

FCC REPORT

(GSM & WCDMA)

Applicant: SWAGTEK

Address of Applicant: 10205 NW 19th Street, STE 101, Miami, FL33172, USA

Equipment Under Test (EUT)

Product Name: 6.8 inch 4G Smart Phone

Model No.: L68, MATRIX, N68

Trade mark: LOGIC, iSWAG, UNONU

FCC ID: O55681521

Applicable standards: FCC CFR Title 47 Part 2
FCC CFR Title 47 Part 22 Subpart H
FCC CFR Title 47 Part 24 Subpart E
FCC CFR Title 47 Part 27 Subpart L

Date of sample receipt: 18 May, 2021

Date of Test: 18 May, to 05 Jul., 2021

Date of report issued: 05 Jul., 2021

Test Result: PASS*

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the JYT product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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2. Version

Version No.	Date	Description
00	22 Jun., 2021	Original
01	05 Jul., 2021	1. Updated test data on Appendix – WCDMA.

Tested by:

Tanet Wei
Test Engineer

Date:

05 Jul., 2021

Reviewed by:

Winner Zhang
Project Engineer

Date:

05 Jul., 2021

3. Contents

	Page
1. COVER PAGE	1
2. VERSION.....	2
3. CONTENTS.....	3
4. TEST SUMMARY	4
5. GENERAL INFORMATION	5
5.1 CLIENT INFORMATION.....	5
5.2 GENERAL DESCRIPTION OF E.U.T.....	5
5.3 TEST ENVIRONMENT AND MODE	7
5.4 DESCRIPTION OF SUPPORT UNITS.....	7
5.5 MEASUREMENT UNCERTAINTY.....	7
5.6 ADDITIONS TO, DEVIATIONS, OR EXCLUSIONS FROM THE METHOD.....	7
5.7 LABORATORY FACILITY.....	8
5.8 LABORATORY LOCATION	8
5.9 TEST INSTRUMENTS LIST.....	8
6. TEST RESULTS.....	9
6.1 CONDUCTED OUTPUT POWER, ERP AND EIRP	9
6.2 PEAK-TO-AVERAGE POWER RATIO	10
6.3 OCCUPY BANDWIDTH	11
6.4 MODULATION CHARACTERISTIC.....	12
6.5 OUT OF BAND EMISSION AT ANTENNA TERMINALS	12
6.6 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT.....	13
6.7 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT.....	19
6.8 FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT	20
7. TEST SETUP PHOTO.....	21
8. EUT CONSTRUCTIONAL DETAILS	22

4. Test Summary

Test Item	Section in CFR 47	Result
RF Exposure (SAR)	Part 1.1307 Part 2.1093	Pass (Please refer to SAR Report)
RF Output Power	Part 2.1046 Part 22.913 (a)(5) Part 24.232 (c) Part 27.50 (d)(4)	Appendix A – GSM Appendix A - WCDMA
Peak-to-Average Power Ratio	Part 24.232 (d) Part 27.50(d)(5)	Appendix B – GSM Appendix B - WCDMA
Modulation Characteristics	Part 2.1047	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 22.917(b) Part 24.238(b) Part 27.53(h)	Appendix C – GSM Appendix C - WCDMA
Out of band emission at antenna terminals	Part 2.1051 Part 22.917 (a) Part 24.238 (a) Part 27.53 (h)	Appendix D – GSM Appendix D – WCDMA Appendix E – GSM Appendix E - WCDMA
Field strength of spurious radiation	Part 2.1053 Part 22.917 (a) Part 24.238 (a) Part 27.53 (h)	Pass
Frequency stability vs. temperature	Part 22.355 Part 24.235 Part 27.54 Part 2.1055(a)(1)(b)	Appendix F – GSM Appendix F - WCDMA
Frequency stability vs. voltage	Part 22.355 Part 24.235 Part 27.54 Part 2.1055(d)(2)	Appendix F – GSM Appendix F - WCDMA
Remark: 1. Pass: The EUT complies with the essential requirements in the standard. 2. The cable insertion loss used by "RF Output Power" and other conduction measurement items is 0.5dB(Fundamental Frequency below 1GHz)/1.0dB(Fundamental Frequency above 1GHz) (provided by the customer).		
Test Method:	ANSI/TIA-603-E-2016 ANSI C63.26-2015	

5. General Information

5.1 Client Information

Applicant:	SWAGTEK
Address:	10205 NW 19th Street, STE 101, Miami, FL33172, USA
Manufacturer/ Factory:	SWAGTEK
Address:	10205 NW 19th Street, STE 101, Miami, FL33172, USA

5.2 General Description of E.U.T.

Product Name:	6.8 inch 4G Smart Phone			
Model No.:	L68, MATRIX, N68			
Operation Frequency range:	GSM 850: 824.20MHz-848.80MHz PCS1900: 1850.20MHz-1909.80MHz WCDMA Band V: 826.4MHz-846.6MHz WCDMA Band II: 1852.4 MHz-1907.6 MHz WCDMA Band IV: 1712.4 MHz-1752.6 MHz			
Modulation type:	2G	☒ Voice(GMSK)	☒ GPRS(GMSK)	☒ EGPRS(GMSK, 8PSK)
	3G	☒ RMC(QPSK)	☒ HSUPA(QPSK)	☒ HSDPA(QPSK,16QAM)
Antenna type:	Internal Antenna			
Antenna gain:	GSM 850: -0.21 dBi(declare by Applicant) PCS 1900: 0.29 dBi(declare by Applicant) WCDMA Band V: -0.21 dBi(declare by Applicant) WCDMA Band II: 0.29 dBi(declare by Applicant) WCDMA Band IV: 0.32 dBi(declare by Applicant)			
Power supply:	Rechargeable Li-ion Battery DC3.85V, 5000mAh			
AC adapter:	Model: GLY-G43UA-050200-629A Input: AC100-240V, 50/60Hz, 0.3A Output: DC 5.0V, 2000mA			
Remark:	Model No.: L68, MATRIX, N68 were identical inside, the electrical circuit design, layout, components used and internal wiring, with only difference being trademark. LOGIC is for L68. iSWAG is for MATRIX, UNONU is for N68			
Test Sample Condition:	The test samples were provided in good working order with no visible defects.			

Operation Frequency List:

GSM 850		PCS1900	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
128	824.20	512	1850.20
129	824.40	513	1850.40
....			
189	836.40	660	1879.80
190	836.60	661	1880.00
191	836.80	662	1880.20
...	...	...	...
250	848.60	809	1909.60
251	848.80	810	1909.80
WCDMA Band V		WCDMA Band II	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
4132	826.40	9262	1852.40
4133	826.60	9263	1852.60
....			
4182	836.40	9399	1879.80
4183	836.60	9400	1880.00
4184	836.80	9401	1880.20
...	...	...	...
4232	846.40	9537	1907.40
4233	846.60	9538	1907.60
WCDMA Band IV			
Channel	Frequency (MHz)		
1312	1712.40		
1313	1712.60		
....			
1412	1732.40		
1413	1732.60		
1414	1732.80		
...	...		
1512	1752.40		
1513	1752.60		

Regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

GSM850			PCS1900		
Channel		Frequency(MHz)	Channel		Frequency(MHz)
Lowest	128	824.20	Lowest	512	1850.20
Middle	190	836.60	Middle	661	1880.00
Highest	251	848.80	Highest	810	1909.80
WCDMA Band V			WCDMA Band II		
Channel		Frequency(MHz)	Channel		Frequency(MHz)
Lowest	4132	826.40	Lowest	9262	1852.40
Middle	4183	836.60	Middle	9400	1880.00
Highest	4233	846.60	Highest	9538	1907.60
WCDMA Band IV					
Channel		Frequency(MHz)			
Lowest	1312	1712.40			
Middle	1413	1732.60			
Highest	1513	1752.60			

5.3 Test environment and mode

Operating Environment:	
Temperature:	Normal: 15°C ~ 35°C, Extreme: -30°C ~ +50°C
Humidity:	20 % ~ 75 % RH
Atmospheric Pressure:	1008 mbar
Voltage:	Nominal: 3.85Vdc, Extreme: Low 3.50 Vdc, High 4.42 Vdc
Test mode:	
GSM mode	Keep the EUT communication with simulated station in GSM mode
GPRS mode	Keep the EUT communication with simulated station in GPRS mode
EGPRS mode	Keep the EUT communication with simulated station in EGPRS mode
RMC mode	Keep the EUT communication with simulated station in RMC mode
HSDPA	Keep the EUT communication with simulated station in HSDPA mode
HSUPA	Keep the EUT communication with simulated station in HSUPA mode
Remark: The EUT has been tested under continuous transmitting mode. Channel Low, Mid and High for each type band with rated data rate were chosen for full testing. The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for these modes. Just the worst case position (H mode) shown in report.	

5.4 Description of Support Units

Test Equipment	Manufacturer	Model No.	Serial No.
Simulated Station	Anritsu	MT8820C	6201026545

5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
Radiated Emission (9kHz ~ 30MHz)	±3.12 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	±4.32 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	±5.16 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±3.20 dB (k=2)

5.6 Additions to, deviations, or exclusions from the method

No

5.7 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC - Designation No.: CN1211**

JianYan Testing Group Shenzhen Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

● **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber of JianYan Testing Group Shenzhen Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

● **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

5.8 Laboratory Location

JianYan Testing Group Shenzhen Co., Ltd.

Address: No.101, Building 8, Innovation Wisdom Port, No.155 Hongtian Road, Huangpu Community, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, People's Republic of China.

Tel: +86-755-23118282, Fax: +86-755-23116366

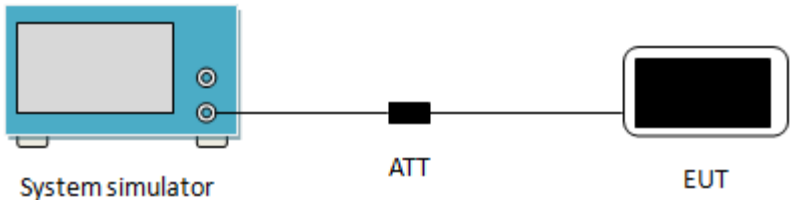
Email: info-JYTee@lets.com, Website: <http://www.ccis-cb.com>

5.9 Test Instruments list

Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	ETS	9m*6m*6m	966	01-19-2021	01-18-2024
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-03-2021	03-02-2022
Biconical Antenna	SCHWARZBECK	VUBA9117	359	06-18-2020	06-17-2021
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-03-2021	03-02-2022
Horn Antenna	SCHWARZBECK	BBHA9120D	1805	06-18-2020	06-17-2021
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170582	11-18-2020	11-17-2021
EMI Test Software	AUDIX	E3	Version: 6.110919b		
Pre-amplifier	HP	8447D	2944A09358	03-03-2021	03-02-2022
Pre-amplifier	CD	PAP-1G18	11804	03-03-2021	03-02-2022
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-03-2021	03-02-2022
Spectrum analyzer	Rohde & Schwarz	FSP40	100363	11-18-2020	11-17-2021
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-03-2021	03-02-2022
Spectrum Analyzer	Agilent	N9020A	MY50510123	11-18-2020	11-17-2021
Signal Generator	Rohde & Schwarz	SMX	835454/016	03-03-2021	03-02-2022
Signal Generator	R&S	SMR20	1008100050	03-03-2021	03-02-2022
RF Switch Unit	MWRFTTEST	MW200	N/A	N/A	N/A
Test Software	MWRFTTEST	MTS8200	Version: 2.0.0.0		
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-03-2021	03-02-2022
Cable	MICRO-COAX	MFR64639	K10742-5	03-03-2021	03-02-2022
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-03-2021	03-02-2022
DC Power Supply	XinNuoEr	WYK-10020K	1409050110020	09-25-2020	09-24-2021
Temperature Humidity Chamber	HengPu	HPGDS-500	20140828008	11-01-2020	10-31-2021
Simulated Station	Rohde & Schwarz	CMW500	140493	07-22-2020	07-21-2021

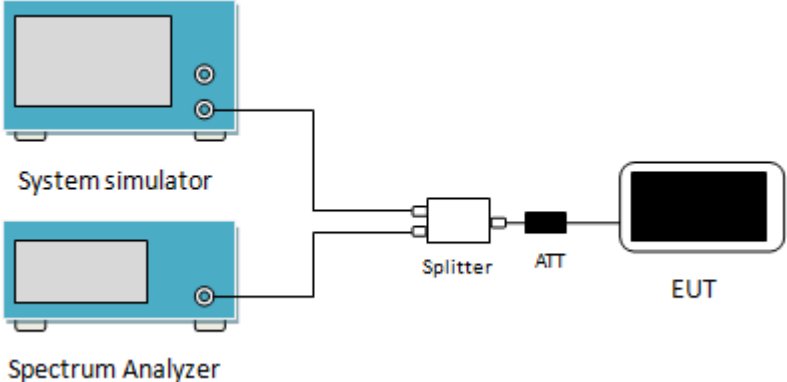
6. Test results

6.1 Conducted Output Power, ERP and EIRP

Test Requirement:	FCC part 22.913(a)(5), FCC part 24.232(c), FCC part 27.50(d)(4)
Limit:	GSM 850: 7W, PCS 1900: 2W WCDMA Band V: 7W, WCDMA Band II: 2W, WCDMA Band IV: 1W
Test setup:	 The diagram illustrates the test setup. On the left is a blue 'System simulator' box with two ports. A line connects one of these ports to a black 'ATT' (attenuator) block. Another line connects the other side of the 'ATT' block to a black 'EUT' (Equipment Under Test) box on the right.
Test Procedure:	The transmitter output was connected to a calibrated attenuator, the other end of which was connected to the simulated station. Transmitter output power was read off in dBm.
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

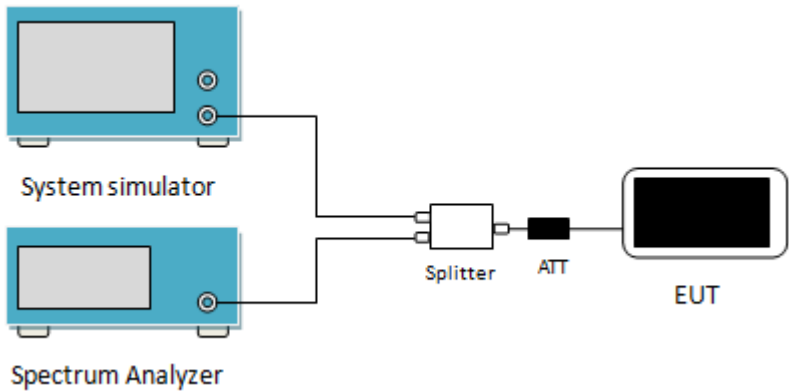
Measurement Data: Refer to Appendix A – GSM, Appendix A - WCDMA

6.2 Peak-to-Average Power Ratio

Test Requirement:	FCC part 24.232(d), FCC part 27.50(d)(5)
Limit:	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.
Test setup:	 The diagram illustrates the test setup. On the left, there are two blue rectangular units: the top one is labeled 'System simulator' and the bottom one is labeled 'Spectrum Analyzer'. Both have two circular ports on their right side. These ports are connected to a central 'Splitter' unit, which is a white rectangle with two input ports on the left and one output port on the right. The output of the Splitter goes through an 'ATT' (Attenuator), represented by a small black rectangle, and finally connects to the 'EUT' (Equipment Under Test), which is a black rectangle with a white screen on the left.
Test Procedure:	1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 Set the CCDF option in spectrum analyzer, RBW $\geq$ OBW, 3 Set the EUT working in highest power level, measured and recorded the 0.1% as PAPR level. 4 Repeat step 1~3 at other frequency and modulations.
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data: Refer to Appendix B – GSM, Appendix B - WCDMA

6.3 Occupy Bandwidth

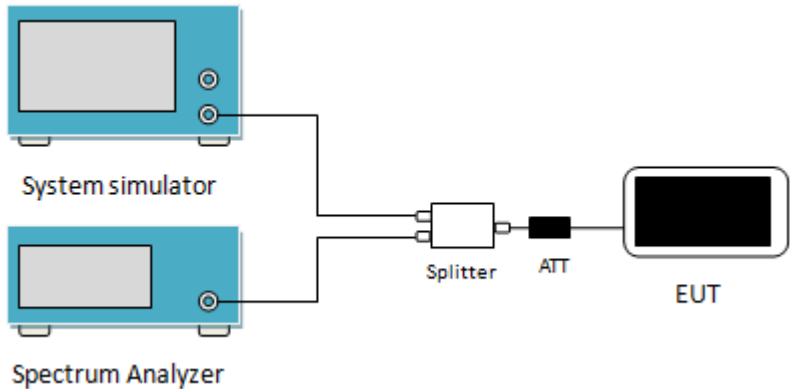
Test Requirement:	FCC part 22.917(b), FCC part 24.238(b), FCC Part 27.53(h)
Test setup:	 The diagram shows a test setup for measuring the occupied bandwidth of an Equipment Under Test (EUT). A System simulator and a Spectrum Analyzer are connected to a Splitter. The Splitter is connected to an ATT (Attenuator) and then to the EUT.
Test Procedure:	1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer 2. RBW was set to about 1% of emission BW, VBW= 3 times RBW. 3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data: Refer to Appendix C – GSM, Appendix C - WCDMA

6.4 Modulation Characteristic

According to FCC § 2.1047(d), Part 22H & 24E & 27L there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

6.5 Out of band emission at antenna terminals

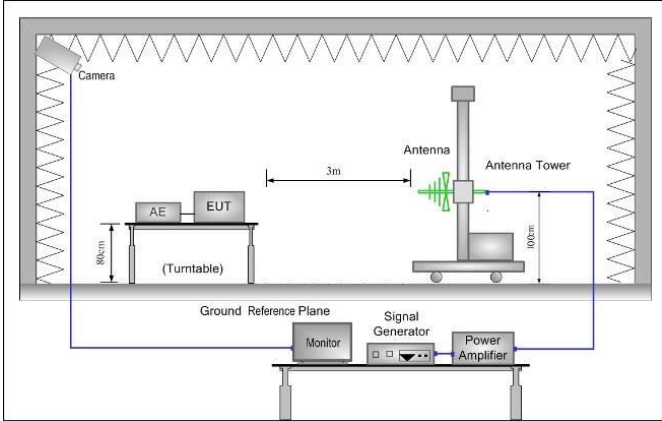
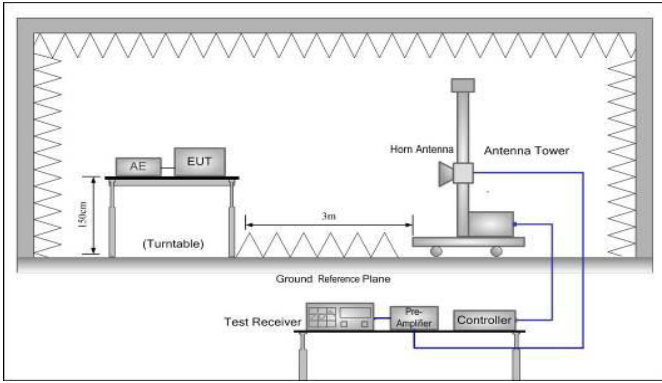
Test Requirement:	FCC part 22.917(a), FCC part 24.238(a), FCC Part 27.53 (h)
Limit:	-13dBm
Test setup:	 The diagram illustrates the test setup for out-of-band emission measurement. A System simulator is connected to a Splitter. The other output of the Splitter is connected to an ATT (Attenuator). The EUT (Equipment Under Test) is connected to the ATT. The Spectrum Analyzer is connected to the other output of the Splitter.
Test Procedure:	1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 For the out of band: For GSM850&WCDMA850 set the RBW=100 kHz, VBW=300 kHz and for PCS1900 & WCDMA1900 set the RBW=1MHz, VBW=3MHz when below 1 GHz, RBW =1 MHz, VBW=3 MHz when above 1 GHz, Start=30MHz, Stop= 10th harmonic. 3 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

Band edge emission: Refer to Appendix D – GSM, Appendix D - WCDMA

Spurious emission: Refer to Appendix E – GSM, Appendix E - WCDMA

6.6 Field strength of spurious radiation measurement

Test Requirement:	FCC part 22.917(a), FCC part 24.238(a), FCC part 27.53(h)
Limit:	-13dBm
Test setup:	Below 1GHz  Above 1GHz 
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8m(below 1GHz)/1.5m(above 1GHz) above the ground at a 3 meter camber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. 2. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations. 3. The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method. 4. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency. $ERP / EIRP = S.G. \text{ output (dBm)} + \text{Antenna Gain(dB/dBi)} - \text{Cable Loss (dB)}$
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details.
Test results:	Passed

Measurement Data (worst case):

GSM850						
Lowest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurious Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1648.40	-48.16	-10.38	-58.54	-13.00	45.54	Vertical
2472.60	-40.81	-9.38	-50.19	-13.00	37.19	Vertical
3296.80	-47.57	-7.84	-55.41	-13.00	42.41	Vertical
1648.40	-40.06	-10.38	-50.44	-13.00	37.44	Horizontal
2472.60	-44.88	-9.38	-54.26	-13.00	41.26	Horizontal
3296.80	-45.29	-7.84	-53.13	-13.00	40.13	Horizontal
Middle channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurious Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1673.20	-48.06	-10.32	-58.38	-13.00	45.38	Vertical
2509.80	-40.80	-9.22	-50.02	-13.00	37.02	Vertical
3346.40	-47.78	-7.49	-55.27	-13.00	42.27	Vertical
1673.20	-39.86	-10.32	-50.18	-13.00	37.18	Horizontal
2509.80	-44.87	-9.22	-54.09	-13.00	41.09	Horizontal
3346.40	-45.44	-7.49	-52.93	-13.00	39.93	Horizontal
Highest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurious Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1697.60	-47.72	-10.24	-57.96	-13.00	44.96	Vertical
2546.40	-41.17	-9.15	-50.32	-13.00	37.32	Vertical
3395.20	-47.24	-7.41	-54.65	-13.00	41.65	Vertical
1697.60	-39.73	-10.24	-49.97	-13.00	36.97	Horizontal
2546.40	-44.80	-9.15	-53.95	-13.00	40.95	Horizontal
3395.20	-45.47	-7.41	-52.88	-13.00	39.88	Horizontal
Remark: 1. The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.						

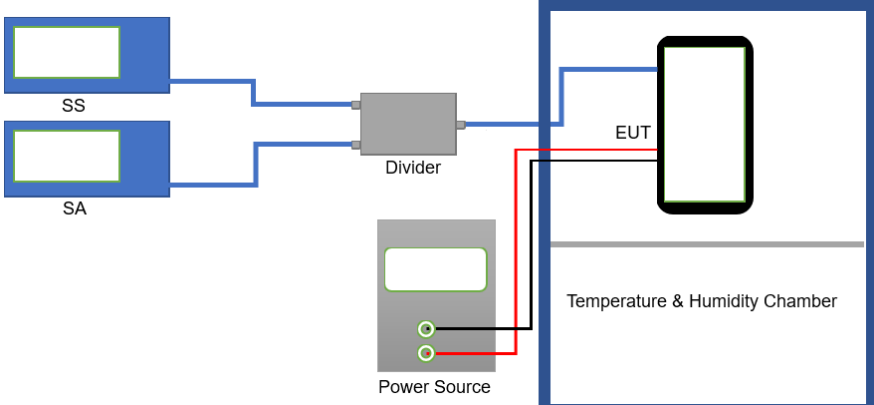
PCS1900						
Lowest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurious Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
3700.40	-47.35	-6.03	-53.38	-13.00	40.38	Vertical
5550.60	-45.33	-0.81	-46.14	-13.00	33.14	Vertical
3700.40	-47.27	-6.03	-53.30	-13.00	40.30	Horizontal
5550.60	-43.85	-0.81	-44.66	-13.00	31.66	Horizontal
Middle channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurious Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
3760.00	-47.05	-6.06	-53.11	-13.00	40.11	Vertical
5640.00	-45.09	-0.52	-45.61	-13.00	32.61	Vertical
3760.00	-47.24	-6.06	-53.30	-13.00	40.30	Horizontal
5640.00	-43.43	-0.52	-43.95	-13.00	30.95	Horizontal
Highest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurious Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
3819.60	-47.85	-5.37	-53.22	-13.00	40.22	Vertical
5729.40	-44.99	-0.09	-45.08	-13.00	32.08	Vertical
3819.60	-47.65	-5.37	-53.02	-13.00	40.02	Horizontal
5729.40	-44.04	-0.09	-44.13	-13.00	31.13	Horizontal
Remark: 1. The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.						

WCDMA BAND V 12.2k RMC						
Lowest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurious Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1652.80	-47.92	-10.81	-58.73	-13.00	45.73	Vertical
2479.20	-47.50	-9.32	-56.82	-13.00	43.82	Vertical
3305.60	-47.58	-7.95	-55.53	-13.00	42.53	Vertical
1652.80	-47.98	-10.81	-58.79	-13.00	45.79	Horizontal
2479.20	-48.09	-9.32	-57.41	-13.00	44.41	Horizontal
3305.60	-46.43	-7.95	-54.38	-13.00	41.38	Horizontal
Middle channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurious Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1673.20	-48.04	-10.28	-58.32	-13.00	45.32	Vertical
2509.80	-47.69	-9.24	-56.93	-13.00	43.93	Vertical
3346.40	-47.99	-7.80	-55.79	-13.00	42.79	Vertical
1673.20	-48.17	-10.28	-58.45	-13.00	45.45	Horizontal
2509.80	-48.47	-9.24	-57.71	-13.00	44.71	Horizontal
3346.40	-45.99	-7.80	-53.79	-13.00	40.79	Horizontal
Highest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurious Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1697.60	-48.17	-10.55	-58.72	-13.00	45.72	Vertical
2546.40	-47.56	-9.08	-56.64	-13.00	43.64	Vertical
3395.20	-47.13	-7.36	-54.49	-13.00	41.49	Vertical
1697.60	-47.53	-10.55	-58.08	-13.00	45.08	Horizontal
2546.40	-47.89	-9.08	-56.97	-13.00	43.97	Horizontal
3395.20	-46.49	-7.36	-53.85	-13.00	40.85	Horizontal
Remark:						
1. The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.						

WCDMA Band II 12.2k RMC						
Lowest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurious Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
3704.80	-47.70	-6.13	-53.83	-13.00	40.83	Vertical
5557.20	-49.61	-0.21	-49.82	-13.00	36.82	Vertical
3704.80	-48.23	-6.13	-54.36	-13.00	41.36	Horizontal
5557.20	-48.78	-0.21	-48.99	-13.00	35.99	Horizontal
Middle channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurious Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
3760.00	-48.18	-5.81	-53.99	-13.00	40.99	Vertical
5640.00	-49.66	0.06	-49.60	-13.00	36.60	Vertical
3760.00	-48.03	-5.81	-53.84	-13.00	40.84	Horizontal
5640.00	-49.28	0.06	-49.22	-13.00	36.22	Horizontal
Highest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurious Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
3815.20	-47.85	-5.48	-53.33	-13.00	40.33	Vertical
5722.80	-49.42	0.32	-49.10	-13.00	36.10	Vertical
3815.20	-48.31	-5.48	-53.79	-13.00	40.79	Horizontal
5722.80	-48.76	0.32	-48.44	-13.00	35.44	Horizontal
Remark: 1. The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.						

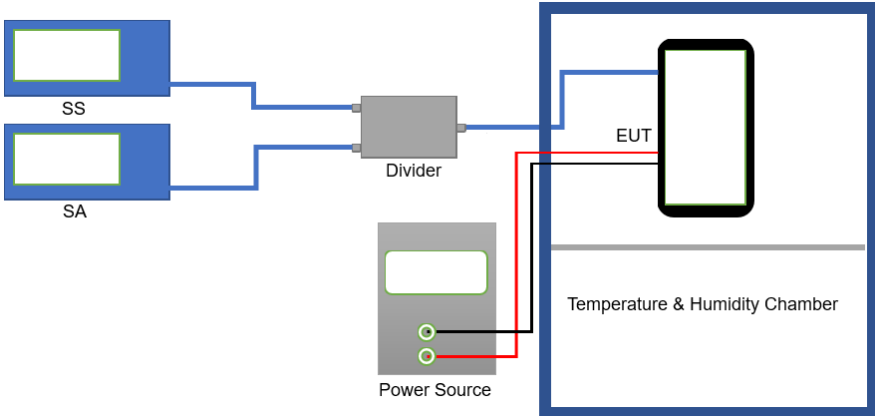
WCDMA Band IV 12.2k RMC						
Lowest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurious Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
3424.40	-48.54	-2.10	-50.64	-13.00	37.64	Vertical
5136.60	-49.60	3.74	-45.86	-13.00	32.86	Vertical
3424.40	-47.60	-2.10	-49.70	-13.00	36.70	Horizontal
5136.60	-48.88	3.74	-45.14	-13.00	32.14	Horizontal
Middle channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurious Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
3464.80	-48.68	-2.05	-50.73	-13.00	37.73	Vertical
5197.20	-49.80	3.82	-45.98	-13.00	32.98	Vertical
3464.80	-48.01	-2.05	-50.06	-13.00	37.06	Horizontal
5197.20	-48.90	3.82	-45.08	-13.00	32.08	Horizontal
Highest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurious Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
3505.20	-48.49	-2.01	-50.50	-13.00	37.50	Vertical
5257.80	-49.77	3.85	-45.92	-13.00	32.92	Vertical
3505.20	-47.71	-2.01	-49.72	-13.00	36.72	Horizontal
5257.80	-49.40	3.85	-45.55	-13.00	32.55	Horizontal
Remark:						
1. The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.						

6.7 Frequency stability V.S. Temperature measurement

Test Requirement:	FCC Part 22.355, FCC Part 24.235, FCC Part 27.54 FCC Part 2.1055(a)(1)(b)
Limit:	±2.5 ppm for GSM 850 and WCDMA 850 Within authorized band for PCS 1900 and WCDMA 1900 and WCDMA 1700
Test setup:	
Test procedure:	1. The equipment under test was connected to an external DC power supply and input rated voltage. 2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. 3. The EUT was placed inside the temperature chamber. 4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. 5. Turn EUT off and set the chamber temperature to –30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. 6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data: Refer to Appendix F – GSM, Appendix F - WCDMA

6.8 Frequency stability V.S. Voltage measurement

Test Requirement:	FCC Part 22.355, FCC Part 24.235, FCC Part 27.54 FCC Part 2.1055(d)(2)
Limit:	±2.5 ppm for GSM 850 and WCDMA 850 Within authorized band for PCS 1900 and WCDMA 1900 and WCDMA 1700
Test setup:	 The diagram illustrates the test setup. A Signal Source (SS) and a Spectrum Analyzer (SA) are connected to a Divider. The output of the Divider is connected to the EUT (Equipment Under Test) inside a Temperature & Humidity Chamber. A Power Source is also connected to the EUT.
Test procedure:	1. Set chamber temperature to 25°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage. 2. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. 3. Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data: Refer to Appendix F – GSM, Appendix F - WCDMA