



Appendix for test report



1 Appendix_A: Effective (Isotropic) Radiated Power Output Data

Part I - Test Results

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	ERP [dBm]	Limit [dBm]	Verdict
WCDMA850	UMTS/TM1	LCH	23.68	20.83	38.5	PASS
		MCH	23.52	20.67	38.5	PASS
		HCH	23.57	20.72	38.5	PASS
Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
WCDMA1700	UMTS/TM1	LCH	23.84	22.74	30	PASS
		MCH	23.78	22.60	30	PASS
		HCH	23.68	22.71	30	PASS
WCDMA1900	UMTS/TM1	LCH	23.01	21.81	33	PASS
		MCH	22.98	21.78	33	PASS
		HCH	22.99	21.79	33	PASS

Note1:

a, For getting the ERP (Efficient Radiated Power) or EIRP (Efficient Isotropic Radiated Power) in substitution method, the following formula should be taken to calculate it,

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

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

b, SGP = Signal Generator Level

Note2:

$$\text{SET Span} = 1.5 * \text{OBW}$$

$$\text{SET RBW} = 1\% \text{ of the OBW, not to exceed 1MHz}$$

$$\text{SET VBW} \geq 3 * \text{RBW}$$

SET Sweep time = auto - couple.

Detector: RMS



2Appendix_B: Peak-to-Average Ratio

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
WCDMA850	UMTS/TM1	LCH	2.730	13	PASS
		MCH	2.780	13	PASS
		HCH	2.790	13	PASS
WCDMA1700	UMTS/TM1	LCH	2.520	13	PASS
		MCH	2.350	13	PASS
		HCH	2.340	13	PASS
WCDMA1900	UMTS/TM1	LCH	2.670	13	PASS
		MCH	2.630	13	PASS
		HCH	2.410	13	PASS

3Appendix_C: Modulation Characteristics

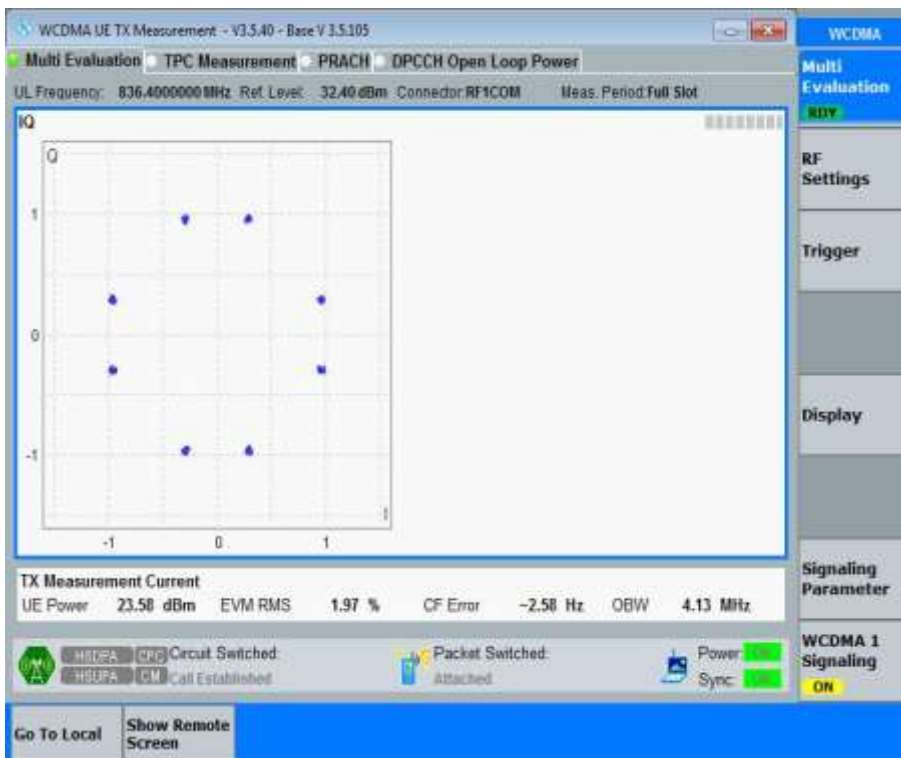
Part I - Test Plots

3.1 For UMTS

3.1.1 Test Band = WCDMA850

3.1.1.1 Test Mode = UMTS/TM1

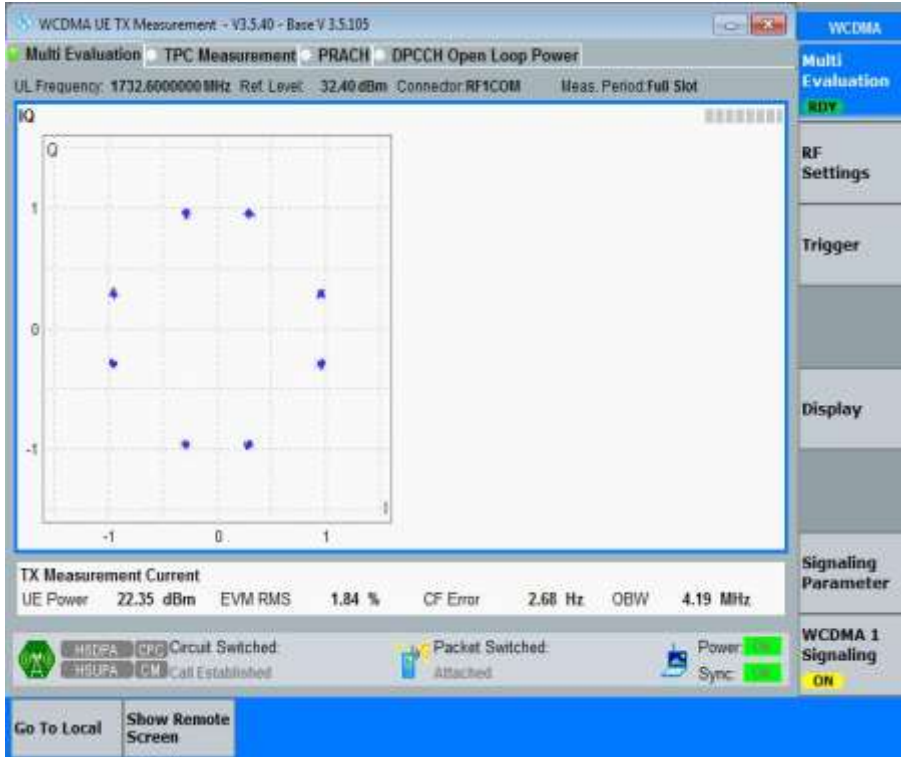
3.1.1.1.1 Test Channel = MCH



3.1.2 Test Band = WCDMA1700

3.1.2.1 Test Mode = UMTS/TM1

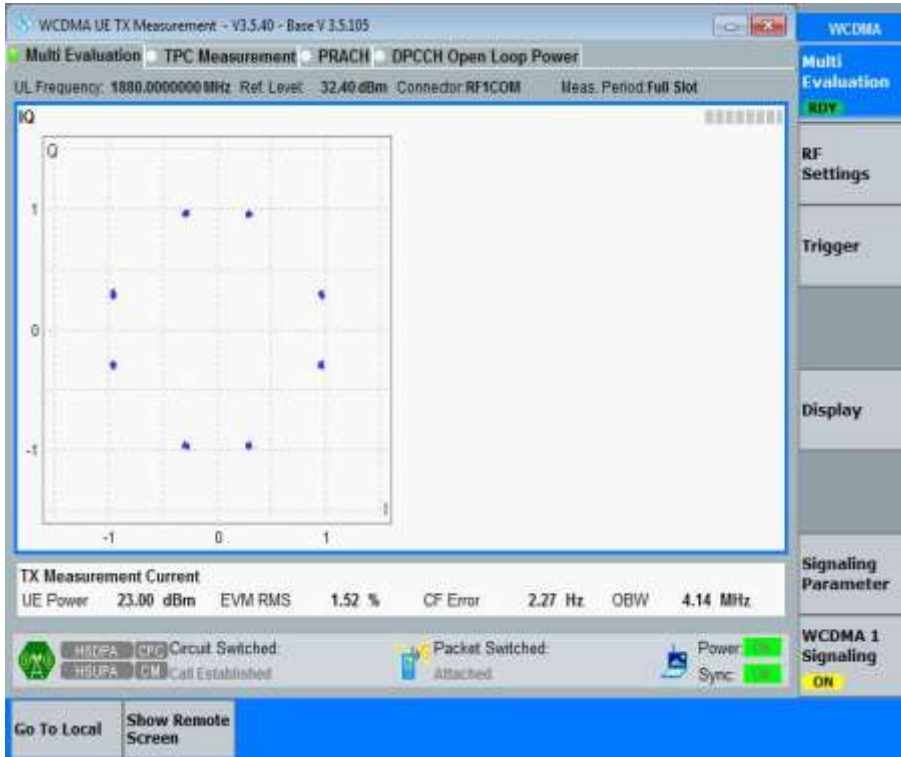
3.1.2.1.1 Test Channel = MCH



3.1.3 Test Band = WCDMA1900

3.1.3.1 Test Mode = UMTS/TM1

3.1.3.1.1 Test Channel = MCH





4Appendix_D: Bandwidth

Part I - Test Results

Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
WCDMA850	UMTS/TM1	LCH	4.16	4.72	Pass
		MCH	4.16	4.72	Pass
		HCH	4.16	4.71	Pass
WCDMA1700	UMTS/TM1	LCH	4.17	4.75	Pass
		MCH	4.18	4.76	Pass
		HCH	4.17	4.74	Pass
WCDMA1900	UMTS/TM1	LCH	4.19	4.75	Pass
		MCH	4.18	4.72	Pass
		HCH	4.17	4.73	Pass

4.1.1.1.2 Test Channel = MCH



4.1.1.1.3 Test Channel = HCH



4.1.2 Test Band = WCDMA1700

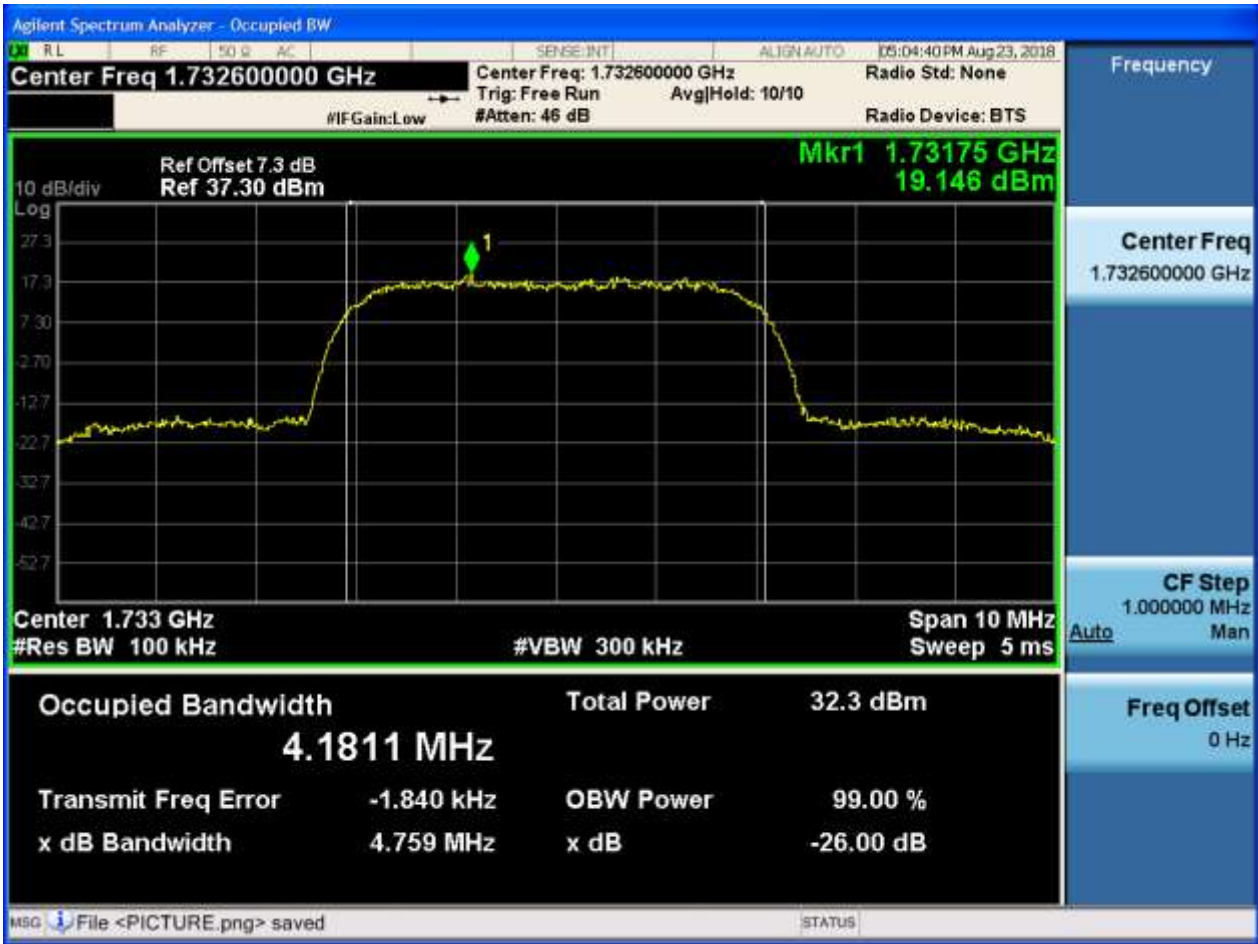
4.1.2.1 Test Mode = UMTS/TM1

4.1.2.1.1 Test Channel = LCH

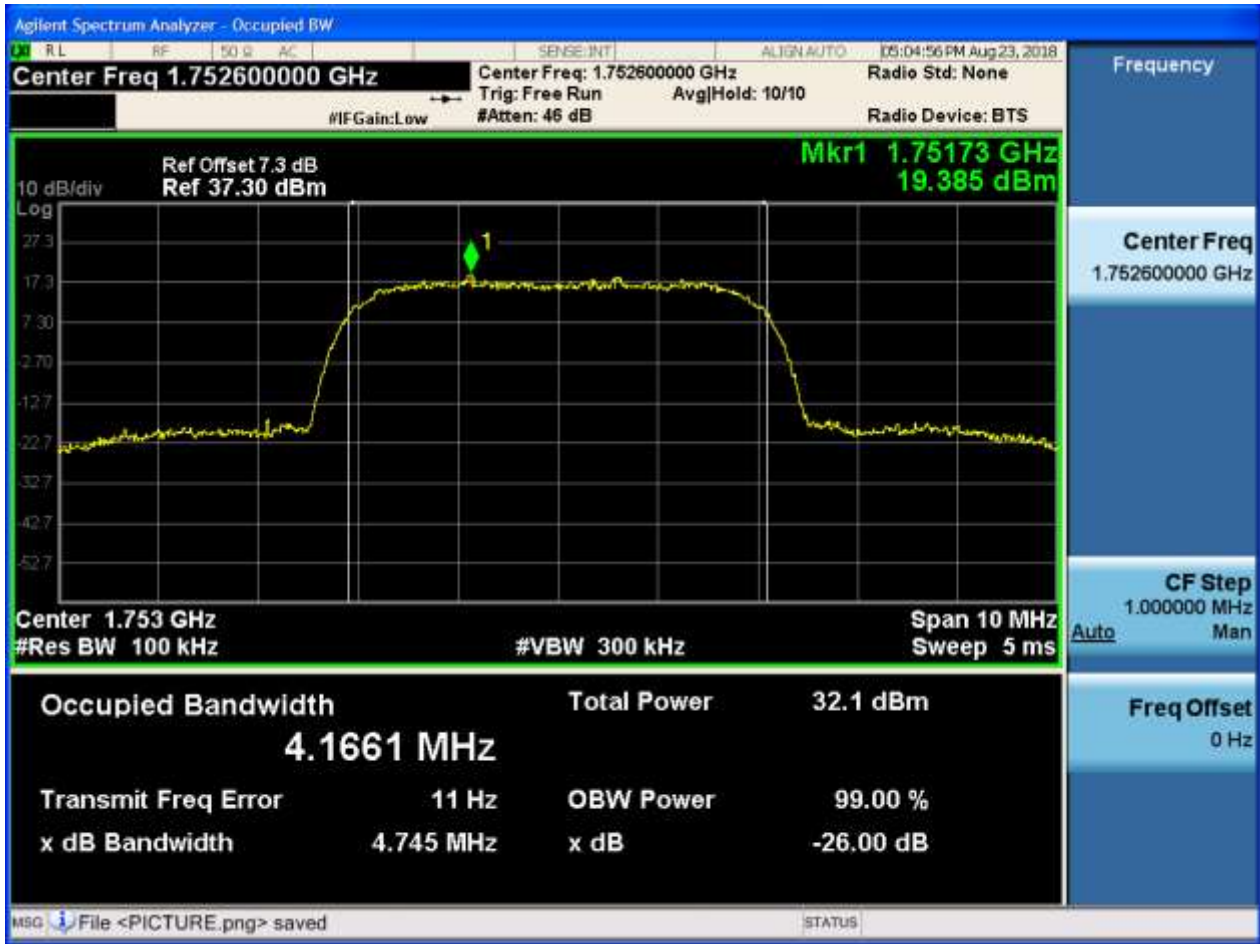




4.1.1.1.2 Test Channel = MCH



4.1.1.1.3 Test Channel = HCH



4.1.3 Test Band = WCDMA1900

4.1.3.1 Test Mode = UMTS/TM1

4.1.3.1.1 Test Channel = LCH



4.1.3.1.2 Test Channel = MCH



4.1.3.1.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

Part I - Test Plots

5.1 For UMTS

5.1.1 Test Band = WCDMA850

5.1.1.1 Test Mode = UMTS/TM1

5.1.1.1.1 Test Channel = LCH



5.1.1.1.2 Test Channel = HCH



5.1.2 Test Band = WCDMA1700

5.1.2.1 Test Mode = UMTS/TM1

5.1.2.1.1 Test Channel = LCH





5.1.1.1.2 Test Channel = HCH



5.1.3 Test Band = WCDMA1900

5.1.3.1 Test Mode = UMTS/TM1

5.1.3.1.1 Test Channel = LCH



5.1.3.1.2 Test Channel = HCH



6Appendix_F: Spurious Emission at Antenna Terminal

NOTE: For the averaged unwanted emissions measurements, the measurement points in each sweep is greater than twice the Span/RBW in order to ensure bin-to-bin spacing of $< RBW/2$ so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points = $k * (Span / RBW)$ " with k between 4 and 5, which results in an acceptable level error of less than 0.5 dB.

Part I - Test Plots

6.1 For UMTS

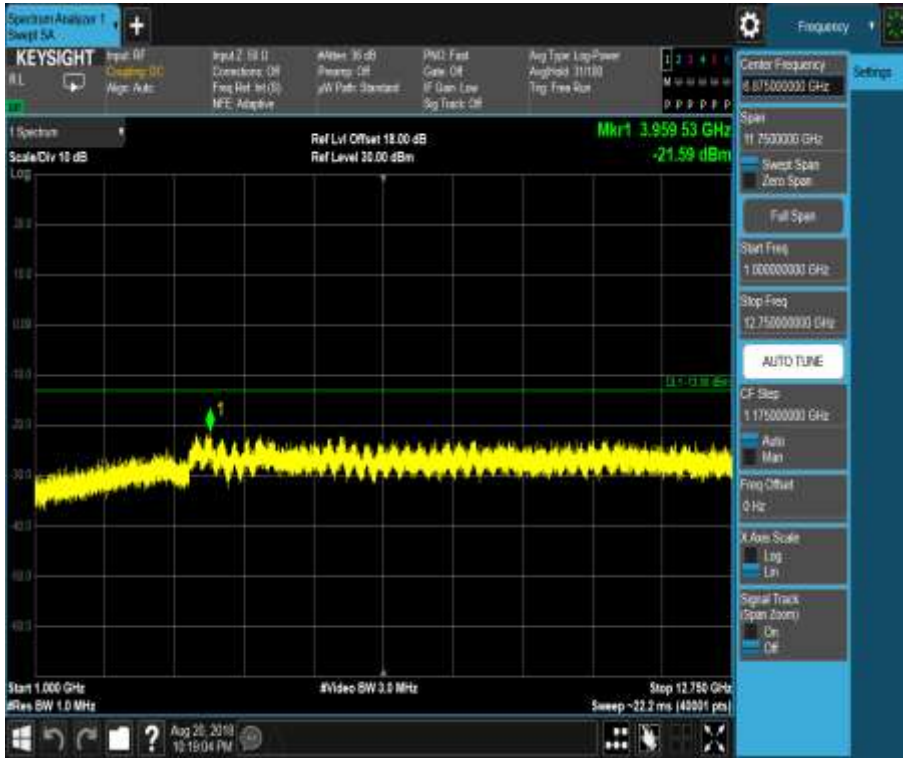
6.1.1 Test Band = WCDMA850

6.1.1.1 Test Mode = UMTS/TM1

6.1.1.1.1 Test Channel = LCH

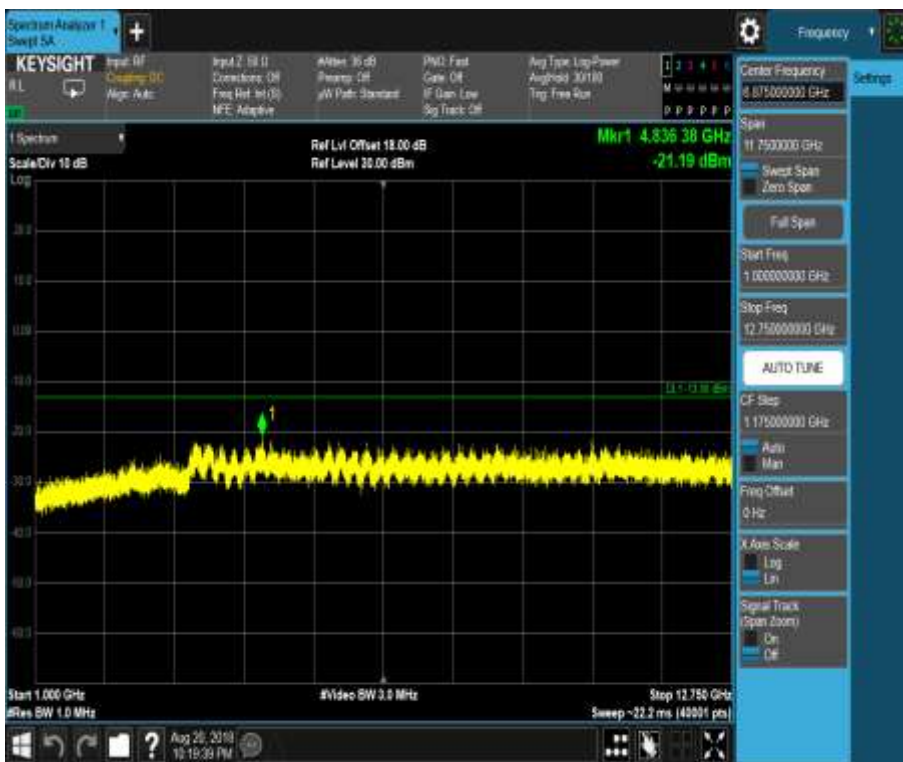




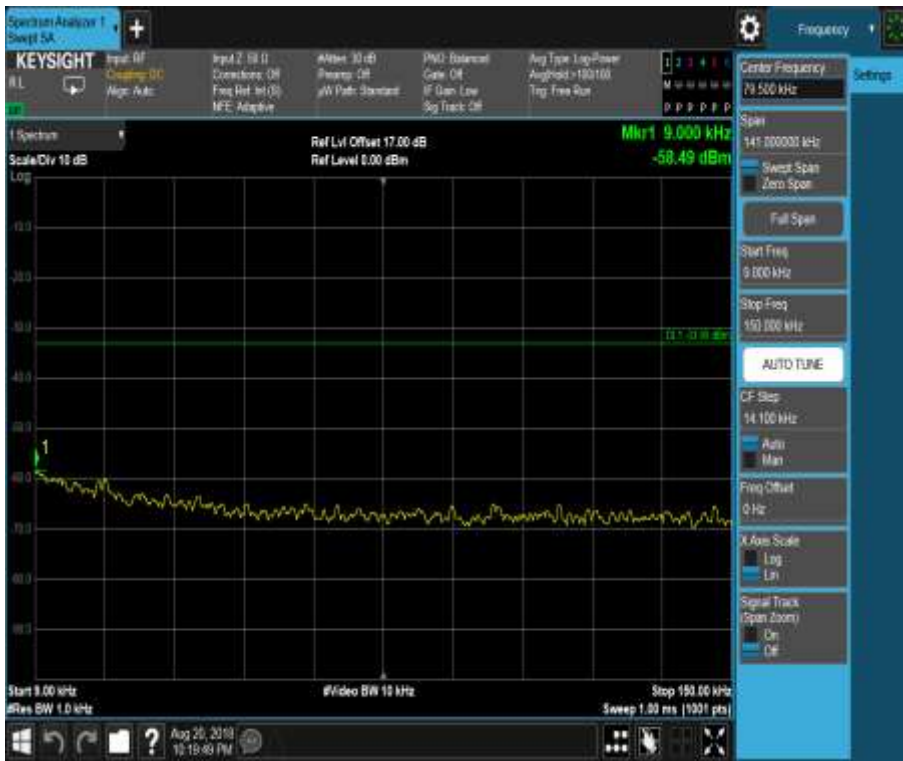


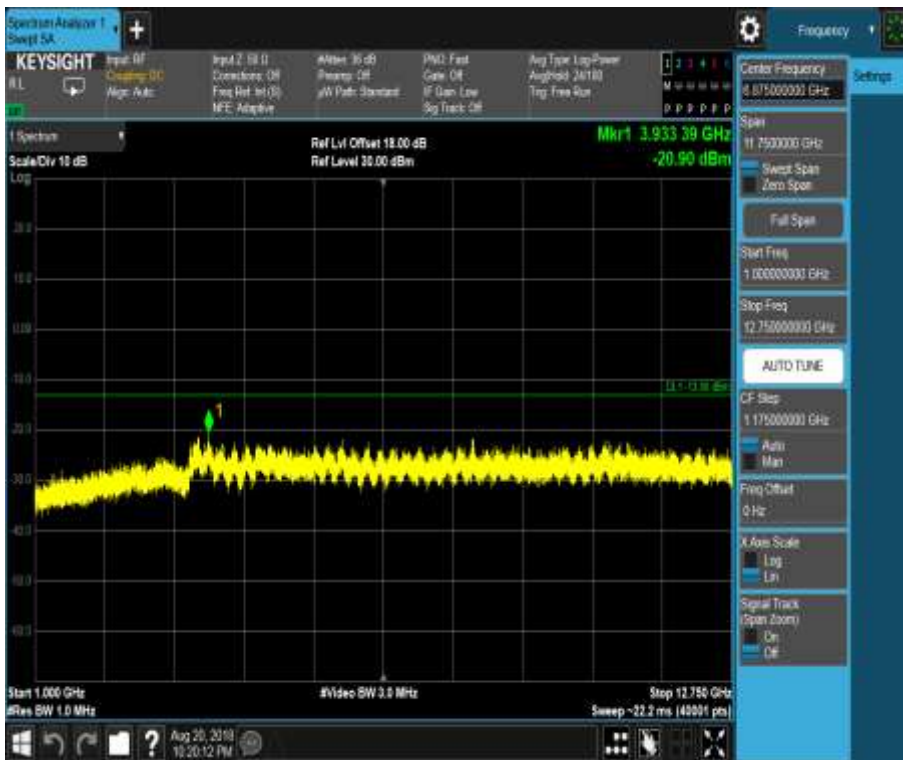
6.1.1.1.2 Test Channel = MCH





6.1.1.1.3 Test Channel = HCH

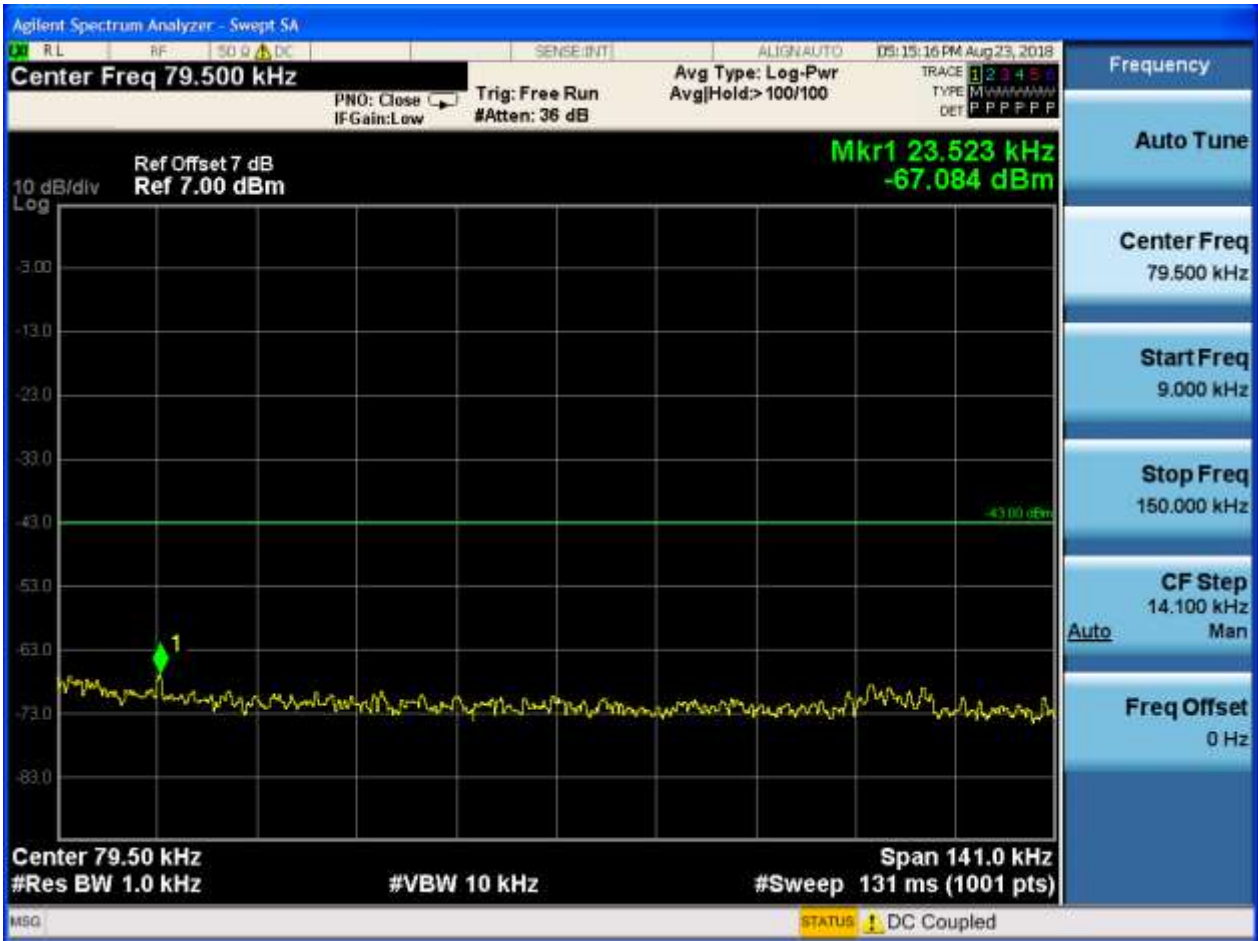


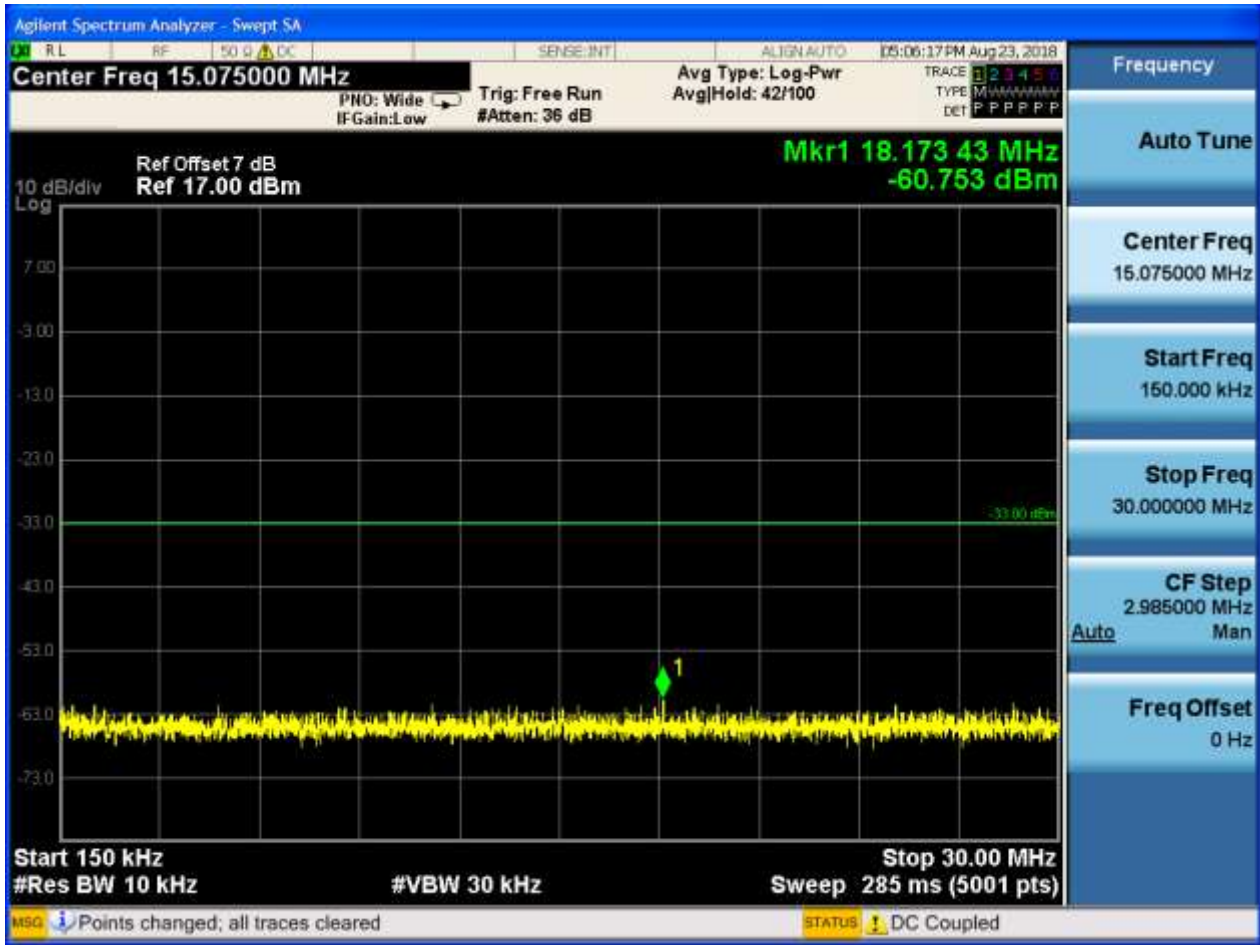


6.1.2 Test Band = WCDMA1700

6.1.2.1 Test Mode = UMTS/TM1

6.1.2.1.1 Test Channel = LCH

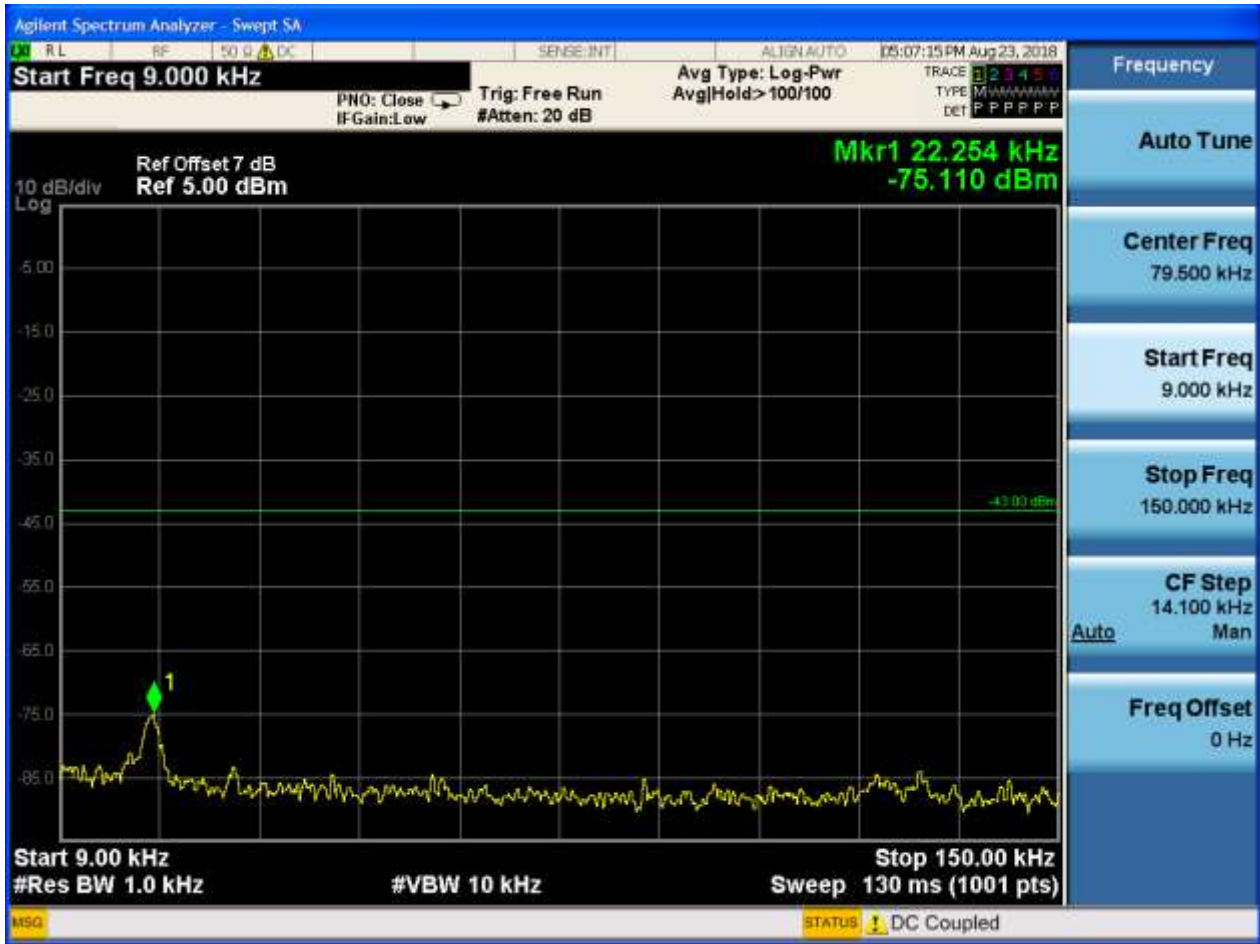








6.1.1.1.2 Test Channel = MCH

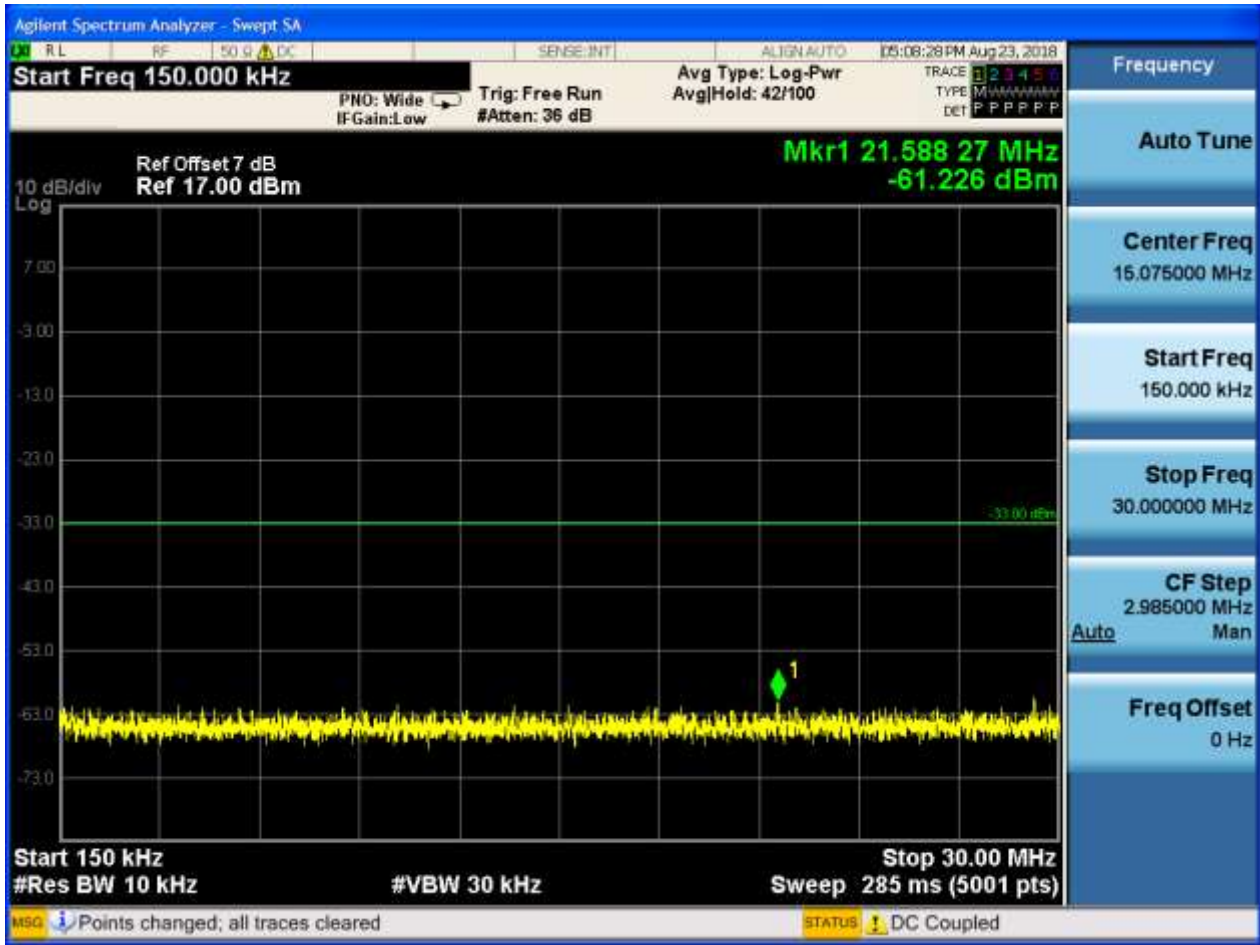






6.1.1.1.3 Test Channel = HCH



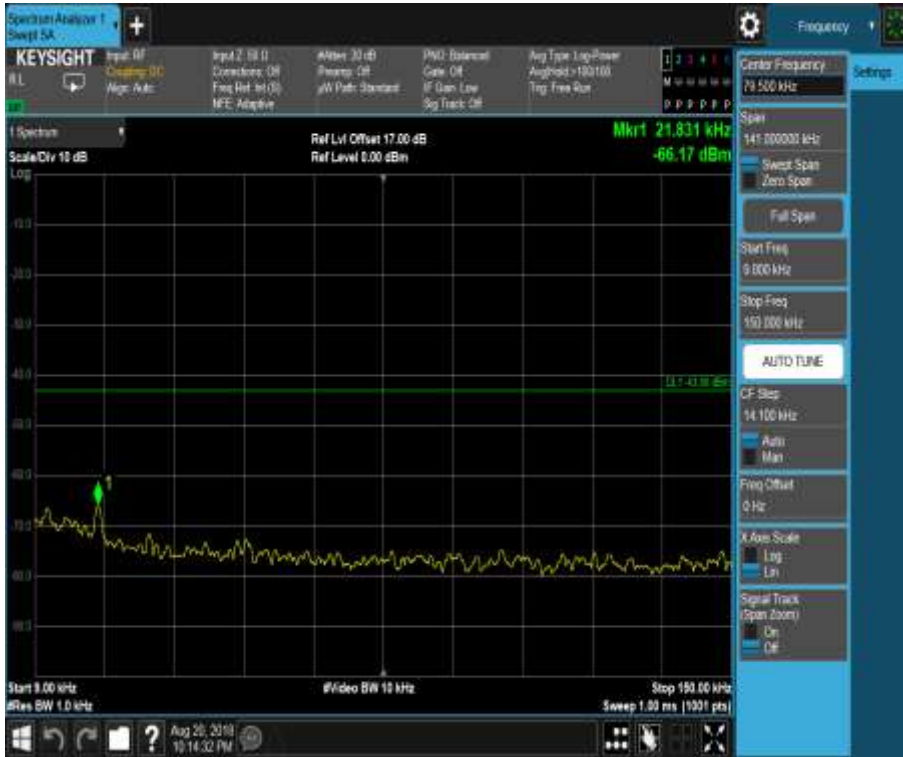


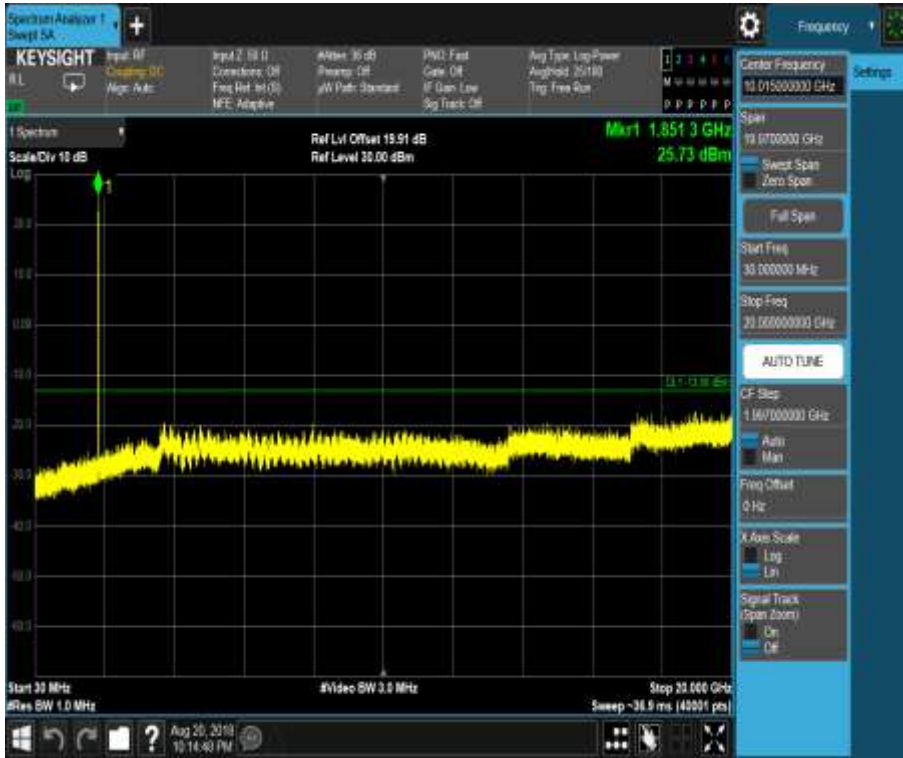


6.1.3 Test Band = WCDMA1900

6.1.3.1 Test Mode = UMTS/TM1

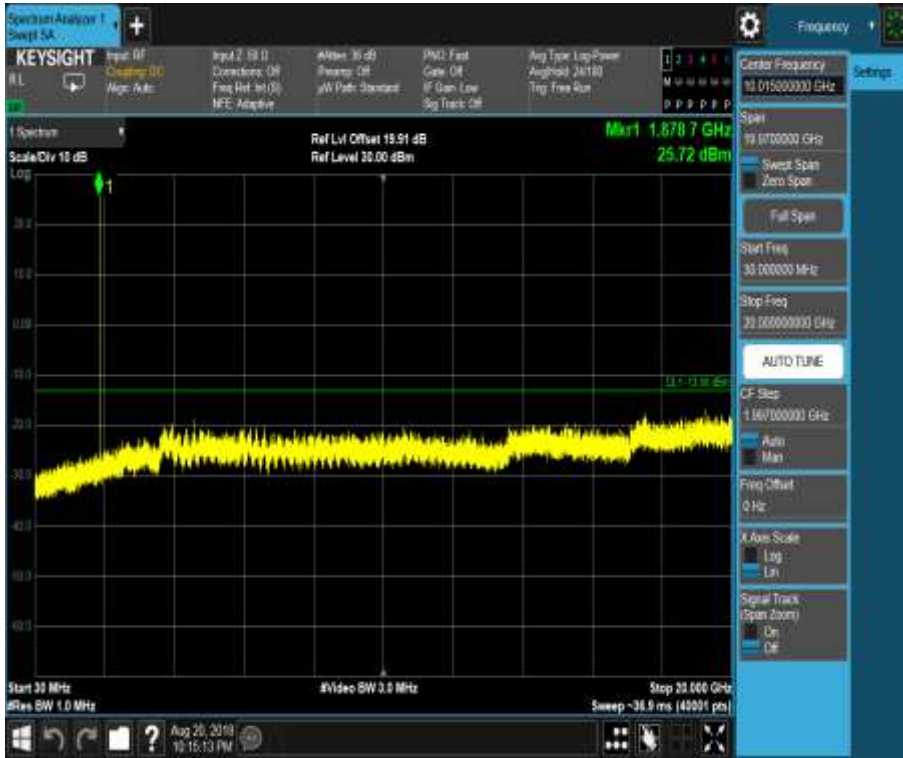
6.1.3.1.1 Test Channel = LCH





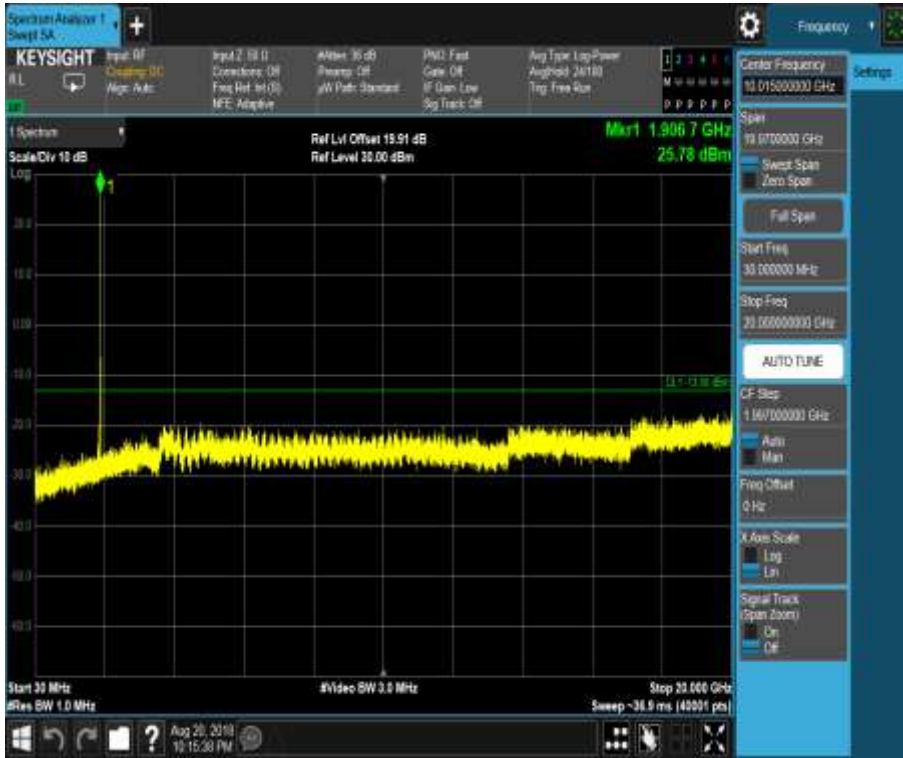
6.1.3.1.2 Test Channel = MCH





6.1.3.1.3 Test Channel = HCH







7Appendix_G: Field Strength of Spurious Radiation

Note:We tested all modes, but the data presented below is the worst case.

9kHz~150kHz, RBW = 200Hz, VBW = 600 Hz, Detector: PK

150kHz~30MHz, RBW = 9kHz, VBW = 30k Hz, Detector: PK

30MHz~1GHz, RBW = 100 kHz, VBW = 300 kHz. Detector: PK

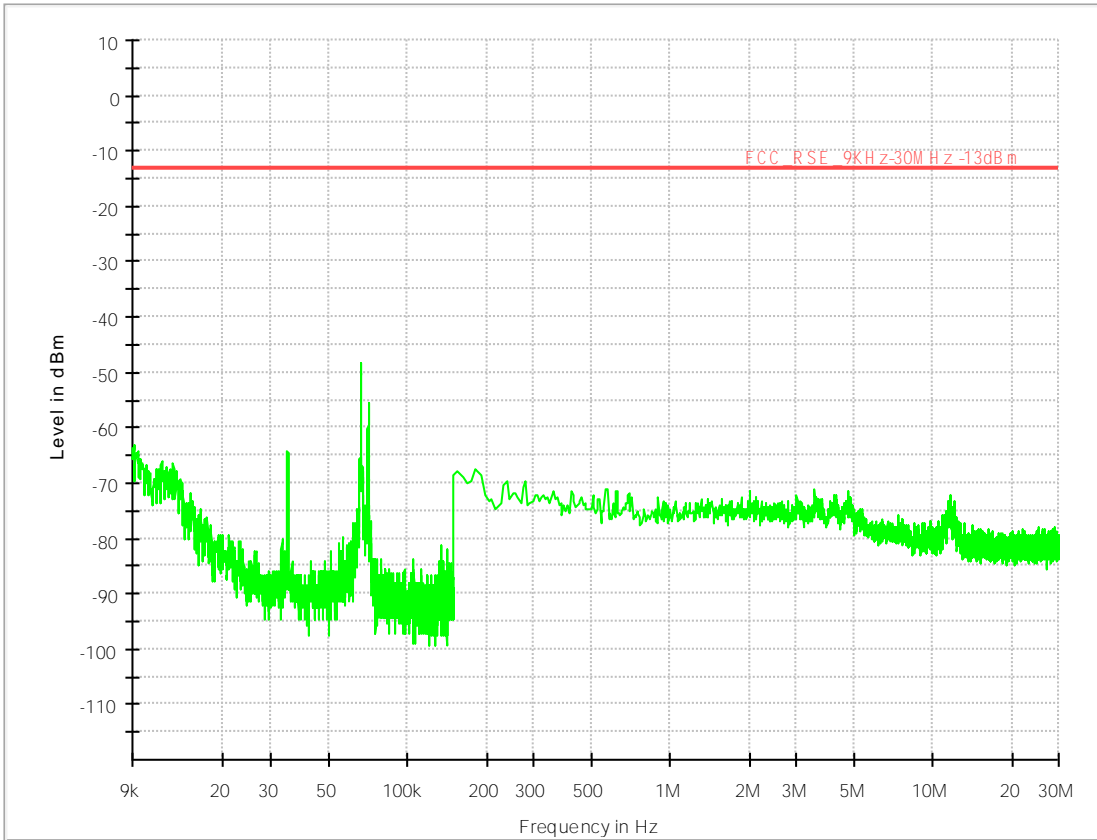
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

Part I - Test Plots

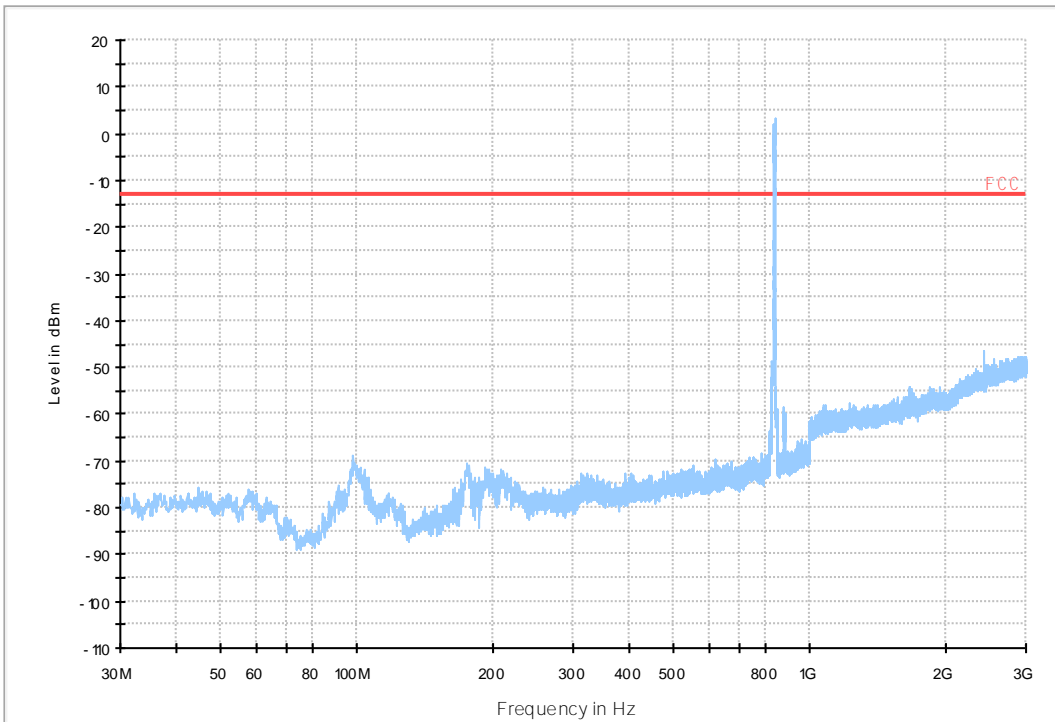
7.1 For UMTS

7.1.1 Test Band = WCDMA850_ANT1

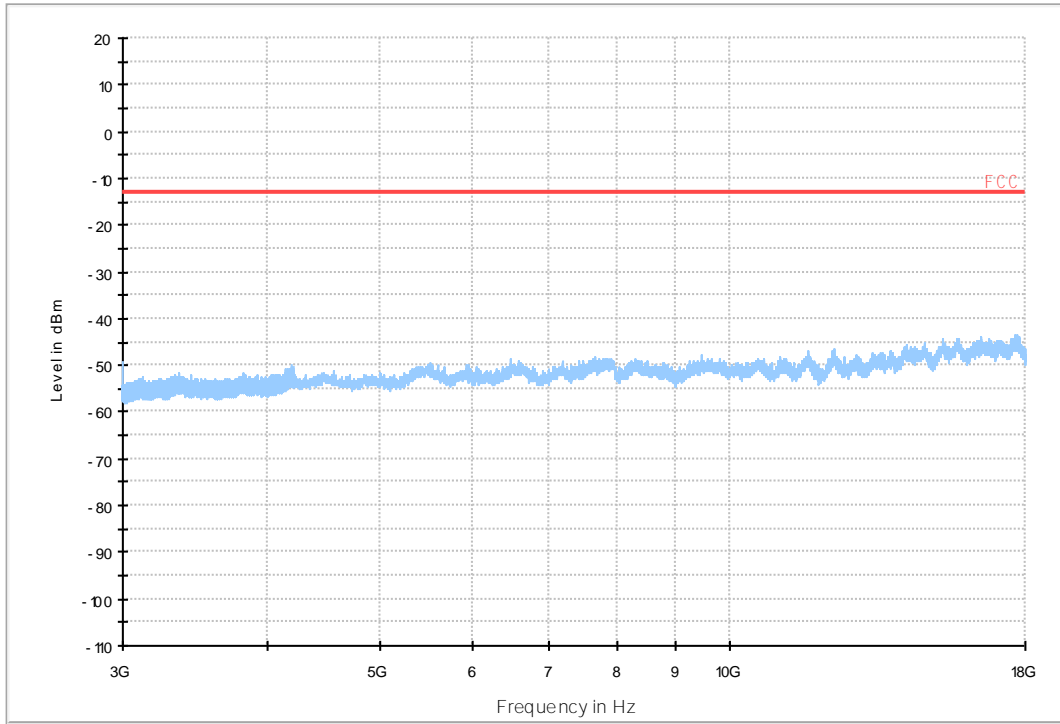
7.1.1.1 Test Mode = UMTS/TM1



06 FCC PART 22 WCDMA850_L



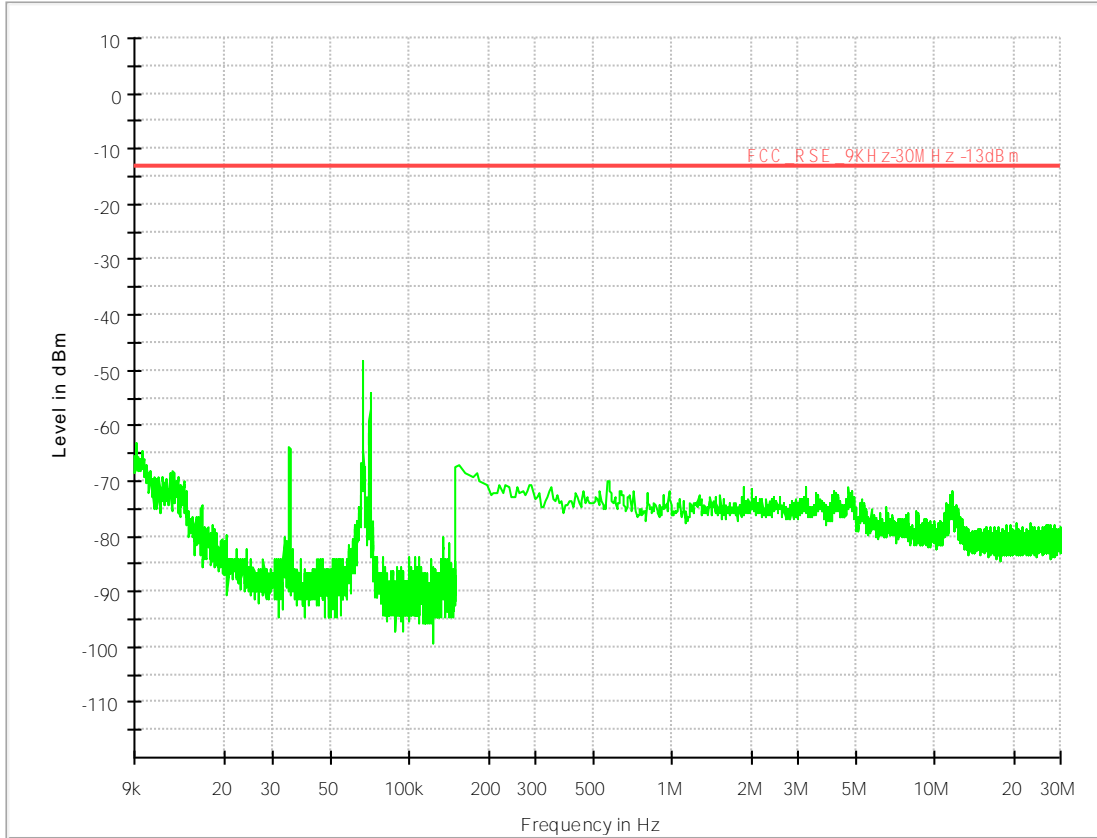
05 FCC PART 22 WCDMA850_H



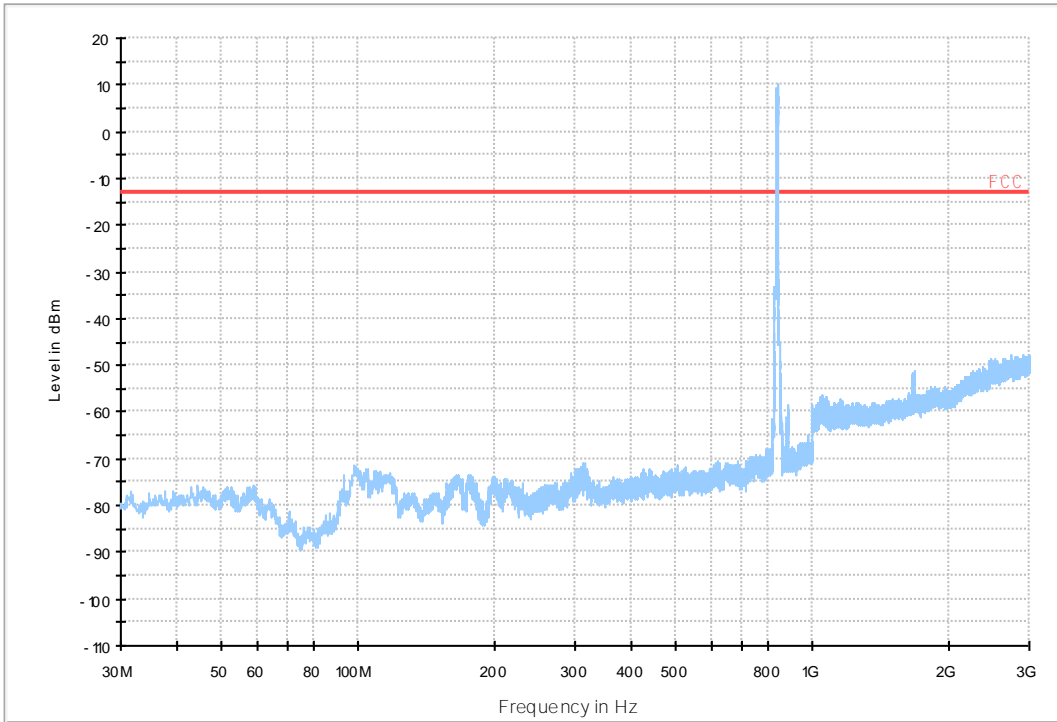


7.1.2 Test Band = WCDMA850_ANT2

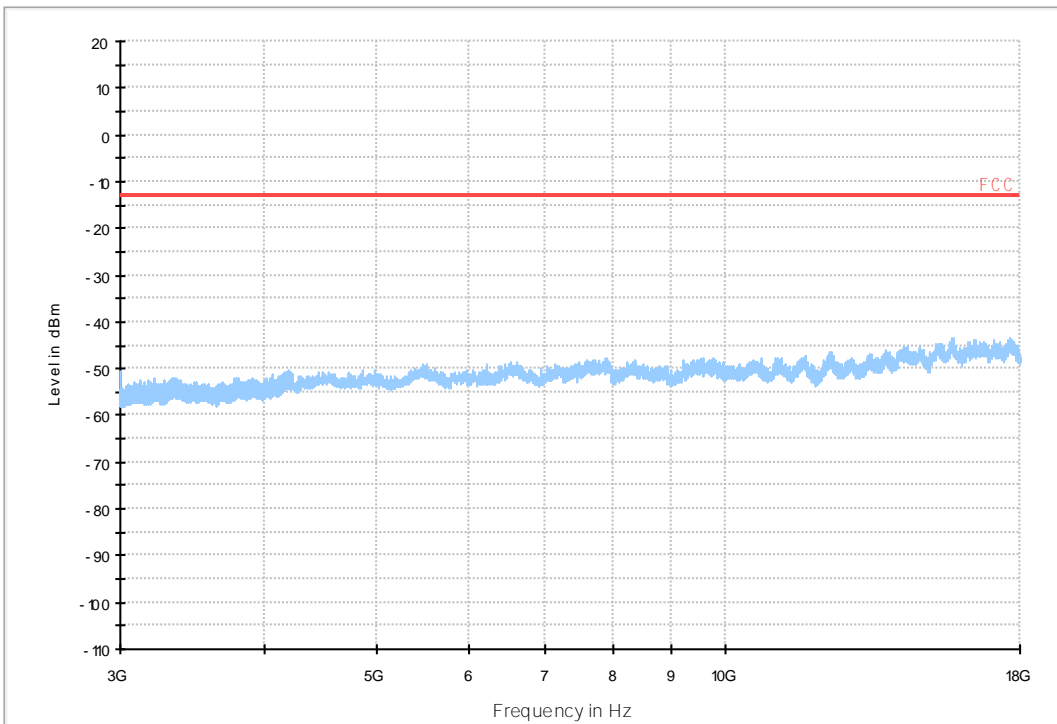
7.1.2.1 Test Mode = UMTS/TM1



06 FCC PART 22 WCDMA850_L



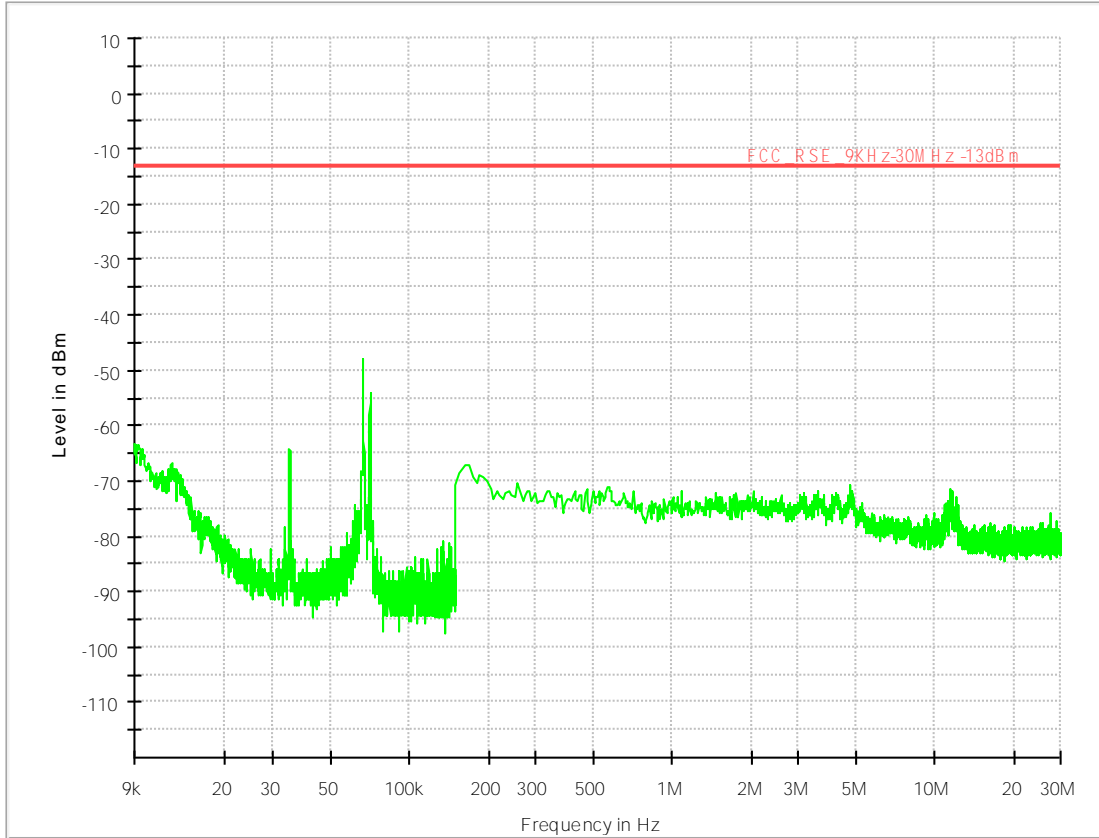
05 FCC PART 22 WCDMA850_H



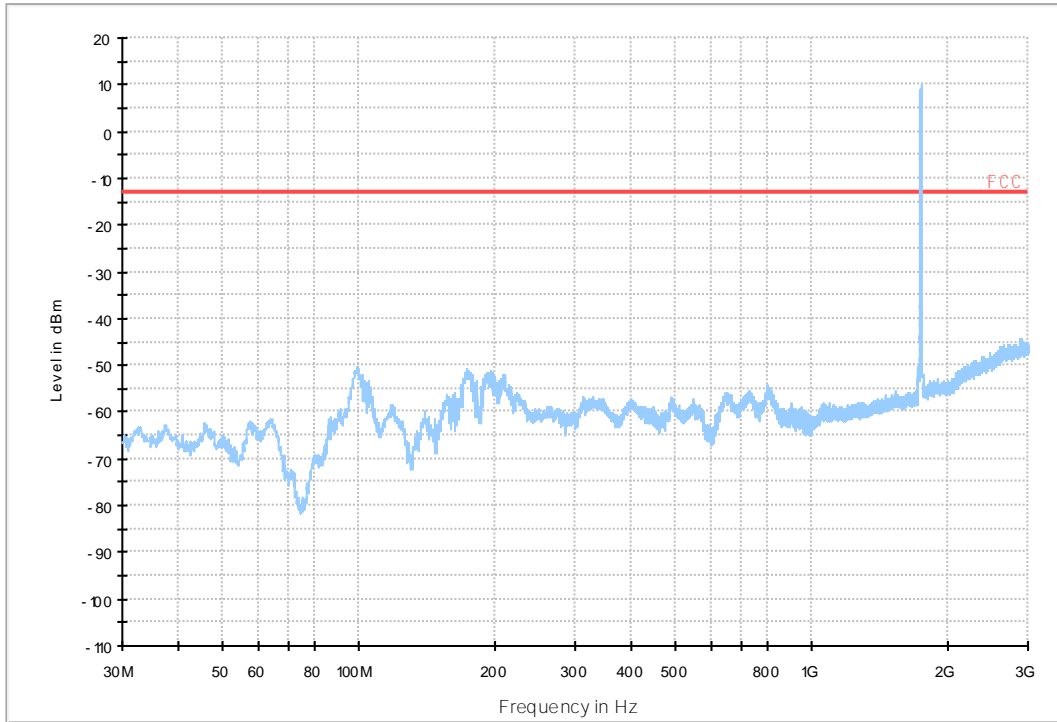


7.1.3 Test Band = WCDMA1700_ANT1

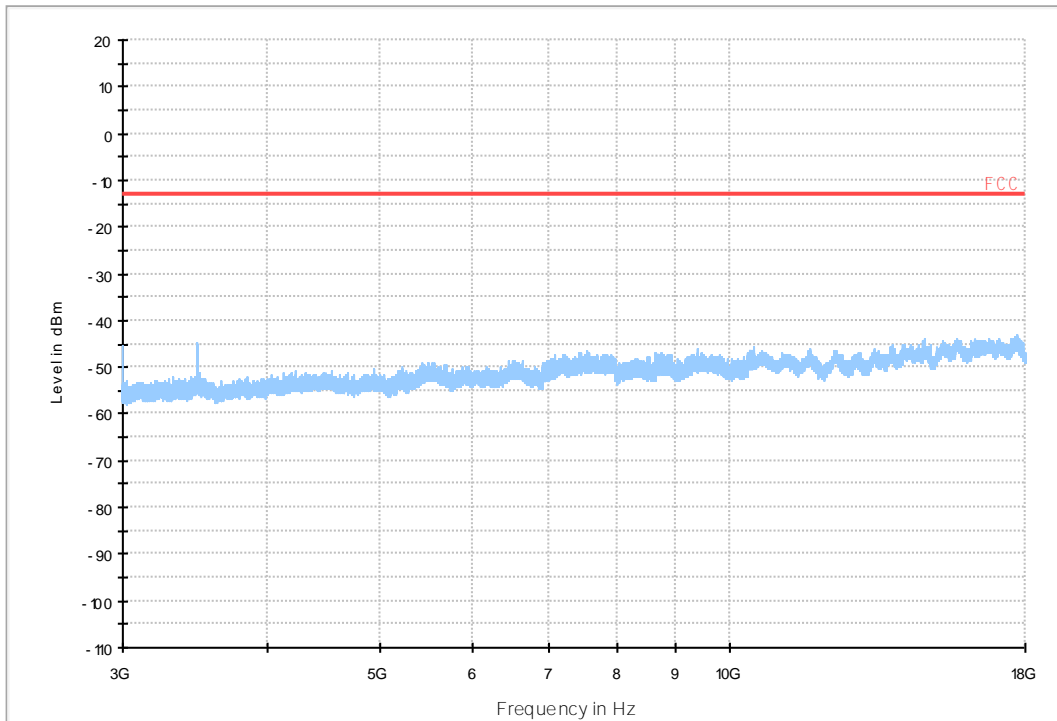
7.1.3.1 Test Mode = UMTS/TM1



18 FCC PART 27 WCDMA1700_L



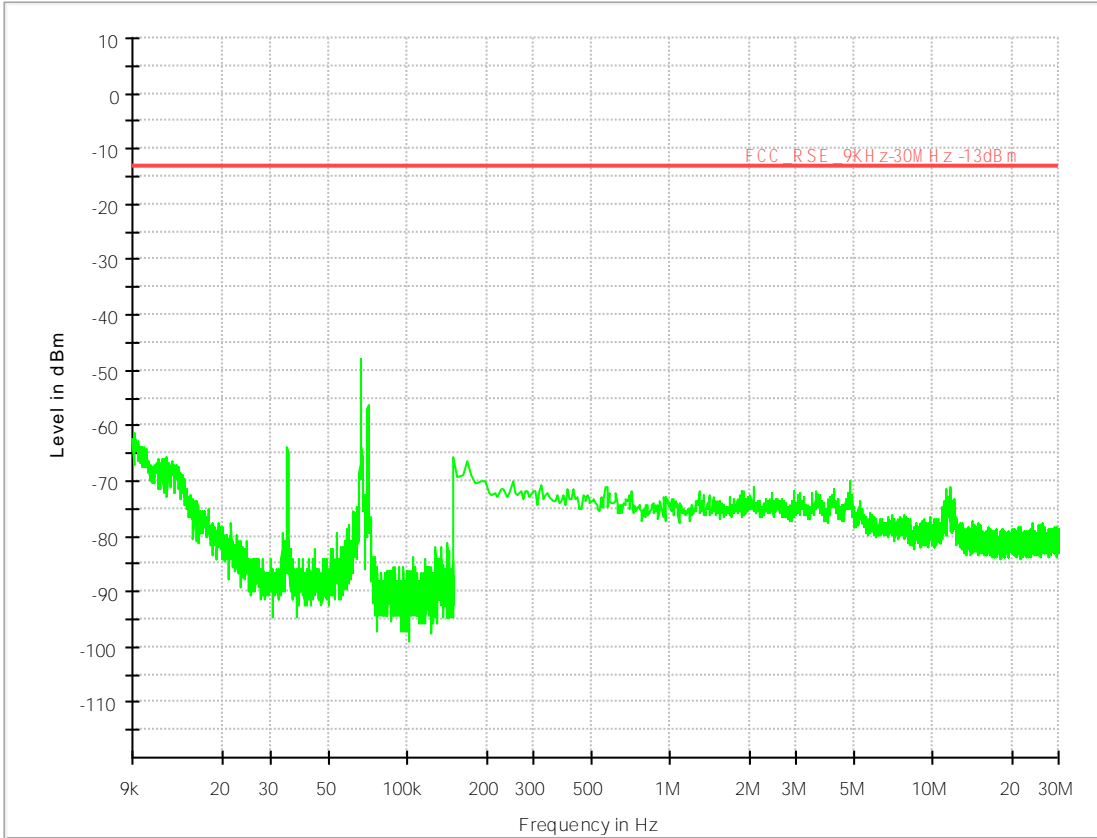
17 FCC PART 27 WCDMA1700_H



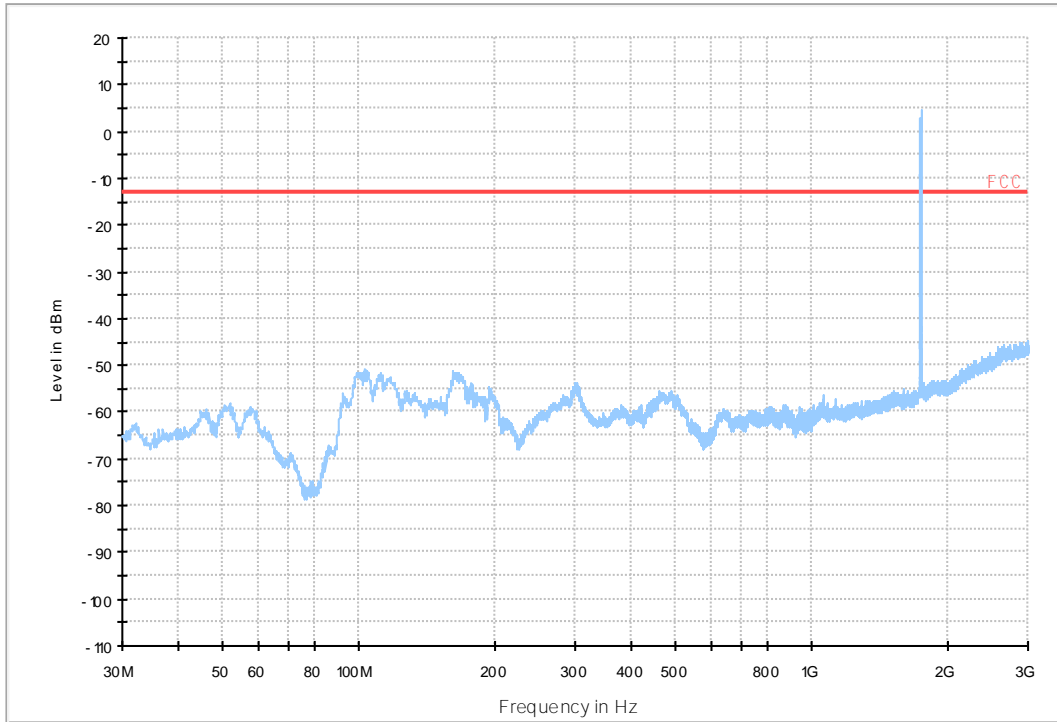


7.1.4 Test Band = WCDMA1700_ANT2

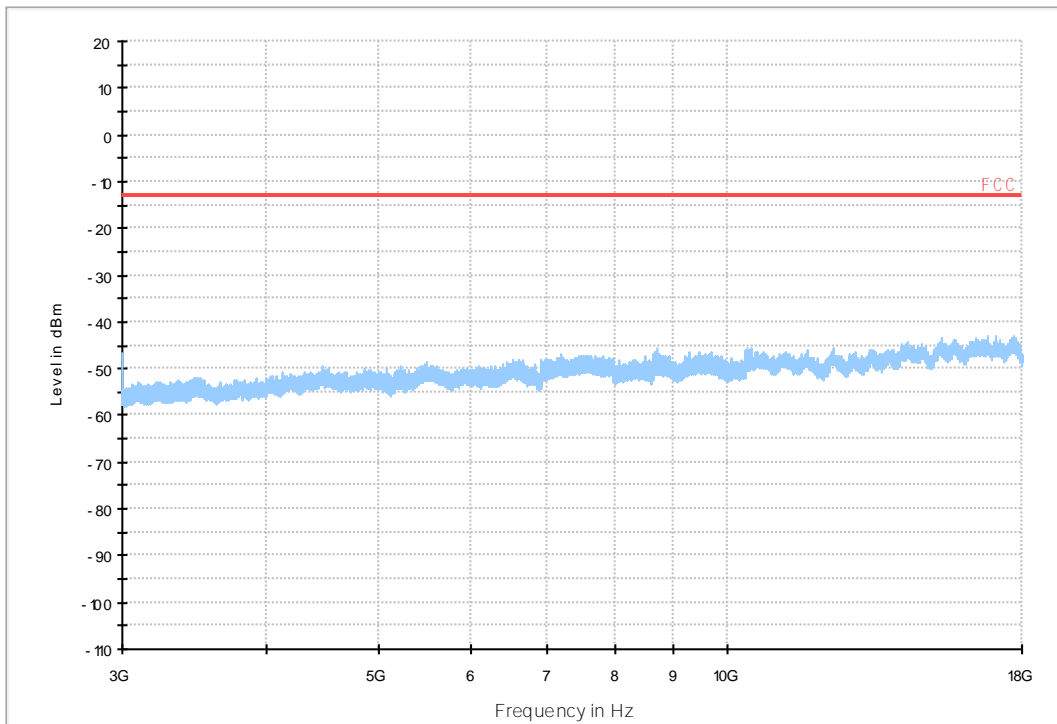
7.1.4.1 Test Mode = UMTS/TM1



18 FCC PART 27 WCDMA1700_L



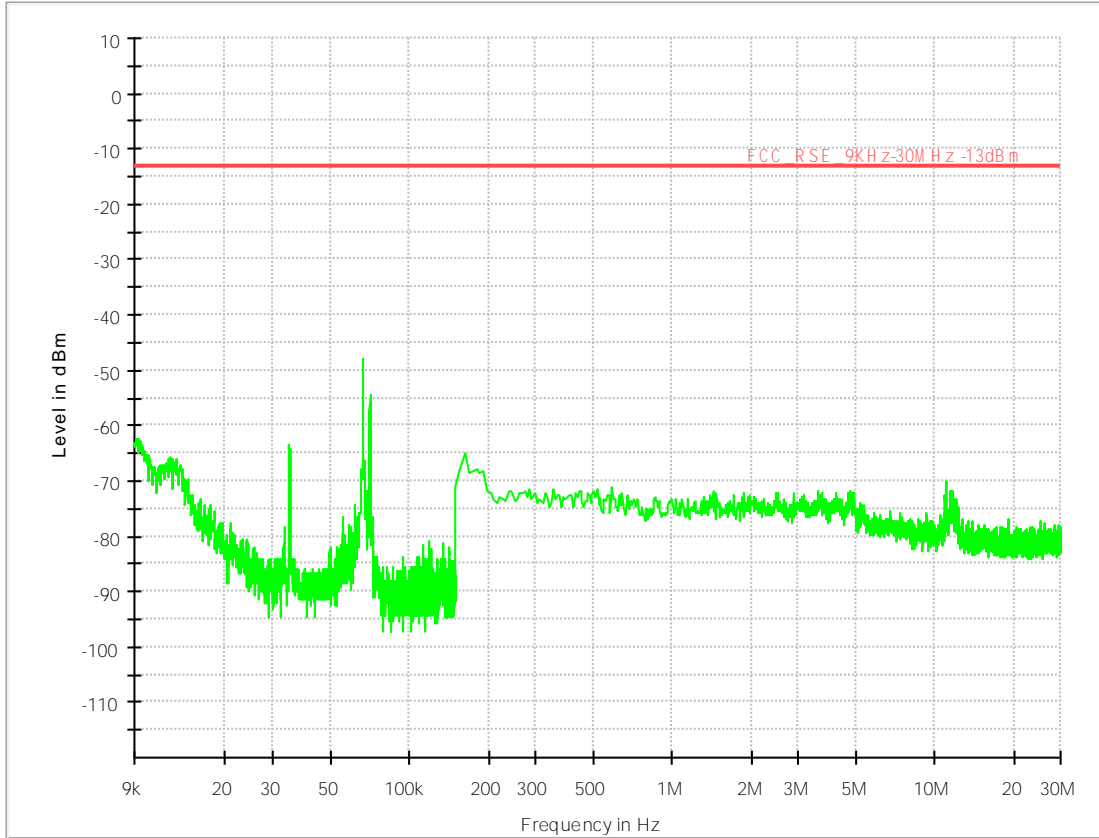
17 FCC PART 27 WCDMA1700_H



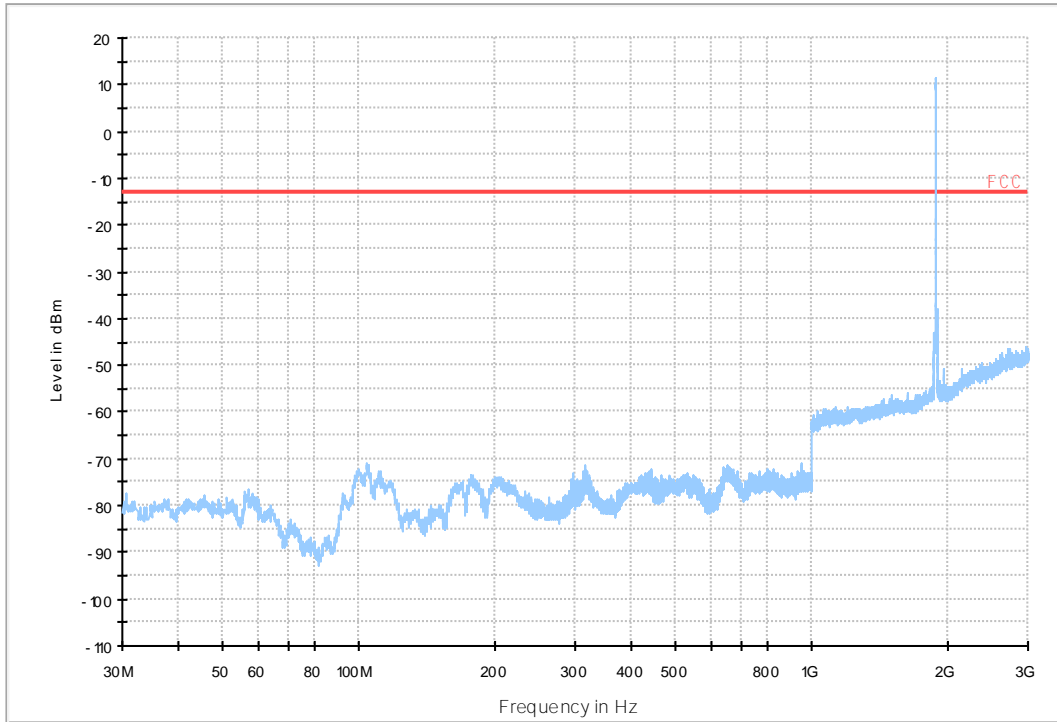


7.1.5 Test Band = WCDMA1900_ANT1

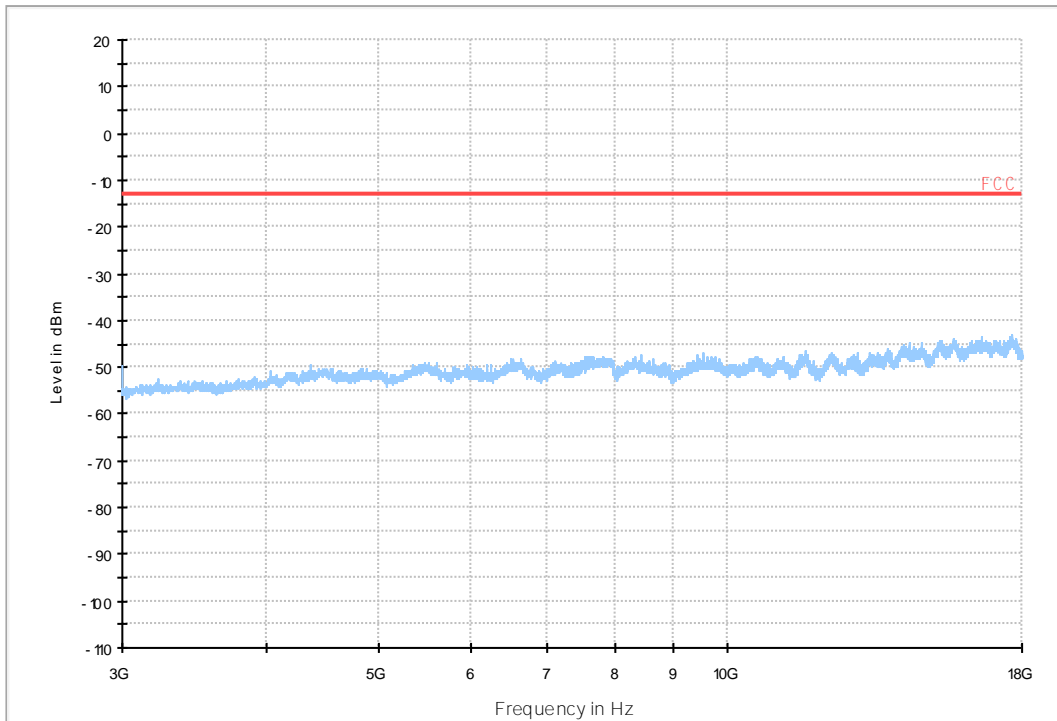
7.1.5.1 Test Mode = UMTS/TM1



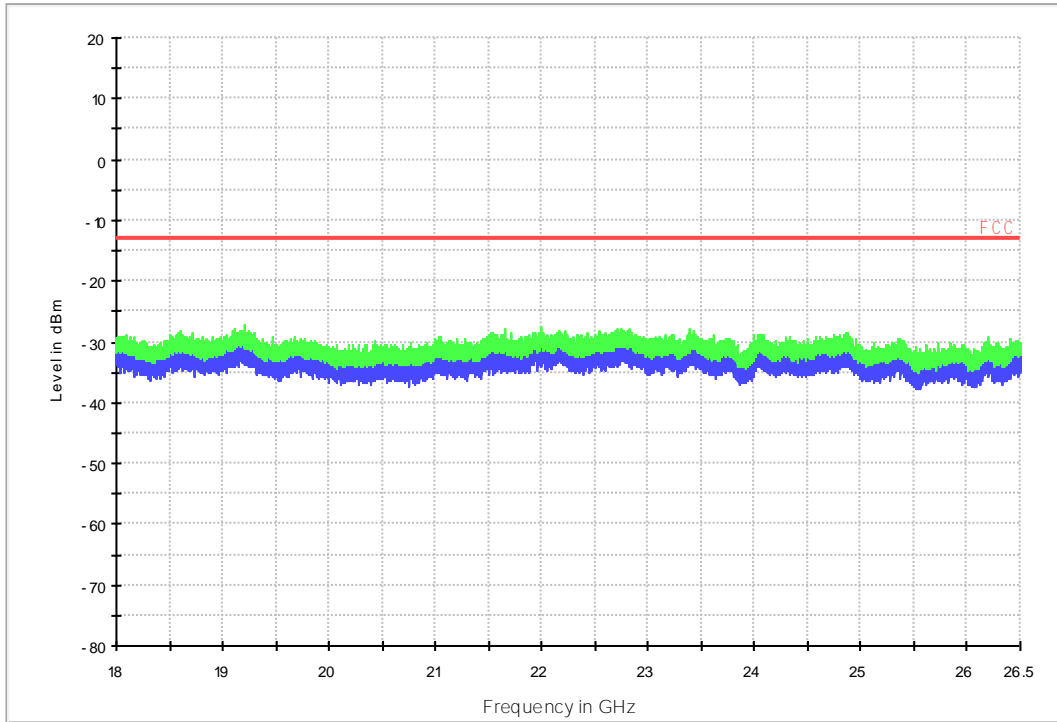
12 FCC PART 24 WCDMA1900_L



11 FCC PART 24 WCDMA1900_H



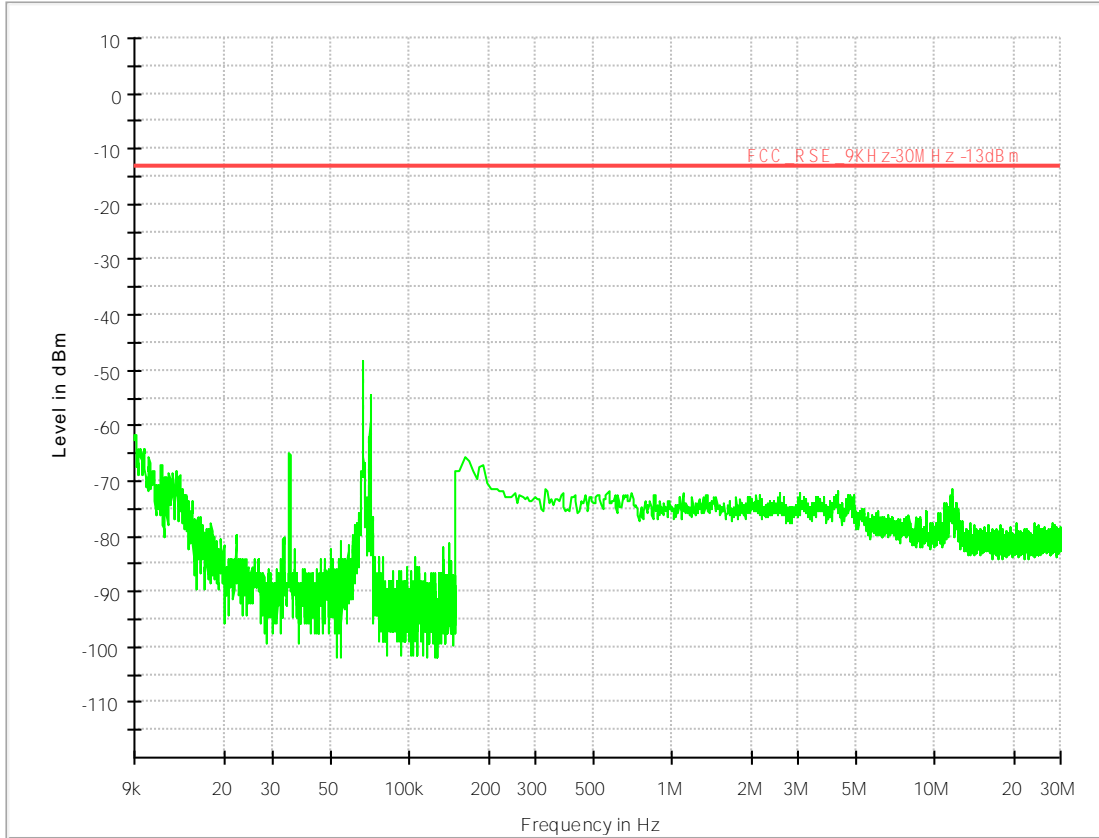
18G~26.5G RSE-TX-DIRECTOR ABOVE 1.5G PK



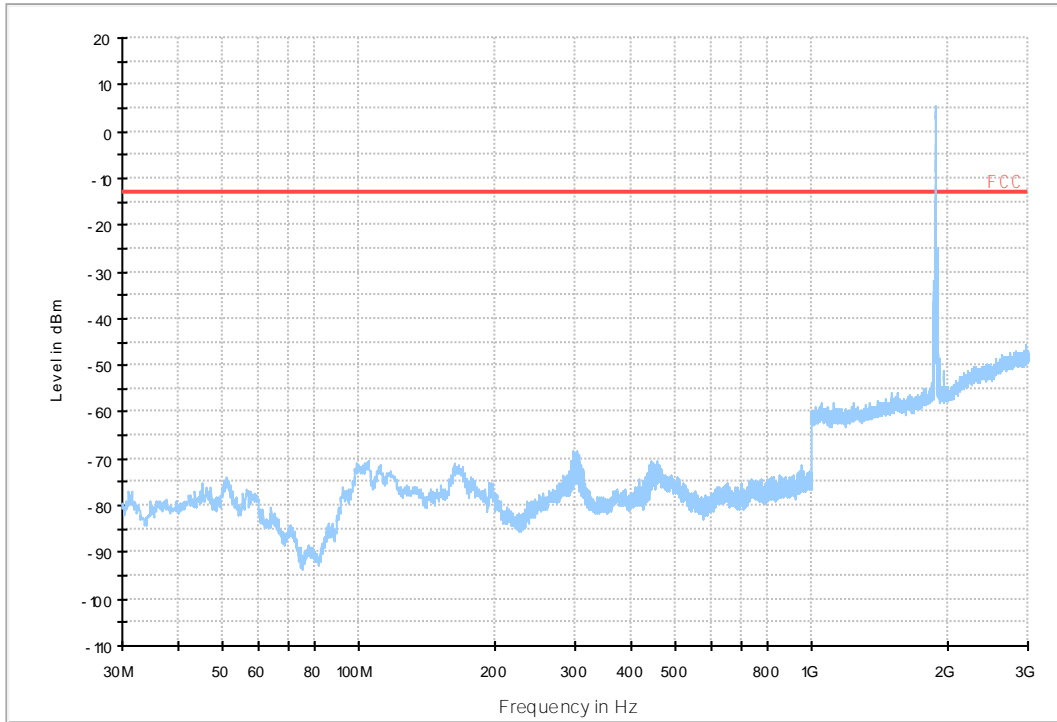


7.1.6 Test Band = WCDMA1900_ANT2

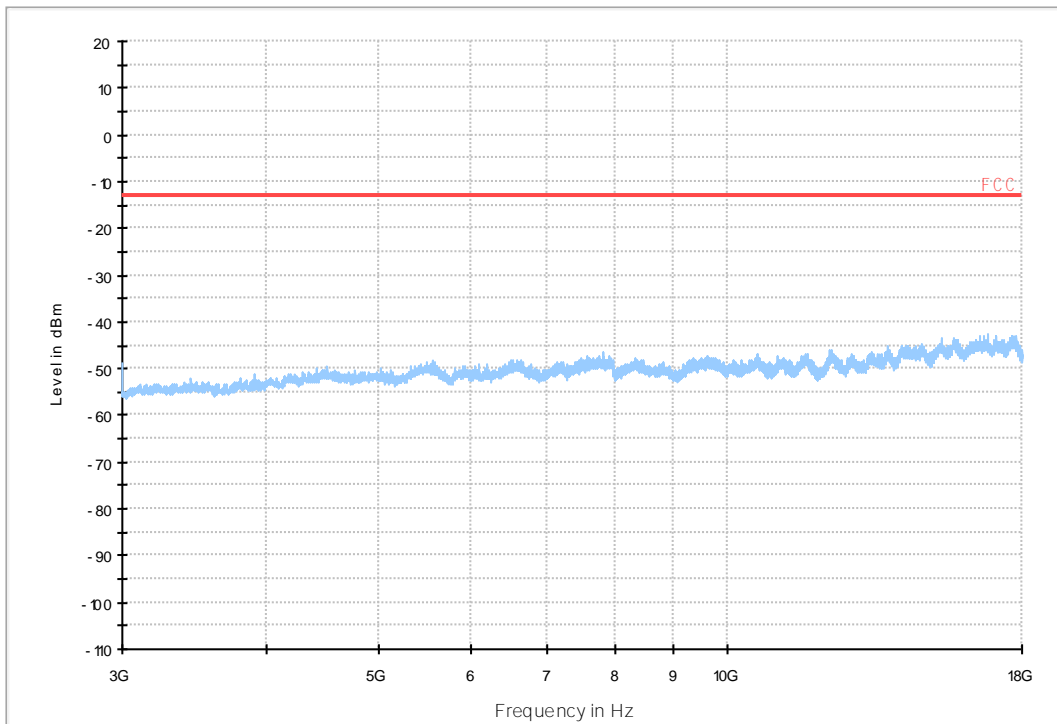
7.1.6.1 Test Mode = UMTS/TM1



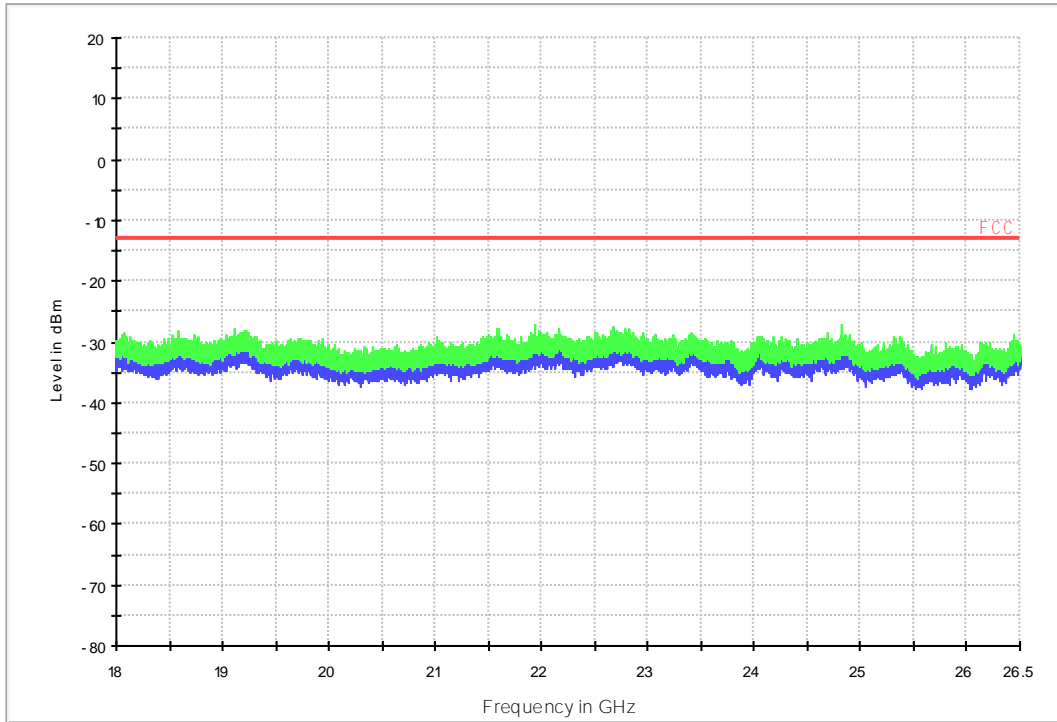
12 FCC PART 24 WCDMA1900_L



11 FCC PART 24 WCDMA1900_H



18G~26.5G RSE-TX-DIRECTOR ABOVE 1.5G PK





8Appendix_H: Frequency Stability

8.1 For UMTS

8.1.1 Frequency Error vs. Voltage:

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA850	UMTS/TM1	LCH	TN	VL	-3.68	-0.00446	PASS
				VN	-2.71	-0.00328	PASS
				VH	0.90	0.00109	PASS
		MCH	TN	VL	-4.84	-0.00578	PASS
				VN	-2.59	-0.0031	PASS
				VH	2.49	0.00298	PASS
		HCH	TN	VL	-0.91	-0.00107	PASS
				VN	-2.87	-0.00339	PASS
				VH	-4.01	-0.00474	PASS
WCDMA1700	UMTS/TM1	LCH	TN	VL	3.41	0.00199	PASS
				VN	-1.26	-0.00074	PASS
				VH	2.17	0.00127	PASS
		MCH	TN	VL	1.48	0.00085	PASS
				VN	-1.34	-0.00077	PASS
				VH	0.97	0.00056	PASS
		HCH	TN	VL	0.22	0.00013	PASS
				VN	-3.85	-0.0022	PASS
				VH	2.07	0.00118	PASS
WCDMA1900	UMTS/TM1	LCH	TN	VL	2.64	0.00142	PASS
				VN	-2.01	-0.00109	PASS
				VH	-1.77	-0.00095	PASS
		MCH	TN	VL	3.28	0.00174	PASS
				VN	3.33	0.00177	PASS
				VH	4.48	0.00238	PASS
		HCH	TN	VL	3.30	0.00142	PASS
				VN	-0.14	-0.00109	PASS
				VH	1.16	-0.00095	PASS



8.1.2 Frequency Error vs. Temperature:

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA850	UMTS/TM1	LCH	VN	-30	-3.82	-0.00462	PASS
				-20	-1.65	-0.00199	PASS
				-10	-3.85	-0.00466	PASS
				0	-1.90	-0.00229	PASS
				10	4.35	0.00526	PASS
				20	-2.71	-0.00328	PASS
				30	2.73	0.00331	PASS
				40	-1.44	-0.00174	PASS
				50	0.87	0.00105	PASS
		MCH	VN	-30	-4.93	-0.00589	PASS
				-20	0.44	0.00052	PASS
				-10	-5.65	-0.00676	PASS
				0	-3.25	-0.00389	PASS
				10	0.95	0.00114	PASS
				20	-2.59	-0.0031	PASS
				30	-4.27	-0.00511	PASS
				40	-3.18	-0.0038	PASS
				50	-5.40	-0.00646	PASS
		HCH	VN	-30	1.34	0.00158	PASS
				-20	-1.83	-0.00216	PASS
				-10	-1.82	-0.00215	PASS
				0	-4.51	-0.00533	PASS
				10	-1.00	-0.00118	PASS
				20	-2.87	-0.00339	PASS
				30	-0.22	-0.00026	PASS
				40	-2.62	-0.00309	PASS
				50	1.42	0.00167	PASS
WCDMA1700	UMTS/TM1	LCH	VN	-30	0.24	0.00014	PASS
				-20	-2.46	-0.00144	PASS
				-10	2.40	0.0014	PASS
				0	5.36	0.00313	PASS
				10	1.74	0.00101	PASS
				20	-1.26	-0.00074	PASS
				30	0.33	0.00019	PASS
				40	3.57	0.00208	PASS
				50	1.51	0.00088	PASS
		MCH	VN	-30	-3.33	-0.00192	PASS
				-20	0.06	0.00003	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict				
				-10	4.55	0.00263	PASS				
				0	-2.83	-0.00163	PASS				
				10	1.06	0.00061	PASS				
				20	-1.34	-0.00077	PASS				
				30	-5.70	-0.00329	PASS				
				40	2.36	0.00136	PASS				
				50	-0.17	-0.0001	PASS				
		HCH	VN	-30	-2.30	-0.00131	PASS				
				-20	-1.79	-0.00102	PASS				
				-10	2.25	0.00129	PASS				
				0	-3.13	-0.00178	PASS				
				10	-0.24	-0.00013	PASS				
				20	-3.85	-0.0022	PASS				
				30	-3.17	-0.00181	PASS				
				40	-0.64	-0.00037	PASS				
				50	2.35	0.00134	PASS				
				WCDMA1900	UMTS/TM1	LCH	VN	-30	0.29	0.00015	PASS
								-20	4.68	0.00253	PASS
-10	0.35	0.00019	PASS								
0	0.52	0.00028	PASS								
10	4.88	0.00263	PASS								
20	-2.01	-0.00109	PASS								
30	5.53	0.00298	PASS								
40	2.19	0.00118	PASS								
50	1.30	0.0007	PASS								
MCH	VN	-30	1.80					0.00095	PASS		
		-20	-2.42			-0.00129	PASS				
		-10	-0.94			-0.0005	PASS				
		0	-1.87			-0.001	PASS				
		10	4.76			0.00253	PASS				
		20	3.33			0.00177	PASS				
		30	-3.32			-0.00177	PASS				
		40	8.12			0.00432	PASS				
		50	3.45			0.00183	PASS				
HCH	VN	-30	-2.07			-0.00109	PASS				
		-20	1.57			0.00082	PASS				
		-10	-1.85			-0.00097	PASS				
		0	-2.65			-0.00139	PASS				
		10	5.12			0.00268	PASS				
		20	-0.14			0.00007	PASS				



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				30	0.15	0.00008	PASS
				40	5.70	0.00299	PASS
				50	0.39	0.0002	PASS

END