



EMC Test Report

Product Name: Handset Phone

Model Number: F261

Report No: SYBH(Z-EMC)075052011-2

FCC ID:QISF261

Reliability Laboratory of Huawei Technologies Co., Ltd.

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Notice 1

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2. The laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 97456.
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Notice 2

Modification Information:

Modification Information

Modification Information	1	
	2	
	3	<i>Not Applicable!</i>
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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	Handset Phone
MANUFACTURERS MODEL NUMBER	F261

1.2 Test Site

Site 1:

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

1.3 Test environment condition

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

2 Summary of Results

Table below shows a brief summary of the results obtained.
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 (TM2)	N/A	Pass	Site1
<u>Conducted Emissions</u>	TC1 (TM1-TM2)	N/A	Pass	Site1
<u>Radiated Spurious Emissions</u> Enclosure Port	TC1 (TM1)	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

F261 are Handset Phones. It's operated in Band Class 0 (800MHz). The Handset Phone implements such functions as RF signal receiving / Transmitting, CDMA protocol processing, voice, etc. The TX is 824MHz-849MHz and the RX 869MHz-894MHz.

Externally it provides Mini-USB interface to computers and power supply.

3.1.1 Main Equipment Technical Data

Description:	Handset Phone
Models:	F261
Input Rated Voltage	5V
Rated Consumption Power:	Max 2.0 W
Maximum Emission Power:	Max 30dBm(E.R.P.)
Dimensions	106 (length) × 44.5 (width) × 13.5 (height) (mm ³)
Weight	65g

Sub-Assembly Identity

Mode		Work Frequency	
		Transmitt Frequency (MHz)	Receive Frequency (MHz)
CDMA	Band Class 0	824-849	869-894

Sub-Assembly Identity

Board				
Model Name	Qty.	Serial		Description
F261	1	B9R6RB1141400160		Centre Processing Unit
Accessory				
Name	Qty.	Manufacture	Serials number	Description
Adapter	1	Huawei Technologies Co., Ltd.	TPAB11255128	Adapter Model: HS-050040E1 voltage nominal: ~120V Input Voltage : 100-240V ~50/60Hz, 0.2A Output Voltage: == 5V 400mA
Adapter	1	Huawei Technologies Co., Ltd.	BYAA70709949	Adapter Model: HS-050040E1 voltage nominal: ~120V Input Voltage : 100-240V ~50/60Hz, 0.2A Output Voltage: == 5V 400mA
Adapter	1	Huawei Technologies Co., Ltd.	HKAA80882822	Adapter Model: HS-050040E1 voltage nominal: ~120V Input Voltage : 100-240V ~50/60Hz, 0.2A Output Voltage: == 5V 400mA
Adapter	1	Huawei Technologies Co., Ltd.	TPAB31864694	Adapter Model: HS-050040E7 voltage nominal: ~120V Input Voltage : 100-240V ~50/60Hz, 0.2A

				Output Voltage: 
Adapter	1	Huawei Technologies Co., Ltd.	BYAA42106934	Adapter Model: HS-050040E7 voltage nominal: ~120V Input Voltage : 100-240V ~50/60Hz, 0.2A Output Voltage: 
Adapter	1	Huawei Technologies Co., Ltd.	HKAB30887786	Adapter Model: HS-050040E7 voltage nominal: ~120V Input Voltage : 100-240V ~50/60Hz, 0.2A Output Voltage: 
Rechargeable Li-ion	1	Huawei Technologies Co., Ltd.	GAGB404XC14E706 2	Battery Model: HB6A2L Rated capacity: 1000mAh Nominal Voltage:  +3.7V 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

Cable Used during Test

Port	Quantity	Type of Cable
POWER	1	Non-shielding

4.2 Associated Equipment Used during Test

Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Cal Date
Radio Communication Tester	CMU200	R&S	3607111817	2010-7-23

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).

Configuration table

TC1	TM1~TM2
-----	---------

4.3.2 Test Mode

There were 2 test Modes. TM1 to TM2 were shown in the diagrams below:

TM1	operate in traffic mode CDMA 800;
TM2	operate in idle mode CDMA 800;

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.

For CDMA, the following conditions shall also be met:
The EUT shall be commanded to operate at maximum transmit power;

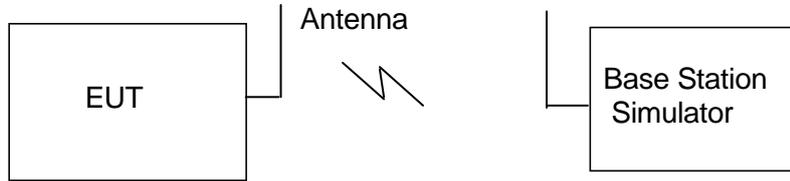


Figure 1.: Test Configuration

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.

The EUT is required to be in the idle mode.

For CDMA, 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.

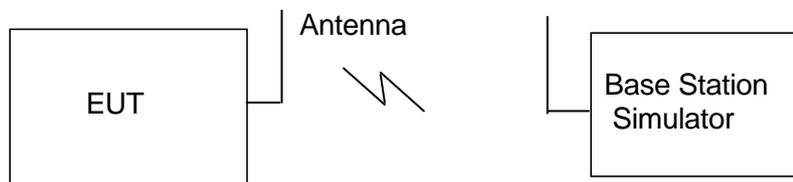


Figure 2. Test Configuration

5 Electromagnetic Interference (EMI)

5.1 Radiated Disturbance

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 C63.4.

A preliminary scan and a final scan of the emissions were made from 30 MHz to 18 GHz by using test script of software; the emissions were measured using Quasi-Peak Detector (30MHz~1GHz) and AV detector (above 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

Measurement bandwidth: 1GHz – 18GHz: 1MHz

Test set up figure:

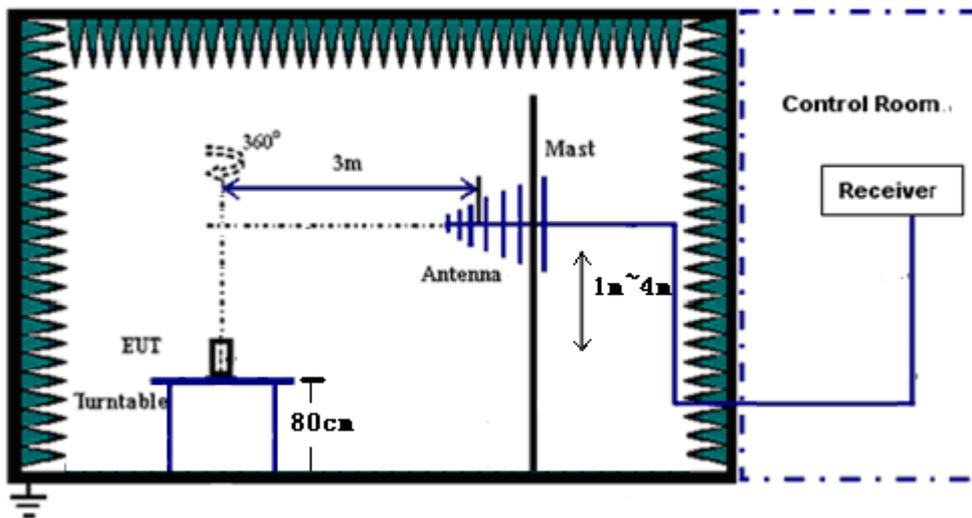


Figure 3. Test set-up

5.1.2 Test Results

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

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.

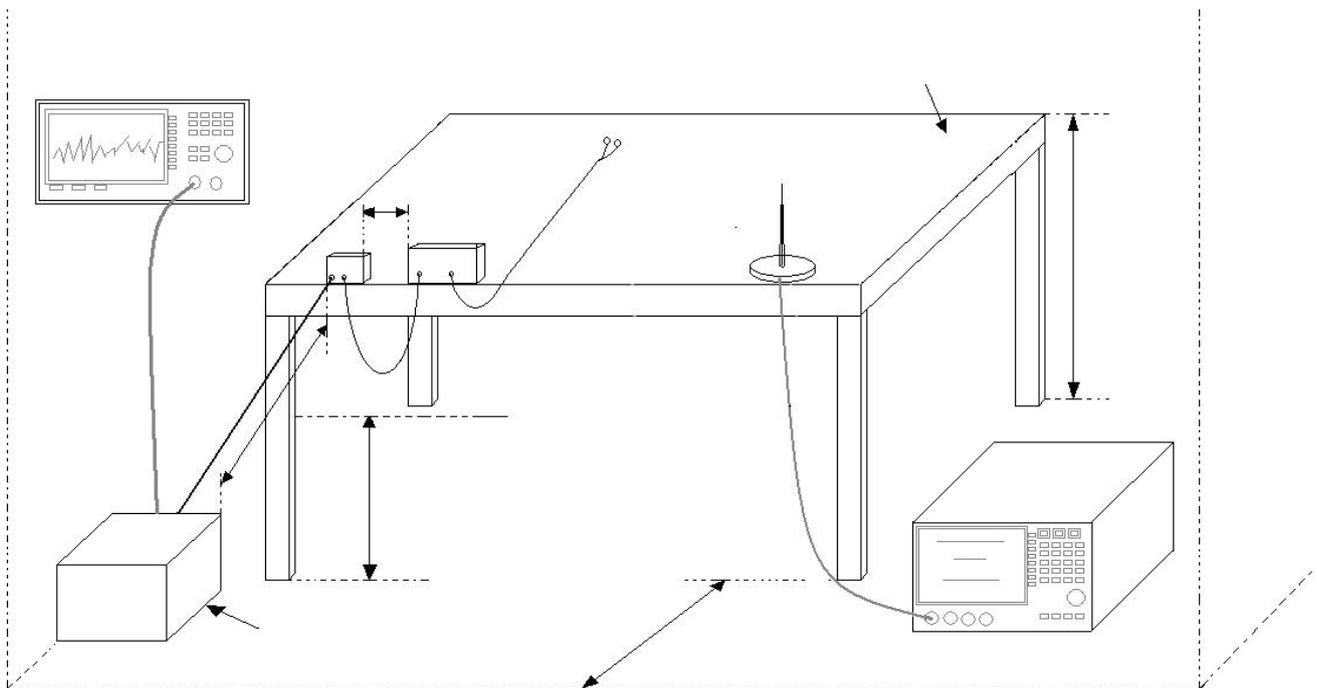


Figure 4. Test Set-up

5.2.2 Test Results

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

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

5.3 Radiated Spurious Emissions

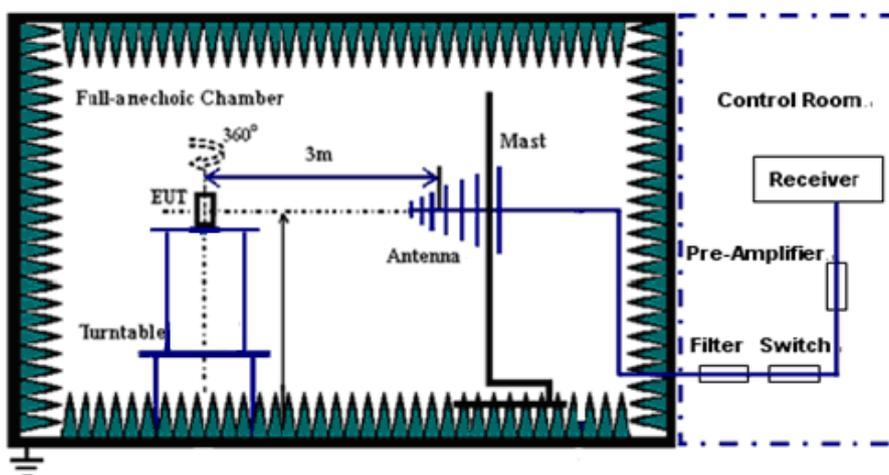
5.3.1 Test Procedure

A test site fulfilling the requirements of ITU-R Recommendation SM329 was used. The EUT was placed on a non-conducting support in the anechoic chamber and was operated from a power source via an RF filter to avoid radiation from the power leads.

Step 1:

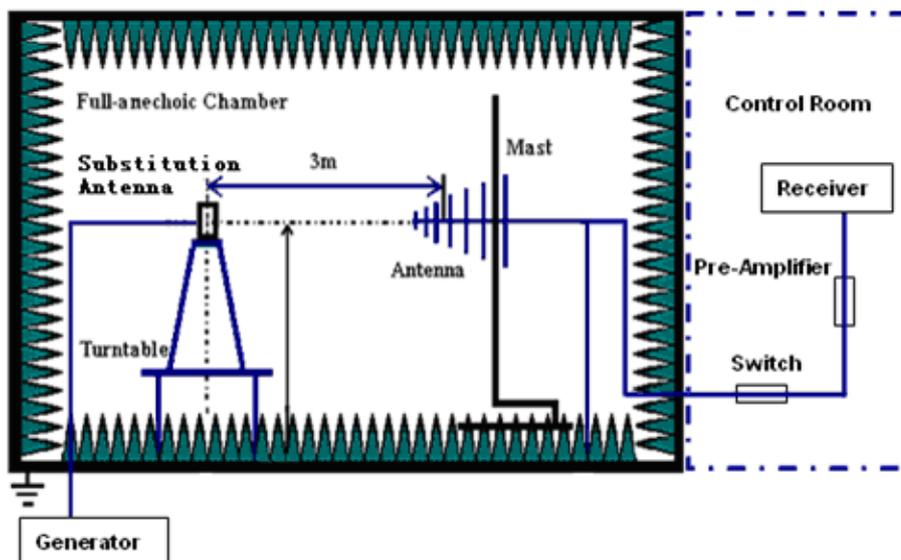
For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, EIRP shall be measured when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in 2.1033(c)(8). Connect the EUT to the BTS simulator via the air interface.

Test the Radiated maximum output power by the Test Receiver from test antenna.



Step 2:

Use substitution method to verify the maximum output power. The EUT is substituted by a dipole antenna. The dipole is connected to a signal generator. And then adjust the output level of the signal generator to get the same received power recorded in step1 on Test Receiver, and record the power level of Signal Generator. Of course, the cable loss at the test frequency should be compensated.



Test should be performed in normal voltage condition.

According to part 22.917, the defined measurement bandwidth as following:

22.917(b) Measurement procedure: Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater.

Measurement bandwidth (RBW) for 9 kHz up to 150 kHz: 10 kHz;
Measurement bandwidth (RBW) for 150 kHz up to 30 MHz: 10 kHz;
Measurement bandwidth (RBW) for 30MHz up to 1 GHz: 100 kHz;
Measurement bandwidth (RBW) for 1GHz up to 18GHz: 1MHz;

Radiated Spurious Emissions Limits

Frequency band	Minimum requirement (E.R.P) traffic mode
9KHz~18GHz	-13dBm

No peak found in pre- test. All frequency points' margin is bigger than 20dB, so the substitution method isn't used.

Calculation Sample:

Substitution Results

Freq. [MHz]	Measurement Value [dBm]	Substitution Antenna Type	Gain [dBd]	Cable Loss [dB]	Signal Generator Level [dBm]	Substitution Level [dBm]	FCC limit [dBm]	Result

Note: For get the E.R.P. (Efficient Radiated Power) in substitution method, the following formula should take to calculate it,

$$\text{E.R.P. [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBd]}$$

NOTE: SGP- Signal Generator Level

5.3.2 Test Results

The EUT has met the requirements of FCC Part 22.

6 Main Test Instruments

Main Test Equipments

Test item	Test Instrument	Model	Manufacturer	Cal-Date	Cal Interval (month)
RE&CE	EMI Test receiver	ESU26	R&S	Jun.25, 2010	12
	Broadband Antenna	VULB 9163	SCHWARZBECK	May.15, 2010	12
	Horn Antenna	HF906	R&S	May.15, 2010	12
	LISN	ENV216	R&S	Jun.25.2010	12
RSE	EMI Test receiver	FSU40	R&S	Jun.24,2010	12
	Broadband Antenna	VULB 9163	SCHWARZBECK	Jun.29,2010	12
	Horn Antenna	HF906	R&S	Sep.29,2010	12
Software Information					
Test Item	Software Name	Manufacturer		Version	
RE/CE	ES-K1	R&S		1.7.1	
RSE	EMC32	R&S		V8.10.10	

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:

System Measurement Uncertainty

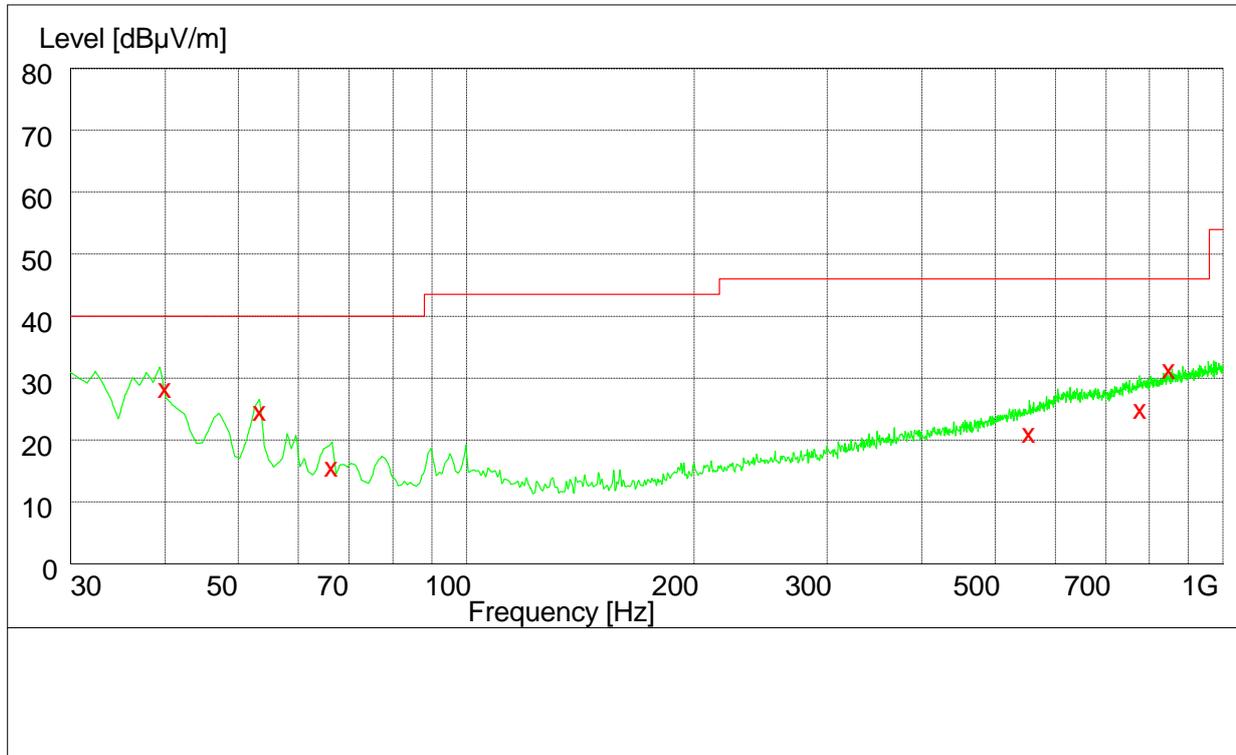
Items		Extended Uncertainty
RE	Field strength (dB μ V/m)	U=4.1dB; k=2(30MHz-1GHz)
RSE	ERP (dBm)	U=2.8dB; k=2
CE	Disturbance Voltage (dB μ V)	U=3.4dB; k=2

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

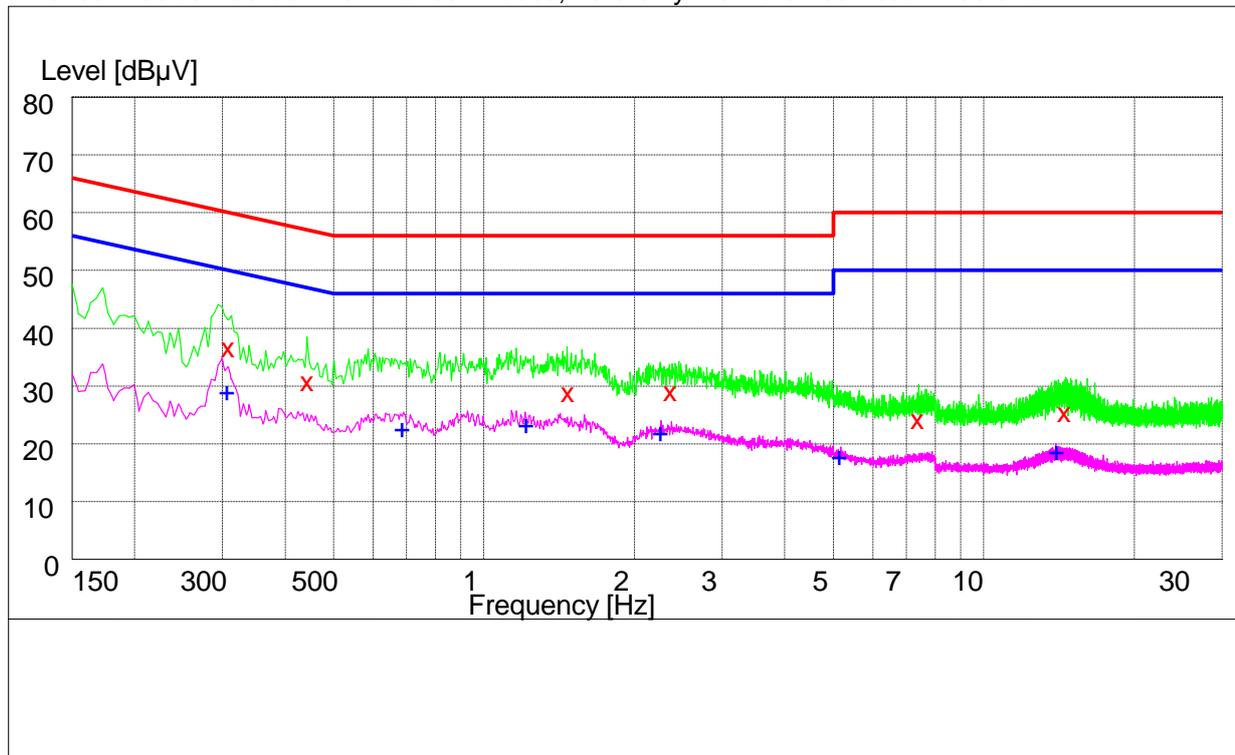


MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
40.020000	28.70	13.1	40.0	11.3	100.0	204.00	VERTICAL
53.340000	25.10	12.7	40.0	14.9	100.0	0.00	HORIZONTAL
66.420000	16.00	9.8	40.0	24.0	127.0	230.00	VERTICAL
555.060000	21.10	21.5	46.0	24.9	100.0	315.00	VERTICAL
776.460000	25.30	24.4	46.0	20.7	178.0	275.00	HORIZONTAL
848.820000	31.80	25.5	46.0	14.2	100.0	0.00	VERTICAL

8.2 Conducted Disturbance

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



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.308000	37.10	10.0	60	22.9	N	FLO
0.444000	30.90	10.1	57	26.1	N	FLO
1.476000	29.40	10.1	56	26.6	N	FLO
2.370000	29.10	10.1	56	26.9	L1	FLO
7.388000	24.70	10.2	60	35.3	N	FLO
14.506000	25.90	10.3	60	34.1	N	FLO

MEASUREMENT RESULT: AV Detector

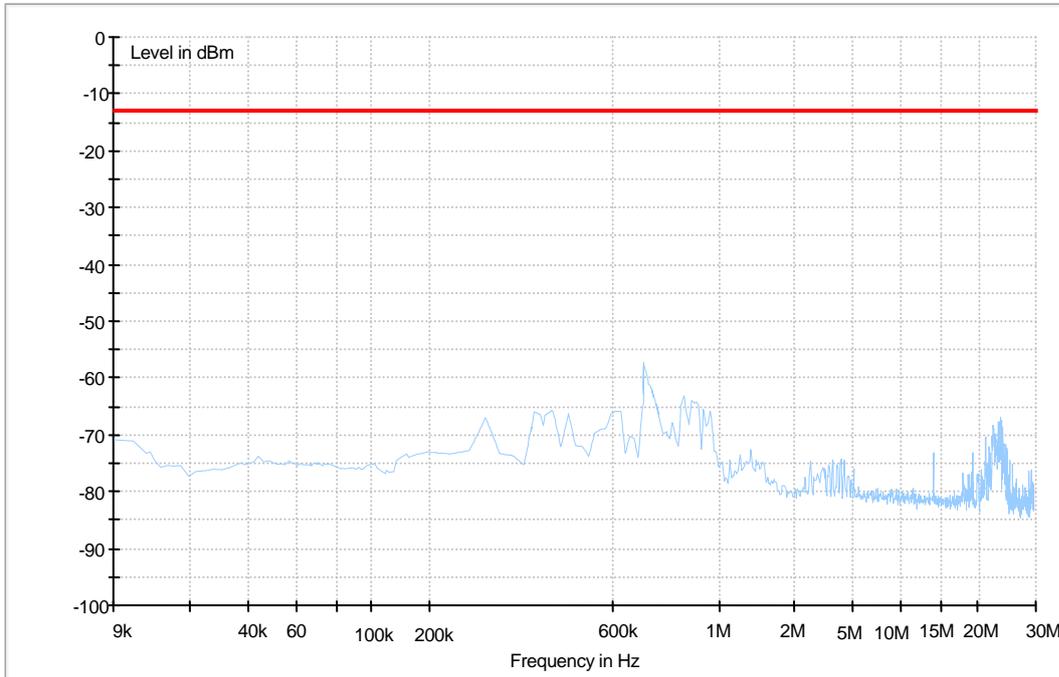
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.306000	29.60	10.0	50	20.4	N	FLO
0.686000	23.20	10.1	46	22.8	N	FLO
1.212000	23.90	10.1	46	22.1	L1	FLO
2.250000	22.80	10.1	46	23.2	L1	FLO
5.140000	18.80	10.2	50	31.2	N	FLO
13.966000	19.60	10.3	50	30.4	N	FLO

8.3 Radiated Spurious Emission

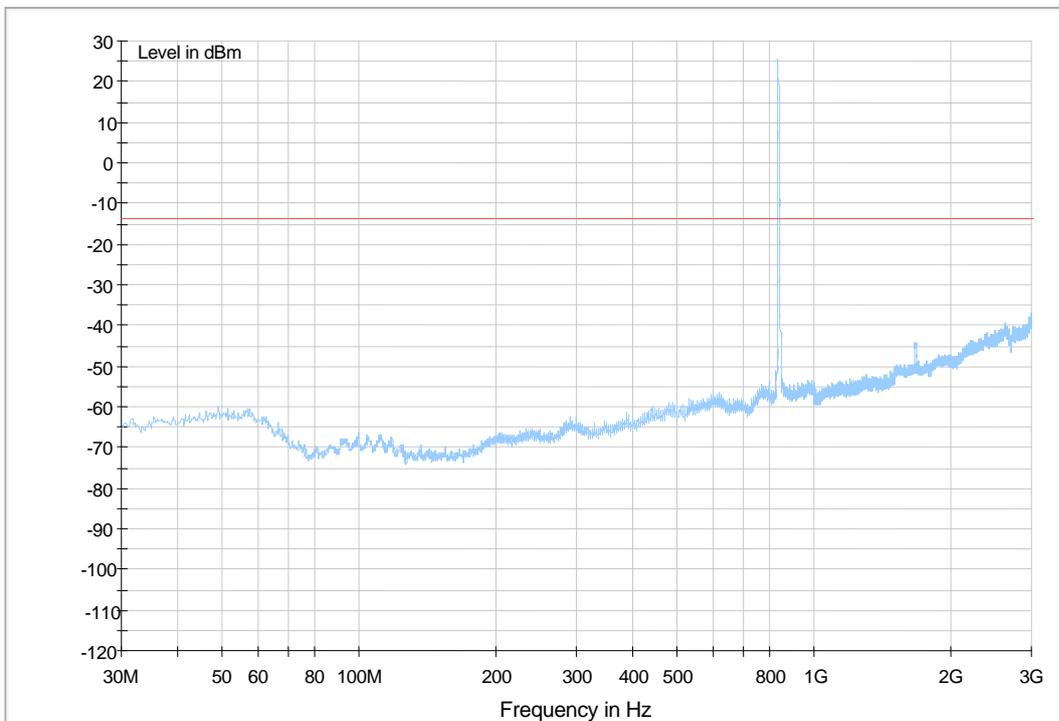
This test results are the maximum level of radiated spurious emissions in vertical and horizontal polarity. The highest peak exceeds the limit line is carrier frequency

8.3.1 For CDMA 800

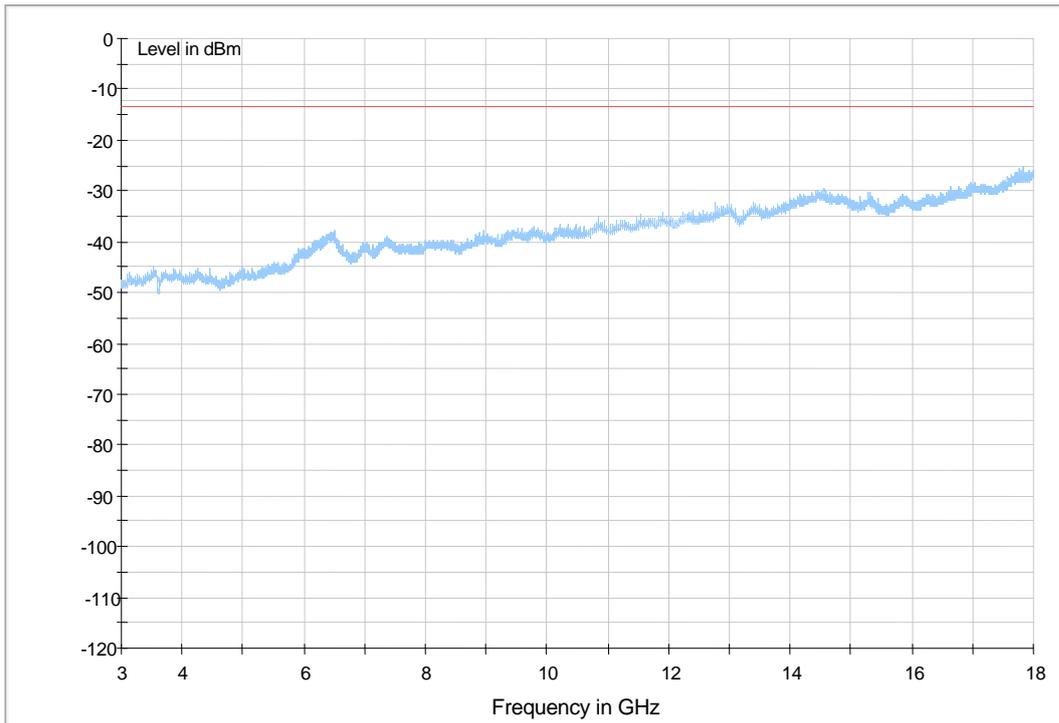
Traffic Mode (9kHz-30MHz)



Traffic Mode (30MHz-3GHz)



Traffic Mode (3GHz-18GHz)



-----**END**-----