FCC Part22H&24E Test Report

Product Name ：GSM Mobile Phone

Model No. ：HUAWEI G3510

FCC ID ：QISG3610

Applicant ：HUAWEI TECHNOLOGIES CO., LTD

Address ：Huawei industrial Base, Bantian, Longgang，Shenzhen 518129, P.R. China

Date of Receipt ： Aug. 24, 2010

Test Date ： Aug. 24, 2010 ~ Aug. 30, 2010

Issued Date ： Aug. 31, 2010

Report No. ：108S041R-RF-CE-P07V01

Report Version ：V 1.0

This appendix reoprt was basde on Quietek report No: 107S046R.

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF, NVLAP, NIST or any agency of the Government.

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Test Report Certification

Issued Date : Aug. 31, 2010
Report No. : 108S041R-HP-US-P07V01

QuieTek

Product Name	:	GSM Mobile Phone
Applicant	:	HUAWEI TECHNOLOGIES CO., LTD
Address	:	Huawei industrial Base, Bantian, Longgang，Shenzhen 518129, P.R. China
Manufacturer	:	HUAWEI TECHNOLOGIES CO., LTD
Address	:	Huawei industrial Base, Bantian, Longgang，Shenzhen 518129, P.R. China
Model No.	:	HUAWEI G3510
FCC ID	:	QISG3610
EUT Voltage	:	DC: 3.6~4.2V
Trade Name	:	HUAWEI
Applicable Standard	:	FCC Part22 Subpart H, FCC Part24 Subpart E TIA-EIA 603C: 2004
Test Result	:	Complied
Performed Location	:	SuZhou EMC laboratory No.99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., SuZhou, China TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098 FCC Registration Number: 800392

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(Engineering ADM: Alice Ni)

Reviewed By : Marlin Chen

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Approved By : Dream Cao

(Engineering Manager: Dream Cao)

Laboratory Information

We, **QuieTek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

Taiwan R.O.C.	**:**	**BSMI, NCC, TAF**
Germany	**:**	**TUV Rheinland**
Norway	**:**	**Nemko, DNV**
USA	**:**	**FCC, NVLAP**
Japan	**:**	**VCCI**

The related certificate for our laboratories about the test site and management system can be downloaded from QuieTek Corporation's Web Site : http://www.quietek.com/tw/emc/accreditations/accreditations.htm
The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site : http://www.quietek.com/
If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

HsinChu Testing Laboratory :

No.75-2, 3rd Lin, Wangye Keng, Yonghxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C.
TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : service@quietek.com

NVLAP Lab Code : 200347-0

Testing Laboratory
1313

LinKou Testing Laboratory :

No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen, Lin-Kou Shiang, Taipei, Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : service@quietek.com

NVLAP Lab Code: 200533-0

Testing Laboratory
0914

Suzhou (China) Testing Laboratory :

No. 99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., Suzhou,China.
TEL : +86-512-6251-5088 / FAX : +86-512-6251-5098 E-Mail : service@quietek.com

NVLAP Lab Code : 200743-0

Testing Laboratory
1596

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1. General Information

1.1. EUT Description

Product Name	GSM Mobile Phone
Trade Name	HUAWEI
Model No.	HUAWEI G3510
Working Voltage	DC: 3.6~4.2V
Support Band	GSM850/PCS1900
Tx Frequency Range	GSM 850: 824MHz to 849MHz PCS 1900: 1850MHz to 1910MHz
Rx Frequency Range	GSM 850: 869MHz to 894MHz PCS 1900: 1930MHz to 1990MHz
Type of modulation	GMSK for GSM & GPRS
Antenna Type	Internal
Antenna Gain	0.3dBi for 820~915MHz 0.8dBi for 1710~1910MHz
AC Adapter	Manufacturer: HUAWEI M/N: ZT-666-E0500 Input: AC 100-300V 50/60Hz 0.15A Output: 5Vdc, 500mA

Note: The difference of G3510 and G3610 are as show below:

Different devices	G3510	G3610
Screen	Size: 1.44 TFT1 Resolutions: 128 * 128	Size: 1.77 TFT Resolutions: 128 * 160
Flash Chip capacity	64 + 32	128 + 32
Keyboard	New, Pure rubber	P + R
A shell	New, Avoid spraying	A spray
LENS	And screen matching, different LENS size of the two project	
Software	Supporting a maximum storage of 200 messages in phone	Supporting a maximum storage of 450 messages in phone
	Ring tone: 10 default	Ring tone: 9 default
	Settings show different	

1.2. Mode of Operation

QuieTek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: GSM850 Link
Mode 2: GSM1900 Link

Note:

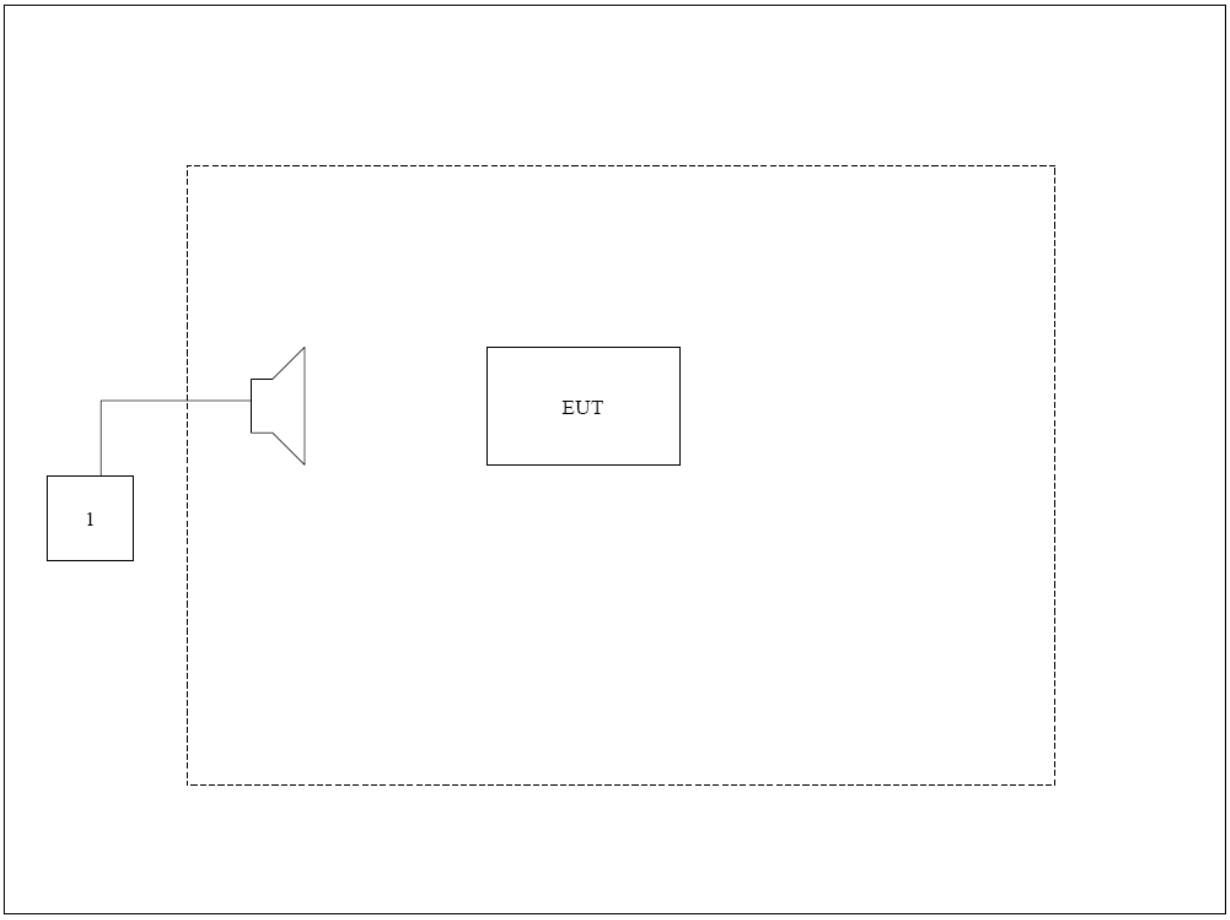
1. Regards to the frequency band operation: the lowest、middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. Radiated power output working at GSM link was higher than that working at GPRS link, so all of test items were done working at GSM mode. Refer to peak power output for more details.

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 No.	Serial No.	Power Cord
1	CMU200	R&S	CMU200	N/A	N/A

1.3. Configuration of Tested System

Connection Diagram


Signal Cable Type	Signal cable Description

1.4. 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 CMU200, then select channel to test.

2. Technical Test

2.1. Summary of Test Result

☒ No deviations from the test standards

☐ Deviations from the test standards as below description:

For GSM850 (FCC Part 22H & Part 2)

Emission			
Performed Item	Normative References	Test Performed	Deviation
Peak Output Power	FCC Part 22.913(a)(2) and Part 2.1046	Yes	No
Spurious Emission	FCC Part 22.917(b) and Part 2.1051, 2.1053	Yes	No

For PCS1900 (FCC Part 24E & Part 2)

Emission			
Performed Item	Normative References	Test Performed	Deviation
Peak Output Power	FCC Part 24.232(b) and Part 2.1046	Yes	No
Spurious Emission	FCC Part 24.238(b) and Part 2.1051, 2.1053	Yes	No

2.2. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	23
Humidity (%RH)	25-75	52
Barometric pressure (mbar)	860-1060	950-1000

3. Peak Output Power

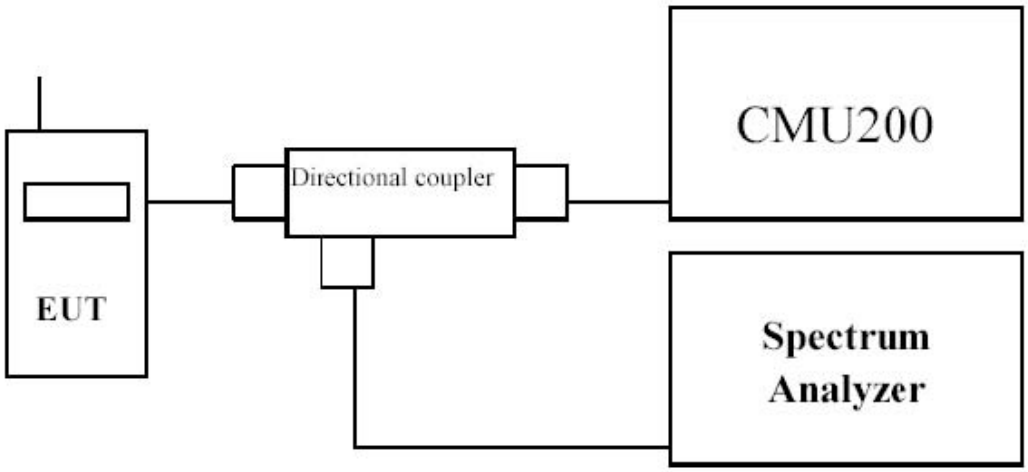
3.1. Test Equipment

Peak Output Power / AC-5

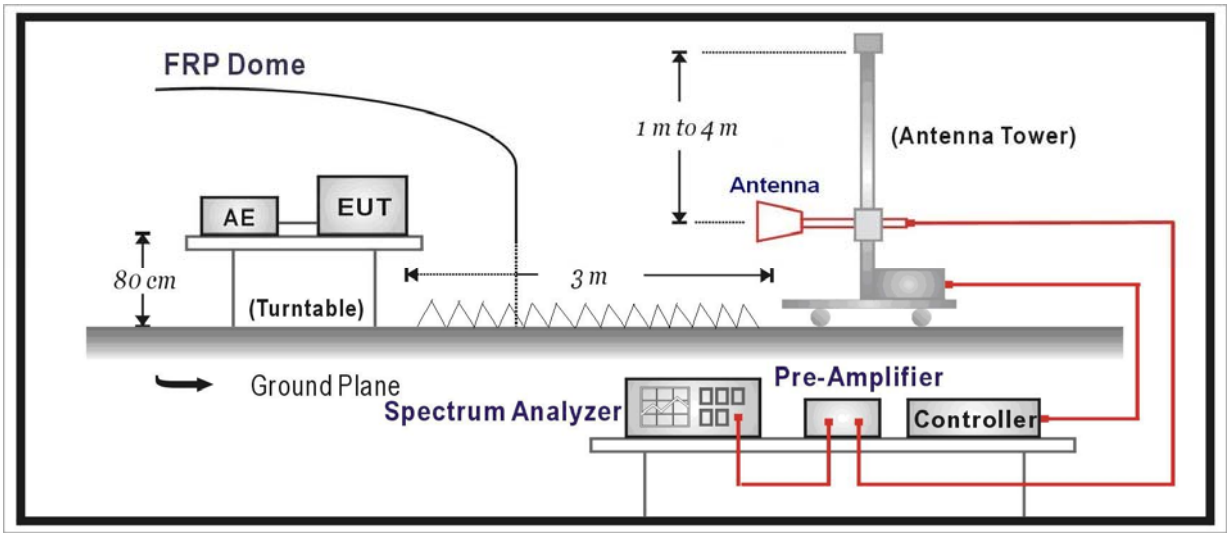
Instrument	Manufacturer	Type No.	Serial No	Cal. Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2010.04.10
Radio Communication Tester	R&S	CMU 200	117088	2010.07.12
Dual Directional Coupler	Agilent	778D	20160	2010.04.20
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2010.04.20
PSG Analog Signal Generator	Agilent	E8257D	MY44321116	2010.04.23
Preamplifier	QuieTek	AP-025C	CHM-0503006	2010.05.05
Preamplifier	Miteq	NSP1800-25	1364185	2010.05.05
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2009.11.12
Half Wave Tuned Dipole Antenna	COM-POWER	AD-100	40137	2009.11.24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	737	2009.11.24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2010.06.11
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2010.01.14

3.2. Test Setup

Conducted Power Measurement:



Radiated Power Measurement:



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(b):

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 CMU200 by a Directional Couple.
c) EUT Communicate with CMU200, then selects a channel for testing.
d) Add a correction factor to the display of spectrum, and then test.

Radiated Power Measurement:

e) The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
f) The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
g) The output of the test antenna shall be connected to the measuring receiver.
h) The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
i) 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.
j) The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
k) 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.
l) The maximum signal level detected by the measuring receiver shall be noted.
m) The transmitter shall be replaced by a substitution antenna.
n) 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.
o) The substitution antenna shall be connected to a calibrated signal generator.
p) If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
q) The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
r) 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.
s) The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
t) 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.
u) Test site anechoic chamber refer to ANSI C63.4: 2009.

3.5. Uncertainty

The measurement uncertainty is defined as for Conducted Power Measurement ± 1.2 dB, for Radiated Power Measurement ± 3.2 dB

3.6. Test Result

GSM 850

Channel No.	Frequency (MHz)	Modulation	Conducted Output Power (dBm)	ERP (dBm)	Limit (dBm)
128	824.2	GMSK	32.22	28.80	38.50
189	836.4	GMSK	**32.28**	27.40	38.50
251	848.8	GMSK	32.24	**29.10**	38.50

PCS1900

Channel No.	Frequency (MHz)	Modulation	Conducted Output Power (dBm)	EIRP (dBm)	Limit (dBm)
512	1850.2	GMSK	**29.25**	26.90	33.00
661	1880.0	GMSK	29.12	**27.89**	33.00
810	1909.8	GMSK	29.22	26.09	33.00

GPRS 850

Channel No.	Frequency (MHz)	Modulation	Conducted Output Power (dBm)	ERP (dBm)	Limit (dBm)
128	824.2	GPRS	32.20	28.64	38.50
189	836.4	GPRS	**32.26**	27.36	38.50
251	848.8	GPRS	32.23	**29.06**	38.50

GPRS 1900

Channel No.	Frequency (MHz)	Modulation	Conducted Output Power (dBm)	EIRP (dBm)	Limit (dBm)
512	1850.2	GPRS	**29.23**	26.17	33.00
661	1880.0	GPRS	29.11	**27.06**	33.00
810	1909.8	GPRS	29.20	25.72	33.00

Note: All conducted measurements are based on a peak detector.

Radiated Measurement

GSM850

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 128 (824.20MHz)								
824.20	4.40	H	18.28	1.76	-0.02	16.50	38.50	-22.00
824.20	16.60	V	30.58	1.76	-0.02	28.80	38.50	-9.70
Middle Channel 189 (836.40MHz)								
836.40	1.90	H	15.75	1.75	0.10	14.10	38.50	-24.40
836.40	16.00	V	29.05	1.75	0.10	27.40	38.50	-11.10
High Channel 251 (848.80MHz)								
848.80	2.80	H	16.65	1.78	0.13	15.00	38.50	-23.50
848.80	17.40	V	30.75	1.78	0.13	29.10	38.50	-9.40

PCS1900

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 512 (1850.20MHz)								
1850.20	32.20	H	16.68	2.68	10.40	24.40	33.00	-8.60
1850.20	34.77	V	19.18	2.68	10.40	26.9	33.00	-6.10
Middle Channel 661 (1880.00MHz)								
1880.00	31.46	H	15.97	2.68	10.43	23.72	33.00	-9.28
1880.00	35.71	V	20.14	2.68	10.43	27.89	33.00	-5.11
High Channel 810 (1909.80MHz)								
1909.80	31.39	H	15.92	2.70	10.44	23.66	33.00	-9.43
1909.80	33.89	V	18.35	2.70	10.44	26.09	33.00	-6.91

GPRS850

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 128 (824.20MHz)								
824.20	4.50	H	16.9	1.76	-0.02	15.12	38.50	-23.38
824.20	16.55	V	29.52	1.76	-0.02	27.74	38.50	-10.76
Middle Channel 189 (836.40MHz)								
836.40	1.96	H	15.77	1.75	0.10	14.12	38.50	-24.38
836.40	15.95	V	29.01	1.75	0.10	27.36	38.50	-11.14
High Channel 251 (848.80MHz)								
848.80	2.39	H	16.21	1.78	0.13	14.56	38.50	-23.94
848.80	17.43	V	30.71	1.78	0.13	29.06	38.50	-9.44

GPRS1900

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 512 (1850.20MHz)								
1850.20	31.88	H	16.38	2.68	10.40	24.10	33.00	-8.90
1850.20	34.04	V	18.45	2.68	10.40	26.17	33.00	-6.83
Middle Channel 661 (1880.00MHz)								
1880.00	31.38	H	15.89	2.68	10.43	23.64	33.00	-9.36
1880.00	34.88	V	19.31	2.68	10.43	27.06	33.00	-5.94
High Channel 810 (1909.80MHz)								
1909.80	30.63	H	15.16	2.70	10.44	22.90	33.00	-10.10
1909.80	33.52	V	17.98	2.70	10.44	25.72	33.00	-7.28

4. Spurious Emission

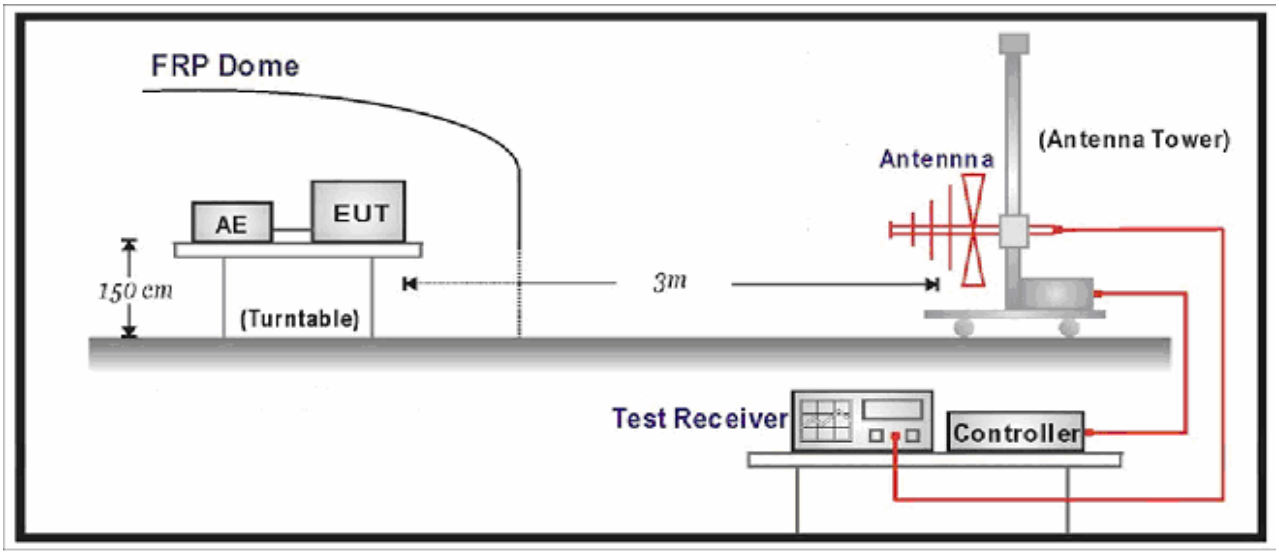
4.1. Test Equipment

Spurious Emission / AC-5

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2010.04.10
Radio Communication Tester	R&S	CMU 200	117088	2010.07.12
Dual Directional Coupler	Agilent	778D	20160	2010.04.20
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2010.04.20
PSG Analog Signal Generator	Agilent	E8257D	MY44321116	2010.04.23
Preamplifier	QuieTek	AP-025C	CHM-0503006	2010.05.05
Preamplifier	Miteq	NSP1800-25	1364185	2010.05.05
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2009.11.12
Half Wave Tuned Dipole Antenna	COM-POWER	AD-100	40137	2009.11.24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	737	2009.11.24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2010.06.11
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2010.01.14

4.2. Test Setup

Radiated Spurious Measurement:



4.3. Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log(P) dB.

4.4. Test Procedure

Conducted Spurious Measurement:

a) Place the EUT on a bench and set it in transmitting mode.
b) Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMU200 by a Directional Couple.
c) EUT Communicate with CMU200, then select a channel for testing.
d) Add a correction factor to the display of spectrum, and then test.
e) The resolution bandwidth of the spectrum analyzer was set at 1 MHz, sufficient scans were taken to show the out of band Emission if any up to 10th harmonic.

Radiated Spurious Measurement:

a) The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.

b) The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
c) The output of the test antenna shall be connected to the measuring receiver.
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.
v) The maximum signal level detected by the measuring receiver shall be noted.
h) The transmitter shall be replaced by a substitution antenna.
i) 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.
j) The substitution antenna shall be connected to a calibrated signal generator.
k) If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
l) The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
m) 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.
n) The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
o) 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.
p) The frequency range was checked up to 10^{th} harmonic.
q) Test site anechoic chamber refer to ANSI C63.4: 2009

4.5. Uncertainty

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

4.6. Test Result

GSM 850

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 128 (824.20MHz)								
1648.40	-36.71	V	-55.54	2.50	9.75	-48.29	-13.00	-35.29
2472.60	-43.67	V	-58.60	3.12	10.48	-51.24	-13.00	-38.24
1648.40	-40.11	H	-58.96	2.50	9.75	-51.71	-13.00	-38.71
2472.60	-43.82	H	-58.77	3.12	10.48	-51.41	-13.00	-38.41
Middle Channel 189 (836.40MHz)								
1672.80	-40.37	V	-59.14	2.52	9.95	-51.71	-13.00	-38.71
2509.20	-44.49	V	-59.60	3.18	10.62	-52.16	-13.00	-39.16
1672.80	-40.34	H	-59.07	2.52	9.95	-51.64	-13.00	-38.64
2509.20	-44.87	H	-59.89	3.18	10.62	-52.45	-13.00	-39.45
High Channel 251 (848.80MHz)								
1697.60	-35.91	V	-54.54	2.54	10.06	-47.02	-13.00	-34.02
2546.40	-48.01	V	-63.23	3.14	10.68	-55.69	-13.00	-42.69
1697.60	-38.37	H	-56.90	2.54	10.06	-49.38	-13.00	-36.38
2546.40	-47.74	H	-62.82	3.14	10.68	-55.28	-13.00	-42.28

PCS 1900

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 512 (1850.20MHz)								
3700.40	-48.52	V	-60.27	3.84	12.69	-51.42	-13.00	-38.42
5550.60	-43.59	V	-50.29	4.82	13.15	-41.96	-13.00	-28.96
3700.40	-40.34	H	-51.67	3.84	12.69	-42.82	-13.00	-29.82
5550.60	-40.65	H	-47.41	4.82	13.15	-39.08	-13.00	-26.08
Middle Channel 661 (1880.00MHz)								
3760.00	-45.11	V	-56.18	3.73	12.72	-47.19	-13.00	-34.19
5640.00	-42.35	V	-48.77	4.93	13.14	-40.56	-13.00	-27.56
3760.00	-38.43	H	-49.56	3.73	12.72	-40.57	-13.00	-27.57
5640.00	-41.86	H	-48.42	4.93	13.14	-40.21	-13.00	-27.21
High Channel 810 (1909.80MHz)								
3819.60	-47.75	V	-58.07	4.02	12.73	-49.36	-13.00	-36.36
5729.40	-40.40	V	-46.99	4.87	13.11	-38.75	-13.00	-25.75
3819.60	-46.38	H	-57.08	4.02	12.73	-48.37	-13.00	-35.37
5729.40	-40.09	H	-46.66	4.87	13.11	-38.42	-13.00	-25.42