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# Appendix A

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



## Conducted Power of Transmitter

Table 1 Measurement Results

		RF Output Power (Conducted)					
TEST CONDITIONS		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		32.27	38.33	32.28	38.33	32.20	38.33
TM2		26.52	38.33	26.49	38.33	26.50	38.33
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	Measured	Limit
TM3		22.21	38.33	22.24	38.33	22.28	38.33
TM4	Case1	22.26	38.33	22.33	38.33	22.27	38.33
	Case2	22.21	38.33	22.31	38.33	22.26	38.33
	Case3	21.44	38.33	21.6	38.33	21.53	38.33
	Case4	21.34	38.33	21.63	38.33	21.47	38.33
TM5	Case1	21.58	38.33	21.42	38.33	21.5	38.33
	Case2	20.25	38.33	20.61	38.33	20.31	38.33
	Case3	20.87	38.33	20.72	38.33	20.85	38.33
	Case4	20.27	38.33	20.52	38.33	20.35	38.33
	Case5	21.54	38.33	21.94	38.33	21.52	38.33



## Effective Radiated Power of Transmitter (ERP)

Table 2 Substitution Results

Test Mode	Freq. [MHz]	Meas. Level [dBm]	Substitution Antenna Type	SGP [dBm]	Substitution Gain [dBd]	Cable Loss [dB]	Substitution Level (ERP) [dBm]	FCC limit [dBm]	Result
TM1	824.2	32.44	Dipole Ant.	35.81	-2.75	0.6	32.46	38.5	Pass
TM1	837.0	32.35	Dipole Ant.	35.81	-2.87	0.6	32.34	38.5	Pass
TM1	848.8	32.37	Dipole Ant.	35.84	-2.85	0.6	32.39	38.5	Pass
TM2	824.2	26.69	Dipole Ant.	30.03	-2.75	0.6	26.68	38.5	Pass
TM2	837.0	26.66	Dipole Ant.	30.14	-2.87	0.6	26.67	38.5	Pass
TM2	848.8	26.67	Dipole Ant.	30.14	-2.85	0.6	26.69	38.5	Pass
TM3	826.4	22.38	Dipole Ant.	25.62	-2.75	0.6	22.27	38.5	Pass
TM3	836.4	22.41	Dipole Ant.	25.93	-2.87	0.6	22.46	38.5	Pass
TM3	846.6	22.45	Dipole Ant.	25.83	-2.85	0.6	22.38	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



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## Appendix B

# Modulation Characteristics

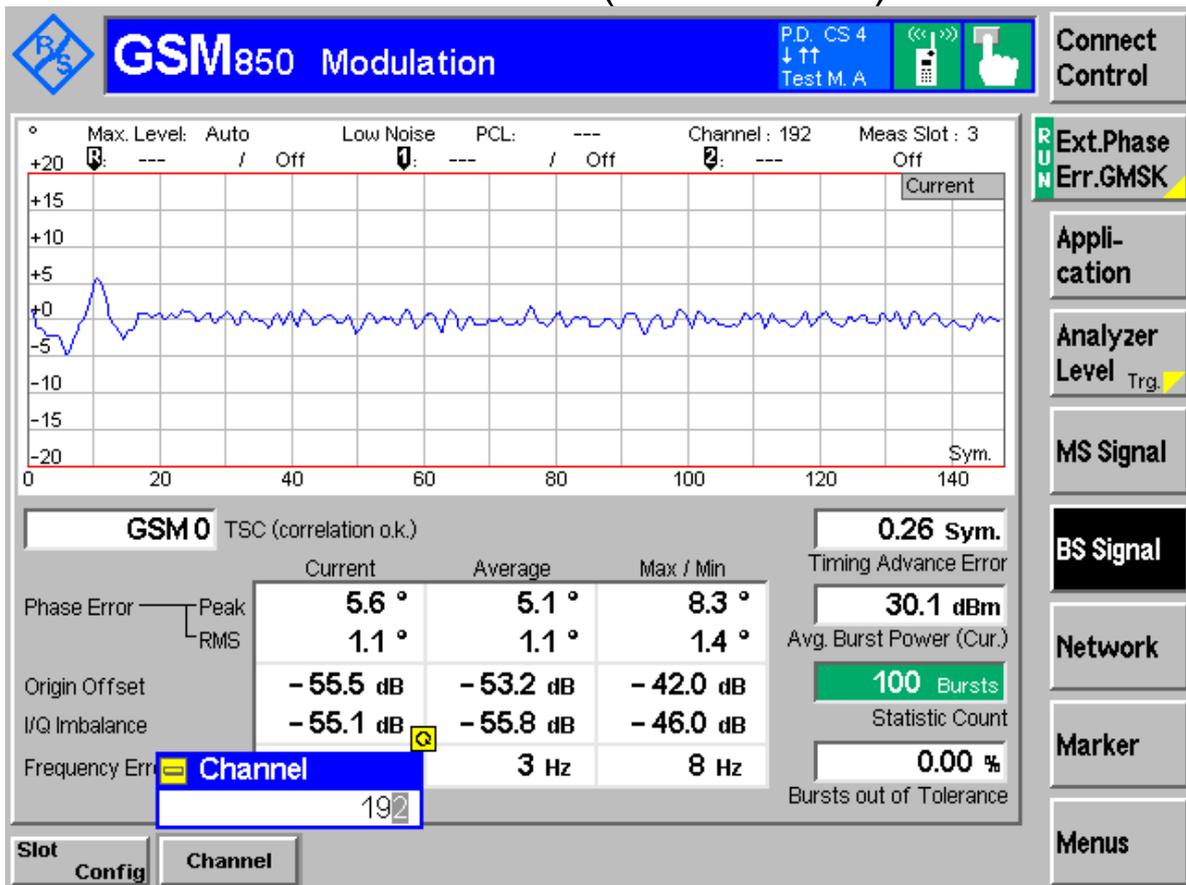
According to FCC Part 2.1047 & Part22 Subpart H



# 1 Test Plot

## 1.1 Test Mode = TM 1

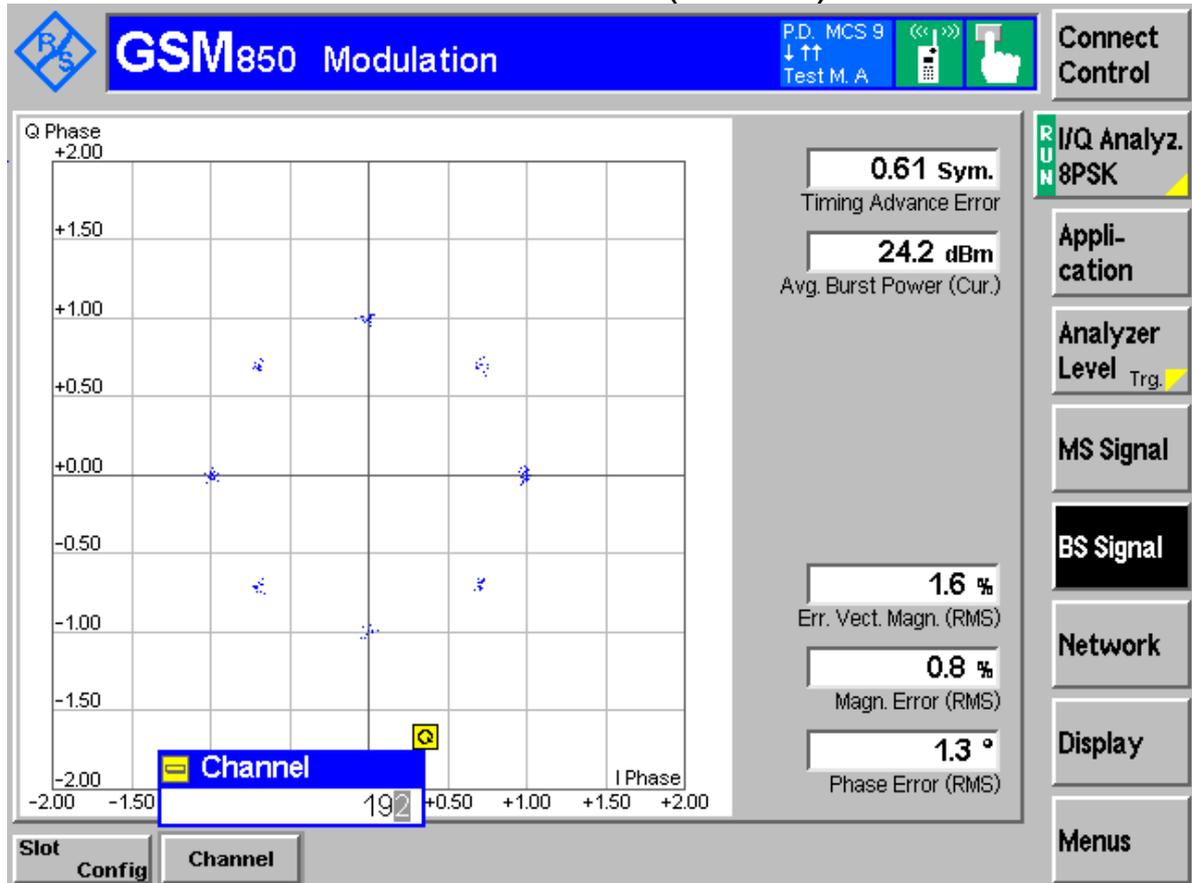
### Channel 192 (GPRS/GSM)





## 1.2 Test Mode = TM 2

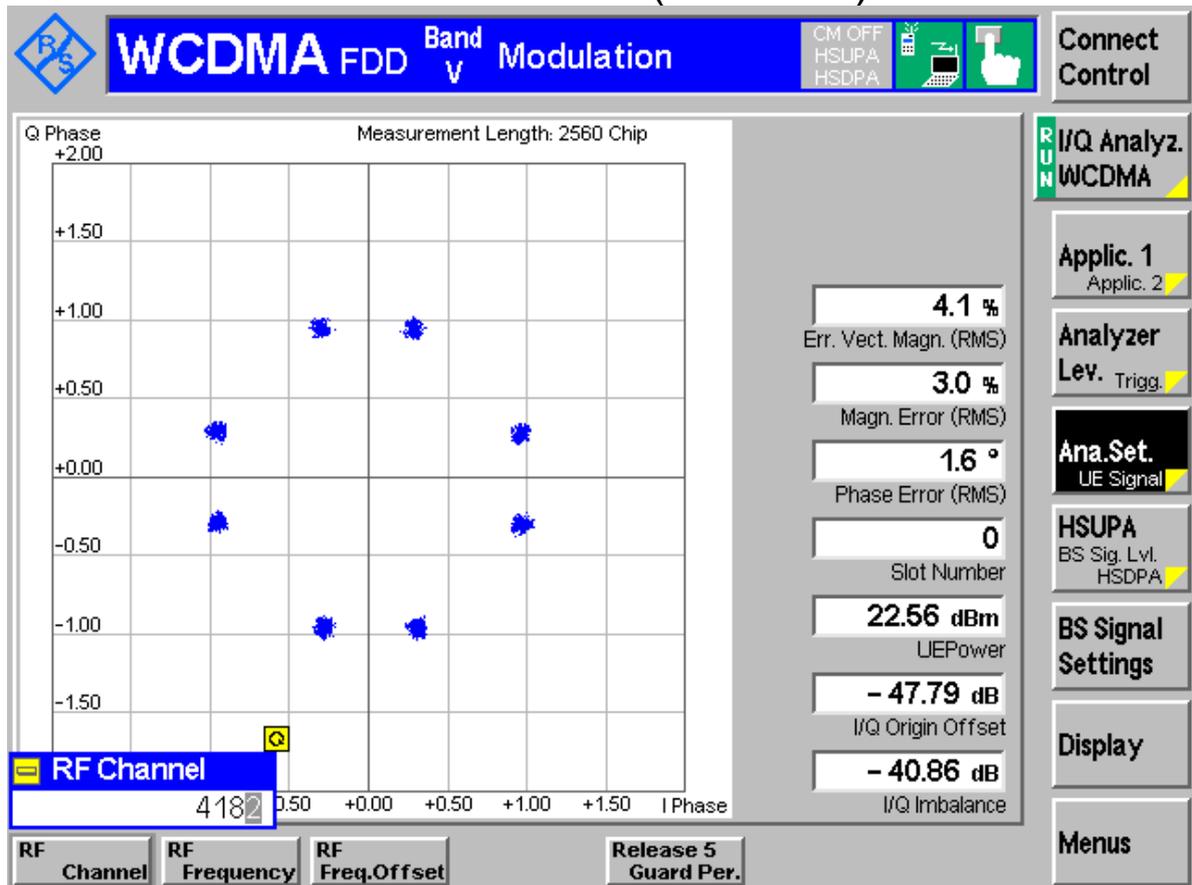
### Channel 192 (EDGE)





### 1.3 Test Mode = TM 3

## Channel 4182 (WCDMA)



END



## Appendix C

# Occupied Bandwidth

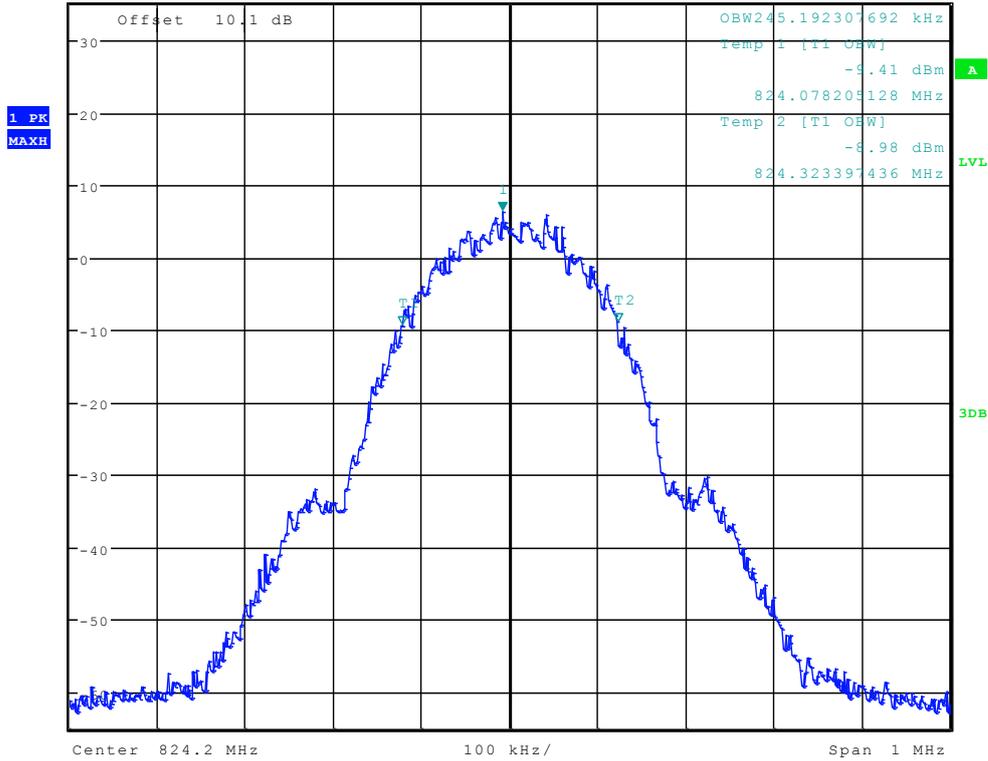
According to FCC Part 2.1049 & Part 22 Subpart H



# TM1:GPRS/GSM Channel 128

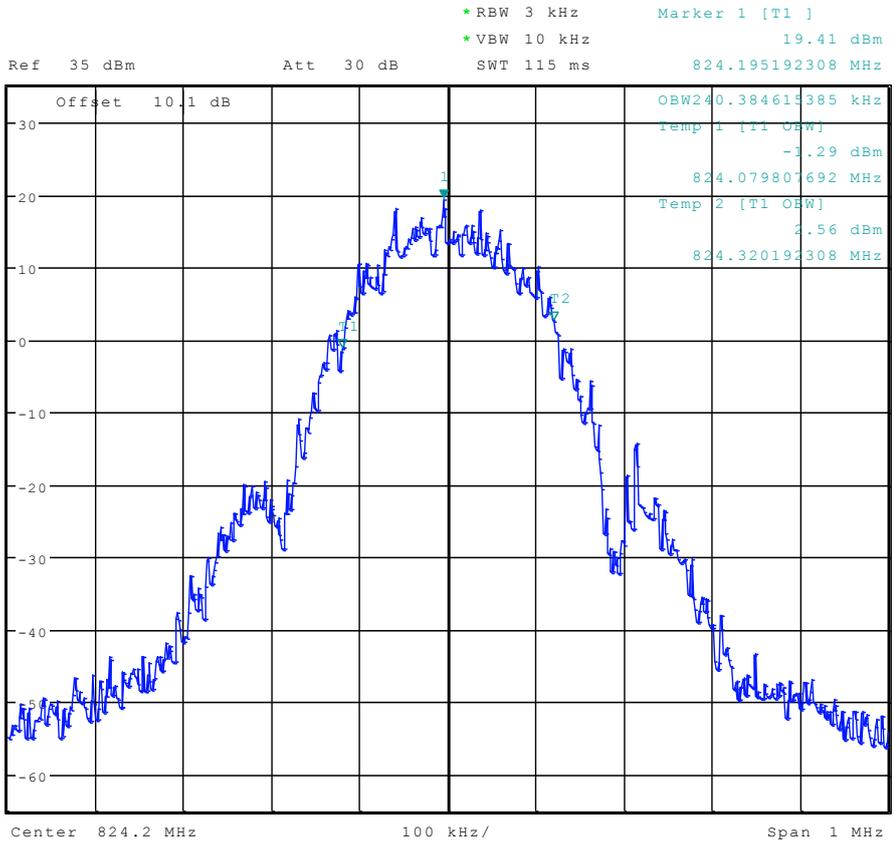


\*RBW 3 kHz      Marker 1 [T1 ]  
 \*VBW 10 kHz      6.37 dBm  
 Ref 35 dBm      Att 30 dB      SWT 115 ms      824.191987179 MHz



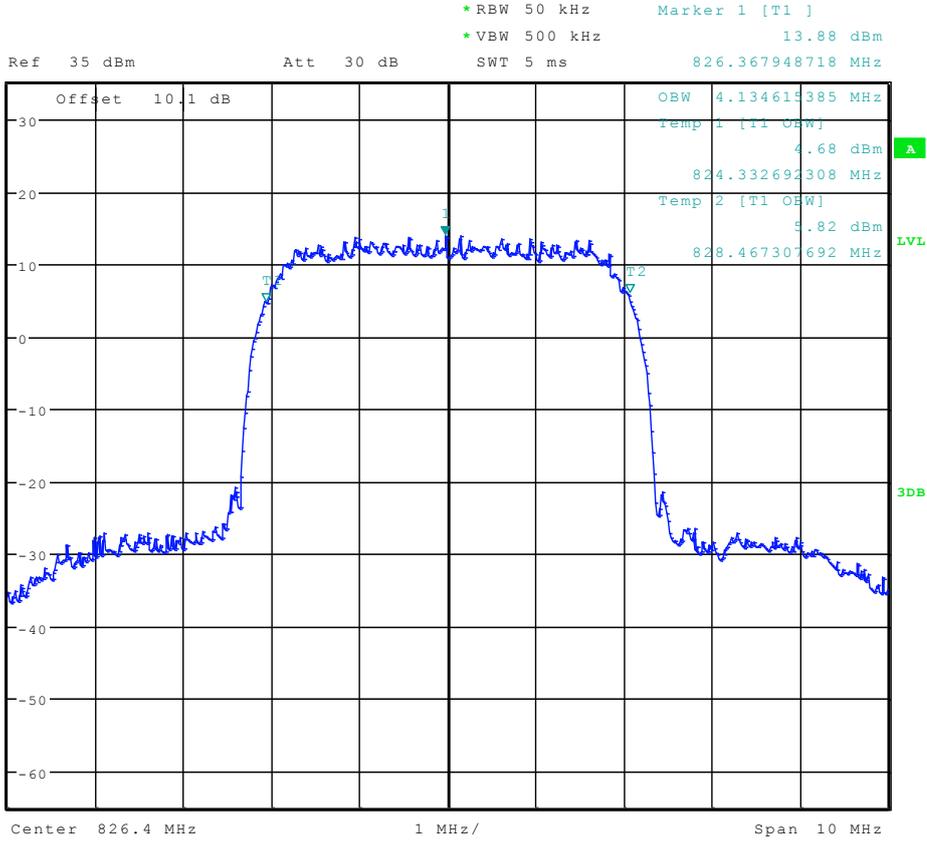


# TM2:EDGE Channel 128



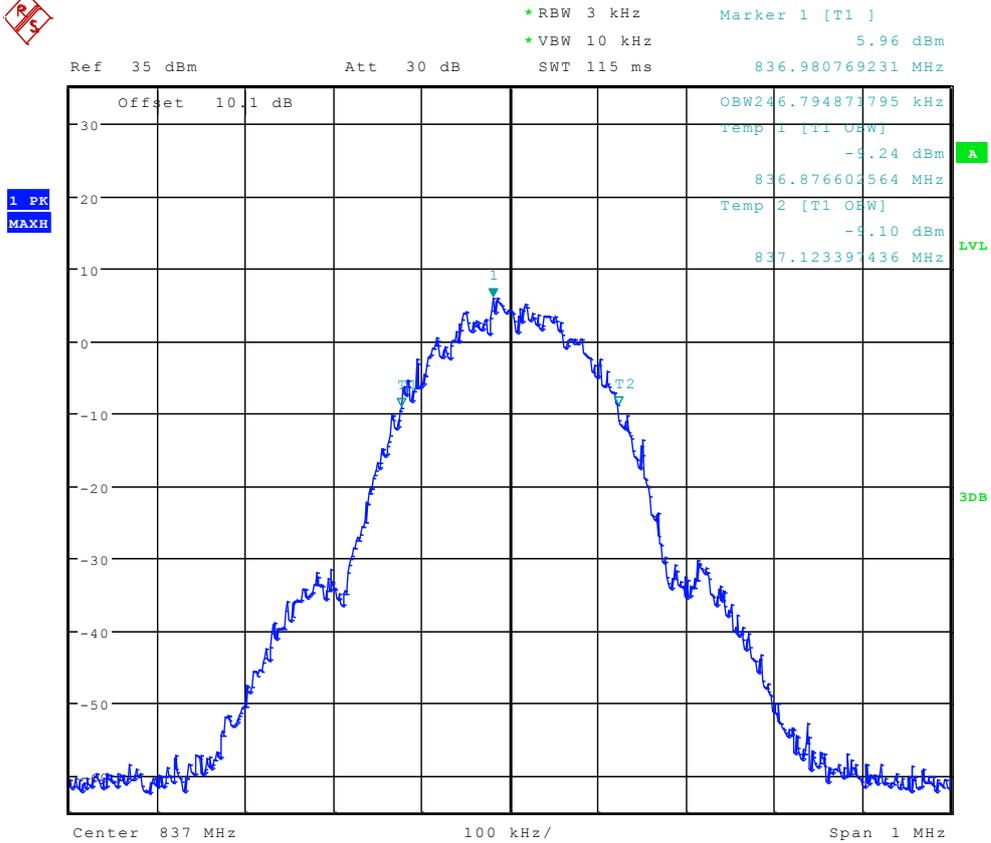


## TM3: WCDMA Channel 4132



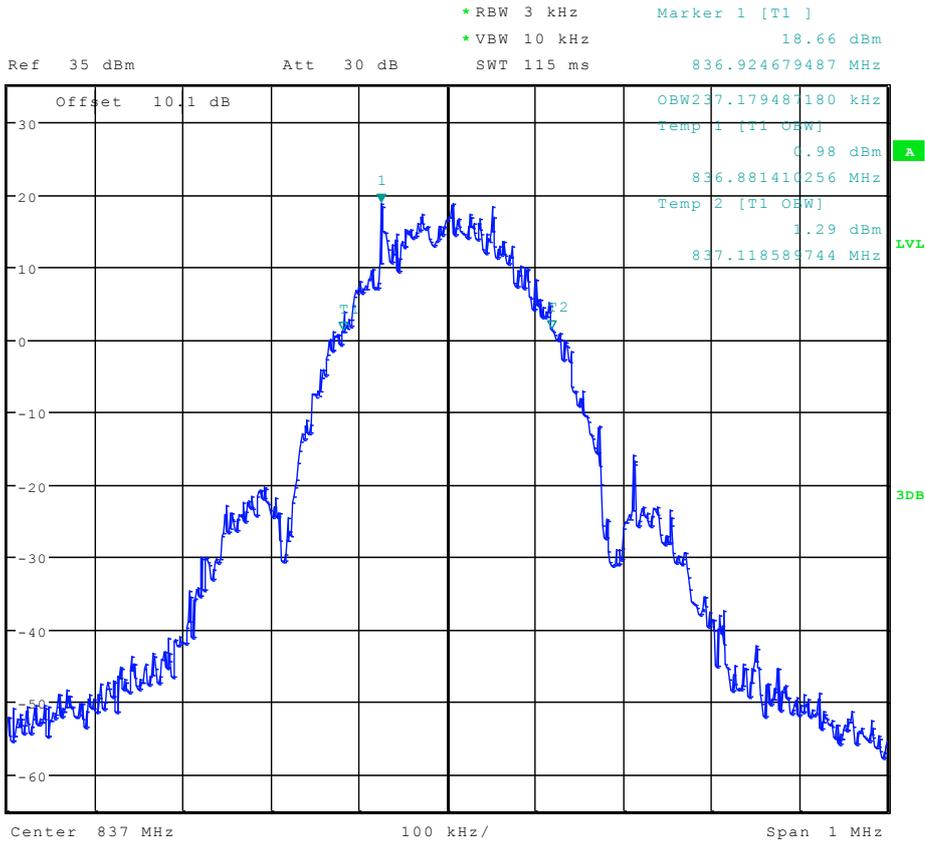


## TM1:GPRS/GSM Channel 192



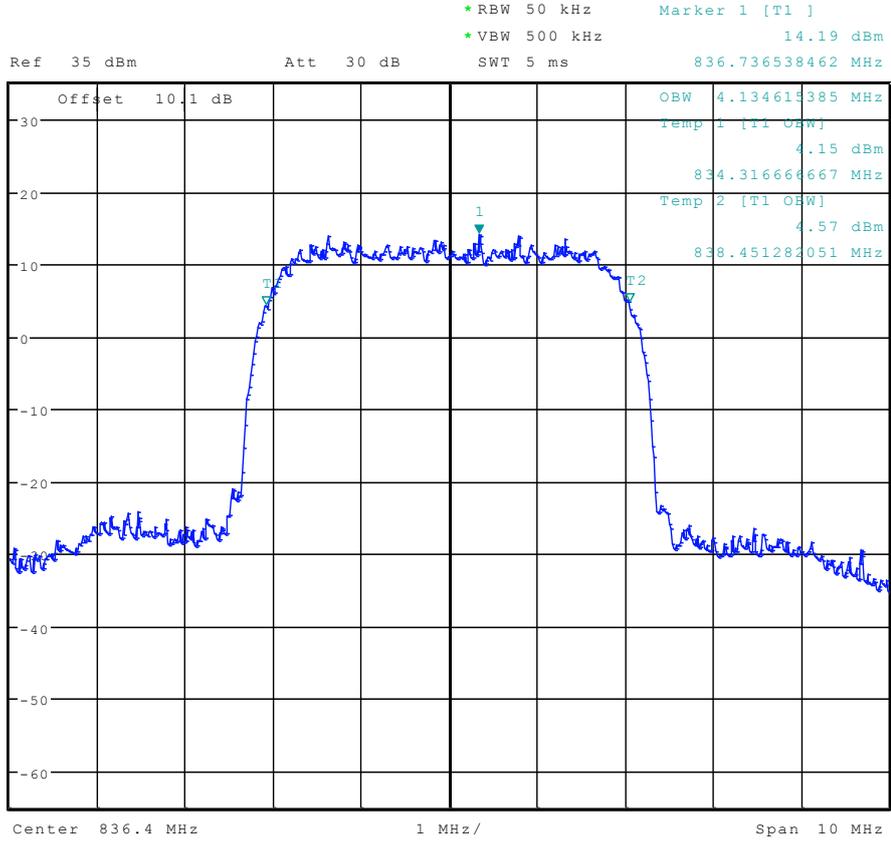


# TM2:EDGE Channel 192



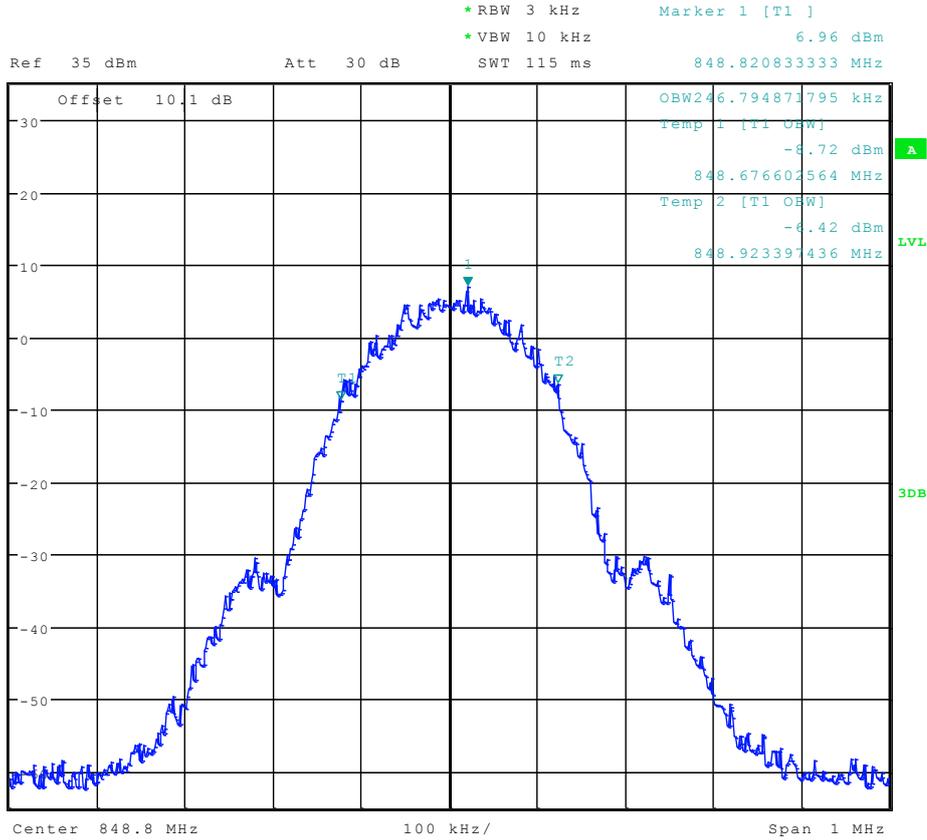


# TM3: WCDMA Channel 4182



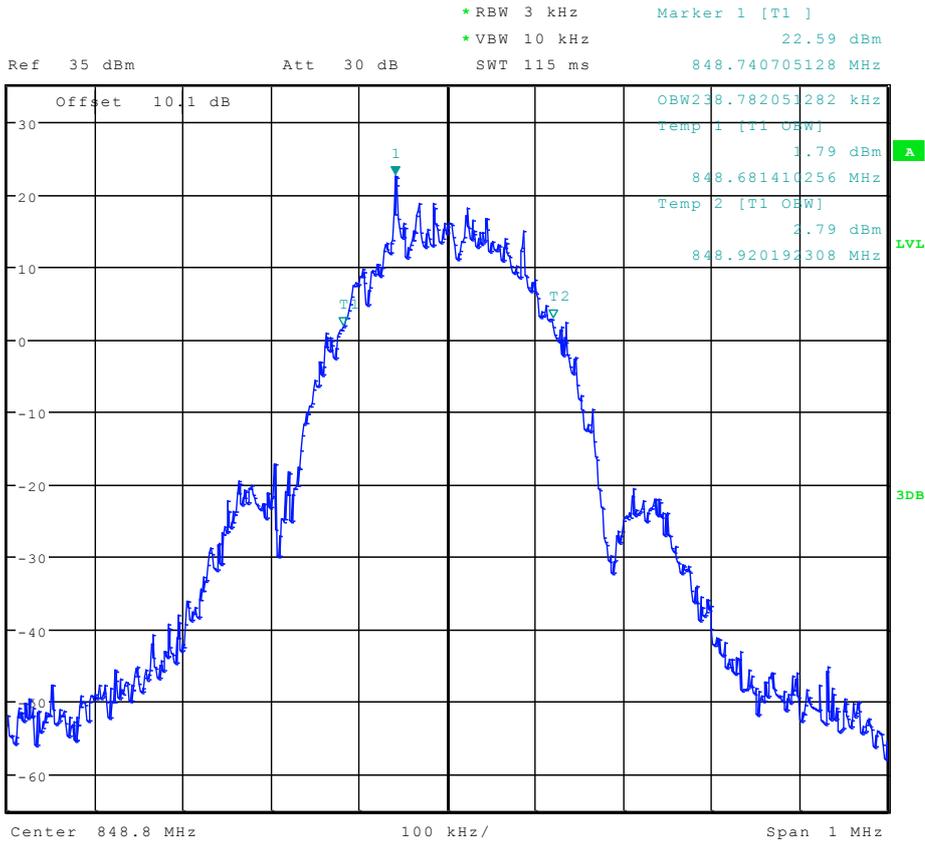


# TM1:GPRS/GSM Channel 251



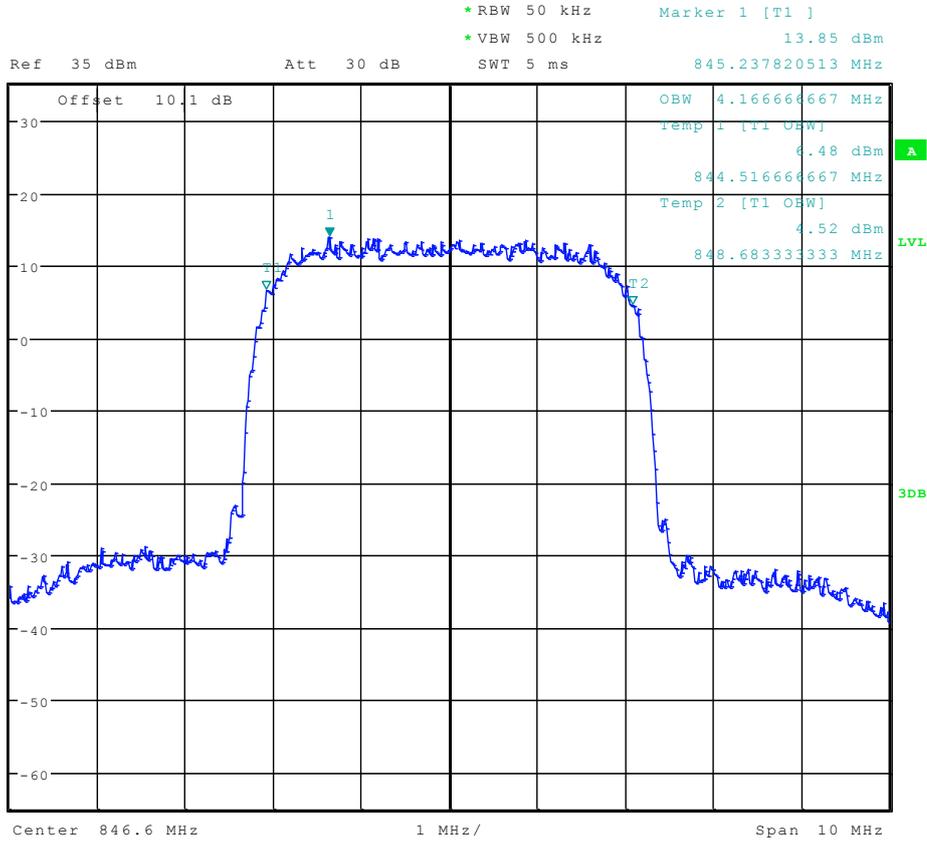


# TM2:EDGE Channel 251





# TM3: WCDMA Channel 4233



END



## Appendix D

# Band Edges Compliance

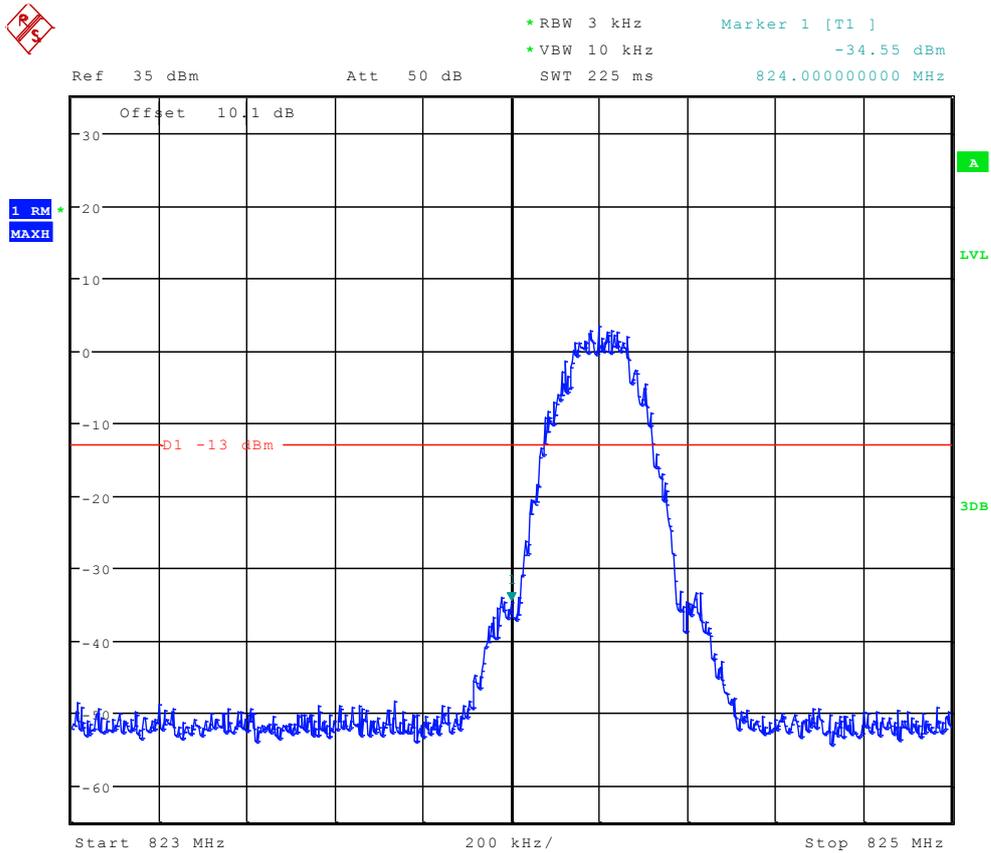
According to FCC Part 2.1051 & Part 22 Subpart H



# TM1:GPRS/GSM

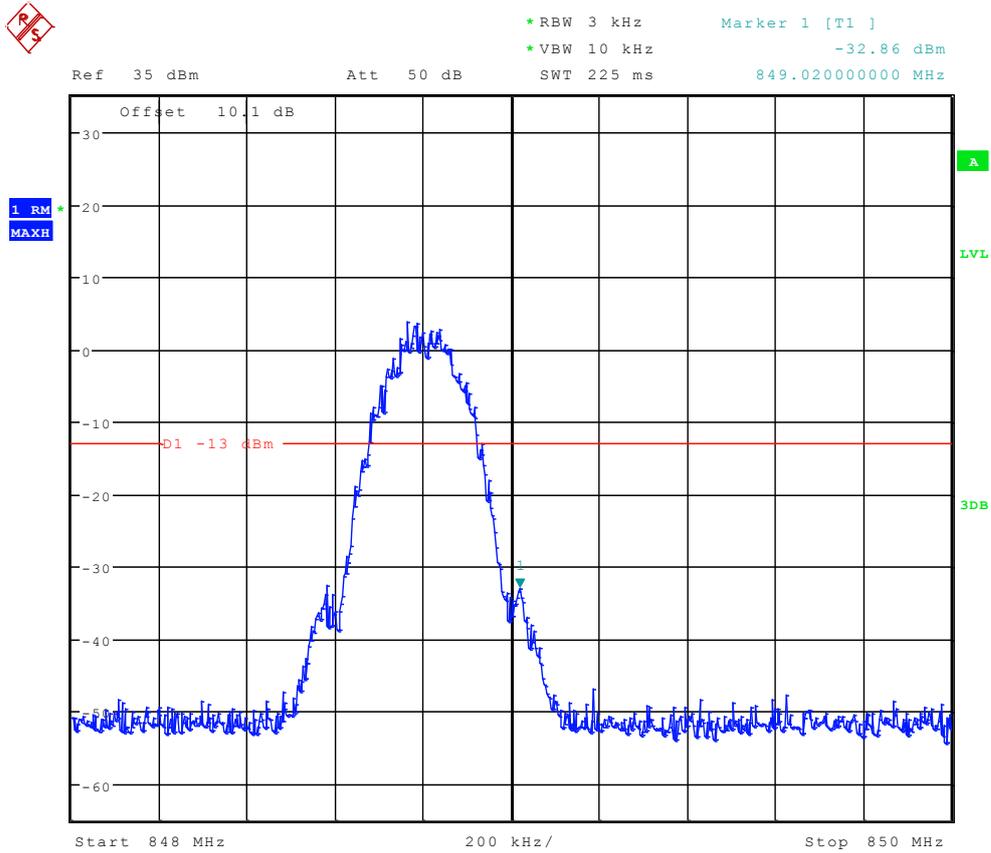
## Left Edge

### Channel 128





## Right Edge Channel 251

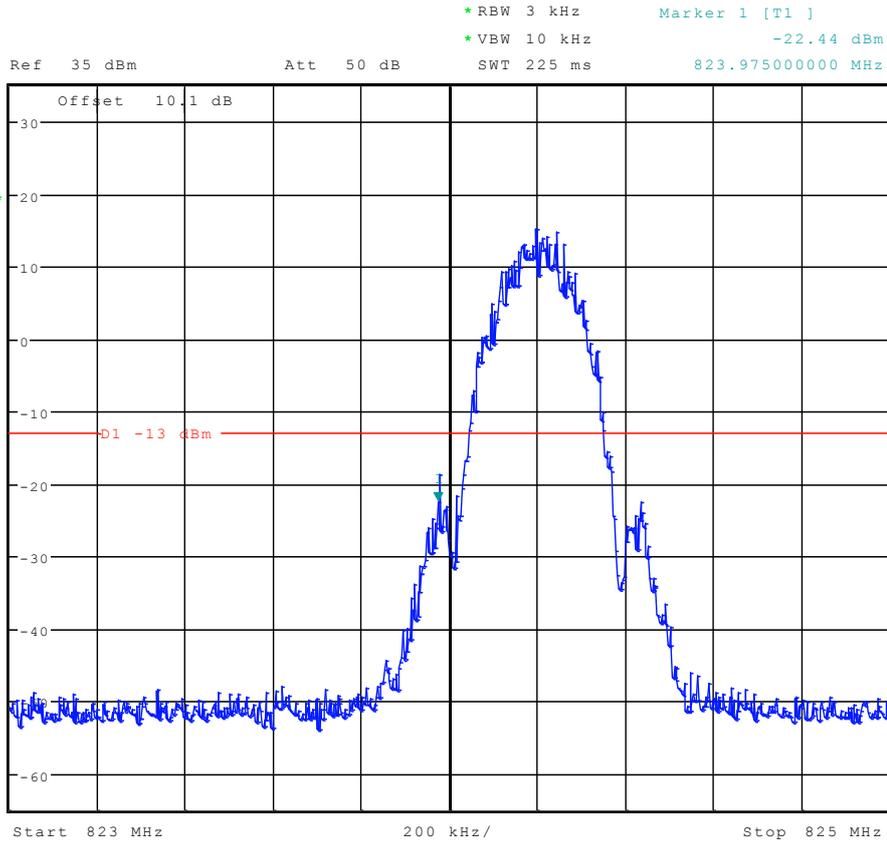




# TM2:EDGE

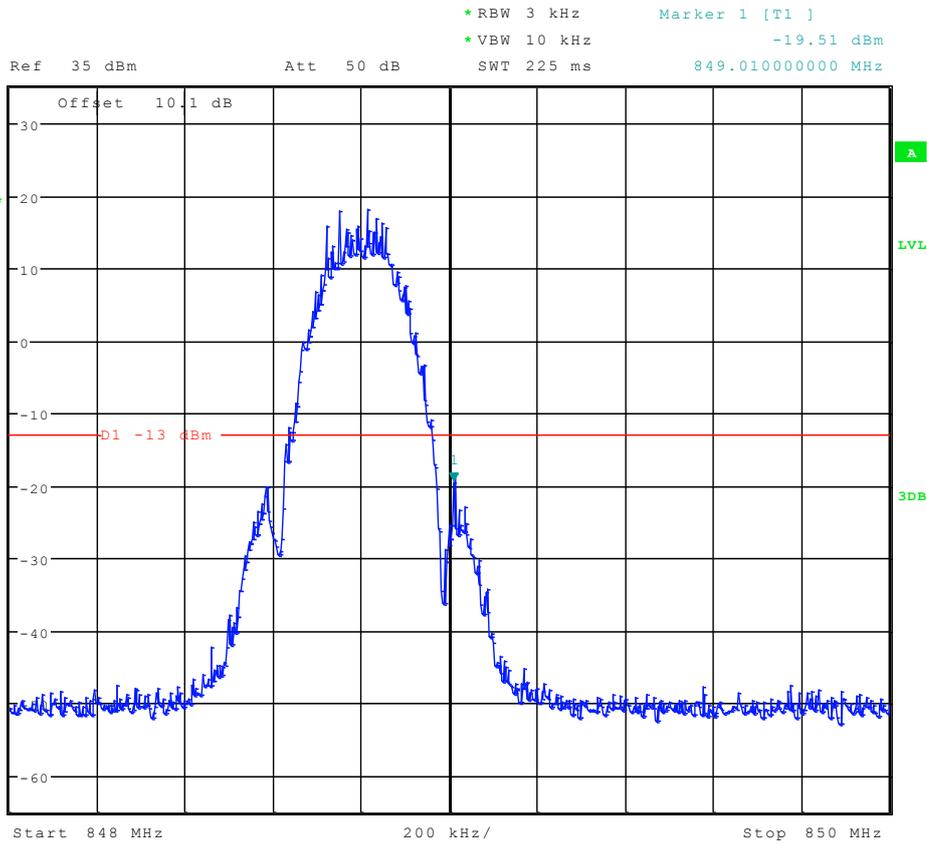
## Left Edge

### Channel 128





## Right Edge Channel 251

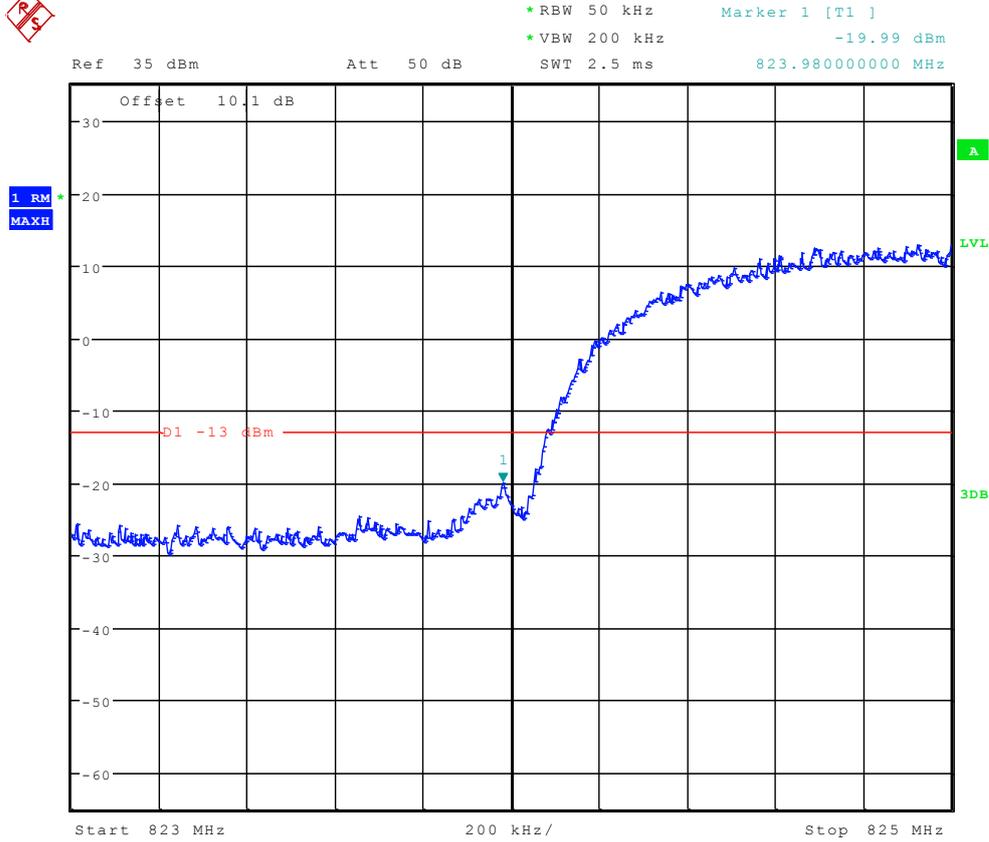




# TM3: WCDMA

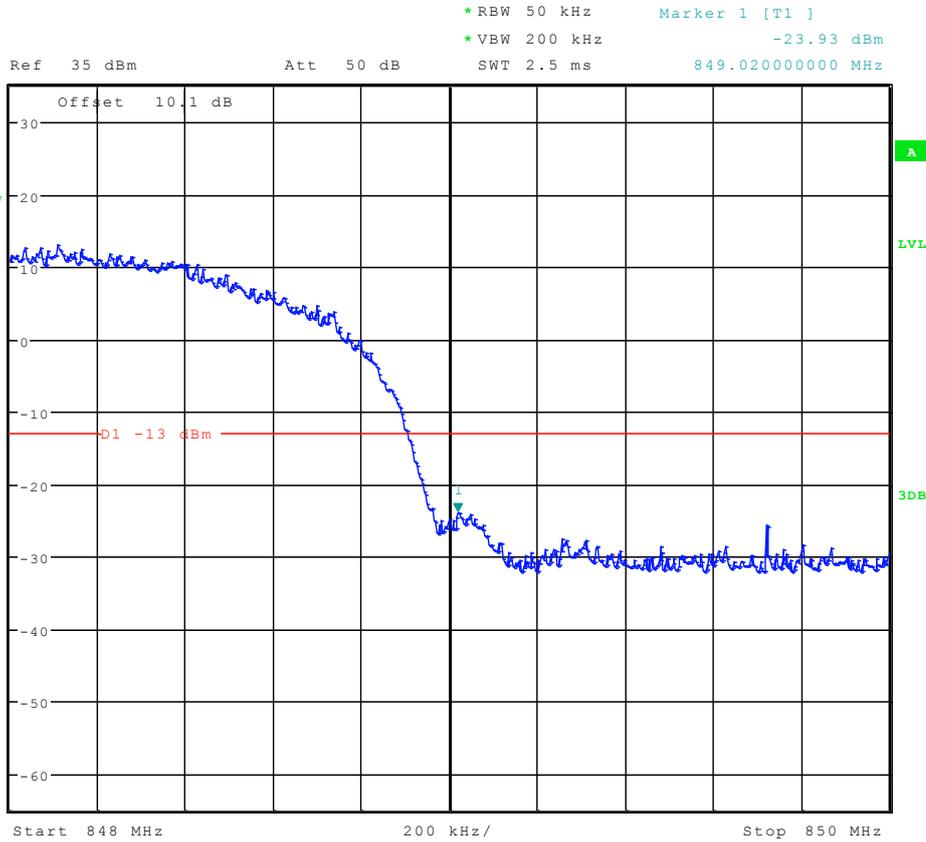
## Left Edge

### Channel 4132





## Right Edge Channel 4233



END



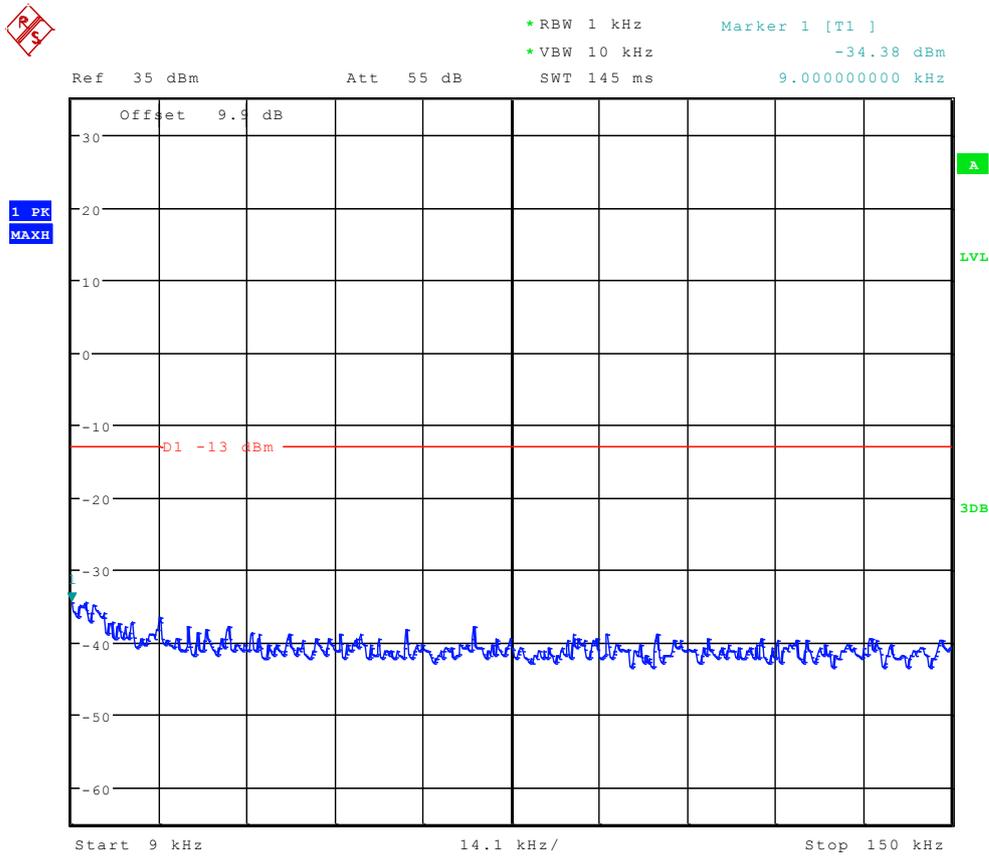
## **Appendix E**

# Spurious Emission at Antenna Terminal

According to FCC Part 2.1051 & Part 22 Subpart H

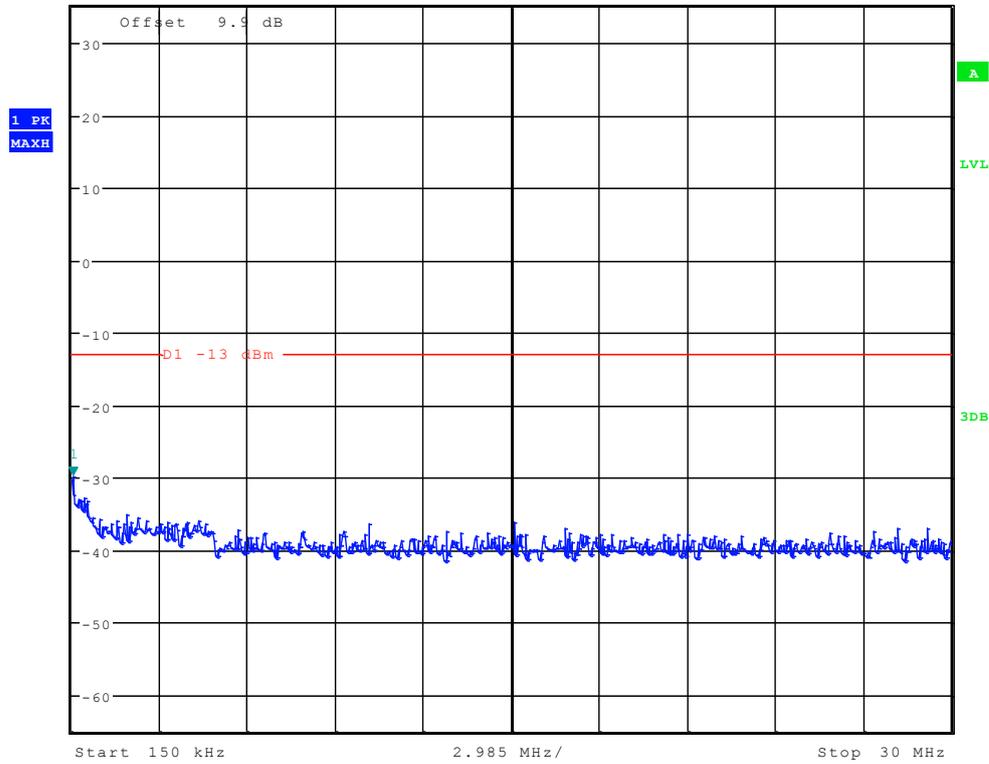


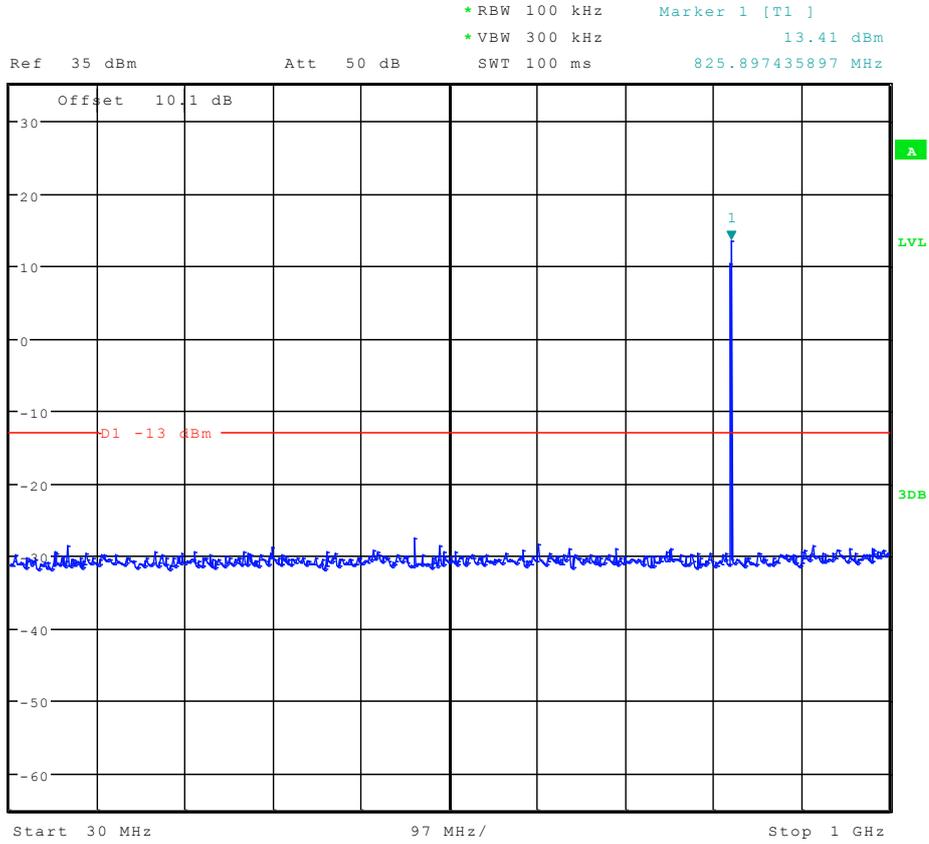
# TM1:GPRS/GSM Channel 128





Ref 35 dBm      Att 55 dB      SWT 300 ms      197.836538462 kHz  
\*RBW 10 kHz      Marker 1 [T1]      -29.87 dBm  
\*VBW 30 kHz

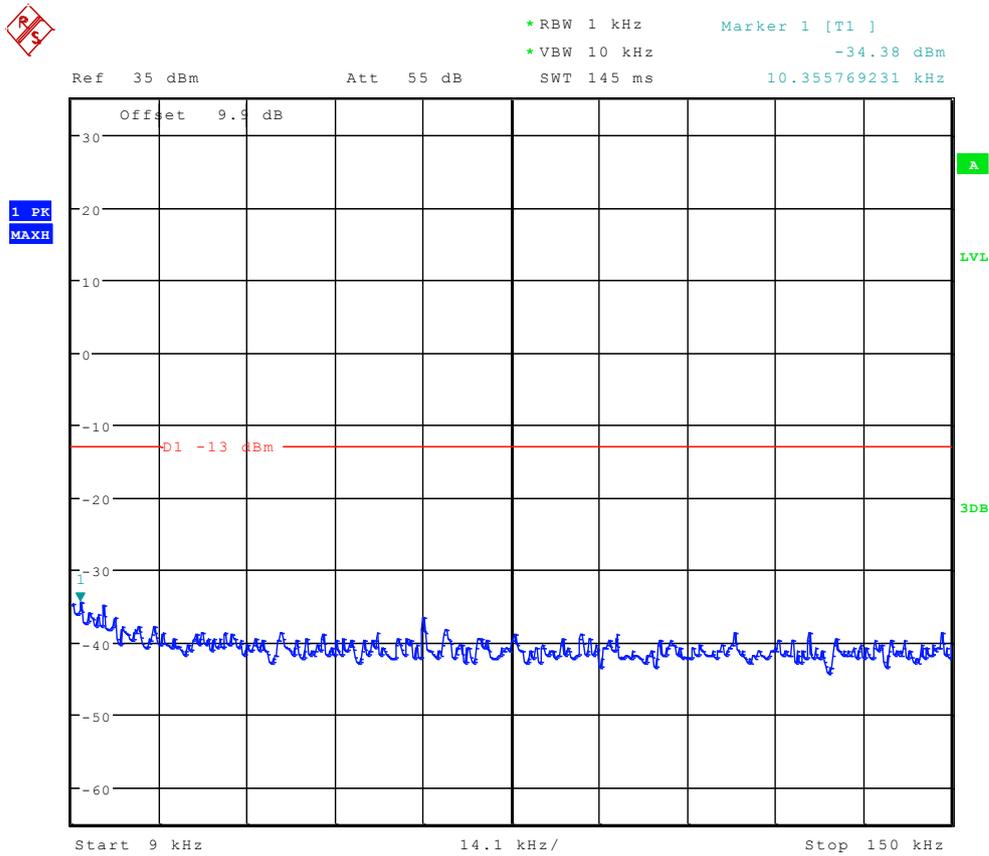


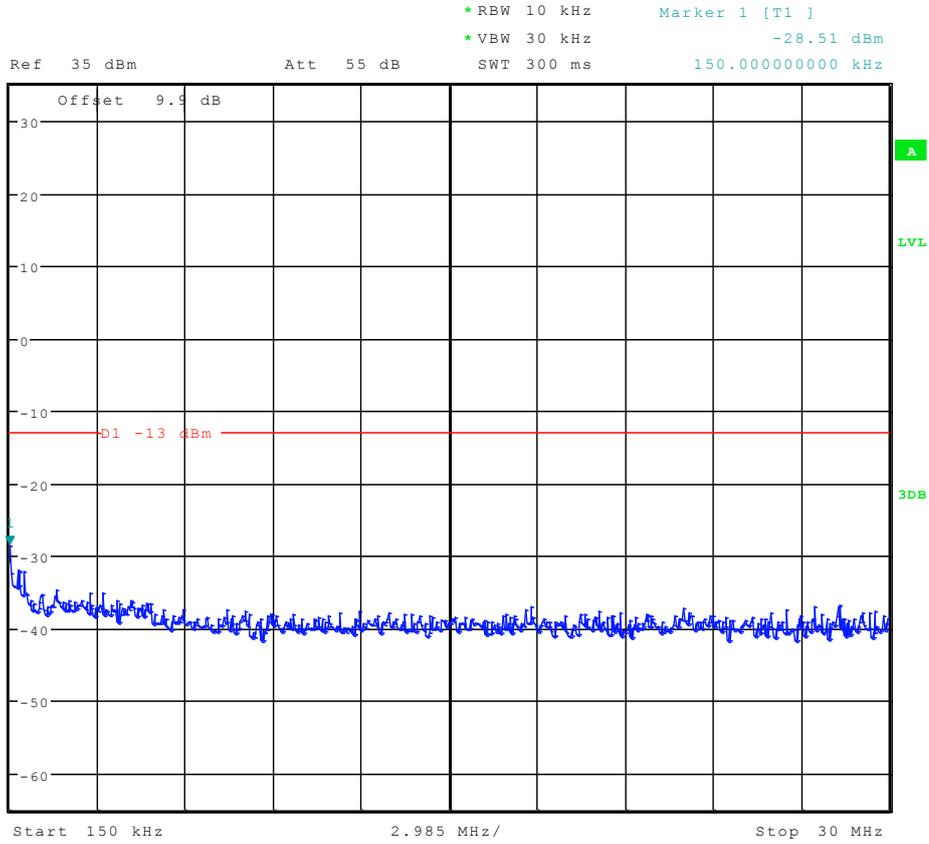


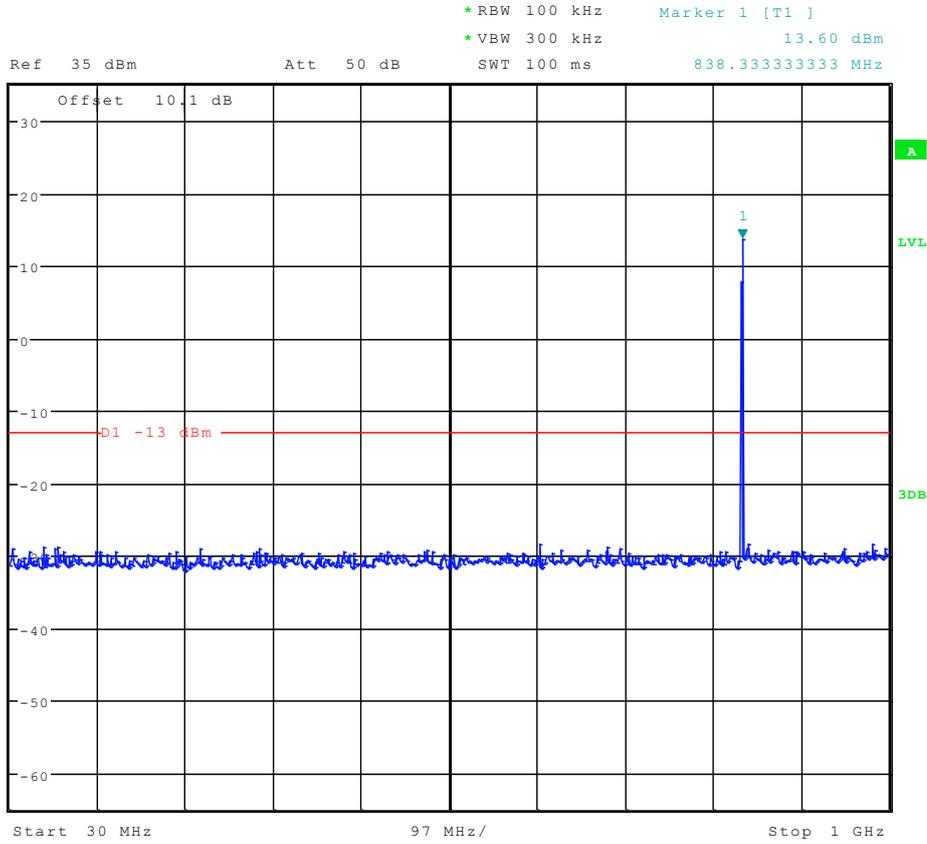




# Channel 192

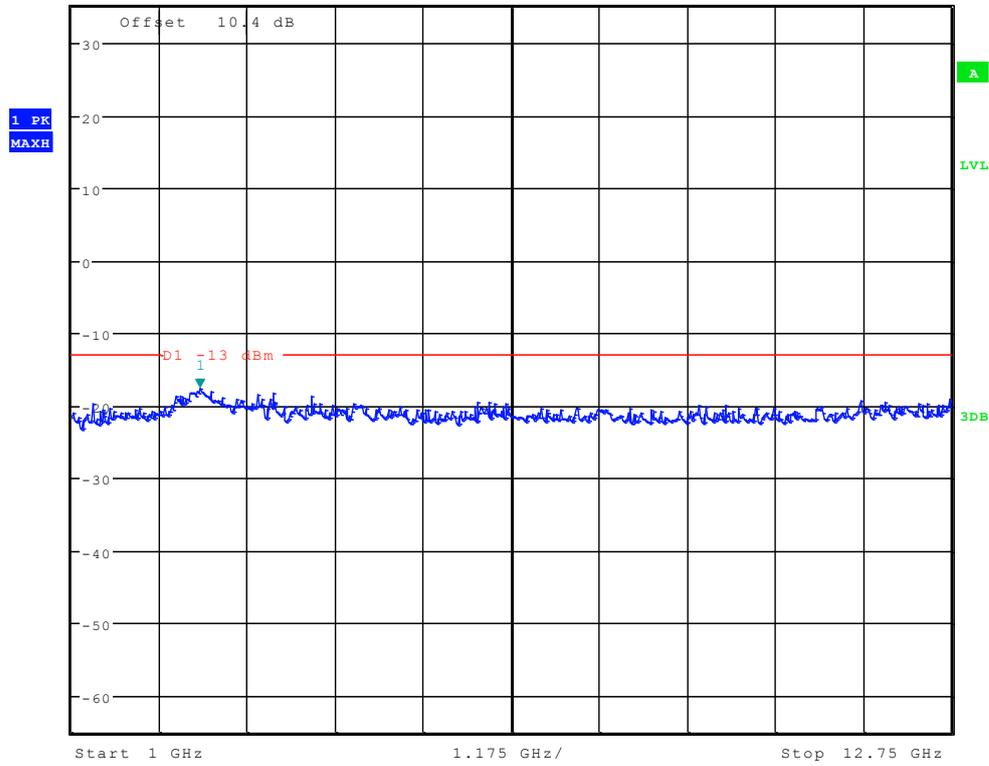








\*RBW 1 MHz      Marker 1 [T1 ]  
 \*VBW 3 MHz      -17.67 dBm  
 Ref 35 dBm      Att 50 dB      SWT 70 ms      2.713541667 GHz

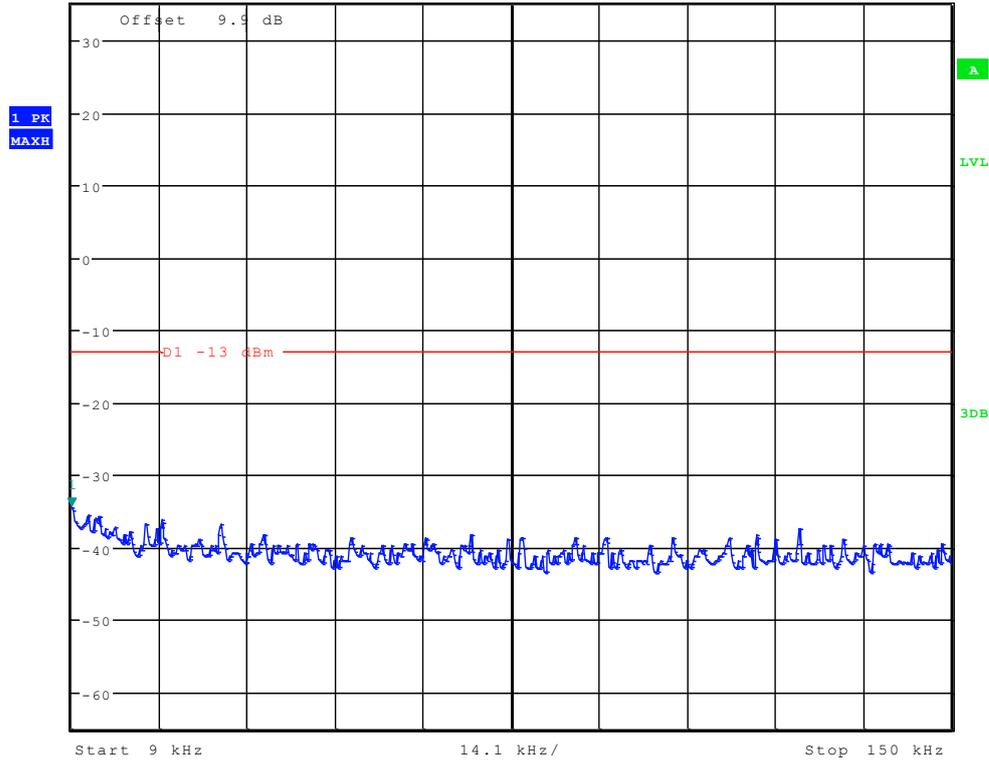




# Channel 251

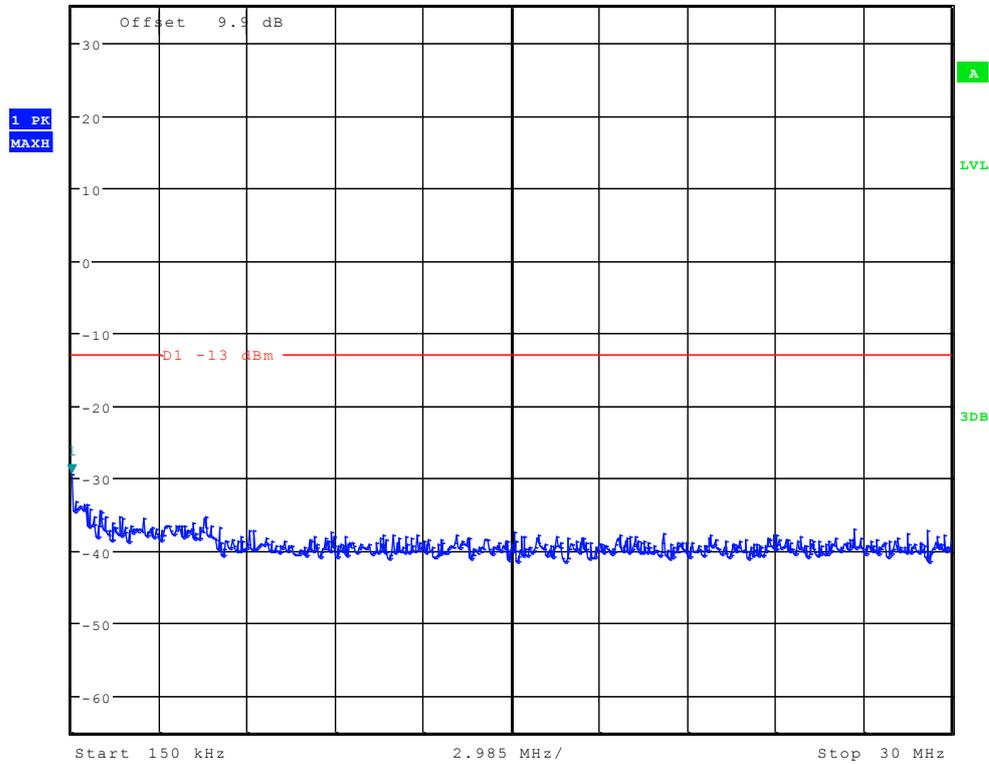


Ref 35 dBm      Att 55 dB      \*RBW 1 kHz      Marker 1 [T1]      -34.38 dBm  
\*VBW 10 kHz      SWT 145 ms      9.000000000 kHz





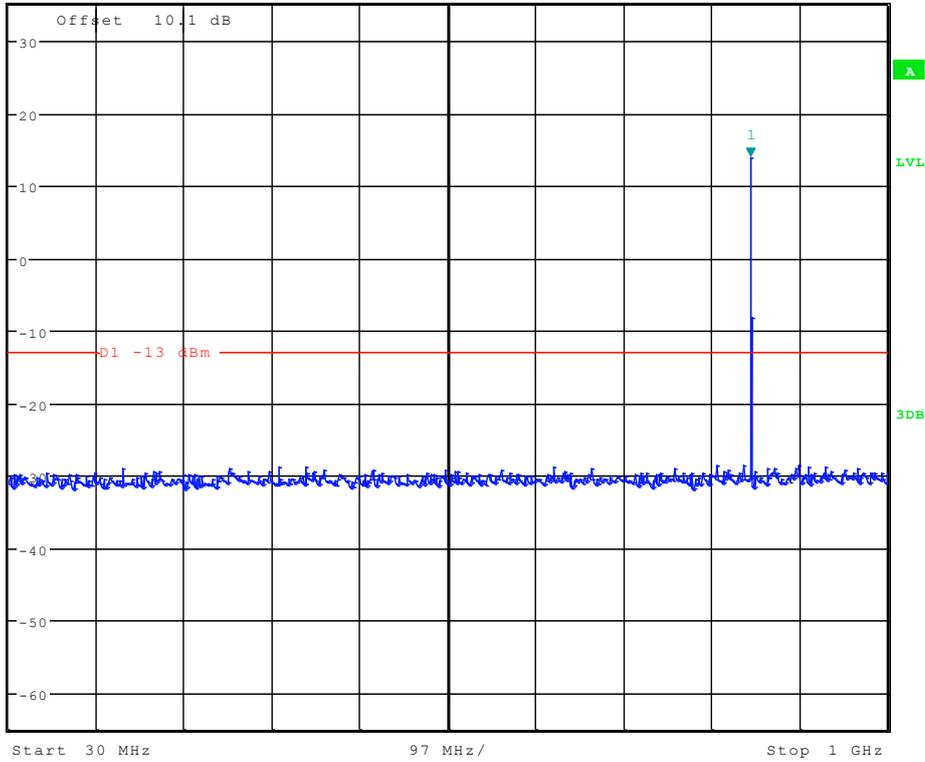
Ref 35 dBm Att 55 dB SWT 300 ms  
\*RBW 10 kHz Marker 1 [T1] -29.32 dBm  
\*VBW 30 kHz 150.000000000 kHz





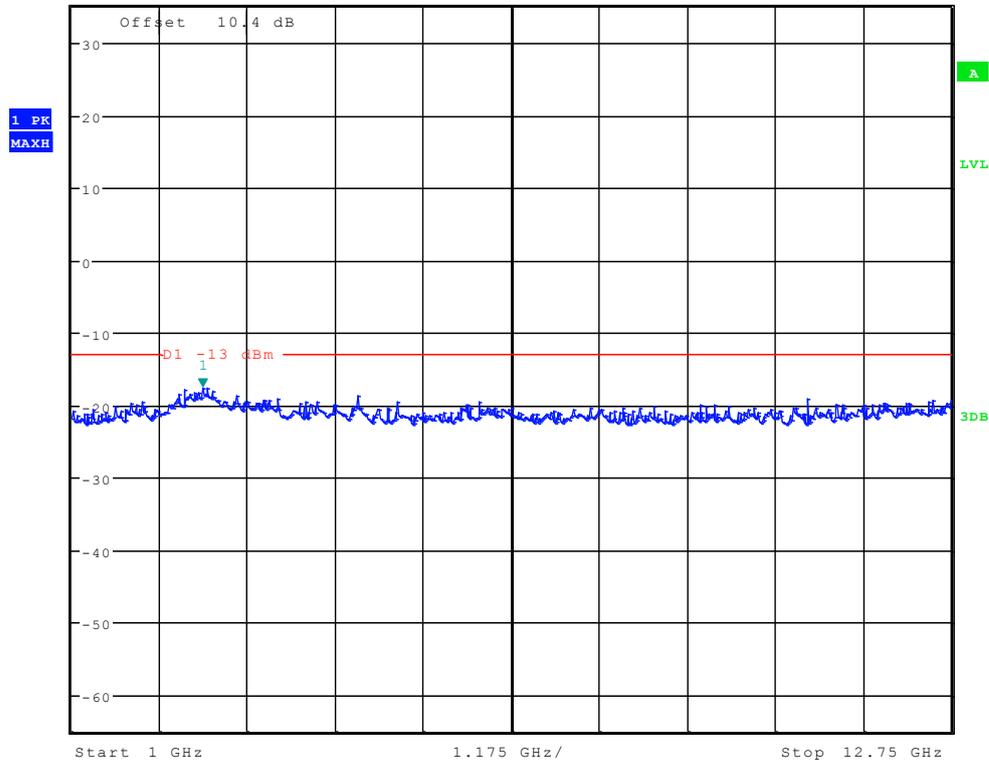
1 PK  
MAXH

\* RBW 100 kHz      Marker 1 [T1 ]  
\* VBW 300 kHz      13.87 dBm  
Ref 35 dBm      Att 50 dB      SWT 100 ms      849.214743590 MHz



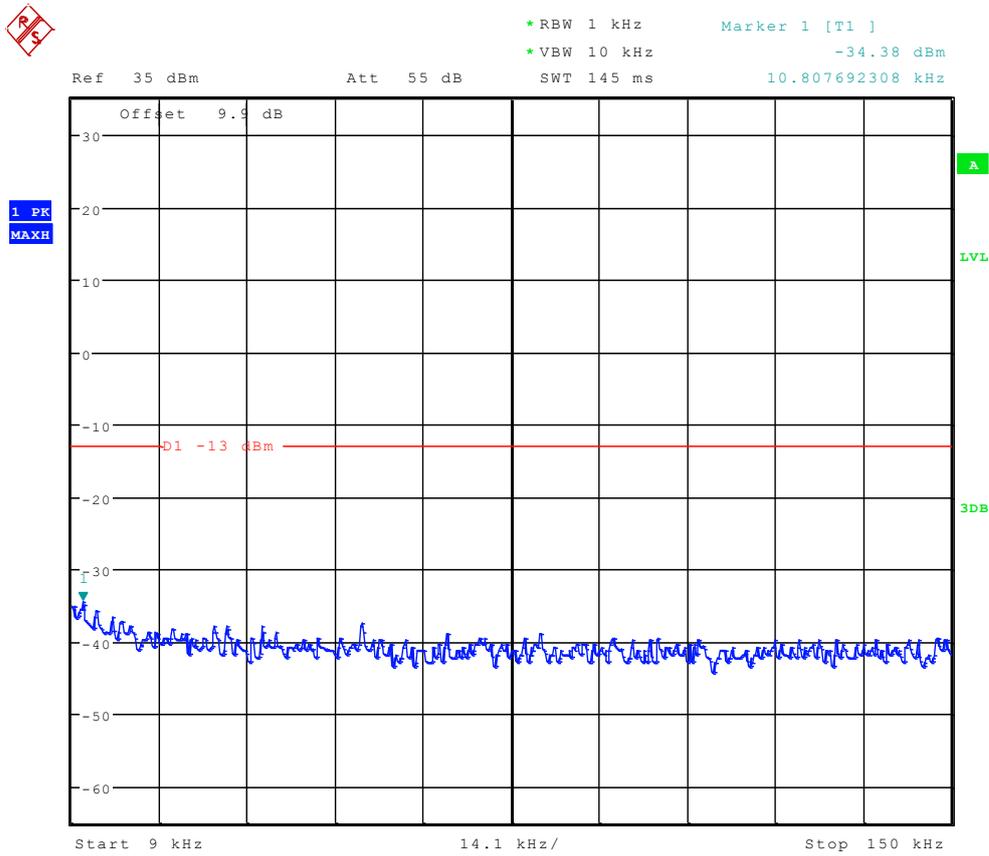


Ref 35 dBm      Att 50 dB      SWT 70 ms      Marker 1 [T1]      -17.56 dBm  
 \*RBW 1 MHz  
 \*VBW 3 MHz      2.751201923 GHz



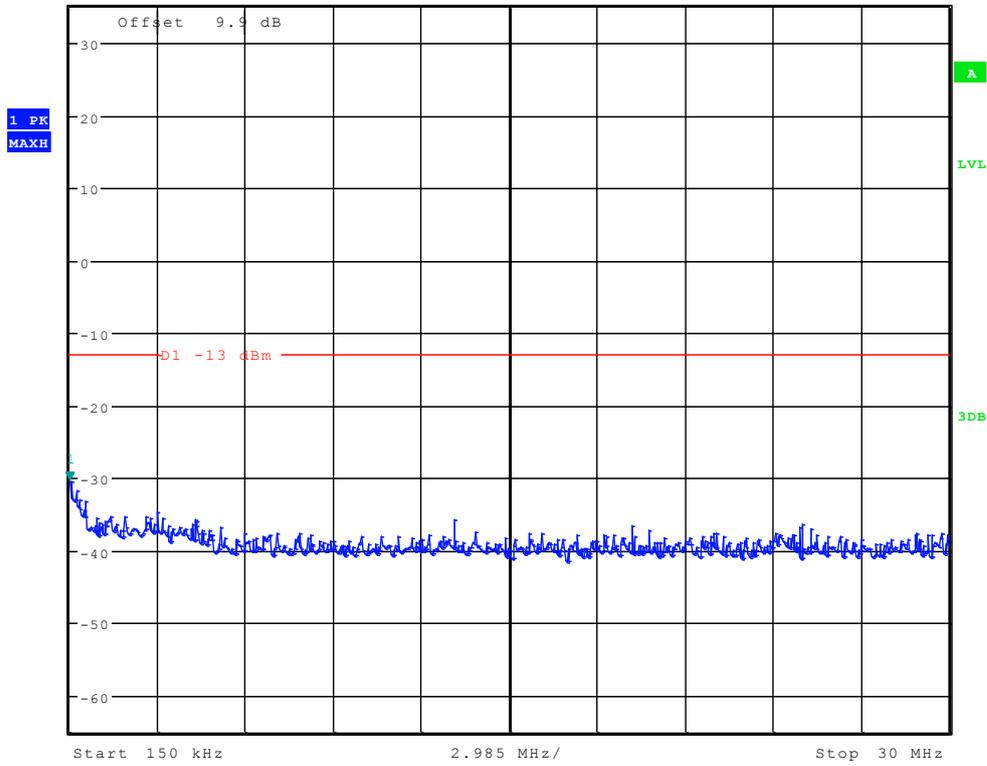


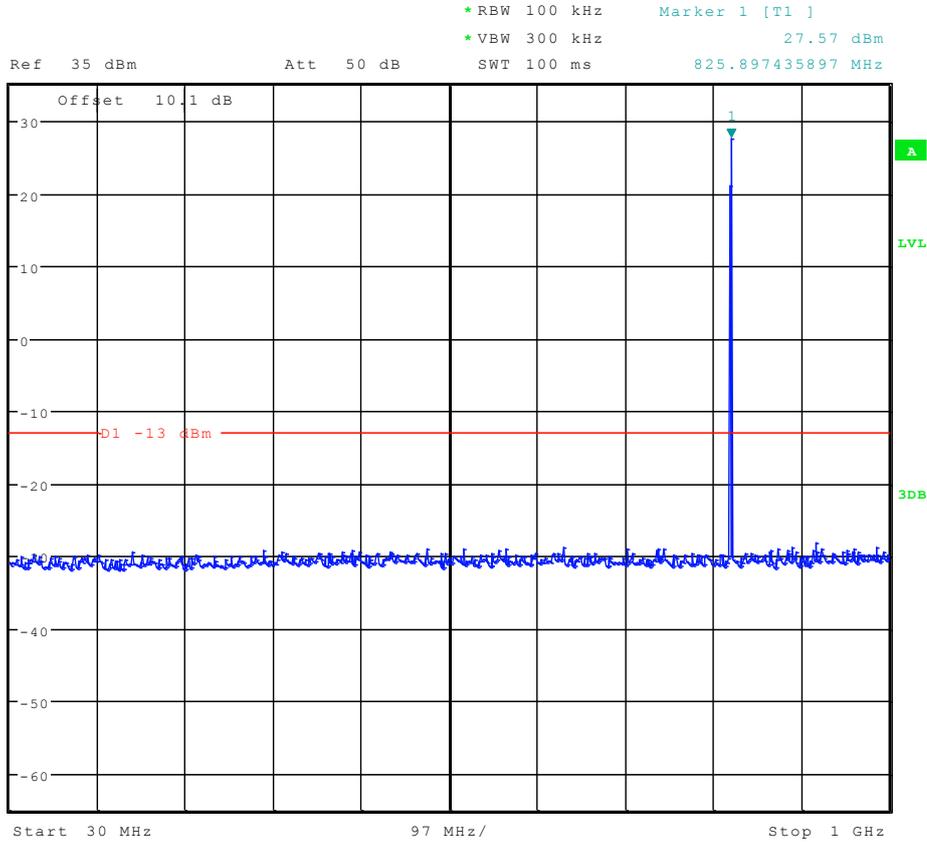
# TM2:EDGE Channel 128





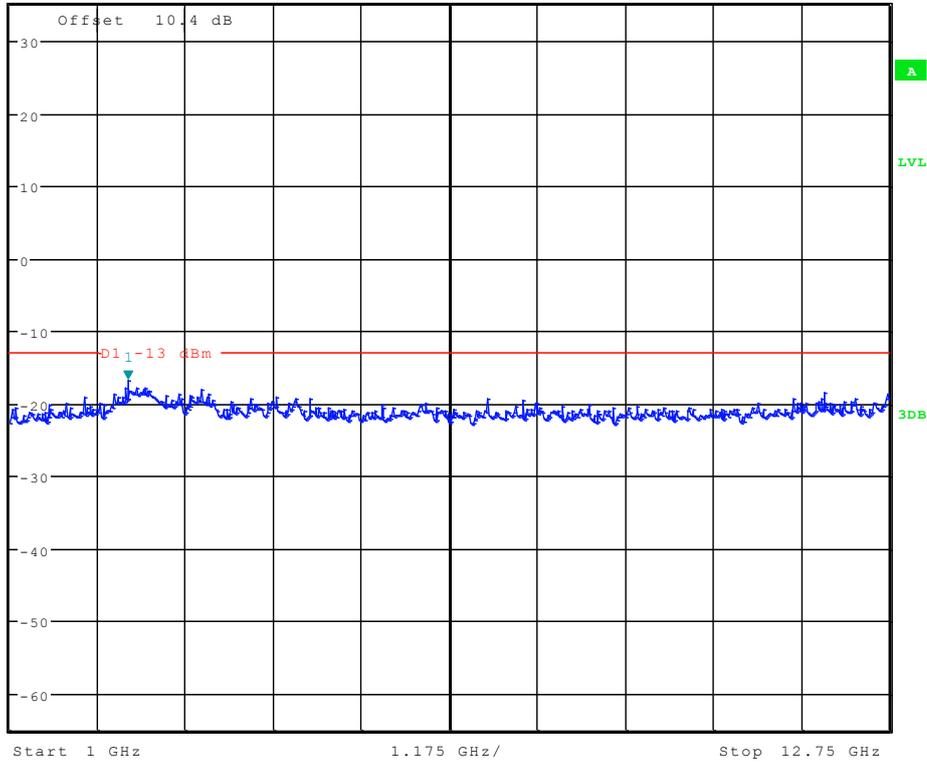
\*RBW 10 kHz      Marker 1 [T1 ]  
 \*VBW 30 kHz      -30.52 dBm  
 Ref 35 dBm      Att 55 dB      SWT 300 ms      150.00000000 kHz





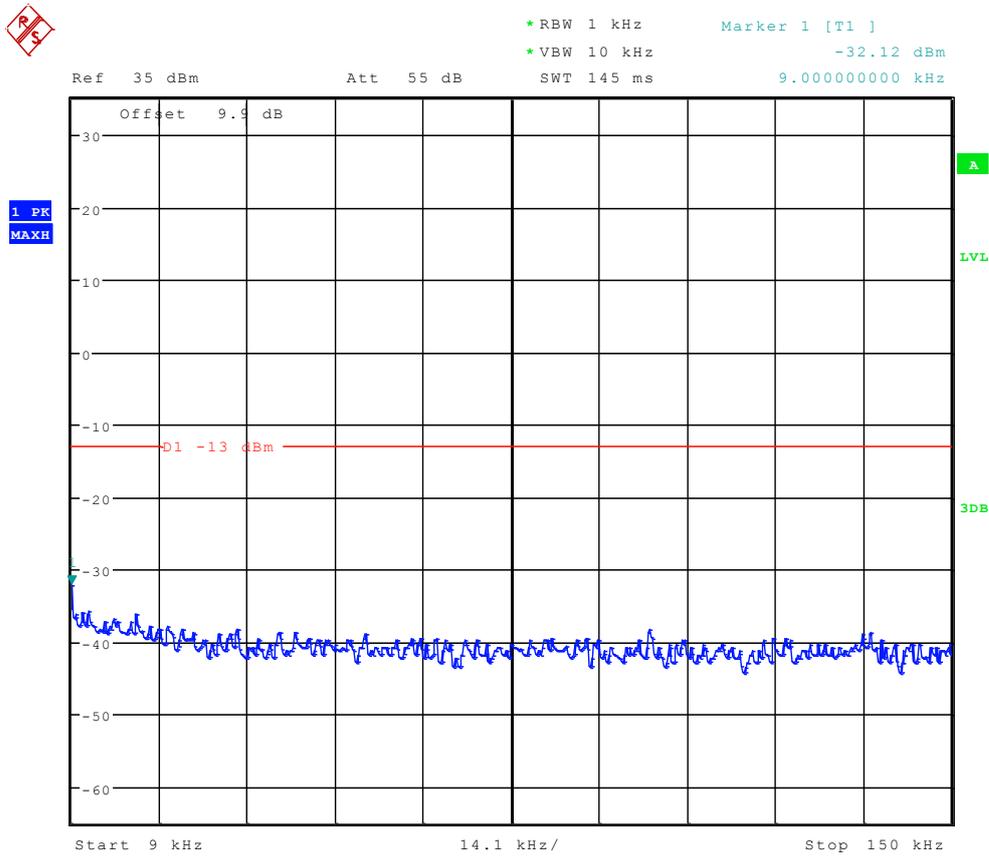


Ref 35 dBm      Att 50 dB      SWT 70 ms      Marker 1 [T1]      -16.86 dBm  
 2.581730769 GHz



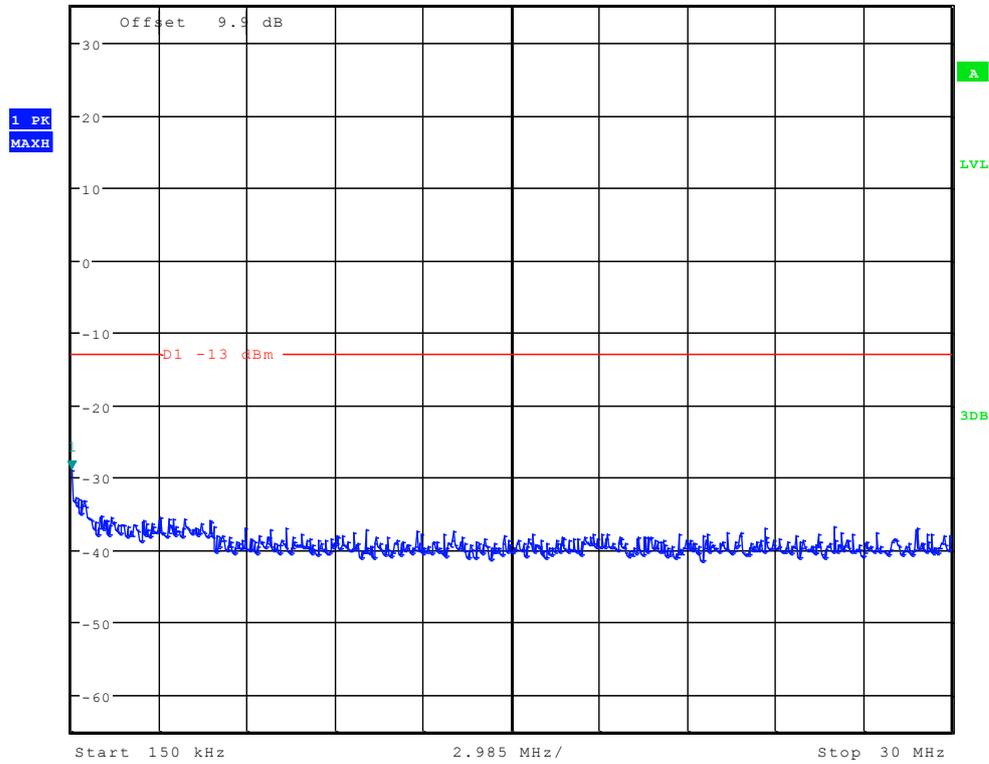


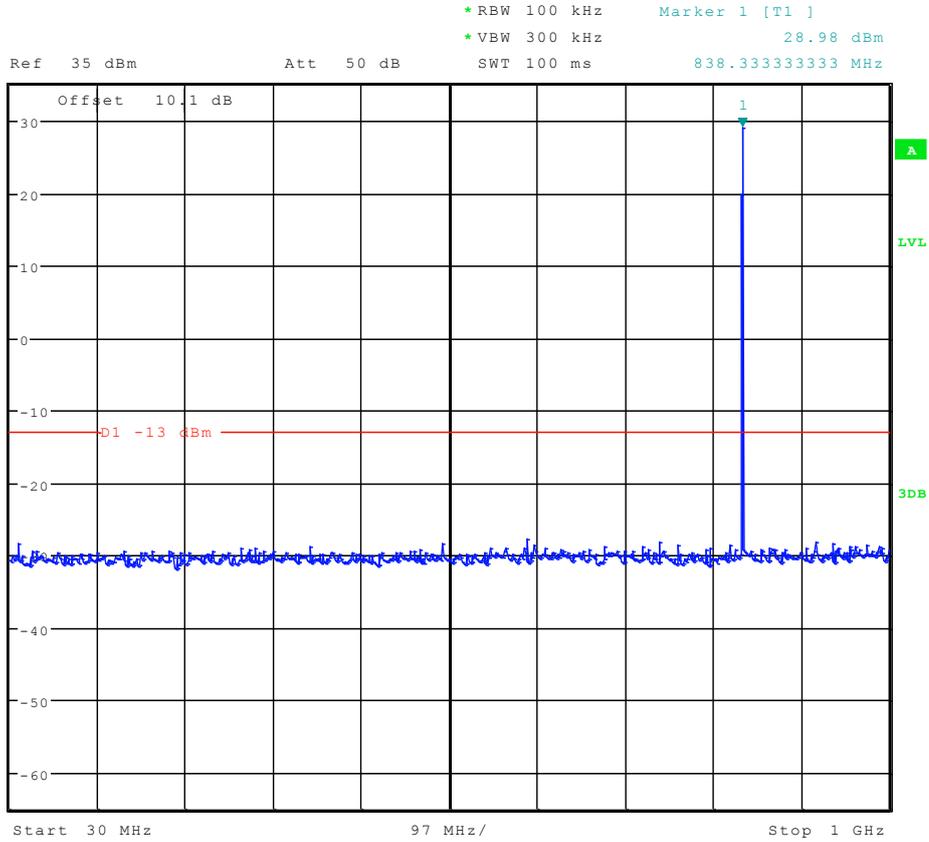
# Channel 192





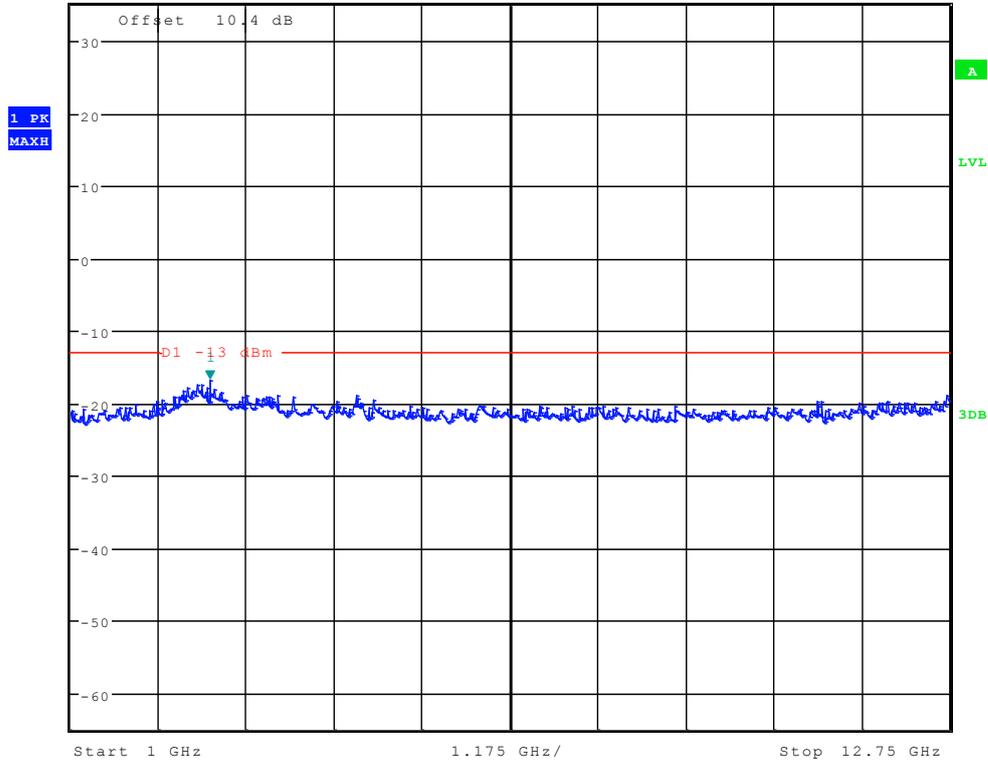
Ref 35 dBm Att 55 dB SWT 300 ms  
\*RBW 10 kHz Marker 1 [T1] -28.90 dBm  
\*VBW 30 kHz 150.00000000 kHz







\*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 3 MHz      -16.86 dBm  
Ref 35 dBm      Att 50 dB      SWT 70 ms      2.864182692 GHz

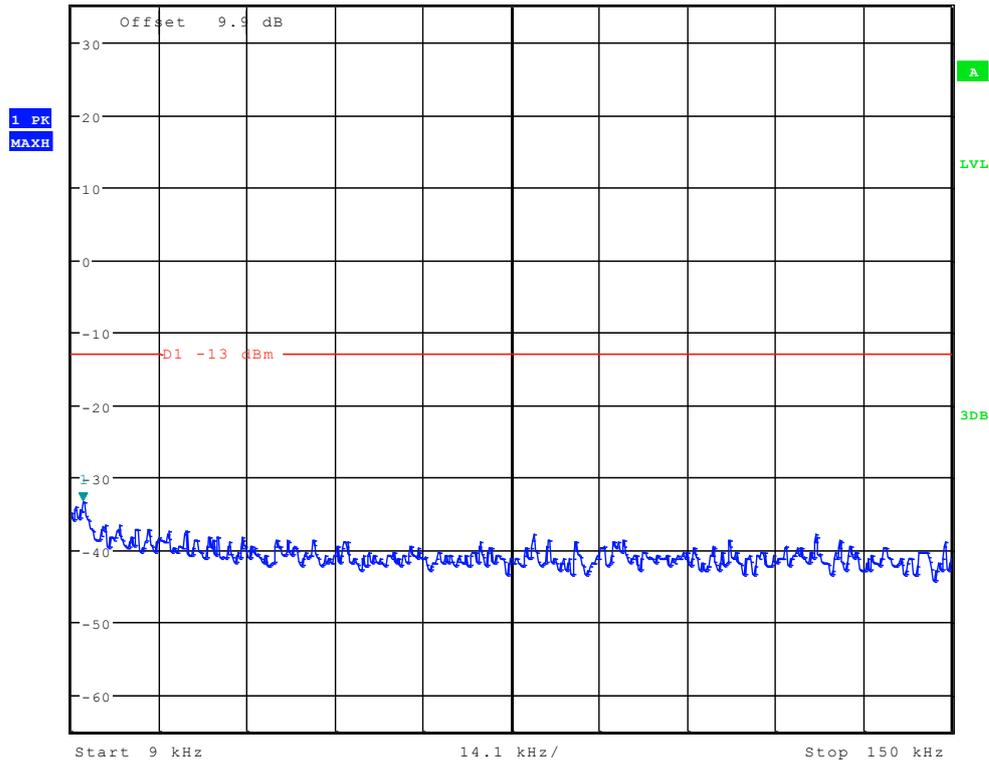




# Channel 251

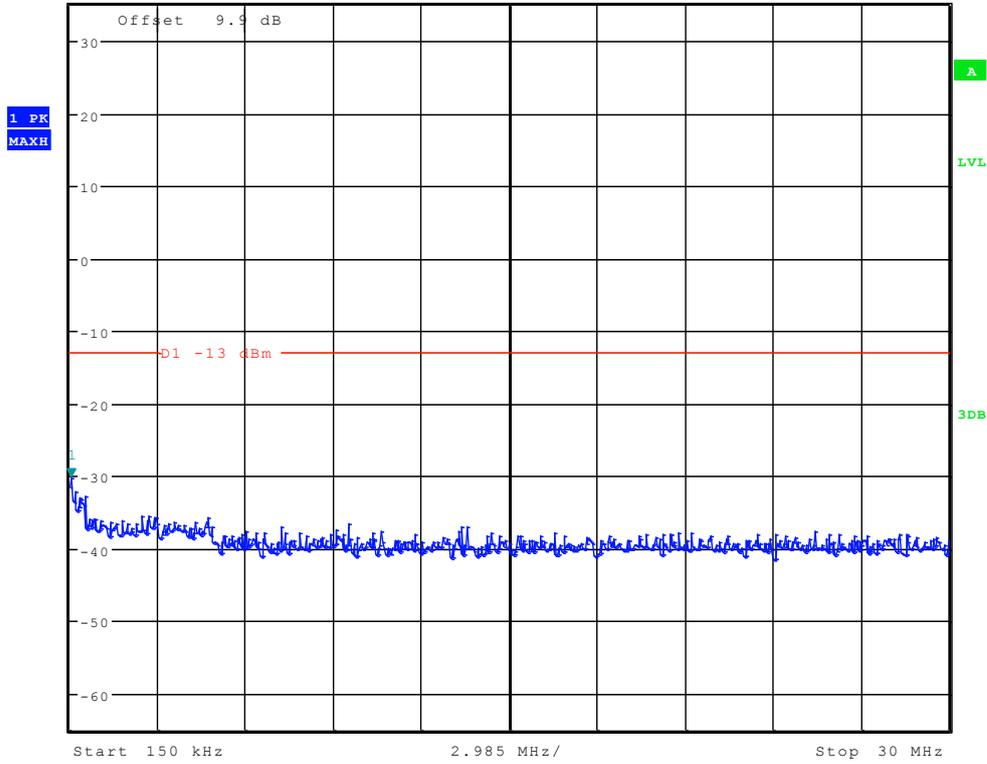


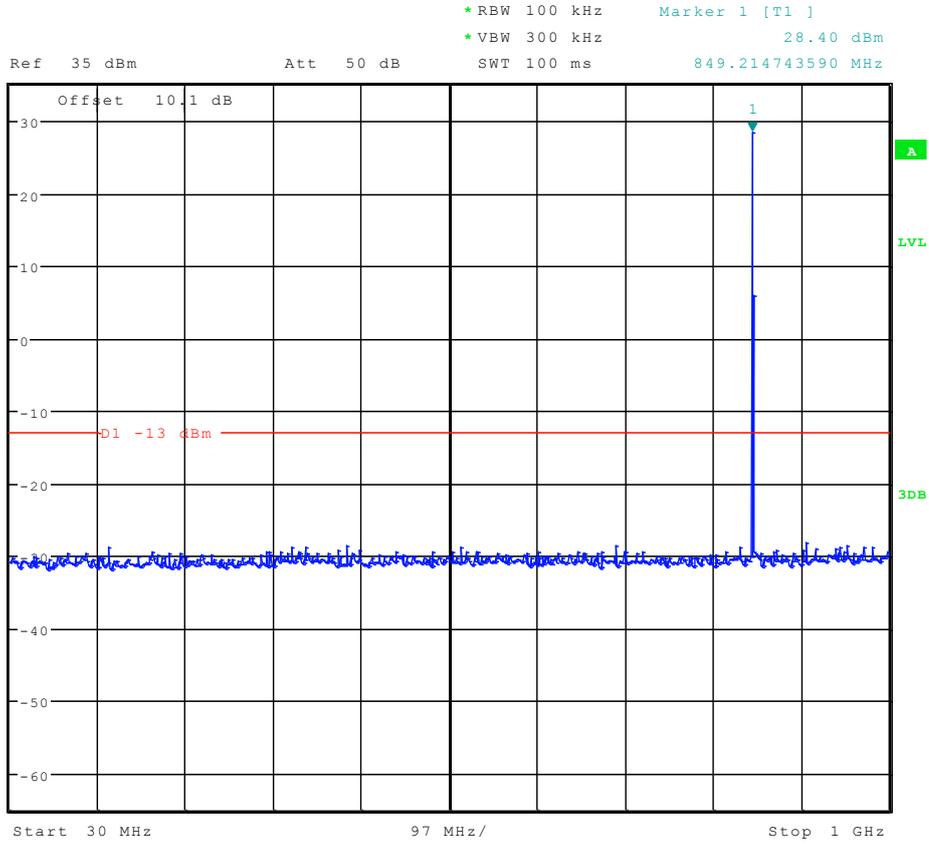
Ref 35 dBm      Att 55 dB      \* RBW 1 kHz      Marker 1 [T1]      -33.31 dBm  
\* VBW 10 kHz      SWT 145 ms      10.807692308 kHz





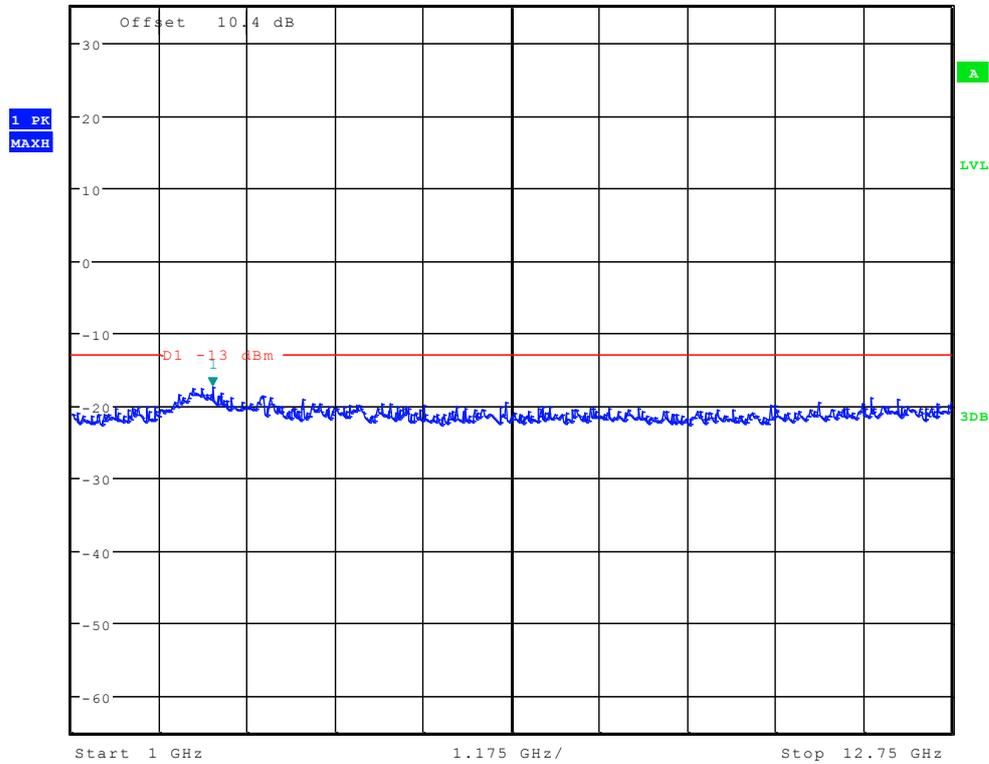
\*RBW 10 kHz      Marker 1 [T1 ]  
\*VBW 30 kHz      -30.16 dBm  
Ref 35 dBm      Att 55 dB      SWT 300 ms      197.836538462 kHz





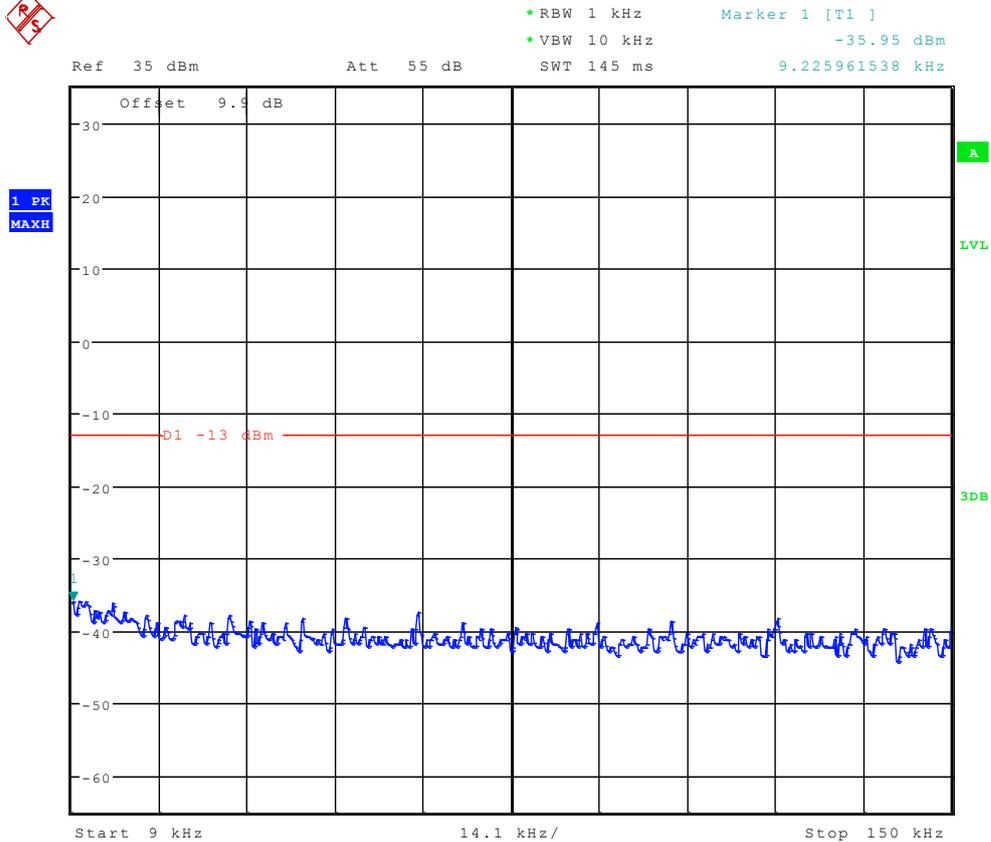


Ref 35 dBm      Att 50 dB      SWT 70 ms      Marker 1 [T1]      -17.44 dBm  
 \*RBW 1 MHz  
 \*VBW 3 MHz      2.883012821 GHz



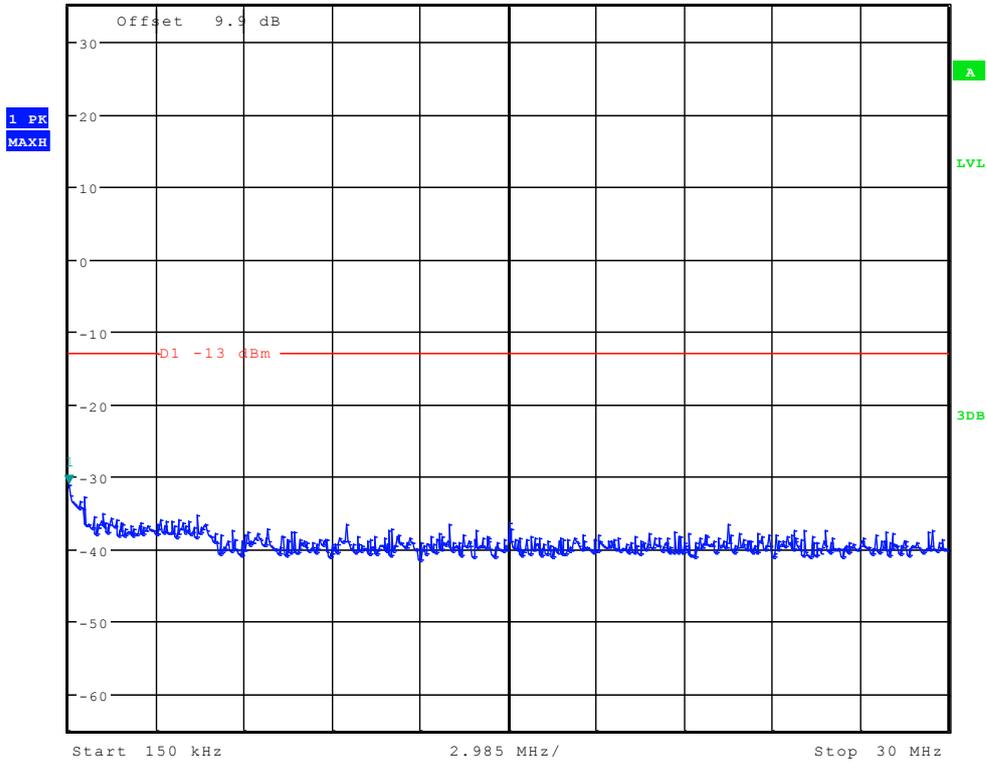


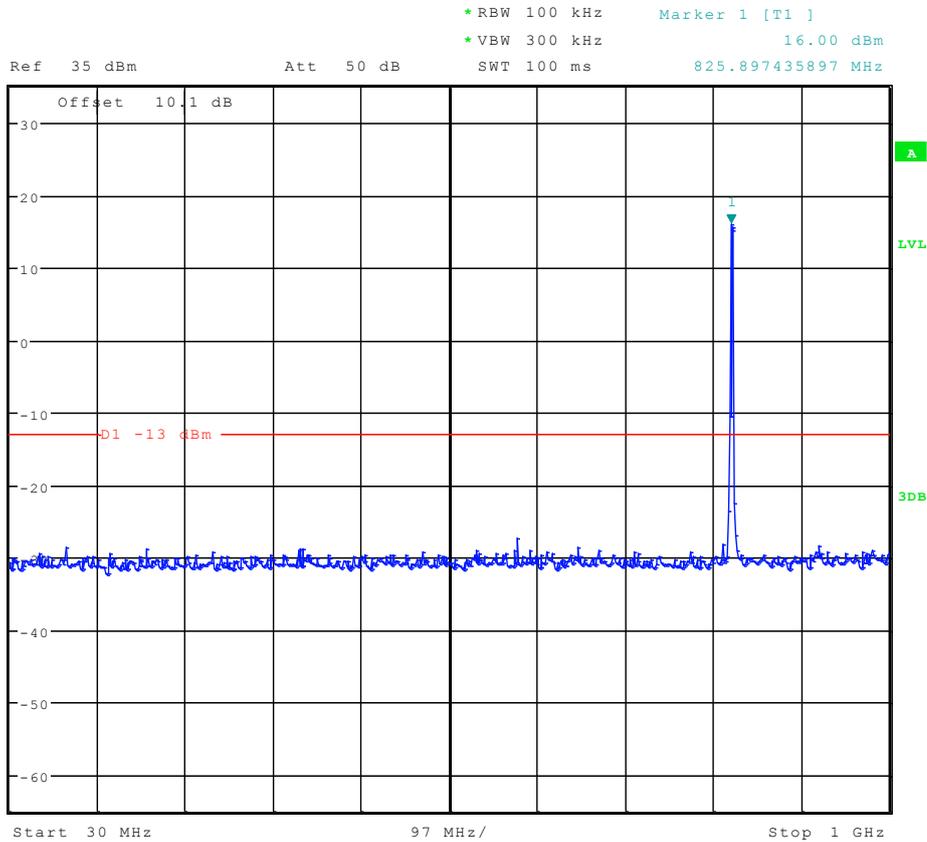
# TM3: WCDMA Channel 4132





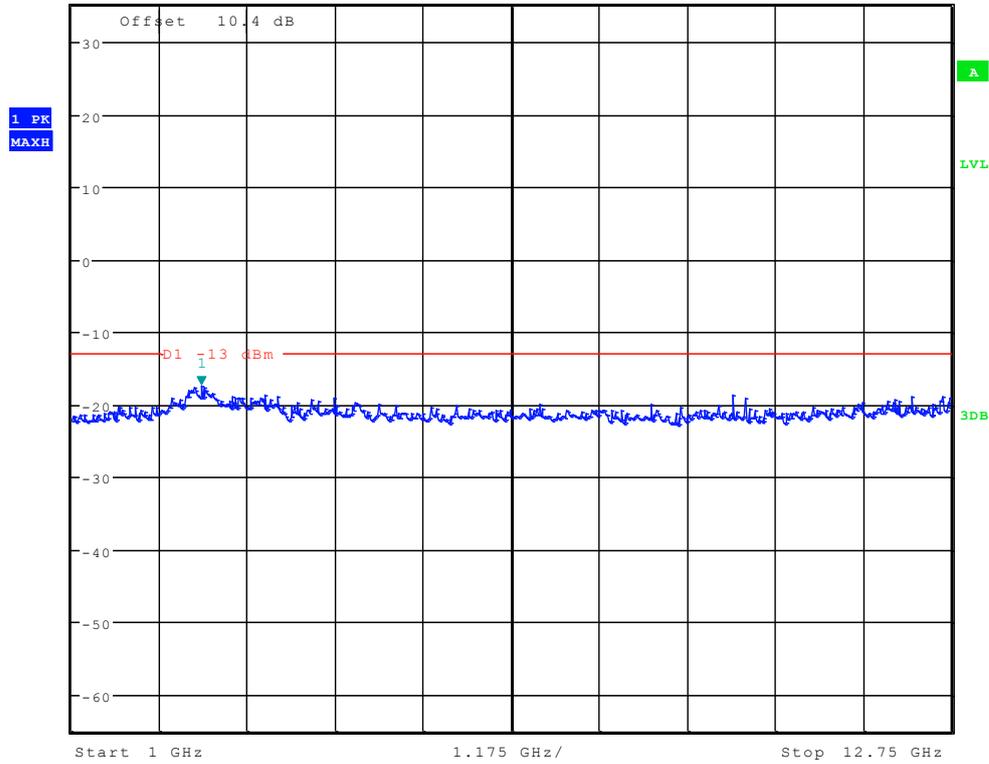
\*RBW 10 kHz      Marker 1 [T1 ]  
\*VBW 30 kHz      -31.02 dBm  
Ref 35 dBm      Att 55 dB      SWT 300 ms      150.000000000 kHz







\* RBW 1 MHz      Marker 1 [T1 ]  
 \* VBW 3 MHz      -17.49 dBm  
 Ref 35 dBm      Att 50 dB      SWT 70 ms      2.732371795 GHz

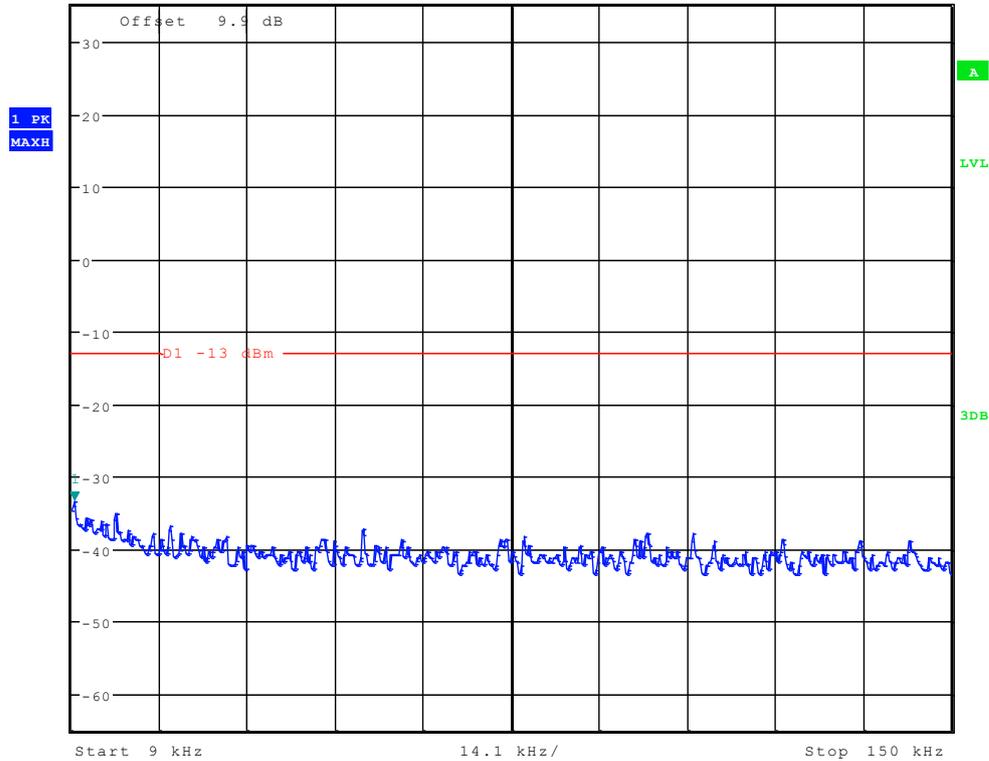




# Channel 4182

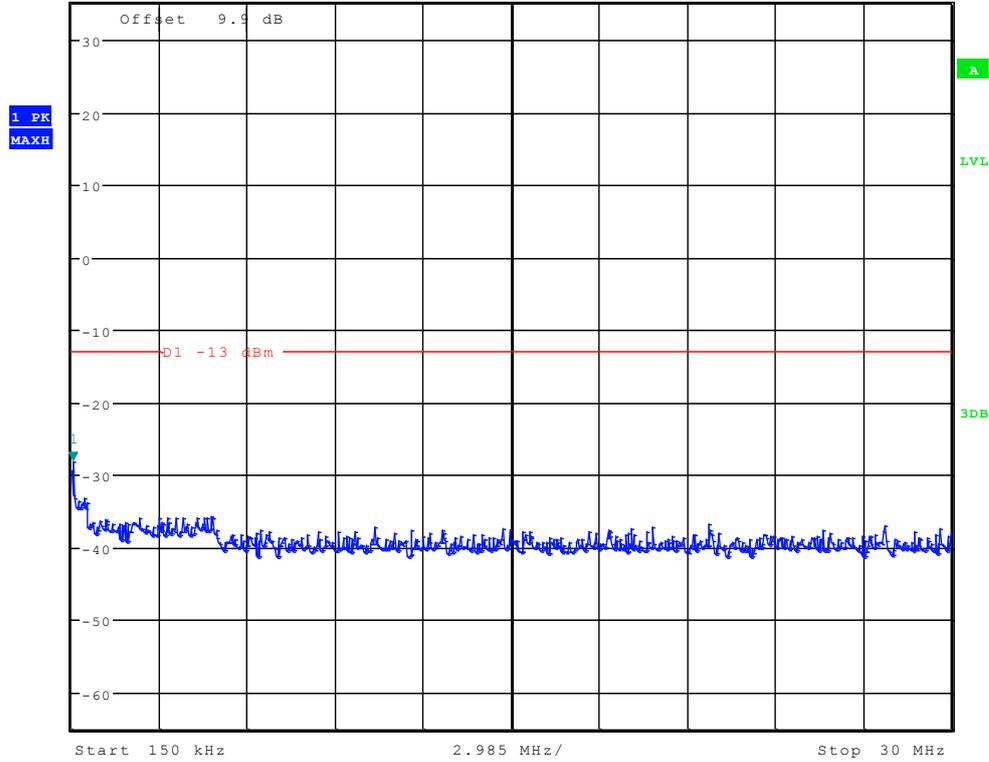


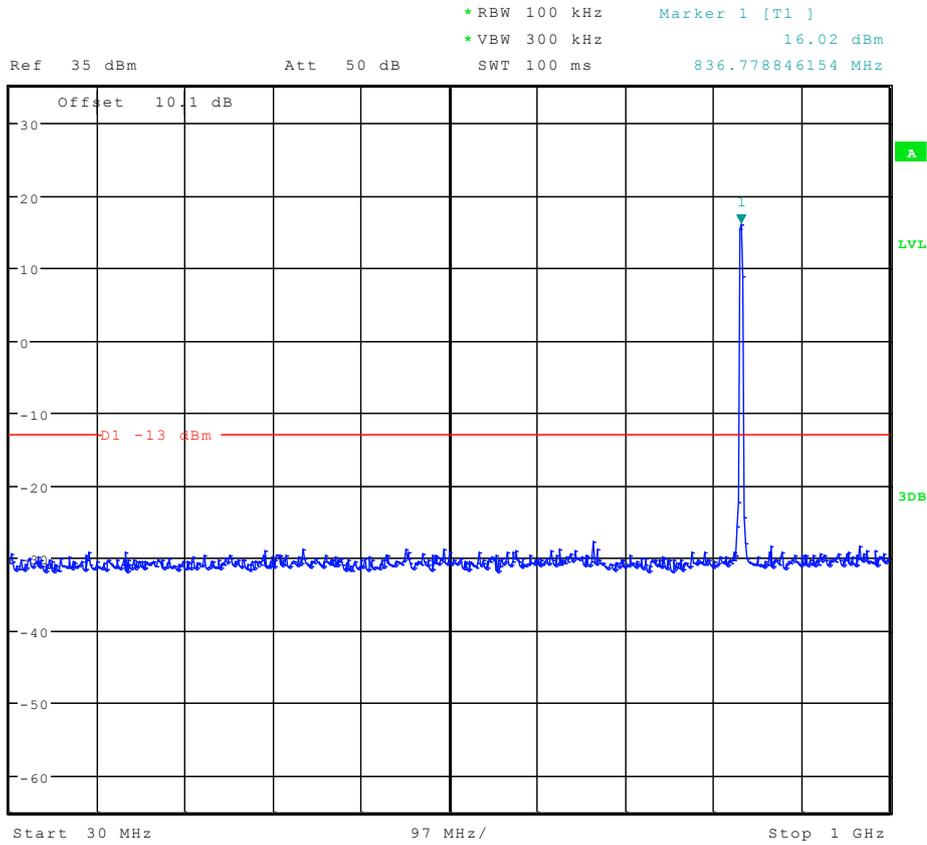
\*RBW 1 kHz      Marker 1 [T1 ]  
 \*VBW 10 kHz      -33.48 dBm  
 Ref 35 dBm      Att 55 dB      SWT 145 ms      9.451923077 kHz





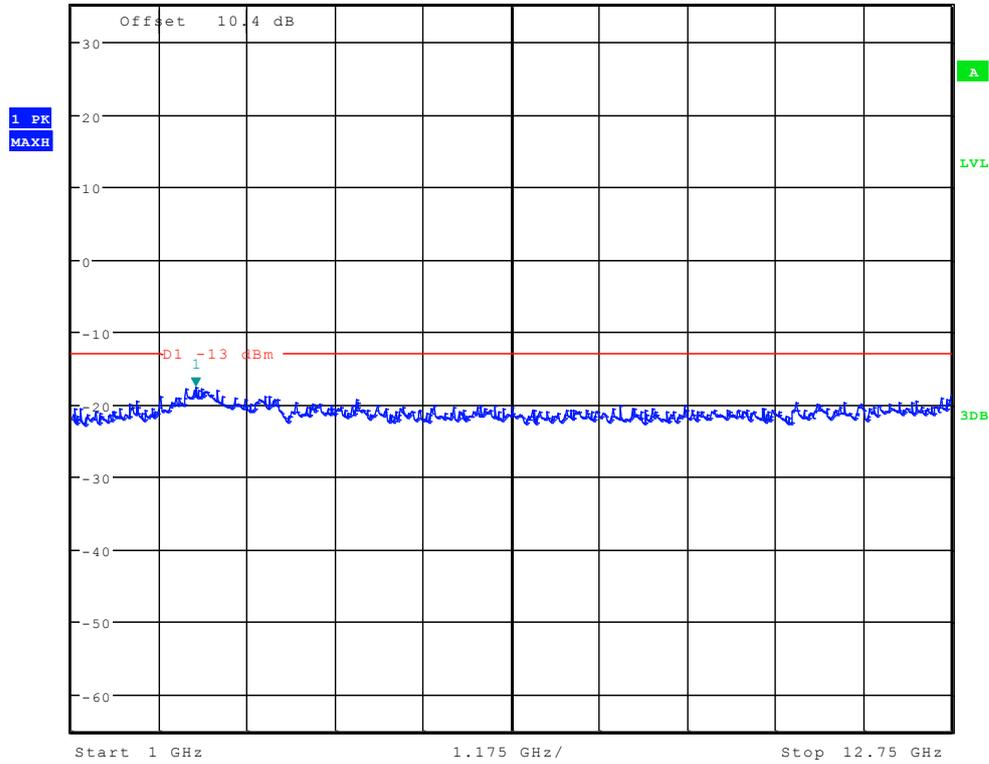
\* RBW 10 kHz      Marker 1 [T1 ]  
 \* VBW 30 kHz      -28.22 dBm  
 Ref 35 dBm      Att 55 dB      SWT 300 ms      197.836538462 kHz







\* RBW 1 MHz      Marker 1 [T1 ]  
 \* VBW 3 MHz      -17.64 dBm  
 Ref 35 dBm      Att 50 dB      SWT 70 ms      2.657051282 GHz

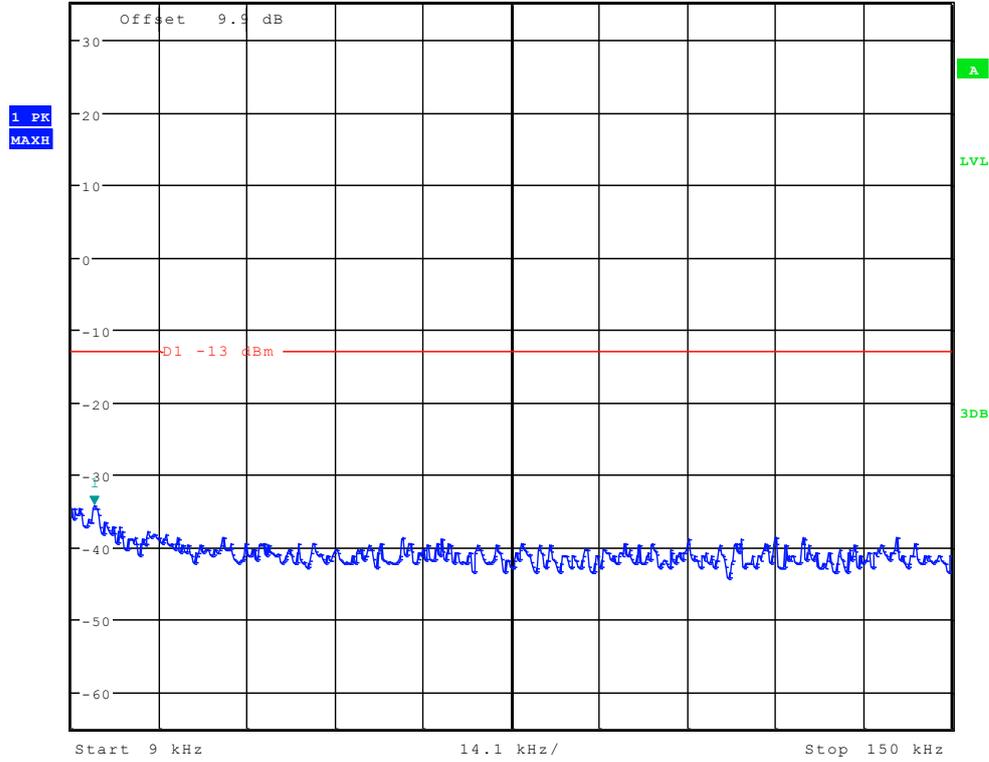


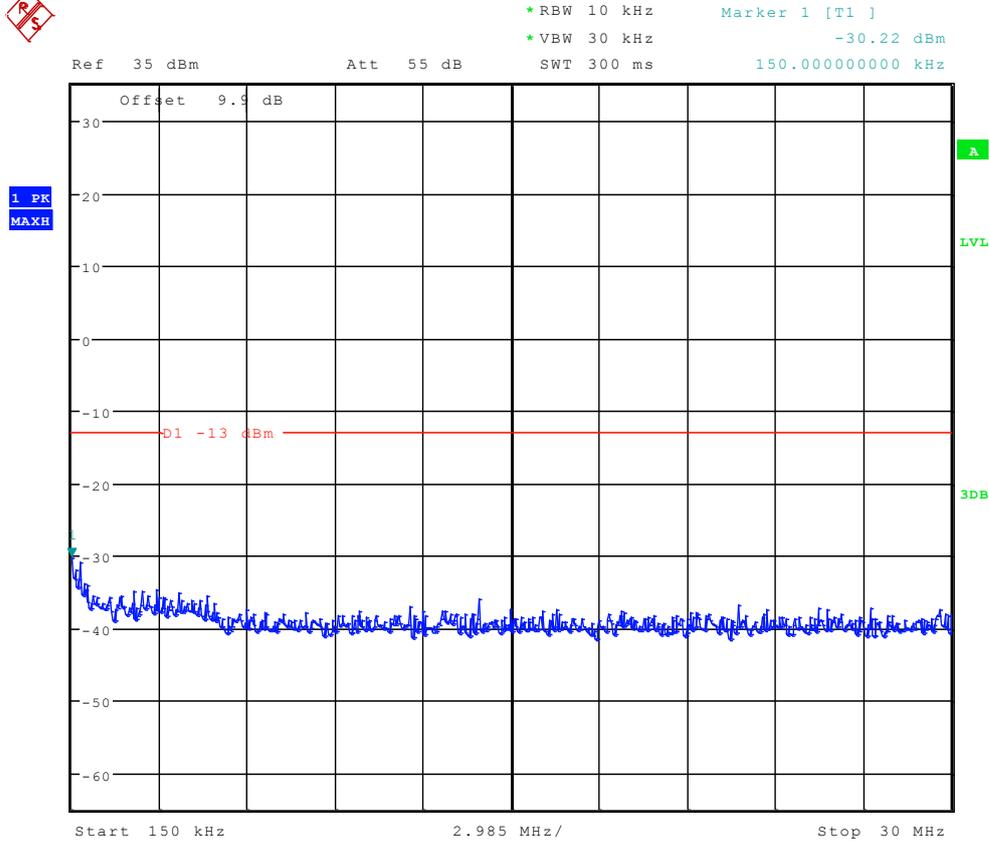


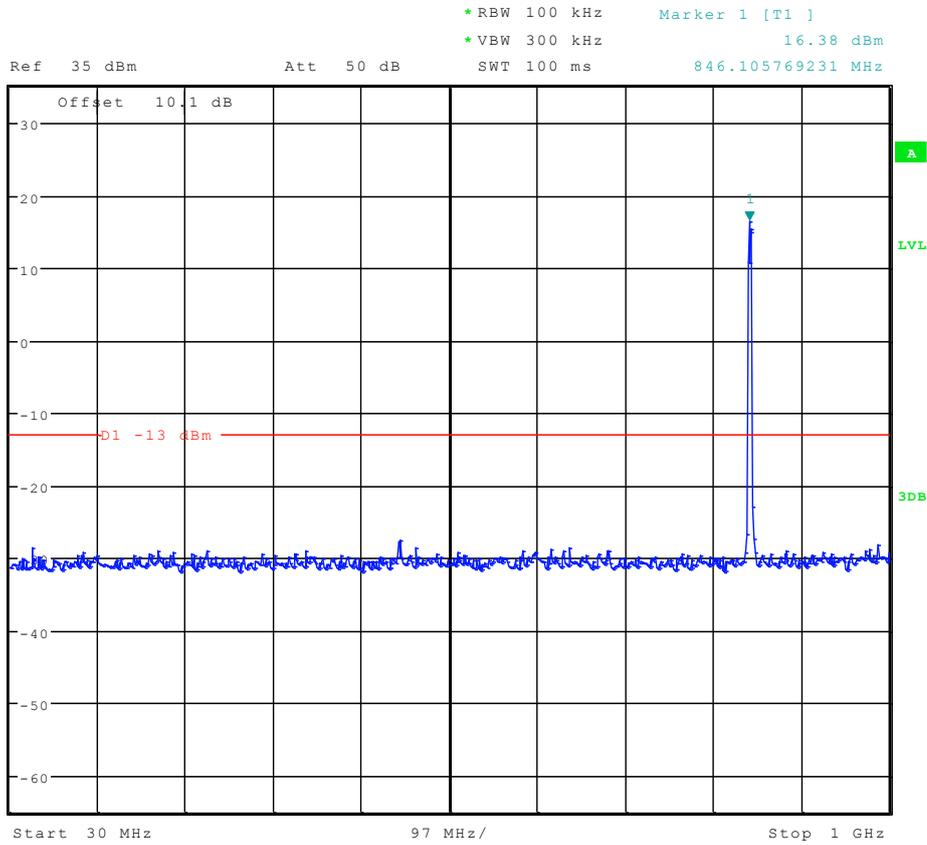
# Channel 4233



\* RBW 1 kHz      Marker 1 [T1 ]  
\* VBW 10 kHz      -34.19 dBm  
Ref 35 dBm      Att 55 dB      SWT 145 ms      12.615384615 kHz

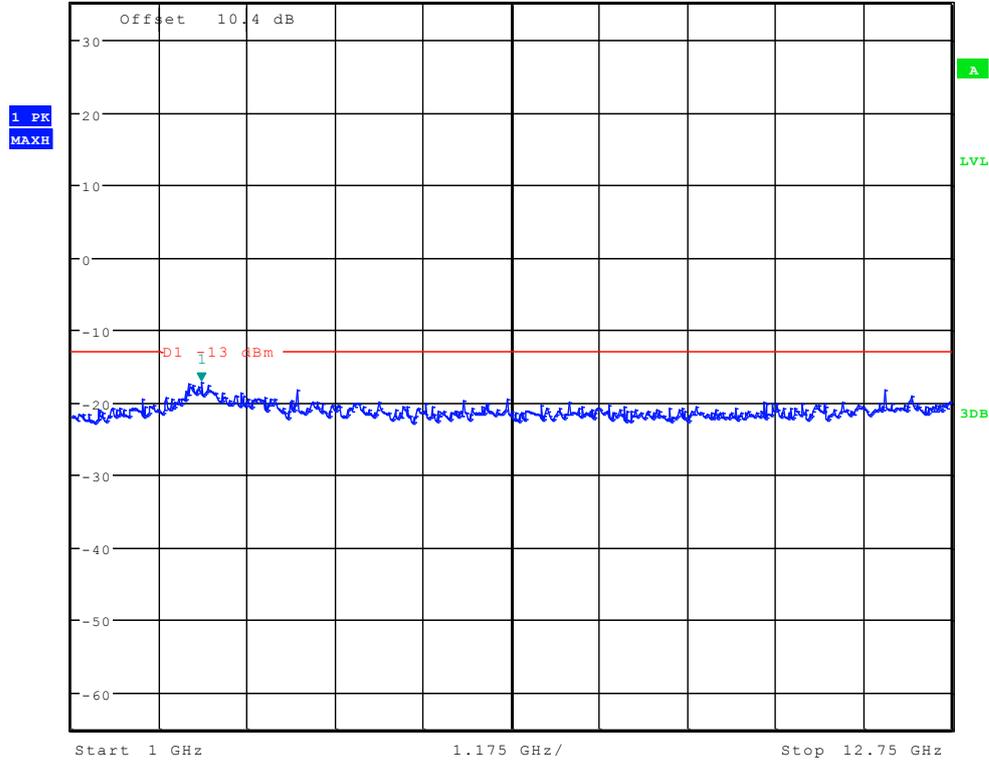








\* RBW 1 MHz      Marker 1 [T1 ]  
 \* VBW 3 MHz      -17.24 dBm  
 Ref 35 dBm      Att 50 dB      SWT 70 ms      2.732371795 GHz



END

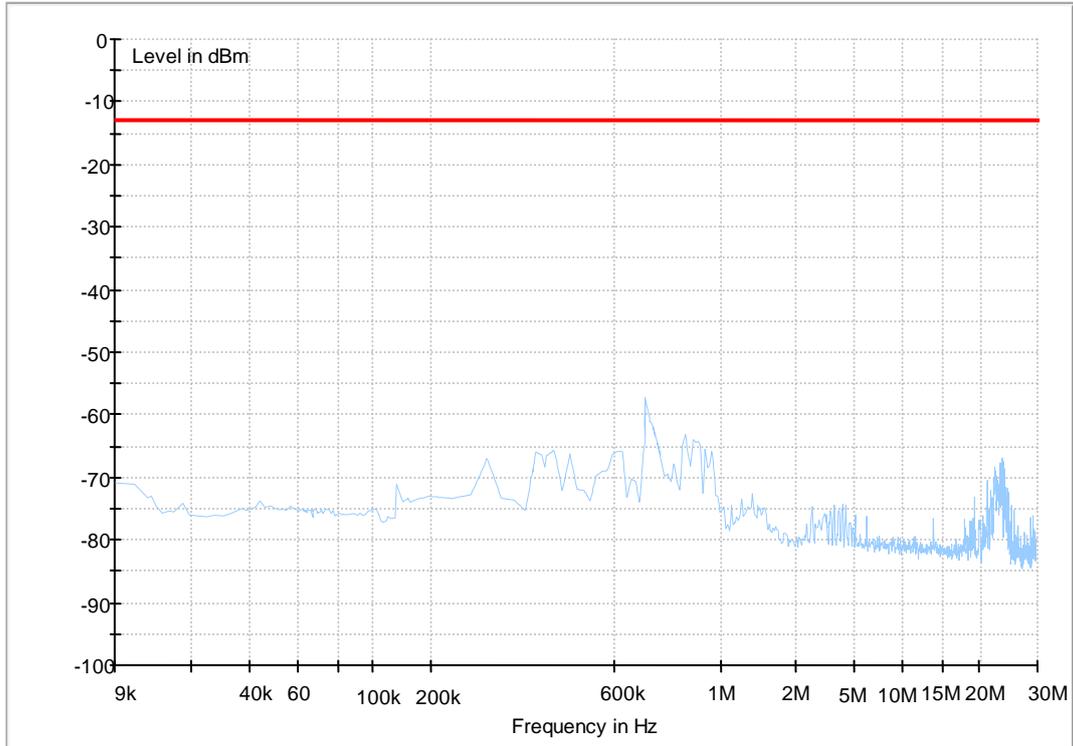


# Appendix F

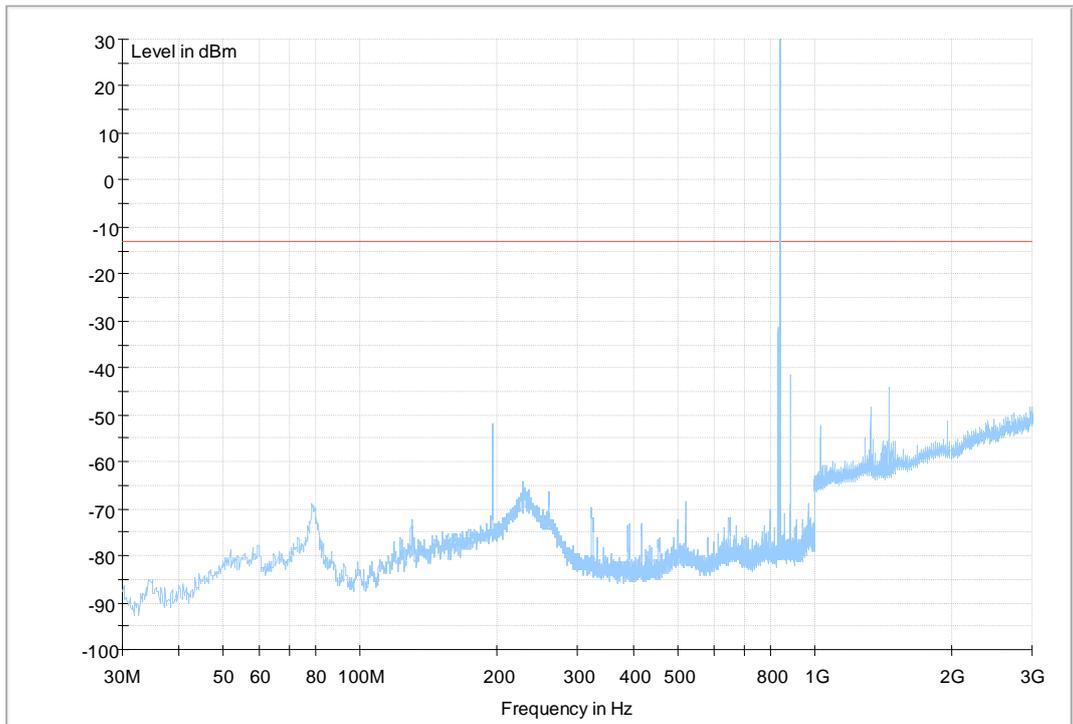
## Radiated spurious emission According to FCC Part 2.1053& Part 22.917

## GPRS 850

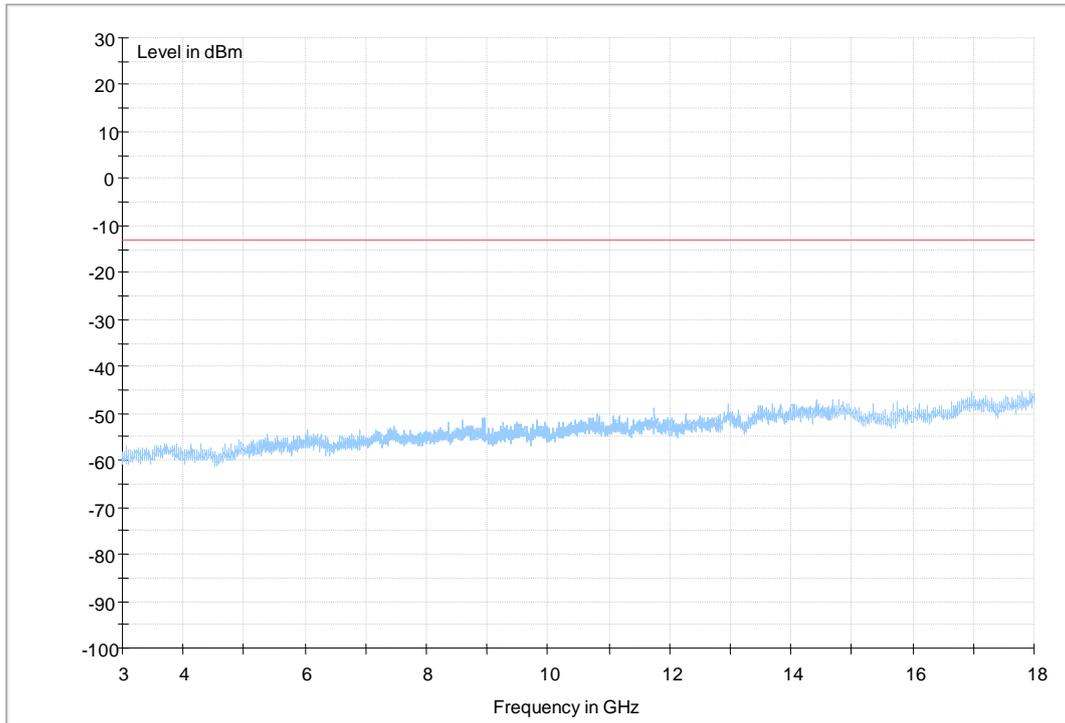
(9kHz~30MHz)



(30MHz~3GHz)

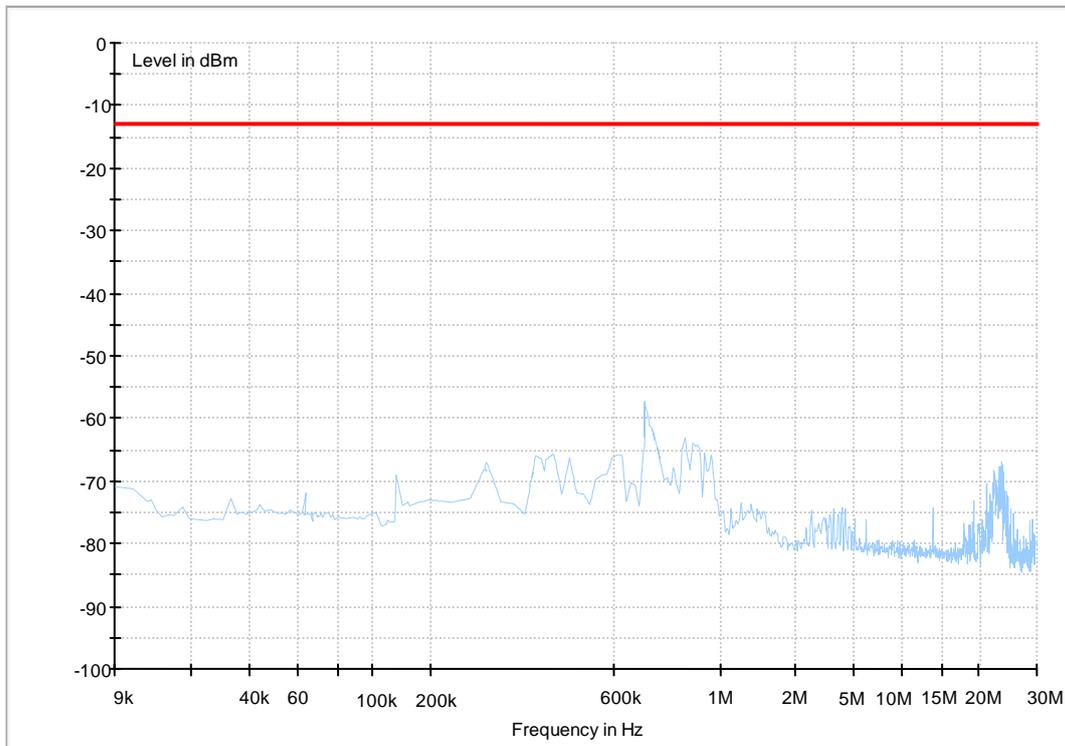


(3GHz~18GHz)

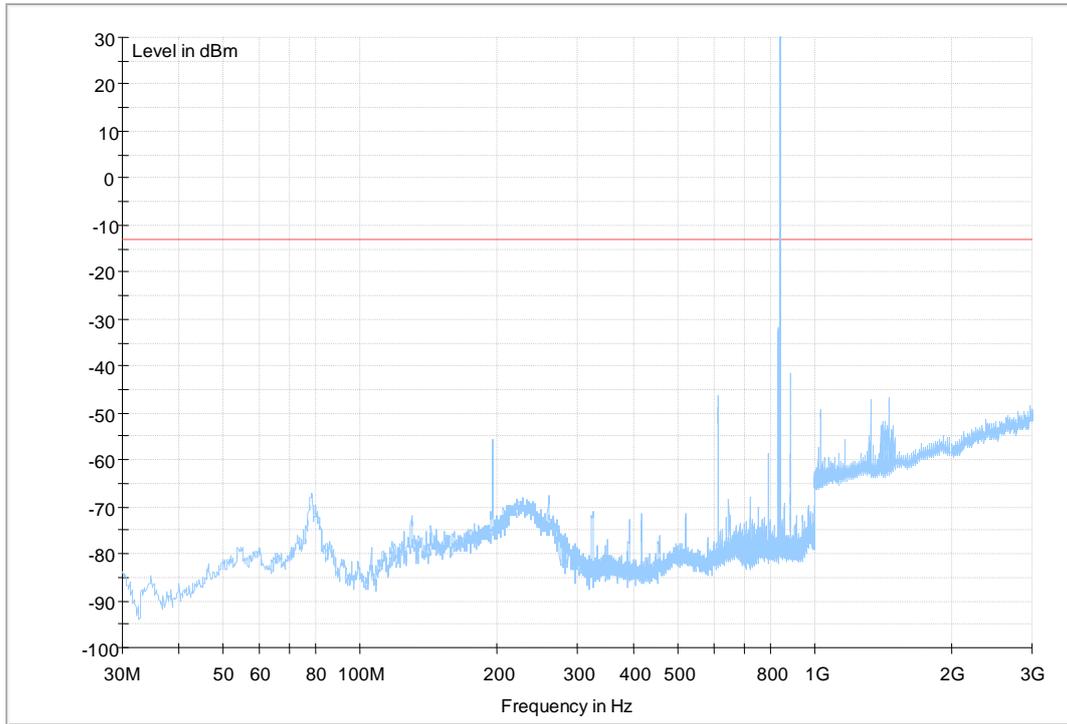


EDGE 850

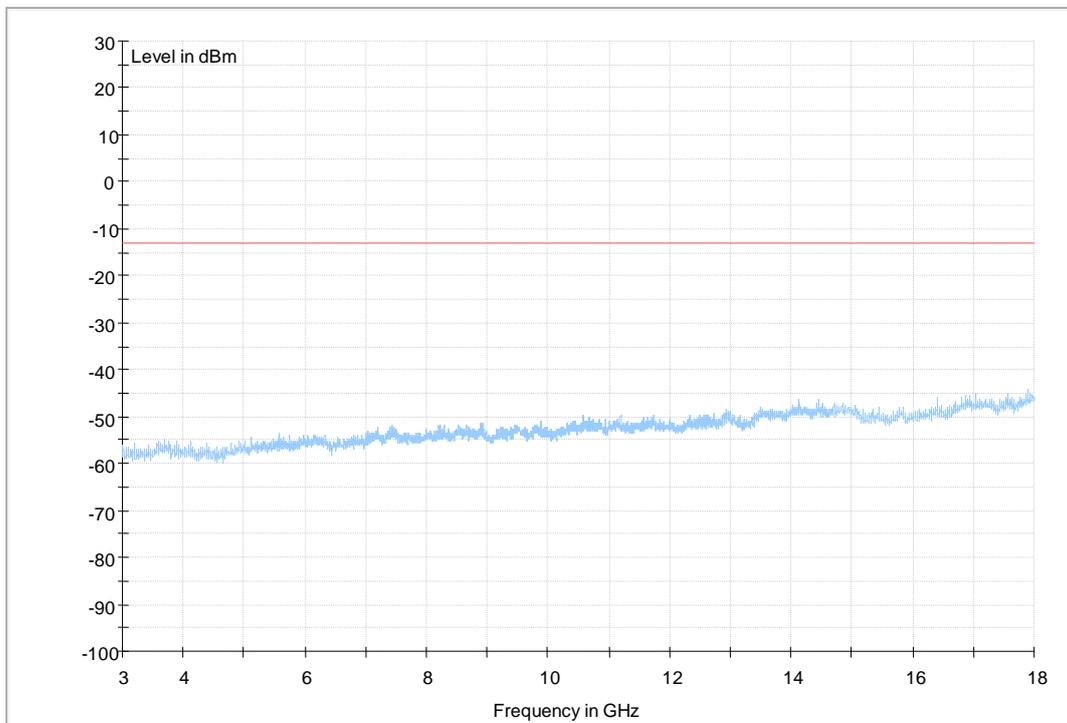
(9kHz~30MHz)



(30MHz~3GHz)

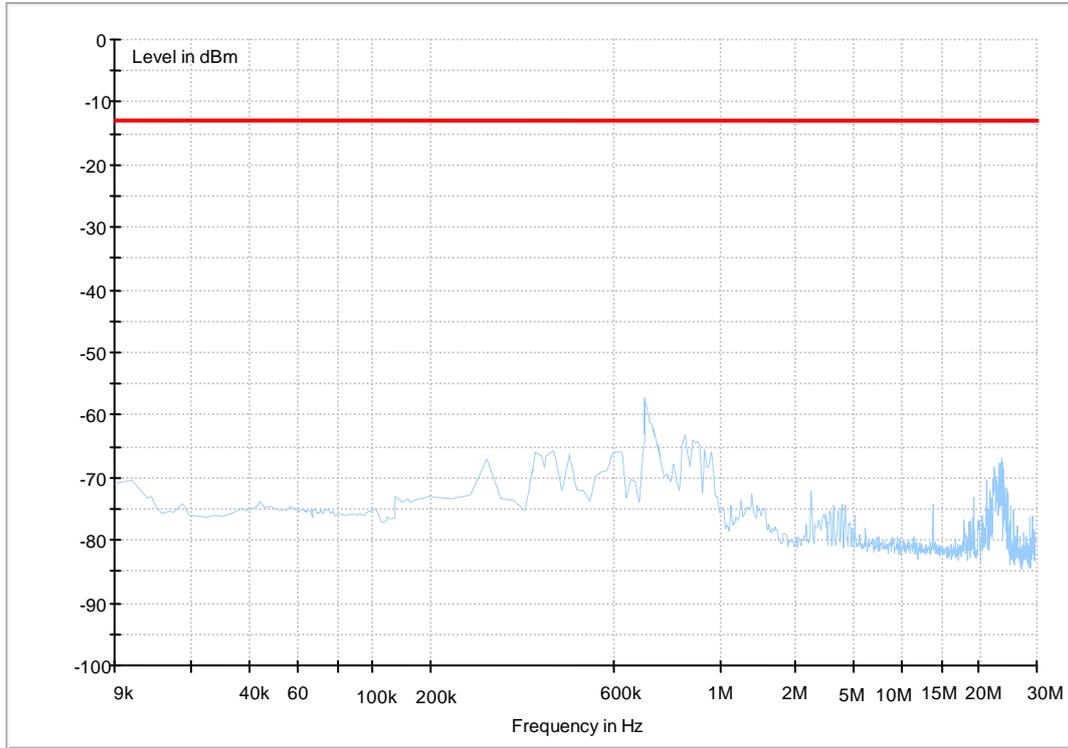


(3GHz~18GHz)

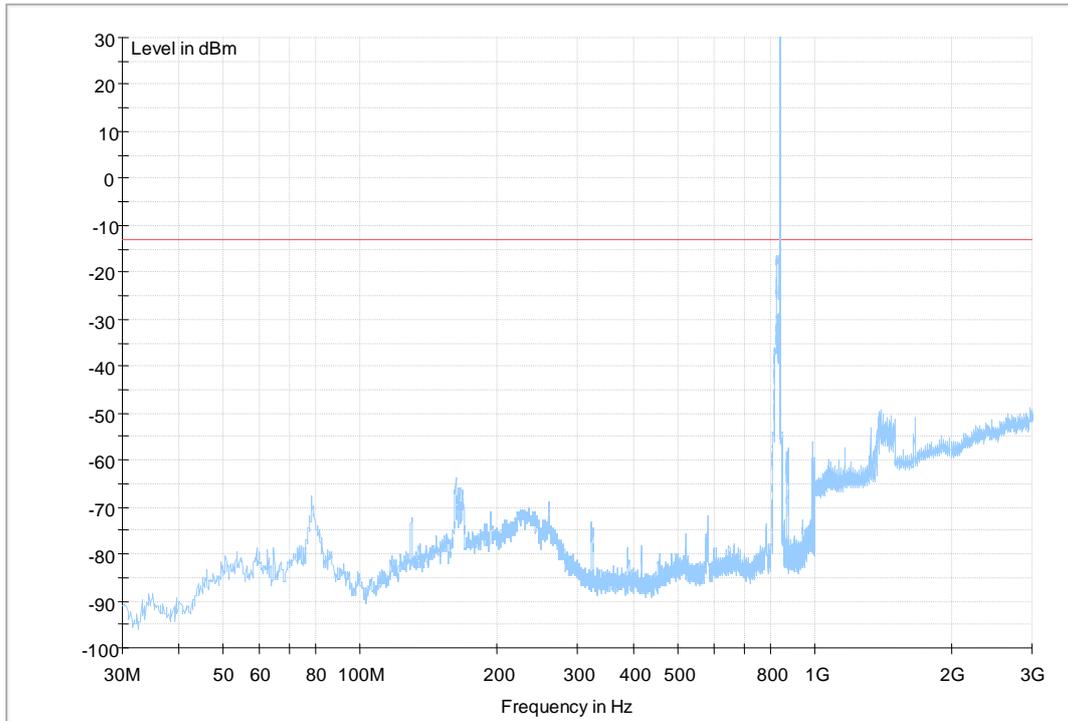


### WCDMA Band V

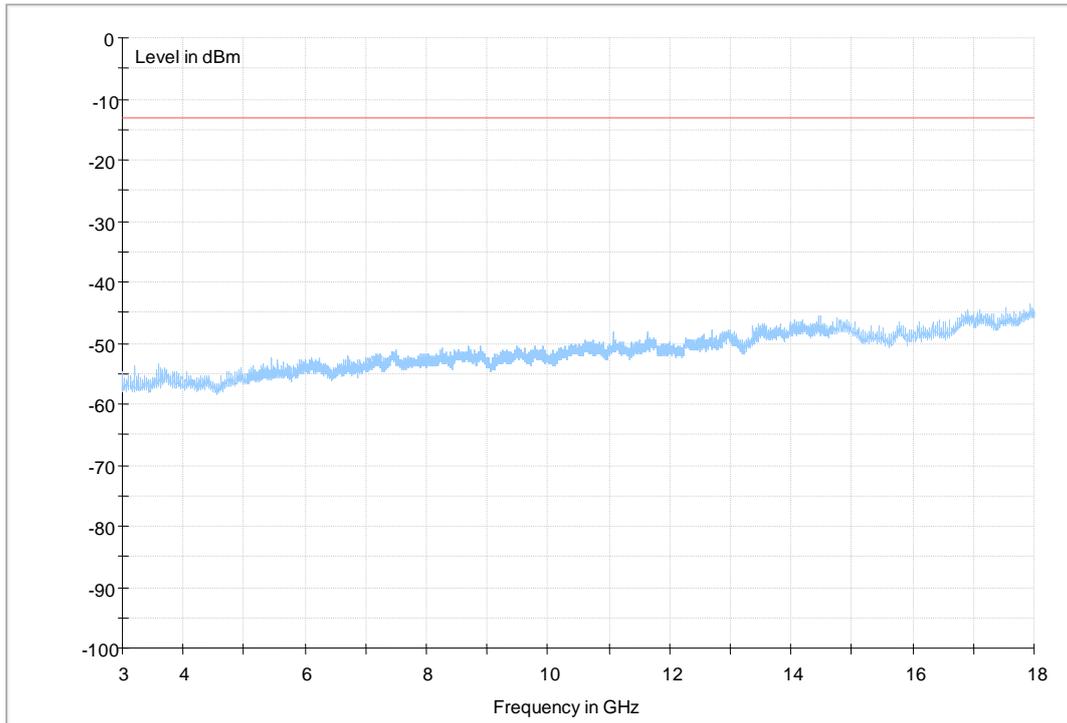
(9KHz~30MHz)



(30MHz~3GHz)

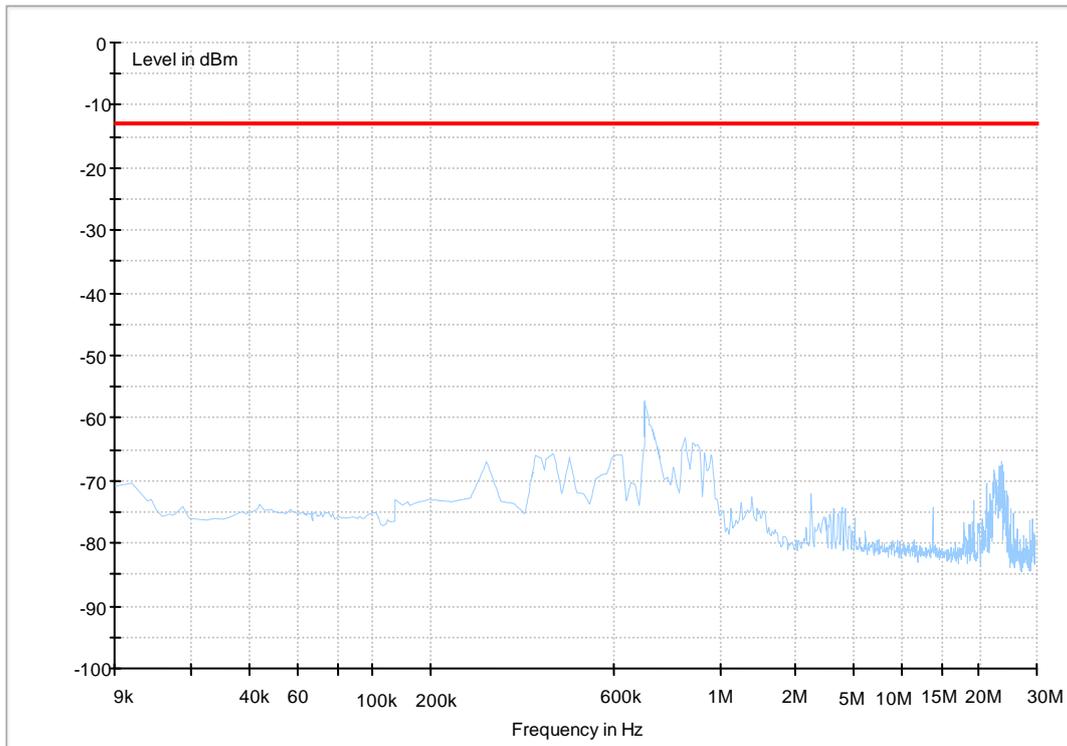


(3GHz~18GHz)

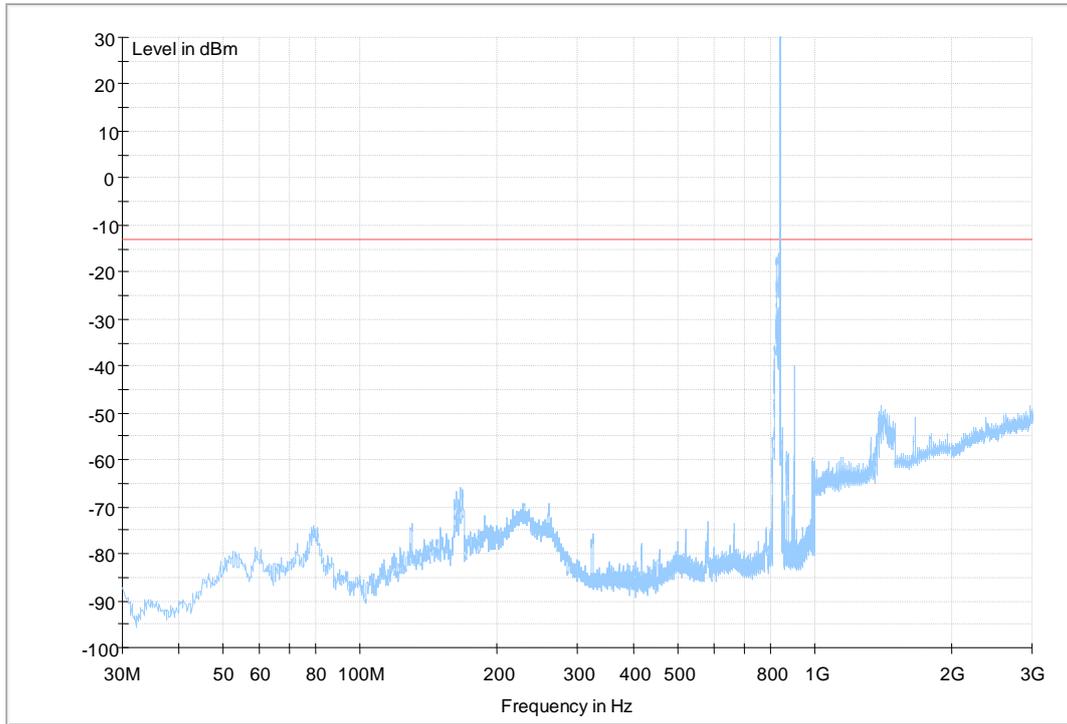


HSDPA Band V

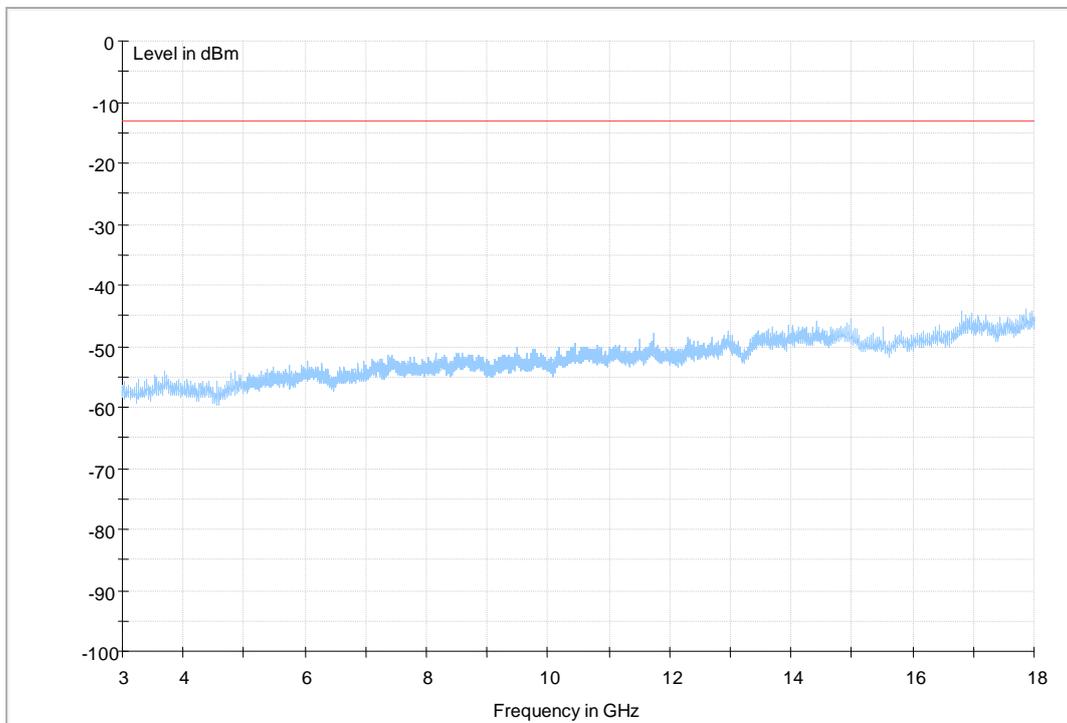
(9KHz~30MHz)



(30MHz~3GHz)

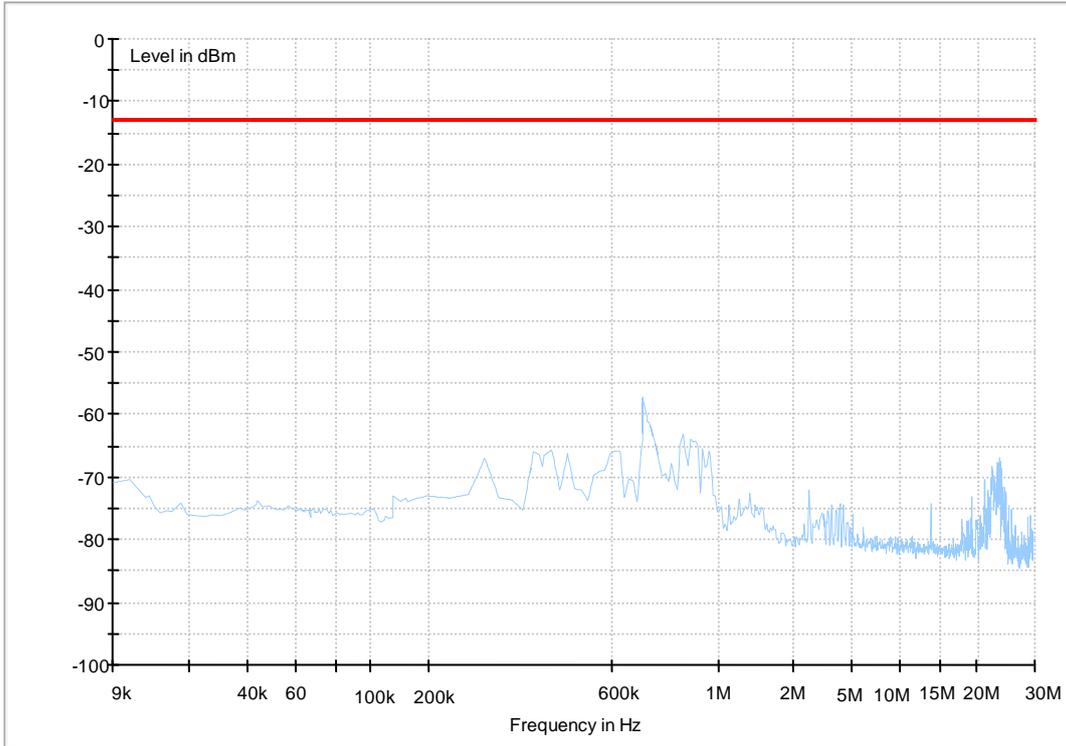


(3GHz~18GHz)

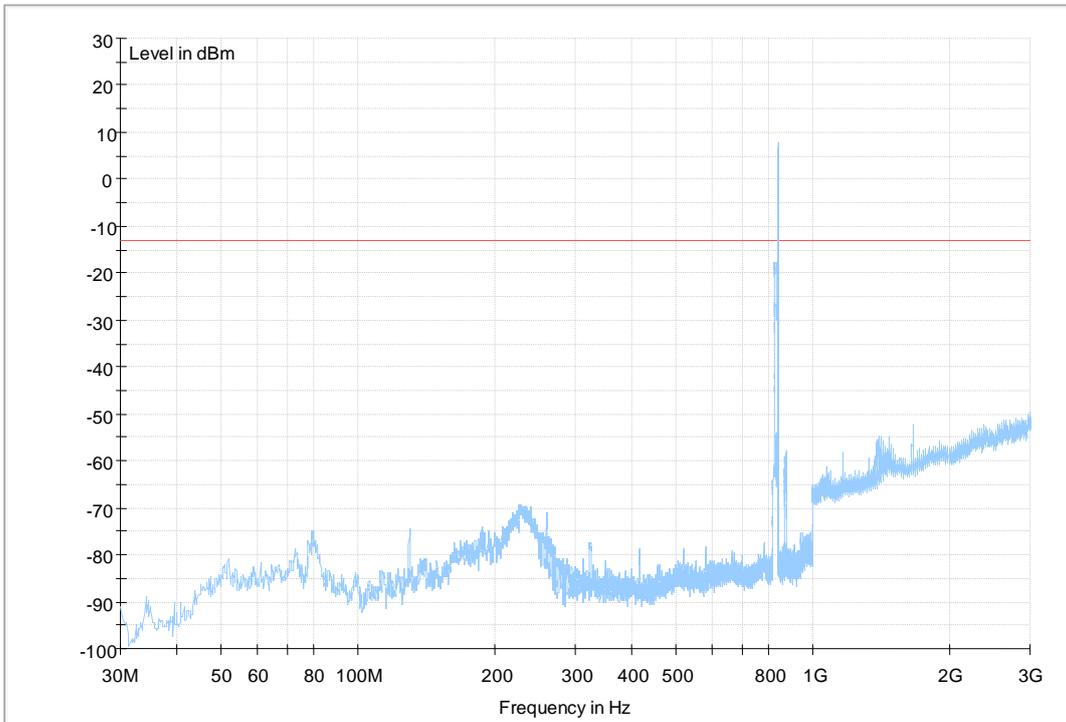


### HSUPA Band V

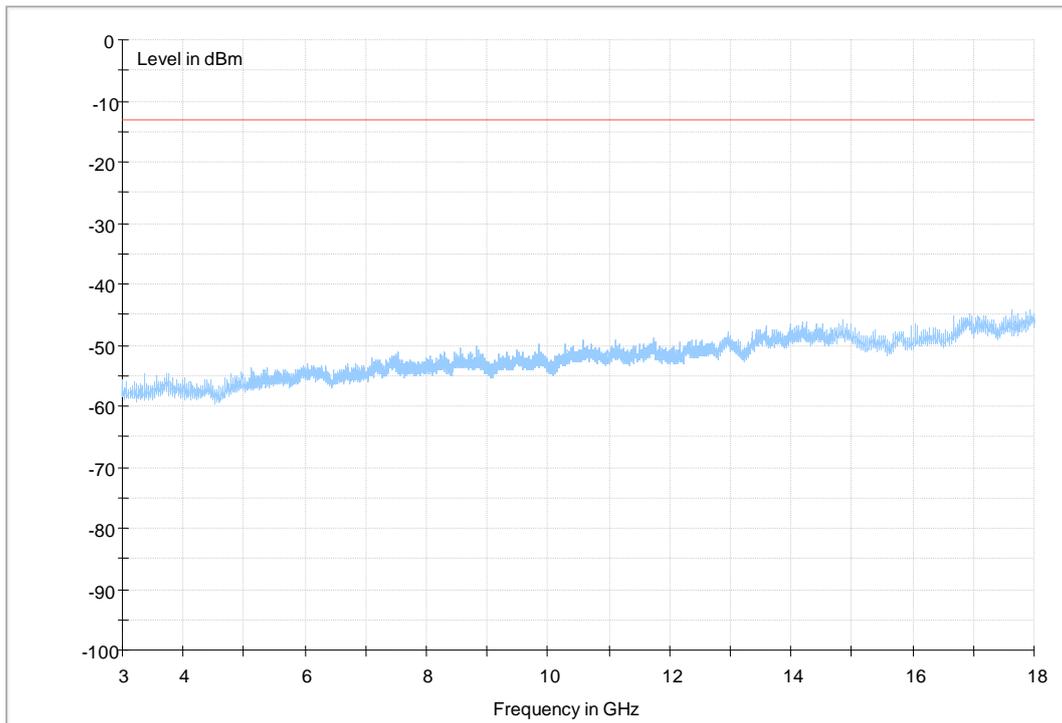
(9KHz~30MHz)



(30MHz~3GHz)



(3GHz~18GHz)



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	13	0.0155	---	±2.5	Pass
			-20 °C	16	0.0191	---	±2.5	Pass
			-10 °C	-15	-0.0179	---	±2.5	Pass
			0 °C	9	0.0108	---	±2.5	Pass
			10 °C	18	0.0215	---	±2.5	Pass
			20 °C	-12	-0.0143	---	±2.5	Pass
			30 °C	-14	-0.0167	---	±2.5	Pass
			40 °C	11	0.0131	---	±2.5	Pass
			50 °C	-17	-0.0203	---	±2.5	Pass
TM 2	M	100%	-30 °C	11	0.0131	---	±2.5	Pass
			-20 °C	-12	-0.0143	---	±2.5	Pass
			-10 °C	15	0.0179	---	±2.5	Pass
			0 °C	-17	-0.0203	---	±2.5	Pass
			10 °C	12	0.0143	---	±2.5	Pass
			20 °C	14	0.0167	---	±2.5	Pass
			30 °C	-8	-0.0096	---	±2.5	Pass
			40 °C	11	0.0131	---	±2.5	Pass
			50 °C	13	0.0155	---	±2.5	Pass
TM 3	M	100%	-30 °C	9	0.01076	---	±2.5	Pass
			-20 °C	11	0.013152	---	±2.5	Pass
			-10 °C	-13	-0.01554	---	±2.5	Pass
			0 °C	12	0.014347	---	±2.5	Pass
			10 °C	-18	-0.02152	---	±2.5	Pass
			20 °C	-17	-0.02033	---	±2.5	Pass
			30 °C	-12	-0.01435	---	±2.5	Pass
			40 °C	13	0.015543	---	±2.5	Pass
			50 °C	-14	-0.01674	---	±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 %	19	0.0227	---	±2.5	Pass
			100 %	18	0.0215	---	±2.5	Pass
			115 %	11	0.0131	---	±2.5	Pass
TM 2	M	20 °C	85 %	-9	-0.0108	---	±2.5	Pass
			100 %	-13	-0.0155	---	±2.5	Pass
			115 %	14	0.0167	---	±2.5	Pass
TM 3	M	20 °C	85 %	-15	-0.01793	---	±2.5	Pass
			100 %	19	0.022716	---	±2.5	Pass
			115 %	-14	-0.01674	---	±2.5	Pass



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## 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)

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

END