



# **FCC 47 CFR PART 15 SUBPART C**

## **TEST REPORT**

*For*

**Applicant : SK Mtek Microelectronics (Shenzhen) Limited**

**Address : 12/F, Microprofit B.D., South 6 Road, High-Tech Industrial Park,  
Nanshan District, Shenzhen, China**

**Product Name : MID**

**Model Name : GT-7120**

**Brand Name : N/A**

**FCC ID : ZSOGT7120**

**Report No. : MOST110810F2A**

**Date of Issue : August. 26, 2011**

**Issued by : Most Technology Service Co., Ltd.**

**Address : No.5, 2nd Langshan Road, North District, Hi-tech Industrial  
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## 1. VERIFICATION OF CONFORMITY

**Equipment Under Test:** MID

**Brand Name:** N/A

**Model Number:** GT-7120

**Series Number:** N/A

**Model Difference description:** N/A

**FCC ID:** ZSOGT7120

**Applicant:** SK Mtek Microelectronics (Shenzhen) Limited  
12/F, Microprofit B.D., South 6 Road, High-Tech Industrial Park, Nanshan District, Shenzhen, China

**Manufacturer:** SK Mtek Microelectronics (Shenzhen) Limited  
12/F, Microprofit B.D., South 6 Road, High-Tech Industrial Park, Nanshan District, Shenzhen, China

**Technical Standards:** 47 CFR Part 15 Subpart C

**File Number:** MOST110810F2A

**Date of test:** August. 19 - August. 25, 2011

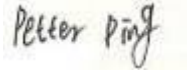

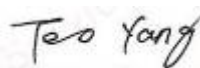
**Deviation:** None

**Condition of Test Sample:** Normal

**Test Result:** PASS

The above equipment was tested by *Most Technology Service Co., Ltd.* for compliance with the requirements set forth in FCC rules and the Technical Standards mentioned above. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment and the level of the immunity endurance of the equipment are within the compliance requirements.

The test results of this report relate only to the tested sample identified in this report.

|                            |  |                  |
|----------------------------|--|------------------|
| Tested by (+ signature):   |  |                  |
|                            | Petter Ping/Test Engineer  | August. 26, 2011 |
| Review by (+ signature):   |  |                  |
|                            | July Wen/Lab Manager   | August. 26, 2011 |
| Approved by (+ signature): |  |                  |
|                            | Terry Yang/Manager   | August. 26, 2011 |

## 2. GENERAL INFORMATION

### 2.1 Product Information

|                               |  |
|-------------------------------|--|
| Description:                  | MID  |
| Brand Name:                   | N/A  |
| Model Name:                   | GT-7120  |
| Series Number:                | N/A  |
| Model Difference description: | N/A.   |
| Power Supply:                 | DC: 7.4V by Li-ion Battery;<br>DC: 9V by AC Adapter(100V-240V 50/60Hz);  |
| Frequency Range:              | 2412MHz - 2462MHz  |
| Number of Channels:           | IEEE 802.11b/g mode: 11 Channels<br>IEEE 802.11n Standard-20 MHz Channel mode: 11 Channels<br>IEEE 802.11n Standard-40 MHz Channel mode: 7 Channels  |
| Modulation Technique:         | IEEE 802.11b mode: DSSS (1, 2, 5.5 and 11 Mbps)<br>IEEE 802.11g mode: OFDM (6, 9, 12, 18, 24, 36, 48 and 54 Mbps)<br>IEEE 802.11n Standard-20 MHz Channel mode: OFDM(6.5, 13, 19.5, 26, 39, 52, 58.5, 65.0Mbps)<br>IEEE 802.11n Standard-40 MHz Channel mode: OFDM (13.5, 27, 40.5, 54, 81, 108, 121.5, 135Mbps) |
| Antenna Type:                 | Internal   |
| Antenna Gain:                 | 2.5dBi   |
| Temperature Range:            | -20°C ~ +50°C  |

**NOTE:**

1. For a more detailed features description about the EUT, please refer to User's Manual.

## 2.2 Objective

The objective of the report is to perform tests according to 47 CFR Part 15 Subpart C for the EUT FCC ID Certification:

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

## 2.3 Test Standards and Results

Test items and the results are as bellow:

| No. | Section                       | Description                 | Result | Date of Test |
|-----|-------------------------------|-----------------------------|--------|--------------|
| 1   | 15.247(a)(2)                  | 6dB Bandwidth               | PASS   | 2011-08-24   |
| 2   | 15.247(b)(3)                  | Peak Output Power           | PASS   | 2011-08-24   |
| 3   | 15.247(d)                     | conducted spurious emission | PASS   | 2011-08-24   |
| 4   | 15.247(d)                     | Band Edge                   | PASS   | 2011-08-24   |
| 5   | 15.247(e)                     | Power Spectral Density      | PASS   | 2011-08-24   |
| 6   | 15.207                        | Conducted Emission          | PASS   | 2011-08-20   |
| 7   | 15.247(d)<br>15.205<br>15.209 | Radiated Emission           | PASS   | 2011-08-19   |

*Note:* 1. The test result judgment is decided by the limit of measurement standard  
2. The information of measurement uncertainty is available upon the customer's request.

## 2.4 Environmental Conditions

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

- Temperature: 15-35°C
- Humidity: 30-60 %
- Atmospheric pressure: 86-106 kPa

### 3. TEST FACILITY

#### 3.1 TEST FACILITY

|                       |  |
|-----------------------|--|
| Test Site:            | Most Technology Service Co., Ltd.  |
| Location:             | No.5, Langshan 2nd Rd, North Hi-Tech Industrial park, Nanshan, Shenzhen, Guangdong, China  |
| Description:          | <p>There is one 3m semi-anechoic an area test sites and two line conducted labs for final test. The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2009 and CISPR 16 requirements. The FCC Registration Number is <b>490827</b>.</p> <p>The <b>CNAS</b> Registration Number is <b>CNAS L3573</b>.</p>  |
| Site Filing:          | The site description is on file with the Federal Communications Commission, 7435 Oakland Mills Road, Columbia, MD 21046.   |
| Instrument Tolerance: | All measuring equipment is in accord with ANSI C63.4:2009 and CISPR 16 requirements that meet industry regulatory agency and accreditation agency requirement.   |
| Ground Plane:         | Two conductive reference ground planes were used during the Line Conducted Emission, one in vertical and the other in horizontal. The dimensions of these ground planes are as below. The vertical ground plane was placed distancing 40 cm to the rear of the wooden test table on where the EUT and the support equipment were placed during test. The horizontal ground plane projected 50 cm beyond the footprint of the EUT system and distanced 80 cm to the wooden test table. For Radiated Emission Test, one horizontal conductive ground plane extended at least 1m beyond the periphery of the EUT and the largest measuring antenna, and covered the entire area between the EUT and the antenna. It has no holes or gaps having longitudinal dimensions larger than one-tenth of a wavelength at the highest frequency of measurement up to 1GHz. |

#### 3.2 GENERAL TEST PROCEDURES

##### EUT Function and Test Mode

The EUT has been tested under normal operating (TX) and standby (RX) condition.

The field strength of radiation emission was measured in the following position: EUT stand-up position (Y axis), lie-down position (X, Z axis).

The following data show only with the worst case setup.

The worst case of Y axis was reported.

Based on client request, all normal using modes of the normal function were tested but only the worst test data of the worst mode is reported by this report.

### Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4:2009, Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

### Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4:2009.

## 3.3 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

- (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

| MHz                        | MHz                   | MHz             | GHz              |
|----------------------------|-----------------------|-----------------|------------------|
| 0.090 - 0.110              | 16.42 - 16.423        | 399.9 - 410     | 4.5 - 5.15       |
| <sup>1</sup> 0.495 - 0.505 | 16.69475 - 16.69525   | 608 - 614       | 5.35 - 5.46      |
| 2.1735 - 2.1905            | 16.80425 - 16.80475   | 960 - 1240      | 7.25 - 7.75      |
| 4.125 - 4.128              | 25.5 - 25.67          | 1300 - 1427     | 8.025 - 8.5      |
| 4.17725 - 4.17775          | 37.5 - 38.25          | 1435 - 1626.5   | 9.0 - 9.2        |
| 4.20725 - 4.20775          | 73 - 74.6             | 1645.5 - 1646.5 | 9.3 - 9.5        |
| 6.215 - 6.218              | 74.8 - 75.2           | 1660 - 1710     | 10.6 - 12.7      |
| 6.26775 - 6.26825          | 108 - 121.94          | 1718.8 - 1722.2 | 13.25 - 13.4     |
| 6.31175 - 6.31225          | 123 - 138             | 2200 - 2300     | 14.47 - 14.5     |
| 8.291 - 8.294              | 149.9 - 150.05        | 2310 - 2390     | 15.35 - 16.2     |
| 8.362 - 8.366              | 156.52475 - 156.52525 | 2483.5 - 2500   | 17.7 - 21.4      |
| 8.37625 - 8.38675          | 156.7 - 156.9         | 2655 - 2900     | 22.01 - 23.12    |
| 8.41425 - 8.41475          | 162.0125 - 167.17     | 3260 - 3267     | 23.6 - 24.0      |
| 12.29 - 12.293             | 167.72 - 173.2        | 3332 - 3339     | 31.2 - 31.8      |
| 12.51975 - 12.52025        | 240 - 285             | 3345.8 - 3358   | 36.43 - 36.5     |
| 12.57675 - 12.57725        | 322 - 335.4           | 3600 - 4400     | ( <sup>2</sup> ) |
| 13.36 - 13.41              |                       |                 |                  |

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

- (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasipeak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

#### 4. TEST EQUIPMENT LIST

**Instrumentation:** The following list contains equipment used at MOST for testing. The equipment conforms to the CISPR 16-1/ANSI C63.2 Specifications for Electromagnetic Interference and Field Strength Instrumentation from 10 kHz to 1.0 GHz or above.

| No. | Equipment                            | Manufacturer      | Model No.      | S/N         | Calibrator due date |
|-----|--------------------------------------|-------------------|----------------|-------------|---------------------|
| 1   | Test Receiver                        | Rohde & Schwarz   | ESCI           | 100492      | 2012/03/14          |
| 2   | Spectrum Analyzer                    | Agilent           | E7405A         | US44210471  | 2012/03/14          |
| 3   | L.I.S.N.                             | Rohde & Schwarz   | ENV216         | 100093      | 2012/03/14          |
| 4   | Coaxial Switch                       | Anritsu Corp      | MP59B          | 6200283933  | 2012/03/14          |
| 5   | Terminator                           | Hubersuhner       | 50Ω            | No.1        | 2012/03/14          |
| 6   | RF Cable                             | SchwarzBeck       | N/A            | No.1        | 2012/03/14          |
| 7   | Test Receiver                        | Rohde & Schwarz   | ESPI           | 101202      | 2012/03/14          |
| 8   | Bilog Antenna                        | Sunol             | JB3            | A121206     | 2012/03/14          |
| 9   | Horn Antenna                         | TRC               | N/A            | N/A         | 2012/03/14          |
| 10  | Cable                                | Resenberger       | N/A            | NO.1        | 2012/03/14          |
| 11  | Cable                                | SchwarzBeck       | N/A            | NO.2        | 2012/03/14          |
| 12  | Cable                                | SchwarzBeck       | N/A            | NO.3        | 2012/03/14          |
| 13  | DC Power Filter                      | DuoJi             | DL2×30B        | N/A         | 2012/03/14          |
| 14  | Single Phase Power Line Filter       | DuoJi             | FNF 202B30     | N/A         | 2012/03/14          |
| 15  | 3 Phase Power Line Filter            | DuoJi             | FNF 402B30     | N/A         | 2012/03/14          |
| 16  | Test Receiver                        | Rohde & Schwarz   | ESCI           | 100492      | 2012/03/14          |
| 17  | Absorbing Clamp                      | Luthi             | MDS21          | 3635        | 2012/03/14          |
| 18  | Coaxial Switch                       | Anritsu Corp      | MP59B          | 6200283933  | 2012/03/14          |
| 19  | AC Power Source                      | Kikusui           | AC40MA         | LM003232    | 2012/03/14          |
| 20  | Test Analyzer                        | Kikusui           | KHA1000        | LM003720    | 2012/03/14          |
| 21  | Line Impedance Network               | Kikusui           | LIN40MA-PCR-L  | LM002352    | 2012/03/14          |
| 22  | ESD Tester                           | Kikusui           | KES4021        | LM003537    | 2012/03/14          |
| 23  | EMC PRO System                       | EM Test           | UCS-500-M4     | V0648102026 | 2012/03/14          |
| 24  | Signal Generator                     | IFR               | 2032           | 203002/100  | 2012/03/14          |
| 25  | Amplifier                            | A&R               | 150W1000       | 301584      | 2012/03/14          |
| 26  | CDN                                  | FCC               | FCC-801-M2-25  | 47          | 2012/03/14          |
| 27  | CDN                                  | FCC               | FCC-801-M3-25  | 107         | 2012/03/14          |
| 28  | EM Injection Clamp                   | FCC               | F-203I-23mm    | 403         | 2012/03/14          |
| 29  | RF Cable                             | MIYAZAKI          | N/A            | No.1/No.2   | 2012/03/14          |
| 30  | Universal Radio Communication Tester | ROHDE&SCHWARZ     | CMU200         | 0304789     | 2012/03/14          |
| 31  | Telecommunication Antenna            | European Antennas | PSA 75301R/170 | 0304213     | 2012/03/14          |

**NOTE:** Equipments listed above have been calibrated and are in the period of validation.



## 5. 47 CFR Part 15 C 15.247 Requirements

### 5.1 6dB Bandwidth

#### 5.1.1 Definition

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

#### 5.1.2 Test Description

The EUT is powered by the Battery, is coupled to the Spectrum Analyzer (SA) through the Attenuator/DC Block. The path loss as the factor is calibrated to correct the reading. During the measurement, the EUT is activated and is set to operate at maximum power. The RF load attached to the EUT antenna terminal is 500hm.

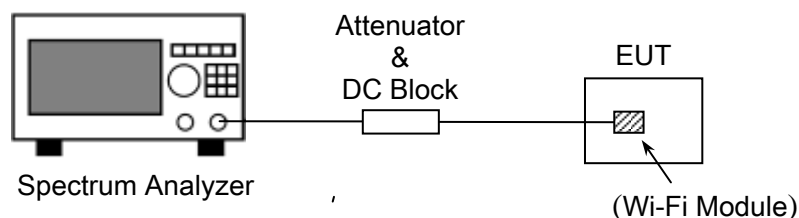


Figure 1: RF Test Setup

#### 5.1.3 Test Result

The lowest, middle and highest channels are selected to perform testing to record the 6 dB bandwidth of the Module.

##### 802.11b Test Mode

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Limits (kHz) | Result |
|---------|-----------------|----------------------|--------------|--------|
| Low     | 2412            | 10.71                | ≥500         | PASS   |
| Middle  | 2437            | 10.54                |              | PASS   |
| High    | 2462            | 10.87                |              | PASS   |

##### 802.11g Test Mode

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Limits (kHz) | Result |
|---------|-----------------|----------------------|--------------|--------|
| Low     | 2412            | 15.85                | ≥500         | PASS   |
| Middle  | 2437            | 16.13                |              | PASS   |

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Limits (kHz) | Result |
|---------|-----------------|----------------------|--------------|--------|
| High    | 2462            | 16.38                |              | PASS   |

## 802.11n-20MHz Test Mode

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Limits (kHz) | Result |
|---------|-----------------|----------------------|--------------|--------|
| Low     | 2412            | 16.51                | ≥500         | PASS   |
| Middle  | 2437            | 16.34                |              | PASS   |
| High    | 2462            | 16.68                |              | PASS   |

## 802.11n-40MHz Test Mode

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Limits (kHz) | Result |
|---------|-----------------|----------------------|--------------|--------|
| Low     | 2412            | 36.33                | ≥500         | PASS   |
| Middle  | 2437            | 37.15                |              | PASS   |
| High    | 2462            | 36.43                |              | PASS   |

## 5.2 Peak Output Power

### 5.2.1 Definition

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power.

### 5.2.2 Test Description

See section 5.1.2 of this report.

### 5.2.3 Test Result

The EUT operates at maximum output power mode. The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output peak power of the Module.

#### 802.11b Test Mode

| Channel | Frequency (MHz) | Measured Output Peak Power |        | Limit | Verdict |
|---------|-----------------|----------------------------|--------|-------|---------|
|         |                 | dBm                        | W      | W     |         |
| Low     | 2412            | 11.68                      | 0.0147 | 0.125 | PASS    |
| Middle  | 2437            | 11.62                      | 0.0145 |       | PASS    |
| High    | 2462            | 11.51                      | 0.0142 |       | PASS    |

#### 802.11g Test Mode

| Channel | Frequency (MHz) | Measured Output Peak Power |        | Limit | Verdict |
|---------|-----------------|----------------------------|--------|-------|---------|
|         |                 | dBm                        | W      | W     |         |
| Low     | 2412            | 10.73                      | 0.0118 | 0.125 | PASS    |
| Middle  | 2437            | 10.64                      | 0.0116 |       | PASS    |
| High    | 2462            | 10.02                      | 0.0100 |       | PASS    |

#### 802.11n-20MHz Test Mode

| Channel | Frequency (MHz) | Measured Output Peak Power |        | Limit | Verdict |
|---------|-----------------|----------------------------|--------|-------|---------|
|         |                 | dBm                        | W      | W     |         |
| Low     | 2412            | 10.24                      | 0.0106 | 0.125 | PASS    |
| Middle  | 2437            | 10.96                      | 0.0125 |       | PASS    |
| High    | 2462            | 10.45                      | 0.0111 |       | PASS    |

## 802.11n-40MHz Test Mode

| Channel | Frequency (MHz) | Measured Output Peak Power |        | Limit | Verdict |
|---------|-----------------|----------------------------|--------|-------|---------|
|         |                 | dBm                        | W      | W     |         |
| Low     | 2412            | 10.32                      | 0.0108 | 0.125 | PASS    |
| Middle  | 2437            | 10.84                      | 0.0121 |       | PASS    |
| High    | 2462            | 11.06                      | 0.0128 |       | PASS    |

### 5.3 Conducted Spurious Emission

#### 5.3.1 Definition

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

#### 5.3.2 Test Description

See section 5.1.2 of this report.

#### 5.3.3 Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions.

| Channel           | Frequency (MHz) | Fundamental Level (dBm) | Emission Level Limit (dBm) |
|-------------------|-----------------|-------------------------|----------------------------|
| 802.11b Low       | 2412            | 11.68                   | -8.32                      |
| 802.11b Mid       | 2437            | 11.26                   | -8.74                      |
| 802.11b High      | 2462            | 11.51                   | -8.49                      |
| 802.11g Low       | 2412            | 10.73                   | -9.27                      |
| 802.11g Mid       | 2437            | 10.64                   | -9.36                      |
| 802.11g High      | 2462            | 10.02                   | -9.98                      |
| 802.11 n-20M Low  | 2412            | 10.24                   | -9.76                      |
| 802.11 n-20M Mid  | 2437            | 10.96                   | -9.04                      |
| 802.11 n-20M High | 2462            | 10.45                   | -9.55                      |
| 802.11 n-40M Low  | 2412            | 10.32                   | -9.68                      |
| 802.11 n-40M Mid  | 2437            | 10.84                   | -9.16                      |
| 802.11 n-40M High | 2462            | 11.06                   | -8.94                      |

| NO.                                   | Frequency | Measurement Bandwidth | Emission Level | Limit | Margin |
|---------------------------------------|-----------|-----------------------|----------------|-------|--------|
|                                       | MHz       | KHz                   | (dBm)          | dBm   | dB     |
| <b>TX:802.11 b Low Channel</b>        |           |                       |                |       |        |
| 1                                     | <1000     | 100                   | \              | -8.32 | >20    |
| 2                                     | 4824      | 100                   | -33.17         | -8.32 | >20    |
| 3                                     | 7236      | 100                   | -37.29         | -8.32 | >20    |
| 4                                     | 9648      | 100                   | \              | -8.32 | >20    |
| 5                                     | 12060     | 100                   | \              | -8.32 | >20    |
| 6                                     | other     | 100                   | \              | -8.32 | >20    |
| <b>TX: 802.11 b Middle Channel</b>    |           |                       |                |       |        |
| 1                                     | <1000     | 100                   | \              | -8.74 | >20    |
| 2                                     | 4874      | 100                   | -32.42         | -8.74 | >20    |
| 3                                     | 7311      | 100                   | -38.16         | -8.74 | >20    |
| 4                                     | 9748      | 100                   | \              | -8.74 | >20    |
| 5                                     | 12185     | 100                   | \              | -8.74 | >20    |
| 6                                     | other     | 100                   | \              | -8.74 | >20    |
| <b>TX: 802.11 b High Channel</b>      |           |                       |                |       |        |
| 1                                     | <1000     | 100                   | \              | -8.49 | >20    |
| 2                                     | 4924      | 100                   | -33.56         | -8.49 | >20    |
| 3                                     | 7386      | 100                   | -37.74         | -8.49 | >20    |
| 4                                     | 9848      | 100                   | \              | -8.49 | >20    |
| 5                                     | 12310     | 100                   | \              | -8.49 | >20    |
| 6                                     | other     | 100                   | \              | -8.49 | >20    |
| <b>Measurement uncertainty:±3.2dB</b> |           |                       |                |       |        |

| NO.                                   | Frequency | Measurement Bandwidth | Emission Level (dBm) | Limit | Margin |
|---------------------------------------|-----------|-----------------------|----------------------|-------|--------|
|                                       | MHz       | KHz                   | dBm                  | dBm   | dB     |
| <b>TX:802.11 g Low Channel</b>        |           |                       |                      |       |        |
| 1                                     | <1000     | 100                   | \                    | -9.27 | >20    |
| 2                                     | 4824      | 100                   | -31.37               | -9.27 | >20    |
| 3                                     | 7236      | 100                   | -37.21               | -9.27 | >20    |
| 4                                     | 9648      | 100                   | \                    | -9.27 | >20    |
| 5                                     | 12060     | 100                   | \                    | -9.27 | >20    |
| 6                                     | other     | 100                   | \                    | -9.27 | >20    |
| <b>TX: 802.11 g Middle Channel</b>    |           |                       |                      |       |        |
| 1                                     | <1000     | 100                   | \                    | -9.36 | >20    |
| 2                                     | 4874      | 100                   | -32.45               | -9.36 | >20    |
| 3                                     | 7311      | 100                   | -36.42               | -9.36 | >20    |
| 4                                     | 9748      | 100                   | \                    | -9.36 | >20    |
| 5                                     | 12185     | 100                   | \                    | -9.36 | >20    |
| 6                                     | other     | 100                   | \                    | -9.36 | >20    |
| <b>TX: 802.11 g High Channel</b>      |           |                       |                      |       |        |
| 1                                     | <1000     | 100                   | \                    | -9.98 | >20    |
| 2                                     | 4924      | 100                   | -33.05               | -9.98 | >20    |
| 3                                     | 7386      | 100                   | -39.48               | -9.98 | >20    |
| 4                                     | 9848      | 100                   | \                    | -9.98 | >20    |
| 5                                     | 12310     | 100                   | \                    | -9.98 | >20    |
| 6                                     | other     | 100                   | \                    | -9.98 | >20    |
| <b>Measurement uncertainty:±3.2dB</b> |           |                       |                      |       |        |

| NO.                                      | Frequency | Measurement Bandwidth | Emission Level (dBm) | Limit | Margin |
|--|-----------|-----------------------|----------------------|-------|--------|
|  | MHz       | KHz                   | dBm                  | dBm   | dB     |
| <b>TX:802.11 n-20MHz Low Channel</b>     |           |                       |                      |       |        |
| 1  | <1000     | 100                   | \                    | -9.76 | >20    |
| 2  | 4824      | 100                   | -34.34               | -9.76 | >20    |
| 3  | 7236      | 100                   | \                    | -9.76 | >20    |
| 4  | 9648      | 100                   | \                    | -9.76 | >20    |
| 5  | 12060     | 100                   | \                    | -9.76 | >20    |
| 6  | other     | 100                   | \                    | -9.76 | >20    |
| <b>TX: 802.11 n-20MHz Middle Channel</b> |           |                       |                      |       |        |
| 1  | <1000     | 100                   | \                    | -9.04 | >20    |
| 2  | 4874      | 100                   | -35.13               | -9.04 | >20    |
| 3  | 7311      | 100                   | \                    | -9.04 | >20    |
| 4  | 9748      | 100                   | \                    | -9.04 | >20    |
| 5  | 12185     | 100                   | \                    | -9.04 | >20    |
| 6  | other     | 100                   | \                    | -9.04 | >20    |
| <b>TX: 802.11 n-20MHz High Channel</b>   |           |                       |                      |       |        |
| 1  | <1000     | 100                   | \                    | -9.55 | >20    |
| 2  | 4924      | 100                   | -34.38               | -9.55 | >20    |
| 3  | 7386      | 100                   | \                    | -9.55 | >20    |
| 4  | 9848      | 100                   | \                    | -9.55 | >20    |
| 5  | 12310     | 100                   | \                    | -9.55 | >20    |
| 6  | other     | 100                   | \                    | -9.55 | >20    |
| <b>Measurement uncertainty:±3.2dB</b>    |           |                       |                      |       |        |



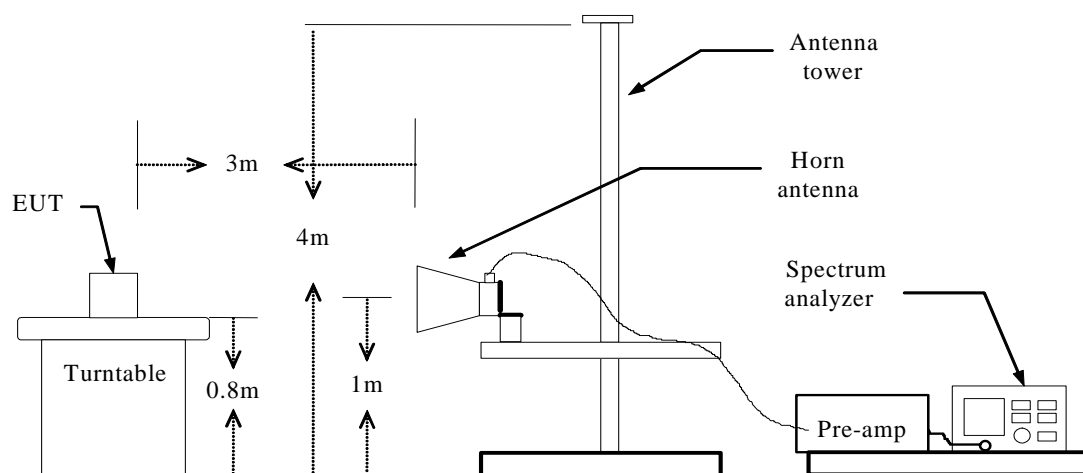
| NO.                                      | Frequency | Measurement Bandwidth | Emission Level (dBm) | Limit | Margin |
|--|-----------|-----------------------|----------------------|-------|--------|
|  | MHz       | KHz                   | dBm                  | dBm   | dB     |
| <b>TX:802.11 n-40MHz Low Channel</b>     |           |                       |                      |       |        |
| 1  | <1000     | 100                   | \                    | -9.68 | >20    |
| 2  | 4824      | 100                   | -33.52               | -9.68 | >20    |
| 3  | 7236      | 100                   | \                    | -9.68 | >20    |
| 4  | 9648      | 100                   | \                    | -9.68 | >20    |
| 5  | 12060     | 100                   | \                    | -9.68 | >20    |
| 6  | other     | 100                   | \                    | -9.68 | >20    |
| <b>TX: 802.11 n-40MHz Middle Channel</b> |           |                       |                      |       |        |
| 1  | <1000     | 100                   | \                    | -9.16 | >20    |
| 2  | 4874      | 100                   | -34.75               | -9.16 | >20    |
| 3  | 7311      | 100                   | \                    | -9.16 | >20    |
| 4  | 9748      | 100                   | \                    | -9.16 | >20    |
| 5  | 12185     | 100                   | \                    | -9.16 | >20    |
| 6  | other     | 100                   | \                    | -9.16 | >20    |
| <b>TX: 802.11 n-40MHz High Channel</b>   |           |                       |                      |       |        |
| 1  | <1000     | 100                   | \                    | -8.94 | >20    |
| 2  | 4924      | 100                   | -34.68               | -8.94 | >20    |
| 3  | 7386      | 100                   | \                    | -8.94 | >20    |
| 4  | 9848      | 100                   | \                    | -8.94 | >20    |
| 5  | 12310     | 100                   | \                    | -8.94 | >20    |
| 6  | other     | 100                   | \                    | -8.94 | >20    |
| <b>Measurement uncertainty:±3.2dB</b>    |           |                       |                      |       |        |

## 5.4 Band Edge

### 5.4.1 Definition

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

### 5.4.2 Test Description



### 5.4.3 Test Result

The EUT operates at continuous transmit test mode. The peak and average test data of the lowest and highest channels are tested to verify the band edge emissions.

| Test Mode          |              | Channel Marked Frequency | Limit (dBuv/m)          | Test Result Highest Emission (dBuv/m) |         |            |         |
|--------------------|--------------|--------------------------|-------------------------|---------------------------------------|---------|------------|---------|
|                    |              |                          |                         | Vertical                              |         | Horizontal |         |
|                    |              |                          |                         | Peak                                  | Average | Peak       | Average |
| 802.11 b           | Low Channel  | 2300MHz                  | 74(Peak)<br>54(Average) | 55.56                                 | 41.37   | 54.96      | 40.70   |
|                    |              | 2390MHz                  |                         | 61.45                                 | 45.59   | 60.85      | 44.92   |
|                    | High Channel | 2483.5MHz                |                         | 56.75                                 | 44.46   | 56.15      | 43.79   |
|                    |              | 2500MHz                  |                         | 54.61                                 | 40.34   | 54.01      | 39.67   |
| 802.11 g           | Low Channel  | 2300MHz                  |                         | 56.48                                 | 43.59   | 55.88      | 42.92   |
|                    |              | 2390MHz                  |                         | 59.61                                 | 47.43   | 59.01      | 46.76   |
|                    | High Channel | 2483.5MHz                |                         | 61.71                                 | 48.48   | 61.11      | 47.81   |
|                    |              | 2500MHz                  |                         | 58.37                                 | 45.78   | 57.77      | 45.11   |
| 802.11 n<br>-20MHz | Low Channel  | 2300MHz                  |                         | 56.02                                 | 45.17   | 55.42      | 44.50   |
|                    |              | 2390MHz                  |                         | 62.15                                 | 39.56   | 61.55      | 38.89   |
|                    | High Channel | 2483.5MHz                |                         | 62.71                                 | 43.97   | 62.11      | 43.30   |
|                    |              | 2500MHz                  |                         | 57.48                                 | 46.14   | 56.88      | 45.47   |
| 802.11 n<br>-40MHz | Low Channel  | 2300MHz                  |                         | 57.69                                 | 44.84   | 57.09      | 44.17   |
|                    |              | 2390MHz                  |                         | 60.37                                 | 48.23   | 59.77      | 47.56   |
|                    | High Channel | 2483.5MHz                |                         | 56.38                                 | 45.64   | 55.78      | 44.97   |
|                    |              | 2500MHz                  |                         | 61.45                                 | 42.81   | 60.85      | 42.14   |

## 5.5 Power Spectral Density (PSD)

### 5.5.1 Definition

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### 5.5.2 Test Description

See section 5.1.2 of this report.

### 5.5.3 Test Result

The lowest, middle and highest channels are tested to verify the power spectral density.

#### 802.11b Test Mode

| Channel | Frequency (MHz) | PSD (dBm) | Limits(dBm) | Result |
|---------|-----------------|-----------|-------------|--------|
| Low     | 2412            | -10.16    | ≤8          | PASS   |
| Middle  | 2437            | -10.42    |             | PASS   |
| High    | 2462            | -10.73    |             | PASS   |

#### 802.11g Test Mode

| Channel | Frequency (MHz) | PSD (dBm) | Limits(dBm) | Result |
|---------|-----------------|-----------|-------------|--------|
| Low     | 2412            | -18.11    | ≤8          | PASS   |
| Middle  | 2437            | -18.42    |             | PASS   |
| High    | 2462            | -18.74    |             | PASS   |

#### 802.11n-20MHz Test Mode

| Channel | Frequency (MHz) | PSD (dBm) | Limits(dBm) | Result |
|---------|-----------------|-----------|-------------|--------|
| Low     | 2412            | -16.74    | ≤8          | PASS   |
| Middle  | 2437            | -17.17    |             | PASS   |
| High    | 2462            | -16.65    |             | PASS   |

#### 802.11n-40MHz Test Mode

| Channel | Frequency (MHz) | PSD (dBm) | Limits(dBm) | Result |
|---------|-----------------|-----------|-------------|--------|
| Low     | 2412            | -17.33    | ≤8          | PASS   |
| Middle  | 2437            | -16.41    |             | PASS   |
| High    | 2462            | -16.35    |             | PASS   |

## 5.6 Conducted Emission

### 5.6.1 Definition

According to FCC section 15.207, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN).

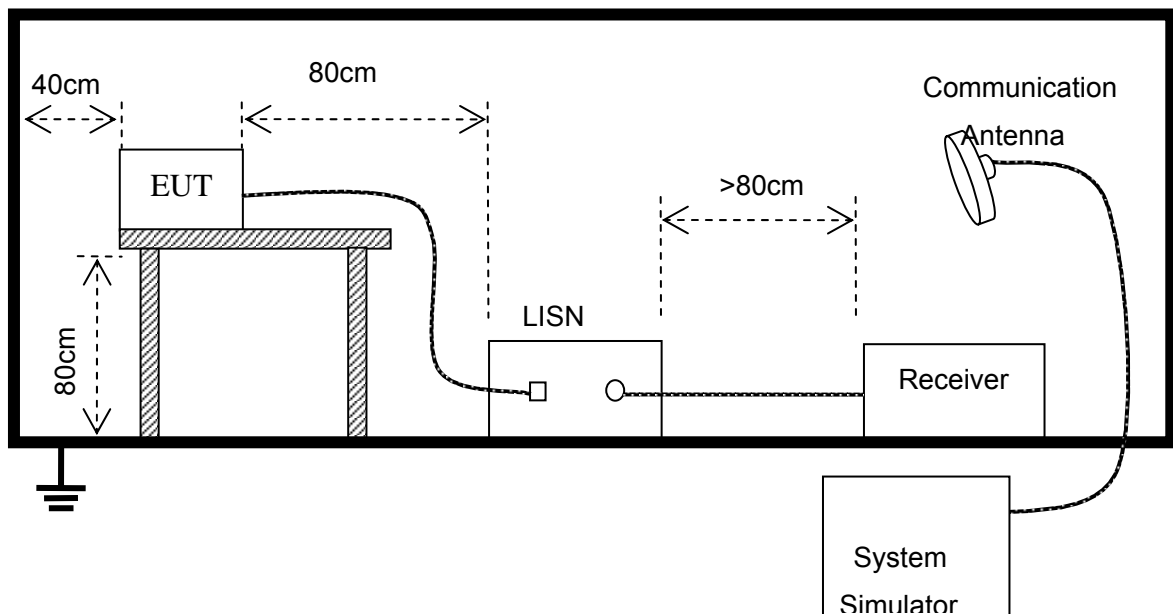
| Frequency     | Maximum RF Line Voltage |                |
|---------------|-------------------------|----------------|
|               | Q.P.( dBuV)             | Average( dBuV) |
| 150kHz-500kHz | 66-56                   | 56-46          |
| 500kHz-5MHz   | 56                      | 46             |
| 5MHz-30MHz    | 60                      | 50             |

**Note:**

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz

### 5.6.2 Test Description

The EUT is powered by the Battery charged with the AC Adapter which is powered by 120V, 60Hz AC mains supply. The path loss as the factor is calibrated to correct the reading. During the measurement, the EUT is activated and is set to operate at maximum power.



## 5.6.3 Test Result



Address: No.5, Langshan 2nd Rd., North Hi-Tech Industrial park  
Guangdong, China  
Tel: 0755-86170306 Fax: 0755-86170310

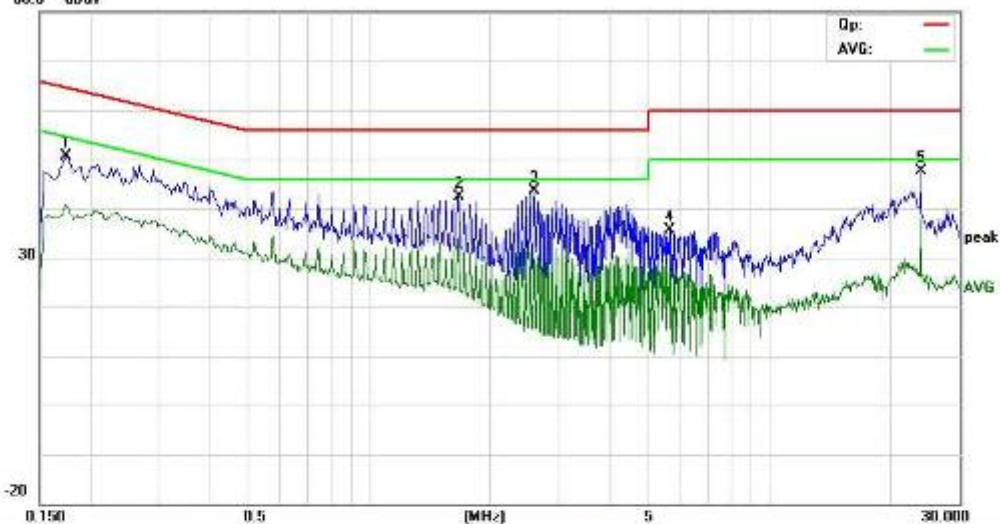
## Conducted Emission Measurement

File: GT-7120  
00.0 dBuV

Data: #7

Date: 2011.08.20

Time: 15:31:40



Site site #1

Phase: **N**

Temperature: 26

Limit: FCC Part15 B Class B QP

Power: AC 120V/60Hz

Humidity: 60 %

EUT: MID

MN: GT-7120

Mode: WIFI

Note:

| No. | Mk | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Over<br>dB | Detector | Comment |
|-----|----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1   |    | 0.1740       | 40.10                    | 10.44                   | 50.54                    | 64.77         | -14.23     | peak     |         |
| 2   |    | 1.6700       | 33.02                    | 9.33                    | 42.35                    | 58.00         | -15.65     | peak     |         |
| 3   | *  | 2.5900       | 34.15                    | 9.58                    | 43.74                    | 58.00         | -14.26     | peak     |         |
| 4   |    | 5.8480       | 23.98                    | 11.61                   | 35.57                    | 60.00         | -24.43     | peak     |         |
| 5   |    | 24.0020      | 38.54                    | 9.00                    | 47.54                    | 60.00         | -12.46     | peak     |         |

\* Maximum data    x Over limit    I Over margin



Address: No.5, Langshan 2nd Rd., North Hi-Tech Industrial park  
Guangdong, China  
Tel: 0755-86170306 Fax: 0755-86170310

### Conducted Emission Measurement

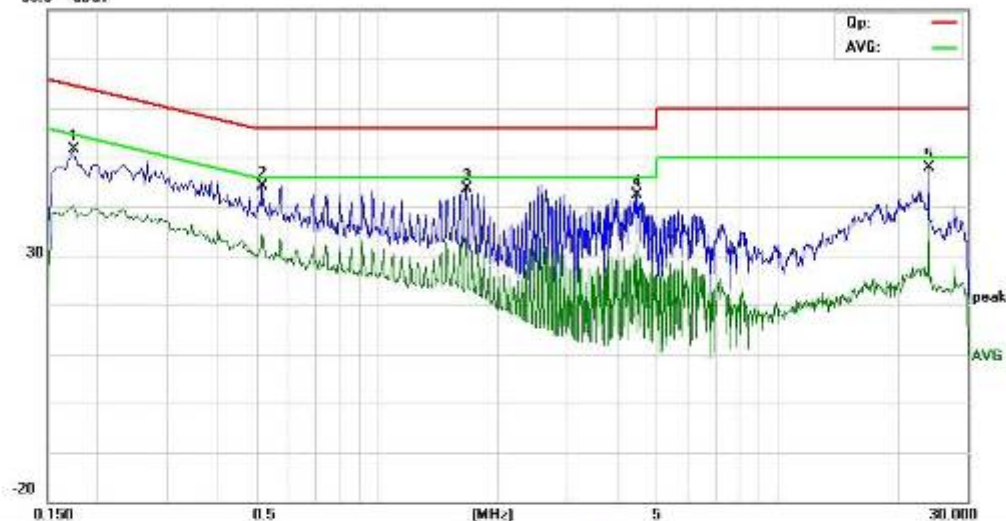
File: GT-7120

Data: #8

Date: 2011.09.20

Time: 15:33:43

00.0 dBuV



Site site #1

Phase: L1

Temperature: 26

Limit: FCC Part15 B Class B QP

Power: AC 120V/60Hz

Humidity: 60 %

EUT: MID

MN: GT-7120

Mode: WIFI

Note:

| No. | Mk | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Over<br>dB | Detector | Comment |
|-----|----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1   |    | 0.1740       | 41.10                    | 10.44                   | 51.54                    | 64.77         | -13.23     | peak     |         |
| 2   | *  | 0.5180       | 34.24                    | 10.00                   | 44.24                    | 58.00         | -11.76     | peak     |         |
| 3   |    | 1.6880       | 34.33                    | 9.33                    | 43.66                    | 58.00         | -12.34     | peak     |         |
| 4   |    | 4.4340       | 30.95                    | 11.43                   | 42.38                    | 58.00         | -13.62     | peak     |         |
| 5   |    | 24.0020      | 38.81                    | 9.00                    | 47.81                    | 60.00         | -12.19     | peak     |         |

\* Maximum data    x Over limit    I over margin

## 5.7 Radiated Emission

### 5.7.1 Definition

According to FCC section 15.247(d), radiated emission outside the frequency band attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

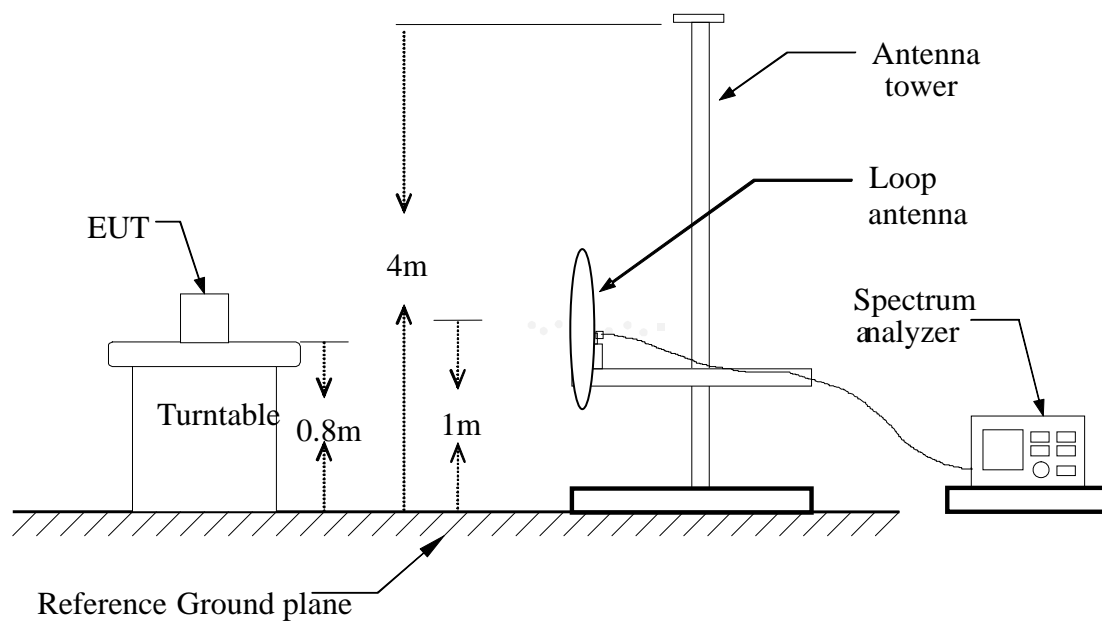
| Frequency (MHz) | Field Strength ( $\mu\text{V/m}$ ) | Measurement Distance (m) |
|-----------------|------------------------------------|--------------------------|
| 0.009 - 0.490   | $2400/F(\text{kHz})$               | 300                      |
| 0.490 - 1.705   | $24000/F(\text{kHz})$              | 30                       |
| 1.705 - 30.0    | 30                                 | 30                       |
| 30 - 88         | 100                                | 3                        |
| 88 - 216        | 150                                | 3                        |
| 216 - 960       | 200                                | 3                        |
| Above 960       | 500                                | 3                        |

As shown in FCC section 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector. When average radiated emission measurements are specified in this part, including emission measurements below 1000MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

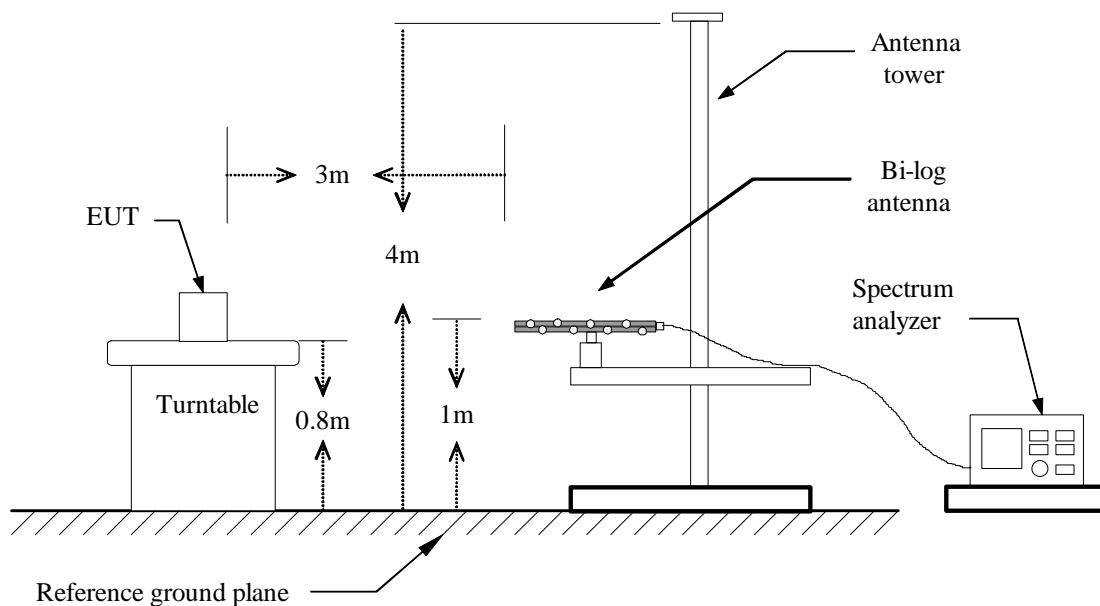


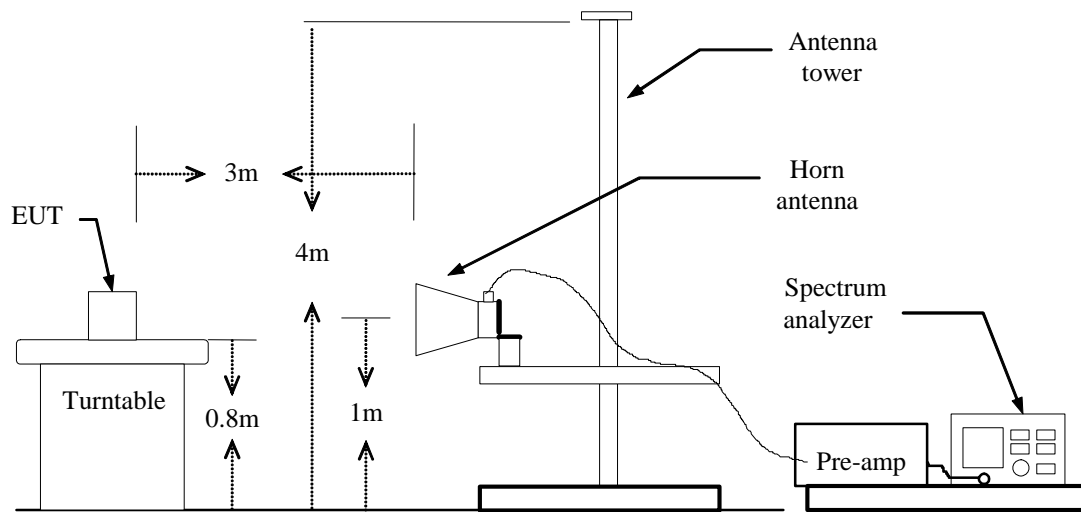
## 5.7.2 Test Description

### A. Test Setup:



### Blow 1GHz:



**Above 1GHz:****B. Test procedures**

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:  
 Below 1GHz: RBW=100 kHz / VBW=300 kHz / Sweep=AUTO  
 Above 1GHz : (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO  
                  (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

### 5.7.3 Test Result

#### Below 1 GHz



Address No.5, Langshan 2nd Rd., North Hi-Tech Industrial park  
Guangdong, China  
Tel: 0755-86170306 Fax: 0755-86170310

#### Radiated Emission Measurement

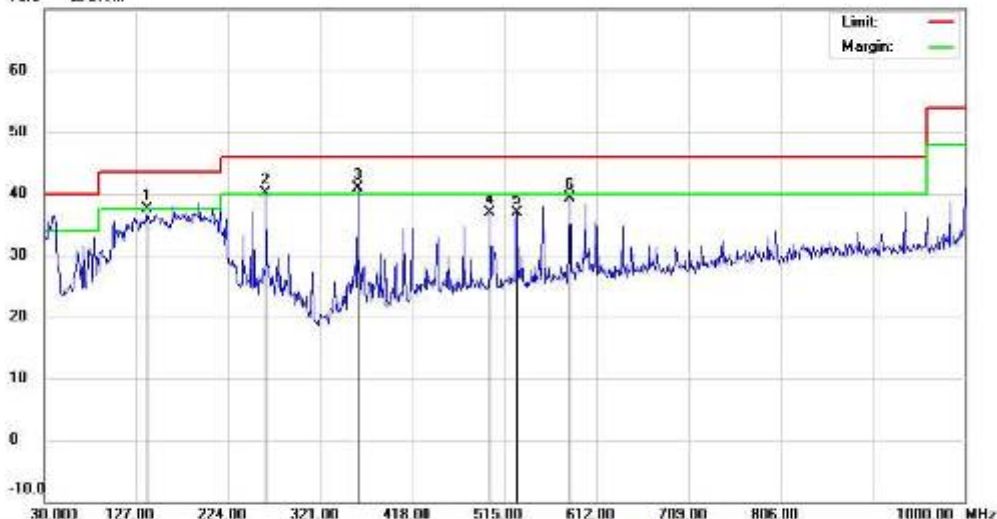
File: GT-7120

Data: #16

Date: 2011-8-18

Time: 20:47:31

70.0 dBuV/m



Site site #1

Polarization: **Vertical**

Temperature: 26

Limit: FCC Part15 B 3M Radiation

Power: AC 120V/60Hz

Humidity: 61 %

EUT: MID

Distance:

MN: GT-7120

Mode: WIFI

Note:

| No. | Mk | Freq<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Antenna<br>Height<br>cm | Table<br>Degree | Comment |
|-----|----|-------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|-------------------------|-----------------|---------|
| 1   |    | 138.6399    | 20.20                    | 17.27                   | 37.47                      | 43.50           | -6.03      | peak     |                         |                 |         |
| 2   |    | 283.7699    | 21.99                    | 18.09                   | 40.08                      | 46.00           | -5.92      | peak     |                         |                 |         |
| 3   |    | 359.8000    | 22.53                    | 18.30                   | 40.83                      | 46.00           | -5.17      | QP       |                         |                 |         |
| 4   |    | 500.4499    | 15.51                    | 21.40                   | 36.91                      | 46.00           | -9.09      | peak     |                         |                 |         |
| 5   |    | 528.5800    | 14.89                    | 22.09                   | 36.98                      | 46.00           | -9.02      | peak     |                         |                 |         |
| 6   |    | 583.8700    | 16.33                    | 22.94                   | 39.27                      | 46.00           | -6.73      | peak     |                         |                 |         |

\* Maximum data    x: Over limit    / : Over margin



Address: No.5, Langshan 2nd Rd., North Hi-Tech Industrial park  
Guangdong, China  
Tel: 0755-86170306 Fax: 0755-86170310

### Radiated Emission Measurement

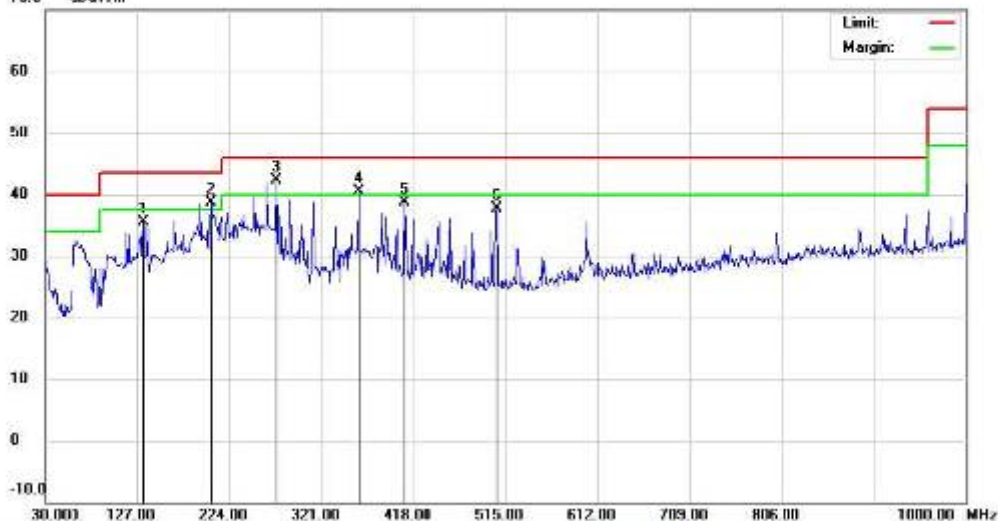
File: GT-7120

Data: #17

Date: 2011-8-19

Time: 20:49:52

70.0 dBuV/m



Site: site #1

Polarization: **Horizontal**

Temperature: 26

Limit: FCC Part15 B 3M Radiation

Power: AC 120V/60Hz

Humidity: 51 %

EUT: MID

Distance:

MN: GT-7120

Mode: WIFI

Note:

| No. | Mk | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Antenna<br>Height<br>cm | Table<br>Degree | Comment |
|-----|----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|-------------------------|-----------------|---------|
| 1   |    | 133.7899     | 18.05                    | 17.51                   | 35.56                      | 43.50           | -7.94      | peak     |                         |                 |         |
| 2   | I  | 205.5699     | 21.70                    | 17.01                   | 38.71                      | 43.50           | -4.79      | QP       |                         |                 |         |
| 3   | F  | 273.4700     | 23.28                    | 19.11                   | 42.39                      | 46.00           | -3.61      | QP       |                         |                 |         |
| 4   | I  | 359.8000     | 22.17                    | 18.30                   | 40.47                      | 46.00           | -5.53      | QP       |                         |                 |         |
| 5   |    | 408.3000     | 19.63                    | 19.00                   | 38.63                      | 46.00           | -7.37      | peak     |                         |                 |         |
| 6   |    | 506.2699     | 16.25                    | 21.43                   | 37.68                      | 46.00           | -8.32      | peak     |                         |                 |         |

\* Maximum data    x: Over limit    : Over margin

**Above 1 GHz****Operation Mode:** Operation Mode**Test Date:** 2011-08-19**Temperature:** 20°C**Tested by:** Petter Ping**Humidity:** 70 % RH**Polarity:** Ver. / Hor.

| Freq.   | Ant. Pol | Peak    | AV      | Ant. / CL | Actual Fs |          | Peak     | AV       | AV     |
|---------|----------|---------|---------|-----------|-----------|----------|----------|----------|--------|
| (MHz)   | H/V      | Reading | Reading | CF        |           |          | Limit    | Limit    | Margin |
|         |          | (dBuV)  | (dBuV)  | (dB)      | Peak      | AV       | (dBuV/m) | (dBuV/m) | (dB)   |
|         |          |         |         |           | (dBuV/m)  | (dBuV/m) |          |          |        |
| 5882.50 | H        | 53.59   | 29.77   | 17.76     | 71.35     | 47.53    | 74.00    | 54.00    | -6.47  |
| N/A     | H        |         |         |           |           |          |          |          |        |
|         |          |         |         |           |           |          |          |          |        |
|         |          |         |         |           |           |          |          |          |        |
|         |          |         |         |           |           |          |          |          |        |
|         |          |         |         |           |           |          |          |          |        |
| 5882.50 | V        | 51.72   | 25.27   | 17.76     | 69.48     | 43.03    | 74.00    | 54.00    | -10.97 |
| N/A     | V        |         |         |           |           |          |          |          |        |
|         |          |         |         |           |           |          |          |          |        |
|         |          |         |         |           |           |          |          |          |        |

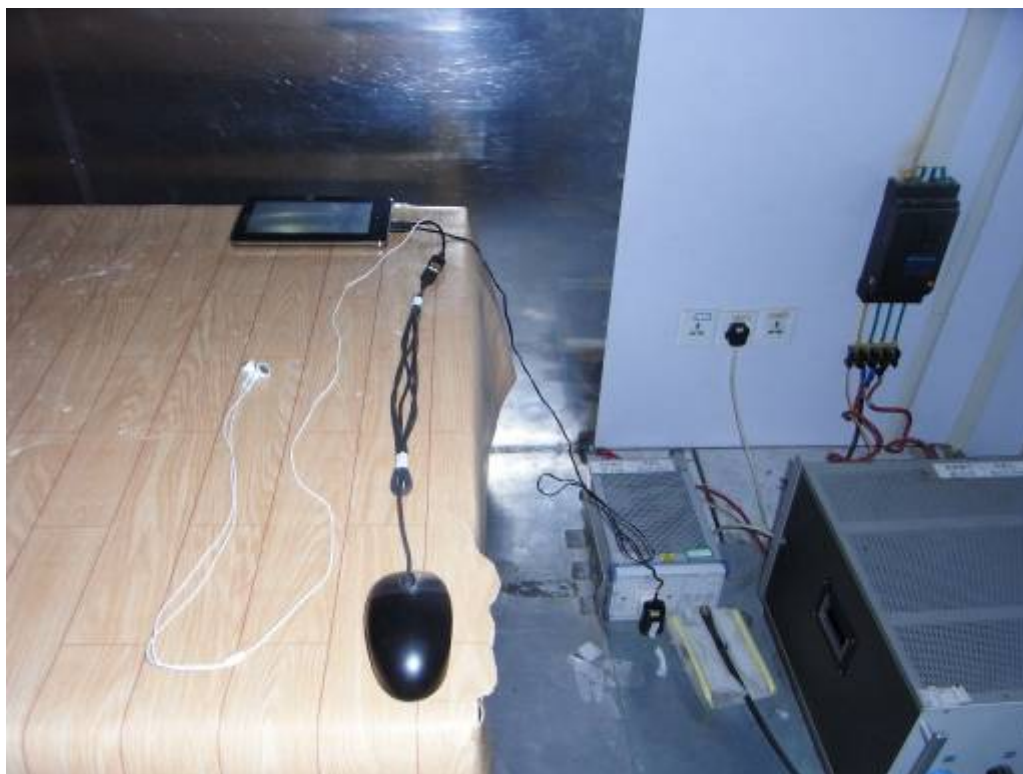
**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

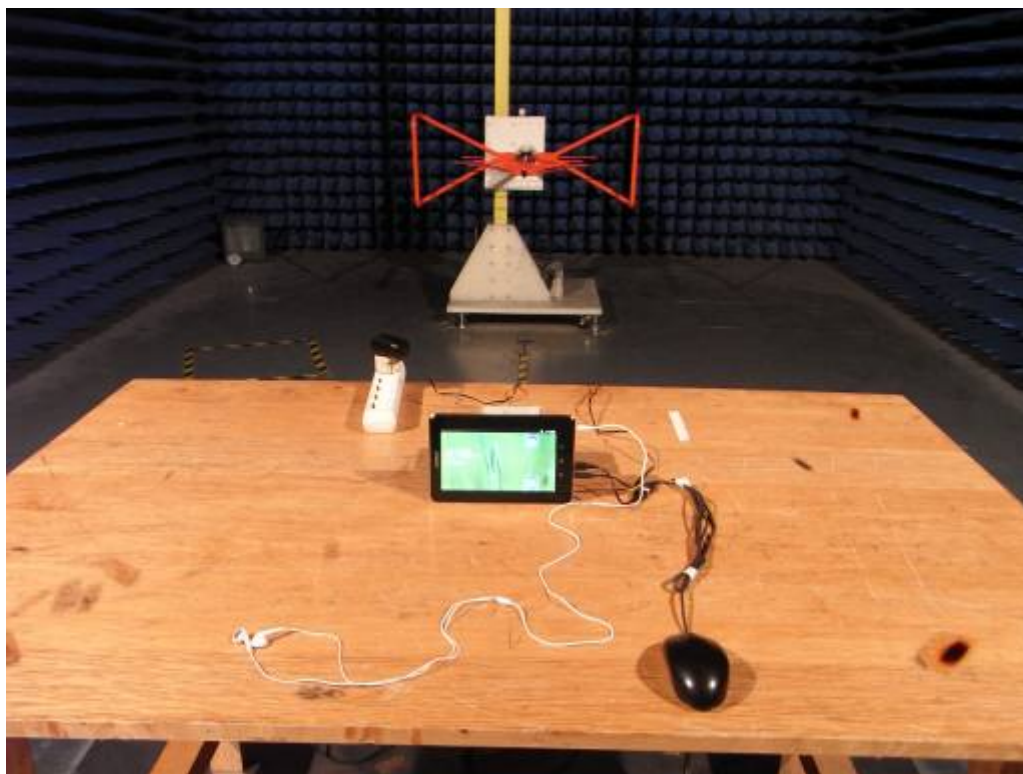
## **APPENDIX 1**

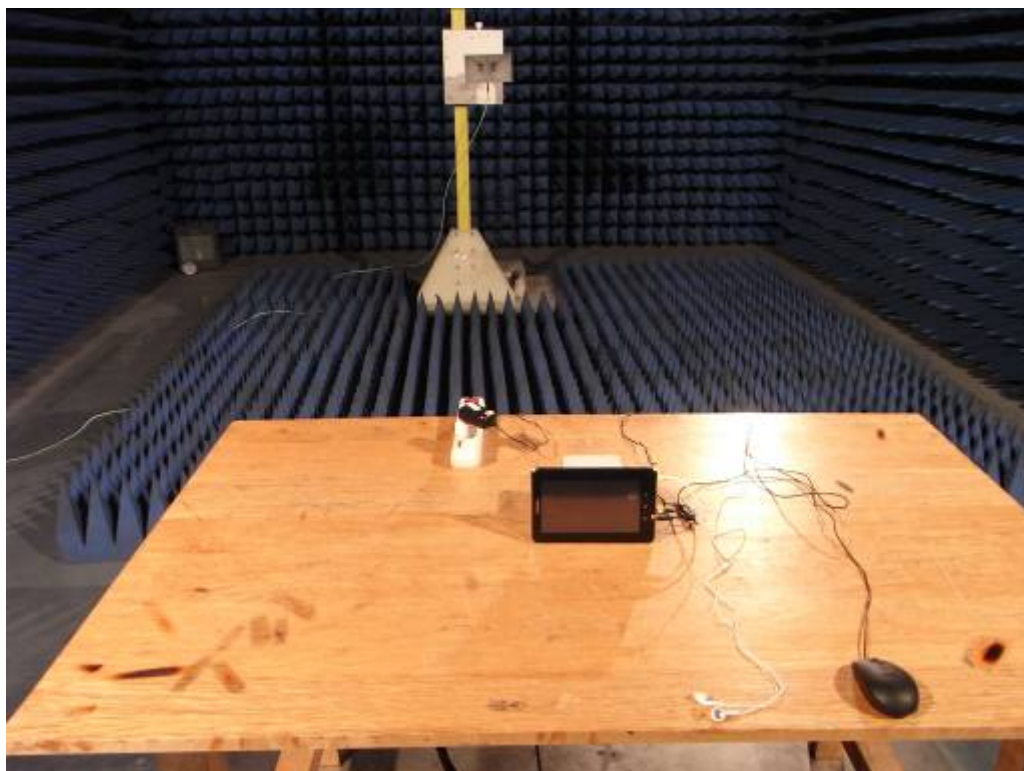
### **PHOTOGRAPHS OF TEST SETUP**

CE TEST SETUP



RE TEST SETUP







## **APPENDIX 2**

### **PHOTOGRAPHS OF EUT**

FRONT VIEW OF SAMPLE



BACK VIEW OF SAMPLE



LEFT VIEW OF SAMPLE



RIGHT VIEW OF SAMPLE



TOP VIEW OF SAMPLE



BOTTOM VIEW OF SAMPLE



VIEW OF AC/DC ADAPTER



VIEW OF EARPHONE



VIEW OF USB CABLE



VIEW OF USB TRANSFER LINE





VIEW OF ENTIRE SAMPLE



VIEW OF BATTERY



INTERNAL PHOTO OF SAMPLE - 1

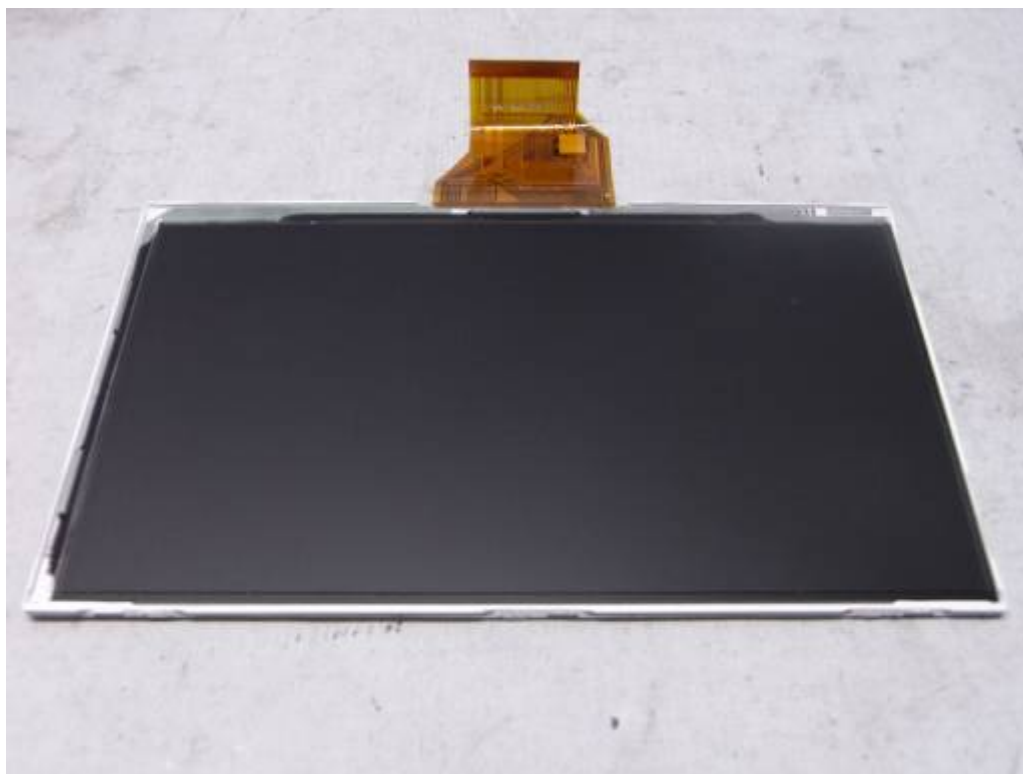


INTERNAL PHOTO OF SAMPLE - 2





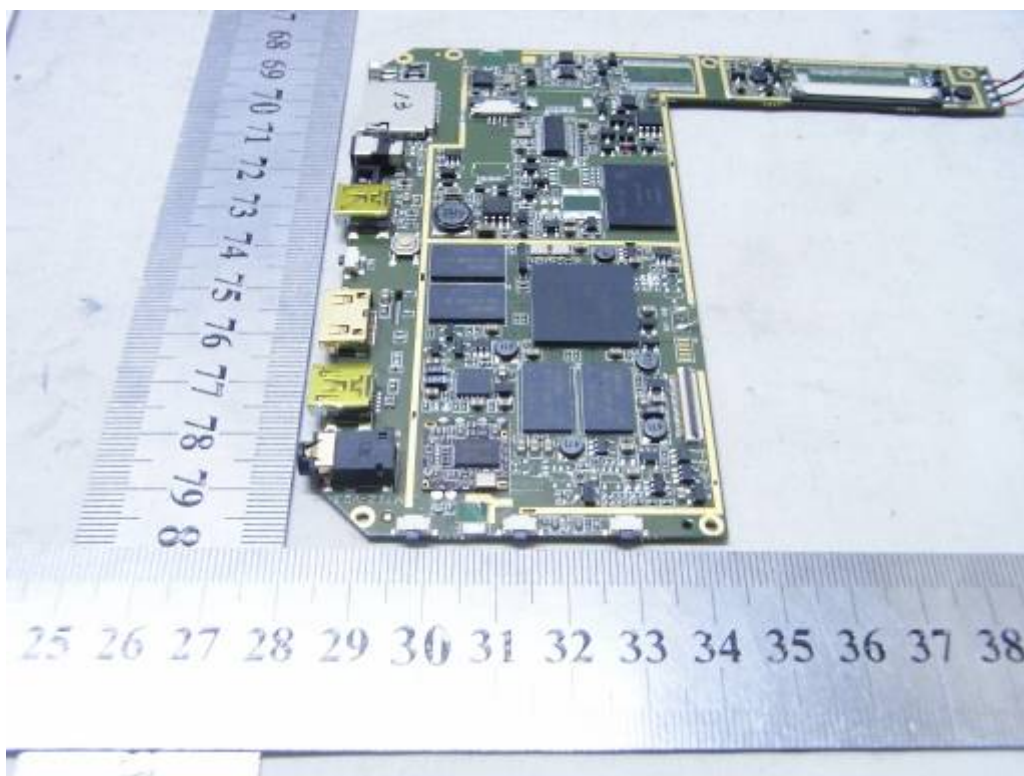
INTERNAL PHOTO OF SAMPLE - 3



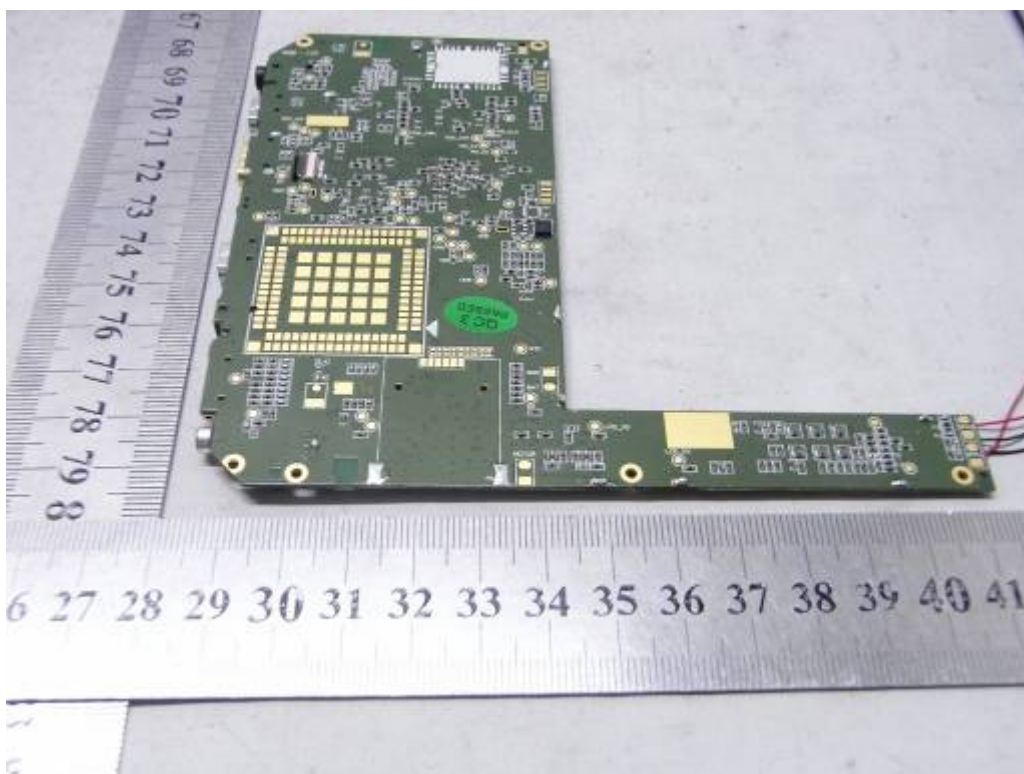
INTERNAL PHOTO OF SAMPLE - 4



INTERNAL PHOTO OF SAMPLE - 5



INTERNAL PHOTO OF SAMPLE - 6



INTERNAL PHOTO OF AC/DC ADAPTER - 1



INTERNAL PHOTO OF AC/DC ADAPTER - 2



-----END OF REPORT-----