

FCC RF Test Report

APPLICANT : ASUSTeK COMPUTER INC.
EQUIPMENT : ASUS VivoTab
BRAND NAME : ASUS
MODEL NAME : K0Y
FCC ID : MSQK0Y
STANDARD : 47 CFR Part 2, 22, 24, 27
CLASSIFICATION : PCS Licensed Transmitter (PCB)

The product was received on Oct. 24, 2012 and completely tested on Dec. 10, 2012. We, SPORTON INTERNATIONAL 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 INC., the test report shall not be reproduced except in full.

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG202430B	Rev. 01	Initial issue of report	Dec. 18, 2012

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Power	NA	PASS	-
3.1	§22.913(a)(2)	Effective Radiated Power (Band 5)	ERP < 7 Watts	PASS	-
	§27.50(c)(10)	Effective Radiated Power (Band 17)	ERP < 3 Watts		
	§24.232(c)	Equivalent Isotropic Radiated Power (Band 2)	EIRP < 2Watt		
	§27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4)	EIRP < 1Watt		
3.2	27.53(d)(5)	Peak-to-Average Ratio	<13 dB	PASS	-
3.3	§2.1049 §22.917(a) §24.238(a) §27.53(g)(1)	Occupied Bandwidth	N/A	PASS	-
3.4	§2.1049 §27.53(h)	Conducted Band Edge Measurement	< 43+10log ₁₀ (P[Watts])	PASS	-
3.5	§2.1051 §27.53(h)	Conducted Spurious Emission	< 43+10log ₁₀ (P[Watts])	PASS	-
3.6	§2.1053 §24.238(a) §27.53(g) §27.53(h)	Radiated Spurious Emission	< 43+10log ₁₀ (P[Watts])	PASS	Under limit 7.29 dB at 3760.000 MHz
3.7	§2.1055 §24.235 §27.54	Frequency Stability Temperature & Voltage	< 2.5 ppm	PASS	-

1 General Description

1.1 Applicant

ASUSTeK COMPUTER INC.

4F., No. 150, Li-Te Rd., Peitou, Taipei, Taiwan

1.2 Manufacturer

Tech-Com (Shanghai) Computer Co., Ltd.

No. 68, Sanzhuang Road, Songjiang Exprot Processing

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	ASUS VivoTab
Brand Name	ASUS
Model Name	K0Y
FCC ID	MSQK0Y
EUT Stage	Production Unit

Product Specification subjective to this standard	
Tx Frequency	LTE Band 2 : 1851.5 MHz ~ 1908.5 MHz LTE Band 4 : 1712.5 MHz ~ 1752.5 MHz LTE Band 5 : 825.5 MHz ~ 847.5 MHz LTE Band 17 : 706.5 MHz ~ 713.5 MHz
Rx Frequency	LTE Band 2 : 1931.5 MHz ~ 1988.5 MHz LTE Band 4 : 2112.5 MHz ~ 2152.5 MHz LTE Band 5 : 870.5 MHz ~ 892.5 MHz LTE Band 17 : 736.5 MHz ~ 743.5 MHz
Bandwidth	3MHz / 5MHz/ 10MHz (Band 2) 5MHz/ 10MHz (Band 4) 3MHz / 5MHz/ 10MHz (Band 5) 5MHz / 10MHz (Band 17)
Maximum Output Power to Antenna	LTE Band 2 : 22.88 dBm LTE Band 4 : 21.96 dBm LTE Band 5 : 23.19 dBm LTE Band 17 : 22.46 dBm
Antenna Type	PCB Antenna
Type of Modulation	QPSK / 16QAM

1.4 Emission Designator

FCC Rule	System	Type of Modulation	BW	Emission Designator	Frequency Tolerance (%, Hz, ppm)	Maximum ERP/EIRP
Part 22	LTE Band 5	QPSK	3MHz	2M74G7D	0.006 ppm	0.1161 W
Part 22	LTE Band 5	16QAM	3MHz	2M73D7W	0.006 ppm	-
Part 22	LTE Band 5	QPSK	5MHz	4M49G7D	0.007 ppm	0.1191 W
Part 22	LTE Band 5	16QAM	5MHz	4M52D7W	0.007 ppm	-
Part 22	LTE Band 5	QPSK	10MHz	9M10G7D	0.009 ppm	0.1197 W
Part 22	LTE Band 5	16QAM	10MHz	9M04D7W	0.007 ppm	-
Part 24	LTE Band 2	QPSK	3MHz	2M75G7D	0.005 ppm	0.3936 W
Part 24	LTE Band 2	16QAM	3MHz	2M75D7W	0.005 ppm	-
Part 24	LTE Band 2	QPSK	5MHz	4M50G7D	0.007 ppm	0.3981 W
Part 24	LTE Band 2	16QAM	5MHz	4M50D7W	0.006 ppm	-
Part 24	LTE Band 2	QPSK	10MHz	9M04G7D	0.005 ppm	0.3990 W
Part 24	LTE Band 2	16QAM	10MHz	9M08D7W	0.004 ppm	-
Part 27	LTE Band 4	QPSK	5MHz	4M52G7D	0.007 ppm	0.1271 W
Part 27	LTE Band 4	16QAM	5MHz	4M52D7W	0.007 ppm	-
Part 27	LTE Band 4	QPSK	10MHz	9M16G7D	0.013 ppm	0.1294 W
Part 27	LTE Band 4	16QAM	10MHz	9M12D7W	0.010 ppm	-
Part 27	LTE Band 17	QPSK	5MHz	4M52G7D	0.008 ppm	0.0962 W
Part 27	LTE Band 17	16QAM	5MHz	4M52D7W	0.008 ppm	-
Part 27	LTE Band 17	QPSK	10MHz	9M17G7D	0.008 ppm	0.0938 W
Part 27	LTE Band 17	16QAM	10MHz	9M10D7W	0.007 ppm	-

1.5 Testing Site

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1 st 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		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	TH02-HY	03CH05-HY	TW1022/4086B-1

1.6 Applied Standards

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

- ♦ 47 CFR Part 2, 22, 24, 27
- ♦ ANSI / TIA / EIA-603-C-2004
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v01

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

1.7 Ancillary Equipment List

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	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.

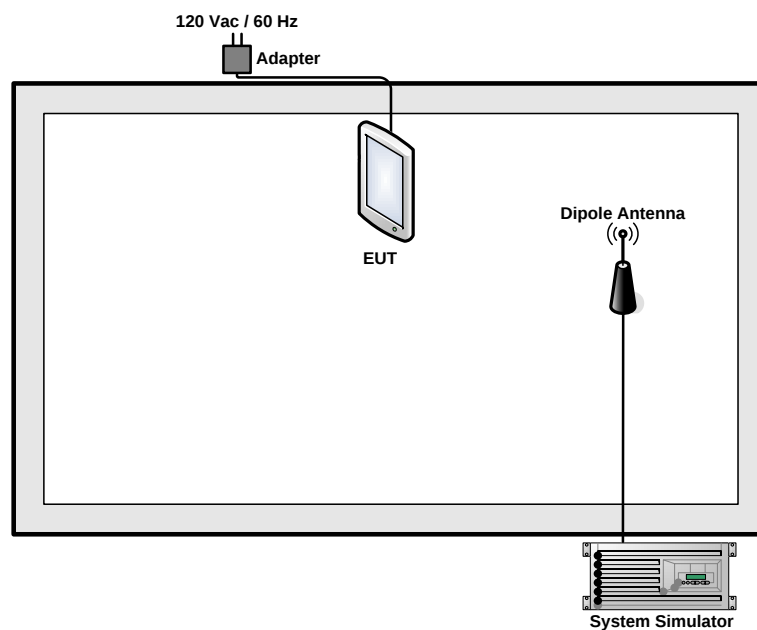
Frequency range investigated for radiated emission: 30MHz to 10th harmonic.

Test Modes			
Band		Radiated TCs	Conducted TCs
LTE Band 5	BW 3MHz	■ LTE (RB Size 1, RB Offset 0) Link	■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 7) Link ■ LTE (RB Size 1, RB Offset 14) Link ■ LTE (RB Size 8, RB Offset 0) Link ■ LTE (RB Size 8, RB Offset 4) Link ■ LTE (RB Size 8, RB Offset 7) Link ■ LTE (RB Size 15, RB Offset 0) Link
	BW 5MHz	■ LTE (RB Size 1, RB Offset 0) Link	■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 12) Link ■ LTE (RB Size 1, RB Offset 24) Link ■ LTE (RB Size 12, RB Offset 0) Link ■ LTE (RB Size 12, RB Offset 6) Link ■ LTE (RB Size 12, RB Offset 11) Link ■ LTE (RB Size 25, RB Offset 0) Link
	BW 10MHz	■ LTE (RB Size 1, RB Offset 0) Link	■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 24) Link ■ LTE (RB Size 1, RB Offset 49) Link ■ LTE (RB Size 25, RB Offset 0) Link ■ LTE (RB Size 25, RB Offset 12) Link ■ LTE (RB Size 25, RB Offset 24) Link ■ LTE (RB Size 50, RB Offset 0) Link

Test Modes			
LTE Band 2	BW 3MHz	■ LTE (RB Size 1, RB Offset 7) Link	■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 7) Link ■ LTE (RB Size 1, RB Offset 14) Link ■ LTE (RB Size 8, RB Offset 0) Link ■ LTE (RB Size 8, RB Offset 4) Link ■ LTE (RB Size 8, RB Offset 7) Link ■ LTE (RB Size 15, RB Offset 0) Link
	BW 5MHz	■ LTE (RB Size 1, RB Offset 12) Link	■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 12) Link ■ LTE (RB Size 1, RB Offset 24) Link ■ LTE (RB Size 12, RB Offset 0) Link ■ LTE (RB Size 12, RB Offset 6) Link ■ LTE (RB Size 12, RB Offset 11) Link ■ LTE (RB Size 25, RB Offset 0) Link
	BW 10MHz	■ LTE (RB Size 1, RB Offset 24) Link	■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 24) Link ■ LTE (RB Size 1, RB Offset 49) Link ■ LTE (RB Size 25, RB Offset 0) Link ■ LTE (RB Size 25, RB Offset 12) Link ■ LTE (RB Size 25, RB Offset 24) Link ■ LTE (RB Size 50, RB Offset 0) Link
LTE Band 4	BW 5MHz	■ LTE (RB Size 1, RB Offset 0) Link	■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 12) Link ■ LTE (RB Size 1, RB Offset 24) Link ■ LTE (RB Size 12, RB Offset 0) Link ■ LTE (RB Size 12, RB Offset 6) Link ■ LTE (RB Size 12, RB Offset 11) Link ■ LTE (RB Size 25, RB Offset 0) Link
	BW 10MHz	■ LTE (RB Size 1, RB Offset 49) Link	■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 24) Link ■ LTE (RB Size 1, RB Offset 49) Link ■ LTE (RB Size 25, RB Offset 0) Link ■ LTE (RB Size 25, RB Offset 12) Link ■ LTE (RB Size 25, RB Offset 24) Link ■ LTE (RB Size 50, RB Offset 0) Link

Test Modes			
LTE Band 17	BW 5MHz	■ LTE (RB Size 1, RB Offset 0) Link	■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 12) Link ■ LTE (RB Size 1, RB Offset 24) Link ■ LTE (RB Size 12, RB Offset 0) Link ■ LTE (RB Size 12, RB Offset 6) Link ■ LTE (RB Size 12, RB Offset 11) Link ■ LTE (RB Size 25, RB Offset 0) Link
	BW 10MHz	■ LTE (RB Size 1, RB Offset 0) Link	■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 24) Link ■ LTE (RB Size 1, RB Offset 49) Link ■ LTE (RB Size 25, RB Offset 0) Link ■ LTE (RB Size 25, RB Offset 12) Link ■ LTE (RB Size 25, RB Offset 24) Link ■ LTE (RB Size 50, RB Offset 0) Link

2.2 Connection Diagram of Test System



3 Test Result

3.1 Conducted Output Power and ERP/EIRP Measurement

3.1.1 Description of the Conducted Output Power and ERP/EIRP Measurement

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

The ERP of mobile transmitters must not exceed 7 Watts and the EIRP of mobile transmitters are limited to 2 Watts. According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$, $ERP = EIRP - 2.15$, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

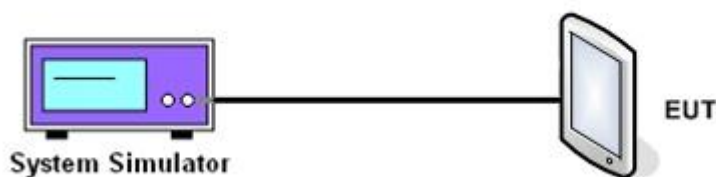
3.1.2 Measuring Instruments

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. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set EUT at maximum power through base station.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure the maximum burst average power for GSM and maximum average power for other modulation signal.

3.1.4 Test Setup



3.1.5 Test Result of Conducted Output Power

Operation Band	Band Width	Modulation	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watts)	PAPR (dB)	Mod / RB (Size – Offset)
LTE Band 5	3MHz	QPSK	20415	825.5	22.99	0.20	5.64	QPSK 1-0
			20525	836.5	22.88	0.19	5.64	QPSK 1-0
			20635	847.5	23.06	0.20	5.64	QPSK 1-0
		16QAM	20415	825.5	22.14	0.16	6.47	16QAM 1-0
			20525	836.5	22.23	0.17	6.47	16QAM 1-0
			20635	847.5	22.21	0.17	6.47	16QAM 1-0
	5MHz	QPSK	20425	826.5	23.11	0.20	5.71	QPSK 1-0
			20525	836.5	22.99	0.20	5.71	QPSK 1-0
			20625	846.5	23.17	0.21	5.71	QPSK 1-0
		16QAM	20425	826.5	22.29	0.17	6.38	16QAM 1-0
			20525	836.5	22.29	0.17	6.38	16QAM 1-0
			20625	846.5	22.28	0.17	6.38	16QAM 1-0
	10MHz	QPSK	20450	829.0	23.19	0.21	5.71	QPSK 1-0
			20525	836.5	23.09	0.20	5.71	QPSK 1-0
			20600	844.0	23.16	0.21	5.71	QPSK 1-0
		16QAM	20450	829.0	22.47	0.18	6.47	16QAM 1-0
			20525	836.5	22.48	0.18	6.47	16QAM 1-49
			20600	844.0	22.49	0.18	6.47	16QAM 1-0



Operation Band	Band Width	Modulation	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watts)	PAPR (dB)	Mod / RB (Size – Offset)
LTE Band 2	3MHz	QPSK	18615	1851.5	22.54	0.18	5.65	QPSK 1-7
			18900	1880.0	22.82	0.19	5.65	QPSK 1-7
			19185	1908.5	22.74	0.19	5.65	QPSK 1-7
		16QAM	18615	1851.5	21.81	0.15	6.49	16QAM 1-14
			18900	1880.0	21.91	0.16	6.49	16QAM 1-7
			19185	1908.5	21.92	0.16	6.49	16QAM 1-7
	5MHz	QPSK	18625	1852.5	22.61	0.18	5.72	QPSK 1-12
			18900	1880.0	22.87	0.19	5.72	QPSK 1-12
			19175	1907.5	22.87	0.19	5.72	QPSK 1-12
		16QAM	18625	1852.5	21.83	0.15	6.40	16QAM 1-24
			18900	1880.0	21.95	0.16	6.40	16QAM 1-12
			19175	1907.5	21.97	0.16	6.40	16QAM 1-12
	10MHz	QPSK	18650	1855.0	22.80	0.19	5.48	QPSK 1-24
			18900	1880.0	22.88	0.19	5.48	QPSK 1-24
			19150	1905.0	22.81	0.15	5.48	QPSK 1-24
		16QAM	18650	1855.0	21.99	0.16	6.40	16QAM 1-0
			18900	1880.0	21.93	0.16	6.40	16QAM 1-24
			19150	1905.0	21.58	0.14	6.40	16QAM 1-24
LTE Band 4	5MHz	QPSK	19975	1712.5	21.88	0.15	5.56	QPSK 1-0
			20175	1732.5	21.38	0.14	5.56	QPSK 1-0
			20375	1752.5	21.86	0.15	5.56	QPSK 1-0
		16QAM	19975	1712.5	21.39	0.14	6.24	16QAM 1-0
			20175	1732.5	21.87	0.15	6.24	16QAM 1-0
			20375	1752.5	21.42	0.14	6.24	16QAM 1-24
	10MHz	QPSK	20000	1715.0	21.87	0.15	5.44	QPSK 1-49
			20175	1732.5	21.96	0.16	5.44	QPSK 1-49
			20350	1750.0	21.86	0.15	5.44	QPSK 1-49
		16QAM	20000	1715.0	21.17	0.13	6.36	16QAM 1-0
			20175	1732.5	21.15	0.13	6.36	16QAM 1-0
			20350	1750.0	21.34	0.14	6.36	16QAM 1-49



Operation Band	Band Width	Modulation	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watts)	PAPR (dB)	Mod / RB (Size – Offset)
LTE Band 17	5MHz	QPSK	23755	706.5	22.35	0.17	6.06	QPSK 1-0
			23790	710.0	22.28	0.17	6.06	QPSK 1-0
			23825	713.5	22.30	0.17	6.06	QPSK 1-0
		16QAM	23755	706.5	21.88	0.15	6.70	16QAM 1-0
			23790	710.0	21.87	0.15	6.70	16QAM 1-0
			23825	713.5	21.82	0.15	6.70	16QAM 1-0
	10MHz	QPSK	23780	709.0	22.46	0.18	5.96	QPSK 1-0
			23790	710.0	22.28	0.17	5.96	QPSK 1-0
			23800	711.0	22.30	0.17	5.96	QPSK 1-0
		16QAM	23780	709.0	21.86	0.15	6.67	16QAM 1-0
			23790	710.0	21.87	0.15	6.67	16QAM 1-0
			23800	711.0	21.82	0.15	6.67	16QAM 1-0

Cellular Band ($G_T - L_C = -0.26$ dB)									
Modes	LTE Band V (QPSK,BW=3M)			LTE Band V (QPSK,BW=5M)			LTE Band V (QPSK,BW=10M)		
Channel	20415 (Low)	20525 (Mid)	20635 (High)	20425 (Low)	20525 (Mid)	20625 (High)	20450 (Low)	20525 (Mid)	20600 (High)
Frequency (MHz)	825.5	836.5	847.5	826.5	836.5	846.5	829.0	836.5	844.0
Conducted Power (dBm)	22.99	22.88	23.06	23.11	22.99	23.17	23.19	23.09	23.16
Conducted Power (Watts)	0.20	0.19	0.20	0.20	0.20	0.21	0.21	0.20	0.21
ERP(dBm)	20.58	20.47	20.65	20.70	20.58	20.76	20.78	20.68	20.75
ERP(Watts)	0.1143	0.1114	0.1161	0.1175	0.1143	0.1191	0.1197	0.1169	0.1189

PCS Band ($G_T - L_C = 3.13$ dB)									
Modes	LTE Band II (QPSK,BW=3M)			LTE Band II (QPSK,BW=5M)			LTE Band II (QPSK,BW=10M)		
Channel	18615 (Low)	18900 (Mid)	19185 (High)	18625 (Low)	18900 (Mid)	19175 (High)	18650 (Low)	18900 (Mid)	19150 (High)
Frequency (MHz)	1851.5	1880	1908.5	1852.5	1880	1907.5	1855.0	1880.0	1905.0
Conducted Power (dBm)	22.54	22.82	22.74	22.61	22.87	22.87	22.80	22.88	22.81
Conducted Power (Watts)	0.18	0.19	0.19	0.18	0.19	0.19	0.19	0.19	0.19
EIRP(dBm)	25.67	25.95	25.87	25.74	26.00	26.00	25.93	26.01	25.94
EIRP(Watts)	0.3690	0.3936	0.3864	0.3750	0.3981	0.3981	0.3917	0.3990	0.3926

PCS Band ($G_T - L_C = -0.84$ dB)						
Modes	LTE Band IV (QPSK,BW=5M)			LTE Band IV (QPSK,BW=10M)		
Channel	19975 (Low)	20175 (Mid)	20375 (High)	20000 (Low)	20175 (Mid)	20350 (High)
Frequency (MHz)	1712.5	1732.5	1752.5	1715.0	1732.5	1750.0
Conducted Power (dBm)	21.88	21.87	21.86	21.87	21.96	21.86
Conducted Power (Watts)	0.15	0.15	0.15	0.15	0.16	0.15
EIRP(dBm)	21.04	21.03	21.02	21.03	21.12	21.02
EIRP(Watts)	0.1271	0.1268	0.1265	0.1268	0.1294	0.1265

Cellular Band ($G_T - L_C = -0.48$ dB)						
Modes	LTE Band 17 (QPSK,BW=5M)			LTE Band 17 (QPSK,BW=10M)		
Channel	23755 (Low)	23790 (Mid)	23825 (High)	23780 (Low)	23790 (Mid)	23800 (High)
Frequency (MHz)	706.5	710	713.5	709.0	710.0	711.0
Conducted Power (dBm)	22.46	22.30	22.12	22.35	22.28	22.30
Conducted Power (Watts)	0.18	0.17	0.16	0.17	0.17	0.17
ERP(dBm)	19.83	19.67	19.49	19.72	19.65	19.67
ERP(Watts)	0.0962	0.0927	0.0889	0.0938	0.0923	0.0927

Note: maximum burst average power for LTE.

$EIRP = P_T + G_T - L_C$, $ERP = EIRP - 2.15$, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

3.2 Peak-to-Average Ratio

3.2.1 Description of the PAR Measurement

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

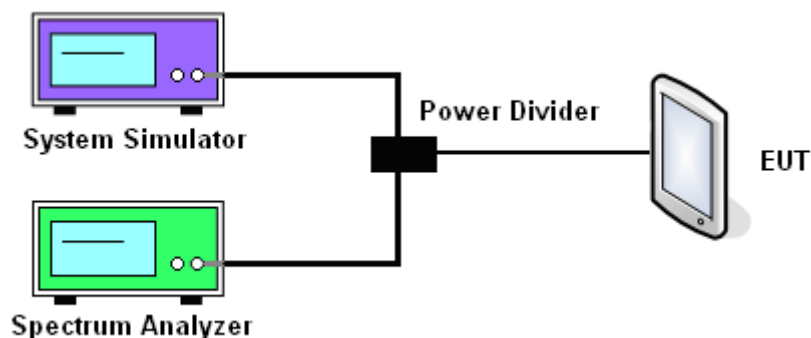
3.2.2 Measuring Instruments

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. For GSM/EGPRS operating modes:
 - a. Set the RBW = 1MHz, VBW = 1MHz, Peak detector in spectrum analyzer.
 - b. Set EUT in maximum power output, and triggered the burst signal.
 - c. Measured respectively the Peak level and Mean level, and the deviation was recorded as Peak to Average Ratio.
3. For UMTS operating modes:
 - a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
 - b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.

3.2.4 Test Setup



3.2.5 Test Result of Peak-to-Average Ratio

Modes	LTE Band 2			
BW / Mod.	3MHz / QPSK	3MHz / 16QAM	5MHz / QPSK	5MHz / 16QAM
Peak-to-Average Ratio (dB)	5.65	6.49	5.72	6.40
BW / Mod.	10MHz / QPSK	10MHz / 16QAM	-	-
Peak-to-Average Ratio (dB)	5.48	6.40	-	-

Modes	LTE Band 4			
BW / Mod.	5MHz / QPSK	5MHz / 16QAM	10MHz / QPSK	10MHz / 16QAM
Peak-to-Average Ratio (dB)	5.56	6.24	5.44	6.36

Modes	LTE Band 17			
BW / Mod.	5MHz / QPSK	5MHz / 16QAM	10MHz / QPSK	10MHz / 16QAM
Peak-to-Average Ratio (dB)	6.06	6.70	5.96	6.67

Note:

The maximum RB configurations of the PAPR summary as below:

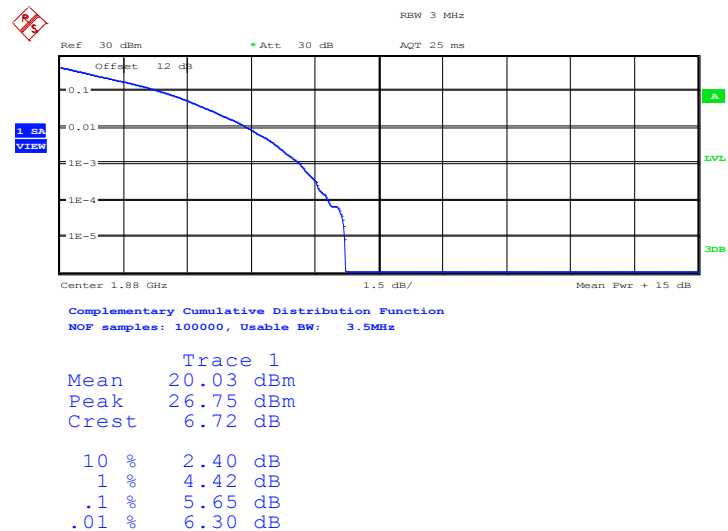
BW3.0M RB setting : RB Size 15, RB offset 0

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

BW10M RB setting : RB Size 50, RB offset 0

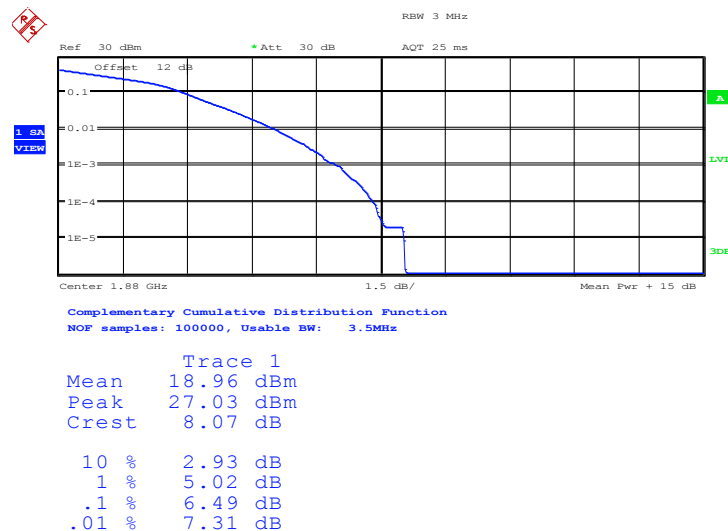
3.2.6 Peak to Average Power Ratio

Peak-to-Average Ratio on LTE Band 2 3MHz / QPSK



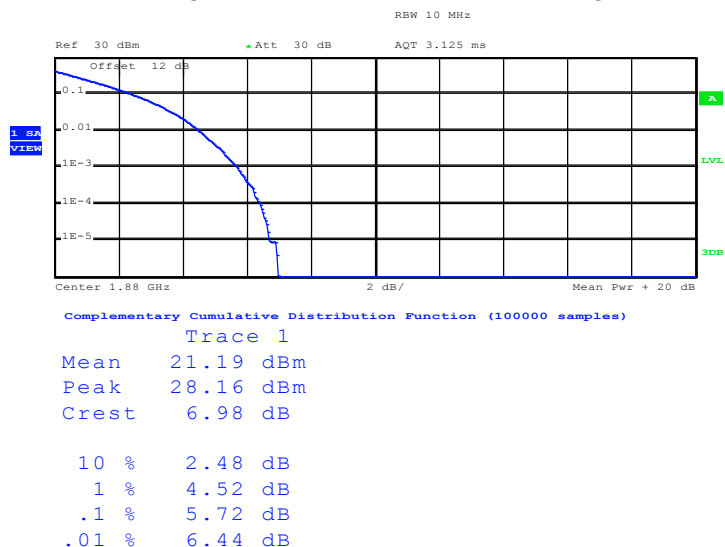
Date: 10,DEC,2012 14:52:00

Peak-to-Average Ratio on LTE Band 2 3MHz / 16QAM



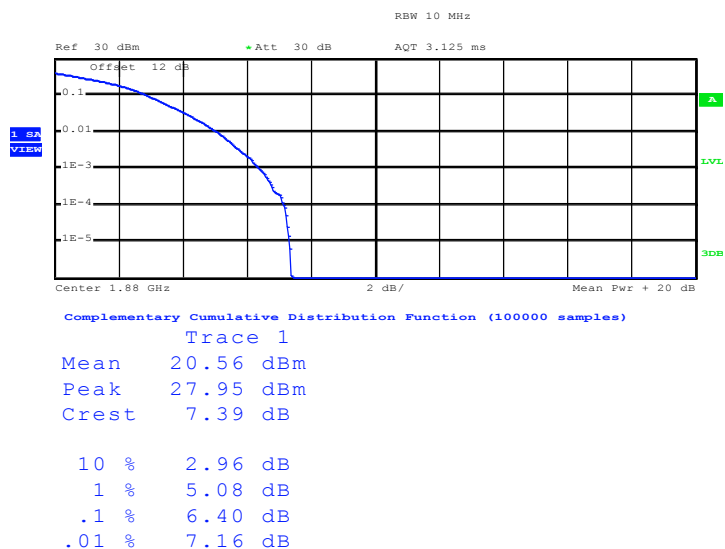
Date: 10,DEC,2012 14:52:27

Peak-to-Average Ratio on LTE Band 2 5MHz / QPSK



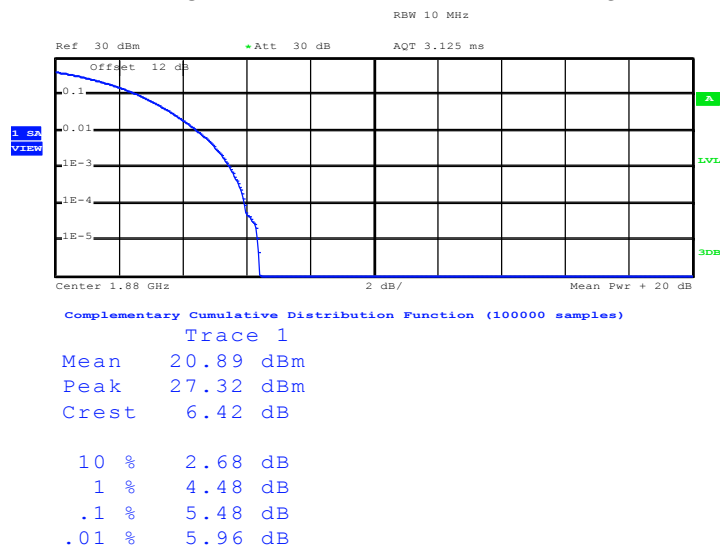
Date: 2.NOV.2012 22:34:52

Peak-to-Average Ratio on LTE Band 2 5MHz / 16QAM



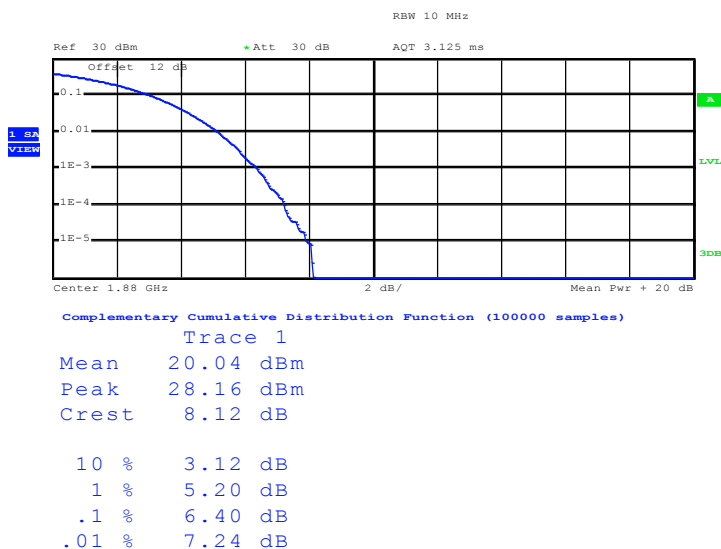
Date: 2.NOV.2012 22:35:15

Peak-to-Average Ratio on LTE Band 2 10MHz / QPSK



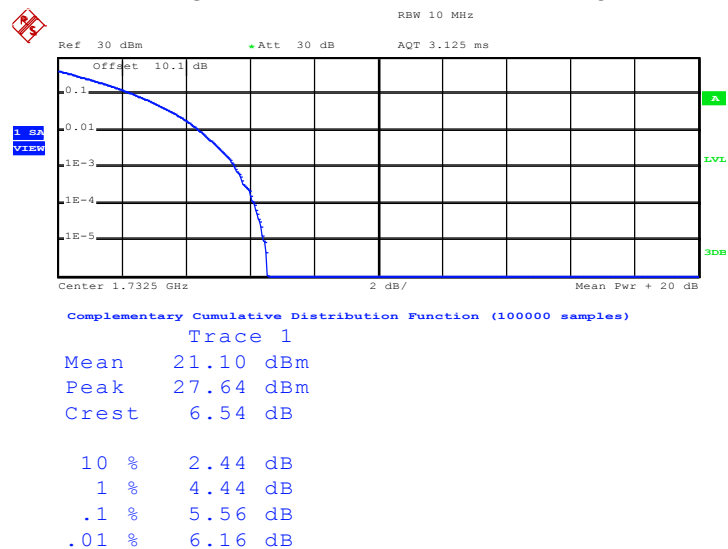
Date: 2.NOV.2012 22:30:34

Peak-to-Average Ratio on LTE Band 2 10MHz / 16QAM



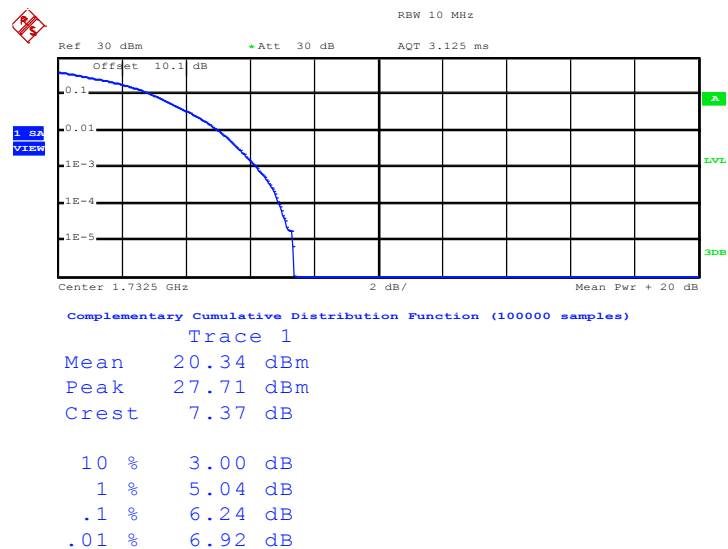
Date: 2.NOV.2012 22:31:14

Peak-to-Average Ratio on LTE Band 4 5MHz / QPSK



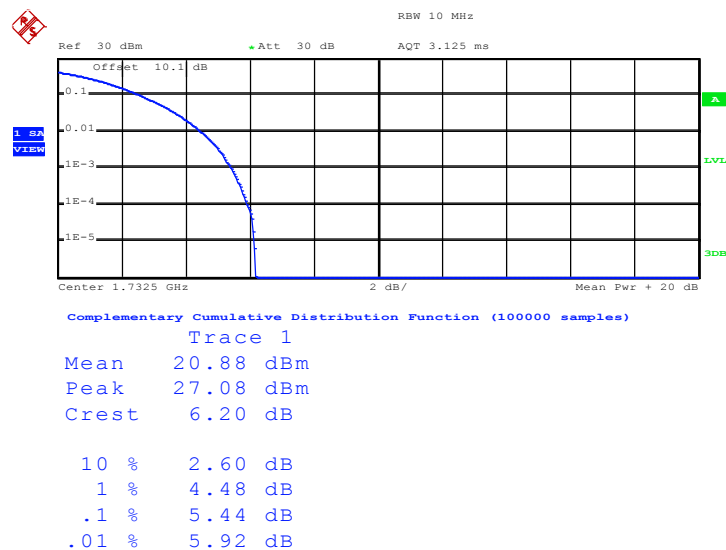
Date: 5.NOV.2012 20:33:58

Peak-to-Average Ratio on LTE Band 4 5MHz / 16QAM



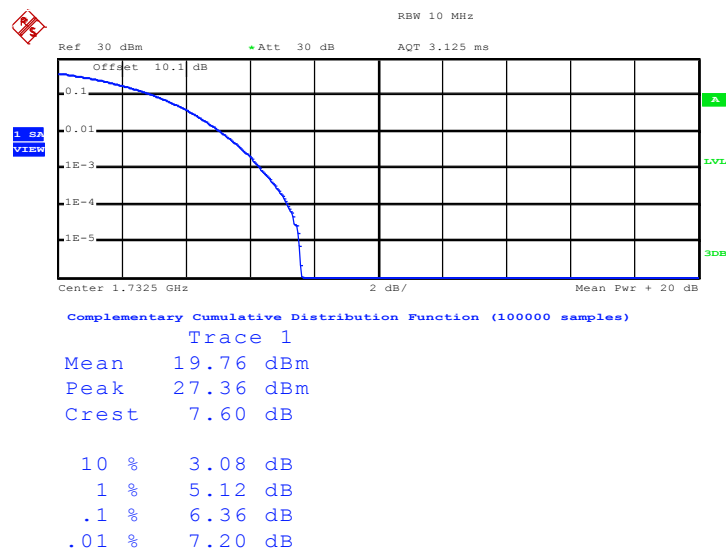
Date: 5.NOV.2012 20:33:13

Peak-to-Average Ratio on LTE Band 4 10MHz / QPSK



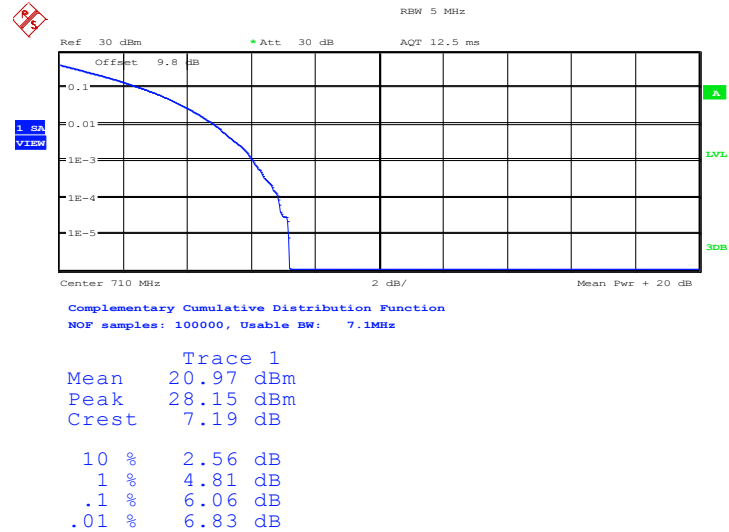
Date: 5.NOV.2012 20:30:54

Peak-to-Average Ratio on LTE Band 4 10MHz / 16QAM



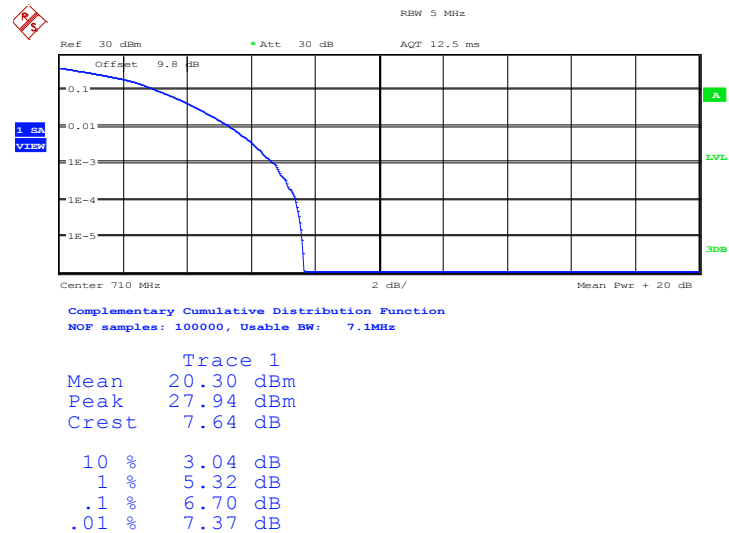
Date: 5.NOV.2012 20:31:32

Peak-to-Average Ratio on LTE Band 17 5MHz / QPSK



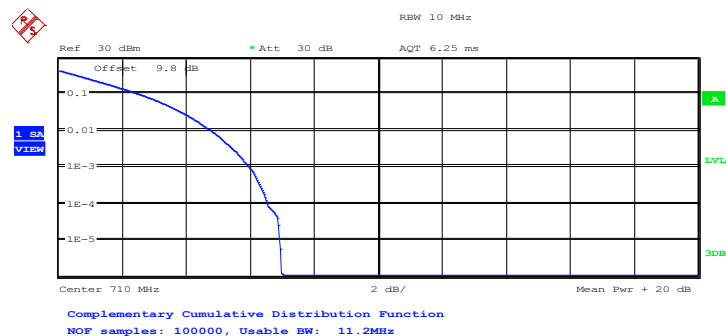
Date: 5.NOV.2012 21:20:13

Peak-to-Average Ratio on LTE Band 17 5MHz / 16QAM



Date: 5.NOV.2012 21:20:25

Peak-to-Average Ratio on LTE Band 17 10MHz / QPSK

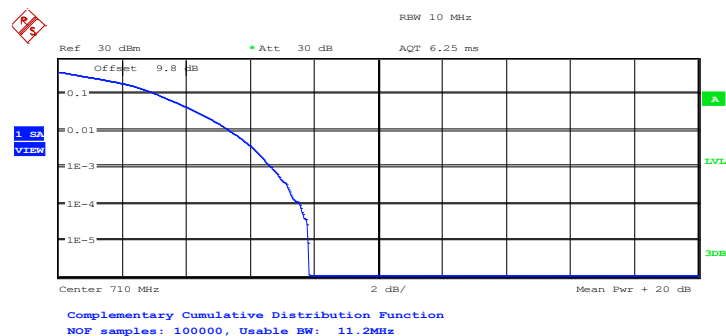


Trace 1
Mean 21.42 dBm
Peak 28.40 dBm
Crest 6.98 dB

10 % 2.53 dB
1 % 4.74 dB
.1 % 5.96 dB
.01 % 6.54 dB

Date: 5.NOV.2012 21:17:58

Peak-to-Average Ratio on LTE Band 17 10MHz / 16QAM



Trace 1
Mean 20.51 dBm
Peak 28.33 dBm
Crest 7.82 dB

10 % 3.08 dB
1 % 5.35 dB
.1 % 6.67 dB
.01 % 7.53 dB

Date: 5.NOV.2012 21:18:19

3.3 Occupied Bandwidth

3.3.1 Description of Occupied 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.

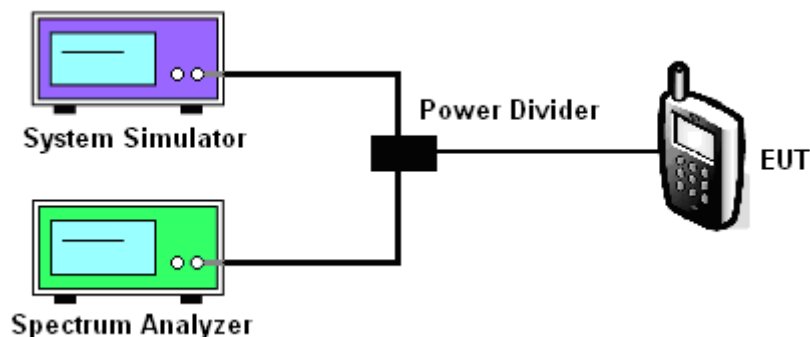
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

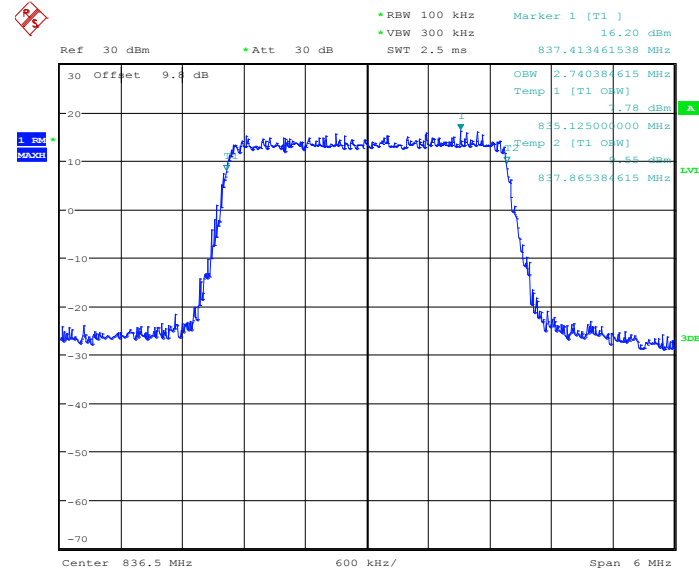
1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The 99% occupied bandwidth (BW) of the middle channel for the highest RF powers with full RB sizes were measured.

3.3.4 Test Setup

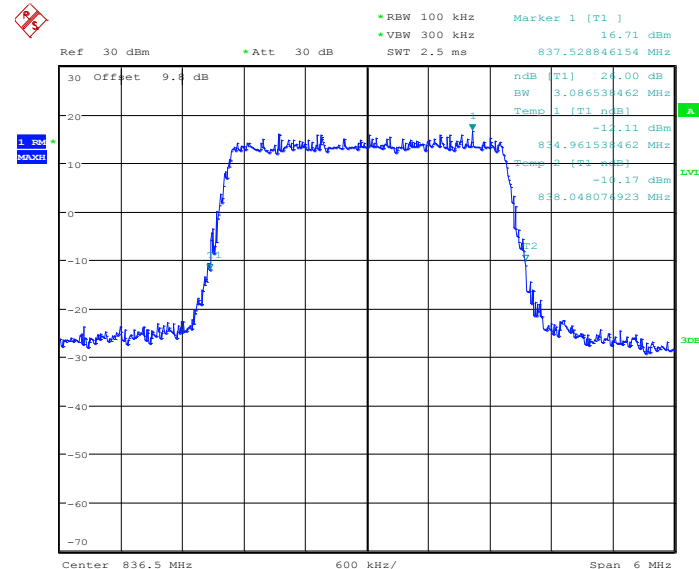


3.3.5 Test Result (Plots) of Occupied Bandwidth

Band :	LTE Band 5	BW / Mod. :	3MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 20525


Date: 10.DEC.2012 16:20:32

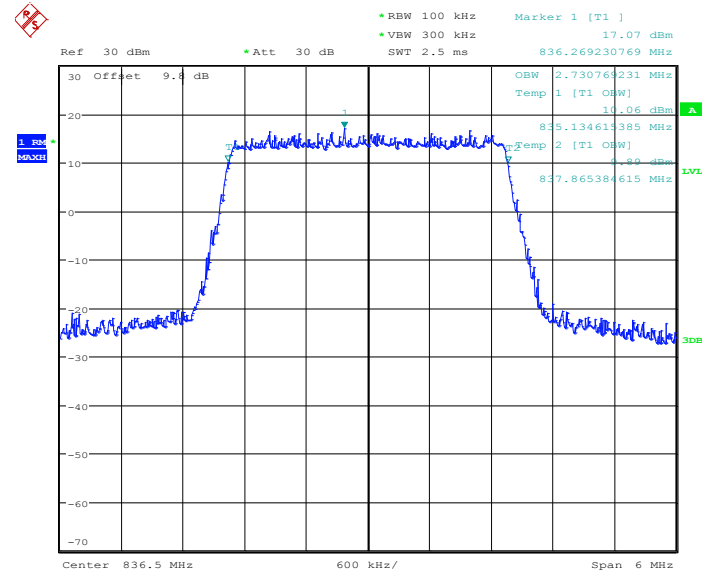
26dB Bandwidth Plot on Channel 20525


Date: 10.DEC.2012 16:25:25



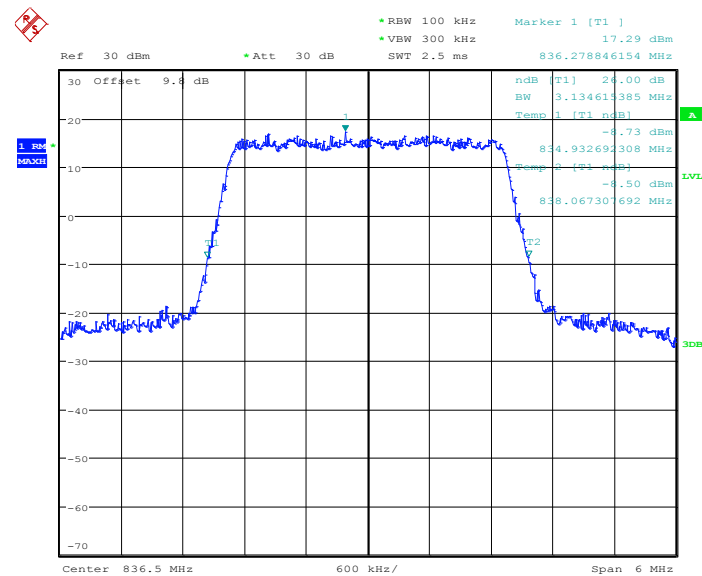
Band :	LTE Band 5	BW / Mod. :	3MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 20525



Date: 10.DEC.2012 16:22:54

26dB Bandwidth Plot on Channel 20525

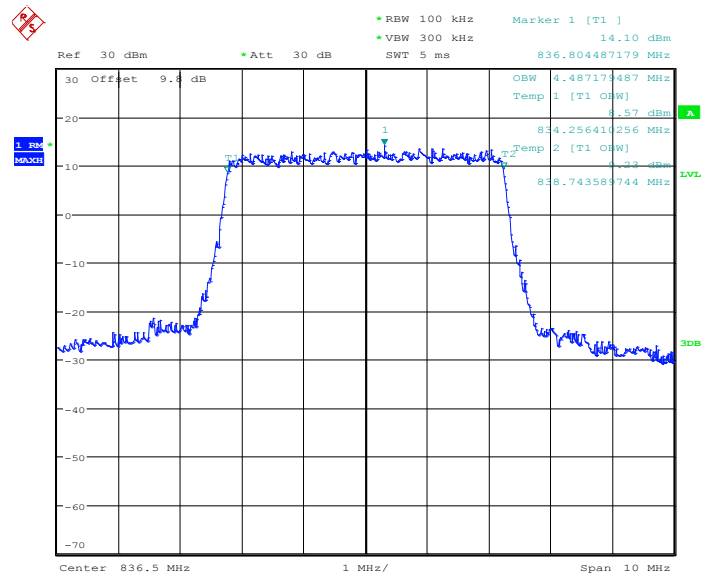


Date: 10.DEC.2012 16:25:14



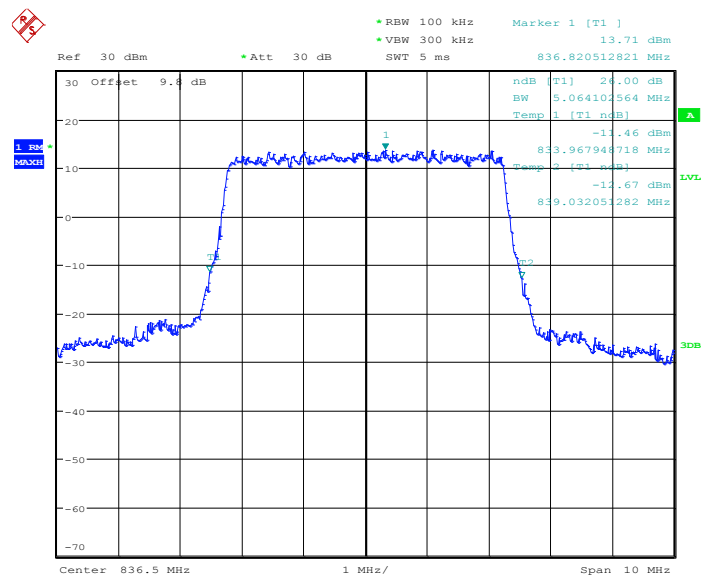
Band :	LTE Band 5	BW / Mod. :	5MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 20525



Date: 5.NOV.2012 22:46:31

26dB Bandwidth Plot on Channel 20525

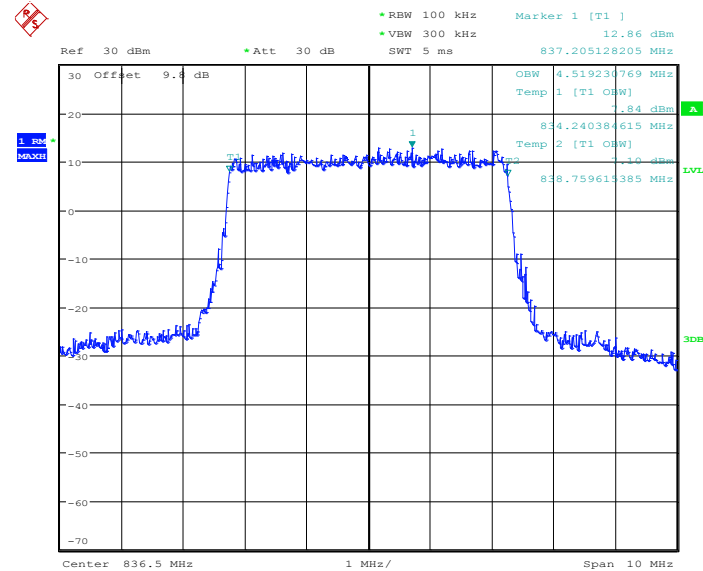


Date: 5.NOV.2012 21:56:42



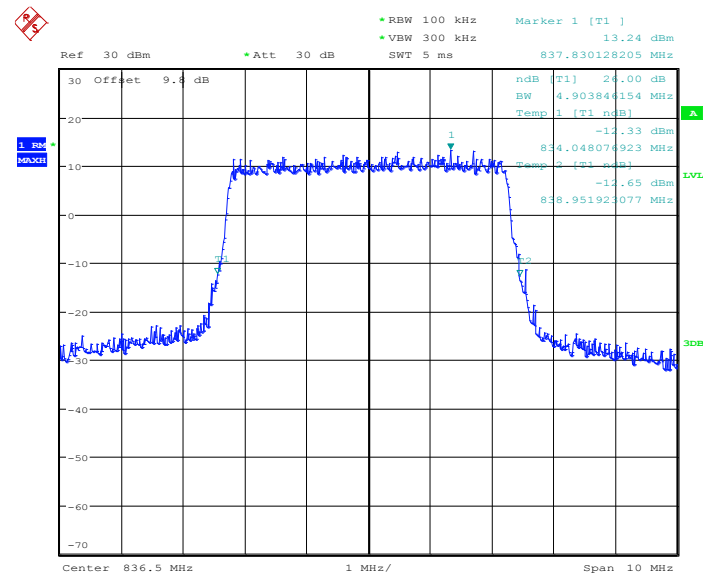
Band :	LTE Band 5	BW / Mod. :	5MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 20525



Date: 5.NOV.2012 22:48:37

26dB Bandwidth Plot on Channel 20525

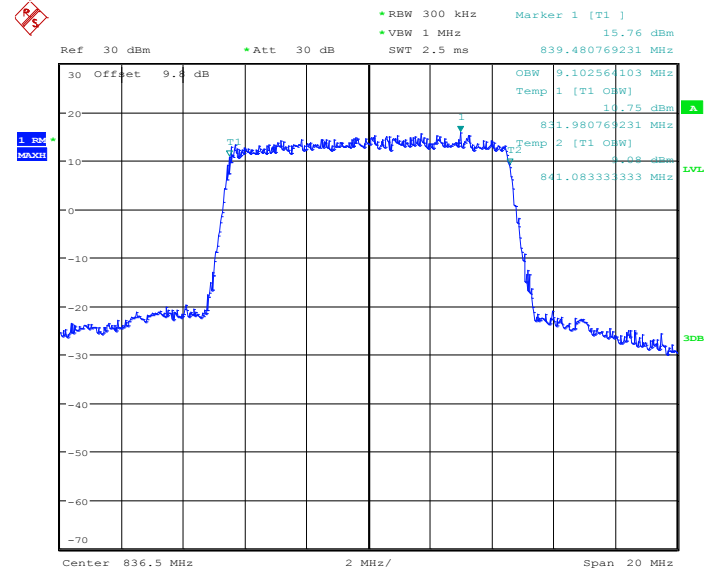


Date: 5.NOV.2012 21:57:38



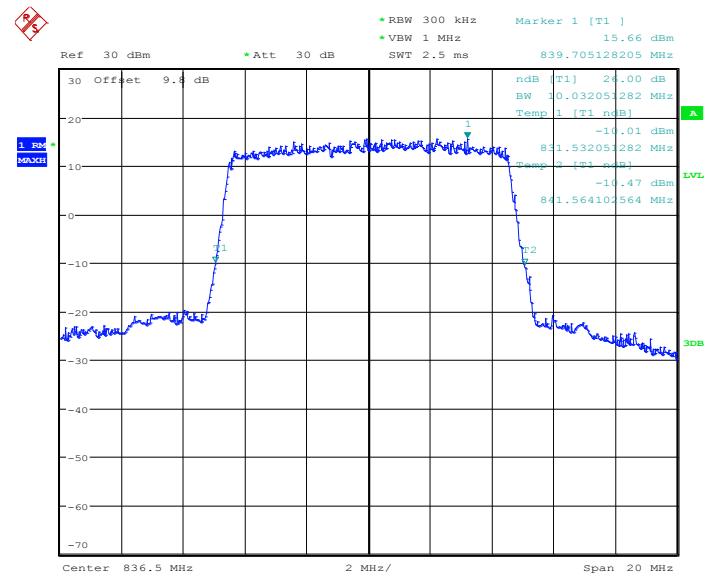
Band :	LTE Band 5	BW / Mod. :	10MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 20525



Date: 5.NOV.2012 22:49:33

26dB Bandwidth Plot on Channel 20525

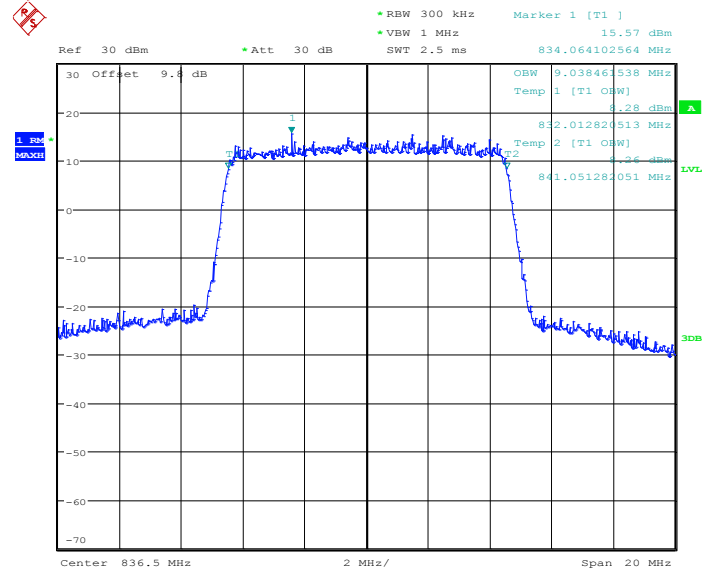


Date: 5.NOV.2012 21:58:24



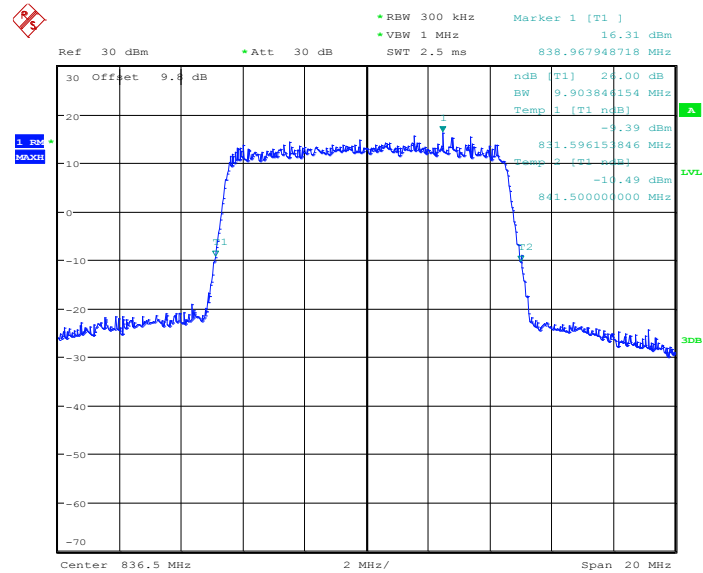
Band :	LTE Band 5	BW / Mod. :	10MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 20525



Date: 5.NOV.2012 22:51:40

26dB Bandwidth Plot on Channel 20525

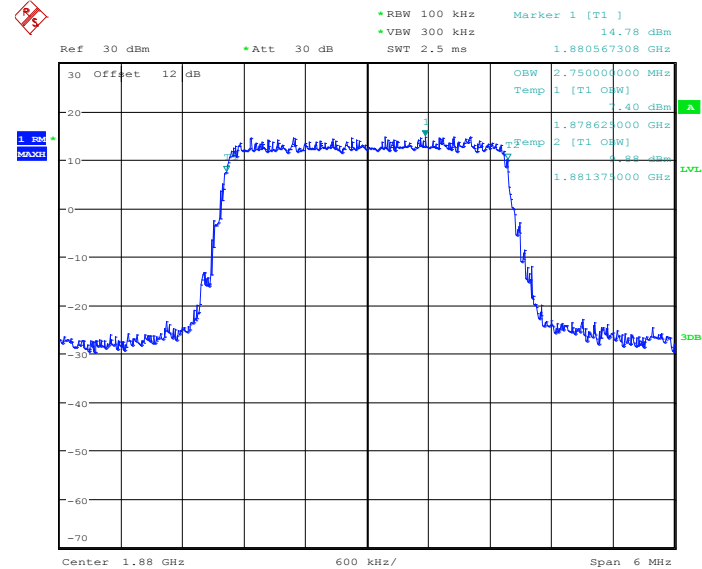


Date: 5.NOV.2012 21:58:45



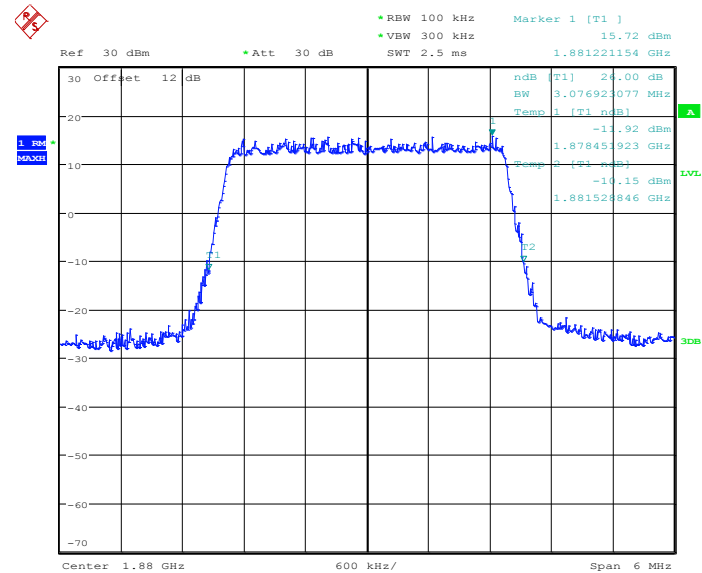
Band :	LTE Band 2	BW / Mod. :	3MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 18900



Date: 10.DEC.2012 14:31:22

26dB Bandwidth Plot on Channel 18900

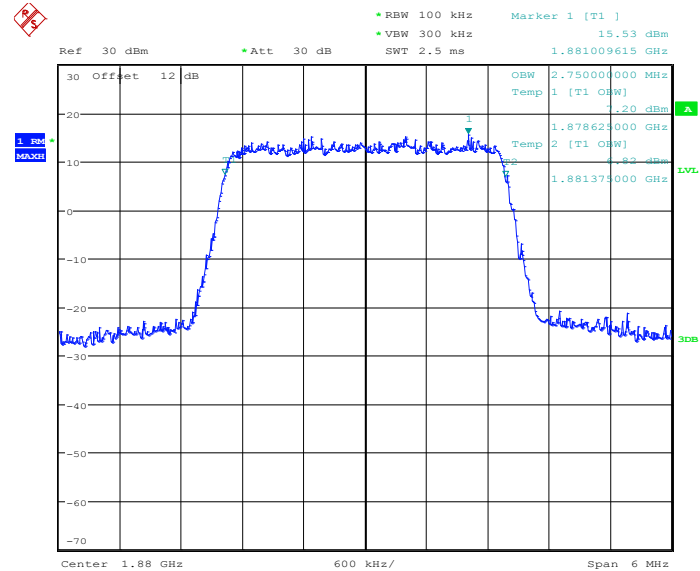


Date: 10.DEC.2012 14:47:00



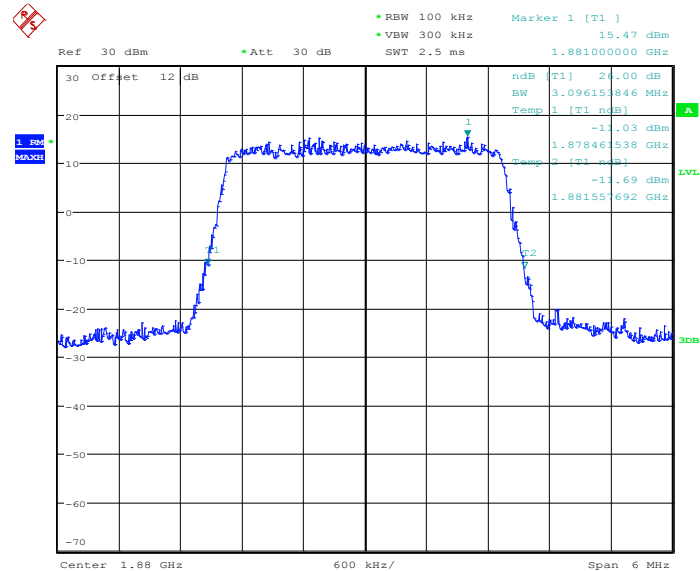
Band :	LTE Band 2	BW / Mod. :	3MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 18900



Date: 10,DEC,2012 14:34:51

26dB Bandwidth Plot on Channel 18900

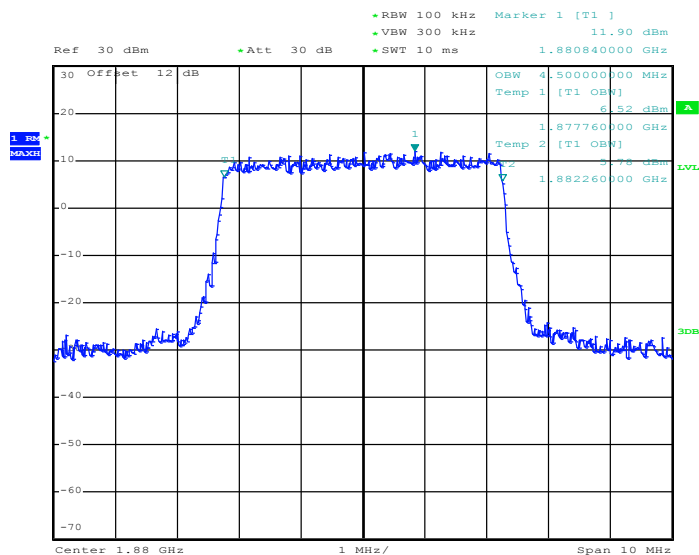


Date: 10,DEC,2012 14:46:51



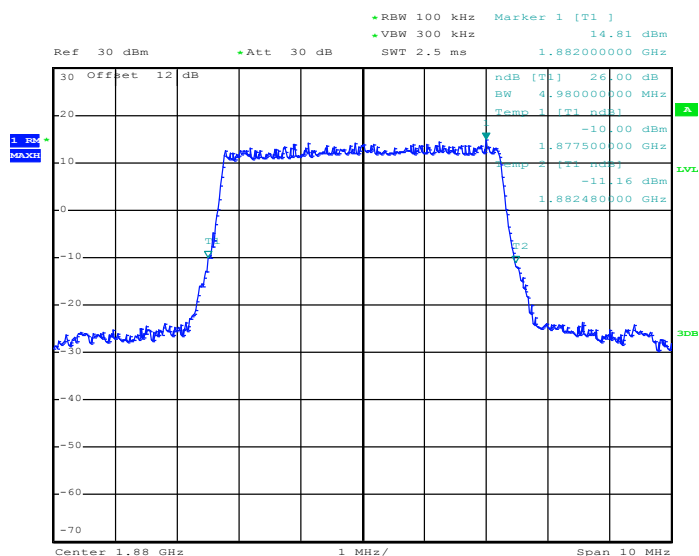
Band :	LTE Band 2	BW / Mod. :	5MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 18900



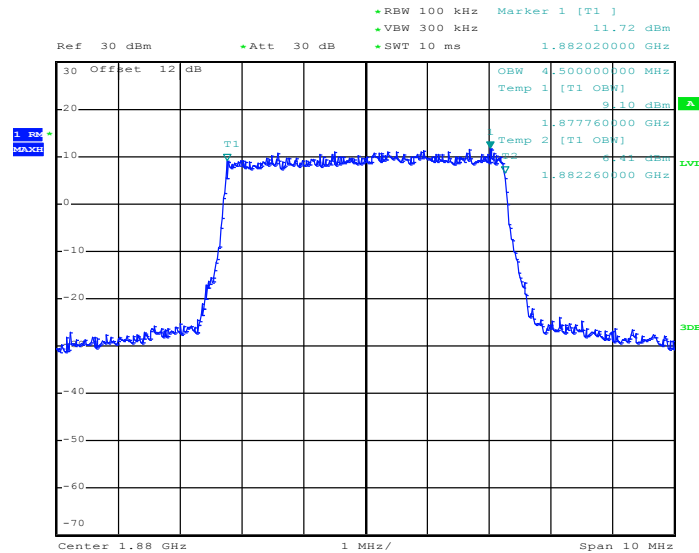
Date: 2.NOV.2012 22:46:15

26dB Bandwidth Plot on Channel 18900

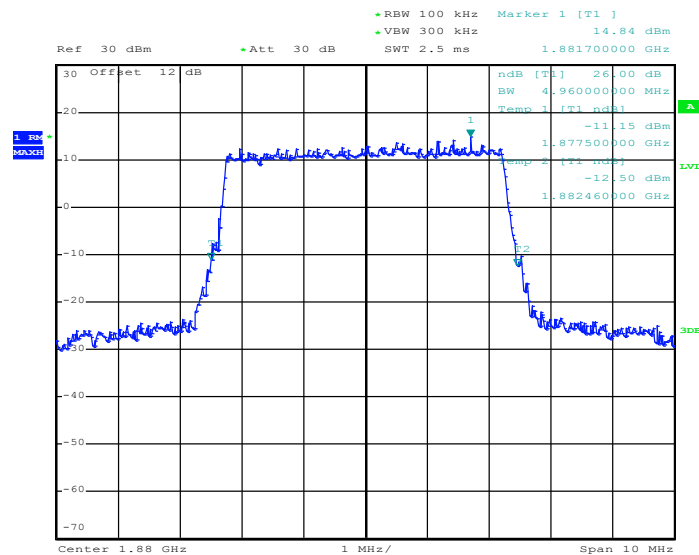


Date: 2.NOV.2012 20:52:17

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


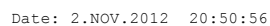
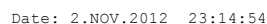
Date: 2.NOV.2012 22:48:54

26dB Bandwidth Plot on Channel 18900


Date: 2.NOV.2012 20:52:44



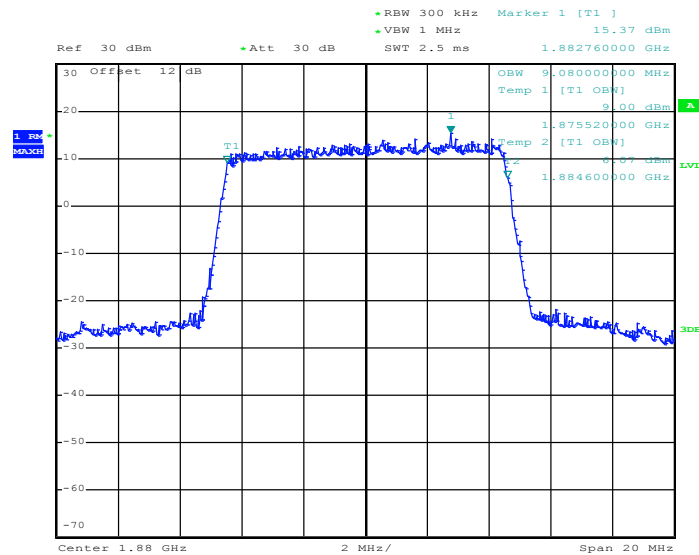
99% Occupied Bandwidth Plot on Channel 18900





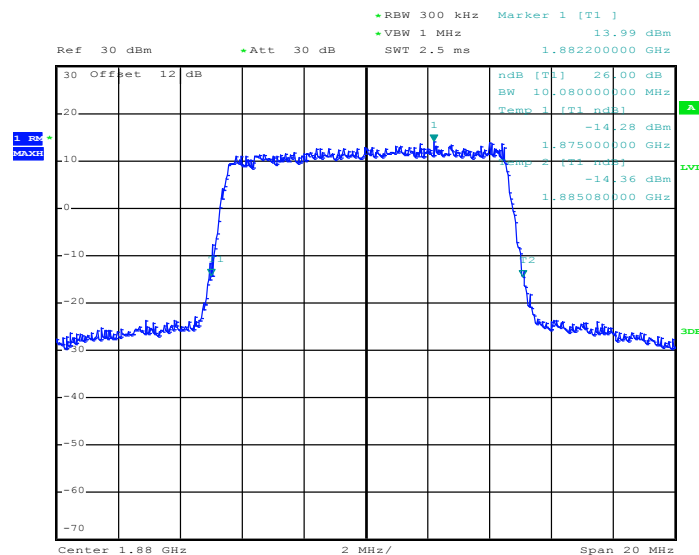
Band :	LTE Band 2	BW / Mod. :	10MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 18900



Date: 2.NOV.2012 23:18:00

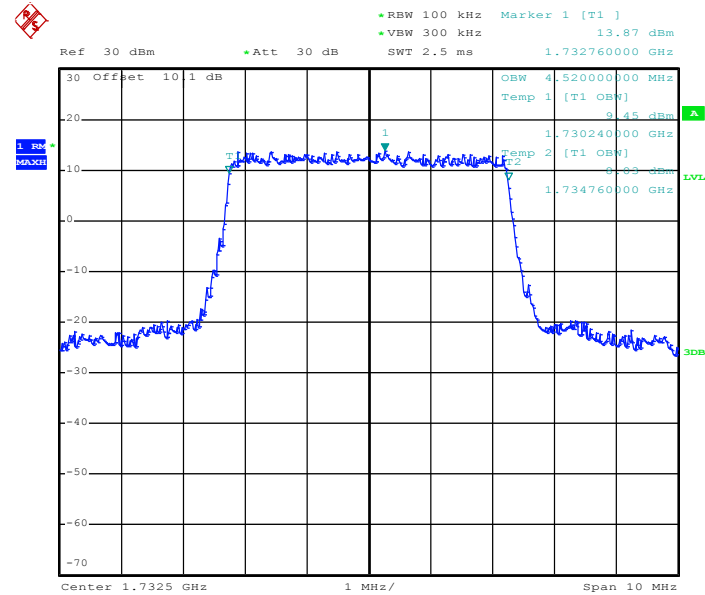
26dB Bandwidth Plot on Channel 18900



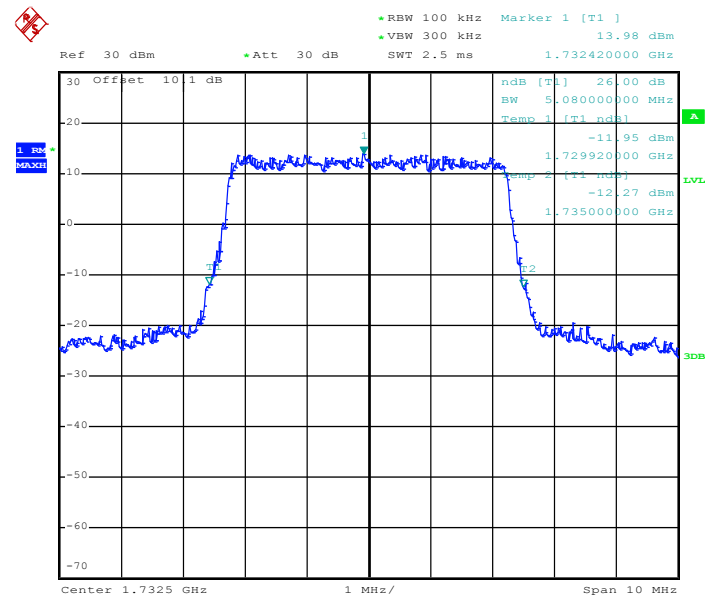
Date: 2.NOV.2012 20:51:19



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

Date: 5.NOV.2012 19:26:46

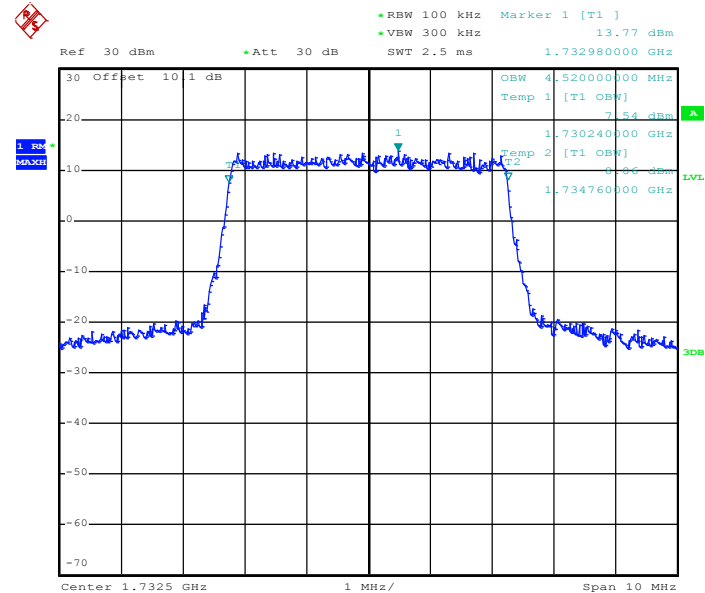
26dB Bandwidth Plot on Channel 20175

Date: 5.NOV.2012 19:29:00



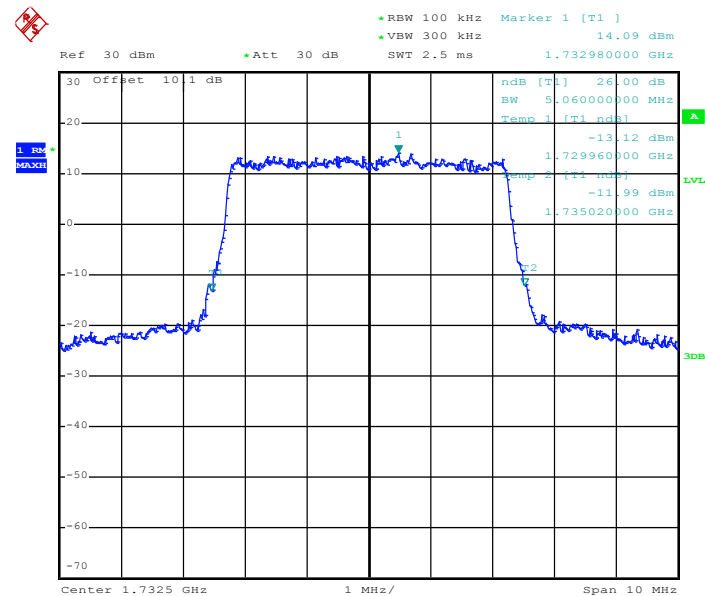
Band :	LTE Band 4	BW / Mod. :	5MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 20175



Date: 5.NOV.2012 19:27:21

26dB Bandwidth Plot on Channel 20175

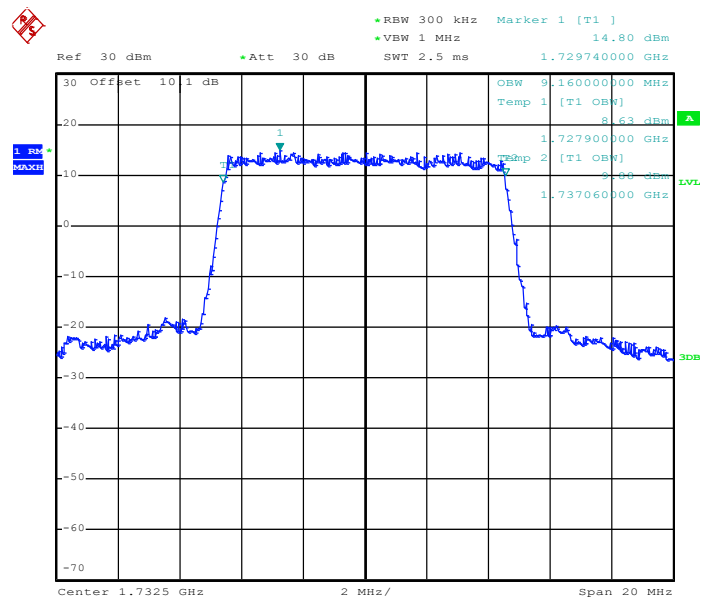


Date: 5.NOV.2012 19:28:31



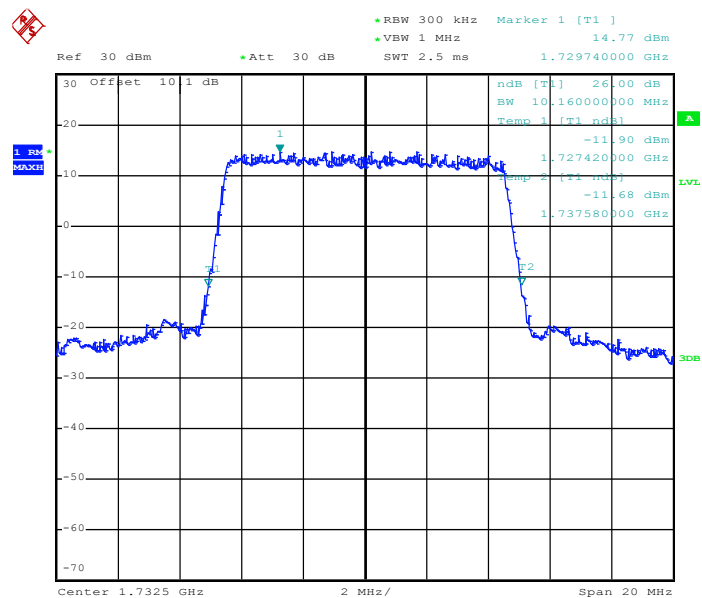
Band :	LTE Band 4	BW / Mod. :	10MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 20175



Date: 5.NOV.2012 19:37:11

26dB Bandwidth Plot on Channel 20175

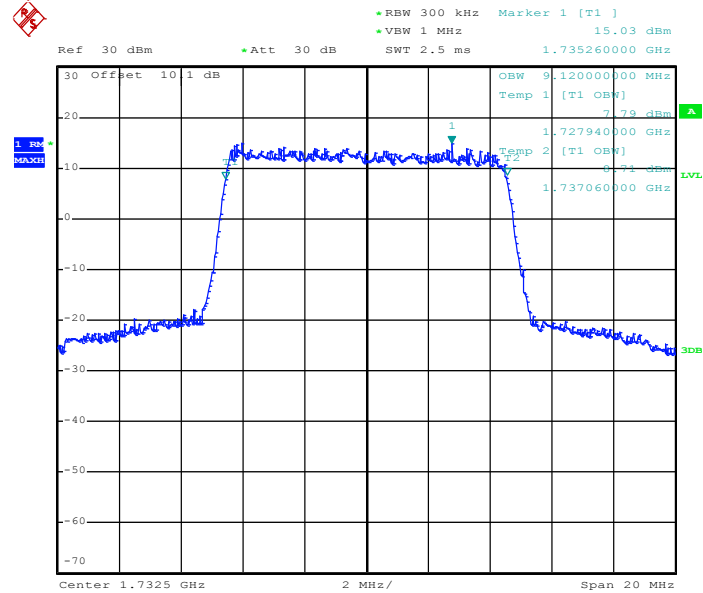


Date: 5.NOV.2012 19:29:52



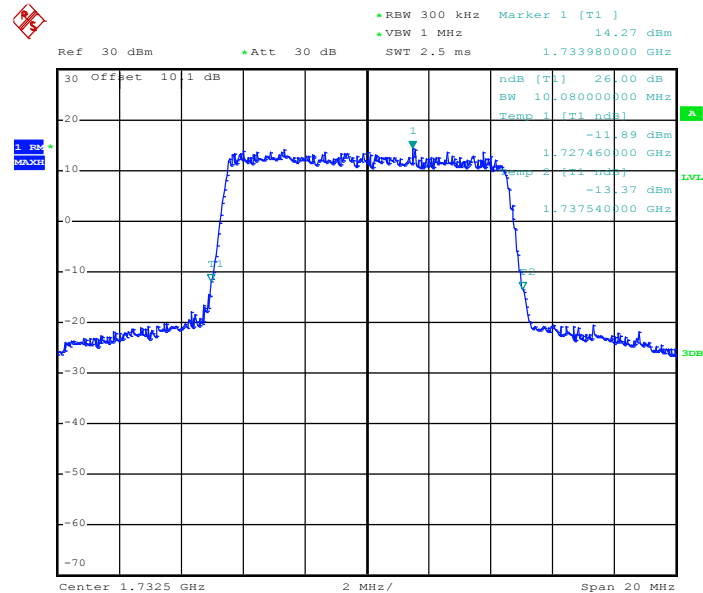
Band :	LTE Band 4	BW / Mod. :	10MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 20175



Date: 5.NOV.2012 19:36:36

26dB Bandwidth Plot on Channel 20175

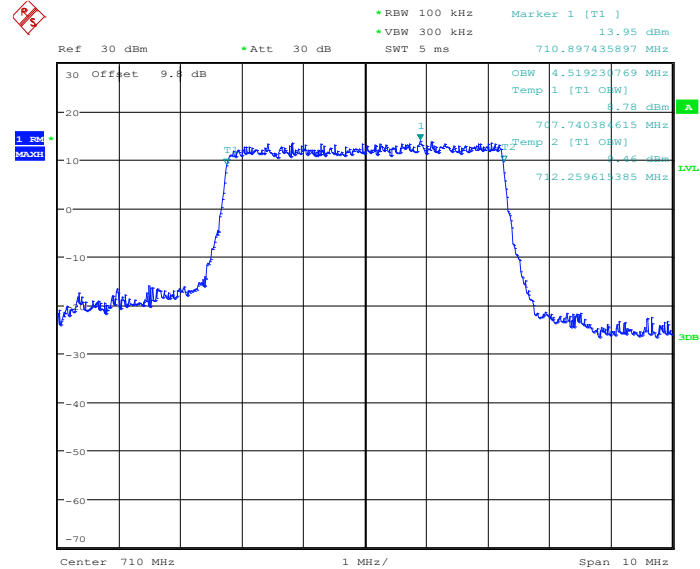


Date: 5.NOV.2012 19:30:22



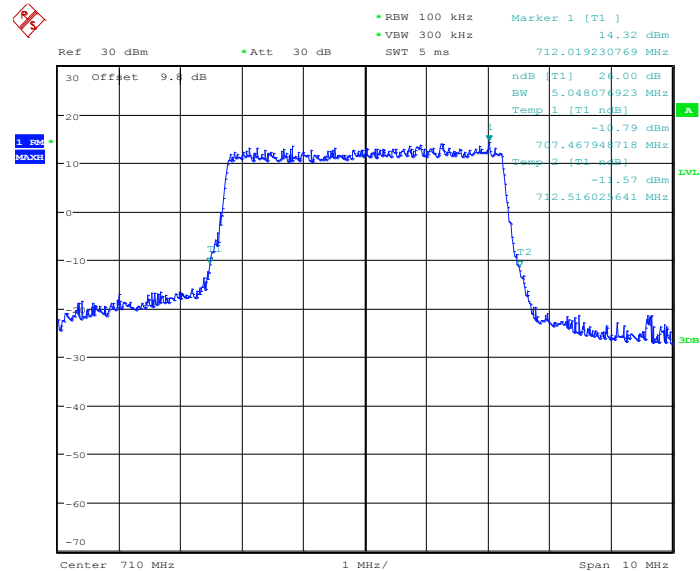
Band :	LTE Band 17	BW / Mod. :	5MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 23790



Date: 5.NOV.2012 21:09:46

26dB Bandwidth Plot on Channel 23790

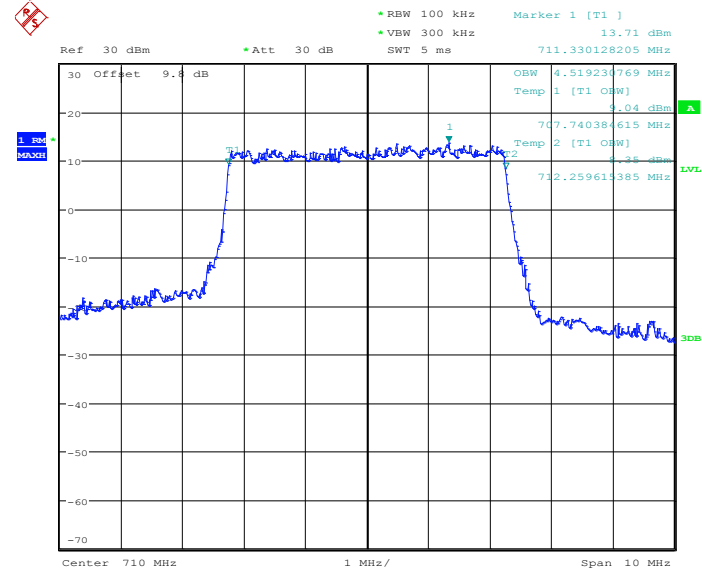


Date: 5.NOV.2012 21:03:30



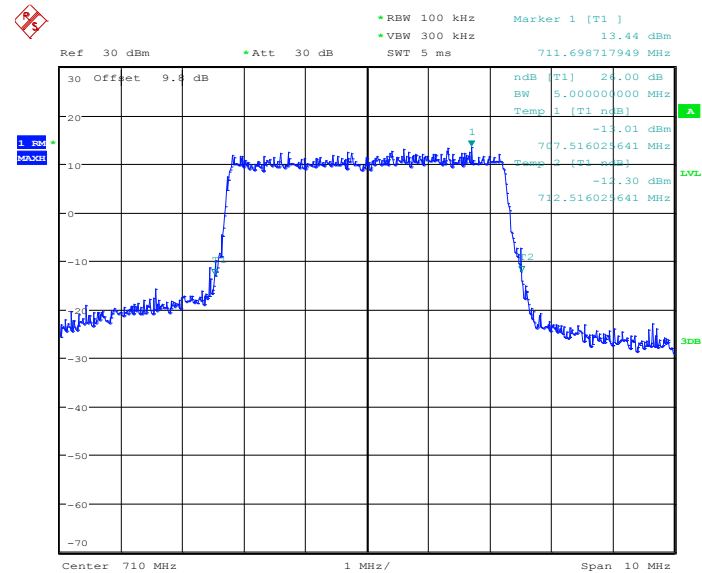
Band :	LTE Band 17	BW / Mod. :	5MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 23790



Date: 5.NOV.2012 21:11:59

26dB Bandwidth Plot on Channel 23790

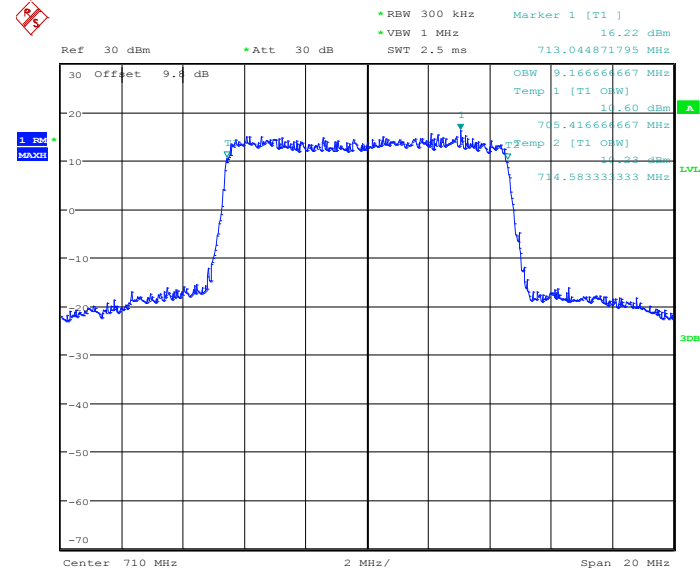


Date: 5.NOV.2012 21:04:04



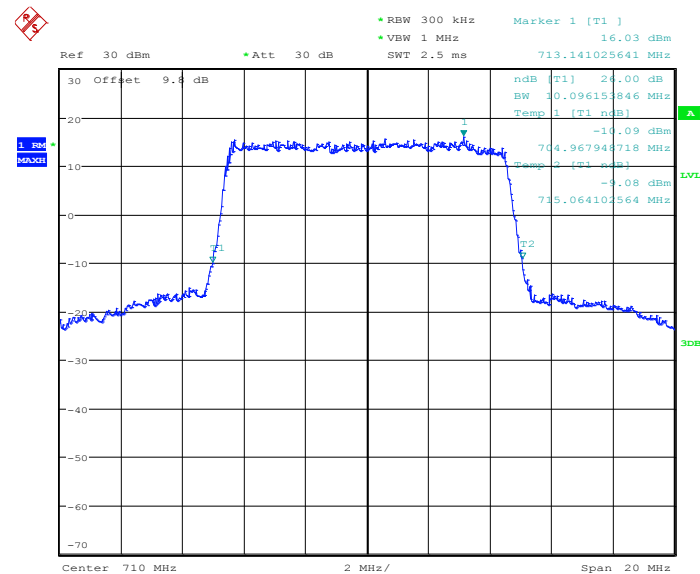
Band :	LTE Band 17	BW / Mod. :	10MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 23790



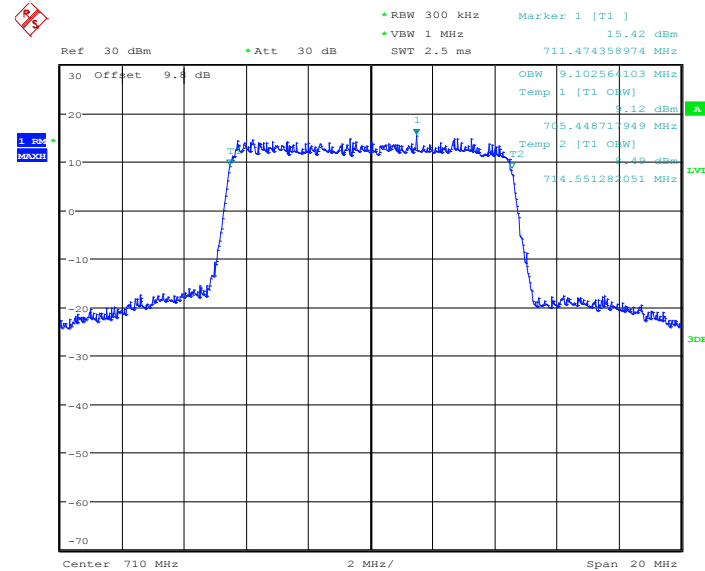
Date: 5.NOV.2012 21:12:50

26dB Bandwidth Plot on Channel 23790

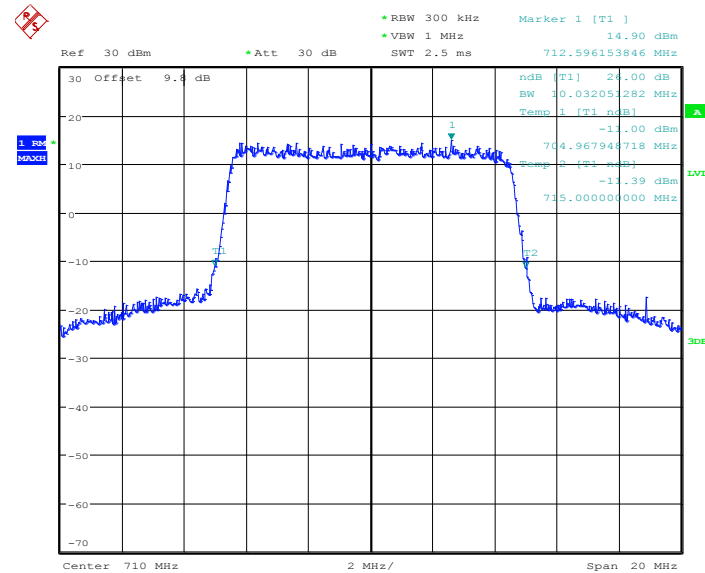


Date: 5.NOV.2012 21:02:29

Band :	LTE Band 17	BW / Mod. :	10MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 23790


Date: 5.NOV.2012 21:14:31

26dB Bandwidth Plot on Channel 23790


Date: 5.NOV.2012 21:02:49

3.4 Conducted Band Edge Measurement

3.4.1 Description of Conducted Band Edge Measurement

The emissions be operated in the 698 -746 MHz band, the FCC limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB = -13 dBm in a 100 KHz bandwidth.

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

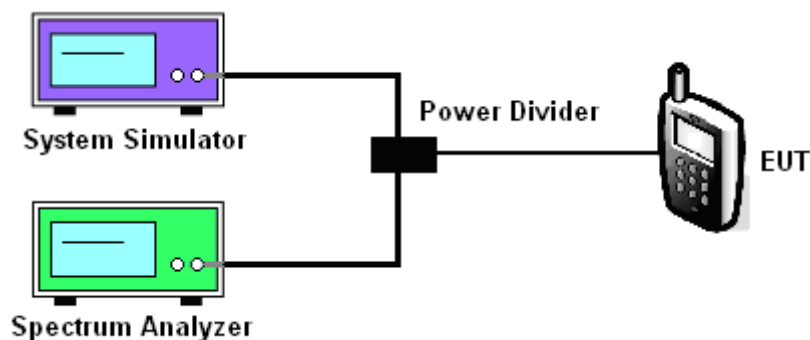
3.4.2 Measuring Instruments

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 band edges of low and high channels for the highest RF powers were measured. Setting $RBW \geq 1\%$ EBW, and measuring bandwidth = 1MHz.
3. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
4. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)]$ (dB)
 $= [30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (dB)
 $= -13\text{dBm}$.

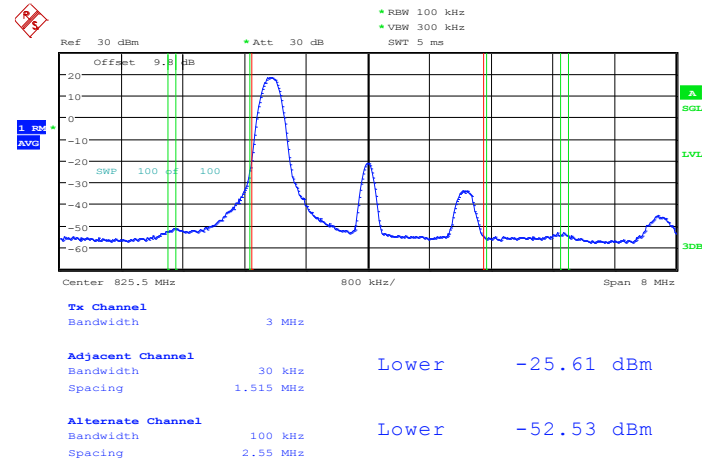
3.4.4 Test Setup



3.4.5 Test Result (Plots) of Conducted Band Edge

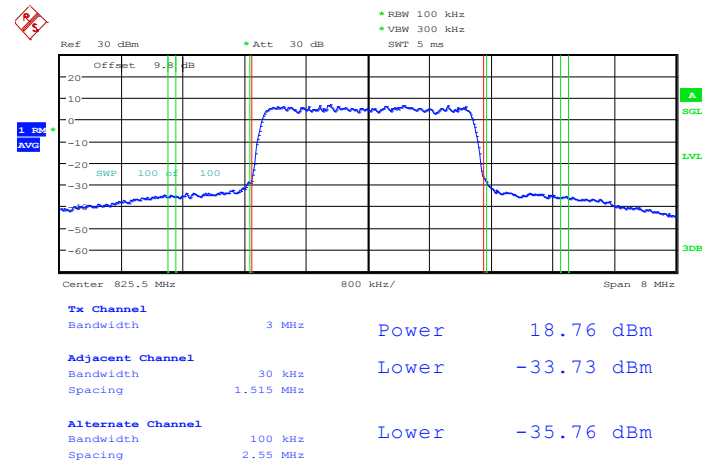
Band :	LTE Band 5	Band Width :	3MHz / QPSK
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



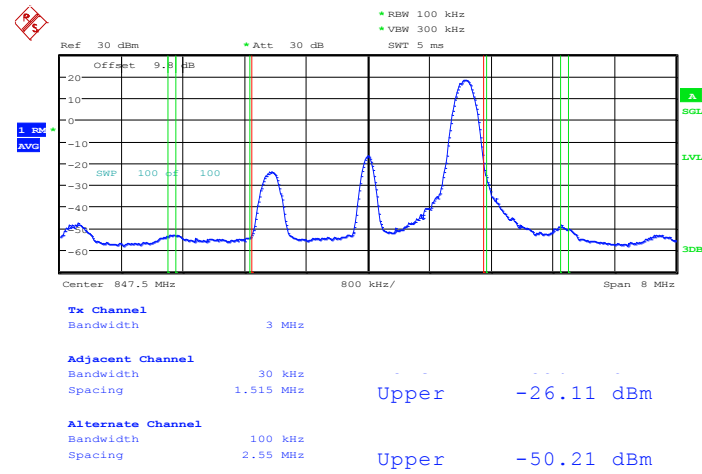
Date: 10.DEC.2012 16:43:32

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



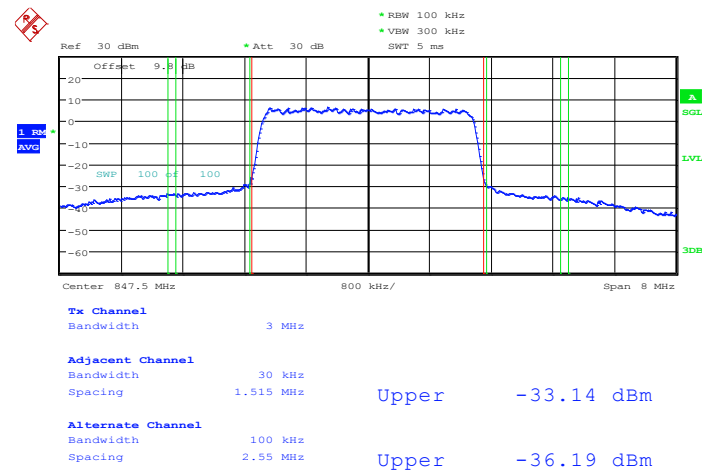
Date: 10.DEC.2012 16:31:00

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



Date: 10.DEC.2012 16:46:30

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

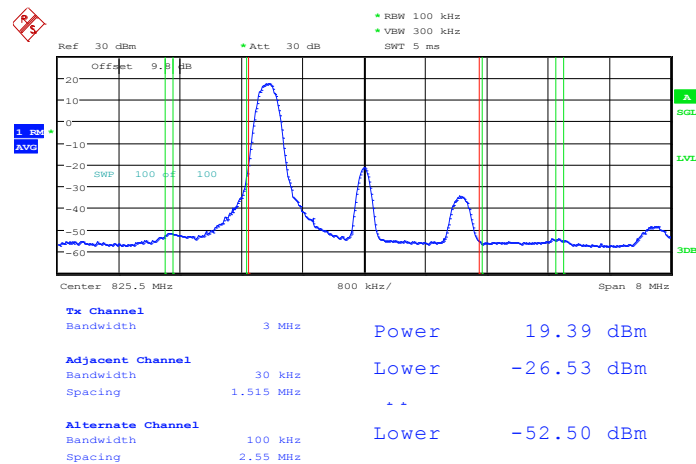


Date: 10.DEC.2012 16:45:58



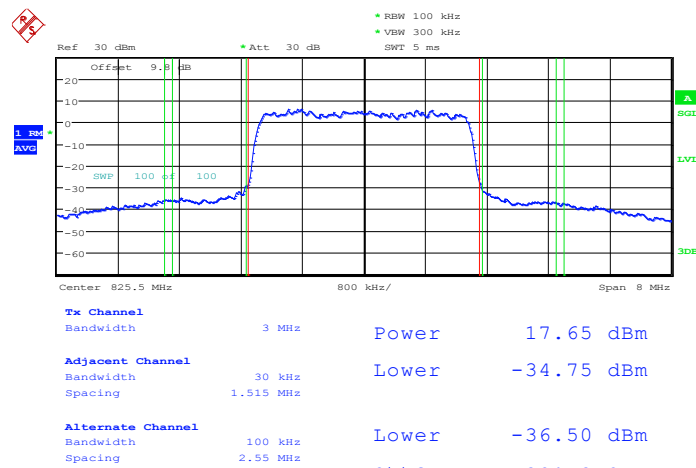
Band :	LTE Band 5	Band Width :	3MHz / 16QAM
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Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



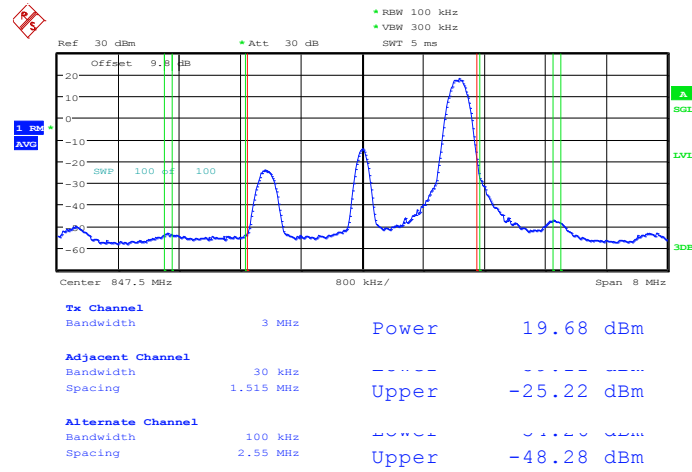
Date: 10,DEC,2012 16:44:06

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



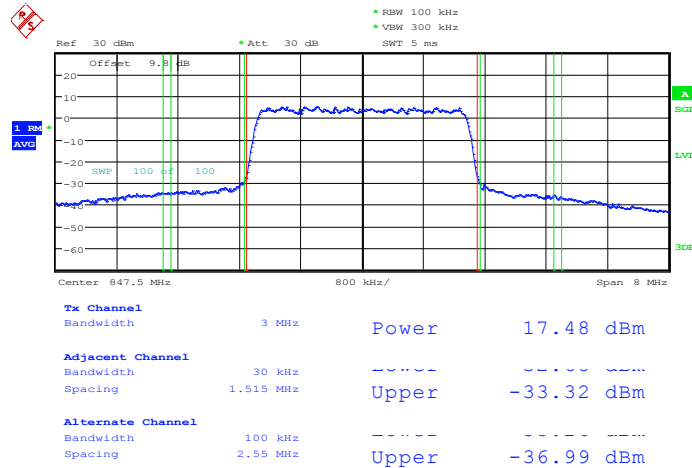
Date: 10,DEC,2012 16:44:59

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



Date: 10.DEC.2012 16:47:31

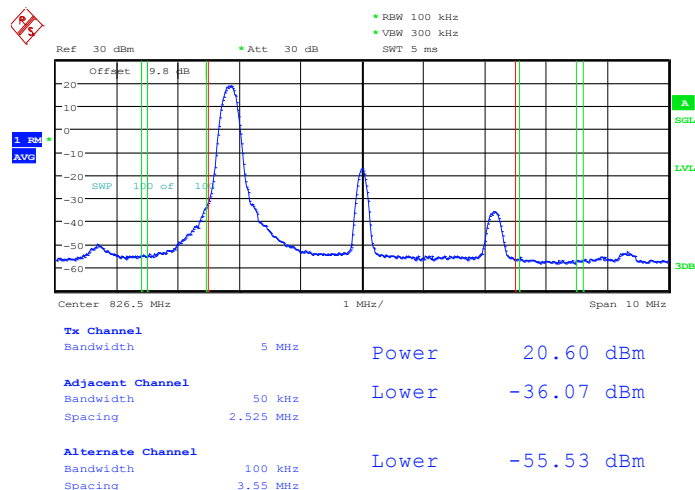
Higher Band Edge Plot for 16QAM -RB Size 15, RB Offset 0



Date: 10.DEC.2012 16:45:45

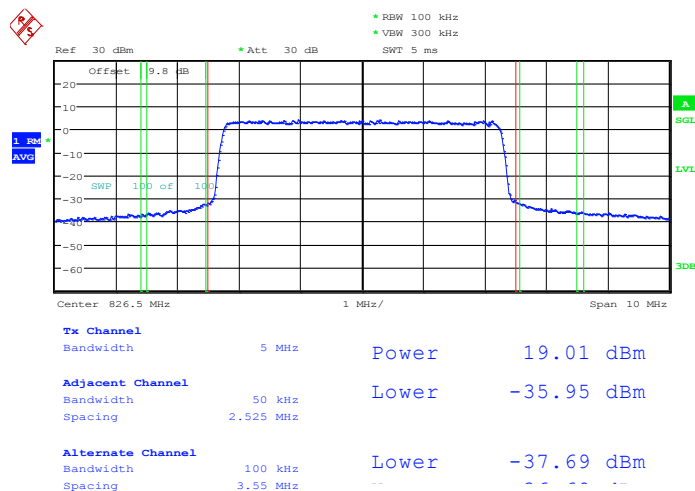
Band :	LTE Band 5	Band Width :	5MHz / QPSK
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



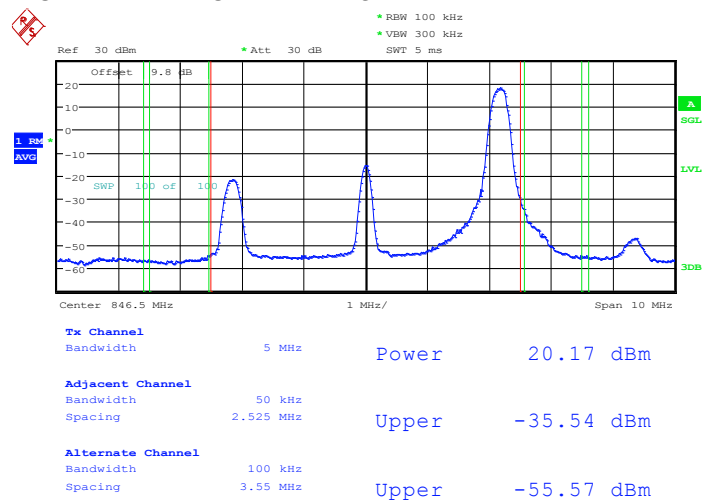
Date: 19.NOV.2012 19:51:50

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



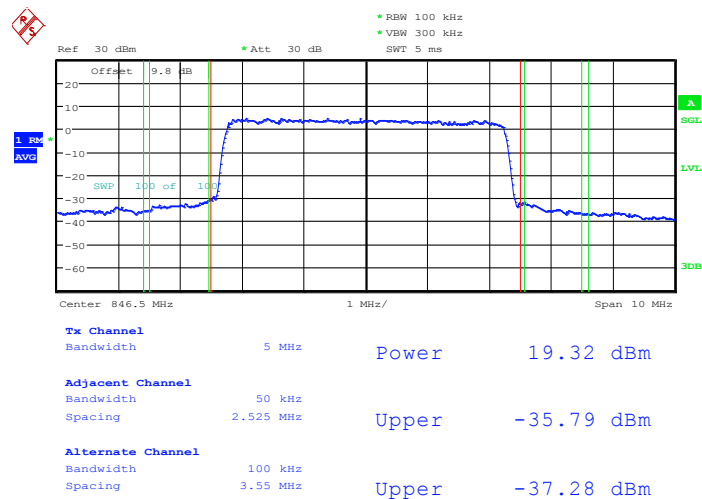
Date: 19.NOV.2012 19:50:56

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



Date: 19.NOV.2012 19:55:52

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

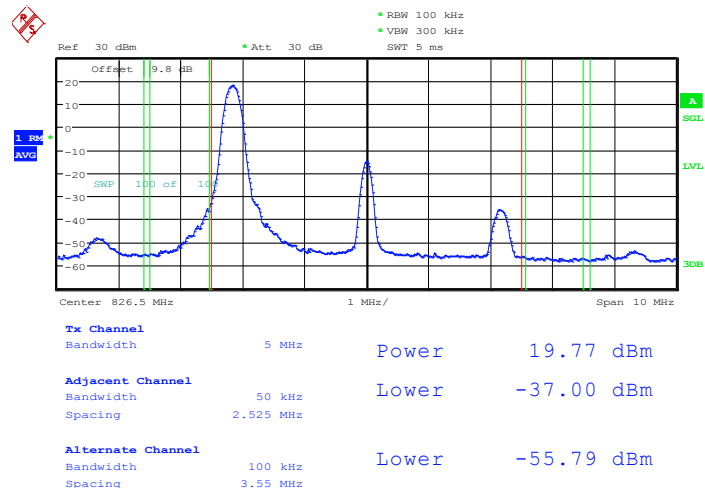


Date: 19.NOV.2012 19:54:52



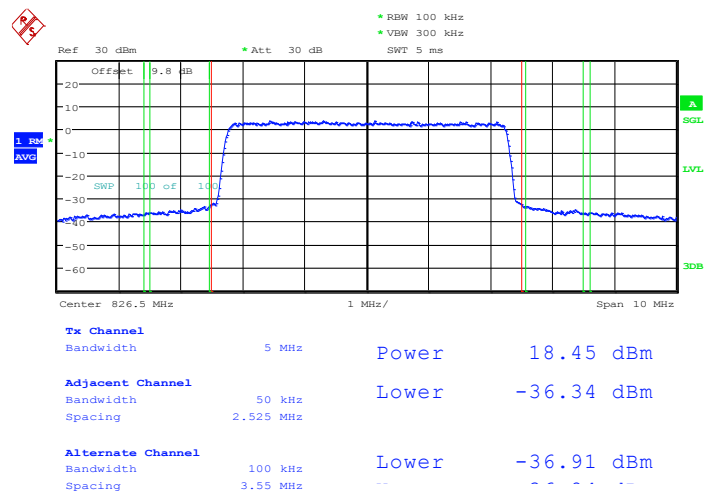
Band :	LTE Band 5	Band Width :	5MHz / 16QAM
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Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



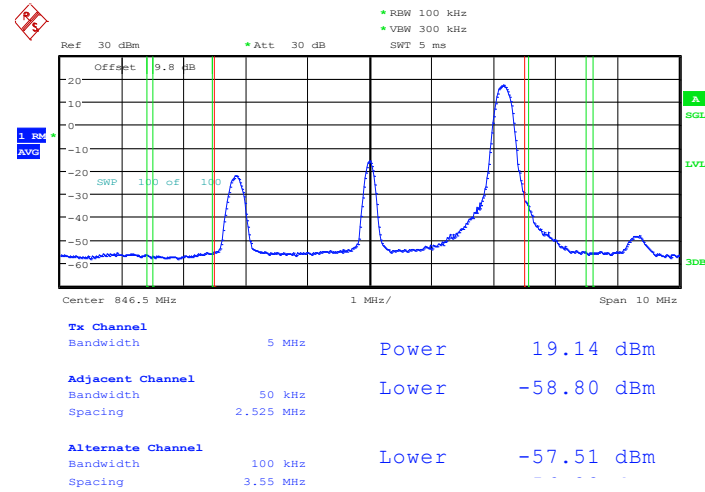
Date: 19.NOV.2012 19:52:06

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



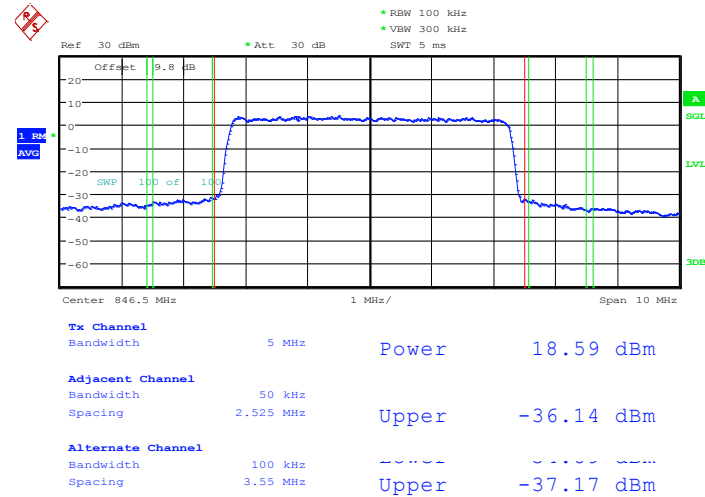
Date: 19.NOV.2012 19:51:11

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



Date: 19.NOV.2012 19:56:08

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

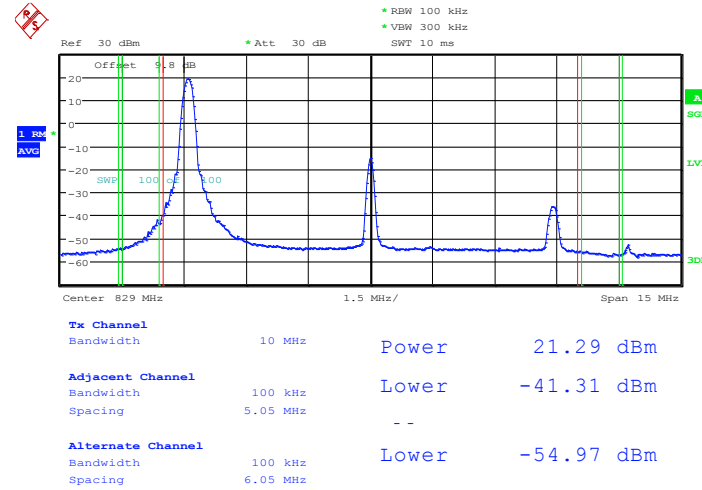


Date: 19.NOV.2012 19:55:24



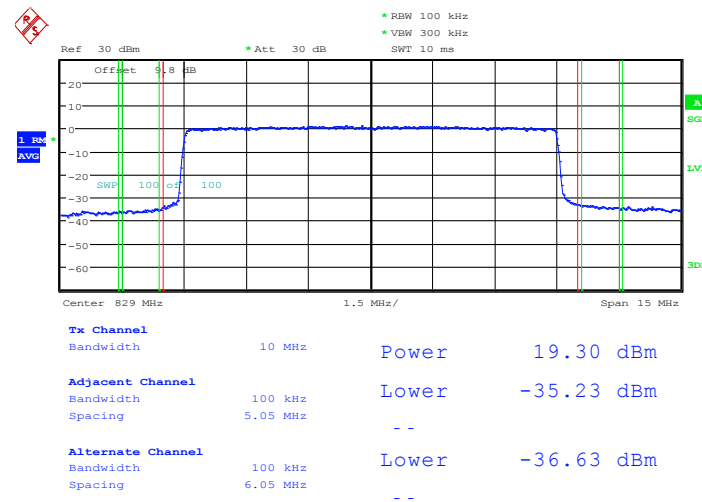
Band :	LTE Band 5	Band Width :	10MHz / QPSK
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



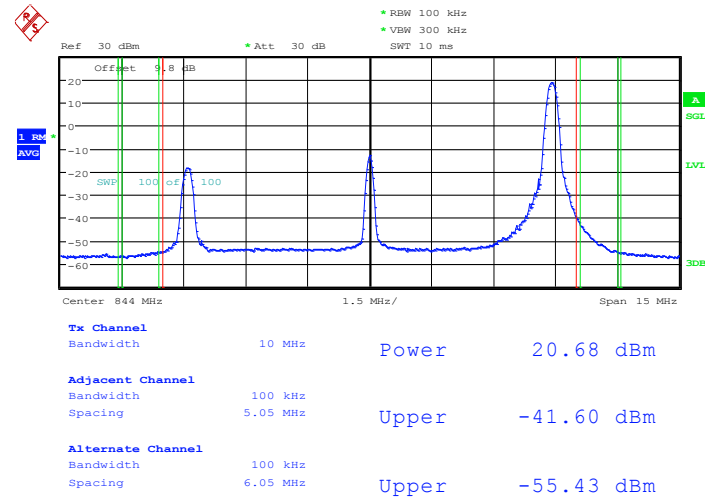
Date: 19.NOV.2012 20:13:10

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



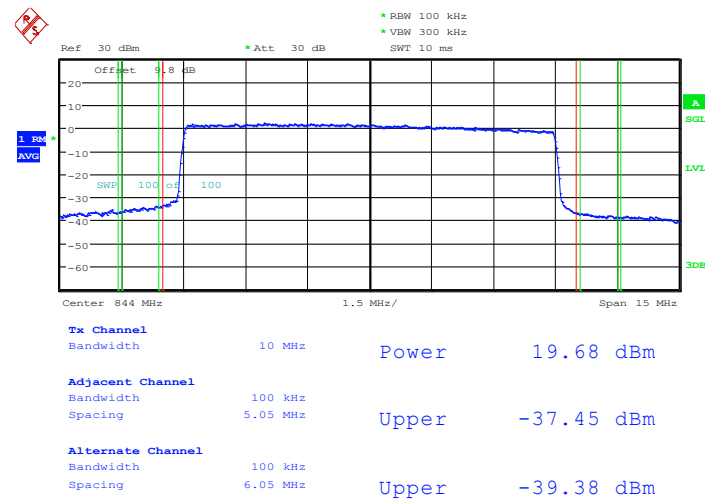
Date: 19.NOV.2012 20:12:16

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



Date: 19.NOV.2012 20:11:05

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

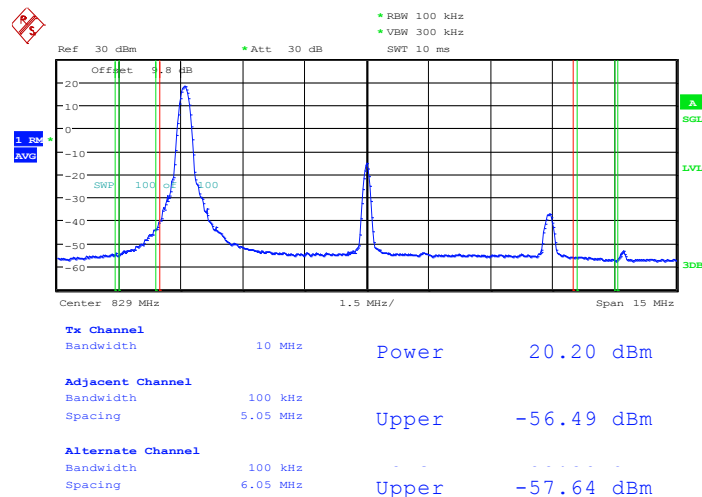


Date: 19.NOV.2012 20:09:40



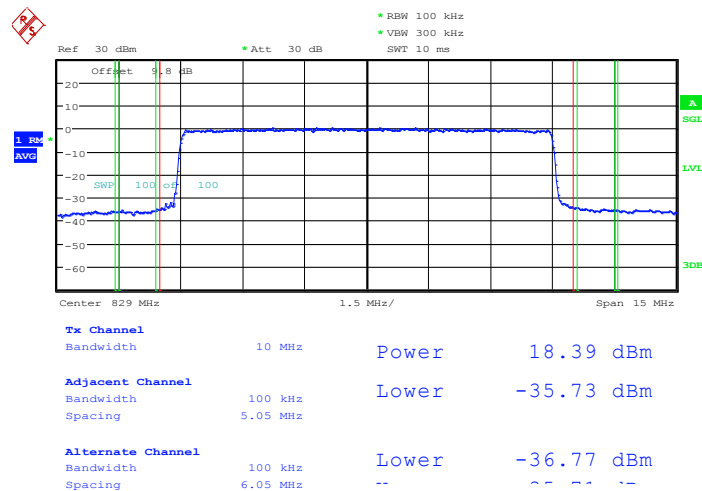
Band :	LTE Band 5	Band Width :	10MHz / 16QAM
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Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



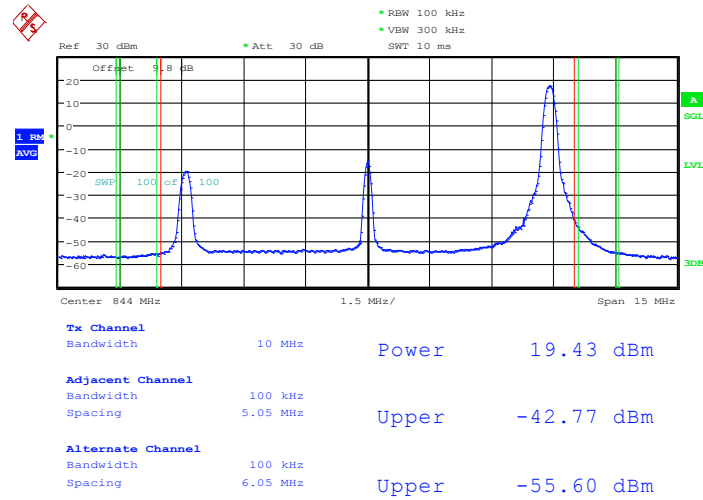
Date: 19,NOV,2012 20:13:25

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



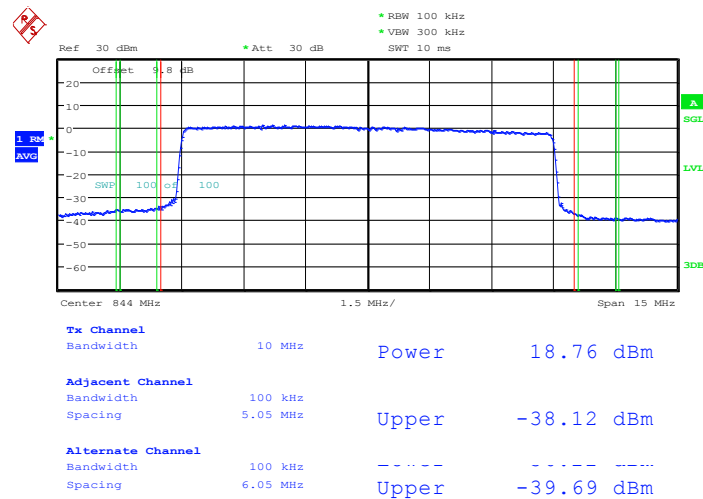
Date: 19,NOV,2012 20:12:30

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



Date: 19.NOV.2012 20:11:24

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

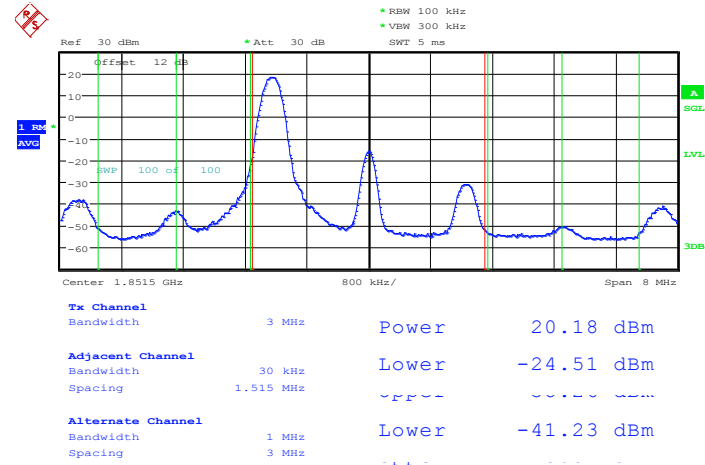


Date: 19.NOV.2012 20:10:18



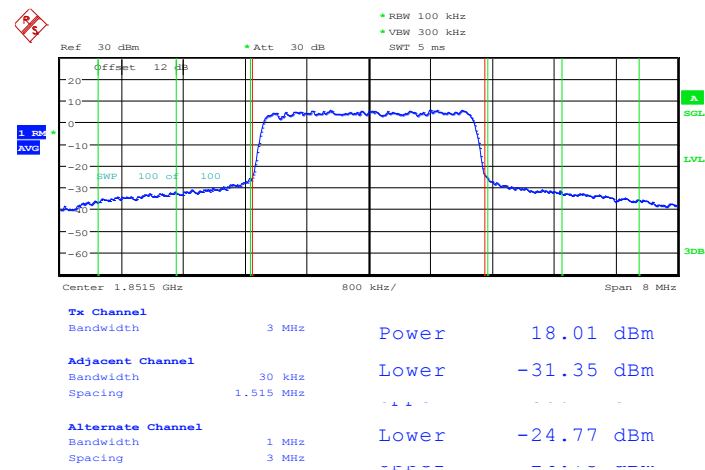
Band :	LTE Band 2	Band Width :	3MHz / QPSK
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 10,DEC,2012 15:03:06

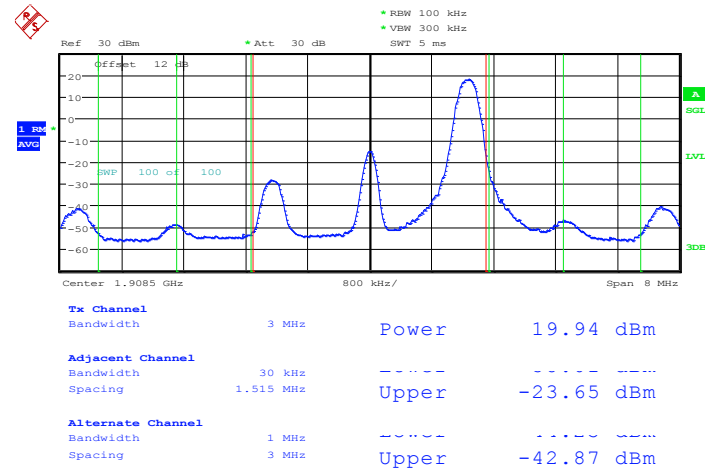
Lower Band Edge Plot for QPSK-RB Size 15, RB Offset 0



Date: 10,DEC,2012 15:02:12

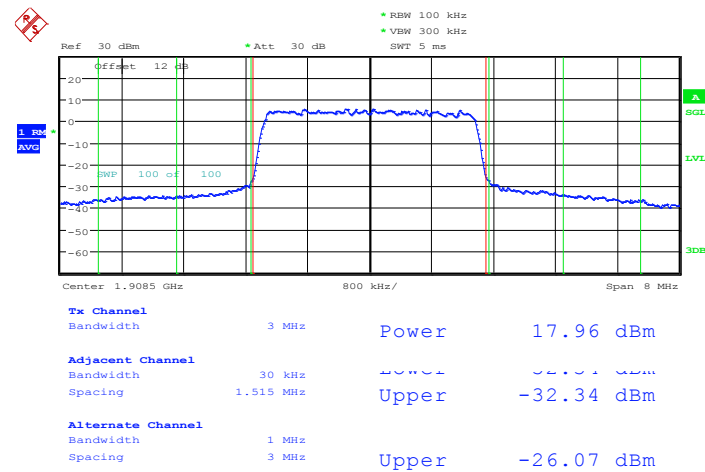


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 14



Date: 10.DEC.2012 15:04:57

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

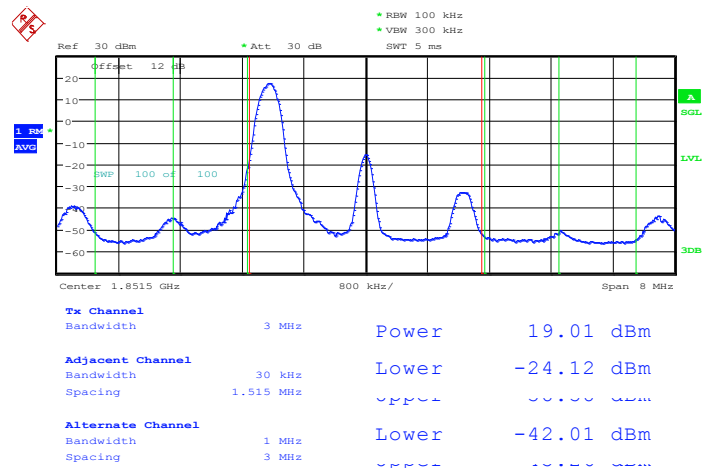


Date: 10.DEC.2012 15:03:51



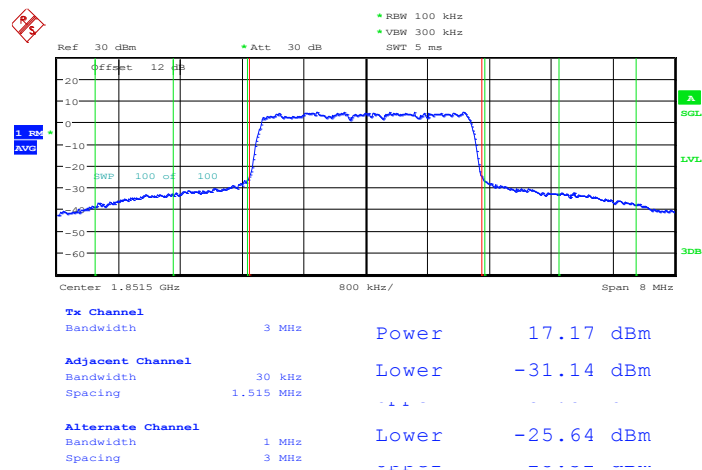
Band :	LTE Band 2	Band Width :	3MHz / 16QAM
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Lower Band Edge Plot for -16QAM-RB Size 1, RB Offset 0



Date: 10,DEC,2012 15:02:47

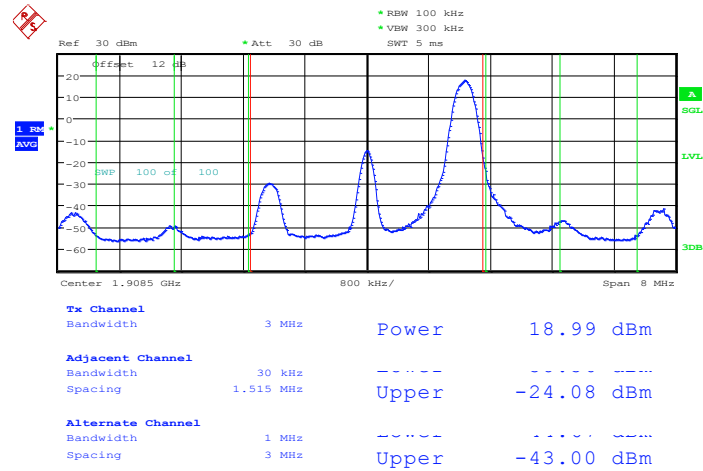
Lower Band Edge Plot for 16QAM-RB Size 15, RB Offset 0



Date: 10,DEC,2012 15:02:32

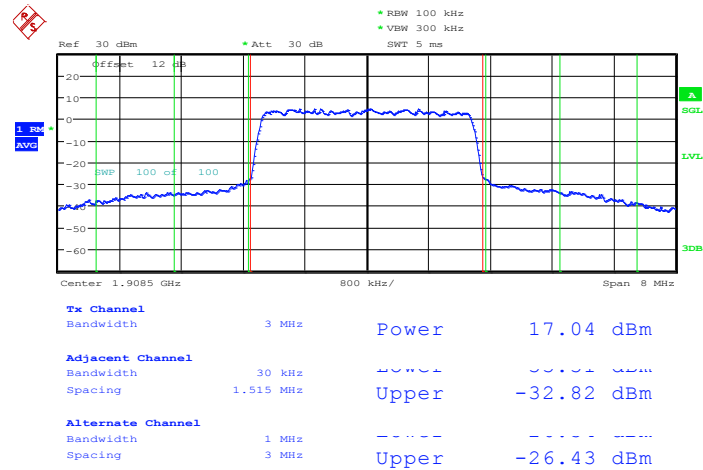


Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 14



Date: 10.DEC.2012 15:04:42

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

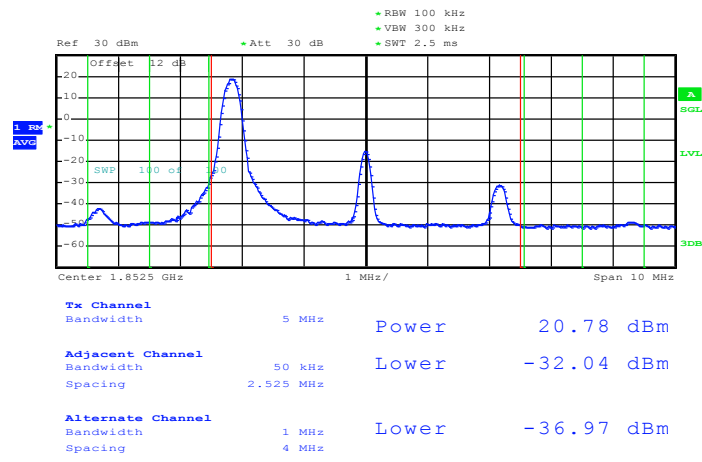


Date: 10.DEC.2012 15:04:11



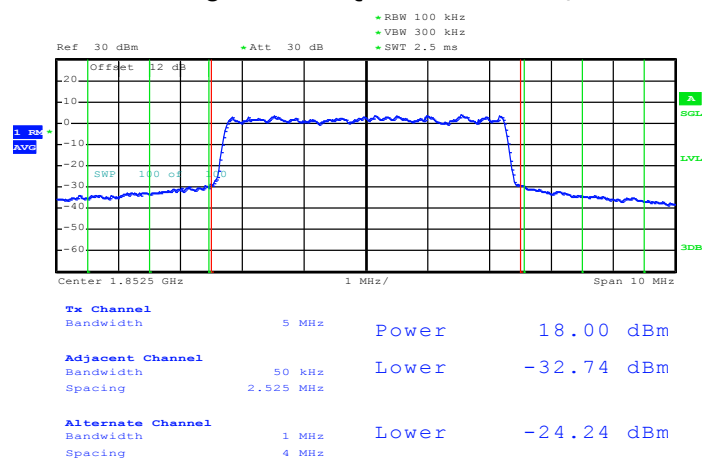
Band :	LTE Band 2	Band Width :	5MHz / QPSK
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 2.NOV.2012 21:12:07

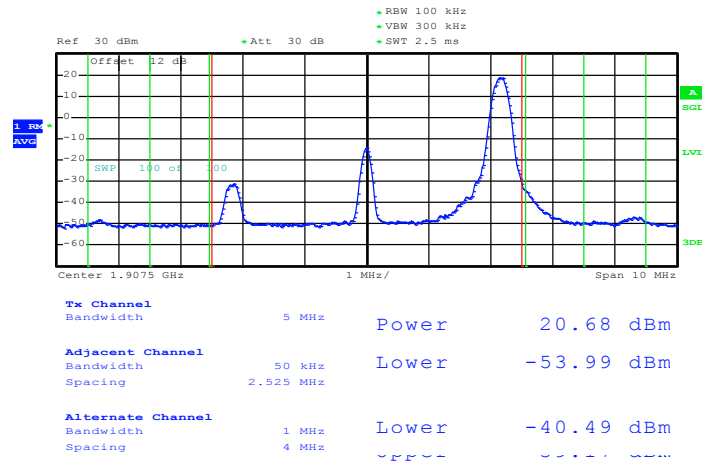
Lower Band Edge Plot for QPSK-RB Size 25, RB Offset 0



Date: 2.NOV.2012 21:11:48

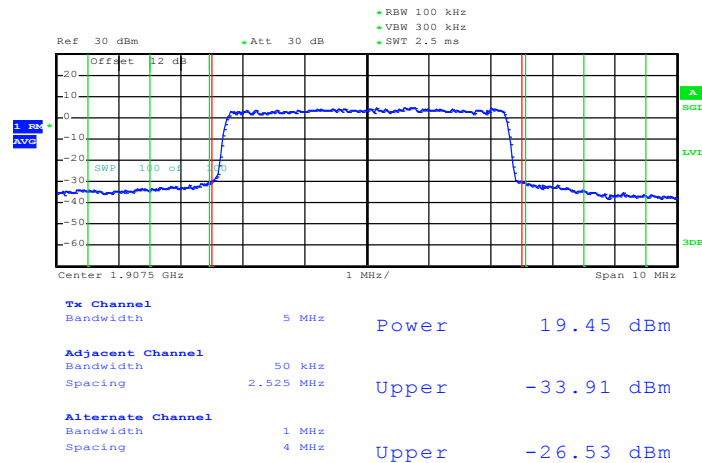


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24



Date: 2.NOV.2012 22:09:57

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

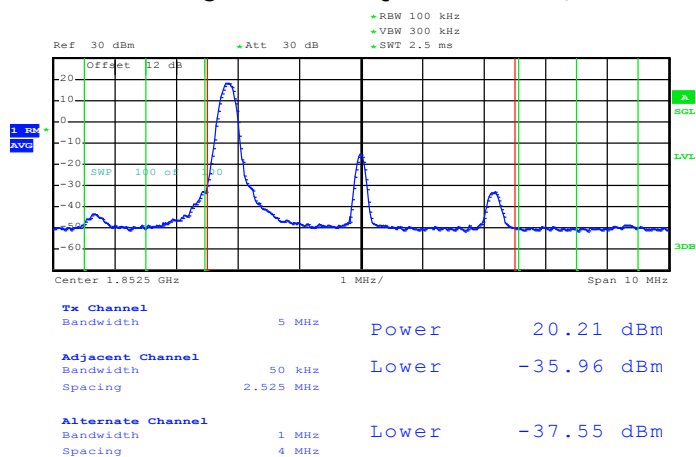


Date: 2.NOV.2012 22:09:26



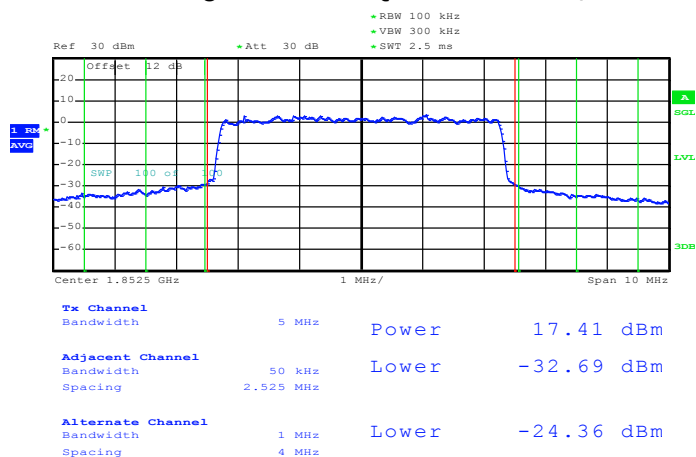
Band :	LTE Band 2	Band Width :	5MHz / 16QAM
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Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



Date: 2.NOV.2012 21:36:10

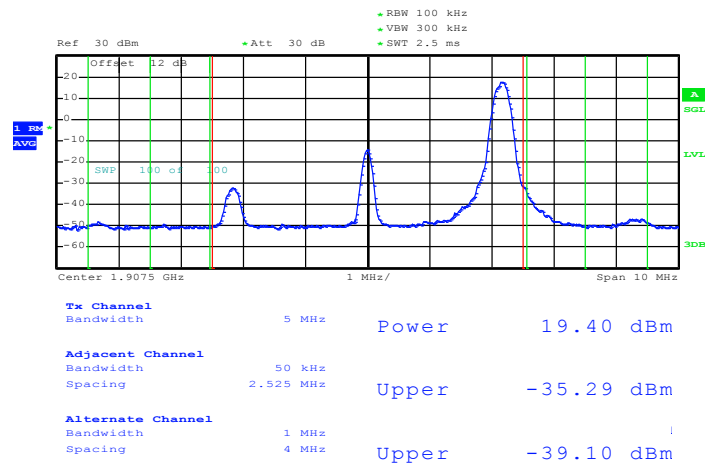
Lower Band Edge Plot for 16QAM-RB Size 25, RB Offset 0



Date: 2.NOV.2012 21:36:33

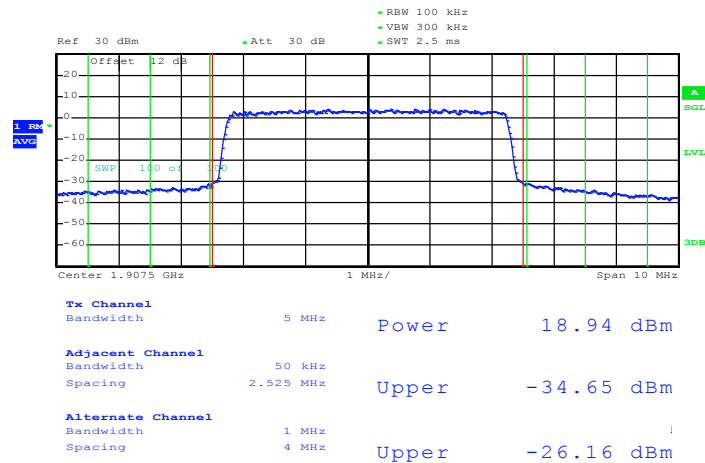


Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 24



Date: 2.NOV.2012 22:10:11

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

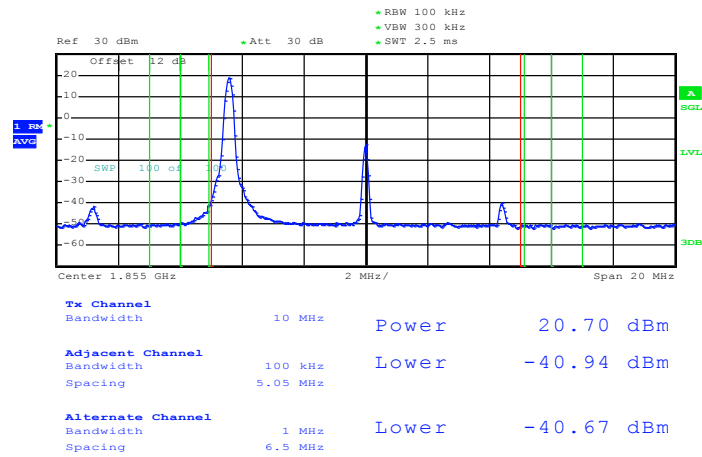


Date: 2.NOV.2012 22:10:35



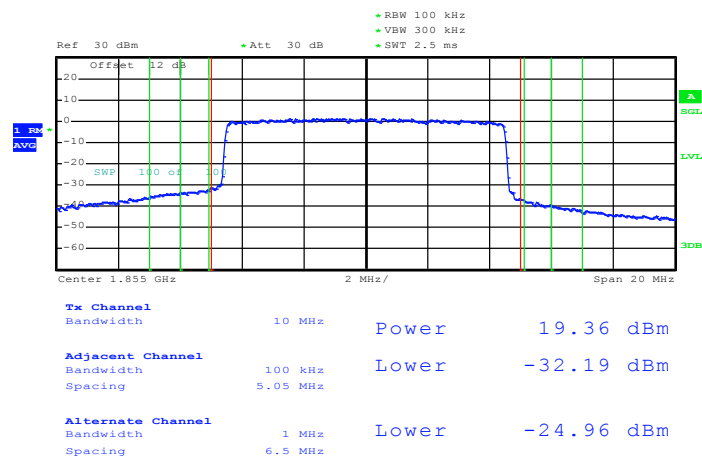
Band :	LTE Band 2	Band Width :	10MHz / QPSK
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 2.NOV.2012 22:22:51

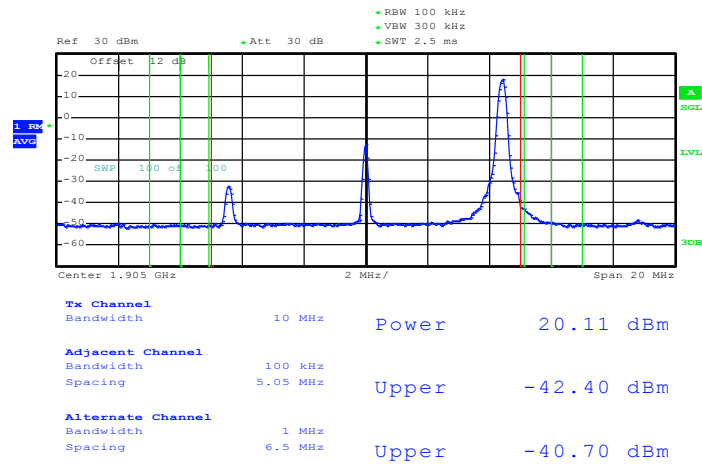
Lower Band Edge Plot for QPSK-RB Size 50, RB Offset 0



Date: 2.NOV.2012 22:22:08

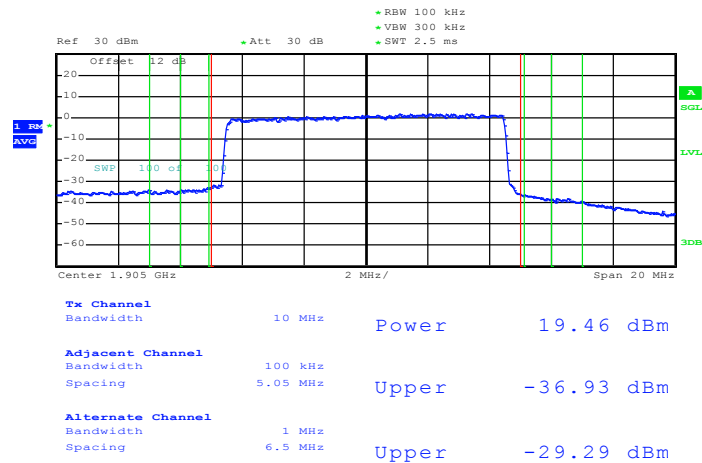


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 49



Date: 2.NOV.2012 22:20:31

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

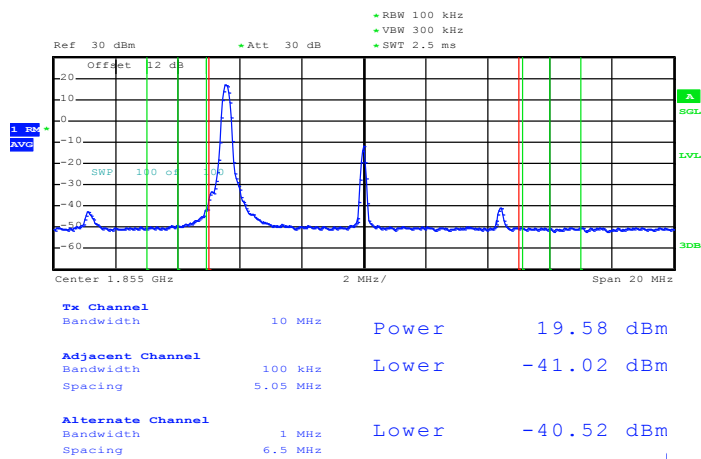


Date: 2.NOV.2012 22:18:37



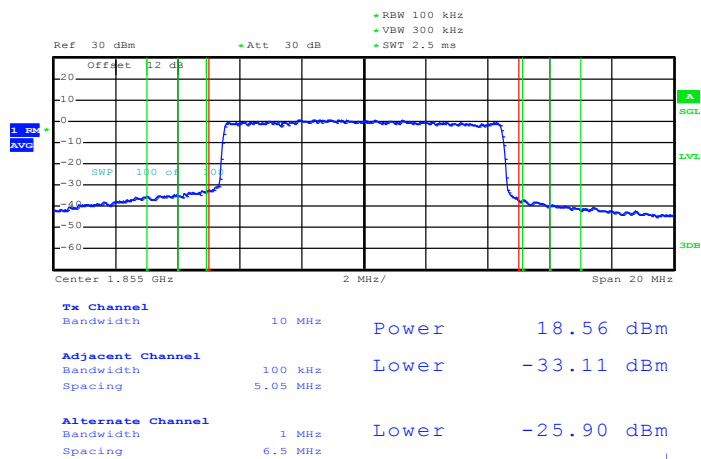
Band :	LTE Band 2	Band Width :	10MHz / 16QAM
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Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0

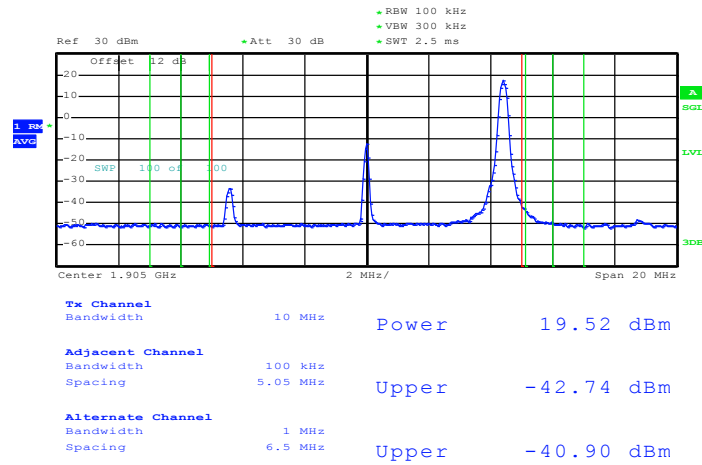


Date: 2.NOV.2012 22:22:33

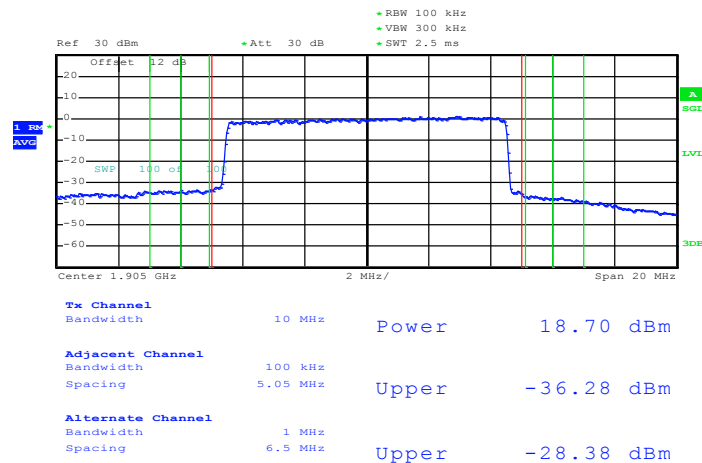
Lower Band Edge Plot for 16QAM-RB Size 50, RB Offset 0



Date: 2.NOV.2012 22:22:20

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


Date: 2.NOV.2012 22:20:51

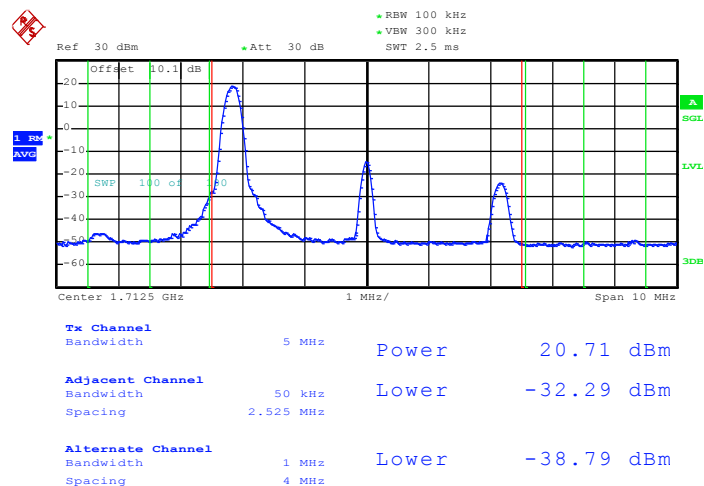
Higher Band Edge Plot for 16QAM-RB Size 50, RB Offset 0


Date: 2.NOV.2012 22:18:52



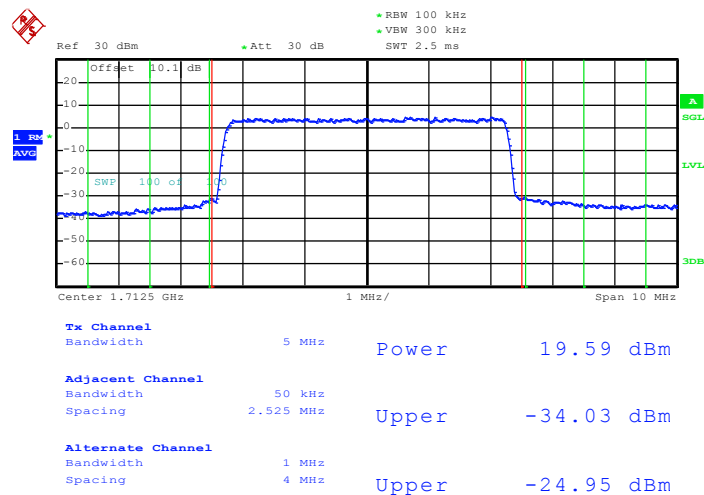
Band :	LTE Band 4	Band Width :	5MHz / QPSK
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 5.NOV.2012 20:12:06

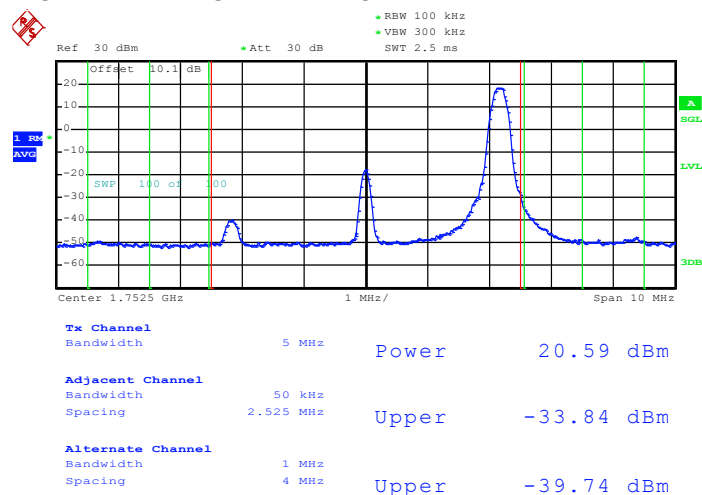
Lower Band Edge Plot for QPSK-RB Size 25, RB Offset 0



Date: 5.NOV.2012 20:10:50

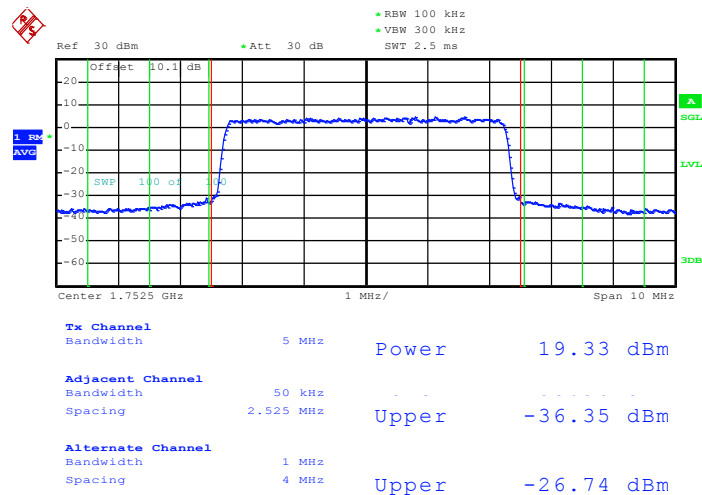


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24



Date: 5.NOV.2012 20:09:31

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

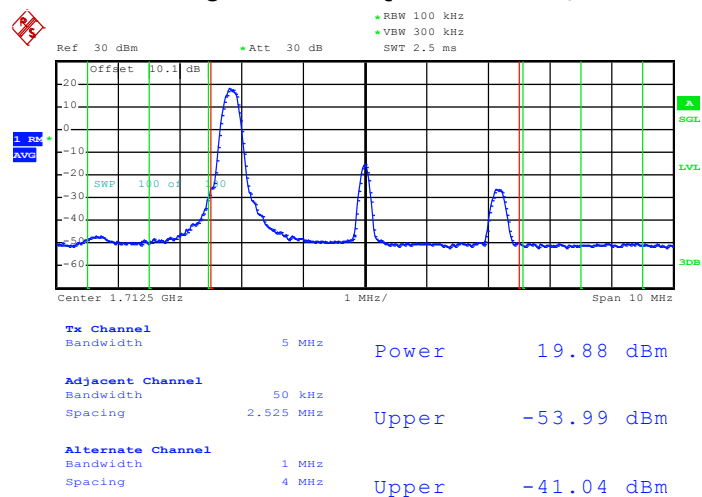


Date: 5.NOV.2012 20:08:00



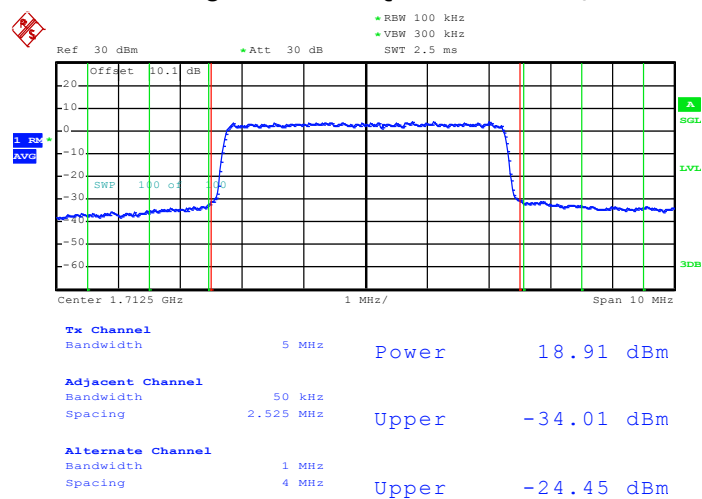
Band :	LTE Band 4	Band Width :	5MHz / 16QAM
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Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



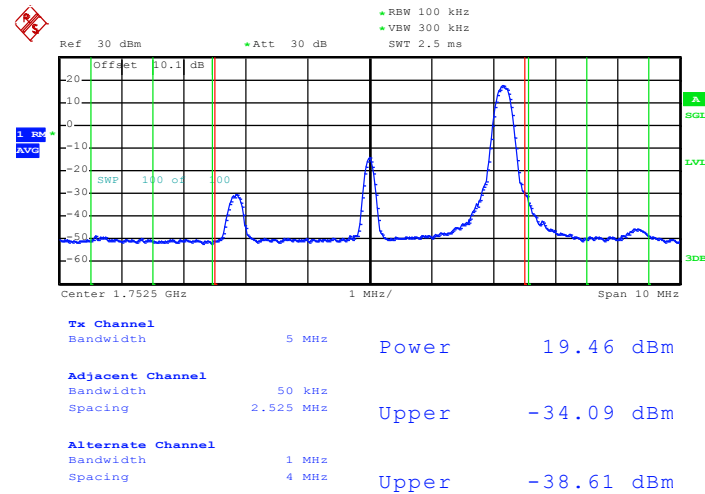
Date: 5.NOV.2012 20:11:43

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



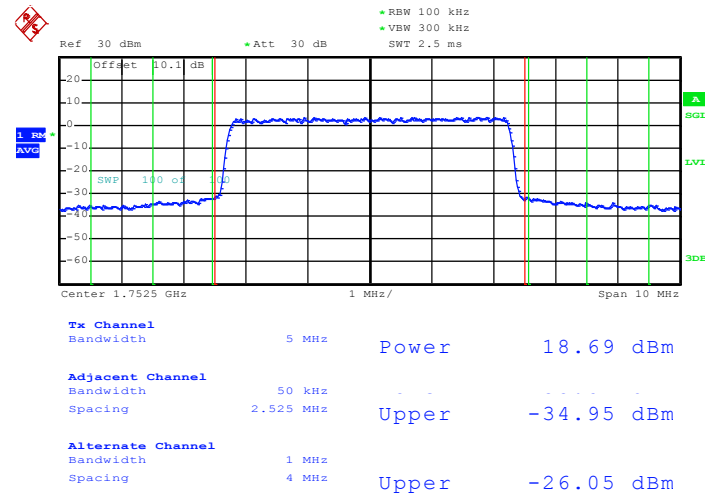
Date: 5.NOV.2012 20:11:09

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



Date: 5.NOV.2012 20:09:09

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

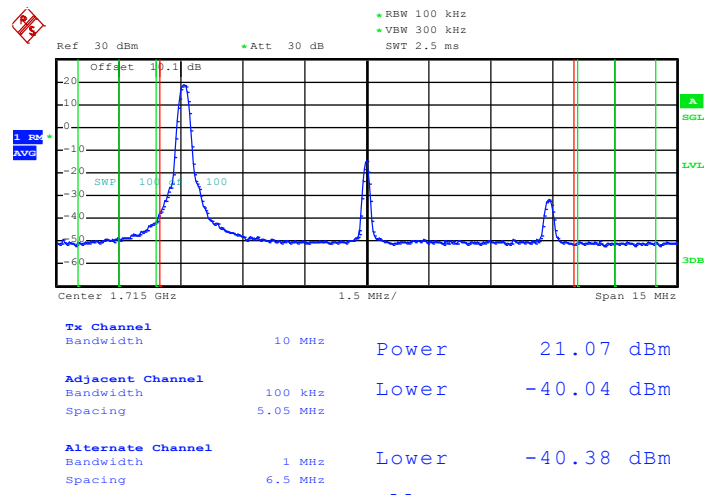


Date: 5.NOV.2012 20:08:25



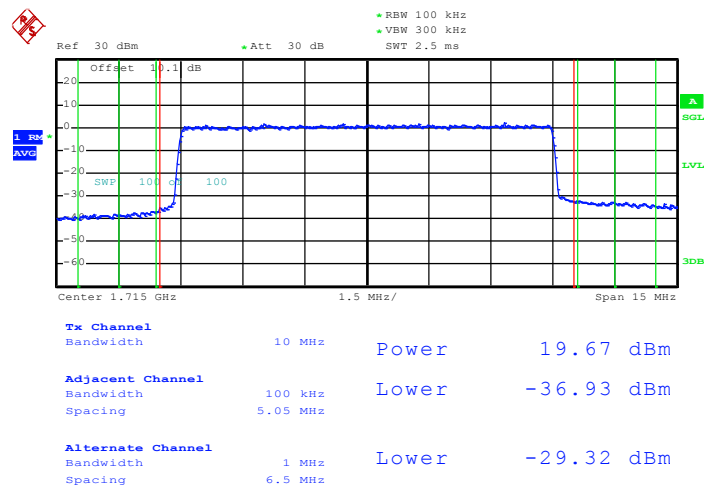
Band :	LTE Band 4	Band Width :	10MHz / QPSK
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0

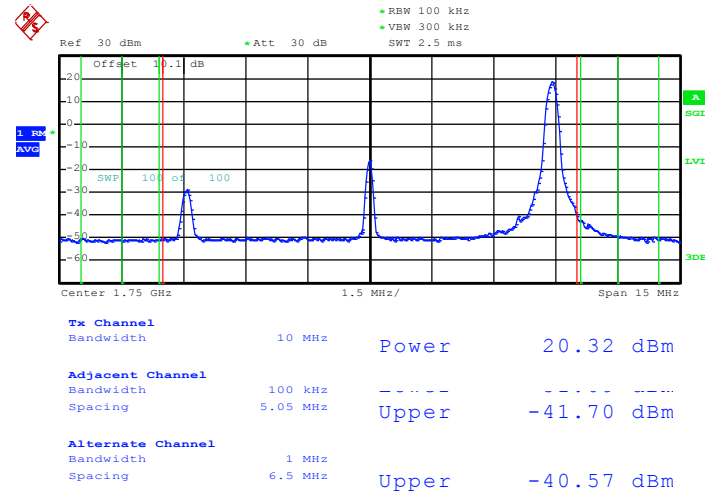


Date: 5.NOV.2012 20:00:51

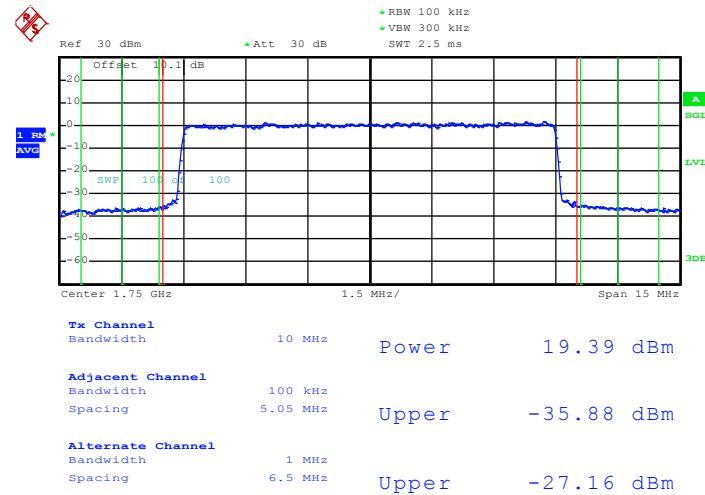
Lower Band Edge Plot for QPSK-RB Size 50, RB Offset 0



Date: 5.NOV.2012 19:56:56

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


Date: 5.NOV.2012 20:05:03

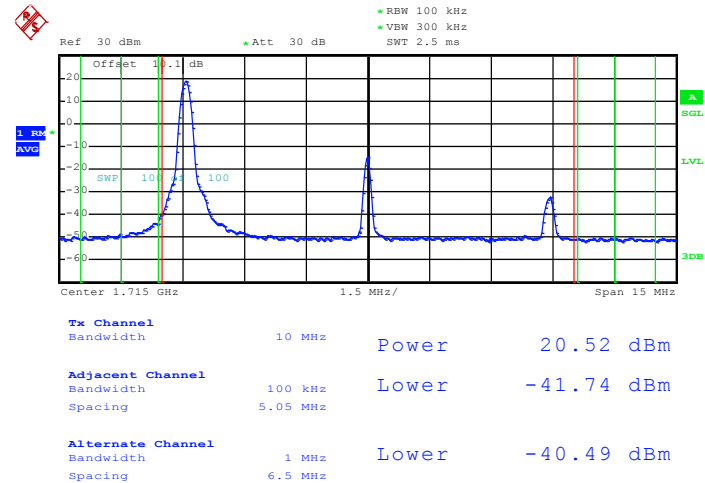
Higher Band Edge Plot for QPSK-RB Size 50, RB Offset 0


Date: 5.NOV.2012 20:03:21



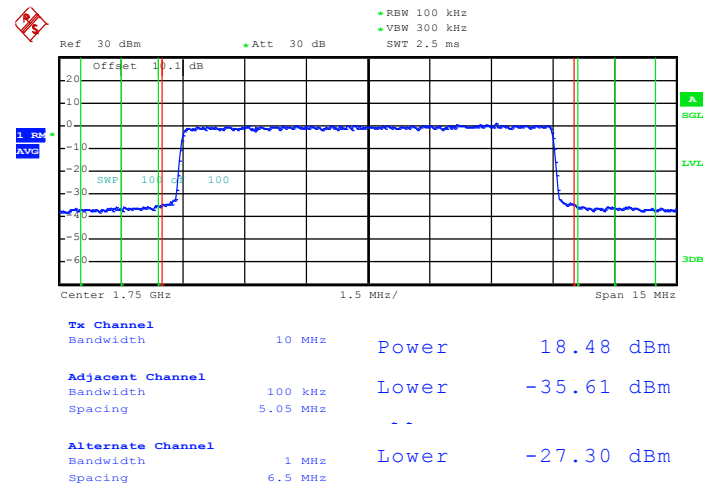
Band :	LTE Band 4	Band Width :	10MHz / 16QAM
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Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



Date: 5.NOV.2012 20:00:26

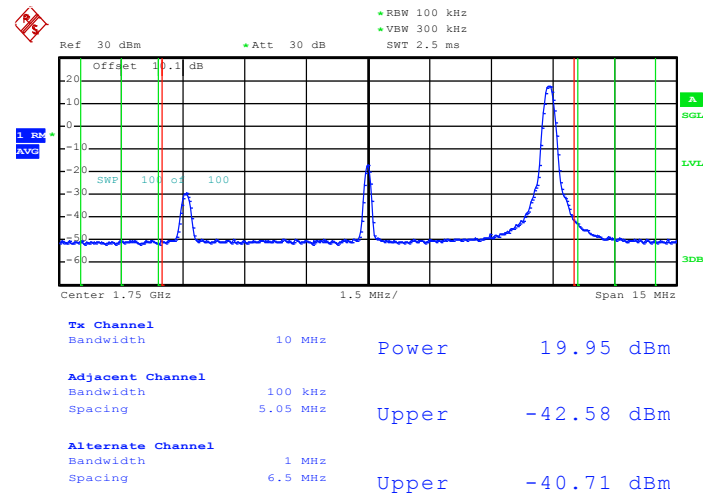
Lower Band Edge Plot for 16QAM-RB Size 50, RB Offset 0



Date: 5.NOV.2012 20:04:07

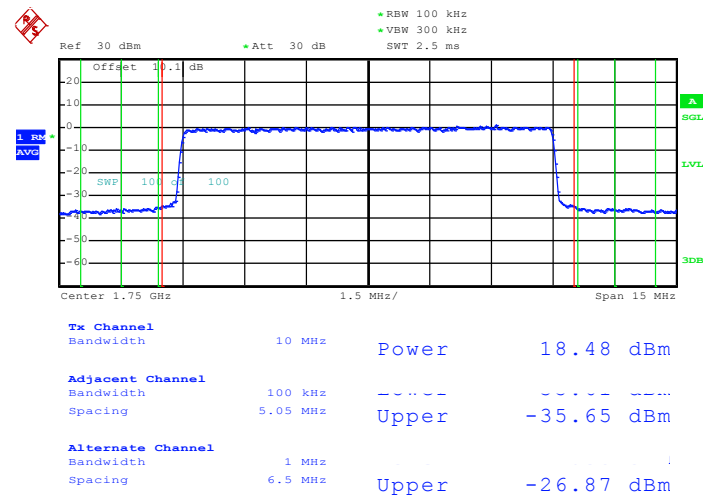


Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 49



Date: 5.NOV.2012 20:04:43

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

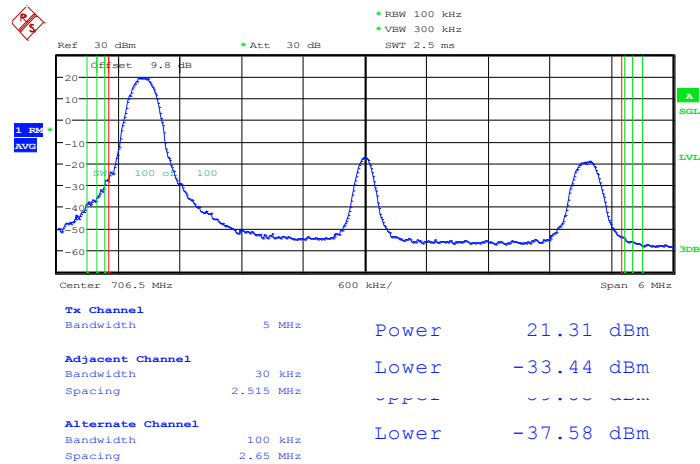


Date: 5.NOV.2012 20:04:07



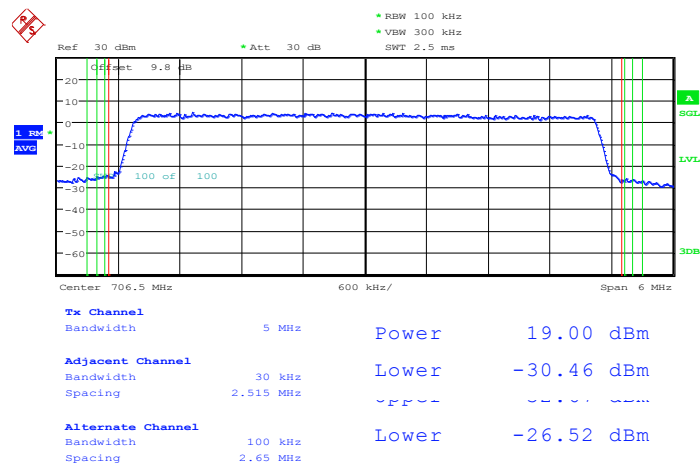
Band :	LTE Band 17	Band Width :	5MHz / QPSK
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 5.NOV.2012 22:35:15

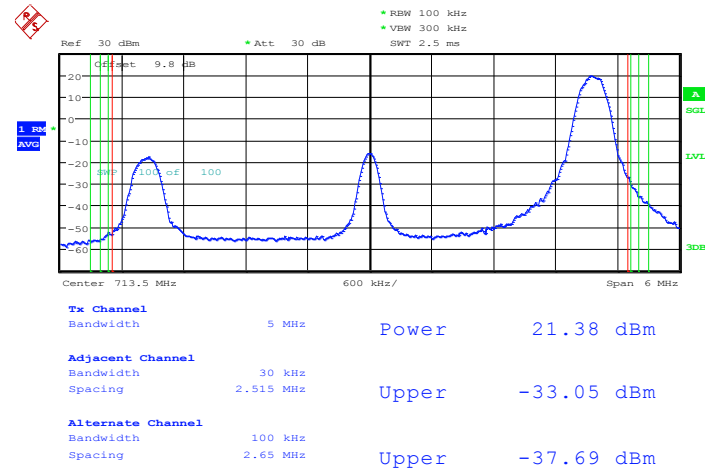
Lower Band Edge Plot for QPSK-RB Size 25, RB Offset 0



Date: 5.NOV.2012 22:34:39

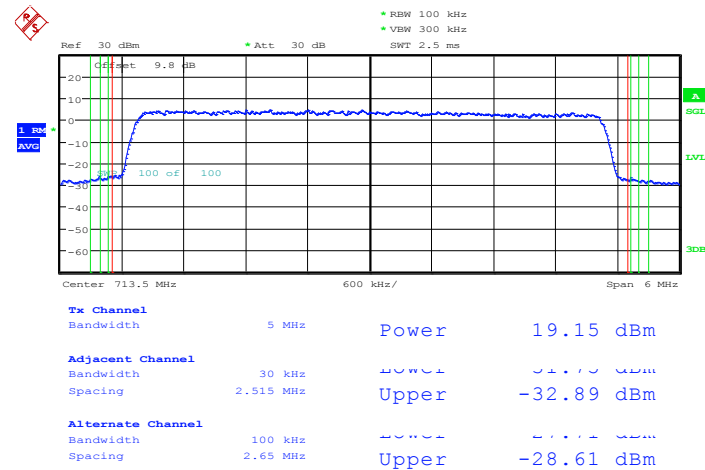


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24



Date: 5.NOV.2012 22:36:52

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



Date: 5.NOV.2012 22:36:04

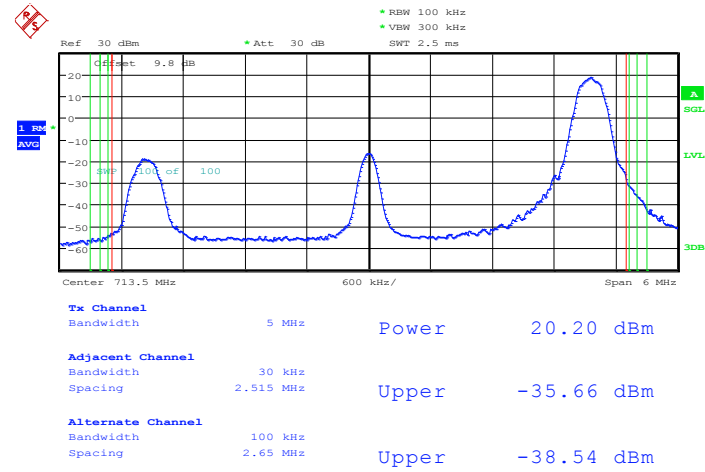


Report No. : FG2O2430B

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

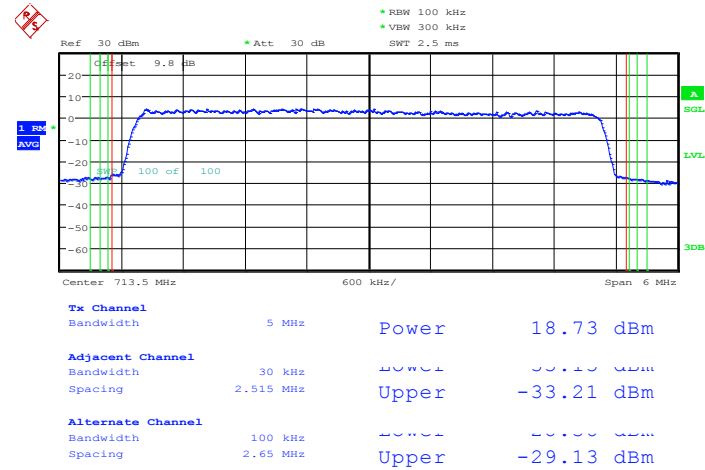


Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 24



Date: 5.NOV.2012 22:37:04

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

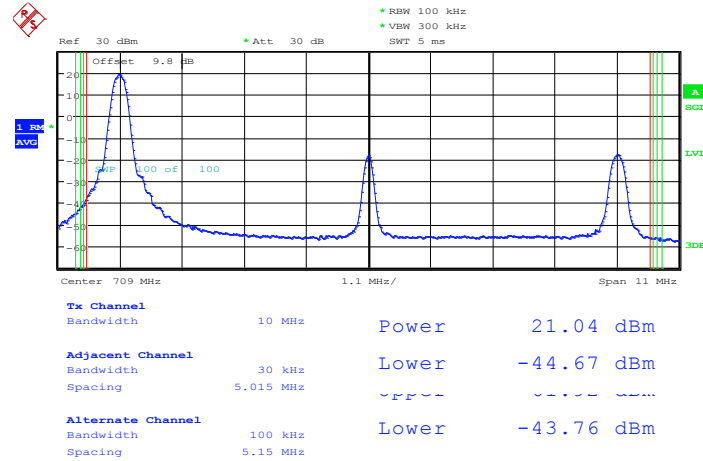


Date: 5.NOV.2012 22:36:21



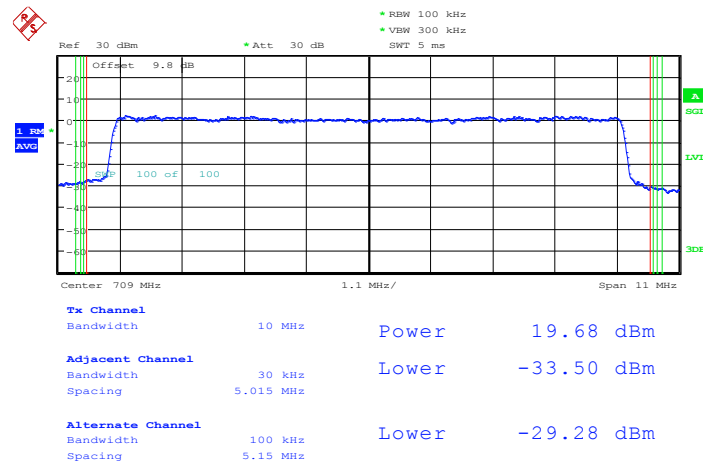
Band :	LTE Band 17	Band Width :	10MHz / QPSK
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 5.NOV.2012 22:39:38

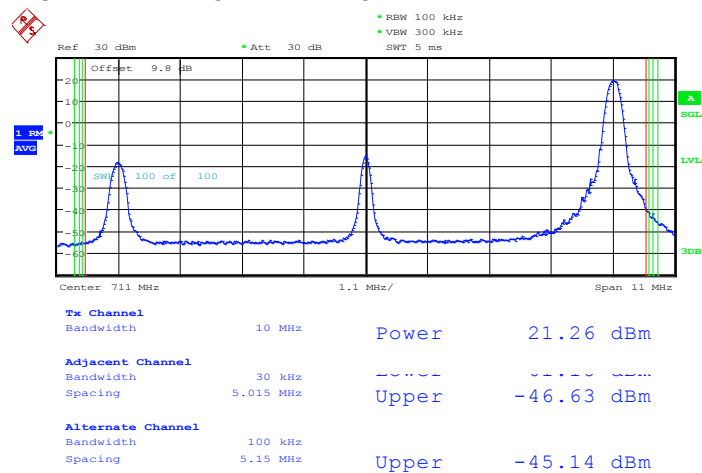
Lower Band Edge Plot for QPSK-RB Size 50, RB Offset 0



Date: 5.NOV.2012 22:39:02

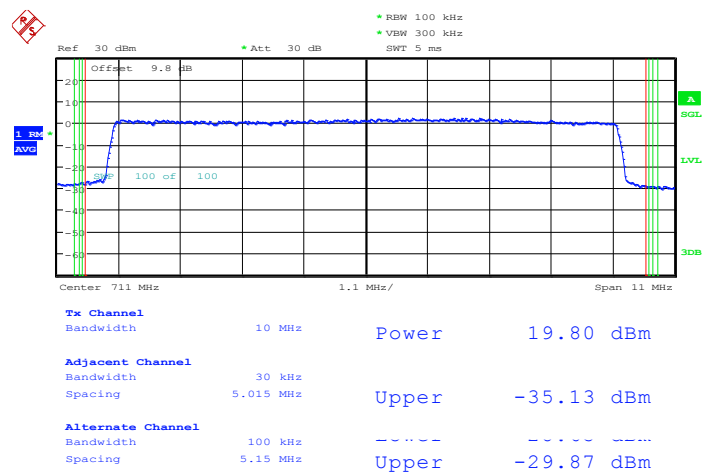


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 49



Date: 5.NOV.2012 22:41:17

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

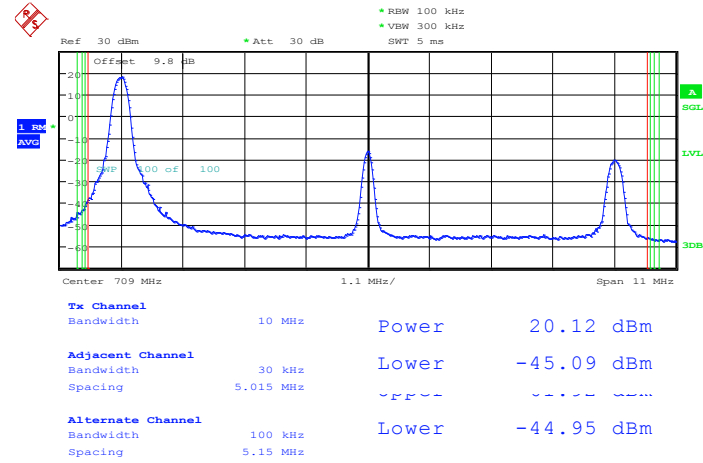


Date: 5.NOV.2012 22:40:22



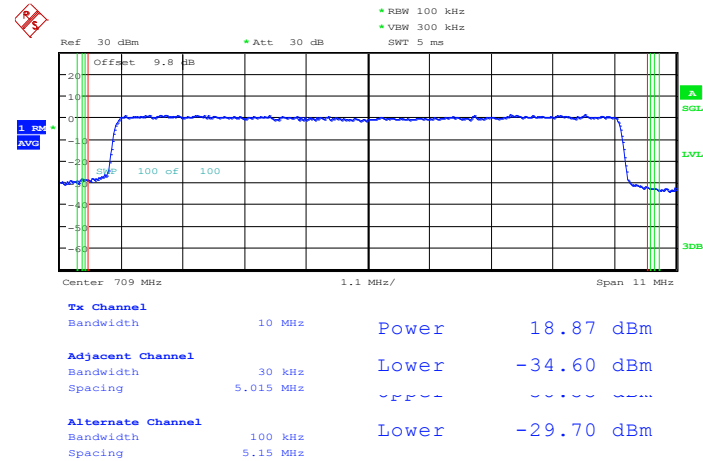
Band :	LTE Band 17	Band Width :	10MHz / 16QAM
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Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



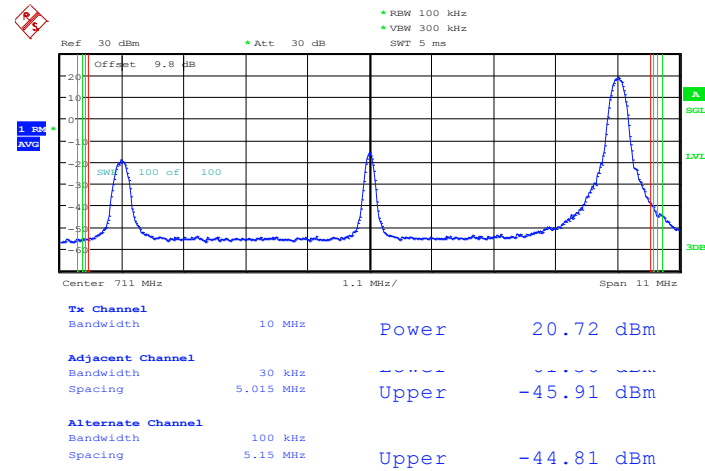
Date: 5.NOV.2012 22:39:52

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



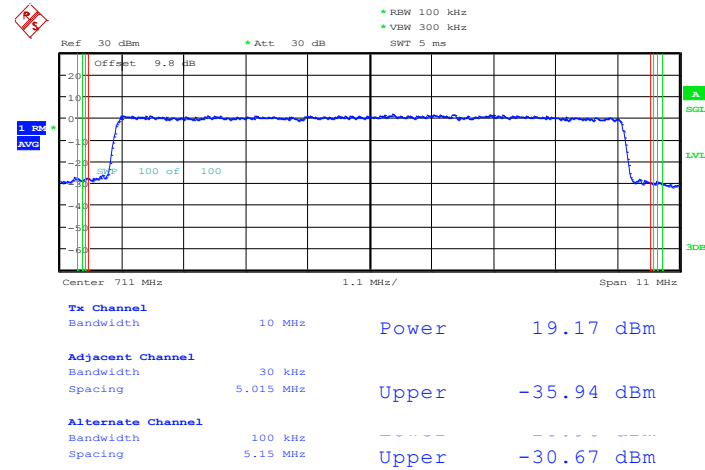
Date: 5.NOV.2012 22:39:19

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



Date: 5.NOV.2012 22:41:33

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



Date: 5.NOV.2012 22:40:41

3.5 Conducted Spurious Emission Measurement

3.5.1 Description of Conducted Spurious Emission Measurement

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

It is measured by means of a calibrated spectrum analyzer and scanned from 9 KHz up to a frequency including its 10th harmonic.

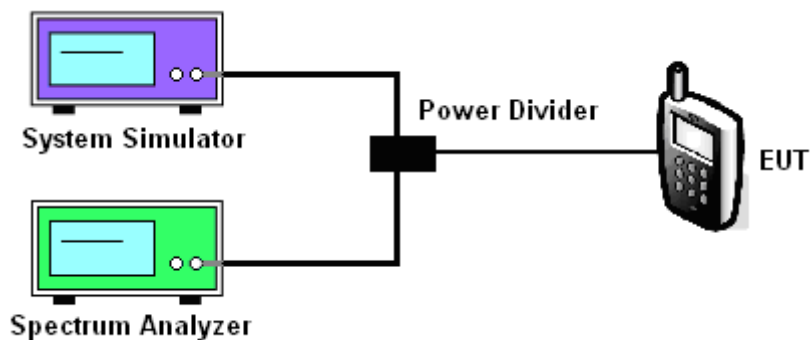
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. The EUT was 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.

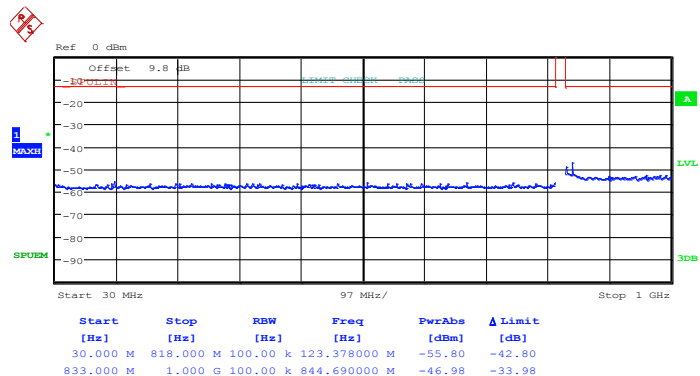
3.5.4 Test Setup



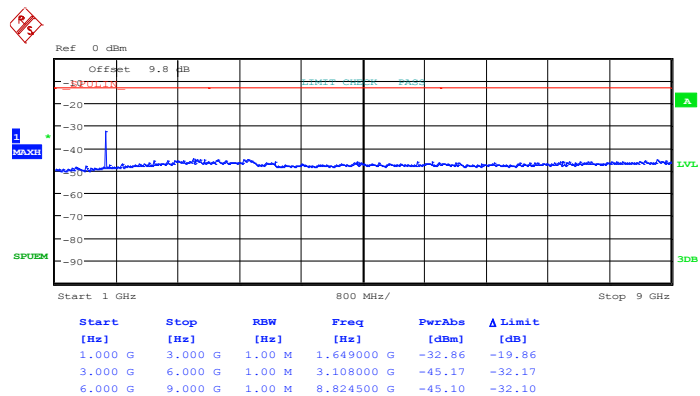
3.5.5 Test Result (Plots) of Conducted Spurious Emission

Band :	LTE Band 5	Channel :	CH20415 (Low)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 49)

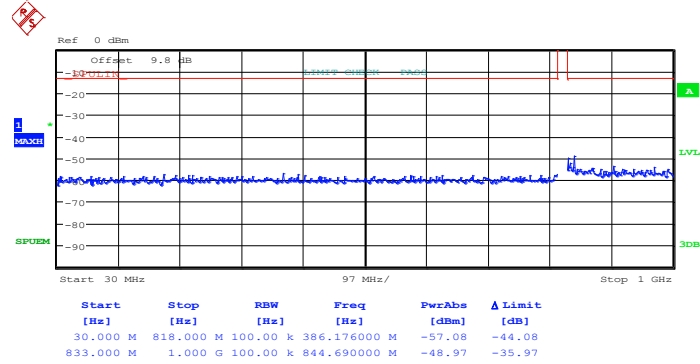


Date: 10,DEC,2012 16:09:26

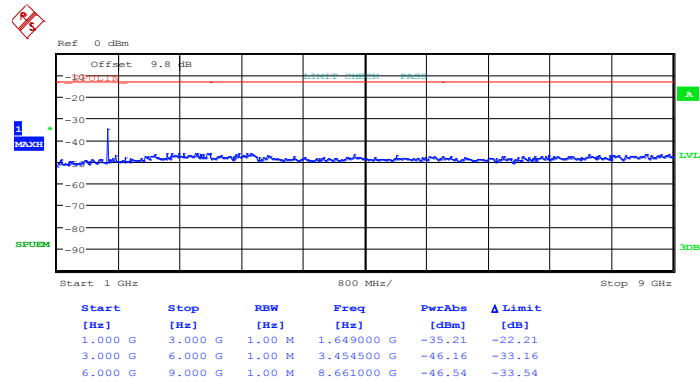


Date: 10,DEC,2012 16:12:36

16QAM (RB Size 1, RB Offset 49)



Date: 10.DEC.2012 16:09:36

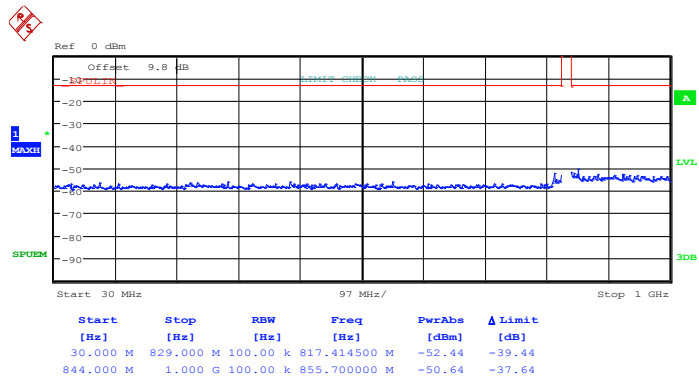


Date: 10.DEC.2012 16:12:28

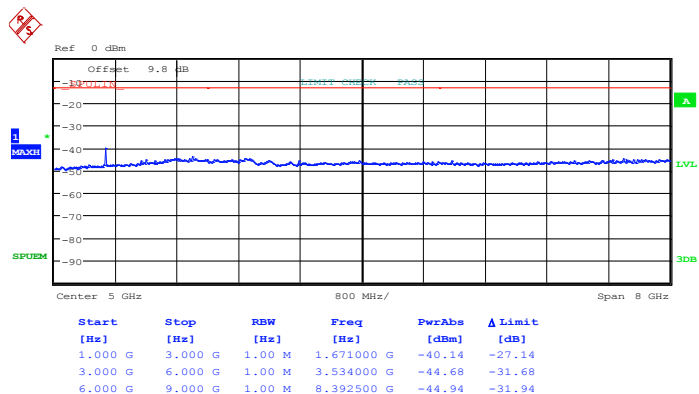


Band :	LTE Band 5	Channel :	CH20525 (Middle)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 49)



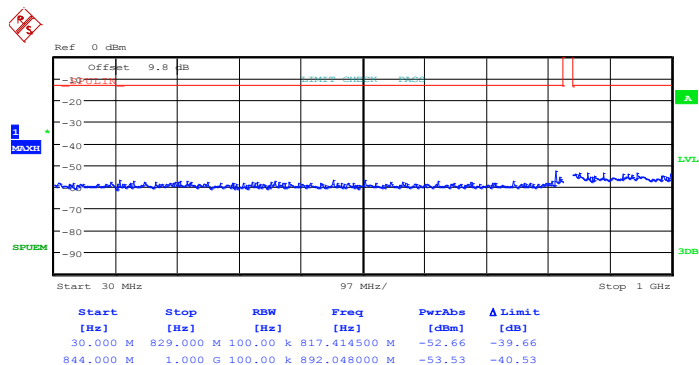
Date: 10,DEC,2012 16:15:38



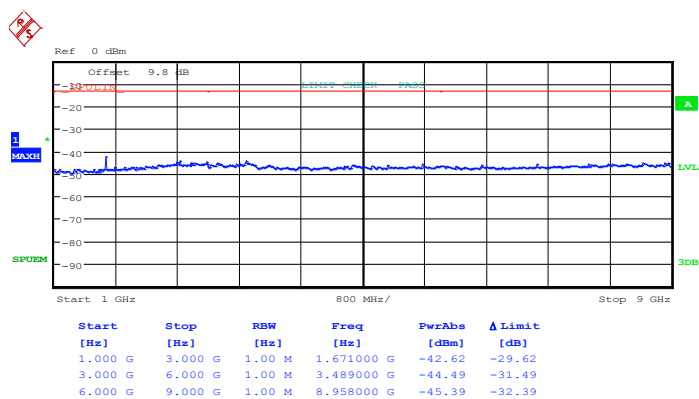
Date: 10,DEC,2012 16:13:53



16QAM (RB Size 1, RB Offset 49)



Date: 10.DEC.2012 16:15:50

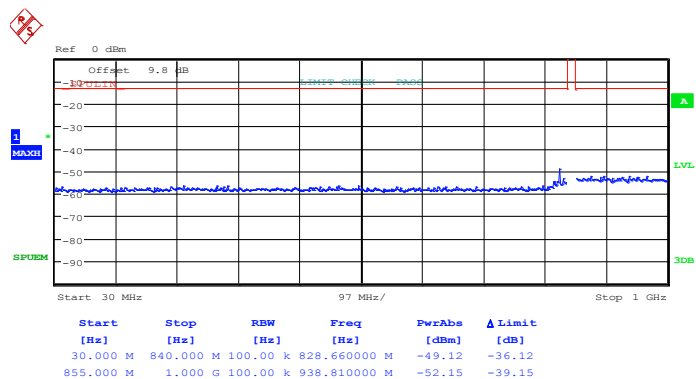


Date: 10.DEC.2012 16:14:09

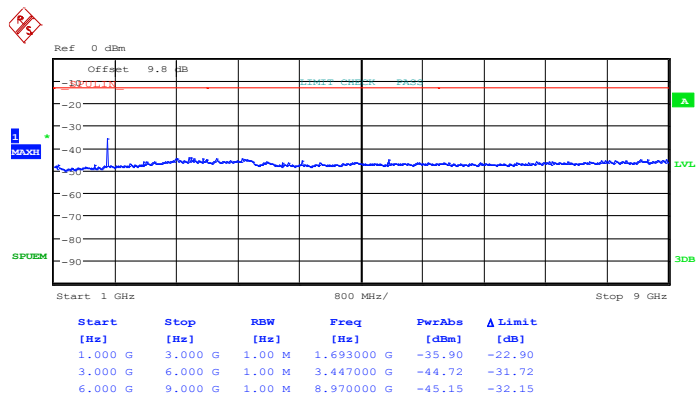


Band :	LTE Band 5	Channel :	CH20635 (High)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 49)

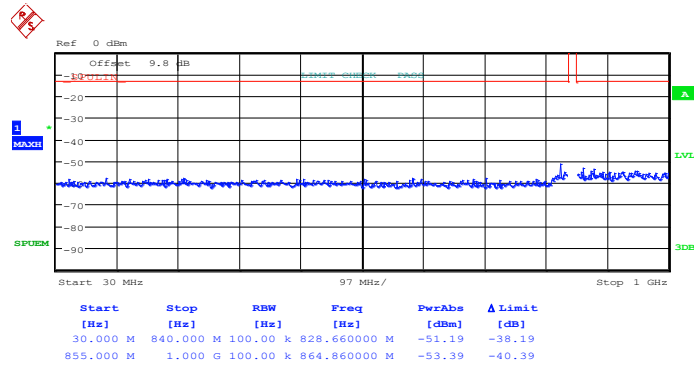


Date: 10.DEC.2012 16:16:59

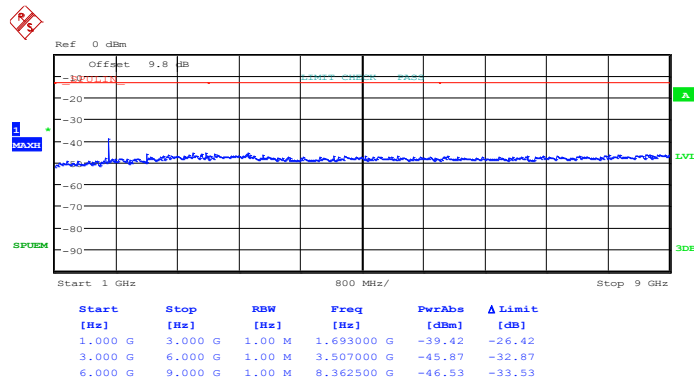


Date: 10.DEC.2012 16:17:48

16QAM (RB Size 1, RB Offset 49)



Date: 10.DEC.2012 16:17:25

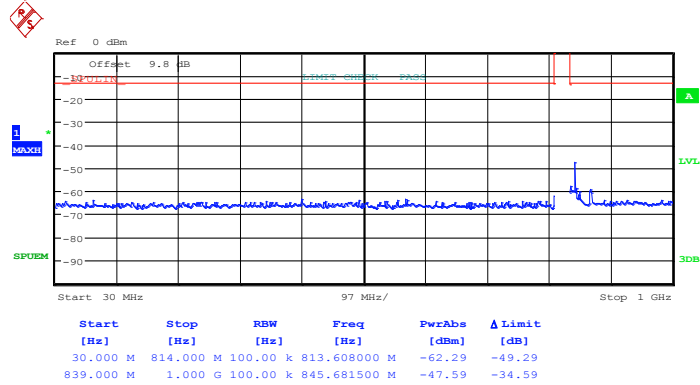


Date: 10.DEC.2012 16:17:58

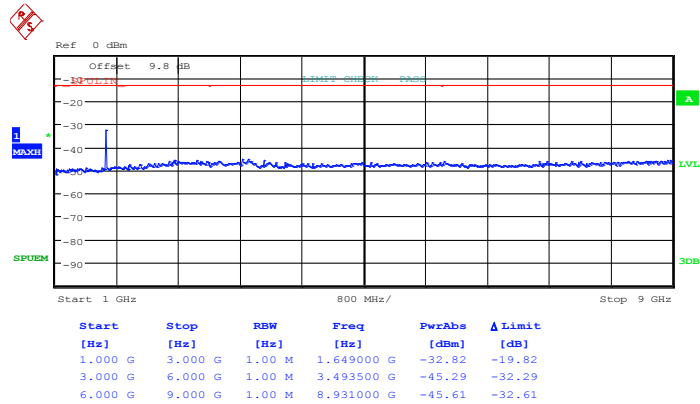




16QAM (RB Size 1, RB Offset 0)



Date: 19.NOV.2012 11:15:48

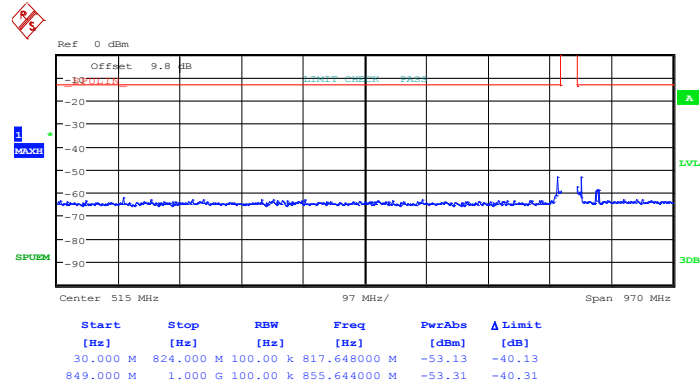


Date: 19.NOV.2012 11:32:38

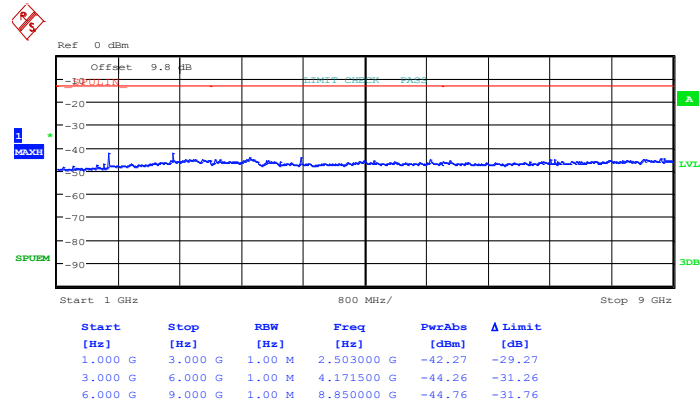


Band :	LTE Band 5	Channel :	CH20525 (Middle)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 0)



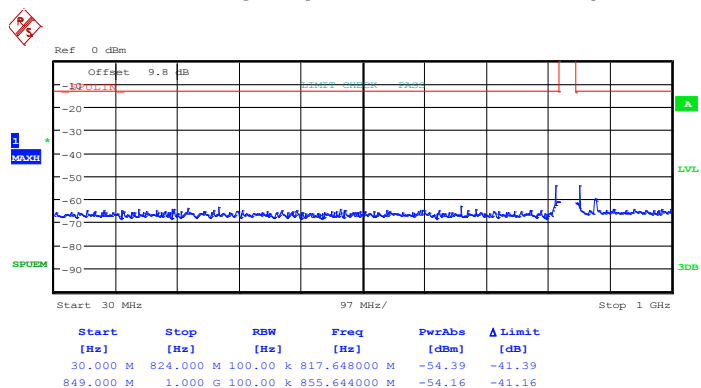
Date: 19.NOV.2012 11:18:38



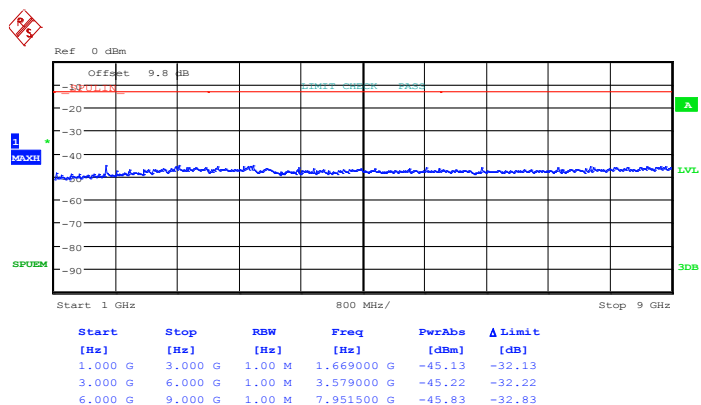
Date: 19.NOV.2012 11:31:19



16QAM (RB Size 1, RB Offset 0)



Date: 19.NOV.2012 11:19:00

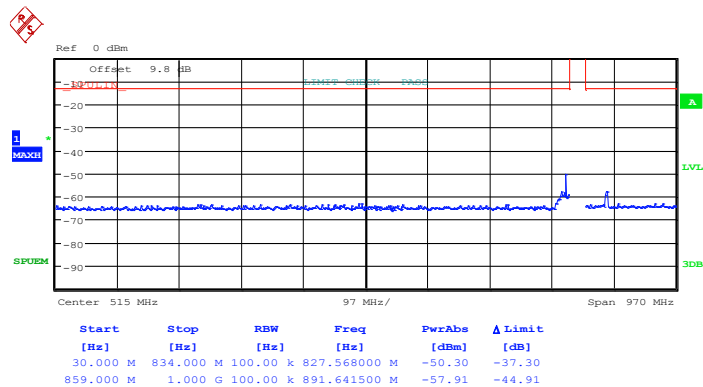


Date: 19.NOV.2012 11:31:48

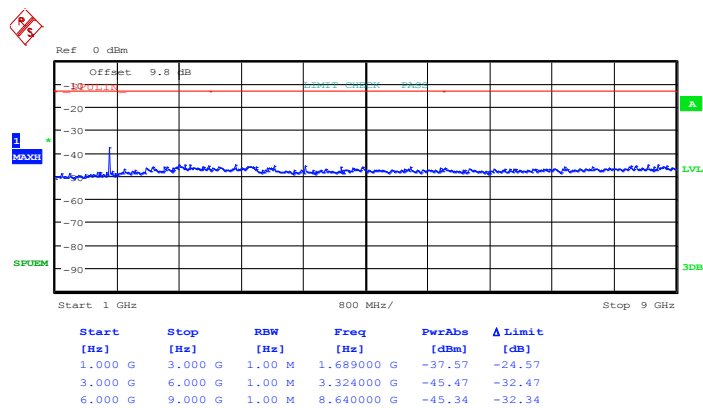


Band :	LTE Band 5	Channel :	CH20625 (High)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 0)

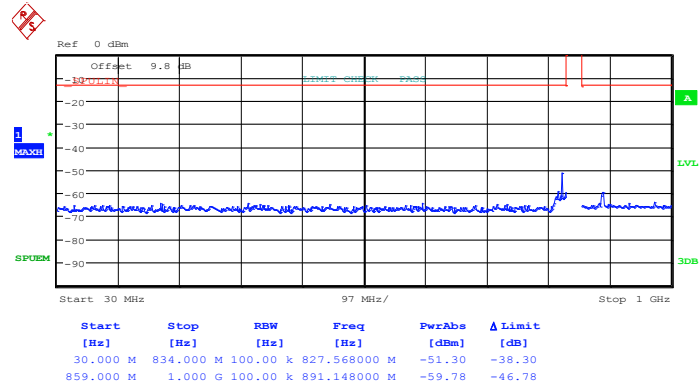


Date: 19.NOV.2012 11:21:17

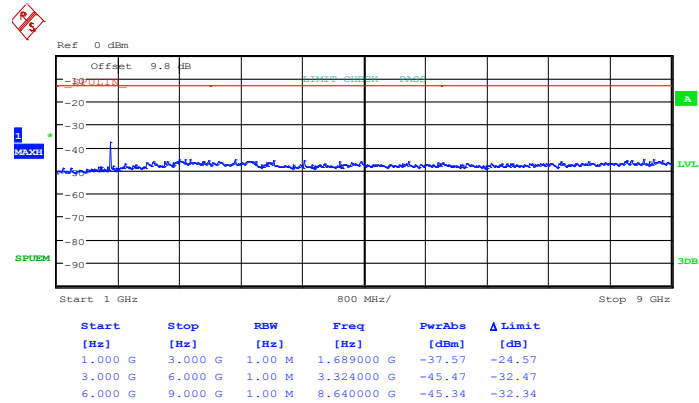


Date: 19.NOV.2012 11:29:51

16QAM (RB Size 1, RB Offset 0)



Date: 19.NOV.2012 11:21:36

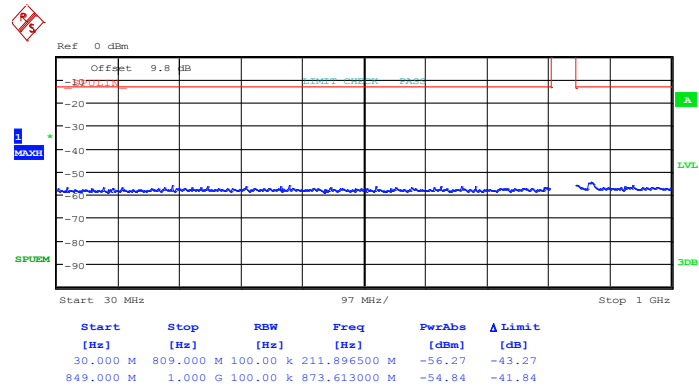


Date: 19.NOV.2012 11:29:51

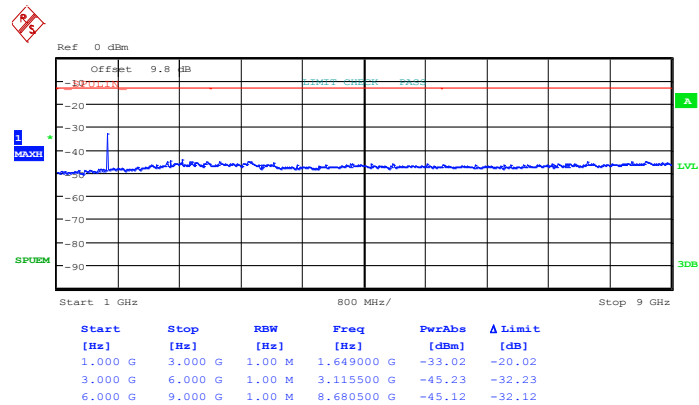


Band :	LTE Band 5	Channel :	CH20450 (Low)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 0)

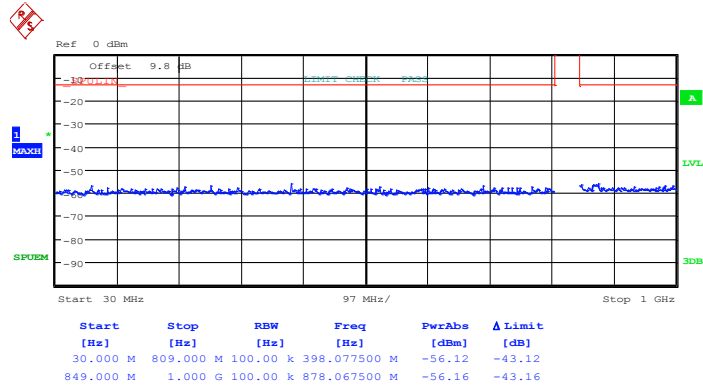


Date: 19.NOV.2012 11:36:14

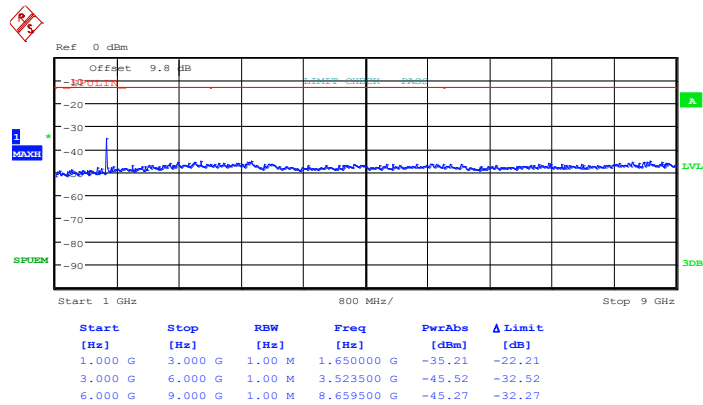


Date: 19.NOV.2012 11:48:59

16QAM (RB Size 1, RB Offset 0)



Date: 19.NOV.2012 11:37:02

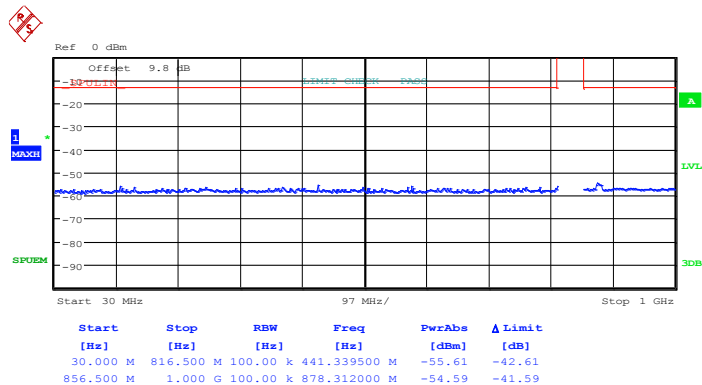


Date: 19.NOV.2012 11:49:17

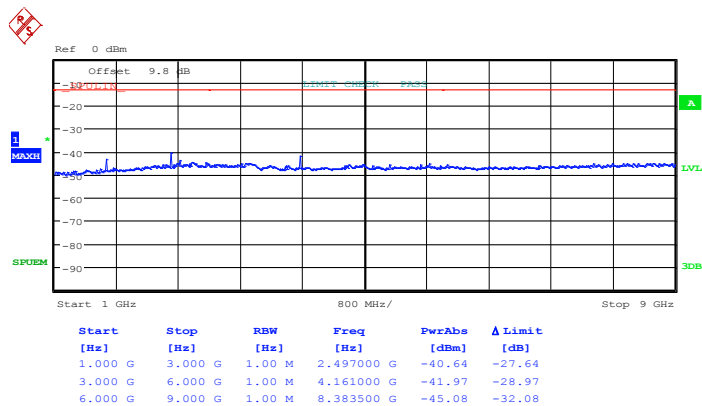


Band :	LTE Band 5	Channel :	CH20525 (Middle)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 0)



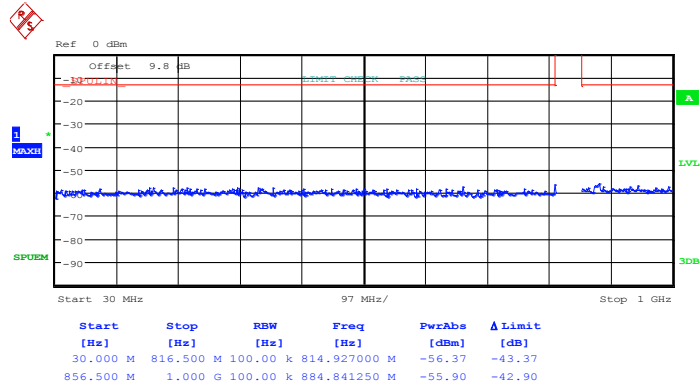
Date: 19.NOV.2012 11:42:36



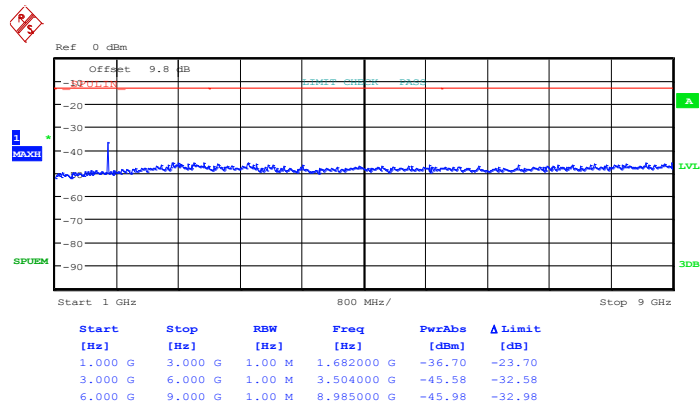
Date: 19.NOV.2012 11:47:08



16QAM (RB Size 1, RB Offset 49)



Date: 19.NOV.2012 11:42:48



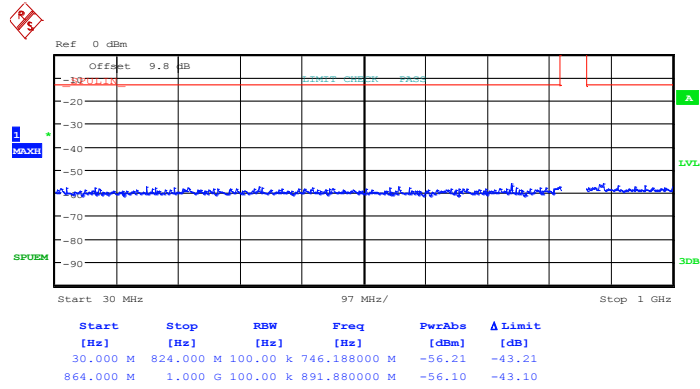
Date: 19.NOV.2012 11:47:59



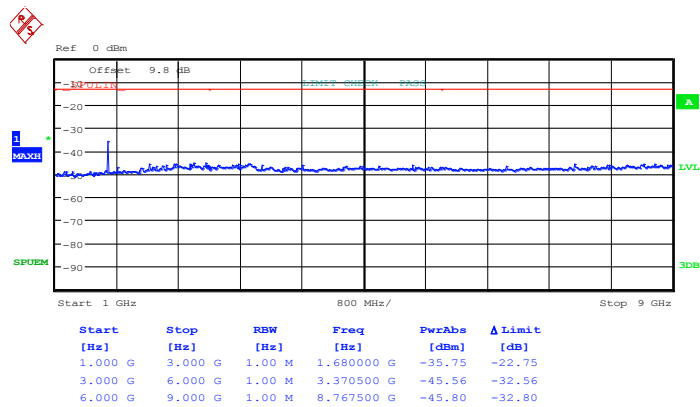
QPSK (RB Size 1, RB Offset 0)



16QAM (RB Size 1, RB Offset 0)



Date: 19.NOV.2012 11:45:12

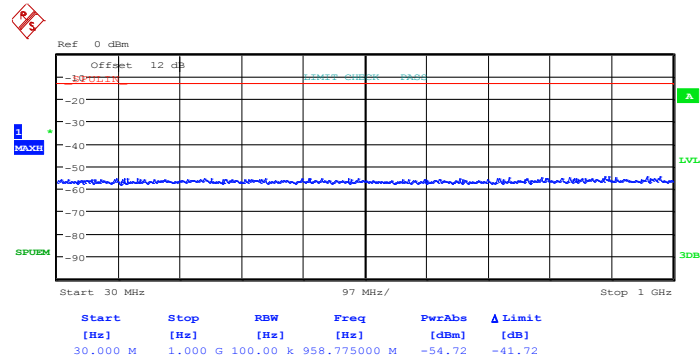


Date: 19.NOV.2012 11:46:23

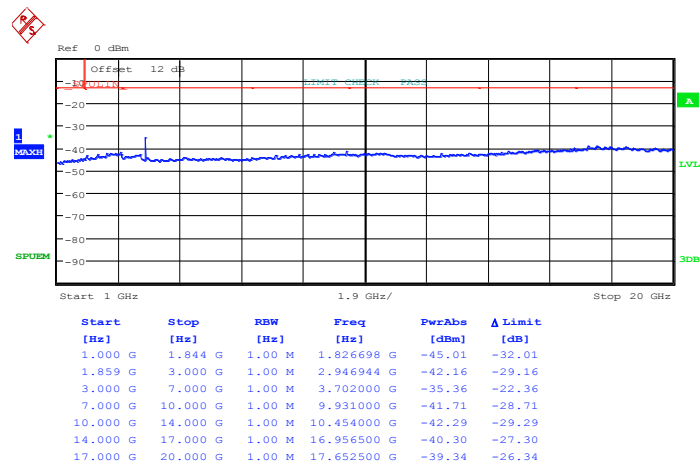


Band :	LTE Band 2	Channel :	CH18615 (Low)
Band Width :	3MHz		

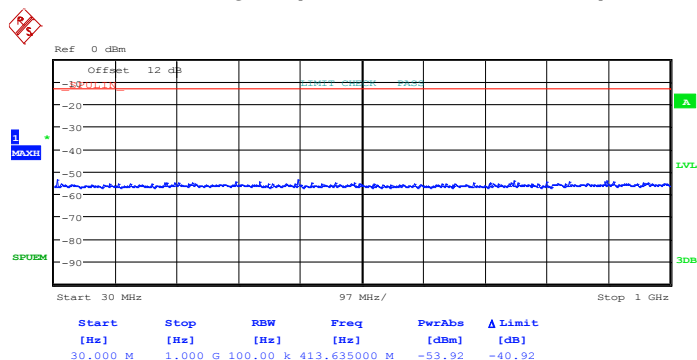
QPSK (RB Size 1, RB Offset 7)



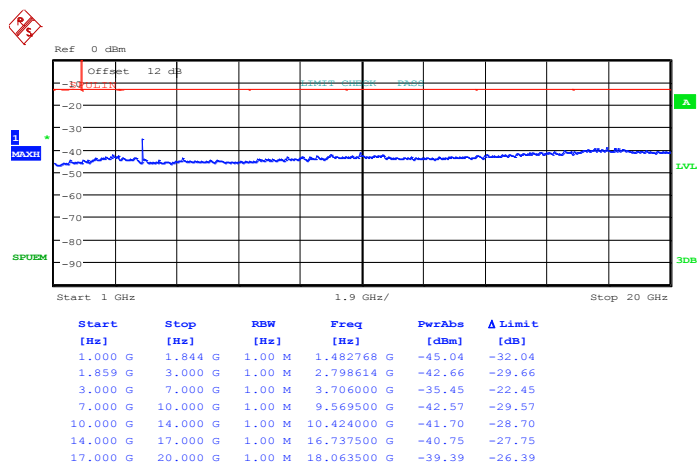
Date: 10.DEC.2012 15:18:04



Date: 10.DEC.2012 15:17:06



Date: 10.DEC.2012 15:17:54

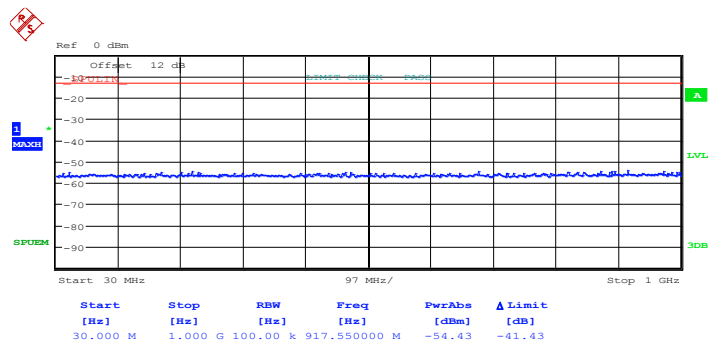


Date: 10.DEC.2012 15:17:24

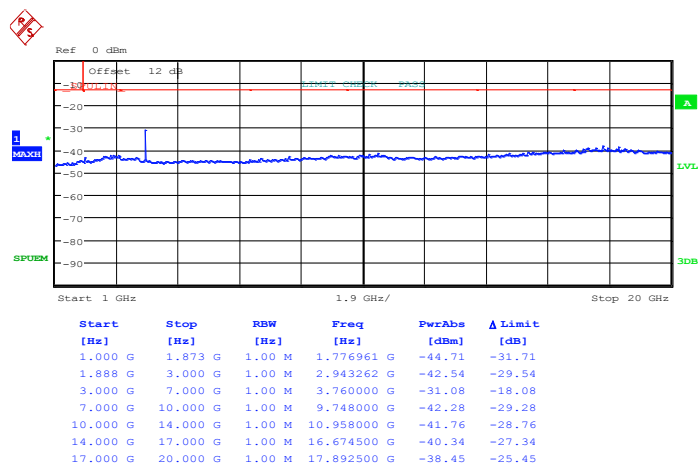


Band :	LTE Band 2	Channel :	CH18900 (Middle)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 7)



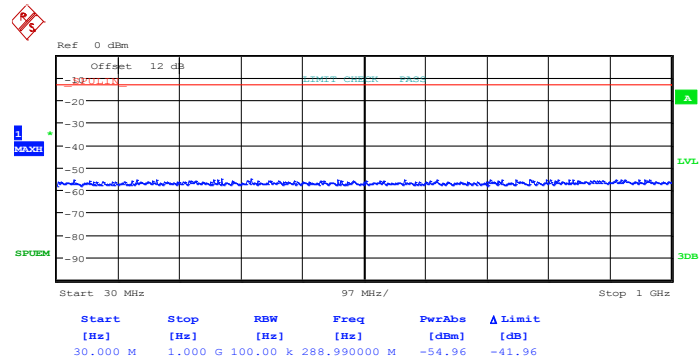
Date: 10.DEC.2012 15:20:08



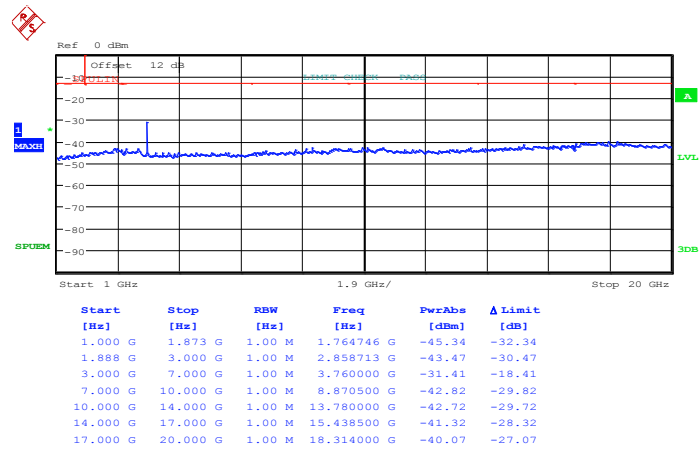
Date: 10.DEC.2012 15:21:37



16QAM (RB Size 1, RB Offset 7)



Date: 10.DEC.2012 15:20:15

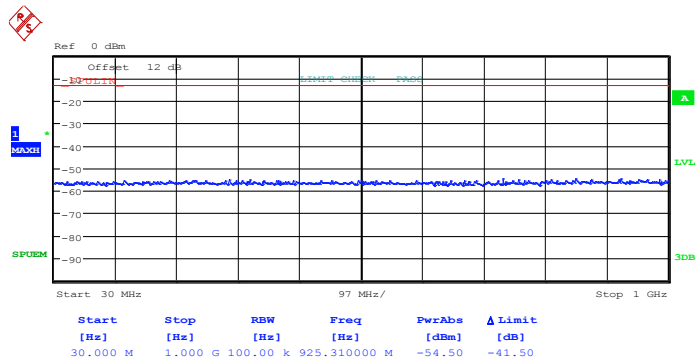


Date: 10.DEC.2012 15:21:49

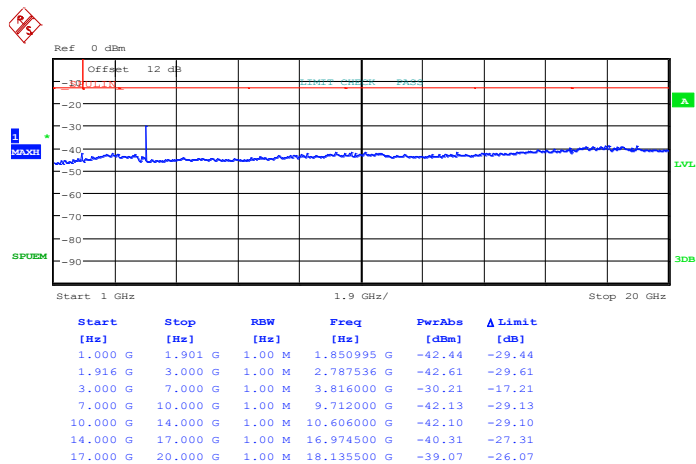


Band :	LTE Band 2	Channel :	CH19185 (High)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 7)



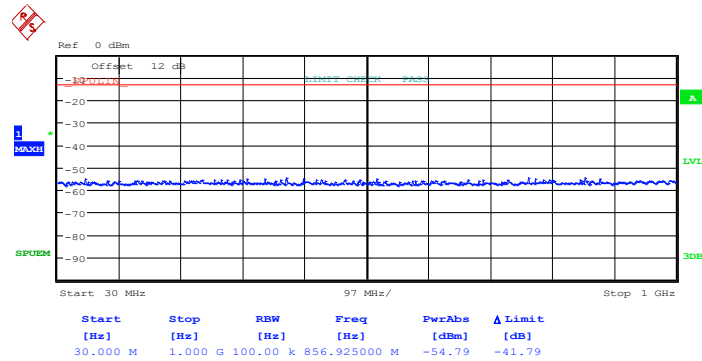
Date: 10,DEC,2012 15:24:21



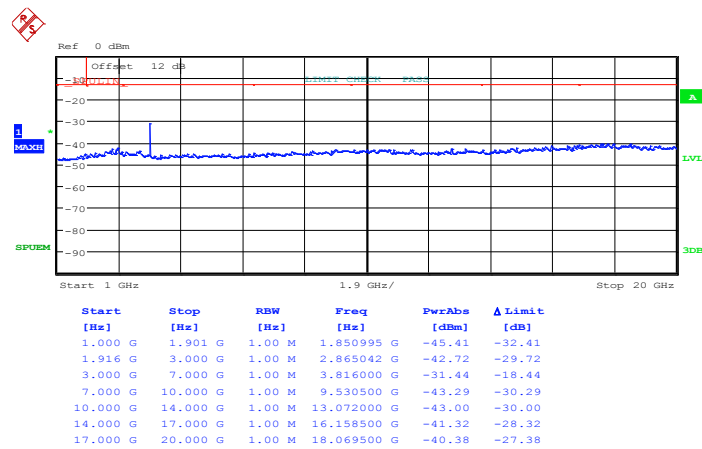
Date: 10,DEC,2012 15:23:43



16QAM (RB Size 1, RB Offset 7)



Date: 10.DEC.2012 15:24:29

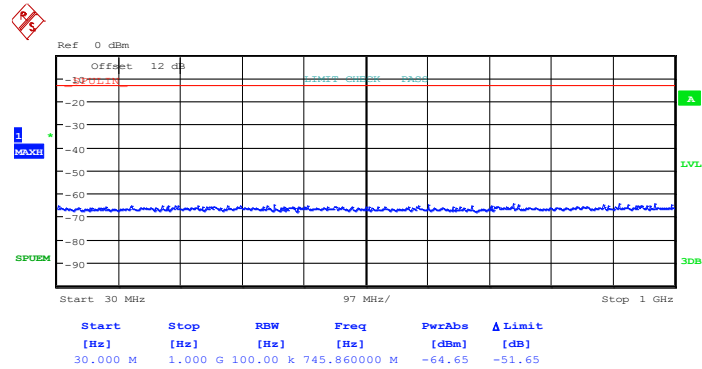


Date: 10.DEC.2012 15:23:56

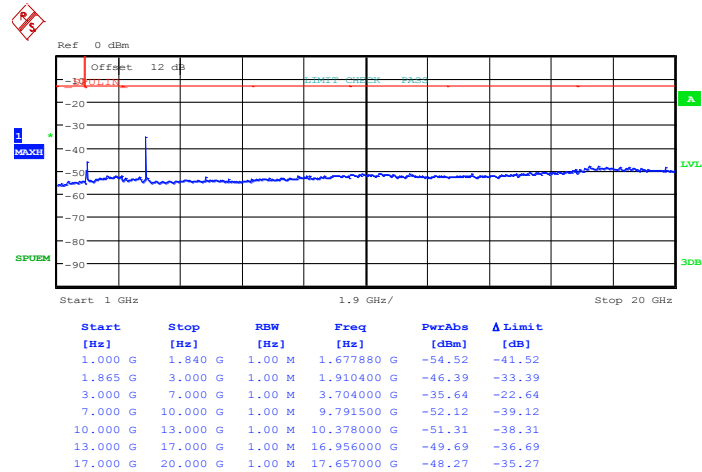


Band :	LTE Band 2	Channel :	CH18625 (Low)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 12)

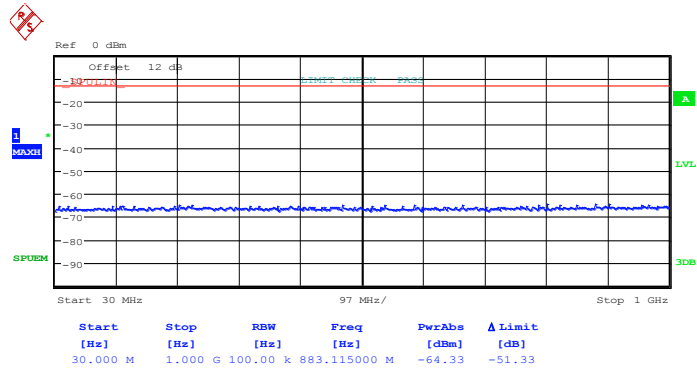


Date: 19.NOV.2012 09:54:53

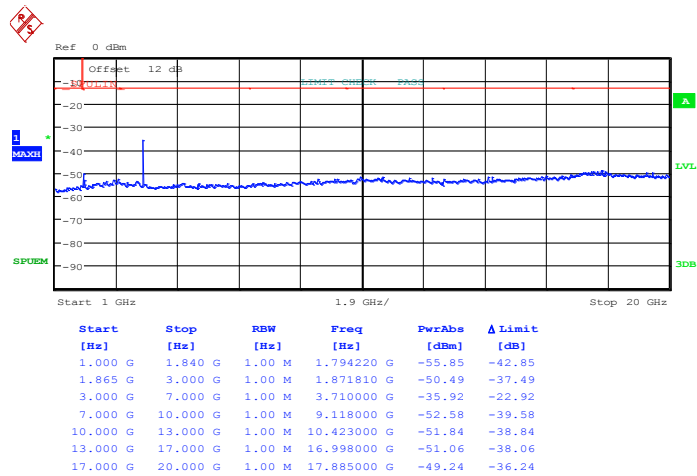


Date: 19.NOV.2012 09:53:01

16QAM (RB Size 1, RB Offset 24)



Date: 19.NOV.2012 09:54:21

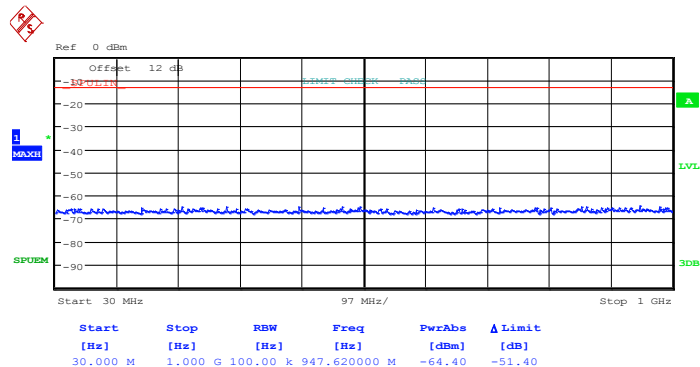


Date: 19.NOV.2012 09:53:52

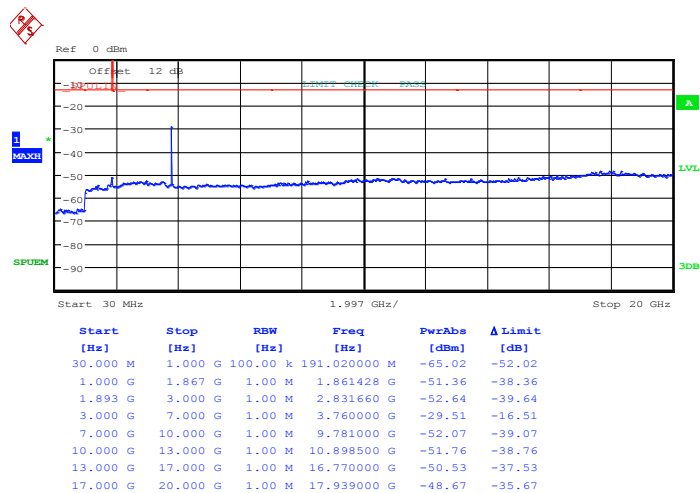


Band :	LTE Band 2	Channel :	CH18900 (Middle)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 12)



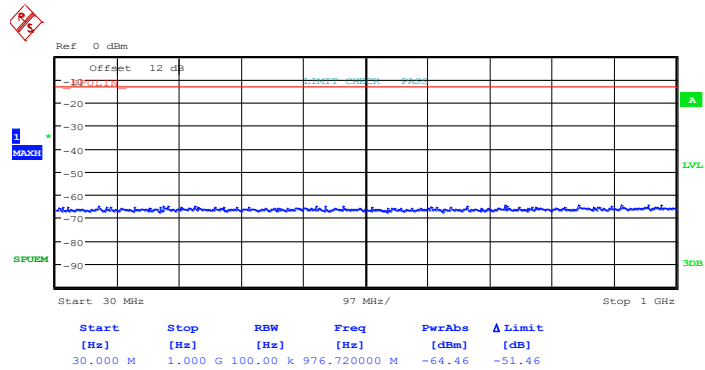
Date: 19.NOV.2012 09:58:20



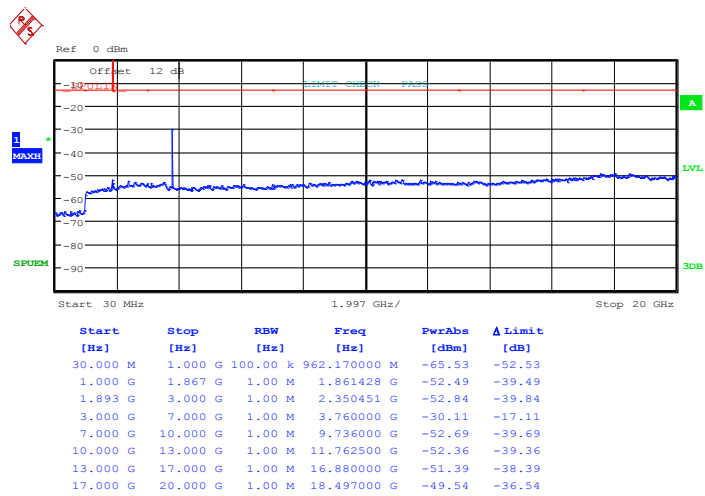
Date: 19.NOV.2012 09:56:51



16QAM (RB Size 1, RB Offset 12)



Date: 19.NOV.2012 09:57:57

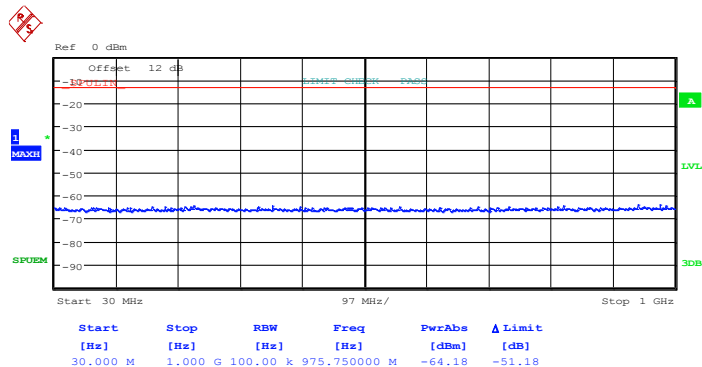


Date: 19.NOV.2012 09:57:30

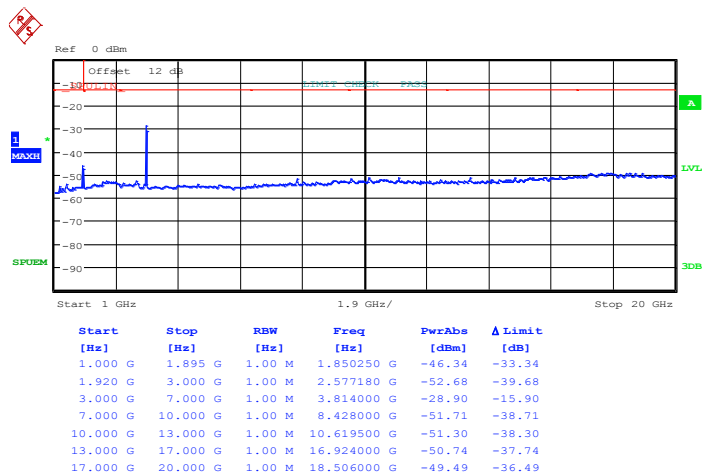


Band :	LTE Band 2	Channel :	CH19175 (High)
Band Width :	5MHz		

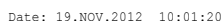
QPSK (RB Size 1, RB Offset 12)



Date: 19.NOV.2012 09:59:52



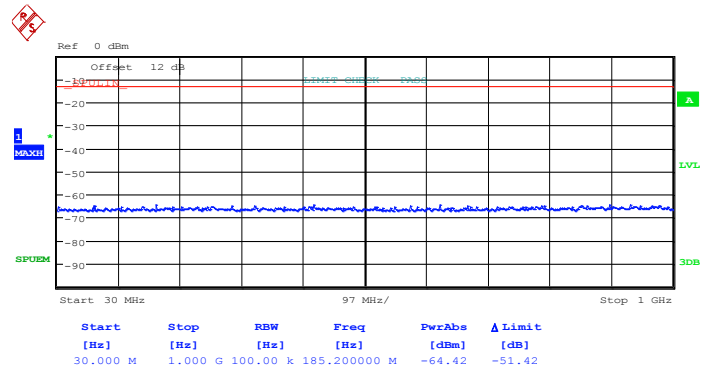
Date: 19.NOV.2012 10:01:20



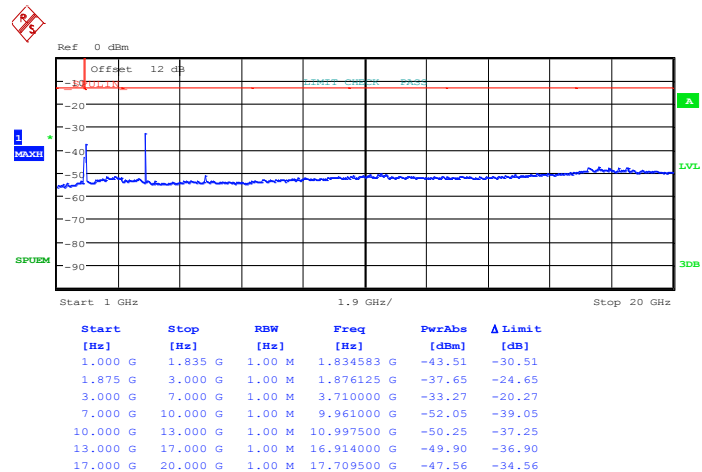


Band :	LTE Band 2	Channel :	CH18650 (Low)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 24)



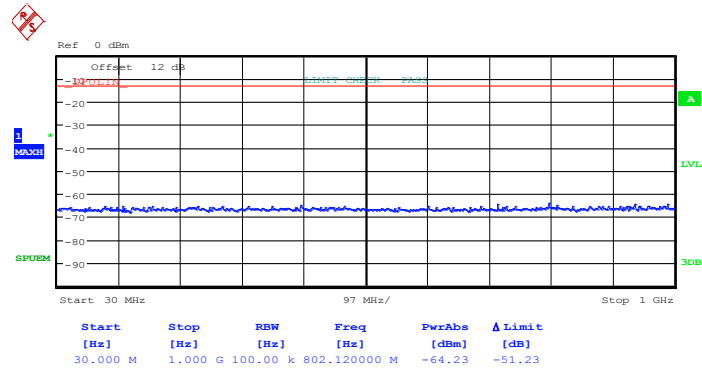
Date: 19.NOV.2012 10:30:11



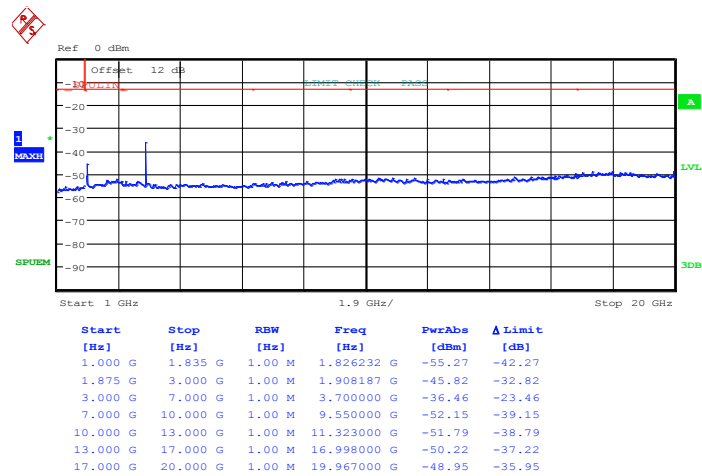
Date: 19.NOV.2012 10:07:10



16QAM (RB Size 1, RB Offset 0)



Date: 19.NOV.2012 10:30:26

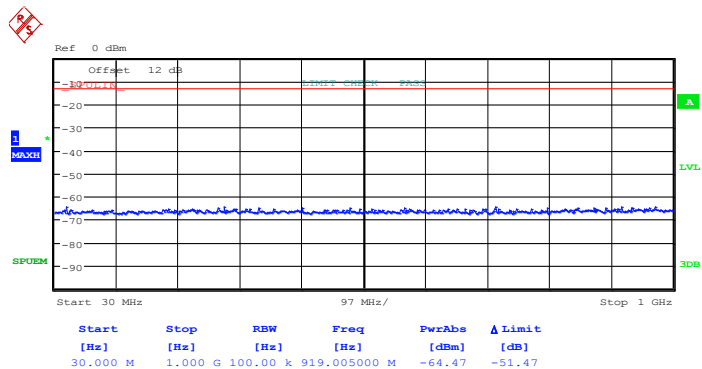


Date: 19.NOV.2012 10:07:52

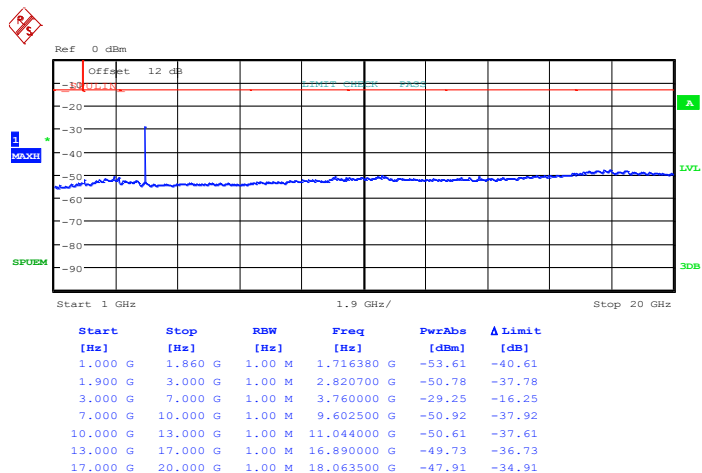


Band :	LTE Band 2	Channel :	CH18900 (Middle)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 24)

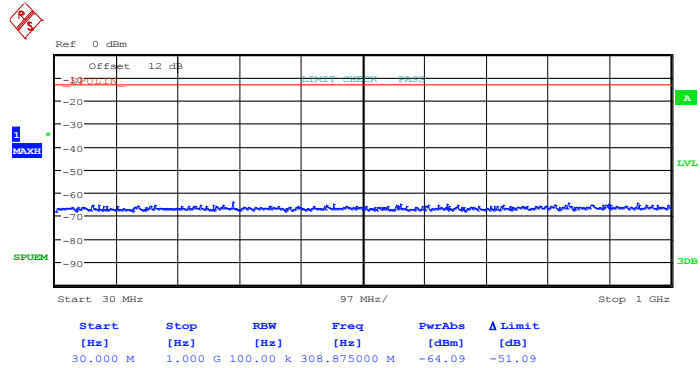


Date: 19.NOV.2012 10:27:20

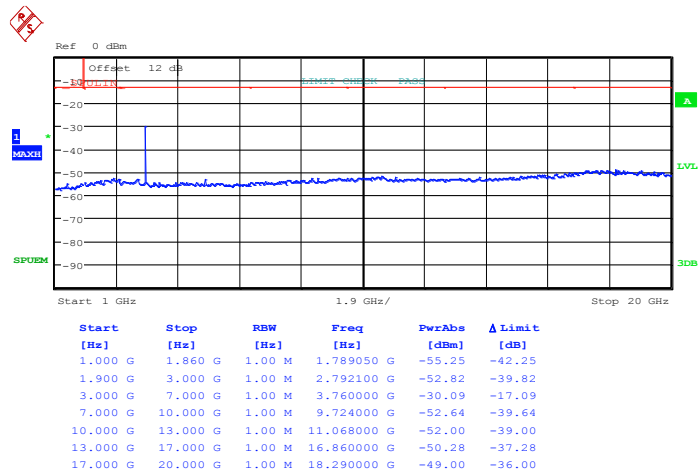


Date: 19.NOV.2012 10:13:32

16QAM (RB Size 1, RB Offset 24)



Date: 19.NOV.2012 10:27:30

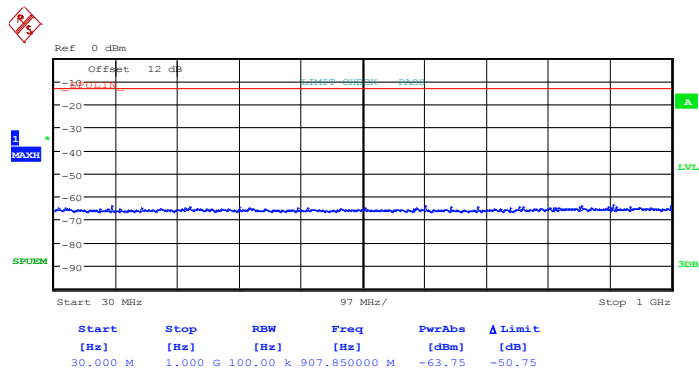


Date: 19.NOV.2012 10:14:54

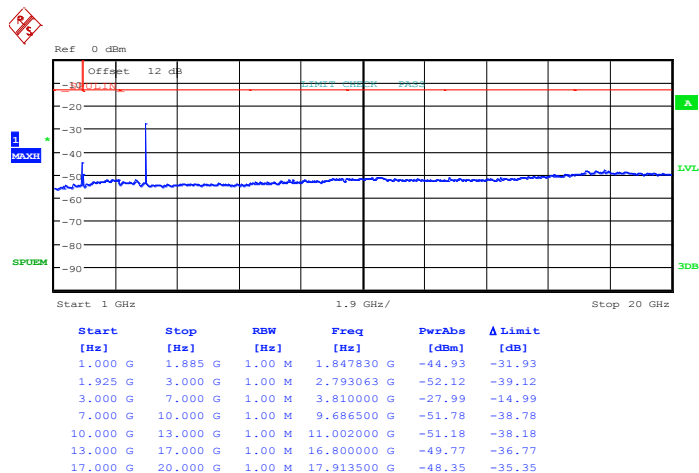


Band :	LTE Band 2	Channel :	CH19150 (High)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 24)



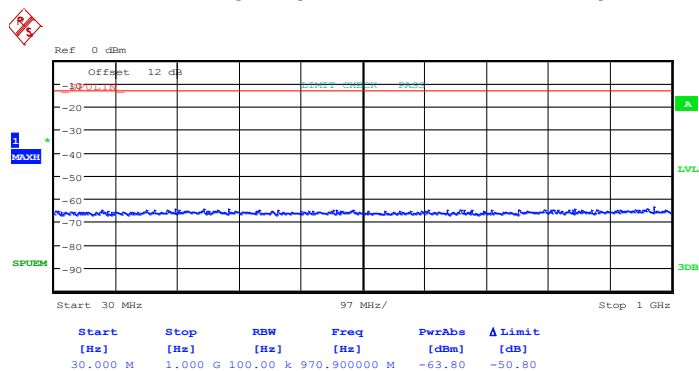
Date: 19.NOV.2012 10:22:16



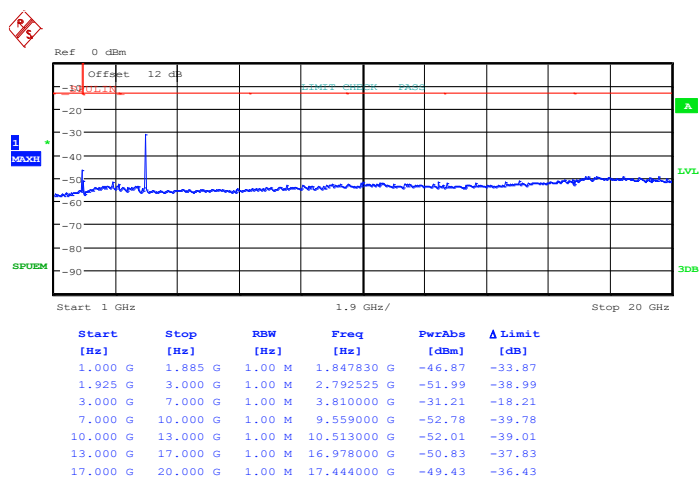
Date: 19.NOV.2012 10:20:13



16QAM (RB Size 1, RB Offset 24)



Date: 19.NOV.2012 10:27:03

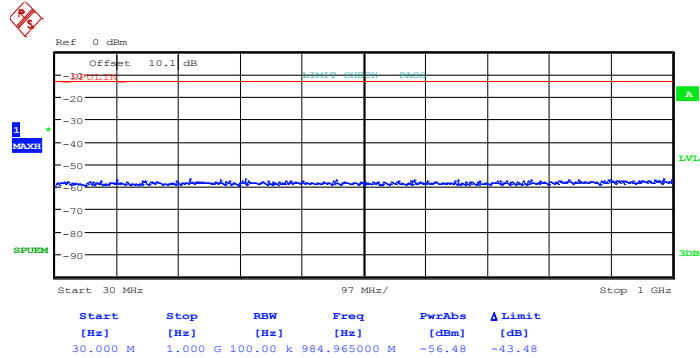


Date: 19.NOV.2012 10:20:39

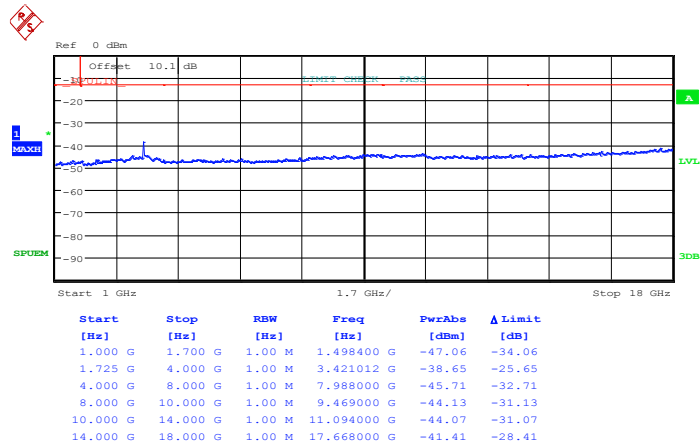


Band :	LTE Band 4	Channel :	CH19975 (Low)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 0)



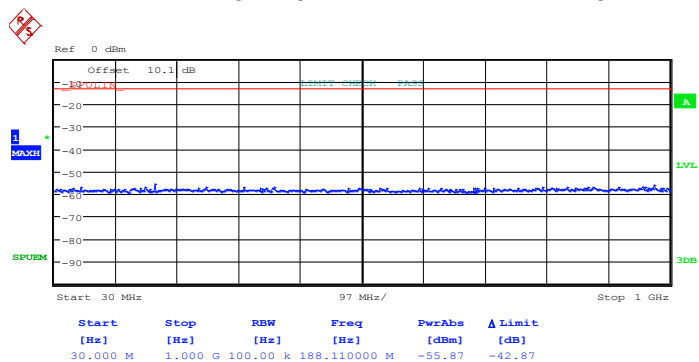
Date: 5.NOV.2012 20:14:42



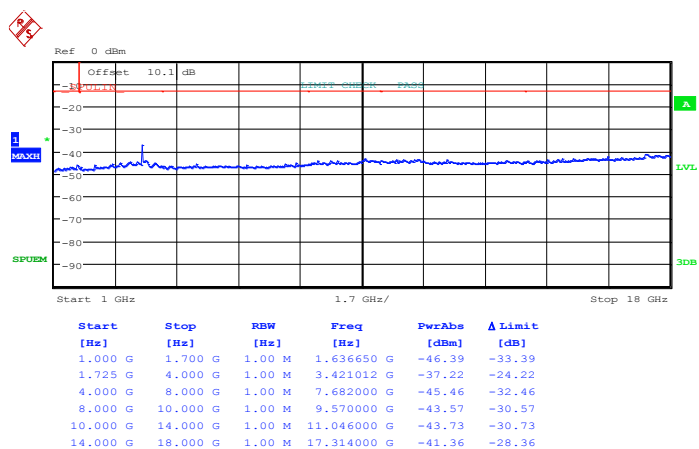
Date: 5.NOV.2012 20:14:09



16QAM (RB Size 1, RB Offset 24)



Date: 5.NOV.2012 20:15:07

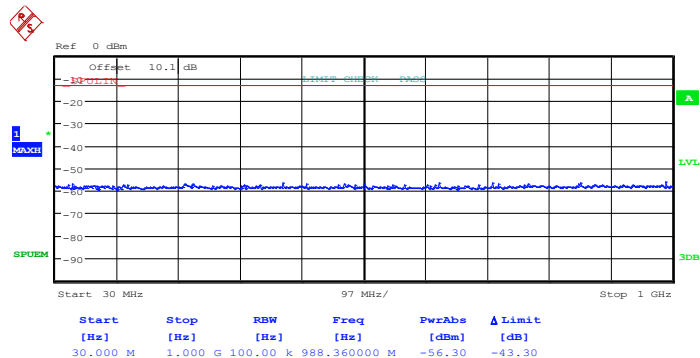


Date: 5.NOV.2012 20:13:38

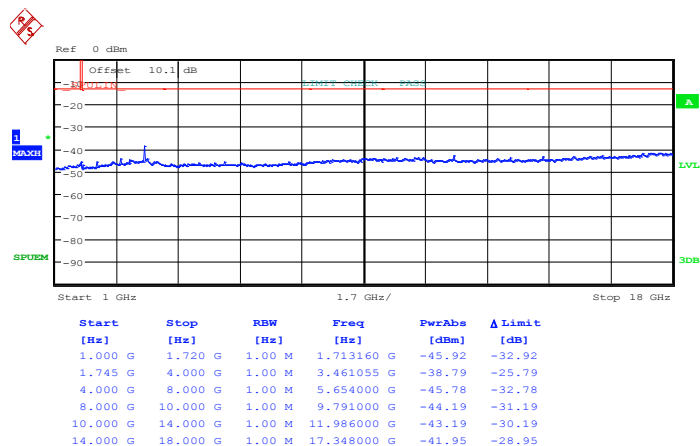


Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	5MHz		

QPSK (RB Size 12, RB Offset 6)

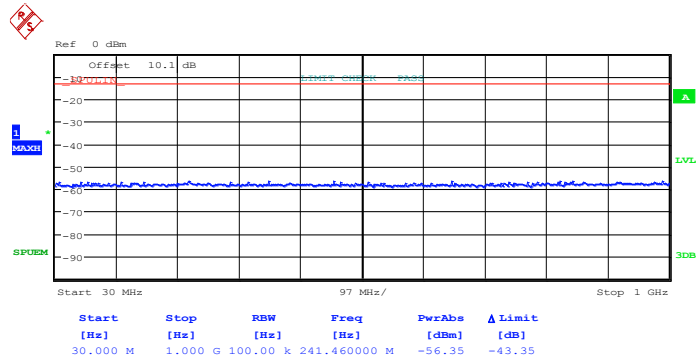


Date: 5.NOV.2012 20:09:41

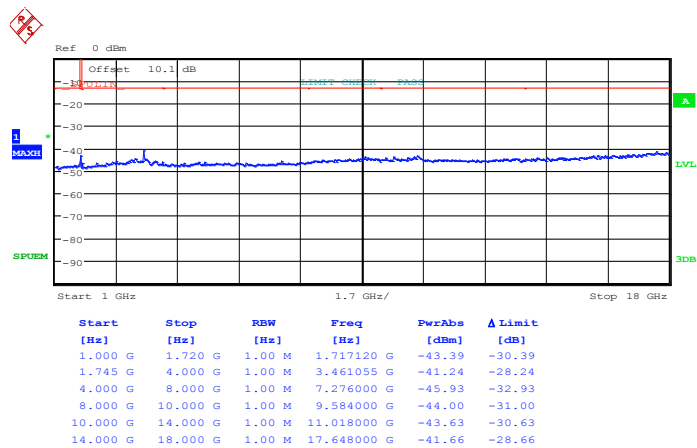


Date: 5.NOV.2012 20:11:09

16QAM (RB Size 1, RB Offset 24)



Date: 5.NOV.2012 20:09:11



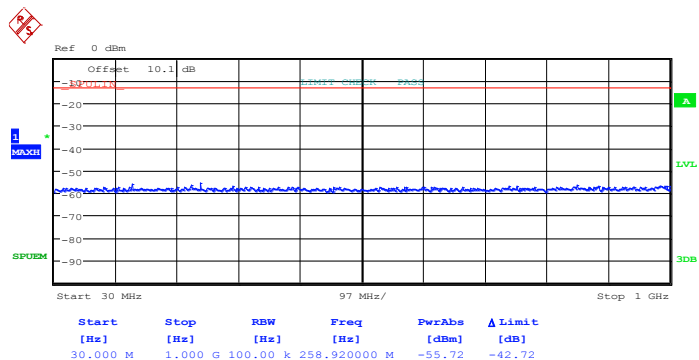
Date: 5.NOV.2012 20:11:32



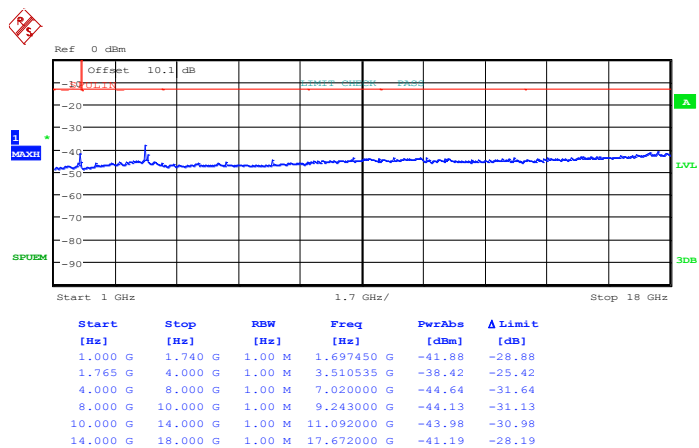
QPSK (RB Size 1, RB Offset 0)



QPSK (RB Size 1, RB Offset 0)



Date: 5.NOV.2012 20:18:07

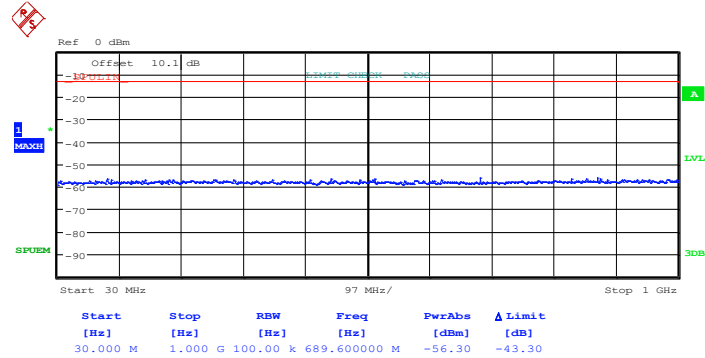


Date: 5.NOV.2012 20:18:51

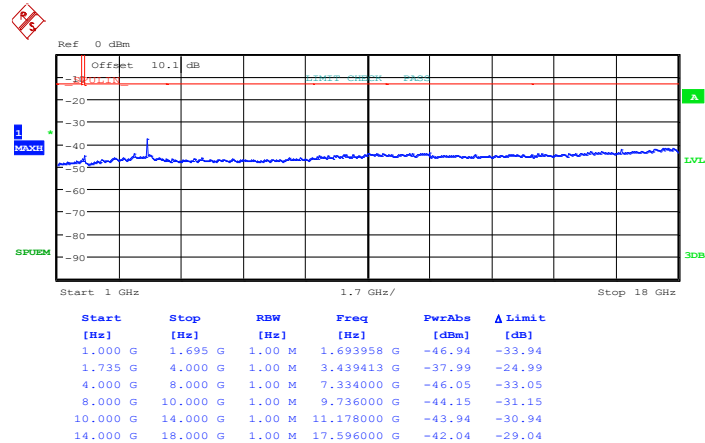


Band :	LTE Band 4	Channel :	CH20000 (Low)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)



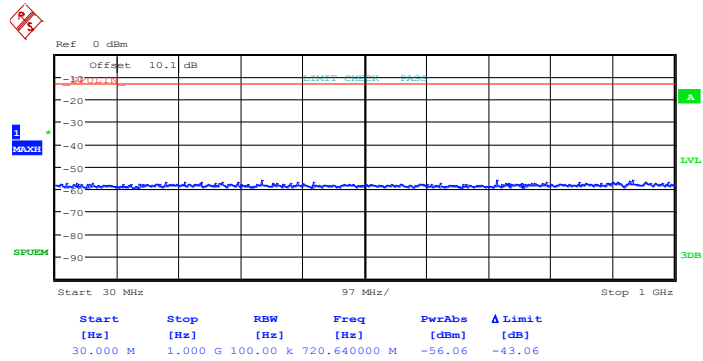
Date: 5.NOV.2012 20:32:37



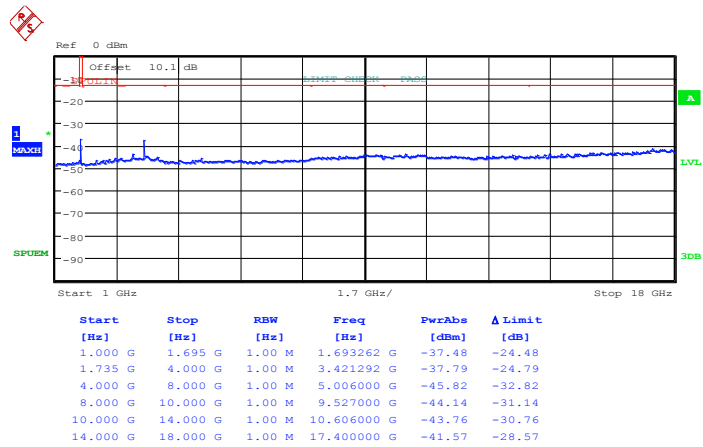
Date: 5.NOV.2012 20:34:01



16QAM (RB Size 1, RB Offset 0)



Date: 5.NOV.2012 20:33:01

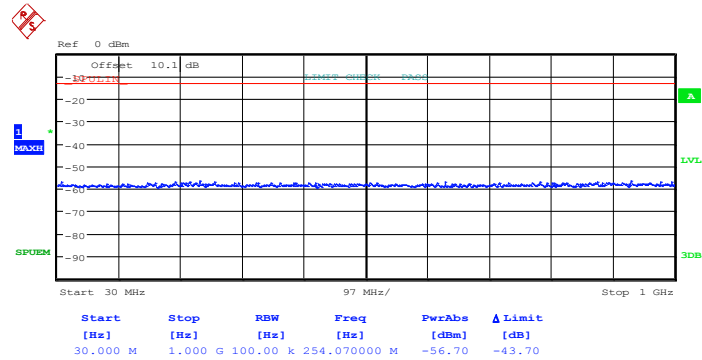


Date: 5.NOV.2012 20:33:35

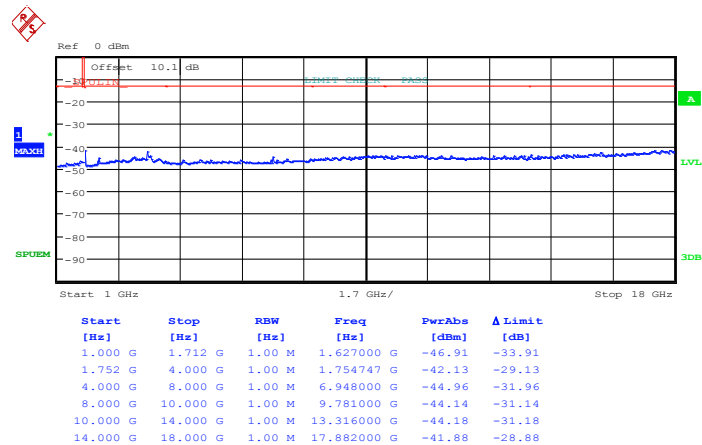


Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)

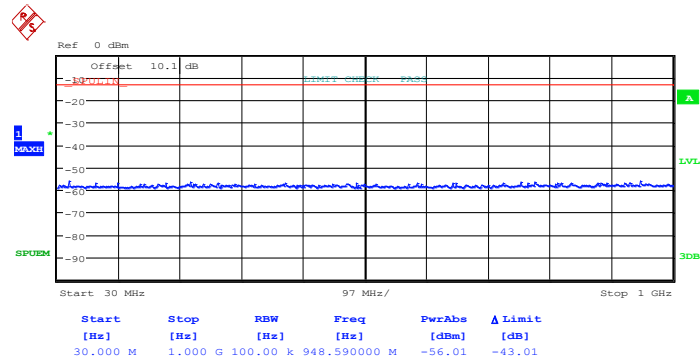


Date: 5.NOV.2012 20:31:11

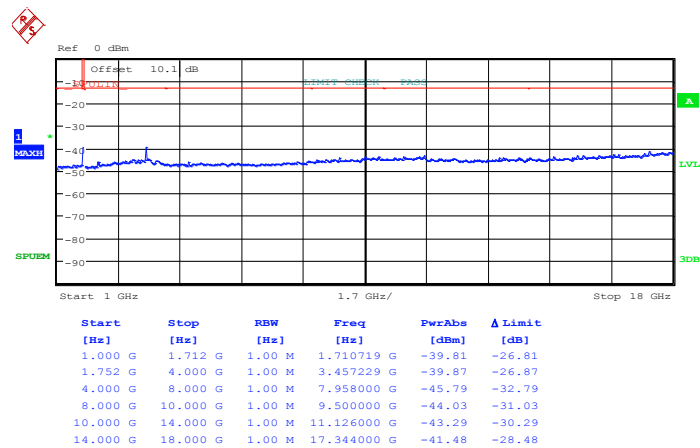


Date: 5.NOV.2012 20:29:38

QPSK (RB Size 1, RB Offset 0)



Date: 5.NOV.2012 20:30:42

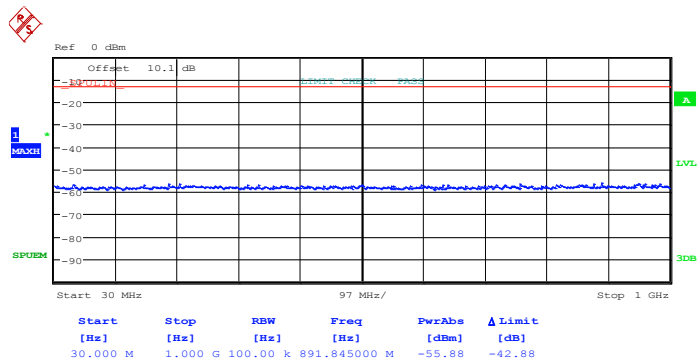


Date: 5.NOV.2012 20:30:08

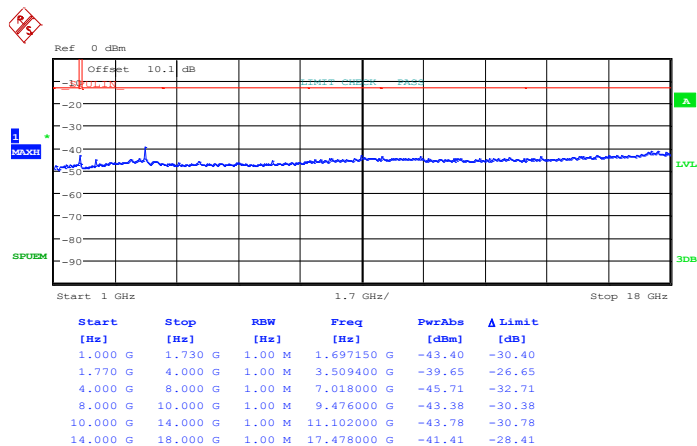


Band :	LTE Band 4	Channel :	CH20375 (High)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 0)

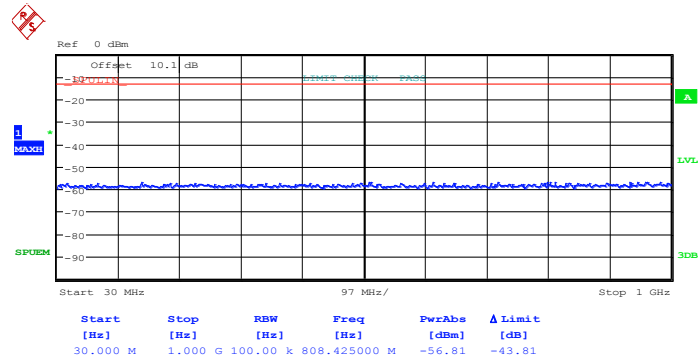


Date: 5.NOV.2012 20:37:40

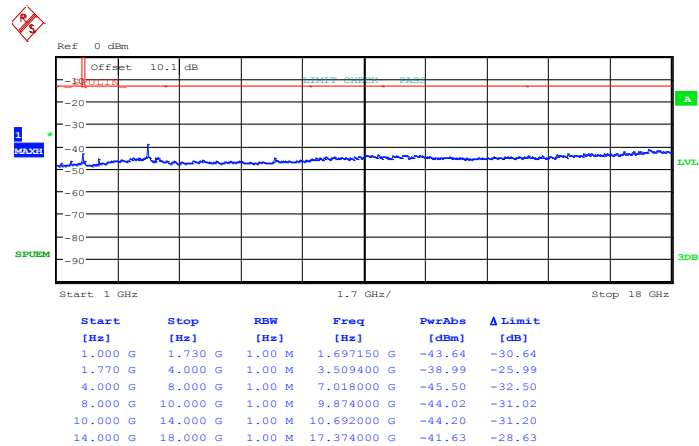


Date: 5.NOV.2012 20:28:01

16QAM (RB Size 1, RB Offset 0)



Date: 5.NOV.2012 20:38:01

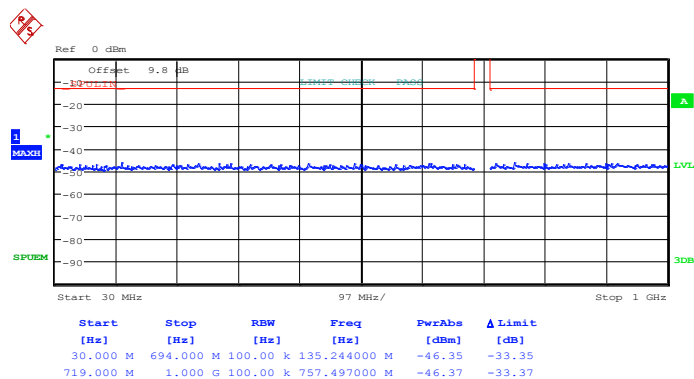


Date: 5.NOV.2012 20:27:43

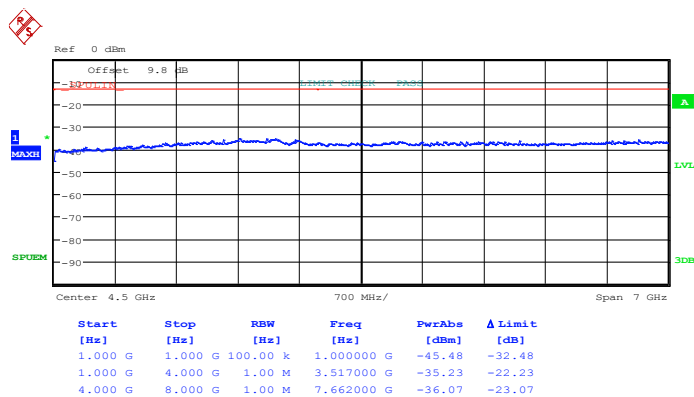


Band :	LTE Band 17	Channel :	CH23755 (Low)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 0)



Date: 5.NOV.2012 21:46:53



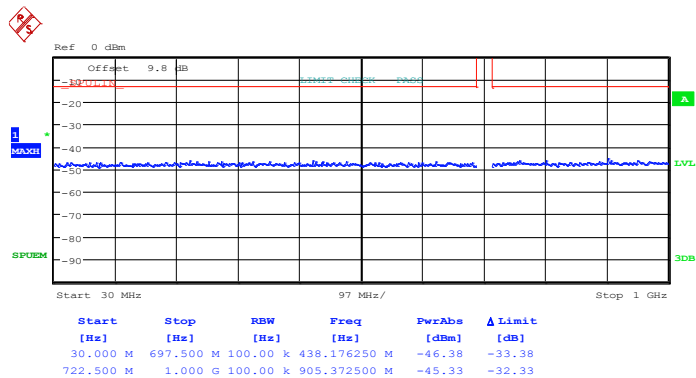
Date: 5.NOV.2012 21:41:36



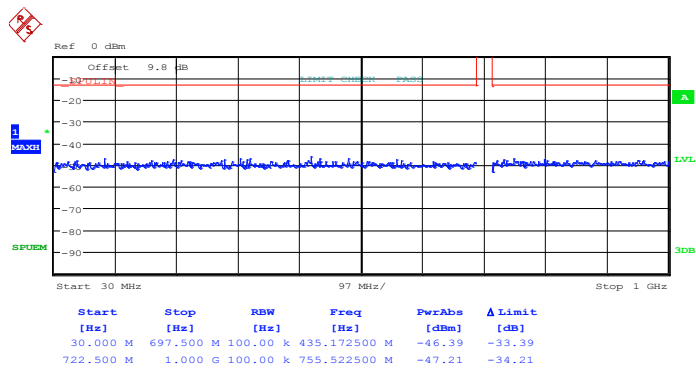


Band :	LTE Band 17	Channel :	CH23790 (Middle)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 24)



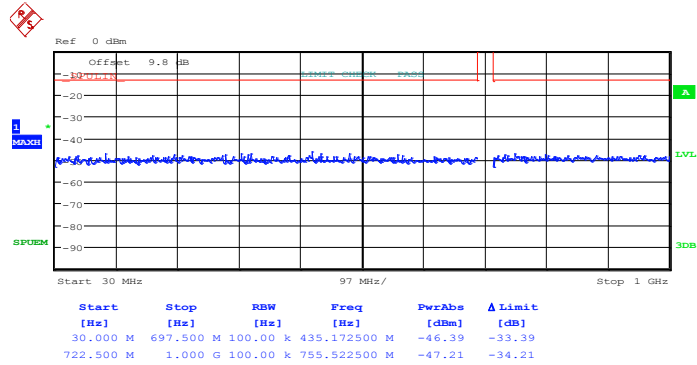
Date: 5.NOV.2012 21:47:52



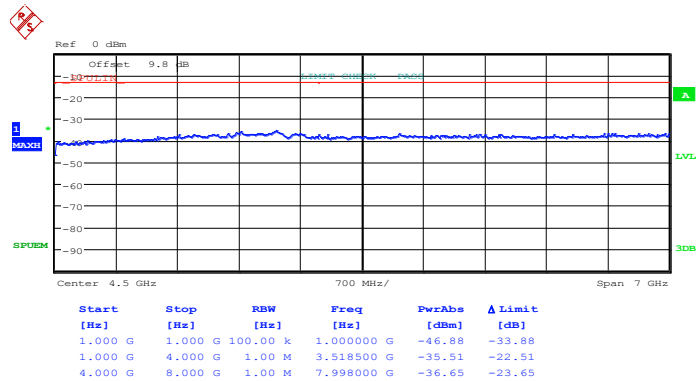
Date: 5.NOV.2012 21:48:08



16QAM (RB Size 1, RB Offset 24)



Date: 5.NOV.2012 21:48:08

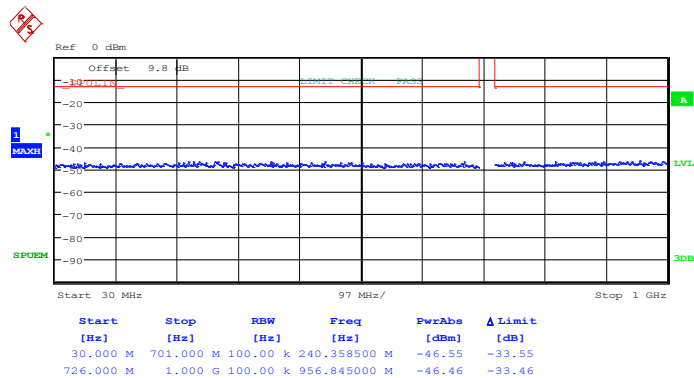


Date: 5.NOV.2012 21:42:57

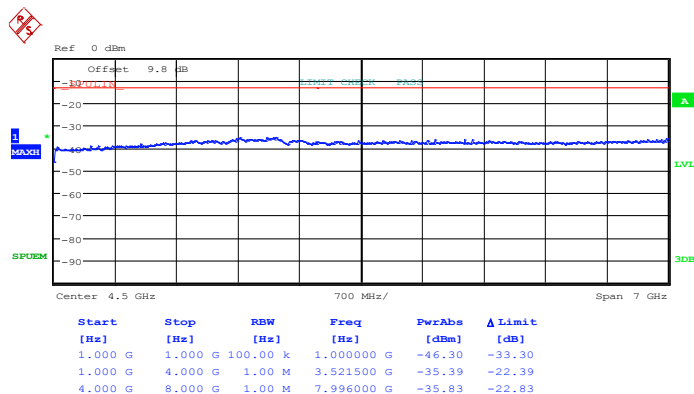


Band :	LTE Band 17	Channel :	CH23825 (High)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 24)



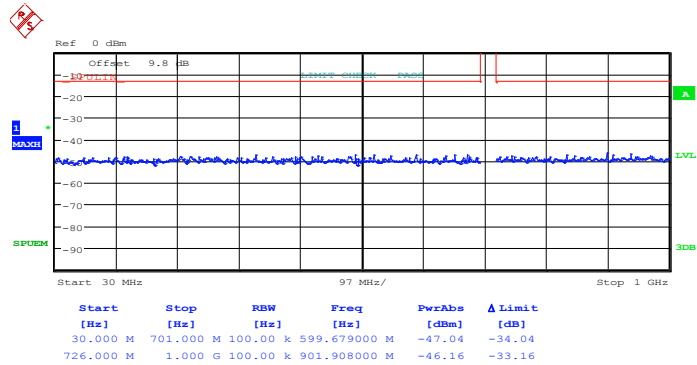
Date: 5.NOV.2012 21:49:28



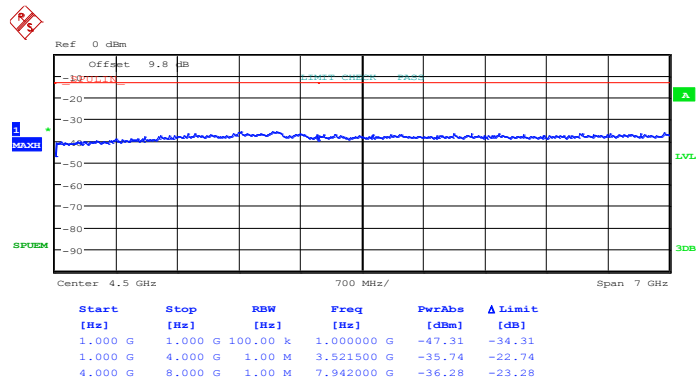
Date: 5.NOV.2012 21:43:13



16QAM (RB Size 1, RB Offset 24)



Date: 5.NOV.2012 21:49:41

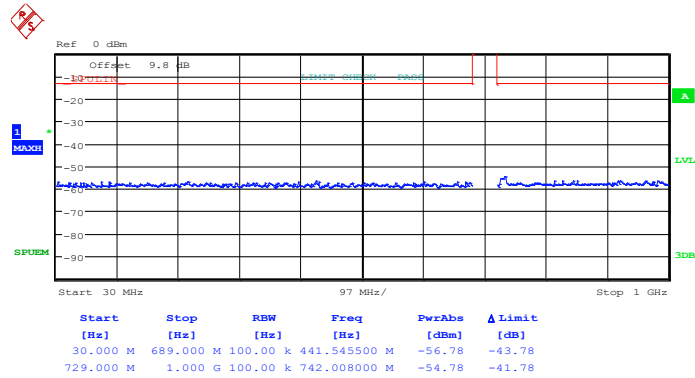


Date: 5.NOV.2012 21:43:30

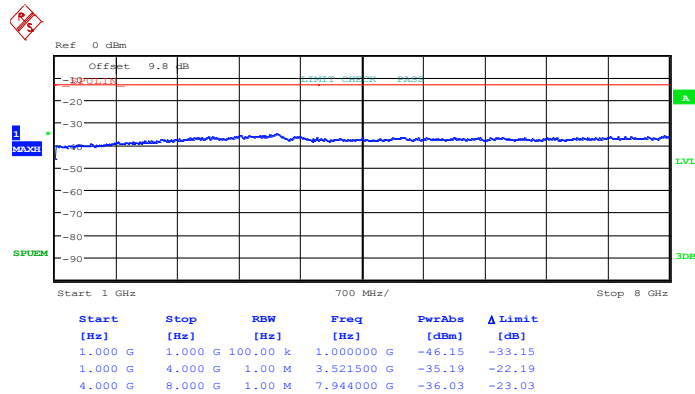


Band :	LTE Band 17	Channel :	CH23755 (Low)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 0)



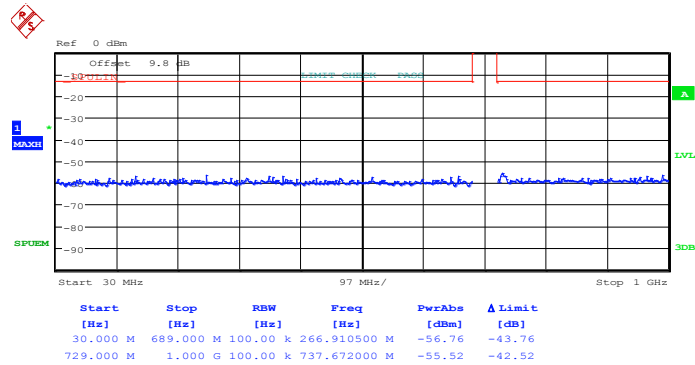
Date: 5.NOV.2012 21:36:20



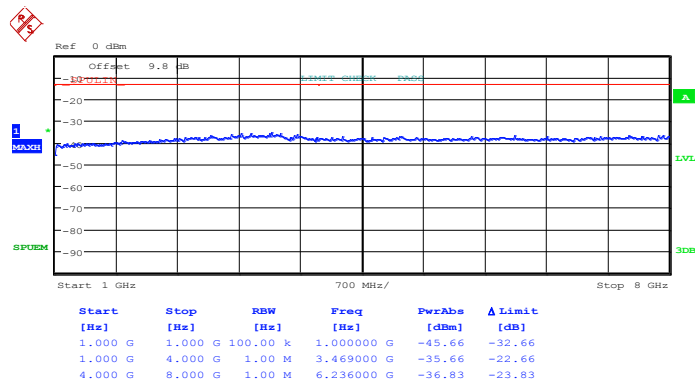
Date: 5.NOV.2012 21:39:09



16QAM (RB Size 1, RB Offset 0)



Date: 5.NOV.2012 21:36:31

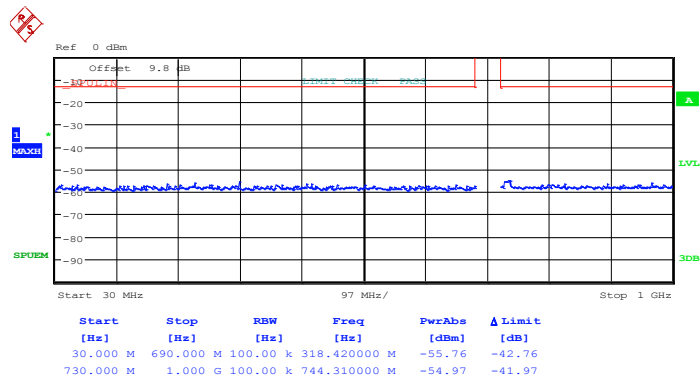


Date: 5.NOV.2012 21:39:23

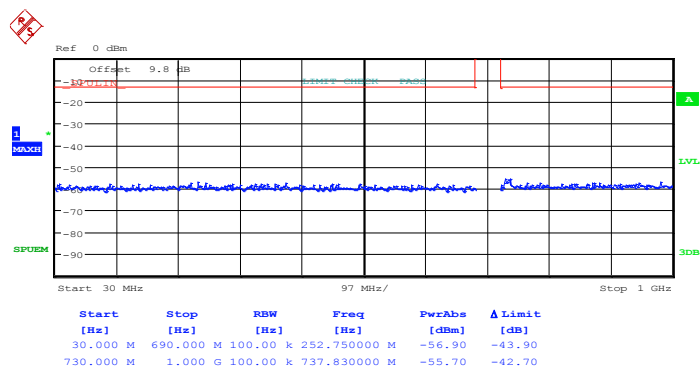


Band :	LTE Band 17	Channel :	CH23790 (Middle)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)

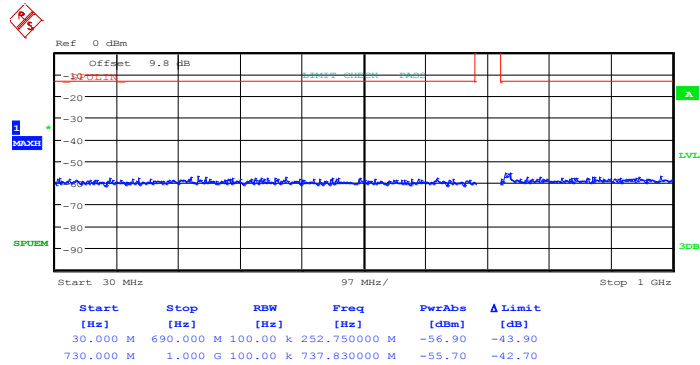


Date: 5.NOV.2012 21:35:03

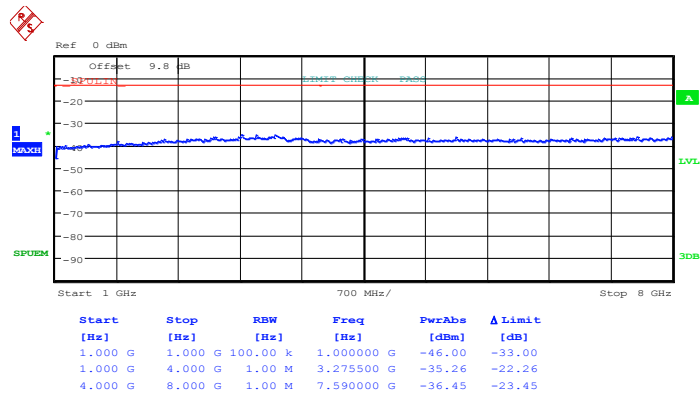


Date: 5.NOV.2012 21:35:29

16QAM (RB Size 1, RB Offset 49)



Date: 5.NOV.2012 21:35:29

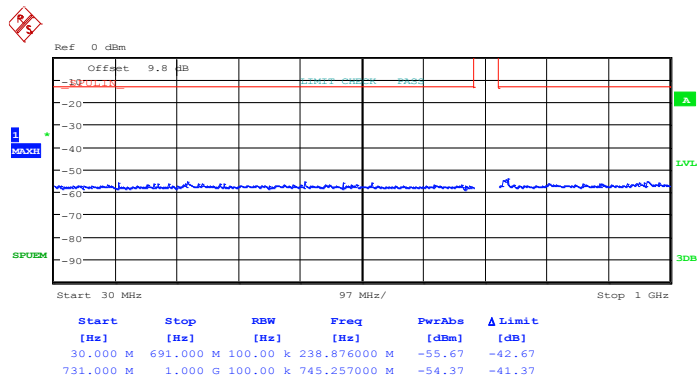


Date: 5.NOV.2012 21:40:05

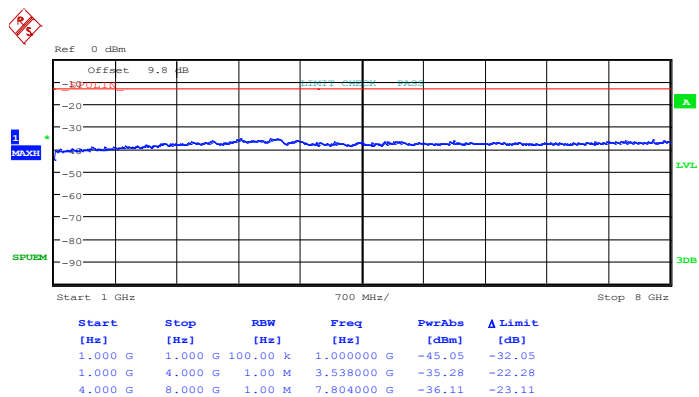


Band :	LTE Band 17	Channel :	CH23825 (High)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)



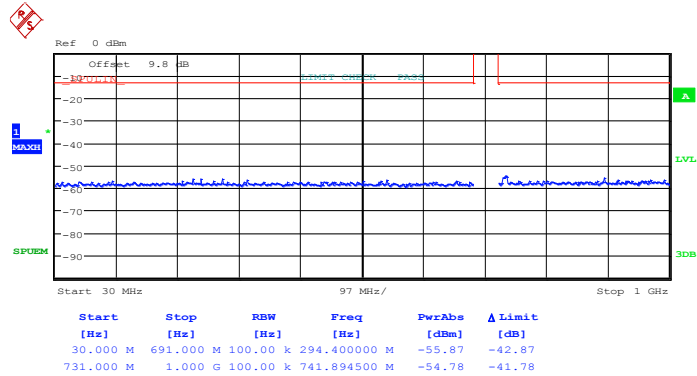
Date: 5.NOV.2012 21:33:56



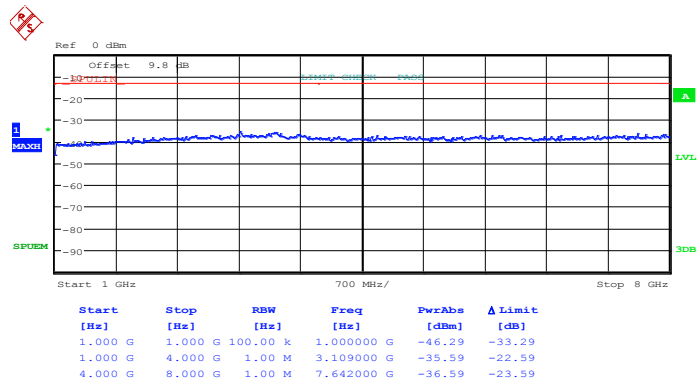
Date: 5.NOV.2012 21:40:36



16QAM (RB Size 1, RB Offset 49)



Date: 5.NOV.2012 21:34:23



Date: 5.NOV.2012 21:40:48

3.6 Radiated Spurious Emission Measurement

3.6.1 Description of Radiated Spurious Emission

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

3.6.2 Measuring Instruments

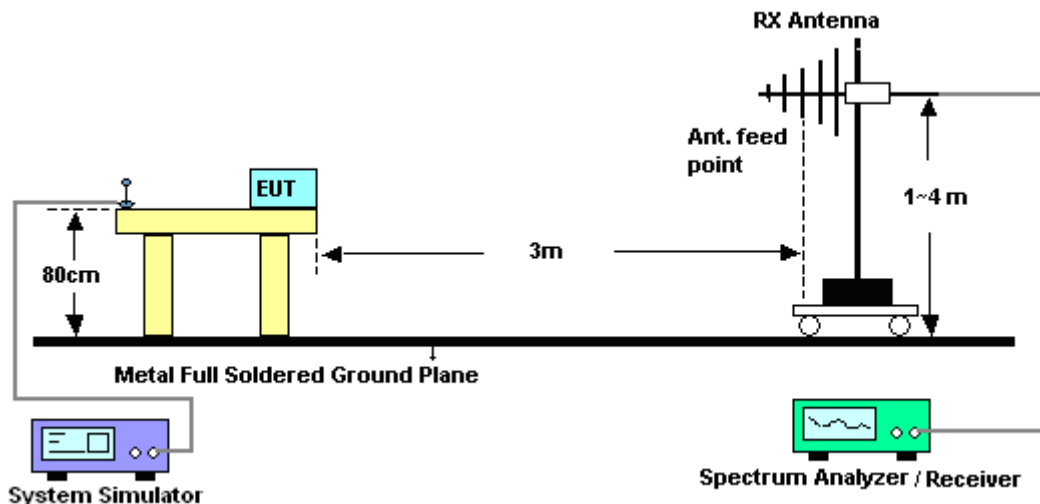
See list of measuring instruments of this test report.

3.6.3 Test Procedures

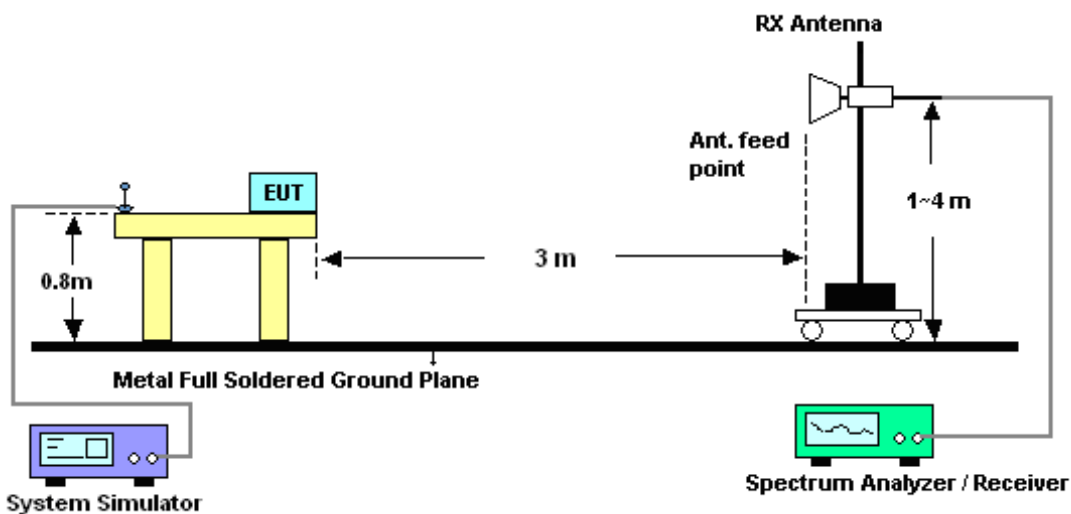
1. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving 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.

3.6.4 Test Setup

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz

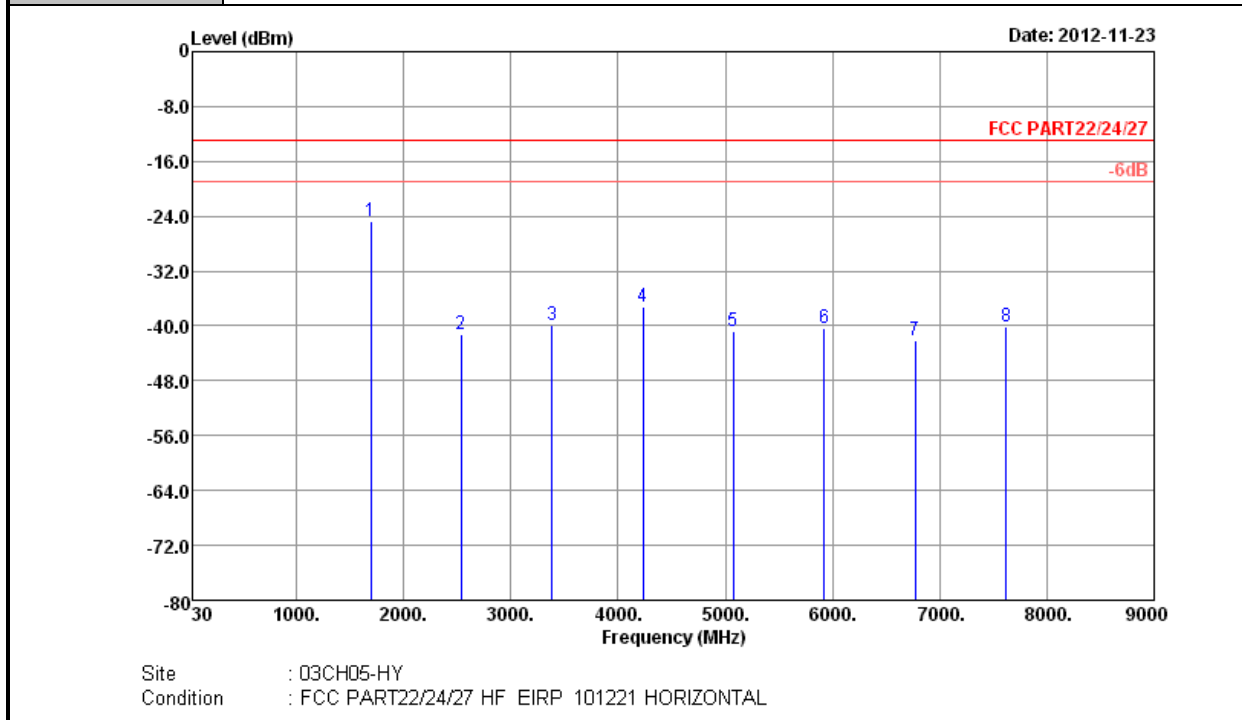


3.6.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

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.

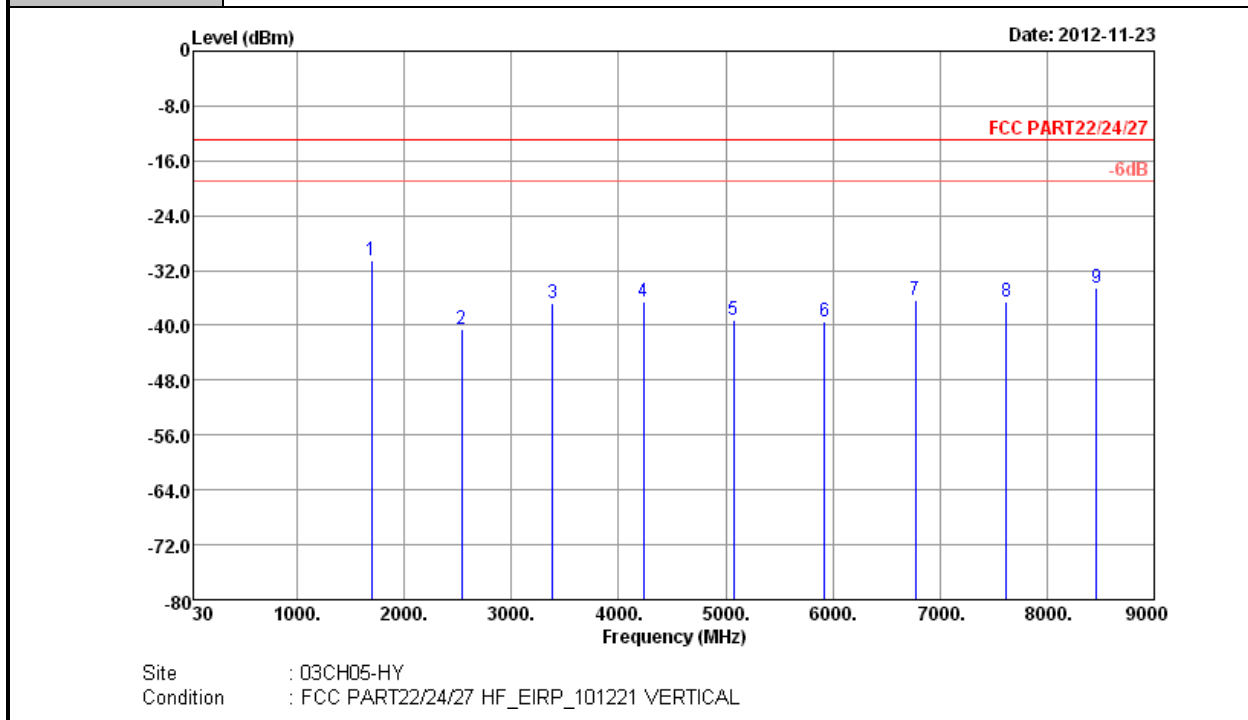
3.6.6 Test Result of Field Strength of Spurious Radiated

Band :	LTE Band 5	Temperature :	23~24°C
Test Mode :	3MHz QPSK RB Size 1	Relative Humidity :	50~51%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



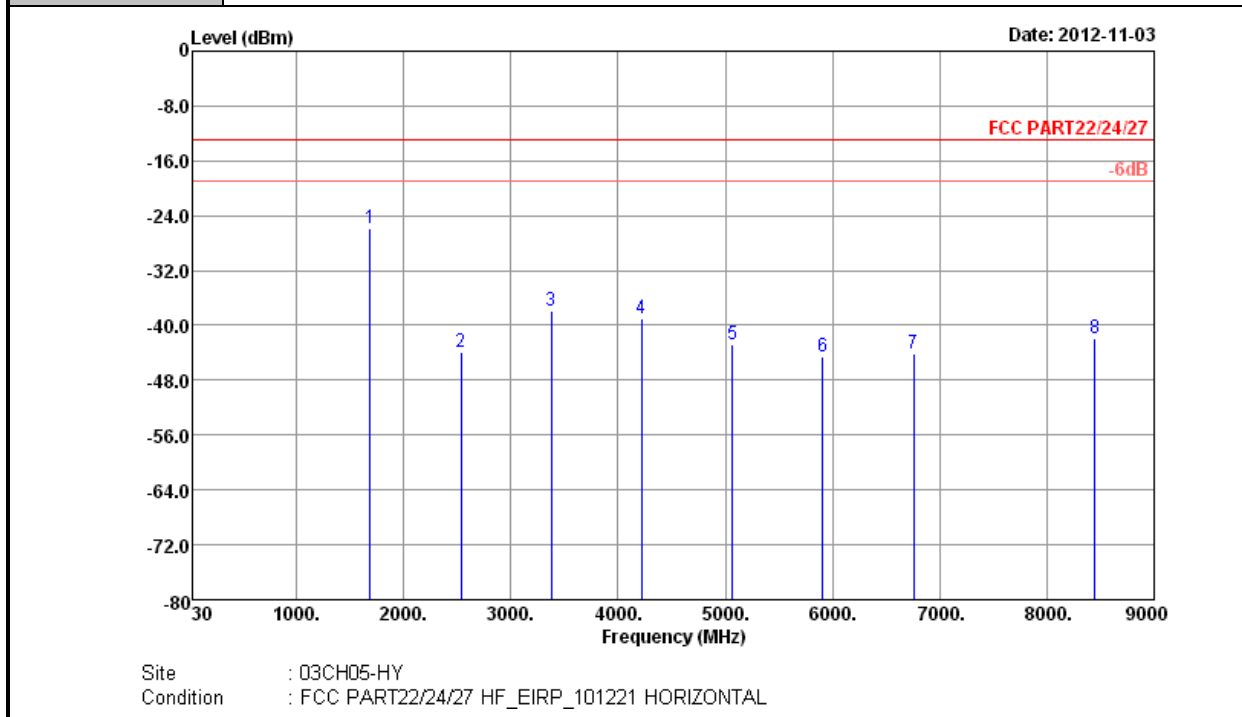
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1693	-24.70	-13	-11.70	-31.98	-26.41	1.35	5.21	H	Pass
2539	-41.13	-13	-28.13	-51.44	-43.56	1.59	6.17	H	Pass
3385	-39.91	-13	-26.91	-52.01	-43.87	1.96	8.07	H	Pass
4230	-37.24	-13	-24.24	-53.31	-42.32	1.96	9.19	H	Pass
5075	-40.69	-13	-27.69	-58.5	-46.92	2.09	10.47	H	Pass
5925	-40.23	-13	-27.23	-60.73	-46.61	2.18	10.71	H	Pass
6770	-42.14	-13	-29.14	-64.28	-48.93	2.35	11.29	H	Pass
7620	-40.11	-13	-27.11	-63.84	-47.58	2.68	12.30	H	Pass

Band :	LTE Band 5	Temperature :	23~24°C
Test Mode :	3MHz QPSK RB Size 1	Relative Humidity :	50~51%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



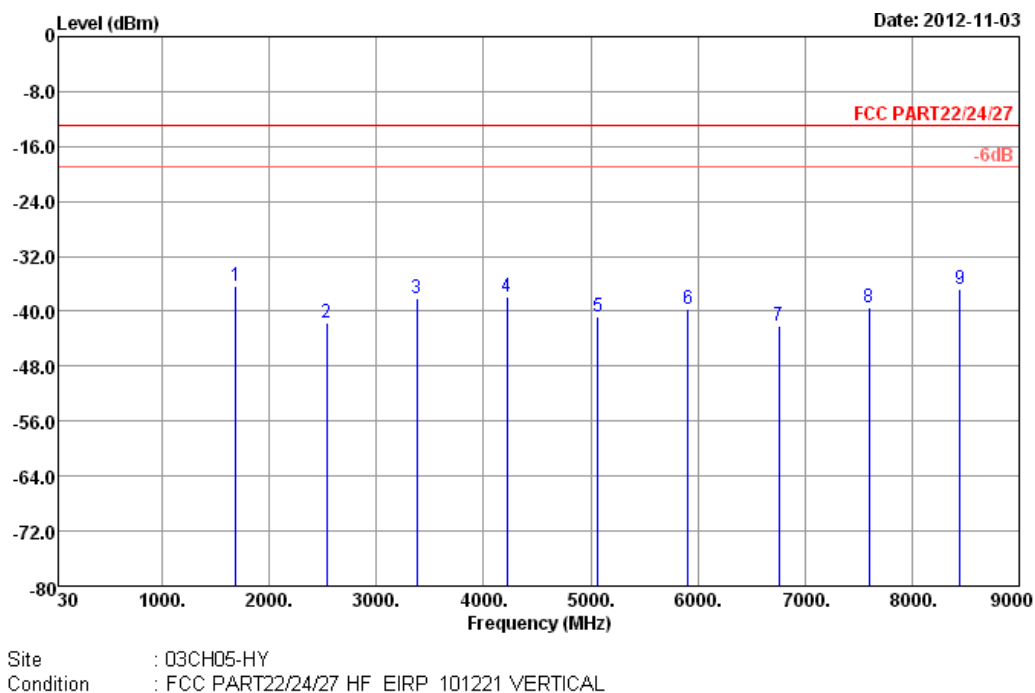
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1693	-30.53	-13	-17.53	-37.75	-32.24	1.35	5.21	V	Pass
2539	-40.52	-13	-27.52	-50.75	-42.95	1.59	6.17	V	Pass
3385	-36.78	-13	-23.78	-49.53	-40.74	1.96	8.07	V	Pass
4230	-36.65	-13	-23.65	-52.1	-41.73	1.96	9.19	V	Pass
5075	-39.30	-13	-26.30	-57.33	-45.53	2.09	10.47	V	Pass
5925	-39.43	-13	-26.43	-59.61	-45.81	2.18	10.71	V	Pass
6770	-36.40	-13	-23.40	-58.57	-43.19	2.35	11.29	V	Pass
7620	-36.48	-13	-23.48	-59.27	-43.95	2.68	12.30	V	Pass
8465	-34.50	-13	-21.50	-58.45	-42.67	2.66	12.98	V	Pass

Band :	LTE Band 5	Temperature :	23~24°C
Test Mode :	5MHz QPSK RB Size 1	Relative Humidity :	50~51%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1687	-25.79	-13	-12.79	-31.3	-27.5	1.35	5.21	H	Pass
2533	-43.88	-13	-30.88	-52.33	-46.3	1.59	6.16	H	Pass
3379	-37.85	-13	-24.85	-49.63	-41.8	1.96	8.06	H	Pass
4220	-38.92	-13	-25.92	-53.46	-44	1.96	9.19	H	Pass
5065	-42.77	-13	-29.77	-59.51	-49	2.08	10.46	H	Pass
5910	-44.61	-13	-31.61	-63.83	-51	2.18	10.71	H	Pass
6755	-44.21	-13	-31.21	-65.31	-51	2.35	11.28	H	Pass
8445	-41.84	-13	-28.84	-64.59	-50	2.66	12.97	H	Pass

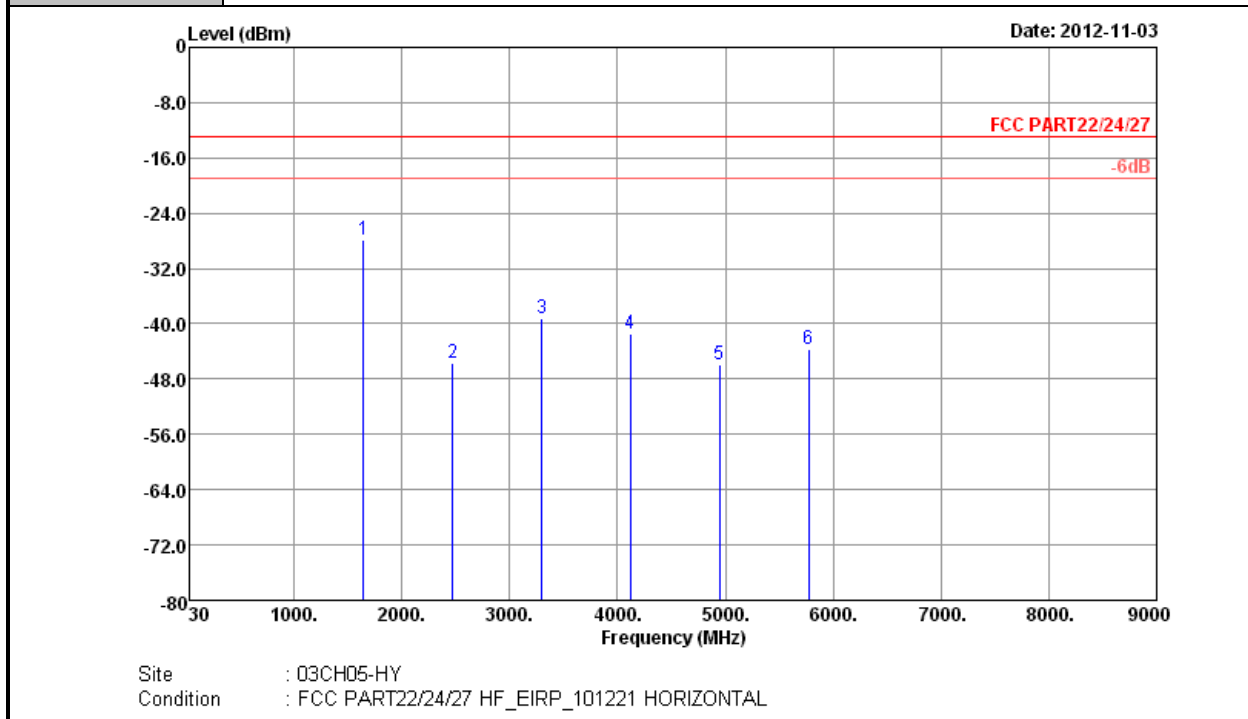
Band :	LTE Band 5	Temperature :	23~24°C
Test Mode :	5MHz QPSK RB Size 1	Relative Humidity :	50~51%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1687	-36.29	-13	-23.29	-42.31	-38	1.35	5.21	V	Pass
2533	-41.58	-13	-28.58	-50.63	-44	1.59	6.16	V	Pass
3379	-38.05	-13	-25.05	-49.94	-42	1.96	8.06	V	Pass
4220	-37.92	-13	-24.92	-53.13	-43	1.96	9.19	V	Pass
5065	-40.77	-13	-27.77	-57.27	-47	2.08	10.46	V	Pass
5910	-39.61	-13	-26.61	-58.36	-46	2.18	10.71	V	Pass
6755	-42.21	-13	-29.21	-63.78	-49	2.35	11.28	V	Pass
7600	-39.54	-13	-26.54	-61.33	-47	2.68	12.29	V	Pass
8445	-36.84	-13	-23.84	-59.52	-45	2.66	12.97	V	Pass

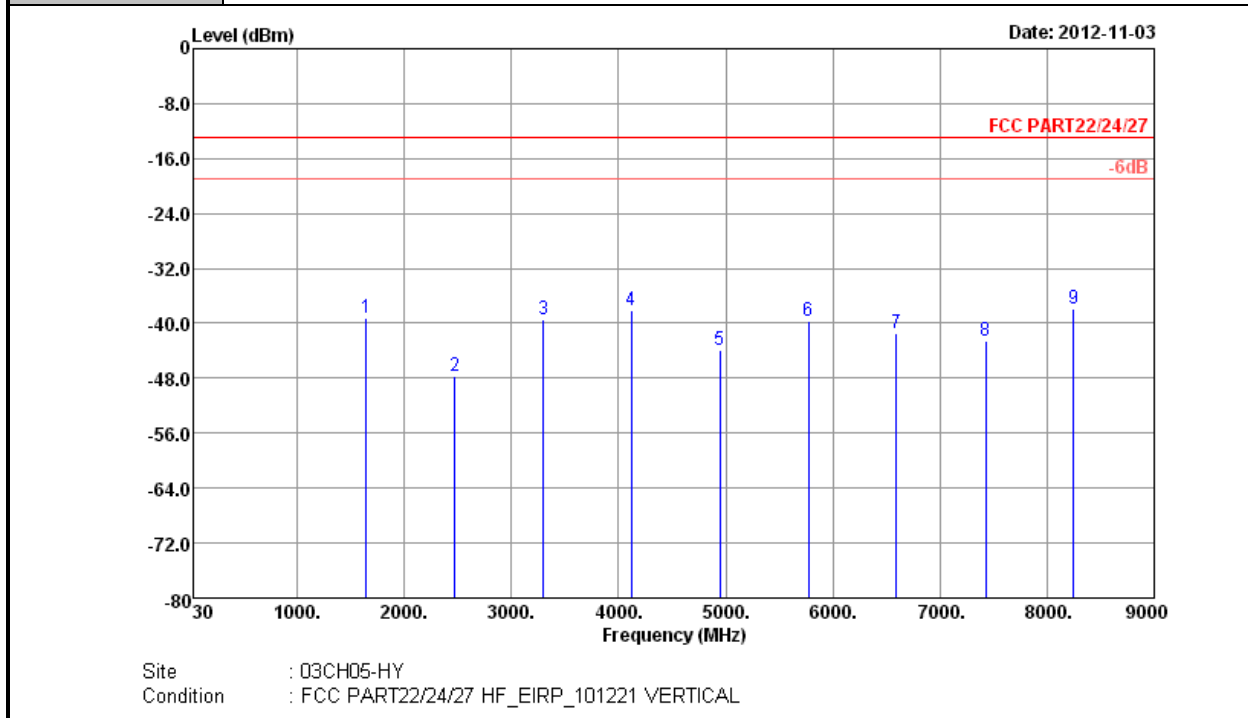


Band :	LTE Band 5	Temperature :	23~24°C
Test Mode :	10MHz QPSK RB Size 1	Relative Humidity :	50~51%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



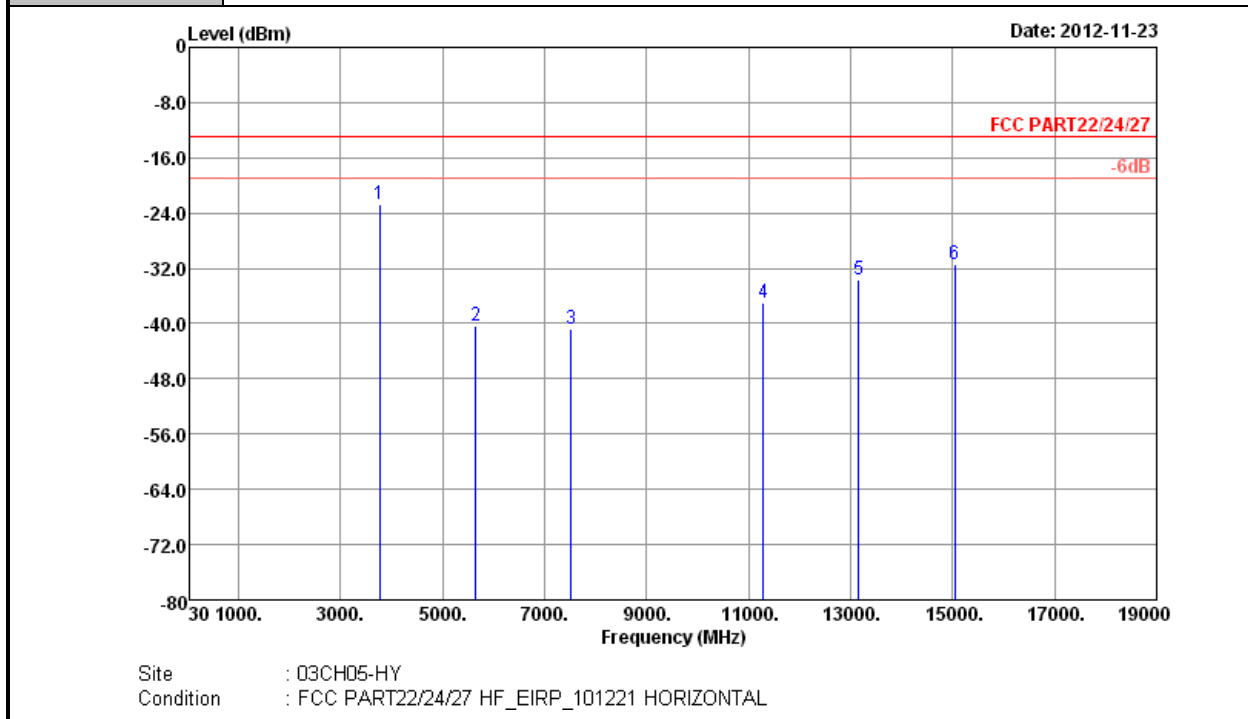
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1648	-27.91	-13	-14.91	-33.42	-29.7	1.34	5.28	H	Pass
2473	-45.67	-13	-32.67	-54.95	-48	1.58	6.06	H	Pass
3301	-39.22	-13	-26.22	-50.85	-43	1.92	7.85	H	Pass
4120	-41.40	-13	-28.40	-56.56	-46.4	1.96	9.12	H	Pass
4945	-45.87	-13	-32.87	-62.77	-52	2.07	10.35	H	Pass
5770	-43.57	-13	-30.57	-62.38	-50	2.16	10.74	H	Pass

Band :	LTE Band 5	Temperature :	23~24°C
Test Mode :	10MHz QPSK RB Size 1	Relative Humidity :	50~51%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



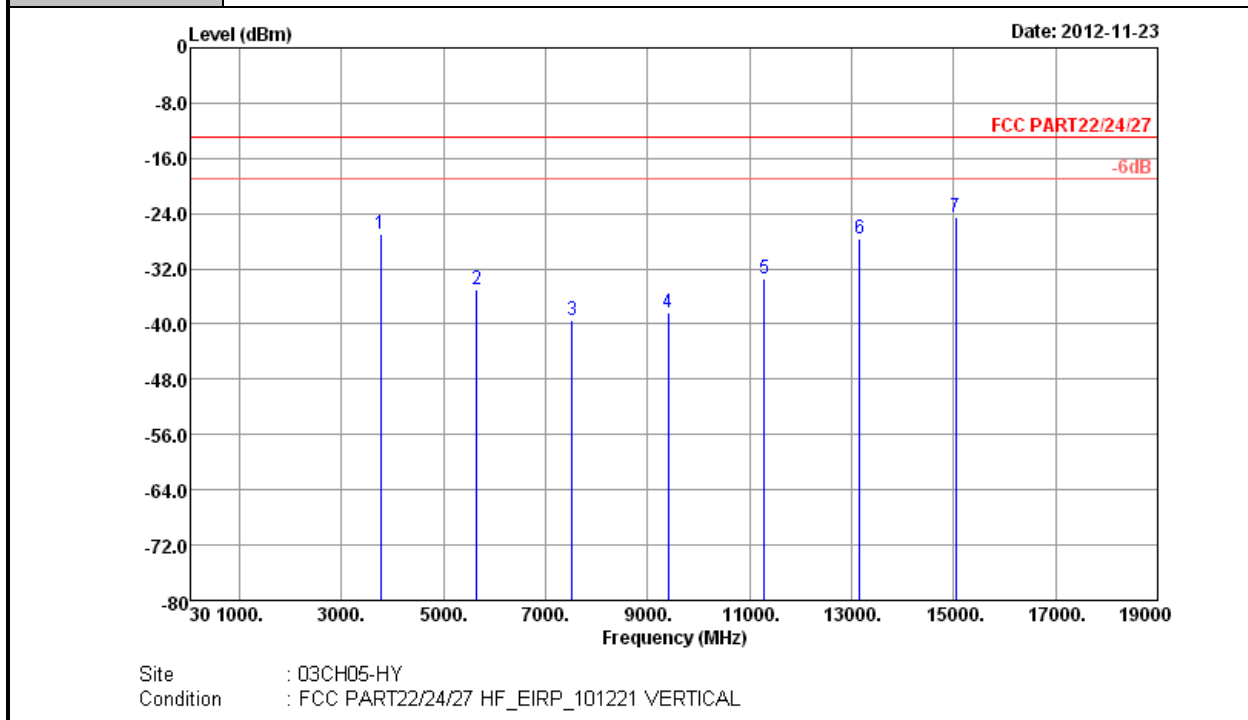
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1648	-39.21	-13	-26.21	-45.04	-41	1.34	5.28	V	Pass
2473	-47.67	-13	-34.67	-56.43	-50	1.58	6.06	V	Pass
3301	-39.42	-13	-26.42	-51.26	-43.2	1.92	7.85	V	Pass
4120	-38.00	-13	-25.00	-52.3	-43	1.96	9.12	V	Pass
4945	-43.87	-13	-30.87	-60.5	-50	2.07	10.35	V	Pass
5770	-39.57	-13	-26.57	-58.47	-46	2.16	10.74	V	Pass
6595	-41.38	-13	-28.38	-62.82	-48	2.31	11.08	V	Pass
7425	-42.65	-13	-29.65	-64.72	-50	2.66	12.15	V	Pass
8250	-37.99	-13	-24.99	-60.07	-46	2.67	12.83	V	Pass

Band :	LTE Band 2	Temperature :	23~24°C
Test Mode :	3MHz QPSK RB Size 1	Relative Humidity :	50~51%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



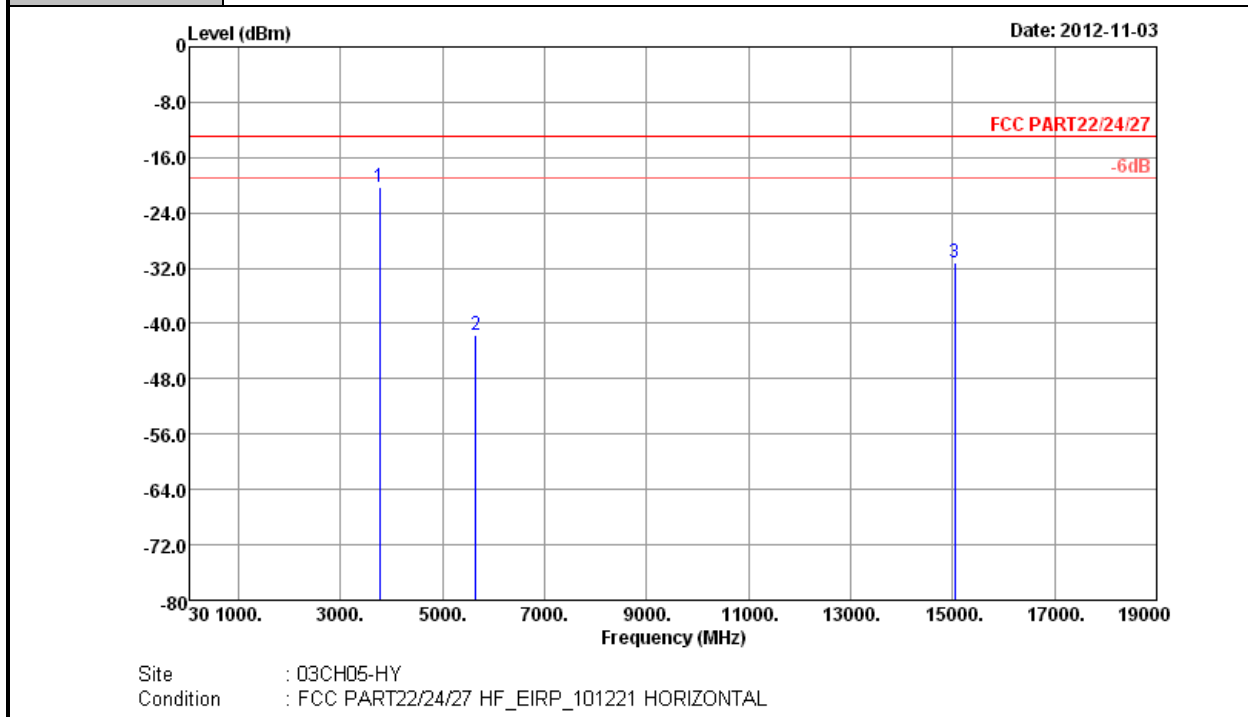
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-22.63	-13	-9.63	-37.01	-29.34	2.00	8.71	H	Pass
5640	-40.23	-13	-27.23	-60.48	-48.87	2.13	10.77	H	Pass
7520	-40.89	-13	-27.89	-62.98	-50.43	2.68	12.22	H	Pass
11280	-37.04	-13	-24.04	-65.41	-47.76	2.64	13.36	H	Pass
13160	-33.69	-13	-20.69	-64.98	-44.52	2.86	13.69	H	Pass
15039	-31.50	-13	-18.50	-63.89	-42.25	3.35	14.09	H	Pass

Band :	LTE Band 2	Temperature :	23~24°C
Test Mode :	3MHz QPSK RB Size 1	Relative Humidity :	50~51%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



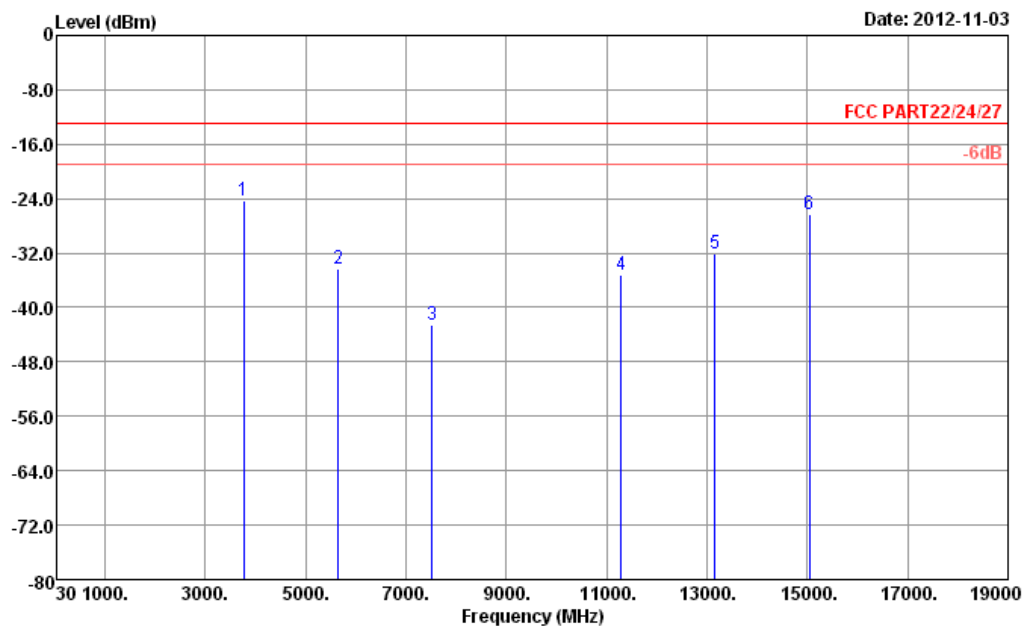
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-26.90	-13	-13.90	-41.03	-33.61	2.00	8.71	V	Pass
5640	-34.95	-13	-21.95	-54.17	-43.59	2.13	10.77	V	Pass
7520	-39.38	-13	-26.38	-62.6	-48.92	2.68	12.22	V	Pass
9400	-38.22	-13	-25.22	-62.89	-48.73	2.87	13.38	V	Pass
11280	-33.47	-13	-20.47	-61.58	-44.19	2.64	13.36	V	Pass
13160	-27.72	-13	-14.72	-59.04	-38.55	2.86	13.69	V	Pass
15039	-24.54	-13	-11.54	-56.14	-35.29	3.35	14.09	V	Pass

Band :	LTE Band 2	Temperature :	23~24°C
Test Mode :	5MHz QPSK RB Size 1	Relative Humidity :	50~51%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-20.29	-13	-7.29	-34.33	-27	2.00	8.71	H	Pass
5640	-41.66	-13	-28.66	-60	-50.3	2.13	10.77	H	Pass
15039	-31.25	-13	-18.25	-62.85	-42	3.35	14.09	H	Pass

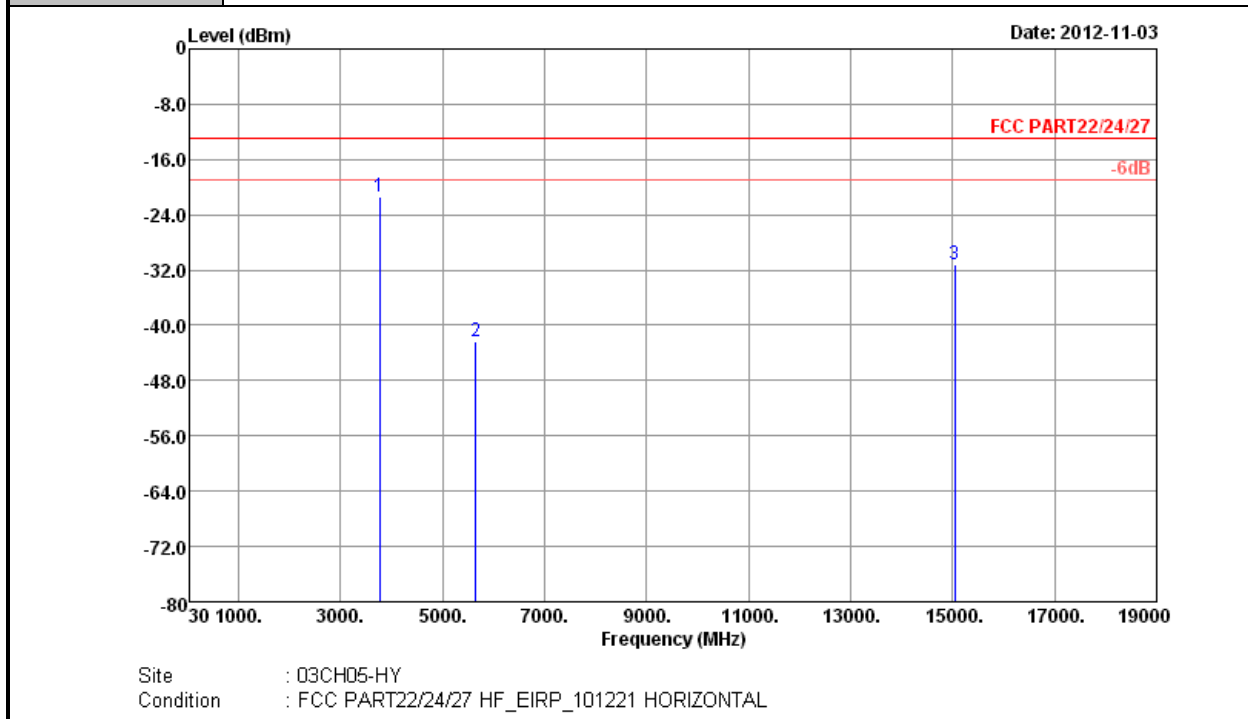
Band :	LTE Band 2	Temperature :	23~24°C
Test Mode :	5MHz QPSK RB Size 1	Relative Humidity :	50~51%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22/24/27 HF_EIRP_101221 VERTICAL

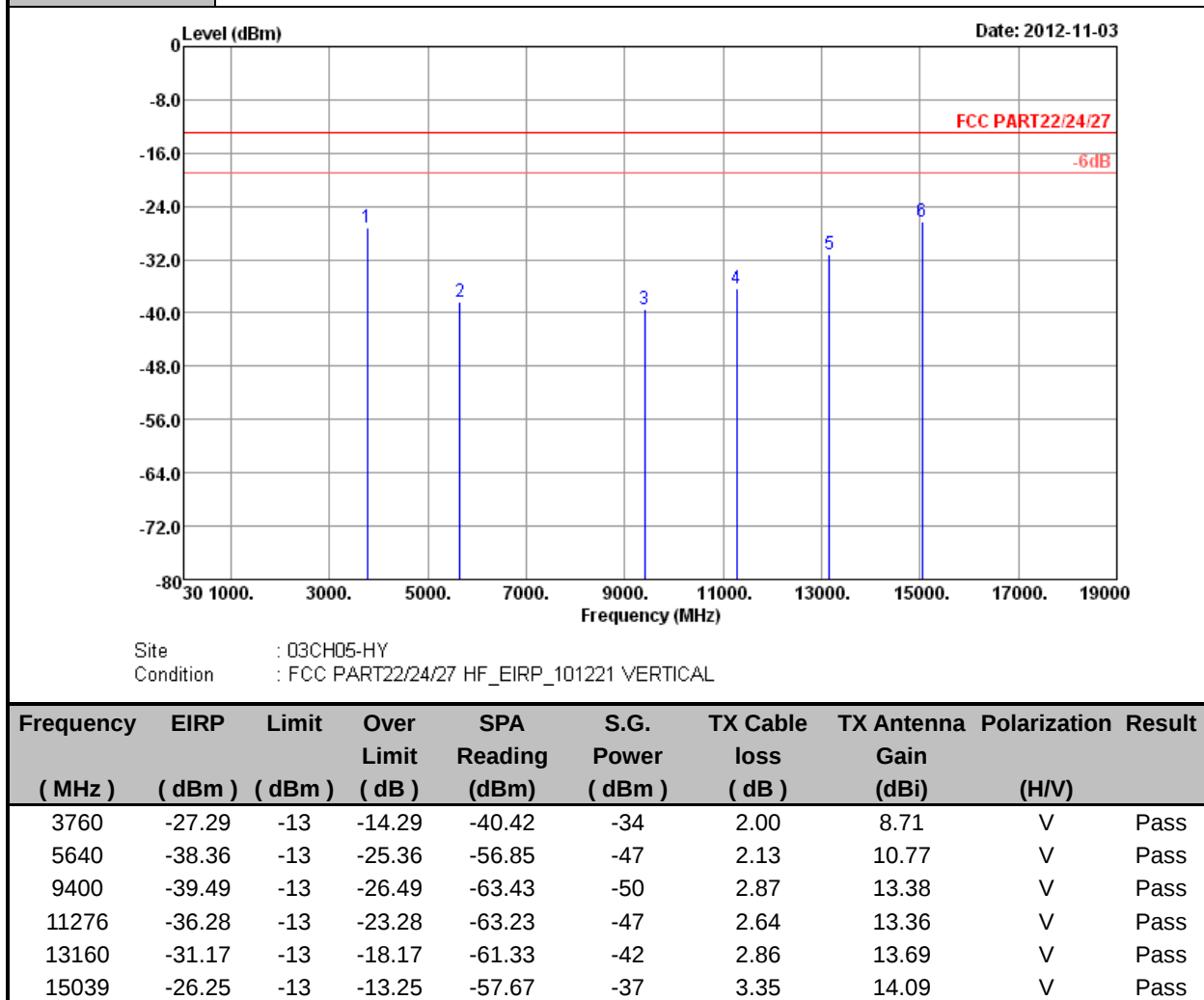
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-24.29	-13	-11.29	-38.26	-31	2.00	8.71	V	Pass
5640	-34.36	-13	-21.36	-52.74	-43	2.13	10.77	V	Pass
7520	-42.46	-13	-29.46	-64.8	-52	2.68	12.22	V	Pass
11280	-35.28	-13	-22.28	-62.79	-46	2.64	13.36	V	Pass
13160	-32.17	-13	-19.17	-62.64	-43	2.86	13.69	V	Pass
15039	-26.25	-13	-13.25	-57.6	-37	3.35	14.09	V	Pass

Band :	LTE Band 2	Temperature :	23~24°C
Test Mode :	10MHz QPSK RB Size 1	Relative Humidity :	50~51%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

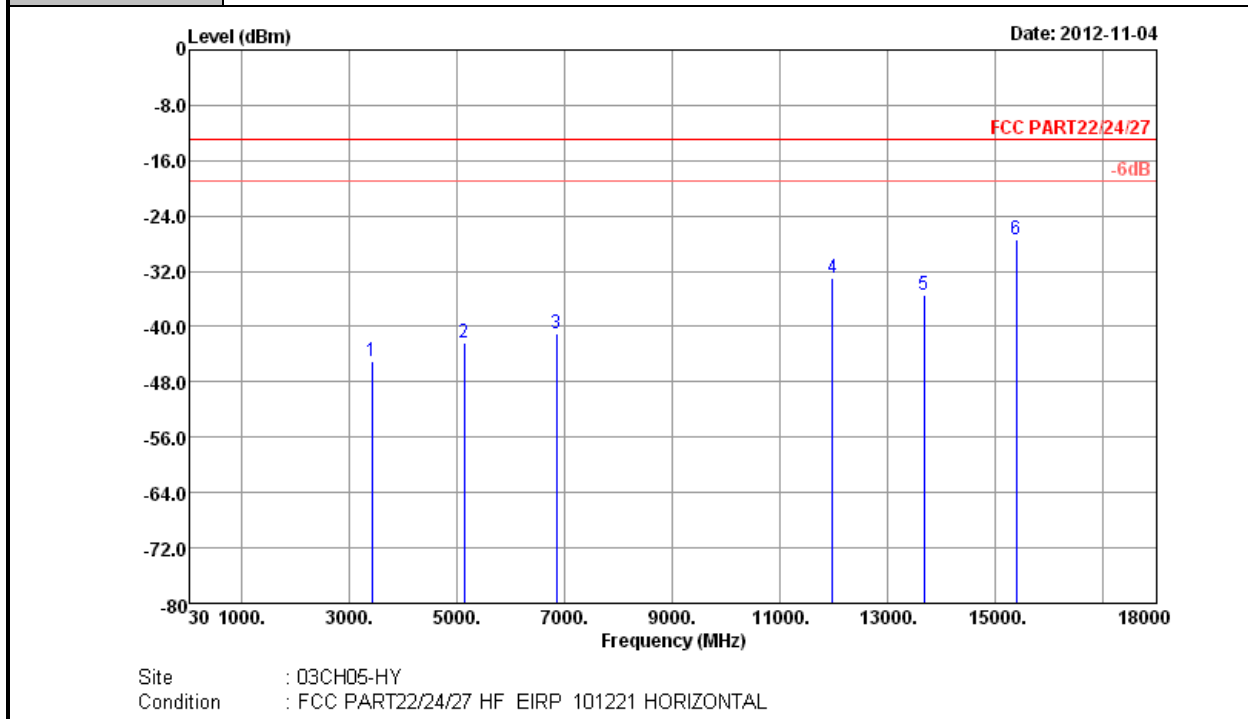


Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-21.29	-13	-8.29	-34.39	-28	2.00	8.71	H	Pass
5640	-42.36	-13	-29.36	-61.09	-51	2.13	10.77	H	Pass
15039	-31.25	-13	-18.25	-62.49	-42	3.35	14.09	H	Pass

Band :	LTE Band 2	Temperature :	23~24°C
Test Mode :	10MHz QPSK RB Size 1	Relative Humidity :	50~51%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		

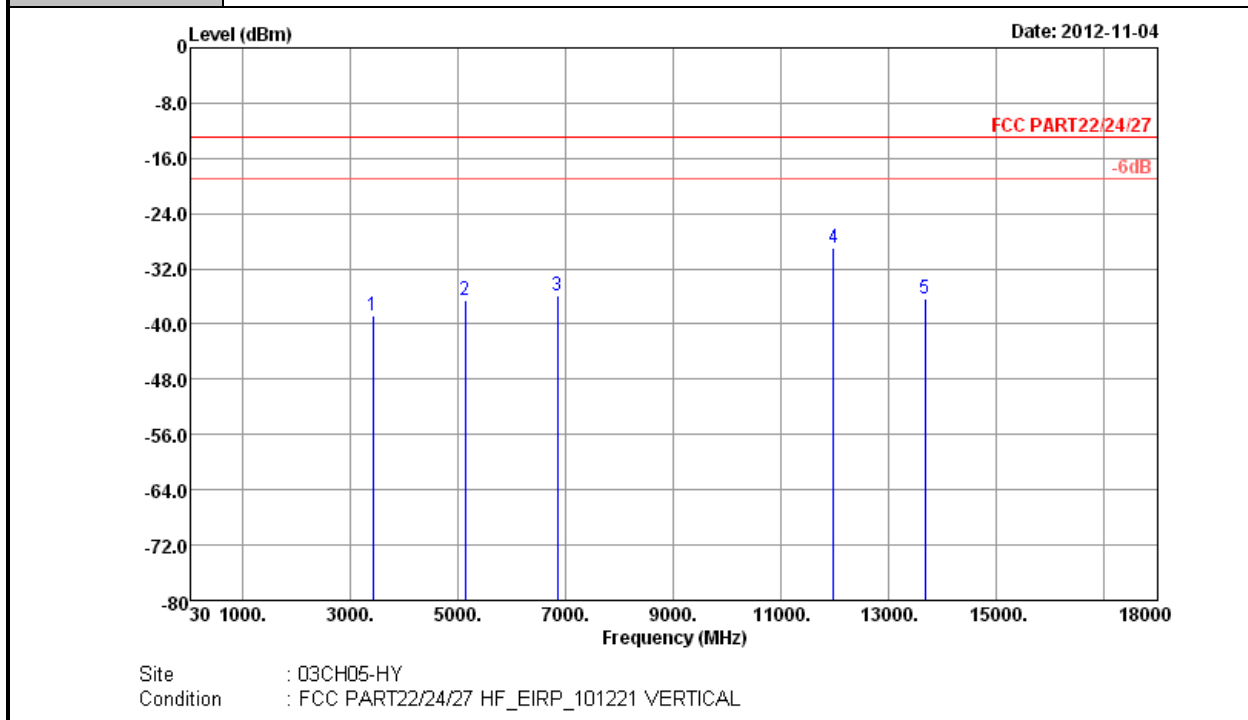


Band :	LTE Band 4	Temperature :	23~24°C
Test Mode :	5MHz QPSK RB Size 1	Relative Humidity :	50~51%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



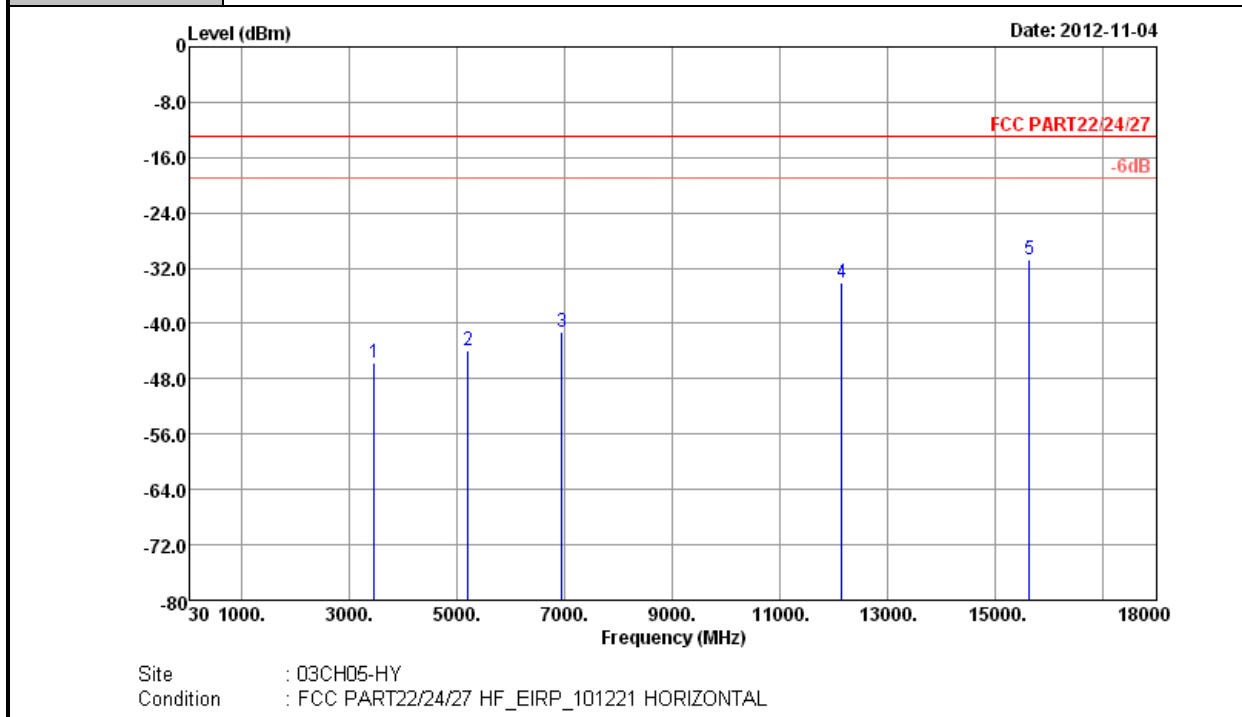
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3420	-44.91	-13	-31.91	-56.14	-51.1	1.99	8.18	H	Pass
5132	-42.38	-13	-29.38	-59.75	-50.8	2.09	10.51	H	Pass
6844	-40.97	-13	-27.97	-62.13	-50	2.36	11.39	H	Pass
11972	-32.92	-13	-19.92	-61.05	-43	3.03	13.11	H	Pass
13684	-35.38	-13	-22.38	-67.18	-47	2.64	14.26	H	Pass
15393	-27.39	-13	-14.39	-59.09	-38	3.41	14.02	H	Pass

Band :	LTE Band 4	Temperature :	23~24°C
Test Mode :	5MHz QPSK RB Size 1	Relative Humidity :	50~51%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



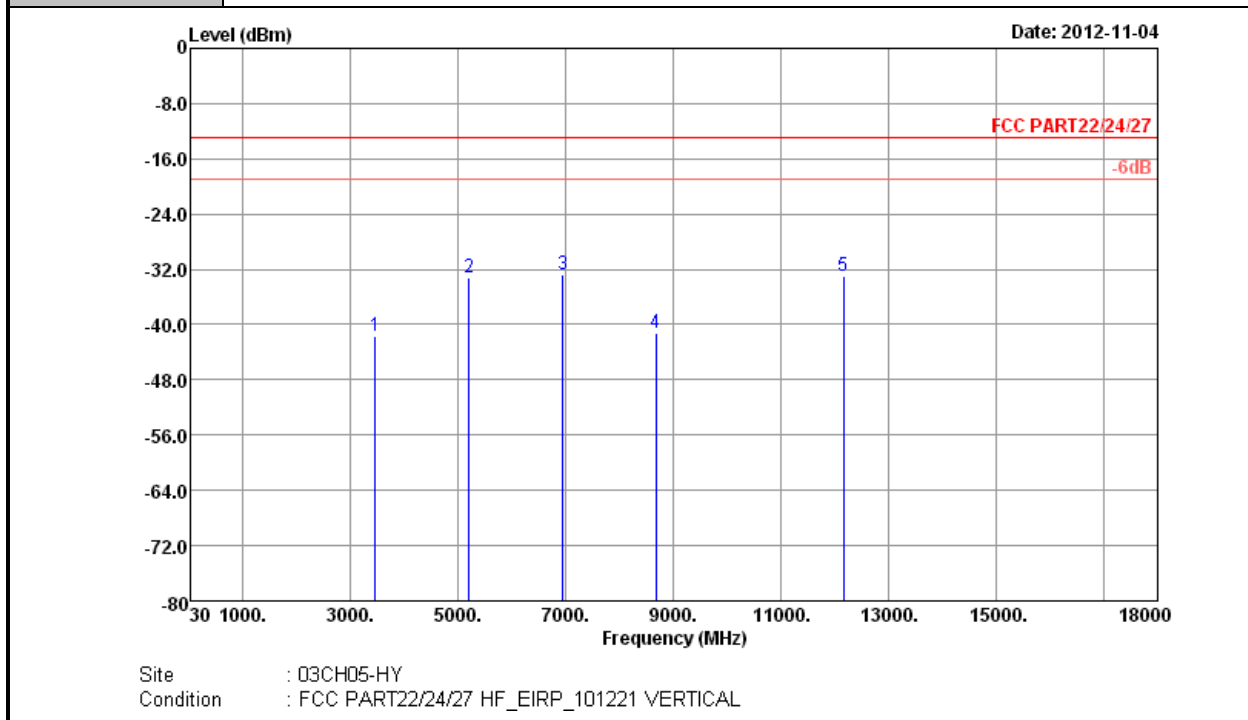
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3420	-38.81	-13	-25.81	-50.49	-45	1.99	8.18	V	Pass
5132	-36.58	-13	-23.58	-54.23	-45	2.09	10.51	V	Pass
6844	-35.97	-13	-22.97	-56.37	-45	2.36	11.39	V	Pass
11972	-28.92	-13	-15.92	-56.91	-39	3.03	13.11	V	Pass
13684	-36.38	-13	-23.38	-68.27	-48	2.64	14.26	V	Pass

Band :	LTE Band 4	Temperature :	23~24°C
Test Mode :	10MHz QPSK RB Size 1	Relative Humidity :	50~51%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



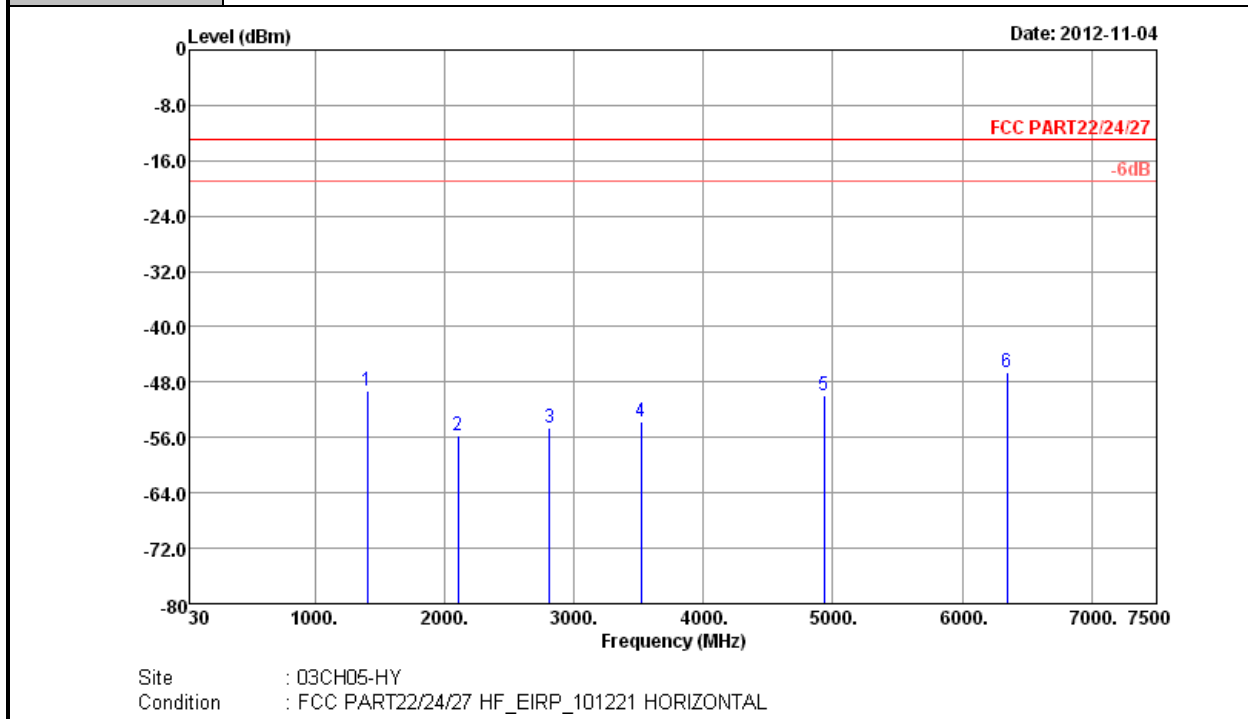
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3472	-45.71	-13	-32.71	-57.64	-52	2.01	8.30	H	Pass
5212	-43.83	-13	-30.83	-60.76	-52.3	2.09	10.56	H	Pass
6948	-41.28	-13	-28.28	-62.02	-50.4	2.38	11.50	H	Pass
12156	-34.11	-13	-21.11	-63.16	-44.1	3.08	13.07	H	Pass
15633	-30.68	-13	-17.68	-62.59	-41.3	3.47	14.08	H	Pass

Band :	LTE Band 4	Temperature :	23~24°C
Test Mode :	10MHz QPSK RB Size 1	Relative Humidity :	50~51%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



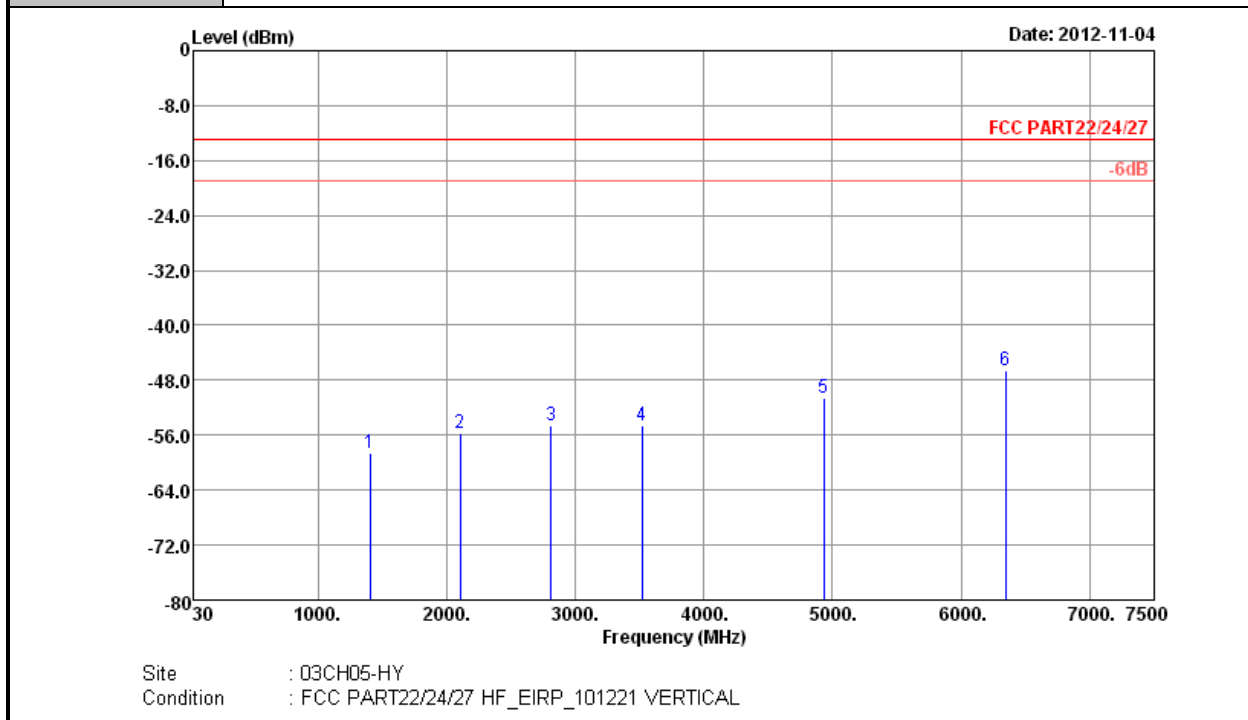
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3472	-41.71	-13	-28.71	-53.61	-48	2.01	8.30	V	Pass
5212	-33.13	-13	-20.13	-50.62	-41.6	2.09	10.56	V	Pass
6952	-32.68	-13	-19.68	-53.18	-41.8	2.38	11.50	V	Pass
8684	-41.23	-13	-28.23	-63.74	-51.7	2.62	13.10	V	Pass
12160	-33.01	-13	-20.01	-61.45	-43	3.08	13.07	V	Pass

Band :	LTE Band 17	Temperature :	23~24°C
Test Mode :	5MHz QPSK RB Size 1	Relative Humidity :	50~51%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1402	-49.32	-13	-36.32	-53.22	-51	1.25	5.08	H	Pass
2108	-55.67	-13	-42.67	-63.26	-57	1.48	4.96	H	Pass
2814	-54.51	-13	-41.51	-64.8	-57.3	1.68	6.62	H	Pass
3520	-53.74	-13	-40.74	-65.36	-58	2.03	8.44	H	Pass
4932	-49.92	-13	-36.92	-66.44	-56	2.06	10.29	H	Pass
6344	-46.66	-13	-33.66	-66.41	-53.1	2.25	10.84	H	Pass

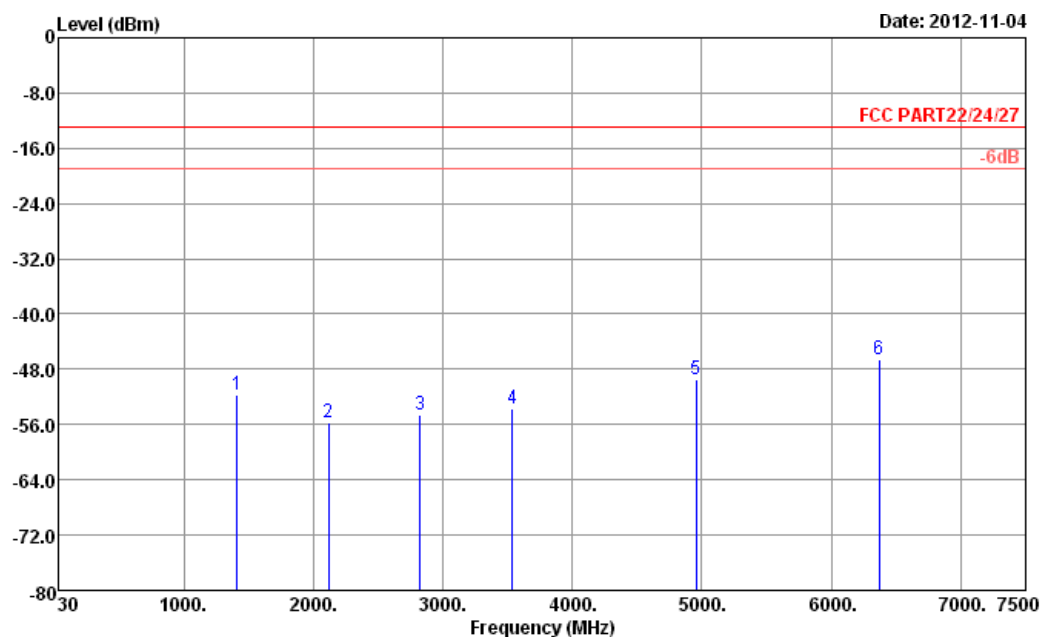
Band :	LTE Band 17	Temperature :	23~24°C
Test Mode :	5MHz QPSK RB Size 1	Relative Humidity :	50~51%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1402	-58.62	-13	-45.62	-63.13	-60.3	1.25	5.08	V	Pass
2108	-55.67	-13	-42.67	-62.85	-57	1.48	4.96	V	Pass
2814	-54.51	-13	-41.51	-64.96	-57.3	1.68	6.62	V	Pass
3520	-54.54	-13	-41.54	-66.09	-58.8	2.03	8.44	V	Pass
4932	-50.62	-13	-37.62	-66.49	-56.7	2.06	10.29	V	Pass
6344	-46.56	-13	-33.56	-67.41	-53	2.25	10.84	V	Pass



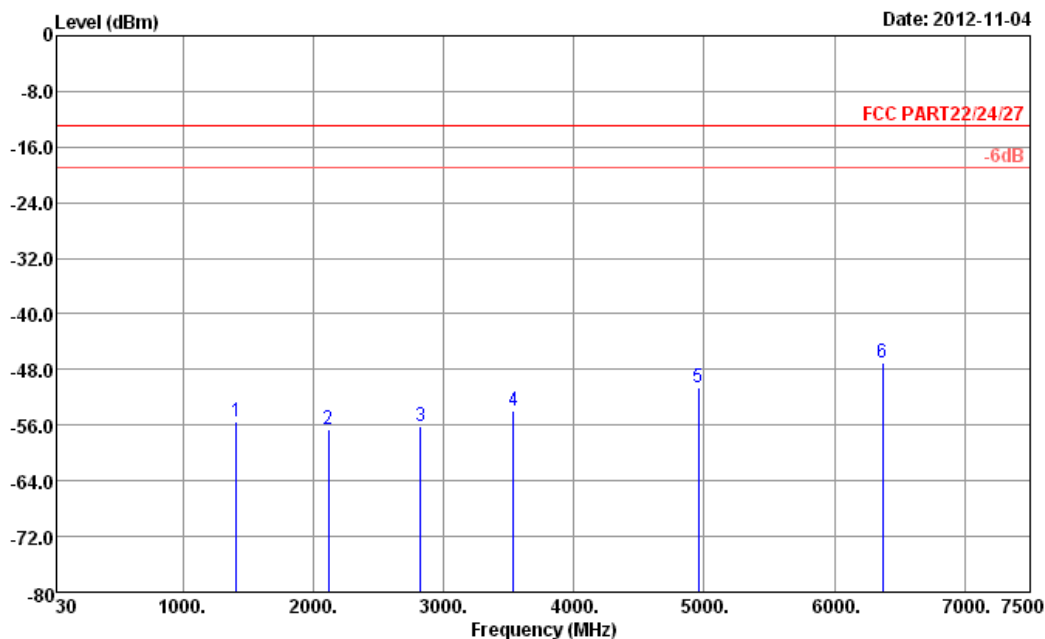
Band :	LTE Band 17	Temperature :	23~24°C
Test Mode :	10MHz QPSK RB Size 1	Relative Humidity :	50~51%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22/24/27 HF_EIRP_101221 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
1408	-51.69	-13	-38.69	-55.39	-53.4	1.25	5.11	H	Pass
2116	-55.65	-13	-42.65	-63.5	-57	1.48	4.98	H	Pass
2826	-54.49	-13	-41.49	-64.78	-57.3	1.68	6.64	H	Pass
3535	-53.62	-13	-40.62	-64.76	-57.9	2.02	8.45	H	Pass
4953	-49.49	-13	-36.49	-66.01	-55.6	2.07	10.33	H	Pass
6371	-46.56	-13	-33.56	-66.97	-53	2.26	10.85	H	Pass

Band :	LTE Band 17	Temperature :	23~24°C
Test Mode :	10MHz QPSK RB Size 1	Relative Humidity :	50~51%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1408	-55.59	-13	-42.59	-59.69	-57.3	1.25	5.11	V	Pass
2117	-56.55	-13	-43.55	-63.75	-57.9	1.48	4.98	V	Pass
2826	-56.09	-13	-43.09	-65.3	-58.9	1.68	6.64	V	Pass
3535	-53.92	-13	-40.92	-65.13	-58.2	2.02	8.45	V	Pass
4953	-50.53	-13	-37.53	-66.49	-56.64	2.07	10.33	V	Pass
6371	-46.96	-13	-33.96	-67.61	-53.4	2.26	10.85	V	Pass

3.7 Frequency Stability Measurement

3.7.1 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.

3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

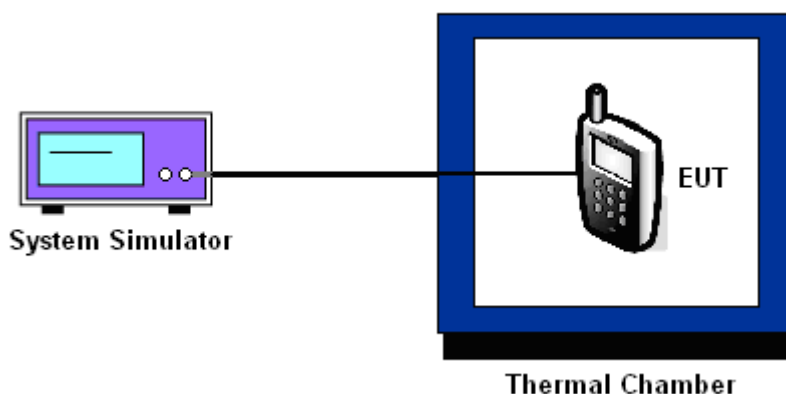
3.7.3 Test Procedures for Temperature Variation

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°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.
4. If the EUT can not be turned on at -30°C , the testing lowest temperature will be raised in 10°C step until the EUT can be turned on.

3.7.4 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 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

3.7.5 Test Setup



3.7.6 Test Result of Temperature Variation

Band :	LTE Band 5		Limit (ppm) :	2.5	
Temperature (°C)	BW 3MHz				Result
	QPSK		16QAM		
	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	4.1	0.005	4.7	0.006	
0	4.2	0.005	3.7	0.004	
10	3.8	0.005	4.0	0.005	
20	4.0	0.005	4.7	0.006	
30	5.0	0.006	4.5	0.005	
40	5.2	0.006	5.0	0.006	
50	5.0	0.006	5.0	0.006	
55	5.1	0.006	4.8	0.006	

Temperature (°C)	BW 5MHz				Result
	QPSK		16QAM		
	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	5.0	0.006	-5.1	-0.006	
0	4.4	0.005	-4.8	-0.006	
10	4.3	0.005	4.2	0.005	
20	-3.8	-0.005	3.7	0.004	
30	-4.1	-0.005	2.3	0.003	
40	-4.2	-0.005	5.4	0.006	
50	-5.0	-0.006	5.6	0.007	
55	5.6	0.007	4.8	0.006	

Temperature (°C)	BW 10MHz				Result
	QPSK		16QAM		
	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	-4.8	-0.006	
0	4.8	0.009	-4.6	-0.005	
10	6.9	0.006	5.1	0.006	
20	3.1	0.008	4.6	0.005	
30	4.3	0.004	5.1	0.006	
40	5.6	0.005	3.9	0.005	
50	-6.8	0.007	-3.7	-0.004	
55	5.9	-0.008	5.0	0.006	

Band :	LTE Band 2	Limit (ppm) :	2.5
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Temperature (°C)	BW 3MHz				Result
	QPSK		16QAM		
	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	-9.2	-0.005	-7.8	-0.004	
0	-9.1	-0.005	-6.5	-0.003	
10	-8.5	-0.005	-5.9	-0.003	
20	-7.8	-0.004	-5.9	-0.003	
30	6.5	0.003	-6.4	-0.003	
40	7.1	0.004	5.3	0.003	
50	7.2	0.004	7.4	0.004	
55	-7.2	-0.004	-8.1	-0.004	

Temperature (°C)	BW 5MHz				Result
	QPSK		16QAM		
	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	-3.3	-0.002	-4.5	-0.002	
0	8.1	0.004	-6.4	-0.003	
10	6.4	0.003	-4.5	-0.002	
20	-3.8	-0.002	5.1	0.003	
30	-2.4	-0.001	4.2	0.002	
40	6.7	0.004	4.9	0.003	
50	7.8	0.004	5.4	0.003	
55	13.4	0.007	7.2	0.004	

Temperature (°C)	BW 10MHz				Result
	QPSK		16QAM		
	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	5.4	0.003	4.1	0.002	
0	5.1	0.003	-4.9	-0.003	
10	4.6	0.002	-5.4	-0.003	
20	4.9	0.003	4.9	0.003	
30	5.0	0.003	4.8	0.003	
40	5.7	0.003	6.1	0.003	
50	-6.0	-0.003	5.8	0.003	
55	-5.7	-0.003	-5.1	-0.003	

Band :	LTE Band 4		Limit (ppm) :	2.5	
Temperature (°C)	BW 5MHz				Result
	QPSK		16QAM		
	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	-5.2	-0.007	-5.2	-0.007	
0	-5.1	-0.007	-4.3	-0.006	
10	-4.8	-0.007	-4.9	-0.007	
20	4.7	0.007	-4.7	-0.007	
30	3.9	0.005	-4.6	-0.006	
40	4.6	0.006	-5.0	-0.007	
50	-5.0	-0.007	-5.1	-0.007	
55	-4.8	-0.007	-5.0	-0.007	

Temperature (°C)	BW 10MHz				Result
	QPSK		16QAM		
	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	9.4	0.013	7.2	0.010	
0	-6.1	-0.009	-5.8	-0.008	
10	-4.8	-0.007	-6.1	-0.009	
20	-5.5	-0.008	-4.3	-0.006	
30	-6.1	-0.009	-4.9	-0.007	
40	5.6	0.008	5.1	0.007	
50	-6.7	-0.009	5.9	0.008	
55	-6.9	-0.010	-5.7	-0.008	

Band :	LTE Band 17		Limit (ppm) :	2.5	
Temperature (°C)	BW 5MHz				Result
	QPSK		16QAM		
	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	4.2	0.006	4.1	0.006	
0	4.1	0.006	4.0	0.006	
10	-3.5	-0.005	3.2	0.005	
20	-3.4	-0.005	3.0	0.004	
30	3.1	0.004	-2.9	-0.004	
40	4.2	0.006	-3.6	-0.005	
50	5.1	0.007	4.3	0.006	
55	5.6	0.008	5.4	0.008	

Temperature (°C)	BW 10MHz				Result
	QPSK		16QAM		
	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	4.0	0.006	4.2	0.006	
0	4.6	0.006	-4.6	-0.006	
10	3.6	0.005	4.5	0.006	
20	-2.9	-0.004	3.8	0.005	
30	2.8	0.004	-2.8	-0.004	
40	2.7	0.004	-3.1	-0.004	
50	3.0	0.004	-3.6	-0.005	
55	3.3	0.005	-3.4	-0.005	

3.7.7 Test Result of Voltage Variation

<QPSK>

Band	Bandwidth	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 5	3M	Normal	5.0	0.006	2.5	PASS
		3.6	4.9	0.006		
		4.2	5.4	0.006		
	5M	Normal	4.7	0.006		
		3.6	3.8	0.005		
		4.2	5.1	0.006		
	10M	Normal	3.3	0.004		
		3.6	4.3	0.005		
		4.2	4.1	0.005		
LTE Band 2	3M	Normal	8.1	0.004	2.5	PASS
		3.6	10.1	0.005		
		4.2	7.7	0.004		
	5M	Normal	11.3	0.006		
		3.6	12.0	0.006		
		4.2	10.2	0.005		
	10M	Normal	8.5	0.005		
		3.6	9.3	0.005		
		4.2	7.3	0.004		

Band	Bandwidth	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 4	5M	Normal	-4.6	-0.006	2.5	PASS
		3.6	4.0	0.006		
		4.2	-3.9	-0.005		
	10M	Normal	3.6	0.005		
		3.6	-3.2	-0.005		
		4.2	-4.5	-0.006		
LTE Band 17	5M	Normal	2.8	0.004	2.5	PASS
		3.6	3.6	0.005		
		4.2	3.9	0.005		
	10M	Normal	5.7	0.008		
		3.6	3.7	0.005		
		4.2	4.8	0.007		

<16QAM>

Band	Bandwidth	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 5	3M	Normal	4.9	0.006	2.5	PASS
		3.6	5.1	0.006		
		4.2	4.7	0.006		
	5M	Normal	3.7	0.004		
		3.6	4.1	0.005		
		4.2	3.9	0.005		
	10M	Normal	3.4	0.004		
		3.6	5.8	0.007		
		4.2	4.2	0.005		
LTE Band 2	3M	Normal	8.9	0.005	2.5	PASS
		3.6	8.1	0.004		
		4.2	9.7	0.005		
	5M	Normal	11.9	0.006		
		3.6	8.9	0.005		
		4.2	11.2	0.006		
	10M	Normal	7.7	0.004		
		3.6	8.4	0.004		
		4.2	7.1	0.004		

Band	Bandwidth	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 4	5M	Normal	4.1	0.006	2.5	PASS
		3.6	-3.5	-0.005		
		4.2	-3.4	-0.005		
	10M	Normal	5.1	0.007		
		3.6	4.8	0.007		
		4.2	4.1	0.006		
LTE Band 17	5M	Normal	3.1	0.004	2.5	PASS
		3.6	3.4	0.005		
		4.2	3.7	0.005		
	10M	Normal	5.1	0.007		
		3.6	5.0	0.007		
		4.2	4.5	0.006		

Remark:

1. Normal Voltage = 3.8V.
2. The manufacturer declared that the EUT could work properly between voltages 3.6V ~ 4.2V.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 06, 2012	Nov. 02, 2012 ~ Dec. 10, 2012	Jun. 05, 2013	Conducted (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D3SP	TBN-930701	N/A	Jul. 23, 2012	Nov. 02, 2012 ~ Dec. 10, 2012	Jul. 22, 2013	Conducted (TH02-HY)
Spectrum Analyzer	R&S	ESU26	100390	20Hz ~ 26.5GHz	Dec. 22, 2011	Nov. 03, 2012 ~ Nov. 23, 2012	Dec. 21, 2012	Radiation (03CH05-HY)
Bilog Antenna	Schaffner	CBL6111C	2725	30MHz~2GHz	Oct. 06, 2012	Nov. 03, 2012 ~ Nov. 23, 2012	Oct. 05, 2013	Radiation (03CH05-HY)
Turn Table	HD	Deis HD 2000	420/611	0 ~ 360 degree	N/A	Nov. 03, 2012 ~ Nov. 23, 2012	N/A	Radiation (03CH05-HY)
Antenna Mast	HD	MA 240	240/666	1 m ~ 4 m	N/A	Nov. 03, 2012 ~ Nov. 23, 2012	N/A	Radiation (03CH05-HY)
Horn Antenna	ESCO	3117	66584	1GHz~18GHz	Aug. 10, 2012	Nov. 03, 2012 ~ Nov. 23, 2012	Aug. 09, 2013	Radiation (03CH05-HY)
Pre Amplifier	Agilent	8449B	3008A02665	1GHz~26.5GHz	Aug. 28, 2012	Nov. 03, 2012 ~ Nov. 23, 2012	Aug. 27, 2013	Radiation (03CH05-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA917025 1	15GHz ~ 40GHz	Sep. 28, 2012	Nov. 03, 2012 ~ Nov. 23, 2012	Sep. 27, 2013	Radiation (03CH05-HY)
Pre Amplifier	COM-POWER	PA-103	161075	10-1000MHz.32dB. GAIN	Feb. 27, 2012	Nov. 03, 2012 ~ Nov. 23, 2012	Feb. 26, 2013	Radiation (03CH05-HY)
LTE Base Station	Anritsu	MT8820C	6201074414	N/A	Jan. 05, 2012	Nov. 02, 2012 ~ Dec. 10, 2012	Jan. 04, 2013	-

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
Combined Standard Uncertainty $U_c(y)$	1.27		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.54		

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	± 0.10	Normal (k=2)	0.10	1	0.10
Antenna Factor Calibration	± 1.70	Normal (k=2)	0.85	1	0.85
Cable Loss Calibration	± 0.50	Normal (k=2)	0.25	1	0.25
Receiver Correction	± 2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	± 1.50	Rectangular	0.87	1	0.87
Site Imperfection	± 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
Combined Standard Uncertainty $U_c(y)$	2.36				
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.72				



Appendix A. Photographs of EUT

Please refer to Sporton report number EP202430 as below.