



EMC Test Report

Product Name: Fixed Wireless Terminal

Model Number: B160

Report No: SYBH(Z-EMC)005032011-2
FCC ID: QISB160

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Notice

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7. Normally, the test report is only responsible for the samples that have undergone the test.
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Notice 2

Modification Information:

Table 1 Modification Information

Modification Information	1	
	2	
	3	<i>Not Applicable!</i>
	4	
	5	
	6	
	7	



REPORT ON	EMC Test Of Fixed Wireless Terminal
	M/N: B160
REGULATION	FCC CFR47 Part 15: Subpart B;
START OF TEST	Feb.28, 2011
END OF TEST	Mar.12, 2011
Final Judgement:	Pass

Approved By

2011-03-13
Date

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1 Status

1.1 Product Information

CLIENT:	Huawei Technologies Co., Ltd.
ADDRESS:	Bantian Longgang District Shenzhen, P.R. China
MANUFACTURING DESCRIPTION	Fixed Wireless Terminal
MANUFACTURERS MODEL NUMBER	B160

1.2 Applied Standard

APPLIED STANDARD	FCC CFR47 Part 15: Subpart B;
	ANSI C63.4

1.3 Test Site

Site 1:

EMC LABORATORY OF RELIABILITY LABORATORY OF HUAWEI TECHNOLOGIES CO., LTD

1.4 Test environment condition

Ambient temperature	20~25°C
Relative humidity	40%~52%
Atmospheric pressure	101kPa

2 Summary of Results

Table 2 below shows a brief summary of the results obtained.

Table 2 Summary of results

EUT Classification: Wireless Terminal				
Test Items	Test Configuration & Test Mode	Required Performance Criteria	Result	Site
<u>Radiated Emissions</u> Enclosure Port	TC1 (TM9-TM16)	N/A	Pass	Site1
<u>Conducted Emissions</u>	TC1 (TM1-TM16)	N/A	Pass	Site1
Note: 1, Measurement taken is within the measurement uncertainty of measurement system. 2, TC = Test configuration				

3 Equipment Specification

3.1 General Description

HUAWEI HSPA/WCDMA/GPRS/GSM Fixed Wireless Terminal – B160 is subscriber equipment in the HSPA/WCDMA/GSM system. The HSPA/WCDMA frequency band is Band I and Band V. The GSM frequency band includes GSM850 and PCS1900. B160 implements such functions as RF signal receiving/sending, HSPA/WCDMA and GSM/GPRS protocol processing, voice and data service etc. Externally it provides USB port interface to PC and USIM card interface.

Note1: This is another report of B160, Add new adapter model HW-050010E5W, Radiated Spurious Emissions not need be tested in this report by estimate.

3.1.1 Main Equipment Technical Data

Description:	Fixed Wireless Terminal
Models:	B160
Input Rated Voltage:	~100-240V
Dimensions:	212 mm ×168 mm × 82 mm
Weight:	<90g (with battery)

Table 3 Sub-Assembly Identity

Mode		Work Frequency	
		Transmitt Frequency(MHz)	Receive Frequency (MHz)
GSM	850	824-849	869-894
	1900	1850-1910	1930-1990
WCDMA	1900	1850-1910	1930-1990
	850	824-849	869-894

3.2 Sub-Assembly Identity

Table 4 Sub-Assembly Identity

Board				
Model Name	Qty.	Hardware Version	Serial	Description
B160	1	WL1B160T	0J2AA11010400024	Interface Processing Unit
Accessory				
Name	Qty.	Manufacture	Serials number	Description
Adapter	1	ShenzhenH UNTKEY POWER TECHNOLO GY CO.,LTD	HKAAC0789651	Adapter Model:HW-050010E5W AC INPUT:~100-240V 50/60Hz ; 0.2A max DC OUTPUT: 5.0V 1A

Battery

Name	Qty.	Manufacture	Serials number	Description
NI-MH Battery	1	Huawei Technologie s Co., Ltd.	EVE911308367	Battery Model: HGB-2A10x3 Rated capacity: 1000mAh Nominal Voltage: --- +3.5V Charging Voltage: --- +4.2V

4 System Configuration during EMC Test

The Equipment under Test (EUT) was functioning correctly during all tests. The EUT was installed within the test site and was configured to simulate a typical user installation.

4.1 Cables Used during Test

Table 5 Cable Used during Test

Cable	Length	Quantity	Type of Cable
AC Power	1.2m	1	Unshielded

4.2 Associated Equipment Used during Test

Table 6 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Cal Date
Radio Communication Tester	CMU200	R&S	1117057	2010-8-4

4.3 Test Configurations and Test Mode

4.3.1 Test Configuration.

The EUT will be connected to test system (Base Station Simulator) in order to simulate normal operating conditions (with reference to the guidance given in the standard for this type of equipment).

TC1:EUT powered with an adapter and connected to the test system (Base Station Simulator).

Table 7 Configuration table

TC1	TM1~TM16
-----	----------

4.3.2 Test Mode

There were 16 test Modes. TM1 to TM16 were shown in the diagrams below:

TM1: operate in traffic mode GSM 850;
 TM2: operate in traffic mode GSM1900;
 TM3: operate in traffic mode GPRS1900;
 TM4: operate in traffic mode GPRS 1900;
 TM5: operate in traffic mode WCDMA 850;
 TM6: operate in traffic mode WCDMA 1900;
 TM7: operate in traffic mode HSPA 850;
 TM8: operate in traffic mode HSPA 1900;
 TM9: operate in idle mode GSM 850;
 TM10: operate in idle mode GSM 1900;
 TM11: operate in idle mode GPRS 850;
 TM12: operate in idle mode GPRS 1900;
 TM13: operate in idle mode WCDMA 850;
 TM14: operate in idle mode WCDMA1900;
 TM15: operate in idle mode HSPA 850;
 TM16: operate in idle mode HSPA 1900;

The EUT will be connected to test system (Base Station Simulator) in order to simulate normal operating conditions (with reference to the guidance given in the standard for this type of equipment).

4.4 Test conditions and test Connections

4.4.1 Test Conditions

The EUT will be connected to test system (Base Station Simulator) in order to simulate normal operating conditions (with reference to the guidance given in the standard for this type of equipment).

4.4.2 Test Connections

Traffic Mode:

The EUT is required to be in the traffic mode, a call is set up according to the generic call set up procedure and enter the EUT into loop back test mode.(WCDMA see 3GPP TS 34.121,GSM see ETSI TS 151.010).

For WCDMA, the following conditions shall also be met:

Logical Test Interface for details regarding generic call set-up procedure and BER, BLER test loop scenarios:

set and send continuously up power control commands to the UE;

The DTX shall be disabled;

Inner Loop Power Control shall be enabled;

transmitting and/or receiving (UL/DL) bit rate for reference test channel shall be 12.2 kbit / s.

The EUT shall be commanded to operate at maximum transmit power;

For GSM and EDGE, the following conditions shall also be met:

The EUT shall be commanded to operate at maximum transmit power;

The downlink RXQUAL shall be monitored.

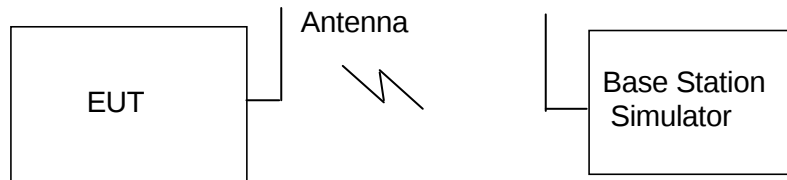


Figure 1.: Test Configuration

Idle Mode:

The EUT will be connected to test system (Base Station Simulator) in order to simulate normal operating conditions (with reference to the guidance given in the standard for this type of equipment).

The EUT is required to be in the idle mode.

For WCDMA, the following conditions shall be met:

UE shall be camped on a cell;

UE shall perform Location Registration (LR) before the test, but not during the test;

UE's neighbour cell list shall be empty;

Paging repetition period and DRX cycle shall be set to minimum (shortest possible time interval).

For GSM and PCS, the following conditions shall be met:

When the EUT is required to be in the idle mode, the test system shall simulate a Base Station (BS) with Broadcast Control Channel/Common Control Channel (BCCH/CCCH) on one carrier. The EUT shall be synchronized to the BCCH, listening to the CCCH and able to respond to paging messages. Periodic Location Updating shall be disabled.

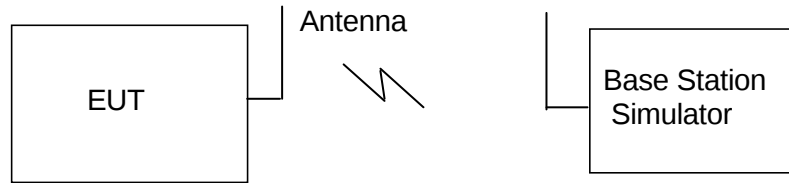


Figure 2. Test Configuration

5 Electromagnetic Interference (EMI)

5.1 Radiated Disturbance 30MHz to 1GHz

5.1.1 Test Procedure

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.4. The test distance was 3m. The set-up and test methods were according to ANSI 63.4 and CAN/CSA-CEI/IEC CISPR 22

A preliminary scan and a final scan of the emissions were made from 30 MHz to 1 GHz by using test script of software; the emissions were measured using Quasi-Peak Detector (30MHz~1GHz). The maximal emission value was acquired by adjusting the antenna height, polarisation and turntable azimuth in accordance with the software setup. Normally, the height range of antenna was 1m to 4m, the azimuth range of turntable was 0° to 360°, The receive antenna has two polarizations V and H.

EUT was configured in idle mode and the test performed at worst emission state.

Measurement bandwidth: 30 MHz – 1000 MHz: 120 kHz

Test set up figure:

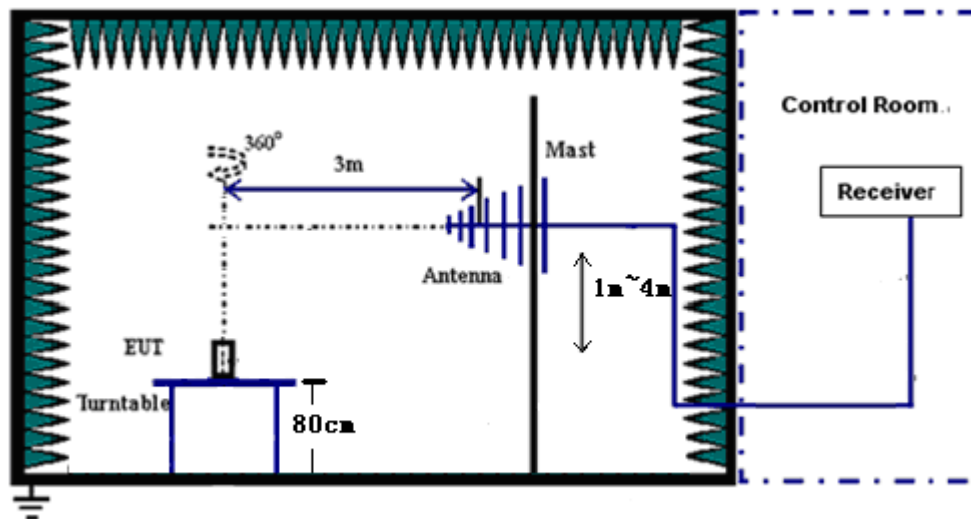


Figure 3. Test set-up

5.1.2 Test Results

The EUT has met the requirements for Radiated Emission of enclosure port.

Table 8 Test Limits

Frequency of Emission (MHz)	Radiated Limit	
	Unit($\mu\text{V}/\text{m}$)	Unit($\text{dB}\mu\text{V}/\text{m}$)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Note: Highest frequency generated or used in the device or on which the device operates or tunes less than 108MHz, so only frequency ranges were tested from 30MHz to 1GHz.

5.2 Conducted Disturbance 0.15 MHz to 30MHz

5.2.1 Test Procedure

The Table-top EUT was placed upon a non-metallic table 0.8 m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.4.

Conducted Disturbance at AC Port measurements were undertaken on the L and N Lines. The emissions were measured using a Quasi-Peak Detector and Average Detector.

Huawei Mobile Station was communicated with the BTS simulator through Air interface, the BTS simulator controls the Mobile Station to transmitter the maximum power which defined in specification of product. The Mobile Station operated on the typical channel.

Measurement bandwidth (RBW) for 150kHz to 30 MHz: 9 kHz;

Test Set-up figure:

The Mobile Station was setup in the screened chamber and operated under nominal conditions.

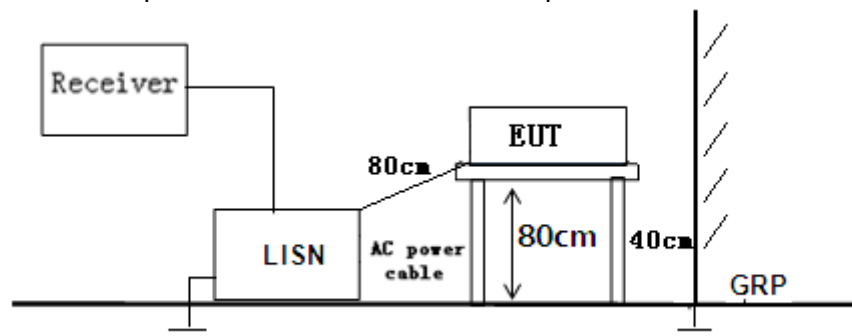


Figure 4. Test Set-up

5.2.2 Test Results

The EUT has met requirements for Conducted disturbance of power lines.

Table 9 Test Limit of DC&AC Power Port

Frequency range	150kHz~ 30MHz	
Classification	Class B	
Limit(Class B)	Voltage limits	
	QP	AV
0.15MHz~0.5MHz	66~56 dB μ V	56~46 dB μ V
0.5MHz~5MHz	56 dB μ V	46 dB μ V
5MHz~30MHz	60 dB μ V	50 dB μ V

6 Main Test Instruments

Table 10 Main Test Equipments

Test item	Test Instrument	Model	Manufacturer	Cal-Date	Cal Interval (month)
RE	EMI Test receiver	ESU26	R&S	Jun.15, 2010	12
	Broadband Antenna	VULB 9163	SCHAFFNER	May.15, 2010	12
CE	EMI Test receiver	ESU26	R&S	Jun.15, 2010	12
	Artificial Mains Network	ENV216	R&S	Jun.15, 2010	12
Software Information					
Test Item	Software Name	Manufacturer		Version	
RE/CE	ES-K1	R&S		1.7.1	

7 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

Table 11 System Measurement Uncertainty

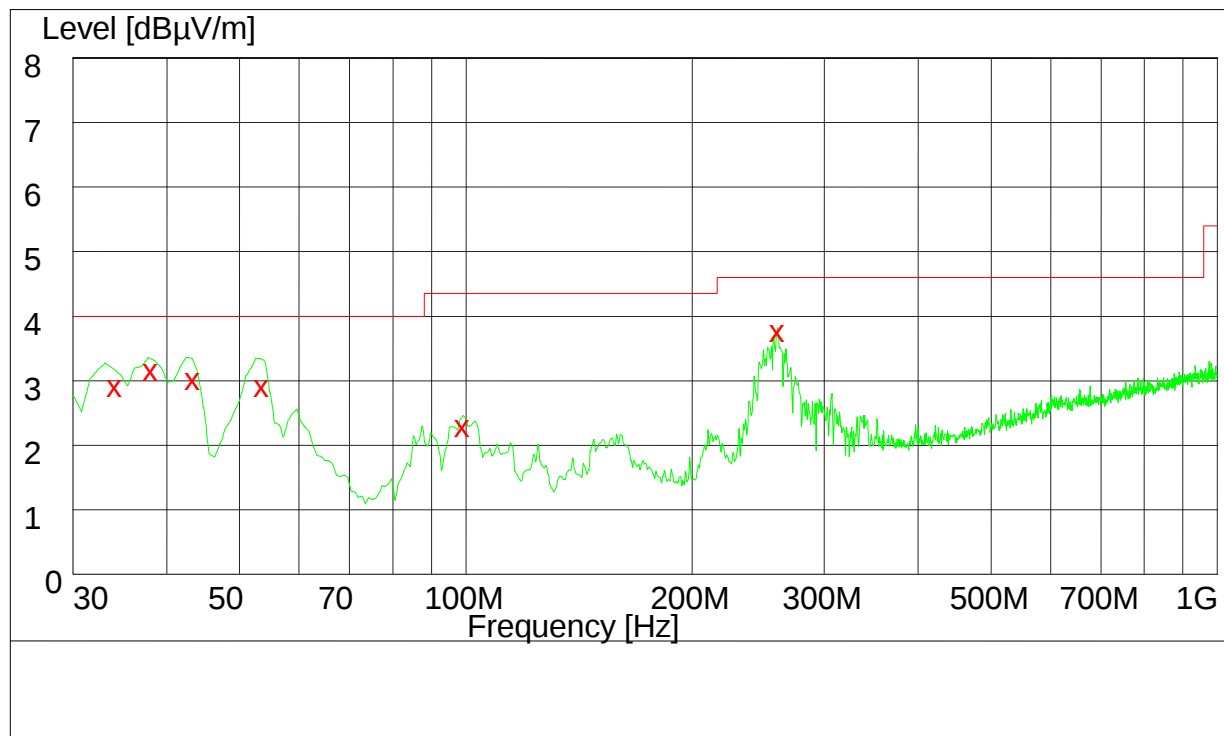
Items		Extended Uncertainty
RE	Field strength (dB μ V/m)	U=4.1dB; k=2(30MHz-1GHz)
CE	Disturbance Voltage (dB μ V)	U=3.4dB; k=2

8 Graph and Data of Emission Test

8.1 Radiated Disturbance

This test was carried out in all the test modes, Here only the worst test result was shown.

30MHz-1GHz



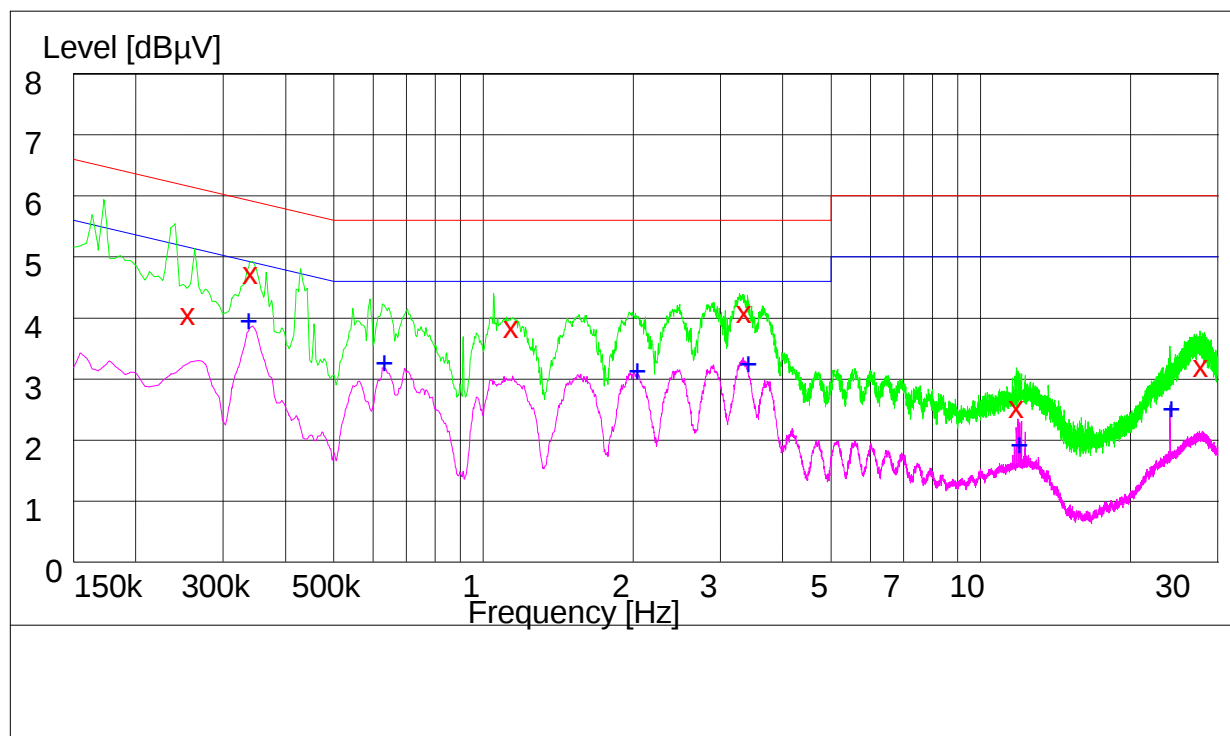
MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
34.004000	29.20	11.7	40.0	10.8	100.0	115.00	VERTICAL
38.000000	31.40	12.6	40.0	8.6	100.0	137.00	VERTICAL
43.196000	30.00	13.1	40.0	10.0	100.0	228.00	VERTICAL
53.400000	29.20	12.7	40.0	10.8	100.0	265.00	VERTICAL
98.824000	23.00	13.0	43.5	20.5	100.0	62.00	VERTICAL
259.216000	37.70	14.2	46.0	8.3	100.0	340.00	HORIZONTAL

9 Conducted Disturbance

This test was carried out in all the test modes, Here only the worst test result was shown.

9.1 AC Power Port Test Data



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.254000	40.50	10.0	62	21.5	N	FLO
0.340000	47.10	10.0	59	11.9	N	FLO
1.134000	38.20	10.1	56	17.8	N	FLO
3.340000	40.70	10.2	56	15.3	N	FLO
11.806000	25.60	10.3	60	34.4	N	FLO
27.608000	31.90	10.4	60	28.1	N	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.336000	39.60	10.0	49	9.4	N	FLO
0.628000	32.40	10.1	46	13.6	N	FLO
2.032000	31.10	10.1	46	14.9	N	FLO
3.384000	32.60	10.2	46	13.4	N	FLO
11.902000	19.00	10.3	50	31.0	N	FLO
24.004000	24.90	10.4	50	25.1	N	FLO

END