing	3 MHz		

Date: 18.APR.2012 09:33:37

Higher Band Edge Plot for QPSK-RB Size 15, RB Offset 0



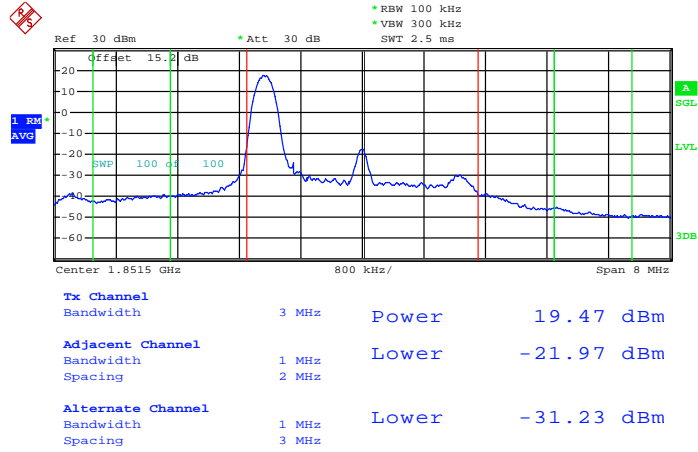
<b>Tx Channel</b>			
Bandwidth	3 MHz	Power	19.05 dBm
<b>Adjacent Channel</b>			
Bandwidth	1 MHz	Upper	-23.54 dBm
Spacing	2 MHz		
<b>Alternate Channel</b>			
Bandwidth	1 MHz	Upper	-26.36 dBm
Spacing	3 MHz		

Date: 19.APR.2012 14:49:52



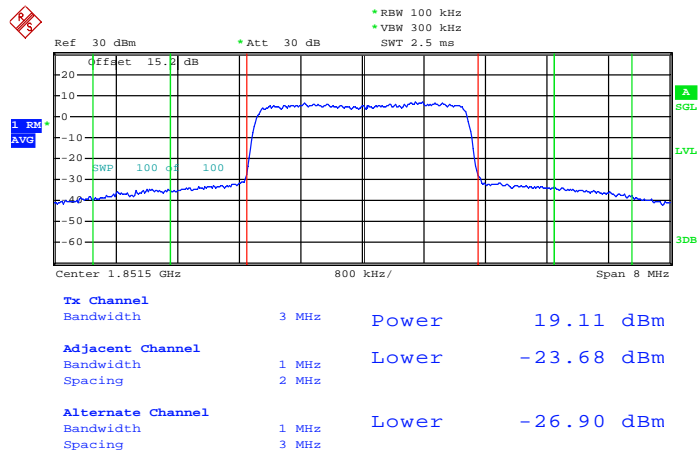
<b>Band :</b>	LTE Band 2	<b>Bandwidth:</b>	3MHz
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Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



Date: 18.APR.2012 09:26:50

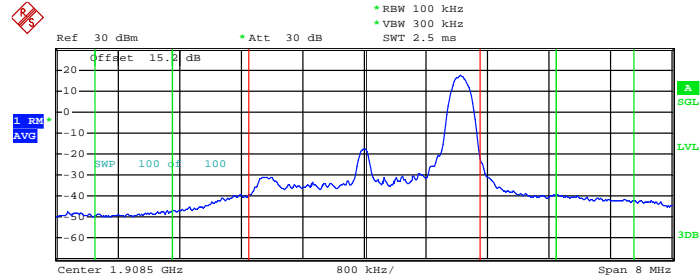
Lower Band Edge Plot for 16QAM -RB Size 15, RB Offset 0



Date: 18.APR.2012 09:16:25



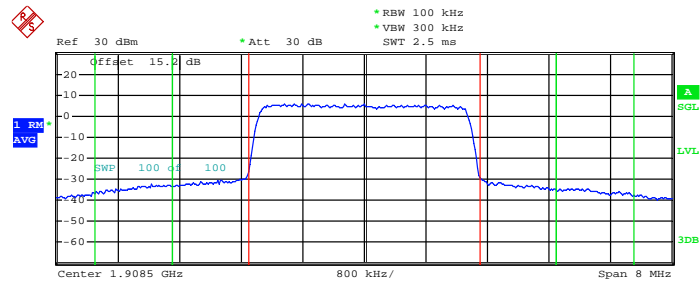
Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 14



<b>Tx Channel</b>			
Bandwidth	3 MHz	Power	19.29 dBm
<b>Adjacent Channel</b>			
Bandwidth	1 MHz	Upper	-23.17 dBm
Spacing	2 MHz		
<b>Alternate Channel</b>			
Bandwidth	1 MHz	Upper	-31.47 dBm
Spacing	3 MHz		

Date: 18.APR.2012 09:33:11

Higher Band Edge Plot for 16QAM -RB Size 15, RB Offset 0



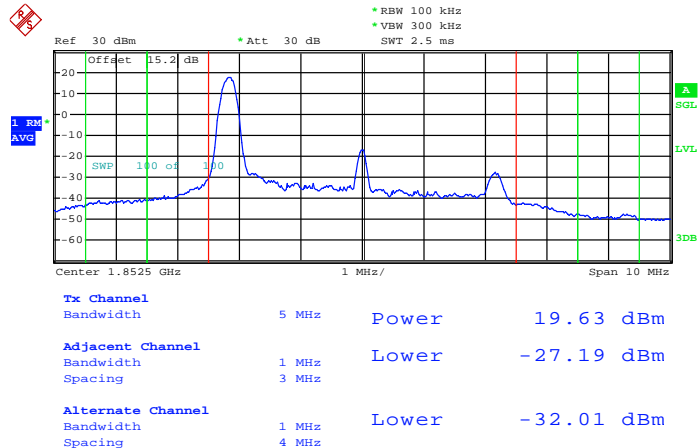
<b>Tx Channel</b>			
Bandwidth	3 MHz	Power	18.73 dBm
<b>Adjacent Channel</b>			
Bandwidth	1 MHz	Upper	-23.17 dBm
Spacing	2 MHz		
<b>Alternate Channel</b>			
Bandwidth	1 MHz	Upper	-26.07 dBm
Spacing	3 MHz		

Date: 18.APR.2012 09:34:24



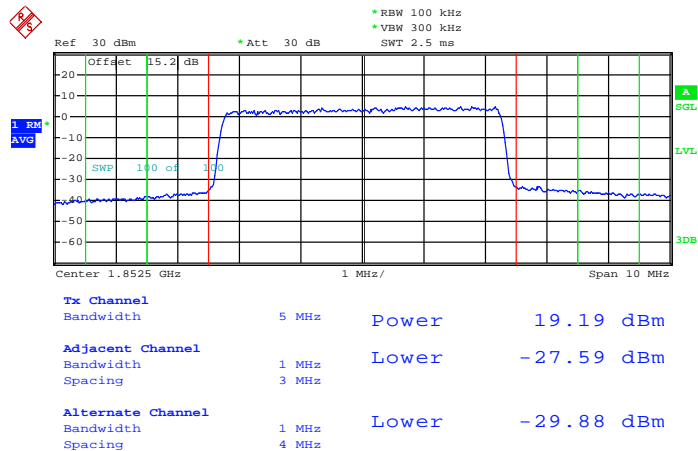
<b>Band :</b>	LTE Band 2	<b>Bandwidth:</b>	5MHz
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 18.APR.2012 11:08:42

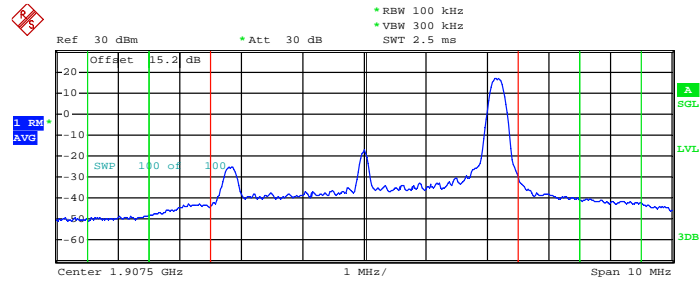
Lower Band Edge Plot for QPSK-RB Size 25, RB Offset 0



Date: 18.APR.2012 11:08:08



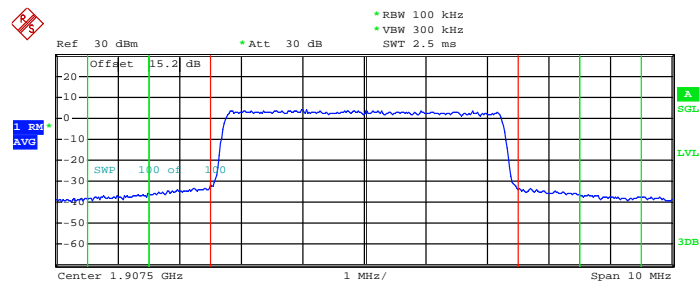
### Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24



<b>Tx Channel</b>			
Bandwidth	5 MHz	Power	19.28 dBm
<b>Adjacent Channel</b>			
Bandwidth	1 MHz	Upper	-27.64 dBm
Spacing	3 MHz		
<b>Alternate Channel</b>			
Bandwidth	1 MHz	Upper	-31.94 dBm
Spacing	4 MHz		

Date: 18.APR.2012 11:02:17

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



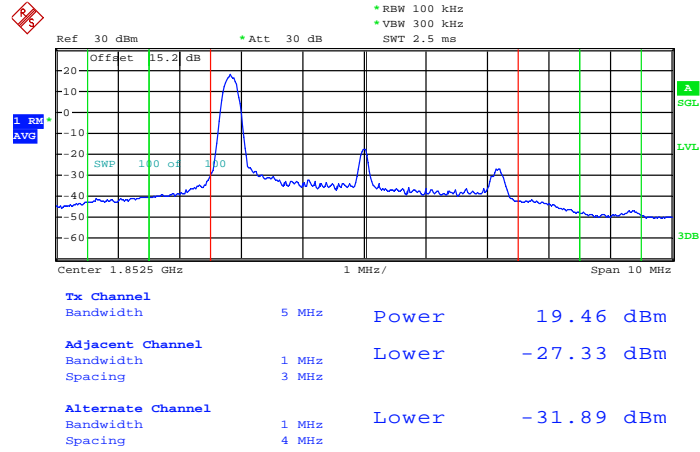
<b>Tx Channel</b>			
Bandwidth	5 MHz	Power	18.90 dBm
<b>Adjacent Channel</b>			
Bandwidth	1 MHz	Upper	-25.33 dBm
Spacing	3 MHz		
<b>Alternate Channel</b>			
Bandwidth	1 MHz	Upper	-27.90 dBm
Spacing	4 MHz		

Date: 18.APR.2012 11:02:56



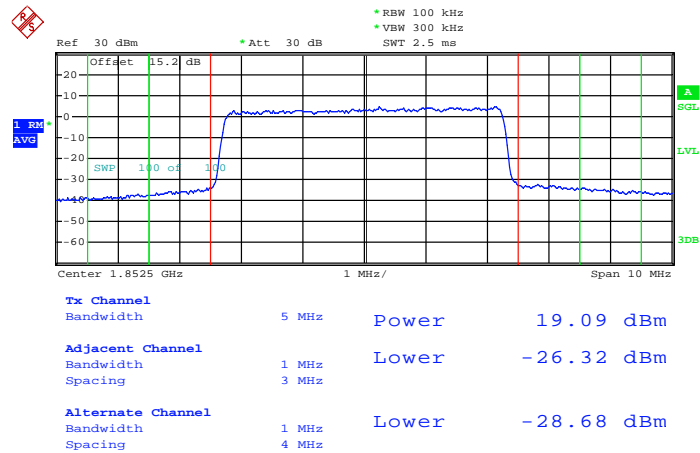
<b>Band :</b>	LTE Band 2	<b>Bandwidth:</b>	5MHz
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Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



Date: 18.APR.2012 11:10:07

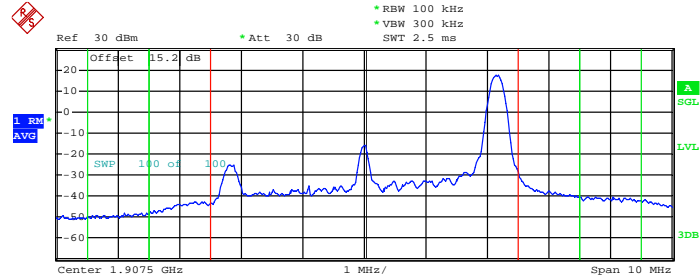
Lower Band Edge Plot for 16QAM -RB Size 25, RB Offset 0



Date: 18.APR.2012 11:06:42



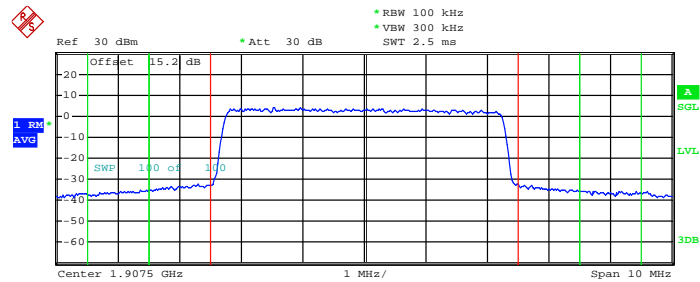
Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 24



<b>Tx Channel</b>	Bandwidth	5 MHz	Power	19.47 dBm
<b>Adjacent Channel</b>	Bandwidth	1 MHz	Upper	-26.96 dBm
	Spacing	3 MHz		
<b>Alternate Channel</b>	Bandwidth	1 MHz	Upper	-31.66 dBm
	Spacing	4 MHz		

Date: 18.APR.2012 11:01:11

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



<b>Tx Channel</b>	Bandwidth	5 MHz	Power	18.90 dBm
<b>Adjacent Channel</b>	Bandwidth	1 MHz	Upper	-24.84 dBm
	Spacing	3 MHz		
<b>Alternate Channel</b>	Bandwidth	1 MHz	Upper	-26.81 dBm
	Spacing	4 MHz		

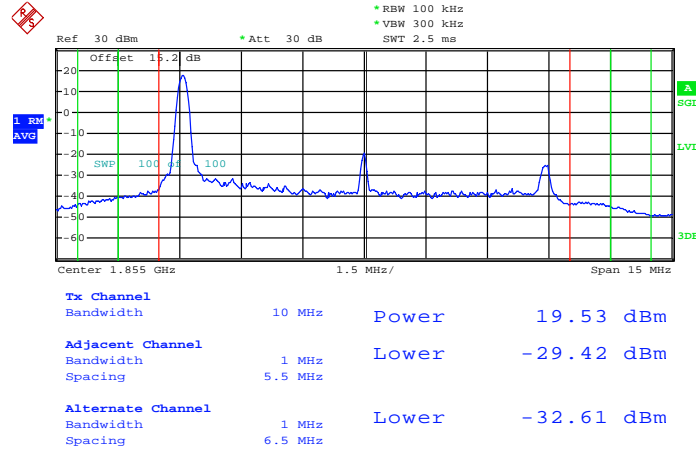
Date: 18.APR.2012 11:04:32





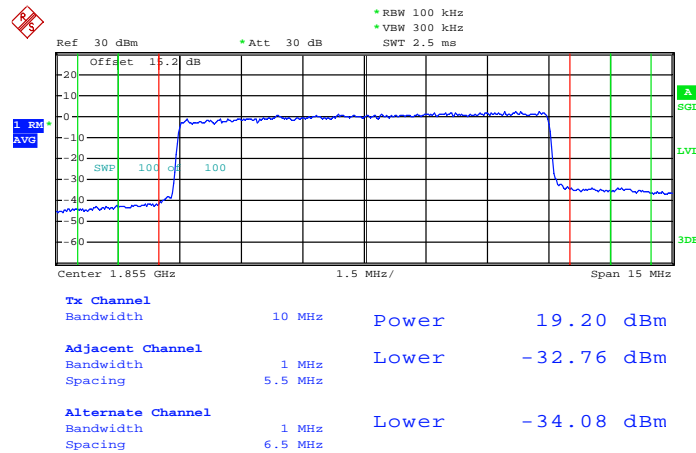
<b>Band :</b>	LTE Band 2	<b>Bandwidth:</b>	10MHz
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 18.APR.2012 11:16:36

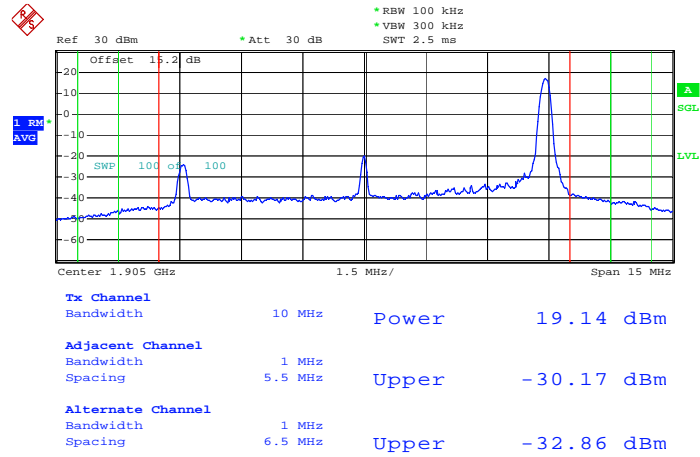
Lower Band Edge Plot for QPSK-RB Size 50, RB Offset 0



Date: 18.APR.2012 11:16:13

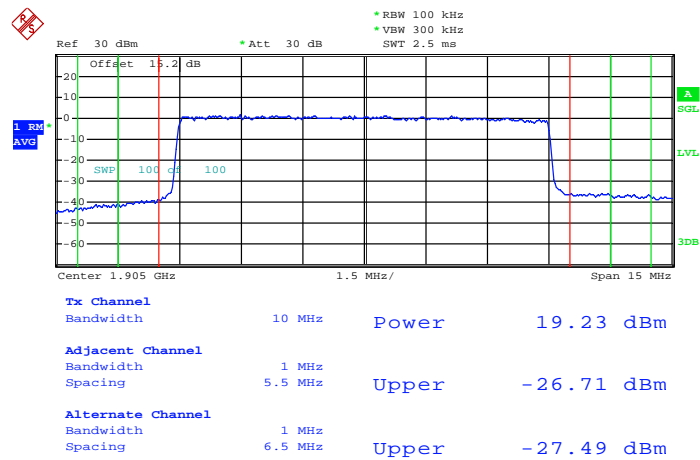


### Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 49



Date: 19.APR.2012 14:39:48

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

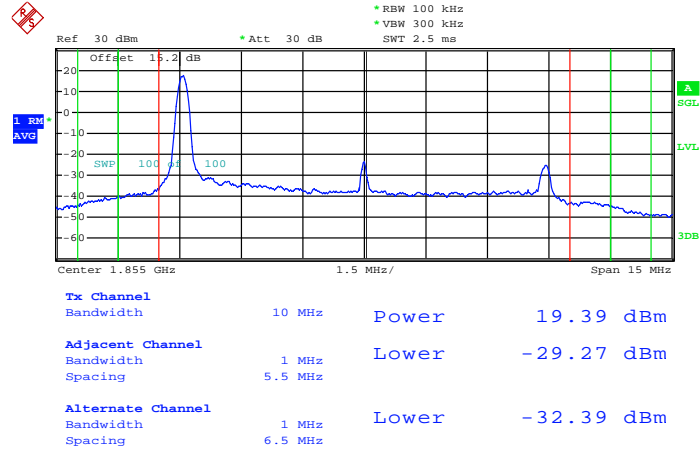


Date: 18.APR.2012 11:22:43



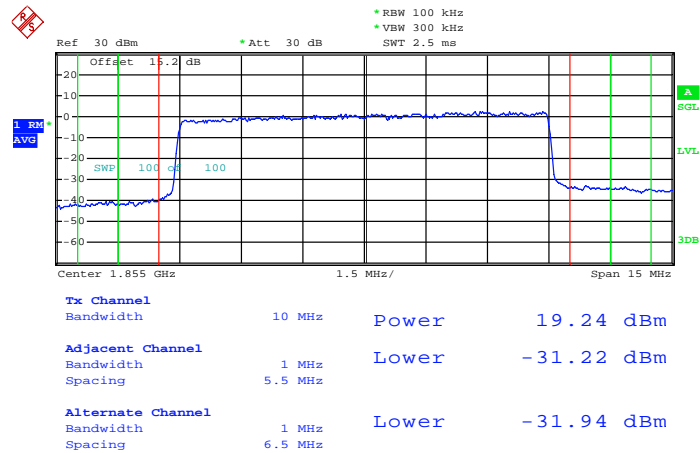
Band :	LTE Band 2	Bandwidth:	10MHz
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Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



Date: 18.APR.2012 11:16:57

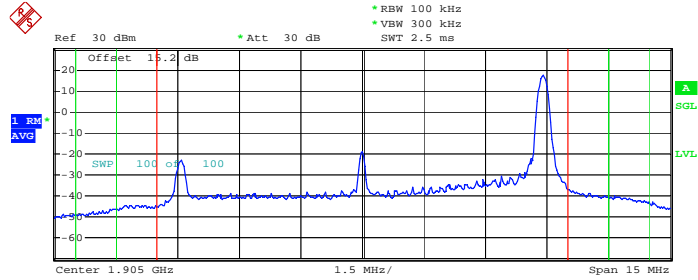
Lower Band Edge Plot for 16QAM -RB Size 50, RB Offset 0



Date: 18.APR.2012 11:15:51



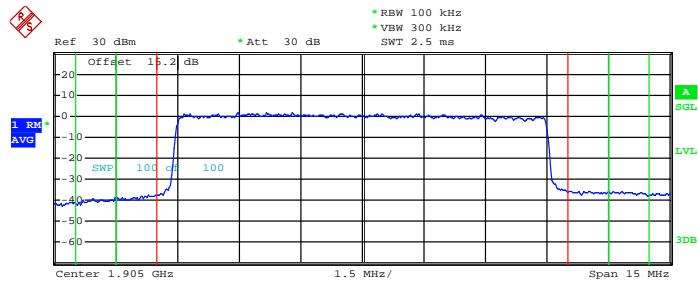
Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 49



<b>Tx Channel</b>	Bandwidth	10 MHz	Power	19.35 dBm
<b>Adjacent Channel</b>	Bandwidth	1 MHz	Upper	-29.39 dBm
	Spacing	5.5 MHz		
<b>Alternate Channel</b>	Bandwidth	1 MHz	Upper	-31.80 dBm
	Spacing	6.5 MHz		

Date: 19.APR.2012 15:27:55

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



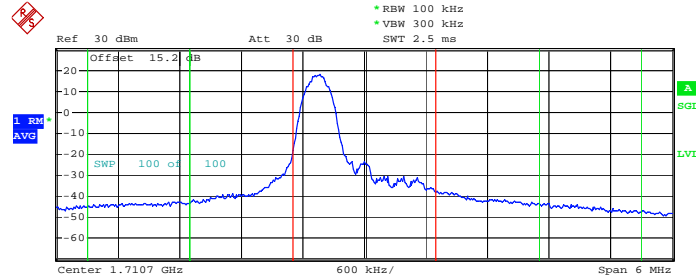
<b>Tx Channel</b>	Bandwidth	10 MHz	Power	19.20 dBm
<b>Adjacent Channel</b>	Bandwidth	1 MHz	Upper	-26.58 dBm
	Spacing	5.5 MHz		
<b>Alternate Channel</b>	Bandwidth	1 MHz	Upper	-26.92 dBm
	Spacing	6.5 MHz		

Date: 18.APR.2012 11:23:14



<b>Band :</b>	LTE Band 4	<b>Bandwidth:</b>	1.4MHz
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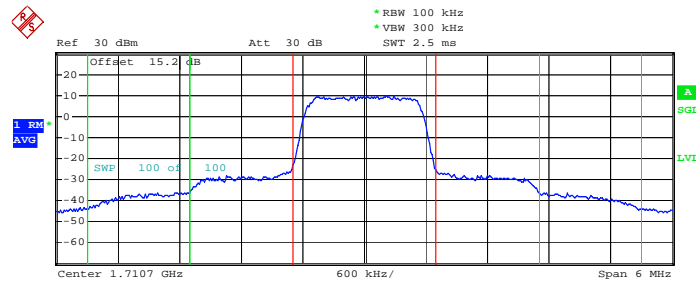
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



<b>Tx Channel</b>			
Bandwidth	1.4 MHz	Power	19.45 dBm
<b>Adjacent Channel</b>			
Bandwidth	1 MHz	Lower	-43.12 dB
Spacing	1.2 MHz		
<b>Alternate Channel</b>			
Bandwidth	1 MHz	Lower	-53.64 dB
Spacing	2.2 MHz		

Date: 23.APR.2012 16:43:28

Lower Band Edge Plot for QPSK-RB Size 6, RB Offset 0

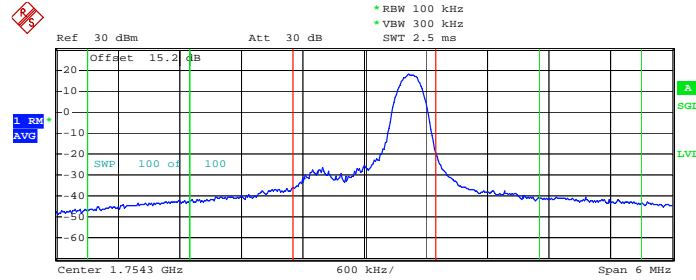


<b>Tx Channel</b>			
Bandwidth	1.4 MHz	Power	18.79 dBm
<b>Adjacent Channel</b>			
Bandwidth	1 MHz	Lower	-38.36 dB
Spacing	1.2 MHz		
<b>Alternate Channel</b>			
Bandwidth	1 MHz	Lower	-47.29 dB
Spacing	2.2 MHz		

Date: 23.APR.2012 16:35:31



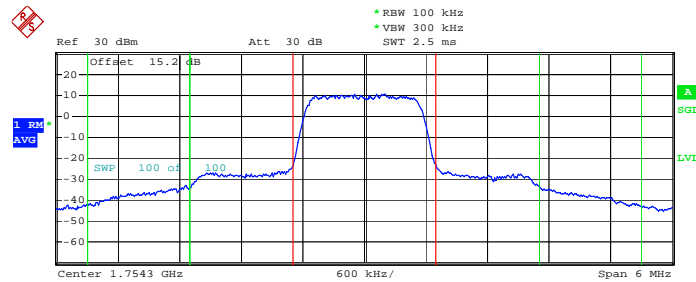
Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 5



<b>Tx Channel</b>	Bandwidth	1.4 MHz	Power	19.77 dBm
<b>Adjacent Channel</b>	Bandwidth	1 MHz	Upper	-42.27 dB
	Spacing	1.2 MHz		
<b>Alternate Channel</b>	Bandwidth	1 MHz	Upper	-52.02 dB
	Spacing	2.2 MHz		

Date: 23.APR.2012 16:51:39

Higher Band Edge Plot for QPSK-RB Size 6, RB Offset 0



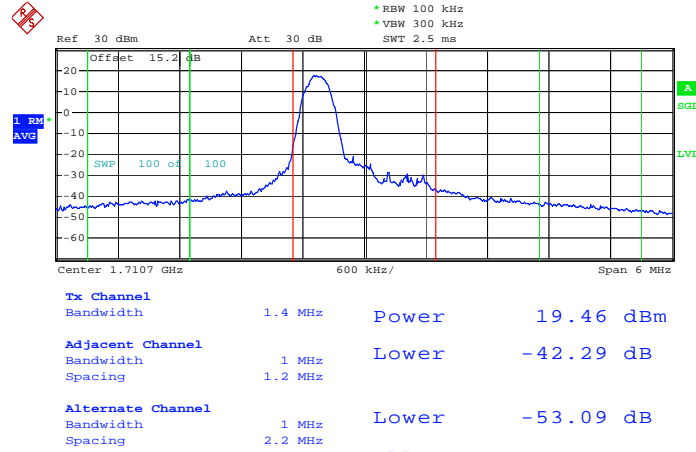
<b>Tx Channel</b>	Bandwidth	1.4 MHz	Power	19.24 dBm
<b>Adjacent Channel</b>	Bandwidth	1 MHz	Upper	-37.91 dB
	Spacing	1.2 MHz		
<b>Alternate Channel</b>	Bandwidth	1 MHz	Upper	-47.19 dB
	Spacing	2.2 MHz		

Date: 23.APR.2012 16:49:43



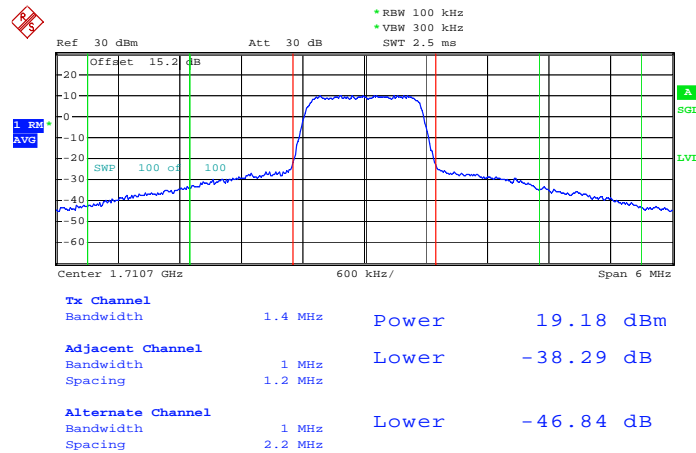
<b>Band :</b>	LTE Band 4	<b>Bandwidth:</b>	1.4MHz
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Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



Date: 23.APR.2012 16:41:38

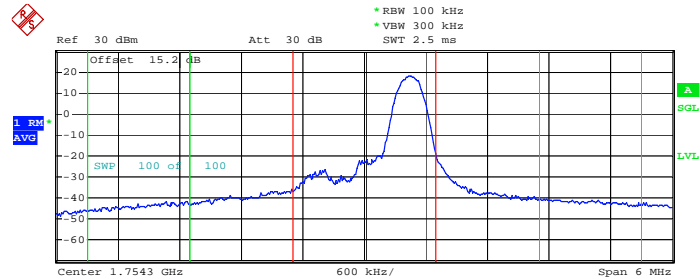
Lower Band Edge Plot for 16QAM -RB Size 6, RB Offset 0



Date: 23.APR.2012 16:38:13



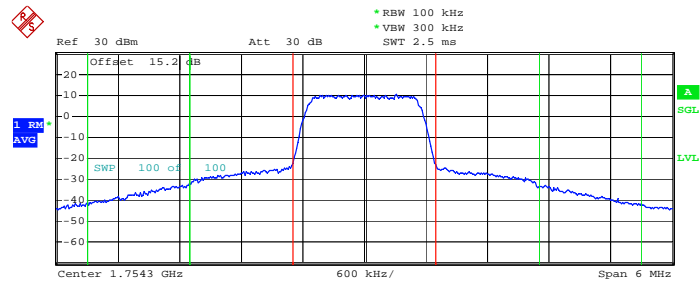
Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 5



<b>Tx Channel</b>	Bandwidth	1.4 MHz	Power	20.03 dBm
<b>Adjacent Channel</b>	Bandwidth	1 MHz	Upper	-41.94 dB
	Spacing	1.2 MHz		
<b>Alternate Channel</b>	Bandwidth	1 MHz	Upper	-52.15 dB
	Spacing	2.2 MHz		

Date: 23.APR.2012 16:51:19

Higher Band Edge Plot for 16QAM -RB Size 6, RB Offset 0



<b>Tx Channel</b>	Bandwidth	1.4 MHz	Power	19.27 dBm
<b>Adjacent Channel</b>	Bandwidth	1 MHz	Upper	-37.10 dB
	Spacing	1.2 MHz		
<b>Alternate Channel</b>	Bandwidth	1 MHz	Upper	-46.54 dB
	Spacing	2.2 MHz		

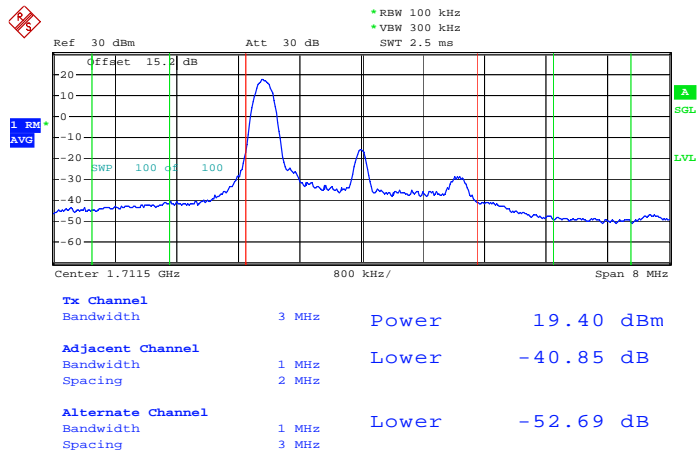
Date: 23.APR.2012 16:50:26





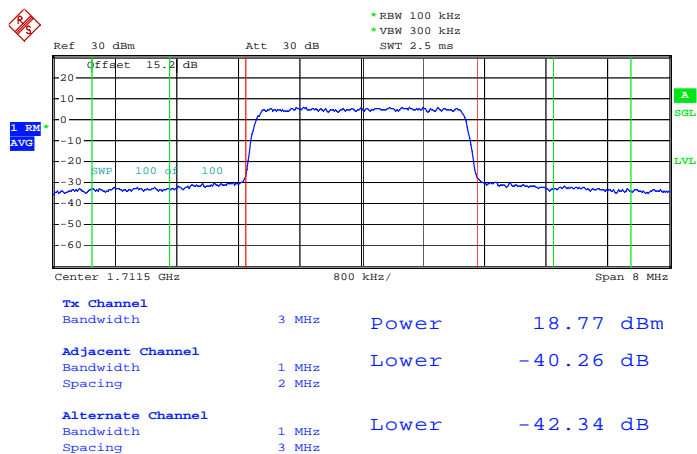
<b>Band :</b>	LTE Band 4	<b>Bandwidth:</b>	3MHz
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 23.APR.2012 15:24:55

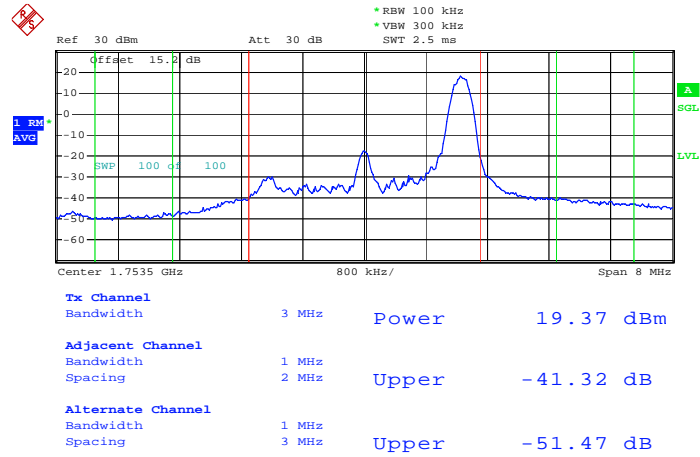
Lower Band Edge Plot for QPSK-RB Size 15, RB Offset 0



Date: 23.APR.2012 15:23:21

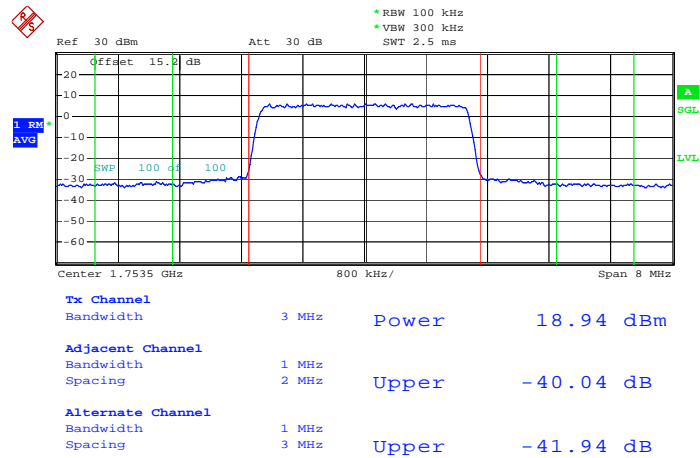


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 14



Date: 23.APR.2012 15:08:11

Higher Band Edge Plot for QPSK-RB Size 15, RB Offset 0

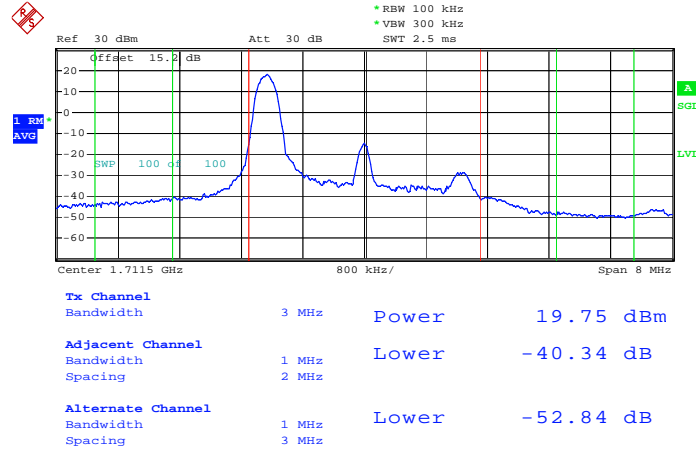


Date: 23.APR.2012 15:05:24



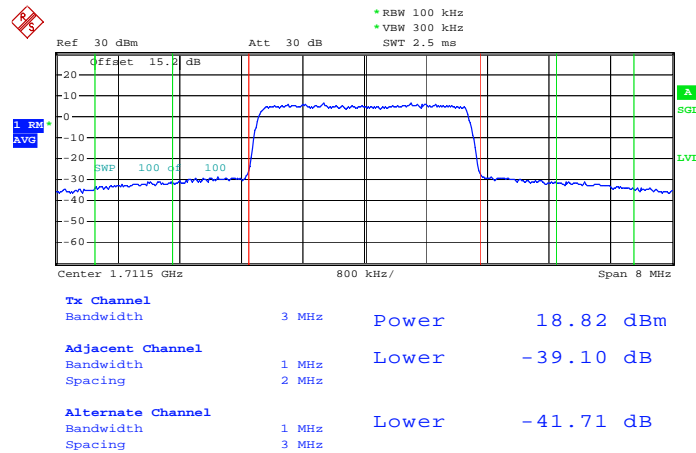
<b>Band :</b>	LTE Band 4	<b>Bandwidth:</b>	3MHz
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Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



Date: 23.APR.2012 15:26:32

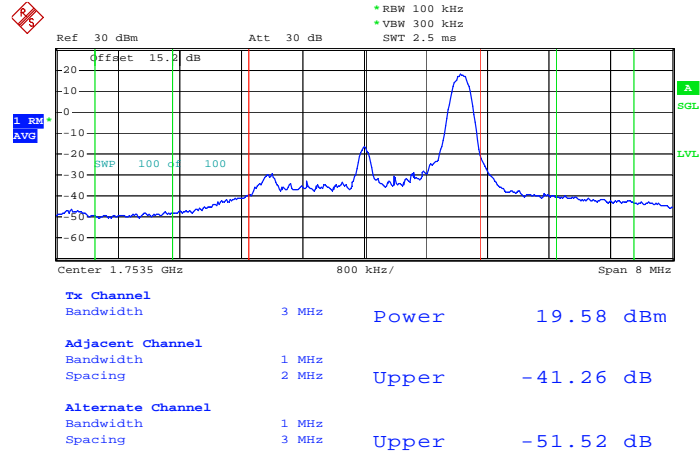
Lower Band Edge Plot for 16QAM -RB Size 15, RB Offset 0



Date: 23.APR.2012 15:22:58

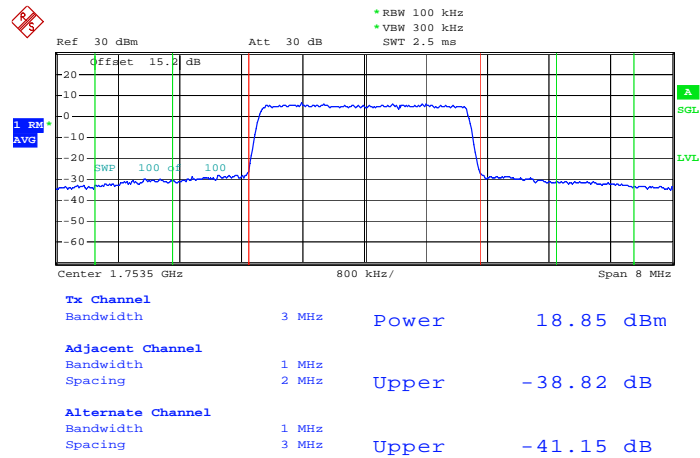


Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 14



Date: 23.APR.2012 15:07:06

Higher Band Edge Plot for 16QAM-RB Size 15, RB Offset 0

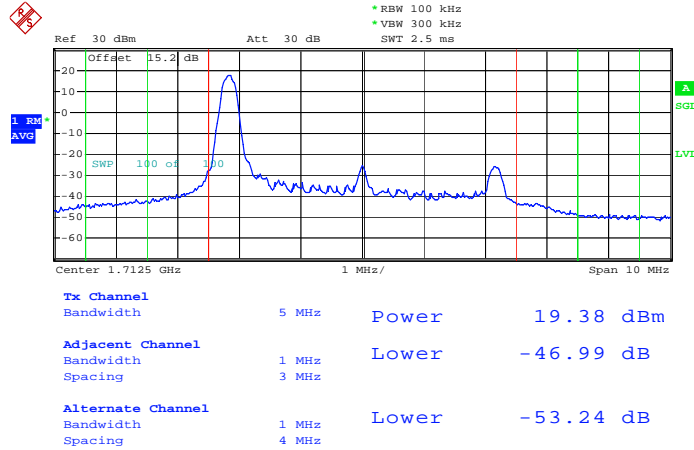


Date: 23.APR.2012 15:06:16



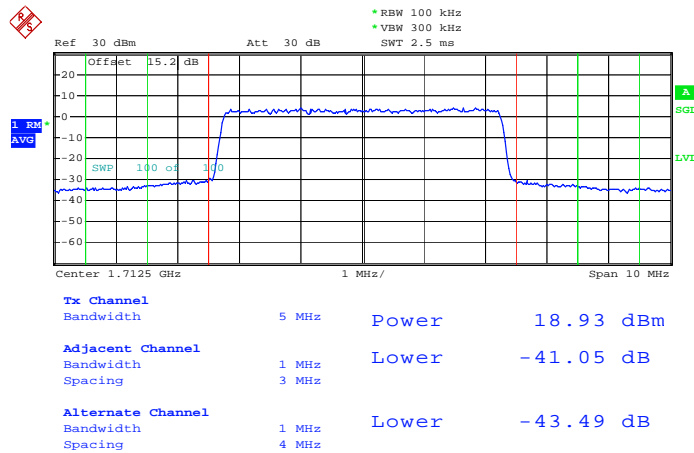
<b>Band :</b>	LTE Band 4	<b>Band Width</b>	5MHz / QPSK
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 23.APR.2012 15:44:12

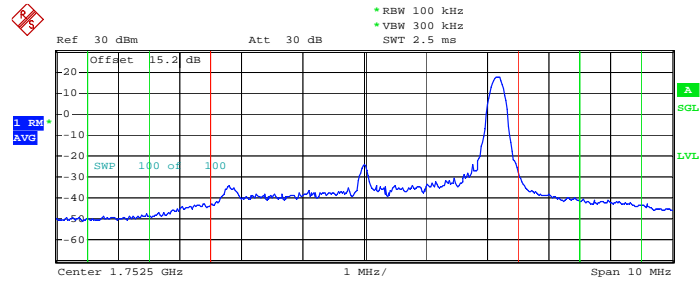
Lower Band Edge Plot for QPSK-RB Size 25, RB Offset 0



Date: 23.APR.2012 15:42:49



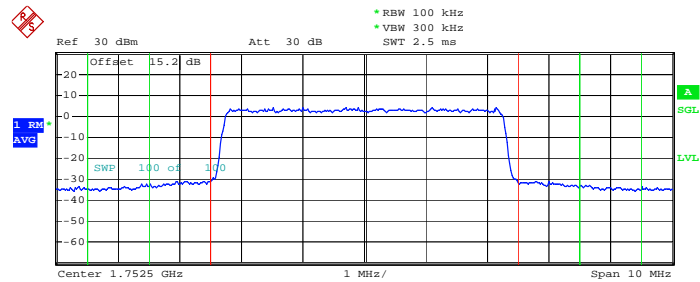
Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24



<b>Tx Channel</b>	Bandwidth	5 MHz	Power	19.60 dBm
<b>Adjacent Channel</b>	Bandwidth	1 MHz	Upper	-46.56 dB
	Spacing	3 MHz		
<b>Alternate Channel</b>	Bandwidth	1 MHz	Upper	-52.07 dB
	Spacing	4 MHz		

Date: 23.APR.2012 15:50:18

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



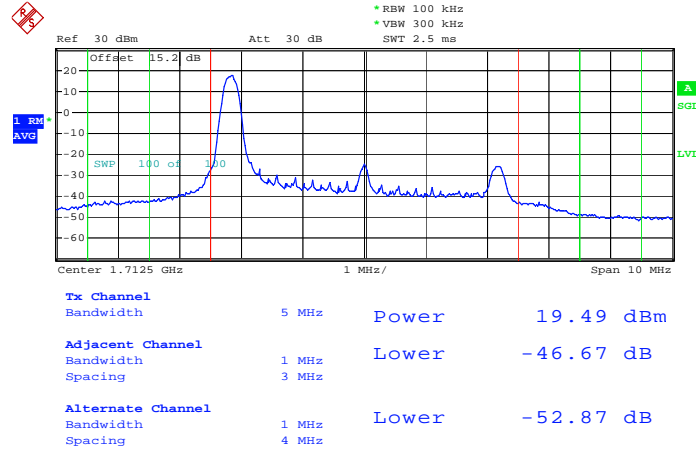
<b>Tx Channel</b>	Bandwidth	5 MHz	Power	19.01 dBm
<b>Adjacent Channel</b>	Bandwidth	1 MHz	Upper	-41.52 dB
	Spacing	3 MHz		
<b>Alternate Channel</b>	Bandwidth	1 MHz	Upper	-43.42 dB
	Spacing	4 MHz		

Date: 23.APR.2012 15:51:08



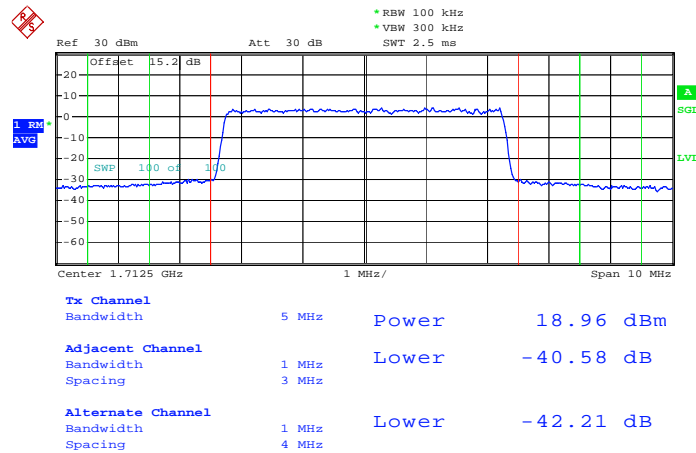
<b>Band :</b>	LTE Band 4	<b>Bandwidth:</b>	5MHz
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Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



Date: 23.APR.2012 15:45:00

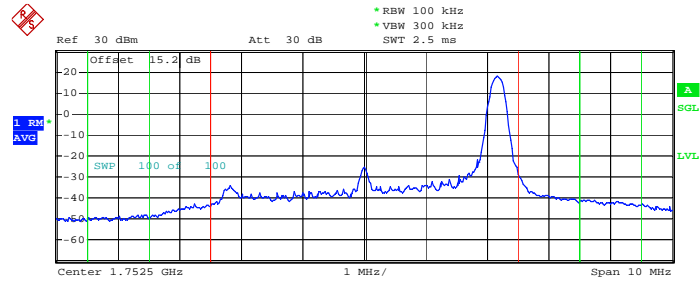
Lower Band Edge Plot for 16QAM -RB Size 25, RB Offset 0



Date: 23.APR.2012 15:41:17



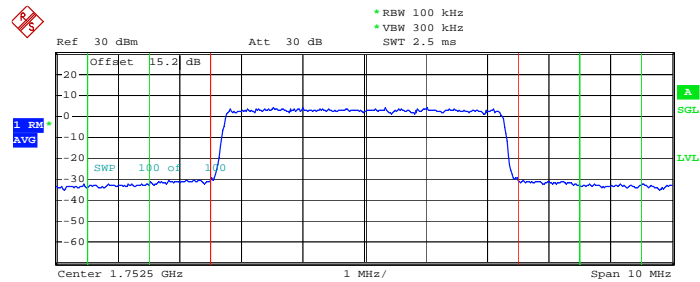
Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 24



<b>Tx Channel</b>	Bandwidth	5 MHz	Power	19.81 dBm
<b>Adjacent Channel</b>	Bandwidth	1 MHz	Upper	-46.86 dB
	Spacing	3 MHz		
<b>Alternate Channel</b>	Bandwidth	1 MHz	Upper	-52.26 dB
	Spacing	4 MHz		

Date: 23.APR.2012 15:48:37

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



<b>Tx Channel</b>	Bandwidth	5 MHz	Power	18.97 dBm
<b>Adjacent Channel</b>	Bandwidth	1 MHz	Upper	-40.79 dB
	Spacing	3 MHz		
<b>Alternate Channel</b>	Bandwidth	1 MHz	Upper	-42.35 dB
	Spacing	4 MHz		

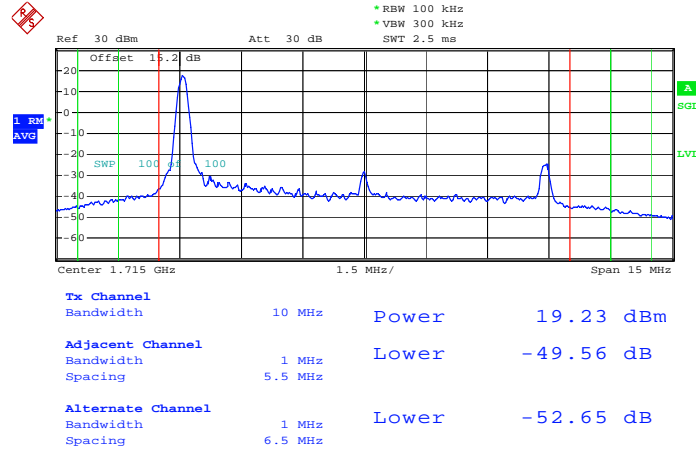
Date: 23.APR.2012 15:50:41





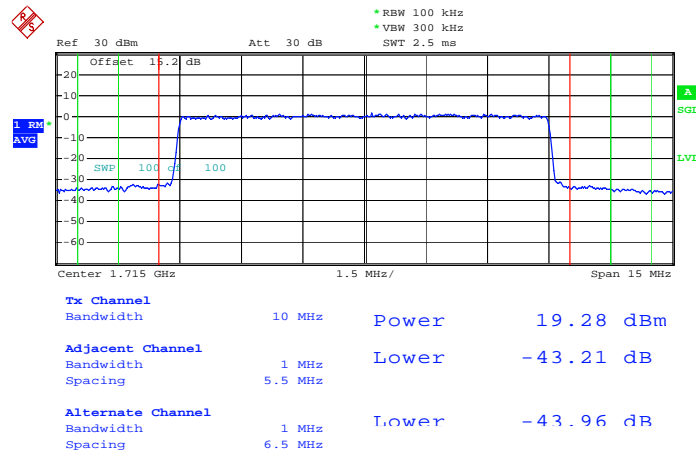
Band :	LTE Band 4	Bandwidth:	10MHz
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 23.APR.2012 16:15:27

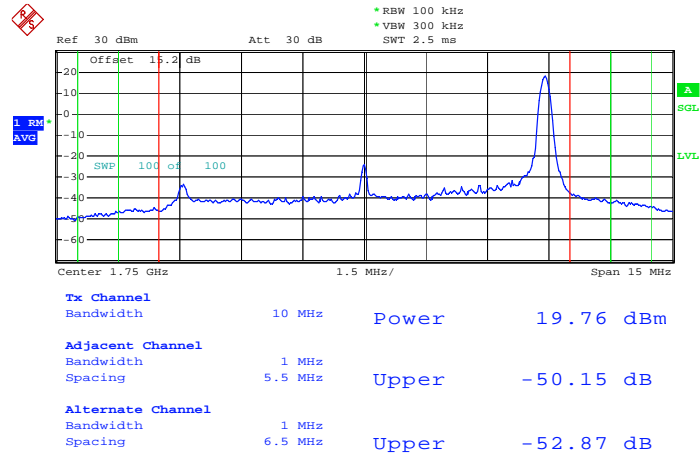
Lower Band Edge Plot for QPSK-RB Size 50, RB Offset 0



Date: 23.APR.2012 16:12:52

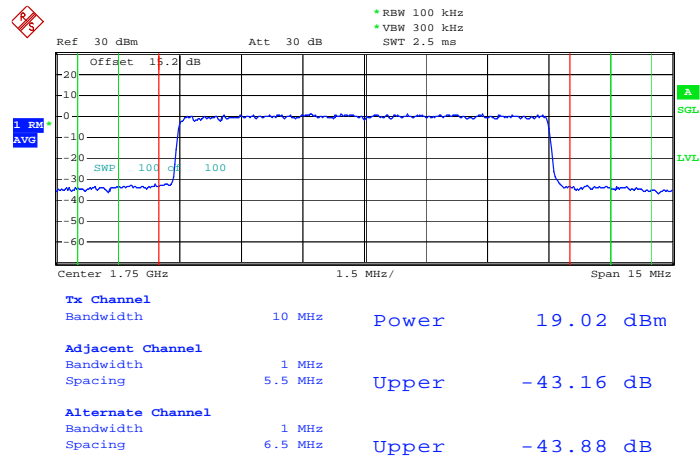


### Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 49



Date: 23.APR.2012 16:02:44

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

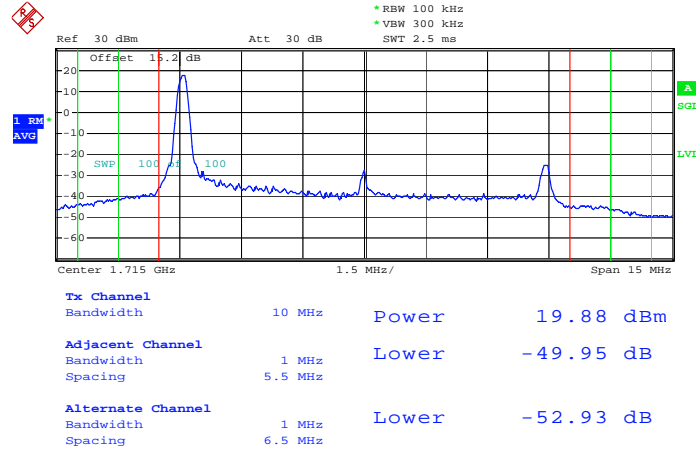


Date: 23.APR.2012 15:59:32



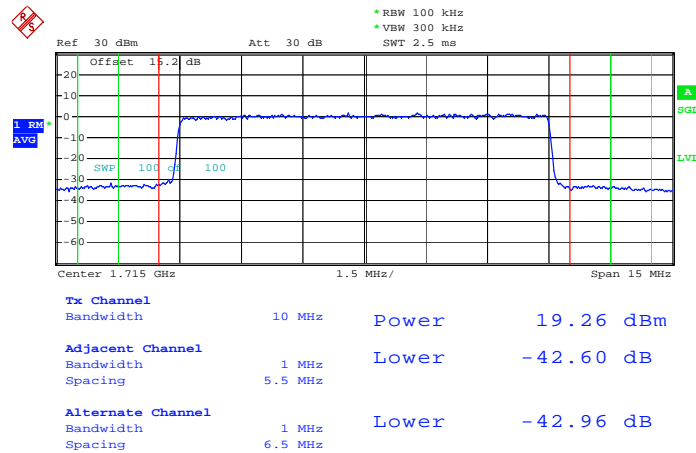
<b>Band :</b>	LTE Band 4	<b>Bandwidth:</b>	10MHz
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Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



Date: 23.APR.2012 16:15:08

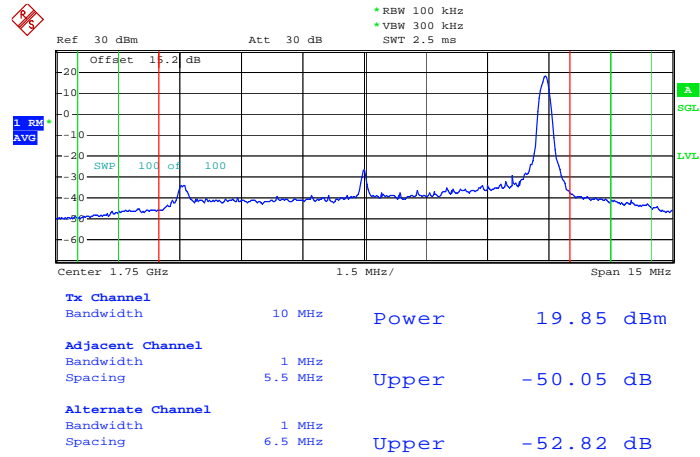
Lower Band Edge Plot for 16QAM -RB Size 50, RB Offset 0



Date: 23.APR.2012 16:14:22

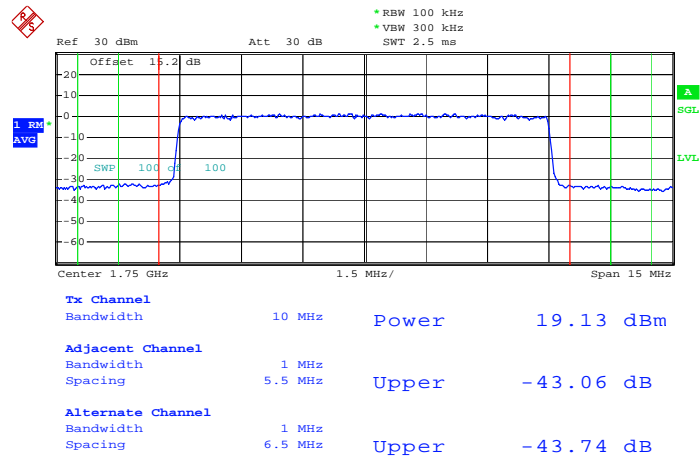


Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 49



Date: 23.APR.2012 16:02:02

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



Date: 23.APR.2012 16:00:36

## 3.6 Conducted Emission Measurement

### 3.6.1 Description of Conducted Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

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.

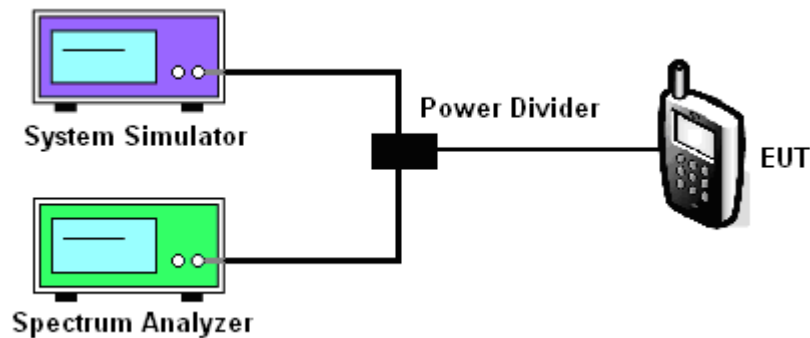
### 3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.6.3 Test Procedures

1. The EUT was connected to spectrum analyzer and base station via power divider.
2. The middle channel for the highest RF power within the transmitting frequency was measured.
3. The conducted spurious emission for the whole frequency range was taken.

### 3.6.4 Test Setup

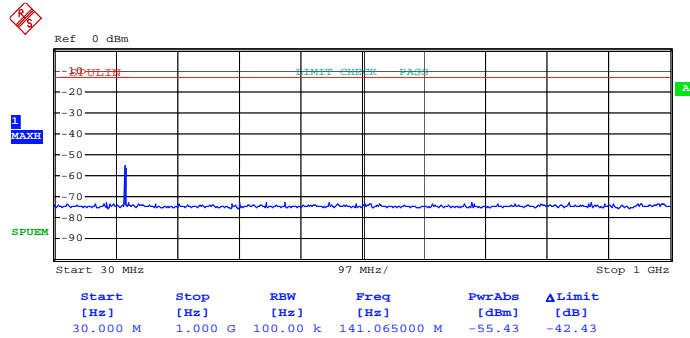




3.6.5 Test Result (Plots) of Conducted Emission

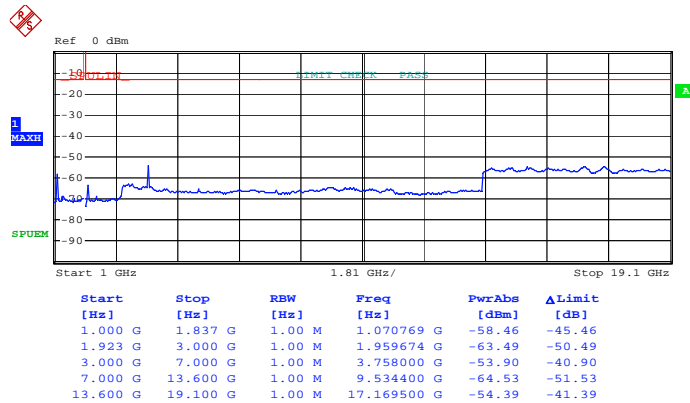
Band :	LTE Band 2	Bandwidth :	1.4MHz / QPSK
Frequency :	1880	Channel :	18900

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



Date: 19.APR.2012 12:14:57

Conducted Emission Plot (1GHz ~ 19.1GHz) for QPSK (RB Size 1, RB Offset 0)

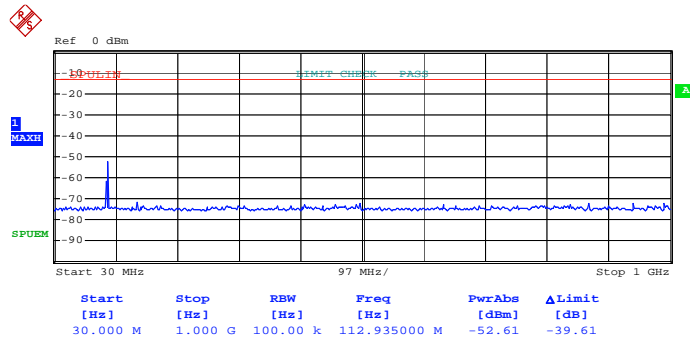


Date: 19.APR.2012 12:14:06



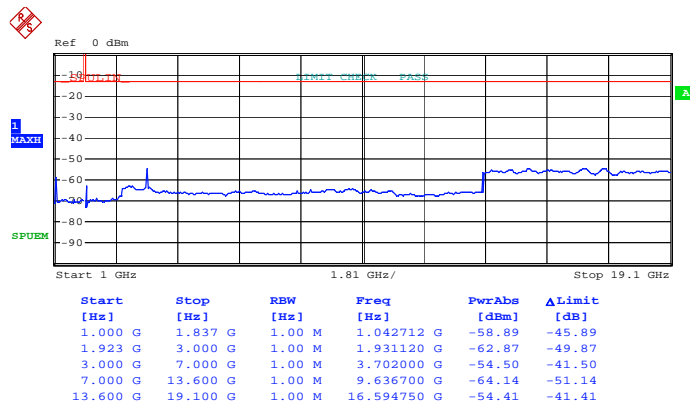
<b>Band :</b>	LTE Band 2	<b>Bandwidth :</b>	1.4MHz / 16QAM
<b>Frequency :</b>	1850.7	<b>Channel :</b>	18607

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



Date: 19.APR.2012 11:26:26

**Conducted Emission Plot (1GHz ~ 19.1GHz) for 16-QAM (RB Size 1, RB Offset 0)**

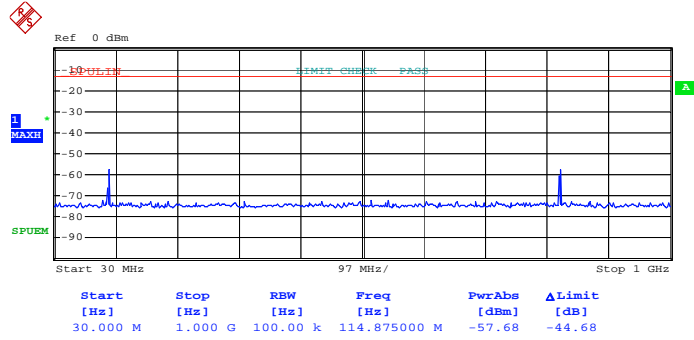


Date: 19.APR.2012 11:27:35



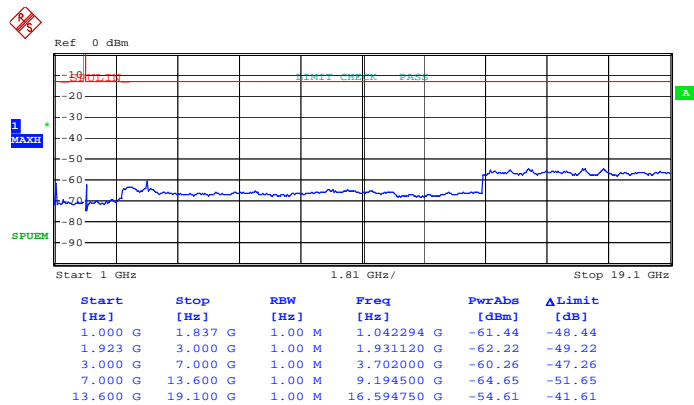
<b>Band :</b>	LTE Band 2	<b>Bandwidth :</b>	3MHz / QPSK
<b>Frequency :</b>	1851.5	<b>Channel :</b>	18615

**Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 14)**



Date: 19.APR.2012 13:08:40

**Conducted Emission Plot (1GHz ~ 19.1GHz) for QPSK (RB Size 1, RB Offset 14)**



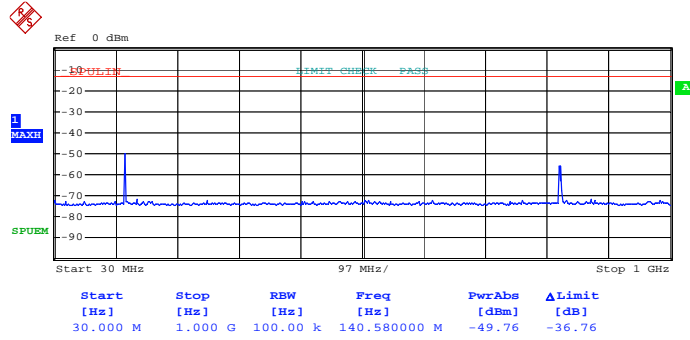
Date: 19.APR.2012 13:07:29





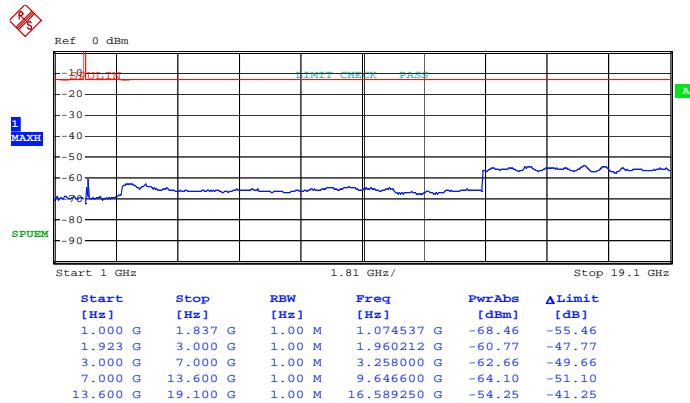
<b>Band :</b>	LTE Band 2	<b>Bandwidth :</b>	3MHz / 16QAM
<b>Frequency :</b>	1880	<b>Channel :</b>	18900

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



Date: 19.APR.2012 12:23:15

**Conducted Emission Plot (1GHz ~ 19.1GHz) for 16-QAM (RB Size 1, RB Offset 0)**

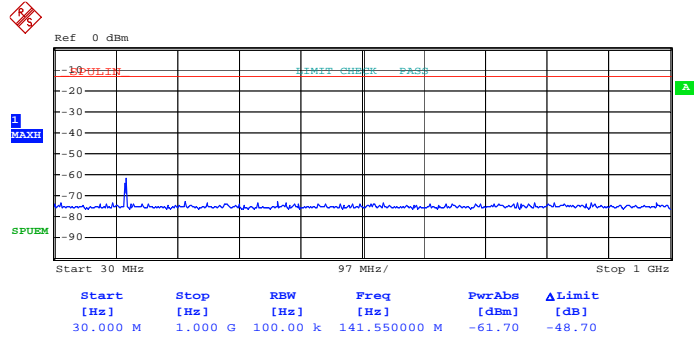


Date: 19.APR.2012 12:19:23



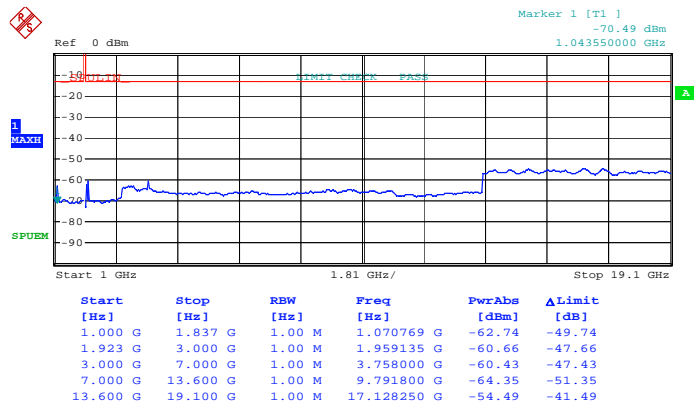
<b>Band :</b>	LTE Band 2	<b>Bandwidth :</b>	5MHz / QPSK
<b>Frequency :</b>	1880	<b>Channel :</b>	18900

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



Date: 19.APR.2012 12:28:29

**Conducted Emission Plot (1GHz ~ 19.1GHz) for QPSK (RB Size 1, RB Offset 0)**

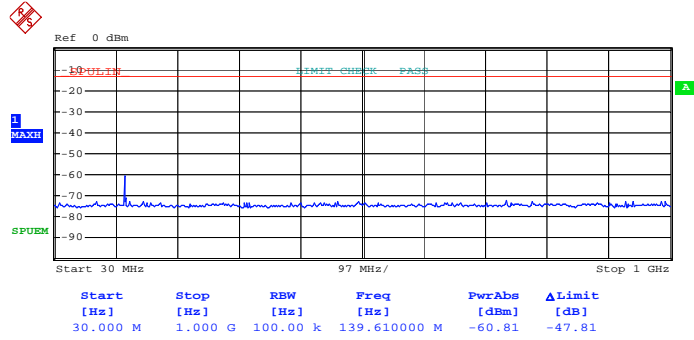


Date: 19.APR.2012 12:27:13



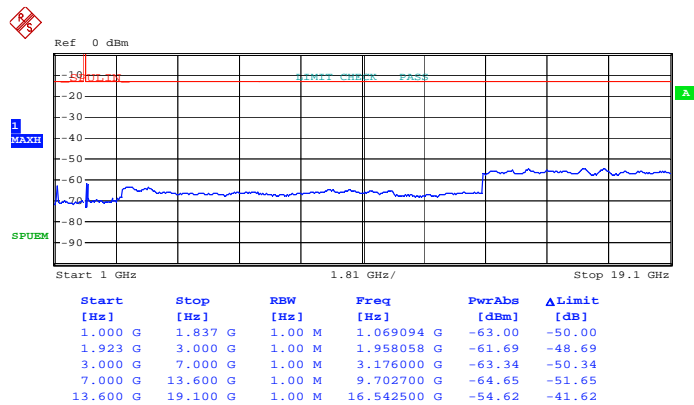
<b>Band :</b>	LTE Band 2	<b>Bandwidth :</b>	5MHz / 16QAM
<b>Frequency :</b>	1880	<b>Channel :</b>	18900

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



Date: 19.APR.2012 12:29:26

**Conducted Emission Plot (1GHz ~ 19.1GHz) for 16-QAM (RB Size 1, RB Offset 0)**

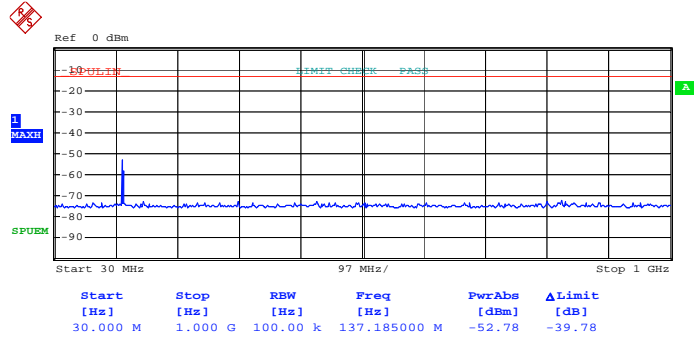


Date: 19.APR.2012 12:29:55



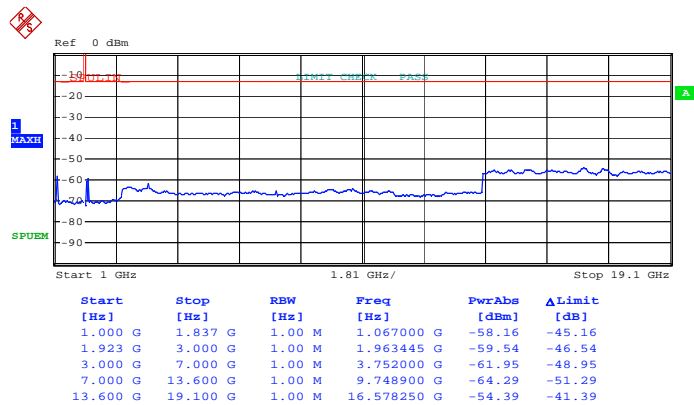
<b>Band :</b>	LTE Band 2	<b>Bandwidth :</b>	10MHz / QPSK
<b>Frequency :</b>	1880	<b>Channel :</b>	18900

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



Date: 19.APR.2012 12:34:16

**Conducted Emission Plot (1GHz ~ 19.1GHz) for QPSK (RB Size 1, RB Offset 0)**

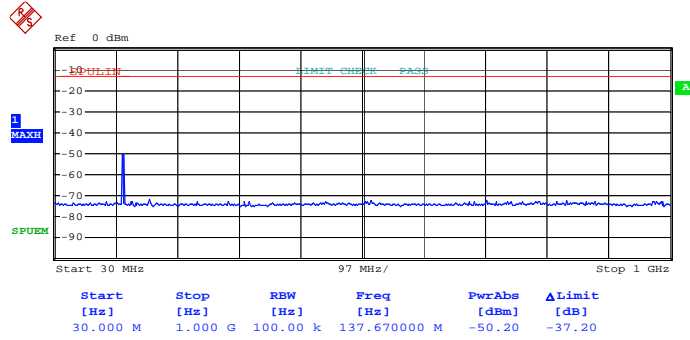


Date: 19.APR.2012 12:34:44



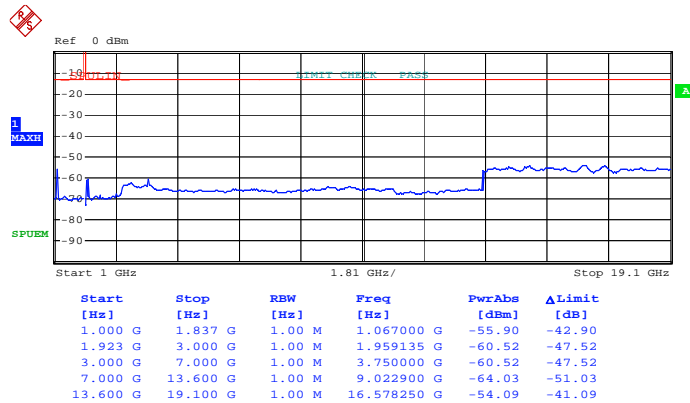
Band :	LTE Band 2	Bandwidth :	10MHz / 16QAM
Frequency :	1880	Channel :	18900

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



Date: 19.APR.2012 12:33:37

Conducted Emission Plot (1GHz ~ 19.1GHz) for 16-QAM (RB Size 1, RB Offset 0)

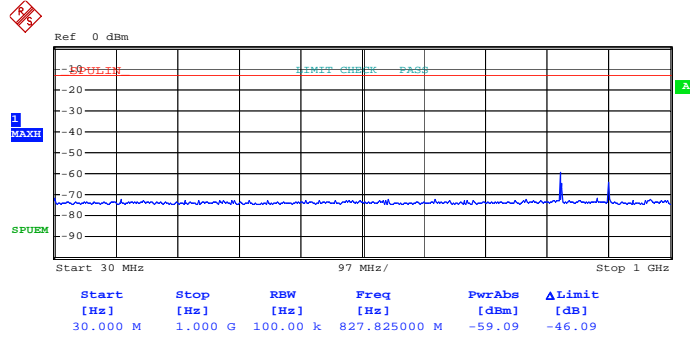


Date: 19.APR.2012 12:32:08



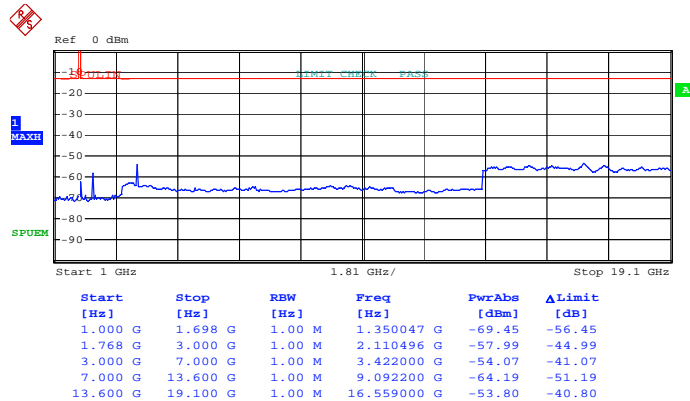
<b>Band :</b>	LTE Band 4	<b>Bandwidth :</b>	1.4MHz / QPSK
<b>Frequency :</b>	1710.7	<b>Channel :</b>	19957

**Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 3, RB Offset 2)**



Date: 26.APR.2012 17:50:31

**Conducted Emission Plot (1GHz ~ 19.1GHz) for QPSK (RB Size 3, RB Offset 2)**

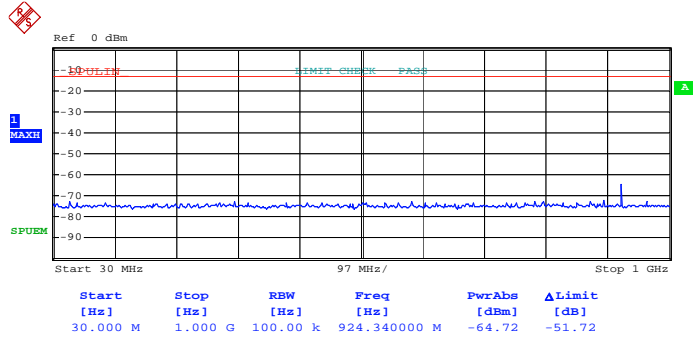


Date: 26.APR.2012 17:47:38



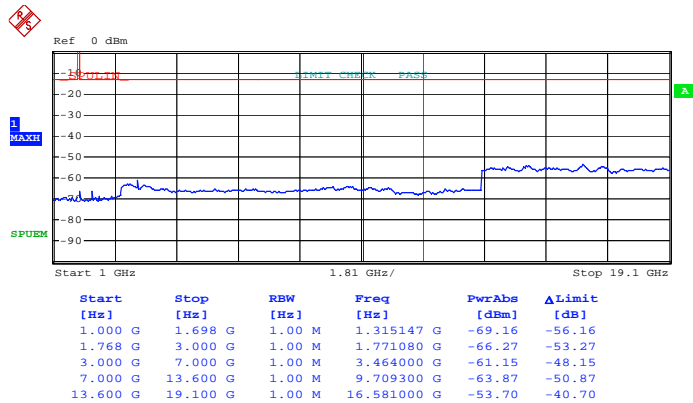
<b>Band :</b>	LTE Band 4	<b>Bandwidth :</b>	1.4MHz / 16QAM
<b>Frequency :</b>	1732.5	<b>Channel :</b>	20175

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



Date: 7.MAY.2012 15:24:45

**Conducted Emission Plot (1GHz ~ 19.1GHz) for 16-QAM (RB Size 1, RB Offset 0)**

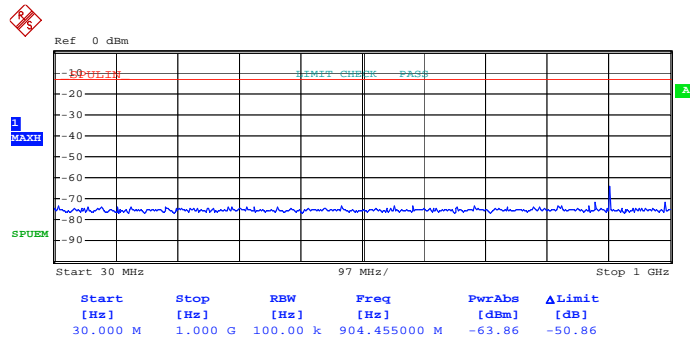


Date: 7.MAY.2012 15:24:08



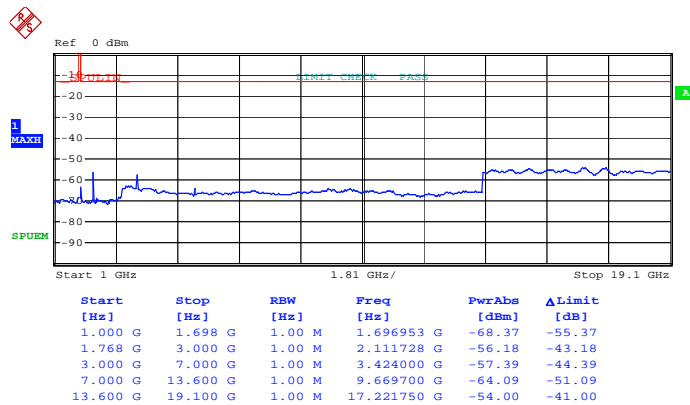
<b>Band :</b>	LTE Band 4	<b>Bandwidth :</b>	3MHz / QPSK
<b>Frequency :</b>	1711.5	<b>Channel :</b>	19965

**Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 14)**



Date: 26.APR.2012 17:54:26

**Conducted Emission Plot (1GHz ~ 19.1GHz) for QPSK (RB Size 1, RB Offset 14)**



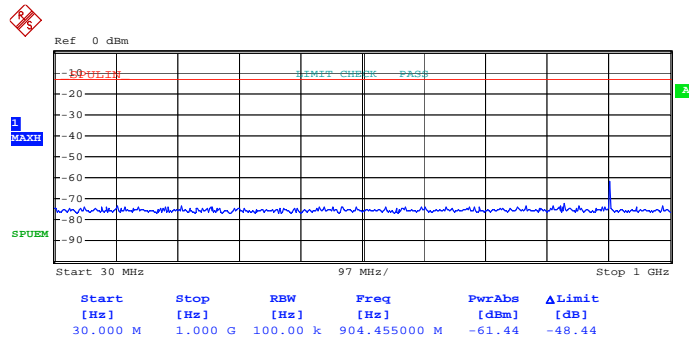
Date: 26.APR.2012 17:53:55





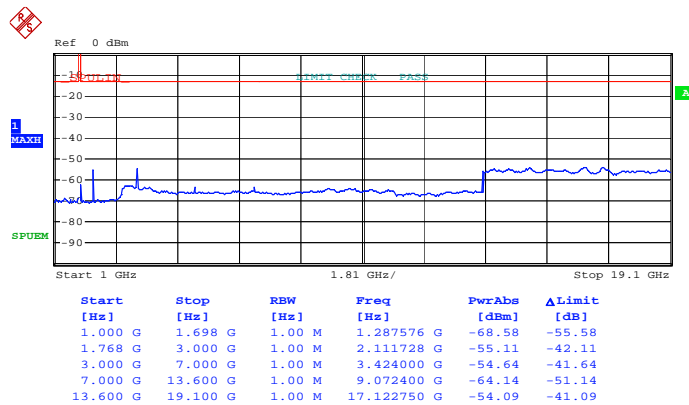
<b>Band :</b>	LTE Band 4	<b>Bandwidth :</b>	3MHz / 16QAM
<b>Frequency :</b>	1711.5	<b>Channel :</b>	19965

**Conducted Emission Plot (30MHz ~ 1GHz) for  
16-QAM (RB Size 1, RB Offset 14)**



Date: 26.APR.2012 17:52:52

**Conducted Emission Plot (1GHz ~ 19.1GHz) for  
16-QAM (RB Size 1, RB Offset 14)**

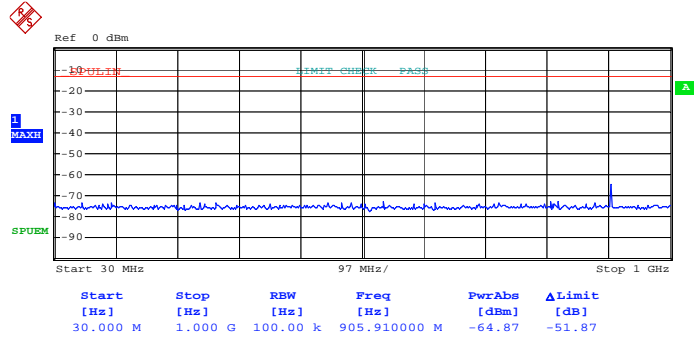


Date: 26.APR.2012 17:53:27



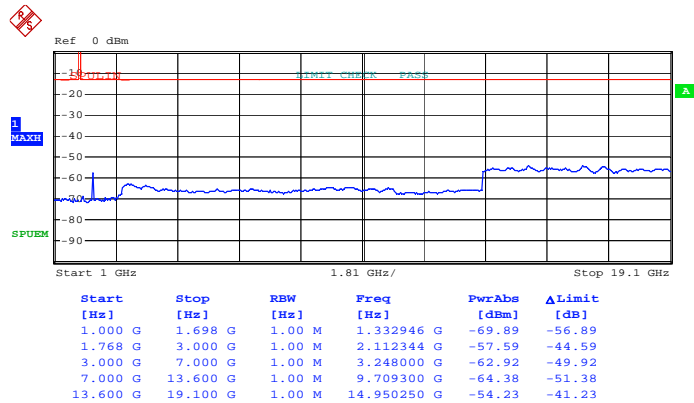
<b>Band :</b>	LTE Band 4	<b>Bandwidth :</b>	5MHz / QPSK
<b>Frequency :</b>	1712.5	<b>Channel :</b>	19975

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



Date: 26.APR.2012 18:13:30

**Conducted Emission Plot (1GHz ~ 19.1GHz) for QPSK (RB Size 1, RB Offset 24)**

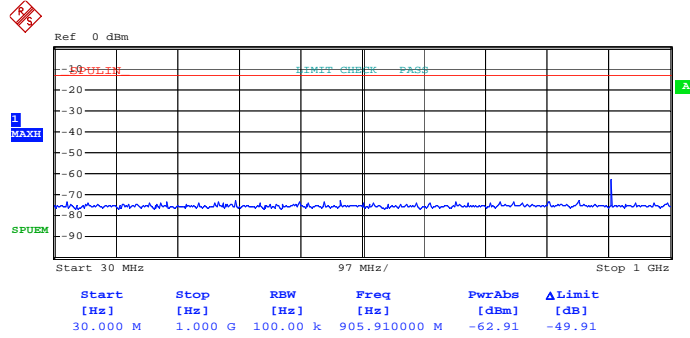


Date: 26.APR.2012 18:14:03



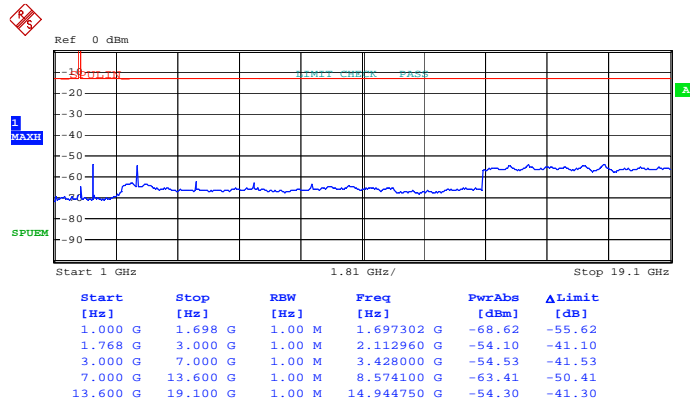
<b>Band :</b>	LTE Band 4	<b>Bandwidth :</b>	5MHz / 16QAM
<b>Frequency :</b>	1712.5	<b>Channel :</b>	19975

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



Date: 26.APR.2012 18:15:05

**Conducted Emission Plot (1GHz ~ 19.1GHz) for  
16-QAM (RB Size 1, RB Offset 24)**

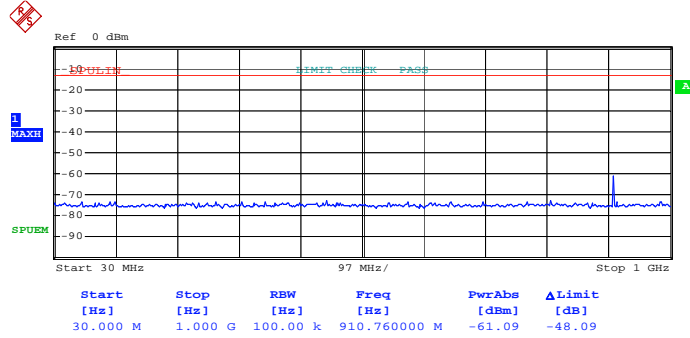


Date: 26.APR.2012 18:14:34



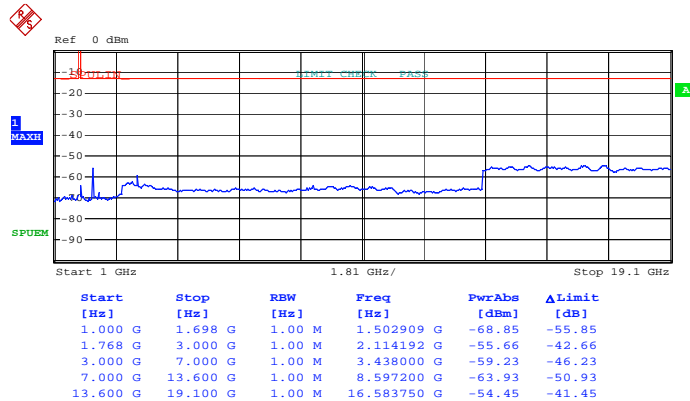
<b>Band :</b>	LTE Band 4	<b>Bandwidth :</b>	10MHz / QPSK
<b>Frequency :</b>	1715	<b>Channel :</b>	20000

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



Date: 26.APR.2012 18:31:28

**Conducted Emission Plot (1GHz ~ 19.1GHz) for QPSK (RB Size 1, RB Offset 49)**

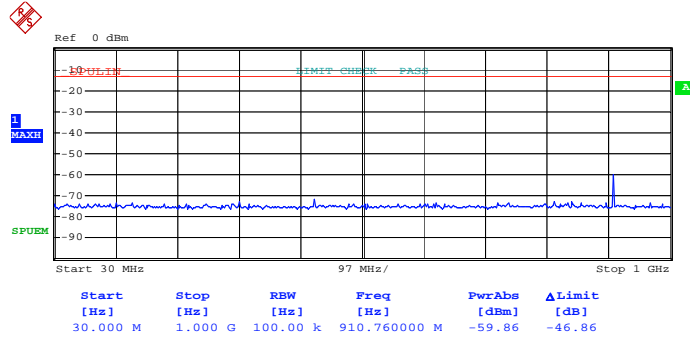


Date: 26.APR.2012 18:30:57



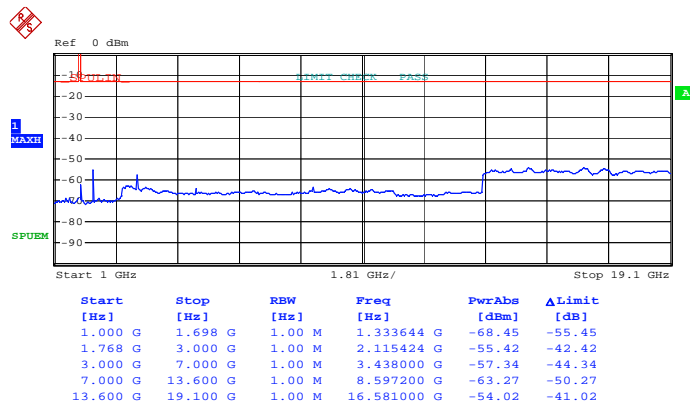
<b>Band :</b>	LTE Band 4	<b>Bandwidth :</b>	10MHz / 16QAM
<b>Frequency :</b>	1715	<b>Channel :</b>	20000

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



Date: 26.APR.2012 18:29:31

**Conducted Emission Plot (1GHz ~ 19.1GHz) for  
16-QAM (RB Size 1, RB Offset 49)**



Date: 26.APR.2012 18:30:21

## 3.7 Field Strength of Spurious Radiation Measurement

### 3.7.1 Description of Field Strength of Spurious Radiated Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least  $43 + 10 \log (P)$  dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

### 3.7.2 Measuring Instruments

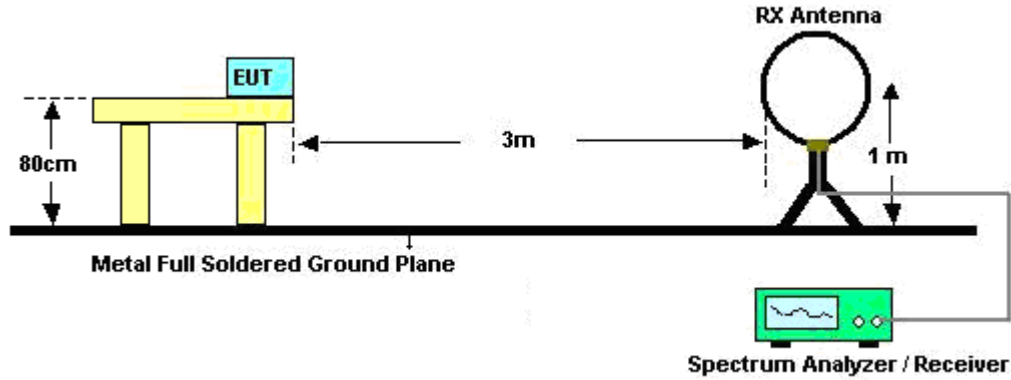
See list of measuring instruments of this test report.

### 3.7.3 Test Procedures

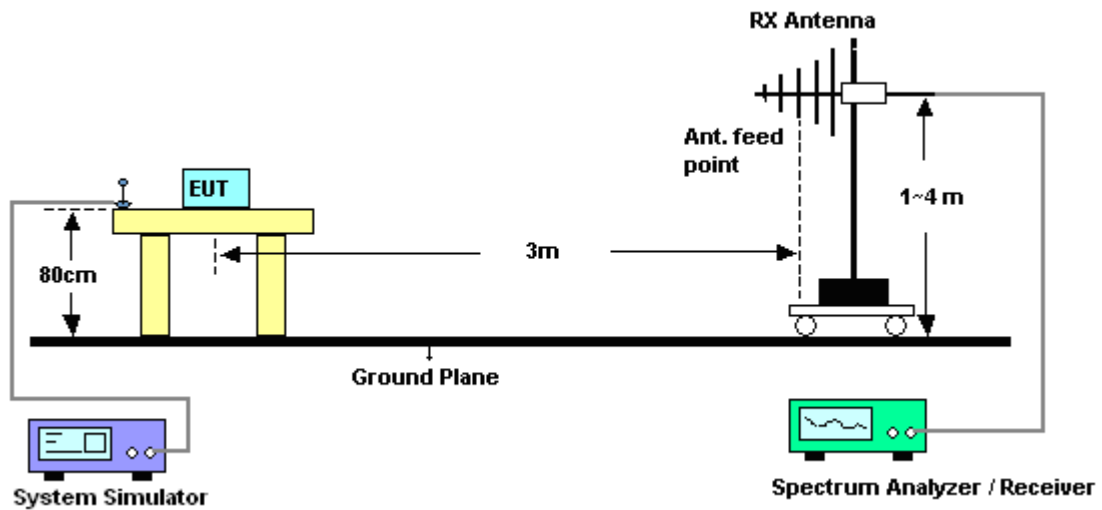
1. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, 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.

### 3.7.4 Test Setup

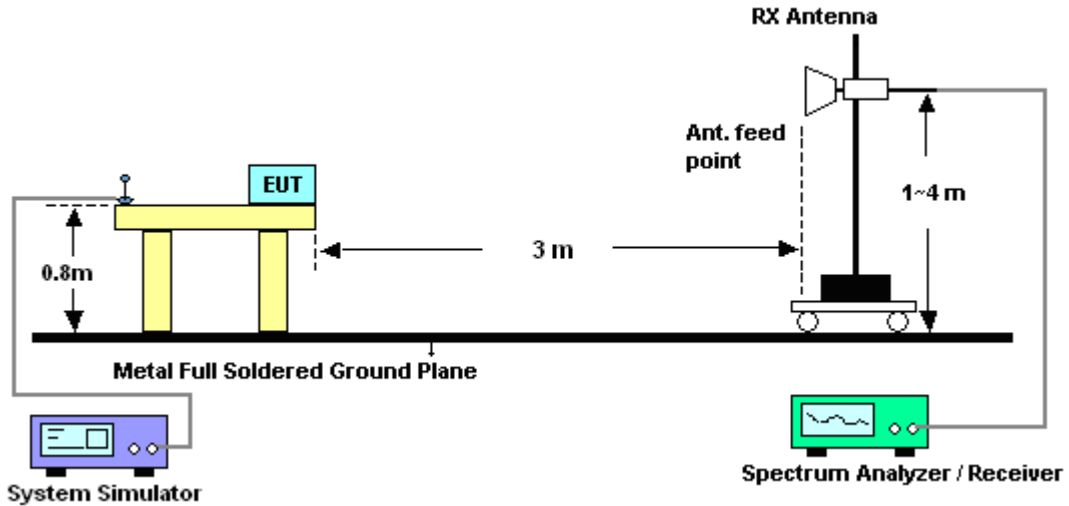
For radiated emissions below 30MHz



For radiated emissions from 30MHz ~ 1000 MHz



For radiated emissions above 1000 MHz



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

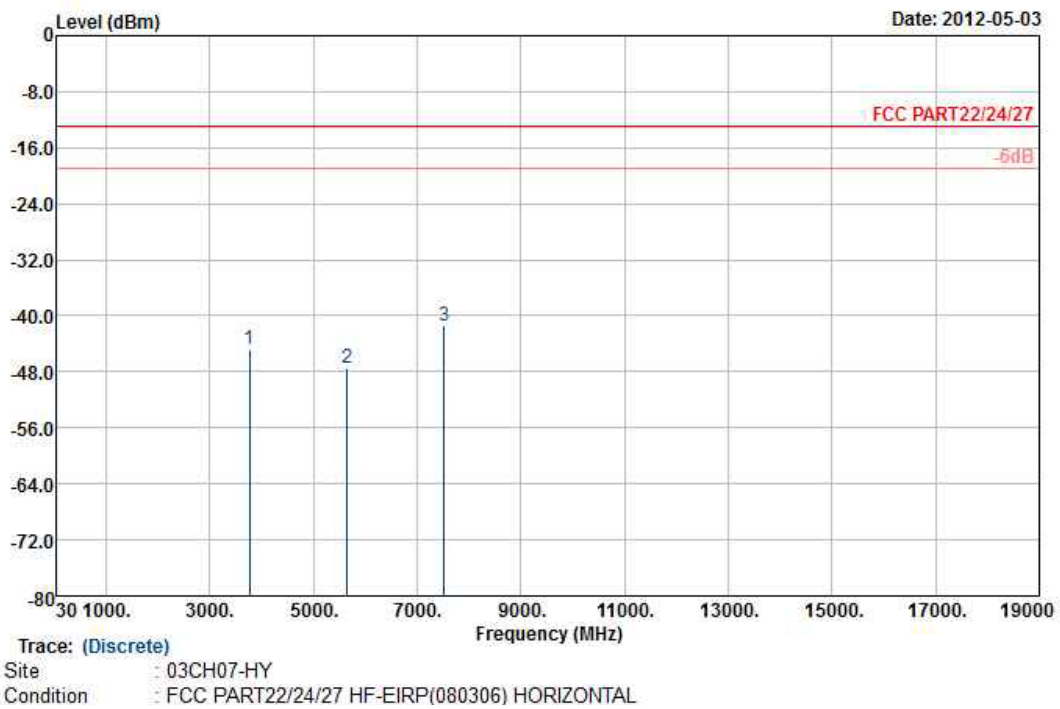
The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.





3.7.6 Test Result of Field Strength of Spurious Radiated

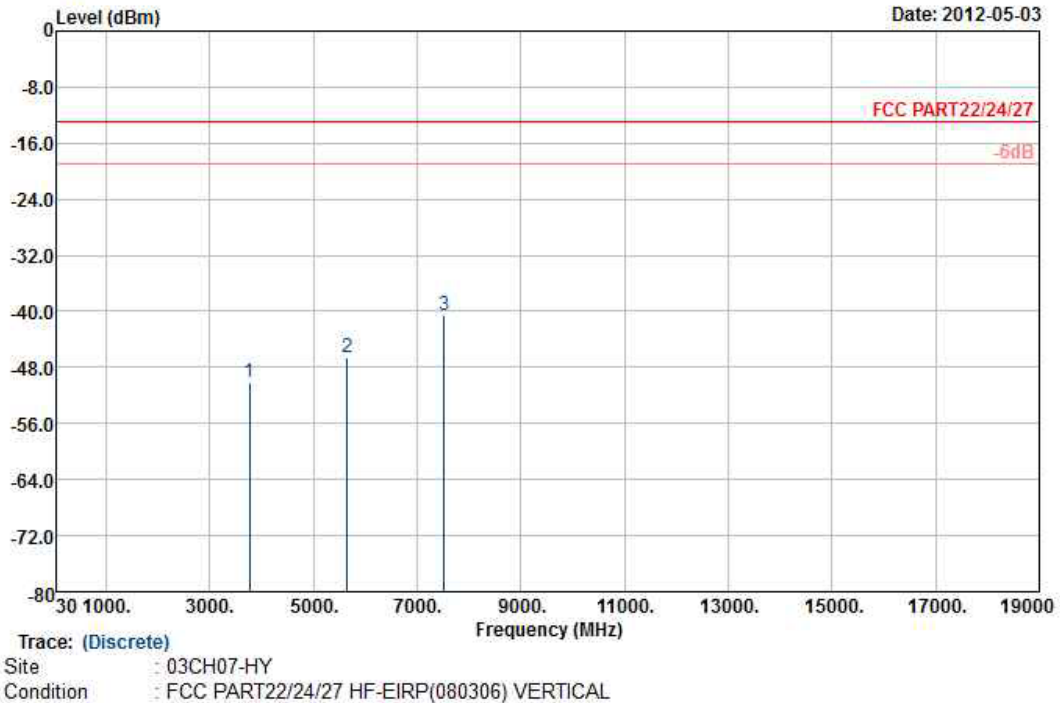
Band :	LTE Band 2	Temperature :	23~24°C
Test Mode :	1.4MHz, 16QAM, RB Size 1, RB Offset 0	Relative Humidity :	41~42%
Test Engineer :	Gavis Wu	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3760	-44.71	-13	-31.71	-60.34	-51.01	2.51	8.81	H	Pass
5636	-47.56	-13	-34.56	-68.48	-55.27	2.99	10.70	H	Pass
7520	-41.36	-13	-28.36	-68.82	-49.89	3.59	12.12	H	Pass



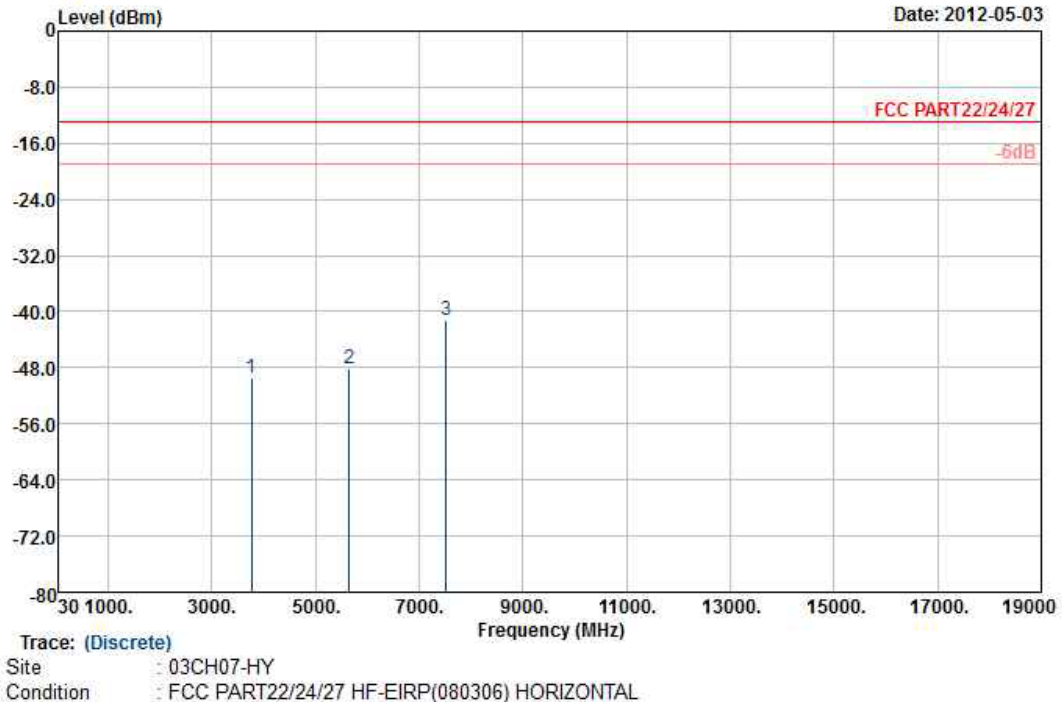
<b>Band :</b>	LTE Band 2	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	1.4MHz, 16QAM, RB Size 1, RB Offset 0	<b>Relative Humidity :</b>	41~42%
<b>Test Engineer :</b>	Gavis Wu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-50.18	-13	-37.18	-66.76	-56.48	2.51	8.81	V	Pass
5636	-46.67	-13	-33.67	-67.39	-54.38	2.99	10.70	V	Pass
7520	-40.59	-13	-27.59	-67.74	-49.12	3.59	12.12	V	Pass



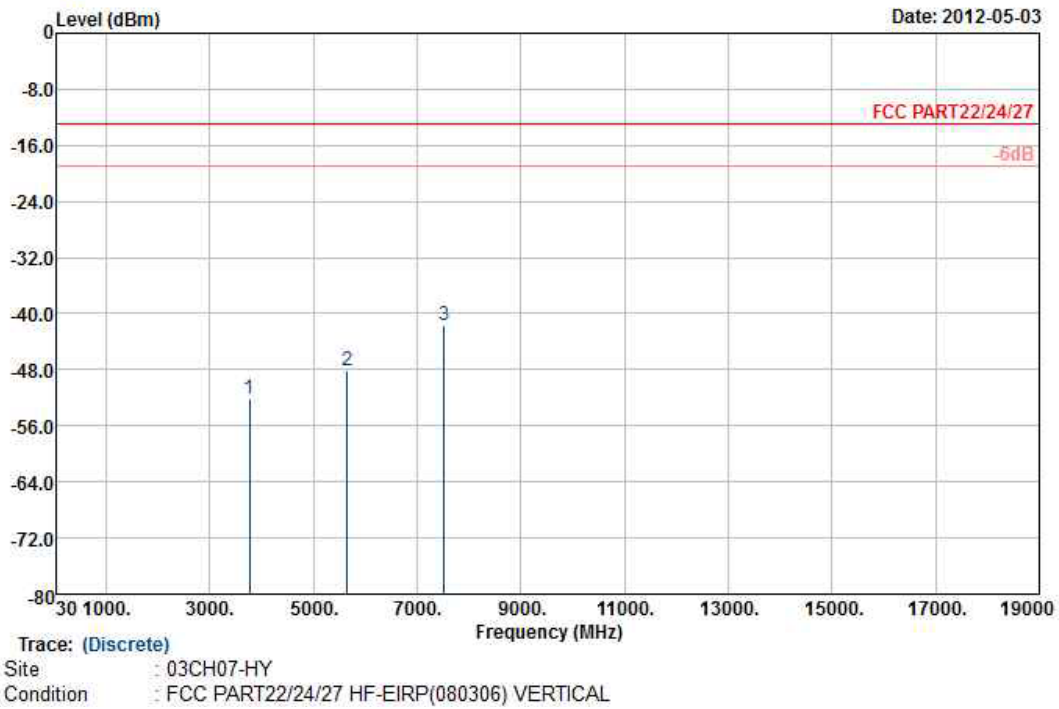
<b>Band :</b>	LTE Band 2	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	3MHz, 16QAM, RB Size 1, RB Offset 0	<b>Relative Humidity :</b>	41~42%
<b>Test Engineer :</b>	Gavis Wu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3760	-49.48	-13	-36.48	-65.11	-55.78	2.51	8.81	H	Pass
5636	-48.11	-13	-35.11	-69.06	-55.82	2.99	10.70	H	Pass
7520	-41.19	-13	-28.19	-68.52	-49.72	3.59	12.12	H	Pass



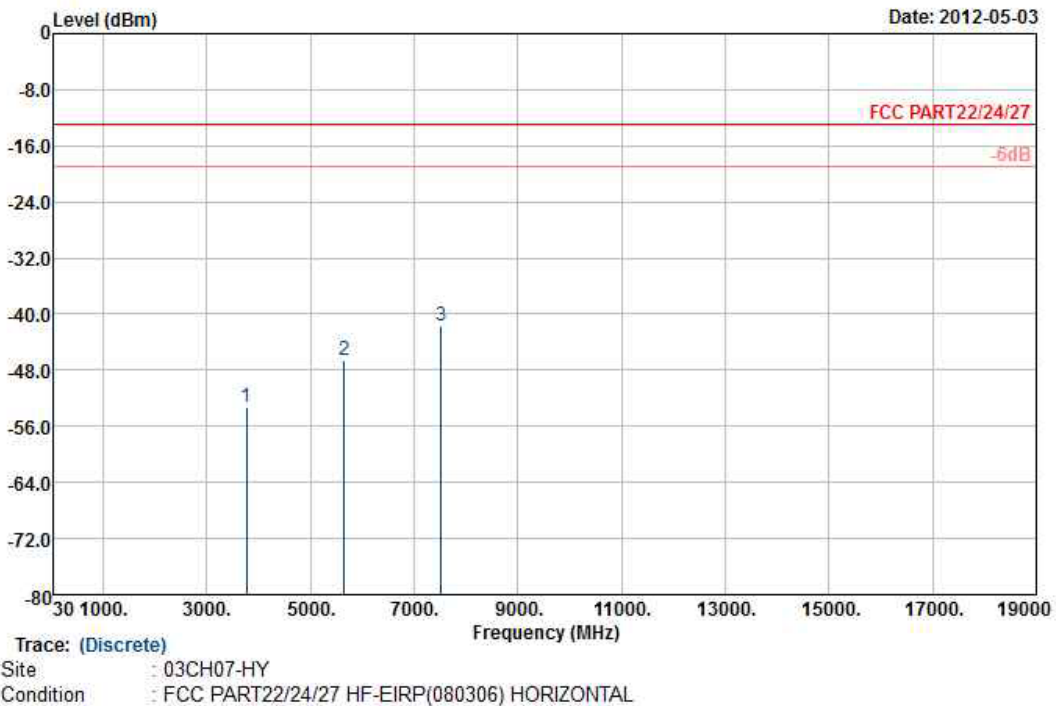
<b>Band :</b>	LTE Band 2	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	3MHz, 16QAM, RB Size 1, RB Offset 0	<b>Relative Humidity :</b>	41~42%
<b>Test Engineer :</b>	Gavis Wu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3760	-52.21	-13	-39.21	-68.77	-58.51	2.51	8.81	V	Pass
5636	-48.05	-13	-35.05	-68.91	-55.76	2.99	10.70	V	Pass
7520	-41.71	-13	-28.71	-68.93	-50.24	3.59	12.12	V	Pass



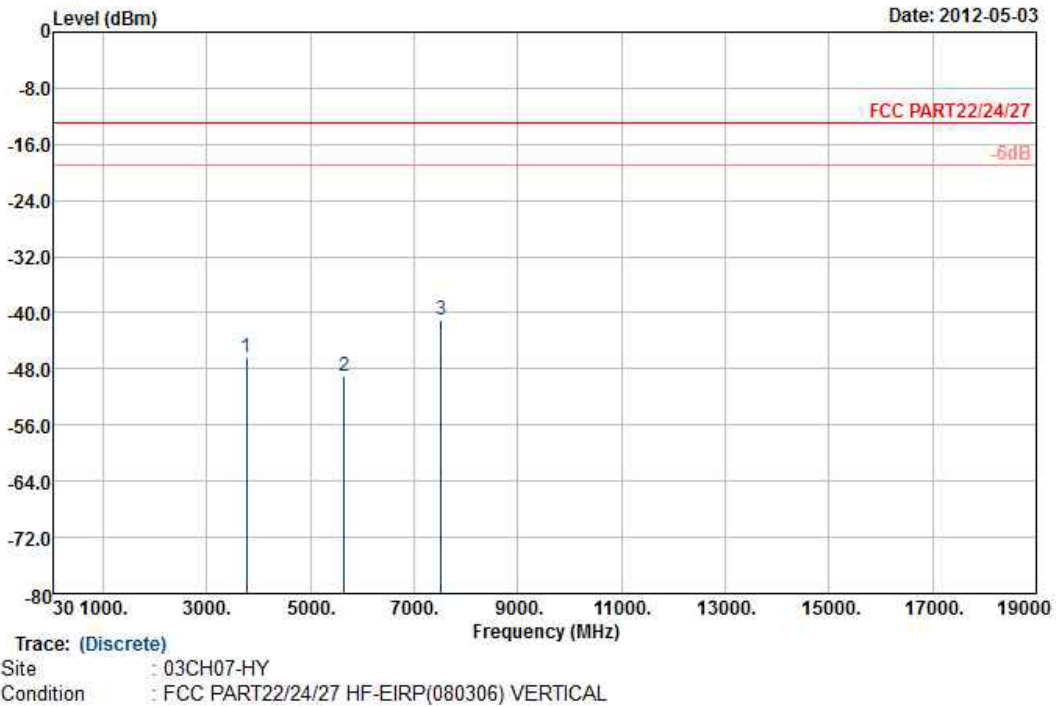
<b>Band :</b>	LTE Band 2	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	5MHz, 16QAM, RB Size 1, RB Offset 0	<b>Relative Humidity :</b>	41~42%
<b>Test Engineer :</b>	Gavis Wu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3760	-53.24	-13	-40.24	-68.95	-59.54	2.51	8.81	H	Pass
5636	-46.50	-13	-33.50	-68.54	-54.21	2.99	10.70	H	Pass
7520	-41.69	-13	-28.69	-68.44	-50.22	3.59	12.12	H	Pass



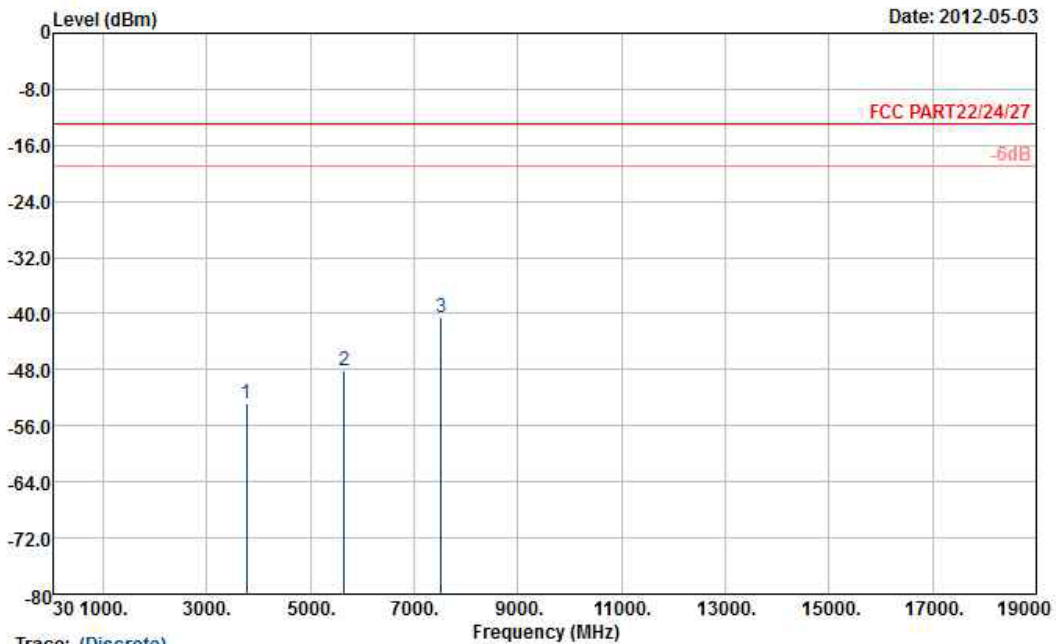
<b>Band :</b>	LTE Band 2	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	5MHz, 16QAM, RB Size 1, RB Offset 0	<b>Relative Humidity :</b>	41~42%
<b>Test Engineer :</b>	Gavis Wu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3760	-46.41	-13	-33.41	-62.94	-52.71	2.51	8.81	V	Pass
5636	-49.00	-13	-36.00	-69.74	-56.71	2.99	10.70	V	Pass
7520	-41.10	-13	-28.10	-68.24	-49.63	3.59	12.12	V	Pass



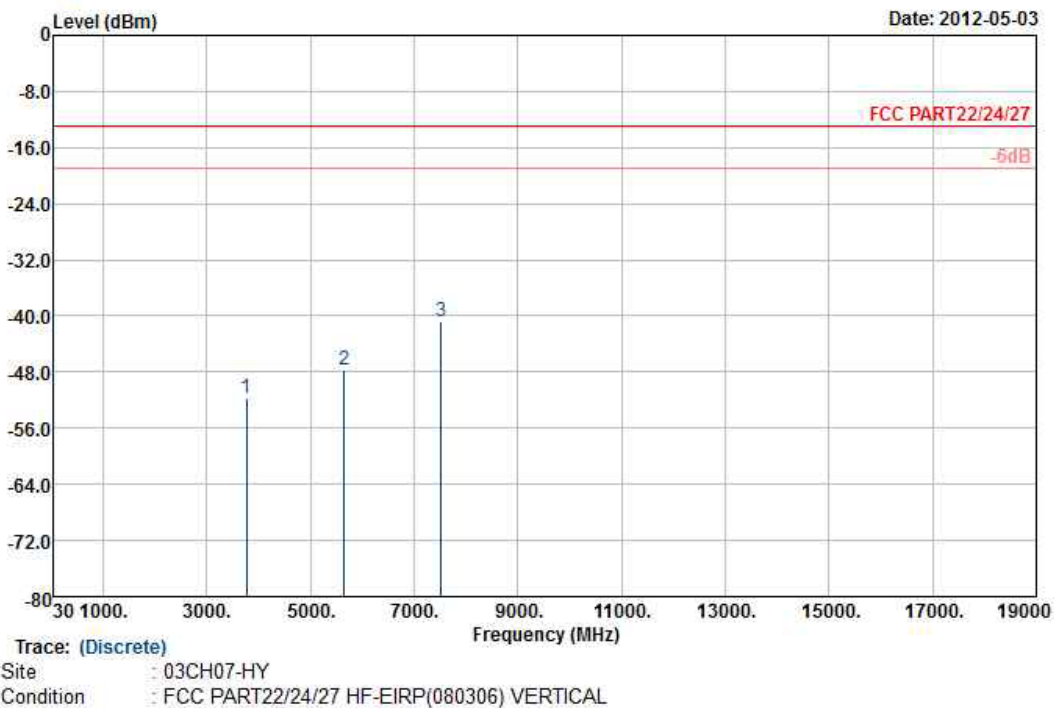
<b>Band :</b>	LTE Band 2	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	10MHz, 16QAM, RB Size 1, RB Offset 0	<b>Relative Humidity :</b>	41~42%
<b>Test Engineer :</b>	Gavis Wu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3760	-52.72	-13	-39.72	-68.25	-59.02	2.51	8.81	H	Pass
5636	-48.16	-13	-35.16	-69.18	-55.87	2.99	10.70	H	Pass
7520	-40.50	-13	-27.50	-67.94	-49.03	3.59	12.12	H	Pass



<b>Band :</b>	LTE Band 2	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	10MHz, 16QAM, RB Size 1, RB Offset 0	<b>Relative Humidity :</b>	41~42%
<b>Test Engineer :</b>	Gavis Wu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

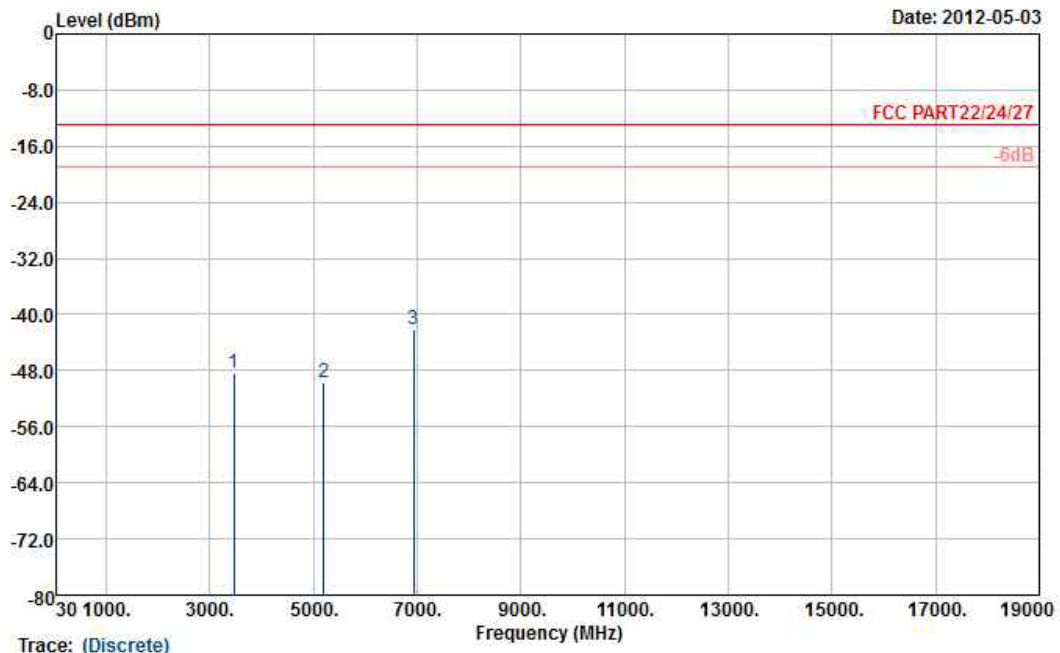


Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3760	-51.63	-13	-38.63	-68.26	-57.93	2.51	8.81	V	Pass
5636	-47.72	-13	-34.72	-68.5	-55.43	2.99	10.70	V	Pass
7520	-40.70	-13	-27.70	-67.92	-49.23	3.59	12.12	V	Pass





<b>Band :</b>	LTE Band 4	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	1.4MHz, 16QAM, RB Size 1, RB Offset 0	<b>Relative Humidity :</b>	41~42%
<b>Test Engineer :</b>	Gavis Wu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

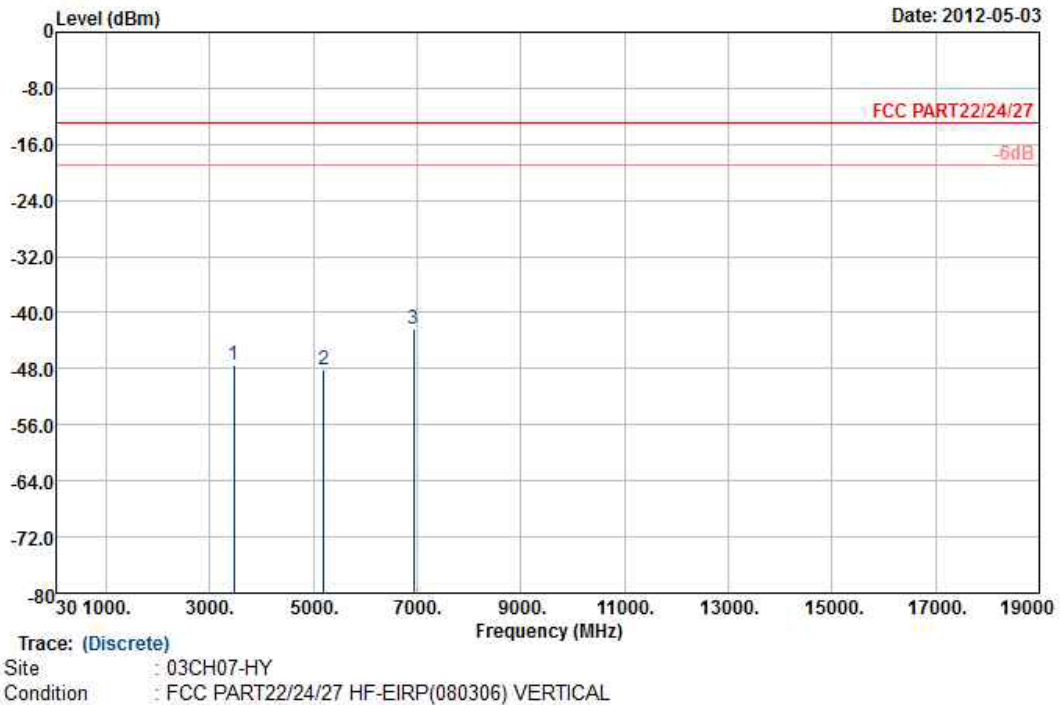


Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : FCC PART22/24/27 HF-EIRP(080306) HORIZONTAL

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
3465	-48.44	-13	-35.44	-63.33	-50.12	4.48	8.31	H	Pass
5197	-49.73	-13	-36.73	-67.93	-52.22	5.332	9.98	H	Pass
6930	-42.13	-13	-29.13	-68.4	-45.22	6.1	11.34	H	Pass



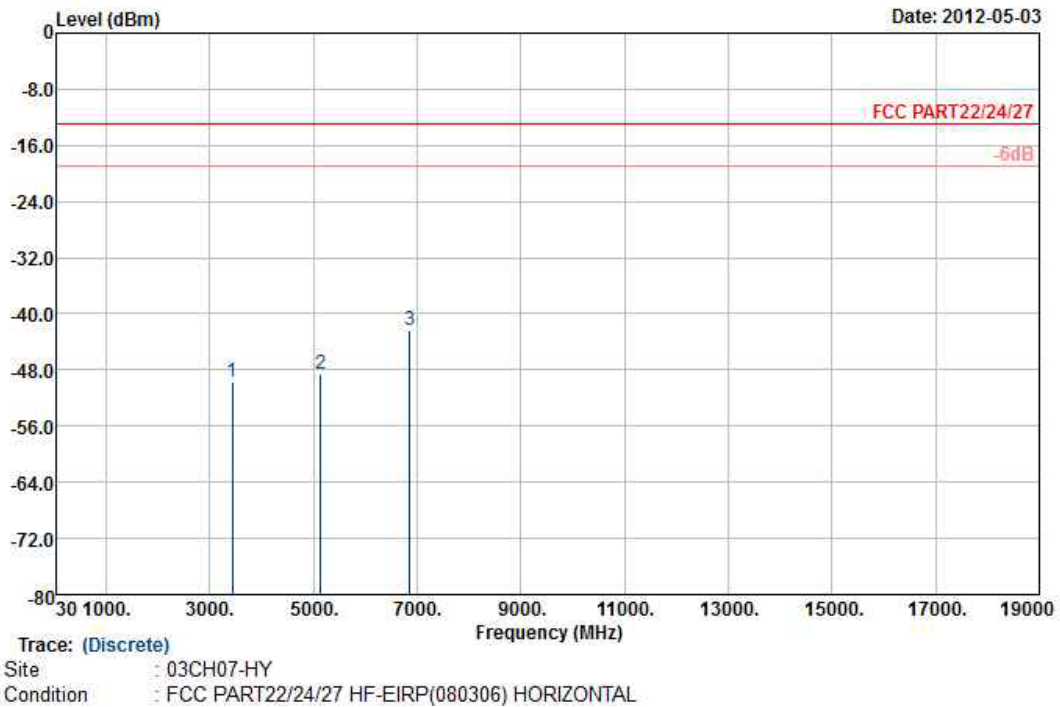
<b>Band :</b>	LTE Band 4	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	1.4MHz, 16QAM, RB Size 1, RB Offset 0	<b>Relative Humidity :</b>	41~42%
<b>Test Engineer :</b>	Gavis Wu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3465	-47.56	-13	-34.56	-62.84	-49.24	4.48	8.31	V	Pass
5197	-48.19	-13	-35.19	-67.86	-50.68	5.332	9.98	V	Pass
6930	-42.42	-13	-29.42	-69.01	-45.51	6.1	11.34	V	Pass



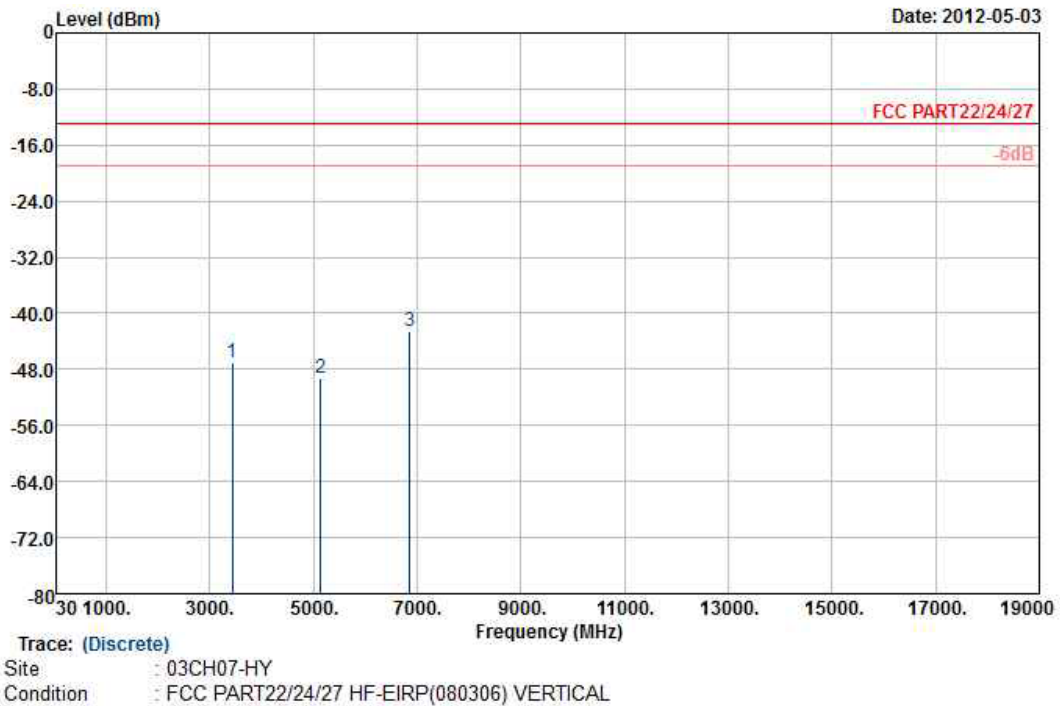
<b>Band :</b>	LTE Band 4	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	3MHz, 16QAM, RB Size 1, RB Offset 14	<b>Relative Humidity :</b>	41~42%
<b>Test Engineer :</b>	Gavis Wu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3423	-49.68	-13	-36.68	-63.71	-51.12	4.61	8.20	H	Pass
5134	-48.56	-13	-35.56	-67.04	-50.88	5.42	9.89	H	Pass
6846	-42.36	-13	-29.36	-67.76	-45.68	5.81	11.28	H	Pass



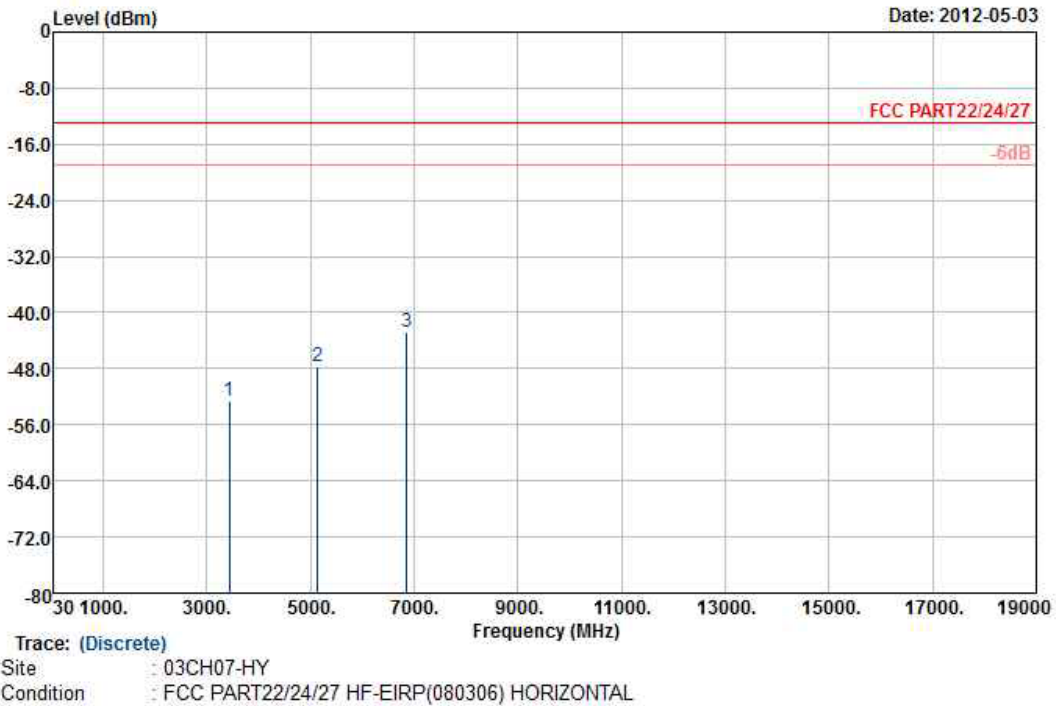
<b>Band :</b>	LTE Band 4	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	3MHz, 16QAM, RB Size 1, RB Offset 14	<b>Relative Humidity :</b>	41~42%
<b>Test Engineer :</b>	Gavis Wu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3423	-47.03	-13	-34.03	-62.73	-48.47	4.61	8.20	V	Pass
5134	-49.26	-13	-36.26	-67.75	-51.58	5.42	9.89	V	Pass
6846	-42.54	-13	-29.54	-68.89	-45.86	5.81	11.28	V	Pass



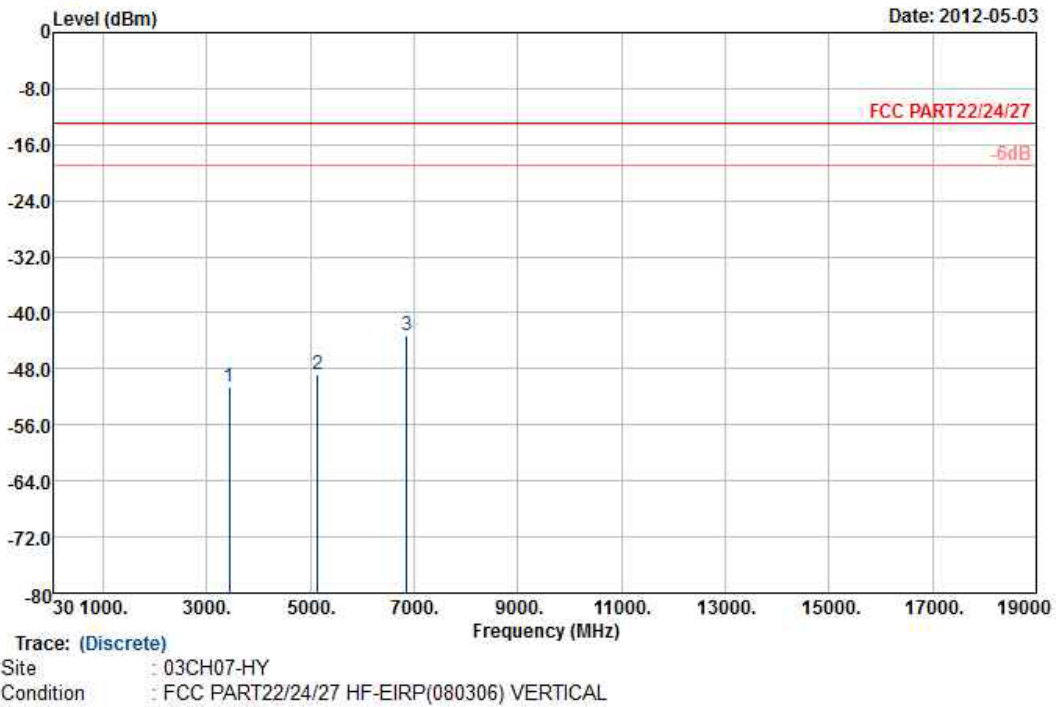
<b>Band :</b>	LTE Band 4	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	5MHz, 16QAM, RB Size 1, RB Offset 24	<b>Relative Humidity :</b>	41~42%
<b>Test Engineer :</b>	Gavis Wu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3425	-52.55	-13	-39.55	-66.44	-56.14	4.61	8.20	H	Pass
5137	-47.67	-13	-34.67	-66.84	-52.14	5.42	9.89	H	Pass
6850	-42.77	-13	-29.77	-68.28	-48.24	5.81	11.28	H	Pass



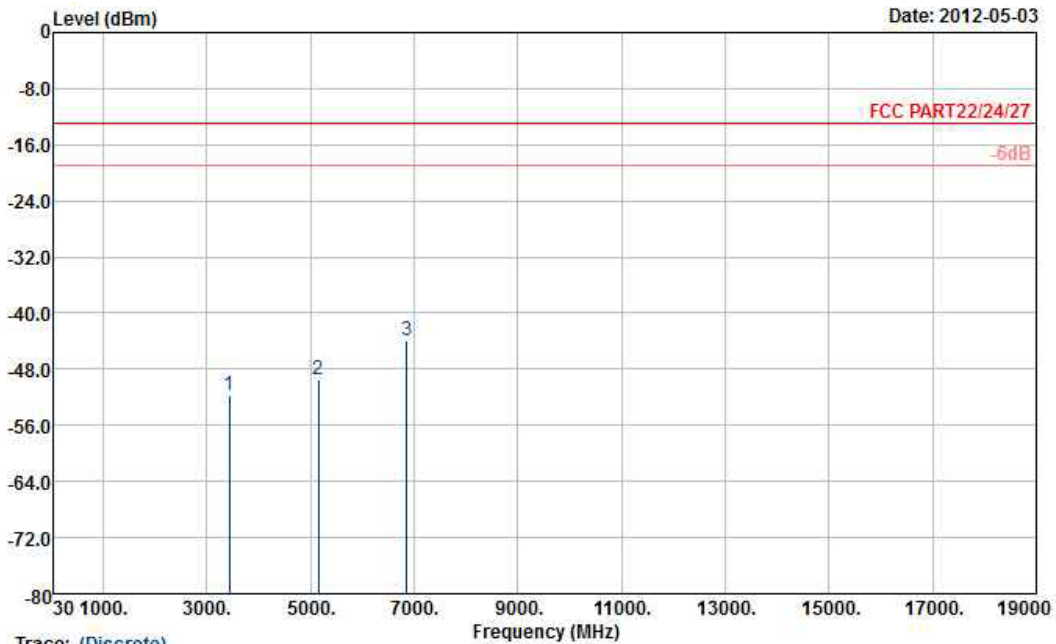
<b>Band :</b>	LTE Band 4	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	5MHz, 16QAM, RB Size 1, RB Offset 24	<b>Relative Humidity :</b>	41~42%
<b>Test Engineer :</b>	Gavis Wu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3425	-50.65	-13	-37.65	-66.03	-54.24	4.61	8.20	V	Pass
5137	-48.77	-13	-35.77	-66.72	-53.24	5.42	9.89	V	Pass
6850	-43.21	-13	-30.21	-68.56	-48.68	5.81	11.28	V	Pass



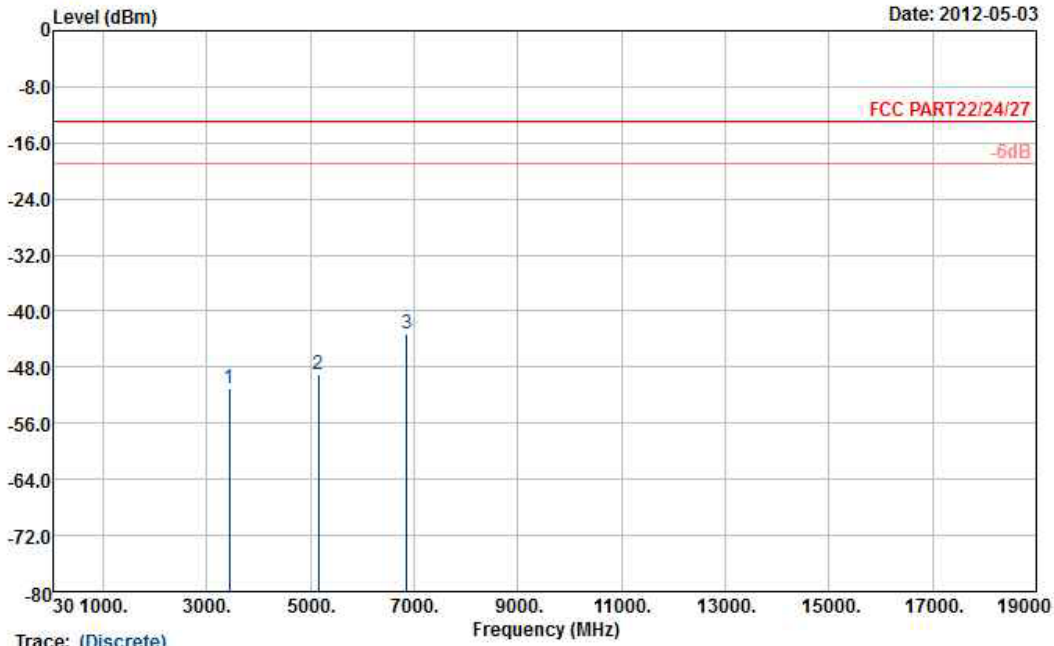
<b>Band :</b>	LTE Band 4	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	10MHz, 16QAM, RB Size 1, RB Offset 49	<b>Relative Humidity :</b>	41~42%
<b>Test Engineer :</b>	Gavis Wu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading ( dBm )	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain ( dBi )	Polarization ( H/V )	Result
3430	-51.61	-13	-38.61	-66.09	-55.2	4.61	8.20	H	Pass
5145	-49.38	-13	-36.38	-68.36	-53.85	5.42	9.89	H	Pass
6860	-43.79	-13	-30.79	-69.35	-49.26	5.81	11.28	H	Pass



<b>Band :</b>	LTE Band 4	<b>Temperature :</b>	23~24°C
<b>Test Mode :</b>	10MHz, 16QAM, RB Size 1, RB Offset 49	<b>Relative Humidity :</b>	41~42%
<b>Test Engineer :</b>	Gavis Wu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Trace: (Discrete)  
 Site : 03CH07-HY  
 Condition : FCC PART22/24/27 HF-EIRP(080306) 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
3430	-51.09	-13	-38.09	-66.59	-54.68	4.61	8.20	V	Pass
5145	-49.01	-13	-36.01	-67.70	-53.48	5.42	9.89	V	Pass
6860	-43.22	-13	-30.22	-68.31	-48.69	5.81	11.28	V	Pass



## 3.8 Frequency Stability Measurement

### 3.8.1 Description of Frequency Stability Measurement

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

### 3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

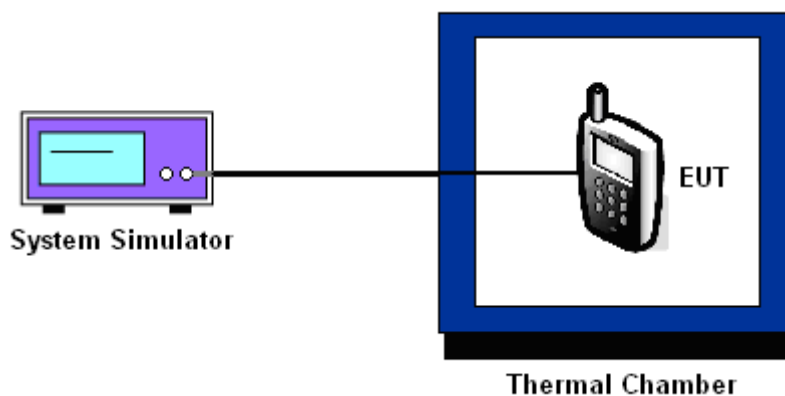
### 3.8.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to  $-30^{\circ}\text{C}$  and the EUT was stabilized for three hours. 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 can not 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.

### 3.8.4 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 base station.
2. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

### 3.8.5 Test Setup



3.8.6 Test Result of Temperature Variation

Band :	LTE Band 2		Limit (ppm) :	2.5	
Temperature (°C)	1.4MHz		3MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	N/A	N/A	N/A	N/A	PASS
-20	N/A	N/A	N/A	N/A	
-10	-7.2	-0.010	2.5	0.004	
0	-3.7	-0.005	9.5	0.013	
10	-6.9	-0.010	11.9	0.017	
20	8.6	0.012	-2.7	-0.004	
30	9.2	0.013	19.9	0.028	
40	-5.1	-0.007	7.8	0.011	
50	N/A	N/A	N/A	N/A	

**Note:** The manufacturer declared that the EUT could work properly between temperatures -10°C~40°C.



Band :	LTE Band 2		Limit (ppm) :	2.5	
Temperature (°C)	5MHz		10MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	N/A	N/A	N/A	N/A	PASS
-20	N/A	N/A	N/A	N/A	
-10	-3.4	-0.005	2.3	0.003	
0	-12.2	-0.017	-5.4	-0.008	
10	-17.5	-0.025	-9.1	-0.013	
20	-11.1	-0.016	-2.7	-0.004	
30	-10.3	-0.015	-11.4	-0.016	
40	-18.0	-0.025	1.1	0.002	
50	N/A	N/A	N/A	N/A	

**Note:** The manufacturer declared that the EUT could work properly between temperatures -10°C~40°C.

Band :	LTE Band 4		Limit (ppm) :	2.5	
Temperature (°C)	1.4MHz		3MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	N/A	N/A	N/A	N/A	PASS
-20	N/A	N/A	N/A	N/A	
-10	-51.2	-0.072	-49.5	-0.070	
0	-43.6	-0.061	-50.9	-0.072	
10	-48.6	-0.068	-48.3	-0.068	
20	-52.3	-0.074	-58.8	-0.083	
30	-49.8	-0.070	-64.4	-0.091	
40	-47.5	-0.067	-44.7	-0.063	
50	N/A	N/A	N/A	N/A	

**Note:** The manufacturer declared that the EUT could work properly between temperatures -10°C~40°C.



Band :	LTE Band 4		Limit (ppm) :	2.5	
Temperature (°C)	5MHz		10MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	N/A	N/A	N/A	N/A	PASS
-20	N/A	N/A	N/A	N/A	
-10	-44.3	-0.062	-21.0	-0.030	
0	-55.1	-0.078	-15.0	-0.021	
10	-57.6	-0.081	-24.5	-0.035	
20	-44.8	-0.063	-11.2	-0.016	
30	-54.1	-0.076	-29.0	-0.041	
40	-57.1	-0.080	-22.6	-0.032	
50	N/A	N/A	N/A	N/A	

**Note:** The manufacturer declared that the EUT could work properly between temperatures -10°C~40°C.

3.8.7 Test Result of Voltage Variation

Band	Band Width & Channel	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 2	1.4MHz	3.8	-9.8	-0.014	2.5	PASS
		BEP	4.4	0.006		
		4.2	5.5	0.008		
	3MHz	3.8	-9.2	-0.013		
		BEP	11.2	0.016		
		4.2	7.6	0.011		
	5MHz	3.8	-7.3	-0.010		
		BEP	-9.7	-0.014		
		4.2	-11.2	-0.016		
	10MHz	3.8	6.5	0.009		
		BEP	-7.2	-0.010		
		4.2	-3.8	-0.005		

Remark:

1. Normal Voltage = 3.8V.
2. Battery End Point (BEP) = 3.7 V.



Band	Band Width & Channel	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 4	1.4MHz	3.8	-52.3	-0.074	2.5	PASS
		BEP	-48.6	-0.068		
		4.2	-45.8	-0.065		
	3MHz	3.8	-38.9	-0.055		
		BEP	-25.6	-0.036		
		4.2	-26.5	-0.037		
	5MHz	3.8	-41.2	-0.058		
		BEP	-42.4	-0.060		
		4.2	-36.9	-0.052		
	10MHz	3.8	-53.3	-0.075		
		BEP	-52.1	-0.073		
		4.2	-48.9	-0.069		

Remark:

- 1. Normal Voltage = 3.8V.
- 2. Battery End Point (BEP) = 3.7 V.

## 4 List of Measuring Equipments

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	Apr. 17, 2012~ May 07, 2012	Dec. 29, 2012	Conducted (TH01-KS)
DC Power Supply	GWINSTEK	GPS-3030D	E1884515	N/A	Aug. 23, 2011	Apr. 17, 2012~ May 07, 2012	Aug. 22, 2012	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 30, 2011	Apr. 17, 2012~ May 07, 2012	Dec. 29, 2012	Conducted (TH01-KS)
Radio communication analyzer	Anritsu	MT8820C	6201074235	LTE_FDD full band	Dec. 30, 2011	Apr. 17, 2012~ May 07, 2012	Dec. 29, 2012	Conducted (TH01-KS)
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 13, 2011	May 07, 2012~ May 08, 2012	Jun. 12, 2012	Conducted (TH02-HY)
LTE Base Station	Anritsu	MT8820C	6200930978	N/A	Dec. 27, 2011	May 07, 2012~ May 08, 2012	Dec. 28, 2012	Conducted (TH02-HY)
DC Power Supply	TOPWARD	3303D	740889	N/A	Jun. 07, 2011	May 07, 2012~ May 08, 2012	Jun. 08, 2012	Conducted (TH02-HY)
Thermal	Ten Billion	TTH-D35P	TBN-930701	N/A	Jul. 27, 2011	May 07, 2012~ May 08, 2012	Jul. 26, 2012	Conducted (TH02-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 22, 2011	May 03, 2012~ May 04, 2012	Oct. 21, 2012	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP30	101067	9KHz ~ 30GHz	Dec. 06, 2011	May 03, 2012~ May 04, 2012	Dec. 05, 2012	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 10, 2011	May 03, 2012~ May 04, 2012	Aug. 09, 2012	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1GHz ~ 26.5GHz	Dec. 05, 2011	May 03, 2012~ May 04, 2012	Dec. 04, 2012	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10 ~ 1000MHz 32dB GAIN	Mar. 28, 2012	May 03, 2012~ May 04, 2012	Mar. 27, 2013	Radiation (03CH07-HY)
EMI TEST RECEIVER	R&S	ESCI 7	100724	9kHz ~ 7GHz	Aug. 22, 2011	May 03, 2012~ May 04, 2012	Aug. 21, 2012	Radiation (03CH07-HY)
Pre Amplifier	EMCI	EMC051845	SN980048	1GHz ~ 18GHz	Jul. 18, 2011	May 03, 2012~ May 04, 2012	Jul. 17, 2012	Radiation (03CH07-HY)
LTE Base Station	Anritsu	MT8820C	6200930978	N/A	Dec. 27, 2011	May 03, 2012~ May 04, 2012	Dec. 28, 2012	Radiation (03CH07-HY)

## 5 Uncertainty of Evaluation

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

Contribution	Uncertainty of $X_i$		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.41	Normal (k=2)	0.21
Antenna Factor Calibration	0.83	Normal (k=2)	0.42
Cable Loss Calibration	0.25	Normal (k=2)	0.13
Pre-Amplifier Gain Calibration	0.27	Normal (k=2)	0.14
RCV/SPA Specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site Imperfection	1.43	Rectangular	0.83
Mismatch	+0.39 / -0.41	U-Shape	0.28
<b>Combined Standard Uncertainty <math>U_c(y)</math></b>	<b>1.27</b>		
<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>	<b>2.54</b>		

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

Contribution	Uncertainty of $X_i$		$u(X_i)$	$C_i$	$C_i * u(X_i)$
	dB	Probability Distribution			
Receiver Reading	$\pm 0.10$	Normal (k=2)	0.10	1	0.10
Antenna Factor Calibration	$\pm 1.70$	Normal (k=2)	0.85	1	0.85
Cable Loss Calibration	$\pm 0.50$	Normal (k=2)	0.25	1	0.25
Receiver Correction	$\pm 2.00$	Rectangular	1.15	1	1.15
Antenna Factor Directional	$\pm 1.50$	Rectangular	0.87	1	0.87
Site Imperfection	$\pm 2.80$	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20\text{Log}(1-\Gamma_1*\Gamma_2)$	+0.34 / -0.35	U-Shape	0.244	1	0.244
<b>Combined Standard Uncertainty <math>U_c(y)</math></b>	<b>2.36</b>				
<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>	<b>4.72</b>				





## **Appendix A. Photographs of EUT**

Please refer to Sporton report number EP230902 as below.