



# FCC RF Test Report

**Product Name: CDMA 1X Mobile Phone**

**Model Number: HUAWEI M570**

**Report No: SYBH(Z-RF)006052012-2001**

**FCC ID: QISM570**

**Reliability Laboratory of Huawei Technologies Co., Ltd.**

Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R. China

Tel: +86 755 28780808 Fax: +86 755 89652518

## Notice

1. The laboratory has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS), and accreditation number: L0310.
2. The laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 97456.
3. The laboratory has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 6369A-2.
4. The test report is invalid if not marked with "exclusive stamp for the test report".
5. The test report is invalid if not marked with the stamps or the signatures of the persons responsible for performing, revising and approving the test report.
6. The test report is invalid if there is any evidence of erasure and/or falsification.
7. If there is any dissidence for the test report, please file objection to the test centre within 15 days from the date of receiving the test report.
8. Normally, the test report is only responsible for the samples that have undergone the test.
9. Context of the test report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of the laboratory.



**Applicant:** Huawei Technologies Co., Ltd.  
**Address:** Huawei Base, Bantian, Longgang District, Shenzhen  
 518129, P.R. China  
**Date of Receipt Test Item:** May.14, 2012  
**Start Date of Test:** May.14, 2012  
**End Date of Test:** May.24, 2012

**Test Result:** Pass

Approved By Senior Engineer May.25, 2012 Dai Linjun *Dai Linjun*  
 Date Name Signature

Reviewed By May.25, 2012 Cousy Xu *Cousy XU*  
 Date Name Signature

Operator May.25, 2012 Huang Qiuliang *Huang Qiuliang*  
 Date Name Signature



## Contents

<b>1</b>	<b><u>General Information</u></b> .....	<b>5</b>
1.1	APPLIED STANDARD.....	5
1.2	TEST LOCATION.....	5
1.3	TEST ENVIRONMENT CONDITION .....	5
<b>2</b>	<b><u>Summary</u></b> .....	<b>6</b>
<b>3</b>	<b><u>Product Description</u></b> .....	<b>7</b>
3.1	PRODUCTION INFORMATION .....	7
<b>4</b>	<b><u>Test Description</u></b> .....	<b>8</b>
4.1	SUPPORTED FREQUENCY RANGE .....	8
4.2	TRANSMITTER / RECEIVER CHARACTERISTICS.....	8
4.3	ANTENNA GAIN.....	8
4.4	POWER SUPPLY .....	8
<b>5</b>	<b><u>General Test Conditions / Configurations</u></b> .....	<b>9</b>
5.1	RF CHANNELS UNDER TEST.....	9
5.2	TEST MODES.....	9
5.3	TEST ENVIRONMENTS .....	9
5.4	TEST SETUPS.....	10
5.5	TEST CONDITIONS .....	12
<b>6</b>	<b><u>Main Test Instruments</u></b> .....	<b>14</b>
<b>7</b>	<b><u>Test Results</u></b> .....	<b>15</b>
<b>8</b>	<b><u>Measurement Uncertainty</u></b> .....	<b>16</b>



# 1 General Information

## 1.1 Applied Standard

Applied Rules: 47 CFR FCC Part 2, 2011. Subpart J  
47 CFR FCC Part 22, 2011. Subpart H  
ANSI/TIA 603C:2004

## 1.2 Test Location

Test Location 1: Reliability Laboratory of Huawei Technologies Co., Ltd.  
Address: Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R.  
China

## 1.3 Test Environment Condition

Ambient Temperature: 20 – 25 °C  
Ambient Relative Humidity: 45 – 55 %  
Atmospheric Pressure: 101 kPa

## 2 Summary

Table 1 Summary of results

Cellular Band			
Test Case	FCC Part No.	Requirements	Result
Transmitter Output Power	2.1046 & 22.913	ERP not exceed 7 W	Pass
Modulation Characteristics	2.1047	Digital modulation	Pass
Occupied Bandwidth	2.1049	(Not specified)	Pass
Band Edges Compliance	2.1051 & 22.917	Below -13 dBm/1%*EBW, in 1 MHz range	Pass
Spurious Emission at Antenna Terminals	2.1051 & 22.917	Below -13 dBm/1 kHz, 9 kHz to 150 kHz Below -13 dBm/10 kHz, 150 kHz to 30 MHz Below -13 dBm/100 kHz, 30 MHz to 10 <sup>th</sup> harmonics	Pass
Field Strength of Spurious Radiation	2.1053 & 22.917	Below -13 dBm/100 kHz	Pass
Frequency Stability	2.1055 & 22.355	Maintained within the tolerances of $\pm 2.5$ ppm	Pass

### 3 Product Description

#### 3.1 Production Information

##### 3.1.1 General Description

CDMA 1X Mobile Phone HUAWEI M570 is a subscriber equipment in the CDMA system. It is a stylish bar-type mobile phone with a 2.4-inch QVGA TFT display. Based on Qualcomm's QSC6055 platform, the M570 provides an extra-long standby time and supports CDMA 1X 800/1900 MHz and AWS band, but only CDMA 1X 800 MHz test data in this report. Besides the basic voice, SMS, MMS, WAP, and BREW functions, the M570 also incorporates a camera, and supports applications such as Bluetooth, and weather forecast.

##### 3.1.2 Board

Table 1 Board Information

CDMA 1X Mobile Phone	
HUAWEI M570	
Main board	
Software Version	Hardware Version
M570 V100R001C45B107	Ver.B

##### 3.1.3 Adapter

AC/DCAdapter Model	HS-050040U5(02220120)
Manufacturer	Huawei Technologies Co., Ltd.
Input Voltage	~100-240V, 50/60Hz
Output Voltage	5V  400mA
Rated Power	2W
Serial Number	HKAC12670683, TPAC11248227

##### 3.1.4 Battery Technical Data

Name	Description
Rechargeable Li-ion	Manufacturer: Huawei Technologies Co., Ltd. Battery Model: HB5A2H Rated capacity: 1150 mAh Nominal Voltage:  +3.7V Charging Voltage:  +4.2V S/N: UNDC302X97700379 S/N: YACC301197702524

## 4 Test Description

### 4.1 Supported Frequency Range

Characteristics	Description
Downlink	869 to 894 MHz
Uplink	824 to 849 MHz

### 4.2 Transmitter / Receiver Characteristics

Characteristics	Description
System Type	CDMA
TX Output Power (per Antenna Port)	24 dBm
Channel Spacing(s) / Bandwidth(s)	CDMA system: 1.23 MHz (Celluar band)
Designation of Emissions	CDMA system: 1M28F9W (Celluar band)

### 4.3 Antenna Gain

Antenna Gain(dBi):	2.5
Antenna Gain(dBd):	0.35

### 4.4 Power Supply

	Description
Power Supply Type	Directly Connected to DC /AC Power Supply
Input to EUT (DC power)	DC Voltage Nominal: $\equiv$ +3.7V DC Voltage Range: $\equiv$ +3.5 V to +4.2V
Input to EUT (AC power)	AC Voltage Nominal: ~ 120V (50/60 Hz) AC Voltage Range: ~ 100V-240V

## 5 General Test Conditions / Configurations

### 5.1 RF Channels under Test

Test Mode	TX / RX	RF Channel		
		Bottom (B)	Middle (M)	Top (T)
TM1/TM3	TX	Channel 1013	Channel 384	Channel 777
		824.7MHz	836.52MHz	848.31MHz
	RX	Channel 1013	Channel 384	Channel 777
		869.7MHz	881.52MHz	893.31MHz

### 5.2 Test Modes

Test Mode	Test Modes Description
TM1/TM3	CDMA2000 1x

### 5.3 Test Environments

Environment Parameter	Selected Values During Tests	
Relative Humidity	Ambient	
Temperature	TN	Ambient
Voltage	VL	3.5V
	VN	3.7V
	VH	4.2V

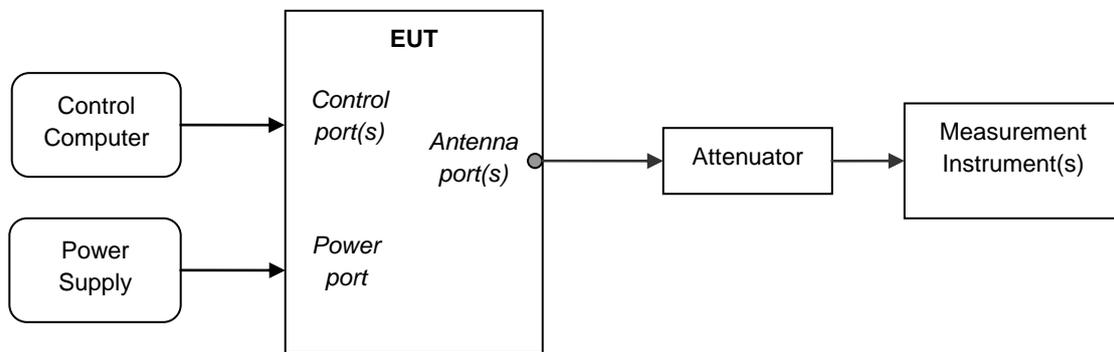
NOTE: VL= lower extreme test voltages  
 VN= nominal voltage  
 VH= upper extreme test voltage  
 TN= normal temperature

## 5.4 Test Setups

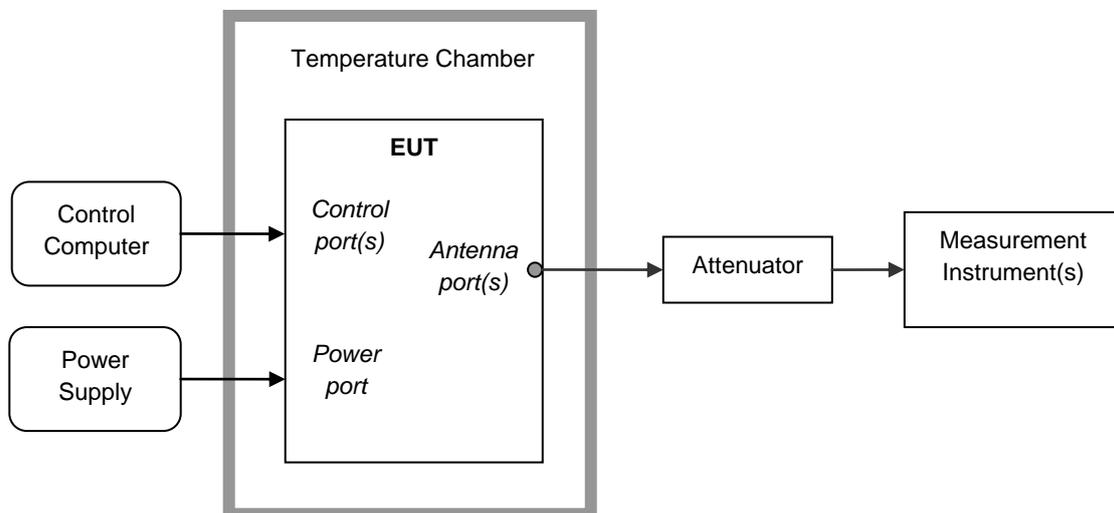
### 5.4.1 General Test Setup Configurations

Configuration	Description
Test Antenna Ports	Until otherwise declared, all TX tests are ONLY performed at the main Transmitter antenna port (e.g. TRXA, TXA and so on) of the EUT, and all RX tests are ONLY performed at the main Receiver antenna port (e.g. TRXA, RXA and so on) of the EUT.
Multiple RF Sources	Other than the tested RF source of the EUT, other RF source(s) are disabled or shutdown during measurements.

### 5.4.2 Test Setup 1



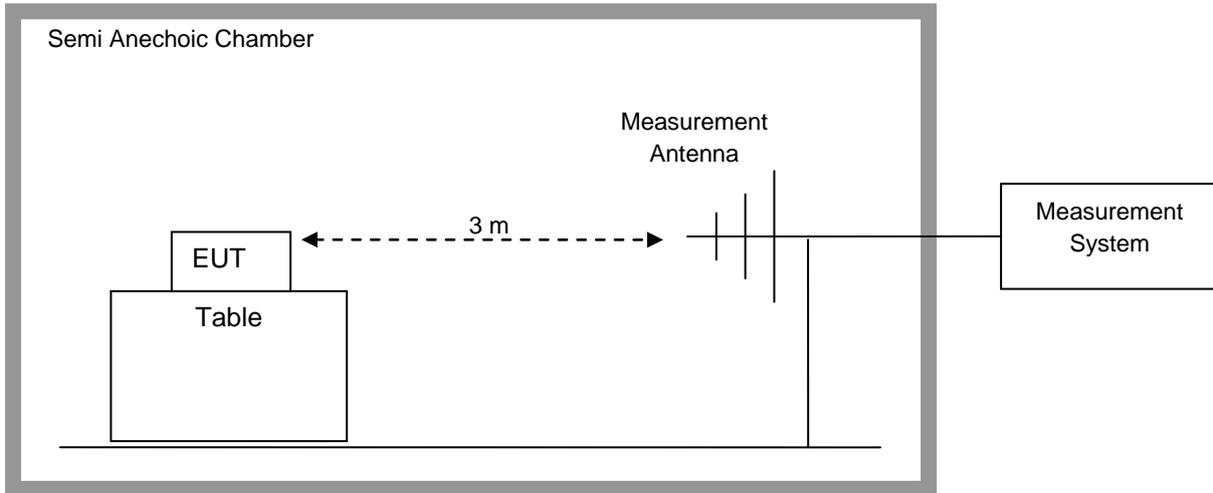
### 5.4.3 Test Setup 2



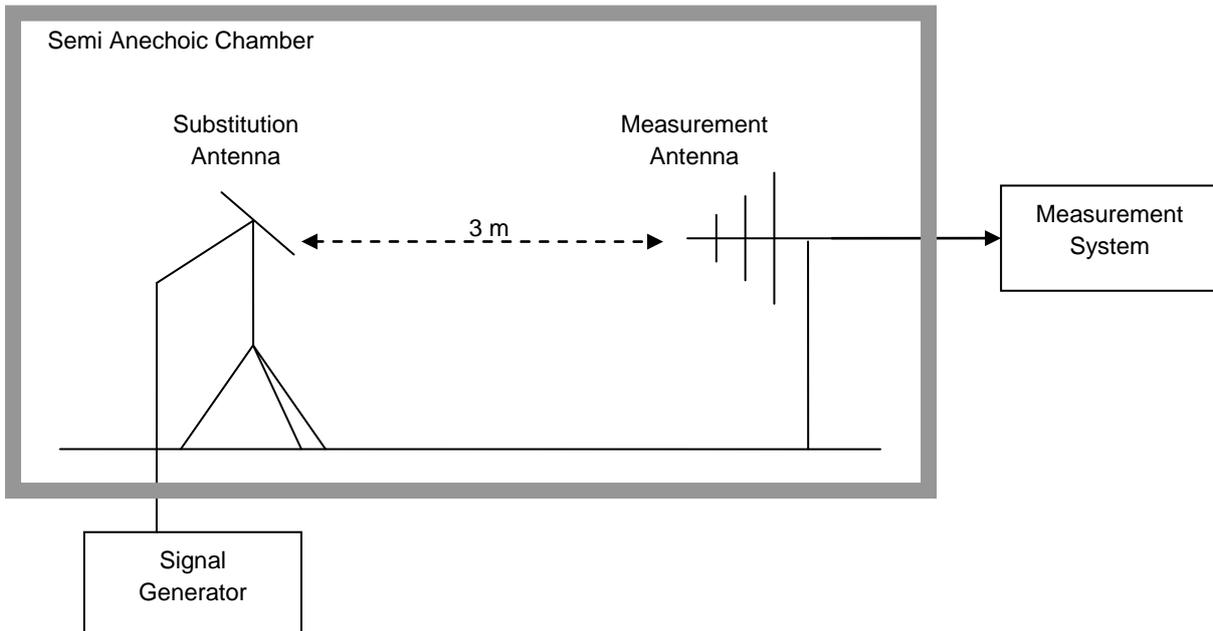
### 5.4.4 Test Setup 3

NOTE: Effective radiated power (ERP) refers to the radiation power output of the EUT, assuming all emissions are radiated from half-wave dipole antennas.

#### Step 1: Pre-test



#### Step 2: Substitution method to verify the maximum ERP



## 5.5 Test Conditions

Test Case	Test Conditions	
Transmitter Output Power	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1 & Test Setup 3
	Detector	RMS
	RF Channels (TX)	B, M, T
	Test Mode	TM1/TM3
Modulation Characteristics	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1
	RF Channels (TX)	M
	Test Mode	TM1/TM3
Occupied Bandwidth	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1
	Detector	PK
	RF Channels (TX)	B, M, T
	Test Mode	TM1/TM3
Band Edges Compliance	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1
	Detector	RMS
	RF Channels (TX)	B, T
	Test Mode	TM1/TM3
Spurious Emission at Antenna Terminals	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1
	Detector	PK
	RF Channels (TX)	B, M, T
	Test Mode	TM1/TM3
Field Strength of Spurious Radiation	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 3
	Detector	PK
	RF Channels (TX)	M
	Test Mode	TM1/TM3
Frequency Stability	Test Configuration	(1) -30 °C to +50 °C with step 10 °C at Rated Voltage; (2) 85%, 100% and 115% of Rated Voltage at Ambient Temperature.
	Test Setup	Test Setup 2



---

---

Test Case	Test Conditions	
	RF Channels (TX)	M
	Test Mode	TM1/TM3

## 6 Main Test Instruments

Table 2 Main Test Equipments

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until
Power supply	KEITHLEY	2303	1288003	Sep.27,2012
Universal Radio Communication Tester	R&S	CMU200	117341	Jan.12.2013
Universal Radio Communication Tester	Agilent	E5515C	MY50260239	Aug.31,2012
Spectrum Analyzer	Agilent	E4440A	MY49420179	Jul.17,2012
Signal Analyzer	R&S	FSQ31	200021	Sep.27,2012
Temperature Chamber	WEISS	WKL64	24600294	Feb.13,2013
Signal generator	Agilent	E8257D	MY49281095	Jul.09.2012
Test receiver	R&S	ESU26	100150	May.29.2012
Tunable Dipole	Schwarzbeck	D69250-UHAP/D69250-VHAP	919/1009	Jan.29.2013
Tunable Dipole	Schwarzbeck	D69250-UHAP/D69250-VHAP	979/917	Jan.29.2013
Horn Antenna	R & S	HF906	100683	May.14, 2013
Horn Antenna	R & S	HF906	100684	Jul.01, 2012
Broadband Antenna	Schwarzbeck	VULB 9163	9163-357	May.14, 2013
Broadband Antenna	Schwarzbeck	VULB 9163	9163-356	May.14, 2013



## 7 Test Results

No.	Test Item	Test Result
1	Transmitter Output Power	Appendix A
2	Modulation Characteristics	Appendix B
3	Occupied Bandwidth	Appendix C
4	Band Edges Compliance	Appendix D
5	Spurious Emission at Antenna Terminals	Appendix E
6	Field Strength of Spurious Radiation	Appendix F
7	Frequency Stability	Appendix G
8	Photos of Radiated Spurious Emissions	Appendix H

NOTE: The Appendix H only photos of Radiated Spurious Emissions, no test data

## 8 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:

Test Item		Extended Uncertainty
Transmitter Output Power	Power (dBm)	U =0.39 dB
Occupied Bandwidth	Magnitude (%)	U=0.2%
Band Edge Compliance	Disturbance Power (dBm)	U=2.0 dB
Conducted Spurious Emissions	Disturbance Power (dBm)	U=2.0 dB
Field Strength of Spurious Radiation	ERP (dBm)	U=4.6 dB (30 MHz – 1GHz) U=3.0 dB (above 1 GHz)
Frequency Stability	Frequency Accuracy (ppm)	U=0.21 ppm

-----The END-----



---

# Appendix A

## Transmitter Output Power According to FCC Part 2.1046 & Part 22.913



### Conducted Power of Transmitter

TEST CONDITIONS (TN/VN)	RF Output Power					
	Channel 1013(B) 824.7MHz		Channel 384(M) 836.52MHz		Channel 777(T) 848.31MHz	
	dBm		dBm		dBm	
	Measured	Limit	Measured	Limit	Measured	Limit
TM1	24.62	38.5	24.64	38.5	24.66	38.5
TM3	24.77	38.5	24.78	38.5	24.71	38.5

### Peak-to-Average Ratio

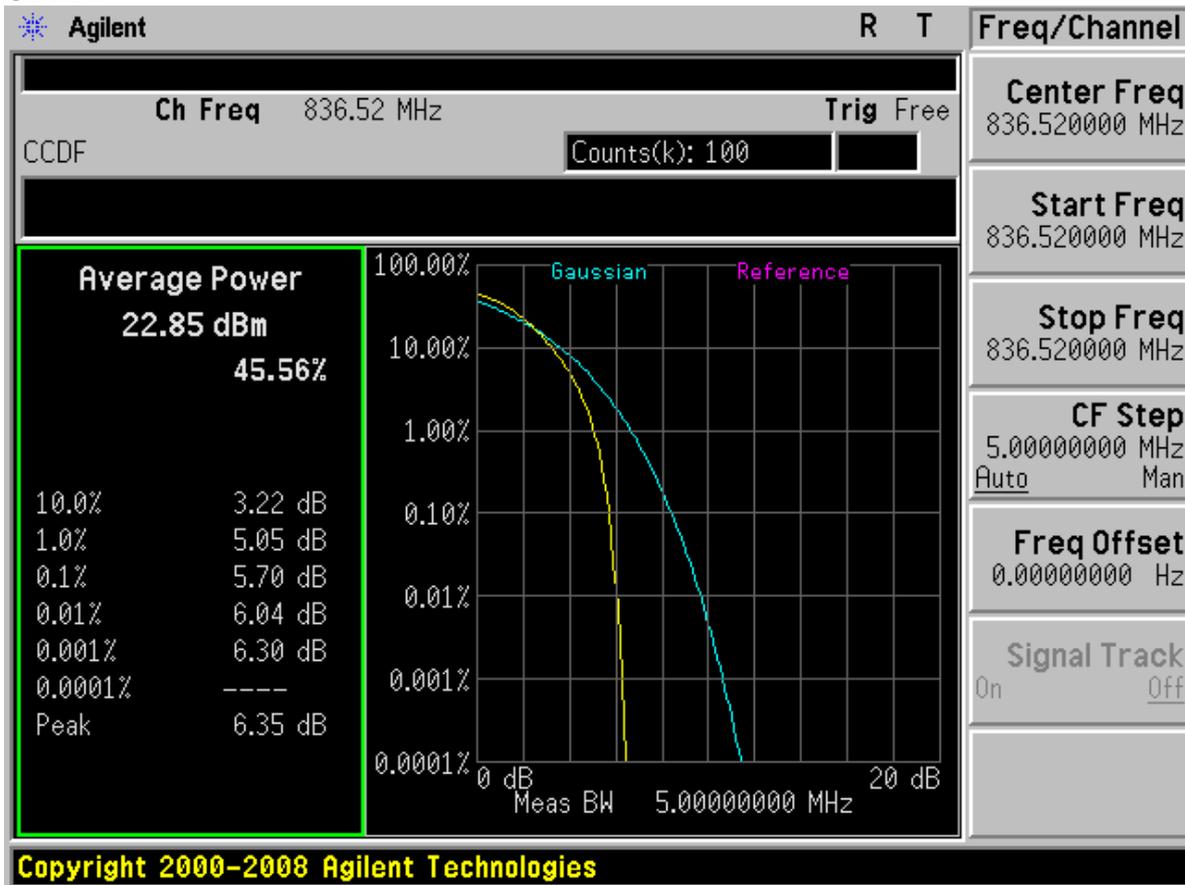
TEST CONDITIONS (TN/VN)	RF Output Power					
	Channel 1013(B) 824.7MHz		Channel 384(M) 836.52MHz		Channel 777(T) 848.31MHz	
	dB		dB		dB	
	Measured	Limit	Measured	Limit	Measured	Limit
TM1	5.4	13.0	<b>5.7</b>	13.0	5.2	13.0
TM3	4.2	13.0	4.1	13.0	3.8	13.0



## Test Plot of Peak-to-Average Ratio

Note: All relevant operation modes have been tested, and the worst case Plot is included in this report.

CDMA





### Effective Radiated Power of Transmitter (ERP)

Test Mode	Freq. [MHz]	Meas. Level [dBm]	Substitution Antenna Type	SGP [dBm]	Substitution Gain [dBd]	Cable Loss [dB]	Substitution Level (ERP) [dBm]	Limit [dBm]	Result
TM1	824.7	24.97	Dipole Ant.	28.44	-2.95	0.6	24.89	38.5	Pass
TM1	836.52	24.99	Dipole Ant.	28.57	-3.02	0.6	24.95	38.5	Pass
TM1	848.31	25.01	Dipole Ant.	28.69	-3.11	0.6	24.98	38.5	Pass
TM3	824.7	25.12	Dipole Ant.	28.62	-2.95	0.6	25.07	38.5	Pass
TM3	836.52	25.13	Dipole Ant.	28.7	-3.02	0.6	25.08	38.5	Pass
TM3	848.31	25.06	Dipole Ant.	28.72	-3.11	0.6	25.01	38.5	Pass

Note: a, For getting the ERP (Efficient Radiated Power) in substitution method, the following formula should take to calculate it,  
 $ERP [dBm] = SGP [dBm] - Cable Loss [dB] + Gain [dBd]$   
 b, SGP=Signal Generator Level

-----The END-----



---

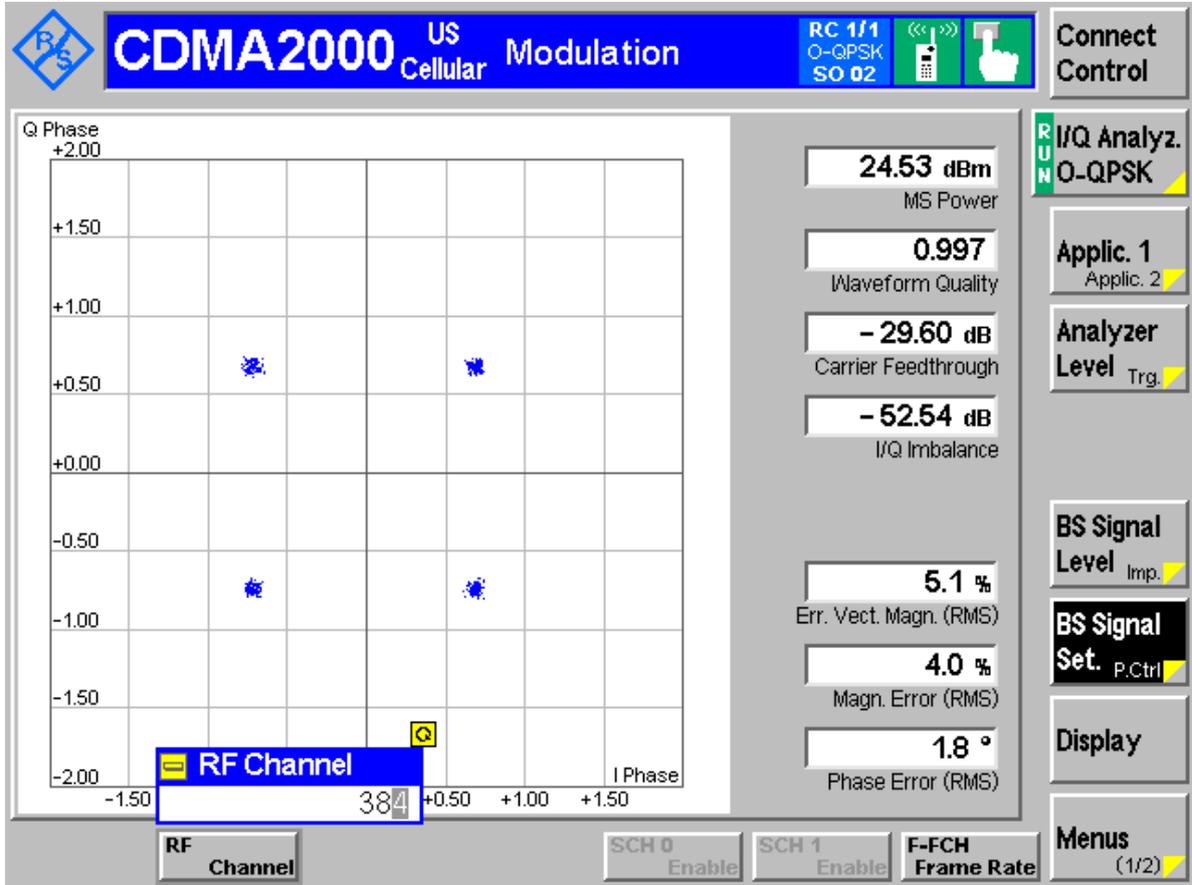
## **Appendix B**

# Modulation Characteristics

According to FCC Part 2.1047 & Part 22 Subpart H

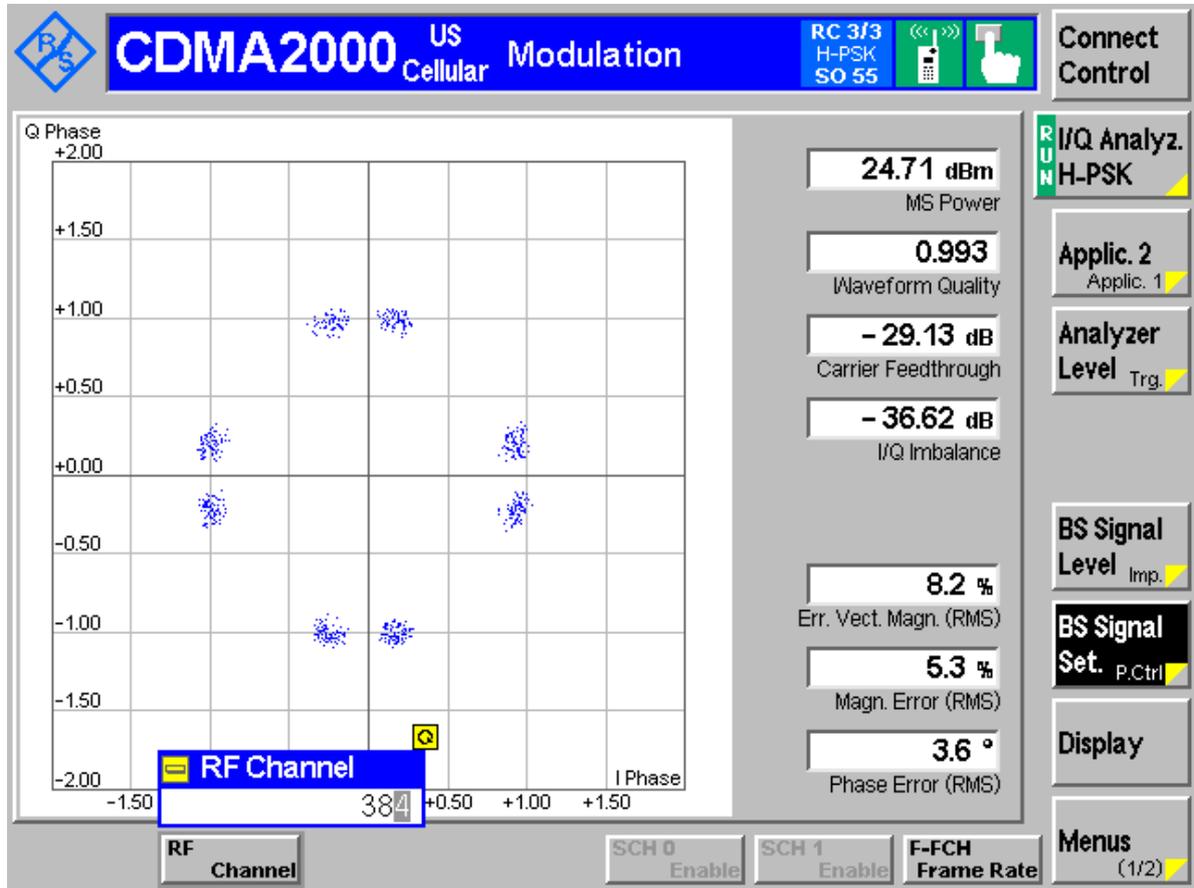


## Channel 384(TM1)





## Channel 384(TM3)



-----The END-----



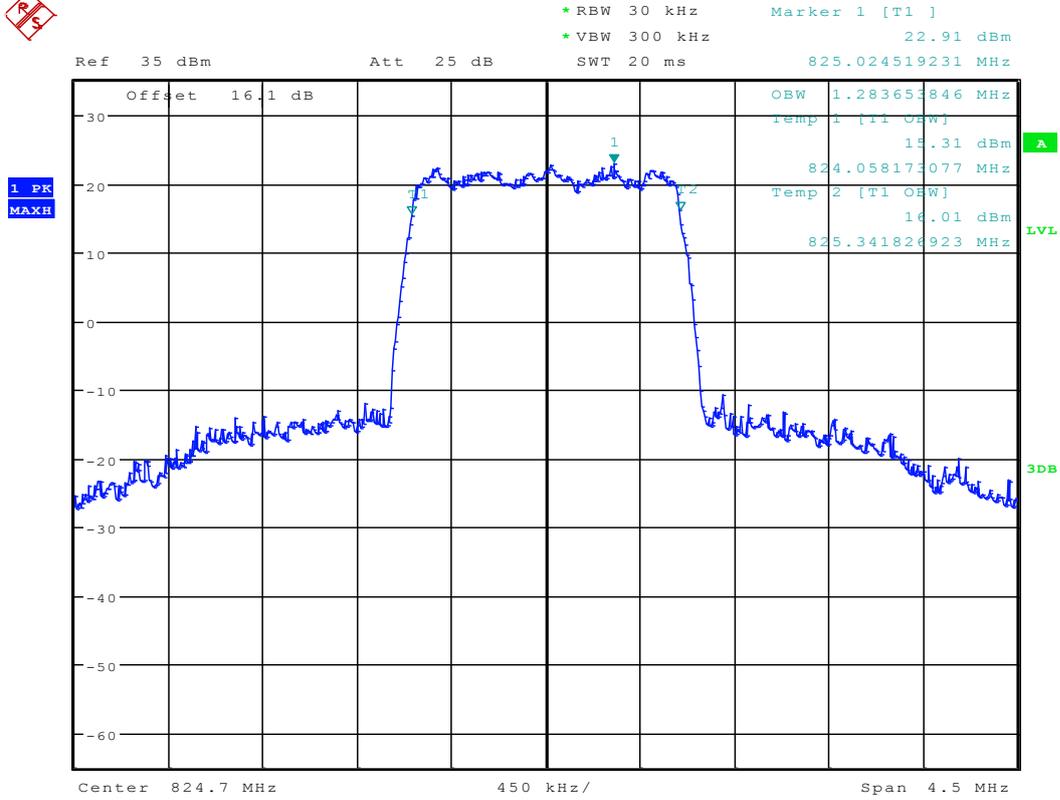
## Appendix C

# Occupied Bandwidth

According to FCC Part 2.1049 & Part 22 Subpart H



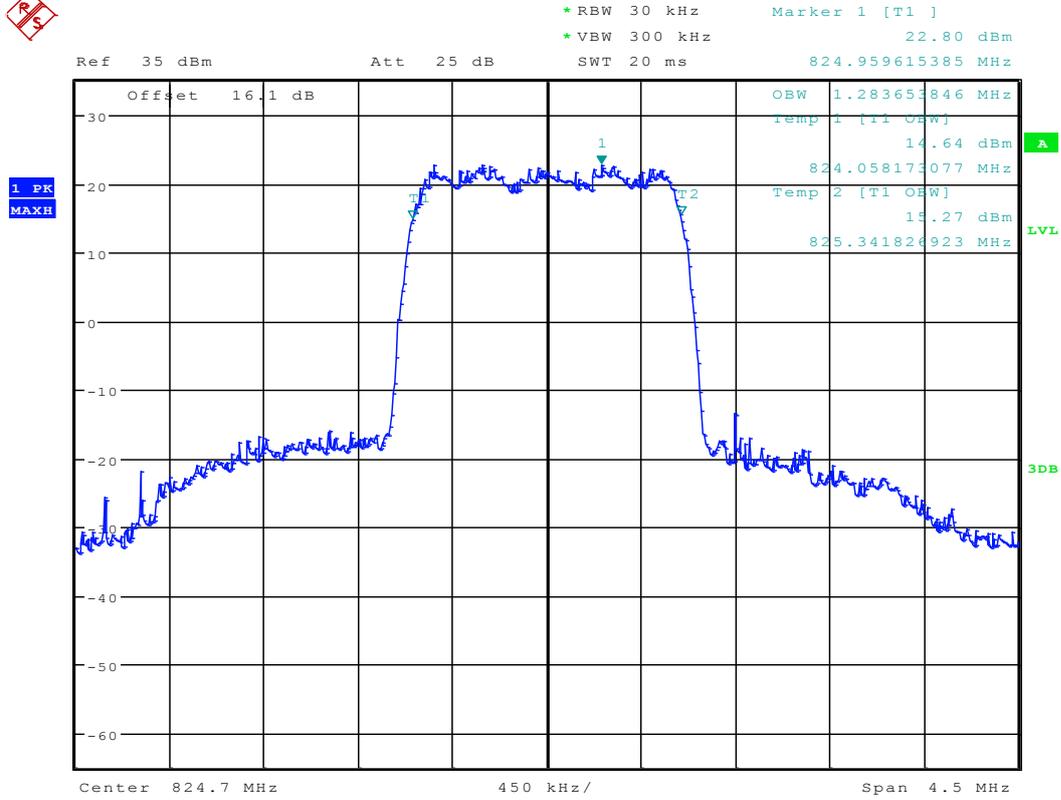
## Channel 1013 (TM1)



Date: 10.MAY.2012 11:41:55



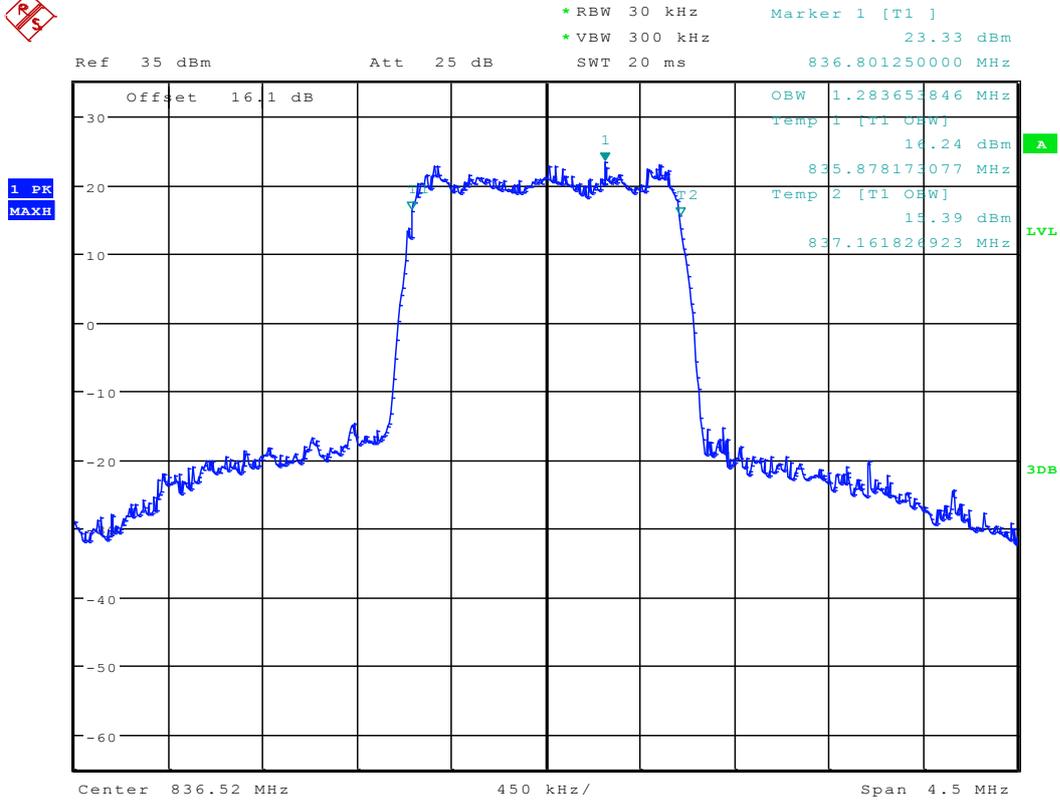
## Channel 1013 (TM3)



Date: 10.MAY.2012 11:42:37



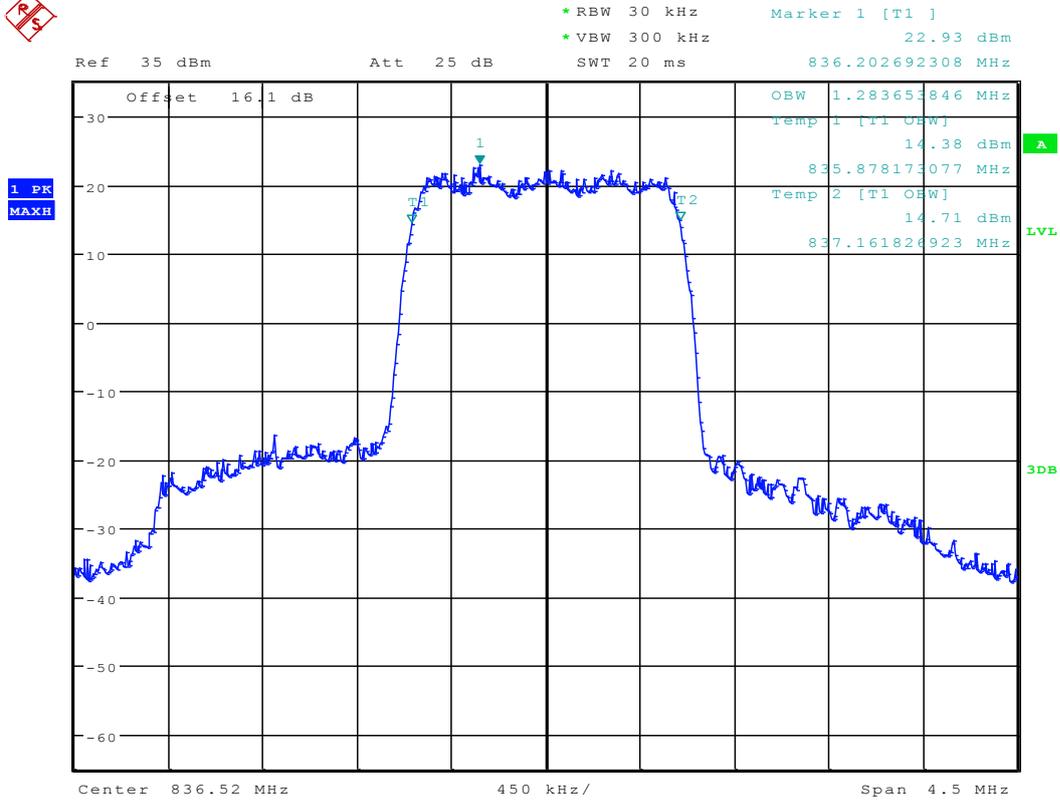
## Channel 384 (TM1)



Date: 10.MAY.2012 11:42:08



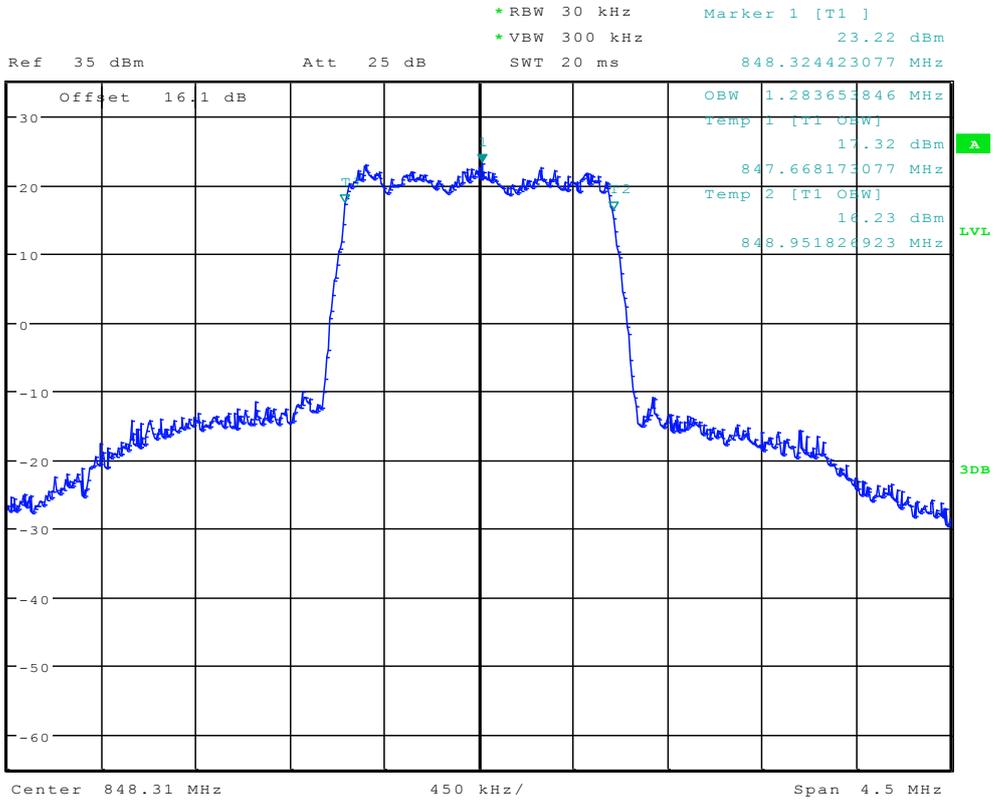
## Channel 384 (TM3)



Date: 10.MAY.2012 11:42:51



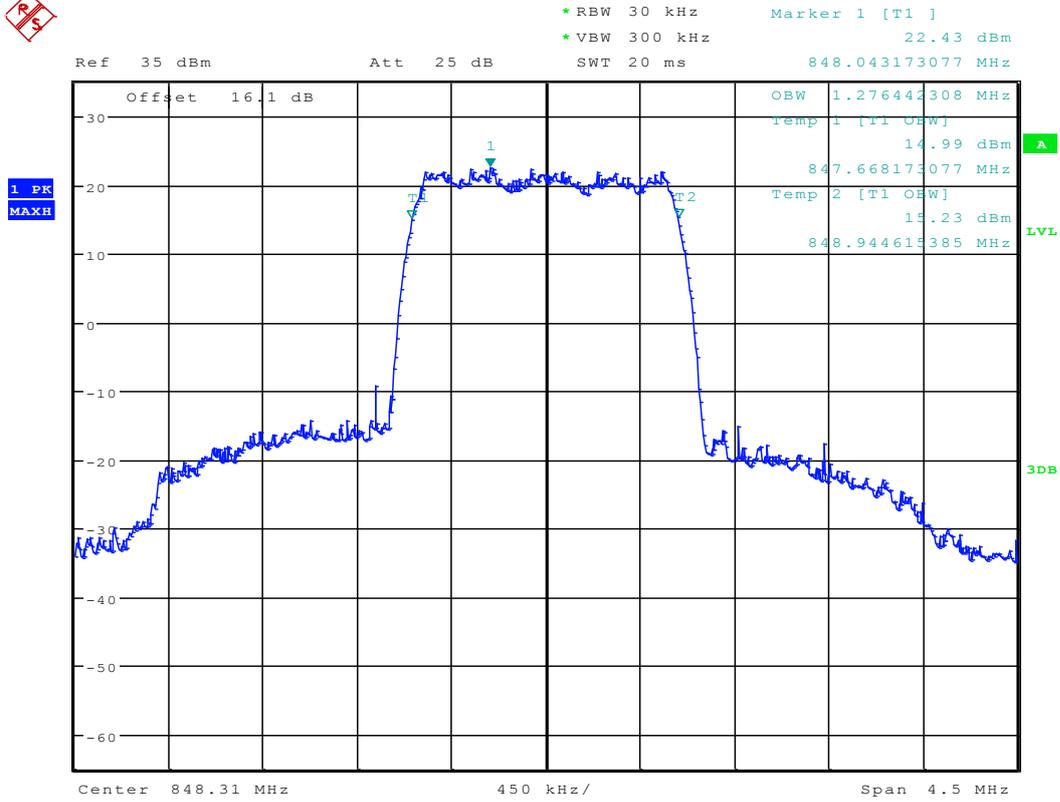
## Channel 777 (TM1)



Date: 10.MAY.2012 11:42:22



## Channel 777 (TM3)



Date: 10.MAY.2012 11:43:05

-----The END-----



## Appendix D

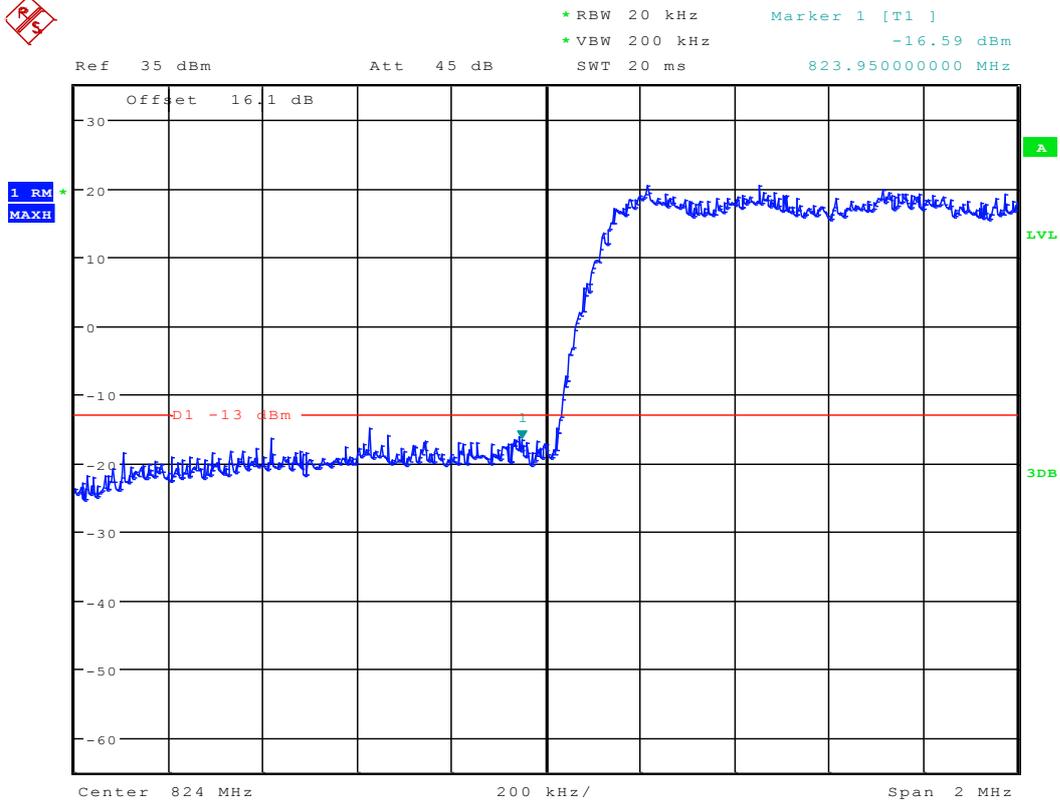
# Band Edges Compliance

According to FCC Part 2.1051 & 22.917



# TM1

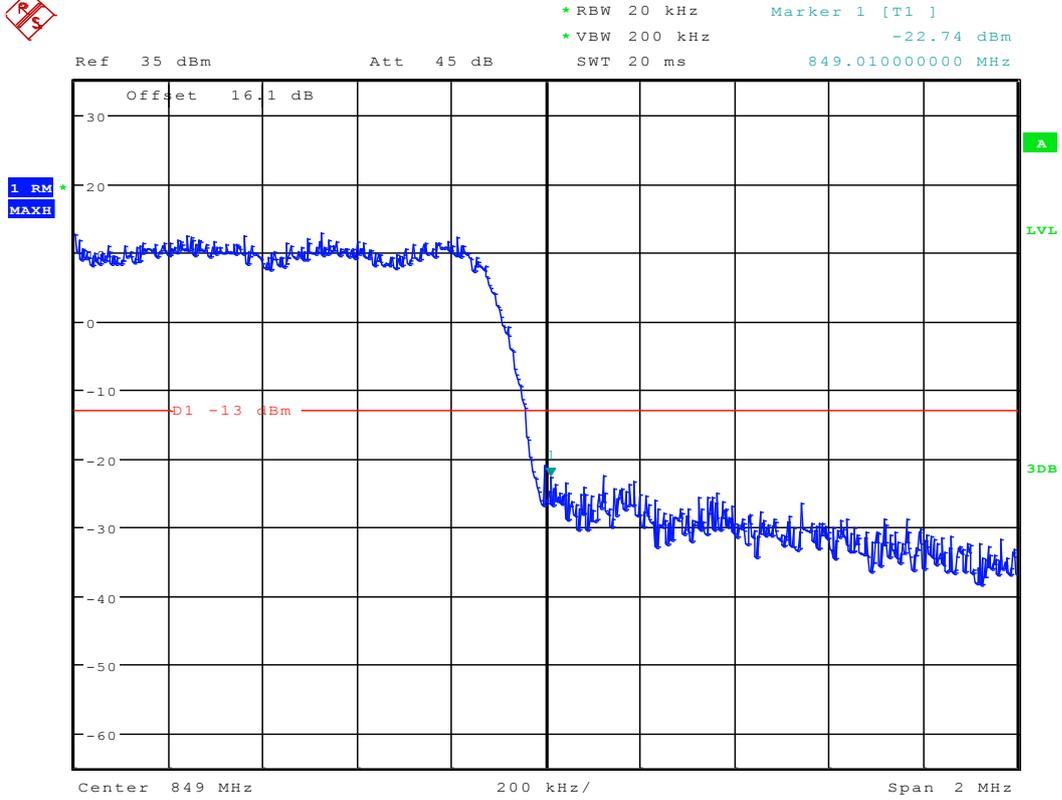
## Left Edge (824 MHz) Channel 1013



Date: 10.MAY.2012 11:40:55



### Right Edge (849MHz) Channel 777

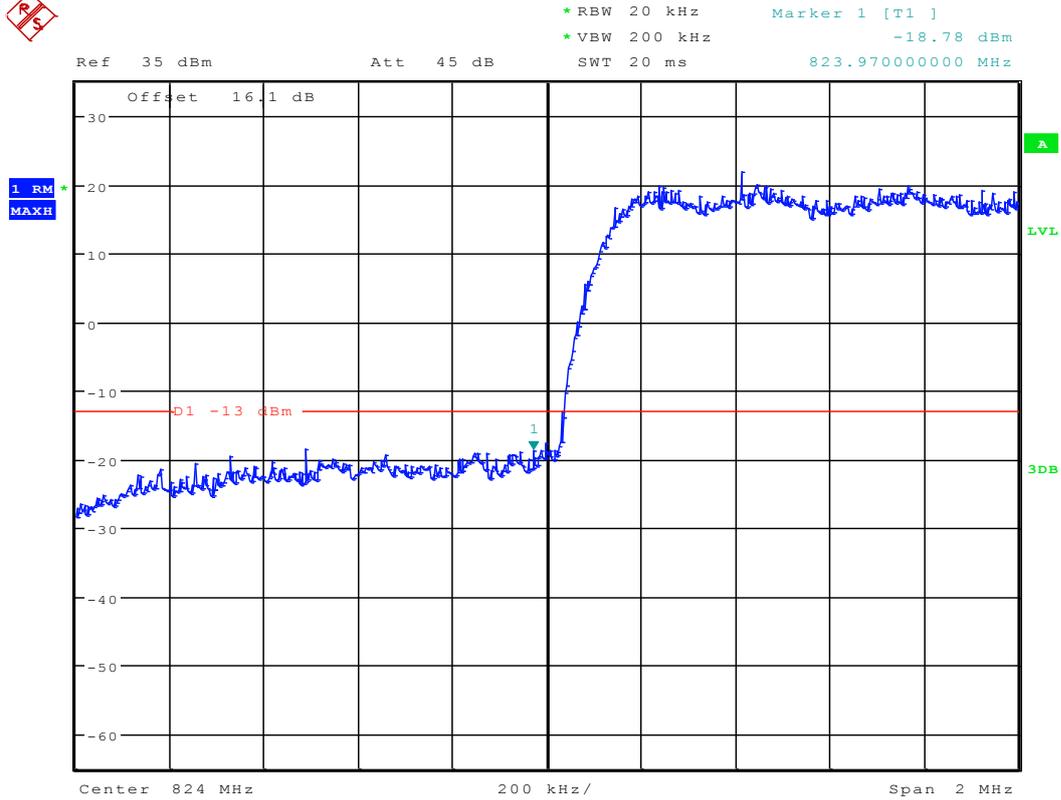


Date: 10.MAY.2012 11:41:09



# TM3

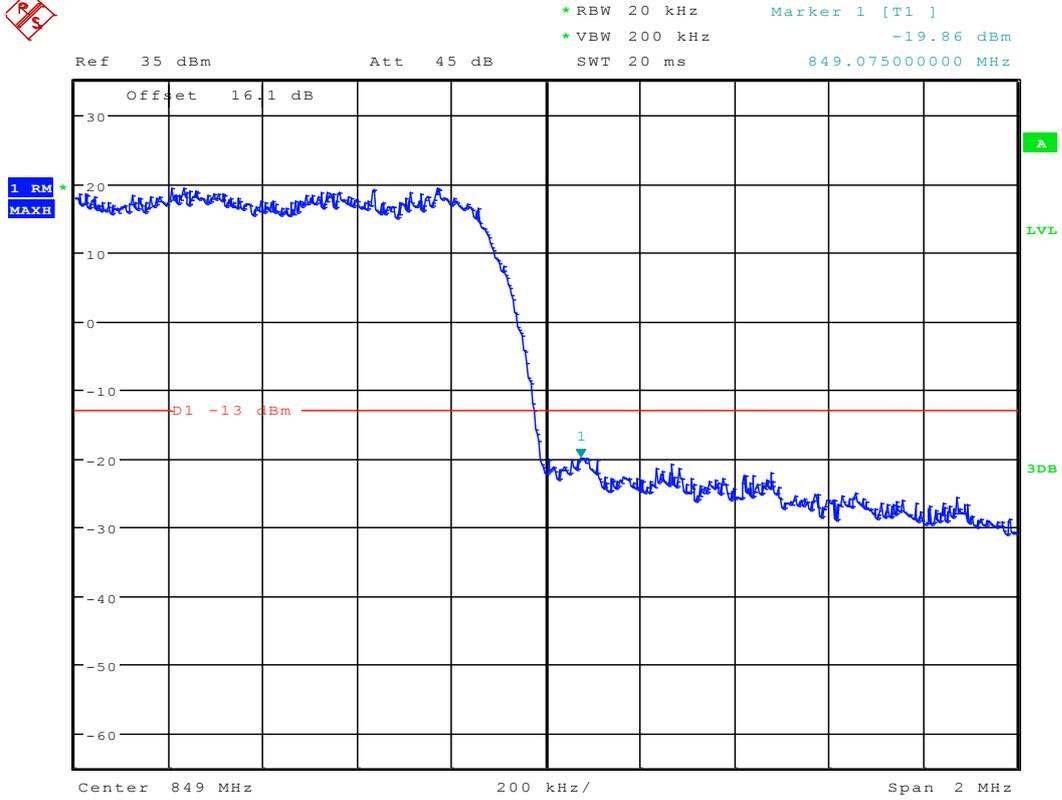
## Left Edge (824 MHz) Channel 1013



Date: 10.MAY.2012 11:41:25



### Right Edge (849MHz) Channel 777



Date: 10.MAY.2012 11:41:39

-----The END-----



## Appendix D

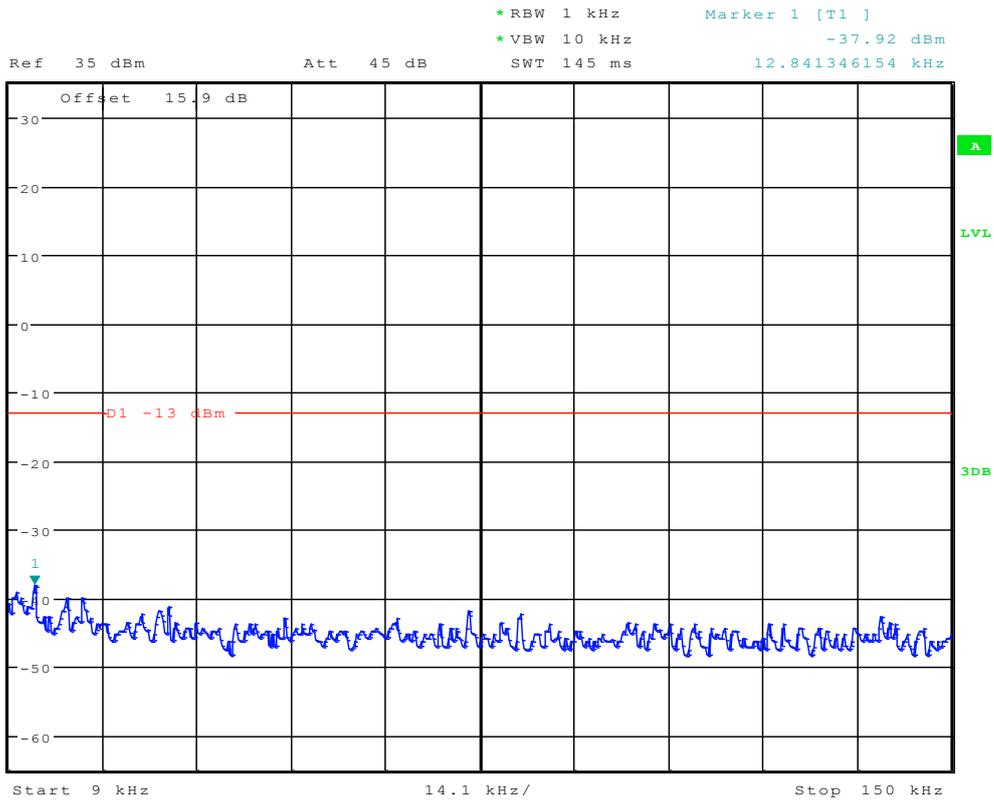
# Spurious Emission at Antenna Terminal

According to FCC Part 2.1051 & 22.917

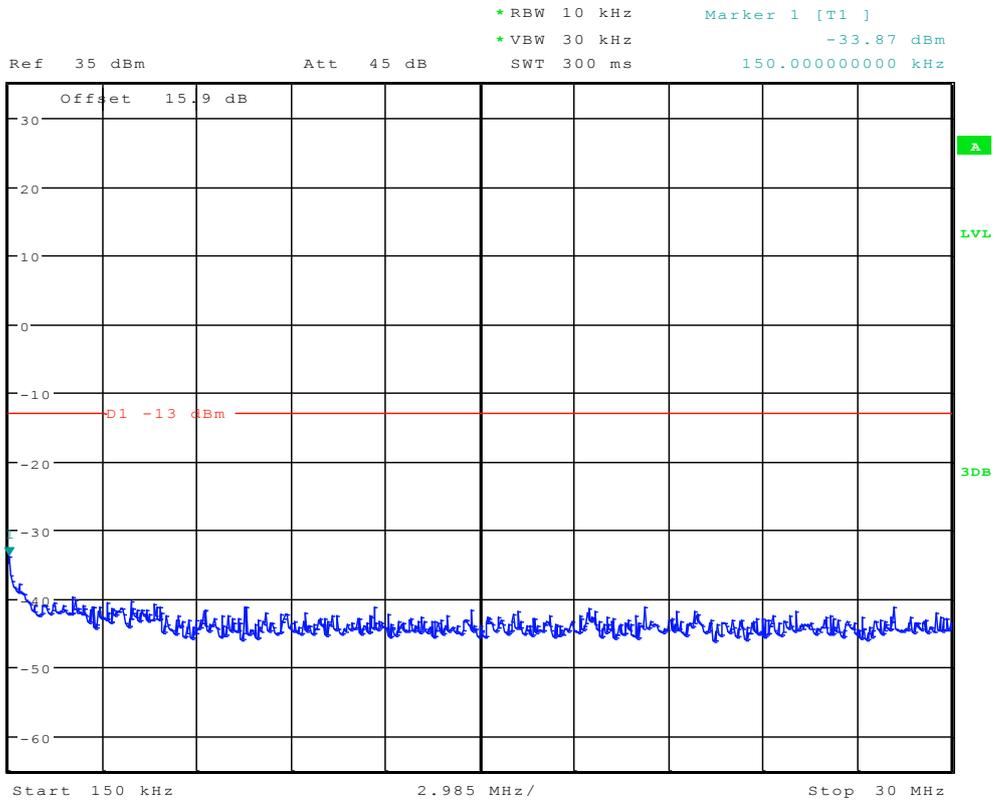


# TM1

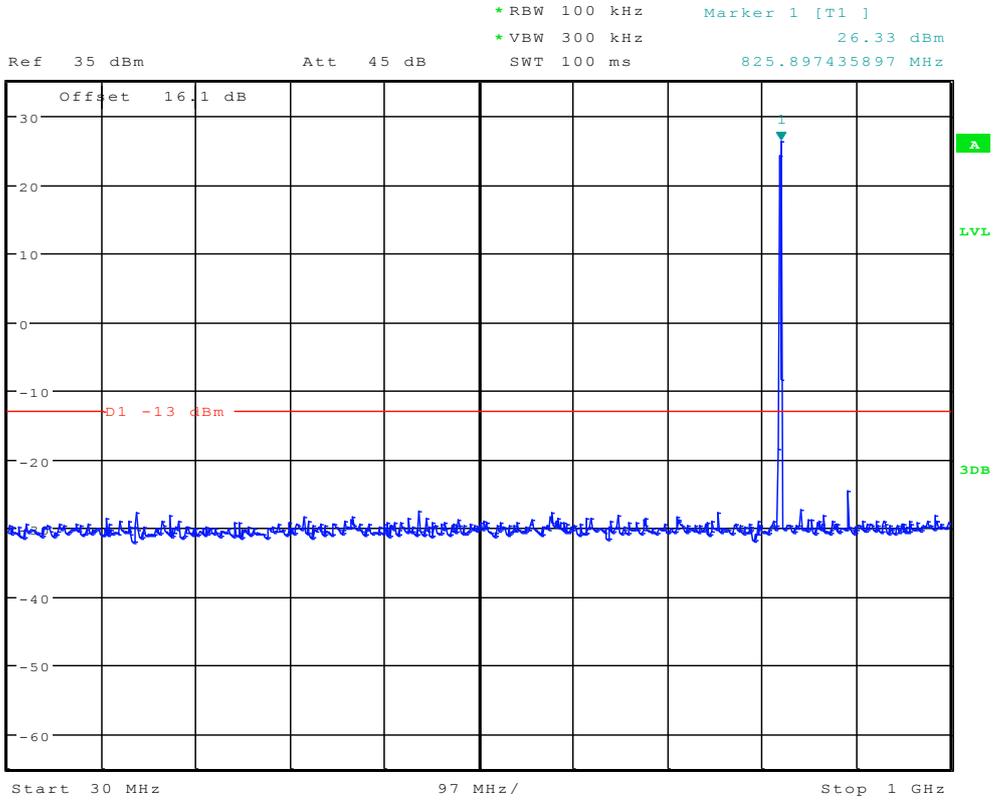
## Channel 1013



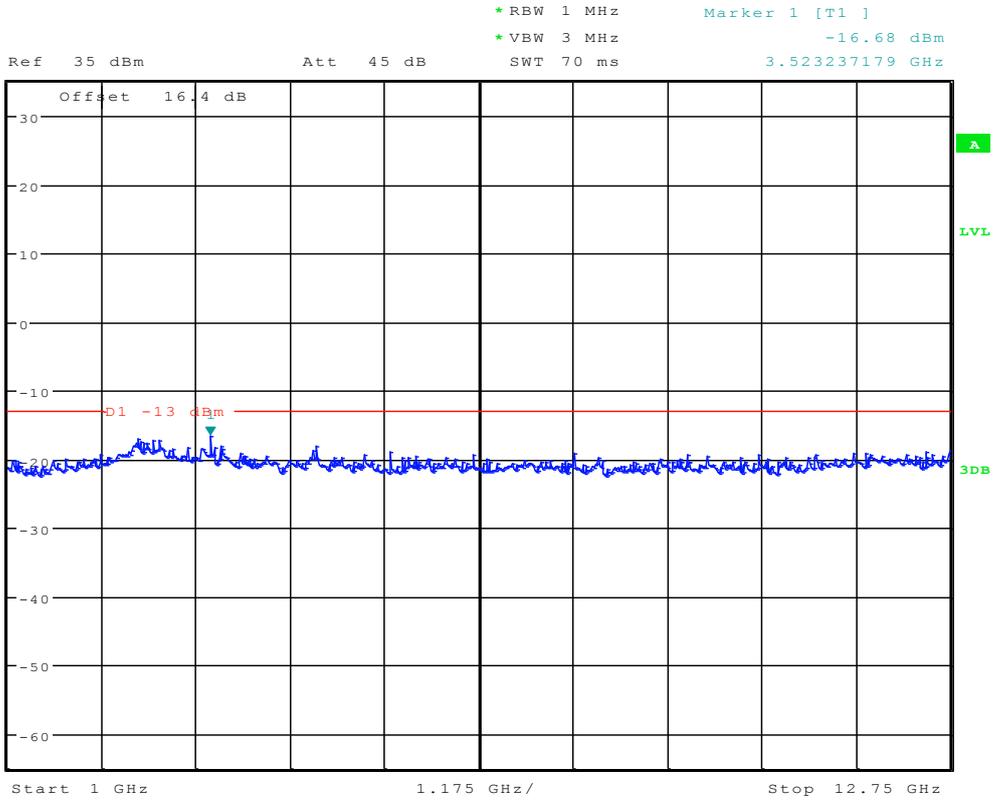
Date: 10.MAY.2012 11:43:15



Date: 10.MAY.2012 11:43:41



Date: 10.MAY.2012 11:44:07



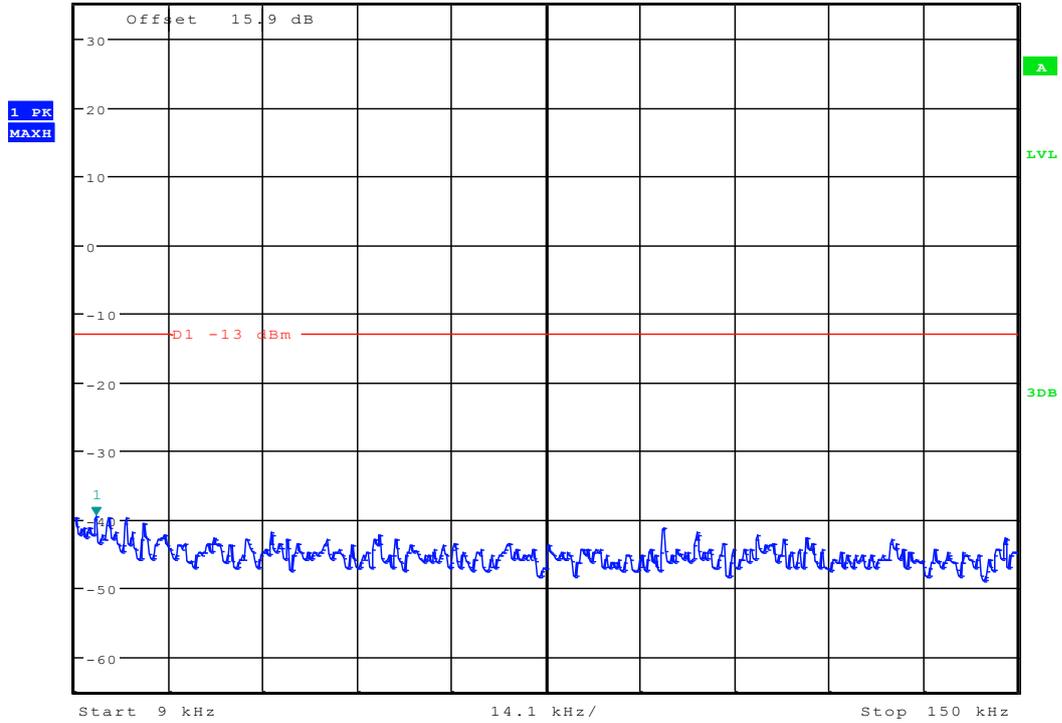
Date: 10.MAY.2012 11:44:32



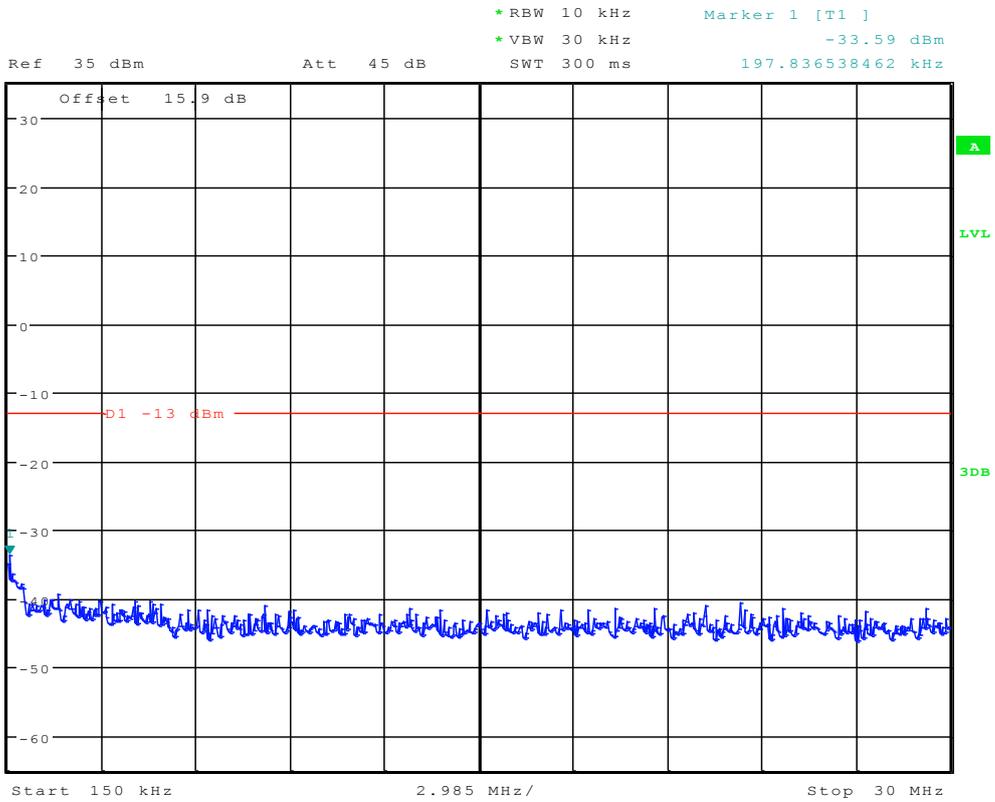
# Channel 384



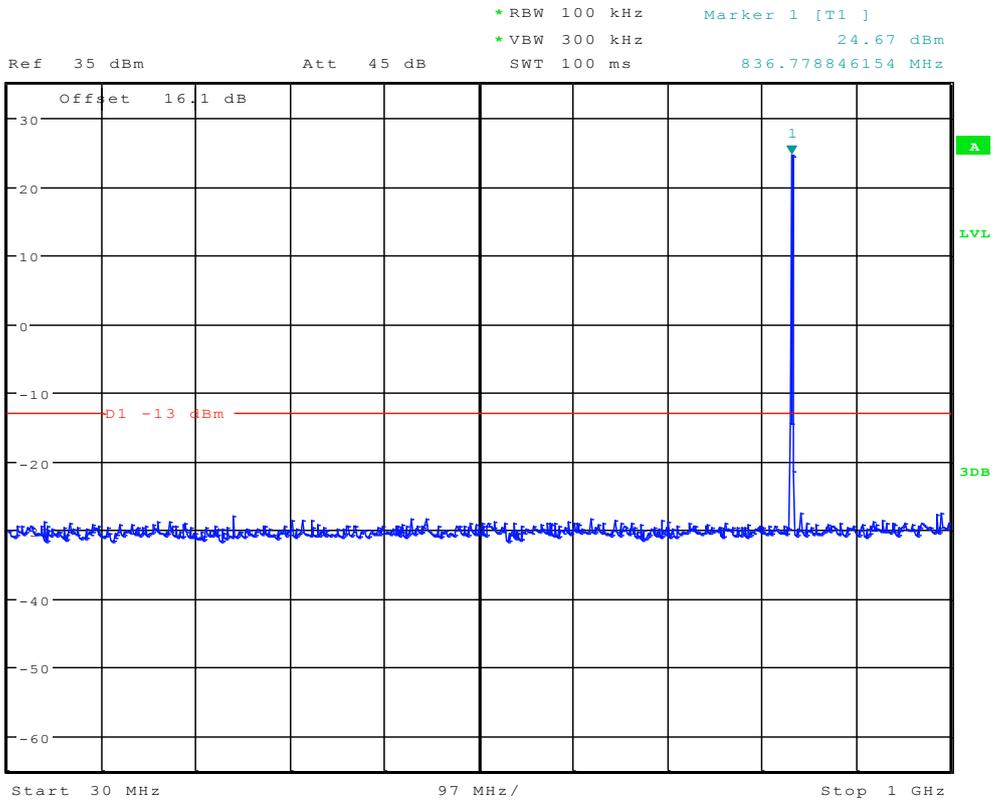
Ref 35 dBm      Att 45 dB      \* RBW 1 kHz      Marker 1 [T1]      -39.39 dBm  
\* VBW 10 kHz      12.163461538 kHz  
SWT 145 ms



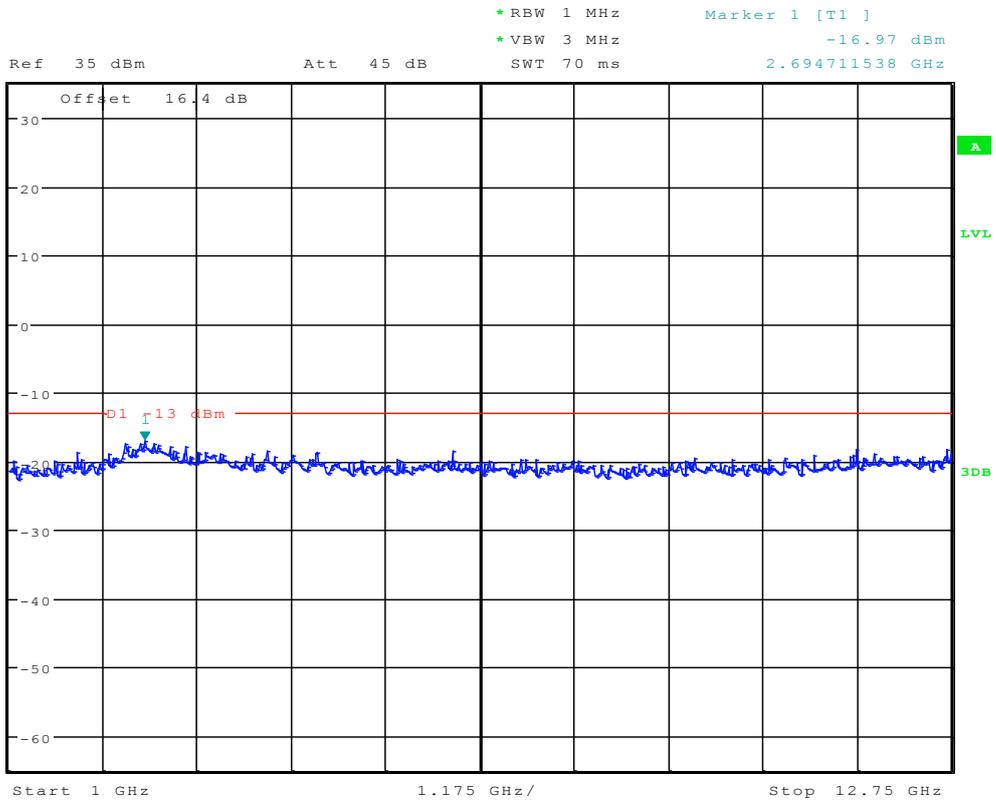
Date: 10.MAY.2012 11:43:24



Date: 10.MAY.2012 11:43:49



Date: 10.MAY.2012 11:44:15



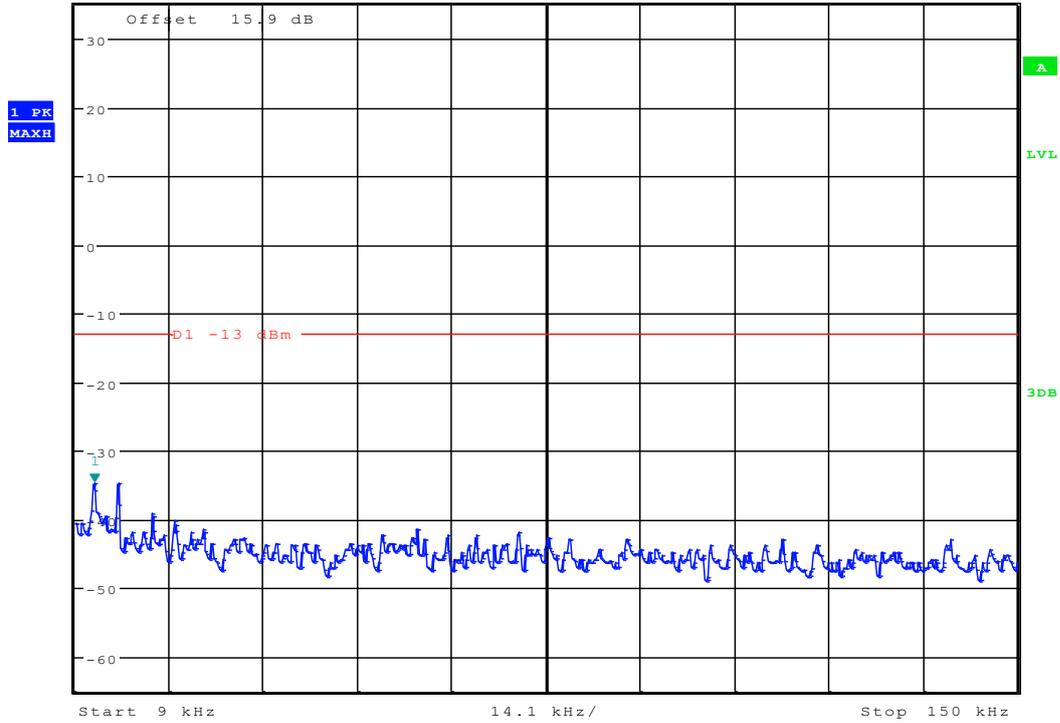
Date: 10.MAY.2012 11:44:41



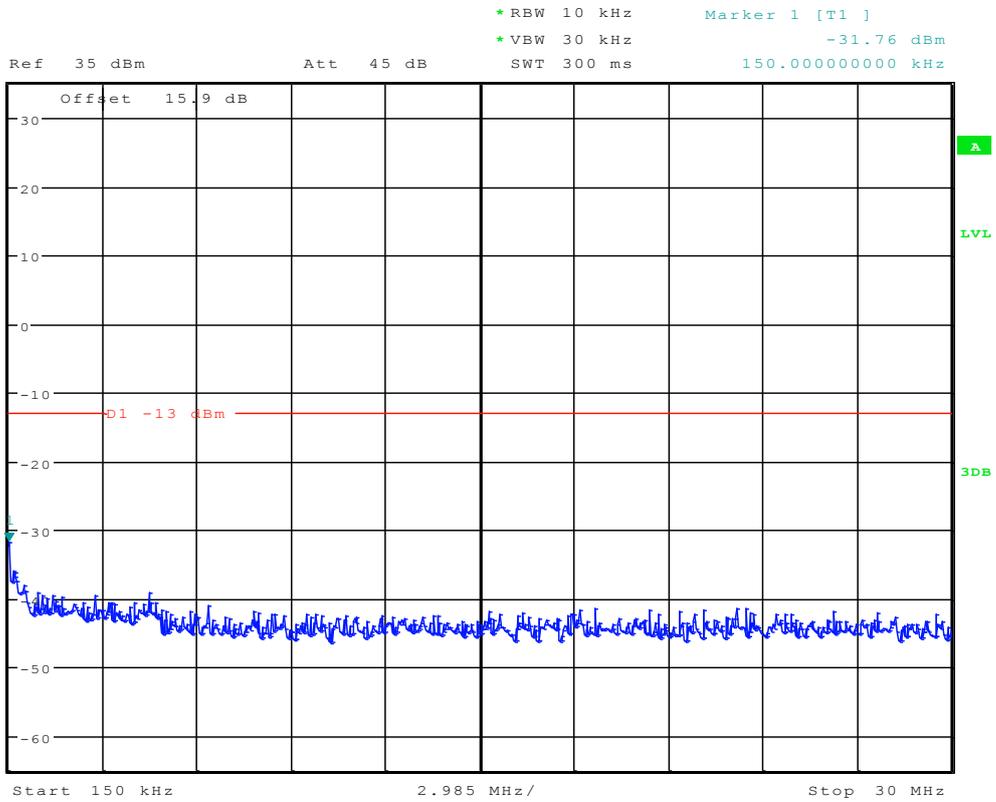
## Channel 777



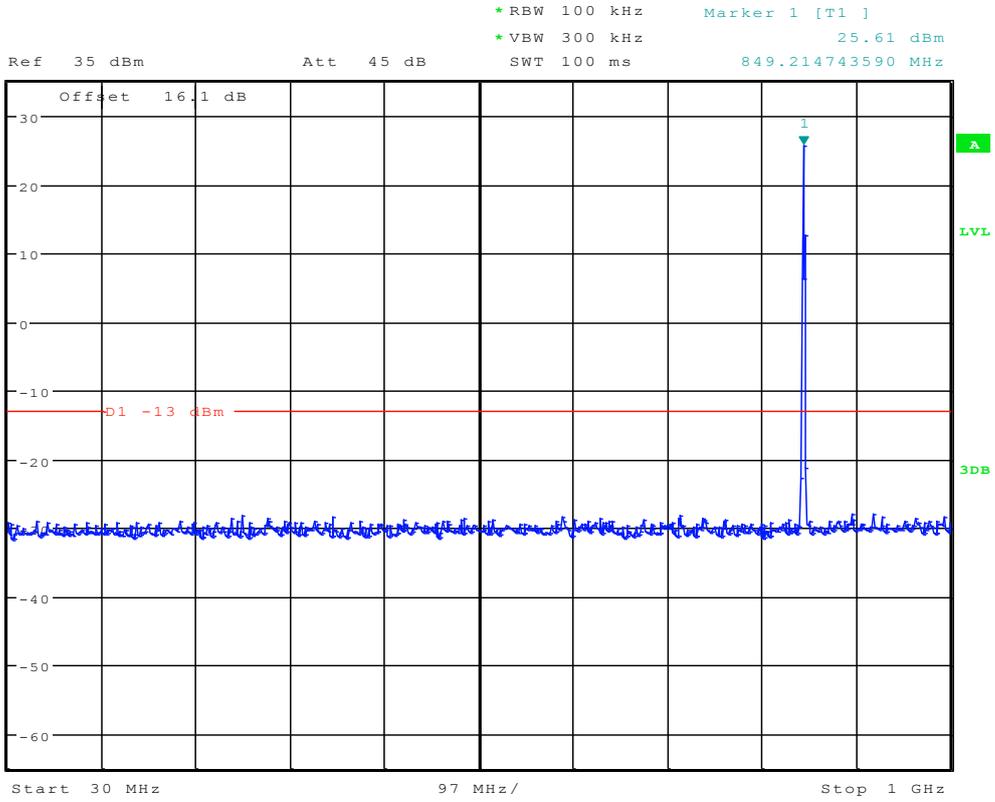
Ref 35 dBm Att 45 dB SWT 145 ms  
\*RBW 1 kHz \*VBW 10 kHz  
Marker 1 [T1] -34.64 dBm  
11.937500000 kHz



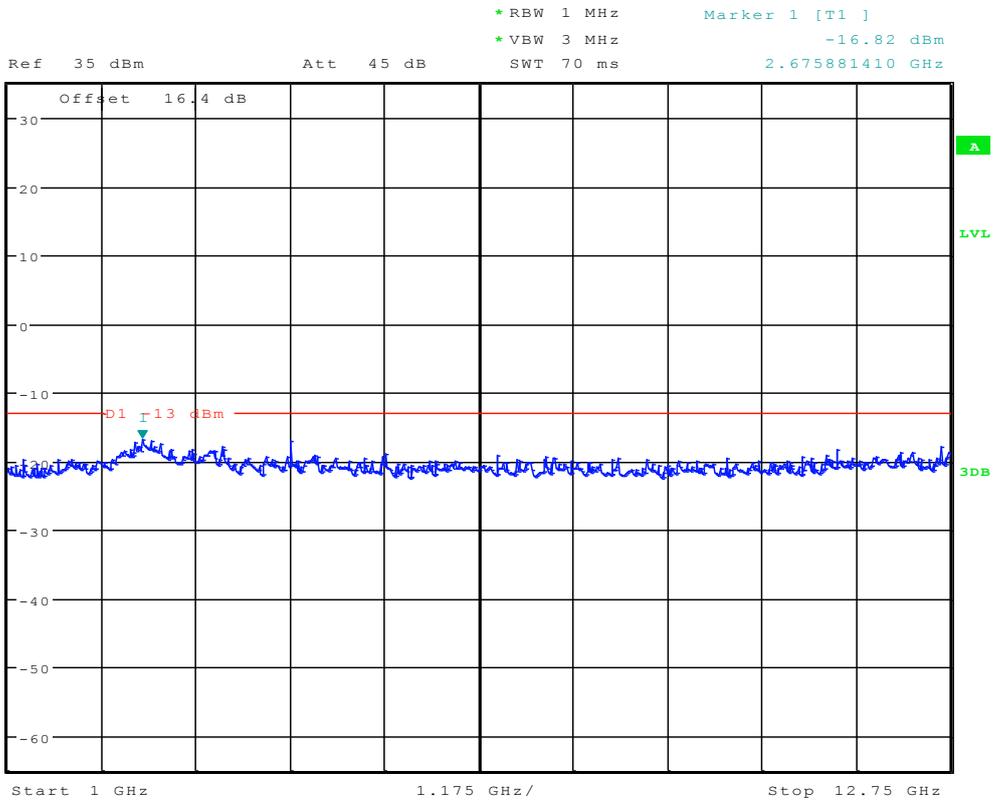
Date: 10.MAY.2012 11:43:32



Date: 10.MAY.2012 11:43:58



Date: 10.MAY.2012 11:44:23

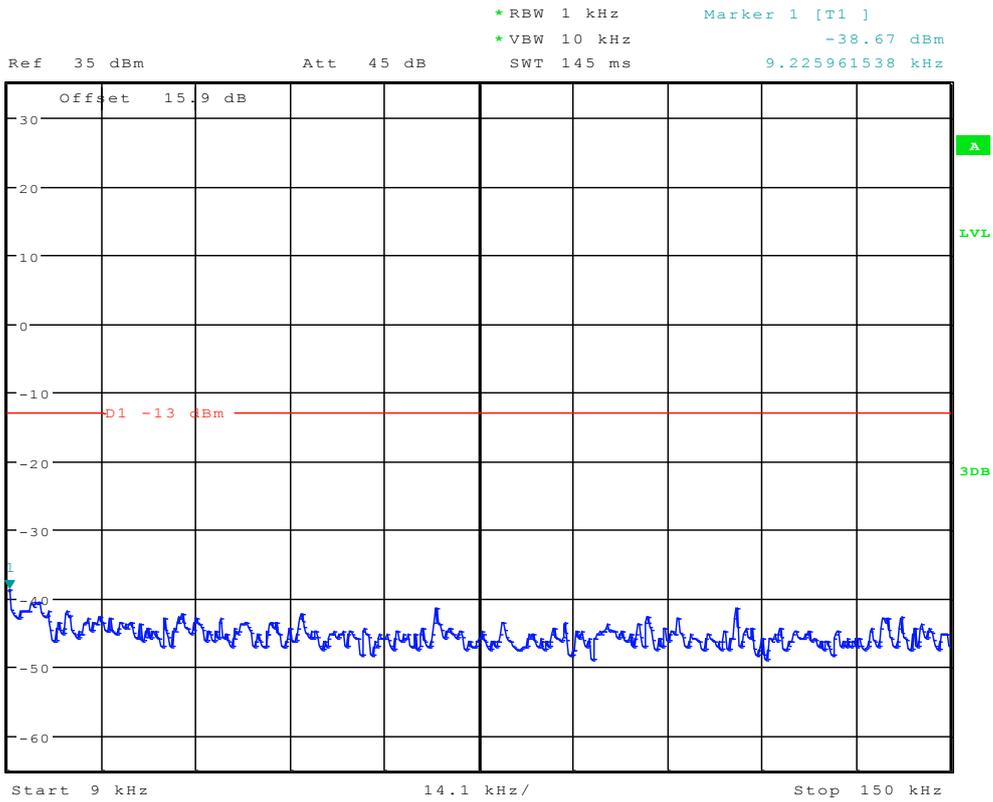


Date: 10.MAY.2012 11:44:49

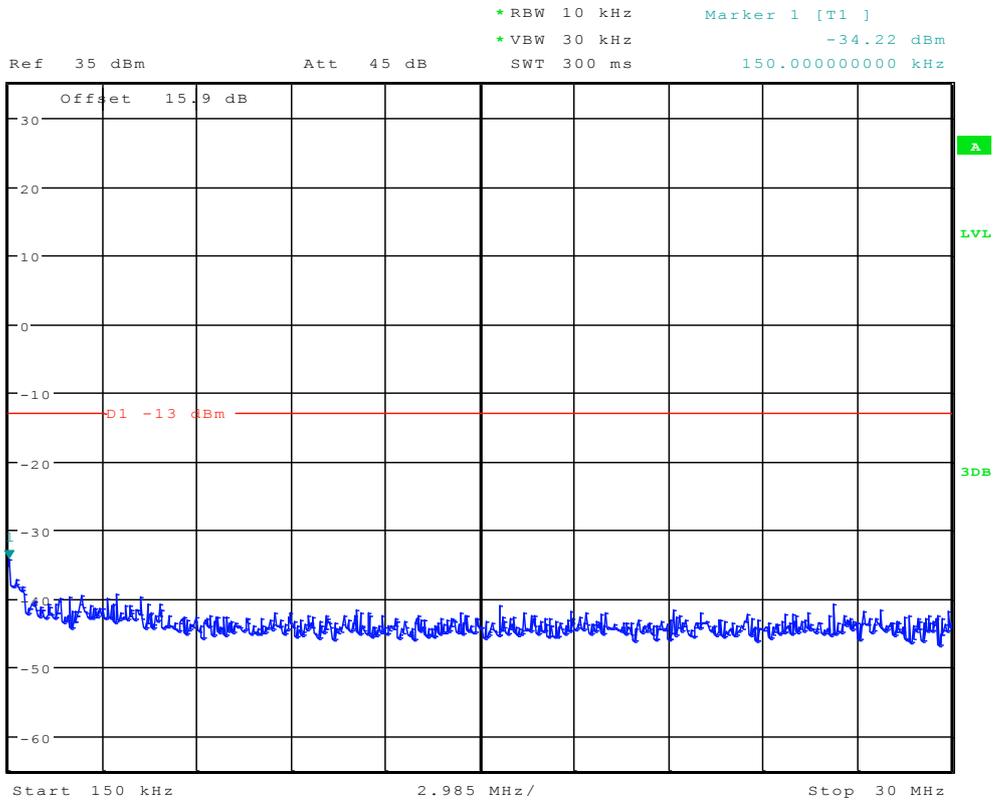


### TM3

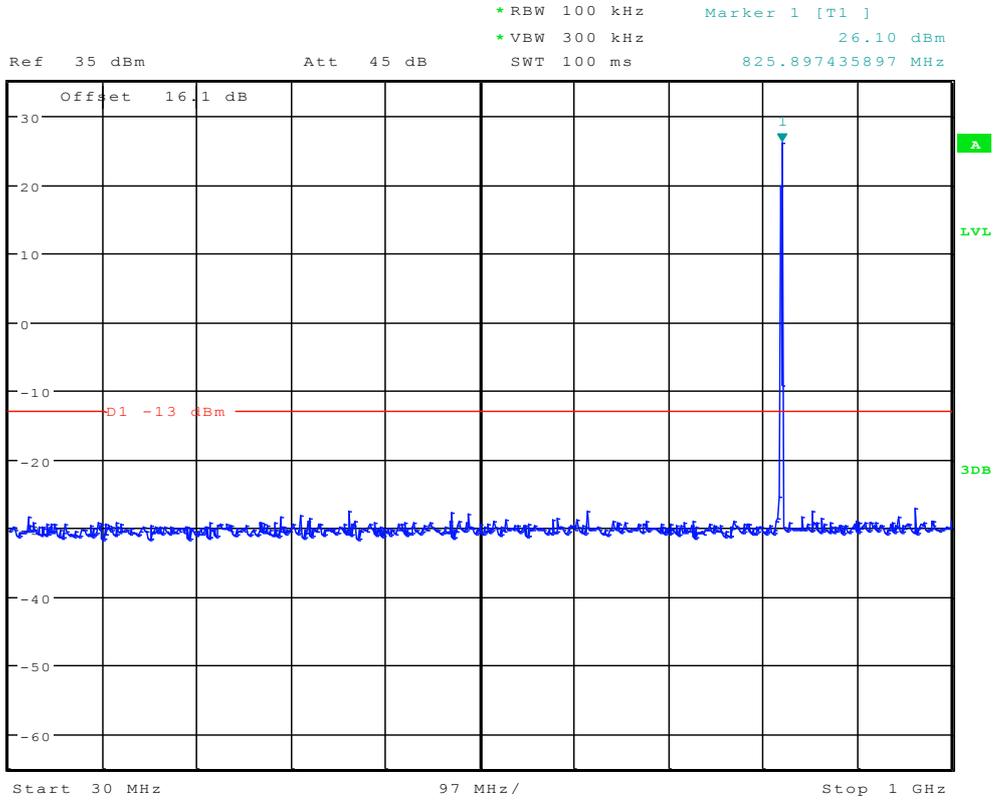
### Channel 1013



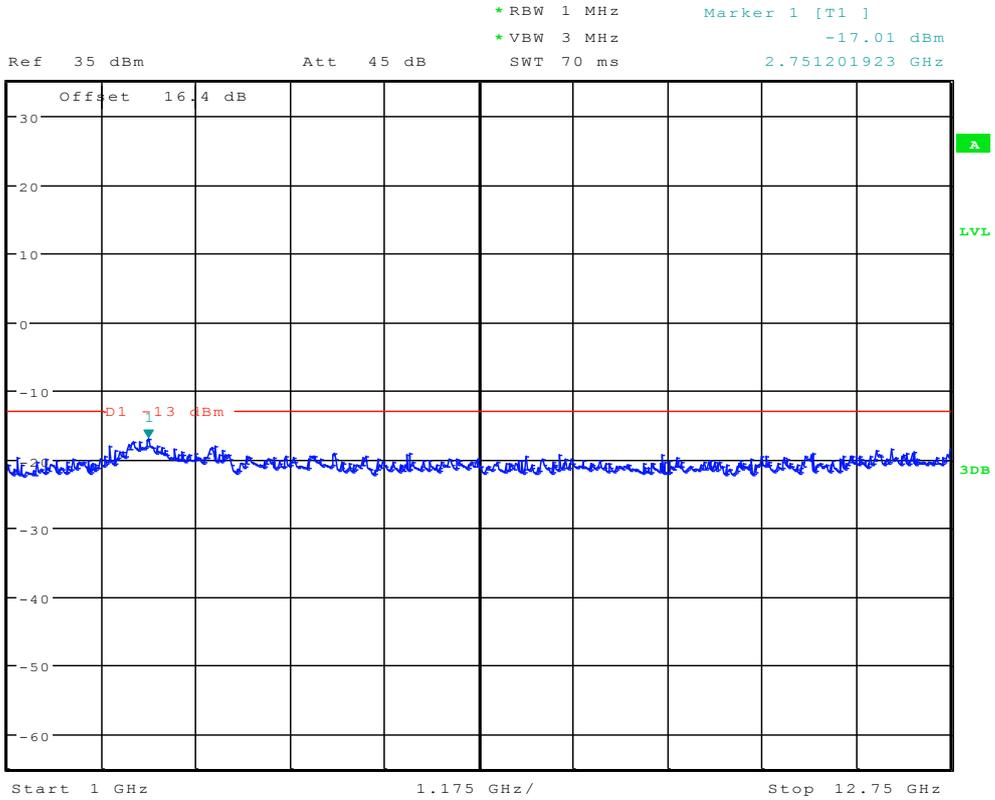
Date: 10.MAY.2012 11:44:59



Date: 10.MAY.2012 11:45:25



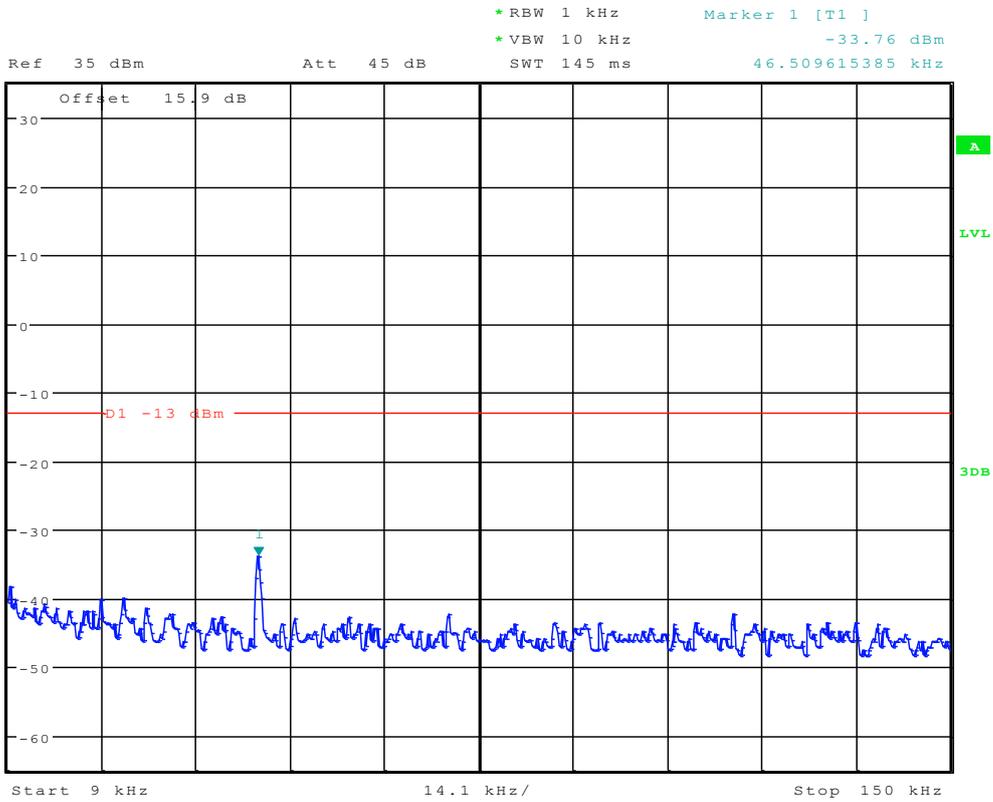
Date: 10.MAY.2012 11:45:51



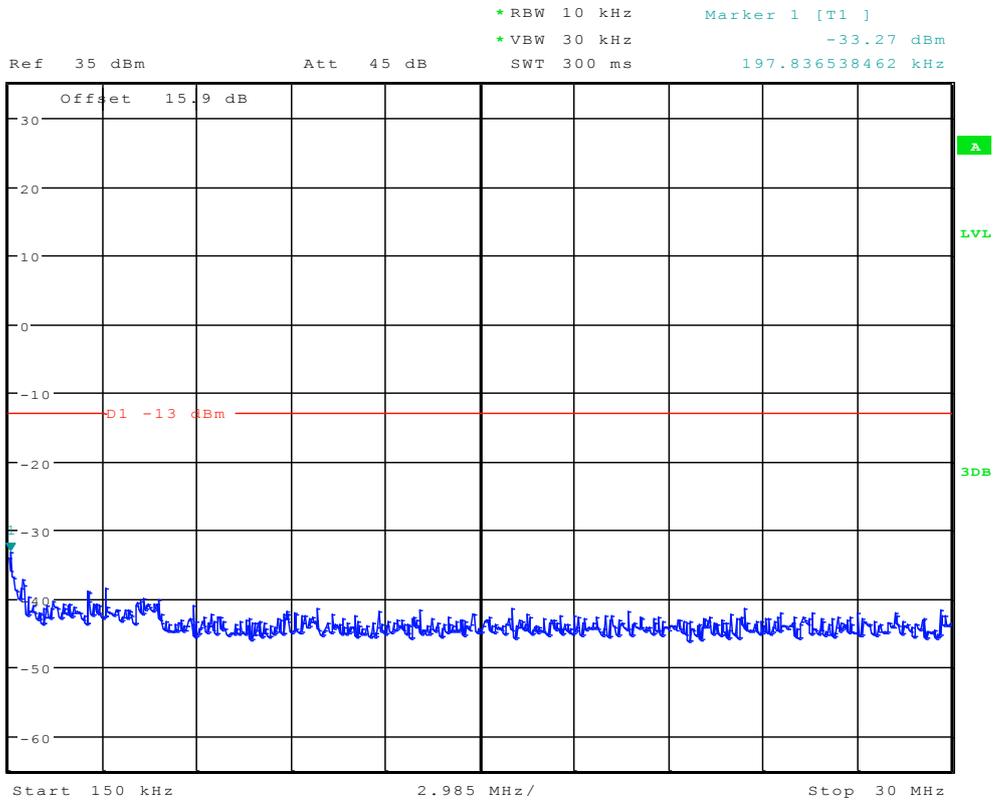
Date: 10.MAY.2012 11:46:16



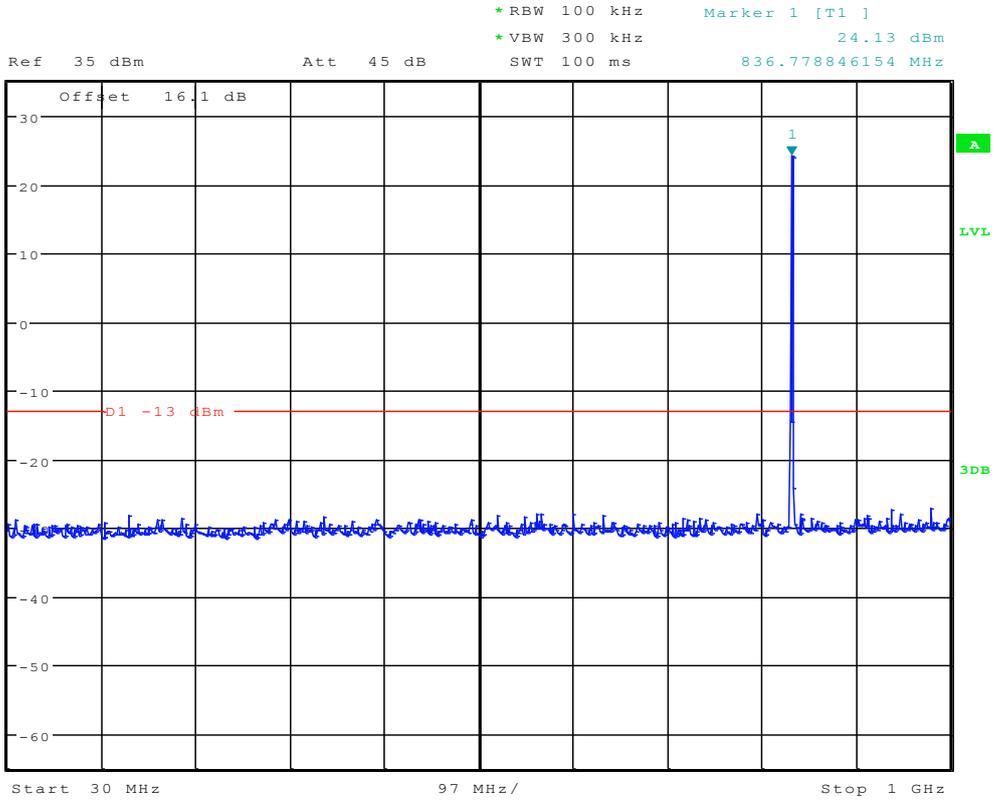
## Channel 384



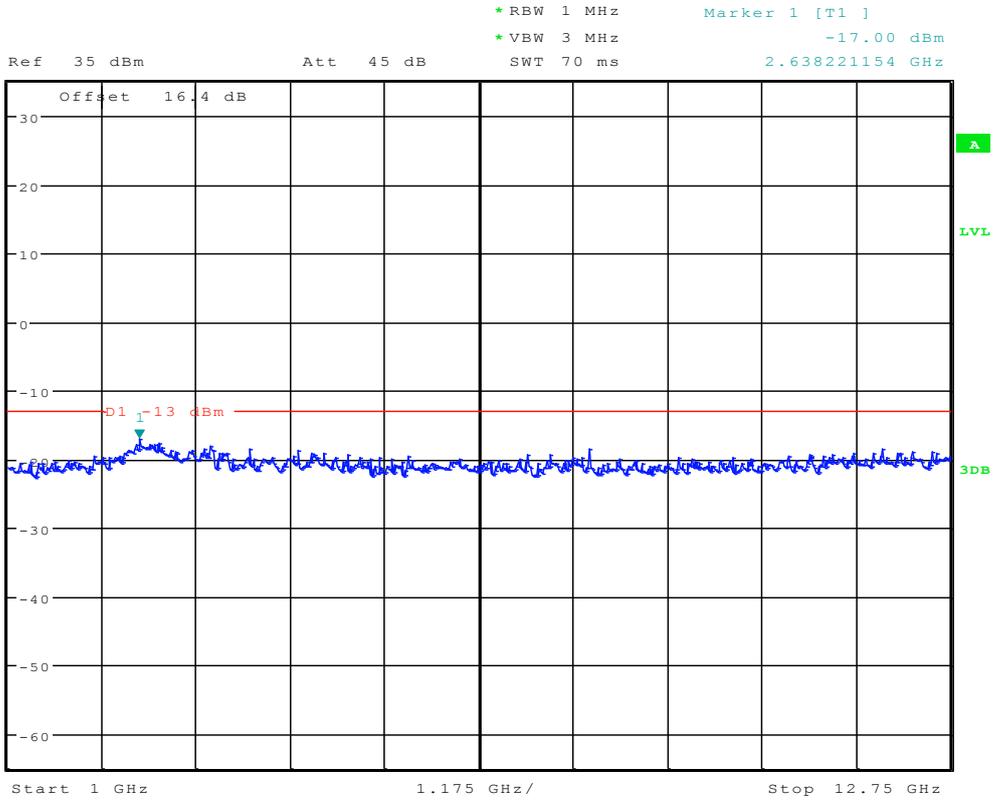
Date: 10.MAY.2012 11:45:08



Date: 10.MAY.2012 11:45:33

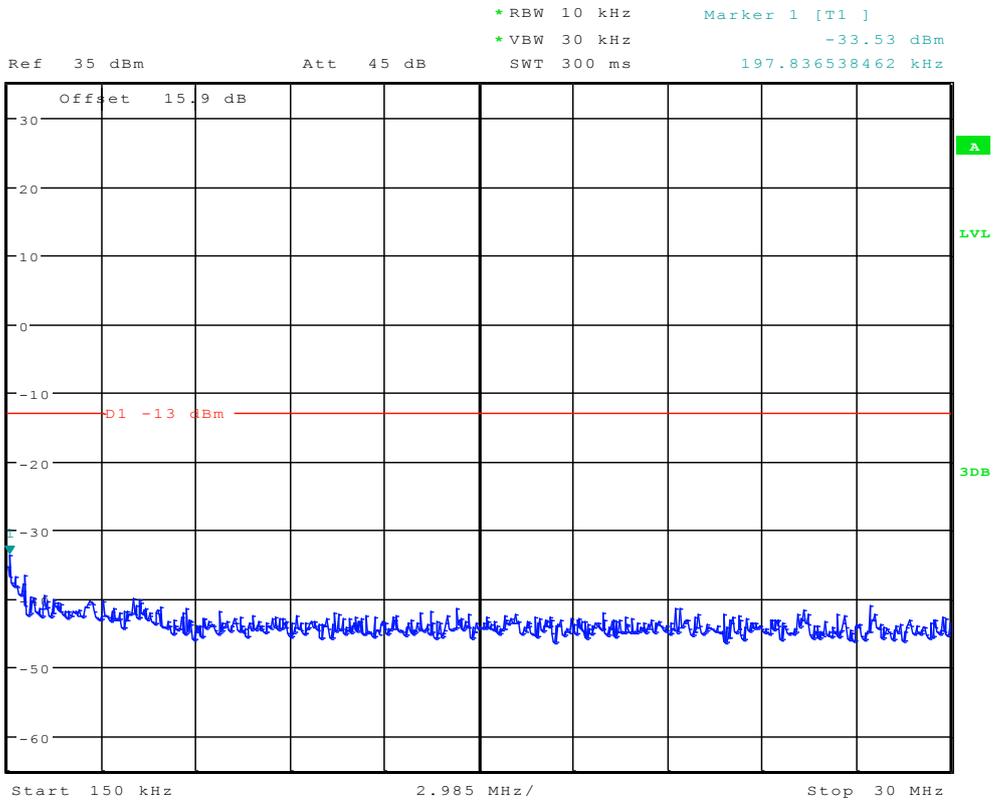


Date: 10.MAY.2012 11:45:59

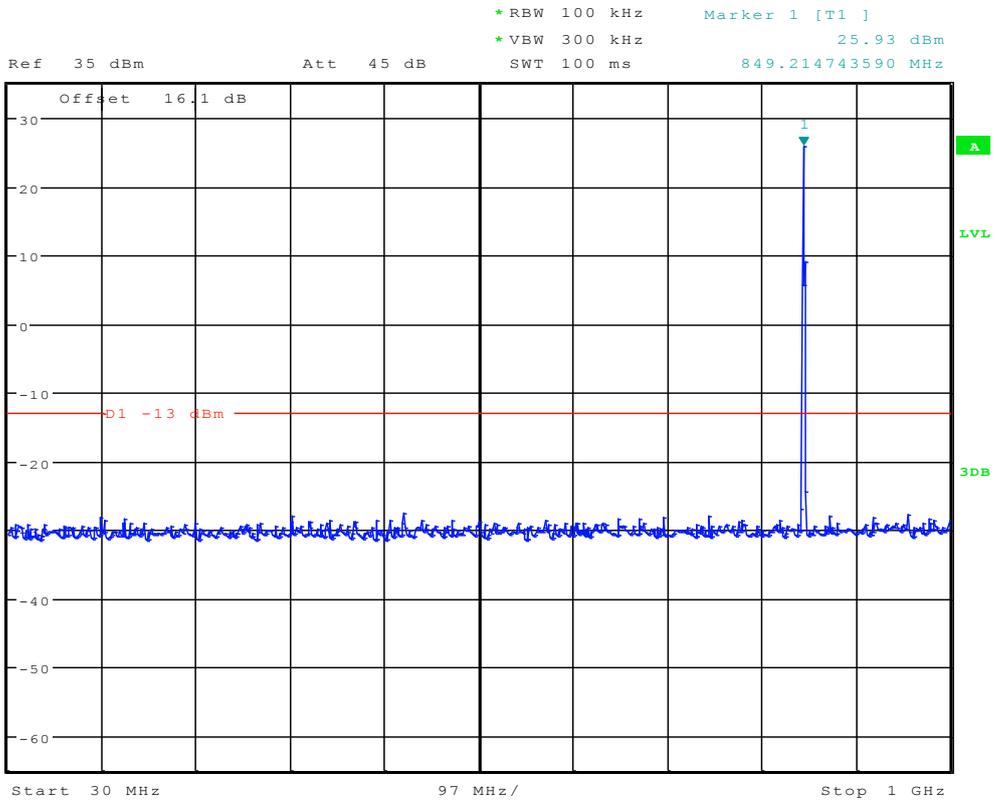


Date: 10.MAY.2012 11:46:25

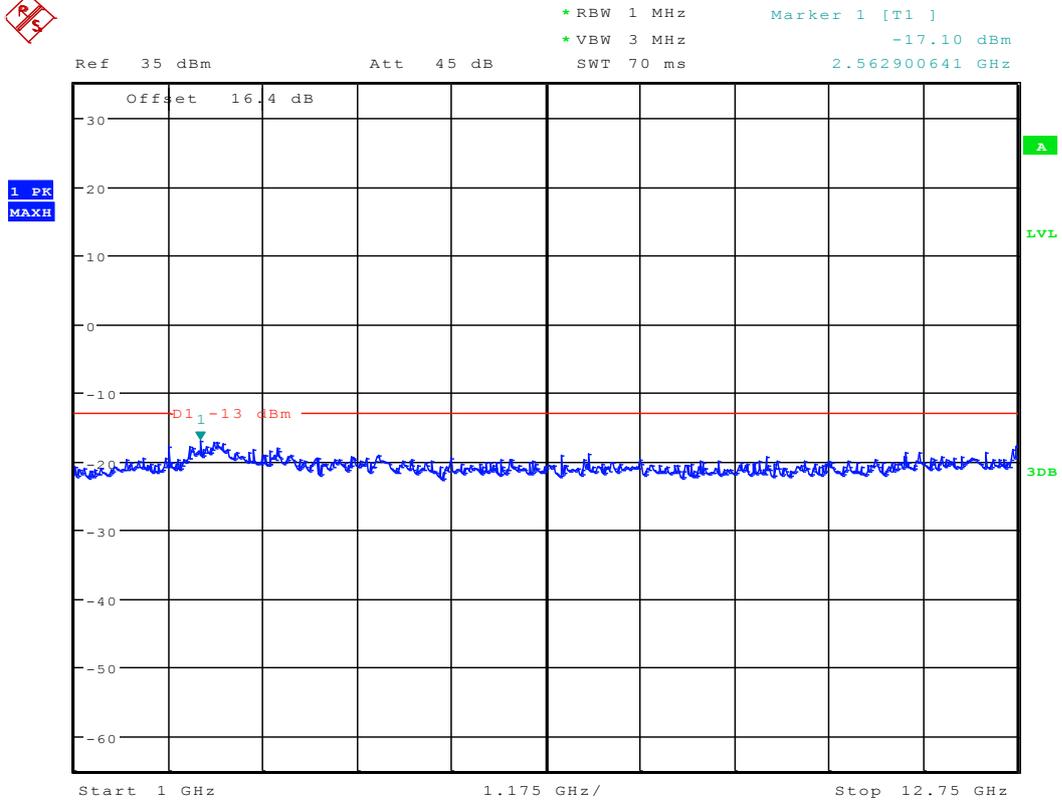




Date: 10.MAY.2012 11:45:42



Date: 10.MAY.2012 11:46:07



Date: 10.MAY.2012 11:46:33

-----The END-----

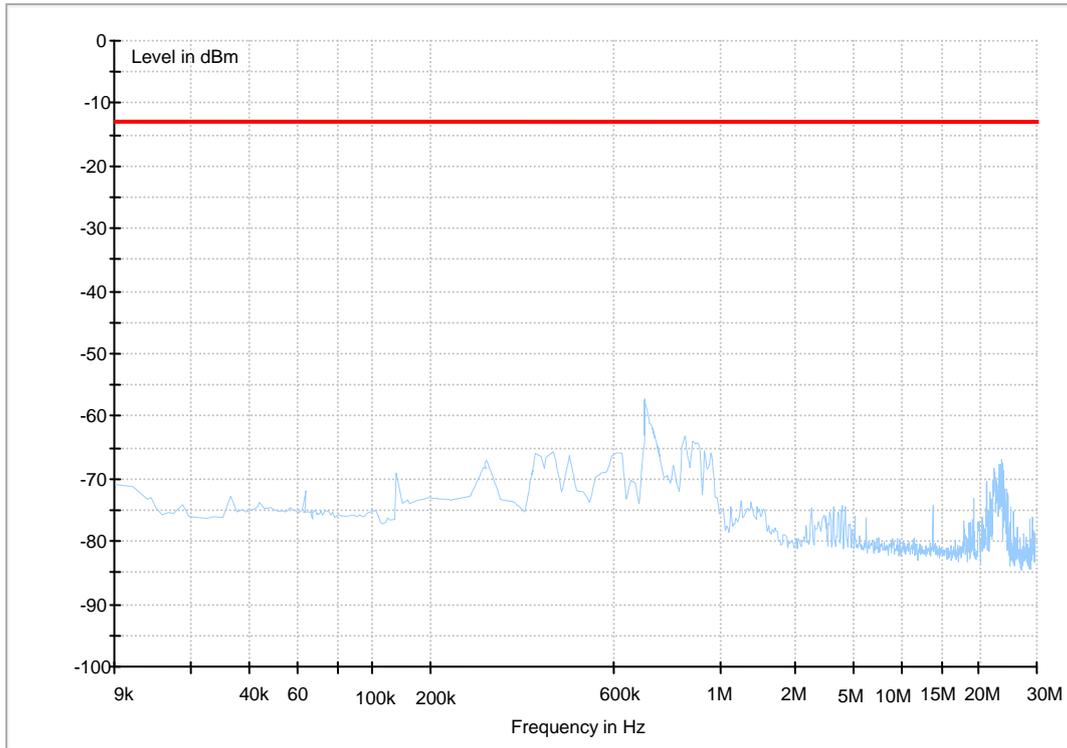


# Appendix F

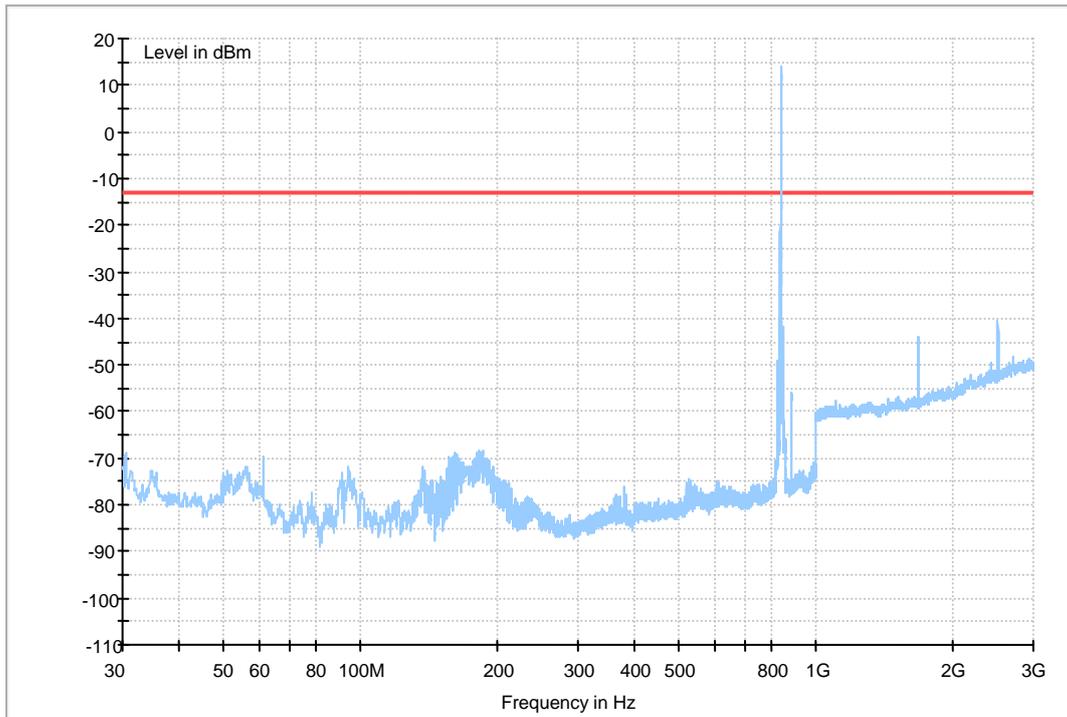
## Radiated spurious emission

## CDMA 800

### Traffic Mode (9kHz-30MHz)

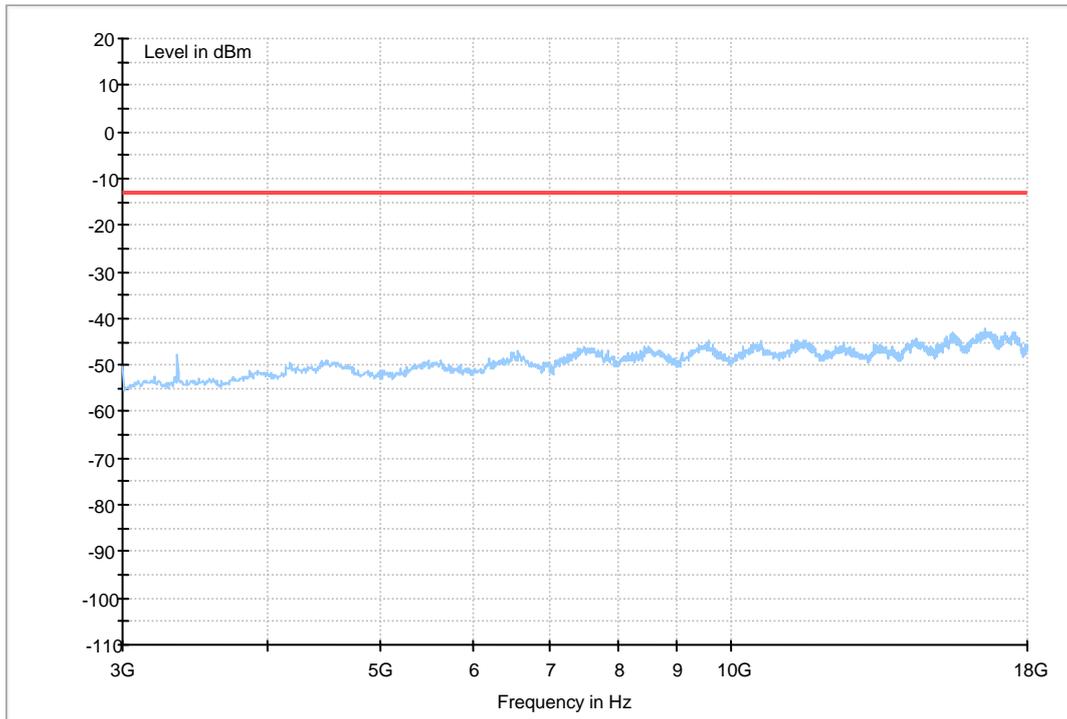


### Traffic Mode (30MHz-3GHz)





### Traffic Mode (3GHz-18GHz)



-----The END-----



# Appendix G

## Frequency Stability According to FCC Part 2.1055& Part 22.355



## Frequency Error vs. Temperature:

Test Mode	RF Ch.	Volt.	Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Freq. vs. 20 °C [ppm]	Limit [ppm]	Verdict
TM 1	M	VN	-30 °C	35	0.042	---	±2.5	Pass
			-20 °C	56	0.067	---	±2.5	Pass
			-10 °C	41	0.049	---	±2.5	Pass
			0 °C	21	0.025	---	±2.5	Pass
			10 °C	5	0.006	---	±2.5	Pass
			20 °C	-54	-0.065	---	±2.5	Pass
			30 °C	-56	-0.067	---	±2.5	Pass
			40 °C	41	0.049	---	±2.5	Pass
			50 °C	31	0.037	---	±2.5	Pass
TM 3	M	VN	-30 °C	-32	-0.038	---	±2.5	Pass
			-20 °C	54	0.065	---	±2.5	Pass
			-10 °C	-12	-0.014	---	±2.5	Pass
			0 °C	-36	-0.043	---	±2.5	Pass
			10 °C	-32	-0.038	---	±2.5	Pass
			20 °C	41	0.049	---	±2.5	Pass
			30 °C	45	0.054	---	±2.5	Pass
			40 °C	35	0.042	---	±2.5	Pass
			50 °C	67	0.080	---	±2.5	Pass

## Frequency Error vs. Voltage:

Test Mode	RF Ch.	Temp.	Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Freq. vs. 20 °C [ppm]	Limit [ppm]	Verdict
TM 1	M	TN	VL	98	0.117	---	±2.5	Pass
			VN	26	0.031	---	±2.5	Pass
			VH	21	0.025	---	±2.5	Pass
TM 3	M	TN	VL	24	0.029	---	±2.5	Pass
			VN	75	0.090	---	±2.5	Pass
			VH	-64	-0.077	---	±2.5	Pass

-----The END-----