RF TEST REPORT

Report No.:	SET2022-05993
Product Name:	M300z
Model No. :	M300z
FCC ID:	SRQ-M300Z
Applicant:	ZTE CORPORATION.
Address:	ZTE Plaza, #55 Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, China
Dates of Testing:	2022.04.22-2022.05.16
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……..:	M300z
Brand Name……:	ZTE
Trade Name……...:	ZTE
Applicant……:	ZTE CORPORATION
Applicant Address……...:	ZTE Plaza, #55 Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, China
Manufacturer……..:	ZTE CORPORATION
Manufacturer Address….:	ZTE Plaza, #55 Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, China
Test Standards……..…:	47 CFR FCC Part 2/22/24
Test Result……..…:	PASS

Tested by……....: Sun 2022.05.17

Sun, Test Engineer

Reviewed by……..…: Chris You 2022.05.17

Chris You, Senior Engineer

Approved by……....: Shuangwen Zhang 2022.05.17

Shuangwen Zhang, Manager

Table of Contents

Change History		
Issue	Date	Reason for change
1.0	2022.05.17	First edition

1. GENERAL INFORMATION

1.1 EUT Description

Model No.	M300z
EUT supports Radios application	GPRS/EDGE
Multi Slot Class	GPRS: Multi slot Class10, EGPRS: Multi slot Class10
Test Band Frequency Range	GPRS 850MHz: Tx: 824.2 - 848.8MHz (at intervals of 200kHz); Rx: 869.2 - 893.8MHz (at intervals of 200kHz) GPRS 1900MHz: Tx: 1850.2 - 1909.8MHz (at intervals of 200kHz); Rx: 1930.2 - 1989.8MHz (at intervals of 200kHz)
Maximum Output Power to Antenna	GPRS 850: 31.64dBm GPRS 1900: 28.80dBm EDGE 850: 26.30dBm EDGE 1900: 25.43dBm
Type of Modulation	GPRS:GMSK EDGE:GMSK / 8PSK
Antenna Type	Internal Antenna
Power supply	DC 5V from Adapter

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

System	Type of Modulation	Emission Designator	Frequency Tolerance (ppm)	Maximum ERP/EIRP(W)
GPRS850	GMSK	250KGXW	0.0082	1.419
GPRS1900	GMSK	246KGXW	0.0073	1.086
EDGE 850	8PSK	245KG7W	0.0069	0.388
EDGE 1900	8PSK	244KG7W	0.0066	0.509

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 Radio	＜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	≤±2.5ppm	PASS
5	2.1051 22.917 (a) 24.238 (a)	Conducted Out of Band Emissions	< 43+10log10 (P[Watts])	PASS
6	2.1051 22.917 (a) 24.238 (a)	Band Edge	< 43+10log10 (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+10log10 (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 GPRS850.
2. 30 MHz to 20000 MHz for GPRS1900.

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
GSM 850	GSM Link EDGE Link	GSM Link EDGE Link
GSM 1900	GSM Link EDGE Link	GSM Link EDGE Link

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

GPRS mode for GMSK modulation,

EDGE multi-slot class 8 mode for 8PSK modulation,

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:

Offset (dB) = RF cable loss(dB) + Power Splitter(dB) + attenuator factor(dB).

= 1 + 3 + 10 = 14 (dB)

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 f iled with the FCC (Federal Communications Commission). The acceptance letter from the FCC is ma intained 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 Engineeri ng Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11 185A-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 (℃):	15℃- 35℃
Relative Humidity (%):	30% -60%
Atmospheric Pressure (kPa):	86KPa-106KPa

2. 47 CFR PART 2, PART 22H & 24E 27L REQUIREMENTS

2.1 Conducted RF Output Power

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.

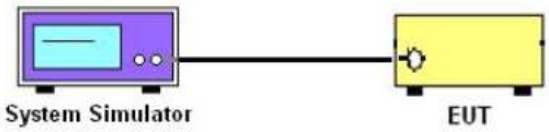
2.1.2 Measuring Instruments

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

GSM ModelTest Verdict:

Band	Burst Average power (dBm)					
	Channel	128	Channel	190	Channel	251
	Frequency	824.2MHz	Frequency	836.6MHz	Frequency	848.8MHz
GPRS 850 (1 Uplink slot)	31.60		31.61		31.64	
GPRS 850 (2 Uplink slot)	31.32		31.31		31.33	
EDGE 850 (1 Uplink slot)	26.20		26.15		26.30	
EDGE 850 (2 Uplink slot)	25.83		25.80		25.95	

Band	Burst Average power (dBm)					
	Channel	512	Channel	661	Channel	810
	Frequency	1850.2MHz	Frequency	1880.0MHz	Frequency	1909.8MHz
GPRS 1900 (1 Uplink slot)	28.11		28.54		28.80	
GPRS 1900 (2 Uplink slot)	27.81		28.36		28.59	
EDGE 1900 (1 Uplink slot)	24.81		25.33		25.43	
EDGE 1900 (2 Uplink slot)	24.54		25.02		25.16	

2.2 Peak to Average Radio

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 (PAPR) 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 GPRS/EGPRS operating modes:

a. Set EUT in maximum power output.

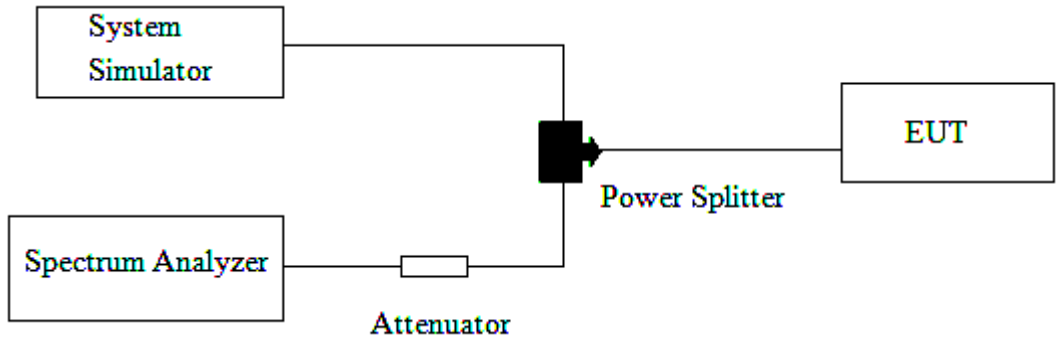
b. Set the RBW = 1MHz, VBW = 3MHz, Peak detector on spectrum analyzer for first trace.

c. Set the RBW = 1MHz, VBW = 3MHz, RMS detector on spectrum analyzer for second trace.

d. The wanted burst signal is triggered by spectrum analyzer, and measured respectively the peak level and Mean level without burst-off time, after system simulator has synchronized with the spectrum analyzer.

4. Record the deviation as Peak to Average Ratio.

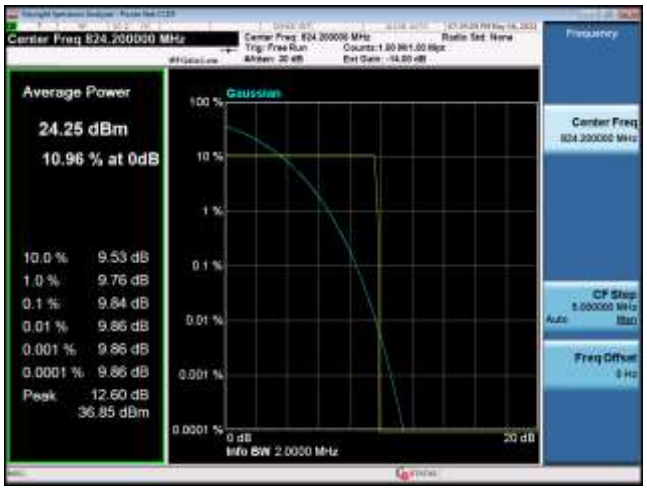
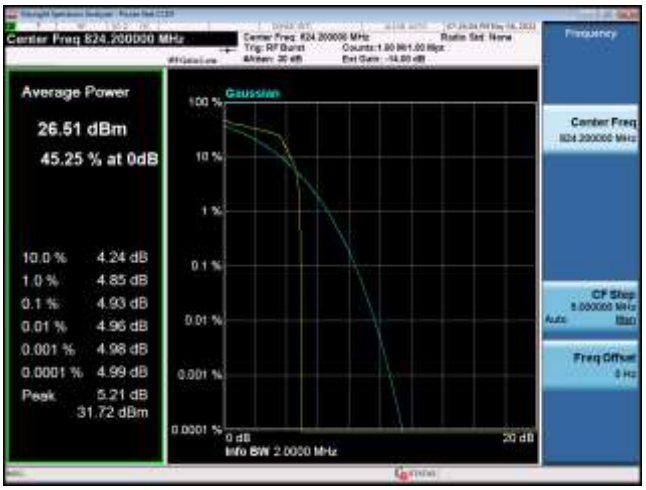
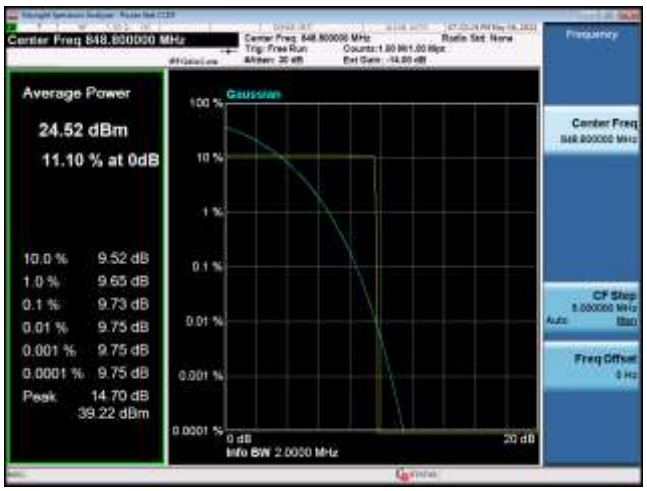
2.2.4 Test Setup

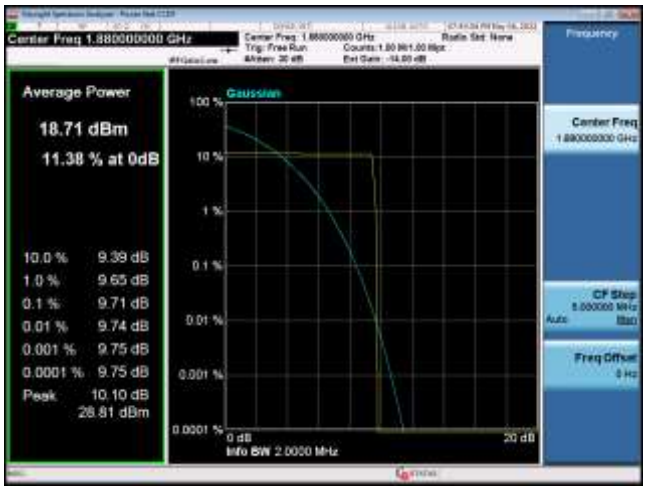
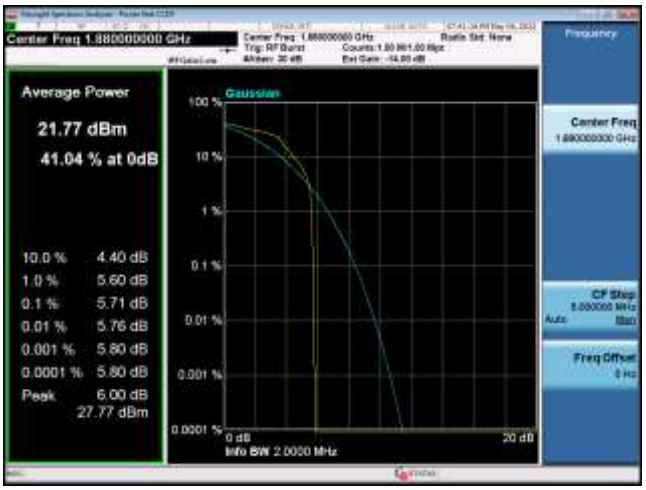


2.2.5 Test Results of Peak-to-Average Ratio

Band	Channel	Frequency (MHz)	Peak to Average radio dB	Limit dB	Verdict
GPRS 850MHz	128	824.2	9.84	13	PASS
	190	836.6	10.00		PASS
	251	848.8	9.73		PASS
EDGE 850MHz	128	824.2	4.93		PASS
	190	836.6	4.99		PASS
	251	848.8	4.96		PASS
GPRS 1900MHz	512	1850.2	9.75		PASS
	661	1880.0	9.71		PASS
	810	1909.8	9.88		PASS
EDGE 1900MHz	512	1850.2	4.99		PASS
	661	1880.0	5.71		PASS
	810	1909.8	4.74		PASS

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

GPRS 850-128	EDGE 850-128
	
GPRS 850-190	EDGE 850-128
	
GPRS 850-251	EDGE 850-128
	

GPRS 1900-512	EDGE 1900-512
	
GPRS 1900-661	EDGE 1900-661
	
GPRS 1900-810	EDGE 1900-810
	

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.

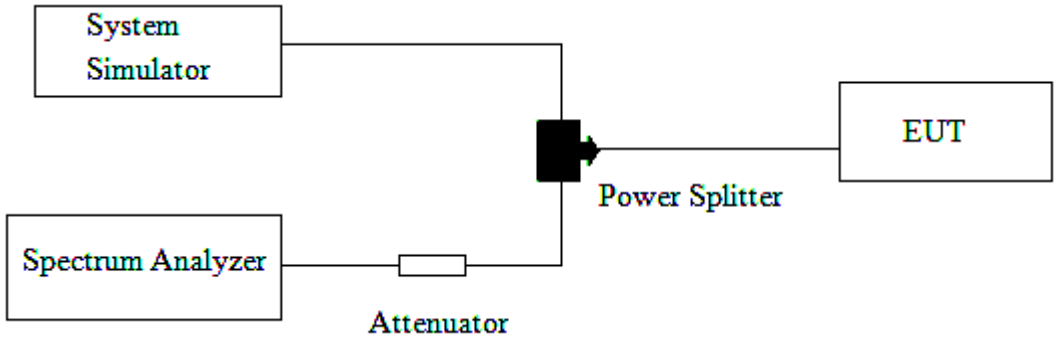
3. The RF output of the EUT was connected to the spectrum analyzer by RF cable and attenuator.

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

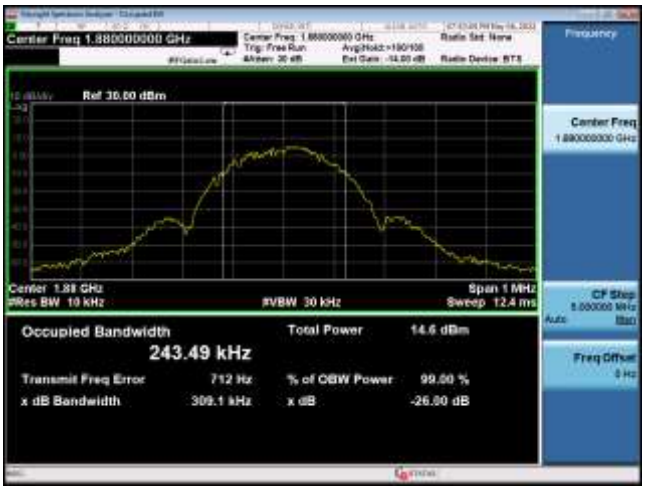


2.3.5 Test Results of 99% Occupied Bandwidth and 26dB Bandwidth

Band	Channel	Frequency (MHz)	26dB bandwidth (KHz)	99% Occupied Bandwidth (KHz)
GPRS 850MHz	128	824.2	325.4	254.88
	190	836.6	314.7	249.62
	251	848.8	317.1	247.95
EDGE 850MHz	128	824.2	324.4	244.69
	190	836.6	318.7	245.58
	251	848.8	326.8	244.02
GPRS 1900MHz	512	1850.2	319.1	247.04
	661	1880.0	321.4	245.15
	810	1909.8	313.9	248.50
EDGE 1900MHz	512	1850.2	328.5	256.89
	661	1880.0	309.1	243.49
	810	1909.8	333.6	266.46

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

GPRS 850-128	EDGE 850-128
	
GPRS 850-190	EDGE 850-128
	
GPRS 850-251	EDGE 850-128
	

GPRS 1900-512	EDGE 1900-512
	
GPRS 1900-661	EDGE 1900-661
	
GPRS 1900-810	EDGE 1900-810
	

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 ±0.00025% (±2.5ppm) of the center frequency.

2.4.2 Measuring Instruments

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

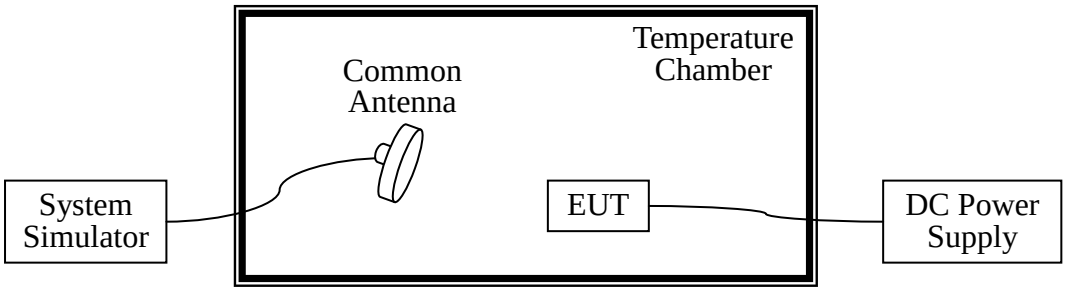
2.4.3 Test Procedures for Temperature Variation

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 ℃ 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 ℃ steps up to 50 ℃. 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±5 °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

GSM 850 Channel=190, Frequency=836.6 MHz					
Power (VDC)	Temperature (℃)	GPRS Deviation (ppm)	EDGE Deviation (ppm)	Limit(ppm)	Result
5.0	-30	0.0052	0.0063	±2.5	PASS
	-20	0.0032	0.0042		
	-10	0.0025	0.0037		
	0	0.0021	0.0033		
	+10	0.0019	0.0018		
	+20	0.0032	0.0027		
	+30	0.0011	0.0045		
	+40	0.0052	0.0033		
	+50	**0.0082**	**0.0069**		
5.5	+25	0.0018	0.0051		
4.5	+25	0.0022	0.0028		

GSM 1900 Channel=661, Frequency=1880.0 MHz					
Power (VDC)	Temperature (℃)	GPRS Deviation (ppm)	EDGE Deviation (ppm)	Limit(ppm)	Result
5.0	-30	0.0029	0.0042	Within authorized band for GSM 1900	PASS
	-20	0.0032	0.0011		
	-10	0.0053	0.0040		
	0	0.0022	0.0048		
	+10	0.0017	0.0019		
	+20	0.0012	0.0022		
	+30	0.0011	0.0016		
	+40	0.0055	0.0042		
	+50	**0.0073**	**0.0066**		
5.5	+25	0.0011	0.0043		
4.5	+25	0.0032	0.0051		

2.5 onducted 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.

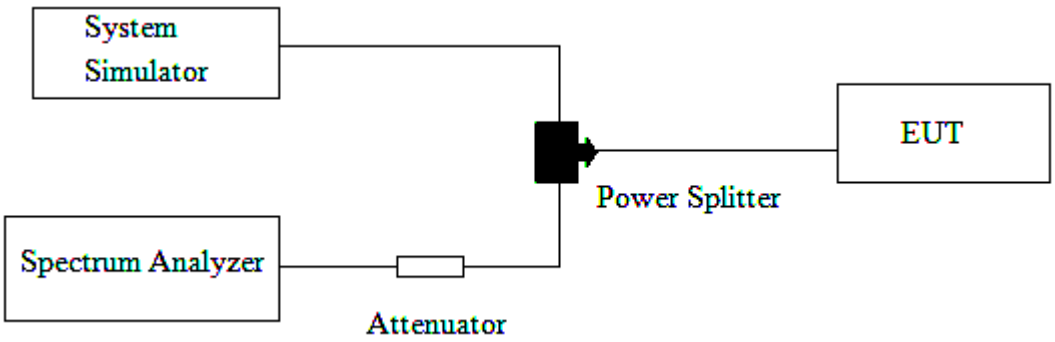
2.5.2 Measuring Instruments

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

2.5.3 Test Procedures

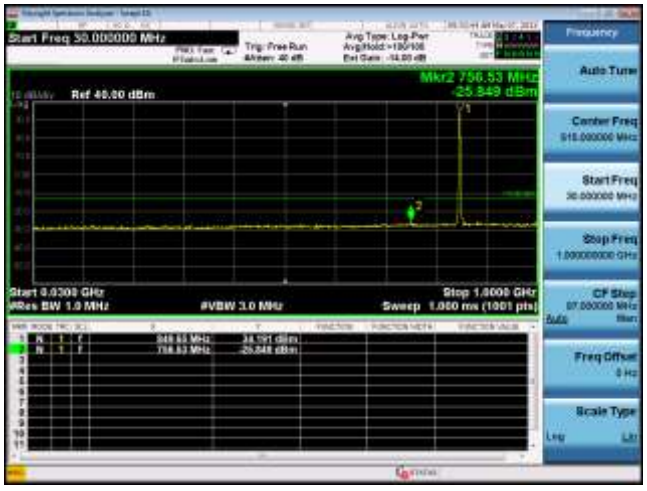
1. The testing follows FCC KDB 971168 D01 v03r01 Section 6.0.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each 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 + 10log(P) dB below the transmitter power P(Watts)
   = P(W) - [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.
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.

GSM 850-128, 30MHz ~1GHz	GSM 850-128, 1GHz to 9GHz
	
GSM 850-190, 30MHz ~1GHz	GSM 850-190, 1GHz to 9GHz
	
GSM 850-251, 30MHz ~1GHz	GSM 850-251, 1GHz to 9GHz
	

GSM 1900-512, 30MHz ~1GHz	GSM 1900-512, 1GHz to 20GHz
	
GSM 1900-661, 30MHz ~1GHz	GSM 1900-661, 1GHz to 20GHz
	
GSM 1900-810, 30MHz ~1GHz	GSM 1900-810, 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.

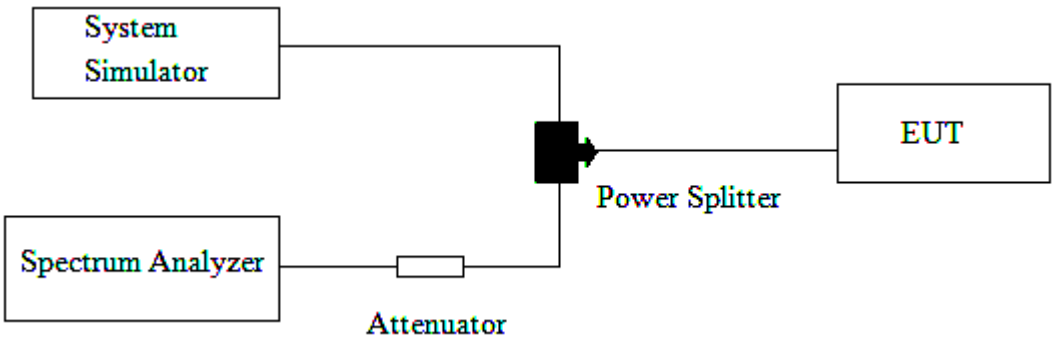
2.6.2 Measuring Instruments

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

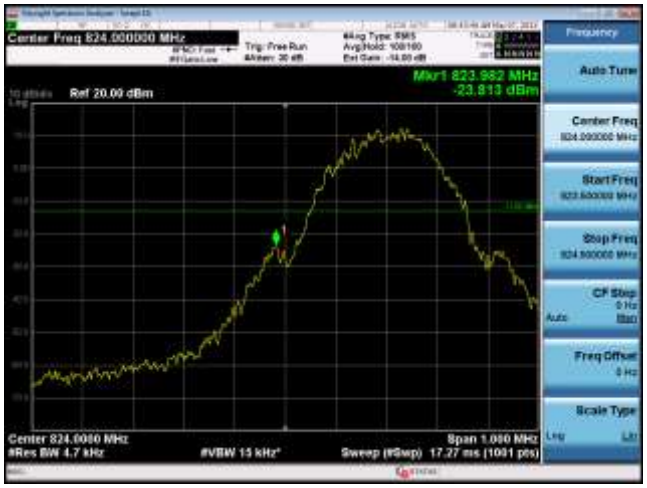
2.6.3 Test Procedures

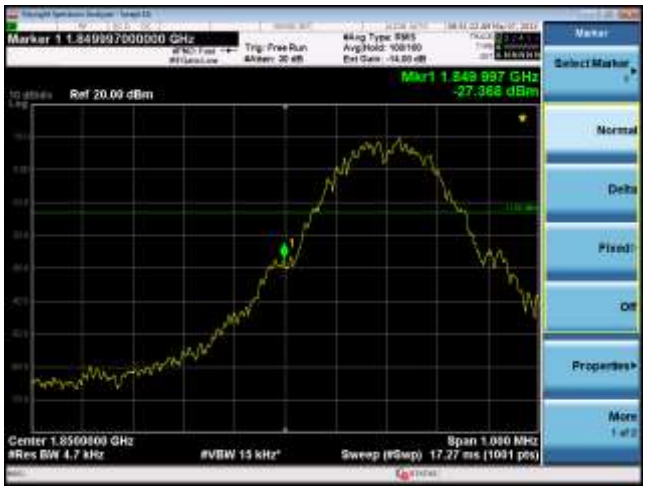
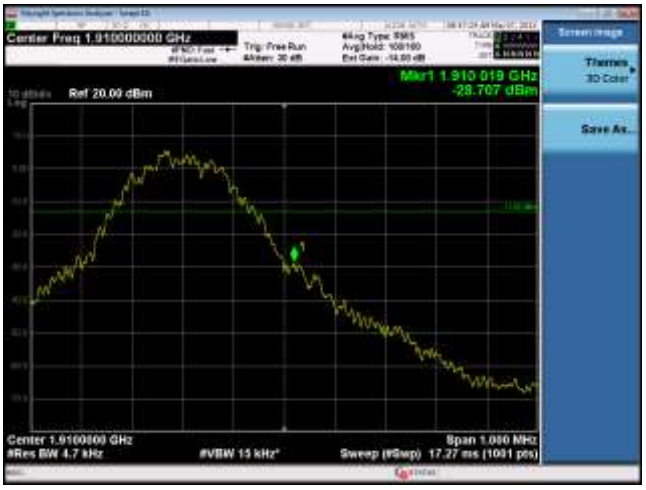
1. The testing follows FCC KDB 971168 D01 v03r01 Section 6.0.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each 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 + 10log(P) dB below the transmitter power P(Watts)
   = P(W) - [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.

2.6.4 Test Setup



2.6.5 Test Result of Conducted Bandedge

GPRS 850-128	GPRS 850-251
	
EDGE 850-128	EDGE 850-251
	

GPRS 1900-512	GPRS 1900-810
	
EDGE 1900-512	EDGE 1900-810
	

2.7 Transmitter Radiated Power (EIRP/ERP)

2.7.1 Requirement

The substitution method, in ANSI C63.26:2015, was used for ERP/EIRP measurement, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v03r01. The ERP of mobile transmitters must not exceed 7 Watts (Cellular Band) and the EIRP of mobile transmitters are limited to 2 Watts (PCS Band) and 1 Watts (AWS Band).

2.7.2 Measuring Instruments

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

2.7.3 Test Procedures

1. The testing follows FCC KDB 971168 D01 v03r01 Section 5.2.1. (for CDMA/WCDMA), Section 5.2.2.2 (for GPRS/GPRS/GPRS) and ANSI / TIA-603-D-2010 Section 2.2.17.
2. The EUT was placed on a turntable 1.5 meters high in a fully anechoic chamber.
3. The EUT was placed 3 meters from the receiving antenna, which was mounted on the antenna tower.
4. GPRS operating modes: Set RBW= 1MHz, VBW= 3MHz, RMS detector over burst;

   UMTS operating modes: Set RBW= 100 kHz, VBW= 300 kHz, RMS detector over frame, and use channel power option with bandwidth=5MHz, per KDB 971168 D01 v03r01.
5. The table was rotated 360 degrees to determine the position of the highest radiated power.
6. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
7. Taking the record of maximum ERP/EIRP.
8. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.

9. The conducted power at the terminal of the dipole antenna is measured.

10. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.

11. ERP/EIRP = Ps + Et – Es + Gs = Ps + Rt – Rs + Gs

Ps (dBm)：Input power to substitution antenna.

Gs (dBi or dBd)：Substitution antenna Gain.

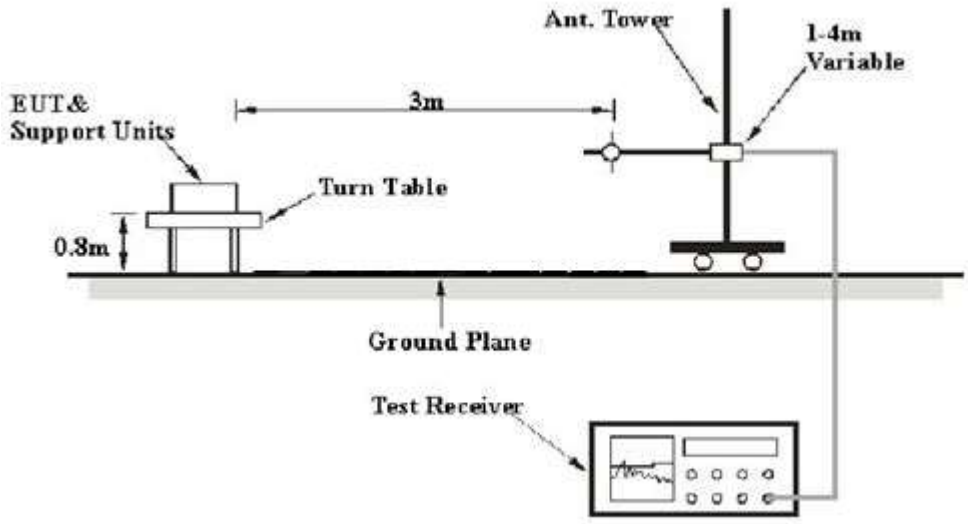
Et = Rt + AF Es = Rs + AF

AF (dB/m)：Receive antenna factor

Rt：The highest received signal in spectrum analyzer for EUT.

Rs：The highest received signal in spectrum analyzer for substitution antenna.

2.7.4 Test Setup



2.7.5 Test Result of Transmitter Radiated Power

Band	Channel	Frequency (MHz)	PCL	Antenna Pol (H/V)	Measured ERP dBm	Limit dBm	Verdict
GPRS 850MHz	128	824.20	5	H	31.48	38.5	PASS
				V	29.05		
	190	836.60	5	H	31.43		PASS
				V	29.12		
	251	848.80	5	H	**31.52**		PASS
				V	29.27		

Band	Channel	Frequency (MHz)	PCL	Antenna Pol (H/V)	Measured EIRP dBm	Limit dBm	Verdict
GPRS 1900MHz	512	1850.2	0	H	29.91	33	PASS
				V	28.05		
	661	1880.0	0	H	30.14		PASS
				V	28.43		
	810	1909.8	0	H	**30.36**		PASS
				V	28.71		

Band	Channel	Frequency (MHz)	PCL	Antenna Pol (H/V)	Measured ERP dBm	Limit dBm	Verdict
EDGE 850MHz	128	824.20	5	H	25.82	38.5	PASS
				V	24.75		
	190	836.60	5	H	25.79		PASS
				V	24.66		
	251	848.80	5	H	**25.89**		PASS
				V	24.93		

Band	Channel	Frequency (MHz)	PCL	Antenna Pol (H/V)	Measured EIRP dBm	Limit dBm	Verdict
EDGE 1900MHz	512	1850.2	0	H	26.59	33	PASS
				V	25.16		
	661	1880.0	0	H	26.91		PASS
				V	25.72		
	810	1909.8	0	H	**27.07**		PASS
				V	25.94		

2.8 Radiated Spurious Emissions

2.8.1 Requirement

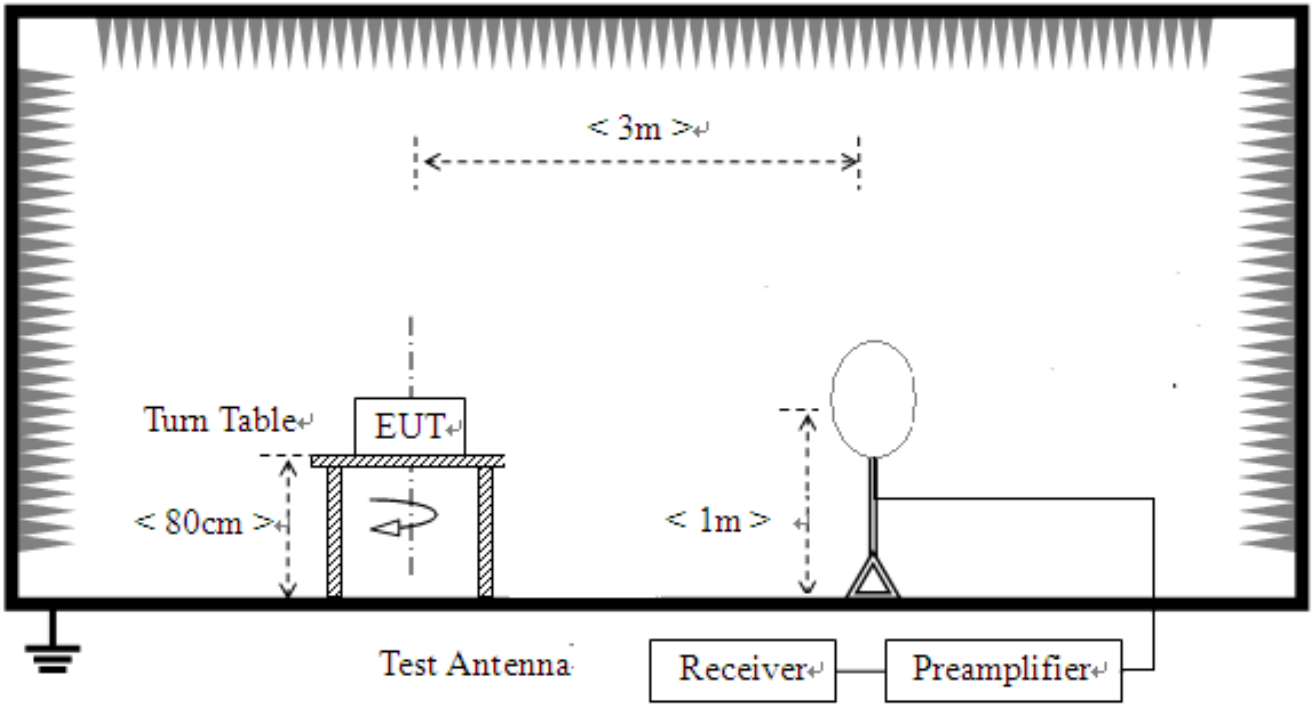
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

2.8.2 Measuring Instruments

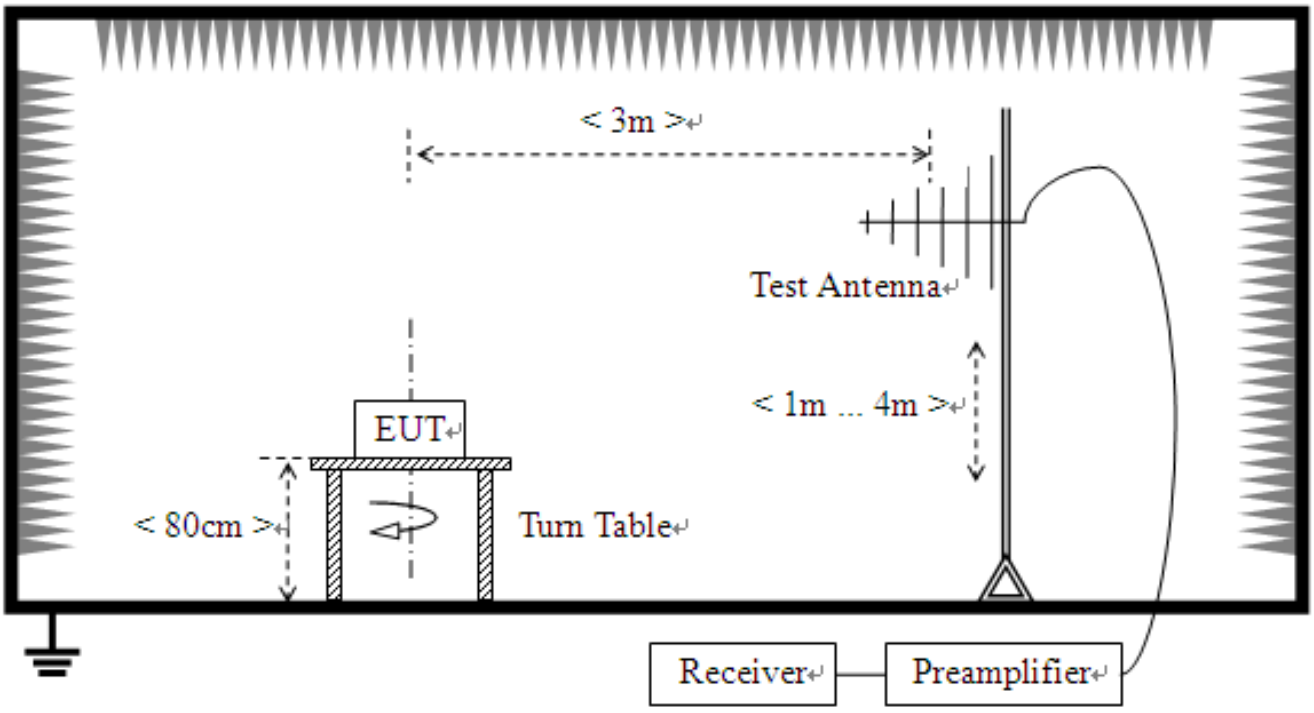
The measuring equipment is listed in the section 3 of this test report.

2.8.3 Test Setup

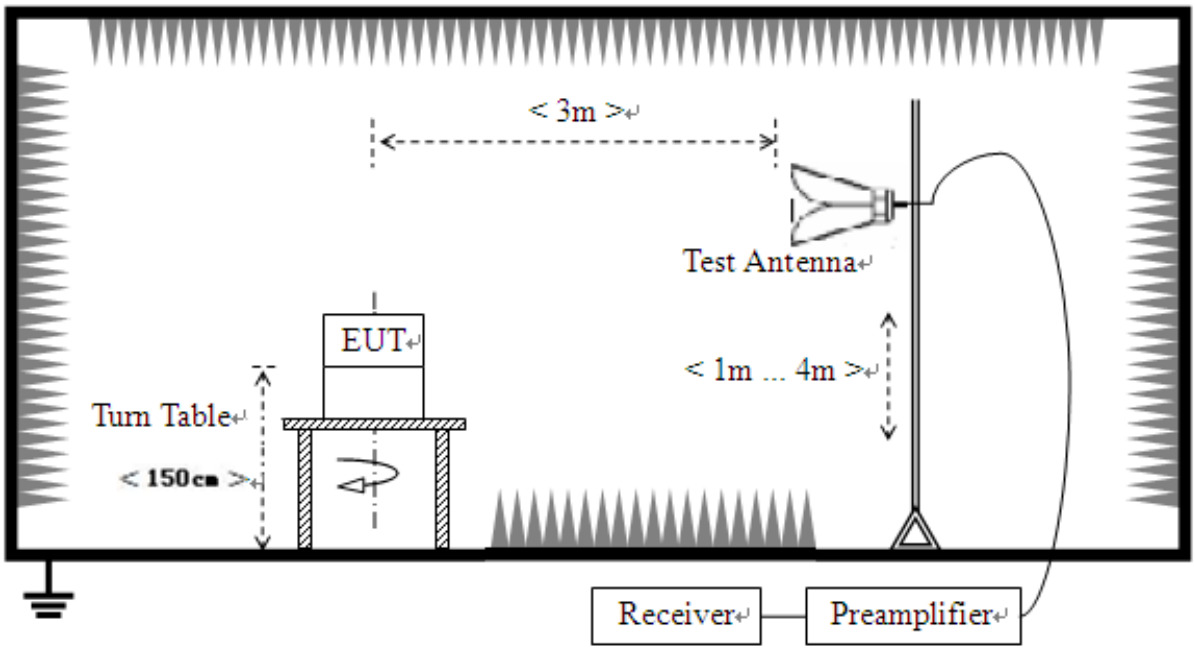
For radiated emissions from 9 kHz to 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



2.8.4 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 + 10log(P) dB below the transmitter power P(Watts)
    = P(W) - [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.
13. This device employs GMSK technology with GPRS and GPRS capabilities. All configurations were investigated and the worst case emissions were found in GPRS mode.
14. 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.
15. This unit was tested with its standard battery.
16. 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.
17. The spectrum is measured from 9 KHz to the 10^{th} 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.

18. 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.

2.8.5 Test Results of Radiated Spurious Emissions

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

Worst-Case test data provide as below:

30MHz~10GHz: GSM 850 Middle Channel							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	41.9673	-93.99	-72.68	-13.00	59.68	21.31	Horizontal
2	512.574	-103.31	-70.34	-13.00	57.34	32.97	Horizontal
3	655.211	-104.16	-68.57	-13.00	55.57	35.59	Horizontal
4	2120.56	-57.63	-54.39	-13.00	41.39	3.24	Horizontal
5	2988.99	-58.27	-50.49	-13.00	37.49	7.78	Horizontal
6	3785.39	-58.89	-49.73	-13.00	36.73	9.16	Horizontal
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	38.086	-80.65	-60.08	-13.00	47.08	20.57	Vertical
2	610.576	-102.38	-68.81	-13.00	55.81	33.57	Vertical
3	810.140	-103.37	-66.44	-13.00	53.44	36.93	Vertical
4	2172.58	-57.36	-54.45	-13.00	41.45	2.91	Vertical
5	2692.84	-57.82	-52.46	-13.00	39.46	5.36	Vertical
6	3605.30	-58.22	-49.84	-13.00	36.84	8.38	Vertical

30MHz~20GHz: GSM 1900 Middle Channel							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	501.655	-88.36	-55.72	-13.00	42.72	32.64	Horizontal
2	657.418	-88.83	-54.00	-13.00	41.00	34.83	Horizontal
3	852.486	-88.76	-51.64	-13.00	38.64	37.12	Horizontal
4	2265.08	-59.52	-55.14	-13.00	42.14	4.38	Horizontal
5	3195.09	-63.19	-53.72	-13.00	40.72	9.47	Horizontal
6	3735.36	-58.86	-48.45	-13.00	35.45	10.41	Horizontal
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	47.9540	-85.90	-66.80	-13.00	53.80	19.10	Vertical
2	612.776	-88.35	-55.46	-13.00	42.46	32.89	Vertical
3	931.580	-89.06	-51.23	-13.00	38.23	37.83	Vertical
4	2109.03	-57.59	-53.28	-13.00	40.28	4.31	Vertical
5	3705.35	-58.61	-48.24	-13.00	35.24	10.37	Vertical
6	5033.51	-58.14	-43.97	-13.00	30.97	14.17	Vertical

3. LIST OF MEASURING EQUIPMENT

Radiated spurious emission measuring equipment

NO.	Description	Manufacturer	Model	Serial No.	Cal. Date	Due Date
1	EMI Test Receiver	R&S	ESU8	A0805559	2022.02.21	2023.02.20
2	Passive Loop Antenna	SCHWARZBECK	FMZB 1519B	A180903206	2020.07.22	2023.07.21
3	Broadband antenna (30MHz~1GHz)	Schwarbeck	BBHA 9120 J	A190503537	2020.12.29	2022.12.28
4	Broadband antenna (30MHz~1GHz)	R&S	VULB9160	A0805560	2019.05.24	2022.05.23
5	Horn Antenna (1GHz~18GHz)	R&S	ESIB7	A0501375	2020.06.24	2022.06.22
6	Horn antenna (18GHz~26.5GHz)	AR	AT4003A	A0329293	2021.09.05	2022.09.04
7	Amplifier 30M~1GHz	MILMEGA	80RF1000-1000	A140101634	2021.12.24	2022.12.23
8	Amplifier 1G~18GHz	MILMEGA	AS0104R-800/400	A160302517	2021.12.24	2022.12.23
9	Spectrum Analyzer	KEYSIGHT	N9030A	A160702554	2022.03.25	2023.03.24
10	Test Receiver	R&S	ESIB26	A0304218	2021.12.27	2022.12.26
11	Temperature chamber	Yamato	DNF810C	A170702700	2022.03.31	2023.03.30
12	Wideband Radio Communication tester	R&S	CMW500	A130101034	2021.01.26	2023.01.25
13	Power Supply	R&S	WYJ-60100	A141102031	2021.11.01	2022.10.31

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=2Uc(y))	2.8dB

Uncertainty of Radiated Emission Measurement (30MHz~1GHz)

Measuring Uncertainty for a level of confidence of 95%(U=2Uc(y))	3.91dB

Uncertainty of Radiated Emission Measurement (1GHz~18GHz)

Measuring Uncertainty for a level of confidence of 95%(U=2Uc(y))	4.5dB

Uncertainty of Radiated Emission Measurement (18GHz~40GHz)

Measuring Uncertainty for a level of confidence of 95%(U=2Uc(y))	4.9dB

** END OF REPORT **