



Appendix A

Transmitter Output Power According to FCC Part 2.1046 & Part22.913



Conducted Power of Transmitter

TEST CONDITIONS		RF Output Power (Conducted)					
		Channel128(B) 824.2MHz		Channel192(M) 837.0MHz		Channel251(T) 848.8MHz	
		dBm		dBm		dBm	
T_{nom} / V_{nom}		Measured	Limit	Measured	Limit	Measured	Limit
TM1		32.07	38.5	32.25	38.5	32.16	38.5
TM2		25.87	38.5	25.72	38.5	25.75	38.5
TEST CONDITIONS		Channel4132(B) 826.4MHz		Channel4182(M) 836.4MHz		Channel4233(T) 846.6MHz	
		dBm		dBm		dBm	
		Measured	Limit	Measured	Limit	Measured	Limit
T_{nom} / V_{nom}		Measured	Limit	Measured	Limit	Measured	Limit
TM3		21.91	38.5	21.67	38.5	21.81	38.5
TM4	Case1	21.89	38.5	21.61	38.5	21.75	38.5
	Case2	21.78	38.5	21.41	38.5	21.56	38.5
	Case3	21.49	38.5	21.21	38.5	21.37	38.5
	Case4	21.02	38.5	20.76	38.5	21.05	38.5
TM5	Case1	21.44	38.5	21.12	38.5	21.23	38.5
	Case2	19.87	38.5	19.55	38.5	19.64	38.5
	Case3	20.62	38.5	20.38	38.5	20.49	38.5
	Case4	19.79	38.5	19.51	38.5	19.62	38.5
	Case5	21.42	38.5	21.09	38.5	21.29	38.5



Effective Radiated Power of Transmitter (ERP)

Test Mode	Freq. [MHz]	Meas. Level [dBm]	Substitution Antenna Type	SGP [dBm]	Substitution Gain [dBi]	Cable Loss [dB]	Substitution Level (ERP)	FCC limit [dBm]	Result
							[dBm]		
TM1	824.2	31.59	Dipole Ant.	34.98	-2.75	0.6	31.63	38.5	Pass
TM1	837.0	31.77	Dipole Ant.	35.22	-2.87	0.6	31.75	38.5	Pass
TM1	848.8	31.68	Dipole Ant.	35.11	-2.85	0.6	31.66	38.5	Pass
TM2	824.2	25.39	Dipole Ant.	28.72	-2.75	0.6	25.37	38.5	Pass
TM2	837.0	25.24	Dipole Ant.	28.75	-2.87	0.6	25.28	38.5	Pass
TM2	848.8	25.27	Dipole Ant.	28.69	-2.85	0.6	25.24	38.5	Pass
TM3	826.4	21.43	Dipole Ant.	24.76	-2.75	0.6	21.41	38.5	Pass
TM3	836.4	21.19	Dipole Ant.	24.75	-2.87	0.6	21.28	38.5	Pass
TM3	846.6	21.33	Dipole Ant.	24.84	-2.85	0.6	21.39	38.5	Pass

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

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

b, SGP=Signal Generator Level

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



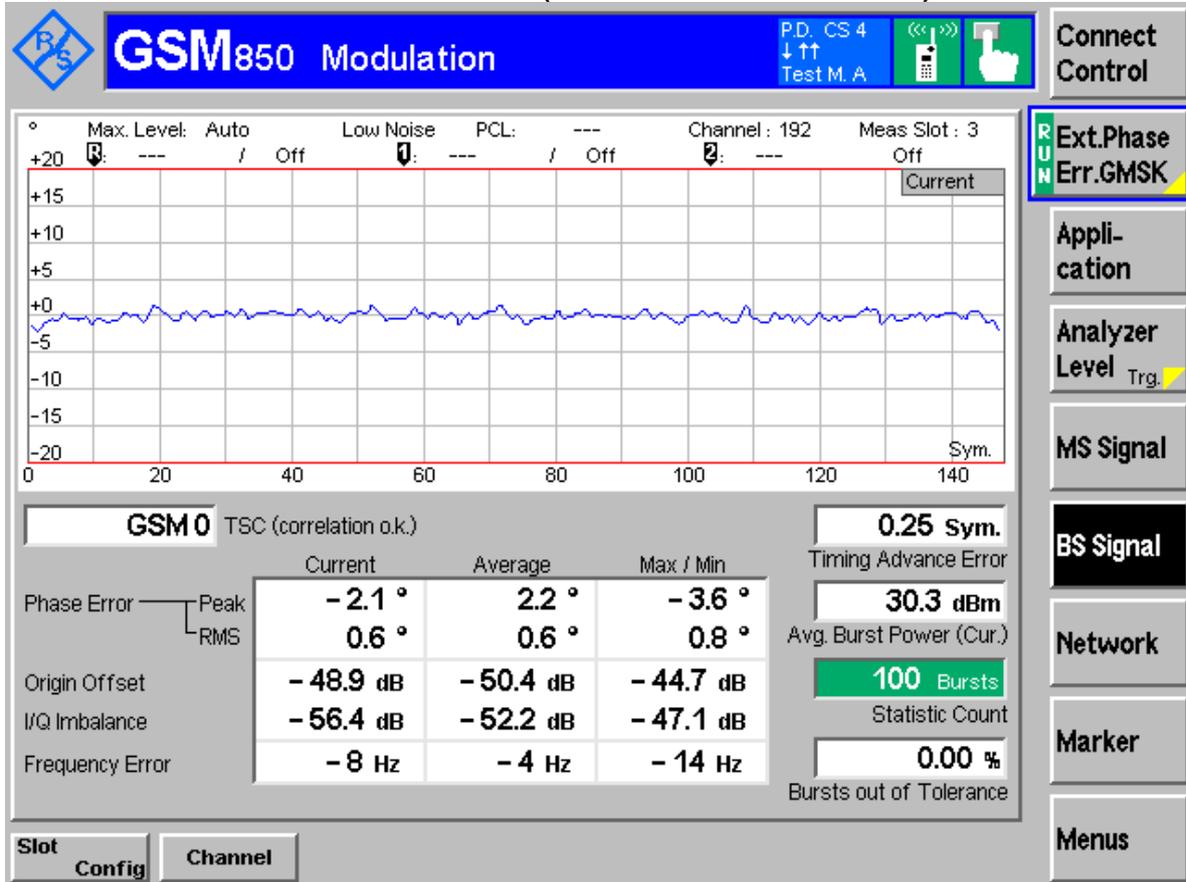
Appendix B

Modulation Characteristics

According to FCC Part 2.1047 & Part22 Subpart H

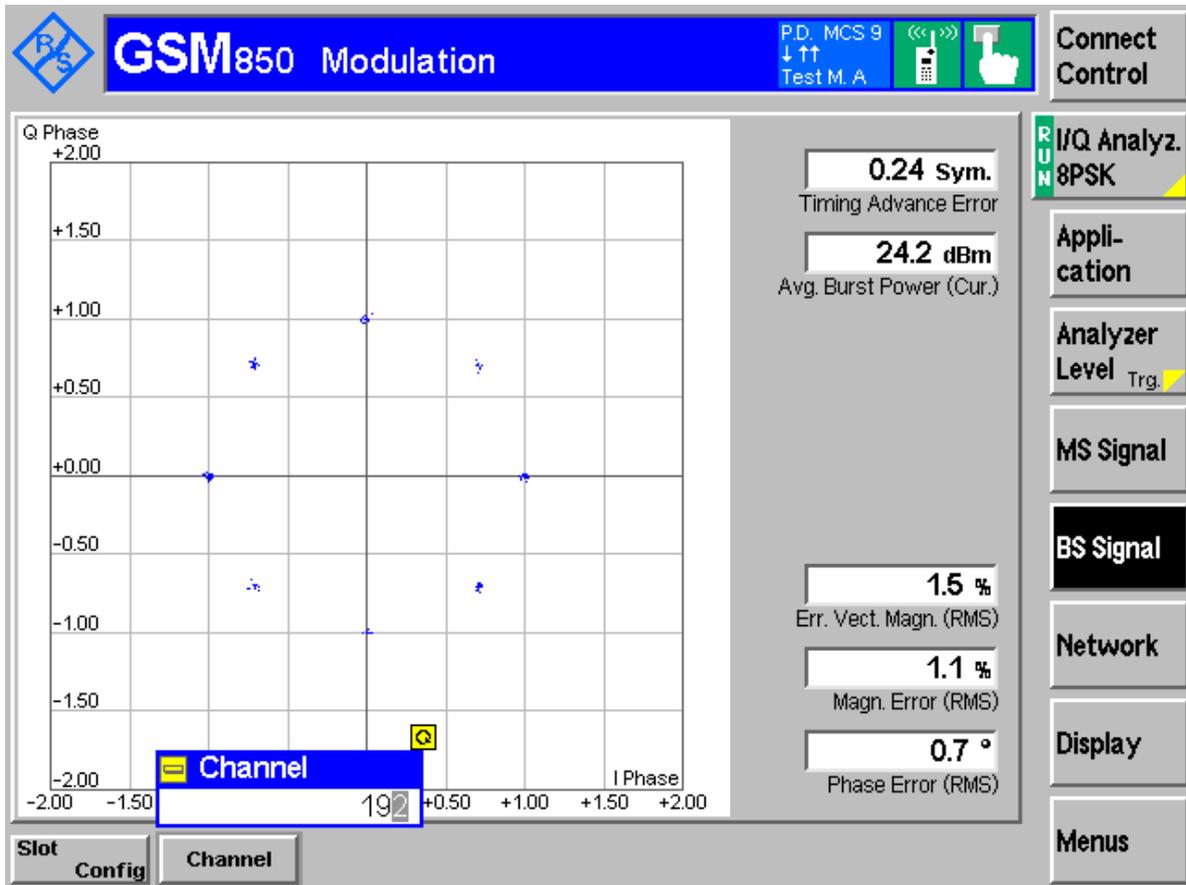


Channel 192(TM1:GPRS/GSM)



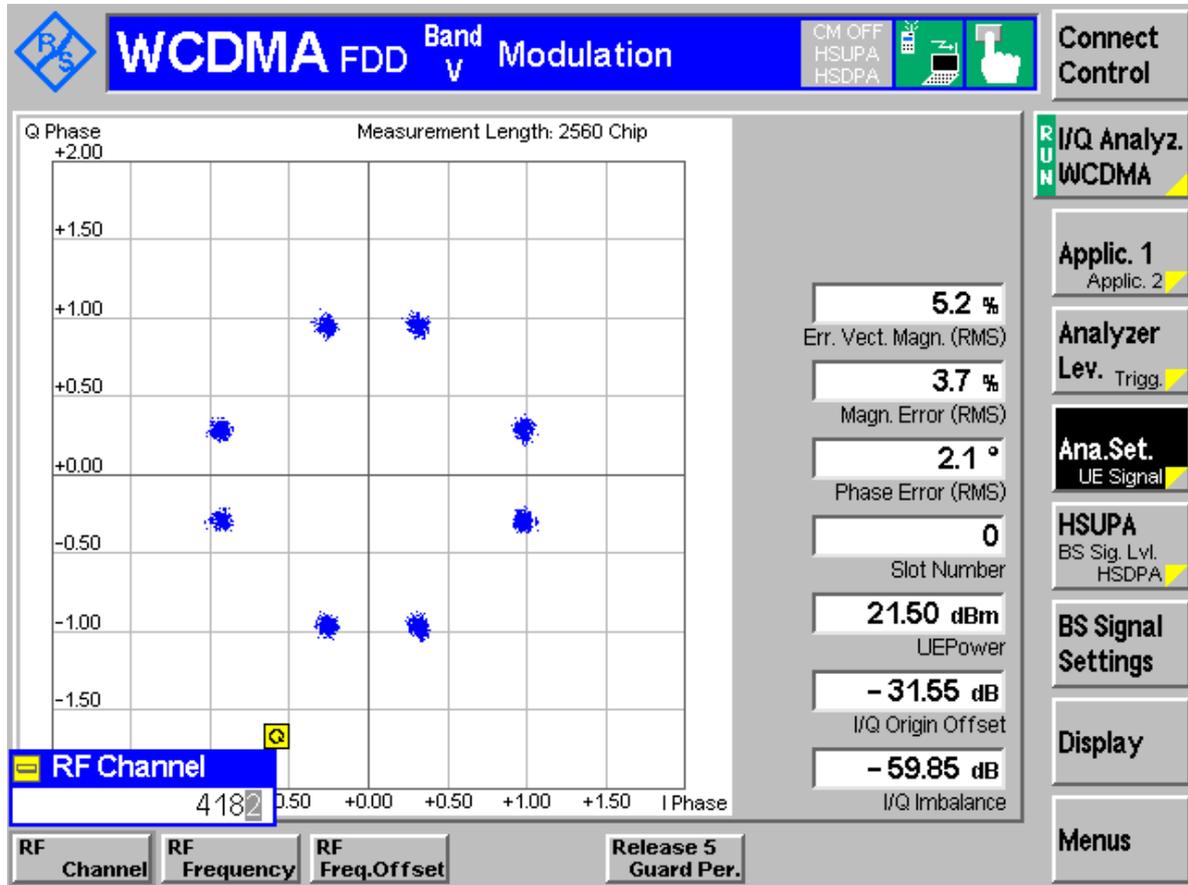


Channel 192(TM2:EDGE)





Channel 4182(TM3: WCDMA)



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



Appendix C

Occupied Bandwidth

According to FCC Part 2.1049 & Part 22 Subpart H



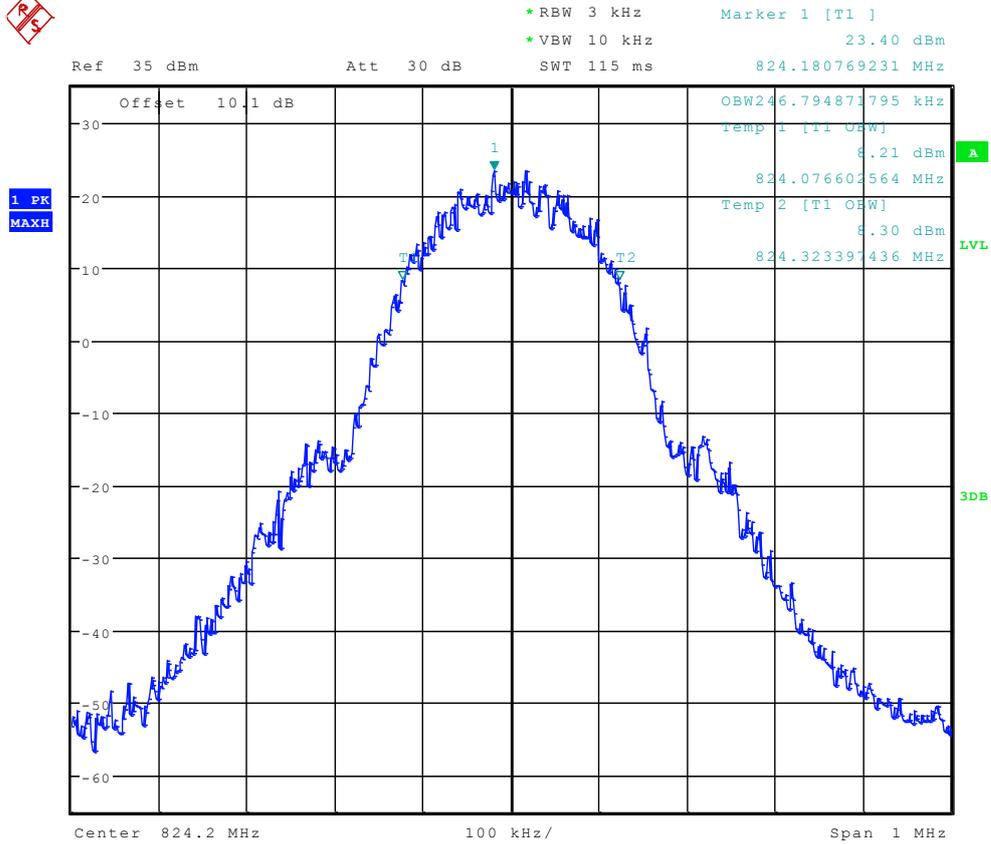
Result Table

Table 1 Measurement Results

Test Mode	RF Channel	Occupied Bandwidth [kHz]	Verdict
TM1	128	246.79	Pass
	192	245.19	Pass
	251	246.79	Pass
TM2	128	245.19	Pass
	192	240.38	Pass
	251	245.19	Pass
Test Mode	RF Channel	Occupied Bandwidth [MHz]	Verdict
TM3	4132	4.18	Pass
	4182	4.18	Pass
	4233	4.17	Pass



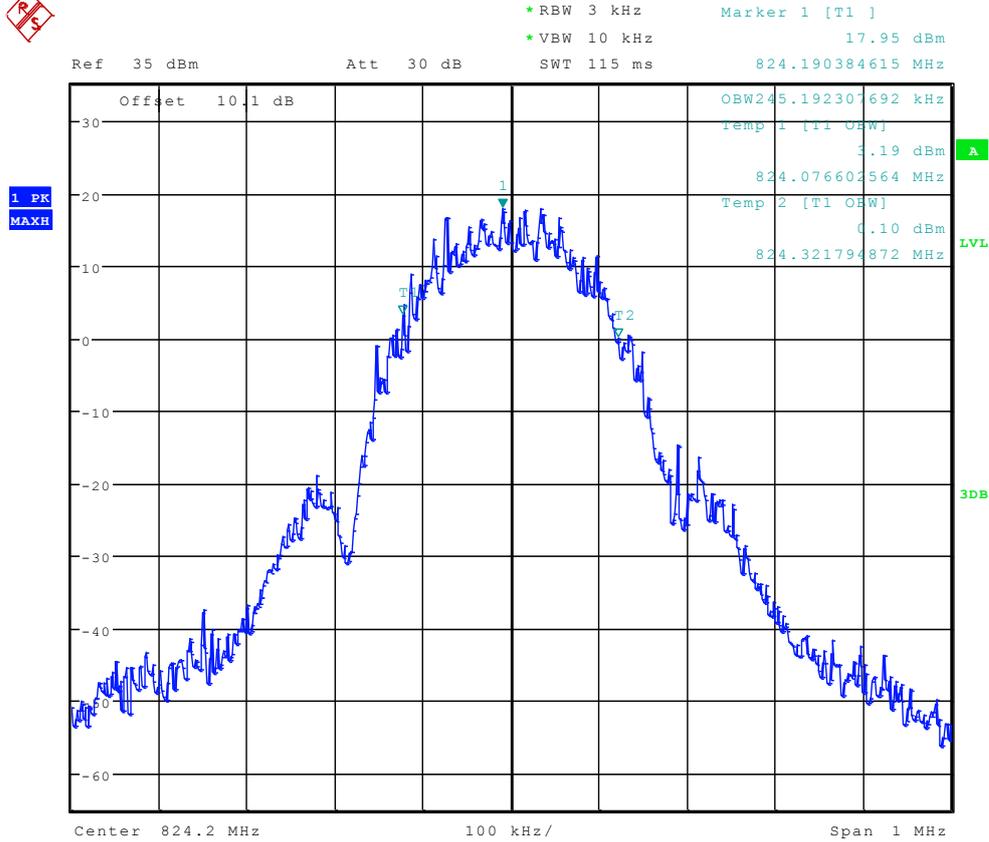
Channel 128 (TM1:GPRS/GSM)



Date: 16.FEB.2012 00:08:51



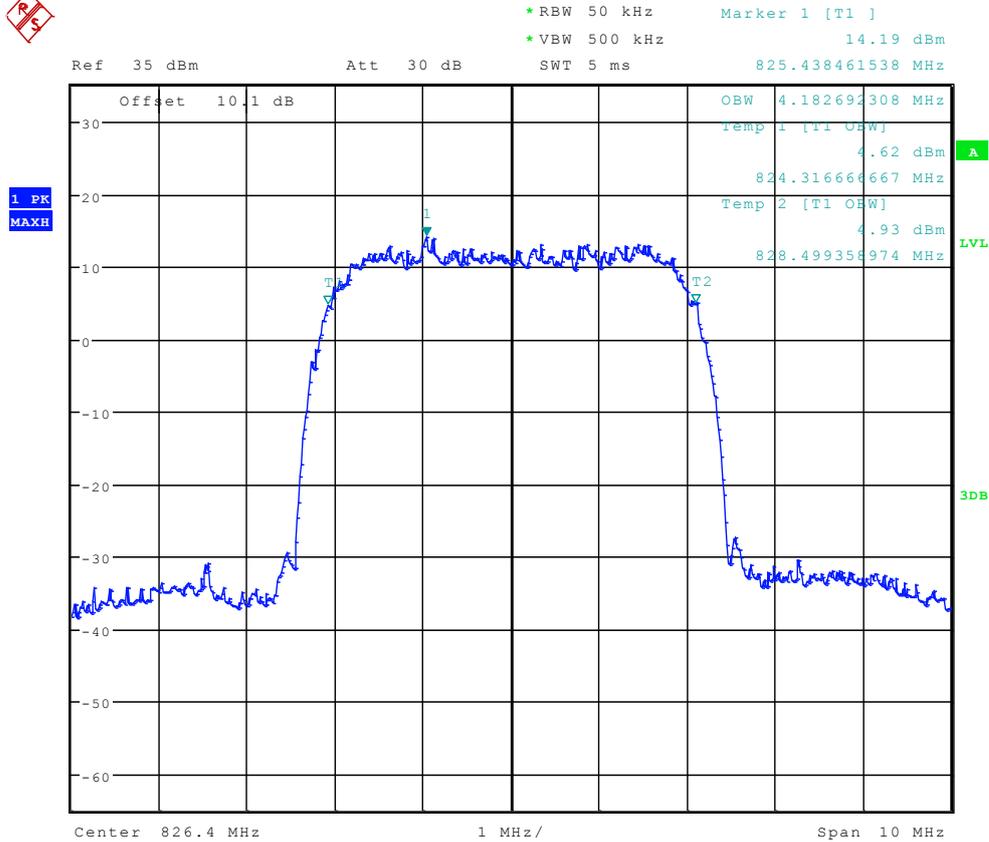
Channel 128 (TM2:EDGE)



Date: 16.FEB.2012 00:24:01



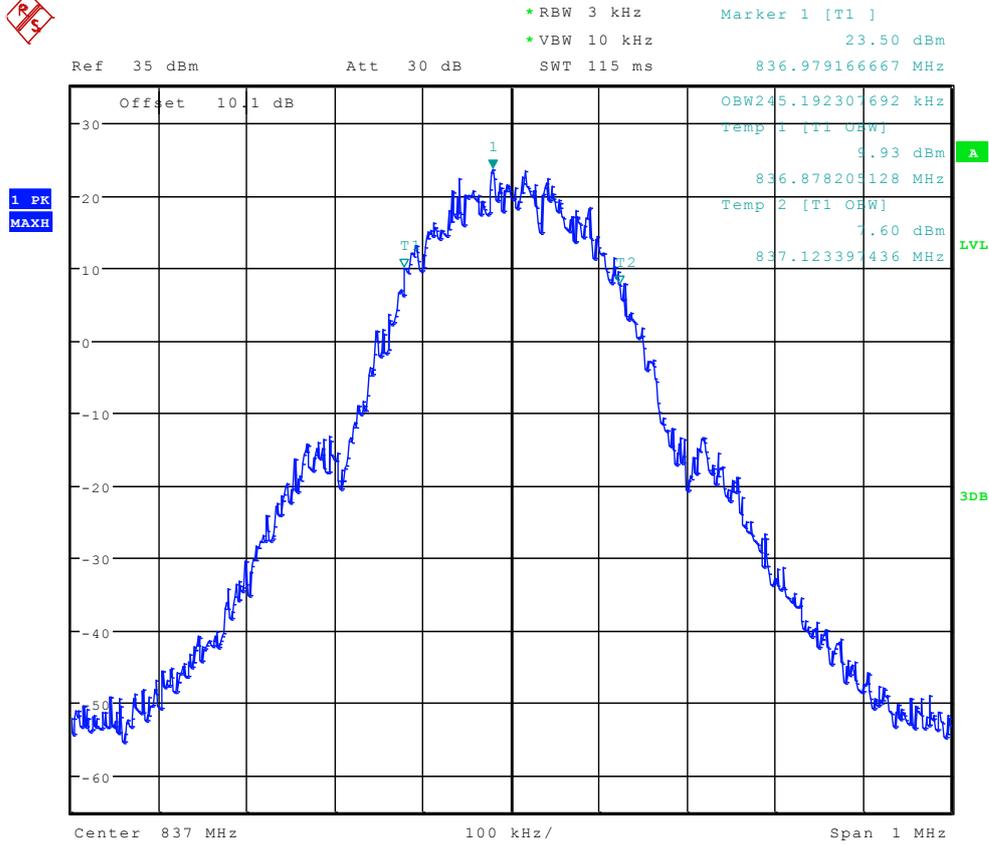
Channel 4132 (TM3: WCDMA)



Date: 16.FEB.2012 00:31:42



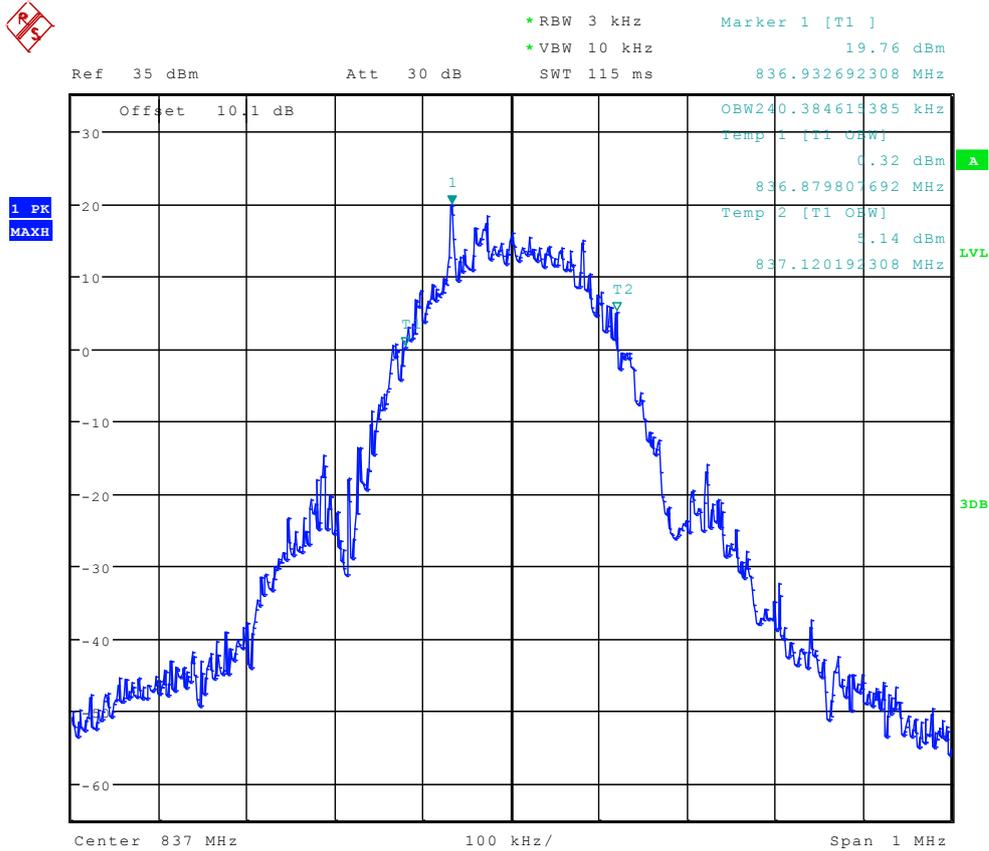
Channel 192 (TM1:GPRS/GSM)



Date: 16.FEB.2012 00:09:05



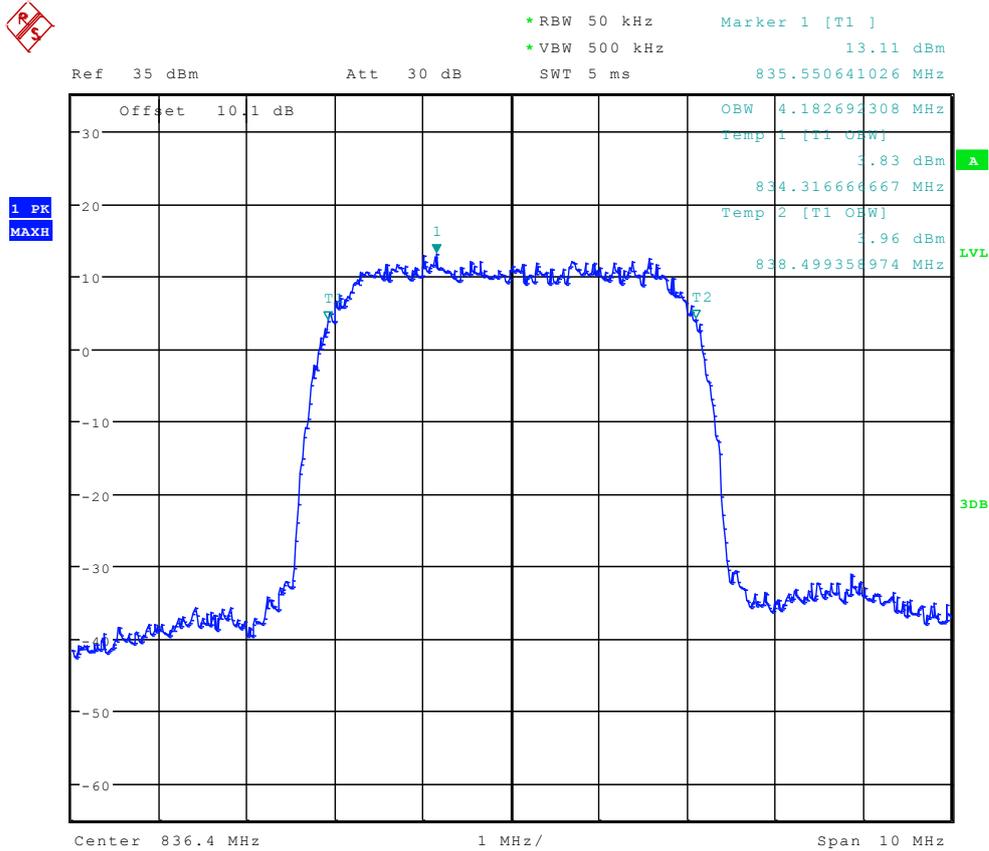
Channel 192 (TM2:EDGE)



Date: 16.FEB.2012 00:24:14



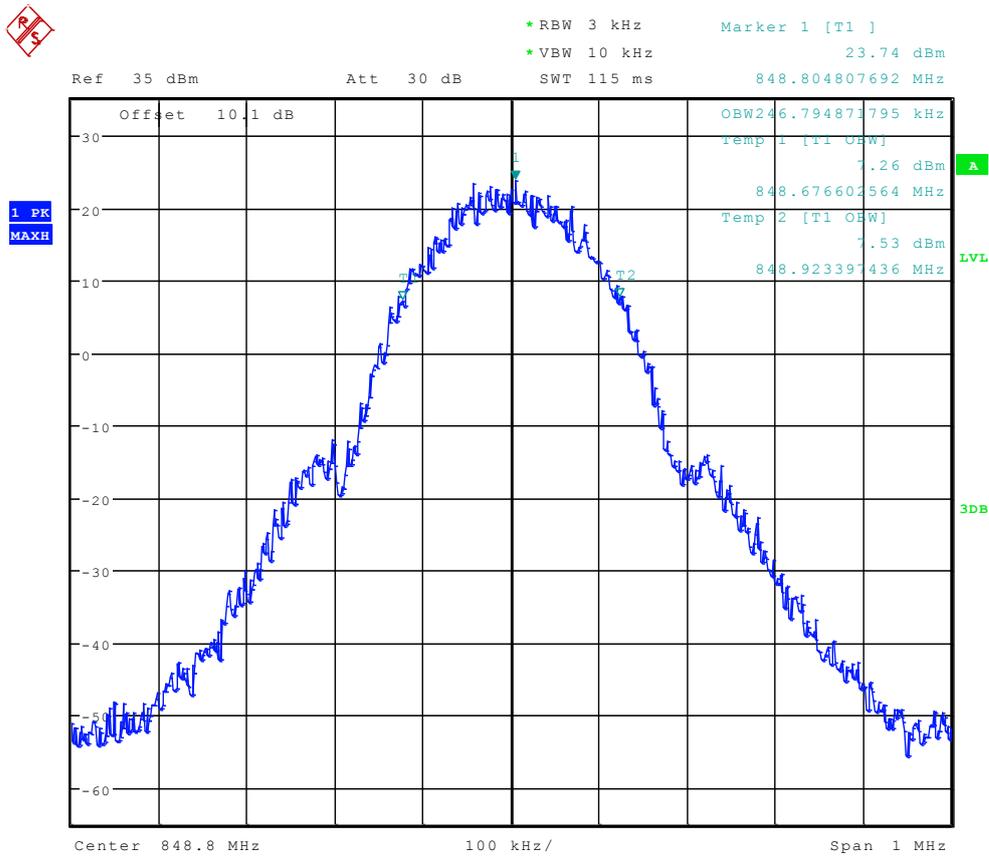
Channel 4182 (TM3: WCDMA)



Date: 16.FEB.2012 00:31:55



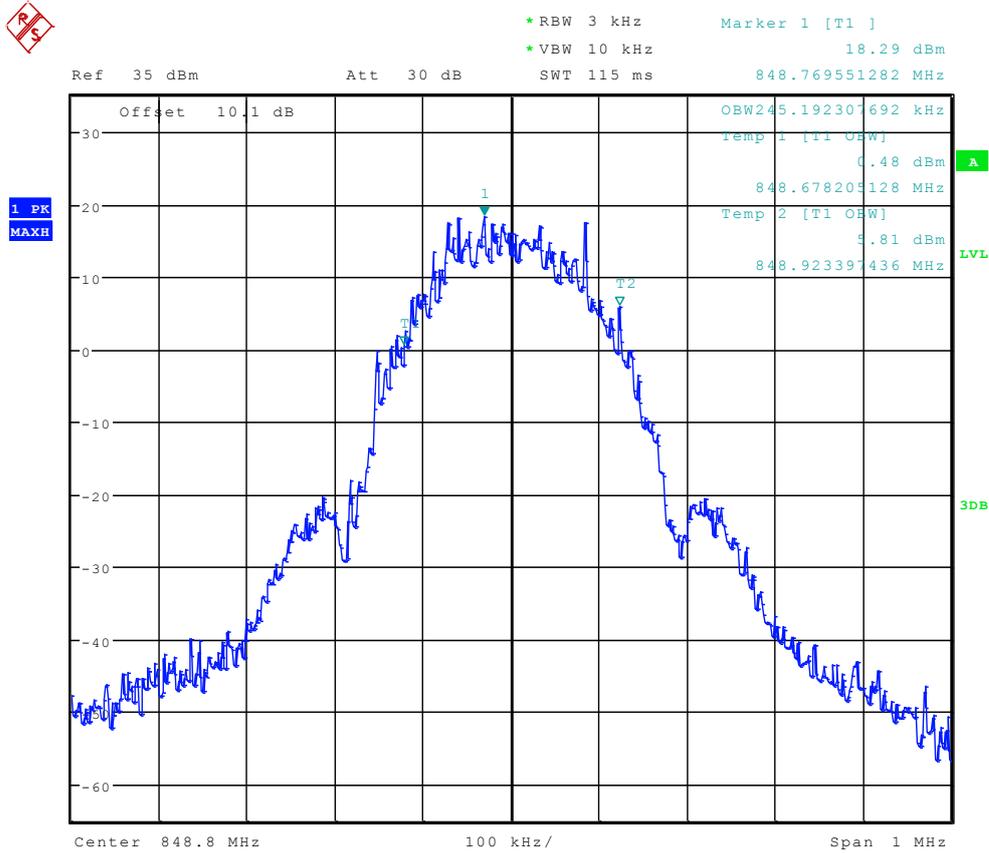
Channel 251 (TM1:GPRS/GSM)



Date: 16.FEB.2012 00:09:19



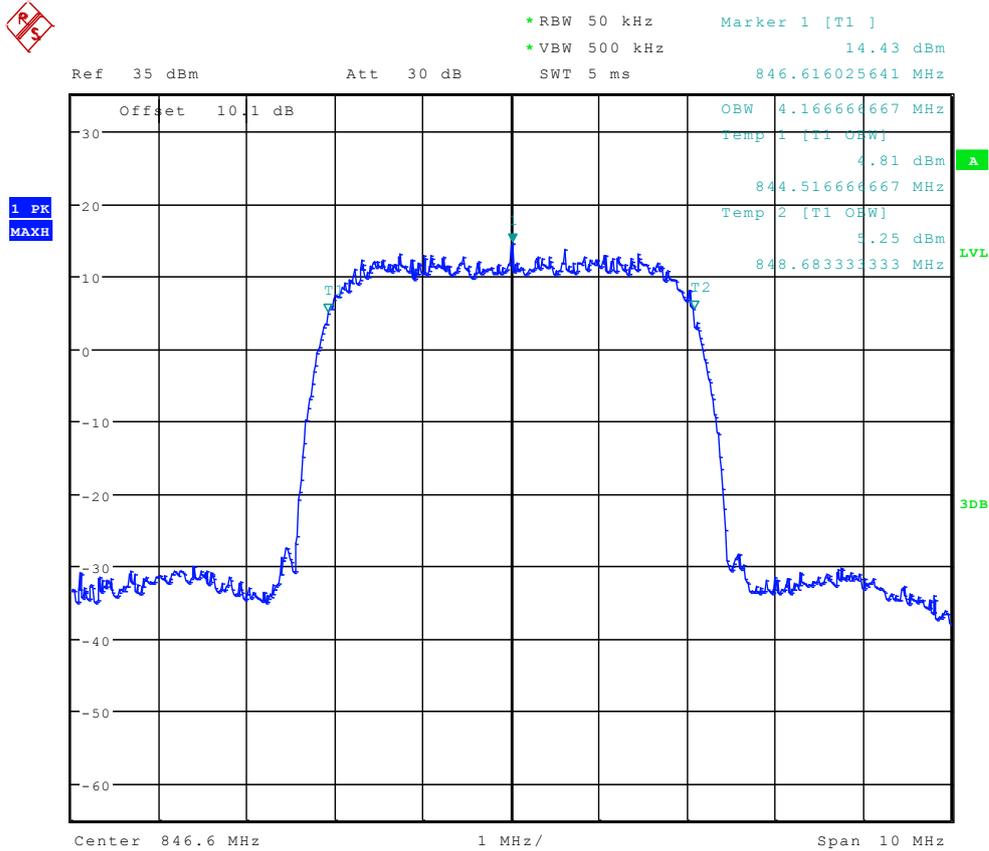
Channel 251 (TM2:EDGE)



Date: 16.FEB.2012 00:24:28



Channel 4233 (TM3: WCDMA)



Date: 16.FEB.2012 00:32:09

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



Appendix D

Band Edges Compliance

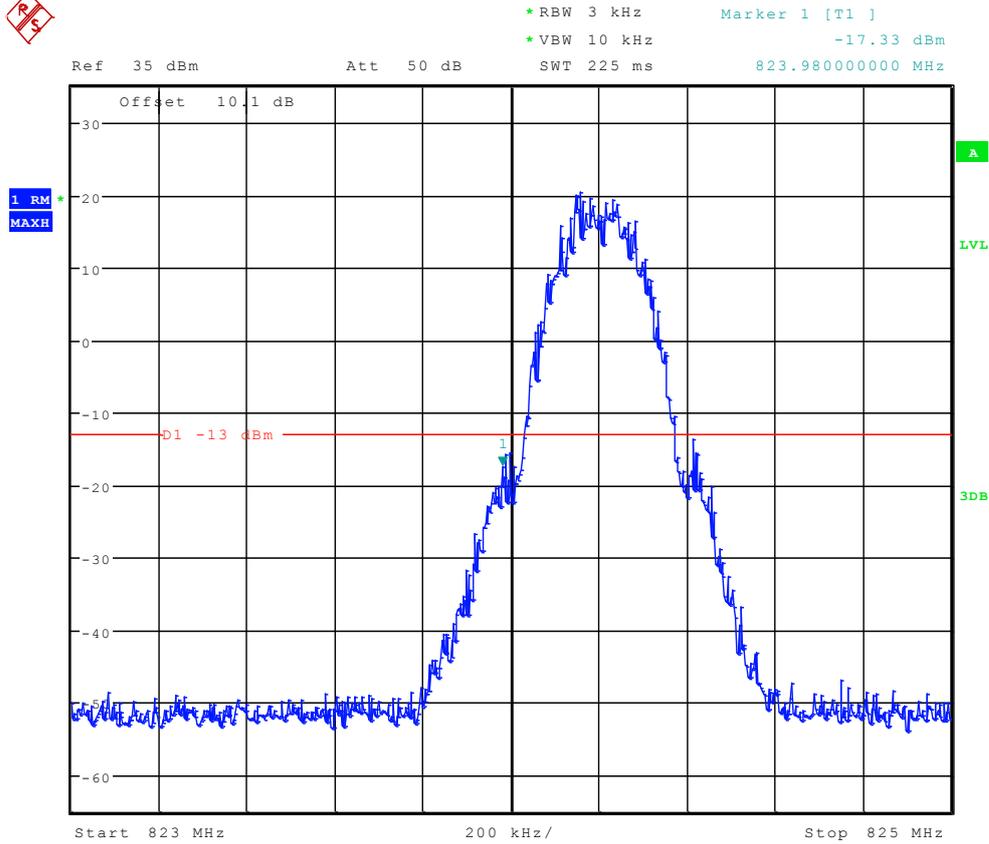
According to FCC Part 2.1051 & Part 22 Subpart H



TM1:GPRS/GSM

Left Edge

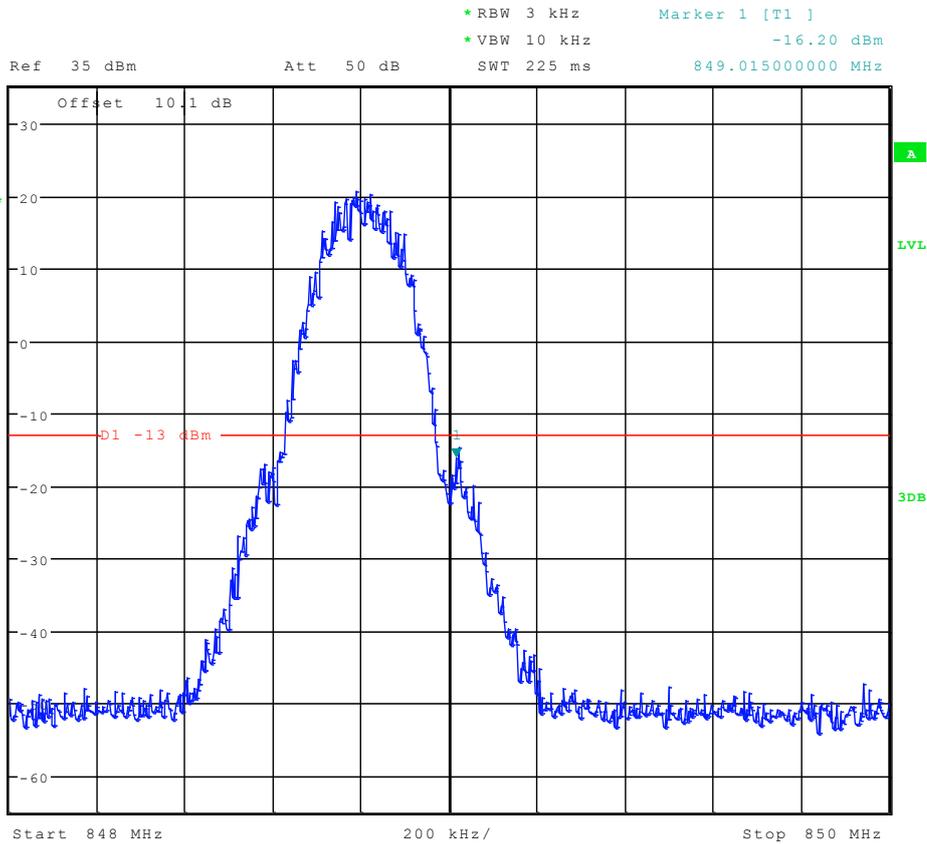
Channel 128



Date: 16.FEB.2012 00:12:28



Right Edge Channel 251



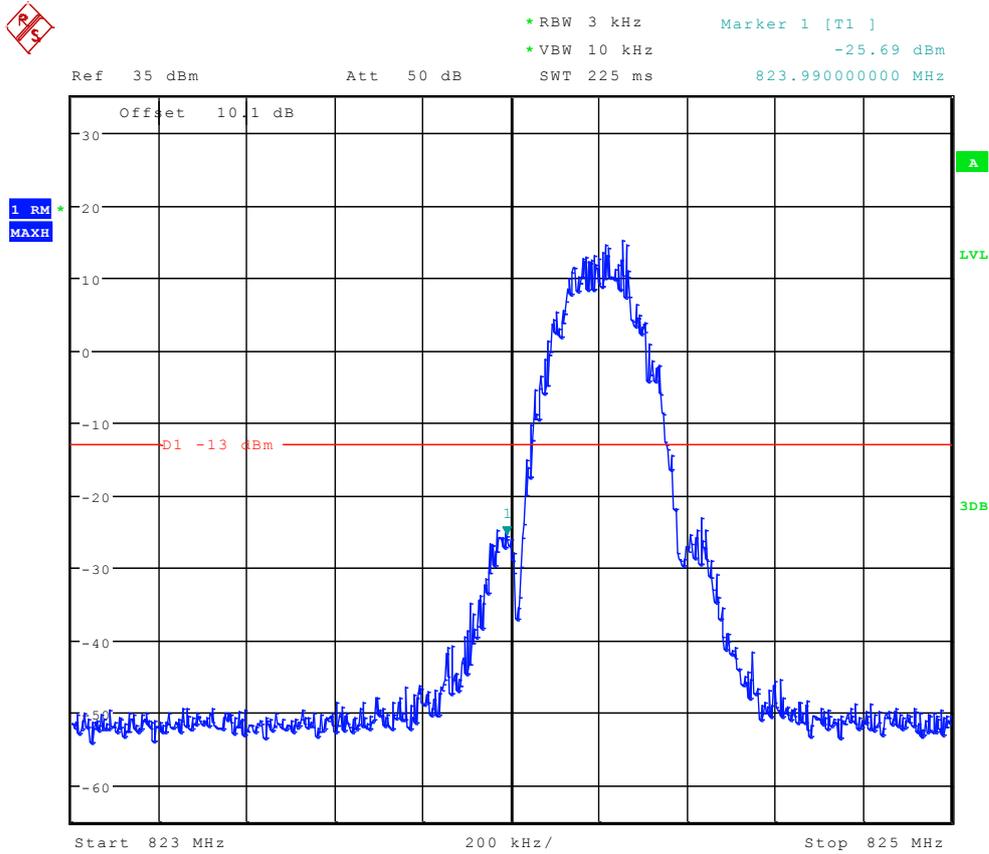
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TM2:EDGE

Left Edge

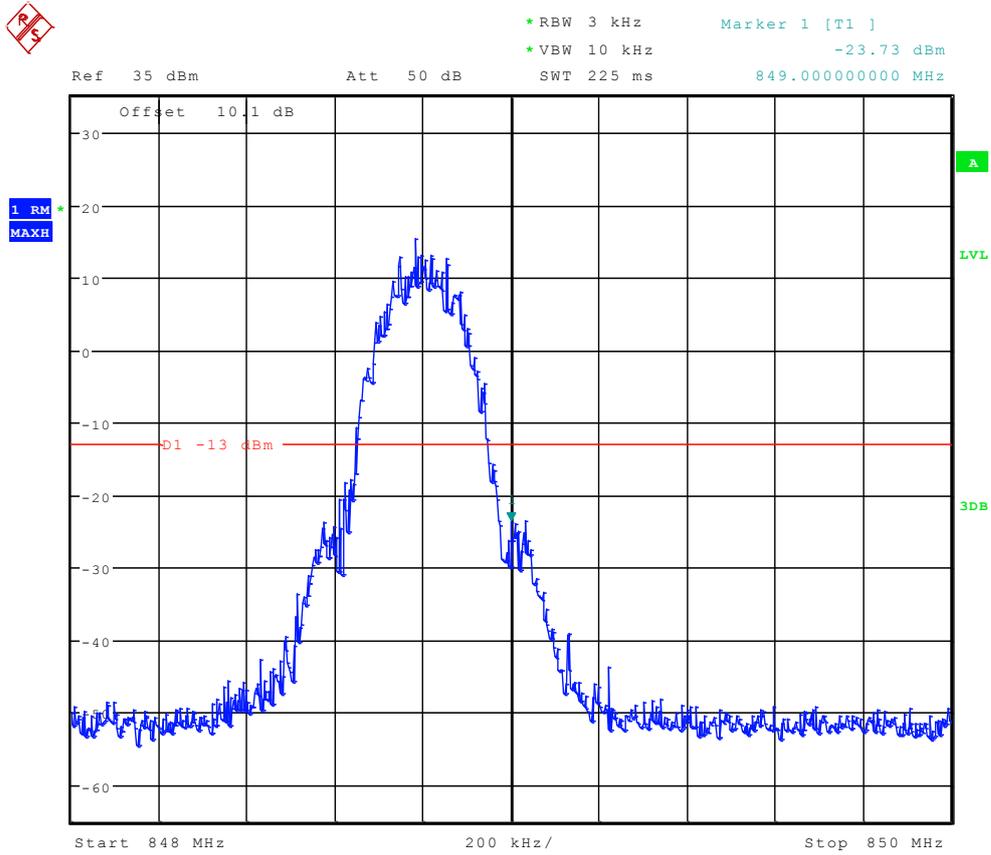
Channel 128



Date: 16.FEB.2012 00:42:36



Right Edge Channel 251



Date: 16.FEB.2012 00:42:50



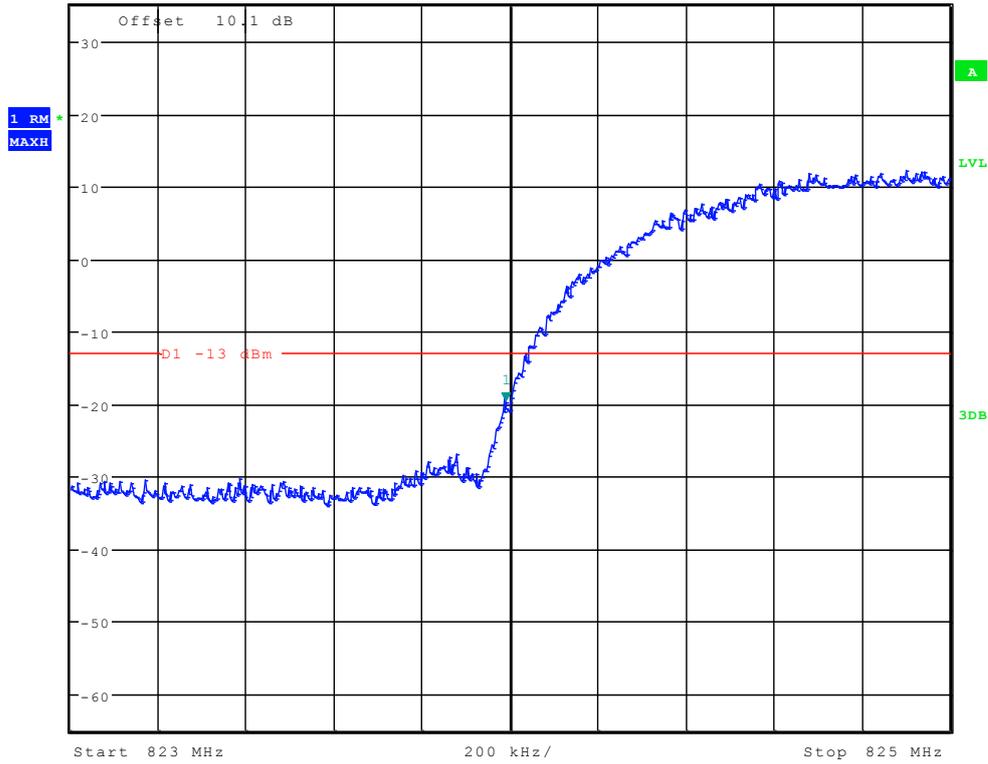
TM3: WCDMA

Left Edge

Channel 4132



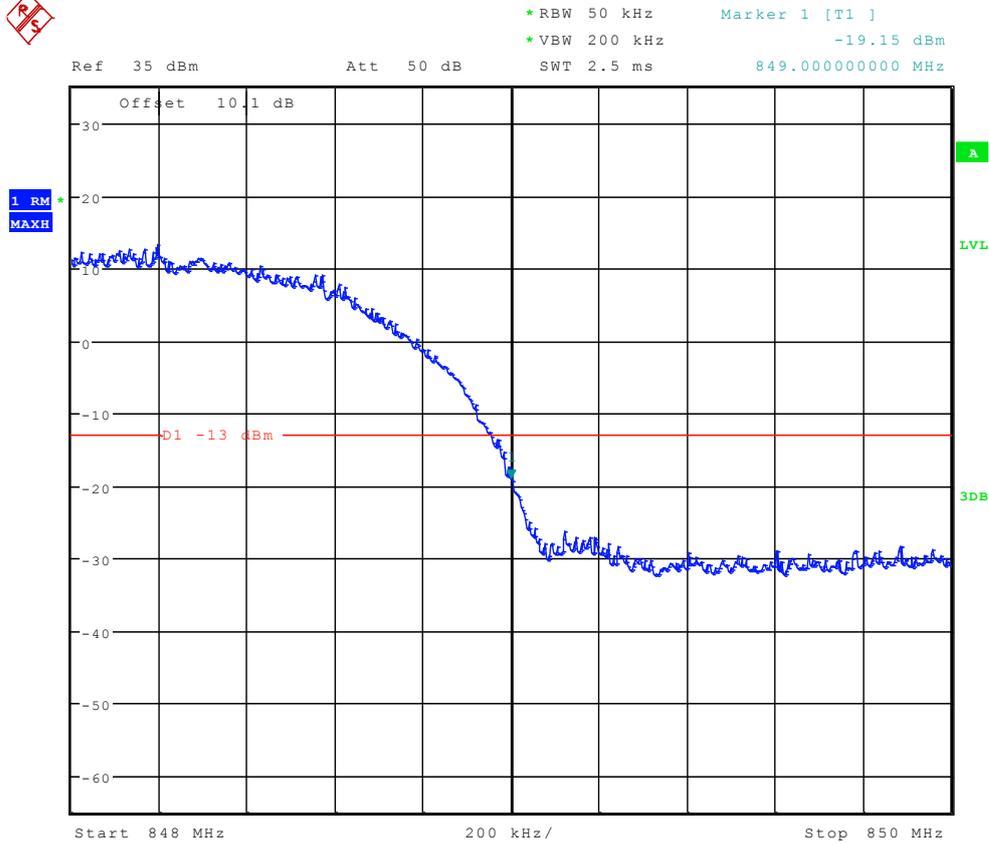
Ref 35 dBm Att 50 dB SWT 2.5 ms Marker 1 [T1] 823.990000000 MHz
 *RBW 50 kHz *VBW 200 kHz -19.74 dBm



Date: 16.FEB.2012 00:32:23



Right Edge Channel 4233



Date: 16.FEB.2012 00:32:37

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



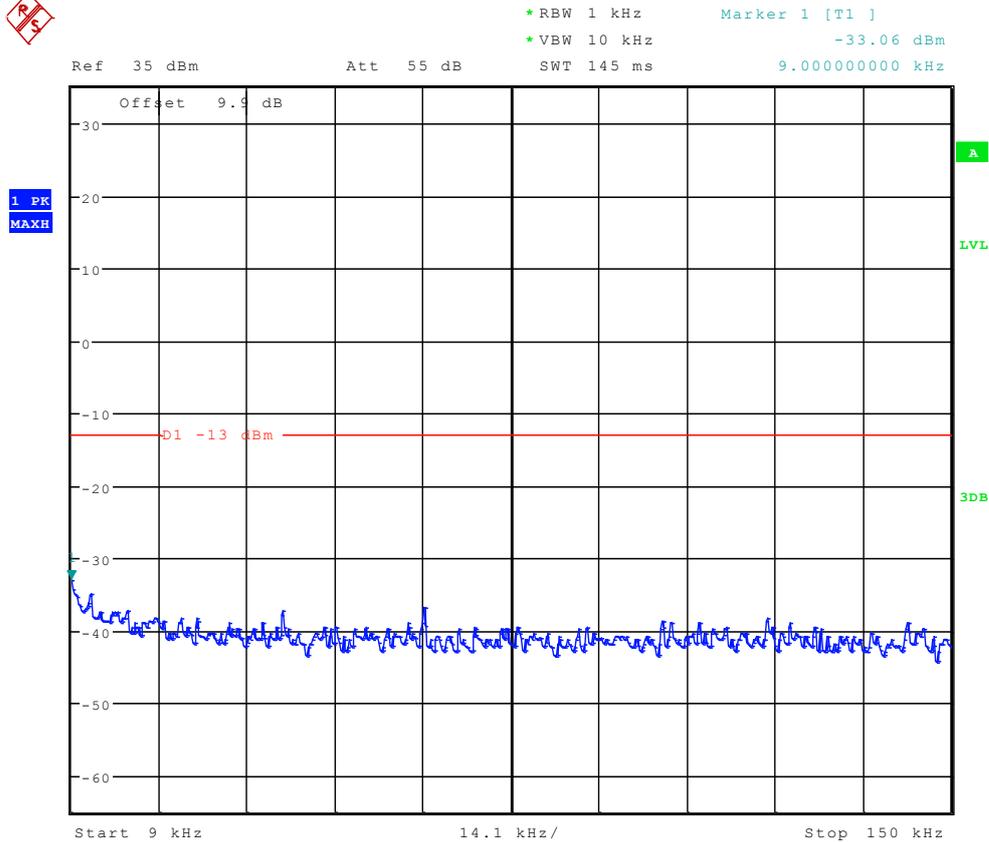
Appendix E

Spurious Emission at Antenna Terminal

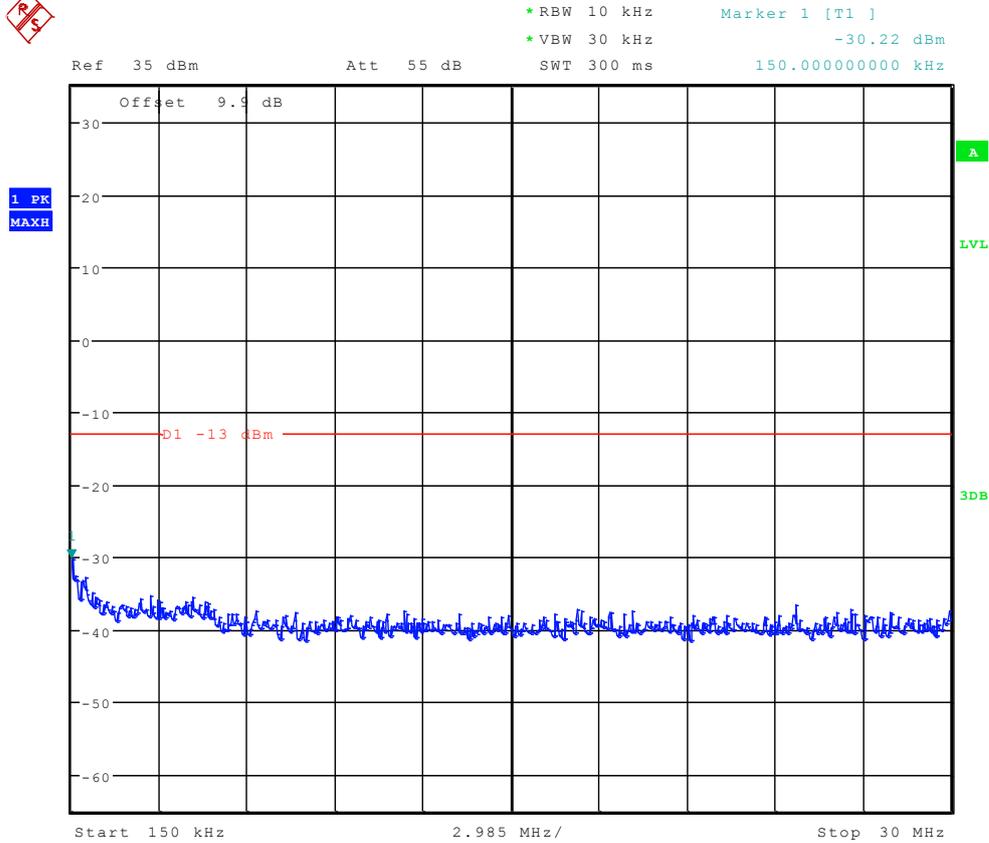
According to FCC Part 2.1051 & Part 22 Subpart H



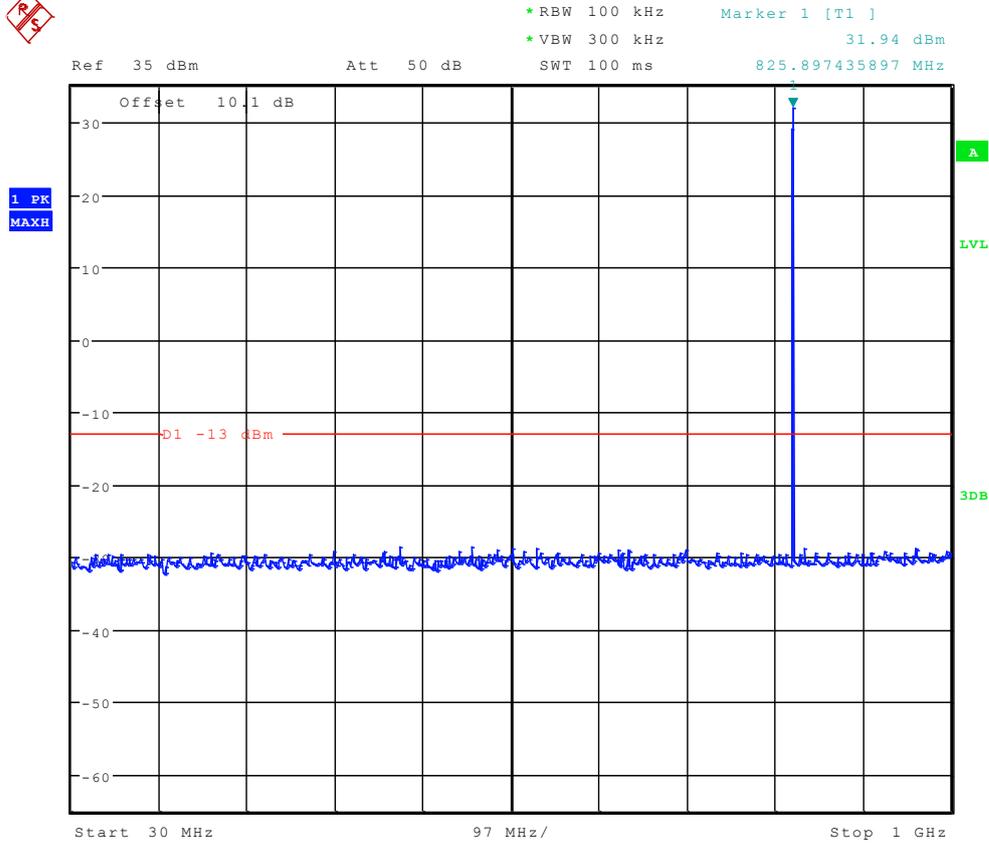
TM1:GPRS/GSM Channel 128



Date: 16.FEB.2012 00:09:34



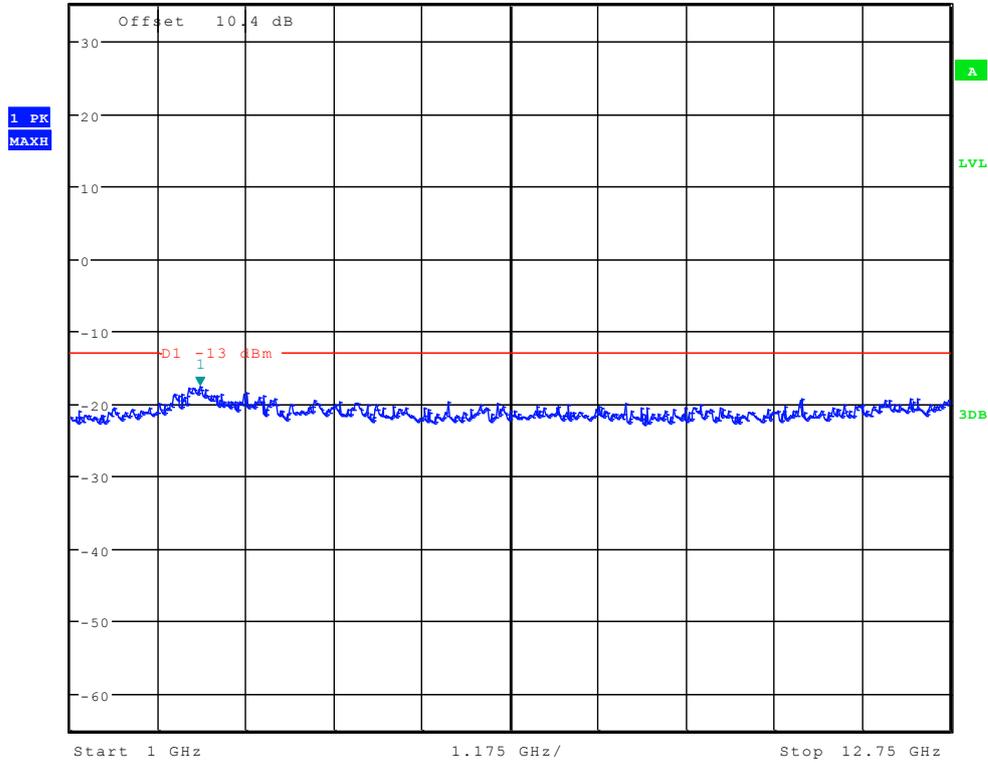
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Date: 16.FEB.2012 00:11:01



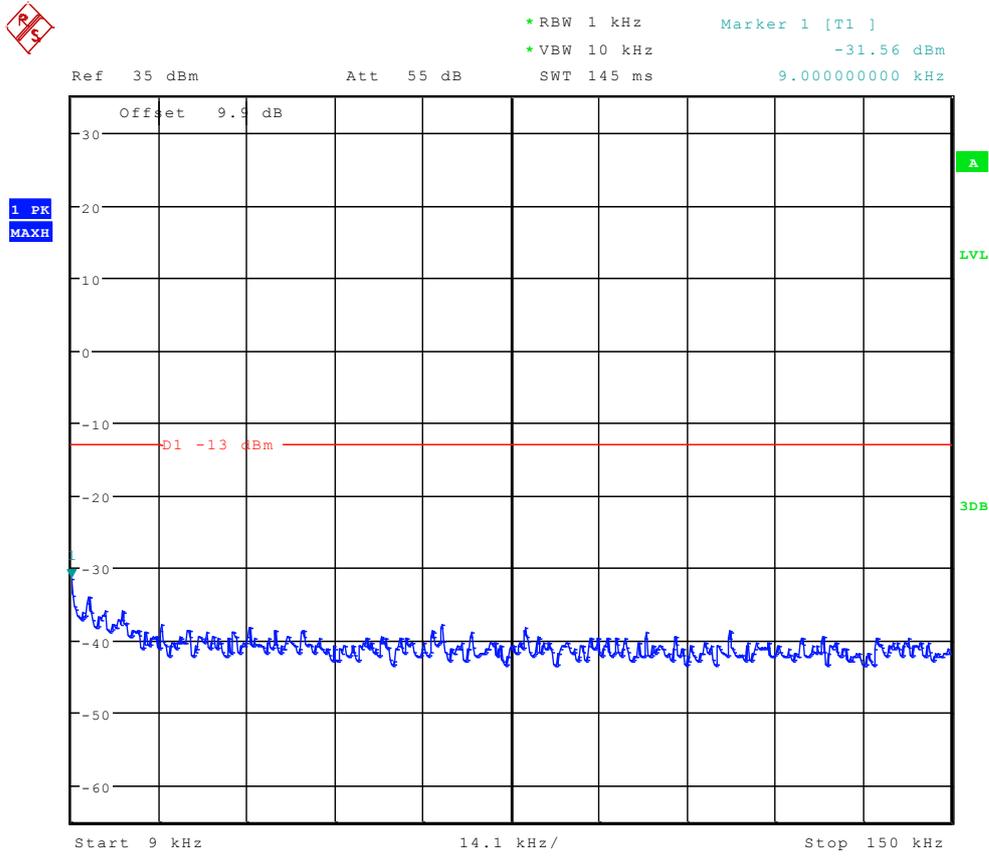
*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -17.66 dBm
Ref 35 dBm Att 50 dB SWT 70 ms 2.732371795 GHz



Date: 16.FEB.2012 00:11:45



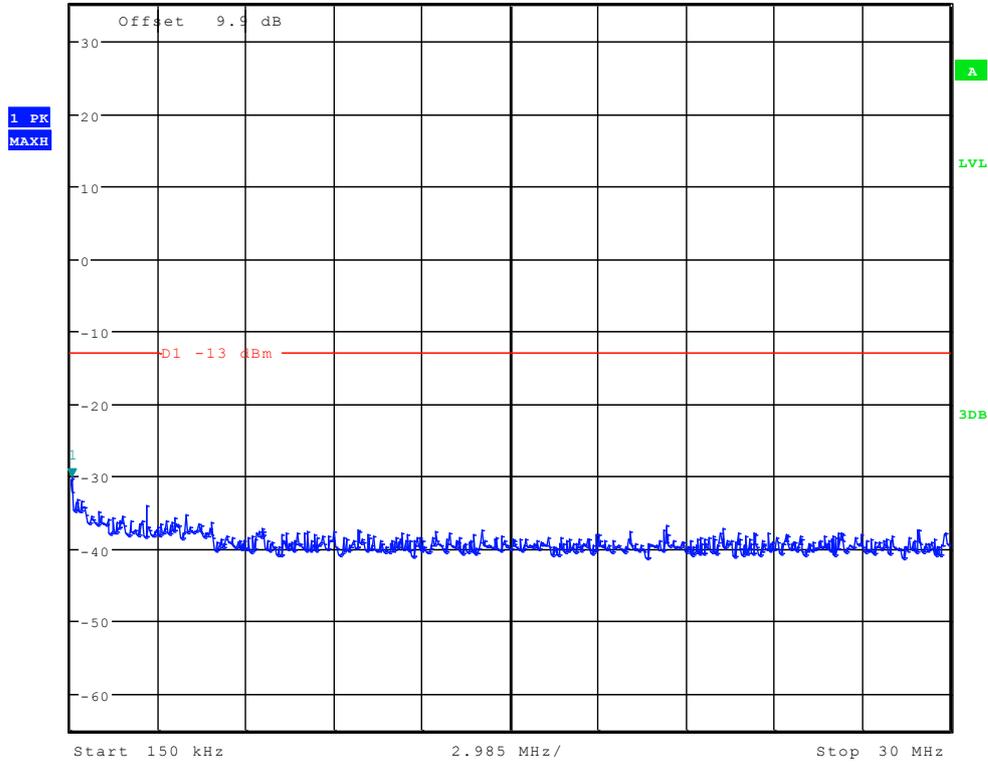
Channel 192



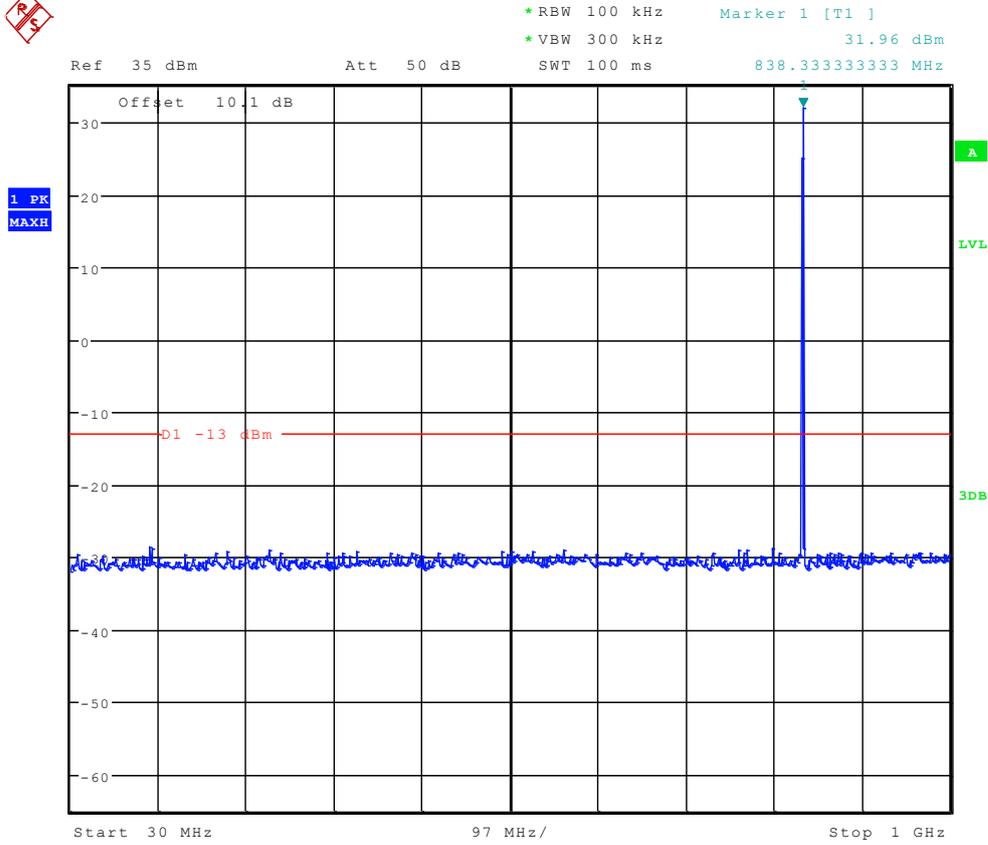
Date: 16.FEB.2012 00:09:48



Ref 35 dBm Att 55 dB SWT 300 ms
 *RBW 10 kHz Marker 1 [T1] -30.28 dBm
 *VBW 30 kHz 197.836538462 kHz



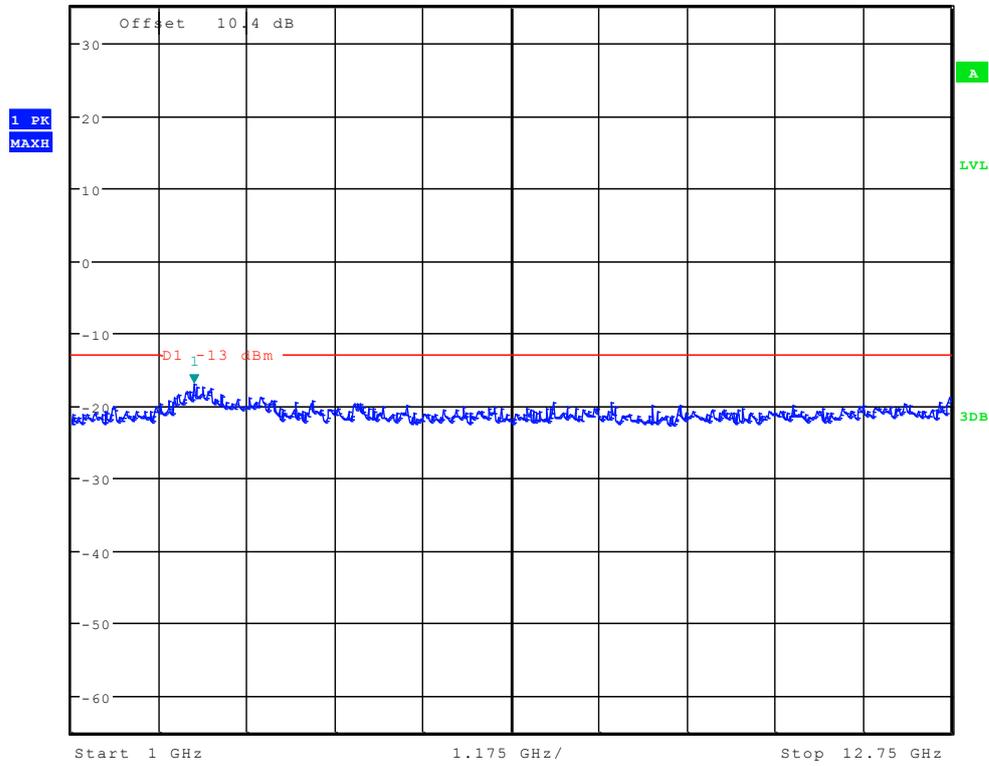
Date: 16.FEB.2012 00:10:32



Date: 16.FEB.2012 00:11:15



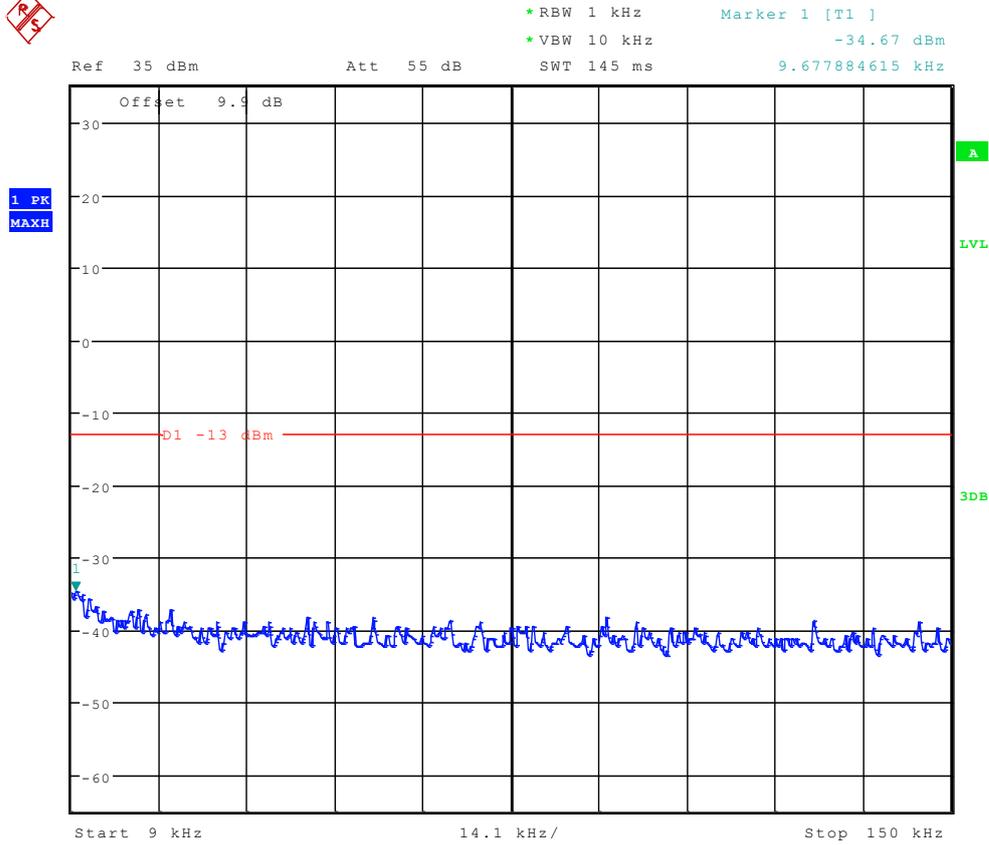
*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -17.04 dBm
Ref 35 dBm Att 50 dB SWT 70 ms 2.638221154 GHz



Date: 16.FEB.2012 00:11:59



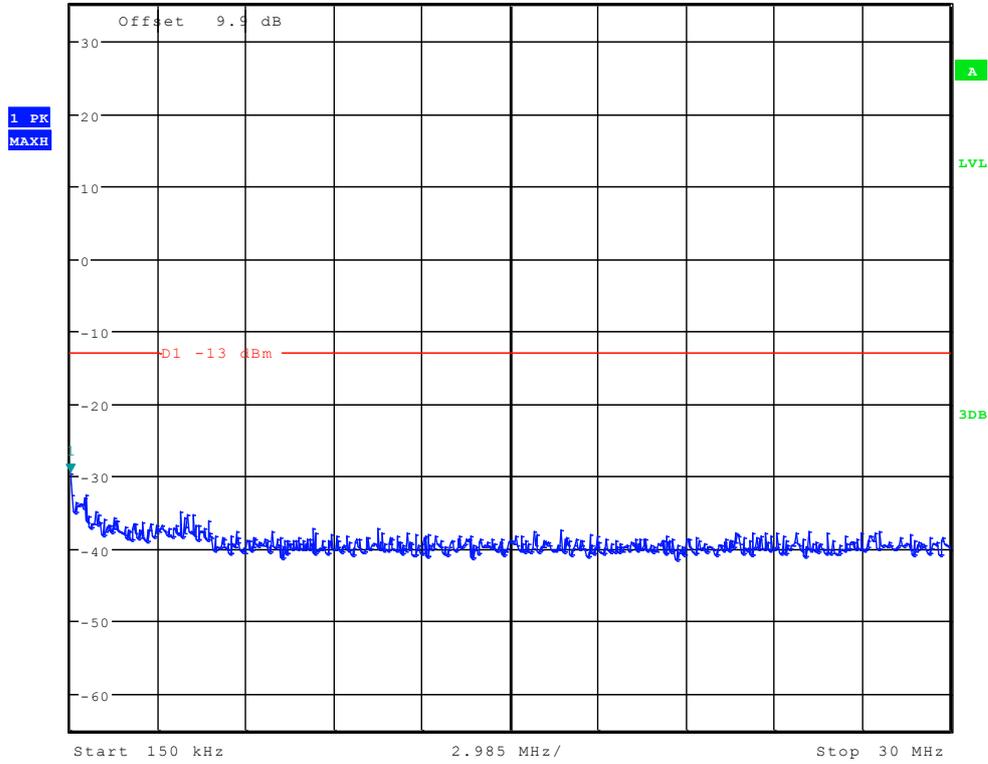
Channel 251



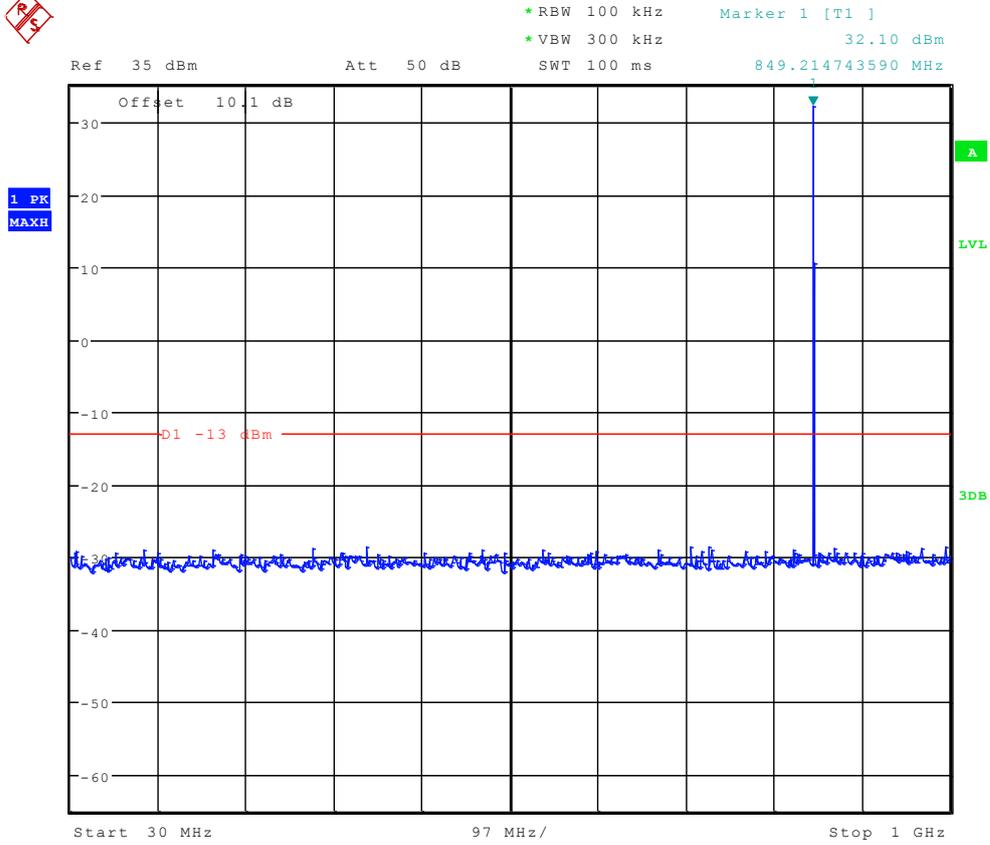
Date: 16.FEB.2012 00:10:02



Ref 35 dBm Att 55 dB SWT 300 ms
 *RBW 10 kHz Marker 1 [T1] -29.59 dBm
 *VBW 30 kHz 150.000000000 kHz



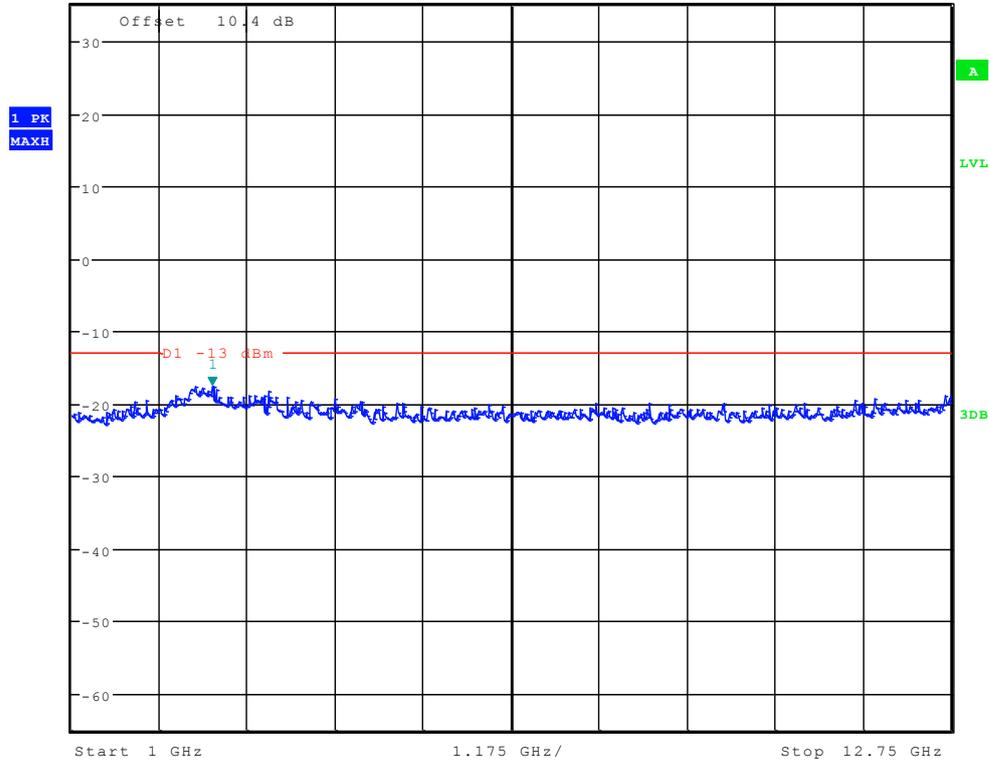
Date: 16.FEB.2012 00:10:46



Date: 16.FEB.2012 00:11:30



*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -17.56 dBm
Ref 35 dBm Att 50 dB SWT 70 ms 2.883012821 GHz



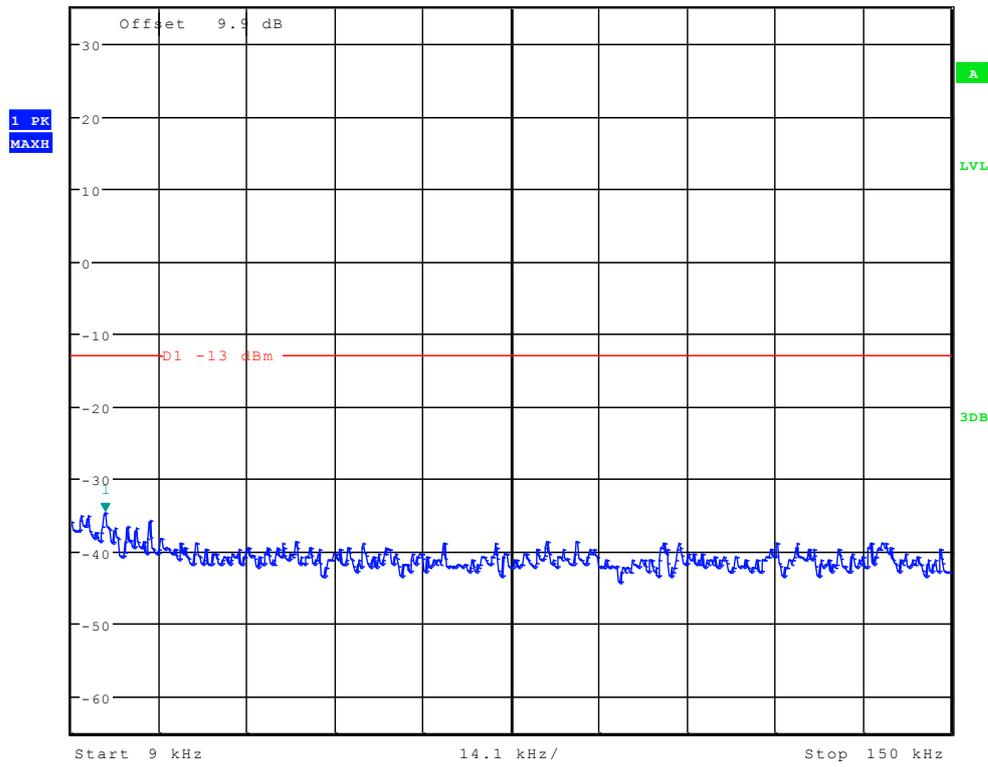
Date: 16.FEB.2012 00:12:14



TM2:EDGE Channel 128



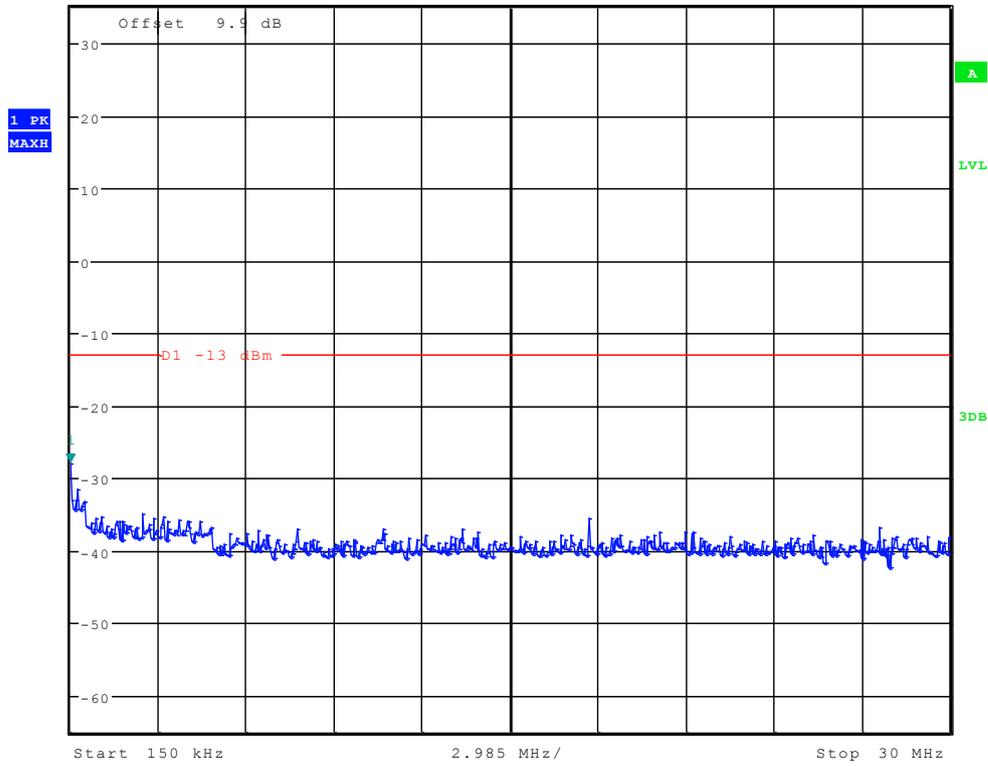
Ref 35 dBm Att 55 dB SWT 145 ms
 *RBW 1 kHz Marker 1 [T1] -34.67 dBm
 *VBW 10 kHz
 14.423076923 kHz



Date: 16.FEB.2012 00:24:43



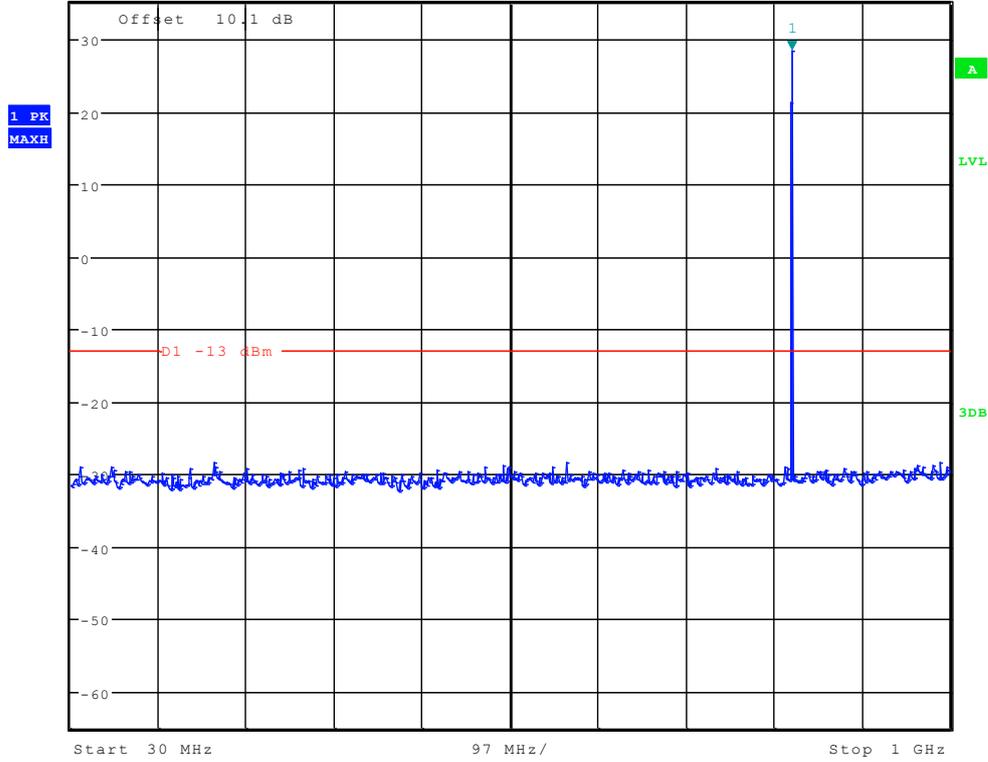
*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -27.99 dBm
Ref 35 dBm Att 55 dB SWT 300 ms 150.000000000 kHz



Date: 16.FEB.2012 00:25:26



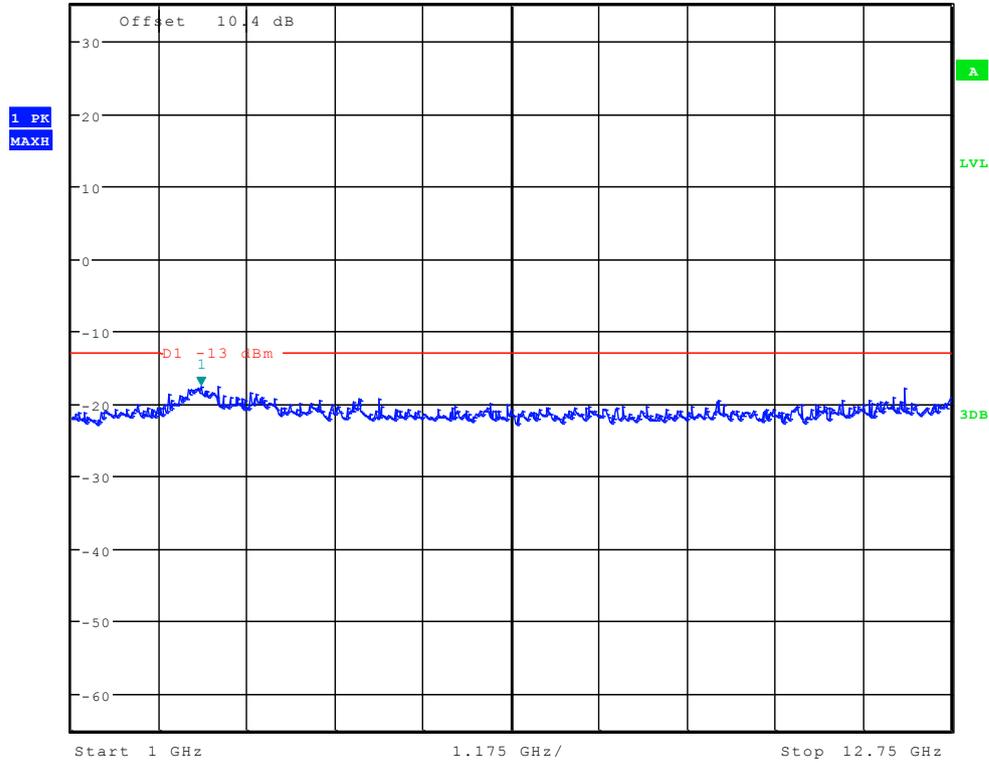
Ref 35 dBm Att 50 dB SWT 100 ms
 *RBW 100 kHz Marker 1 [T1] 28.31 dBm
 *VBW 300 kHz 825.897435897 MHz



Date: 16.FEB.2012 00:26:10



Ref 35 dBm Att 50 dB SWT 70 ms
 *RBW 1 MHz Marker 1 [T1] -17.68 dBm
 *VBW 3 MHz 2.732371795 GHz



Date: 16.FEB.2012 00:26:54

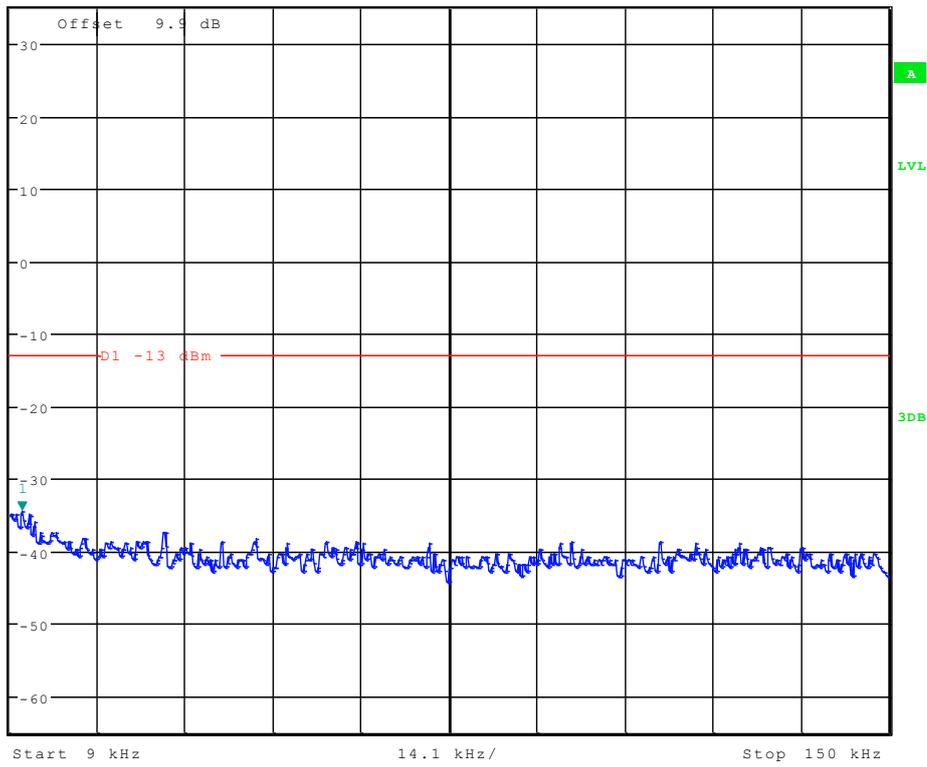


Channel 192

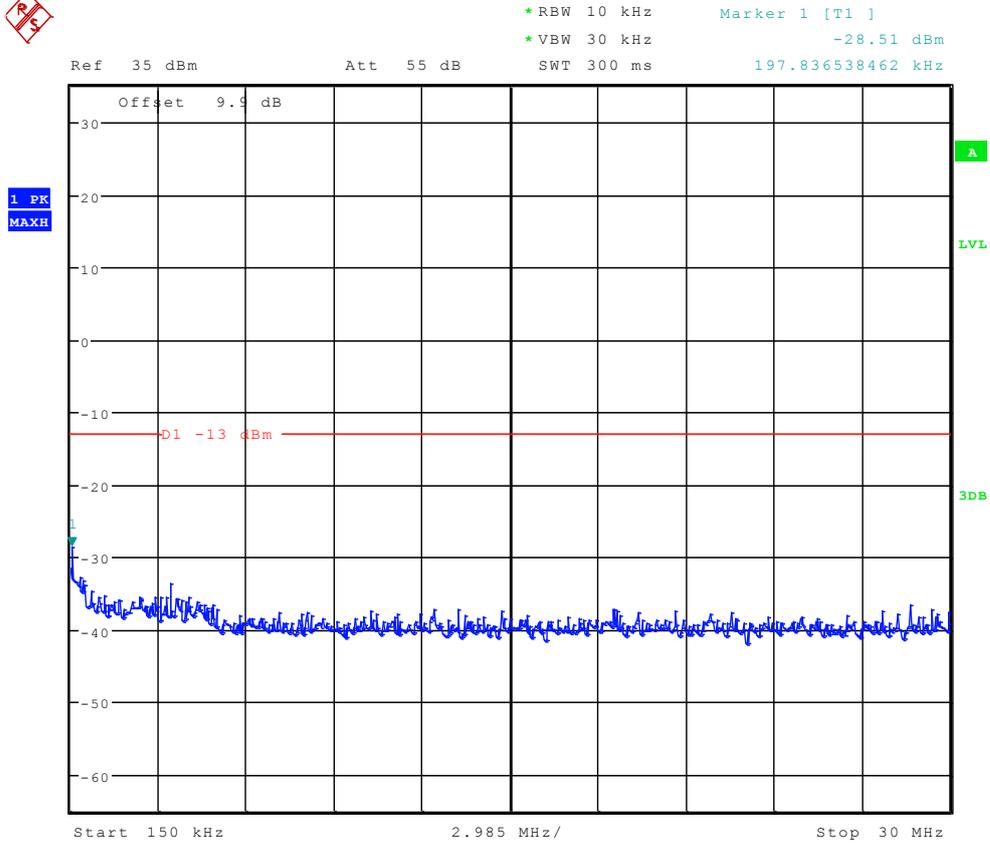


1 PK
MAXH

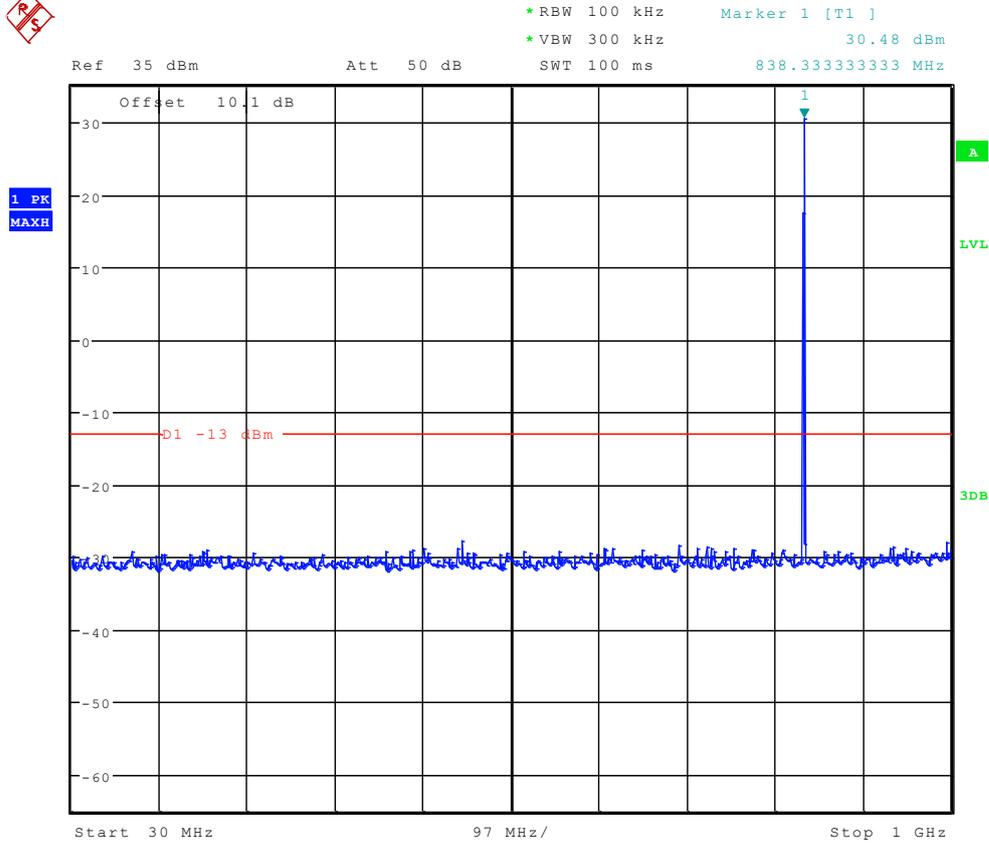
*RBW 1 kHz Marker 1 [T1]
*VBW 10 kHz -34.38 dBm
Ref 35 dBm Att 55 dB SWT 145 ms 11.033653846 kHz



Date: 16.FEB.2012 00:24:57



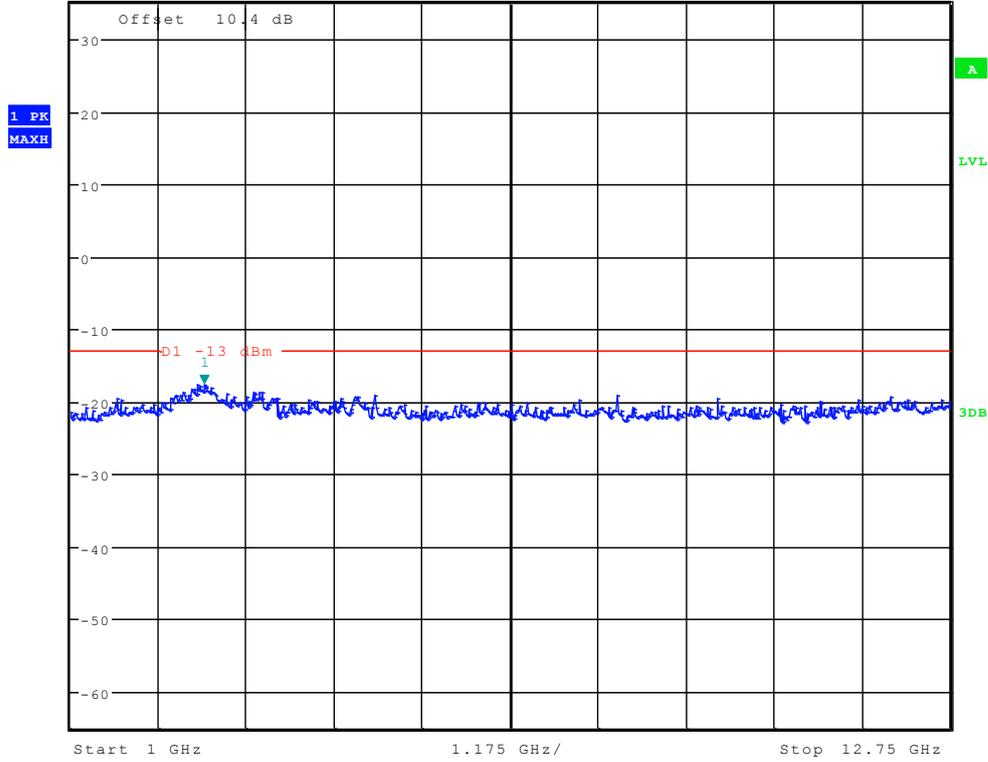
Date: 16.FEB.2012 00:25:41



Date: 16.FEB.2012 00:26:25



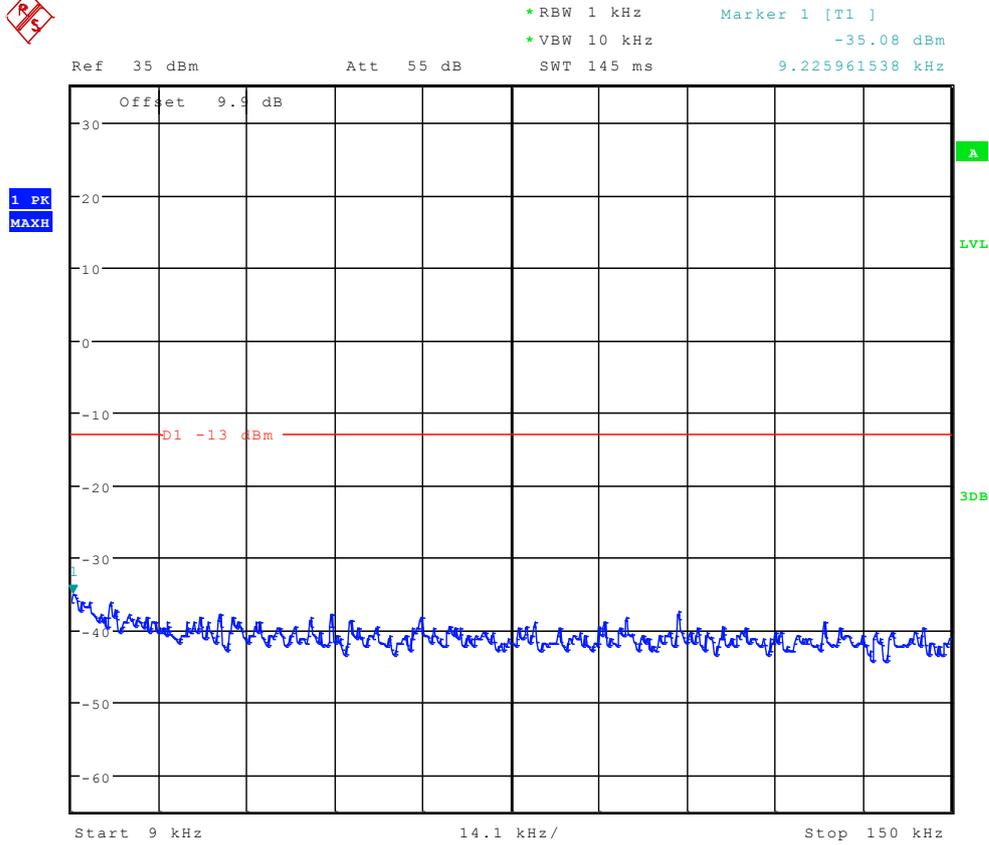
*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -17.61 dBm
Ref 35 dBm Att 50 dB SWT 70 ms 2.788862179 GHz



Date: 16.FEB.2012 00:27:08



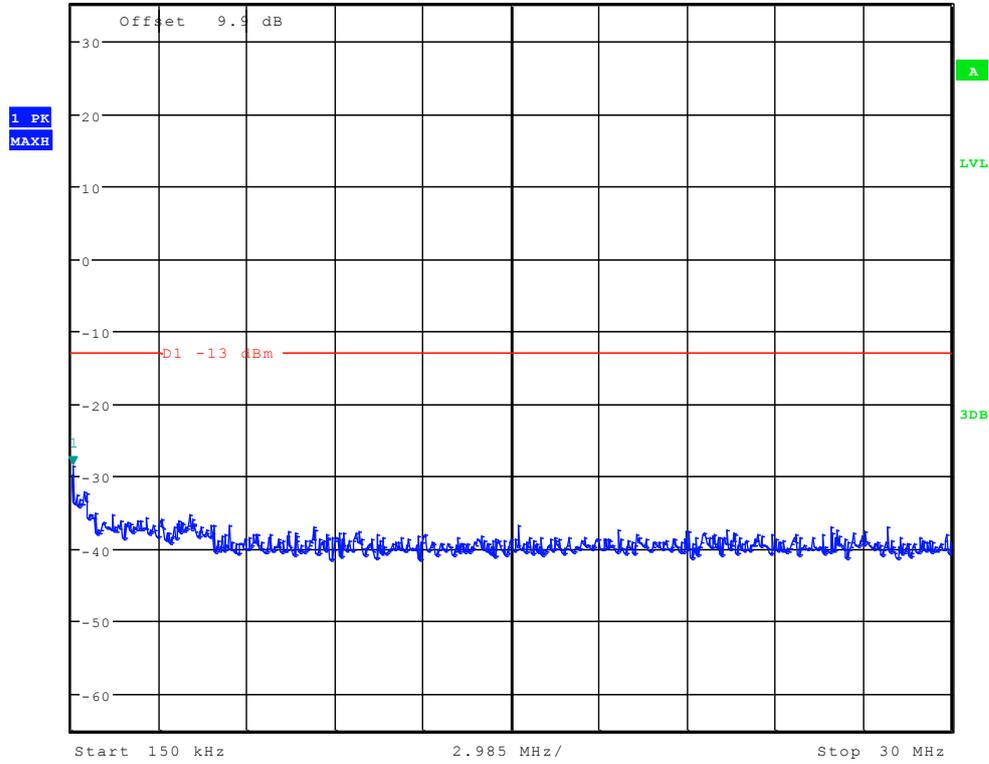
Channel 251



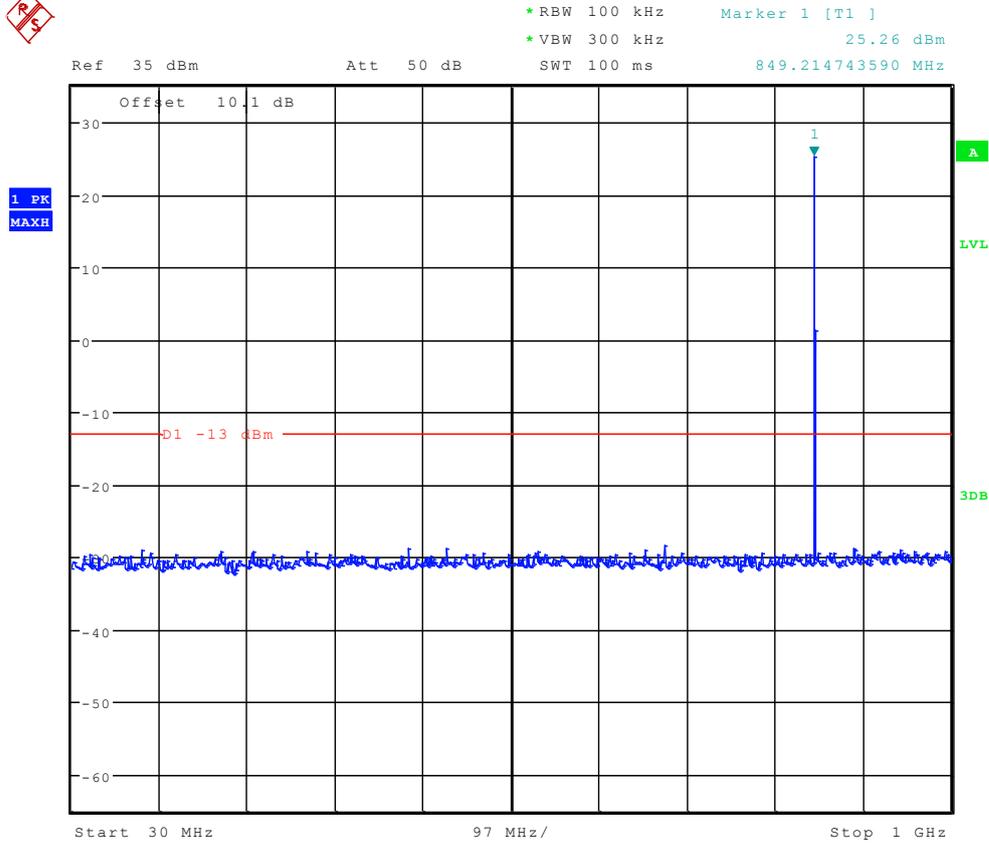
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Ref 35 dBm Att 55 dB SWT 300 ms
 *RBW 10 kHz Marker 1 [T1] -28.65 dBm
 *VBW 30 kHz 197.836538462 kHz



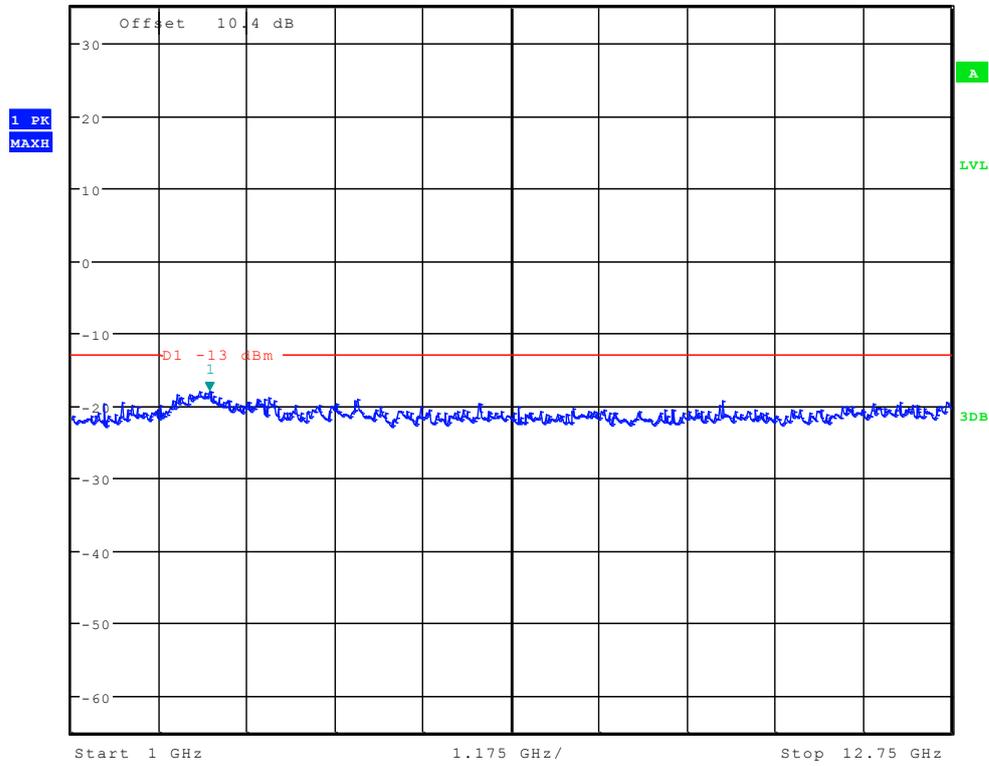
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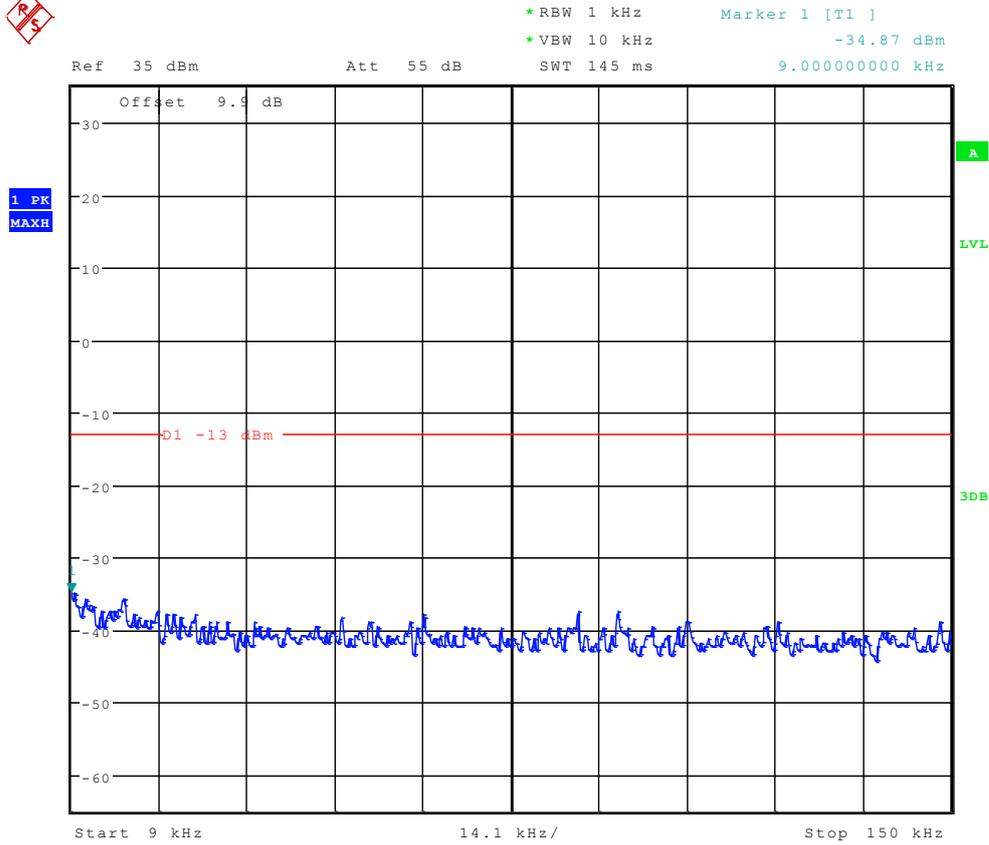
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*VBW 3 MHz -18.04 dBm
Ref 35 dBm Att 50 dB SWT 70 ms 2.845352564 GHz



Date: 16.FEB.2012 00:27:23



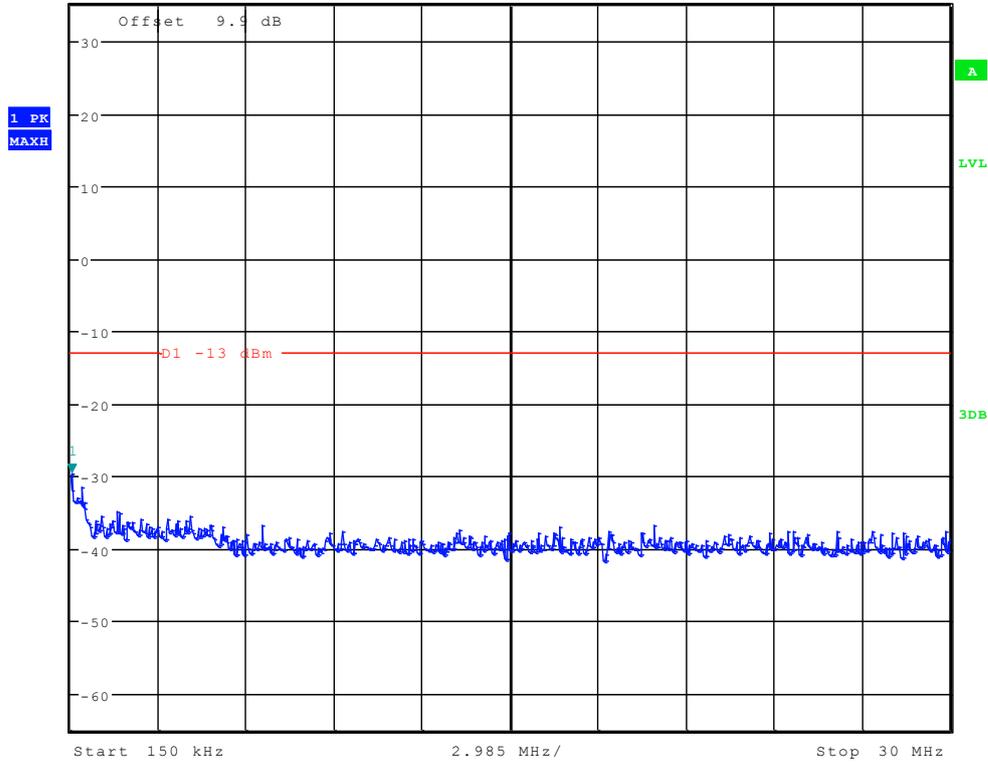
TM3: WCDMA Channel 4132



Date: 16.FEB.2012 00:32:52



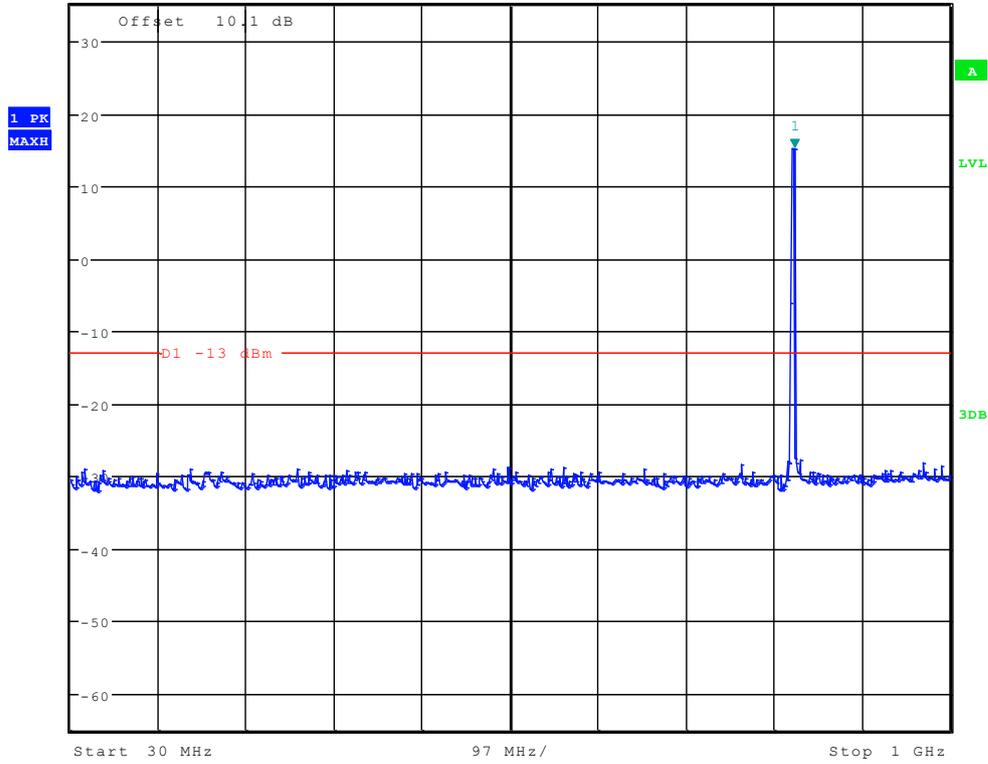
Ref 35 dBm Att 55 dB SWT 300 ms
 *RBW 10 kHz Marker 1 [T1] -29.59 dBm
 *VBW 30 kHz 197.836538462 kHz



Date: 16.FEB.2012 00:33:35



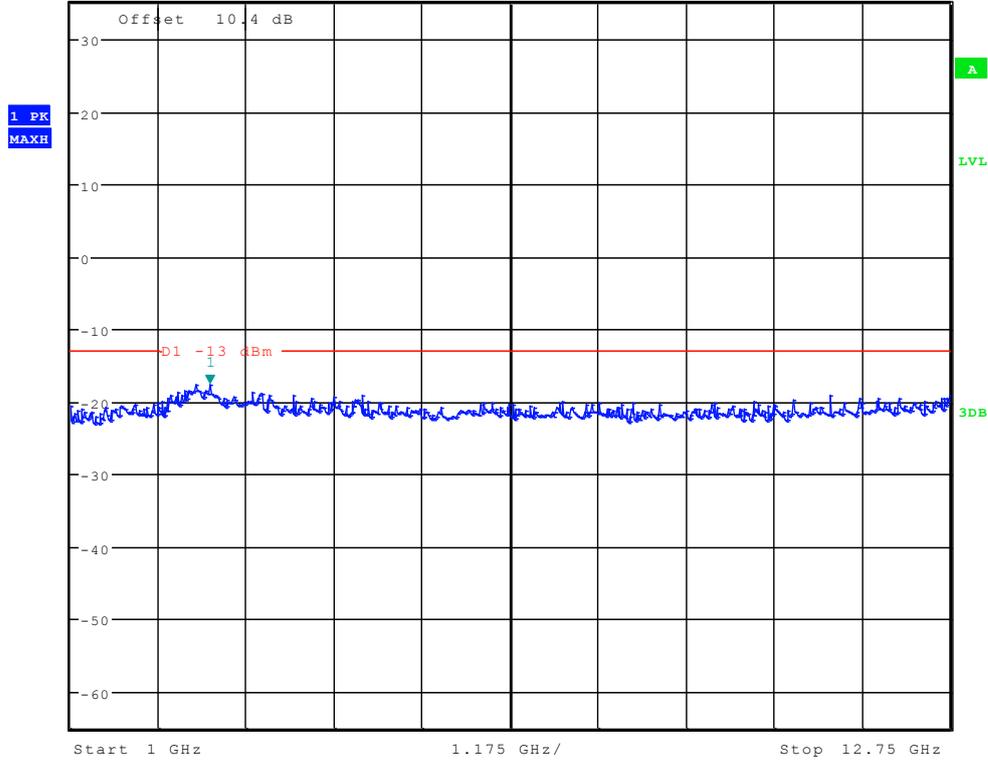
Ref 35 dBm Att 50 dB SWT 100 ms
 *RBW 100 kHz Marker 1 [T1] 15.17 dBm
 *VBW 300 kHz 829.006410256 MHz



Date: 16.FEB.2012 00:34:19



*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -17.58 dBm
Ref 35 dBm Att 50 dB SWT 70 ms 2.864182692 GHz



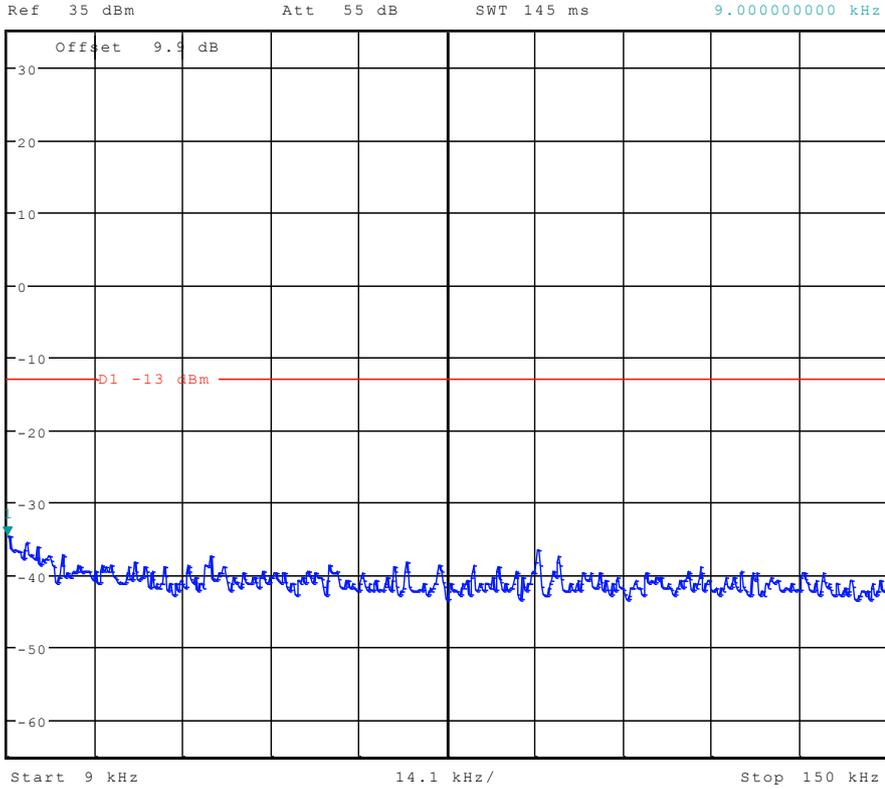
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Channel 4182



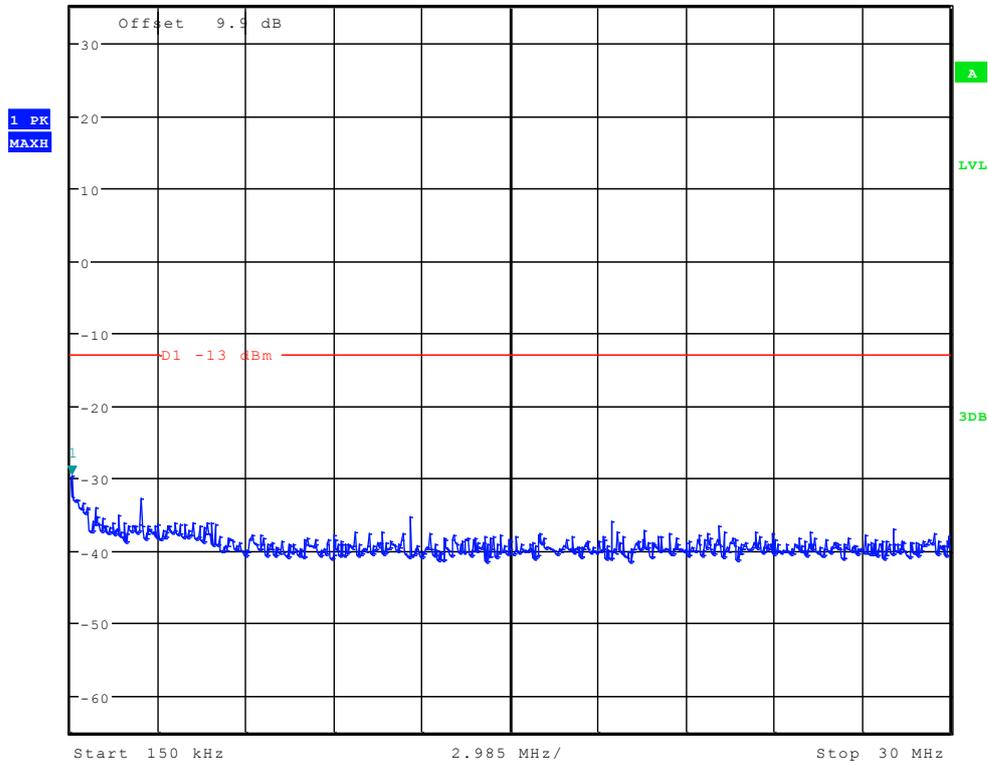
*RBW 1 kHz Marker 1 [T1]
*VBW 10 kHz -34.67 dBm
SWT 145 ms 9.000000000 kHz



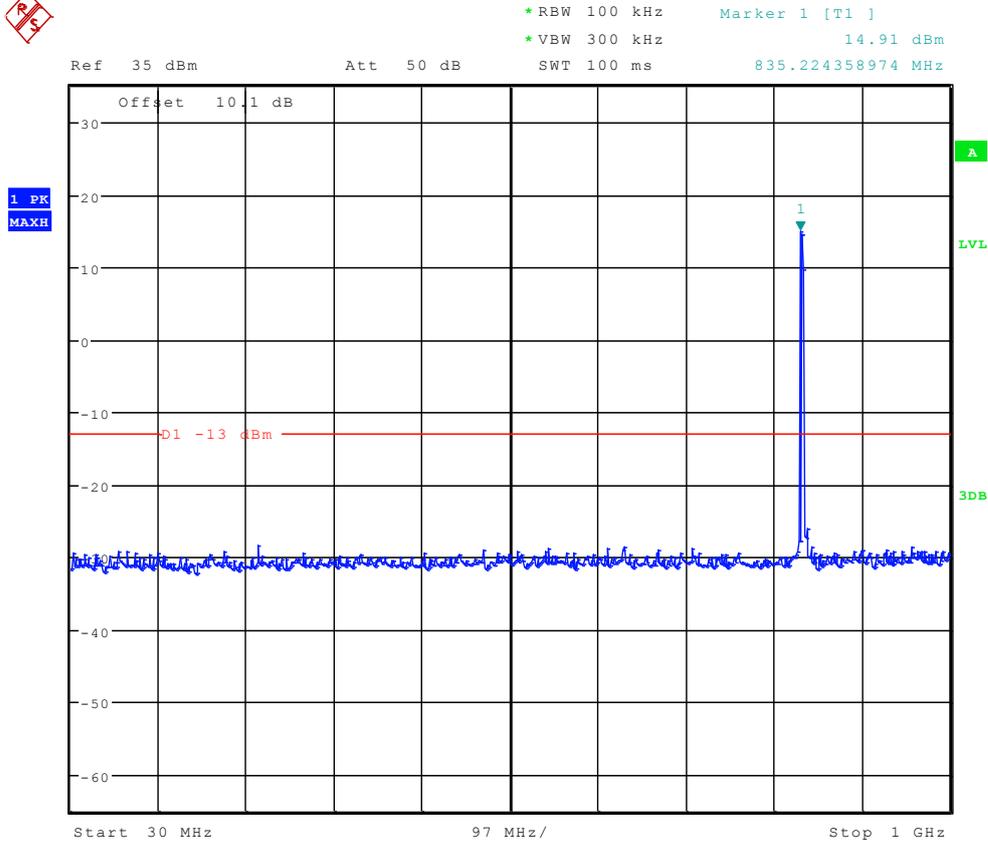
Date: 16.FEB.2012 00:33:06



*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -29.59 dBm
Ref 35 dBm Att 55 dB SWT 300 ms 197.836538462 kHz



Date: 16.FEB.2012 00:33:50

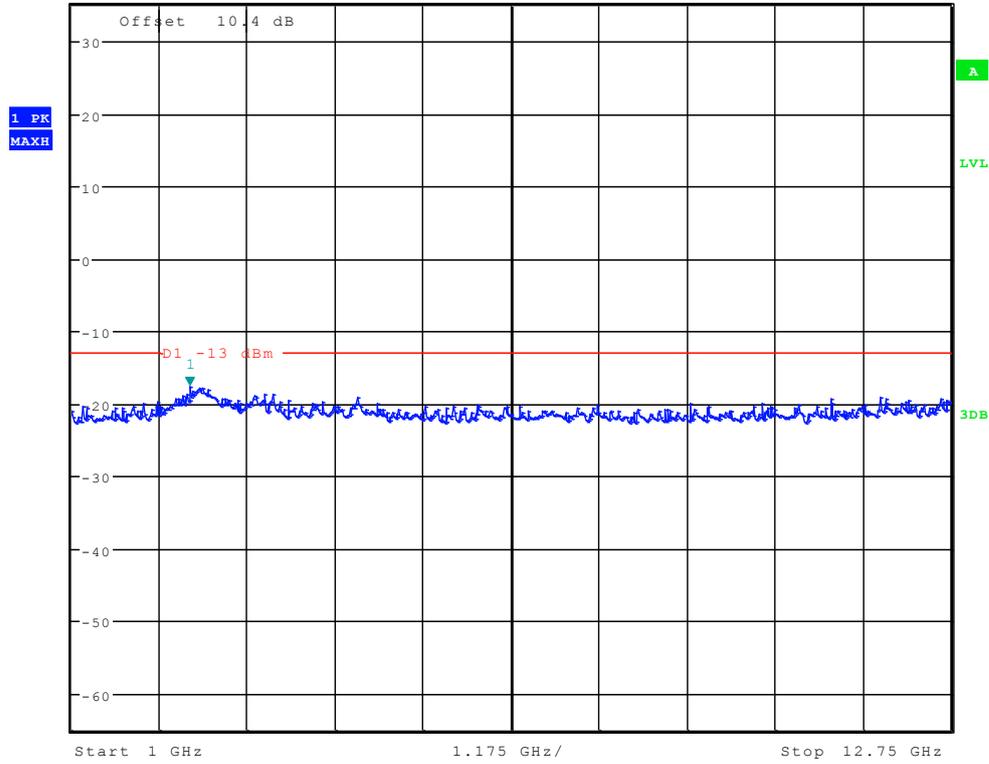


Date: 16.FEB.2012 00:34:33



Ref 35 dBm Att 50 dB SWT 70 ms

*RBW 1 MHz Marker 1 [T1] -17.52 dBm
*VBW 3 MHz 2.581730769 GHz



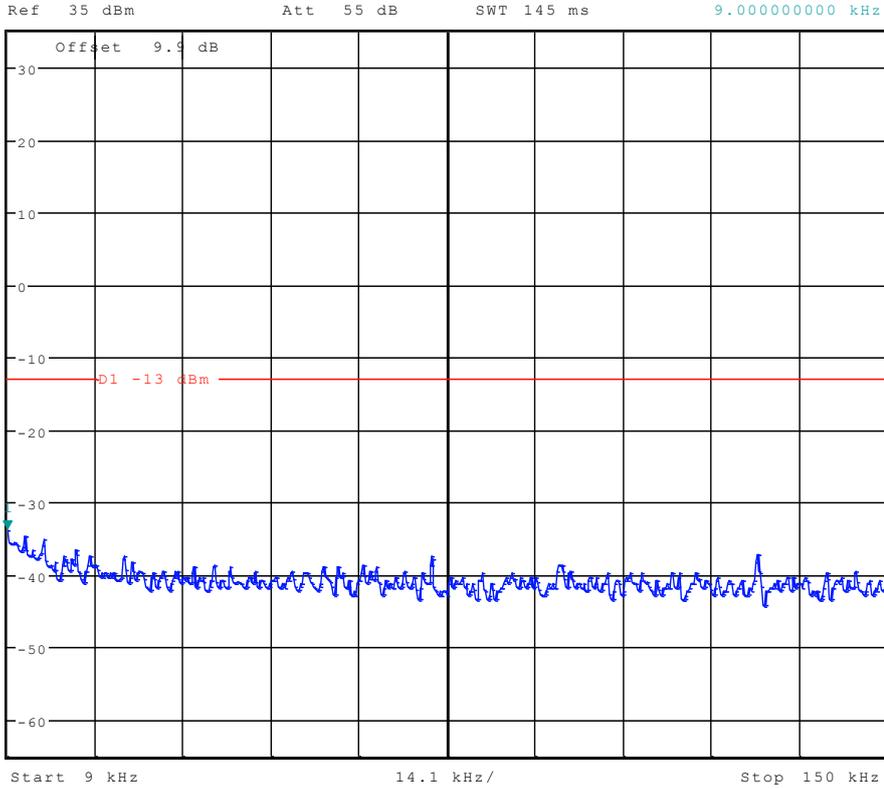
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Channel 4233



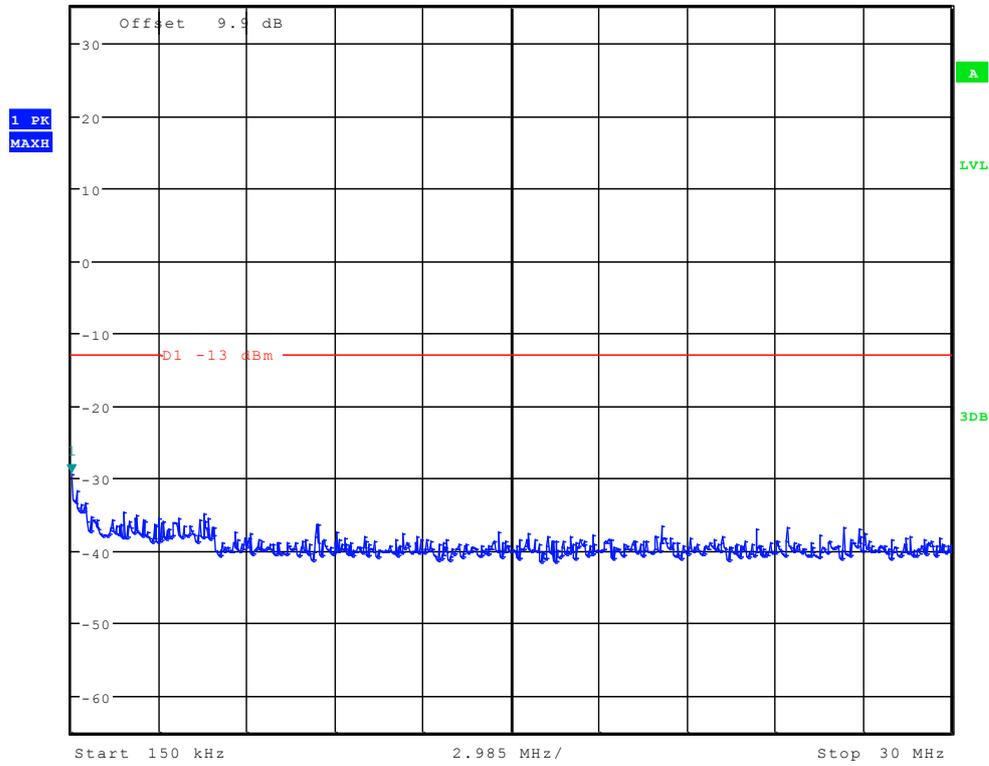
*RBW 1 kHz Marker 1 [T1]
*VBW 10 kHz -33.74 dBm
SWT 145 ms 9.000000000 kHz



Date: 16.FEB.2012 00:33:20



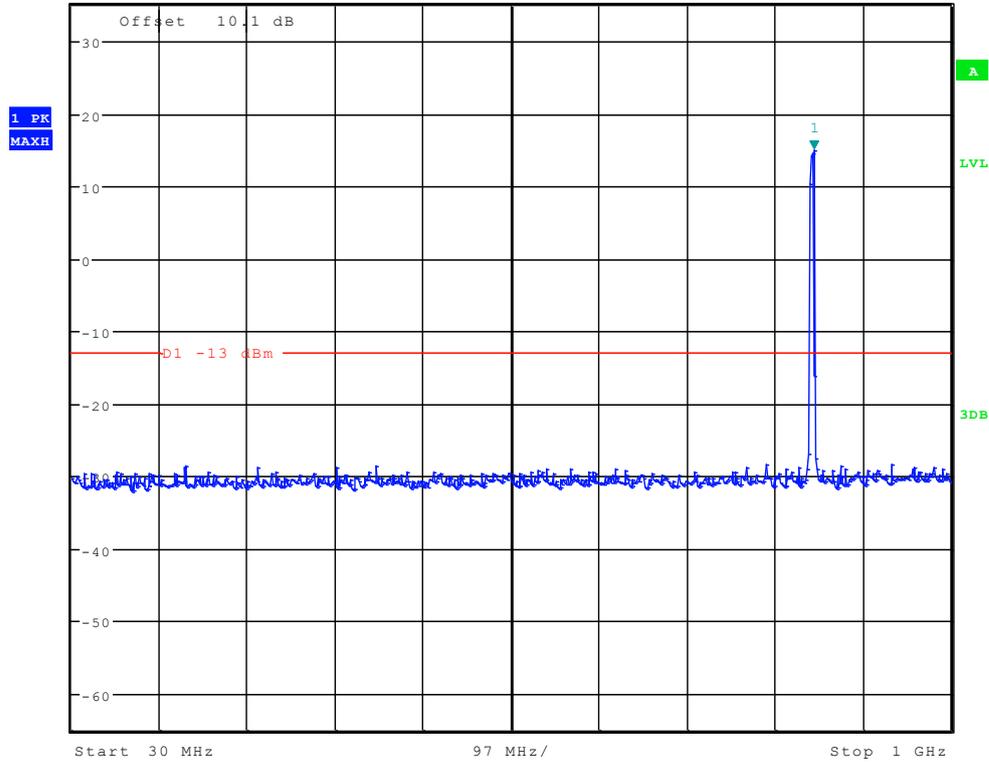
Ref 35 dBm Att 55 dB SWT 300 ms 150.000000000 kHz
 *RBW 10 kHz Marker 1 [T1] -29.37 dBm
 *VBW 30 kHz



Date: 16.FEB.2012 00:34:04



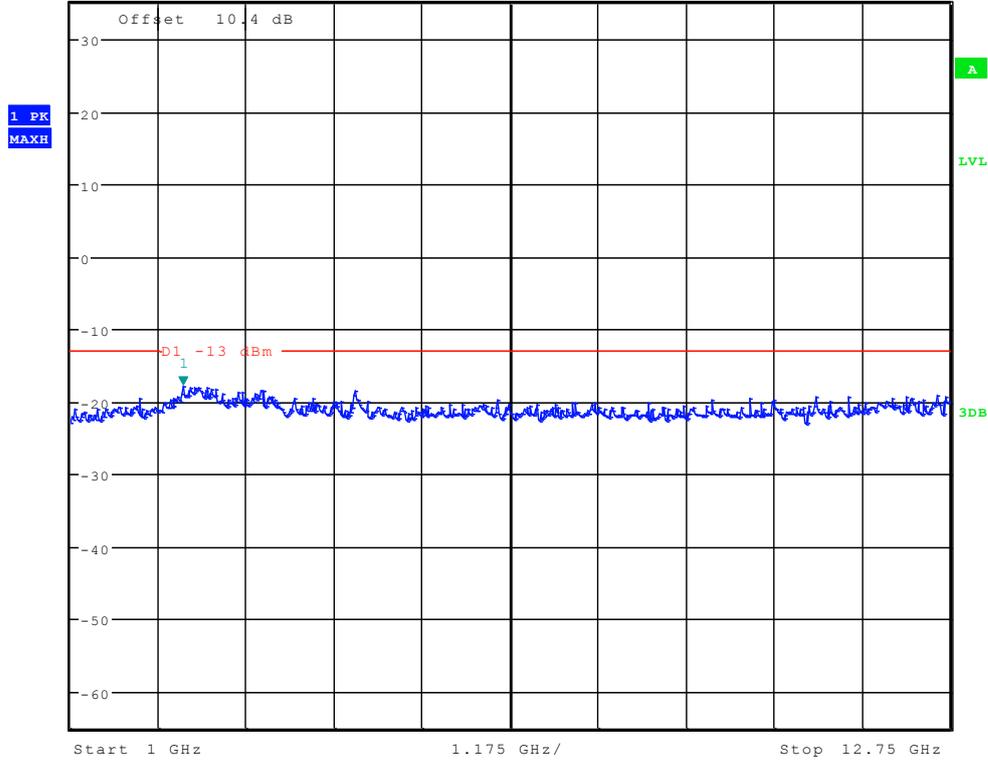
Ref 35 dBm Att 50 dB SWT 100 ms
 *RBW 100 kHz Marker 1 [T1] 14.88 dBm
 *VBW 300 kHz 849.214743590 MHz



Date: 16.FEB.2012 00:34:48



*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -17.85 dBm
Ref 35 dBm Att 50 dB SWT 70 ms 2.506410256 GHz



Date: 16.FEB.2012 00:35:32

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



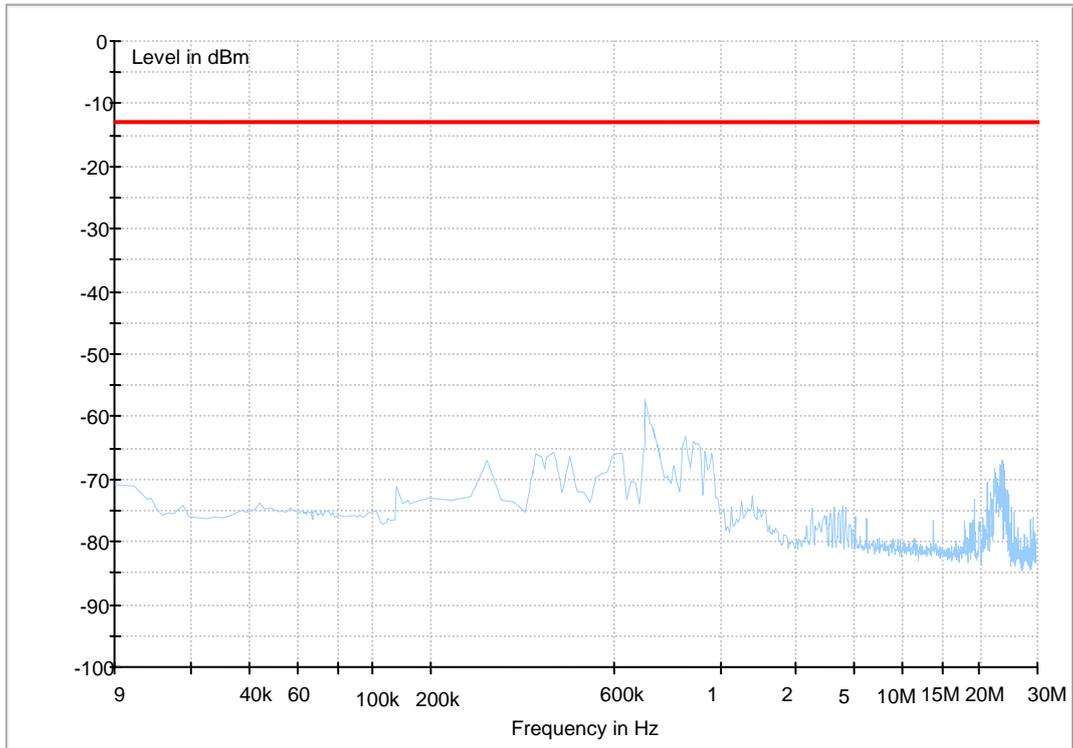
Appendix F

Radiated spurious emission

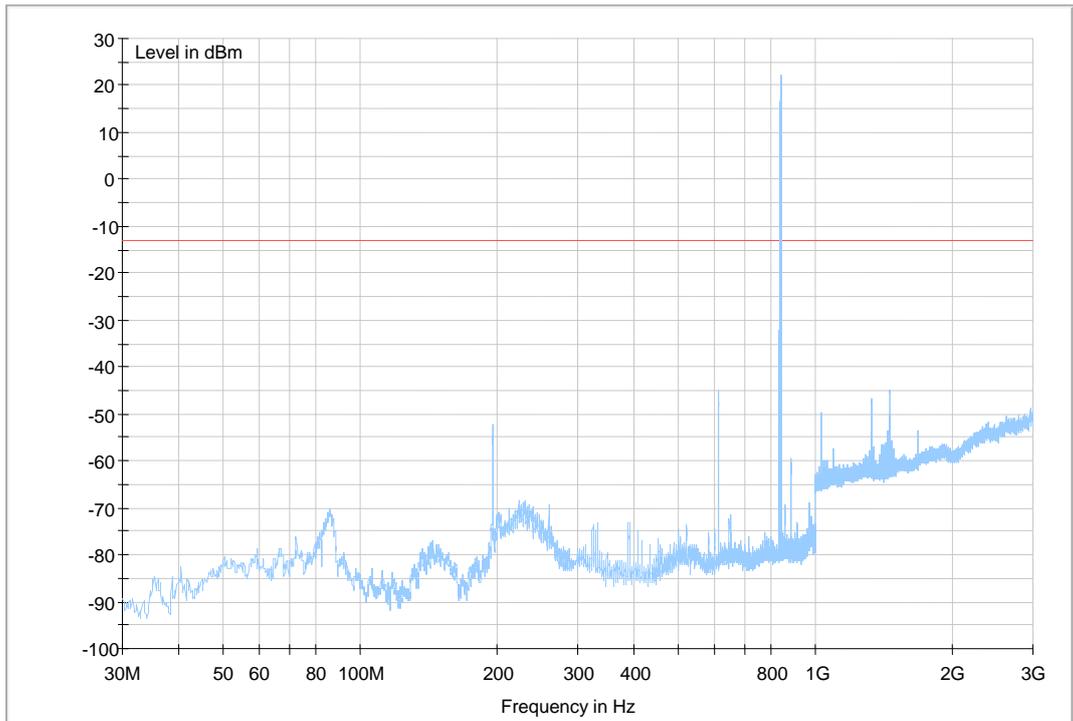
According to FCC Part 2.1053& Part 22.917

GPRS 850

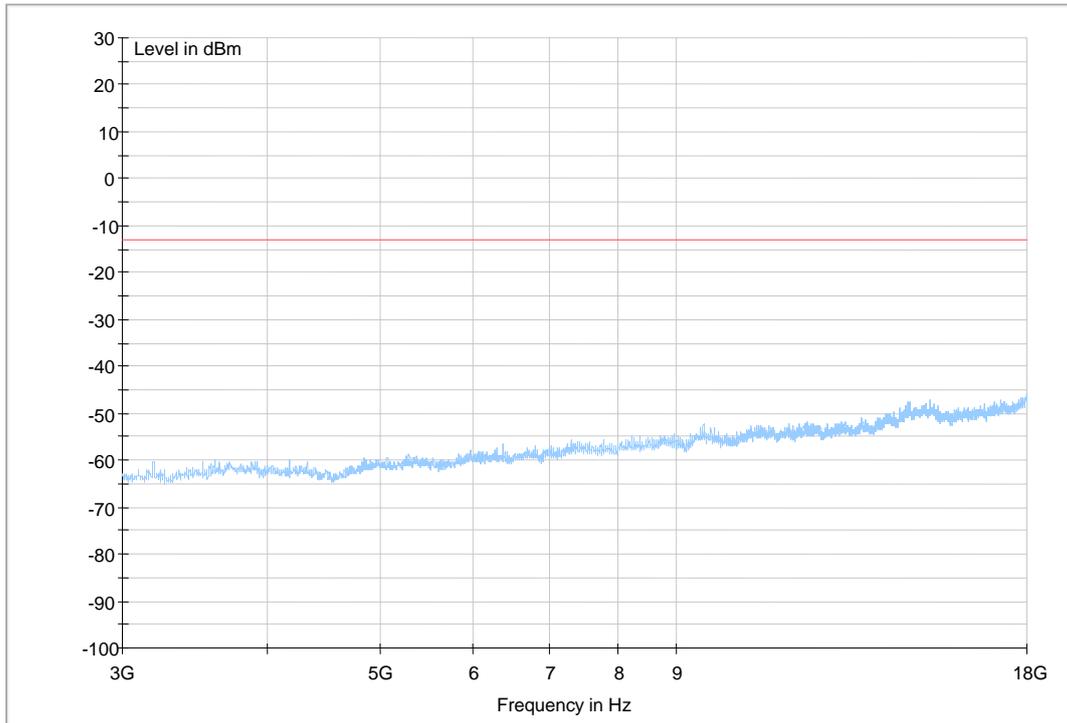
(9kHz~30MHz)



(30MHz~3GHz)

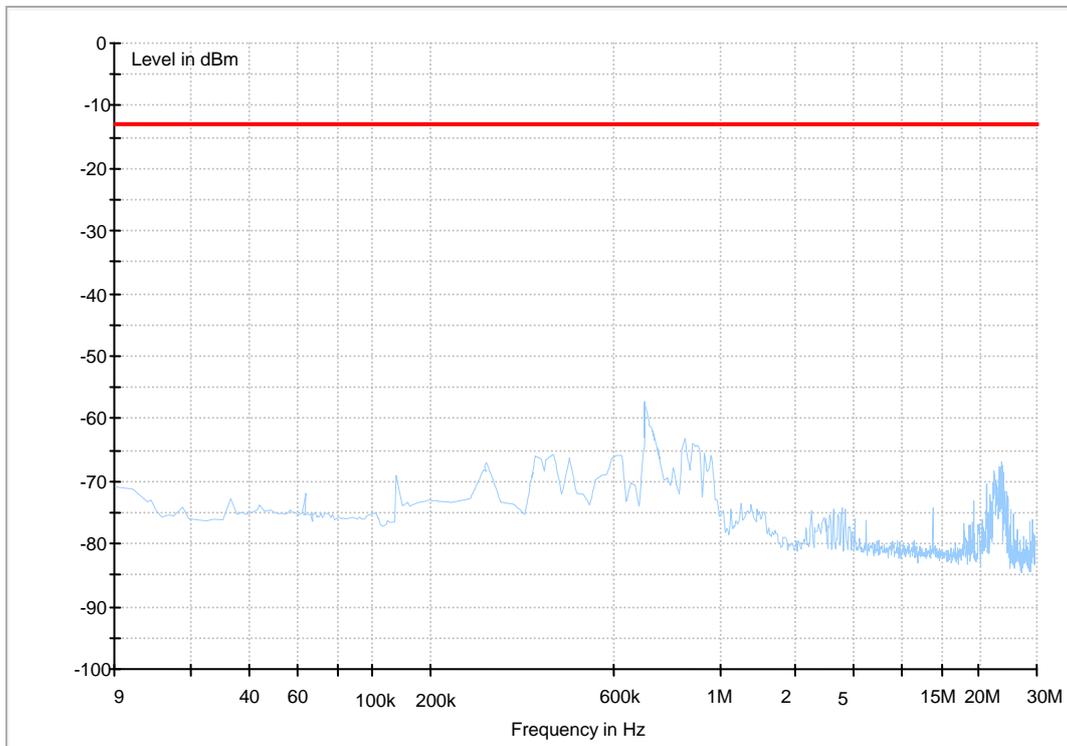


(3GHz~18GHz)

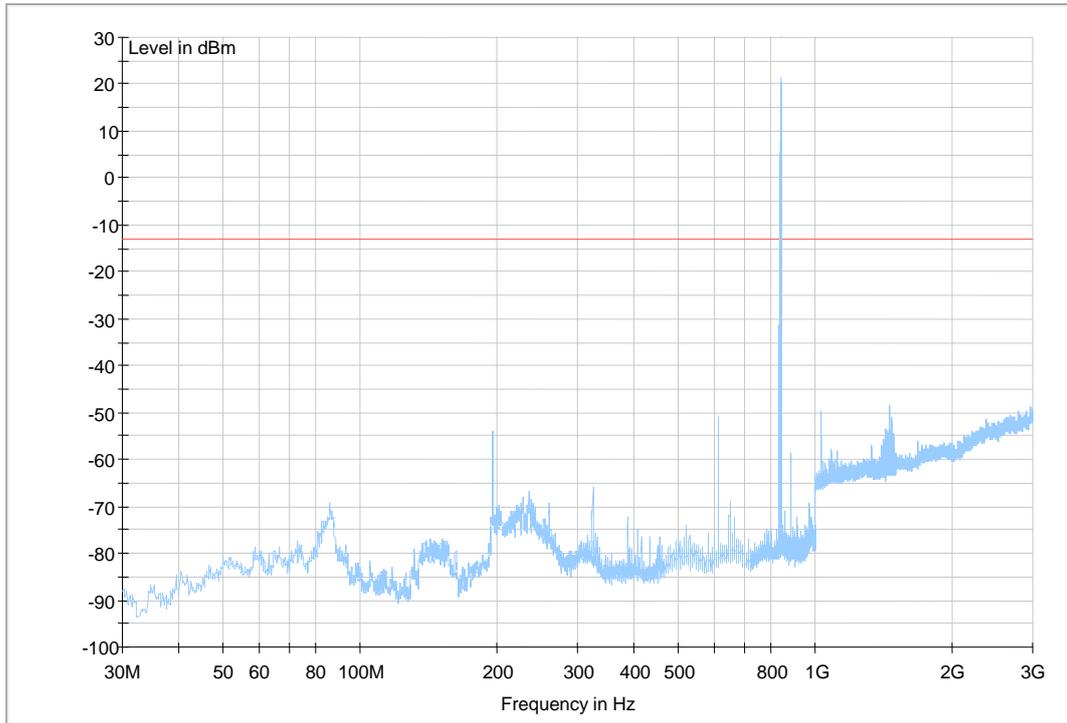


EDGE 850

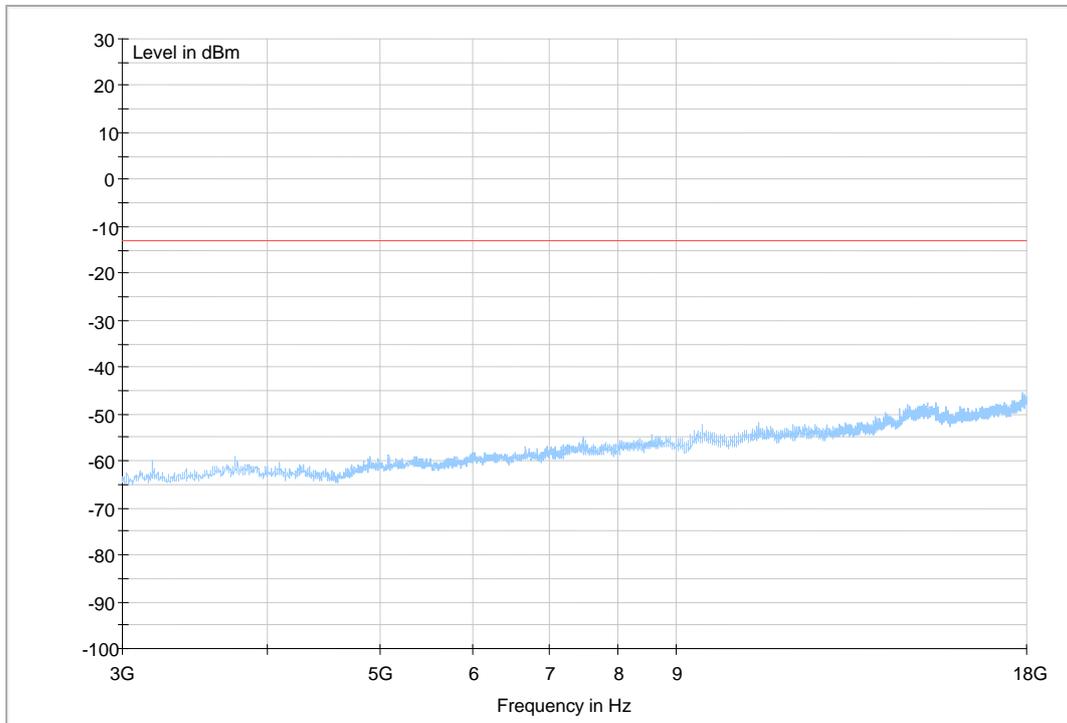
(9kHz~30MHz)



(30MHz~3GHz)

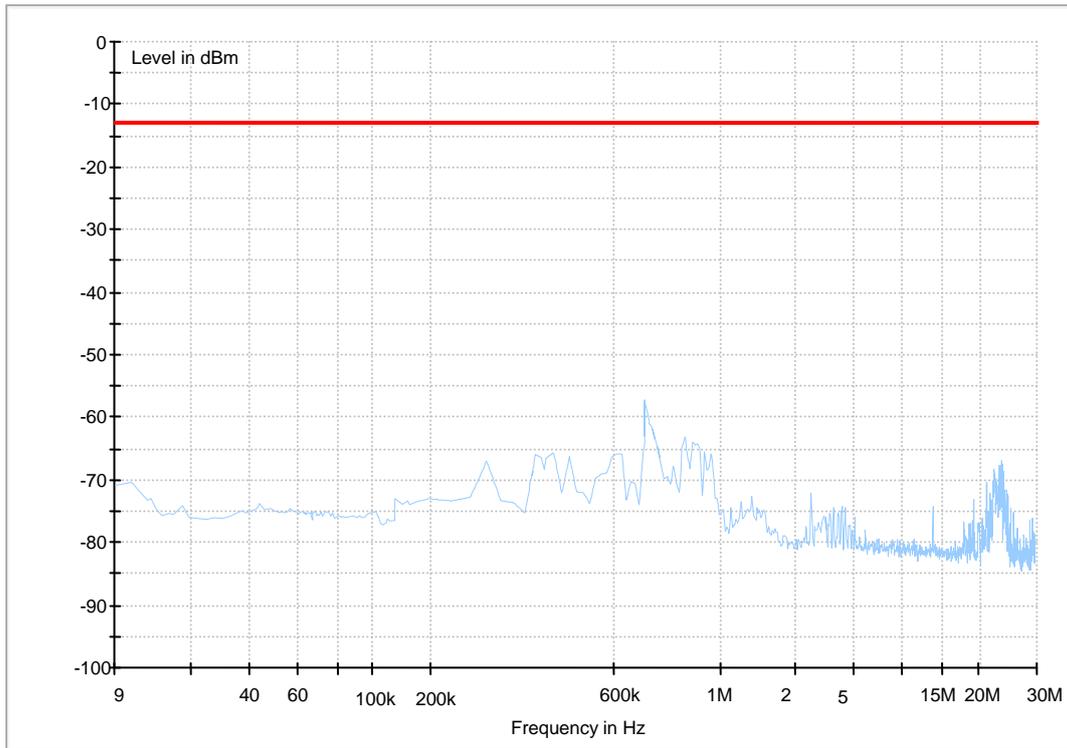


(3GHz~18GHz)

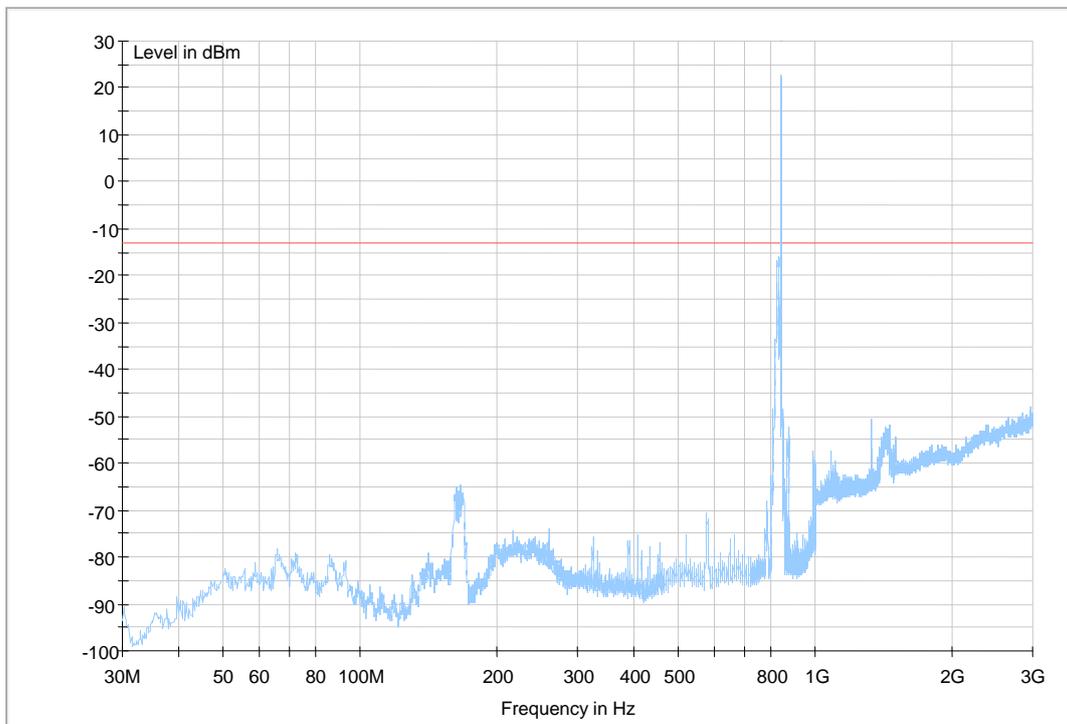


WCDMA Band V

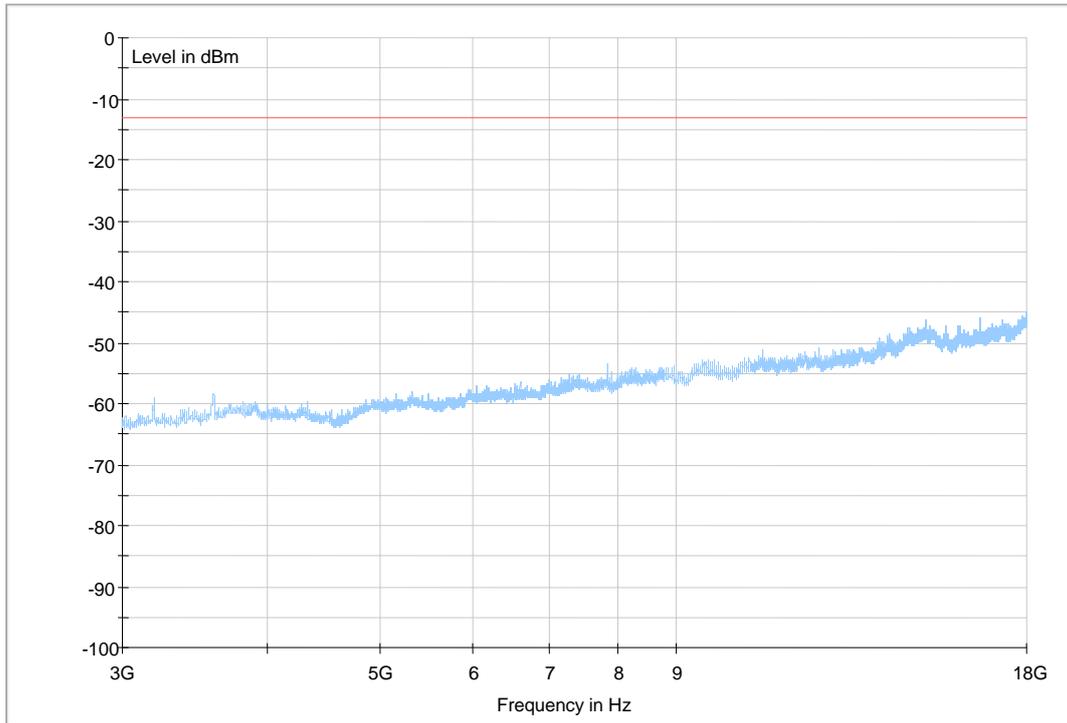
(9KHz~30MHz)



(30MHz~3GHz)

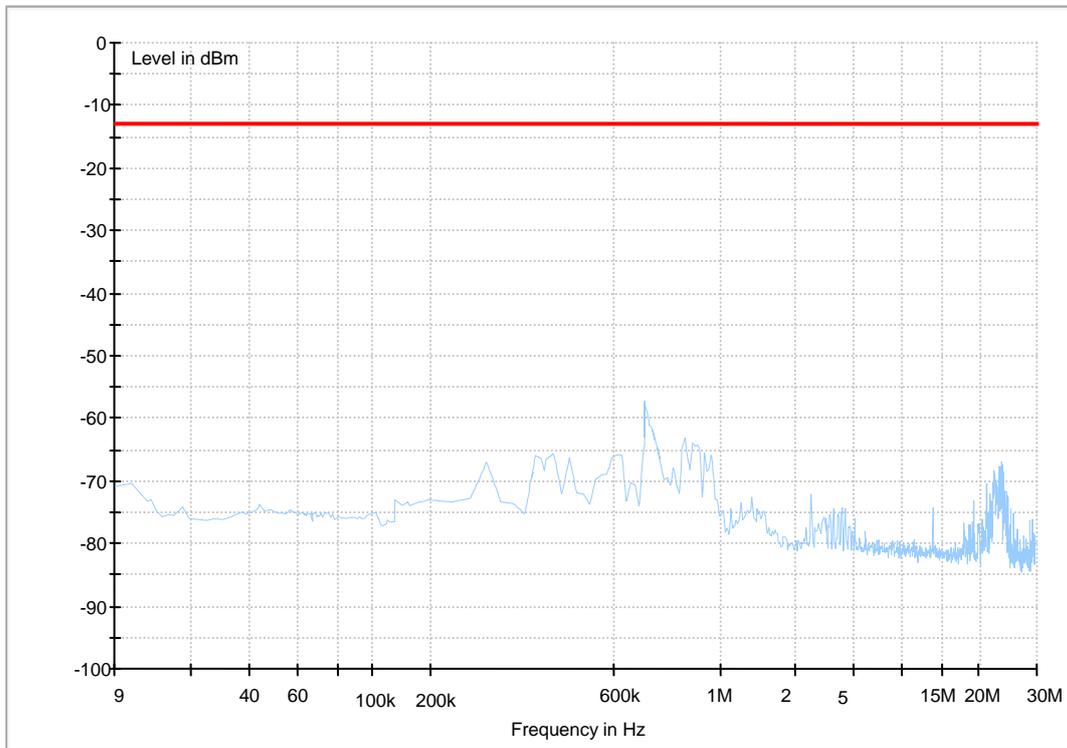


(3GHz~18GHz)

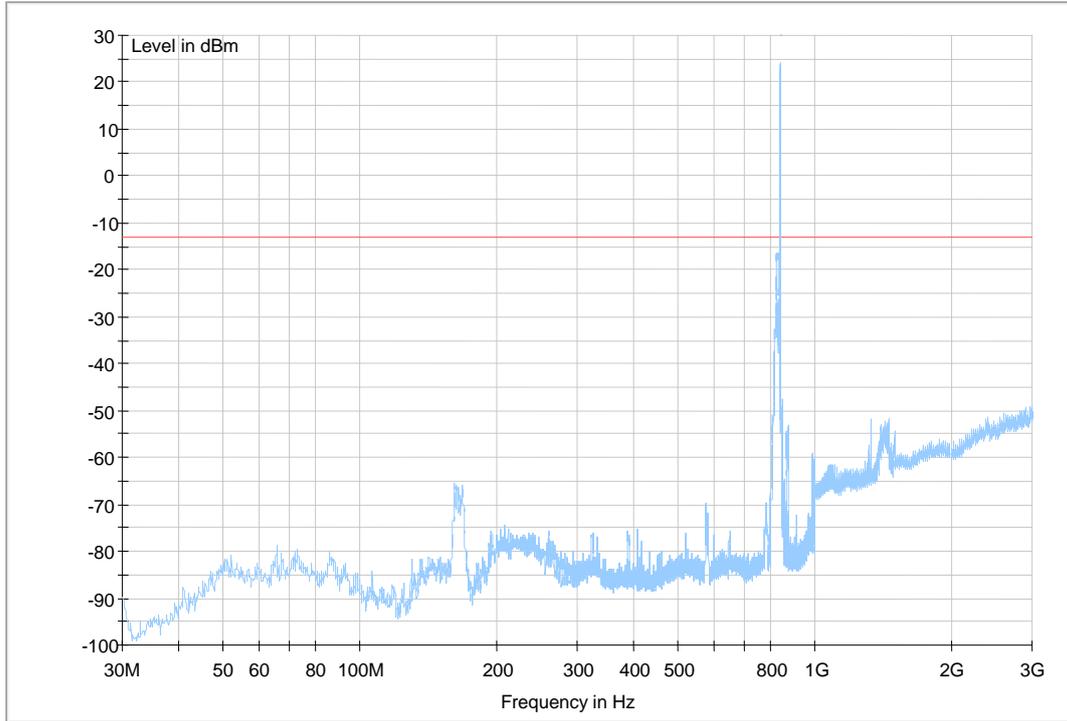


HSDPA Band V

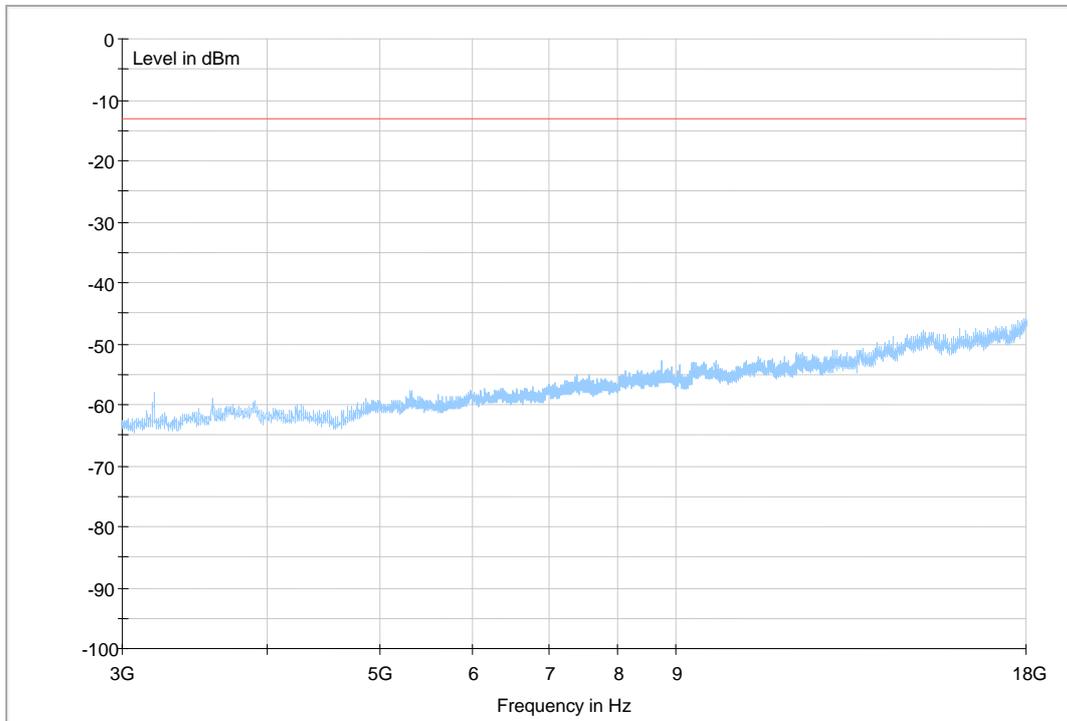
(9KHz~30MHz)



(30MHz~3GHz)

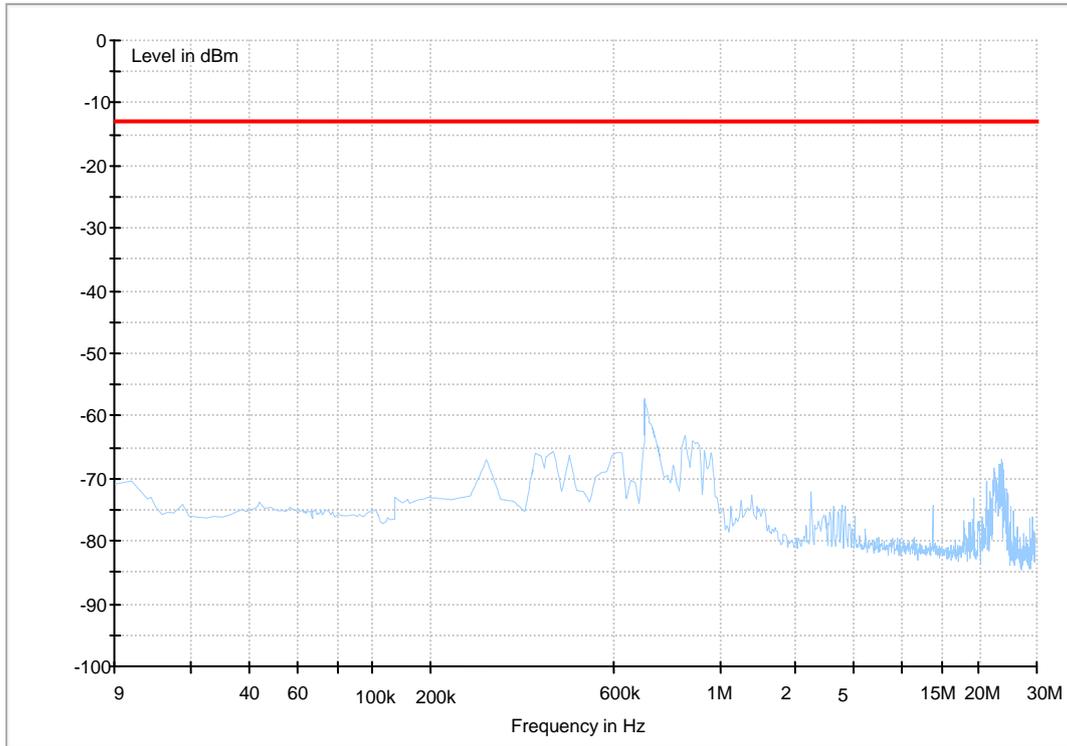


(3GHz~18GHz)

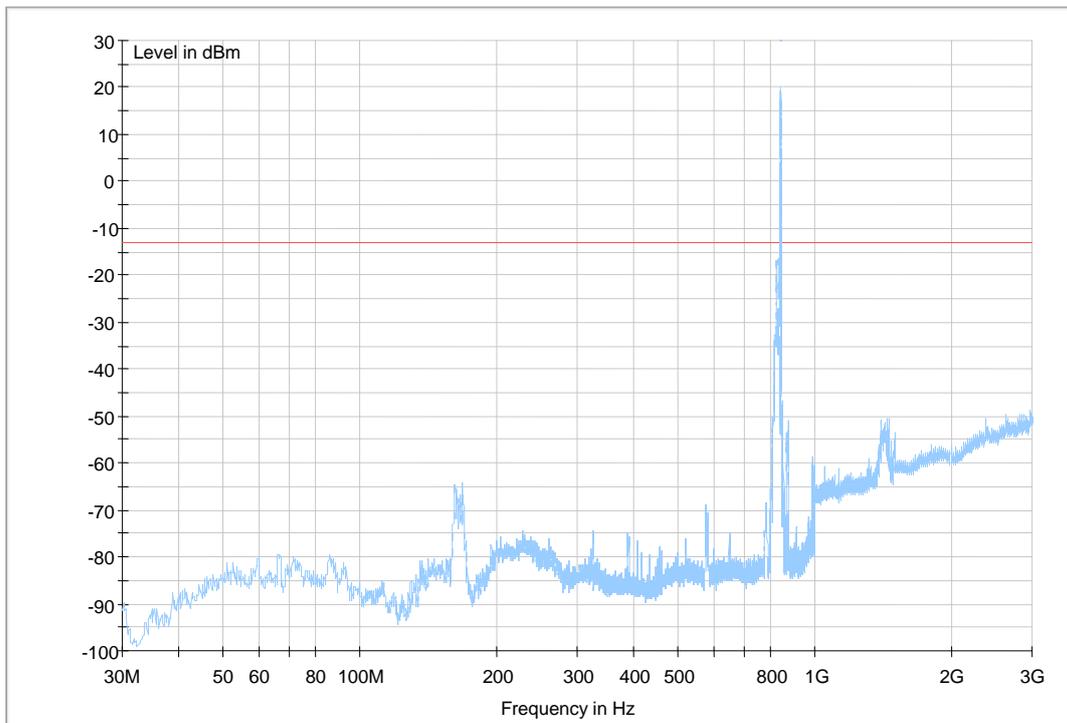


HSUPA Band V

(9KHz~30MHz)

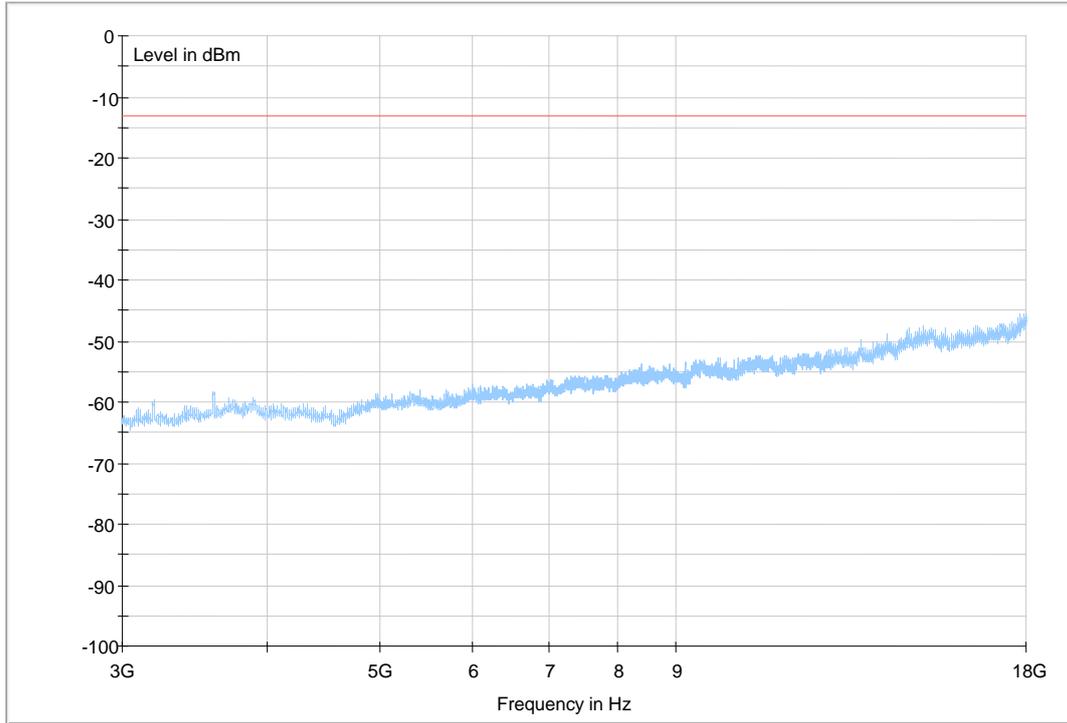


(30MHz~3GHz)





(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	100%	-30 °C	-17	-0.0203	---	±2.5	Pass
			-20 °C	-12	-0.0143	---	±2.5	Pass
			-10 °C	8	0.0096	---	±2.5	Pass
			0 °C	16	0.0191	---	±2.5	Pass
			10 °C	-13	-0.0155	---	±2.5	Pass
			20 °C	-18	-0.0215	---	±2.5	Pass
			30 °C	8	0.0096	---	±2.5	Pass
			40 °C	15	0.0179	---	±2.5	Pass
			50 °C	14	0.0167	---	±2.5	Pass
TM 2	M	100%	-30 °C	12	0.0143	---	±2.5	Pass
			-20 °C	-17	-0.0203	---	±2.5	Pass
			-10 °C	11	0.0131	---	±2.5	Pass
			0 °C	6	0.0072	---	±2.5	Pass
			10 °C	-21	-0.0251	---	±2.5	Pass
			20 °C	-15	-0.0179	---	±2.5	Pass
			30 °C	-12	-0.0143	---	±2.5	Pass
			40 °C	16	0.0191	---	±2.5	Pass
			50 °C	10	0.0119	---	±2.5	Pass
TM 3	M	100%	-30 °C	10	0.0120	---	±2.5	Pass
			-20 °C	-11	-0.0132	---	±2.5	Pass
			-10 °C	5	0.0060	---	±2.5	Pass
			0 °C	13	0.0155	---	±2.5	Pass
			10 °C	-17	-0.0203	---	±2.5	Pass
			20 °C	12	0.0143	---	±2.5	Pass
			30 °C	-4	-0.0048	---	±2.5	Pass
			40 °C	18	0.0215	---	±2.5	Pass
			50 °C	13	0.0155	---	±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	85 %	15	0.0179	---	±2.5	Pass
			100 %	-17	-0.0203	---	±2.5	Pass
			115 %	-11	-0.0131	---	±2.5	Pass
TM 2	M	20 °C	85 %	8	0.0096	---	±2.5	Pass
			100 %	-9	-0.0108	---	±2.5	Pass
			115 %	20	0.0239	---	±2.5	Pass
TM 3	M	20 °C	85 %	-15	-0.0179	---	±2.5	Pass
			100 %	-8	-0.0100	---	±2.5	Pass
			115 %	6	0.0072	---	±2.5	Pass

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



Appendix H

Photos of Radiated Spurious Emissions



Photos of Test Setup



1 Radiated Spurious Emissions



Radiated Spurious Emission (below 3GHz)



Radiated Spurious Emission (3GHz to18GHz)

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