



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



Appendix B

Modulation Characteristics

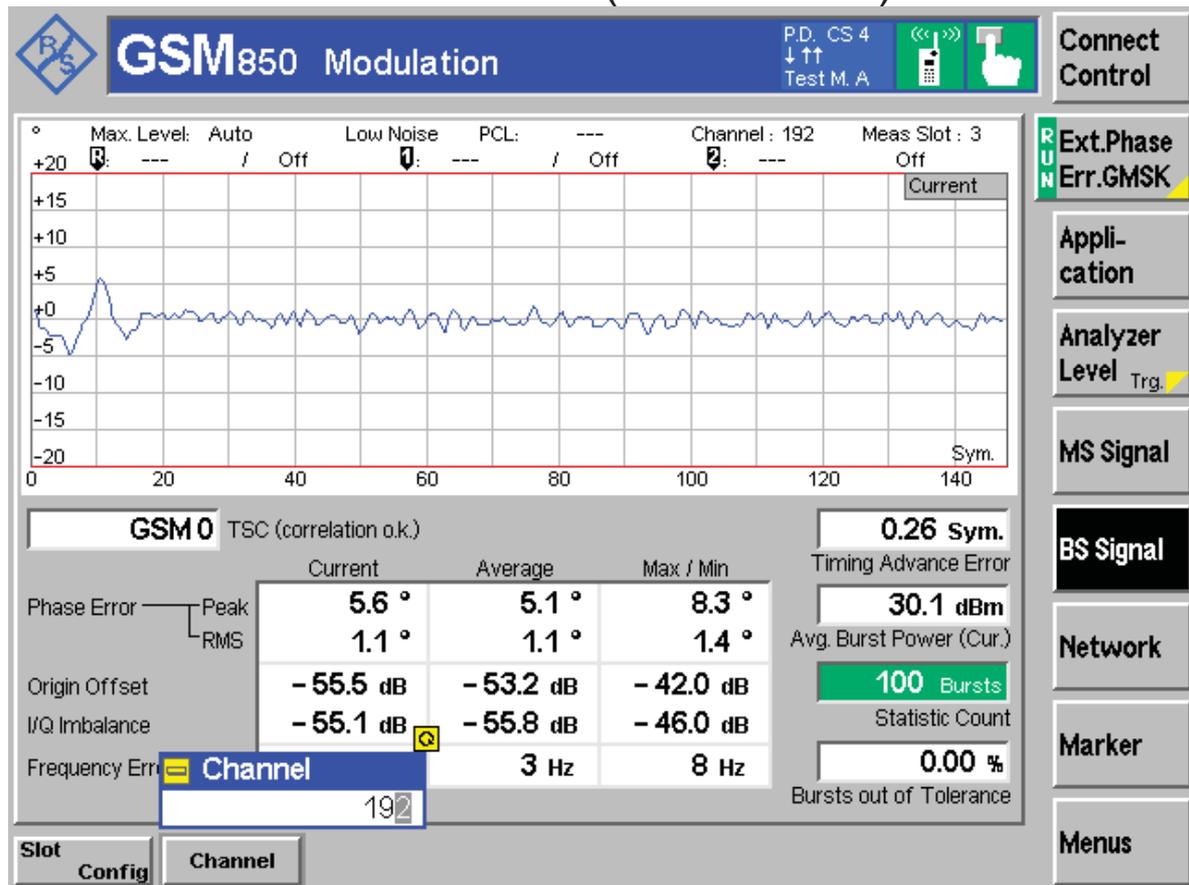
According to FCC Part 2.1047 & Part22 Subpart H



1 Test Plot

1.1 Test Mode = TM 1

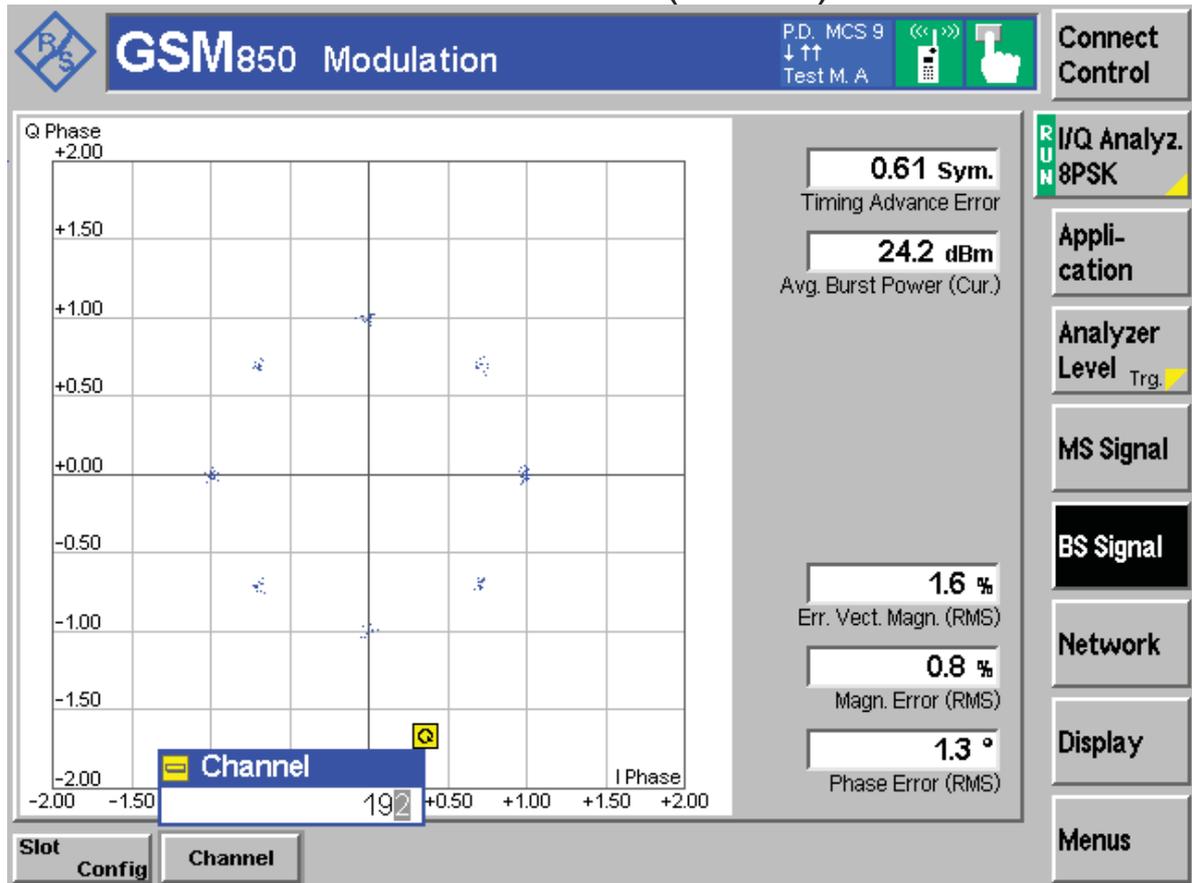
Channel 192 (GPRS/GSM)





1.2 Test Mode = TM 2

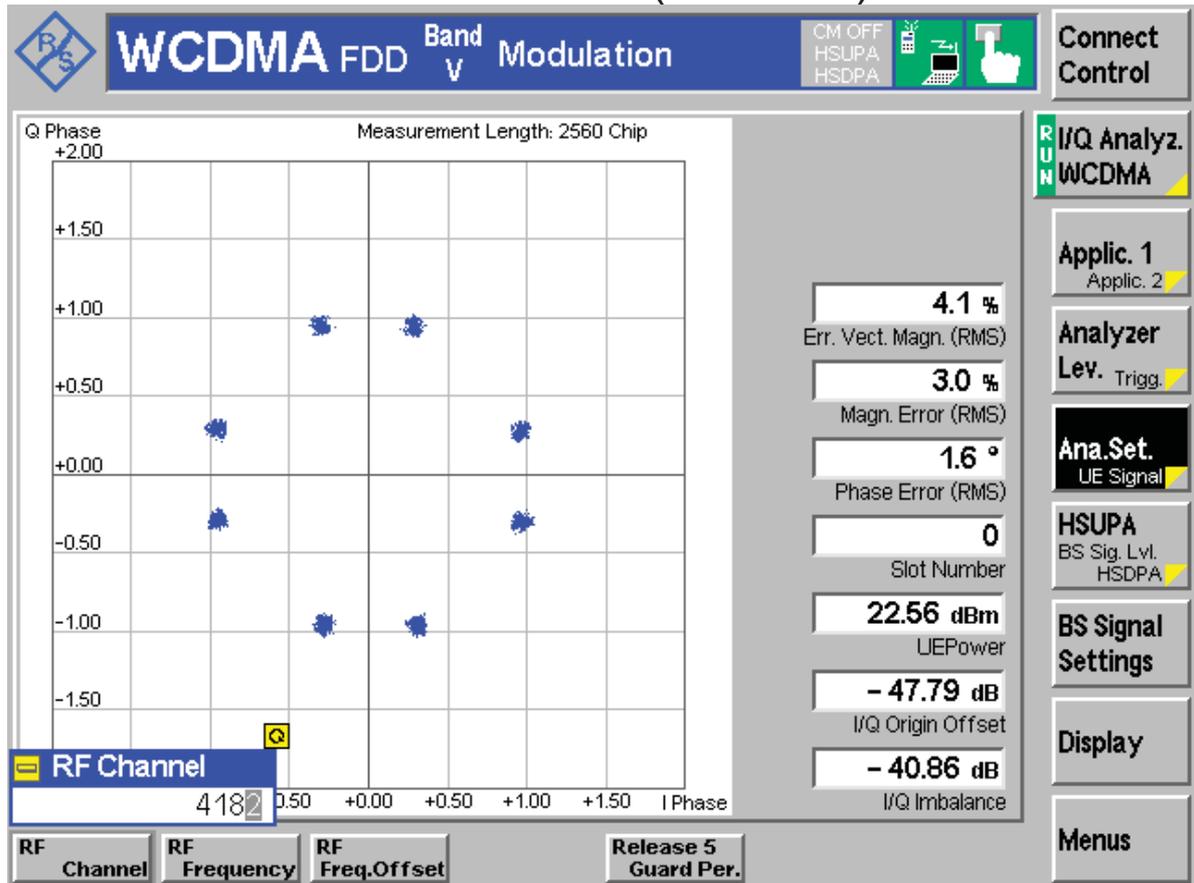
Channel 192 (EDGE)





1.3 Test Mode = TM 3

Channel 4182 (WCDMA)



END



Appendix C

Occupied Bandwidth

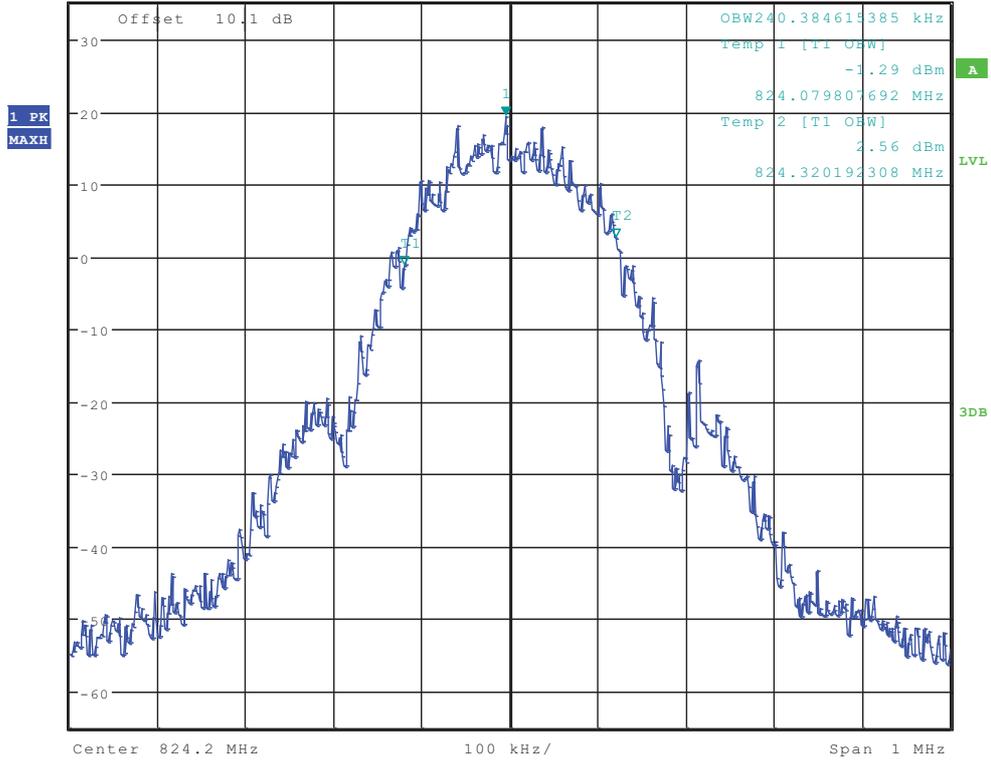
According to FCC Part 2.1049 & Part 22 Subpart H



TM2:EDGE Channel 128



*RBW 3 kHz Marker 1 [T1]
 *VBW 10 kHz 19.41 dBm
 Ref 35 dBm Att 30 dB SWT 115 ms 824.195192308 MHz

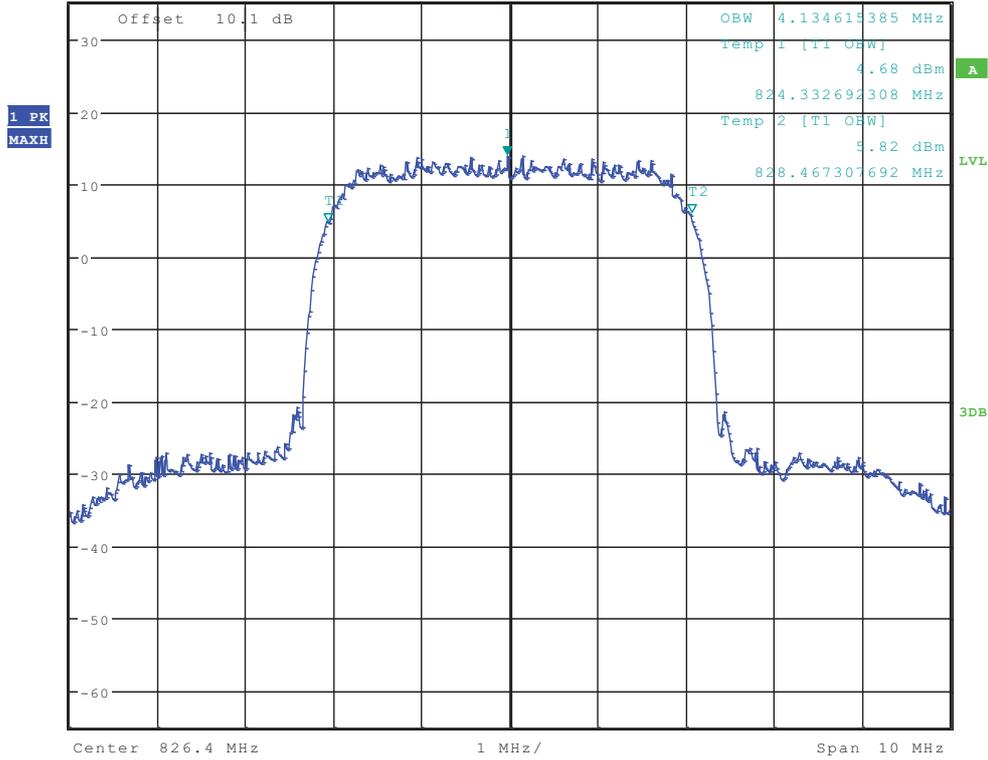




TM3: WCDMA Channel 4132

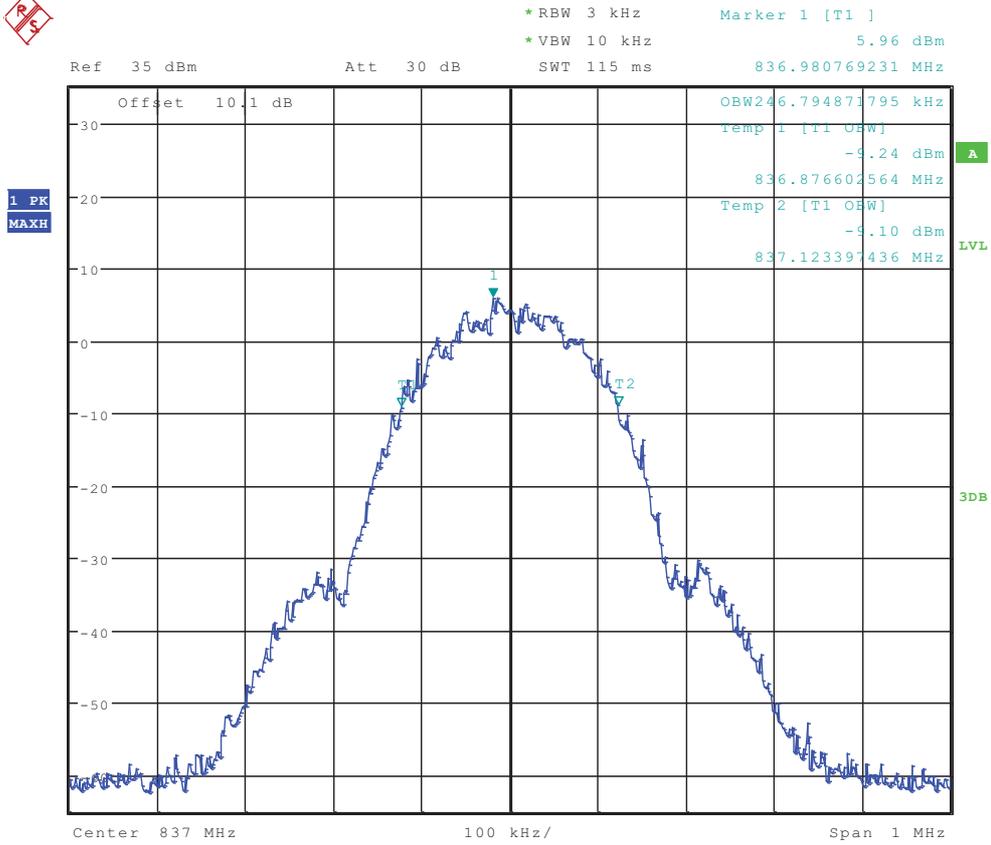


*RBW 50 kHz Marker 1 [T1]
 *VBW 500 kHz 13.88 dBm
 Ref 35 dBm Att 30 dB SWT 5 ms 826.367948718 MHz



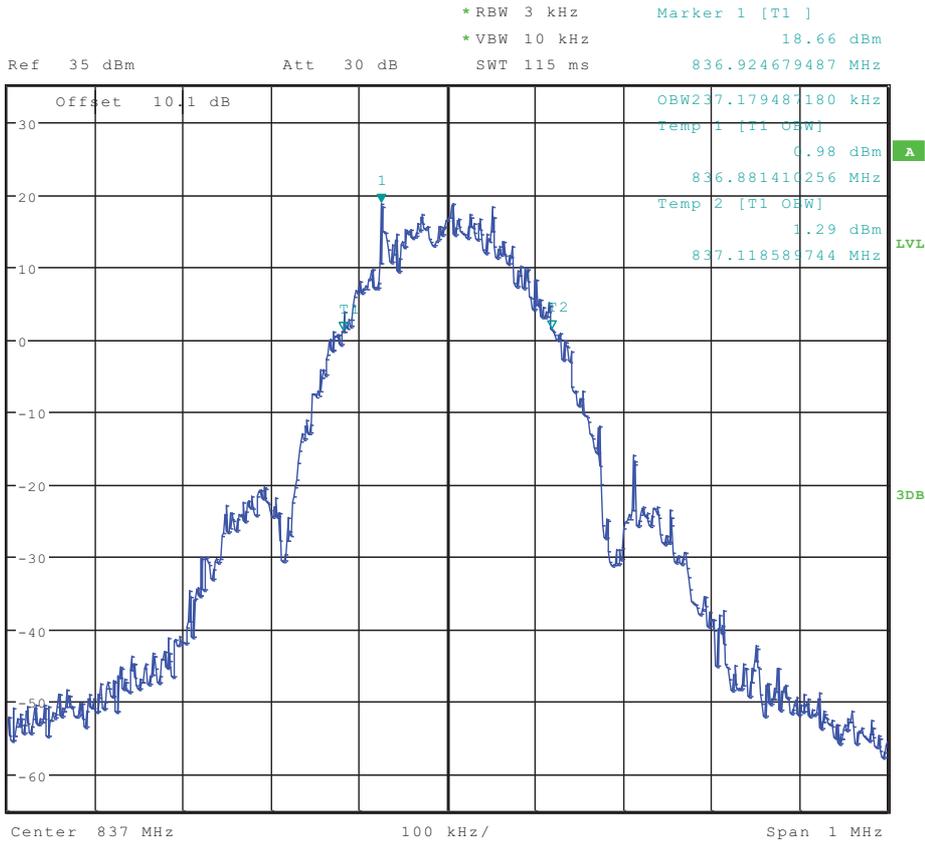


TM1:GPRS/GSM Channel 192



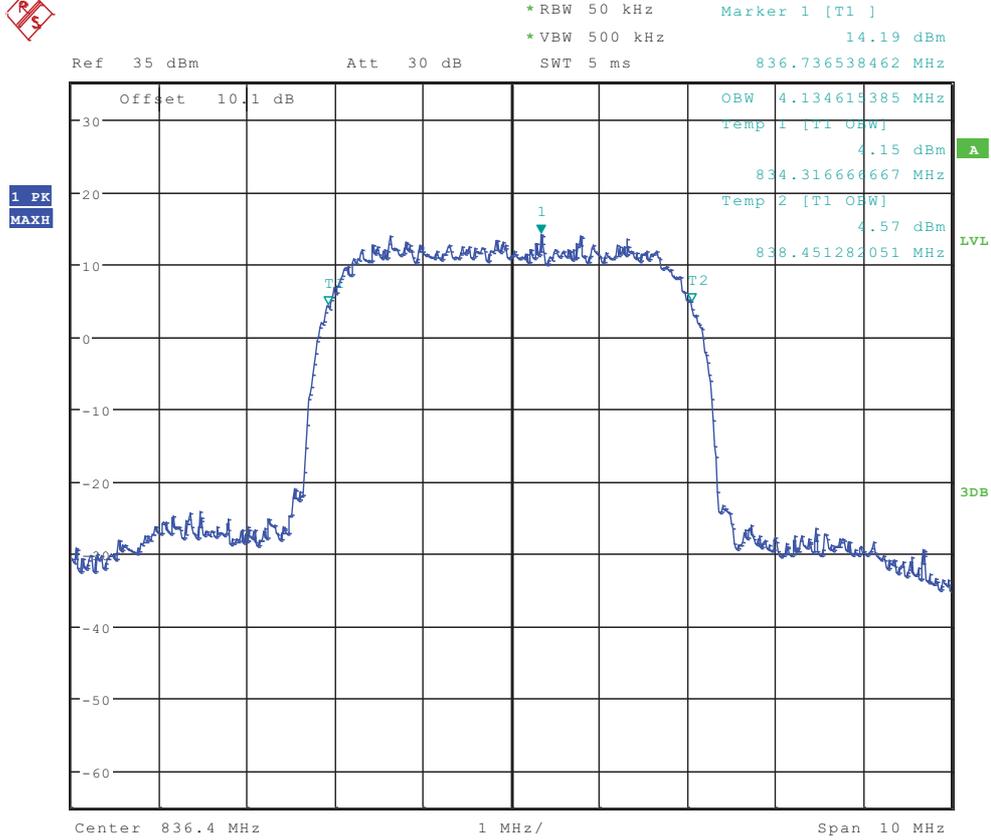


TM2:EDGE Channel 192



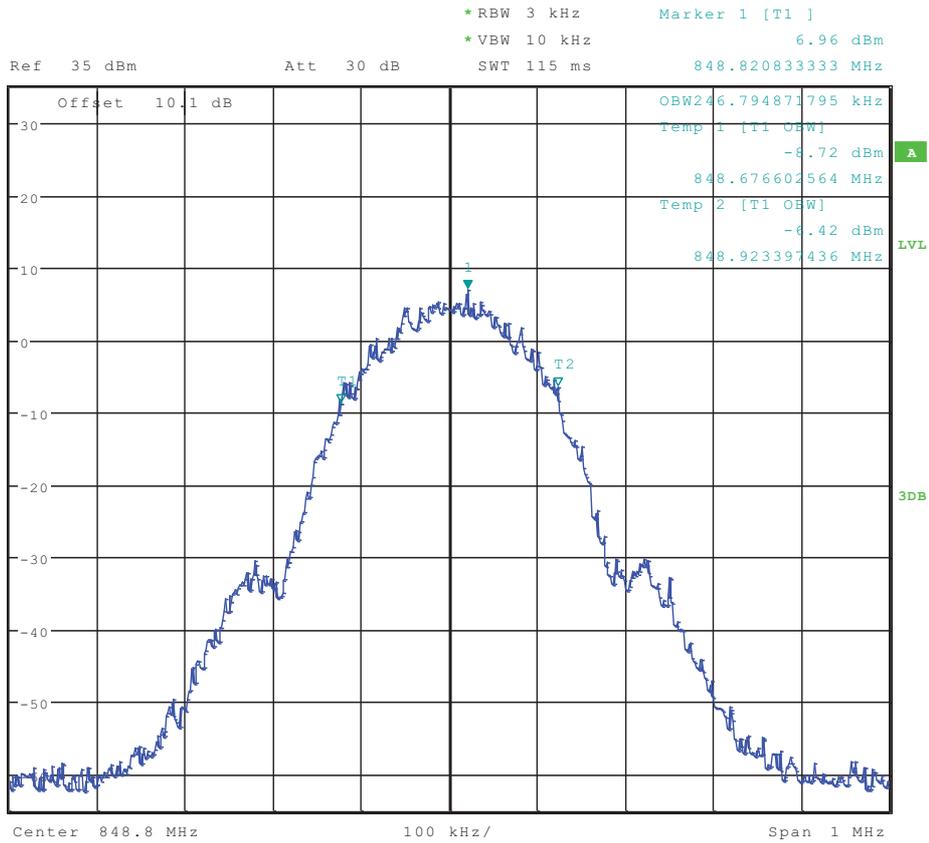


TM3: WCDMA Channel 4182



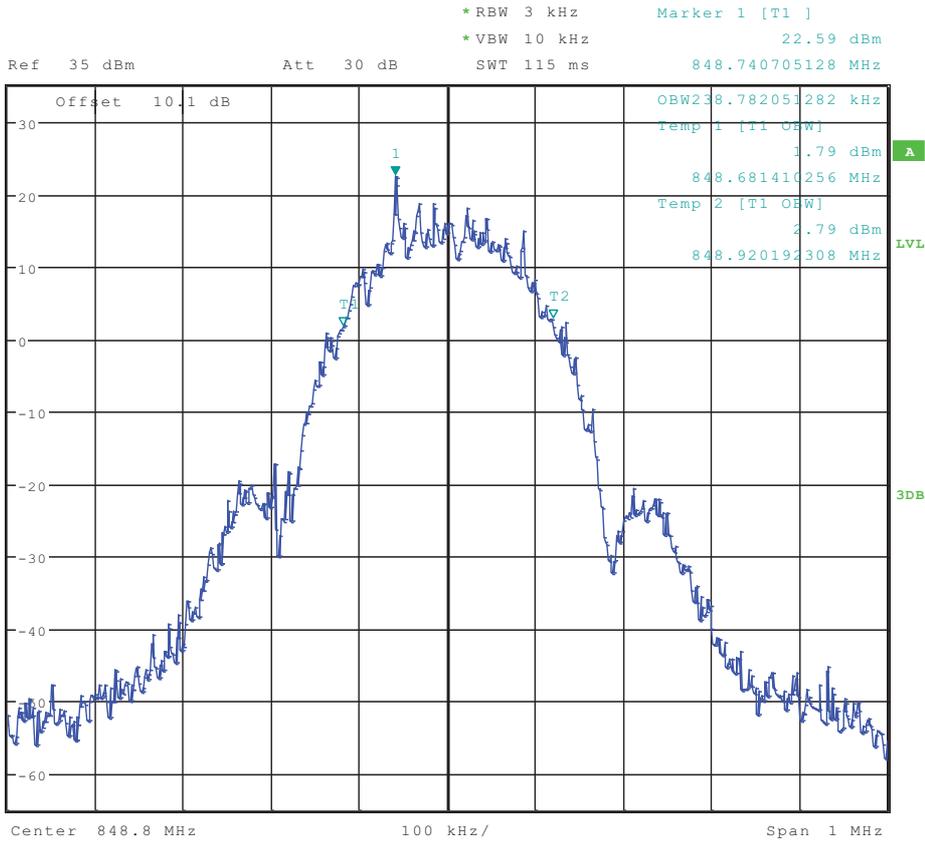


TM1:GPRS/GSM Channel 251



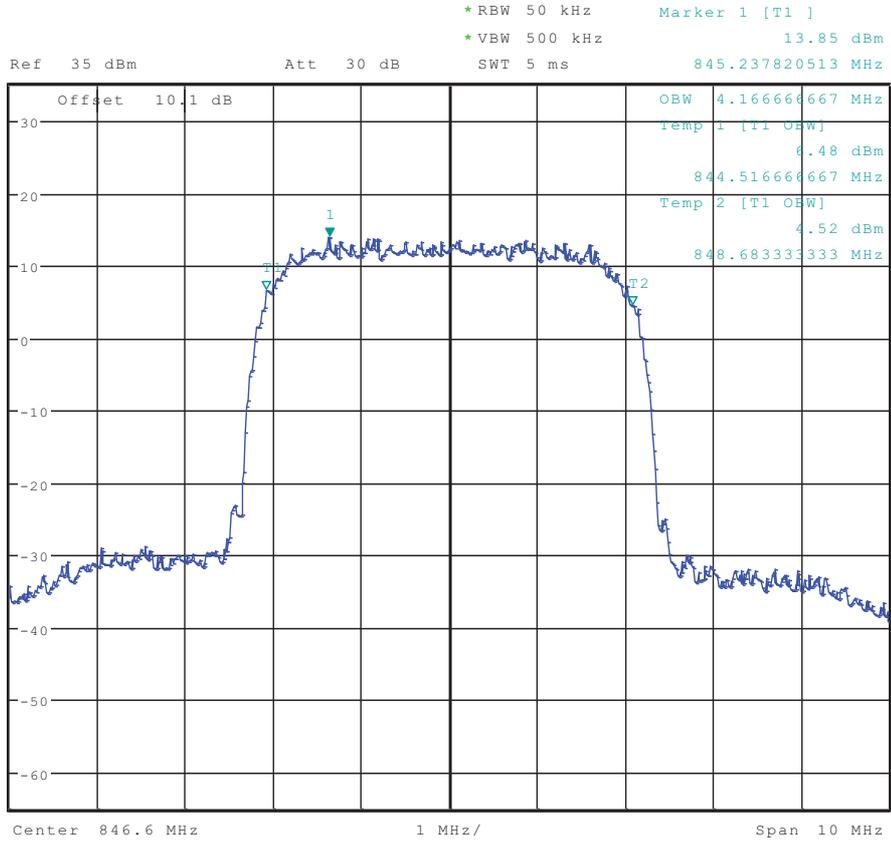


TM2:EDGE Channel 251





TM3: WCDMA Channel 4233



END



Appendix D

Band Edges Compliance

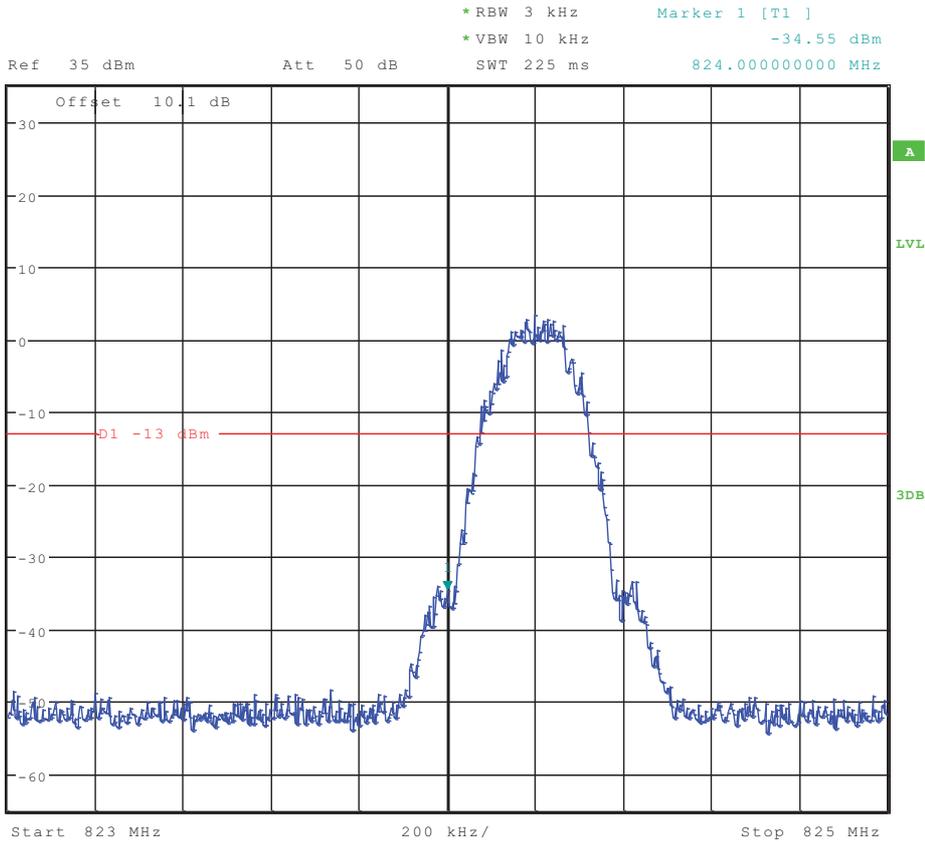
According to FCC Part 2.1051 & Part 22 Subpart H



TM1:GPRS/GSM

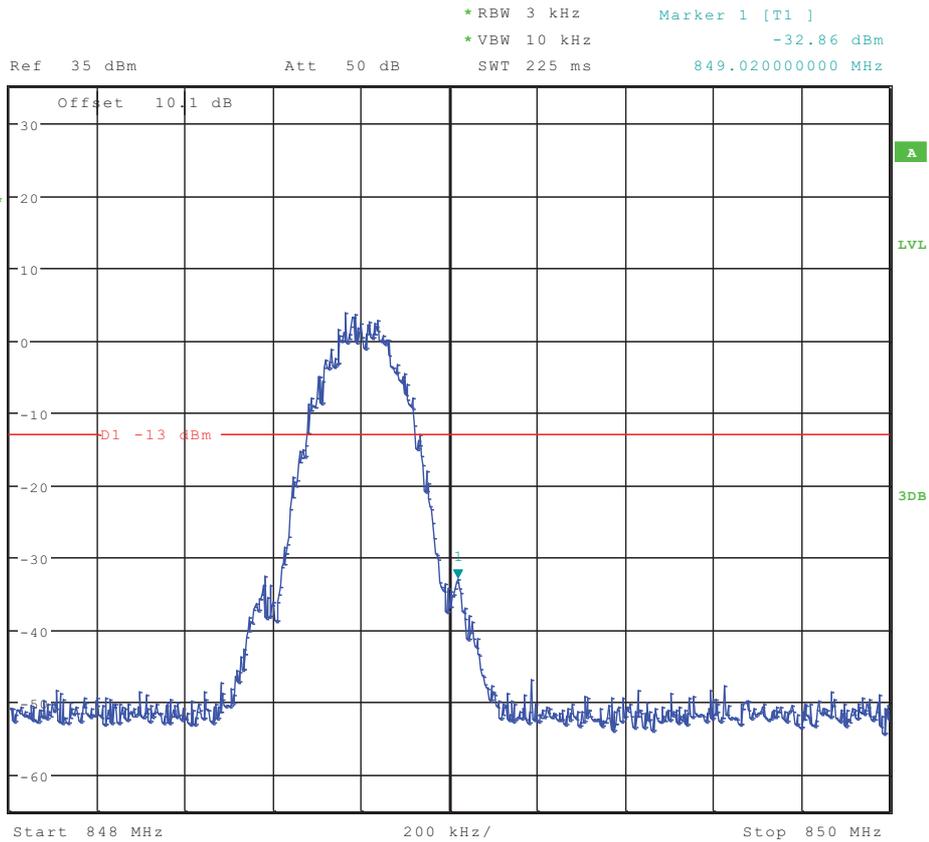
Left Edge

Channel 128





Right Edge Channel 251





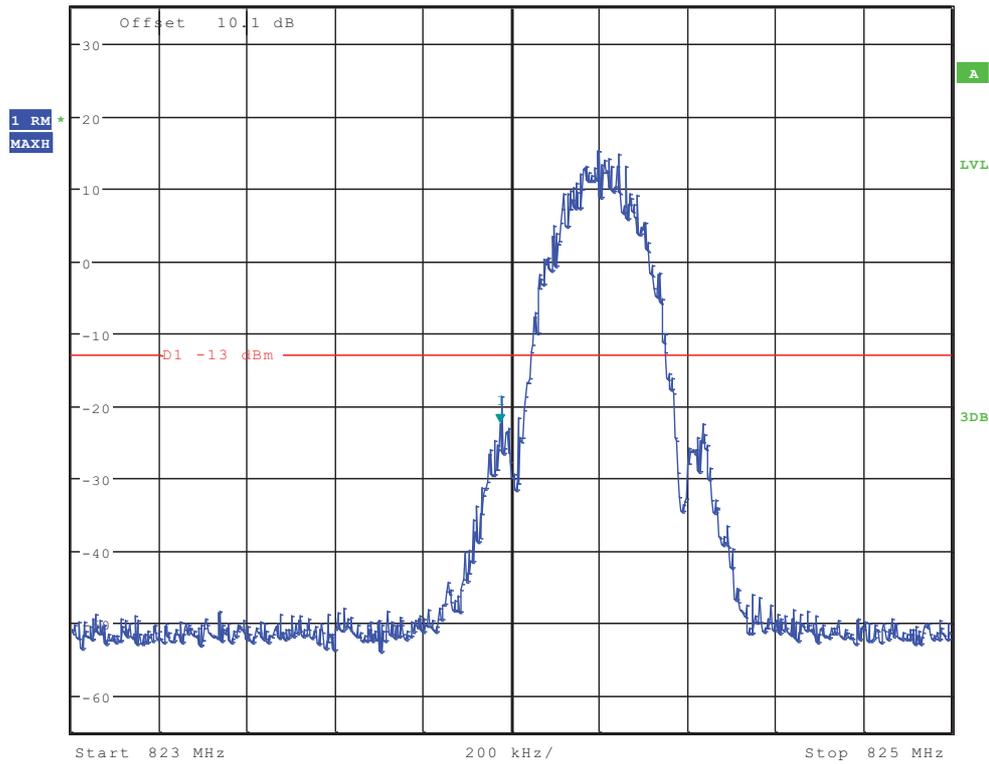
TM2:EDGE

Left Edge

Channel 128

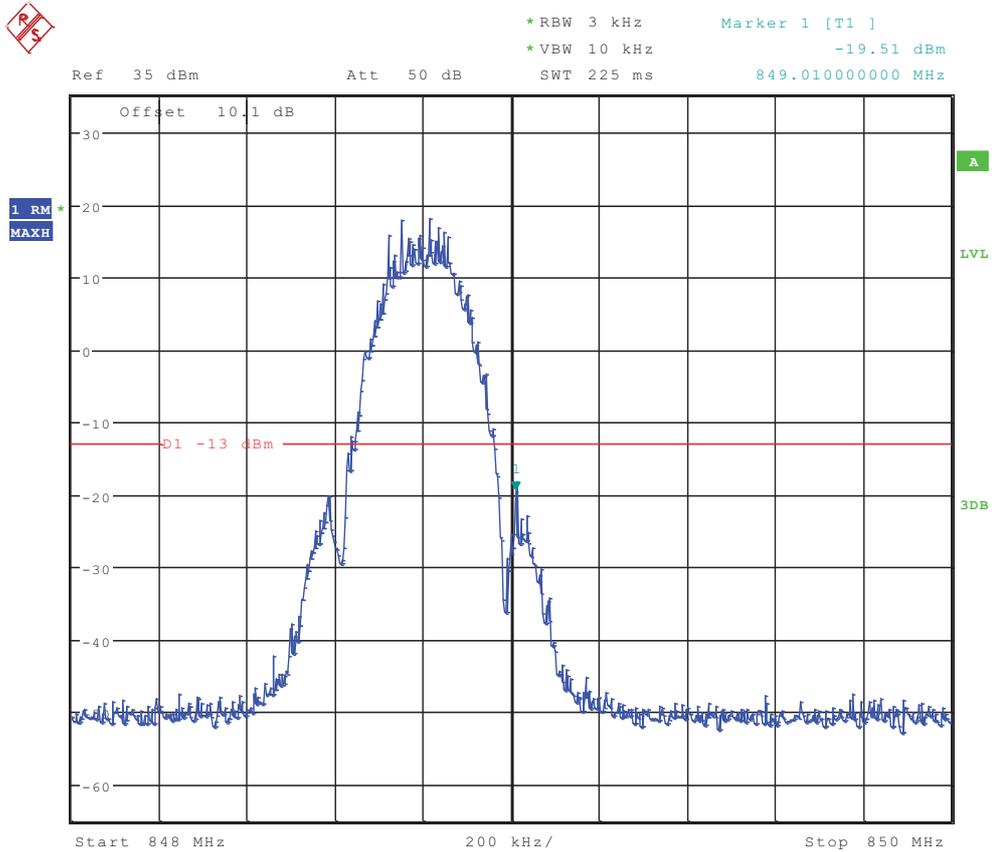


Ref 35 dBm Att 50 dB SWT 225 ms Marker 1 [T1]
* RBW 3 kHz * VBW 10 kHz -22.44 dBm
823.97500000 MHz





Right Edge Channel 251





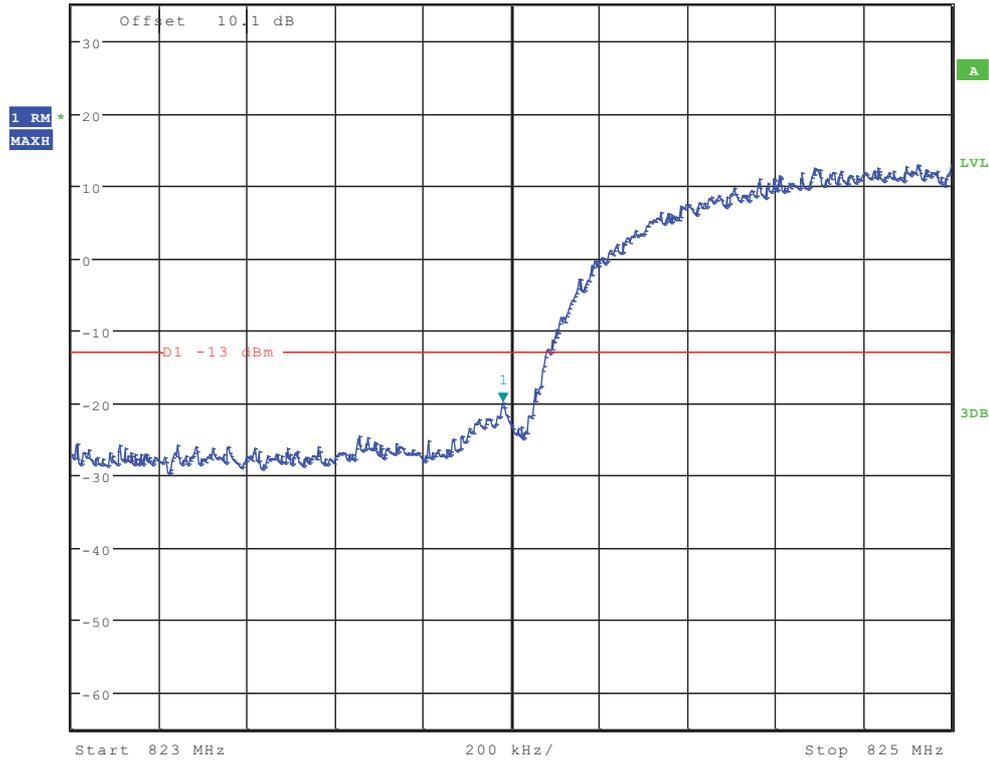
TM3: WCDMA

Left Edge

Channel 4132

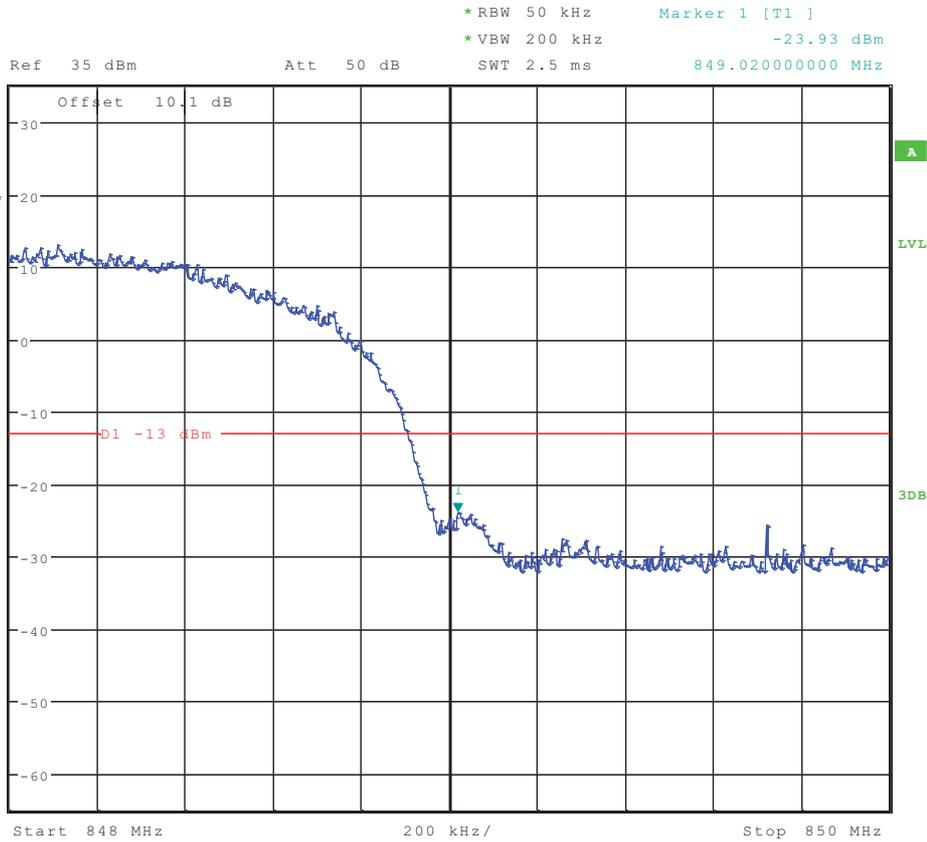


Ref 35 dBm Att 50 dB *RBW 50 kHz Marker 1 [T1] -19.99 dBm
 *VBW 200 kHz SWT 2.5 ms 823.98000000 MHz





Right Edge Channel 4233



END



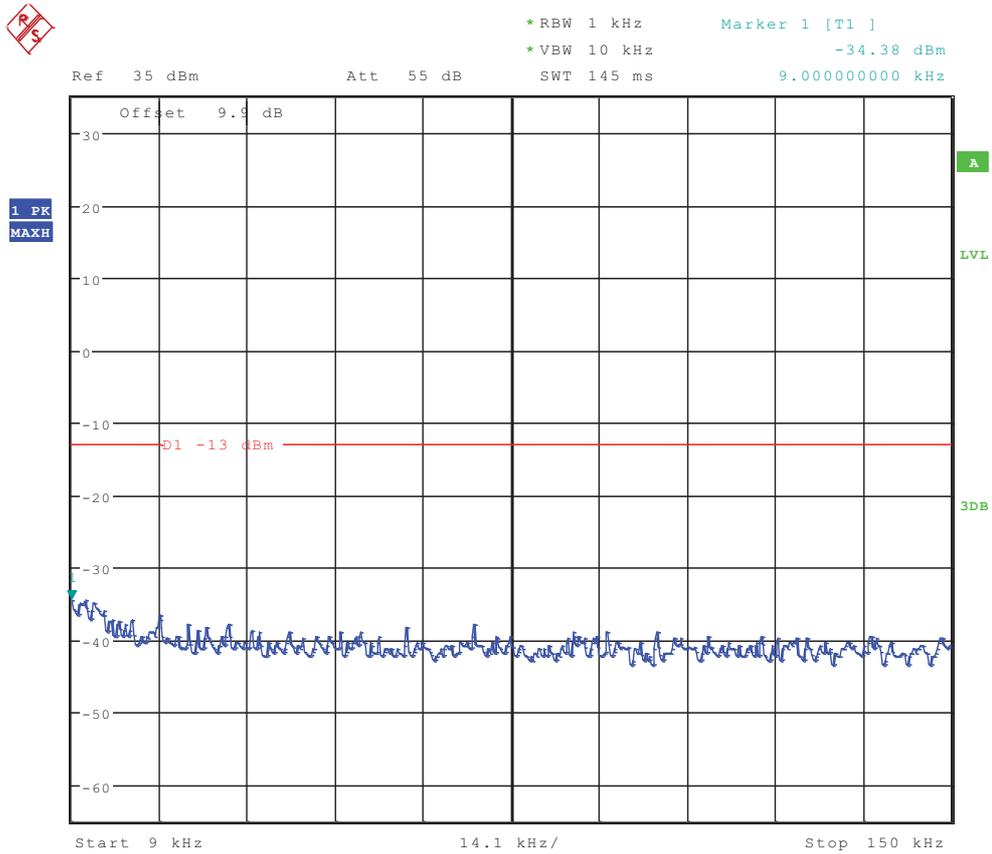
Appendix E

Spurious Emission at Antenna Terminal

According to FCC Part 2.1051 & Part 22 Subpart H

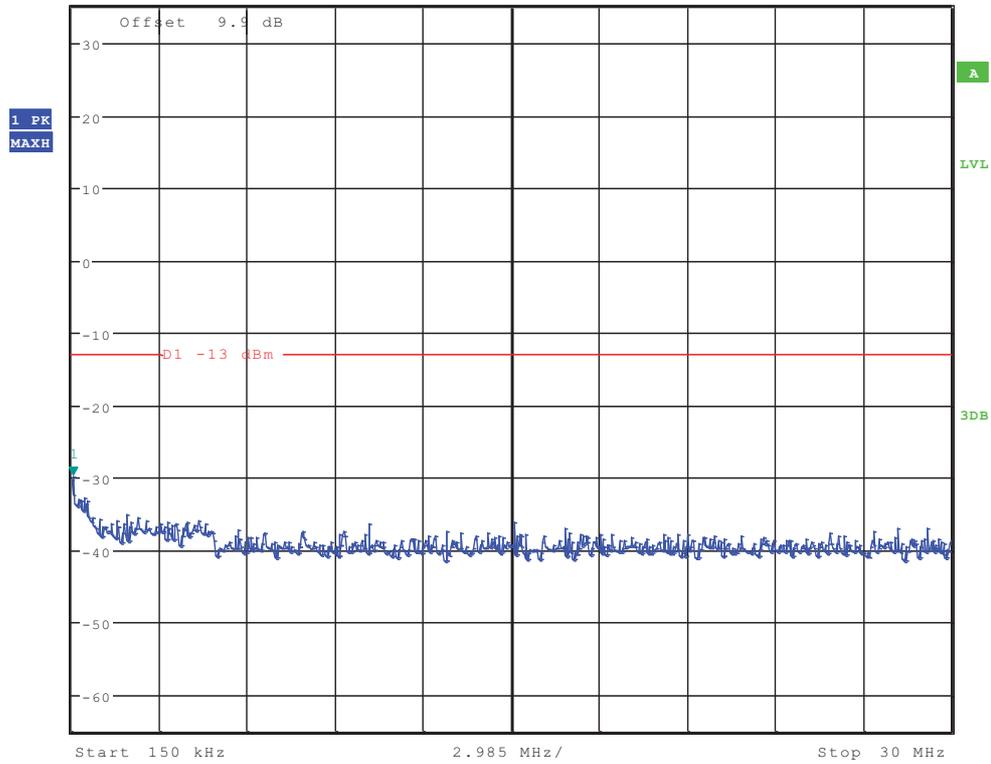


TM1:GPRS/GSM Channel 128



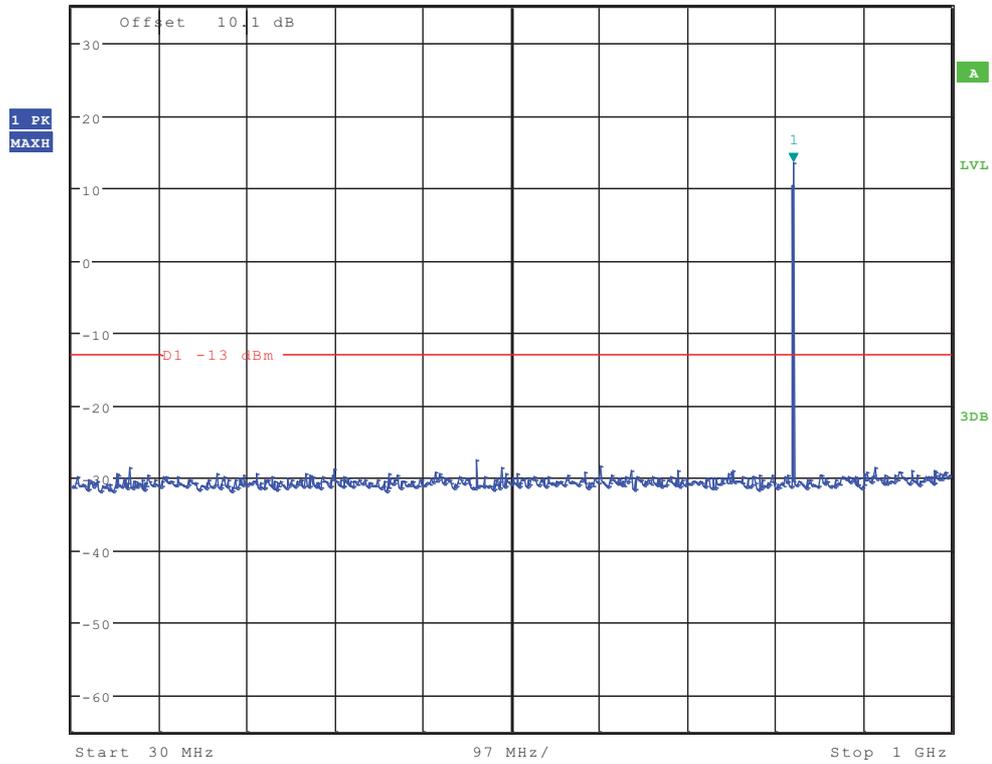


*RBW 10 kHz Marker 1 [T1]
 *VBW 30 kHz -29.87 dBm
 Ref 35 dBm Att 55 dB SWT 300 ms 197.836538462 kHz



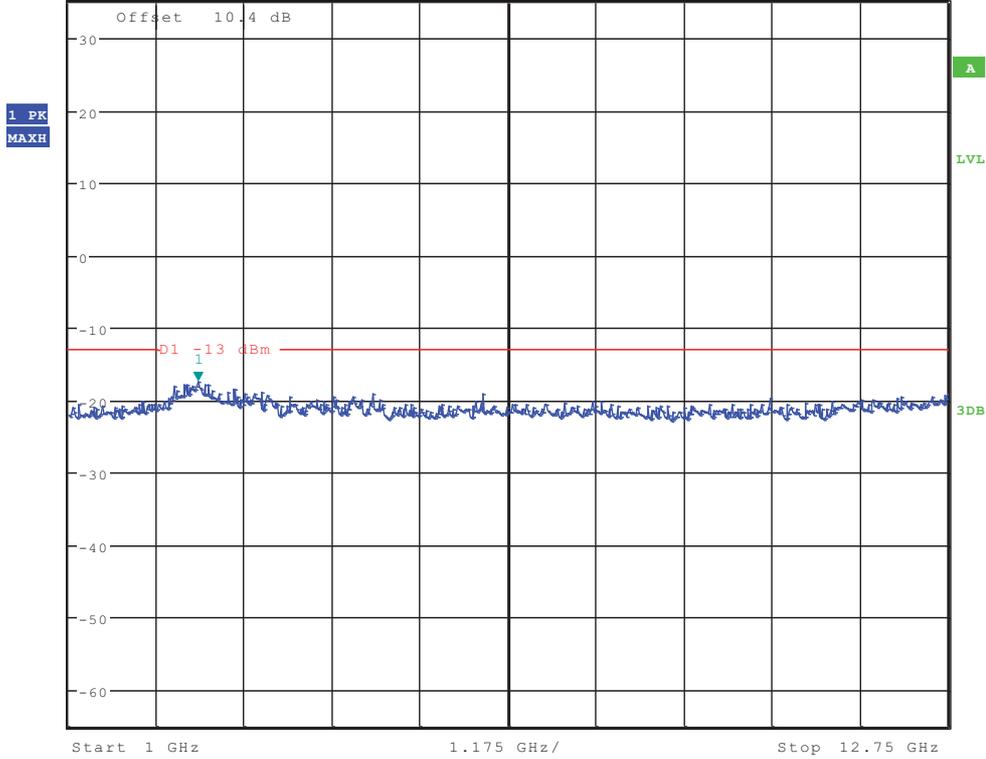


Ref 35 dBm Att 50 dB SWT 100 ms
 *RBW 100 kHz Marker 1 [T1] 13.41 dBm
 *VBW 300 kHz 825.897435897 MHz





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

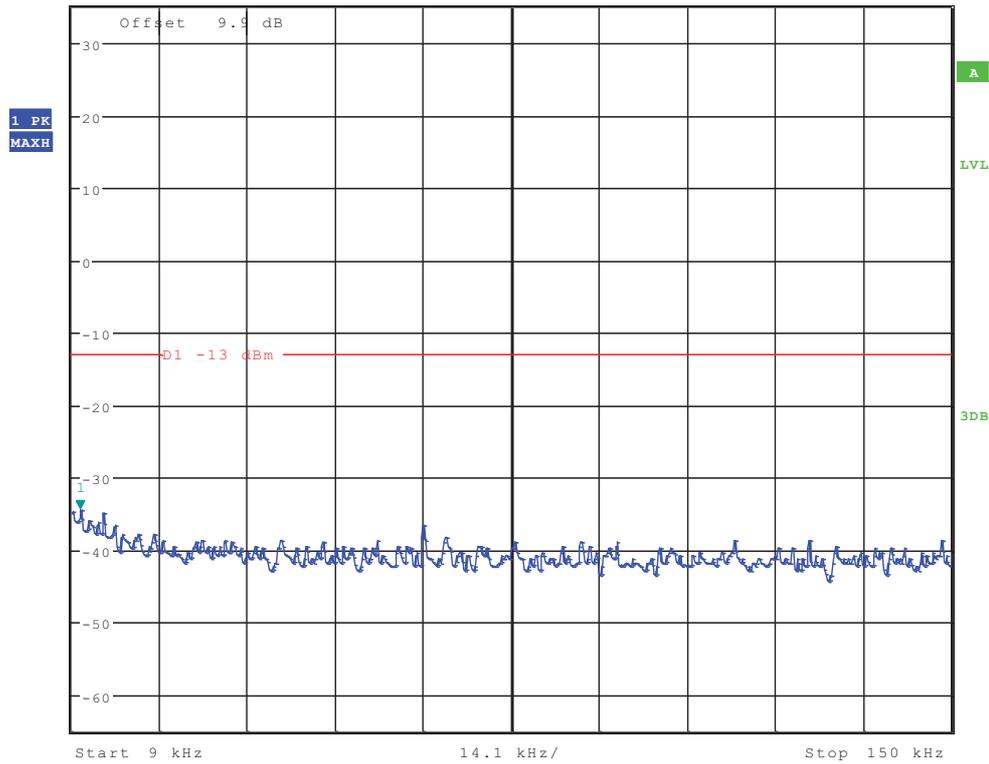




Channel 192

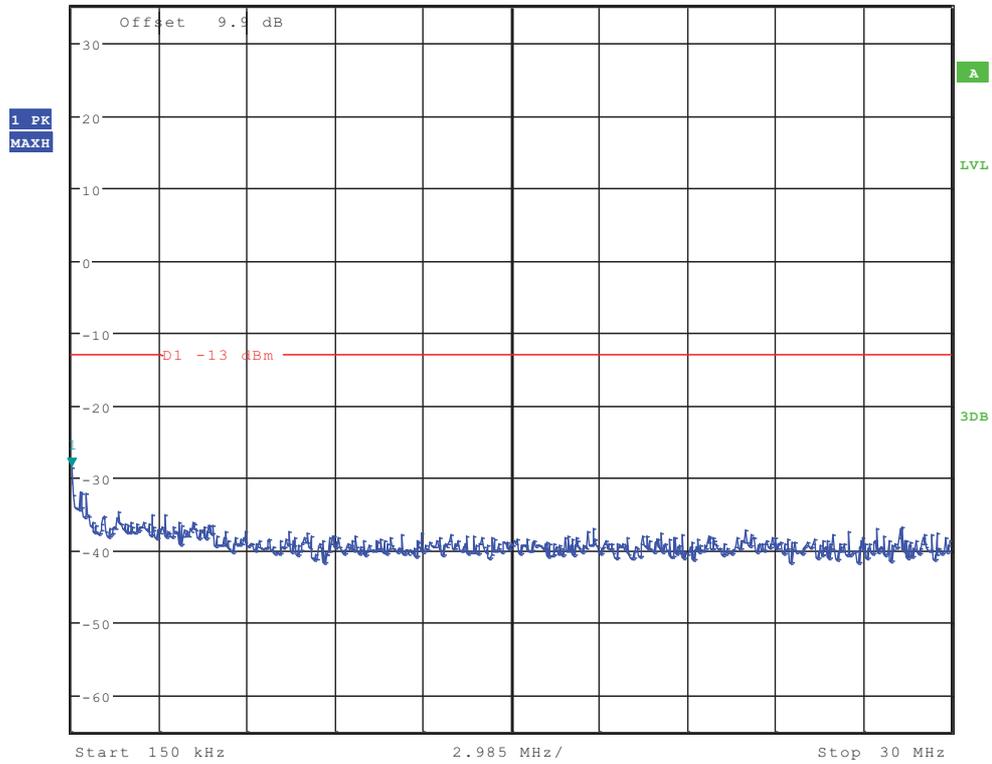


Ref 35 dBm Att 55 dB *RBW 1 kHz Marker 1 [T1]
*VBW 10 kHz -34.38 dBm
SWT 145 ms 10.355769231 kHz



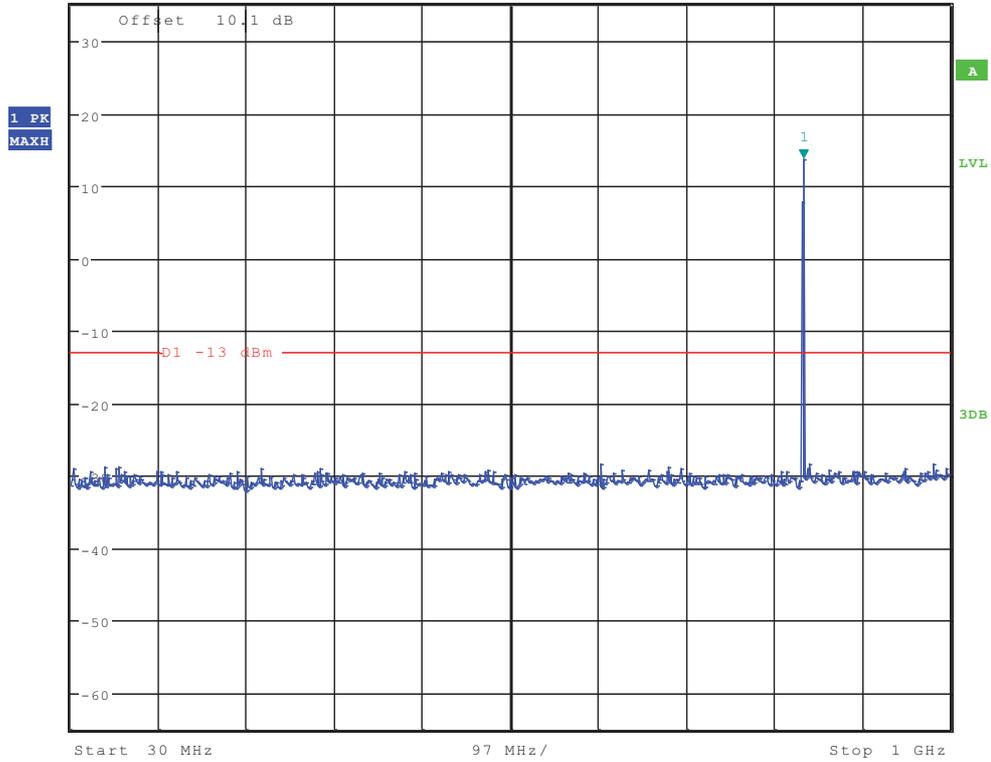


*RBW 10 kHz Marker 1 [T1]
 *VBW 30 kHz -28.51 dBm
 Ref 35 dBm Att 55 dB SWT 300 ms 150.000000000 kHz



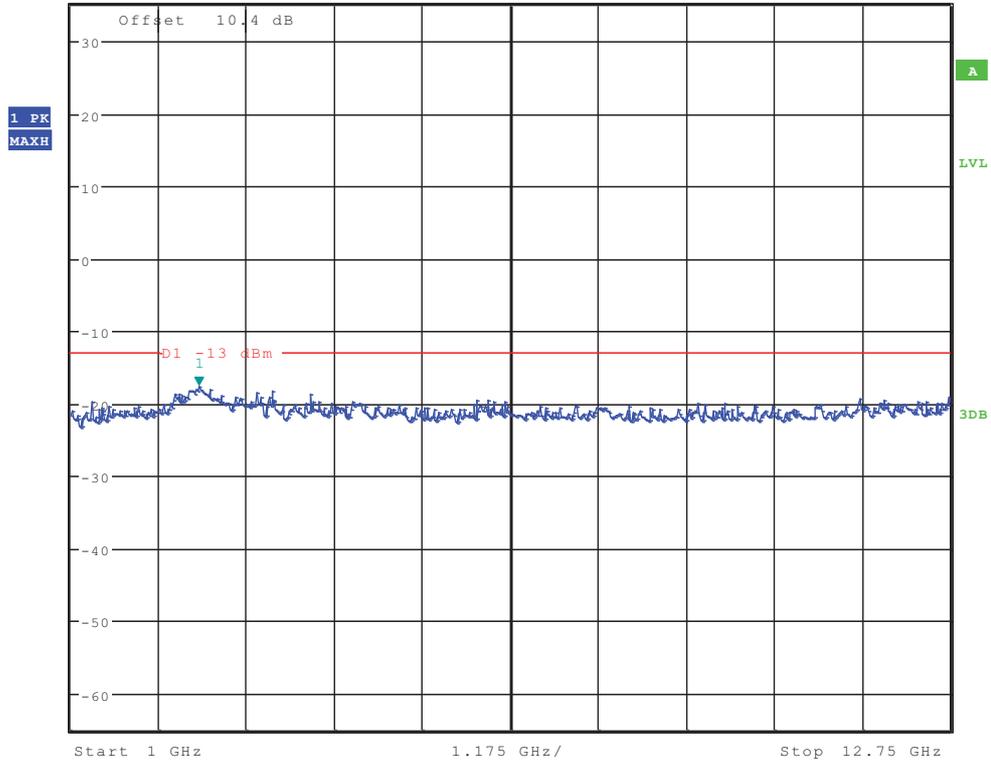


*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 13.60 dBm
Ref 35 dBm Att 50 dB SWT 100 ms 838.333333333 MHz





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

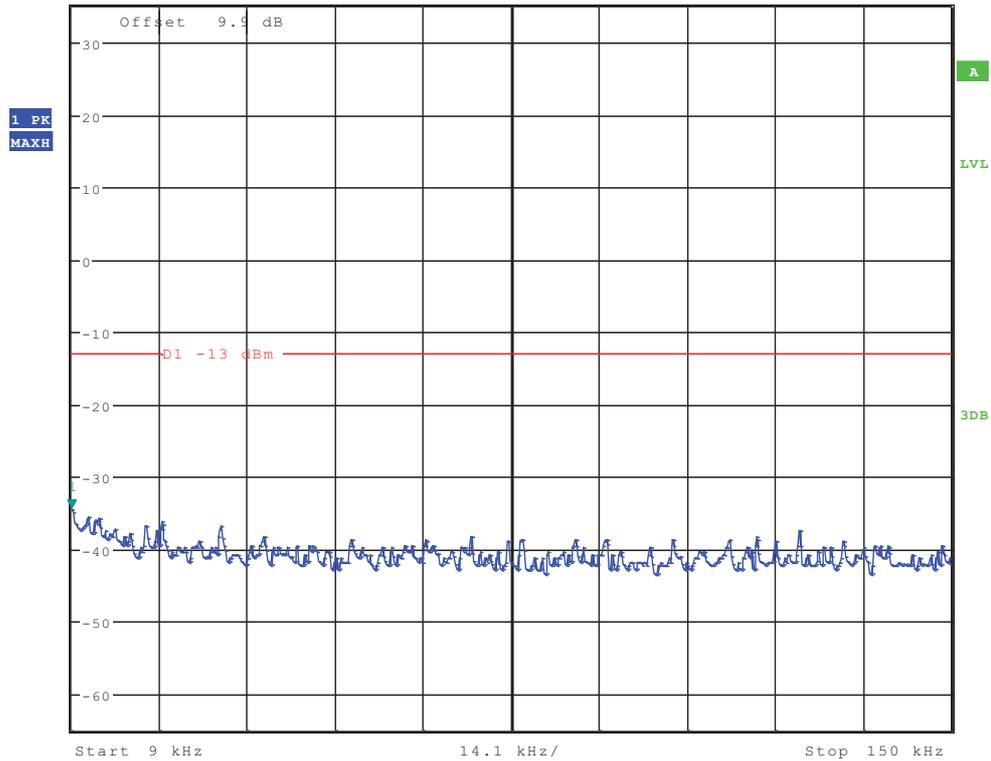




Channel 251

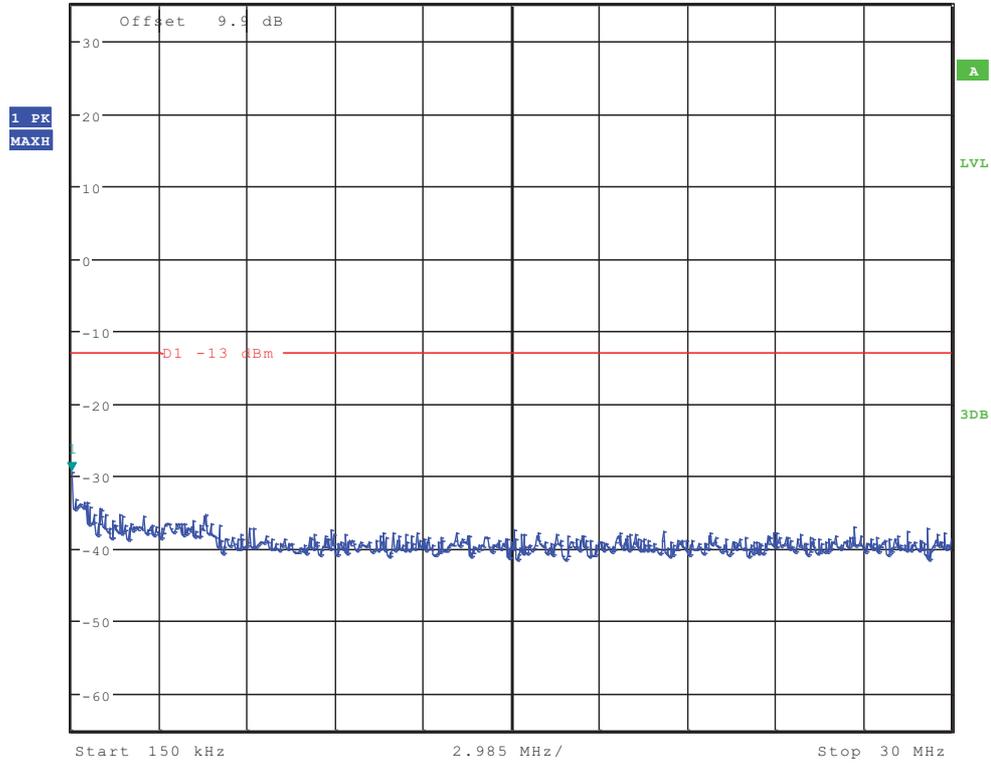


Ref 35 dBm Att 55 dB * RBW 1 kHz Marker 1 [T1] -34.38 dBm
* VBW 10 kHz SWT 145 ms 9.000000000 kHz



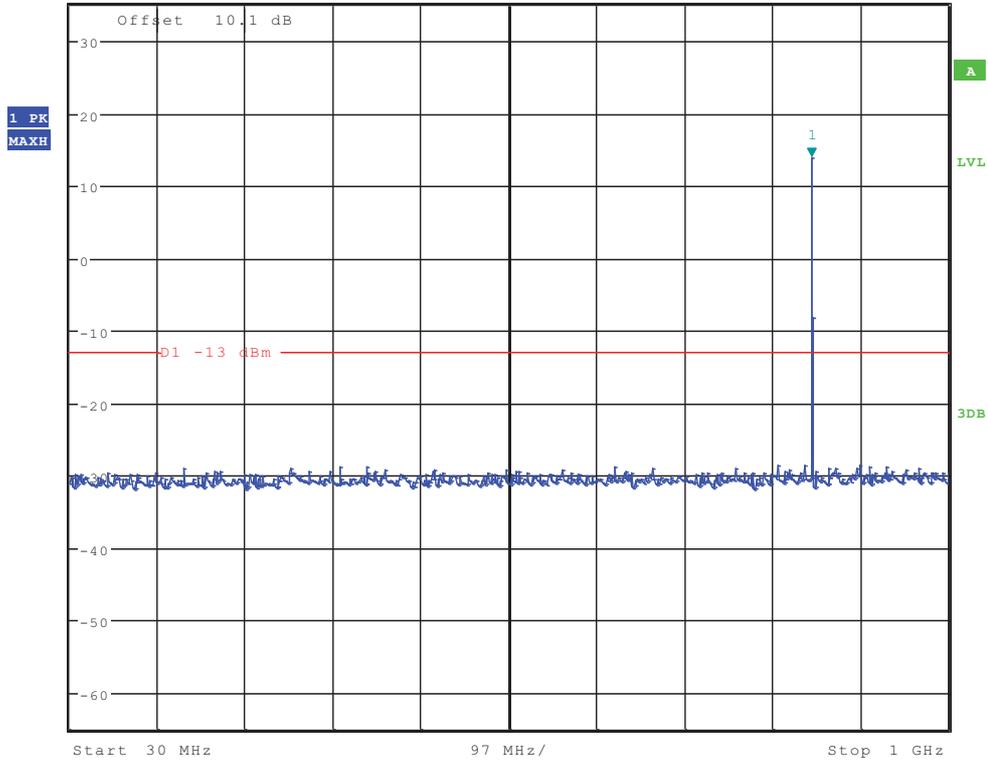


Ref 35 dBm Att 55 dB SWT 300 ms
*RBW 10 kHz Marker 1 [T1] -29.32 dBm
*VBW 30 kHz
150.000000000 kHz



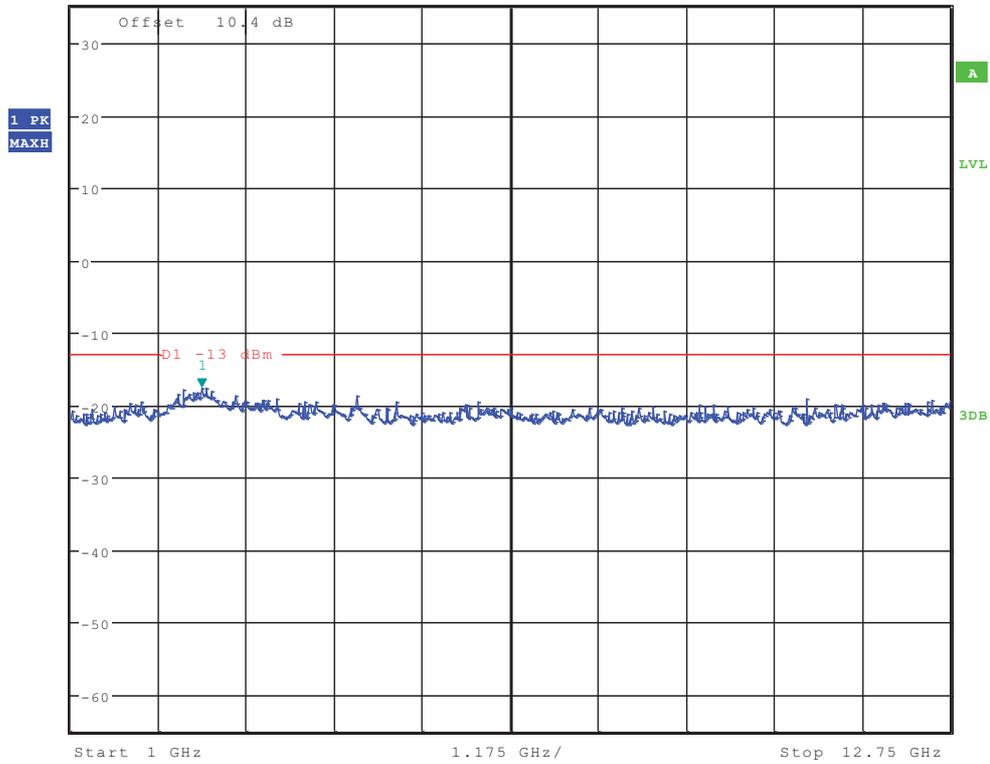


* RBW 100 kHz Marker 1 [T1]
* VBW 300 kHz 13.87 dBm
Ref 35 dBm Att 50 dB SWT 100 ms 849.214743590 MHz



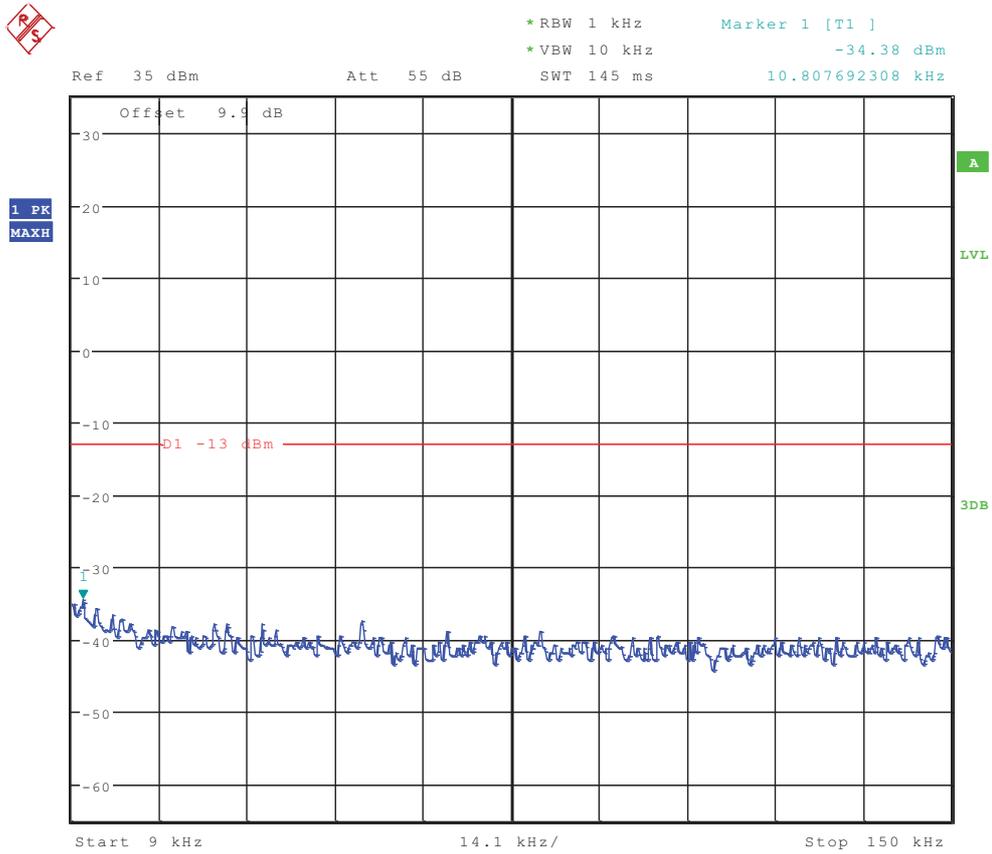


* RBW 1 MHz Marker 1 [T1]
 * VBW 3 MHz -17.56 dBm
 Ref 35 dBm Att 50 dB SWT 70 ms 2.751201923 GHz



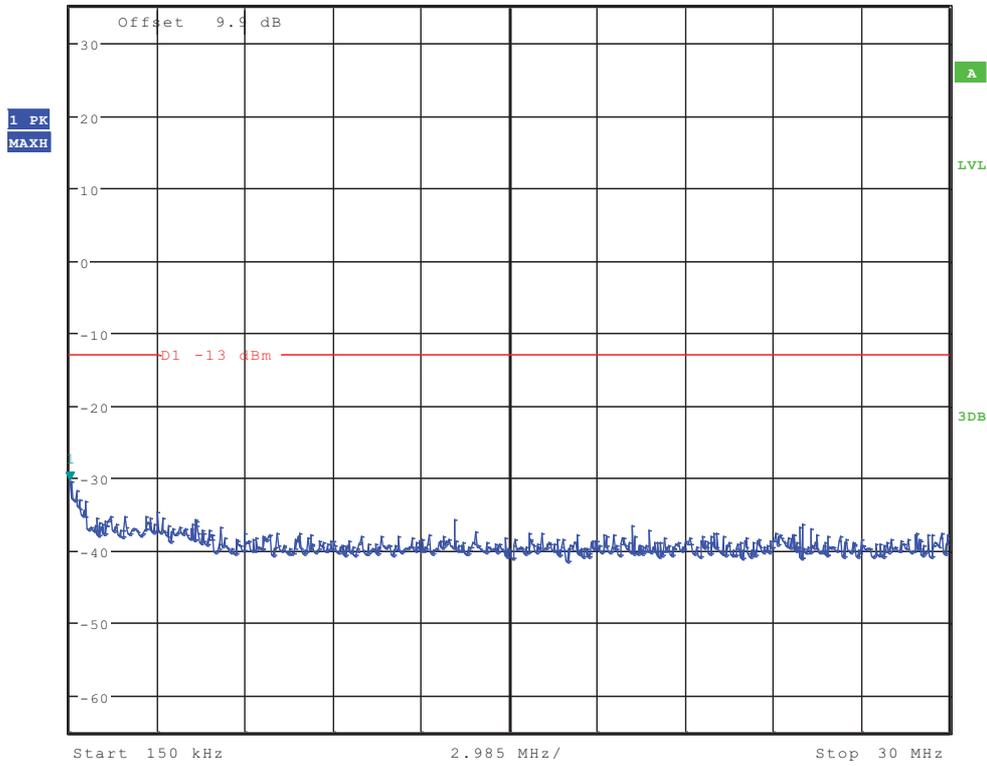


TM2:EDGE Channel 128



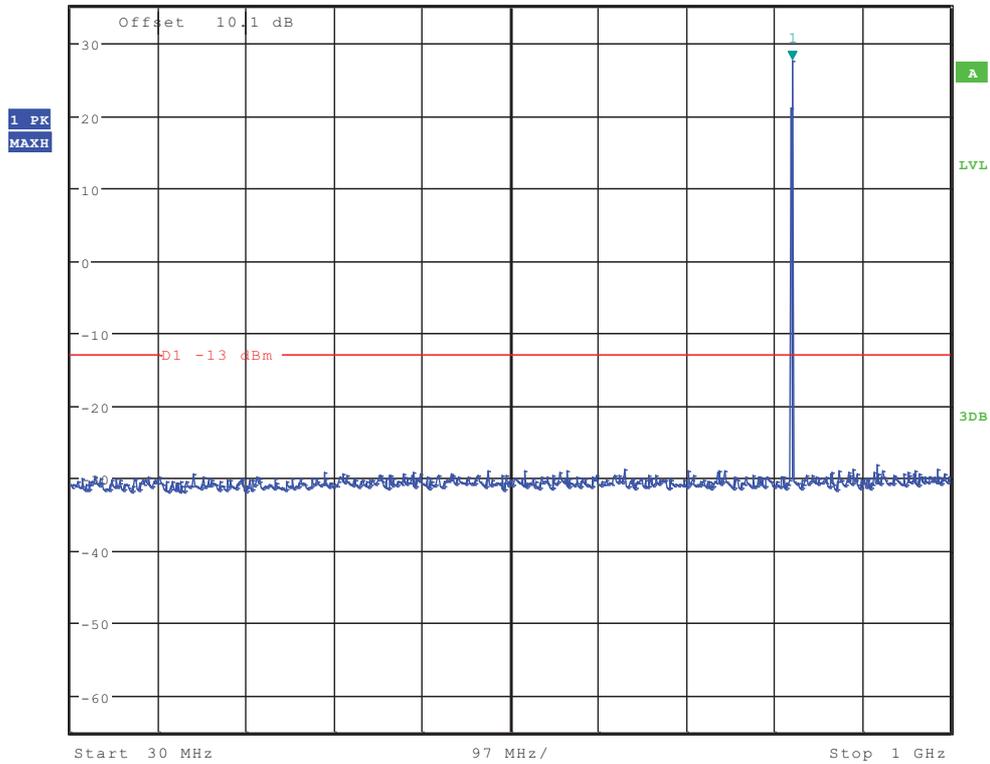


Ref 35 dBm Att 55 dB SWT 300 ms
*RBW 10 kHz *VBW 30 kHz
Marker 1 [T1] -30.52 dBm
150.000000000 kHz



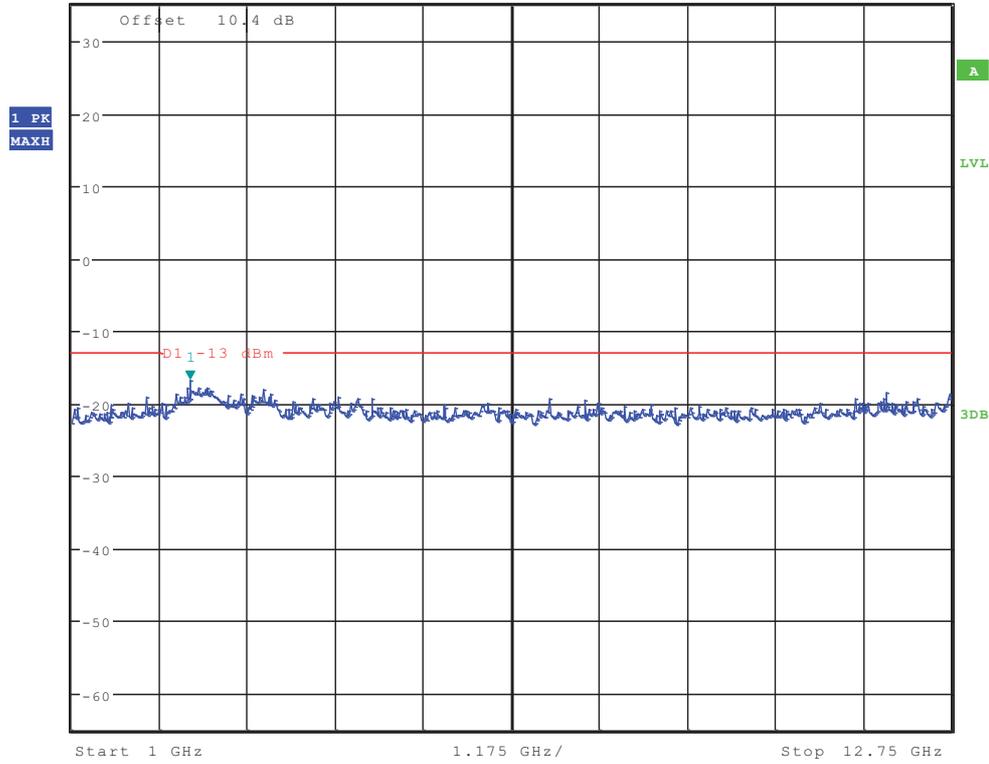


Ref 35 dBm Att 50 dB SWT 100 ms
*RBW 100 kHz Marker 1 [T1] 27.57 dBm
*VBW 300 kHz 825.897435897 MHz



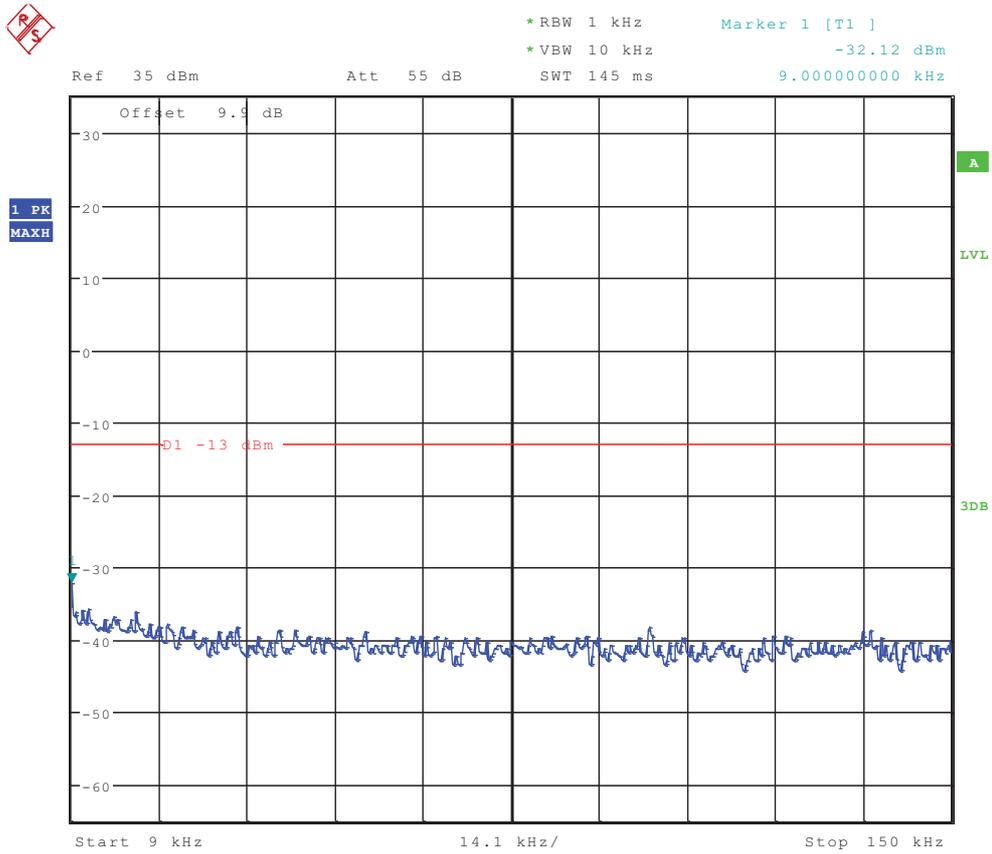


Ref 35 dBm Att 50 dB SWT 70 ms Marker 1 [T1] -16.86 dBm
*RBW 1 MHz
*VBW 3 MHz 2.581730769 GHz



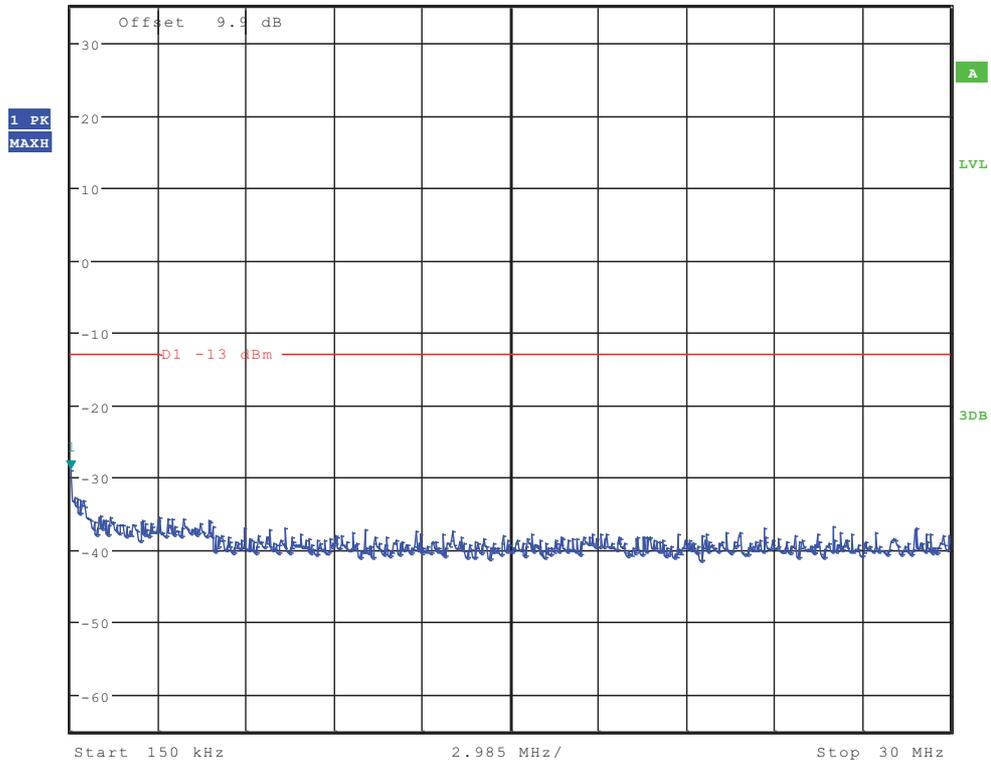


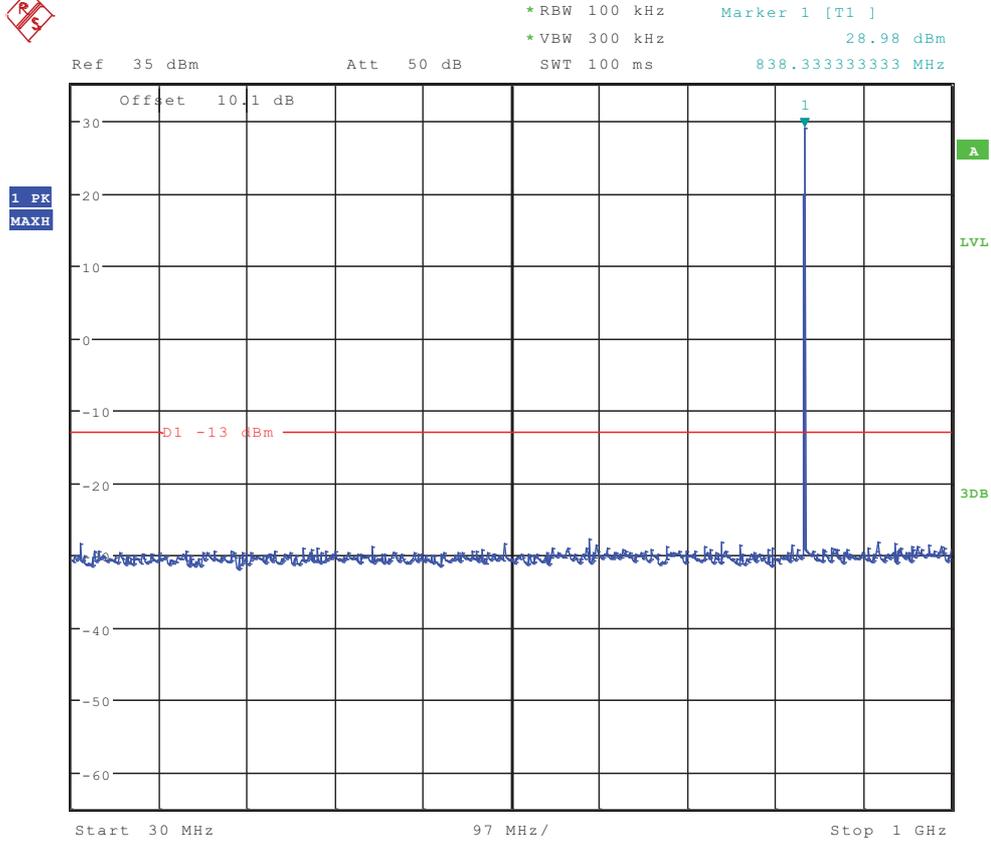
Channel 192





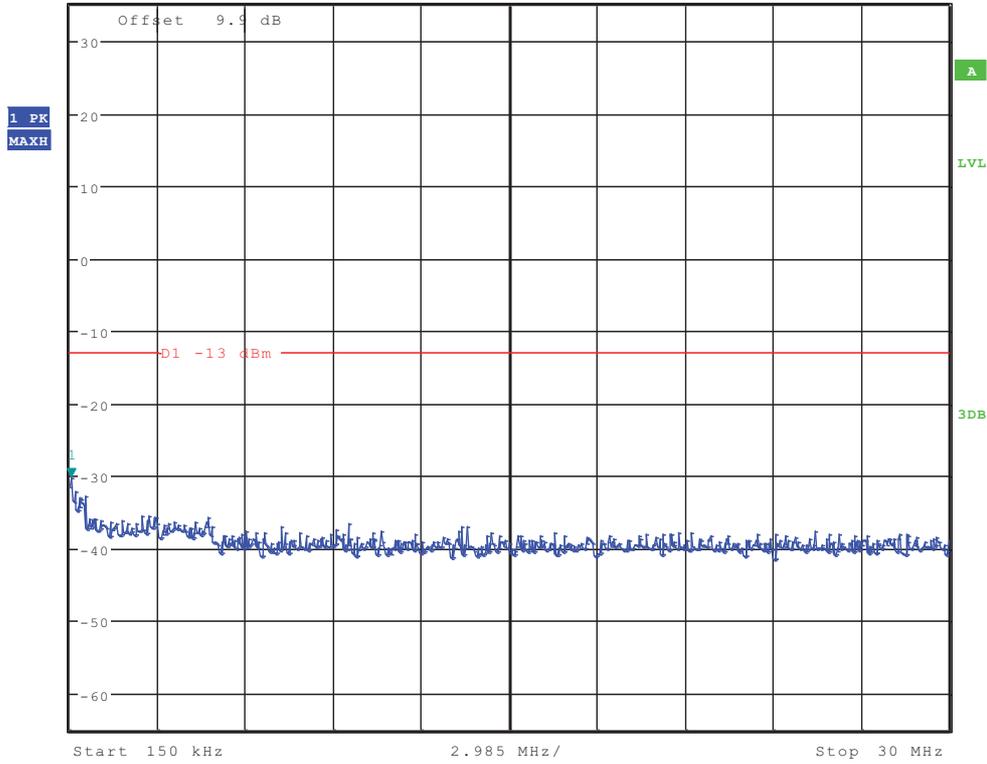
*RBW 10 kHz Marker 1 [T1]
 *VBW 30 kHz -28.90 dBm
 Ref 35 dBm Att 55 dB SWT 300 ms 150.000000000 kHz

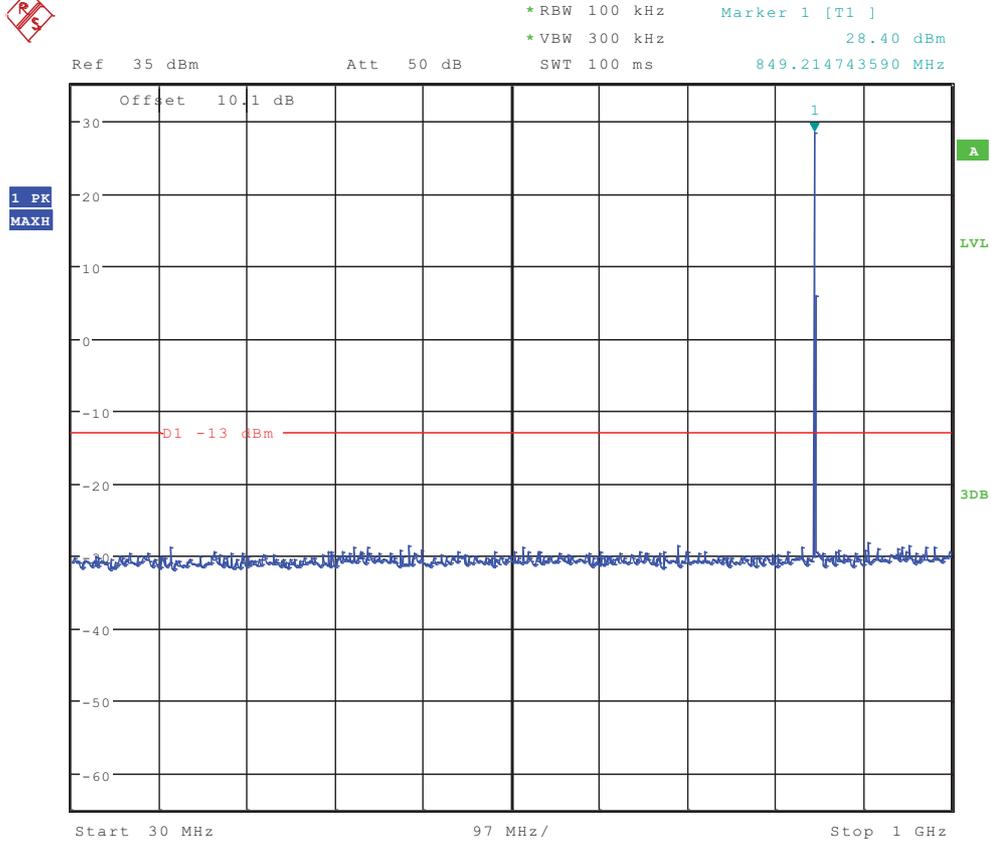






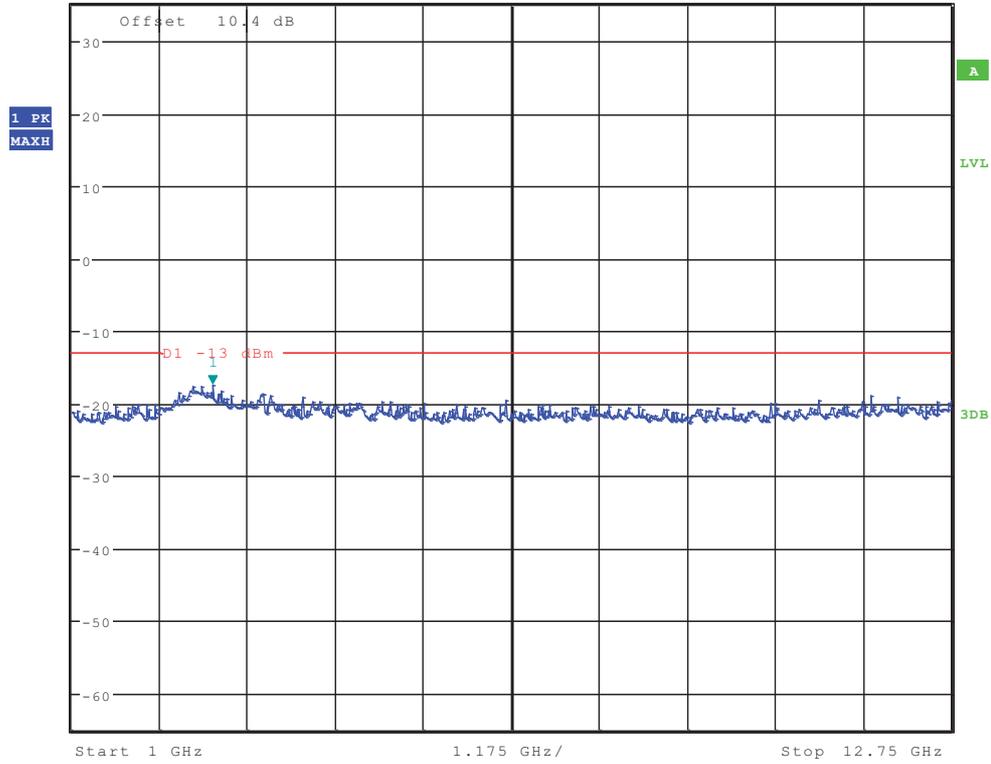
Ref 35 dBm Att 55 dB SWT 300 ms
*RBW 10 kHz *VBW 30 kHz
Marker 1 [T1] -30.16 dBm
197.836538462 kHz







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

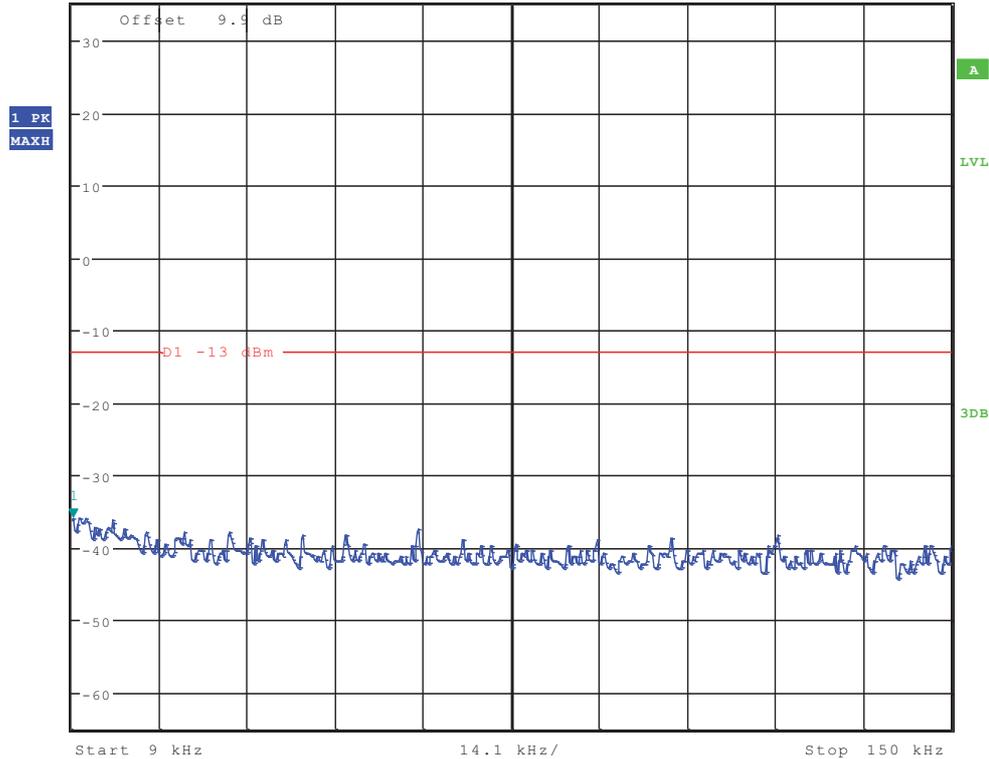




TM3: WCDMA Channel 4132

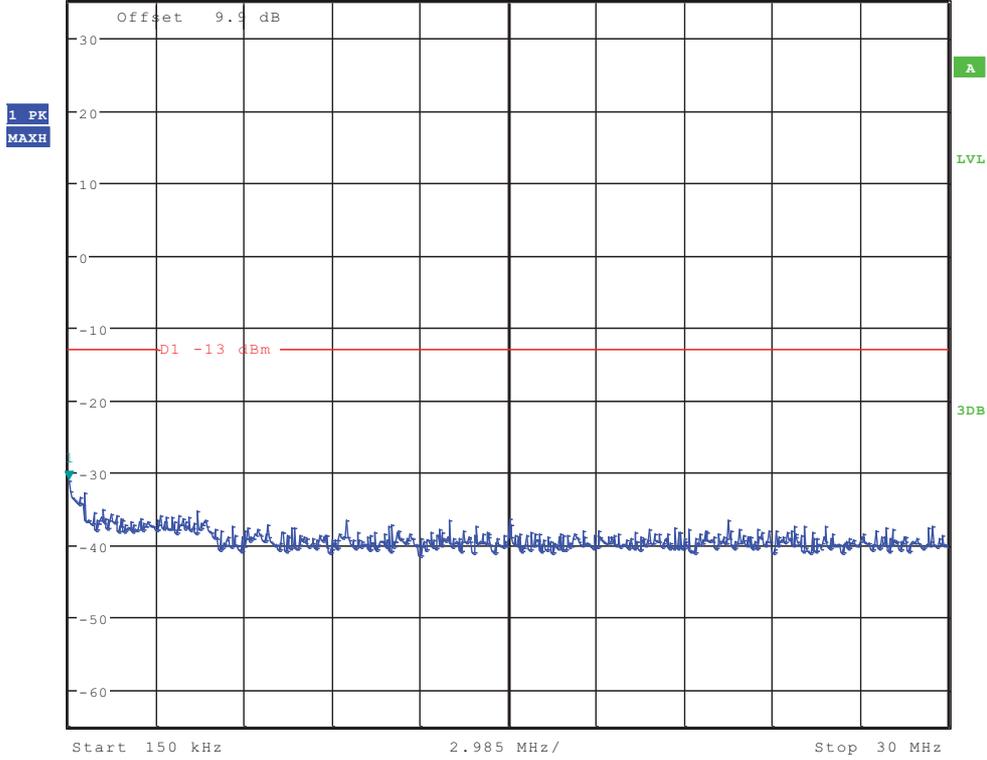


Ref 35 dBm Att 55 dB *RBW 1 kHz Marker 1 [T1] -35.95 dBm
 *VBW 10 kHz SWT 145 ms 9.225961538 kHz



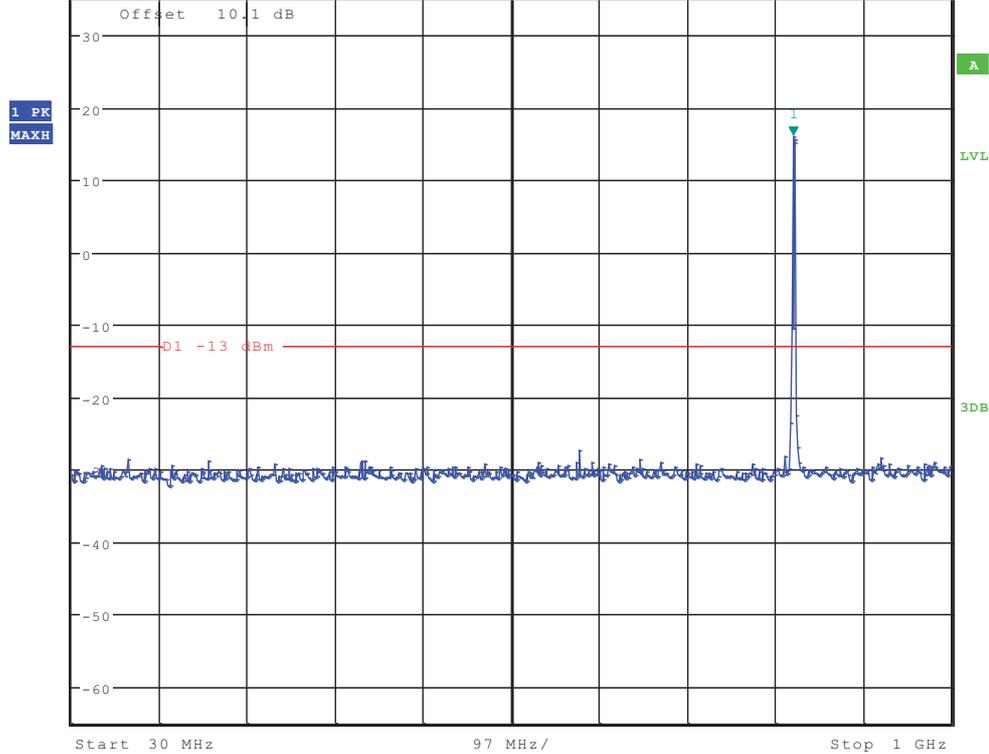


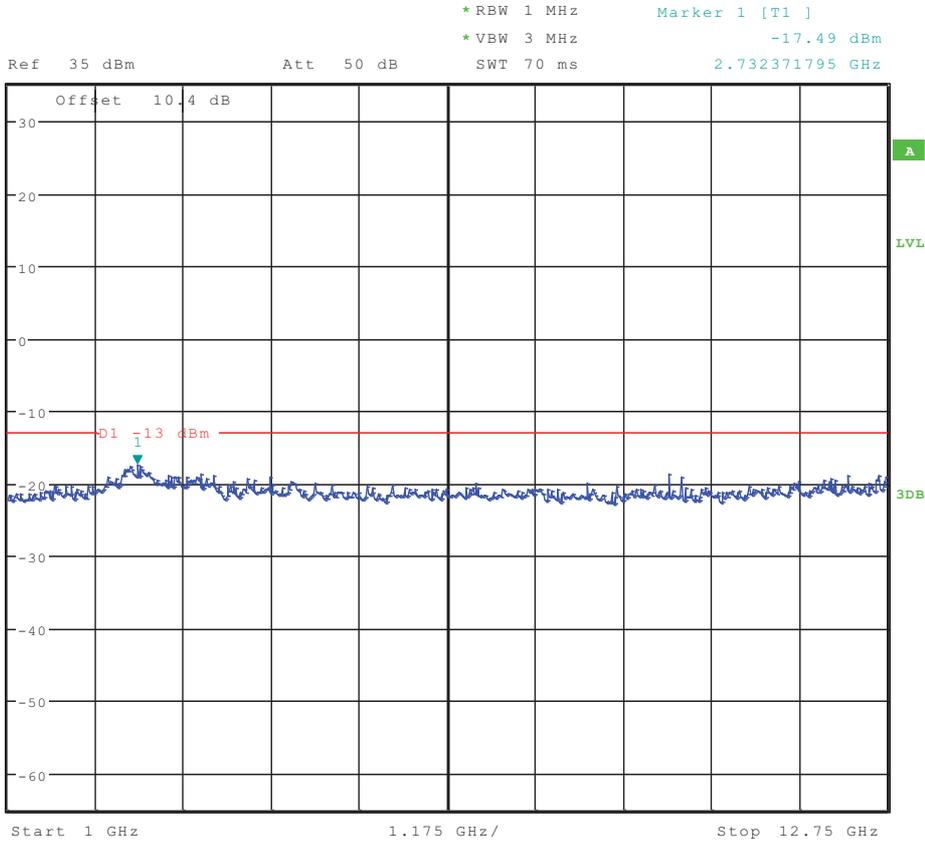
*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -31.02 dBm
Ref 35 dBm Att 55 dB SWT 300 ms 150.000000000 kHz





Ref 35 dBm Att 50 dB *RBW 100 kHz Marker 1 [T1] 16.00 dBm
*VBW 300 kHz 825.897435897 MHz
SWT 100 ms



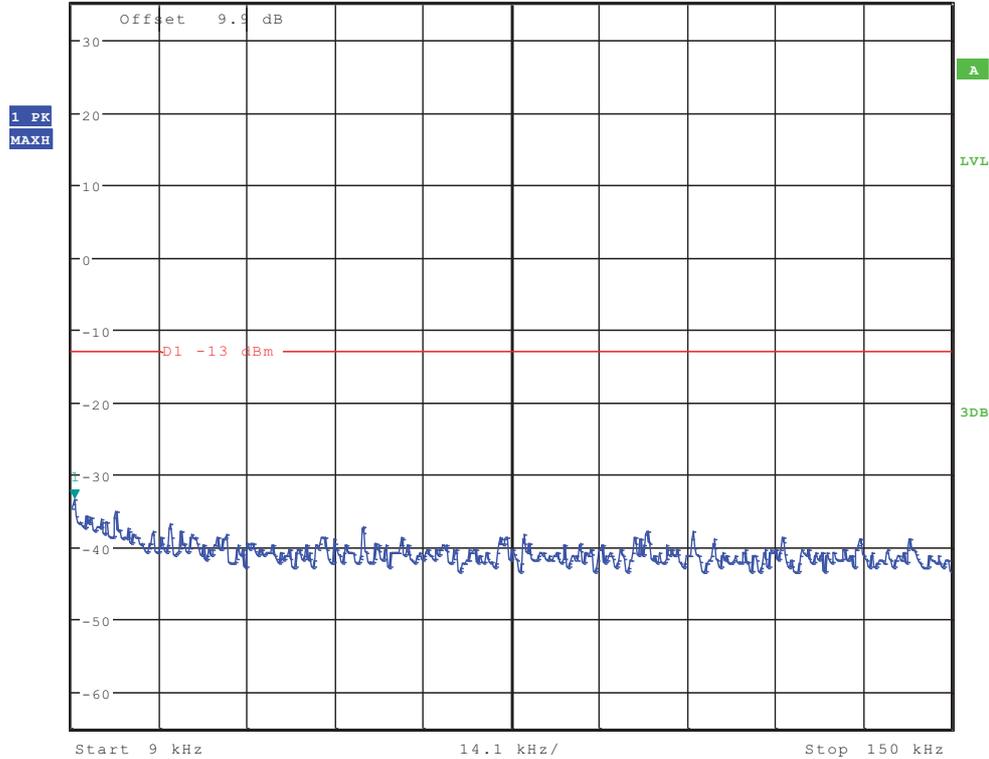




Channel 4182

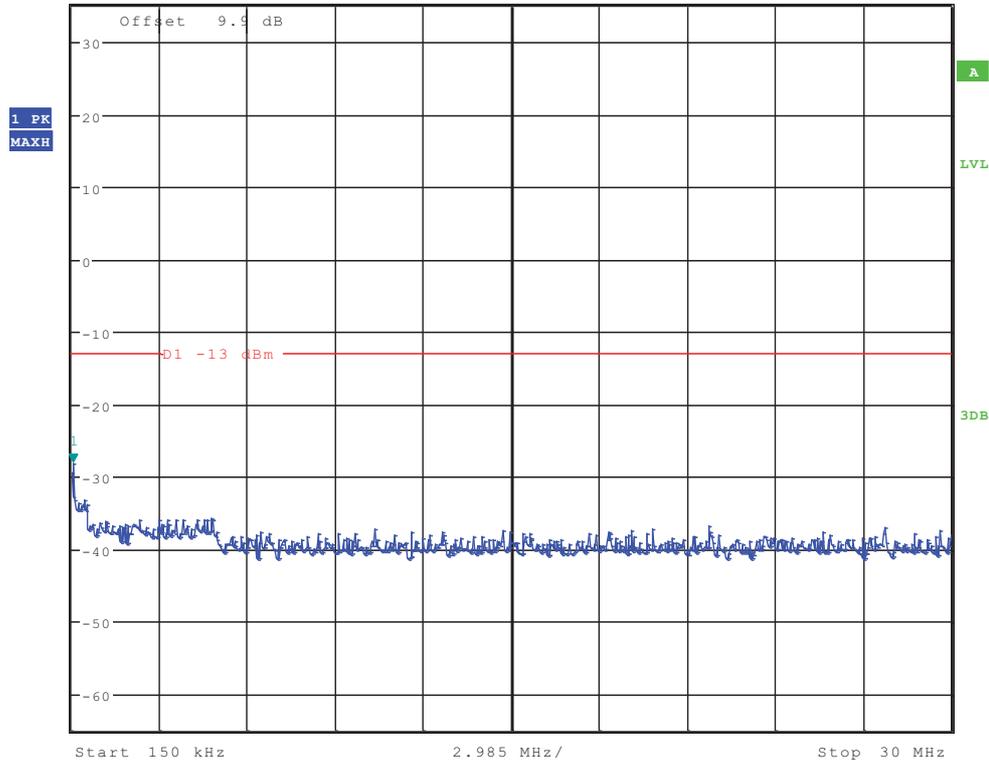


*RBW 1 kHz Marker 1 [T1]
*VBW 10 kHz -33.48 dBm
Ref 35 dBm Att 55 dB SWT 145 ms 9.451923077 kHz



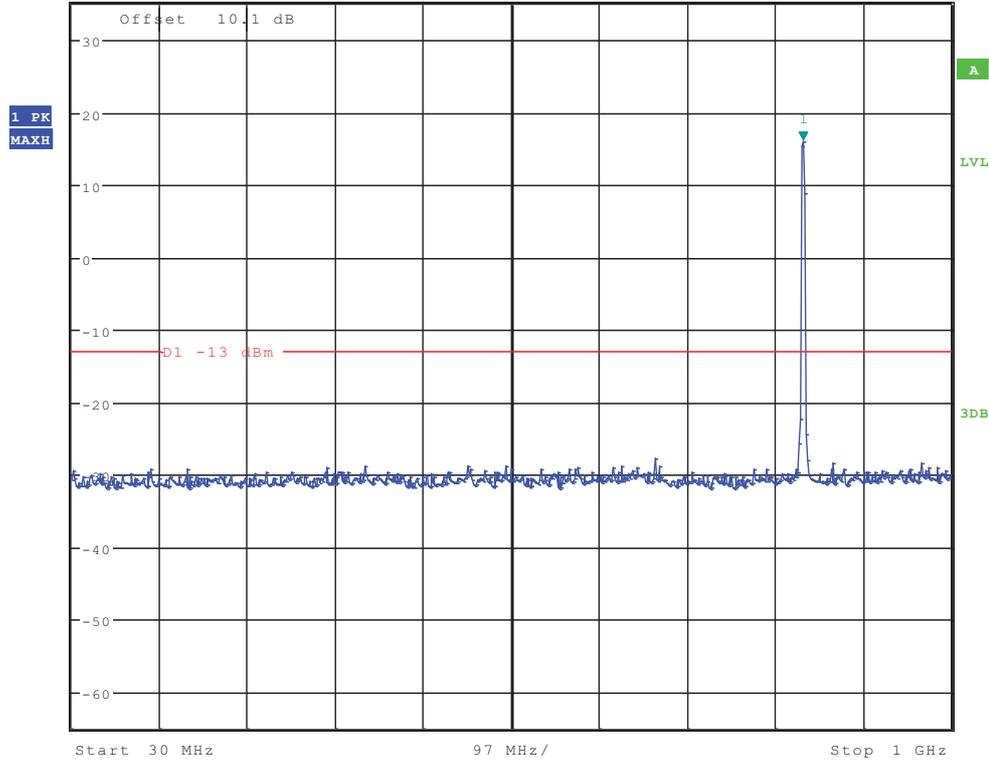


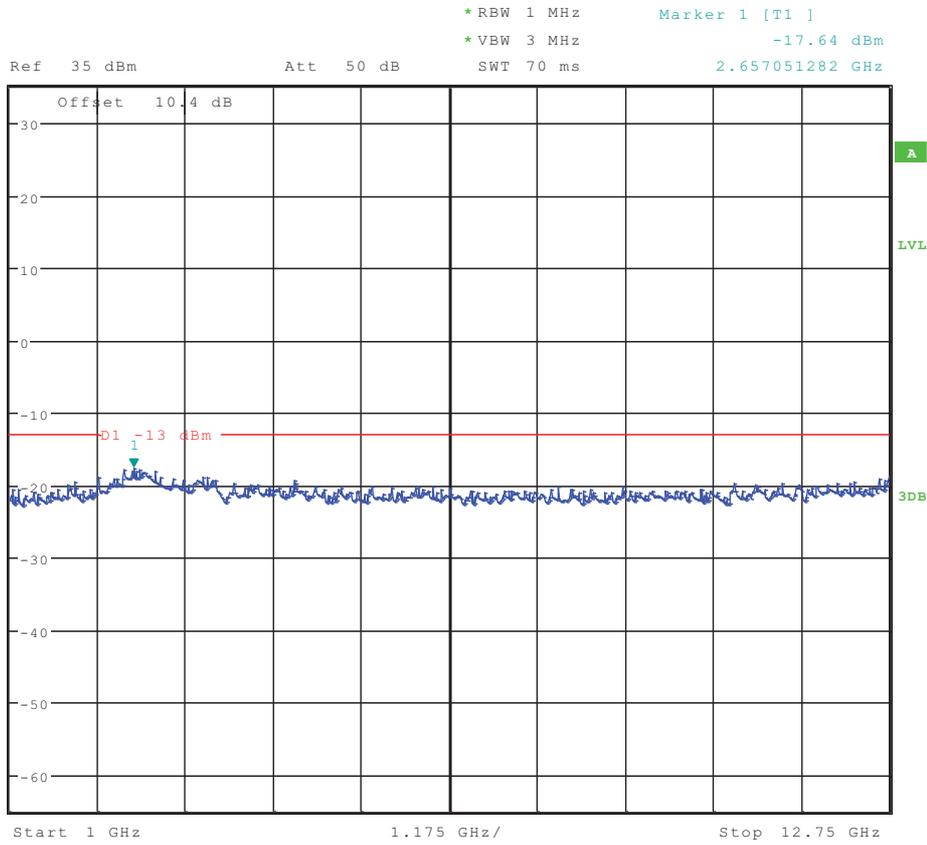
* RBW 10 kHz Marker 1 [T1]
 * VBW 30 kHz -28.22 dBm
 Ref 35 dBm Att 55 dB SWT 300 ms 197.836538462 kHz





Ref 35 dBm Att 50 dB *RBW 100 kHz Marker 1 [T1] 16.02 dBm
*VBW 300 kHz 836.778846154 MHz
SWT 100 ms



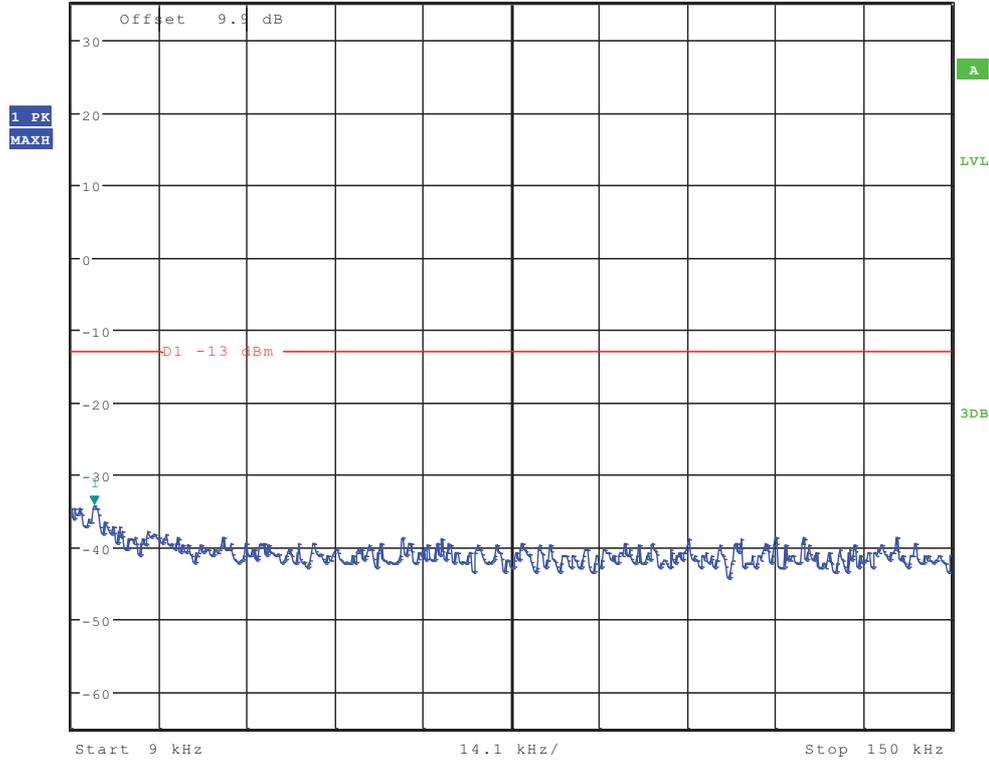




Channel 4233

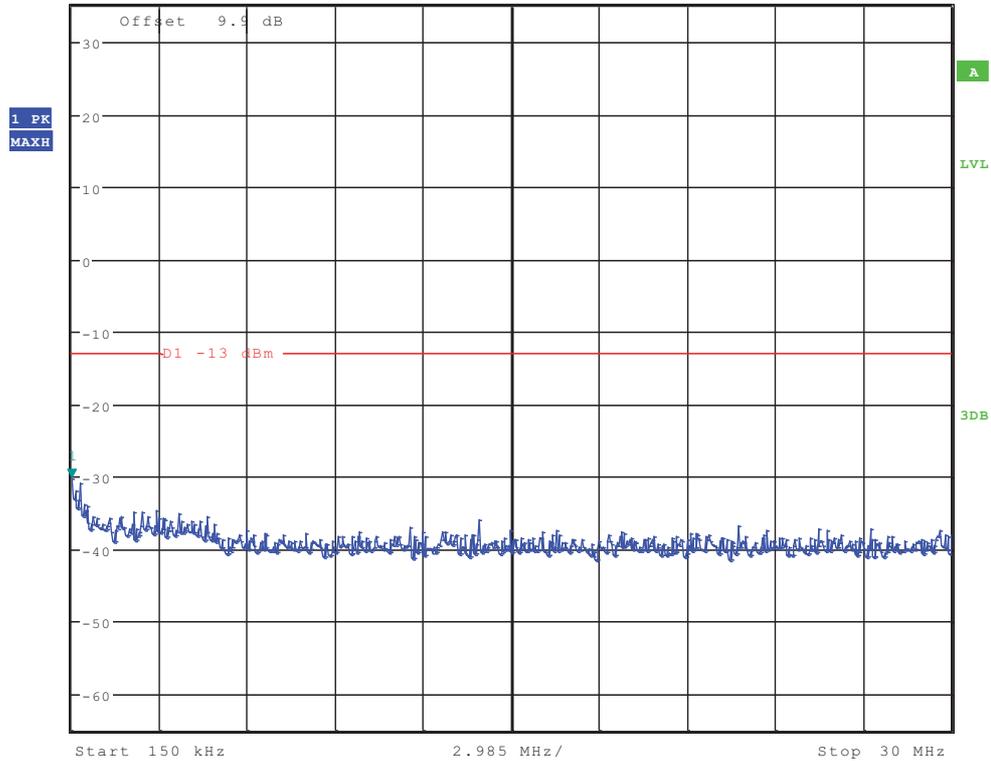


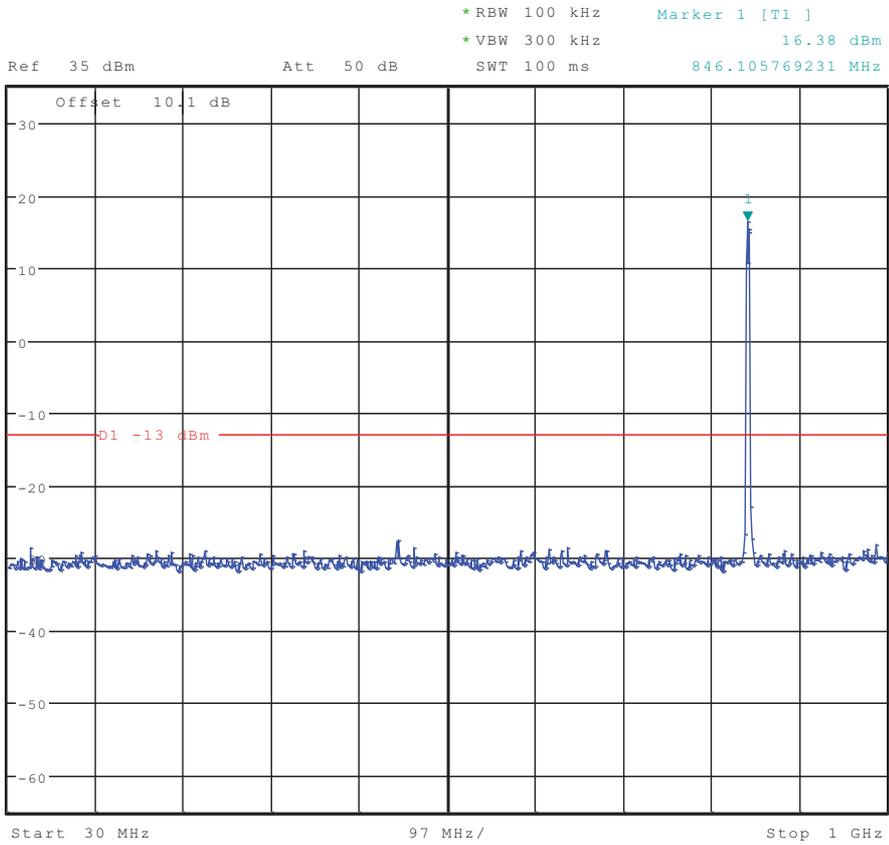
* RBW 1 kHz Marker 1 [T1]
 * VBW 10 kHz -34.19 dBm
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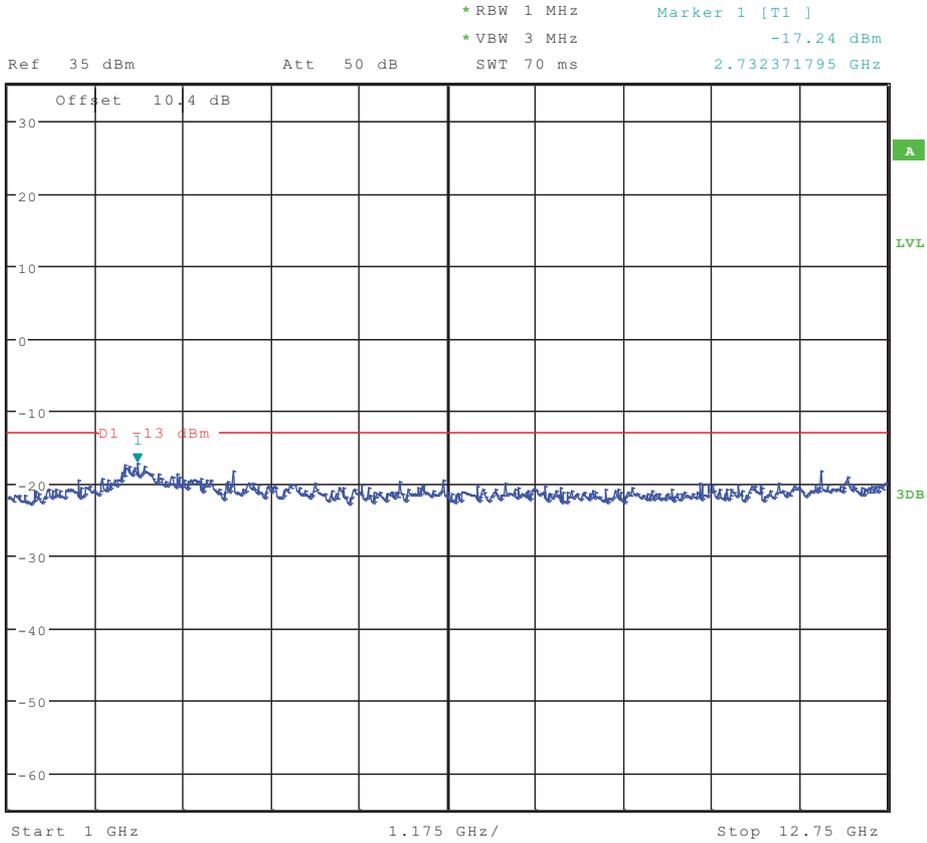




Ref 35 dBm Att 55 dB *RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -30.22 dBm
SWT 300 ms 150.00000000 kHz







END

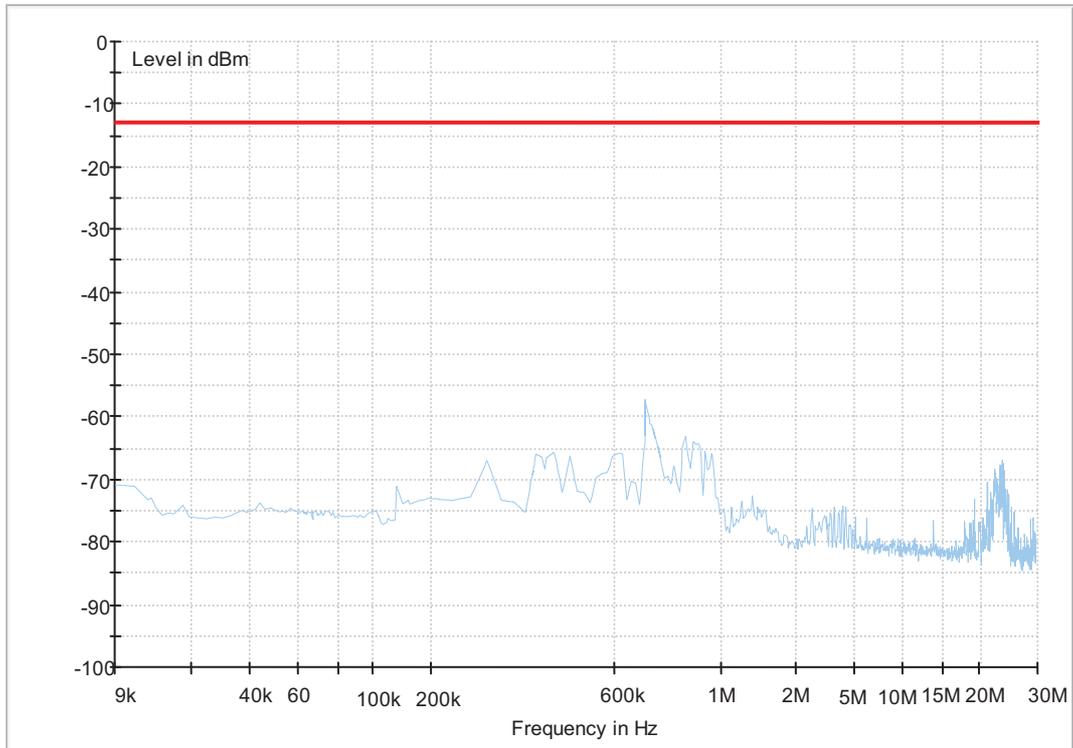


Appendix F

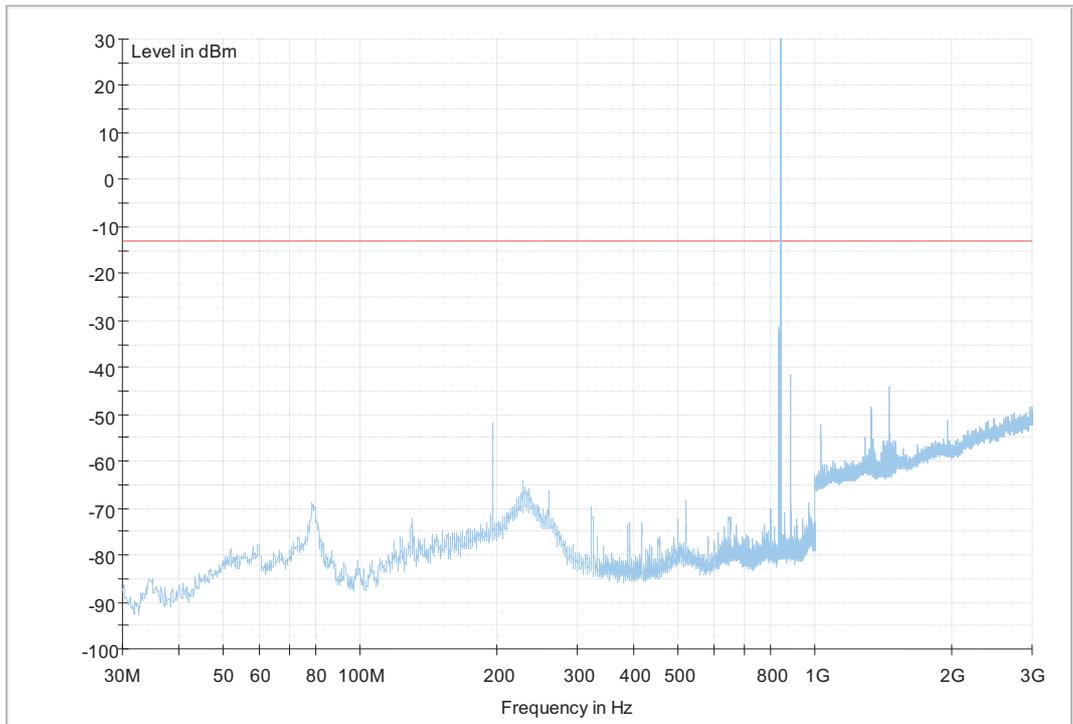
Radiated spurious emission According to FCC Part 2.1053& Part 22.917

GPRS 850

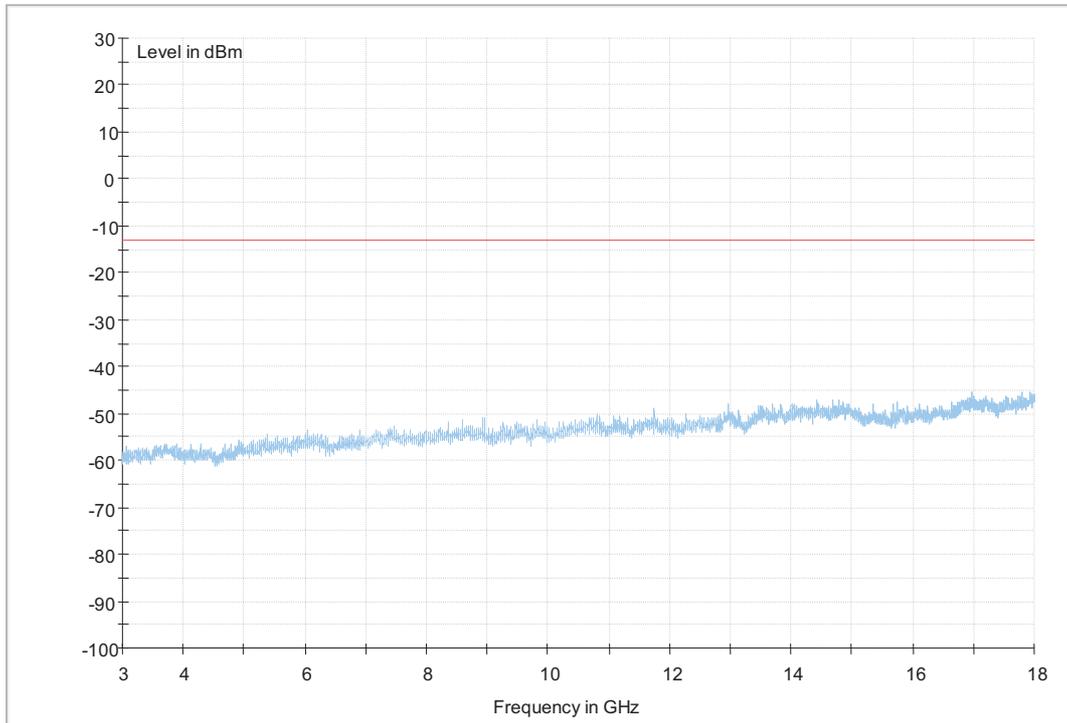
(9kHz~30MHz)



(30MHz~3GHz)

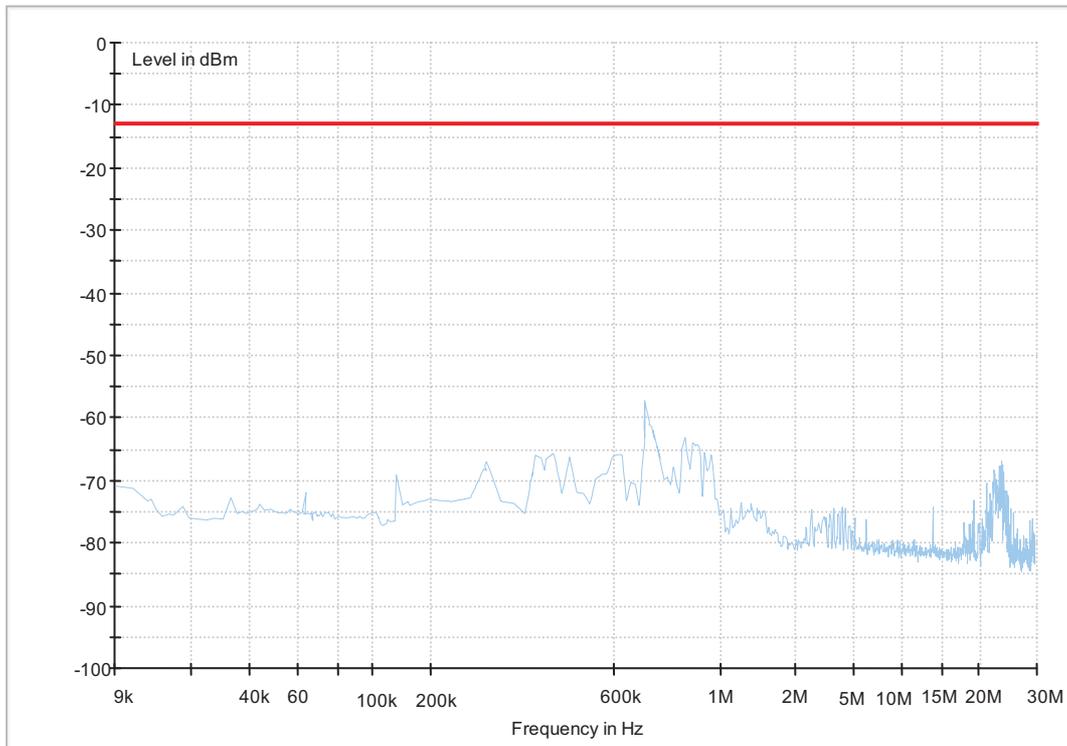


(3GHz~18GHz)

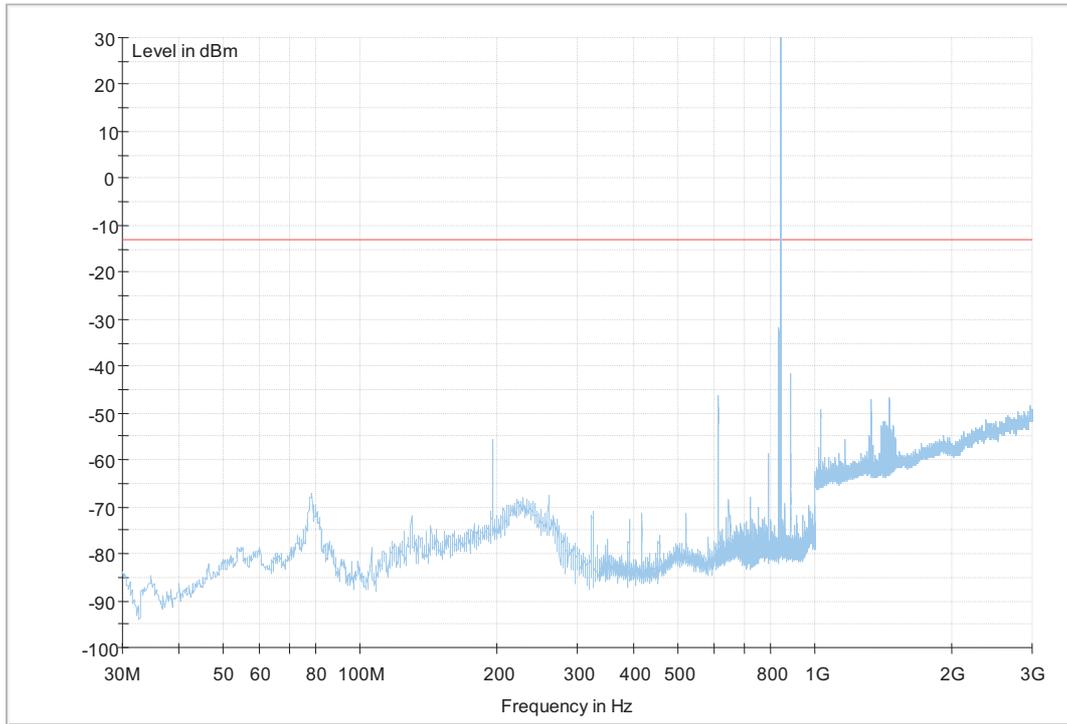


EDGE 850

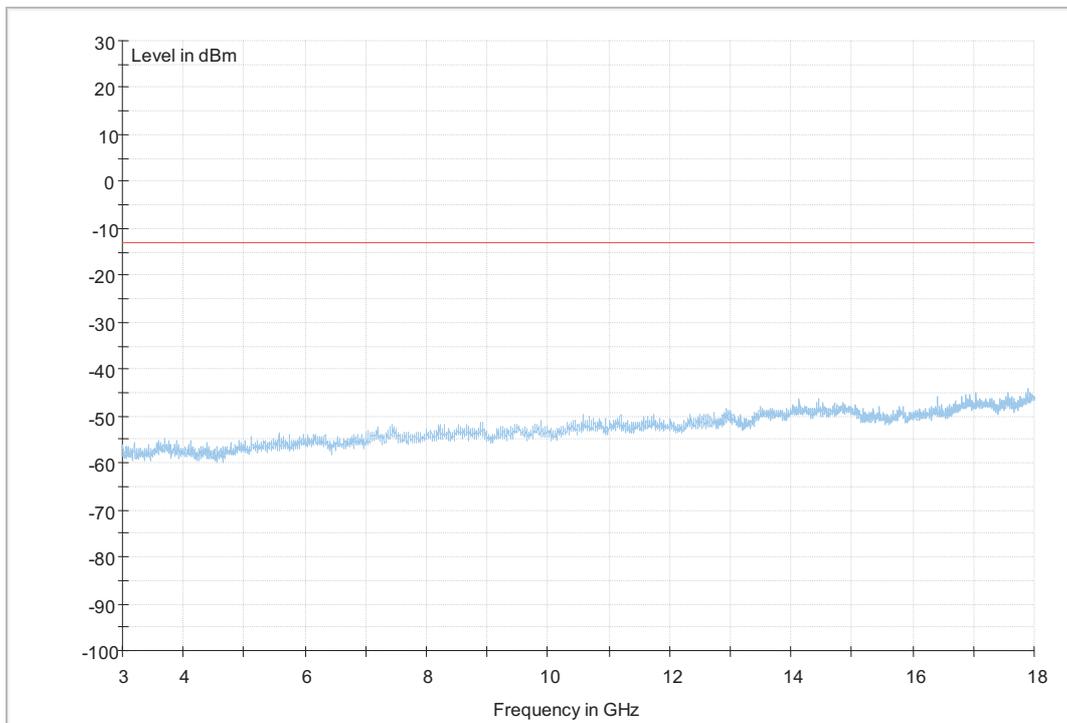
(9kHz~30MHz)



(30MHz~3GHz)

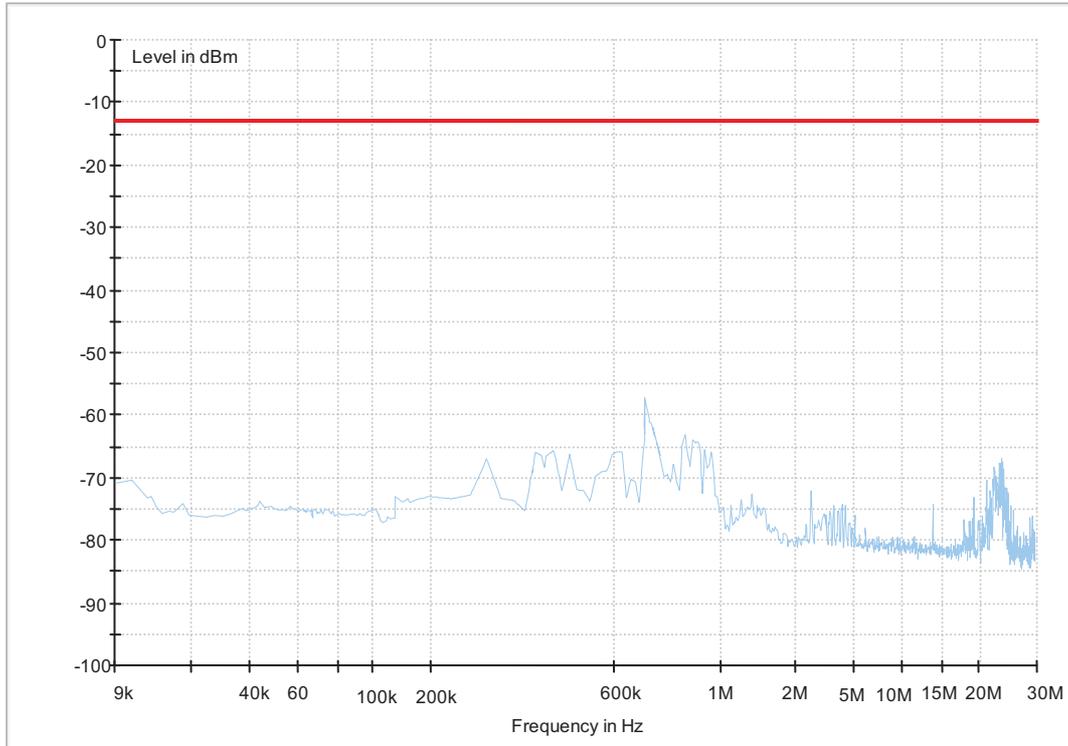


(3GHz~18GHz)

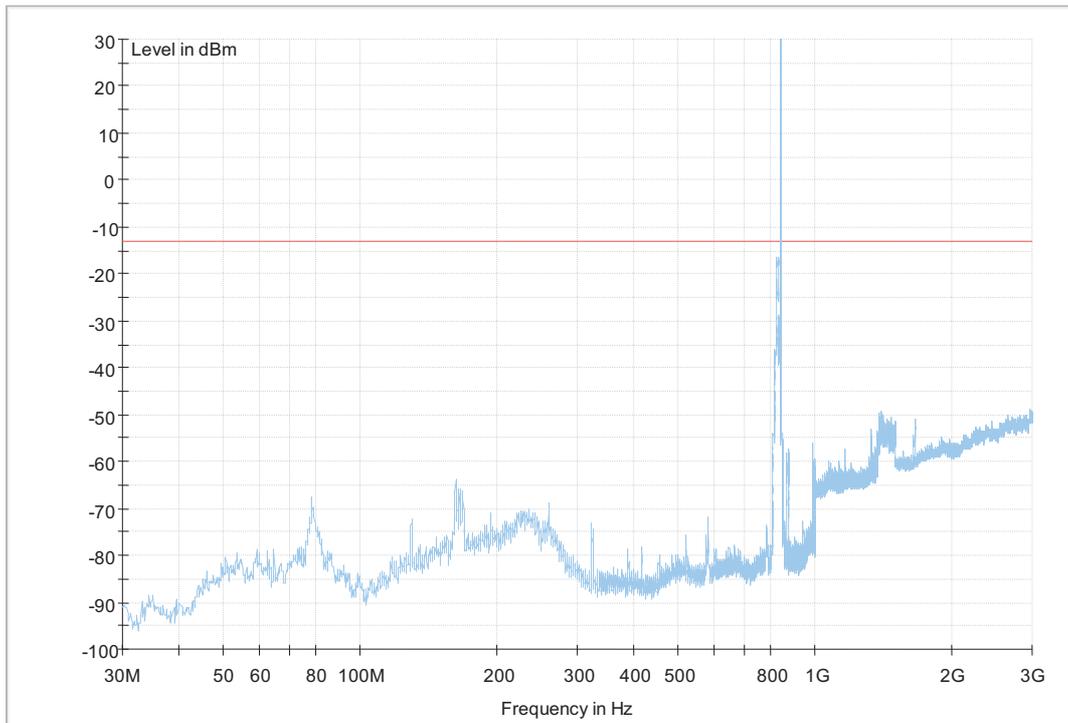


WCDMA Band V

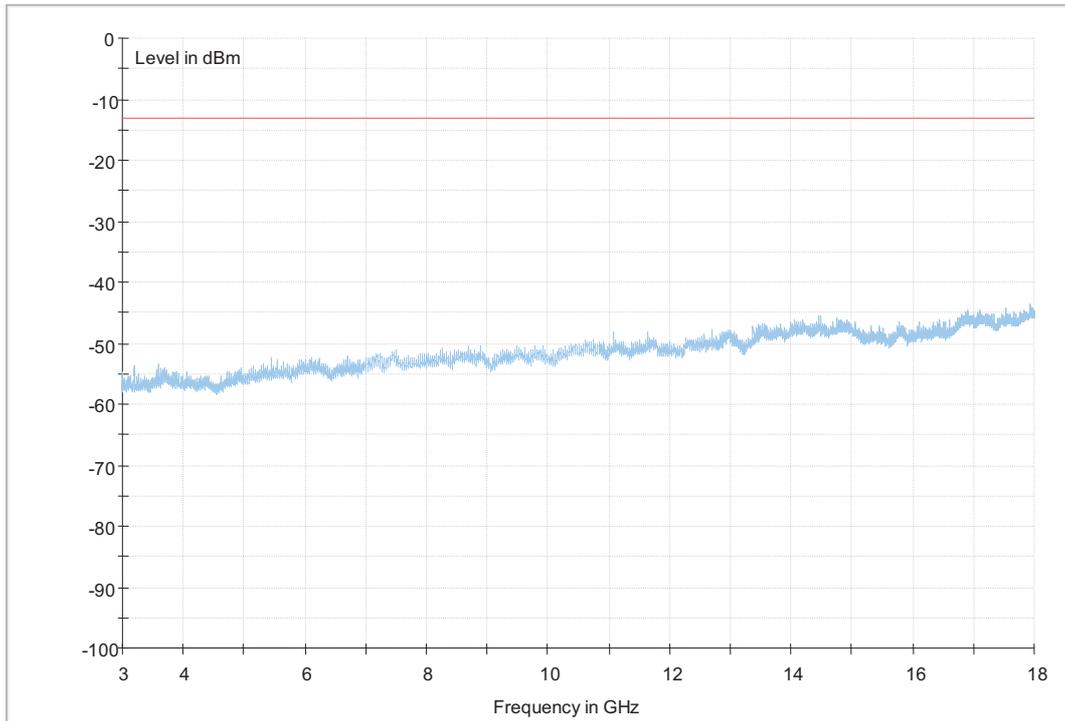
(9KHz~30MHz)



(30MHz~3GHz)

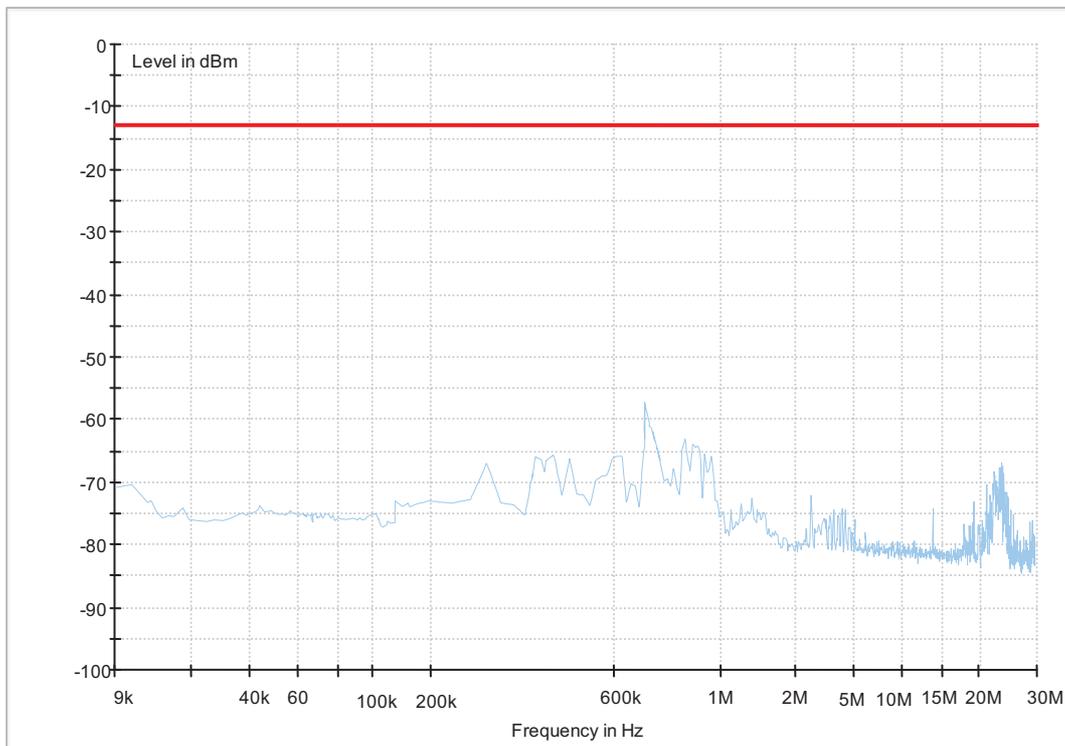


(3GHz~18GHz)

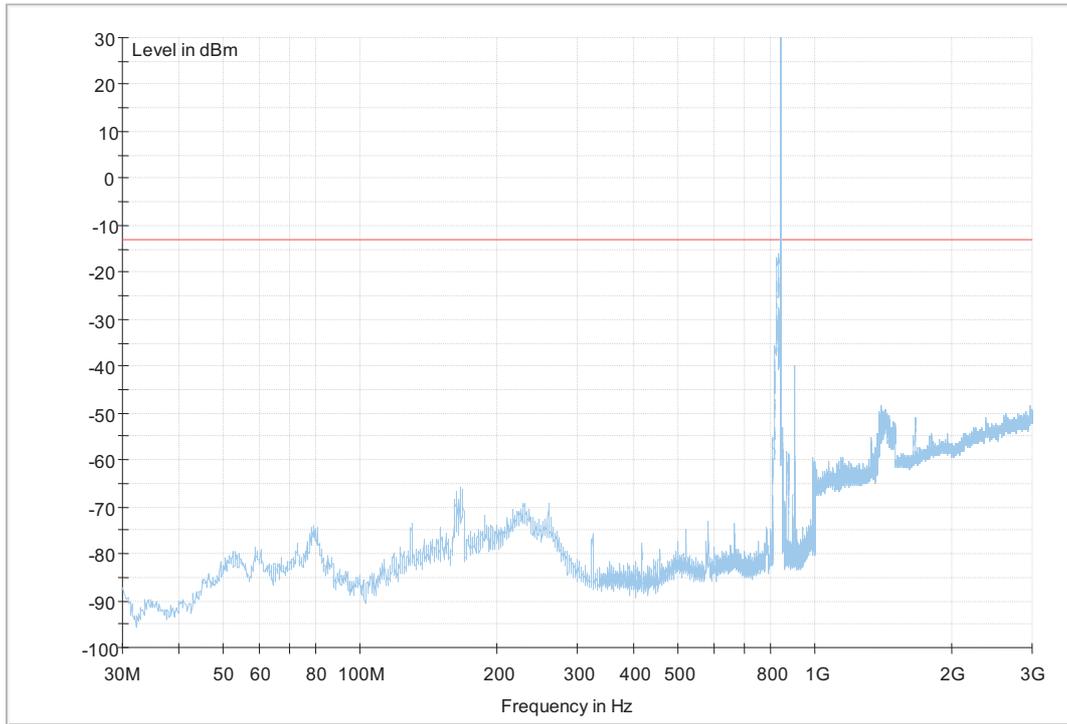


HSDPA Band V

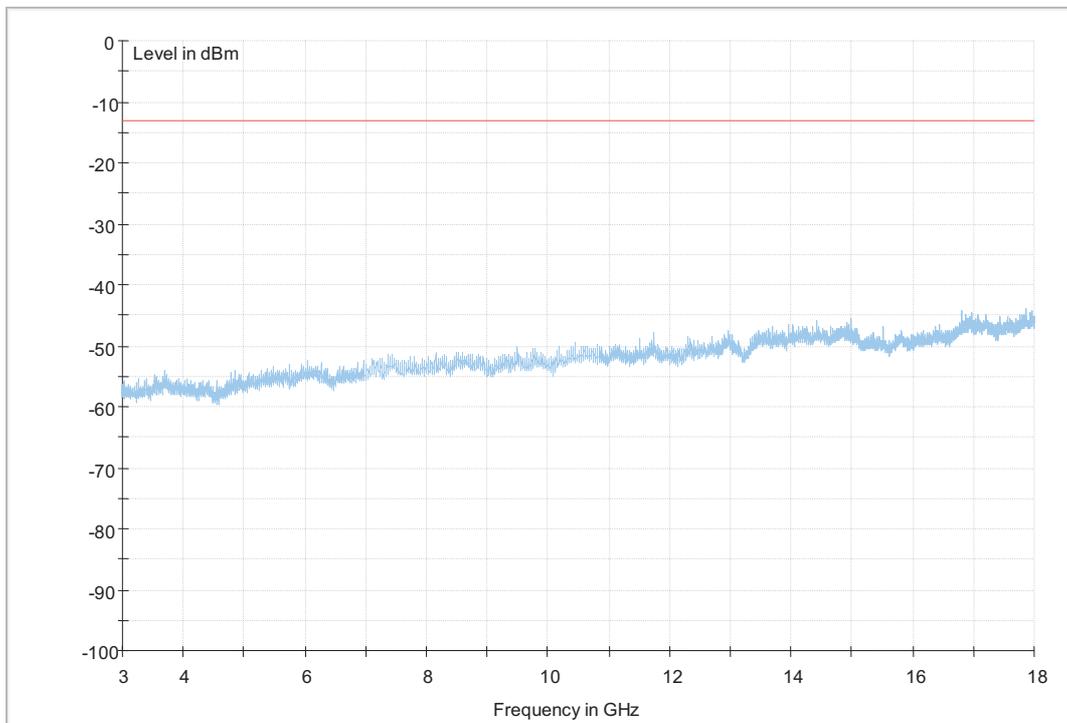
(9KHz~30MHz)



(30MHz~3GHz)

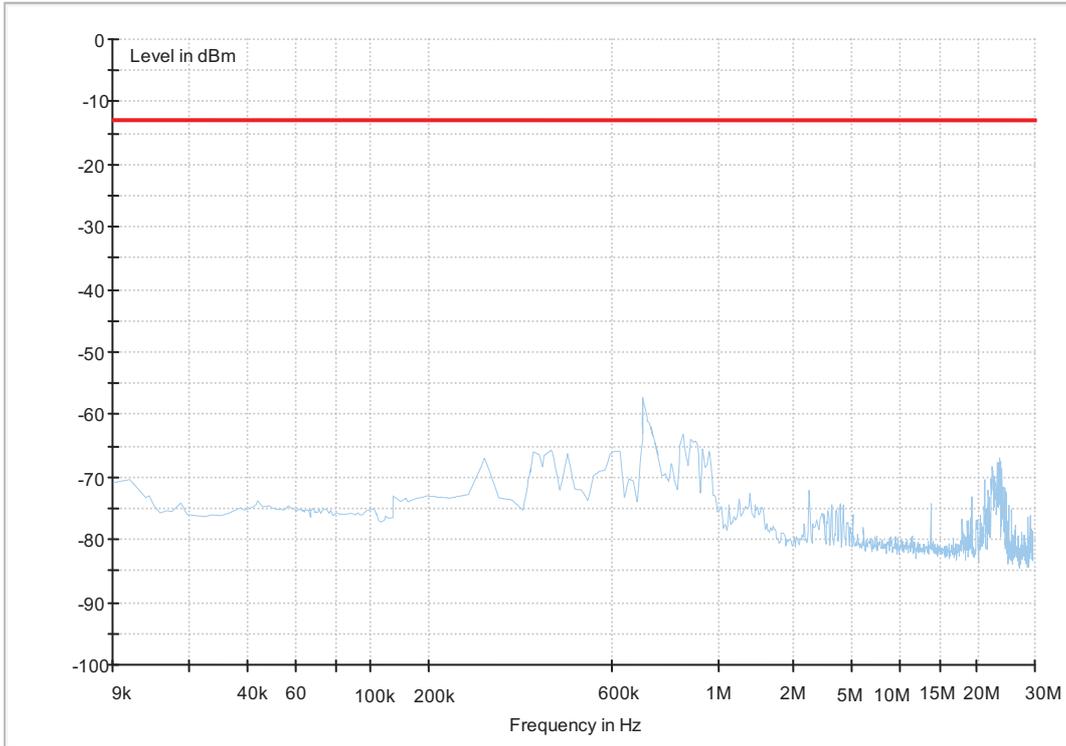


(3GHz~18GHz)

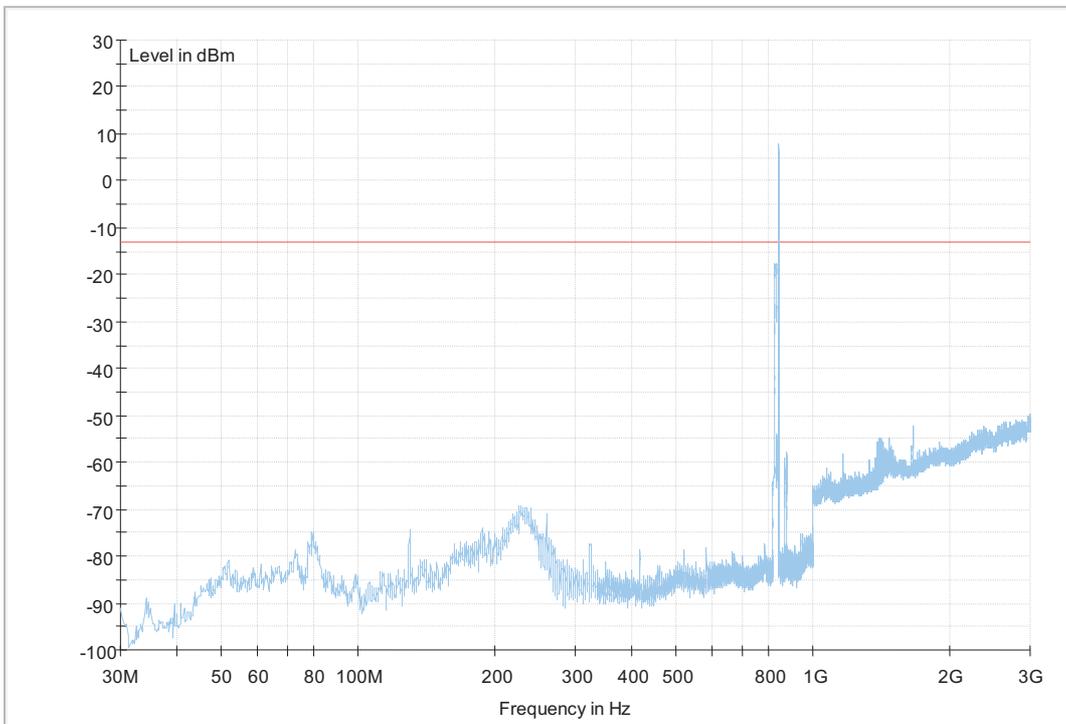


HSUPA Band V

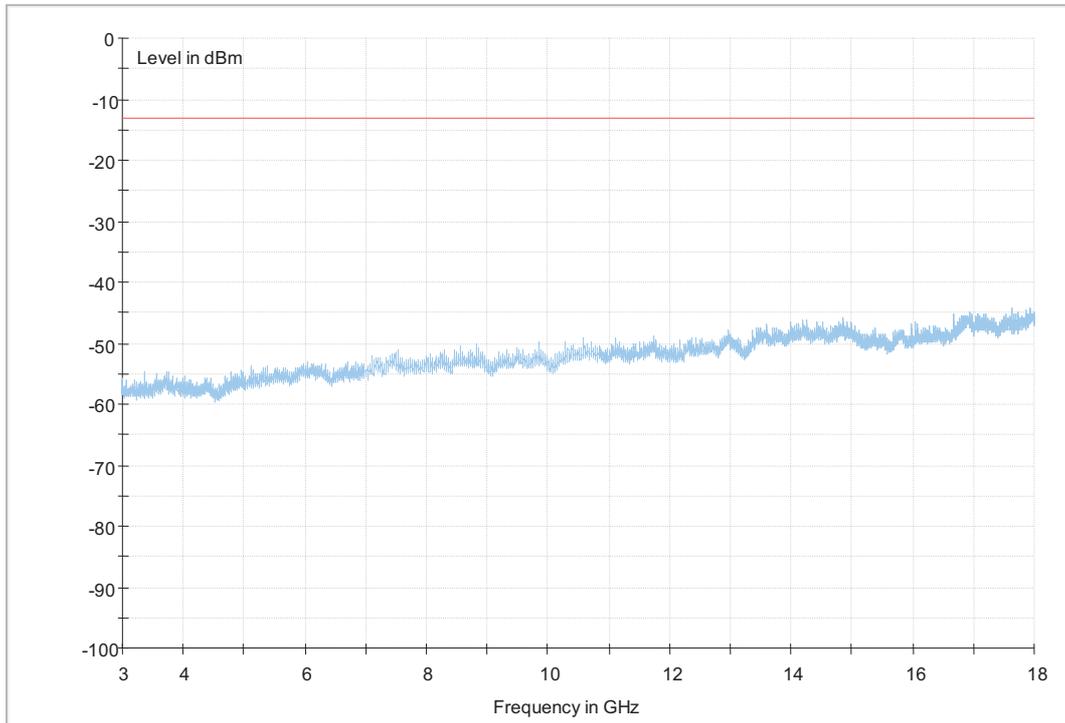
(9KHz~30MHz)



(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
TM 2	M	100%	50 °C	-17	-0.0203	---	±2.5	Pass
			-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
TM 3	M	100%	40 °C	11	0.0131	---	±2.5	Pass
			50 °C	13	0.0155	---	±2.5	Pass
			-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