

RF TEST REPORT

Test item : Swing U
Model No. : NTRM-U-2
Order No. : DEMC1405-02054
Date of receipt : 2014-05-28
Test duration : 2014-06-18 ~ 2014-06-25
Date of issue : 2014-07-09
Use of report : FCC Original Grant

Applicant : NetHom Co. Ltd.
#507, Hansol Techno-Town, DangJung-Dong, GunPo-City, Gyeonggi-Do,
435-735, South Korea

Test laboratory : DT&C Co., Ltd.
42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea
449-935

Test specification : FCC Part 15 Subpart C 247
Test environment : See appended test report
Test result : Pass Fail

The test results presented in this test report are limited only to the sample supplied by applicant and
the use of this test report is inhibited other than its purpose. This test report shall not be reproduced except in full,
without the written approval of DT&C Co., Ltd.

Tested by:



Engineer
HyunSu Son

Reviewed by:



Deputy General Manager
HongHee Lee

Test Report Version

| Test Report No. | Date | Description |
|------------------------|---------------|--------------------|
| DRTFCC1407-0898 | Jul. 09, 2014 | Initial issue |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Table of Contents

| | |
|---|-----------|
| 1. General Information | 5 |
| 1.1 Testing Laboratory | 5 |
| 1.2 Details of Applicant | 5 |
| 1.3 Description of EUT | 5 |
| 1.4. Declaration by the manufacturer | 5 |
| 1.5. Test Equipment List | 6 |
| 1.6. Summary of Test Results | 7 |
| 1.7 Conclusion of worst-case and operation mode | 8 |
| 2. Radiated Spurious Emissions and Conducted Spurious Emission | 9 |
| 2.1. Test Setup | 9 |
| 2.2. Limit | 9 |
| 2.3. Test Procedures | 10 |
| 2.3.1. Test Procedures for Radiated Spurious Emissions | 10 |
| 2.3.2. Test Procedures for Conducted Spurious Emissions | 10 |
| 2.4. Test Results | 11 |
| 2.4.1. Radiated Emission | 11 |
| 2.4.2. Conducted Spurious Emissions | 12 |
| 3. Carrier Frequency Separation | 18 |
| 3.1. Test Setup | 18 |
| 3.2. Limit | 18 |
| 3.3 Test Procedure: | 18 |
| 3.4 Test Results: | 18 |
| 4. Number of Hopping Frequencies | 19 |
| 4.1. Test Setup | 19 |
| 4.2. Limit | 19 |
| 4.3 Test Procedure: | 19 |
| 4.4 Test Results: | 19 |
| 5. 20dBc BW | 20 |
| 5.1. Test Setup | 20 |
| 5.2. Limit | 20 |
| 5.3. Test Procedure | 20 |
| 5.4. Test Results | 20 |
| 6. Time of Occupancy (Dwell Time) | 23 |
| 6.1. Test Setup | 23 |
| 6.2. Limit | 23 |
| 6.3. Test Procedure | 23 |
| 6.4. Test Results | 23 |
| 7. Maximum Peak Output Power Measurement | 24 |
| 7.1. Test Setup | 24 |
| 7.2. Limit | 24 |
| 7.3. Test Procedure | 24 |
| 7.4. Test Results | 24 |
| 8. Transmitter AC Power Line Conducted Emission | 27 |

| | |
|-------------------------------------|-----------|
| 8.1. Test Setup | 27 |
| 8.2. Limit..... | 27 |
| 8.3. Test Procedures | 27 |
| 8.4. Test Results | 27 |
| 9. Antenna Requirement | 28 |
| 9.1 Procedure..... | 28 |
| 9.2 Conclusion..... | 28 |
| APPENDIX I..... | 29 |

1.General Information

1.1 Testing Laboratory

DT&C Co., Ltd.

42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea, 449-935

www.dtnc.net

Telephone : + 82-31-321-2664
FAX : + 82-31-321-1664

1.2 Details of Applicant

Applicant : NetHom Co. Ltd.
Address : #507, Hansol Techno-Town, DangJung-Dong, GunPo-City,
Contact person : Gyeonggi-Do, 435-735, South Korea
Phone No. : Jerry Kim
: +82-31-427-3037

1.3 Description of EUT

| | |
|-----------------------------|----------------------------|
| Product | Swing U |
| Model Name | NTRM-U-2 |
| Serial Number | Identical prototype |
| Power Supply | DC 3.7 V |
| Frequency Range | 910.2 ~ 920 MHz |
| Modulation Technique | A1D |
| Number of Channels | 50(Channel Spacing 200kHz) |
| Antenna Type | Internal Antenna |
| Antenna Gain | Max. PK 5.7 dBi |

1.4. Declaration by the manufacturer

- N/A

1.5. Test Equipment List

| Type | Manufacturer | Model | Cal.Date (yy/mm/dd) | Next.Cal.Date (yy/mm/dd) | S/N |
|-----------------------------|---------------|-------------|------------------------|-----------------------------|------------|
| MXA Spectrum Analyzer | Agilent | N9020A | 13/09/24 | 14/09/24 | MY50200834 |
| System DC Power Supply | Agilent | 6654A | 13/10/21 | 14/10/21 | MY40002935 |
| Vector Signal Generator | Rohde Schwarz | SMBV100A | 14/01/07 | 15/01/07 | 255571 |
| Signal Generator | Rohde Schwarz | SMF100A | 13/07/22 | 14/07/22 | 102341 |
| Digital Multimeter | HP | 34401A | 14/02/27 | 15/02/27 | 3146A13475 |
| 50W 10dB ATT | SMAJK | SMAJK-50-10 | 13/10/23 | 14/10/23 | 3-50-10 |
| PreAmplifier (30dB) | Agilent | 8449B | 14/02/27 | 15/02/27 | 3008A00370 |
| Amplifier (22dB) | HP | 8447E | 14/01/08 | 15/01/08 | 2945A02865 |
| High-Pass Filter (1.0 GHz) | Wainwright | WHKX1.0 | 13/09/12 | 14/09/12 | 9 |
| LOOP Antenna | Schwarzbeck | FMZB1513 | 14/04/29 | 16/04/29 | 1513-128 |
| BILOG ANTENNA | SCHAFFNER | CBL6112B | 12/11/06 | 14/11/06 | 2737 |
| Double-Ridged Guide Antenna | ETS-LINDGREN | 3117 | 14/05/12 | 16/05/12 | 00140394 |
| EMI TEST RECEIVER | R&S | ESU | 14/01/08 | 15/01/08 | 100014 |
| Thermo hygrometer | BODYCOM | BJ5478 | 14/05/13 | 16/05/13 | 120612-2 |

1.6. Summary of Test Results

| FCC Part Section(s) | Parameter | Limit (Using in 2400~2483.5MHz) | Test Condition | Status Note 1 |
|---------------------|-------------------------------|---|-------------------|----------------------|
| 15.247(a) | Carrier Frequency Separation | >= 20dB BW or >= Two-Thirds of the 20dB BW | Conducted | C |
| | Number of Hopping Frequencies | >= 15 hops | | C |
| | 20 dB Bandwidth | None | | C |
| | Dwell Time | =< 0.4 seconds | | C |
| 15.247(b) | Transmitter Output Power | =< 1Watt , if CHs >= 75 Others =<0.125W | | C |
| 15.247(d) | Band-edge /Conducted | The radiated emission to any 100 kHz of out-band shall be at least 20dB below the highest in-band spectral density. | | C |
| | Conducted Spurious Emissions | | | C |
| 15.205, 15.209 | Radiated Spurious Emissions | FCC 15.209 Limits | Radiated | C Note.2 |
| 15.207 | AC Conducted Emissions | FCC 15.207 Limits | AC Line Conducted | N/A Note.3 |
| 15.203 | Antenna Requirements | FCC 15.203 | - | C |

Note 1: C=Comply NC=Not Comply NT=Not Tested NA=Not Applicable

Note 2: This test item was performed in each axis. And the worst case data were reported.

Semi anechoic chamber registration Number : 678747

Note 3: The power of this device is only DC(Internal Battery) and RFID & Bluetooth function is disabled in charging status.

1.7 Conclusion of worst-case and operation mode

The field strength of spurious emission was measured in three orthogonal EUT positions(X-axis, Y-axis and Z-axis).

Tested frequency information,

- Hopping Function: Enable

| | TX Frequency(MHz) | RX Frequency(MHz) |
|---------------------|-------------------|-------------------|
| Hopping Band | 910.2 ~ 920.0 | 910.2 ~ 920.0 |

- Hopping Function: Disable

| | TX Frequency(MHz) | RX Frequency(MHz) |
|------------------------|-------------------|-------------------|
| Lowest Channel | 910.2 | 910.2 |
| Middle Channel | 915.0 | 915.0 |
| Highest Channel | 920.0 | 920.0 |

Note : EUT was operated at modulated signal of 100% duty cycle.

2. Radiated Spurious Emissions and Conducted Spurious Emission

2.1. Test Setup

Refer to the APPENDIX I.

2.2. Limit

According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph(b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in section §15.209(a) is not required. In addition, radiated emission which in the restricted band, as defined in section §15.205(a), must also comply the radiated emission limits specified in section §15.209(a) (see section §15.205(c))

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

| Frequency (MHz) | Limit (uV/m) | Measurement Distance (meter) |
|-----------------|--------------|------------------------------|
| 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 |

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

According to § 15.205(a) and (b), only spurious emissions are permitted in any of the frequency bands listed below:

| MHz | MHz | MHz | MHz | GHz | GHz |
|-------------------|---------------------|-------------------|-----------------|--------------|---------------|
| 0.009 ~ 0.110 | 8.41425 ~ 8.41475 | 108 ~ 121.94 | 1300 ~ 1427 | 4.5 ~ 5.15 | 14.47 ~ 14.5 |
| 0.495 ~ 0.505 | 12.29 ~ 12.293 | 123 ~ 138 | 1435 ~ 1626.5 | 5.35 ~ 5.46 | 15.35 ~ 16.2 |
| 2.1735 ~ 2.1905 | 12.51975 ~ 12.52025 | 149.9 ~ 150.05 | 1645.5 ~ 1646.5 | 7.25 ~ 7.75 | 17.7 ~ 21.4 |
| 4.125 ~ 4.128 | 12.57675 ~ 12.57725 | 156.52475 ~ | 1660 ~ 1710 | 8.025 ~ 8.5 | 22.01 ~ 23.12 |
| 4.17725 ~ 4.17775 | 13.36 ~ 13.41 | 156.52525 | 1718.8 ~ 1722.2 | 9.0 ~ 9.2 | 23.6 ~ 24.0 |
| 4.20725 ~ 4.20775 | 16.42 ~ 16.423 | 156.7 ~ 156.9 | 2200 ~ 2300 | 9.3 ~ 9.5 | 31.2 ~ 31.8 |
| 6.215 ~ 6.218 | 16.69475 ~ 16.69525 | 162.0125 ~ 167.17 | 2310 ~ 2390 | 10.6 ~ 12.7 | 36.43 ~ 36.5 |
| 6.26775 ~ 6.26825 | 16.80425 ~ 16.80475 | 167.72 ~ 173.2 | 2483.5 ~ 2500 | 13.25 ~ 13.4 | Above 38.6 |
| 6.31175 ~ 6.31225 | 25.5 ~ 25.67 | 240 ~ 285 | 2655 ~ 2900 | | |
| 8.291 ~ 8.294 | 37.5 ~ 38.25 | 322 ~ 335.4 | 3260 ~ 3267 | | |
| 8.362 ~ 8.366 | 73 ~ 74.6 | 399.90 ~ 410 | 3332 ~ 3339 | | |
| 8.37625 ~ 8.38675 | 74.8 ~ 75.2 | 608 ~ 614 | 3345.8 ~ 3358 | | |
| | | 960 ~ 1240 | 3600 ~ 4400 | | |

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

2.3. Test Procedures

Radiated emissions from the EUT were measured according to the DA 00-705 and ANSI C63.10:2009

2.3.1. Test Procedures for Radiated Spurious Emissions

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
2. During performing radiated emission below 1 GHz, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1 GHz, the EUT was set 3 meter away from the interference-receiving antenna.
3. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE :

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1 GHz.

2.3.2. Test Procedures for Conducted Spurious Emissions

1. The transmitter output was connected to the spectrum analyzer.
2. The **reference level** of the fundamental frequency was measured with the spectrum analyzer using RBW=100 kHz, VBW=300 kHz.
3. The conducted spurious emission was tested each ranges were set as below.

Frequency range: 9 kHz ~ 30 MHz

RBW= 100kHz, VBW= 300kHz, SWEEP TIME = AUTO, DETECTOR = PEAK, TRACE = MAX HOLD, SWEEP POINT: 10001

Frequency range: 30 MHz ~ 10 GHz

RBW= 100kHz, VBW= 300kHz, SWEEP TIME = AUTO, DETECTOR = PEAK, TRACE = MAX HOLD, SWEEP POINT: 10001

LIMIT LINE = 20 dB below of the reference level of above measurement procedure Step 2. (RBW = 100 kHz, VBW = 300 kHz)

2.4. Test Results

Ambient temperature : 23 °C
Relative humidity : 42 %

2.4.1. Radiated Emission

9kHz ~ 10GHz Data

▪ Lowest Channel

| Frequency (MHz) | ANT Pol | The worst case EUT Position (Axis) | Detector Mode | Reading (dBuV) | T.F (dB/m) | D.C.F. (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----------------|---------|------------------------------------|---------------|----------------|------------|-------------|-----------------|----------------|-------------|
| 1820.645 | V | Y | PK | 45.43 | -8.98 | N/A | 36.45 | 74.00 | 37.55 |
| 1820.410 | V | Y | AV | 32.51 | -8.98 | N/A | 23.53 | 54.00 | 30.47 |
| 3640.770 | H | Z | PK | 47.38 | 1.52 | N/A | 48.90 | 74.00 | 25.10 |
| 3640.855 | H | Z | AV | 41.84 | 1.52 | N/A | 43.36 | 54.00 | 10.64 |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |

▪ Middle Channel

| Frequency (MHz) | ANT Pol | The worst case EUT Position (Axis) | Detector Mode | Reading (dBuV) | T.F (dB/m) | D.C.F. (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----------------|---------|------------------------------------|---------------|----------------|------------|-------------|-----------------|----------------|-------------|
| 1830.275 | V | Y | PK | 45.77 | -8.89 | N/A | 36.88 | 74.00 | 37.12 |
| 1830.045 | V | Y | AV | 34.44 | -8.89 | N/A | 25.55 | 54.00 | 28.45 |
| 3659.820 | H | Z | PK | 48.10 | 1.63 | N/A | 49.73 | 74.00 | 24.27 |
| 3660.035 | H | Z | AV | 39.01 | 1.63 | N/A | 40.64 | 54.00 | 13.36 |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |

▪ Highest Channel

| Frequency (MHz) | ANT Pol | The worst case EUT Position (Axis) | Detector Mode | Reading (dBuV) | T.F (dB/m) | D.C.F. (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|-----------------|---------|------------------------------------|---------------|----------------|------------|-------------|-----------------|----------------|-------------|
| 1839.945 | V | Y | PK | 46.60 | -8.80 | N/A | 37.80 | 74.00 | 36.20 |
| 1839.975 | V | Y | AV | 35.98 | -8.80 | N/A | 27.18 | 54.00 | 26.82 |
| 3680.055 | H | Z | PK | 45.94 | 1.73 | N/A | 47.67 | 74.00 | 26.33 |
| 3680.045 | H | Z | AV | 35.86 | 1.73 | N/A | 37.59 | 54.00 | 16.41 |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |

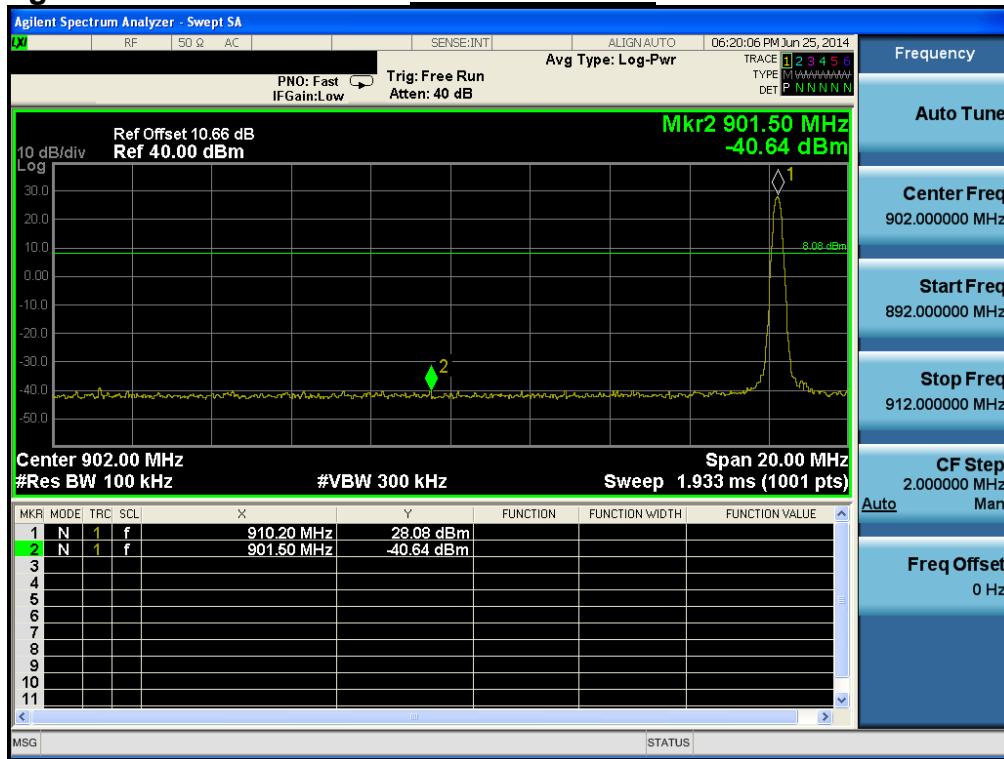
Note.

1. No other spurious and harmonic emissions were reported greater than listed emissions above table.
2. Above listed point data is the worst case data.
3. Sample Calculation.
Margin = Limit – Result / Result = Reading + T.F+ DCF / T.F = AF + CL – AG
Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,
DCF = Duty Cycle Correction Factor
4. EUT had its hopping function disabled at the highest, middle and the lowest available channels.

2.4.2. Conducted Spurious Emissions

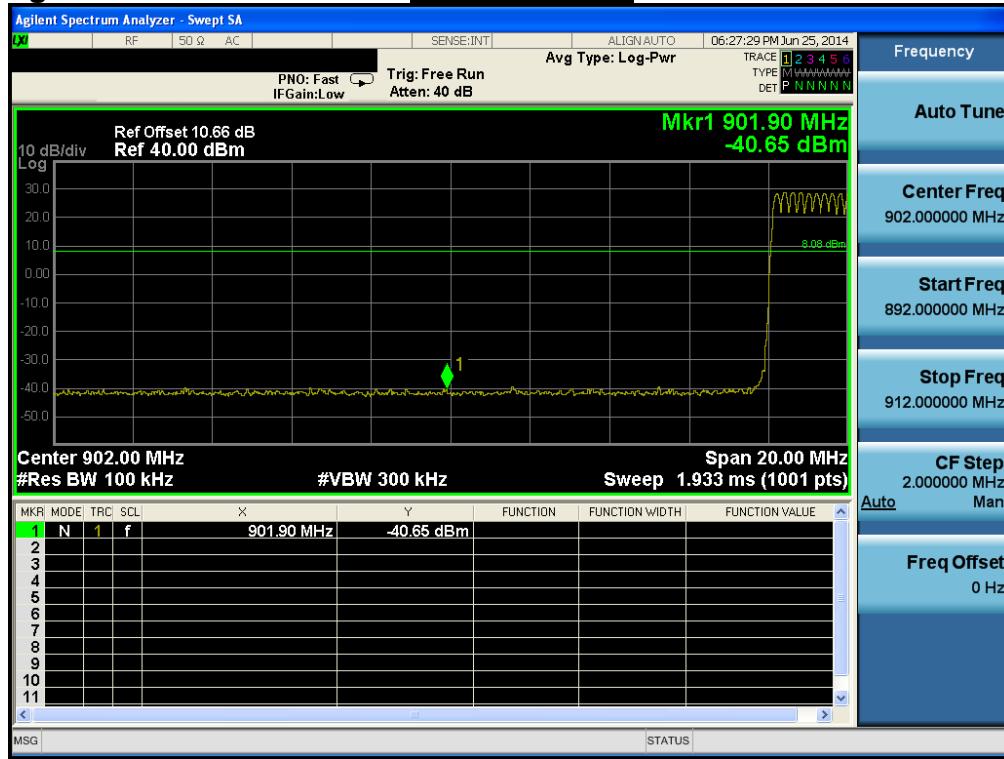
Low Band-edge

Lowest Channel



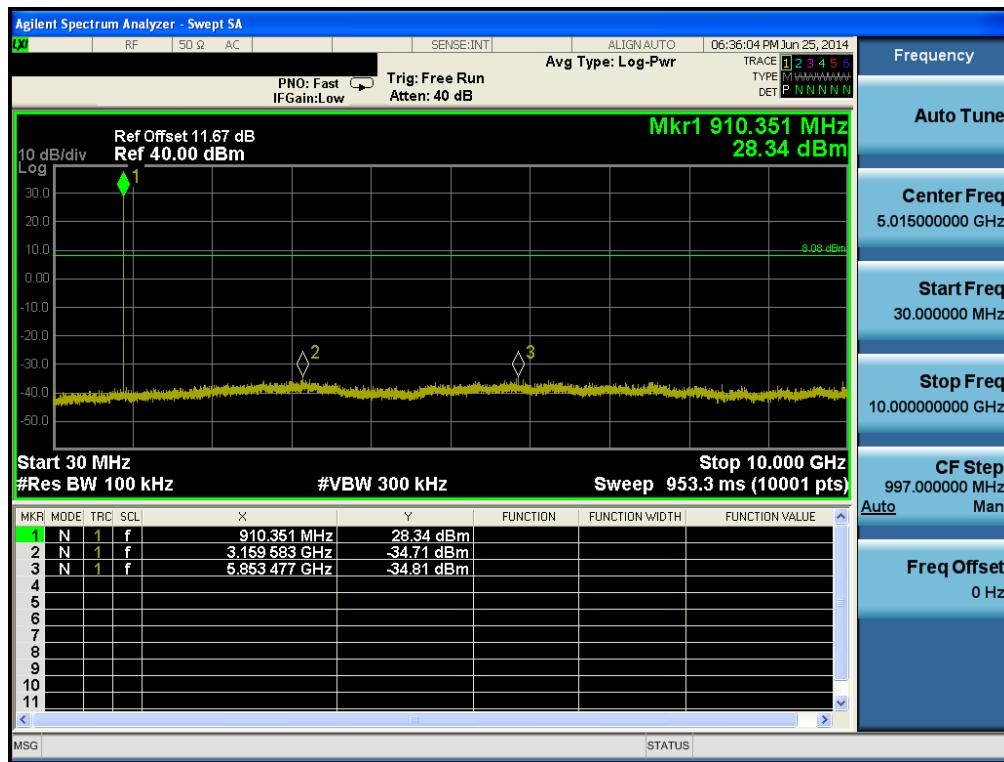
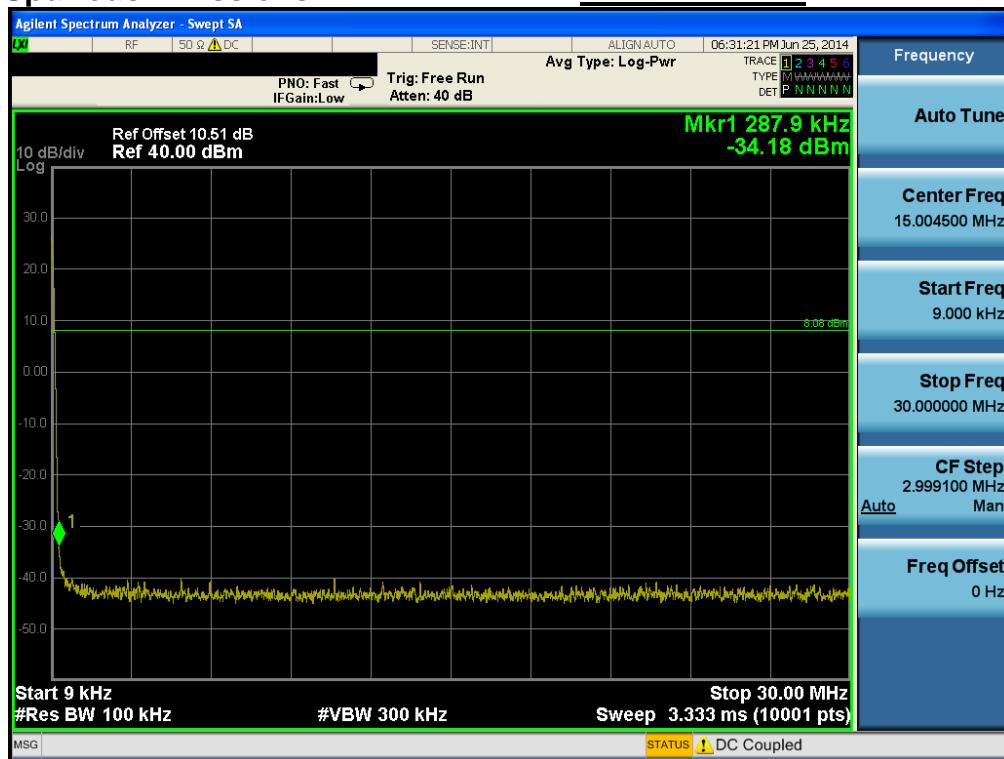
Low Band-edge

Hopping mode



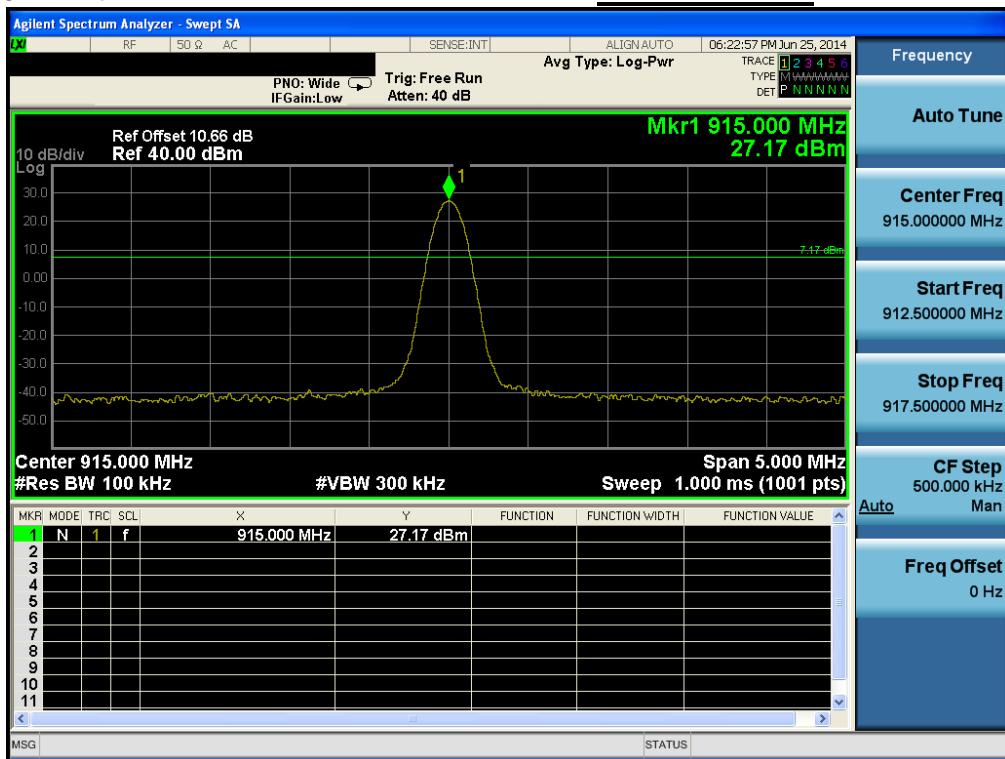
Conducted Spurious Emissions

Lowest Channel



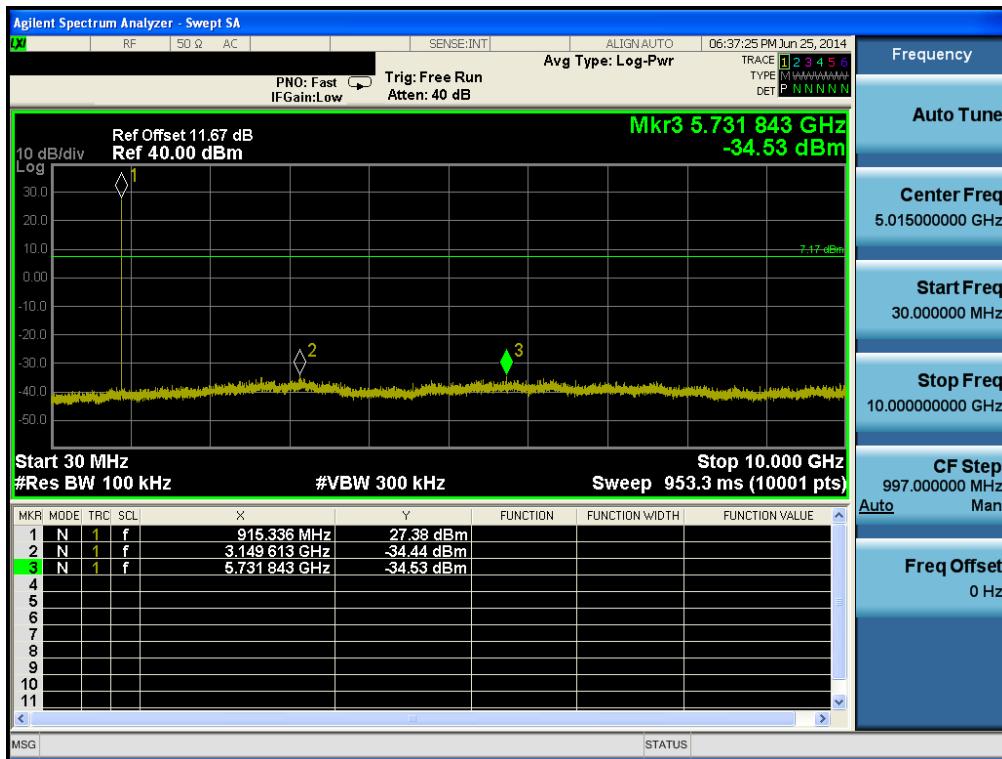
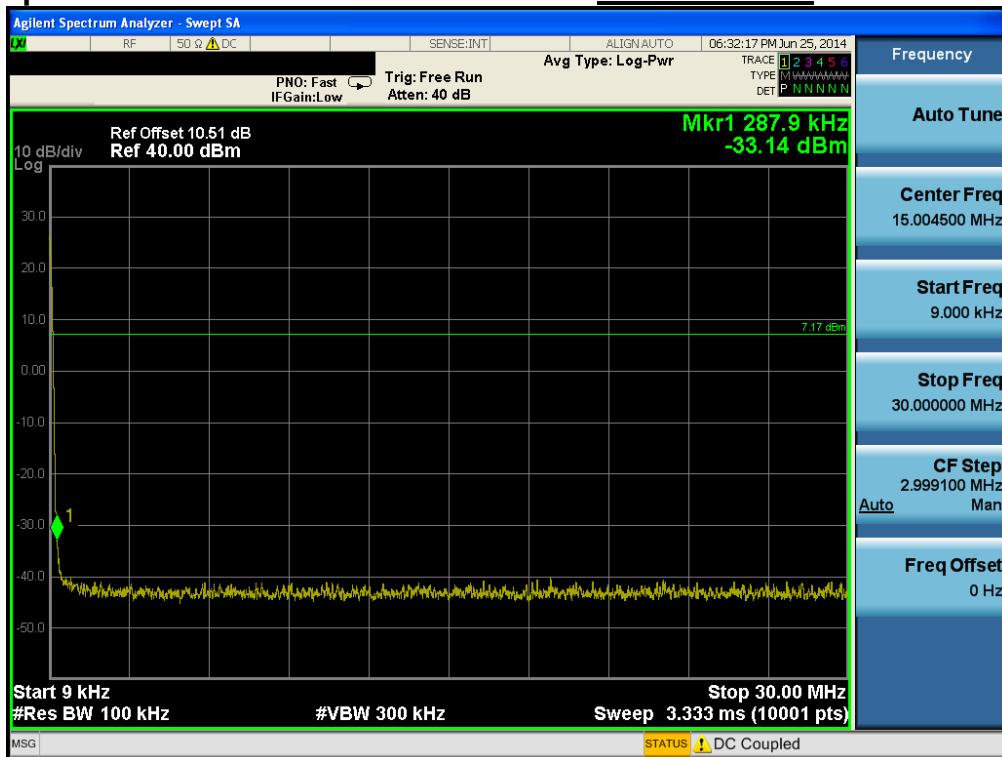
Reference for limit

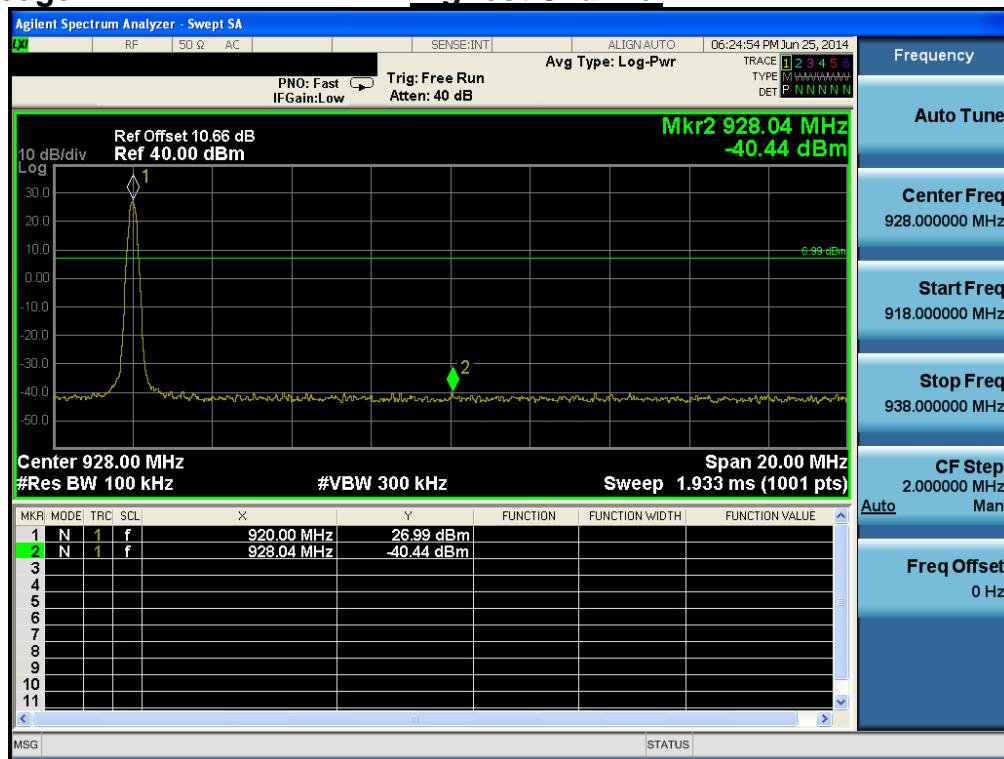
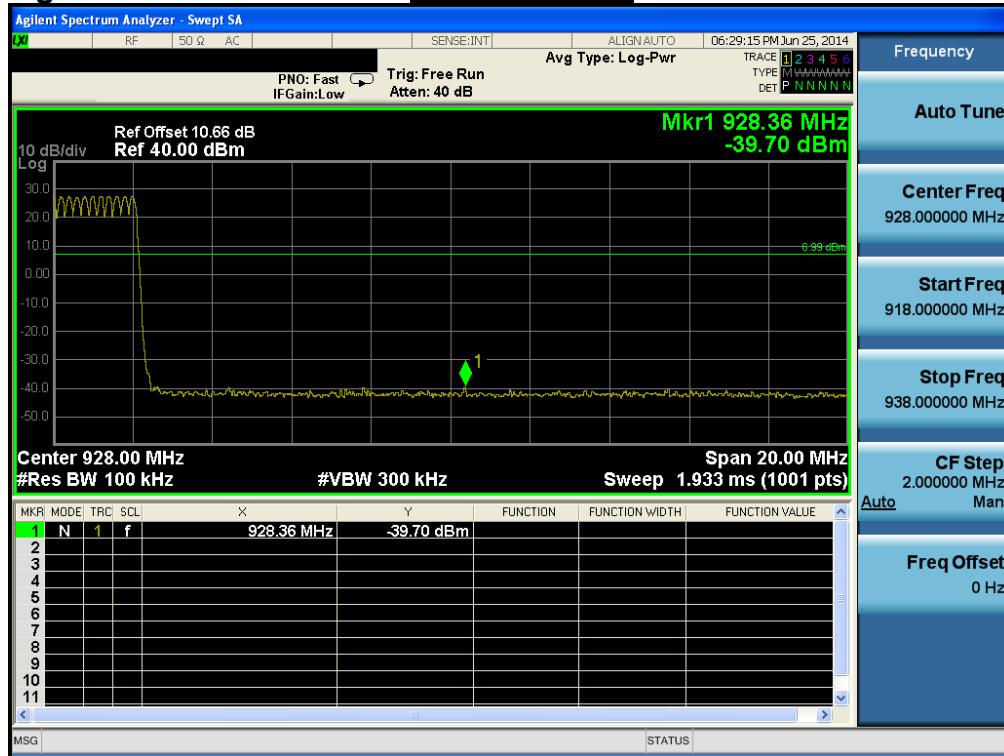
Middle Channel



Conducted Spurious Emissions

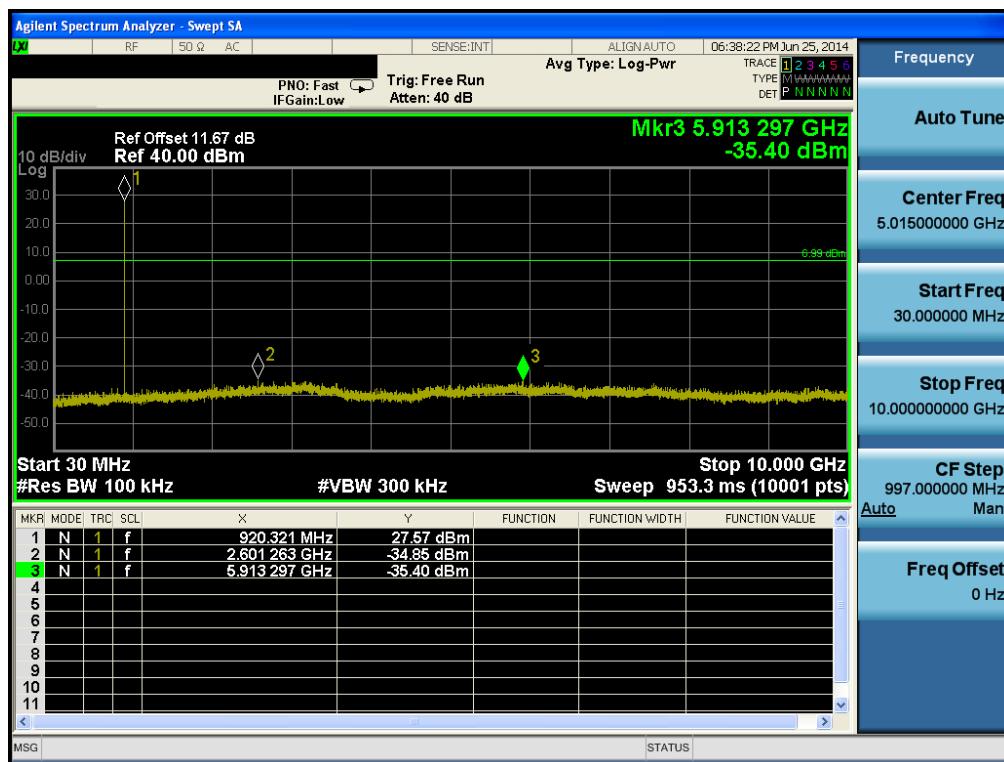
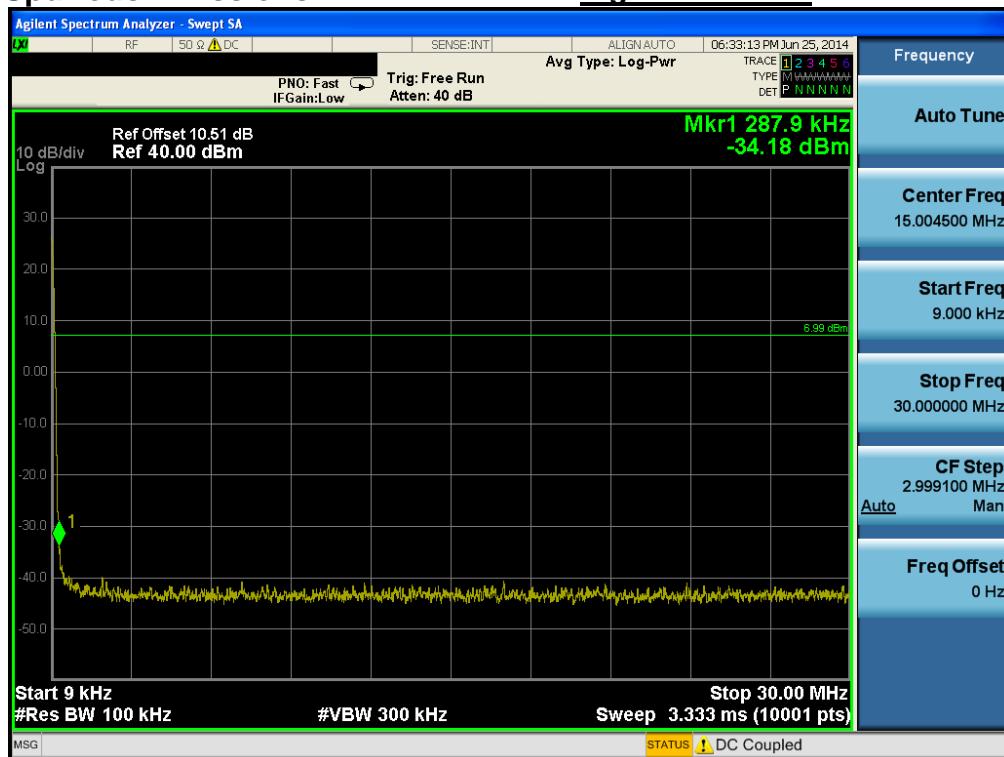
Middle Channel



High Band-edge**Highest Channel****High Band-edge****Hopping mode**

Conducted Spurious Emissions

Highest Channel



3. Carrier Frequency Separation

3.1. Test Setup

Refer to the APPENDIX I.

3.2. Limit

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

3.3 Test Procedure:

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

After the trace being stable, the reading value between the peaks of the adjacent channels using the marker-delta function was recorded as the measurement results.

The spectrum analyzer is set to:

Span = wide enough to capture the peaks of two adjacent channels

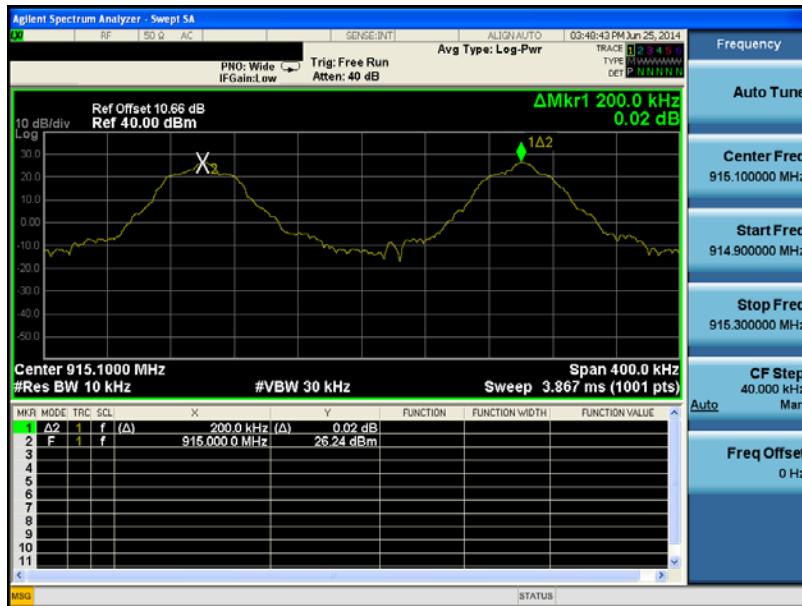
RBW = 1% of the span Sweep = auto

VBW = \geq RBW Detector function = peak

Trace = max hold

3.4 Test Results:

| Hopping Mode | Peak of center channel (MHz) | Peak of adjacent Channel (MHz) | Test Result (kHz) |
|--------------|------------------------------|--------------------------------|-------------------|
| Enable | 915.000 | 915.200 | 200 |



4. Number of Hopping Frequencies

4.1. Test Setup

Refer to the APPENDIX I.

4.2. Limit

Limit: ≥ 50 hops

4.3 Test Procedure:

The number of hopping frequencies was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

The spectrum analyzer is set to:

Span = 15 MHz(Start Frequency = 907.6 MHz / Stop Frequency = 922.6 MHz)

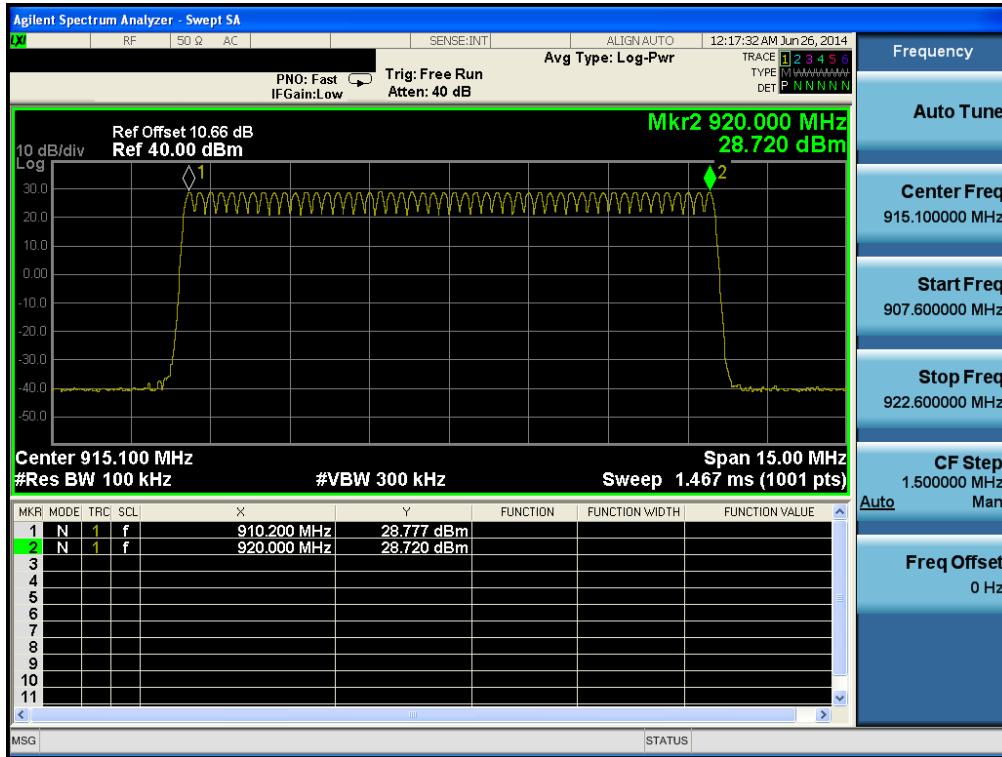
RBW = 1% of the span or more Sweep = auto

VBW = \geq RBW Detector function = peak

Trace = max hold

4.4 Test Results:

| Hopping mode | Test Result (Total Hops) |
|--------------|-----------------------------|
| Enable | 50 |



5. 20dBc BW

5.1. Test Setup

Refer to the APPENDIX I.

5.2. Limit

Limit: < 250kHz for applying the hopping frequencies and the average time of occupancy

5.3. Test Procedure

The bandwidth at 20 dB below the highest in band spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function disabled at the highest, middle and the lowest available channels.

After the trace being stable, Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

Span = 500 kHz

RBW = 1 kHz

Sweep = auto

VBW = ≥ RBW

Detector function = peak

Trace = max hold

5.4. Test Results

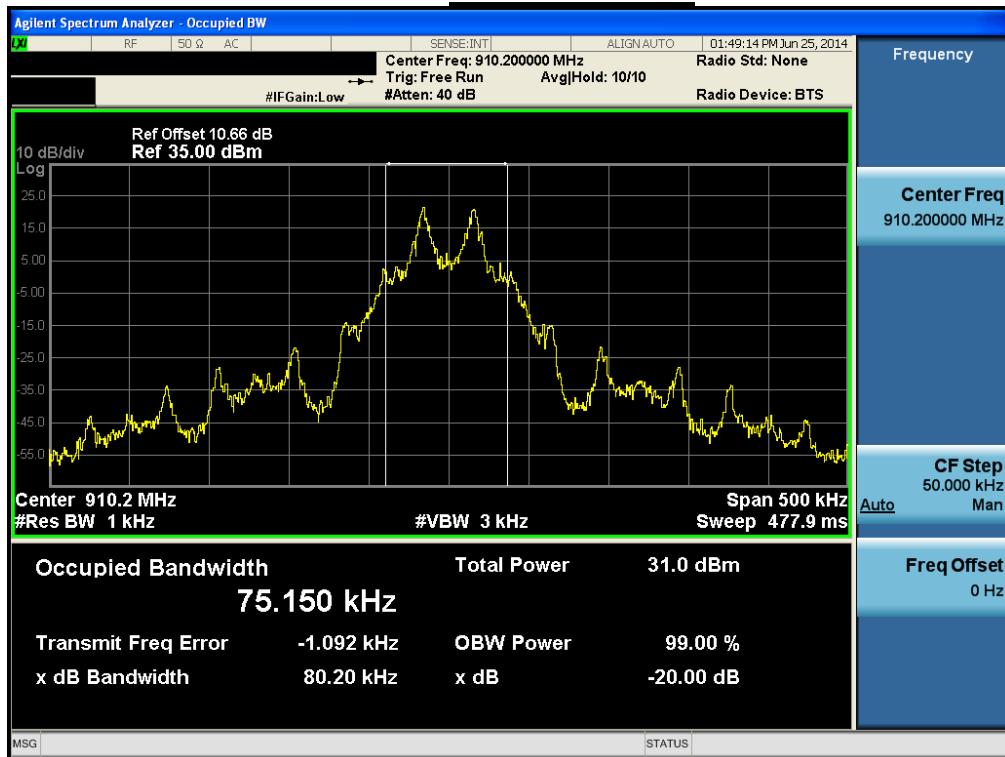
Ambient temperature : 24 °C
Relative humidity : 42 %

| Frequency (MHz) | Tested Channel | 20dBc BW (kHz) |
|-----------------|----------------|----------------|
| 910.2 | Lowest | 80.20 |
| 915.0 | Middle | 72.83 |
| 920.0 | Highest | 74.89 |

Note 1: See next pages for actual measured spectrum plots.

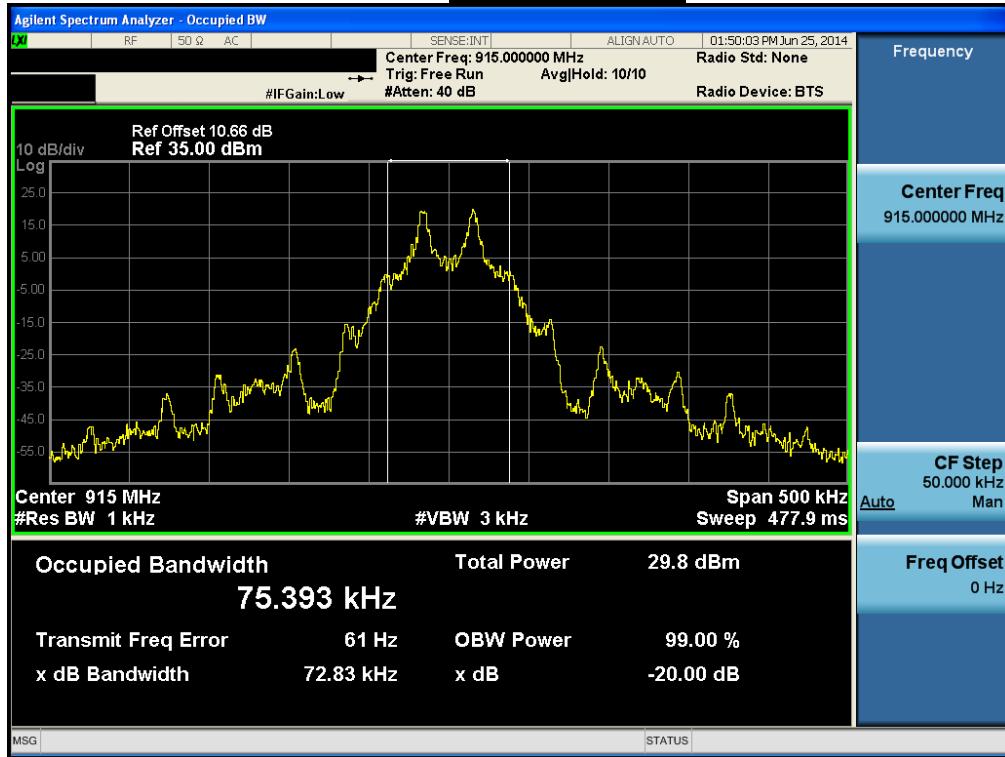
20dBc Bandwidth

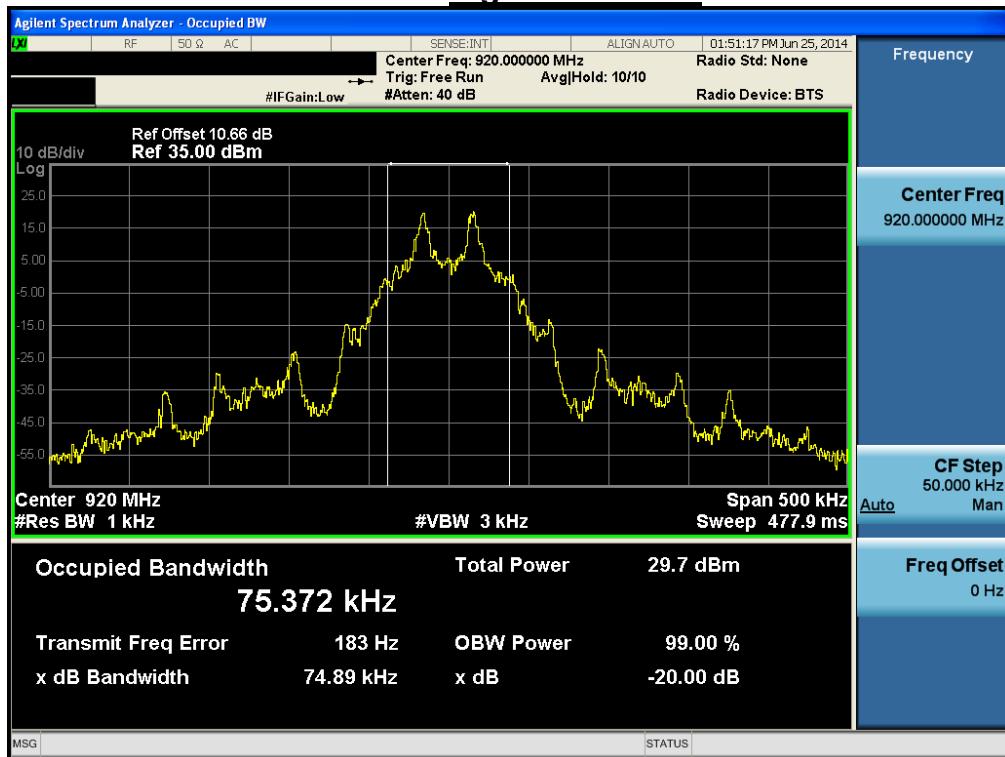
Lowest Channel



20dBc Bandwidth

Middle Channel



20dBc Bandwidth**Highest Channel**

6. Time of Occupancy (Dwell Time)

6.1. Test Setup

Refer to the APPENDIX I.

6.2. Limit

Limit: < 0.4 seconds within a 20 second period

6.3. Test Procedure

The dwell time was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

The spectrum analyzer is set to:

RBW = 100kHz

VBW = \geq RBW

Span = zero

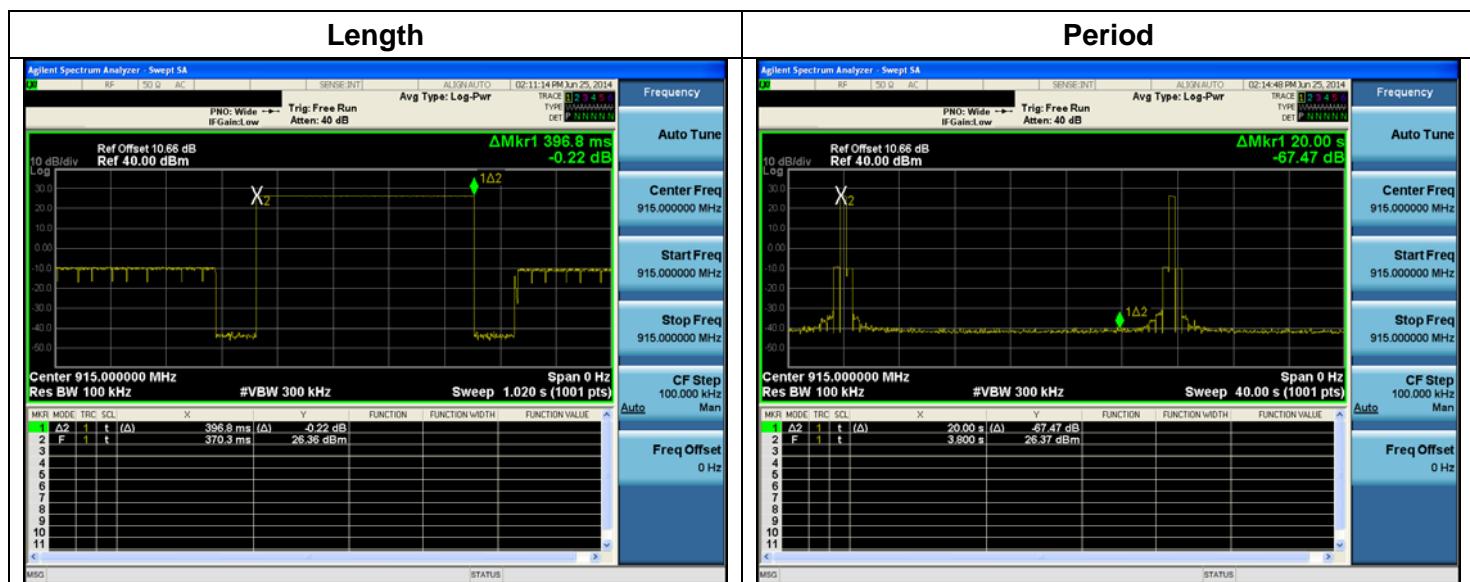
Detector function = peak

Trace max hold

6.4. Test Results

Ambient temperature : 24 °C
Relative humidity : 42 %

| Channel Frequency (MHz) | Length (ms) | Number | Dwell Time (ms) |
|-------------------------|-------------|--------|-----------------|
| 915 | 396.8 | 1 | 396.8 |



7. Maximum Peak Output Power Measurement

7.1. Test Setup

Refer to the APPENDIX I.

7.2. Limit

The maximum peak output power of the intentional radiator shall not exceed the following :

1. §15.247(b)(2), For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels,

7.3. Test Procedure

1. The RF power output was measured with a Spectrum analyzer connected to the RF Antenna connector (conducted measurement) while EUT was operating in transmit mode at the appropriate center frequency, A spectrum analyzer was used to record the shape of the transmit signal.

2. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using :

RBW \geq 20dBW

VBW \geq RBW

Sweep = auto

Detector function = peak

Trace = max hold

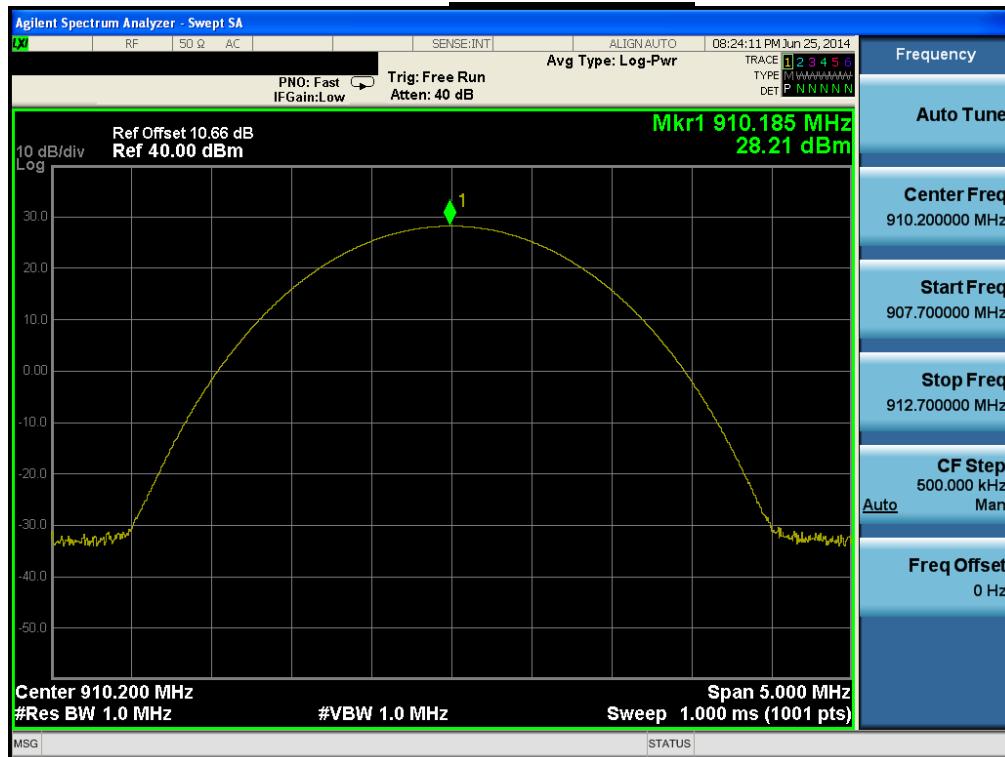
7.4. Test Results

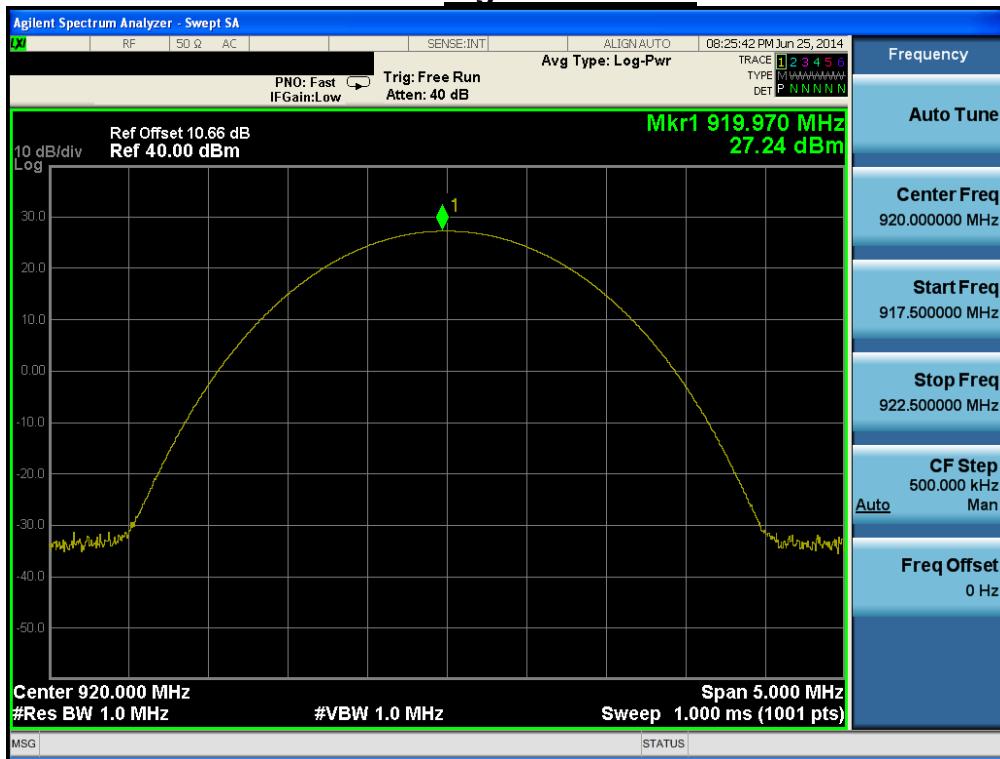
Ambient temperature : 24 °C

Relative humidity : 42 %

| Tested Channel | Peak Output Power | |
|----------------|-------------------|---------|
| | dBm | mW |
| Lowest | 28.210 | 662.217 |
| Middle | 27.350 | 543.250 |
| Highest | 27.240 | 529.663 |

Note 1: See next pages for actual measured spectrum plots.

Peak Output Power**Lowest Channel****Peak Output Power****Middle Channel**

Peak Output Power**Highest Channel**

8. Transmitter AC Power Line Conducted Emission

8.1. Test Setup

N/A

8.2. Limit

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

Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequency ranges.

| Frequency Range (MHz) | Conducted Limit (dBuV) | |
|--------------------------|------------------------|------------|
| | Quasi-Peak | Average |
| 0.15 ~ 0.5 | 66 to 56 * | 56 to 46 * |
| 0.5 ~ 5 | 56 | 46 |
| 5 ~ 30 | 60 | 50 |

* Decreases with the logarithm of the frequency

8.3. Test Procedures

Conducted emissions from the EUT were measured according to the dictates of ANSI C63.4:2003

1. The test procedure is performed in a 6.5 m × 3.5 m × 3.5 m (L × W × H) shielded room. The EUT along with its peripherals were placed on a 1.0 m (W) × 1.5 m (L) and 0.8 m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
2. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room.
3. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.
4. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

8.4. Test Results

N/A

9. Antenna Requirement

9.1 Procedure

Describe how the EUT complies with the requirement that either its antenna is permanently attached, or that it employs a unique antenna connector, for every antenna proposed for use with the EUT.

9.2 Conclusion: **Comply**

The internal antennas of this E.U.T are permanently attached using the unique connectors.

Minimum Standard:

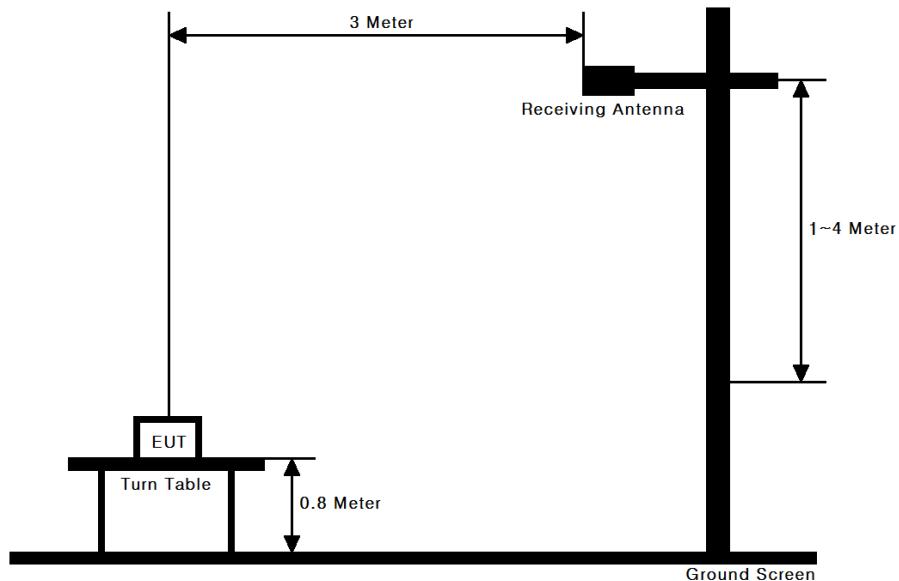
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions.

APPENDIX I

Test set up Diagrams

▪Radiated Measurement

The diagram below shows the test setup that is utilized to make the measurements for emission from 9kHz to 10GHz Emissions.



▪Conducted Measurement

