

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT****INTENTIONAL RADIATOR CERTIFICATION TO  
FCC PART 15 SUBPART C REQUIREMENT  
INDUSTRY CANADA RSS-210  
OF**

**Product Name:** Multilane POS Terminal

**Brand Name:** Hypercom

**Model No.:** L5200; L5100

**Model Differences:** L5200 with touch screen function  
L5100 without touch screen function

**FCC ID:** NVA00007

**IC:** 1204B-00007

**Report No.:** ER/2011/70015

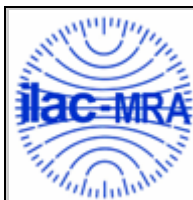
**Issue Date:** July 28, 2011

**FCC Rule Part:** §15.225

**IC Rule Part:** RSS-210 issue 8: 2010, Annex 2 A2.6

**Prepared for** Hypercom Corporation  
8888 E. Raintree Drive, Suite 300 Scottsdale,  
AZ 85260 USA  
SGS Taiwan Ltd.

**Prepared by:** Electronics & Communication Laboratory  
No. 134, Wu Kung Rd., Wuku Industrial Zone,  
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## VERIFICATION OF COMPLIANCE

**Applicant:** Hypercom Corporation  
8888 E. Raintree Drive, Suite 300 Scottsdale, AZ 85260 USA

**Equipment Under Test:** Multilane POS Terminal

**FCC ID:** NVA00007

**IC:** 1204B-00007

**Brand Name:** Hypercom

**Model No.:** L5200; L5100

**Model Difference:** L5200 with touch screen function  
L5100 without touch screen function

**File Number:** ER/2011/70015

**Date of Test:** July 11, 2011 ~ July 27, 2011

**Date of EUT Received:** July 11, 2011

## We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.407 and RSS-210 issue 8: 2010 Annex 2 A2.6

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

Test By:

Lion Wang

Date:

July 28, 2011

Lion Wang / Engineer

Prepared By:

Celine Chou

Date:

July 28, 2011

Celine Chou / Clerk

Approved By

Jim Chang

Date:

July 28, 2011

Jim Chang / Supervisor

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## Version

| Version No. | Date          | Description                  |
|-------------|---------------|------------------------------|
| 00          | July 28, 2011 | Initial creation of document |
|             |               |                              |

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## 1 GENERAL INFORMATION

### 1.1 Product Description

General:

|                  |                                                                         |                                                  |
|------------------|-------------------------------------------------------------------------|--------------------------------------------------|
| Product Name     | Multilane POS Terminal                                                  |                                                  |
| Brand Name       | Hypercom                                                                |                                                  |
| Model No.        | L5200; L5100                                                            |                                                  |
| Model Difference | L5200 with touch screen function<br>L5100 without touch screen function |                                                  |
| Power Supply     | 100-240Vac by AC/DC power adapter                                       |                                                  |
|                  | Adapter:                                                                | Model No.: NU40-8120250-I3<br>Supplier: HYPERCOM |

RFID:

|                     |                    |
|---------------------|--------------------|
| Operating Frequency | 13.56MHz           |
| Transmit Power      | < 123dBuV/m at 3m. |
| Number of Channels  | 1                  |
| Operating Mode      | Point-to-Point     |
| Antenna Type        | PCB Antenna        |
| Module Type         | ASK                |

This report applies for RFID.

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## 1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: NVA00007** filing to comply with Section 15.407 of the FCC Part 15, Subpart E Rules and **IC: 1204B-00007** filing to comply with Industry Canada RSS-210 issue 8: 2010 Annex 2. The composite system (digital device) is compliance with Subpart B is authorized under a DoC procedure..

## 1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003) and RSS-Gen: 2010. Radiated testing was performed at an antenna to EUT distance 3 meters.

## 1.4 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-1.

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: 94644.

## 1.5 Special Accessories

Not available for this EUT intended for grant.

## 1.6 Equipment Modifications

Not available for this EUT intended for grant.

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## 2 System Test Configuration

### 2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### 2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. the Tx frequency was fixed which was for the purpose of the measurements.

### 2.3 Test Procedure

#### 2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.

#### 2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table 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 max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.4-2003.

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## 2.4 Limitation

### (1) Conducted Emission

According to section 15.207(a) Conducted Emission Limits is as following.

| Frequency range<br>MHz                                                                                | Limits<br>dB (uV) |          |
|-------------------------------------------------------------------------------------------------------|-------------------|----------|
|                                                                                                       | Quasi-peak        | Average  |
| 0.15 to 0.50                                                                                          | 66 to 56          | 56 to 46 |
| 0.50 to 5                                                                                             | 56                | 46       |
| 5 to 30                                                                                               | 60                | 50       |
| Note                                                                                                  |                   |          |
| 1.The lower limit shall apply at the transition frequencies                                           |                   |          |
| 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz. |                   |          |

### (2) Radiated Emission

- The field strength of any emission within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- The field strength of any emissions appearing outside of the 13.110-14.010 MHz shall not exceed the general radiated emission limits in section 15.209 (Intentional Radiators general limit).as below.

| Frequency<br>(MHz) | Field strength<br>$\mu\text{V/m}$ | Distance (m) | Field strength at 3m<br>$\text{dB}\mu\text{V/m}$ |
|--------------------|-----------------------------------|--------------|--------------------------------------------------|
| 1.705-30           | 30                                | 30           | 69.54                                            |
| 30-88              | 100                               | 3            | 40                                               |
| 88-216             | 150                               | 3            | 43.5                                             |
| 216-960            | 200                               | 3            | 46                                               |
| Above 960          | 500                               | 3            | 54                                               |

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- Remark:
1. Emission level in dBuV/m=20 log (uV/m)
  2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
  3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of § 15.205 & RSS-210 2.5
  4. Emission spurious frequency which appearing within the Restricted Bands specified in provision of §15.205 & RSS-210 2.5, then the general radiated emission limits in § 15.209 & RSS-210 2.5

### (3) Frequency Tolerance

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of 5 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

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## 2.5 Configuration of Tested System

Fig. 2-1 Configuration of Tested System

EUT

Table 2-1 Equipment Used in Tested System

| Item | Equipment | Mfr/Brand | Model/<br>Type No. | FCC ID | Series No. | Data Cable | Power<br>Cord |
|------|-----------|-----------|--------------------|--------|------------|------------|---------------|
|      | N/A       |           |                    |        |            |            |               |

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### 3 Summary of Test Results

| FCC Rules                                | Description Of Test | Result    |
|------------------------------------------|---------------------|-----------|
| §15.207<br>&<br>RSS-Gen §7.2.4           | Conducted Emission  | Compliant |
| §15.225 (a), (d)<br>&<br>RSS-210 2.5     | Radiated Emission   | Compliant |
| §15.225 (e)<br>&<br>RSS-210 Annex 2 A2.6 | Frequency Stability | Compliant |

### 4 Description of test modes

The EUT stay in continuous transmitting mode. The frequency 13.56 MHz is chosen for radiated emission testing.

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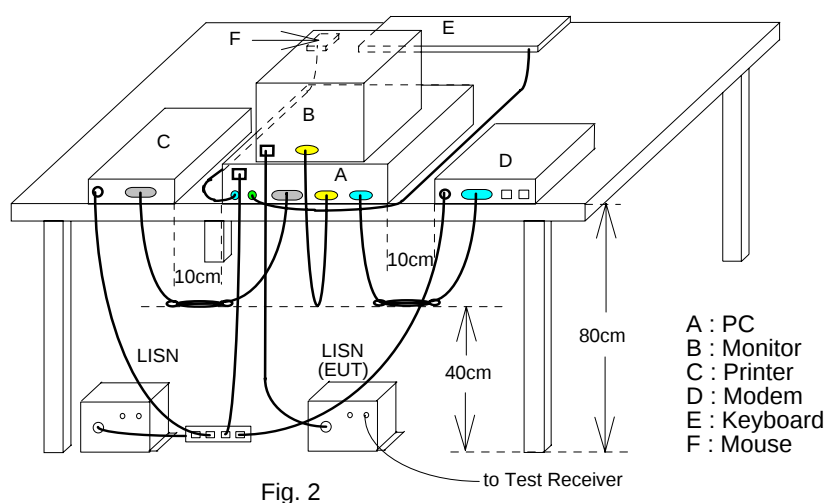
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## 5 Conducted Emissions Test

### 5.1 Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

### 5.2 Test SET-UP (Block Diagram of Configuration)



### 5.3 Measurement Equipment Used:

| Conducted Emission Test Site |            |                         |               |            |            |
|------------------------------|------------|-------------------------|---------------|------------|------------|
| EQUIPMENT TYPE               | MFR        | MODEL NUMBER            | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
| EMI Test Receiver            | R&S        | ESCS30                  | 828985/004    | 09/23/2010 | 09/22/2012 |
| LISN                         | Rolf-Heine | NNB-2/16Z               | 99012         | 03/31/2011 | 03/30/2012 |
| LISN                         | FCC        | FCC-LISN-50/250-25-2-01 | 04034         | 03/31/2011 | 03/30/2012 |
| Coaxial Cables               | N/A        | WK CE Cable             | N/A           | 11/28/2010 | 11/27/2011 |

### 5.4 Measurement Result:

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peak.

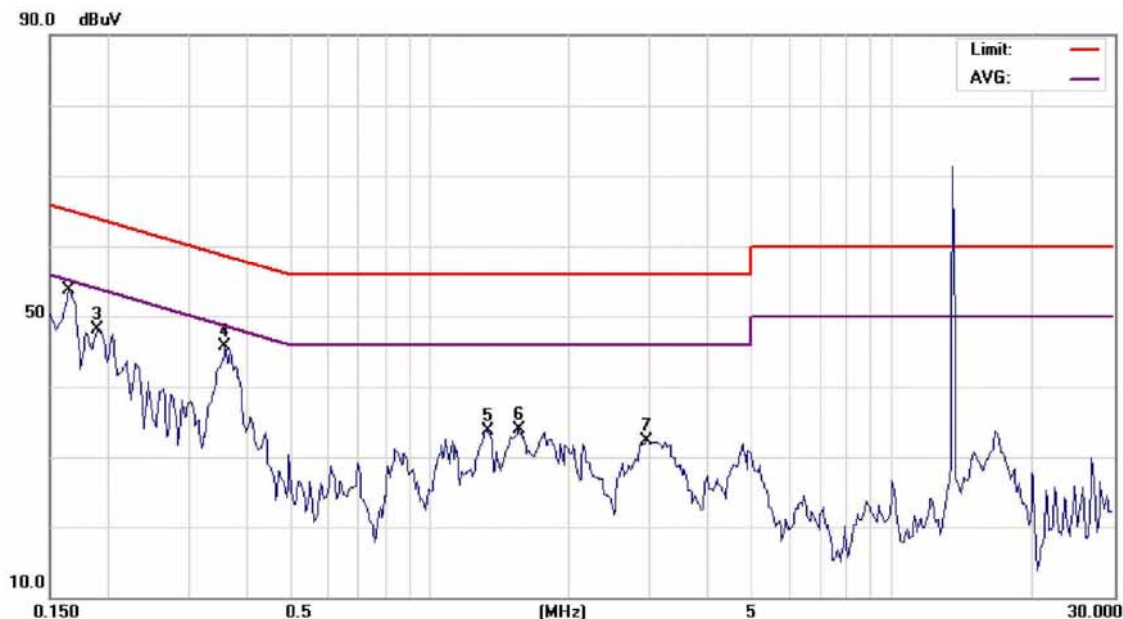
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## AC POWER LINE CONDUCTED EMISSION TEST DATA

|                 |                     |           |      |            |               |
|-----------------|---------------------|-----------|------|------------|---------------|
| Operation Mode: | RFID Operation Mode |           |      | Test Date: | July 27, 2011 |
| Temperature:    | 23 °C               | Humidity: | 57 % | Test By:   | Lion          |



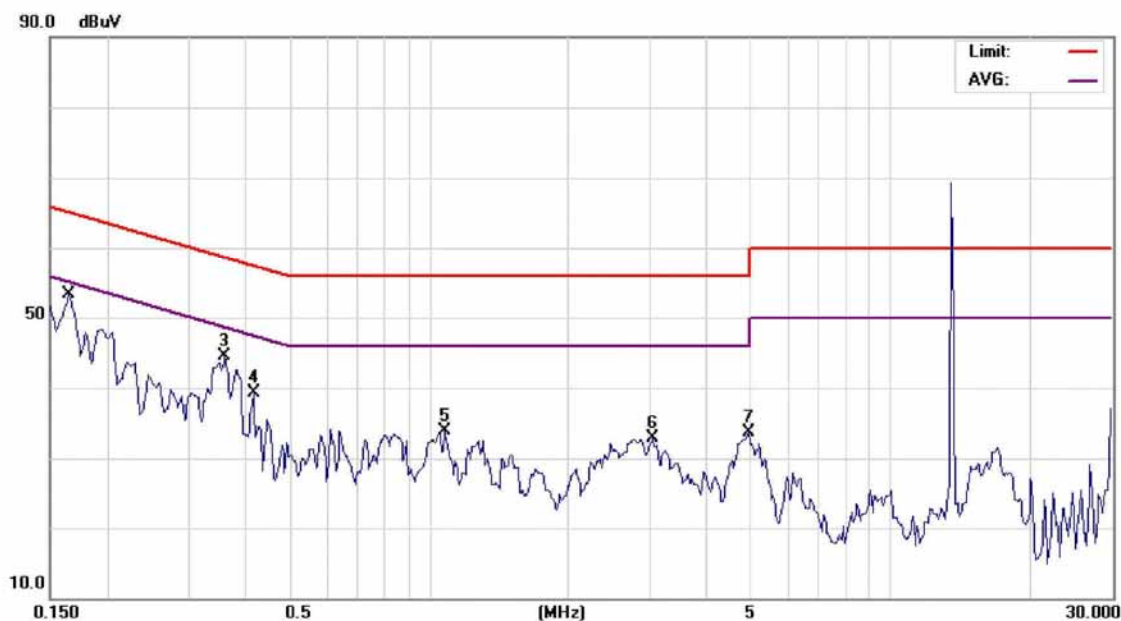
|        |                            |           |              |               |       |
|--------|----------------------------|-----------|--------------|---------------|-------|
| Site   | SGS CONDUCTED #1           | Phase:    | L1           | Temperature:  | 23 °C |
| Limit: | FCC Class B Conduction(QP) | Power:    | AC 120V/60Hz | Humidity:     | 57%   |
| EUT:   | Multilane POS Terminal     | Distance: |              | Air Pressure: | hpa   |
| M/N:   | L5200                      |           |              |               |       |
| Note:  | RFID                       |           |              |               |       |

| No. | Mk. | Freq.  | Reading Level | Factor | Measure-ment | Limit | Over   |          |         |
|-----|-----|--------|---------------|--------|--------------|-------|--------|----------|---------|
|     |     | MHz    | dBμV          | dB     | dBμV         | dBμV  | dB     | Detector | Comment |
| 1   |     | 0.1650 | 43.55         | 0.13   | 43.68        | 65.21 | -21.53 | QP       |         |
| 2   |     | 0.1650 | 40.21         | 0.13   | 40.34        | 55.21 | -14.87 | AVG      |         |
| 3   |     | 0.1900 | 47.98         | 0.12   | 48.10        | 64.04 | -15.94 | peak     |         |
| 4   | *   | 0.3600 | 45.60         | 0.12   | 45.72        | 58.73 | -13.01 | peak     |         |
| 5   |     | 1.3400 | 33.58         | 0.12   | 33.70        | 56.00 | -22.30 | peak     |         |
| 6   |     | 1.5600 | 33.74         | 0.14   | 33.88        | 56.00 | -22.12 | peak     |         |
| 7   |     | 2.9463 | 32.23         | 0.16   | 32.39        | 56.00 | -23.61 | peak     |         |

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Site SGS CONDUCTED #1  
Limit: FCC Class B Conduction(QP)  
EUT: Multilane POS Terminal  
M/N: L5200  
Note: RFID

Phase: **N**  
Power: AC 120V/60Hz  
Distance:

Temperature: 23 °C  
Humidity: 57%  
Air Pressure: hpa

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|--------------|--------------------------|---------------|------------|----------|---------|
| 1   |     | 0.1650       | 43.51                    | 0.13         | 43.64                    | 65.21         | -21.57     | QP       |         |
| 2   |     | 0.1650       | 39.57                    | 0.13         | 39.70                    | 55.21         | -15.51     | AVG      |         |
| 3   | *   | 0.3600       | 44.44                    | 0.12         | 44.56                    | 58.73         | -14.17     | peak     |         |
| 4   |     | 0.4148       | 39.14                    | 0.12         | 39.26                    | 57.55         | -18.29     | peak     |         |
| 5   |     | 1.0800       | 33.85                    | 0.11         | 33.96                    | 56.00         | -22.04     | peak     |         |
| 6   |     | 3.0600       | 32.71                    | 0.16         | 32.87                    | 56.00         | -23.13     | peak     |         |
| 7   |     | 4.9400       | 33.54                    | 0.18         | 33.72                    | 56.00         | -22.28     | peak     |         |

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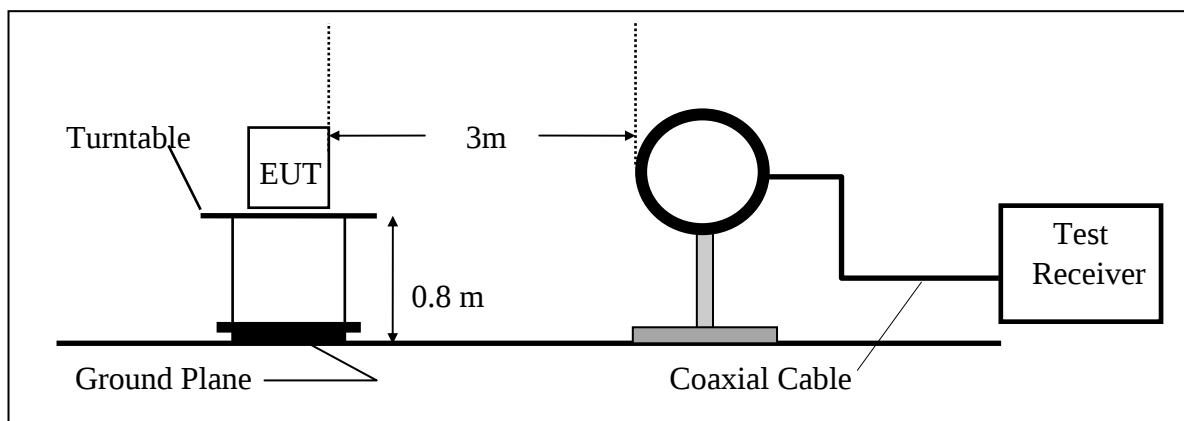
## 6 Radiated Emission Test

### 6.1 Measurement Procedure

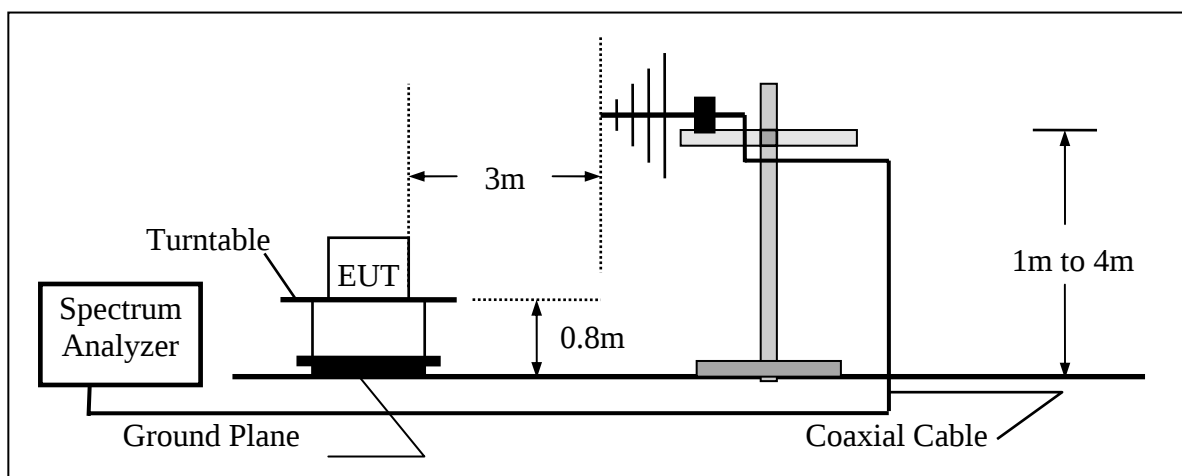
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

### 6.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



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### 6.3 Measurement Equipment Used:

| 966 Chamber                  |              |                     |               |            |            |
|------------------------------|--------------|---------------------|---------------|------------|------------|
| EQUIPMENT TYPE               | MFR          | MODEL NUMBER        | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
| Spectrum Analyzer            | R&S          | FSP 40              | 100034        | 03/30/2011 | 03/29/2012 |
| Bilog Antenna                | SCHWAZBECK   | VULB9160            | 3136          | 11/19/2010 | 11/18/2011 |
| Horn antenna                 | SCHWAZBECK   | BBHA 9120D          | 309/320       | 01/22/2010 | 01/21/2012 |
| Pre-Amplifier                | Agilent      | 8447D               | 1937A02834    | 11/28/2010 | 11/27/2011 |
| Pre-Amplifier                | Agilent      | 8449B               | 3008A01973    | 01/05/2011 | 01/04/2012 |
| Radio Communication Analyzer | R & S        | CMU200              | 102189        | 08/12/2010 | 08/11/2012 |
| DC Block                     | Agilent      | BLK-18              | 155452        | 01/05/2011 | 01/04/2012 |
| Turn Table                   | HD           | DT420               | N/A           | N.C.R      | N.C.R      |
| Antenna Tower                | HD           | MA240-N             | 240/657       | N.C.R      | N.C.R      |
| Controller                   | HD           | HD100               | N/A           | N.C.R      | N.C.R      |
| Low Loss Cable               | HUBER+SUHNER | SUCOFLEX 104PEA-10M | 10m           | 01/05/2011 | 01/04/2012 |
| Low Loss Cable               | HUBER+SUHNER | SUCOFLEX 104PEA-3M  | 3m            | 01/05/2011 | 01/04/2012 |
| 3m Site                      | SGS          | 966 chamber         | N/A           | 09/06/2010 | 09/05/2011 |

### 6.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

|       |                        |                                            |
|-------|------------------------|--------------------------------------------|
| Where | FS = Field Strength    | CL = Cable Attenuation Factor (Cable Loss) |
|       | RA = Reading Amplitude | AG = Amplifier Gain                        |
|       | AF = Antenna Factor    |                                            |

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## 6.5 Measurement Result

Operation Mode: Transmitting Mode  
Fundamental Frequency: 13.56 MHz  
Temperature : 25 °C  
Humidity : 65 %

Test Date : July 27, 2011  
Test By: Lion  
Pol: Vertical

| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Detector<br>Mode<br>(PK/AV/QP) | Reading<br>(dBuV) | Factor<br>(dB) | Actual FS<br>(dBuV/m) | Limit@3m<br>(dBuV/m) | Safe<br>Margin<br>(dB) | Note |
|----------------|-----------------|--------------------------------|-------------------|----------------|-----------------------|----------------------|------------------------|------|
| 13.56          | V               | Peak                           | 75.87             | -4.76          | 71.11                 | 124.00               | -52.89                 | F    |
| 27.12          | V               | Peak                           | 31.90             | -0.20          | 31.70                 | 69.54                | -37.84                 | H    |
| 40.68          | V               | Peak                           | --                |                |                       |                      |                        |      |
| 54.24          | V               | Peak                           | --                |                |                       |                      |                        |      |
| 67.80          | V               | Peak                           | --                |                |                       |                      |                        |      |
| 81.36          | V               | Peak                           | --                |                |                       |                      |                        |      |
| 94.92          | V               | Peak                           | --                |                |                       |                      |                        |      |
| 108.48         | V               | Peak                           | --                |                |                       |                      |                        |      |
| 122.04         | V               | Peak                           | --                |                |                       |                      |                        |      |
| 135.60         | V               | Peak                           | 50.42             | -13.41         | 37.01                 | 43.50                | -6.49                  | H    |
| 60.07          | V               | Peak                           | 51.89             | -14.52         | 37.37                 | 40.00                | -2.63                  | H    |
| 222.06         | V               | Peak                           | 47.97             | -14.95         | 33.02                 | 46.00                | -12.98                 | H    |
| 487.84         | V               | Peak                           | 44.24             | -9.33          | 34.91                 | 46.00                | -11.09                 | H    |
| 569.32         | V               | Peak                           | 42.68             | -7.75          | 34.93                 | 46.00                | -11.07                 | H    |
| 774.89         | V               | Peak                           | 32.80             | -4.44          | 28.36                 | 46.00                | -17.64                 | H    |

### Remark :

- (1) Measuring frequencies from 25 MHz to the 1GHz.
- (2) Radiated emissions measured in frequency range from 25 MHz to 1000MHz were made with an instrument using Peak detector mode.
- (3) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (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) The IF bandwidth of SPA between 25MHz to 30MHz was 10KHz; 30MHz to 1GHz was 100KHz.

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Operation Mode: Transmitting Mode  
Fundamental Frequency: 13.56 MHz  
Temperature : 25 °C  
Humidity : 65 %

Test Date : July 27, 2011  
Test By: Lion  
Pol: Horizontal

| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Detector<br>Mode<br>(PK/AV/QP) | Reading<br>(dBuV) | Factor<br>(dB) | Actual FS<br>(dBuV/m) | Limit@3m<br>(dBuV/m) | Safe<br>Margin<br>(dB) | Note |
|----------------|-----------------|--------------------------------|-------------------|----------------|-----------------------|----------------------|------------------------|------|
| 13.56          | H               | Peak                           | 76.23             | -5.30          | 66.17                 | 124.00               | -57.83                 | F    |
| 27.12          | H               | Peak                           | 31.02             | -0.20          | 30.82                 | 69.54                | -38.72                 | H    |
| 40.68          | H               | Peak                           | --                |                |                       |                      |                        |      |
| 54.24          | H               | Peak                           | --                |                |                       |                      |                        |      |
| 67.80          | H               | Peak                           | --                |                |                       |                      |                        |      |
| 81.36          | H               | Peak                           | --                |                |                       |                      |                        |      |
| 94.92          | H               | Peak                           | --                |                |                       |                      |                        |      |
| 108.48         | H               | Peak                           | --                |                |                       |                      |                        |      |
| 122.04         | H               | Peak                           | --                |                |                       |                      |                        |      |
| 135.60         | H               | Peak                           | 50.38             | -13.41         | 36.97                 | 43.50                | -6.53                  | H    |
| 65.89          | H               | Peak                           | 45.53             | -15.63         | 29.90                 | 40.00                | -10.10                 | H    |
| 222.06         | H               | Peak                           | 51.32             | -14.95         | 36.37                 | 46.00                | -9.63                  | H    |
| 261.83         | H               | Peak                           | 50.07             | -13.50         | 36.57                 | 46.00                | -9.43                  | H    |
| 487.84         | H               | Peak                           | 43.14             | -9.33          | 33.81                 | 46.00                | -12.19                 | H    |
| 874.87         | H               | Peak                           | 34.94             | -2.81          | 32.13                 | 46.00                | -13.87                 | H    |

Remark :

- (1) Measuring frequencies from 25 MHz to the 1GHz.
- (2) Radiated emissions measured in frequency range from 25 MHz to 1000MHz were made with an instrument using Peak detector mode.
- (3) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (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) The IF bandwidth of SPA between 25MHz to 30MHz was 10KHz; 30MHz to 1GHz was 100KHz.

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Operation Mode: RX Mode  
Fundamental Frequency: 13.56 MHz  
Temperature : 25 °C  
Humidity : 65 %

Test Date : July 27, 2011  
Test By: Lion  
Pol: Vertical

| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Detector<br>Mode<br>(PK/AV/QP) | Reading<br>(dBuV) | Factor<br>(dB) | Actual FS<br>(dBuV/m) | Limit@3m<br>(dBuV/m) | Safe<br>Margin<br>(dB) | Note |
|----------------|-----------------|--------------------------------|-------------------|----------------|-----------------------|----------------------|------------------------|------|
| 67.83          | V               | Peak                           | 48.38             | -16.00         | 32.38                 | 40.00                | -7.62                  | H    |
| 225.94         | V               | Peak                           | 45.60             | -14.70         | 30.90                 | 46.00                | -15.10                 | H    |
| 273.47         | V               | Peak                           | 49.46             | -13.12         | 36.34                 | 46.00                | -9.66                  | H    |
| 450.98         | V               | Peak                           | 38.43             | -9.76          | 28.67                 | 46.00                | -17.33                 | H    |
| 524.70         | V               | Peak                           | 37.57             | -8.67          | 28.90                 | 46.00                | -17.10                 | H    |
| 749.74         | V               | Peak                           | 36.05             | -4.34          | 31.71                 | 46.00                | -14.29                 | H    |

Remark :

- (1) Measuring frequencies from 25 MHz to the 1GHz.
- (2) Radiated emissions measured in frequency range from 25 MHz to 1000MHz were made with an instrument using Peak detector mode.
- (3) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (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) The IF bandwidth of SPA between 25MHz to 30MHz was 10KHz; 30MHz to 1GHz was 100KHz.

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Operation Mode: RX Mode  
Fundamental Frequency: 13.56 MHz  
Temperature : 25 °C  
Humidity : 65 %

Test Date : July 27, 2011  
Test By: Lion  
Pol: Horizontal

| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Detector<br>Mode<br>(PK/AV/QP) | Reading<br>(dBuV) | Factor<br>(dB) | Actual FS<br>(dBuV/m) | Limit@3m<br>(dBuV/m) | Safe<br>Margin<br>(dB) | Note |
|----------------|-----------------|--------------------------------|-------------------|----------------|-----------------------|----------------------|------------------------|------|
| 68.80          | H               | Peak                           | 47.52             | -16.38         | 31.14                 | 40.00                | -8.86                  | H    |
| 220.12         | H               | Peak                           | 38.24             | -15.07         | 23.17                 | 46.00                | -22.83                 | H    |
| 277.35         | H               | Peak                           | 49.37             | -13.01         | 36.36                 | 46.00                | -9.64                  | H    |
| 399.57         | H               | Peak                           | 37.04             | -10.90         | 26.14                 | 46.00                | -19.86                 | H    |
| 533.43         | H               | Peak                           | 39.12             | -8.48          | 30.64                 | 46.00                | -15.36                 | H    |
| 800.18         | H               | Peak                           | 38.43             | -3.66          | 34.77                 | 46.00                | -11.23                 | H    |

Remark :

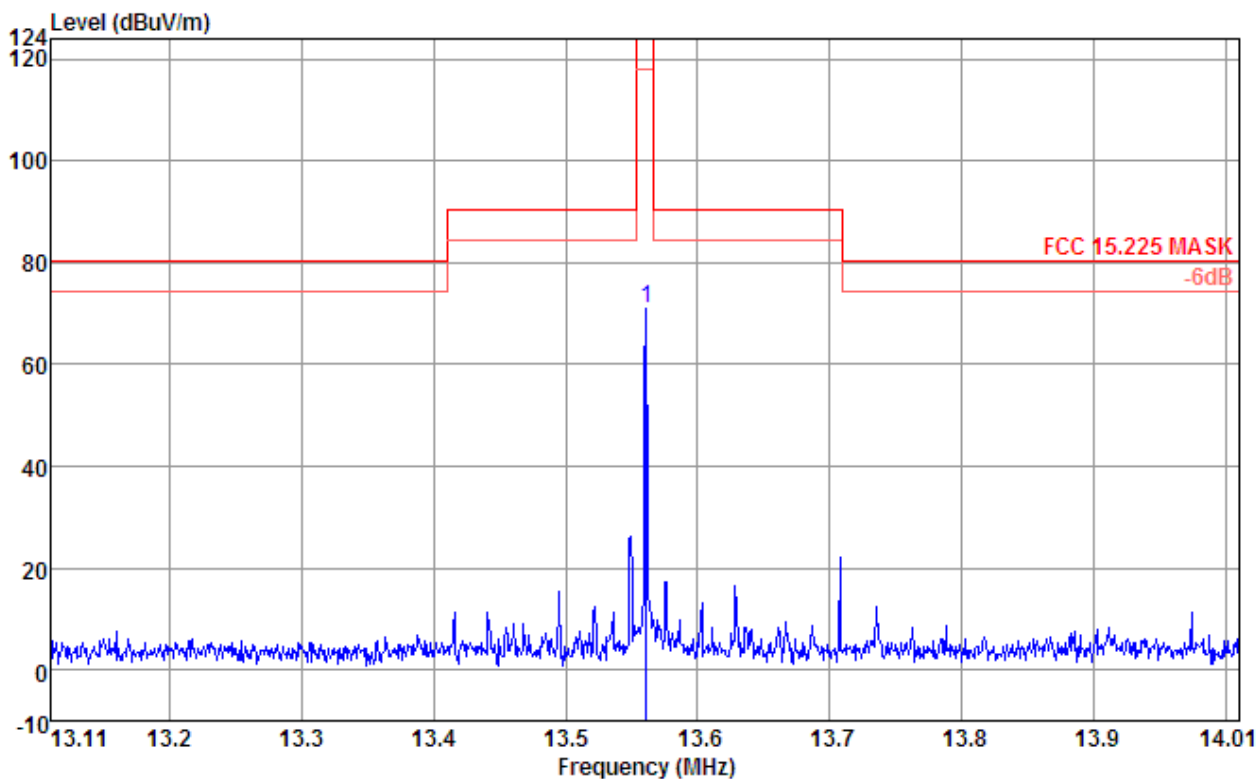
- (1) Measuring frequencies from 25 MHz to the 1GHz.
- (2) Radiated emissions measured in frequency range from 25 MHz to 1000MHz were made with an instrument using Peak detector mode.
- (3) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (4) Data 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) The IF bandwidth of SPA between 25MHz to 30MHz was 10KHz; 30MHz to 1GHz was 100KHz.

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## Radiated Mask



Site : 966 Chamber  
Condition : FCC 15.225 MASK FLA30 VERTICAL  
Project No. : ER-2011-70015  
Applicant : 神達  
EUT Description: Multilane POS Terminal  
EUT Model : L5200  
Test Mode : TX 13.56 Mask  
Temp./Humid. : 25/65  
Operator : Lion

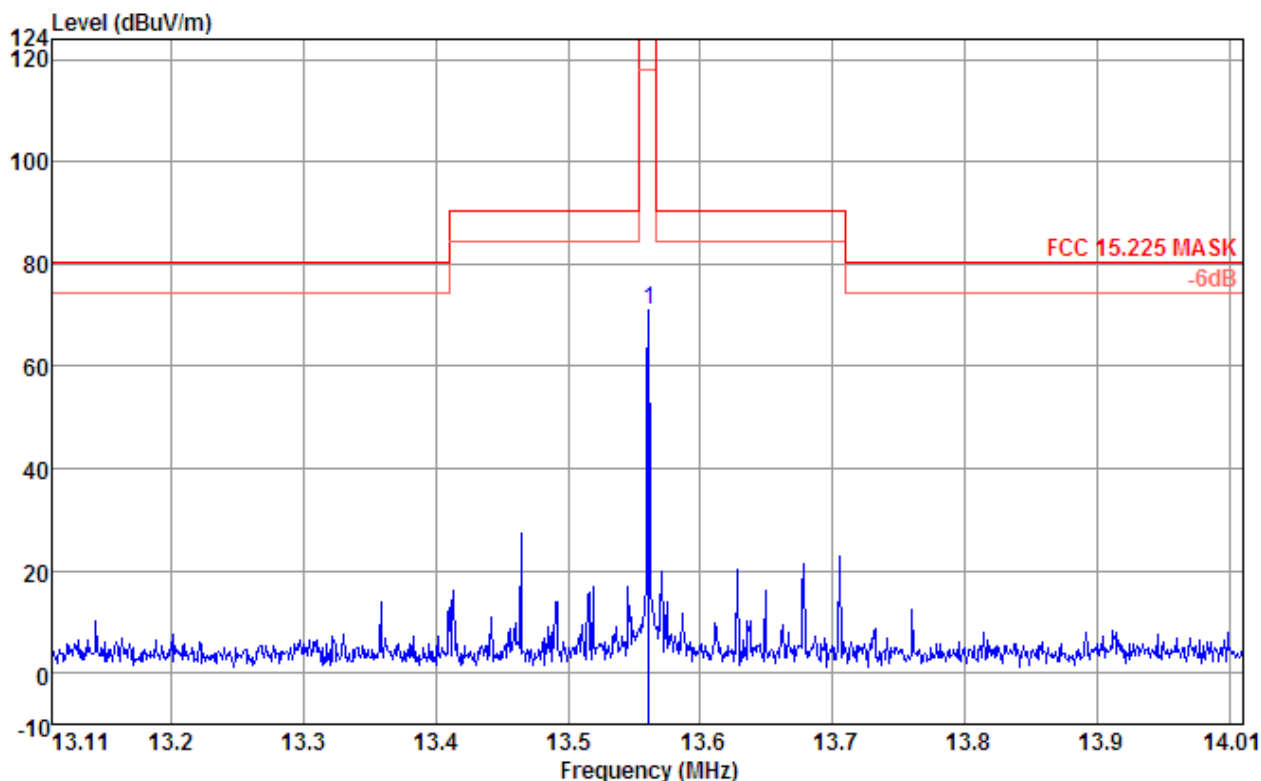
|     | Freq  | Read Level | Antenna Factor | Preamplifier Factor | Cable Loss | Factor | Level  | Limit  | Over Limit | Remark |
|-----|-------|------------|----------------|---------------------|------------|--------|--------|--------|------------|--------|
|     | MHz   | dBuV       | dB/m           | dB                  | dB         | dB/m   | dBuV/m | dBuV/m | dB         |        |
| 1 p | 13.56 | 75.80      | 22.82          | 27.84               | 0.26       | -4.76  | 71.04  | 124.00 | -52.96     | Peak   |

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## Radiated Mask



Site : 966 Chamber  
Condition : FCC 15.225 MASK FLA30 HORIZONTAL  
Project No. : ER-2011-70015  
Applicant : 神達  
EUT Description: Multilane POS Terminal  
EUT Model : L5200  
Test Mode : TX 13.56 Mask  
Temp./Humid. : 25/65  
Operator : Lion

|     | Freq  | Read Level | Antenna Factor | Preamplifier Factor | Cable Loss | Factor | Level  | Limit  | Over Limit | Remark |
|-----|-------|------------|----------------|---------------------|------------|--------|--------|--------|------------|--------|
|     | MHz   | dBuV       | dB/m           | dB                  | dB         | dB/m   | dBuV/m | dBuV/m | dB         |        |
| 1 p | 13.56 | 75.90      | 22.82          | 27.84               | 0.26       | -4.76  | 71.14  | 124.00 | -52.86     | Peak   |

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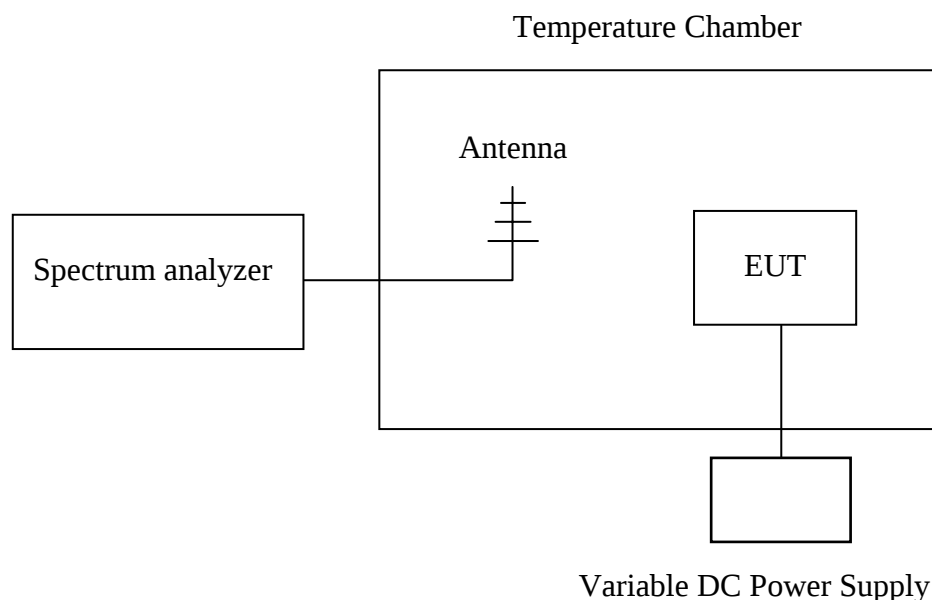
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## 7 Frequency Tolerance

### 7.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation
3. Set SPA Center Frequency = fundamental frequency, RBW, VBW= 10kHz, Span =100kHz.
4. Set SPA Max hold. Mark peak, -26dB.

### 7.2 Test SET-UP (Block Diagram of Configuration)



### 7.3 Measurement Equipment Used:

Same as 6.2 Radiated Emission Measurement.

### 7.4 Measurement Results

Refer to attached data chart.

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## A. Temperature Variation

| Power Supply | Environment      | Frequency | Delta (Hz) | Limit (KHz) |
|--------------|------------------|-----------|------------|-------------|
| Vac          | Temperature (°C) | (MHz)     |            |             |
| 120          | -20              | 13.560833 | -16.00     | +/- 1.356   |
| 120          | -10              | 13.560821 | -4.00      | +/- 1.356   |
| 120          | 0                | 13.560825 | -8.00      | +/- 1.356   |
| 120          | 10               | 13.560803 | 14.00      | +/- 1.356   |
| 120          | 20               | 13.560817 | 0.00       | +/- 1.356   |
| 120          | 30               | 13.560845 | -28.00     | +/- 1.356   |
| 120          | 40               | 13.560851 | -34.00     | +/- 1.356   |
| 120          | 50               | 13.560895 | -78.00     | +/- 1.356   |

## B. Supply Voltage Variation

| Power Supply | Environment      | Frequency | Delta (Hz) | Limit (KHz) |
|--------------|------------------|-----------|------------|-------------|
| Vac          | Temperature (°C) | (MHz)     |            |             |
| 138          | 20               | 13.560833 | -16.00     | +/- 1.356   |
| 120          | 20               | 13.560817 | 0.00       | +/- 1.356   |
| 102          | 20               | 13.560825 | -8.00      | +/- 1.356   |

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## 8. 99% OCCUPIED BANDWIDTH MEASUREMENT

### 8.1 Test Set-up:

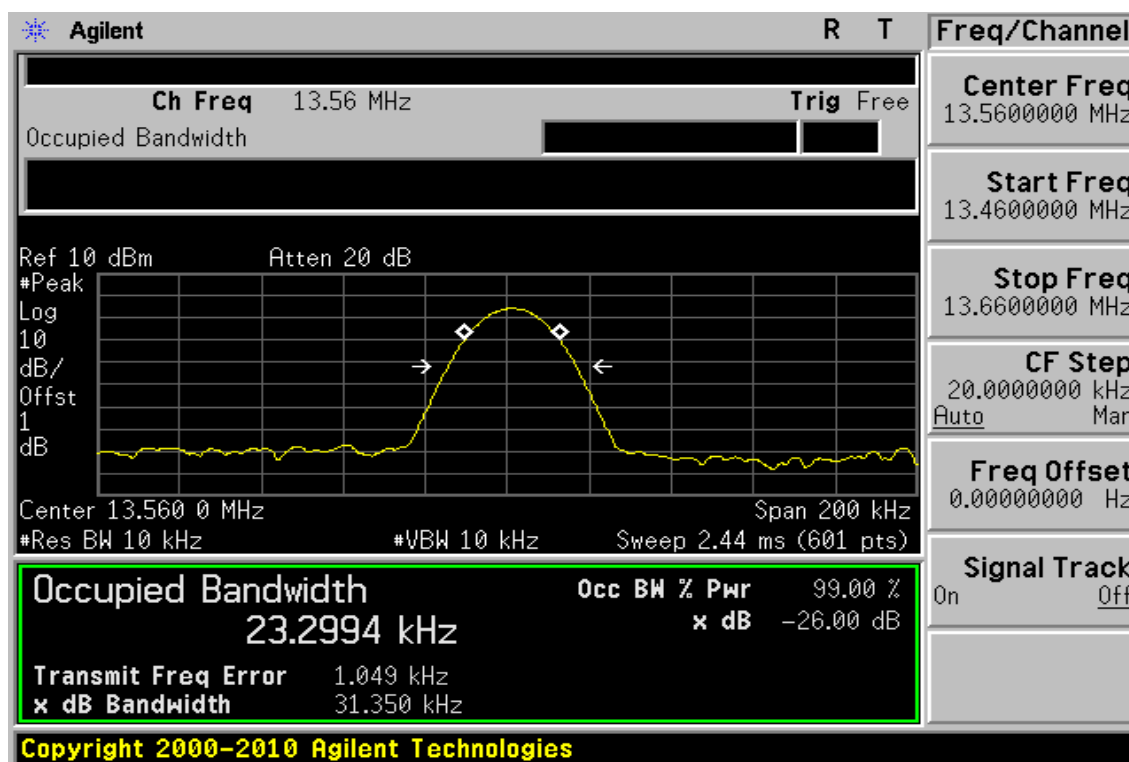
Refer to section 6.2 in this report

### 8.2 Measurement Procedure:

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW (10KHz) was set to about 1% of emission BW, VBW= 3 times RBW(10KHz), -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

### 8.3 Measurement Equipment Used:

Refer to section 6.3 in this report



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