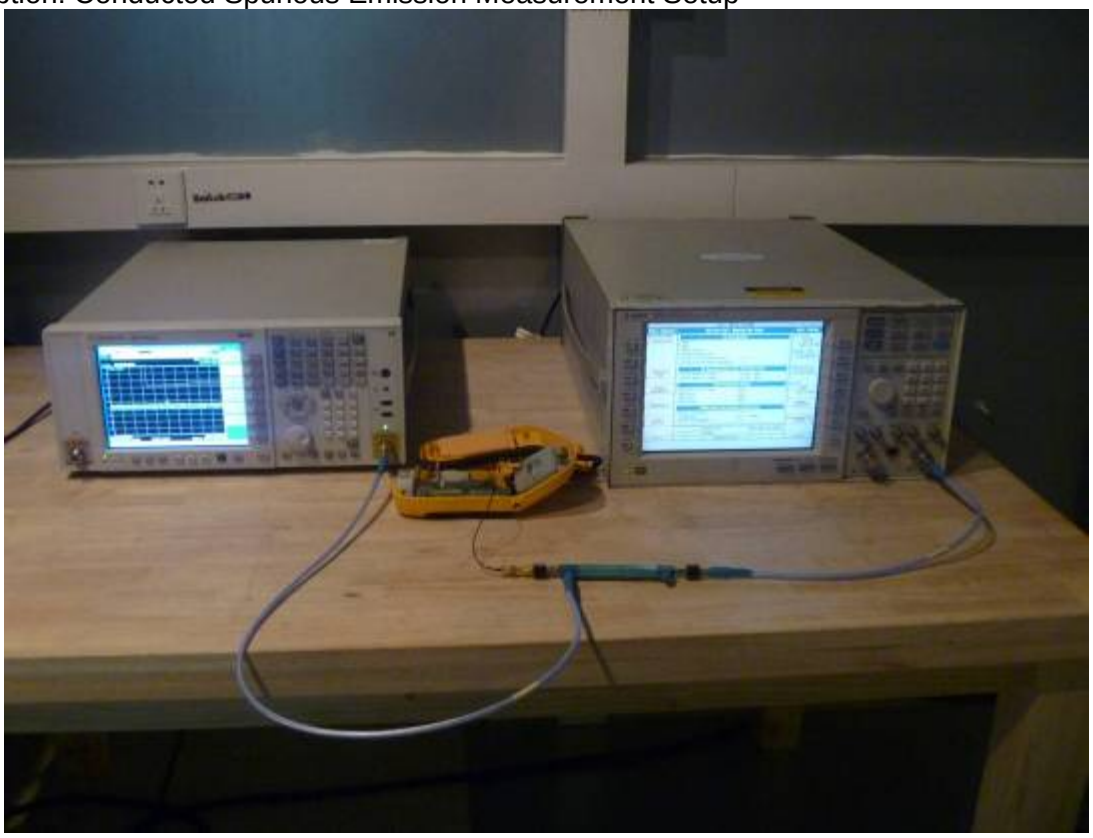
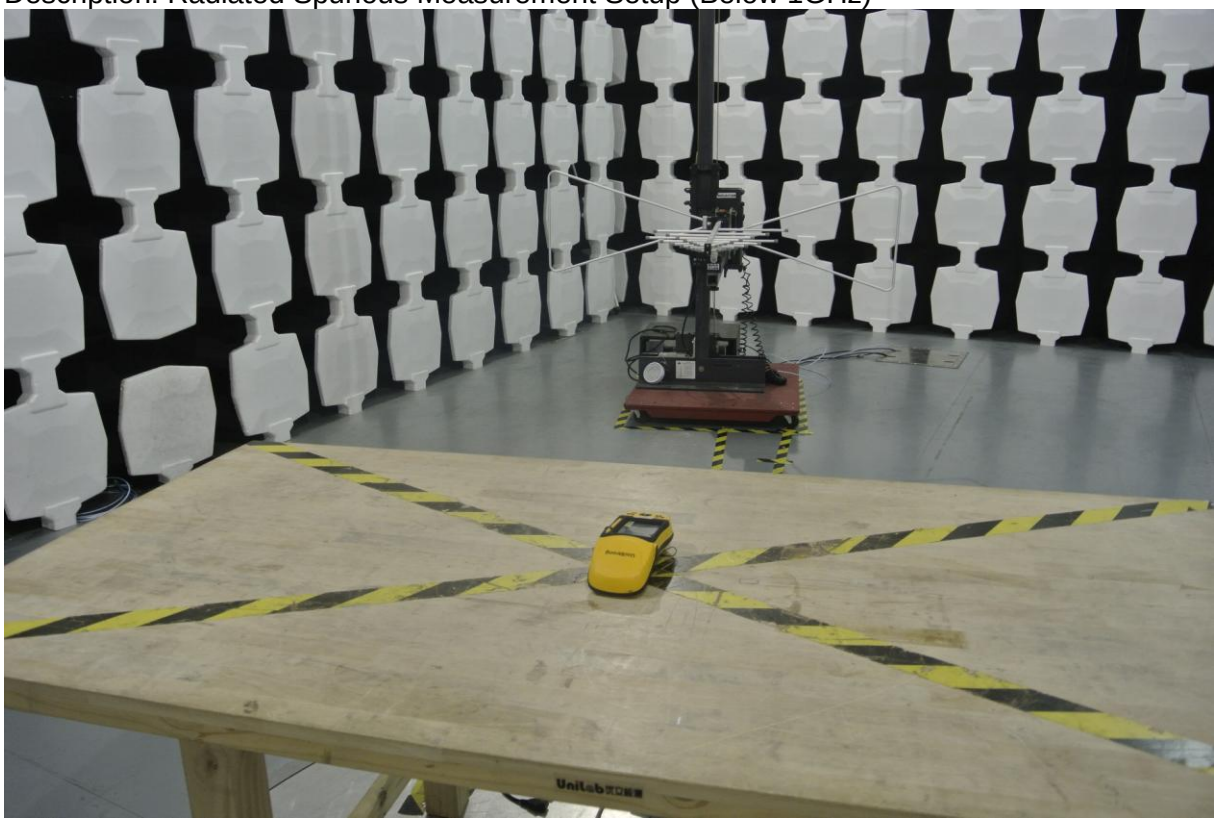
7.7. Test Photograph

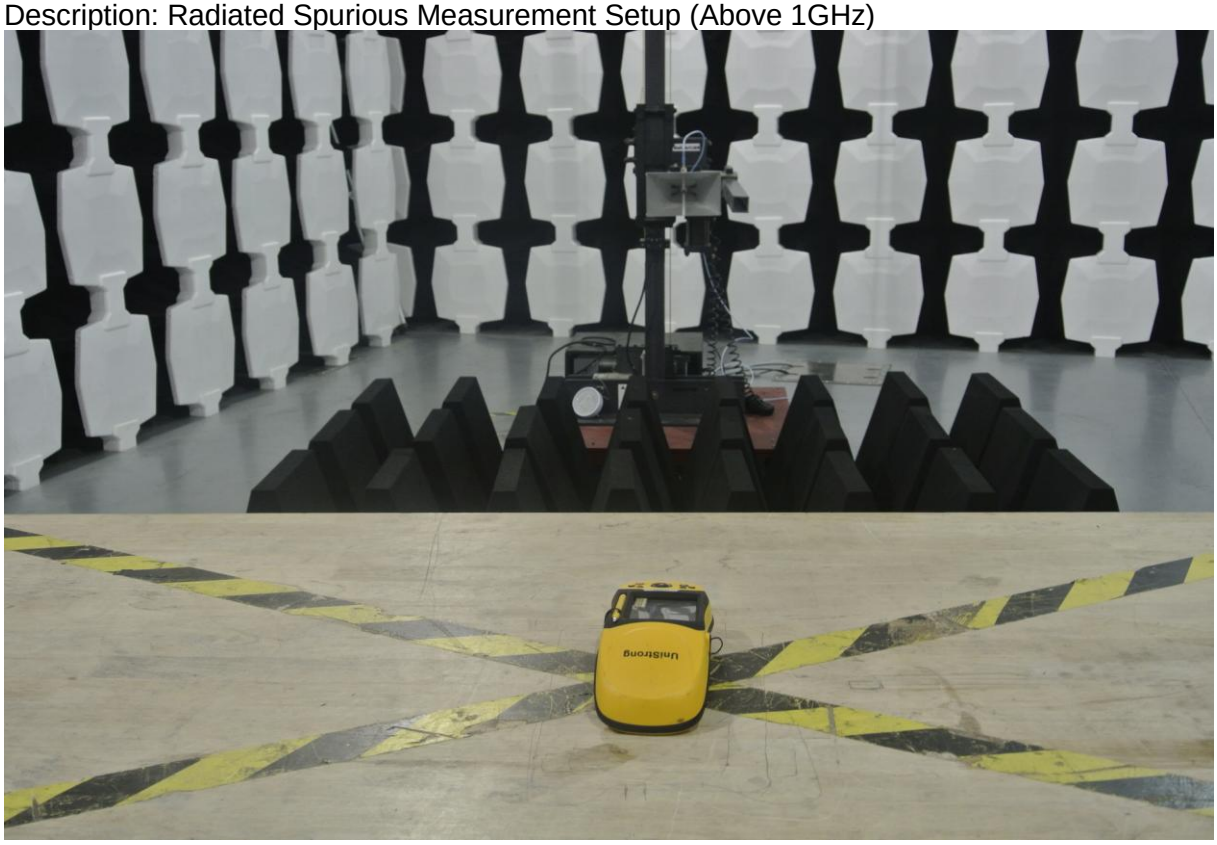
Description: Conducted Spurious Emission Measurement Setup



Description: Radiated Spurious Measurement Setup (Below 1GHz)



Description: Radiated Spurious Measurement Setup (Above 1GHz)

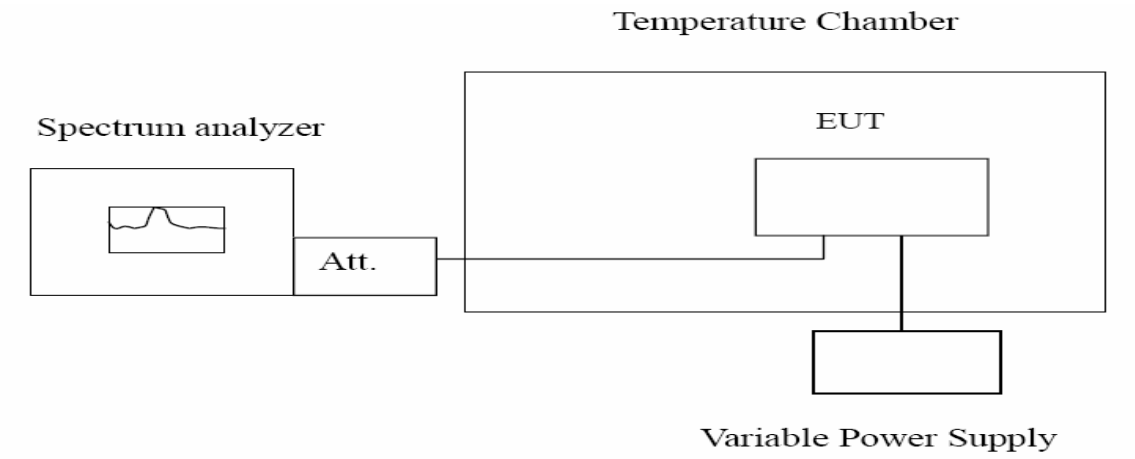


8. Frequency Stability Under Temperature & Voltage Variations

8.1. Test Equipment

Instrument	Manufacturer	Model	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	N9038A	MY51210142	2013.09.27
Radio Communication Tester	Agilent	E5515C	GB46581718	2013.10.25
DC Power Supply	Agilent	6612C	MY43002989	2013.01.17
DC Power Supply	ITECH	IT5612	01600210661201014	2013.11.16
Temperature Chamber	WEISS	DU/20/40	58226017340050	2013.12.04

8.2. Test Setup



8.3. Limit

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Limit	< ±2.5 ppm

8.4. Test Procedure

Frequency Stability Under Temperature Variations:
The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure
EUT 20℃ operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30℃. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10℃ increased per stage until the highest temperature of +80℃ reached.
Frequency Stability Under Voltage Variations:
Set chamber temperature to 20℃. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.
Reduce the input voltage to specify extreme voltage variation (±15%) and endpoint, record the maximum frequency change.

8.5. Uncertainty

The measurement uncertainty is defined as±10 Hz.

8.6. Test Result

GPRS850

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-20	836.40	-27.92	±2091
-10	836.40	-23.41	±2091
0	836.40	-13.23	±2091
10	836.40	-12.42	±2091
20	836.40	-19.61	±2091
30	836.40	-34.32	±2091
40	836.40	-32.42	±2091
50	836.40	-44.74	±2091
60	836.40	-38.93	±2091

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
3.6	836.40	-16.80	±2091
3.7	836.40	-21.24	±2091
4.2	836.40	-31.79	±2091

GPRS1900

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-20	1880.00	-25.89	±4700
-10	1880.00	-26.54	±4700
0	1880.00	-22.48	±4700
10	1880.00	-28.53	±4700
20	1880.00	-32.12	±4700
30	1880.00	-44.31	±4700
40	1880.00	-56.21	±4700
50	1880.00	-51.75	±4700
60	1880.00	-59.89	±4700

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
3.6	1880.00	-11.26	±4700
3.7	1880.00	-19.17	±4700
4.2	1880.00	-24.17	±4700

EDGE850

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-20	836.40	-26.81	±2091
-10	836.40	-24.32	±2091
0	836.40	-15.44	±2091
10	836.40	-11.85	±2091
20	836.40	-21.43	±2091
30	836.40	-33.32	±2091
40	836.40	-31.51	±2091
50	836.40	-43.63	±2091
60	836.40	-37.86	±2091

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
3.6	836.40	-15.84	±2091
3.7	836.40	-19.42	±2091
4.2	836.40	-32.74	±2091

EDGE1900

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-20	1880.00	-24.67	±4700
-10	1880.00	-25.58	±4700
0	1880.00	-23.56	±4700
10	1880.00	-27.48	±4700
20	1880.00	-31.34	±4700
30	1880.00	-46.56	±4700
40	1880.00	-54.27	±4700
50	1880.00	-53.67	±4700
60	1880.00	-58.76	±4700

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
3.6	1880.00	-13.27	±4700
3.7	1880.00	-18.32	±4700
4.2	1880.00	-25.37	±4700

WCDMA Band V

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-20	836.40	16.30	±2091
-10	836.40	-17.21	±2091
0	836.40	-18.81	±2091
10	836.40	-16.82	±2091
20	836.40	-17.64	±2091
30	836.40	15.70	±2091
40	836.40	19.21	±2091
50	836.40	22.71	±2091
60	836.40	-31.31	±2091

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
3.6	836.40	17.21	±2091
3.7	836.40	-16.62	±2091
4.2	836.40	29.46	±2091

8.7. Test Photograph

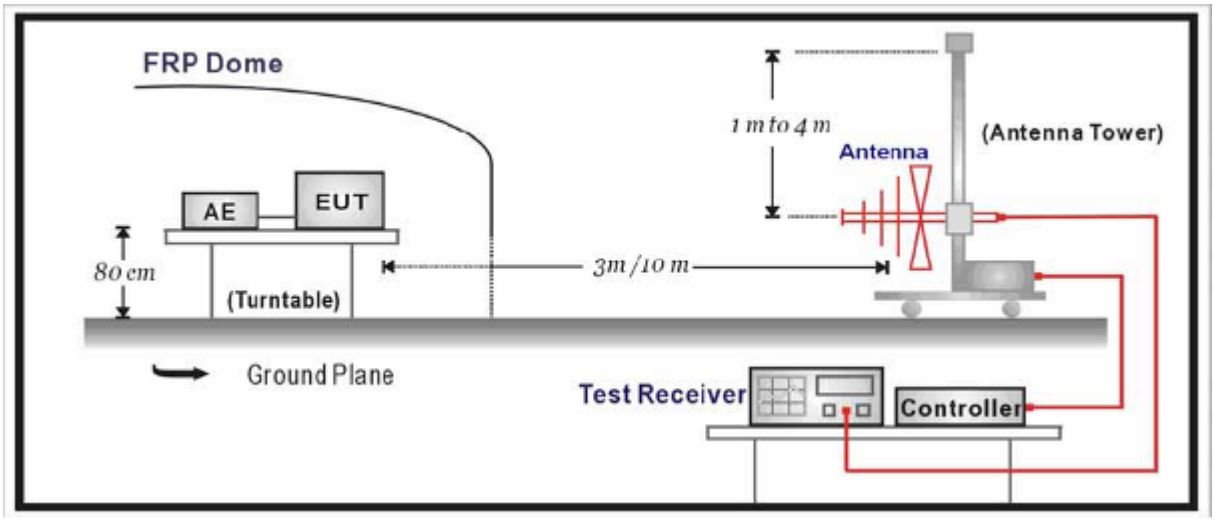
9.Receiver Spurious Emission for RSS 132/133

9.1. Test Equipment

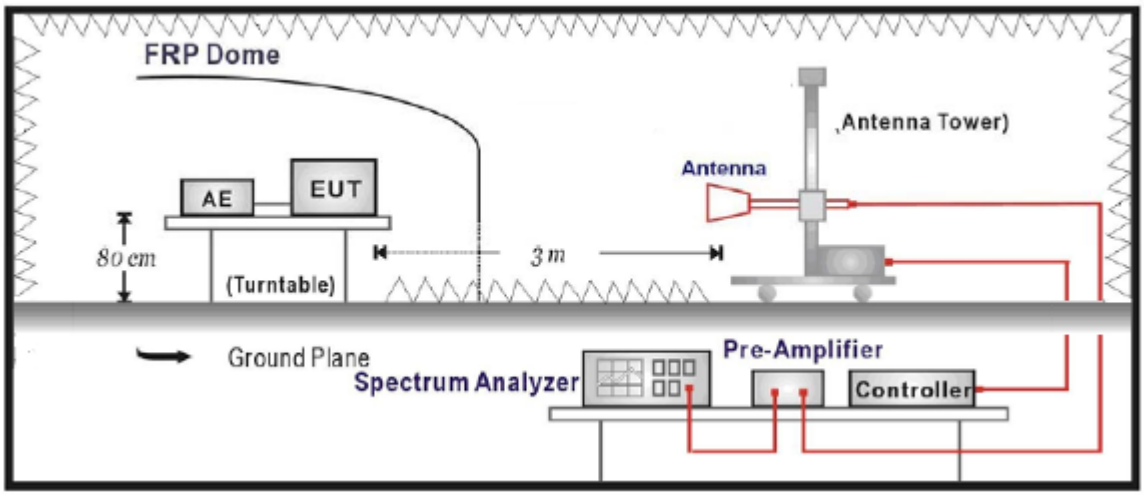
Instrument	Manufacturer	Model	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	N9038A	MY51210142	2013.09.27
Radio Communication Tester	Agilent	E5515C	GB46581718	2013.10.25
Signal Generator	Agilent	N5183A	MY50140938	2013.10.08
Preamplifier	CEM	EM30180	3008A0245	2014.03.01
DC Power Supply	Agilent	6612C	MY43002989	2014.03.04
Bilog Antenna	Schwarzbeck	VULB9160	9160-3316	2013.09.19
VHF-UHF-Biconical Antenna	Schwarzbeck	VUBA9117	9117-263	2013.09.19
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-942	2013.09.19
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-943	2013.09.19

9.2. Test Setup

Below 1GHz Test Setup



Above 1GHz Test Setup



9.3. Limit

According to Standard RSS132/133 refer to RSS-Gen Issu 3.

Field Strength micro-volts/m at 3 meters		
Frequency (MHz)	Distance (m)	Level (dBuV/m)
30 - 88	3	40
88 - 216	3	43.5
216 - 960	3	46
Above 960	3	54

Note 1: The lower limit shall apply at the transition frequency.
Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
Note 3: E field strength (dBuV/m) = 20 log E field strength (uV/m).

9.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 10 meters. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated on radiated measurement. On any frequency or frequencies below or equal to 1000 MHz, the radiated limits shown are based on

measuring equipment employing a quasi-peak detector function and above 100MHz, the radiated limits shown are based measuring equipment employing an average detector function.

When average radiated emission measurement are included emission measurement Above 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

For class A, the measurement distance between the EUT and antenna is 10 meters for below 1GHz and above 1GHz.

For class B, the measurement distance between the EUT and antenna is 10 meters for below 1GHz and 3 meters for above 1GHz.

The bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

Note: When measurement above 1GHz, the horn antenna will bend down a little (as horn antenna have the narrow beamwidth) in order to find the maximum emission of EUT.

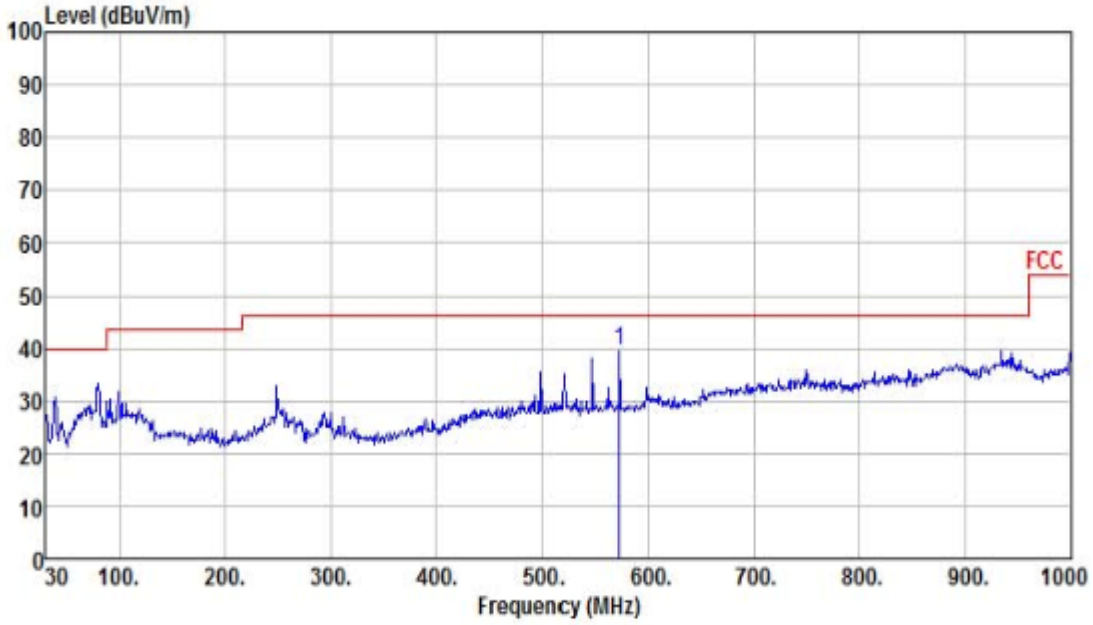
9.5. Uncertainty

The measurement uncertainty is defined as 3.1 dB for Radiated Power Measurement.

9.6. Test Result

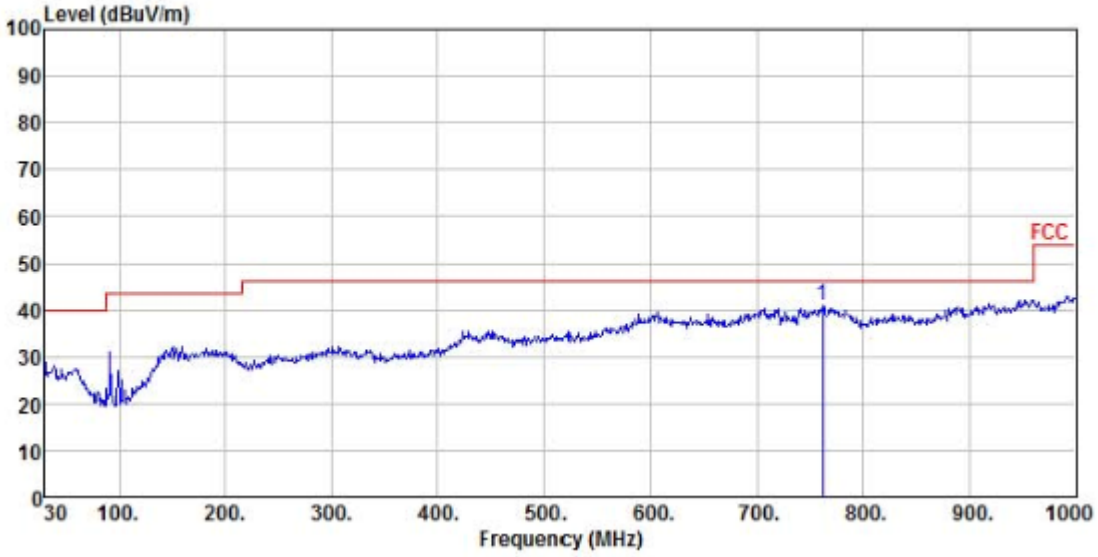
No significant emissions measurable. Plots reported here represent the worse case emissions.

Prob： VULB9160(30M-1G)	Polarity: Horizontal
GSM 850 Idle	



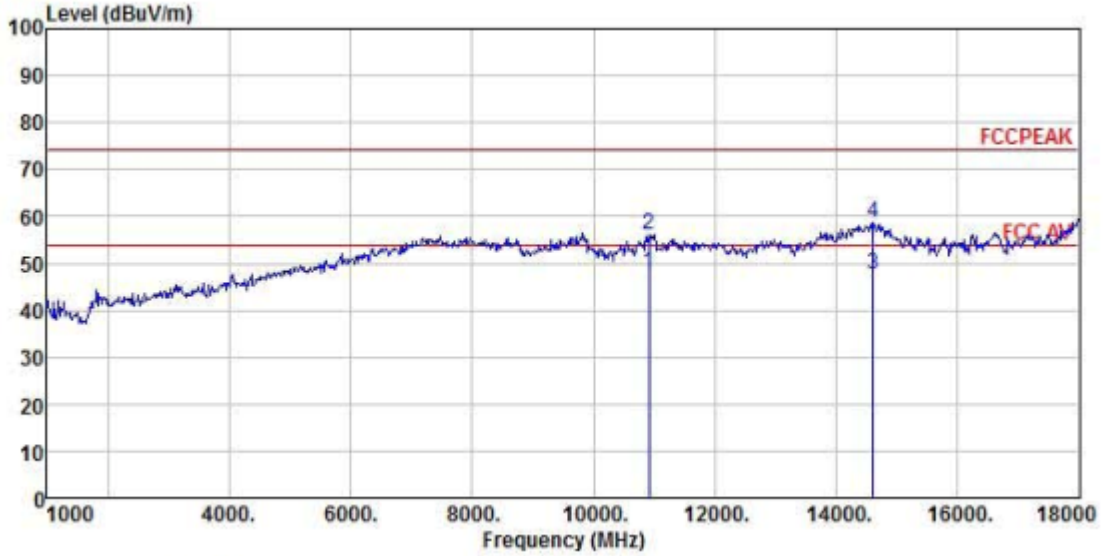
NO.	Freq	Read Level	Atenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
1	572.23 MHz	8.09 dBuV	28.27 dB/m	3.23 dB	0.00 dB	39.59 dBuV/m	46.00 dBuV/m	-6.41 dB	QP

Prob： VULB9160(30M-1G)	Polarity: Vertical
GSM 850 Idle	



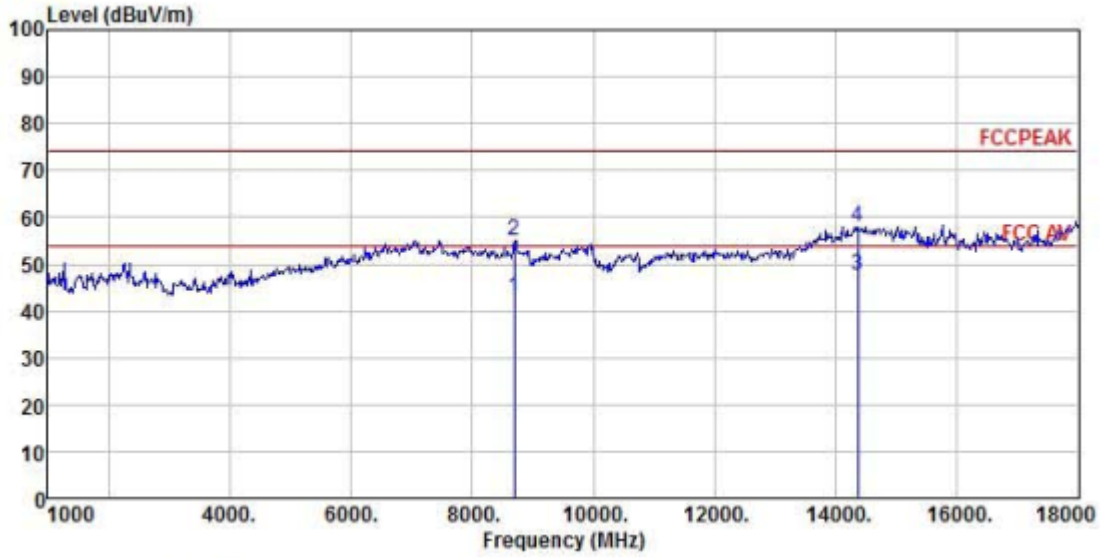
NO.	Freq	Read Level	Atenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
1	761.38 MHz	-3.15 dBuV	40.33 dB/m	3.70 dB	0.00 dB	40.88 dBuV/m	46.00 dBuV/m	-5.12 dB	QP

Prob： BBHA9120D(1G-18G)	Polarity: Horizontal
GSM 850 Idle	



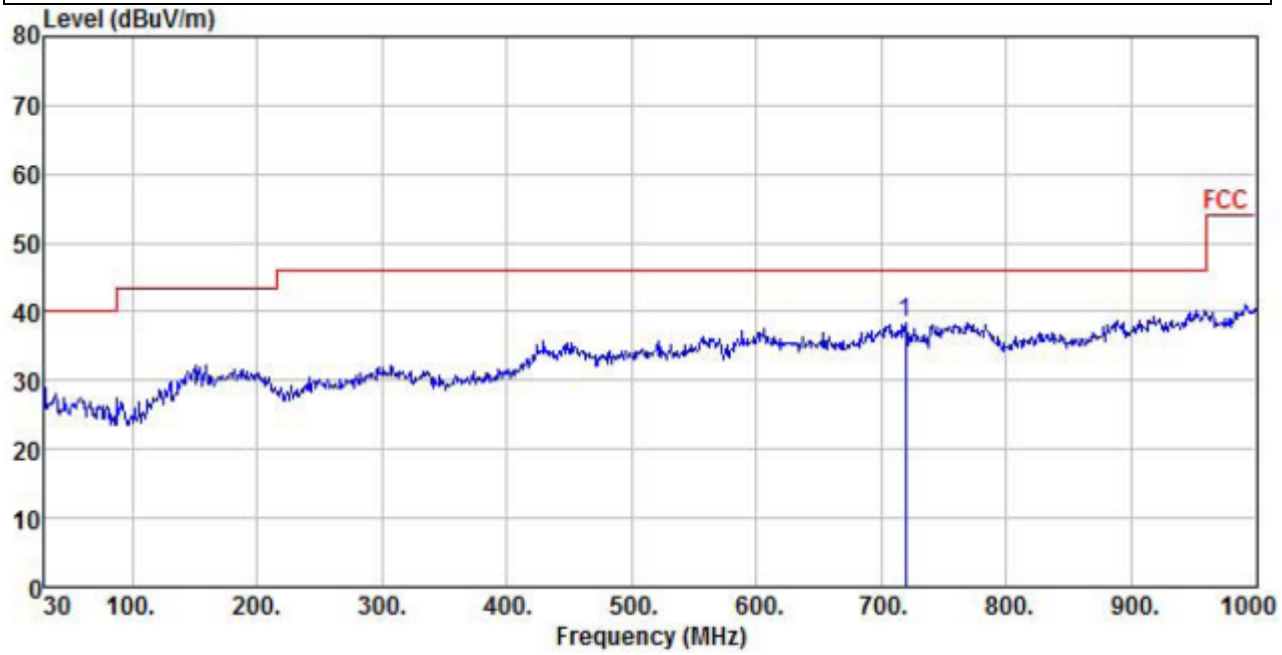
NO.	Freq	Read Level	Atenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
1	10911 MHz	39.09 dBuV	40.28 dB/m	15.65 dB	38.94 dB	48.07 dBuV/m	74.00 dBuV/m	-17.92 dB	Peak
2	10911 MHz	20.08 dBuV	40.28 dB/m	15.65 dB	38.94 dB	37.07 dBuV/m	54.00 dBuV/m	-16.93 dB	AV
3	14600 MHz	14.54 dBuV	42.43 dB/m	18.66 dB	38.11 dB	37.52 dBuV/m	54.00 dBuV/m	-16.48 dB	AV
4	14600 MHz	35.55 dBuV	42.43 dB/m	18.66 dB	38.11 dB	58.53 dBuV/m	74.00 dBuV/m	-15.47 dB	Peak

Prob ： BBHA9120D(1G-18G)	Polarity: Vertical
GSM 850 Idle	



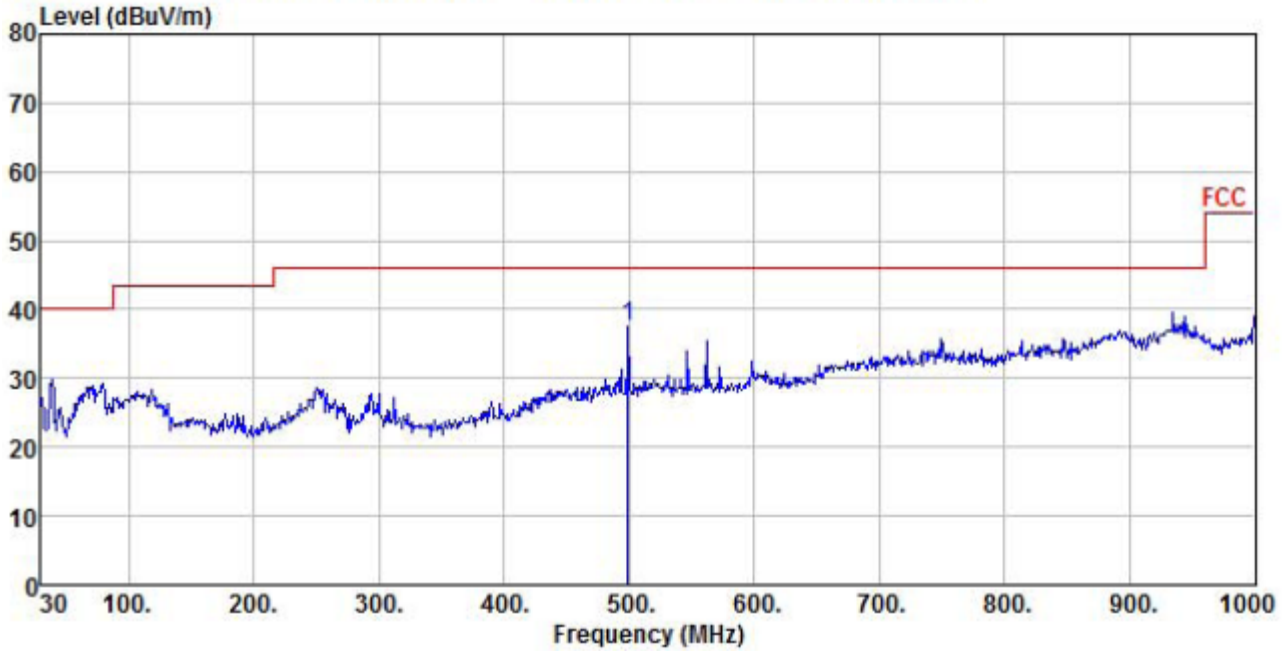
NO.	Freq	Read Level	Atenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
1	8701 MHz	45.40 dBuV	36.90 dB/m	13.40 dB	40.77 dB	54.93 dBuV/m	74.00 dBuV/m	-19.07 dB	Peak
2	8701 MHz	23.38 dBuV	36.90 dB/m	13.40 dB	40.77 dB	32.91 dBuV/m	54.00 dBuV/m	-21.09 dB	AV
3	14362 MHz	14.58 dBuV	42.43 dB/m	19.06 dB	38.34 dB	37.73 dBuV/m	54.00 dBuV/m	-16.27 dB	AV
4	14362 MHz	34.86 dBuV	42.43 dB/m	19.06 dB	38.34 dB	58.01 dBuV/m	74.00 dBuV/m	-15.99 dB	Peak

Prob ： VULB9160(30M-1G)	Polarity: Horizontal
EDGE 850 Idle	



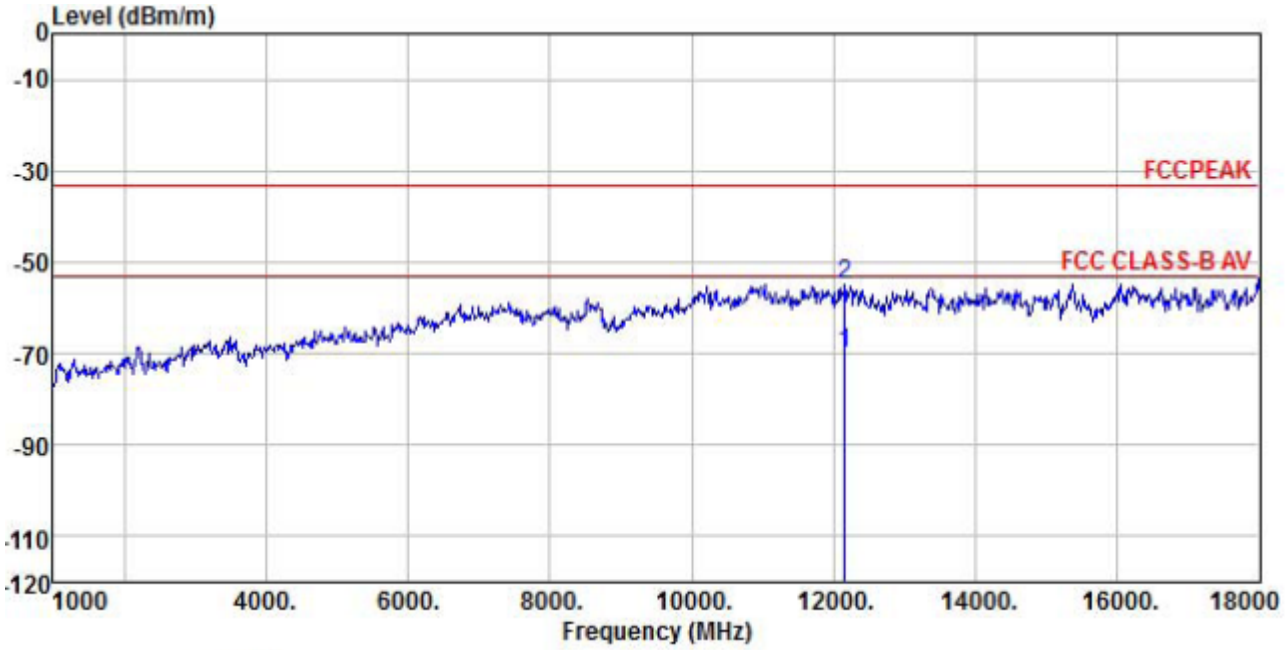
NO.	Freq	Read Level	Atenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
1	719.67 MHz	-4.03 dBuV	38.58 dB/m	3.70 dB	0.00 dB	38.25dB uV/m	46.00 dBuV/m	-7.75 dB	QP

Prob ： VULB9160(30M-1G)	Polarity: Vertical
EDGE 850 Idle	



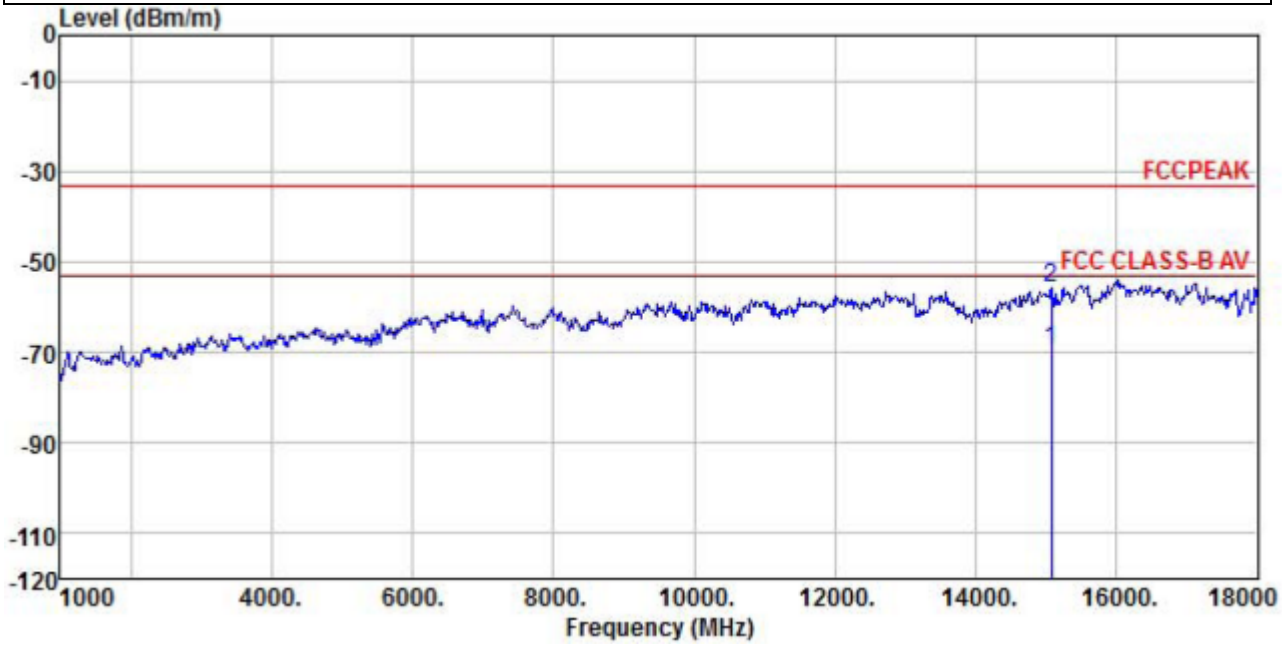
NO.	Freq	Read Level	Atenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
1	499.48 MHz	5.53 dBuV	28.79 dB/m	3.03 dB	0.00 dB	37.35 dBuV/m	46.00 dBuV/m	-8.65 dB	QP

Prob： BBHA9120D(1G-18G)	Polarity: Horizontal
EDGE 850 Idle	



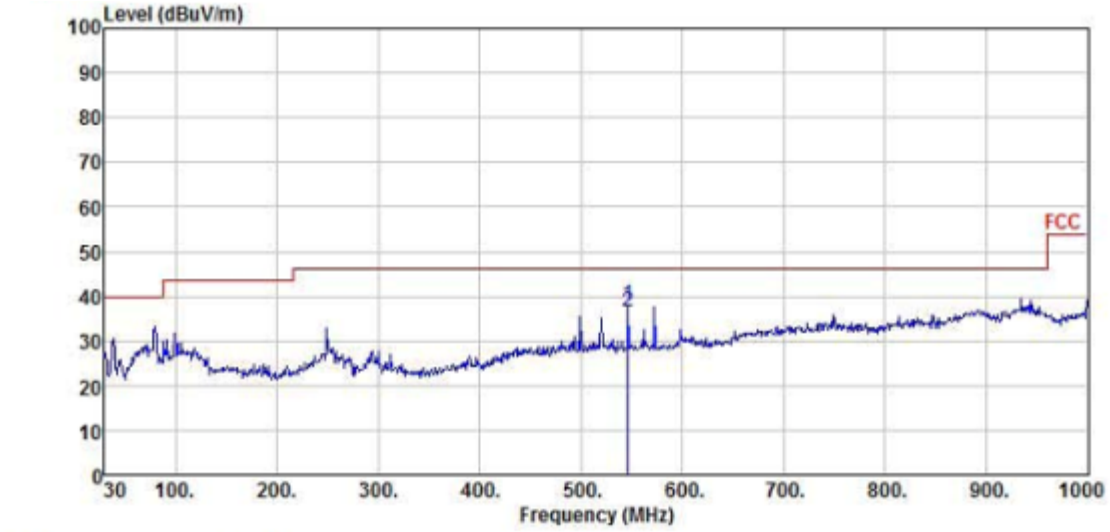
NO.	Freq	Read Level	Atenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
1	12152 MHz	-98.36 dBuV	51.17 dB/m	16.34 dB	38.25 dB	-70.10 dBuV/m	54.00 dBuV/m	-37.11 dB	AV
2	12152 MHz	-83.25 dBuV	51.17 dB/m	16.34 dB	39.25 dB	-54.29 dBuV/m	74.00 dBuV/m	-22.00 dB	Peak

Prob： BBHA9120D(1G-18G)	Polarity: Vertical
EDGE 850 Idle	



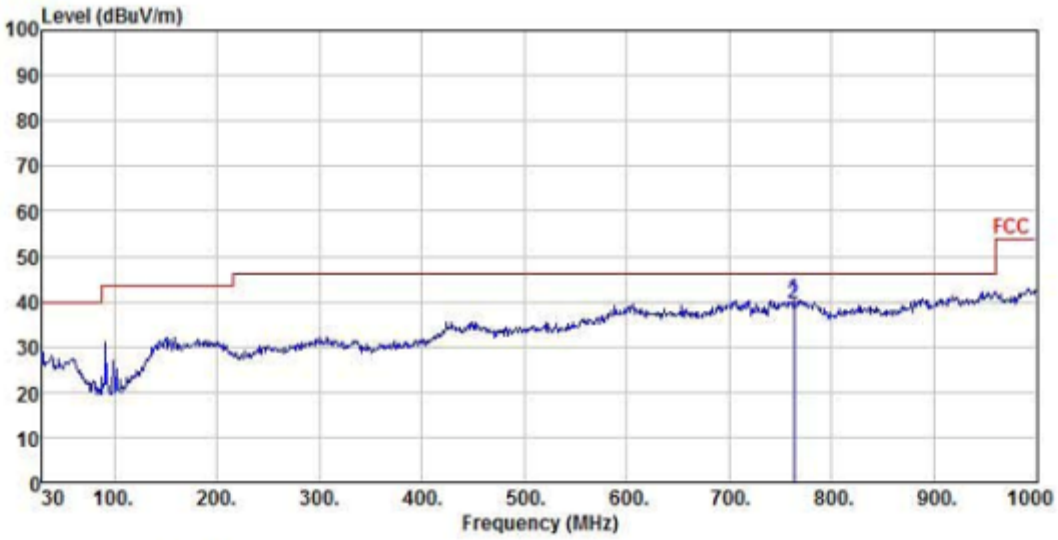
NO.	Freq	Read Level	Atenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
1	15076 MHz	-100.75 dBuV	51.32 dB/m	17.68 dB	37.76 dB	-69.51 dBuV/m	54.00 dBuV/m	-36.52 dB	AV
2	15076 MHz	-87.02 dBuV	51.32 dB/m	17.68 dB	37.76 dB	-55.78 dBuV/m	74.00 dBuV/m	-22.79 dB	Peak

Prob： VULB9160(30M-1G)	Polarity: Horizontal
GSM 1900 Idle	



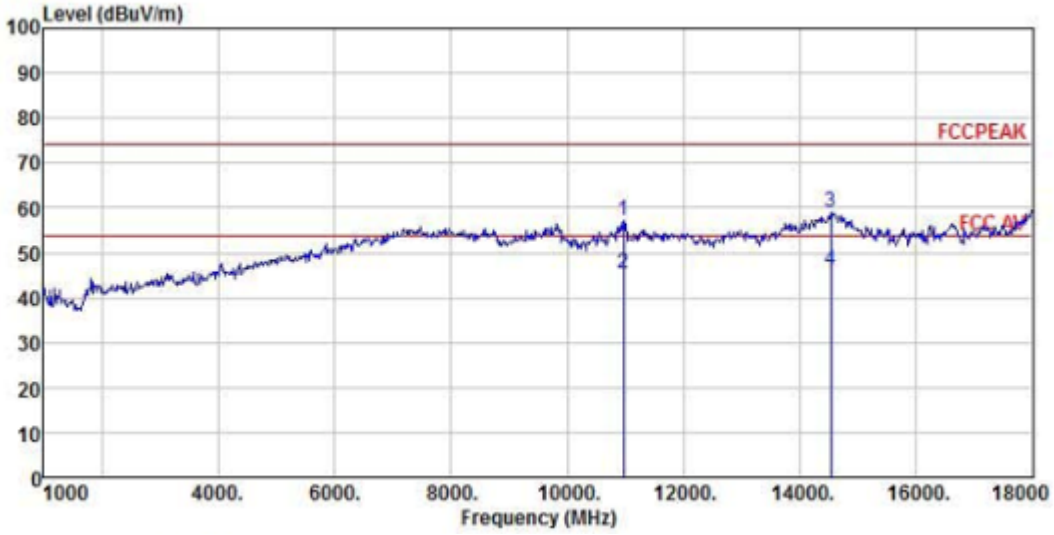
NO.	Freq	Read Level	Atenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
2	546.04 MHz	5.00 dBuV	28.27 dB/m	3.15 dB	0.00 dB	36.42 dBuV/m	46.00 dBuV/m	-9.58 dB	QP

Prob： VULB9160(30M-1G)	Polarity: Vertical
GSM 1900 Idle	



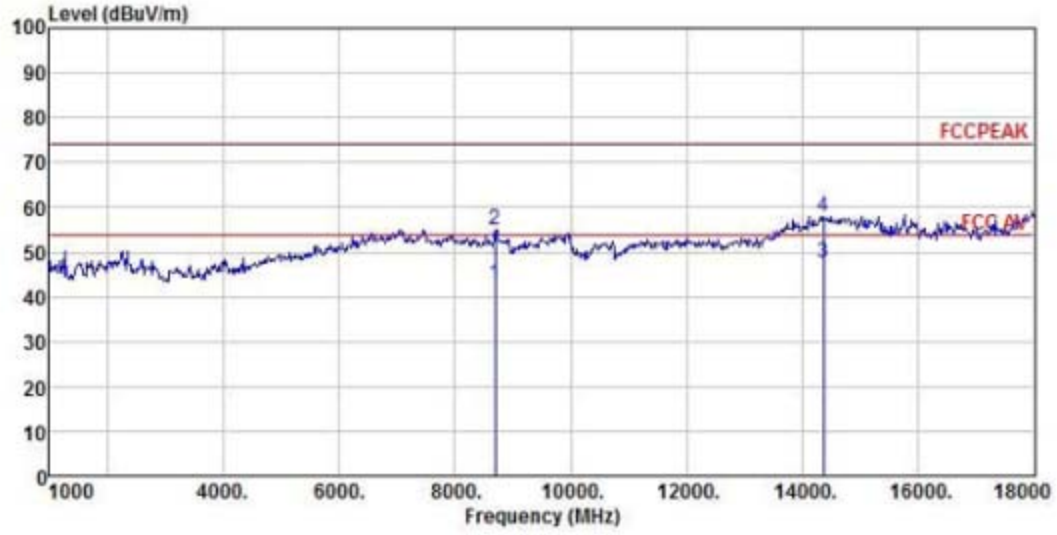
NO.	Freq	Read Level	Atenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
2	763.32 MHz	-4.07 dBuV	40.33 dB/m	3.70 dB	0.00 dB	39.35 dBuV/m	46.00 dBuV/m	-6.65 dB	QP

Prob： BBHA9120D(1G-18G)	Polarity: Horizontal
GSM 1900 Idle	



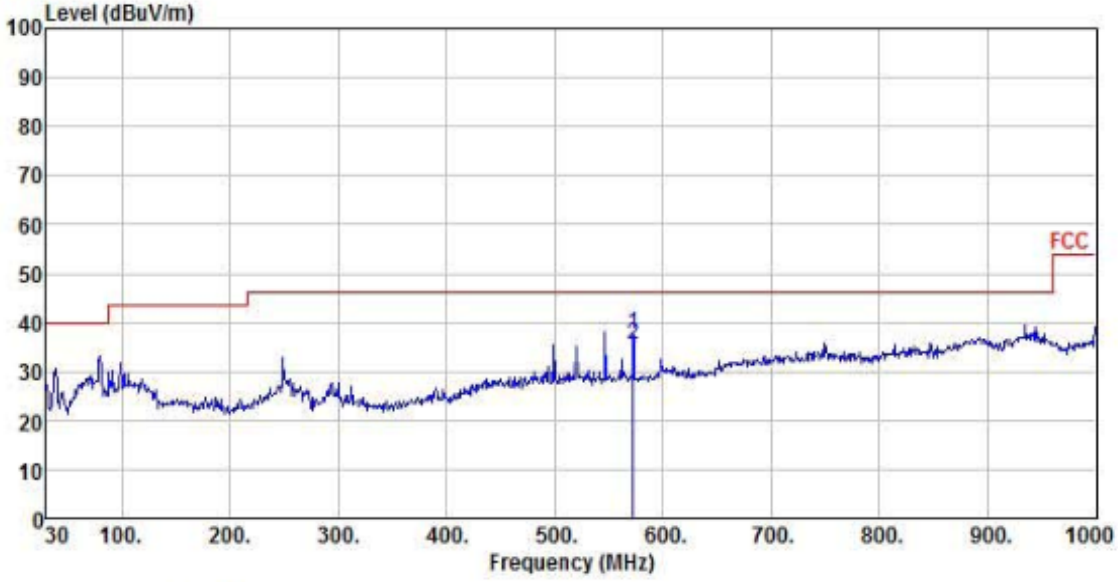
NO.	Freq	Read Level	Atenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
1	10979 MHz	28.33 dBuV	40.30 dB/m	15.71 dB	38.91 dB	45.43 dBuV/m	74.00 dBuV/m	-28.57 dB	Peak
2	10979 MHz	9.21 dBuV	40.30 dB/m	15.71 dB	38.91 dB	26.31 dBuV/m	54.00 dBuV/m	-27.69 dB	AV
3	14532 MHz	19.98 dBuV	42.52 dB/m	18.80 dB	38.17 dB	43.13 dBuV/m	54.00 dBuV/m	-10.87 dB	AV
4	14532 MHz	40.21 dBuV	42.52 dB/m	18.80 dB	38.17 dB	46.14 dBuV/m	74.00 dBuV/m	-27.86 dB	Peak

Prob： BBHA9120D(1G-18G)	Polarity: Vertical
GSM 1900 Idle	



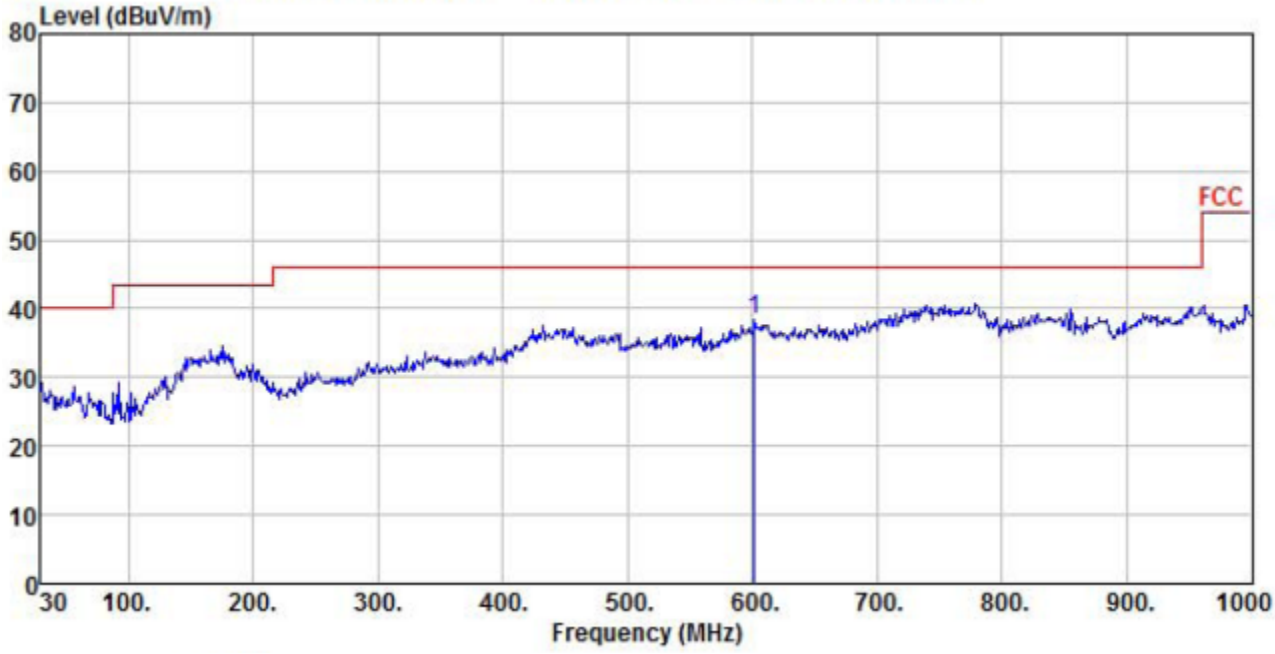
NO.	Freq	Read Level	Atenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
1	8701 MHz	45.40 dBuV	36.90 dB/m	13.40 dB	40.77 dB	54.93 dBuV/m	74.00 dBuV/m	-19.07 dB	Peak
2	8701 MHz	26.24 dBuV	36.90 dB/m	13.40 dB	40.77 dB	35.77 dBuV/m	54.00 dBuV/m	-18.23 dB	AV
3	14412 MHz	17.01 dBuV	42.50 dB/m	18.71 dB	38.29 dB	39.92 dBuV/m	54.00 dBuV/m	-14.08 dB	AV
4	14413 MHz	36.14 dBuV	42.50 dB/m	18.71 dB	38.29 dB	59.06 dBuV/m	74.00 dBuV/m	-14.94 dB	Peak

Prob： VULB9160(30M-1G)	Polarity: Horizontal
WCDMA Band V Idle	



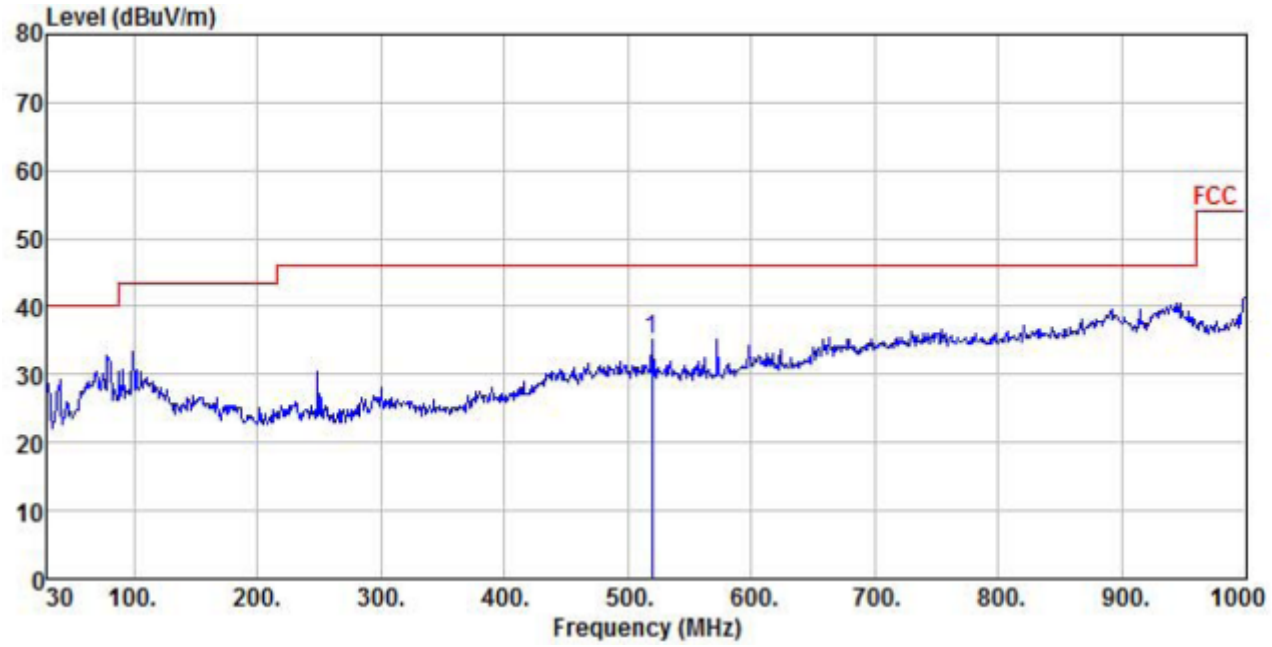
NO.	Freq	Read Level	Atenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
1	572.23 MHz	4.00 dBuV	28.27 dB/m	3.23 dB	0.00 dB	35.50 dBuV/m	46.00 dBuV/m	-10.50 dB	QP

Prob ： VULB9160(30M-1G)	Polarity: Horizontal
EDGE 1900 Idle	



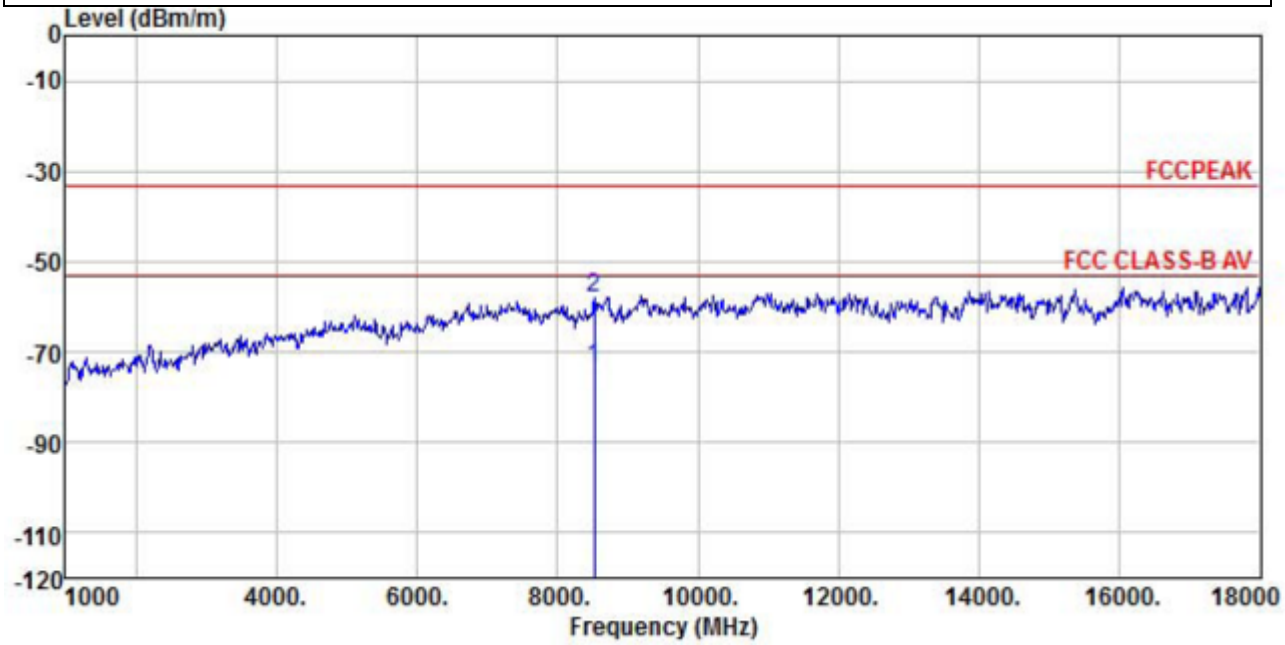
NO.	Freq	Read Level	Atenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
1	601.33 MHz	-1.64 dBuV	36.60 dB/m	3.34 dB	0.00 dB	38.30 dBuV/m	46.00 dBuV/m	-7.70 dB	QP

Prob ： VULB9160(30M-1G)	Polarity: Vertical
EDGE 1900 Idle	



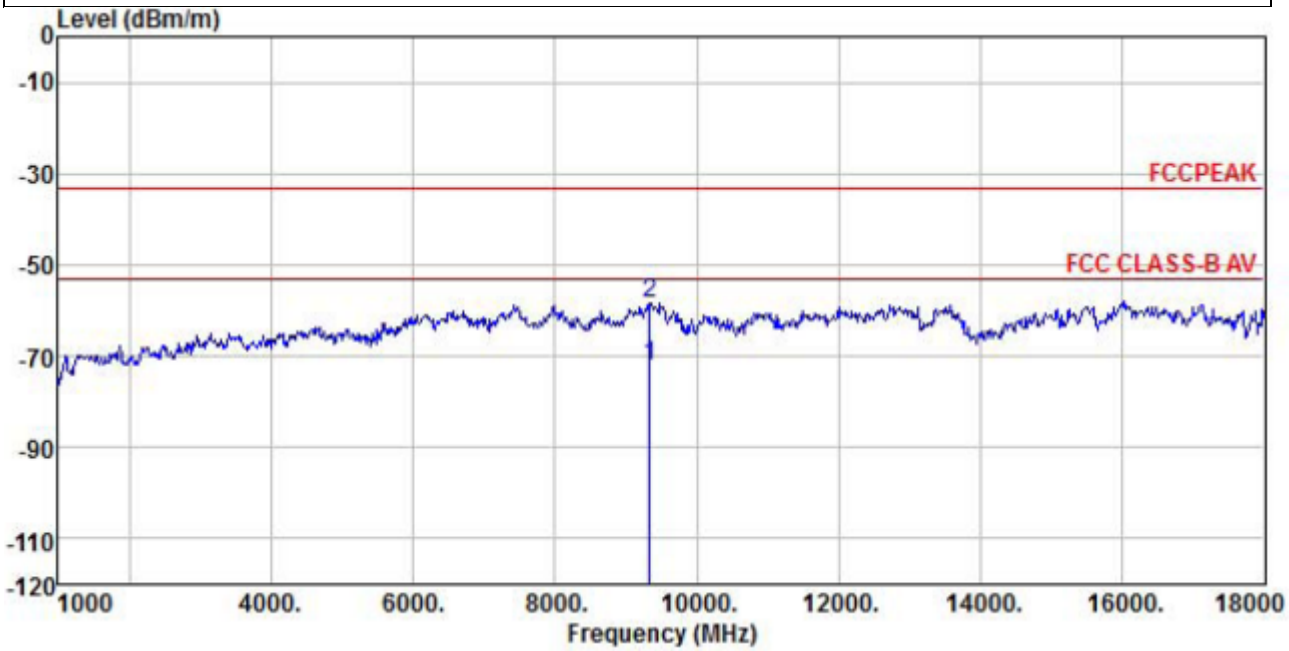
NO.	Freq	Read Level	Atenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
1	519.85 MHz	2.88 dBuV	29.09 dB/m	3.10 dB	0.00 dB	35.07 dBuV/m	46.00 dBuV/m	-10.93 dB	QP

Prob： BBHA9120D(1G-18G)	Polarity: Horizontal
EDGE 1900 IDLE	



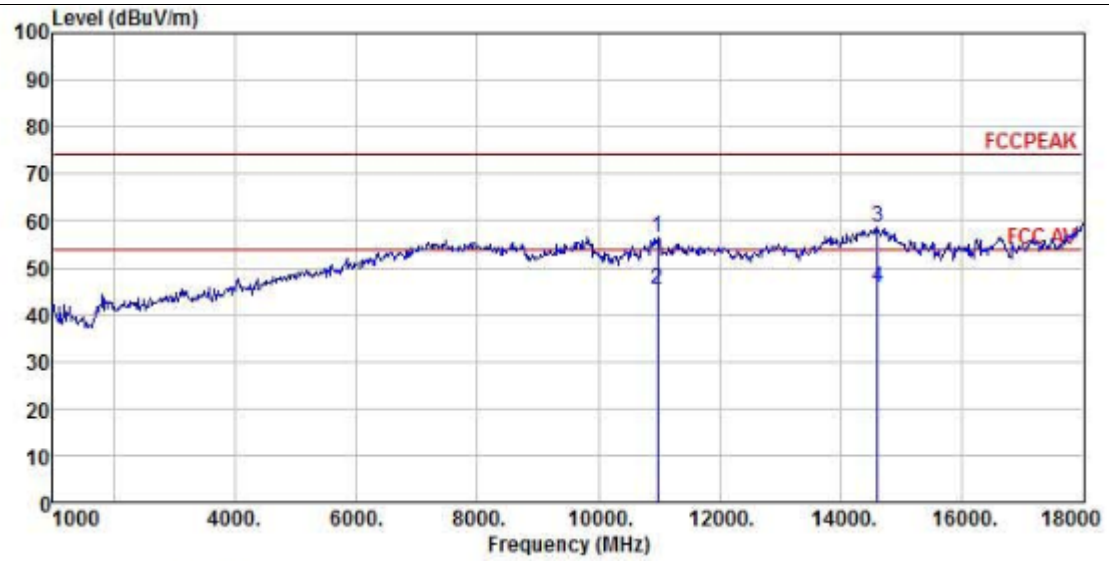
NO.	Freq	Read Level	Atenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
1	8531 MHz	-95.35 dBuV	49.25 dB/m	13.29 dB	40.54 dB	-73.35 dBuV/m	74.00 dBuV/m	-40.36 dB	AV
2	8531 MHz	-80.05 dBuV	49.25 dB/m	13.29 dB	40.54 dB	-58.05 dBuV/m	54.00 dBuV/m	-25.06 dB	Peak

Prob： BBHA9120D(1G-18G)	Polarity: Vertical
EDGE 1900 IDLE	



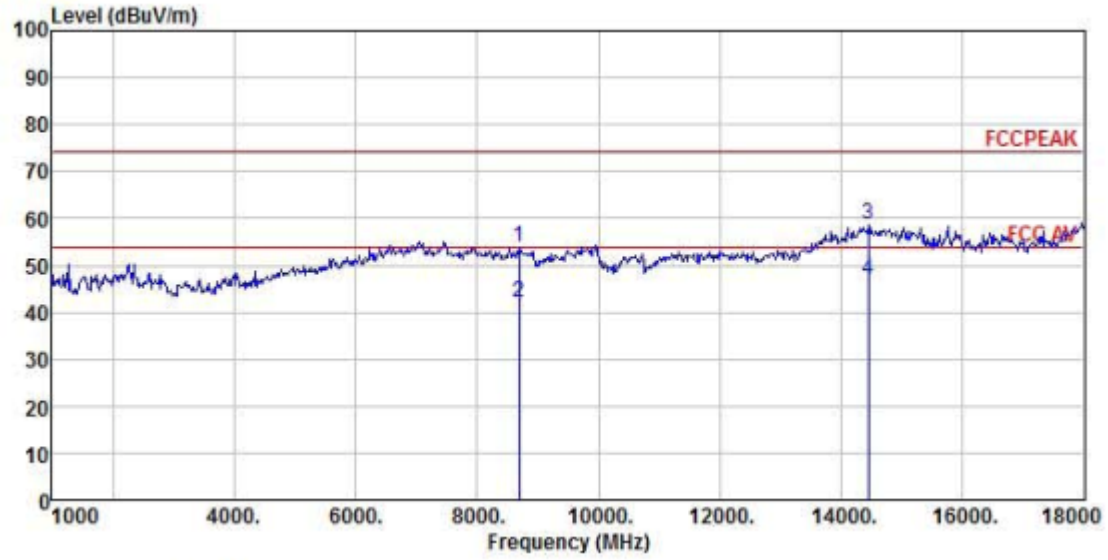
NO.	Freq	Read Level	Atenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
1	9330 MHz	-96.65 dBuV	51.13 dB/m	14.06 dB	40.61 dB	-72.07 dBuV/m	74.00 dBuV/m	-39.08 dB	AV
2	9330 MHz	-82.95 dBuV	51.13 dB/m	14.06 dB	40.61 dB	-58.37 dBuV/m	54.00 dBuV/m	-25.38 dB	Peak

Prob： BBHA9120D(1G-18G)	Polarity: Horizontal
WCDMA Band V Idle	



NO.	Freq	Read Level	Atenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
1	10979 MHz	39.21 dBuV	40.30 dB/m	15.71 dB	38.91 dB	56.31 dBuV/m	74.00 dBuV/m	-17.69 dB	Peak
2	10979 MHz	18.31 dBuV	40.30 dB/m	15.71 dB	38.91 dB	35.41 dBuV/m	54.00 dBuV/m	-18.59 dB	AV
3	14600 MHz	12.69 dBuV	42.43 dB/m	18.66 dB	38.11 dB	35.67 dBuV/m	54.00 dBuV/m	-18.33 dB	AV
4	14600 MHz	35.55 dBuV	42.43 dB/m	18.66 dB	38.11 dB	58.53 dBuV/m	74.00 dBuV/m	-15.47 dB	Peak

Prob ： BBHA9120D(1G-18G)	Polarity: Vertical
WCDMA B and V Idle	



NO.	Freq	Read Level	Atenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
1	8701 MHz	44.4 dBuV	36.90 dB/m	13.40 dB	40.77 dB	54.93 dBuV/m	74.00 dBuV/m	-20.07 dB	Peak
2	8701 MHz	22.56 dBuV	36.90 dB/m	13.40 dB	40.77 dB	32.09 dBuV/m	54.00 dBuV/m	-21.91 dB	AV
3	14447 MHz	14.12 dBuV	42.54 dB/m	18.32 dB	38.26 dB	36.72 dBuV/m	54.00 dBuV/m	-17.28 dB	AV
4	14447 MHz	36.11 dBuV	42.54 dB/m	18.32 dB	38.26 dB	58.71 dBuV/m	74.00 dBuV/m	-15.29 dB	Peak

10.Attachment

EUT Photograph

View of EUT-1

View of EUT-2

View of EUT-3

View of EUT-4

View of EUT-5