



## 47 CFR PART 15 SUBPART B

# TEST REPORT

of

### WCDMA mobile phone

Model Name: A1680  
Brand Name: Motorola  
Report No.: SH10030063E01  
FCC ID: IHDP56LR1  
Type Name: IUQ6-34411A11

*prepared for*

**Motorola Inc. (Mobile Devices Business)**  
600 N. U.S. Highway 45 Libertyville, IL 60048-5343 U.S.A



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LAB CODE 20081223-00

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## 1 TEST CERTIFICATION

Equipment under Test: WCDMA mobile phone

Brand Name: Motorola  
Model Name: A1680  
FCC ID: IHDP56LR1  
Applicant: Motorola Inc. (Mobile Devices Business)  
600 N. U.S. Highway 45 Libertyville, IL 60048-5343 U.S.A  
Manufacturer: Motorola Electronics Taiwan Ltd.  
48F, No.9, Songgao Rd, Taipei 110, Taiwan, R.O.C.

Test Standards: 47 CFR Part 15 Subpart B

Test Date(s): Apr 6 ,2010 –Apr 23 , 2010

Test Result: PASS

### \* We Hereby Certify That:

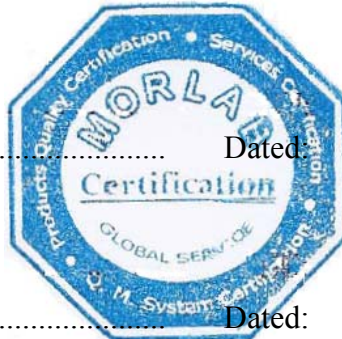
The equipment under test was tested by Shenzhen Electronic Product Quality Testing Center Morlab Laboratory. The test data, data evaluation, test procedures and equipment configurations shown in this report were made in accordance with the requirement of related FCC rules.

The test results of this report only apply for the tested sample equipment identified above. The test report shall be invalid without all the signatures of the test engineer, the reviewer and the approver.

Tested by: Zhang Wenjie Dated: 2010.5.7  
Zhang Wenjie

Reviewed by: Zhang Jun Dated: 2010.5.7  
Zhang Jun

Approved by: Su Feng Dated: 2010.5.7  
Su Feng



## 2 GENERAL INFORMATION

### 2.1 EUT Description

EUT Type .....: WCDMA mobile phone  
Model Name .....: A1680  
Serial No.....: (n.a)  
IMEI .....: 0000000000000000  
Hardware Version ..... : P3  
Software Version .....: E28.0006\_A.1.6\_01.21I  
Modulation Type.....: GMSK/8PSK/QPSK/16QAM  
Power Supply .....: Battery  
Brand name: Motorola  
Mode Name.: BT60  
Capacitance: 1130mAh  
Rated voltage: 3.7V  
Charge limited: 4.2V  
Manufacturer: Motorola (China) Electronics Ltd.  
No. 10 4th Avenue. TEDA Tanggu,Tianjin  
300457,P.R.C..

Ancillary Equipment 1 .....: AC Adapter (Charger for Battery)  
Brand name: Motorola  
Mode Name.: DC4050US0301  
Rated Input: AC 100/240V,200mA,50/60Hz  
Rated Output: DC 5.1V,850mA  
Manufacturer: Motorola (China) Electronics Ltd.  
No. 10 4th Avenue. TEDA Tanggu,Tianjin  
300457,P.R.C..

Note 1: The EUT is a model of GSM 850/900/1800/1900、WCDMA 2100、HSDPA、GPRS、EDGE、Bluetooth、WIFI mobile phone.

Note 2: The normal configuration for the EUT is the MS associated with ancillary equipments e.g.theBattery and/or the AC Adapter(Charger).

Note 3: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

## 2.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart B:

No.	Identity	Document Title
1	47 CFR Part 15 (10-1-05 Edition)	Radio Frequency Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Result
1	15.107	Conducted Emission	PASS
2	15.109	Radiated Emission	PASS

## 2.3 Facilities and Accreditations

### 2.3.1 Facilities

Shenzhen Electronic Product Quality Testing Center Morlab Laboratory is a testing organization accredited by China National Accreditation Service for Laboratories (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659.

All measurement facilities used to collect the measurement data are located at Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen 518055 CHINA. The test site is constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22; the FCC registration number is 741109.

### 2.3.2 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	20 – 25
Relative Humidity (%):	40 – 60
Atmospheric Pressure (kPa):	96

### 3 TEST CONDITIONS SETTING

#### 3.1 Test Mode

1. The test modes of the EUT are showed as below:

- a) The first test mode (GSM)

The EUT configuration of the emission tests is EUT + Battery + Charger.

During the measurement, the lithium battery was installed into the EUT, and the charger was connected to the EUT. A communication link was established between the EUT and a System Simulator (SS).

- b) The second test mode (GPRS)

The EUT configuration of the emission tests is EUT + Battery + Charger.

In this test mode, a GPRS link was established between the EUT and a System Simulator (SS); data was transmitted between EUT and System Simulator (SS), and maintained during the measurement.

- c) The third test mode (EDGE)

The EUT configuration of the emission tests is EUT + Battery + Charger.

In this test mode, a EDGE link was established between the EUT and a System Simulator (SS); data was transmitted between EUT and System Simulator (SS), and maintained during the measurement.

- d) The fourth test mode (WCDMA)

The EUT configuration of the emission tests is EUT + Battery + Charger.

During the measurement, the lithium battery was installed into the EUT, and the charger was connected to the EUT. A communication link was established between the EUT and a System Simulator (SS).

- e) The fifth test mode (HSDPA)

The EUT configuration of the emission tests is EUT + Battery + Charger.

In this test mode, a EDGE link was established between the EUT and a System Simulator (SS); data was transmitted between EUT and System Simulator (SS), and maintained during the measurement.

- f) The sixth test mode (Bluetooth)

The EUT configuration of the emission test is EUT + Battery + Charger.

In this test mode ,a Bluetooth link was established between the EUT and a System Simulator(SS); data was transmitted between EUT and System Simulator (SS), and maintained during the measurement.

- g) The seventh test mode (WIFI)

The EUT configuration of the emission test is EUT + Battery + Charger.

In this test mode , a WIFI link was established between the EUT and a System Simulator(SS); data was transmitted between EUT and System Simulator (SS), and maintained during the measurement.

h) The eighth test mode (EUT+PC)

The EUT configuration of the emission test is EUT + Battery + Charger+PC.

In this test mode , a connection was established between the EUT and a PC; data was transmitted between EUT and the PC, and maintained during the measurement.

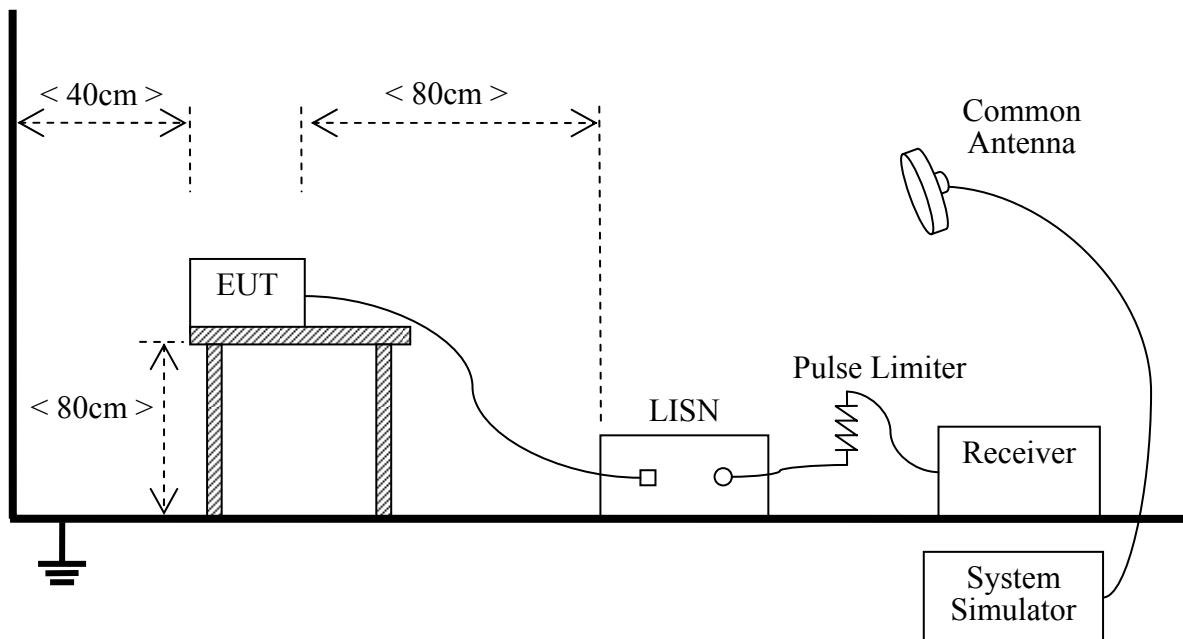
NOTE:

All test modes are performed, only the worst cases are recorded in this report.

## 3.2 Test Setup and Equipments List

### 3.2.1 Conducted Emission

#### A. Test Setup:



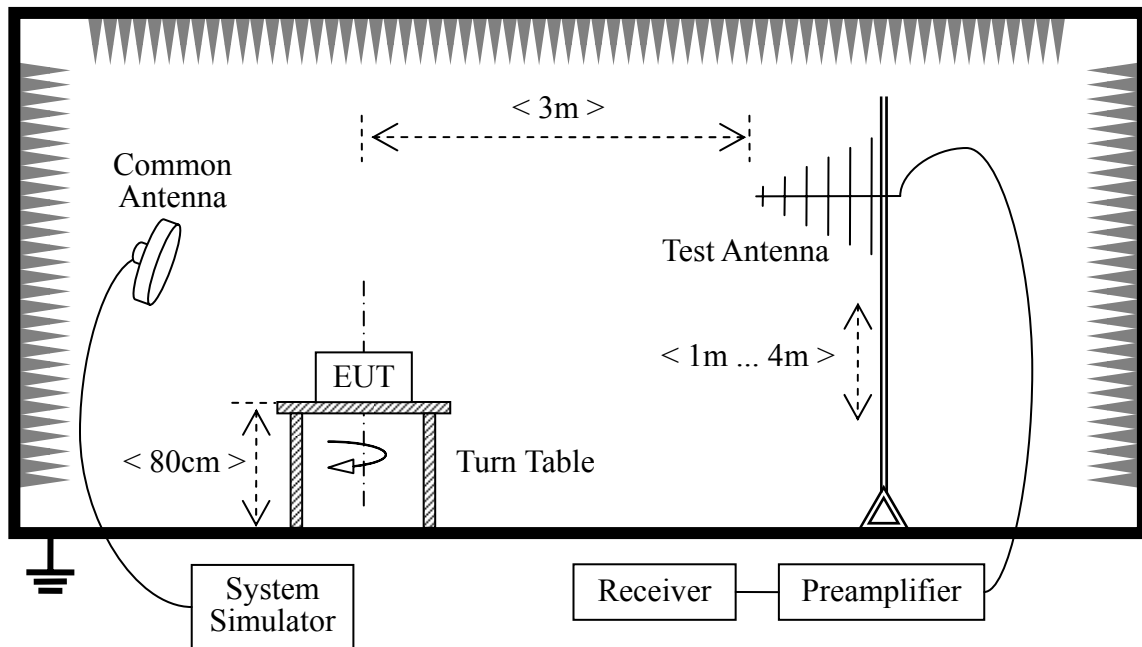
The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides  $50\Omega/50\mu\text{H}$  of coupling impedance for the measuring instrument. The Common Antenna is used for the call between the EUT and the System Simulator (SS). A Pulse Limiter is used to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.

#### B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Receiver	Rohde&Schwarz	ESCI3	100666	2009.10	1year
LISN	Rohde&Schwarz	ENV216	812744	2009.10	1year
System Simulator	Rohde&Schwarz	CMU200	105571	2009.10	1year
Personal Computer	Lenovo	(n.a.)	(n.a.)	(n.a.)	(n.a.)

### 3.2.2 Radiated Emission

#### C. Test Setup:



The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor, cable loss and so on of the site (factors) is calculated to correct the reading. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted on a variable-height antenna master tower. The Common Antenna is used for the call between the EUT and the System Simulator (SS).

#### D. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Receiver	Rohde&Schwarz	ESCI3	100666	2009.10	1year
Full-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	2009.10	1year
Test Antenna - Bi-Log	Rohde&Schwarz	HL562	100385	2009.10	1year
System Simulator	Rohde&Schwarz	CMU200	105571	2009.10	1year
Personal Computer	Lenovo	(n.a.)	(n.a.)	(n.a.)	(n.a.)

## 47 CFR PART 15B REQUIREMENTS

### 4 Conducted Emission

#### 4.1 Requirement

According to FCC section 15.107, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 $\mu$ H/50 $\Omega$  line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dB $\mu$ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5- 30	60	50

NOTE:

- The limit subjects to the Class B digital device.
- The lower limit shall apply at the band edges.
- The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

#### 4.2 Test Description

See section 3.2.1 of this report.

#### 4.3 Test Result

The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. All test modes are considered, refer to recorded points and plots below.

##### 4.3.1.1 Test Mode

###### 4.3.1.1.1 The test mode

The EUT configuration of the emission tests is EUT + Battery + Charger.

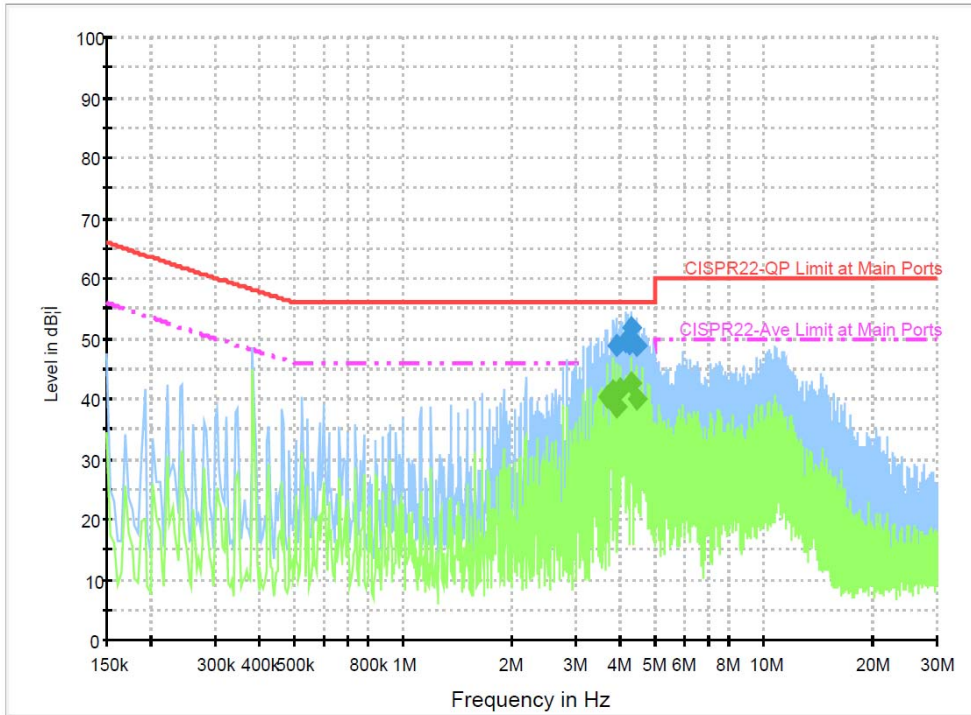
#### A. Test Verdict Recorded for Suspicious Points:



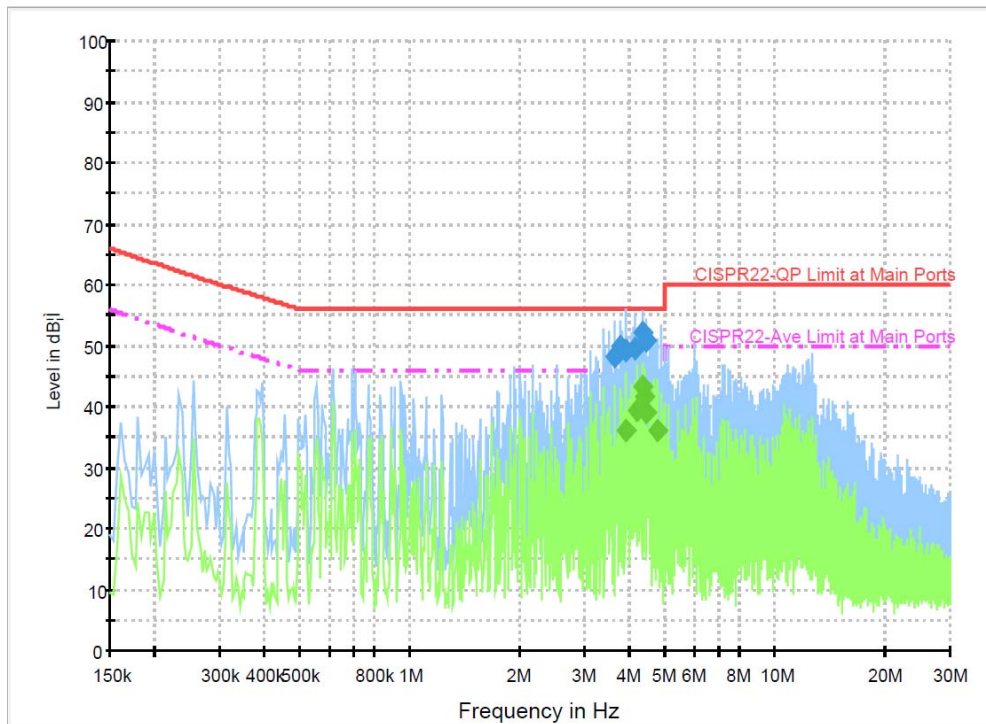
Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Meas. Time (ms)	Band width (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)	Comment
3.605138	48.2	1000.000	9.000	N	9.9	7.8	56.0	PASS
3.769312	49.8	1000.000	9.000	N	9.9	6.2	56.0	PASS
3.884981	49.2	1000.000	9.000	N	9.9	6.8	56.0	PASS
4.123781	49.4	1000.000	9.000	N	9.9	6.6	56.0	PASS
4.321538	52.1	1000.000	9.000	N	9.9	3.9	56.0	PASS
4.437206	50.7	1000.000	9.000	N	9.9	5.3	56.0	PASS
3.892444	48.7	1000.000	9.000	L1	9.9	7.3	56.0	PASS
4.112588	49.7	1000.000	9.000	L1	9.9	6.3	56.0	PASS
4.190944	49.9	1000.000	9.000	L1	9.9	6.1	56.0	PASS
4.209600	49.3	1000.000	9.000	L1	9.9	6.7	56.0	PASS
4.269300	51.8	1000.000	9.000	L1	9.9	4.2	56.0	PASS
4.429744	49.0	1000.000	9.000	L1	9.9	7.0	56.0	PASS

Frequency (MHz)	Average (dB $\mu$ V)	Meas. Time (ms)	Band width (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)	Comment
3.884981	36.0	1000.000	9.000	N	9.9	10.0	46.0	PASS
4.161094	39.4	1000.000	9.000	N	9.9	6.6	46.0	PASS
4.321538	43.2	1000.000	9.000	N	9.9	2.8	46.0	PASS
4.381238	41.7	1000.000	9.000	N	9.9	4.3	46.0	PASS
4.437206	38.9	1000.000	9.000	N	9.9	7.1	46.0	PASS
4.717050	35.9	1000.000	9.000	N	9.9	10.1	46.0	PASS
3.676031	40.3	1000.000	9.000	L1	9.9	5.7	46.0	PASS
3.814088	41.3	1000.000	9.000	L1	9.8	4.7	46.0	PASS
3.892444	38.7	1000.000	9.000	L1	9.9	7.3	46.0	PASS
3.955875	41.7	1000.000	9.000	L1	9.9	4.3	46.0	PASS
4.269300	42.6	1000.000	9.000	L1	9.9	3.4	46.0	PASS
4.411088	40.1	1000.000	9.000	L1	9.9	5.9	46.0	PASS

**B. Test Plot:**



(Plot: L Phase)



(Plot: N Phase)

## 5 Radiated Emission

### 5.1 Requirement

According to FCC section 15.109, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency range (MHz)	Field Strength	
	$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

NOTE:

- Field Strength ( $\text{dB}\mu\text{V/m}$ ) =  $20 \cdot \log[\text{Field Strength } (\mu\text{V/m})]$ .
- In the emission tables above, the tighter limit applies at the band edges.

### 5.2 Test Description

See section 3.2.2 of this report.

### 5.3 Test Result

The maximum radiated emission is searched using PK, QP and AV detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with AV and QP detectors. Both the vertical and the horizontal polarizations of the Test Antenna are considered to perform the tests. All test modes are considered, refer to recorded points and plots below.

#### 5.3.1.1 Test Mode

##### 5.3.1.1.1 The test mode

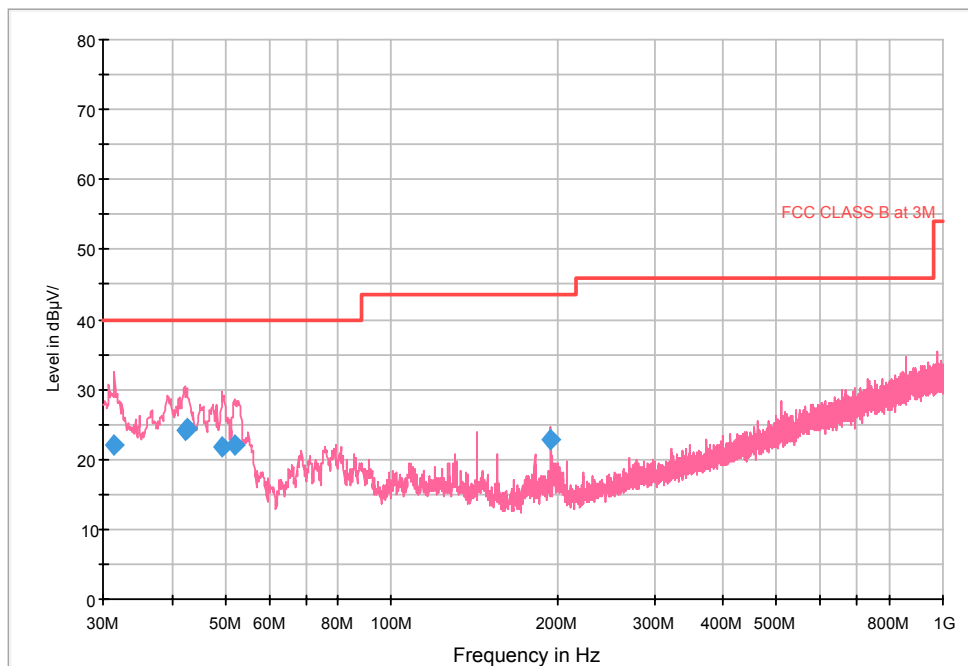
The EUT configuration of the emission tests is EUT + Battery + Charger.

**A. Test Verdict Recorded:**

No.	@Frequency (MHz)	Measured Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)	Margin (dB)	Verdict
		QP	Polarity			
1	31.455000	22.1	V	40.0	17.9	PASS
2	42.246250	24.1	V	40.0	15.9	PASS
3	42.610000	24.3	V	40.0	15.7	PASS
4	49.400000	21.7	V	40.0	18.3	PASS
5	52.067500	22.0	V	40.0	18.0	PASS
6	195.021250	22.7	V	43.5	20.8	PASS
7	31.818750	17.6	H	40.0	22.4	PASS
8	67.830000	13.4	H	40.0	26.6	PASS
9	90.988750	24.8	H	43.5	18.7	PASS
10	103.962500	17.7	H	43.5	25.8	PASS
11	143.005000	21.5	H	43.5	22.0	PASS
12	195.021250	20.5	H </td <td>43.5</td> <td>21.0</td> <td>PASS</td>	43.5	21.0	PASS

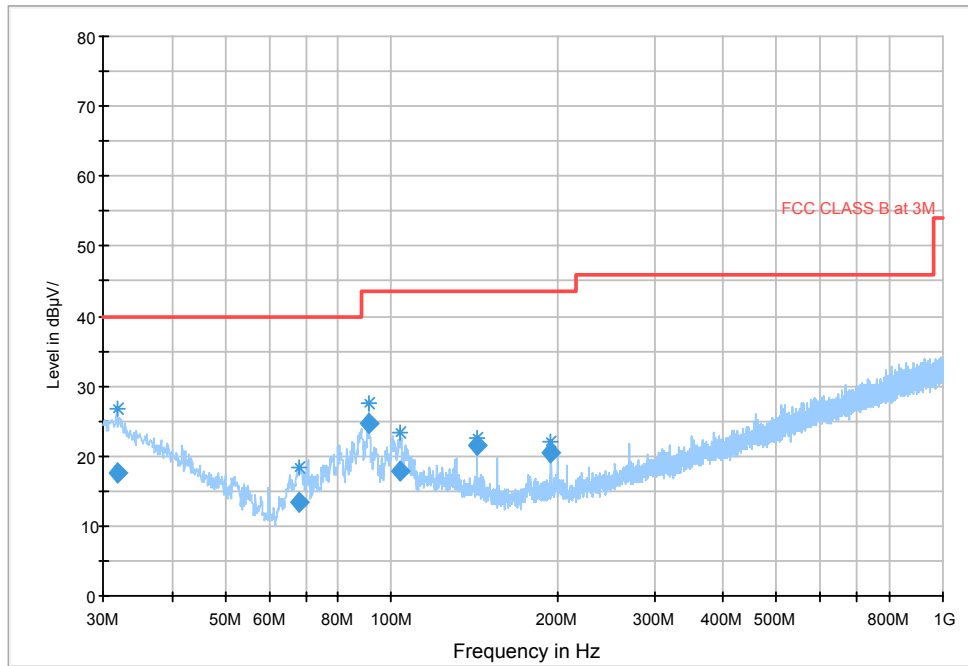
**B. Test Plot:**

MORLAB-RE\_HL562 Auto-FCC limit Test



(Plot: Test Antenna Vertical)

MORLAB-RE\_HL562 Auto-FCC limit Test



(Plot: Test Antenna Horizontal)

**\*\* END OF REPORT \*\***