FCC TEST REPORT

For

Handheld Data Terminal

Model Number: i6200S

FCC ID: SWSI6200S

Report Number : WT168001368

Test Laboratory	:	Shenzhen Academy of Metrology and Quality Inspection National Digital Electronic Product Testing Center
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Test report declaration

Applicant : Shenzhen Urovo Technology Co., Ltd

Address : 7/F, Zondy Cyber Building, Keyuan South Road,
Nanshan Direct, Shenzhen City, China

Manufacturer : Shenzhen Urovo Technology Co., Ltd

Address : 7/F, Zondy Cyber Building, Keyuan South Road,
Nanshan Direct, Shenzhen City, China

EUT Description : Handheld Data Terminal

Model No : i6200S

Trade mark : UROVO

Serial Number : /

FCC ID : SWSI6200S

Test Standards:

FCC PART 22H AND 24E (2015)

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI/TIA-603-D (2010) & KDB971168 and the energy emitted by the sample EUT tested as described in this report is in compliance with FCC Rules Part 22H AND 24E.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Project
Engineer: _____ Date: Apr.22, 2016
(Chen Silin 陈司林)

Checked by: _____ Date: Apr.22, 2016
(Lin Yixiang 林奕翔)

Approved by: _____ Date: Apr.22, 2016
(Lin Bin 林斌)

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TEST Results SUmmary

Table 1 Test Results Summary

FCC Measurement Specification	FCC Limits Part(s)	Description	Result
2.1046	22.913 24.232	Effective Radiated Power of Transmitter	PASS
2.1046	22.913 24.232(b)	Conducted Power of Transmitter	PASS
2.1046	24.232(d)	Peak to Average Radio	PASS
2.1049	22.917(b) 24.238(b)	Occupied Bandwidth	PASS
2.1051	22.917 24.238	Spurious Emission at Antenna Terminal	PASS
2.1053	22.917 24.238	Radiated Spurious Emissions	PASS
2.1055	22.355 24.235	Frequency Stability	PASS

CFR 47 (FCC) part 22 subpart H and part 24 subpart E .

Remark: "N/A" means "Not applicable."
The tests documented in this report were performed in accordance with
ANSI/TIA-603-D (2010) & KDB971168, FCC CFR 47 Part 2, Part 22 and Part 24.

1. GENERAL INFORMATION

1.1. Report information

1.1.1. This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.

1.1.2. The samples mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

1.1.3. Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through SMQ, unless the applicant has authorized SMQ in writing to do so.

1.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at Bldg. of Metrology & Quality Inspection, Longzhu Road, Nanshan District, Shenzhen, Guangdong, China. At the time of testing, Laboratory is accredited by the following organizations:

China National Accreditation Service for Conformity Assessment (CNAS) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is CNAS L0579.
The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number are 446246 806614 994606(semi anechoic chamber).

The Laboratory is listed in Voluntary Control Council for Interference by Information Technology Equipment (VCCI), and the registration number are R-1974(open area test site) , R-1966(semi anechoic chamber),C-2117(mains ports conducted interference measurement) and T-180(telecommunication ports conducted interference measurement).

The Laboratory is registered to perform emission tests with Industry Canada (IC), and the registration number is IC4174.

TUV Rhineland accredits the Laboratory for conformance to IEC and EN standards, the registration number is E2024086Z02.

1.3. Measurement Uncertainty

For a 95% confidence level (k = 2), the measurement expanded uncertainties for defined   systems, in accordance with the recommendations of ISO 17025 as following:
Radiated Emission
30MHz~1000MHz   4.5dB
1GHz~26.5GHz   4.6dB

2. PRODUCT DESCRIPTION

2.1. EUT Description

Table 2 Specification of the Equipment under Test

Product Type:	Handheld Data Terminal
Hardware Version:	V04
Software Version :	ID86_P3_00WE_YBXX_AU88_417_R_0_151023_03_3674c43
FCC-ID:	SWSI6200S

Frequency Range	GSM850:
	    TX 824MHz~849MHz RX 869MHz~894MHz
	PCS1900:
	    TX 1850MHZ~1910MHz RX 1930MHz~1990MHz
	WCDMA 850:
	    TX 824MHz~849MHz RX 869MHz~894MHz
	WCDMA 1900:
	    TX 1850MHZ~1910MHz RX 1930MHz~1990MHz

Type(s) of Modulation:	GSM850/PCS1900 :GMSK 8PSK WCDMA850/ WCDMA1900:QPSK
Antenna Designation:	PIFA Antenna 824MHz~849MHz: 1.5dBi 1850MHZ~1910MHz: 2.8dBi
Operating voltage:	Internal battery, 120V AC Adapter; 3.5V (Low)/3.8V (Nominal)/ 4.35V (Max)

Remark: --

Table 3 Identification of the Equipment Under Test (EUT)

EUT	Serial Number/IMEI	HW Version	SW Version	Notes
1	35817305102727723	V04	ID86_P3_00WE_YBXX_AU88_417_R_0_151023_03_3674c43	Conducted testing sample.
2	35817305102727708	V04	ID86_P3_00WE_YBXX_AU88_417_R_0_151023_03_3674c43	Radiated testing sample.

Table 4 Identification of Accessory equipment

Name	Model No	S/N	Manufacturer
Li-polymer Battery	HBL6200	---	Shenzhen Urovo Technology Co., Ltd
Adaptor for EUT	ZAU-A050150A-02	---	Shenzhen Zhongling Electronics Technology Co.,Ltd
Adaptor for EUT	ZAU-A050260A-04	--	Shenzhen Zhongling Electronics Technology Co.,Ltd

2.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **SWSI6200S** filing to comply with FCC PART 22H and 24E .

2.3. Operating Condition of EUT

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

TM1: GSM/GPRS Mode with GMSK Modulation
TM2: EDGE Mode with 8PSK Modulation
TM3: WCDMA Mode with QPSK Modulation

The maximum power levels are GSM/GPRS mode for GMSK link, Edge mode for 8PSK link, WCDMA mode for QPSK link.only these modes were used for all tests. The conducted power tables are as follows:

Band: GSM850	Average Power [dBm]		
Channel	128	190	251
Frequency (MHz)	824.2	836.6	848.8
GSM (GMSK, 1 Tx slot)	32.50	32.33	32.10
GPRS (GMSK, 1 Tx slot)	32.48	32.33	32.06
GPRS (GMSK, 2 Tx slots)	30.16	30.10	29.88
GPRS (GMSK, 3 Tx slots)	29.23	29.03	28.82
GPRS (GMSK, 4 Tx slots)	27.25	27.19	26.84
EDGE (8PSK, 1 Tx slot)	26.44	26.36	26.09
EDGE (8PSK, 2 Tx slot)	23.43	23.42	23.14
EDGE (8PSK, 3 Tx slot)	22.50	22.34	22.12
EDGE (8PSK, 4 Tx slot)	21.57	21.44	21.07

Band: GSM1900	Average Power [dBm]		
Channel	512	661	810
Frequency (MHz)	1850.2	1880	1909.8

GSM (GMSK, 1 Tx slot)	**30.79**	**31.06**	**29.79**
GPRS (GMSK, 1 Tx slot)	30.79	31.05	29.79
GPRS (GMSK, 2 Tx slots)	27.92	28.19	29.13
GPRS (GMSK, 3 Tx slots)	26.74	26.99	27.30
GPRS (GMSK, 4 Tx slots)	24.68	24.97	25.07
EDGE (8PSK, 1 Tx slot)	25.19	25.49	25.59
EDGE (8PSK, 2 Tx slot)	22.48	22.86	22.85
EDGE (8PSK, 3 Tx slot)	21.93	22.27	22.47
EDGE (8PSK, 4 Tx slot)	21.11	21.43	21.65

Band: WCDMA Band II	Average Power [dBm]		
Channel	**9262**	**9400**	**9538**
Frequency (MHz)	**1852.4**	**1880.0**	**1907.6**
RMC 12.2K	**24.36**	**23.87**	**24.03**
HSDPA Subtest-1	23.25	23.16	23.39
HSDPA Subtest-2	23.05	22.47	22.66
HSDPA Subtest-3	23.17	22.51	22.55
HSDPA Subtest-4	23.29	22.39	22.82
HSUPA Subtest-1	22.97	22.48	22.55
HSUPA Subtest-2	21.74	21.90	22.14
HSUPA Subtest-3	21.42	21.44	21.67
HSUPA Subtest-4	22.16	21.98	22.24
HSUPA Subtest-5	21.54	21.30	20.97

Band :WCDMA Band V	Average Power [dBm]		
Channel	**4,132**	**4,182**	**4,233**
Frequency (MHz)	**826.4**	**836.4**	**846.6**
RMC 12.2K	**24.47**	**24.37**	**24.00**
HSDPA Subtest-1	23.41	23.20	22.96
HSDPA Subtest-2	22.70	22.57	22.34
HSDPA Subtest-3	22.60	22.43	22.22
HSDPA Subtest-4	22.78	22.41	22.38
HSUPA Subtest-1	22.78	22.61	22.34
HSUPA Subtest-2	22.15	21.82	21.69
HSUPA Subtest-3	21.82	21.34	21.29
HSUPA Subtest-4	22.63	22.33	22.08
HSUPA Subtest-5	22.32	21.69	21.10

2.4. Support Equipment List

Table 5 Support Equipment List

Name	Model No	S/N	Manufacturer
N/A	---	---	---

2.5. Test Conditions

Date of test：Mar.22,2016-Apr.20 , 2016
Date of EUT Receive：Mar.22,2016
Temperature: -30-50 ℃
Relative Humidity: 36-54%

2.6. Special Accessories

Not available for this EUT intended for grant.

2.7. Equipment Modifications

Not available for this EUT intended for grant.

3. TEST EQUIPMENT USED

Table 6 Test Equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB8501/09	EMI Test Receiver	Rohde & Schwarz	ESU40	Mar.23, 2016	1 Year
SB9721/04	Signal Generator	Agilent	E8257D	Dec.28, 2015	1 Year
SB8501/04	Bilog Antenna	Schwarzbeck	VULB9163	Mar.23, 2015	1 Year
SB5472/02	Bilog Antenna	Schwarzbeck	VULB9163	Jan.07, 2016	1 Year
SB3435	Horn Antenna	Rohde & Schwarz	HF906	Jan.07, 2016	1 Year
SB3434	Horn Antenna	Rohde & Schwarz	HF906	Jan.07, 2016	1 Year
SB3435/01	Amplifier(1-18GHz)	Rohde & Schwarz	---	Jan.07, 2016	1 Year
SB3435/02	Amplifier(18-40GHz)	Rohde & Schwarz	---	Jan.07, 2016	1 Year
SB8501/16	Horn Antenna	Rohde & Schwarz	SCU-26	Mar.21, 2016	1 Year
SB3450/01	3m Semi-anechoic chamber	Albatross Projects	9X6X6	Oct.11, 2014	2 Years
SB8501/02	Communication Test Unit	Rohde & Schwarz	CMU200	Dec.06, 2015	1 Year
SB9721/07	DC Power Supply	Agilent	66319D	---	---
SB11818	Temperature&Humidity Test chamber	ESPEC	EH-010U	Jan.19, 2016	1 Year
SB9060	Signal Analyzer	Rohde & Schwarz	FSQ40	May.13,2015	1 Year

4. TEST RESULTS

4.1. RF Power Output

4.1.1. Test Standard

FCC: CFR Part 2.1046, CFR Part 22.913, CFR Part 24.232

4.1.2. Test Limit

FCC 22.913 (a) Effective radiated power limits.
The effective radiated power (ERP) of mobile transmitters must not exceed 7 Watts.
FCC 24.232 (b)(c) Power limits.
(b) Mobile/portable stations are limited to 2 Watts effective isotropic radiated power (EIRP). (c) Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms equivalent voltage. The measurement results shall be properly adjusted for any limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement over the full bandwidth of the channel.

4.1.3. Test Procedure

Radiated Output Power Measurement procedure
Ref: ANSI/TIA-603-D (2010) & KDB971168-2.2.17.2 Effective Radiated Power (ERP) or Effective Isotropic
1. Connect the equipment as shown in the above diagram with the EUT's antenna in a vertical orientation.
2. Adjust the settings of the Universal Radio Communication Tester (CMU) to set the EUT to its maximum power at the required channel.
3. Set the spectrum analyzer to the channel frequency. Set the analyzer to measure peak hold with the required settings.
4. Rotate the EUT 360 . Record the peak level in dBm (LVL).
5. Replace the EUT with a vertically polarized half wave dipole or known gain antenna. The center of the antenna should be at the same location as the center of the EUT's antenna.
6. Connect the antenna to a signal generator with known output power and record the path loss in dB (LOSS). LOSS = Generator Output Power (dBm) – Analyzer reading (dBm).
7. Determine the ERP using the following equation:
ERP (dBm) = LVL (dBm) + LOSS (dB)
8. Determine the EIRP using the following equation:
EIRP (dBm) = ERP (dBm) + 2.15 (dB)
9. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

4.1.4. Test Data

Table 7 Substitution Results

Test Mode	Freq. [MHz]	SG. Level [dBm]	Cable Loss [dB]	Antenna Gain [dBd]	Substitution Level (ERP) [dBm]	Polarization	Limit [dBm]	Result
TM1	824.2	23.04	0.5	5.28	27.82	V	38.5	Pass
	836.6	23.11	0.5	5.28	**27.89**	V	38.5	Pass
	848.8	22.93	0.5	5.28	27.71	V	38.5	Pass
TM2	824.2	18.67	0.5	5.28	23.45	V	38.5	Pass
	836.6	18.93	0.5	5.28	**23.71**	V	38.5	Pass
	848.8	18.47	0.5	5.28	23.25	V	38.5	Pass
TM3	826.4	14.99	0.5	5.28	19.77	V	38.5	Pass
	836.4	15.77	0.5	5.28	20.55	V	38.5	Pass
	846.6	17.63	0.5	5.28	**22.41**	V	38.5	Pass

Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Table 8 Substitution Results

Test Mode	Freq. [MHz]	SG. Level [dBm]	Cable Loss [dB]	Antenna Gain [dBi]	Substitution Level (EIRP) [dBm]	Polarization	Limit [dBm]	Result
TM1	1850.2	16.8	0.97	8.92	24.75	H	33	Pass
	1880	16.91	0.97	8.92	24.86	H	33	Pass
	1909.8	16.96	0.97	8.92	**24.91**	H	33	Pass
TM2	1850.2	14.68	0.97	8.92	**22.63**	H	33	Pass
	1880	14.56	0.97	8.92	22.51	H	33	Pass
	1909.8	14.13	0.97	8.92	22.08	H	33	Pass
TM3	1852.4	11.35	0.97	8.92	**19.30**	H	33	Pass
	1880	12.57	0.97	8.92	20.52	H	33	Pass
	1907.6	12.71	0.97	8.92	**20.66**	H	33	Pass

Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

4.2. Peak to Average Ratio

4.2.1. Test Standard

CFR 47 (FCC) part 24 subpart E

4.2.2. Test Limit

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

4.2.3. Test Procedure

A peak to average ratio measurement is performed at the conducted port of the EUT. For WCDMA signals, the spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level. For GSM signals, an average and a peak trace are used on a spectrum analyzer to determine the largest deviation between the average and the peak power of the EUT in a bandwidth greater than the emission bandwidth. The traces are generated with the spectrum analyzer set to zero span mode.

4.2.4. Test Data

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
GSM1900	GSM/TM1	1850.2	0.25	<13	PASS
		1880	0.30	<13	PASS
		1909.8	0.29	<13	PASS
GSM1900	EDGE/TM2	1850.2	0.25	<13	PASS
		1880	0.30	<13	PASS
		1909.8	0.29	<13	PASS

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
WCDMA1900	UMTS/TM3	1852.4	3.37	<13	PASS
		1880	2.82	<13	PASS
		1907.6	2.60	<13	PASS

4.3. Occupied Bandwidth/Emission Bandwidth

4.3.1. Test Standard

FCC: CFR Part 2.1049, CFR Part 22.917, CFR Part 24.238

4.3.2. Test Limit

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable.

4.3.3. Test Procedure

1. Connect the equipment as shown in the above diagram.
2. Adjust the settings of the Universal Radio Communication Tester (CMU) to set the EUT to its maximum power at the required channel.
3. Set the spectrum analyzer to measure the 99% occupied bandwidth. Record the value.
4. Set the spectrum analyzer to measure the -26 dB emission bandwidth. Record the value.
5. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.
Spectrum analyzer settings: Measurement bandwidth of at least 1% of the occupied bandwidth.
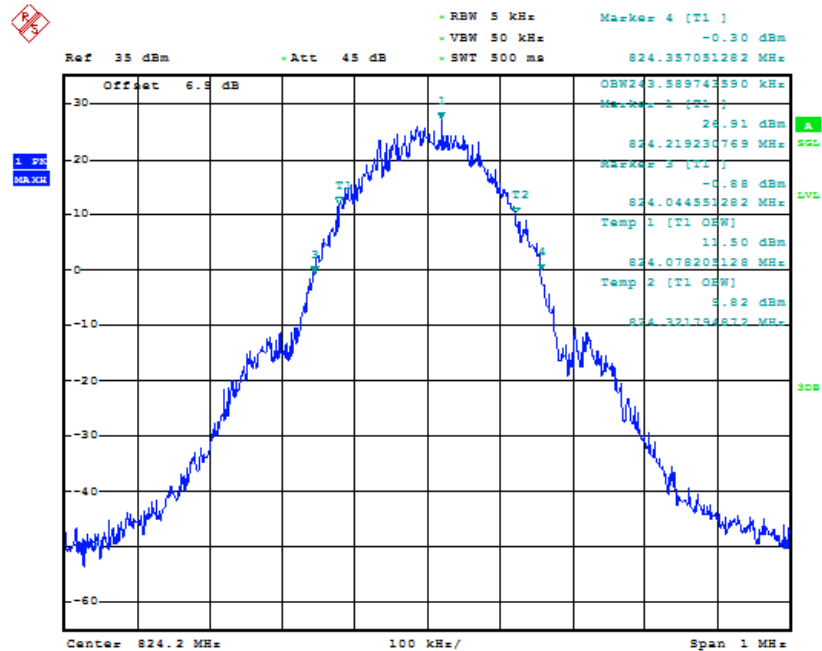
4.3.4. Test Setup
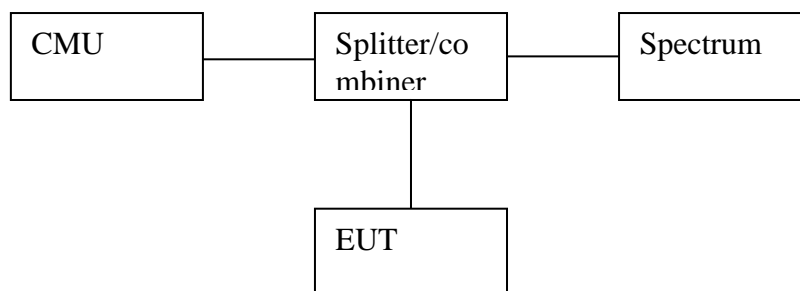
4.3.5.Test Data

Table 9 Occupied Bandwidth Test Data

Test Band	Test Mode	Test Channel	99% OBW (kHz)	26dBc BANDWIDTH (kHz)	Verdict
GSM850	GSM/TM1	LCH	243.59	312.50	PASS
		MCH	246.79	312.50	PASS
		HCH	246.79	298.08	PASS
	EDGE/TM2	LCH	248.40	298.08	PASS
		MCH	245.19	301.28	PASS
		HCH	243.59	312.50	PASS
GSM1900	GSM/TM1	LCH	245.19	312.50	PASS
		MCH	241.99	309.29	PASS
		HCH	245.19	315.71	PASS
	EDGE/TM2	LCH	240.38	291.67	PASS
		MCH	243.59	299.68	PASS
		HCH	240.38	302.88	PASS

Table 10 Occupied Bandwidth Test Data

Test Band	Test Mode	Test Channel	99% OBW (kHz)	26dBc BANDWIDTH (kHz)	Verdict
WCDMA850	UMTS/TM3	LCH	4182.7	4728	PASS
		MCH	4166.7	4760	PASS
		HCH	4182.7	4728	PASS
WCDMA1900	UMTS/TM3	LCH	4166.7	4760	PASS
		MCH	4182.7	4776	PASS
		HCH	4198.7	4808	PASS

Test Band = GSM850
Test Mode = GSM/TM1
Test Channel = LCH

```
                                      * RBW 5 kHz        Marker 4 [T1 ]
                                      * VBW 50 kHz                    -0.30 dBm
        Ref  35 dBm        * Att  45 dB   * SWT 500 ms    824.357051282 MHz
      Offset  6.5 dB                       OBW243.589743590 kHz
  -30                              1       Marker 1 [T1 ]
                                                           26.91 dBm
                                                    824.219230769 MHz
  -20                                      Marker 3 [T1 ]
                                                           -0.88 dBm
  -10          T1              T2                   824.044551282 MHz
                                           Temp 1 [T1 OBW]
                                                           11.50 dBm
    0          3               4                   824.078205128 MHz
                                           Temp 2 [T1 OBW]
                                                            5.82 dBm
  -10                                              824.321794872 MHz
  -20
  -30
  -40
  -60
  Center  824.2 MHz           100 kHz/              Span  1 MHz
```

Date: 14.APR.2016 11:14:51

Test Band = GSM850
Test Mode = GSM/TM1
Test Channel = MCH

```
                                      * RBW 5 kHz        Marker 4 [T1 ]
                                      * VBW 50 kHz                    -1.22 dBm
        Ref  35 dBm        * Att  45 dB   * SWT 500 ms    836.755448718 MHz
      Offset  6.5 dB                       OBW246.794871795 kHz
  -30                              1       Marker 1 [T1 ]
                                                           25.79 dBm
  -20                                              836.593589744 MHz
                                           Marker 3 [T1 ]
  -10      T1              T2                       -0.94 dBm
                                                   836.442946718 MHz
                                           Temp 1 [T1 OBW]
    0          3                                    11.79 dBm
                                                   836.476602564 MHz
  -10                                      Temp 2 [T1 OBW]
                                                   10.72 dBm
  -20                                              836.723391436 MHz
  -30
  -40
  -60
  Center  836.6 MHz           100 kHz/              Span  1 MHz
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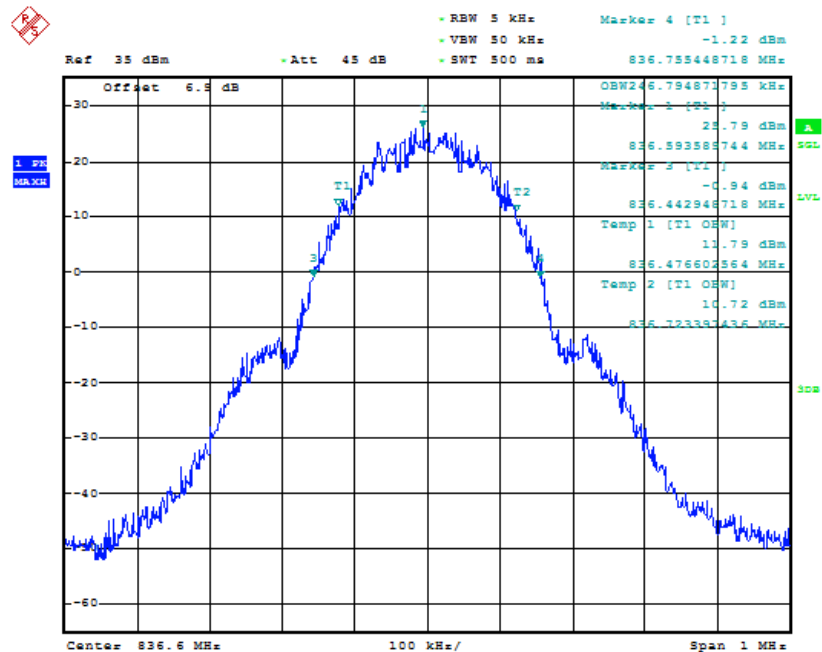
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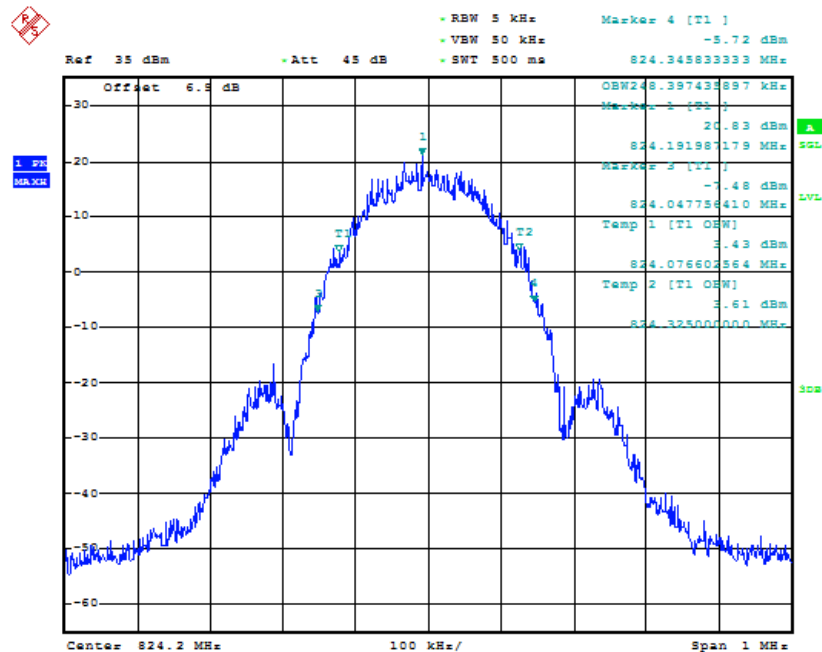
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Test Channel = LCH
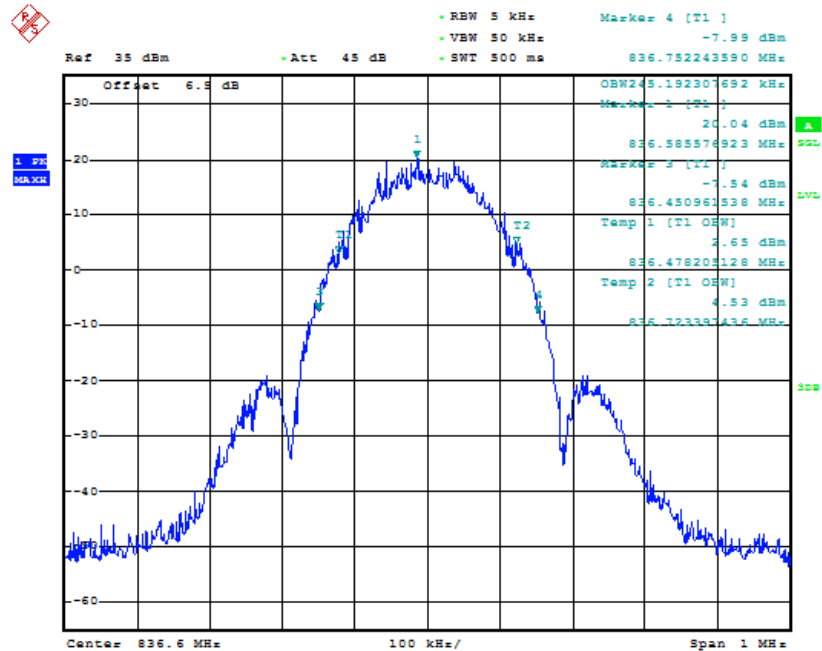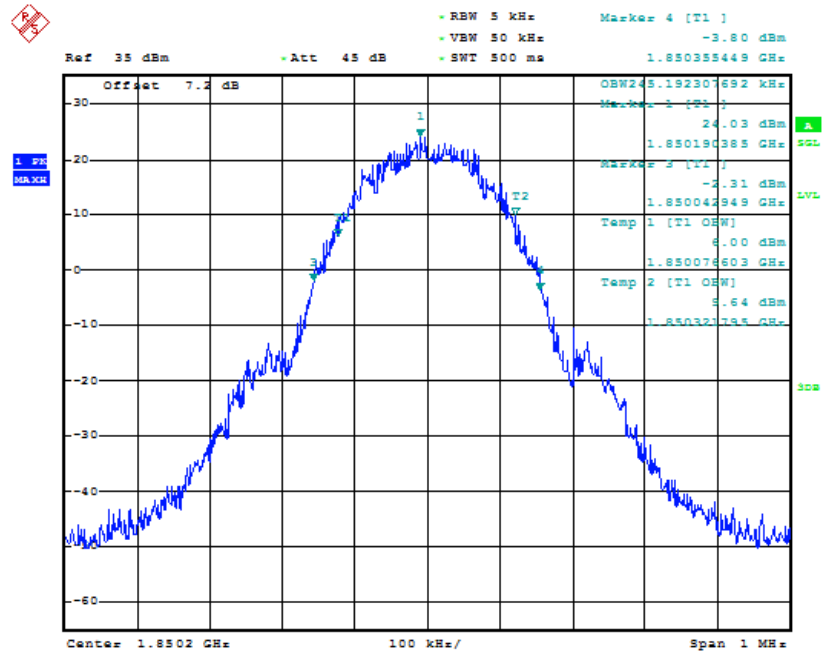
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Test Mode = EDGE/TM2
Test Channel = MCH

Test Band = GSM850
Test Mode = EDGE/TM2
Test Channel = HCH
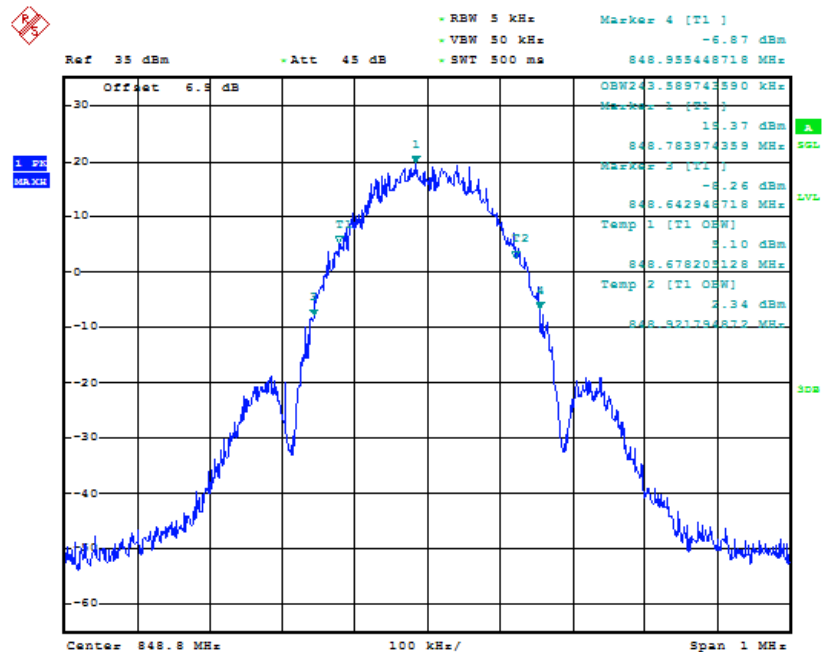
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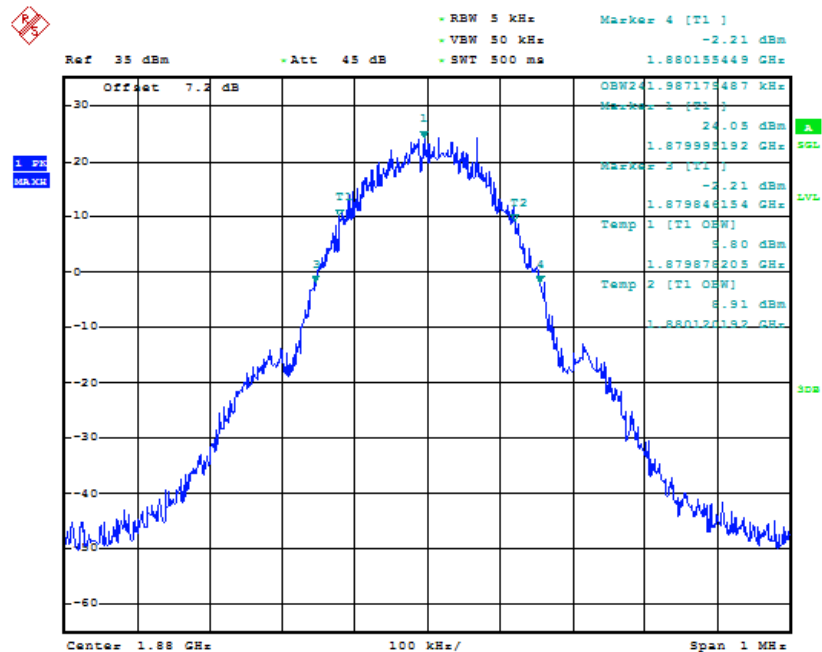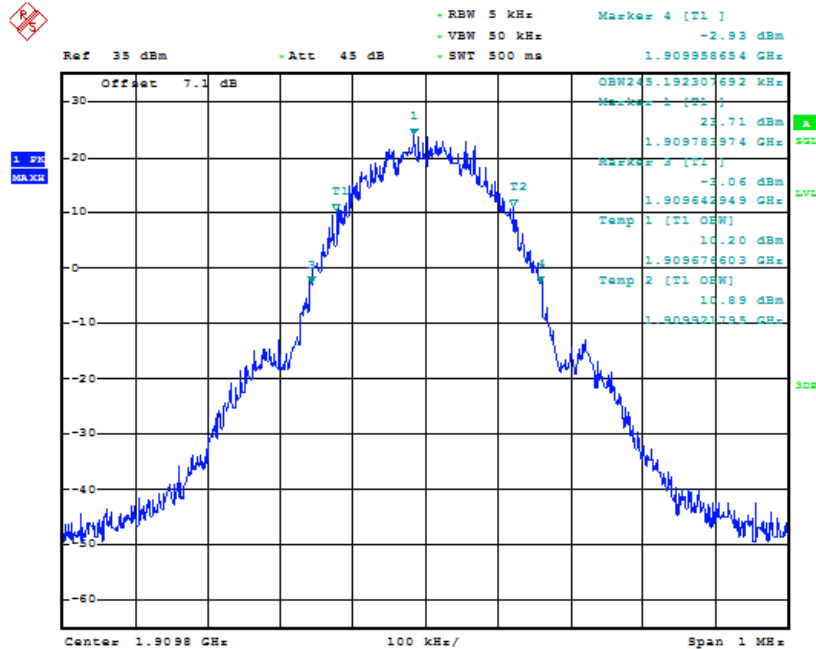Test Mode = GSM/TM1
Test Channel = LCH

Date: 13.APR.2016 19:02:51

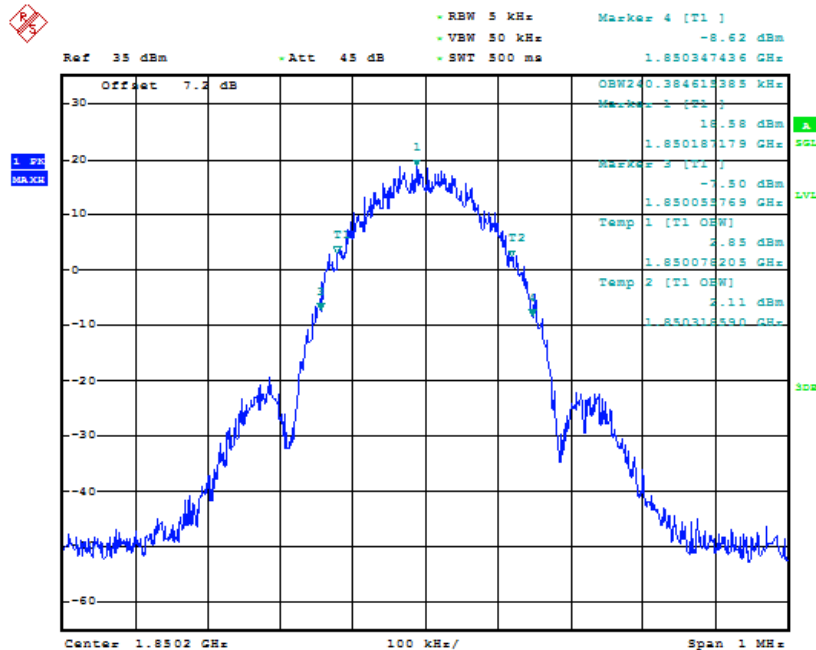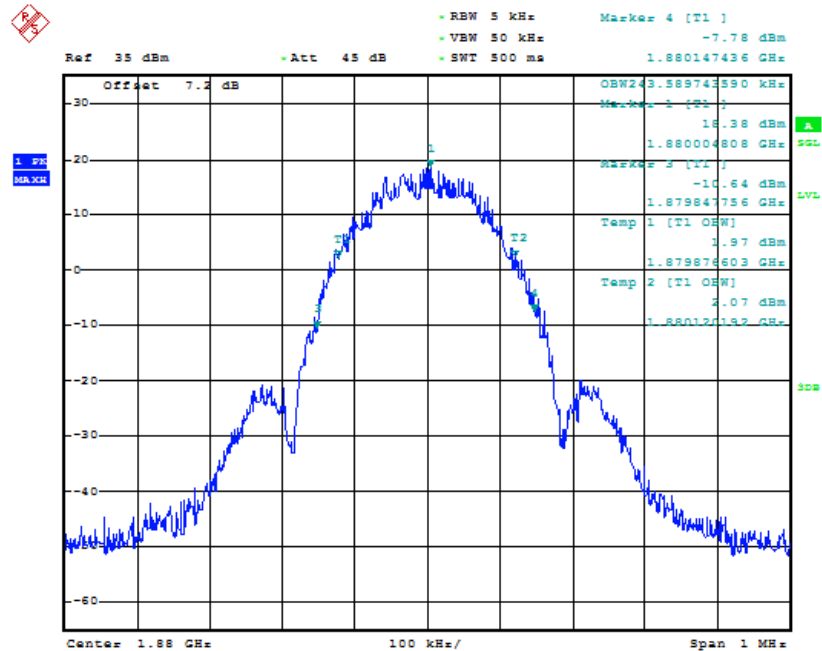Test Band = GSM1900
Test Mode = GSM /TM1
Test Channel = MCH

Date: 13.APR.2016 19:03:16

Test Band = GSM1900
Test Mode = GSM /TM1
Test Channel = HCH

```
                                        RBW  5 kHz        Marker 4 [T1 ]
                                        VBW  50 kHz                    -2.93 dBm
                    Ref  35 dBm         Att  45 dB    SWT 500 ms        1.909958654 GHz
         Offset  7.1 dB                                    OBW245.192307692 kHz
      -30                                                  Marker 1 [T1 ]
                                          1                             23.71 dBm       A
      -20                                                   1.909783974 GHz           SGL
                              T1                          Marker 3 [T1 ]
      -10                              T2                               -3.06 dBm      LVL
                                                           1.909642949 GHz
       0                                                  Temp 1 [T1 OBW]
                                                                       10.20 dBm
      -10                                                  1.909676603 GHz
                                                          Temp 2 [T1 OBW]
      -20                                                              10.89 dBm       3DB
                                                           1.909921795 GHz
      -30
      -40
      -50
      -60
      Center  1.9098 GHz            100 kHz/              Span  1 MHz
```

Date: 13.APR.2016 19:03:41

Test Band = GSM1900
Test Mode = EDGE /TM2
Test Channel = LCH

```
                                        RBW  5 kHz        Marker 4 [T1 ]
                                        VBW  50 kHz                    -8.62 dBm
                    Ref  35 dBm         Att  45 dB    SWT 500 ms        1.850347436 GHz
         Offset  7.2 dB                                    OBW240.384615385 kHz
      -30                                                  Marker 1 [T1 ]
                                                                       16.58 dBm       A
      -20                               1                   1.850187179 GHz           SGL
      -10                                                  Marker 3 [T1 ]
                              T1        T2                             -7.50 dBm       LVL
       0                                                   1.850055769 GHz
                                                          Temp 1 [T1 OBW]
      -10                                                               2.85 dBm
                                                           1.850076205 GHz
      -20                                                  Temp 2 [T1 OBW]
                                                                       2.11 dBm
      -30                                                   1.850316590 GHz           3DB
      -40
      -50
      -60
      Center  1.8502 GHz            100 kHz/              Span  1 MHz
```

Date: 13.APR.2016 19:35:59

Test Band = GSM1900
Test Mode = EDGE /TM2
Test Channel = MCH

Test Band = GSM1900
Test Mode = EDGE /TM2
Test Channel = HCH
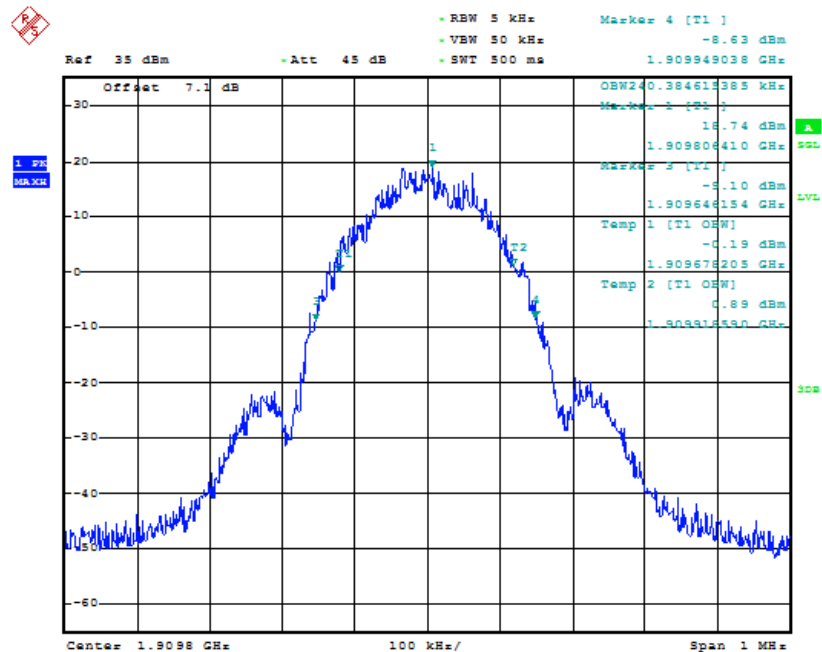
Test Band=WCDMA850
Test Mode=UMTS/TM3
Test Channel=LCH
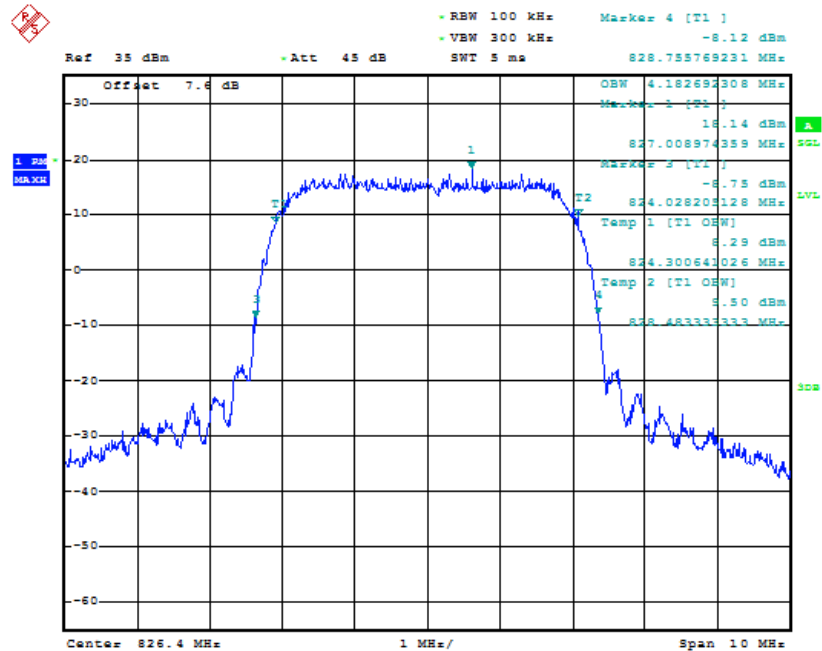
Date: 14.APR.2016 12:24:55

Test Band=WCDMA850
Test Mode=UMTS/TM3
Test Channel=MCH
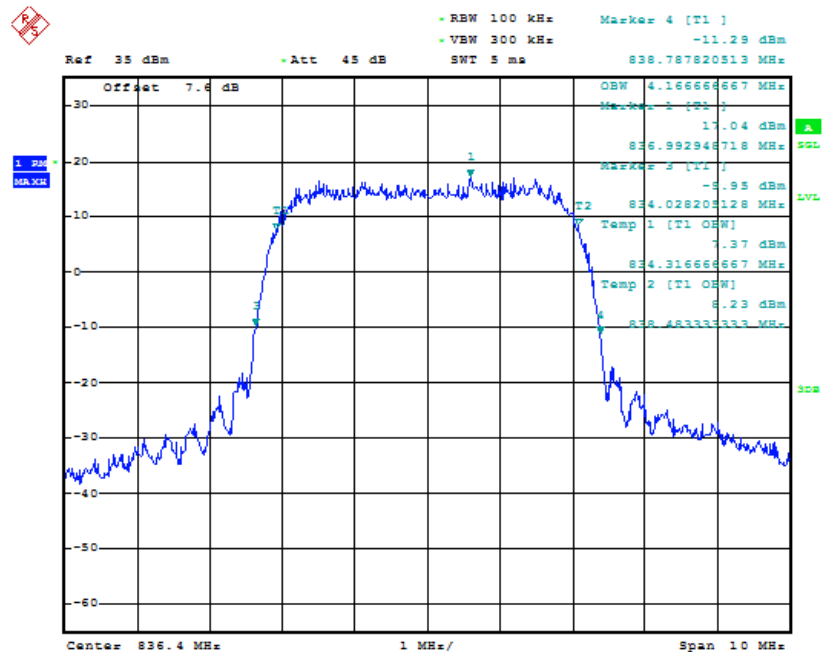
Date: 14.APR.2016 12:25:18

Test Band=WCDMA850
Test Mode=UMTS/TM3
Test Channel=HCH
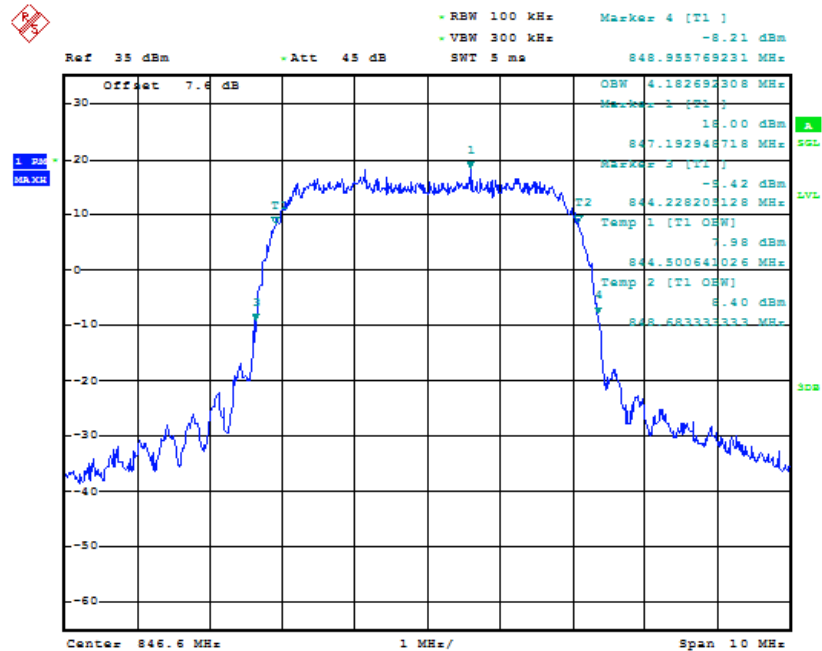
Date: 14.APR.2016 12:25:41
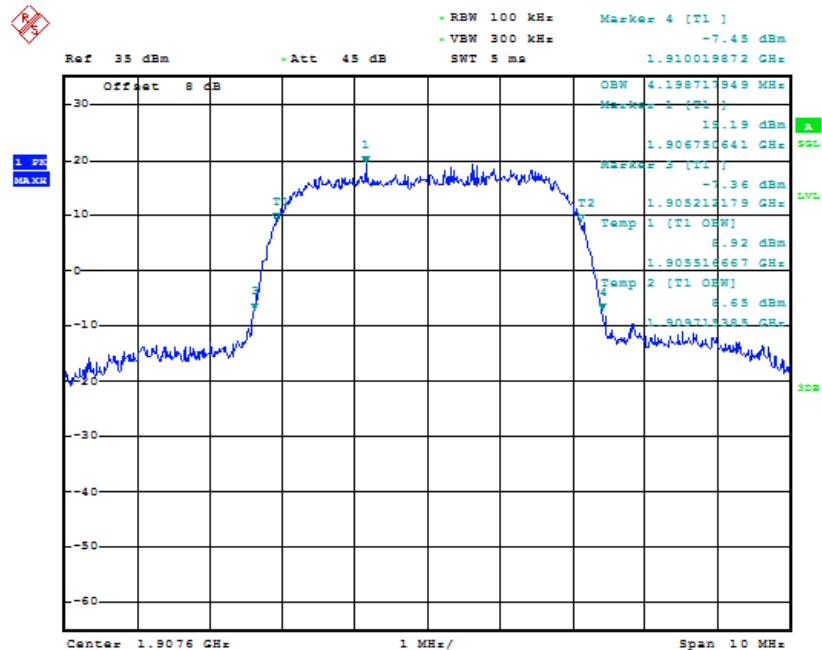
Test Band=WCDMA1900
Test Mode=UMTS/TM3
Test Channel=LCH
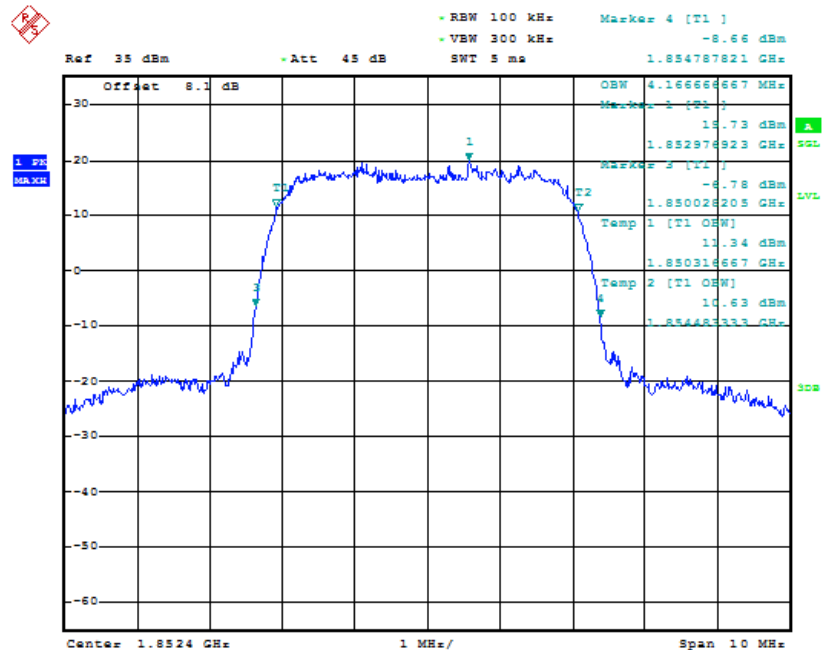
Date: 14.APR.2016 12:04:56

Test Band=WCDMA1900
Test Mode=UMTS/TM3
Test Channel=MCH

RBW 100 kHz	Marker 4 [T1]
VBW 300 kHz	-6.78 dBm
Ref 35 dBm	Att 45 dB	SWT 5 ms	1.882387821 GHz

Offset 8.1 dB

OBW 4.182692308 MHz
Marker 1 [T1]
19.55 dBm
1.879116590 GHz
Marker 3 [T1]
-6.34 dBm
1.877612179 GHz
Temp 1 [T1 OBW]
5.29 dBm
1.877916667 GHz
Temp 2 [T1 OBW]
10.37 dBm
1.882093359 GHz

Center 1.88 GHz   1 MHz/   Span 10 MHz
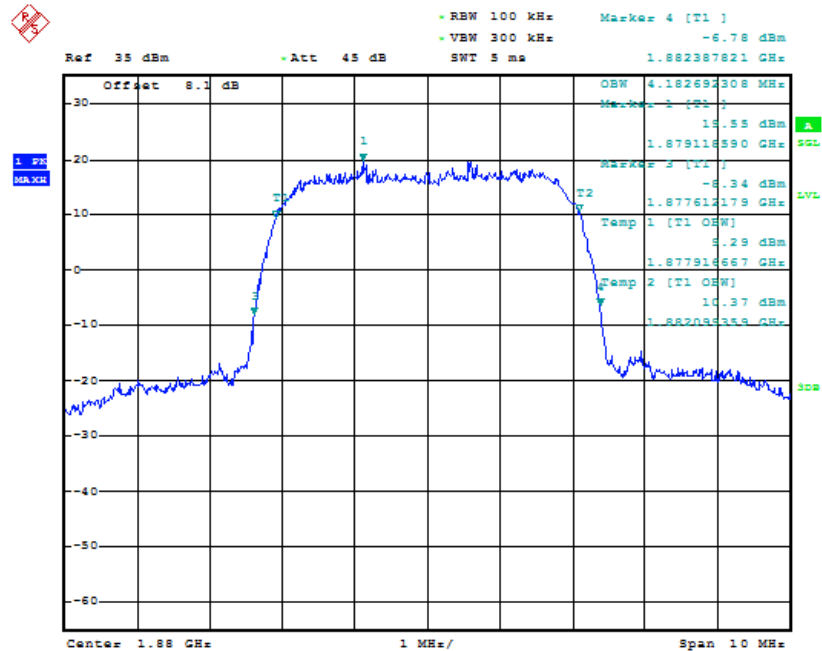
Date: 14.APR.2016 12:05:19

Test Band=WCDMA1900
Test Mode=UMTS/TM3
Test Channel=HCH

RBW 100 kHz	Marker 4 [T1]
VBW 300 kHz	-7.45 dBm
Ref 35 dBm	Att 45 dB	SWT 5 ms	1.910019872 GHz

Offset 8 dB

OBW 4.198717949 MHz
Marker 1 [T1]
19.19 dBm
1.906750641 GHz
Marker 3 [T1]
-7.36 dBm
1.905212179 GHz
Temp 1 [T1 OBW]
6.92 dBm
1.905516667 GHz
Temp 2 [T1 OBW]
6.65 dBm
1.909713359 GHz

Center 1.9076 GHz   1 MHz/   Span 10 MHz

Date: 14.APR.2016 12:05:42

4.4. Spurious Emission at Antenna Terminal

FCC: CFR Part 2.1051, CFR Part 22.917, CFR Part 24.238

4.4.1. Test Limit

The radio frequency voltage or power generated within the equipment and appearing on a
spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in FCC 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. For all power levels +30dBm to 0dBm, this becomes a constant specification of -13dBm.

FCC 22.917 Emission limitations for cellular equipment.
The rules in this section govern the spectral characteristics of emissions in the Cellular Radiotelephone Service.
(b) Measurement procedure. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz of 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

FCC 24.238 Emission limitations for Broadband PCS equipment.
The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.
(b) Measurement procedure. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz of 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

4.4.2. Test Procedure

1. Connect the equipment as shown in the above diagram.
2. Set the spectrum analyzer to measure peak hold with the required settings.
3. Set the signal generator to a known output power and record the path loss in dB (LOSS) for frequencies up to the tenth harmonic of the EUT's carrier frequency.
LOSS = Generator Output Power (dBm) – Analyzer reading (dBm).
4. Replace the signal generator with the EUT.
5. Adjust the settings of the Universal Radio Communication Tester (CMU) to set the EUT to its maximum power at the required channel.
6. Set the spectrum analyzer to measure peak hold with the required settings. Offset the spectrum analyzer reference level by the path loss measured above.
7. Measure and record all spurious emissions up to the tenth harmonic of the carrier frequency.
8. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.
9. If necessary steps 6 and 7 may be performed with the spectrum analyzer set to average detector.
(Note: Step 3 above is performed prior to testing and LOSS is recorded by test software. Steps 2, 6, and 7 above are performed with test software.)

4.4.3. Test Setup

```
  ┌──────────┐      ┌──────────────┐      ┌──────────────┐
  │   CMU    │──────│ Splitter/co  │──────│  Spectrum    │
  │          │      │   mbiner     │      │              │
  └──────────┘      └──────┬───────┘      └──────────────┘
                           │
                    ┌──────┴───────┐
                    │    EUT       │
                    │              │
                    └──────────────┘
```
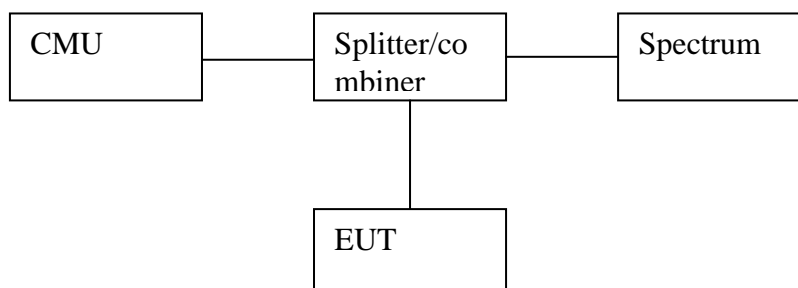
4.4.4. Test Data

Out of band measurement
Test Band = GSM850
Test Mode = GSM /TM1
Test Channel = LCH
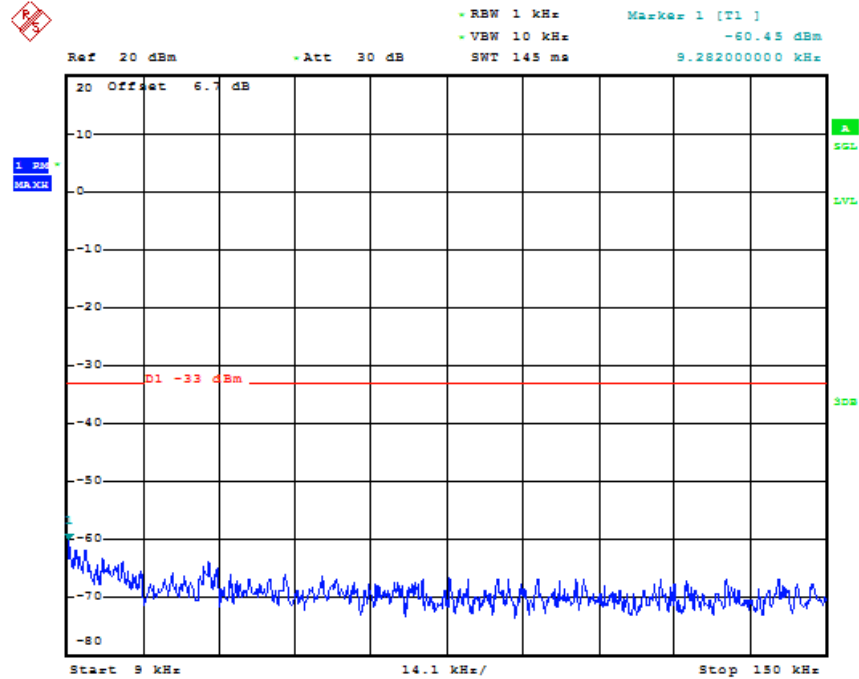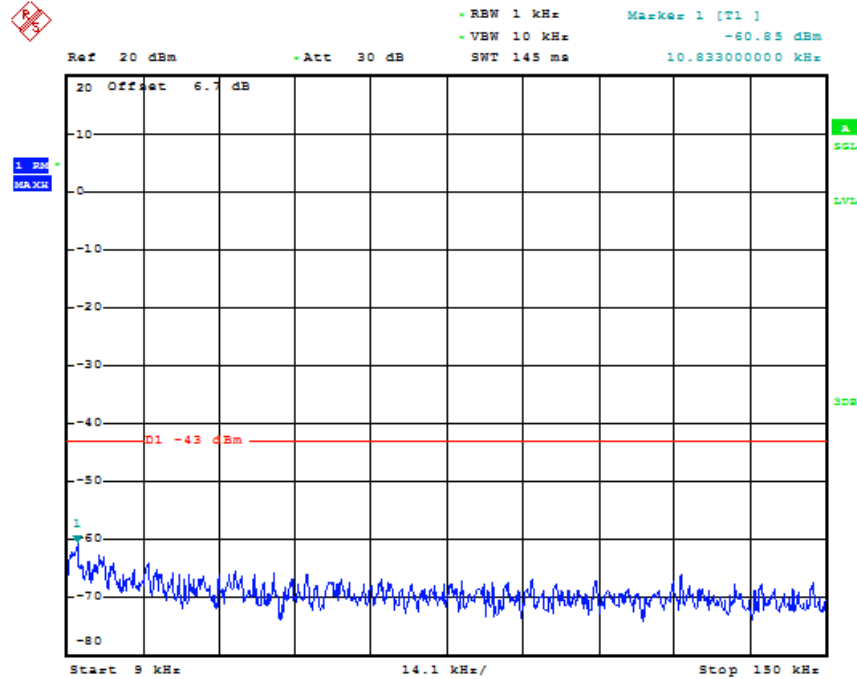
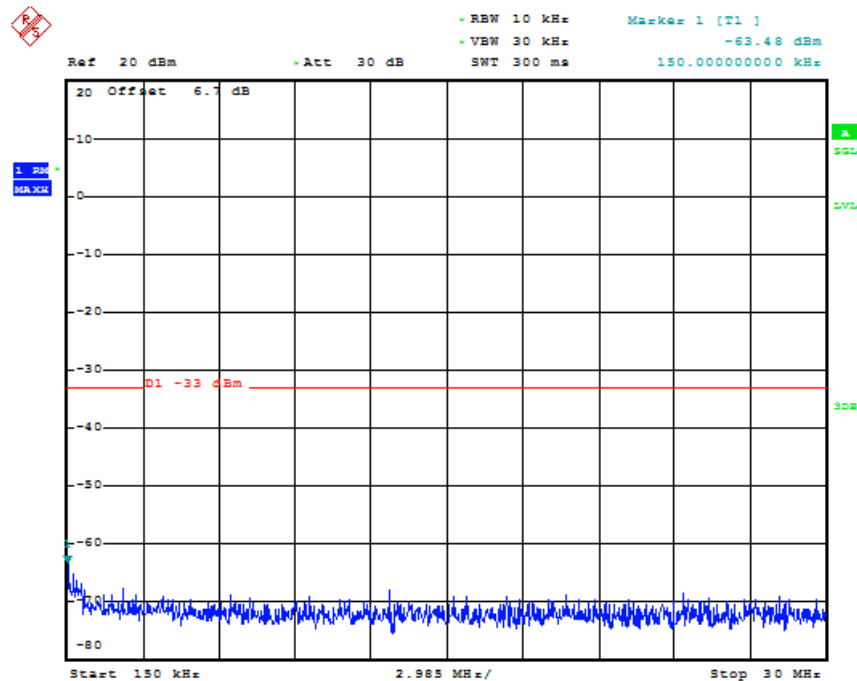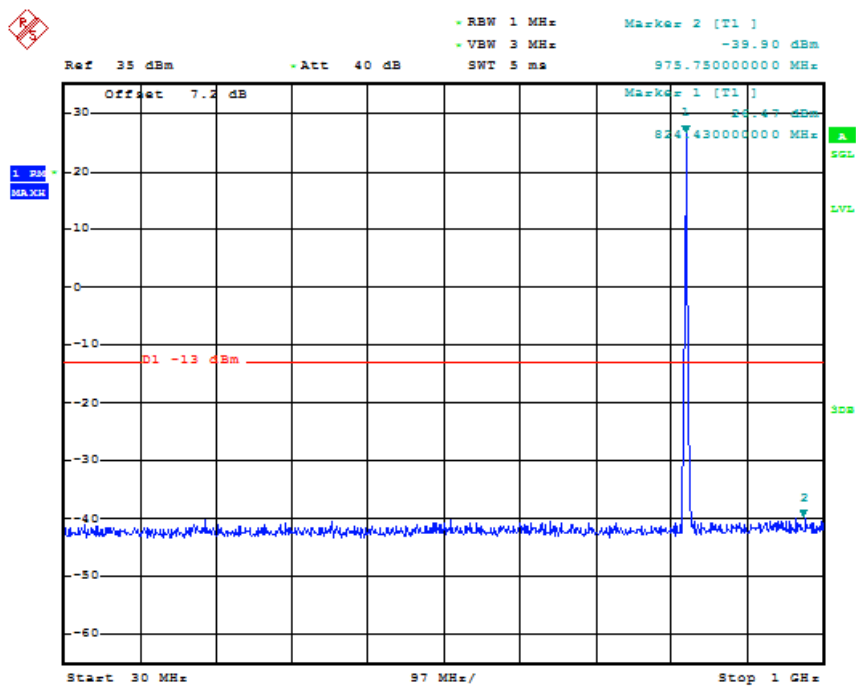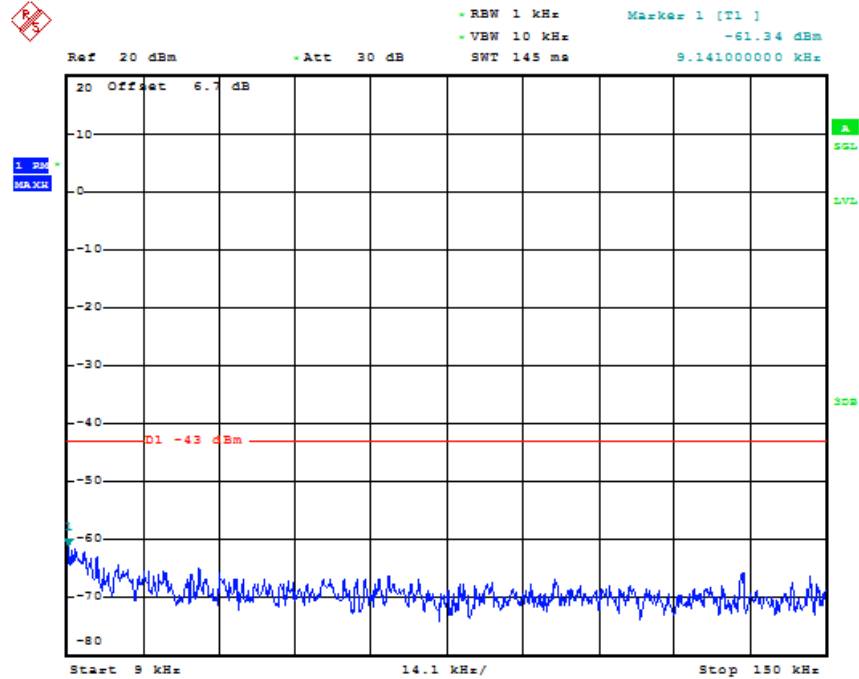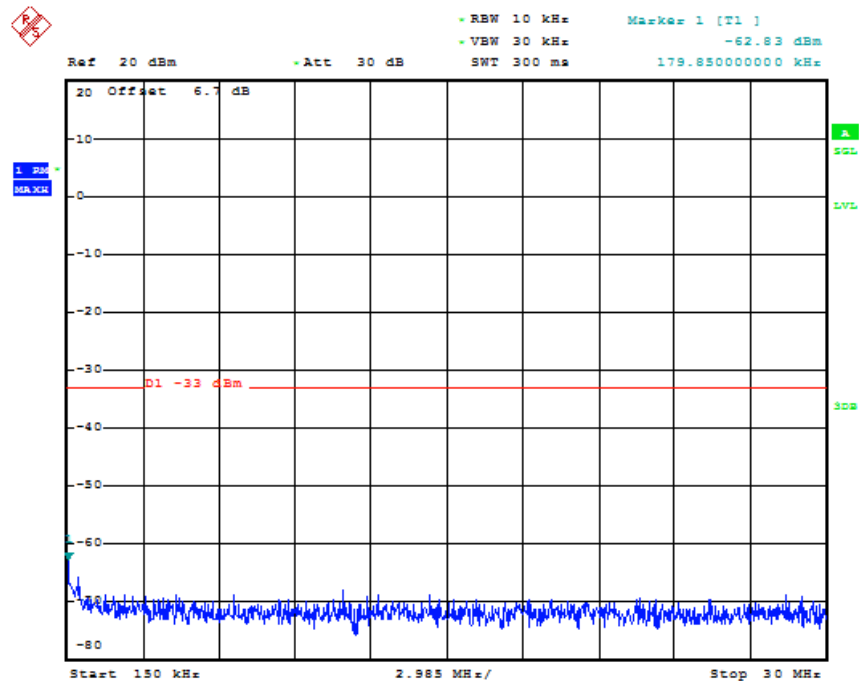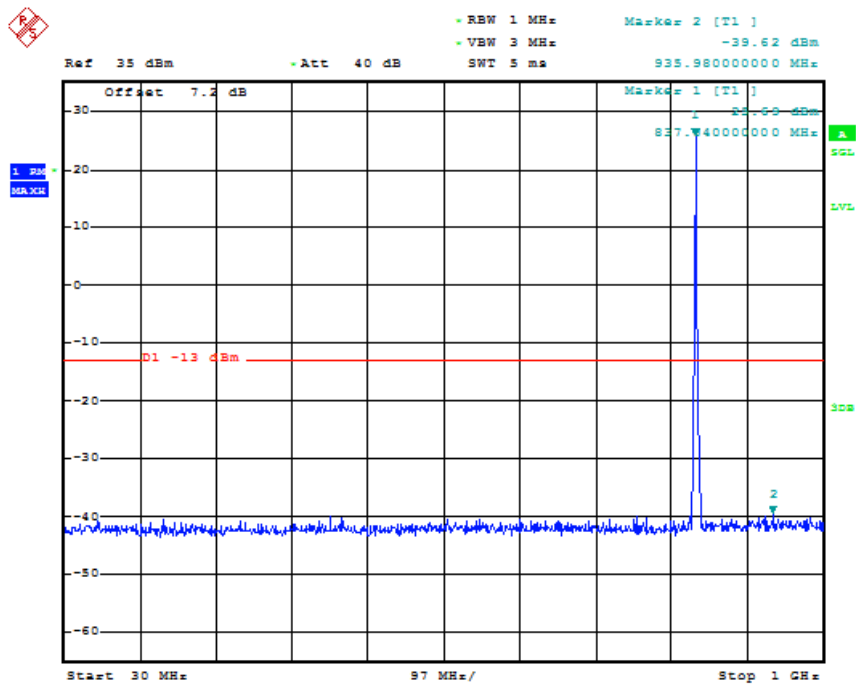

Date: 14.APR.2016 11:17:19

Date: 14.APR.2016 11:17:28

First plot:

RBW 1 MHz
VBW 3 MHz
Ref 35 dBm
Att 40 dB
SWT 5 ms

Marker 2 [T1]
-39.99 dBm
957.320000000 MHz

Offset 7.2 dB
Marker 1 [T1]
824.430000000 MHz

1 RM
MAXH

D1 -13 dBm

SGL
LVL
3DB
A

Start 30 MHz 97 MHz/ Stop 1 GHz

Date: 14.APR.2016 11:17:39

Second plot:

RBW 1 MHz
VBW 3 MHz
Ref 35 dBm
Att 40 dB
SWT 50 ms

Marker 1 [T1]
-37.27 dBm
3.630243902 GHz

Offset 7.5 dB

1 RM
MAXH

D1 -13 dBm

SGL
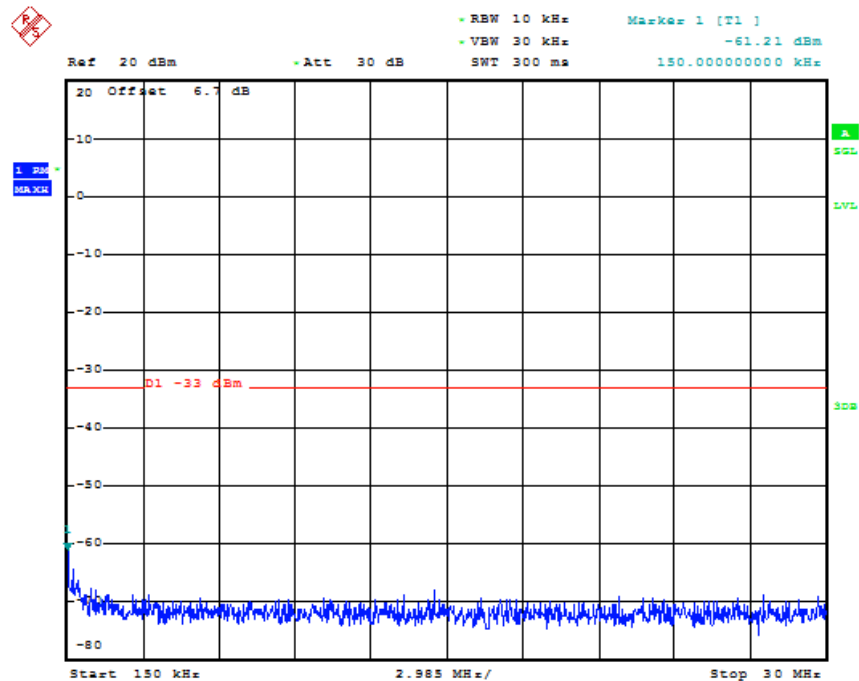LVL
3DB
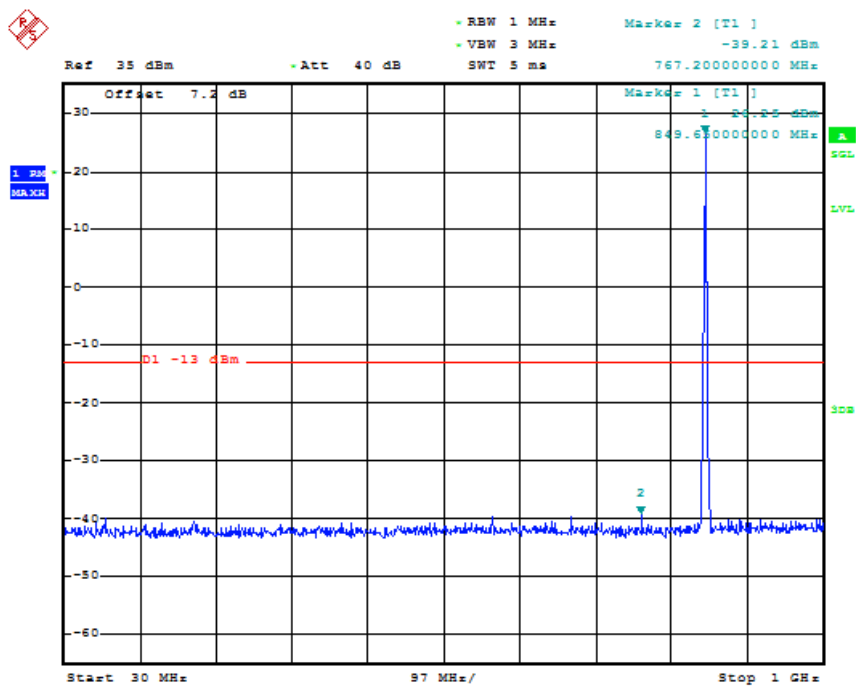A

Start 1 GHz 800 MHz/ Stop 9 GHz
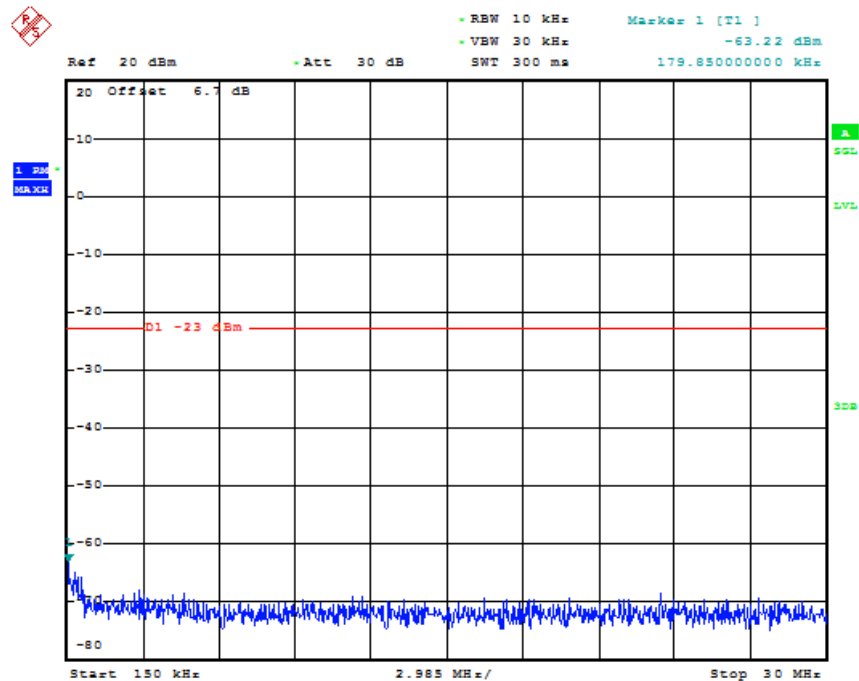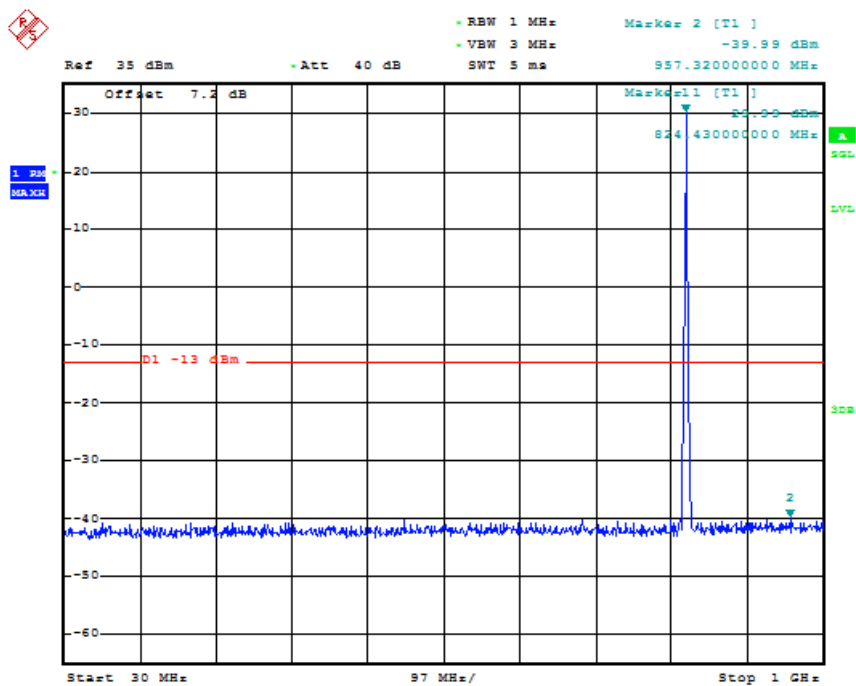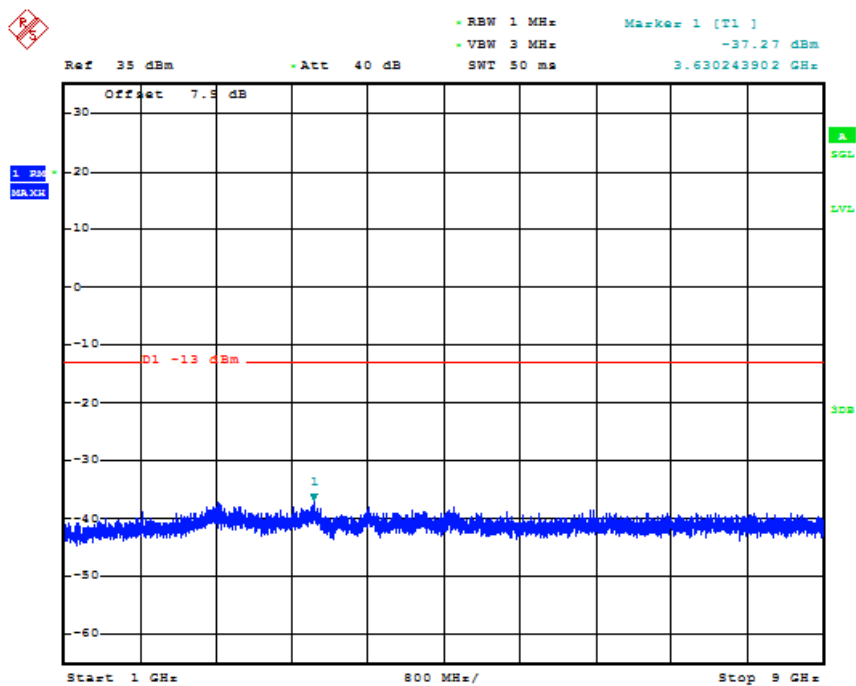
Date: 14.APR.2016 11:17:49

Out of band measurement
Test Band = GSM850
Test Mode = GSM /TM1
Test Channel = MCH
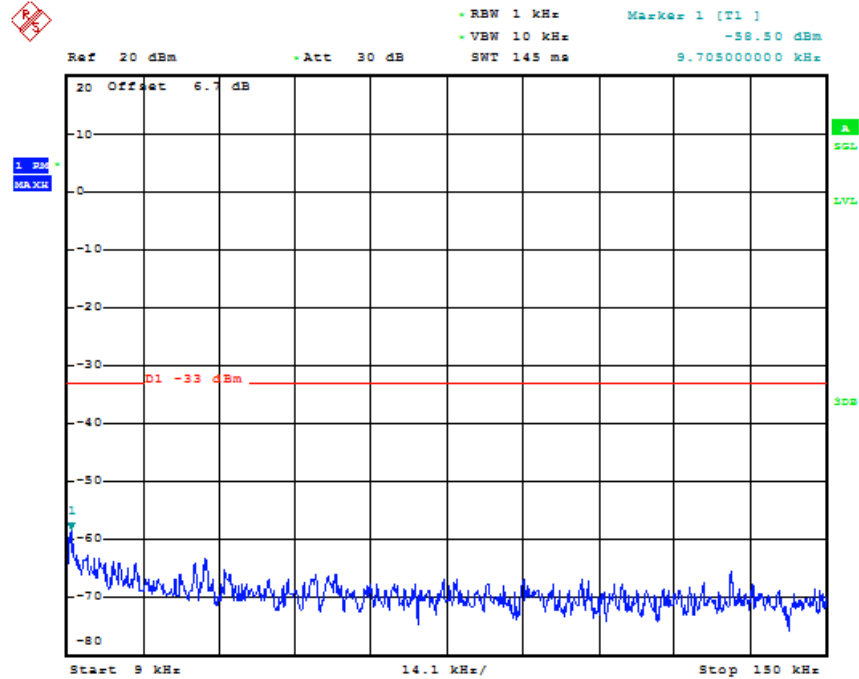
Date: 14.APR.2016 11:18:06

Date: 14.APR.2016 11:18:15

Graph 1:
```
                                          • RBW  1 MHz        Marker 2 [T1 ]
                                          • VBW  3 MHz                -39.62 dBm
         Ref  35 dBm        • Att  40 dB   SWT  5 ms         966.050000000 MHz
```
Offset 7.2 dB — Marker 1 [T1] — 837.040000000 MHz

D1 -13 dBm

Start 30 MHz   97 MHz/   Stop 1 GHz

Date: 14.APR.2016 11:18:26

Graph 2:
```
                                          • RBW  1 MHz        Marker 1 [T1 ]
                                          • VBW  3 MHz                -36.72 dBm
         Ref  35 dBm        • Att  40 dB   SWT  50 ms        3.624390244 GHz
```
Offset 7.5 dB

D1 -13 dBm

Start 1 GHz   800 MHz/   Stop 9 GHz
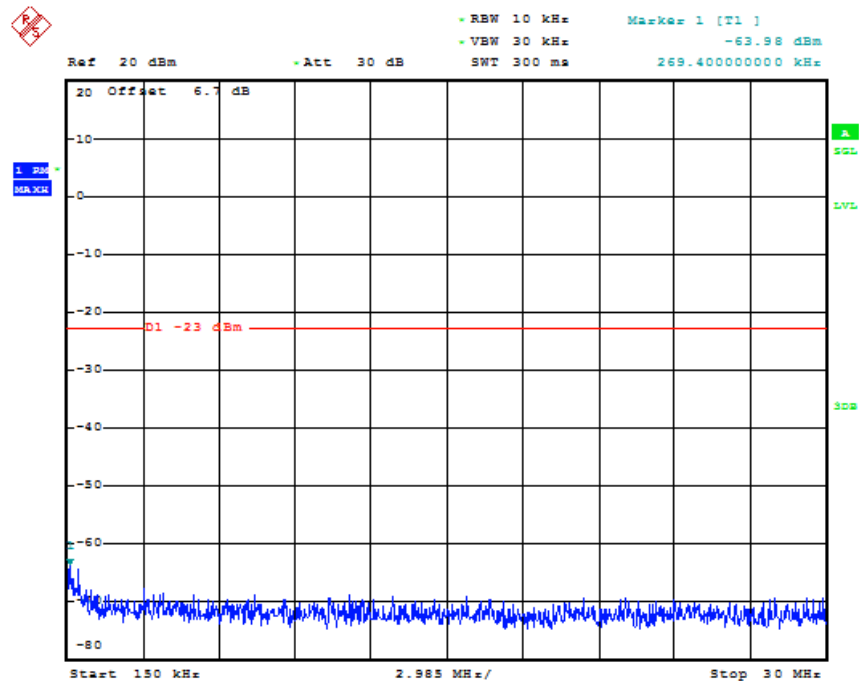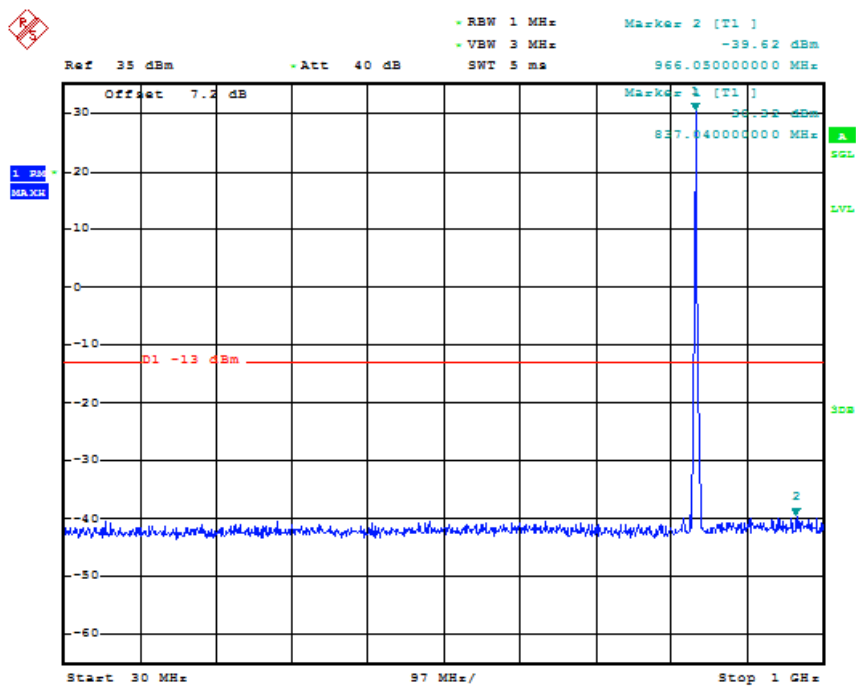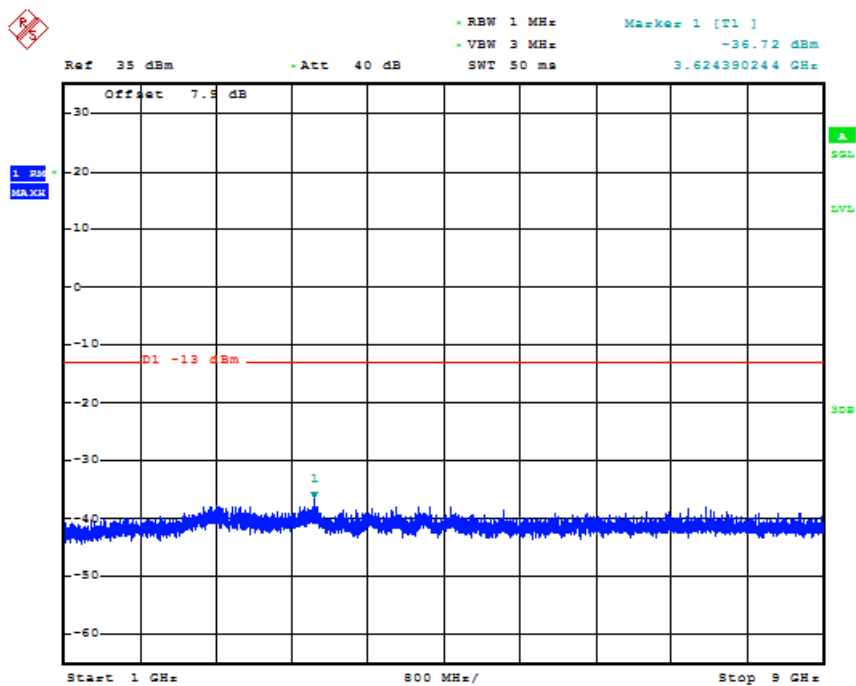
Date: 14.APR.2016 11:18:36

Out of band measurement
Test Band = GSM850
Test Mode = GSM /TM1
Test Channel = HCH
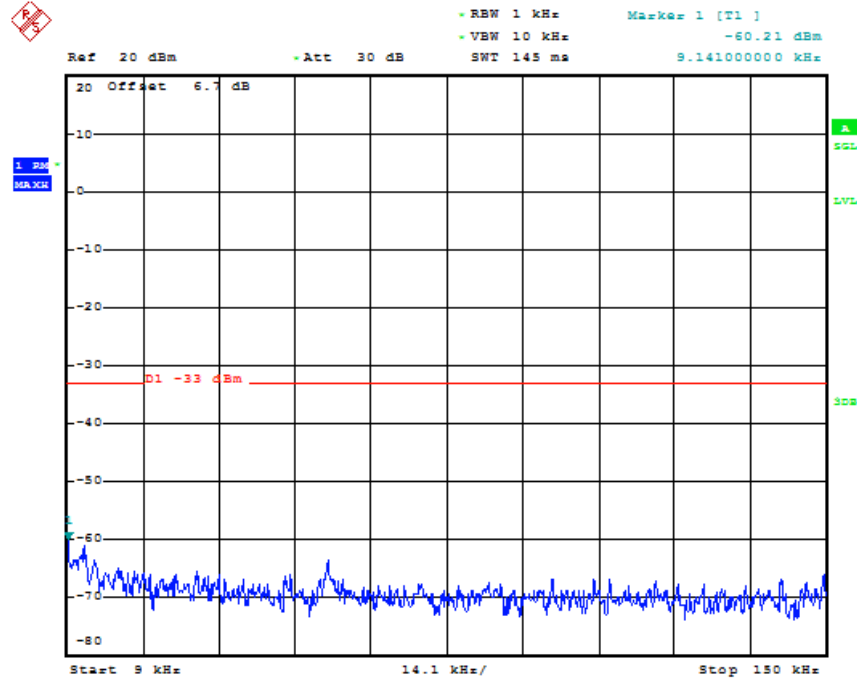
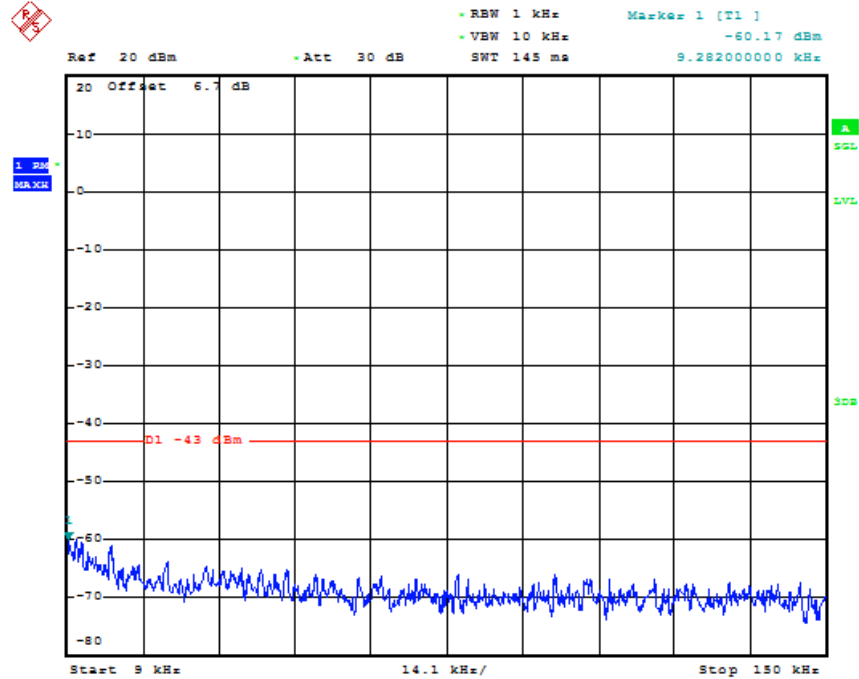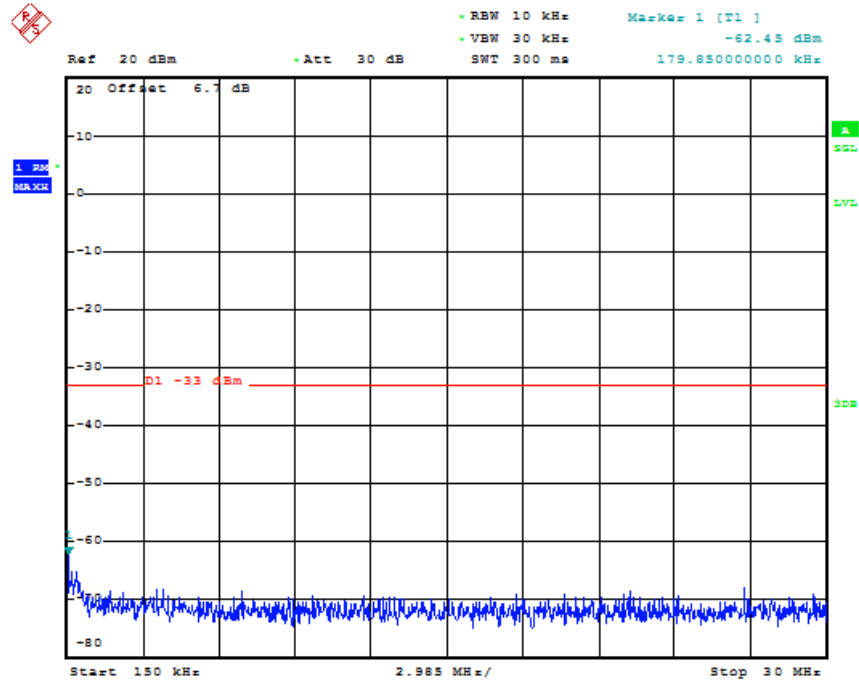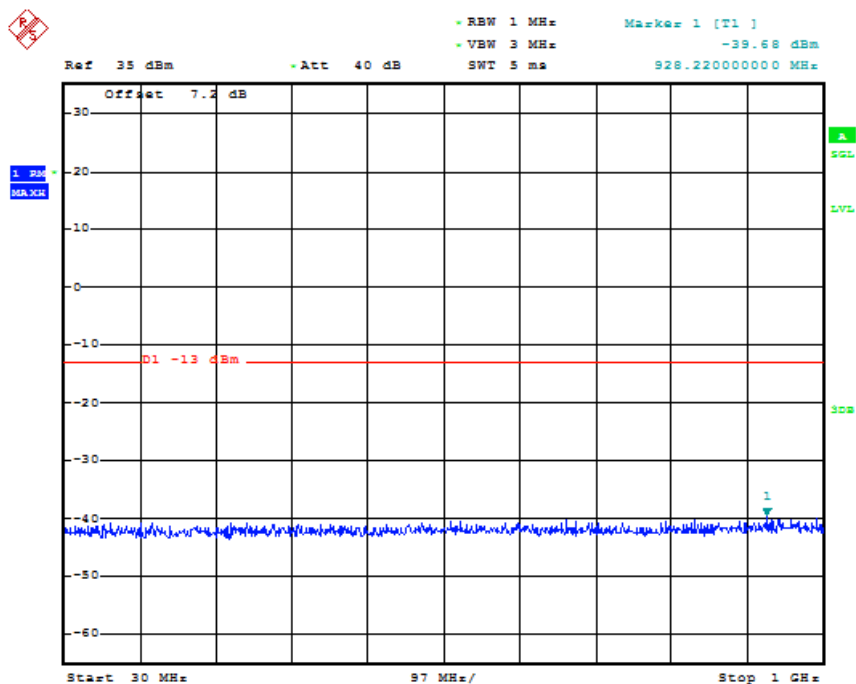

Date: 14.APR.2016 11:18:52

Date: 14.APR.2016 11:19:01

First plot

```
• RBW  1 MHz          Marker 2 [T1 ]
• VBW  3 MHz                    -39.65 dBm
Ref  35 dBm        • Att  40 dB    SWT 5 ms        868.080000000 MHz
```

Offset 7.2 dB

Marker 1 [T1]
-36.02 dBm
849.630000000 MHz

D1 -13 dBm

2

```
Start  30 MHz          97 MHz/          Stop  1 GHz
```

Date: 14.APR.2016 11:19:12

Second plot

```
• RBW  1 MHz          Marker 1 [T1 ]
• VBW  3 MHz                    -36.37 dBm
Ref  35 dBm        • Att  40 dB    SWT 50 ms       2.583414634 GHz
```

Offset 7.5 dB

D1 -13 dBm

```
Start  1 GHz           800 MHz/          Stop  9 GHz
```
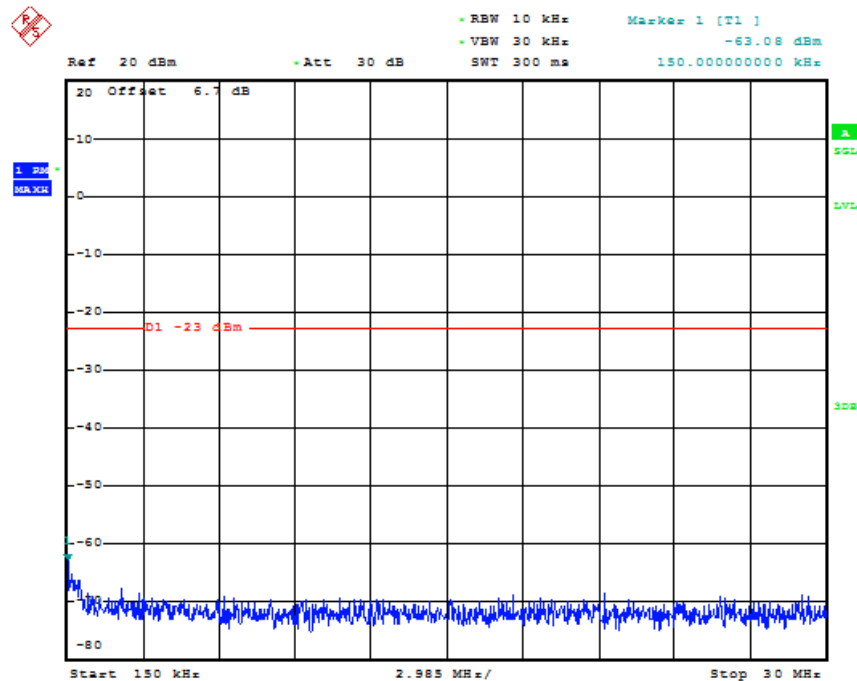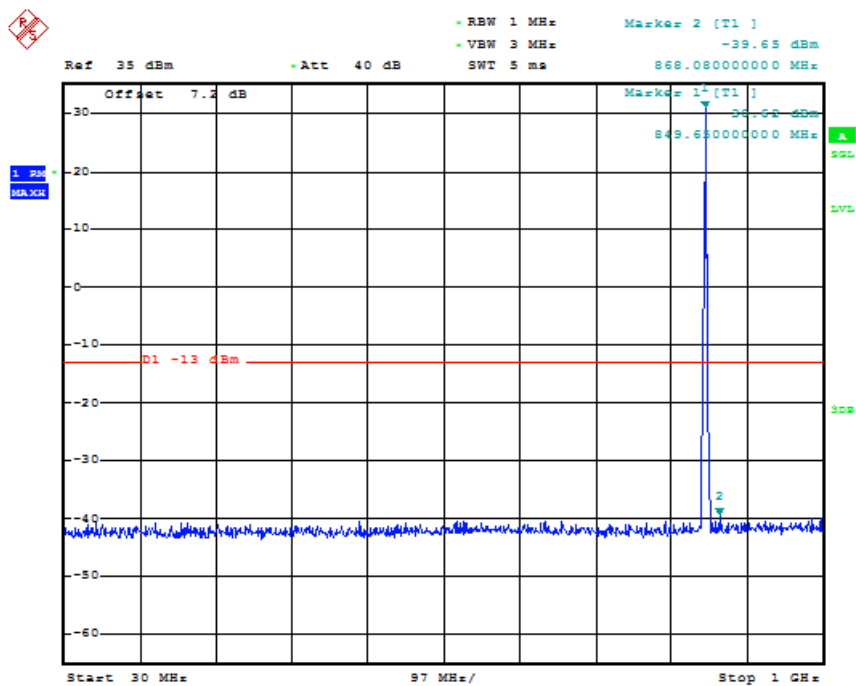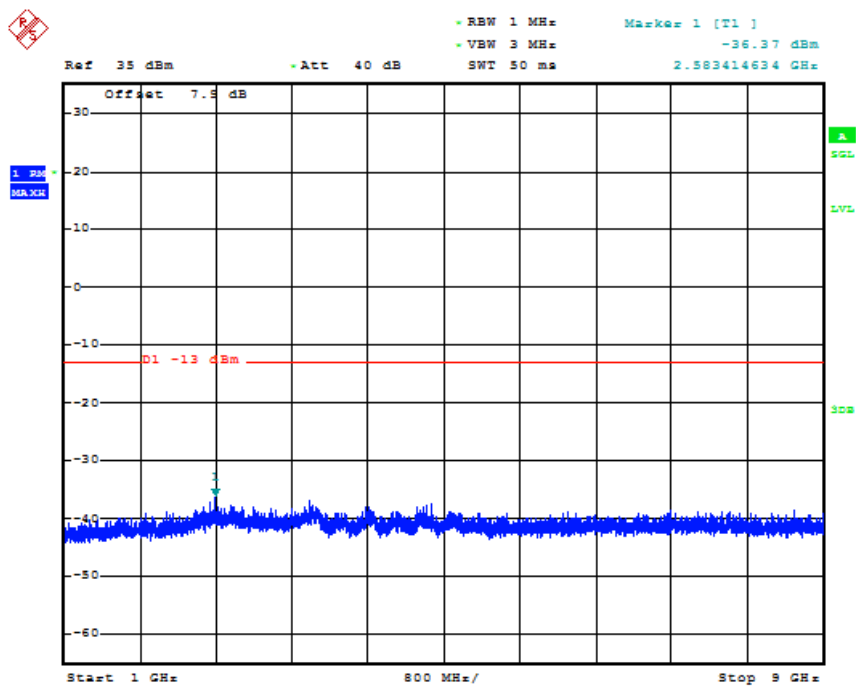
Date: 14.APR.2016 11:19:22

Out of band measurement
Test Band = GSM850
Test Mode = EDGE /TM2
Test Channel = LCH

Date: 14.APR.2016 11:49:29

Date: 14.APR.2016 11:49:38

Date: 14.APR.2016 11:49:48
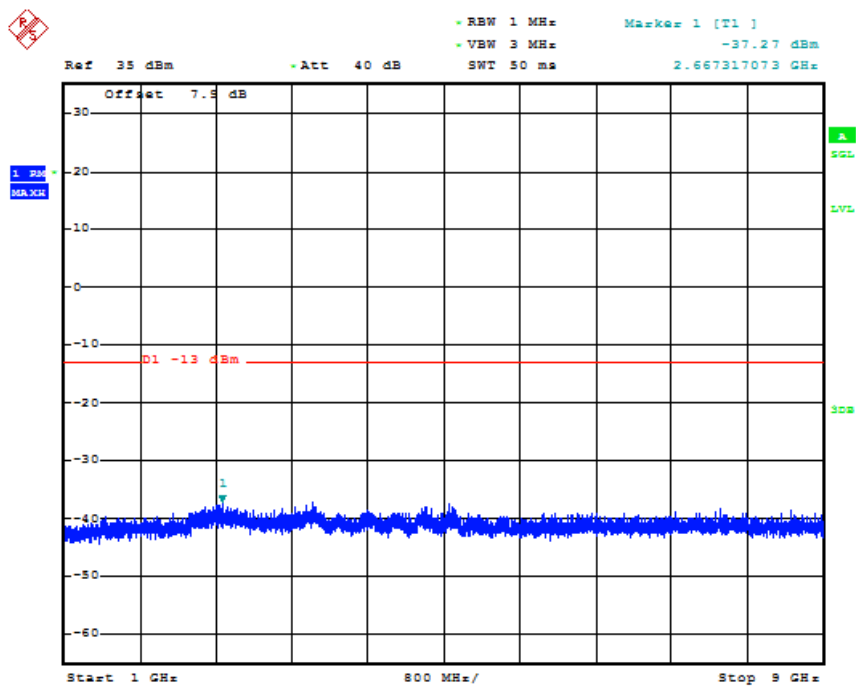
Date: 14.APR.2016 11:49:57

Out of band measurement
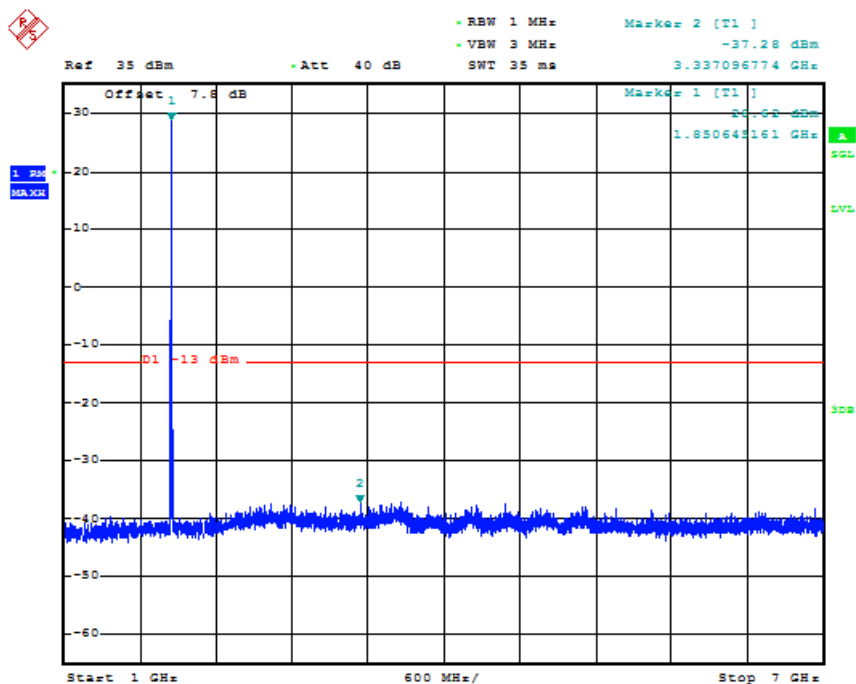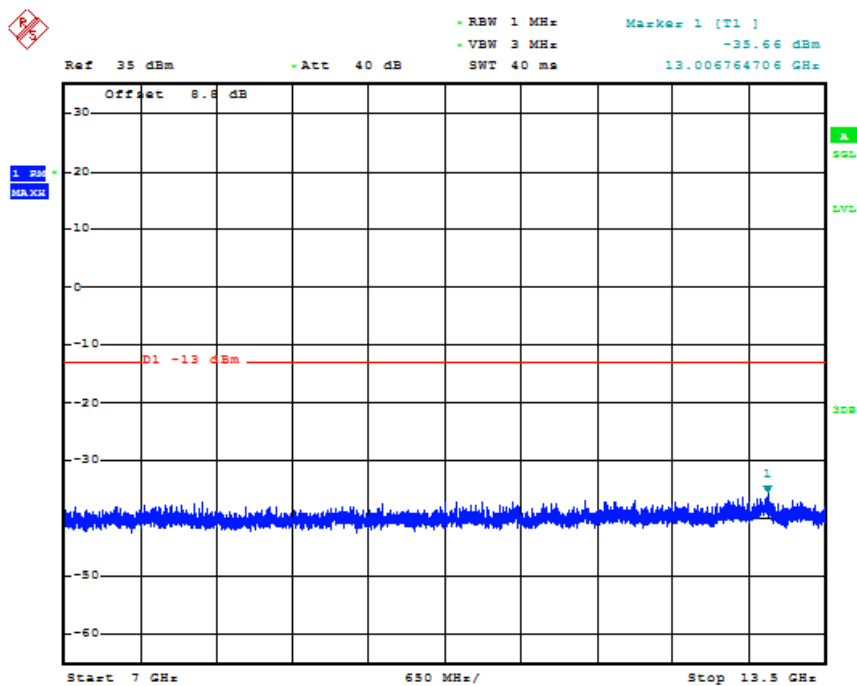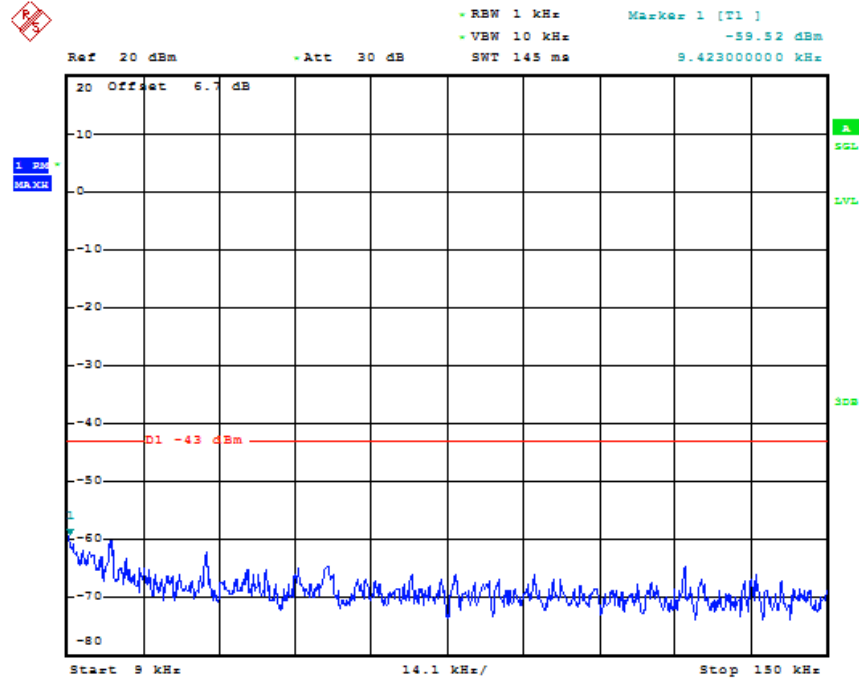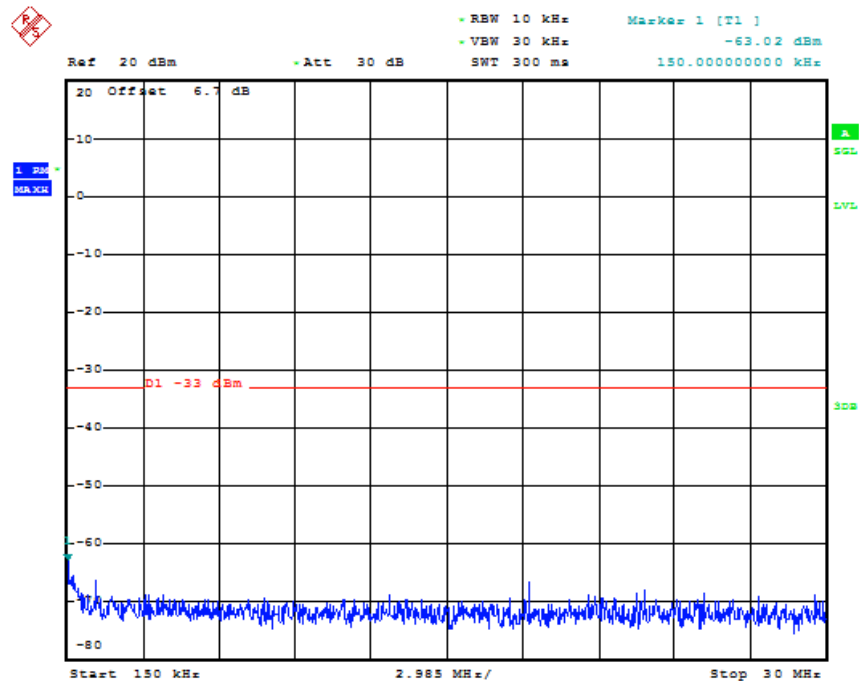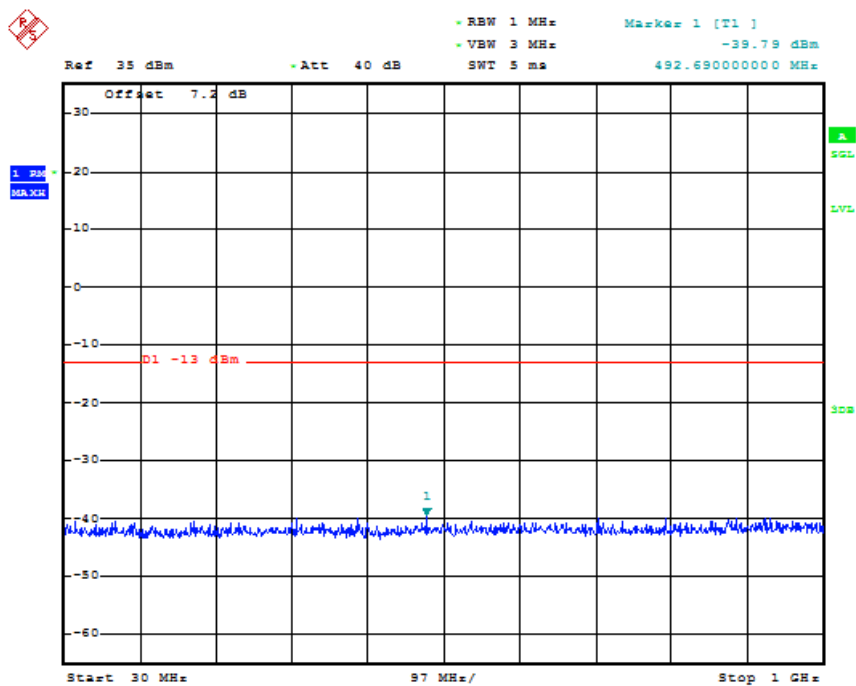Test Band = GSM850
Test Mode = EDGE /TM2
Test Channel = MCH

Date: 14.APR.2016 11:50:14

Date: 14.APR.2016 11:50:23

First plot

- RBW 1 MHz Marker 2 [T1]
- VBW 3 MHz -39.62 dBm
Ref 35 dBm · Att 40 dB SWT 5 ms 935.980000000 MHz

Offset 7.2 dB Marker 1 [T1]
-30 1 25.00 dBm
837.840000000 MHz

1 RM -20
MAXH

-10

0

-10 D1 -13 dBm

-20

-30

-40 2

-50

-60

Start 30 MHz 97 MHz/ Stop 1 GHz

SGL
LVL
3DB

Date: 14.APR.2016 11:50:33

Second plot

- RBW 1 MHz Marker 1 [T1]
- VBW 3 MHz -36.78 dBm
Ref 35 dBm · Att 40 dB SWT 50 ms 4.715121951 GHz

Offset 7.5 dB
-30

1 RM -20
MAXH

-10

0

-10 D1 -13 dBm

-20

-30 1

-40

-50

-60

Start 1 GHz 800 MHz/ Stop 9 GHz

SGL
LVL
3DB

Date: 14.APR.2016 11:50:42

Out of band measurement
Test Band = GSM850
Test Mode = EDGE /TM2
Test Channel = HCH
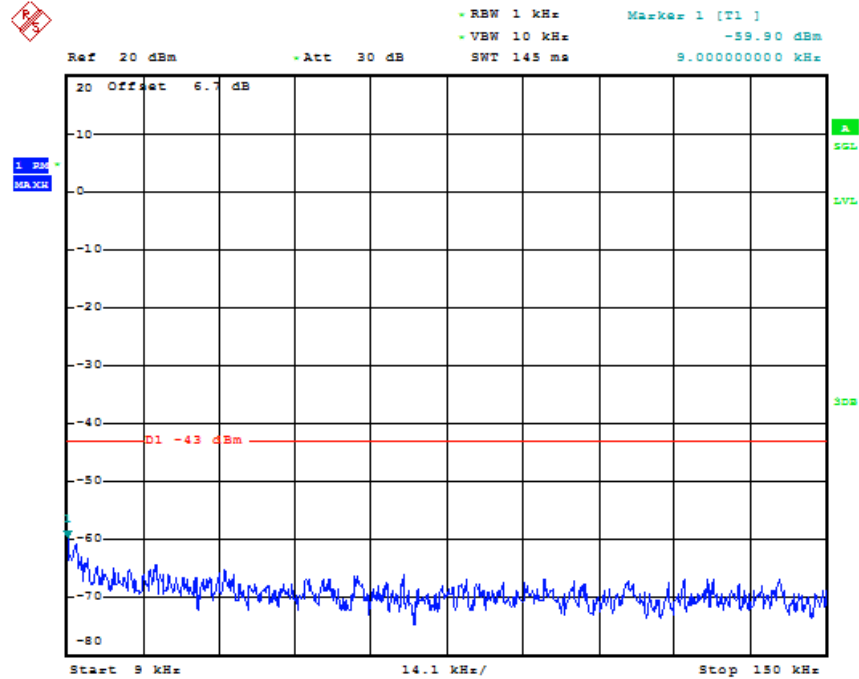
Date: 14.APR.2016 11:50:59

Date: 14.APR.2016 11:51:08

Date: 14.APR.2016 11:51:18
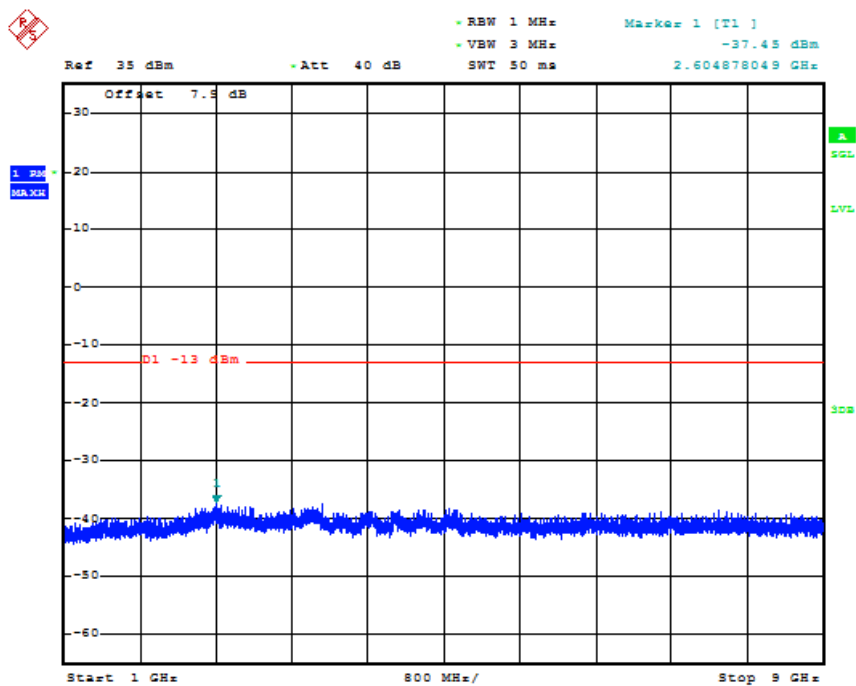
Date: 14.APR.2016 11:51:27

Out of band measurement
Test Band = GSM1900
Test Mode = GSM /TM1
Test Channel = LCH

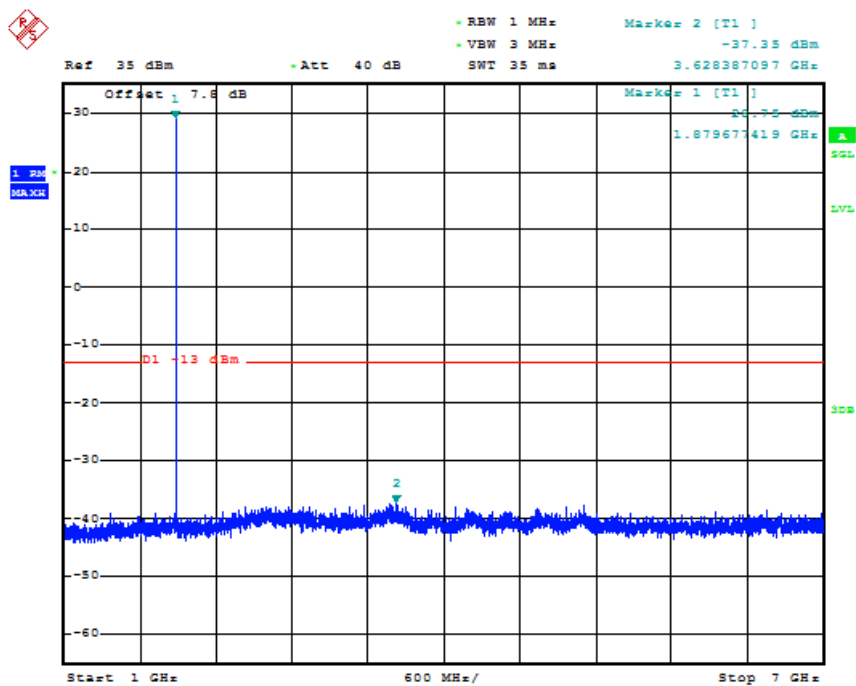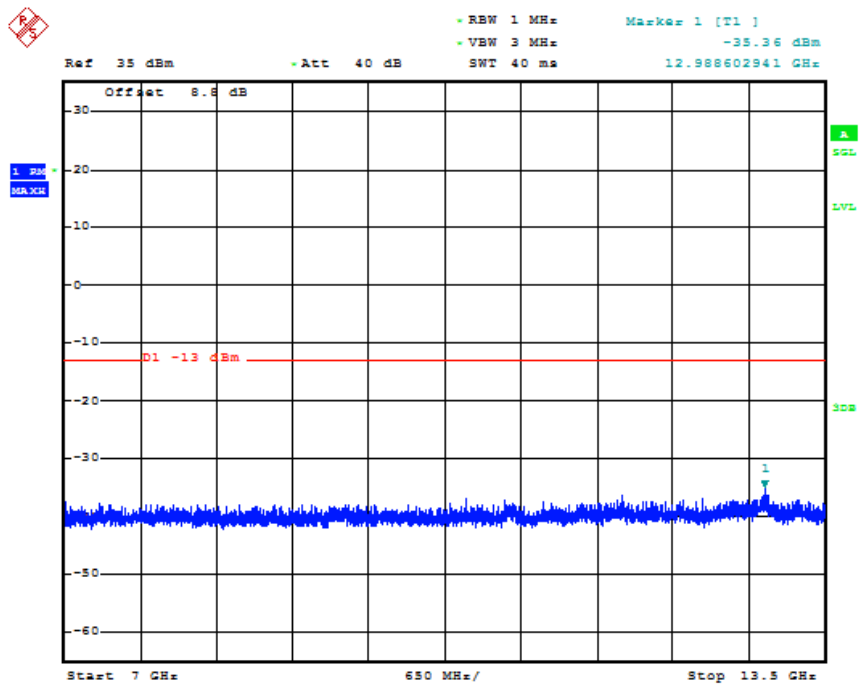|		
＊ RBW 1 kHz	Marker 1 [T1]	
＊ VBW 10 kHz		-60.17 dBm
Ref 20 dBm	＊Att 30 dB	SWT 145 ms	9.282000000 kHz

20 Offset 6.7 dB

D1 -43 dBm

Start 9 kHz   14.1 kHz/   Stop 150 kHz

Date: 13.APR.2016 19:05:18

＊ RBW 10 kHz	Marker 1 [T1]	
＊ VBW 30 kHz		-62.45 dBm
Ref 20 dBm	＊Att 30 dB	SWT 300 ms	179.850000000 kHz

20 Offset 6.7 dB

D1 -33 dBm

Start 150 kHz   2.985 MHz/   Stop 30 MHz

Date: 13.APR.2016 19:05:28

Date: 13.APR.2016 19:05:37
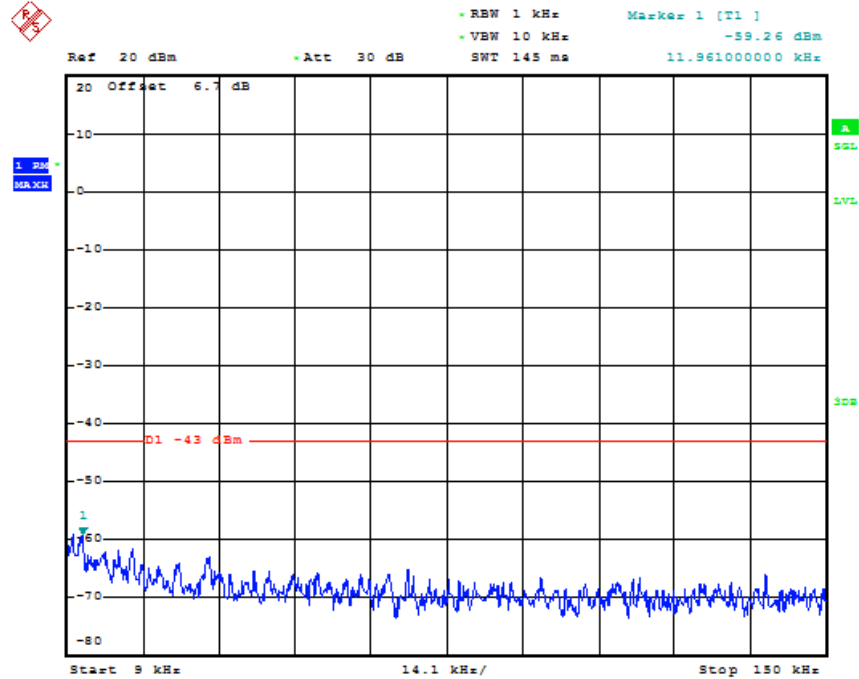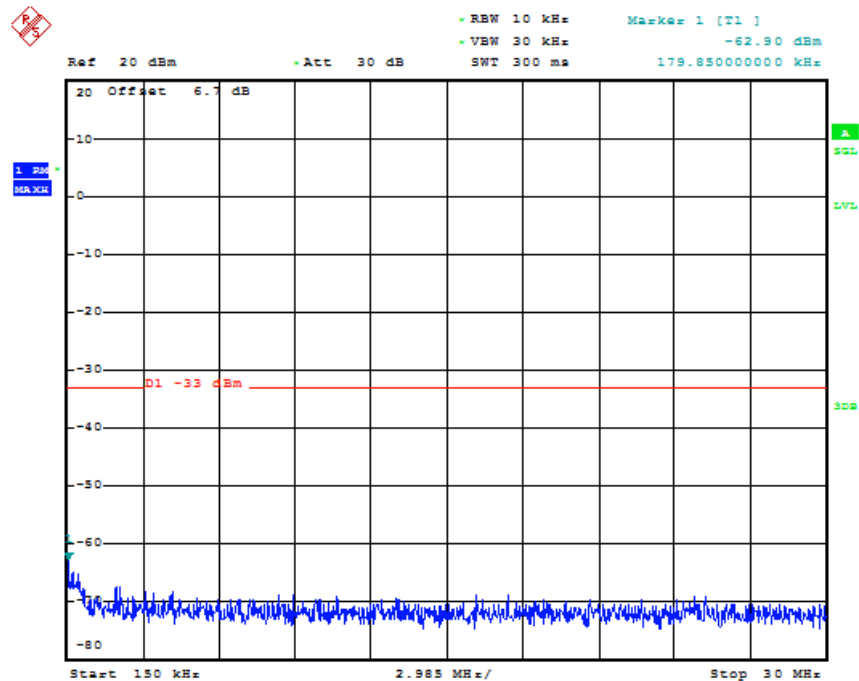

Date: 13.APR.2016 19:05:48
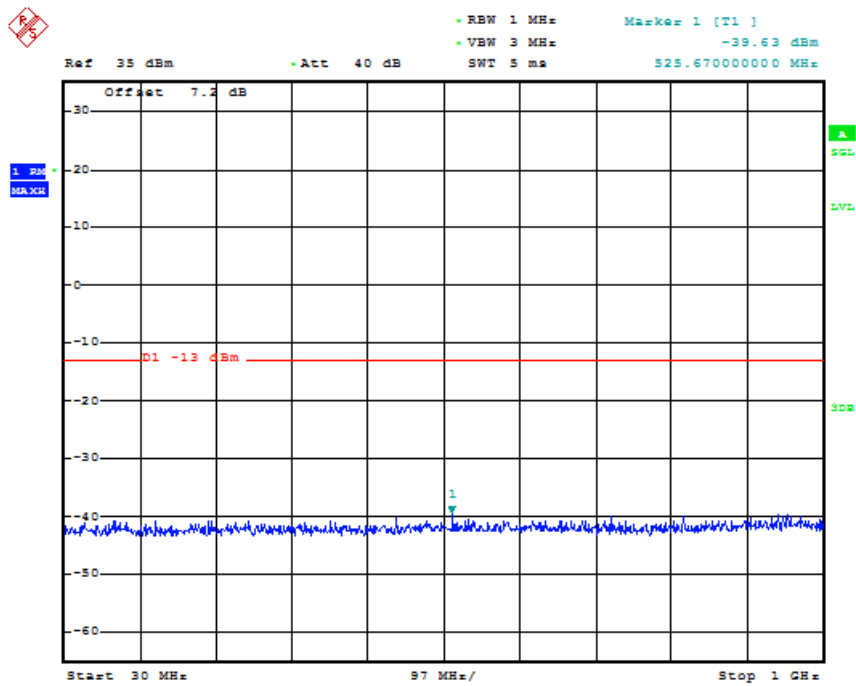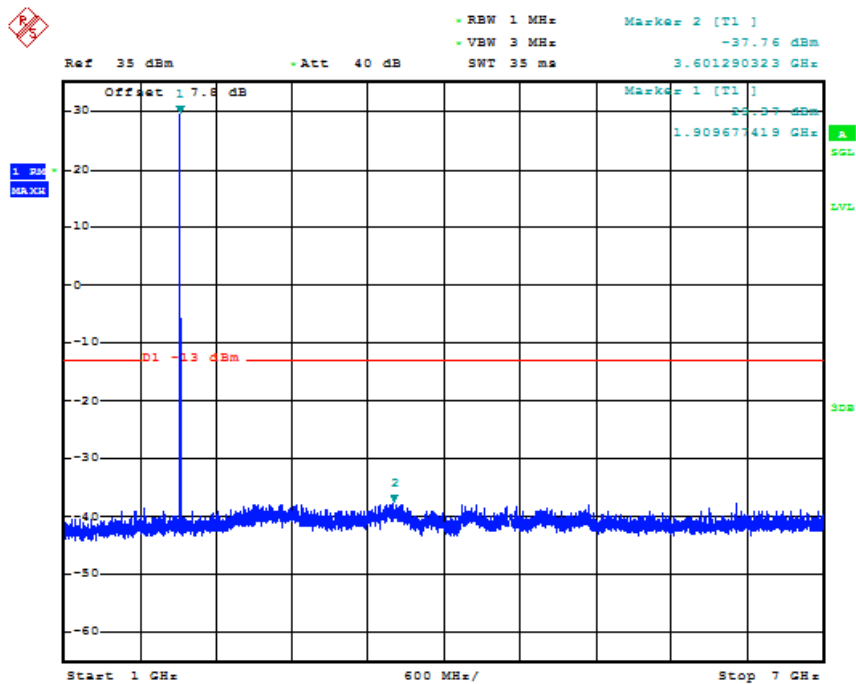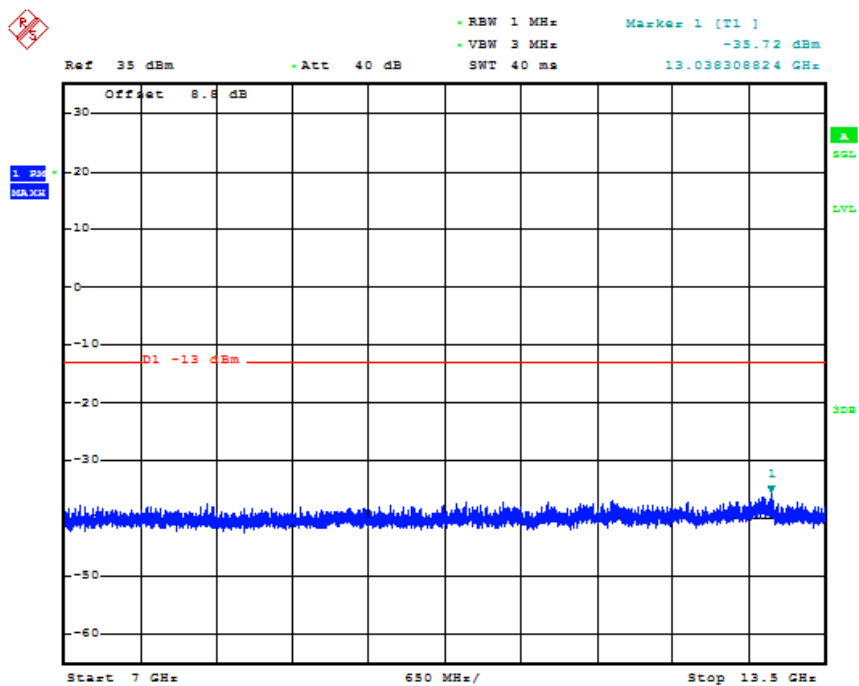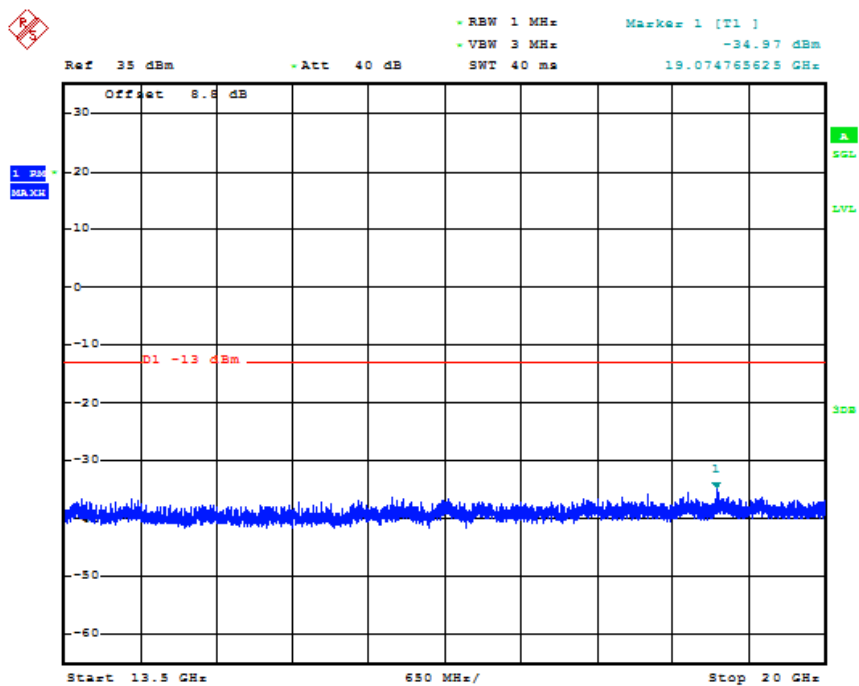
Date: 13.APR.2016 19:05:58
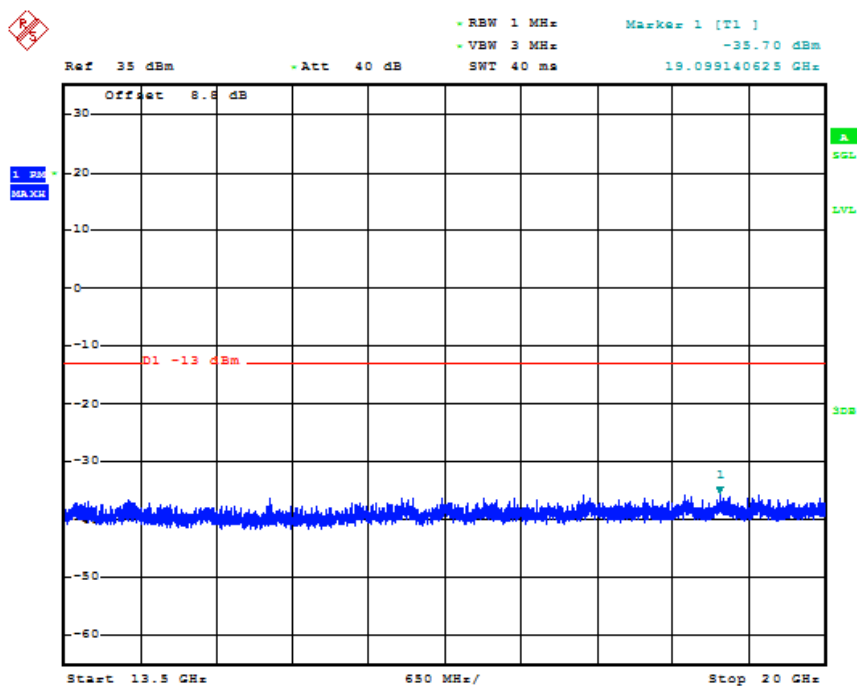
Date: 13.APR.2016 19:06:08

Out of band measurement
Test Band = GSM1900
Test Mode = GSM /TM1
Test Channel = MCH

• RBW 1 kHz	Marker 1 [T1]		
• VBW 10 kHz	-59.52 dBm		
Ref 20 dBm	• Att 30 dB	SWT 145 ms	9.423000000 kHz

20 Offset 6.7 dB

D1 -43 dBm

Start 9 kHz   14.1 kHz/   Stop 150 kHz

Date: 13.APR.2016 19:06:24

• RBW 10 kHz	Marker 1 [T1]		
• VBW 30 kHz	-63.02 dBm		
Ref 20 dBm	• Att 30 dB	SWT 300 ms	150.000000000 kHz

20 Offset 6.7 dB

D1 -33 dBm

Start 150 kHz   2.985 MHz/   Stop 30 MHz

Date: 13.APR.2016 19:06:34

First plot:
- RBW 1 MHz
- VBW 3 MHz
- SWT 5 ms
- Ref 35 dBm
- Att 40 dB
- Offset 7.2 dB
- Marker 1 [T1] −39.79 dBm 492.690000000 MHz
- D1 −13 dBm
- Start 30 MHz   97 MHz/   Stop 1 GHz

Date: 13.APR.2016 19:06:43

Second plot:
- RBW 1 MHz
- VBW 3 MHz
- SWT 35 ms
- Ref 35 dBm
- Att 40 dB
- Offset 7.8 dB
- Marker 2 [T1] −37.35 dBm 3.628387097 GHz
- Marker 1 [T1] −26.75 dBm 1.879677419 GHz
- D1 −13 dBm
- Start 1 GHz   600 MHz/   Stop 7 GHz

Date: 13.APR.2016 19:06:54

Plot 1:

* RBW 1 MHz
* VBW 3 MHz

Marker 1 [T1]
-35.36 dBm

Ref 35 dBm   • Att 40 dB   SWT 40 ms   12.988602941 GHz

Offset 8.6 dB

-30

A
SGL

1 RM
MAXH

-20

LVL

-10

0

-10

D1 -13 dBm

-20

3DB

-30

1

-50

-60

Start 7 GHz   650 MHz/   Stop 13.5 GHz

Date: 13.APR.2016 19:07:04

Plot 2:

* RBW 1 MHz
* VBW 3 MHz

Marker 1 [T1]
-34.92 dBm

Ref 35 dBm   • Att 40 dB   SWT 40 ms   19.108281250 GHz

Offset 8.6 dB

-30

A
SGL

1 RM
MAXH

-20

LVL

-10

0

-10

D1 -13 dBm

-20

3DB

-30

1

-50

-60

Start 13.5 GHz   650 MHz/   Stop 20 GHz

Date: 13.APR.2016 19:07:14

Out of band measurement
Test Band = GSM1900
Test Mode = GSM /TM1
Test Channel = HCH

		*RBW 1 kHz	Marker 1 [T1]
		*VBW 10 kHz	-59.26 dBm
Ref 20 dBm	*Att 30 dB	SWT 145 ms	11.961000000 kHz

20 Offset 6.7 dB

D1 -43 dBm

Start 9 kHz   14.1 kHz/   Stop 150 kHz

Date: 13.APR.2016 19:07:31

		*RBW 10 kHz	Marker 1 [T1]
		*VBW 30 kHz	-62.90 dBm
Ref 20 dBm	*Att 30 dB	SWT 300 ms	179.850000000 kHz

20 Offset 6.7 dB

D1 -33 dBm

Start 150 kHz   2.985 MHz/   Stop 30 MHz

Date: 13.APR.2016 19:07:40

Date: 13.APR.2016 19:07:50

Date: 13.APR.2016 19:08:00

Date: 13.APR.2016 19:08:10

Date: 13.APR.2016 19:08:20

Out of band measurement
Test Band = GSM1900
Test Mode = EDGE /TM2
Test Channel = LCH
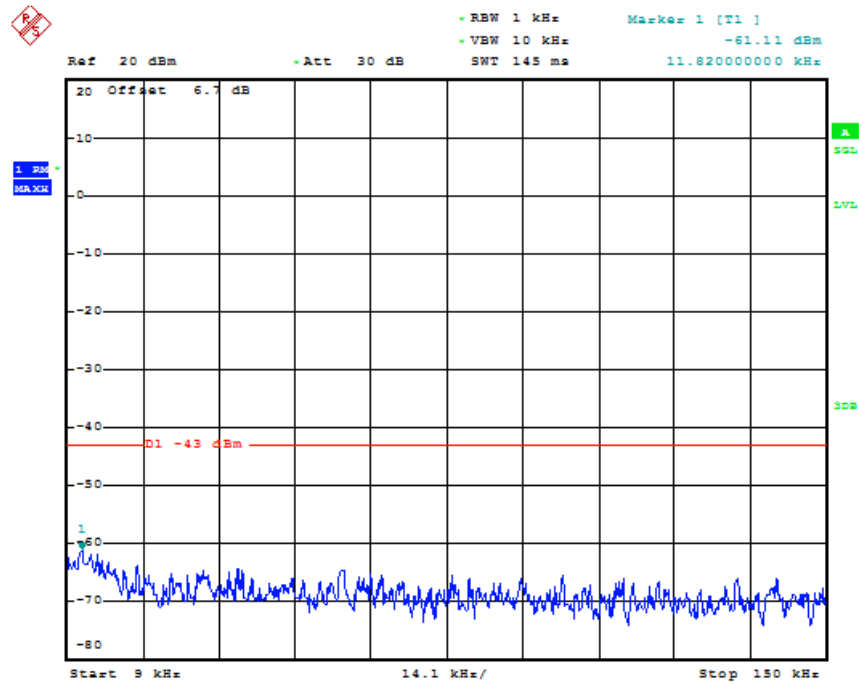
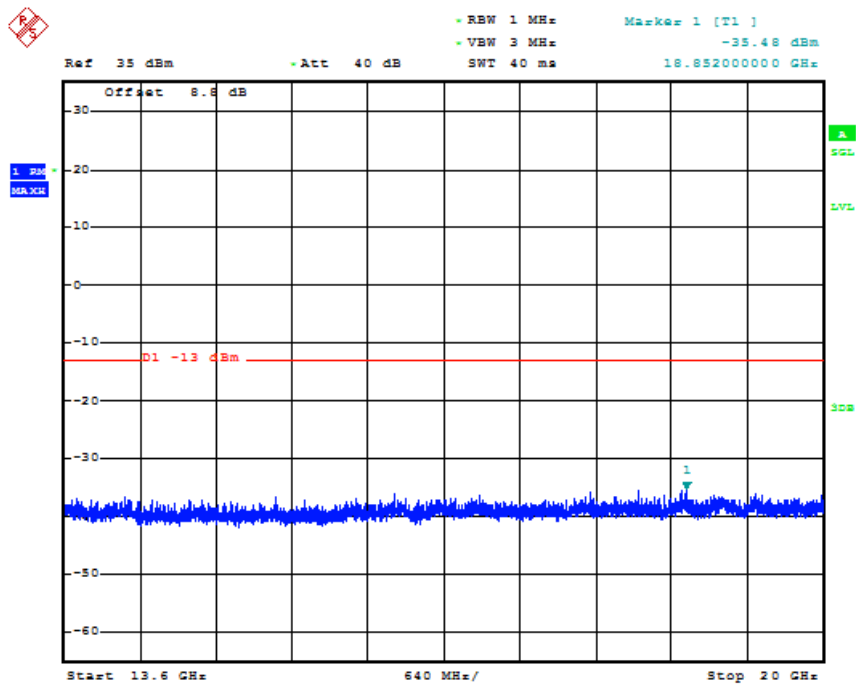
Date: 13.APR.2016 19:38:45
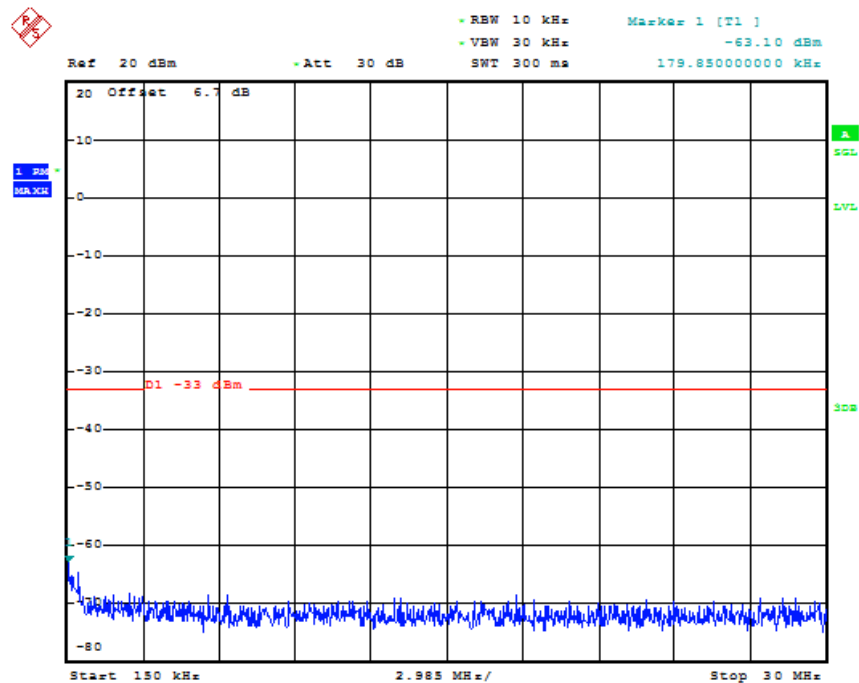
Date: 13.APR.2016 19:38:53
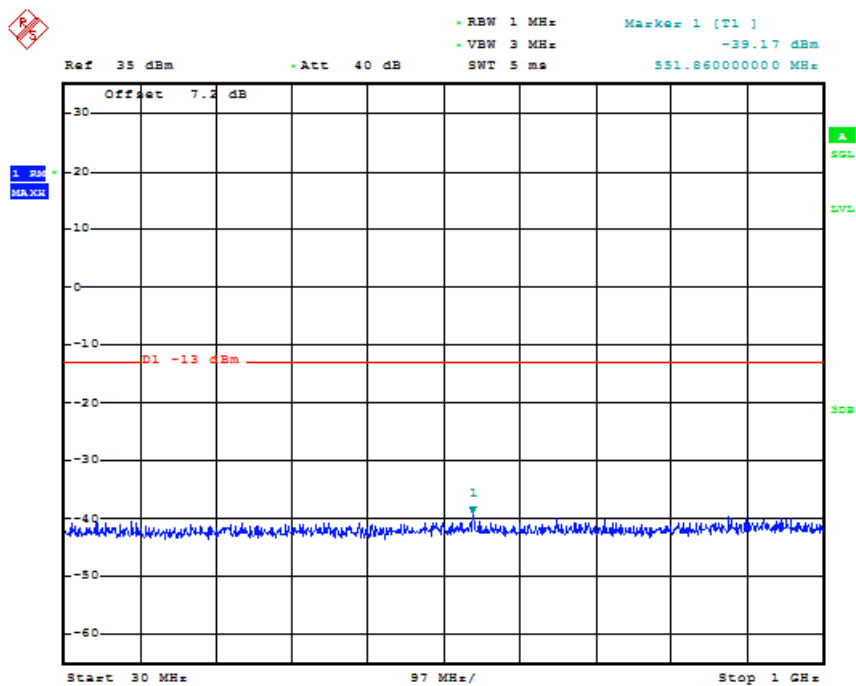
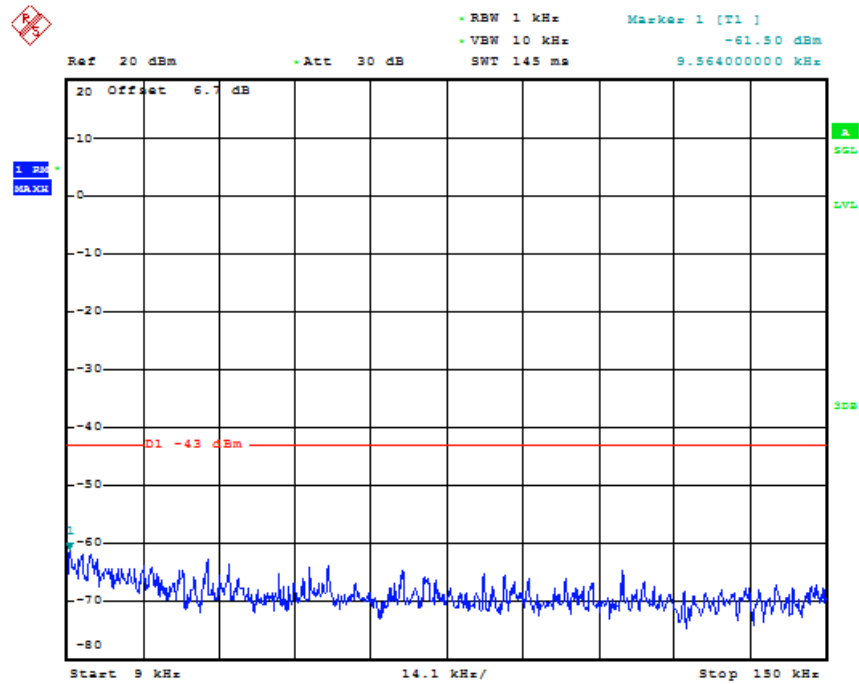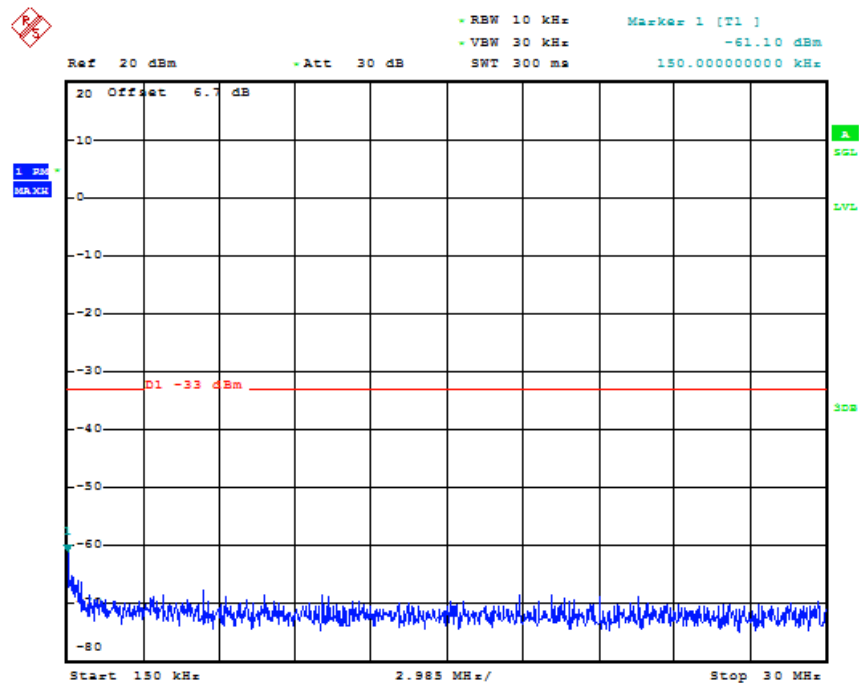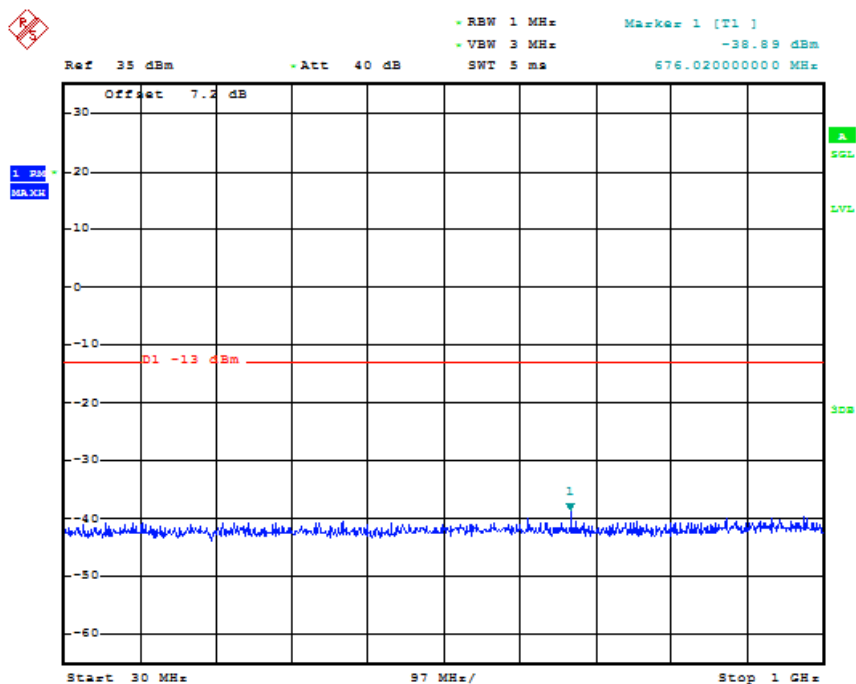Date: 13.APR.2016 19:39:02

Date: 13.APR.2016 19:39:12

Offset 8.8 dB

Start 7 GHz   660 MHz/   Stop 13.6 GHz

Date: 13.APR.2016 19:39:21

Offset 8.8 dB

Start 13.6 GHz   640 MHz/   Stop 20 GHz
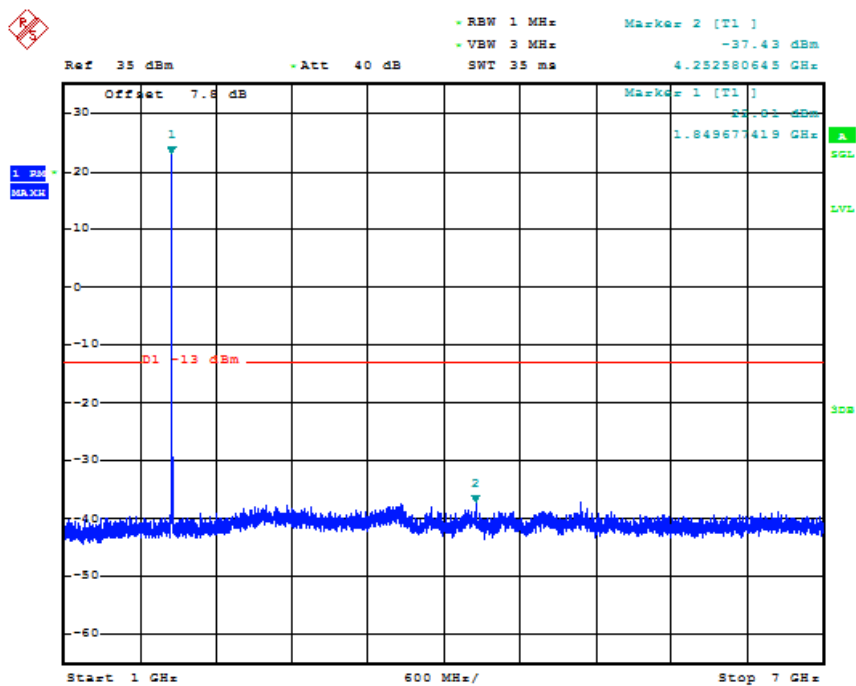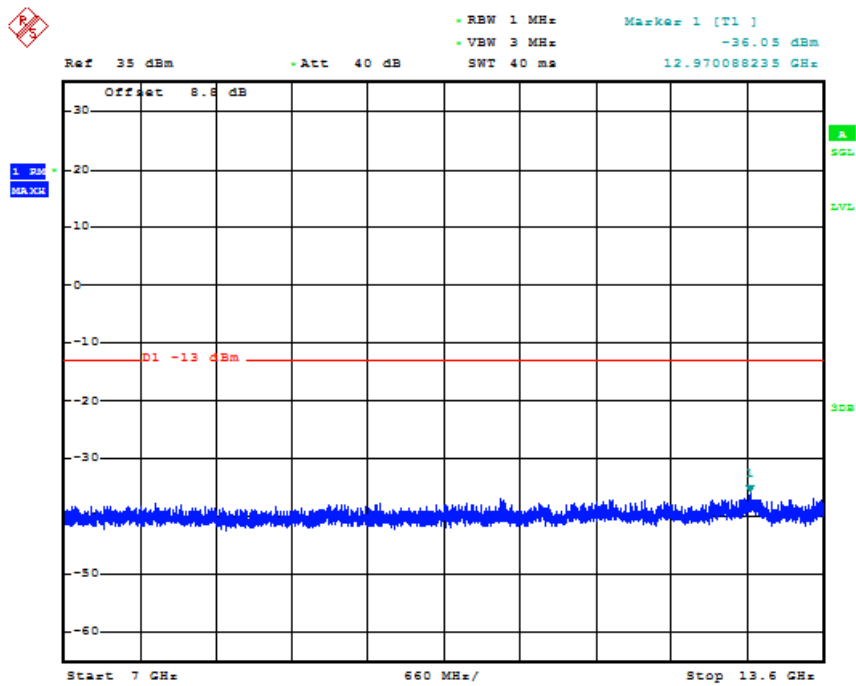
Date: 13.APR.2016 19:39:30

Out of band measurement
Test Band = GSM1900
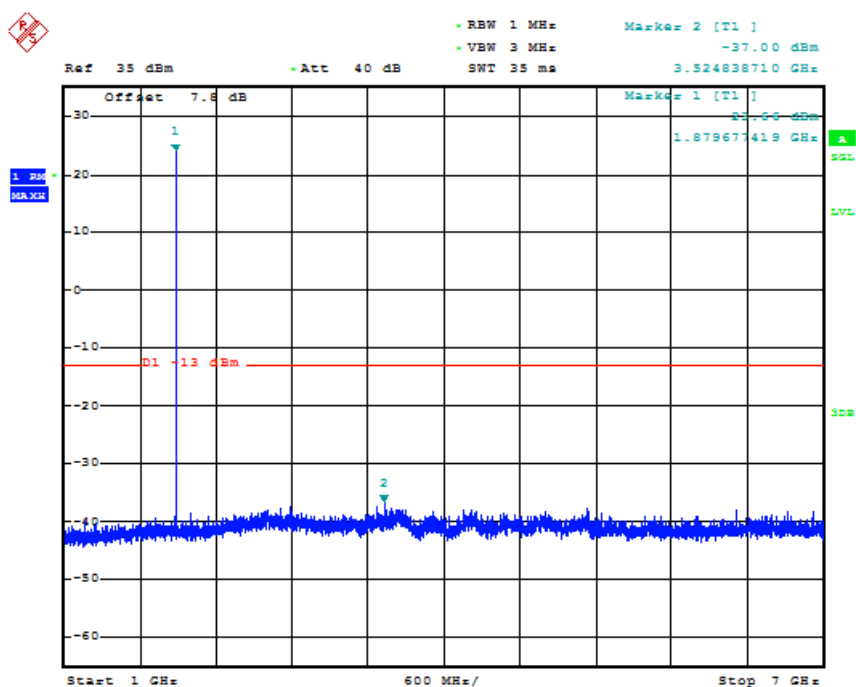Test Mode = EDGE /TM2
Test Channel = MCH

Date: 13.APR.2016 19:39:48
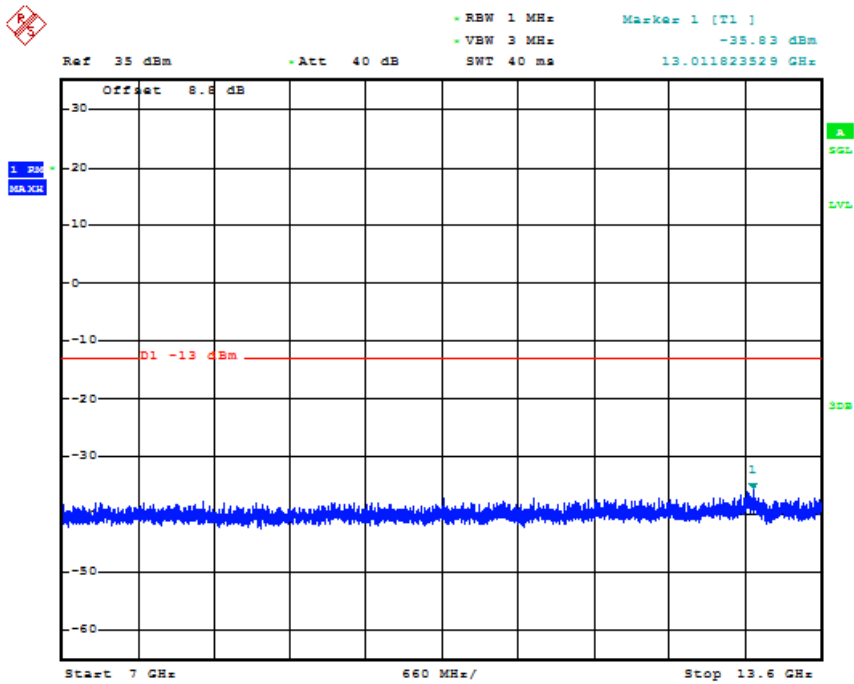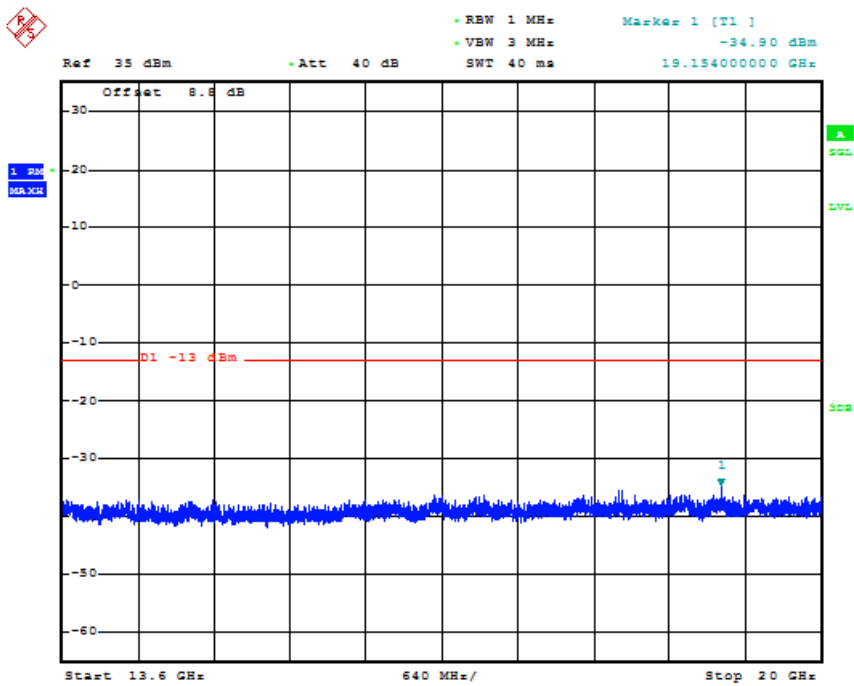

Date: 13.APR.2016 19:39:57

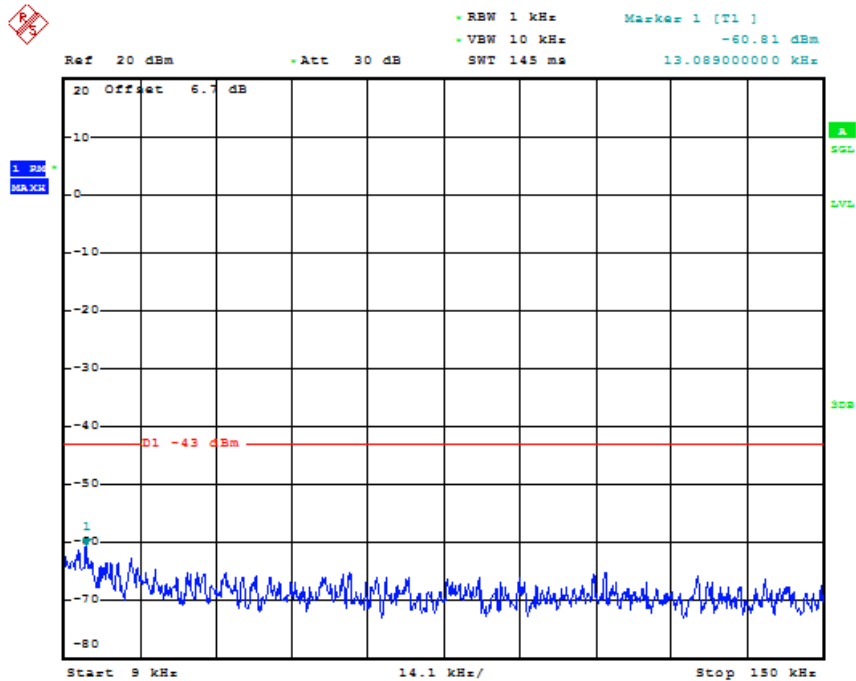Date: 13.APR.2016 19:40:06

Date: 13.APR.2016 19:40:16

RBW 1 MHz   Marker 1 [T1]
VBW 3 MHz   -35.83 dBm
Ref 35 dBm   Att 40 dB   SWT 40 ms   13.011823529 GHz

Offset 8.8 dB

```
-30

-20   A
             SGL
-10
             LVL
  0

-10
      D1 -13 dBm
-20          3DB

-30
                        1
-40

-50

-60
```

Start 7 GHz   660 MHz/   Stop 13.6 GHz

Date: 13.APR.2016   19:40:25

RBW 1 MHz   Marker 1 [T1]
VBW 3 MHz   -34.90 dBm
Ref 35 dBm   Att 40 dB   SWT 40 ms   19.154000000 GHz

Offset 8.8 dB

```
-30

-20   A
             SGL
-10
             LVL
  0

-10
      D1 -13 dBm
-20          3DB

-30
                        1
-40

-50

-60
```

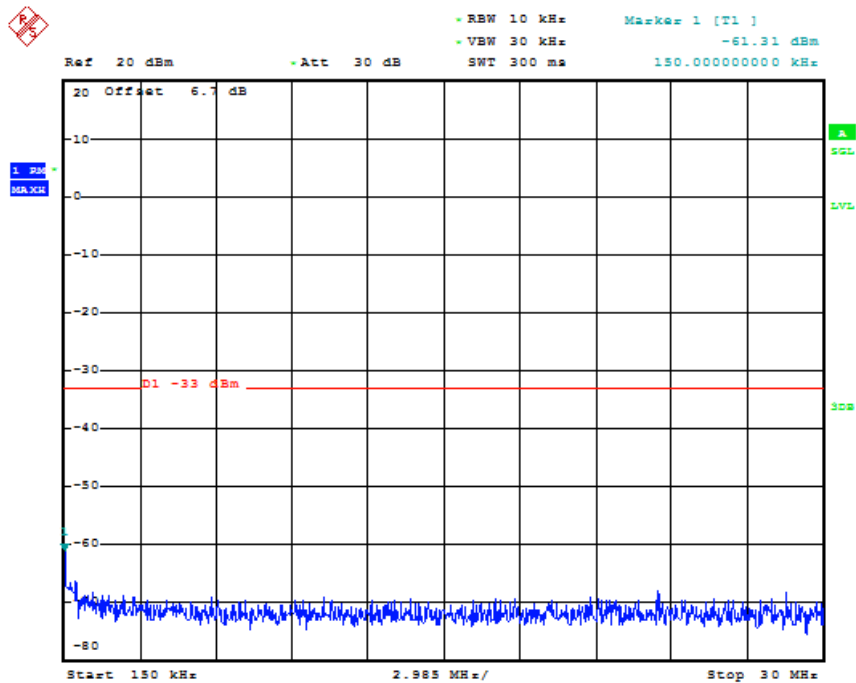Start 13.6 GHz   640 MHz/   Stop 20 GHz

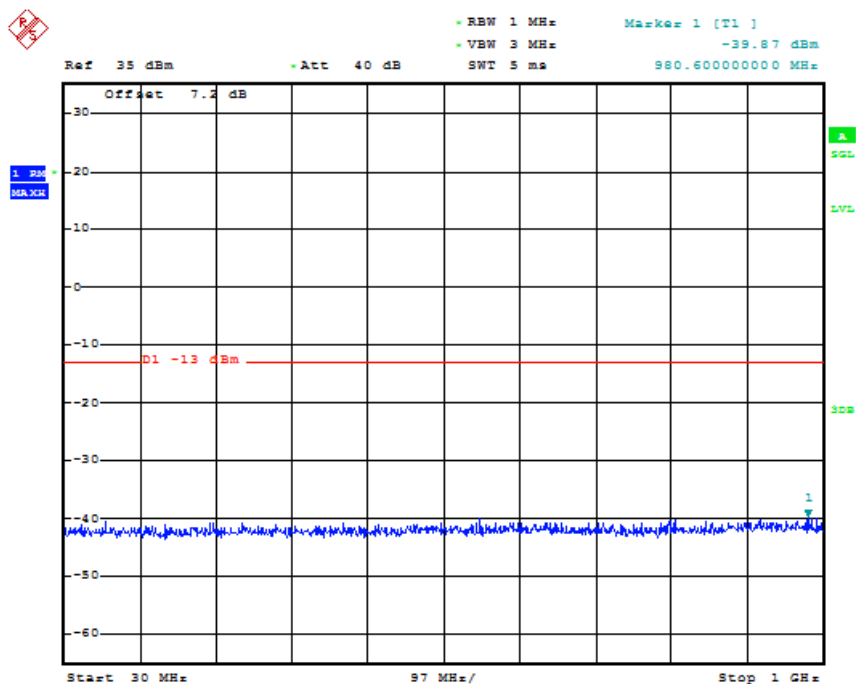Date: 13.APR.2016   19:40:34

Out of band measurement
Test Band = GSM1900
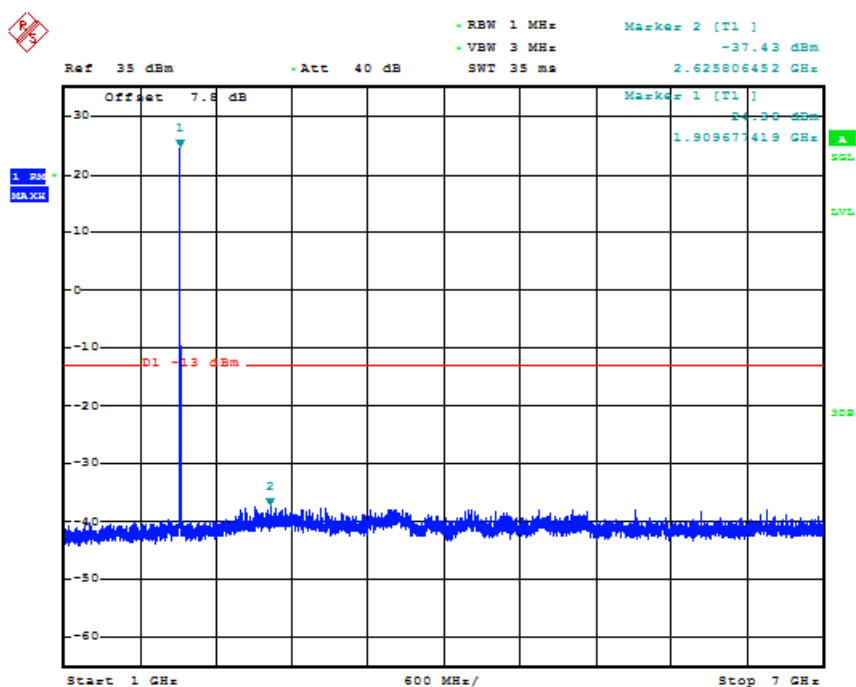Test Mode = EDGE /TM2
Test Channel = HCH

Date: 13.APR.2016 19:40:51
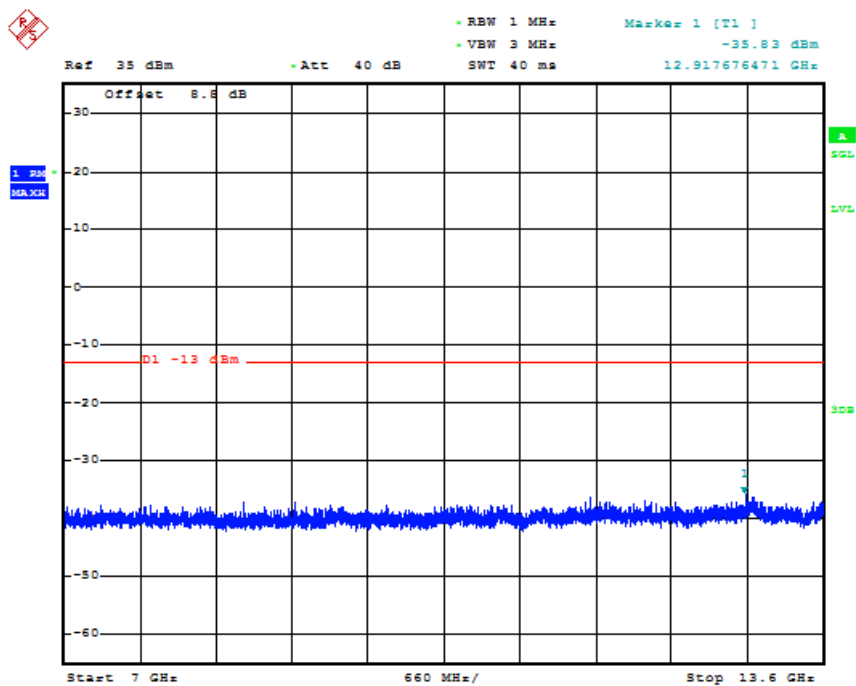

Date: 13.APR.2016 19:41:00

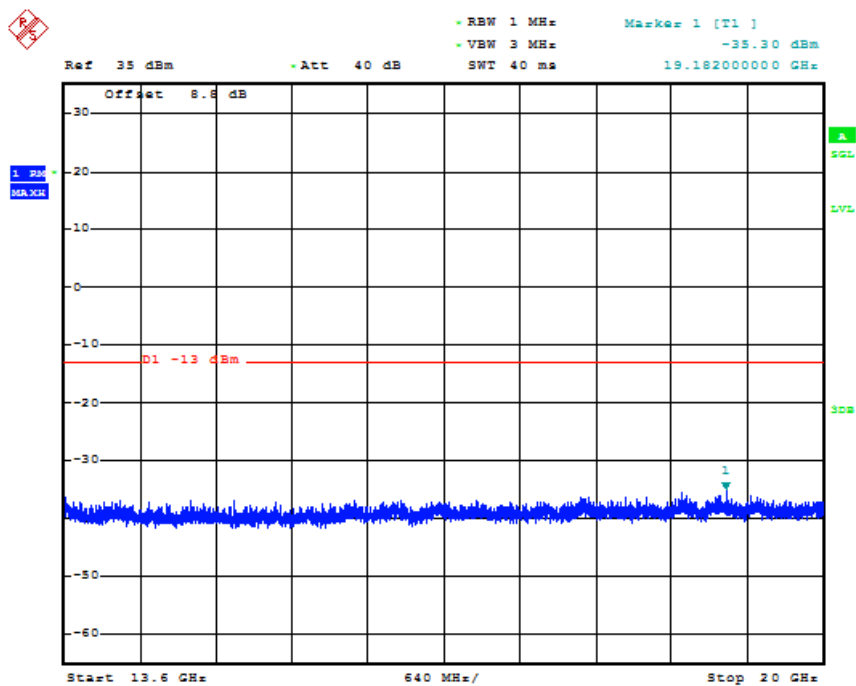Date: 13.APR.2016 19:41:09

Date: 13.APR.2016 19:41:19

Chart 1

RBW 1 MHz
VBW 3 MHz
Ref 35 dBm
Att 40 dB
SWT 40 ms

Marker 1 [T1]
-35.83 dBm
12.917676471 GHz

Offset 8.8 dB

A
SGL
LVL
3DB

1 RM
MAXH

D1 -13 dBm

Start 7 GHz 660 MHz/ Stop 13.6 GHz

Date: 13.APR.2016 19:41:28

Chart 2

RBW 1 MHz
VBW 3 MHz
Ref 35 dBm
Att 40 dB
SWT 40 ms

Marker 1 [T1]
-35.30 dBm
19.182000000 GHz

Offset 8.8 dB

A
SGL
LVL
3DB

1 RM
MAXH

D1 -13 dBm

Start 13.6 GHz 640 MHz/ Stop 20 GHz
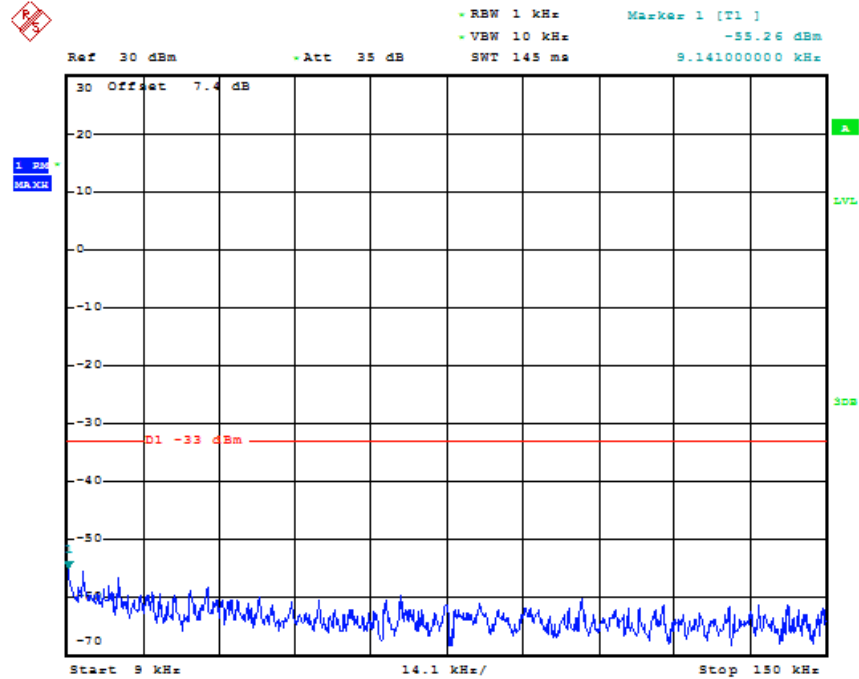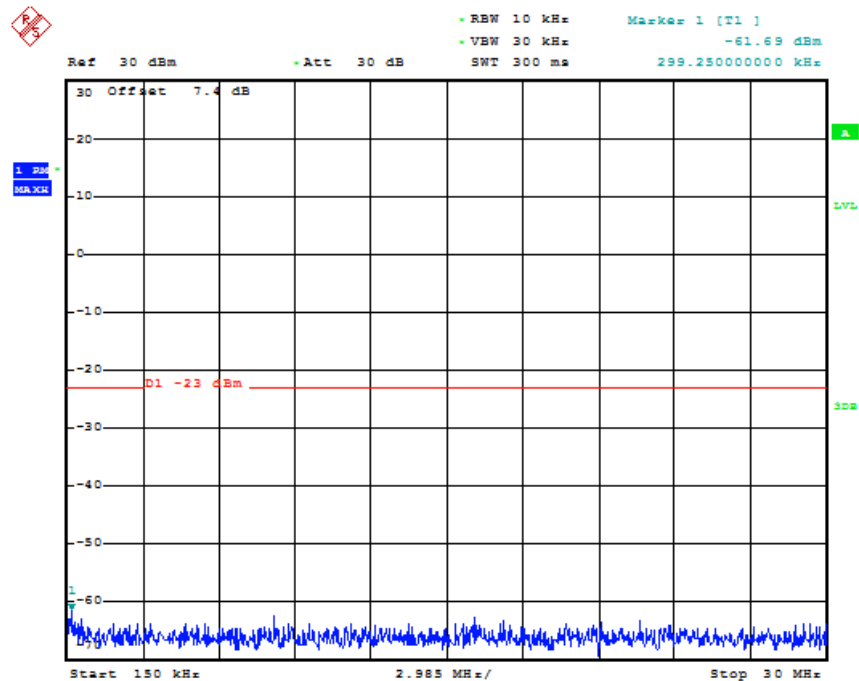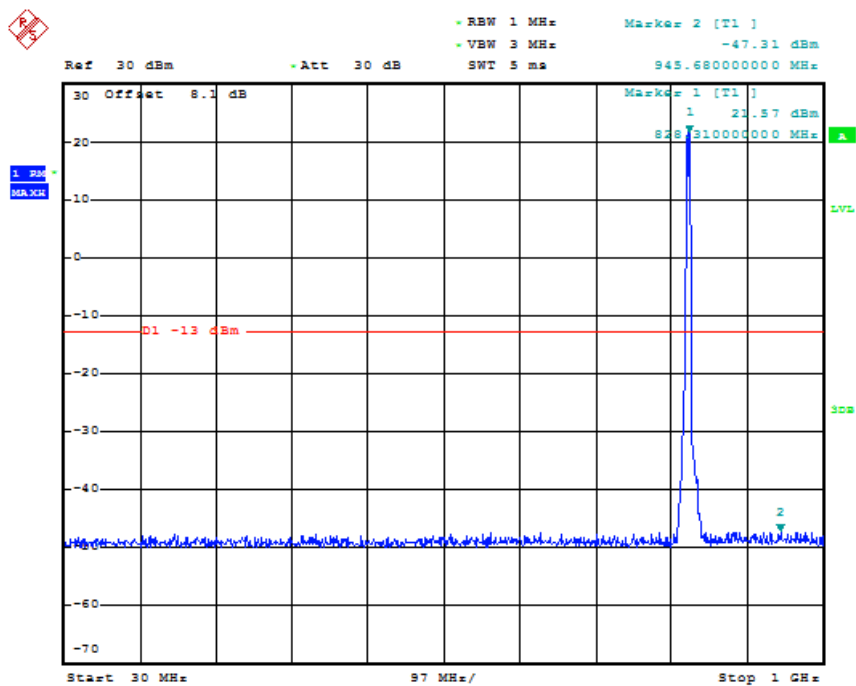
Date: 13.APR.2016 19:41:37

Out of band measurement
Test Band = WCDMA850
Test Mode = UMTS/TM3
Test Channel = LCH

Date: 14.APR.2016 12:26:51

Date: 14.APR.2016 12:26:59

RBW 1 MHz   Marker 2 [T1]
VBW 3 MHz   -47.31 dBm
Ref 30 dBm   • Att 30 dB   SWT 5 ms   945.680000000 MHz

30 Offset 8.1 dB   Marker 1 [T1]
                              1   21.57 dBm
                          828.310000000 MHz

D1 -13 dBm

Start 30 MHz   97 MHz/   Stop 1 GHz

Date: 14.APR.2016 12:27:08

RBW 1 MHz   Marker 1 [T1]
VBW 3 MHz   -37.45 dBm
Ref 30 dBm   • Att 40 dB   SWT 50 ms   3.620645161 GHz

30 Offset 8.6 dB

D1 -13 dBm

Start 1 GHz   800 MHz/   Stop 9 GHz
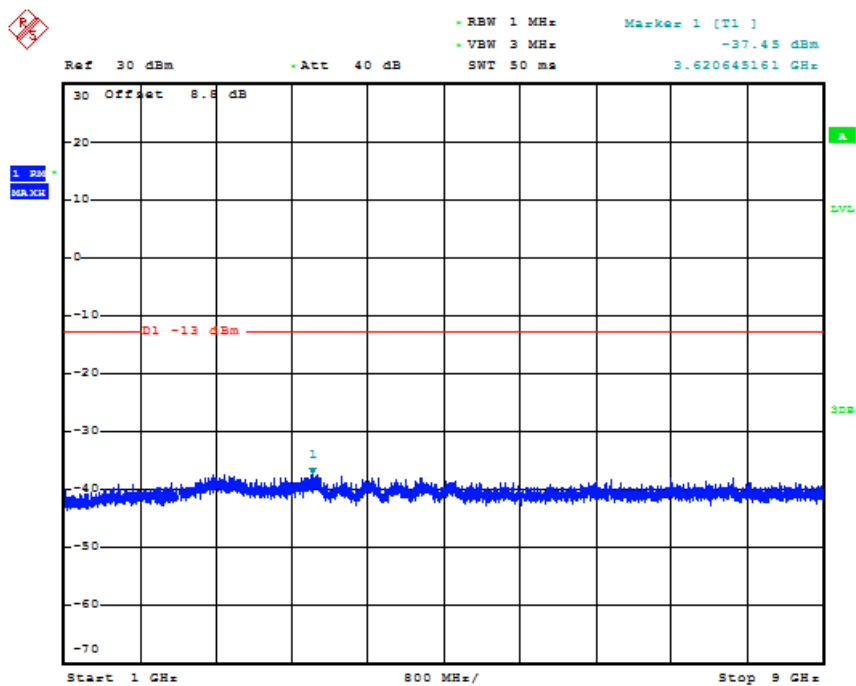
Date: 14.APR.2016 12:27:16

Out of band measurement
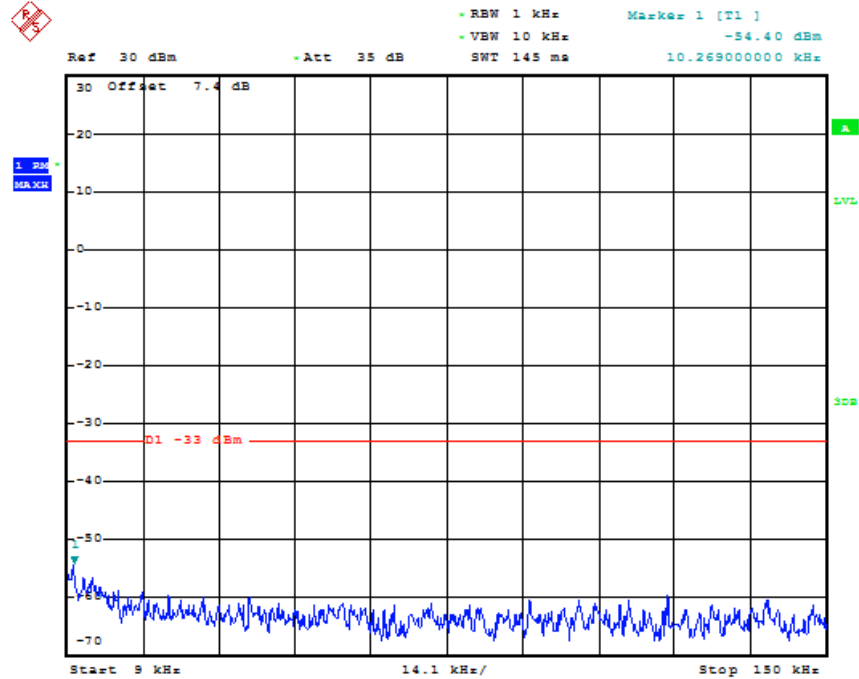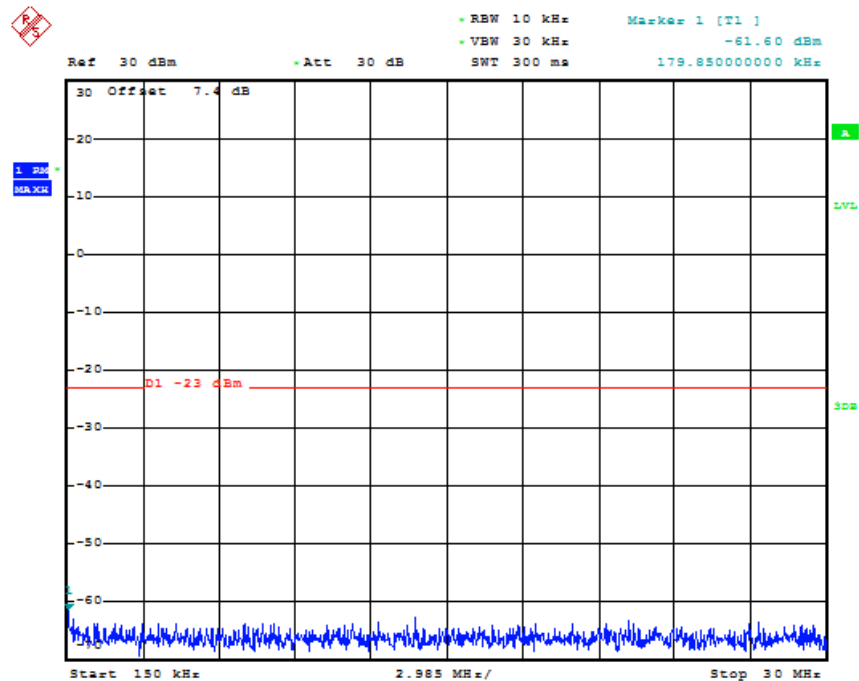Test Band = WCDMA850
Test Mode = UMTS/TM3
Test Channel = MCH

		RBW 1 kHz	Marker 1 [T1]
		VBW 10 kHz	-54.40 dBm
Ref 30 dBm	Att 35 dB	SWT 145 ms	10.269000000 kHz

30 Offset 7.4 dB

A

1 RM
MAXH

LVL

D1 -33 dBm

3DB

Start 9 kHz   14.1 kHz/   Stop 150 kHz

Date: 14.APR.2016 12:27:34

		RBW 10 kHz	Marker 1 [T1]
		VBW 30 kHz	-61.60 dBm
Ref 30 dBm	Att 30 dB	SWT 300 ms	179.850000000 kHz

30 Offset 7.4 dB

A

1 RM
MAXH

LVL

D1 -23 dBm

3DB

Start 150 kHz   2.985 MHz/   Stop 30 MHz

Date: 14.APR.2016 12:27:42

Ref 30 dBm • Att 30 dB SWT 5 ms

• RBW 1 MHz Marker 2 [T1]
• VBW 3 MHz -46.45 dBm
895.240000000 MHz

30 Offset 8.1 dB
Marker 1 [T1]
1 21.33 dBm
836.070000000 MHz

D1 -13 dBm

Start 30 MHz 97 MHz/ Stop 1 GHz

Date: 14.APR.2016 12:27:52

Ref 30 dBm • Att 40 dB SWT 50 ms

• RBW 1 MHz Marker 1 [T1]
• VBW 3 MHz -37.26 dBm
2.637419355 GHz

30 Offset 8.8 dB

D1 -13 dBm
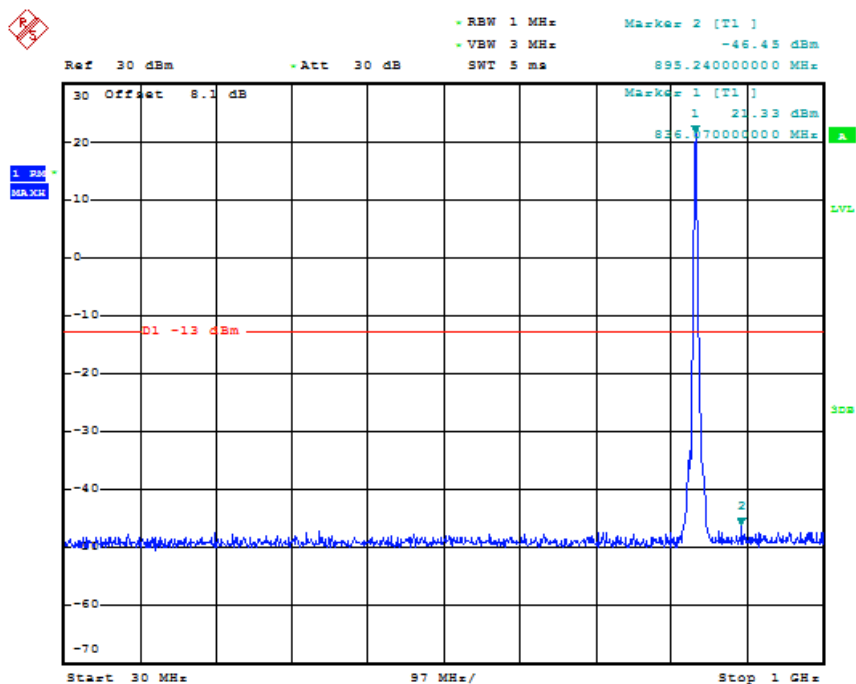
Start 1 GHz 800 MHz/ Stop 9 GHz

Date: 14.APR.2016 12:28:00

Out of band measurement
Test Band = WCDMA850
Test Mode = UMTS/TM3
Test Channel = HCH
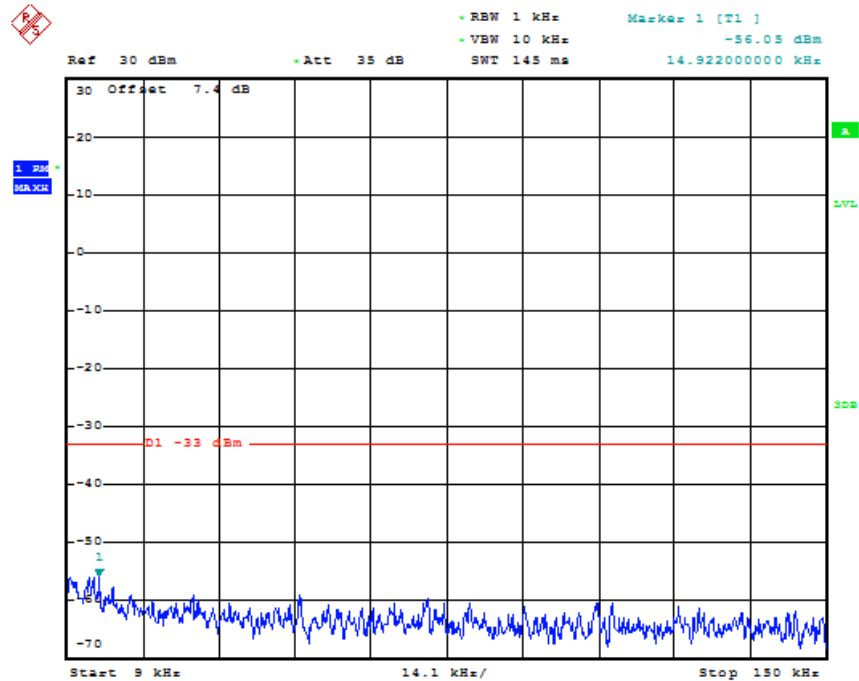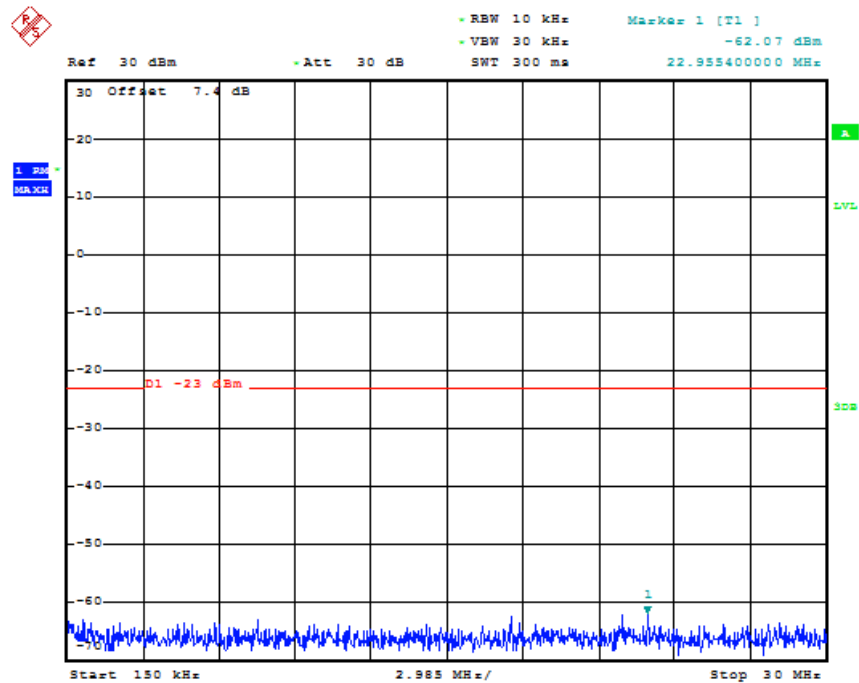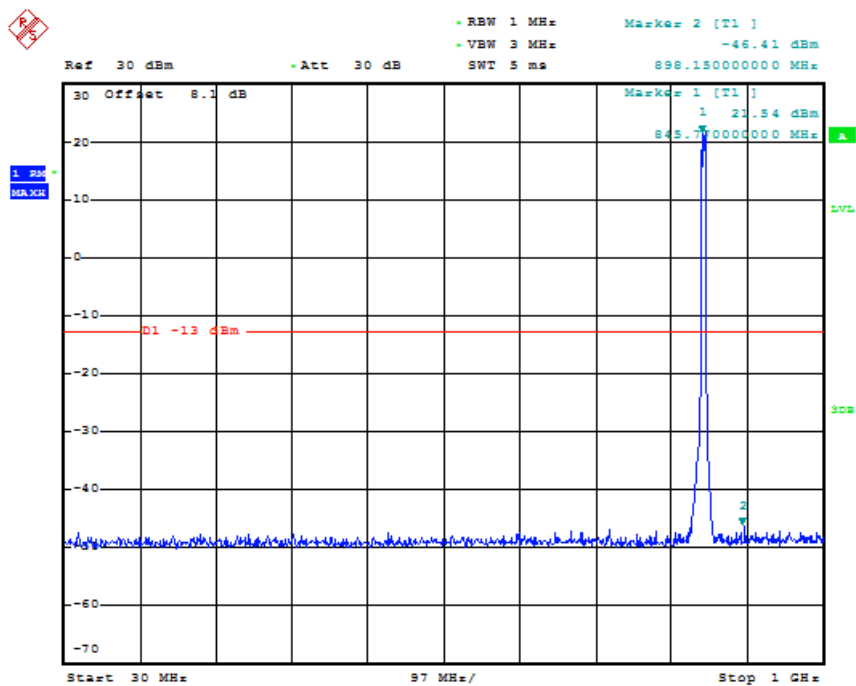

Date: 14.APR.2016 12:28:18

Date: 14.APR.2016 12:28:26

RBW 1 MHz   Marker 2 [T1]
VBW 3 MHz   -46.41 dBm
Ref 30 dBm   Att 30 dB   SWT 5 ms   898.150000000 MHz

30 Offset 8.1 dB   Marker 1 [T1]
   1   21.54 dBm
845.700000000 MHz

D1 -13 dBm

Start 30 MHz   97 MHz/   Stop 1 GHz

Date: 14.APR.2016 12:28:35

RBW 1 MHz   Marker 1 [T1]
VBW 3 MHz   -36.21 dBm
Ref 30 dBm   Att 40 dB   SWT 50 ms   3.660645161 GHz

30 Offset 8.6 dB

D1 -13 dBm

Start 1 GHz   800 MHz/   Stop 9 GHz
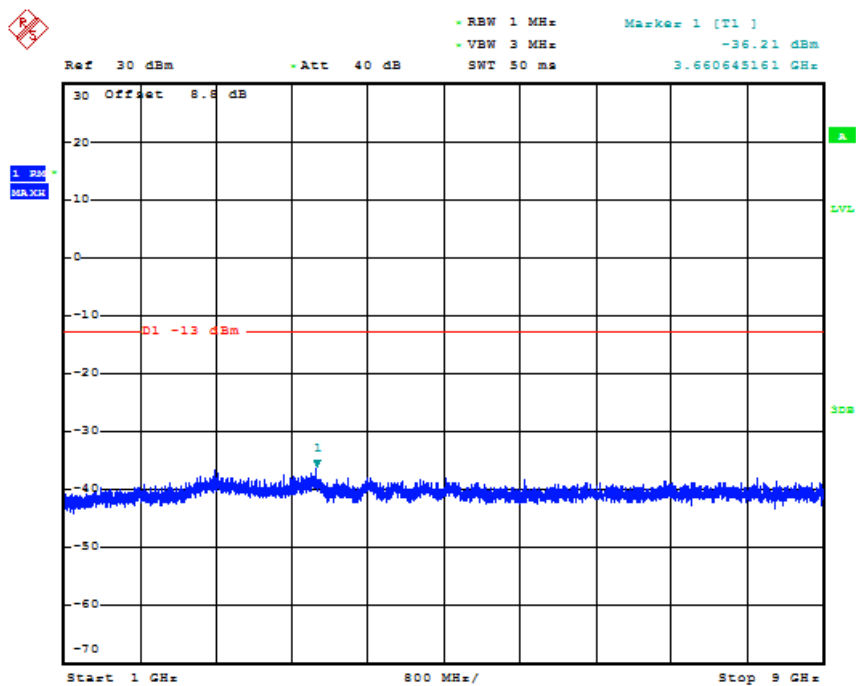
Date: 14.APR.2016 12:28:43

Test Band=WCDMA1900
Test Mode=UMTS/TM3
Test Channel=LCH

Date: 14.APR.2016 12:07:55

Date: 14.APR.2016 12:08:02

First plot

• VBW 3 MHz   -46.19 dBm

Ref 30 dBm   • Att 30 dB   SWT 5 ms   699.300000000 MHz

30 Offset 8.1 dB

A

-20

-10   LVL

0

1 RM •
MAXH

-10

D1 -13 dBm

-20

-30   3DB

-40

1

-60

-70

Start 30 MHz   97 MHz/   Stop 1 GHz

Date: 14.APR.2016 12:08:10

Second plot

• VBW 3 MHz   -32.83 dBm

Ref 30 dBm   • Att 40 dB   SWT 35 ms   3.706774194 GHz

30 Offset 8.7 dB   Marker 1 [T1]

-20   1   20.27 dBm

                             1.852580645 GHz A

1 RM •
MAXH

-10   LVL

0

-10

D1 -13 dBm

-20

-30   3DB

           2

-50

-60

-70

Start 1 GHz   600 MHz/   Stop 7 GHz
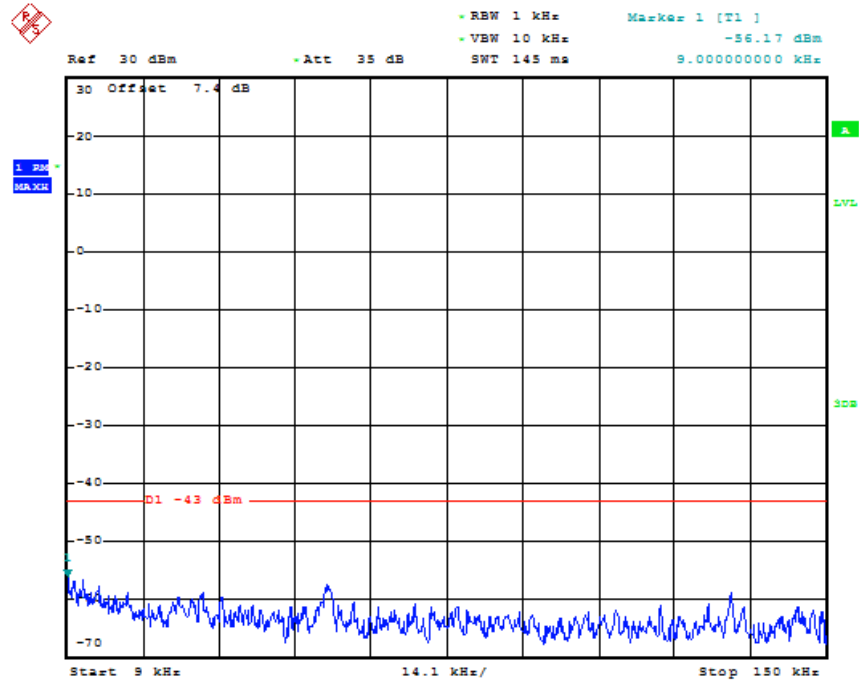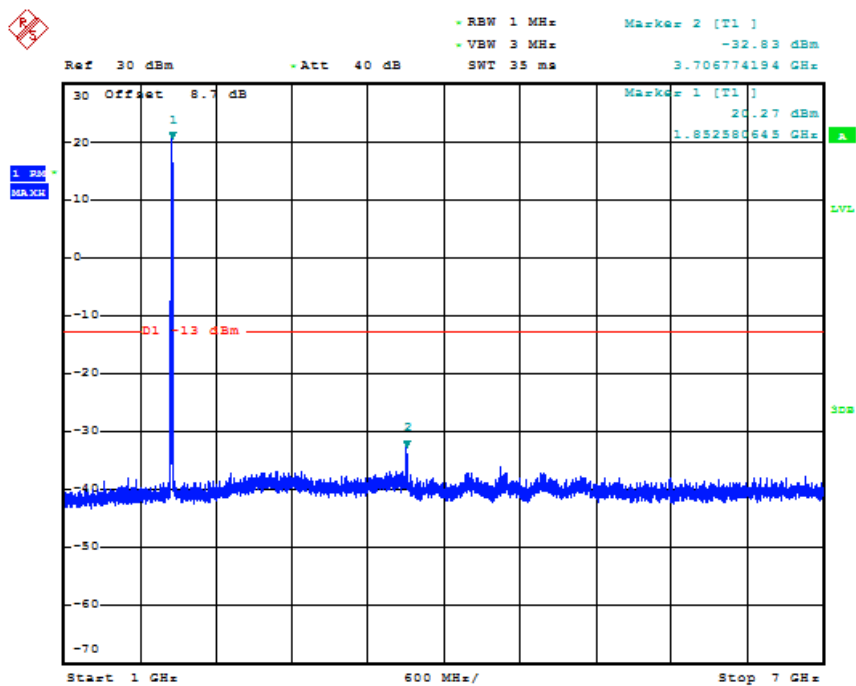
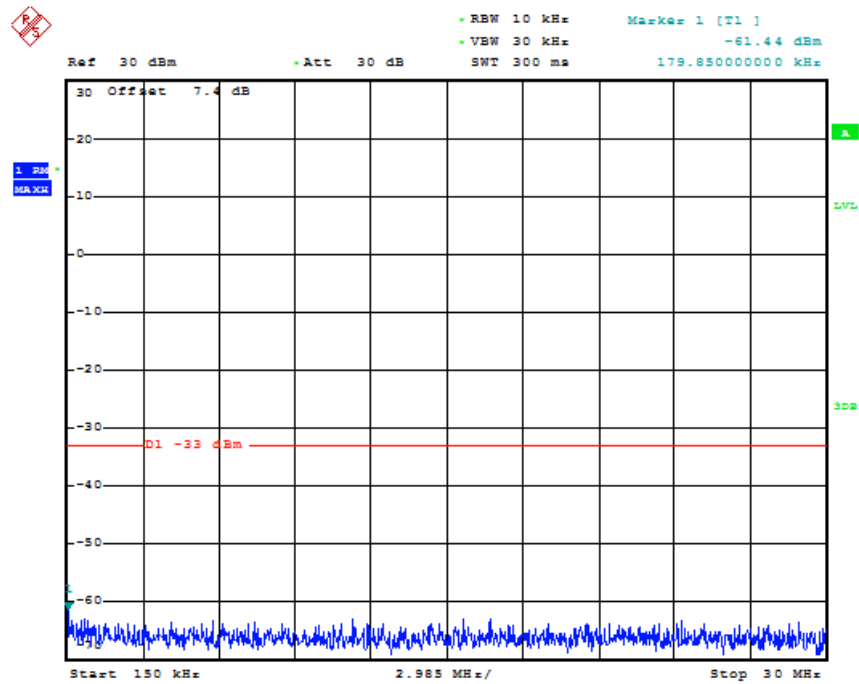Date: 14.APR.2016 12:08:20

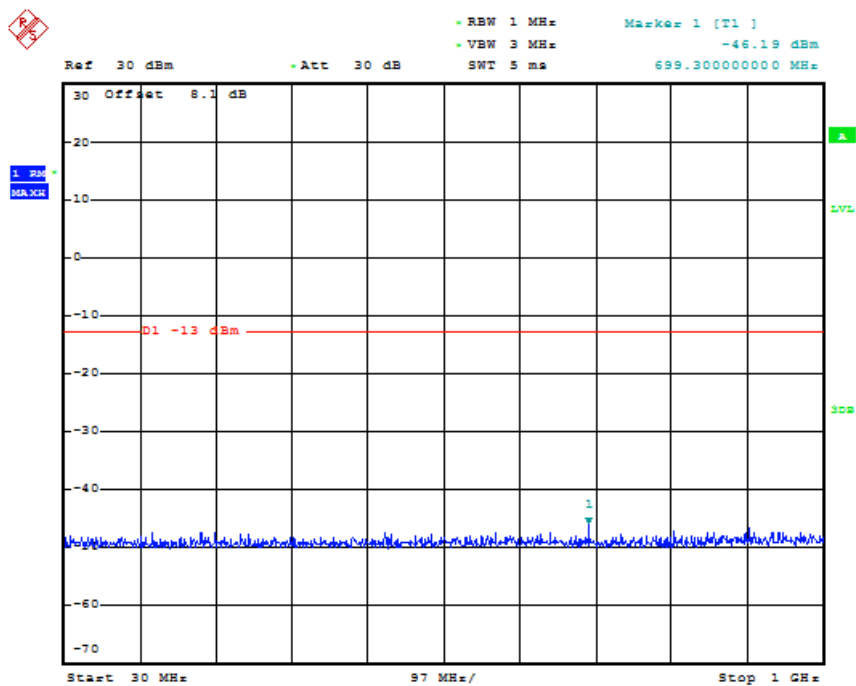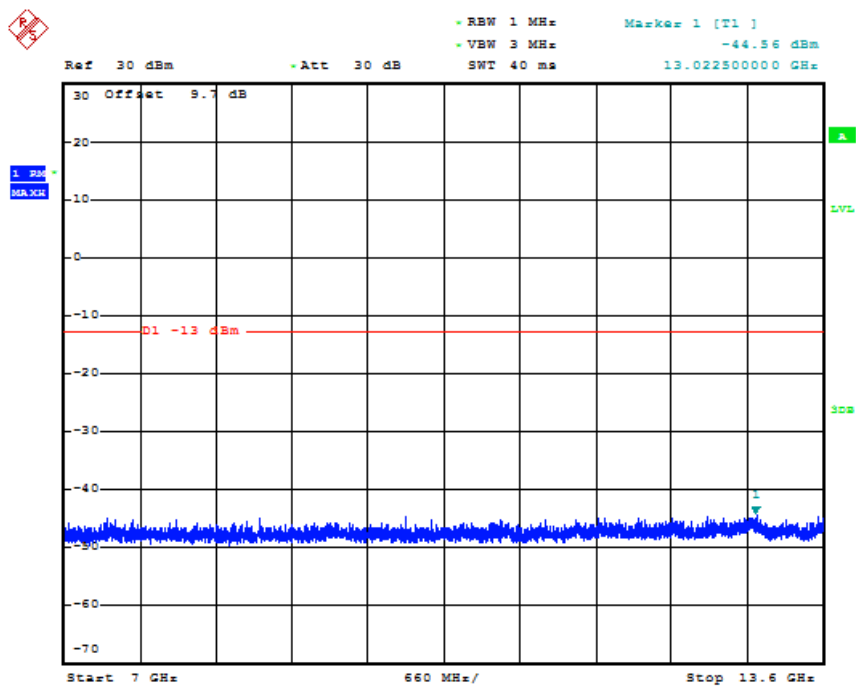Date: 14.APR.2016 12:08:28

Date: 14.APR.2016 12:08:37

Test Band=WCDMA1900
Test Mode=UMTS/TM3
Test Channel=MCH

Date: 14.APR.2016 12:08:55

Date: 14.APR.2016 12:09:03
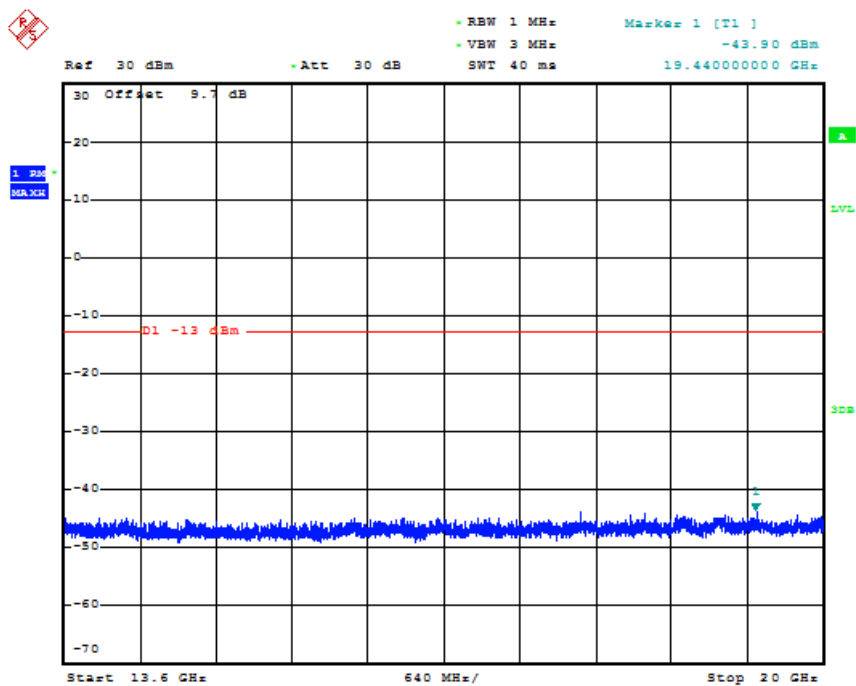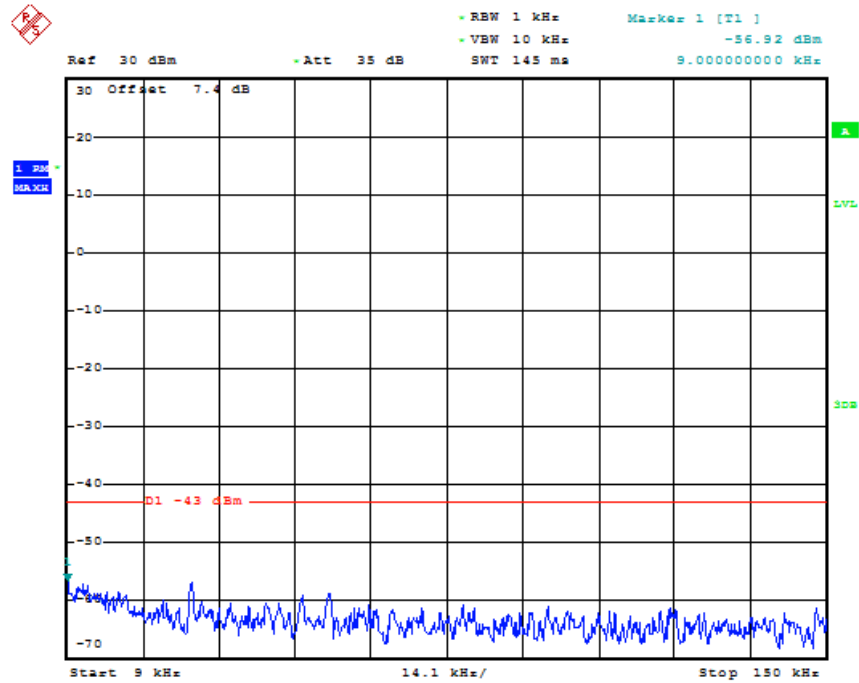
Plot 1

	• RBW 1 MHz	Marker 1 [T1]
	• VBW 3 MHz	-46.58 dBm
Ref 30 dBm	• Att 30 dB SWT 5 ms	683.780000000 MHz

30 Offset 8.1 dB

- A
- LVL
- 3DB

D1 -13 dBm

Marker: 1

Start 30 MHz   97 MHz/   Stop 1 GHz

Date: 14.APR.2016 12:09:11

Plot 2

	• RBW 1 MHz	Marker 2 [T1]
	• VBW 3 MHz	-34.97 dBm
Ref 30 dBm	• Att 40 dB SWT 35 ms	3.761935484 GHz

30 Offset 8.7 dB

Marker 1 [T1]
20.01 dBm
1.880645161 GHz

- A
- LVL
- 3DB

D1 -13 dBm

Markers: 1, 2

Start 1 GHz   600 MHz/   Stop 7 GHz

Date: 14.APR.2016 12:09:20

Plot 1:

RBW 1 MHz   Marker 1 [T1]

VBW 3 MHz   -44.00 dBm

Ref 30 dBm   Att 30 dB   SWT 40 ms   12.998235294 GHz

30 Offset 9.7 dB

A

1 RM

MAXH

LVL

3DB

D1 -13 dBm

Start 7 GHz   660 MHz/   Stop 13.6 GHz

Date: 14.APR.2016 12:09:29

Plot 2:

RBW 1 MHz   Marker 1 [T1]

VBW 3 MHz   -43.80 dBm

Ref 30 dBm   Att 30 dB   SWT 40 ms   19.127000000 GHz

30 Offset 9.7 dB

A

1 RM

MAXH

LVL

3DB

D1 -13 dBm

Start 13.6 GHz   640 MHz/   Stop 20 GHz

Date: 14.APR.2016 12:09:37

Test Band=WCDMA1900
Test Mode=UMTS/TM3
Test Channel=HCH

1.1.1.1

Date: 14.APR.2016 12:09:55

Date: 14.APR.2016 12:10:03

Date: 14.APR.2016 12:10:11

Date: 14.APR.2016 12:10:21
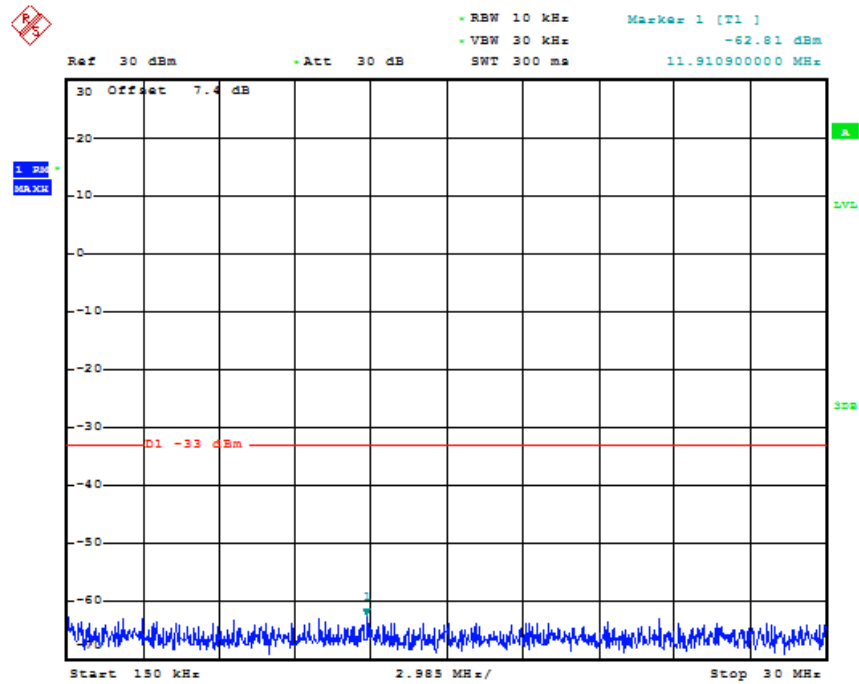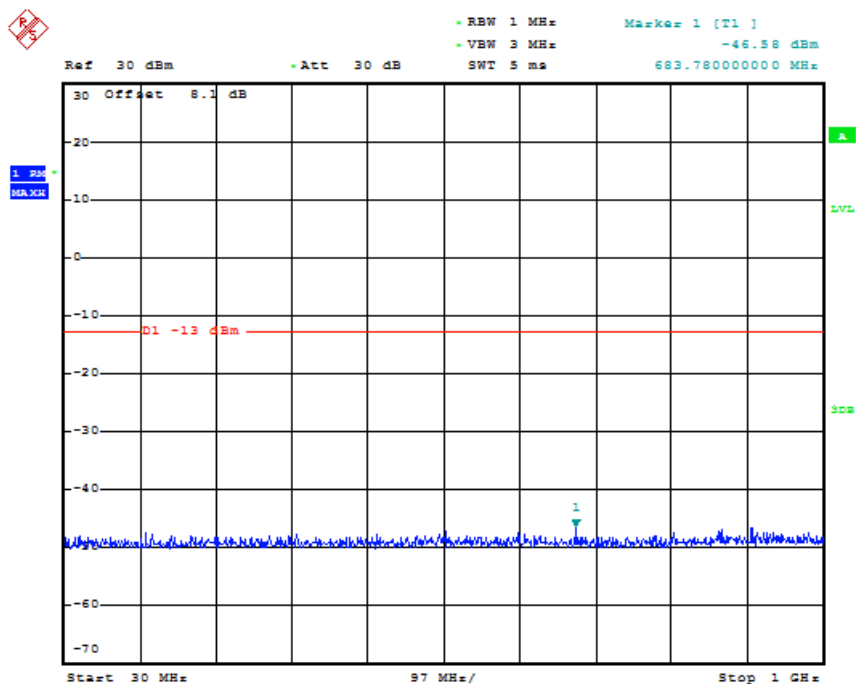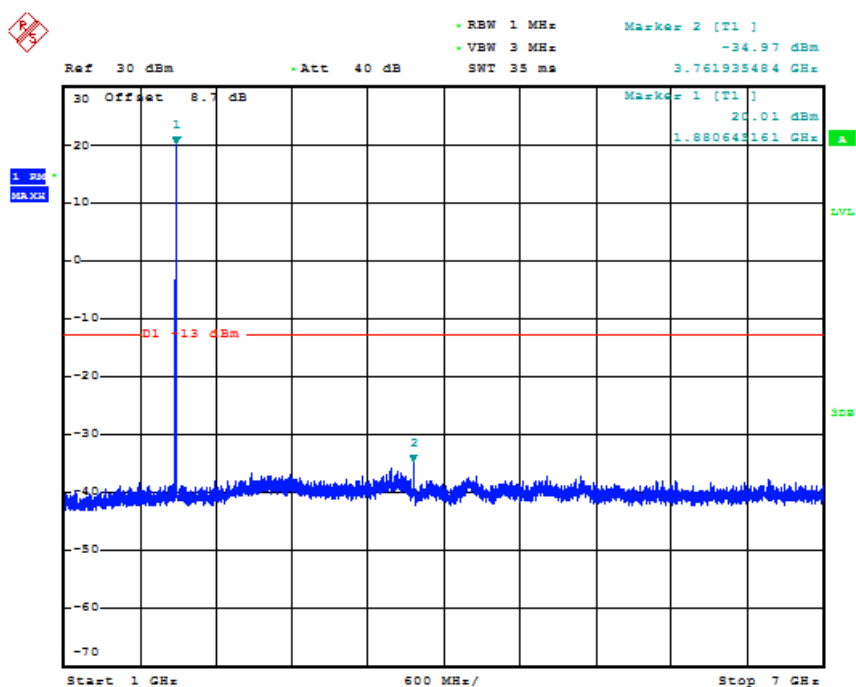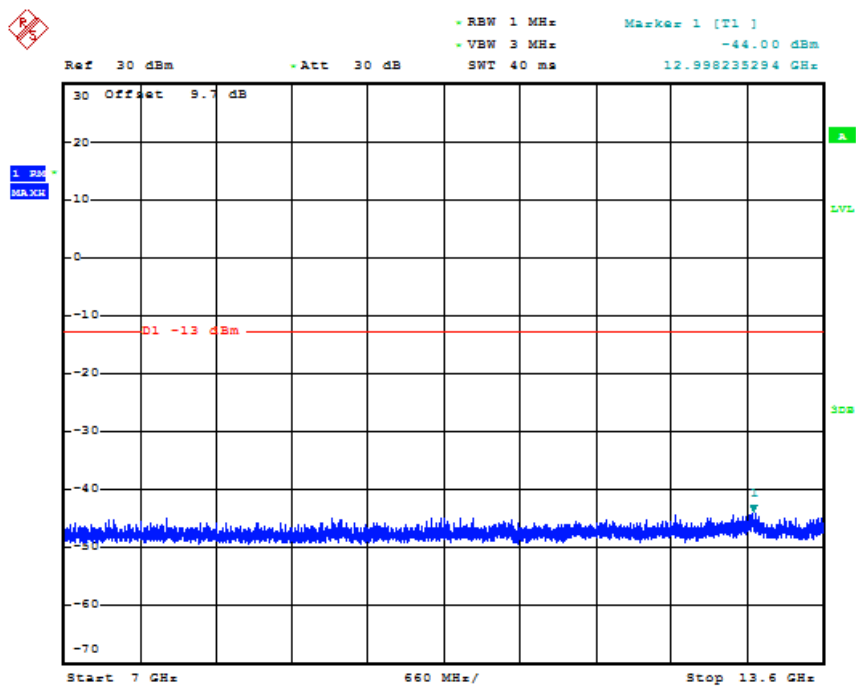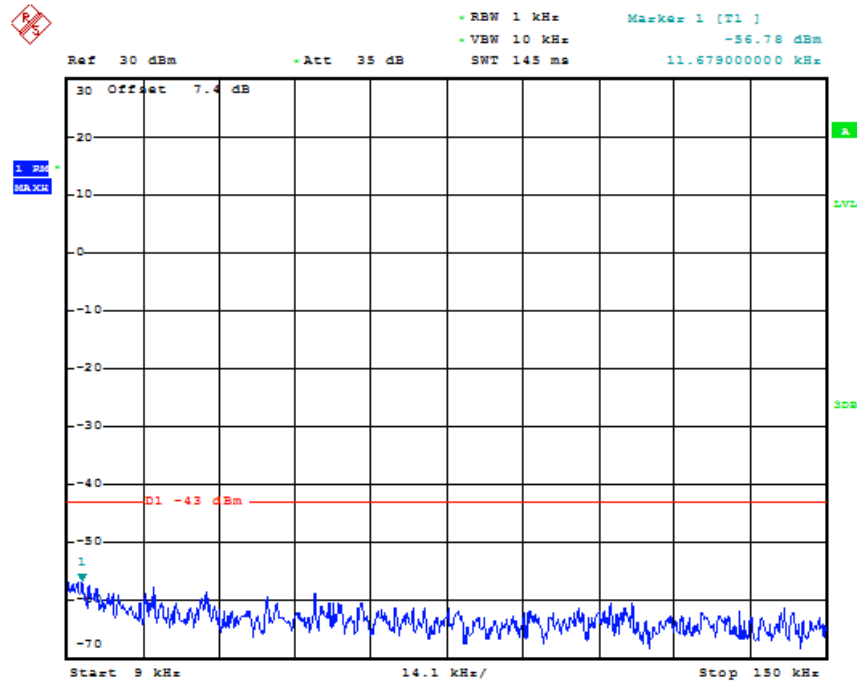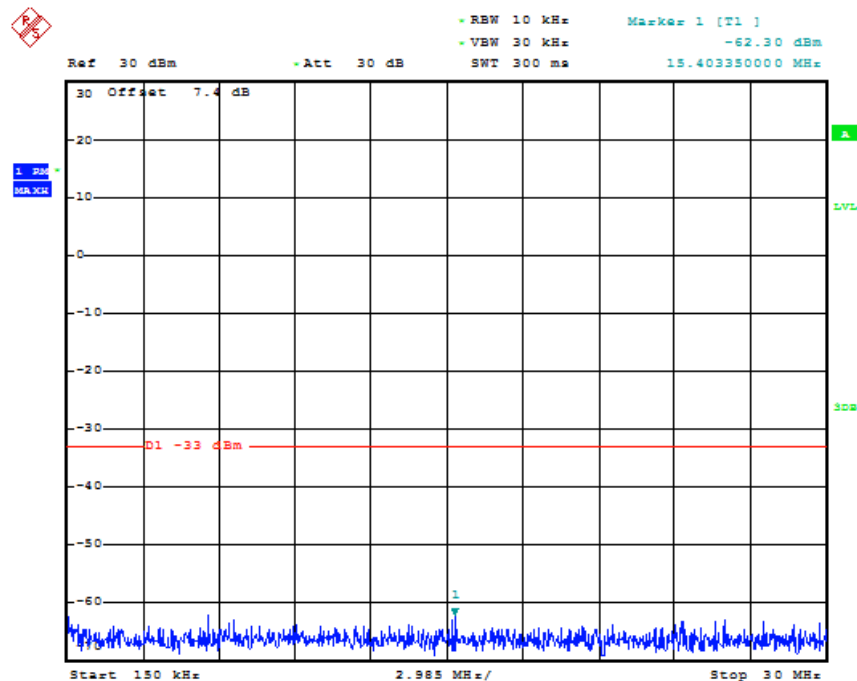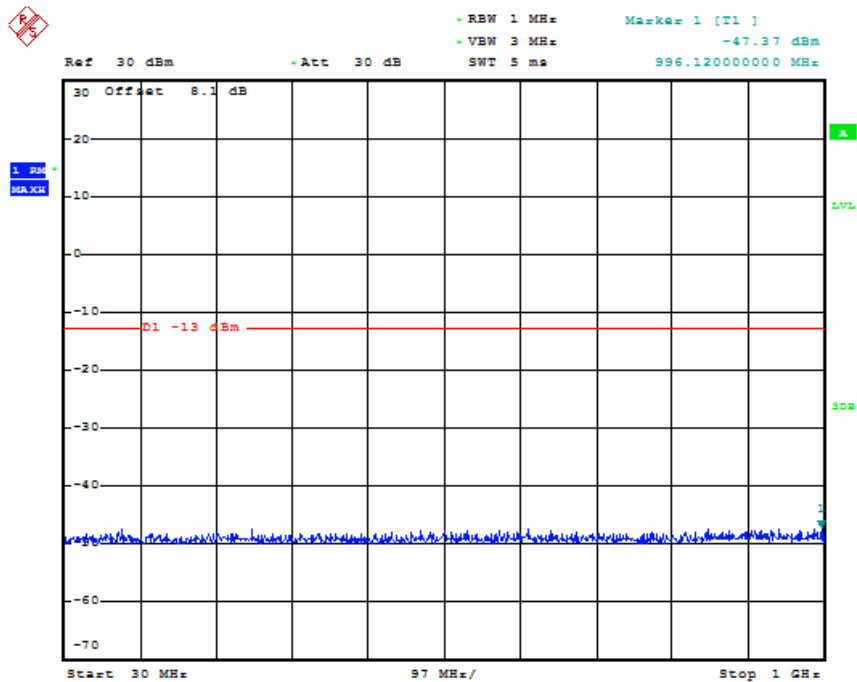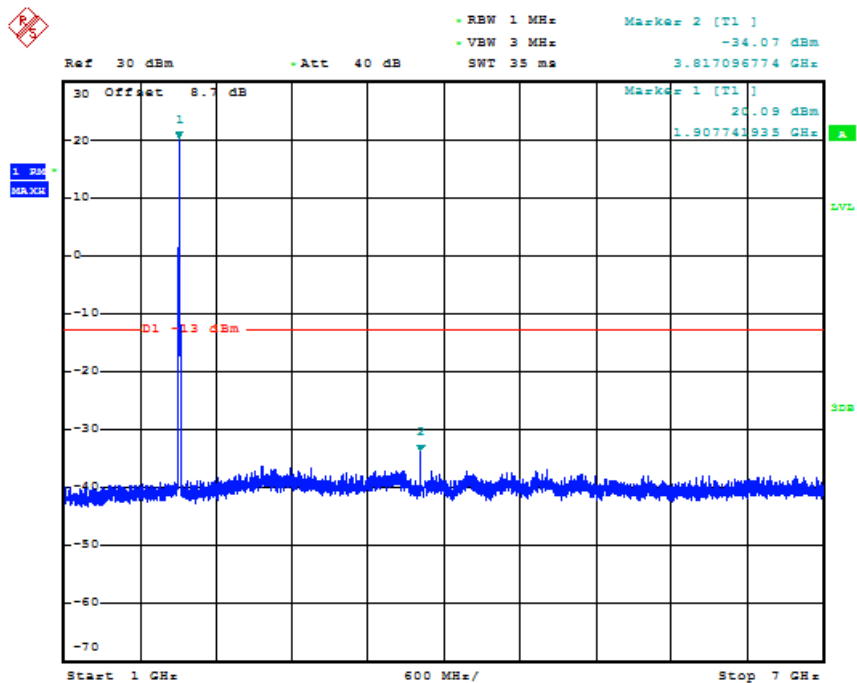
Plot 1

```
                              • RBW  1 MHz        Marker 1 [T1 ]
                              • VBW  3 MHz                -43.76 dBm
          Ref  30 dBm    • Att  30 dB   SWT  40 ms       12.714823529 GHz
```

```
   30  Offset  9.7 dB                                              A
  -20
  -10                                                             LVL
   0
1 RM
MAXH -10   D1 -13 dBm
  -20
  -30                                                             3DB
  -40
  -50
  -60
  -70
   Start  7 GHz              660 MHz/            Stop  13.6 GHz
```

Date: 14.APR.2016 12:10:29

Plot 2

```
                              • RBW  1 MHz        Marker 1 [T1 ]
                              • VBW  3 MHz                -43.48 dBm
          Ref  30 dBm    • Att  30 dB   SWT  40 ms       18.563000000 GHz
```

```
   30  Offset  9.7 dB                                              A
  -20
  -10                                                             LVL
   0
1 RM
MAXH -10   D1 -13 dBm
  -20
  -30                                                             3DB
  -40
  -50
  -60
  -70
   Start  13.6 GHz           640 MHz/            Stop  20 GHz
```
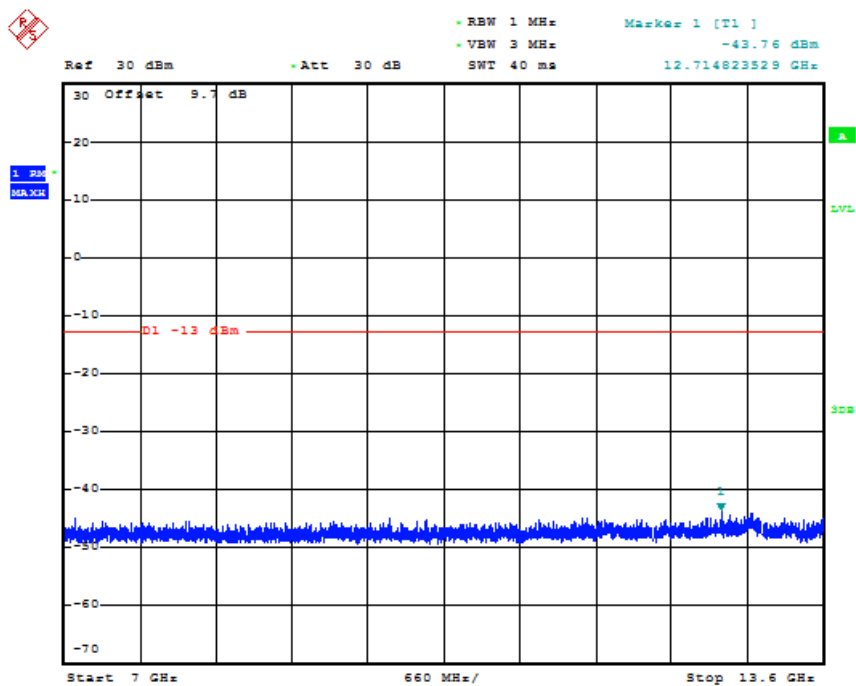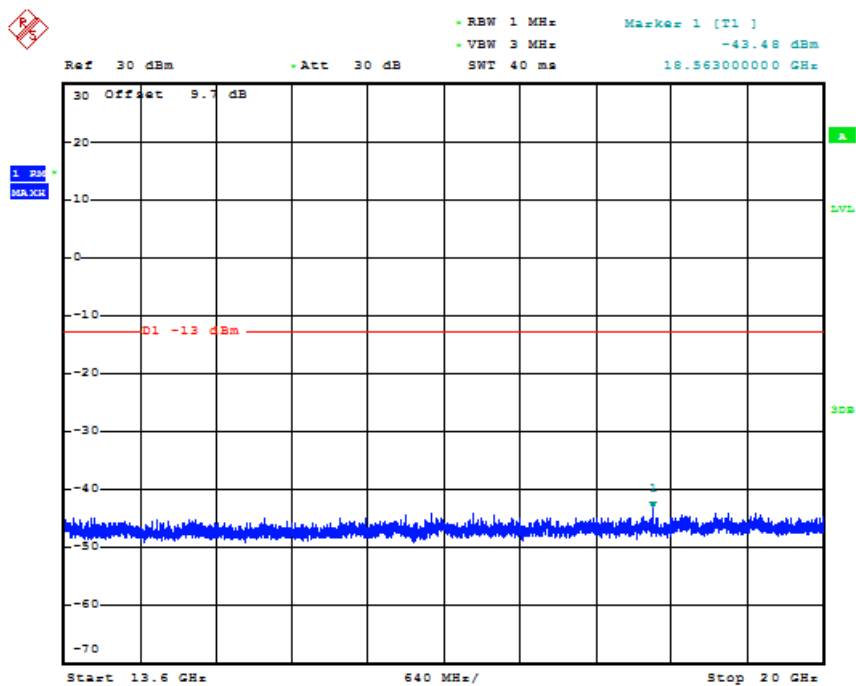
Date: 14.APR.2016 12:10:37

Band edge measurement
Test Band = GSM850
Test Mode = GSM /TM1
Test Channel = LCH/HCH

Date: 14.APR.2016 11:16:21

Date: 14.APR.2016 11:16:53

Band edge measurement
Test Band = GSM850
Test Mode = EDGE /TM2
Test Channel = LCH/HCH

	* RBW 5 kHz	Marker 1 [T1]	
	* VBW 50 kHz		-18.40 dBm
Ref 35 dBm	* Att 45 dB	* SWT 1 s	823.996794872 MHz

Offset 6.5 dB

A
SGL

1 RM
MAXH

LVL

D1 -13 dBm

3DB

Center 824 MHz   200 kHz/   Span 2 MHz

Date: 14.APR.2016 11:16:21

	* RBW 5 kHz	Marker 1 [T1]	
	* VBW 50 kHz		-19.92 dBm
Ref 35 dBm	* Att 45 dB	* SWT 1 s	849.019230769 MHz

Offset 6.5 dB

A
SGL

1 RM
MAXH

LVL

D1 -13 dBm

3DB

Center 849 MHz   200 kHz/   Span 2 MHz

Date: 14.APR.2016 11:16:53

Band edge measurement
Test Band = GSM1900
Test Mode = GSM /TM1
Test Channel = LCH/HCH

Date: 13.APR.2016 19:04:21

Date: 13.APR.2016 19:04:53

Band edge measurement
Test Band = GSM1900
Test Mode = EDGE /TM2
Test Channel = LCH/HCH

Date: 13.APR.2016 19:37:42

Date: 13.APR.2016 19:38:18

Band edge measurement
Test Band = WCDMA850
Test Mode = UMTS /TM3
Test Channel = LCH/HCH
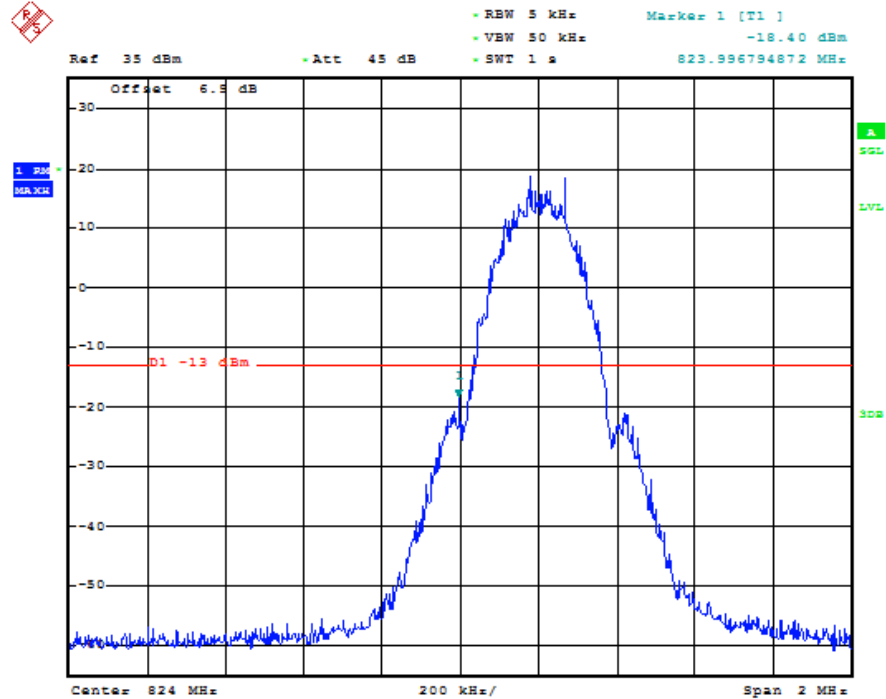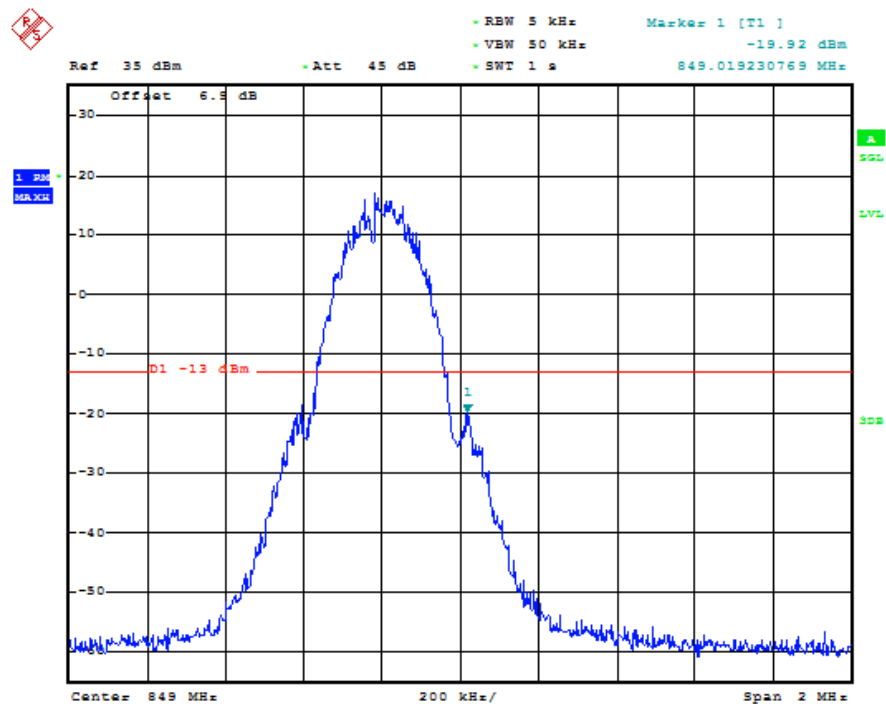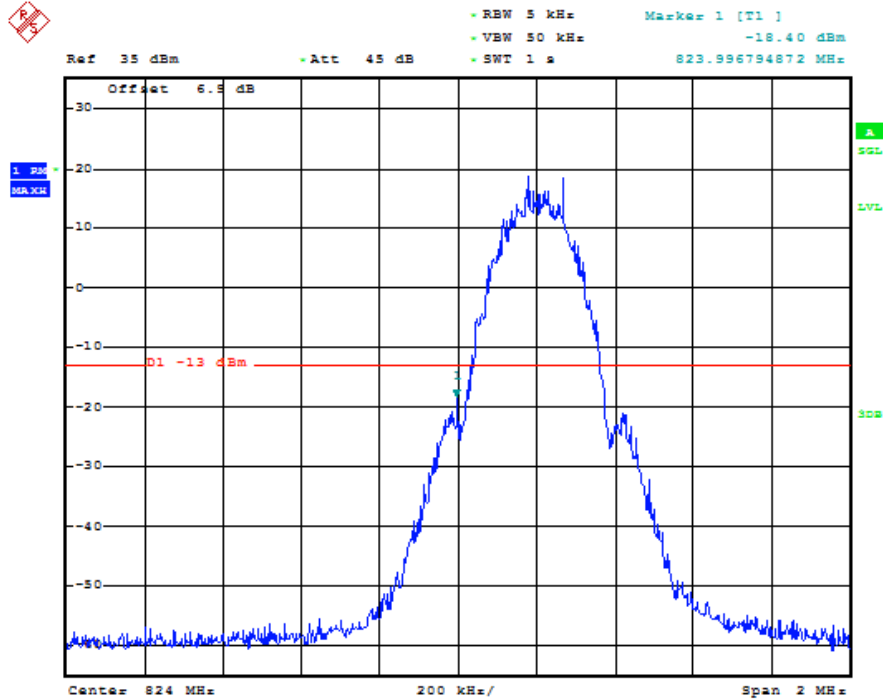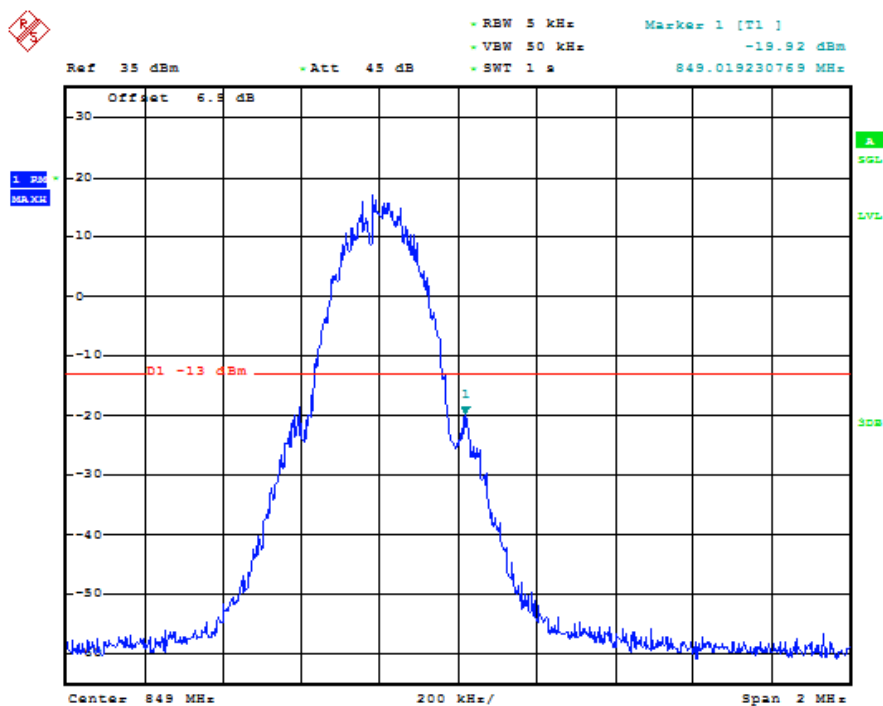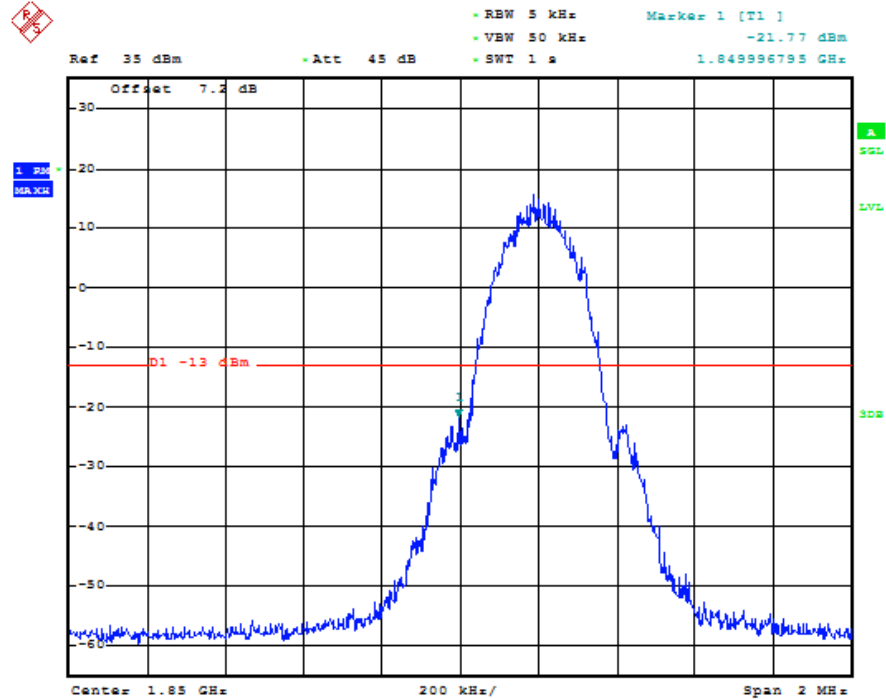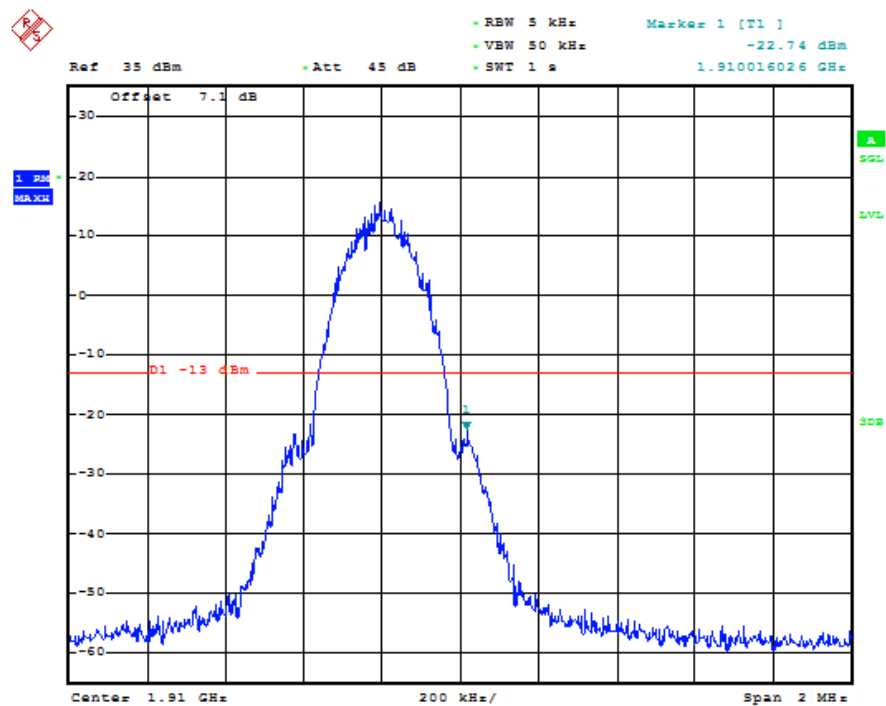

Date: 14.APR.2016 12:26:07

Date: 14.APR.2016 12:26:22

Band edge measurement
Test Band = WCDMA1900
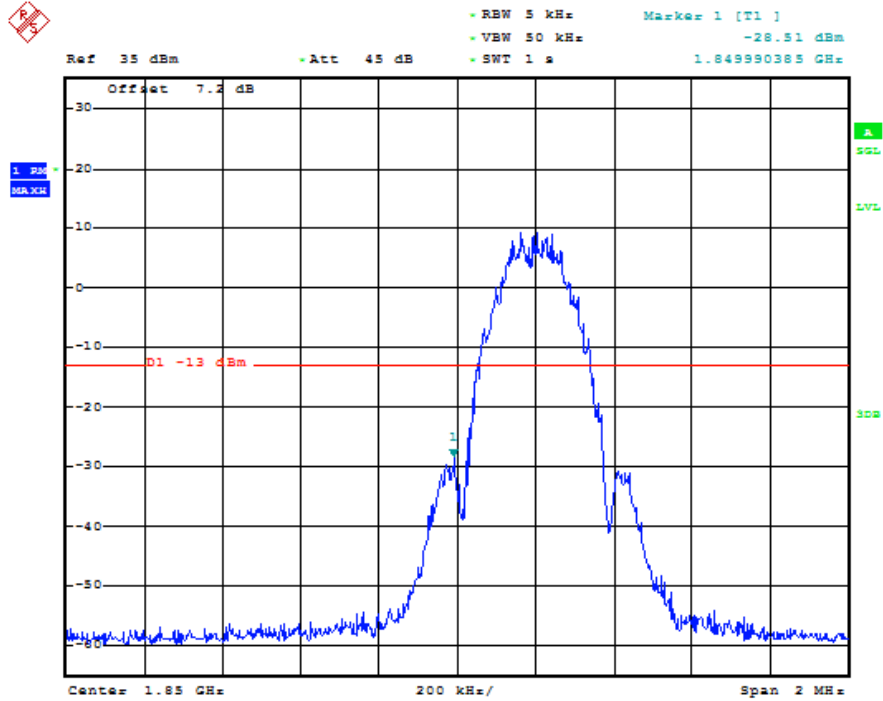Test Mode = UMTS /TM3
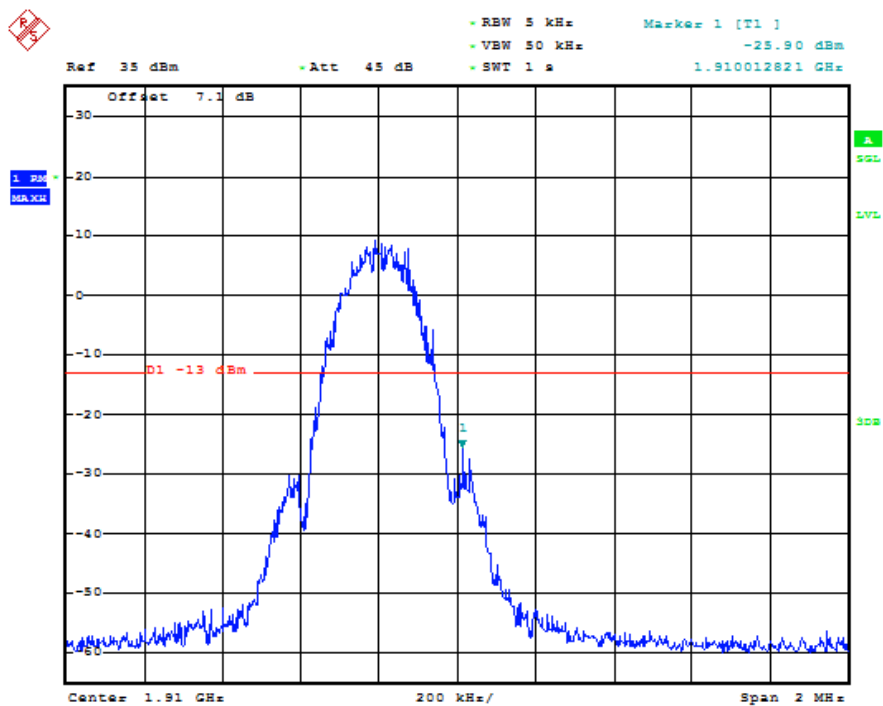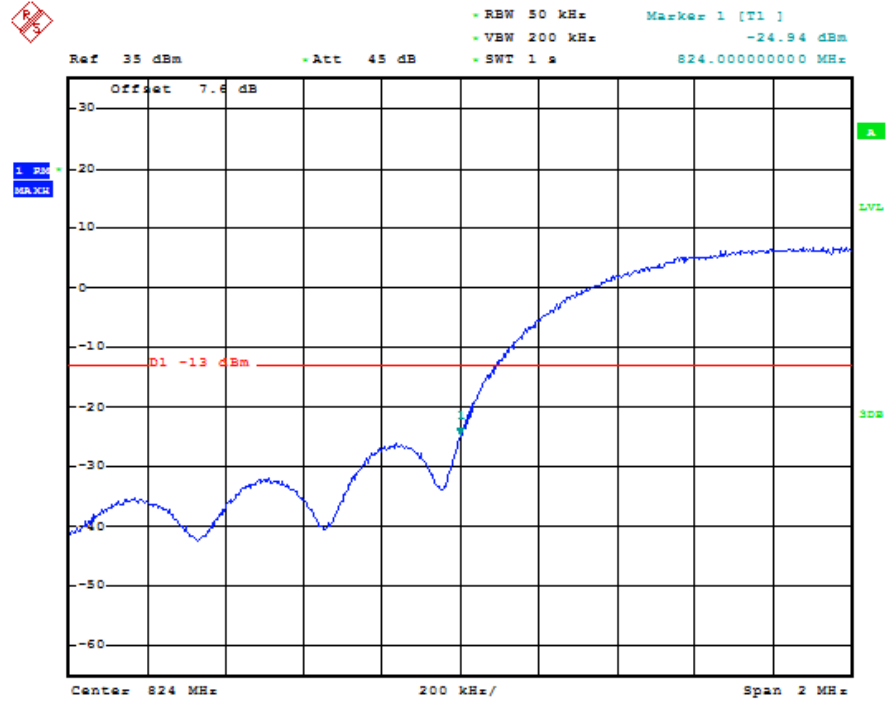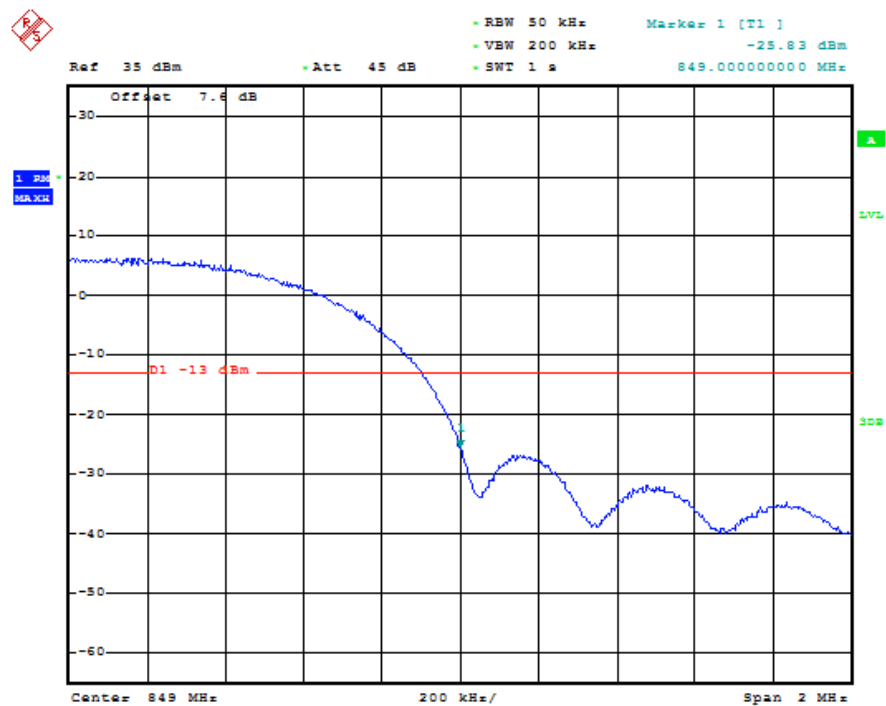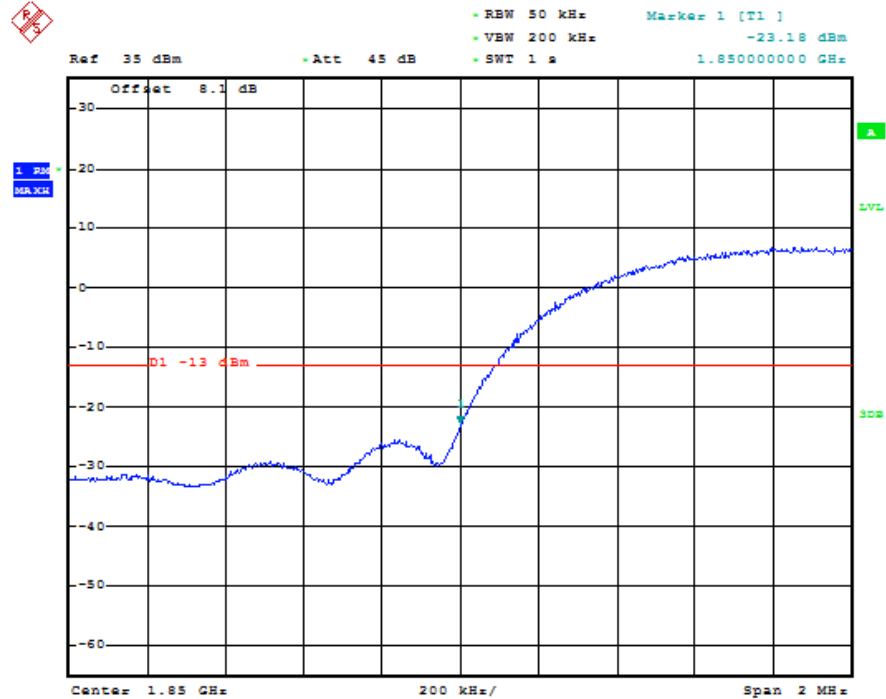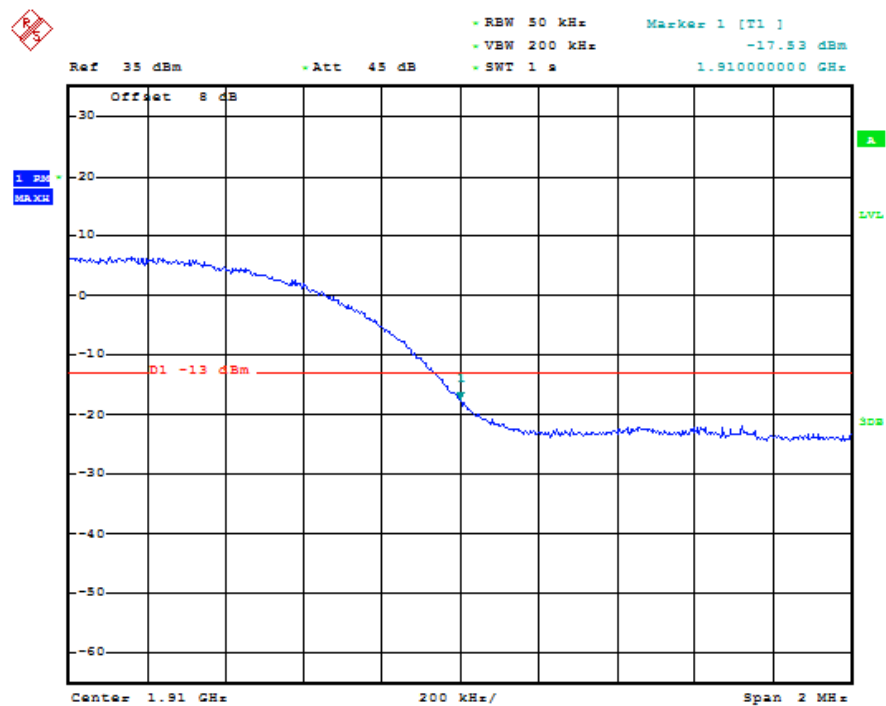Test Channel = LCH/HCH

Date: 14.APR.2016 12:19:34

Date: 14.APR.2016 12:19:49

4.5. Spurious Emissions Radiated

4.5.1. Test Standard

FCC: CFR Part 2.1053, CFR Part 22.917, CFR Part 24.238,CFR Part 27

4.5.2. Test Limit

Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission.

5.5.3   Limits:
(a) Out of band emissions.   The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.
For all power levels +30dBm to 0dBm, this becomes a constant specification of -13dBm.
5.5.3.1   FCC 22.917   Emission limitations for cellular equipment.
The rules in this section govern the spectral characteristics of emissions in the Cellular
Radiotelephone Service.
(b) Measurement procedure.   Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater.   In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.   A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz of 1 percent of emission bandwidth, as specified).   The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

5.5.3.2   FCC 24.238   Emission limitations for Broadband PCS equipment.
The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.
(b) Measurement procedure. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz of 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

§ 27.53 (h) For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any
emission outside a licensee's frequency block shall be attenuated below the transmitter power
(P) by at least 43 + 10 log10(P) dB.
The unwanted emission power shall be measured with a resolution bandwidth of at least 1% ofthe occupied bandwidth in the 1 MHz band immediately outside and adjacent to the channel edge of the equipment. Beyond the 1 MHz band immediately outside the channel edge of the equipment, a resolution bandwidth of 1 MHz shall be employed. A narrower resolution bandwidth is allowed to be used provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz or 1% of the occupied bandwidth as applicable.
The power of any unwanted emissions measured from the channel edge of the equipment shall be attenuated below the transmitter power, P (dBW), as follows:
a.   for base station and subscriber equipment, other than mobile subscriber
equipment, the attenuation shall not be less than 43 + 10 Log10 (p), dB; and
b.   for mobile subscriber equipment, the attenuation shall not be less than
43 + 10 Log10
(p), dB at the channel edges and 55 + 10 Log10 (p) at 5.5 MHz away and beyond the channel edges where p in (a) and (b) is the transmitter power measured in watts

4.5.3.Test Procedure

1.   Connect the equipment as shown in the above diagram with the EUT's antenna in a horizontal orientation.
2.   Adjust the settings of the Universal Radio Communication Tester (CMU) to set the EUT to its maximum power at the required channel.
3.   Set the spectrum analyzer to measure peak hold with the required settings.
4.   Place the measurement antenna in a horizontal orientation. Rotate the EUT 360 .
Raise the measurement antenna at 1.5 meters increments and rotate the EUT 360 at maximize all emissions. Measure and record all spurious emissions (LVL) up to the tenth harmonic of the carrier frequency.
5.   Replace the EUT with a horizontally polarized half wave dipole or known gain antenna. The center of the antenna should be at the same location as the center of the EUT's antenna.
6.   Connect the antenna to a signal generator with known output power and record the path loss in dB (LOSS). LOSS = Generator Output Power (dBm) – Analyzer reading (dBm).
7.   Determine the level of spurious emissions using the following equation:
Spurious (dBm) = LVL (dBm) + LOSS (dB):
8.   Repeat steps 4, 5 and 6 with all antennas vertically polarized.
9.   Determine the level of spurious emissions using the following equation:
Spurious (dBm) = LVL (dBm) + LOSS (dB):
10. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.
(Note: Steps 5 and 6 above are performed prior to testing and LOSS is recorded by test software.   Steps 3, 4 and 7 above are performed with test software.)

Spectrum analyzer settings: RBW=VBW=1MHz

4.5.4.Test Setup
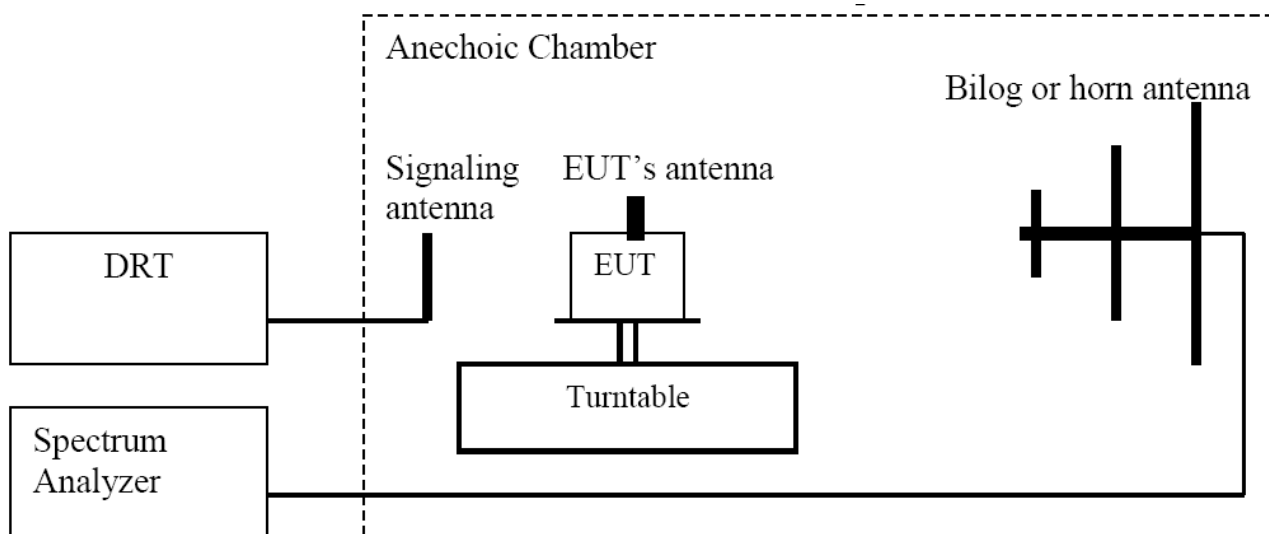
4.5.5.Test Data

Test Band = GSM850
Test Mode = GSM /TM1
Test Channel = LCH

Freq.	SG. Level	Cable Loss	Antenna Gain	Preamp	Substitution	polarization	Limit
[MHz]	[dBm]	[dB]	[dBd]	dB	Level (ERP) [dBm]		[dBm]
1648.4	6.57	0.9	6.77	40.6	-28.16	Vertical	-13

The emissions don't show in above result tables are more than 20dB below the limits
Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Test Band = GSM850
Test Mode = GSM /TM1
Test Channel = MCH

Freq.	SG. Level	Cable Loss	Antenna Gain	Preamp	Substitution	polarization	Limit
[MHz]	[dBm]	[dB]	[dBd]	dB	Level (ERP) [dBm]		[dBm]
1673.2	7.84	0.9	6.77	40.6	-26.89	Vertical	-13

The emissions don' t show in above result tables are more than 20dB below the limits
Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Test Band = GSM850
Test Mode = GSM /TM1
Test Channel = HCH

Freq.	SG. Level	Cable Loss	Antenna Gain	Preamp	Substitution	polarization	Limit
[MHz]	[dBm]	[dB]	[dBd]	dB	Level (ERP) [dBm]		[dBm]
1697.6	-1.34	0.9	6.77	40.6	-36.07	Vertical	-13

The emissions don' t show in above result tables are more than 20dB below the limits
Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Test Band = GSM850
Test Mode = EDGE /TM2
Test Channel = LCH

Freq.	SG. Level	Cable Loss	Antenna Gain	Preamp	Substitution	polarization	Limit
[MHz]	[dBm]	[dB]	[dBd]	dB	Level (ERP) [dBm]		[dBm]
1648.4	-4.09	0.9	6.77	40.6	-38.82	Vertical	-13

The emissions don't show in above result tables are more than 20dB below the limits
Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Test Band = GSM850
Test Mode = EDGE /TM2
Test Channel = MCH

Freq.	SG. Level	Cable Loss	Antenna Gain	Preamp	Substitution	polarization	Limit
[MHz]	[dBm]	[dB]	[dBd]	dB	Level (ERP) [dBm]		[dBm]
1673.2	-4.41	0.9	6.77	40.6	-39.14	Vertical	-13

The emissions don' t show in above result tables are more than 20dB below the limits
Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Test Band = GSM850
Test Mode = EDGE /TM2
Test Channel = HCH

Freq.	SG. Level	Cable Loss	Antenna Gain	Preamp	Substitution	polarization	Limit
[MHz]	[dBm]	[dB]	[dBd]	dB	Level (ERP) [dBm]		[dBm]
1697.6	-2.56	0.9	6.77	40.6	-37.29	Vertical	-13

The emissions don' t show in above result tables are more than 20dB below the limits
Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Test Band = WCDMA850
Test Mode = UMTS/TM3
Test Channel = LCH

Freq.	SG. Level	Cable Loss	Antenna Gain	Preamp	Substitution	polarization	Limit
[MHz]	[dBm]	[dB]	[dBd]	dB	Level (ERP) [dBm]		[dBm]
1652.8	-10.33	0.9	6.77	40.6	-45.06	Vertical	-13

The emissions don't show in above result tables are more than 20dB below the limits
Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Test Band = WCDMA850
Test Mode = UMTS/TM3
Test Channel = MCH

Freq.	SG. Level	Cable Loss	Antenna Gain	Preamp	Substitution	polarization	Limit
[MHz]	[dBm]	[dB]	[dBd]	dB	Level (ERP) [dBm]		[dBm]
1672.8	-9.5	0.9	6.77	40.6	-44.23	Vertical	-13

The emissions don' t show in above result tables are more than 20dB below the limits
Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Test Band = WCDMA850
Test Mode = UMTS/TM3
Test Channel = HCH

Freq.	SG. Level	Cable Loss	Antenna Gain	Preamp	Substitution	polarization	Limit
[MHz]	[dBm]	[dB]	[dBd]	dB	Level (ERP) [dBm]		[dBm]
1693.2	-9.64	0.9	6.77	40.6	-44.37	Vertical	-13

The emissions don' t show in above result tables are more than 20dB below the limits
Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Test Band = GSM1900
Test Mode = GSM /TM1
Test Channel = LCH

Freq.	SG. Level	Cable Loss	Antenna Gain	Preamp	Substitution	polarization	Limit
[MHz]	[dBm]	[dB]	[dBi]	dB	Level (EIRP) [dBm]		[dBm]
3700.4	-9.49	4.6	9.53	39	-43.56	Horizontal	-13

The emissions don't show in above result tables are more than 20dB below the limits

Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Test Band = GSM1900
Test Mode = GSM /TM1
Test Channel = MCH

Freq.	SG. Level	Cable Loss	Antenna Gain	Preamp	Substitution	polarization	Limit
[MHz]	[dBm]	[dB]	[dBi]	dB	Level (EIRP) [dBm]		[dBm]
3760	-4.67	4.6	9.53	39	-38.74	Horizontal	-13

The emissions don't show in above result tables are more than 20dB below the limits

Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Test Band = GSM1900
Test Mode = GSM /TM1
Test Channel = HCH

Freq.	SG. Level	Cable Loss	Antenna Gain	Preamp	Substitution	polarization	Limit
[MHz]	[dBm]	[dB]	[dBi]	dB	Level (EIRP) [dBm]		[dBm]
3819.6	-11.14	4.6	9.53	39	-45.21	Horizontal	-13

The emissions don't show in above result tables are more than 20dB below the limits

Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Test Band = GSM1900
Test Mode = EDGE /TM2
Test Channel = LCH

Freq.	SG. Level	Cable Loss	Antenna Gain	Preamp	Substitution	polarization	Limit
[MHz]	[dBm]	[dB]	[dBi]	dB	Level (EIRP) [dBm]		[dBm]
3700.4	-5.99	4.6	9.53	39	-40.06	Horizontal	-13

The emissions don't show in above result tables are more than 20dB below the limits
Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Test Band = GSM1900
Test Mode = EDGE /TM2
Test Channel = MCH

Freq.	SG. Level	Cable Loss	Antenna Gain	Preamp	Substitution	polarization	Limit
[MHz]	[dBm]	[dB]	[dBi]	dB	Level (EIRP) [dBm]		[dBm]
3760	-7.22	4.6	9.53	39	-41.29	Horizontal	-13

The emissions don't show in above result tables are more than 20dB below the limits
Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Test Band = GSM1900
Test Mode = EDGE /TM2
Test Channel = HCH

Freq.	SG. Level	Cable Loss	Antenna Gain	Preamp	Substitution	polarization	Limit
[MHz]	[dBm]	[dB]	[dBi]	dB	Level (EIRP) [dBm]		[dBm]
3819.6	-6.76	4.6	9.53	39	-40.83	Horizontal	-13

The emissions don't show in above result tables are more than 20dB below the limits
Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Test Band = WCDMA1900
Test Mode = UMTS /TM3
Test Channel = LCH

Freq.	SG. Level	Cable Loss	Antenna Gain	Preamp	Substitution	polarization	Limit
[MHz]	[dBm]	[dB]	[dBi]	dB	Level (EIRP) [dBm]		[dBm]
3705	-6.99	4.6	9.53	39	-41.06	Vertical	-13

The emissions don' t show in above result tables are more than 20dB below the limits

Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Test Band = WCDMA1900
Test Mode = UMTS /TM3
Test Channel = MCH

Freq.	SG. Level	Cable Loss	Antenna Gain	Preamp	Substitution	polarization	Limit
[MHz]	[dBm]	[dB]	[dBi]	dB	Level (EIRP) [dBm]		[dBm]
3760	-4.88	4.6	9.53	39	-38.95	Vertical	-13

The emissions don' t show in above result tables are more than 20dB below the limits

Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

Test Band = WCDMA1900
Test Mode = UMTS /TM3
Test Channel = HCH

Freq.	SG. Level	Cable Loss	Antenna Gain	Preamp	Substitution	polarization	Limit
[MHz]	[dBm]	[dB]	[dBi]	dB	Level (EIRP) [dBm]		[dBm]
3815.2	-6.69	4.6	9.53	39	-40.76	Vertical	-13

The emissions don' t show in above result tables are more than 20dB below the limits

Note: both of Vertical and Horizontal polarization are evaluated, and only the worst case is recorded in this report

4.6. Frequency Stability

CFR 47 (FCC) part 2.1055, 22.355 and 24.235

4.6.1. Test Limit

According to part 22.355, from 821MHz to 896MHz, for mobile device, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances 2.5ppm.

4.6.2. Test Procedure

GSM/WCDMA

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a "call mode". This is accomplished with the use of R&S CMU 200 Universal Radio Communication Tester.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30℃.
3. With the EUT, powered via nominal voltage, connected to the CMU 200 and in a simulated call on mid channel (190 for GSM 850 & 4183 for WCDMA 850 & 661 for PCS1900 & 9400 for WCDMA 1900& 1413 for WCDMA 1700), measure the carrier frequency. These measurements should be made within 2 minutes of powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10 C increments from -30 ℃ to +50 ℃. Allow at least 1 1/2 hours at each temperature, un-powered, before making measurements.
5. Re-measure carrier frequency at room temperature with nominal voltage. Re-measure carrier frequency at low and high voltage. Pause at nominal voltage for 1 1/2 hours un-powered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50 ℃.
7. With the EUT, powered via nominal voltage, connected to the CMU 200 and in a simulated call on mid channel (190 for GSM 850 & 4183 for WCDMA 850 & 661 for PCS1900 & 9400 for WCDMA 1900 & 1413 for WCDMA 1700), measure the carrier frequency. These measurements should be made within 2 minutes of powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 ℃ increments from +50 ℃ to -30 ℃. Allow at least 1 1/2 hours at each temperature, un-powered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5 ℃ during the measurement procedure.

4.6.3. Test Setup

Connect the EUT to the Wireless Communication test set CMU200 via the connector. Then measure the frequency error by the Wireless Communication test set CMU200/CMW 500. The EUT's output is matched with a 50 Ω load.

4.6.4.Test Data

Measurement Results vs. Variation of Temperature－GSM850

Temperature	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
-30 °C	836.6	-11.88	Pass
-20 °C	836.6	-11.82	Pass
-10 °C	836.6	-8.39	Pass
0 °C	836.6	-11.24	Pass
+10 °C	836.6	-3.10	Pass
+20 °C	836.6	-7.17	Pass
+30 °C	836.6	-8.27	Pass
+40 °C	836.6	-8.52	Pass
+50 °C	836.6	-4.65	Pass

Measurement Results vs. Variation of Voltage－GSM850

Voltage	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
3.5 V	836.6	-11.36	Pass
3.7 V	836.6	-7.04	Pass
4.2 V	836.6	-6.78	Pass

Measurement Results vs. Variation of Temperature－EDGE850

Temperature	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
-30 °C	836.6	-5.91	Pass
-20 °C	836.6	-2.32	Pass
-10 °C	836.6	-2.81	Pass
0 °C	836.6	-2.29	Pass
+10 °C	836.6	0.13	Pass
+20 °C	836.6	-2.32	Pass
+30 °C	836.6	-3.97	Pass
+40 °C	836.6	-0.10	Pass
+50 °C	836.6	-2.13	Pass

Measurement Results vs. Variation of Voltage－EDGE850

Voltage	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
3.5 V	836.6	0.16	Pass
3.7 V	836.6	-0.94	Pass
4.2 V	836.6	-0.03	Pass

Measurement Results vs. Variation of Temperature－WCDMA850

Temperature	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
-30 °C	836.6	-2.24	Pass
-20 °C	836.6	-3.28	Pass
-10 °C	836.6	-2.98	Pass
0 °C	836.6	-3.48	Pass
+10 °C	836.6	-1.51	Pass
+20 °C	836.6	-1.31	Pass
+30 °C	836.6	-3.69	Pass
+40 °C	836.6	-3.01	Pass
+50 °C	836.6	-1.42	Pass

Measurement Results vs. Variation of Voltage－WCDMA850

Voltage	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
3.5 V	836.6	-4.23	Pass
3.7 V	836.6	-0.89	Pass
4.2 V	836.6	-3.37	Pass

Measurement Results vs. Variation of Temperature－GSM1900

Temperature	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
-30 °C	1880.0	-14.21	Pass
-20 °C	1880.0	-20.99	Pass
-10 °C	1880.0	-6.97	Pass
0 °C	1880.0	-18.34	Pass
+10 °C	1880.0	-13.17	Pass
+20 °C	1880.0	-10.59	Pass
+30 °C	1880.0	-16.72	Pass
+40 °C	1880.0	-16.47	Pass
+50 °C	1880.0	-19.63	Pass

Measurement Results vs. Variation of Voltage－GSM1900

Voltage	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
3.5 V	1880.0	-11.30	Pass
3.7 V	1880.0	-15.05	Pass
4.2 V	1880.0	-12.07	Pass

Measurement Results vs. Variation of Temperature－EDGE1900

Temperature	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
-30 °C	1880.0	4.23	Pass
-20 °C	1880.0	-5.17	Pass
-10 °C	1880.0	-10.23	Pass
0 °C	1880.0	-4.88	Pass
+10 °C	1880.0	0.00	Pass
+20 °C	1880.0	-3.03	Pass
+30 °C	1880.0	-6.42	Pass
+40 °C	1880.0	-2.91	Pass
+50 °C	1880.0	-5.62	Pass

Measurement Results vs. Variation of Voltage－EDGE1900

Voltage	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
3.5 V	1880.0	0.19	Pass
3.7 V	1880.0	2.55	Pass
4.2 V	1880.0	-7.23	Pass

Measurement Results vs. Variation of Temperature－WCDMA1900

Temperature	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
-30 °C	1880.0	-5.36	Pass
-20 °C	1880.0	-3.30	Pass
-10 °C	1880.0	-7.48	Pass
0 °C	1880.0	-4.39	Pass
+10 °C	1880.0	-7.43	Pass
+20 °C	1880.0	-7.10	Pass
+30 °C	1880.0	-8.62	Pass
+40 °C	1880.0	-8.24	Pass
+50 °C	1880.0	-7.97	Pass

Measurement Results vs. Variation of Voltage－WCDMA1900

Voltage	Nominal Frequency (MHz)	Measured Frequency Error(Hz)	Result
3.5 V	1880.0	-5.19	Pass
3.7 V	1880.0	-5.72	Pass
4.2 V	1880.0	-2.88	Pass