



FCC Part22H&24E Test Report

Product Name : GSM Mobile Phone
Model No. : HUAWEI G7500
FCC ID : QISG7500

Applicant : HUAWEI TECHNOLOGIES CO.,LTD
Address : Administration Building, Headquarters of Huawei
Technologies Co., Ltd., Bantian, Longgang
District, Shenzhen, 518129, P.R.C

Date of Receipt : 26/02/2013
Test Date : 26/02/2013~18/03/2013
Issued Date : 19/03/2013
Report No. : 132S031R-HP-US-P07V01
Report Version : V 1.0

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.

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Test Report Certification

Issued Date : 19/03/2013

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Product Name : GSM Mobile Phone

Applicant : HUAWEI TECHNOLOGIES CO.,LTD

Address : Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

Manufacturer : HUAWEI TECHNOLOGIES CO.,LTD

Address : Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

Model No. : HUAWEI G7500

FCC ID : QISG7500

EUT Voltage : DC 3.7V

Brand Name : HUAWEI

Applicable Standard : FCC CFR Title 47 Part 2, TIA/EIA 603-C
FCC Part22 Subpart H, FCC Part24 Subpart E

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

Documented By : Alice Mi

Reviewed By : Sunny Sun

Approved By : Robin Wu

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
China	:	CNAS

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/ctg/cts/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

LinKou Testing Laboratory :

No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : service@quietek.com

Suzhou 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

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1. General Information

1.1. EUT Description

Product Name	GSM Mobile Phone
Model No.	HUAWEI G7500
Hardware Version	12750_1_21
Software Version	G7500V100R001C00B201SP08_ENG
Device Category	Portable
RF Exposure Environment	Uncontrolled
Antenna Type	Internal
2G	
Support Band	GSM850/PCS1900
GPRS Type	Class B
GPRS Class	Class 12
Uplink	GSM 850: 824~849MHz PCS 1900: 1850~1910MHz
Downlink	GSM 850: 869~894MHz PCS 1900: 1930~1990MHz
Release Version	R99
Type of modulation	GMSK for GSM/GPRS 8PSK for EDGE(only support downlink)
Antenna Gain	2.2dBi for GSM850 0dBi for PCS1900
Bluetooth	
Bluetooth Frequency	2402~2480MHz
Bluetooth Version	V2.1 + EDR
Type of modulation	FHSS
Data Rate	1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK)
Antenna Gain	-3.9dBi
Wi-Fi	
Wi-Fi Frequency	802.11b/g/n(20MHz): 2412 ~ 2462 MHz
Type of modulation	802.11b: DSSS; 802.11g/n: OFDM
Data Rate	802.11b: 1/2/5.5/11 Mbps
	802.11g: 6/9/12/18/24/36/48/54 Mbps
	802.11n: up to 150 Mbps
Antenna Gain	-4.1dBi

Components	
Headset Model Number #1	HUAWEI/ 125G#+3261# 3.5MM-122
Headset Model Number #2	HUAWEI/ MEMD1532B480000
Battery #1	Brand Name: HUAWEI M/N: HB5N1 Rated Voltage and Capacitance: 3.7V/1350mAh S/N: GAGCA16Z98002175
Battery #2	Brand Name: HUAWEI M/N: HB5N1H Rated Voltage and Capacitance: 3.7V/1500mAh S/N: MLCD218997508029

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: GSM 850 Link
Mode 2: PCS 1900 Link

Note:

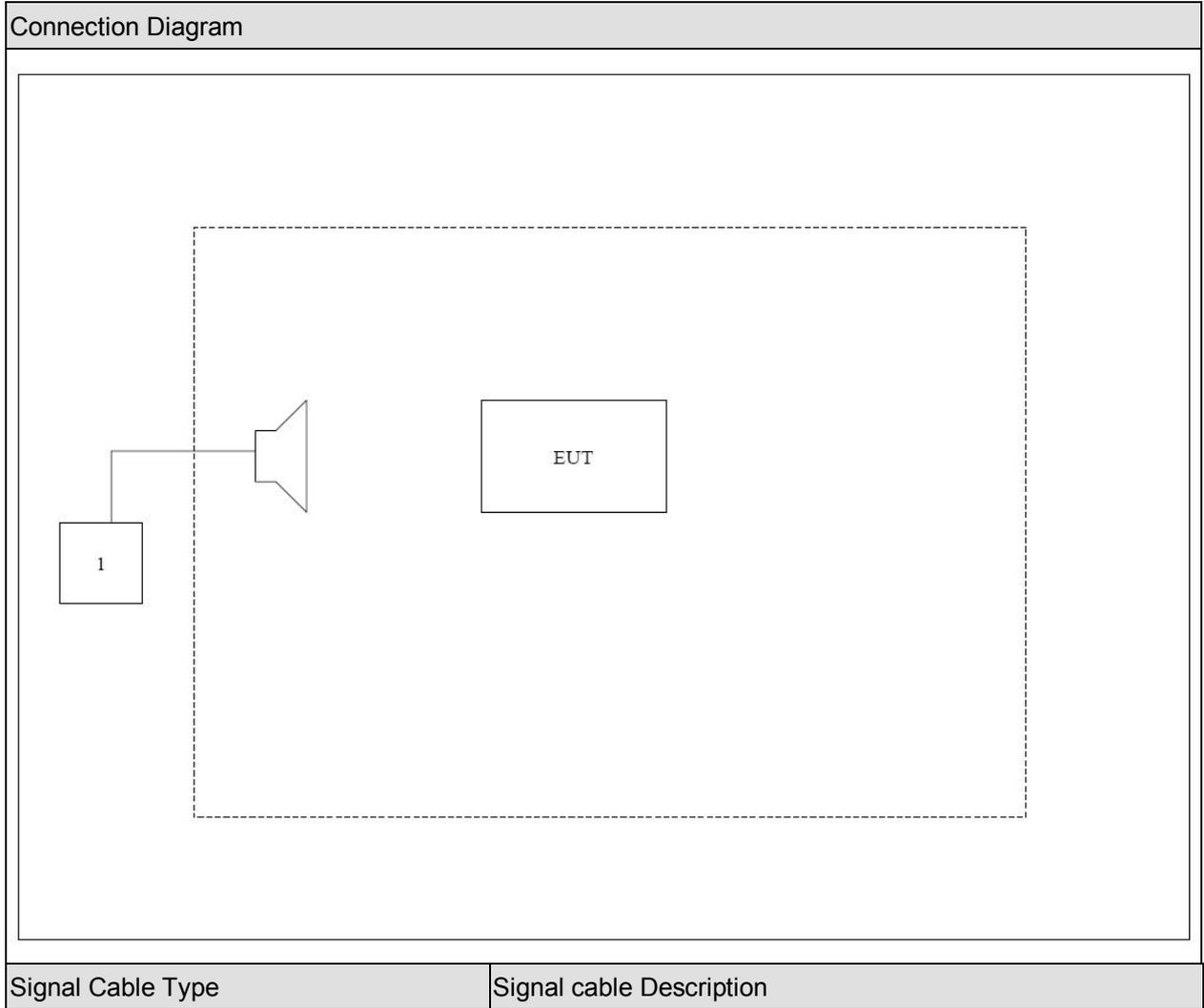
1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. For the ERP/EIRP and radiated emission test, every axis (X, Y, Z) was verified, and show the worst result on this report.
3. Radiated power 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.
4. This device is a composite device in accordance with Part 15 Subpart B regulations. The report number is 133025R-ITUSP01V02.

1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

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

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of all equipment.
3	EUT Communicate with 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 GSM 850 (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
Modulation Characteristic	FCC Part 2.1047(d)	Yes	No
Occupied Bandwidth	FCC Part 2.1049	Yes	No
Spurious Emission At Antenna Terminals (+/- 1MHz)	FCC Part 22.917(a) and Part 2.1049	Yes	No
Spurious Emission	FCC Part 22.917(b) and Part 2.1051, 2.1053	Yes	No
Frequency Stability Under Temperature & Voltage Variations	FCC Part 22.355 and 2.1055	Yes	No

For PCS 1900 (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
Modulation Characteristic	FCC Part 2.1047(d)	Yes	No
Occupied Bandwidth	FCC Part 24.238(b) and Part 2.1049	Yes	No
Spurious Emission At Antenna Terminals (+/- 1MHz)	FCC Part 24.238(a) and Part 2.1049	Yes	No
Spurious Emission	FCC Part 24.238(b) and Part 2.1051, 2.1053	Yes	No
Frequency Stability Under Temperature & Voltage Variations	FCC Part 24.235 and 2.1055	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

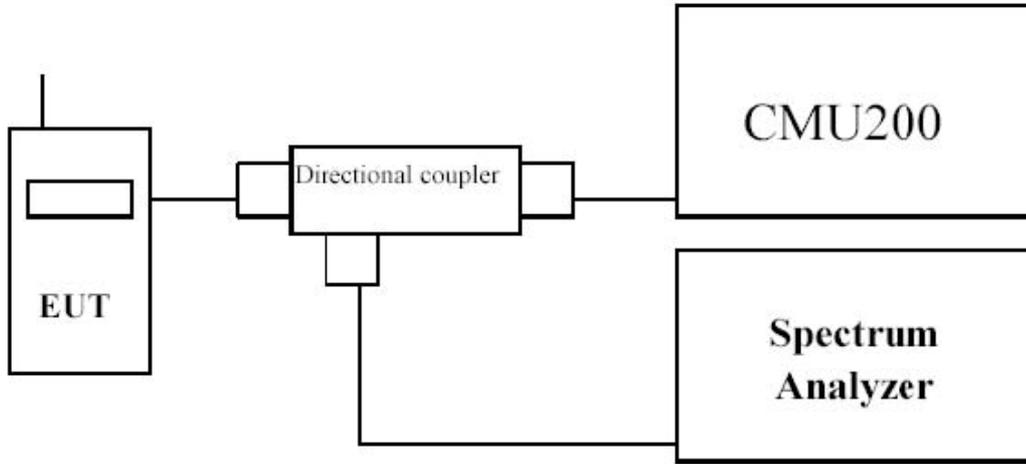
3.1. Test Equipment

Spurious Emission / AC-5

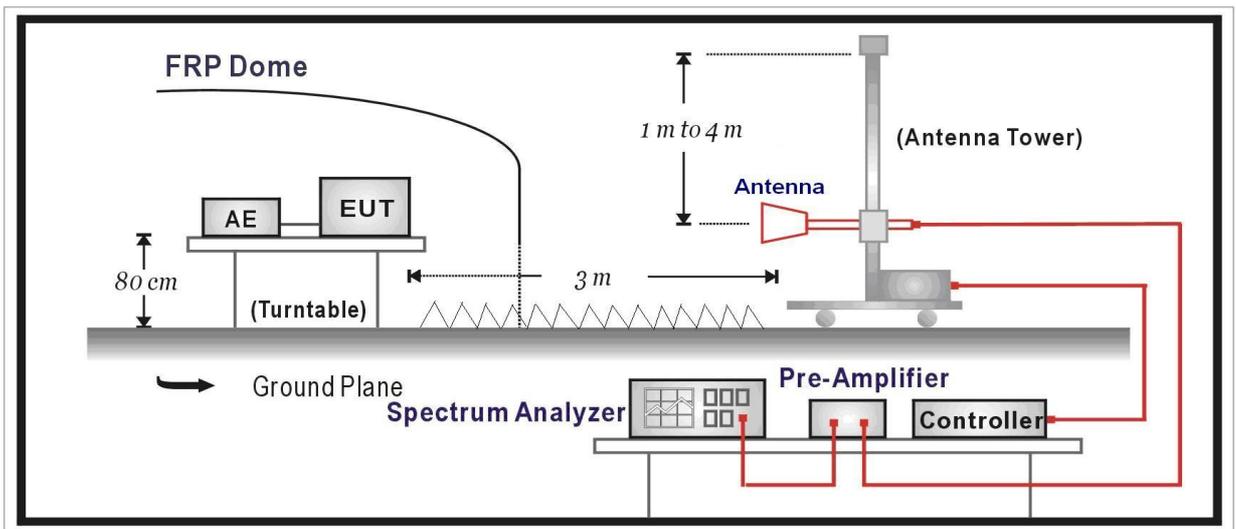
Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2013.04.10
Radio Communication Tester	R&S	CMU 200	117088	2013.04.18
Dual Directional Coupler	Agilent	778D	20160	2013.04.18
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2013.04.18
PSG Analog Signal Generator	Agilent	E8257D	MY44321116	2013.04.18
Preamplifier	QuieTek	AP-025C	CHM-0503006	2013.05.04
Preamplifier	Miteq	NSP1800-25	1364185	2013.05.04
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2013.10.15
Half Wave Tuned Dipole Antenna	COM-POWER	AD-100	40137	2013.11.24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	737	2013.11.24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2014.06.08
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2014.01.11

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

Product	GSM Mobile Phone		
Test Item	Peak Output Power		
Date of Test	2013/03/01	Test Site	AC-6

GSM 850

Channel No.	Frequency (MHz)	Modulation	Conducted Power (dBm)	ERP (dBm)	Limit (dBm)
128	824.2	GMSK	32.14	34.26	38.50
189	836.4	GMSK	32.20	33.27	38.50
251	848.8	GMSK	32.31	33.67	38.50

PCS1900

Channel No.	Frequency (MHz)	Modulation	Conducted Power (dBm)	EIRP (dBm)	Limit (dBm)
512	1850.2	GMSK	29.31	28.72	33.00
661	1880.0	GMSK	29.49	29.35	33.00
810	1909.8	GMSK	29.89	29.83	33.00

Note: The maximum PAR for PCS1900 is 9.6dB less than 13 dB.

GPRS 850

Channel No.	Frequency (MHz)	Modulation	Conducted Power (dBm)	ERP (dBm)	Limit (dBm)
128	824.2	GMSK	32.11	34.12	38.50
189	836.4	GMSK	32.19	33.09	38.50
251	848.8	GMSK	32.29	33.43	38.50

GPRS1900

Channel No.	Frequency (MHz)	Modulation	Conducted Power (dBm)	EIRP (dBm)	Limit (dBm)
512	1850.2	GMSK	29.30	28.99	33.00
661	1880.0	GMSK	29.48	29.29	33.00
810	1909.8	GMSK	29.67	29.65	33.00

Note: The maximum PAR for GPRS1900 is 11.9dB less than 13 dB.

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)								
824.2	-16.18	H	17.58	1.76	-0.02	15.80	38.50	-22.70
824.2	1.55	V	36.04	1.76	-0.02	34.26	38.50	-4.24
Middle Channel 189 (836.40MHz)								
836.4	-18.23	H	15.66	1.75	0.10	14.01	38.50	-24.49
836.4	0.16	V	34.92	1.75	0.10	33.27	38.50	-5.23
High Channel 251 (848.80MHz)								
848.8	-19.51	H	14.50	1.78	0.13	12.85	38.50	-25.65
848.8	0.71	V	35.32	1.78	0.13	33.67	38.50	-4.83

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)								
1850.2	21.16	H	19.76	2.68	10.40	27.48	33.00	-5.52
1850.2	22.59	V	21.00	2.68	10.40	28.72	33.00	-4.28
Middle Channel 661 (1880.00MHz)								
1880.0	21.02	H	19.52	2.68	10.43	27.27	33.00	-5.73
1880.0	23.44	V	21.60	2.68	10.43	29.35	33.00	-3.65
High Channel 810 (1909.80MHz)								
1909.8	21.58	H	20.23	2.70	10.44	27.97	33.00	-5.03
1909.8	26.26	V	22.09	2.70	10.44	29.83	33.00	-3.17

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)								
824.2	-16.02	H	17.74	1.76	-0.02	15.96	38.50	-22.54
824.2	1.40	V	35.90	1.76	-0.02	34.12	38.50	-4.38
Middle Channel 189 (836.40MHz)								
836.4	-17.45	H	16.45	1.75	0.10	14.80	38.50	-23.70
836.4	0.8	V	34.74	1.75	0.10	33.09	38.50	-5.41
High Channel 251 (848.80MHz)								
848.8	-19.09	H	14.93	1.78	0.13	13.28	38.50	-25.22
848.8	1.14	V	34.74	1.78	0.13	33.43	38.50	-5.07

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)								
1850.2	22.12	H	20.72	2.68	10.40	28.44	33.00	-4.56
1850.2	22.87	V	21.27	2.68	10.40	28.99	33.00	-4.01
Middle Channel 661 (1880.00MHz)								
1880.0	19.01	H	17.51	2.68	10.43	25.26	33.00	-7.74
1880.0	23.38	V	21.54	2.68	10.43	29.29	33.00	-3.71
High Channel 810 (1909.80MHz)								
1909.8	17.31	H	15.97	2.70	10.44	23.71	33.00	-9.29
1909.8	21.33	V	19.54	2.70	10.44	29.65	33.00	-3.35

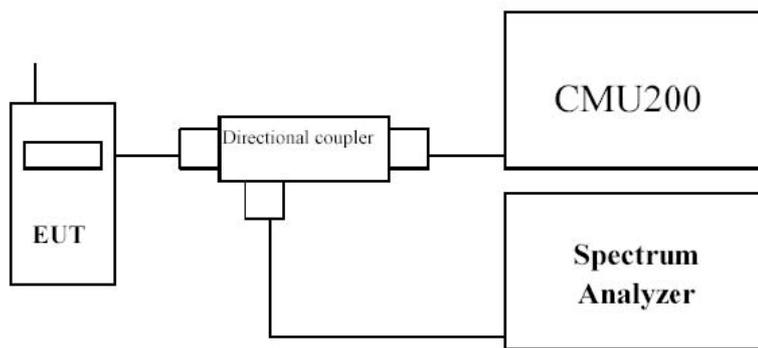
4. Modulation Characteristic

4.1. Test Equipment

Modulation Characteristic / AC-6

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2013.04.10
Radio Communication Tester	R&S	CMU 200	117088	2013.04.18
Dual Directional Coupler	Agilent	778D	20160	2013.04.18
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2013.04.18
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC6-TH	2014.01.11

4.2. Test Setup



4.3. Limit

N/A

4.4. Test Procedure

GMSK is a form of binary signaling schemes which represent digital states as a shift between discrete sinusoidal frequencies called Frequency Shift Keying (FSK). Minimum Shift Keying (MSK) is continuous phase FSK with the smallest possible modulation index h . Modulation index is defined as: $h = 2 \cdot F \cdot T_b$

where F = Peak frequency deviation in Hz and T_b = Bit period in seconds

Two discrete frequencies, representing two distinct digital states, with equal phases at switch time $t = 0$ requires a minimum value of $h = 0.5$. The Gaussian part of GMSK describes the fact that the digital pulses are filtered in the time domain. This results in bits which are sinusoidal rather than square. The effective spectrum is then compressed with the average carrier frequency in the center of the passband. This is a great advantage because of the significantly reduced bandwidth. GMSK is utilized because of these bandwidth conservation properties.

The bandwidth for GSM is a 60 MHz up-link at 1850-1910 MHz and down-link at 1930-1990 MHz. The 65 MHz is divided into 299 channels, each of which is 200 kHz wide. Slight spectral spillage is allowed into neighboring channels (which is minimized by GMSK). This separated transmit/receive frequencies scheme under GSM enables easier duplex filtering.

Within the bandwidth, individual channels are subdivided into multiframes (made of 26 frames), frames (made of 8 time slots), and time slots (made of 8 fields). The time slots are 0.57 ms long allowing 156.25 bits of information including overhead.

The modulation used in GPRS is the same used in GSM. A GSM channel contains eight timeslots, each timeslot is dedicated to one circuit switched call. For GPRS the timeslots are assigned on an as needed basis, and more than one timeslot can be assigned for a particular transmission depending on the network and the device.

4.5. Uncertainty

The measurement uncertainty is defined as 0.1%

4.6. Test Result

The modulation of GSM was verified and confirmed compliance with requirement.

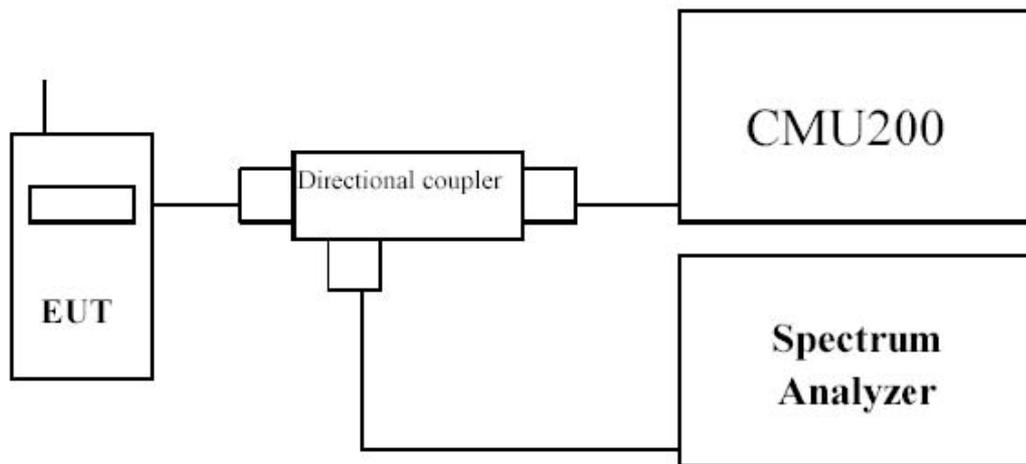
5. Occupied Bandwidth

5.1. Test Equipment

Occupied Bandwidth / AC-6

Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2013.04.10
Radio Communication Tester	R&S	CMU 200	117088	2013.04.18
Dual Directional Coupler	Agilent	778D	20160	2013.04.18
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2013.04.18
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC6-TH	2014.01.11

5.2. Test Setup



5.3. Limit

N/A

5.4. Test Procedure

Using Occupied Bandwidth measurement function of spectrum analyzer, and setting as follows:

For GSM 850/1900 test --- RBW = 3 kHz and VBW = 10 kHz

5.5. Uncertainty

The measurement uncertainty is defined as ± 10 Hz

5.6. Test Result

Product	GSM Mobile Phone		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: GSM 850 Link		
Date of Test	2013/03/01	Test Site	AC-6

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
128	824.20	314.73	243.06
189	836.40	313.61	245.22
251	848.80	321.19	252.39

Figure Channel 128 (824.20MHz)

