



# FCC RADIO TEST REPORT

Applicant : Xema Inc.  
Address : 12960 Sunnyside, Santa Fe Springs, CA 90670  
Equipment : UHF RFID 4-Port Module  
Model No. : M87P4  
Trade Name : XEMA  
FCC ID. : 2BEYTM87P4

## I HEREBY CERTIFY THAT :

The sample was received on Jul. 12, 2024 and the testing was completed on Aug. 07, 2024 at CerpPASS Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of CerpPASS Technology Corp., the test report shall not be reproduced except in full.

Approved by:

Mark Liao / Supervisor

Laboratory Accreditation:

CerpPASS Technology Corporation Test Laboratory





## CONTENTS

|                                                              |           |
|--------------------------------------------------------------|-----------|
| <b>1. Summary of Test Procedure and Test Results .....</b>   | <b>5</b>  |
| 1.1 Applicable Standards .....                               | 5         |
| <b>2. Test Configuration of Equipment under Test .....</b>   | <b>6</b>  |
| 2.1 Feature of Equipment under Test.....                     | 6         |
| 2.2 Carrier Frequency of Channes.....                        | 6         |
| 2.3 Test Mode & Test Software .....                          | 7         |
| 2.4 Description of Test System.....                          | 8         |
| 2.5 General Information of Test.....                         | 9         |
| 2.6 Measurement Uncertainty .....                            | 10        |
| <b>3. Test Equipment and Ancillaries Used for Tests.....</b> | <b>11</b> |
| <b>4. Antenna Requirements.....</b>                          | <b>13</b> |
| 4.1 Standard Applicable .....                                | 13        |
| 4.2 Antenna Construction and Directional Gain.....           | 13        |
| <b>5. Test of AC Power Line Conducted Emission .....</b>     | <b>14</b> |
| 5.1 Test Limit .....                                         | 14        |
| 5.2 Test Procedures .....                                    | 14        |
| 5.3 Typical Test Setup .....                                 | 15        |
| 5.4 Test Result and Data.....                                | 16        |
| 5.5 Test Photographs .....                                   | 22        |
| <b>6. Test of Radiated Spurious Emission.....</b>            | <b>23</b> |
| 6.1 Test Limit .....                                         | 23        |
| 6.2 Test Procedures.....                                     | 23        |
| 6.3 Typical Test Setup .....                                 | 24        |
| 6.4 Test Result and Data (9kHz ~ 30MHz) .....                | 25        |
| 6.5 Test Result and Data (30MHz ~ 1GHz) .....                | 25        |
| 6.6 Test Result and Data (1GHz ~ 25GHz).....                 | 31        |
| 6.7 Restricted Bands of Operation.....                       | 37        |
| 6.8 Test Photographs (30MHz ~ 1GHz).....                     | 38        |
| 6.9 Test Photographs (1GHz ~ 25GHz) .....                    | 39        |
| <b>7. Test of Conducted Spurious Emission .....</b>          | <b>40</b> |
| 7.1 Test Limit .....                                         | 40        |
| 7.2 Test Procedure .....                                     | 40        |
| 7.3 Test Setup Layout .....                                  | 40        |
| 7.4 Test Result and Data.....                                | 40        |
| <b>8. On Time, Duty Cycle and Measurement methods .....</b>  | <b>43</b> |
| 8.1 Test Limit .....                                         | 43        |
| 8.2 Test Procedure .....                                     | 43        |
| 8.3 Test Setup Layout .....                                  | 43        |
| 8.4 Test Result and Data.....                                | 43        |
| <b>9. 20dB Bandwidth Measurement Data.....</b>               | <b>44</b> |
| 9.1 Test Limit .....                                         | 44        |
| 9.2 Test Procedures .....                                    | 44        |



|            |                                         |           |
|------------|-----------------------------------------|-----------|
| 9.3        | Test Setup Layout .....                 | 44        |
| 9.4        | Test Result and Data .....              | 44        |
| <b>10.</b> | <b>Frequencies Separation .....</b>     | <b>46</b> |
| 10.1       | Test Limit .....                        | 46        |
| 10.2       | Test Procedures .....                   | 46        |
| 10.3       | Test Setup Layout .....                 | 46        |
| 10.4       | Test Result and Data .....              | 46        |
| <b>11.</b> | <b>Dwell Time on each channel .....</b> | <b>48</b> |
| 11.1       | Test Limit .....                        | 48        |
| 11.2       | Test Procedures .....                   | 48        |
| 11.3       | Test Setup Layout .....                 | 48        |
| 11.4       | Test Result and Data .....              | 48        |
| <b>12.</b> | <b>Number of Hopping Channels .....</b> | <b>50</b> |
| 12.1       | Test Limit .....                        | 50        |
| 12.2       | Test Procedures .....                   | 50        |
| 12.3       | Test Setup Layout .....                 | 50        |
| 12.4       | Test Result and Data .....              | 50        |
| <b>13.</b> | <b>Maximum Peak Output Power .....</b>  | <b>52</b> |
| 13.1       | Test Limit .....                        | 52        |
| 13.2       | Test Procedures .....                   | 52        |
| 13.3       | Test Setup Layout .....                 | 52        |
| 13.4       | Test Result and Data .....              | 53        |
| <b>14.</b> | <b>Radio Frequency Exposure .....</b>   | <b>54</b> |
| 14.1       | Applicable Standards .....              | 54        |
| 14.2       | EUT Specification .....                 | 55        |
| 14.3       | Result .....                            | 55        |

**History of this test report**

| Report No.       | Issued Date   | Description |
|------------------|---------------|-------------|
| 24090112-TRFCC01 | Sep. 30, 2024 | Original    |
|                  |               |             |
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| Report Type                         |                   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/>            | Original report   | NA                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <input checked="" type="checkbox"/> | Derivative Report | <p>This sample provided has been confirmed to be identical to the original report sample. The only difference are as listed below. As it doesn't affect the test result, the original report number: 24070239-TRFCC01 and content will be used.</p> <ol style="list-style-type: none"><li>1. Applicant information change.</li><li>2. Equipment Name change.</li><li>3. Model No. change.</li><li>4. Trade Name change.</li><li>5. FCC ID. . change.</li></ol> |



## 1. Summary of Test Procedure and Test Results

### 1.1 Applicable Standards

**ANSI C63.10:2013**

**FCC Rules and Regulations Part 15 Subpart C §15.247**

| FCC Rule         | Description of Test                      | Result |
|------------------|------------------------------------------|--------|
| 15.203           | . Antenna Requirement                    | PASS   |
| 15.207           | . AC Power Line Conducted Emission       | PASS   |
| 15.209<br>15.205 | . Radiated Spurious Emission             | PASS   |
| 15.247(d)        | . Conducted Spurious Emission            | PASS   |
| 15.247(a)(1)     | . Channel Carrier Frequencies Separation | PASS   |
| 15.247(a)(1)     | . 20dB Bandwidth                         | PASS   |
| 15.247(a)(1)     | . Dwell Time                             | PASS   |
| 15.247(b)        | . Number of Hopping Channels             | PASS   |
| 15.247(b)        | . Peak Output Power Measurement Data     | PASS   |

\*The lab has reduced the uncertainty risk factor from test equipment, environment and staff technicians which according to the standard on contract. Therefore, the test result will only be determined by standard requirement, measurement uncertainty evaluation is not considered.



## 2. Test Configuration of Equipment under Test

### 2.1 Feature of Equipment under Test

|                           |                     |
|---------------------------|---------------------|
| Operation Frequency Range | 902MHz~928MHz       |
| Modulation Type           | ASK                 |
| Antenna Type              | Patch Antenna       |
| Antenna Gain              | ANT 1/2/3/4: 5.5dBi |
| Antenna Cable Loss        | 0.5dBi              |

Note:

1. Antenna & Antenna Cable are not sold with the EUT.
2. For more details, please refer to the User's manual of the EUT.

### 2.2 Carrier Frequency of Channes

| Channel No. | Frequency(MHz) | Channel No. | Frequency(MHz) |
|-------------|----------------|-------------|----------------|
| <b>*1</b>   | <b>902.75</b>  | 26          | 915.25         |
| 2           | 903.25         | 27          | 915.75         |
| 3           | 903.75         | 28          | 916.25         |
| 4           | 904.25         | 29          | 916.75         |
| 5           | 904.75         | 30          | 917.25         |
| 6           | 905.25         | 31          | 917.75         |
| 7           | 905.75         | 32          | 918.25         |
| 8           | 906.25         | 33          | 918.75         |
| 9           | 906.75         | 34          | 919.25         |
| 10          | 907.25         | 35          | 919.75         |
| 11          | 907.75         | 36          | 920.25         |
| 12          | 908.25         | 37          | 920.75         |
| 13          | 908.75         | 38          | 921.25         |
| 14          | 909.25         | 39          | 921.75         |
| 15          | 909.75         | 40          | 922.25         |
| 16          | 910.25         | 41          | 922.75         |
| 17          | 910.75         | 42          | 923.25         |
| 18          | 911.25         | 43          | 923.75         |
| 19          | 911.75         | 44          | 924.25         |
| 20          | 912.25         | 45          | 924.75         |
| 21          | 912.75         | 46          | 925.25         |
| 22          | 913.25         | 47          | 925.75         |
| 23          | 913.75         | 48          | 926.25         |
| 24          | 914.25         | 49          | 926.75         |
| <b>*25</b>  | <b>914.75</b>  | <b>*50</b>  | <b>927.25</b>  |

Note: Channels remarked \* are selected to perform test.



## 2.3 Test Mode & Test Software

- During testing, the interface cables and equipment positions were varied according to ANSI C63.10
- The complete test system included Notebook and EUT for RF test.
- An executive program, " Docklight Scripting v2.0.5" under Windows OS system was executed to transmit and receive data via RFID.
- The following test modes were performed for the test:

| Conducted Emissions from the AC mains power ports                                    |                                                              |
|--------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Test Mode                                                                            | Operating Description                                        |
| 1                                                                                    | TX Mode, DC 5.2V/2A Power from DC Power Supply(AC 120V/60Hz) |
| caused "Test Mode 1" generated the worst case, it was reported as the final data.    |                                                              |
| Radiation Emissions (30MHz ~ 1GHz)                                                   |                                                              |
| Test Mode                                                                            | Operating Description                                        |
| 1                                                                                    | TX Mode, DC 5.2V/2A Power from DC Power Supply(AC 120V/60Hz) |
| caused "Test Mode 1" generated the worst case, they were reported as the final data. |                                                              |
| Radiation Emissions (1GHz ~ 25GHz)                                                   |                                                              |
| Test Mode                                                                            | Operating Description                                        |
| 1                                                                                    | TX Mode, DC 5.2V/2A Power from DC Power Supply(AC 120V/60Hz) |
| caused "Test Mode 1" generated the worst case, they were reported as the final data. |                                                              |

Note: There are four ports of EUT, Port1/2/3/4. After engineering evaluation, Port 2 is worst case, hence, is used at test report.

| Modulation Type | TX CONFIGURATION |
|-----------------|------------------|
| ASK             | 1TX              |



## 2.4 Description of Test System

| RF Conducted                     |          |                |             |                        |
|----------------------------------|----------|----------------|-------------|------------------------|
| Equipment                        | Brand    | Model          | Length/Type | Power cord/Length/Type |
| Antenna Cable*4                  | N/A      | N/A            | 1.2m / NS   | N/A                    |
| Notebook                         | lenovo   | S1GL2W         | N/A         | N/A                    |
| USB Cable                        | N/A      | N/A            | 1.8m / NS   | N/A                    |
| Testfixture                      | N/A      | N/A            | N/A         | N/A                    |
| DC Power Supply                  | Gwinstek | GPR-360600     | N/A         | N/A                    |
| Radiated Emissions               |          |                |             |                        |
| Equipment                        | Brand    | Model          | Length/Type | Power cord/Length/Type |
| Antenna*4                        | N/A      | N/A            | 0.1m / NS   | N/A                    |
| Antenna Cable*4                  | N/A      | N/A            | 1.2m / NS   | N/A                    |
| Notebook                         | DELL     | Latitude E5470 | N/A         | Adapter / 1.8m / NS    |
| USB Cable                        | N/A      | N/A            | 1.8m / NS   | N/A                    |
| Testfixture                      | N/A      | N/A            | N/A         | N/A                    |
| DC Power Supply                  | Gwinstek | GPR-360600     | N/A         | N/A                    |
| AC Power Line Conducted Emission |          |                |             |                        |
| Equipment                        | Brand    | Model          | Length/Type | Power cord/Length/Type |
| Antenna*4                        | N/A      | N/A            | 0.1m / NS   | N/A                    |
| Antenna Cable*4                  | N/A      | N/A            | 1.2m / NS   | N/A                    |
| Notebook                         | DELL     | Latitude E5470 | N/A         | Adapter / 1.8m / NS    |
| USB Cable                        | N/A      | N/A            | 1.8m / NS   | N/A                    |
| Testfixture                      | N/A      | N/A            | N/A         | N/A                    |
| DC Power Supply                  | Gwinstek | GPR-360600     | N/A         | N/A                    |



## 2.5 General Information of Test

|                                               |                                                                                                                                                                                       |                  |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| <input checked="" type="checkbox"/> Test Site | Cerpass Technology Corporation Test Laboratory<br>Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.)<br>Tel: +886-3-3226-888<br>Fax: +886-3-3226-881 |                  |
|                                               | FCC                                                                                                                                                                                   | TW1439, TW1079   |
|                                               | IC                                                                                                                                                                                    | 4934E-1, 4934E-2 |
| Frequency Range Investigated                  | Conducted: from 150kHz to 30 MHz<br>Radiation: from 9 KHz to 10,000MHz                                                                                                                |                  |
| Test Distance                                 | The test distance of radiated emission from antenna to EUT is 3 M.                                                                                                                    |                  |

| Test Item                        | Test Site  | Test Period | Environmental Conditions | Tested By  |
|----------------------------------|------------|-------------|--------------------------|------------|
| RF Conducted                     | RFCON01-NK | 2024/07/22  | 24.7℃ / 53%              | Leon Huang |
| RF Conducted                     | RFCON01-NK | 2024/08/07  | 25.8℃ / 39%              | Leon Huang |
| Radiated Emissions               | 3M02-NK    | 2024/08/06  | 24.9℃ / 45%              | Leon Huang |
| AC Power Line Conducted Emission | CON02-NK   | 2024/07/26  | 26.1℃ / 54%              | Park Chen  |



## 2.6 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor ( $k=2$ ))

| Measurement Item                         | Uncertainty          |
|------------------------------------------|----------------------|
| AC Power Line Conducted Emission         | $\pm 3.12\text{dB}$  |
| Radiated Spurious Emission(9KHz~30MHz)   | $\pm 3.405\text{dB}$ |
| Radiated Spurious Emission(30MHz~1GHz)   | $\pm 5.326\text{dB}$ |
| Radiated Spurious Emission(1GHz~25GHz)   | $\pm 5.918\text{dB}$ |
| Conducted Spurious Emission              | $\pm 2.156\text{dB}$ |
| 20dB Bandwidth                           | $\pm 4.40\%$         |
| Peak Output Power(Conducted Power Meter) | $\pm 1.31\text{dB}$  |
| Dwell Time                               | $\pm 0.11\%$         |
| Duty Cycle                               | $\pm 0.17\%$         |



### 3. Test Equipment and Ancillaries Used for Tests

| Test Item           | Radiated Emissions          |                      |             |                  |            |
|---------------------|-----------------------------|----------------------|-------------|------------------|------------|
| Test Site           | Semi Anechoic Room(3M02-NK) |                      |             |                  |            |
| Instrument          | Manufacturer                | Model No             | Serial No   | Calibration Date | Valid Date |
| Bilog Antenna       | Schwarzbeck                 | VULB9168             | 369         | 2024/02/19       | 2025/02/18 |
| Active Loop Antenna | Schwarzbeck                 | FMZB 1513            | 414         | 2024/01/16       | 2025/01/15 |
| Horn Antenna        | EMCO                        | 3115                 | 31589       | 2024/02/26       | 2025/02/25 |
| Horn Antenna        | EMCO                        | 3116                 | 31974       | 2023/10/16       | 2024/10/15 |
| EMI Receiver        | ROHDE & SCHWARZ             | ESR 7                | 101906      | 2024/05/13       | 2025/05/12 |
| Spectrum Analyzer   | ROHDE & SCHWARZ             | FSV 40-N             | 102151      | 2023/08/15       | 2024/08/14 |
| Preamplifier        | Agilent                     | 8449B                | 3008A01954  | 2024/03/01       | 2025/02/28 |
| Preamplifier        | EMC INSTRUMENTS             | EMC184045            | 980065      | 2023/10/13       | 2024/10/12 |
| Preamplifier        | EM Electronics corp.        | EM330                | 60659       | 2024/02/17       | 2025/02/16 |
| Cable-6m(9k~300M)   | N/A                         | EMC5D-BM-BM-6        | 130606      | 2024/03/13       | 2025/03/12 |
| Cable-3in1(30M-1G)  | HARBOUR INDUSTRIES          | LL142                | CCE1315     | 2024/02/23       | 2025/02/22 |
| Cable-0.5m(1G-40G)  | HUBER SUHNER                | SUCOFLEX 104         | 805443/4    | 2024/03/05       | 2025/03/04 |
| Cable-3m(1G-40G)    | HUBER SUHNER                | SUCOFLEX 104         | 805796/4    | 2024/03/05       | 2025/03/04 |
| Cable-8m(1G-26.5G)  | WOKEN                       | WCBA-WCA203SM        | CCE1374     | 2024/03/05       | 2025/03/04 |
| Cable-1m(1G-40G)    | HUBER SUHNER                | HUBER SUHNER / SF102 | 804398/2    | 2023/10/12       | 2024/10/11 |
| Cable-3m(1G-40G)    | HUBER SUHNER                | HUBER SUHNER / SF102 | 804619/2    | 2023/10/12       | 2024/10/11 |
| E3                  | AUDIX                       | v8.2014-8-6          | RK-000529   | NA               | NA         |
| Highpass Filter     | WOKEN                       | WFIL-H3000-18000F-03 | WR377WC2B1  | 2023/08/17       | 2024/08/16 |
| Notch Filter        | Warison                     | WFIL-N5925-7125F-04  | WRQ4BFWC4M1 | 2024/03/11       | 2025/03/10 |
| Hipass Filter       | Warison                     | WFIL-H7500-18000F    | WRQ4BFWC2J1 | 2024/03/11       | 2025/03/10 |

| Test Item            | RF Conducted    |              |            |                  |            |
|----------------------|-----------------|--------------|------------|------------------|------------|
| Test Site            | RFCON01-NK      |              |            |                  |            |
| Instrument           | Manufacturer    | Model No     | Serial No  | Calibration Date | Valid Date |
| Spectrum Analyzer    | ROHDE & SCHWARZ | FSP 40       | 100047     | 2024/02/01       | 2025/01/31 |
| Attenuator           | KEYSIGHT        | 8491B        | MY39250703 | 2024/02/20       | 2025/02/19 |
| Cable-0.5m(30M-40G ) | HUBER SUHNER    | SUCOFLEX 102 | 28420/2    | 2023/10/12       | 2024/10/11 |
| Power Meter          | Anritsu         | ML2495A      | 1224005    | 2024/02/17       | 2025/02/16 |
| Power Sensor         | Anritsu         | MA2411B      | 1207295    | 2024/02/17       | 2025/02/16 |
| Switch Box           | Theda           | 1-4          | TW5451159  | NA               | NA         |



|                       |                                  |               |           |                  |            |
|-----------------------|----------------------------------|---------------|-----------|------------------|------------|
| Test Item             | AC Power Line Conducted Emission |               |           |                  |            |
| Test Site             | CON02-NK                         |               |           |                  |            |
| Instrument            | Manufacturer                     | Model No      | Serial No | Calibration Date | Valid Date |
| EMI Receiver          | ROHDE & SCHWARZ                  | ESR 7         | 101906    | 2024/05/13       | 2025/05/12 |
| TWO-LINE<br>V-NETWORK | ROHDE & SCHWARZ                  | ENV216        | 102185    | 2023/08/29       | 2024/08/28 |
| Cable-6m(9k~300M)     | N/A                              | EMC5D-BM-BM-6 | 130606    | 2024/03/13       | 2025/03/12 |
| E3                    | AUDIX                            | v8.2014-8-6   | RK-000536 | NA               | NA         |



## 4. Antenna Requirements

### 4.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### 4.2 Antenna Construction and Directional Gain

|              |               |
|--------------|---------------|
| Antenna Type | Patch Antenna |
| Antenna Gain | 5.5dBi        |



## 5. Test of AC Power Line Conducted Emission

### 5.1 Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz, according to the methods defined in ANSI C63.10-2013. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

| Frequency<br>(MHz) | Quasi Peak<br>(dB $\mu$ V) | Average<br>(dB $\mu$ V) |
|--------------------|----------------------------|-------------------------|
| 0.15 – 0.5         | 66-56*                     | 56-46*                  |
| 0.5 – 5.0          | 56                         | 46                      |
| 5.0 – 30.0         | 60                         | 50                      |

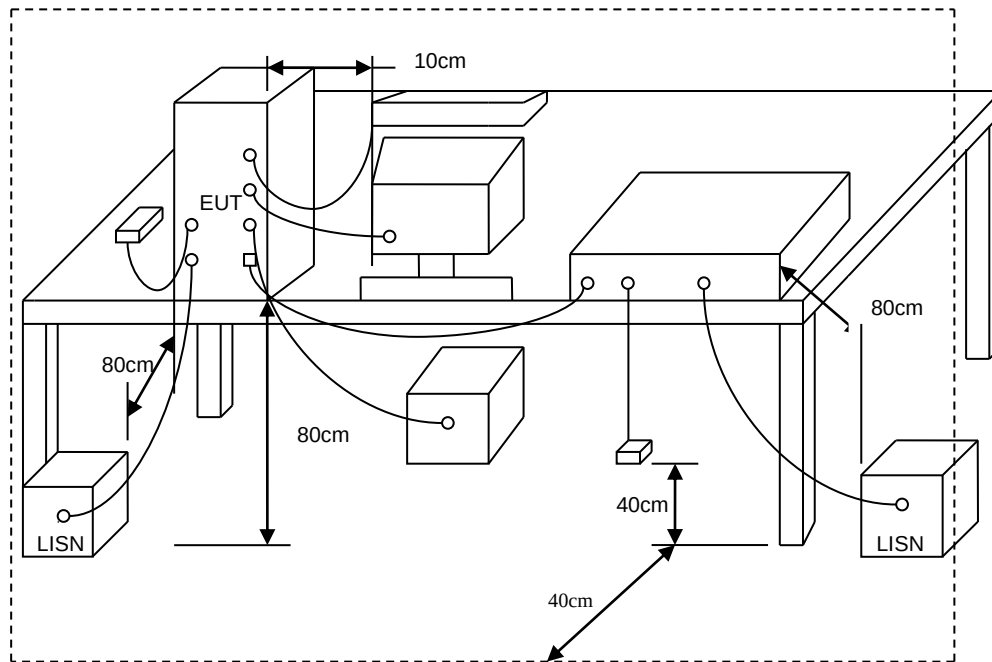
\*Decreases with the logarithm of the frequency.

### 5.2 Test Procedures

- The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- Connect EUT to the power mains through a line impedance stabilization network (LISN).
- All the support units are connecting to the other LISN.
- The LISN provides 50 ohm coupling impedance for the measuring instrument.
- The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- Both sides of AC line were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.



### 5.3 Typical Test Setup

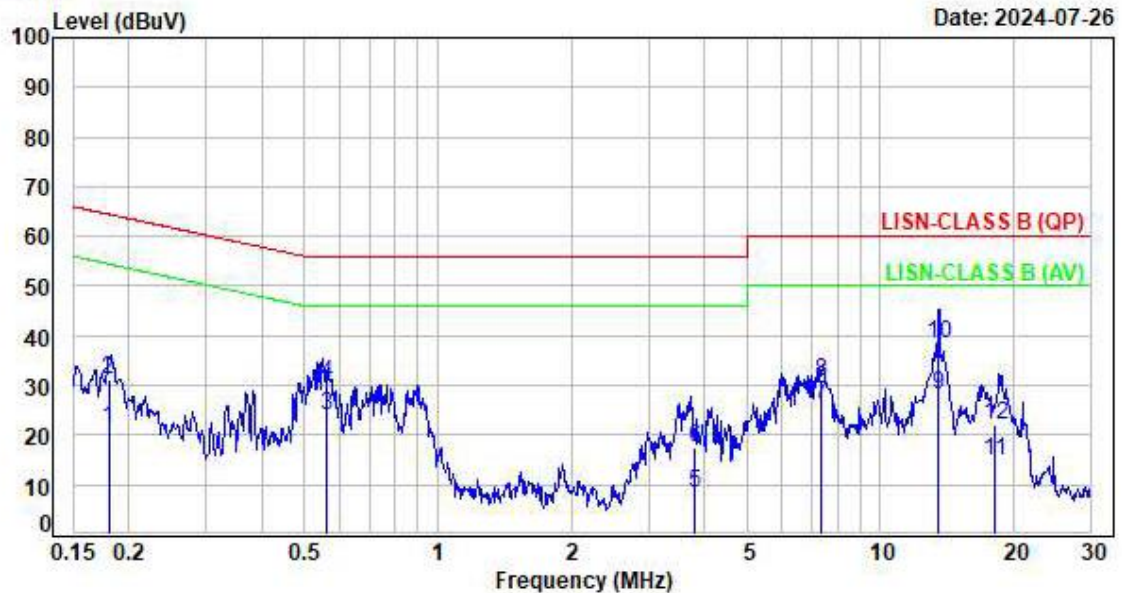




## 5.4 Test Result and Data

Test Mode : RFID 1TX 902.75MHz  
Voltage : From DC Power Supply(5.2V/2A)  
Phase : Line

Data: 3



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|-----|
| 1   | 0.1803          | 9.64        | 11.56          | 21.20        | 54.47        | -33.27      | Average  | P   |
| 2   | 0.1803          | 9.64        | 21.62          | 31.26        | 64.47        | -33.21      | QP       | P   |
| 3   | 0.5622          | 9.64        | 14.26          | 23.90        | 46.00        | -22.10      | Average  | P   |
| 4   | 0.5622          | 9.64        | 20.61          | 30.25        | 56.00        | -25.75      | QP       | P   |
| 5   | 3.7889          | 9.75        | -1.50          | 8.25         | 46.00        | -37.75      | Average  | P   |
| 6   | 3.7889          | 9.75        | 7.74           | 17.49        | 56.00        | -38.51      | QP       | P   |
| 7   | 7.3300          | 9.84        | 16.31          | 26.15        | 50.00        | -23.85      | Average  | P   |
| 8   | 7.3300          | 9.84        | 21.05          | 30.89        | 60.00        | -29.11      | QP       | P   |
| 9   | 13.5600         | 9.92        | 18.30          | 28.22        | 50.00        | -21.78      | Average  | P   |
| 10  | 13.5600         | 9.92        | 28.65          | 38.57        | 60.00        | -21.43      | QP       | P   |
| 11  | 18.1606         | 9.96        | 4.98           | 14.94        | 50.00        | -35.06      | Average  | P   |
| 12  | 18.1606         | 9.96        | 12.22          | 22.18        | 60.00        | -37.82      | QP       | P   |

Note: Level=Reading+Factor

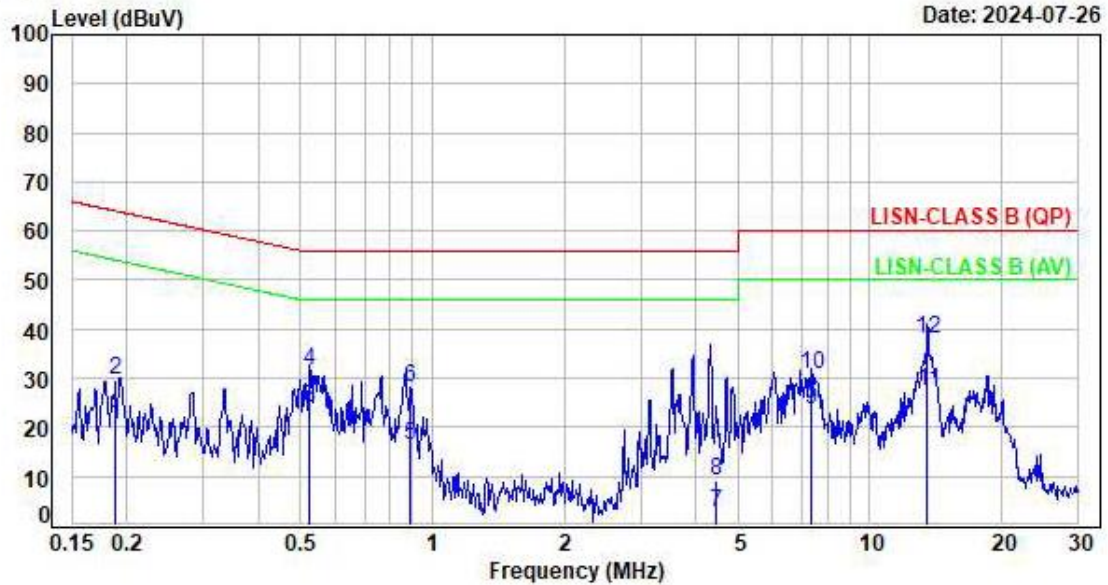
Margin=Level-Limit

Factor=(LISN or ISN or Current Probe)Factor + Cable Loss



Test Mode : RFID 1TX 902.75MHz  
Voltage : From DC Power Supply(5.2V/2A)  
Phase : Neutral

Data: 4



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|-----|
| 1   | 0.1891          | 9.57        | 11.01          | 20.58        | 54.08        | -33.50      | Average  | P   |
| 2   | 0.1891          | 9.57        | 20.21          | 29.78        | 64.08        | -34.30      | QP       | P   |
| 3   | 0.5249          | 9.57        | 14.52          | 24.09        | 46.00        | -21.91      | Average  | P   |
| 4   | 0.5249          | 9.57        | 22.15          | 31.72        | 56.00        | -24.28      | QP       | P   |
| 5   | 0.8909          | 9.60        | 6.82           | 16.42        | 46.00        | -29.58      | Average  | P   |
| 6   | 0.8909          | 9.60        | 18.43          | 28.03        | 56.00        | -27.97      | QP       | P   |
| 7   | 4.4397          | 9.75        | -7.18          | 2.57         | 46.00        | -43.43      | Average  | P   |
| 8   | 4.4397          | 9.75        | -0.79          | 8.96         | 56.00        | -47.04      | QP       | P   |
| 9   | 7.3251          | 9.81        | 13.85          | 23.66        | 50.00        | -26.34      | Average  | P   |
| 10  | 7.3251          | 9.81        | 21.11          | 30.92        | 60.00        | -29.08      | QP       | P   |
| 11  | 13.5574         | 9.92        | 17.28          | 27.20        | 50.00        | -22.80      | Average  | P   |
| 12  | 13.5574         | 9.92        | 28.07          | 37.99        | 60.00        | -22.01      | QP       | P   |

Note: Level=Reading+Factor

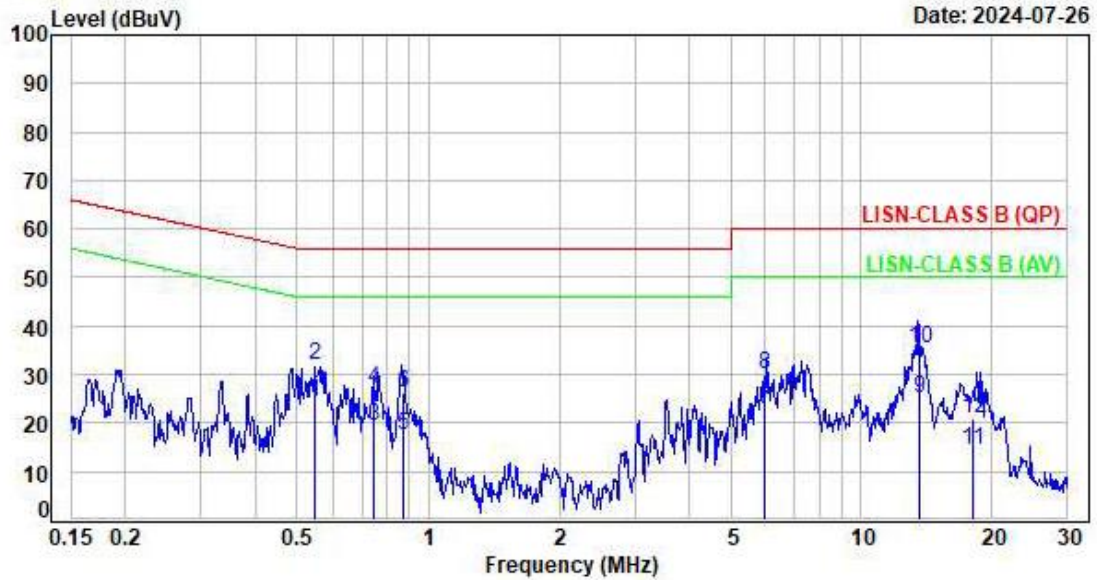
Margin=Level-Limit

Factor=(LISN or ISN or Current Probe)Factor + Cable Loss



Test Mode : RFID 1TX 914.75MHz  
Voltage : From DC Power Supply(5.2V/2A)  
Phase : Line

Data: 5



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|-----|
| 1   | 0.5496          | 9.64        | 14.69          | 24.33        | 46.00        | -21.67      | Average  | P   |
| 2   | 0.5496          | 9.64        | 22.13          | 31.77        | 56.00        | -24.23      | QP       | P   |
| 3   | 0.7427          | 9.64        | 9.91           | 19.55        | 46.00        | -26.45      | Average  | P   |
| 4   | 0.7427          | 9.64        | 17.39          | 27.03        | 56.00        | -28.97      | QP       | P   |
| 5   | 0.8714          | 9.64        | 7.99           | 17.63        | 46.00        | -28.37      | Average  | P   |
| 6   | 0.8714          | 9.64        | 16.75          | 26.39        | 56.00        | -29.61      | QP       | P   |
| 7   | 6.0059          | 9.82        | 12.91          | 22.73        | 50.00        | -27.27      | Average  | P   |
| 8   | 6.0059          | 9.82        | 20.30          | 30.12        | 60.00        | -29.88      | QP       | P   |
| 9   | 13.5979         | 9.92        | 15.19          | 25.11        | 50.00        | -24.89      | Average  | P   |
| 10  | 13.5979         | 9.92        | 25.47          | 35.39        | 60.00        | -24.61      | QP       | P   |
| 11  | 18.1484         | 9.96        | 4.36           | 14.32        | 50.00        | -35.68      | Average  | P   |
| 12  | 18.1484         | 9.96        | 10.87          | 20.83        | 60.00        | -39.17      | QP       | P   |

Note: Level=Reading+Factor

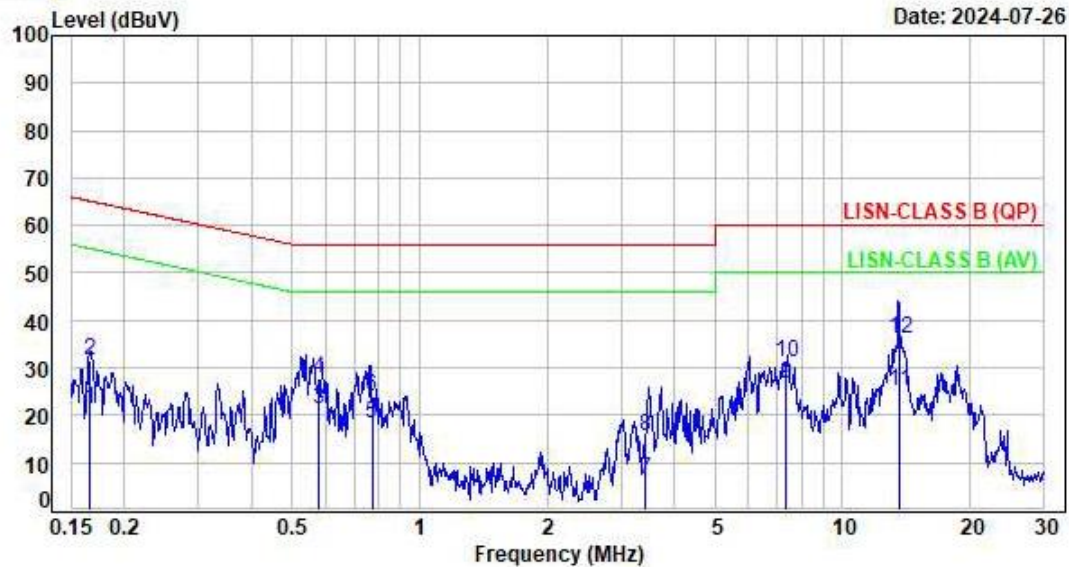
Margin=Level-Limit

Factor=(LISN or ISN or Current Probe)Factor + Cable Loss



Test Mode : RFID 1TX 914.75MHz  
Voltage : From DC Power Supply(5.2V/2A)  
Phase : Neutral

Data: 6



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|-----|
| 1   | 0.1659          | 9.56        | 11.62          | 21.18        | 55.16        | -33.98      | Average  | P   |
| 2   | 0.1659          | 9.56        | 22.14          | 31.70        | 65.16        | -33.46      | QP       | P   |
| 3   | 0.5773          | 9.57        | 11.56          | 21.13        | 46.00        | -24.87      | Average  | P   |
| 4   | 0.5773          | 9.57        | 18.17          | 27.74        | 56.00        | -28.26      | QP       | P   |
| 5   | 0.7713          | 9.58        | 8.66           | 18.24        | 46.00        | -27.76      | Average  | P   |
| 6   | 0.7713          | 9.58        | 14.29          | 23.87        | 56.00        | -32.13      | QP       | P   |
| 7   | 3.4318          | 9.71        | -3.07          | 6.64         | 46.00        | -39.36      | Average  | P   |
| 8   | 3.4318          | 9.71        | 6.06           | 15.77        | 56.00        | -40.23      | QP       | P   |
| 9   | 7.3294          | 9.81        | 16.66          | 26.47        | 50.00        | -23.53      | Average  | P   |
| 10  | 7.3294          | 9.81        | 21.50          | 31.31        | 60.00        | -28.69      | QP       | P   |
| 11  | 13.5979         | 9.92        | 15.12          | 25.04        | 50.00        | -24.96      | Average  | P   |
| 12  | 13.5979         | 9.92        | 26.35          | 36.27        | 60.00        | -23.73      | QP       | P   |

Note: Level=Reading+Factor

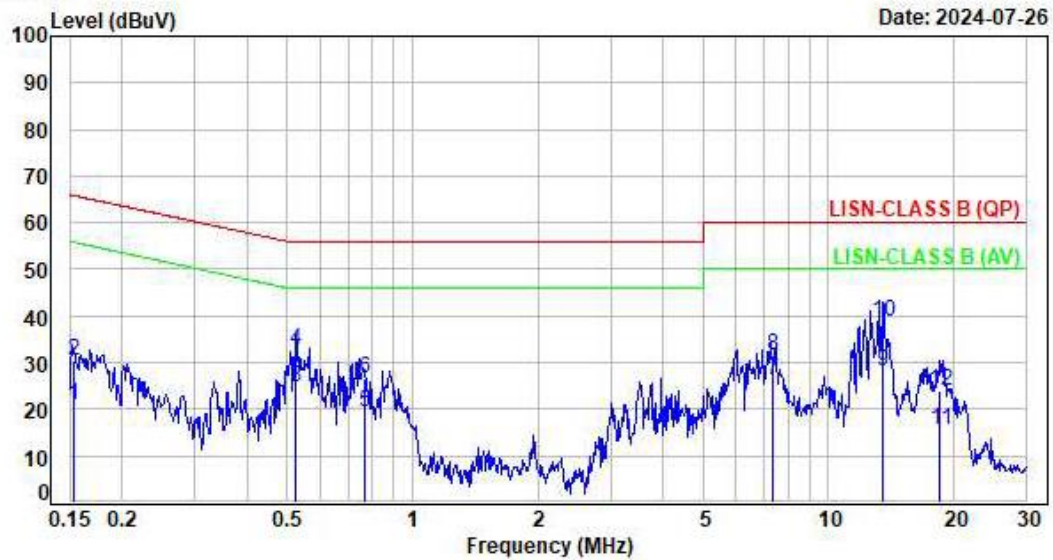
Margin=Level-Limit

Factor=(LISN or ISN or Current Probe)Factor + Cable Loss



Test Mode : RFID 1TX 927.25MHz  
Voltage : From DC Power Supply(5.2V/2A)  
Phase : Line

Data: 7



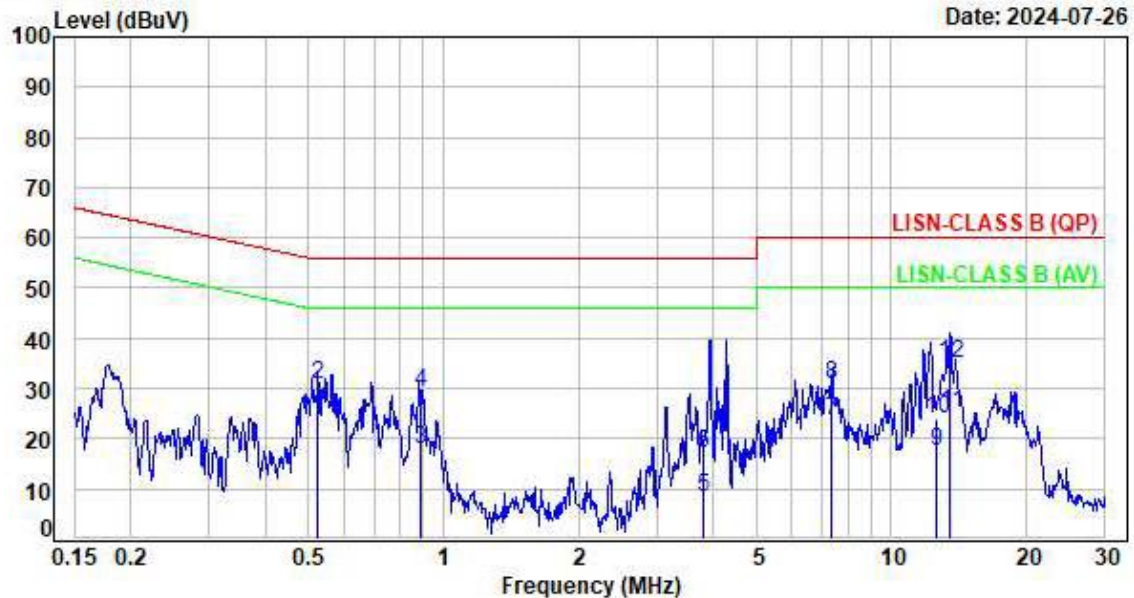
| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|-----|
| 1   | 0.1528          | 9.65        | 11.25          | 20.90        | 55.85        | -34.95      | Average  | P   |
| 2   | 0.1528          | 9.65        | 20.64          | 30.29        | 65.85        | -35.56      | QP       | P   |
| 3   | 0.5240          | 9.64        | 15.00          | 24.64        | 46.00        | -21.36      | Average  | P   |
| 4   | 0.5240          | 9.64        | 23.23          | 32.87        | 56.00        | -23.13      | QP       | P   |
| 5   | 0.7643          | 9.64        | 9.89           | 19.53        | 46.00        | -26.47      | Average  | P   |
| 6   | 0.7643          | 9.64        | 17.05          | 26.69        | 56.00        | -29.31      | QP       | P   |
| 7   | 7.3300          | 9.84        | 16.32          | 26.16        | 50.00        | -23.84      | Average  | P   |
| 8   | 7.3300          | 9.84        | 21.64          | 31.48        | 60.00        | -28.52      | QP       | P   |
| 9   | 13.5525         | 9.92        | 18.29          | 28.21        | 50.00        | -21.79      | Average  | P   |
| 10  | 13.5525         | 9.92        | 29.03          | 38.95        | 60.00        | -21.05      | QP       | P   |
| 11  | 18.5622         | 9.96        | 5.68           | 15.64        | 50.00        | -34.36      | Average  | P   |
| 12  | 18.5622         | 9.96        | 13.90          | 23.86        | 60.00        | -36.14      | QP       | P   |

Note: Level=Reading+Factor  
Margin=Level-Limit  
Factor=(LISN or ISN or Current Probe)Factor + Cable Loss



Test Mode : RFID 1TX 927.25MHz  
Voltage : From DC Power Supply(5.2V/2A)  
Phase : Neutral

Data: 8



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|-----|
| 1   | 0.5252          | 9.57        | 14.92          | 24.49        | 46.00        | -21.51      | Average  | P   |
| 2   | 0.5252          | 9.57        | 21.25          | 30.82        | 56.00        | -25.18      | QP       | P   |
| 3   | 0.8937          | 9.60        | 8.25           | 17.85        | 46.00        | -28.15      | Average  | P   |
| 4   | 0.8937          | 9.60        | 19.61          | 29.21        | 56.00        | -26.79      | QP       | P   |
| 5   | 3.8046          | 9.73        | -1.49          | 8.24         | 46.00        | -37.76      | Average  | P   |
| 6   | 3.8046          | 9.73        | 7.56           | 17.29        | 56.00        | -38.71      | QP       | P   |
| 7   | 7.3250          | 9.81        | 13.62          | 23.43        | 50.00        | -26.57      | Average  | P   |
| 8   | 7.3250          | 9.81        | 21.01          | 30.82        | 60.00        | -29.18      | QP       | P   |
| 9   | 12.6042         | 9.90        | 7.77           | 17.67        | 50.00        | -32.33      | Average  | P   |
| 10  | 12.6042         | 9.90        | 14.03          | 23.93        | 60.00        | -36.07      | QP       | P   |
| 11  | 13.5671         | 9.92        | 15.14          | 25.06        | 50.00        | -24.94      | Average  | P   |
| 12  | 13.5671         | 9.92        | 24.93          | 34.85        | 60.00        | -25.15      | QP       | P   |

Note: Level=Reading+Factor

Margin=Level-Limit

Factor=(LISN or ISN or Current Probe)Factor + Cable Loss



## 6. Test of Radiated Spurious Emission

### 6.1 Test Limit

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter measurement is based on the maximum conducted output power, the attenuation required under this paragraph shall be 30dB instead of 20dB. In addition, radiated emissions which fall in section 15.205(a) the restricted bands must also comply with the radiated emission limit specified in section 15.209(a).

| Frequency (MHz) | Field Strength (microvolt/meter) | Measurement Distance (meters) |
|-----------------|----------------------------------|-------------------------------|
| 0.009 ~ 0.490   | 2400/F(kHz)                      | 300                           |
| 0.490 ~ 1.705   | 24000/F(kHz)                     | 30                            |
| 1.705 ~ 30.0    | 30                               | 30                            |
| 30 ~ 88         | 100                              | 3                             |
| 88 ~ 216        | 150                              | 3                             |
| 216 ~ 960       | 200                              | 3                             |
| Above 960       | 500                              | 3                             |

### 6.2 Test Procedures

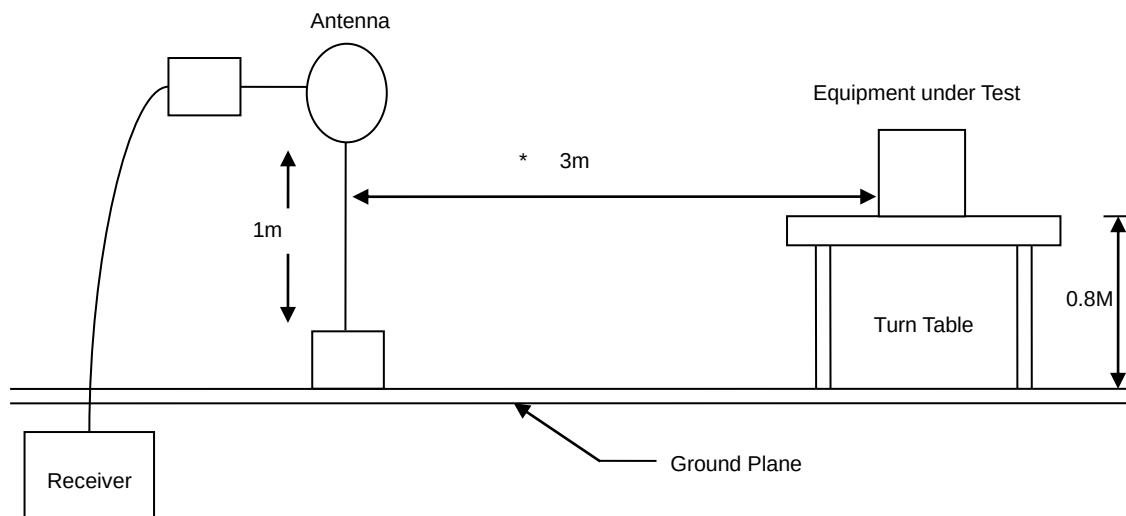
- The EUT was placed on a rotatable table top 0.8 meter above ground.
- The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- The table was rotated 360 degrees to determine the position of the highest radiation.
- The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
- For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Note: The supporting fixture shall permit orientation of the EUT in each of three orthogonal axis positions such that emissions from the EUT are maximized.

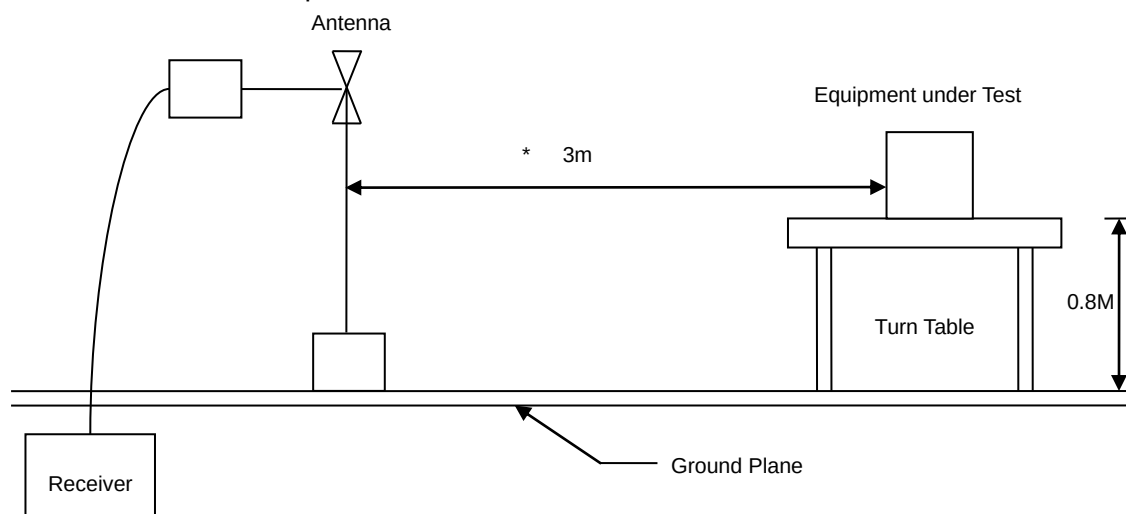


### 6.3 Typical Test Setup

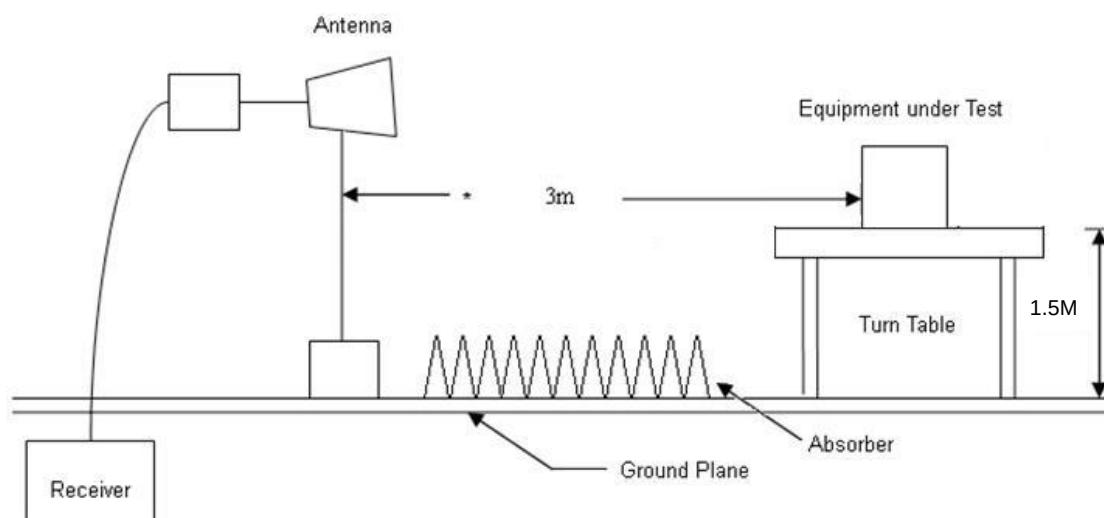
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup



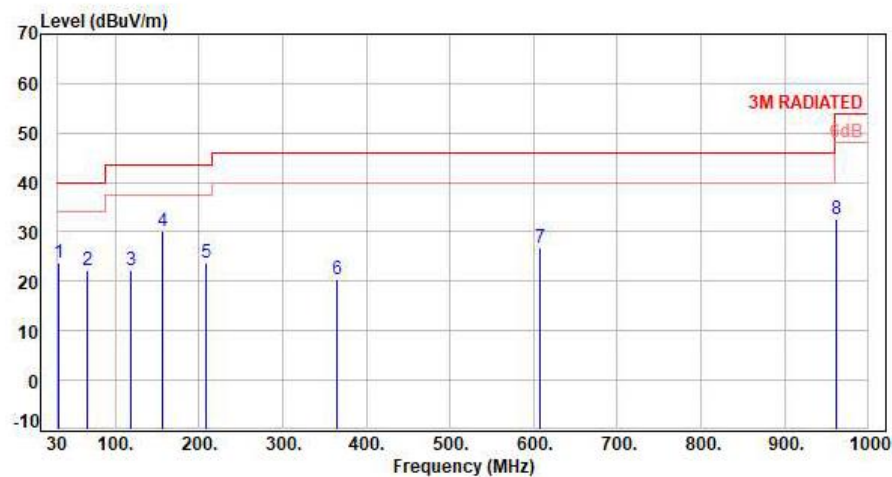


## 6.4 Test Result and Data (9kHz ~ 30MHz)

The 9kHz-30MHz spurious emission is under limit 20dB more.

## 6.5 Test Result and Data (30MHz ~ 1GHz)

Test Mode : RFID 1TX 902.75MHz  
Voltage : AC110V/60Hz From PowerSupply DC(5.2v/2A)  
Pol : Vertical



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|-------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 31.94           | -10.04      | 33.93          | 23.89          | 40.00          | -16.11      | Peak     | 400         | 360           | P   |
| 2   | 66.86           | -10.99      | 33.19          | 22.20          | 40.00          | -17.80      | Peak     | 400         | 360           | P   |
| 3   | 119.24          | -12.25      | 34.60          | 22.35          | 43.50          | -21.15      | Peak     | 400         | 360           | P   |
| 4   | 156.10          | -9.44       | 39.66          | 30.22          | 43.50          | -13.28      | Peak     | 400         | 360           | P   |
| 5   | 208.48          | -12.26      | 36.02          | 23.76          | 43.50          | -19.74      | Peak     | 400         | 360           | P   |
| 6   | 365.62          | -6.68       | 27.22          | 20.54          | 46.00          | -25.46      | Peak     | 400         | 360           | P   |
| 7   | 608.12          | -0.67       | 27.42          | 26.75          | 46.00          | -19.25      | Peak     | 400         | 360           | P   |
| 8   | 961.20          | 4.70        | 27.80          | 32.50          | 54.00          | -21.50      | Peak     | 400         | 360           | P   |

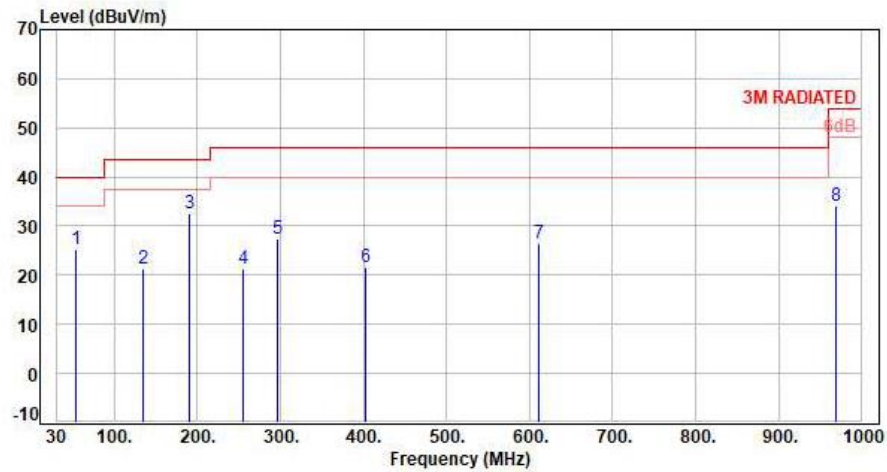
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Test Mode : RFID 1TX 902.75MHz  
Voltage : AC110V/60Hz From PowerSupply DC(5.2v/2A)  
Pol : Horizontal



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|-------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 53.28           | -9.05       | 34.29          | 25.24          | 40.00          | -14.76      | Peak     | 400         | 360           | P   |
| 2   | 134.76          | -10.61      | 31.87          | 21.26          | 43.50          | -22.24      | Peak     | 400         | 360           | P   |
| 3   | 191.02          | -11.60      | 44.18          | 32.58          | 43.50          | -10.92      | Peak     | 400         | 360           | P   |
| 4   | 255.04          | -9.94       | 31.37          | 21.43          | 46.00          | -24.57      | Peak     | 400         | 360           | P   |
| 5   | 295.78          | -8.63       | 36.15          | 27.52          | 46.00          | -18.48      | Peak     | 400         | 360           | P   |
| 6   | 402.48          | -5.59       | 27.20          | 21.61          | 46.00          | -24.39      | Peak     | 400         | 360           | P   |
| 7   | 612.00          | -0.60       | 27.13          | 26.53          | 46.00          | -19.47      | Peak     | 400         | 360           | P   |
| 8   | 968.96          | 4.69        | 29.47          | 34.16          | 54.00          | -19.84      | Peak     | 400         | 360           | P   |

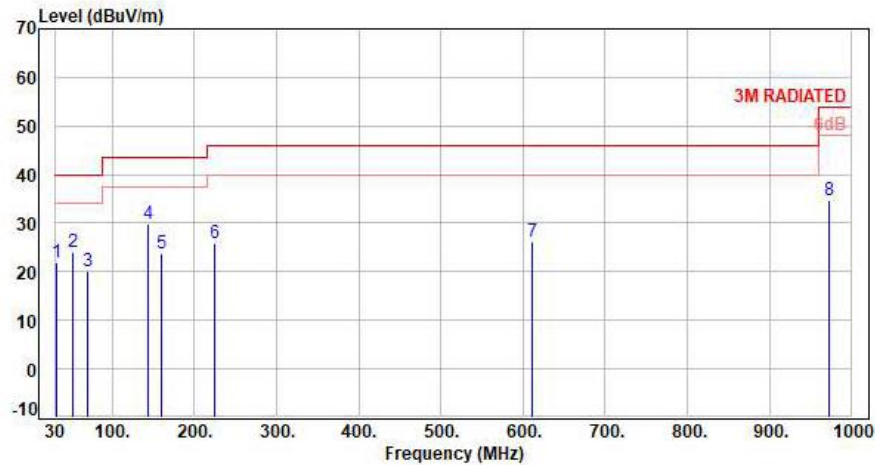
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Test Mode : RFID 1TX 914.75MHz  
Voltage : AC110V/60Hz From PowerSupply DC(5.2v/2A)  
Pol : Horizontal



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|-------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 31.94           | -10.04      | 31.85          | 21.81          | 40.00          | -18.19      | Peak     | 400         | 360           | P   |
| 2   | 51.34           | -9.08       | 33.23          | 24.15          | 40.00          | -15.85      | Peak     | 400         | 360           | P   |
| 3   | 70.74           | -12.04      | 32.23          | 20.19          | 40.00          | -19.81      | Peak     | 400         | 360           | P   |
| 4   | 144.46          | -9.73       | 39.65          | 29.92          | 43.50          | -13.58      | Peak     | 400         | 360           | P   |
| 5   | 159.98          | -9.39       | 33.23          | 23.84          | 43.50          | -19.66      | Peak     | 400         | 360           | P   |
| 6   | 224.00          | -11.87      | 37.71          | 25.84          | 46.00          | -20.16      | Peak     | 400         | 360           | P   |
| 7   | 612.00          | -0.60       | 26.90          | 26.30          | 46.00          | -19.70      | Peak     | 400         | 360           | P   |
| 8   | 972.84          | 4.82        | 30.04          | 34.86          | 54.00          | -19.14      | Peak     | 400         | 360           | P   |

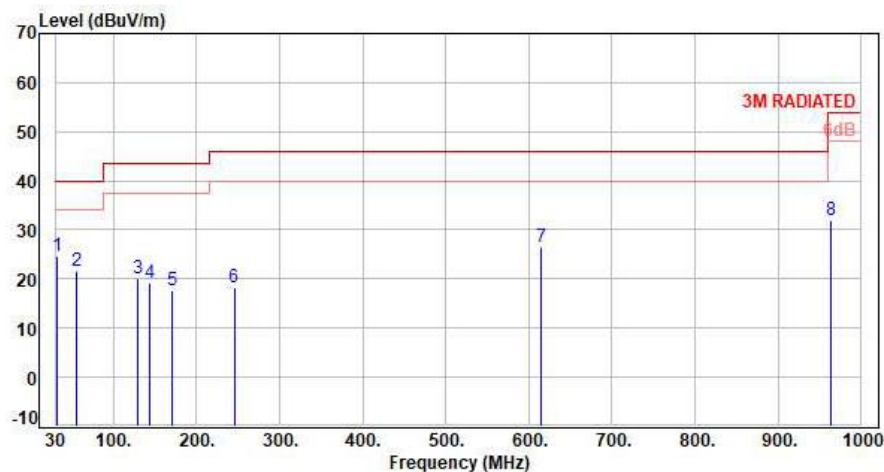
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Test Mode : RFID 1TX 914.75MHz  
Voltage : AC110V/60Hz From PowerSupply DC(5.2v/2A)  
Pol : Vertical



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|-------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 31.94           | -10.04      | 34.66          | 24.62          | 40.00          | -15.38      | Peak     | 400         | 360           | P   |
| 2   | 55.22           | -9.22       | 30.74          | 21.52          | 40.00          | -18.48      | Peak     | 400         | 360           | P   |
| 3   | 128.94          | -11.37      | 31.47          | 20.10          | 43.50          | -23.40      | Peak     | 400         | 360           | P   |
| 4   | 144.46          | -9.73       | 28.94          | 19.21          | 43.50          | -24.29      | Peak     | 400         | 360           | P   |
| 5   | 170.65          | -9.74       | 27.50          | 17.76          | 43.50          | -25.74      | Peak     | 400         | 360           | P   |
| 6   | 245.34          | -10.28      | 28.72          | 18.44          | 46.00          | -27.56      | Peak     | 400         | 360           | P   |
| 7   | 614.00          | -0.60       | 27.09          | 26.49          | 46.00          | -19.51      | Peak     | 400         | 360           | P   |
| 8   | 963.14          | 4.65        | 27.37          | 32.02          | 54.00          | -21.98      | Peak     | 400         | 360           | P   |

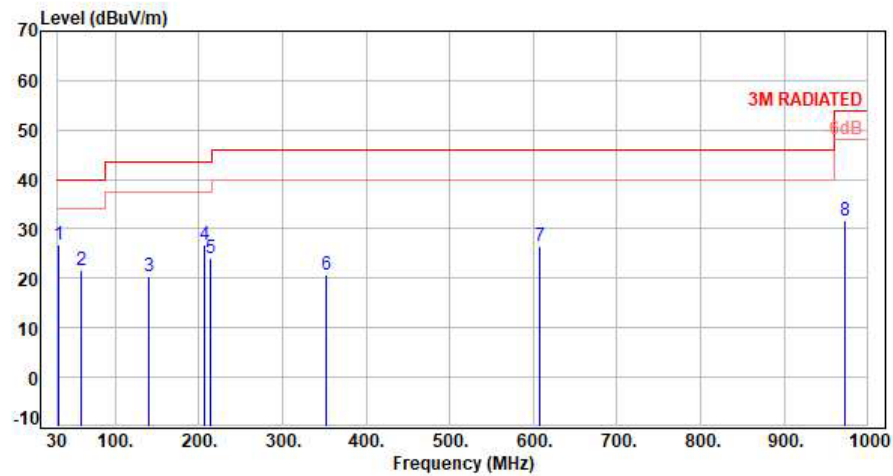
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Test Mode : RFID 1TX 927.25MHz  
Voltage : AC110V/60Hz From PowerSupply DC(5.2v/2A)  
Pol : Vertical



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|-------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 31.94           | -10.04      | 36.72          | 26.68          | 40.00          | -13.32      | Peak     | 400         | 360           | P   |
| 2   | 59.10           | -9.44       | 31.06          | 21.62          | 40.00          | -18.38      | Peak     | 400         | 360           | P   |
| 3   | 140.58          | -10.08      | 30.38          | 20.30          | 43.50          | -23.20      | Peak     | 400         | 360           | P   |
| 4   | 206.54          | -12.27      | 39.05          | 26.78          | 43.50          | -16.72      | Peak     | 400         | 360           | P   |
| 5   | 214.30          | -12.01      | 36.23          | 24.22          | 43.50          | -19.28      | Peak     | 400         | 360           | P   |
| 6   | 352.04          | -7.23       | 27.91          | 20.68          | 46.00          | -25.32      | Peak     | 400         | 360           | P   |
| 7   | 608.00          | -0.67       | 27.29          | 26.62          | 46.00          | -19.38      | Peak     | 400         | 360           | P   |
| 8   | 972.84          | 4.82        | 26.96          | 31.78          | 54.00          | -22.22      | Peak     | 400         | 360           | P   |

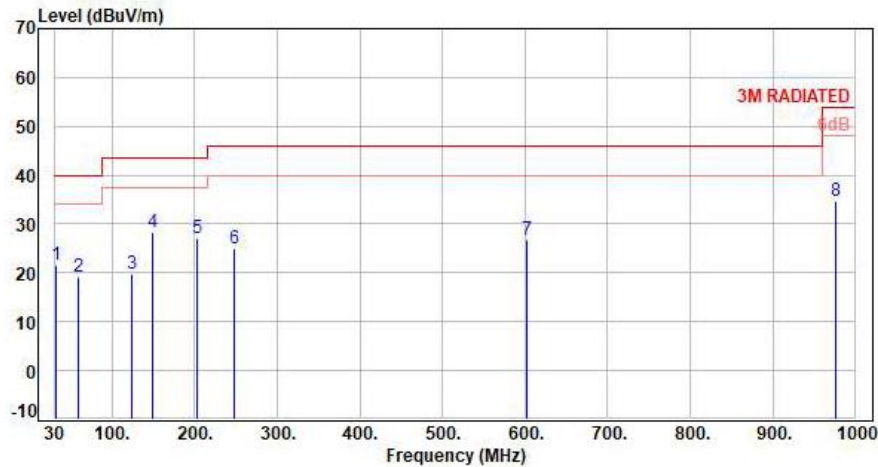
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Test Mode : RFID 1TX 927.25MHz  
Voltage : AC110V/60Hz From PowerSupply DC(5.2v/2A)  
Pol : Horizontal



Note: Level=Reading+Factor

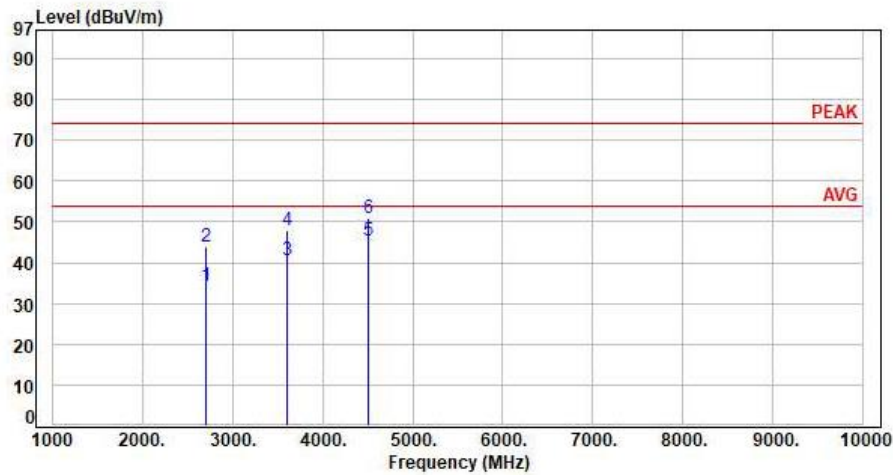
Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



## 6.6 Test Result and Data (1GHz ~ 25GHz)

Test Mode : RFID 1TX 902.75MHz  
Voltage : AC110V/60Hz From PowerSupply DC(5.2v/2A)  
Pol : Vertical



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|-------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 2708.25         | -0.99       | 35.45          | 34.46          | 54.00          | -19.54      | Average  | 153         | 6             | P   |
| 2   | 2708.25         | -0.99       | 45.01          | 44.02          | 74.00          | -29.98      | Peak     | 153         | 6             | P   |
| 3   | 3611.00         | 2.80        | 37.67          | 40.47          | 54.00          | -13.53      | Average  | 100         | 204           | P   |
| 4   | 3611.00         | 2.80        | 45.02          | 47.82          | 74.00          | -26.18      | Peak     | 100         | 204           | P   |
| 5   | 4513.75         | 5.11        | 40.34          | 45.45          | 54.00          | -8.55       | Average  | 100         | 73            | P   |
| 6   | 4513.75         | 5.11        | 45.66          | 50.77          | 74.00          | -23.23      | Peak     | 100         | 73            | P   |

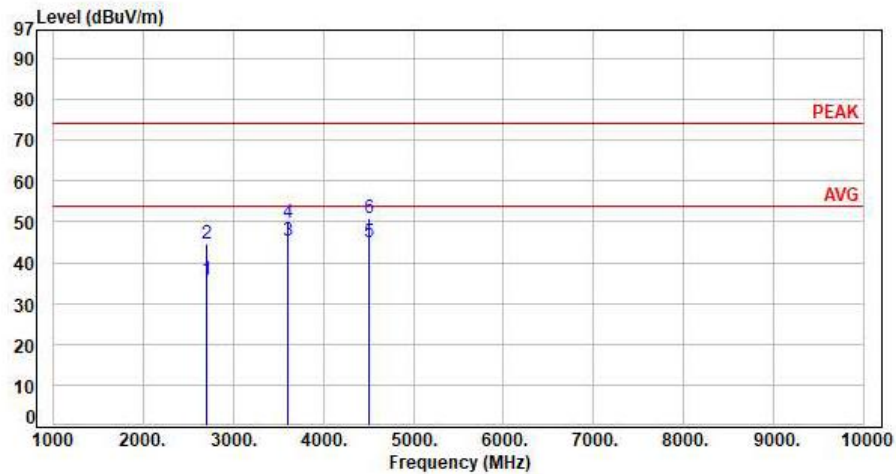
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Test Mode : RFID 1TX 902.75MHz  
Voltage : AC110V/60Hz From PowerSupply DC(5.2v/2A)  
Pol : Horizontal



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|-------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 2708.25         | -0.99       | 36.84          | 35.85          | 54.00          | -18.15      | Average  | 220         | 7             | P   |
| 2   | 2708.25         | -0.99       | 45.62          | 44.63          | 74.00          | -29.37      | Peak     | 220         | 7             | P   |
| 3   | 3611.00         | 2.80        | 42.68          | 45.48          | 54.00          | -8.52       | Average  | 400         | 328           | P   |
| 4   | 3611.00         | 2.80        | 46.98          | 49.78          | 74.00          | -24.22      | Peak     | 400         | 328           | P   |
| 5   | 4513.75         | 5.11        | 39.71          | 44.82          | 54.00          | -9.18       | Average  | 100         | 29            | P   |
| 6   | 4513.75         | 5.11        | 45.91          | 51.02          | 74.00          | -22.98      | Peak     | 100         | 29            | P   |

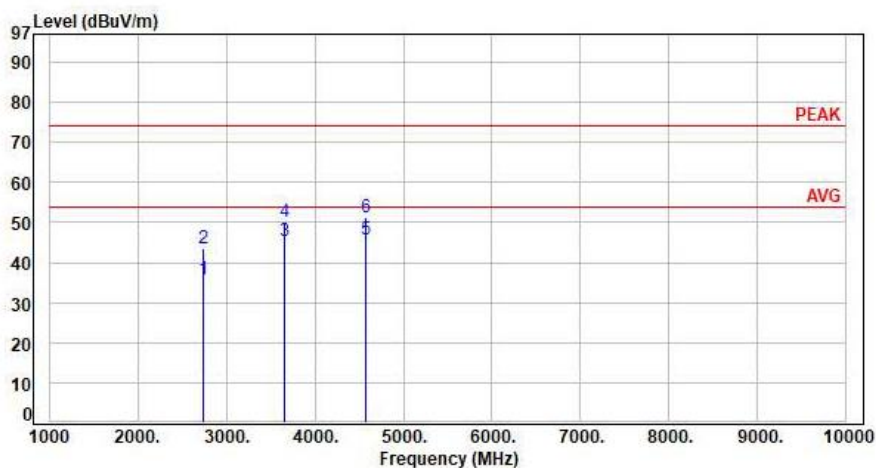
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Test Mode : RFID 1TX 914.75MHz  
Voltage : AC110V/60Hz From PowerSupply DC(5.2v/2A)  
Pol : Vertical



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|-------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 2744.25         | -0.95       | 36.85          | 35.90          | 54.00          | -18.10      | Average  | 100         | 360           | P   |
| 2   | 2744.25         | -0.95       | 44.62          | 43.67          | 74.00          | -30.33      | Peak     | 100         | 360           | P   |
| 3   | 3659.00         | 3.13        | 42.23          | 45.36          | 54.00          | -8.64       | Average  | 351         | 332           | P   |
| 4   | 3659.00         | 3.13        | 46.90          | 50.03          | 74.00          | -23.97      | Peak     | 351         | 332           | P   |
| 5   | 4573.75         | 5.24        | 40.67          | 45.91          | 54.00          | -8.09       | Average  | 100         | 72            | P   |
| 6   | 4573.75         | 5.24        | 45.96          | 51.20          | 74.00          | -22.80      | Peak     | 100         | 72            | P   |

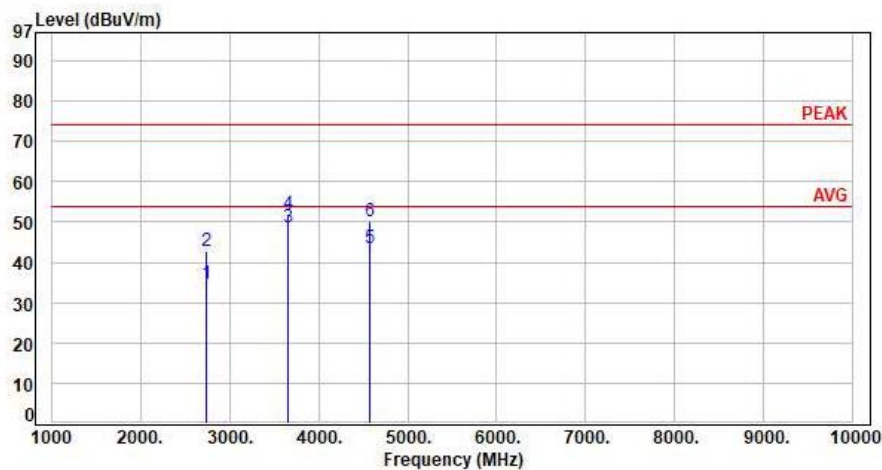
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Test Mode : RFID 1TX 914.75MHz  
Voltage : AC110V/60Hz From PowerSupply DC(5.2v/2A)  
Pol : Horizontal



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|-------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 2744.25         | -0.95       | 35.66          | 34.71          | 54.00          | -19.29      | Average  | 100         | 180           | P   |
| 2   | 2744.25         | -0.95       | 43.61          | 42.66          | 74.00          | -31.34      | Peak     | 100         | 180           | P   |
| 3   | 3659.00         | 3.13        | 45.62          | 48.75          | 54.00          | -5.25       | Average  | 243         | 33            | P   |
| 4   | 3659.00         | 3.13        | 48.91          | 52.04          | 74.00          | -21.96      | Peak     | 243         | 33            | P   |
| 5   | 4573.75         | 5.24        | 38.39          | 43.63          | 54.00          | -10.37      | Average  | 100         | 303           | P   |
| 6   | 4573.75         | 5.24        | 44.76          | 50.00          | 74.00          | -24.00      | Peak     | 100         | 303           | P   |

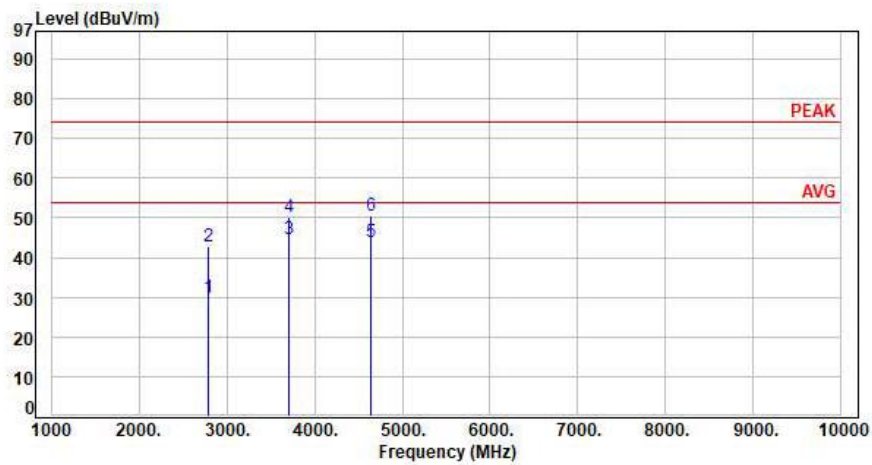
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Test Mode : RFID 1TX 927.25MHz  
Voltage : AC110V/60Hz From PowerSupply DC(5.2v/2A)  
Pol : Vertical



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|-------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 2781.75         | -0.80       | 30.83          | 30.03          | 54.00          | -23.97      | Average  | 100         | 360           | P   |
| 2   | 2781.75         | -0.80       | 43.64          | 42.84          | 74.00          | -31.16      | Peak     | 100         | 360           | P   |
| 3   | 3709.00         | 3.68        | 40.83          | 44.51          | 54.00          | -9.49       | Average  | 100         | 335           | P   |
| 4   | 3709.00         | 3.68        | 46.51          | 50.19          | 74.00          | -23.81      | Peak     | 100         | 335           | P   |
| 5   | 4636.25         | 5.44        | 38.34          | 43.78          | 54.00          | -10.22      | Average  | 100         | 69            | P   |
| 6   | 4636.25         | 5.44        | 45.04          | 50.48          | 74.00          | -23.52      | Peak     | 100         | 69            | P   |

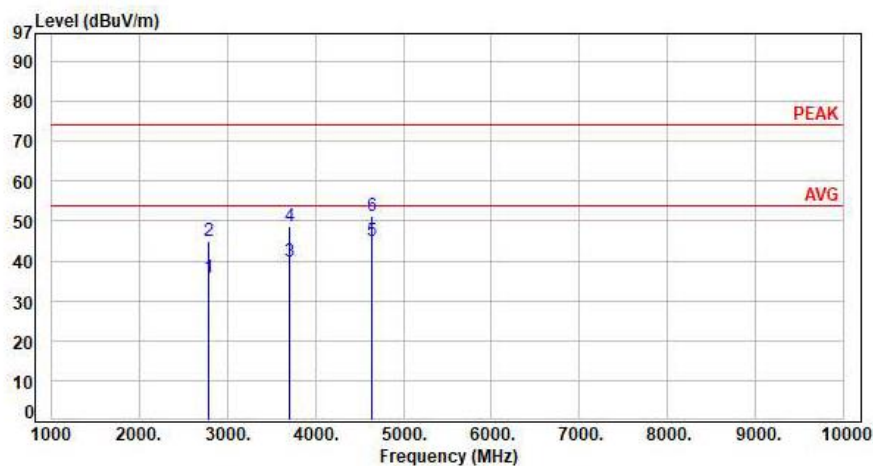
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Test Mode : RFID 1TX 927.25MHz  
Voltage : AC110V/60Hz From PowerSupply DC(5.2v/2A)  
Pol : Horizontal



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg) | P/F |
|-----|-----------------|-------------|----------------|----------------|----------------|-------------|----------|-------------|---------------|-----|
| 1   | 2781.75         | -0.80       | 36.42          | 35.62          | 54.00          | -18.38      | Average  | 100         | 3             | P   |
| 2   | 2781.75         | -0.80       | 45.73          | 44.93          | 74.00          | -29.07      | Peak     | 100         | 3             | P   |
| 3   | 3709.00         | 3.68        | 36.29          | 39.97          | 54.00          | -14.03      | Average  | 100         | 360           | P   |
| 4   | 3709.00         | 3.68        | 45.03          | 48.71          | 74.00          | -25.29      | Peak     | 100         | 360           | P   |
| 5   | 4636.25         | 5.44        | 39.61          | 45.05          | 54.00          | -8.95       | Average  | 387         | 58            | P   |
| 6   | 4636.25         | 5.44        | 45.80          | 51.24          | 74.00          | -22.76      | Peak     | 387         | 58            | P   |

Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



## 6.7 Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below:

| MHz                 | MHz                   | MHz             | GHz             |
|---------------------|-----------------------|-----------------|-----------------|
| 0.09000 – 0.11000   | 16.42000 – 16.42300   | 399.9 – 410.0   | 4.500 – 5.250   |
| 0.49500 – 0.505**   | 16.69475 – 16.69525   | 608.0 – 614.0   | 5.350 – 5.460   |
| 2.17350 – 2.19050   | 16.80425 – 16.80475   | 960.0 – 1240.0  | 7.250 – 7.750   |
| 4.12500 – 4.12800   | 25.50000 – 25.67000   | 1300.0 – 1427.0 | 8.025 – 8.500   |
| 4.17725 – 4.17775   | 37.50000 – 38.25000   | 1435.0 – 1626.5 | 9.000 – 9.200   |
| 4.20725 – 4.20775   | 73.00000 – 74.60000   | 1645.5 – 1646.5 | 9.300 – 9.500   |
| 6.21500 – 6.21800   | 74.80000 – 75.20000   | 1660.0 – 1710.0 | 10.600 – 12.700 |
| 6.26775 – 6.26825   | 108.00000 – 121.94000 | 1718.8 – 1722.2 | 13.250 – 13.400 |
| 6.31175 – 6.31225   | 123.00000 – 138.00000 | 2200.0 – 2300.0 | 14.470 – 14.500 |
| 8.29100 – 8.29400   | 149.90000 – 150.05000 | 2310.0 – 2390.0 | 15.350 – 16.200 |
| 8.36200 – 8.36600   | 156.52475 – 156.52525 | 2483.5 – 2500.0 | 17.700 – 21.400 |
| 8.37625 – 8.38675   | 156.70000 – 156.90000 | 2655.0 – 2900.0 | 22.010 – 23.120 |
| 8.41425 – 8.41475   | 162.01250 – 167.17000 | 3260.0 – 3267.0 | 23.600 – 24.000 |
| 12.29000 – 12.29300 | 167.72000 – 173.20000 | 3332.0 – 3339.0 | 31.200 – 31.800 |
| 12.51975 – 12.52025 | 240.00000 – 285.00000 | 3345.8 – 3358.0 | 36.430 – 36.500 |
| 12.57675 – 12.57725 | 322.00000 – 335.40000 | 3600.0 – 4400.0 | Above 38.6      |
| 13.36000 – 13.41000 |                       |                 |                 |

\*\* : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz



## 7. Test of Conducted Spurious Emission

### 7.1 Test Limit

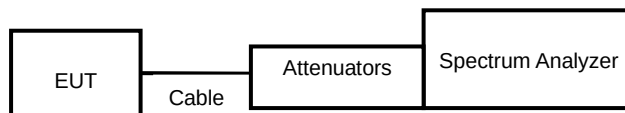
According to the methods defined in ANSI C63.10-2013 Section 11.11.1  
Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

### 7.2 Test Procedure

According to the methods defined in ANSI C63.10-2013 Section 11.11.2 & 11.11.3

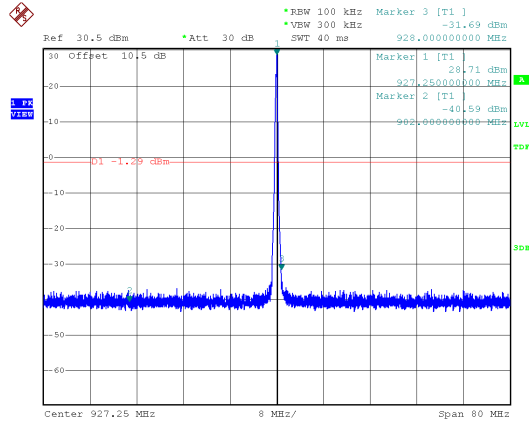
- The transmitter output was connected to the spectrum analyzer via a low loss cable.
- Set both RBW and VBW of spectrum analyzer to 100 KHz with convenient frequency span including 100 KHz bandwidth from band edge.
- The band edges was measured and recorded.

### 7.3 Test Setup Layout

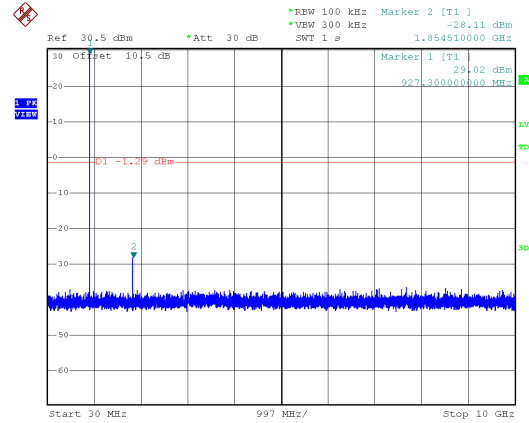


### 7.4 Test Result and Data

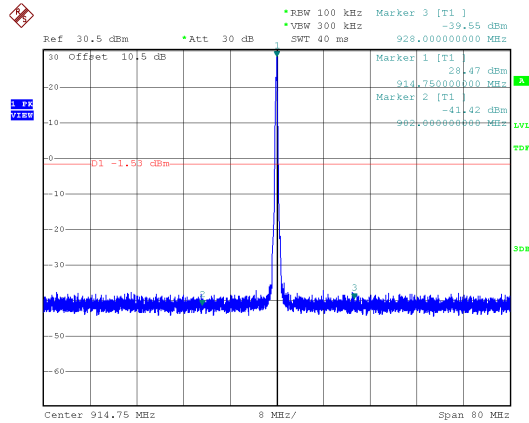
Note: Test plots refer to the following pages.

Modulation Type: ASK  
CH01-1

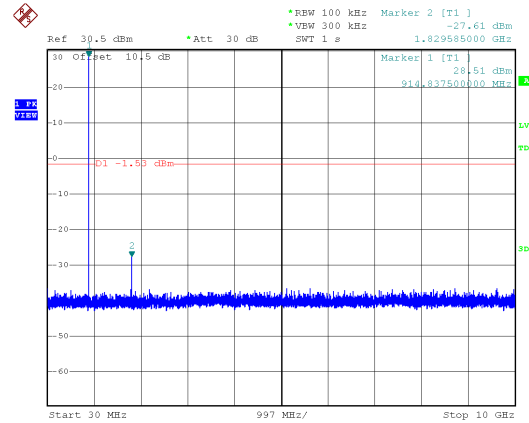
## CH01-2



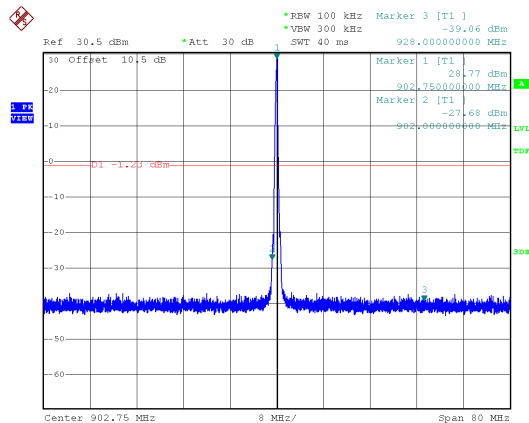
## CH25-1



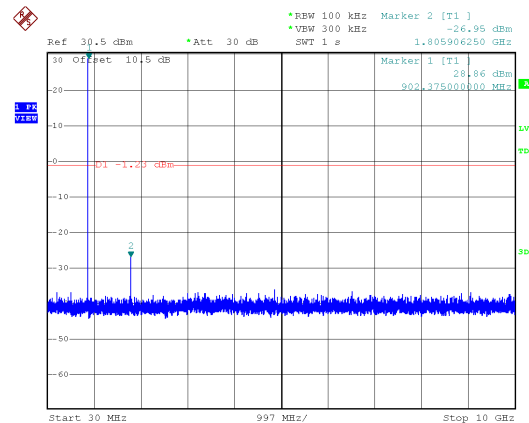
## CH25-2



## CH50-1

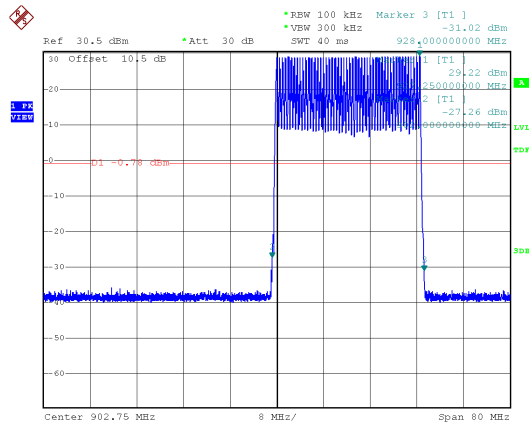


## CH50-2

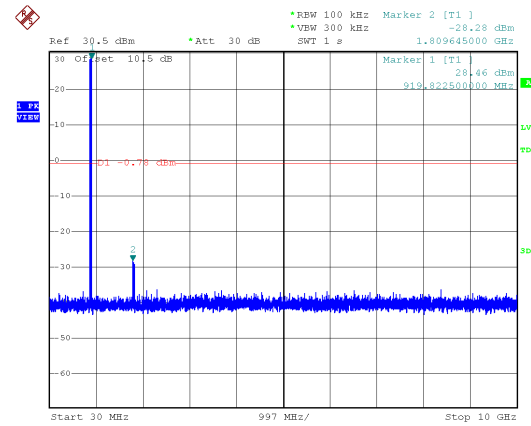




Modulation Type: ASK  
Hopping-1



Hopping-2





## 8. On Time, Duty Cycle and Measurement methods

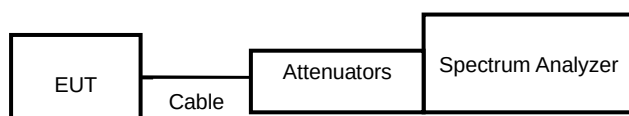
### 8.1 Test Limit

None; for reporting purposes only.

### 8.2 Test Procedure

According to the methods defined in ANSI C63.10-2013 Section 11.6  
Zero-Span Spectrum Analyzer Method.

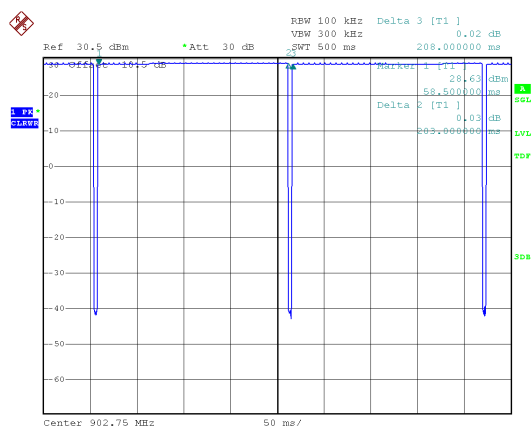
### 8.3 Test Setup Layout



### 8.4 Test Result and Data

| Modulation Mode | On Time (ms) | Period Time (ms) | Duty Cycle (%) |
|-----------------|--------------|------------------|----------------|
| GFSK            | 203.00       | 208.00           | 97.60%         |

Modulation Type: ASK





## 9. 20dB Bandwidth Measurement Data

### 9.1 Test Limit

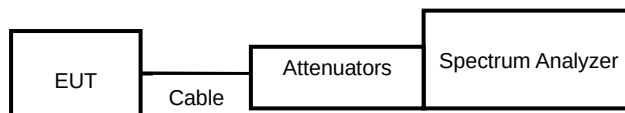
The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz..

### 9.2 Test Procedures

According to the methods defined in ANSI C63.10-2013 Section 6.9

- The transmitter output was connected to the spectrum analyzer.
- Set RBW of spectrum analyzer to 10 KHz and VBW to 30 KHz.
- The 20 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20 dB.

### 9.3 Test Setup Layout

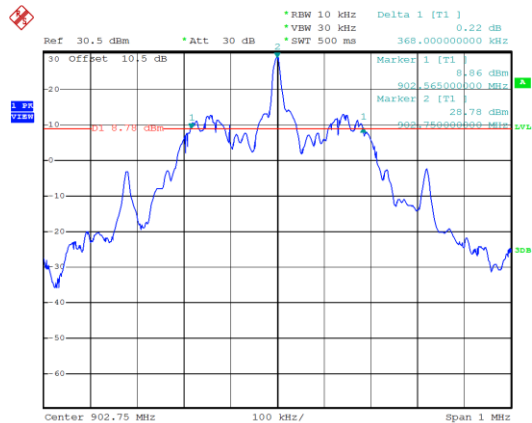


### 9.4 Test Result and Data

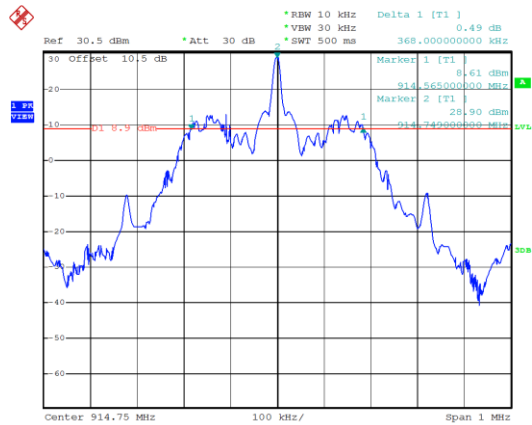
| Modulation Type | Channel | Channel Frequency (MHz) | 20dB Bandwidth (MHz) | Limit (MHz) |
|-----------------|---------|-------------------------|----------------------|-------------|
| ASK             | 1       | 902.75                  | 0.368                | 0.500       |
|                 | 25      | 914.75                  | 0.368                | 0.500       |
|                 | 50      | 927.25                  | 0.370                | 0.500       |



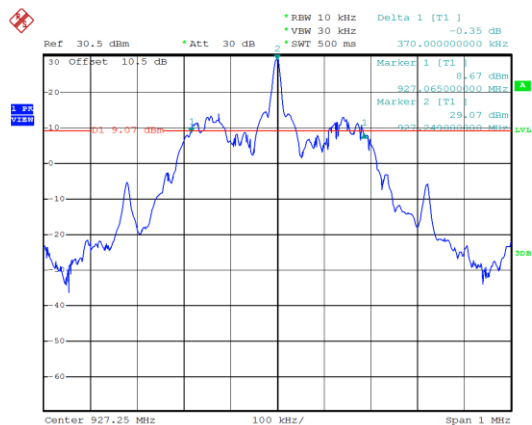
Modulation Type: ASK  
CH01



CH25



CH50





## 10. Frequencies Separation

### 10.1 Test Limit

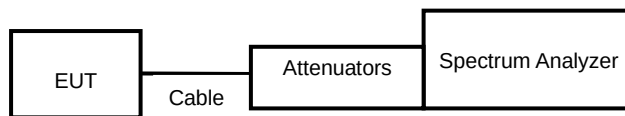
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

### 10.2 Test Procedures

According to the methods defined in ANSI C63.10-2013 Section 7.8.2

- The transmitter output was connected to the spectrum analyzer.
- Set RBW of spectrum analyzer to 30 KHz and VBW to 100 KHz.
- By using the MaxHold function record the separation of two adjacent channels.
- Measure the frequency difference of these two adjacent channels.

### 10.3 Test Setup Layout

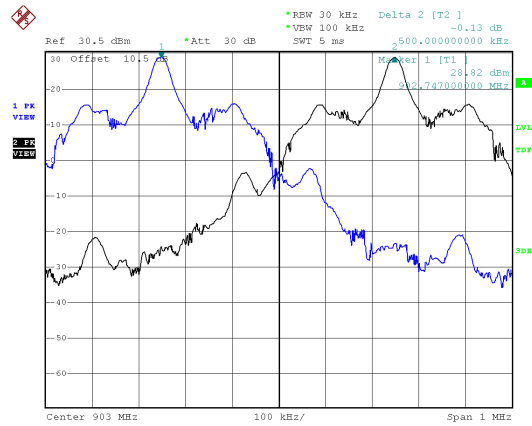


### 10.4 Test Result and Data

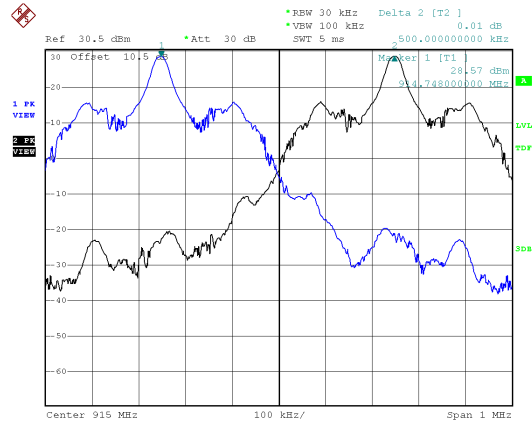
| Modulation Type | Channel | Channel Frequency (MHz) | Channel Separation (MHz) | Limit (MHz) |
|-----------------|---------|-------------------------|--------------------------|-------------|
| ASK             | 1       | 902.75                  | 0.50                     | 0.368       |
|                 | 25      | 914.75                  | 0.50                     | 0.368       |
|                 | 50      | 927.25                  | 0.50                     | 0.37        |



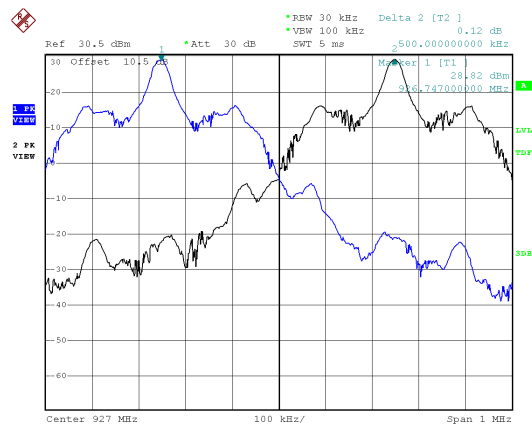
Modulation Type: ASK  
CH01



CH25



CH50





## 11. Dwell Time on each channel

### 11.1 Test Limit

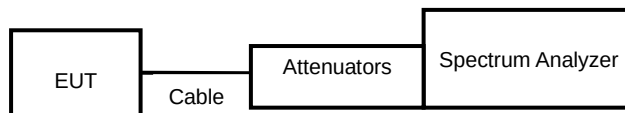
The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

### 11.2 Test Procedures

According to the methods defined in ANSI C63.10-2013 Section 7.8.4

1. The transmitter output was connected to the spectrum analyzer.
2. Adjust the center frequency to measure frequency, then set zero span mode.
2. Set RBW of spectrum analyzer to 1 MHz and VBW to 3 MHz.
4. Measure the time duration of one transmission on the measured frequency.

### 11.3 Test Setup Layout

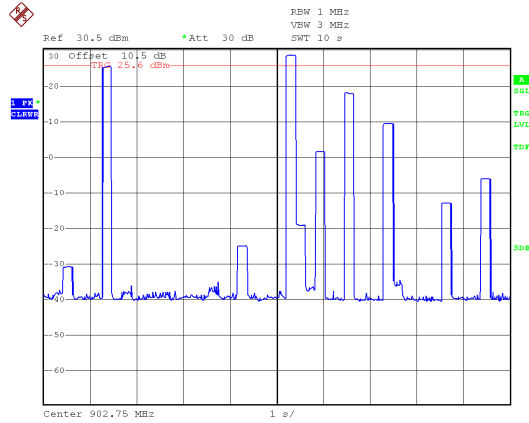


### 11.4 Test Result and Data

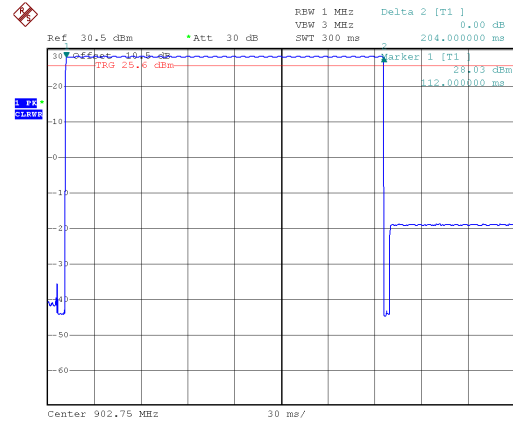
| Channel | Channel Frequency (MHz) | Length of transmission time (ms) | Number of transmission in a 10s | Dwell Time (ms) | Limit (ms) |
|---------|-------------------------|----------------------------------|---------------------------------|-----------------|------------|
| 1       | 902.75                  | 204.000                          | 1.00                            | 204.00          | 400        |
| 25      | 914.75                  | 204.000                          | 1.00                            | 204.00          | 400        |
| 50      | 927.25                  | 204.000                          | 1.00                            | 204.00          | 400        |



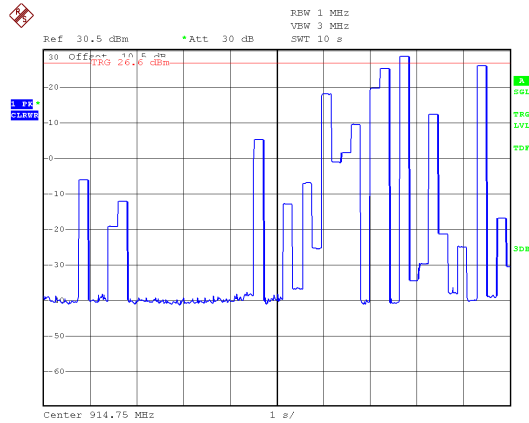
Modulation Type: ASK  
CH01-1



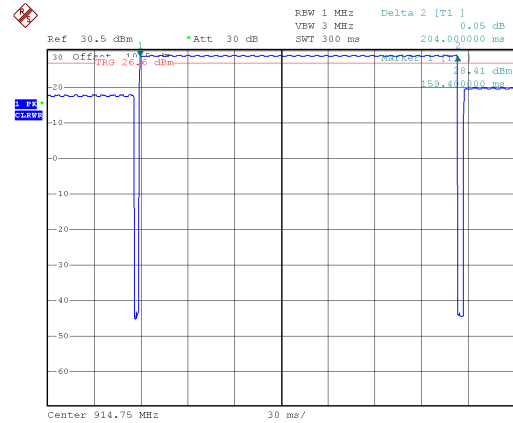
CH01-2



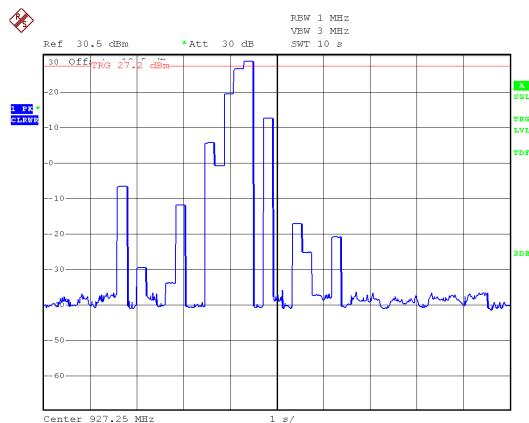
CH25-1



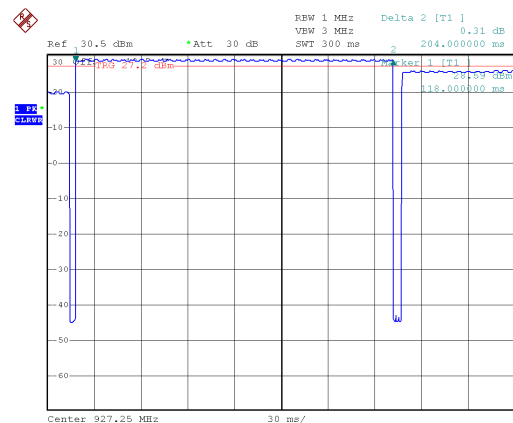
CH25-2



CH50-1



CH50-2





## 12. Number of Hopping Channels

### 12.1 Test Limit

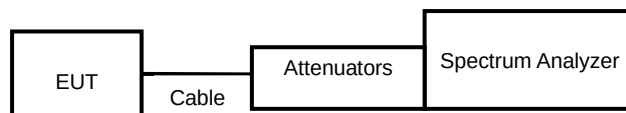
Frequency hopping systems in the 902 ~ 928MHz band shall use at least 50 channels.

### 12.2 Test Procedures

According to the methods defined in ANSI C63.10-2013 Section 7.8.3

- a. The transmitter output was connected to the spectrum analyzer.
- b. 2. Set RBW of spectrum analyzer to 100 KHz and VBW to 300 KHz.
- c. 3. Set the MaxHold function, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been record.

### 12.3 Test Setup Layout

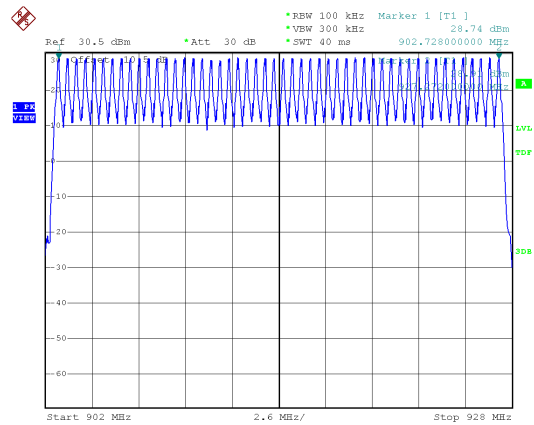


### 12.4 Test Result and Data

| Modulation Type | Hopping Channels | Limit |
|-----------------|------------------|-------|
| ASK             | 50               | 25    |



Modulation Type: ASK





## 13. Maximum Peak Output Power

### 13.1 Test Limit

The Maximum Peak Output Power Measurement is 30dBm.

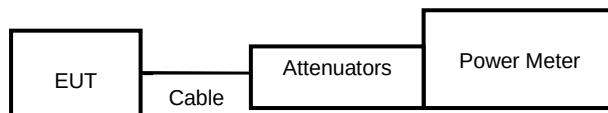
### 13.2 Test Procedures

According to the methods defined in ANSI C63.10-2013 Section 7.8.5

The antenna port( RF output )of the EUT was connected to the input( RF input )of a power meter.

Power was read directly from the meter and cable loss connection was added to the reading to obtain power at the EUT antenna terminal. The EUT Output Power was set to maximum to produce the worse case test result.

### 13.3 Test Setup Layout





### 13.4 Test Result and Data

Port-1

| Setting | Modulation Type | Channel | Channel Frequency (MHz) | AV Output Power (dBm) | AV Output Power (mW) |
|---------|-----------------|---------|-------------------------|-----------------------|----------------------|
| 30      | ASK             | 1       | 902.75                  | 28.97                 | 788.860              |
| 30      |                 | 25      | 914.75                  | 29.03                 | 799.834              |
| 30      |                 | 50      | 927.25                  | 29.05                 | 803.526              |

Port-2 -worst

| Setting | Modulation Type | Channel | Channel Frequency (MHz) | AV Output Power (dBm) | AV Output Power (mW) |
|---------|-----------------|---------|-------------------------|-----------------------|----------------------|
| 30      | ASK             | 1       | 902.75                  | 28.98                 | 790.679              |
| 30      |                 | 25      | 914.75                  | 29.16                 | 824.138              |
| 30      |                 | 50      | 927.25                  | 29.18                 | 827.942              |

Port-3

| Setting | Modulation Type | Channel | Channel Frequency (MHz) | AV Output Power (dBm) | AV Output Power (mW) |
|---------|-----------------|---------|-------------------------|-----------------------|----------------------|
| 30      | ASK             | 1       | 902.75                  | 28.81                 | 760.326              |
| 30      |                 | 25      | 914.75                  | 28.85                 | 767.361              |
| 30      |                 | 50      | 927.25                  | 28.90                 | 776.247              |

Port-4

| Setting | Modulation Type | Channel | Channel Frequency (MHz) | AV Output Power (dBm) | AV Output Power (mW) |
|---------|-----------------|---------|-------------------------|-----------------------|----------------------|
| 30      | ASK             | 1       | 902.75                  | 28.85                 | 767.361              |
| 30      |                 | 25      | 914.75                  | 28.91                 | 778.037              |
| 30      |                 | 50      | 927.25                  | 28.97                 | 788.860              |