



# 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		32.18	38.5	32.15	38.5	32.01	38.5
TM2		26.17	38.5	26.24	38.5	26.08	38.5
TEST CONDITIONS		Channel4132(B) 826.4MHz		Channel4182(M) 836.4MHz		Channel4233(T) 846.6MHz	
		dBm		dBm		dBm	
		$T_{nom} / V_{nom}$		Measured	Limit	Measured	Limit
TM3		21.69	38.5	21.60	38.5	21.58	38.5
TM4	Case1	21.76	38.5	21.55	38.5	21.52	38.5
	Case2	21.71	38.5	21.39	38.5	21.48	38.5
	Case3	21.47	38.5	21.19	38.5	21.26	38.5
	Case4	21.01	38.5	20.75	38.5	20.98	38.5
TM5	Case1	21.31	38.5	21.11	38.5	21.13	38.5
	Case2	19.92	38.5	19.67	38.5	19.72	38.5
	Case3	20.67	38.5	20.42	38.5	20.35	38.5
	Case4	19.83	38.5	19.64	38.5	19.58	38.5
	Case5	21.37	38.5	21.63	38.5	21.17	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	31.70	Dipole Ant.	35.08	-2.75	0.6	31.73	38.5	Pass
TM1	837.0	31.67	Dipole Ant.	35.18	-2.87	0.6	31.71	38.5	Pass
TM1	848.8	31.53	Dipole Ant.	34.93	-2.85	0.6	31.48	38.5	Pass
TM2	824.2	25.69	Dipole Ant.	29.05	-2.75	0.6	25.70	38.5	Pass
TM2	837.0	25.76	Dipole Ant.	29.29	-2.87	0.6	25.82	38.5	Pass
TM2	848.8	25.60	Dipole Ant.	29.02	-2.85	0.6	25.57	38.5	Pass
TM3	826.4	21.21	Dipole Ant.	24.59	-2.75	0.6	21.24	38.5	Pass
TM3	836.4	21.12	Dipole Ant.	24.57	-2.87	0.6	21.10	38.5	Pass
TM3	846.6	21.10	Dipole Ant.	24.52	-2.85	0.6	21.07	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-----



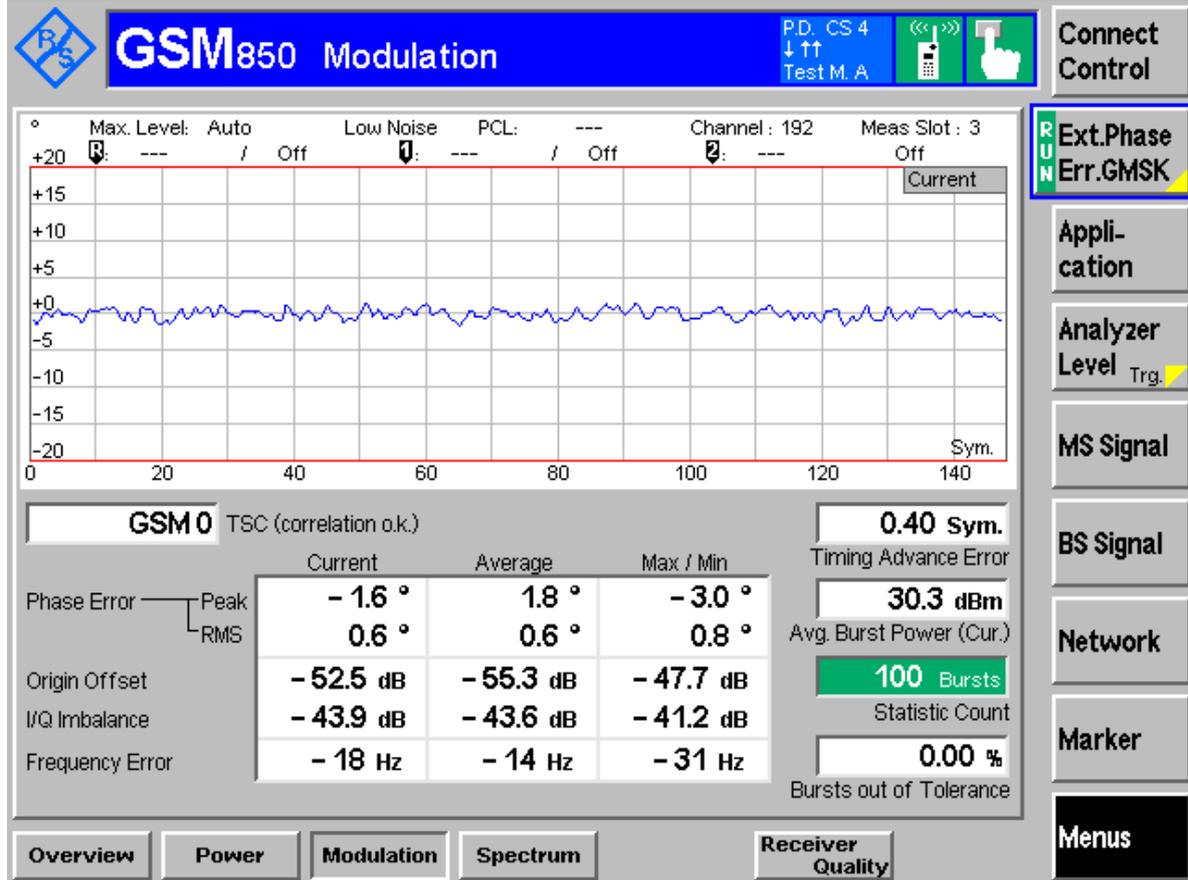
## Appendix B

# Modulation Characteristics

According to FCC Part 2.1047 & Part22 Subpart H

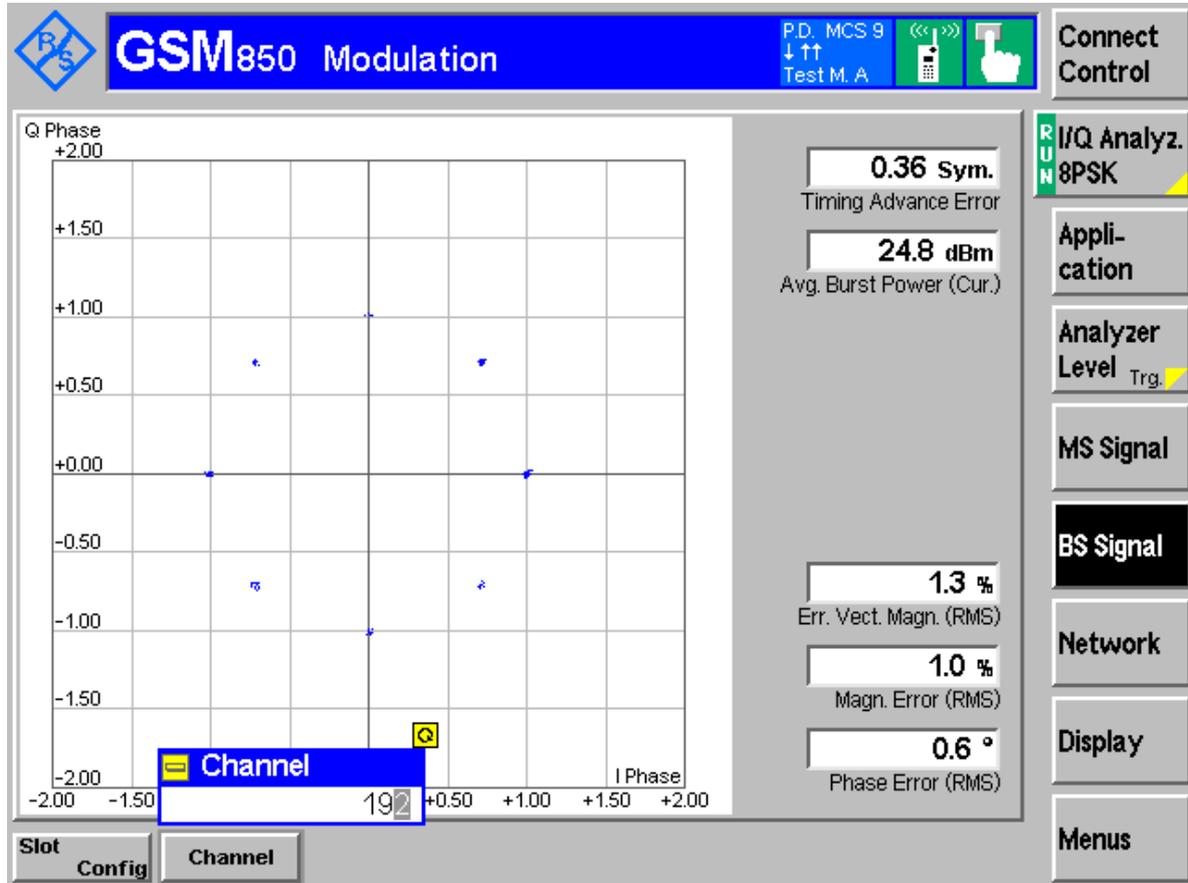


## Channel 192 (TM1:GPRS/GSM)



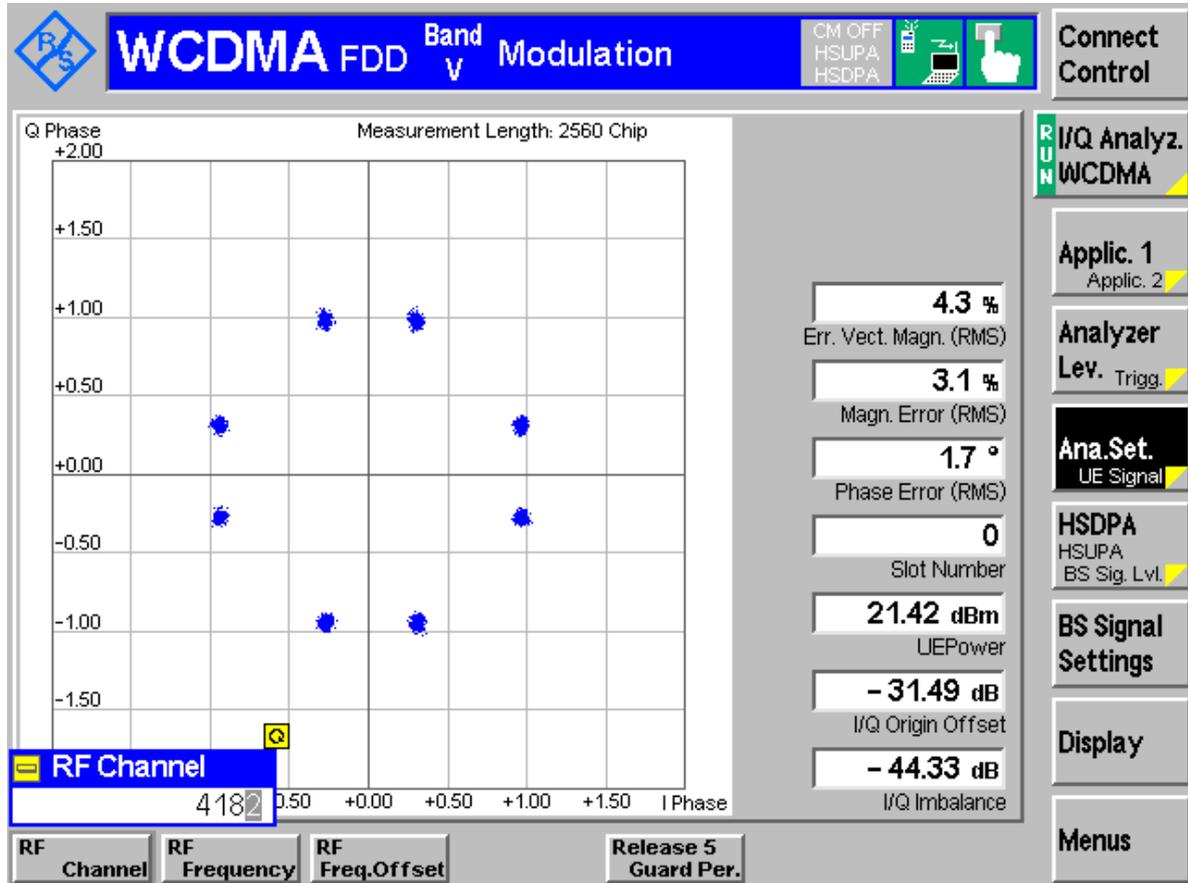


## Channel 192 (TM2:EDGE)





## Channel 4182 (TM3: WCDMA)



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



## Appendix C

# Occupied Bandwidth

According to FCC Part 2.1049 & Part 22 Subpart H



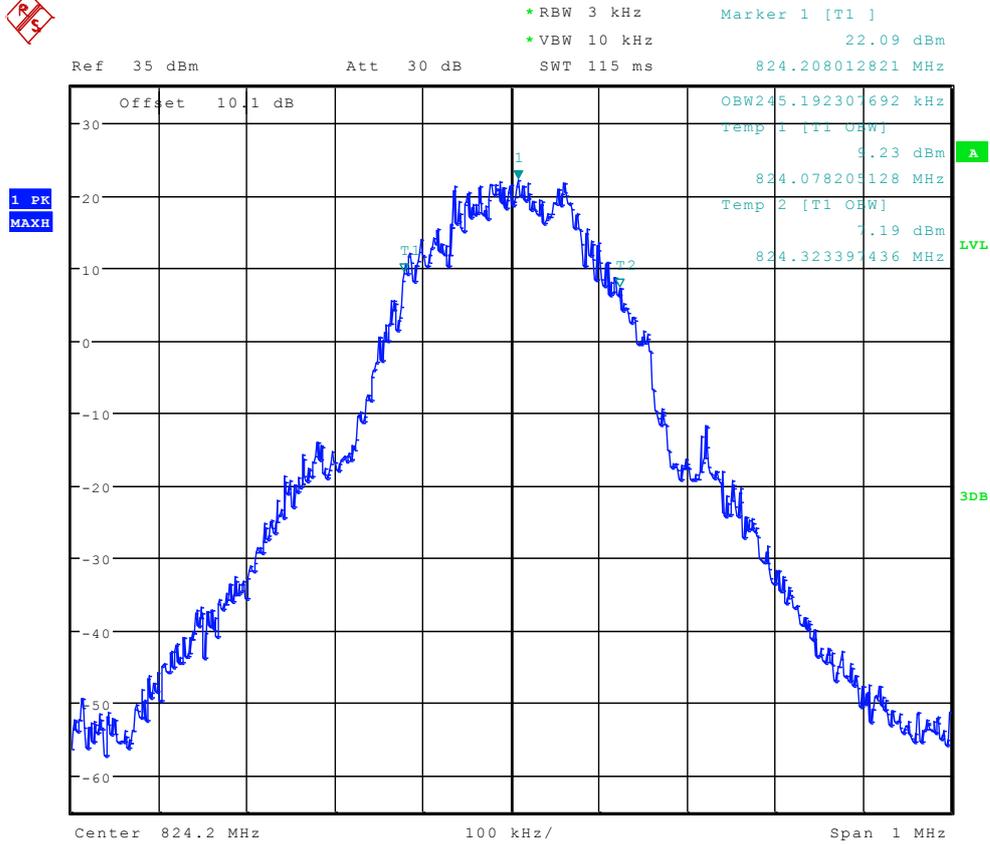
Result Table

Table 1 Measurement Results

Test Mode	RF Channel	Occupied Bandwidth [kHz]	Verdict
TM1	128	245.19	Pass
	192	243.59	Pass
	251	243.59	Pass
TM2	128	245.19	Pass
	192	246.79	Pass
	251	248.40	Pass
Test Mode	RF Channel	Occupied Bandwidth [MHz]	Verdict
TM3	4132	4.17	Pass
	4182	4.18	Pass
	4233	4.15	Pass



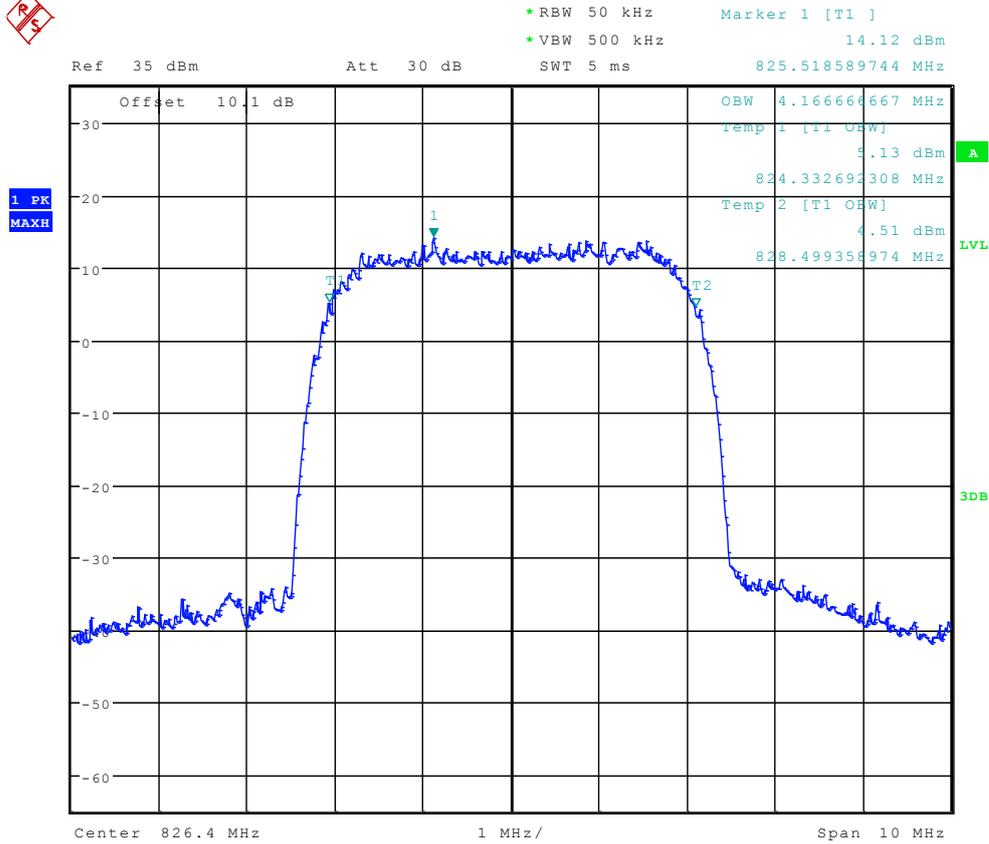
## Channel 128 (TM1:GPRS/GSM)





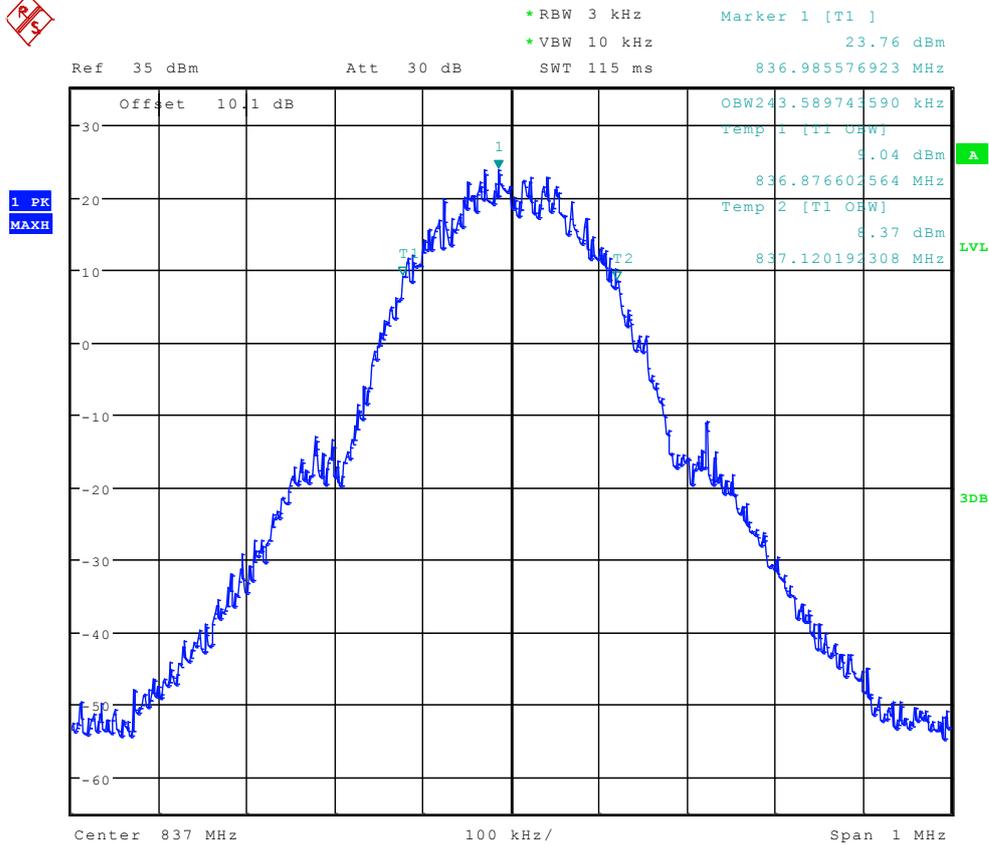


## Channel 4132 (TM3: WCDMA)



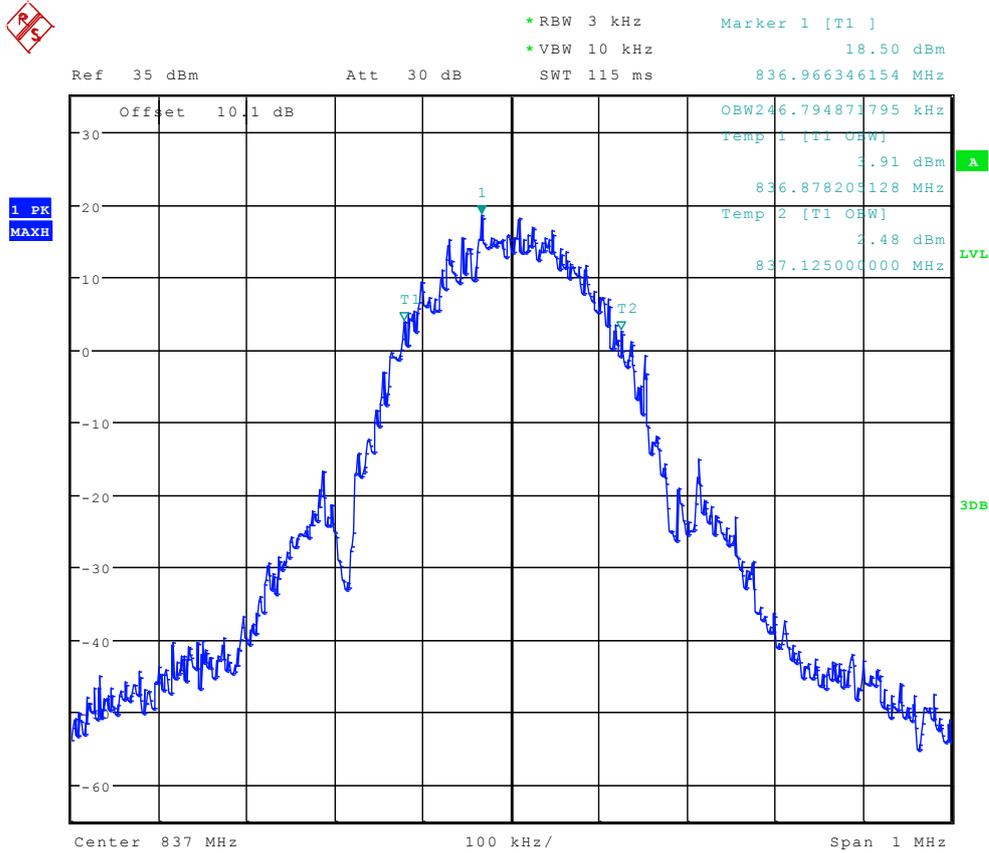


## Channel 192 (TM1:GPRS/GSM)



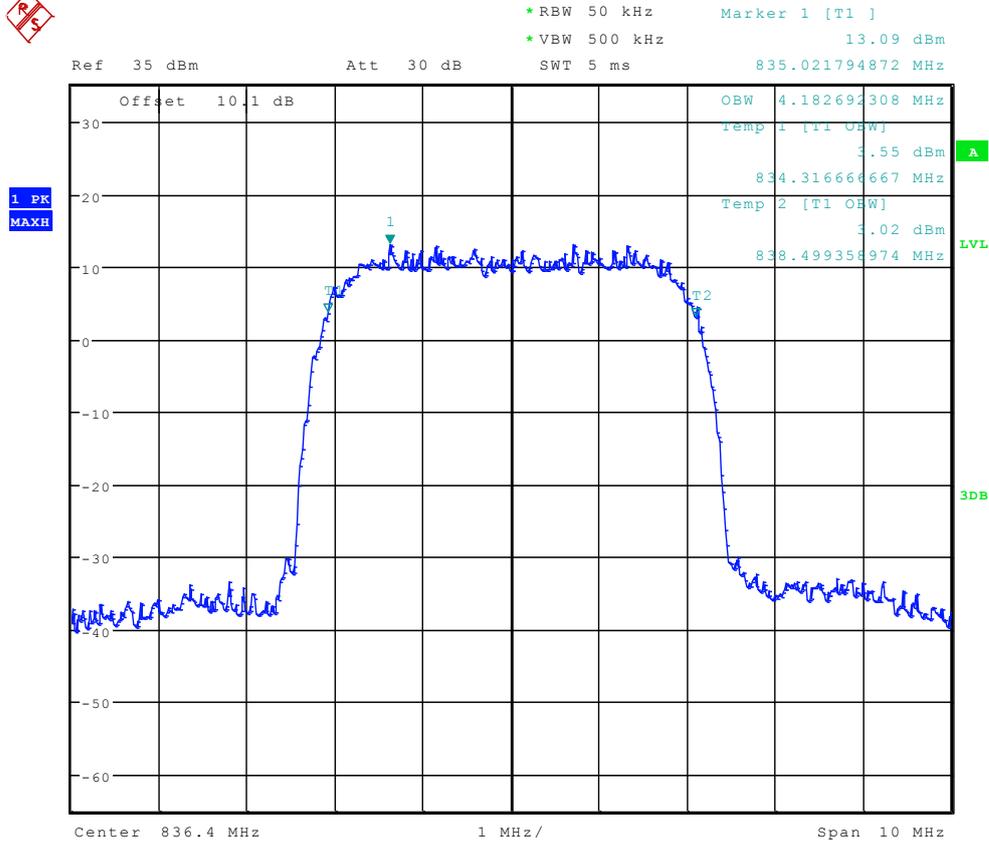


## Channel 192 (TM2:EDGE)



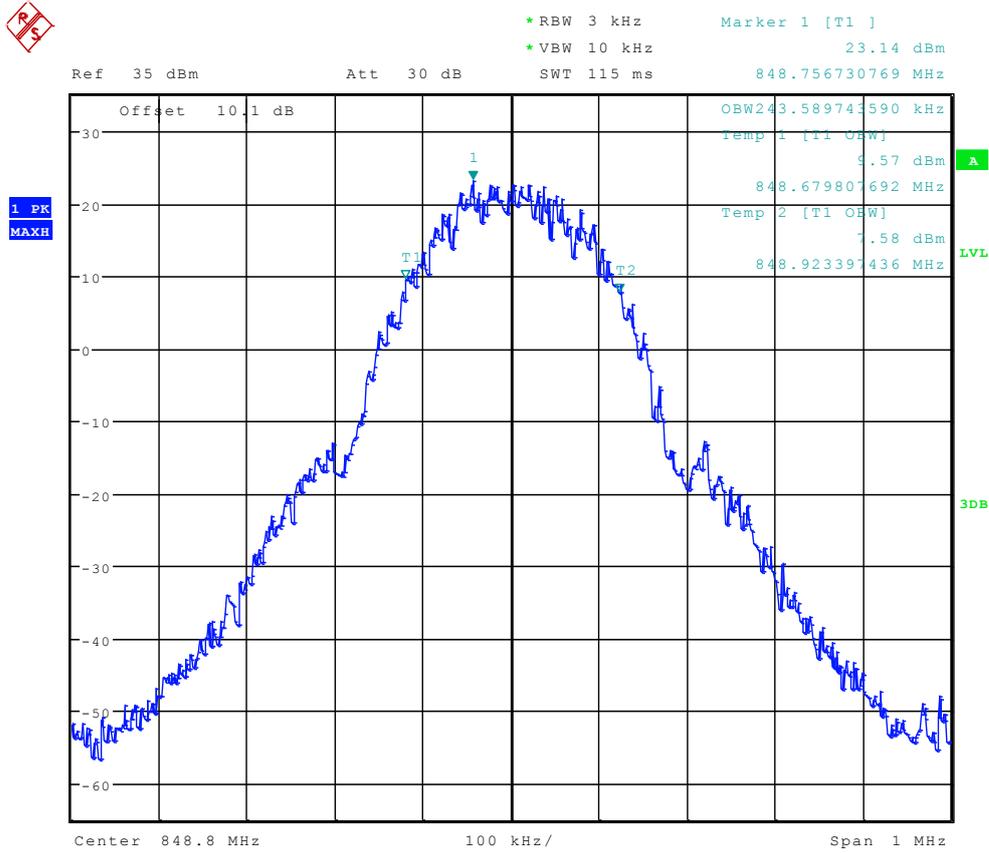


## Channel 4182 (TM3: WCDMA)



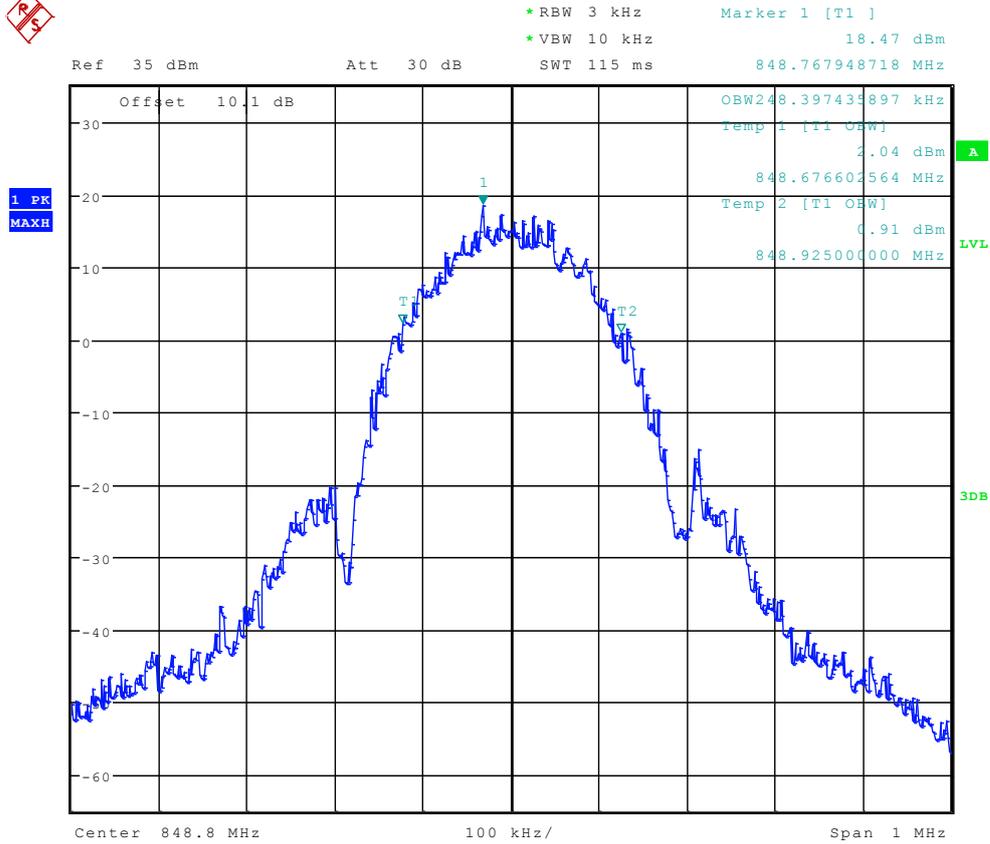


## Channel 251 (TM1:GPRS/GSM)



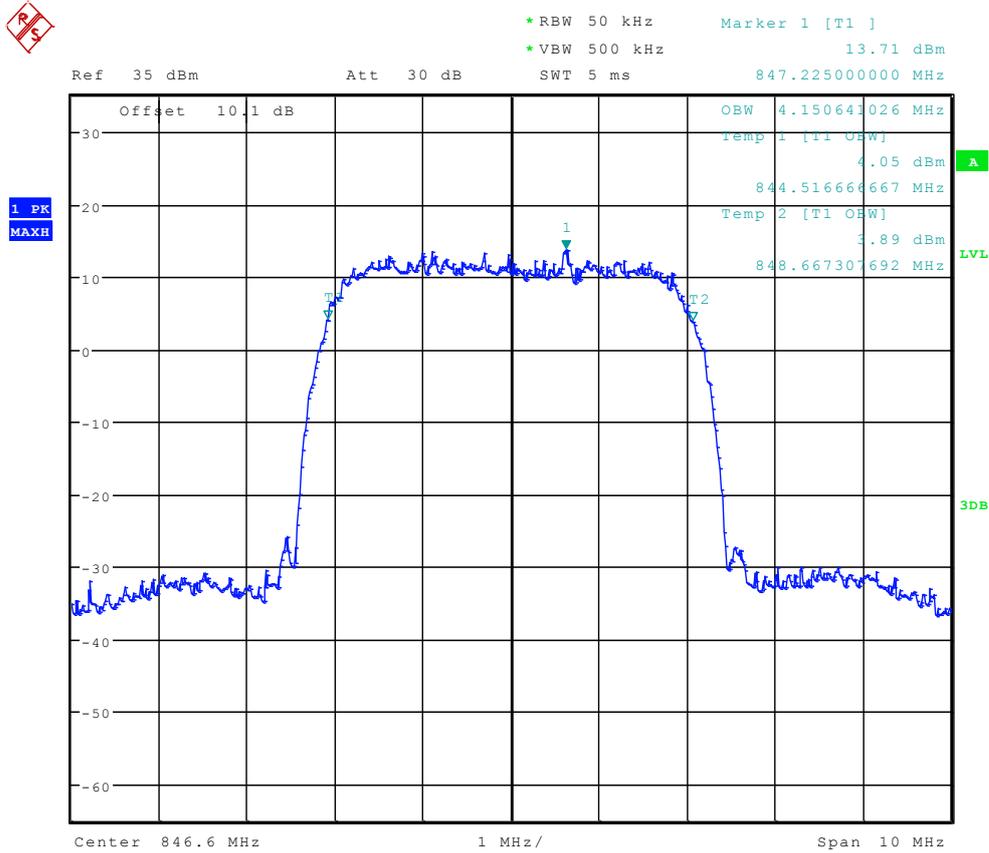


## Channel 251 (TM2:EDGE)





## Channel 4233 (TM3: WCDMA)



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



## Appendix D

# Band Edges Compliance

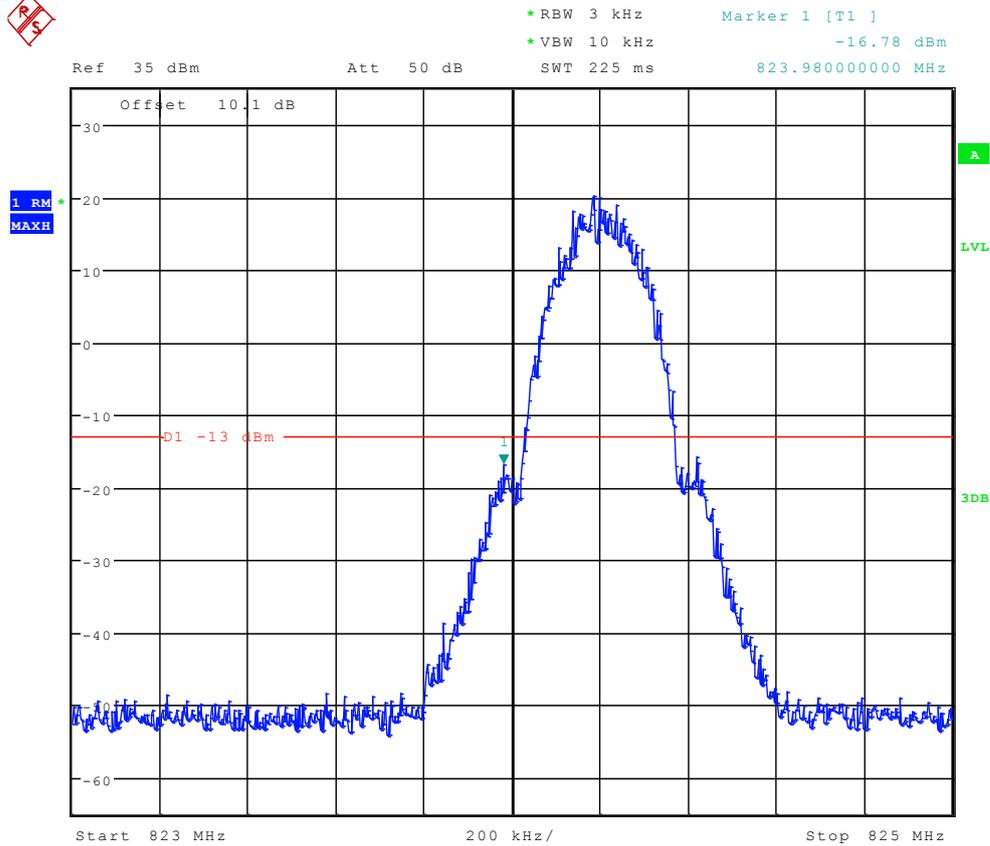
According to FCC Part 2.1051 & Part 22 Subpart H



# TM1:GPRS/GSM

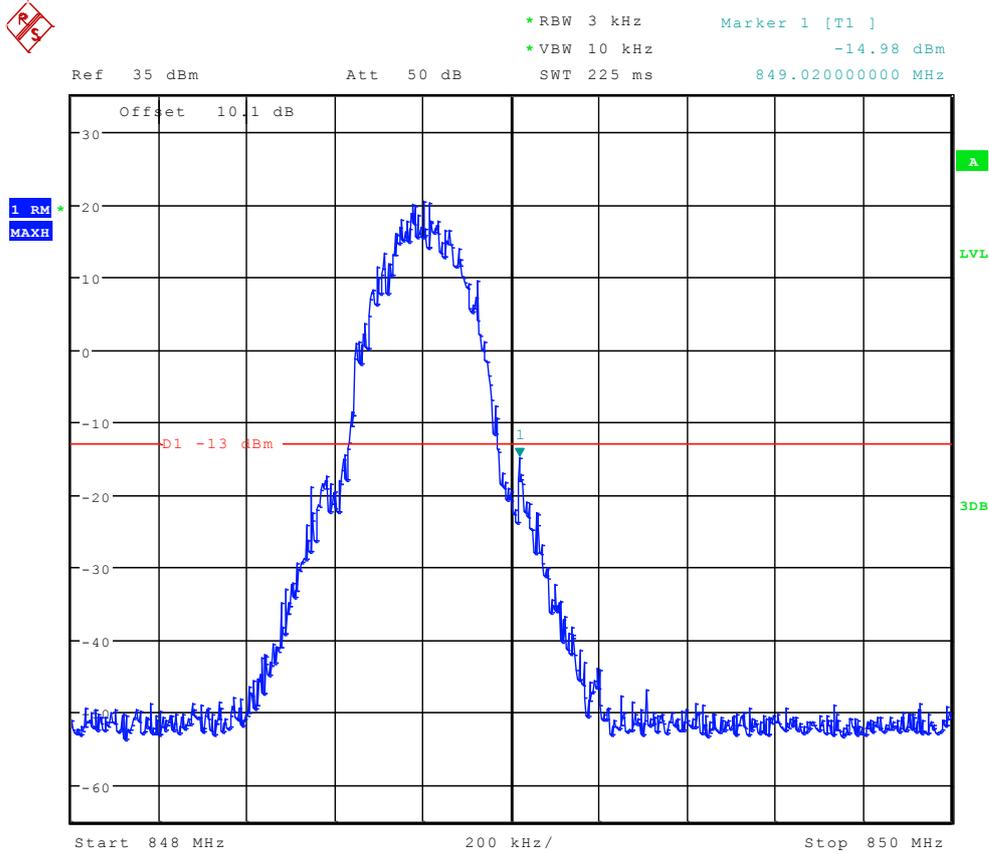
## Left Edge

### Channel 128





## Right Edge Channel 251

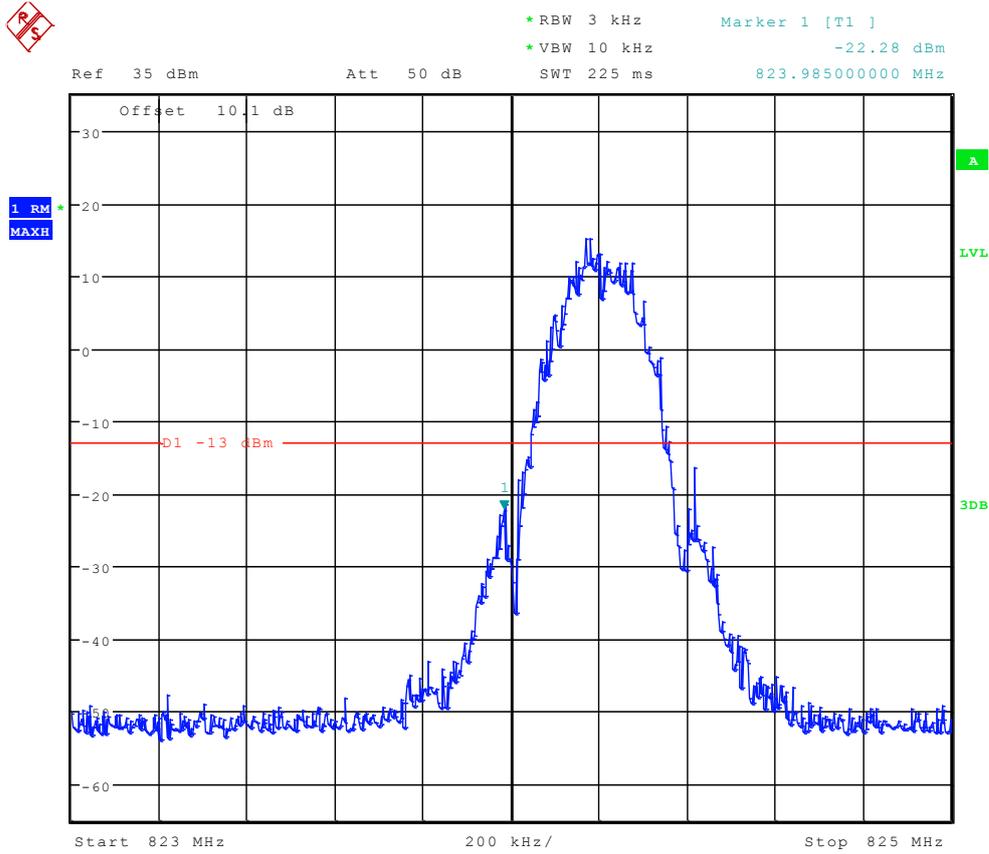




# TM2:EDGE

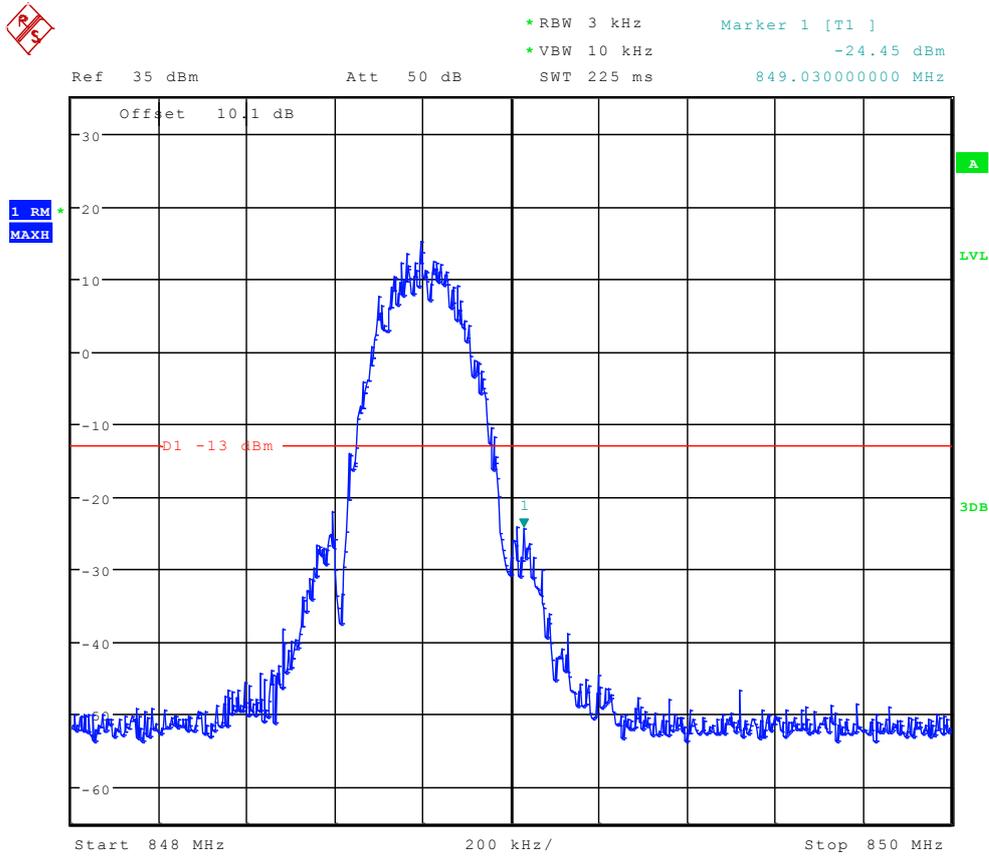
## Left Edge

### Channel 128





## Right Edge Channel 251





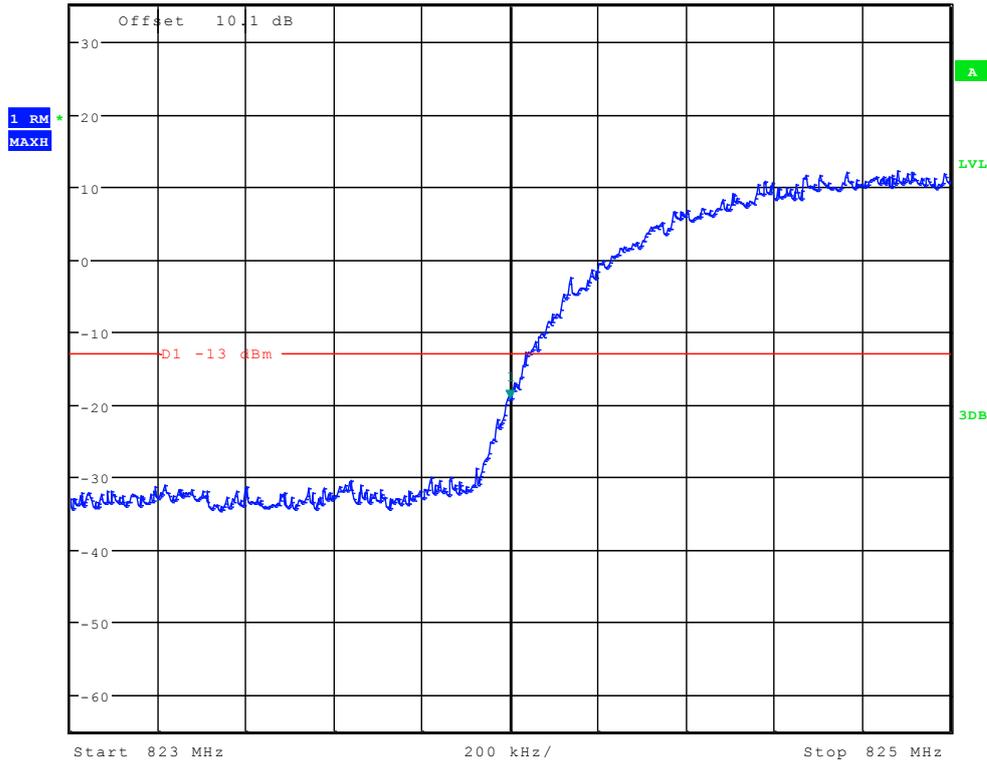
# TM3: WCDMA

## Left Edge

### Channel 4132

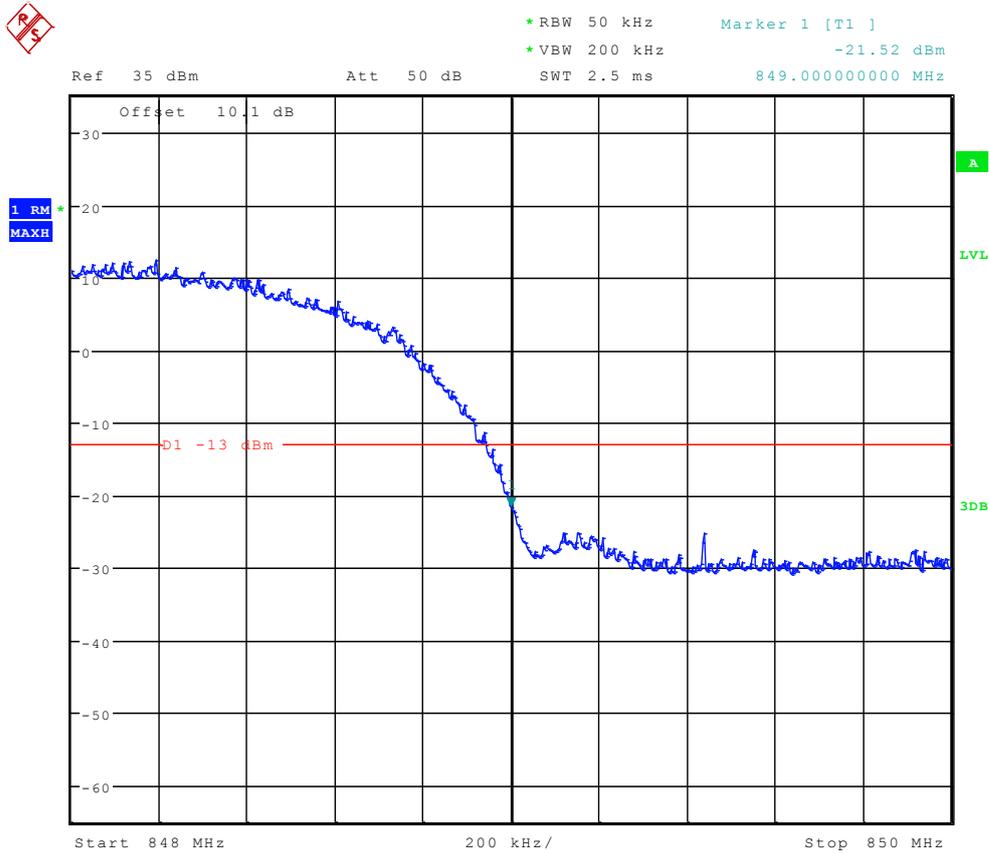


Ref 35 dBm      Att 50 dB      SWT 2.5 ms      824.00000000 MHz  
 \*RBW 50 kHz      Marker 1 [T1]      -19.22 dBm  
 \*VBW 200 kHz





## Right Edge Channel 4233



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



## Appendix E

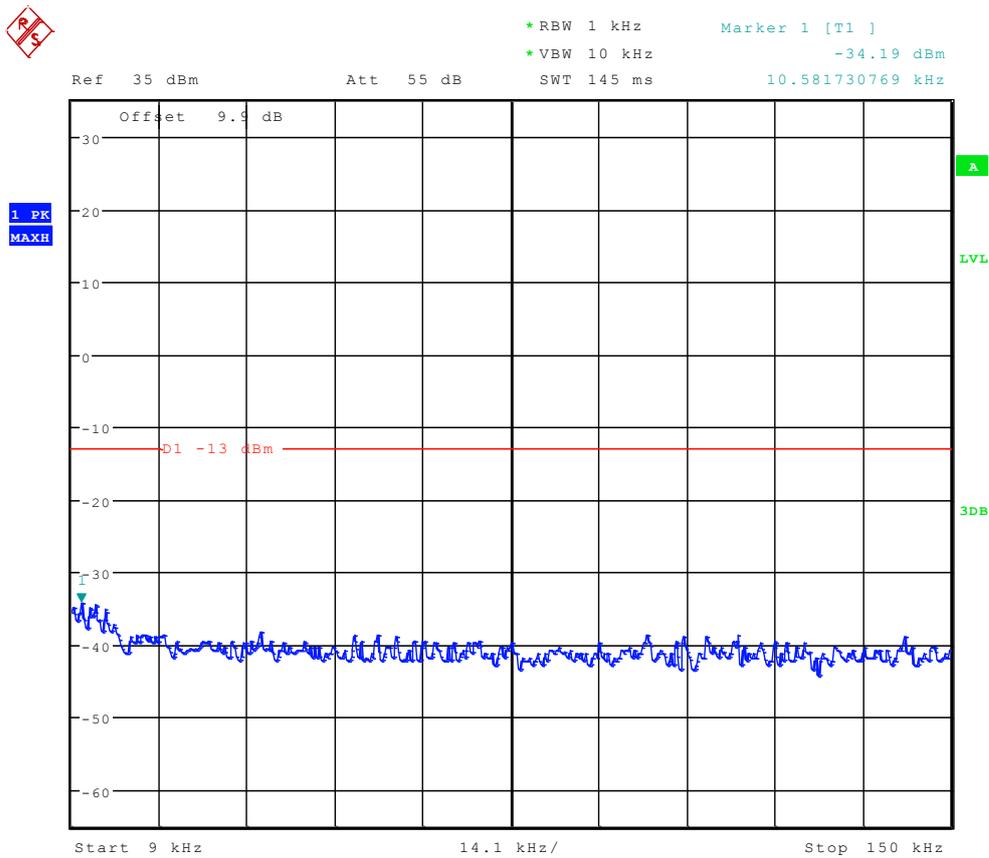
# Spurious Emission at Antenna Terminal

According to FCC Part 2.1051 & Part 22 Subpart H



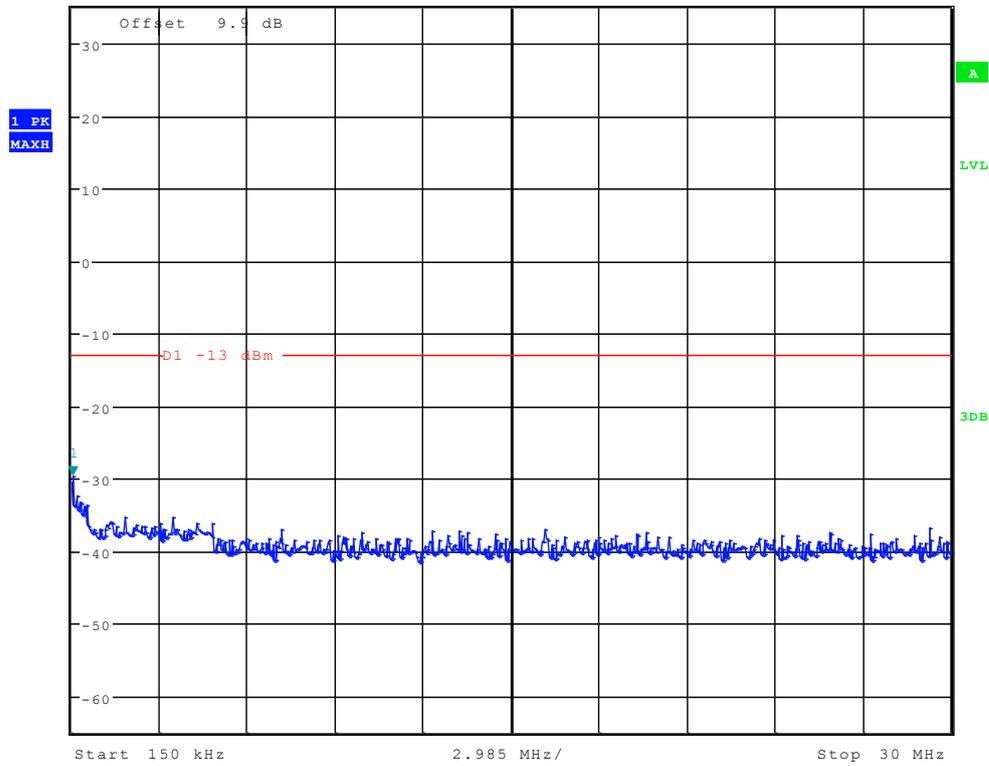
# TM1: GPRS/GSM

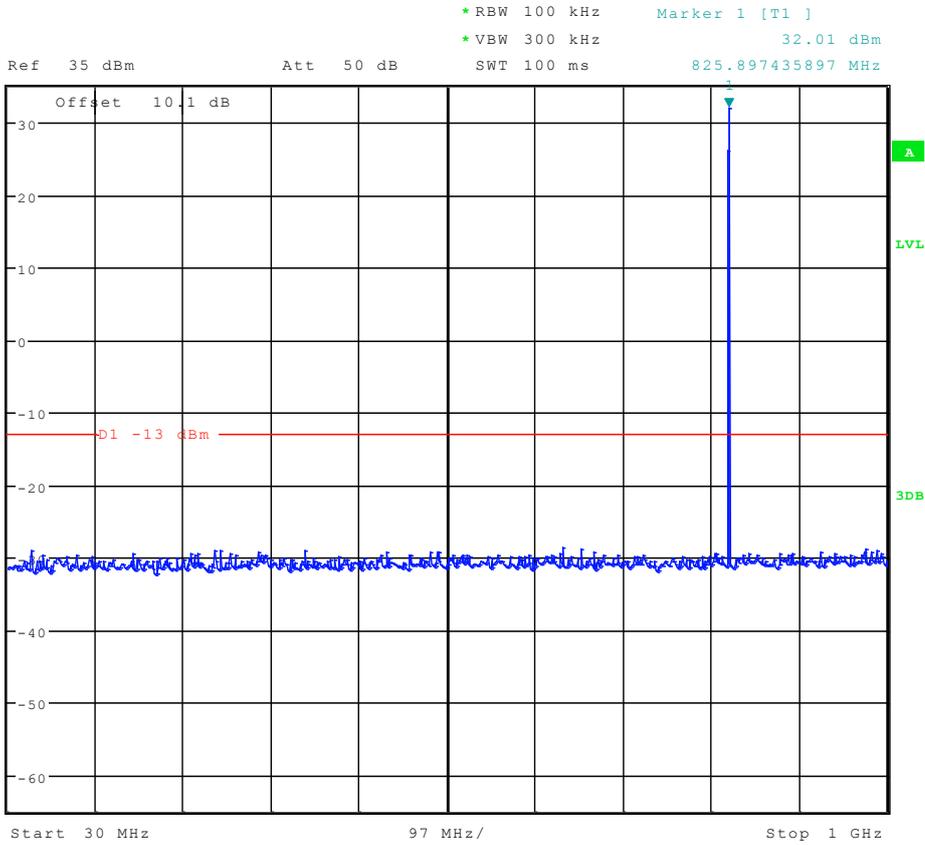
## Channel 128





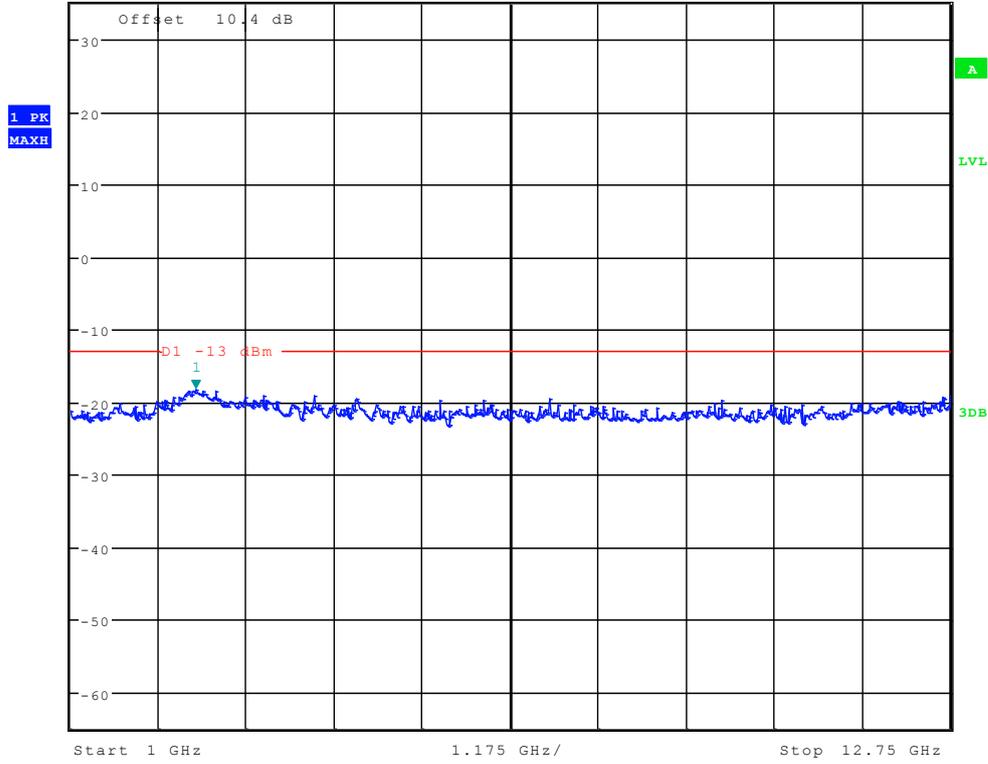
\*RBW 10 kHz      Marker 1 [T1 ]  
\*VBW 30 kHz      -29.59 dBm  
Ref 35 dBm      Att 55 dB      SWT 300 ms      197.836538462 kHz







\*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 3 MHz      -18.30 dBm  
Ref 35 dBm      Att 50 dB      SWT 70 ms      2.675881410 GHz

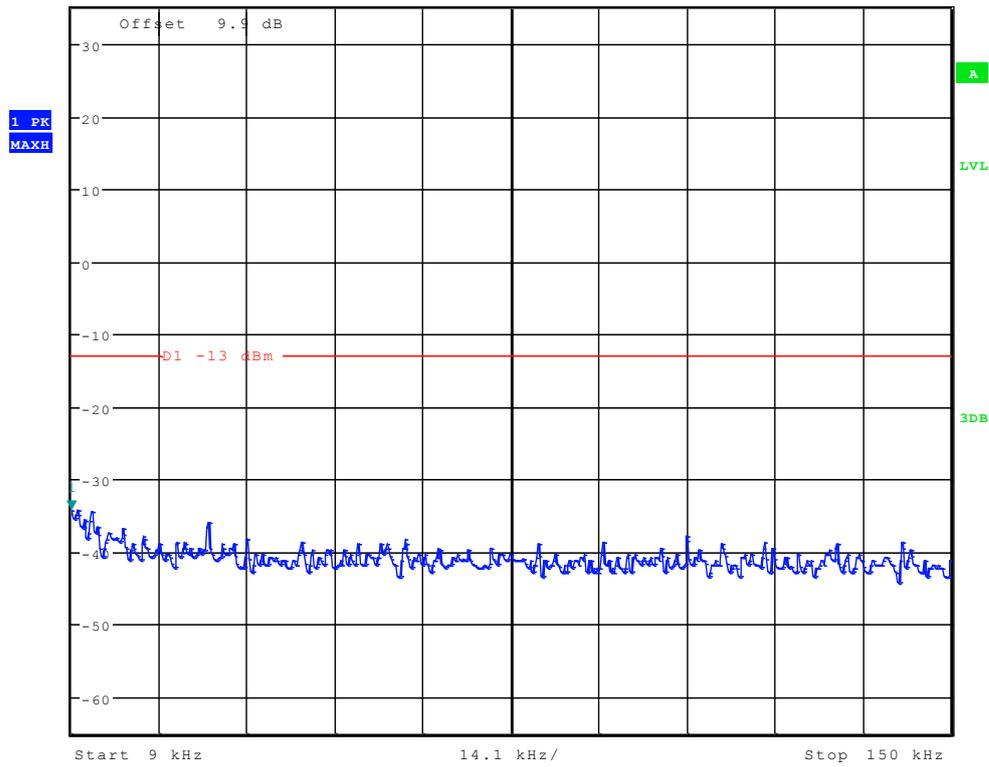




# Channel 192



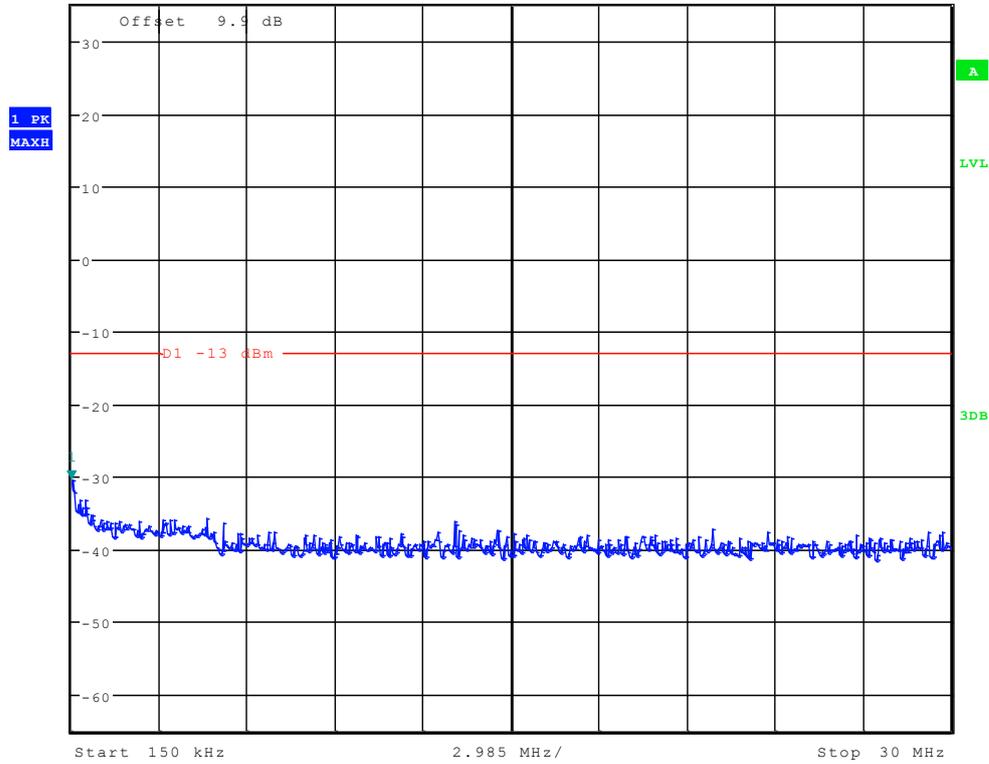
Ref 35 dBm      Att 55 dB      SWT 145 ms      9.000000000 kHz  
 \*RBW 1 kHz      Marker 1 [T1]      -34.19 dBm  
 \*VBW 10 kHz

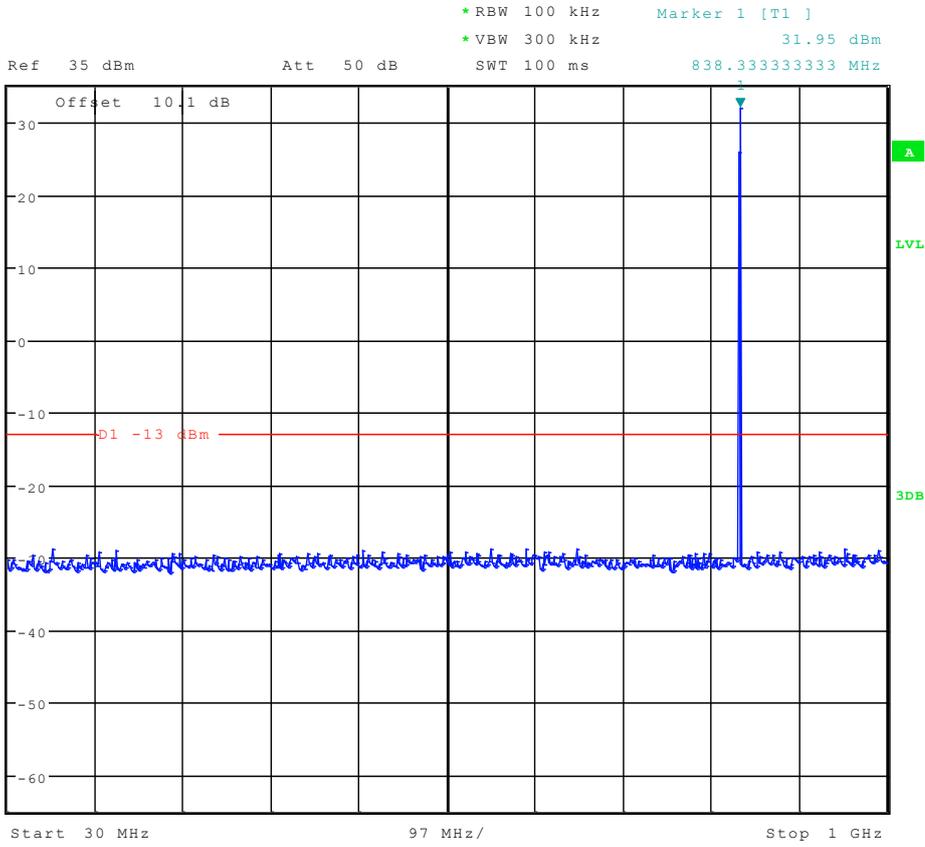




Ref 35 dBm Att 55 dB SWT 300 ms

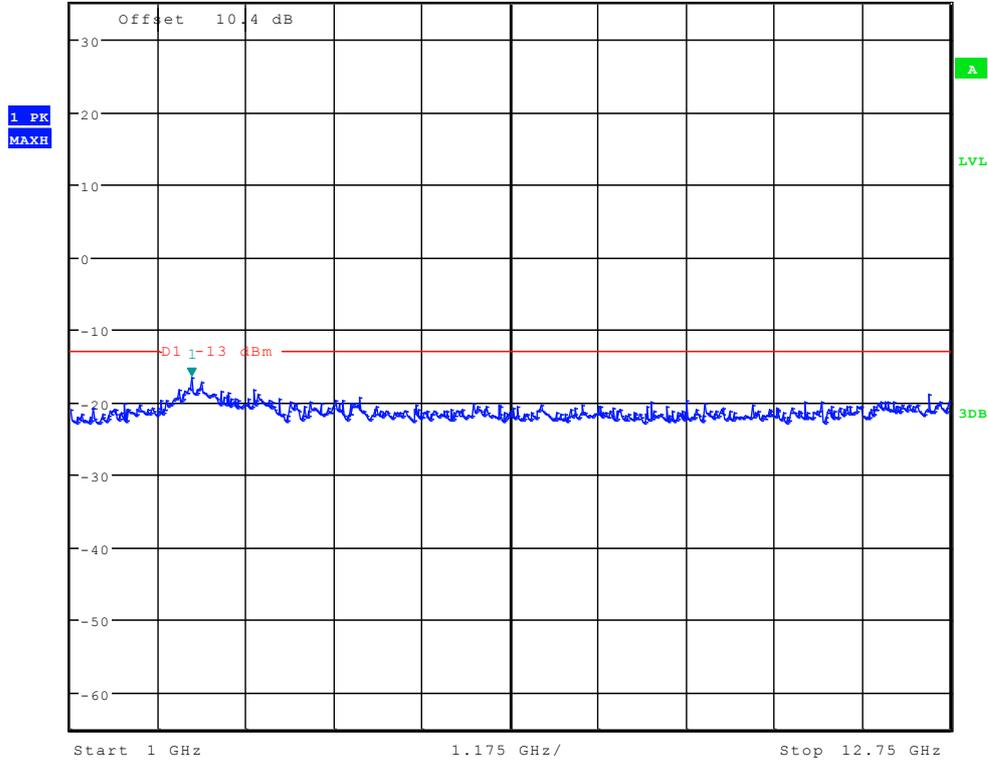
\*RBW 10 kHz Marker 1 [T1] -30.52 dBm  
\*VBW 30 kHz 150.00000000 kHz







\*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 3 MHz      -16.64 dBm  
Ref 35 dBm      Att 50 dB      SWT 70 ms      2.619391026 GHz





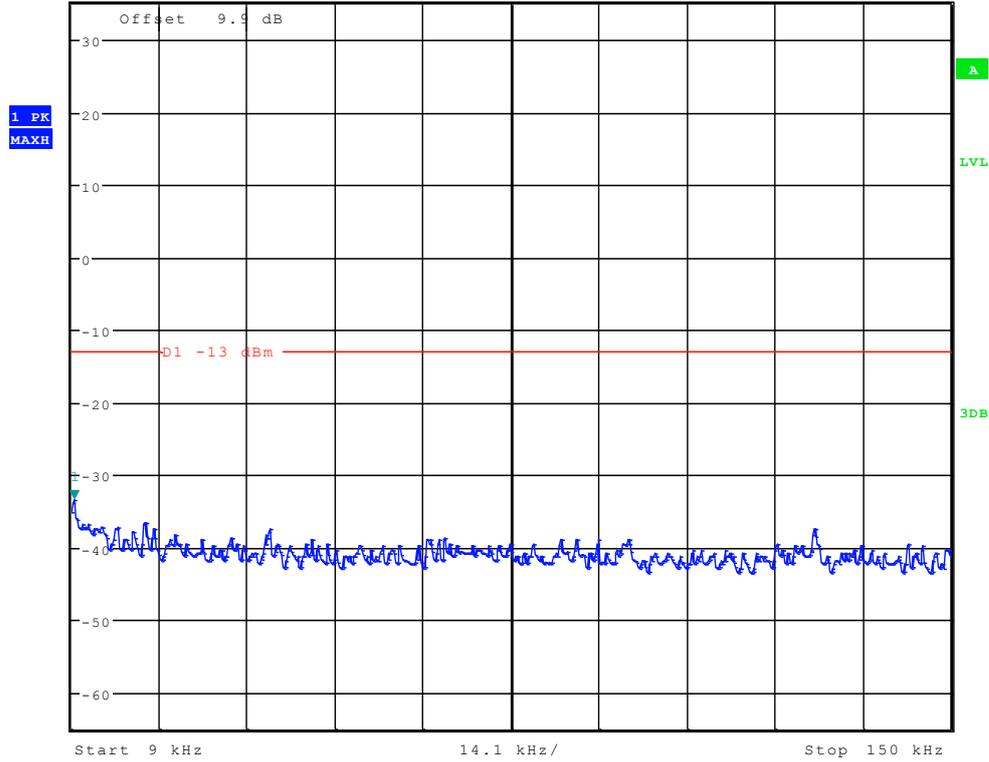
# Channel 251



\*RBW 1 kHz  
\*VBW 10 kHz  
SWT 145 ms

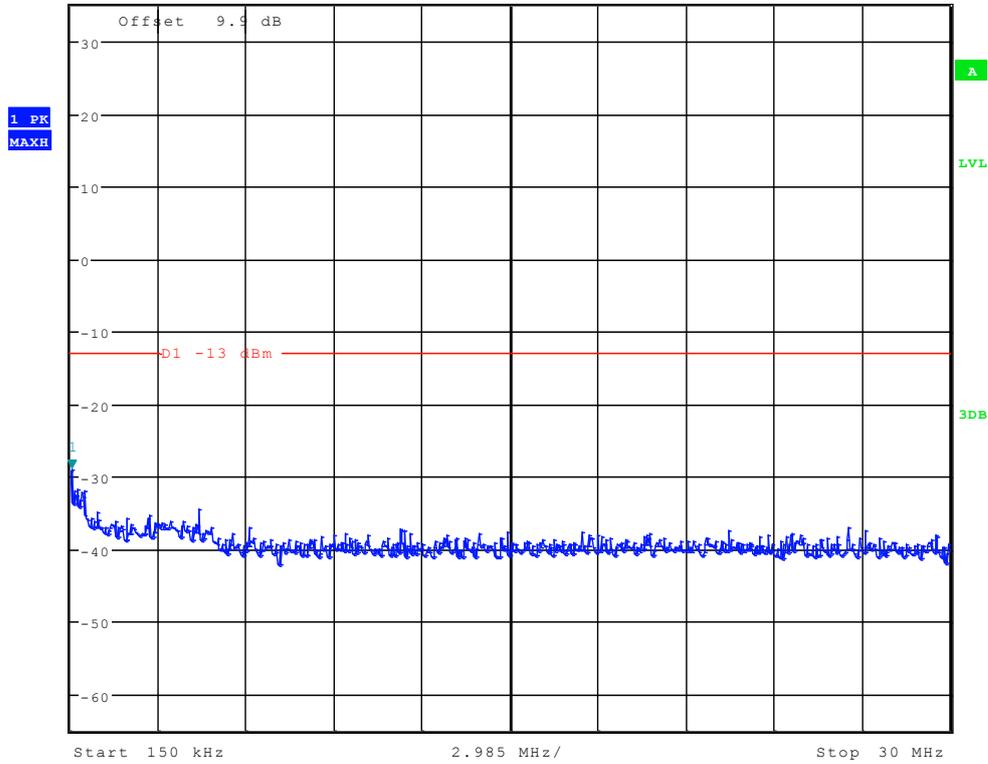
Marker 1 [T1 ]  
-33.48 dBm  
9.451923077 kHz

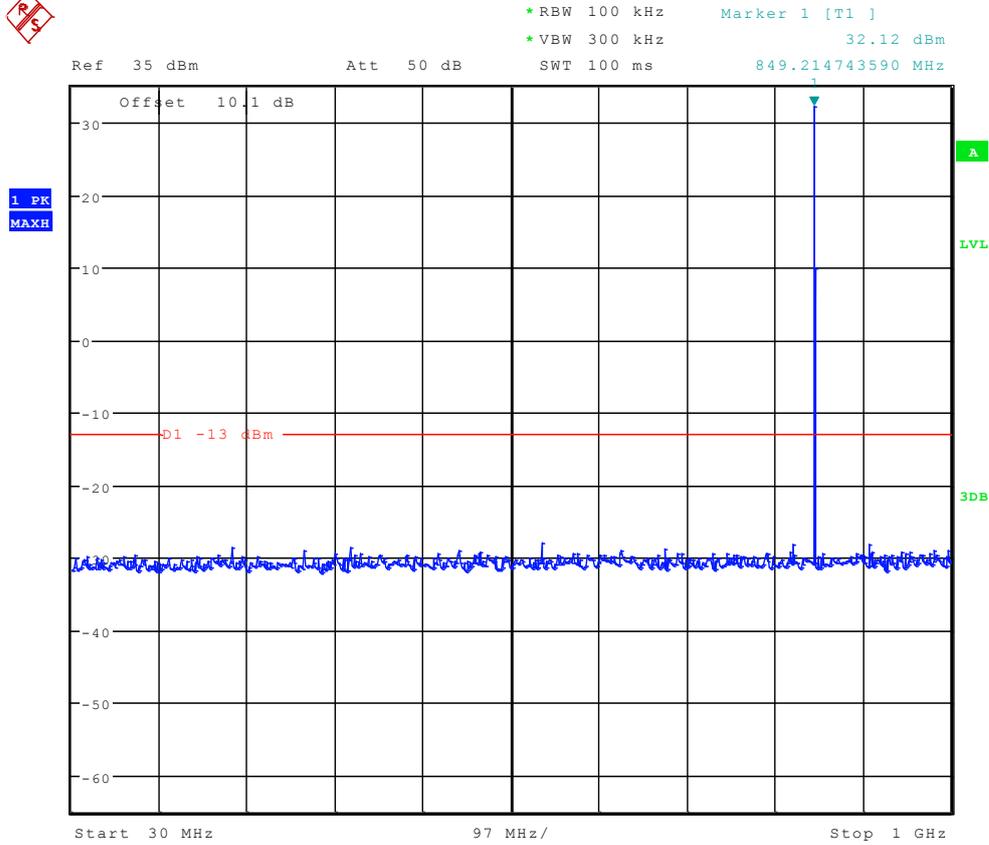
Ref 35 dBm Att 55 dB





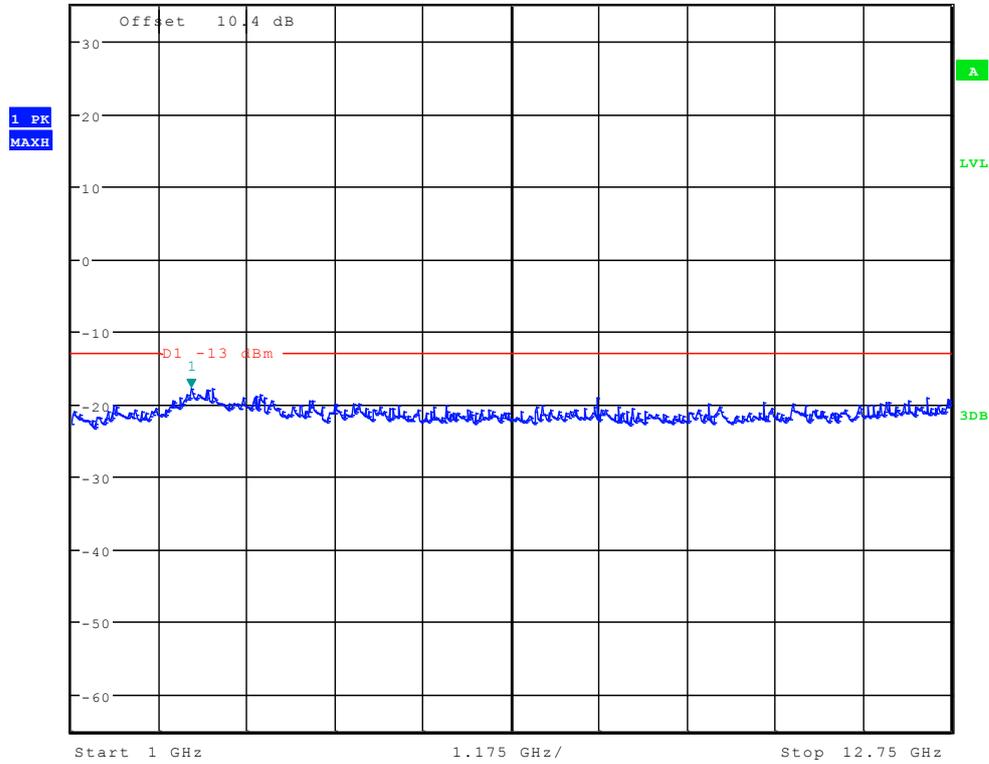
Ref 35 dBm Att 55 dB SWT 300 ms  
\*RBW 10 kHz Marker 1 [T1] -28.90 dBm  
\*VBW 30 kHz 197.836538462 kHz







\*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 3 MHz      -17.80 dBm  
Ref 35 dBm      Att 50 dB      SWT 70 ms      2.600560897 GHz

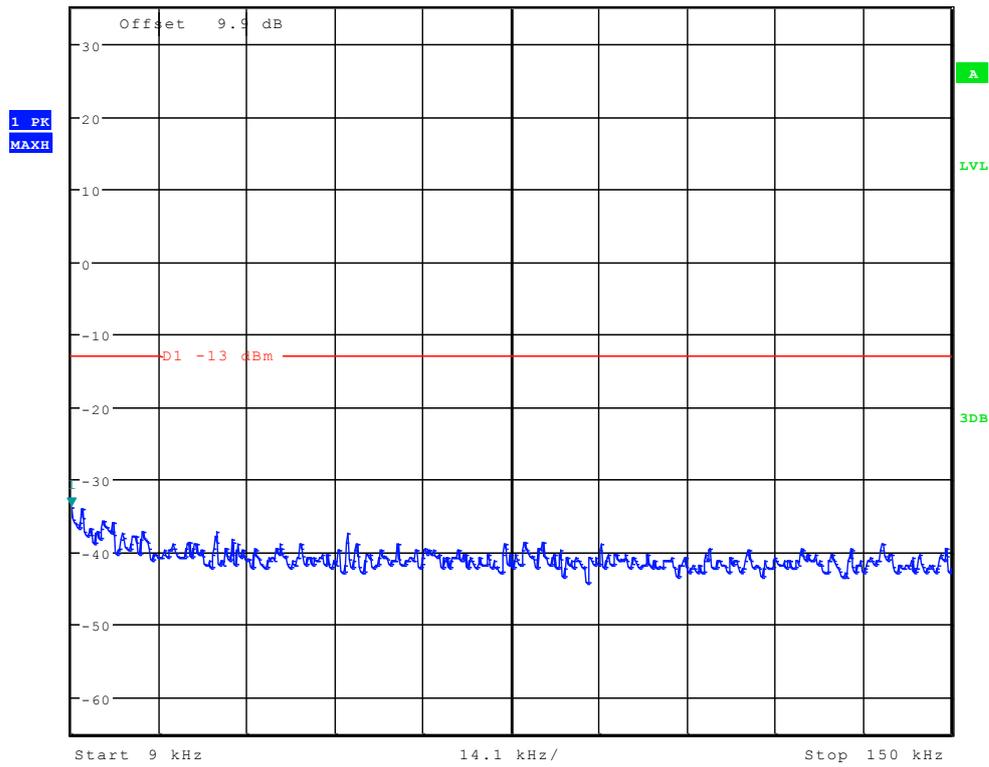




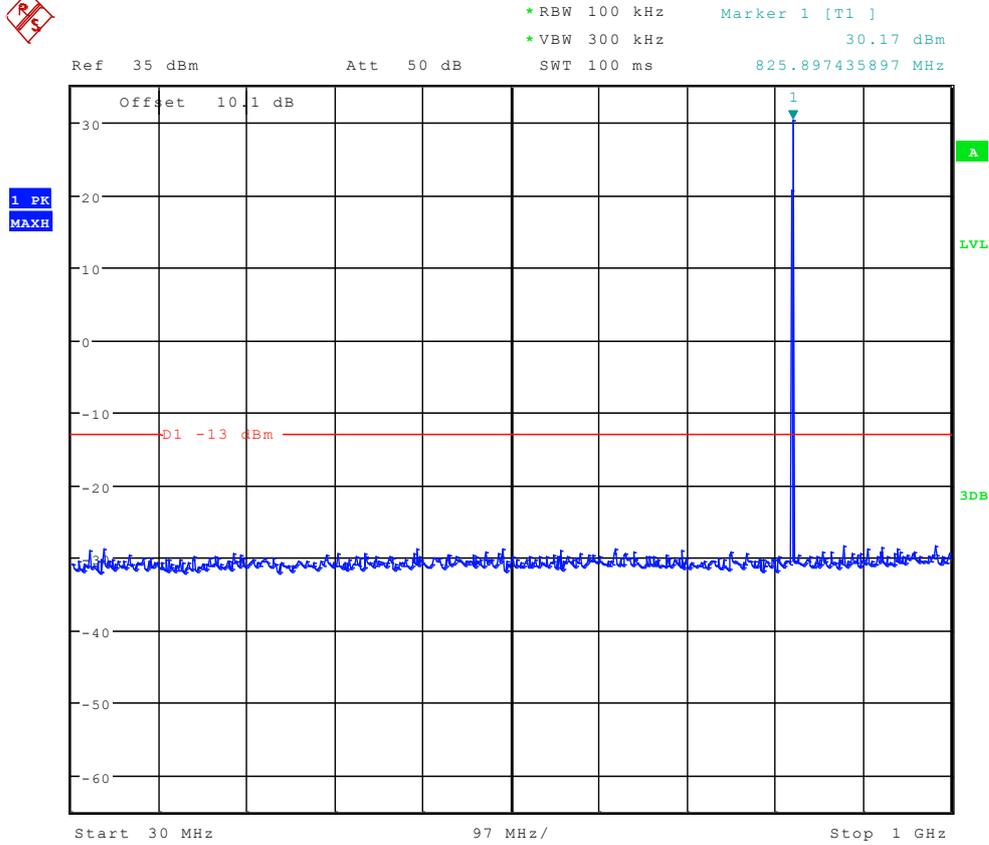
# TM2: EDGE Channel 128



Ref 35 dBm Att 55 dB SWT 145 ms  
 \*RBW 1 kHz Marker 1 [T1] -33.74 dBm  
 \*VBW 10 kHz  
 9.000000000 kHz

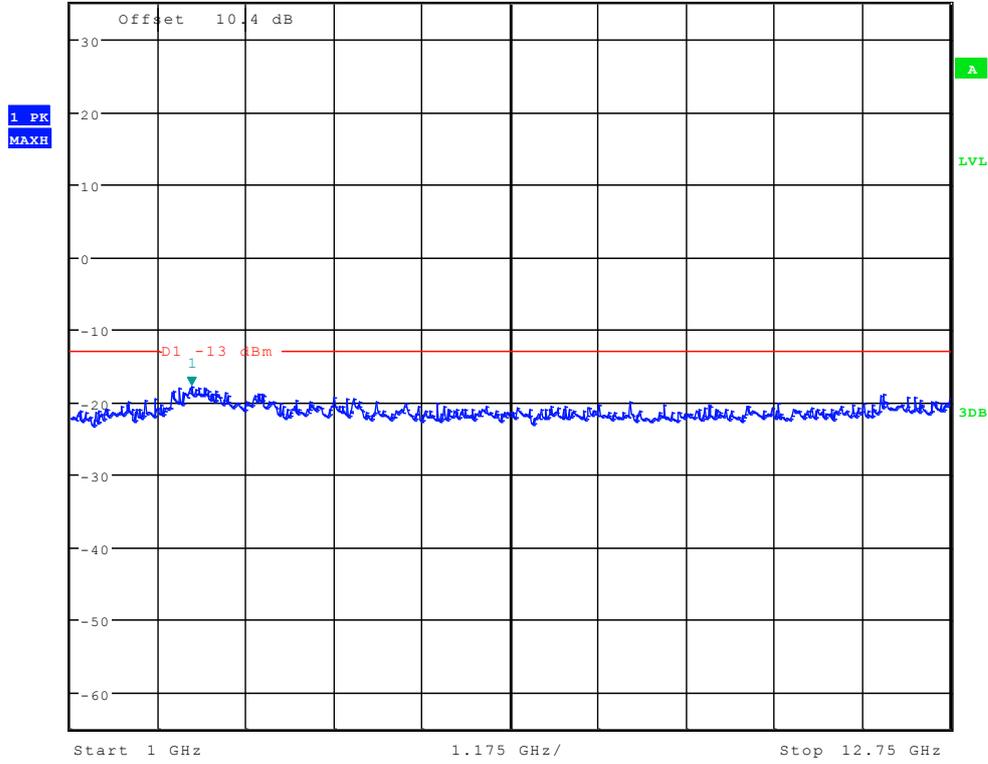






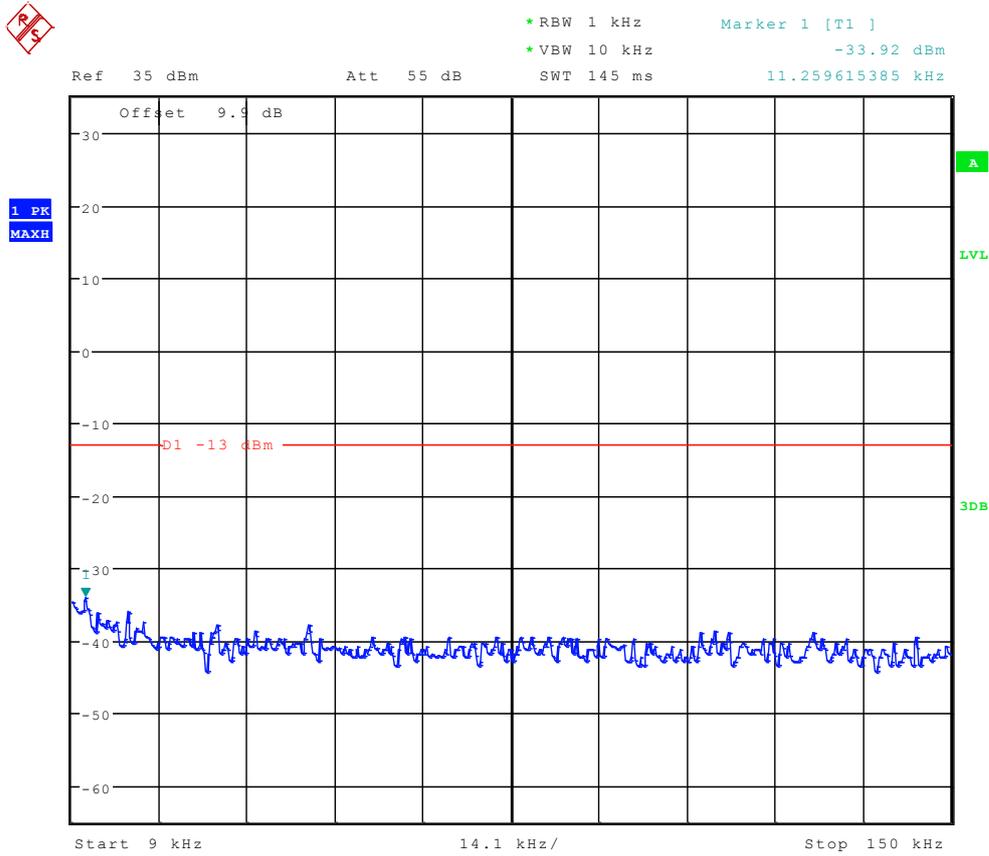


\*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 3 MHz      -17.91 dBm  
Ref 35 dBm      Att 50 dB      SWT 70 ms      2.619391026 GHz





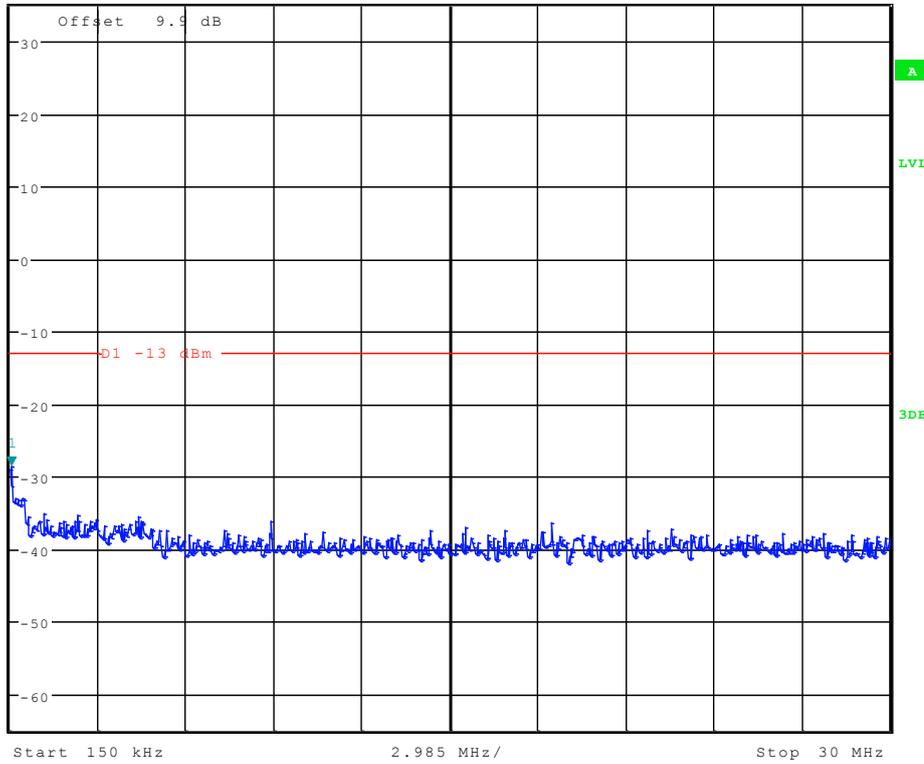
# Channel 192

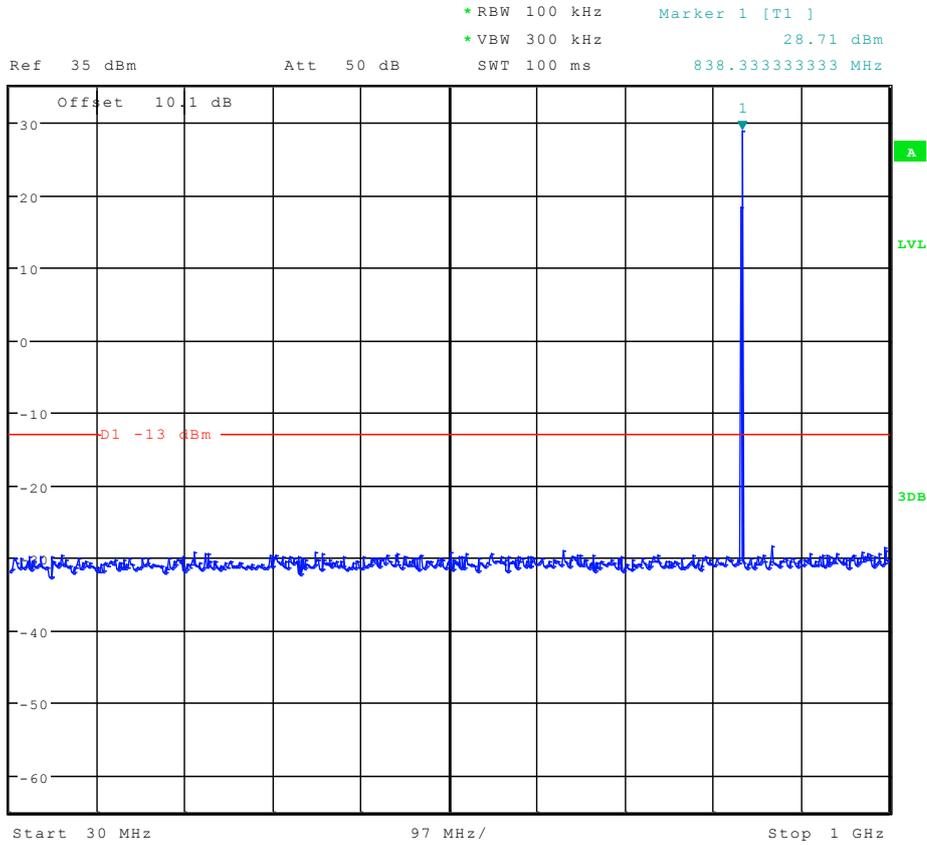




\*RBW 10 kHz      Marker 1 [T1 ]  
\*VBW 30 kHz      -28.51 dBm  
Ref 35 dBm      Att 55 dB      SWT 300 ms      197.836538462 kHz

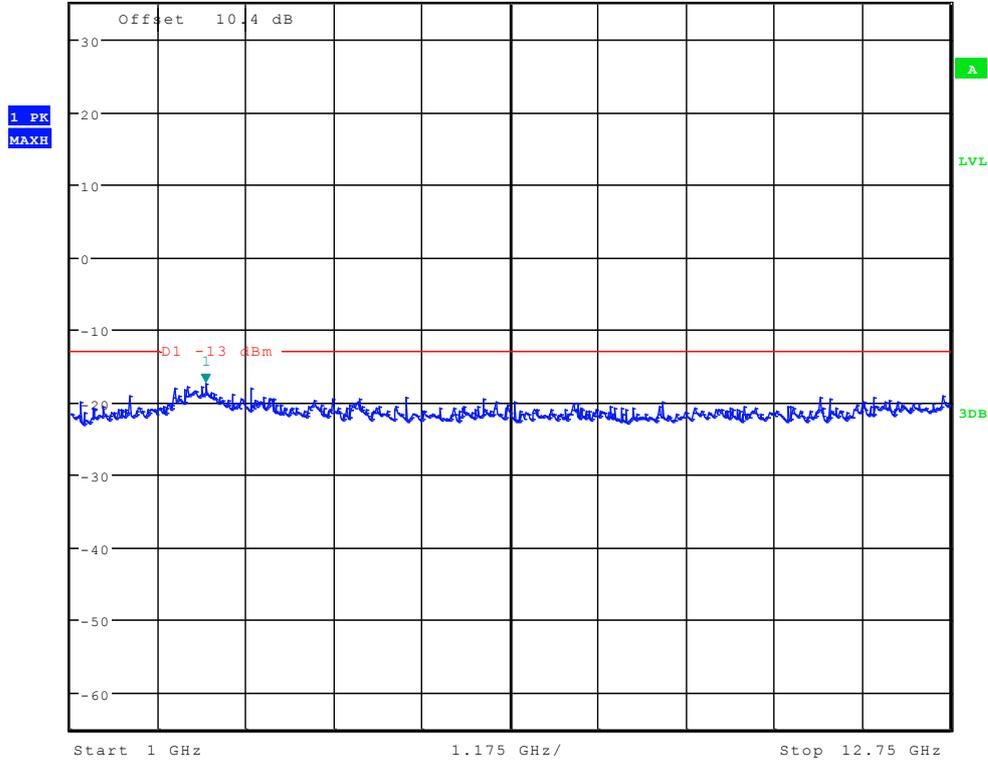
1 PK  
MAXH







\*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 3 MHz      -17.44 dBm  
Ref 35 dBm      Att 50 dB      SWT 70 ms      2.807692308 GHz



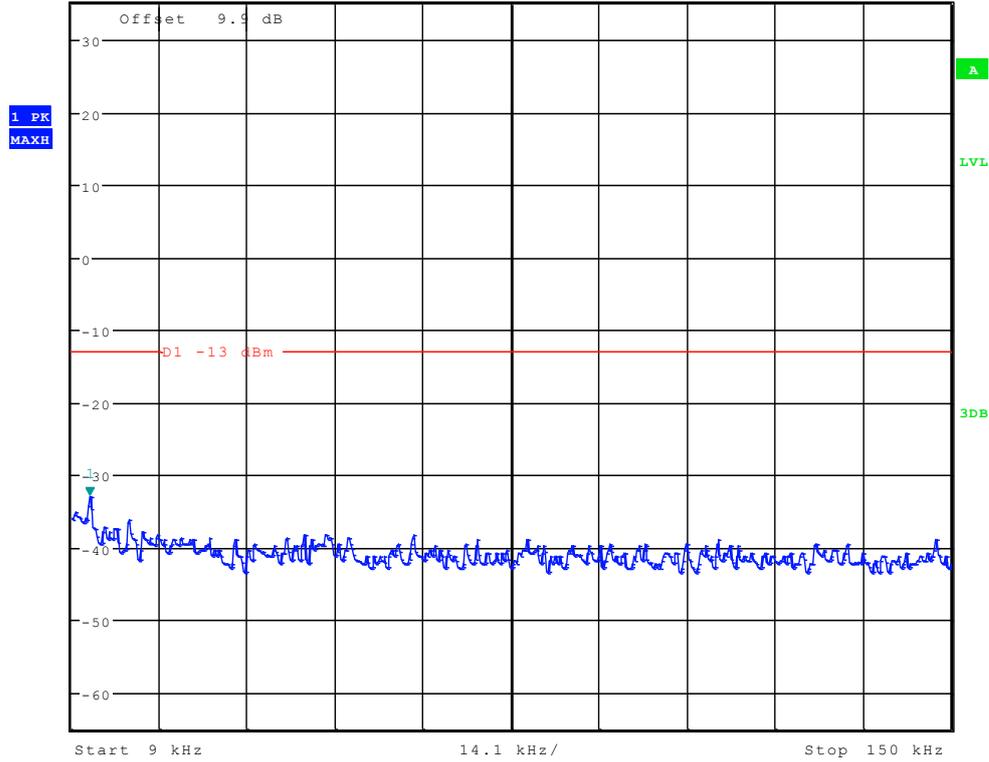


# Channel 251



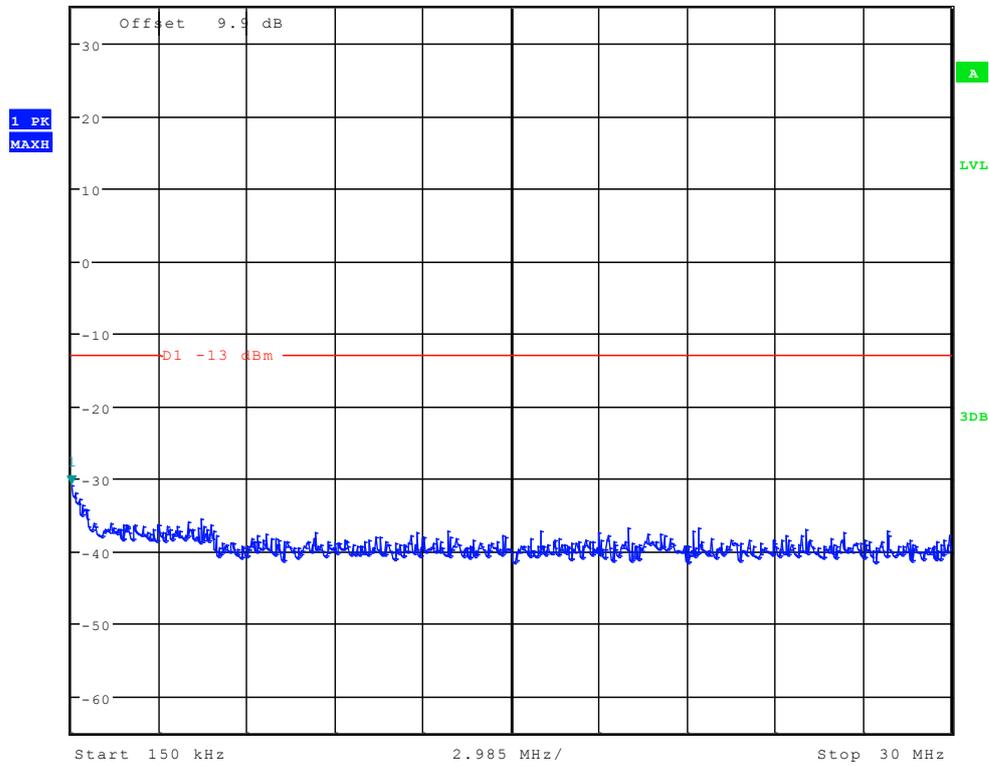
\*RBW 1 kHz  
\*VBW 10 kHz  
Marker 1 [T1 ]  
-33.06 dBm  
11.937500000 kHz

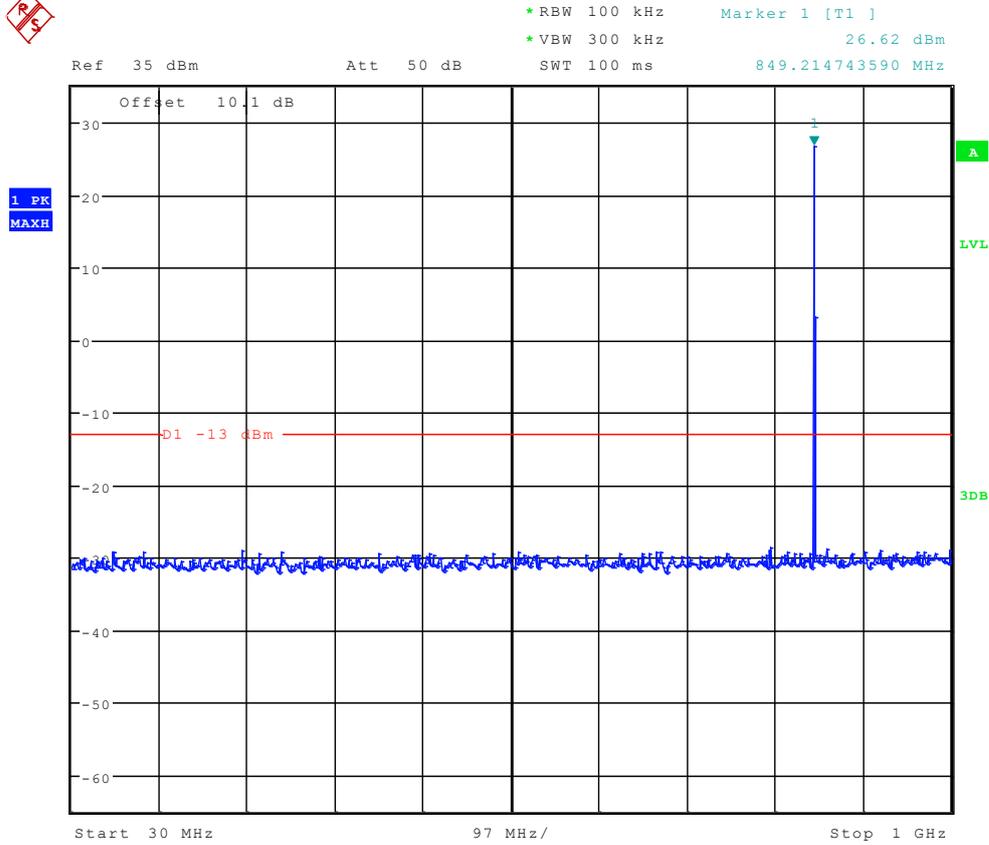
Ref 35 dBm Att 55 dB SWT 145 ms





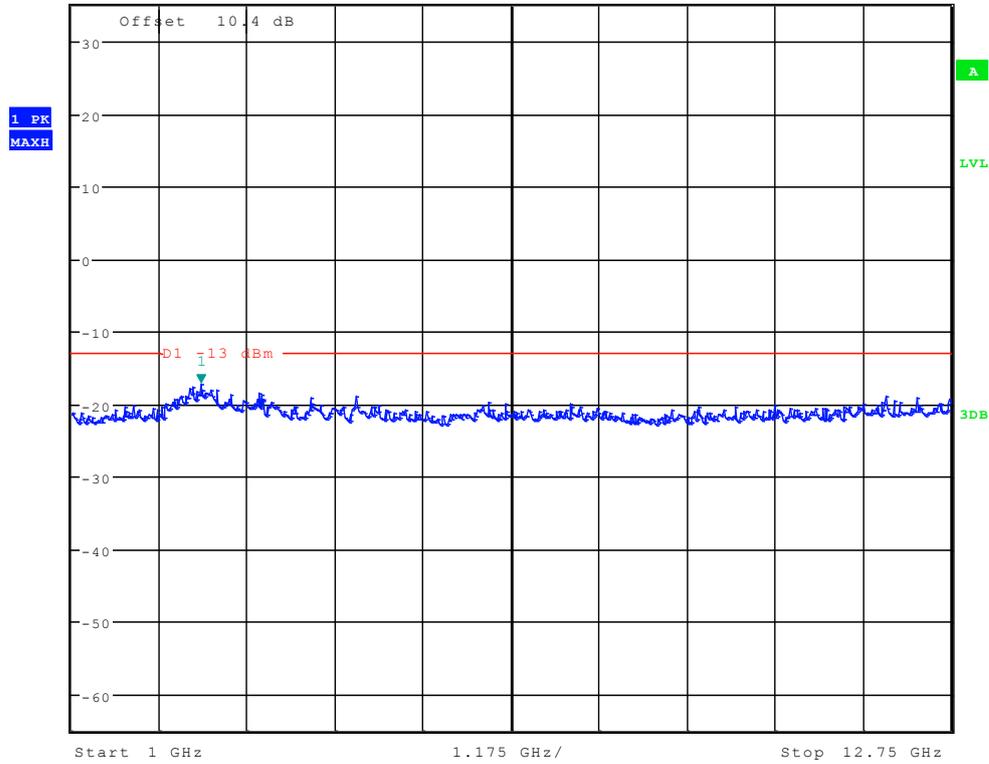
\*RBW 10 kHz      Marker 1 [T1 ]  
\*VBW 30 kHz      -30.76 dBm  
Ref 35 dBm      Att 55 dB      SWT 300 ms      150.000000000 kHz





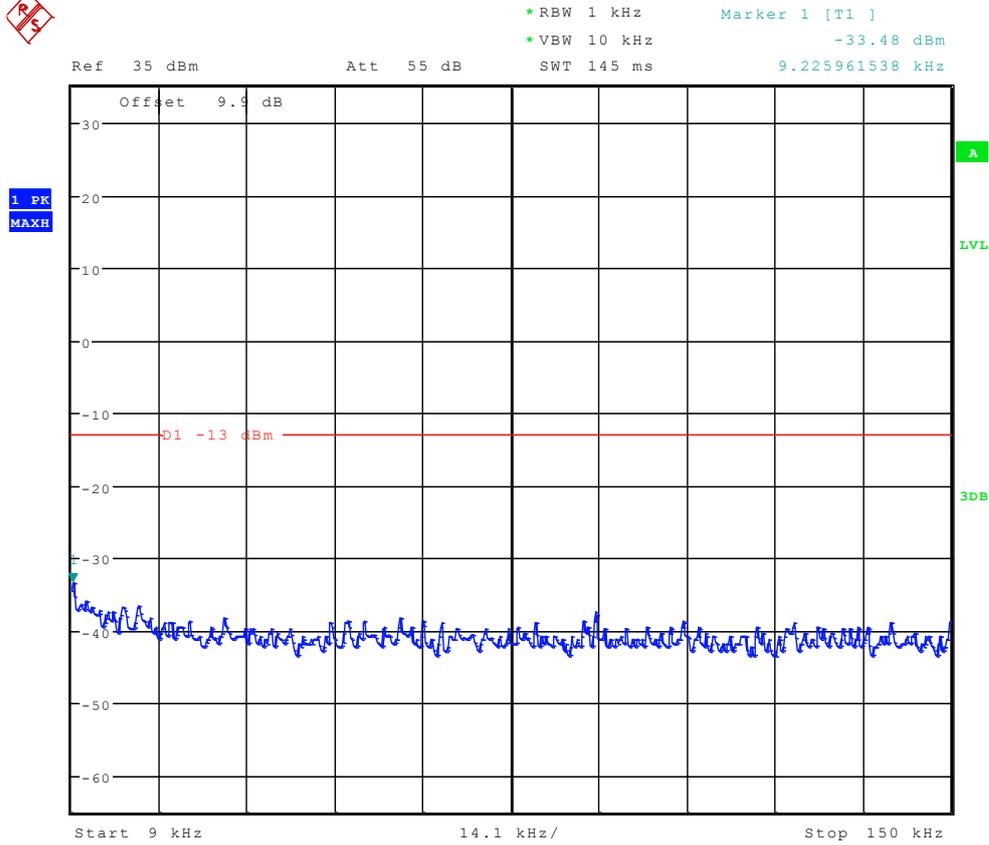


\*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 3 MHz      -17.21 dBm  
Ref 35 dBm      Att 50 dB      SWT 70 ms      2.732371795 GHz



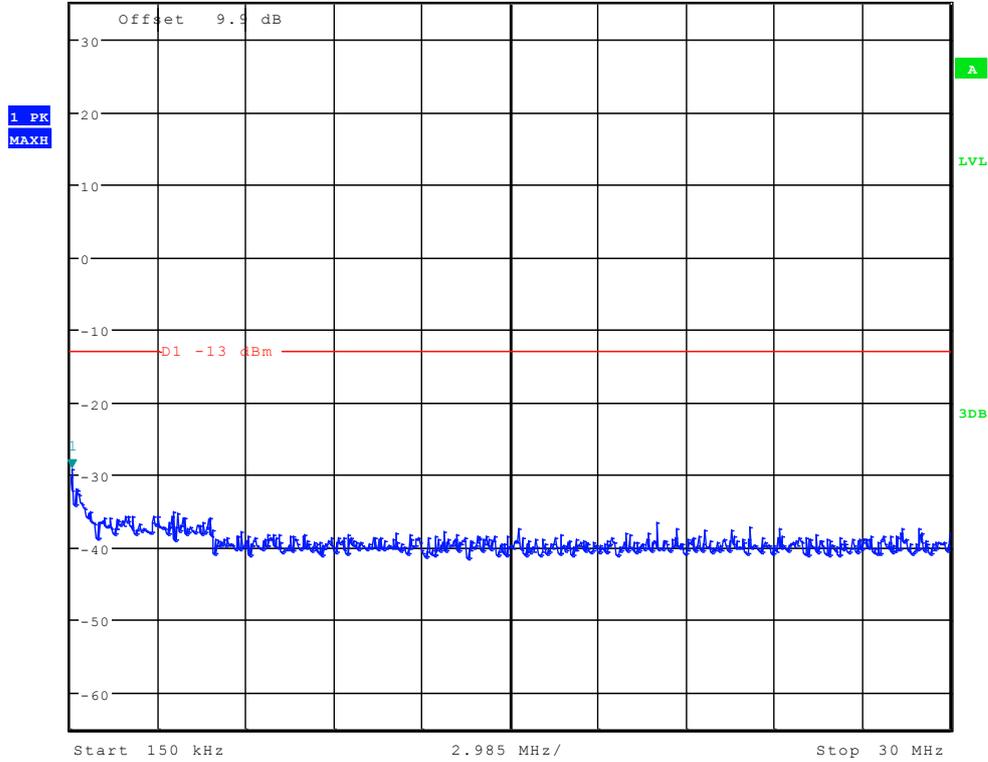


# TM3: WCDMA Channel 4132



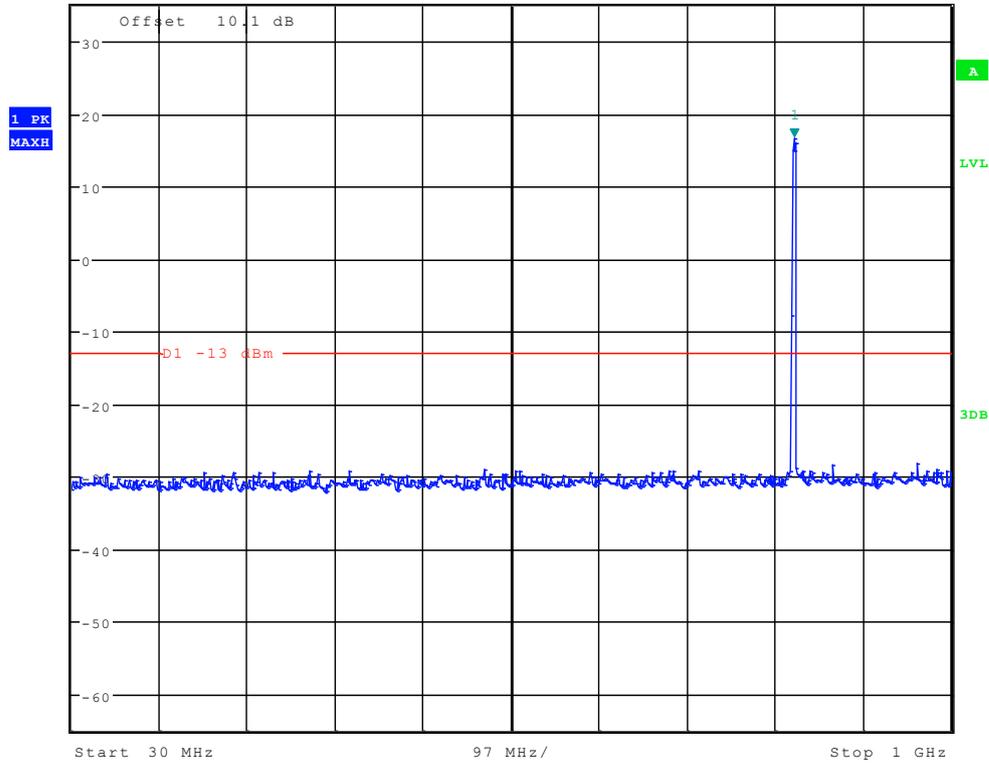


Ref 35 dBm      Att 55 dB      SWT 300 ms      Marker 1 [T1]      -29.16 dBm  
\*RBW 10 kHz  
\*VBW 30 kHz      197.836538462 kHz



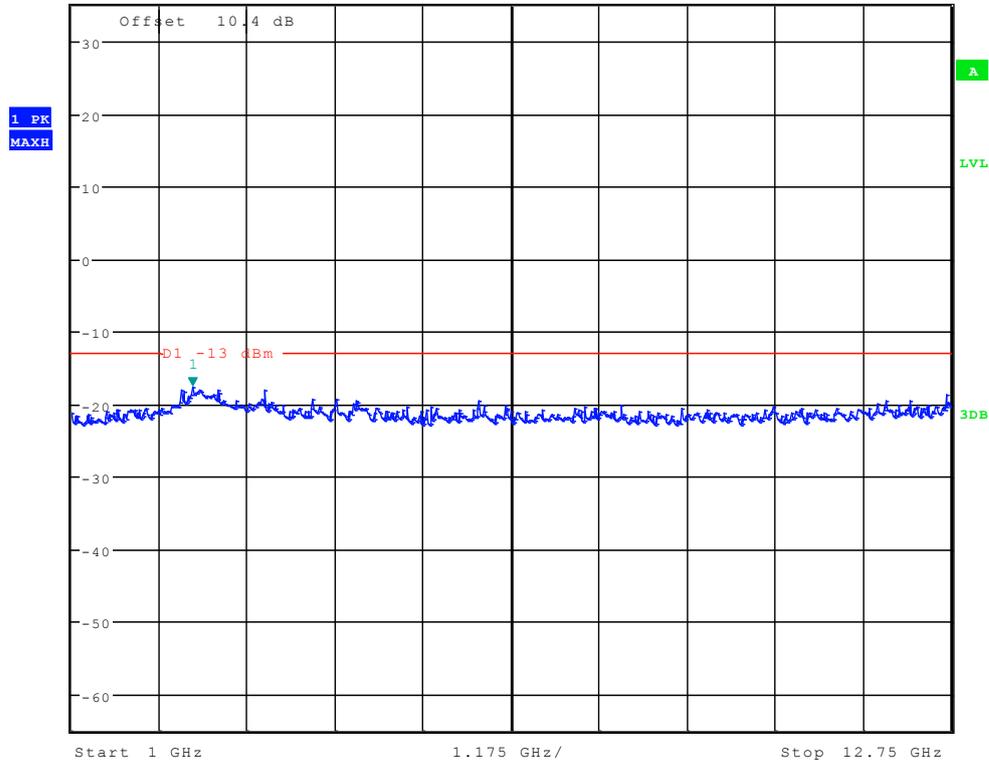


Ref 35 dBm Att 50 dB SWT 100 ms  
\*RBW 100 kHz Marker 1 [T1] 16.60 dBm  
\*VBW 300 kHz 827.451923077 MHz





\*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 3 MHz      -17.55 dBm  
Ref 35 dBm      Att 50 dB      SWT 70 ms      2.619391026 GHz

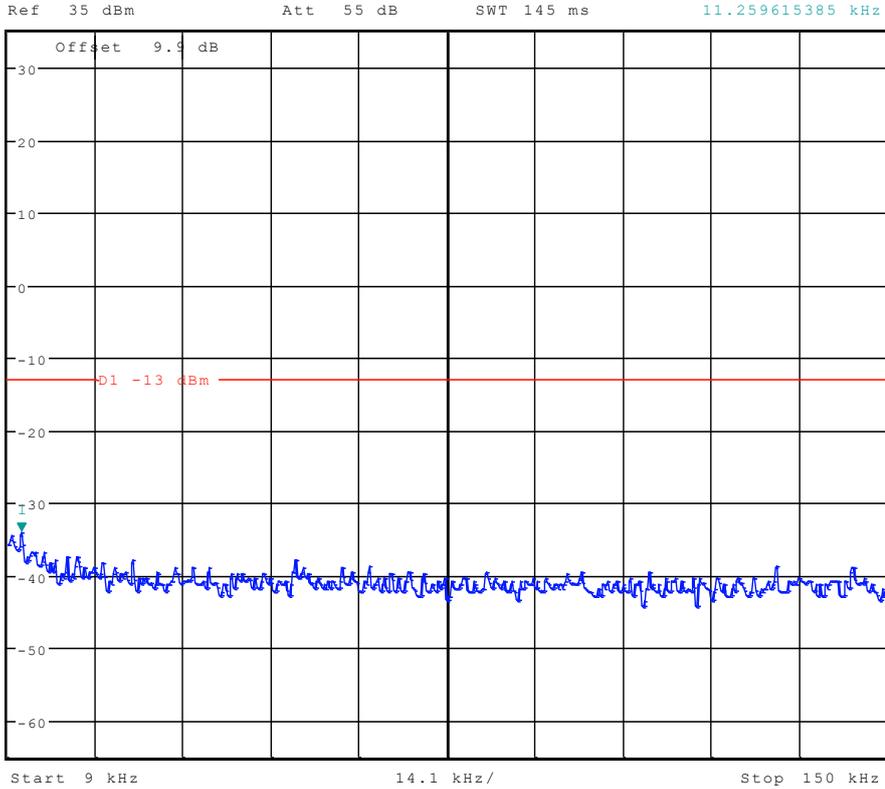




# Channel 4182

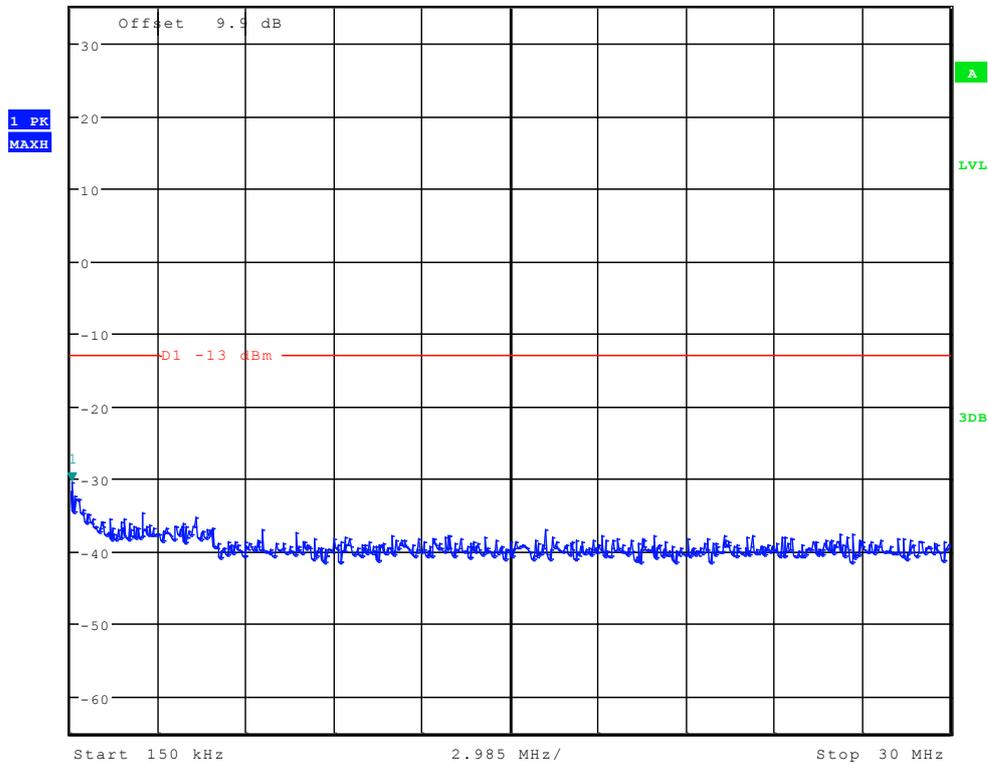


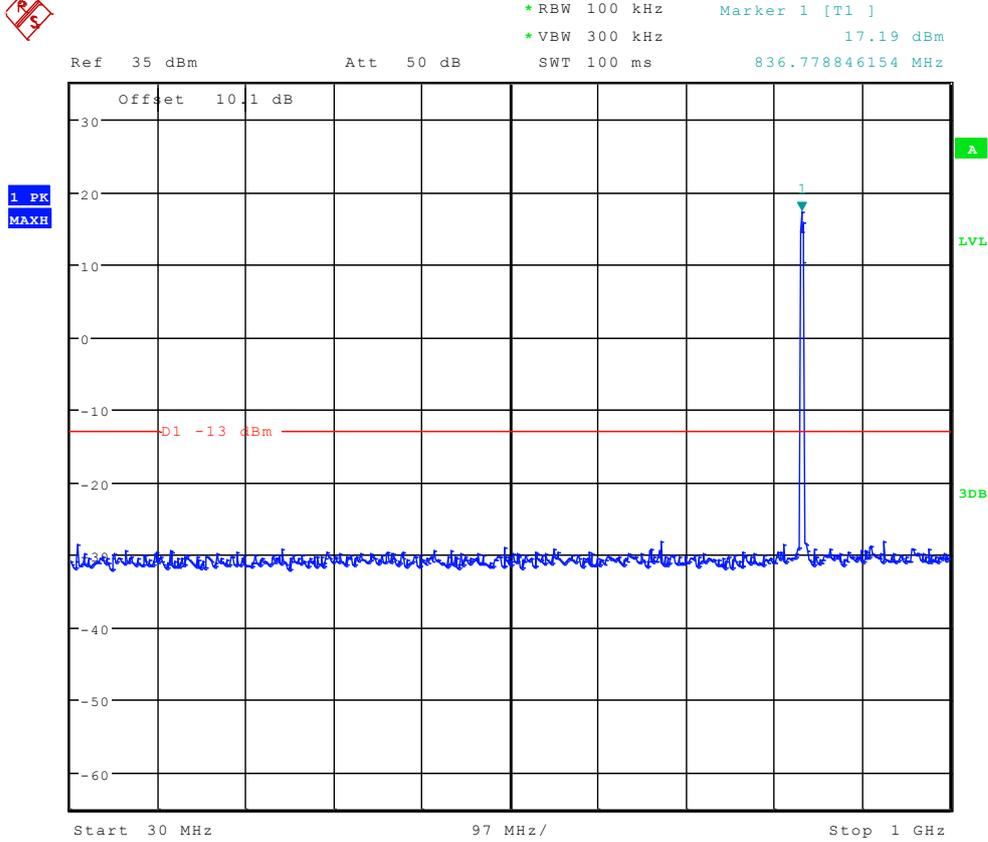
\*RBW 1 kHz      Marker 1 [T1 ]  
\*VBW 10 kHz      -33.92 dBm  
SWT 145 ms      11.259615385 kHz





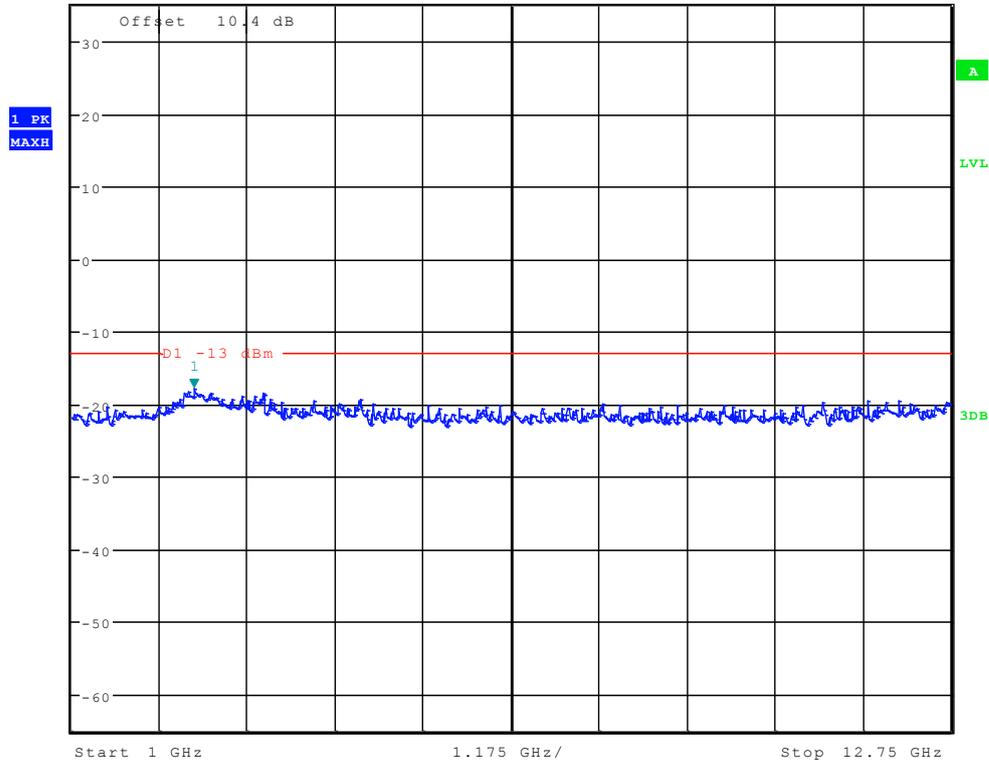
\*RBW 10 kHz      Marker 1 [T1 ]  
\*VBW 30 kHz      -30.46 dBm  
Ref 35 dBm      Att 55 dB      SWT 300 ms      197.836538462 kHz







\*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 3 MHz      -17.87 dBm  
Ref 35 dBm      Att 50 dB      SWT 70 ms      2.638221154 GHz

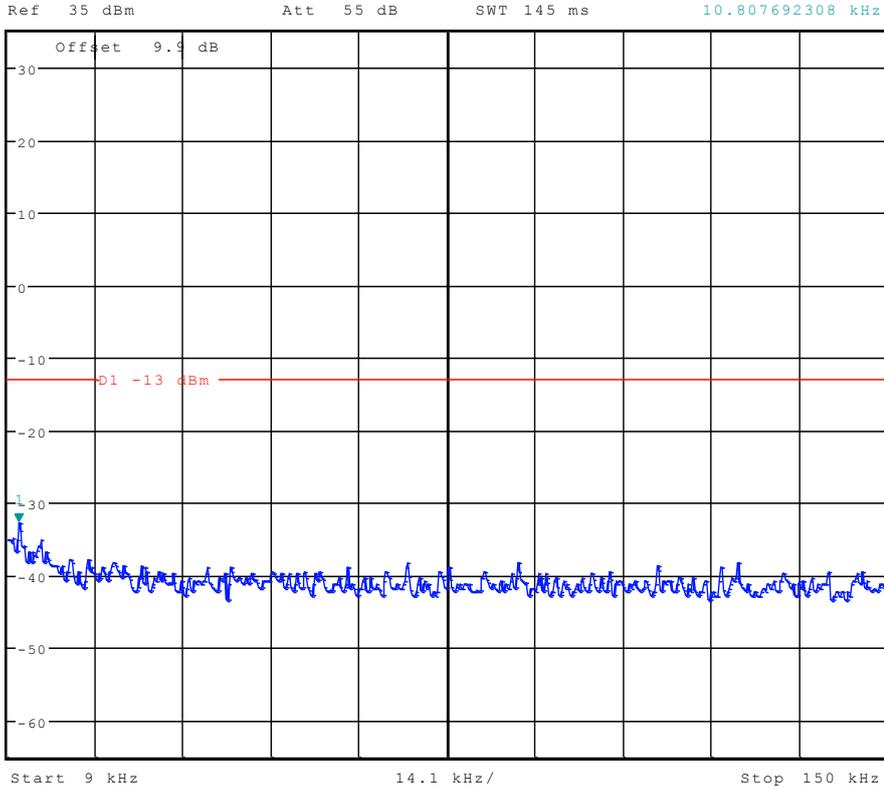




# Channel 4233



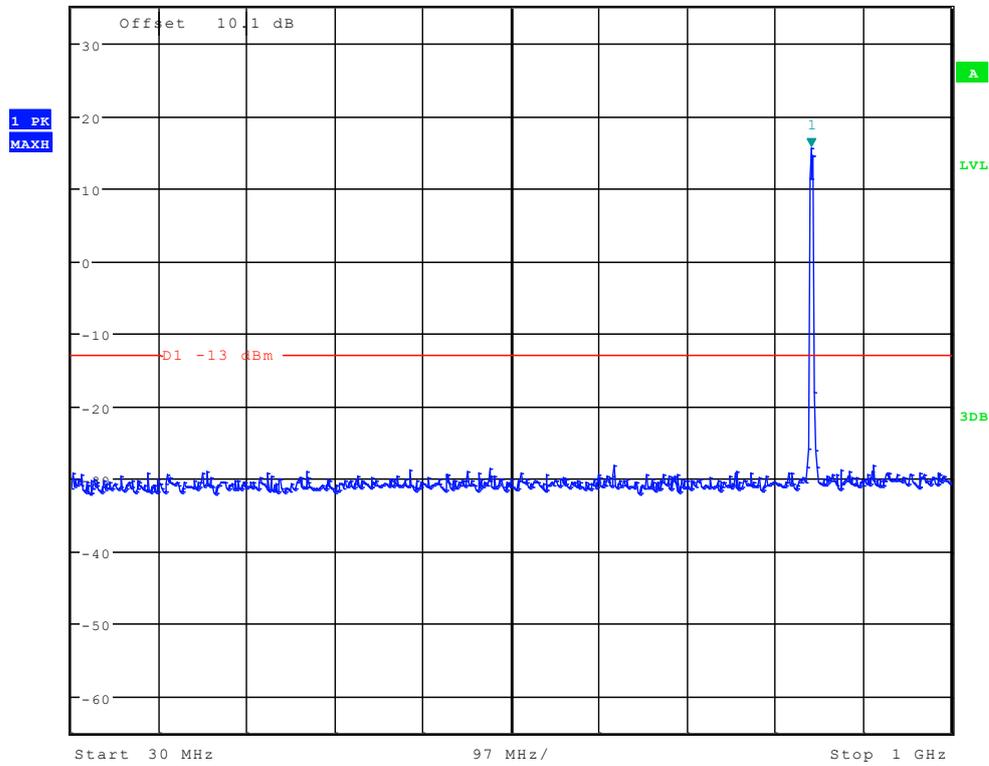
\*RBW 1 kHz      Marker 1 [T1 ]  
\*VBW 10 kHz      -32.66 dBm  
SWT 145 ms      10.807692308 kHz





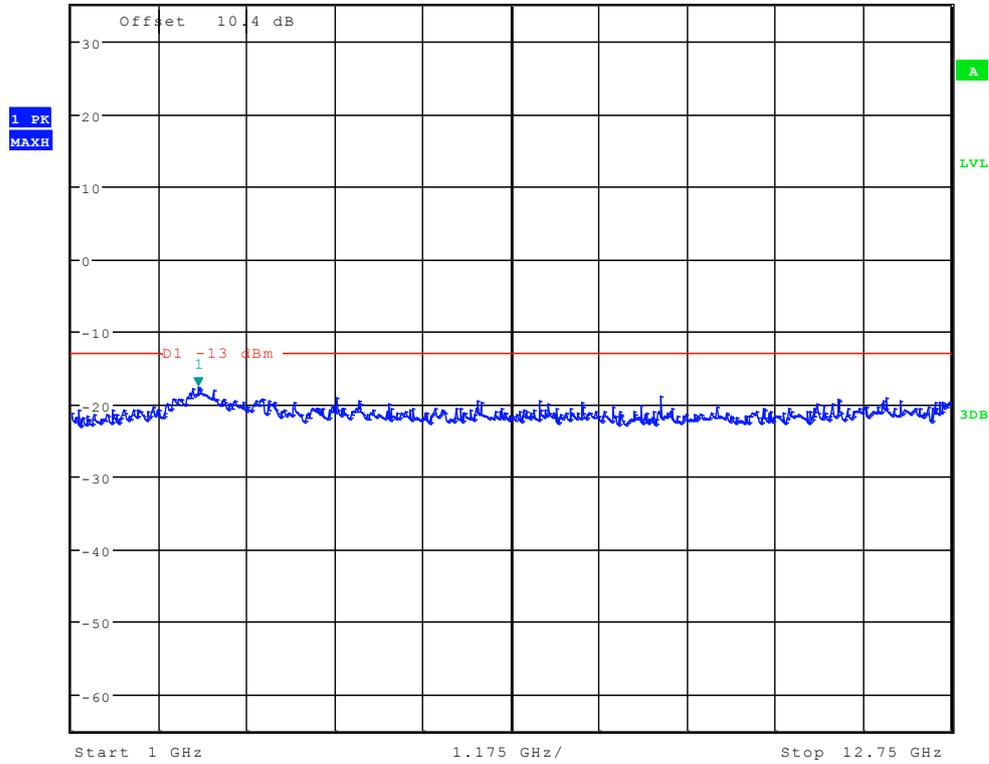


Ref 35 dBm Att 50 dB SWT 100 ms  
\*RBW 100 kHz Marker 1 [T1 ] 15.58 dBm  
\*VBW 300 kHz 846.105769231 MHz





Ref 35 dBm      Att 50 dB      SWT 70 ms      Marker 1 [T1]      -17.61 dBm  
\*RBW 1 MHz      \*VBW 3 MHz      2.694711538 GHz



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



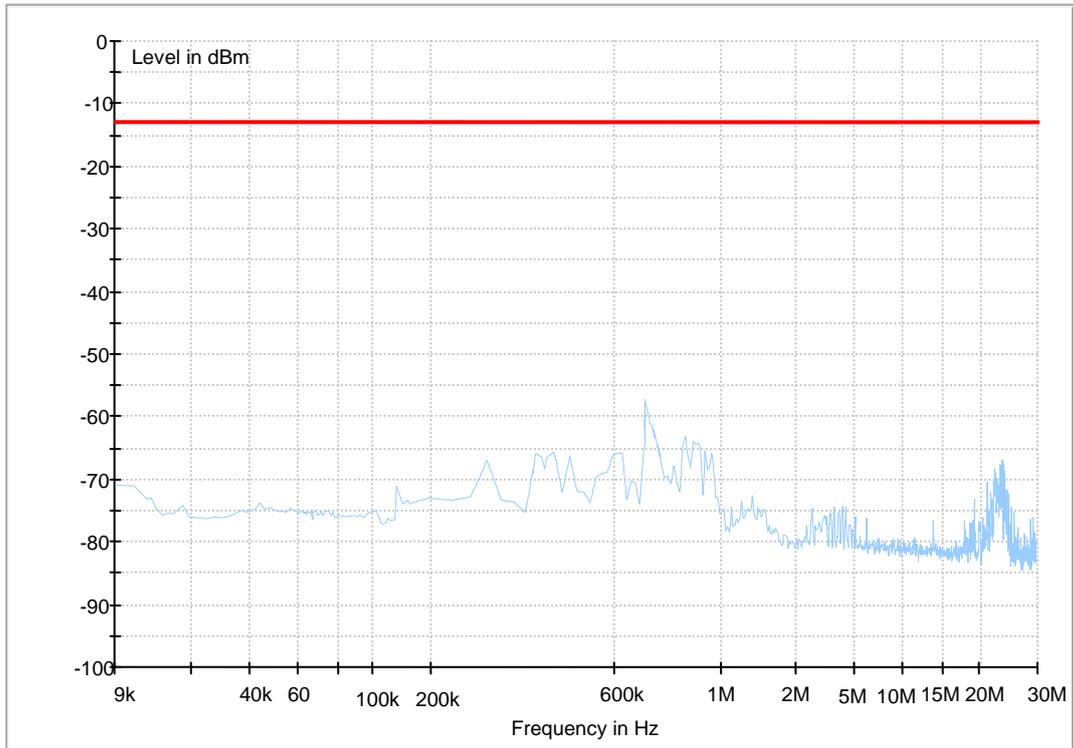
# Appendix F

## Radiated spurious emission

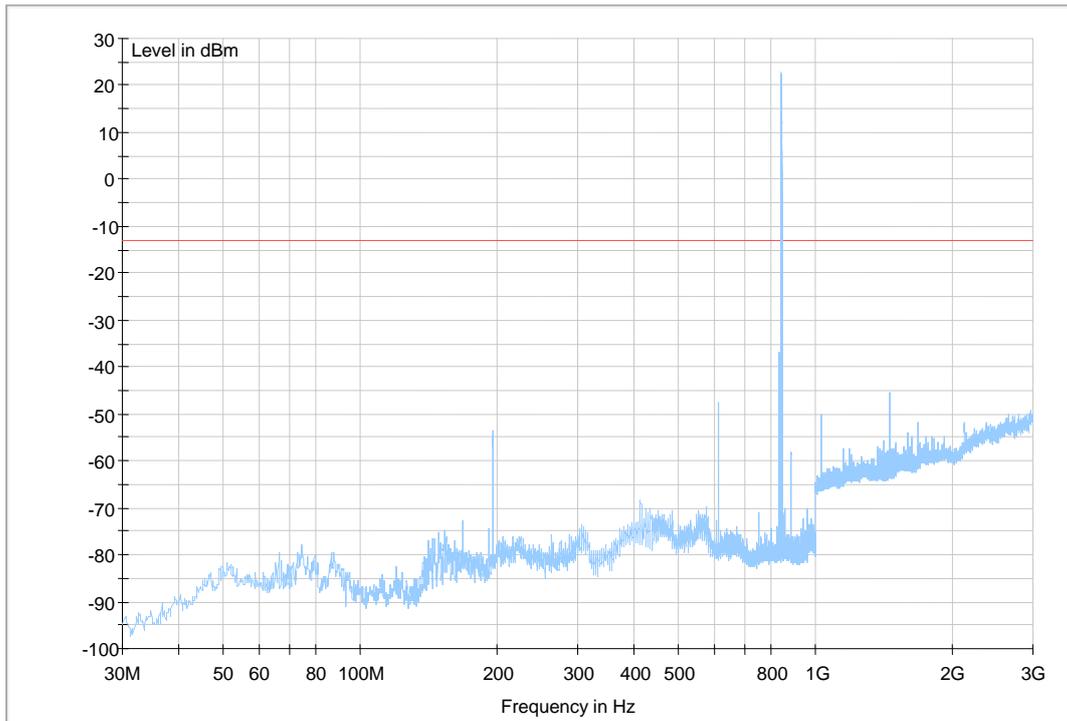
According to FCC Part 2.1053& Part 22.917

## GPRS 850

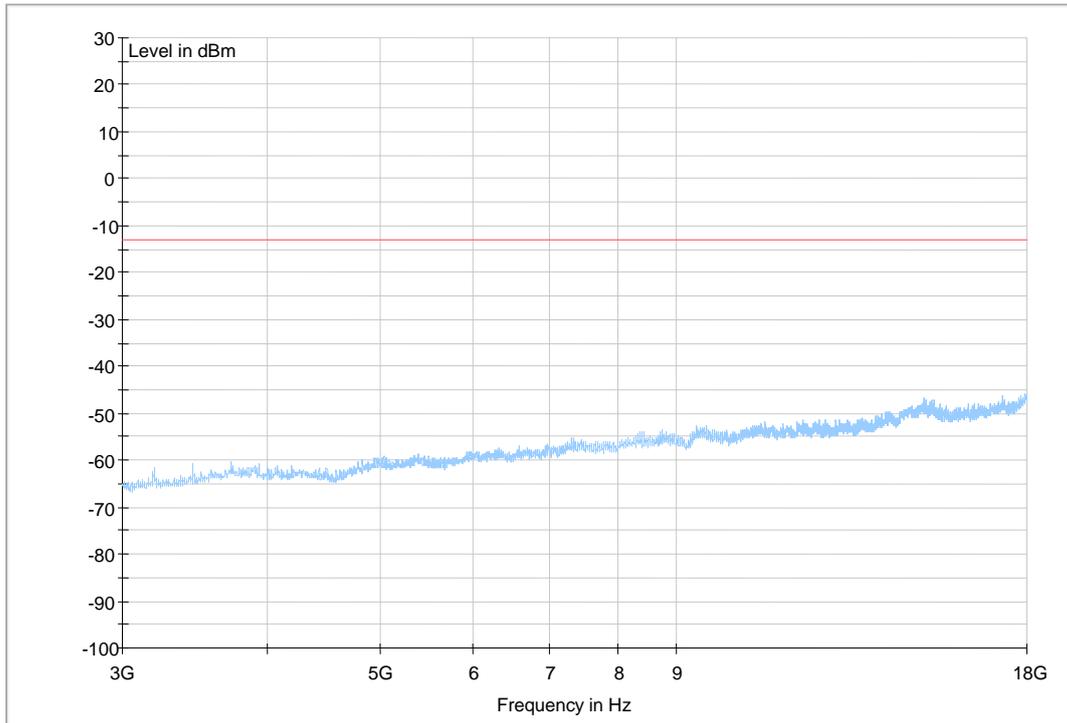
(9kHz~30MHz)



(30MHz~3GHz)

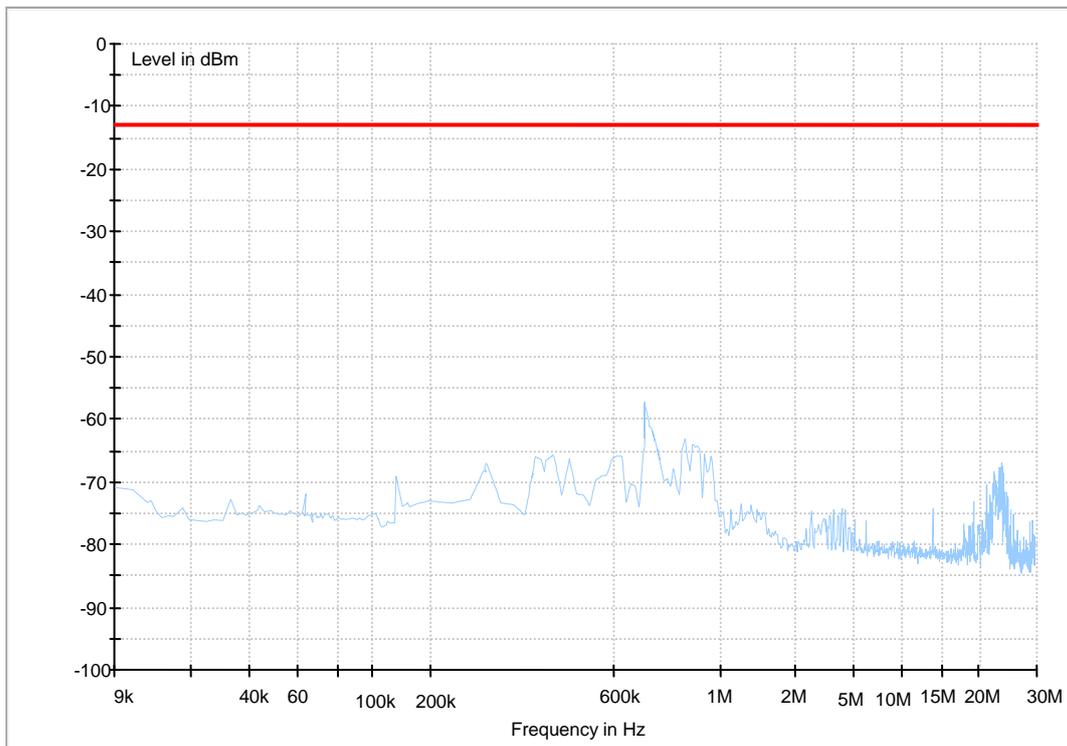


(3GHz~18GHz)

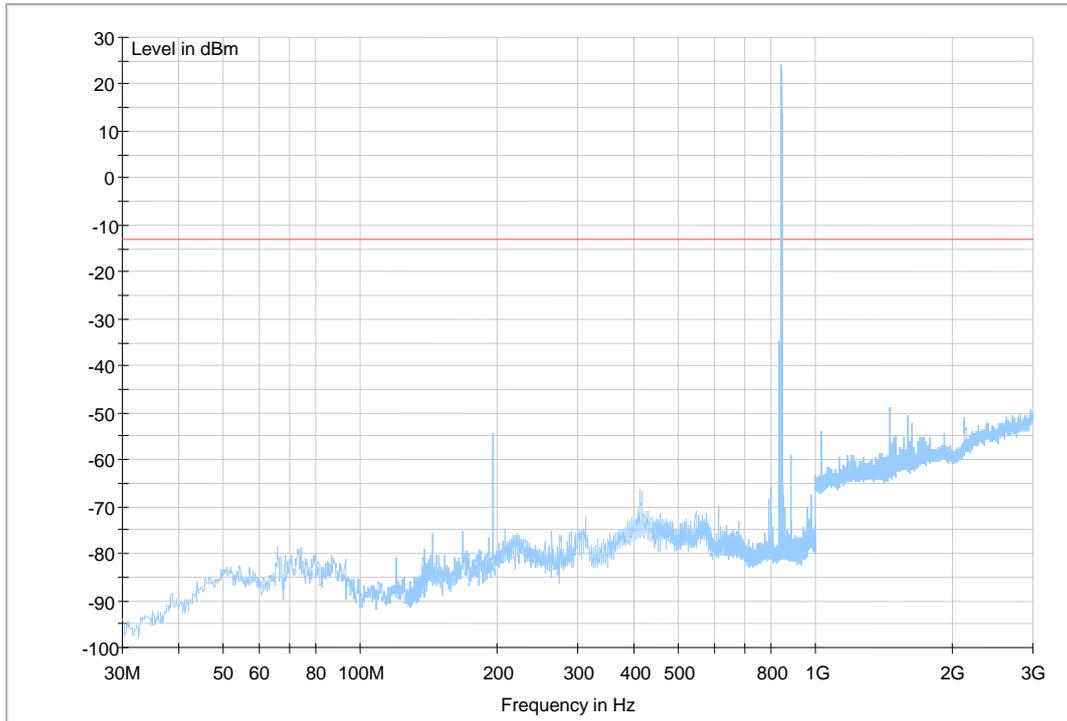


EDGE 850

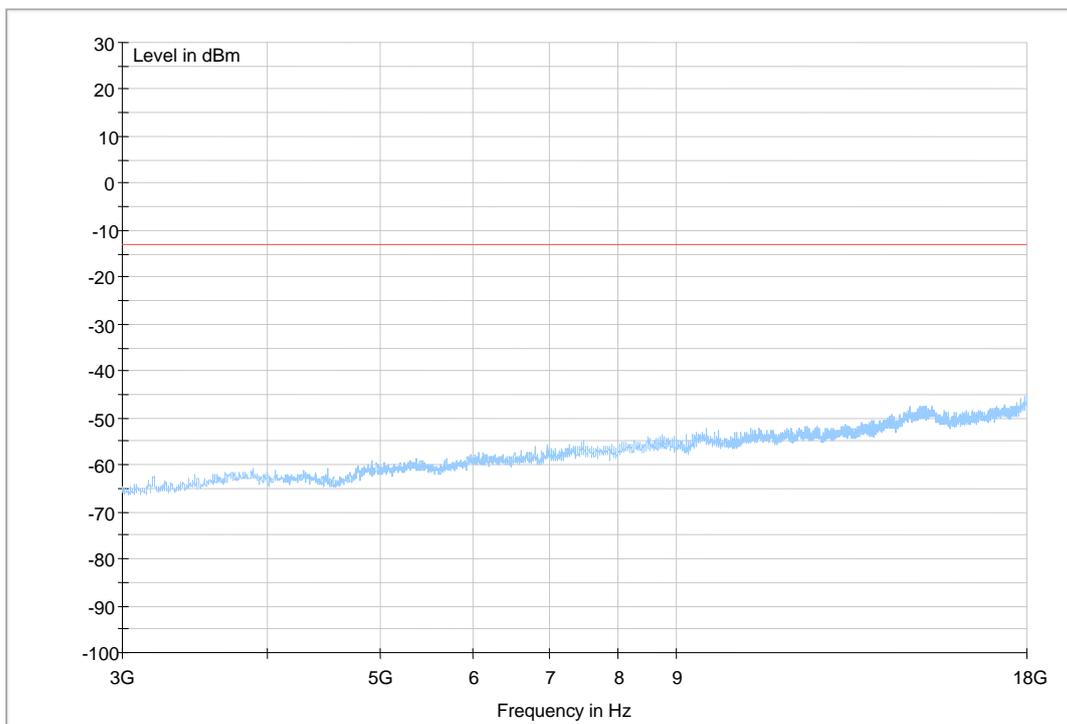
(9kHz~30MHz)



(30MHz~3GHz)

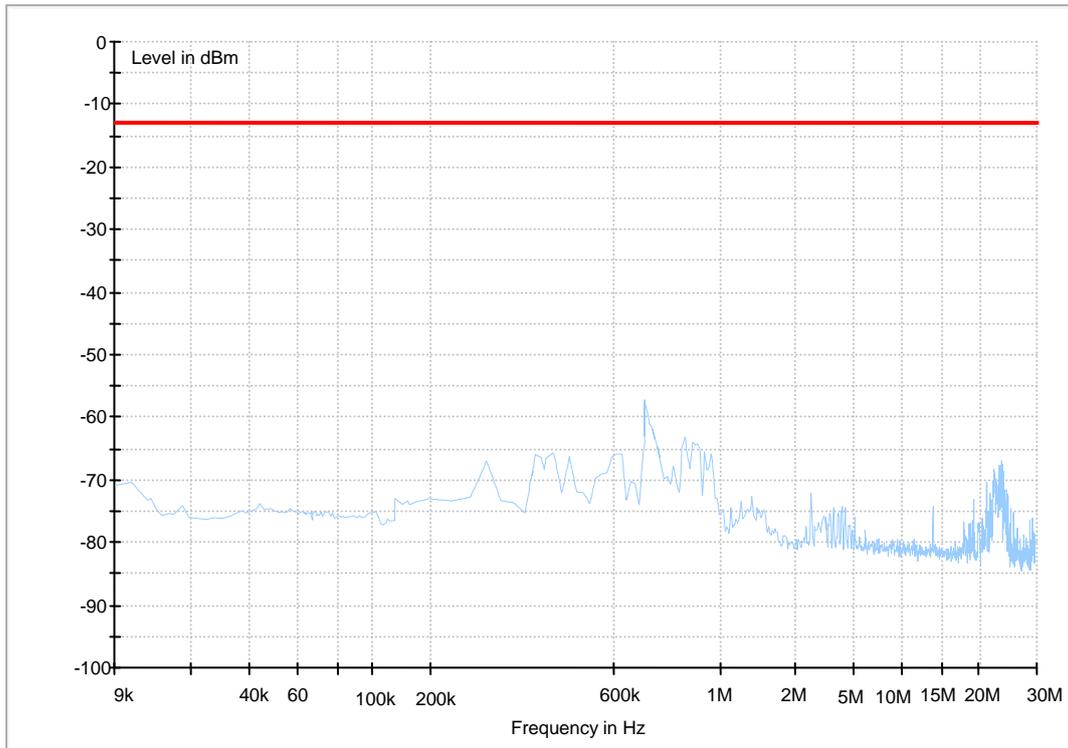


(3GHz~18GHz)

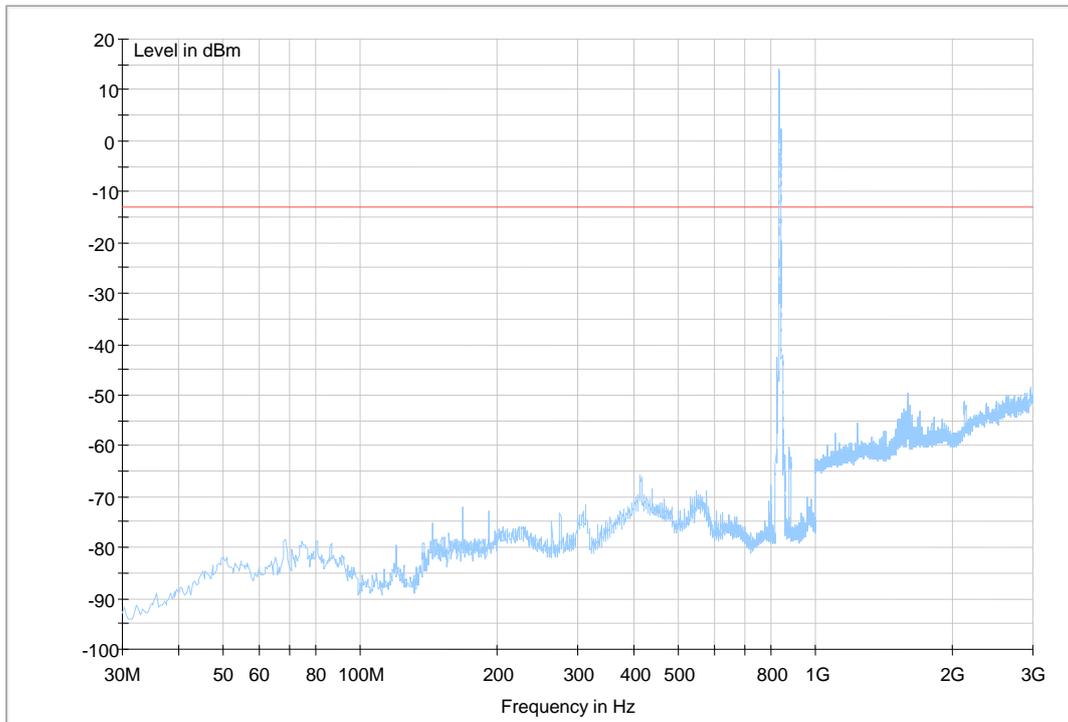


### WCDMA Band V

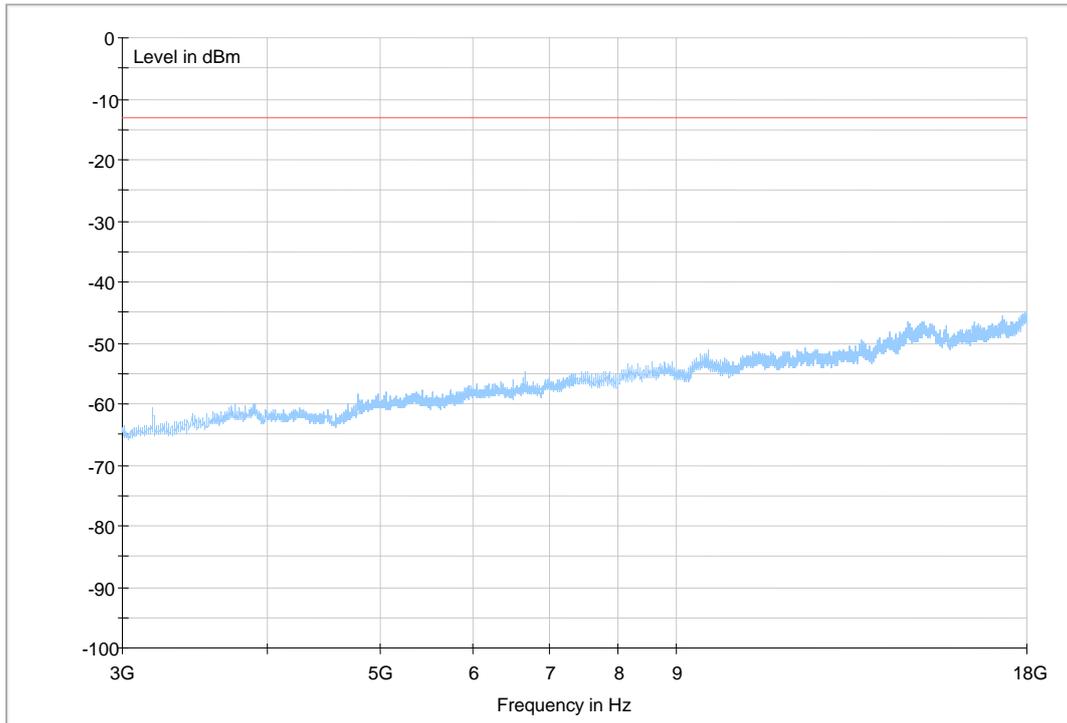
(9KHz~30MHz)



(30MHz~3GHz)

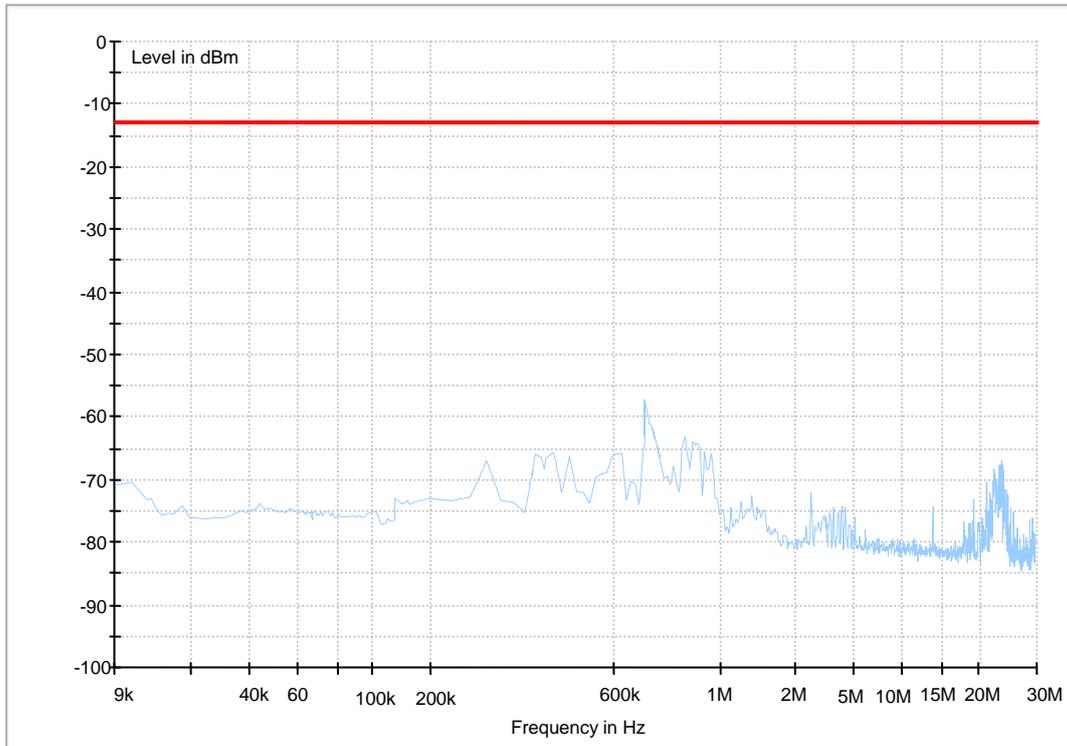


(3GHz~18GHz)

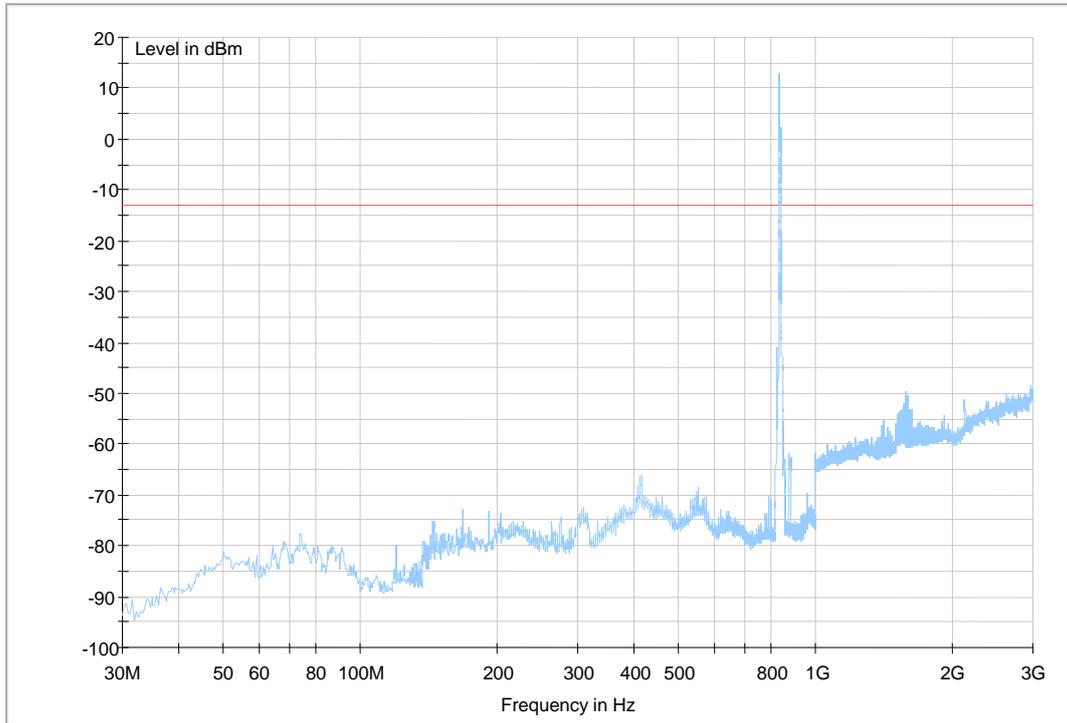


HSDPA Band V

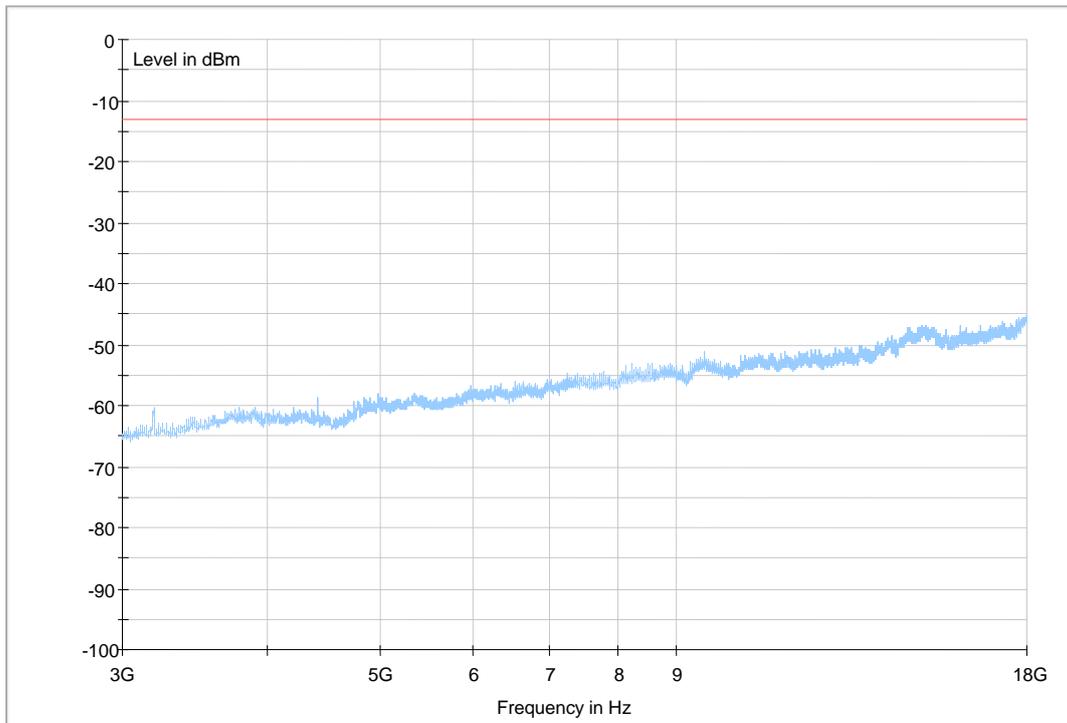
(9KHz~30MHz)



(30MHz~3GHz)

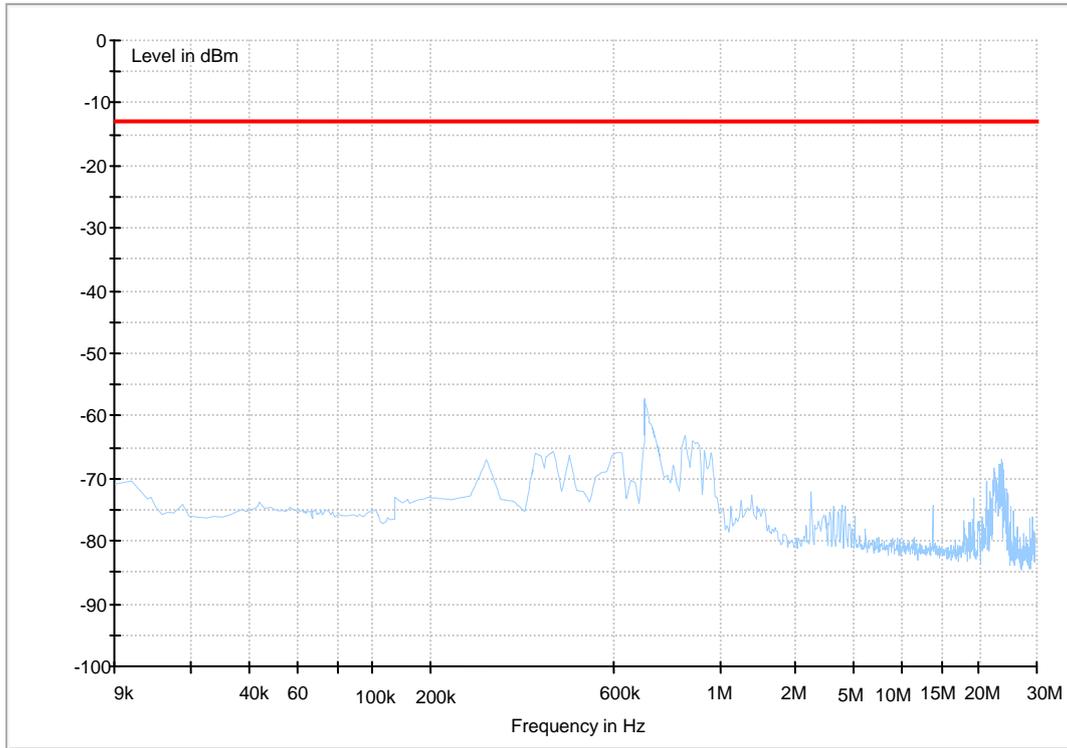


(3GHz~18GHz)

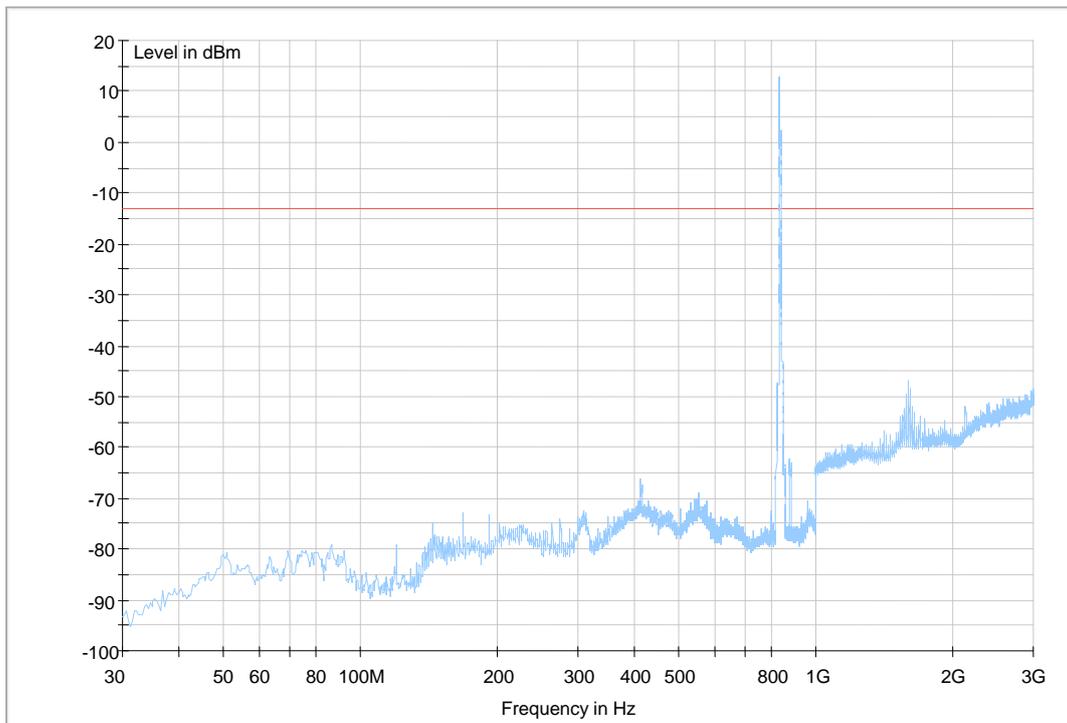


### HSUPA Band V

(9KHz~30MHz)

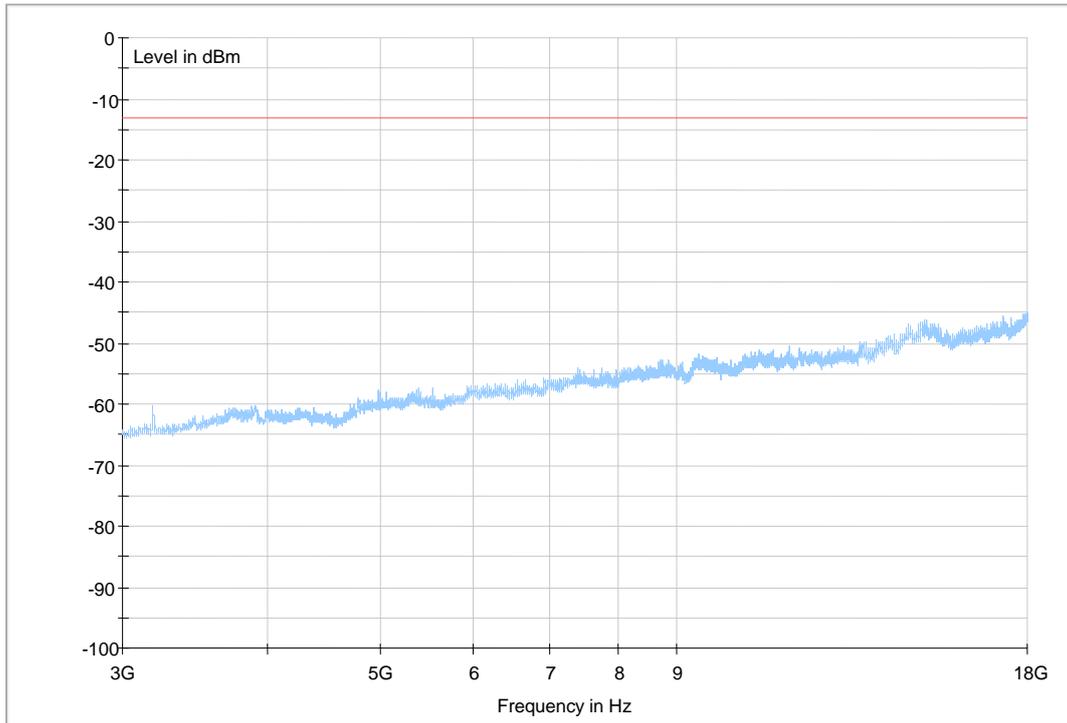


(30MHz~3GHz)





(3GHz~18GHz)



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



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# 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	-15	-0.0179	---	±2.5	Pass
			-20 °C	-10	-0.0119	---	±2.5	Pass
			-10 °C	20	0.0239	---	±2.5	Pass
			0 °C	18	0.0215	---	±2.5	Pass
			10 °C	-11	-0.0131	---	±2.5	Pass
			20 °C	-16	-0.0191	---	±2.5	Pass
			30 °C	15	0.0179	---	±2.5	Pass
			40 °C	17	0.0203	---	±2.5	Pass
			50 °C	16	0.0191	---	±2.5	Pass
TM 2	M	VN	-30 °C	14	0.0167	---	±2.5	Pass
			-20 °C	-15	-0.0179	---	±2.5	Pass
			-10 °C	13	0.0155	---	±2.5	Pass
			0 °C	18	0.0215	---	±2.5	Pass
			10 °C	-19	-0.0227	---	±2.5	Pass
			20 °C	-13	-0.0155	---	±2.5	Pass
			30 °C	-10	-0.0119	---	±2.5	Pass
			40 °C	18	0.0215	---	±2.5	Pass
			50 °C	21	0.0251	---	±2.5	Pass
TM 3	M	VN	-30 °C	13	0.0155	---	±2.5	Pass
			-20 °C	-8	-0.0096	---	±2.5	Pass
			-10 °C	18	0.0215	---	±2.5	Pass
			0 °C	16	0.0191	---	±2.5	Pass
			10 °C	-14	-0.0167	---	±2.5	Pass
			20 °C	15	0.0179	---	±2.5	Pass
			30 °C	-11	-0.0132	---	±2.5	Pass
			40 °C	-15	-0.0179	---	±2.5	Pass
			50 °C	16	0.0191	---	±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	17	0.0203	---	±2.5	Pass
			VN	-15	-0.0179	---	±2.5	Pass
			VH	13	0.0155	---	±2.5	Pass
TM 2	M	TN	VL	20	0.0239	---	±2.5	Pass
			VN	-17	-0.0203	---	±2.5	Pass
			VH	22	0.0263	---	±2.5	Pass
TM 3	M	TN	VL	12	0.0143	---	±2.5	Pass
			VN	21	0.0251	---	±2.5	Pass
			VH	-13	-0.0155	---	±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-----