



RF TEST REPORT

Report No.: SET2021-16817

Product Name: Fixed Android UHF Reader

Model No. : URA4

FCC ID: 2AC6AURA4

Applicant: Shenzhen Chainway Information Technology Co., Ltd.

Address: 9F Building 2, Daqian Industrial Park, District 67, XingDong Community, Xin'an Street, Bao'an District, Shenzhen, Guangdong, China.

Dates of Testing: 02/04/2021 - 12/14/2021

Issued by: CCIC Southern Testing Co., Ltd.

Lab Location: Electronic Testing Building, No. 43 Shahe Road, Xili Street, Nanshan District, Shenzhen, Guangdong, China.

Tel: 86 755 26627338 **Fax:** 86 755 26627238

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Test Report

Product.....: Fixed Android UHF Reader

Brand Name.....: CHAINWAY

Trade Name.....: CHAINWAY

Applicant.....: Shenzhen Chainway Information Technology Co., Ltd.

Applicant Address.....: 9F Building 2, Daqian Industrial Park, District 67, XingDong
Community, Xin'an Street, Bao'an District, Shenzhen,
Guangdong, China.

Manufacturer.....: Shenzhen Chainway Information Technology Co., Ltd.

Manufacturer Address.....: 9F Building 2, Daqian Industrial Park, District 67, XingDong
Community, Xin'an Street, Bao'an District, Shenzhen,
Guangdong, China.

Test Standards.....: 47 CFR FCC Part 2/22/24

Test Result.....: PASS

Tested by.....: Sun 2021.12.17

Sun, Test Engineer

Reviewed by.....: Chris You 2021.12.17

Chris You, Senior Engineer

Approved by.....: Shuangwen Zhang 2021.12.17

Shuangwen Zhang, Manager



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Change History		
Issue	Date	Reason for change
1.0	2021.12.17	First edition

1. GENERAL INFORMATION

1.1 EUT Description

EUT Type	Fixed Android UHF Reader
Model No.	URA4
EUT supports Radios application	WCDMA/HSPA
Test Band 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)
Maximum Output Power to Antenna	WCDMA 850: 23.14dBm WCDMA 1900: 23.26dBm
Type of Modulation	WCDMA: QPSK(Uplink) HSDPA:QPSK(Uplink) HSUPA:QPSK(Uplink)
Antenna Type	External Antenna
Antenna Gain	WCDMA 850: 0.46 dBi WCDMA 1900: 0.87 dBi
Power supply	DC 12V from Adapter

**1.2 Maximum ERP/EIRP, Frequency Tolerance, and Emission Designator**

System	Type of Modulation	Emission Designator	Frequency Tolerance (ppm)	Maximum ERP/EIRP(W)
WCDMA 850 RMC 12.2Kbps	QPSK	4M13F9W	0.0059	0.124
WCDMA 1900 RMC 12.2Kbps	QPSK	4M13F9W	0.0061	0.230

1.3 Test Standards and Results

1. 47 CFR Part 2, 22(H), 24(E)
2. ANSI C63.26:2015
3. FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

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

No.	Section	Description	Limit	Result
1	2.1046	Conducted Output Power	Reporting Only	PASS
2	22.913 (d) 24.232 (d)	Peak to Average Ratio	<13dBm	PASS
3	2.1049 22.917 (b)(1) 24.238 (b)	Occupied Bandwidth	Reporting Only	PASS
4	2.1055 22.355 24.235	Frequency Stability	$\leq \pm 2.5\text{ppm}$	PASS
5	2.1051 22.917 (a) 24.238 (a)	Conducted Out of Band Emissions	$< 43+10\log_{10}$ (P[Watts])	PASS
6	2.1051 22.917 (a) 24.238 (a)	Band Edge	$< 43+10\log_{10}$ (P[Watts])	PASS
7	22.913 (a)(5)	Effective Radiated Power	<7Watts	PASS
	24.232 (c)	Equivalent Isotropic Radiated Power	<2Watts	PASS
8	2.1053 22.917 (a) 24.238 (a)	Radiated Spurious Emissions	$< 43+10\log_{10}$ (P[Watts])	PASS

1.4 Test Configuration of Equipment under Test

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission.

Radiated emissions were investigated as following frequency range:

1. 30 MHz to 9000 MHz for WCDMA Band V.
2. 30 MHz to 20000 MHz for WCDMA Band II.

All modes and data rates and positions were investigated.

Test modes are chosen to be reported as the worst case configuration below:

Test Modes		
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: The maximum power levels are chosen to test as the worst case configuration as follows:

RMC 12.2Kbps mode for WCDMA band V,

RMC 12.2Kbps mode for WCDMA band II, only these modes were used for all tests.

1.5 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + Power Splitter + attenuator factor..

Following shows an offset computation example with cable loss 1dB, 3dB Power Splitter, 10dB attenuator.

Example:

$$\begin{aligned}\text{Offset (dB)} &= \text{RF cable loss(dB)} + \text{Power Splitter(dB)} + \text{attenuator factor(dB)} \\ &= 1 + 3 + 10 = 14 \text{ (dB)}\end{aligned}$$



1.6 Facilities and Accreditations

1.6.1 Test Facilities

CNAS-Lab Code: L1659

CCIC-SET is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659.

FCC-Registration No.: 406086

CCIC Southern Testing Co., Ltd EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Designation Number: CN1283, valid time is until April 19th, 2023.

ISED Registration: 11185A-1

CAB identifier: CN0064

CCIC Southern Testing Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on Aug. 04, 2016, valid time is until Jun. 30th, 2023.

A2LA Code: 5721.01

CCIC-SET is a third party testing organization accredited by A2LA according to ISO/IEC 17025. The accreditation certificate number is 5721.01.

1.6.2 Test Environment Conditions

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

Temperature (°C):	15°C - 35°C
Relative Humidity (%):	30% - 60%
Atmospheric Pressure (kPa):	86KPa-106KPa

2. 47 CFR PART 2, PART 22H, PART 24E REQUIREMENTS

2.1 Conducted RF Output Power and ERP/EIRP

2.1.1 Definition

A system simulator was used to establish communication with the EUT. Its parameters were set to enforce EUT transmitting at the maximum power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

The ERP of mobile transmitters must not exceed 7 Watts for WCDMA Band V.

The EIRP of mobile transmitters must not exceed 2 Watts for WCDMA Band II.

According to KDB 412172 D01 Determining ERP and EIRP v01r01.

$ERP = PT + GT - LC$, $ERP = EIRP - 2.15$, where

PT = transmitter output power in dBm

GT = gain of the transmitting antenna in dBi

LC = signal attenuation in the connecting cable between the transmitter and antenna in dB

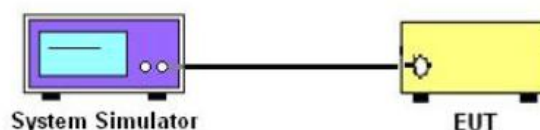
2.1.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.1.3 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the system simulator.

2.1.4 Test Setup



2.1.5 Test Results of Conducted Output Power and ERP/EIRP

WCDMA 850							
EUT Mode		Average power (dBm)			Ant. Gain (dBi)	Max. ERP (dBm)	ERP Limit (dBm)
		4132	4183	4233			
		826.4MHz	836.6MHz	846.6MHz			
RMC	12.2 kbps	22.62	22.55	22.59	0.46	20.93	38.45
HSDPA	Subtest 1	22.24	22.19	22.21			
	Subtest 2	21.36	21.29	21.31			
	Subtest 3	20.85	20.74	20.71			
	Subtest 4	21.46	21.41	21.43			
HSUPA	Subtest 1	21.72	21.68	21.70			
	Subtest 2	20.67	20.60	20.62			
	Subtest 3	21.49	21.46	21.42			
	Subtest 4	21.75	21.64	21.72			
	Subtest 5	21.68	21.64	21.61			
WCDMA 1900							
EUT Mode		Average power (dBm)			Ant. Gain (dBi)	Max. EIRP (dBm)	EIRP Limit (dBm)
		9262	9400	9538			
		1852.4MHz	1880.0MHz	1907.6MHz			
RMC	12.2 kbps	22.42	22.38	22.74	0.87	23.61	33.00
HSDPA	Subtest 1	21.85	21.82	21.96			
	Subtest 2	21.45	21.41	21.58			
	Subtest 3	19.82	19.75	19.93			
	Subtest 4	21.88	21.79	21.96			
HSUPA	Subtest 1	21.42	21.38	21.51			
	Subtest 2	21.74	21.72	21.88			
	Subtest 3	19.43	19.40	19.49			
	Subtest 4	21.84	21.81	21.97			
	Subtest 5	20.35	20.32	20.47			

2.2 Peak to Average Ratio

2.2.1 Definition

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

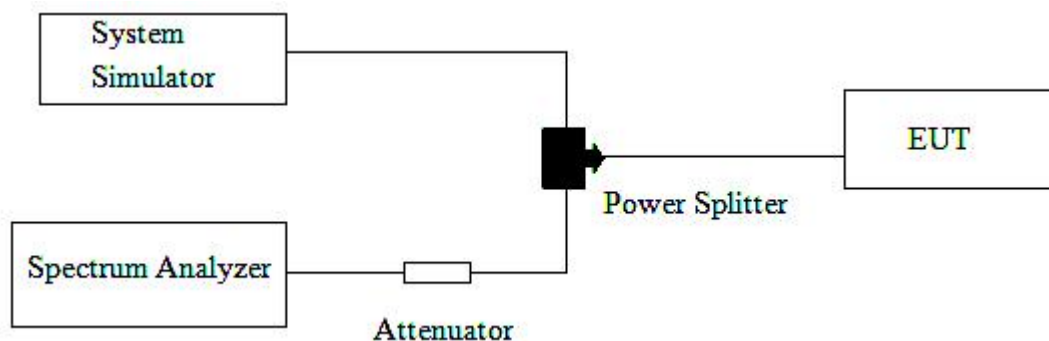
2.2.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.2.3 Test Procedures

1. The testing follows FCC KDB 971168 D01 v03r01 Section 5.7.1.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. For UMTS operating modes:
 - a. Set the CCDF (Complementary Cumulative Distribution Function) option on the spectrum analyzer.
 - b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
4. Record the deviation as Peak to Average Ratio.

2.2.4 Test Setup



**2.2.5 Test Results of Peak-to-Average Ratio**

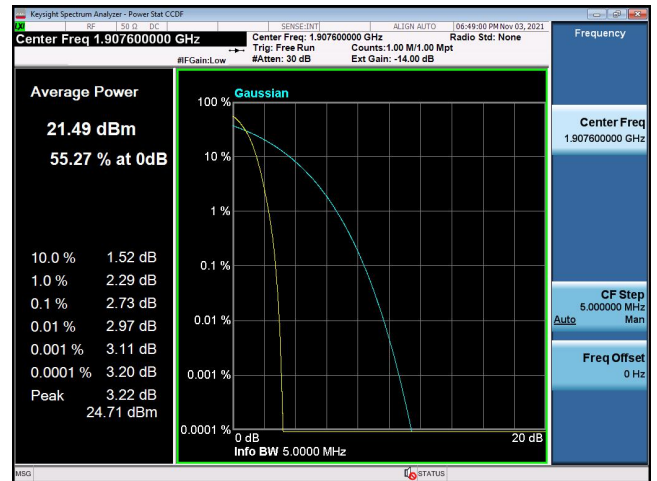
Band	Channel	Frequency (MHz)	Peak to Average ratio	Limit	Verdict
			dB	dB	
WCDMA 850MHz	4132	826.4	2.92	13	PASS
	4183	836.6	2.96		PASS
	4233	846.6	3.03		PASS
WCDMA 1900MHz	9262	1852.4	2.83	13	PASS
	9400	1880.0	2.77		PASS
	9538	1907.6	2.73		PASS

2.2.6 Test Results (Plots) of Peak-to-Average Ratio

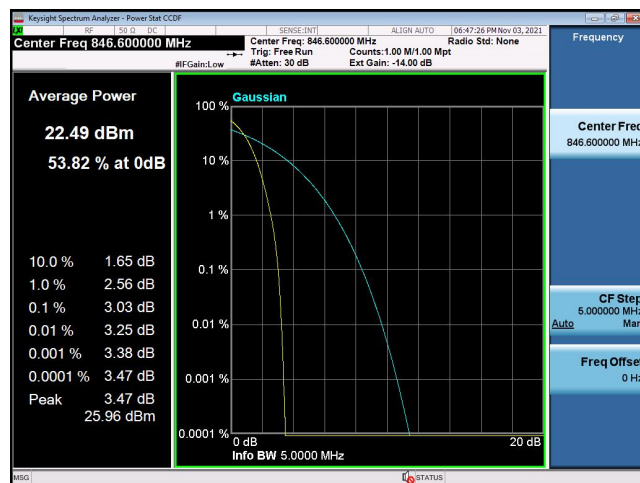
WCDMA 850-4132



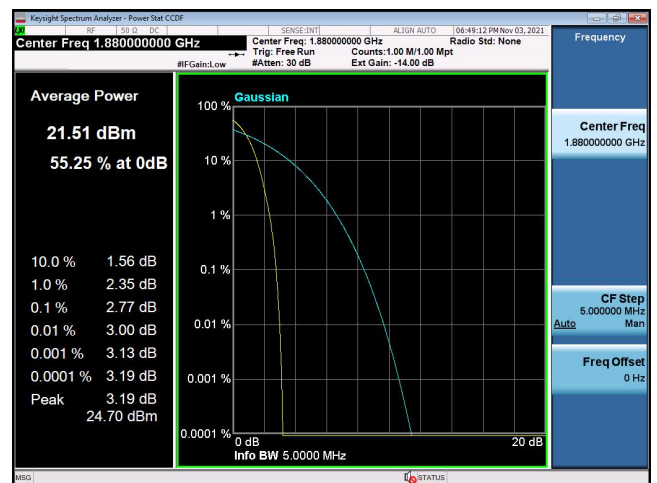
WCDMA 1900-9262



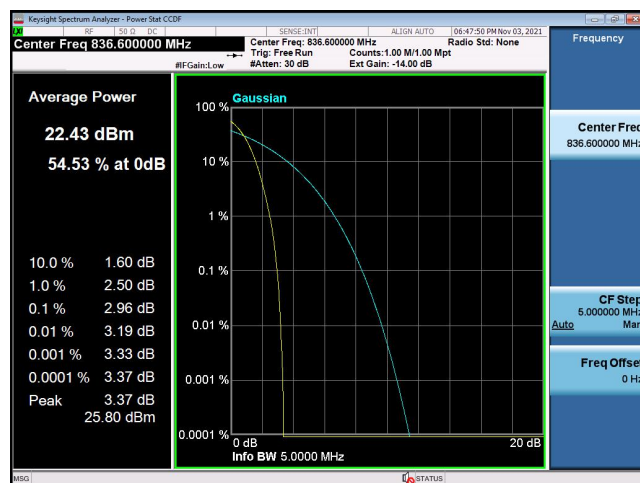
WCDMA 850-4183



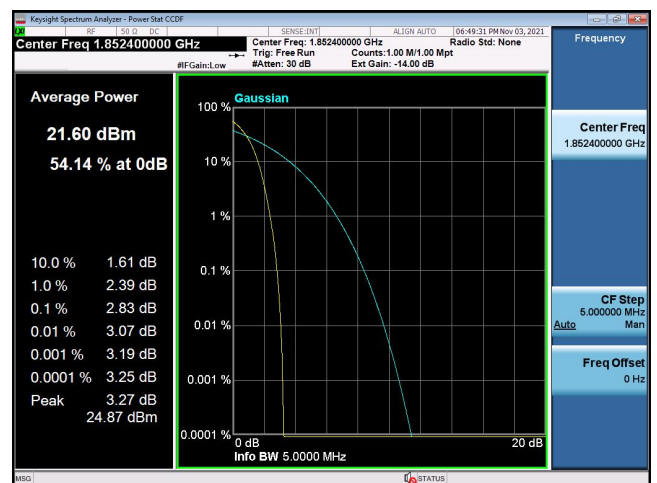
WCDMA 1900-9400



WCDMA 850-4233



WCDMA 1900-9538



2.3 99% Occupied Bandwidth and 26dB Bandwidth Measurement

2.3.1 Definition

The 99% occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The emission bandwidth is defined as the width of the signal between two points, located at the 2 sides of the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

2.3.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.3.3 Test Procedures

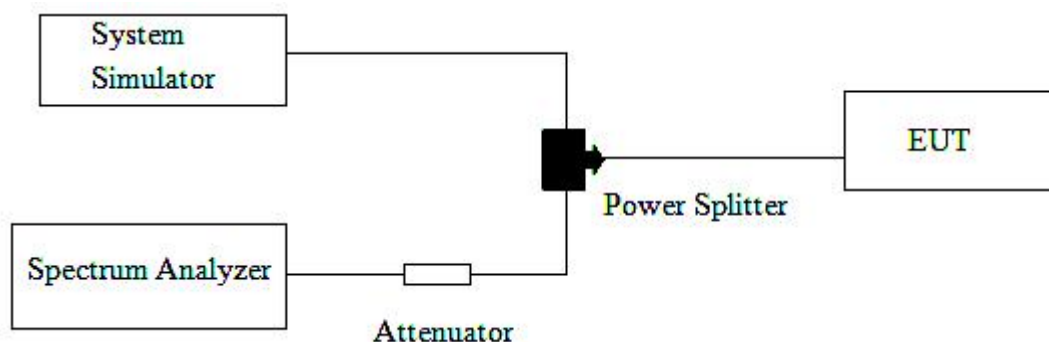
1. The testing follows FCC KDB 971168 D01 v03r01 Section 4.2.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of the EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

4. The 99% occupied bandwidth were measured, set RBW= 1% of span, VBW= 3*RBW, sample detector, trace maximum hold.

5. The 26dB bandwidth were measured, set RBW= 1% of EBW, VBW= 3*RBW, peak detector, trace maximum hold.

2.3.4 Test Setup



2.3.5 Test Results of 99% Occupied Bandwidth and 26dB Bandwidth

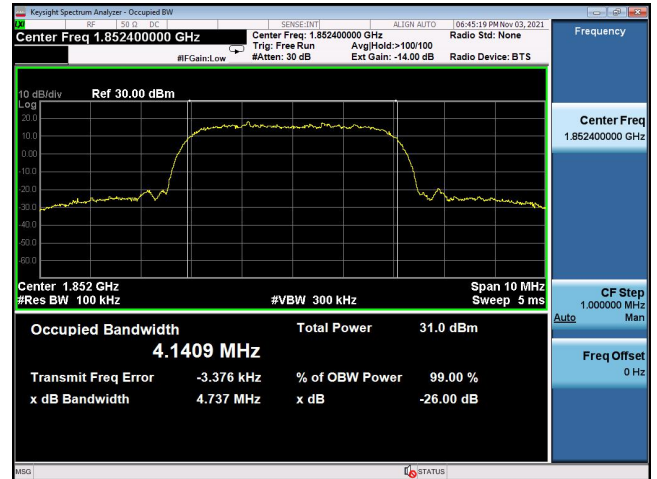
Band	Channel	Frequency (MHz)	26dB bandwidth (MHz)	99% Occupied Bandwidth (MHz)
WCDMA 850MHz	4132	826.4	4.717	4.1312
	4183	836.6	4.695	4.1126
	4233	846.6	4.689	4.1225
WCDMA 1900MHz	9262	1852.4	4.737	4.1409
	9400	1880.0	4.717	4.1345
	9538	1907.6	4.728	4.1368

2.3.6 Test Results (Plots) of 99% Occupied Bandwidth and 26dB Bandwidth

WCDMA 850-4132



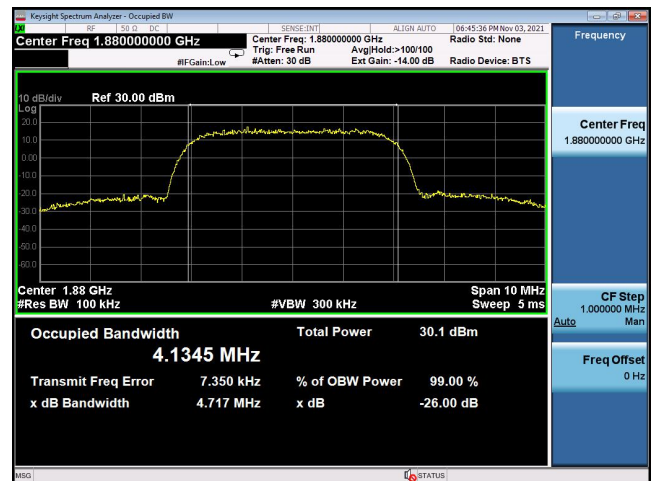
WCDMA 1900-9262



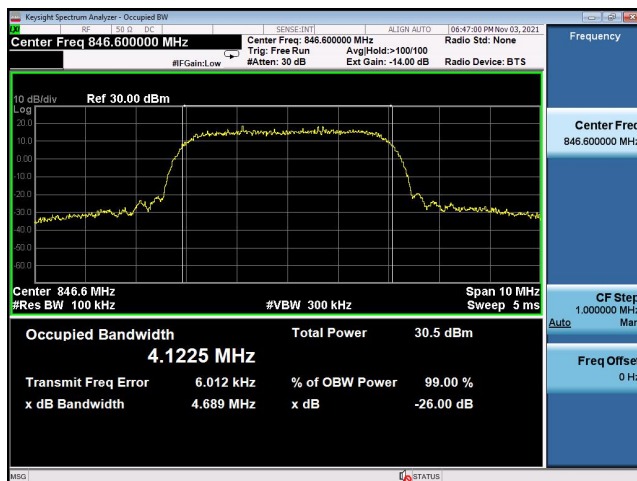
WCDMA 850-4183



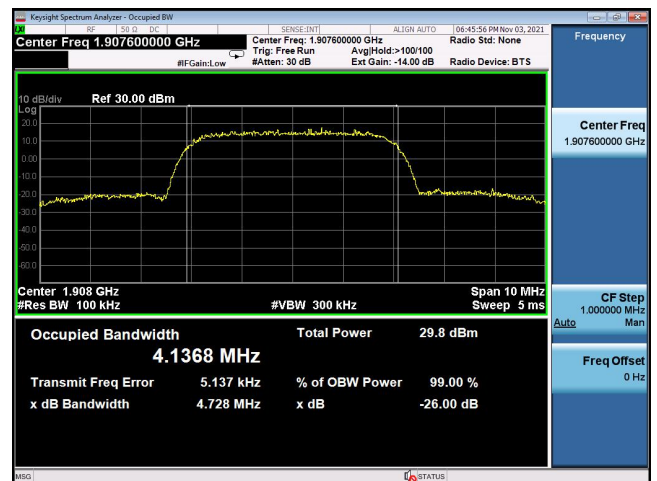
WCDMA 1900-9400



WCDMA 850-4233



WCDMA 1900-9538



2.4 Frequency Stability

2.4.1 Requirement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.

2.4.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

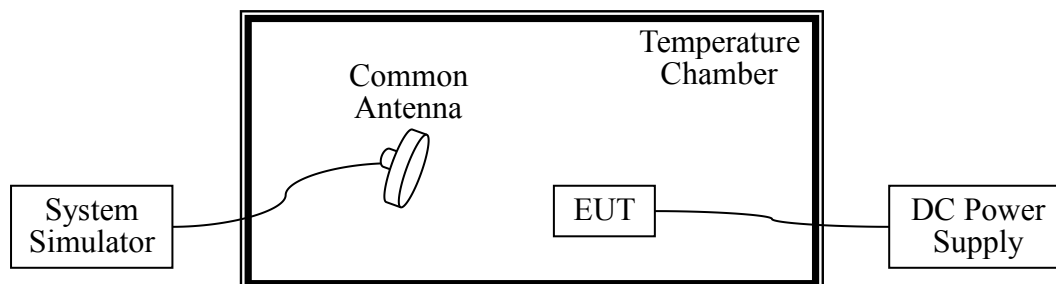
2.4.3 Test Procedures for Temperature Variation

1. The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in 10°C steps up to 50°C . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

2.4.4 Test Procedures for Voltage Variation

1. The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.
2. The EUT was placed in a temperature chamber at $25 \pm 5^{\circ}\text{C}$ and connected with the system simulator.
3. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
4. The variation in frequency was measured for the worst case.

2.4.5 Test Setup



2.4.6 Test Results of Frequency Stability

WCDMA Band V, RMC 12.2Kbps, Channel=4183, Frequency=836.6 MHz				
Power (VDC)	Temperature (°C)	Deviation (ppm)	Limit(ppm)	Result
12.0	-30	0.0032	± 2.5	PASS
	-20	0.0024		
	-10	0.0041		
	0	0.0039		
	+10	0.0032		
	+20	0.0028		
	+30	0.0016		
	+40	0.0037		
	+50	0.0059		
10.2	+25	0.0045	± 2.5	PASS
13.8	+25	0.0037		



WCDMA Band II, RMC 12.2Kbps, Channel=9400, Frequency=1880.0 MHz				
Power (VDC)	Temperature (°C)	Deviation (ppm)	Limit(ppm)	Result
12.0	-30	0.0041	Within authorized band for WCDMA II	PASS
	-20	0.0032		
	-10	0.0019		
	0	0.0025		
	+10	0.0027		
	+20	0.0033		
	+30	0.0022		
	+40	0.0035		
	+50	0.0061		
10.2	+25	0.0048	Within authorized band for WCDMA II	PASS
13.8	+25	0.0034		

2.5 Conducted Out of Band Emissions

2.5.1 Requirement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

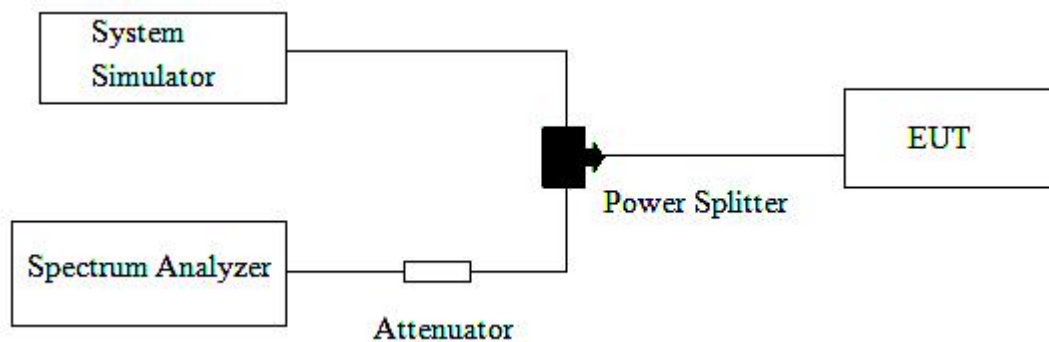
2.5.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.5.3 Test Procedures

1. The testing follows FCC KDB 971168 D01 v03r01 Section 6.0.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
$$= P(W) - [43 + 10\log(P)] \text{ (dB)}$$
$$= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$$
$$= -13\text{dBm}.$$
8. For 9KHz to 30MHz: the amplitude of spurious emissions are attenuated by more than 20dB below the permissible value has no need to be reported.

2.5.4 Test Setup

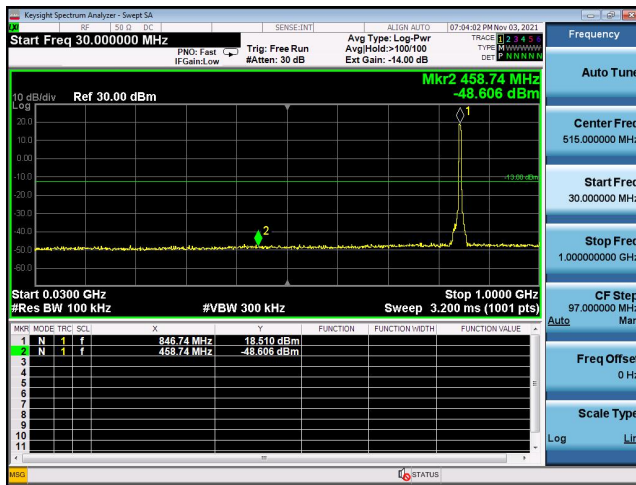


2.5.5 Test Result (Plots) of Conducted Spurious Emission

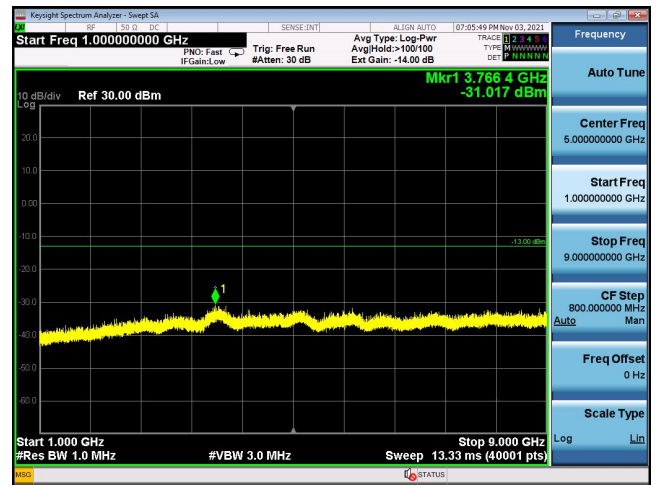
Note 1: For 9 KHz to 30MHz: the amplitude of spurious emissions is attenuated by more than 20dB below the permissible value, so we not provide the test result here.

Note 2: All channel and all modulation had been tested, but only the worst case data displayed in this report.

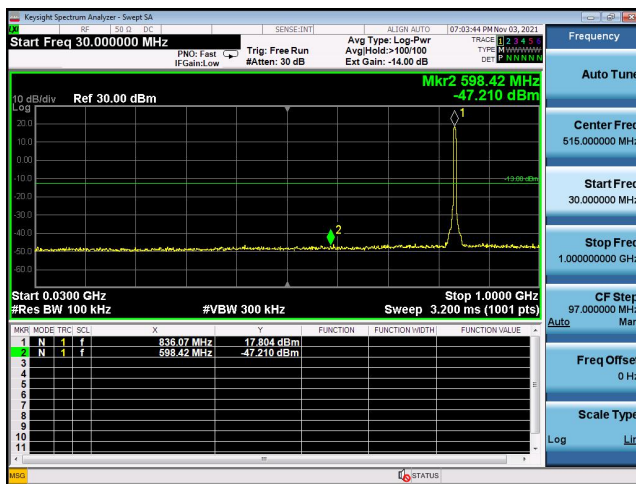
WCDMA 850-4132, 30MHz ~1GHz



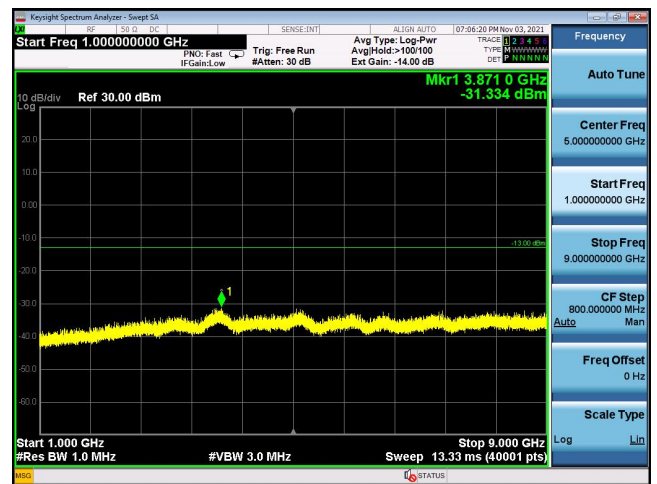
WCDMA 850-4132, 1GHz to 9GHz



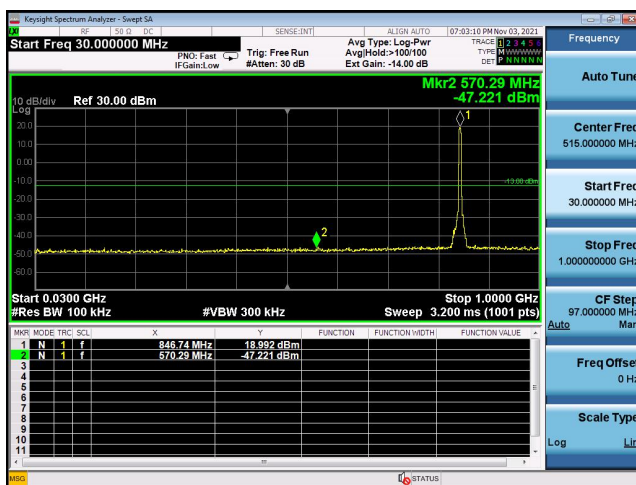
WCDMA 850-4183, 30MHz ~1GHz



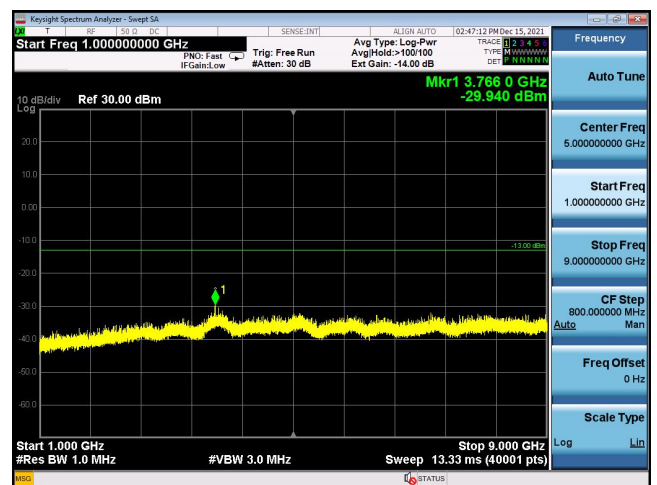
WCDMA 850-4183, 1GHz to 9GHz



WCDMA 850-4233, 30MHz ~1GHz

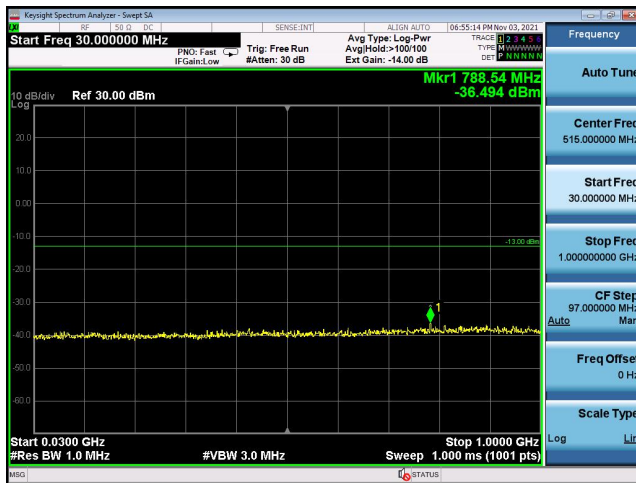


WCDMA 850-4233, 1GHz to 9GHz

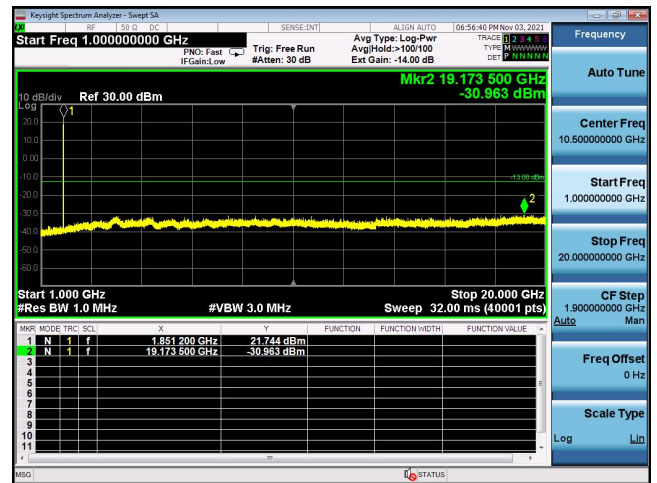




WCDMA 1900-9262, 30MHz ~1GHz



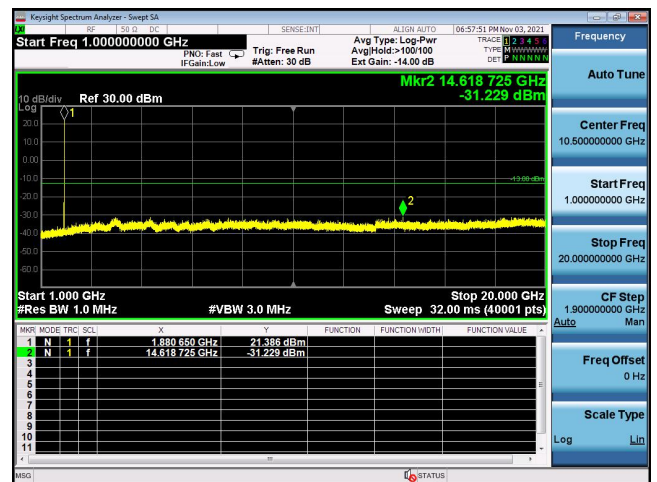
WCDMA 1900-9262, 1GHz to 20GHz



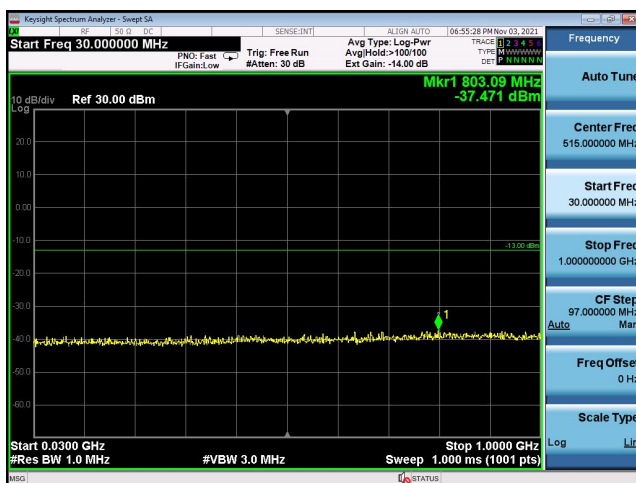
WCDMA 1900-9400, 30MHz ~1GHz



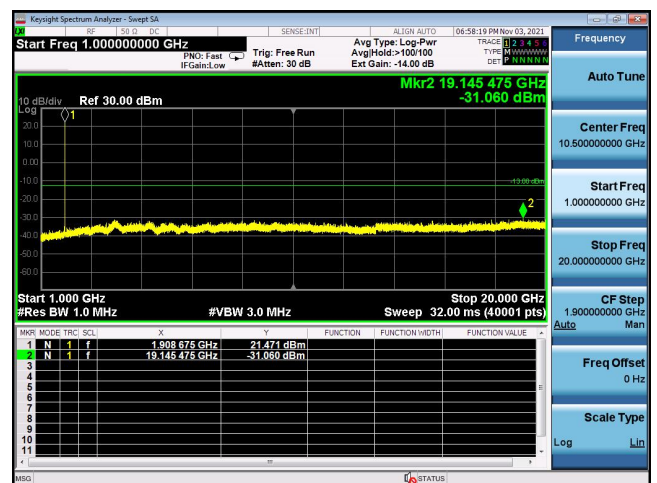
WCDMA 1900-9400, 1GHz to 20GHz



WCDMA 1900-9538, 30MHz ~1GHz



WCDMA 1900-9538, 1GHz to 20GHz



2.6 Bandedge

2.6.1 Requirement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

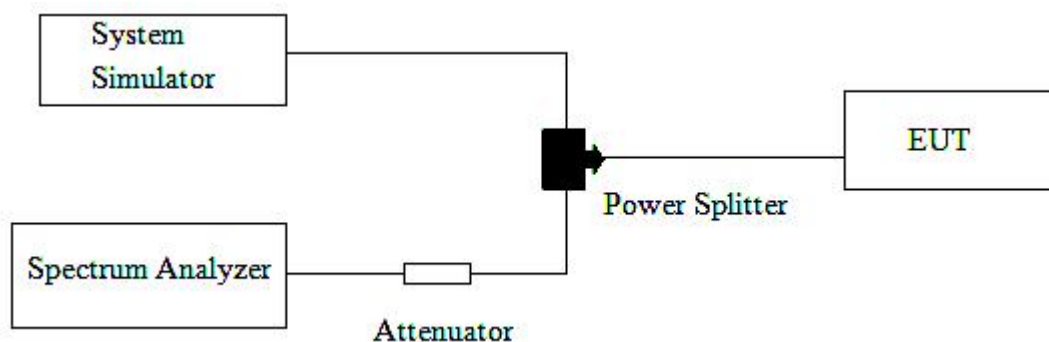
2.6.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.6.3 Test Procedures

1. The testing follows FCC KDB 971168 D01 v03r01 Section 6.0.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The band GPRSs of low and high channels for the highest RF powers were measured.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13\text{dBm}.$

2.6.4 Test Setup



2.6.5 Test Result of Conducted Bandedge

WCDMA 850-4132



WCDMA 850-4233



WCDMA 1900-9262



WCDMA 1900-9538



2.7 Radiated Spurious Emissions

2.7.1 Requirement

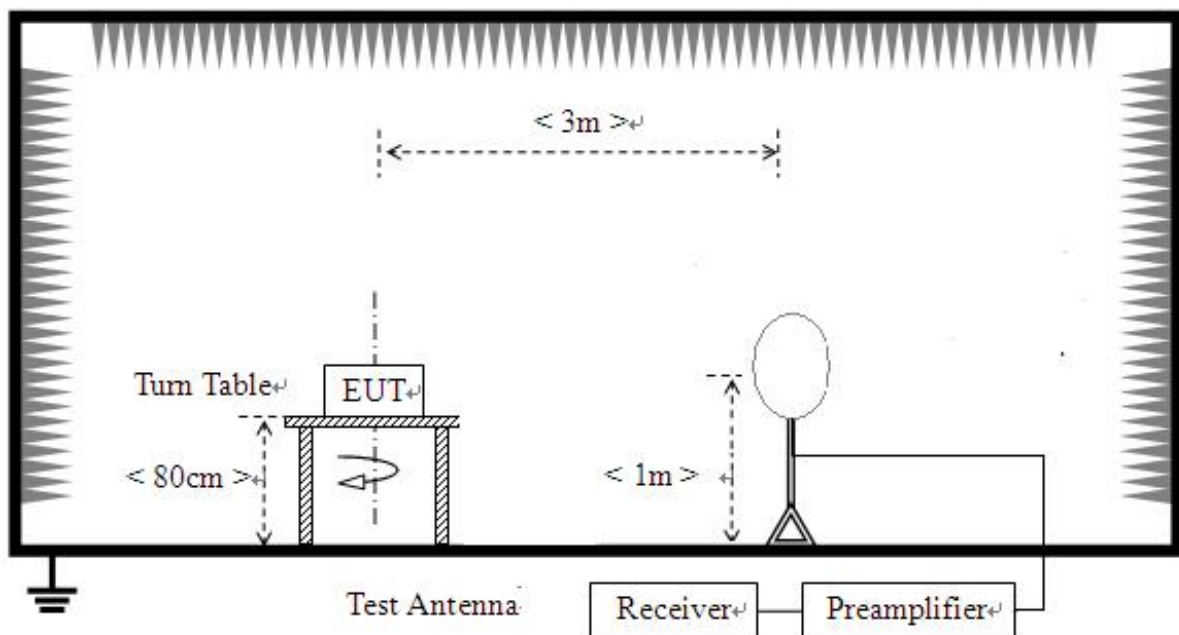
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

2.7.2 Measuring Instruments

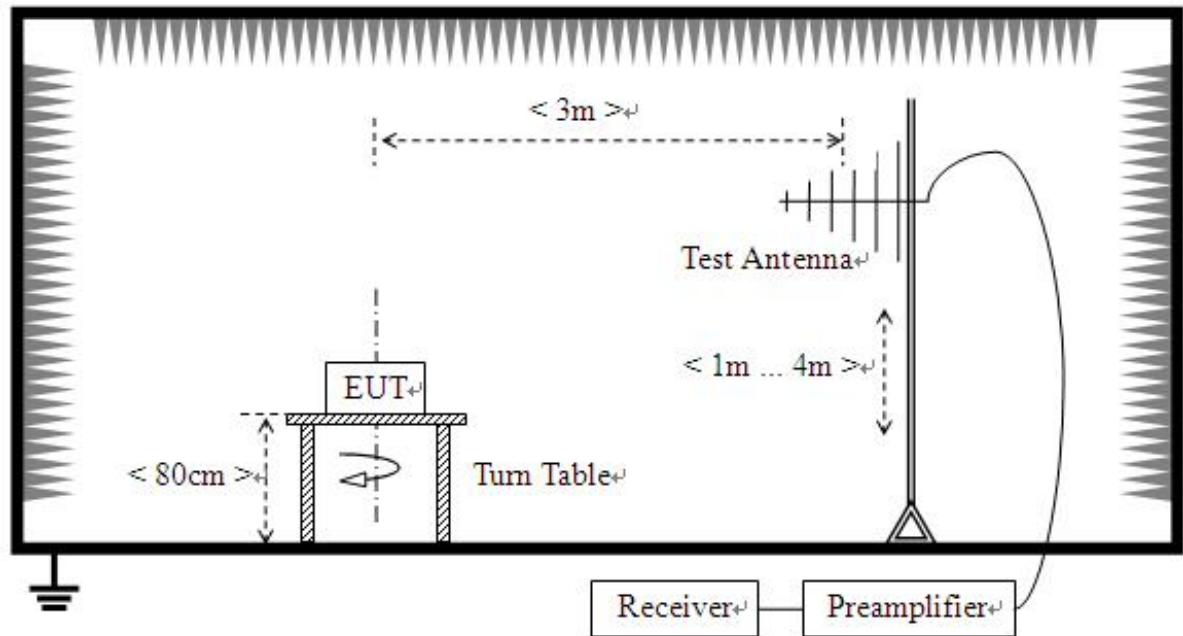
The measuring equipment is listed in the section 3 of this test report.

2.7.3 Test Setup

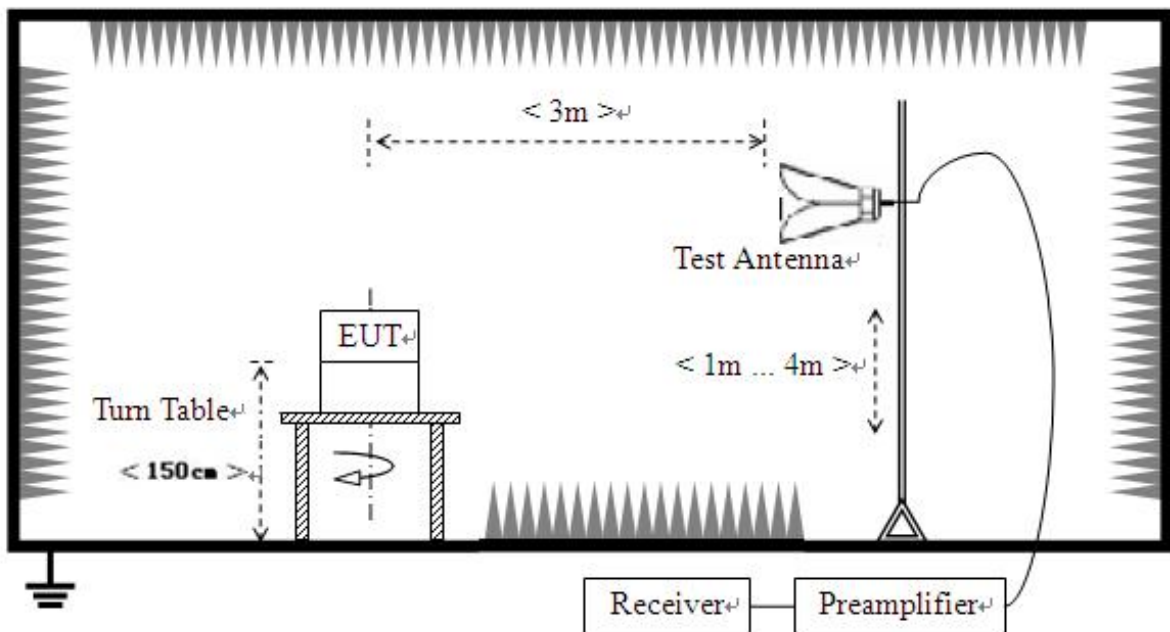
For radiated emissions from 9 kHz to 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



2.7.4 Test Procedures

1. The testing follows FCC KDB 971168 D01 v03r01 Section 5.8.
2. The EUT was placed on a rotatable wooden table 0.8/1.5 meters above the ground.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna

tower.

4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between one meter and four meters to search for the maximum spurious emission for both horizontal and vertical polarizations.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
9. Taking the record of output power at antenna port.
10. Repeat step 7 to step 8 for another polarization.
11. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
12. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)]$ (dB)
 $= [30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (dB)
 $= -13\text{dBm}$.
13. This device employs UMTS technology with WCDMA (AMR/RMC), HSDPA, HSUPA capabilities. All configurations were investigated and the worst case UMTS emissions were found in RMC WCDMA mode at 12.2Kbps.
14. This unit was tested with its standard battery.
15. All Spurious Emission tests were performed in X, Y, Z axis direction and low, middle, high channel. And only the worst axis test condition was recorded in this test report.
16. The spectrum is measured from 9 KHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. The worst case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
17. For 9KHz to 30MHz: the amplitude of spurious emissions are attenuated by more than 20dB below the permissible value has no need to be reported.

2.7.5 Test Results of Radiated Spurious Emissions

Note: 1. (Absolute)Level=Reading Level + Factor

Worst-Case test data provide as below:

30MHz~10GHz: WCDMA 850 Middle Channel							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	63.9840	-89.99	-70.65	-13.00	57.65	19.34	Horizontal
2	361.101	-97.84	-69.23	-13.00	56.23	28.61	Horizontal
3	678.608	-103.96	-69.34	-13.00	56.34	34.62	Horizontal
4	3234.11	-57.31	-48.07	-13.00	35.07	9.24	Horizontal
5	3656.32	-57.65	-48.05	-13.00	35.05	9.60	Horizontal
6	6353.67	-59.54	-41.29	-13.00	28.29	18.25	Horizontal
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	47.4775	-91.00	-71.59	-13.00	58.59	19.41	Vertical
2	361.101	-99.21	-71.95	-13.00	58.95	27.26	Vertical
3	651.421	-103.66	-69.92	-13.00	56.92	33.74	Vertical
4	3040.02	-57.51	-48.79	-13.00	35.79	8.72	Vertical
5	3832.41	-58.30	-48.09	-13.00	35.09	10.21	Vertical
6	5001.00	-58.69	-44.40	-13.00	31.40	14.29	Vertical

30MHz~20GHz: WCDMA 1900 Middle Channel							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	47.4775	-87.64	-67.82	-13.00	54.82	19.82	Horizontal
2	361.101	-98.34	-69.73	-13.00	56.73	28.61	Horizontal
3	813.573	-104.02	-66.87	-13.00	53.87	37.15	Horizontal
4	3820.82	-57.85	-47.53	-13.00	34.53	10.32	Horizontal
5	5286.28	-59.50	-44.75	-13.00	31.75	14.75	Horizontal
6	6395.39	-59.86	-41.25	-13.00	28.25	18.61	Horizontal
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	364.985	-98.64	-71.73	-13.00	58.73	26.91	Vertical
2	868.918	-97.18	-61.17	-13.00	48.17	36.01	Vertical
3	1224.22	-62.42	-63.99	-13.00	50.99	-1.57	Vertical
4	3776.77	-58.65	-48.30	-13.00	35.30	10.35	Vertical
5	5354.35	-58.60	-43.90	-13.00	30.90	14.70	Vertical
6	6291.29	-59.84	-41.67	-13.00	28.67	18.17	Vertical



3. LIST OF MEASURING EQUIPMENT

Radiated spurious emission measuring equipment

Description	Manufacturer	Model	Serial No.	Cal. Date	Due Date	Remark
EMI Test Receiver	R&S	ESR3	A181103297	2021.06.25	2022.06.24	Radiation
Loop Antenna	Schwarz beck	HFH2-Z2	100047	2019.04.26	2022.04.25	Radiation
Broadband antenna (30MHz~1GHz)	Schwarbeck	BBHA 9120 J	A190503537	2019.01.07	2022.01.06	Radiation
Broadband antenna (30MHz~1GHz)	R&S	VULB9160	A0805560	2019.05.24	2022.05.23	Radiation
Double ridge horn antenna (1GHz~18GHz)	R&S	HF906	100150	2019.04.27	2022.04.26	Radiation
Double ridge horn antenna (1GHz~18GHz)	R&S	HF906	100149	2019.04.17	2022.04.16	Radiation
Horn antenna (18GHz~26.5GHz)	AR	AT4510	A0804450	2020.06.19	2023.06.18	Radiation
Horn antenna (18GHz~26.5GHz)	AR	AT4003A	0329293	2020.09.17	2022.08.16	Radiation
Amplifier 30M~1GHz	MILMEGA	80RF1000-10004	A140101634	2020.09.22	2023.09.21	Radiation
Amplifier 1G~18GHz	MILMEGA	AS0104R-800/40 0	A160302517	2021.01.26	2022.01.25	Radiation
Spectrum Analyzer	KEYSIGHT	N9030A	A160702554	2021.04.26	2022.04.25	Conducted
Test Receiver	R&S	ESIB7	A0501375	2021.05.24	2022.05.23	Conducted
Temperature chamber	TABAI	PS-232	A8708054	2021.09.24	2022.09.23	Temperature chamber
Wideband Radio Communication tester	R&S	CMW500	A130101034	2021.01.26	2023.01.25	Conducted
Power Supply	R&S	WYJ-60100	A141102031	2020.01.16	2023.01.15	Conducted

4. UNCERTAINTY OF EVALUATION

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013. All the measurement uncertainty value were shown with a coverage $K=2$ to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Conducted Emission Measurement (150KHz~30MHz)

Measuring Uncertainty for a level of confidence of 95%($U=2U_c(y)$)	2.8dB
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Uncertainty of Radiated Emission Measurement (30MHz~1GHz)

Measuring Uncertainty for a level of confidence of 95%($U=2U_c(y)$)	3.91dB
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Uncertainty of Radiated Emission Measurement (1GHz~18GHz)

Measuring Uncertainty for a level of confidence of 95%($U=2U_c(y)$)	4.5dB
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Uncertainty of Radiated Emission Measurement (18GHz~40GHz)

Measuring Uncertainty for a level of confidence of 95%($U=2U_c(y)$)	4.9dB
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**** END OF REPORT ****