

Huawei Technologies Co., Ltd

Application
For
Certification
FCC ID: QISY520-U33

WCDMA Digital Mobile Phone

Model: HUAWEI Y520-U33

Class B Personal Computer Peripherals

Report No.: 140710014SZN-005

Prepared and Checked by:

Approved by:

Sign on file

Jenner Liu
Assistant Engineer



Digitally signed
by Andy Yan
Location: Intertek
Testing Services

Andy Yan
Senior Project Engineer
Date: 15 August 2014

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TRF No.: FCC 15C_PC_b

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INTERTEK TESTING SERVICES

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MEASUREMENT / TECHNICAL REPORT

Huawei Technologies Co., Ltd

MODEL: HUAWEI Y520-U33

FCC ID: QISY520-U33

This report concerns (check one:) Original Grant ☒ Class II Change ☐

Equipment Type: JBP-Part 15 Class B Computing Device/Peripherals

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes ☐ No ☒

If yes, defer until: _____
date

Company Name agrees to notify the Commission by: _____
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes ☐ No ☒

If no, assumed Part 15, Subpart B for unintentional radiator – the new 47 CFR [10-01-13 Edition] provision.

Report prepared by:

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List of attached file

Exhibit Type	File Description	Filename
Test Report	Test Report	report.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
Test Setup Photo	Conducted Emission	conducted photos.pdf
External Photo	External Photos	external photos.pdf
Internal Photo	Internal Photos	internal photos.pdf
Block Diagram	Block Diagram	block.pdf
ID Label / Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Cover Letter	Confidential Letter	request.pdf
Cover Letter	Letter of Agency	agency.pdf

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EXHIBIT 1

GENERAL DESCRIPTION

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1.0 **General Description**

1.1 Product Description

The Equipment Under Test (EUT) is a WCDMA Digital Mobile Phone. The personal computers can through this WCDMA Digital Mobile Phone to read and write data. For more detailed features description, please refer to the user's manual.

1.2 Related Submittal(s) Grants

This is an application for certification of a computer peripheral.

Remaining portions are subject to the following procedures:

1. Bluetooth FHSS (2.4G band): 140710014SZN-001
2. Bluetooth LE 4.0(2.4G band): 140710014SZN-002
3. WiFi Transceiver (2.4G band): 140710014SZN-003
4. WCDMA Digital Mobile Phone (2G&3G): 140710014SZN-004
5. Other function: 140710014SZN-006

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1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009). Radiated emission measurement was performed in Semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

1.4 Test Facility

The Semi-anechoic chamber and shielding room used to collect the radiated data and conducted data are **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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EXHIBIT 2

SYSTEM TEST CONFIGURATION

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2.0 **System Test Configuration**

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2009).

The device was powered by PC USB Port (PC Adapter is powered by AC 120V/60Hz) during the test. The worst case data was reported in this report.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. The step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The rear of unit shall be flushed with the rear of the table.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

The frequency range from 30MHz to 6.5GHz (The highest frequency of the internal sources of the EUT is 1.3GHz, the measurement shall be made up to 6.5GHz) was searched for spurious emissions from the device. Only those emissions reported were detected. All other emissions were at least 20 dB below the applicable limits.

2.2 EUT Exercising Software

N/A

2.3 Special Accessories

Shielded USB cable is attached.

2.4 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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2.5 Measurement Uncertainty

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

2.6 Support Equipment List and Description

This product was tested in the following configuration:

Refer List:

Description	Manufacturer	Model No.
Earphone (Black)	Goertek	HA1-3
	Quancheng	1293#+3283# 3.5MM-150
	Lianchuang	MEMD1532B528000
Earphone (White)	Merry	EMC323-011-01
	Goertek	HG-04A
USB Cable	/	Data Cable USB A Male to Micro USB, shielded, 100cm
Battery	BYD	HB5V1 (1730mAh)
	LISHEN	
	SUNWODA	HB5V1HV (1950mAh)
	SCUD	
Laptop	Lenovo	T420
Hard Disk	Smart.drive	HD-003
USB Cable	Smart.drive	Unshielded, Length 155cm
1394 Cable	Smart.drive	Unshielded, Length 180cm

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EXHIBIT 3

EMISSION RESULTS

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3.0 **Emission Results**

Data is included worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

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3.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG$$

where FS = Field Strength in dB μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB/m

AG = Amplifier Gain in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG$$

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3.1 Field Strength Calculation (cont'd)

Example

Assume a receiver reading of 62.0dB μ V is obtained. The antenna factor of 7.4dB/m and cable factor of 1.6dB is added. The amplifier gain of 29dB is subtracted. The net field strength for comparison to the appropriate emission limit is 42dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$RA = 62.0\text{dB}\mu\text{V}$$

$$AF = 7.4\text{dB/m}$$

$$CF = 1.6\text{dB}$$

$$AG = 29.0\text{dB}$$

$$FS = 62 + 7.4 + 1.6 - 29 = 42\text{dB}\mu\text{V/m}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(42\text{dB}\mu\text{V/m})/20] = 125.9\mu\text{V/m}$$

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3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
At
199.875MHz (Data transfer Mode)

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated photos.pdf.

3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by 1.2dB margin (Data transfer Mode)

TEST PERSONNEL:

Sign on file

Jenner Liu Assistant Engineer
Typed/Printed Name

25 July 2014
Date

INTERTEK TESTING SERVICES

Applicant: Huawei Technologies Co., Ltd
Model: HUAWEI Y520-U33
Worst case operating Mode: Data transfer

Table 1

Radiated Emissions (30MHz~6.5GHz)

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	199.875	51.6	20.0	10.7	42.3	43.5	-1.2
Horizontal	258.920	47.5	20.0	12.3	39.8	46.0	-6.2
Horizontal	359.997	45.0	20.0	16.1	41.1	46.0	-4.9
Horizontal	1604.000	27.9	20.0	28.1	36.0	54.0	-18.0
Horizontal	2009.024	27.9	20.0	29.4	37.3	54.0	-16.7
Horizontal	2216.000	28.8	20.0	31.2	40.0	54.0	-14.0
Vertical	179.880	44.6	20.0	10.6	35.2	43.5	-8.3
Vertical	299.640	48.6	20.0	13.2	41.8	46.0	-4.2
Vertical	960.060	35.6	20.0	24.0	39.6	54.0	-14.4
Vertical	1502.000	30.1	20.0	26.4	36.5	54.0	-17.5
Vertical	2300.000	25.3	20.0	31.4	36.7	54.0	-17.3

NOTES:

1. Quasi-Peak detector is used for frequency up to 1GHz and Peak detector is used for frequency from 1-6.5GHz.
2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3 meter distances were measured at 0.3- meter and an inverse proportional extrapolation was performed to compare the signal level to the 3 meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. All emissions up to 1GHz are below the QP limit and all emissions between 1-6.5GHz are below the AV limit.

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3.4 Conducted Emission at Mains Terminal

3.5 Conducted Emission Configuration Photograph

Worst Case Conducted Configuration
at
0.630 MHz (Data transfer Mode)

For electronic filing, the worst case conducted emission configuration photograph is saved with filename: conducted photos.pdf.

3.6 Conducted Emission Data

Judgement: Passed by 21.3 dB margin (Data transfer Mode)

TEST PERSONNEL:

Sign on file

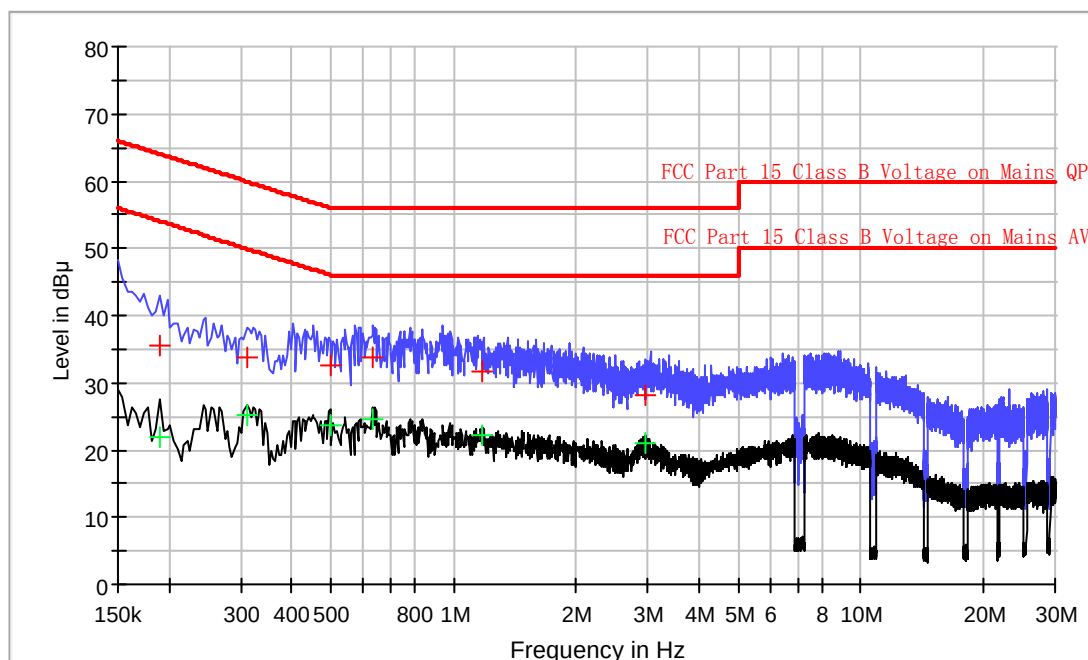
Jenner Liu Assistant Engineer
Typed/Printed Name

25 July 2014
Date

INTERTEK TESTING SERVICES

Applicant: Huawei Technologies Co., Ltd
Model: HUAWEI Y520-U33
Worst case operating Mode: Data transfer
Phase: Live

Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.190	35.7	L1	9.8	28.3	64.0
0.310	33.7	L1	9.8	26.3	60.0
0.498	32.5	L1	9.8	23.5	56.0
0.630	33.8	L1	9.9	22.2	56.0
1.178	31.6	L1	9.9	24.4	56.0
2.970	28.1	L1	9.9	27.9	56.0

Result Table AV

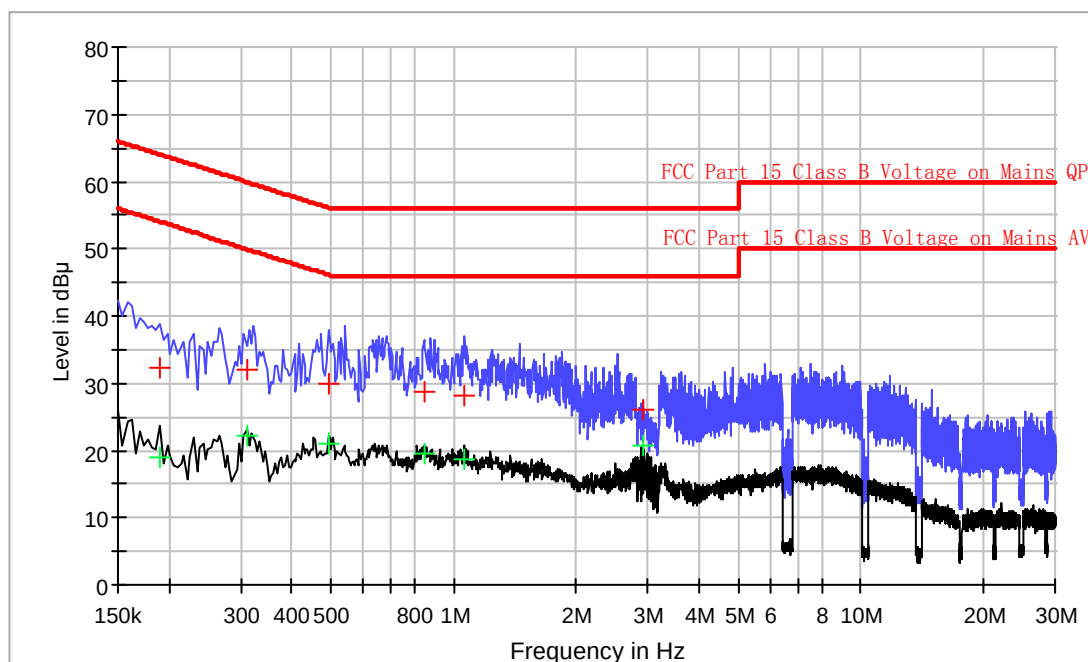
Frequency (MHz)	Average (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.190	21.9	L1	9.8	32.1	54.0
0.310	25.2	L1	9.8	24.8	50.0
0.498	23.8	L1	9.8	22.2	46.0
0.630	24.7	L1	9.9	21.3	46.0
1.178	22.3	L1	9.9	23.7	46.0
2.970	21.0	L1	9.9	25.0	46.0

TRF No.: FCC 15C_PC_b
FCC ID: QISY520-U33
Report No.: 140710014SZN-005

INTERTEK TESTING SERVICES

Applicant: Huawei Technologies Co., Ltd
Model: HUAWEI Y520-U33
Worst case operating Mode: Data transfer
Phase: Neutral

Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.190	32.3	N	10.1	31.7	64.0
0.310	31.9	N	10.1	28.1	60.0
0.494	29.9	N	10.2	26.2	56.1
0.846	28.8	N	10.2	27.2	56.0
1.062	28.1	N	10.3	27.9	56.0
2.938	26.2	N	10.3	29.8	56.0

Result Table AV

Frequency (MHz)	Average (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.190	18.9	N	10.1	35.1	54.0
0.310	22.2	N	10.1	27.8	50.0
0.494	21.0	N	10.2	25.1	46.1
0.846	19.6	N	10.2	26.4	46.0
1.062	18.7	N	10.3	27.3	46.0
2.938	20.7	N	10.3	25.3	46.0

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EXHIBIT 4

EQUIPMENT PHOTOGRAPHS

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4.0 **Equipment Photographs**

For electronic filing, photographs of the tested EUT are saved with filename: external photos.pdf and internal photos.pdf.

EXHIBIT 5
PRODUCT LABELLING

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5.0 **Product Labelling**

For electronics filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

EXHIBIT 6

TECHNICAL SPECIFICATIONS

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6.0 **Technical Specifications**

For electronic filing, the block diagram of the tested EUT is saved with filename: block.pdf.

EXHIBIT 7
INSTRUCTION MANUAL

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7.0 **Instruction Manual**

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold / leased in the United States.

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EXHIBIT 8

MISCELLANEOUS INFORMATION

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8.0 Miscellaneous Information

This miscellaneous information includes emission measuring procedure.

8.1 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of computer peripheral operating under Part 15, Subpart B rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 – 2009.

The computer peripheral equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The antenna height and polarization are varied during the testing to search for maximum signal levels. The height of the antenna is varied from one to four meters.

Detector function for radiated emissions are in QP mode from the frequency band 30MHz to 1GHz with RBW setting 120kHz. Detector function for radiated emissions are in PK mode from the frequency band above 1GHz with RBW setting 1MHz. Detector function for conducted emissions are in QP & AV mode and IFBW setting is 9kHz from the frequency band 150kHz to 30MHz.

For radiated emission, the frequency range scanned is 30MHz to 6.5GHz. For line-conducted emissions, the range scanned is 150kHz to 30MHz.

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8.1 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

Conducted measurements are made as described in ANSI C63.4 – 2009.

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EXHIBIT 9

CONFIDENTIALITY REQUEST

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9.0 **Confidentiality Request**

For electronic filing, the confidentiality request of the tested EUT is saved with filename: request.pdf.

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EXHIBIT 10

TEST EQUIPMENT LIST

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10.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-03	BiConiLog Antenna	ETS	3142C	00066460	28-Jun-2014	28-Jun-2015
SZ185-01	EMI Receiver	R&S	ESCI	100547	10-Mar-2014	10-Mar-2015
SZ061-09	Horn Antenna	ETS	3115	00092346	16-Nov-2013	16-Nov-2014
EM031-03	EXA Spectrum Analyzer	R&S	FSV40	101506	09-Jun-2014	09-Jun-2015
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	10-Mar-2014	10-Mar-2015
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	19-Apr-2014	19-Apr-2015
SZ062-02	RF Cable	RADIALL	RG 213U	--	19-Apr-2014	19-Oct-2014
SZ062-05	RF Cable	RADIALL	0.04-26.5GHz	--	19-Apr-2014	19-Oct-2014
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz	--	19-Apr-2014	19-Oct-2014
SZ067-04	Notch Filter	Micro-Tronics	BRM5070 2-02	--	21-May-2014	21-May-2015
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	9-Nov-2013	9-Nov-2014
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	9-Nov-2013	9-Nov-2014
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	9-Nov-2013	9-Nov-2014
SZ188-03	Shielding Room	ETS	RFD-100	4100	23-Aug-2013	23-Aug-2014