## 47 CFR PART 15 SUBPART B

# TEST REPORT

of

**GSM/WCDMA mobile phone**

| | |
|---|---|
| Model Name: | Perai-H |
| Brand Name: | TechFaith |
| Report No.: | SZ07060024E05 |
| FCC ID: | UJQ-09438T |

*prepared for*

**TechFaith Wireless Technology Group Limited.**
No. 10A, Tower D2, IT Park, Electronic Town, Jiu Xian Qiao North Road,
Chao Yang District, Beijing, China (100015)


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# 1. TEST CERTIFICATION

| | |
|---|---|
| Equipment under Test: | GSM/WCDMA mobile phone |
| Brand Name: | TechFaith |
| Model Name: | Perai-H |
| FCC ID: | UJQ-09438T |
| Applicant: | TechFaith Wireless Technology Group Limited. No. 10A, Tower D2, IT Park, Electronic Town, Jiu Xian Qiao North Road, Chao Yang District, Beijing, China (100015) |
| Manufacturer: | TechFaith Wireless Technology Group Limited. No. 10A, Tower D2, IT Park, Electronic Town, Jiu Xian Qiao North Road, Chao Yang District, Beijing, China (100015) |
| Test Standards: | 47 CFR Part 15 Subpart B |
| Test Date(s): | July 25, 2007 – July 27, 2007 |
| 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: Luo Biao Dated: 2007.08.23
Luo Biao

Reviewed by: weiyanquan Dated: 2007.08.25
Wei Yanquan

Approved by: Zeng Dexin Dated: 2007.08.23
Zeng dexin

# 2. GENERAL INFORMATION

## 2.1 EUT Description

| | | |
|---|---|---|
| EUT Type | : | GSM/WCDMA mobile phone |
| Model Name | : | Perai-H |
| Serial No. | : | (n.a, marked #1 by test site) |
| IMEI | : | 355792015105151 |
| Hardware Version | : | EP2 |
| Software Version | : | TF_WM6_Perai_H_VER_02.02 |
| Modulation Type | : | GMSK |
| Power Supply | : | Battery |
| | | Brand name: XWORD |
| | | Mode no.: US454261A8T |
| | | Capacitance: 1500mAh |
| | | Rated voltage: 3.7V |
| | | Charge limited: 4.2V |
| | | Manufacturer: XWORD |
| | | Manufacturer Address: (n.a) |
| Ancillary Equipment 1 | : | AC Adapter (Charger for Battery) |
| | | Model Name: MPW0508 |
| | | Brand Name: TAMURA |
| | | Serial No.: (n.a. marked #1 by test site) |
| | | Rated Input: ~ 100-240V, 0.2A,50/60Hz |
| | | Rated Output: ⎓ 5V, 800mA |
| | | Manufacturer: (n.a) |
| | | Wire Length: 105cm |

*Note 1:* The EUT is a GSM /WCDMA terminal which include Bluetooth Module and Wi-Fi Module; it supports GSM 850MHz, 900MHz, 1800MHz, 1900MHz and WCDMA bands, GSM 850MHz, 1900MHz and WCDMA bands are tested in this report.

*Note 2:* A communication link between the EUT and the Bluetooth Earphone are established at the start of the test, and maintained during the all test in this report.

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

## 2.2 EUT Function

The EUT supports Bluetooth function.

The EUT supports Wi-Fi function, Wi-Fi Module can not work in company with GSM/WCDMA at the same time.

The EUT is equipped with a T-Flash card slot; equipped with a special port which can be connected to the ancillary equipments supplied by the manufacturer e.g. the AC Adapter and the USB Adapter Cable.

The EUT outfits an inner Camera.

## 2.3 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<br>(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 |

## 2.4 Facilities and Accreditations

### 2.4.1 Facilities

Shenzhen Electronic Product Quality Testing Center Morlab Laboratory is a testing organization accredited by China National Accreditation Board for Laboratories (CNAL) 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.

### 2.4.2 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): | 960 |

# 3. TEST CONDITIONS SETTING

## 3.1 GSM Test Mode

1. During the measurement, the GSM radio is working. The test modes of the EUT are showed as below:
   (1) Traffic operating mode
   The EUT configuration of the emission tests is EUT + Battery + Charger.
   Before the measurement, the lithium battery was completely discharged.
   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). The EUT operated at GSM 850MHz mid ARFCN (190) and maximum output power (level 5).
   (2) Idle operating mode
   The EUT configuration of the emission tests is EUT + Battery + Charger.
   The EUT was registered to the base station simulator but no call was set up.

NOTE:

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

2. During the measurement, there are two Test Modes that will be tested in Mains Terminal Disturbance Voltage and Radiated Disturbance tests. These test modes are showed as below:
   (1) The first test mode
   The EUT configuration of the emission tests is EUT + Battery + Charger.
   (2) The second test mode
   The EUT configuration of the emission tests is TransFlash Card + EUT + Battery + PC.

   In the second test mode, the EUT with a TransFlash Card embedded is connected with a PC via a special USB cable supplied by applicant. During the measurement, a communication link was established between the EUT and a System Simulator (SS), simultaneity, the date is transmitting between the PC and the TransFlash Card of the EUT.

## 3.2 WCDMA Test Mode

During the measurement, the WCDMA 1900MHz radio is working. The test modes of the EUT are showed as below:

(1) Traffic operating mode
The EUT configuration of the emission tests is EUT + Battery + Charger.
Before the measurement, the lithium battery was completely discharged.

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).

(2) Idle operating mode

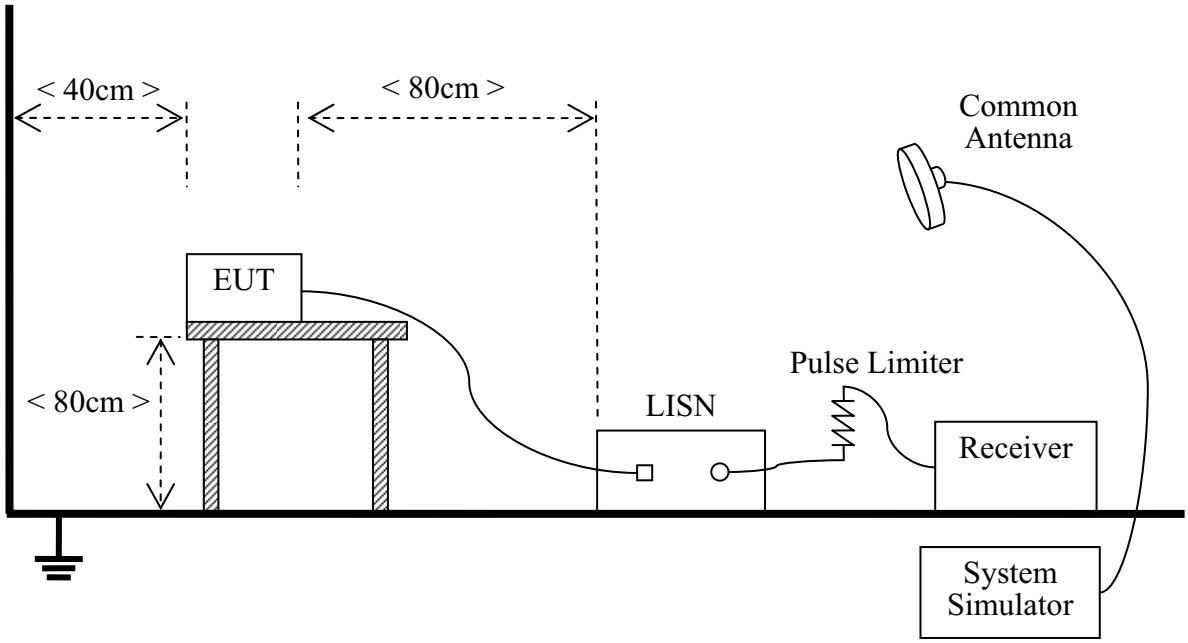
The EUT configuration of the emission tests is EUT + Battery + Charger.

The EUT was registered to the base station simulator but no call was set up.

## 3.3 Test Setup and Equipments List

### 3.3.1 Conducted Emission

**A. Test Setup:**



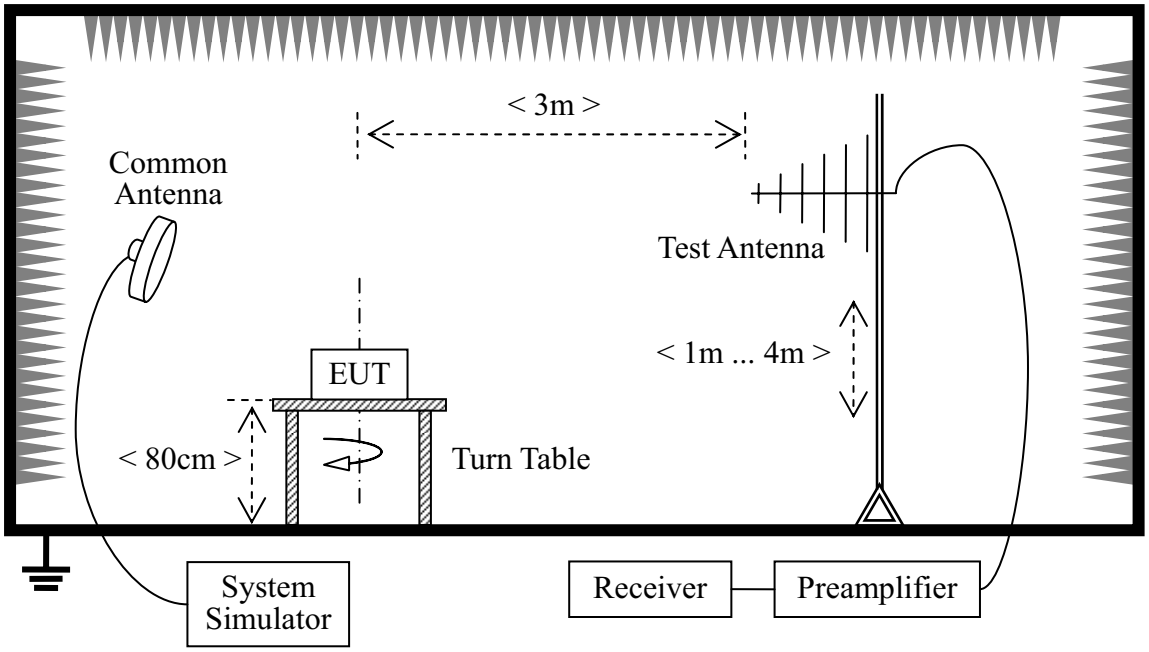

The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides 50Ω/50μH of coupling impedance for the measuring instrument. The Common Antenna 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 | Agilent | E7405A | US44210471 | 2007.07 | 1year |
| LISN | Schwarzbeck | NSLK 8127 | 812744 | 2006.08 | 1year |
| Pulse Limiter (20dB) | Schwarzbeck | VTSD 9561-D | 9391 | (n.a.) | (n.a.) |
| System Simulator | Agilent | E5515C | GB43130131 | 2007.06 | 1year |
| Personal Computer | HP | Pavilion ze2202 | CNF5460DNL | (n.a.) | (n.a.) |
| Bluetooth-Headset | Nokia | HS-36W | (n.a.) | (n.a.) | (n.a.) |
| Wireless Router | (n.a.) | D-Link | BN64448000052 | (n.a.) | (n.a.) |
| T-Flash Card | SanDisk | 256MB | (n.a.) | (n.a.) | (n.a.) |

### 3.3.2 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 | Agilent | E7405A | US44210471 | 2007.07 | 1year |
| Full-Anechoic Chamber | Albatross | 9m*6m*6m | (n.a.) | 2006.08 | 2year |
| Test Antenna - Bi-Log | Schwarzbeck | VULB 9163 | 9163-274 | 2007.07 | 1year |
| Test Antenna - Horn | Schwarzbeck | BBHA 9120C | 9120C-384 | 2007.07 | 1year |
| System Simulator | Agilent | E5515C | GB43130131 | 2007.06 | 1year |
| Personal Computer | HP | Pavilion ze2202 | CNF5460DNL | (n.a.) | (n.a.) |
| Wireless Router | (n.a.) | D-Link | BN64448000052 | (n.a.) | (n.a.) |
| Bluetooth-Headset | Nokia | HS-36W | (n.a.) | (n.a.) | (n.a.) |
| T-Flash Card | SanDisk | 256MB | (n.a.) | (n.a.) | (n.a.) |

# 4. 47 CFR PART 15B REQUIREMENTS

## 4.1 Conducted Emission

### 4.1.1 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 50μH/50Ω line impedance stabilization network (LISN).

| Frequency range (MHz) | Conducted Limit (dBμV) | |
|---|---|---|
| | Quai-peak | Average |
| 0.15 - 0.50 | 66 to 56 | 56 to 46 |
| 0.50 - 5 | 56 | 46 |
| 0.50 - 30 | 60 | 50 |

NOTE:

a) The limit subjects to the Class B digital device.

b) The lower limit shall apply at the band edges.

c) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

### 4.1.2 Test Description

See section 3.3.1 of this report.

### 4.1.3 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.

#### 4.1.3.1 GSM Test Tode

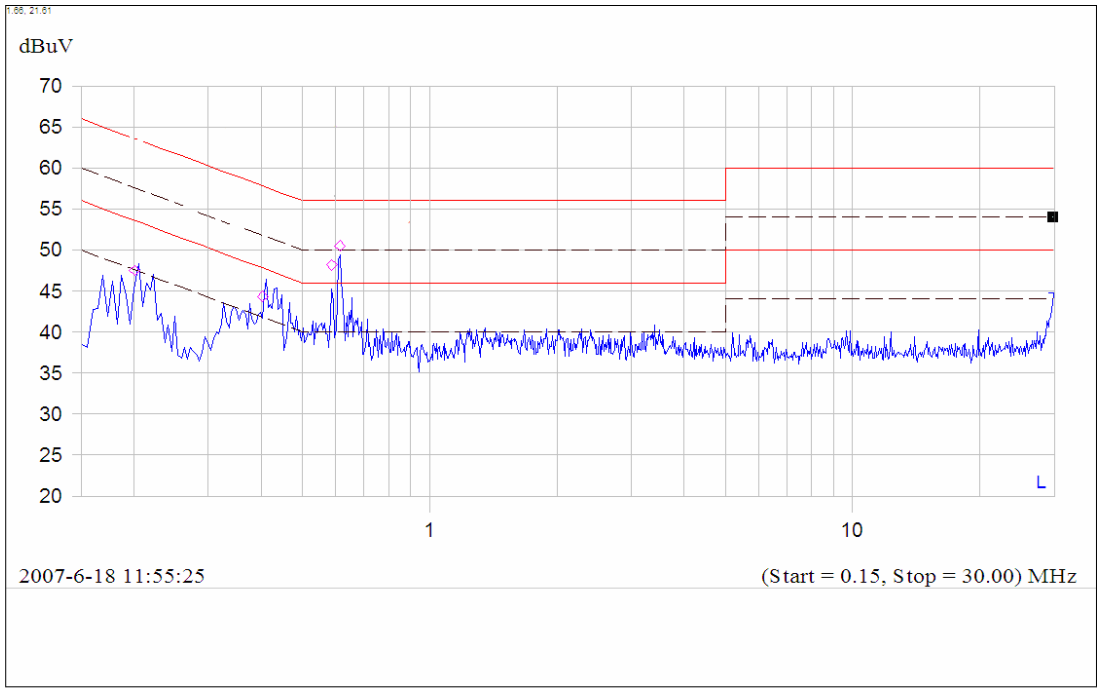
##### 4.1.3.1.1 The first test mode

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

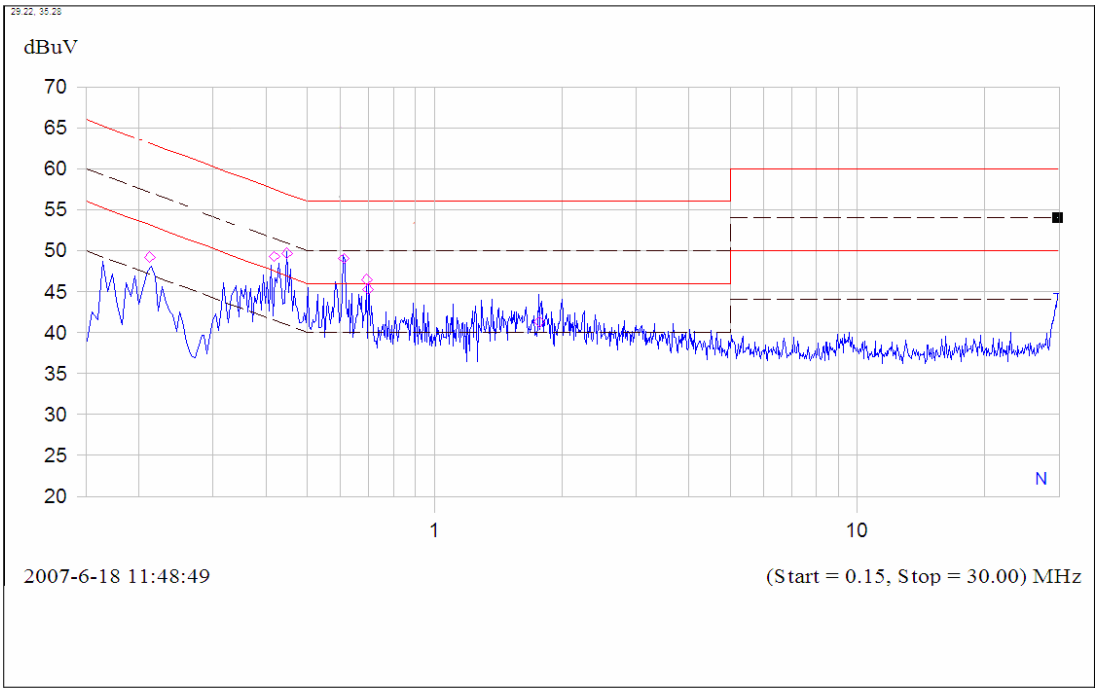
**A. Test Verdict Recorded for Suspicious Points:**

| No. | @Frequency (MHz) | Measured Emission Level (dBµV) | | | | Limit (dBµV) | | Verdict |
|---|---|---|---|---|---|---|---|---|
| | | PK | QP | AV | Phase | QP | AV | |
| 1 | 0.587 | 47.3 | 44.5 | 37.7 | L | 56.0 | 46.0 | PASS |
| 2 | 0.615 | 51.5 | 48.7 | 38.9 | L | 56.0 | 46.0 | PASS |
| 3 | (n.a.) | (n.a.) | (n.a.) | (n.a.) | L | (n.a.) | (n.a.) | (n.a.) |
| 4 | (n.a.) | (n.a.) | (n.a.) | (n.a.) | L | (n.a.) | (n.a.) | (n.a.) |
| 5 | (n.a.) | (n.a.) | (n.a.) | (n.a.) | L | (n.a.) | (n.a.) | (n.a.) |
| 6 | (n.a.) | (n.a.) | (n.a.) | (n.a.) | L | (n.a.) | (n.a.) | (n.a.) |
| 7 | 0.212 | 49.2 | 45.6 | 31.3 | N | 63.1 | 53.2 | PASS |
| 8 | 0.418 | 49.3 | 44.2 | 30.4 | N | 57.5 | 47.5 | PASS |
| 9 | 0.448 | 49.7 | 44.1 | 29.0 | N | 56.9 | 46.9 | PASS |
| 10 | 0.610 | 49.0 | 47.2 | 37.4 | N | 56.0 | 46.0 | PASS |
| 11 | 0.692 | 46.5 | 38.2 | 26.2 | N | 56.0 | 46.0 | PASS |
| 12 | 1.697 | 45.3 | 36.8 | 25.8 | N | 56.0 | 46.0 | PASS |

**B. Test Plot:**




(Plot A: L Phase)




(Plot B: N Phase)

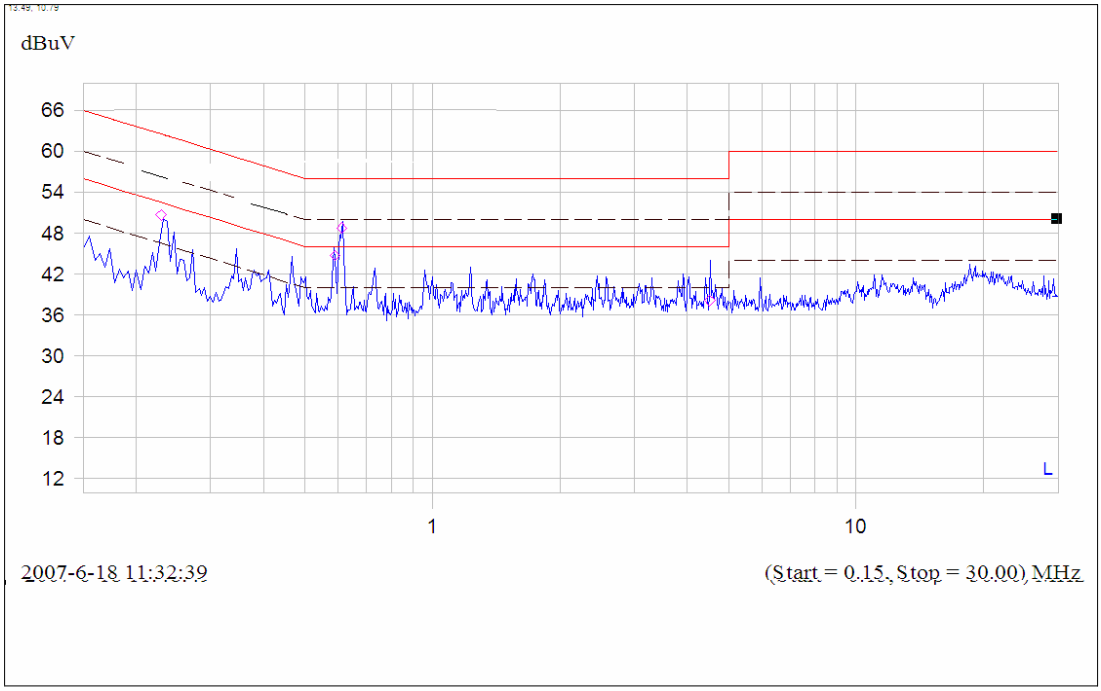
#### 4.1.3.1.2 The second test mode

The EUT configuration of the emission tests is TransFlash Card + EUT + Battery + PC.

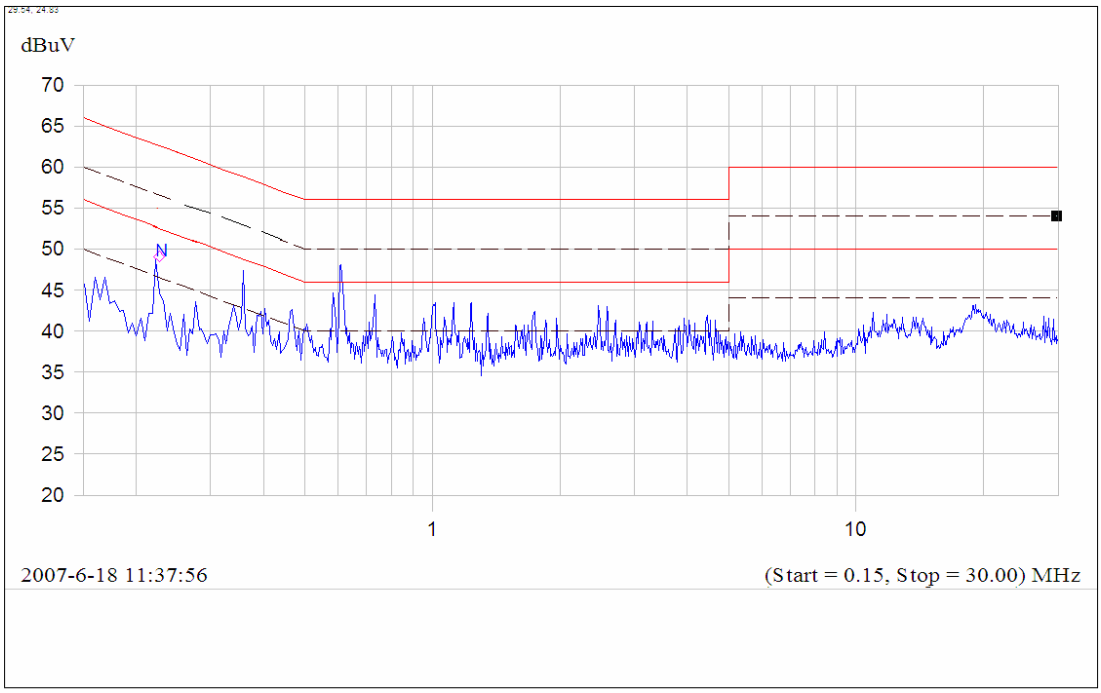
**A. Test Verdict Recorded for Suspicious Points:**

| No. | @Frequency (MHz) | Measured Emission Level (dBμV) | | | | Limit (dBμV) | | Verdict |
|---|---|---|---|---|---|---|---|---|
| | | PK | QP | AV | Phase | QP | AV | |
| 1 | 0.229 | 50.6 | 48.6 | 41.3 | L | 62.5 | 52.5 | PASS |
| 2 | 0.589 | 44.7 | 41.5 | 32.9 | L | 56.0 | 46.0 | PASS |
| 3 | 0.611 | 48.8 | 46.3 | 36.3 | L | 56.0 | 46.0 | PASS |
| 4 | 4.518 | 38.1 | 30.8 | 24.9 | L | 56.0 | 46.0 | PASS |
| 5 | (n.a.) | (n.a.) | (n.a.) | (n.a.) | L | (n.a.) | (n.a.) | (n.a.) |
| 6 | (n.a.) | (n.a.) | (n.a.) | (n.a.) | L | (n.a.) | (n.a.) | (n.a.) |
| 7 | 0.227 | 49.1 | 47.4 | 40.3 | N | 62.6 | 52.6 | PASS |
| 8 | 0.361 | 38.9 | 34.8 | 24.0 | N | 58.7 | 48.7 | PASS |
| 9 | 0.608 | 47..2 | 45.3 | 33.7 | N | 56.0 | 46.0 | PASS |
| 10 | (n.a.) | (n.a.) | (n.a.) | (n.a.) | N | (n.a.) | (n.a.) | (n.a.) |
| 11 | (n.a.) | (n.a.) | (n.a.) | (n.a.) | N | (n.a.) | (n.a.) | (n.a.) |
| 12 | (n.a.) | (n.a.) | (n.a.) | (n.a.) | N | (n.a.) | (n.a.) | (n.a.) |

**B. Test Plot:**




(Plot A: L Phase)



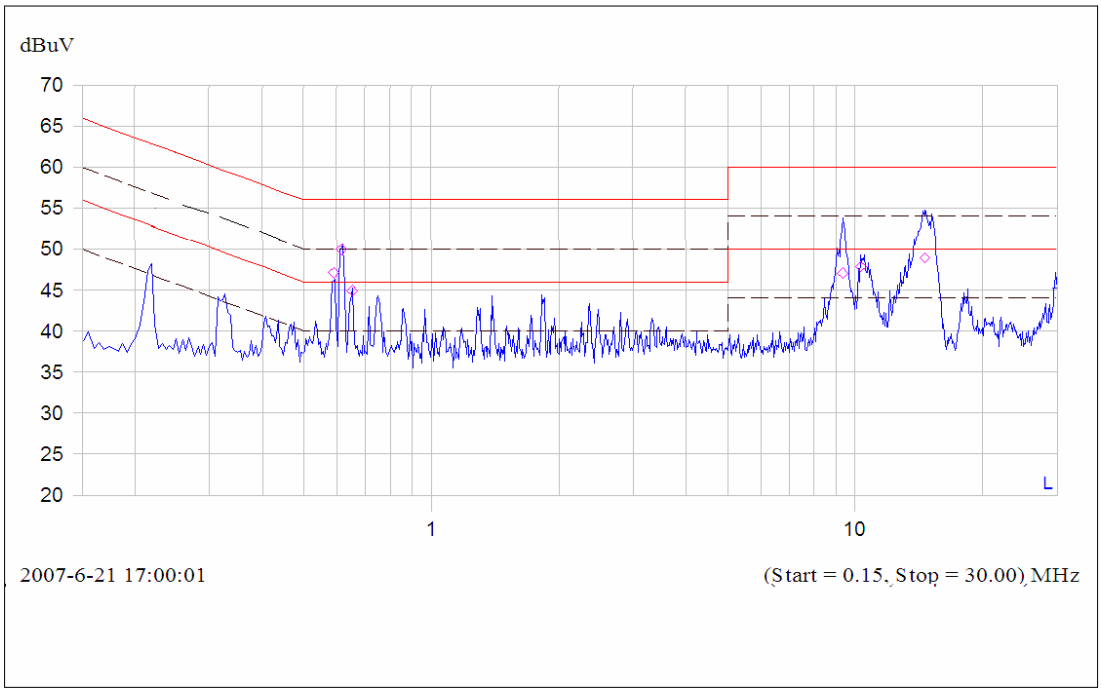

(Plot B: N Phase)

### 4.1.3.2 WCDMA Test Mode

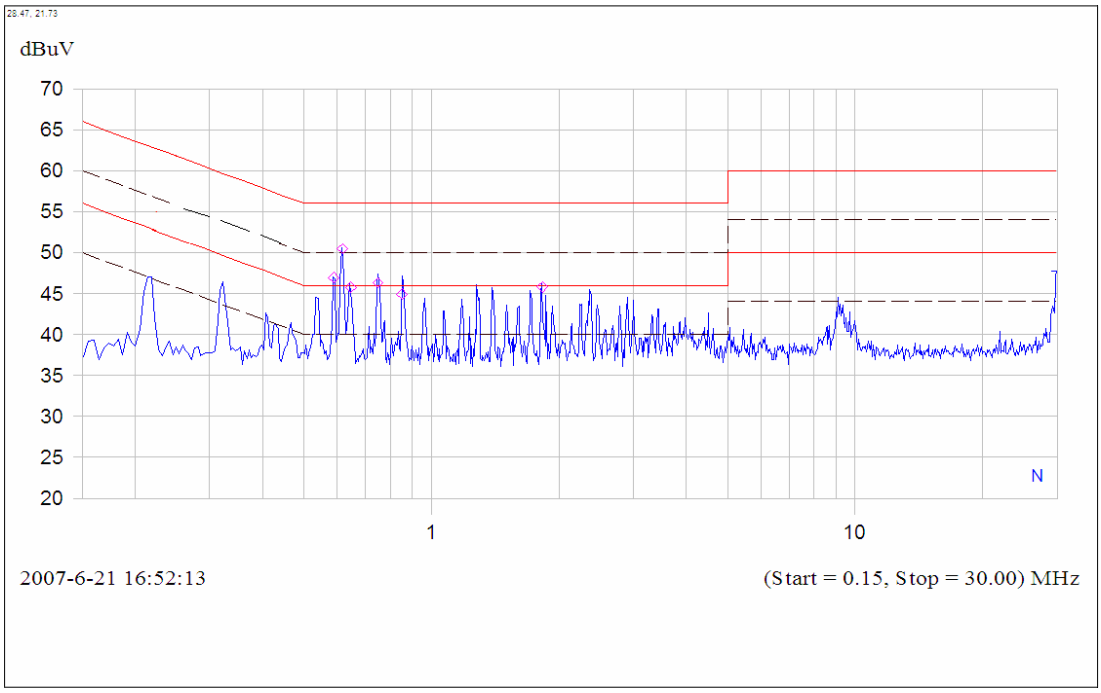
**A. Test Verdict Recorded for Suspicious Points:**

| No. | @Frequency (MHz) | Measured Emission Level (dBμV) | | | | Limit (dBμV) | | Verdict |
|---|---|---|---|---|---|---|---|---|
| | | PK | QP | AV | Phase | QP | AV | |
| 1 | 0.588 | 47.1 | 45.5 | 36.8 | L | 56.0 | 46.0 | PASS |
| 2 | 0.613 | 50.0 | 48.5 | 37.7 | L | 56.0 | 46.0 | PASS |
| 3 | 0.651 | 44.9 | 41.0 | 32.3 | L | 56.0 | 46.0 | PASS |
| 4 | 9.354 | 47.1 | 43.4 | 33.2 | L | 60.0 | 50.0 | PASS |
| 5 | 10.330 | 47.8 | 43.8 | 31.5 | L | 60.0 | 50.0 | PASS |
| 6 | 14.618 | 48.9 | 44.0 | 33.0 | L | 60.0 | 50.0 | PASS |
| 7 | 0.588 | 46.9 | 45.4 | 37.1 | N | 56.0 | 46.0 | PASS |
| 8 | 0.616 | 50.5 | 48.9 | 38.3 | N | 56.0 | 46.0 | PASS |
| 9 | 0.646 | 45.8 | 43.5 | 34.1 | N | 56.0 | 46.0 | PASS |
| 10 | 0.748 | 46.3 | 44.5 | 33.8 | N | 56.0 | 46.0 | PASS |
| 11 | 0.853 | 44.9 | 40.9 | 29.1 | N | 56.0 | 46.0 | PASS |
| 12 | 1.828 | 45.8 | 42.7 | 31.8 | N | 56.0 | 46.0 | PASS |

**B. Test Plot:**




(Plot A: L Phase)




(Plot B: N Phase)

## 4.2 Radiated Emission

### 4.2.1 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 | |
|---|---|---|
| | μV/m | dBμV/m |
| 30 - 88 | 100 | 40 |
| 88 - 216 | 150 | 43.5 |
| 216 - 960 | 200 | 46 |
| Above 960 | 500 | 54 |

NOTE:

a) Field Strength (dBμV/m) = 20*log[Field Strength (μV/m)].

b) In the emission tables above, the tighter limit applies at the band edges.

### 4.2.2 Test Description

See section 3.3.2 of this report.

### 4.2.3 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.

#### 4.2.3.1 GSM test mode

##### 4.2.3.1.1 The first test mode

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

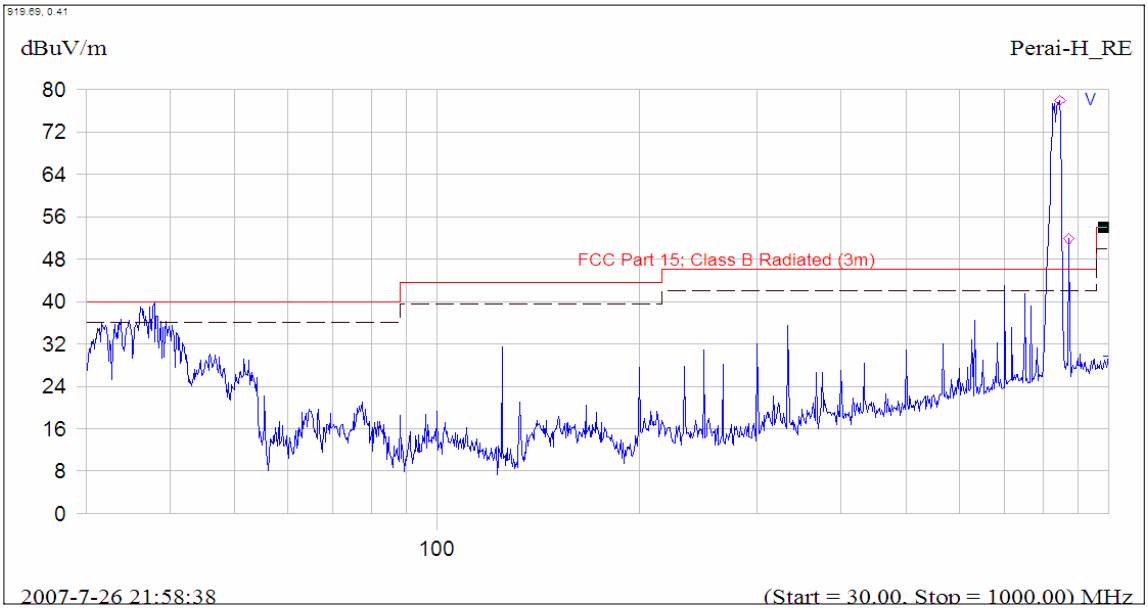
**A. Test Verdict Recorded for Suspicious Points:**

| No. | @Frequency (MHz) | Emission Level (dBμV/m) | | | Quasi-Peak Limit (dBμV/m) | Result |
|---|---|---|---|---|---|---|
| | | PK | QP | Antenna Polarization | | |
| 1 | 37.923 | 30.1 | 29.2 | Vertical | 40 | PASS |
| 2 | 36.172 | 32.9 | 29.2 | Vertical | 40 | PASS |
| 3 | 39.369 | 41.0 | 36.8 | Vertical | 40 | PASS |

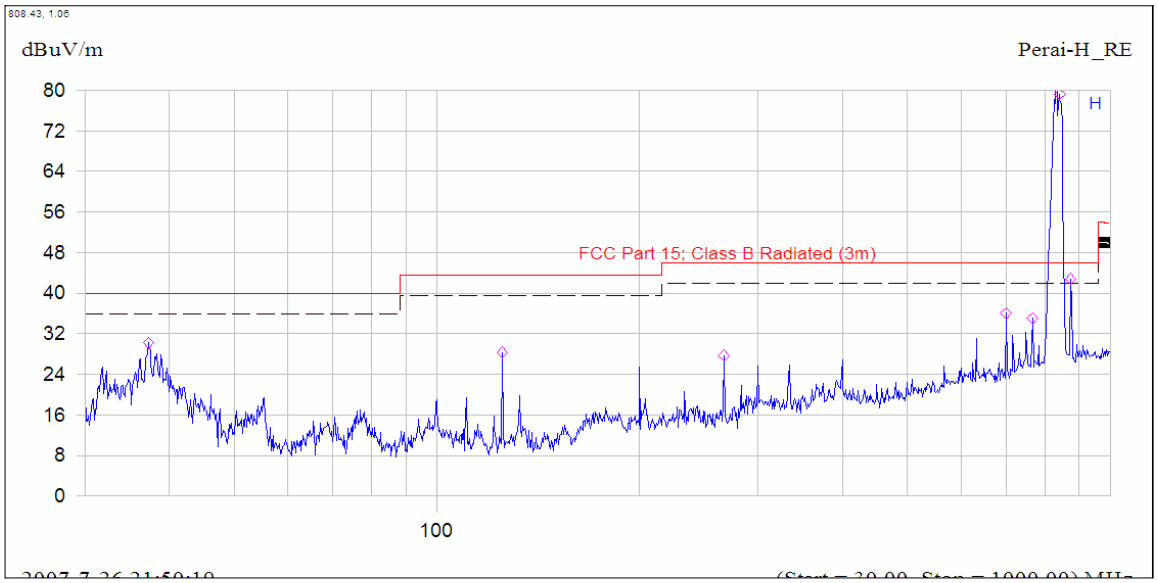
| No. | @Frequency (MHz) | Emission Level (dBμV/m) | | | Quasi-Peak Limit (dBμV/m) | Result |
|---|---|---|---|---|---|---|
| | | PK | QP | Antenna Polarization | | |
| 4 | 700.027 | 44.2 | 41.7 | Vertical | 46 | (n.a) |
| 5 | 750.008 | 43.1 | 38.4 | Vertical | 46 | (n.a) |
| 6 | (n.a) | (n.a) | (n.a) | Vertical | (n.a) | (n.a) |
| 7 | 37.272 | 30.2 | --- | Horizontal | 40 | PASS |
| 8 | 124.968 | 28.3 | --- | Horizontal | 43.6 | PASS |
| 9 | 266.700 | 27.7 | --- | Horizontal | 46 | PASS |
| 10 | 700.056 | 36.0 | --- | Horizontal | 46 | PASS |
| 11 | 766.692 | 35.0 | --- | Horizontal | 46 | (n.a) |
| 12 | (n.a) | (n.a) | (n.a) | Horizontal | (n.a) | (n.a) |

**B. Test Plot:**

Note: Following is the plots for emission measurement; please note that marked spikes with circle should be ignored because they are MS and SS carrier frequency.




(Plot A: Test Antenna Vertical)




(Plot B: Test Antenna Horizontal)

#### 4.2.3.1.2 The second test mode

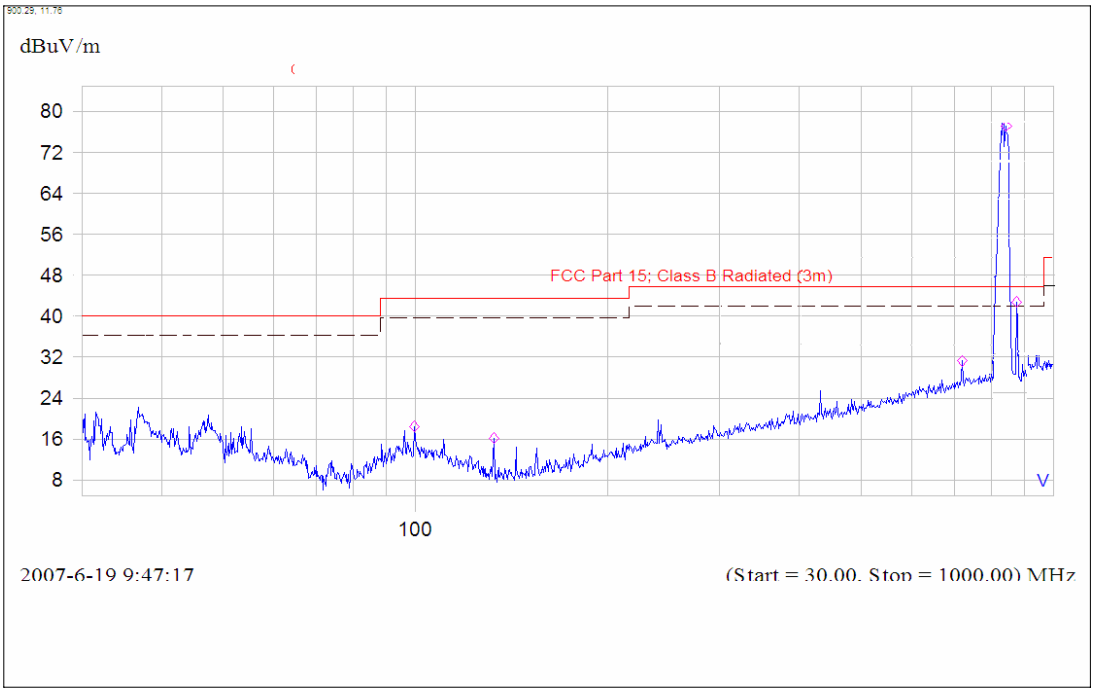
The EUT configuration of the emission tests is TransFlash Card + EUT + Battery + PC.

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

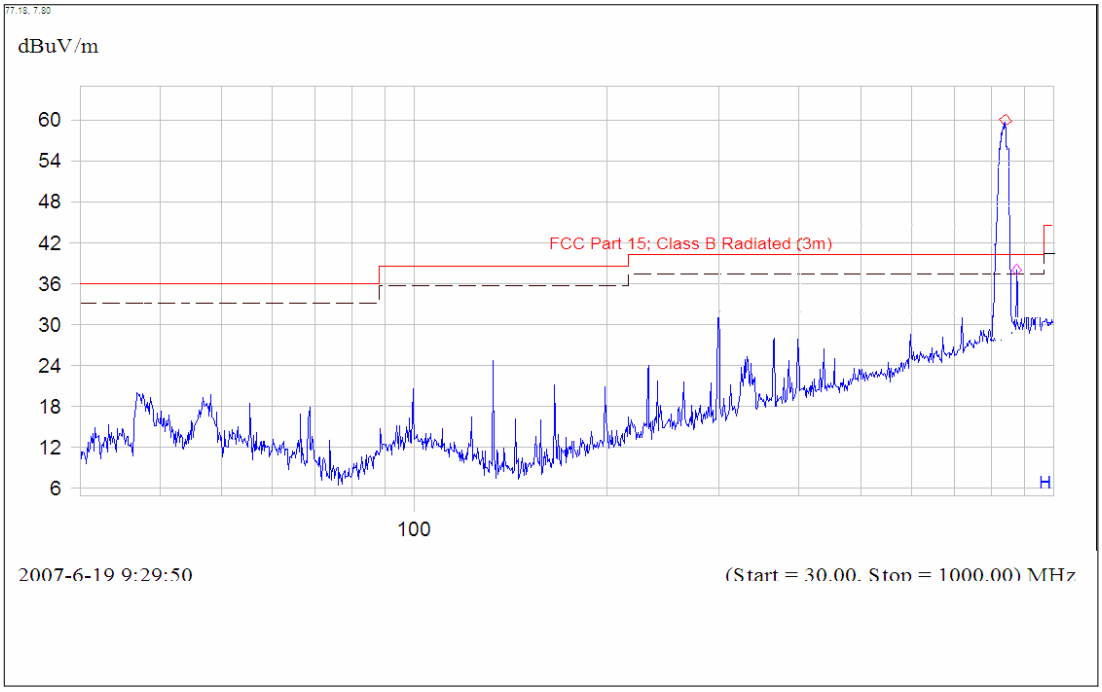
| No. | @Frequency (MHz) | Emission Level (dBμV/m) | | | Quasi-Peak Limit (dBμV/m) | Result |
|---|---|---|---|---|---|---|
| | | PK | QP | Antenna Polarization | | |
| 1 | 99.576 | 18.5 | --- | Vertical | 43.6 | PASS |
| 2 | 132.780 | 16.2 | --- | Vertical | 43.6 | PASS |
| 3 | 720.108 | 31.3 | --- | Vertical | 46 | PASS |
| 4 | (n.a) | (n.a) | (n.a) | Vertical | (n.a) | (n.a) |
| 5 | (n.a) | (n.a) | (n.a) | Vertical | (n.a) | (n.a) |
| 6 | (n.a) | (n.a) | (n.a) | Vertical | (n.a) | (n.a) |
| 7 | 132.780 | 24.8 | --- | Horizontal | 43.6 | PASS |
| 8 | 165.912 | 21.2 | --- | Horizontal | 43.6 | PASS |
| 9 | 232.488 | 24.0 | --- | Horizontal | 46 | PASS |
| 10 | 299.184 | 32.1 | --- | Horizontal | 46 | PASS |
| 11 | (n.a) | (n.a) | (n.a) | Horizontal | (n.a) | (n.a) |
| 12 | (n.a) | (n.a) | (n.a) | Horizontal | (n.a) | (n.a) |

**B. Test Plot:**

Note: Following is the plots for emission measurement; please note that marked spikes with circle should be ignored because they are MS and SS carrier frequency.




(Plot A: Test Antenna Vertical)




(Plot B: Test Antenna Horizontal)

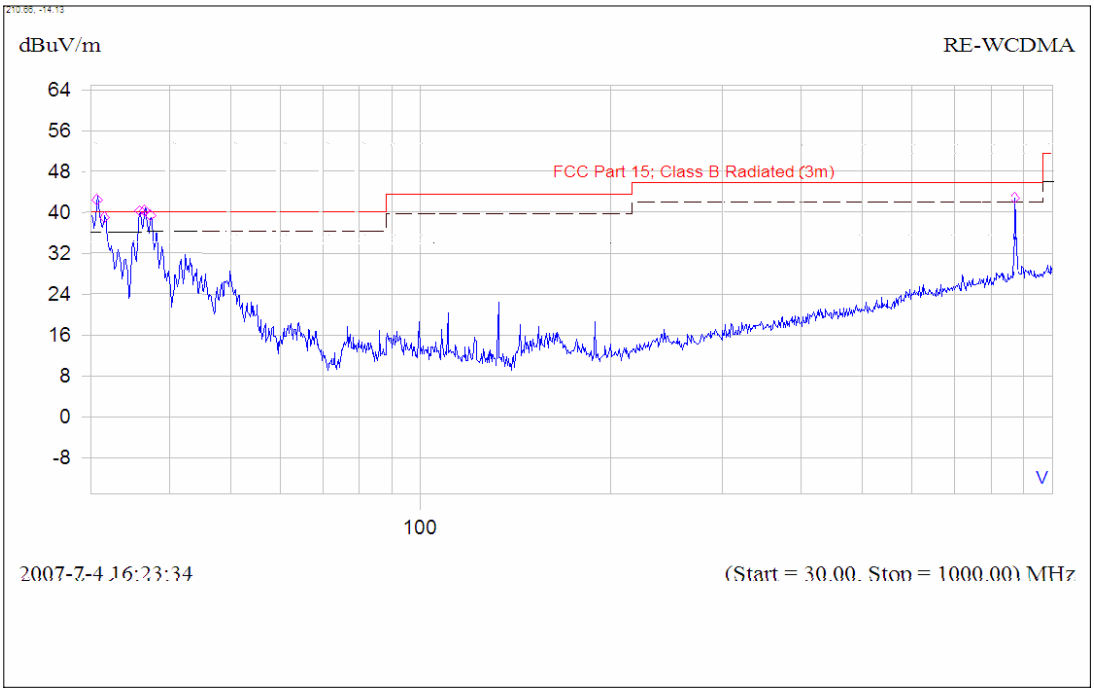
### 4.2.3.2 WCDMA Test Mode

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

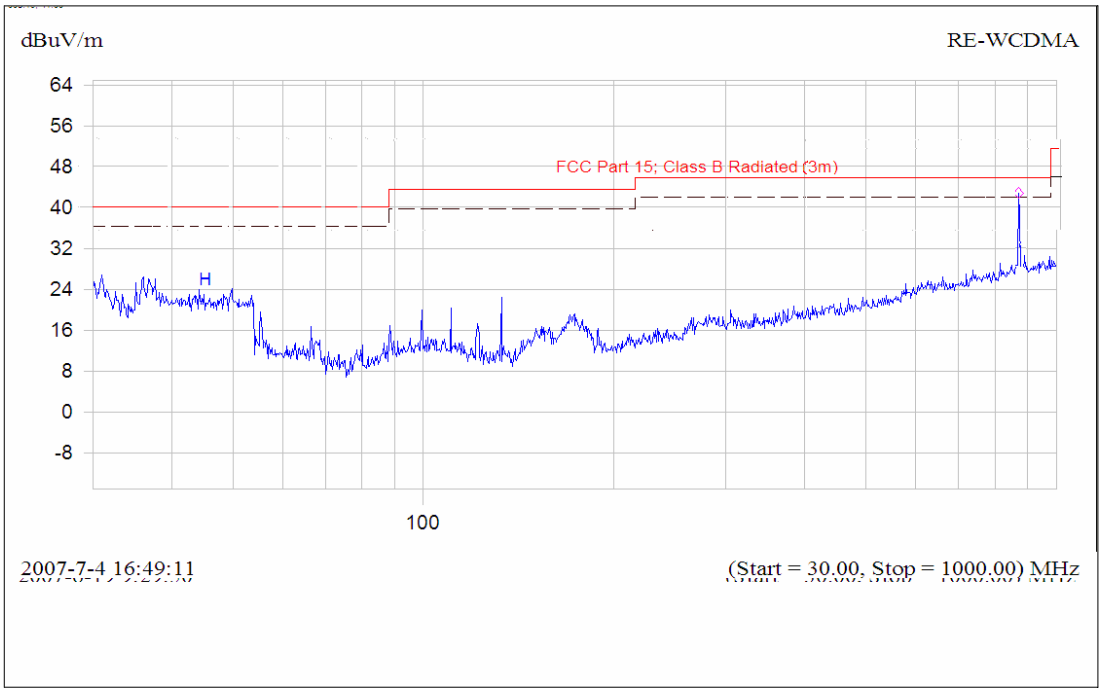
| No. | @Frequency (MHz) | Emission Level (dBμV/m) | | | Quasi-Peak Limit (dBμV/m) | Result |
|---|---|---|---|---|---|---|
| | | PK | QP | Antenna Polarization | | |
| 1 | 30.747 | 42.3 | 38.5 | Vertical | 40 | PASS |
| 2 | 31.579 | 38.9 | 36.4 | Vertical | 40 | PASS |
| 3 | 35.932 | 40.1 | 37.2 | Vertical | 40 | PASS |
| 4 | 37.348 | 39.3 | 36.6 | Vertical | 40 | PASS |
| 5 | (n.a) | (n.a) | (n.a) | Vertical | (n.a) | (n.a) |
| 6 | (n.a) | (n.a) | (n.a) | Vertical | (n.a) | (n.a) |
| 7 | (n.a) | (n.a) | (n.a) | Horizontal | (n.a) | (n.a) |
| 8 | (n.a) | (n.a) | (n.a) | Horizontal | (n.a) | (n.a) |
| 9 | (n.a) | (n.a) | (n.a) | Horizontal | (n.a) | (n.a) |
| 10 | (n.a) | (n.a) | (n.a) | Horizontal | (n.a) | (n.a) |
| 11 | (n.a) | (n.a) | (n.a) | Horizontal | (n.a) | (n.a) |
| 12 | (n.a.) | (n.a.) | (n.a.) | Horizontal | (n.a) | (n.a) |

**B. Test Plot:**

Note: Following is the plots for emission measurement; please note that marked spikes with circle should be ignored because they are MS and SS carrier frequency.




(Plot A: Test Antenna Vertical)




(Plot B: Test Antenna Horizontal)

** END OF REPORT **