RF Test Report

Test in accordance with
Federal Communications Commission(FCC)
CFR TITLE 47, Parts 2, 22, 24

Product Name : WCDMA/HSDPA Module

Model No. : SIM5320AL

FCC ID : UDV-1403022014008

Applicant : Shanghai Simcom Ltd.
Address : Building A, SIM Technology Building No.633，
Jinzhong Road，Changning Disdrict，
Shanghai P.R. China 200335

Date of Receipt : 2014-08-14

Test Date : 2014-08-15~2014-08-22

Issued Date : 2014-08-25

Report No. : UL15820140814FCC031-2

Report Version : V1.0

Notes：
The test results only relate to these samples which have been tested.
Partly using this report will not be admitted unless been allowed by Unilab.
Unilab is only responsible for the complete report with the reported stamp of Unilab.

Test Report Certification

Issued Date : 2014-08-25
Report No. : UL20140814FCC031-2

Product Name :	WCDMA/HSDPA Module
Applicant :	Shanghai Simcom Ltd.
Address :	Building A, SIM Technology Building No.633, Jinzhong Road, Changning Disdrict，Shanghai P.R. China 200335
Manufacturer :	Shanghai Simcom Ltd.
Address :	Building A, SIM Technology Building No.633, Jinzhong Road, Changning Disdrict，Shanghai P.R. China 200335
Model No. :	SIM5320AL
EUT Voltage :	MIN:3.4V, NOR:3.8V, MAX:4.2V
Brand Name :	SIMCom
FCC ID:	UDV-1403022014008
Applicable Standard :	ANSI/TIA-603-D-2010; FCC CFR Title 47 Part 2; FCC CFR Title 47 Part 22 Subpart H; FCC CFR Title 47 Part24 Subpart E;
Test Result :	Complied
Performed Location :	Unilab (Shanghai) Co., Ltd. FCC 2.948 register number is 714465 No. 1350, Lianxi Rd. Pudong New District, Shanghai, China TEL: +86-21-50275125 FAX: +86-21-50275126

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(Technical Engineer: Jeffrey. Wang)

Reviewed By : Forest cao

(Senior Engineer: Forest Cao)

Approved By : Eva wang

(Supervisor: Eva Wang)

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SUMMARY OF TEST RESULT

Report Section	SPECIFICATION	Description	Limit	Result
3	part2.1046	Conducted Output Power	N/A	PASS
3	part 22.913(a)(2)	Effective Radiated Power	<7 Watts	PASS
3	part 24.232(c)	Equivalent Isotropic Radiated Power	<2 Watts	PASS
4	part 2.1049 part 22.917(a) part 24.238(a)	Occupied Bandwidth	N/A	PASS
5	part 2.1051 part 22.917(a) part 24.238(a)	Band Edge Measurement	<43+10lg(P[Watts])	PASS
6	part 2.1051 part 22.917(a) part 24.238(a)	Conducted Spurious Emission	<43+10lg(P[Watts])	PASS
6	part 2.1053 part 22.917(a) part 24.238(a)	Field Strength of Supurious Radiation	<43+10lg(P[Watts])	PASS
7	part 2.1055 part 22.355 part 24.235	Frequency Stability for Temperature & Voltage	<2.5 ppm	PASS

1.General Information

1.1. EUT Description

Product Name:	WCDMA/HSDPA Module
Model Name:	SIM5320AL
Hardware Version:	V1.03
Software Version:	SIM5320AL_V1.5
RF Exposure Environment:	Uncontrolled
UMTS/HSDPA	
Support Band:	WCDMA Band Ⅱ / V
Tx Frequency Range:	WCDMA Band Ⅱ: 1850MHz ~1910MHz WCDMA Band V: 824MHz ~849MHz
Rx Frequency Range:	WCDMA Band Ⅱ: 1930MHz ~1990MHz WCDMA Band V: 869MHz ~894MHz
Type of modulation:	WCDMA(UMTS/HSDPA): QPSK
Antenna Type:	Connector
Antenna Peak Gain:	WCDMA Band Ⅱ/ V: 1.0dBi
Component	
AC Adapter:	Model Name: P12-060200 EU
	Input: AC 100-240V 50/60Hz 0.3A
	Output: DC 6.0V/2.0A

1.2. Mode of Operation

Unilab has verified the construction and function in typical operation. EUT is inlink mode with base station emulator at maximum power level. All the test modes were carried out with the EUT in normal operation, which was shown in this test report is the worst test mode and defined as:

Test Mode		
Band	Radiated TCs	Conducted TCs
WCDMA Band Ⅴ	RMC 12.2Kbps Link	RMC 12.2Kbps Link
WCDMA Band Ⅱ	RMC 12.2Kbps Link	RMC 12.2Kbps Link

Note:
1. Regards to the frequency band operation: the lowest、middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. The maximum power levels are RMC 12.2Kbps mode for WCDMA band Ⅴ, and RMC 12.2Kbps mode for WCDMA band Ⅱ, only these modes were used for all test.
3. For the ERP/EIRP and radiated emission test, every axis (X, Y, Z) was verified, and show the worst (Z axis) result on this report.

The conducted power table is as follows:

Conducted Power (Unit: dBm)						
Band	WCDMA V			WCDMA II		
TX Channel	4132	4182	4233	9262	9400	9538
RX Channel	4357	4407	4458	9662	9800	9938
Frequency	826.4	836.4	846.6	1852.4	1880	1907.6
RMC 12.2Kbps	22.93	22.82	23.07	21.77	22.05	21.53
HSDPA Subtest-1	22.72	22.49	22.84	21.25	21.64	21.48
HSDPA Subtest-2	21.80	21.76	21.81	21.17	21.46	21.59
HSDPA Subtest-3	21.25	21.27	21.28	21.31	21.35	21.32
HSDPA Subtest-4	21.02	21.04	21.01	21.06	21.01	21.03

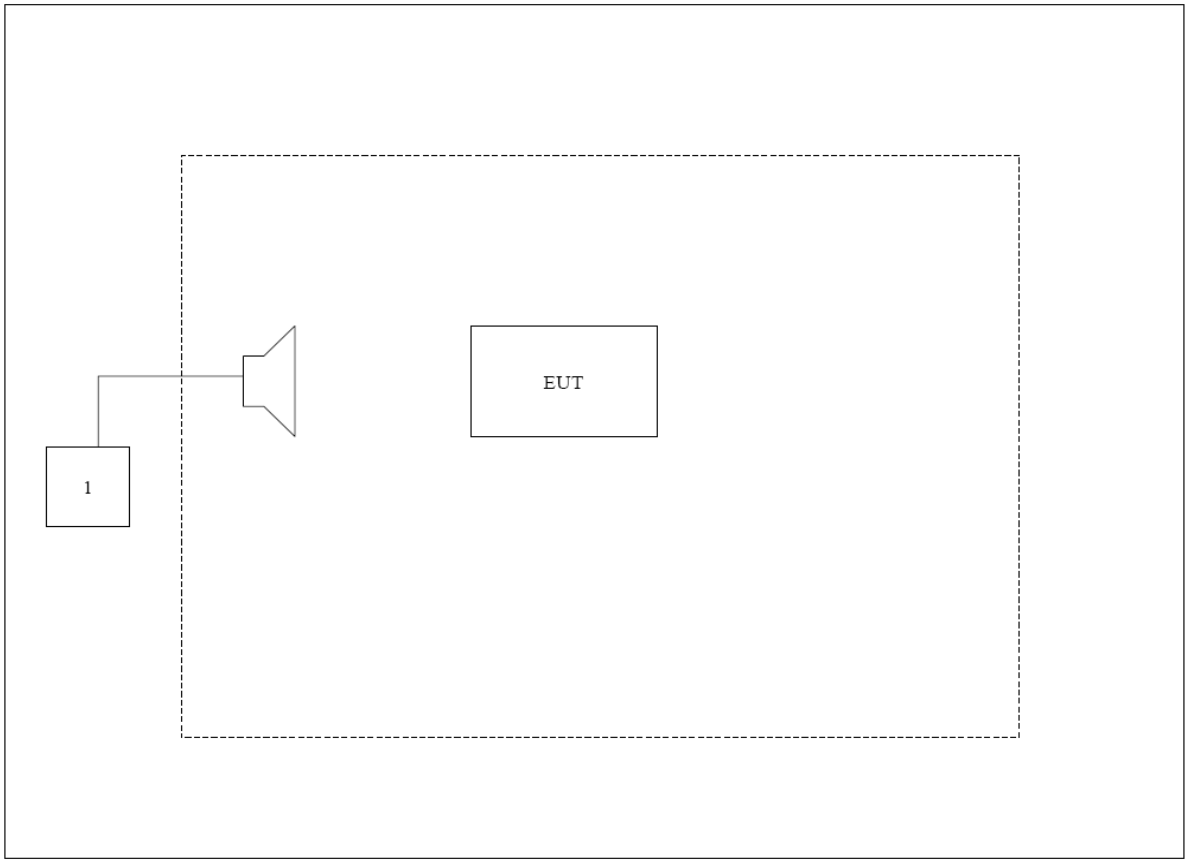
1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model	Serial No.	Power Cord
1	Agilent8960	Agilent	E5515C	GB46581718	N/A

1.4. Configuration of Tested System

Connection Diagram



1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of all equipment.
3	EUT Communicate with E5515C, then select channel to test.

2. Technical Test

2.1. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (℃)	15-35	22
Humidity (%RH)	25-75	54
Barometric pressure (mbar)	860-1060	950-1000

3. Peak Output Power

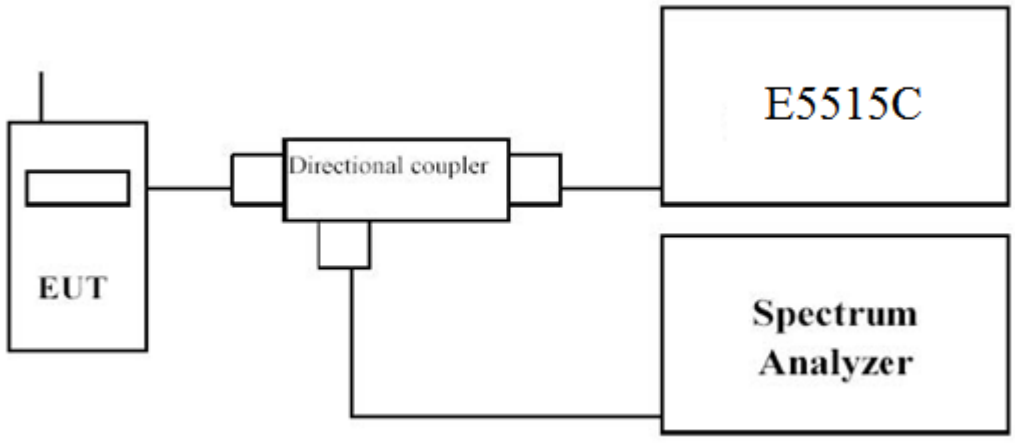
3.1. Test Equipment

Instrument	Manufacturer	Model	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	N9038A	MY51210142	2014.12.17
Radio Communication Tester	Agilent	E5515C	GB46581718	2014.10.21
Signal Generator	Agilent	N5183A	MY50140938	2015.01.03
Preamplifier	CEM	EM30180	3008A0245	2015.02.28
DC Power Supply	Agilent	6612C	MY43002989	2015.03.03
Bilog Antenna	Schwarzbeck	VULB9160	9160-3316	2015.07.18
VHF-UHF-Biconical Antenna	Schwarzbeck	VUBA9117	9117-263	2015.07.18
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-942	2015.07.18
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-943	2015.07.18

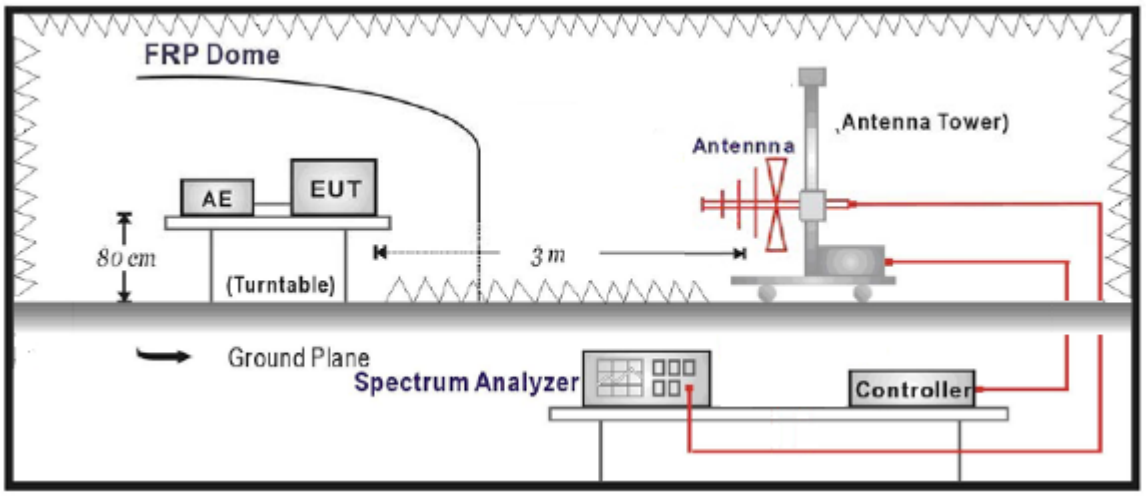
The measure equipment had been calibrated once a year.

3.2. Test Setup

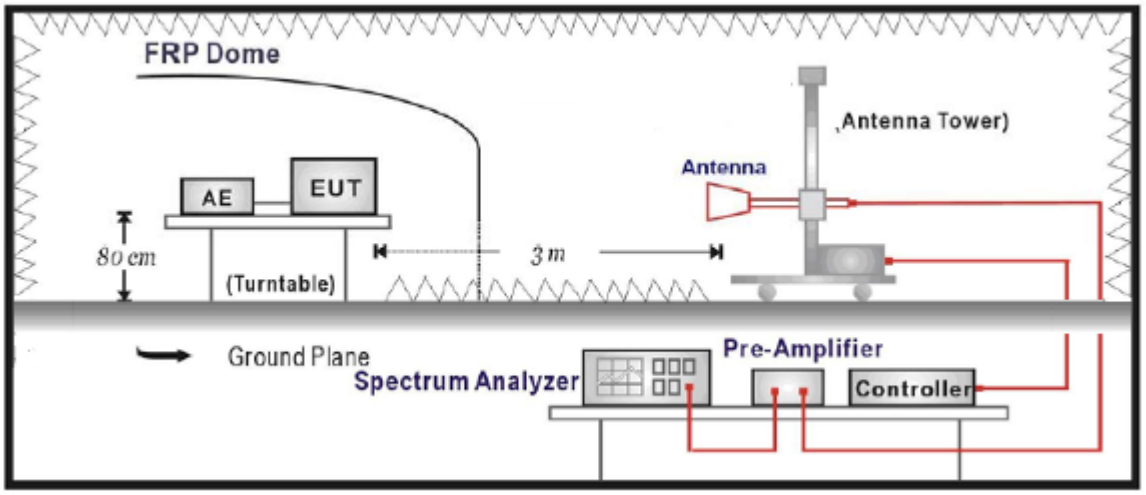
Conducted Power Measurement:



Radiated Spurious Measurement: below 1GHz



Radiated Spurious Measurement: above 1GHz



3.3. Limit

For FCC Part 22.913(a)(2):
The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

For FCC Part 24.232(c):
The EIRP of mobile transmitters and auxiliary test transmitters must not exceed 2 Watts.

3.4. Test Procedure

Conducted Power Measurement:

a. Place the EUT on a bench and set it in transmitting mode.
b.Connect a low loss RF cable from the antenna port to a spectrum analyzer and E5515C by a Directional Couple.
c. EUT Communicate with E5515C, then selects a channel for testing.
d. Add a correction factor to the display of spectrum, and then test.

Radiated Power Measurement:

a. The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
b. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
c. The output of the test antenna shall be connected to the measuring receiver.
d. The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
e. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
f. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
g. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
h. The maximum signal level detected by the measuring receiver shall be noted.
i.The transmitter shall be replaced by a substitution antenna.
j. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
k. The substitution antenna shall be connected to a calibrated signal generator.
l. If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
m. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
n. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
o. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
p. The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
q.Test site anechoic chamber refer to ANSI C63.4: 2009.

3.5. Uncertainty

The measurement uncertainty is defined as for Conducted Power Measurement±1.1 dB,
for Radiated Power Measurement±3.1 dB

3.6. Test Result

The following table shows the conducted power measured:

WCDMA				
Modes	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)
WCDMA Band V	4132(Low)	826.4	22.93	0.196
	4182(Mid)	836.4	22.82	0.191
	4233(High)	846.6	23.07	0.203
WCDMA Band II	9262(Low)	1852.4	21.77	0.150
	9400(Mid)	1880.0	22.05	0.160
	9538(High)	1907.6	21.51	0.142

The following table shows the Radiated power measured:

WCDMA Band V

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBd)	ERP (dBm)	ERP (W)
Low Channel 4132(826.4MHz)						
826.4	H	29.20	3.83	-2.99	22.38	0.173
826.4	V	24.47	3.83	-2.99	17.65	0.058
Middle Channel 4182 (836.4MHz)						
836.4	H	29.44	3.95	-3.04	22.21	0.166
836.4	V	25.00	3.95	-3.04	18.01	0.063
High Channel 4233 (846.6MHz)						
846.6	H	28.70	3.97	-3.10	21.63	0.146
846.6	V	24.51	3.97	-3.10	17.44	0.055

WCDMA Band II

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBd)	EIRP (dBm)	EIRP (W)
Low Channel 9262(1852.40MHz)						
1850.2	H	13.46	6.26	10.40	19.75	0.094
1850.2	V	15.27	6.26	10.40	21.56	0.143
Middle Channel 9400 (1880.00MHz)						
1880.0	H	13.90	6.19	10.43	20.29	0.107
1880.0	V	15.35	6.19	10.43	21.74	0.149
High Channel 9538 (1907.60MHz)						
1909.8	H	13.41	6.15	10.44	19.85	0.097
1909.8	V	15.43	6.15	10.44	21.87	0.154

4. Occupied Bandwidth

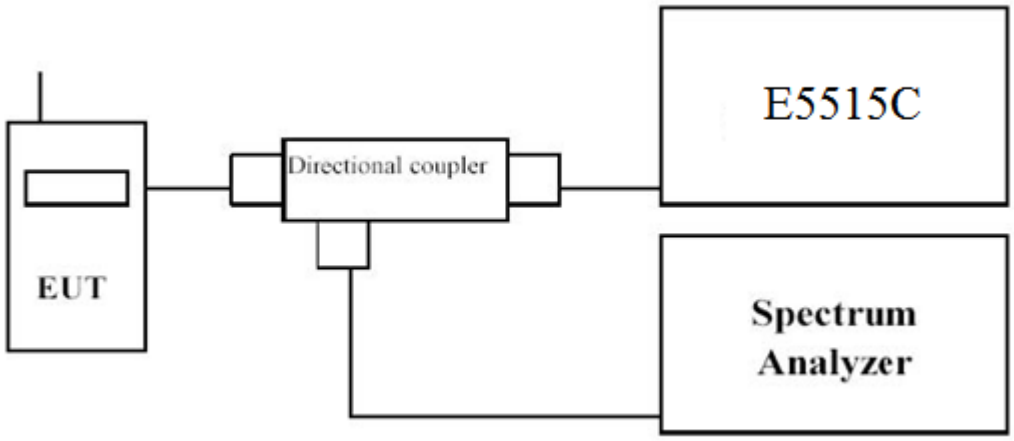
4.1. Test Equipment

Occupied Bandwidth

Instrument	Manufacturer	Model	Serial No	Cal. Date
Radio Communication Tester	Agilent	E5515C	GB46581718	2014.10.21
Spectrum Analyzer	Agilent	N9038A	MY51210142	2014.12.17
DC Power Supply	Agilent	6612C	MY43002989	2015.03.03

The measure equipment had been calibrated once a year.

4.2. Test Setup



4.3. Limit

N/A

4.4. Test Procedure

Using Occupied Bandwidth measurement function of spectrum analyzer, and setting as follows:
For WCDMA Band V/II test --- RBW = 100 kHz and VBW = 300 kHz

4.5. Uncertainty

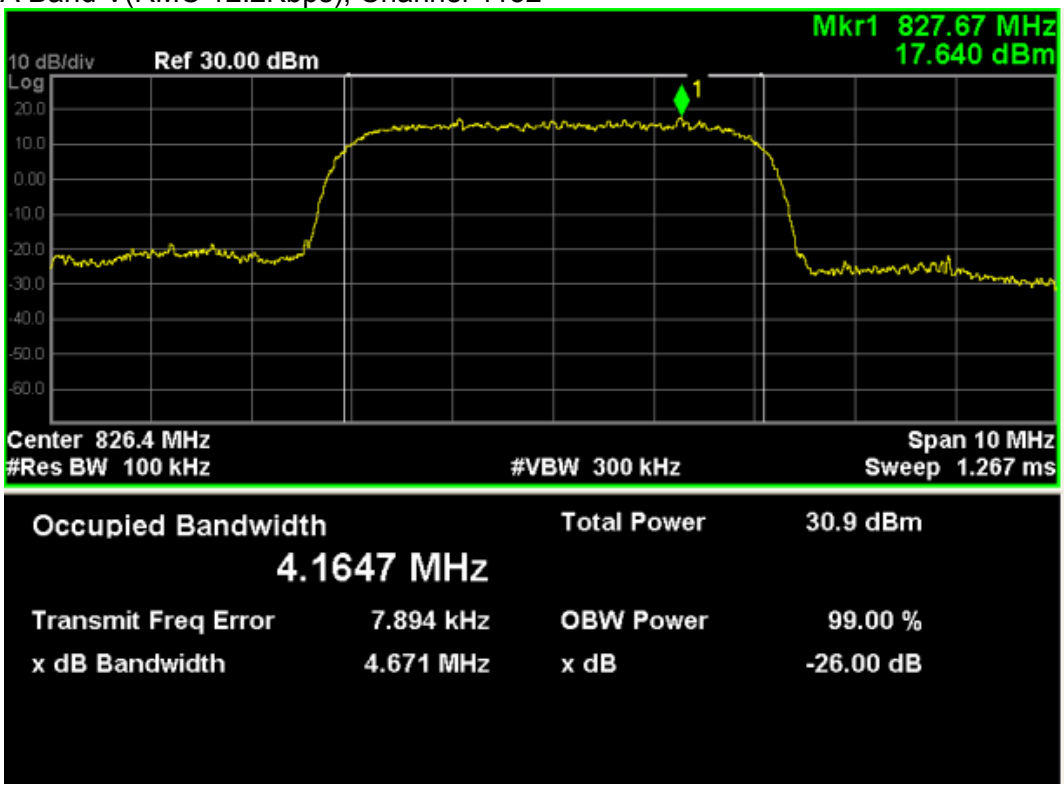
The measurement uncertainty is defined as ± 10 Hz

4.6. Test Result

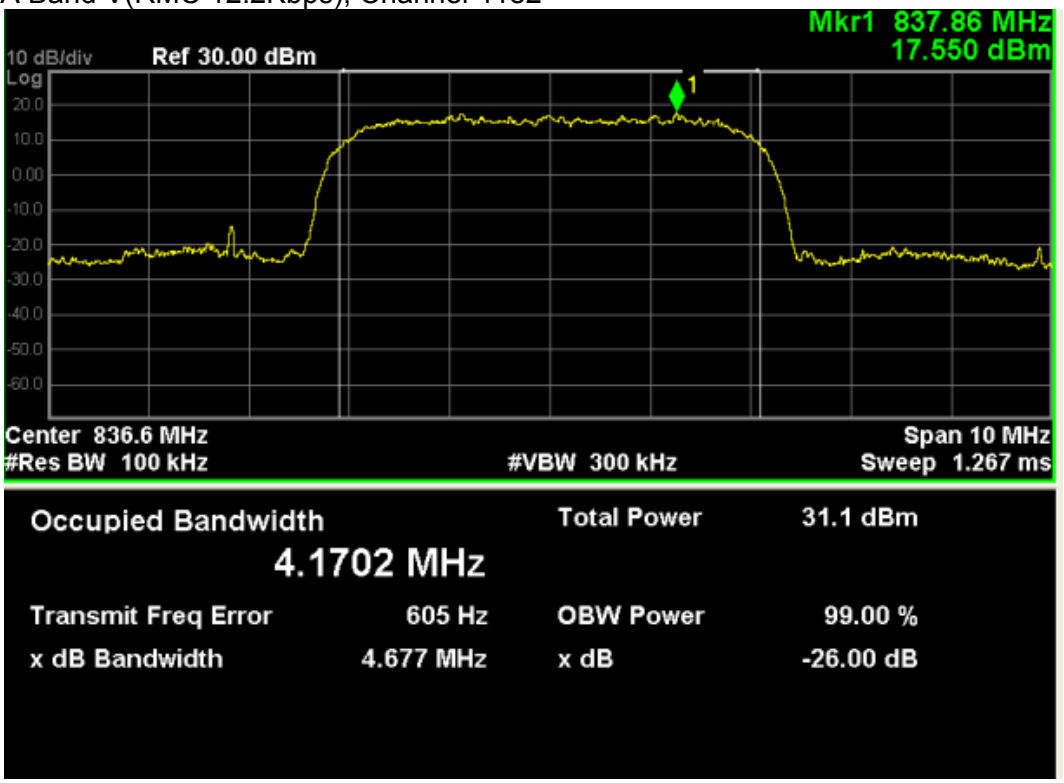
WCDMA Band V (RMC 12.2Kbps)

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
4132	826.40	4671	4165
4182	836.40	4677	4170
4233	846.60	4666	4161

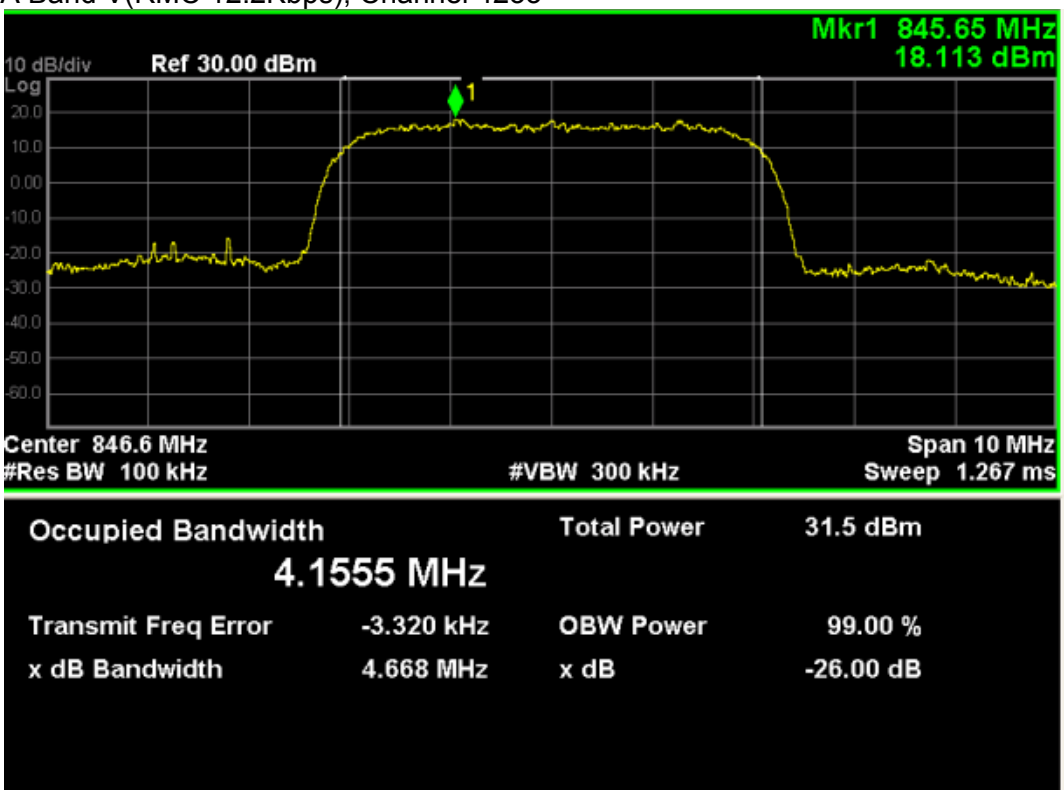
WCDMA Band V(RMC 12.2Kbps), Channel 4132



WCDMA Band V(RMC 12.2Kbps), Channel 4182



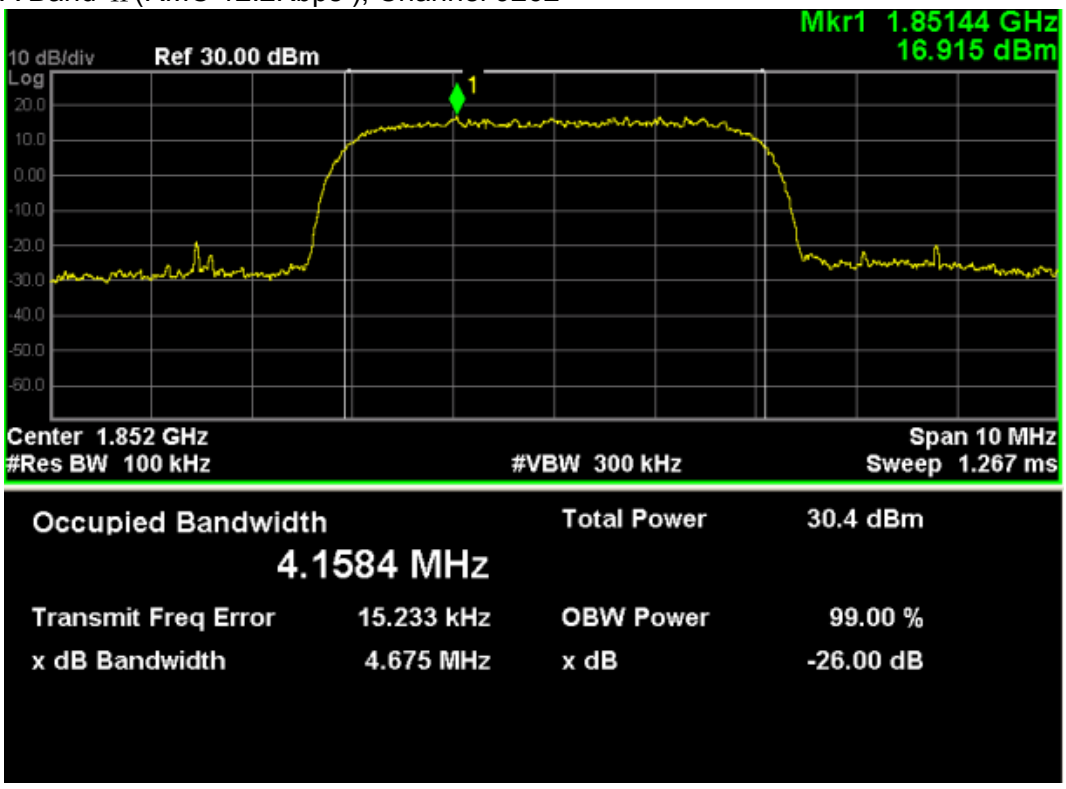
WCDMA Band V(RMC 12.2Kbps), Channel 4233



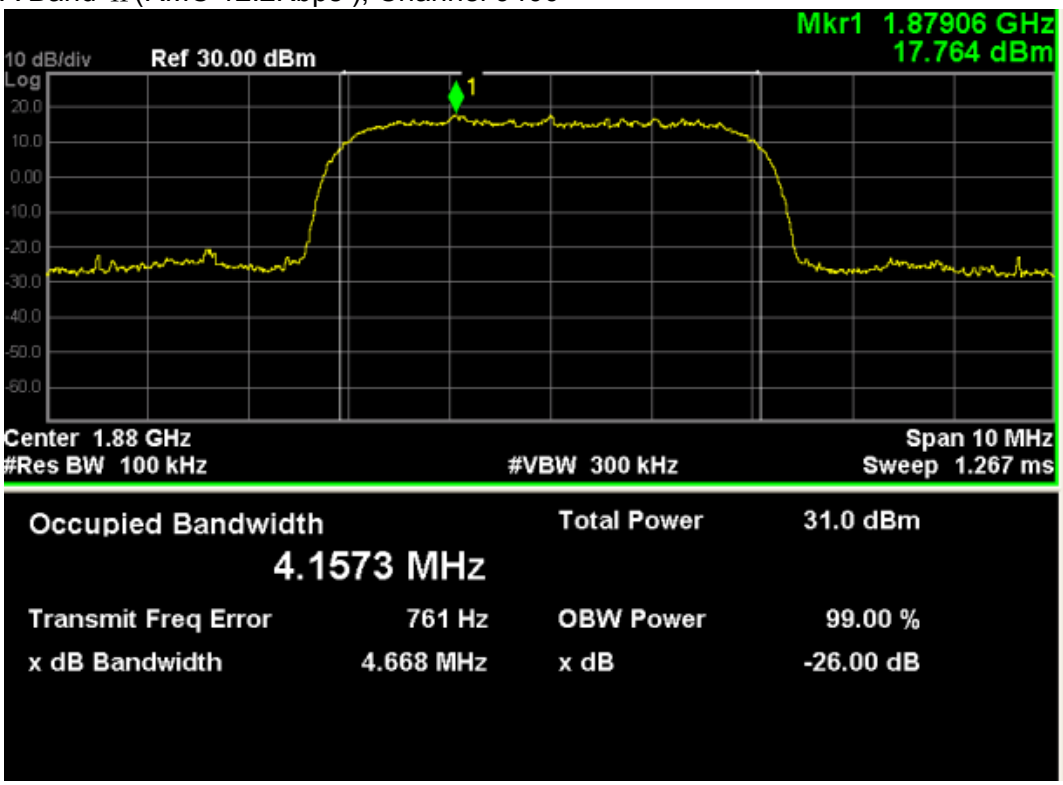
WCDMA Band Ⅱ(RMC 12.2Kbps)

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
9262	1852.00	4675	4158
9400	1880.00	4668	4157
9538	1907.60	4678	4170

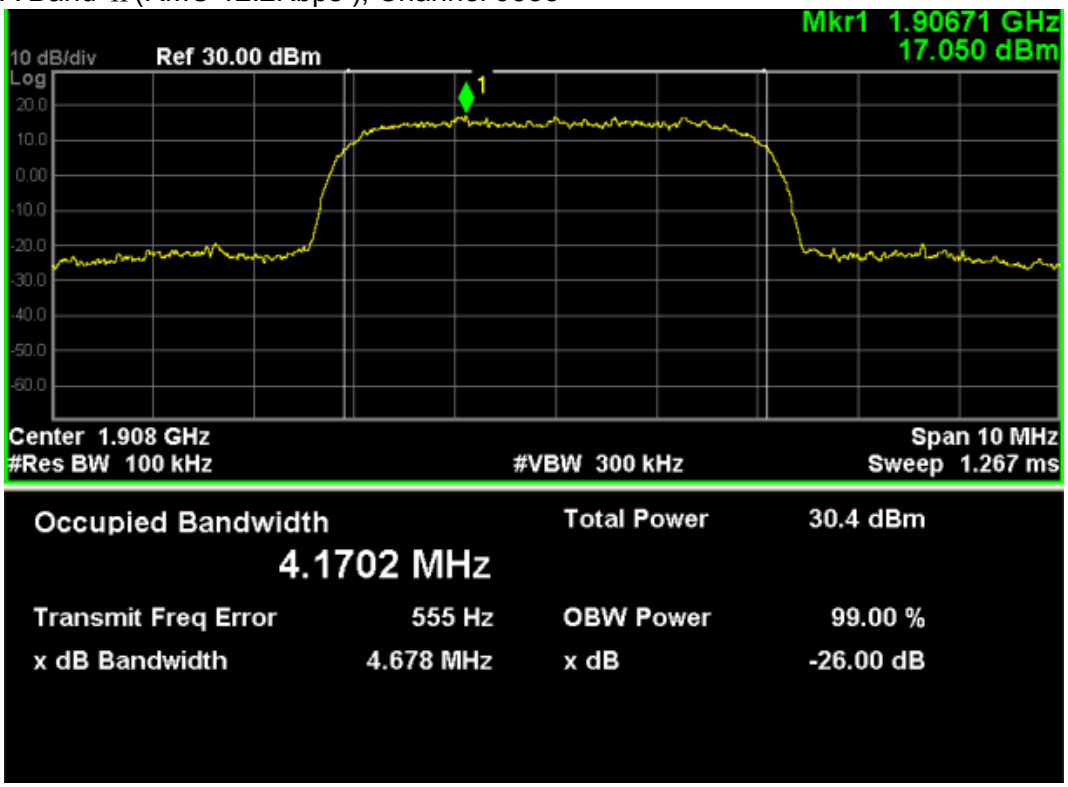
WCDMA Band Ⅱ(RMC 12.2Kbps), Channel 9262



WCDMA Band Ⅱ(RMC 12.2Kbps), Channel 9400



WCDMA Band Ⅱ(RMC 12.2Kbps), Channel 9538



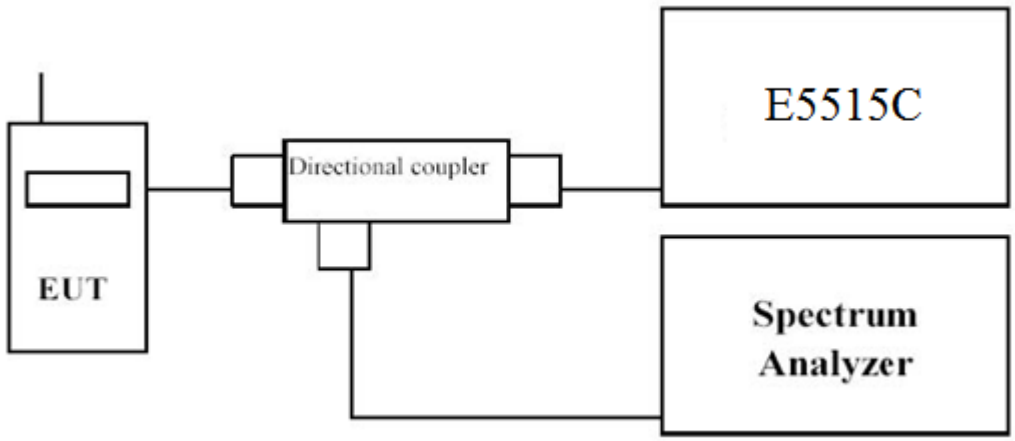
5.Spurious Emission At Antenna Terminals (+/- 1MHz)

5.1. Test Equipment

Instrument	Manufacturer	Model	Serial No	Cal. Date
Radio Communication Tester	Agilent	E5515C	GB46581718	2014.10.21
Spectrum Analyzer	Agilent	N9038A	MY51210142	2014.12.17
DC Power Supply	Agilent	6612C	MY43002989	2015.03.03

The measure equipment had been calibrated once a year.

5.2. Test Setup



5.3. Limit

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 + 10log(P) dB.

5.4. Test Procedure

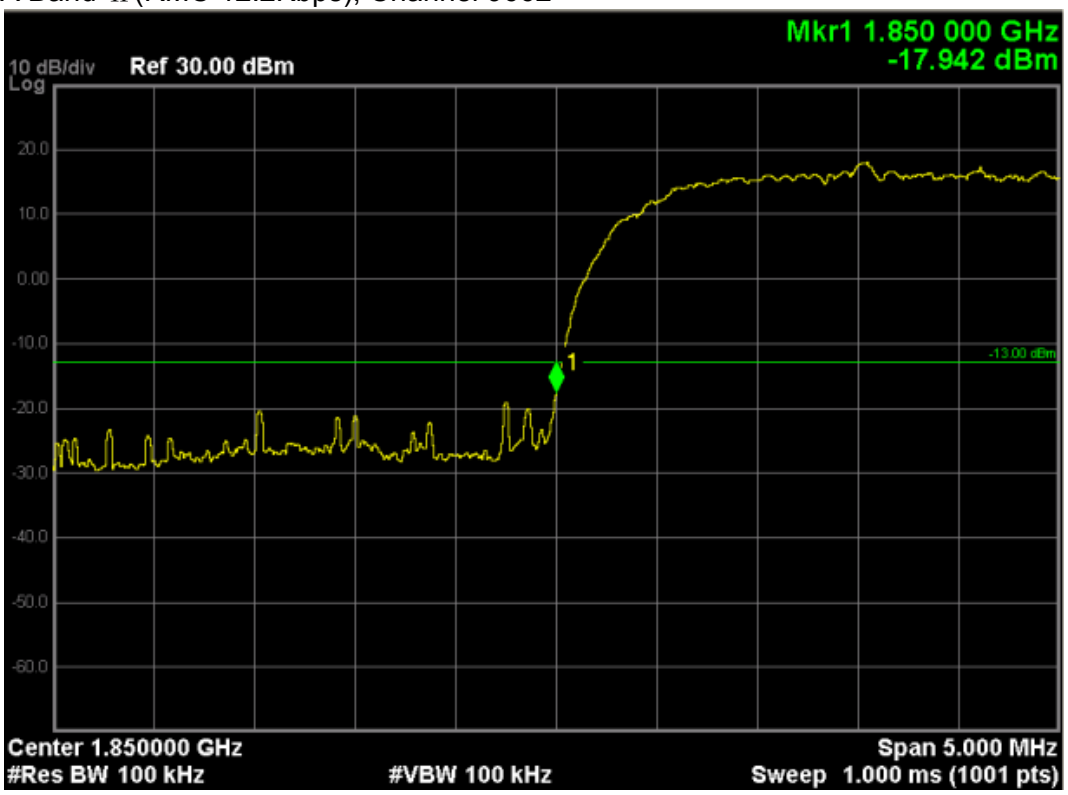
In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.

5.5. Uncertainty

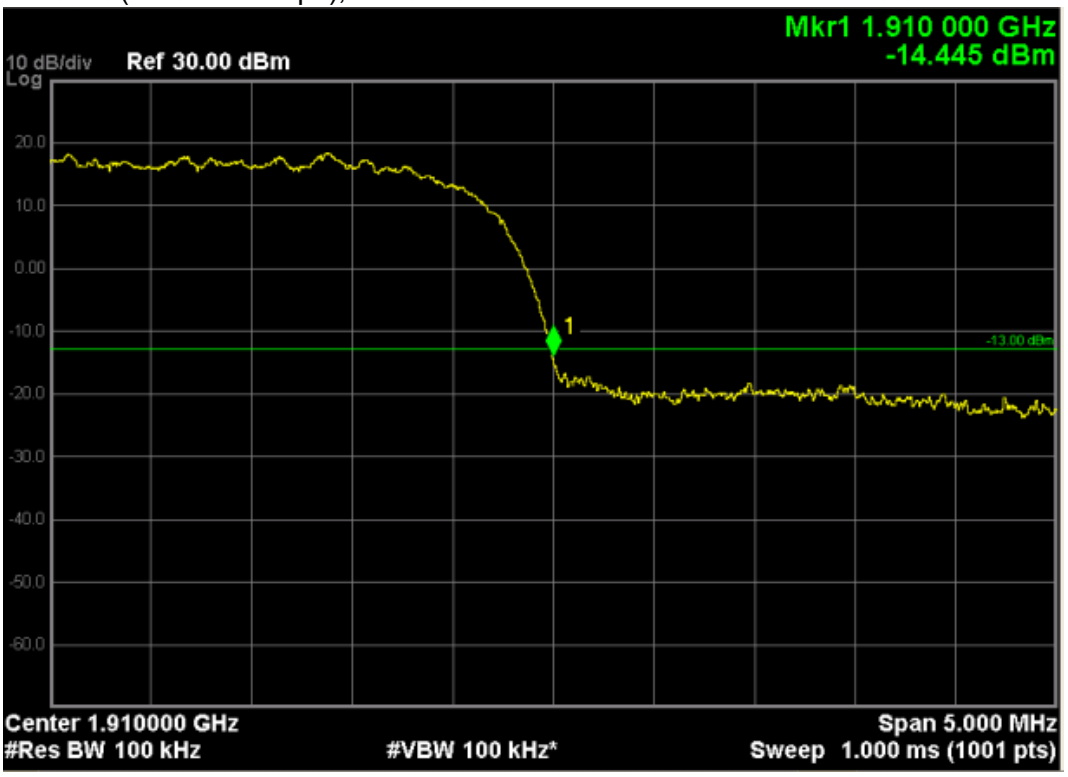
The measurement uncertainty is defined as ±1.2 dB.

5.6. Test Result

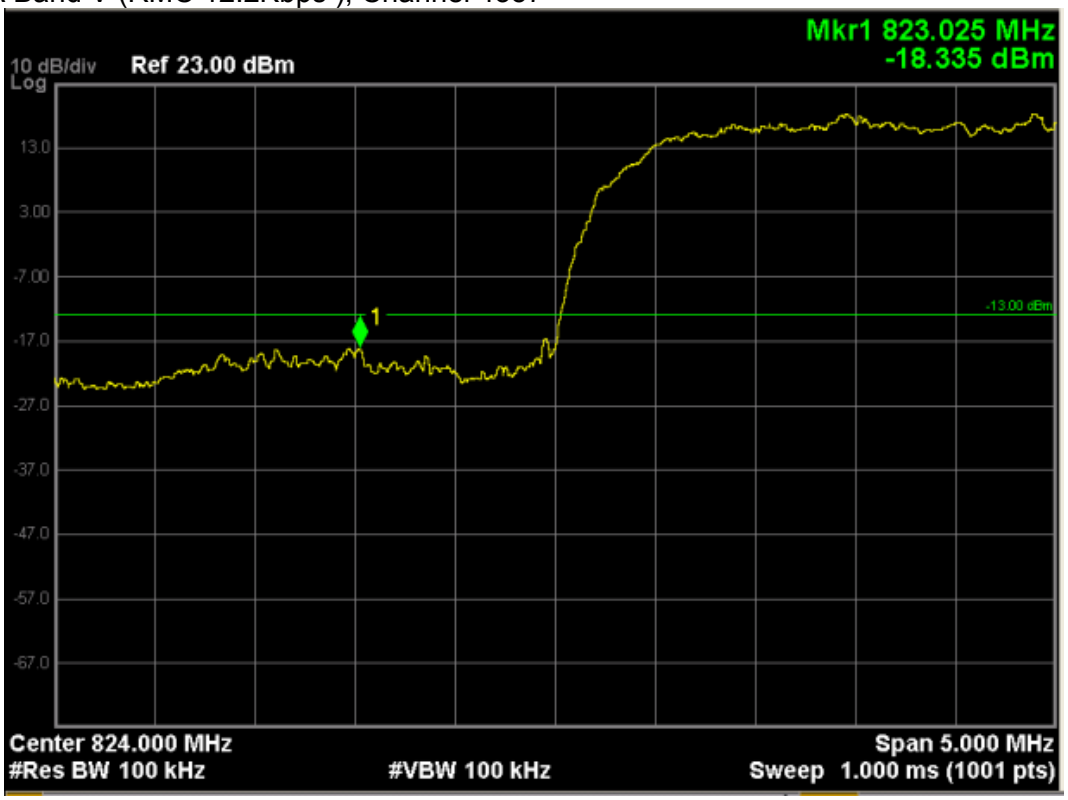
WCDMA Band Ⅱ(RMC 12.2Kbps), Channel 9662



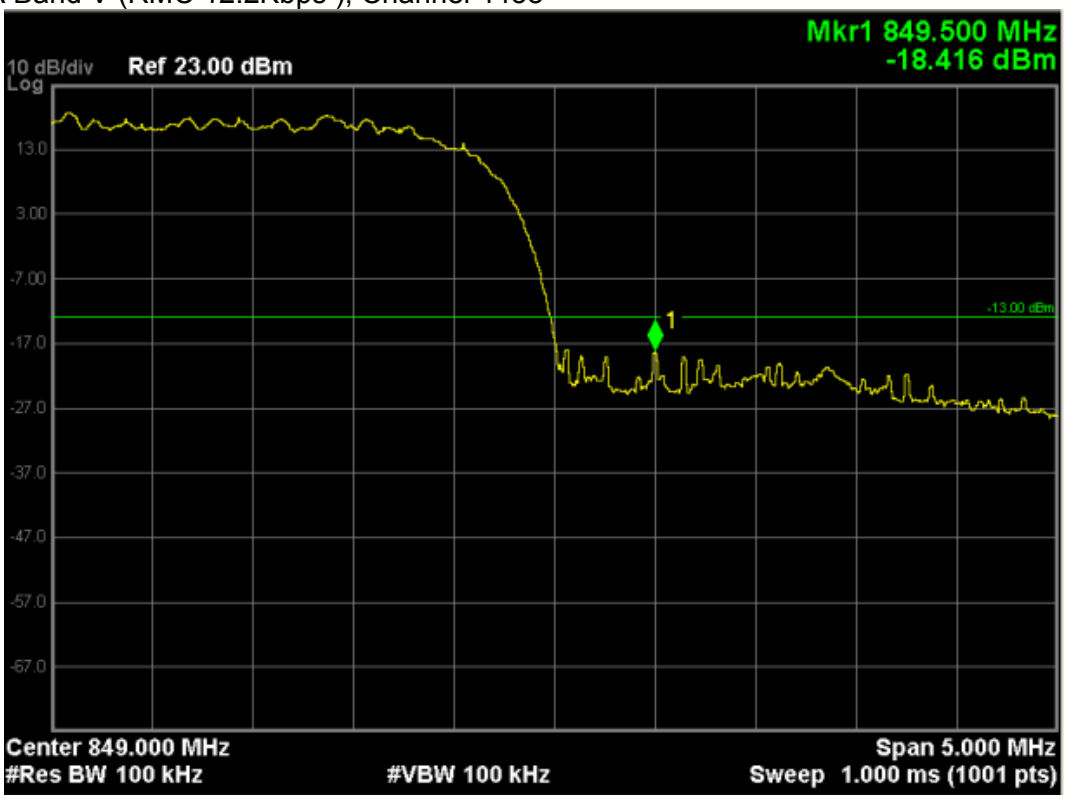
WCDMA Band Ⅱ(RMC 12.2Kbps), Channel 9938



WCDMA Band V (RMC 12.2Kbps), Channel 4357



WCDMA Band V (RMC 12.2Kbps), Channel 4458



6.Spurious Emission

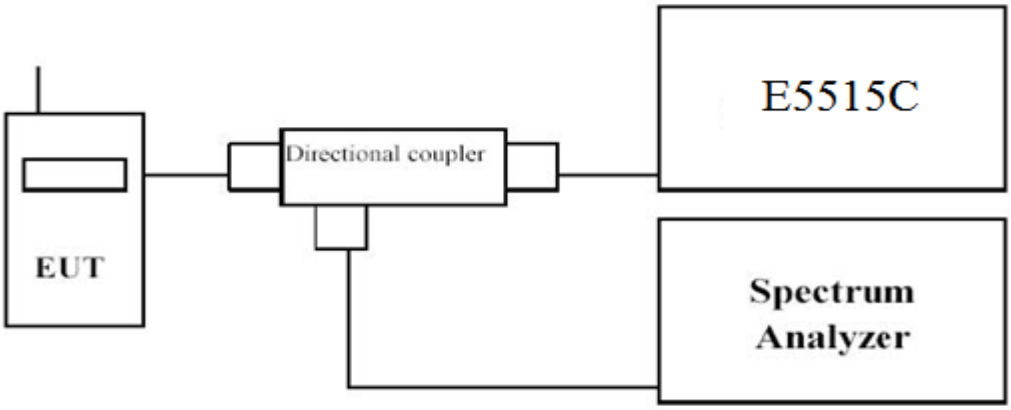
6.1. Test Equipment

Instrument	Manufacturer	Model	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	N9038A	MY51210142	2014.12.17
Radio Communication Tester	Agilent	E5515C	GB46581718	2014.10.21
Signal Generator	Agilent	N5183A	MY50140938	2015.01.03
Preamplifier	CEM	EM30180	3008A0245	2015.02.28
Loop Antenna	Schwarzbeck	FMZB1519	1519-020	2015.03.26
Bilog Antenna	Schwarzbeck	VULB9160	9160-3316	2015.07.18
VHF-UHF-Biconical Antenna	Schwarzbeck	VUBA9117	9117-263	2015.07.18
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-942	2015.07.18
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-943	2015.07.18

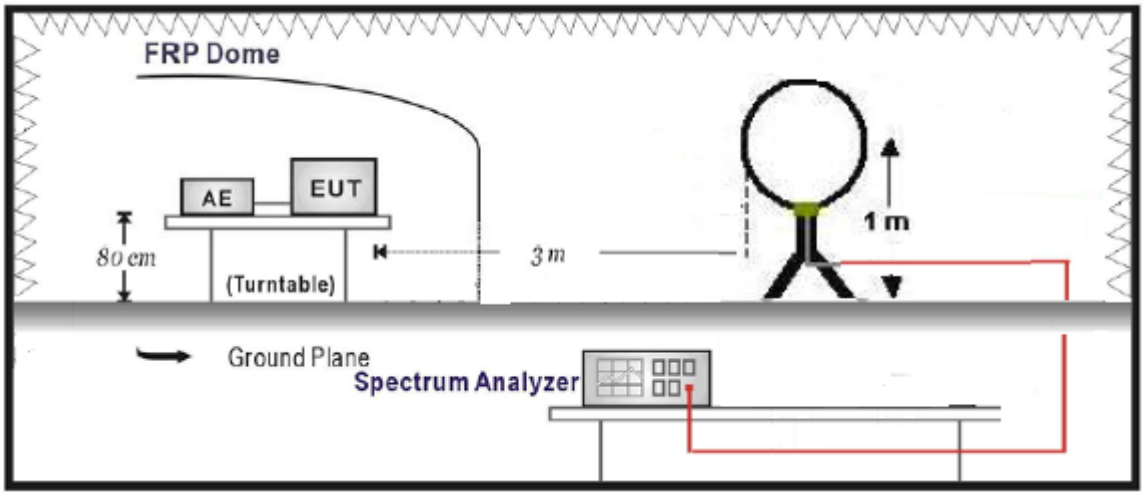
The measure equipment had been calibrated once a year.

6.2. Test Setup

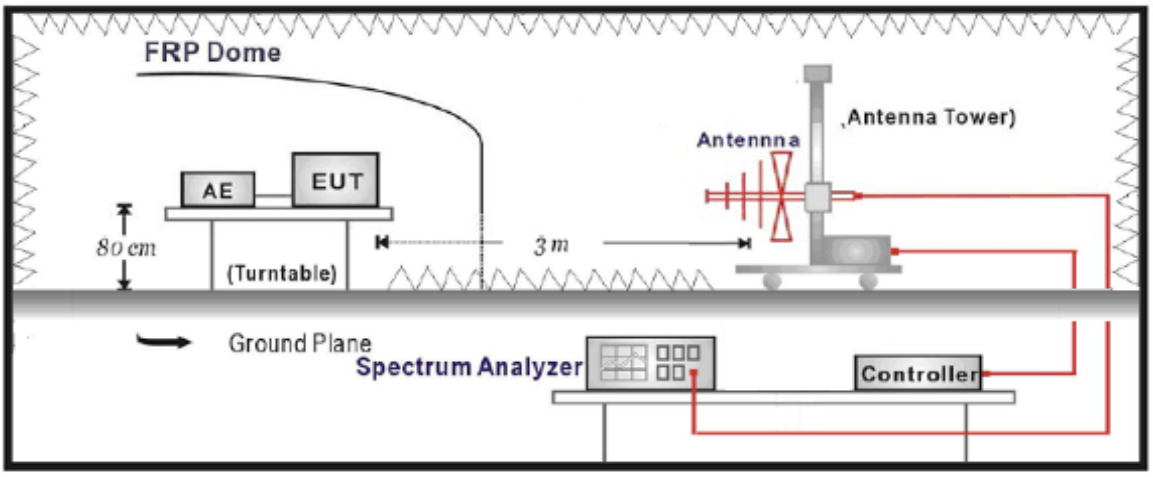
Conducted Spurious Emission Measurement:



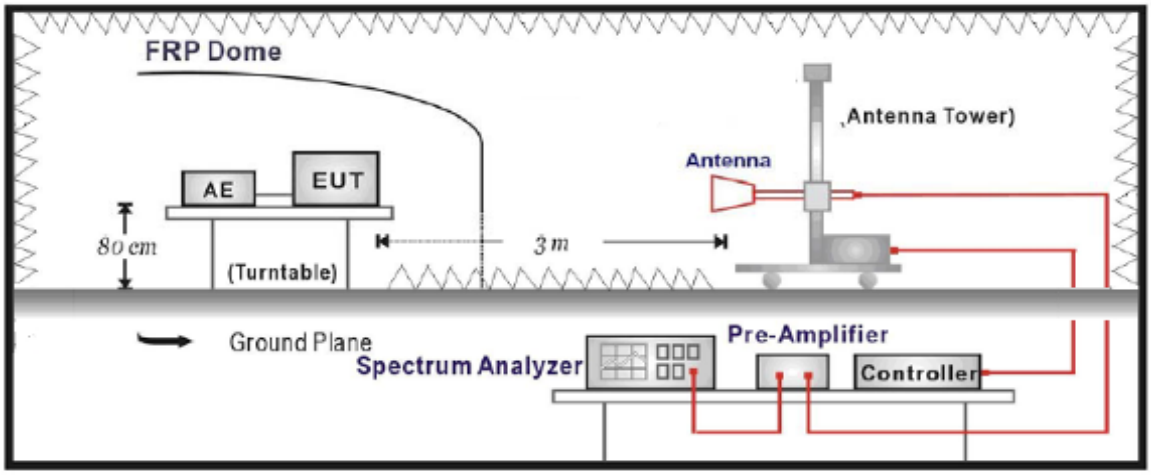
Radiated Spurious Measurement: below 30MHz



Radiated Spurious Measurement: 30MHz to 1GHz



Radiated Spurious Measurement: above 1GHz



6.3. Limit

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 + 10log(P) dB.

6.4. Test Procedure

Conducted Spurious Measurement:

a. Place the EUT on a bench and set it in transmitting mode.
b. Connect a low loss RF cable from the antenna port to a spectrum analyzer and E5515C by a Directional Couple.
c. EUT Communicate with E5515C, then select a channel for testing.
d. Add a correction factor to the display of spectrum, and then test.
e. The resolution bandwidth of the spectrum analyzer was set at 1 MHz, sufficient scans were taken to show the out of band Emission if any up to 10th harmonic.

Radiated Spurious Measurement:

a. The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
b. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
c. The output of the test antenna shall be connected to the measuring receiver. The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
d. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
e. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.

f. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
h. The maximum signal level detected by the measuring receiver shall be noted.
i. The transmitter shall be replaced by a substitution antenna.
j. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
k. The substitution antenna shall be connected to a calibrated signal generator.
l. If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
m. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
n. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
o. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
p. The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
q. The frequency range was checked up to 10^{th} harmonic.
r. Test site anechoic chamber refer to ANSI/TIA-603-C-2004.

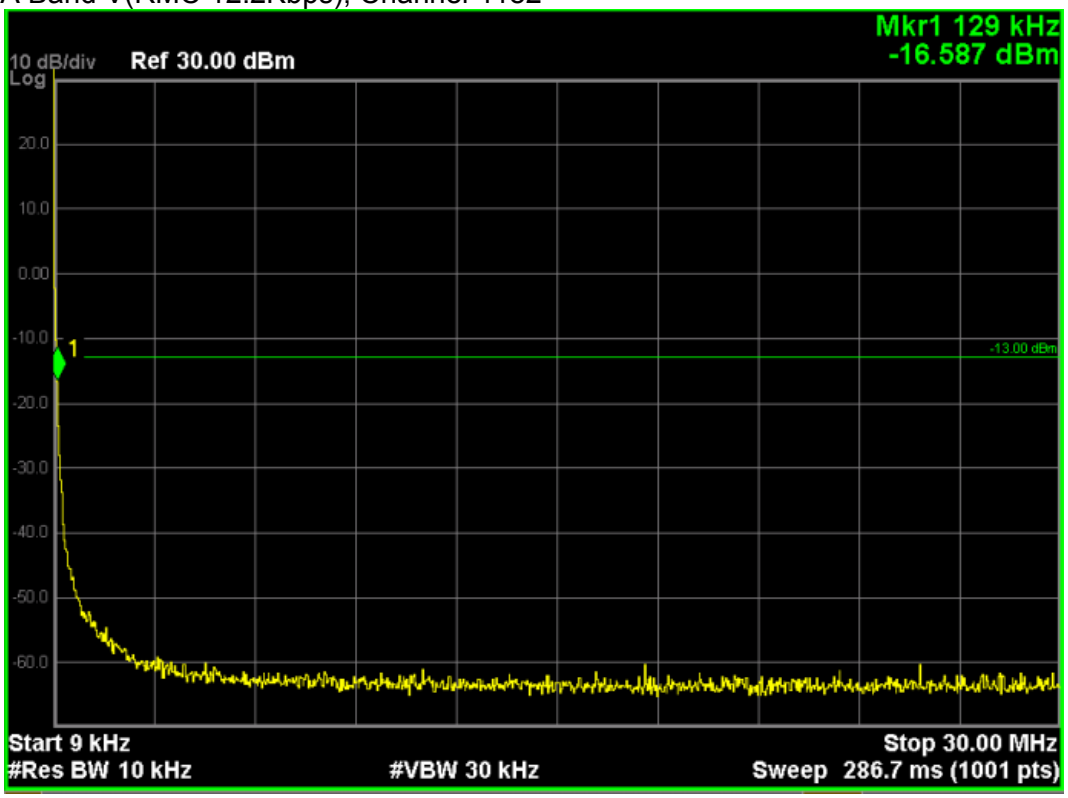
6.5. Uncertainty

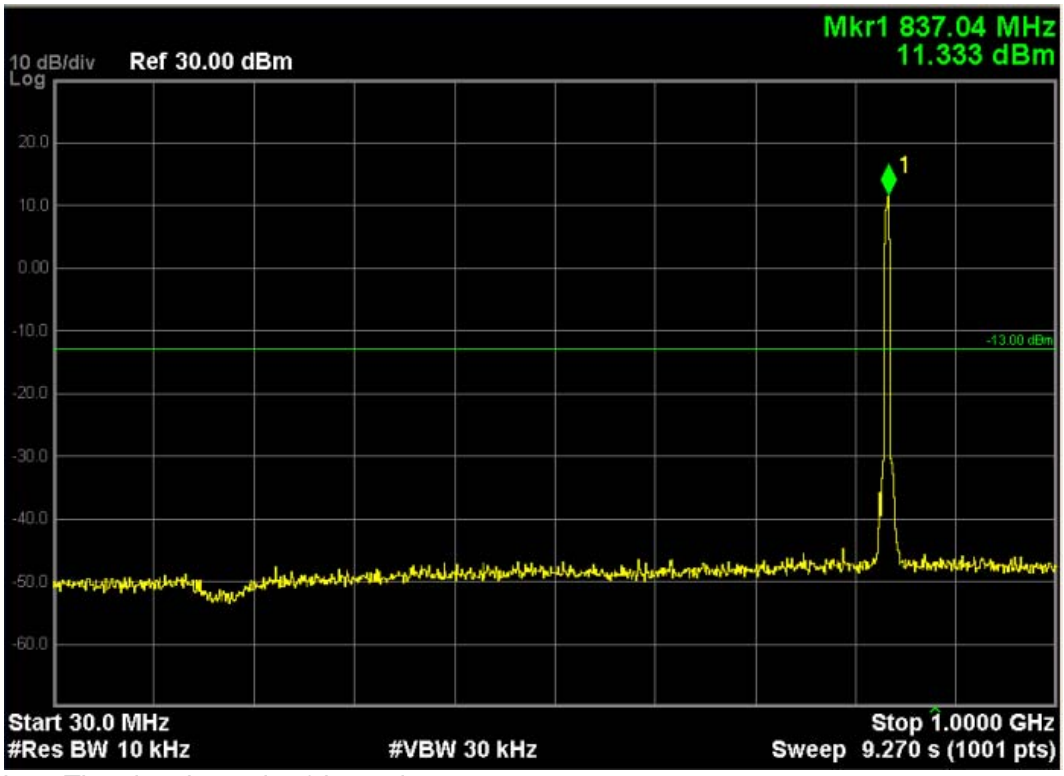
The measurement uncertainty is defined as 3.2 dB for Radiated Power Measurement.

6.6. Test Result

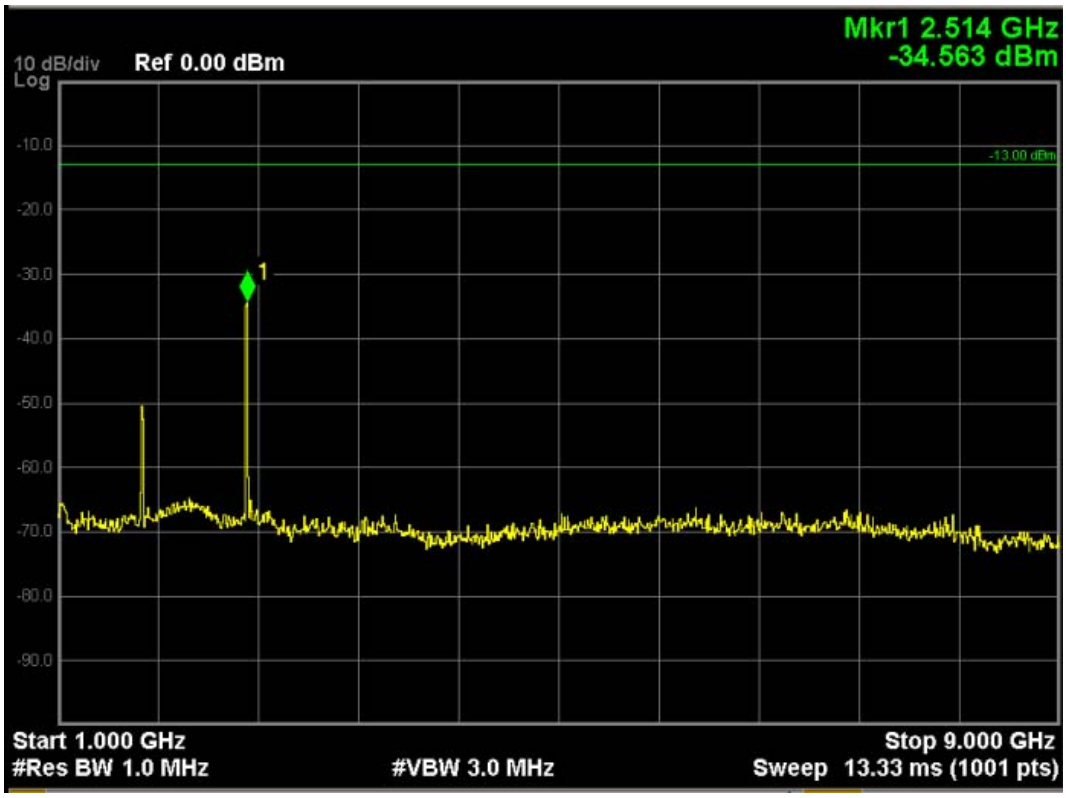
Conducted Spurious Measurement:

WCDMA Band V(RMC 12.2Kbps), Channel 4182

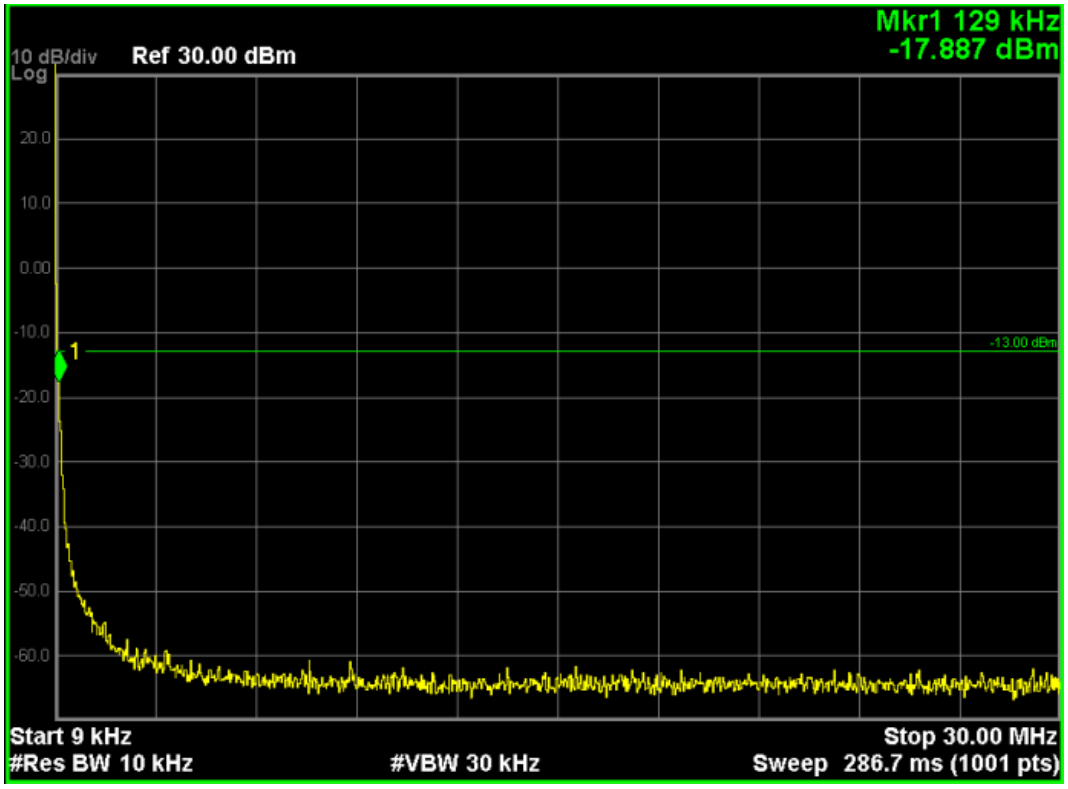


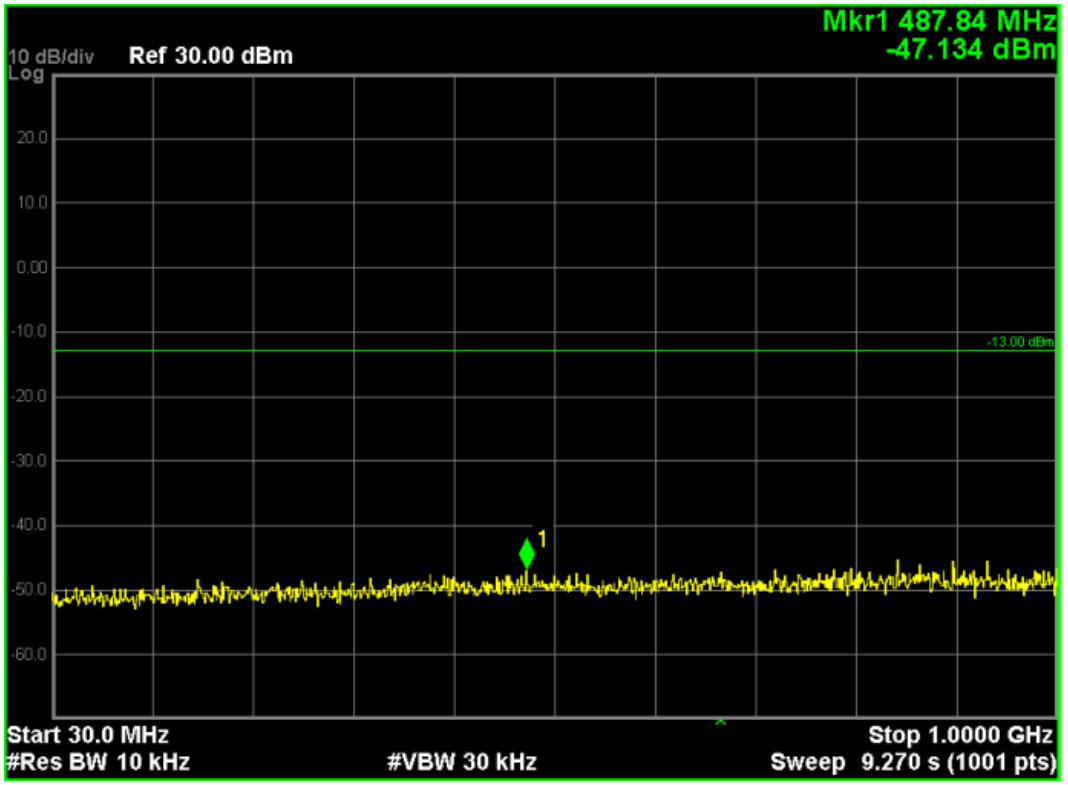


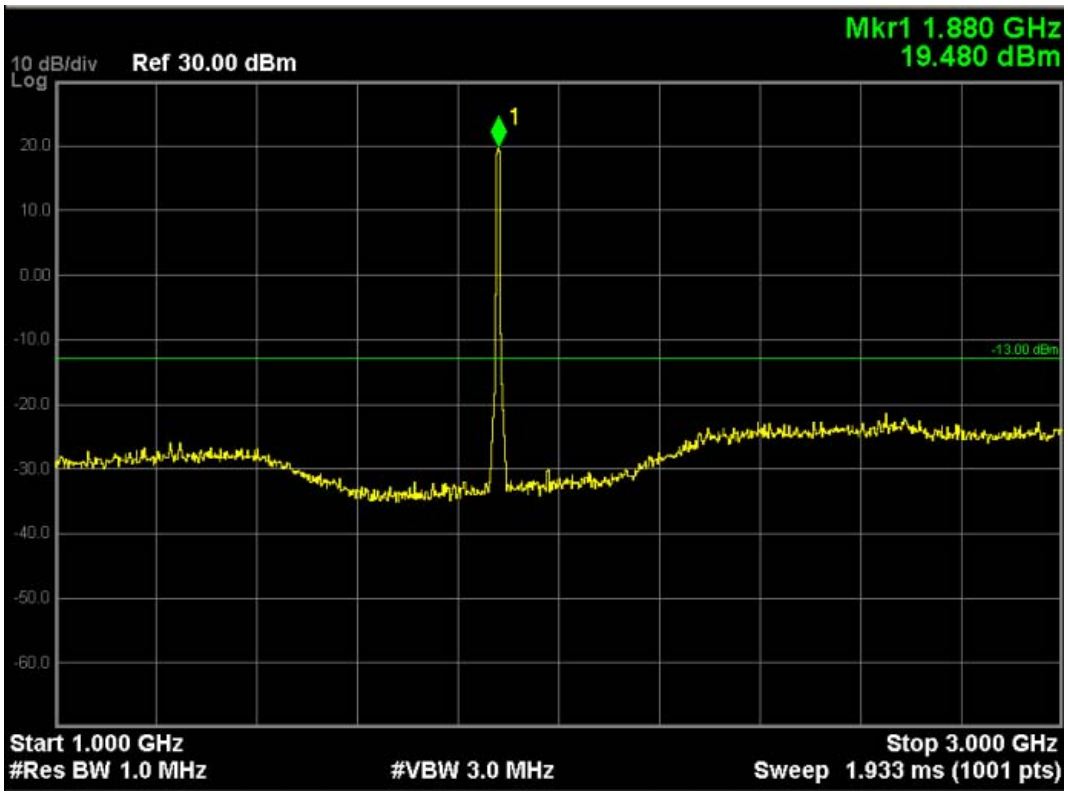
Note: The signal at point 1 is carrier


Mkr1 2.514 GHz
-34.563 dBm
10 dB/div
Log
Ref 0.00 dBm
-13.00 dBm
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
1
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 9.000 GHz
Sweep 13.33 ms (1001 pts)

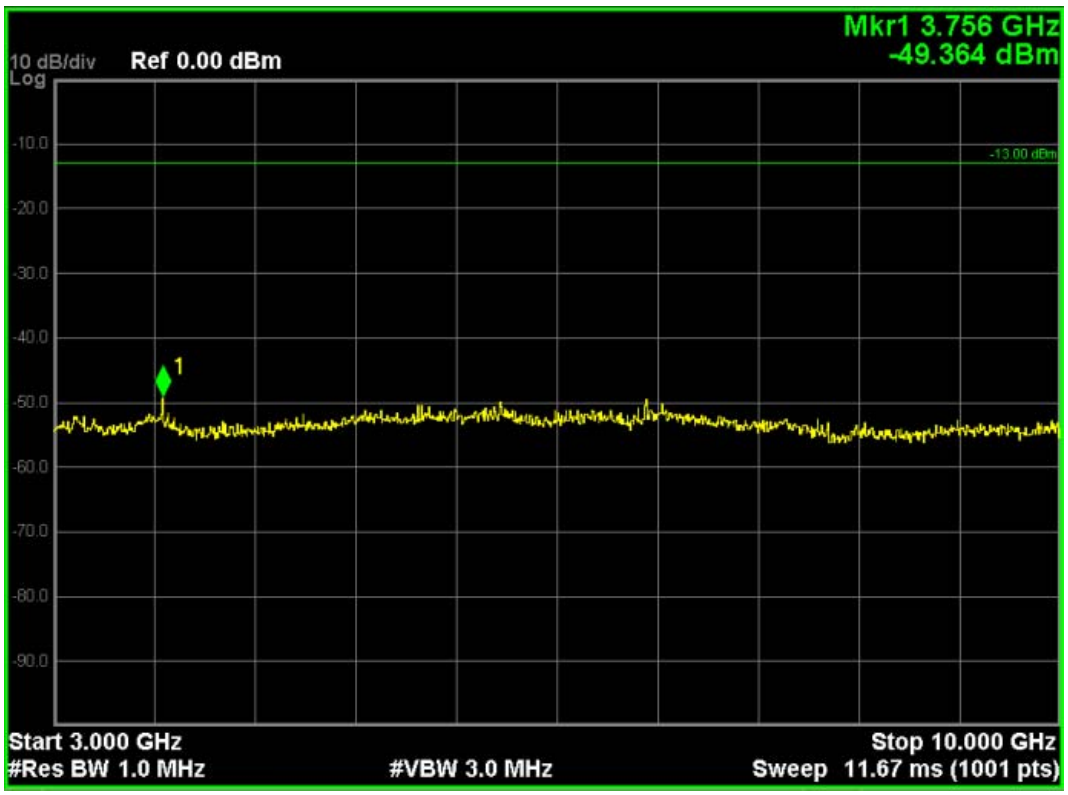
WCDMA Band Ⅱ(RMC 12.2Kbps), Channel 9400

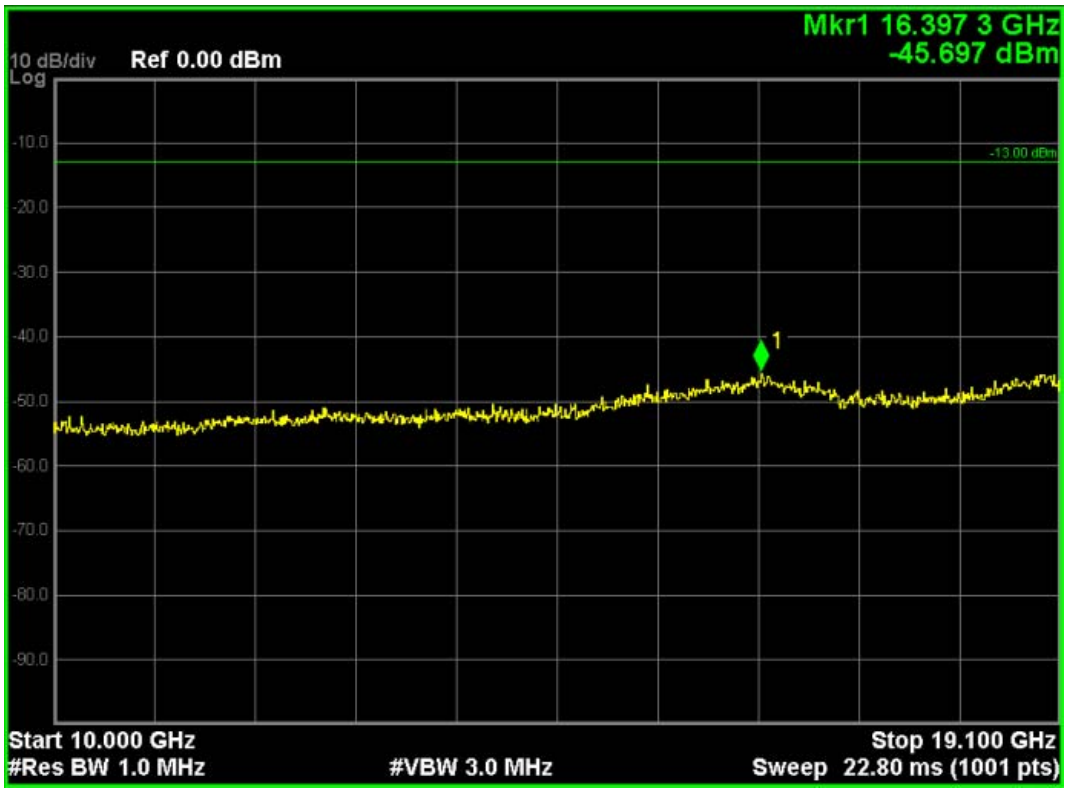






Note: The signal at point 1 is carrier




Mkr1 16.397 3 GHz
-45.697 dBm
10 dB/div
Log
Ref 0.00 dBm
-13.00 dBm
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
1
Start 10.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 19.100 GHz
Sweep 22.80 ms (1001 pts)

Radiated Spurious Measurement:

WCDMA Band V 9KHz to 30MHz
The low frequency, which started from 9KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line, and that was not reported per 2.1057 (c).

WCDMA Band V 30MHz to 1GHz

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Middle Channel 4182 (836.40MHz)							
535.1	H	-61.54	2.85	-1.85	-63.24	-13.00	-53.24
535.1	V	-60.68	2.85	-1.85	-65.38	-13.00	-52.38

WCDMA Band V Above 1GHz

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Middle Channel 4182 (836.40MHz)							
1672.8	H	-56.00	6.13	-2.59	-64.72	-13.00	-51.72
1672.8	V	-50.72	6.13	-2.59	-59.44	-13.00	-46.44
2529.2	H	-53.36	7.32	-2.86	-63.54	-13.00	-50.54
2529.2	V	-54.24	7.32	-2.86	-64.42	-13.00	-51.42
3345.6	H	-59.02	8.43	-3.79	-71.24	-13.00	-58.24
3345.6	V	-57.28	8.43	-3.79	-69.50	-13.00	-56.50

WCDMA Band II 9KHz to 30MHz
The low frequency, which started from 9KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line, and that was not reported per 2.1057 (c).

WCDMA Band II 30MHz to 1GHz

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Middle Channel 9400 (1880MHz)							
568.2	H	-59.35	2.97	-1.98	-64.3	-13.00	-51.3
568.2	V	-58.64	2.97	-1.98	-63.59	-13.00	-50.59

WCDMA Band II Above 1GHz

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Middle Channel 9400 (1880MHz)							
3760	H	-57.44	8.85	-3.28	-69.57	-13.00	-56.57

3760	V	-58.65	8.85	-3.28	-70.92	-13.00	-57.92
5640	H	-54.20	10.79	-3.98	-68.97	-13.00	-55.97
5640	V	-58.61	10.79	-3.98	-73.38	-13.00	-60.38
7520	H	-60.28	12.93	-3.03	-76.24	-13.00	-63.24
7520	V	-58.34	12.93	-3.03	-74.30	-13.00	-61.30

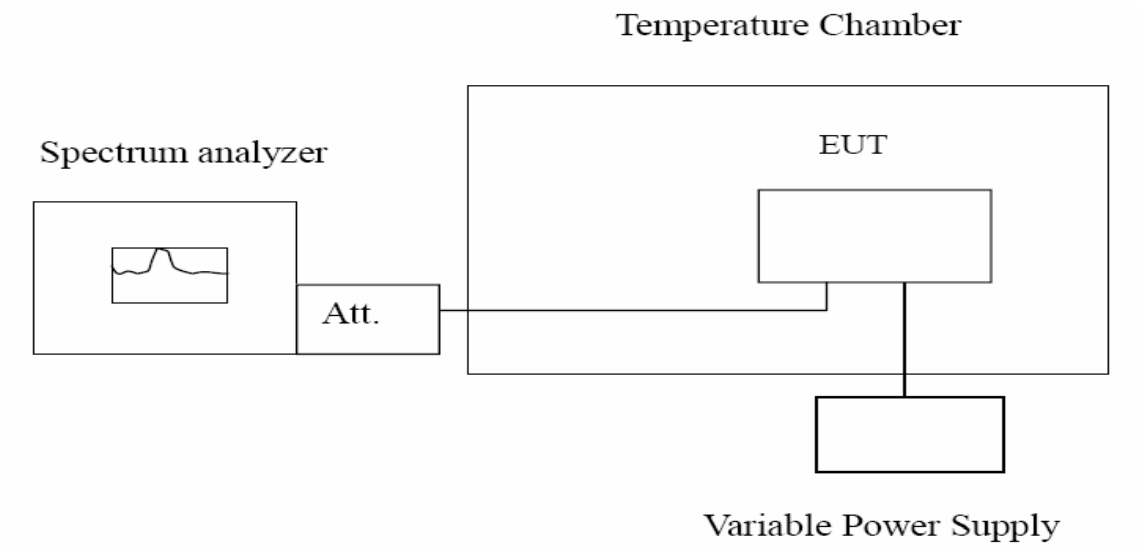
7. Frequency Stability Under Temperature & Voltage Variations

7.1. Test Equipment

Instrument	Manufacturer	Model	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	N9038A	MY51210142	2014.12.17
Radio Communication Tester	Agilent	E5515C	GB46581718	2014.10.21
DC Power Supply	Agilent	6612C	MY43002989	2015.03.03
Temperature Chamber	WEISS	DU/20/40	58226017340050	2015.01.03

The measure equipment had been calibrated once a year.

7.2. Test Setup



7.3. Limit

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

Limit	< ±2.5 ppm

7.4. 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 -20℃. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10℃ increased per stage until the highest temperature of +50℃ 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.

7.5. Uncertainty

The measurement uncertainty is defined as±10 Hz.

7.6. Test Result

WCDMA Band V:

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-20	836.40	-25.23	±2091
-10	836.40	-23.99	±2091
0	836.40	-18.21	±2091
10	836.40	-13.17	±2091
20	836.40	-11.25	±2091
30	836.40	-24.61	±2091
40	836.40	-34.12	±2091
50	836.40	-33.52	±2091
60	836.40	-35.57	±2091

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
3.4	836.40	-18.51	±2091
3.8	836.40	-21.30	±2091
4.2	836.40	-29.74	±2091

Notes: the manufacture declared that the EUT could work between voltages3.4V～4.2V, and this EUT could normally work under the condition from -20℃ to 60℃, otherwise this EUT will shut down and not transmit.

WCDMA Band II:

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-20	1880.00	-20.62	±2091
-10	1880.00	-17.52	±2091
0	1880.00	-18.56	±2091
10	1880.00	-17.20	±2091
20	1880.00	-21.22	±2091
30	1880.00	-30.61	±2091
40	1880.00	-18.22	±2091
50	1880.00	-20.16	±2091
60	1880.00	-22.19	±2091

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
3.4	1880.00	-13.55	±2091
3.8	1880.00	-27.32	±2091
4.2	1880.00	21.16	±2091

Notes: the manufacture declared that the EUT could work between voltages 3.4V～4.2V, and this EUT could normally work under the condition from -20℃ to 60℃, otherwise this EUT will shut down and not transmit.

9.Attachment

PHOTOGRAPHS OF TEST SETUP

Please refer to the file named “RF Setup Photos”.

PHOTOGRAPHS OF EUT

Please refer to the two files named “SIM5320AL_EUT Photos”.

----End of the report----