

RF Test Report

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

Product Name : LTE/WCDMA Module
Model No. : SIM7100A
FCC ID : UDV-SIM7100A

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

Date of Receipt : 11-17-2014
Test Date : 11-17-2014~12-16-2014
Issued Date : 12-16-2014
Report No. : UL15820141117FCC036-1
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 : 12-16-2014
Report No. : UL20141117FCC036-1

Product Name : LTE/WCDMA Module
Applicant : Shanghai Simcom Ltd.
Address : Building A, SIM Technology Building No.633, Jinzhong Road, Changning
Disdriect, Shanghai P.R. China 200335
Manufacturer : Shanghai Simcom Ltd.
Address : Building A, SIM Technology Building No.633, Jinzhong Road, Changning
Disdriect, Shanghai P.R. China 200335
Model No. : SIM7100A
EUT Voltage : MIN: 3.4V, NOR: 3.8V, MAX: 4.2V
Brand Name : SIMCom
FCC ID: UDV-SIM7100A
Applicable Standard : ANSI/TIA-603-C-2004; FCC KDB 971168 D01 Power Meas License Digital
Systems v02r02; 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: +86-21-50277862

Documented By :

Andy Wei

(Technical Engineer: Andy Wei)

Reviewed By :

Forest Cao

(Senior Engineer: Forest Cao)

Approved By :

Eva Wang

(Supervisor: Eva Wang)

TABLE OF CONTENTS

SUMMARY OF TEST RESULT.....	4
1. General Information.....	5
1.1. EUT Description.....	5
1.2. Mode of Operation.....	6
1.3. Tested System Details.....	7
1.4. Configuration of Tested System.....	8
1.5. EUT Exercise Software.....	8
2. Technical Test.....	9
2.1. Test Environment.....	9
3. Peak Output Power.....	10
3.1. Test Equipment.....	10
3.2. Test Setup.....	10
3.3. Limit.....	11
3.4. Test Procedure.....	12
3.5. Uncertainty.....	12
3.6. Test Result.....	13
4. Occupied Bandwidth.....	15
4.1. Test Equipment.....	15
4.2. Test Setup.....	15
4.3. Limit.....	15
4.4. Test Procedure.....	16
4.5. Uncertainty.....	16
4.6. Test Result.....	17
5. Spurious Emission At Antenna Terminals (+/- 1MHz).....	21
5.1. Test Equipment.....	21
5.2. Test Setup.....	21
5.3. Limit.....	21
5.4. Test Procedure.....	22
5.5. Uncertainty.....	22
5.6. Test Result.....	23
6. Spurious Emission.....	25
6.1. Test Equipment.....	25
6.2. Test Setup.....	26
6.3. Limit.....	27
6.4. Test Procedure.....	27
6.5. Uncertainty.....	28
6.6. Test Result.....	29
7. Frequency Stability Under Temperature & Voltage Variations.....	34
7.1. Test Equipment.....	34
7.2. Test Setup.....	34
7.3. Limit.....	34
7.4. Test Procedure.....	35
7.5. Uncertainty.....	35
7.6. Test Result.....	36
8. Peak to Average.....	38
8.1. Test Equipment.....	38
8.2. Test Setup.....	38
8.3. Limit.....	38
8.4. Test Procedure.....	38
8.5. Uncertainty.....	39
8.6. Test Result.....	39
10.Attachment.....	40

SUMMARY OF TEST RESULT

Report Section	SPECIFICATION	Description	Limit	Result
	FCC CFR 47			
3	part2.1046	Conducted Output Power	N/A	PASS
3	part 22.913(a)(2) part 24.232(c)	Effective Radiated Power Equivalent Isotropic Radiated Power	<7 Watts <2 Watts	PASS
4	part 2.1046	Modulation Characteristic	N/A	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 Spurious 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
8	part 24.232(d)	Peak-to-Average	<13dB	PASS

1.General Information

1.1. EUT Description

Product Name:	LTE/WCDMA Module
Model Name:	SIM7100A
Hardware Version:	V1.03
Software Version:	SIM7100A_V1.0
RF Exposure Environment:	Uncontrolled
WCDMA	
Support Band:	WCDMA Band II
Tx Frequency Range:	WCDMA Band II : 1850MHz ~1910MHz
Rx Frequency Range:	WCDMA Band II : 1930MHz ~1990MHz
Type of modulation:	WCDMA(UMTS): QPSK
Antenna Type:	Connector
Antenna Peak Gain:	WCDMA Band II : 3.4dBi
Support Band:	WCDMA Band V
Tx Frequency Range:	WCDMA Band V: 824MHz ~849MHz
Rx Frequency Range:	WCDMA Band V: 869MHz ~894MHz
Type of modulation:	WCDMA(UMTS): QPSK
Antenna Type:	Connector
Antenna Peak Gain:	WCDMA Band V: 2.8dBi

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 tests.
3. For the ERP/EIRP and radiated emission test, every axis (X, Y, Z) was verified, and show the worst (Z axis) result in this report.

The conducted power table is as follows:

Conducted Power						
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	23.35	23.24	23.13	22.35	22.34	22.10
AMC 12.2Kbps	23.24	23.18	23.20	22.10	22.27	22.13
HSDPA Subtest-1	23.26	23.15	23.12	22.05	21.94	21.89
HSDPA Subtest-2	22.77	22.59	22.50	21.52	21.42	21.30
HSDPA Subtest-3	22.11	21.96	21.88	21.04	20.93	20.78
HSDPA Subtest-4	21.57	21.23	21.14	20.57	20.22	20.16
HSUPA Subtest-1	23.18	23.10	23.12	22.29	22.08	22.11

HSUPA Subtest-2	22.72	22.65	22.47	21.60	21.42	21.53
HSUPA Subtest-3	22.06	22.10	21.92	21.02	20.96	21.00
HSUPA Subtest-4	21.41	21.66	21.37	20.46	20.35	20.44

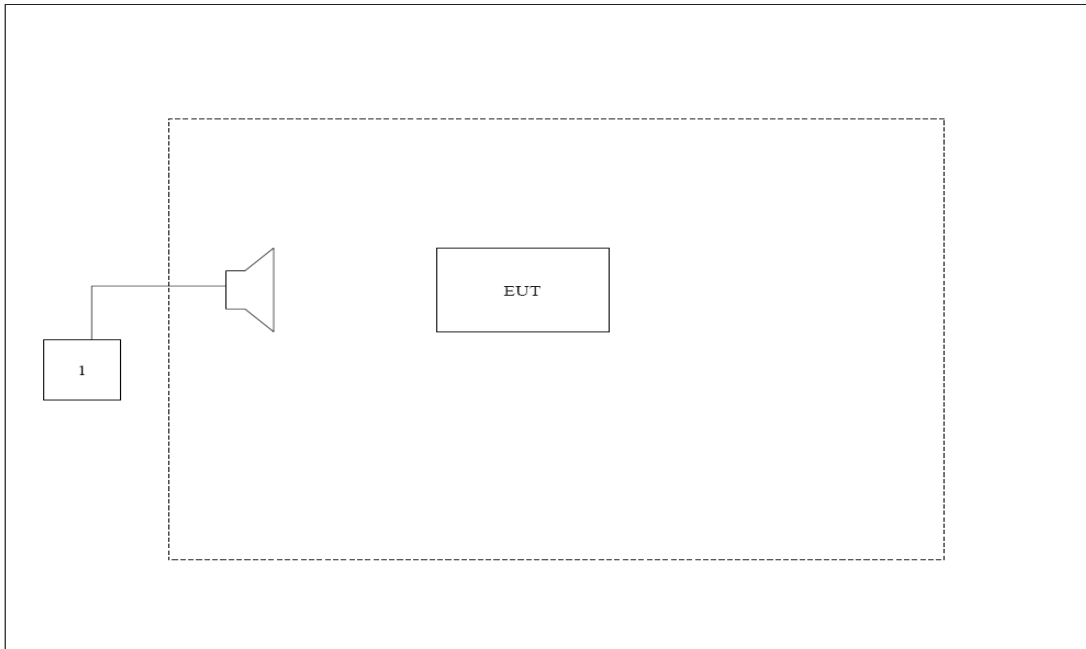
1.3. Tested System Details

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
Radio Communication Tester	R&S	CMW500	147483	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 CMW500, then select channel to test.

2. Technical Test

2.1. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	22
Humidity (%RH)	25-75	53
Barometric pressure (mbar)	860-1060	950-1000

3. Peak Output Power

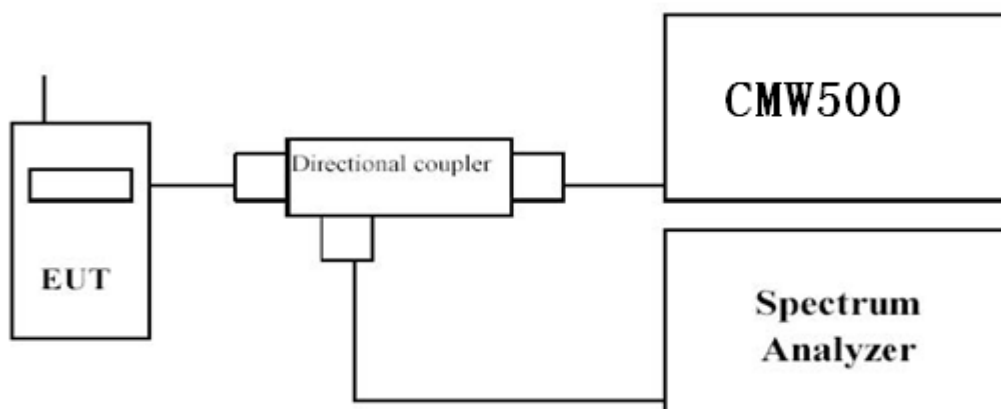
3.1. Test Equipment

Instrument	Manufacturer	Model	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	N9038A	MY51210142	12/17/2014
Radio Communication Tester	R&S	CMW500	147483	10/15/2014
Signal Generator	Agilent	N5183A	MY50140938	01/03/2015
Preamplifier	CEM	EM30180	3008A0245	02/28/2015
DC Power Supply	Agilent	6612C	MY43002989	03/03/2015
Bilog Antenna	Schwarzbeck	VULB9160	9160-3316	10/19/2015
VHF-UHF-Biconical Antenna	Schwarzbeck	VUBA9117	9117-263	10/19/2015
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-942	10/19/2015
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-943	10/19/2015

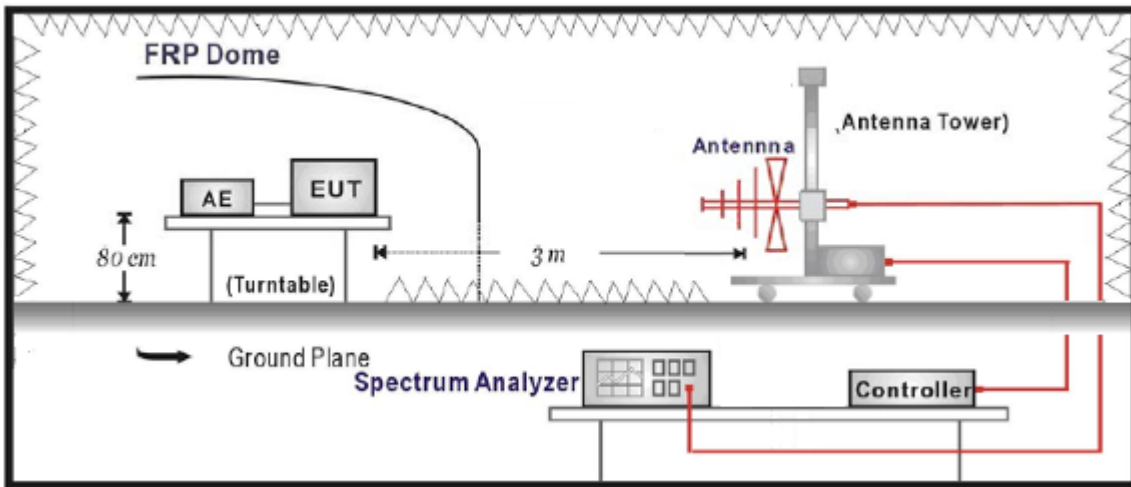
The measure equipment had been calibrated once a year.

3.2. Test Setup

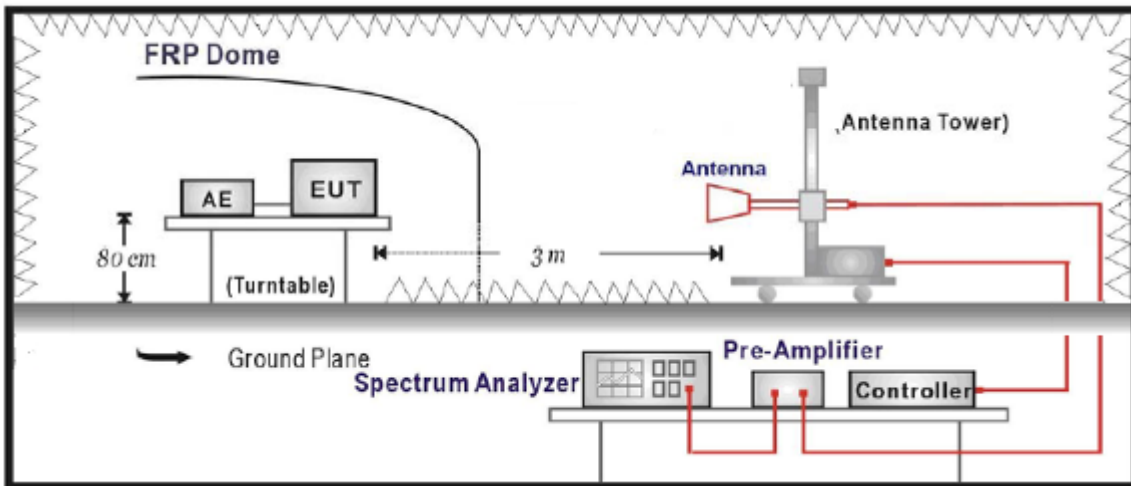
Conducted Power Measurement:



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 CMW500 by a Directional Couple.
- c. EUT Communicate with CMW500, 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:

Table 1

WCDMA				
Modes	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)
WCDMA Band V	4132(Low)	826.4	23.35	0.22
	4182(Mid)	836.4	23.24	0.21
	4233(High)	846.6	23.13	0.21
WCDMA Band II	9262(Low)	1852.4	22.35	0.17
	9400(Mid)	1880.0	22.34	0.17
	9538(High)	1907.6	22.10	0.16

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	31.67	3.83	-2.99	24.85	0.31
826.4	V	30.78	3.83	-2.99	23.96	0.25
Middle Channel 4182 (836.4MHz)						
836.4	H	31.74	3.96	-3.04	24.74	0.30
836.4	V	30.84	3.96	-3.04	23.84	0.24
High Channel 4233 (846.6MHz)						
846.6	H	31.87	3.97	-3.10	24.80	0.30
846.6	V	30.96	3.97	-3.10	23.89	0.24

WCDMA Band II

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	EIRP (W)
Low Channel 9262(1852.40MHz)						
1850.2	H	20.04	6.26	10.40	24.18	0.26
1850.2	V	19.30	6.26	10.40	23.44	0.22
Middle Channel 9400 (1880.00MHz)						
1880.0	H	19.99	6.19	10.43	24.23	0.26
1880.0	V	19.15	6.19	10.43	23.39	0.22
High Channel 9538 (1907.60MHz)						
1909.8	H	19.84	6.15	10.44	24.13	0.26
1909.8	V	18.99	6.15	10.44	23.28	0.21

4. Occupied Bandwidth

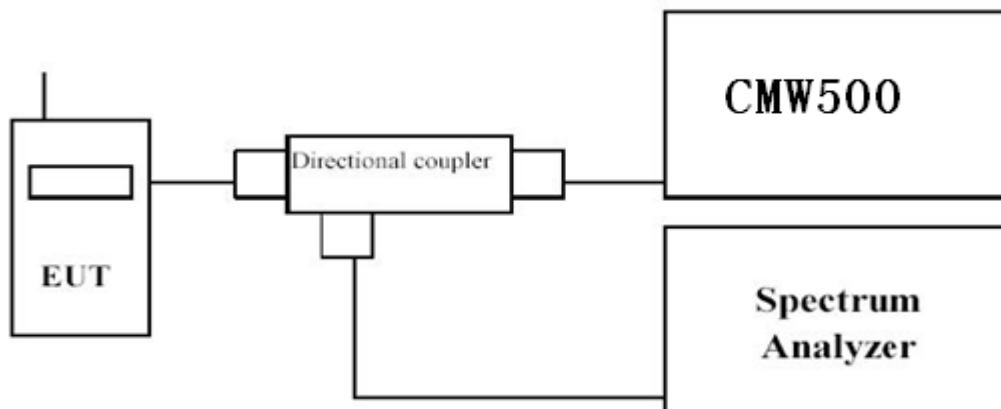
4.1. Test Equipment

Occupied Bandwidth

Instrument	Manufacturer	Model	Serial No	Cal. Date
Radio Communication Tester	R&S	CMW500	147483	10/15/2015
Spectrum Analyzer	Agilent	N9038A	MY51210142	12/17/2014
DC Power Supply	Agilent	6612C	MY43002989	03/03/2015

The measure equipment had been calibrated once a year.

4.2. Test Setup



4.3. Limit

N/A

4.4. Test Procedure

1. The testing follows FCC KDB 972268 v02v02 Section 4.2;
2. Using Occupied Bandwidth measurement function of spectrum analyzer. In the Occupied Bandwidth measurement a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

4.5. Uncertainty

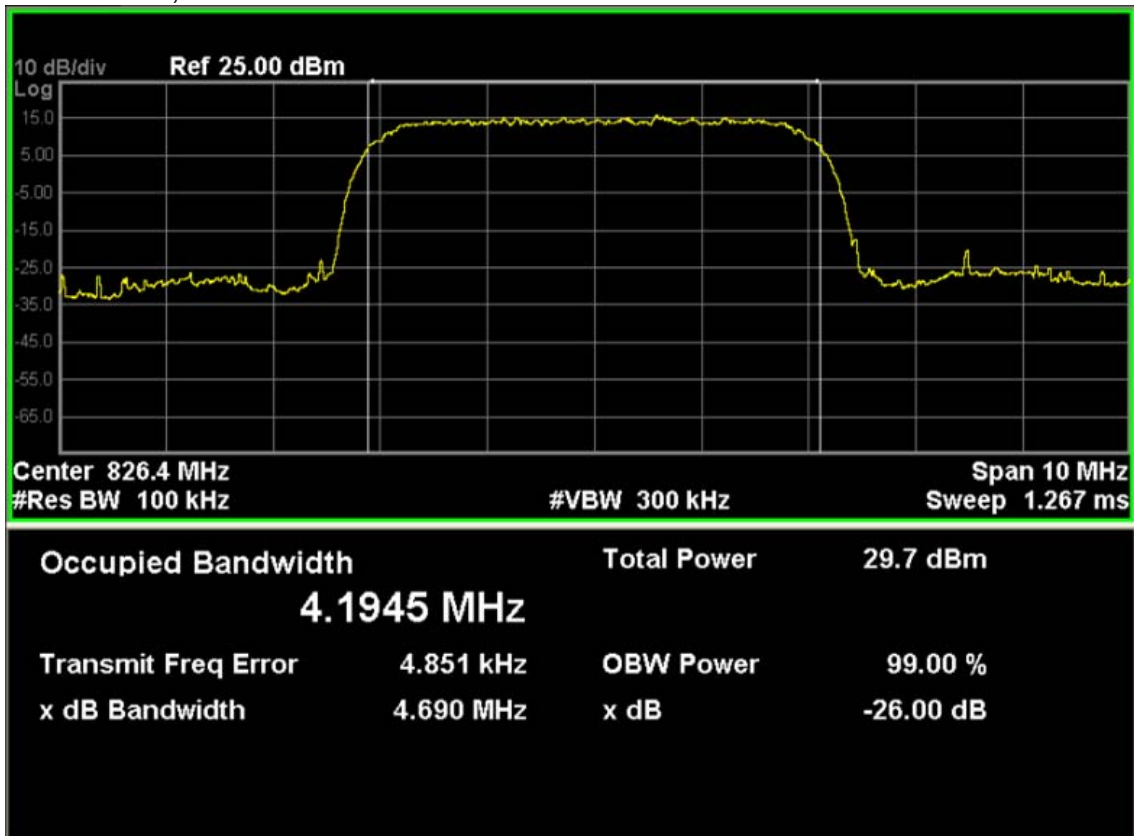
The measurement uncertainty is defined as ± 10 Hz

4.6. Test Result

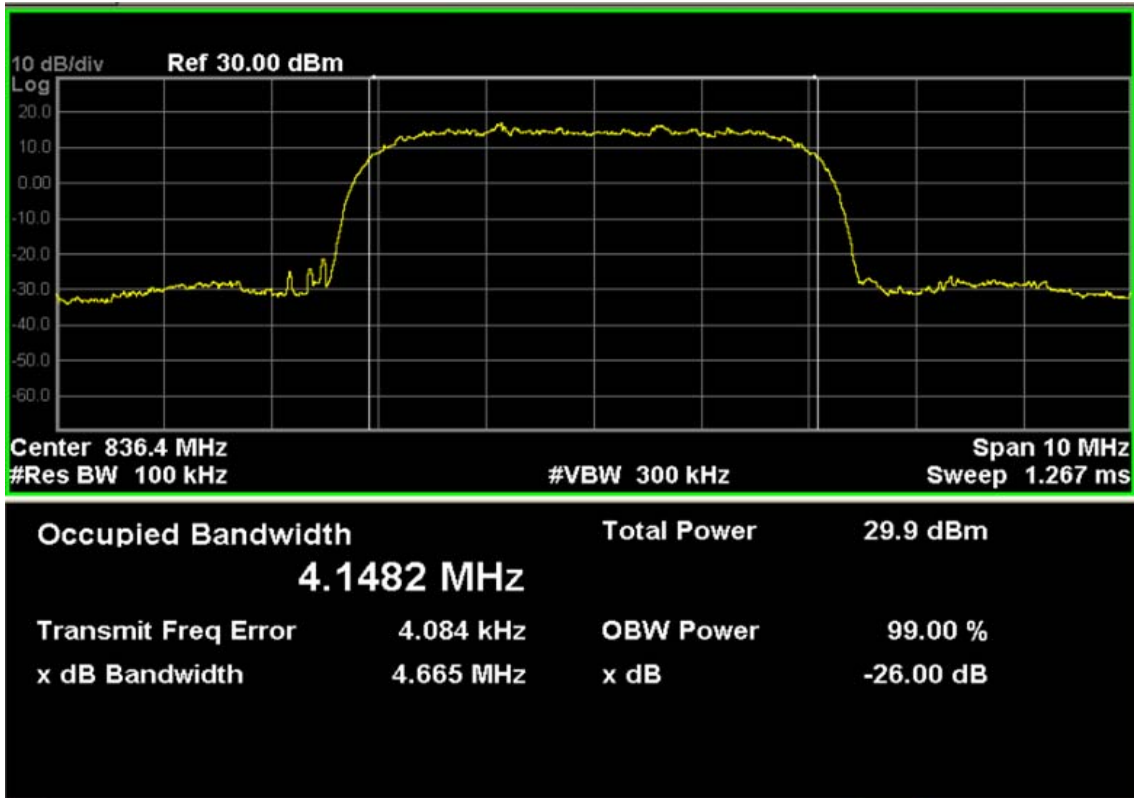
WCDMA Band V

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
4132	826.40	4.690	4.195
4182	836.40	4.665	4.148
4233	846.40	4.679	4.148

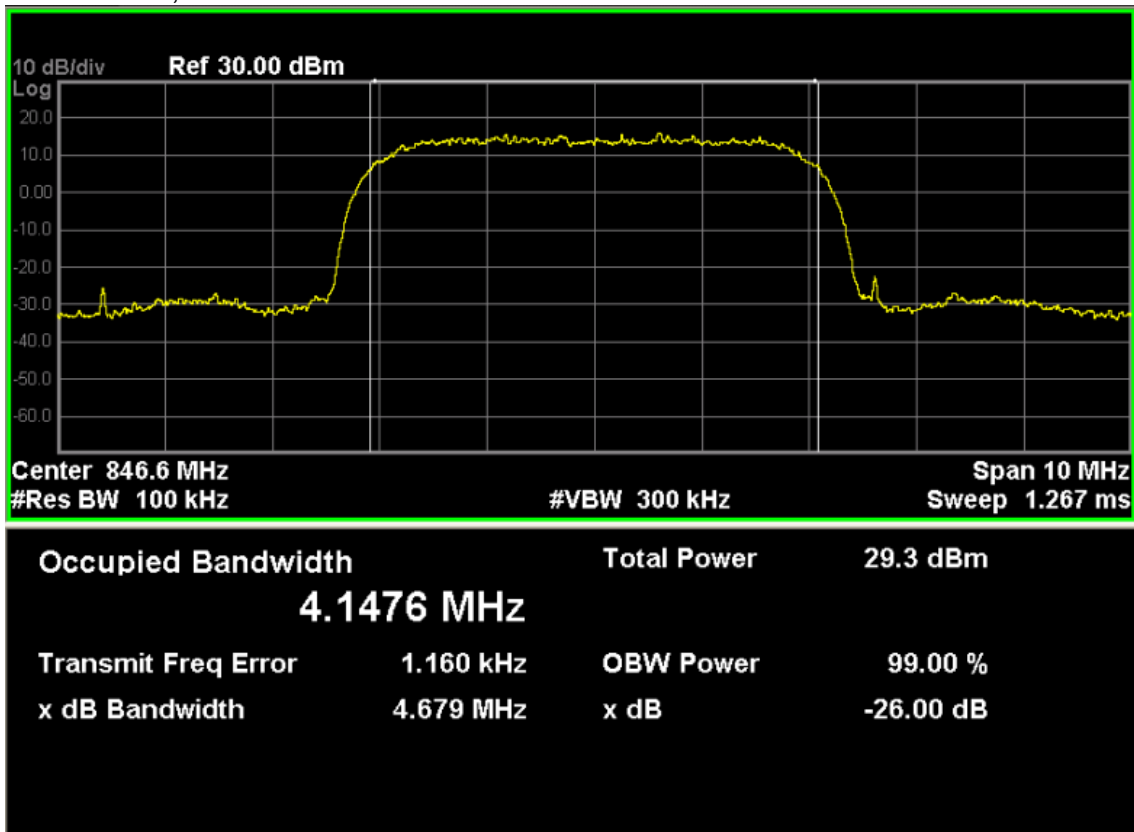
WCDMA Band V, Channel 4132



WCDMA Band V, Channel 4182



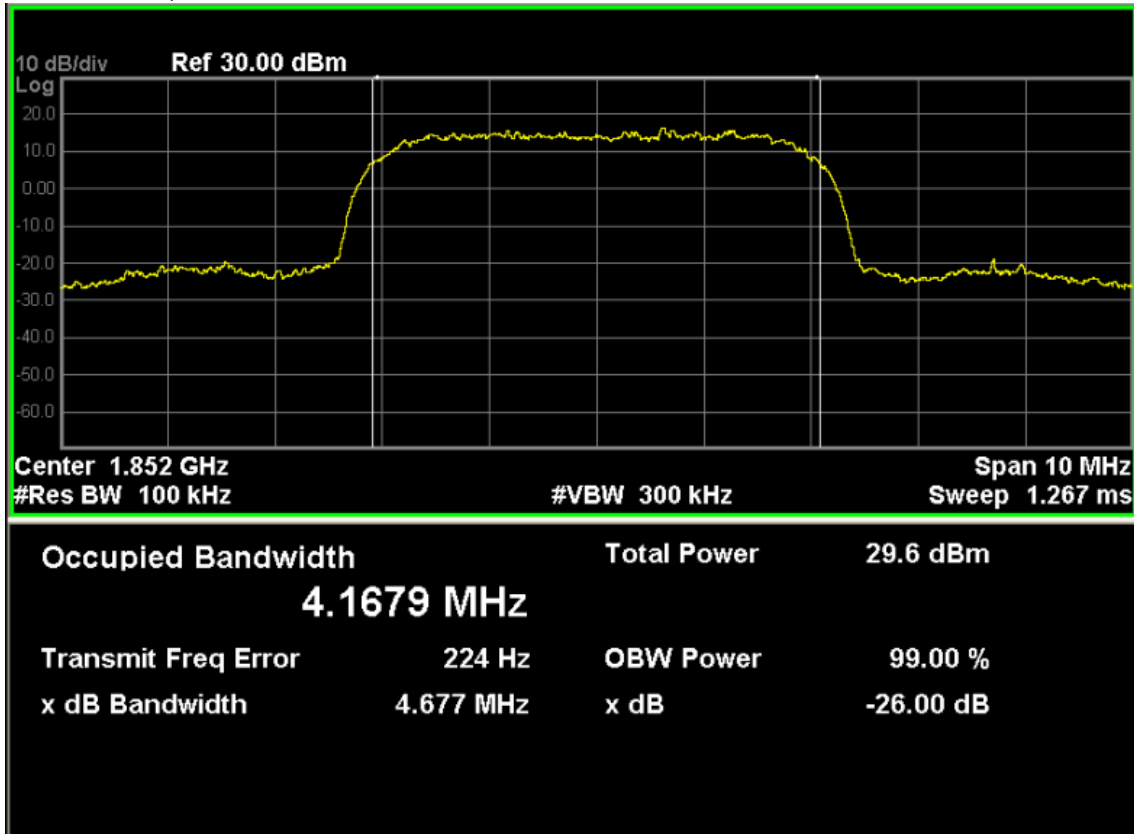
WCDMA Band V, Channel 4233



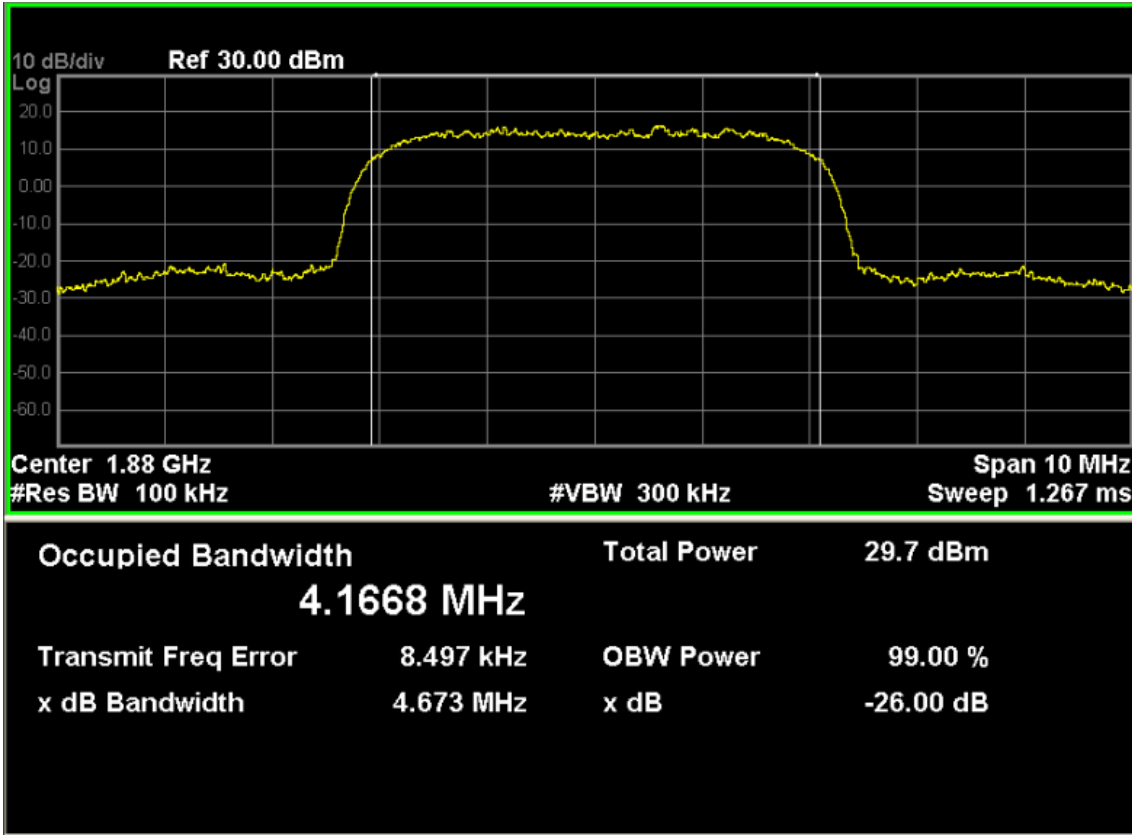
WCDMA Band II

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
9262	1852.4	4.677	4.168
9400	1880.0	4.673	4.167
9538	1907.6	4.676	4.173

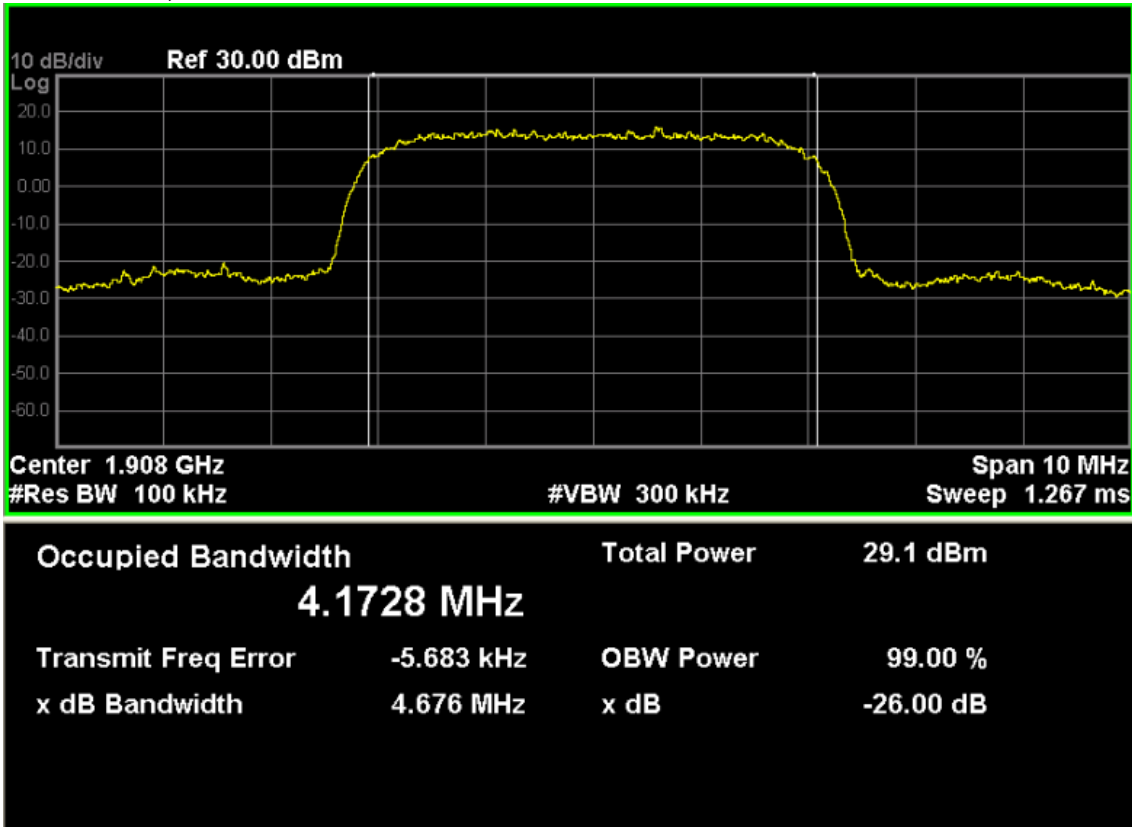
WCDMA Band II, Channel 9262



WCDMA Band II, Channel 9400



WCDMA Band II, Channel 9538



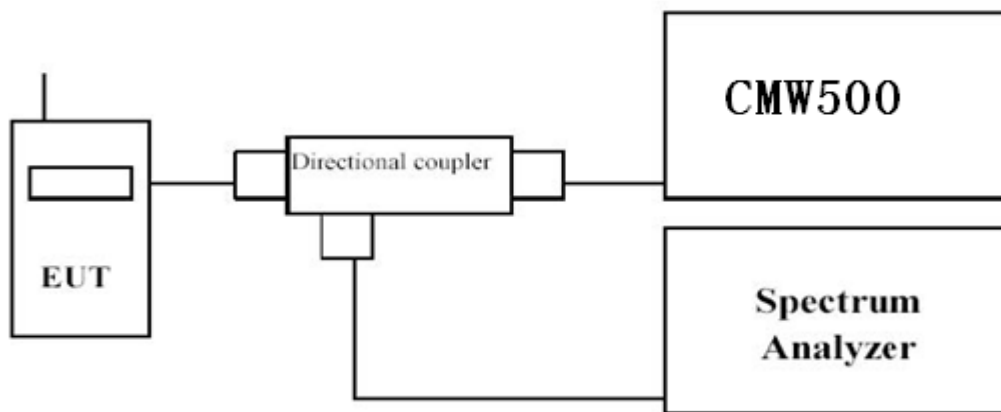
5. Spurious Emission At Antenna Terminals (+/- 1MHz)

5.1. Test Equipment

Instrument	Manufacturer	Model	Serial No	Cal. Date
Radio Communication Tester	R&S	CMW500	147483	10/15/2015
Spectrum Analyzer	Agilent	N9038A	MY51210142	12/17/2014
DC Power Supply	Agilent	6612C	MY43002989	03/03/2015

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 $43 + 10\log(P)$ 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.

Procedure:

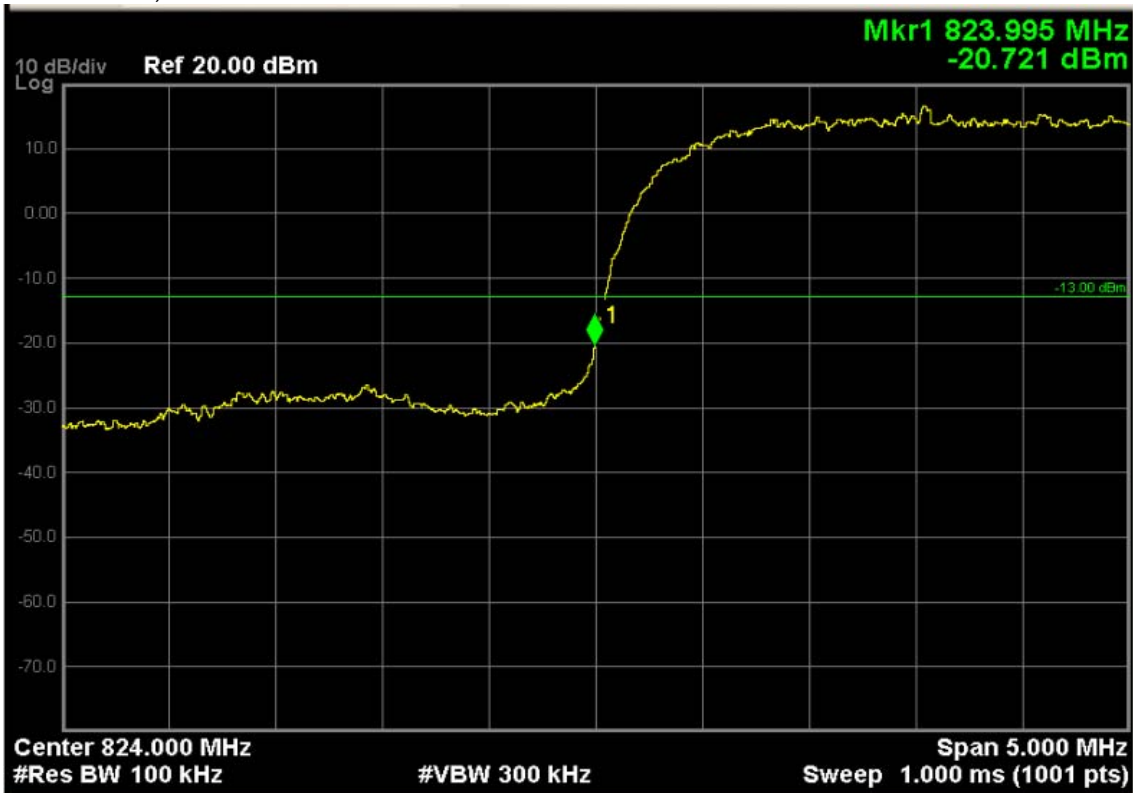
1. The testing follows FCC KDB 972268 v02v02 Section 6.0;
2. The EUT was connected to spectrum analyzer and the CMW500;
3. The band edges of low and high channels for the highest RF powers were measured. Set RBW \geq 1%OBW in the 1MHz band immediately outside and adjacent to the band edge.
4. Set spectrum analyzer with RMS detector.

5.5. Uncertainty

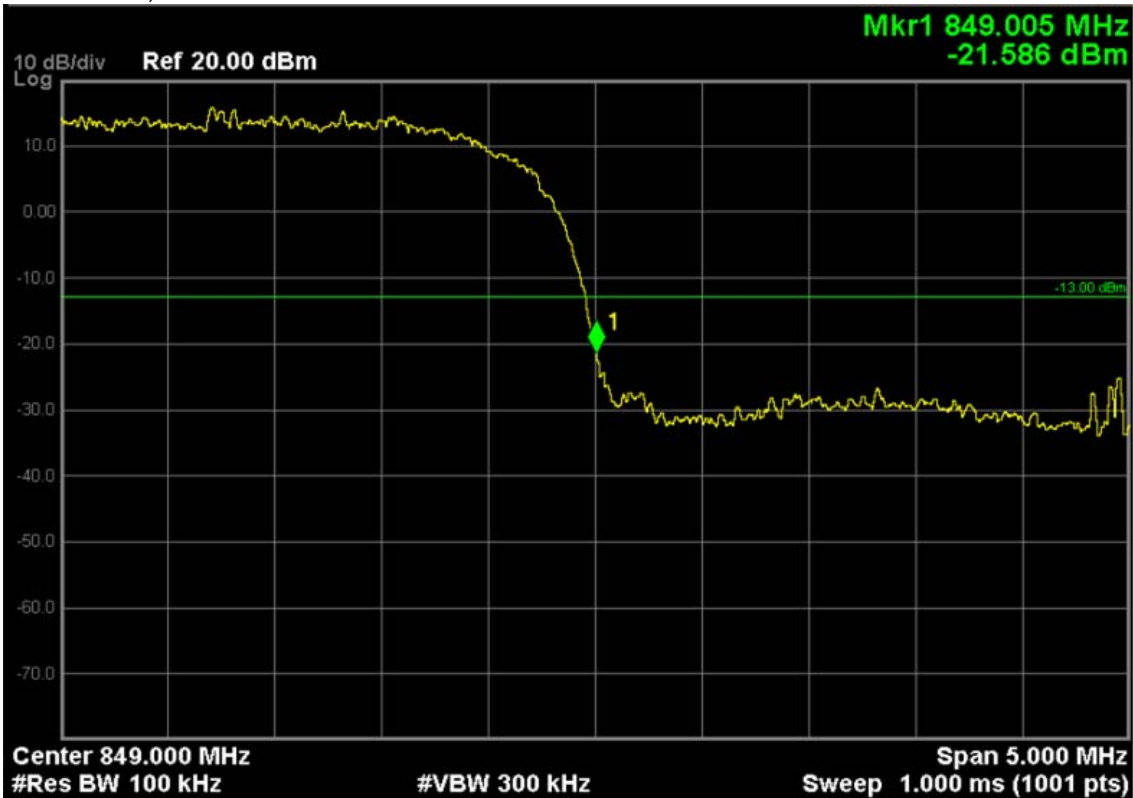
The measurement uncertainty is defined as ± 1.2 dB.

5.6. Test Result

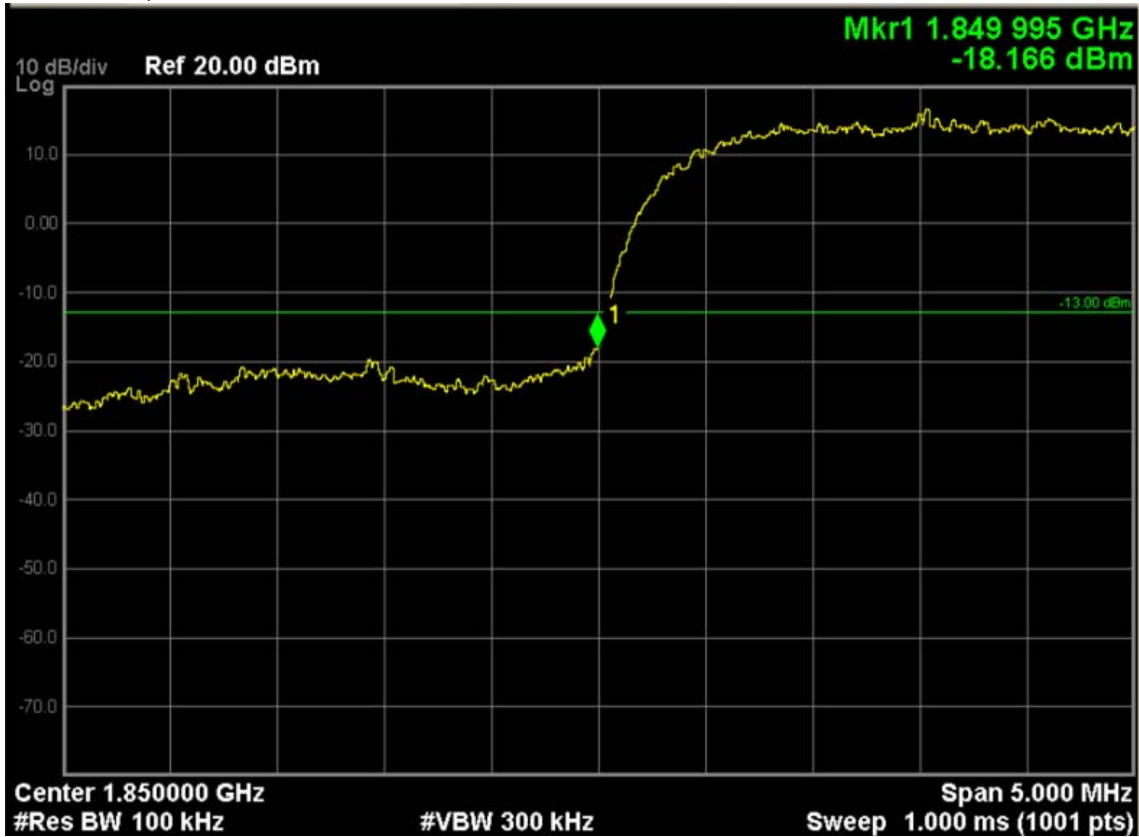
WCDMA Band V, Channel 4132



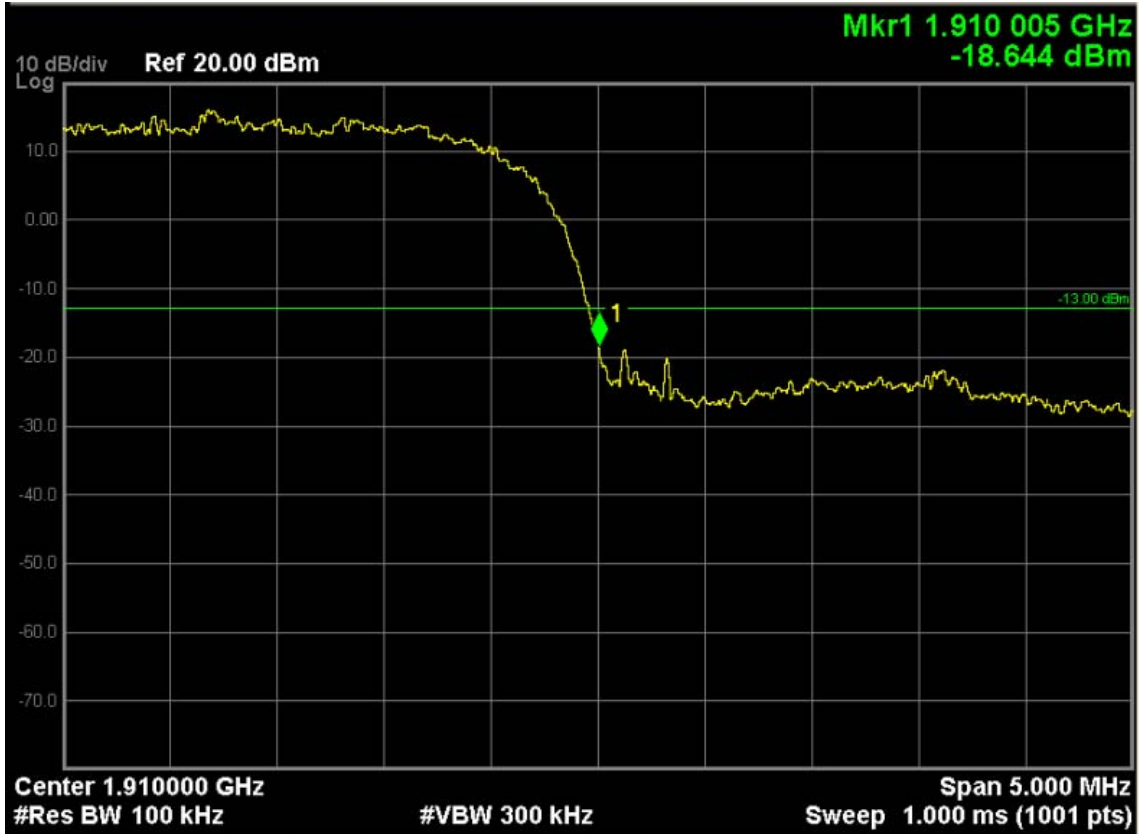
WCDMA Band V, Channel 4233



WCDMA Band II, Channel 9262



WCDMA Band II, Channel 9538



6.Spurious Emission

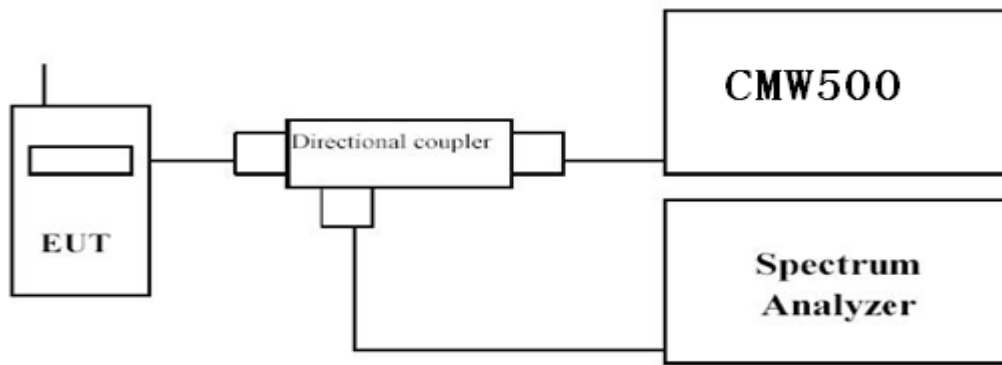
6.1. Test Equipment

Instrument	Manufacturer	Model	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	N9038A	MY51210142	12/17/2014
Radio Communication Tester	R&S	CMW500	147483	10/15/2015
Signal Generator	Agilent	N5183A	MY50140938	01/03/2015
Preamplifier	CEM	EM30180	3008A0245	02/28/2015
Loop Antenna	Schwarzbeck	FMZB1519	1519-020	03/26/2015
Bilog Antenna	Schwarzbeck	VULB9160	9160-3316	10/19/2015
VHF-UHF-Biconical Antenna	Schwarzbeck	VUBA9117	9117-263	10/19/2015
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-942	10/19/2015
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-943	10/19/2015

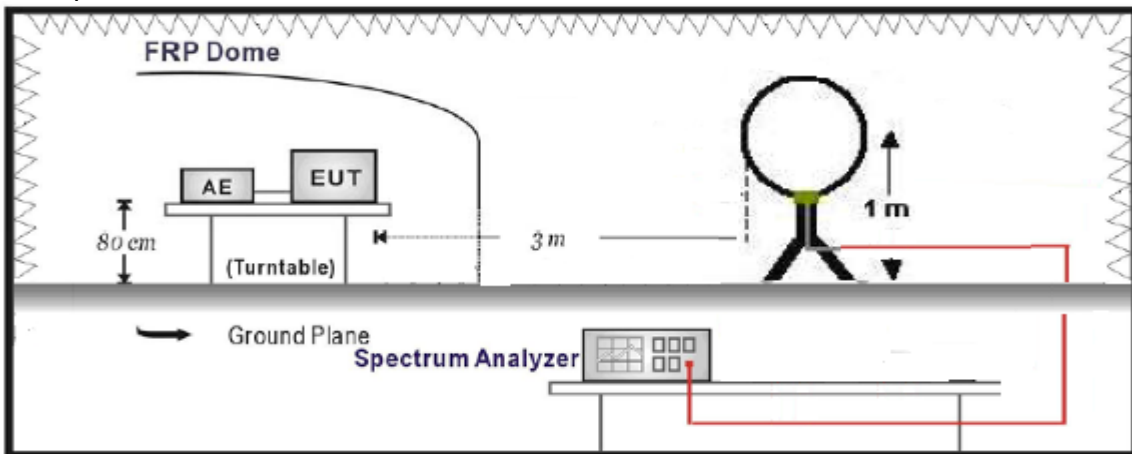
The measure equipment had been calibrated once a year.

6.2. Test Setup

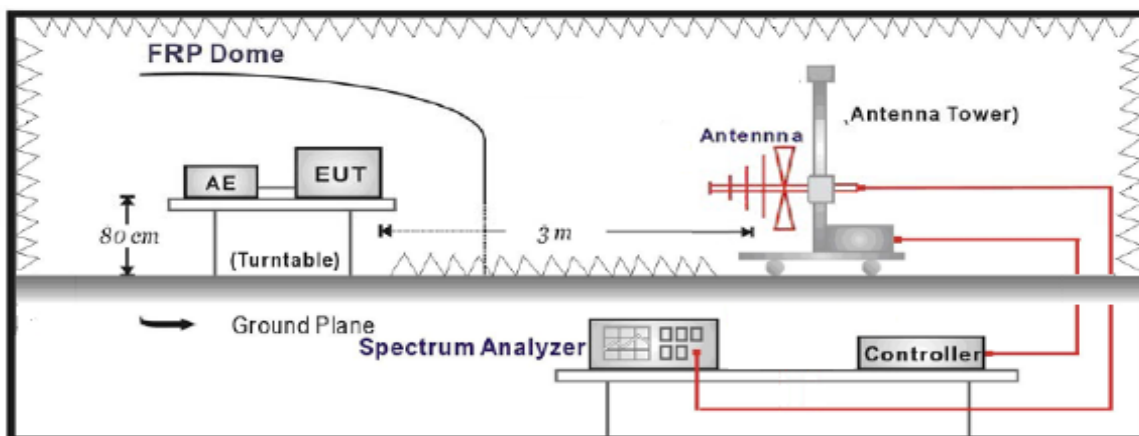
Conducted Spurious Emission Measurement:



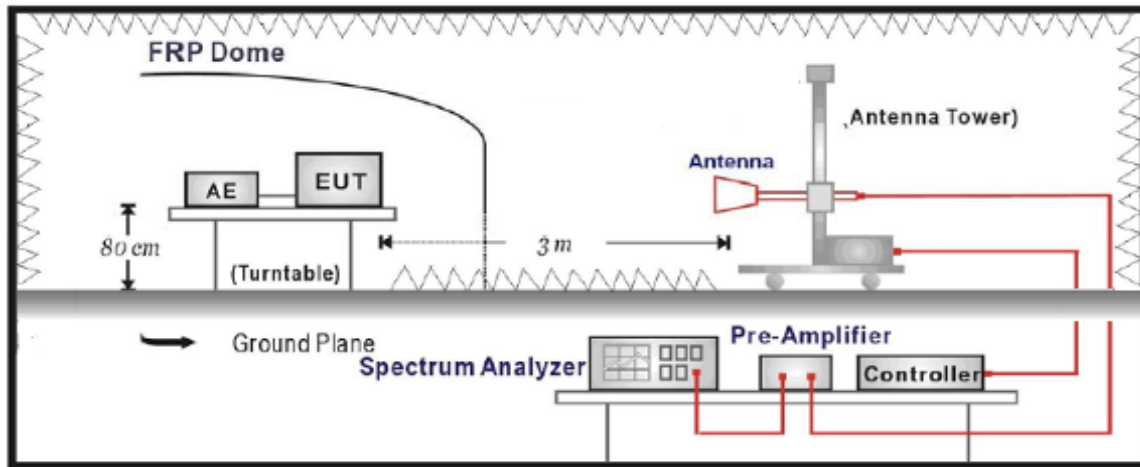
Radiated Spurious Measurement: below 30MHz



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 $43 + 10\log(P)$ dB.

6.4. Test Procedure

Conducted Spurious Measurement:

- The testing follows FCC KDB 972268 v02v02 Section 6.0;
- Place the EUT on a bench and set it in transmitting mode.
- Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Coupler.
- EUT Communicate with CMW500, then select a channel for testing.
- Add a correction factor to the display of spectrum, and then test.
- 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:

- The testing follows FCC KDB 972268 v02v02 Section 5.8 and ANSI/TIA-603-C-2004 Section 2.2.12;
- The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
- The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
- 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.
- 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. The frequency range was checked up to 10th harmonic.

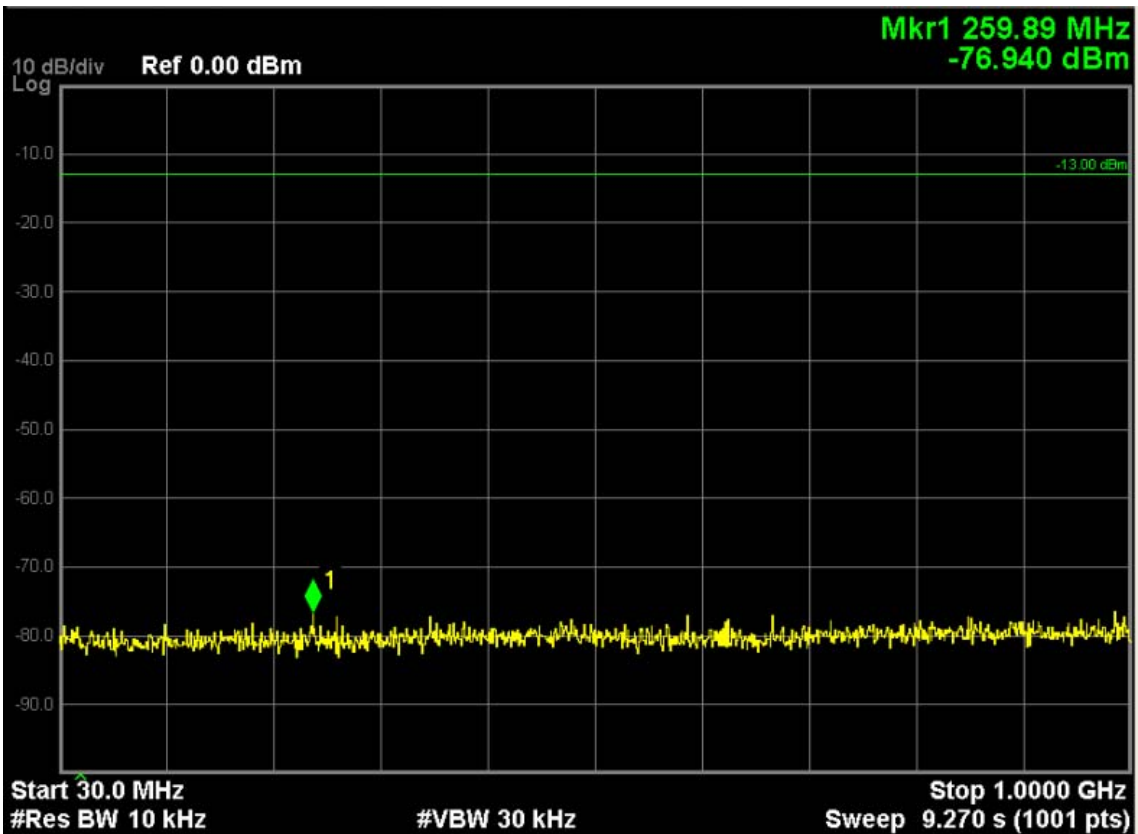
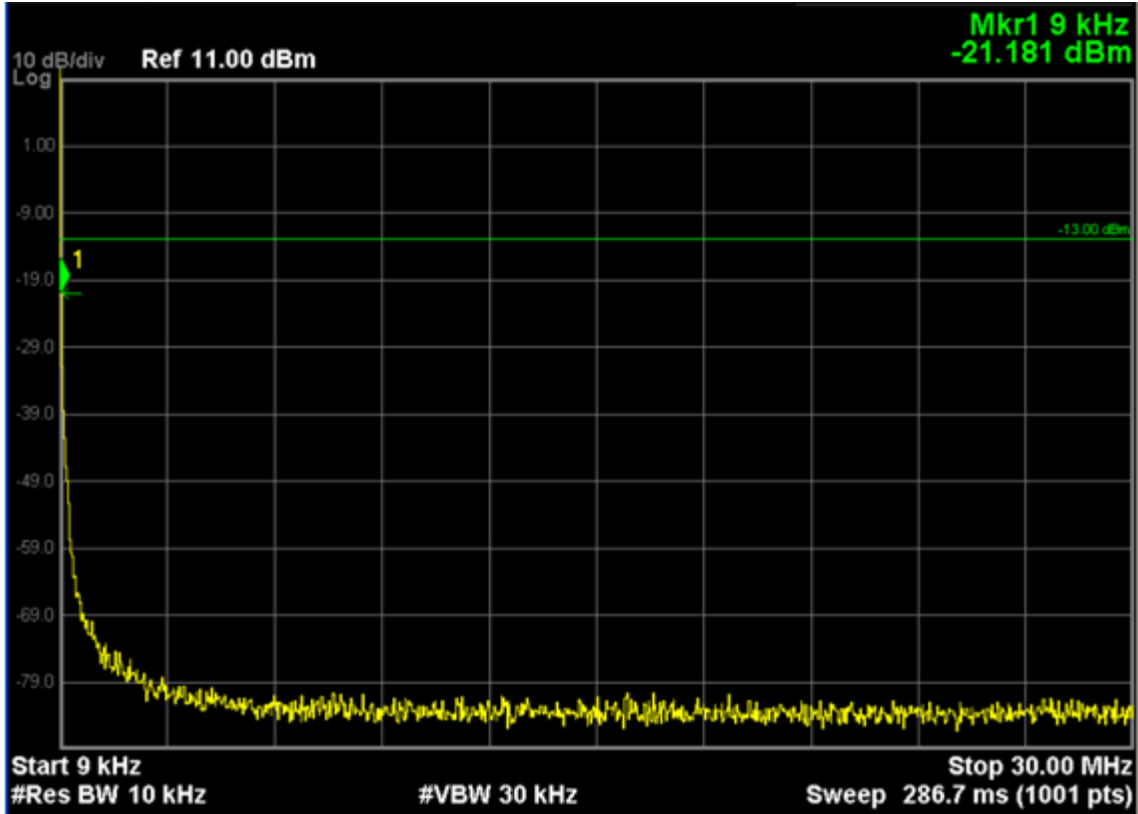
6.5. Uncertainty

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

6.6. Test Result

Conducted Spurious Measurement:

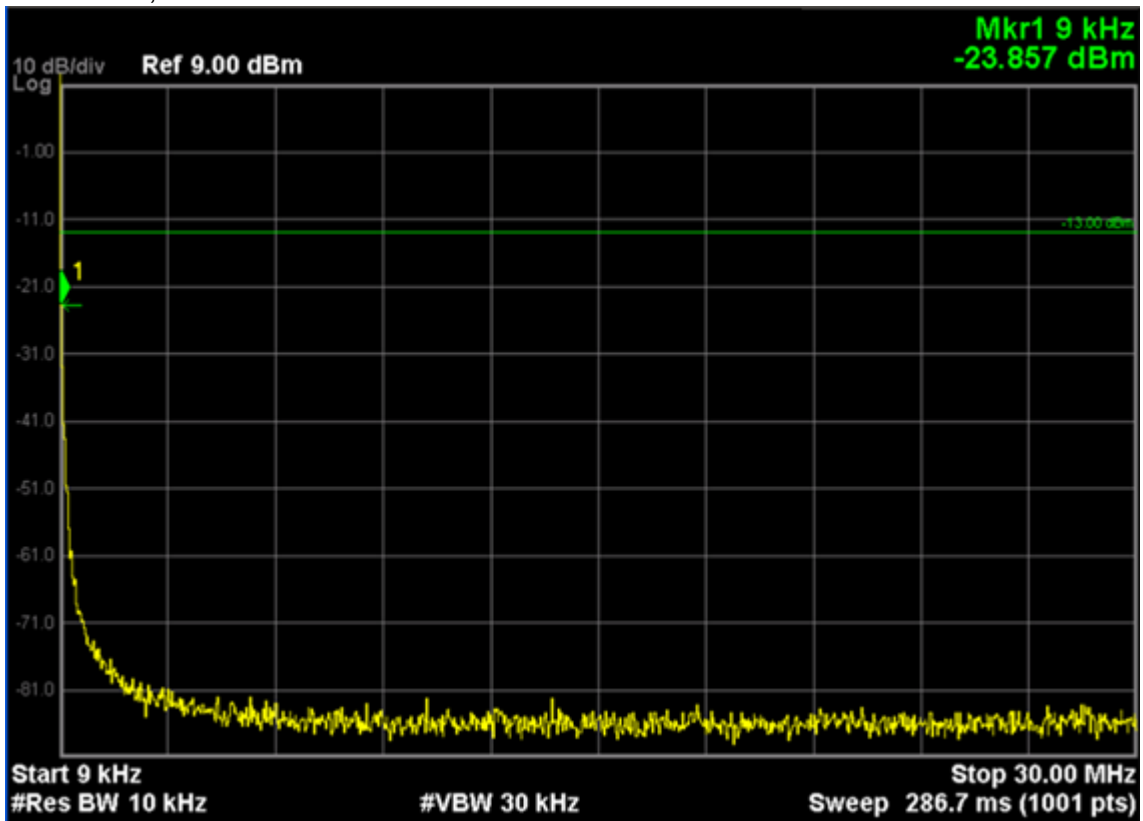
WCDMA Band II, Channel 9400:

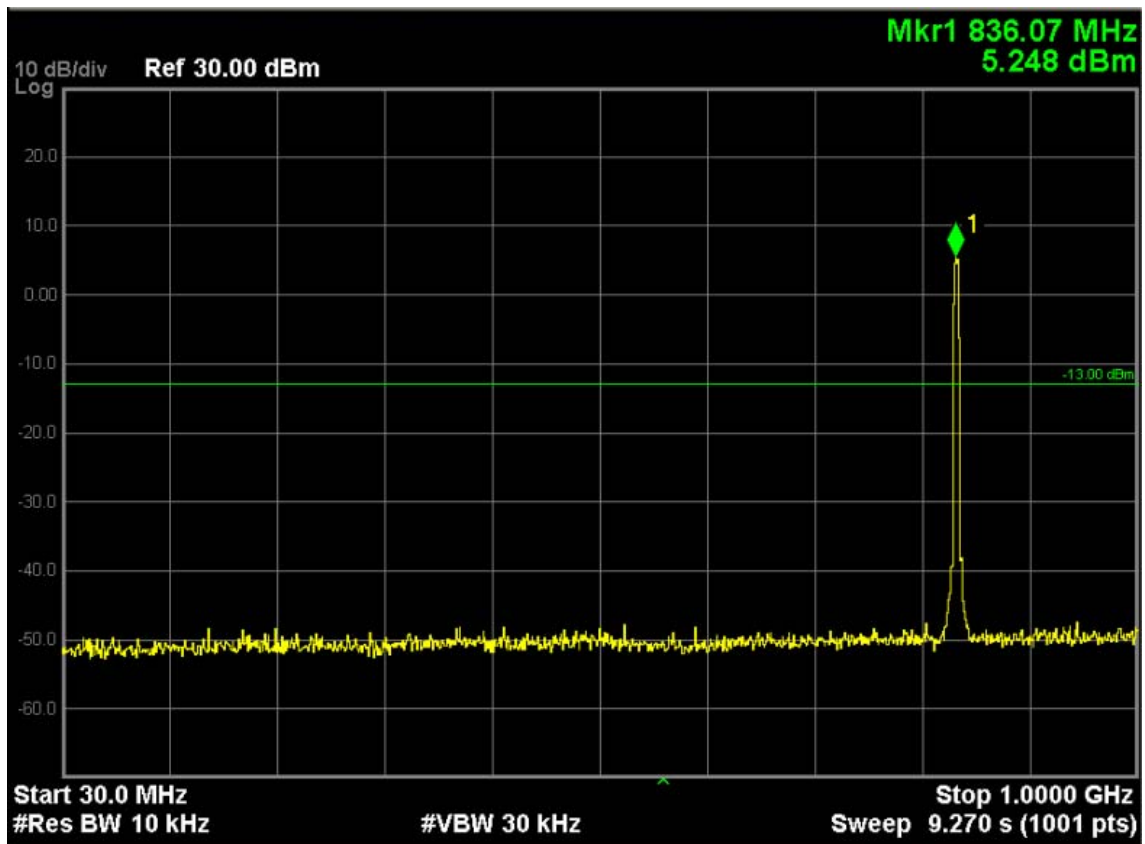




Note: The signal at point 1 is carrier

WCDMA Band V, Channel 4182:





Note: The signal at point 1 is carrier



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)							
667.8	H	-50.21	2.97	-2.16	-55.34	-13.00	-42.34
667.8	V	-48.33	2.97	-2.16	-53.46	-13.00	-40.46

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	-39.12	6.13	9.40	-35.85	-13.00	-22.85
1672.8	V	-41.25	6.13	9.40	-37.98	-13.00	-24.98
2509.2	H	-44.71	7.32	10.5	-41.53	-13.00	-28.53
2509.2	V	-48.35	7.32	10.5	-45.17	-13.00	-32.17
3345.6	H	-50.62	8.43	11.5	-47.55	-13.00	-34.55
3345.6	V	-52.49	8.43	11.5	-49.42	-13.00	-36.42

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)							
732.7	H	-49.13	3.42	-2.56	-55.11	-13.00	-42.11
732.7	V	-51.10	3.42	-2.56	-57.08	-13.00	-44.08

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	-40.35	8.85	12.6	-36.60	-13.00	-23.60
3760	V	-43.54	8.85	12.6	-39.79	-13.00	-26.79
5640	H	-49.68	10.79	13.1	-47.37	-13.00	-34.37
5640	V	-52.03	10.79	13.1	-49.72	-13.00	-36.72

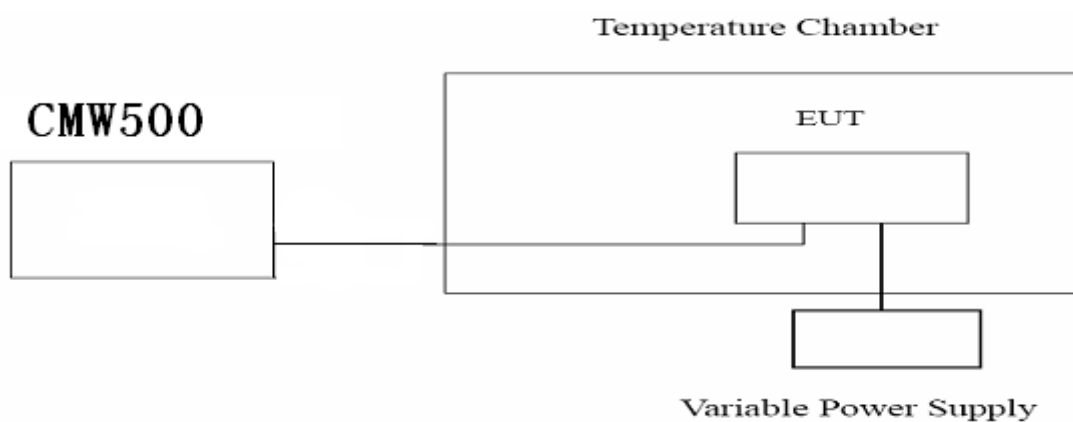
7. Frequency Stability Under Temperature & Voltage Variations

7.1. Test Equipment

Instrument	Manufacturer	Model	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	N9038A	MY51210142	12/17/2014
Radio Communication Tester	R&S	CMW500	147483	10/15/2015
DC Power Supply	Agilent	6612C	MY43002989	03/03/2015
Temperature Chamber	WEISS	DU/20/40	58226017340050	01/03/2015

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

1. The testing follows FCC KDB 972268 v02v02 Section 9.0;

2. 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 CMW500. The EUT was placed inside the temperature chamber.

EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -20°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

3. Frequency Stability Under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage.

Reduce the input voltage to specify extreme voltage variation ($\pm 15\%$) 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 (°C)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
-20	836.40	-3.68	±2091
-10	836.40	5.64	±2091
0	836.40	2.37	±2091
10	836.40	-8.16	±2091
20	836.40	3.48	±2091
30	836.40	-6.89	±2091
40	836.40	3.74	±2091
50	836.40	2.40	±2091

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
3.2	836.40	3.29	±2091
3.8	836.40	0.32	±2091
4.4	836.40	7.02	±2091

WCDMA Band II:

Frequency Stability under Temperature

Temperature Interval (°C)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
-20	1880.00	-1.24	±4700
-10	1880.00	0.23	±4700
0	1880.00	-2.69	±4700
10	1880.00	1.51	±4700
20	1880.00	3.57	±4700
30	1880.00	-3.57	±4700
40	1880.00	1.63	±4700
50	1880.00	-2.30	±4700

Frequency Stability under Voltage

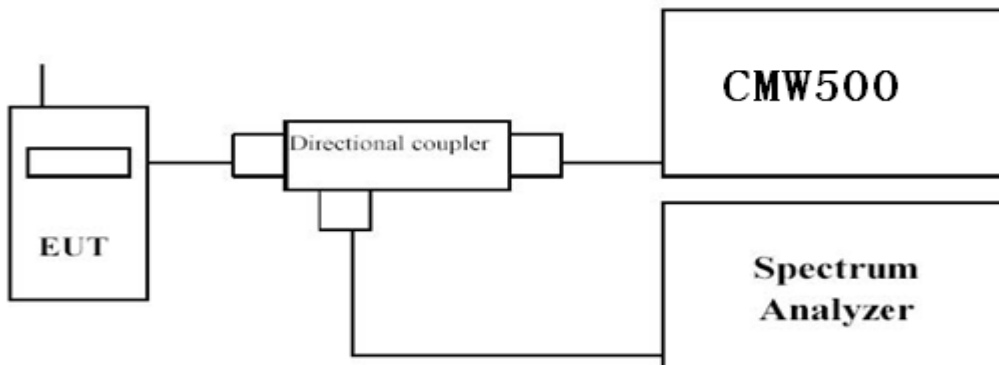
DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit(Hz)
3.2	1880.00	1.34	±4700
3.8	1880.00	2.55	±4700
4.4	1880.00	-2.78	±4700

8. Peak to Average

8.1. Test Equipment

Instrument	Manufacturer	Model	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	N9038A	MY51210142	12/17/2014
Radio Communication Tester	R&S	CMW500	147483	10/15/2015
Signal Generator	Agilent	N5183A	MY50140938	01/03/2015
Preamplifier	CEM	EM30180	3008A0245	02/28/2015
DC Power Supply	Agilent	6612C	MY43002989	03/03/2015

8.2. Test Setup



8.3. Limit

In addition, the transmitter's peak-to-average power ratio (PAPR) shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

8.4. Test Procedure

A peak to average ratio measurement is performed at the conducted port of the EUT. For WCDMA signals, the spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

Procedure:

1. The testing follows FCC KDB 972268 v02v02 Section 5.7.1;
2. Place the EUT on a bench and set it in transmitting mode.
3. Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Couple.
4. EUT Communicate with CMW500, then select a channel for testing.
5. Add a correction factor to the display of spectrum, and then test.
6. Set resolution/measurement bandwidth \geq signal's occupied bandwidth;

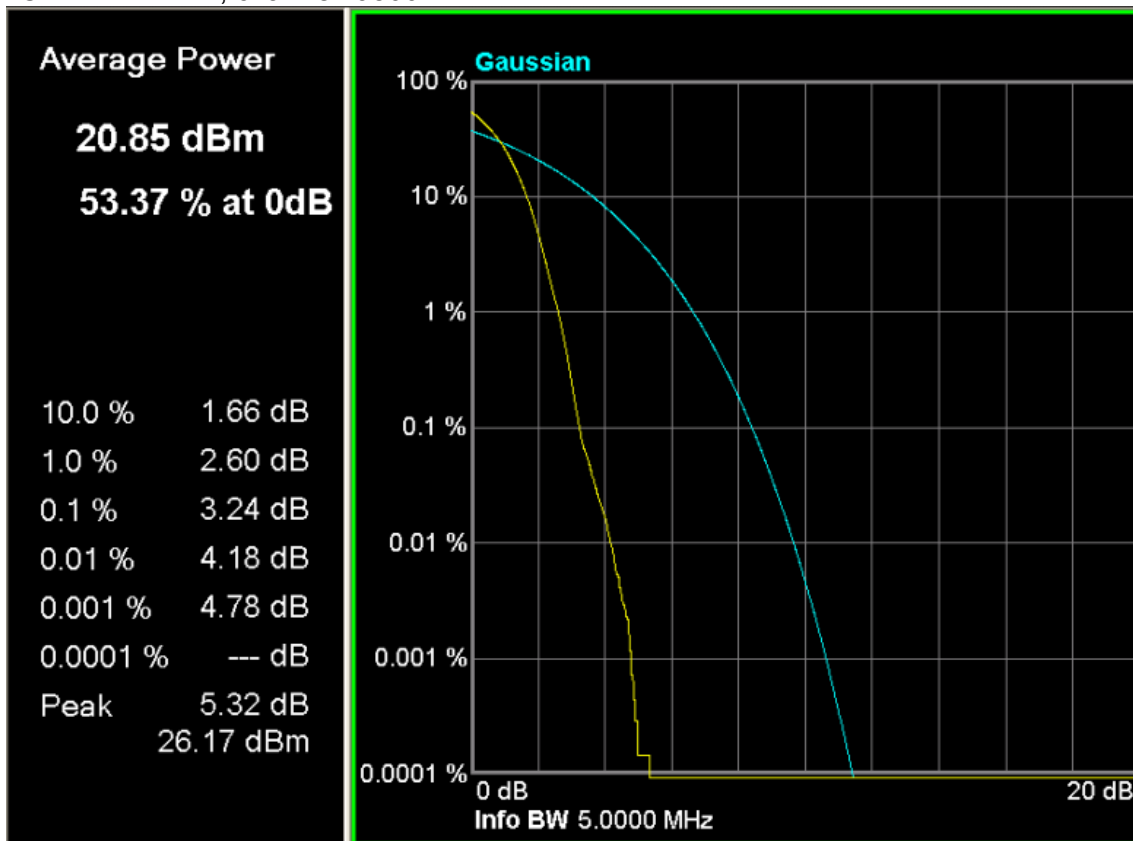
8.5. Uncertainty

The measurement uncertainty is defined as ± 1.2 dB.

8.6. Test Result

Band	Channel No.	Limit (dB)	Result (dB)
WCDMA BAND II	9800	<13	5.32

For WCDMA BAND II, channel 9800



10.Attachment

PHOTOGRAPHS OF TEST SETUP

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

PHOTOGRAPHS OF EUT

Please refer to the two files named“External Photos”and” Internal Photos” .

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