



FCC TEST REPORT

REPORT NO.:VITE1107006E-1

MODEL NO.: M31

FCC ID: R38-YLM31

RECEIVED: July15, 2011

TESTED: July15, 2011 to August 21, 2011

APPLICANT: Yulong Computer Telecommunication Scientific (Shenzhen) Co. LTD

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ISSUED BY: SHENZHEN UNITE-CICC SERVICES CO.,LTD.

LAB LOCATION: 21F, COFCO Building, Baoan District, Shenzhen, Guangdong, China

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Address : Coolpad Information Harbor,2nd Mengxi Road,Hi-Tich Industrial Park
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Manufacture : Yulong Computer Telecommunication Scientific (Shenzhen) Co. LTD
Address : Coolpad Information Harbor,2nd Mengxi Road,Hi-Tich Industrial Park
(North) ,NanShan District,ShenZhen, China
Product : CDMA 1x EV-DO Rev A (800MHZ)
Model No. : M31
Trademark : Coolpad
Test Standard : FCC Part 2 subpart J
FCC Part 22 subpart H
Prepared by : SHENZHEN UNITE-CICC SERVICES CO.,LTD.
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Prepared by : 
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(Manager)

Report Number : VITE1107006E-1

Date of Test : July16, 2011 to August 22, 2011

Date of Report : August 22, 2011

The device described above is tested by SHENZHEN UNITE-CICC SERVICES CO.,LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. This report applies to above tested sample only and shall not be reproduced in part without written approval of SHENZHEN UNITE-CICC SERVICES CO.,LTD.

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1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	CDMA 1x EV-DO Rev A (800MHZ)
Brand Name	:	YULONG
Model Number	:	M31
IMEI	:	a10000075c8009
Hardware Version	:	Msm7627_7X_SURF
Software Version	:	1.0.24552.0144
Power Supply	:	Battery DC 3.7V, Adapter DC USB 5V
Power Cable	:	No cable
Frequency range:	:	CDMA800:824.7~848.31(Tx)868.7~893.31(Rx) WiFi:2400~2483.5MHz Bluetooth:2400~2483.5MHz
Modulation	:	GMSK
	:	
Antenna Gain:	:	CDMA800: 0dBi
Type of Antenna	:	Integral Antenna
Manufacturer	:	Yulong Computer Telecommunication Scientific (Shenzhen) Co. LTD
	:	
Address	:	Coolpad Information Harbor,2nd Mengxi Road,Hi-Tich Industrial Park (North) ,NanShan District,ShenZhen, China
	:	
Date of receiver	:	June 15, 2011
	:	
Date of Test	:	June 16, 2011 to June 29, 2011

1.2. Test Standards

Test Standards/Items	
§ 15.207	Conducted Emission
§ 22.913 (a)	RF Output Power
§ 22.917 (b)	Emission Bandwidth
§ 22.917 (a)	Spurious Emissions at Antenna Terminal
§ 22.917 (a)	Spurious Radiation Emissions

1.3. Measurement Uncertainty

Radiation Uncertainty : $U_r = \pm 3.84\text{dB}$

Conduction Uncertainty : $U_c = \pm 2.72\text{dB}$

2. MEASURING DEVICE AND TEST FACILITY

2.1.Measurement Facilities List

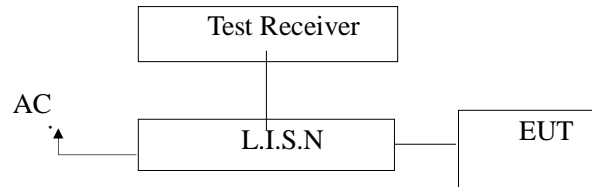
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Test Receiver	Rohde & Schwarz	ESCI	100869	Dec. 28, 2010	1 Year
2	L.I.S.N	Rohde & Schwarz	ESH3-Z5	101288	Dec. 28, 2010	1 Year
3	Horn Antenna	SCHWARZBECK	VULB9418	9418-763	Dec. 28, 2010	1 Year
4	Trilog Broadband Antenna	SCHWARZBECK	VULB 9163	9613-470	Dec. 28, 2010	1 Year
5	Universal Radio Communication Tester	Rohde & Schwarz	CMU200	112065	Dec. 28, 2010	1 Year
6	Signal Generator	Rohde & Schwarz	SMR20	100158	Dec. 28, 2010	1 Year
7	Amplifier	MITEQ	AFS44-0012	858687	Dec. 28, 2010	1 Year
8	Test Receiver	Advantest	R3182	14060028	Dec. 28, 2010	1 Year
9	Spectrum Analyzer	Agilent	E4443A	MY48250208	Dec. 28, 2010	1 Year

2.2.Test Facility

Test Laboratory: Shenzhen LCS Compliance Testing Laboratory Ltd. The Lab is registered Federal Communications Commission, the Registration Number is 899208.
Address: Xingyuan Industrial Park, Tongda Road, Bao'an Blvd, Bao'an District, Shenzhen, China

3. CONDUCTED EMISSION MEASUREMENT

3.1 Block Diagram of Test Setup



3.2 Measuring Standard

According as FCC 15.207 requirements and testing conducted refer to ANSI C63.4, American national Standard for methods of measurement of radio-noise emission from low voltage electrical and electronic equipment in the range of 9kHz to 40GHz.

3.3 Conducted Emission Limits

Frequency (MHz)	Limit (dB μ V)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66.0 ~ 56.0 *	59.0 ~ 46.0 *
0.50 ~ 5.00	56.0	46.0
5.00 ~ 30.00	60.0	50.0

Remark: * means decreasing linearly with logarithm of frequency.

3.4 EUT Configuration on Measurement

The following equipments are installed on Conducted Emission Measurement to meet ANSI C63.4 requirements and operating in a manner, which tends to maximize its emission characteristics in a normal application.

3.5 Operating Condition of EUT

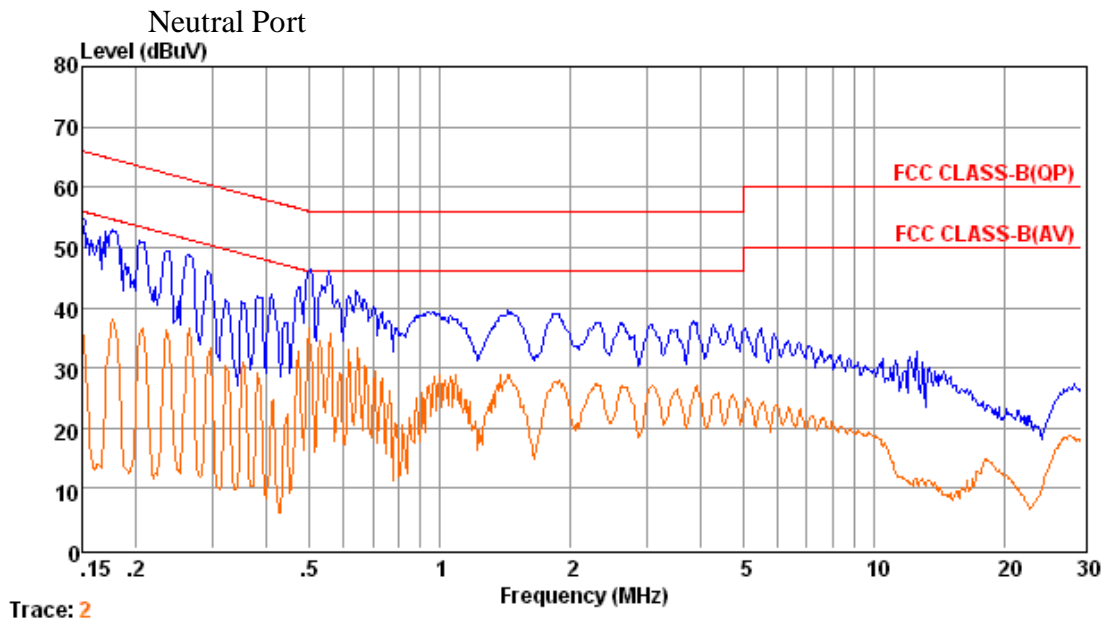
- 3.5.1. Setup the EUT as shown on Section 3.1.
- 3.5.2. Turn on the power of all equipments.
- 3.5.3. Let the EUT work in measuring mode (NORMAL) and measure it.

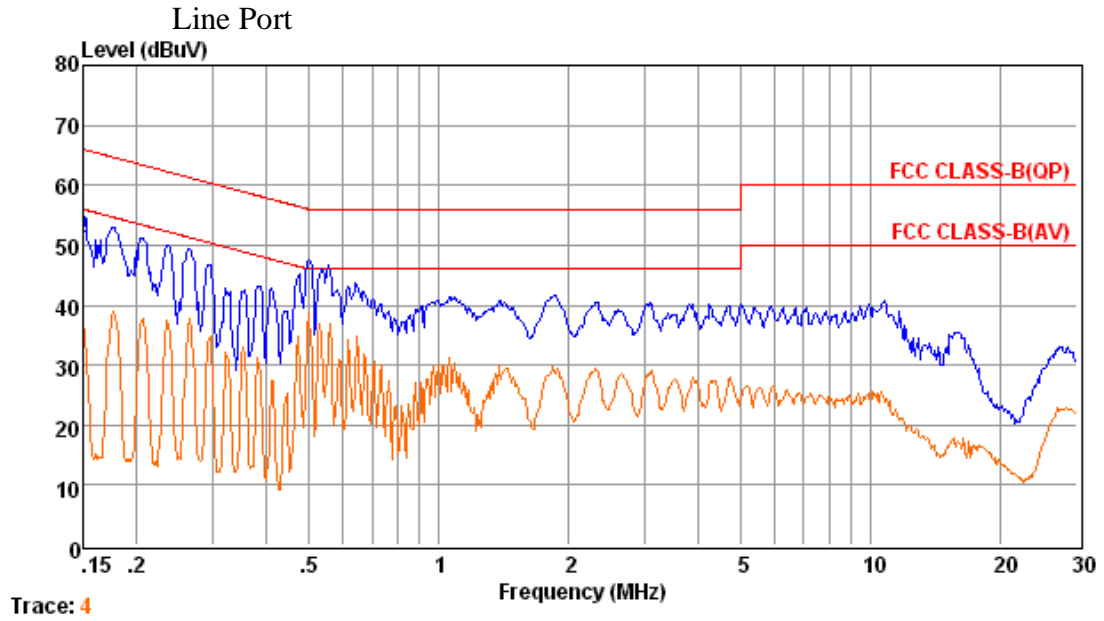
3.6 Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through a Line Impedance Stability Network (L.I.S.N). This provided 50ohm-coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the ANSI C63.4 regulations during conducted emission measurement. The bandwidth of the field strength meter (R&S Test Receiver ESCI) is set at 9KHz. The frequency range from 150kHz to 30MHz is investigated.

3.7 Measuring Results

Following Diagram/Table of Conducted Emissions Test



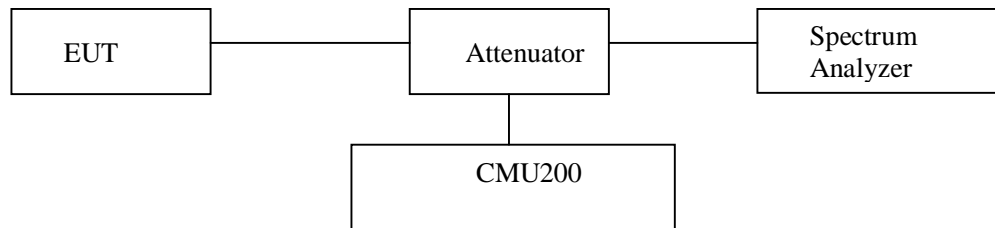


Data Table

Frequency MHz	Detector QP/AV	Test result dBµV	Limit dBµV	Margin dB	Port L/N
0.150	QP	55.30	66.00	-10.70	L
0.500	QP	46.99	56.00	-9.01	L
5.626	QP	40.68	60.00	-19.32	L
0.514	AV	38.02	46.00	-7.98	L
3.490	AV	30.28	46.00	-15.72	L
12.198	AV	26.14	50.00	-23.86	L
0.510	QP	47.50	56.00	-8.50	N
0.658	QP	46.20	56.00	-9.80	N
1.390	QP	42.25	56.00	-13.75	N
0.530	AV	38.21	46.00	-7.79	N
2.451	AV	31.03	46.00	-14.97	N
10.012	AV	25.34	50.00	-24.66	N

4. RF OUT POWER MEASUREMENT

4.1 Block Diagram of Test Setup(Conducted)



4.2 Measuring Standard Requirement

According to FCC 22.913(a)(2), The conducted of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

4.3 Test Procedure

The EUT was placed in a chamber, demonstrated as section 4.1 block diagram of test setup.

The wireless communications test set (CMU200) was used to set the transmit channels and power levels, modulate the Tx signal with different modes and use the spectrum analyzer measure the output power.

4.4 Measuring Results

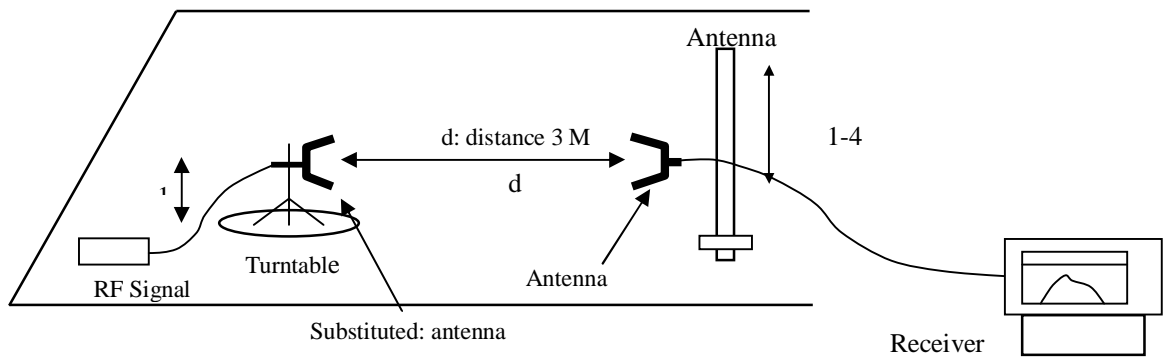
Conducted output power

Test Mode	FED	REV	Low CH (824.7MHz)	Middle CH (836.52MHz)	High CH (848.31MHz)	Part22H Limit(dBm)
CDMA 2000 1xRTT	RC1	RC1(S02)	23.40	23.13	23.75	38.45
	RC1	RC1(S055)	23.42	23.45	23.15	38.45
	RC2	RC2(S09)	23.33	23.31	23.48	38.45
	RC2	RC2(S055)	23.13	23.30	23.37	38.45
	RC3	RC3(S02)	23.45	23.42	23.24	38.45
	RC3	RC3(S055)	23.46	23.35	23.64	38.45
	RC4	RC4(S02)	23.32	23.57	23.32	38.45
	RC4	RC4(S055)	23.62	23.64	23.18	38.45
	RC5	RC5(S09)	23.25	23.32	23.39	38.45
	RC5	RC5(S055)	23.35	23.31	23.42	38.45

Test Mode	Low CH (824.7MHz)	Middle CH (83.652MHz)	High CH (848.31MH)	Part22H Limit(dBm)
1x EV-DO Rev A	23.33	23.41	23.62	38.45

Remark: Limit=7Watts=38.45

4.5 Block Diagram of Test Setup(ERP)



4.6 Measuring Standard Requirement

According to FCC 22.913(a)(2), The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

4.7 Test Procedure

The setup of EUT is according with per TIA/EIA Standard 603C and ANSI C63.4-2003 measurement procedure.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis. The frequency range up to tenth harmonic of the fundamental frequency was investigated. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

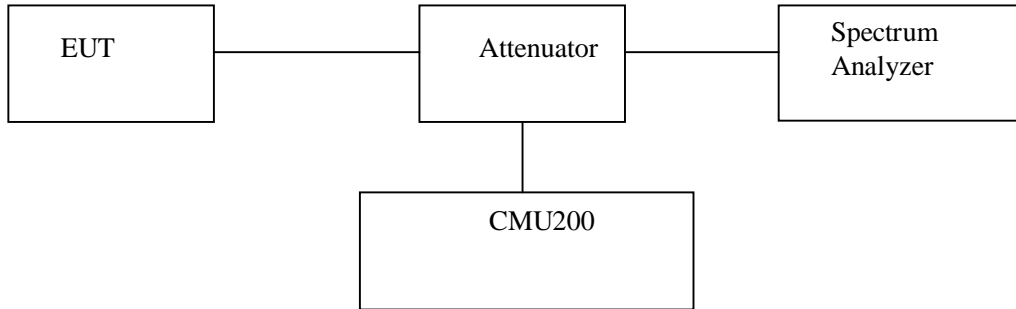
4.8 Measuring Results

Radiated Power (ERP)

Indicated		Turntable Degree (°)	Antenna Height (m)	Polar (H/V)	Level (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
Frequency (MHz)	Reading (dBuV/m)								
824.7MHz	98.42	33	100	H	23.42	0	0.20	23.22	38.45
824.7MHz	98.32	360	100	V	23.24	0	0.20	23.04	38.45
836.52MHz	99.21	31	100	H	23.98	0	0.20	23.78	38.45
836.52MHz	99.12	321	100	V	23.44	0	0.20	23.24	38.45
848.31MHz	98.67	323	100	H	23.67	0	0.20	23.47	38.45
848.31MHz	98.32	12	100	V	23.34	0	0.20	23.14	38.45

5. EMISSION BANDWINTH MEASUREMENT

5.1 Block Diagram of Test (In shielding Chamber)



5.2 Measuring Standard

According to FCC 22.917(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

5.3 Test Procedure

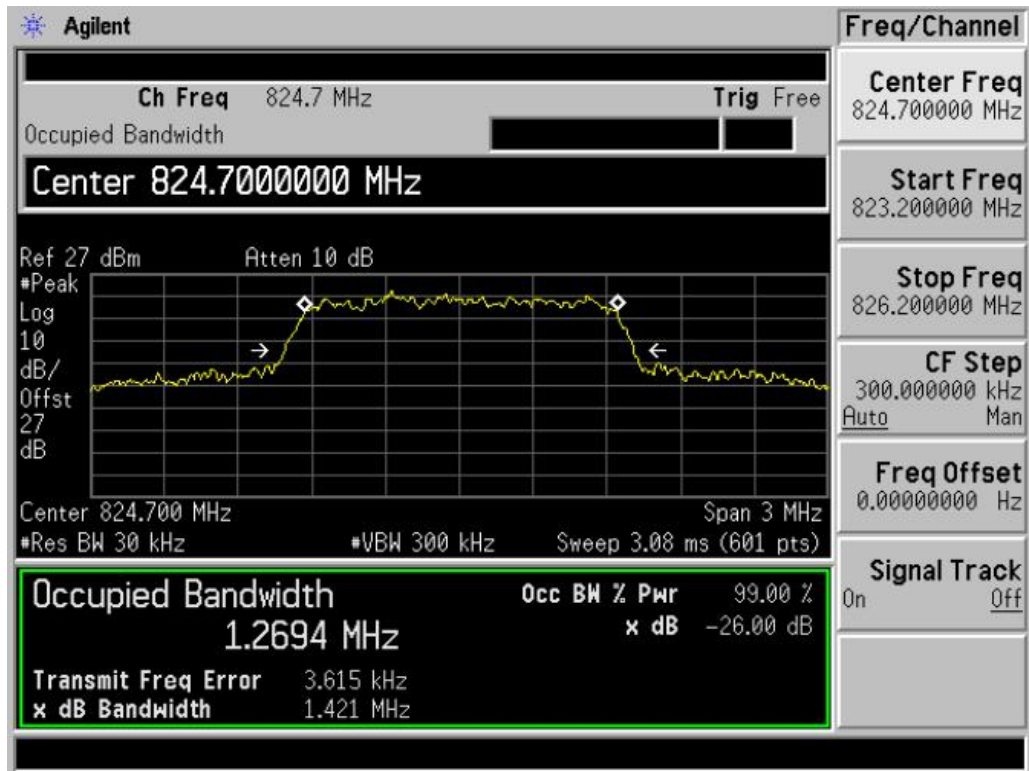
The bandwidth of the Receiver (ESCI) is set at 30 kHz.
Test 26dB down emission bandwidth and record.

5.4 Measuring Results

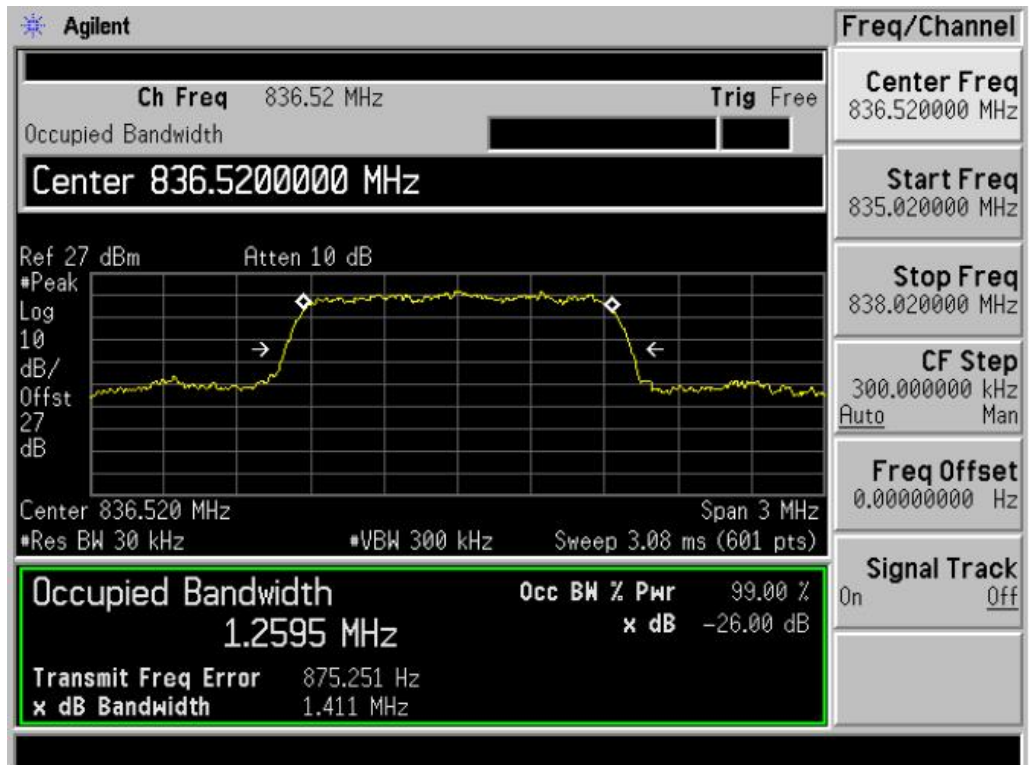
Test Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
1xRTT	1013	824.7	1.2694	1.421
	384	836.5	1.2595	1.411
	777	848.31	1.2620	1.427
1xEV-DO ReV.A	1013	824.7	1.2668	1.453
	384	836.5	1.2557	1.419
	777	848.31	1.2668	1.430

Reference the plots as following page:

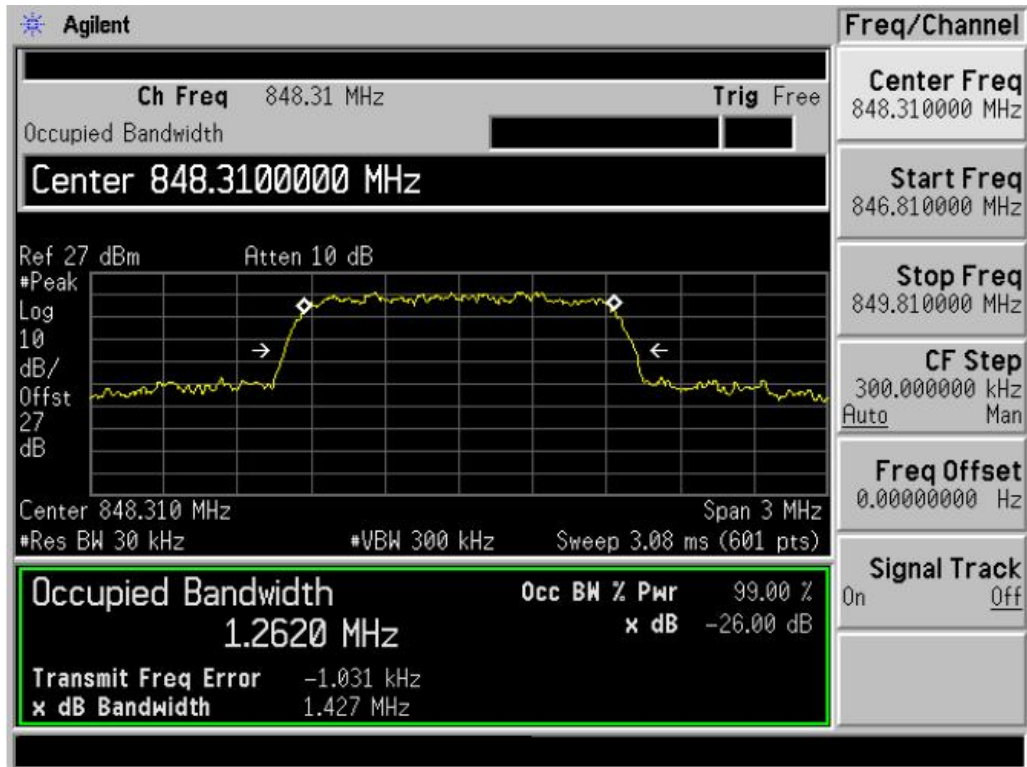
For 1xRTT:
Low Channel



Middle Channel

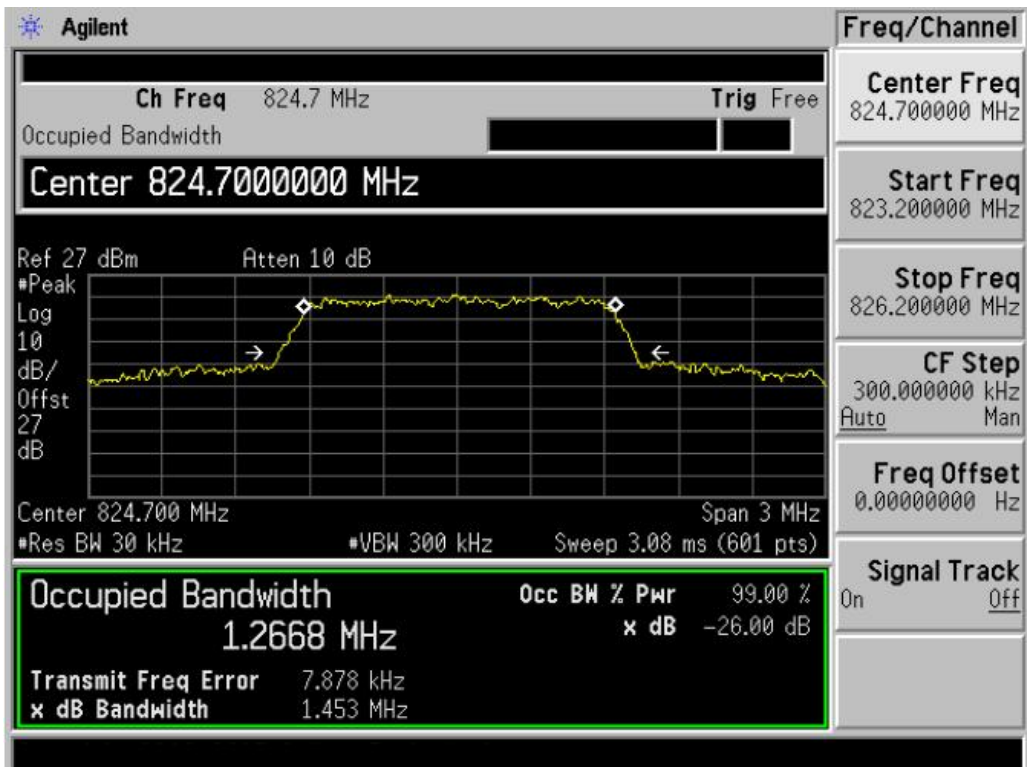


High Channel

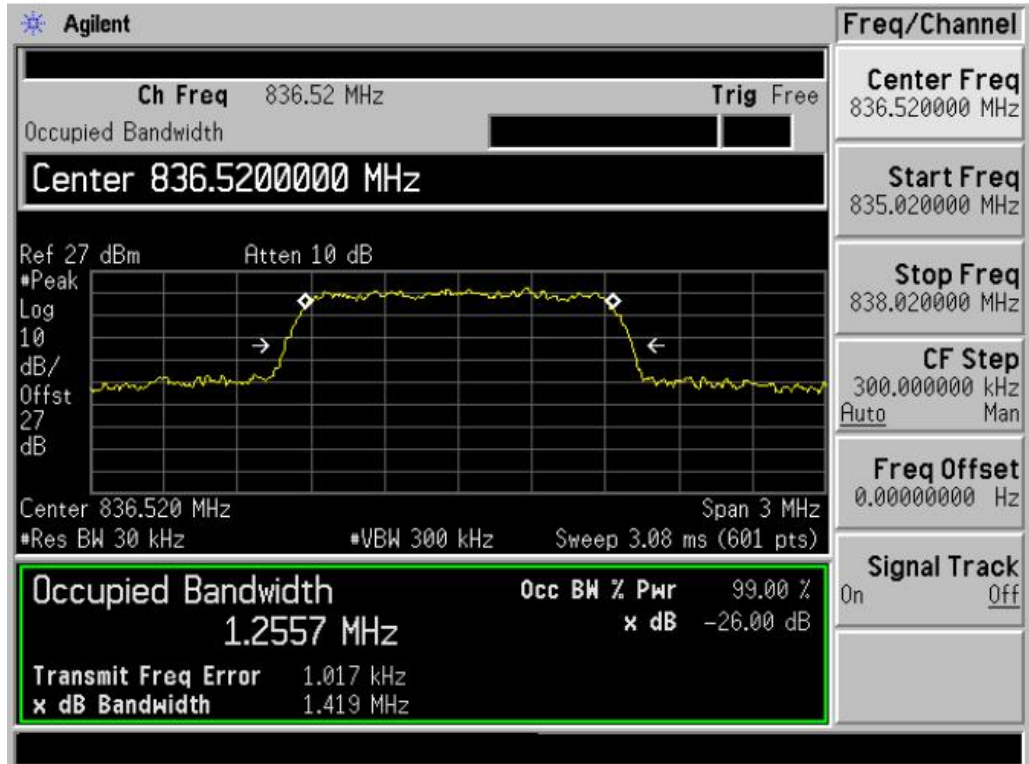


For 1xEV-DO ReV.A:

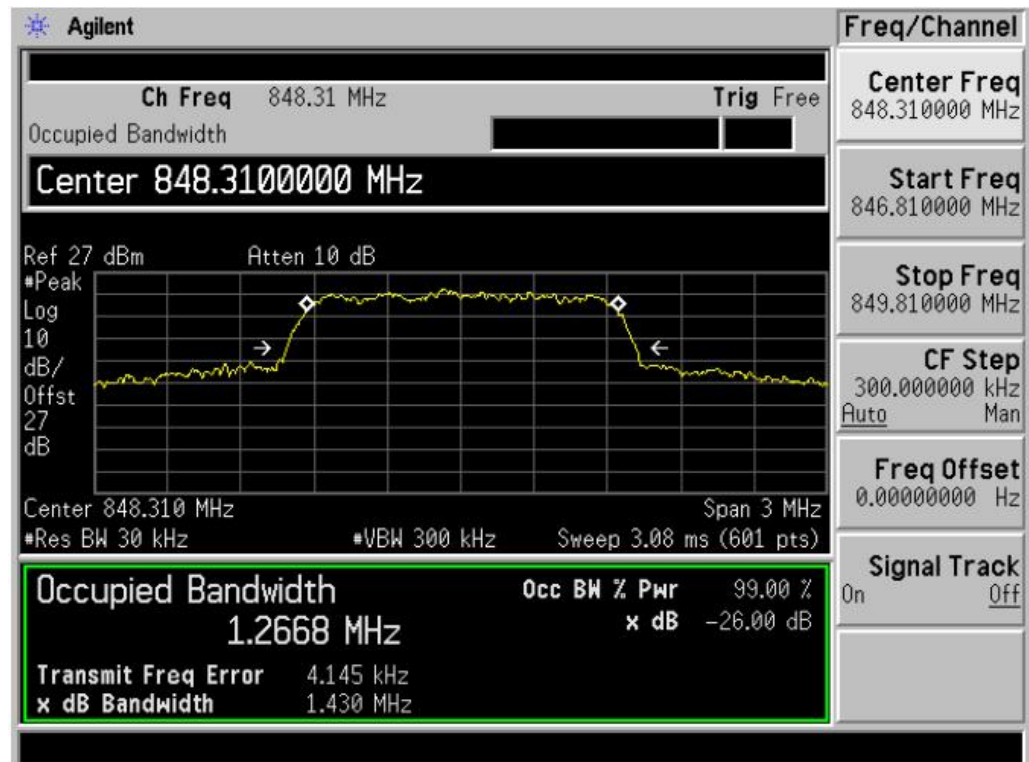
Low Channel



Middle Channel

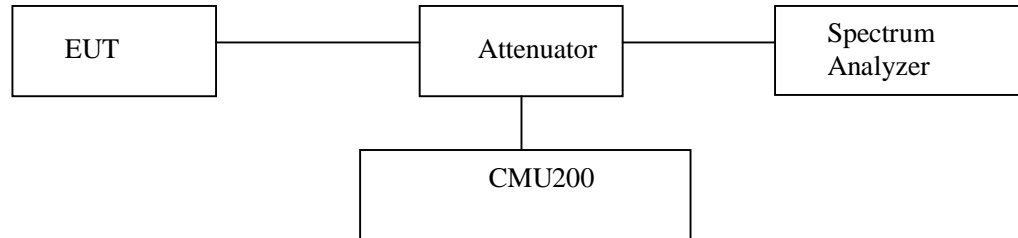


High Channel



6. OUT OF BAND EMISSION AT ANTENNA TERMINAL

6.1 Block Diagram of Test Setup



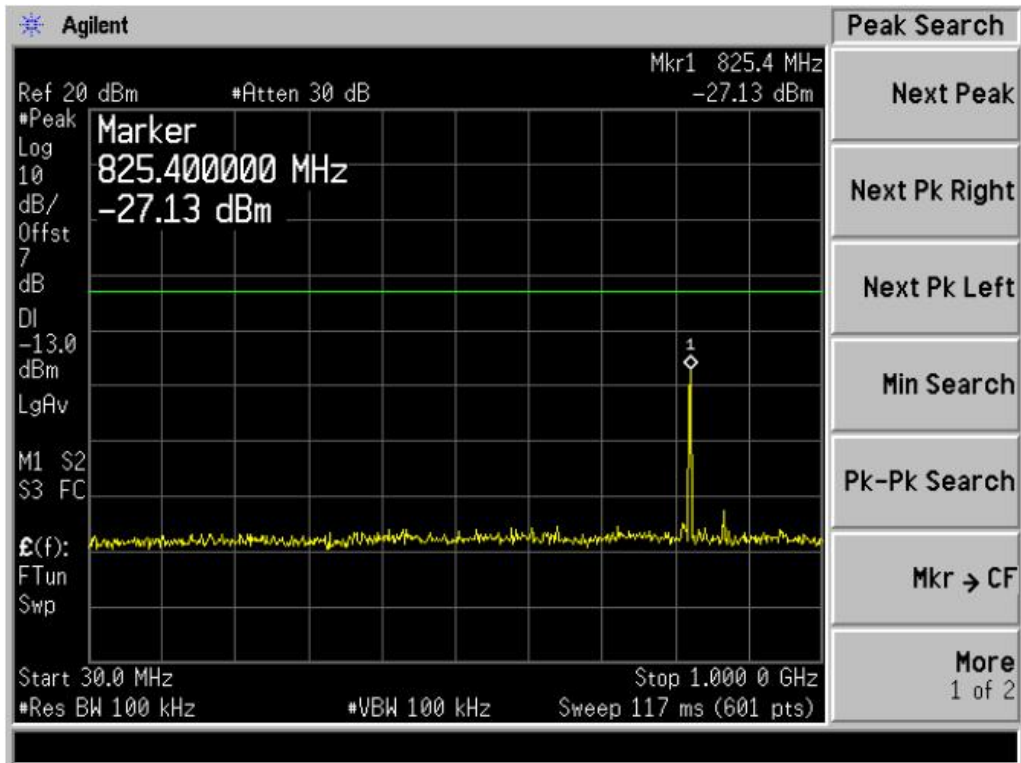
6.2 Measuring Standard

According to FCC 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

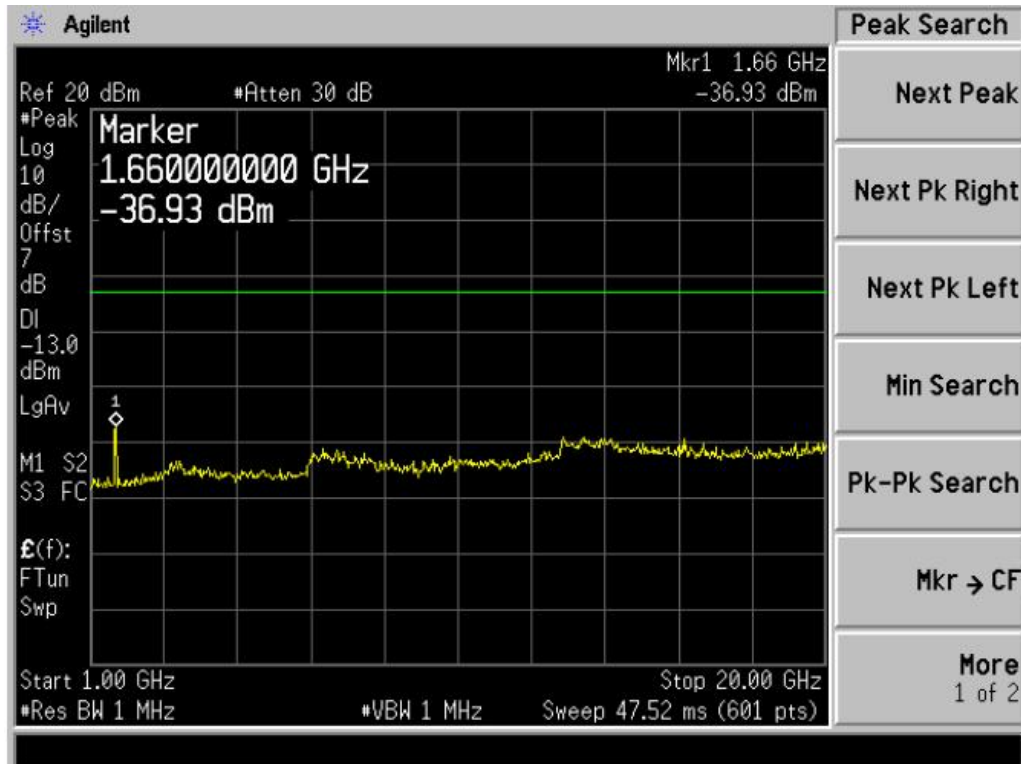
6.3 Measuring Results

Please refer to the following test plots:

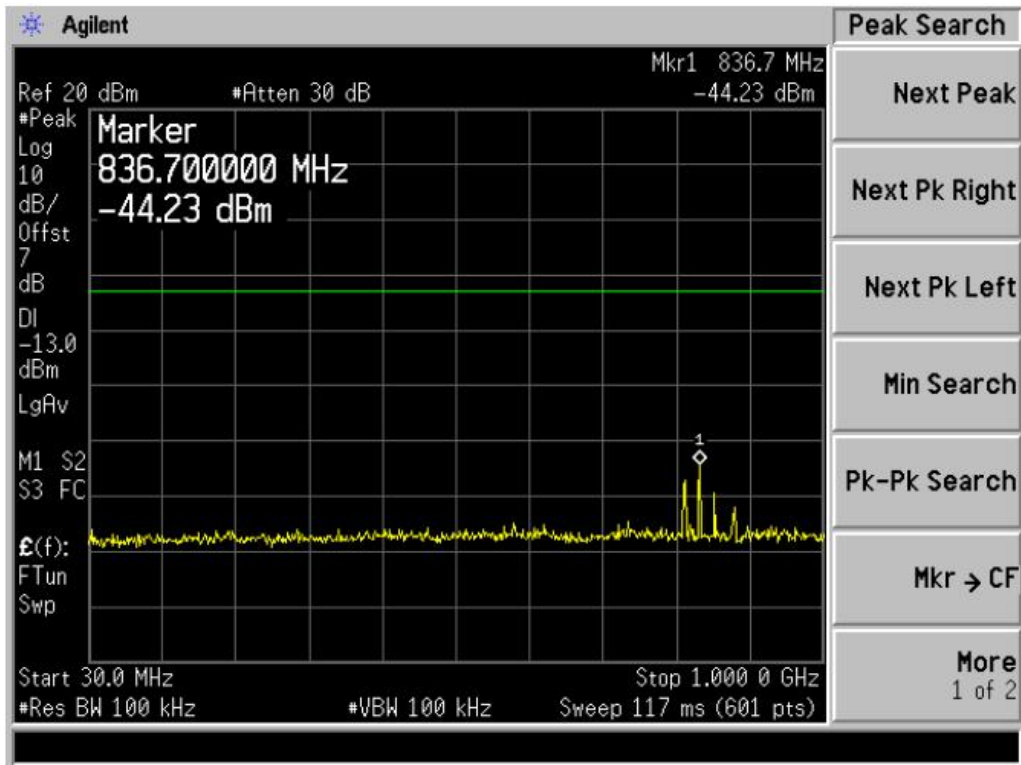
1xRTT Mode
 Low Channel
 30MHz to 1GHz



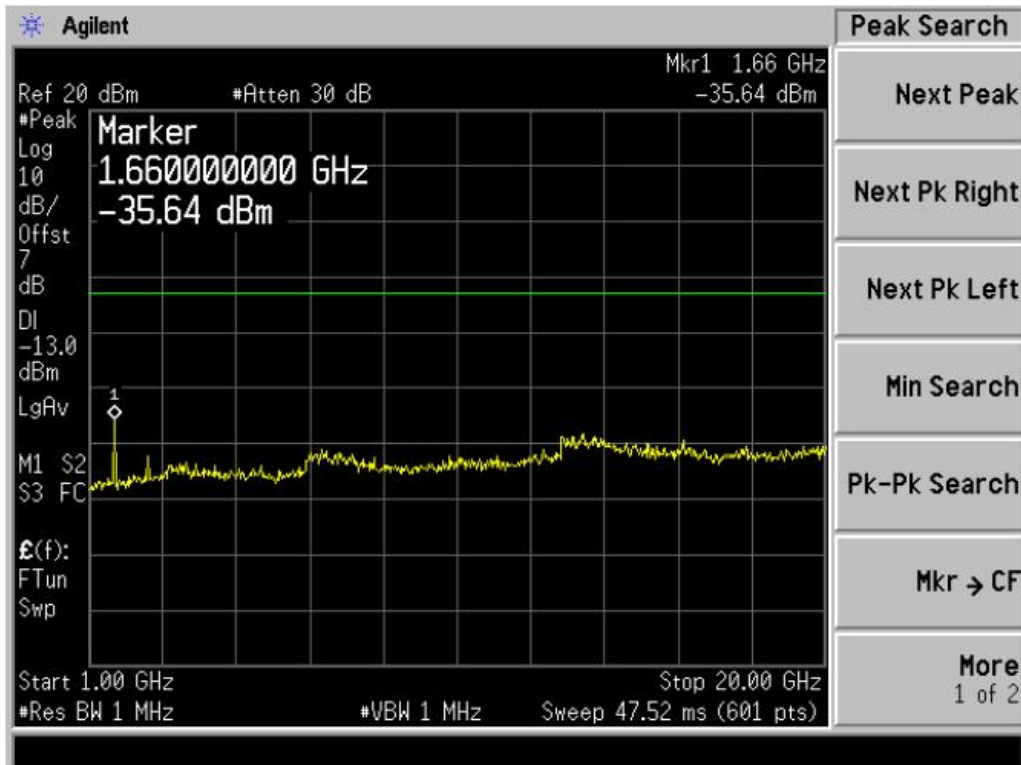
Above 1GHz



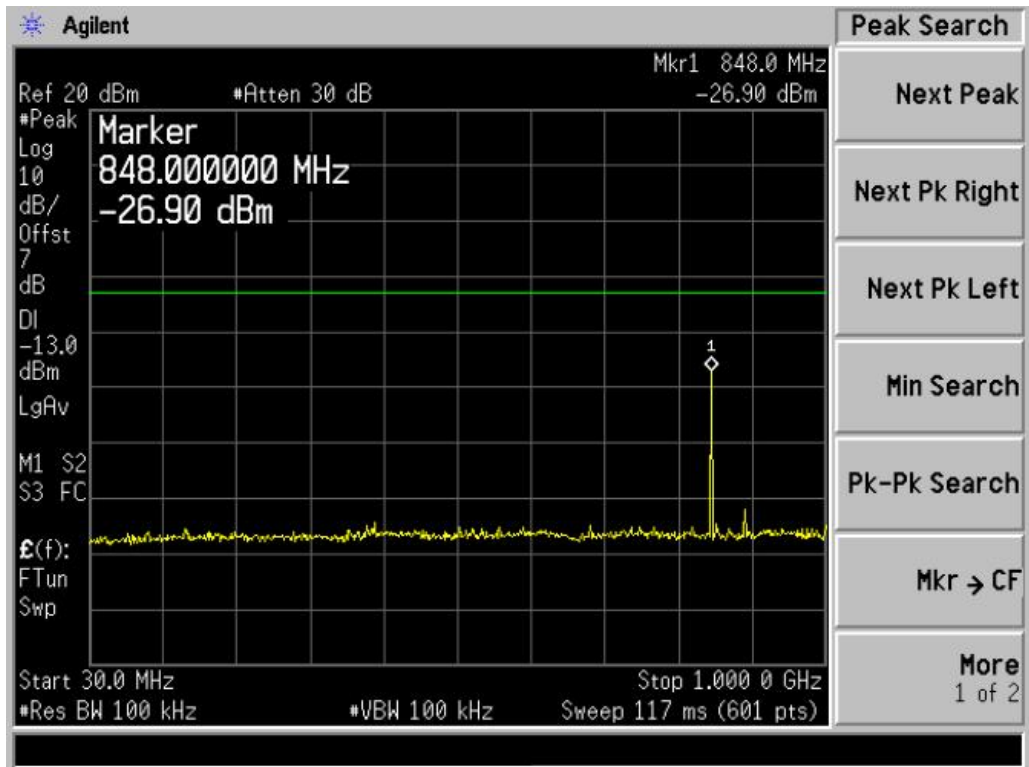
1xRTT Mode
 Middle Channel
 30MHz to 1GHz



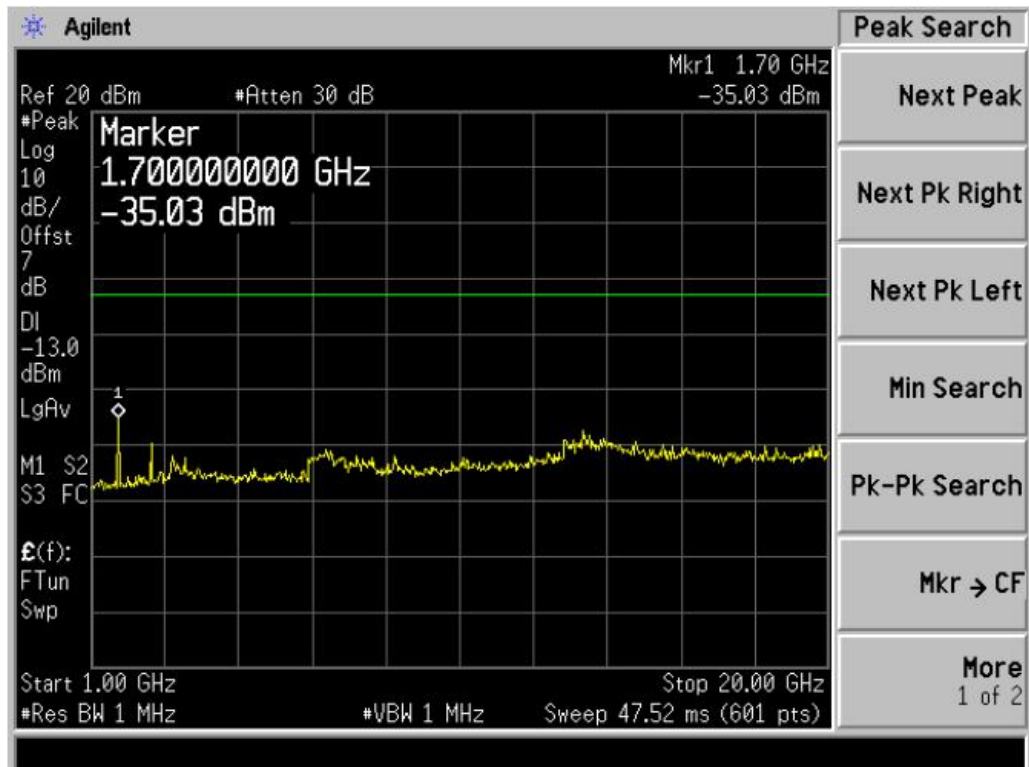
Above 1GHz



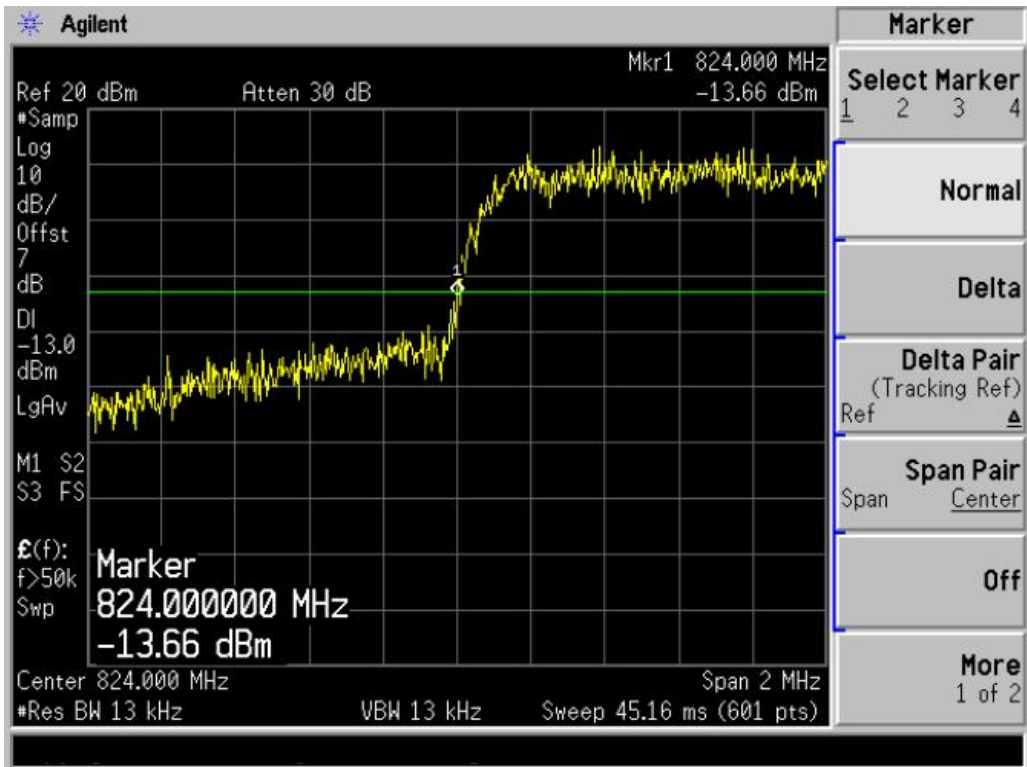
1xRTT Mode
 High Channel
 30MHz to 1GHz



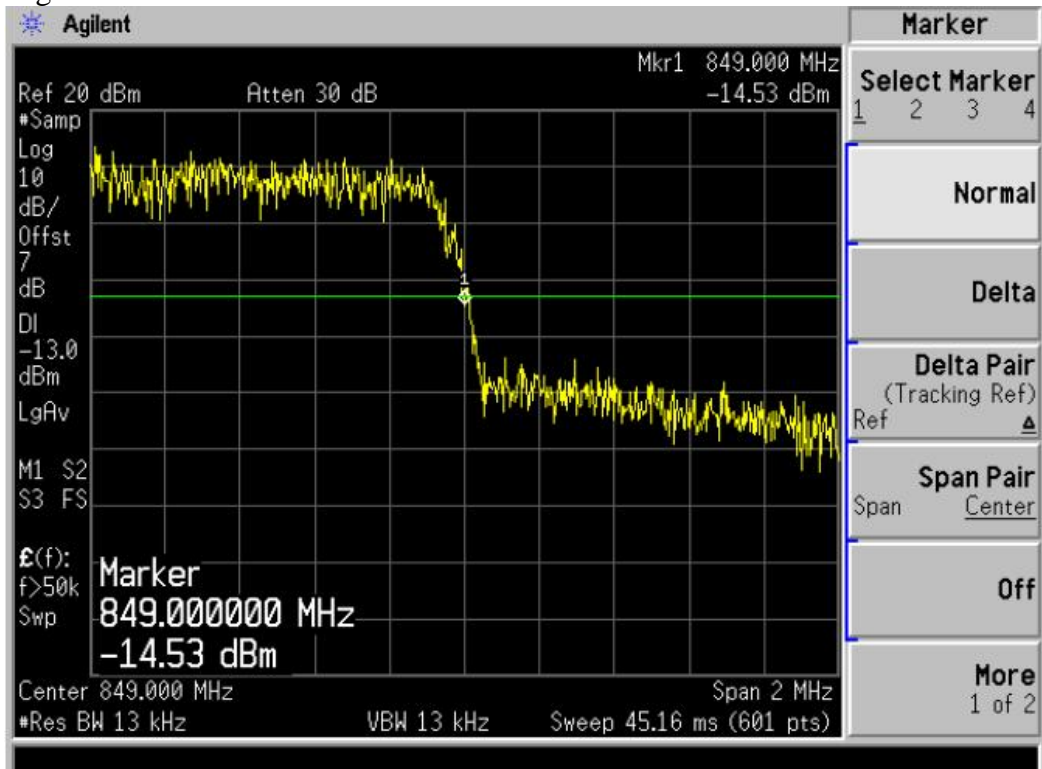
Above 1GHz



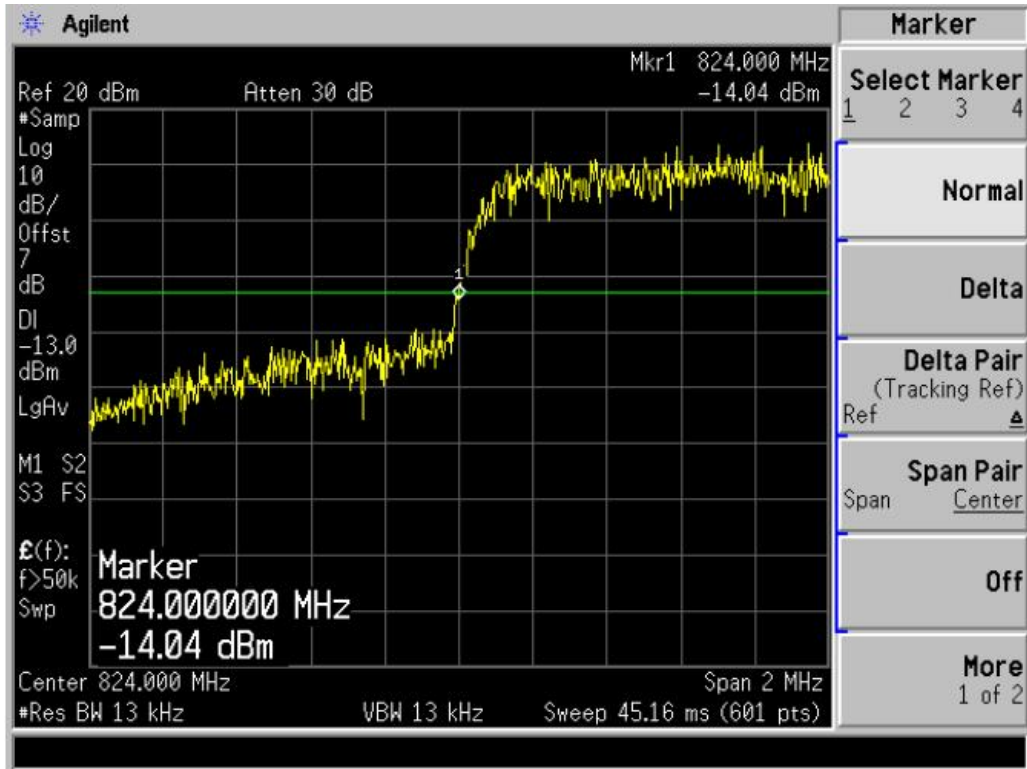
Band Edge
 1xRTT
 Lowest Channel



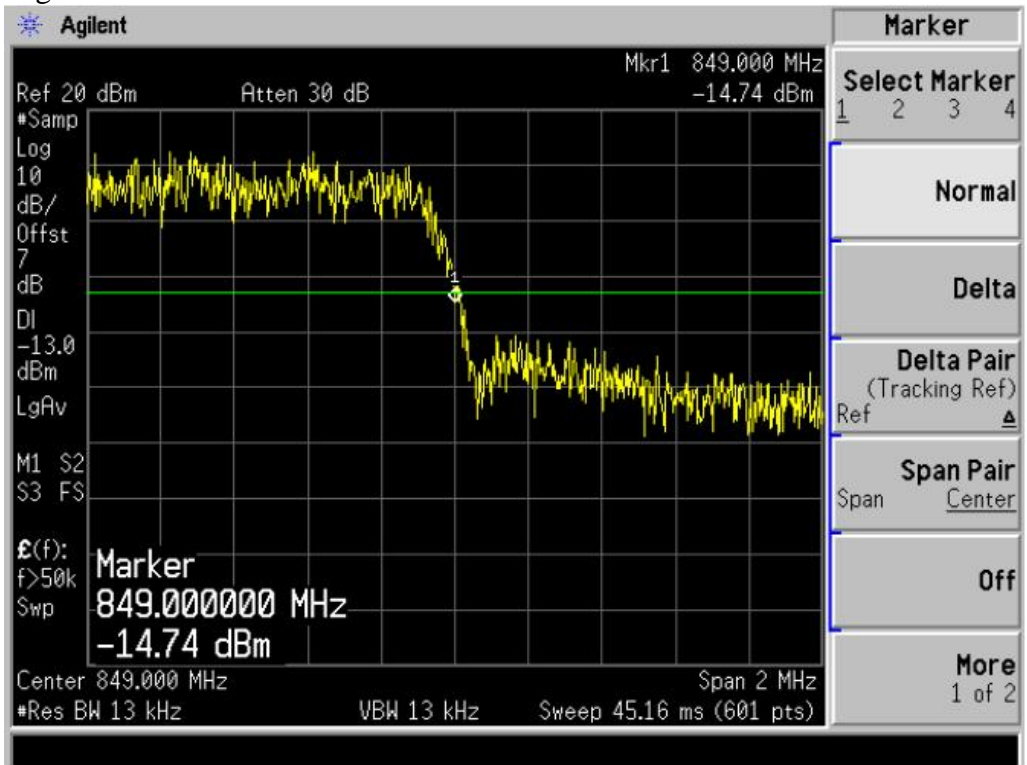
Highest Channel



Band Edge
1xEV-DO Rev.A
Lowest Channel

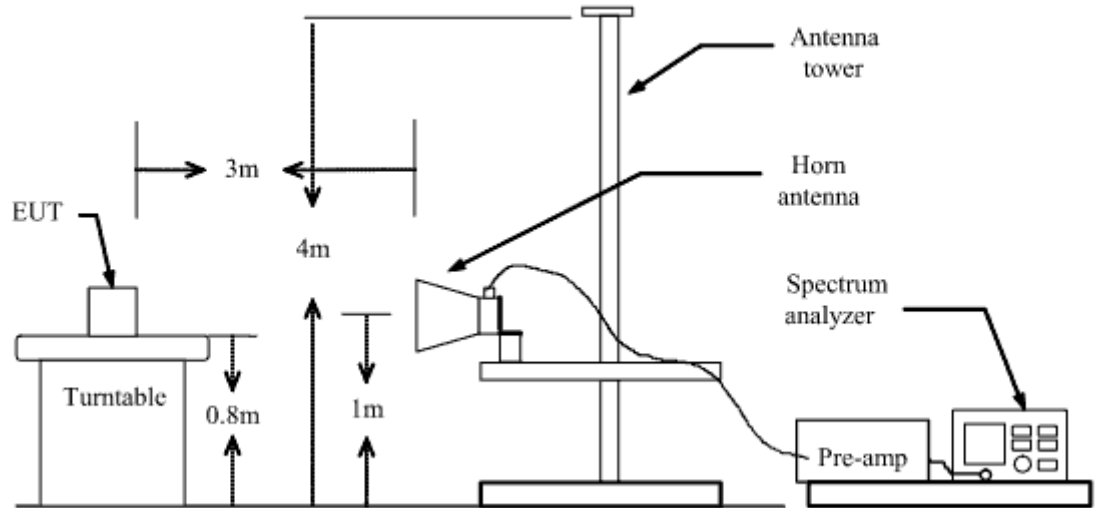


Highest Channel



7. SPURIOUS RADIATED EMISSION MEASUREMENT

7.1 Block Diagram of Test Setup



7.2 Measuring Standard

According to FCC 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

7.4 Test Procedure

The setup of EUT is according with per TIA/EIA Standard 603C and ANSI C63.4-2003 measurement procedure.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious attenuation limit in dB = $43 + 10 \log_{10}(\text{power out in Watts})$

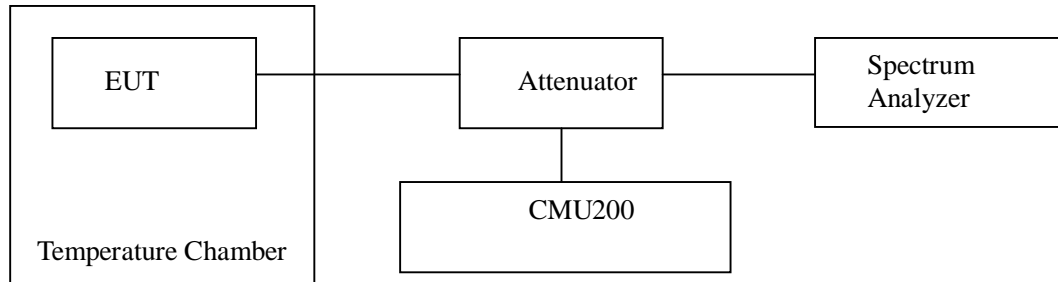
7.5 Test data

Refer the following table of testing data

Frequency	SG Reading	Height	Polar	Cable loss	Antenna Gain	Corrected Ampl.	FCC Part 22H	
							Limit	Margin
MHz	dBm	Meter	H / V	dB	dB	dBm	dBm	dB
Low Channel (824.7MHz)								
1649.4	-44.95	1.5	V	1.8	7.6	-39.15	-13	-26.15
2474.1	-48.95	1.5	V	2.4	7.9	-43.45	-13	-30.45
1649.4	-45.97	1.5	H	1.8	7.6	-40.17	-13	-27.17
2474.1	-49.65	1.5	H	2.4	7.9	-44.15	-13	-31.15
Middle Channel (836.5MHz)								
1673.0	-45.15	1.5	V	1.9	7.6	-39.45	-13	-26.45
2509.5	-49.24	1.5	V	2.5	7.9	-43.84	-13	-30.84
1673.0	-48.05	1.5	H	1.9	7.6	-42.35	-13	-29.35
2509.5	-51.57	1.5	H	2.5	7.9	-46.17	-13	-33.17
High Channel (848.31MHz)								
1696.6	-43.76	1.5	V	2.0	7.6	-38.16	-13	-25.16
2544.9	-47.45	1.5	V	2.6	7.9	-42.15	-13	-29.15
1696.6	-45.71	1.5	H	2.0	7.6	-40.11	-13	-27.11
2544.9	-49.87	1.5	H	2.6	7.9	-44.57	-13	-31.57

8. FREQUENCY STABILITY TEST

8.1 Block Diagram of Test Setup



8.2 Test Standard

According to §2.1055, the following test procedure was performed. The Frequency Stability is measured directly with a Frequency Domain Analyzer. Frequency Deviation in ppm is calculated from the measured peak to peak value. The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a Frequency Domain Analyzer in histogram mode.

8.6 Test Procedure

Supply the EUT with nominal ac voltage or install a new or fully charged battery in the EUT. If possible, a dummy load should be connected to the EUT, because an antenna near the metallic walls of an environmental test chamber could affect the output frequency of the EUT. If the EUT is equipped with a permanently attached, adjustable-length antenna, the EUT should be placed in the center of the chamber with the antenna adjusted to the shortest length possible. Adjust the location of the measurement antenna and the controls on the measuring instrument to obtain a suitable signal level (i.e., a level that will not overload the measuring instrument but is strong enough to allow measurement of the operating or fundamental frequency of the EUT). Turn the EUT OFF and place it inside an environmental temperature chamber. For devices that are normally operated continuously, the EUT may be energized while inside the test chamber. For devices that have oscillator heaters, energize only the heater circuit while the EUT is inside the chamber. Set the temperature control on the chamber to the highest specified EUT operating temperature and allow the temperature inside the chamber to stabilize at the set temperature before starting frequency Measurements.

8.7 Test Results

Please refer to the following page

For Cellular Band GSM Mode

Reference Frequency(Middle Channel): 836.52 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	3.7	-38	-0.0454
40	3.7	-43	-0.0514
30	3.7	-43	-0.0514
20	3.7	-38	-0.0454
10	3.7	-31	-0.0370
0	3.7	-26	-0.0310
-10	3.7	-29	-0.0346
-20	3.7	-26	-0.0310
-30	3.7	-34	-0.0406

So, Frequency Stability Versus Input Voltage is:

Reference Frequency(Middle Channel): GSM 836.5MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.5	-32	-0.0383
	3.7	-24	-0.0287
	4.2	-25	-0.0299

-----The End Report -----