



FCC RF Test Report

Product Name: Mobile WiFi

Model Number: E589u-512

**Report No: SYBH(Z-RF)011072012-2001
FCC ID:QISE589U-512**

Reliability Laboratory of Huawei Technologies Co., Ltd.

Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R. China
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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:	Jul., 04, 2012
Start Date of Test:	Jul., 05, 2012
End Date of Test:	Jul., 16, 2012
Test Result:	Pass

Approved By Senior Engineer Sep., 10, 2012 Dai Linjun Dai Linjun
Date Name Signature

Reviewed By Sep., 10, 2012 Cousy Xu Cousy XU
Date Name Signature

Operated By Sep., 10, 2012 Huang Qiuliang Huang Qiuliang
Date Name Signature



Modification Record

Last Report No.	Date	Modification Description
SYBH(Z-RF) 011072012-2001	2012-7-18	First report.
SYBH(Z-RF) 011072012-2001	2012-9-10	1. Justification that HSPA+ and DC-HSPA were not tested shall be in the test report at page 10. 2. CCDF plots have been removed from Annex A.

Contents

1	<u>General Information</u>	6
1.1	APPLIED STANDARD	6
1.2	TEST LOCATION	6
1.3	TEST ENVIRONMENTAL CONDITION	6
2	<u>Summary</u>	7
3	<u>Product Description</u>	8
3.1	PRODUCT INFORMATION	8
4	<u>Test Description</u>	9
4.1	SUPPORTED FREQUENCY RANGE	9
4.2	TRANSMITTER / RECEIVER CHARACTERISTICS	9
4.3	ANTENNA GAIN	9
5	<u>General Test Conditions / Configurations</u>	10
5.1	RF CHANNELS UNDER TEST	10
5.2	TEST MODES	10
5.3	TEST ENVIRONMENT	11
5.4	TEST SETUP	12
5.5	TEST CONDITIONS	16
6	<u>Main Test Instruments</u>	17
7	<u>Test Results</u>	18
8	<u>Measurement Uncertainty</u>	18



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 KDB 971168 D01 Power Meas License Digital Systems v01
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 Environmental Condition	
Ambient Temperature:	20 – 25 °C
Ambient Relative Humidity:	45 – 55 %
Atmospheric Pressure:	101 kPa

2 Summary

Table 1 Summary of results

Test Case	FCC Part No.	Requirements	Result
Cellular Band			
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 & 917	Below -13 dBm/1%*EBW, in 1 MHz range	Pass
Spurious Emission at Antenna Terminals	2.1051 & 2.917	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 th 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 ± 2.5 ppm	Pass

3 Product Description

3.1 Product Information

3.1.1 General Description

E589u-512 is a LTE/UMTS/GSM triple mode and WiFi Wireless mobile Router; it can be used as a WiFi Access Point based on standard of IEEE802.11b/g/n. It supports 3G WCDMA and 4G LTE wireless internet accessing function. About 3G WCDMA wireless mode, it supports WCDMA and HSDPA/HSUPA/HSPA+/DC-HSPA+, operating in Band2 and Band 5, and the 4G LTE, operating in Band2, Band4 and Band7. The WiFi frequency is 2.4GHz.
E589u-512 supports 1Tx2Rx for 3G WCDMA and 4G LTE, WiFi only supports 1Tx1Rx.

3.1.2 Board Information

Table 2 Board Information

Mobile WiFi		
E589u-512		
Board		
Hardware Version	Software Version	Description
CL1E589M22	11.433.13.C0.167	Main board

3.1.3 Adapter Technical Data

AC/DCAdapter Model	HW-050200U3W
Manufacturer	HUAWEI
Input Voltage	100-240V1 ~50/60Hz, 0.5A MAX
Output Voltage	 5.0V 2.0A

3.1.4 Battery Technical Data

Name	Qty.	Manufacture	Description
Li-ion Battery	1	HUAWEI	Battery Model: HB5P1H Rated capacity: 3000mAh Nominal Voltage:  +3.7V Charging Voltage:  +4.2V

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	GSM UMTS
TX Output Power (per Antenna Port)	GSM system: 32dBm UMTS system: 22dBm
Channel Spacing(s) / Bandwidth(s)	GSM system: 200 kHz UMTS system: 5 MHz
Designation of Emissions	GSM system: 246KGXW (GMSK modulation), 242KG7W (8PSK modulation) UMTS system: 4M15F9W

4.3 Antenna Gain

Rated Antenna Gain(dBi)	1.51
Rated Antenna Gain(dBd)	-0.64

5 General Test Conditions / Configurations

5.1 RF Channels under Test

Test Mode	TX / RX	RF Channel		
		Low (L)	Middle (M)	High (H)
TM1/TM2	TX	Channel 128	Channel 192	Channel 251
		824.2MHz	837.0MHz	848.8MHz
	RX	Channel 128	Channel 192	Channel 251
		869.2MHz	882.0MHz	893.8MHz
TM3/TM4/TM5	TX	Channel 4132	Channel 4182	Channel 4233
		826.4MHz	836.4MHz	846.6MHz
	RX	Channel 4357	Channel 4407	Channel 4458
		871.4MHz	881.4MHz	891.6MHz

5.2 Test Modes

Test Mode	Test Modes Description
TM1	GSM/GPRS, GMSK modulation
TM2	EDGE, 8PSK modulation
TM3	WCDMA, QPSK modulation
TM4	HSDPA, QPSK modulation
TM5	HSUPA, QPSK modulation

Note:

HSPA+ implementation of this device, 16QAM is not used for uplink. The uplink Category and release number is same as HSUPA, RF test is evaluation is not required.

DC-HSDPA implementation of this device, the uplink parameters are the same as HSDPA. No additional channels and modulations (16 QAM, and 64 QAM) are supported in uplink. The difference is only in the downlink parameters. HSDPA settings were used on uplink.

5.3 Test Environment

Environment Parameter	Selected Values During Tests	
Relative Humidity	Ambient	
Temperature	TN	Ambient
Voltage	VL	3.6V
	VN	3.7V
	VH	4.2V

NOTE: VL= lower extreme test voltage

VN= nominal voltage

VH= upper extreme test voltage

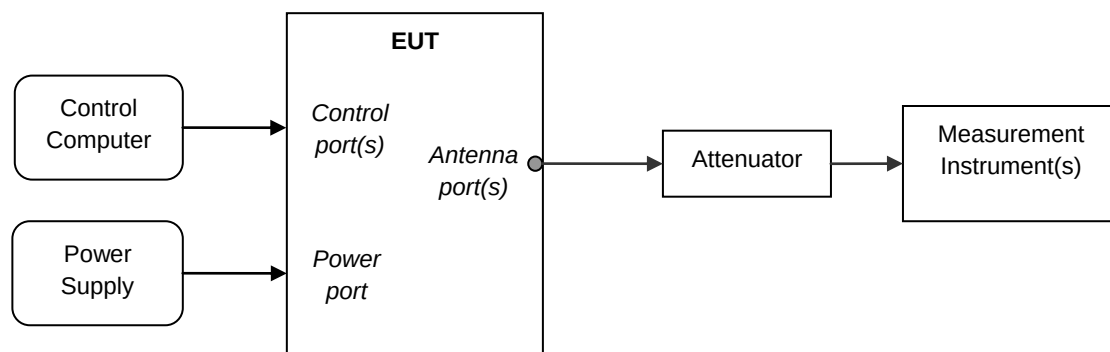
TN= normal temperature

5.4 Test Setup

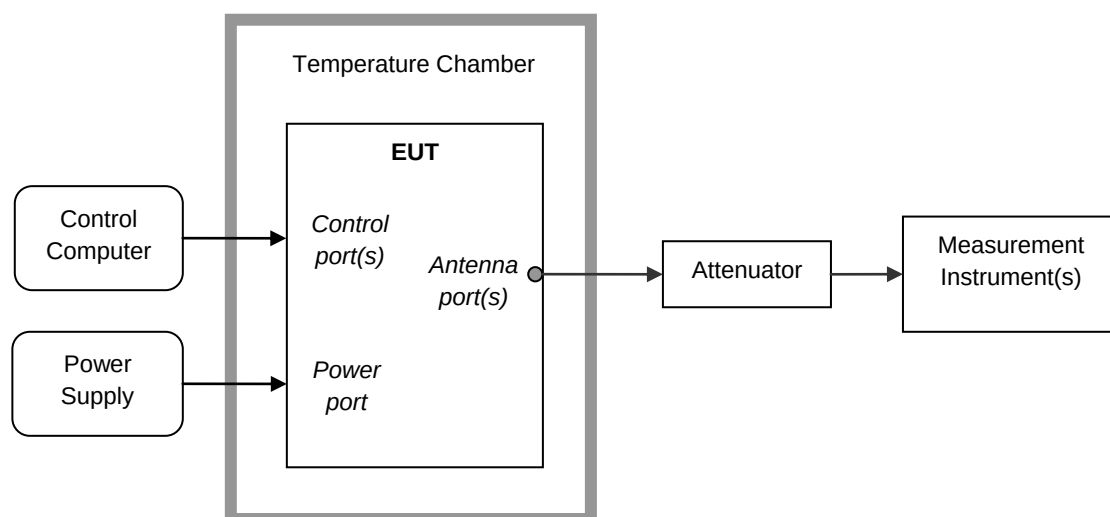
5.4.1 General Test Setup Configurations

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



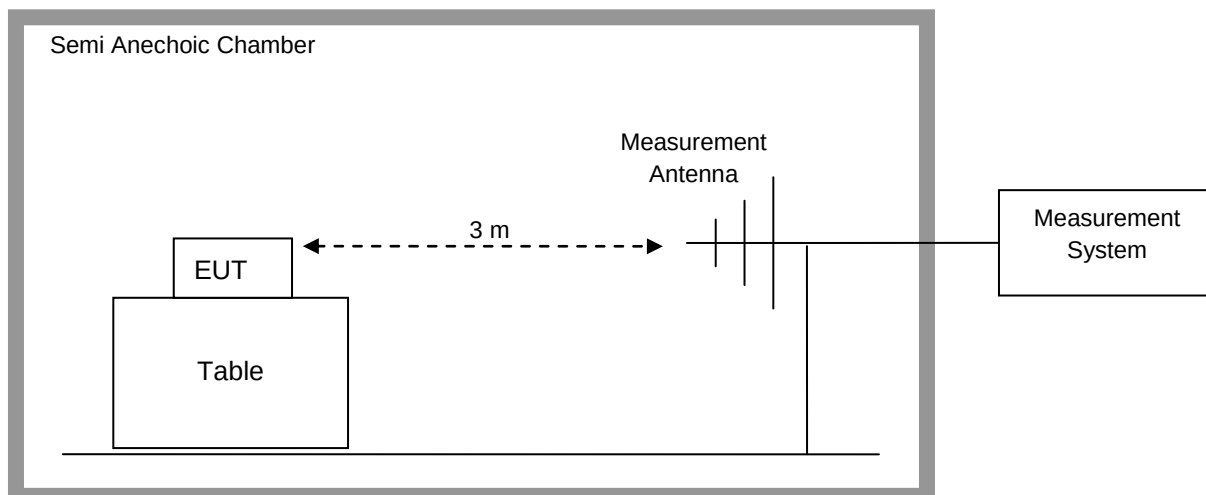
5.4.4 Test Setup 3

NOTE1: Effective radiated power (ERP) or Effective Isotropic radiated power (EIRP) refers to the EUT radiation power output, assuming all emissions are radiated from half-wave dipole antennas or horn antennas.

NOTE2: The EUT was set on insulator 80cm above the Ground Plane. The setup and test methods were according to ANSI-TIA-603C 2004. The measurements were carried through with a Rohde and Schwarz Test Receiver and control software.

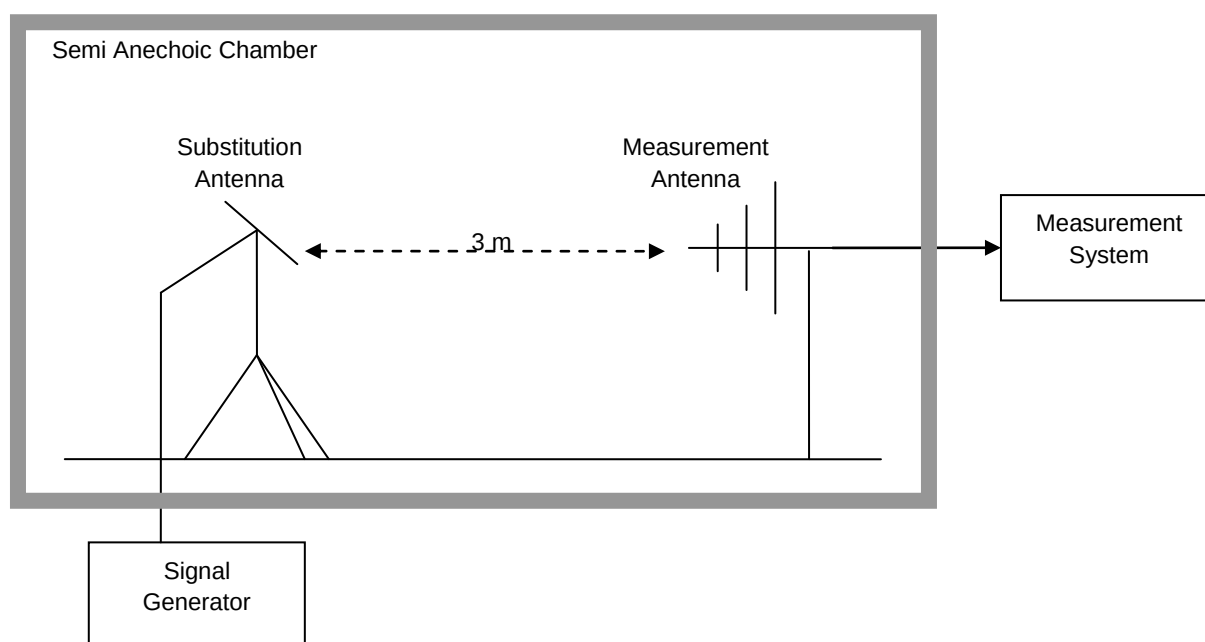
Step 1: Pre-test to find the Maximum ERP or EIRP

1. Connect the test system according to the following figure. EUT is running for 30 minutes before test, and measurement instruments are warming-up for 30 minutes.
2. Set up communication link between Universal radio communication tester and EUT, set EUT working frequency, and control EUT to transmit at maximum power.
3. Set the center frequency of the signal analyzer or receiver to the EUT's operating frequency, the RBW is equal to the emission bandwidth of the signal. Set RMS detector for the test, and the span is equal to 2 times of emission bandwidth, the other settings should remain automatic. Normally, the height range of antenna was 1m to 4m, the azimuth range of turntable was 0° to 360°. The receiver antenna has two polarizations V and H. A portable or small unlicensed wireless device shall be placed on a non-metallic test fixture or other non-metallic support during testing. The supporting fixture shall permit orientation of the EUT in each of three orthogonal (x, y, z) axis positions such that emissions from the EUT are maximized. Measure the EUT maximum RF power and record the result.
4. Changing EUT working frequency and measuring the RF power at channel T, M, B respectively.
Complete the test data.



Step 2: Substitution method to verify the maximum ERP or EIRP

1. Measurement setup is according to the following figure. EUT was substituted by antenna, and the polarization is identical with the test antenna; the signal generator was connected to the substitution antenna.
2. The radiated output power, measured by signal analyzer set, is the same as recorded in above. Then this power level is matched by a signal from a calibrated signal generator which is substituted for EUT. The power supplied by the generator is then equal to the ERP or EIRP after corrected by the antenna gain and cable loss.



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)	L, M, H
	Test Mode	TM1/TM2/TM3/TM4/TM5
Modulation Characteristics	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1
	RF Channels (TX)	M
	Test Mode	TM1/TM2/TM3
Occupied Bandwidth	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1
	Detector	PK
	RF Channels (TX)	L, M, H
	Test Mode	TM1/TM2/TM3
Band Edges Compliance	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1
	Detector	RMS
	RF Channels (TX)	L, H
	Test Mode	TM1/TM2/TM3
Spurious Emission at Antenna Terminals	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1
	Detector	PK
	RF Channels (TX)	L, M, H
	Test Mode	TM1/TM2/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/TM2/TM3/TM4/TM5
Frequency Stability	Test Configuration	(1) -30 °C to +50 °C with step 10 °C at Rated Voltage; (2) VL, VH and VN Voltage at Ambient Temperature.
	Test Setup	Test Setup 2
	RF Channels (TX)	M
	Test Mode	TM1/TM2/TM3

6 Main Test Instruments

Table 3 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., 08, 2013
Spectrum analyzer	R&S	FSU3	200474	Mar., 05, 2013
Spectrum analyzer	R&S	FSU43	100144	Mar., 05, 2013
Double-Ridged Waveguide Horn Antenna (1G~18GHz)	R&S	HF907	100304	Apr., 05, 2013
Double-Ridged Waveguide Horn Antenna (1G~18GHz)	R&S	HF907	100391	Apr., 05, 2013
Trilog Broadband Antenna (30M~3GHz)	SCHWARZBECK	VULB 9163	9163-521	Jul., 07, 2013
Pyramidal Horn Antenna(26GHz-40GHz)	ETS-Lindgren	3160-10	00123940	Feb., 27, 2013
Pyramidal Horn Antenna(18GHz-26.5GHz)	ETS-Lindgren	3160-09	00125912	Feb., 27, 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 Test Setup	Appendix H

NOTE: There is no test data in Appendix H, only Photos of Test Setup for Field Strength of Spurious Radiation.

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

		RF Output Power (Conducted)		
TEST CONDITIONS		Channel128(B)	Channel192(M)	Channel251(T)
		824.2MHz	837.0MHz	848.8MHz
		dBm	dBm	dBm
T_{nom} / V_{nom}		Measured	Measured	Measured
TM1		32.53	32.43	32.51
TM2		26.95	26.96	27.01
TEST CONDITIONS		Channel4132(B)	Channel4182(M)	Channel4233(T)
		826.4MHz	836.4MHz	846.6MHz
		dBm	dBm	dBm
T_{nom} / V_{nom}		Measured	Measured	Measured
TM3		22.1	22.31	21.99
TM4	Case1	22.14	22.25	21.98
	Case2	22.15	22.05	21.92
	Case3	21.65	21.53	21.56
	Case4	21.31	21.32	21.34
TM5	Case1	21.15	21.78	21.73
	Case2	20.56	20.18	20.39
	Case3	20.63	20.65	20.66
	Case4	20.39	20.58	20.7
	Case5	21.16	21.82	21.74



Effective Radiated Power of Transmitter (ERP)

Test Mode	Freq. [MHz]	Meas. Level [dBm]	Substitution on Antenna Type	SGP [dBm]	Substitution on Gain [dBd]	Cable Loss [dB]	Substitution Level (ERP) [dBm]	FCC limit [dBm]	Result
TM1	824.2	31.89	Dipole Ant.	35.04	-2.75	0.6	31.69	38.5	Pass
TM1	837.0	31.79	Dipole Ant.	35.06	-2.87	0.6	31.59	38.5	Pass
TM1	848.8	31.87	Dipole Ant.	35.12	-2.85	0.6	31.67	38.5	Pass
TM2	824.2	26.31	Dipole Ant.	29.69	-2.75	0.6	26.34	38.5	Pass
TM2	837.0	26.32	Dipole Ant.	29.94	-2.87	0.6	26.47	38.5	Pass
TM2	848.8	26.37	Dipole Ant.	29.94	-2.85	0.6	26.49	38.5	Pass
TM3	826.4	21.46	Dipole Ant.	24.61	-2.75	0.6	21.26	38.5	Pass
TM3	836.4	21.67	Dipole Ant.	24.94	-2.87	0.6	21.47	38.5	Pass
TM3	846.6	21.35	Dipole Ant.	24.6	-2.85	0.6	21.15	38.5	Pass

Note: a, For getting the ERP (Efficient Radiated Power) in substitution method, the following formula should take to calculate it,

$$\text{ERP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBd]}$$

b, SGP=Signal Generator Level

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



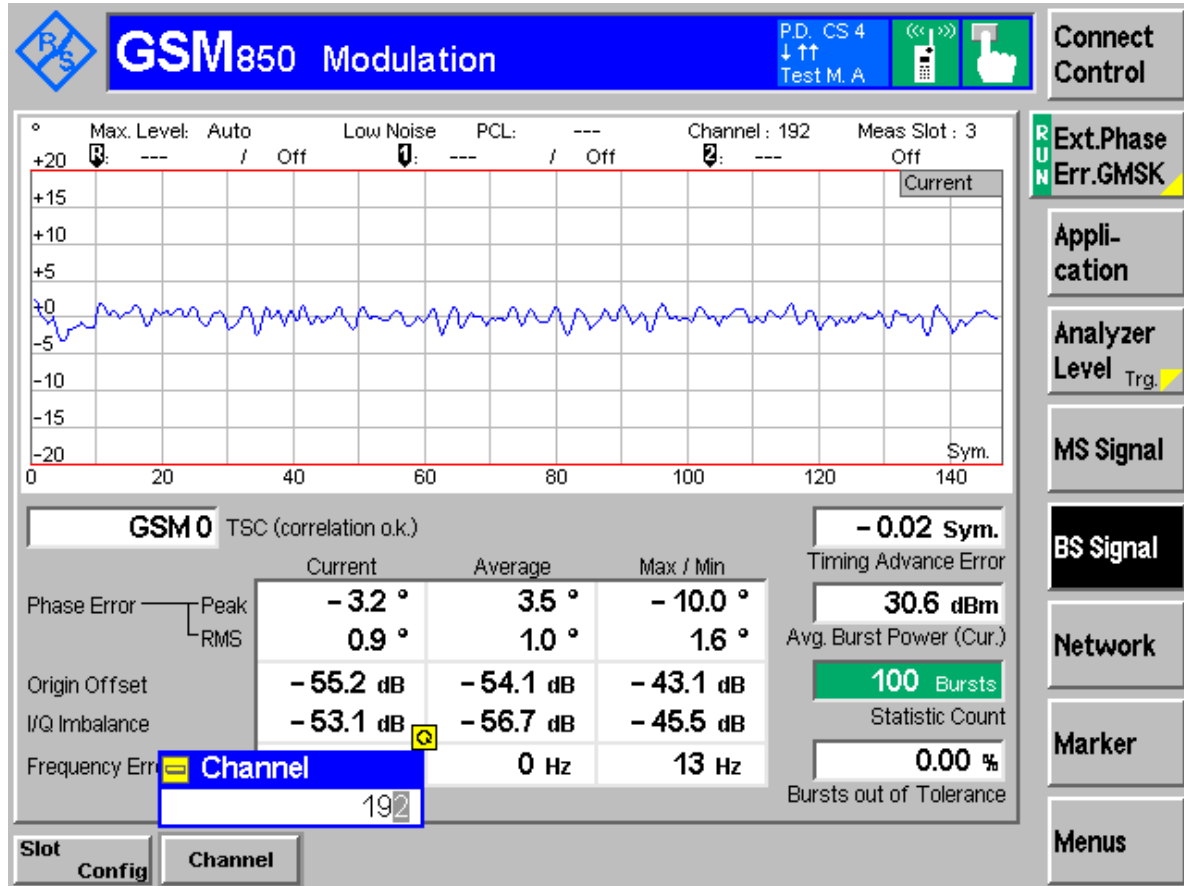
Appendix B

Modulation Characteristics

According to FCC Part 2.1047 & Part22 Subpart H

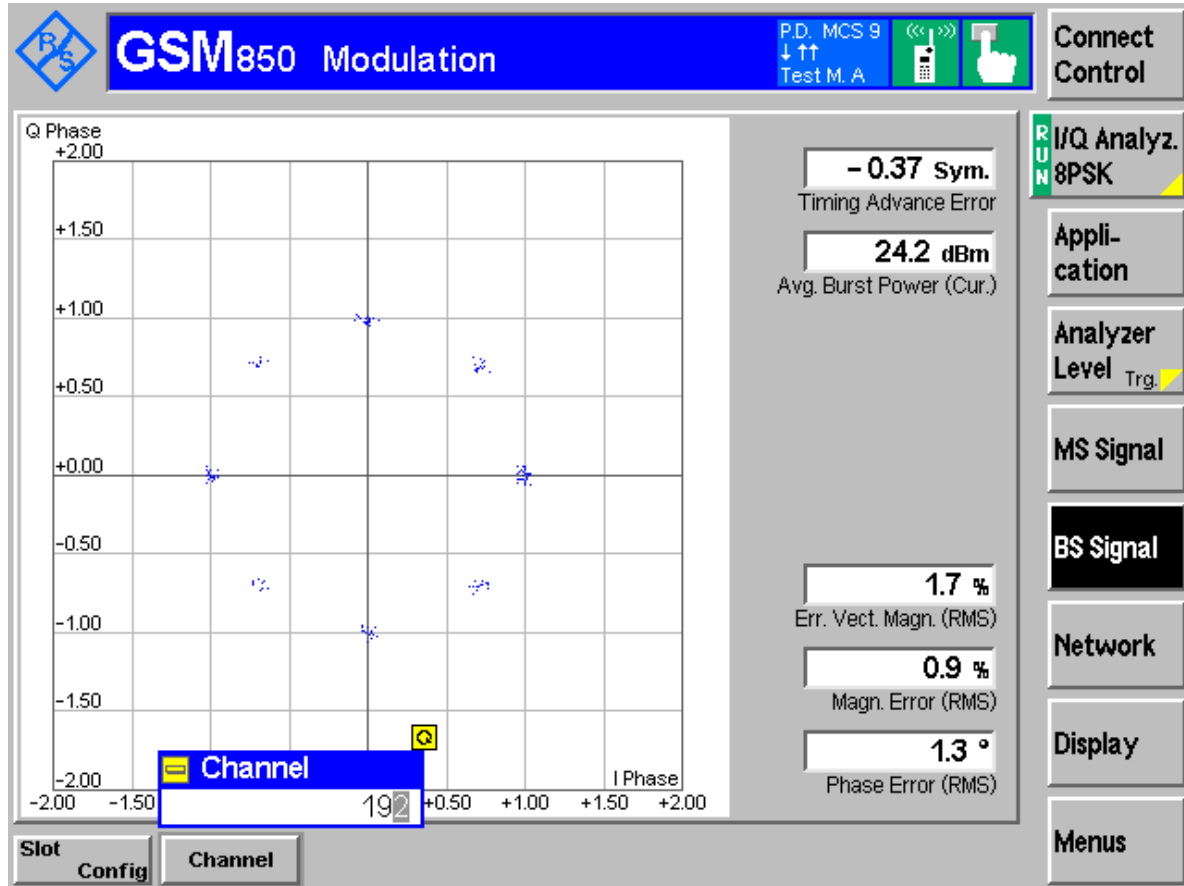


Channel 192 (TM1:GPRS/GSM)



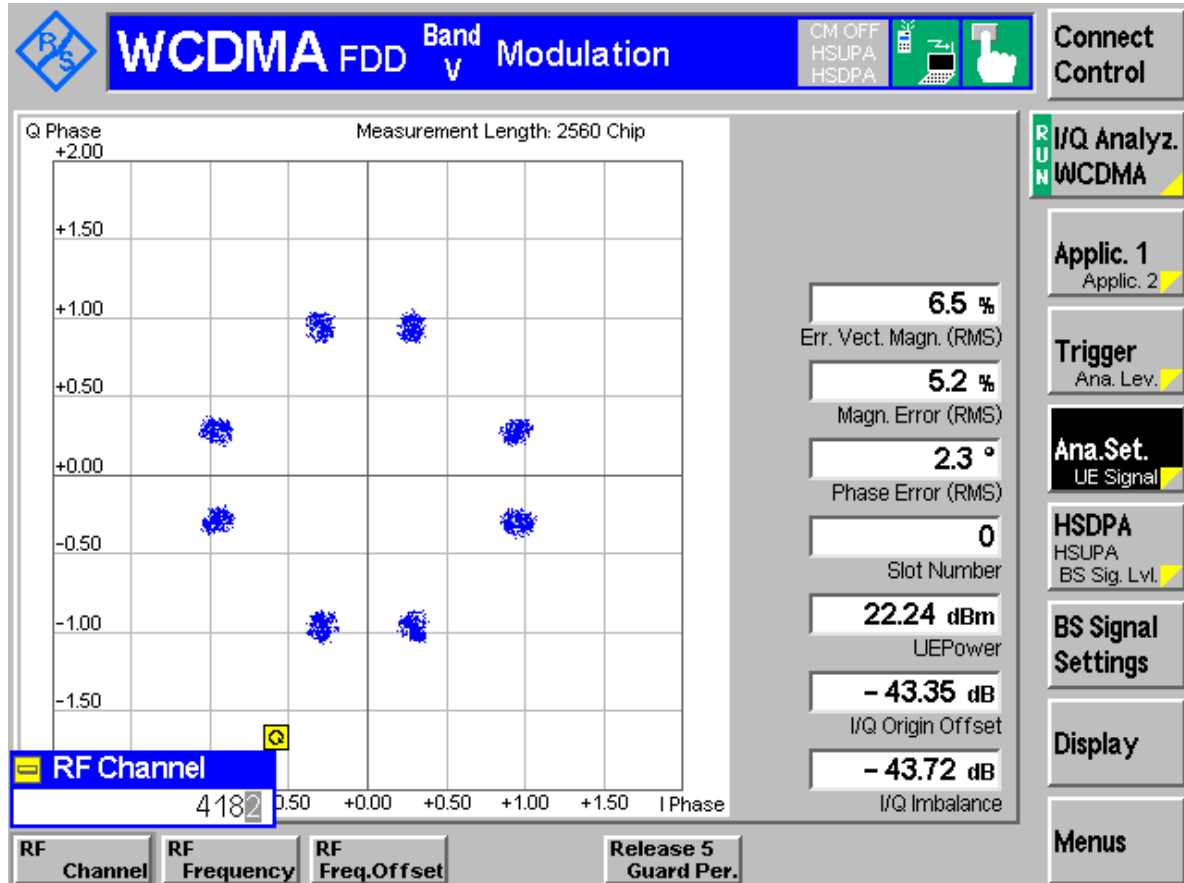


Channel 192 (TM2:EDGE)





Channel 4182 (TM3: WCDMA)



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

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Appendix C

Occupied Bandwidth According to FCC Part 2.1049 & Part 22 Subpart H



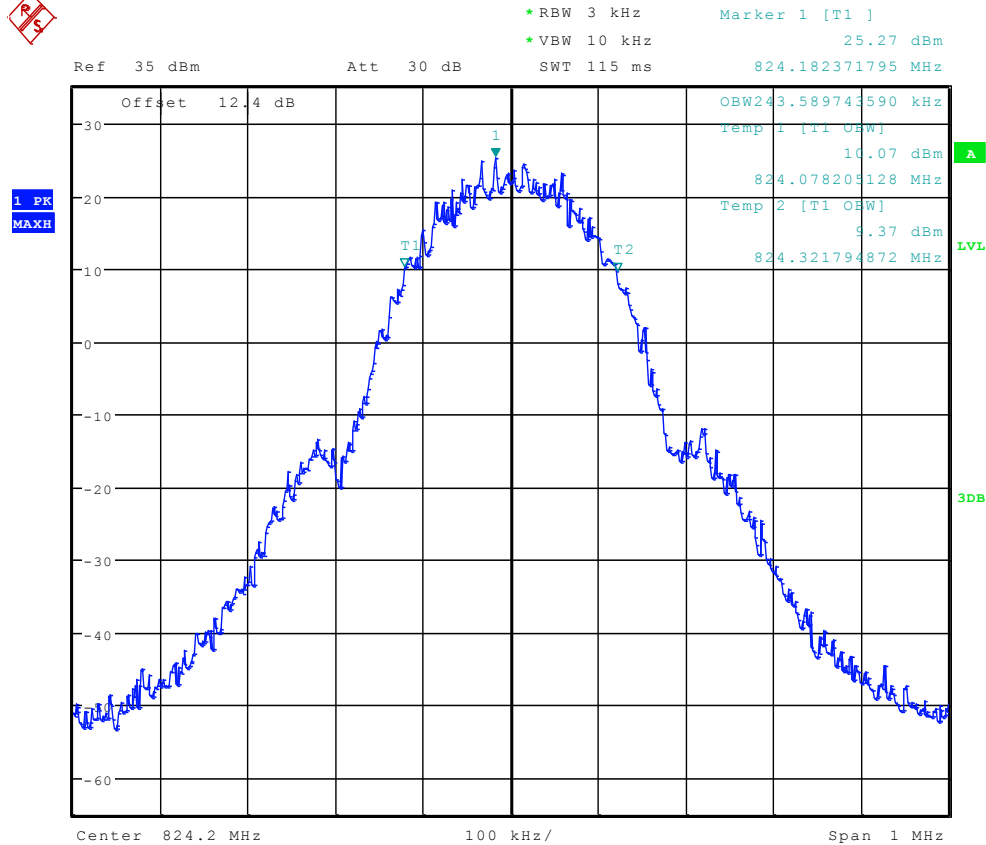
Result Table

Table 1 Measurement Results

Test Mode	RF Channel	Occupied Bandwidth [kHz]	Verdict
TM1	128	243.59	Pass
	192	245.20	Pass
	251	243.59	Pass
TM2	128	238.79	Pass
	192	241.99	Pass
	251	238.79	Pass
Test Mode	RF Channel	Occupied Bandwidth [MHz]	Verdict
TM3	4132	4.1507	Pass
	4182	4.1347	Pass
	4233	4.1186	Pass



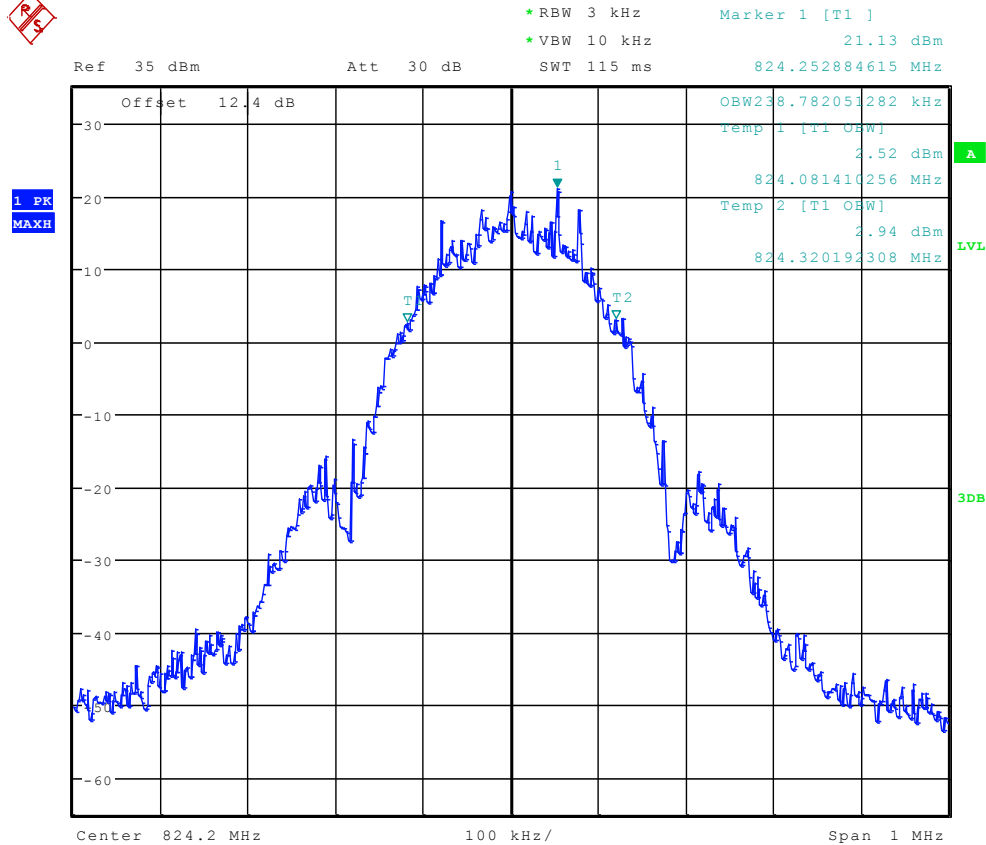
Channel 128 (TM1:GPRS/GSM)



Date: 4.JUL.2012 00:41:22



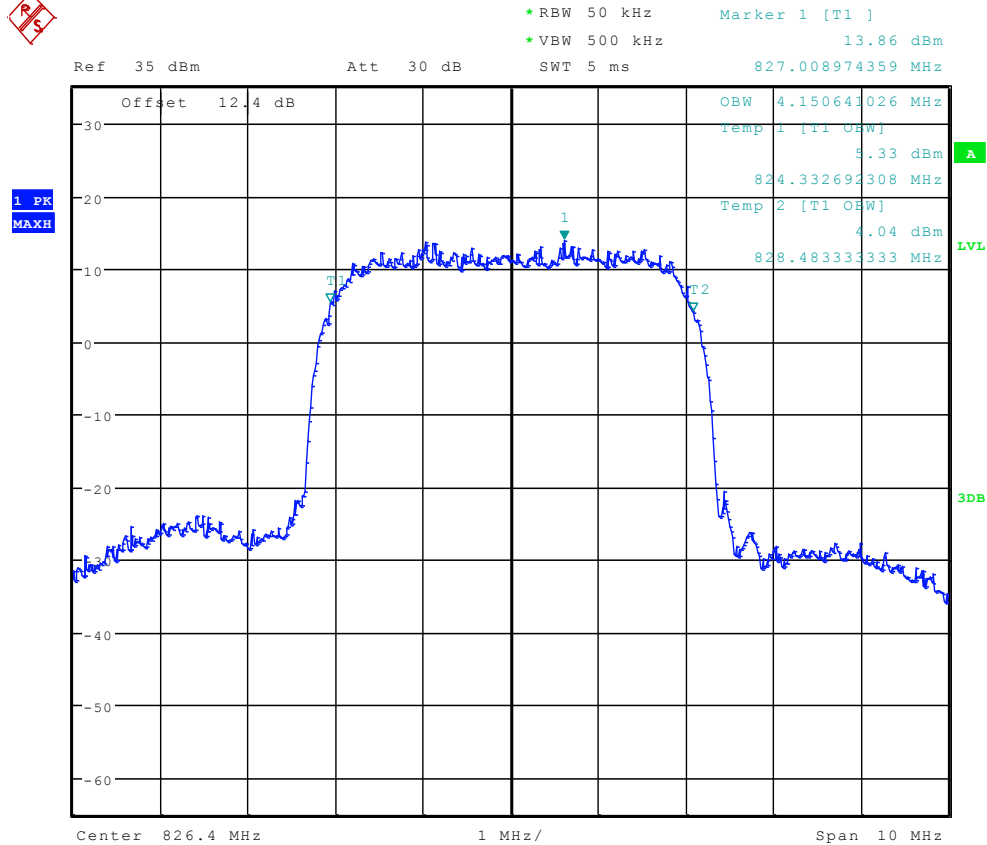
Channel 128 (TM2:EDGE)



Date: 4.JUL.2012 00:51:03



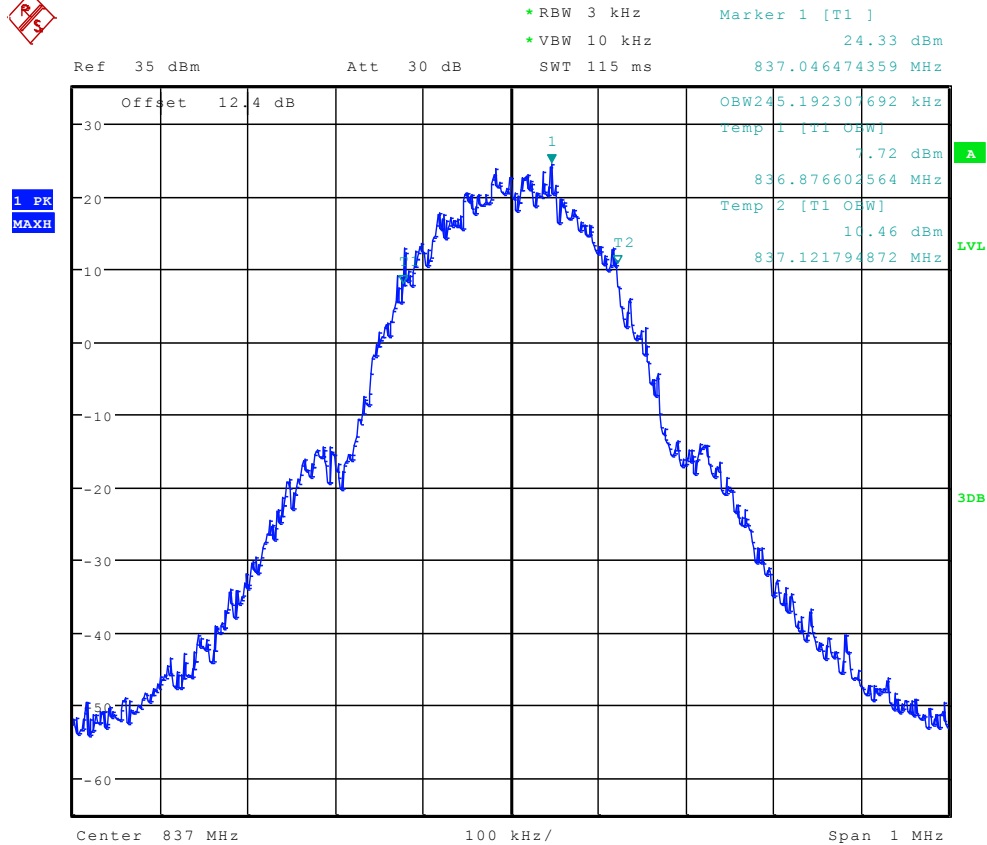
Channel 4132 (TM3: WCDMA)



Date: 4.JUL.2012 00:57:44



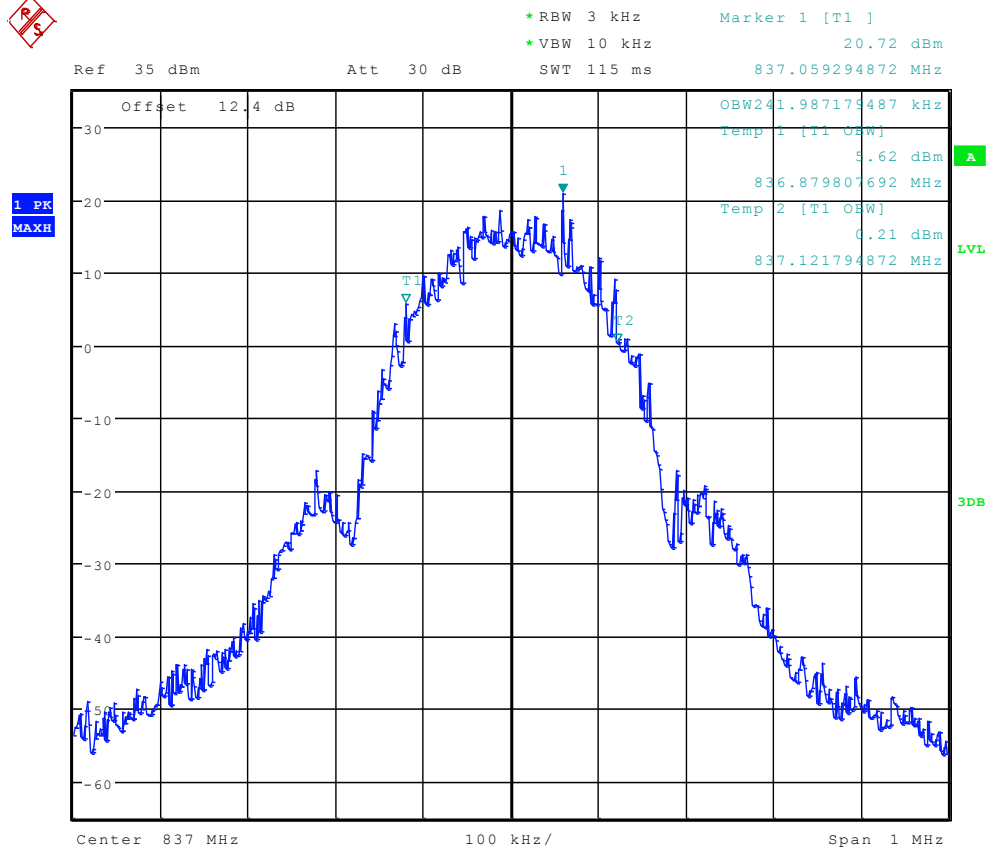
Channel 192 (TM1:GPRS/GSM)



Date: 4.JUL.2012 00:41:41



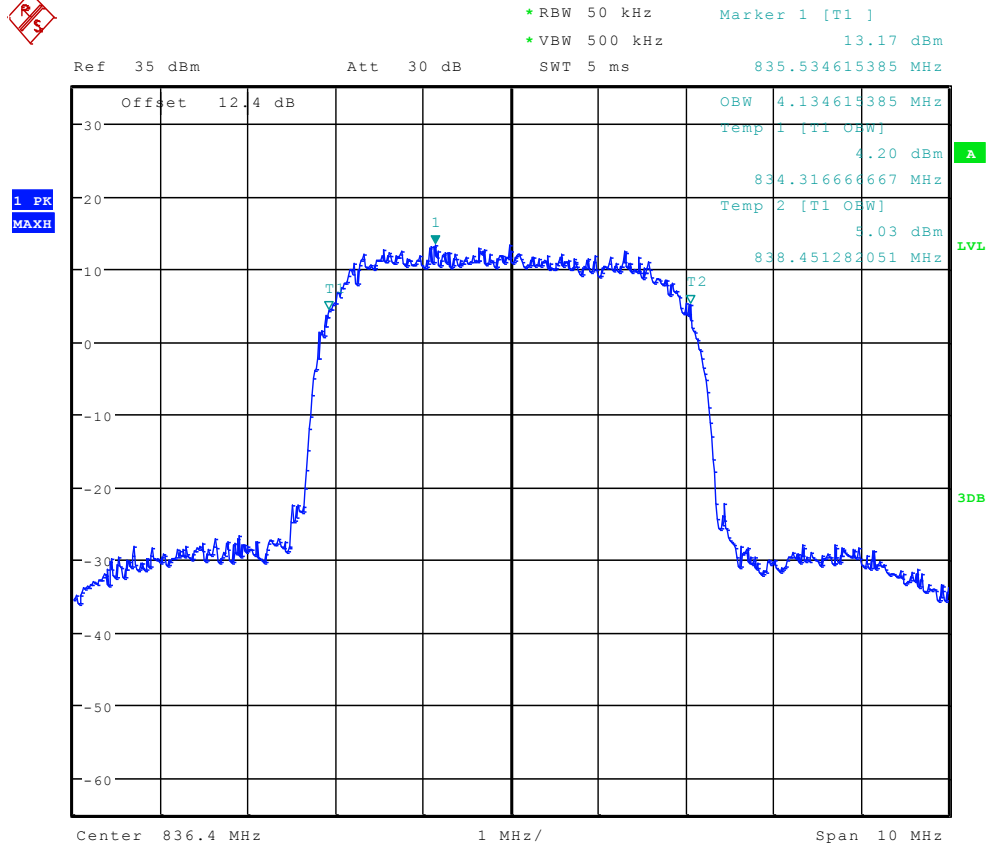
Channel 192 (TM2:EDGE)



Date: 4.JUL.2012 00:51:17



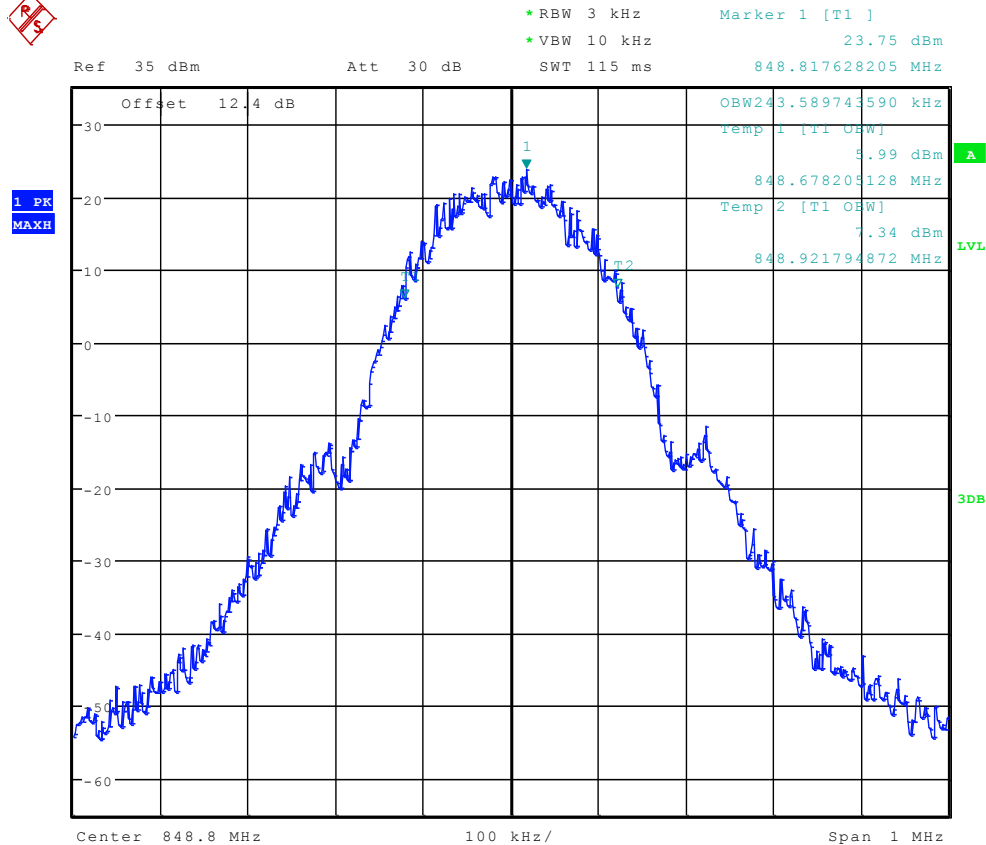
Channel 4182 (TM3: WCDMA)



Date: 4.JUL.2012 00:57:57



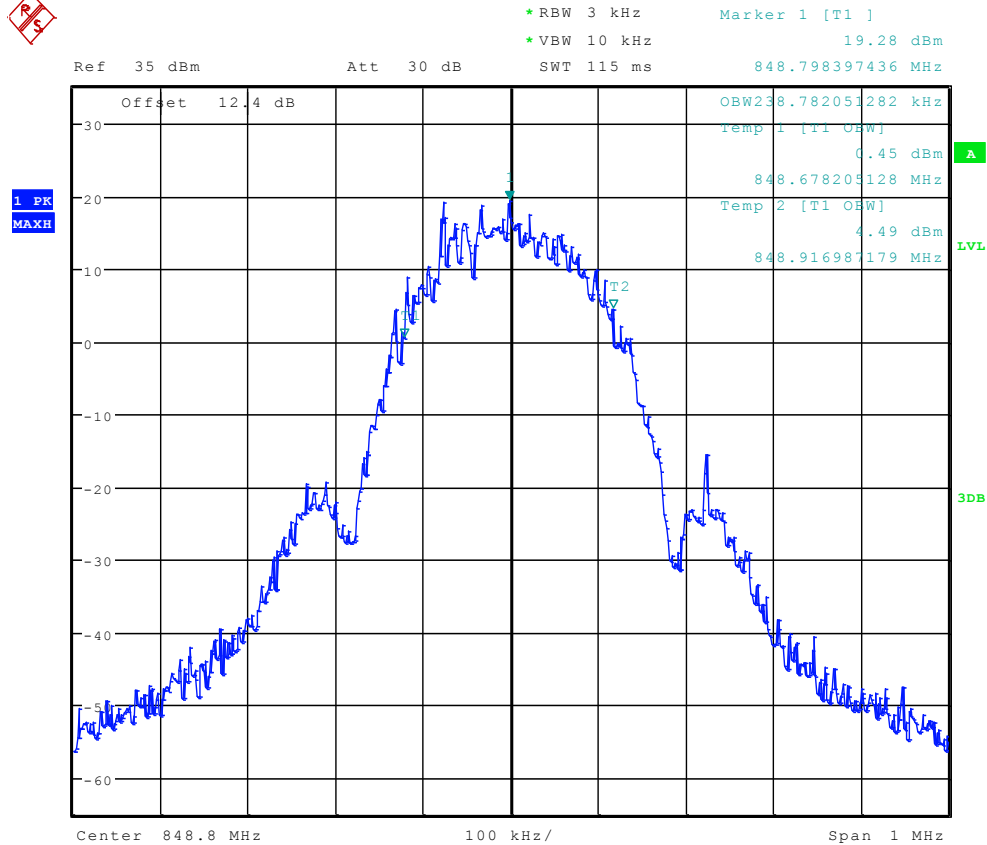
Channel 251 (TM1:GPRS/GSM)



Date: 4.JUL.2012 00:41:55



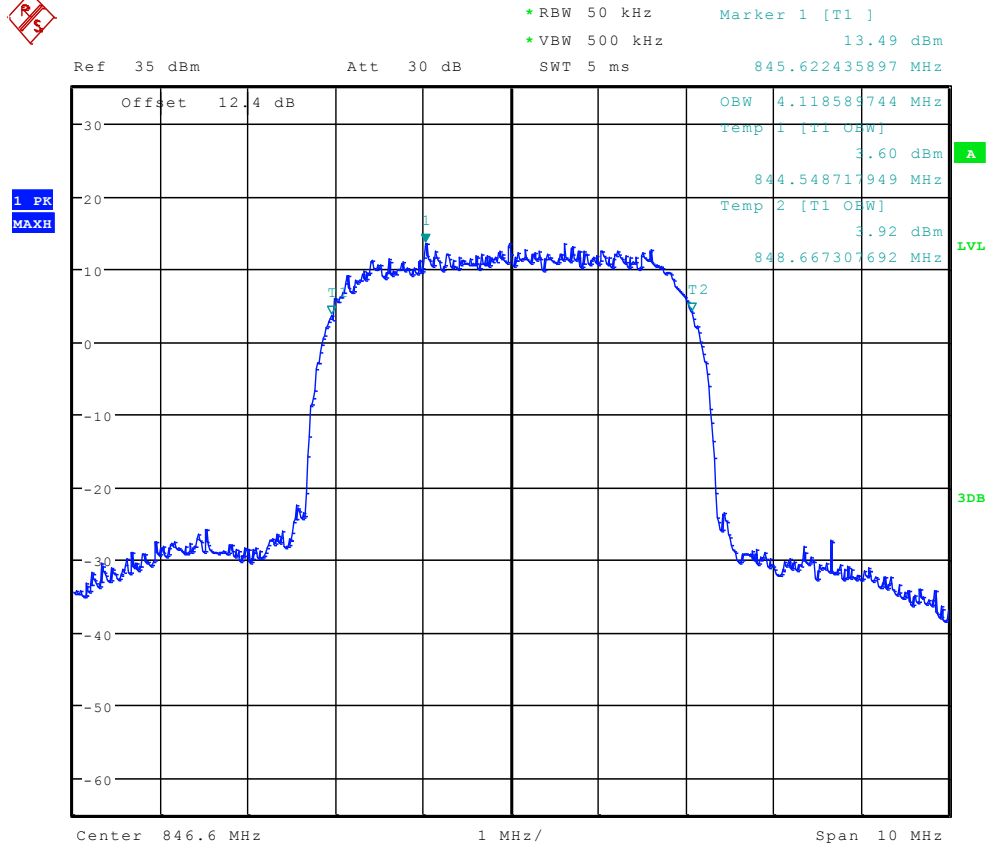
Channel 251 (TM2:EDGE)



Date: 4.JUL.2012 00:51:31



Channel 4233 (TM3: WCDMA)



Date: 4.JUL.2012 00:58:11

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

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Appendix D

Band Edges Compliance

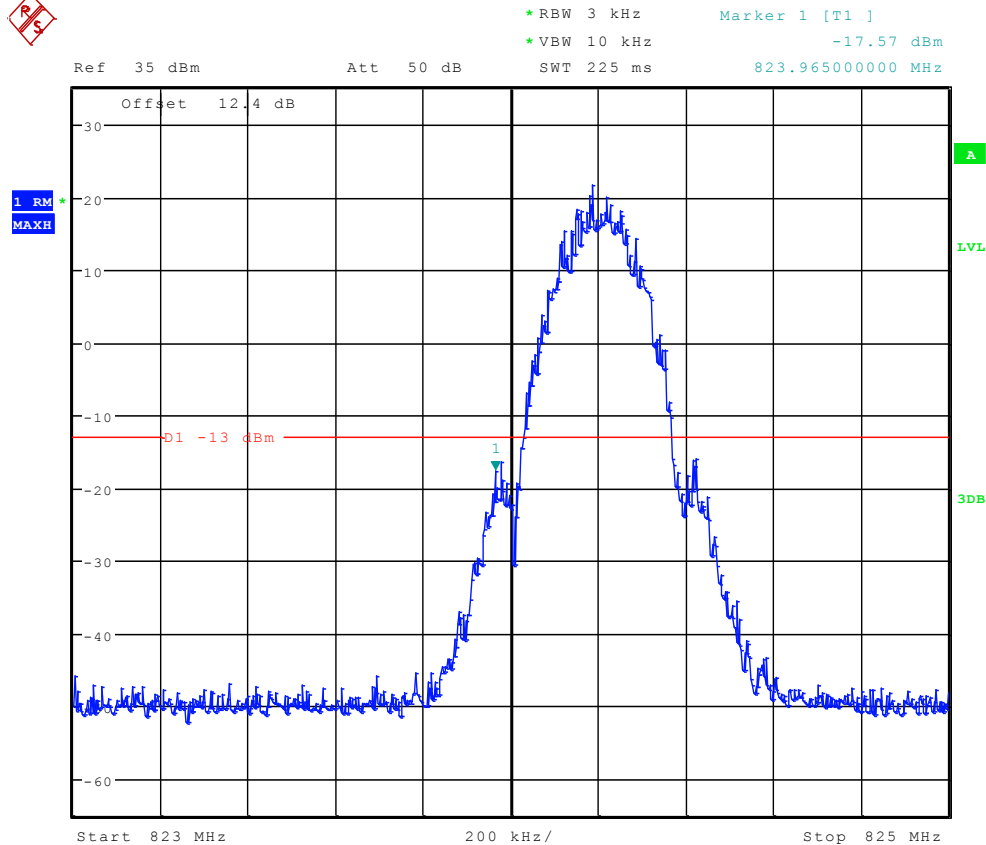
According to FCC Part 2.1051 & Part 22 Subpart H



TM1:GPRS/GSM

Left Edge

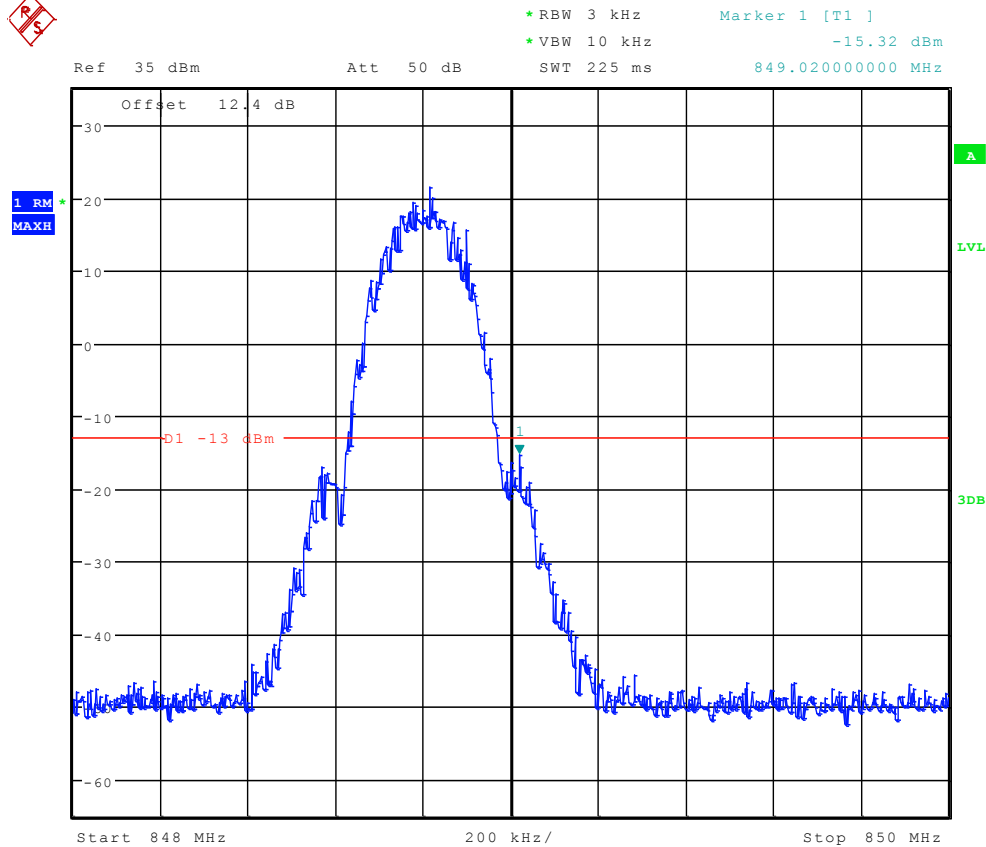
Channel 128



Date: 4.JUL.2012 00:45:04



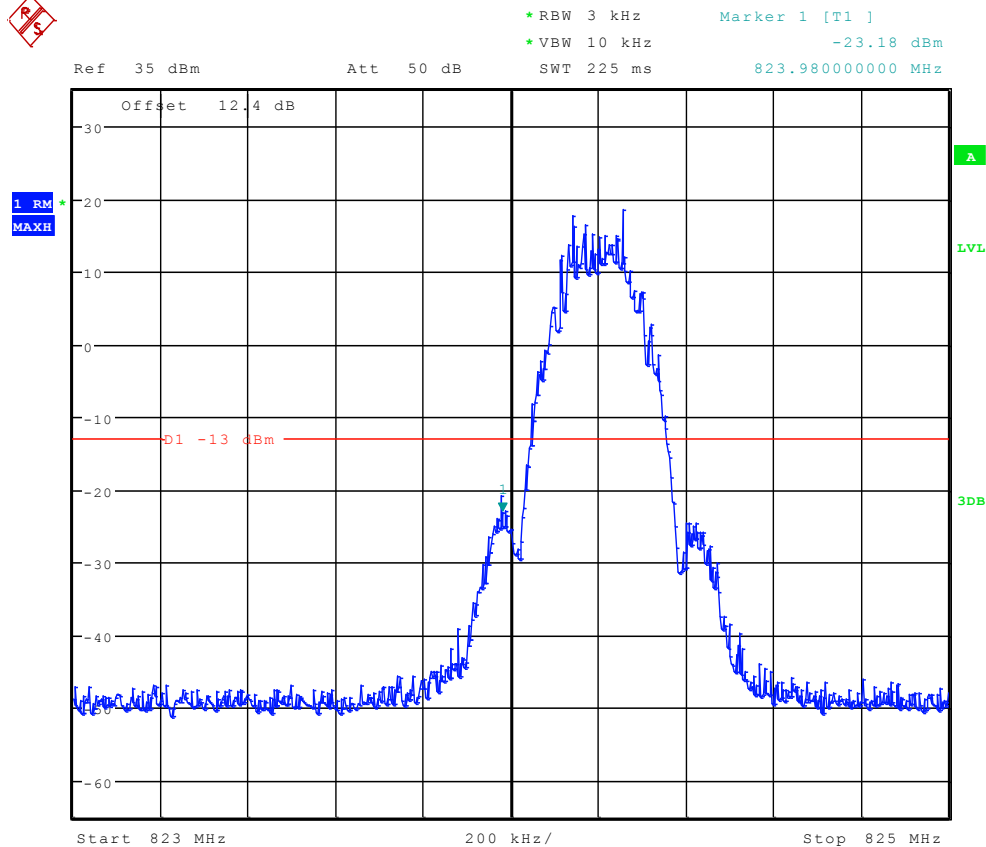
Right Edge Channel 251



Date: 4.JUL.2012 00:45:17



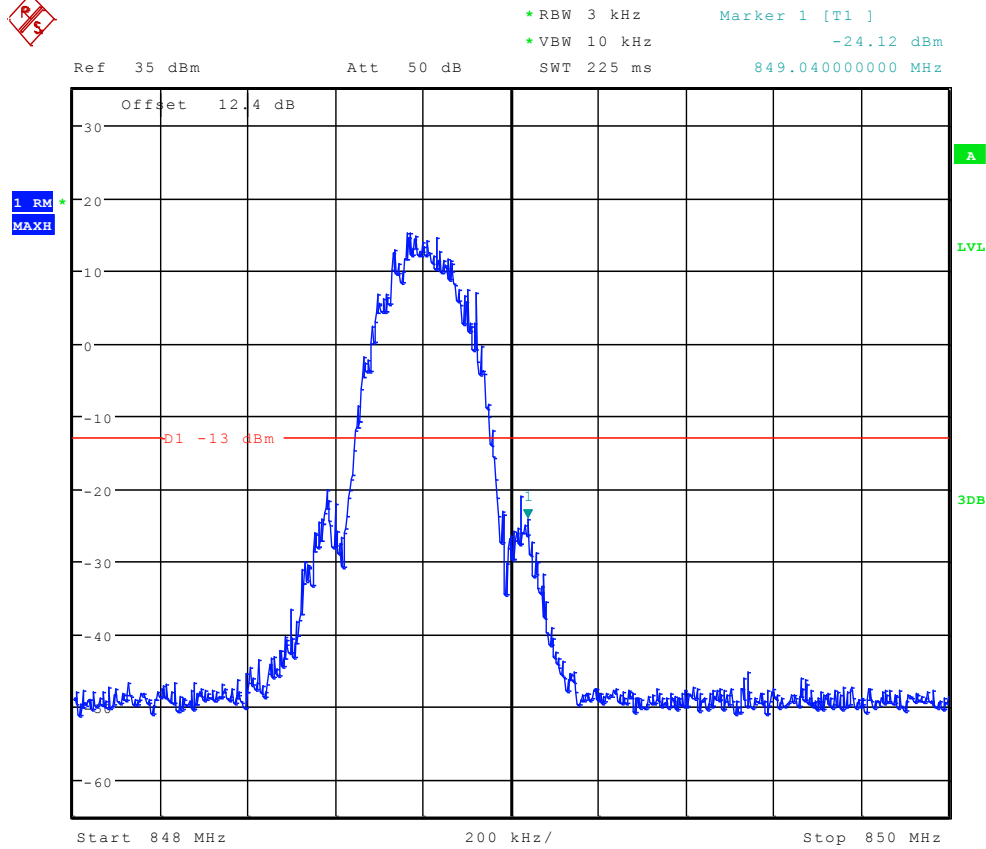
TM2:EDGE Left Edge Channel 128



Date: 4.JUL.2012 00:54:51



Right Edge Channel 251



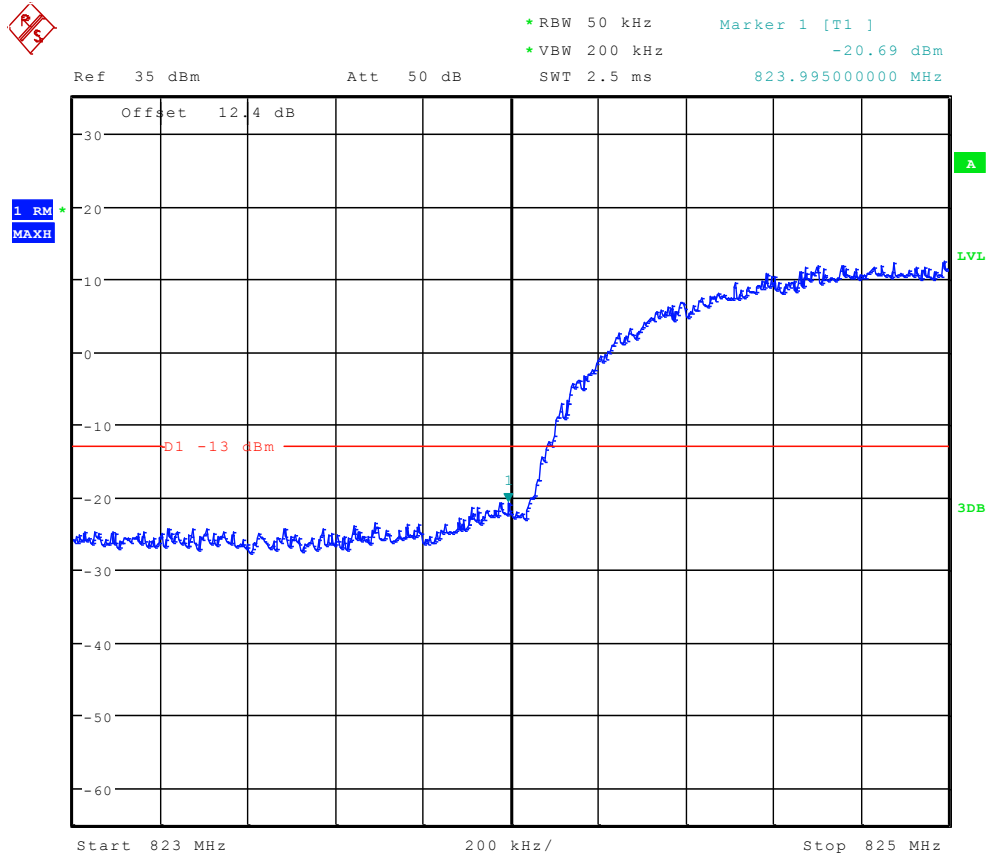
Date: 4.JUL.2012 00:55:13



TM3: WCDMA

Left Edge

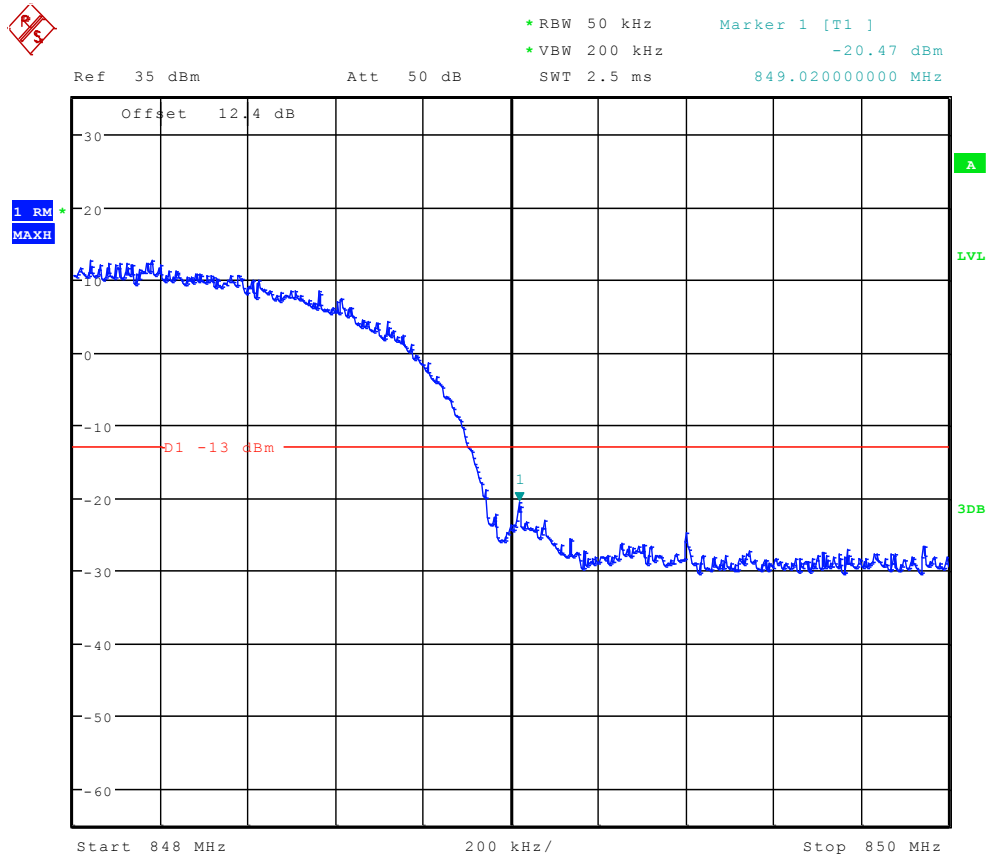
Channel 4132



Date: 4.JUL.2012 01:01:20



Right Edge Channel 4233



Date: 4.JUL.2012 01:01:34

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

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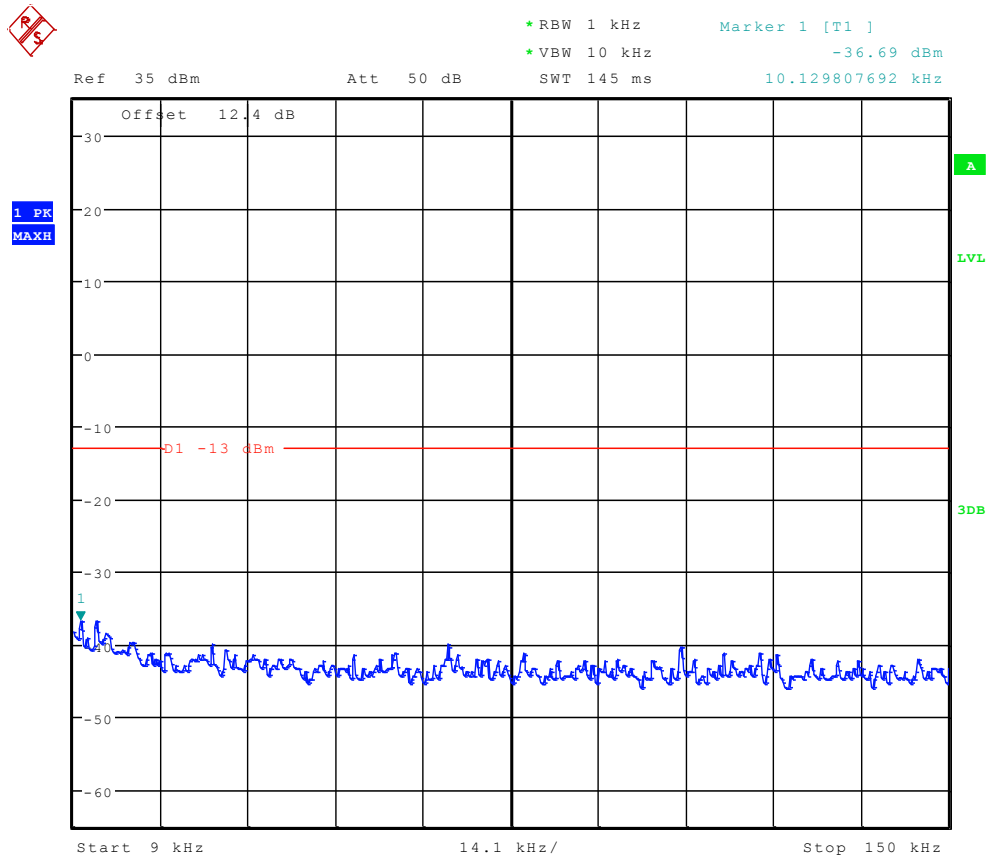
Appendix E

Spurious Emission at Antenna Terminal

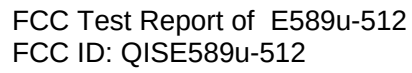
According to FCC Part 2.1051 & Part 22 Subpart H



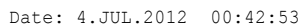
TM1:GPRS/GSM Channel 128

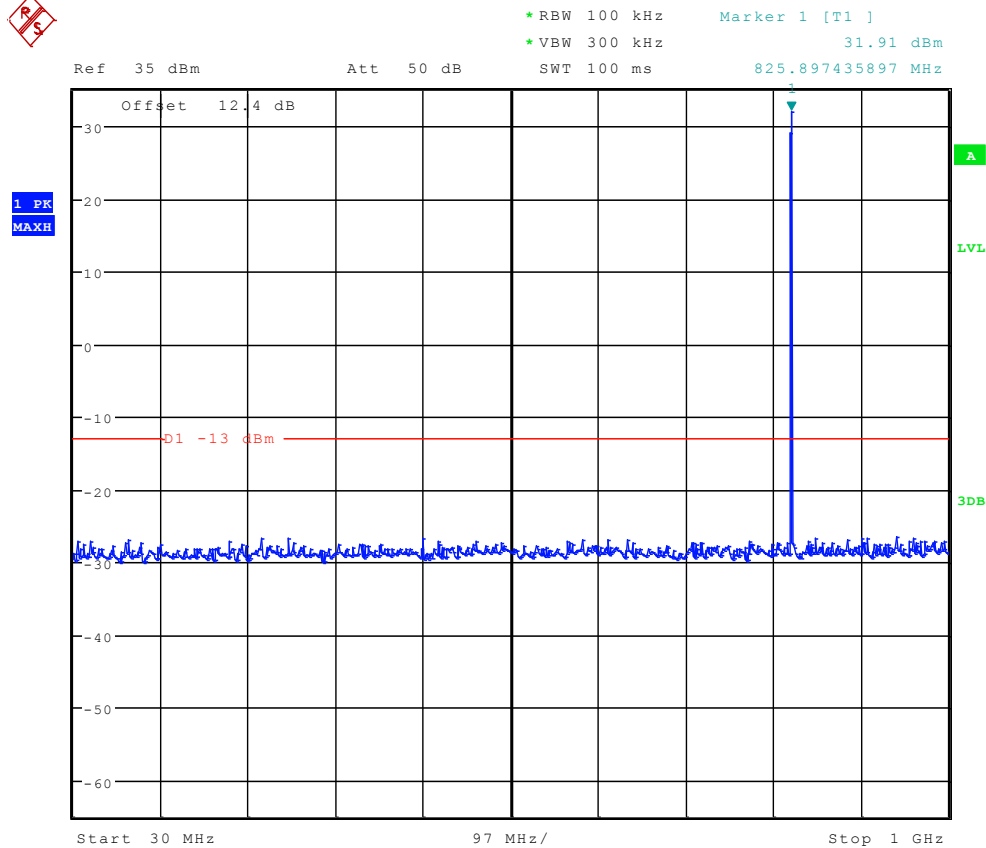


Date: 4.JUL.2012 00:42:10

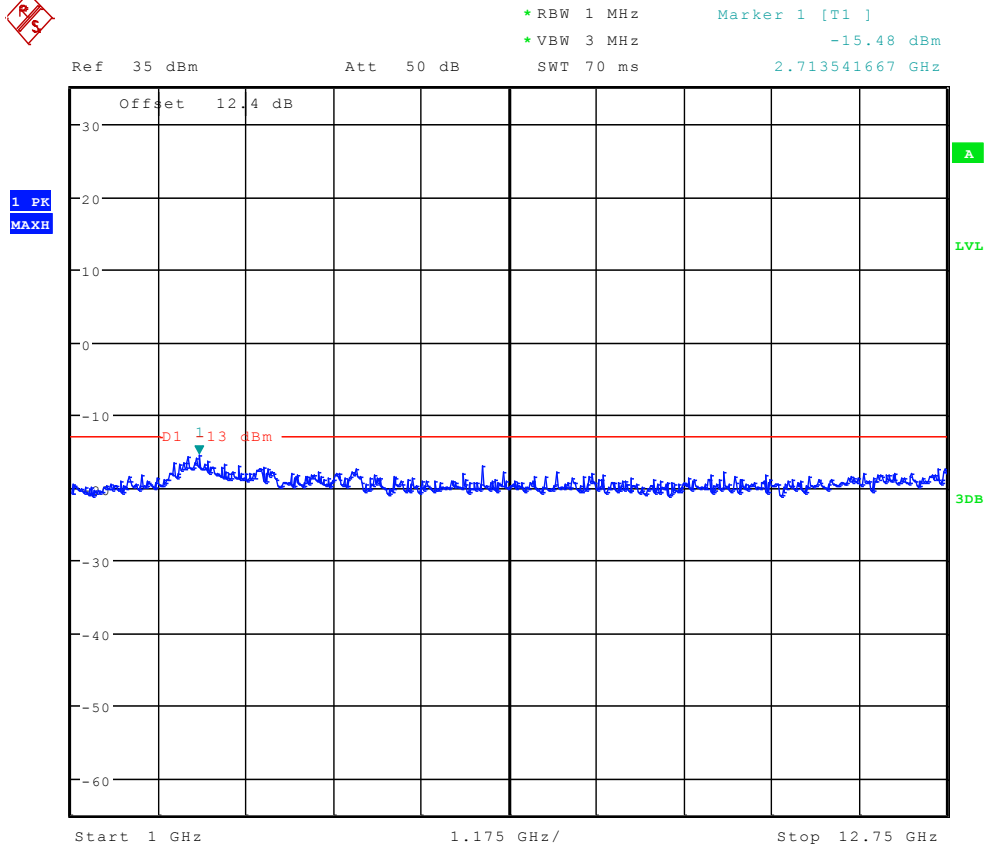


Ref 35 dB Att 50 dB SWT 300 ms 150.00000000 kHz





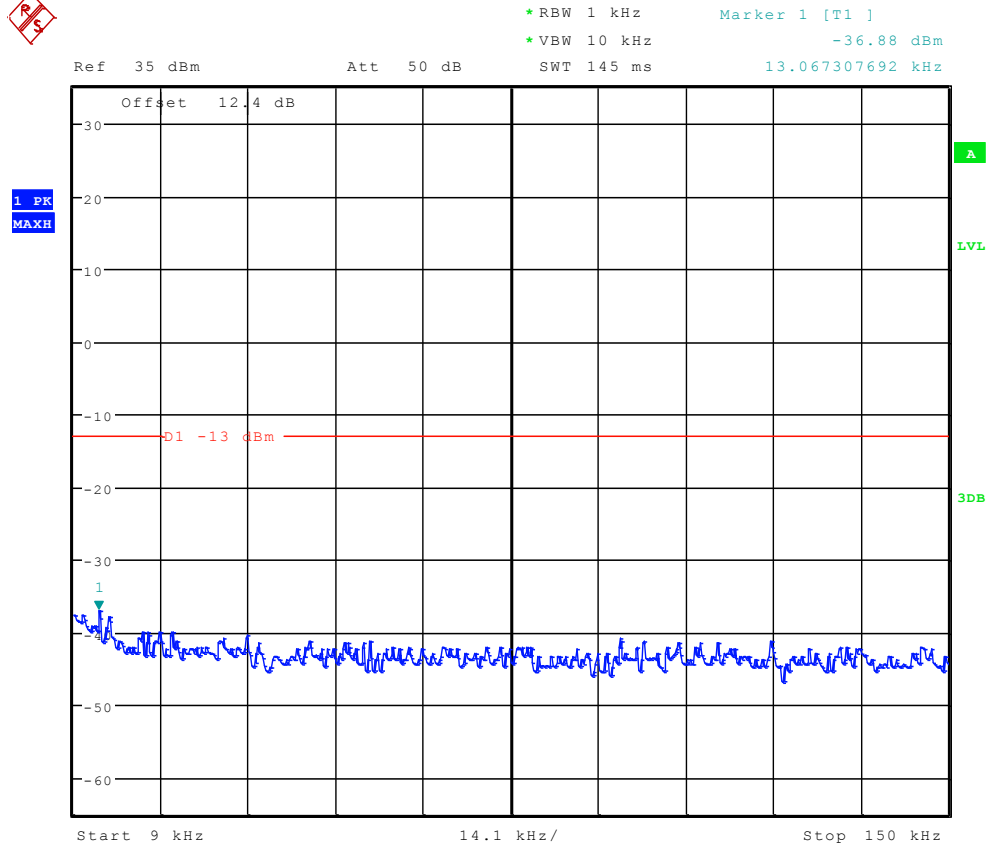
Date: 4.JUL.2012 00:43:37



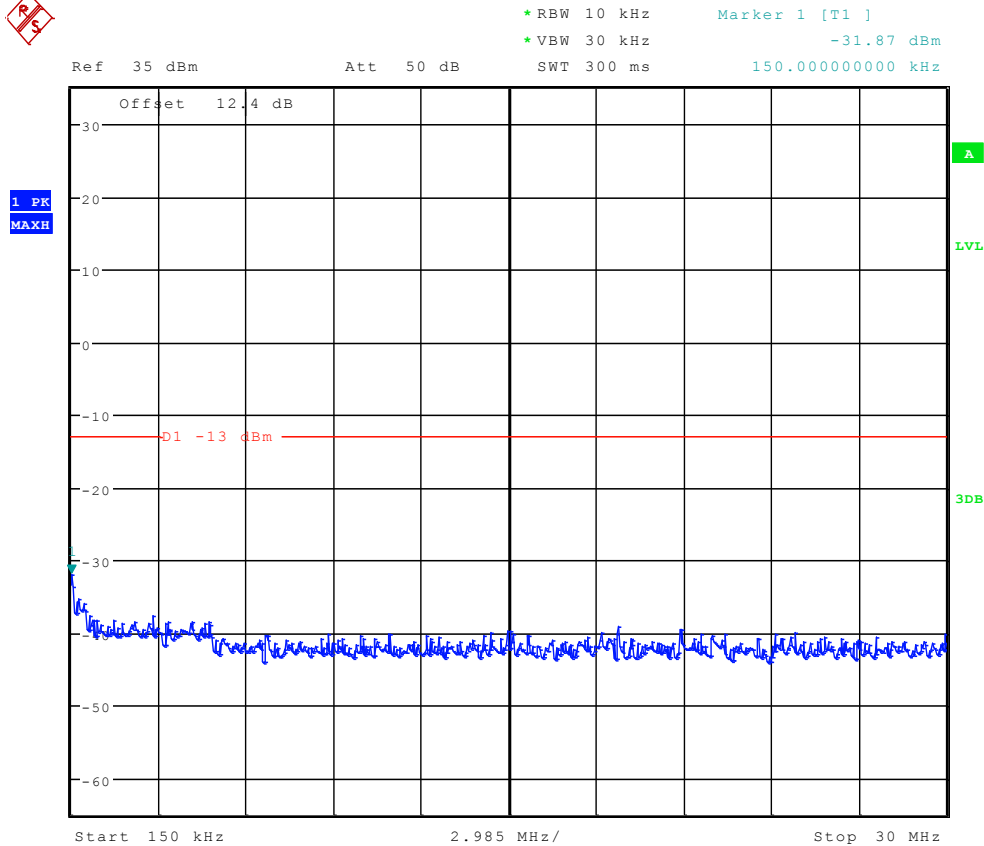
Date: 4.JUL.2012 00:44:20



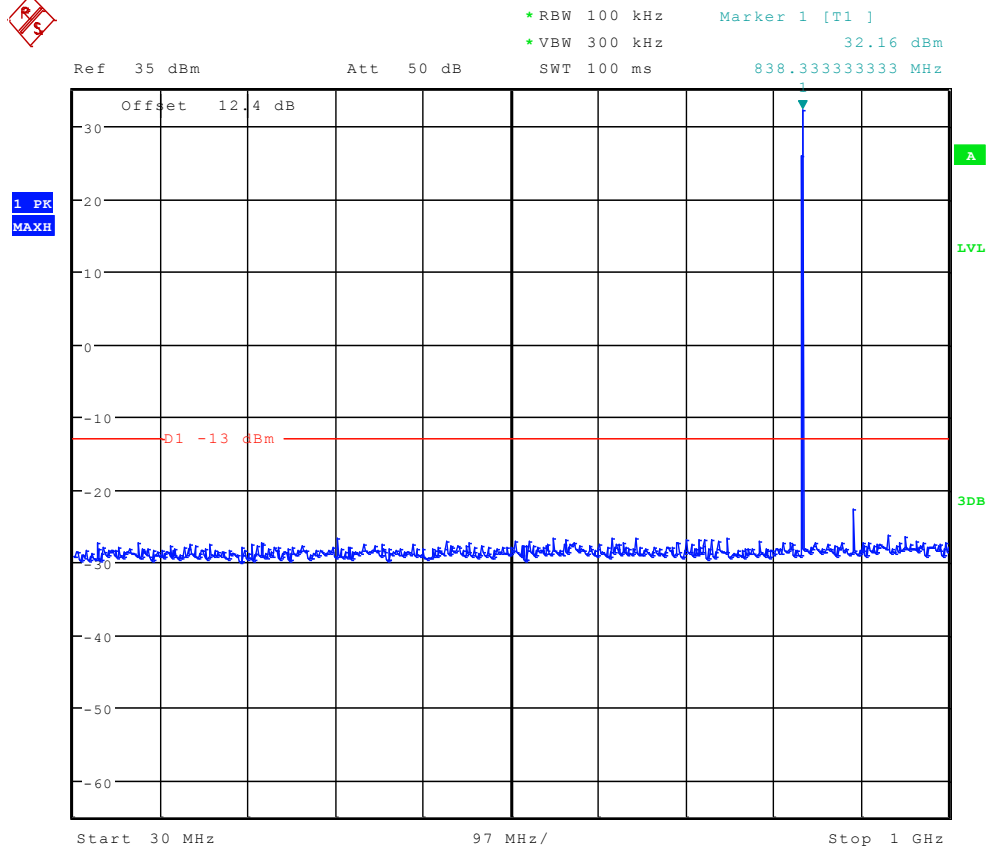
Channel 192



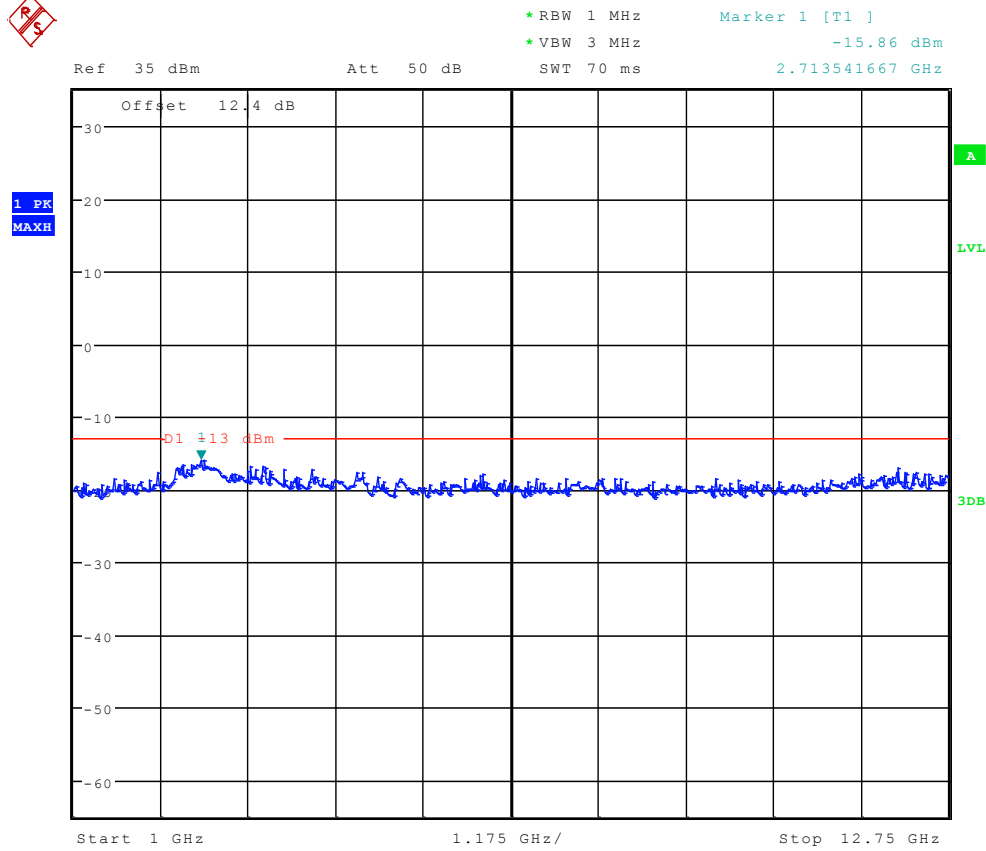
Date: 4.JUL.2012 00:42:24



Date: 4.JUL.2012 00:43:08



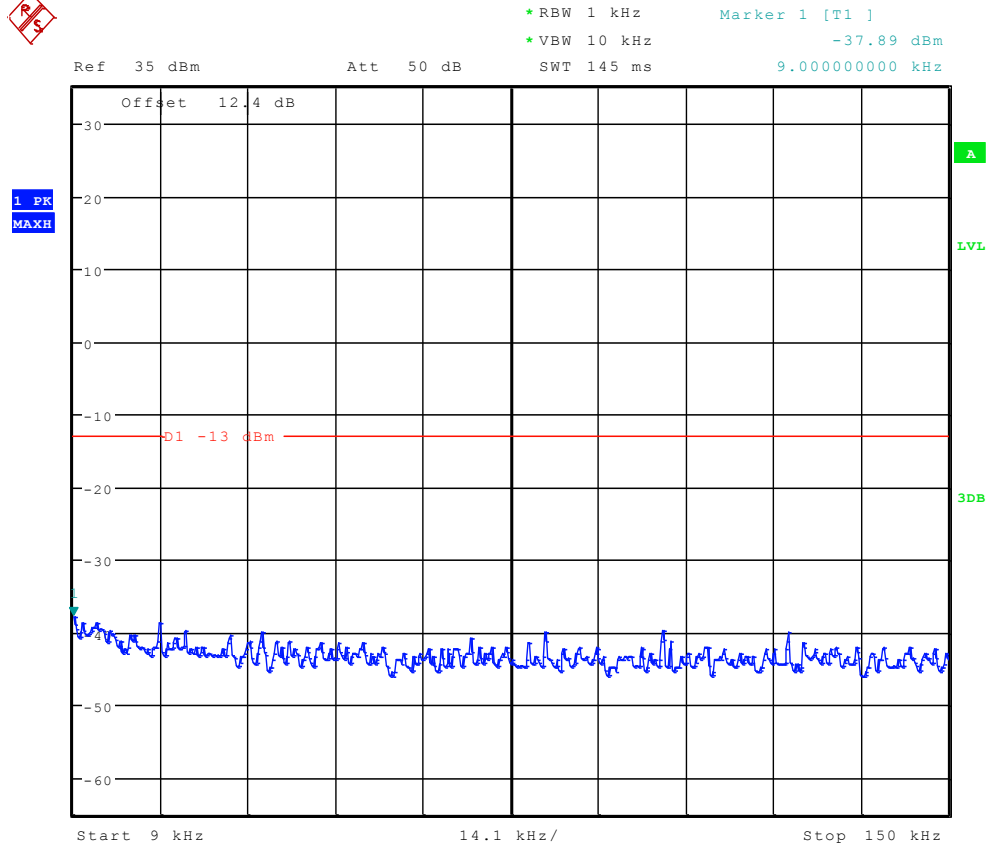
Date: 4.JUL.2012 00:43:51



Date: 4.JUL.2012 00:44:35



Channel 251

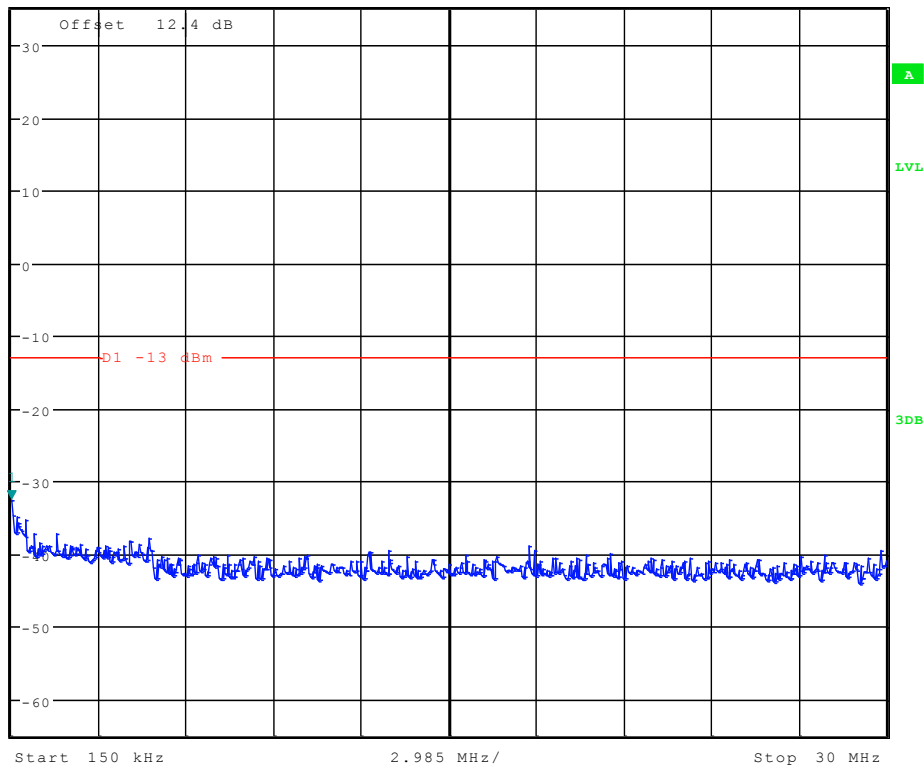


Date: 4.JUL.2012 00:42:39

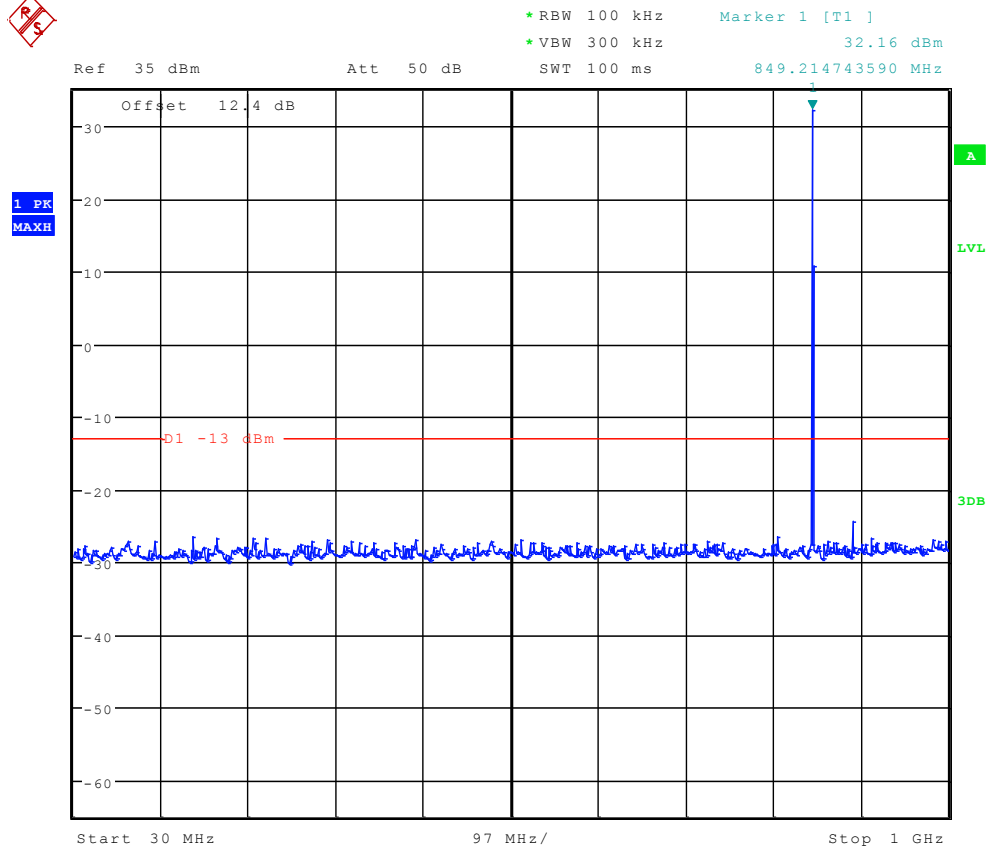


1 PK
MAXH

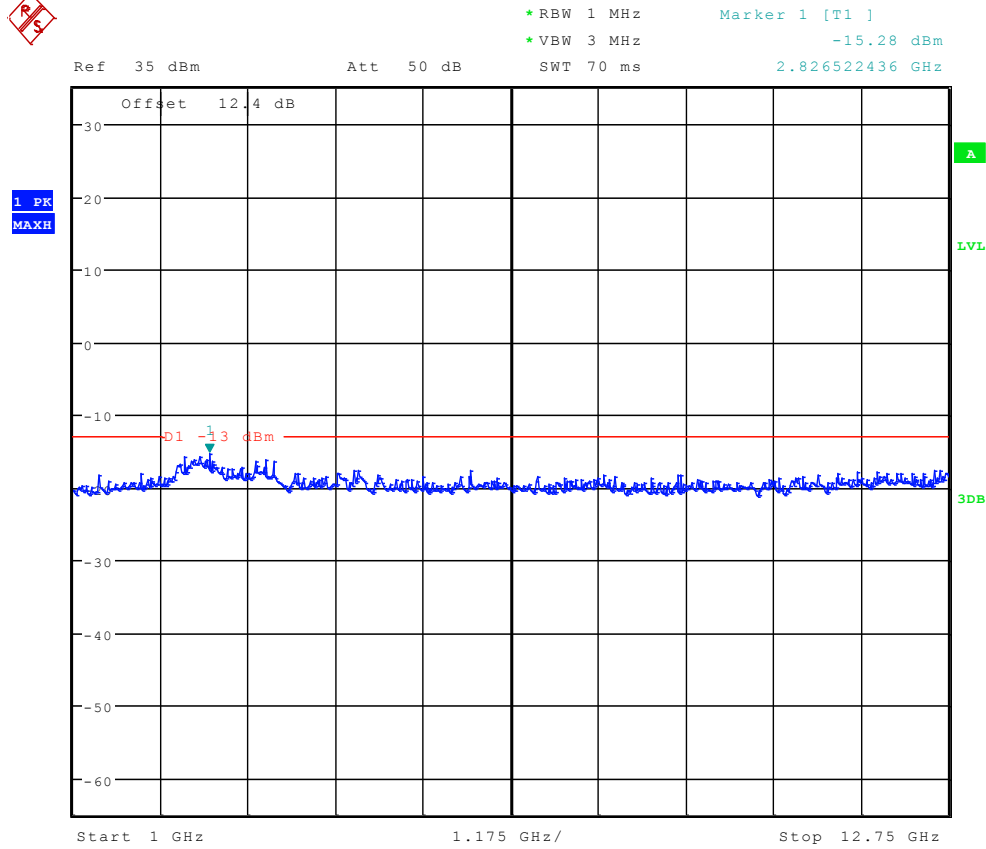
*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -32.48 dBm
Ref 35 dBm Att 50 dB SWT 300 ms 150.00000000 kHz



Date: 4.JUL.2012 00:43:22



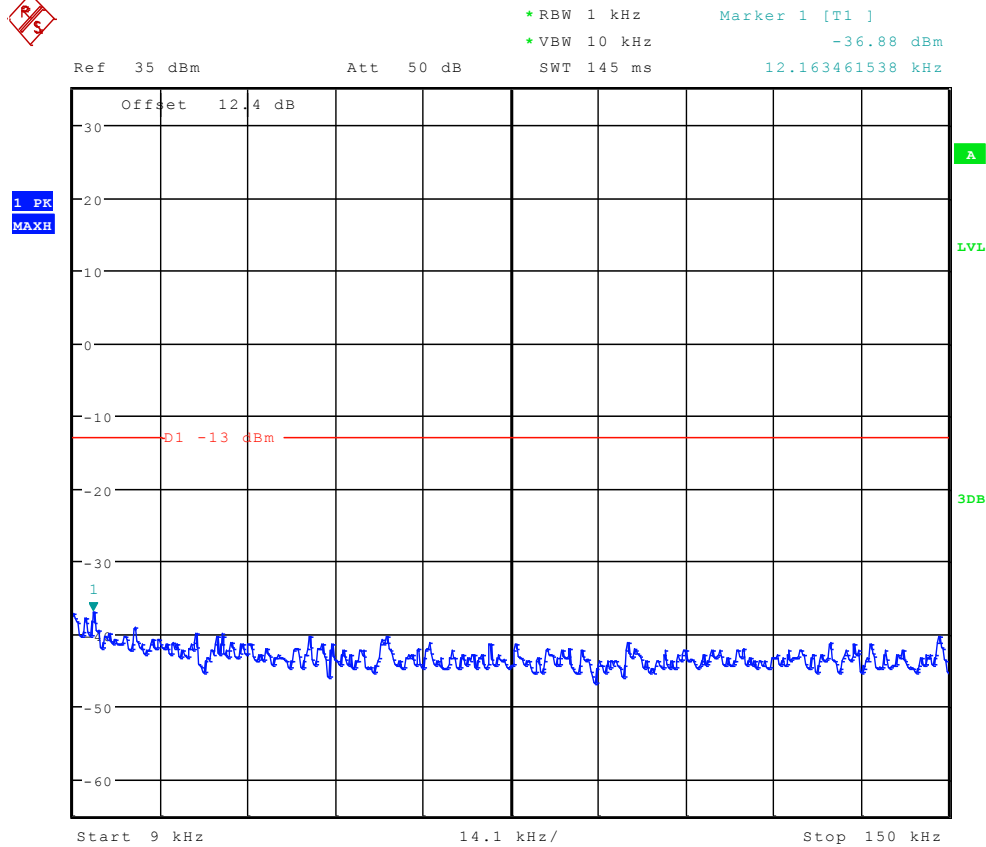
Date: 4.JUL.2012 00:44:06



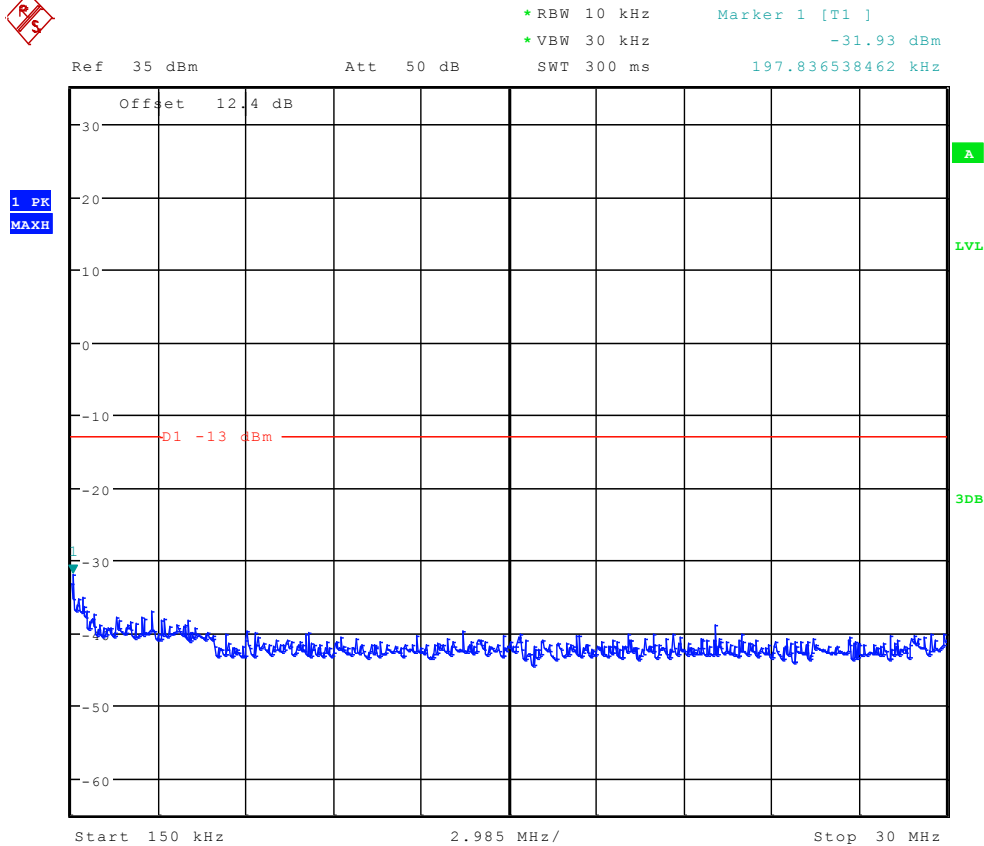
Date: 4.JUL.2012 00:44:49



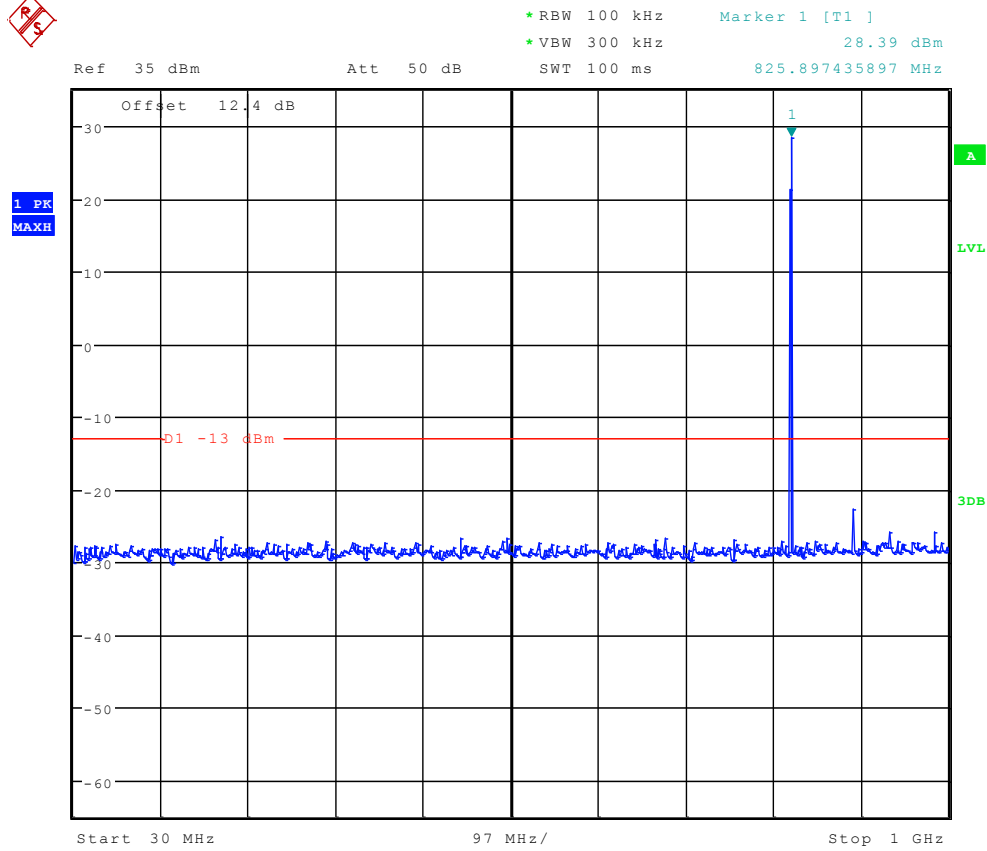
TM2:EDGE Channel 128



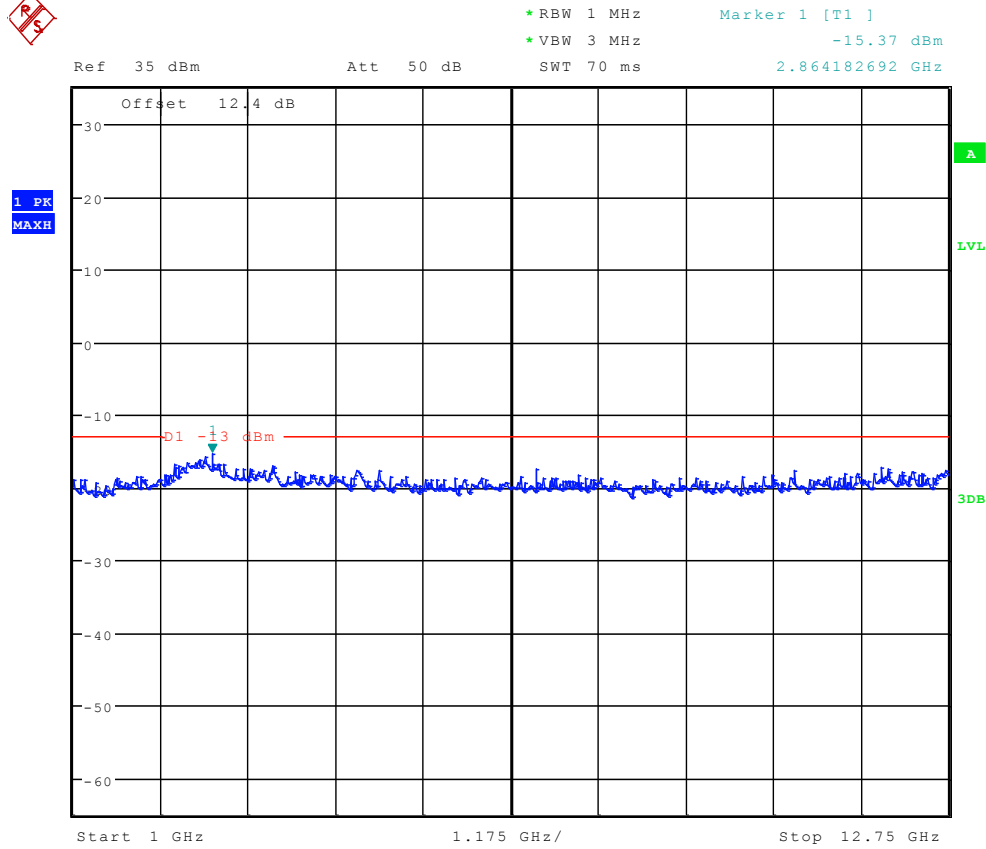
Date: 4.JUL.2012 00:51:45



Date: 4.JUL.2012 00:52:29



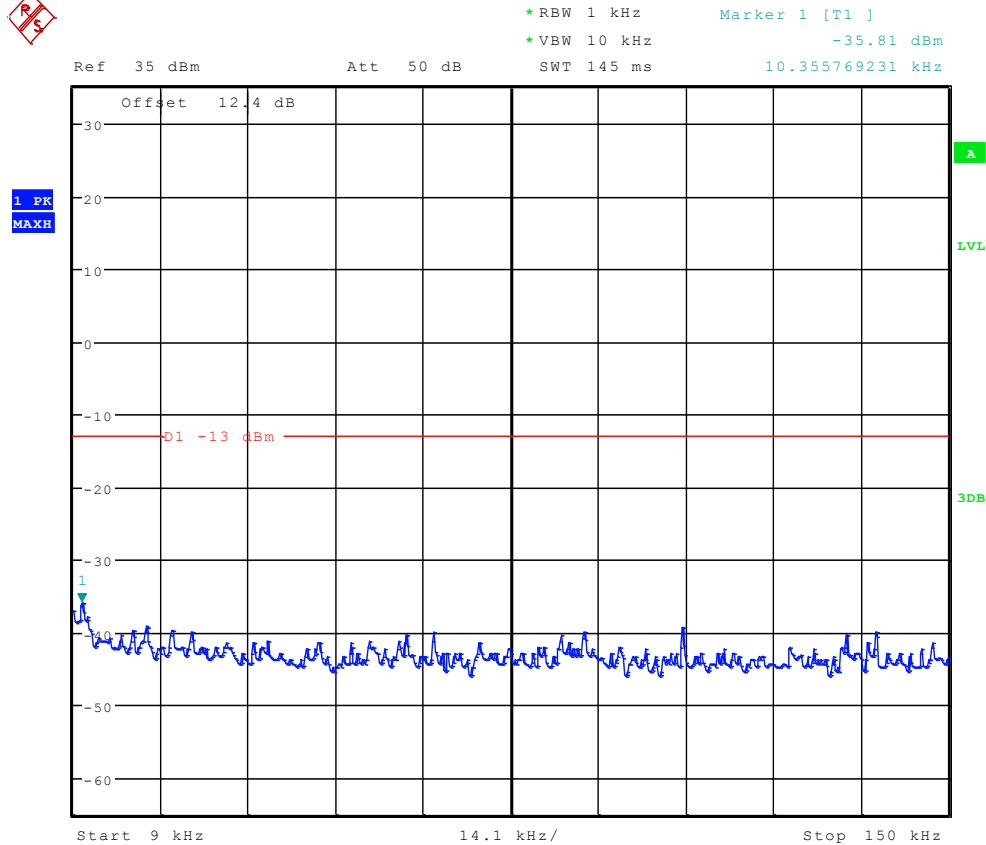
Date: 4.JUL.2012 00:53:13



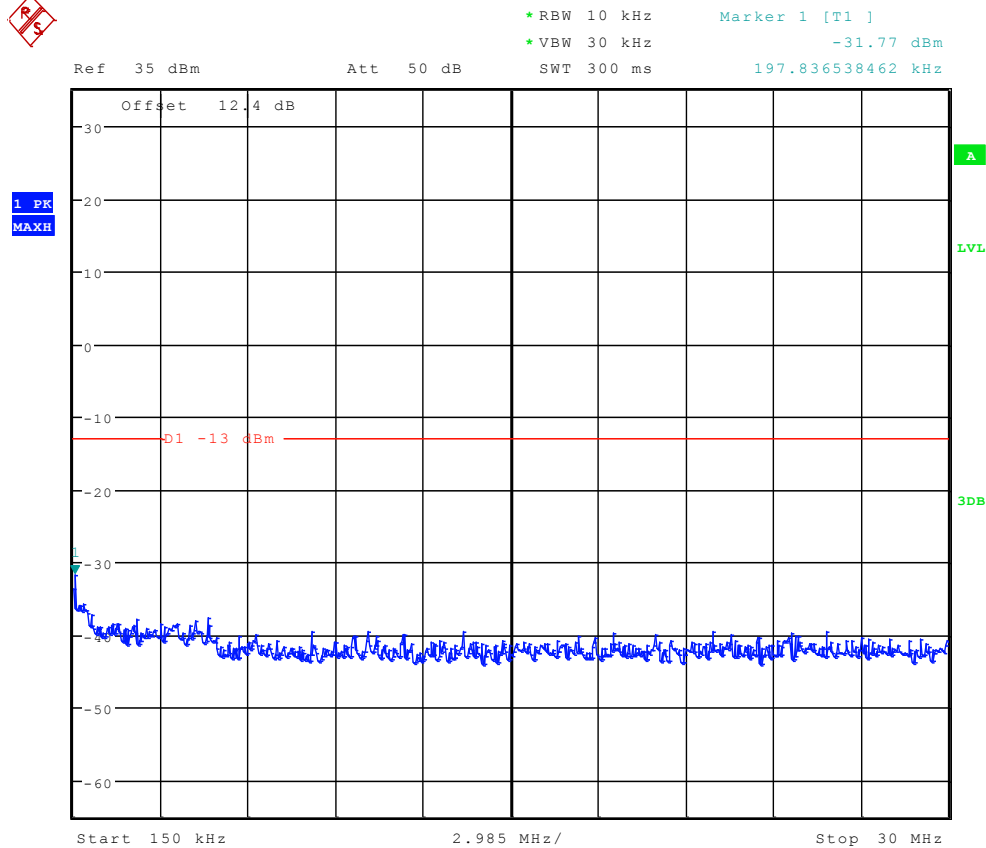
Date: 4.JUL.2012 00:53:56



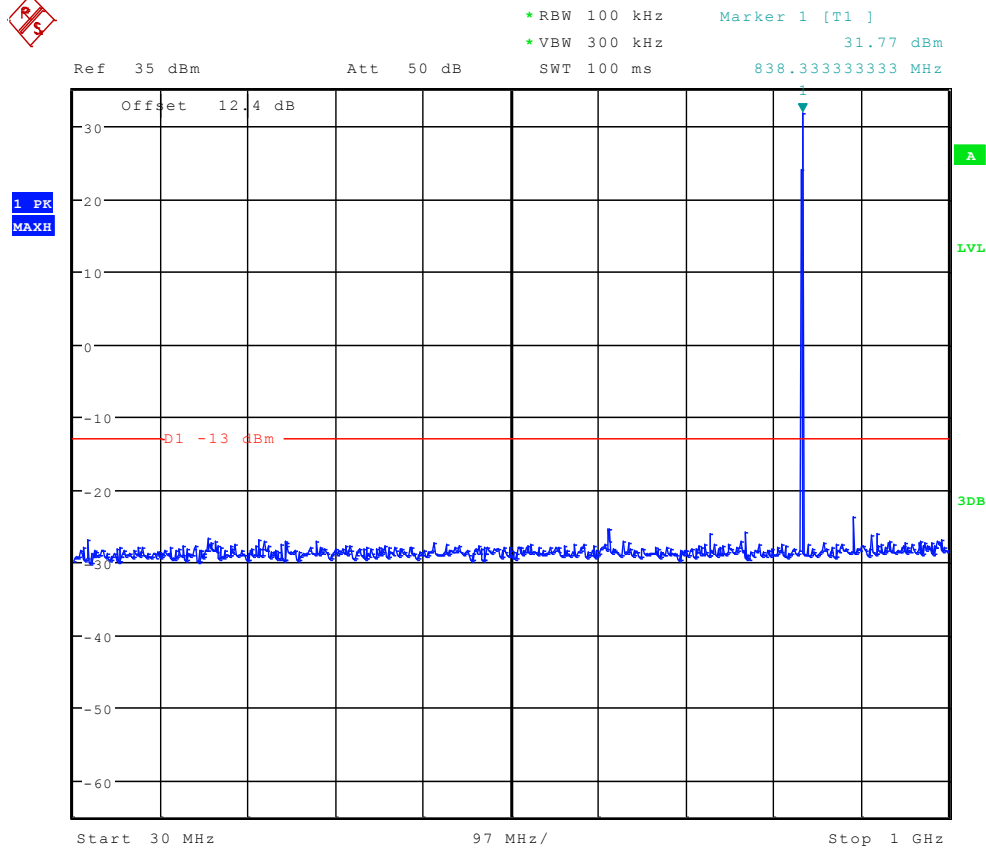
Channel 192



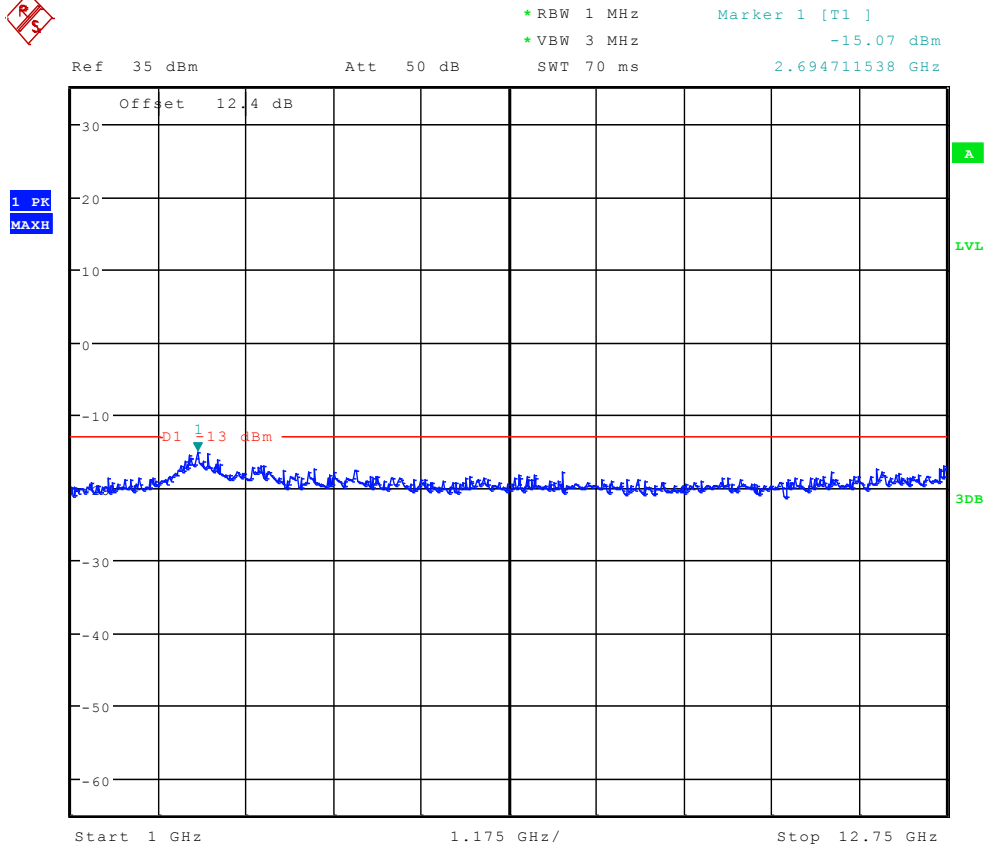
Date: 4.JUL.2012 00:52:00



Date: 4.JUL.2012 00:52:43



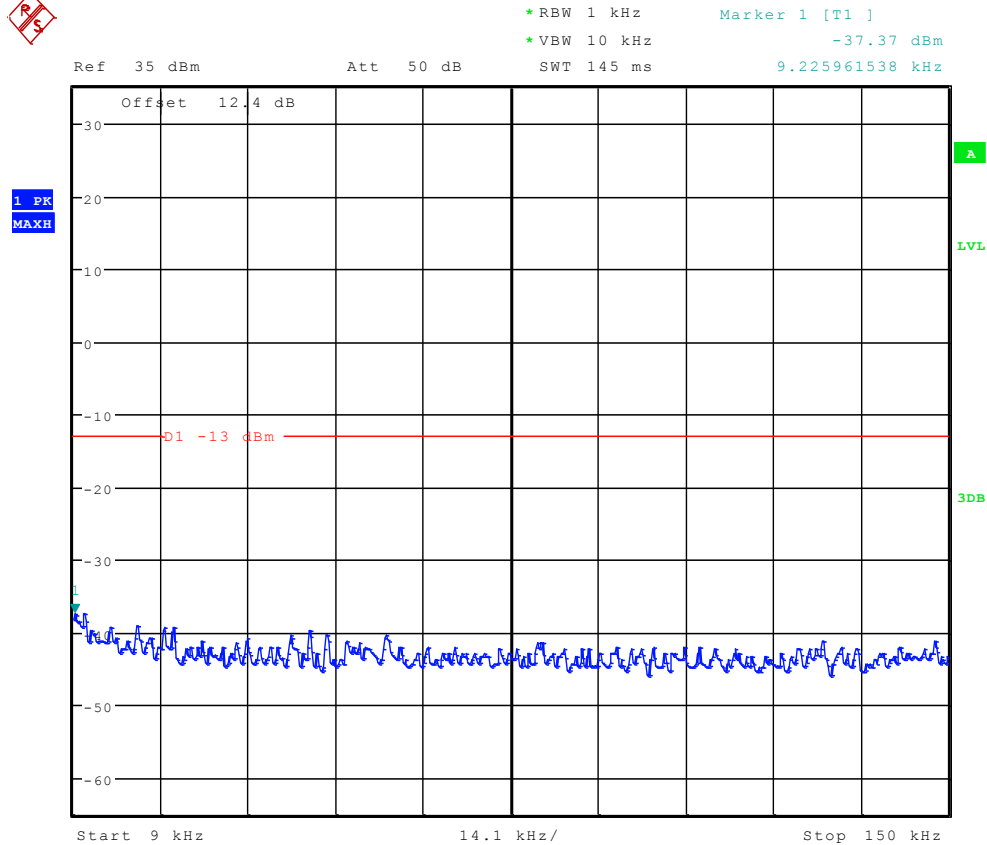
Date: 4.JUL.2012 00:53:27



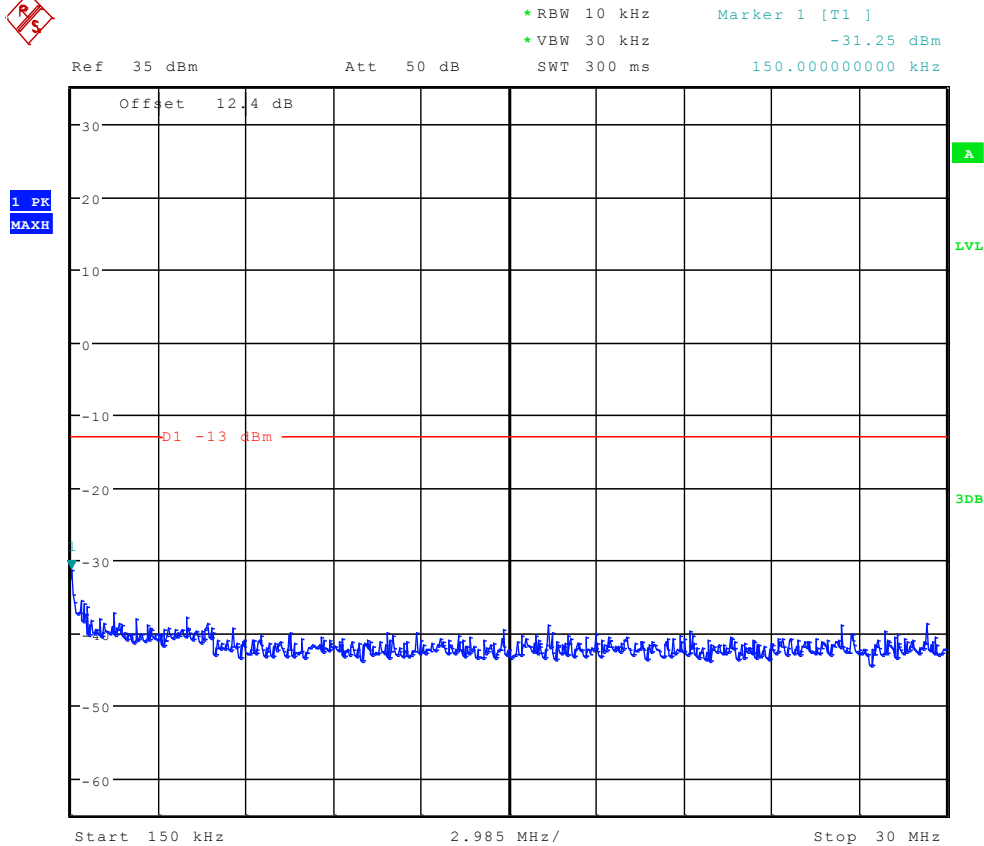
Date: 4.JUL.2012 00:54:11



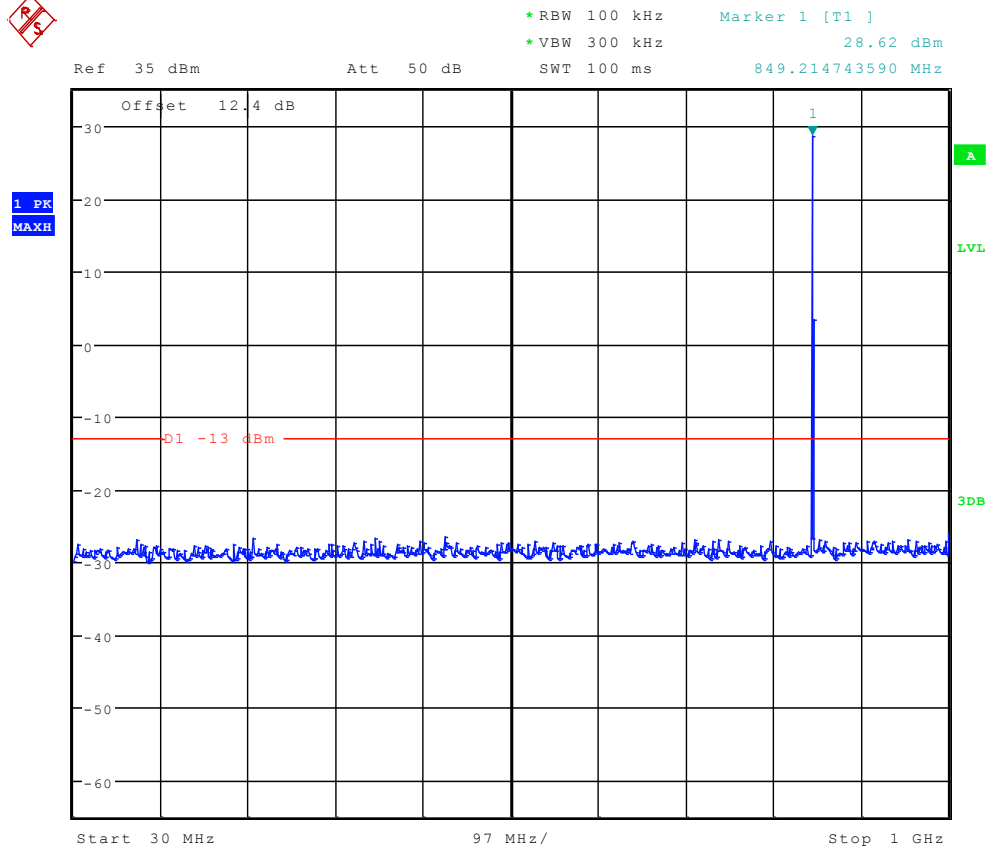
Channel 251



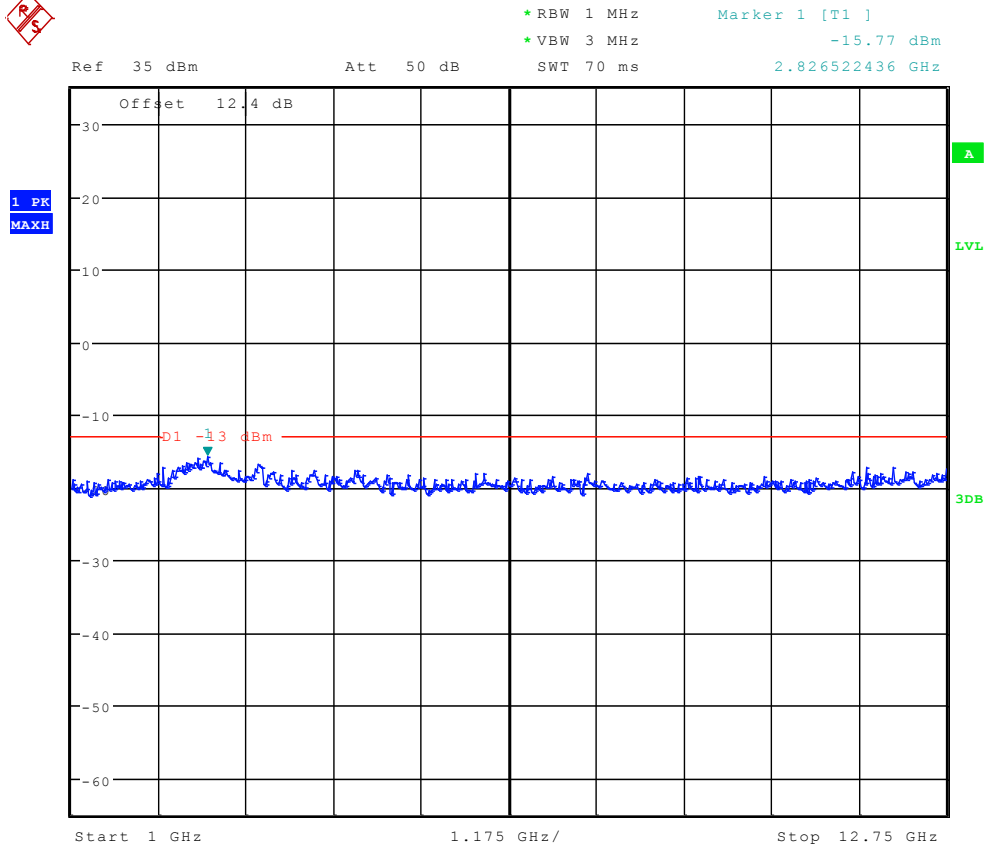
Date: 4.JUL.2012 00:52:14



Date: 4.JUL.2012 00:52:58



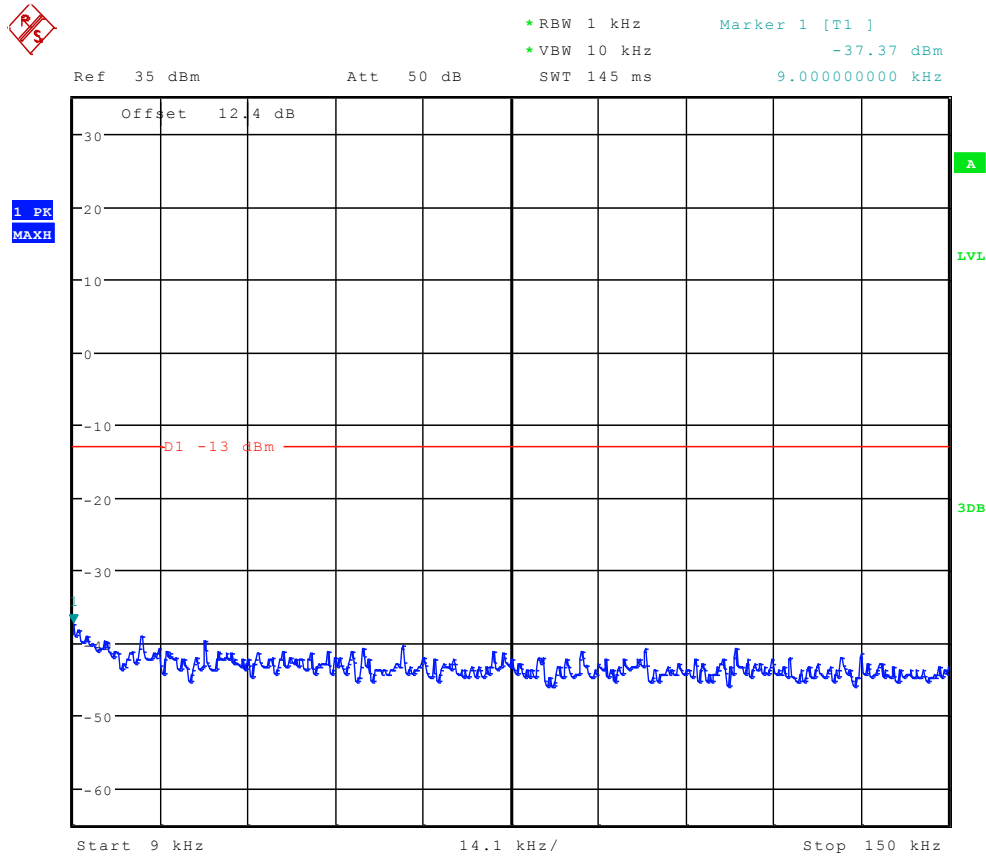
Date: 4.JUL.2012 00:53:41



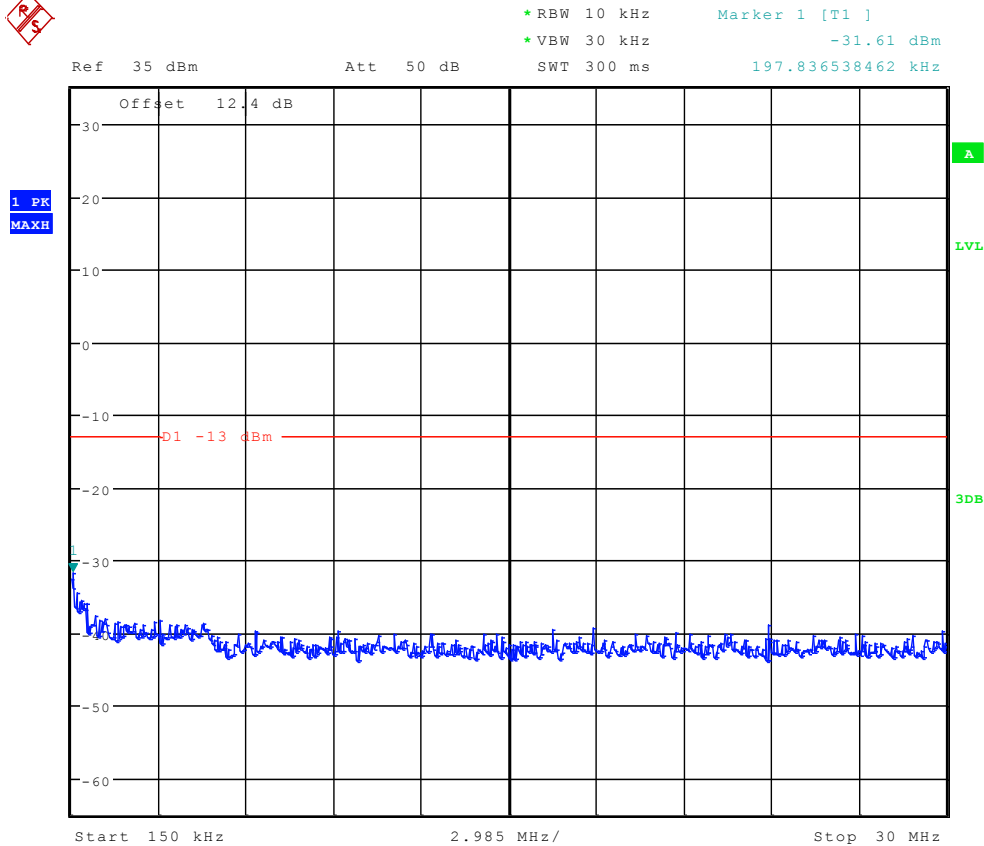
Date: 4.JUL.2012 00:54:25



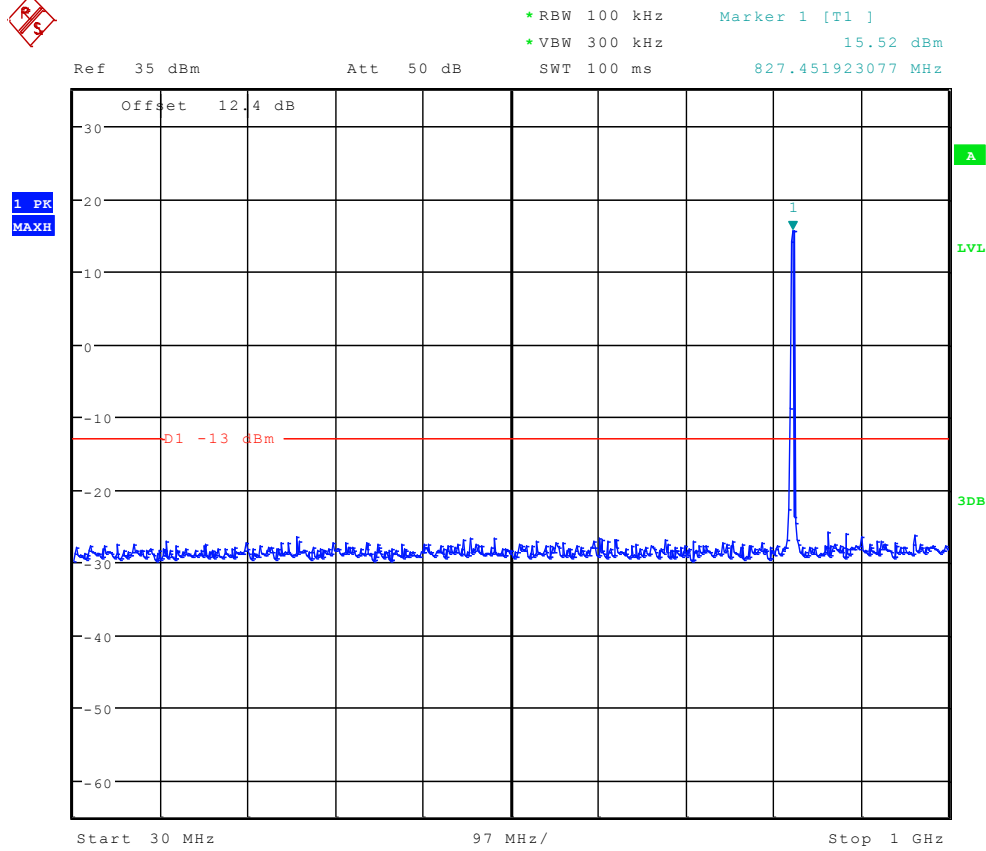
TM3: WCDMA Channel 4132



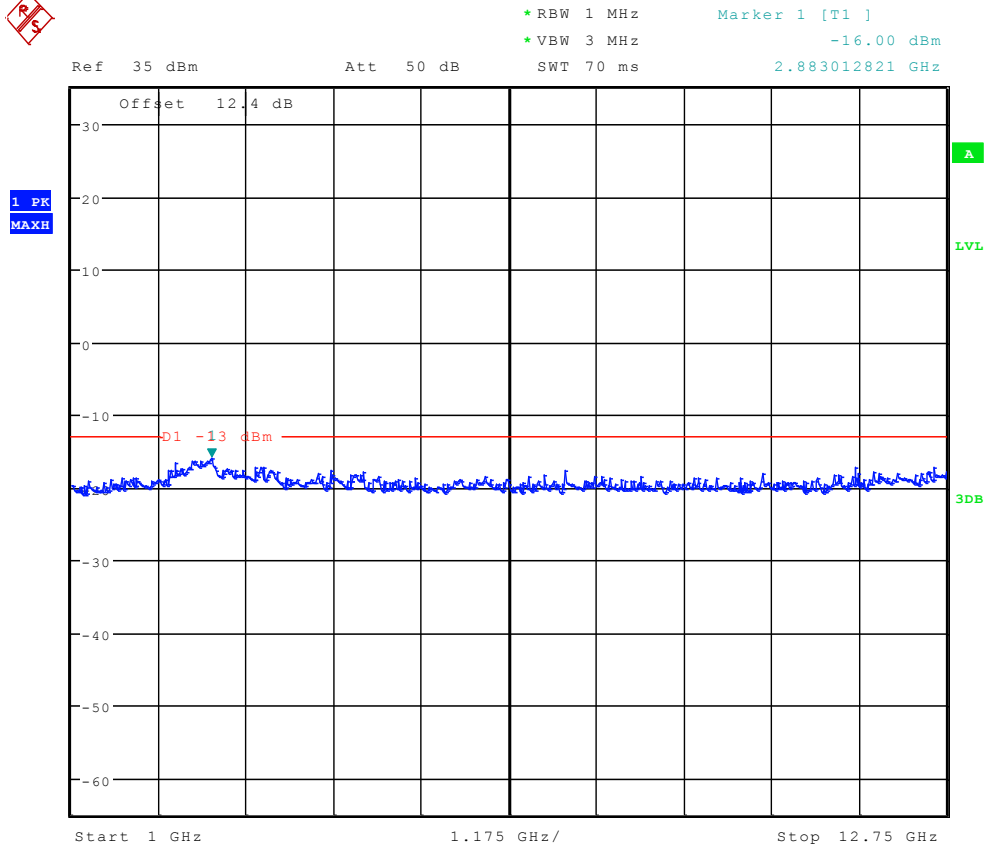
Date: 4.JUL.2012 00:58:26



Date: 4.JUL.2012 00:59:09



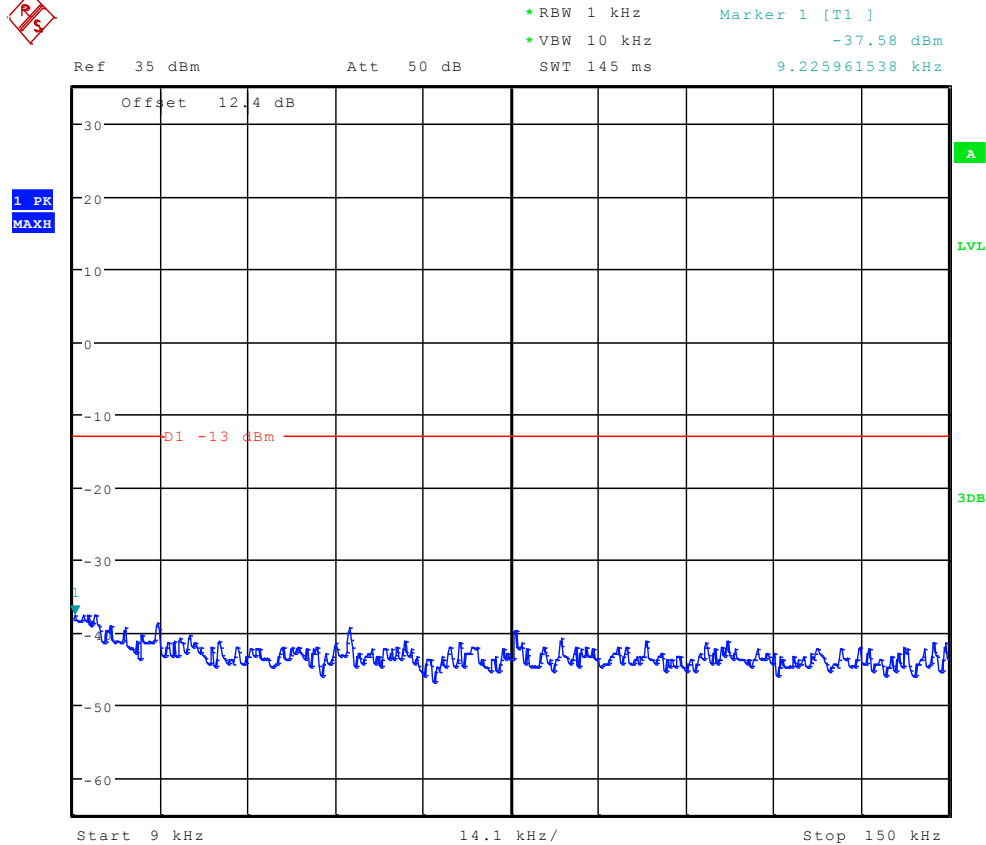
Date: 4.JUL.2012 00:59:53



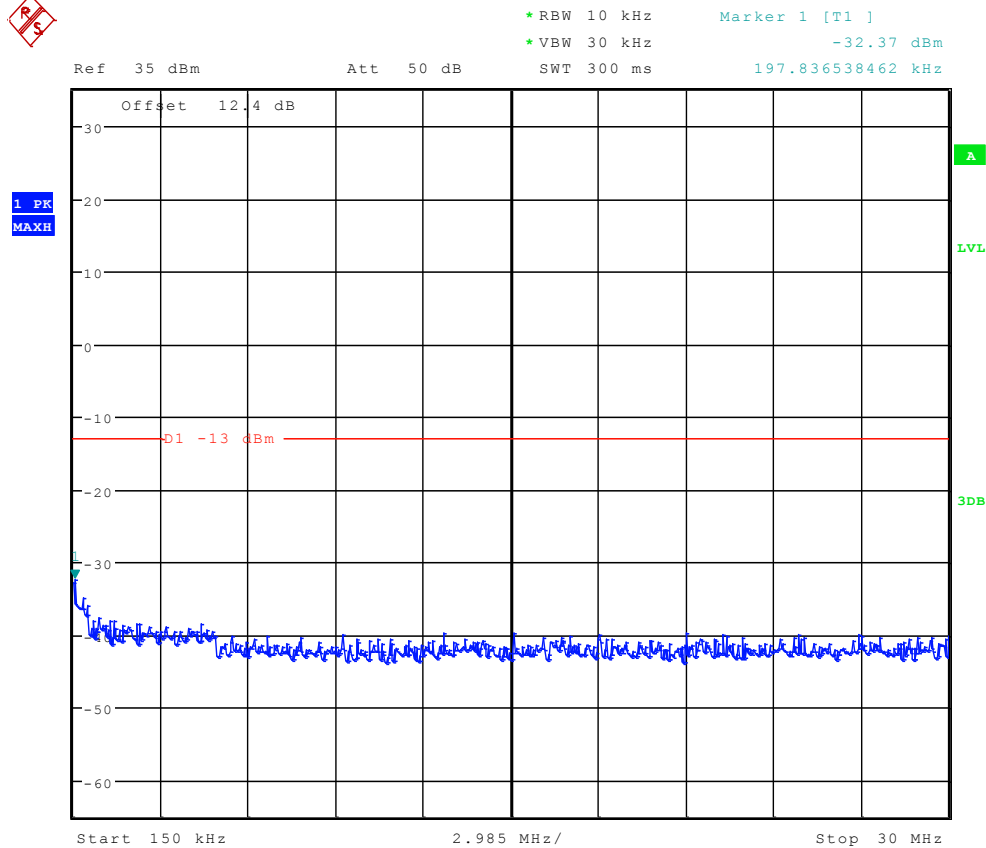
Date: 4.JUL.2012 01:00:37



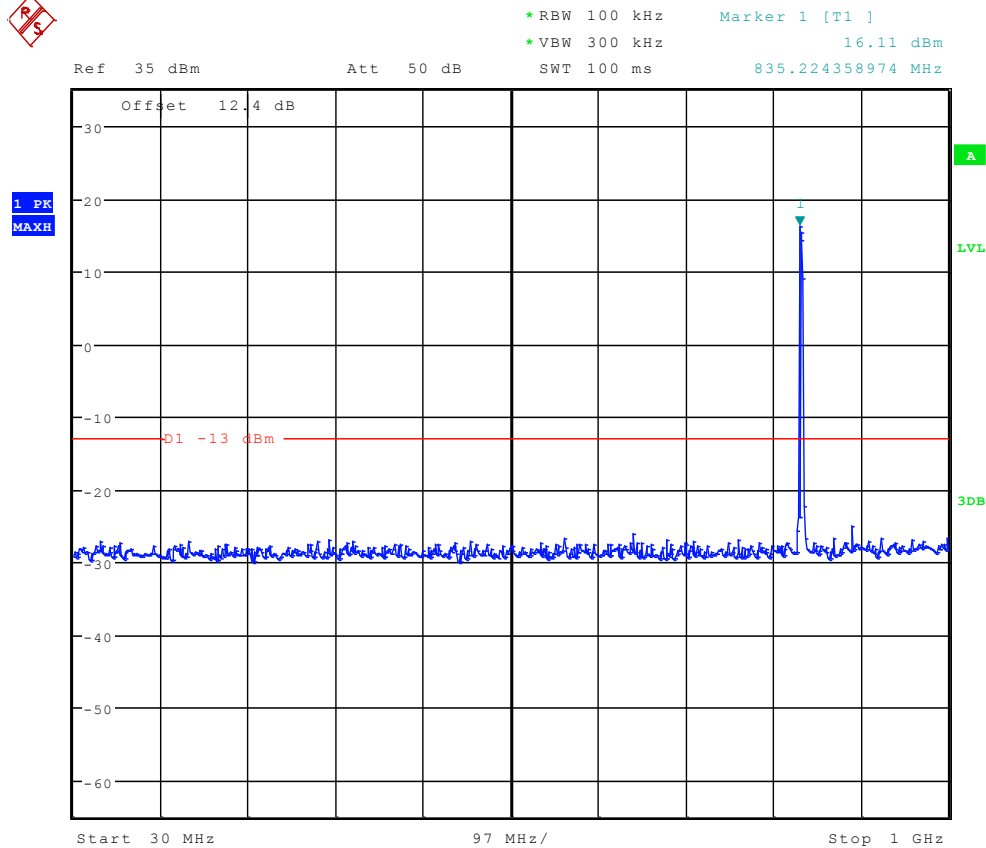
Channel 4182



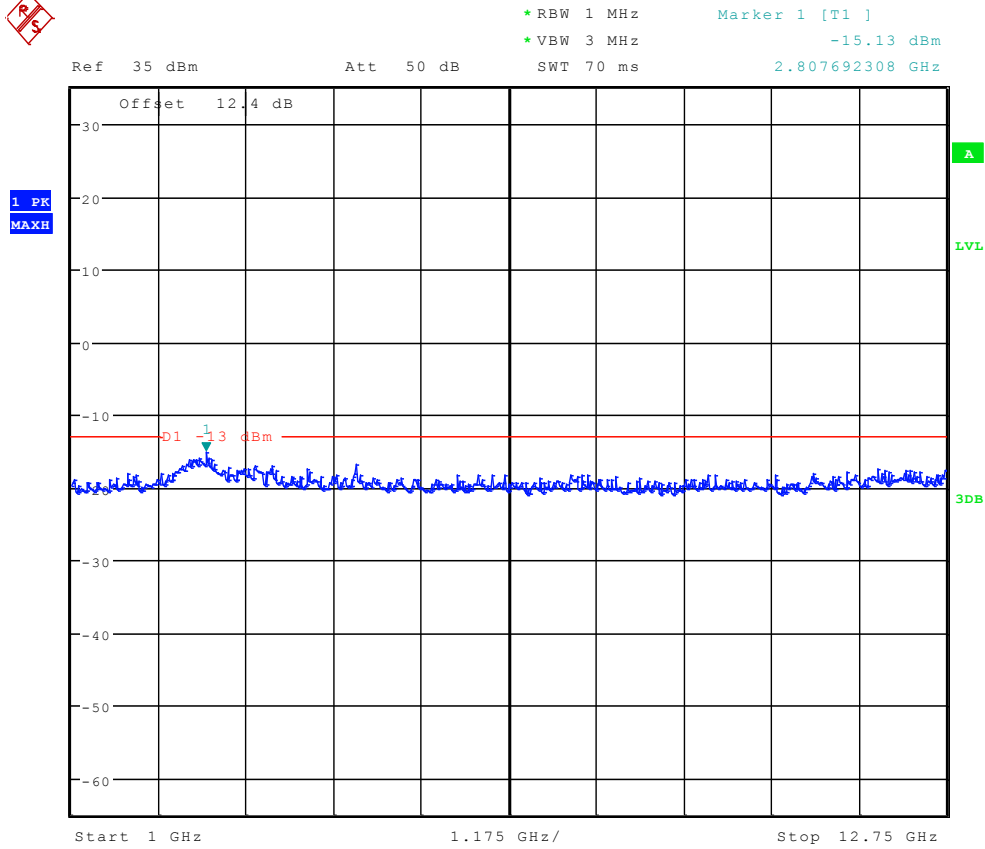
Date: 4.JUL.2012 00:58:40



Date: 4.JUL.2012 00:59:24



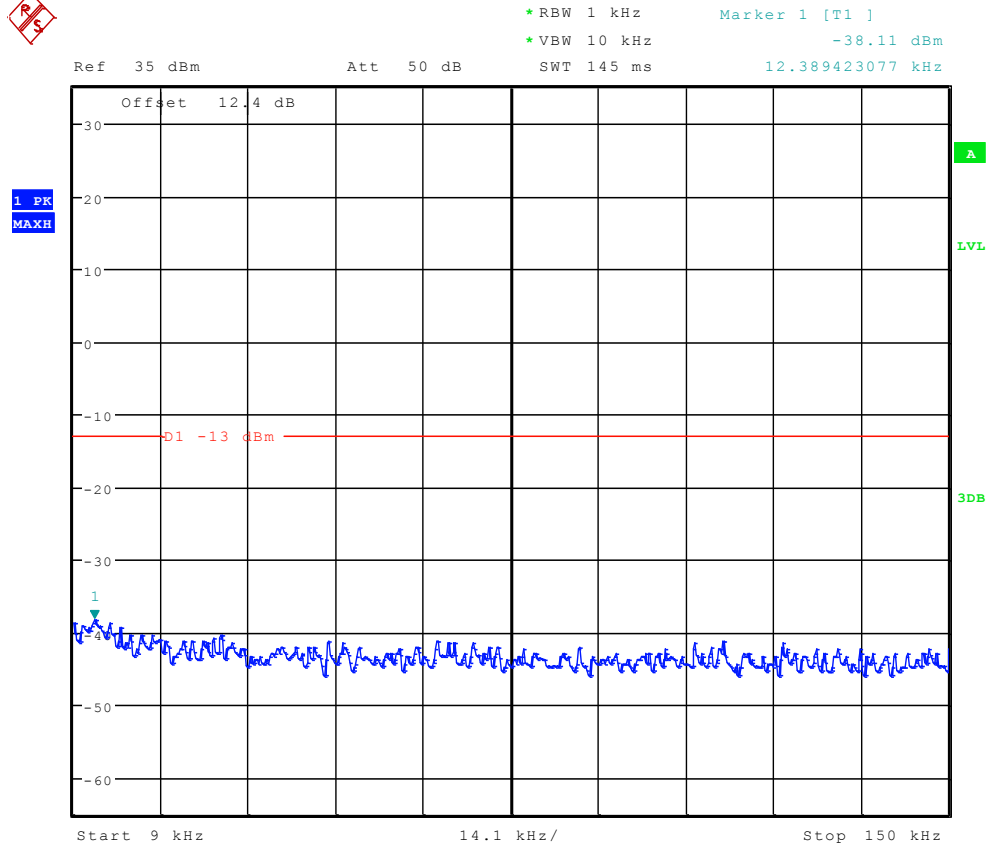
Date: 4.JUL.2012 01:00:07



Date: 4.JUL.2012 01:00:51



Channel 4233

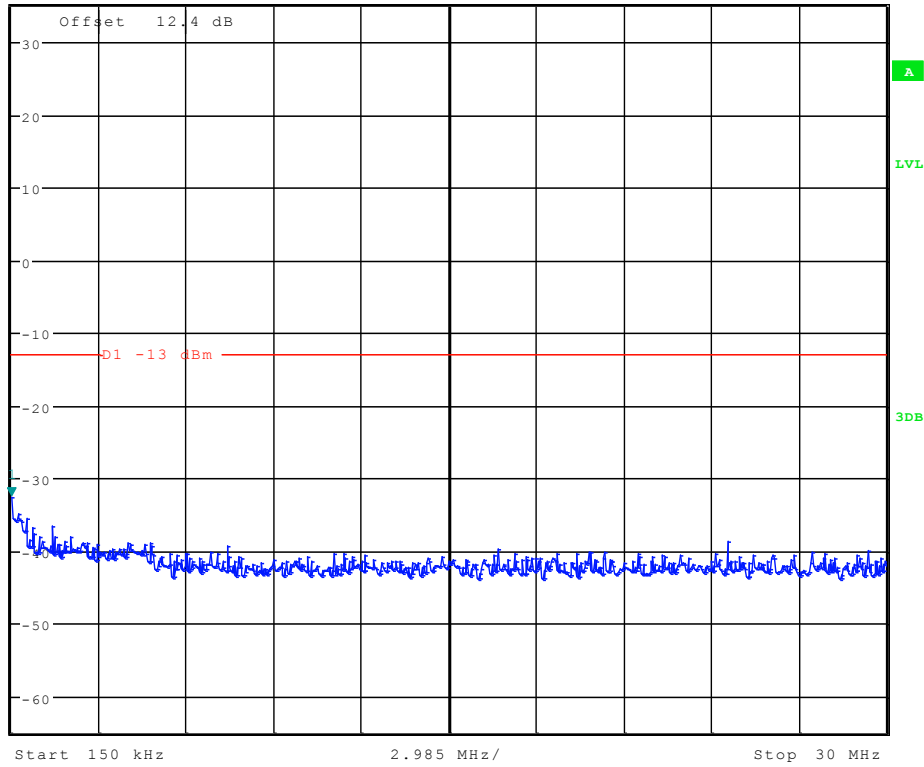


Date: 4.JUL.2012 00:58:54

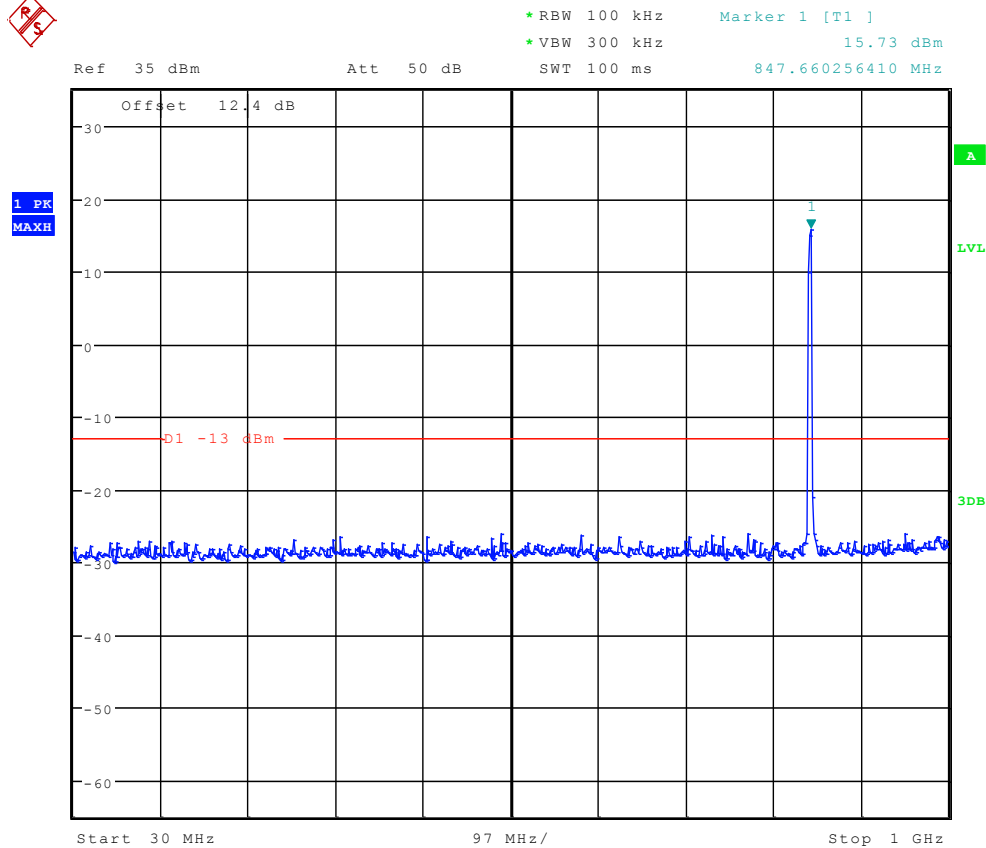


1 PK
MAXH

*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -32.60 dBm
Ref 35 dBm Att 50 dB SWT 300 ms 150.00000000 kHz



Date: 4.JUL.2012 00:59:38

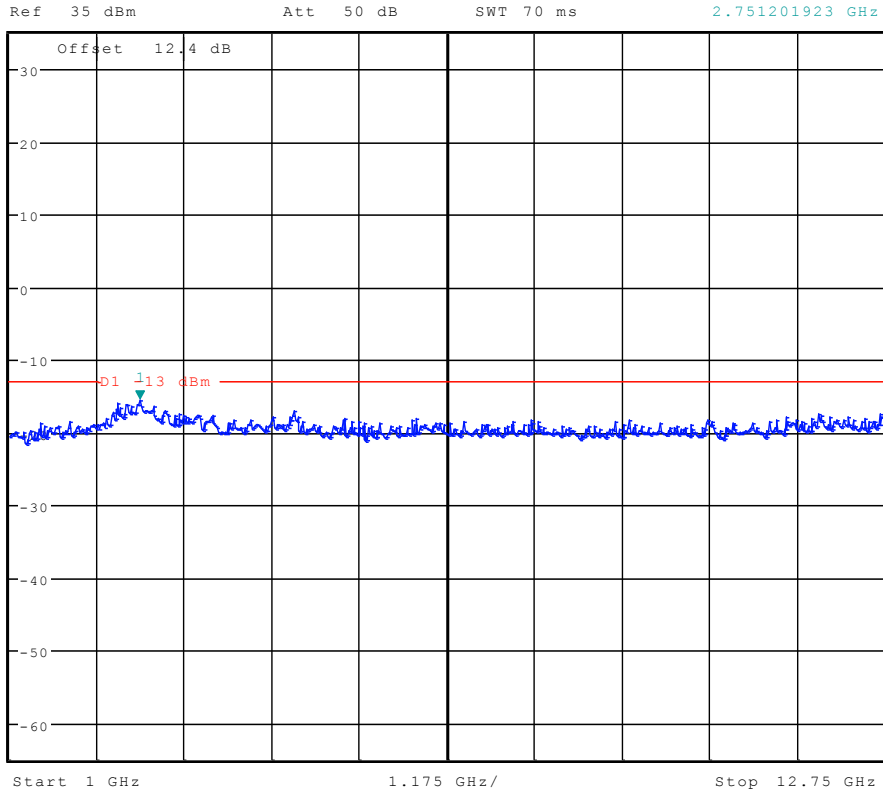


Date: 4.JUL.2012 01:00:22



1 PK
MAXH

* RBW 1 MHz
* VBW 3 MHz
Marker 1 [T1]
-15.57 dBm
2.751201923 GHz



Date: 4.JUL.2012 01:01:05

-----The END-----
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Appendix F

Radiated spurious emission

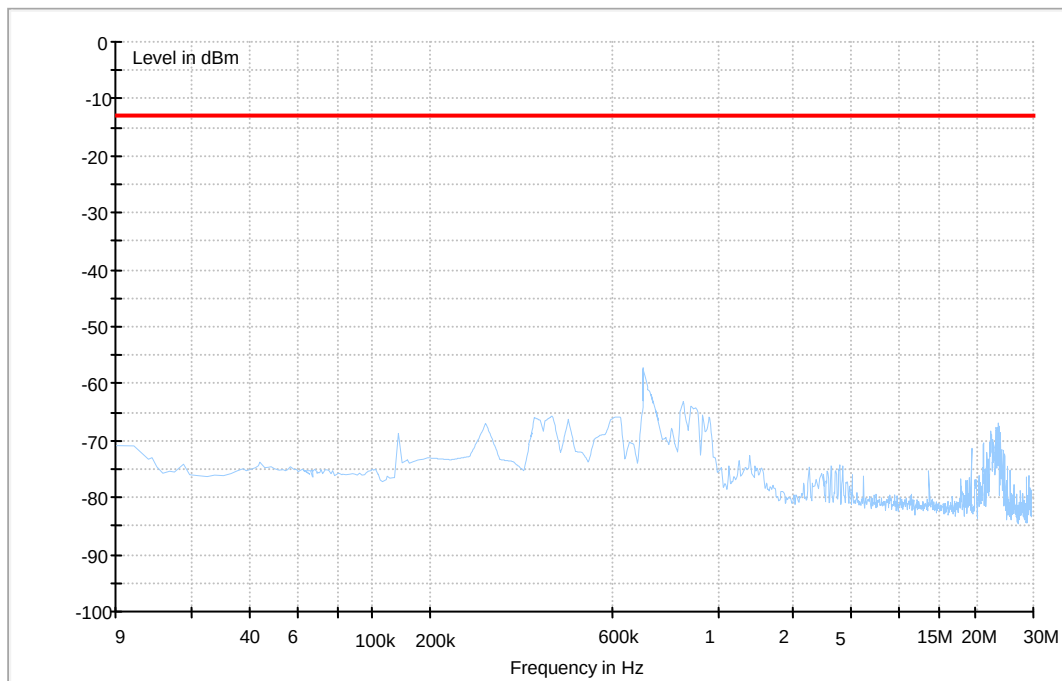


- Note: 1. Simultaneous transmission was investigated and no new emissions were found.
2. $RBW \geq 100 \text{ kHz}$, $VBW > 3 \times RBW$.
3. This device was tested in all configurations and the mid channel test data in this report.

GPRS 850

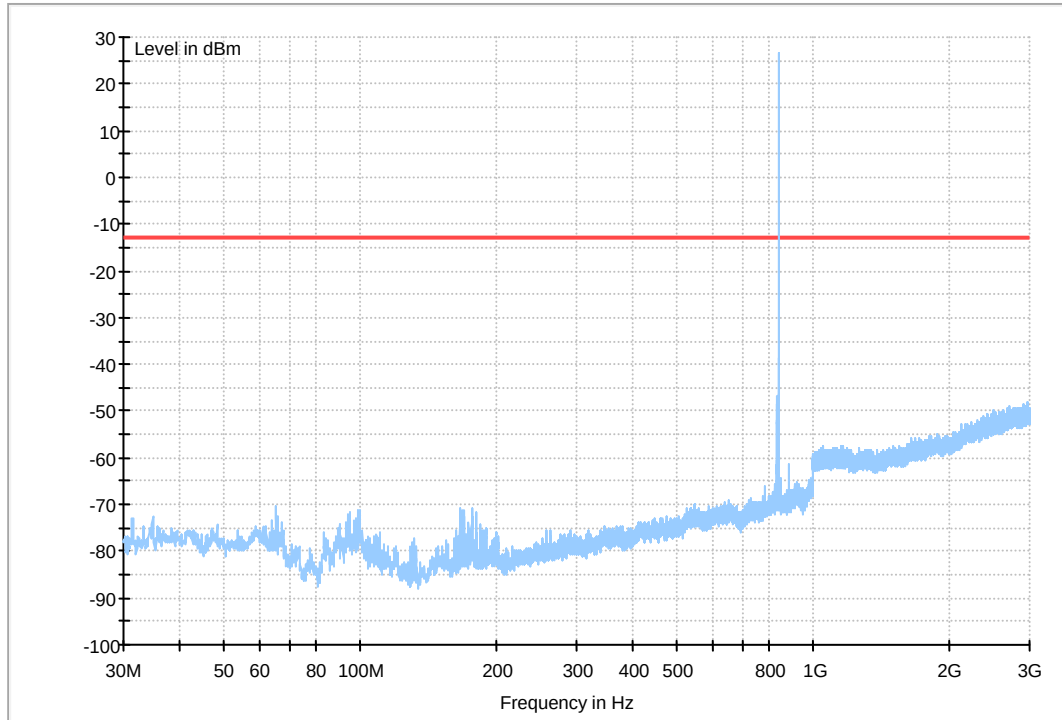
Channel 192

Traffic Mode (9kHz-30MHz)



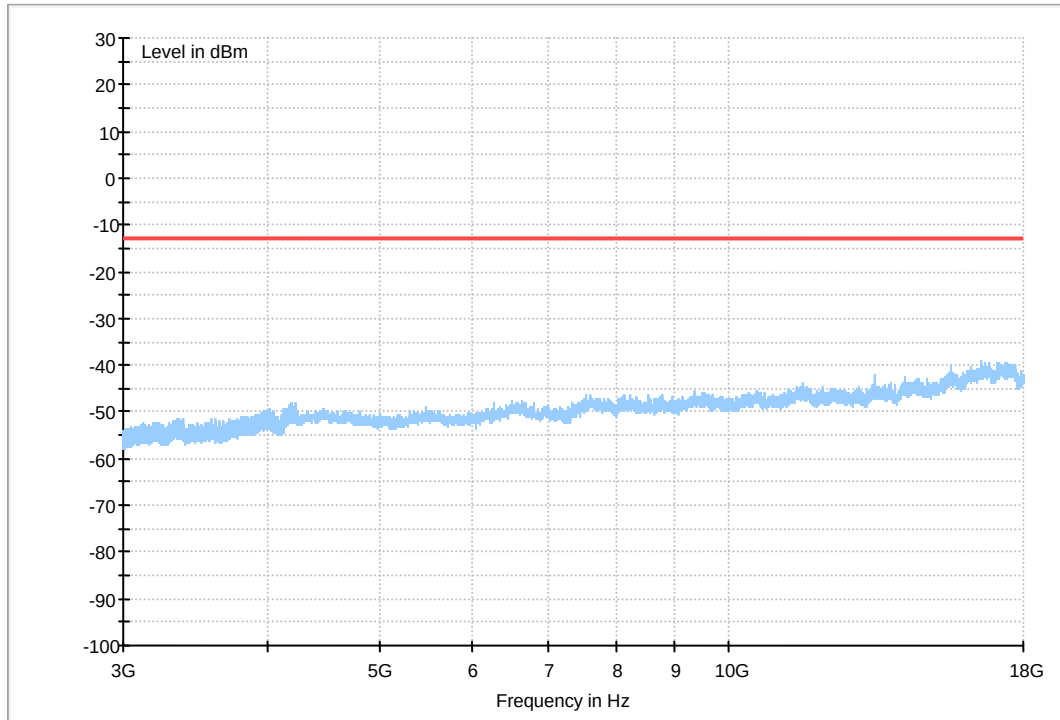


Traffic Mode (30MHz-3GHz)





Traffic Mode (3GHz-18GHz)

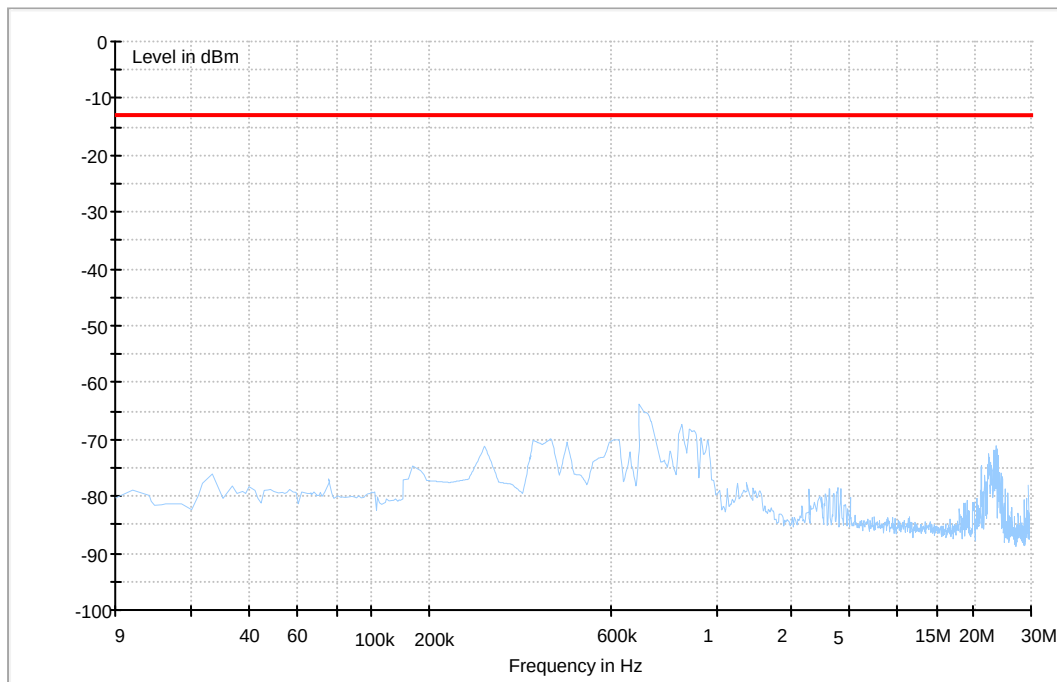




EDGE 850

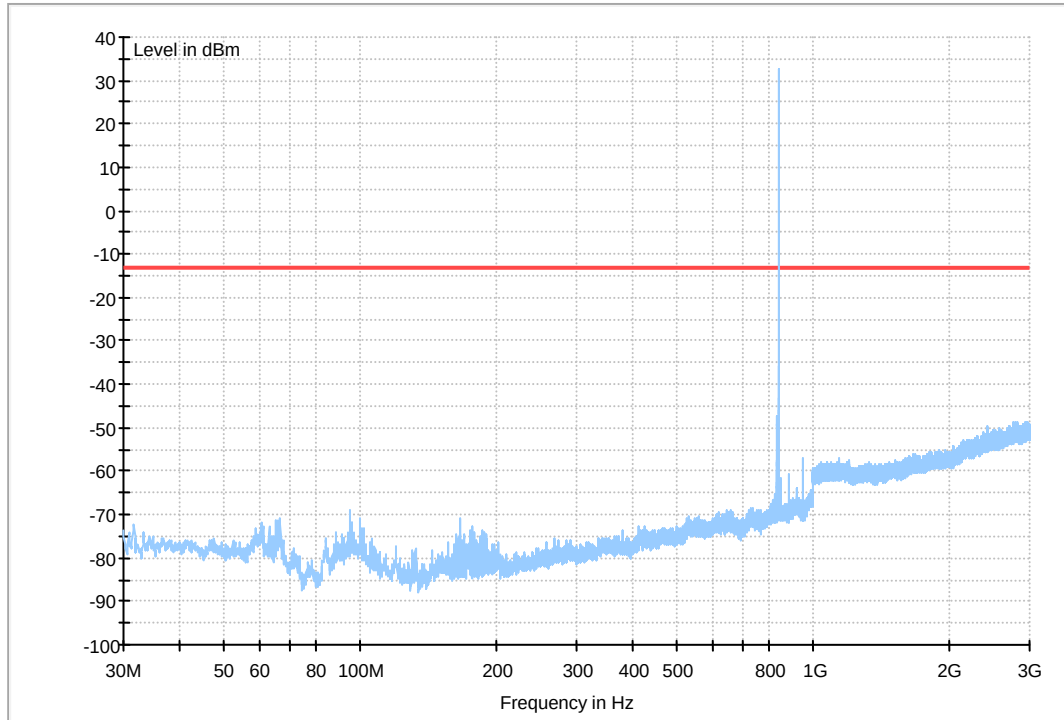
Channel 192

Traffic Mode (9kHz-30MHz)



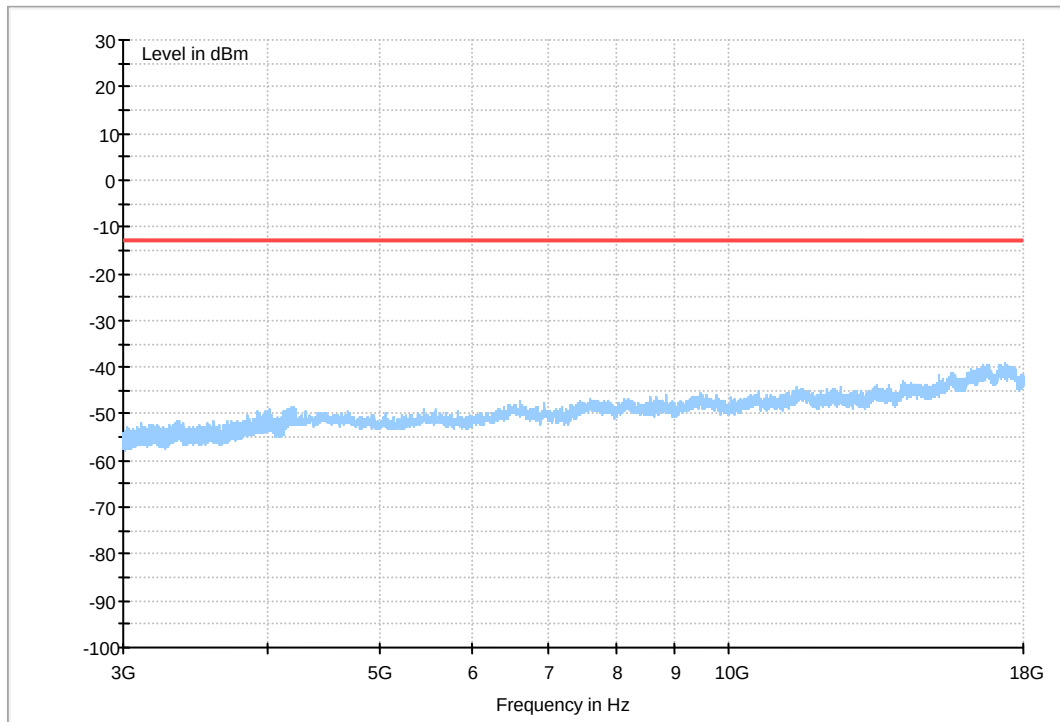


Traffic Mode (30MHz-3GHz)





Traffic Mode (3GHz-18GHz)

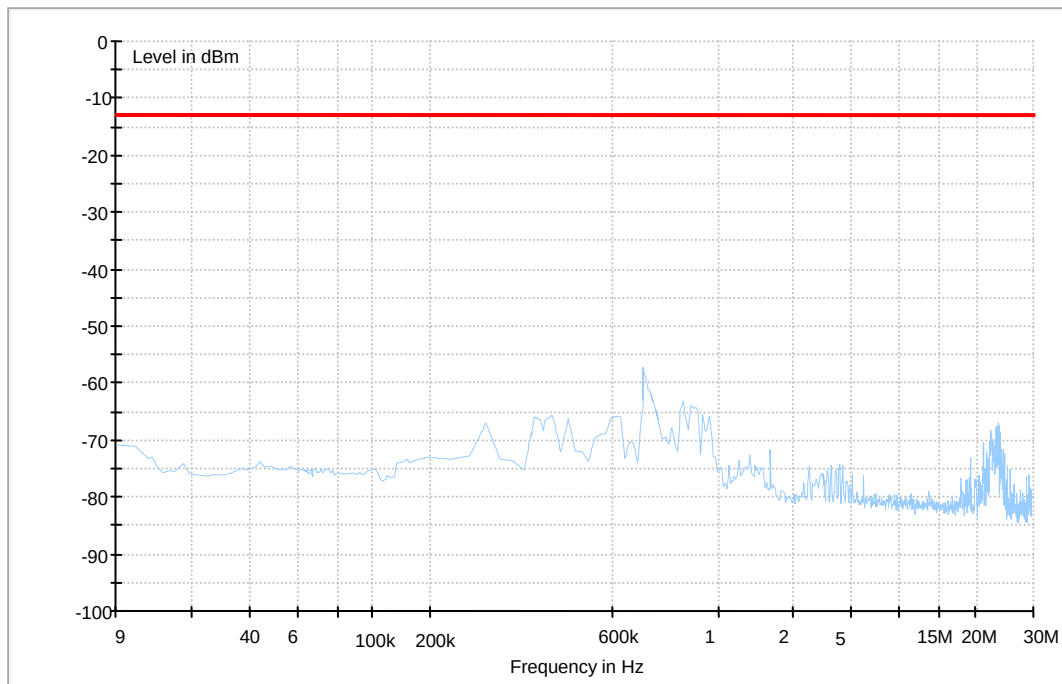




WCDMA Band V

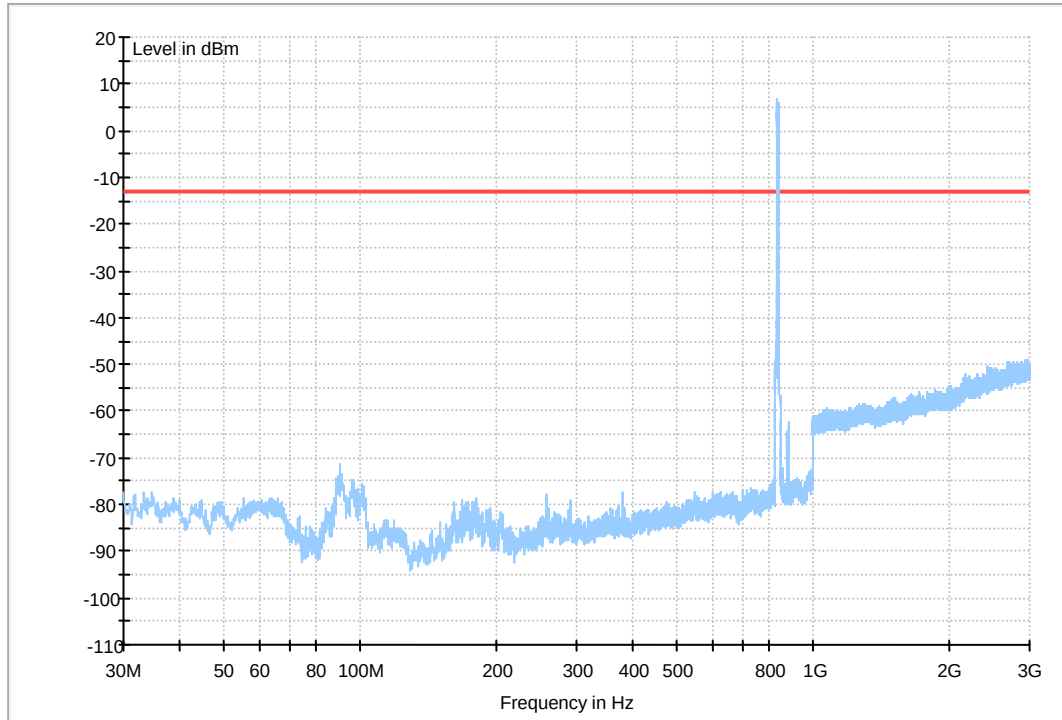
Channel 4182

Traffic Mode (9kHz-30MHz)



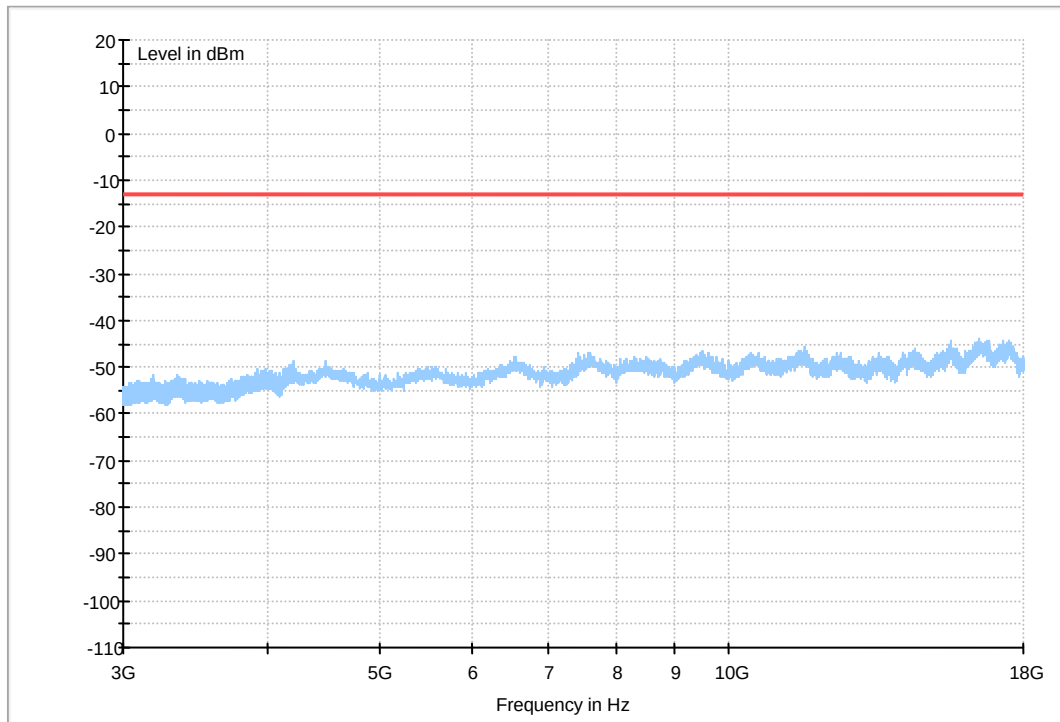


Traffic Mode (30MHz-3GHz)





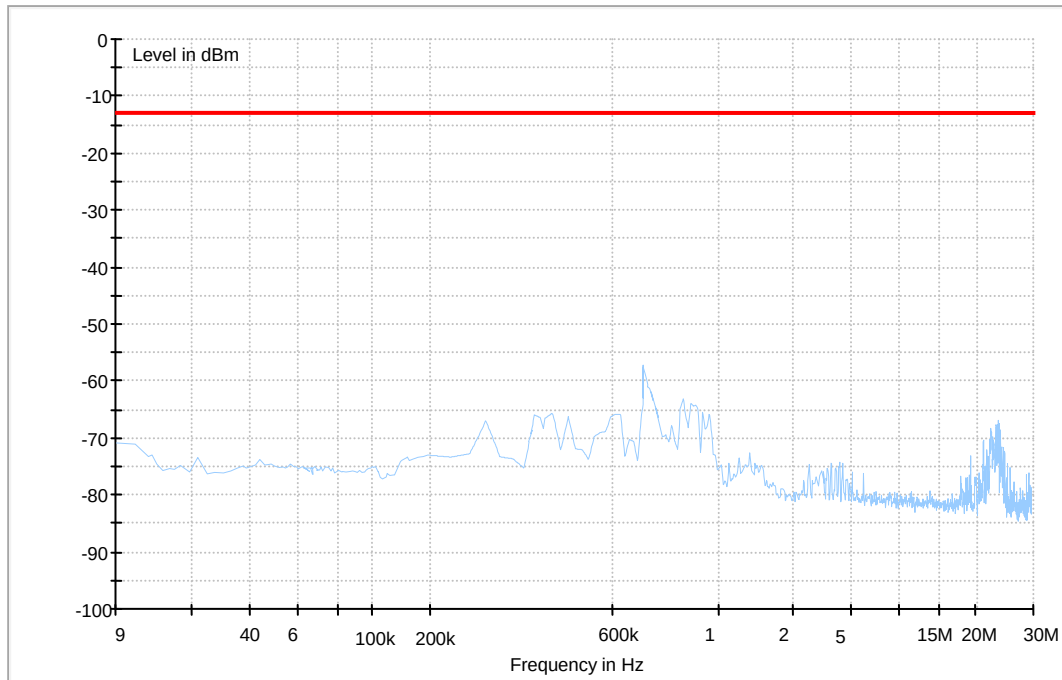
Traffic Mode (3GHz-18GHz)





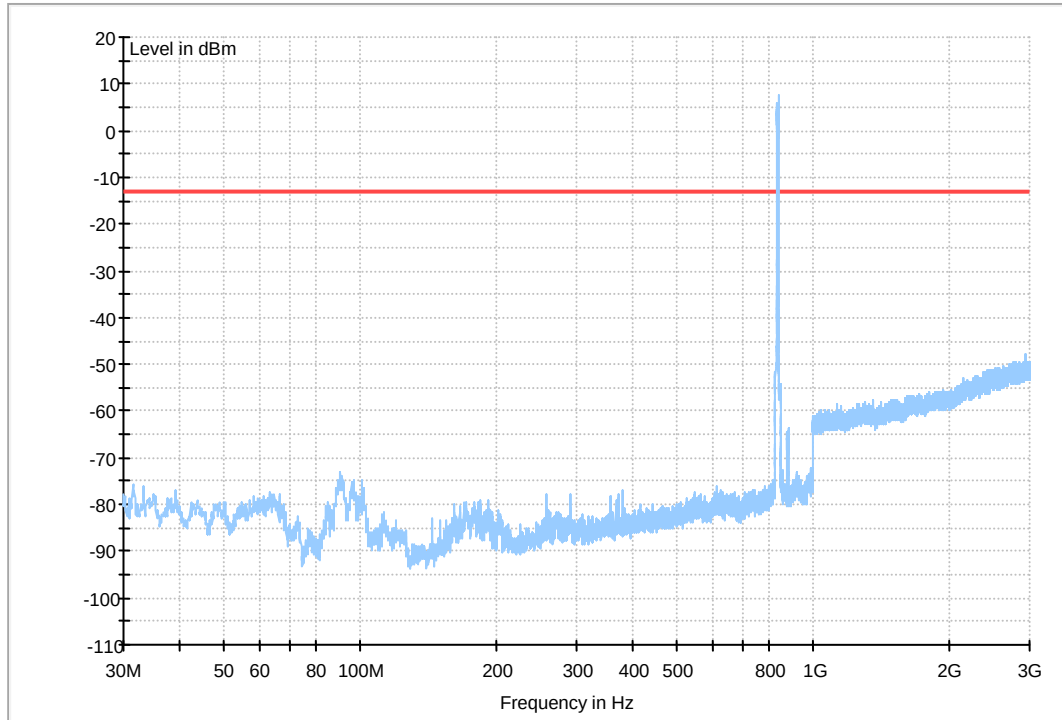
HSDPA Band V

Traffic Mode (9kHz-30MHz)



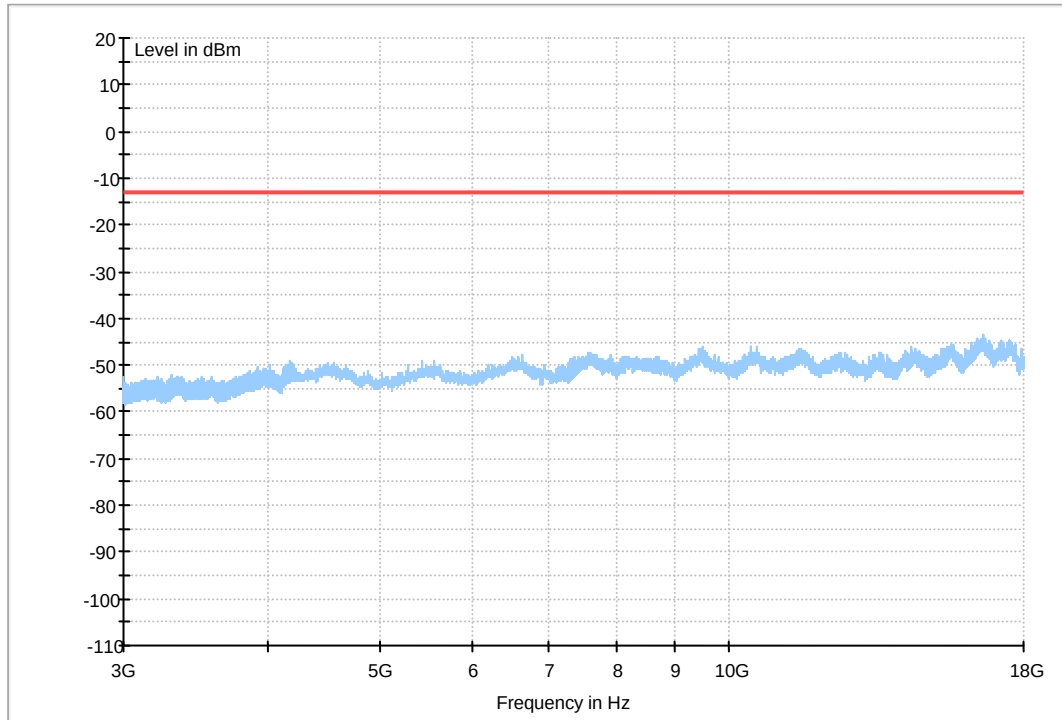


Traffic Mode (30MHz-3GHz)





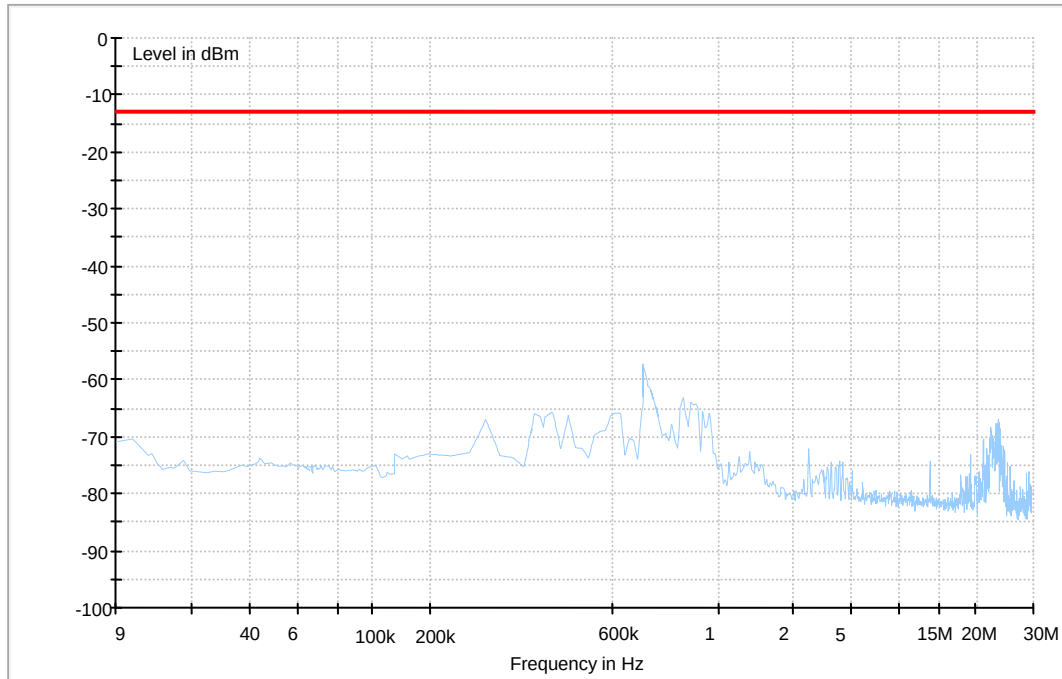
Traffic Mode (3GHz-18GHz)





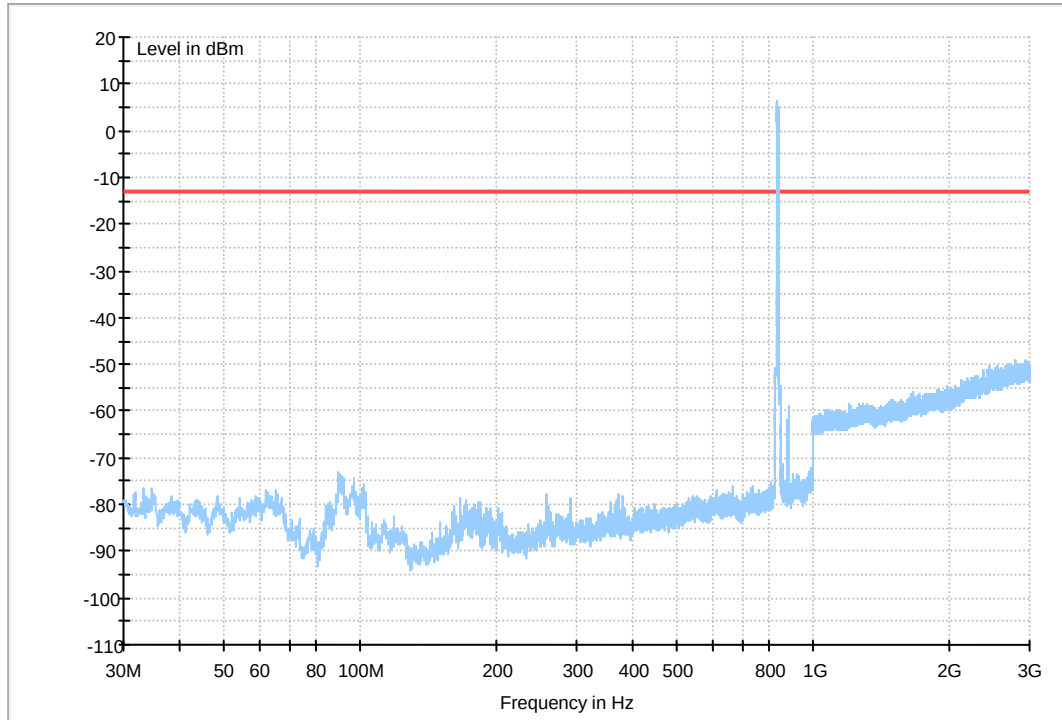
HSUPA Band V

Traffic Mode (9kHz-30MHz)



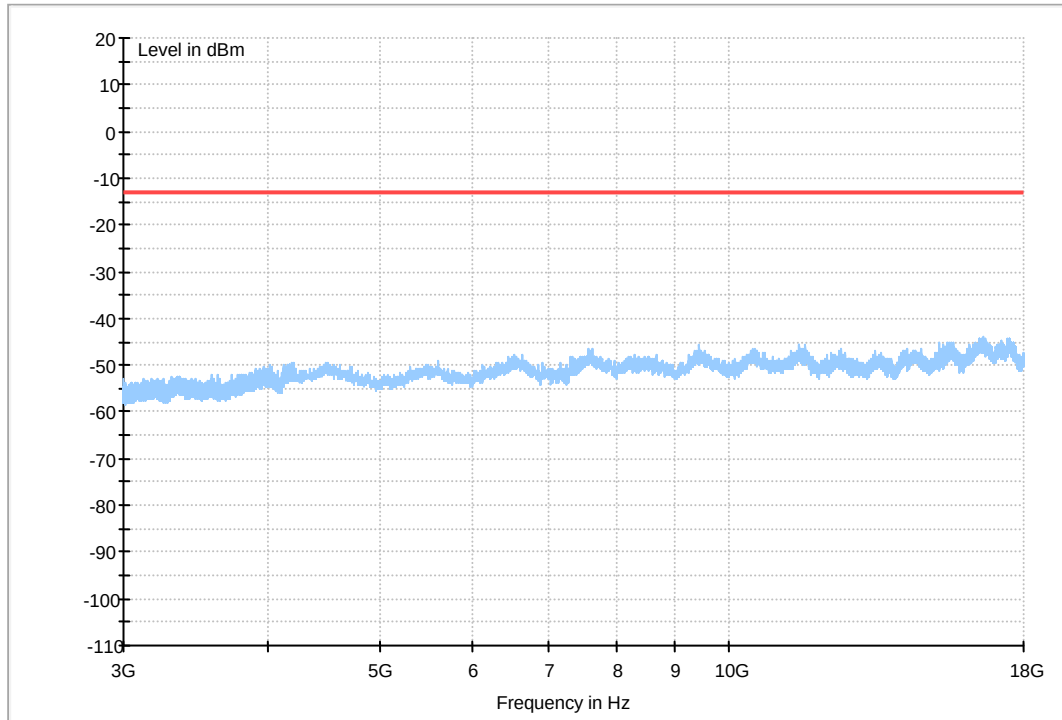


Traffic Mode (30MHz-3GHz)





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	24	0.02867	---	±2.5	Pass
			-20 °C	24	0.02867	---	±2.5	Pass
			-10 °C	19	0.02270	---	±2.5	Pass
			0 °C	-17	-0.02031	---	±2.5	Pass
			10 °C	24	0.02867	---	±2.5	Pass
			20 °C	-18	-0.02151	---	±2.5	Pass
			30 °C	-9	-0.01075	---	±2.5	Pass
			40 °C	15	0.01792	---	±2.5	Pass
TM 2	M	VN	50 °C	-22	-0.02628	---	±2.5	Pass
			-30 °C	16	0.01912	---	±2.5	Pass
			-20 °C	-22	-0.02628	---	±2.5	Pass
			-10 °C	-19	-0.02270	---	±2.5	Pass
			0 °C	-19	-0.02270	---	±2.5	Pass
			10 °C	-19	-0.02270	---	±2.5	Pass
			20 °C	9	0.01075	---	±2.5	Pass
			30 °C	12	0.01434	---	±2.5	Pass
TM 3	M	VN	40 °C	-7	-0.00836	---	±2.5	Pass
			50 °C	-20	-0.02389	---	±2.5	Pass
			-30 °C	18	0.02151	---	±2.5	Pass
			-20 °C	-23	-0.02748	---	±2.5	Pass
			-10 °C	-11	-0.01314	---	±2.5	Pass
			0 °C	-13	-0.01553	---	±2.5	Pass
			10 °C	24	0.02867	---	±2.5	Pass
			20 °C	12	0.01434	---	±2.5	Pass
			30 °C	-22	-0.02628	---	±2.5	Pass
			40 °C	-7	-0.00836	---	±2.5	Pass
			50 °C	28	0.03345	---	±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	20 °C	VL	-12	-0.01434	---	±2.5	Pass
			VN	22	0.02628	---	±2.5	Pass
			VH	13	0.01553	---	±2.5	Pass
TM 2	M	20 °C	VL	-14	-0.01673	---	±2.5	Pass
			VN	25	0.02987	---	±2.5	Pass
			VH	29	0.03465	---	±2.5	Pass
TM 3	M	20 °C	VL	-9	-0.01075	---	±2.5	Pass
			VN	13	0.01553	---	±2.5	Pass
			VH	11	0.01314	---	±2.5	Pass

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

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