



Appendix for test report



1Appendix_A: Effective (Isotropic) Radiated Power Output Data

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dBm]	EIRP [dBm]	Limit [dBm]	Verdict
WCDMA1900	UMTS/TM1	LCH	23.27	26.27	33	PASS
		MCH	23.15	26.15	33	PASS
		HCH	23.19	26.19	33	PASS
Test Band	Test Mode	Test Channel	Measured[dBm]	ERP [dBm]	Limit [dBm]	Verdict
WCDMA850	UMTS/TM1	LCH	23.27	21.02	38.5	PASS
		MCH	23.17	20.92	38.5	PASS
		HCH	23.09	20.84	38.5	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:

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

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

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

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
WCDMA1900	UMTS/TM1	LCH	3.04	13	PASS
		MCH	2.91	13	PASS
		HCH	2.86	13	PASS
WCDMA850	UMTS/TM1	LCH	3.05	13	PASS
		MCH	3.11	13	PASS
		HCH	3.08	13	PASS

3Appendix_C: Modulation Characteristics

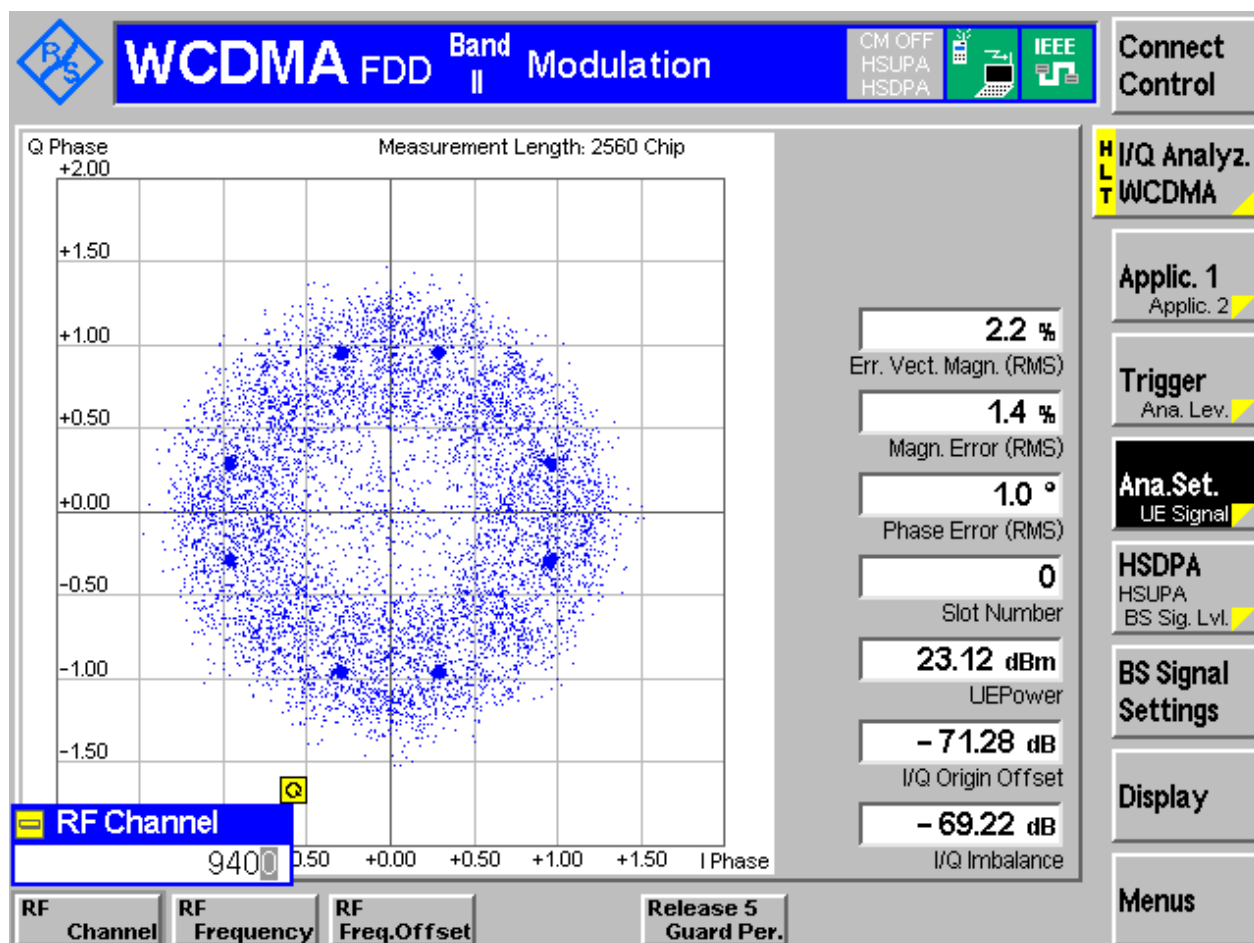
Part I - Test Plots

3.1 For UMTS

3.1.1 Test Band = WCDMA1900

3.1.1.1 Test Mode = UMTS/TM1

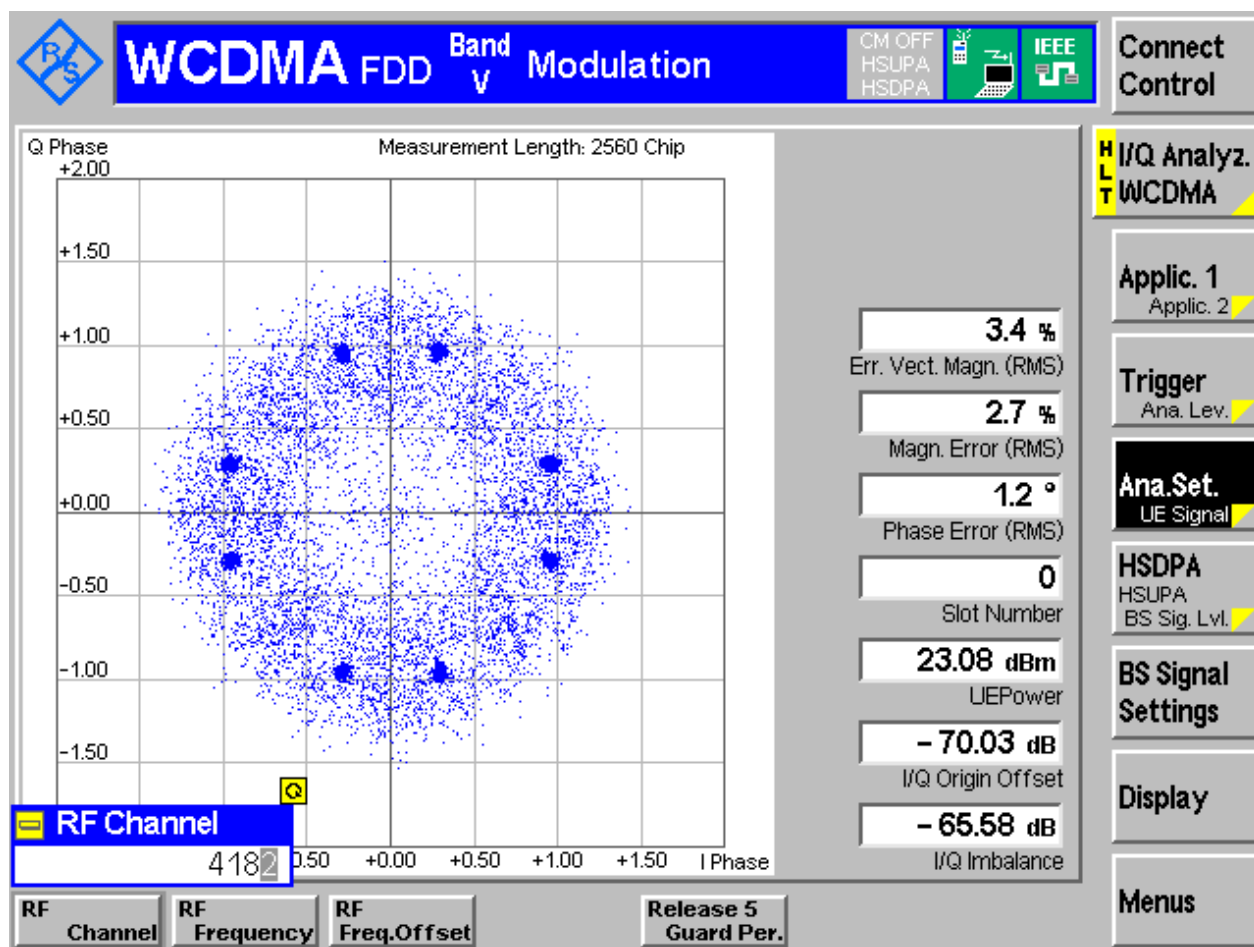
3.1.1.1.1 Test Channel = MCH



3.1.2 Test Band = WCDMA850

3.1.2.1 Test Mode = UMTS/TM1

3.1.2.1.1 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	4.71	Pass
		MCH	4.16	4.73	Pass
		HCH	4.16	4.70	Pass
WCDMA1900	UMTS/TM1	LCH	4.16	4.71	Pass
		MCH	4.17	4.71	Pass
		HCH	4.16	4.71	Pass

Part II - Test Plots

4.1 For UMTS

4.1.1 Test Band = WCDMA850

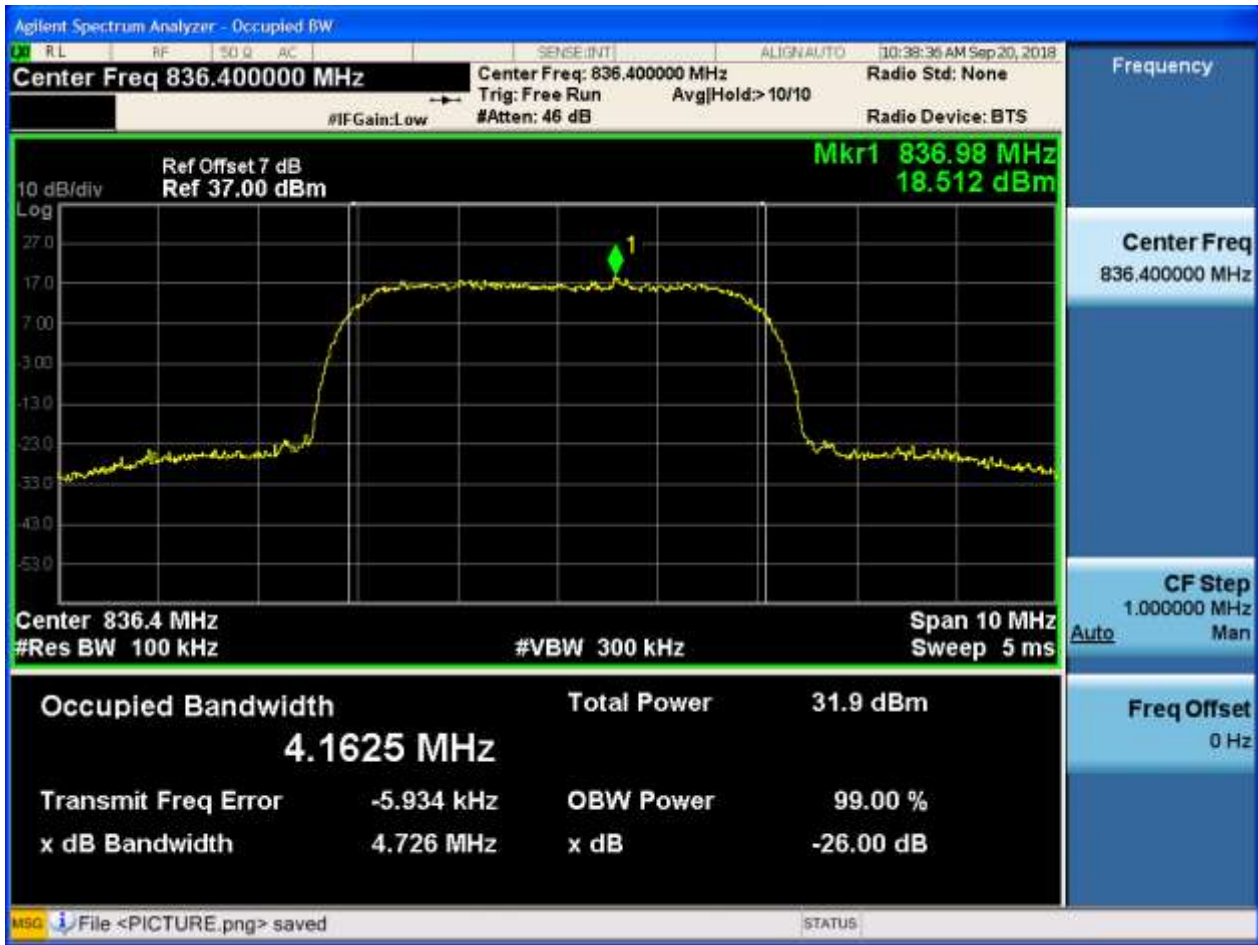
4.1.1.1 Test Mode = UMTS/TM1

4.1.1.1.1 Test Channel = LCH





4.1.1.1.2 Test Channel = MCH





4.1.1.1.3 Test Channel = HCH

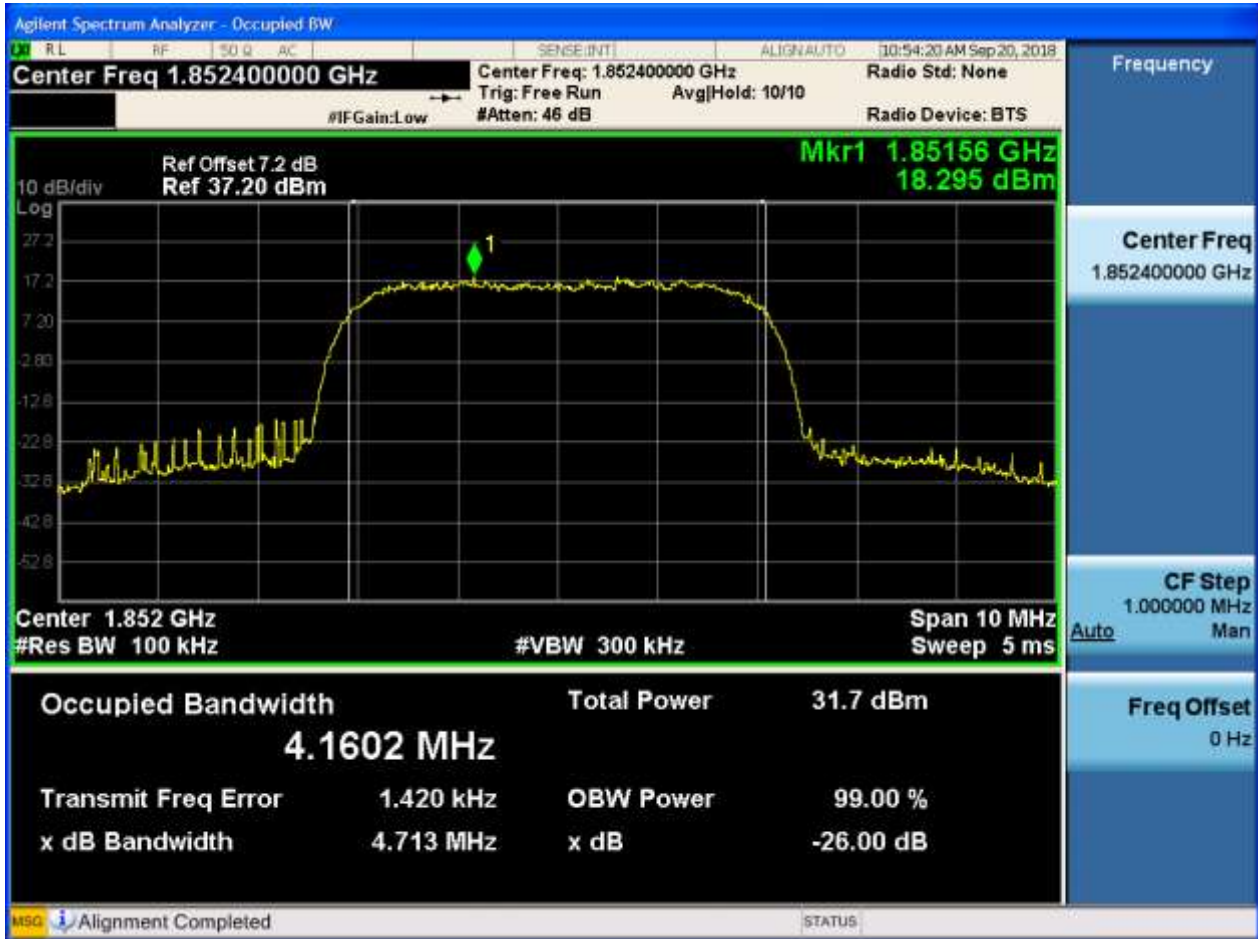




4.1.2 Test Band = WCDMA1900

4.1.2.1 Test Mode = UMTS/TM1

4.1.2.1.1 Test Channel = LCH





Agilent Spectrum Analyzer - Occupied BW

RL RF 50 Q AC SENSE (INT) ALIGN AUTO 10:54:37 AM Sep 20, 2018

Center Freq 1.880000000 GHz Center Freq: 1.880000000 GHz Radio Std: None
Trig: Free Run Avg|Hold: 10/10
#IFGain: Low #Atten: 46 dB Radio Device: BTS

Ref Offset 7.2 dB Mkr1 1.87912 GHz
Ref 37.20 dBm 18.850 dBm

10 dB/div Log

Center 1.88 GHz Span 10 MHz
#Res BW 100 kHz #VBW 300 kHz Sweep 5 ms

Occupied Bandwidth		Total Power	
4.1707 MHz		31.7 dBm	
Transmit Freq Error	-1.037 kHz	OBW Power	99.00 %
x dB Bandwidth	4.714 MHz	x dB	-26.00 dB

Frequency

Center Freq
1.880000000 GHz

CF Step
1.000000 MHz
Man

Auto

Freq Offset
0 Hz

MSO STATUS



4.1.2.1.3 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 = WCDMA1900

5.1.2.1 Test Mode = UMTS/TM1

5.1.2.1.1 Test Channel = LCH



5.1.2.1.2 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.

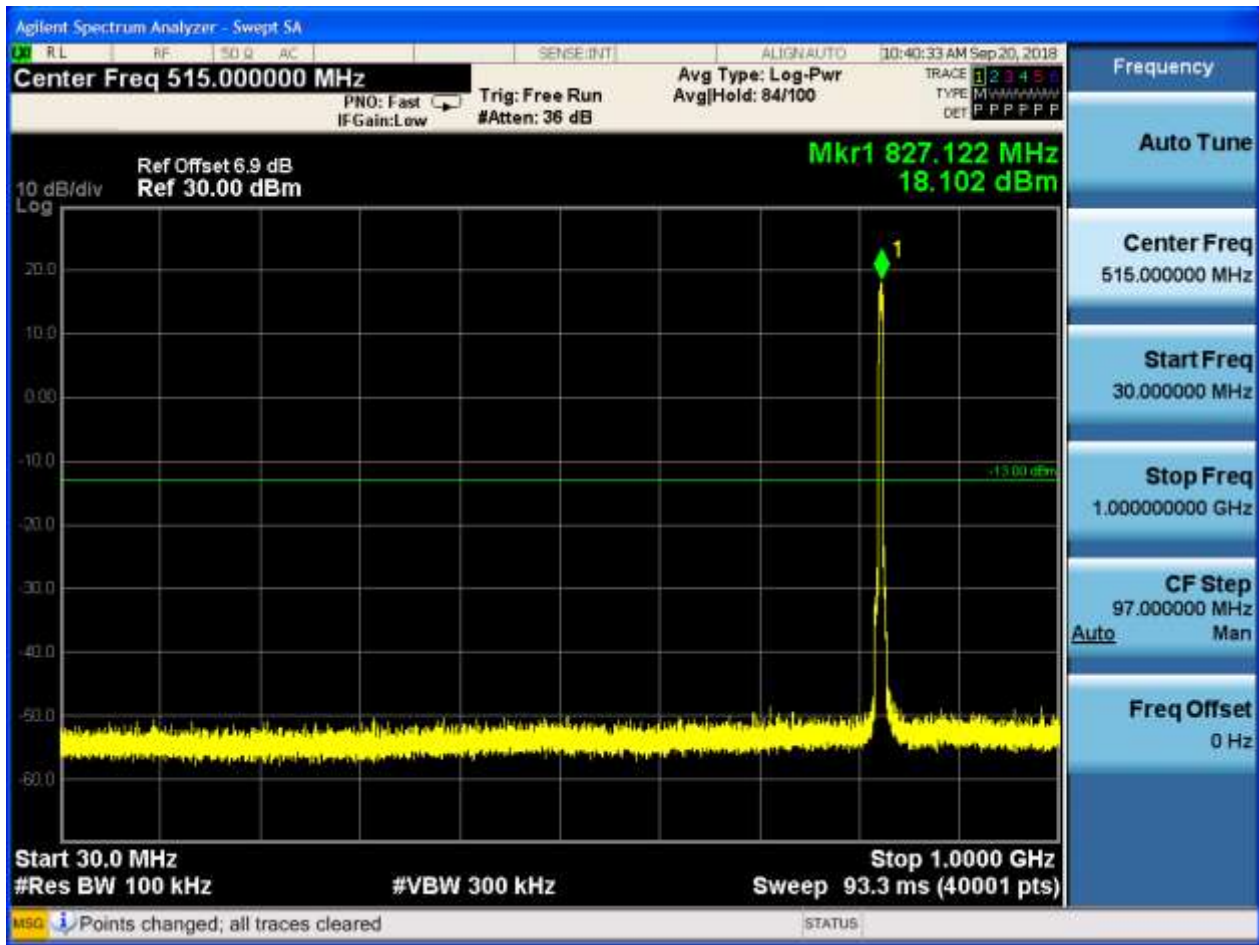
Part I - Test Plots

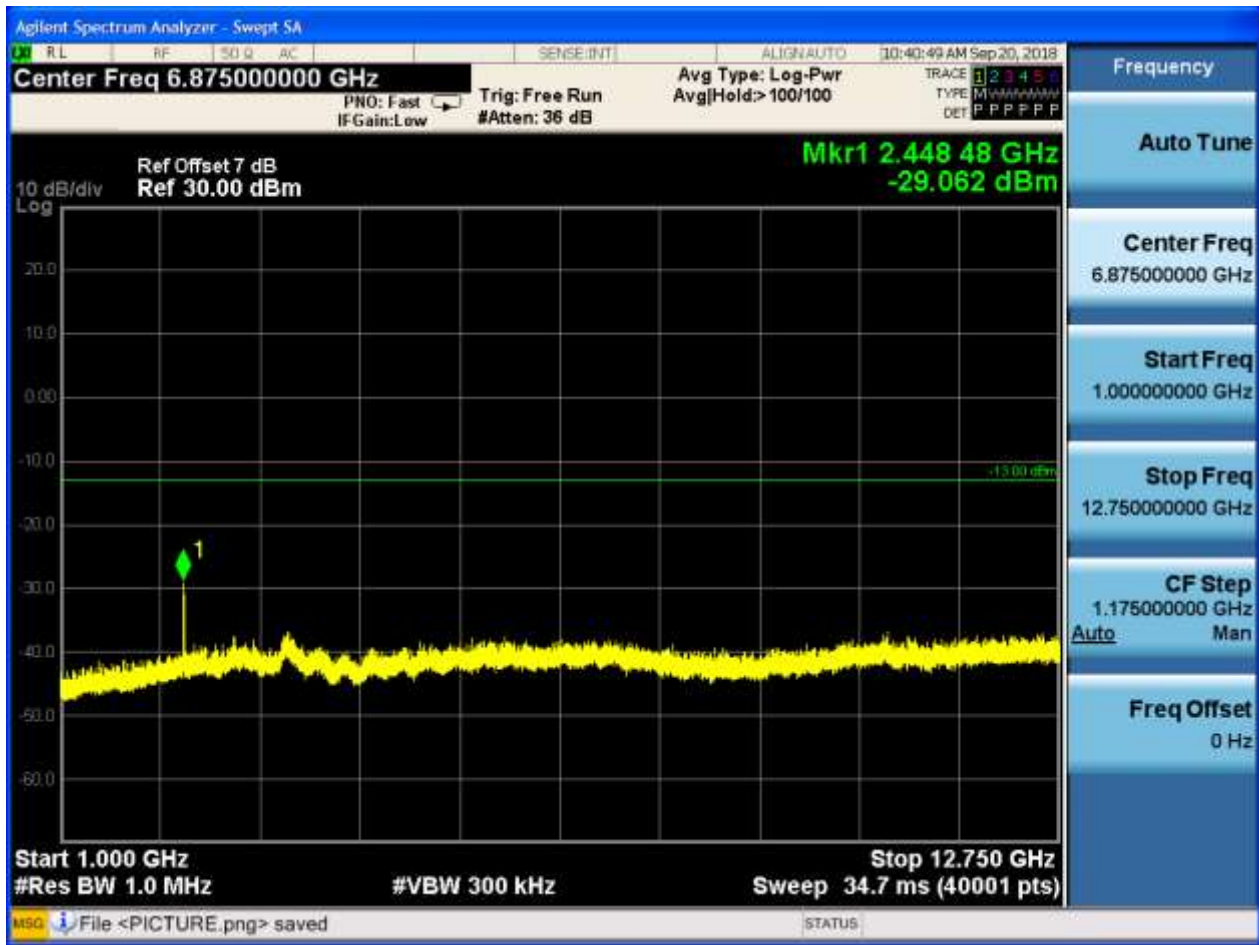
6.1 For UMTS

6.1.1 Test Band = WCDMA850

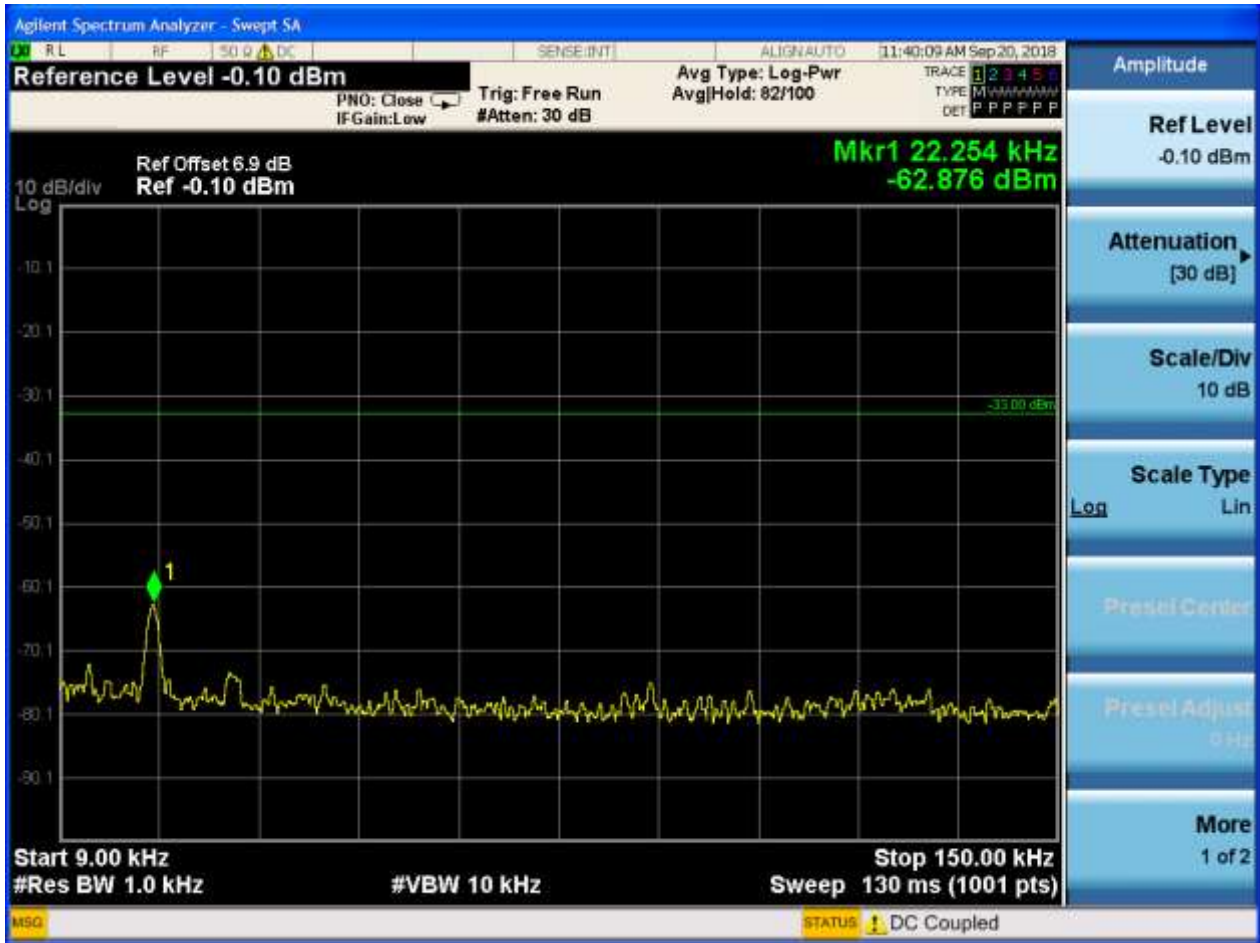
6.1.1.1 Test Mode = UMTS/TM1

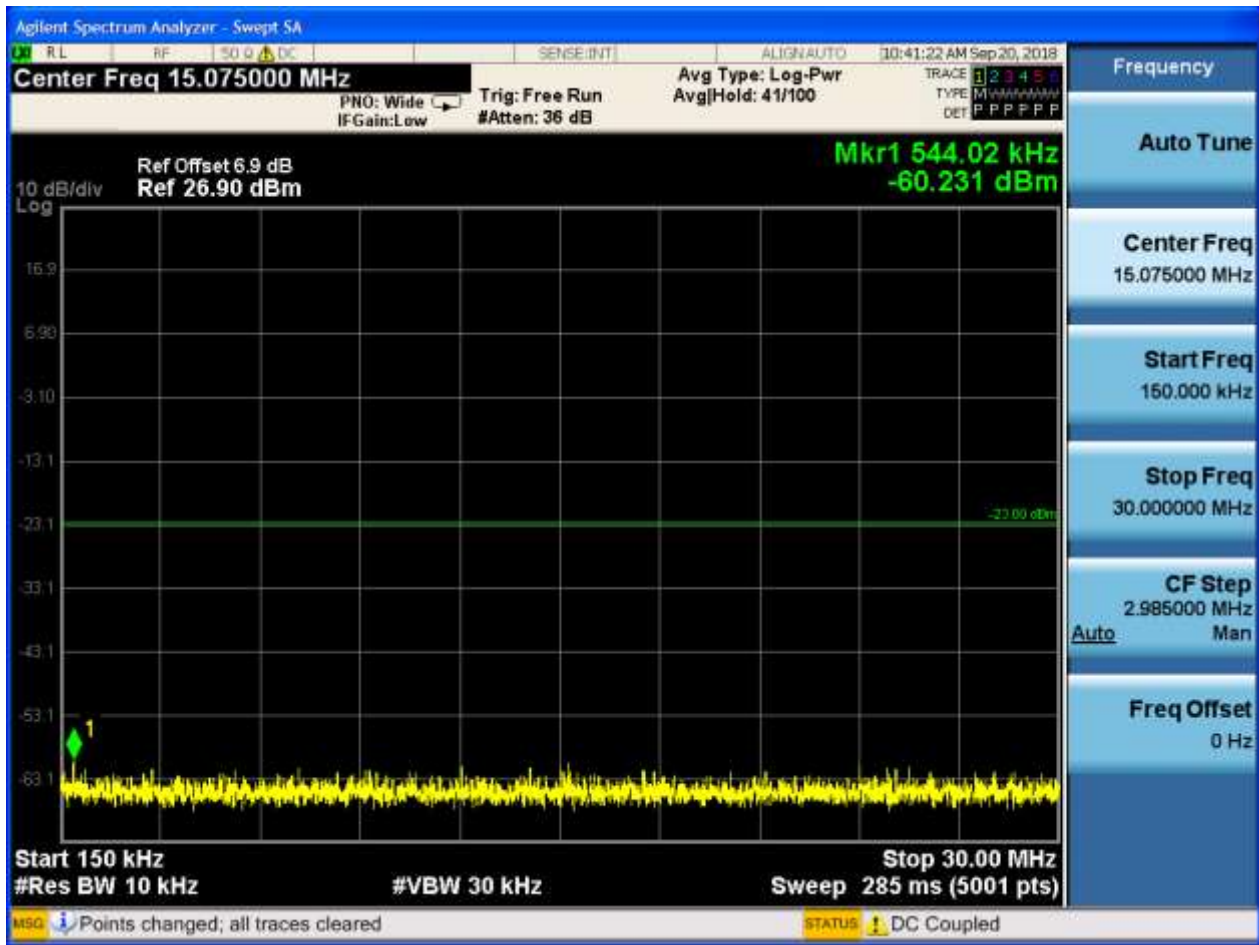
6.1.1.1.1 Test Channel = LCH

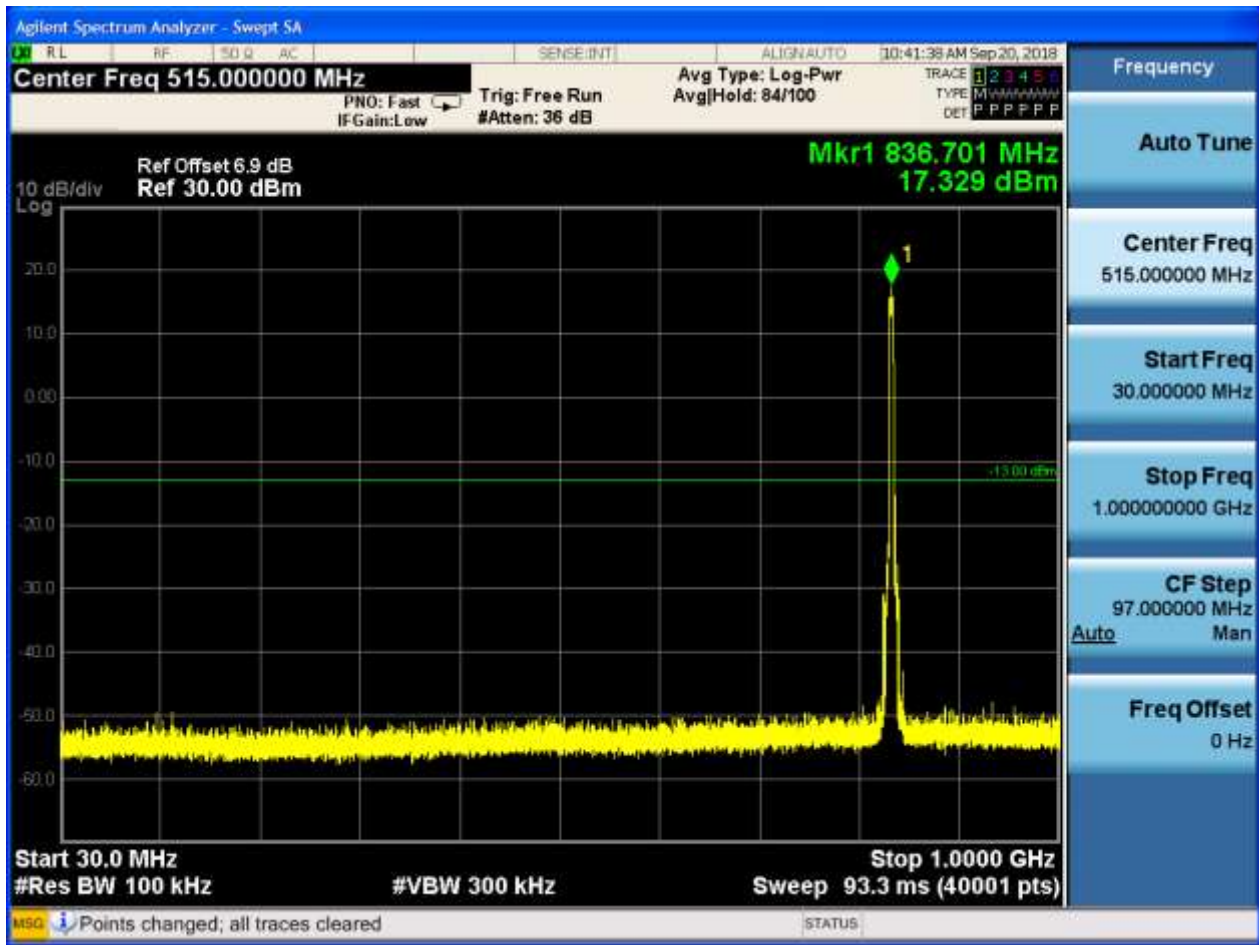


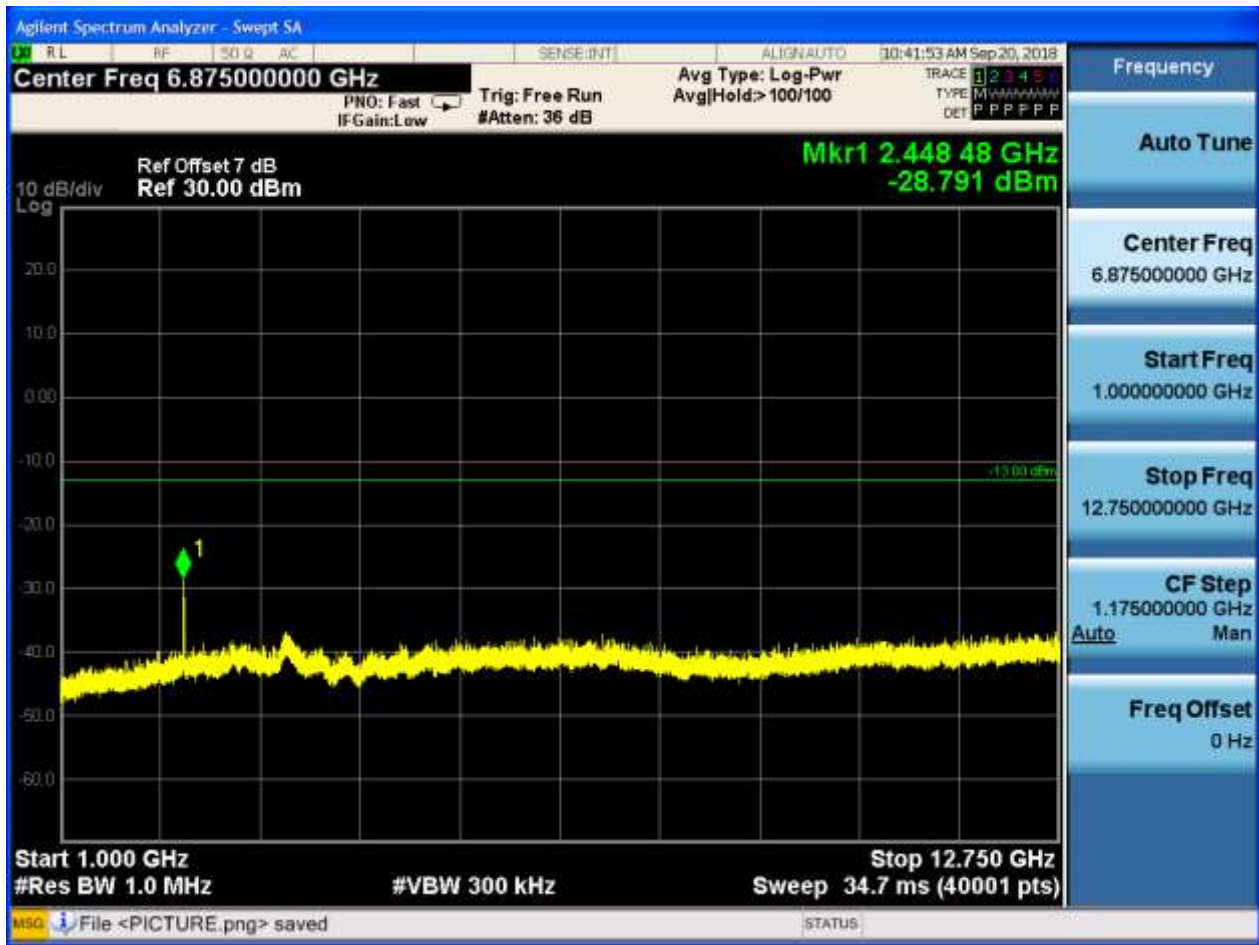


6.1.1.1.2 Test Channel = MCH

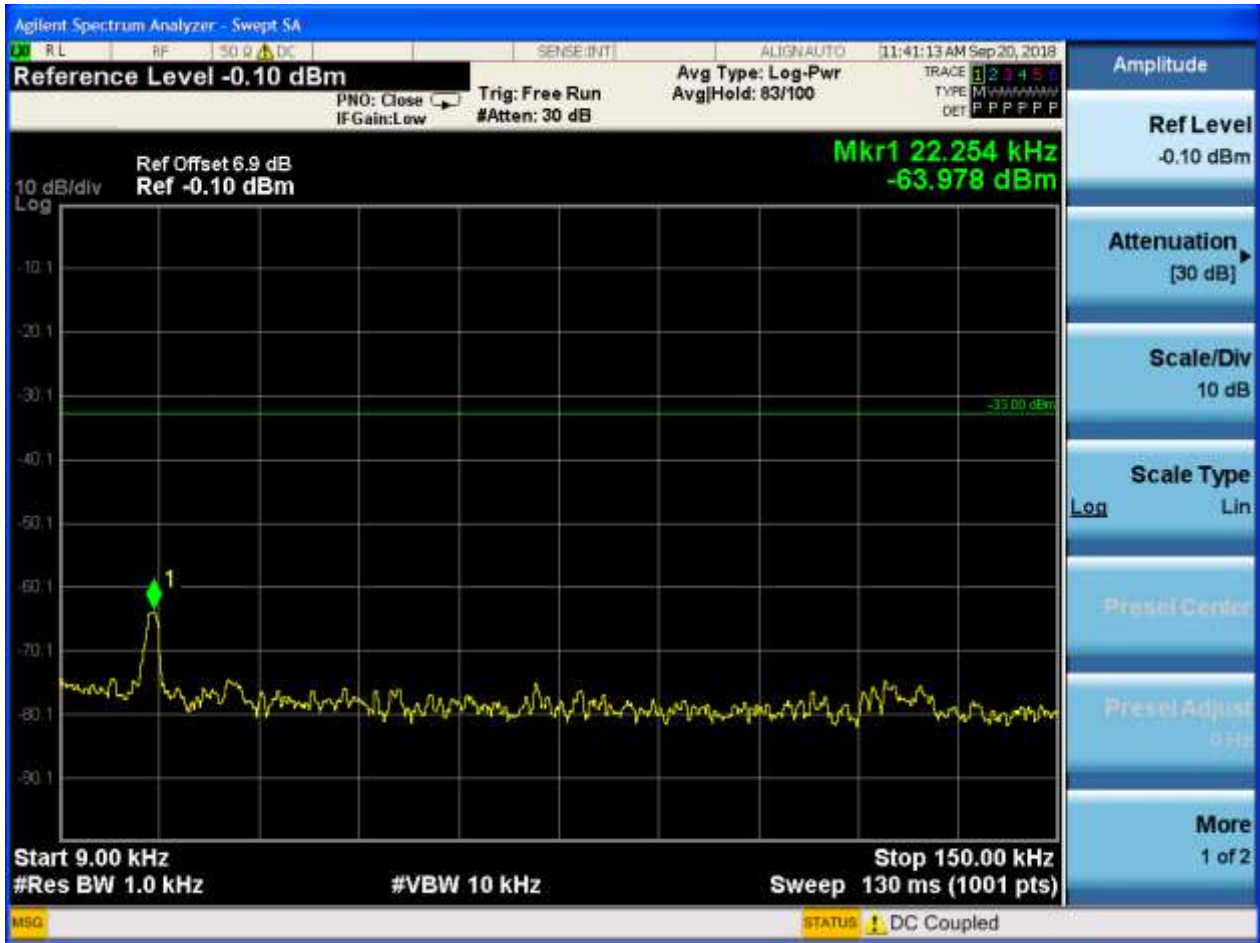


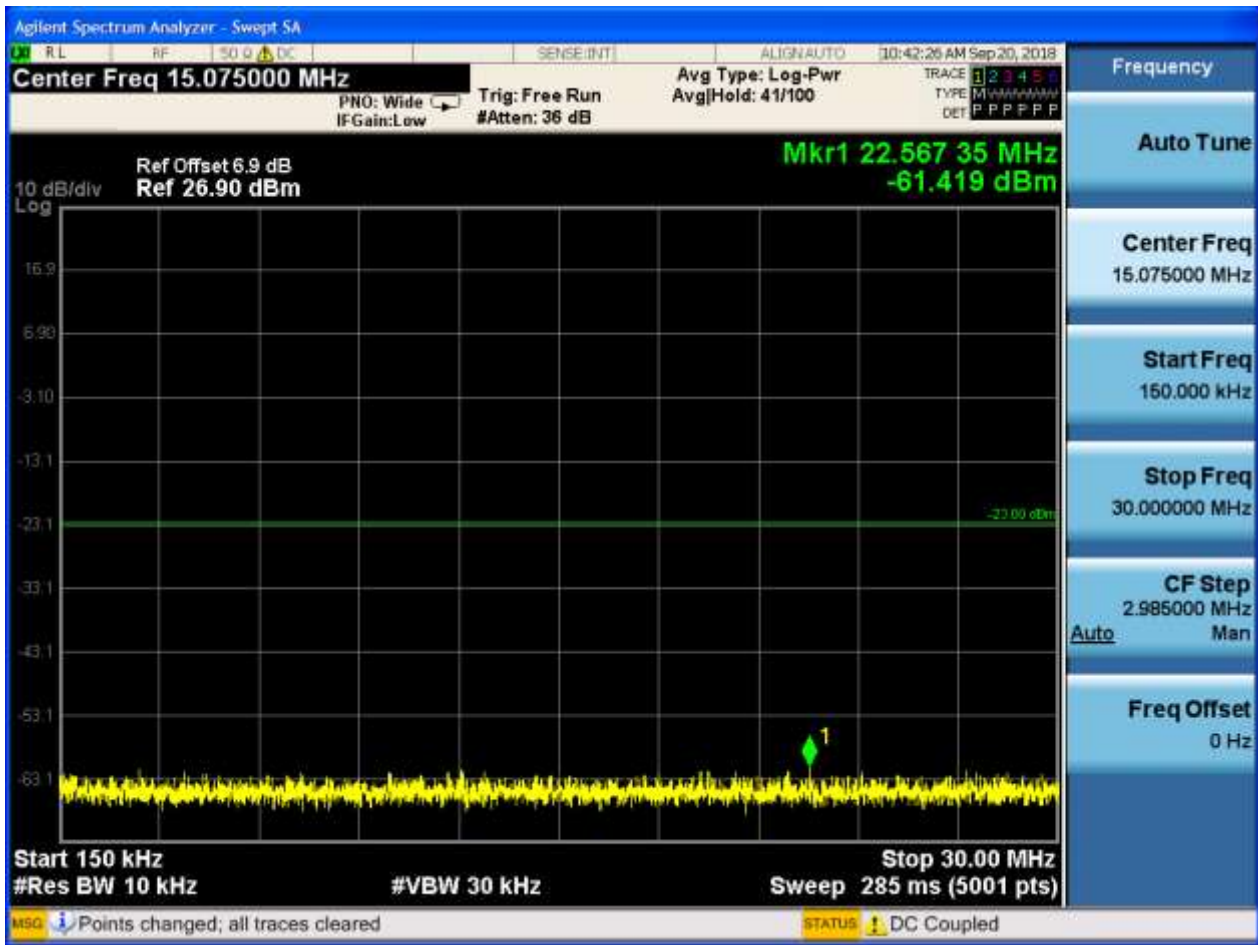


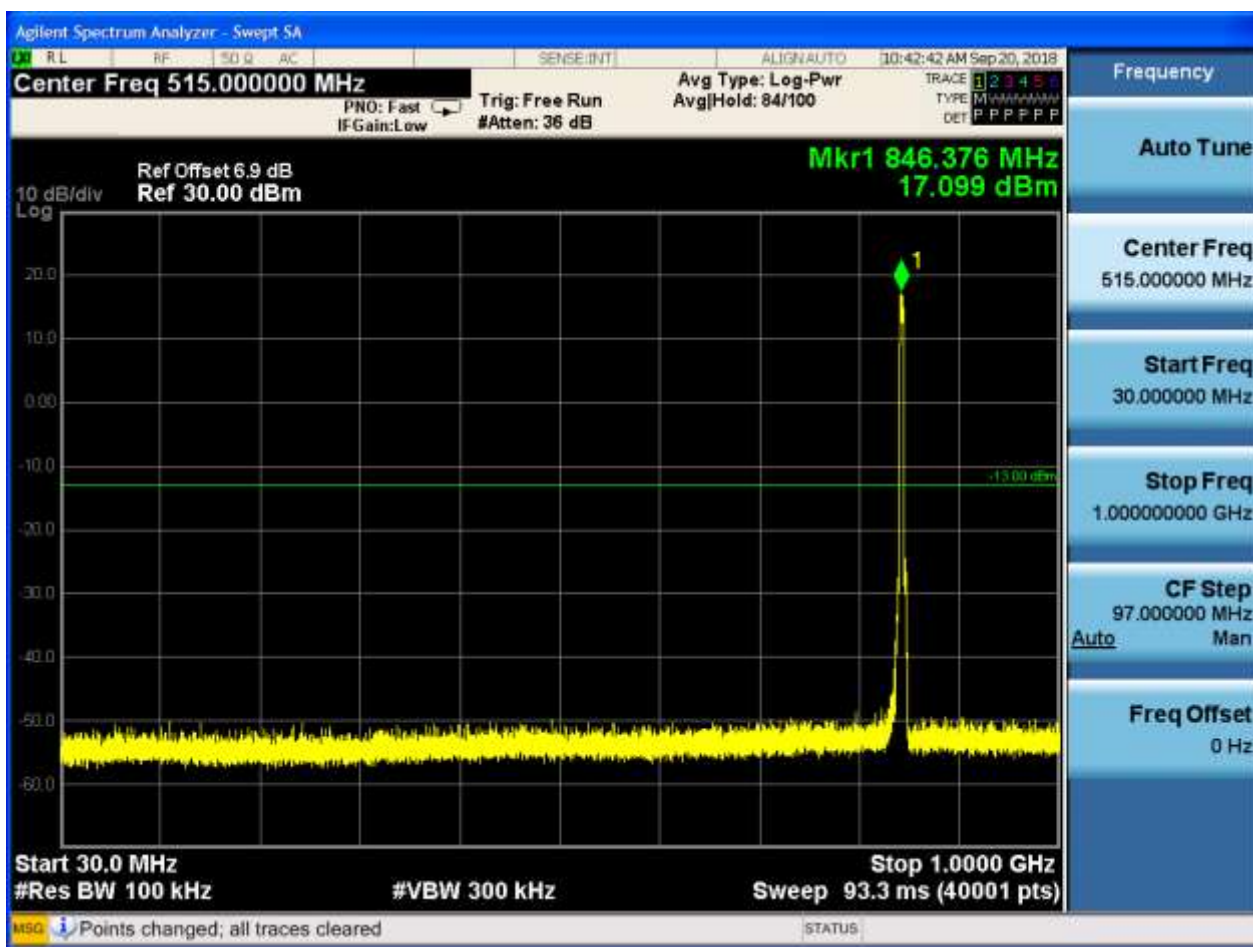




6.1.1.1.3 Test Channel = HCH







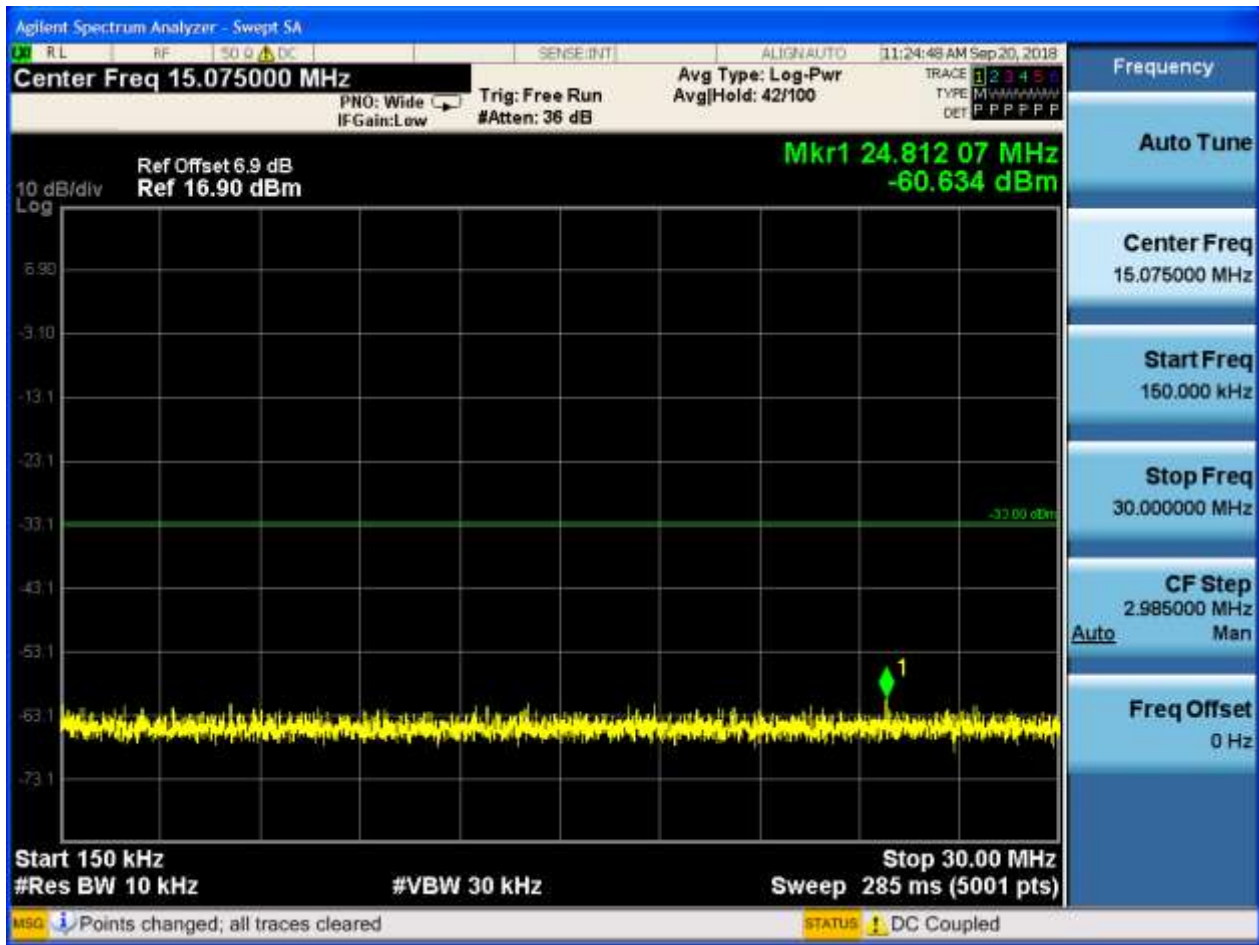


6.1.2 Test Band = WCDMA1900

6.1.2.1 Test Mode = UMTS/TM1

6.1.2.1.1 Test Channel = LCH



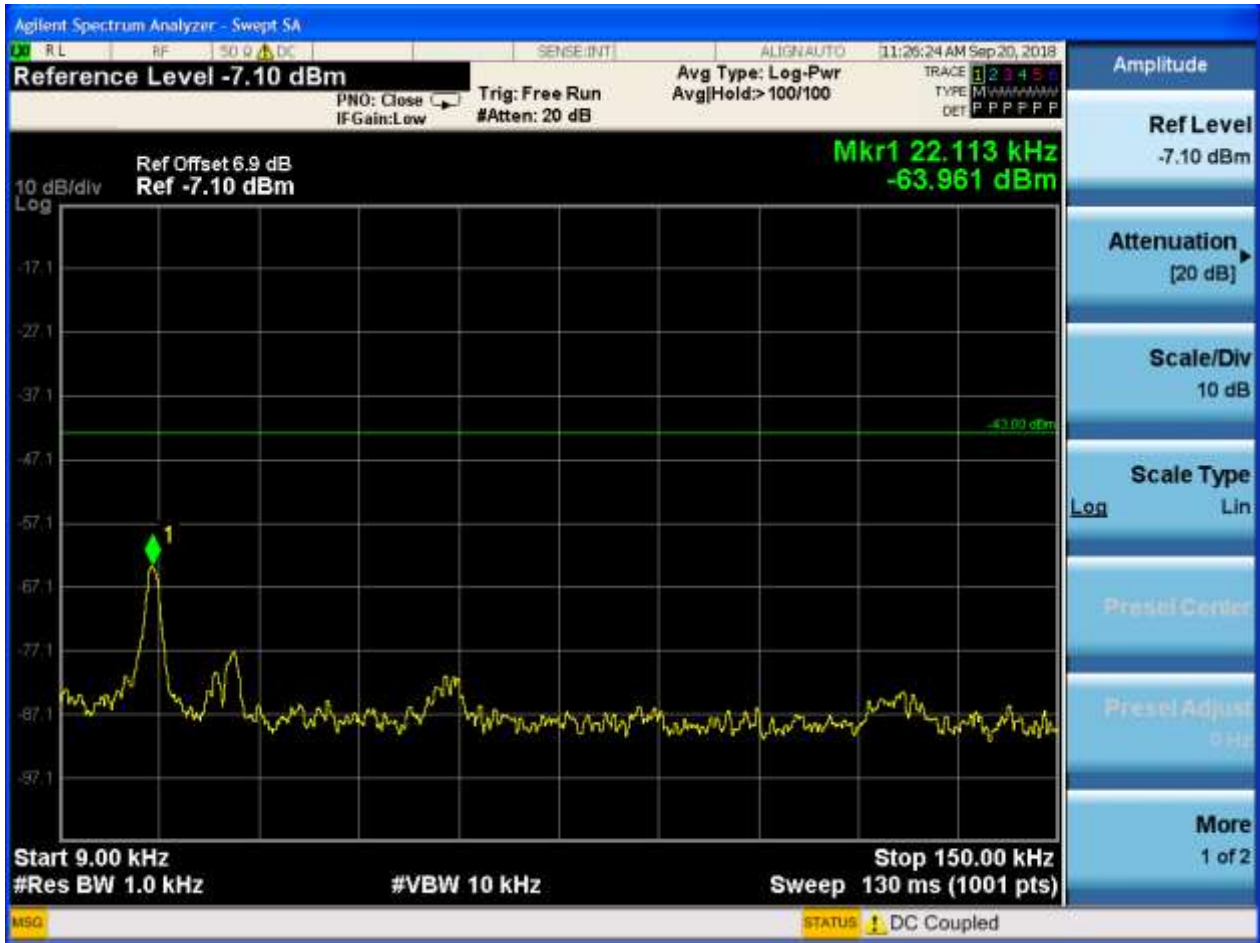




6.1.2.1.2 Test Channel = MCH



6.1.2.1.3 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

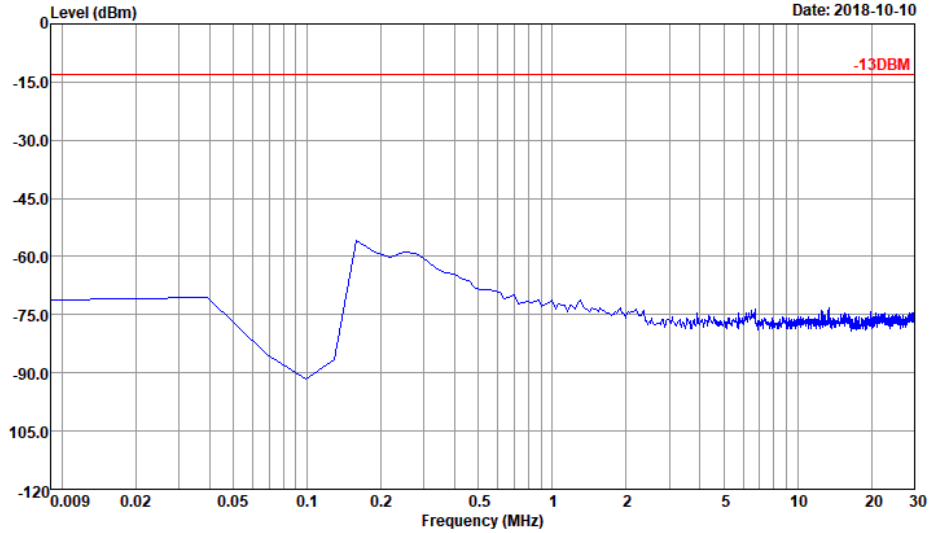
7.1 For UMTS

7.1.1 Test Band = WCDMA850

7.1.1.1 Test Mode = UMTS/TM1

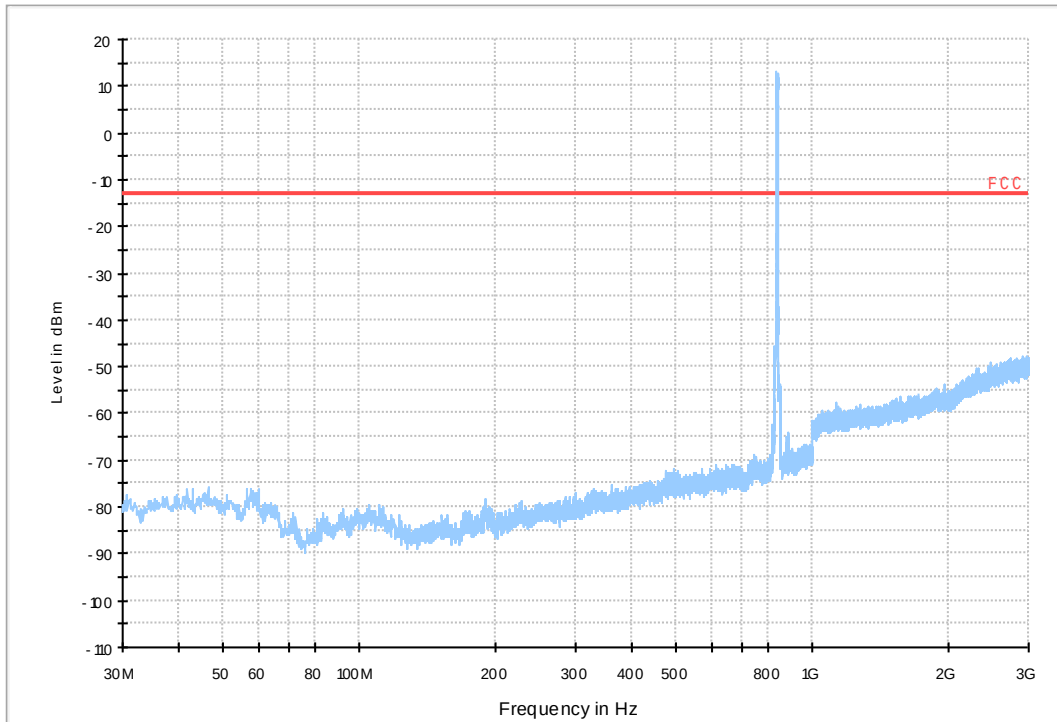


Data: 21

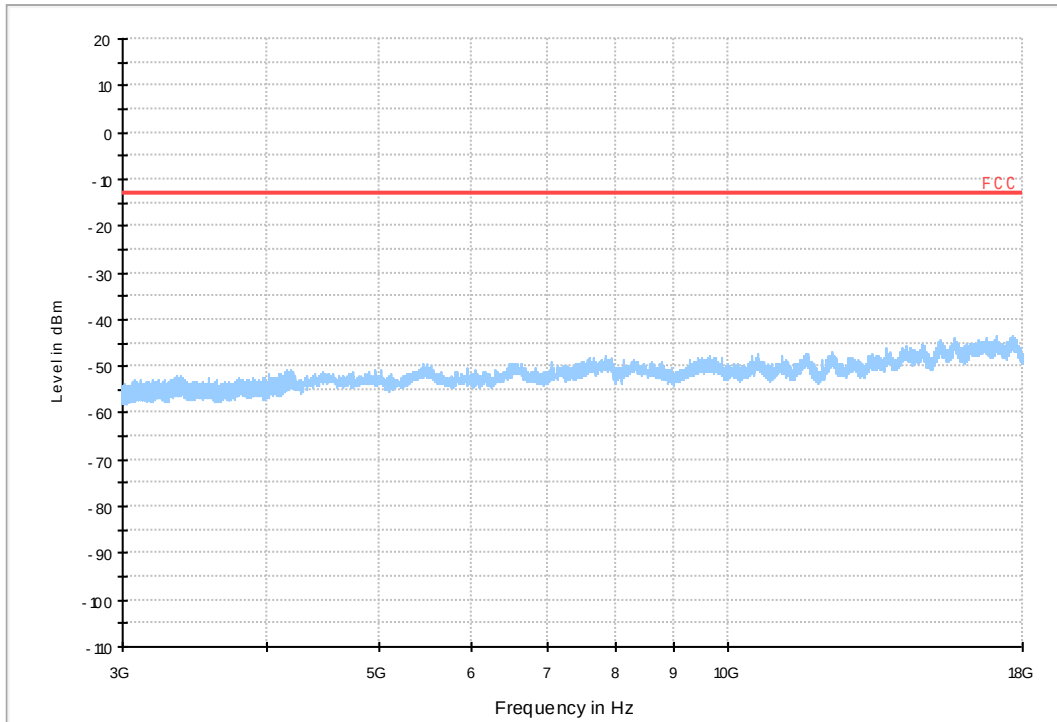


Site : 03CH01-SZ
Condition : -13DBM 9K-30M AMP NEUTRAL
: RBW:9.000KHz VBW:30.000KHz
: WCDMA B5

06 FCC PART 22 WCDMA850_L

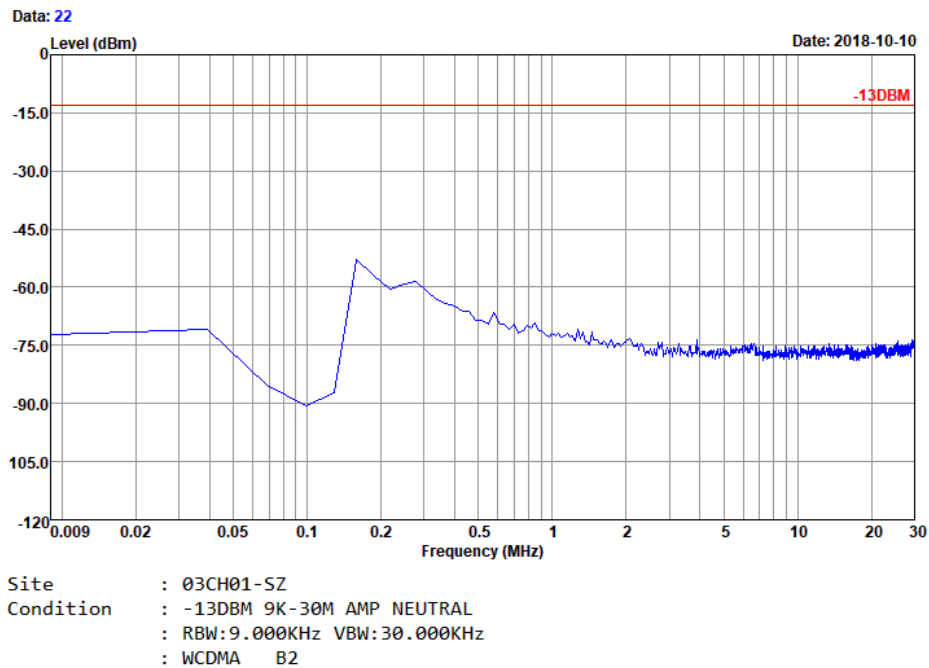


05 FCC PART 22 WCDMA850_H

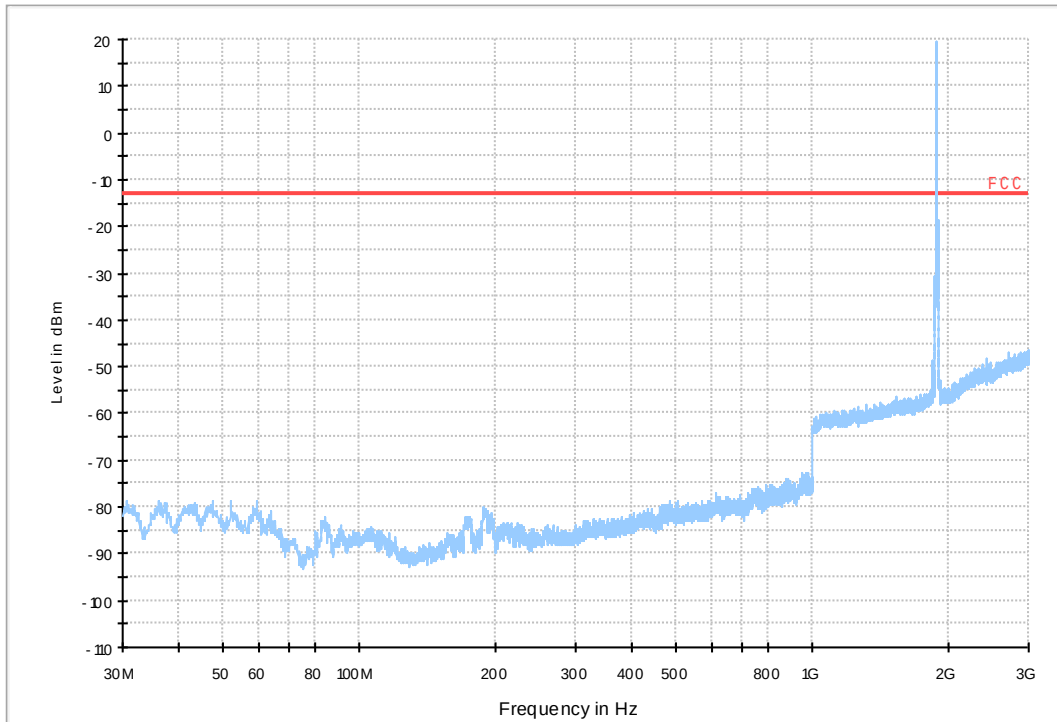


7.1.2 Test Band = WCDMA1900

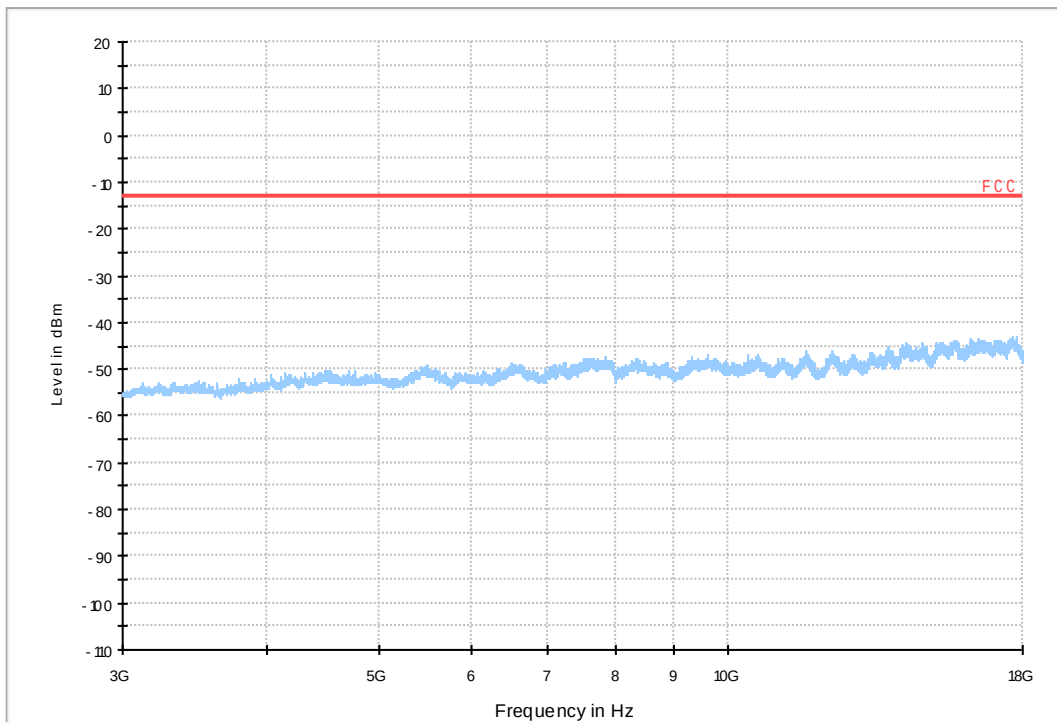
7.1.2.1 Test Mode = UMTS/TM1

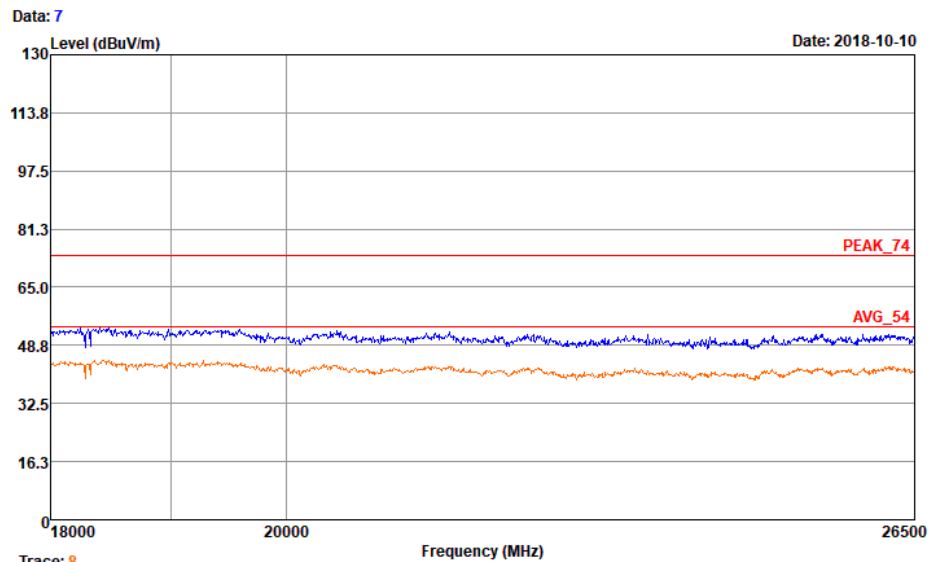


12 FCC PART 24 WCDMA1900_L



11 FCC PART 24 WCDMA1900_H





Site : 03CH01-SZ
Condition : PEAK_74 3m HF_ANT(AH840)_101071 HORIZONTAL
: RBW:1000.000KHz VBW:3000.000KHz
: ANT0
: 11G CH5

Data: 8 Date: 2018-10-10
Site : 03CH01-SZ
Condition : PEAK_74 3m HF_ANT(AH840)_101071 HORIZONTAL
: RBW:1000.000KHz VBW:3000.000KHz
: ANT0
: 11N40 CH7

8Appendix_H: Frequency Stability

8.1 For UMTS

8.1.1Frequency 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	8.65	0.01047	PASS
				VN	13.76	0.01665	PASS
				VH	13.31	0.01611	PASS
		MCH	TN	VL	12.53	0.01498	PASS
				VN	0.56	0.00067	PASS
				VH	0.40	0.00048	PASS
		HCH	TN	VL	5.72	0.00676	PASS
				VN	2.47	0.00292	PASS
				VH	16.57	0.01957	PASS
WCDMA1900	UMTS/TM1	LCH	TN	VL	0.89	0.00048	PASS
				VN	4.04	0.00218	PASS
				VH	10.62	0.00573	PASS
		MCH	TN	VL	12.33	0.00656	PASS
				VN	-1.17	-0.00062	PASS
				VH	-1.10	-0.00059	PASS
		HCH	TN	VL	2.58	0.00135	PASS
				VN	4.03	0.00211	PASS
				VH	1.27	0.00067	PASS

8.1.2Frequency 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	1.27	0.00154	PASS
				-20	12.31	0.0149	PASS
				-10	3.19	0.00386	PASS
				0	5.72	0.00692	PASS
				10	2.20	0.00266	PASS
				20	11.67	0.01412	PASS
				30	4.32	0.00523	PASS
				40	9.51	0.01151	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		MCH	VN	50	8.16	0.00987	PASS
				-30	9.99	0.01194	PASS
				-20	1.36	0.00163	PASS
				-10	7.74	0.00925	PASS
				0	4.46	0.00533	PASS
				10	2.88	0.00344	PASS
				20	4.68	0.0056	PASS
				30	6.85	0.00819	PASS
				40	2.06	0.00246	PASS
				50	4.85	0.0058	PASS
		HCH	VN	-30	-0.11	-0.00013	PASS
				-20	6.73	0.00795	PASS
				-10	5.14	0.00607	PASS
				0	1.14	0.00135	PASS
				10	4.58	0.00541	PASS
				20	6.77	0.008	PASS
				30	6.87	0.00811	PASS
				40	13.31	0.01572	PASS
				50	6.45	0.00762	PASS
WCDMA1900	UMTS/TM1	LCH	VN	-30	3.74	0.00202	PASS
				-20	-0.24	-0.00013	PASS
				-10	-5.29	-0.00286	PASS
				0	4.33	0.00234	PASS
				10	4.10	0.00221	PASS
				20	2.49	0.00134	PASS
				30	7.26	0.00392	PASS
				40	5.80	0.00313	PASS
				50	6.96	0.00376	PASS
		MCH	VN	-30	9.81	0.00522	PASS
				-20	14.77	0.00786	PASS
				-10	6.81	0.00362	PASS
				0	3.05	0.00162	PASS
				10	6.74	0.00359	PASS
				20	14.71	0.00782	PASS
				30	9.92	0.00528	PASS
				40	11.83	0.00629	PASS
				50	15.08	0.00802	PASS
		HCH	VN	-30	0.75	0.00039	PASS
				-20	2.32	0.00122	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				-10	13.92	0.0073	PASS
				0	8.24	0.00432	PASS
				10	12.50	0.00655	PASS
				20	17.26	0.00905	PASS
				30	8.12	0.00426	PASS
				40	3.56	0.00187	PASS
				50	12.15	0.00637	PASS

END