

APPLICATION FOR CERTIFICATION

On Behalf of

TP-Link Technologies Co., Ltd

3G Mobile Wi-Fi

Model No. : M5350

FCC ID : TE7M5350V2

Brand : TP-LINK

Prepared for: TP-Link Technologies Co., Ltd
Building 24 (Floors 1,2,4,5) and 28 (floorsl-4)
Central Science and technology park , Shennan Rd,
Nanshan, Shenzhen, China

Prepared by: AUDIX Technology Corporation
EMC Department
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Date of Test : 2014. 07. 08 ~ 08. 14
Date of Report : 2014. 08. 28

TABLE OF CONTENTS

Description	Page
TEST REPORT CERTIFICATION	4
1. DESCRIPTION OF REVISION HISTORY	5
2. GENERAL INFORMATION	6
2.1. Description of Device (EUT).....	6
2.2. Antenna Information.....	7
2.3. Tested Supporting System Details	8
2.4. Description of Test Facility	9
2.5. Measurement Uncertainty	9
3. CONDUCTED EMISSION MEASUREMET	10
3.1. Test Equipment.....	10
3.2. Block Diagram of Test Setup.....	10
3.3. Conducted Emission Limits (§15.207)	11
3.4. Operating Condition of EUT	11
3.5. Test Procedure	11
3.6. Conducted Emission Measurement Results.....	12
4. RF OUTPUT POWER MEASUREMENT	17
4.1. Test Equipment.....	17
4.2. Block Diagram of Test Setup.....	18
4.3. Specification Limits.....	18
4.4. Test Procedure	19
4.5. Test Results.....	19
5. FREQUENCY STABILITY MEASUREMENT	27
5.1. Test Equipment.....	27
5.2. Block Diagram of Test Setup.....	27
5.3. Specification Limits.....	27
5.4. Test Procedure	27
5.5. Test Results.....	28
6. OCCUPIED BANDWIDTH 99% POWER MEASUREMENT.....	31
6.1. Test Equipment.....	31
6.2. Block Diagram of Test Setup.....	31
6.3. Specification Limit	31
6.4. Test Procedure	31
6.5. Test Results.....	32
7. SPURIOUS EMISSION AT ANTENNA TERMINALS MEASUREMENT	39
7.1. Test Equipment.....	39
7.2. Block Diagram of Test Setup.....	39
7.3. Specification Limit	39
7.4. Test Procedure	39
7.5. Test Results.....	39
8. BAND EDGES EMISSION AT ANTENNA TERMINALS MEASUREMENT	58
8.1. Test Equipment.....	58
8.2. Block Diagram of Test Setup.....	58
8.3. Specification Limit	58
8.4. Test Procedure	58
8.5. Test Results.....	58
9. RADIATED EMISSION MEASUREMENT	65
9.1. Test Equipment.....	65

9.2. Block Diagram of Test Setup.....	66
9.3. Specification Limits.....	66
9.4. Test Procedure	66
9.5. Test Results.....	66
10. DEVIATION TO TEST SPECIFICATIONS.....	71
11. PHOTOGRAPHS.....	72
11.1. Photos of Conducted Disturbance Measurement.....	72
11.2. Photo of Conducted Measurement.....	74
11.3. Photos of Radiated Emission Measurement at Semi-Anechoic Chamber	75

TEST REPORT CERTIFICATION

Applicant : TP-Link Technologies Co., Ltd
 Manufacturer : TP-Link Technologies Co., Ltd
 EUT Description : 3G Mobile Wi-Fi
 FCC ID : **TE7M5350V2**
 (A) Model No. : M5350
 (B) Serial No. : N/A
 (C) Brand : TP-LINK
 (D) Power Supply : (1) DC 5V (Via USB)
 (2) DC 3.7V (Via Battery)

Measurement Procedure Used:

FCC Rules and Regulations Part 22 Subpart H and Part 24 Subpart E
 And ANSI C63.4/2003, ANSI/TIA/EIA 603C/2004

The device described above was tested by AUDIX Technology Corporation to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 22 Subpart H, Part 24 Subpart E limits.

The measurement results are contained in this test report and AUDIX Technology Corporation is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the requirements of FCC Part 22H, Part 24E standards.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX Technology Corporation.

Date of Test: 2014. 07. 08 ~ 08. 14

Date of Report: 2014. 08. 28

Producer: 
 (Tina Huang/Administrator)

Signatory: 
 (Ben Cheng/Manager)

1. DESCRIPTION OF REVISION HISTORY

Edition No.	Date of Rev.	Revision Summary	Report No.
0	2014. 08. 28	Original Report	EM-F140427

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

Product	3G Mobile Wi-Fi
Model Number	M5350
Serial Number	N/A
Brand Name	TP-LINK
Applicant	TP-Link Technologies Co., Ltd Building 24 (Floors 1,2,4,5) and 28 (floorsl-4) Central Science and technology park , Shennan Rd, Nanshan, Shenzhen, China
Manufacturer	TP-Link Technologies Co., Ltd Building 24 (Floors 1,2,4,5) and 28 (floorsl-4) Central Science and technology park , Shennan Rd, Nanshan, Shenzhen, China
FCC ID	TE7M5350V2
Fundamental Range	802.11b/g: 2412MHz ~ 2462MHz 802.11n-HT20: 2412MHz ~ 2462MHz GPRS/EGPRS 850: UL: 824.2MHz ~ 848.8MHz DL: 869.2MHz ~ 893.8MHz GPRS/EGPRS 1900: UL: 1850.2MHz ~ 1909.8MHz DL: 1930.2MHz ~ 1989.8MHz WCDMA Band: Band II: UL: 1852.4MHz ~ 1907.6MHz DL: 1932.4MHz ~ 1987.6MHz Band V: UL: 826.4MHz ~ 846.6MHz DL: 871.4MHz ~ 891.6MHz
Frequency Channel	802.11b/g: 11 channels 802.11n-HT20: 2.4GHz: 11 channels GPRS/EGPRS 850: CH 128- CH 251 GPRS/EGPRS 1900: CH 512-CH 810 WCDMA Band: Band II: UL: CH 9262 ~ CH9538; DL: CH 9662 ~ CH9938 Band V: UL: CH 4132 ~ CH4233; DL: CH 4357 ~ CH4458
Radio Technology	802.11b: DSSS Modulation (DBPSK/DQPSK/CCK) 802.11g: DSSS /OFDM Modulation (BPSK/QPSK/16QAM/64QAM) 802.11n: DSSS /OFDM Modulation (SISO) (BPSK/QPSK/16QAM/64QAM) GPRS/EGPRS: GMSK/8PSK WCDMA: QPSK/16-QAM/64-QAM
Data Transfer Rate	802.11b: 1/2/5.5/11Mbps 802.11g: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 72.2Mbps GSM:DL 14.4kbps/UL 14.4kbps GPRS: DL 85.6kbps/UL 85.6kbps EGPRS:DL 236.8kbps/UL 236.8kbps WCDMA CS: DL 64kbps/UL 64kbps WCDMA PS: DL 384kbps/UL 384kbps HSPA+:DL 21.6Mbps/UL 5.76Mbps
USB Cable	Shielded, Detachable, 0.6m
Battery	SHENZHEN BAK Battery Co., Ltd. M/N: TBL-71A2000, Rating: 3.7V, 2000mAh, 7.4Wh
AC Adapter	TP-LINK, M/N T050100-2B3 Input: 100-240V~ 50/60Hz 0.3A, Output: DC 5V, 1A

Date of Receipt of Sample	2014. 06. 23
Note: This EUT has 2.4GHz (WLAN) and GPRS/EGPRS/WCDMA function. See below for related test reports based on radio functionality. 1. The 2.4GHz (WLAN) function has been test in other report of EM-F140426. 2. The GPRS/EGPRS/WCDMA function has been test in other report of EM-F140427.	

2.2. Antenna Information

Antenna Part Number	Manufacture	Antenna Type	Peak Gain	
			Frequency	Max Gain
WLAN Antenna	SkyCross	PIFA	2400~2500MHz	3.7dBi
2G+3G Primary Antenna	SkyCross	Fixed Internal	824MHz~894MHz	-1.99dBi
			1850MHz~1990MHz	0.11dBi
3G DRX Antenna	SkyCross	Fixed Internal	869MHz~894MHz	-5.40dBi
			1930MHz~1990MHz	-3.68dBi

2.3. Tested Supporting System Details

【For Conducted Measurement】

2.3.1. NOTEBOOK PC

Model Number	:	X5502E
Serial Number	:	N/A
Manufacturer	:	ASUS
AC Adapter	:	Enerironix, M/N EXA1208UH
		DC Cord:
		Non-Shielded, Undetachable, 1.8m, Bonded a ferrite core
AC Power Cord	:	Non-Shielded, Detachable, 1.8m

【For Radiated Emission Measurement】

2.3.2. DC POWER SUPPLY

Model Number	:	3303A
Serial Number	:	721773X
Manufacturer	:	TOP WARD
Power Cord	:	Non-Shielded, Detachable, 1.8m

2.4. Description of Test Facility

Name of Firm : **AUDIX Technology Corporation**
EMC Department
 No. 53-11, Dingfu, Linkou Dist.,
 New Taipei City 244, Taiwan

Test Site : **No. 8 Shielded Room**
 No. 53-11, Dingfu, Linkou Dist.,
 New Taipei City 244, Taiwan

Semi-Anechoic Chamber
 No. 53-11, Dingfu, Linkou Dist.,
 New Taipei City 244, Taiwan

May 11, 2012 Renewal on
 Federal Communication Commission
 Registration Number: 90993

NVLAP Lab. Code : 200077-0

TAF Accreditation No : 1724

2.5. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty
Conduction Test	150kHz~30MHz	±3.43dB
Radiation Test (Distance: 3m)	30MHz~300MHz	± 2.91dB
	300MHz~1000MHz	± 2.74dB
	Above 1GHz	± 5.02dB

Remark : Uncertainty = $k_{uc}(y)$

Test Item	Uncertainty
99% Bandwidth	± 0.05kHz
Emission Limitations	± 0.13dB
Maximum Peak Output Power	± 0.33dB
Band Edges	± 0.13dB
Frequency Tolerance	± 0.0074ppm

3. CONDUCTED EMISSION MEASUREMENT

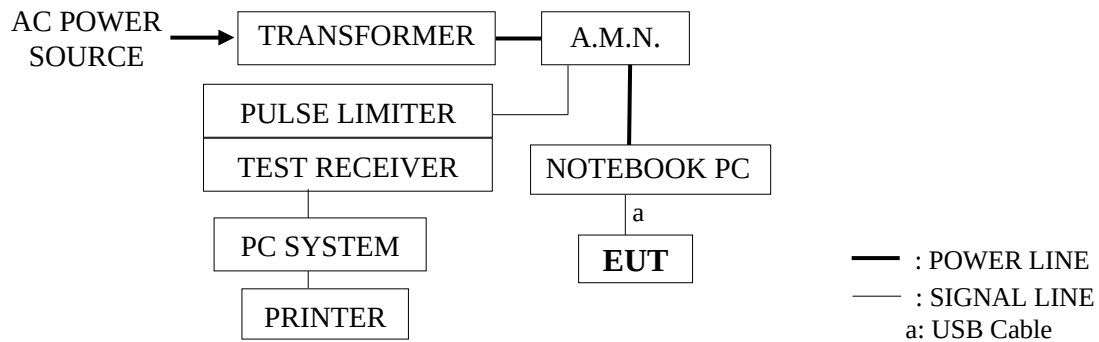
3.1. Test Equipment

The following test equipment was used during the conducted emission measurement :
(No. 8 Shielded Room)

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1.	Test Receiver	R&S	ESR3	101774	2015. 02. 18
2	A.M.N.	R&S	ESH2-Z5	100366	2015. 06. 20
3	Pulse Limiter	R&S	ESH3-Z2	100354	2015. 01. 17

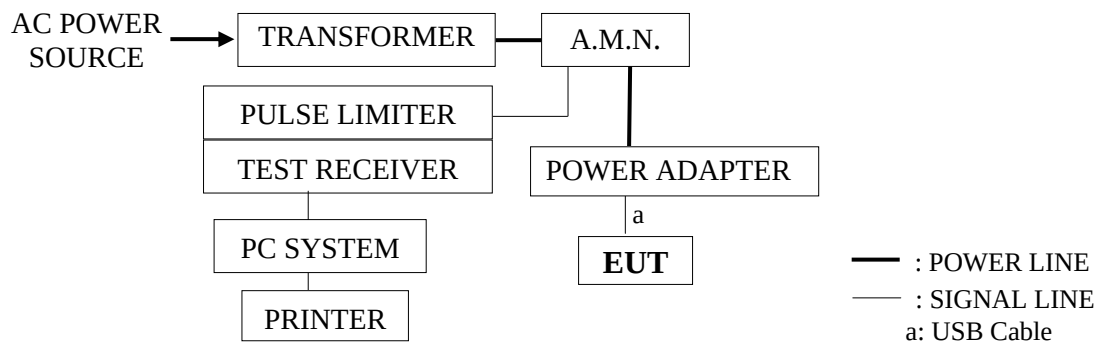
3.2. Block Diagram of Test Setup

[Link Notebook PC with Charge and Operating Mode]



EUT: 3G Mobile Wi-Fi

[Link Power Adapter with Charge and Operating Mode]



EUT: 3G Mobile Wi-Fi

3.3. Conducted Emission Limits (§15.207)

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level	Average Level
150kHz ~ 500kHz	66 ~ 56 dB μ V	56 ~ 46 dB μ V
500kHz ~ 5MHz	56 dB μ V	46 dB μ V
5MHz ~ 30MHz	60 dB μ V	50 dB μ V

Remark 1. If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary.

2. The lower limit applies at the band edges.

3.4. Operating Condition of EUT

3.4.1. Set up the EUT and simulator as shown on 3.2.

3.4.2. Turn on the power of all equipment.

3.4.3. The test program “QRCT” was used to enable the EUT to transmit data during all testing.

3.4.4. The other peripheral devices were driven and operated in turn during all testing.

3.5. Test Procedure

The EUT was put on table which was above the ground by 80cm and its AC adapter's power cord connected to the AC mains through an Artificial Mains Network (A.M.N.). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provided a 50 ohm coupling impedance for the measuring equipment. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions simulators of the interface cables should be manipulated according to FCC ANSI C63.4-2003, Canada IC RSS-Gen regulation during conducted measurement.

The bandwidth of the R&S Test Receiver ESR3 was set at 9kHz.

The frequency range from 150kHz to 30MHz was checked.

All the final readings from Test Receiver were measured with the Quasi-Peak detector and Average detector. Remark: If the Average limit is met when using a Quasi-Peak detector, the Average detector is unnecessary)

3.6. Conducted Emission Measurement Results

PASSED.

(All the emissions not reported below are too low against the prescribed limits.)

EUT with following test modes was performed during this section testing and all the test results are attached in next pages.

EUT: 3G Mobile Wi-Fi

Model No.: M5350

Test Date: 2014. 07. 10

Temperature: 25°C

Humidity: 70%

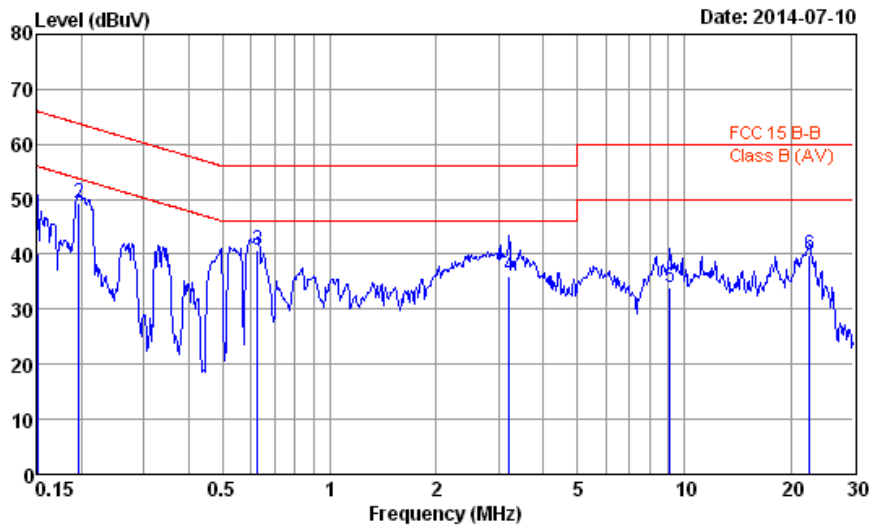
The details are as follows :

Mode	Test Voltage	Operation of EUT	Reference Test Data No.	
			Neutral	Line
1	AC 120V/60Hz (Via Notebook)	Charge and Operating	# 2	# 1
2	AC 120V/60Hz (Via Power Adapter)	Charge and Operating	# 4	# 3



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Data: 2



Site no. : No.8 Shielded Room Data no. : 2
Condition : ESH2-Z5 366 LISN Phase : NEUTRAL
Limit : FCC 15B-B
Env. / Ins. : 25°C / 70% ESR3 (1774) Engineer : Fate
EUT : M5350
Power Rating : 120Vac/60Hz
Test Mode : NB

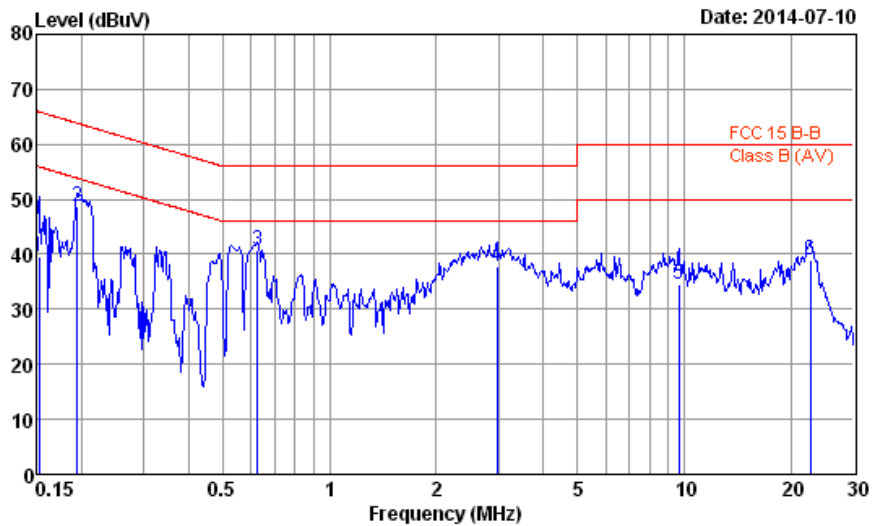
	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.150	0.21	0.02	9.85	30.15	40.23	65.99	25.76	QP
2	0.197	0.21	0.03	9.85	39.12	49.21	63.76	14.55	QP
3	0.627	0.23	0.03	9.85	30.50	40.61	56.00	15.39	QP
4	3.207	0.31	0.07	9.86	25.83	36.07	56.00	19.93	QP
5	9.107	0.45	0.13	9.88	23.41	33.87	60.00	26.13	QP
6	22.535	0.76	0.22	9.95	28.90	39.83	60.00	20.17	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
2. If the average limit is met when using a quasi-peak detector,
the EUT shall be deemed to meet both limits and measurement
with average detector is unnecessary.



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Data: 1



Site no. : No.8 Shielded Room Data no. : 1
Condition : ESH2-Z5 366 LISN Phase : LINE
Limit : FCC 15B-B
Env. / Ins. : 25°C / 70% ESR3 (1774) Engineer : Fate
EUT : M5350
Power Rating : 120Vac/60Hz
Test Mode : NB

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.152	0.18	0.02	9.85	29.48	39.53	65.91	26.38	QP
2	0.194	0.18	0.03	9.85	38.61	48.67	63.84	15.17	QP
3	0.627	0.20	0.03	9.85	30.59	40.67	56.00	15.33	QP
4	2.962	0.27	0.07	9.86	27.71	37.91	56.00	18.09	QP
5	9.654	0.42	0.14	9.89	24.13	34.58	60.00	25.42	QP
6	22.655	0.71	0.22	9.95	28.22	39.10	60.00	20.90	QP

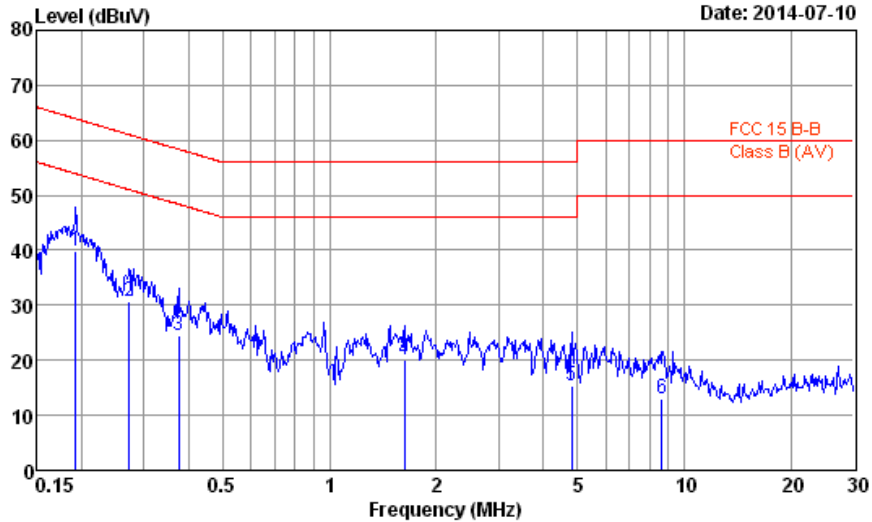
Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
2. If the average limit is met when using a quasi-peak detector,
the EUT shall be deemed to meet both limits and measurement
with average detector is unnecessary.



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Data: 4

Date: 2014-07-10



Site no. : No.8 Shielded Room Data no. : 4
Condition : ESH2-Z5 366 LISN Phase : NEUTRAL
Limit : FCC 15B-B
Env. / Ins. : 25°C / 70% ESR3 (1774) Engineer : Fate
EUT : M5350
Power Rating : 120Vac/60Hz
Test Mode : Charge

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.192	0.21	0.03	9.85	29.91	40.00	63.93	23.93	QP
2	0.273	0.22	0.03	9.85	20.61	30.71	61.03	30.32	QP
3	0.375	0.23	0.03	9.84	14.34	24.44	58.39	33.95	QP
4	1.628	0.24	0.05	9.85	9.98	20.12	56.00	35.88	QP
5	4.822	0.36	0.09	9.86	5.07	15.38	56.00	40.62	QP
6	8.637	0.44	0.13	9.88	2.68	13.13	60.00	46.87	QP

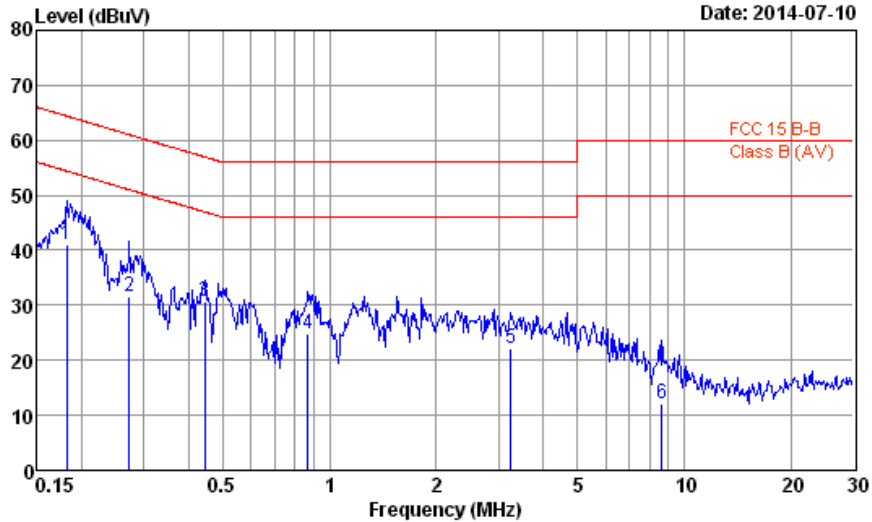
Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
2. If the average limit is met when using a quasi-peak detector,
the EUT shall be deemed to meet both limits and measurement
with average detector is unnecessary.



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Data: 3

Date: 2014-07-10



Site no. : No.8 Shielded Room Data no. : 3
Condition : ESH2-Z5 366 LISN Phase : LINE
Limit : FCC 15B-B
Env. / Ins. : 25°C / 70% ESR3 (1774) Engineer : Fate
EUT : M5350
Power Rating : 120Vac/60Hz
Test Mode : Charge

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.182	0.18	0.03	9.85	31.04	41.10	64.42	23.32	QP
2	0.273	0.19	0.03	9.85	21.63	31.70	61.03	29.33	QP
3	0.444	0.19	0.03	9.84	20.62	30.68	56.98	26.30	QP
4	0.871	0.21	0.04	9.85	14.71	24.81	56.00	31.19	QP
5	3.241	0.27	0.07	9.86	11.99	22.19	56.00	33.81	QP
6	8.637	0.41	0.13	9.88	1.55	11.97	60.00	48.03	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
2. If the average limit is met when using a quasi-peak detector,
the EUT shall be deemed to meet both limits and measurement
with average detector is unnecessary.

4. RF OUTPUT POWER MEASUREMENT

4.1. Test Equipment

4.1.1. For Conducted Measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1.	Spectrum Analyzer	R&S	FSV30	101181	2015. 03. 03
2.	Power Divider	Anritsu	K240C	019728	2015. 01. 03
3.	Universal Radio Communication Tester	Anritsu	MT8820C	6201144416	2015. 07. 31
4.	Horn Antenna	EMCO	3115	9112-3775	2015. 05. 08
5.	Power Meter	Agilent	N1913A	MY52070009	2015. 01. 24
6.	Power Sensor	Agilent	N8482B	MY51330003	2015. 01. 24

4.1.2. For Radiated Measurement (for 30MHz-1GHz)

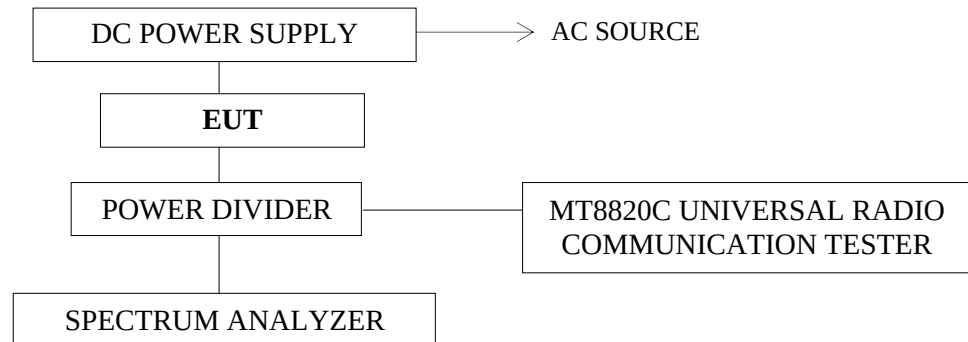
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1.	Spectrum Analyzer	Agilent	N9010A-526	MY53400071	2014. 09. 18
2.	Test Receiver	R&S	ESCS30	100338	2015. 06. 23
3.	Amplifier	HP	8447D	2944A06305	2015. 02. 17
4.	Bilog Antenna	TESEQ	CBL6112D	33821	2014. 08. 07
5.	Universal Radio Communication Tester	Anritsu	MT8820C	6201144416	2015. 07. 31
6.	Horn Antenna	EMCO	3115	9112-3775	2015. 05. 08
7.	Horn Antenna	EMCO	3115	9609-4927	2015. 06. 16

4.1.3. For Radiated Measurement (for above 1GHz)

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1.	Spectrum Analyzer	Agilent	N9010A-526	MY53400071	2014. 09. 18
2.	Pre-Amplifier	Agilent	8449B	3008A02676	2015. 02. 20
3.	Universal Radio Communication Tester	Anritsu	MT8820C	6201144416	2015. 07. 31
4.	Horn Antenna	EMCO	3115	9112-3775	2015. 05. 08
5.	Horn Antenna	EMCO	3115	9609-4927	2015. 06. 16

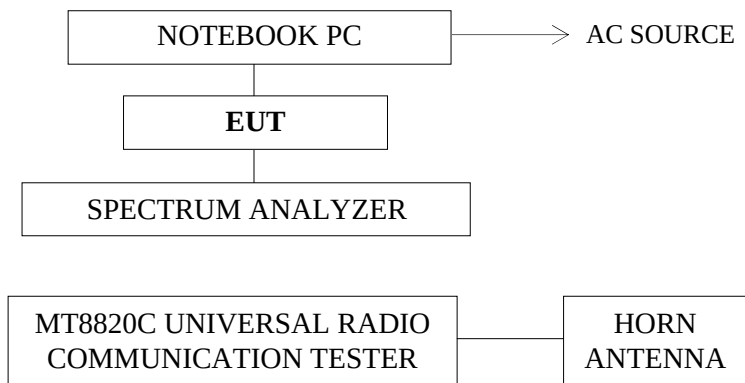
4.2. Block Diagram of Test Setup

4.2.1. For Conducted Measurement



EUT: 3G Mobile Wi-Fi

4.2.2. For Radiated Measurement



EUT: 3G Mobile Wi-Fi

4.3. Specification Limits

FCC §2.1046

FCC §22.913(a): The Effective Radiated Power (E.R.P) of Mobile transmitter auxiliary test transmitter must not exceed 7 Watts (38.45dBm)

FCC §24.232(d): Mobile/portable stations are limited to 2 Watts (33dBm) Effective Isotropic Radiated Power (E.I.R.P) peak power.

4.4. Test Procedure

The conducted RF output power measurements were made at the RF output terminals of the EUT using an attenuator, power splitter and spectrum analyzer. The EUT was controlled via the Universal Radio Communication tester Anritsu MT8820C selecting maximum transmission power of the EUT and different modes of modulation.

For radiated measurements the EUT was placed on a 1m high non-conductive stand inside an anechoic chamber. The measuring antenna was placed at 3m distance and the maximum field strength was measured for the three channels. The EUT was controlled via the Universal Radio Communication tester Anritsu MT8820C selecting maximum transmission power of the EUT and different modes of modulation.

The Effective Radiated Power (E.R.P.) is obtained by using the Substitution Method according to ANSI/TIA/EIA603C:2004 or according to KDB412172 D01. Here the result we presented is used the method reference to KDB412172 D01.

The Effective Isotropic Radiated Power (E.I.R.P.) is obtained by using the Substitution Method according to ANSI/TIA/EIA603C:2004 or according to KDB412172 D01. Here the result we presented is used the method reference to KDB412172 D01.

4.5. Test Results

PASSED. All the test results are attached in next pages.

4.5.1. For Conducted Test Results

Test Date: 2014. 07. 08

Temperature: 25°C

Humidity: 50%

Type of Modulation	Channel	Frequency (MHz)	Conducted Peak Power (dBm)
GPRS 850	CH 128	824.20	31.49
	CH 189	836.40	31.61
	CH 251	848.80	31.41
EGPRS 850	CH 128	824.20	29.33
	CH 189	836.40	29.43
	CH 251	848.80	29.23
Type of Modulation	Channel	Frequency (MHz)	Conducted Peak Power (dBm)
GPRS 1900	CH 512	1850.20	27.15
	CH 661	1880.00	27.82
	CH 810	1909.80	28.67
EGPRS 1900	CH 512	1850.20	26.87
	CH 661	1880.00	27.63
	CH 810	1909.80	28.64

Test Date: 2014. 08. 14

Temperature: 26°C

Humidity: 57%

Type of Modulation	Channel	Frequency (MHz)	Conducted Peak Power (dBm)
WCDMA Band V	CH 4132	826.40	22.53
	CH 4182	836.40	22.52
	CH 4233	846.60	22.39
HSDPA Band V	Case 1	CH 4132	21.76
		CH 4182	21.79
		CH 4233	21.73
	Case 2	CH 4132	21.86
		CH 4182	21.82
		CH 4233	21.83
	Case 3	CH 4132	20.98
		CH 4182	21.44
		CH 4233	21.40
	Case 4	CH 4132	21.14
		CH 4182	21.54
		CH 4233	21.45
HSUPA Band V	Case 1	CH 4132	21.74
		CH 4182	21.77
		CH 4233	21.66
	Case 2	CH 4132	21.76
		CH 4182	21.78
		CH 4233	21.62
	Case 3	CH 4132	22.30
		CH 4182	22.31
		CH 4233	22.25
	Case 4	CH 4132	22.24
		CH 4182	22.25
		CH 4233	22.23
	Case 5	CH 4132	22.30
		CH 4182	22.31
		CH 4233	22.20

Type of Modulation		Channel	Frequency (MHz)	Conducted Peak Power (dBm)
WCDMA Band II		CH 9262	1852.40	22.51
		CH 9400	1880.00	22.63
		CH 9538	1907.60	22.54
HSDPA Band II	Case 1	CH 9262	1852.40	22.06
		CH 9400	1880.00	22.09
		CH 9538	1907.60	22.03
	Case 2	CH 9262	1852.40	22.16
		CH 9400	1880.00	22.12
		CH 9538	1907.60	22.13
	Case 3	CH 9262	1852.40	21.28
		CH 9400	1880.00	21.74
		CH 9538	1907.60	21.70
	Case 4	CH 9262	1852.40	21.54
		CH 9400	1880.00	21.84
		CH 9538	1907.60	21.75
HSUPA Band II	Case 1	CH 9262	1852.40	21.73
		CH 9400	1880.00	21.97
		CH 9538	1907.60	21.92
	Case 2	CH 9262	1852.40	21.69
		CH 9400	1880.00	21.94
		CH 9538	1907.60	21.88
	Case 3	CH 9262	1852.40	22.20
		CH 9400	1880.00	22.49
		CH 9538	1907.60	22.39
	Case 4	CH 9262	1852.40	22.07
		CH 9400	1880.00	22.47
		CH 9538	1907.60	22.30
	Case 5	CH 9262	1852.40	22.46
		CH 9400	1880.00	22.43
		CH 9538	1907.60	22.43

4.5.2. For Radiated Test Results

Test Date: 2014. 07. 08

Temperature: 25°C

Humidity: 50%

Type of Modulation	Channel	Frequency (MHz)	Filed Strength (dBuV/m)	E(V/m)	E.R.P (dBm)	E.R.P Limite (dBm)
GPRS 850	CH 128	824.20	128.87	2.78	31.49	38.45
	CH 189	836.40	130.57	3.38	33.19	
	CH 251	848.80	131.05	3.57	33.67	
EGPRS 850	CH 128	824.20	127.93	2.49	30.55	
	CH 189	836.40	129.30	2.92	31.92	
	CH 251	848.80	129.81	3.09	32.43	

Type of Modulation	Channel	Frequency (MHz)	Filed Strength (dBuV/m)	E(V/m)	E.I.R.P (dBm)	E.I.R.P Limite (dBm)
GPRS 1900	CH 512	1850.20	126.04	2.00	30.81	33
	CH 661	1880.00	125.89	1.97	30.66	
	CH 810	1909.80	125.84	1.96	30.61	
EGPRS 1900	CH 512	1850.20	125.98	1.99	30.75	
	CH 661	1880.00	125.81	1.95	30.58	
	CH 810	1909.80	125.64	1.91	30.41	

Type of Modulation	Channel	Frequency (MHz)	Filed Strength (dBuV/m)	E(V/m)	E.R.P (dBm)	E.R.P Limite (dBm)
WCDMA Band V	CH 4132	826.40	124.24	1.63	26.86	38.45
	CH 4182	836.40	124.19	1.62	26.81	
	CH 4233	846.60	125.88	1.97	28.50	

Type of Modulation	Channel	Frequency (MHz)	Filed Strength (dBuV/m)	E(V/m)	E.I.R.P (dBm)	E.I.R.P Limite (dBm)
WCDMA Band II	CH 9262	1852.40	120.54	1.06	25.31	33
	CH 9400	1880.00	121.29	1.16	26.06	
	CH 9538	1907.60	122.91	1.40	27.68	

Remark: According to KDB412172 D01

Field Strength Approach (Linear terms):

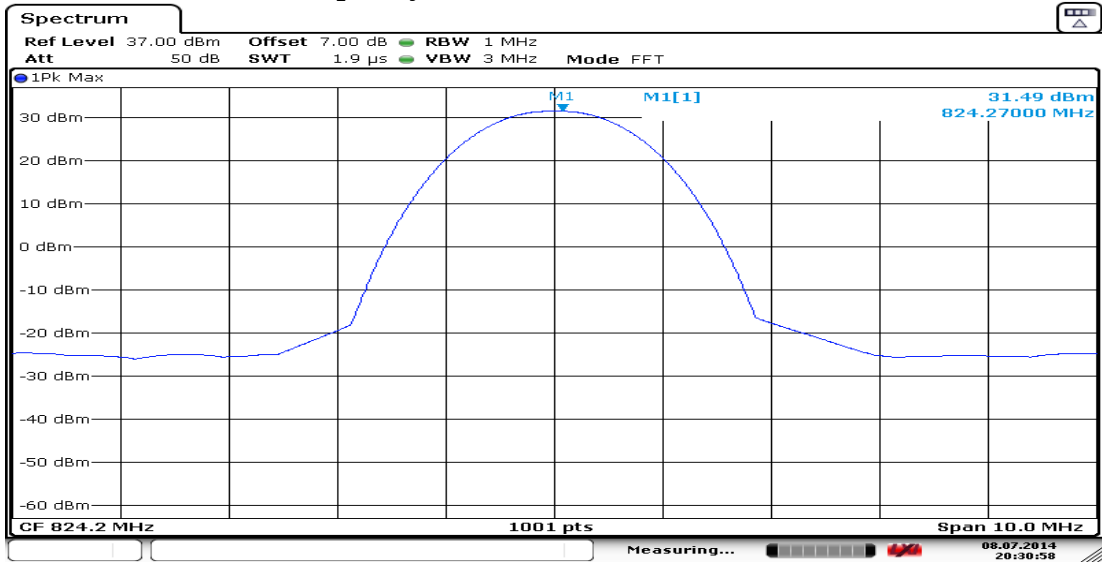
$$\mathbf{E.I.R.P} = \mathbf{p_t} \times \mathbf{g_t} = (\mathbf{E} \times \mathbf{d})^2 / 30$$

Where:

 $\mathbf{p_t}$ = transmitter output power in watts, $\mathbf{g_t}$ = numeric gain of the transmitting antenna (unitless), $\mathbf{E}$ = electric field strength in V/m, $\mathbf{d}$ = measurement distance in meters (m).

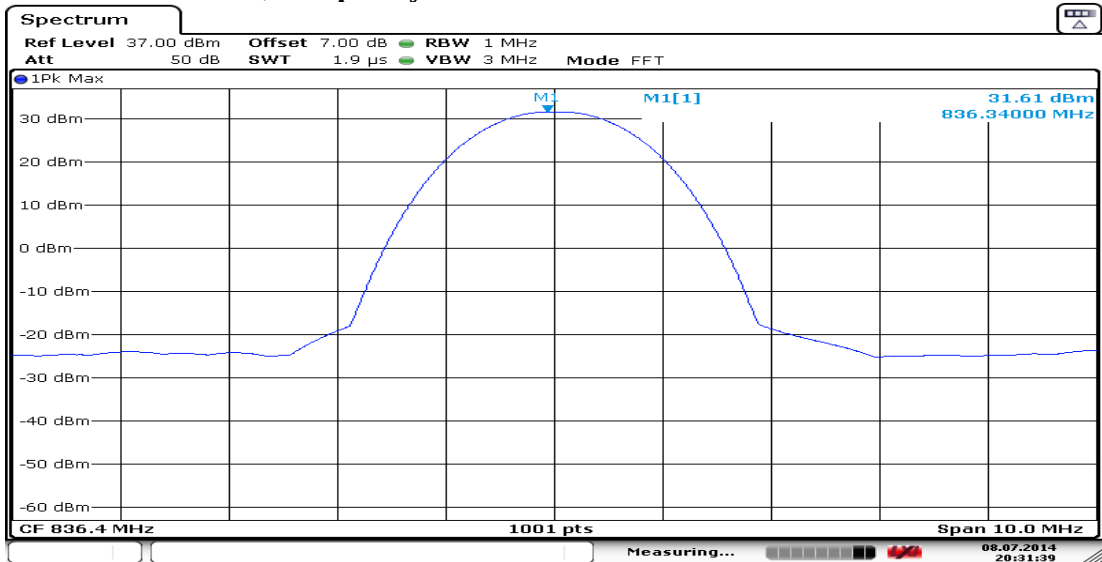
$$\mathbf{E.R.P} = \mathbf{E.I.R.P} / 1.64 = (\mathbf{E} \times \mathbf{d})^2 / (30 \times 1.64)$$

Peak Output Power (conducted)—GPRS 850/EGPRS 850 **GPRS Modulation, Frequency: 824.20MHz**



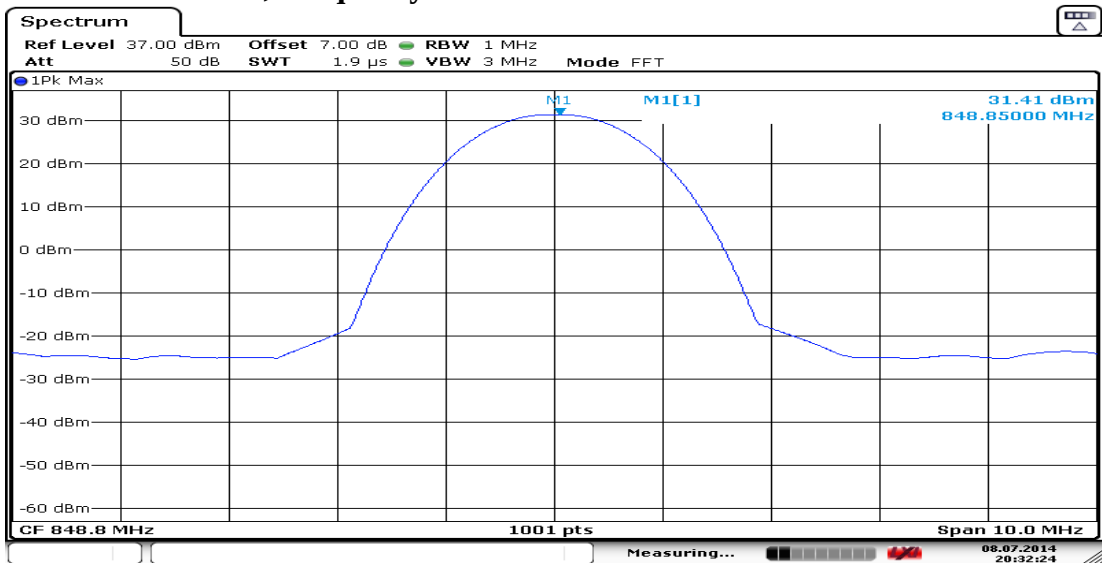
Date: 8.JUL.2014 20:30:58

GPRS Modulation, Frequency: 836.40MHz

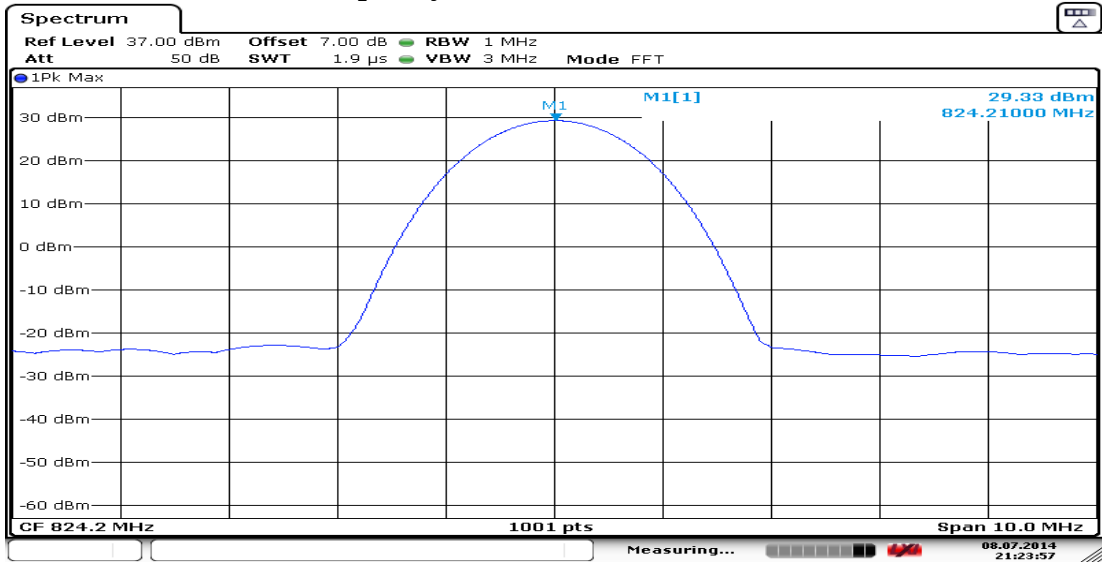


Date: 8.JUL.2014 20:31:39

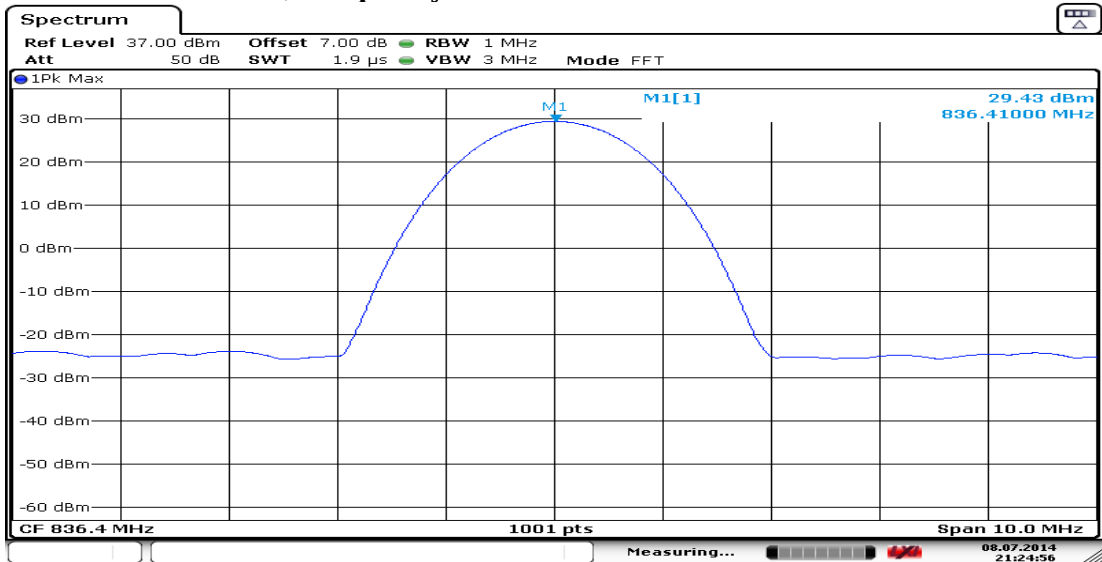
GPRS Modulation, Frequency: 848.80MHz



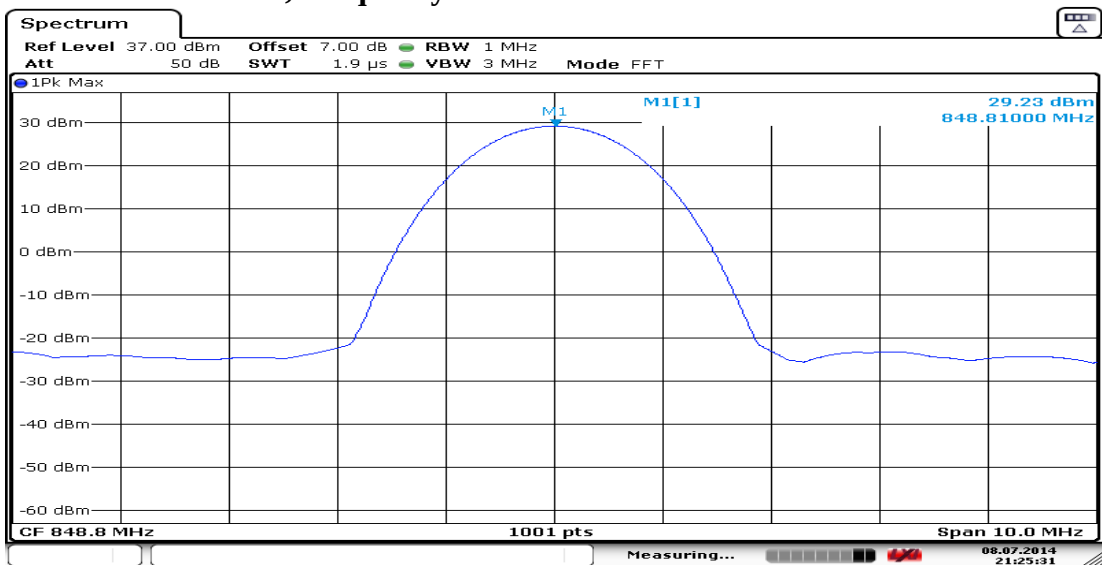
Date: 8.JUL.2014 20:32:24

EGPRS Modulation, Frequency: 824.20MHz

Date: 8.JUL.2014 21:23:57

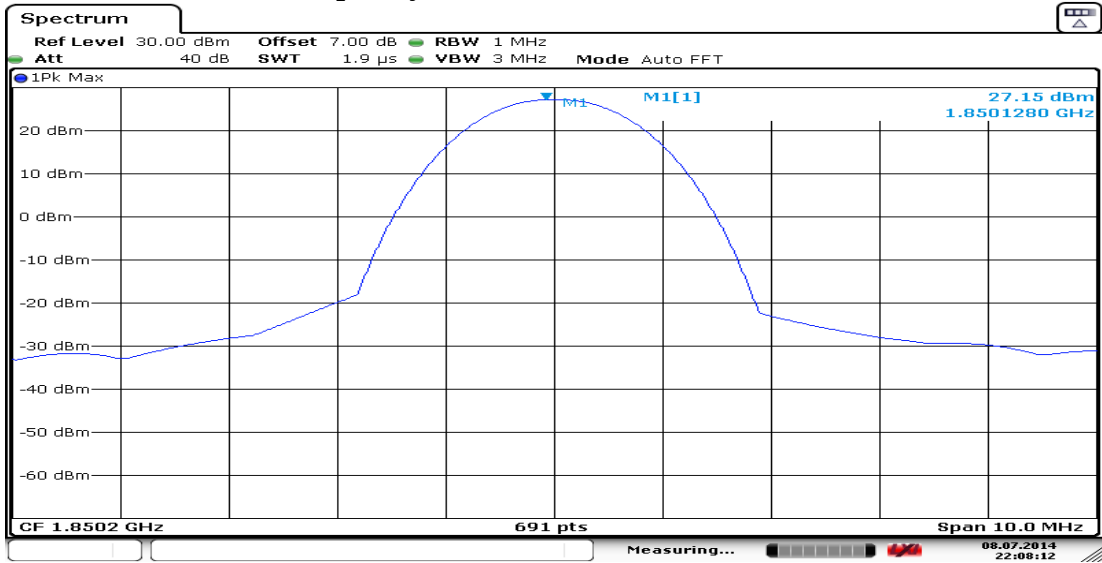
EGPRS Modulation, Frequency: 836.40MHz

Date: 8.JUL.2014 21:24:56

EGPRS Modulation, Frequency: 848.80MHz

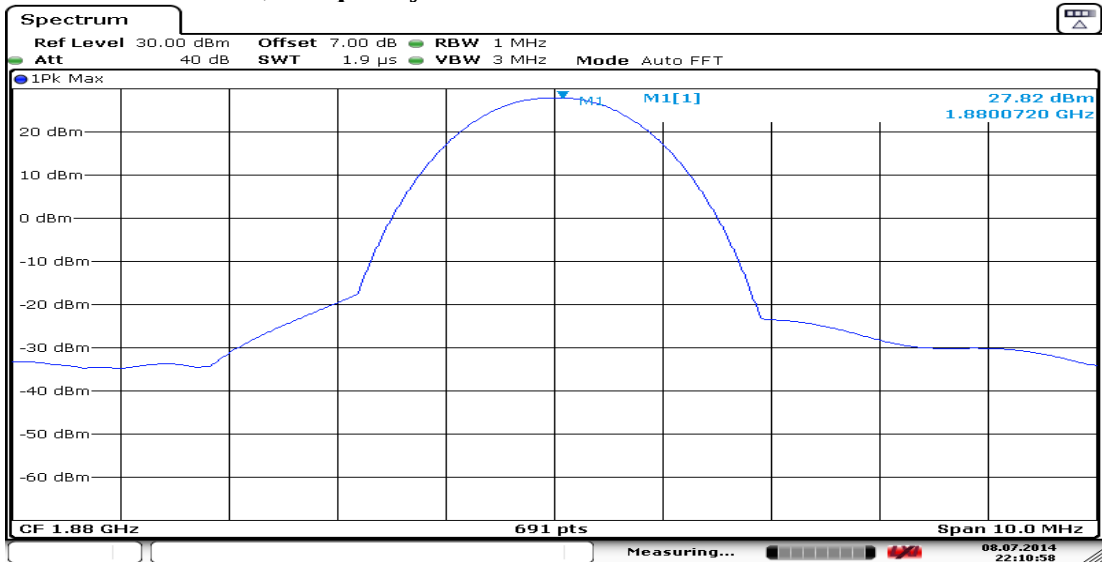
Date: 8.JUL.2014 21:25:30

Peak Output Power (conducted)—GPRS 1900/EGPRS 1900 **GPRS Modulation, Frequency: 1850.20MHz**



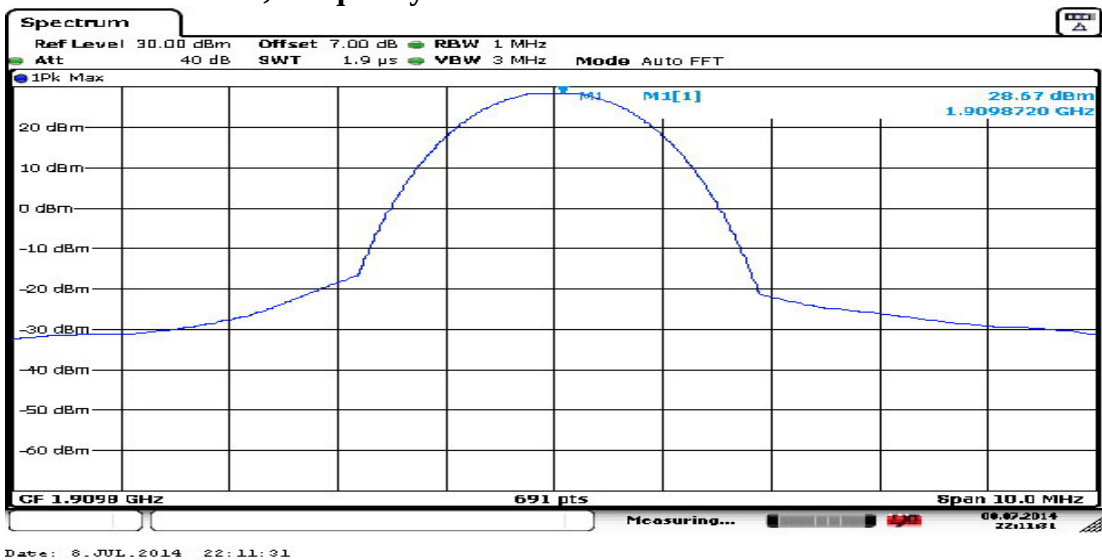
Date: 8.JUL.2014 22:08:12

GPRS Modulation, Frequency: 1880.00MHz

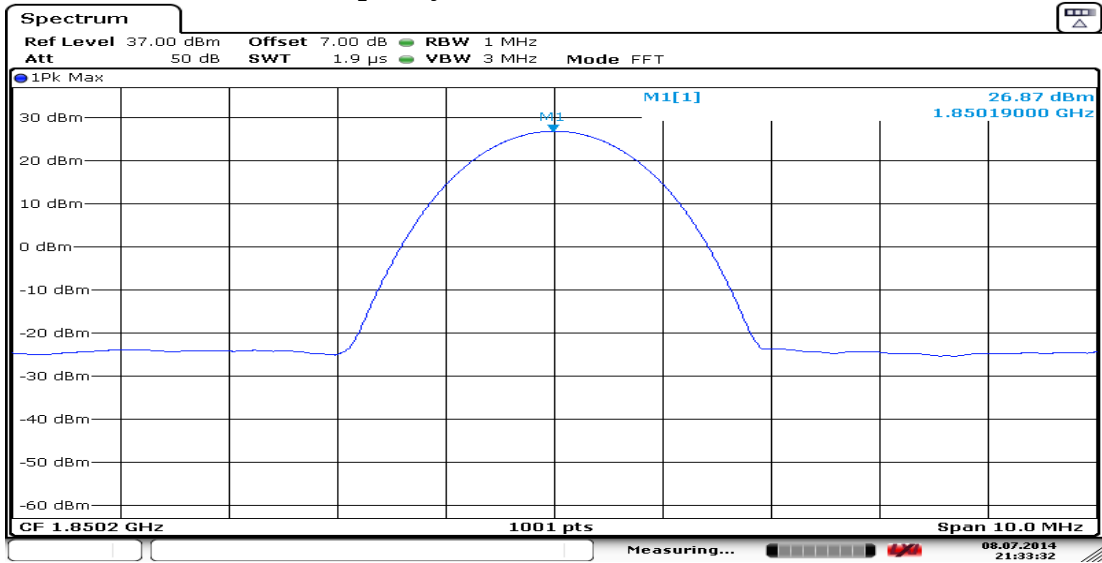


Date: 8.JUL.2014 22:10:57

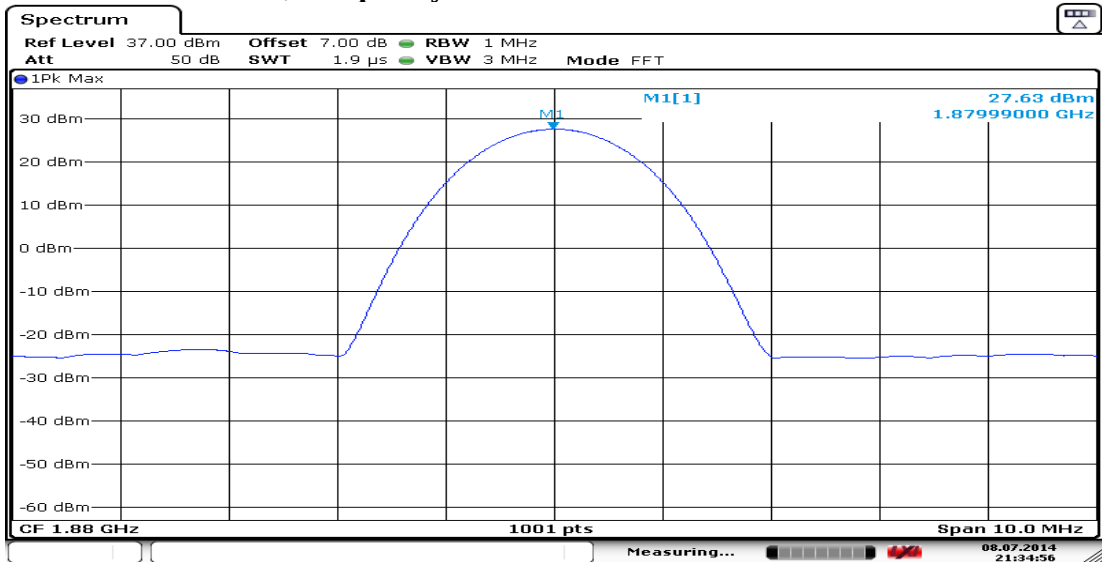
GPRS Modulation, Frequency: 1909.80MHz



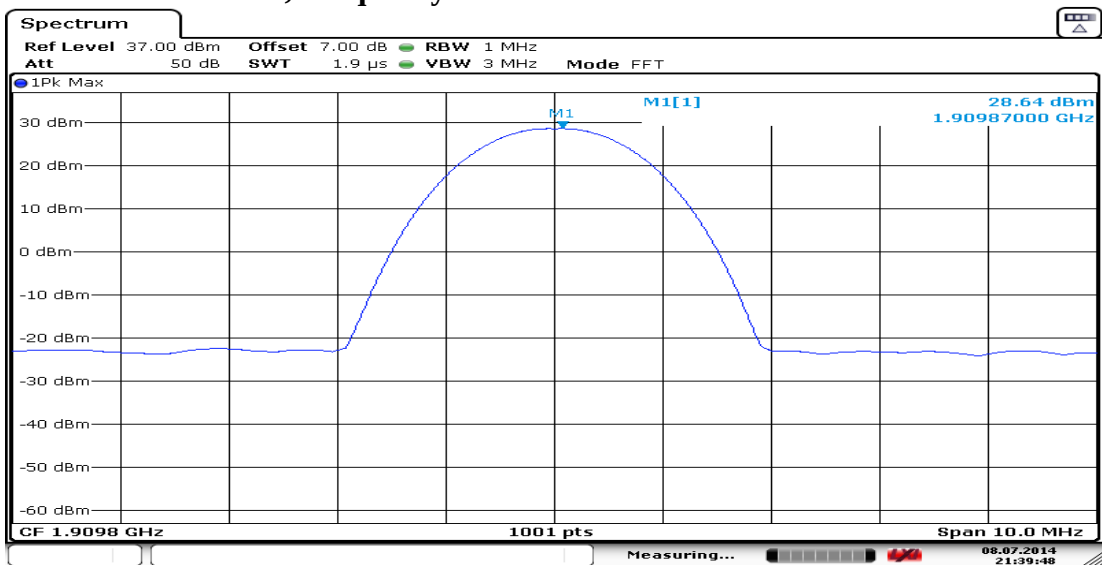
Date: 8.JUL.2014 22:11:31

EGPRS Modulation, Frequency: 1850.20MHz

Date: 8.JUL.2014 21:33:32

EGPRS Modulation, Frequency: 1880.00MHz

Date: 8.JUL.2014 21:34:56

EGPRS Modulation, Frequency: 1909.80MHz

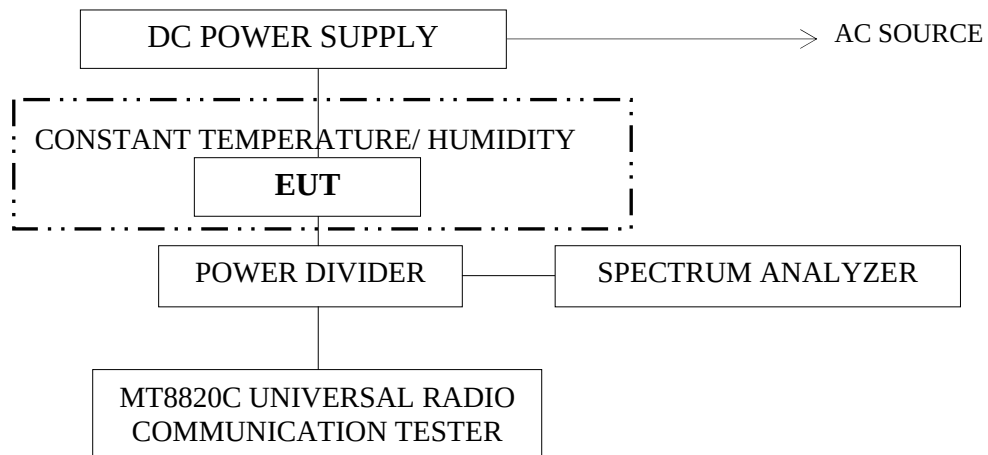
Date: 8.JUL.2014 21:39:48

5. FREQUENCY STABILITY MEASUREMENT

5.1. Test Equipment

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1.	Spectrum Analyzer	R&S	FSV30	101181	2015. 03. 03
2.	Power Divider	Anritsu	K240C	019728	2015. 01. 03
3.	Universal Radio Communication Tester	Anritsu	MT8820C	6201144416	2015. 07. 31
4.	Constant Temperature/ Humidity	Taichy	MHG-120LF	920538	2015. 09. 15

5.2. Block Diagram of Test Setup



EUT: 3G Mobile Wi-Fi

5.3. Specification Limits

FCC §2.1055(a)(1)

FCC §22.355

FCC §24.235

Frequency Tolerance: +/- 2.5ppm

5.4. Test Procedure

The frequency tolerance measurements over temperature variations were made over the temperature range of -30°C to $+50^{\circ}\text{C}$. The EUT was placed inside a Constant Temperature/ Humidity and the temperature was raised hourly in 10°C steps from -30°C up to $+50^{\circ}\text{C}$.

Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.

The EUT was set in “call mode” in the middle channel using the Universal Radio Communication tester Anritsu MT8820C (for modulations GPRS and EGPRS) and the maximum frequency error was measured using the frequency meter of MT8820C.

5.5. Test Results

PASSED. All the test results are attached in next pages.

Test Date: 2014. 07. 08

Temperature: 25°C

Humidity: 50%

GPRS Modulation/850				
Power (VDC)	Temperature (°C)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Frequency Deviation (%)
3.7	20	-53	-0.063351661	-0.0000000076
	-30	-58	-0.069328233	-0.0000000083
	-20	-59	-0.070523548	-0.0000000084
	-10	-61	-0.072914176	-0.0000000087
	0	-60	-0.071718862	-0.0000000086
	10	-52	-0.062156347	-0.0000000074
	20	-58	-0.069328233	-0.0000000083
	30	-57	-0.068132919	-0.0000000081
	40	-52	-0.062156347	-0.0000000074
	50	-55	-0.065742290	-0.0000000079
4.26	20	-51	-0.060961033	-0.0000000073
3.6 (Battery end point)	20	-49	-0.058570404	-0.0000000070
EGPRS Modulation/850				
Power (VDC)	Temperature (°C)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Frequency Deviation (%)
3.7	20	-42	-0.049481621	-0.0000000058
	-30	-49	-0.057728558	-0.0000000068
	-20	-51	-0.060084826	-0.0000000071
	-10	-47	-0.055372290	-0.0000000065
	0	-44	-0.051837889	-0.0000000061
	10	-40	-0.047125353	-0.0000000056
	20	-46	-0.054194156	-0.0000000064
	30	-43	-0.050659755	-0.0000000060
	40	-45	-0.053016023	-0.0000000062
	50	-39	-0.045947220	-0.0000000054
4.26	20	-42	-0.049481621	-0.0000000058
3.6 (Battery end point)	20	-41	-0.048303487	-0.0000000057

GPRS Modulation/1900				
Power (VDC)	Temperature (°C)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Frequency Deviation (%)
3.7	20	-68	-0.081281377	-0.0000000097
	-30	-56	-0.066937605	-0.0000000080
	-20	-54	-0.064546976	-0.0000000077
	-10	-57	-0.068132919	-0.0000000081
	0	-60	-0.071718862	-0.0000000086
	10	-59	-0.070523548	-0.0000000084
	20	-66	-0.078890748	-0.0000000094
	30	-69	-0.082476691	-0.0000000099
	40	-72	-0.086062634	-0.0000000103
	50	-70	-0.083672006	-0.0000000100
4.26	20	-63	-0.075304805	-0.0000000090
3.6 (Battery end point)	20	-67	-0.080086063	-0.0000000096
EGPRS Modulation/1900				
Power (VDC)	Temperature (°C)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Frequency Deviation (%)
3.7	20	-72	-0.084825636	-0.0000000100
	-30	-70	-0.082469369	-0.0000000097
	-20	-62	-0.073044298	-0.0000000086
	-10	-67	-0.078934967	-0.0000000093
	0	-68	-0.080113101	-0.0000000094
	10	-63	-0.074222432	-0.0000000087
	20	-65	-0.076578699	-0.0000000090
	30	-73	-0.086003770	-0.0000000101
	40	-75	-0.088360038	-0.0000000104
	50	-79	-0.093072573	-0.0000000110
4.26	20	-69	-0.081291235	-0.0000000096
3.6 (Battery end point)	20	-74	-0.087181904	-0.0000000103

WCDMA Band V				
Power (VDC)	Temperature (°C)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Frequency Deviation (%)
3.7	20	-59	-0.070540411	-0.0000000084
	-30	-53	-0.063366810	-0.0000000076
	-20	-49	-0.058584409	-0.0000000070
	-10	-38	-0.045432807	-0.0000000054
	0	-56	-0.066953611	-0.0000000080
	10	-64	-0.076518412	-0.0000000091
	20	-70	-0.083692013	-0.0000000100
	30	-79	-0.094452415	-0.0000000113
	40	-63	-0.075322812	-0.0000000090
	50	-66	-0.078909613	-0.0000000094
4.26	20	-67	-0.080105213	-0.0000000096
3.6 (Battery end point)	20	-61	-0.072931612	-0.0000000087
WCDMA Band II				
Power (VDC)	Temperature (°C)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Frequency Deviation (%)
3.7	20	-73	-0.038829787	-0.0000000046
	-30	-51	-0.027127660	-0.0000000032
	-20	-59	-0.031382979	-0.0000000038
	-10	-60	-0.031914894	-0.0000000038
	0	-68	-0.036170213	-0.0000000043
	10	-76	-0.040425532	-0.0000000048
	20	-79	-0.042021277	-0.0000000050
	30	-82	-0.043617021	-0.0000000052
	40	-65	-0.034574468	-0.0000000041
	50	-89	-0.047340426	-0.0000000057
4.26	20	-90	-0.047872340	-0.0000000057
3.6 (Battery end point)	20	-77	-0.040957447	-0.0000000049

6. OCCUPIED BANDWIDTH 99% POWER MEASUREMENT

6.1. Test Equipment

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1.	Spectrum Analyzer	R&S	FSV30	101181	2015. 03. 03
2.	Power Divider	Anritsu	K240C	019728	2015. 01. 03
3.	Universal Radio Communication Tester	Anritsu	MT8820C	6201144416	2015. 07. 31
4.	Horn Antenna	EMCO	3115	9609-4927	2015. 06. 16

6.2. Block Diagram of Test Setup

The same as section.4.2.1.

6.3. Specification Limit

FCC §2.1049

6.4. Test Procedure

The EUT was configured to transmit a modulated carrier signal. For GPRS and EGPRS, RBW was set to about 1% of emission BW, VBW=3 times RBW.

6.5. Test Results

PASSED. All the test results are attached in next pages.

Test Date: 2014. 07. 08

Temperature: 25°C

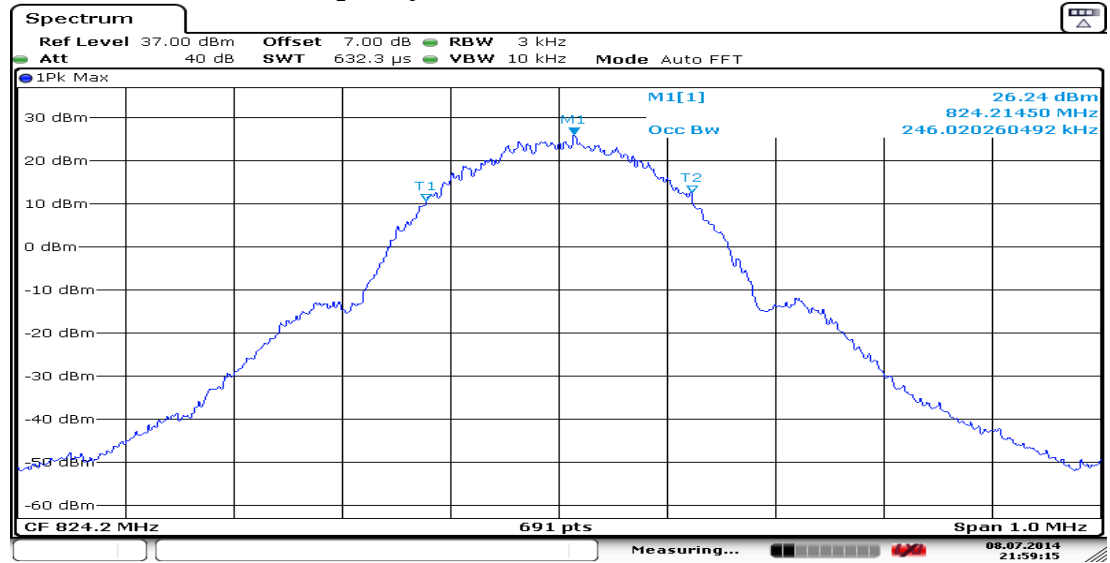
Humidity: 50%

Test Date: 2014. 08. 14

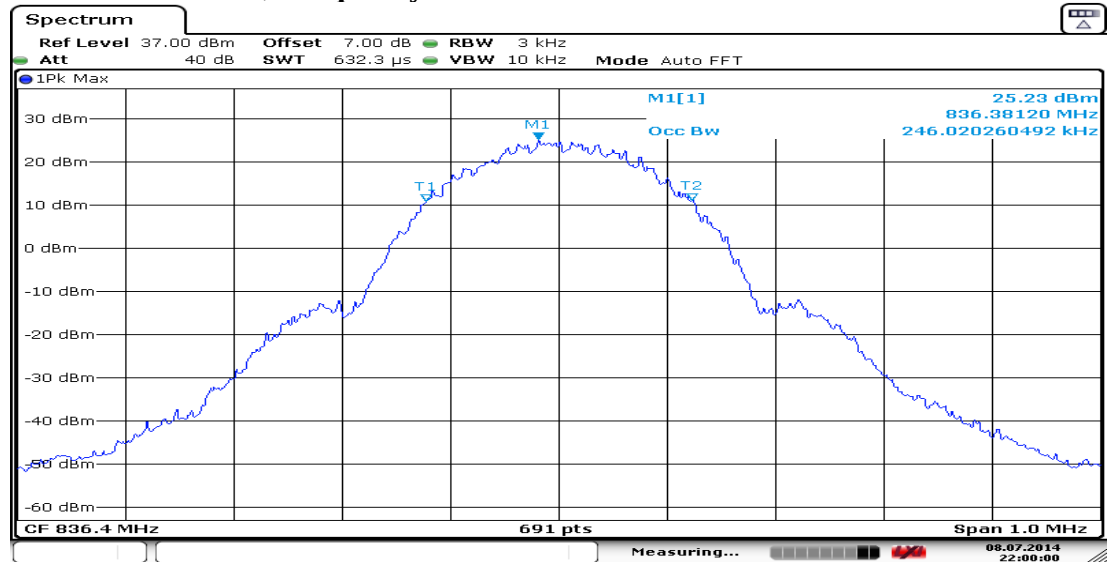
Temperature: 26°C

Humidity: 57%

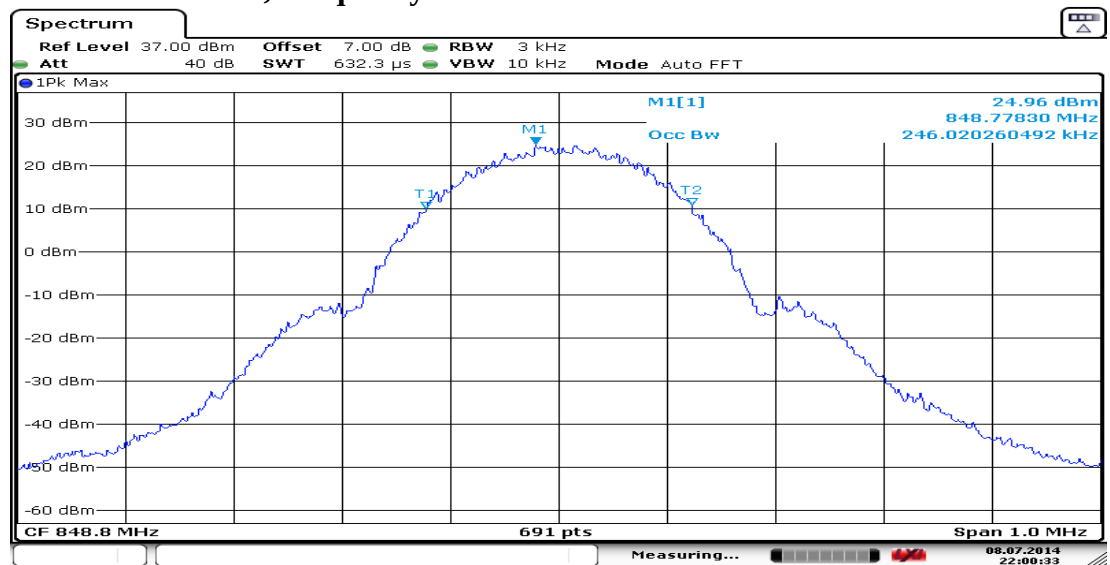
Type of Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
GPRS 850	CH 128	824.20	246.020260492
	CH 189	836.40	246.020260492
	CH 251	848.80	246.020260492
EGPRS 850	CH 128	824.20	245.754245754
	CH 189	836.40	246.020260492
	CH 251	848.80	246.020260492
Type of Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
GPRS 1900	CH 512	1850.20	243.125904486
	CH 661	1880.00	243.125904486
	CH 810	1909.80	244.573082489
EGPRS 1900	CH 512	1850.20	246.753246753
	CH 661	1880.00	239.760239760
	CH 810	1909.80	244.755244755
Type of Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)
WCDMA Band V	CH 4132	826.40	4.165834166
	CH 4182	836.40	4.175824176
	CH 4233	846.60	4.155844156
WCDMA Band II	CH 9262	1852.40	4.175824176
	CH 9400	1880.00	4.175824176
	CH 9538	1907.60	4.175824176

99% Occupied Bandwidth — GPRS 850/EGPRS 850**GPRS Modulation, Frequency: 824.20MHz**

Date: 8.JUL.2014 21:59:15

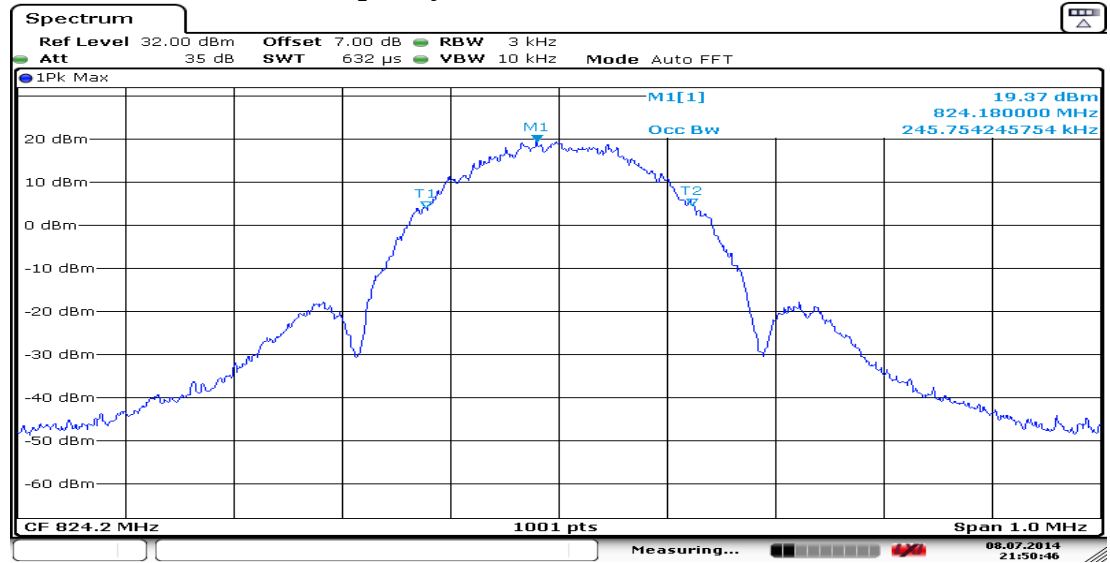
GPRS Modulation, Frequency: 836.40MHz

Date: 8.JUL.2014 22:00:00

GPRS Modulation, Frequency: 848.80MHz

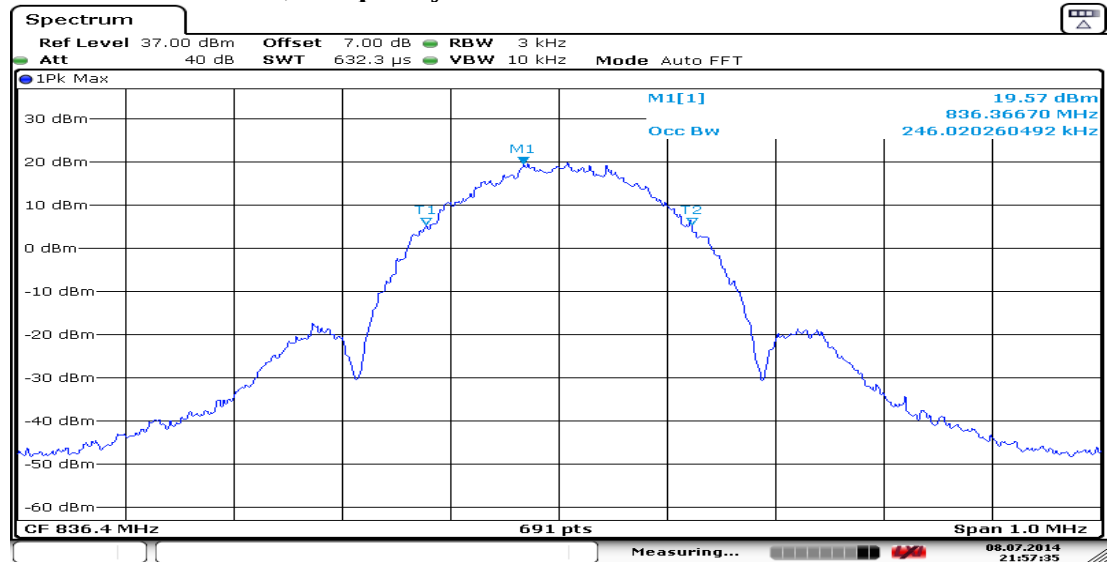
Date: 8.JUL.2014 22:00:33

EGPRS Modulation, Frequency: 824.20MHz



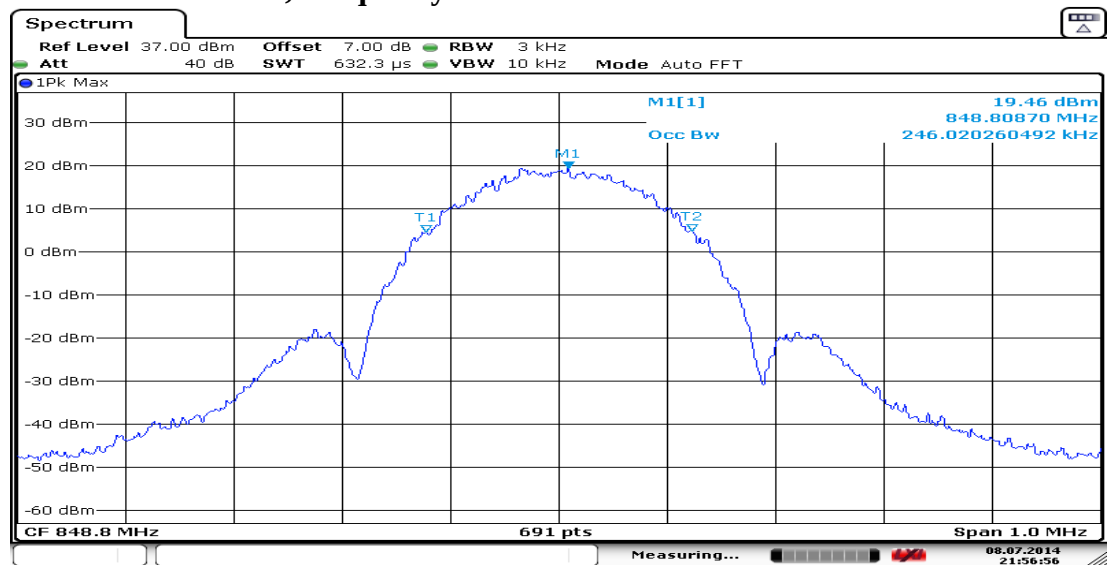
Date: 8.JUL.2014 21:50:46

EGPRS Modulation, Frequency: 836.40MHz

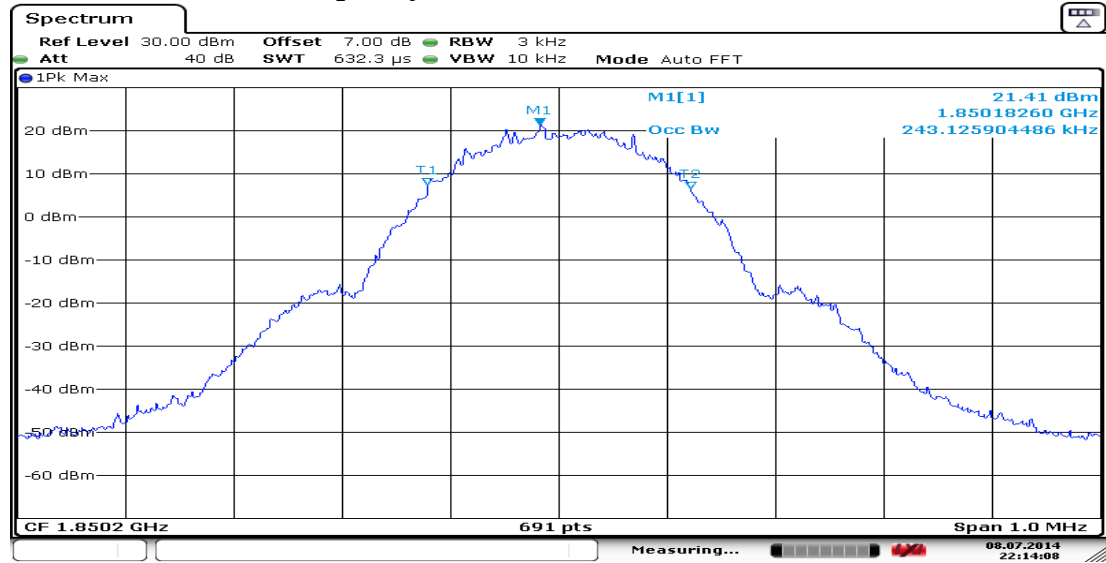


Date: 8.JUL.2014 21:57:35

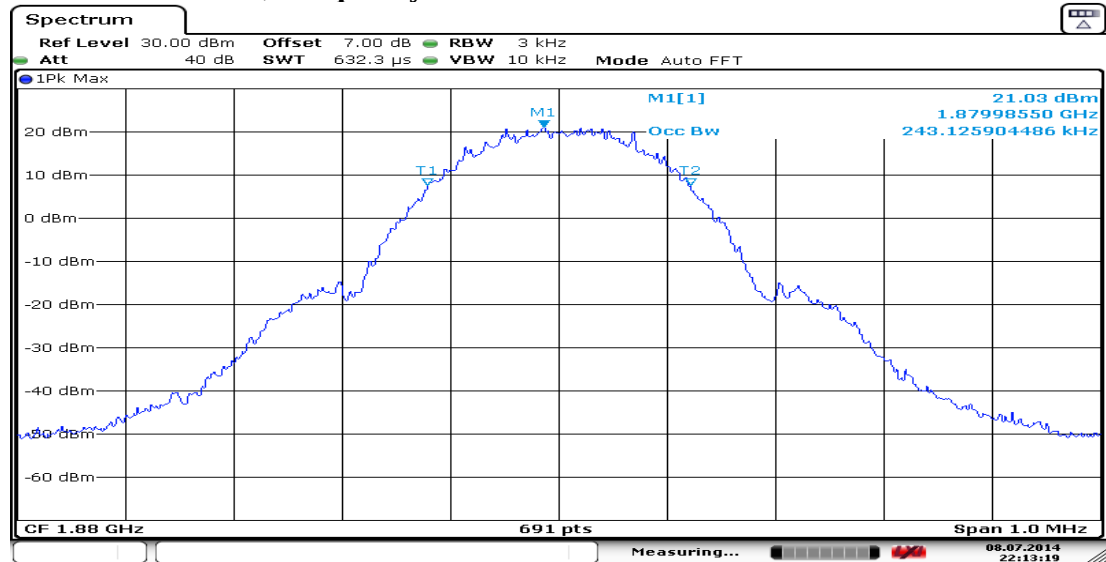
EGPRS Modulation, Frequency: 848.80MHz



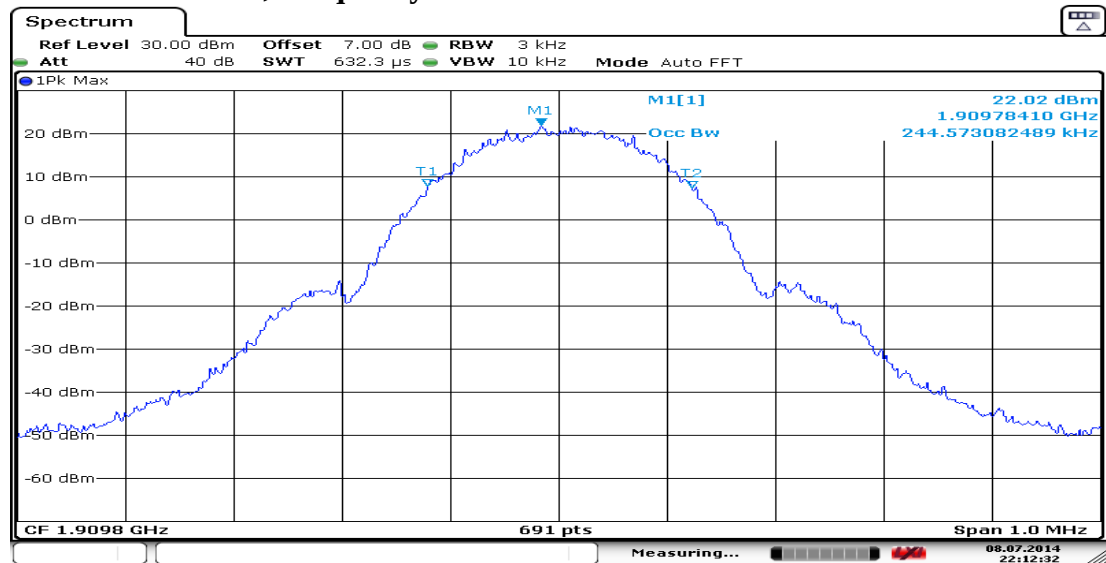
Date: 8.JUL.2014 21:56:56

99% Occupied Bandwidth —GPRS 1900/EGPRS 1900**GPRS Modulation, Frequency: 1850.20MHz**

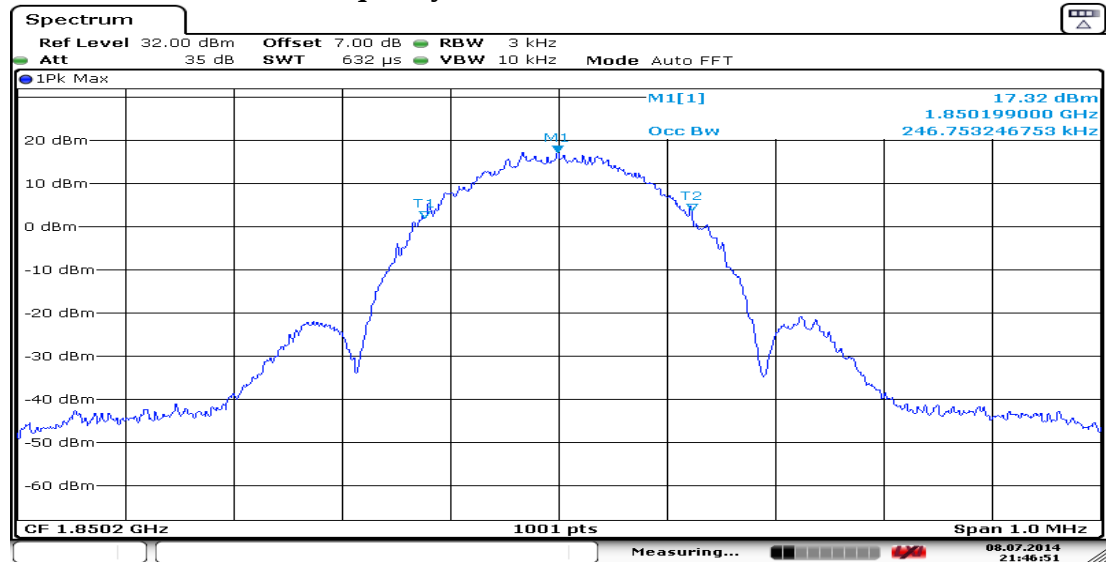
Date: 8.JUL.2014 22:14:08

GPRS Modulation, Frequency: 1880.00MHz

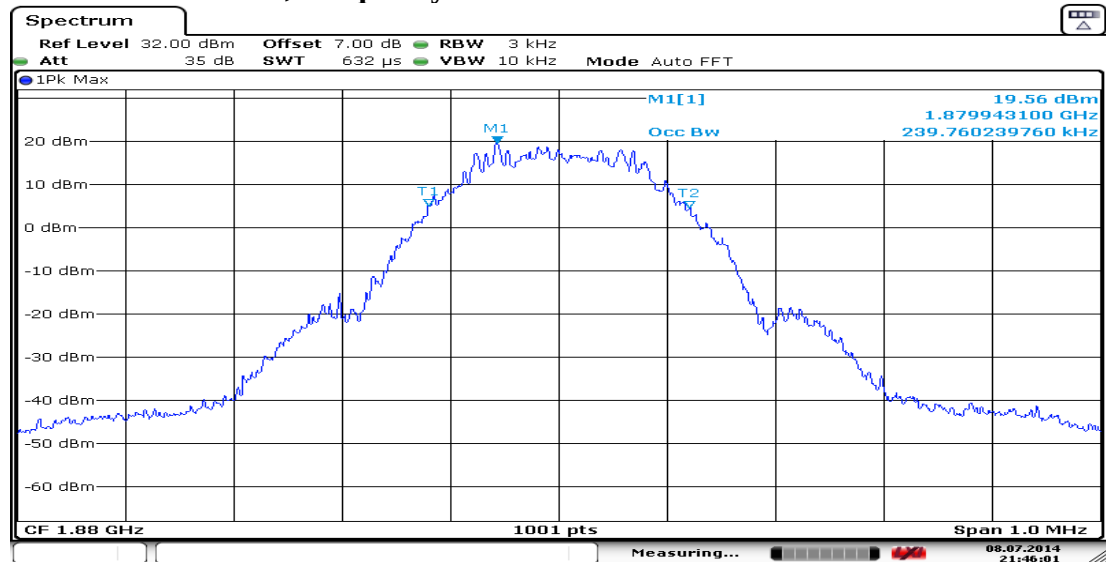
Date: 8.JUL.2014 22:13:18

GPRS Modulation, Frequency: 1909.80MHz

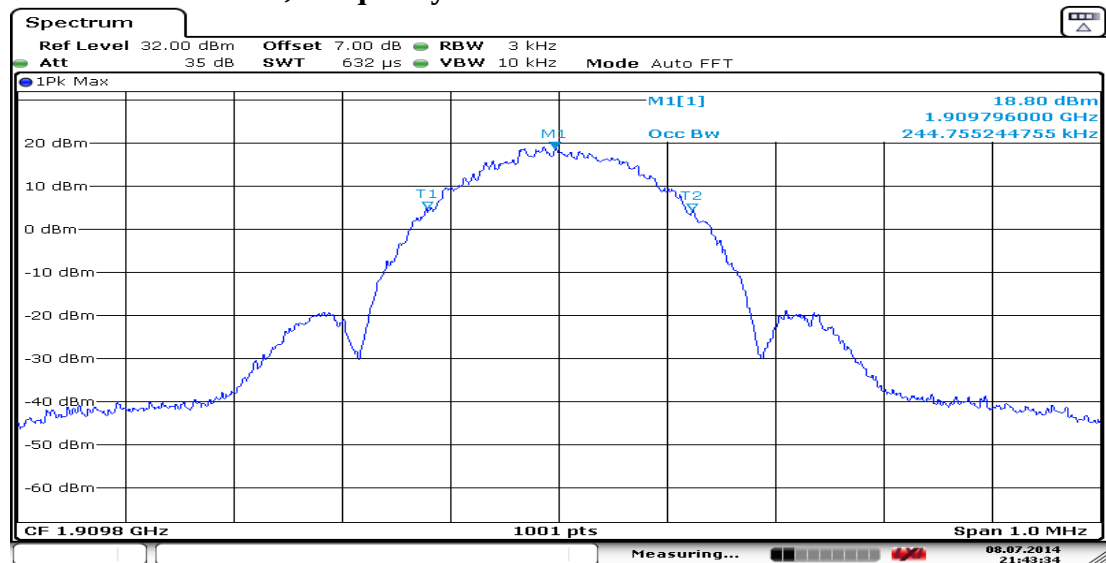
Date: 8.JUL.2014 22:12:32

EGPRS Modulation, Frequency: 1850.20MHz

Date: 8.JUL.2014 21:46:51

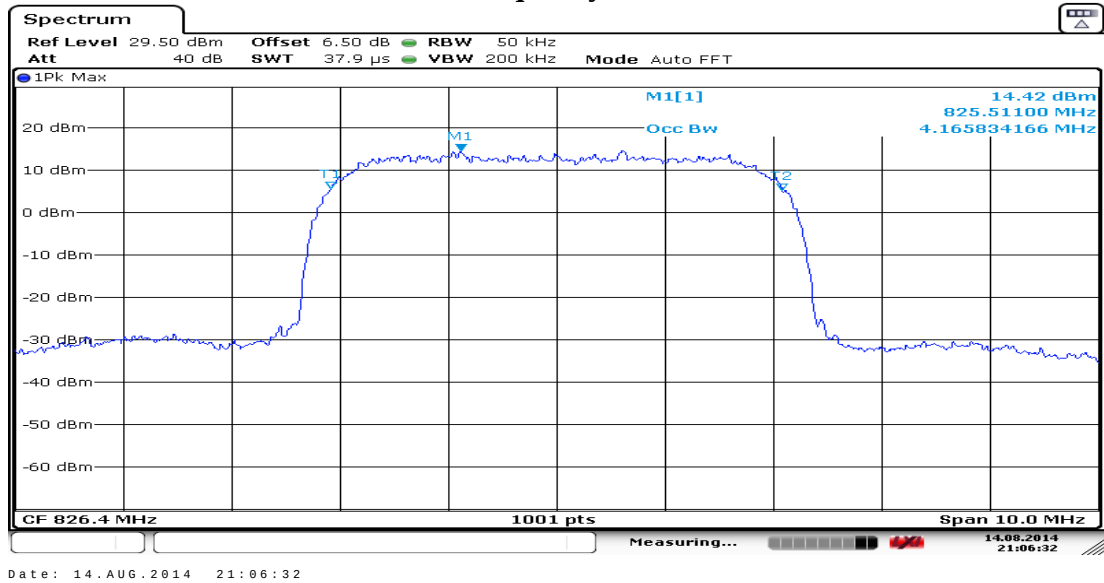
EGPRS Modulation, Frequency: 1880.00MHz

Date: 8.JUL.2014 21:46:00

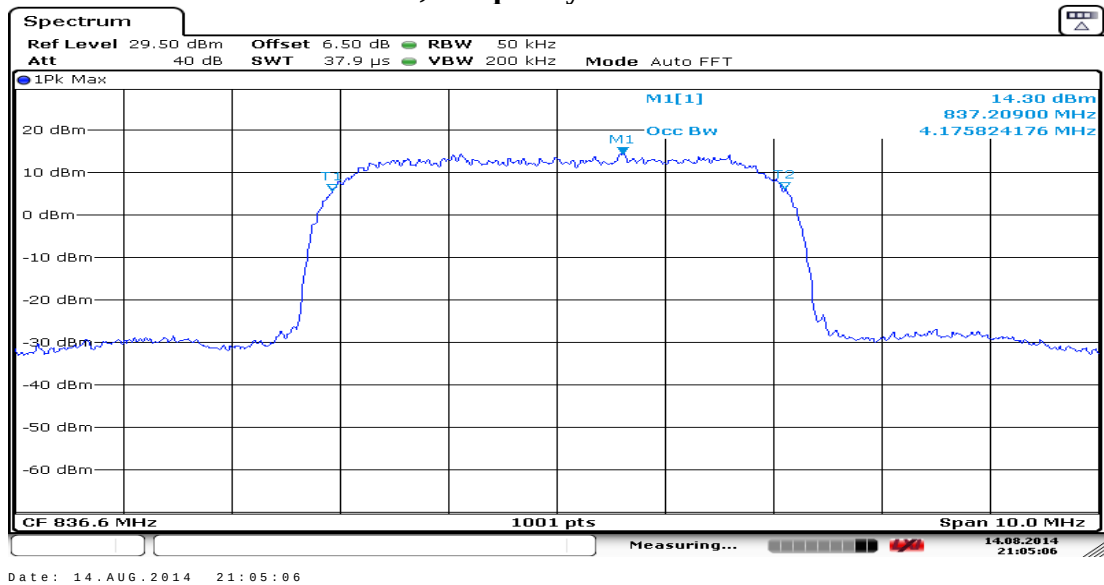
EGPRS Modulation, Frequency: 1909.80MHz

Date: 8.JUL.2014 21:43:33

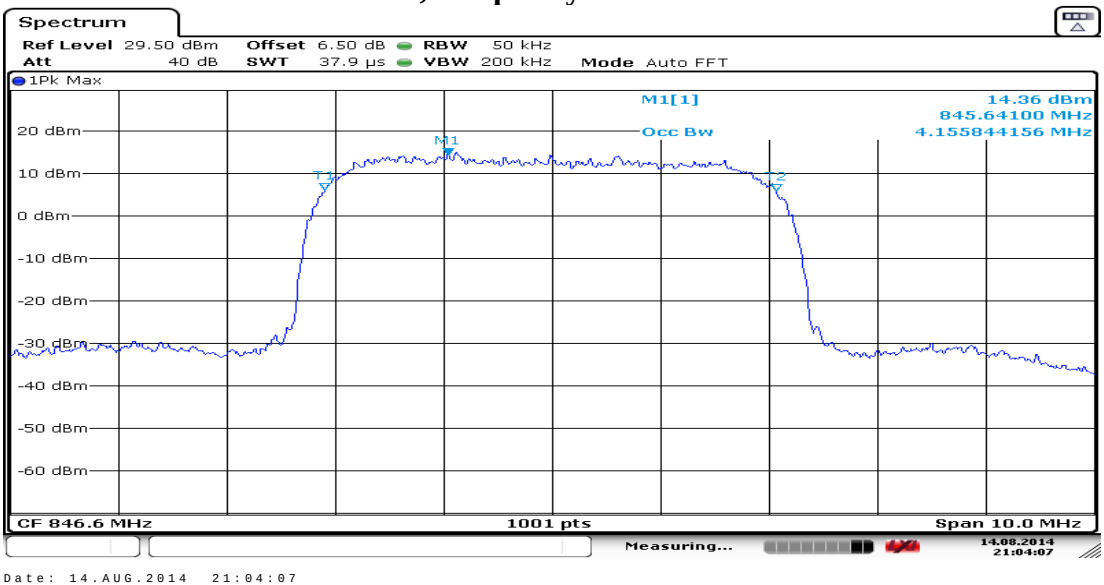
WCDMA Band V Modulation, Frequency: 826.40MHz



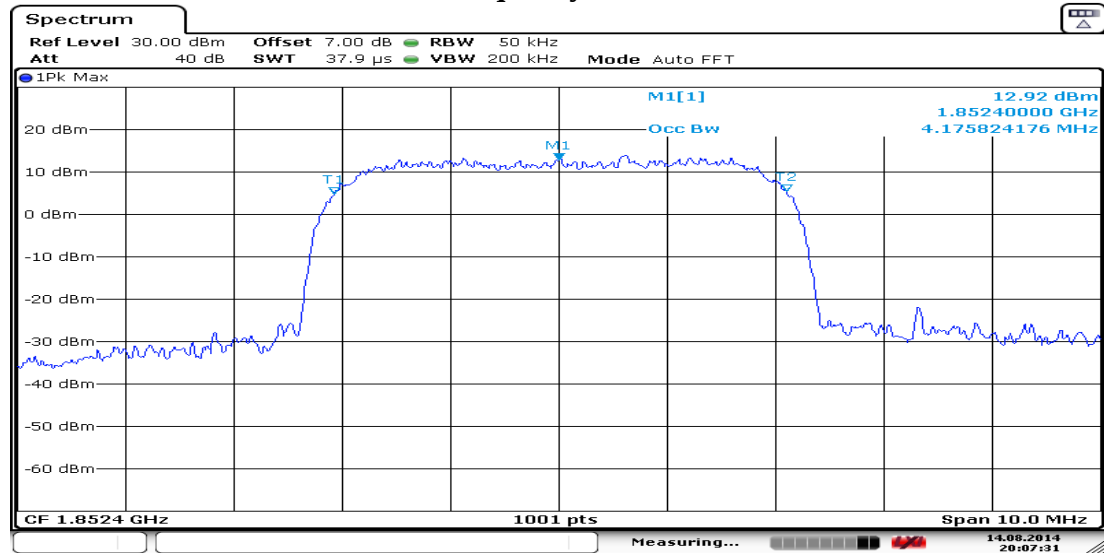
WCDMA Band V Modulation, Frequency: 836.40MHz



WCDMA Band V Modulation, Frequency: 846.60MHz

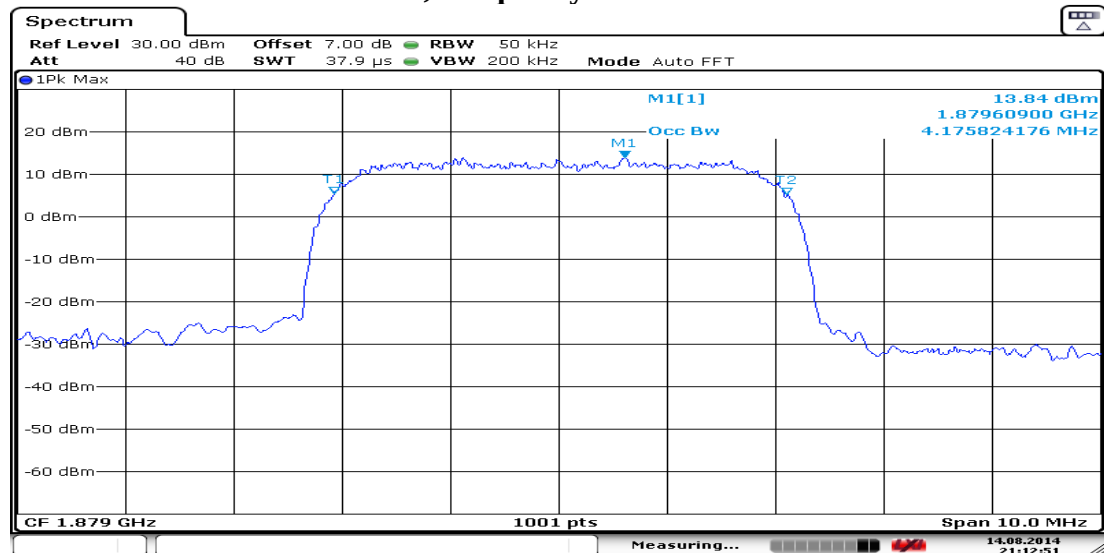


WCDMA Band II Modulation, Frequency: 1852.40MHz



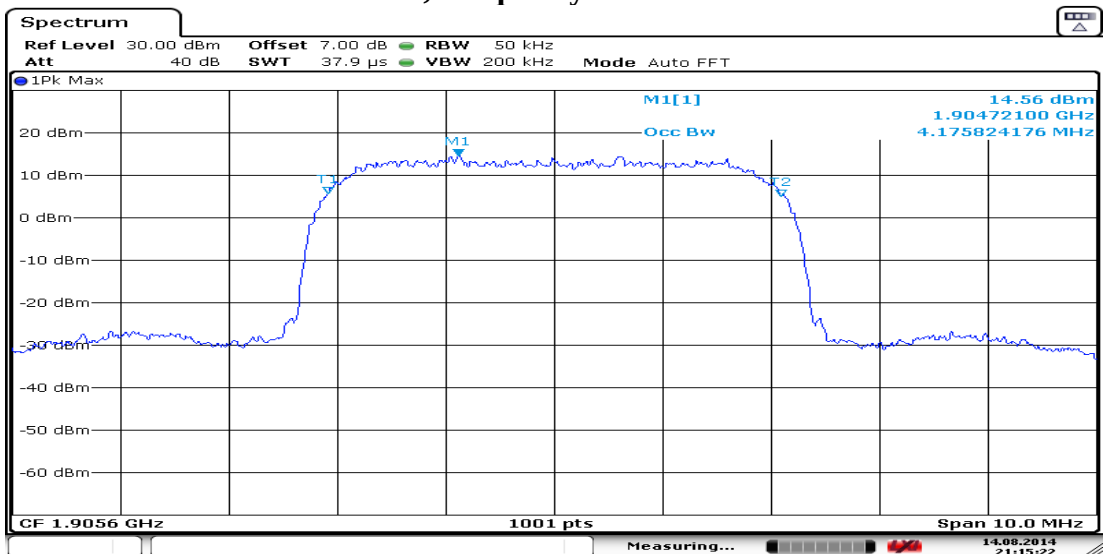
Date: 14.AUG.2014 20:07:31

WCDMA Band II Modulation, Frequency: 1880.00MHz



Date: 14.AUG.2014 21:12:51

WCDMA Band II Modulation, Frequency: 1907.60MHz



Date: 14.AUG.2014 21:15:22

7. SPURIOUS EMISSION AT ANTENNA TERMINALS MEASUREMENT

7.1. Test Equipment

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1.	Spectrum Analyzer	R&S	FSV30	101181	2015. 03. 03
2.	Power Divider	Anritsu	K240C	019728	2015. 01. 03
3.	Universal Radio Communication Tester	Anritsu	MT8820C	6201144416	2015. 07. 31
4.	Horn Antenna	EMCO	3115	9609-4927	2015. 06. 16

7.2. Block Diagram of Test Setup

The same as section 4.2.1.

7.3. Specification Limit

FCC §2.1051

FCC §22.917(a)

FCC §24.238(a)

According to specification, the power of emissions shall be attenuated below the transmitter power (P) by a factor of at least $43+10\log(P)$ dB, P in watts.

At P_o transmitting power, the specified minimum attenuation becomes $43+10\log(P_o)$, and the level in dBm relative P_o becomes:

$P_o \text{ (dBm)} - [43+10\log(P_o \text{ in m watts})-30] = -13\text{dBm}$

7.4. Test Procedure

The EUT RF output connector was connected to a spectrum analyzer using a 50ohm attenuator and there solution bandwidth of the spectrum analyzer was set to at least 100kHz. The spectrum was investigated from 30MHz to 20GHz.

The reading of the spectrum analyzer is corrected with the attenuation loss of connection between output terminal of EUT and input of the spectrum analyzer.

7.5. Test Results

PASSED. The testing data was attached in the next pages.

Test Date: 2014. 07. 10

Temperature: 26°C

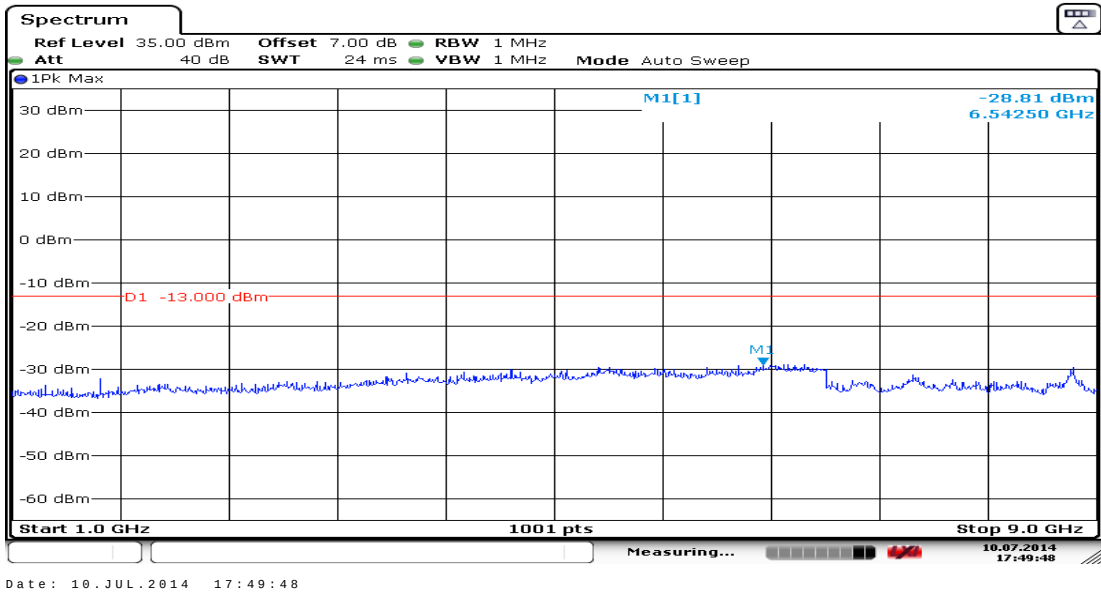
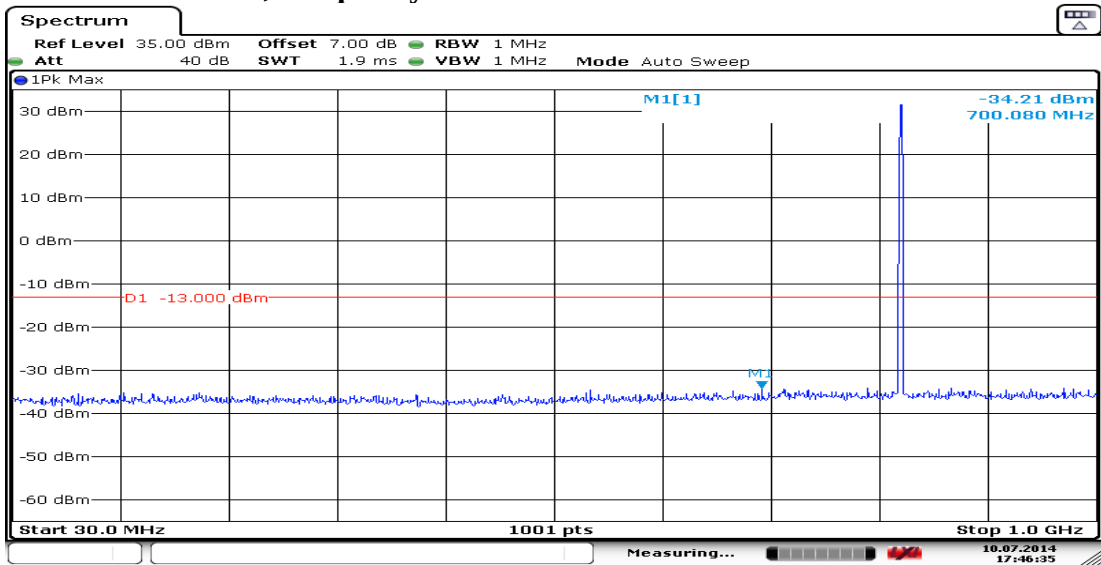
Humidity: 60%

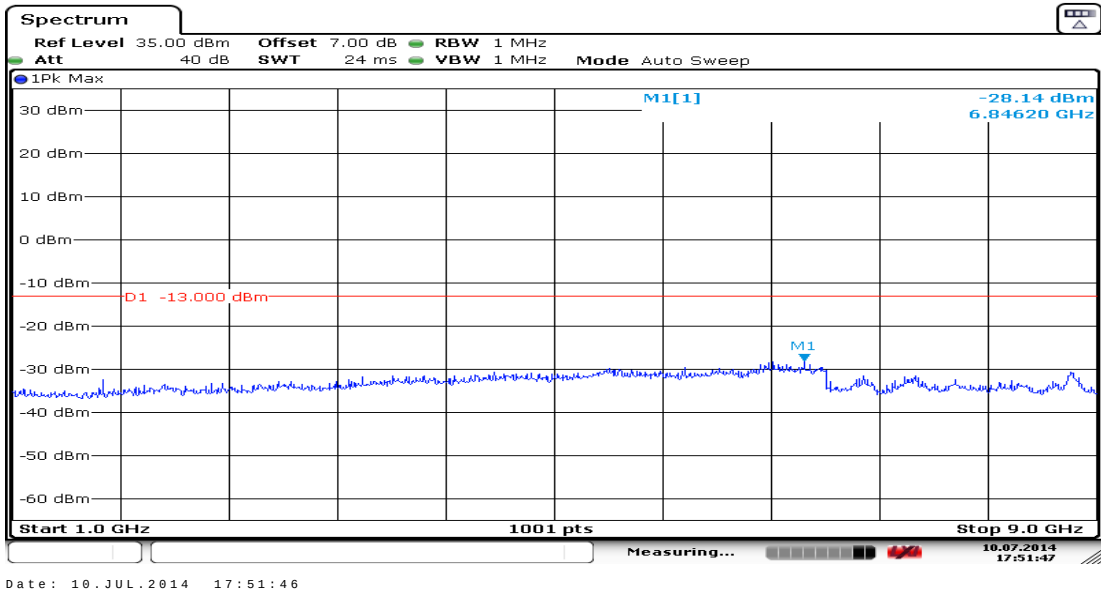
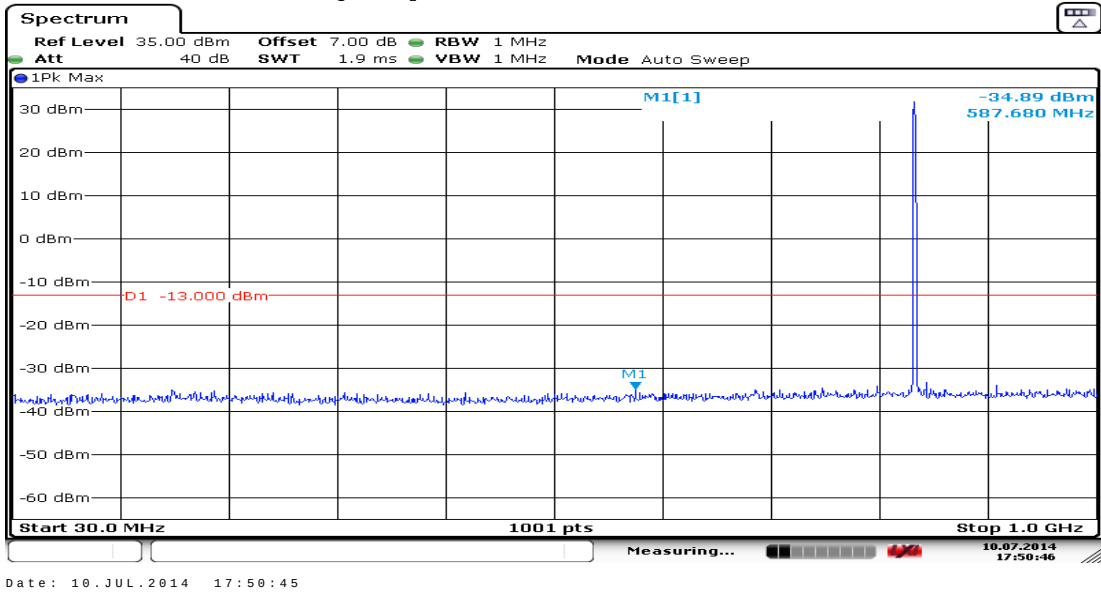
Test Date: 2014. 08. 14

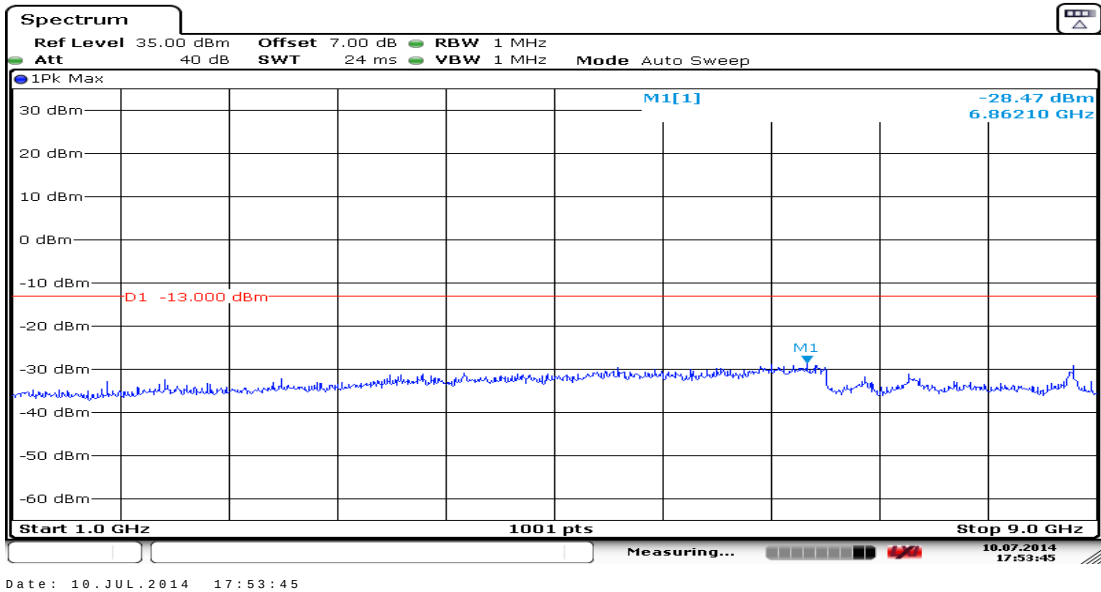
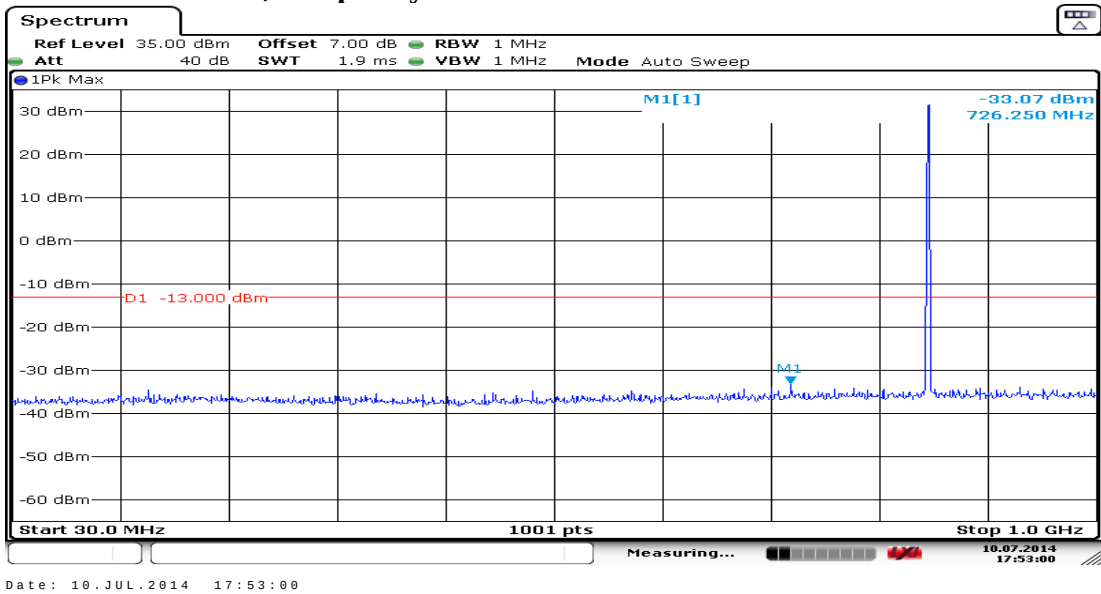
Temperature: 26°C

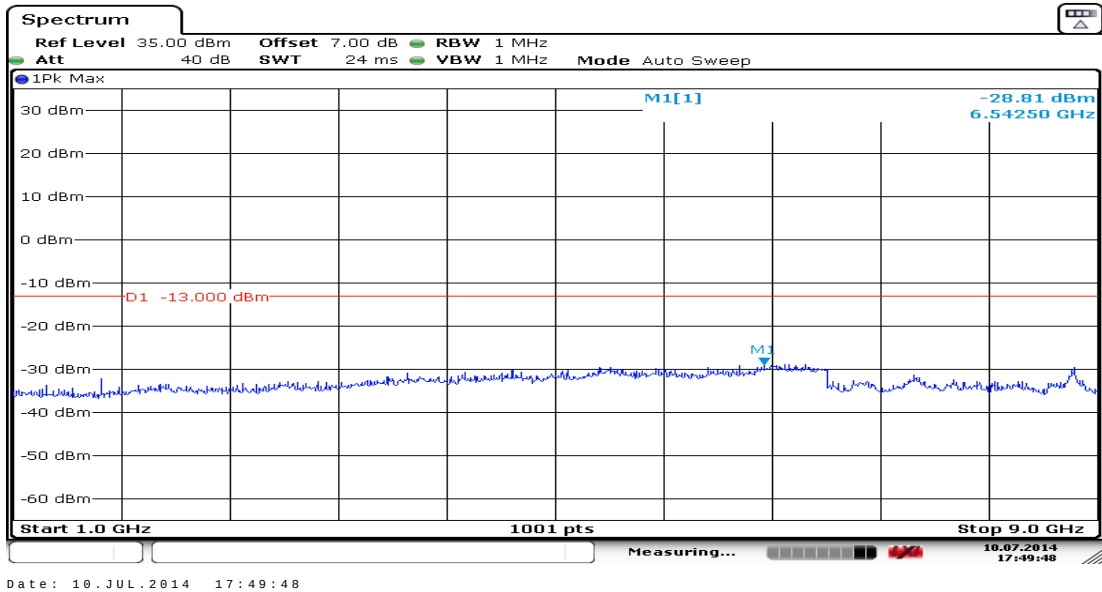
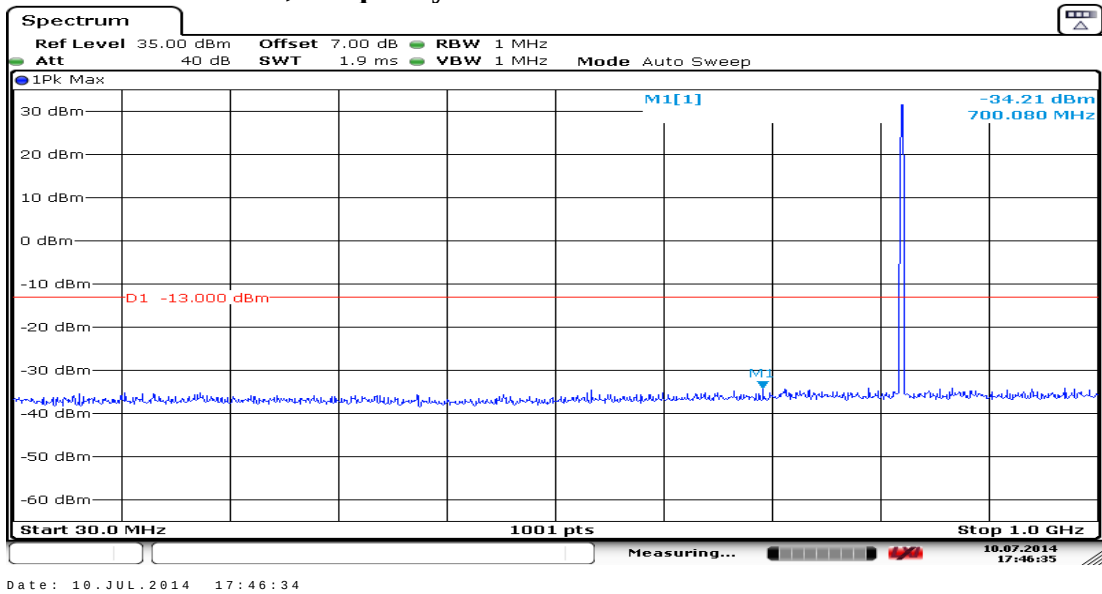
Humidity: 57%

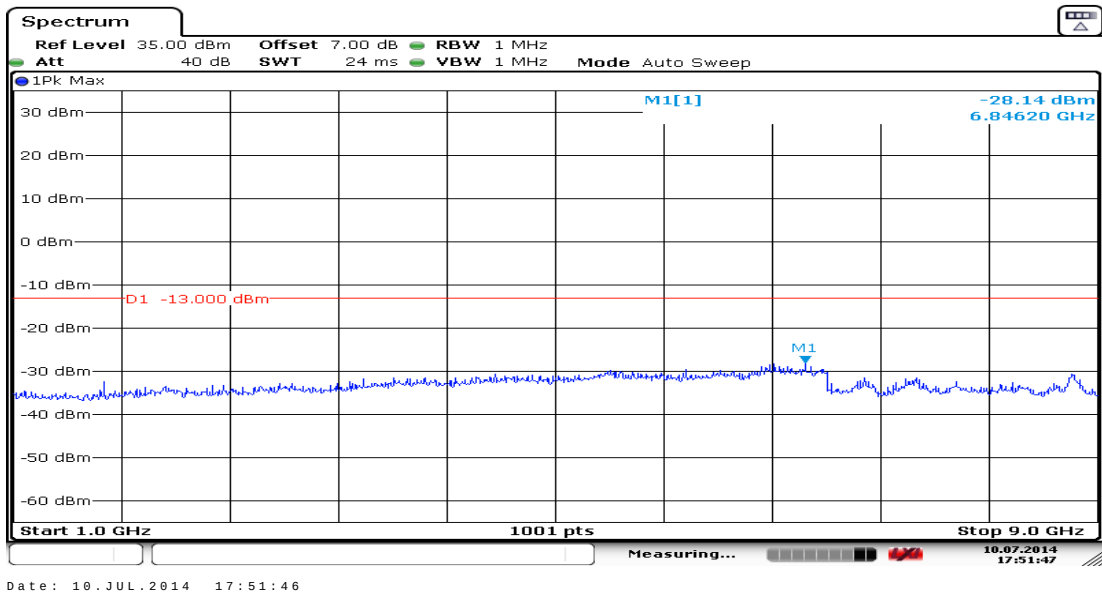
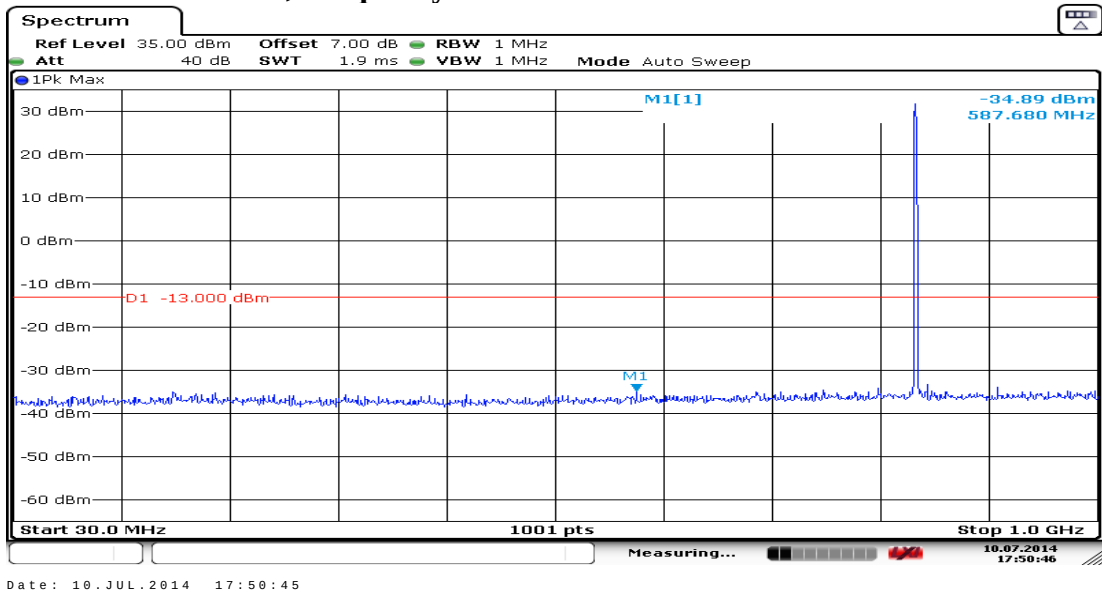
Spurious Emissions at Antenna Terminals (Conducted)—GPRS 850/EGPRS 850 GPRS Modulation, Frequency: 824.20MHz

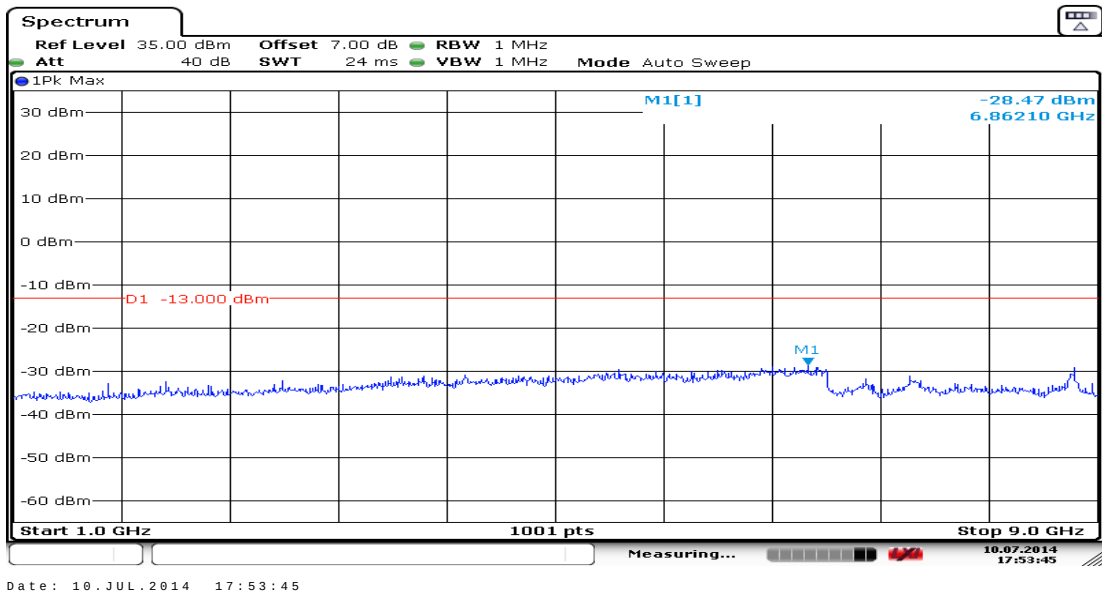
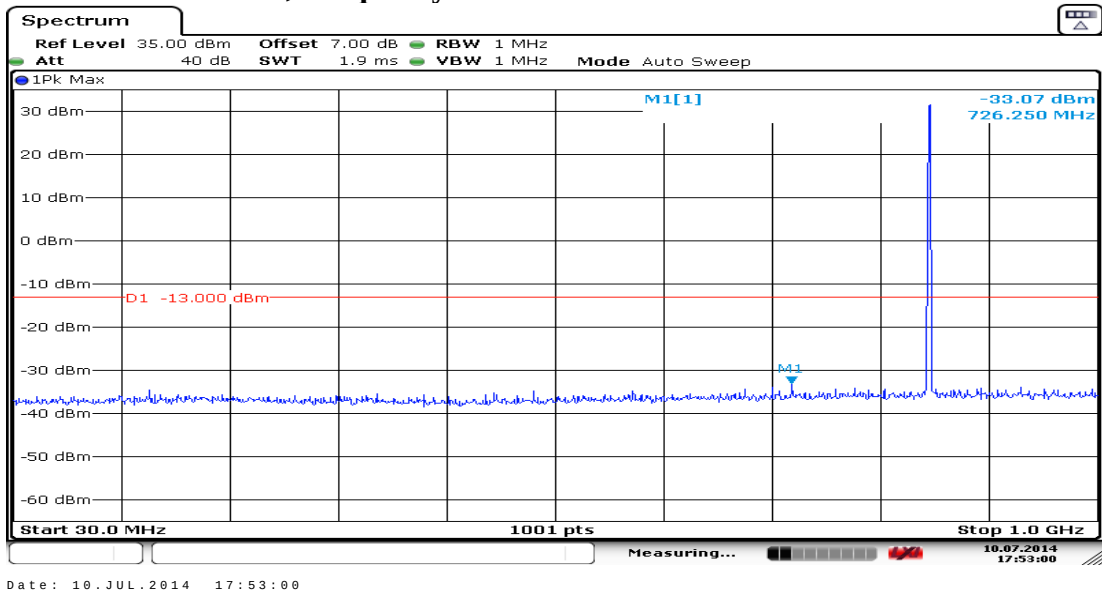


GPRS Modulation, Frequency: 836.40MHz

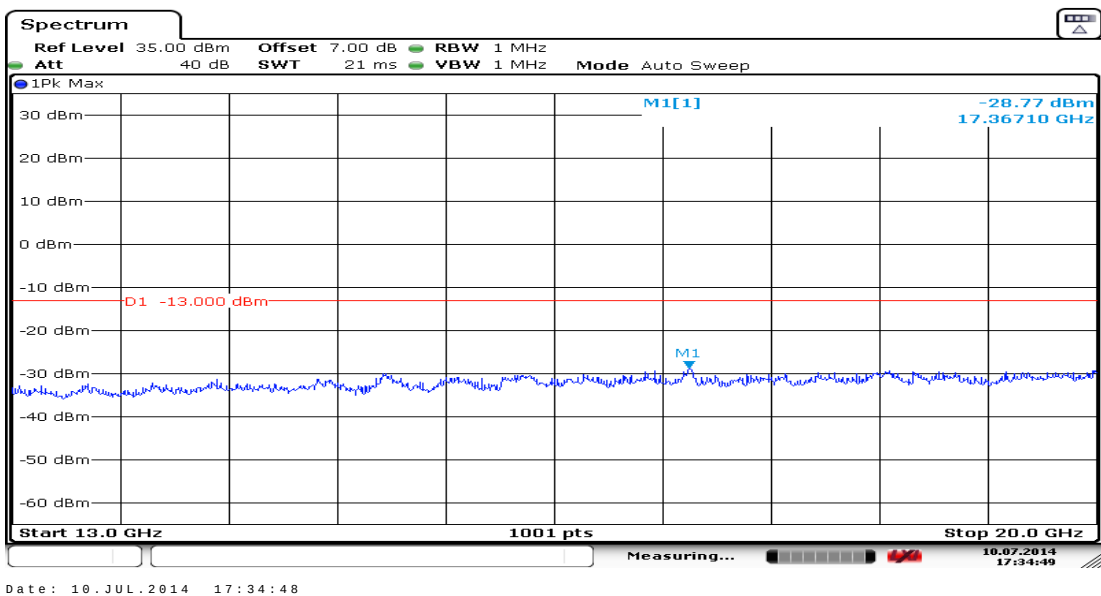
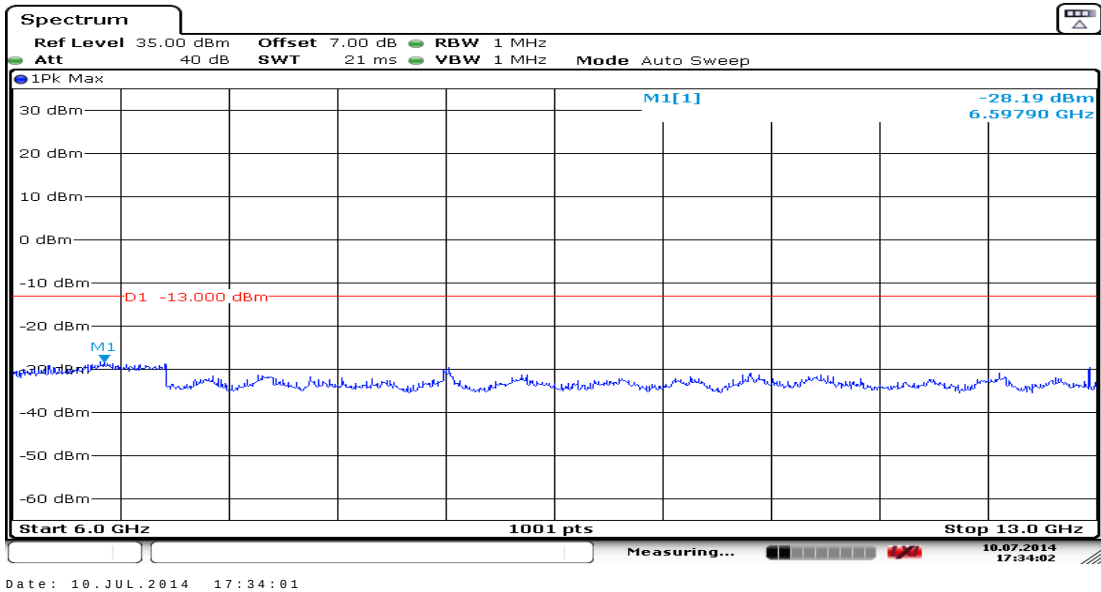
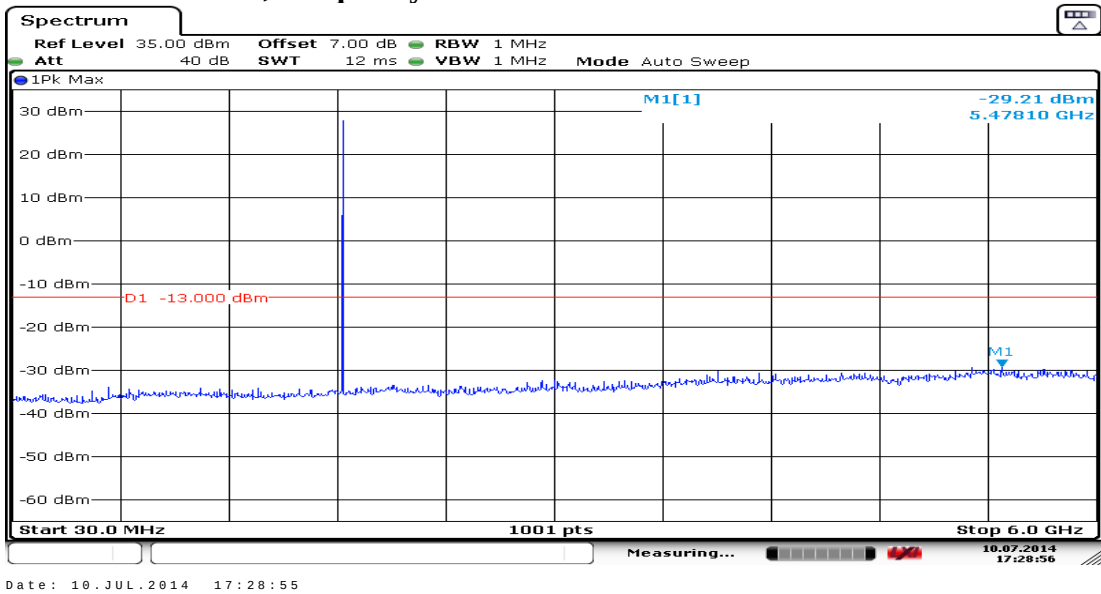
GPRS Modulation, Frequency: 848.80MHz

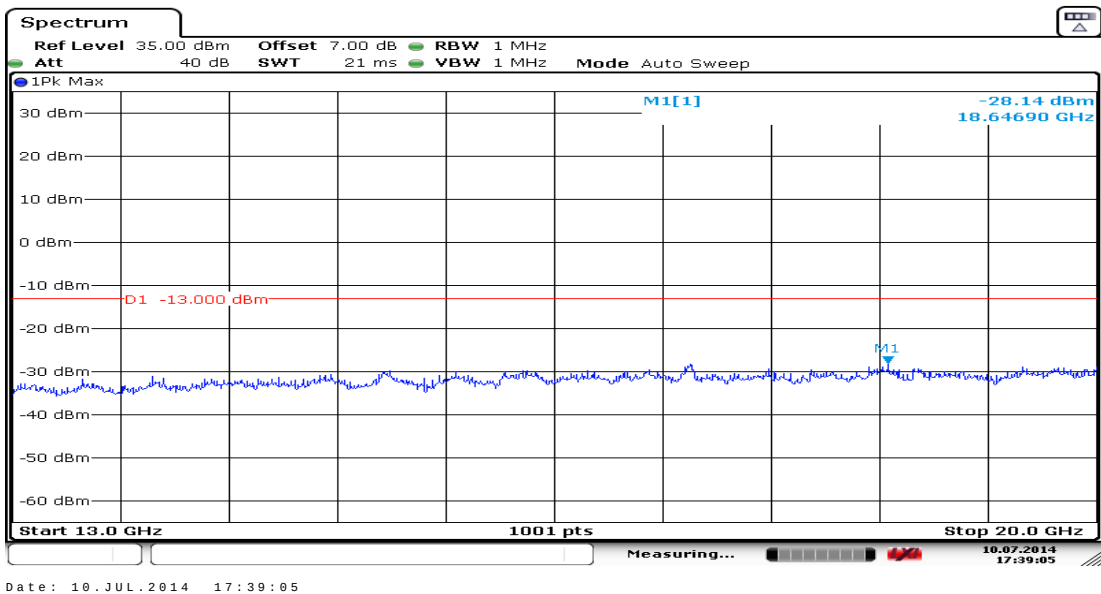
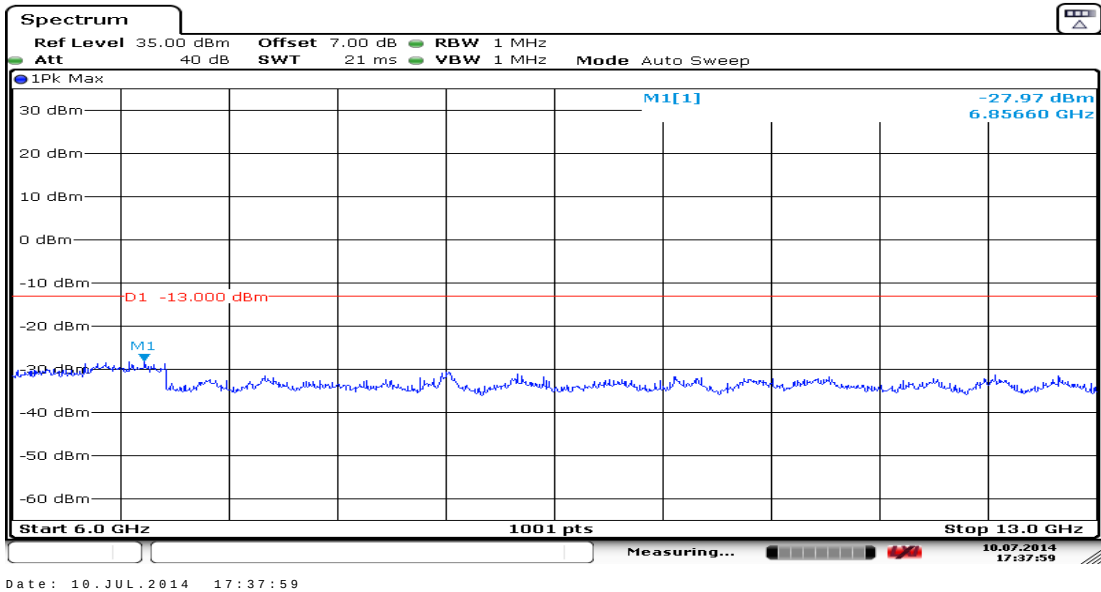
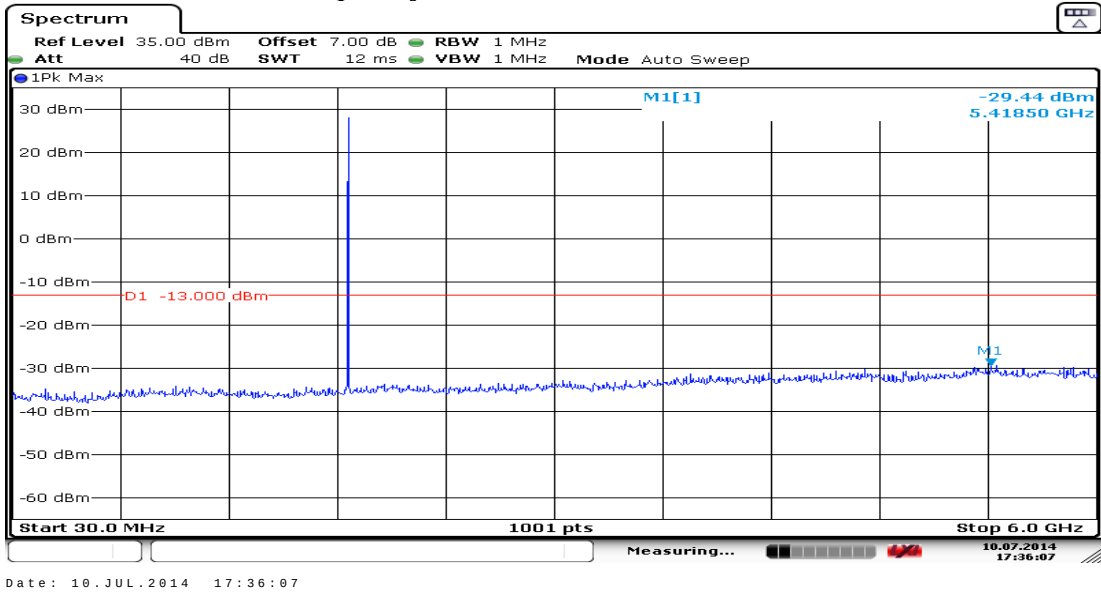
EGPRS Modulation, Frequency: 824.20MHz

EGPRS Modulation, Frequency: 836.40MHz

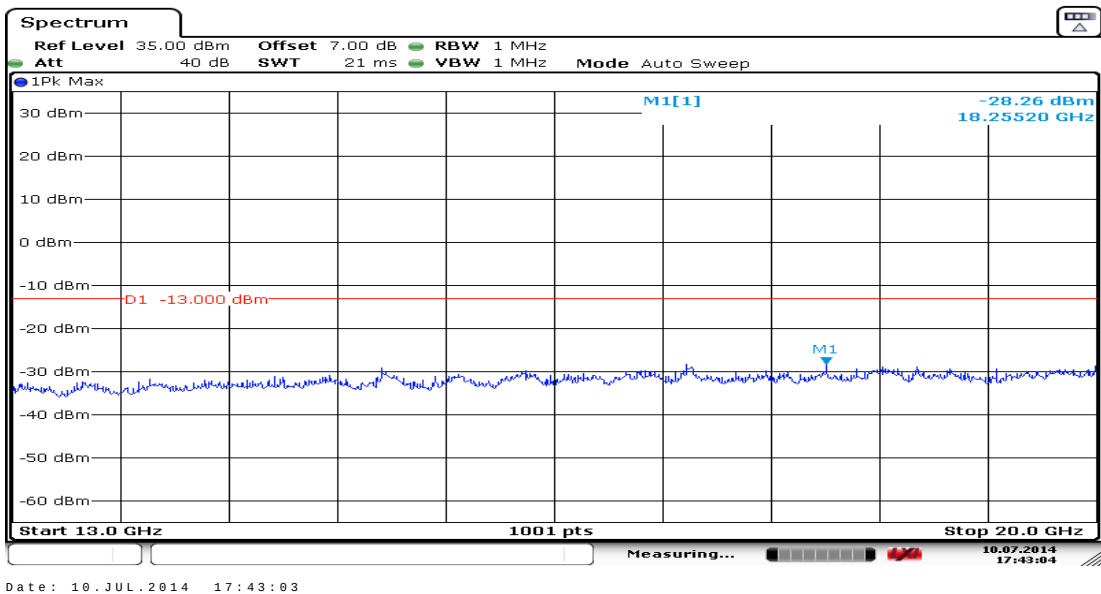
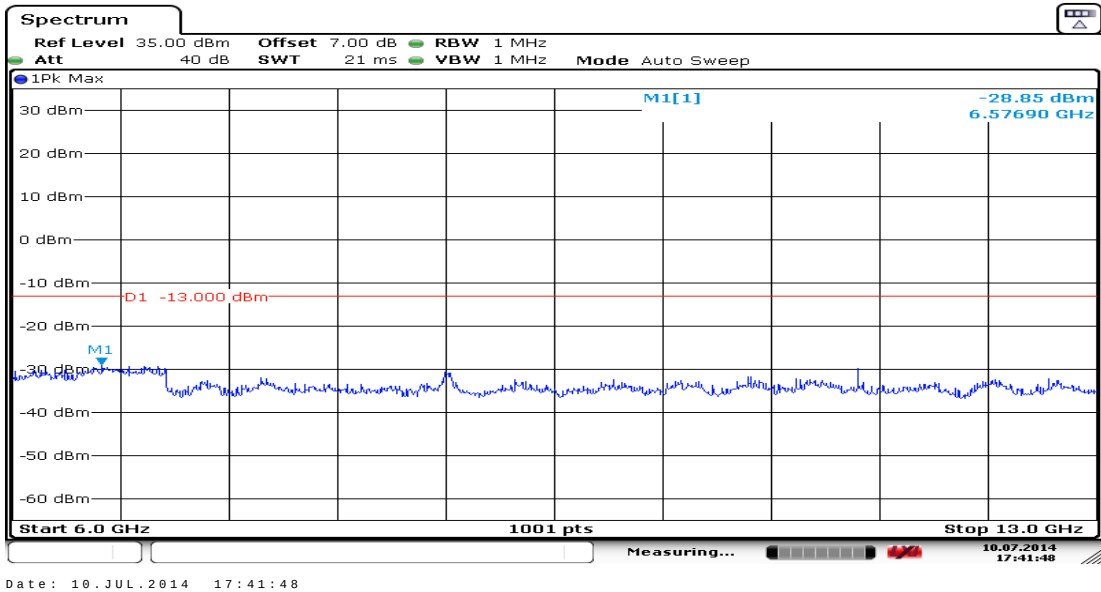
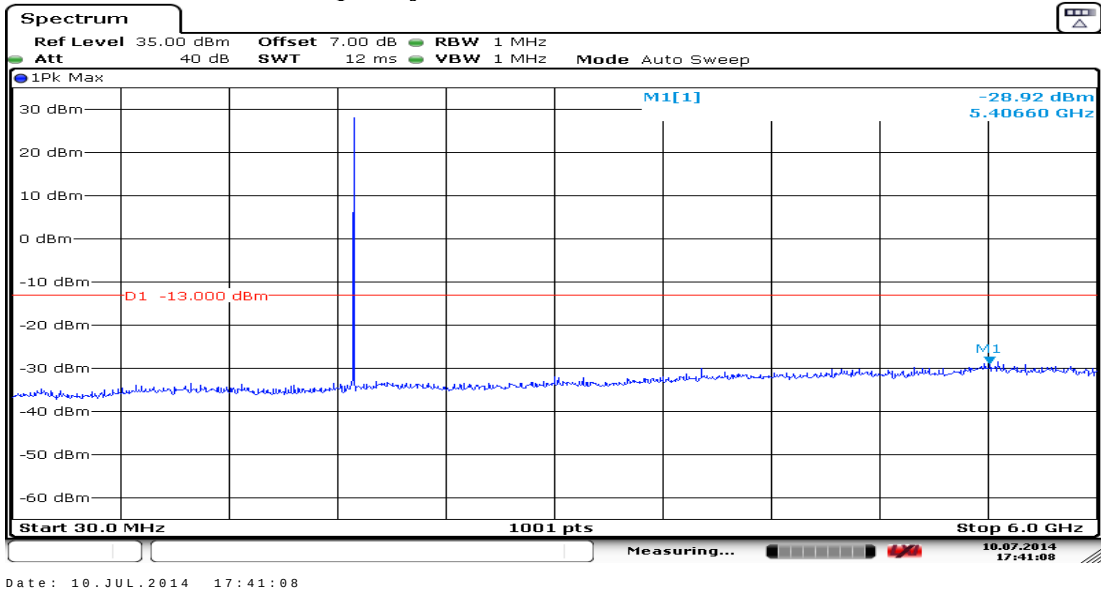
EGPRS Modulation, Frequency: 848.80MHz

Spurious Emissions at Antenna Terminals (Conducted)—GPRS 1900/EGPRS 1900 GPRS Modulation, Frequency: 1850.20MHz

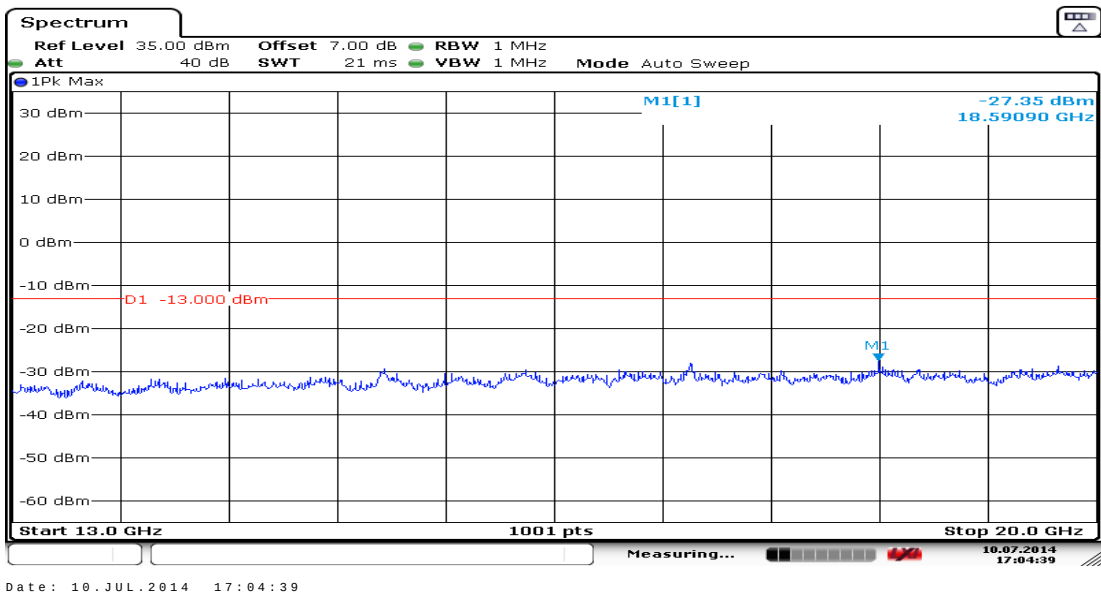
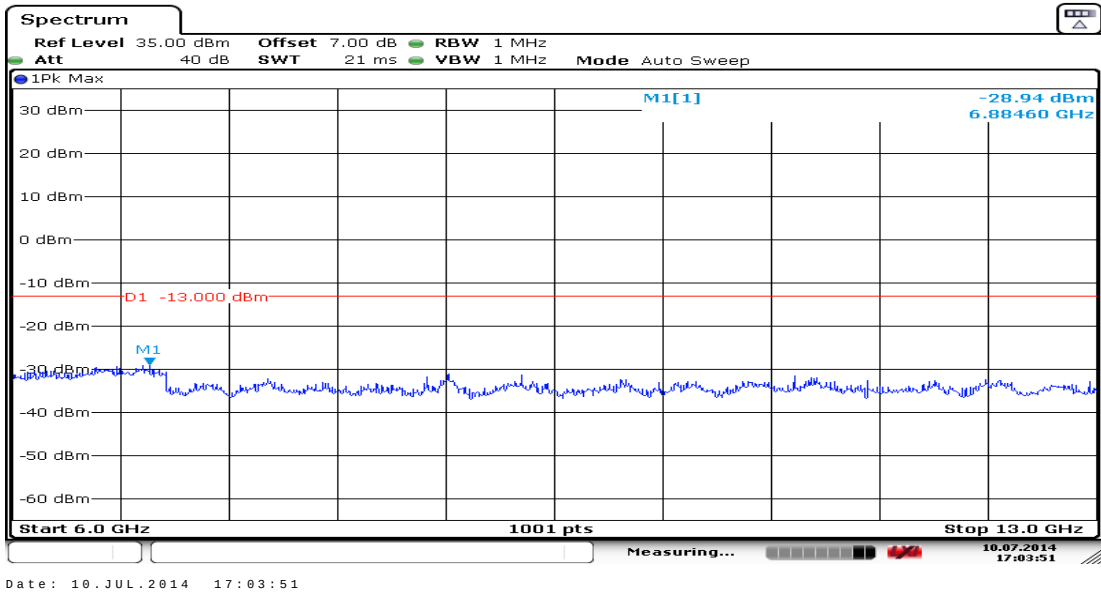
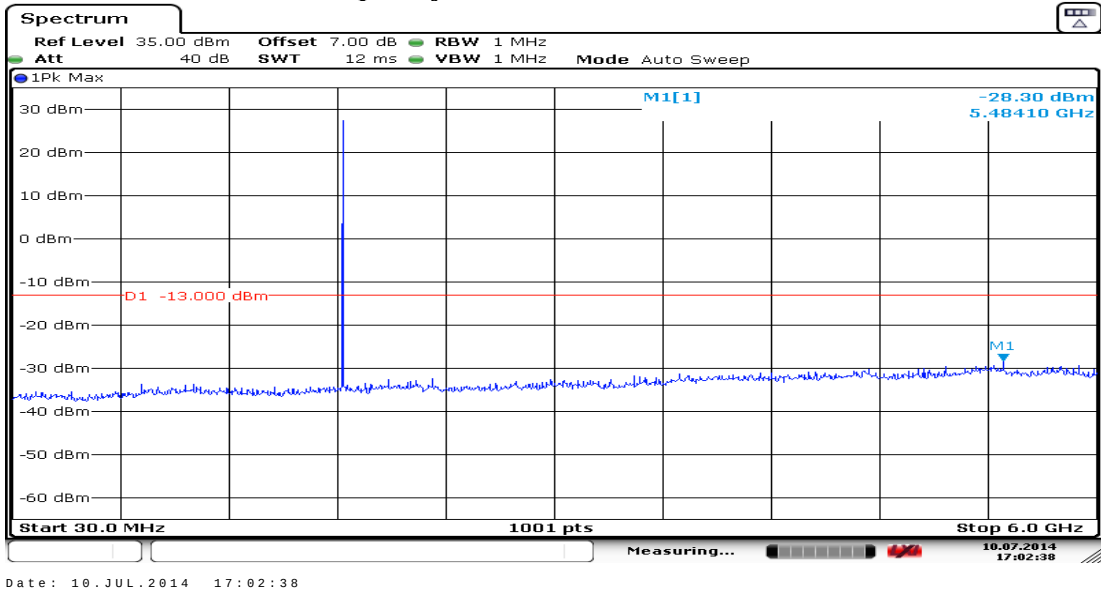


GPRS Modulation, Frequency: 1880.00MHz

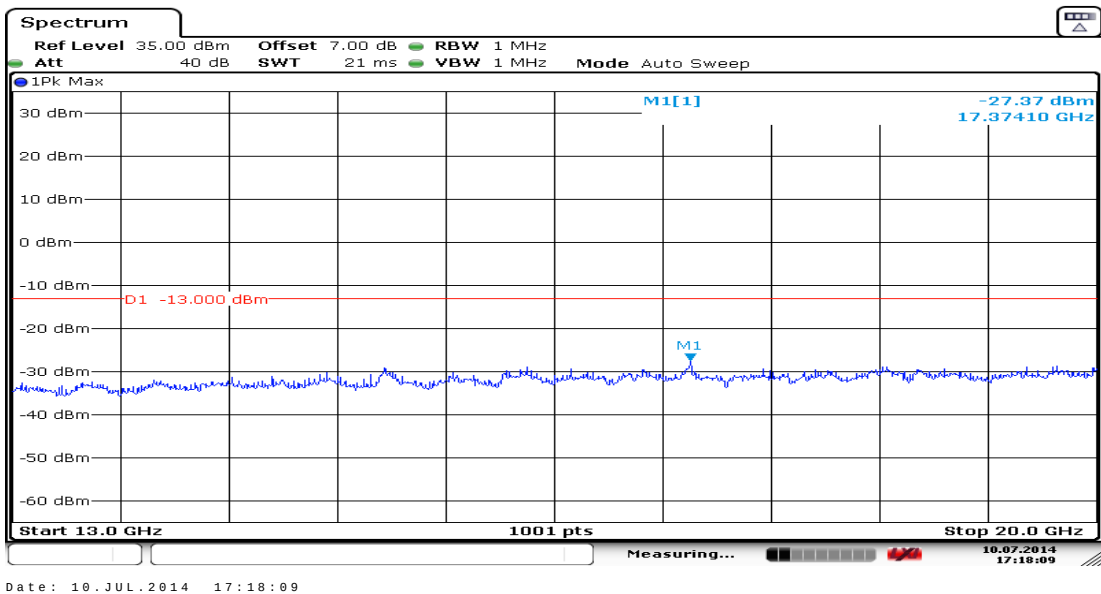
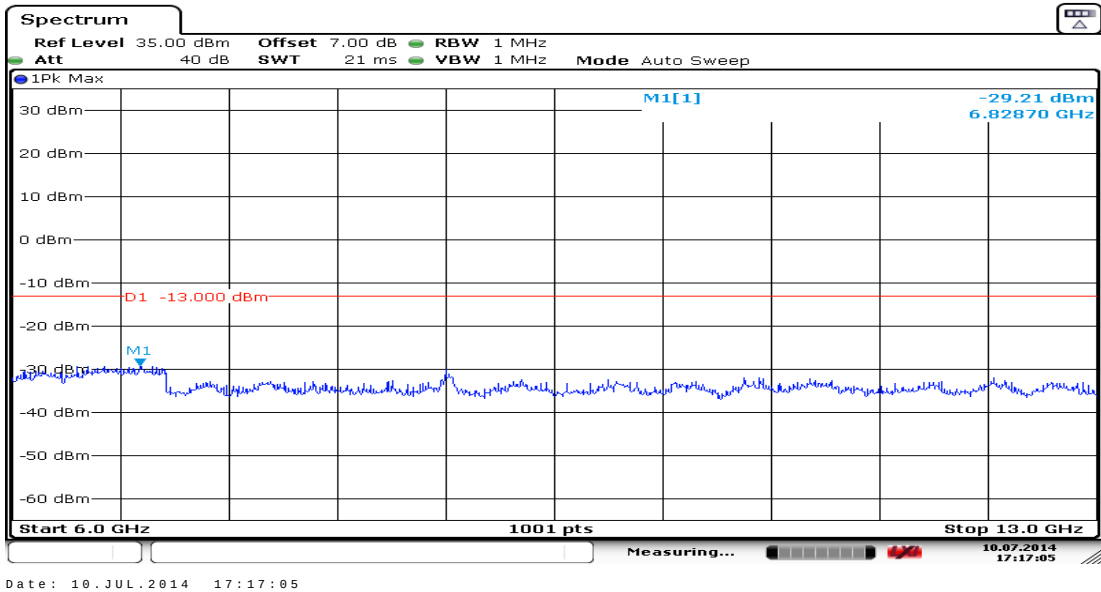
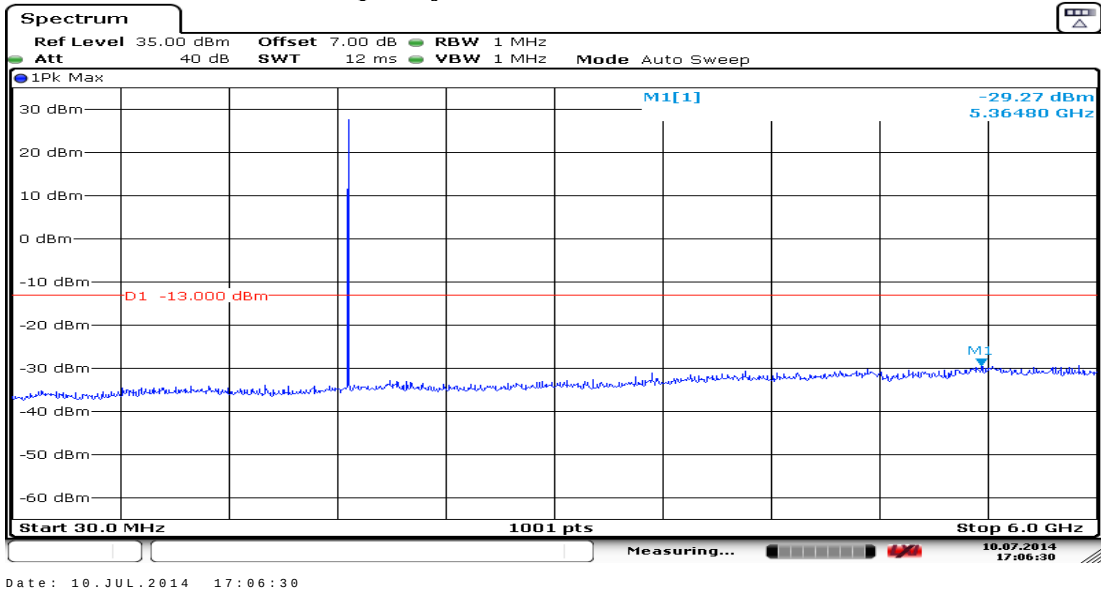
GPRS Modulation, Frequency: 1909.80MHz



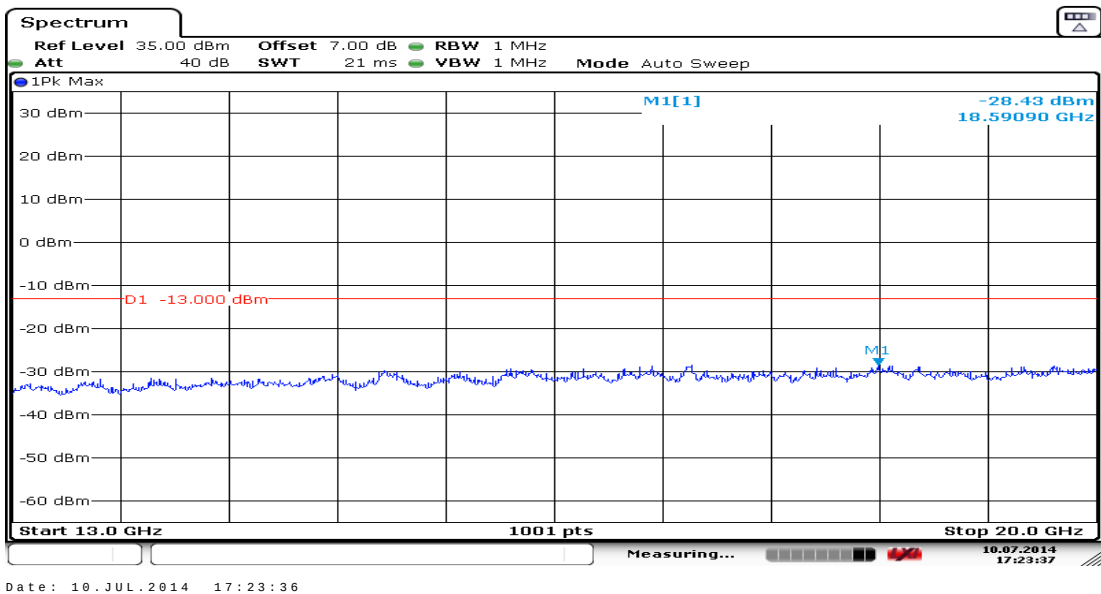
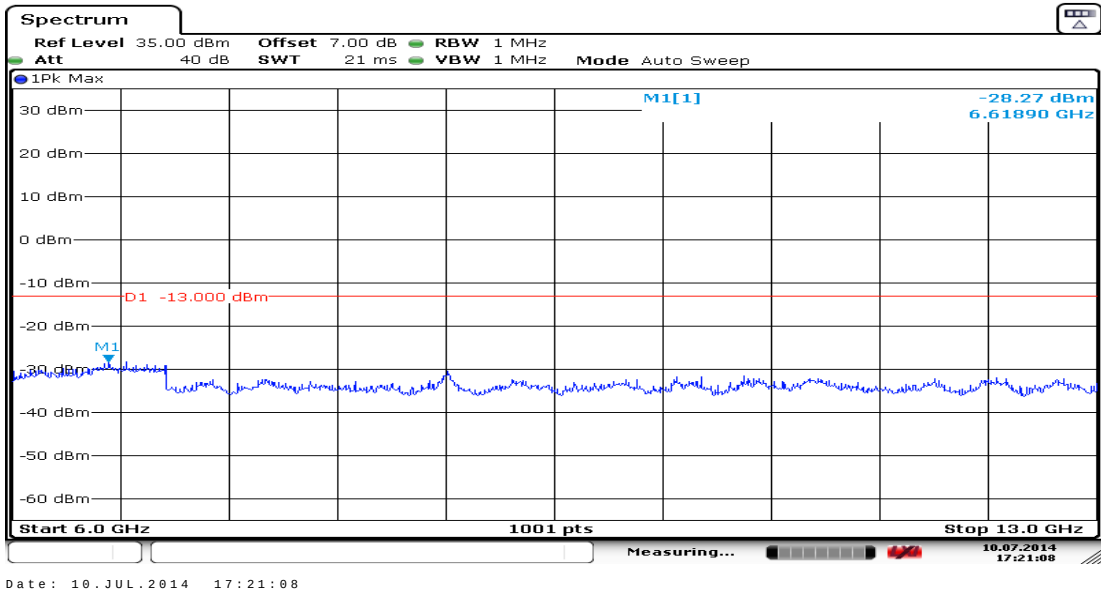
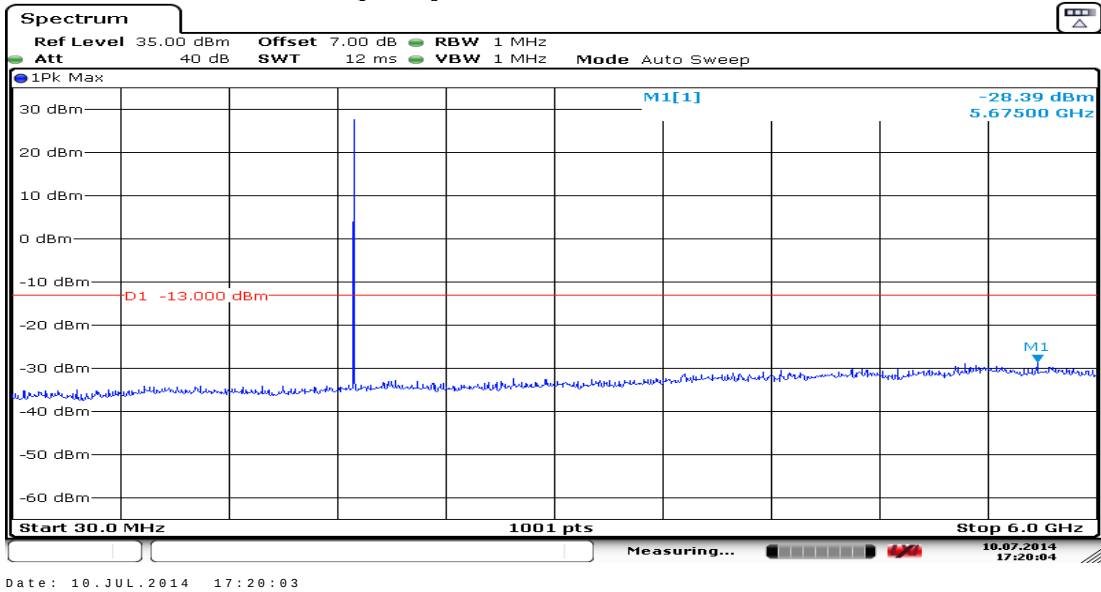
EGPRS Modulation, Frequency: 1850.20MHz

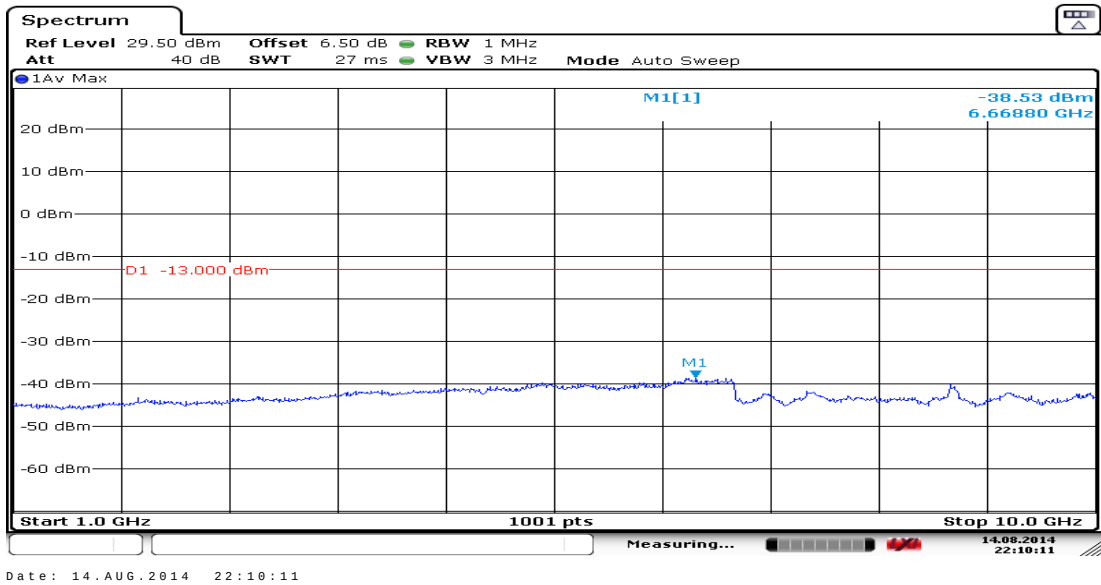
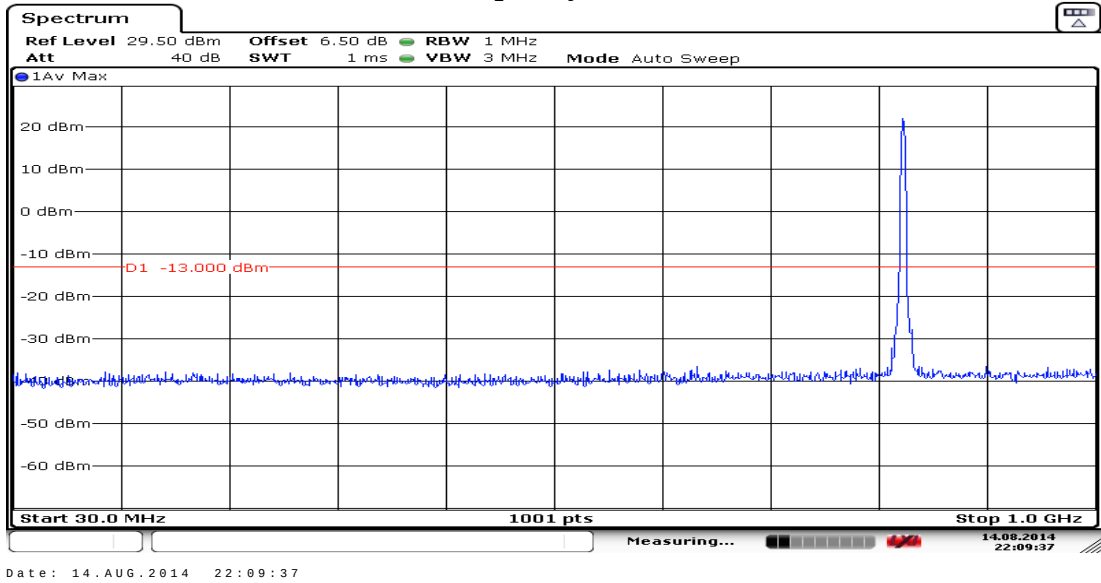


EGPRS Modulation, Frequency: 1880.00MHz

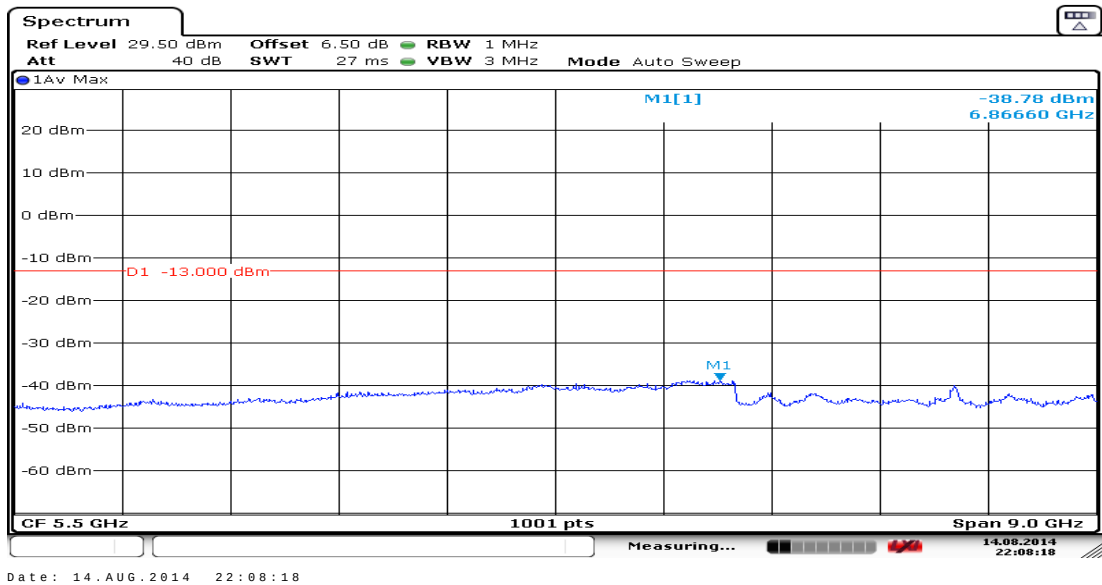
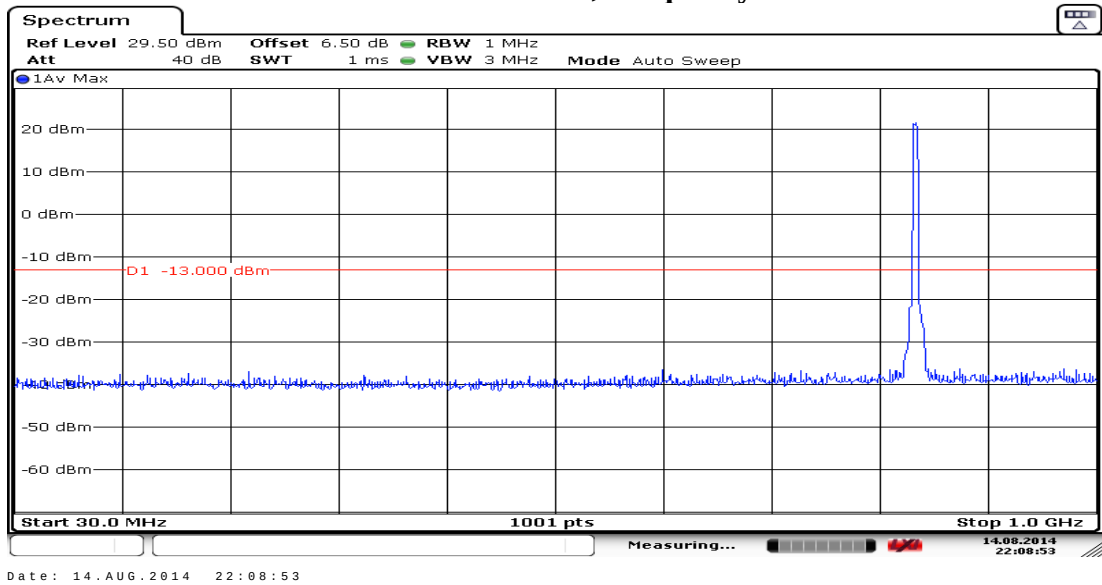


EGPRS Modulation, Frequency: 1909.80MHz

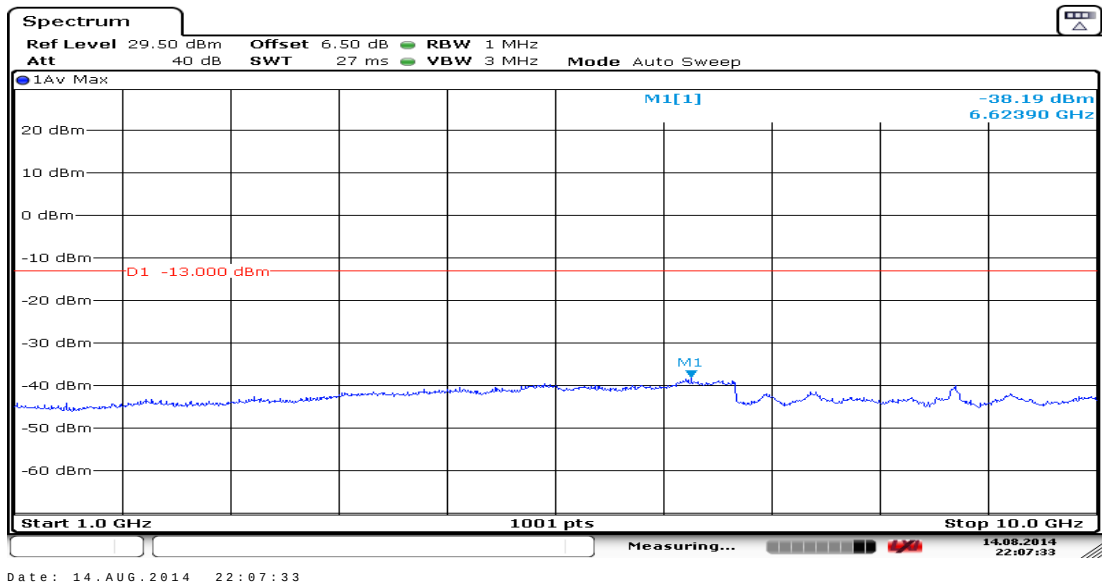
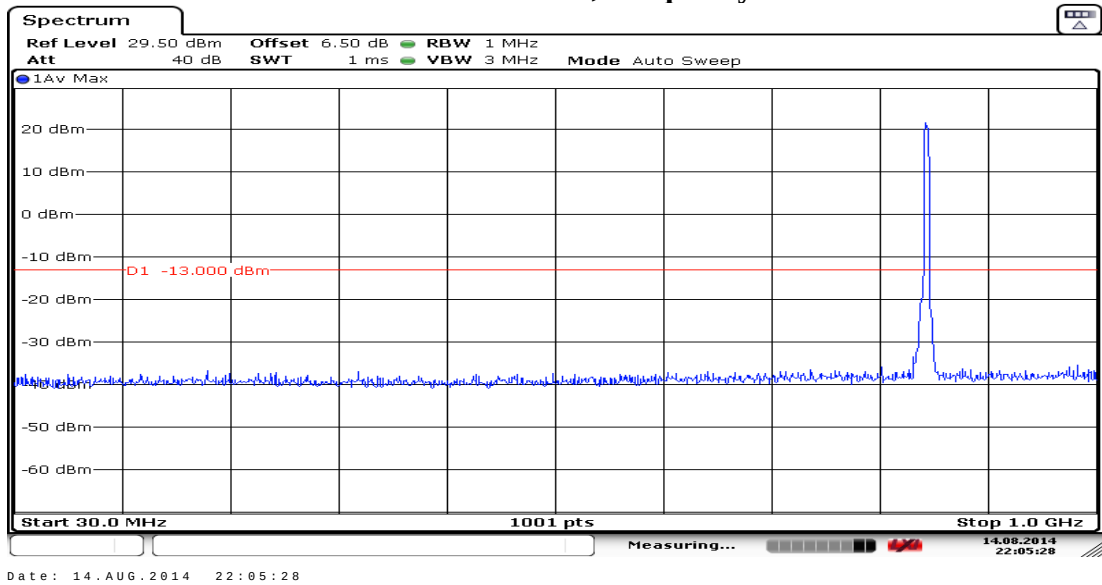


Spurious Emissions at Antenna Terminals (Conducted)—WCDMA Band V / Band II
WCDMA Band V Modulation, Frequency: 826.40MHz

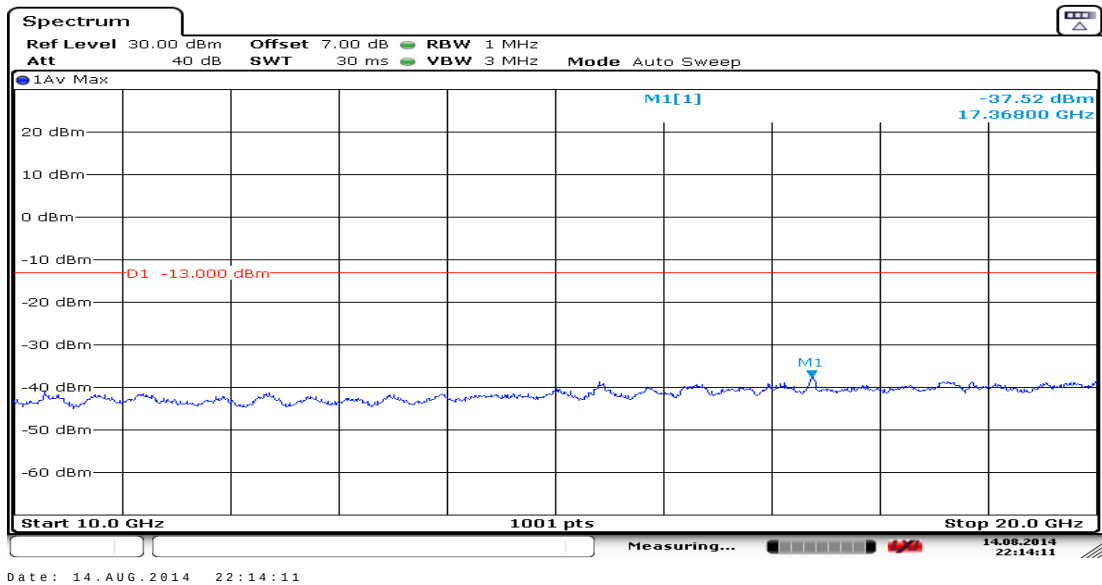
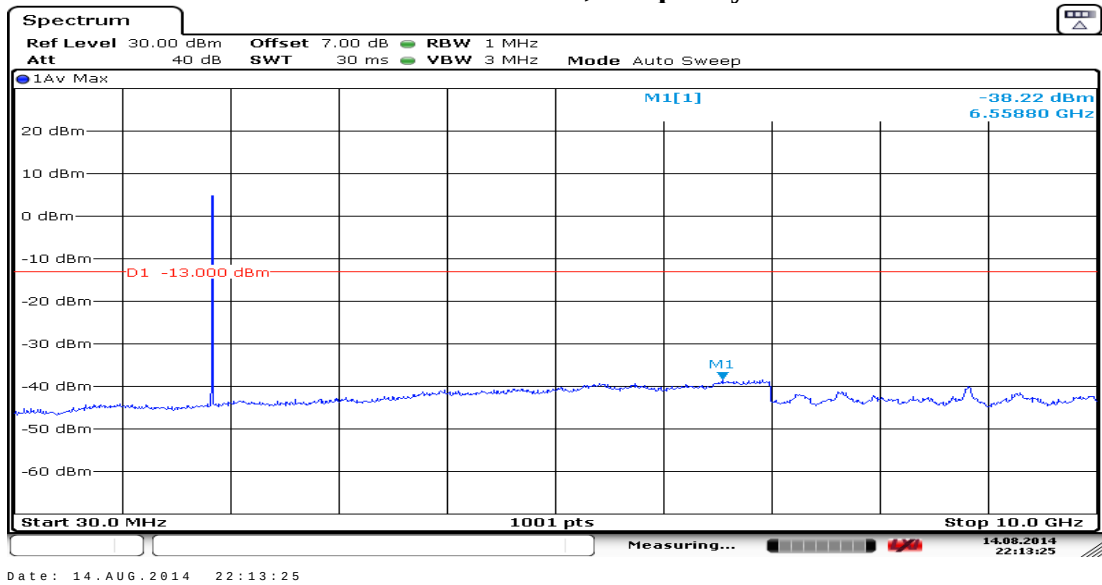
WCDMA Band V Modulation, Frequency: 836.40MHz



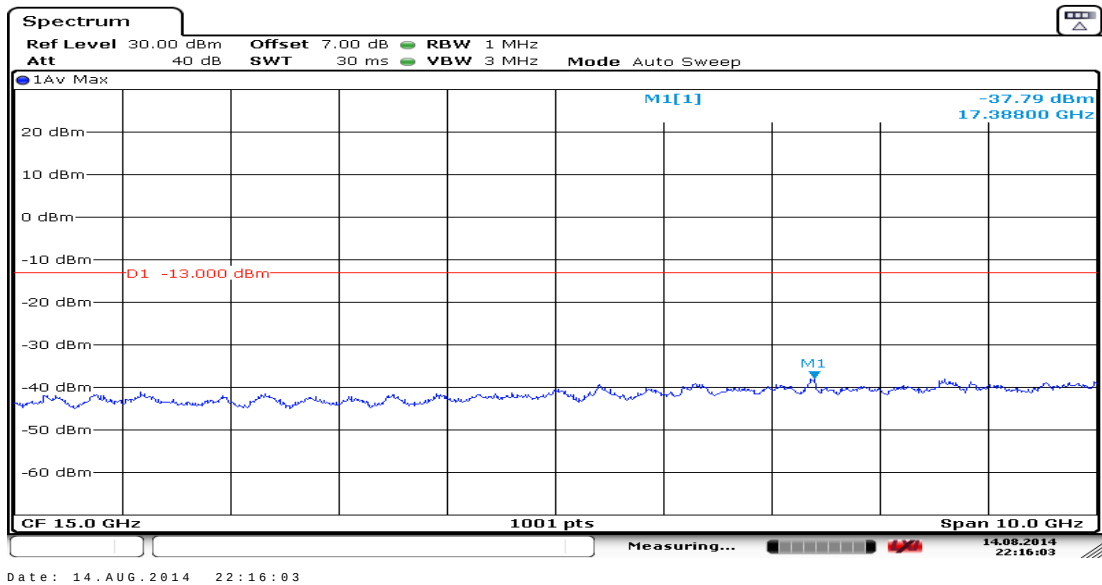
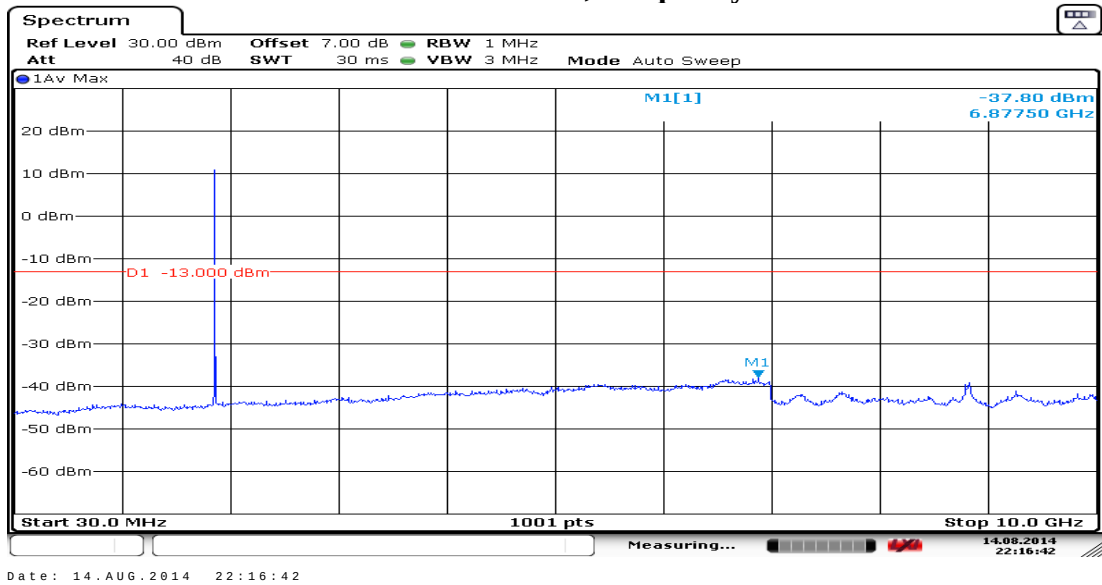
WCDMA Band V Modulation, Frequency: 846.40MHz



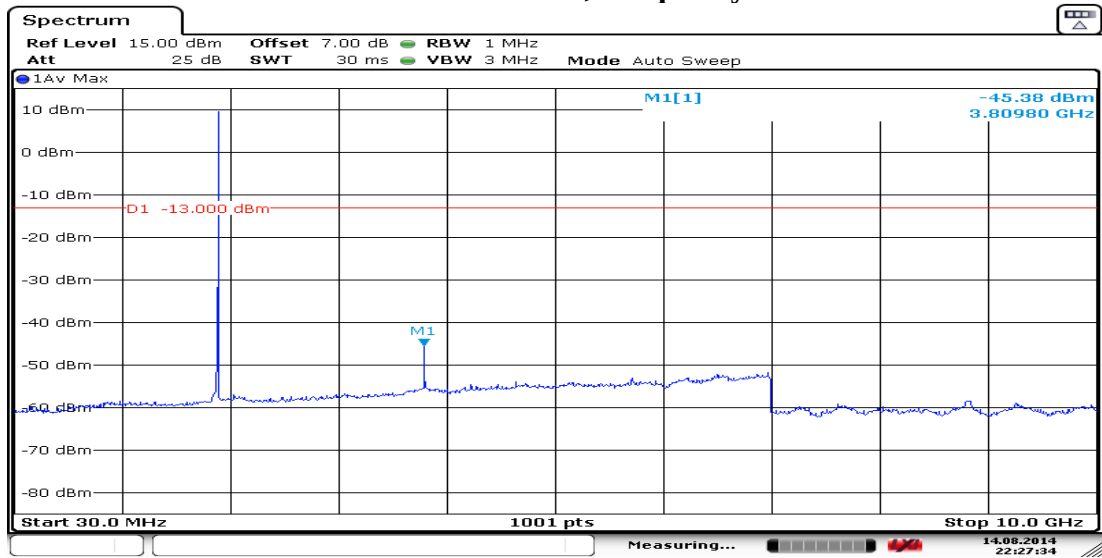
WCDMA Band II Modulation, Frequency: 1852.40MHz



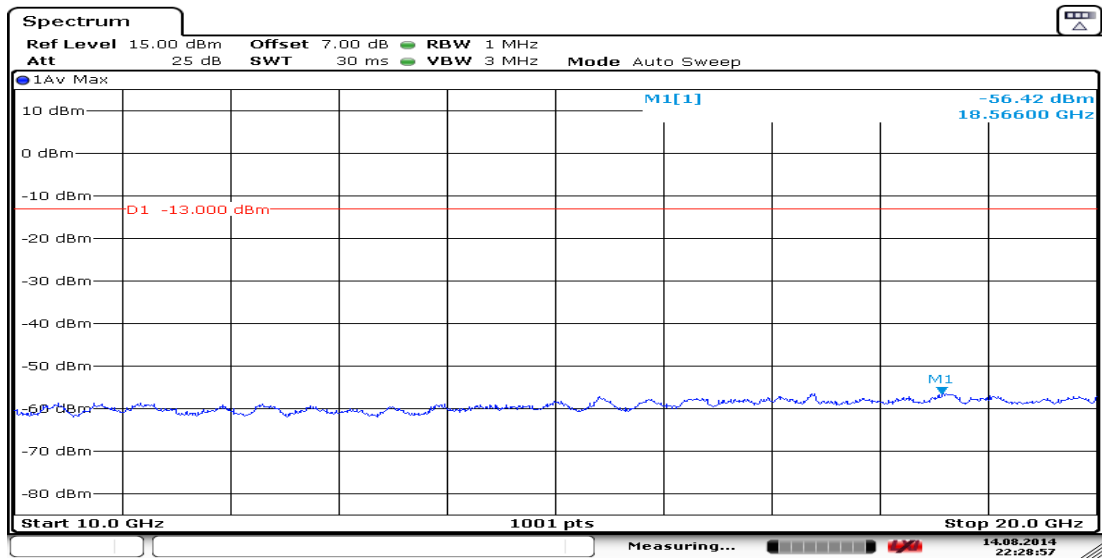
WCDMA Band II Modulation, Frequency: 1880.00MHz



WCDMA Band II Modulation, Frequency: 1907.60MHz



Date: 14.AUG.2014 22:27:33



Date: 14.AUG.2014 22:28:57

8. BAND EDGES EMISSION AT ANTENNA TERMINALS MEASUREMENT

8.1. Test Equipment

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1.	Spectrum Analyzer	R&S	FSV30	101181	2015. 03. 03
2.	Power Divider	Anritsu	K240C	019728	2015. 01. 03
3.	Universal Radio Communication Tester	Anritsu	MT8820C	6201144416	2015. 07. 31
4.	Horn Antenna	EMCO	3115	9609-4927	2015. 06. 16

8.2. Block Diagram of Test Setup

The same as section.4.2.1.

8.3. Specification Limit

FCC §2.1051

FCC §22.917(a)

FCC §24.238(a)

According to specification, the power of emissions shall be attenuated below the transmitter power (P) by a factor of at least $43+10\log(P)$ dB, P in watts.

At P_o transmitting power, the specified minimum attenuation becomes $43+10\log(P_o)$, and the level in dBm relative P_o becomes:

$P_o \text{ (dBm)} - [43+10\log(P_o \text{ in m watts})-30] = -13\text{dBm}$

8.4. Test Procedure

As indicated in FCC Part 22 and Part 24, in the 1MHz bands immediately out side and adjacent to the frequency block or band are solution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A resolution bandwidth of 3.3kHz was used for GPRS and EGPRS modulations.

8.5. Test Results

PASSED. The testing data was attached in the next pages.

Test Date: 2014. 07. 10

Temperature: 26°C

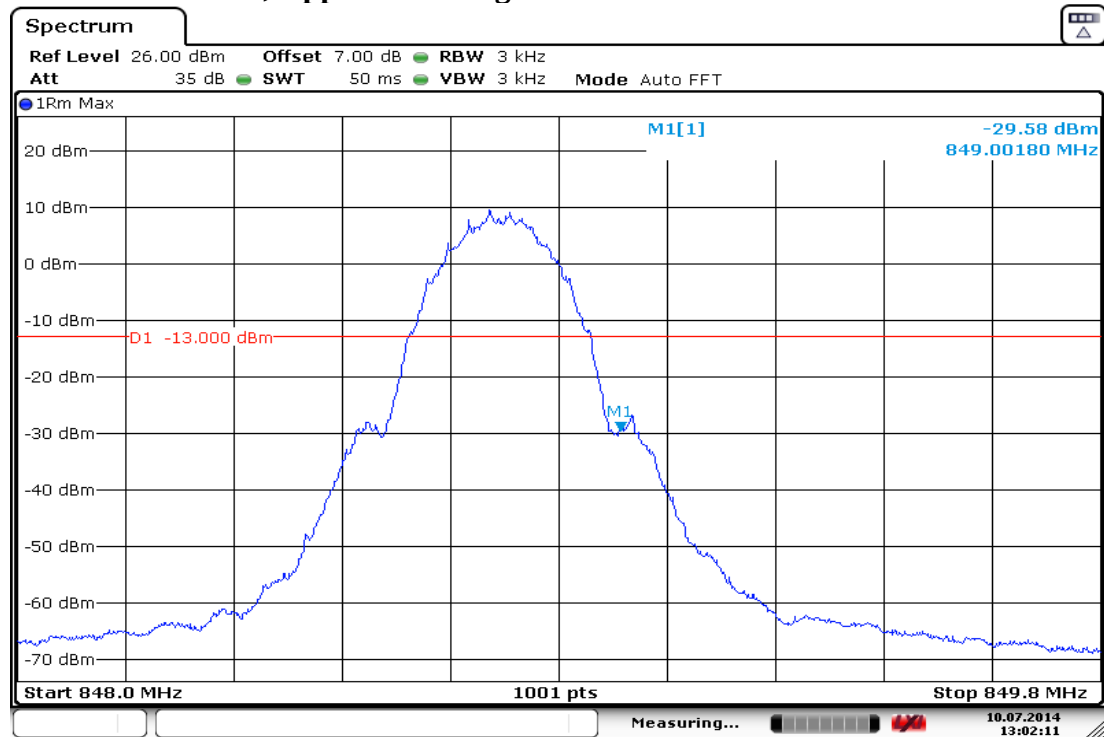
Humidity: 60%

Test Date: 2014. 08. 14

Temperature: 26°C

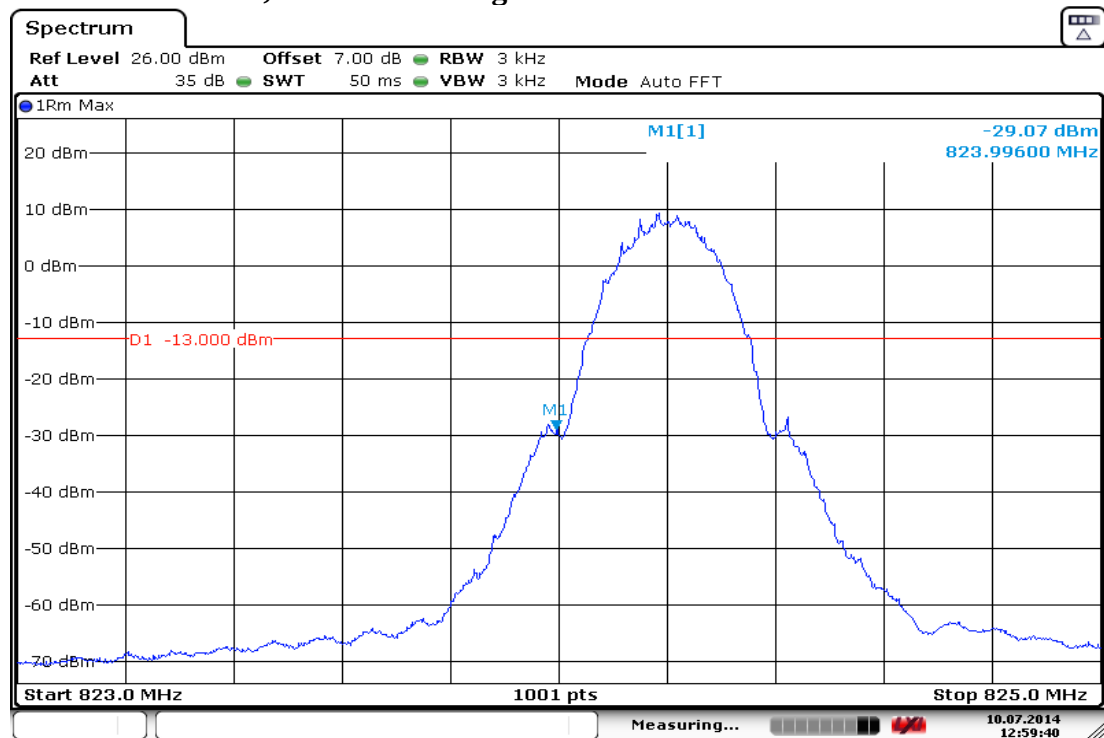
Humidity: 57%

Band Edges Emissions at Antenna Terminals (Conducted)—GPRS 850/EGPRS 850 GPRS Modulation, Upper Band Edges



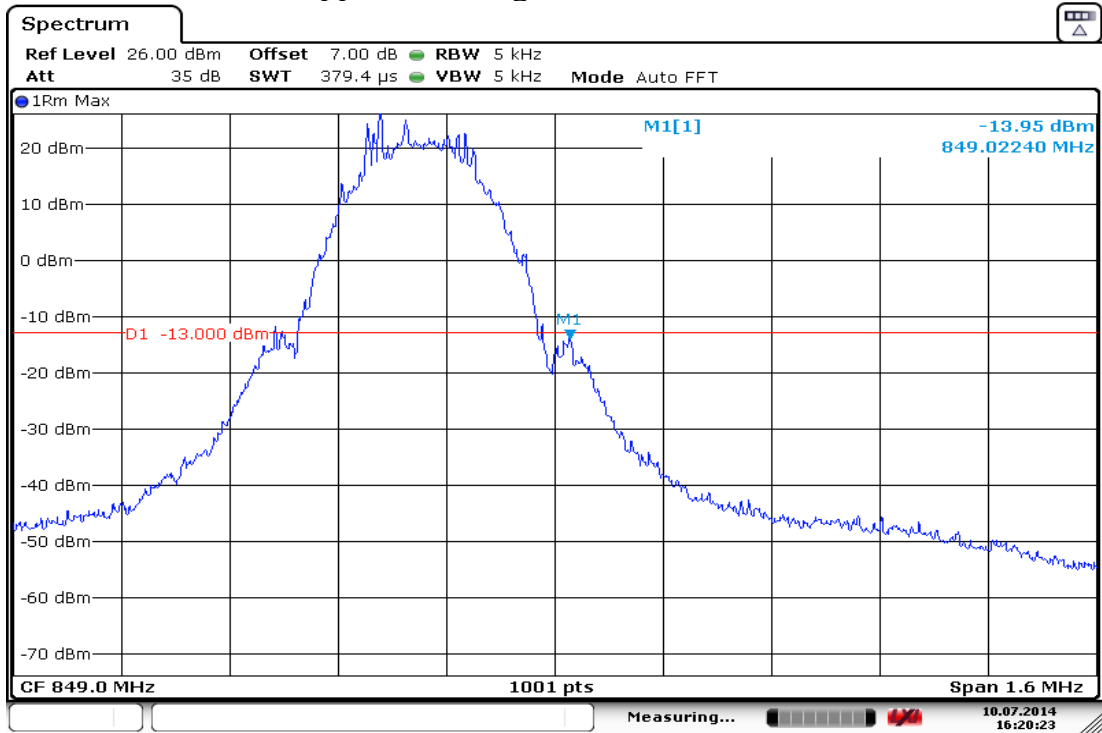
Date: 10.JUL.2014 13:02:10

GPRS Modulation, Below Band Edges



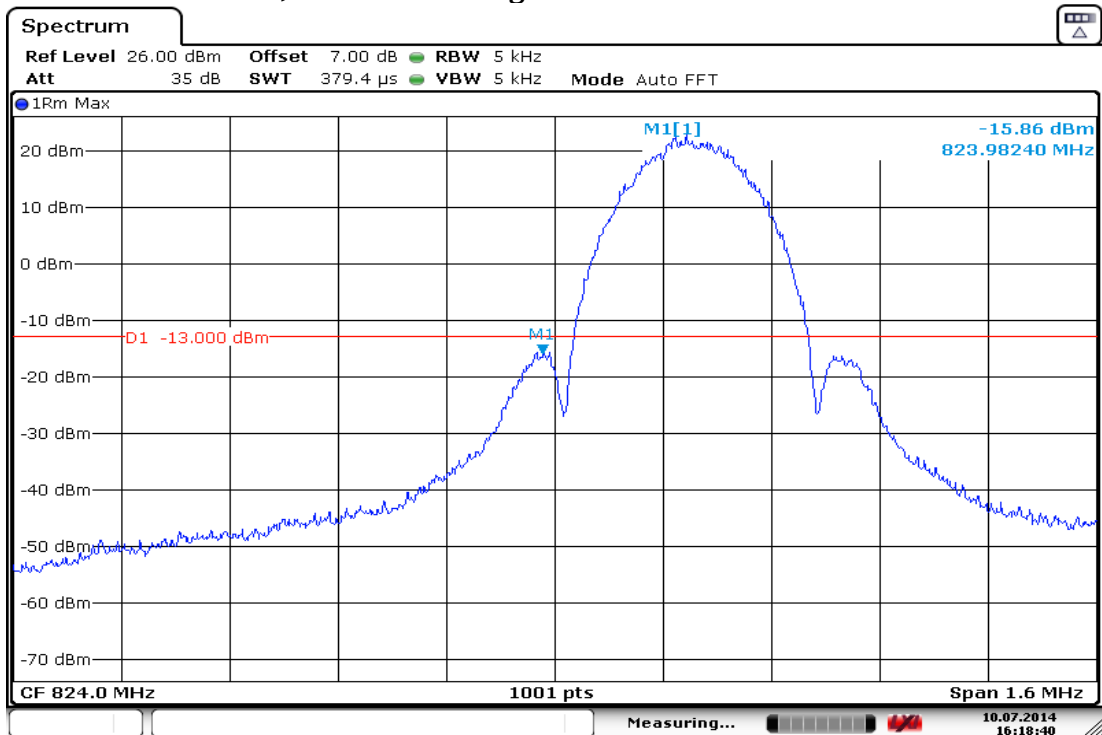
Date: 10.JUL.2014 12:59:40

EGPRS Modulation, Upper Band Edges



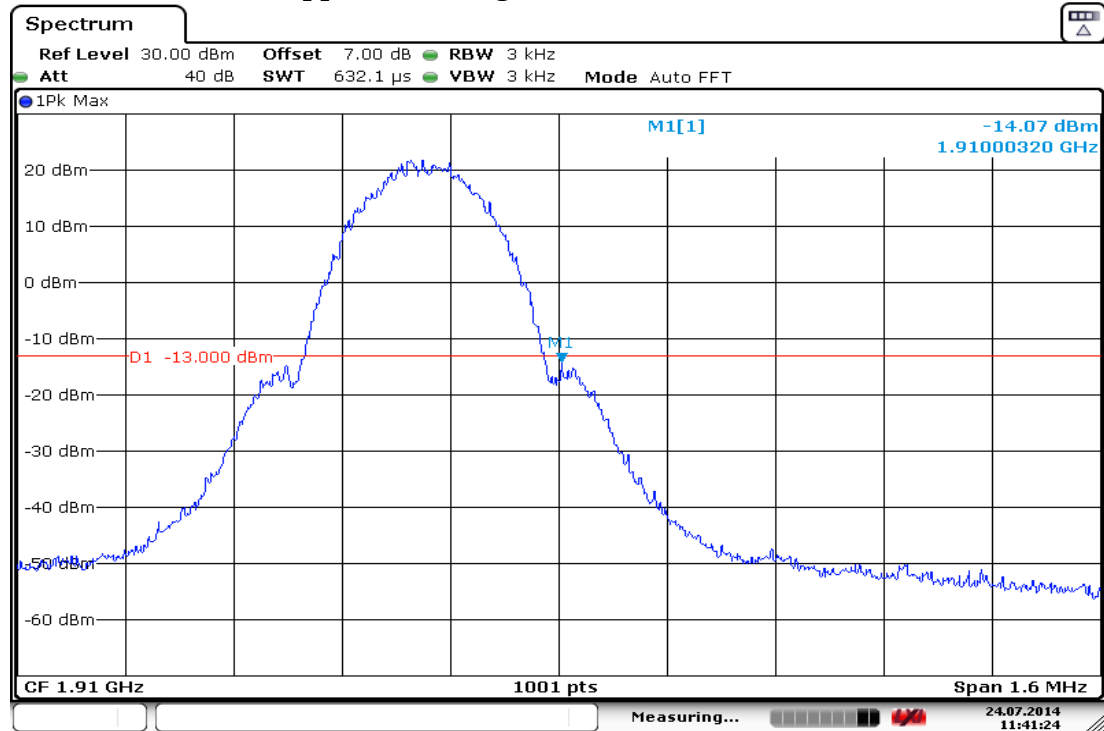
Date: 10.JUL.2014 16:20:22

EGPRS Modulation, Below Band Edges



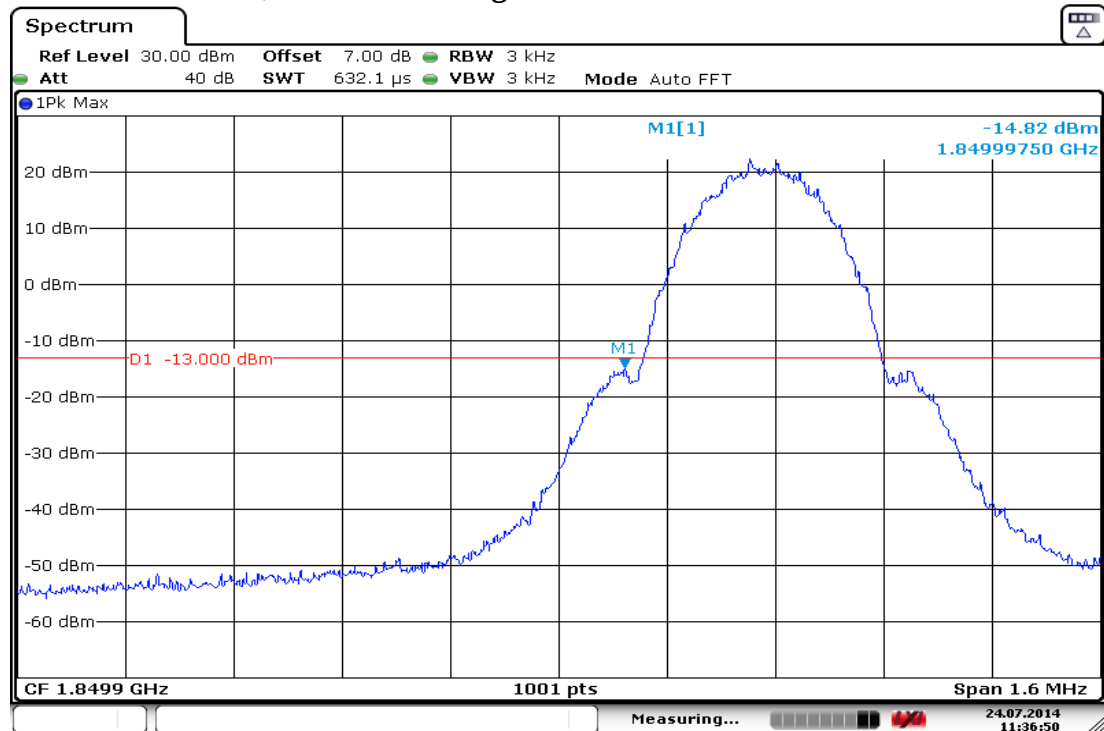
Date: 10.JUL.2014 16:18:39

Band Edges Emissions at Antenna Terminals (Conducted)—GPRS 1900/EGPRS 1900 GPRS Modulation, Upper Band Edges



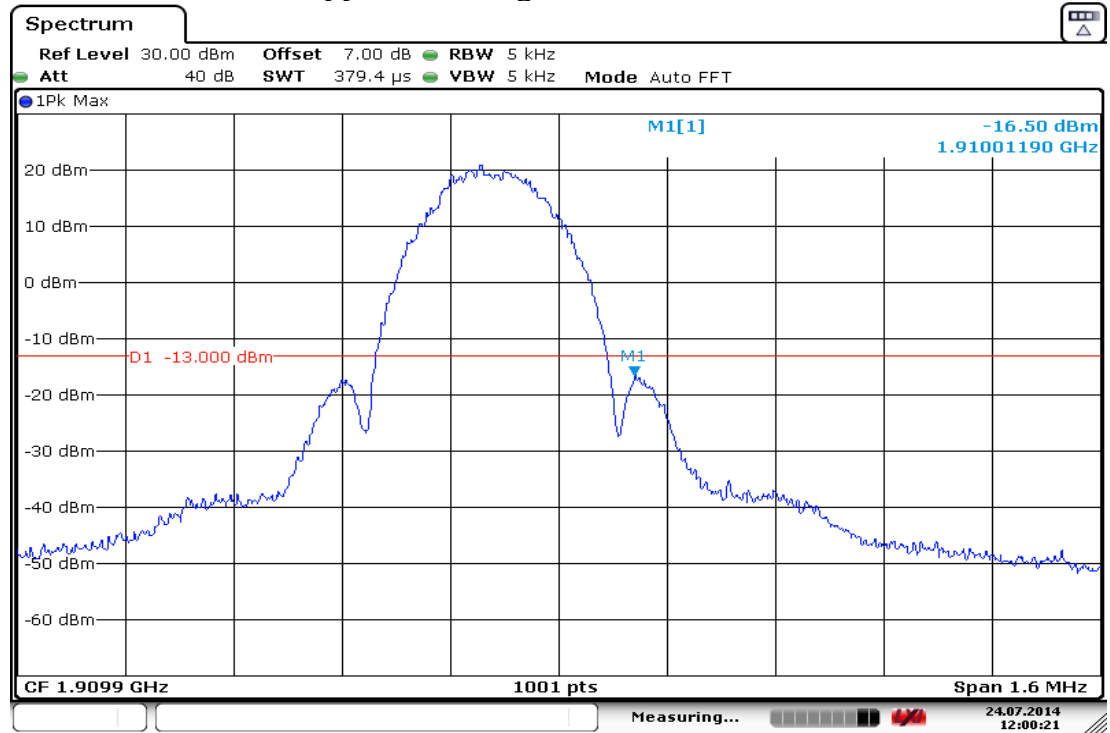
Date: 24.JUL.2014 11:41:25

GPRS Modulation, Below Band Edges



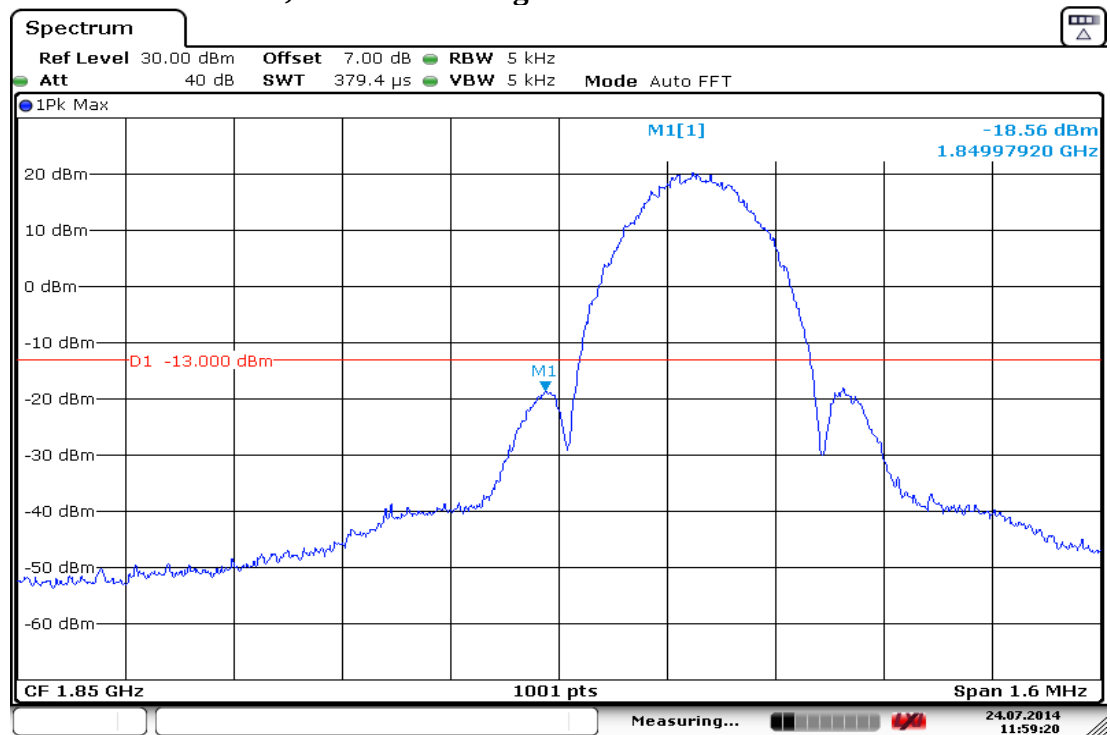
Date: 24.JUL.2014 11:36:51

EGPRS Modulation, Upper Band Edges



Date: 24.JUL.2014 12:00:21

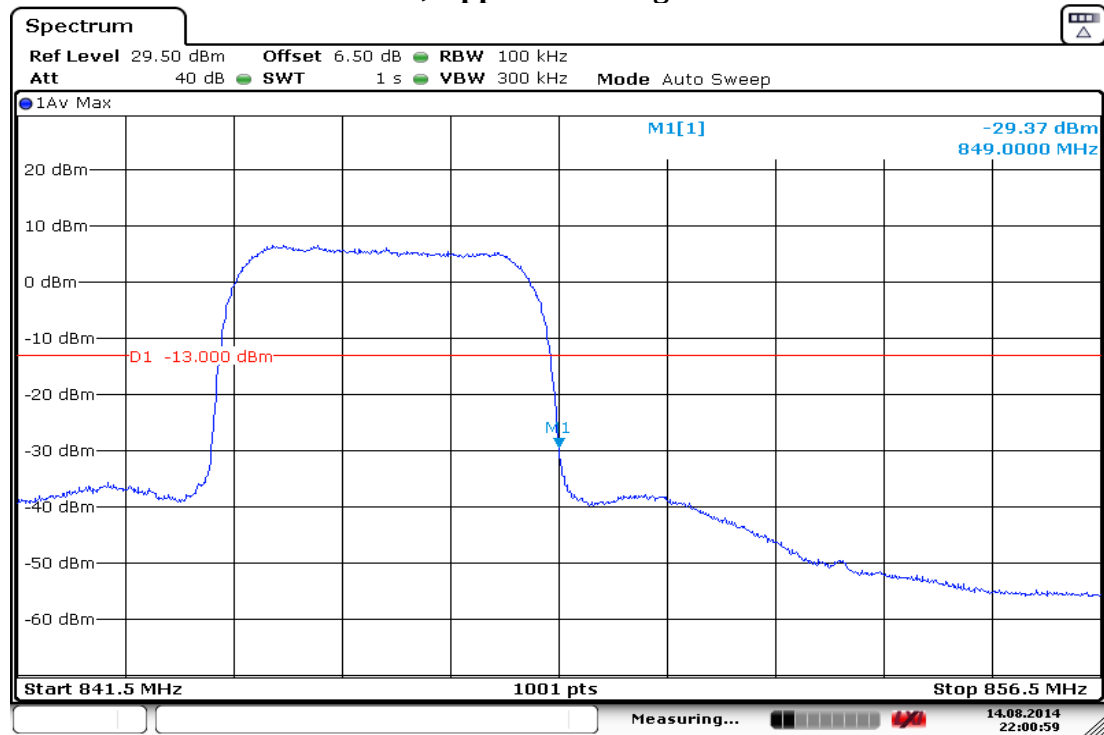
EGPRS Modulation, Below Band Edges



Date: 24.JUL.2014 11:59:20

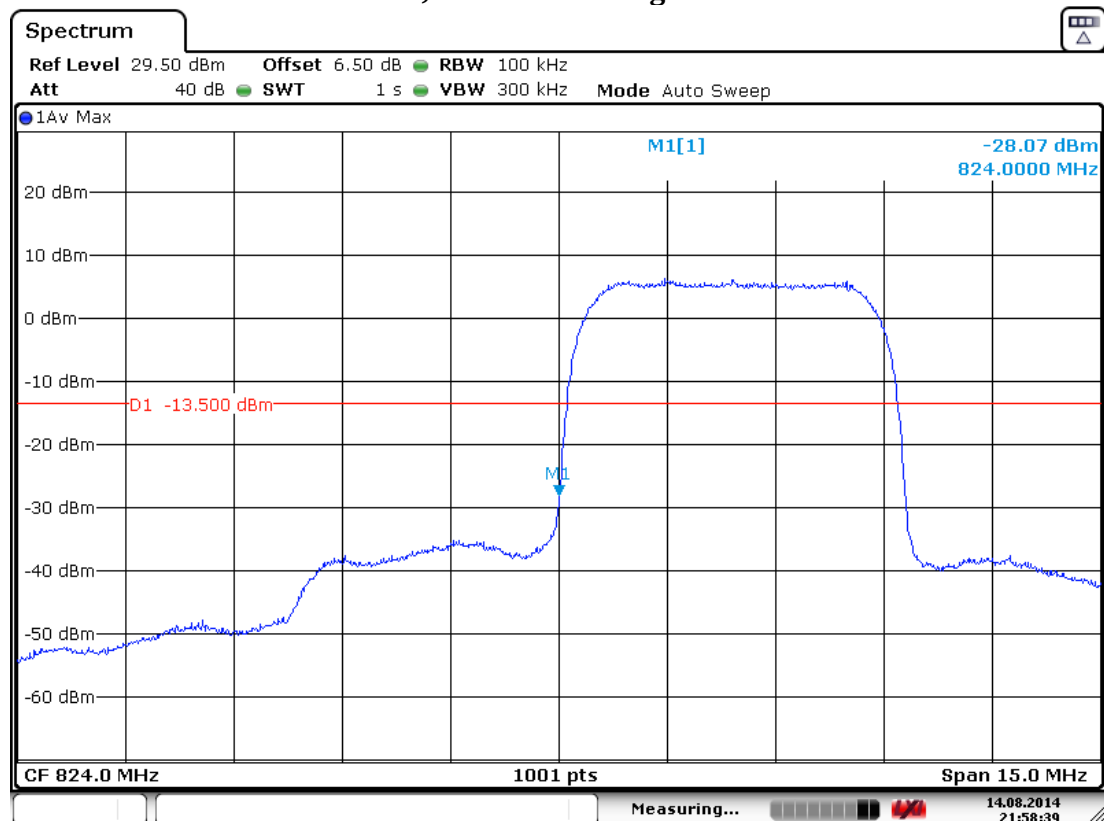
Band Edges Emissions at Antenna Terminals (Conducted)—WCDMA Band V / Band II

WCDMA Band V Modulation, Upper Band Edges



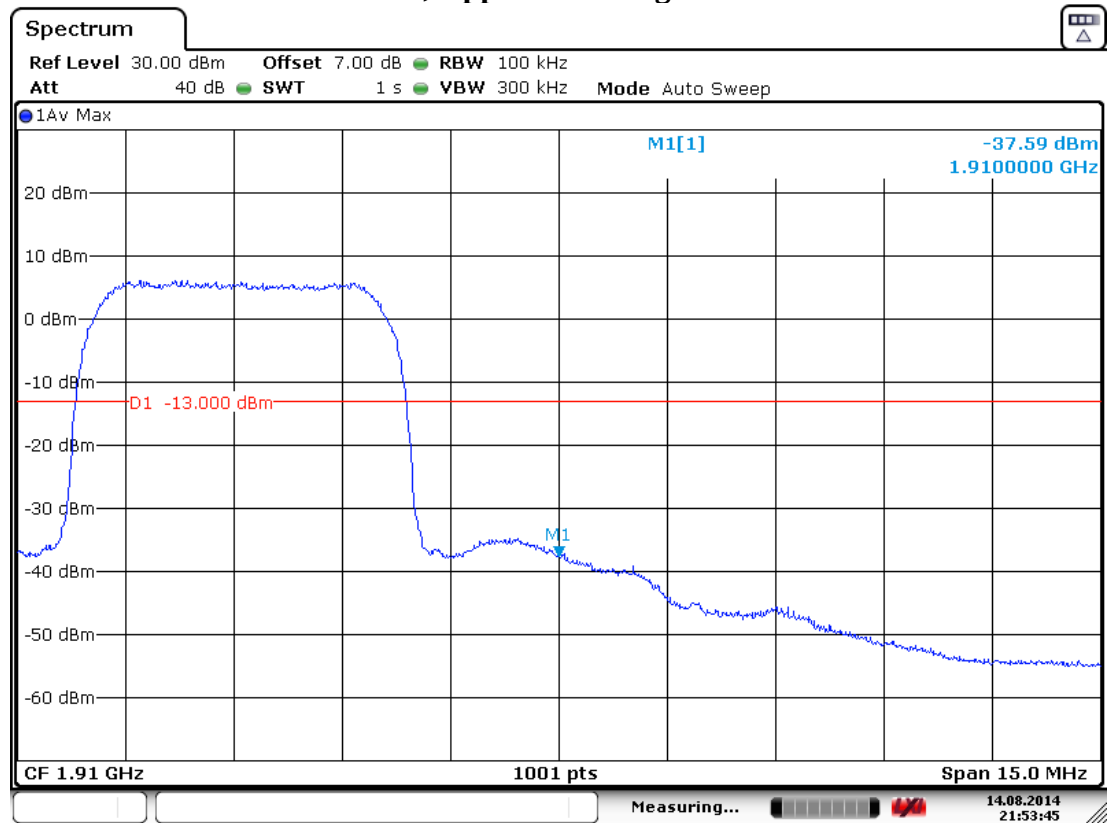
Date: 14.AUG.2014 22:00:59

WCDMA Band V Modulation, Below Band Edges



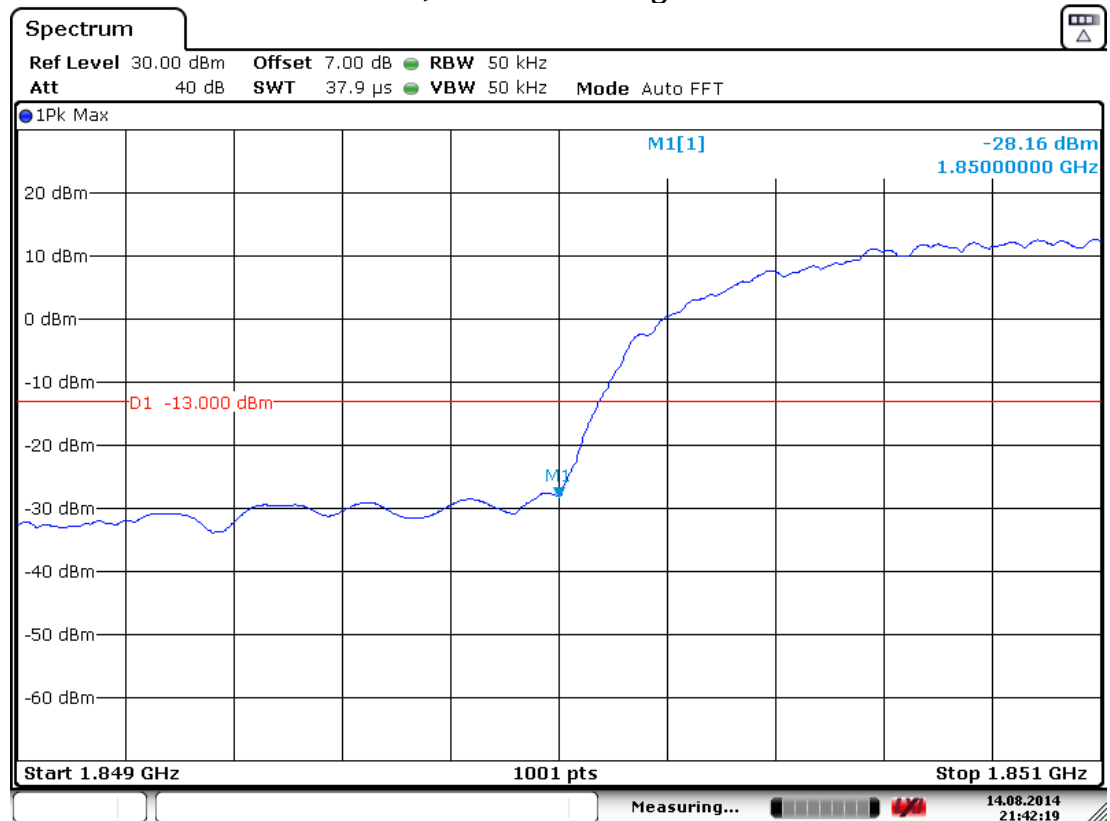
Date: 14.AUG.2014 21:58:39

WCDMA Band II Modulation, Upper Band Edges



Date: 14.AUG.2014 21:53:45

WCDMA Band II Modulation, Below Band Edges



Date: 14.AUG.2014 21:42:19

9. RADIATED EMISSION MEASUREMENT

9.1. Test Equipment

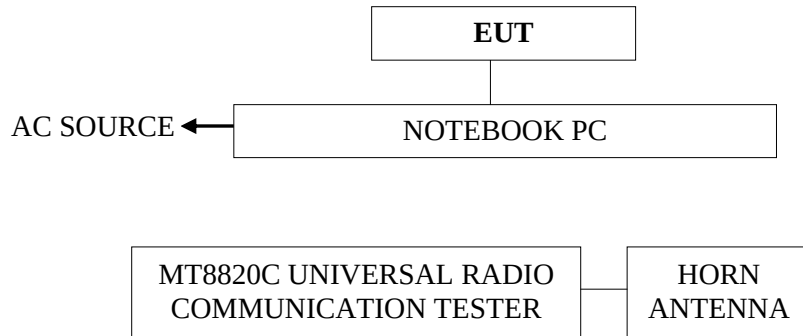
9.1.1. For Radiated Measurement (for 30MHz-1GHz)

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1.	Spectrum Analyzer	Agilent	N9010A-526	MY53400071	2014. 09. 18
2.	Test Receiver	R&S	ESCS30	100338	2015. 06. 23
3.	Amplifier	HP	8447D	2944A06305	2015. 02. 17
4.	Bilog Antenna	TESEQ	CBL6112D	33821	2014. 08. 07
5.	Universal Radio Communication Tester	Anritsu	MT8820C	6201144416	2015. 07. 31
6.	Horn Antenna	EMCO	3115	9112-3775	2015. 05. 08

9.1.2. For Radiated Measurement (for above 1GHz)

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1.	Spectrum Analyzer	Agilent	N9010A-526	MY53400071	2014. 09. 18
2.	Pre-Amplifier	Agilent	8449B	3008A02676	2015. 02. 20
3.	Tunable Notch Filter	K&L	3TNF-800/1000 -0.2-N/N	498	2015. 01. 05
4.	Tunable Notch Filter	K&L	5TNF-1700/200 0-01-N/N	344	2015. 01. 05
5.	Notch Filter	Micro Wave	H3G018G1	484797	2015. 06. 12
6.	Notch Filter	Micro Wave	H1G013G1	459777	2015. 06. 12
7.	Low Pass Filter	Mini-Circuits	BLP-1200+	15542	2014. 10. 23
8.	Universal Radio Communication Tester	Anritsu	MT8820C	6201144416	2015. 07. 31
9.	Horn Antenna	EMCO	3115	9112-3775	2015. 05. 08
10.	Horn Antenna	EMCO	3115	9609-4927	2015. 06. 16

9.2. Block Diagram of Test Setup



EUT: 3G Mobile Wi-Fi

9.3. Specification Limits

FCC §2.1053

FCC §22.917(a)

FCC §24.238(a)

According to specification, the power of emissions shall be attenuated below the transmitter power (P) by a factor of at least $43 + 10\log(P)$ dB, P in watts.

At P_o transmitting power, the specified minimum attenuation becomes $43 + 10\log(P_o)$, and the level in dBm relative P_o becomes:

$P_o \text{ (dBm)} - [43 + 10\log(P_o \text{ in m watts}) - 30] = -13\text{dBm}$

9.4. Test Procedure

The measurement was performed with the EUT inside a semi-anechoic chamber. The spectrum was scanned from 30MHz to at least the 10th harmonic of the highest frequency generated within the equipment. The EUT was placed on a 1 meter high non-conductive stand at a 3 meter distance from the measuring antenna for measurements below 1GHz and above 1GHz.

Detected emissions were maximized at each frequency by rotating the EUT and adjusting the measuring antenna height and polarization. The maximum meter reading was recorded. The radiated emissions were measured with peak detector and 1MHz bandwidth. Each detected emissions were substituted by the Substitution method, in accordance with the ANSI/TIA/EIA603C:2004.

9.5. Test Results

PASSED. All the test results are attached in next pages.

Test Date: 2014. 07. 10

Temperature: 26°C

Humidity: 60%

Test Date: 2014. 08. 14

Temperature: 26°C

Humidity: 57%

GPRS 850 Band, Frequency: 824.20MHz

Frequency (MHz)	Antenna Polarization	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)
1648.00	Horizontal	-29.48	-13.00	-16.48
4856.00	Horizontal	-20.15	-13.00	-7.15
7280.00	Horizontal	-23.92	-13.00	-10.92

Frequency (MHz)	Antenna Polarization	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)
1648.00	Vertical	-38.87	-13.00	-25.87
4856.00	Vertical	-29.10	-13.00	-16.10

Note 1. : All the emissions (up to 12.75GHz) not reported are too low to be measured.

Note 2. : The emission behavior belongs to narrowband spurious emission.

GPRS 850 Band, Frequency: 836.40MHz

Frequency (MHz)	Antenna Polarization	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)
1674.00	Horizontal	-31.01	-13.00	-18.01
2510.00	Horizontal	-43.24	-13.00	-30.24

Frequency (MHz)	Antenna Polarization	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)
1674.00	Vertical	-31.01	-13.00	-18.01
2510.00	Vertical	-42.04	-13.00	-29.04

Note 1. : All the emissions (up to 12.75GHz) not reported are too low to be measured.

Note 2. : The emission behavior belongs to narrowband spurious emission.

GPRS 850 Band, Frequency: 848.80MHz

Frequency (MHz)	Antenna Polarization	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)
1698.00	Horizontal	-33.84	-13.00	-20.84
2546.00	Horizontal	-49.37	-13.00	-36.37

Frequency (MHz)	Antenna Polarization	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)
1698.00	Vertical	-47.18	-13.00	-34.18
2546.00	Vertical	-51.61	-13.00	-38.61

Note 1. : All the emissions (up to 12.75GHz) not reported are too low to be measured.

Note 2. : The emission behavior belongs to narrowband spurious emission.

GPRS 1900 Band, Frequency: 1850.20MHz

Frequency (MHz)	Antenna Polarization	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)
3700.4	Horizontal	-48.09	-13.00	-35.09

Frequency (MHz)	Antenna Polarization	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)
3700.4	Vertical	-48.38	-13.00	-35.38

Note 1. : All the emissions (up to 12.75GHz) not reported are too low to be measured.

Note 2. : The emission behavior belongs to narrowband spurious emission.

GPRS 1900 Band, Frequency: 1880.00MHz

Frequency (MHz)	Antenna Polarization	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)
3760.00	Horizontal	-47.18	-13.00	-34.18
5632.00	Horizontal	-43.74	-13.00	-30.74

Frequency (MHz)	Antenna Polarization	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)
3760.00	Vertical	-47.90	-13.00	-34.90
5632.00	Vertical	-41.57	-13.00	-28.57

Note 1. : All the emissions (up to 12.75GHz) not reported are too low to be measured.

Note 2. : The emission behavior belongs to narrowband spurious emission.

GPRS 1900 Band, Frequency: 1909.80MHz

Frequency (MHz)	Antenna Polarization	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)
3820.00	Horizontal	-44.23	-13.00	-31.23
5736.00	Horizontal	-41.13	-13.00	-28.13

Frequency (MHz)	Antenna Polarization	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)
3816.00	Vertical	-44.90	-13.00	-31.90
5728.00	Vertical	-41.87	-13.00	-28.87

Note 1. : All the emissions (up to 12.75GHz) not reported are too low to be measured.

Note 2. : The emission behavior belongs to narrowband spurious emission.

WCDMA Band V, Frequency: 826.40MHz

Frequency (MHz)	Antenna Polarization	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)
1652.00	Horizontal	-56.10	-13.00	-43.10
2480.00	Horizontal	-52.40	-13.00	-39.40
3312.00	Horizontal	-46.99	-13.00	-33.99
7450.00	Horizontal	-32.84	-13.00	-19.84

Note 1. : All the emissions (up to 12.75GHz) not reported are too low to be measured.

Note 2. : The emission behavior belongs to narrowband spurious emission.

WCDMA Band V, Frequency: 836.40MHz

Frequency (MHz)	Antenna Polarization	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)
1676.00	Horizontal	-49.58	-13.00	-36.58
3352.00	Horizontal	-46.76	-13.00	-33.76

Note 1. : All the emissions (up to 12.75GHz) not reported are too low to be measured.

Note 2. : The emission behavior belongs to narrowband spurious emission.

WCDMA Band V, Frequency: 846.40MHz

Frequency (MHz)	Antenna Polarization	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)
1690.00	Horizontal	-48.11	-13.00	-35.11
2539.80	Horizontal	-52.65	-13.00	-39.65

Note 1. : All the emissions (up to 12.75GHz) not reported are too low to be measured.

Note 2. : The emission behavior belongs to narrowband spurious emission.

WCDMA Band II, Frequency: 1852.40MHz

Frequency (MHz)	Antenna Polarization	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)
3708.00	Horizontal	-40.41	-13.00	-27.41
5576.00	Horizontal	-40.48	-13.00	-27.48

Note 1. : All the emissions (up to 12.75GHz) not reported are too low to be measured.

Note 2. : The emission behavior belongs to narrowband spurious emission.

WCDMA Band II, Frequency: 1880.00MHz

Frequency (MHz)	Antenna Polarization	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)
3756.00	Horizontal	-42.02	-13.00	-29.02
5656.00	Horizontal	-42.63	-13.00	-29.63

Note 1. : All the emissions (up to 12.75GHz) not reported are too low to be measured.

Note 2. : The emission behavior belongs to narrowband spurious emission.

WCDMA Band II, Frequency: 1907.60MHz

Frequency (MHz)	Antenna Polarization	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)
3816.00	Horizontal	-38.95	-13.00	-25.95
5728.00	Horizontal	-41.25	-13.00	-28.25

Note 1. : All the emissions (up to 12.75GHz) not reported are too low to be measured.

Note 2. : The emission behavior belongs to narrowband spurious emission.

10.DEVIATION TO TEST SPECIFICATIONS

【NONE】

11.PHOTOGRAPHS

11.1.Photos of Conducted Disturbance Measurement

[Link Notebook PC with Charge and Operating Mode]



FRONT VIEW OF CONDUCTED MEASUREMENT



BACK VIEW OF CONDUCTED MEASUREMENT

[Link Power Adapter with Charge and Operating Mode]



FRONT VIEW OF CONDUCTED MEASUREMENT



BACK VIEW OF CONDUCTED MEASUREMENT

11.2.Photo of Conducted Measurement



11.3.Photos of Radiated Emission Measurement at Semi-Anechoic Chamber

11.3.1. Frequency Below 1GHz



11.3.2. Frequency Above 1GHz

