47 CFR PART 22 H & PART 24 E

TEST REPORT

of

WCDMA USB mode

Trade Name:	Haier
Brand Name:	Haier
Model Name:	HW-WM100
Report No.:	SZ08120148E01
FCC ID:	SG70812HW-WM100

prepared for

Qingdao Haier Telecom Co., Ltd.
No.1, Haier Road,Hi-tech Zone, Qingdao, 266101, P.R.China

prepared by

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1. TEST CERTIFICATION

Equipment under Test:	WCDMA USB mode
Brand Name:	Haier
Model Name:	HW-WM100
FCC ID:	SG70812HW-WM100
Applicant:	Qingdao Haier Telecom Co., Ltd. No.1, Haier Road,Hi-tech Zone, Qingdao, 266101, P.R.China
Manufacturer:	Qingdao Haier Telecom Co., Ltd. No.1, Haier Road,Hi-tech Zone, Qingdao, 266101, P.R.China
Test Standards:	47 CFR Part 2 47 CFR Part 22 Subpart H 47 CFR Part 24 Subpart E
Test Date(s):	January 08, 2009 – January 18, 2009
Test Result:	PASS

*** We Hereby Certify That:**

The equipment under test was tested by Shenzhen Electronic Product Quality Testing Center Morlab Laboratory. The test data, data evaluation, test procedures and equipment configurations shown in this report were made in accordance with the requirement of related FCC rules.

The test results of this report only apply for the tested sample equipment identified above. The test report shall be invalid without all the signatures of the test engineer, the reviewer and the approver.

Tested by: Li Yi Dated: 2009.03.16

Li Yi

Reviewed by: Wei Yanquan Dated: 9.03.16

Wei Yanquan

Approved by: Zeng Dexin Dated: 20.9.03.16

Zeng Dexin

2. GENERAL INFORMATION

2.1 EUT Description

EUT Type ..... :	WCDMA USB mode
Model Name ..... :	HW-WM100
Serial No. ..... :	(n.a, marked #1 by test site)
Hardware Version ..... :	P1.0
Software Version ..... :	HW-WM100-H01-S001
Frequency Range ..... :	WCDMA 850MHz Tx: 826.4- 846.6MHz (at intervals of 200kHz); Rx: 871.4 – 891.6MHz (at intervals of 200kHz) WCDMA 1900MHz Tx: 1852.4 – 1907.6MHz (at intervals of 200kHz); Rx: 1932.4 – 1987.6MHz (at intervals of 200kHz)
Modulation Type..... :	WCDMA
Emission Designators ..... :	4M20F9W
Power Supply ..... :	The EUT was powered by PC via USB port.

Note 1: The EUT is the WCDMS/GSM wireless date card, it supports GSM 850 MHz, 1900 MHz and WCDMA 850 MHz, 1900 MHz; only WCDMA 850 MHz, 1900 MHz was tested in this report.

Note 2: The transmitter (Tx) frequency arrangement of the WCDMA 850MHz band used by the EUT can be represented with the formula F(n)=826.4+0.2*(n-4132), 4132<=n<=4233; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 4132 (826.4MHz), 4175 (835MHz) and 4233 (846.6MHz).

Note 3: The transmitter (Tx) frequency arrangement of the WCDMA 1900MHz band used by the EUT can be represented with the formula F(n)=1852.4+0.2*(n-9262), 9262<=n<=9538; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 9262 (1852.4MHz), 9400 (1880MHz) and 9538 (1907.6MHz).

Note 4: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

2.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2, Part 22 and Part 24 for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 2 (10-1-05 Edition)	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 22 (10-1-05 Edition)	Public Mobile Services
3	47 CFR Part 24 (10-1-05 Edition)	Personal Communications Services

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Result
1	2.106 22.905 24.229	Frequencies	(n.a)
2	2.1046	Conducted RF Output Power	PASS
3	2.1049	Occupied Bandwidth	PASS
4	2.1055 22.355 24.235	Frequency Stability	PASS
5	2.1051 22.917 24.238	Conducted Out of Band Emissions	PASS
6	2.1051 2.1057 22.917 24.238	Band Edge	PASS
7	22.913 24.232	Radiated RF Output Power	PASS
8	2.1053 22.917 24.238	Field strength of spurious radiation	PASS

2.3 Facilities and Accreditations

2.3.1 Facilities

Shenzhen Electronic Product Quality Testing Center Morlab Laboratory is a testing organization accredited by China National Accreditation Board for Laboratories (CNAL) according to ISO/IEC 17025. The accreditation certificate number is L1659.

All measurement facilities used to collect the measurement data are located at Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen 518055 CHINA. The test site is constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22; the FCC registration number is 741109.

2.3.2 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	20 - 25
Relative Humidity (%):	40 - 60
Atmospheric Pressure (kPa):	96

3. 47 CFR PART 2, PART 22H REQUIREMENTS

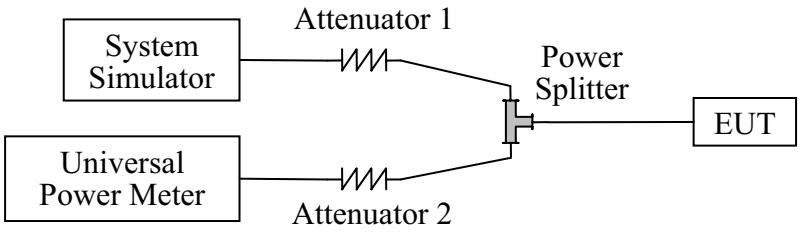
3.1 Conducted RF Output Power

3.1.1 Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

3.1.2 Test Description

3.1.2.1 Test Setup:



The EUT, which is powered by the Battery, is coupled to the Universal Power Meter and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power i.e. Power Class = 3. A call is established between the EUT and the SS.

3.1.2.2 Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Agilent	E5515C	GB43130131	2008.09	1year
Universal Power Meter	Giga - tronics	8542C	1832005	2008.09	1year
Power Splitter	Weinschel	1506A	NW521	(n.a.)	(n.a.)
Attenuator 1	Resnet	20dB	(n.a.)	(n.a.)	(n.a.)
Attenuator 2	Resnet	3dB	(n.a.)	(n.a.)	(n.a.)

3.1.3 Test Result

Here the lowest, middle and highest channels are selected to perform testing to verify the conducted

RF output power of the EUT. For the mobile phone operates at Max Output Power, the rated conducted RF output power is 24dBm within the tolerance of +1/-3dB.

Test Verdict:

Band	Channel	Frequency (MHz)	Measured Output Power (dBm)	Rated Output Power		Verdict
				dBm	Tolerance (dB)	
CDMA 850MHz	4132	826.4	23.41	24	+1/-3	PASS
	4175	835	23.25			PASS
	4233	846.6	24.12			PASS
CDMA 1900MHz	9262	1852.4	22.75	24	+1/-3	PASS
	9400	1880	22.66			PASS
	9538	1907.6	21.57			PASS

Note: The measured output power was calculated by the reading of the Power Meter and calibration.

3.2 Frequency Stability

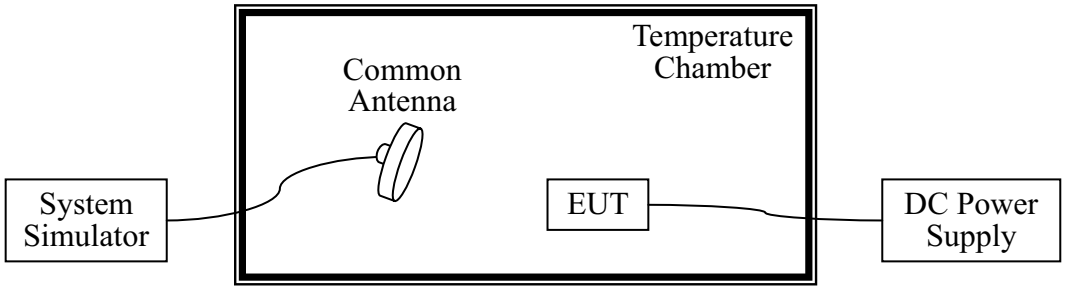
3.2.1 Requirement

According to FCC section 22.355 and FCC section 24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

(a) The temperature is varied from -30°C to +50°C at intervals of not more than 10°C.
(b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

3.2.2 Test Description

1. Test Setup:



The EUT, which is powered by the DC Power Supply directly, is located in the Temperature Chamber. The EUT is commanded by the System Simulator (SS) to operate at the maximum output power. A call is established between the EUT and the SS via a Common Antenna.

2. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Agilent	E5515C	GB43130131	2008.09	1year
DC Power Supply	Good Will	GPS-3030DD	EF920938	2008.08	2year
Temperature Chamber	YinHe Experimental Equip.	HL4003T	(n.a.)	2008.08	1year

3.2.3 Test Verdict

The nominal, highest and lowest extreme voltages are separately 3.7VDC, 4.2VDC and 3.6VDC, which are specified by the applicant; the normal temperature here used is 25°C. The frequency deviation limit is ±2.5ppm.

Band	Test Conditions		Frequency Deviation						Verdict
	Power (VDC)	Temperature (°C)	Channel = 4132 (826.4MHz)		Channel = 4175 (835MHz)		Channel = 4233 (846.6MHz)		
			Hz	Limit	Hz	Limit	Hz	Limit	
WCDMA 850MHz	3.7	-30	51.51	±826.4	33.65	±835	34.56	±846.6	PASS
		-20	33.26		29.98		30.29		
		-10	-21.16		21.04		-10.54		
		0	31.05		20.66		-22.85		
		+10	19.09		18.46		26.91		
		+20	25.11		34.87		-30.15		
		+30	-22.61		-22.15		-20.19		
		+40	-21.05		10.02		30.72		
		+50	36.54		33.26		-27.49		
	4.2	+25	-21.24		-15.28		-20.82		
	3.6	+25	-18.07		-33.81		26.78		
WCDMA 1900MHz	3.7	-30	33.15	±1852.4	22.01	±1880	38.21	±1907.6	PASS
		-20	26.89		20.84		26.01		
		-10	-15.68		15.48		-9.32		
		0	20.48		11.26		-18.25		
		+10	10.55		15.64		19.44		
		+20	18.26		26.54		-20.18		
		+30	-15.62		-28.75		-18.94		
		+40	-27.22		62.02		26.15		
		+50	26.25		26.05		-33.21		
	4.2	+25	-18.21		-10.55		-25.46		
	3.6	+25	-23.02		-28.16		22.08		

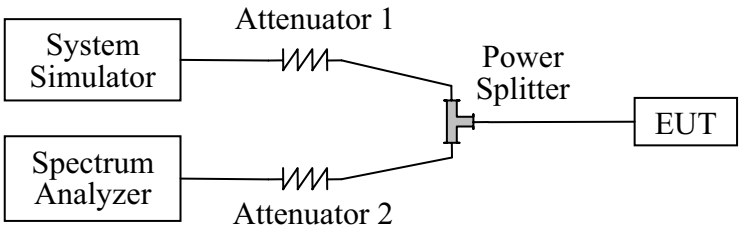
3.3 Conducted Out of Band Emissions

3.3.1 Requirement

According to FCC section 22.917(a) and FCC section 24.238(a), the power of any emission 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. This calculated to be -13dBm.

3.3.2 Test Description

3.3.2.1 Test Setup:



The EUT, which is powered by the Battery, is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power i.e. Power Class = 3. A call is established between the EUT and the SS.

3.3.2.2 Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Agilent	E5515C	GB43130131	2008.09	1year
Spectrum Analyzer	Agilent	E7405A	US44210471	2008.09	1year
Power Splitter	Weinschel	1506A	NW521	(n.a.)	(n.a.)
Attenuator 1	Resnet	20dB	(n.a.)	(n.a.)	(n.a.)
Attenuator 2	Resnet	3dB	(n.a.)	(n.a.)	(n.a.)

3.3.3 Test Result

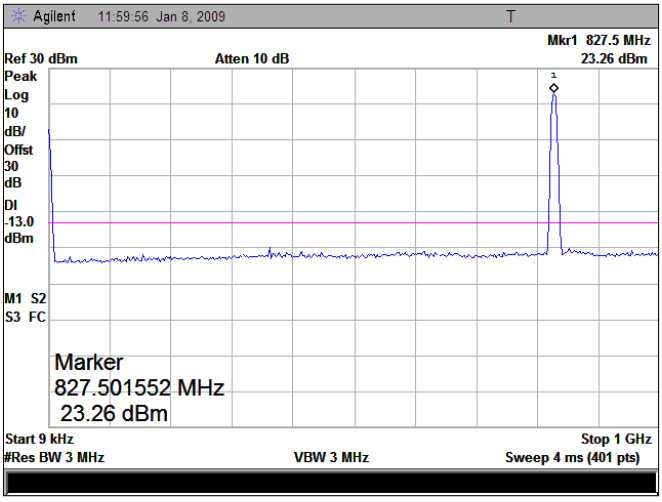
The measurement frequency range is from 30MHz to the 10^{th} harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.

1. Test Verdict:

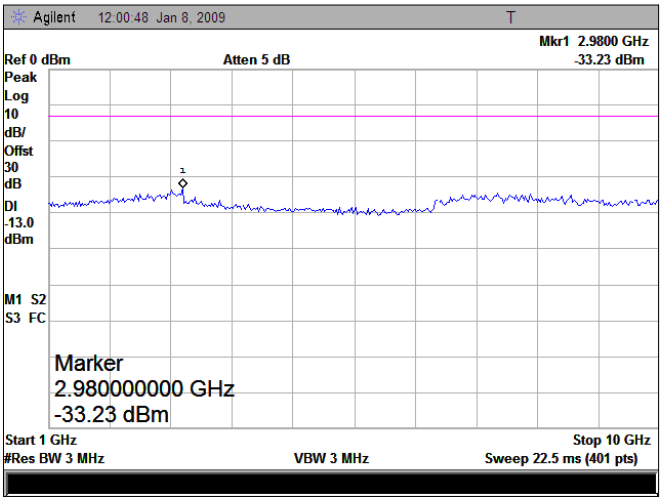
Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
WCDMA 850MHz	4132	826.4	---	Plot A.1/A.2	-13	PASS
	4175	835	---	Plot B.1/B.2		PASS
	4233	846.6	---	Plot C.1/C.2		PASS
WCDMA 1900MHz	9262	1852.4	---	Plot D1/D.2	-13	PASS
	9400	1880	---	Plot E.1/E.2		PASS
	9538	1907.6	---	Plot F.1/F.2		PASS

2. Test Plot for the Whole Measurement Frequency Range:

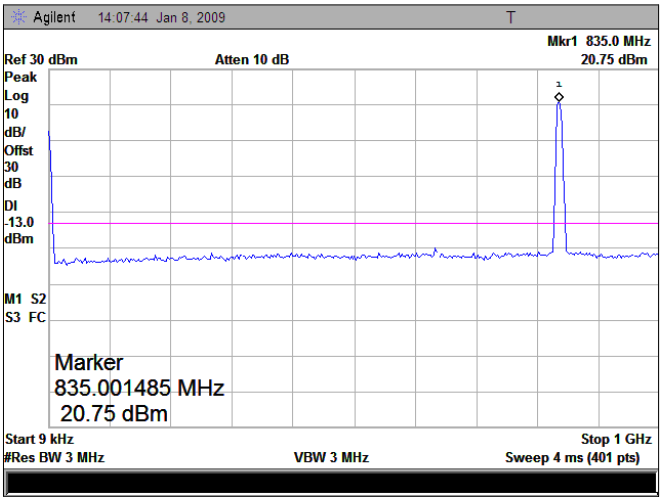
Note: the power of the EUT transmitting frequency should be ignored.



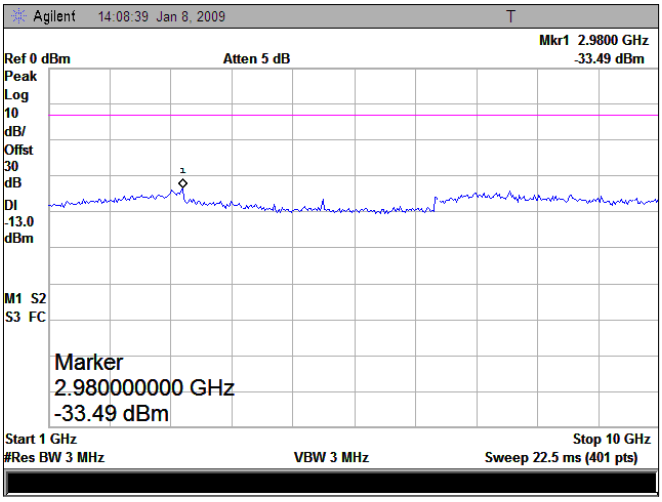
(Plot A.1: WCDMA 850MHz Channel = 4132, 30MHz to 3GHz)



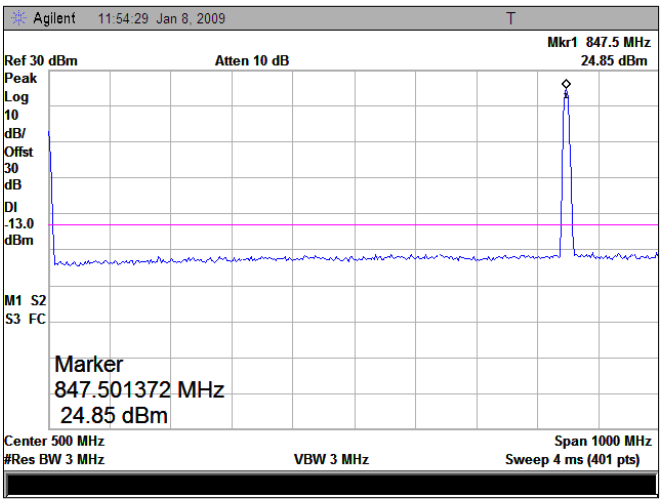
(Plot A.2: WCDMA 850MHz Channel = 4132, 3GHz to 20GHz)



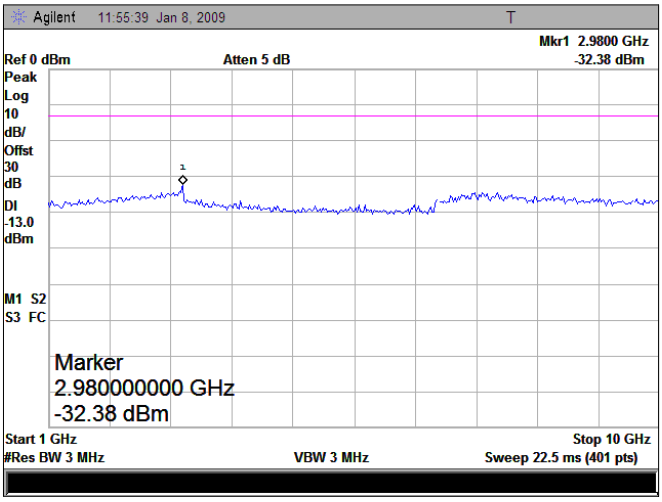
(Plot B.1: WCDMA 850MHz Channel = 4175, 30MHz to 3GHz)



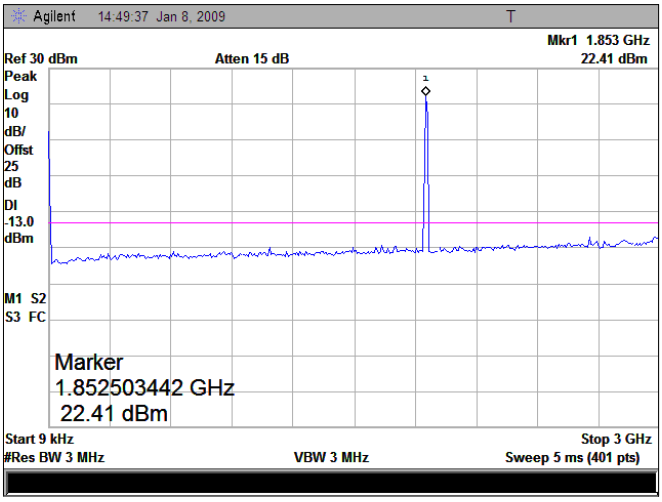
(Plot B.2: WCDMA 850MHz Channel =4175, 3GHz to 20GHz)



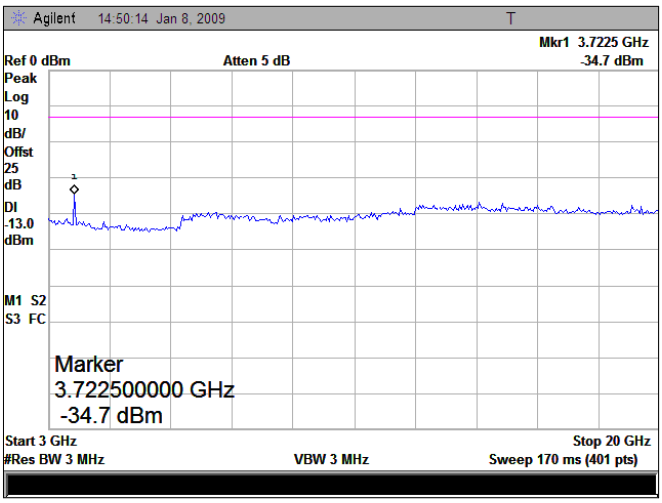
(Plot C.1: WCDMA 850MHz Channel =4233, 30MHz to 3GHz)



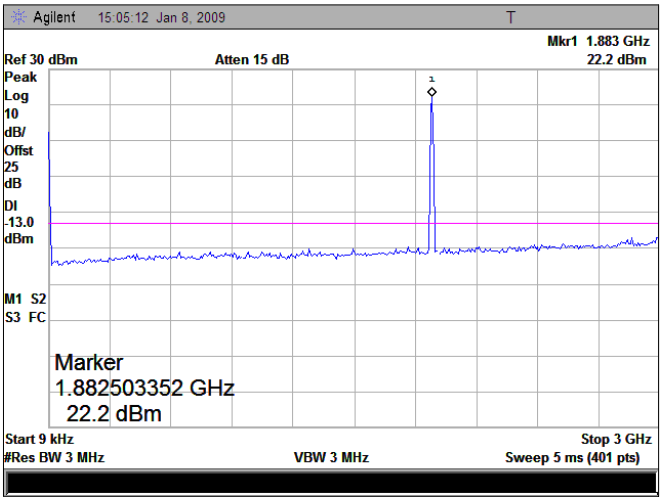
(Plot C.2: WCDMA 850MHz Channel = 4233, 3GHz to 20GHz)



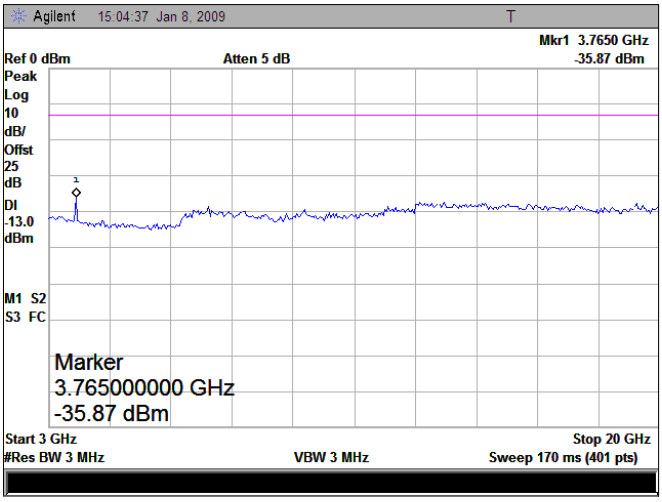
(Plot D.1: WCDMA 1900MHz Channel = 9262, 30MHz to 3GHz)



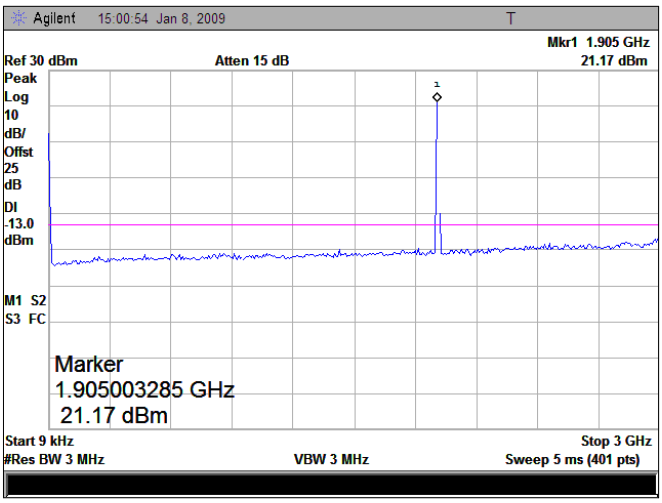
(Plot D.2: WCDMA 1900MHz Channel = 9262, 3GHz to 20GHz)



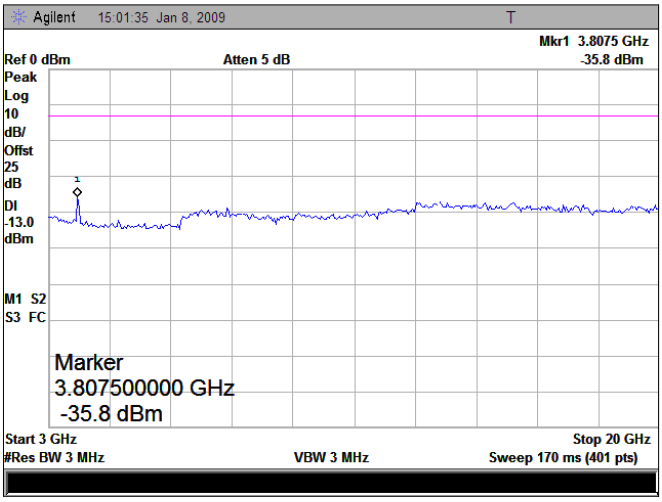
(Plot E.1: WCDMA 1900MHz Channel = 9400, 30MHz to 3GHz)



(Plot E.2: WCDMA 1900MHz Channel =9400, 3GHz to 20GHz)



(Plot F.1: WCDMA 1900MHz Channel =9538, 30MHz to 3GHz)



(Plot F.2: WCDMA 1900MHz Channel = 9538, 3GHz to 20GHz)

3.4 Occupied Bandwidth

3.4.1 Definition

According to FCC section 2.1049, The EUT was setup to maximum output power at its middle channel. The occupied bandwidth was measured sing a spectrum analyzer. The measurements are repeated for the middle channel. The EUT's occupied bandwidth is measured as the width of the signal between two points, one below the carrier center requency and one above the carrier frequency, outside of which all emissions are attenuated at least 26 dB elow the transmitter power. Plots of the EUT's occupied bandwidth are shown herein.

3.4.2 Test Description

See section 3.3.2 of this report.

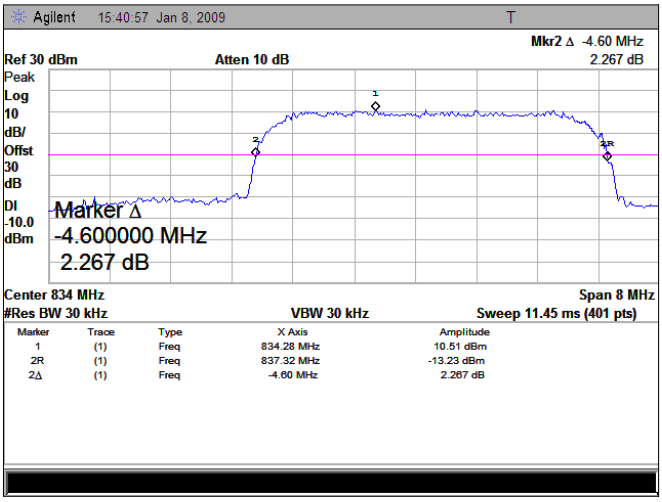
3.4.3 Test Verdict

Here the middle channels are tested to record the 26dB occupied bandwidth. The measurement is made according to FCC rules part 22 and 24

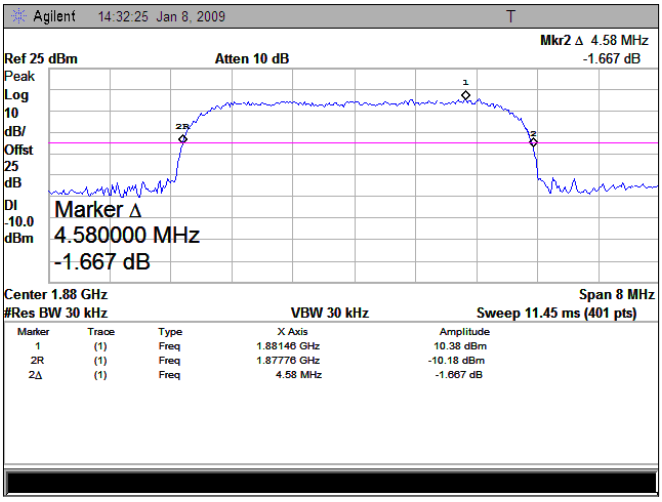
1. Test Verdict:

Band	Channel	Frequency (MHz)	Measured 26dB Occupied Bandwidth (MHz)	Refer to Plot
WCDMA 850MHz	4175	835	4.60	Plot A
WCDMA 1900MHz	9400	1880	4.58	Plot B

2. Test Plot:



(Plot A: WCDMA 850MHz Channel = 4175)



(Plot B: WCDMA 1900MHz Channel = 9400)

3.5 Band Edge

3.5.1 Requirement

According to FCC section 22.917(b) and FCC section 24.238(b), in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth (26dB emission bandwidth) of the fundamental emission of the transmitter may be employed.

3.5.2 Test Description

See section 3.3.2 of this report.

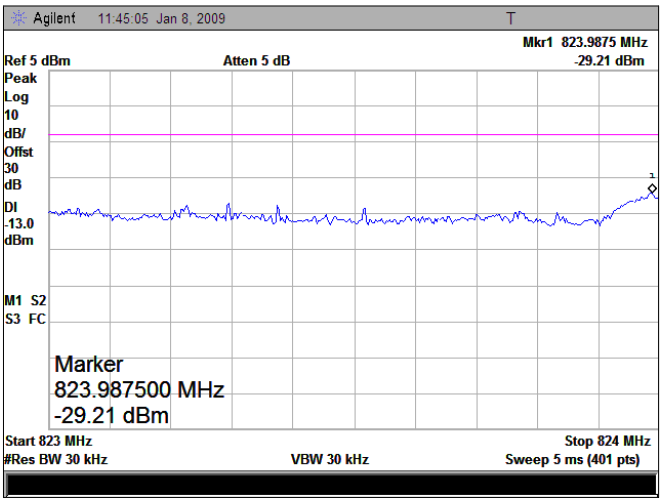
3.5.3 Test Result

The lowest and highest channels are tested to verify the band edge emissions.

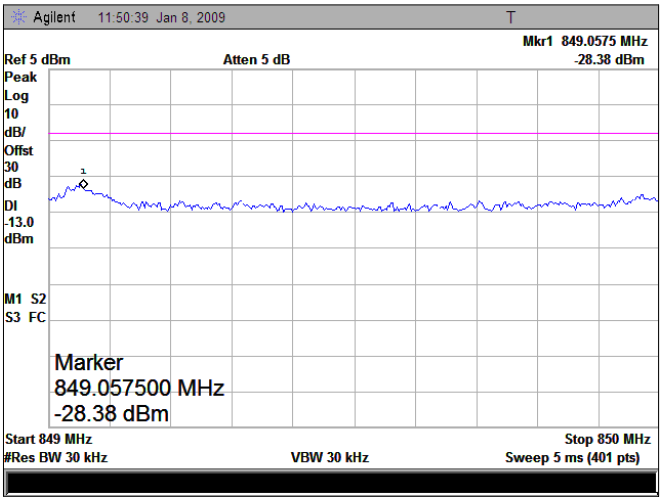
3. Test Verdict:

Band	Channel	Frequency (MHz)	Measured Max. Band Edge Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
WCDMA 850MHz	4132	823.98	-29.21	Plat A	-13	PASS
	4233	849.04	-28.38	Plot B		PASS
WCDMA 1900MHz	9262	1849.98	-30.32	Plat C	-13	PASS
	9538	1910.00	-28.37	Plot D		PASS

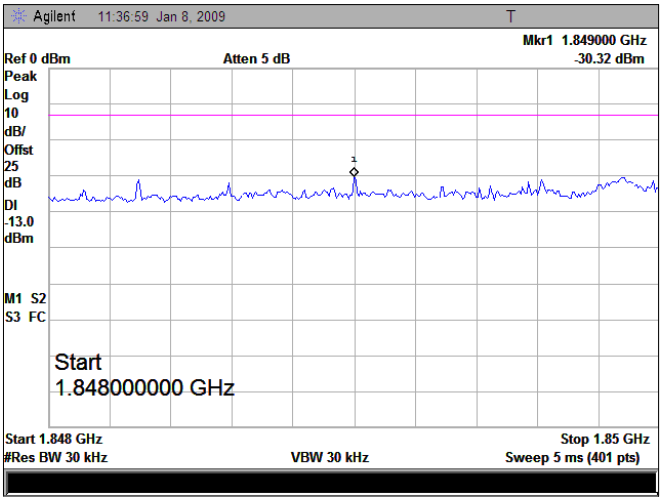
4. Test Plot:



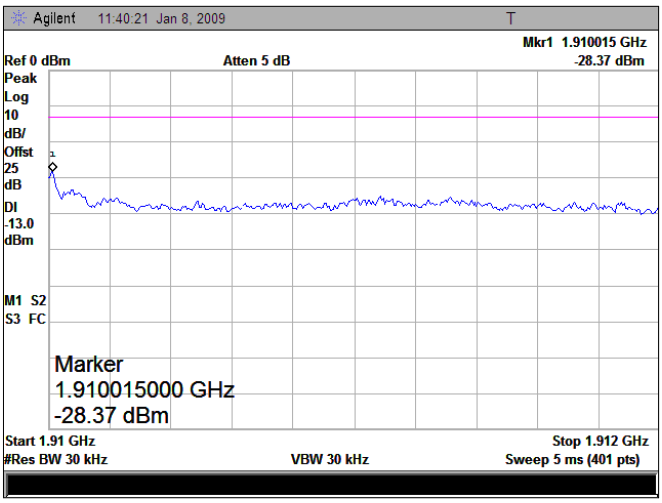
(Plot A: Channel = 4132)



(Plot B: Channel = 4233)



(Plot C: Channel = 9262)



(Plot D: Channel = 9538)

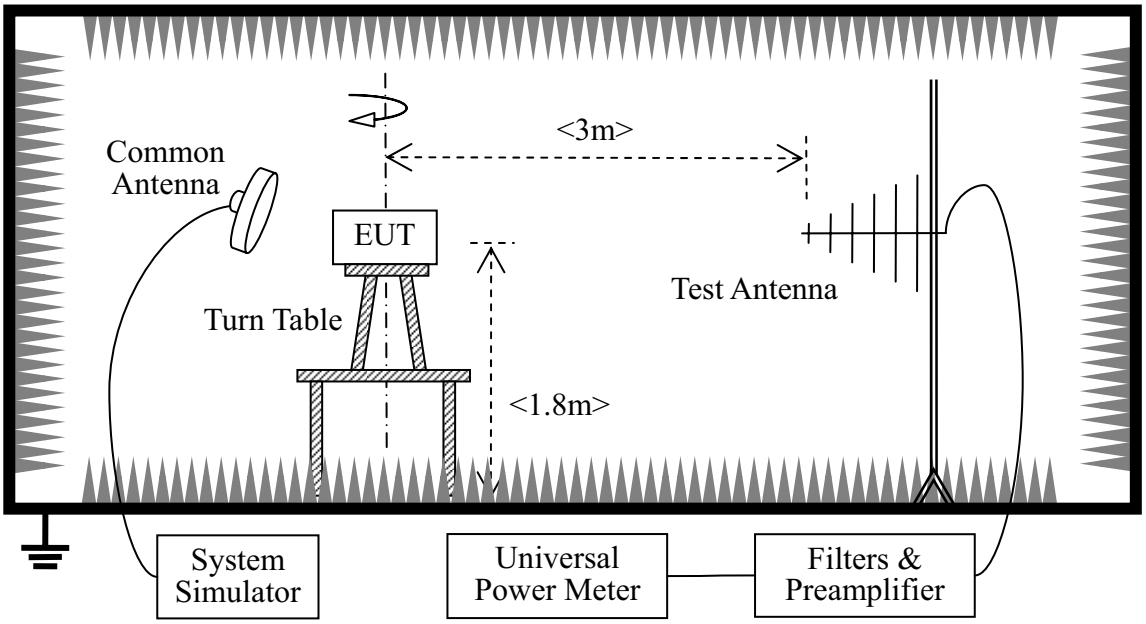
3.6 Transmitter Radiated Power (EIRP/ERP)

3.6.1 Requirement

According to FCC section 22.913, the mobile station is limited to 7 Watts e.i.r.p. peak power, and according to FCC section 24.232, the mobile station is limited to 2Watts e.i.r.p. peak power.

3.6.2 Test Description

1. Test Setup:



The EUT, which is powered by the Battery charged with the AC Adapter, is located in a 3m Full-Anechoic Chamber; the cable loss, air loss and so on of the site as factors are pre-calibrated using the "Substitution" method, and are calculated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power; and a call is established between the EUT and the SS via a Common Antenna.

The Test Antenna is a Bi-Log one (used for 30MHz to 1GHz) or a Horn one (used for above 3GHz), and it's located at the same height as the EUT. The Filters consists of Notch Filters and High Pass Filter.

2. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Agilent	E5515C	GB43130131	2008.09	1year
Universal Power Meter	Giga - tronics	8542C	1832005	2008.09	1year
Spectrum Analyzer	Agilent	E7405A	US44210471	2008.09	1year

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Full-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	2008.08	2year
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-274	2008.08	1year
Test Antenna - Horn	Schwarzbeck	BBHA 9120C	9120C-384	2008.08	1year

3.6.3 Test Result

The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested.

1. Test Verdict:

Band	Channel	Frequency (MHz)	Measured ERP		Limit		Verdict
			dBm	W	dBm	W	
WCDMA 850MHz	4132	826.4	19.62	0.092	38.5	7	PASS
	4175	835	19.23	0.084			PASS
	4233	846.6	21.83	0.152			PASS
WCDMA 1900MHz	9262	1852.4	20.52	0.113	33	2	PASS
	9400	1880	19.35	0.086			PASS
	9538	1907.6	19.86	0.097			PASS

Note: The measured output power was calculated by the reading of the Power Meter and calibration

3.7 Radiated Out of Band Emissions

3.7.1 Requirement

According to FCC section 22.917(a) and FCC section 24.238(a), the power of any emission 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. This calculated to be -13dBm.

3.7.2 Test Description

See section 3.6.2 of this report.

3.7.3 Test Result

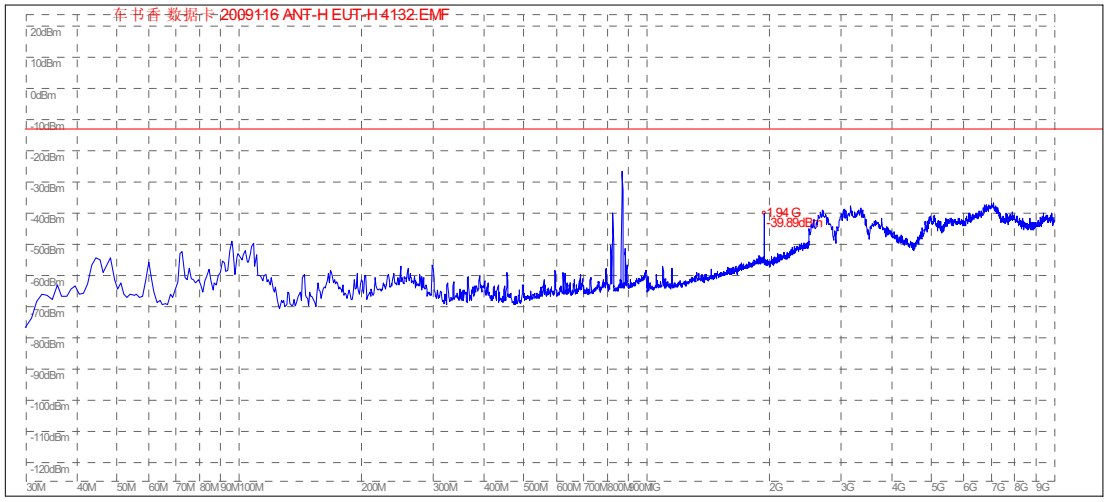
The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested to verify the out of band emissions.

1. Test Verdict:

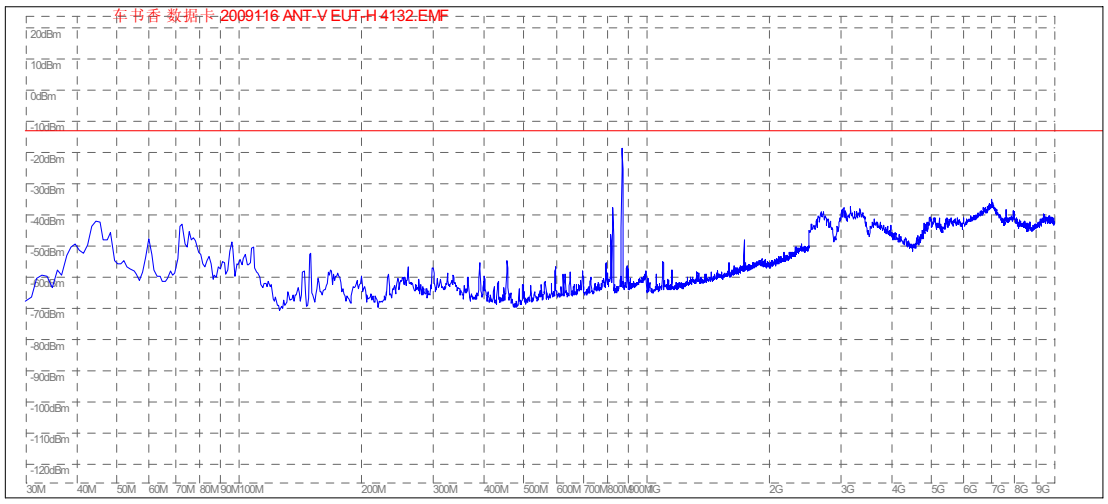
Brand	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)		Refer to Plot	Limit (dBm)	Verdict
			Test Antenna Horizontal	Test Antenna Vertical			
WCDMA 850MHz	4132	826.4	< -25	< -25	Plot A.1/A.2	-13	PASS
	4175	835	< -25	< -25	Plot B.1/B.2		PASS
	4233	846.6	< -25	< -25	Plot C.1/C.2		PASS
WCDMA 1900MHz	9262	1852.4	< -25	< -25	Plot D.1/D.2	-13	PASS
	9400	1880	< -25	< -25	Plot E.1/E.2		PASS
	9538	1907.6	< -25	< -25	Plot F.1/F.2		PASS

2. Test Plot for the Whole Measurement Frequency Range:

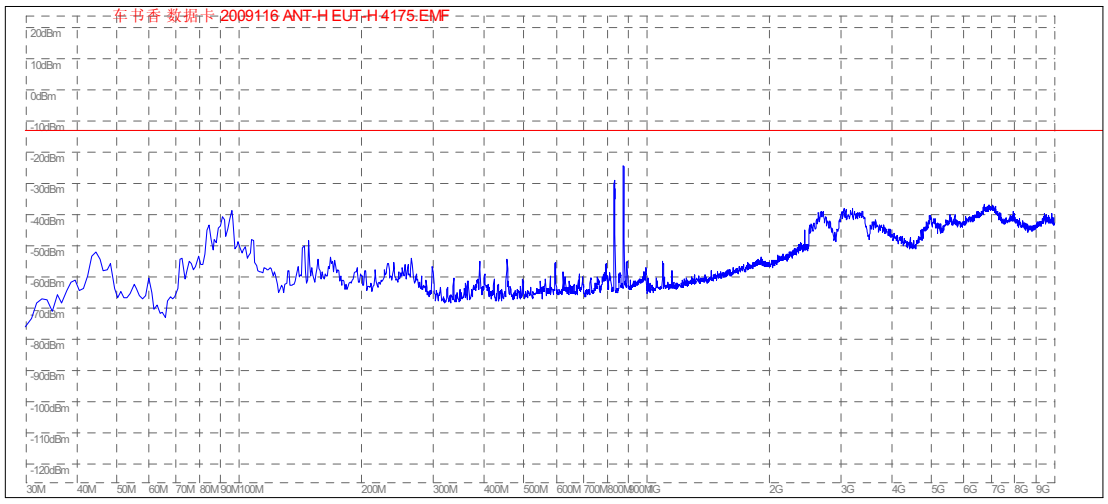
Note: the power of the EUT transmitting frequency should be ignored.



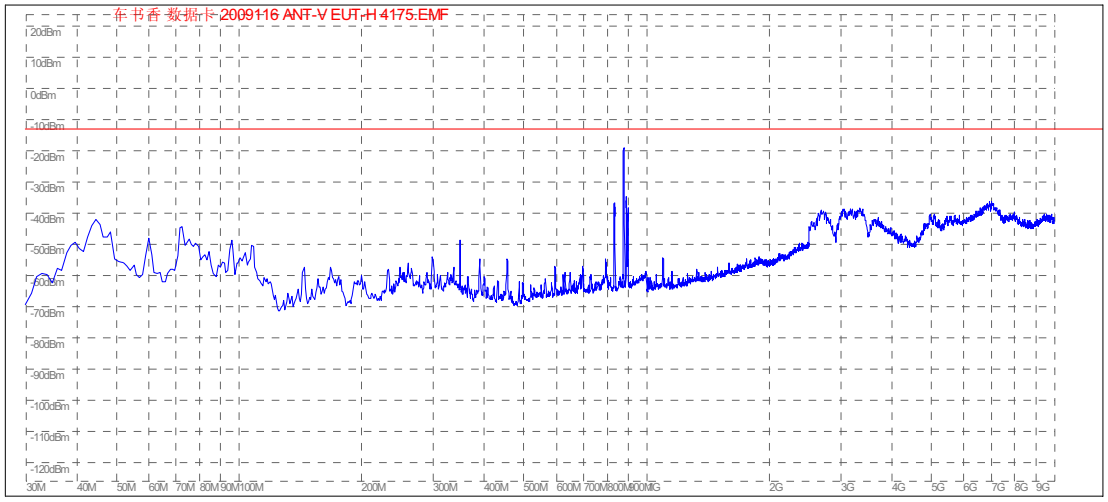
(Plot A.1: WCDMA 850MHz Channel = 4132, Test Antenna Horizontal)



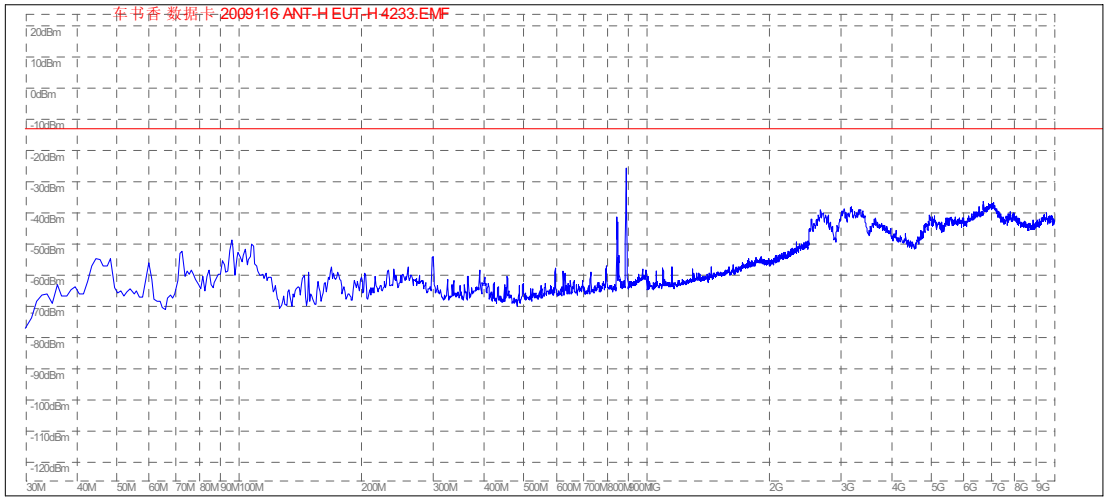
(Plot A.2: WCDMA 850MHz Channel = 4132, Test Antenna Vertical)



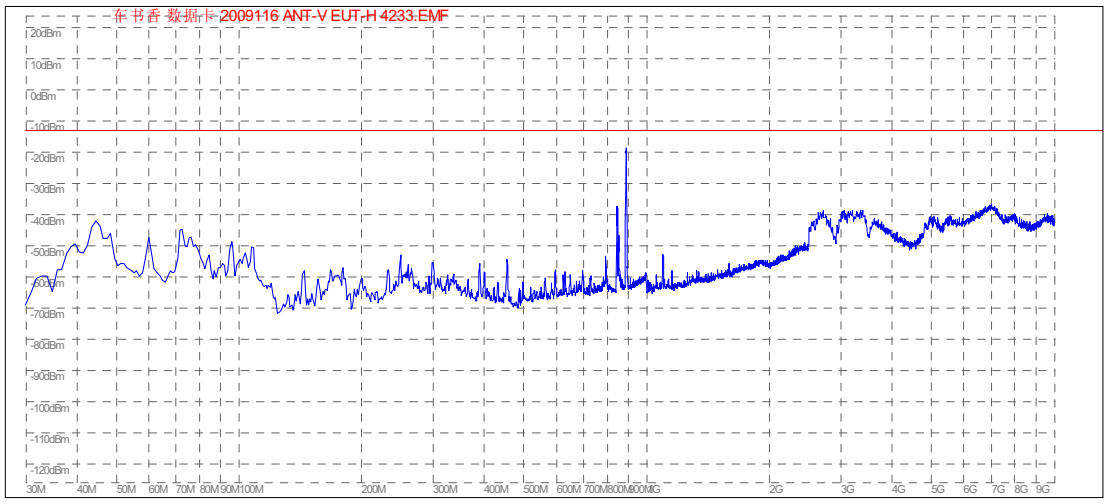
(Plot B.1: WCDMA 850MHz Channel = 4175, Test Antenna Horizontal)



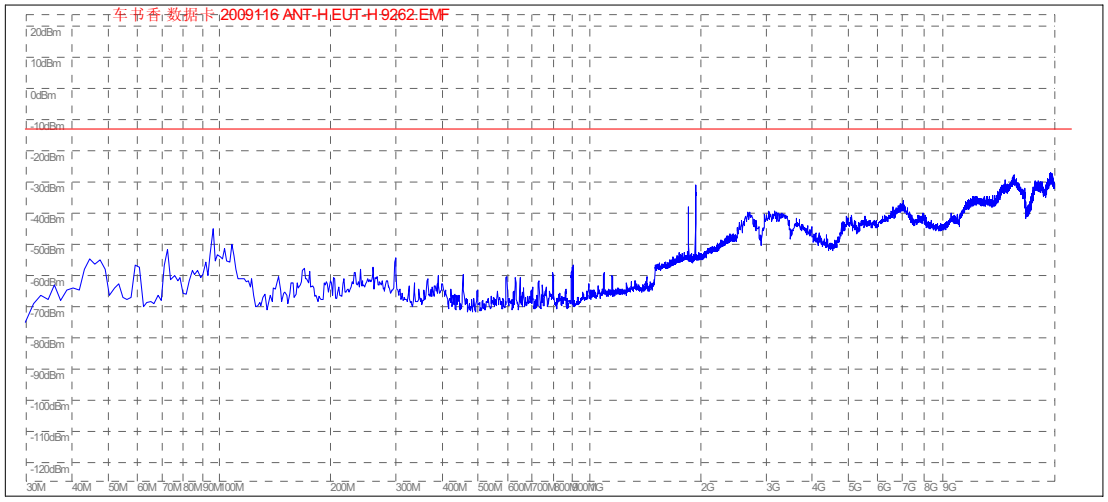
(Plot B.2: WCDMA 850MHz Channel = 4175, Test Antenna Vertical)



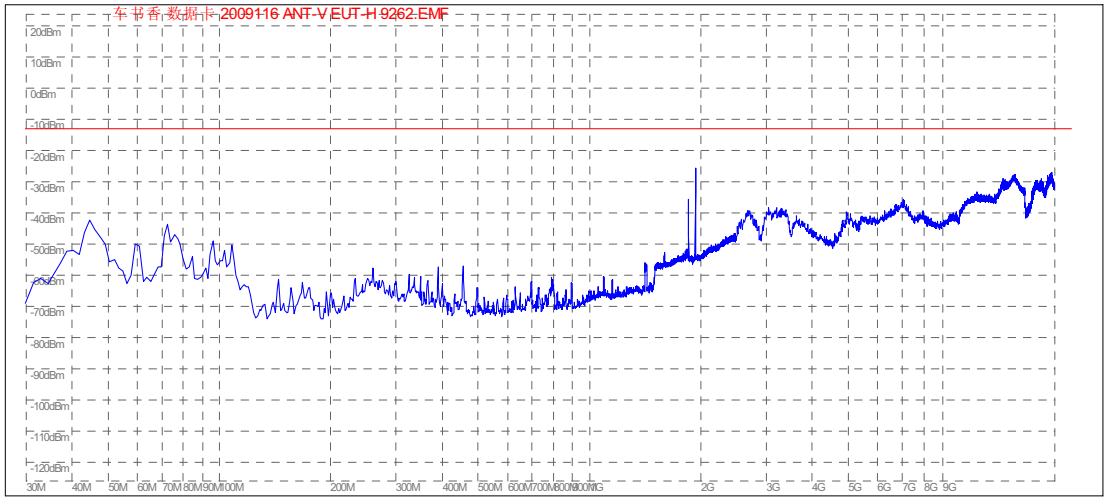
(Plot C.1: WCDMA 850MHz Channel = 4233, Test Antenna Horizontal)



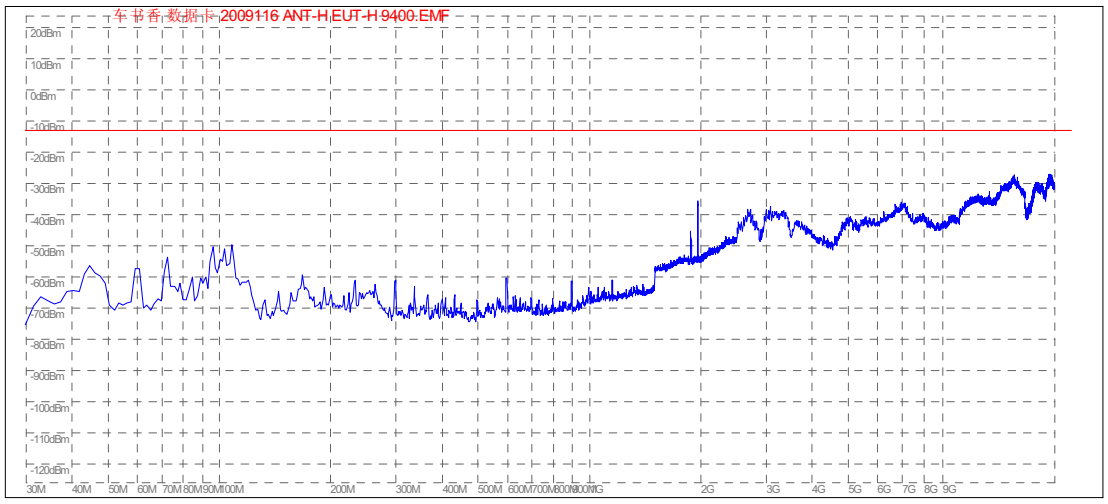
(Plot C.2: WCDMA 850MHz Channel = 4233, Test Antenna Vertical)



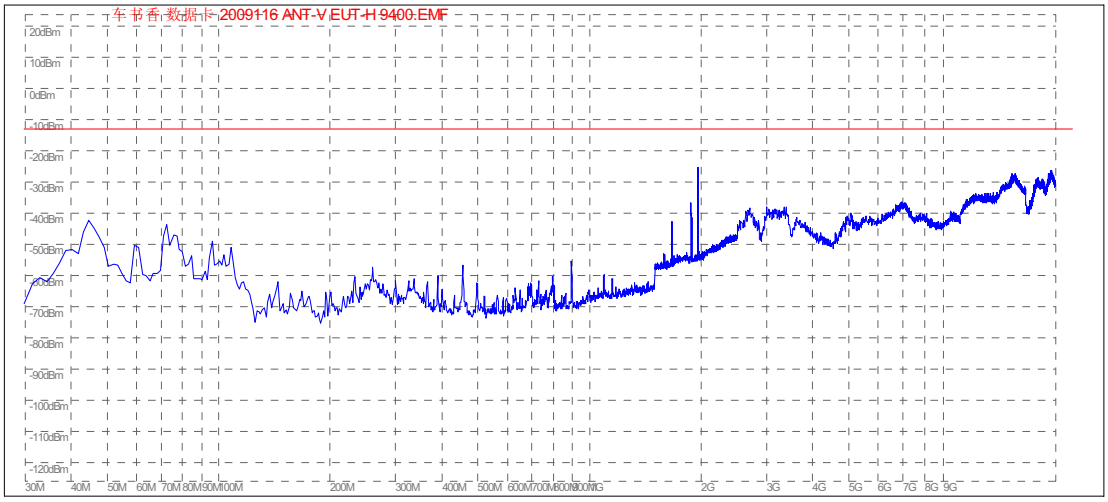
(Plot D.1: WCDMA 1900MHz Channel = 9262, Test Antenna Horizontal)



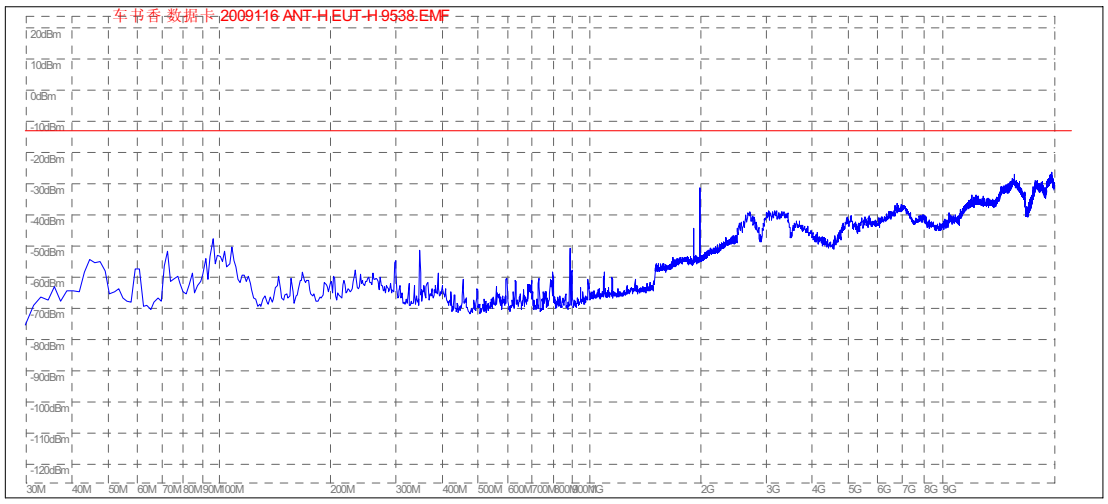
(Plot D.2: WCDMA 1900MHz Channel = 9262, Test Antenna Vertical)



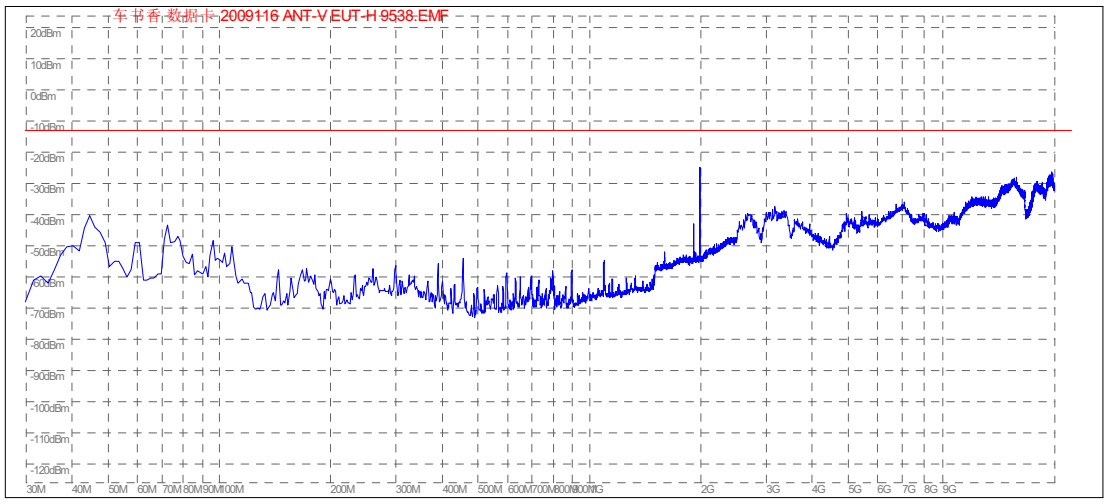
(Plot E.1: WCDMA 1900MHz Channel = 9400, Test Antenna Horizontal)



(Plot E.2: WCDMA 1900MHz Channel = 9400, Test Antenna Vertical)



(Plot F.1: WCDMA 1900MHz Channel = 9538, Test Antenna Horizontal)



(Plot F.2: WCDMA 1900MHz Channel = 9538, Test Antenna Vertical)

** END OF REPORT **