

10 January, 2013

Huawei Technologies Co.,Ltd
Bantian, Longgang District, Shenzhen, China
Tel.: (86) 755- 89650288
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Dear Mr. Zhang Xinghai:

Enclosed you will find your file copy of an Original Grant of Part 22 and Part 24 Certification report (FCC ID: QISF361). Model: F361.

For your reference, TCB will normally take another 5 working days for reviewing the report. Approval will then be granted when no query is sorted.

Please contact me if you have any questions regarding the enclosed material.

Sincerely,

A handwritten signature in blue ink, appearing to read "Leung Wai Leung".

Leung Wai Leung, Tommy
Deputy General Manager

Enclosure

List of Exhibits

Exhibit Type	File Description	Filename
Test Report	Test Report	report.pdf
Operational Description	Technical Description	descri.pdf
Test Report	Bandwidth Plot	bw.pdf
Test Report	Spurious Emissions	cspurious.pdf
Test Report	Bandedge Plot	be.pdf
RF Exposure Info	SAR Report	sar report. pdf
External Photos	External Photo	external photos.pdf
Internal Photos	Internal Photo	internal photos.pdf
ID Label/Location Info	Label Artwork and Location	label.pdf
Cover Letter	Label Location Justification	justification.pdf
Schematics	Circuit Diagram	circuit.pdf
User Manual	User Manual	manual.pdf
Part List/Tune Up Info	Tune Up Procedure	tuneup.pdf
Part List/Tune Up Info	Part List	partlist.pdf
Cover Letter	Letter of Agency	agency.pdf
Cover Letter	Confidentiality Request	request.pdf

Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch

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TEST REPORT

Report Number: 130106033SZN-001

Application
for
Original Grant
of 47 CFR Part 22 and Part 24 Certification

Handset Phone

FCC ID: QISF361

Prepared and Checked by:

Approved by:



Billy Li
Supervisor
10 January, 2013



Leung Wai Leung, Tommy
Deputy General Manager
10 January, 2013

- The test results reported in this test report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.
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- The evaluation data of the report will be kept for 3 years from the date of issuance.

TRF No.: FCC 22H&24E_b

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GENERAL INFORMATION

Applicant Name:	Huawei Technologies Co.,Ltd
Applicant Address:	Bantian, Longgang District, Shenzhen, China
FCC Specification Standard:	FCC Part 22: 2012 FCC Part 24: 2012
FCC ID:	QISF361
FCC Model(s):	F361
Type of EUT:	GSM 850/1900 Transceiver
Description of EUT:	Handset Phone
Serial Number:	N/A
Sample Receipt Date:	6 January, 2013
Date of Test:	9 January, 2013
Report Date:	10 January, 2013
Environmental Conditions:	Temperature: 25 ± 10°C Humidity: 10 to 90%

INTERTEK TESTING SERVICES

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Appendix – Exhibits for Application of Certification

INTERTEK TESTING SERVICES

1.0 Summary of Test Results

Test Items	FCC Section	Results	Details see section
Channels for Cellular and Broadband PCS Services	22.905 24.229	Pass	4.1
RF Output Power	2.1046 22.913 24.232	Pass	4.3
Occupied Bandwidth	2.1049	Pass	4.4
Spurious Emissions at Antenna Terminals	2.1051 2.1057 22.917 24.238	Pass	4.5
Power of Spurious Emissions	2.1053 2.1057 22.917 24.238	Pass	4.6
Blockage at antenna terminal	22.917 24.238	Pass	4.7
Frequency Stability	2.1055 22.355 24.235	Pass	4.8
RF Exposure	1.1307 2.1093	Pass	4.9

1.1 Statement of Compliance

The equipment under test is found to be complying with the applicable requirements of following standards:

FCC Part 22: 2012
FCC Part 24: 2012

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2.0 General Description

2.1 Product Description

The F361 is a Handset Phone.

The Cellular radiotelephone service and personal communications services frequency ranges of the EUT are as below:

GSM 850MHz:

Tx: 824.20 - 848.80MHz (at intervals of 200kHz)

Rx: 869.20 - 893.80MHz (at intervals of 200kHz)

GSM 1900MHz:

Tx: 1850.20 - 1909.80MHz (at intervals of 200kHz)

Rx: 1930.20 - 1989.80MHz (at intervals of 200kHz)

The EUT is powered by Lithium rechargeable battery pack.

The antenna attached with the EUT as below:

Integral Antenna with antenna gain 4dBi

The circuit description is attached in the Appendix and saved with filename: descri.pdf.

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2.2 Test Methodology

Preliminary radiated scans and all radiated measurements were performed in semi-anechoic chamber. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application. All measurements were made in accordance with the procedures in 47 CFR Part 2, Part 22, Part 24 and TIA-603-C.

2.3 Test Facility

The facilities used to collect the radiated data and conducted data are in **Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch** and located at 6F, D Block, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China. This test facility and site measurement data have been fully placed on file with the FCC. (Registration Number: 242492).

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3.0 System Test Configuration

3.1 Justification

For radiated emissions testing, the equipment under test (EUT) was controlled by communication tester to produce maximum power. Care was taken to ensure proper power supply voltages during testing. During testing, all cables (if any) were manipulated to produce worst case emissions.

The EUT was powered by the fully charged Lithium battery and charged by the AC adapter described in page 7 and only the worst case was reported (The worst case configuration is the EUT with Model 1 battery & Model 2 adapter).

For the measurements, the EUT is attached to a plastic stand if necessary and placed on the wooden turntable. If the EUT attaches to peripherals, they are connected and operational to simulate typical use.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna polarizations are varied during the search for maximum signal level. Only the worst-case polarization is reported. For each spurious, raise and lower the test antenna from 1m to 4m to obtain a maximum reading on the spectrum analyzer. Radiated emissions are taken at three meters. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

The power level of EUT is set by the communication tester as follows:

850MHz band: Power Control Level (PCL) = 5 (Power class 4)

1900MHz band: Power Control Level (PCL) = 0 (Power class 1)

Which are the maximum power levels emitted by the EUT.

For the 850MHz band, according to 22.917, compliance with the rule is based on the use of instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter is employed. The 26dB emission bandwidth taken in section 4.4 is used for calculating the resolution bandwidth.

For the 1900MHz band, according to 24.238, compliance with the rule is based on the use of instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter is employed. The 26dB emission bandwidth taken in section 4.4 is used for calculating the resolution bandwidth.

Emission that are directly caused by digital circuits in the transmit path and transmitter portion are measured, and the limit are according to FCC Part 15 Section 15.109.

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3.1 Justification - Cont'd

Detector function for radiated emissions is in peak mode.

All relevant operation modes have been tested, and the worst case data is included in this report.

3.2 Details of EUT and Description of Accessories

Accessory	Model	Manufacturer
Battery	Model 1: HBL3A	HUAWEI
AC Adapter	Model 1: A361-0500500U	Shenzhen Aohai Technology Co.,LTD
	Model 2: H05Z	Shenzhen Sunlight Electronic Technology Co.,LTD

3.3 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

3.4 Equipment Modification

Any modifications installed previous to testing by Huawei Technologies Co.,Ltd will be incorporated in each production model sold/leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch.

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4.0 Test Results

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). Configuration and data tables of the emissions are included.

4.1 Channels for Cellular and Broadband PCS Services (FCC Part 22.905, Part 24.229)

The following frequency bands are allocated for assignment to service providers in the Cellular Radiotelephone and Broadband PCS Services by FCC:

850MHz band

(a) Channel Block A:

869 - 880 MHz paired with 824 - 835 MHz

890 - 891.5 MHz paired with 845 - 846.5 MHz

(b) Channel Block B:

880 - 890 MHz paired with 835 - 845 MHz

891.5 - 894 MHz paired with 846 - 849 MHz

1900MHz band

The following frequency blocks are available for assignment on a Major Trading Areas (MTA) basis:

Block A: 1850 - 1865 MHz paired with 1930 - 1945 MHz; and

Block B: 1870 - 1885 MHz paired with 1950 - 1965 MHz.

The following frequency blocks are available for assignment on a Basic Trading Areas (BTA) basis:

Block C: 1895 - 1910 MHz paired with 1975 - 1990 MHz

Block D: 1865 - 1870 MHz paired with 1945 - 1950 MHz

Block E: 1885 - 1890 MHz paired with 1965 - 1970 MHz

Block F: 1890 - 1895 MHz paired with 1970 - 1975 MHz

The frequency range of the EUT is as below:

GSM 850MHz:

Tx: 824.20 - 848.80MHz (at intervals of 200kHz)

Rx: 869.20 - 893.80MHz (at intervals of 200kHz)

GSM 1900MHz:

Tx: 1850.20 - 1909.80MHz (at intervals of 200kHz)

Rx: 1930.20 - 1989.80MHz (at intervals of 200kHz)

As a result, the frequency range of the EUT fits into the allocated frequency blocks.

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4.2 RF Power Output (FCC Part 2.1046, 22.913 & 24.232)

The RF power output is measured at the RF output terminal. The limit is as follows:

Part 22.913 (for 850MHz band):

[] ≤ 500W ERP (57dBm) for base stations and cellular repeaters

[√] ≤ 7W ERP (38.5dBm) for mobile and auxiliary test transmitters

Part 24.232 (for 1900MHz band):

[] ≤ 1640W e.i.r.p. (62.1dBm) for base stations up to 300m HAAT;

[√] ≤ 2W e.i.r.p. (33dBm) peak output power for portable mobile

Test results:

Band	ARFCN	Frequency (MHz)	Antenna Gain (dBi)	Measured output power (dBm)	*ERP (dBm)	Limit (dBm)	Verdict
GSM 850MHz	190	836.6	4.0	30.4	32.25	38.5	PASS

Band	ARFCN	Frequency (MHz)	Antenna Gain (dBi)	Measured output power (dBm)	#EIRP (dBm)	Limit (dBm)	Verdict
GSM 1900MHz	661	1880.0	4.0	28.6	32.6	33.0	PASS

*ERP (dBm) = Conducted Power (dBm) + Antenna Gain (dBi) - 2.15dB

*EIRP (dBm) = Conducted Power (dBm) + Antenna Gain (dBi)

Remark: PK detector was used for output power measurement.

RBW: 1MHz and VBW: 3MHz were used when testing the GSM mode.

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4.3 Occupied Bandwidth (FCC Part 2.1049)

From 2.1049, occupied bandwidth is defined as the measured spectral width of an emission. The measurement determines occupied bandwidth as the difference between upper and lower frequencies where 0.5% of the emission power is above the upper frequency and 0.5% of the emission power is below the lower frequency.

The 26dB bandwidth is also recorded to determine the resolution bandwidth used in measurements, as specified in 22.917 and 24.238.

Test results:

Band	ARFCN	Frequency (MHz)	99% Bandwidth (kHz)	26dB Bandwidth (kHz)
GSM 850MHz	190	836.6	246	316
GSM 1900MHz	661	1880.0	242	314

The plots of 99% and 26dB bandwidth are saved in the file bw.pdf.

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4.4 Spurious Emissions at Antenna Terminals (FCC Part 22.1051, 2.1057, 22.917, 24.238)

The conducted spurious emissions are measured from 9kHz up to the 10th harmonic of fundamental emission.

According to 22.917 and 24.238, 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 $43 + 10\log(P)$ dB, i.e. at or below -13dBm.

Test results:

Band	ARFCN	Channel Frequency (MHz)	Verdict
GSM 850MHz	190	836.6	PASS
GSM 1900MHz	661	1880.0	PASS

The plots are saved in the file cspurious.pdf.

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4.5 Power of Spurious Emissions (FCC Part 2.1053, 2.1057, 22.917, 24.238)

The radiated spurious emissions are tested per TIA/EIA-603 using the Substitution Method and measured from 9KHz up to the 10th harmonic of fundamental emission.

According to 22.917, 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 $43 + 10\log(P)$ dB, i.e. at or below -13dBm.

Test results:

GSM 850MHz (ARFCN = 190, Channel frequency = 836.6MHz):

Polarization	Frequency (MHz)	Measured ERP (dBm)	Limit ERP (dBm)	Margin (dB)
V	1673.2	-47.43	-13	-34.43
V	2509.8	-44.68	-13	-31.68

GSM 1900MHz (ARFCN = 661, Channel frequency = 1880.0MHz):

Polarization	Frequency (MHz)	*Calculated EIRP (dBm)	Limit EIRP (dBm)	Margin (dB)
V	3760.0	-33.72	-13	-20.72
V	5640.0	-51.23	-13	-38.23

*EIRP = ERP+2.15dB

Remarks: the magnitudes of spurious emission which are attenuated more than 20 dB below the permissible value are not reported.

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4.6 Blockage at Antenna Terminals (FCC Part 22.917, 24.238)

In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter is employed. The 26dB emission bandwidth taken in section 4.4 is used for calculating the resolution bandwidth.

The power of any emission at the blockage must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB, i.e. at or below -13dBm when using 1% emissions bandwidth.

According to the FCC KDB with Publication Number: 890810, measurements using narrower resolution bandwidths are acceptable and must sum the power from all contiguous reduced resolution bandwidths within the 1% resolution specified, an alternative is to add an additional correction factor of $10 \log(RBW1/RBW2)$ to the $43 + 10 \log(P)$ limit. RBW1 is the narrower measurement resolution bandwidth and RBW2 is the 1% emissions bandwidth.

The correction factor = $10 \log(RBW1/RBW2) = 10 \log(1/3.16) = -5.00$ dB

Test results:

Band	ARFCN	Channel Frequency (MHz)	Worst case bandedge emission with RBW 1KHz(dBm)	Correction Factor (dB)	Worst case bandedge emission with RBW 3.16KHz(dBm)	Limit (dBm)	Verdict
GSM 850MHz	128	824.2	-19.95	5.00	-14.95	-13	PASS
	251	848.8	-20.95	5.00	-15.95	-13	PASS
GSM 1900MHz	512	1850.2	-21.14	5.00	-16.14	-13	PASS
	810	1909.8	-21.83	5.00	-16.83	-13	PASS

The plots are saved in the file be.pdf.

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4.7 Frequency Stability (FCC Part 2.1055, 22.355, 24.235)

The frequency stability is measured with the temperature variation range of -30°C to +50°C (10°C increment), and voltage supply variation range of 85% to 115% of nominal AC supply voltage, and/or nominal to battery end points for hand-carried battery-powered supplies.

[√] AC nominal supply voltage: 120VAC

[√] nominal voltage: 3.8 VDC; End points: 3.5 VDC

20°C is taken as temperature in normal condition.

For the 850MHz band, according to 22.355, the stability requirements are: ±1.5ppm for base units and ±2.5ppm for mobile units.

For the 1900MHz band, according to 24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test results for battery operation:

GSM 850MHz (AFRCN = 190, Channel frequency = 836.6MHz):

Input voltage (VDC)	Temperature (°C)	Frequency deviation (Hz)	Limit (Hz)	Verdict
3.8	-30	-78	±2091.5	PASS
	-20	-72		PASS
	-10	-66		PASS
	0	-63		PASS
	+10	-57		PASS
	+20	-54		PASS
	+30	-56		PASS
	+40	-59		PASS
	+50	-60		PASS
3.5	+20	-55		PASS

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GSM 1900MHz (AFRCN = 512, Channel frequency = 1850.2MHz):

Input voltage (VDC)	Temperature (°C)	Measured Frequency (MHz)	Limit (MHz)	Verdict
3.8	-30	1850.199920	1850 - 1910	PASS
	-20	1850.199923		PASS
	-10	1850.199946		PASS
	0	1850.199900		PASS
	+10	1850.199903		PASS
	+20	1850.199920		PASS
	+30	1850.199931		PASS
	+40	1850.199928		PASS
	+50	1850.199925		PASS
3.5	+20	1850.199922		PASS

GSM 1900MHz (AFRCN = 810, Channel frequency = 1909.8MHz):

Input voltage (VDC)	Temperature (°C)	Measured Frequency (MHz)	Limit (MHz)	Verdict
3.8	-30	1909.799987	1850 - 1910	PASS
	-20	1909.799905		PASS
	-10	1909.799914		PASS
	0	1909.799925		PASS
	+10	1909.799928		PASS
	+20	1909.799932		PASS
	+30	1909.799935		PASS
	+40	1909.799933		PASS
	+50	1909.799940		PASS
3.5	+20	1909.799927		PASS

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Test results for battery operation charged by AC voltage:

GSM 850MHz (AFRCN = 190, Channel frequency = 836.6MHz):

Input voltage (VAC)	Temperature (°C)	Frequency deviation (Hz)	Limit (Hz)	Verdict
120	-30	-68	±2091.5	PASS
	-20	-64		PASS
	-10	-60		PASS
	0	-56		PASS
	+10	-52		PASS
	+20	-50		PASS
	+30	-53		PASS
	+40	-51		PASS
	+50	-55		PASS
102	+20	-54		PASS
138	+20	-56		PASS

GSM 1900MHz (AFRCN = 512, Channel frequency = 1850.2MHz):

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Limit (MHz)	Verdict
120	-30	1850.199932	1850 - 1910	PASS
	-20	1850.199944		PASS
	-10	1850.199950		PASS
	0	1850.199953		PASS
	+10	1850.199965		PASS
	+20	1850.199976		PASS
	+30	1850.199973		PASS
	+40	1850.199967		PASS
	+50	1850.199978		PASS
102	+20	1850.199974		PASS
138	+20	1850.199969		PASS

GSM 1900MHz (AFRCN = 810, Channel frequency = 1909.8MHz):

Input voltage (VAC)	Temperature (°C)	Measured Frequency (MHz)	Limit (MHz)	Verdict
120	-30	1909.799922	1850 - 1910	PASS
	-20	1909.799921		PASS
	-10	1909.799935		PASS
	0	1909.799944		PASS
	+10	1909.799950		PASS
	+20	1909.799952		PASS
	+30	1909.799955		PASS
	+40	1909.799951		PASS
	+50	1909.799953		PASS
102	+20	1909.799954		PASS
138	+20	1909.799956		PASS

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4.8 Radio Frequency Exposure Compliance

EUT is subject to the radio frequency exposure requirements specified in FCC Rule § 1.1307(b), 2.1093. It shall be considered to operate in a “general population / uncontrolled” environment.

- ☒ Portable unit: EUT was evaluated for Specific Absorption Rate (SAR) evaluation compliance according to OET Bulletin 65, Supplement C (Edition 01-01). It is in compliance with the SAR evaluation requirements. The caution statement is saved as filename: RF exposure info.pdf. A SAR test report was submitted at same time and saved as SAR Report.pdf.
- ☐ Mobile unit: EUT was evaluated for Maximum Permissible Exposure (MPE) evaluation compliance according to OET Bulletin 65(Edition 97-01). The evaluation calculation results are saved as filename: RF exposure info.pdf.

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5.0 Equipment List

Equipment	EMI Test Receiver	EMI Test Receiver	Spectrum Analyzer	Universal Radio Communication Tester
Registration No.	SZ185-02	SZ185-01	SZ056-03	SZ065-1
Manufacturer	R&S	R&S	R&S	R&S
Model No.	ESCI	ESCI	FSP30	CMU200
Calibration Date	5-Nov-2012	5-Nov-2012	11-Mar-2012	14-Jul-2012
Calibration Due Date	5-Nov-2013	5-Nov-2013	11-Mar-2013	14-Jul-2013

Equipment	BiConLog Antenna	Horn Antennas	Signal Generator	Active Loop Antenna
Registration No.	SZ061-03	SZ061-08 SZ061-09	SZ180-01	SZ185-02
Manufacturer	ETS	ETS	R&S	Electro-Metrics
Model No.	3142C	3115	SML03	EM-6876
Calibration Date	30-Jun-2012	3-Nov-2012	17-May-2012	5-Nov-2012
Calibration Due Date	30-Jun-2013	3-Nov-2013	17-May-2013	5-Nov-2013

Equipment	RF Power Meter	Temperature & Humidity Chamber	Roberts Antennas
Registration No.	SZ182-01	SZ016-02	EW-0159
Manufacturer	BOONTON	Dongzhix	CDI
Model No.	4232A	WGD/SJ-415-A	A100
Calibration Date	11-Mar-2012	3-Nov-2012	13-May-2012
Calibration Due Date	11-Mar-2013	3-Nov-2013	13-May-2013

Equipment	Notch Filter	Notch Filter	Highpass Filter
Registration No.	SZ067-05	SZ067-08	SZ067-11
Manufacturer	Micro-Tronics	Wainwright	Wainwright
Model No.	BRM50707-02	WRCT800/960-0.2/40-8SSK	WHKX1.0/15G-10S
Calibration Date	11-Jun-2012	14-Jul-2012	11-Jun-2012
Calibration Due Date	11-Jun-2013	14-Jul-2013	11-Jun-2013

END OF TEST REPORT

INTERTEK TESTING SERVICES

APPENDIX EXHIBITS OF APPLICATION FOR CERTIFICATION