# *FCC Part 74 Subpart H*

# *EMI TEST REPORT*

*of*

E.U.T. : Wireless Tour Guide System
FCC ID. : 2ADLG-TG201TU
Model No. : TG-201T , TG-200T
Working Frequency : 470~608MHz; 944~952MHz

*for*

APPLICANT : LINKX ELECTRONICS CO., LTD
ADDRESS : 4F-1, No.332 Ming-Chen 2nd Road, Tsou-In Dist., Kaohsiung Taiwan.

Test Performed by

ELECTRONICS TESTING CENTER (ETC) , TAIWAN
NO. 34. LIN 5, DINGFU VIL., LINKOU DIST.,
NEW TAIPEI CITY, TAIWAN, 24442, R.O.C.
TEL : (02)26023052 FAX : (02)26010910
http:// www.etc.org.tw ; e-mail:emc@etc.org.tw

Report Number : 17-08-RBF-022-01

# *TEST REPORT CERTIFICATION*

| | | |
|---|---|---|
| Applicant | : | LINKX ELECTRONICS CO., LTD<br>4F-1, No.332 Ming-Chen 2nd Road, Tsou-In Dist., Kaohsiung Taiwan. |
| Manufacturer | : | LINKX ELECTRONICS CO., LTD<br>4F-1, No.332 Ming-Chen 2nd Road, Tsou-In Dist., Kaohsiung Taiwan. |

| | | |
|---|---|---|
| Description of EUT | : | |
| a) Type of EUT | : | Wireless Tour Guide System |
| b) Trade Name | : | Linkx |
| c) Model No. | : | TG-201T , TG-200T |
| d) FCC ID | : | 2ADLG-TG201TU |
| e) Working Frequency | : | 470~608MHz; 944~952MHz |
| f) Power Supply | : | DC 3.7V |

Regulation Applied: FCC Rules and Regulations Part 74 Subpart H

I HEREBY CERTIFY THAT; The data shown in this report were made in accordance with the procedures given in ANSI C63.10-2013 and the energy emitted by the device was founded to be within the limits applicable. I assume full responsibility for accuracy and completeness of these data.

Issued Date : Dec. 21, 2017

Test Engineer : Kazuma Ho

(Kazuma Ho, Engineer )

Approve & Authorized Signer : S. S. Liou

S. S. Liou, Section Manager
EMC Dept. II of ELECTRONICS TESTING CENTER, TAIWAN

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# 1. GENERAL INFORMATION

## 1.1 Product Description

| | | |
|---|---|---|
| a) Type of EUT | : | Wireless Tour Guide System |
| b) Trade Name | : | Linkx |
| c) Model No. | : | TG-201T , TG-200T |
| d) FCC ID | : | 2ADLG-TG201TU |
| e) Working Frequency | : | 470~608MHz; 944~952MHz |
| f) Power Supply | : | DC3.7V |
| g) Emission Designator | : | 166KF1D |
| h) Difference Description | : | The difference between the serial model product and the original sample is only the model name and the function.<br>TG-201T has two-way communication function.<br>TG-200T has no two-way communication function. |

## 1.2 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.10-2013. Test also follow "TIA-603-D(2010)-Land Mobile FM or PM Communications Equipment Measurement and Performance Standsrds" and section 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, and 2.1055 of Part 2 of CFR 47.

Measueement Software

| Software | Version | Note |
|---|---|---|
| e3 | Version 6.100618b | Radiated Emission Test |
| e3 | Version 6.100421 | Conducted Emission Test |

## 1.3 Test Facility

Location of the Test site: No.34, Lin 5, Dingfu Vil., Linkou Dist., New Taipei City, Taiwan 24442, R.O.C.

Designation Number: TW2628.

# 2. REQUIREMENTS OF PROVISIONS

## 2.1 Definition

Intentional radiator:
A device that intentionally generates and emits radio frequency energy by radiation or induction.

## 2.2 Frequencies Available

According to sec. 74.802 of Part 74, the following frequencies are available for low power auxiliary station :

Frequencies (MHz)

| | |
|---|---|
| 26.100-26.480 | 455.000-456.000 |
| 54.000-72.000 | 470.000-488.000 |
| 76.000-88.000 | 488.000-494.000 |
| 161.625-161.775 | 494.000-608.000 |
| 174.000-216.000 | 614.000-698.000 |
| 450.000-451.000 | 941.500-944.000 |
| | 944.000-952.000 |

## 2.3 Requirements for Radio Equipment on Certification

**(1) RF Output Power**
For transmitters, the power output shall be measured at the RF output terminals.

**(2) Modulation Characteristics**
For Voice Modulated Communication Equipment, a curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted.

**(3) Occupied Bandwidth**
For radiotelephone transmitter, other than single sideband or indenpent sideband transmitter, when modulateed by a 2.5kHz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation.

**(4) Spurious Emissions at Antenna Terminals**
The radio frequency voltage or power generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminal when properly loaded with a suitable artificial antenna.

**(5) Field Strength of Spurious Emissions**

Measurements shall be made to detect spurious emission that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal condition of installation and operation.

**(6) Frequencies Tolerance**

a) The frequency stability shall be measured with variation of ambient temperature.
b) The frequency stability shall be measured with variation of primary supply voltage.

## 2.4 Labeling Requirement

Each equipment for which a type acceptance application is filed on or after May 1,1981, shall bear an identification plate or label pursuant to § 2.925 （ Identification of equipment） and §2.926（FCC identifier）.

# 3. OUTPUT POWER MEASUREMENT

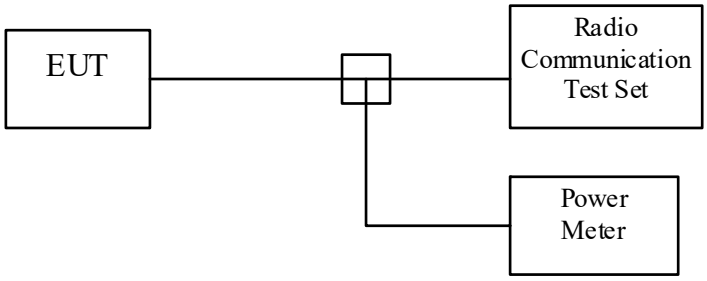
## 3.1 Provision Applicable

According to §74.861(e)(1)(ii), the output power shall not exceed 250 milliwatts.

## 3.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 1, and Install new batteries in the EUT. Turn on the EUT ant set it to any one convenient frequency within its operating range.
3. Apply a 2.5 kHz modulation signal to EUT. Record the readings on the instrument.
4. Repeat above procedures until all frequencies measured were complete.

Figure 1: Transmit power measurement configuration.



## 3.3 Test Data

**(A)**

Operated mode : TX
Temperature : 23°C
Test Date : Nov. 24, 2017
Humidity : 55 %

| Frequency (MHz) | Transmit Power | | Limit (mW) |
|---|---|---|---|
| | (dBm) | (mW) | |
| 470.050 | 7.15 | 5.188 | 250.0 |
| 607.950 | 7.12 | 5.152 | 250.0 |
| 944.050 | 7.14 | 5.176 | 250.0 |
| 951.950 | 7.14 | 5.176 | 250.0 |

## 3.4 Test Equipment

| Equipment | Manufacturer | Model No. | Calibration Date | Next Cal. Date |
|---|---|---|---|---|
| POWER METER +SENSOR | ANRITSU | ML2487A +MA2491A | 2017/05/18 | 2018/05/17 |
| Communications Service Monitor | AEROFLEX | 2945B | 2017/11/18 | 2018/11/17 |

# 4. MODULATION CHARACTERISTICS

## 4.1 Provisions Applicable

According to § 2.1047 (a), for Voice Modulated Communication Equipment, the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be measured.

## 4.2 Measurement Method

A) Modulation Limit

1. Position the EUT as shown in figure 2, adjust the audio input frequency to 100 Hz and the input level from 0V to maximum permitted input voltage with recording each carrier frequency deviation responding to respective input level.

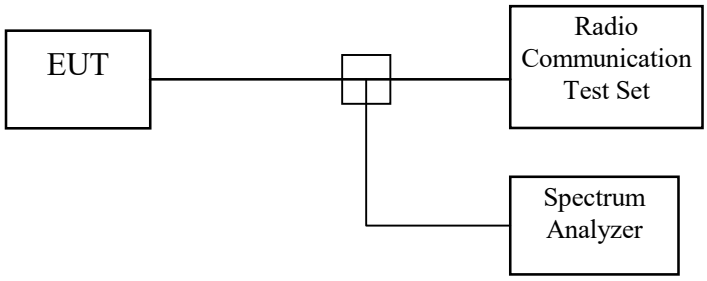
2. Repeat step 1 with changing the input frequency for 200, 500, 1000, 3000, and 5000 Hz in sequence.

B) Frequency response of all circuits

1. Position the EUT as shown in figure 2.

2. Vary the modulating frequency from 100 Hz to 15000 Hz with constant input voltage (derived from 5.4(a) of this test report), and observe the change in output.

Figure 2 : Modulation characteristic measurement configuration



## 4.3 Measurement Instrument

| Equipment | Manufacturer | Model No. | Calibration Date | Next Cal. Date |
|---|---|---|---|---|
| Communications Service Monitor | AEROFLEX | 2945B | 2017/01/09 | 2018/01/08 |
| Spectrum Analyzer | Rohde & Schwarz | FSP40 | 2017/11/02 | 2018/11/01 |

## 4.4 Measurement Result

**N/A**

Note: This test is not applicable bcause this device has digital modulation.

# 5. OCCUPIED BANDWIDTH OF EMISSION

## 5.1 Provisions Applicable

According to §2.1049 (c)(1), For radiotelephone transmitter, other than single sideband or indenpent sideband transmitter, when modulateed by a 2.5kHz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation.
According to §74.861( e)(5), the frequency emission bandwidth shall not exceed 200 kHz.

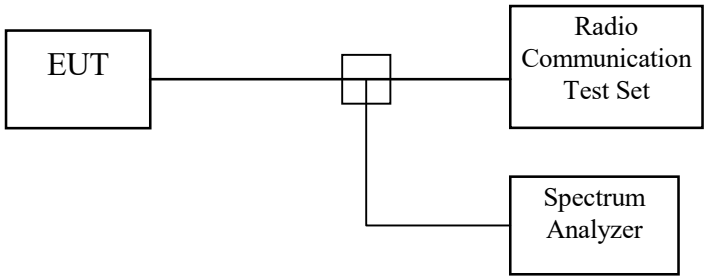
## 5.2 Measurement Method

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.

2. Position the EUT as shown in figure 3, and Install new batteries in the EUT. Turn on the EUT ant set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.

3. Apply a 2.5 kHz modulation signal to EUT and measure the frequencies of the modulated signal from the EUT where it is the specified number of dB below the reference level set in step 2. This is the occupied bandwidth specified.

Figure 3 : Occupied bandwidth measurement configuration




## 5.3 Occupied Bandwidth Test Equipment

| Equipment | Manufacturer | Model No. | Calibration Date | Next Cal. Date |
|---|---|---|---|---|
| Communications Service Monitor | AEROFLEX | 2945B | 2017/01/09 | 2018/01/08 |
| Spectrum Analyzer | Rohde & Schwarz | FSP40 | 2017/11/02 | 2018/11/01 |

## 5.4 Bandwidth Measured

### 5.4.1 Input Level Derived

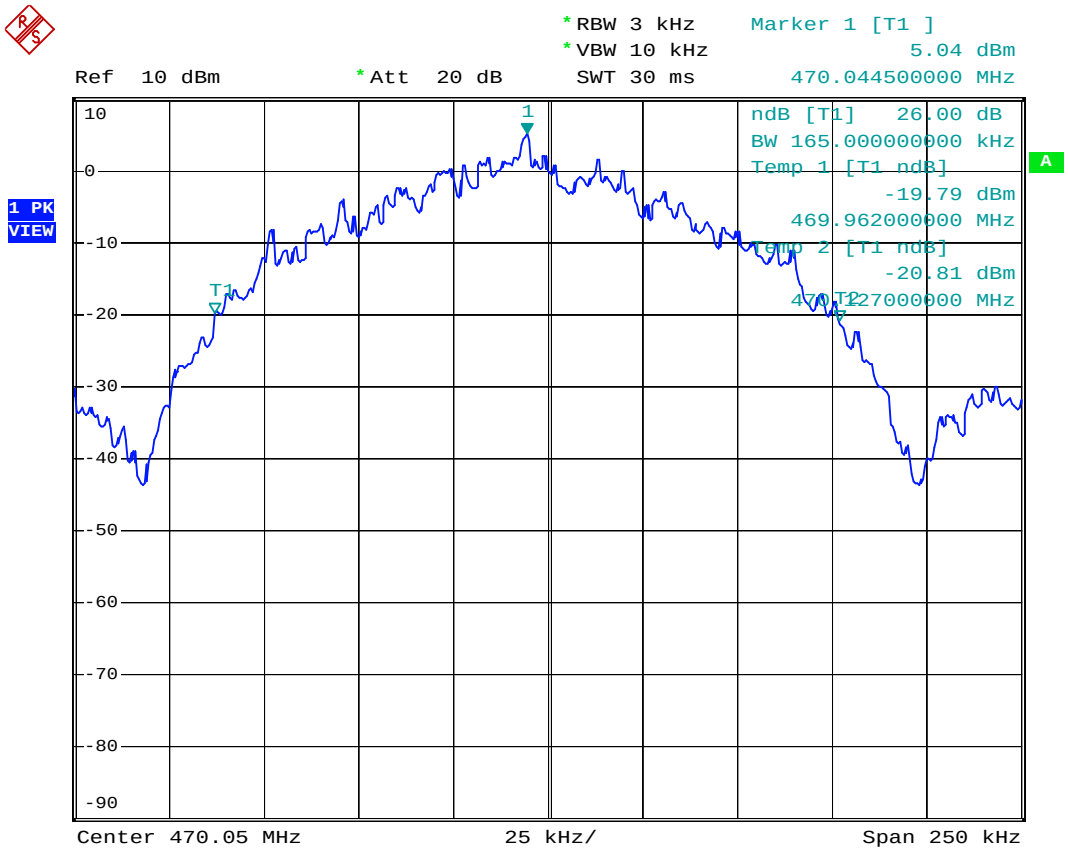
**N/A**

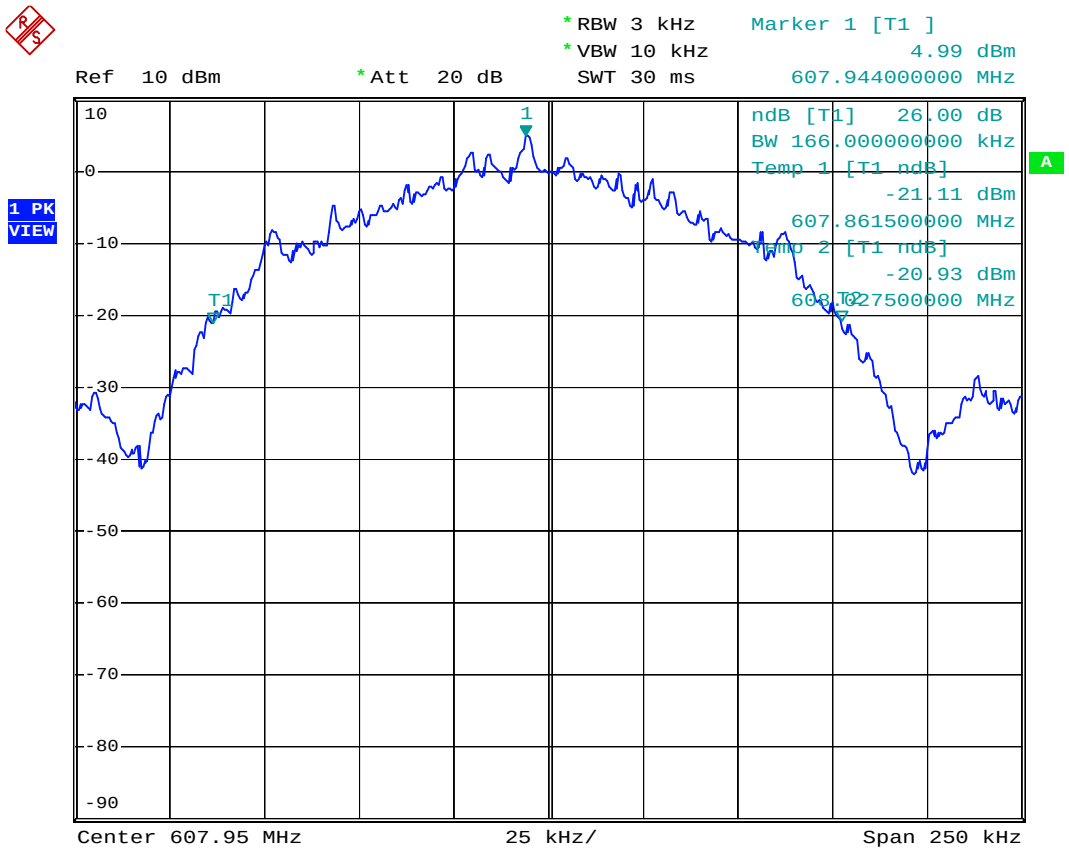
Note: This test is not applicable bcause this device has digital modulation.

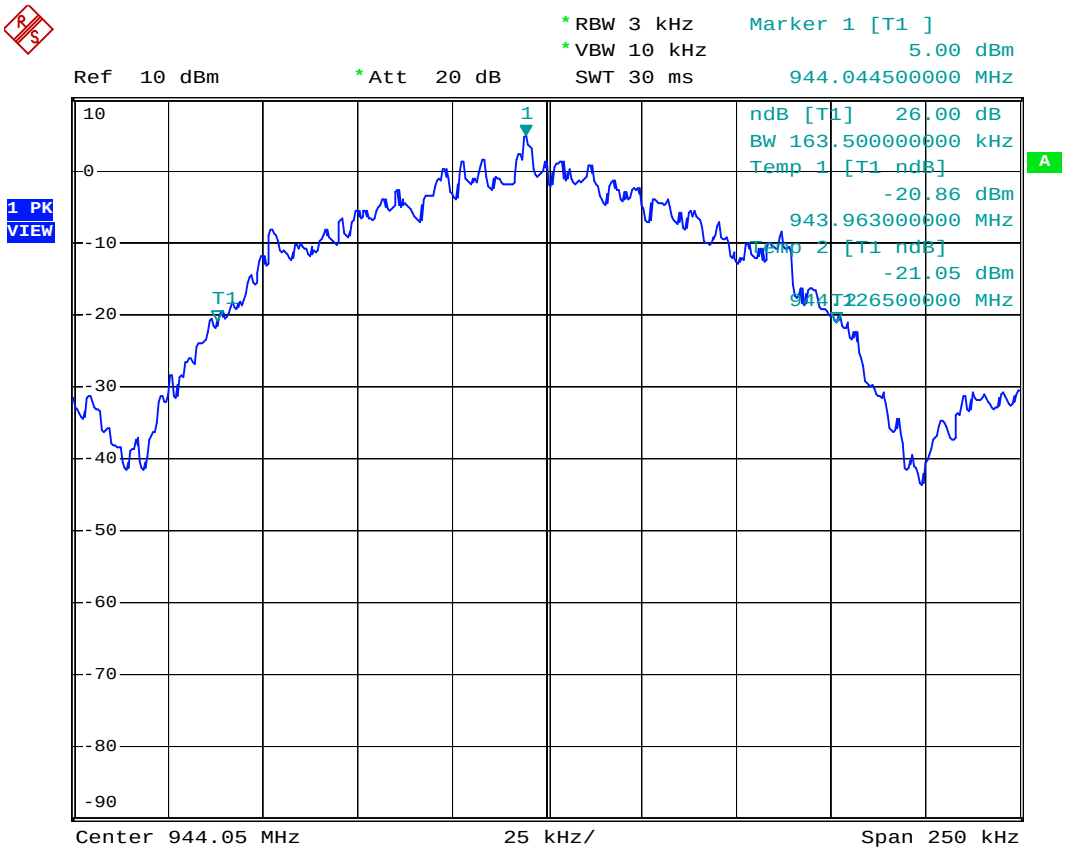
### 5.4.2 Occupied Bandwidth Plotted

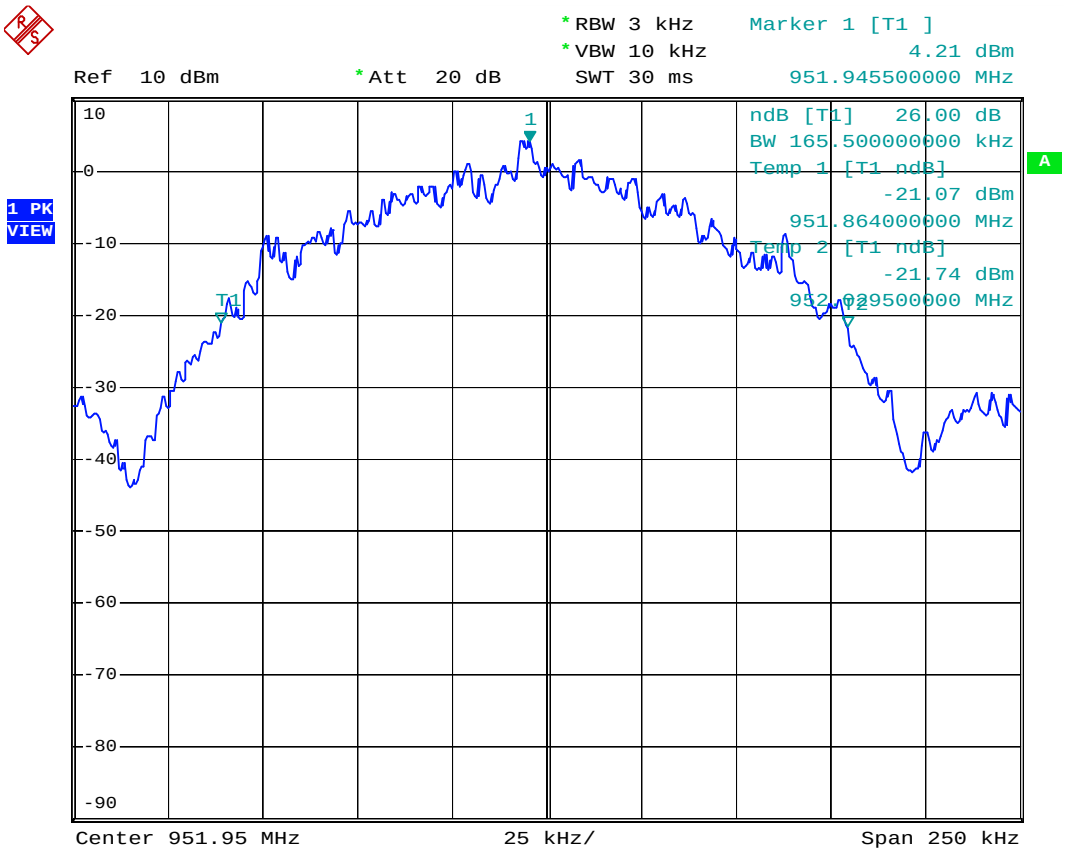
Test Date : Nov. 24, 2017 Temperature : 23 °C Humidity : 68 %

| RF Frequency (MHz) | 26 dB Bandwidth (kHz) |
|---|---|
| 470.05 | 165 |
| 607.95 | 166 |
| 944.05 | 163 |
| 951.95 | 165 |


*RBW 3 kHz
*VBW 10 kHz
Ref 10 dBm
*Att 20 dB
SWT 30 ms
Marker 1 [T1 ]
5.04 dBm
470.044500000 MHz
ndB [T1] 26.00 dB
BW 165.000000000 kHz
Temp 1 [T1 ndB]
-19.79 dBm
469.962000000 MHz
Temp 2 [T1 ndB]
-20.81 dBm
470.127000000 MHz
1 PK
VIEW
A
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 470.05 MHz
25 kHz/
Span 250 kHz


*RBW 3 kHz
*VBW 10 kHz
Ref 10 dBm
*Att 20 dB
SWT 30 ms
Marker 1 [T1 ]
4.99 dBm
607.944000000 MHz
ndB [T1] 26.00 dB
BW 166.000000000 kHz
Temp 1 [T1 ndB]
-21.11 dBm
607.861500000 MHz
Temp 2 [T1 ndB]
-20.93 dBm
608.027500000 MHz
1 PK
VIEW
A
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 607.95 MHz
25 kHz/
Span 250 kHz


*RBW 3 kHz
*VBW 10 kHz
Ref 10 dBm
*Att 20 dB
SWT 30 ms
Marker 1 [T1 ]
5.00 dBm
944.044500000 MHz
ndB [T1] 26.00 dB
BW 163.500000000 kHz
Temp 1 [T1 ndB]
-20.86 dBm
943.963000000 MHz
Temp 2 [T1 ndB]
-21.05 dBm
944.226500000 MHz
1 PK
VIEW
A
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 944.05 MHz
25 kHz/
Span 250 kHz


*RBW 3 kHz
*VBW 10 kHz
Ref 10 dBm
*Att 20 dB
SWT 30 ms
Marker 1 [T1 ]
4.21 dBm
951.945500000 MHz
ndB [T1] 26.00 dB
BW 165.500000000 kHz
Temp 1 [T1 ndB]
-21.07 dBm
951.864000000 MHz
Temp 2 [T1 ndB]
-21.74 dBm
952.029500000 MHz
1 PK
VIEW
A
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 951.95 MHz
25 kHz/
Span 250 kHz

# 6. FIELD STRENGTH OF EMISSION

## 6.1 Provisions Applicable

According to §2.1053, measurements shall be made to detect spurious emission that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal condition of installation and operation. Information submitted shall include the relative radiated power of spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from a halfwave dipole antenna.

According to §74.861(e)(6), the mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the follwing sceedule:

(i) on any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB.

(ii) on any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB.

(iii) on any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth shall be attenuated below the unmodulated carrier by at least 43 plus 10 Log(output power in watts) dB.

## 6.2 Measurement Procedure

1. Setup the configuration per figure 4 and 5 for frequencies measured below and above 1 GHz respectively.

2. For emission frequencies measured below and above 1 GHz, set the spectrum analyzer on a 100 kHz and 1 MHz resolution bandwidth respectively.

3. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 ° to 360 ° with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading. A RF test receiver is also used to confirm emissions measured.

4. Repeat step 3 until all frequencies need to be measured were complete.

5. Repeat step 5 with search antenna in vertical polarized orientations.

6. Check the three frequencies of highest emission with varying the placement of cables associated with EUT (if any) to obtain the worse case and record the result.

**Note:**
According to 12.7.2(d)(2) of ANSI C63.10-2013:

$$E[dB\mu V/m] = EIRP[dBm] + 95.2, \text{ for } d = 3 \text{ m}.$$

12.7.2(e) of ANSI C63.10-2013:
For conducted measurements below 1000 MHz, the field strength shall be computed as specified in item d), and then an additional 4.7 dB shall be added as an upper bound on the field strength that would be observed on a test range with a ground plane for frequencies between 30 MHz and 1000 MHz, or an additional 6 dB shall be added for frequencies below 30 MHz.

Figure 4 : Frequencies measured below 1 GHz configuration

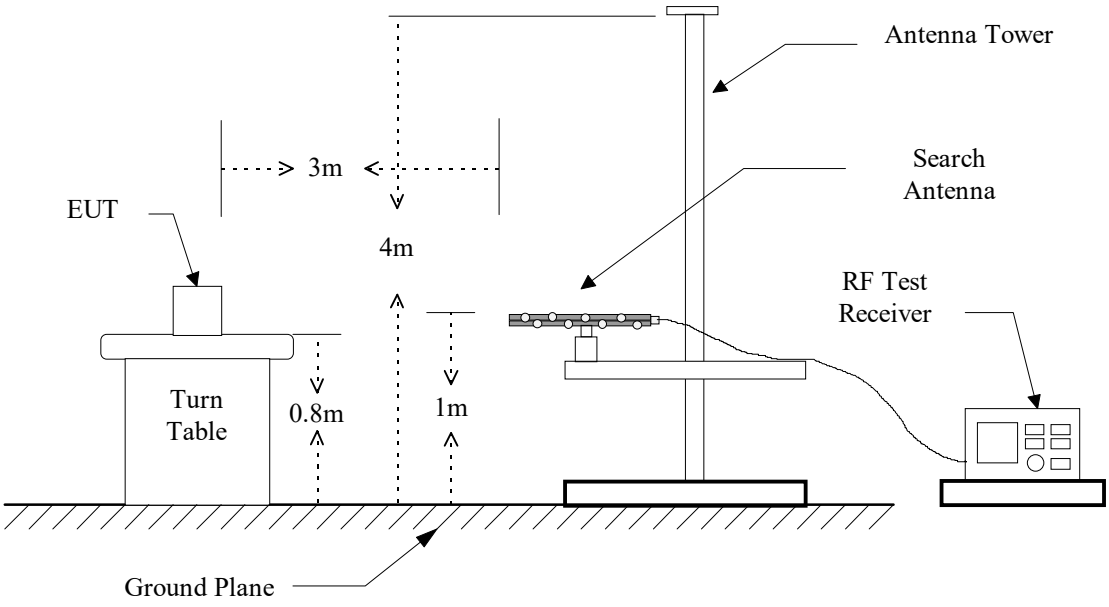
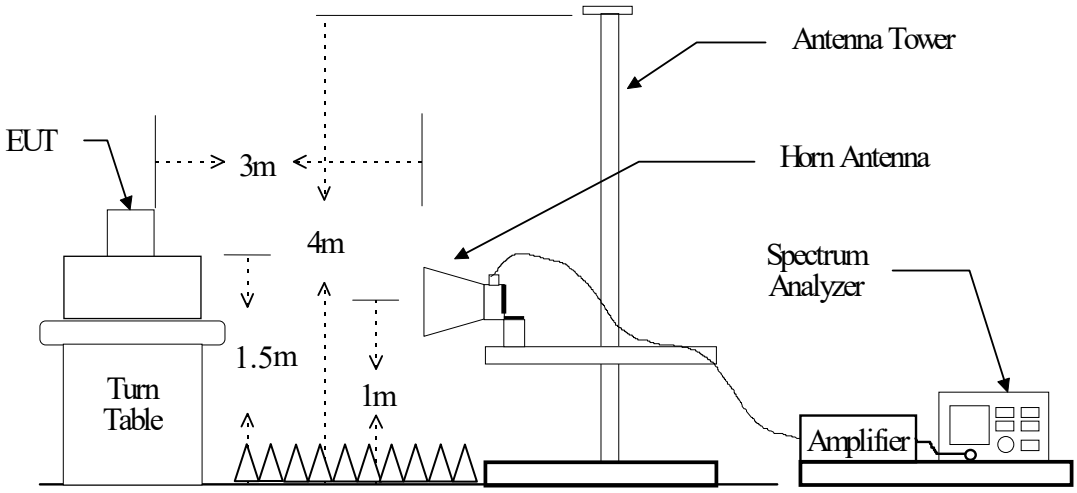



Figure 6 : Frequencies measured above 1 GHz configuration



## 6.3 Measuring Instrument

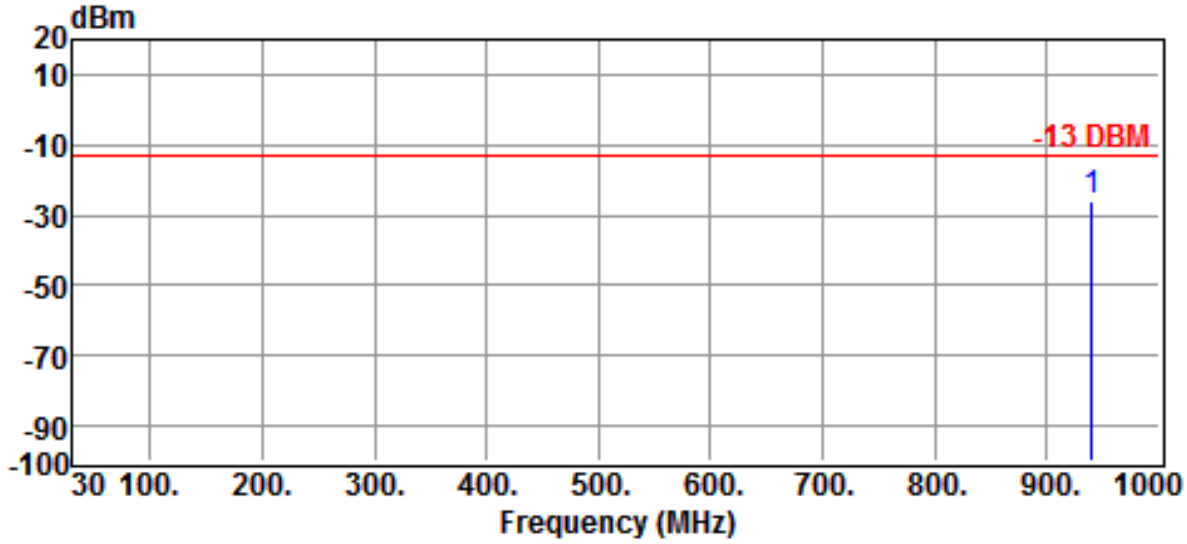
| Equipment | Manufacturer | Model No. | Calibration Date | Next Cal. Date |
|---|---|---|---|---|
| Spectrum Analyzer | Rohde & Schwarz | FSP40 | 2017/11/02 | 2018/11/01 |
| Double Ridged Antenna | EMCO | 3115 | 2017/10/11 | 2018/10/10 |
| Log-periodic Antenna | EMCO | 3146 | 2017/08/10 | 2018/08/09 |
| Biconical Antenna | EMCO | 3110 | 2017/07/04 | 2018/07/03 |
| Amplifier | HP | 8449B | 2017/10/05 | 2018/10/04 |
| Amplifier | HP | 8447D | 2016/12/05 | 2017/12/04 |
| Signal generator | HP | 83732B | 2016/12/06 | 2017/12/05 |

Measuring instrument setup in frequency band measured is as following :

| Frequency Band (MHz) | Instrument | Function | Resolution bandwidth | Video Bandwidth |
|---|---|---|---|---|
| 30 to 1000 | Spectrum Analyzer | Peak | 100 kHz | 100 kHz |
| Above 1000 | Spectrum Analyzer | Peak | 1 MHz | 1 MHz |

## 6.4 Measuring Data

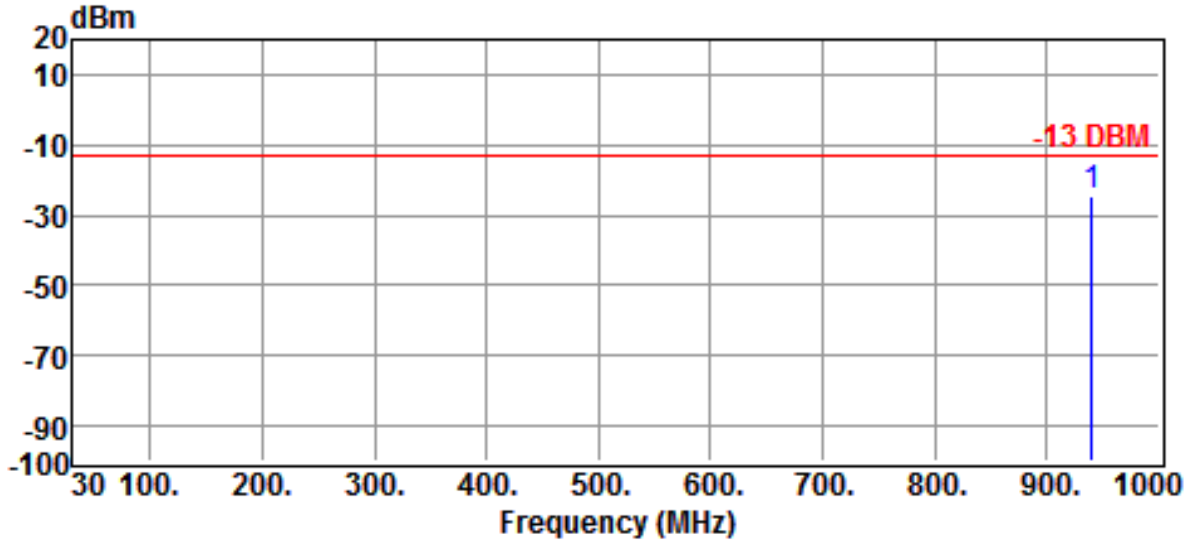
### 6.4.1. Harmonic Frequencies




| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-11-20 |
| Limit | :-13 DBM | Ant. Pol. | :HORIZONTAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC3.7V Battery | Temp. | :20˚C |
| Engineer | : Kazuma Ho | Humi. | :68 % |
| Test Mode | :470-608MHz | | |
| Test Mode | :TX | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 940.1000 | 67.49 | -93.82 | -26.33 | -13.00 | -13.33 | Peak |

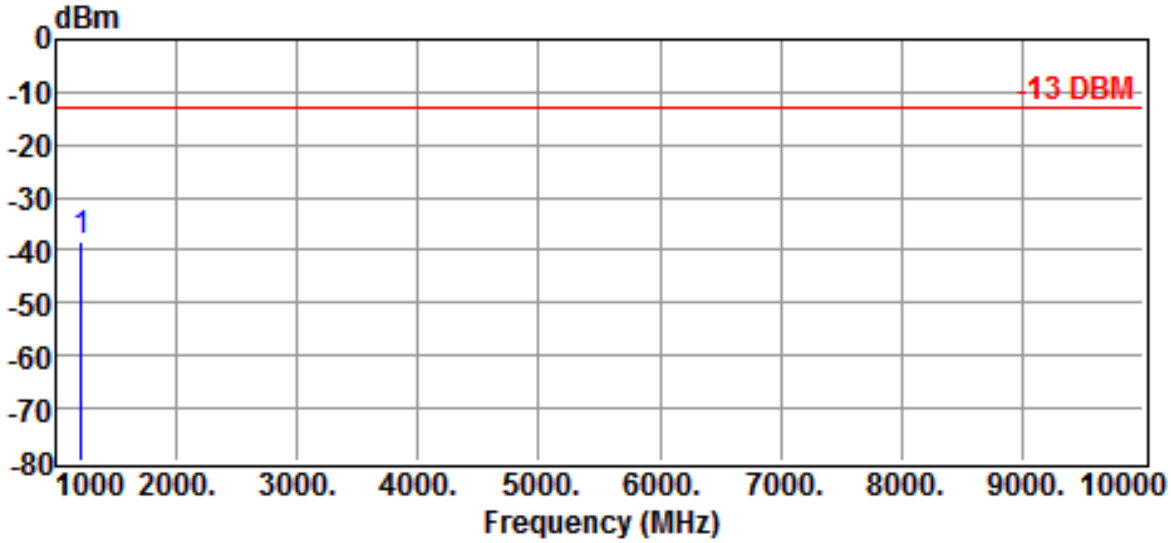
Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
   {EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
   {ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit - Result




| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-11-20 |
| Limit | :-13 DBM | Ant. Pol. | :VERTICAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC3.7V Battery | Temp. | :20˚C |
| Engineer | : Kazuma Ho | Humi. | :68 % |
| Test Mode | :470-608MHz | | |
| Test Mode | :TX | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 940.1000 | 69.29 | -93.82 | -24.53 | -13.00 | -11.53 | Peak |

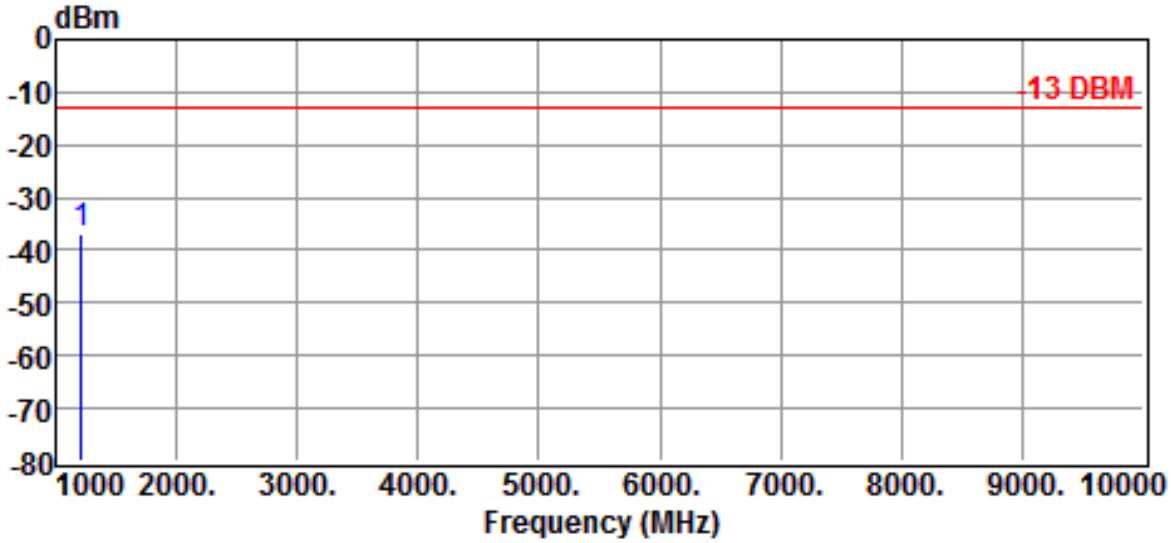
Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
   {EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
   {ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit - Result




| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-11-20 |
| Limit | :-13 DBM | Ant. Pol. | :HORIZONTAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC3.7V Battery | Temp. | :20˚C |
| Engineer | : Kazuma Ho | Humi. | :68 % |
| Test Mode | :470-608MHz | | |
| Test Mode | :TX | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 1215.9000 | 69.63 | -108.14 | -38.51 | -13.00 | -25.51 | Peak |

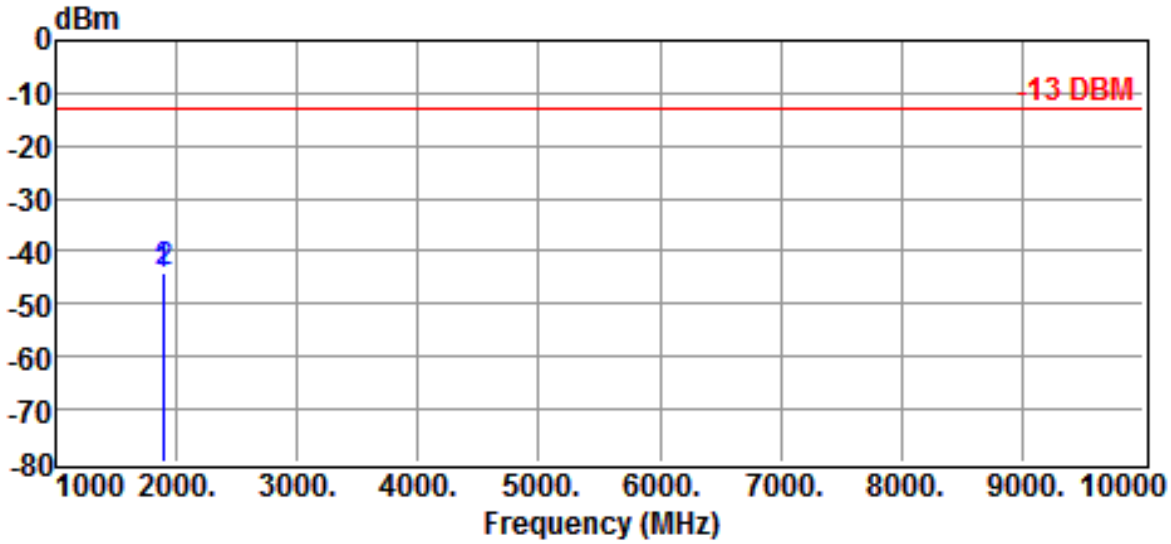
Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
   {EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
   {ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit - Result




| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-11-20 |
| Limit | :-13 DBM | Ant. Pol. | :VERTICAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC3.7V Battery | Temp. | :20˚C |
| Engineer | : Kazuma Ho | Humi. | :68 % |
| Test Mode | :470-608MHz | | |
| Test Mode | :TX | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 1215.9000 | 71.42 | -108.14 | -36.72 | -13.00 | -23.72 | Peak |

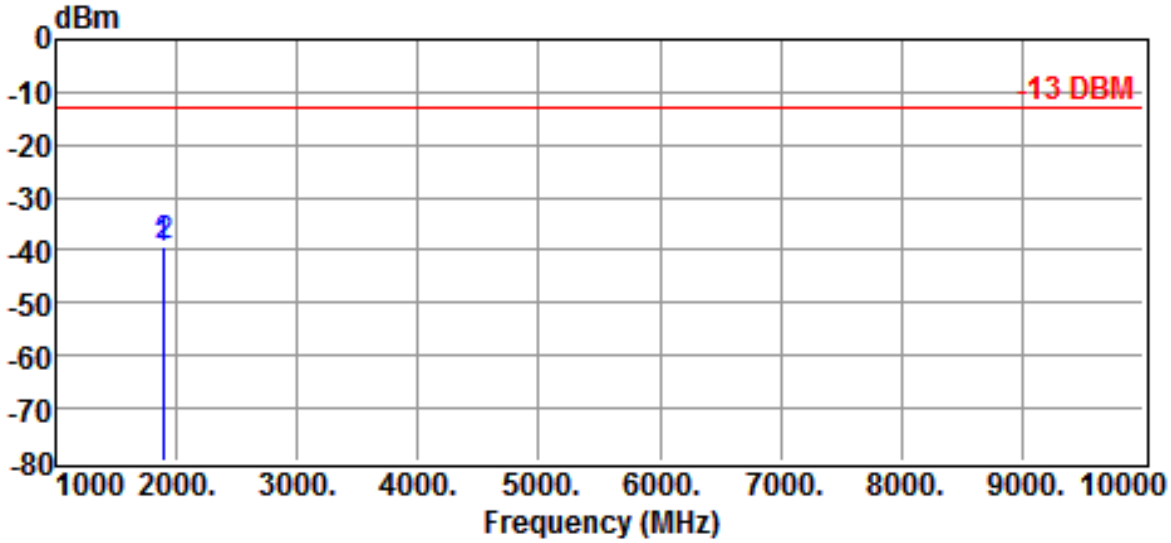
Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
   {EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
   {ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit – Result




| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-11-20 |
| Limit | :-13 DBM | Ant. Pol. | :HORIZONTAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC3.7V Battery | Temp. | :20˚C |
| Engineer | : Kazuma Ho | Humi. | :68 % |
| Test Mode | :944-952MHz | | |
| Test Mode | :TX | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 1888.1000 | 60.31 | -104.69 | -44.38 | -13.00 | -31.38 | Peak |
| 1903.9000 | 60.73 | -104.60 | -43.87 | -13.00 | -30.87 | Peak |

Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
   {EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
   {ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit – Result

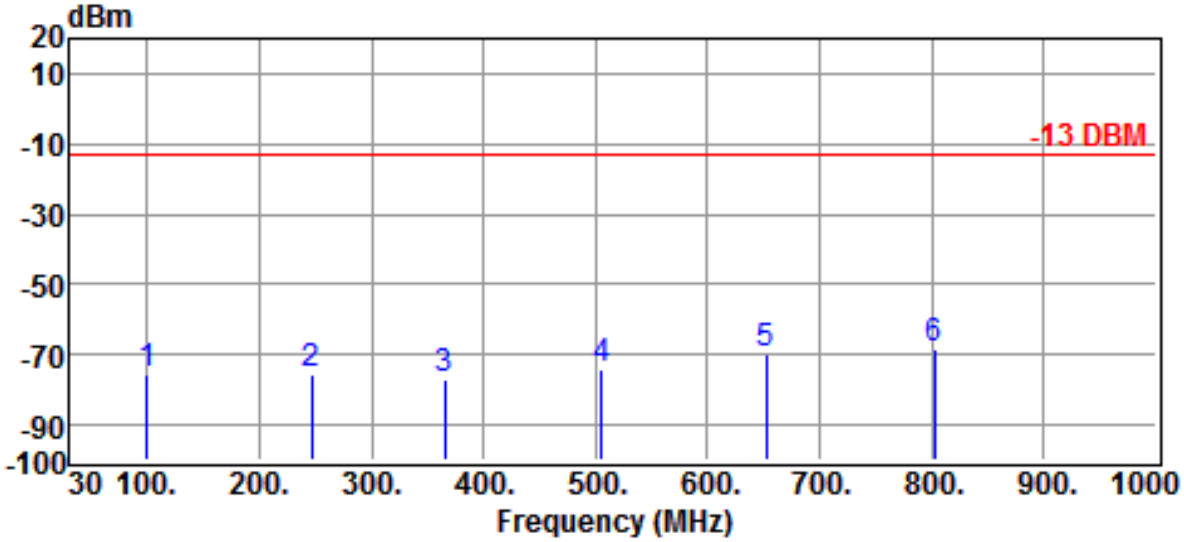



| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-11-20 |
| Limit | :-13 DBM | Ant. Pol. | :VERTICAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC3.7V Battery | Temp. | :20˚C |
| Engineer | : Kazuma Ho | Humi. | :68 % |
| Test Mode | :944-952MHz | | |
| Test Mode | :TX | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 1888.1000 | 64.75 | -104.69 | -39.94 | -13.00 | -26.94 | Peak |
| 1903.9000 | 65.25 | -104.60 | -39.35 | -13.00 | -26.35 | Peak |

Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
   {EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
   {ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit – Result

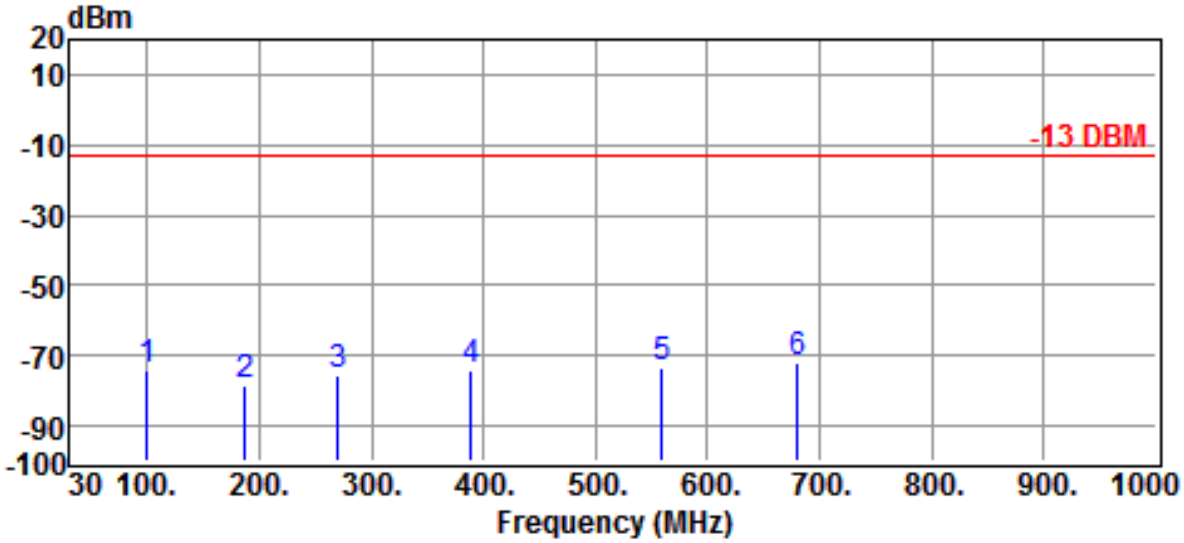
### 6.4.2 Spurious Emissions




| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-10-23 |
| Limit | :-13 DBM | Ant. Pol. | :HORIZONTAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC5V(Power from PC) | Temp. | :24˚C |
| Engineer | : Kazuma Ho | Humi. | :57 % |
| Test Mode | :Charging | | |
| Test Mode | :470-608MHz | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 99.8400 | 36.33 | -111.75 | -75.42 | -13.00 | -62.42 | Peak |
| 247.2800 | 31.80 | -107.45 | -75.65 | -13.00 | -62.65 | Peak |
| 365.6200 | 27.17 | -103.85 | -76.68 | -13.00 | -63.68 | Peak |
| 505.3000 | 27.82 | -101.78 | -73.96 | -13.00 | -60.96 | Peak |
| 652.7400 | 29.30 | -99.17 | -69.87 | -13.00 | -56.87 | Peak |
| 802.1200 | 28.17 | -96.76 | -68.59 | -13.00 | -55.59 | Peak |

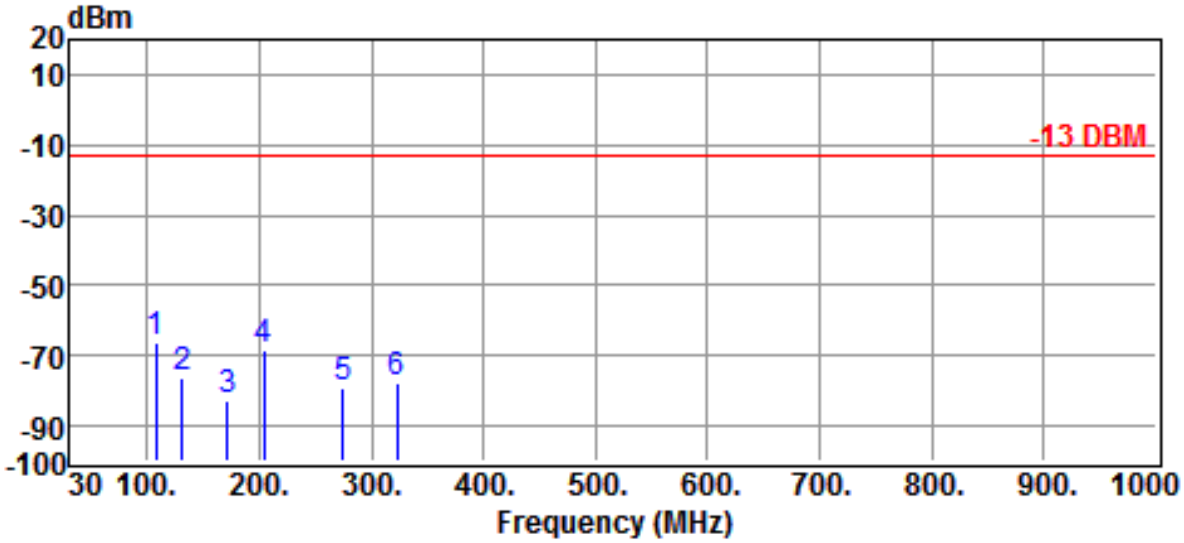
Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
   {EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
   {ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit - Result




| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-10-23 |
| Limit | :-13 DBM | Ant. Pol. | :VERTICAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC5V(Power from PC) | Temp. | :24˚C |
| Engineer | : Kazuma Ho | Humi. | :57 % |
| Test Mode | :Charging | | |
| Test Mode | :470-608MHz | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 99.8400 | 37.65 | -111.75 | -74.10 | -13.00 | -61.10 | Peak |
| 187.1400 | 32.95 | -111.31 | -78.36 | -13.00 | -65.36 | Peak |
| 270.5600 | 30.90 | -106.66 | -75.76 | -13.00 | -62.76 | Peak |
| 388.9000 | 29.33 | -103.13 | -73.80 | -13.00 | -60.80 | Peak |
| 559.6200 | 27.50 | -101.07 | -73.57 | -13.00 | -60.57 | Peak |
| 679.9000 | 26.78 | -98.78 | -72.00 | -13.00 | -59.00 | Peak |

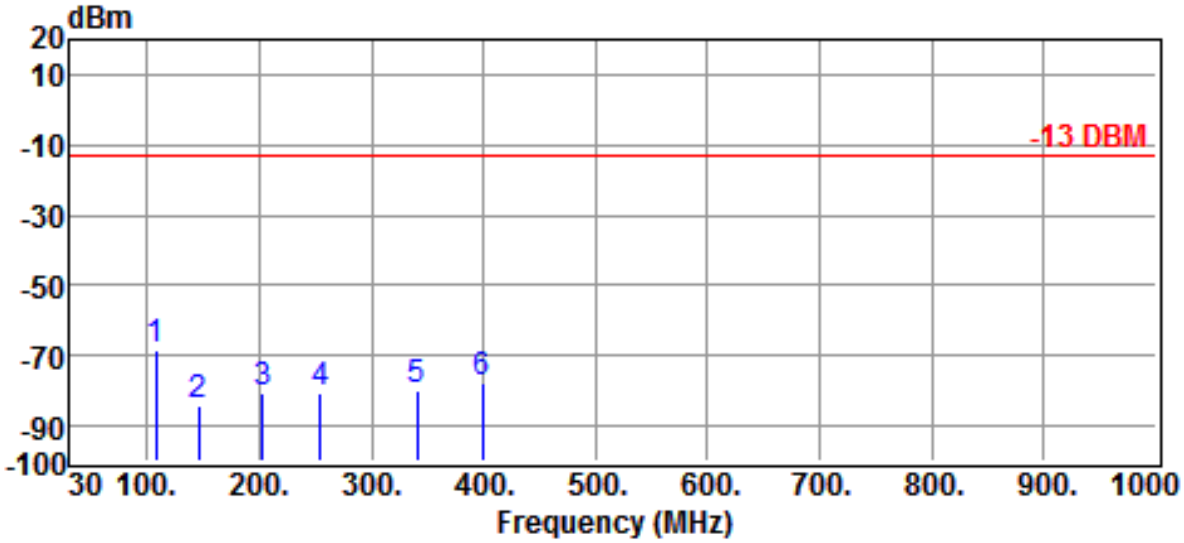
Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
   {EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
   {ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit – Result




| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-10-23 |
| Limit | :-13 DBM | Ant. Pol. | :HORIZONTAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC3.7V Battery | Temp. | :24˚C |
| Engineer | : Kazuma Ho | Humi. | :57 % |
| Test Mode | :TX | | |
| Test Mode | :470-608MHz | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 107.6000 | 44.75 | -111.02 | -66.27 | -13.00 | -53.27 | Peak |
| 130.8800 | 32.88 | -109.49 | -76.61 | -13.00 | -63.61 | Peak |
| 171.6200 | 27.57 | -110.39 | -82.82 | -13.00 | -69.82 | Peak |
| 204.6000 | 40.97 | -109.65 | -68.68 | -13.00 | -55.68 | Peak |
| 274.4400 | 27.12 | -106.45 | -79.33 | -13.00 | -66.33 | Peak |
| 322.9400 | 27.30 | -104.67 | -77.37 | -13.00 | -64.37 | Peak |

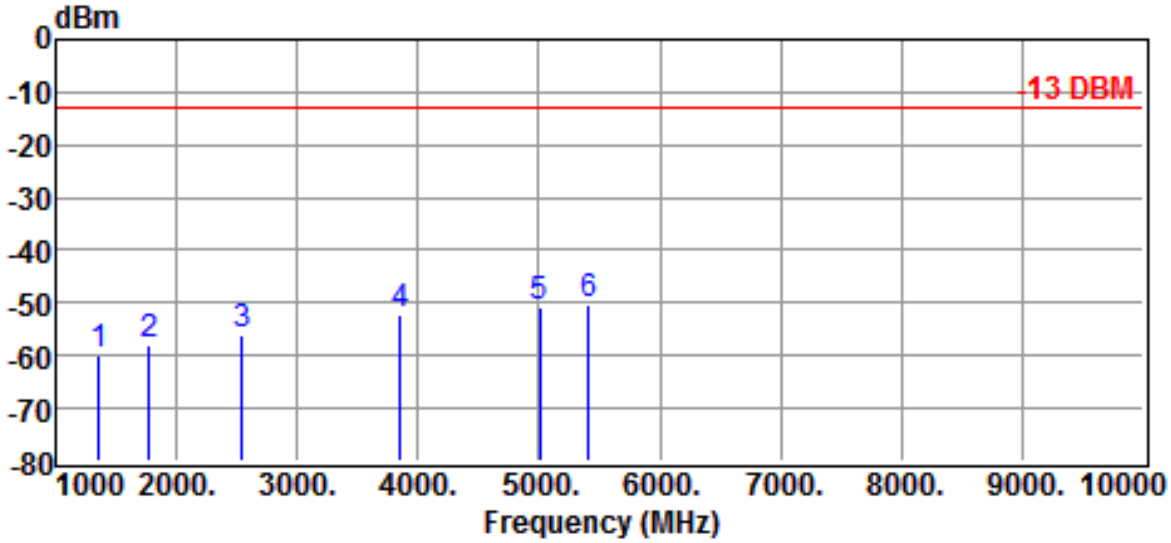
Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
   {EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
   {ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit - Result




| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-10-23 |
| Limit | :-13 DBM | Ant. Pol. | :VERTICAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC3.7V Battery | Temp. | :24˚C |
| Engineer | : Kazuma Ho | Humi. | :57 % |
| Test Mode | :TX | | |
| Test Mode | :470-608MHz | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 107.6000 | 42.33 | -111.02 | -68.69 | -13.00 | -55.69 | Peak |
| 145.4300 | 25.48 | -109.39 | -83.91 | -13.00 | -70.91 | Peak |
| 202.6600 | 29.64 | -109.99 | -80.35 | -13.00 | -67.35 | Peak |
| 255.0400 | 26.31 | -106.89 | -80.58 | -13.00 | -67.58 | Peak |
| 340.4000 | 24.43 | -104.45 | -80.02 | -13.00 | -67.02 | Peak |
| 398.6000 | 24.95 | -102.84 | -77.89 | -13.00 | -64.89 | Peak |

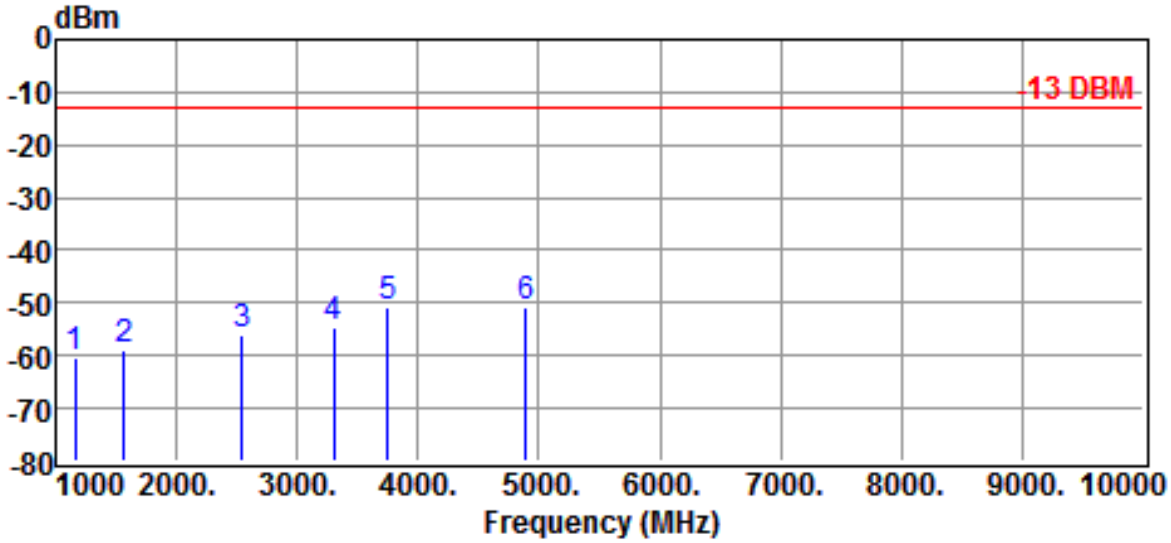
Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
{EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
{ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit – Result




| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-10-30 |
| Limit | :-13 DBM | Ant. Pol. | :HORIZONTAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC5V(Power from PC) | Temp. | :23 ˚C |
| Engineer | : Kazuma Ho | Humi. | :59 % |
| Test Mode | :Charging | | |
| Test Mode | :470-608MHz | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 1360.0000 | 47.64 | -107.68 | -60.04 | -13.00 | -47.04 | Peak |
| 1770.0000 | 47.51 | -105.48 | -57.97 | -13.00 | -44.97 | Peak |
| 2540.0000 | 46.45 | -102.59 | -56.14 | -13.00 | -43.14 | Peak |
| 3850.0000 | 45.60 | -97.90 | -52.30 | -13.00 | -39.30 | Peak |
| 5010.0000 | 44.92 | -95.52 | -50.60 | -13.00 | -37.60 | Peak |
| 5410.0000 | 44.27 | -94.72 | -50.45 | -13.00 | -37.45 | Peak |

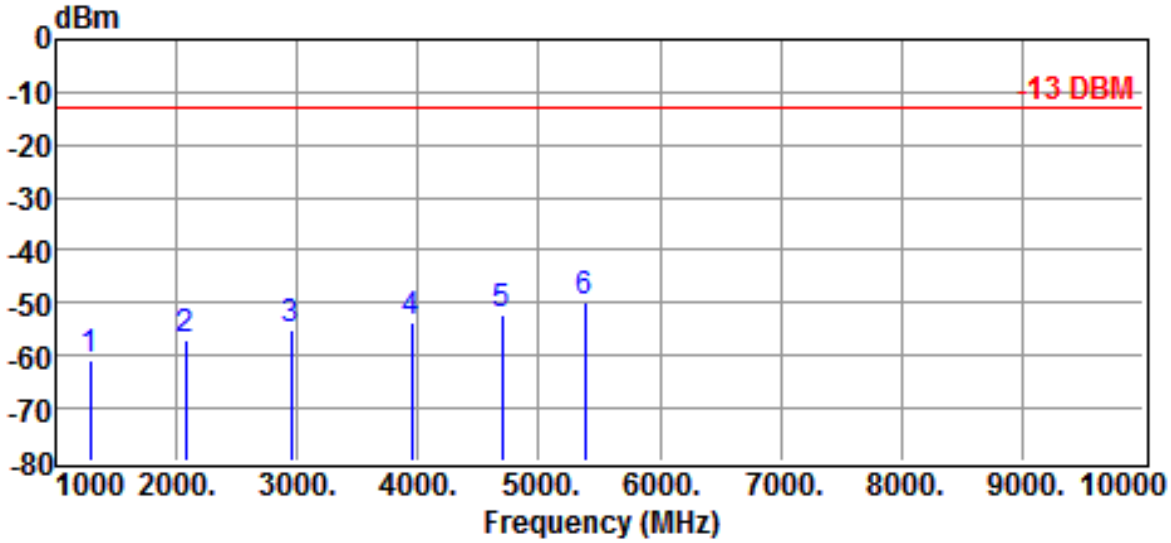
Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
   {EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
   {ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit - Result




| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-10-30 |
| Limit | :-13 DBM | Ant. Pol. | :VERTICAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC5V(Power from PC) | Temp. | :23˚C |
| Engineer | : Kazuma Ho | Humi. | :59 % |
| Test Mode | :Charging | | |
| Test Mode | :470-608MHz | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 1160.0000 | 48.06 | -108.31 | -60.25 | -13.00 | -47.25 | Peak |
| 1570.0000 | 47.59 | -106.71 | -59.12 | -13.00 | -46.12 | Peak |
| 2540.0000 | 46.75 | -102.59 | -55.84 | -13.00 | -42.84 | Peak |
| 3300.0000 | 45.49 | -99.89 | -54.40 | -13.00 | -41.40 | Peak |
| 3750.0000 | 47.73 | -98.29 | -50.56 | -13.00 | -37.56 | Peak |
| 4890.0000 | 45.25 | -95.88 | -50.63 | -13.00 | -37.63 | Peak |

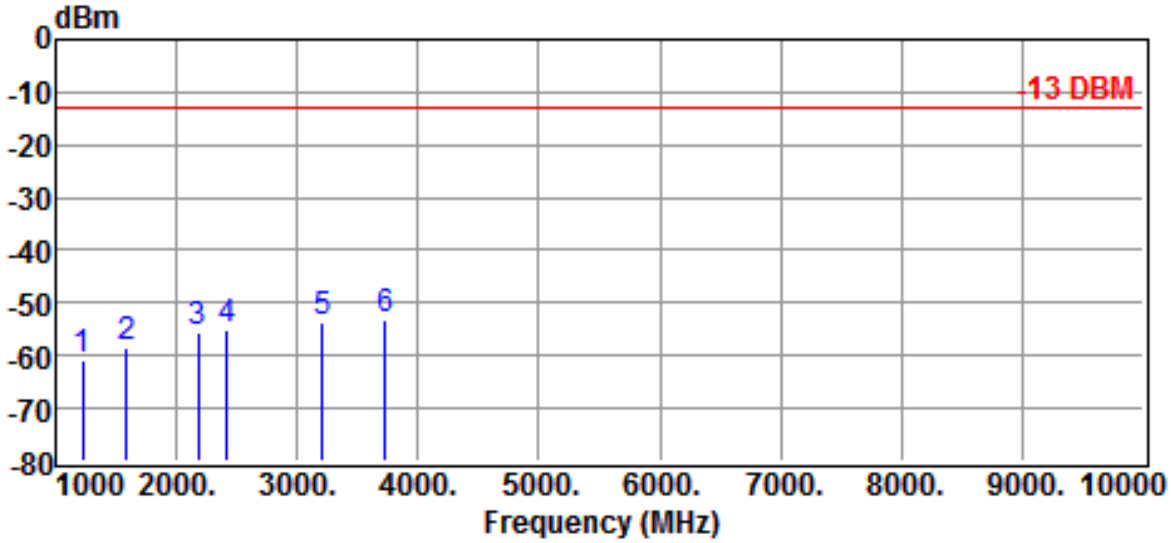
Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
   {EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
   {ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit - Result




| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-10-30 |
| Limit | :-13 DBM | Ant. Pol. | :HORIZONTAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC3.7V Battery | Temp. | :23 ˚C |
| Engineer | : Kazuma Ho | Humi. | :59 % |
| Test Mode | :TX | | |
| Test Mode | :470-608MHz | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 1290.0000 | 47.13 | -107.91 | -60.78 | -13.00 | -47.78 | Peak |
| 2080.0000 | 46.70 | -103.74 | -57.04 | -13.00 | -44.04 | Peak |
| 2950.0000 | 45.88 | -101.02 | -55.14 | -13.00 | -42.14 | Peak |
| 3950.0000 | 43.93 | -97.51 | -53.58 | -13.00 | -40.58 | Peak |
| 4690.0000 | 44.23 | -96.55 | -52.32 | -13.00 | -39.32 | Peak |
| 5380.0000 | 44.90 | -94.76 | -49.86 | -13.00 | -36.86 | Peak |

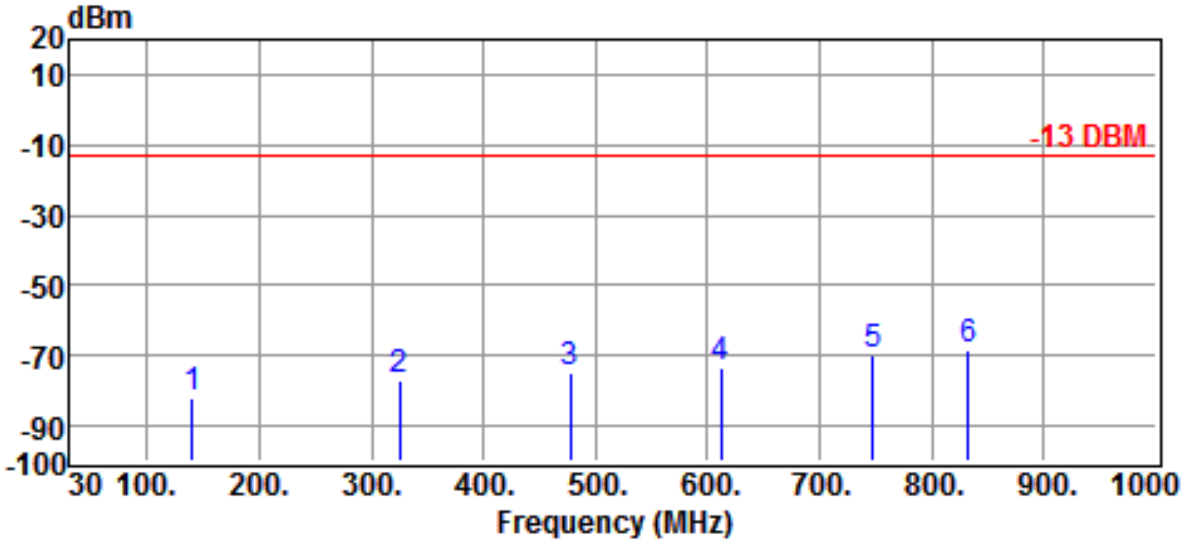
Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
   {EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
   {ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit - Result




| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-10-30 |
| Limit | :-13 DBM | Ant. Pol. | :VERTICAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC3.7V Battery | Temp. | :23˚C |
| Engineer | : Kazuma Ho | Humi. | :59 % |
| Test Mode | :TX | | |
| Test Mode | :470-608MHz | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 1220.0000 | 47.34 | -108.08 | -60.74 | -13.00 | -47.74 | Peak |
| 1590.0000 | 48.32 | -106.59 | -58.27 | -13.00 | -45.27 | Peak |
| 2180.0000 | 48.03 | -103.53 | -55.50 | -13.00 | -42.50 | Peak |
| 2420.0000 | 47.91 | -102.94 | -55.03 | -13.00 | -42.03 | Peak |
| 3210.0000 | 46.75 | -100.17 | -53.42 | -13.00 | -40.42 | Peak |
| 3730.0000 | 45.26 | -98.34 | -53.08 | -13.00 | -40.08 | Peak |

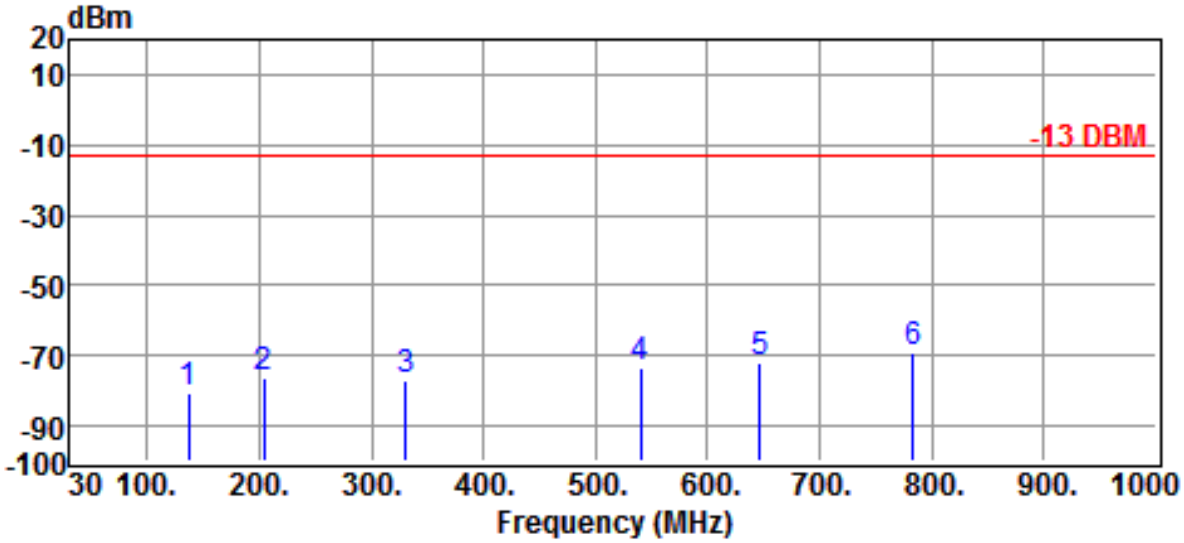
Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
   {EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
   {ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit - Result




| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-10-23 |
| Limit | :-13 DBM | Ant. Pol. | :HORIZONTAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC5V(Power from PC) | Temp. | :24˚C |
| Engineer | : Kazuma Ho | Humi. | :57 % |
| Test Mode | :Charging | | |
| Test Mode | :944-952MHz | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 140.5800 | 27.31 | -109.32 | -82.01 | -13.00 | -69.01 | Peak |
| 324.8800 | 27.35 | -104.65 | -77.30 | -13.00 | -64.30 | Peak |
| 477.1700 | 26.93 | -102.04 | -75.11 | -13.00 | -62.11 | Peak |
| 612.0000 | 26.90 | -100.13 | -73.23 | -13.00 | -60.23 | Peak |
| 747.8000 | 28.01 | -98.10 | -70.09 | -13.00 | -57.09 | Peak |
| 832.1900 | 28.40 | -96.48 | -68.08 | -13.00 | -55.08 | Peak |

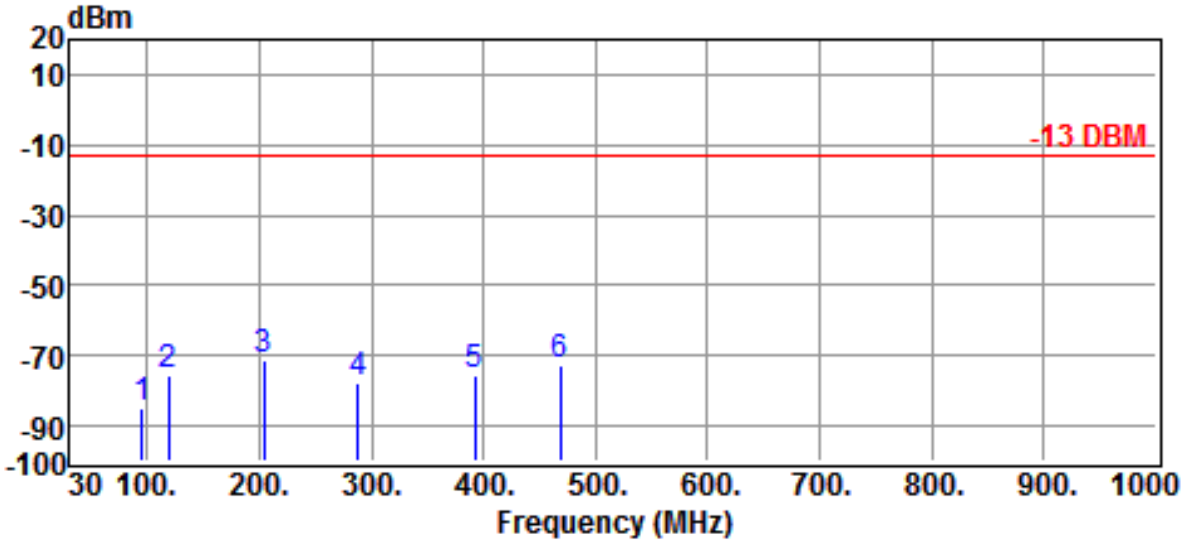
Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
   {EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
   {ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit - Result




| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-10-23 |
| Limit | :-13 DBM | Ant. Pol. | :VERTICAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC5V(Power from PC) | Temp. | :24˚C |
| Engineer | : Kazuma Ho | Humi. | :57 % |
| Test Mode | :Charging | | |
| Test Mode | :944-952MHz | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 136.7000 | 28.48 | -109.36 | -80.88 | -13.00 | -67.88 | Peak |
| 204.6000 | 33.14 | -109.65 | -76.51 | -13.00 | -63.51 | Peak |
| 330.7000 | 27.81 | -104.57 | -76.76 | -13.00 | -63.76 | Peak |
| 540.2200 | 27.74 | -101.36 | -73.62 | -13.00 | -60.62 | Peak |
| 646.9200 | 27.13 | -99.27 | -72.14 | -13.00 | -59.14 | Peak |
| 782.7200 | 27.90 | -97.24 | -69.34 | -13.00 | -56.34 | Peak |

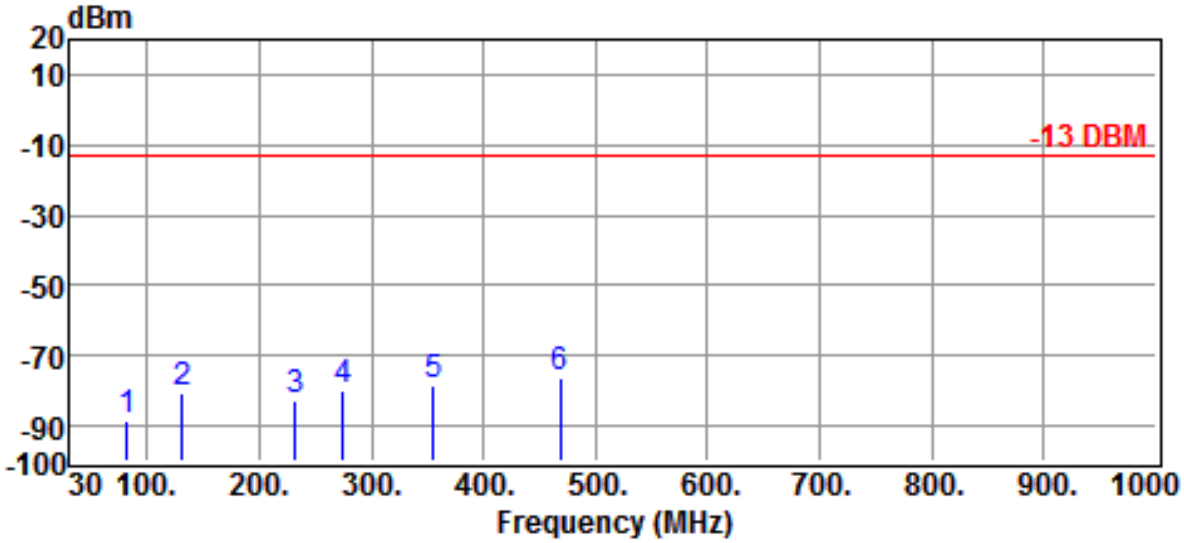
Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
{EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
{ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit - Result




| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-10-23 |
| Limit | :-13 DBM | Ant. Pol. | :HORIZONTAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC3.7V Battery | Temp. | :24˚C |
| Engineer | : Kazuma Ho | Humi. | :57 % |
| Test Mode | :TX | | |
| Test Mode | :944-952MHz | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 95.9600 | 27.34 | -112.28 | -84.94 | -13.00 | -71.94 | Peak |
| 119.2400 | 34.65 | -110.18 | -75.53 | -13.00 | -62.53 | Peak |
| 204.6000 | 38.66 | -109.65 | -70.99 | -13.00 | -57.99 | Peak |
| 288.0200 | 28.03 | -105.67 | -77.64 | -13.00 | -64.64 | Peak |
| 392.7800 | 27.52 | -103.01 | -75.49 | -13.00 | -62.49 | Peak |
| 468.4400 | 29.11 | -102.12 | -73.01 | -13.00 | -60.01 | Peak |

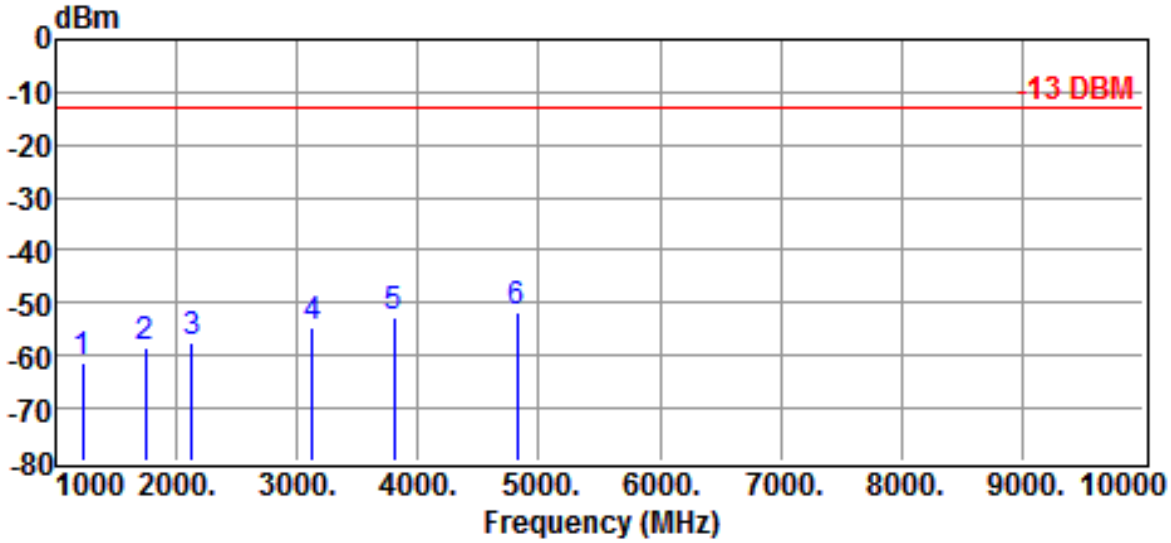
Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
{EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
{ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit - Result




| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-10-23 |
| Limit | :-13 DBM | Ant. Pol. | :VERTICAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC3.7V Battery | Temp. | :24˚C |
| Engineer | : Kazuma Ho | Humi. | :57 % |
| Test Mode | :TX | | |
| Test Mode | :944-952MHz | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 82.3800 | 25.63 | -114.21 | -88.58 | -13.00 | -75.58 | Peak |
| 130.8800 | 28.58 | -109.49 | -80.91 | -13.00 | -67.91 | Peak |
| 231.7600 | 26.34 | -108.98 | -82.64 | -13.00 | -69.64 | Peak |
| 274.4400 | 26.48 | -106.45 | -79.97 | -13.00 | -66.97 | Peak |
| 355.9200 | 25.76 | -104.16 | -78.40 | -13.00 | -65.40 | Peak |
| 468.4400 | 25.59 | -102.12 | -76.53 | -13.00 | -63.53 | Peak |

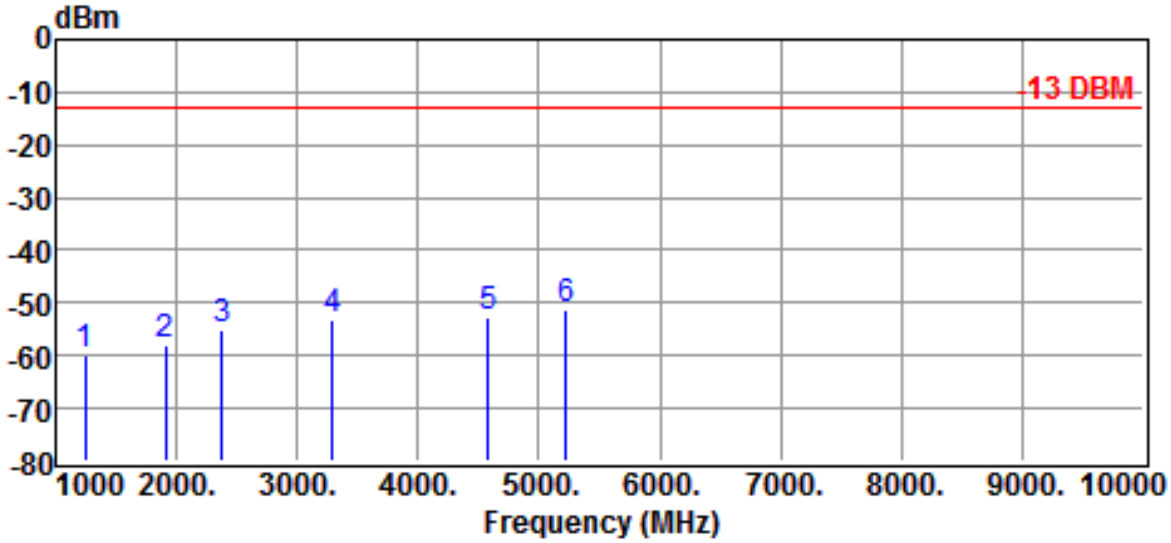
Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
   {EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
   {ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit - Result




| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-10-30 |
| Limit | :-13 DBM | Ant. Pol. | :HORIZONTAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC5V(Power from PC) | Temp. | :23˚C |
| Engineer | : Kazuma Ho | Humi. | :59 % |
| Test Mode | :Charging | | |
| Test Mode | :944-952MHz | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 1220.0000 | 46.54 | -108.08 | -61.54 | -13.00 | -48.54 | Peak |
| 1740.0000 | 47.09 | -105.60 | -58.51 | -13.00 | -45.51 | Peak |
| 2130.0000 | 46.33 | -103.66 | -57.33 | -13.00 | -44.33 | Peak |
| 3130.0000 | 45.97 | -100.44 | -54.47 | -13.00 | -41.47 | Peak |
| 3800.0000 | 45.33 | -98.09 | -52.76 | -13.00 | -39.76 | Peak |
| 4820.0000 | 44.29 | -96.11 | -51.82 | -13.00 | -38.82 | Peak |

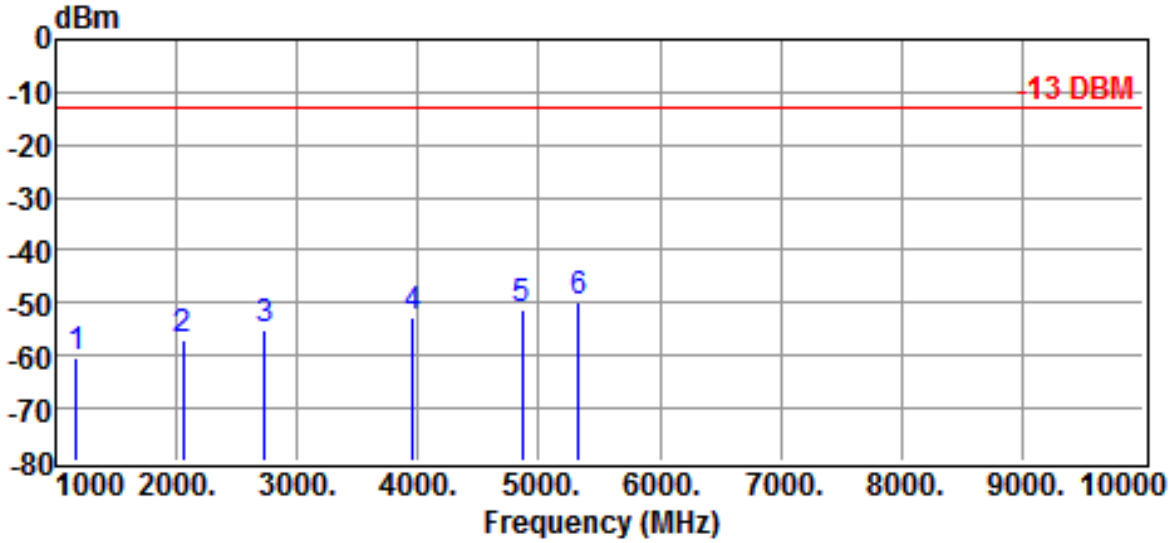
Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
   {EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
   {ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit - Result




| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-10-30 |
| Limit | :-13 DBM | Ant. Pol. | :VERTICAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC5V(Power from PC) | Temp. | :23˚C |
| Engineer | : Kazuma Ho | Humi. | :59 % |
| Test Mode | :Charging | | |
| Test Mode | :944-952MHz | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 1240.0000 | 48.11 | -108.07 | -59.96 | -13.00 | -46.96 | Peak |
| 1910.0000 | 46.41 | -104.49 | -58.08 | -13.00 | -45.08 | Peak |
| 2380.0000 | 47.82 | -103.06 | -55.24 | -13.00 | -42.24 | Peak |
| 3290.0000 | 46.68 | -99.89 | -53.21 | -13.00 | -40.21 | Peak |
| 4580.0000 | 44.23 | -96.90 | -52.67 | -13.00 | -39.67 | Peak |
| 5220.0000 | 43.62 | -95.10 | -51.48 | -13.00 | -38.48 | Peak |

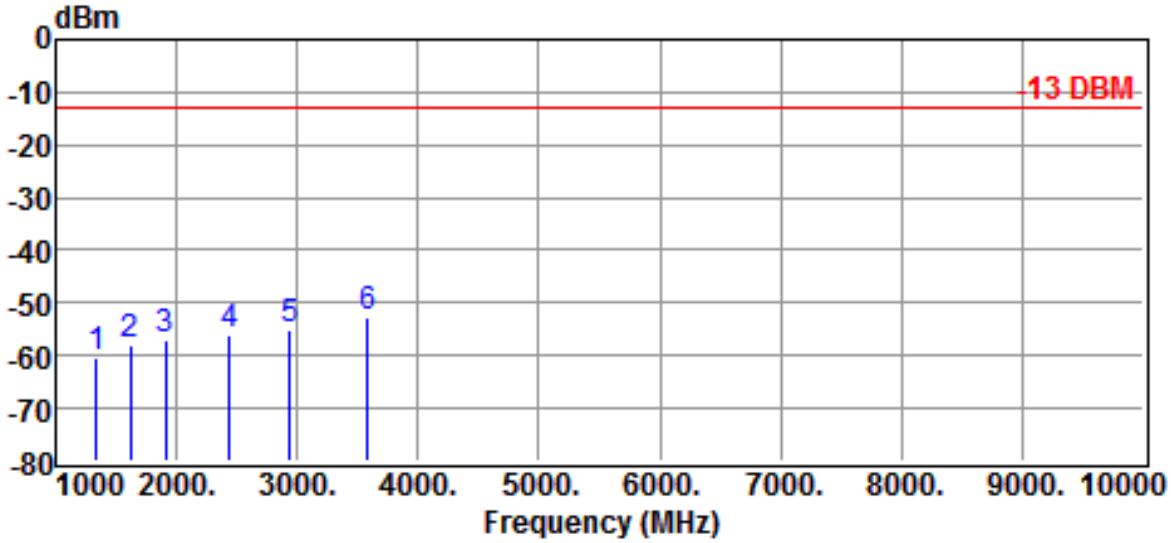
Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
   {EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
   {ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit - Result




| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-10-30 |
| Limit | :-13 DBM | Ant. Pol. | :HORIZONTAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC3.7V Battery | Temp. | :23 ˚C |
| Engineer | : Kazuma Ho | Humi. | :59 % |
| Test Mode | :TX | | |
| Test Mode | :944-952MHz | | |

| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 1170.0000 | 47.76 | -108.24 | -60.48 | -13.00 | -47.48 | Peak |
| 2050.0000 | 46.67 | -103.82 | -57.15 | -13.00 | -44.15 | Peak |
| 2730.0000 | 46.67 | -101.87 | -55.20 | -13.00 | -42.20 | Peak |
| 3960.0000 | 44.61 | -97.51 | -52.90 | -13.00 | -39.90 | Peak |
| 4860.0000 | 44.67 | -96.00 | -51.33 | -13.00 | -38.33 | Peak |
| 5330.0000 | 45.19 | -94.86 | -49.67 | -13.00 | -36.67 | Peak |

Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
{EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
{ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit - Result

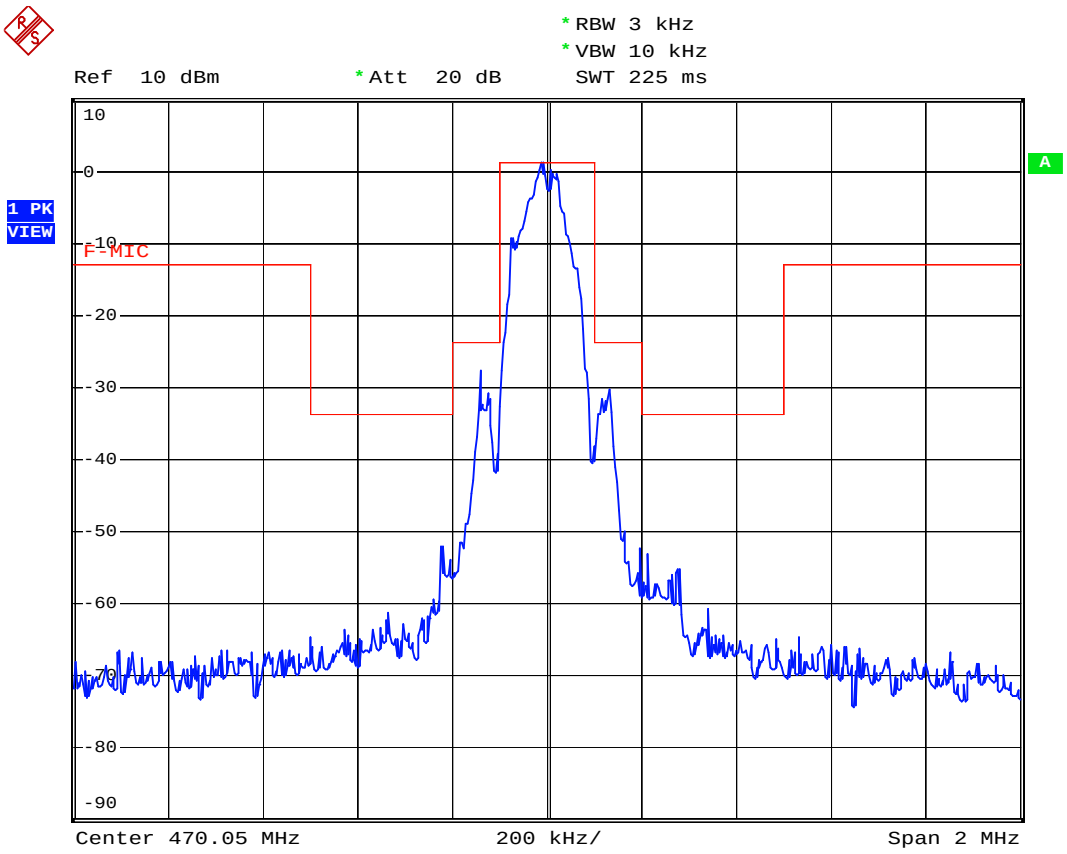


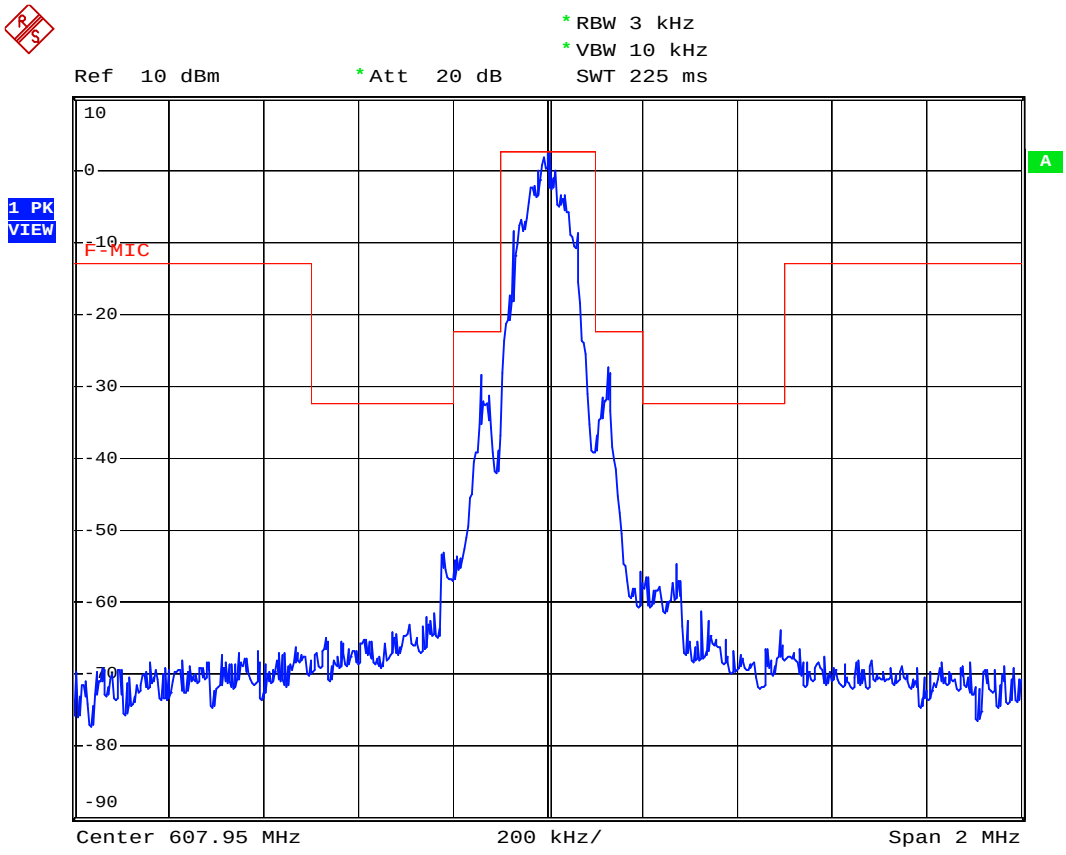

| | | | |
|---|---|---|---|
| Site | :CHAMBER #2 | Date | :2017-10-30 |
| Limit | :-13 DBM | Ant. Pol. | :VERTICAL |
| EUT | : Wireless Tour Guide System | Model | :TG-201T |
| Power Rating | :DC3.7V Battery | Temp. | :23˚C |
| Engineer | : Kazuma Ho | Humi. | :59 % |
| Test Mode | :TX | | |
| Test Mode | :944-952MHz | | |

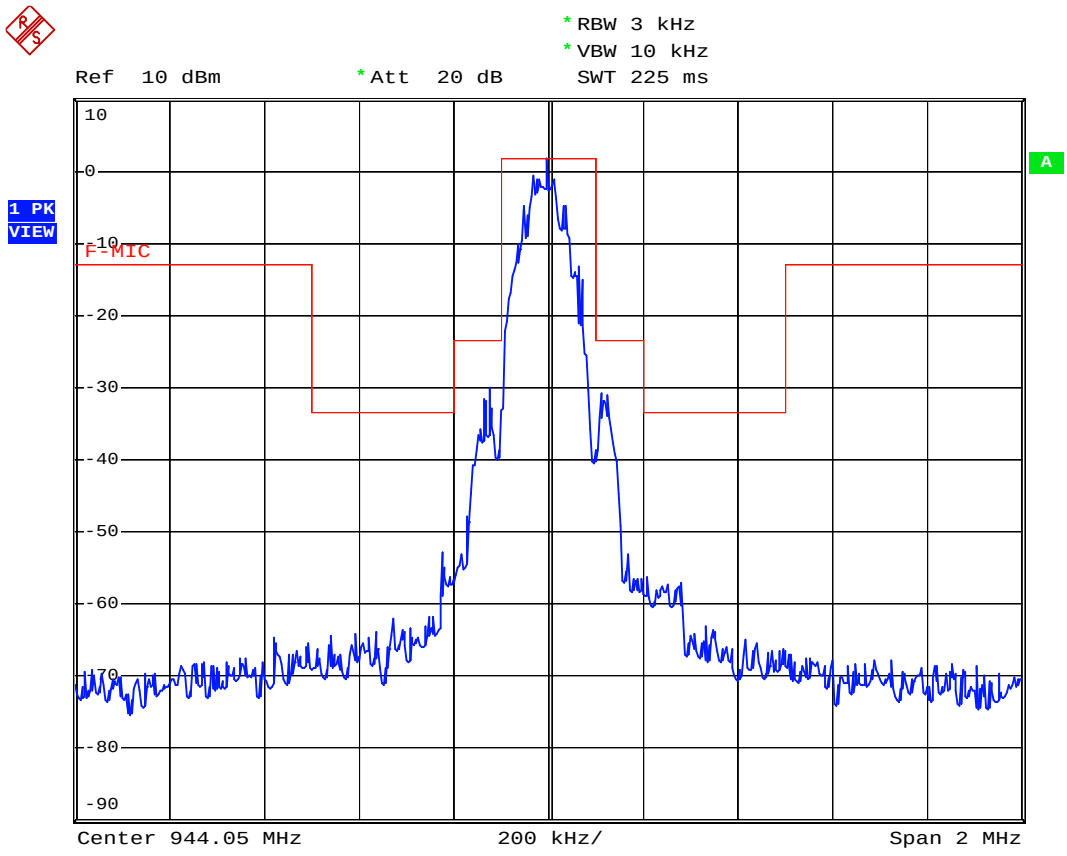
| Freq<br>MHz | Reading<br>dBuV | Correction Factor<br>dB | Result<br>dBm | Limits<br>dBm | Over limit<br>dB | Detector |
|---|---|---|---|---|---|---|
| 1340.0000 | 47.61 | -107.76 | -60.15 | -13.00 | -47.15 | Peak |
| 1620.0000 | 48.74 | -106.48 | -57.74 | -13.00 | -44.74 | Peak |
| 1910.0000 | 47.38 | -104.49 | -57.11 | -13.00 | -44.11 | Peak |
| 2440.0000 | 46.89 | -102.90 | -56.01 | -13.00 | -43.01 | Peak |
| 2940.0000 | 45.90 | -101.08 | -55.18 | -13.00 | -42.18 | Peak |
| 3580.0000 | 46.19 | -98.93 | -52.74 | -13.00 | -39.74 | Peak |

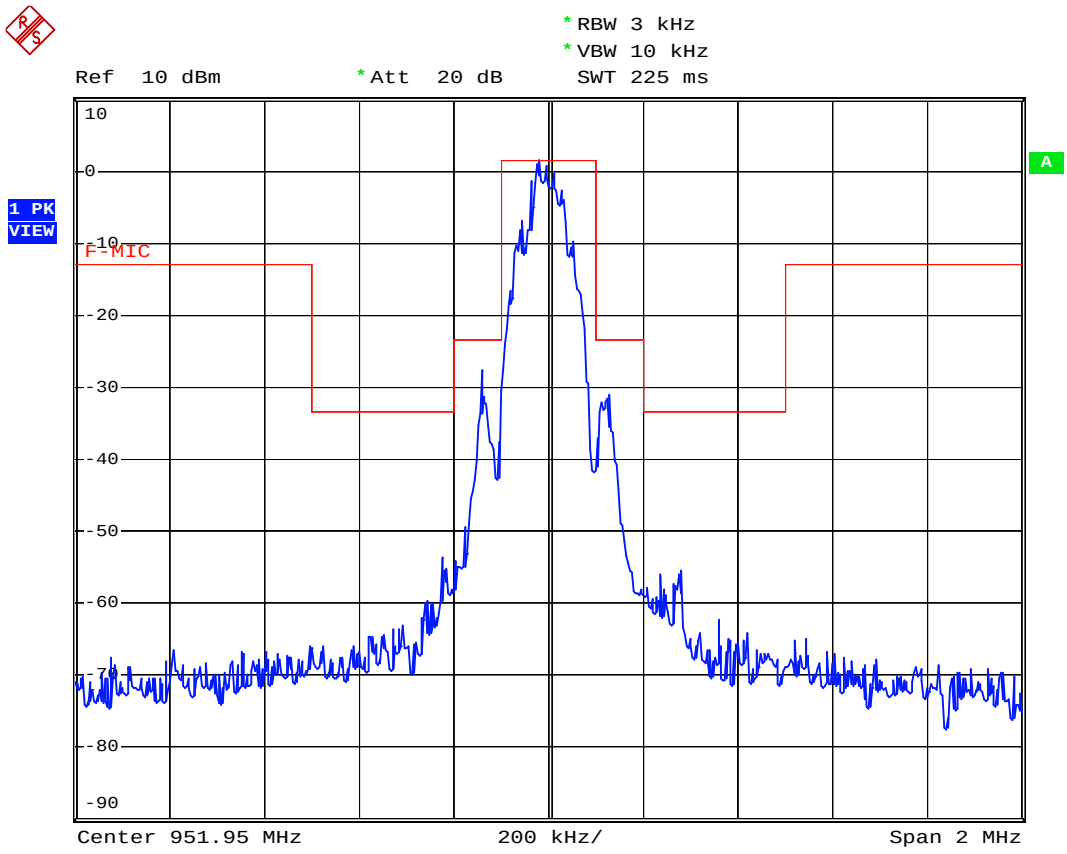
Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)-EIRP Factor-2.15dB
   {EIRP Factor = 99.9dB (30MHz-1GHz) or 95.2dB (1GHz Above)}
   {ERP = EIRP – 2.15dB}
3. The expanded uncertainty of the radiated emission tests is 3.53 dB.
4. The margin value=Limit - Result

### 6.4.3 Emission mask plots




*RBW 3 kHz
*VBW 10 kHz
Ref 10 dBm
*Att 20 dB
SWT 225 ms
1 PK
VIEW
F-MIC
A
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 607.95 MHz
200 kHz/
Span 2 MHz

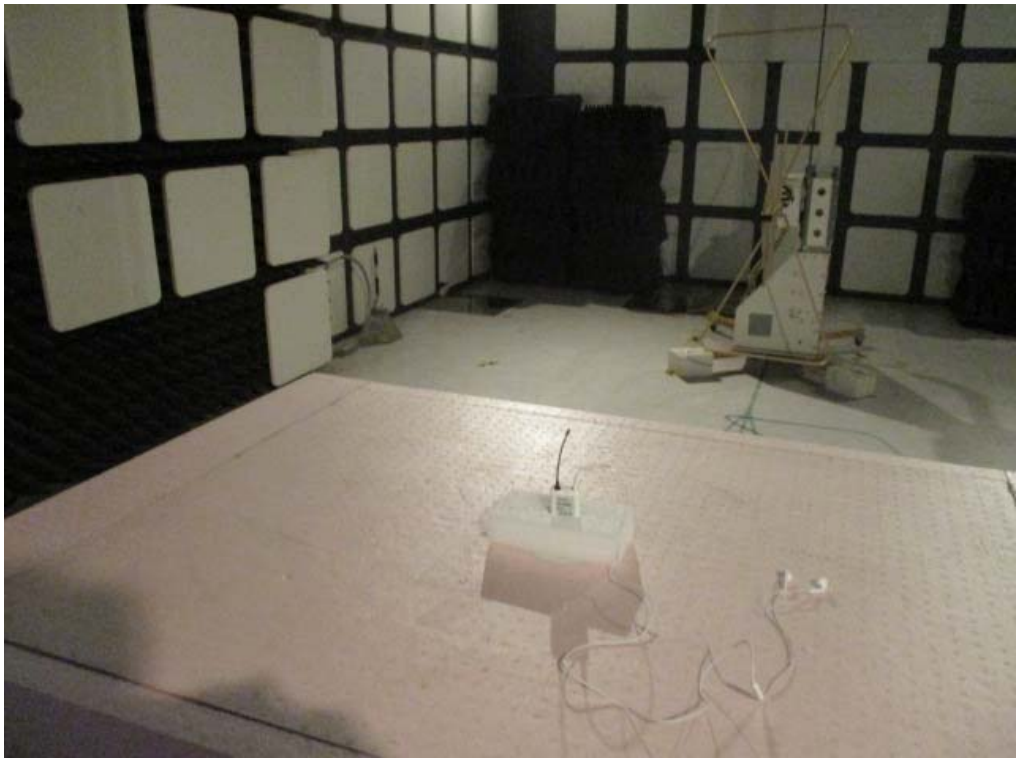

*RBW 3 kHz
*VBW 10 kHz
Ref 10 dBm
*Att 20 dB
SWT 225 ms
1 PK
VIEW
A
F-MIC
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 944.05 MHz
200 kHz/
Span 2 MHz


*RBW 3 kHz
*VBW 10 kHz
Ref 10 dBm
*Att 20 dB
SWT 225 ms
1 PK
VIEW
A
F-MIC
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 951.95 MHz
200 kHz/
Span 2 MHz

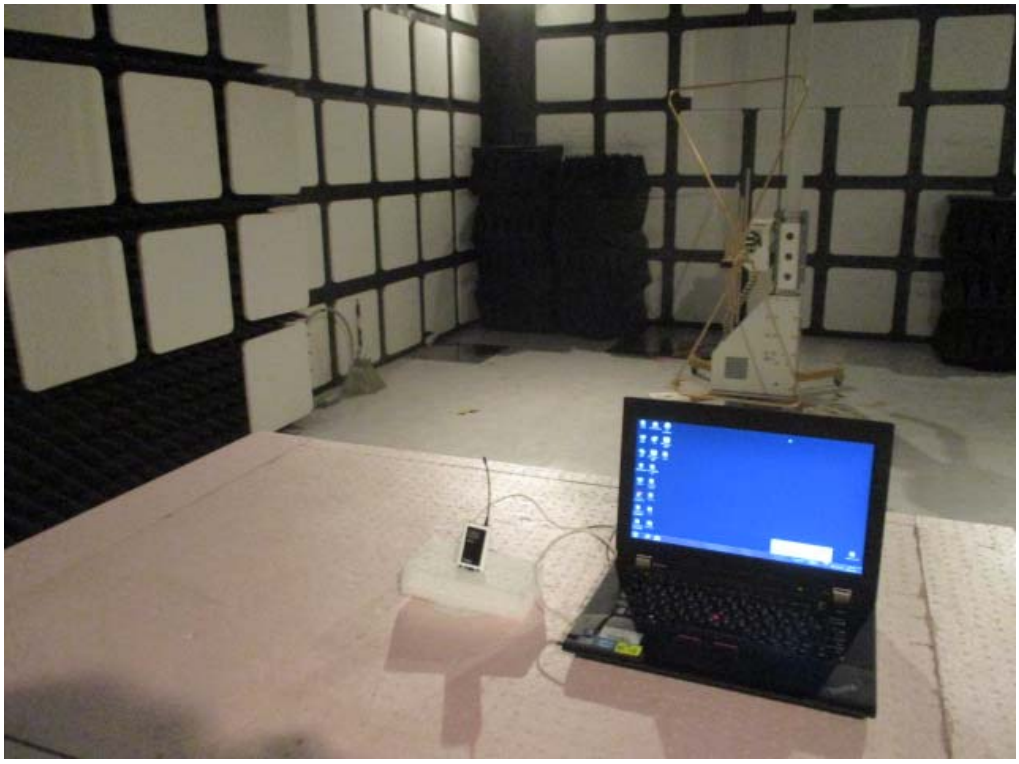
## 6.5 Radiated Measurement Photos

(Below 1GHz)

TX Mode

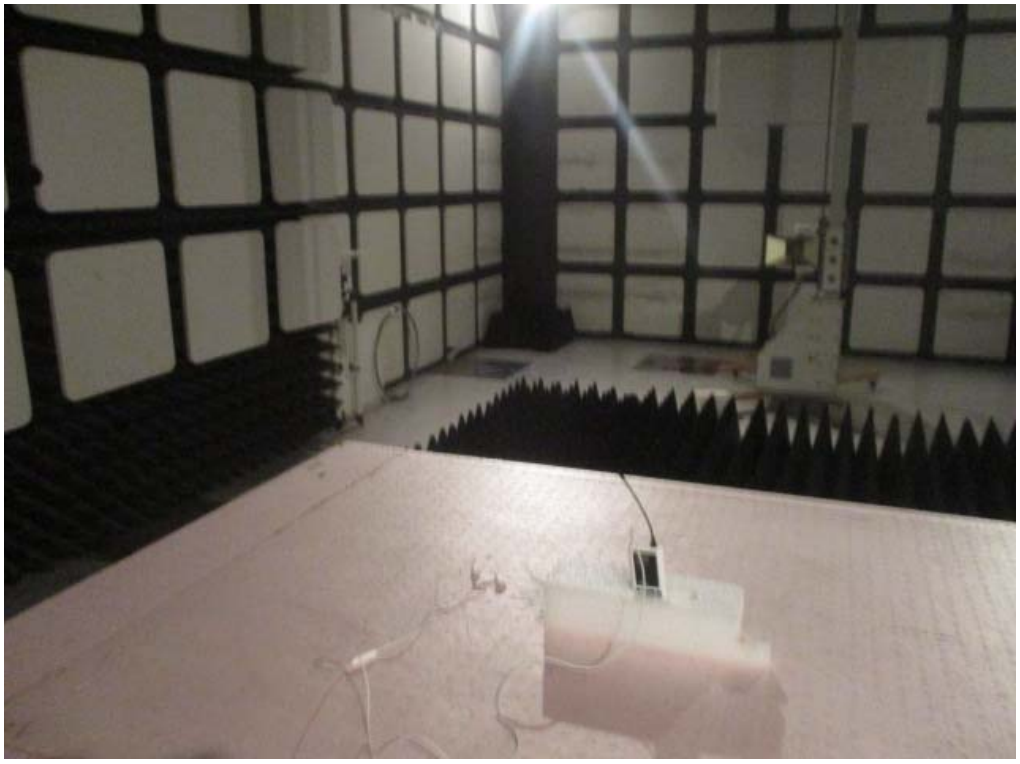


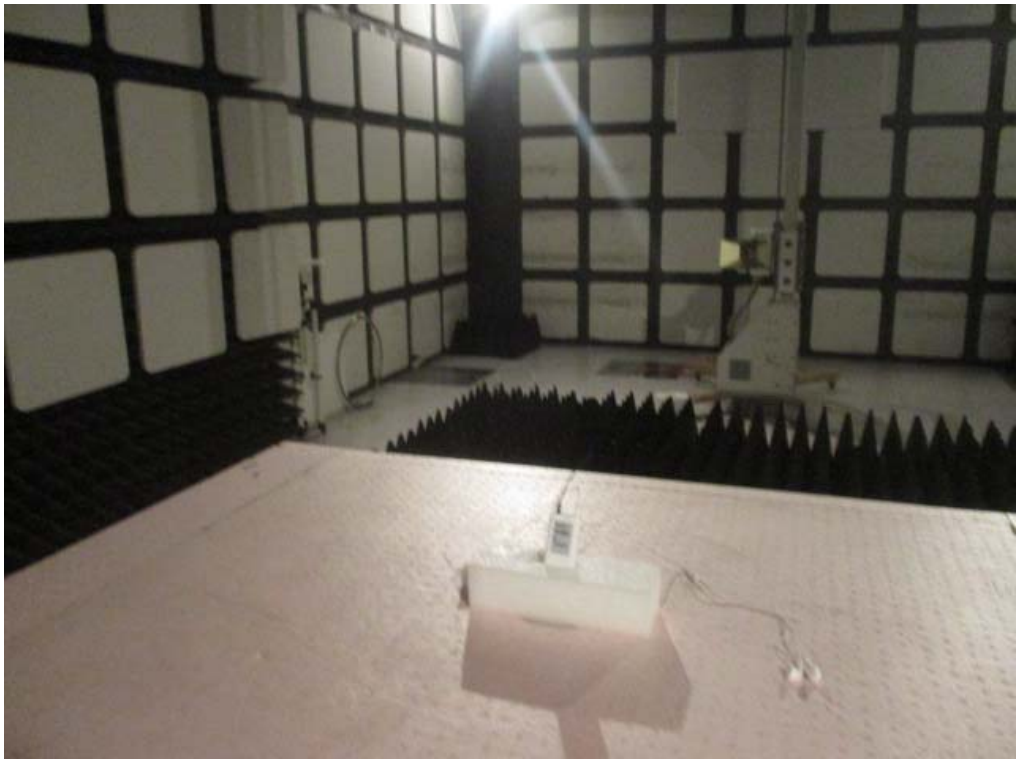
Charging Mode



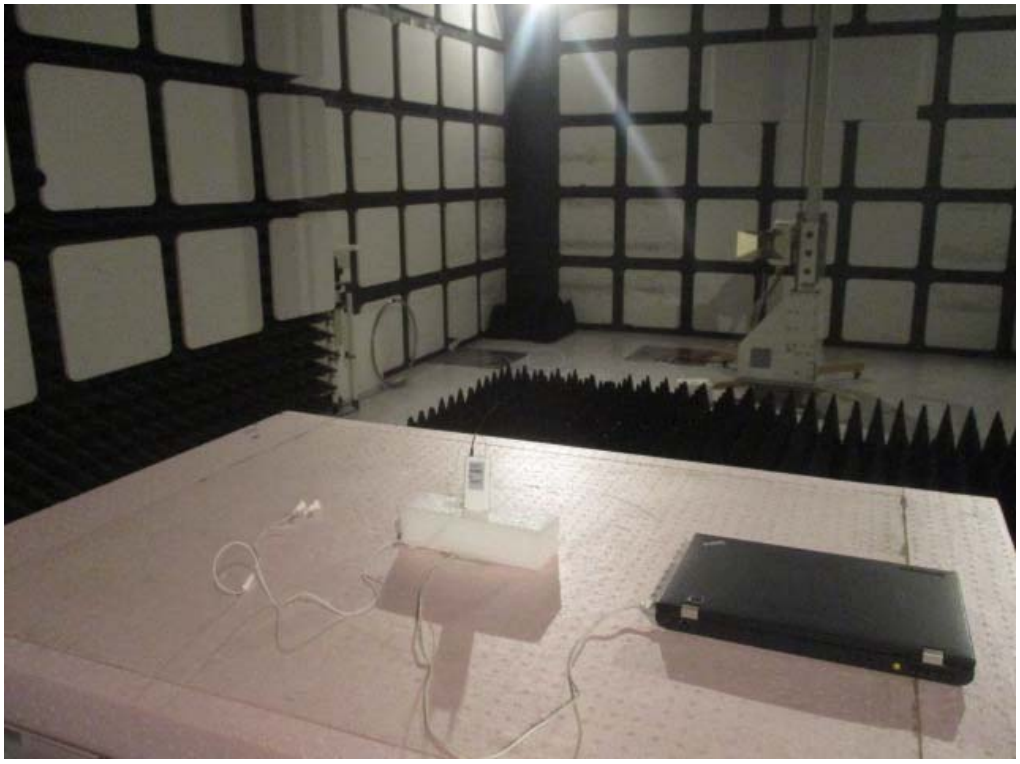
(Above 1GHz)

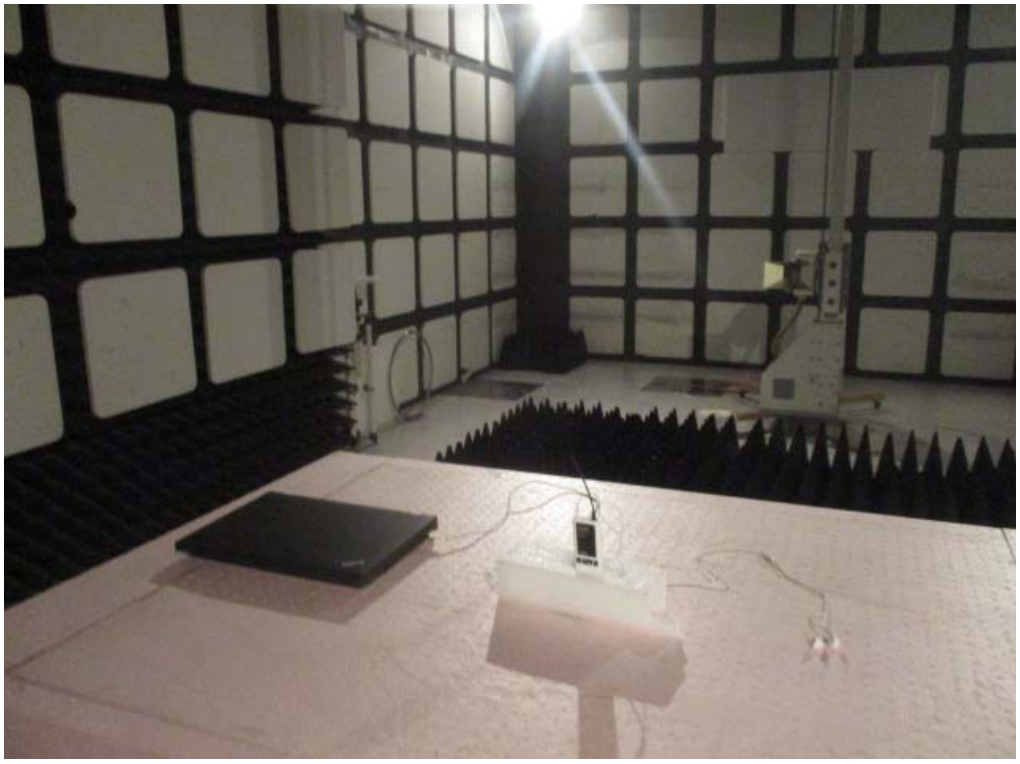
TX Mode





Charging Mode





# 7. FREQUENCY STABILITY MEASUREMENT

## 7.1 Provisions Applicable

According to §2.1055 (a)(1), the frequency stability shall be measured with variation of ambient temperature from -30 to +50 centigrade.
According to §2.1055 (d)(1), the frequency stability shall be measured with variation of primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.
According to §2.1055 (d)(2), for hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.

According to §74.861(e)(4), the frequency tolerance of the transmitter shall be 0.005 percent.

## 7.2 Measurement Procedure

A) Frequency stability versus environmental temperature

1. Setup the configuration per figure 6 for frequencies measured at an environmental chamber.

2. Turn on EUT and set SA center frequency to the right frequency needs to be measured. Set SA RBW to 30 kHz, VBW to 100kHz and frequency span to 500 kHz. Then turn off the EUT.

3. Set the temperature of chamber to 50℃. Allow sufficient time for the temperature of the chamber to stabilize. While maintaining a constant temperature inside the chamber, turn the EUT on and measure the EUT operating frequency when the frequency has stablized.

4. Repeat step 3 with a 10℃ decreased per stage until the lowest temperature -30℃ is measured, record all measurement frequencies.

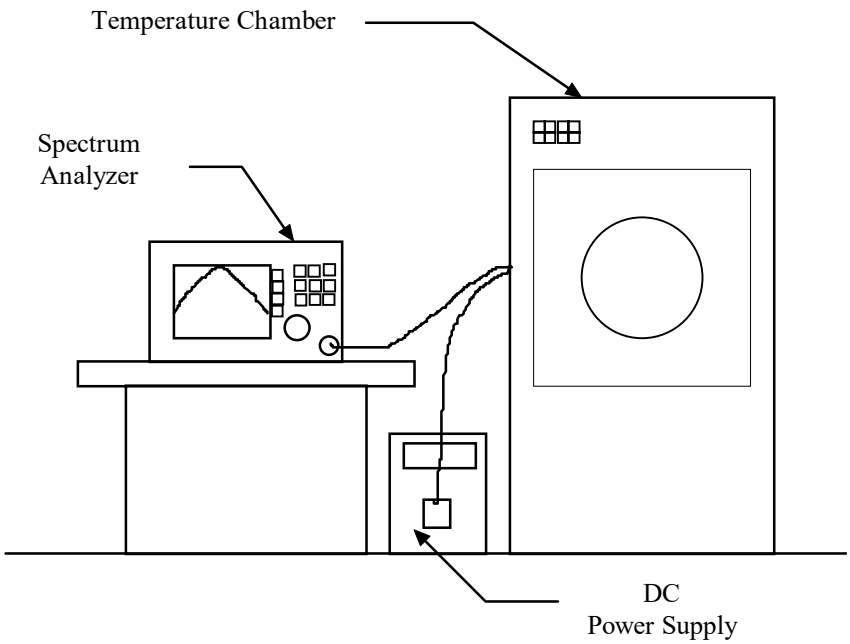
B) Frequency stability versus input voltage

1. Setup the configuration per figure 6 for frequencies measured at an environmental chamber set for a temperature of 25℃.

2. Set SA center frequency to the right frequency needs to be measured. Then set SA RBW to 30 kHz, VBW to 100kHz and frequency span to 500 kHz.

3. Supply the EUT primary voltage with 85 and 115 percent of the nominal value and record the frequency.

Figure 6 : Frequency stability measurement configuration




## 7.3 Measurement Instrument

| Equipment | Manufacturer | Model No. | Calibration Date | Next Cal. Date |
|---|---|---|---|---|
| Spectrum Analyzer | Rohde & Schwarz | FSP40 | 2017/11/02 | 2018/11/01 |
| Temperature Chamber | MALLIER | MCT-2X-M | 2016/12/14 | 2017/12/13 |

## 7.4 Measurement Data

Test Date : Nov. 24, 2017 Temperature : 22 °C Humidity : 65 %

**A. Tx Frequency 470.050 MHz**

A1. Frequency stability versus enviroment tempture

| Reference Frequency :470.050 MHz | | | Limit：0.005% |
|---|---|---|---|
| Enviroment Tempture (℃) | Power Supplied (Vdc) | (MHz) | (%) |
| 50 | 3.7 | 470.0384 | -0.00247 |
| 40 | | 470.0410 | -0.00191 |
| 30 | | 470.0437 | -0.00134 |
| 20 | | 470.0460 | -0.00085 |
| 10 | | 470.0488 | -0.00026 |
| 0 | | 470.0505 | 0.00011 |
| -10 | | 470.0514 | 0.00030 |
| -20 | | 470.0534 | 0.00072 |
| -30 | | 470.0548 | 0.00102 |

A2. Frequency stability versus supplied voltage

| Reference Frequency : 470.050 MHz | | | Limit：0.005% |
|---|---|---|---|
| Enviroment Tempture (℃) | Power Supplied (Vdc) | (MHz) | (%) |
| 25 | 3.1 | 470.0453 | -0.00100 |
| 25 | 4.3 | 470.0453 | -0.00100 |

Test Date : Nov. 24, 2017 Temperature : 22 °C Humidity : 65 %

**B. Tx Frequency 951.950 MHz**

B1. Frequency stability versus enviroment tempture

| Reference Frequency :951.950 MHz | | | Limit：0.005% |
|---|---|---|---|
| Enviroment Tempture (℃) | Power Supplied (Vdc) | (MHz) | (%) |
| 50 | 3.7 | 951.9304 | -0.00206 |
| 40 | | 951.9360 | -0.00147 |
| 30 | | 951.9429 | -0.00075 |
| 20 | | 951.9453 | -0.00049 |
| 10 | | 951.9485 | -0.00016 |
| 0 | | 951.9529 | 0.00030 |
| -10 | | 951.9572 | 0.00076 |
| -20 | | 951.9597 | 0.00102 |
| -30 | | 951.9621 | 0.00127 |

B2. Frequency stability versus supplied voltage

| Reference Frequency : 951.950 MHz | | | Limit：0.005% |
|---|---|---|---|
| Enviroment Tempture (℃) | Power Supplied (Vdc) | (MHz) | (%) |
| 25 | 3.1 | 951.9440 | -0.00063 |
| 25 | 4.3 | 951.9440 | -0.00063 |

# 8 CONDUCTED EMISSION MEASUREMENT

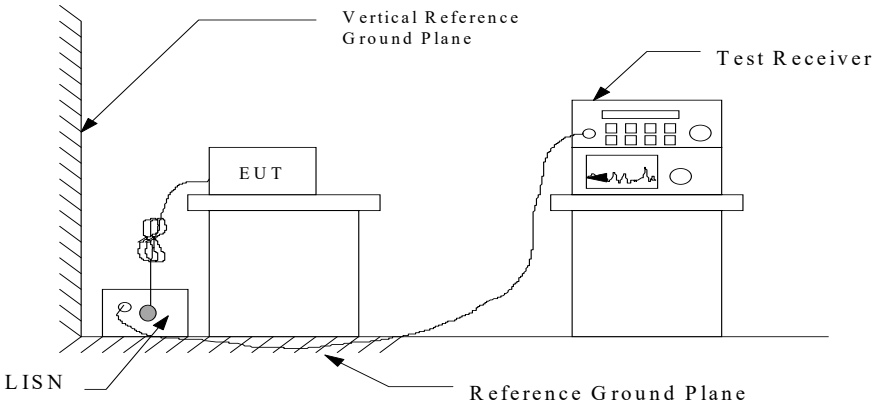
## 8.1 Standard Applicable

For unintentional and intentional device, Line Conducted Emission Limits are in accordance to § 15.107(a) and § 15.207(a) respectively. Both Limits are identical specification.

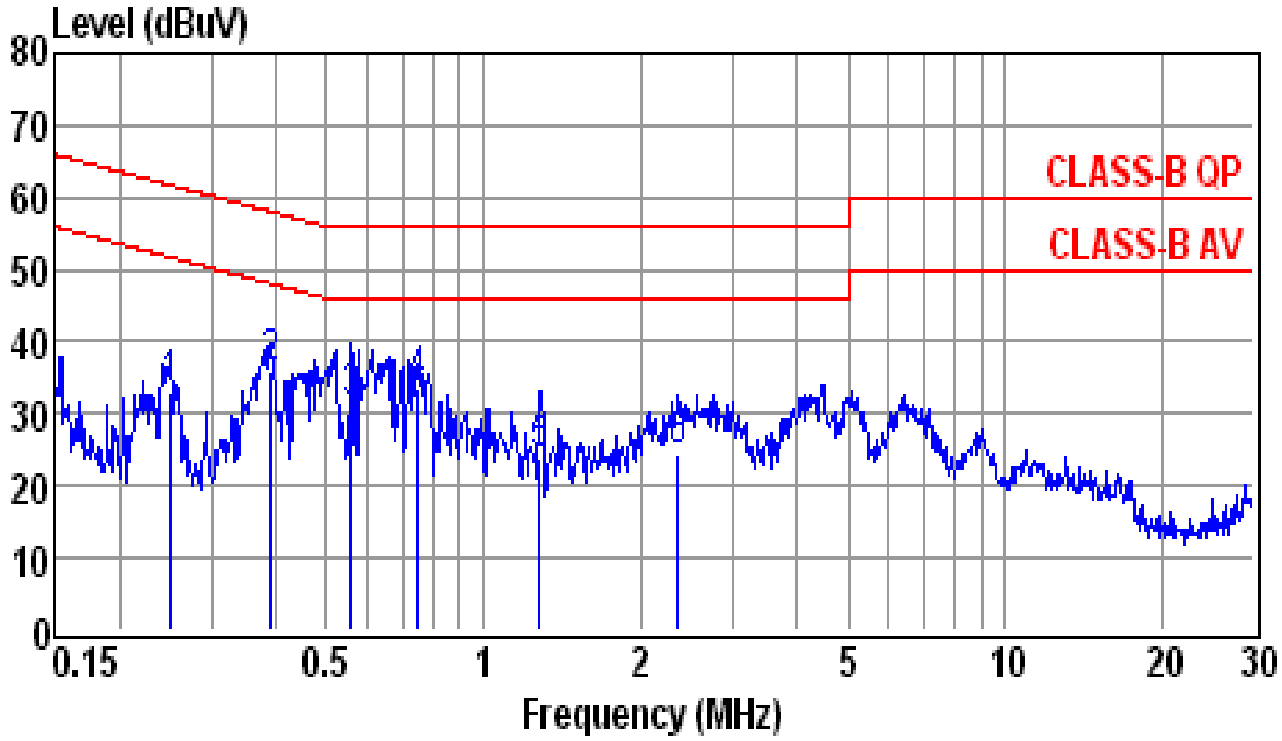
## 8.2 Measurement Procedure

1. Setup the configuration per figure 3.
2. A preliminary scan with a spectrum monitor is performed to identify the frequency of emission that has the highest amplitude relative to the limit by operating the EUT in selected modes of operation, typical cable positions, and with a typical system configuration.
3. Record the 6 or 8 highest emissions relative to the limit.
4. Measure each frequency obtained from step 3 by a test receiver set on quasi peak detector function, and then record the accuracy frequency and emission level. If all emissions measured in the specified band are attenuated more than 20 dB from the limit, this step would be ignored, and the peak detector function would be used.
5. Confirm the highest three emissions with variation of the EUT cable configuration and record the final data.
6. Repeat all above procedures on measuring each operation mode of EUT.

Figure 3 : Conducted emissions measurement configuration



## 8.3 Conducted Emission Data

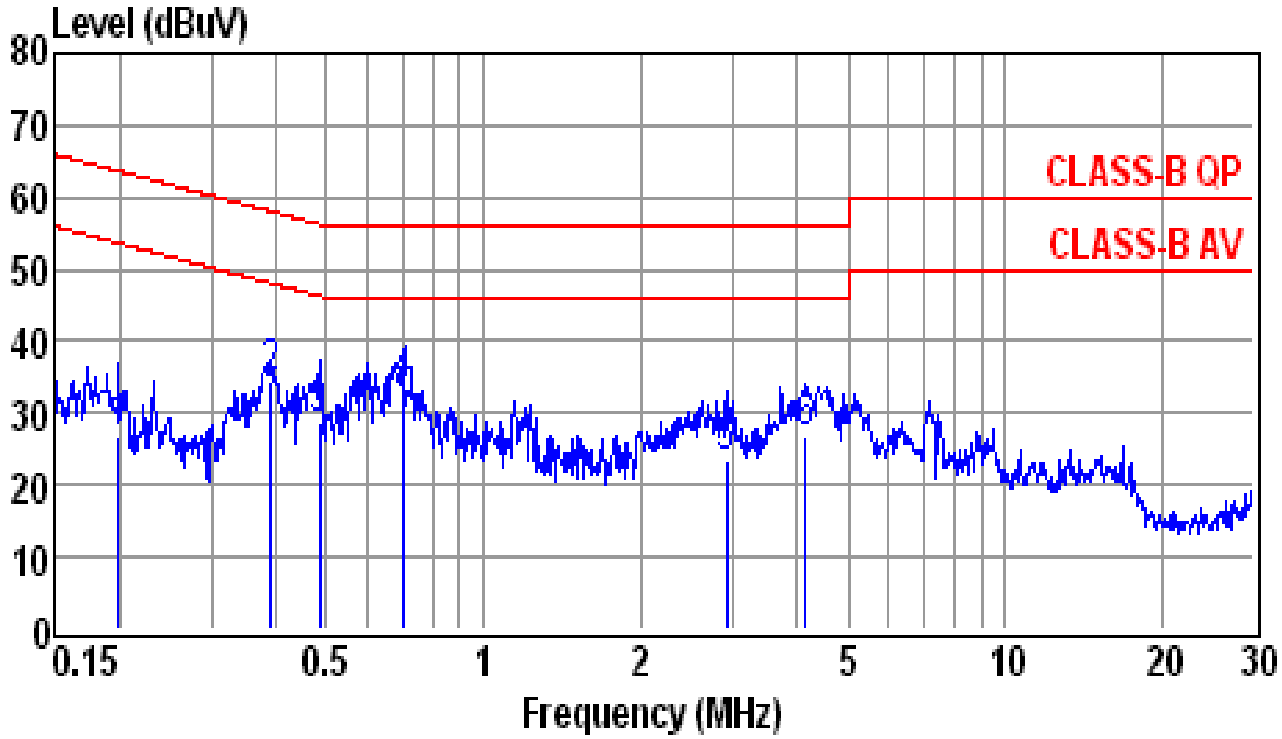



Site : conducted #1
Condition : CLASS-B QP
Tem / Hum : 24 ℃ / 50%
Test Mode : Charging Mode
EUT : TG-201T
Power Rating : DC5V(Power from PC)

Date : 10-12-2017
LISN : NEUTRAL

| Freq (MHz) | Reading (dBuV) | Factor (dB) | Emission Level (dBuV) | Limit Line (dBuV) | Over Limit (dB) | Remark |
|---|---|---|---|---|---|---|
| 0.2508 | 22.83 | 10.19 | 33.02 | 61.73 | -28.71 | QP |
| 0.3914 | 25.54 | 10.21 | 35.75 | 58.03 | -22.28 | QP |
| 0.5581 | 20.79 | 10.22 | 31.01 | 56.00 | -24.99 | QP |
| 0.7470 | 23.37 | 10.23 | 33.60 | 56.00 | -22.40 | QP |
| 1.2820 | 13.66 | 10.27 | 23.93 | 56.00 | -32.07 | QP |
| 2.3580 | 14.10 | 10.33 | 24.43 | 56.00 | -31.57 | QP |

Note :
1. Result = Reading + Factor
2. Factor = LISN Factor + Cable Loss




Site : conducted #1
Condition : CLASS-B QP
Tem / Hum : 24 ℃ / 50%
Test Mode : Charging Mode
EUT : TG-201T
Power Rating : DC5V(Power from PC)

Date : 10-12-2017
LISN : LINE

| Freq (MHz) | Reading (dBuV) | Factor (dB) | Emission Level (dBuV) | Limit Line (dBuV) | Over Limit (dB) | Remark |
|---|---|---|---|---|---|---|
| 0.1997 | 16.56 | 10.19 | 26.75 | 63.62 | -36.87 | QP |
| 0.3914 | 24.31 | 10.20 | 34.51 | 58.03 | -23.52 | QP |
| 0.4838 | 18.63 | 10.21 | 28.84 | 56.27 | -27.43 | QP |
| 0.7010 | 23.25 | 10.22 | 33.47 | 56.00 | -22.53 | QP |
| 2.9310 | 13.30 | 10.35 | 23.65 | 56.00 | -32.35 | QP |
| 4.1360 | 16.18 | 10.41 | 26.59 | 56.00 | -29.41 | QP |

Note :
1. Result = Reading + Factor
2. Factor = LISN Factor + Cable Loss

## 8.4 Result Data Calculation

The result data is calculated by adding the LISN Factor to the measured reading. The basic equation with a sample calculation is as follows:

***RESULT = READING + LISN FACTOR***

Assume a receiver reading of 22.5 dB $\mu$ V is obtained, and LISN Factor is 0.1 dB, then the total of disturbance voltage is 22.6 dB $\mu$ V.

RESULT = 22.5 + 0.1 = 22.6 dB $\mu$ V
Level in $\mu$ V = Common Antilogarithm[(22.6 dB $\mu$ V)/20]
= 13.48 $\mu$ V

## 8.5 Conducted Measurement Equipment

The following test equipment are used during the conducted test .

| Equipment | Manufacturer | Model No. | Calibration Date | Next Cal. Date |
|---|---|---|---|---|
| EMI Test Receiver | Rohde & Schwarz | ESCI | 2017/09/19 | 2018/09/18 |
| LISN | Rohde & Schwarz | ESH2-Z5 | 2017/04/01 | 2018/03/31 |

## 8.6 Photos of Conduction Measuring Setup