



FCC TEST REPORT

REPORT NO.: RF130521C33

MODEL NO.: SP-922PRO V3 (refer to item 3.1 for more details)

FCC ID: A8J-SP922PROV3

RECEIVED: May 21, 2013

TESTED: May 28 ~ Jun. 06, 2013

ISSUED: Jun. 13, 2013

APPLICANT: EnGenius Technologies

ADDRESS: 1580 Scenic Avenue, Costa Mesa, CA92626

ISSUED BY: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.

TEST LOCATION: No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.



TABLE OF CONTENTS

| | |
|--|----|
| RELEASE CONTROL RECORD..... | 4 |
| 1. CERTIFICATION | 5 |
| 2. SUMMARY OF TEST RESULTS | 6 |
| 2.1 MEASUREMENT UNCERTAINTY..... | 6 |
| 3. GENERAL INFORMATION..... | 7 |
| 3.1 GENERAL DESCRIPTION OF EUT | 7 |
| 3.2 DESCRIPTION OF TEST MODES | 8 |
| 3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL | 9 |
| 3.3 DESCRIPTION OF SUPPORT UNITS | 11 |
| 3.3.1 CONFIGURATION OF SYSTEM UNDER TEST | 11 |
| 3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS | 11 |
| 4. TEST TYPES AND RESULTS | 12 |
| 4.1 RADIATED EMISSION AND BANDEdge MEASUREMENT | 12 |
| 4.1.1 LIMITS OF RADIATED EMISSION AND BANDEdge MEASUREMENT | 12 |
| 4.1.2 TEST INSTRUMENTS..... | 13 |
| 4.1.3 TEST PROCEDURES | 14 |
| 4.1.4 DEVIATION FROM TEST STANDARD | 14 |
| 4.1.5 TEST SETUP | 15 |
| 4.1.6 EUT OPERATING CONDITIONS | 15 |
| 4.1.7 TEST RESULTS | 16 |
| 4.2 CONDUCTED EMISSION MEASUREMENT | 25 |
| 4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT | 25 |
| 4.2.2 TEST INSTRUMENTS..... | 25 |
| 4.2.3 TEST PROCEDURES | 26 |
| 4.2.4 DEVIATION FROM TEST STANDARD | 26 |
| 4.2.5 TEST SETUP | 26 |
| 4.2.6 EUT OPERATING CONDITIONS | 26 |
| 4.2.7 TEST RESULTS | 27 |
| 4.3 NUMBER OF HOPPING FREQUENCY USED | 31 |
| 4.3.1 LIMIT OF HOPPING FREQUENCY USED..... | 31 |
| 4.3.2 TEST SETUP | 31 |
| 4.3.3 TEST INSTRUMENTS..... | 31 |
| 4.3.4 TEST PROCEDURES | 31 |
| 4.3.5 DEVIATION FROM TEST STANDARD | 31 |
| 4.3.6 TEST RESULTS | 31 |
| 4.4 DWELL TIME ON EACH CHANNEL | 33 |
| 4.4.1 LIMIT OF DWELL TIME USED | 33 |
| 4.4.2 TEST SETUP | 33 |
| 4.4.3 TEST INSTRUMENTS..... | 33 |
| 4.4.4 TEST PROCEDURES | 33 |
| 4.4.5 DEVIATION FROM TEST STANDARD | 33 |
| 4.4.6 TEST RESULTS | 34 |



A D T

| | | |
|-------|---|----|
| 4.5 | CHANNEL BANDWIDTH | 35 |
| 4.5.1 | LIMITS OF CHANNEL BANDWIDTH | 35 |
| 4.5.2 | TEST SETUP | 35 |
| 4.5.3 | TEST INSTRUMENTS | 35 |
| 4.5.4 | TEST PROCEDURE | 35 |
| 4.5.5 | DEVIATION FROM TEST STANDARD | 35 |
| 4.5.6 | EUT OPERATING CONDITION | 35 |
| 4.5.7 | TEST RESULTS | 36 |
| 4.6 | HOPPING CHANNEL SEPARATION | 37 |
| 4.6.1 | LIMIT OF HOPPING CHANNEL SEPARATION | 37 |
| 4.6.2 | TEST SETUP | 37 |
| 4.6.3 | TEST INSTRUMENTS | 37 |
| 4.6.4 | TEST PROCEDURES | 37 |
| 4.6.5 | DEVIATION FROM TEST STANDARD | 37 |
| 4.6.6 | TEST RESULTS | 38 |
| 4.7 | MAXIMUM OUTPUT POWER | 39 |
| 4.7.1 | LIMITS OF MAXIMUM OUTPUT POWER MEASUREMENT | 39 |
| 4.7.2 | TEST SETUP | 39 |
| 4.7.3 | TEST INSTRUMENTS | 39 |
| 4.7.4 | TEST PROCEDURES | 39 |
| 4.7.5 | DEVIATION FROM TEST STANDARD | 39 |
| 4.7.6 | EUT OPERATING CONDITION | 39 |
| 4.7.7 | TEST RESULTS | 40 |
| 4.8 | CONDUCTED OUT OF BAND EMISSION MEASUREMENT | 41 |
| 4.8.1 | LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT | 41 |
| 4.8.2 | TEST INSTRUMENTS | 41 |
| 4.8.3 | TEST PROCEDURE | 41 |
| 4.8.4 | DEVIATION FROM TEST STANDARD | 41 |
| 4.8.5 | EUT OPERATING CONDITION | 41 |
| 4.8.6 | TEST RESULTS | 41 |
| 5. | PHOTOGRAPHS OF THE TEST CONFIGURATION | 43 |
| 6. | INFORMATION ON THE TESTING LABORATORIES | 44 |
| 7. | APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB | 45 |



A D T

RELEASE CONTROL RECORD

| ISSUE NO. | REASON FOR CHANGE | DATE ISSUED |
|-------------|-------------------|---------------|
| RF130521C33 | Original release | Jun. 13, 2013 |



A D T

1. CERTIFICATION

PRODUCT: 4-Line Cordless Phone System

MODEL NO.: SP-922PRO V3 (refer to item 3.1 for more details)

BRAND: EnGenius

APPLICANT: EnGenius Technologies

TESTED: May 28 ~ Jun. 06, 2013

TEST SAMPLE: ENGINEERING SAMPLE

STANDARDS: FCC Part 15, Subpart C (Section 15.247)

ANSI C63.10-2009

The above equipment (model: SP-922PRO V3) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Celine Chou , DATE : Jun. 13, 2013

Celine Chou / Specialist

APPROVED BY : Ken Liu , DATE : Jun. 13, 2013

Ken Liu / Senior Manager

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247) | | | |
|---|---|--------|--|
| STANDARD SECTION | TEST TYPE AND LIMIT | RESULT | REMARK |
| 15.207 | AC Power Conducted Emission | PASS | Meet the requirement of limit. Minimum passing margin is -12.26dB at 0.15782MHz. |
| 15.247(a)(1)(i) | Number of Hopping Frequency Used Spec.: At least 50 channels | PASS | Meet the requirement of limit. |
| 15.247(a)(1)(i) | Dwell Time on Each Channel Spec.: Max. 0.4 second within 20 second | PASS | Meet the requirement of limit. |
| 15.247(a)(1)(i) | 1. Hopping Channel Separation Spec.: Min. 25 kHz or 20 dB bandwidth, whichever is greater 2. Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System | PASS | Meet the requirement of limit. |
| 15.247(b)(2) | Maximum Peak Output Power Spec.: max. 30dBm | PASS | Meet the requirement of limit. |
| 15.247(d) | Transmitter Radiated Emissions Spec.: Table 15.209 | PASS | Meet the requirement of limit. Minimum passing margin is -1.0dB at 943.83MHz. |
| 15.247(d) | Band Edge Measurement | PASS | Meet the requirement of limit. |
| 15.203 | Antenna Requirement | PASS | Antenna connector is Reversed TNC not a standard connector. |

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| MEASUREMENT | FREQUENCY | UNCERTAINTY |
|---------------------|-----------------|-------------|
| Conducted emissions | 150kHz~30MHz | 2.44 dB |
| Radiated emissions | 30MHz ~ 200MHz | 2.93 dB |
| | 200MHz ~1000MHz | 2.95 dB |
| | 1GHz ~ 18GHz | 2.26 dB |
| | 18GHz ~ 40GHz | 1.94 dB |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

| | |
|----------------------------|---|
| EUT | 4-Line Cordless Phone System |
| MODEL NO. | SP-922PRO V3 (refer to note for more details) |
| POWER SUPPLY | 12Vdc (Adapter) |
| MODULATION TYPE | MSK |
| TRANSFER RATE | 170.66Kbps |
| CHANNEL SPACING | 202.272KHz |
| OPERATING FREQUENCY | 902.3840 ~ 927.4656MHz |
| NUMBER OF CHANNEL | 50 |
| OUTPUT POWER | 933.254mW |
| ANTENNA TYPE | Dipole Antenna with 2dBi gain |
| ANTENNA CONNECTOR | Reversed TNC |
| DATA CABLE | 1.8m non-shielded RJ11 cable without core x 4 1.8m non-shielded audio cable without core x 1 |
| I/O PORTS | Refer to user's manual |
| ACCESSORY DEVICES | Adapter |

NOTE:

1. The following models are electrically identical, different model names are for marketing purpose.

| BRAND | MODEL |
|----------|--------------|
| EnGenius | SP-922PRO V3 |
| | DuraFon PRO |

* The model of the SP-922PRO V3 was chosen for final test.

2. The EUT uses following adapters.

| ADAPTER 1 | |
|---------------------|--------------------------------------|
| BRAND | DVE |
| MODEL | DSA-12G-12 FUS 120120 |
| INPUT POWER | 100-240Vac, 50/60Hz, 0.3A |
| OUTPUT POWER | 12Vdc, 1A |
| POEWR LINE | 1.5m non-shielded cable without core |

| ADAPTER 2 | |
|---------------------|--------------------------------------|
| BRAND | DVE |
| MODEL | DSA-15P-12 US 120120 |
| INPUT POWER | 100-240Vac, 50/60Hz, 0.5A |
| OUTPUT POWER | 12Vdc, 1A |
| POEWR LINE | 1.5m non-shielded cable without core |

3. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.



A D T

3.2 DESCRIPTION OF TEST MODES

50 channels are provided to this EUT:

| CH. | FREQ. (MHz) |
|-----|-------------|-----|-------------|-----|-------------|-----|-------------|-----|-------------|
| 1 | 902.3840 | 11 | 907.6430 | 21 | 912.4975 | 31 | 918.1611 | 41 | 923.0157 |
| 2 | 902.7885 | 12 | 908.0476 | 22 | 912.9021 | 32 | 918.9702 | 42 | 923.8247 |
| 3 | 903.1930 | 13 | 908.4521 | 23 | 913.3066 | 33 | 919.3748 | 43 | 924.2293 |
| 4 | 903.5976 | 14 | 909.2612 | 24 | 914.1157 | 34 | 919.7793 | 44 | 924.6338 |
| 5 | 904.4067 | 15 | 909.6657 | 25 | 914.9248 | 35 | 920.1839 | 45 | 925.0384 |
| 6 | 904.8112 | 16 | 910.0703 | 26 | 915.3293 | 36 | 920.5884 | 46 | 925.4429 |
| 7 | 905.2158 | 17 | 910.4748 | 27 | 915.7339 | 37 | 921.3975 | 47 | 926.2520 |
| 8 | 905.6203 | 18 | 910.8797 | 28 | 916.5430 | 38 | 921.8020 | 48 | 926.6566 |
| 9 | 906.0248 | 19 | 911.6885 | 29 | 917.3521 | 39 | 922.2066 | 49 | 927.0611 |
| 10 | 906.8339 | 20 | 912.0930 | 30 | 917.7566 | 40 | 922.6111 | 50 | 927.4656 |

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

| EUT CONFIGURE MODE | APPLICABLE TO | | | | DESCRIPTION |
|--------------------------|---------------|-----------|-----|------|--------------------|
| | RE \geq 1G | RE $<$ 1G | PLC | APCM | |
| A | ✓ | ✓ | ✓ | ✓ | EUT with adapter 1 |
| B | - | - | ✓ | - | EUT with adapter 2 |

Where RE \geq 1G: Radiated Emission above 1GHz

PLC: Power Line Conducted Emission

RE $<$ 1G: Radiated Emission below 1GHz

APCM: Antenna Port Conducted Measurement

NOTE:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.
2. “-”means no effect.

RADIATED EMISSION TEST (ABOVE 1GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

| EUT CONFIGURE MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TYPE |
|--------------------|-------------------|----------------|-----------------|
| A | 1 to 50 | 1, 25, 50 | MSK |

RADIATED EMISSION TEST (BELOW 1GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

| EUT CONFIGURE MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TYPE |
|--------------------|-------------------|----------------|-----------------|
| A | 1 to 50 | 1, 25, 50 | MSK |

POWER LINE CONDUCTED EMISSION TEST:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

| EUT CONFIGURE MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TYPE |
|--------------------|-------------------|----------------|-----------------|
| A | 1 to 50 | 1 | MSK |
| B | 1 to 50 | 1 | MSK |



A D T

BANDEDGE MEASUREMENT:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

| EUT CONFIGURE MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TYPE |
|--------------------|-------------------|----------------|-----------------|
| A | 1 to 50 | 1, 50 | MSK |

ANTENNA PORT CONDUCTED MEASUREMENT:

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

| EUT CONFIGURE MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TYPE |
|--------------------|-------------------|----------------|-----------------|
| A | 1 to 50 | 1, 25, 50 | MSK |

TEST CONDITION:

| APPLICABLE TO | ENVIRONMENTAL CONDITIONS | INPUT POWER | TESTED BY |
|---------------|--------------------------|--------------|-----------|
| RE \geq 1G | 25deg. C, 65%RH | 120Vac, 60Hz | Chris Lin |
| RE<1G | 25deg. C, 65%RH | 120Vac, 60Hz | Chris Lin |
| PLC | 25deg. C, 65%RH | 120Vac, 60Hz | Alan Wu |
| APCM | 25deg. C, 65%RH | 120Vac, 60Hz | Nick Chen |

3.3 DESCRIPTION OF SUPPORT UNITS

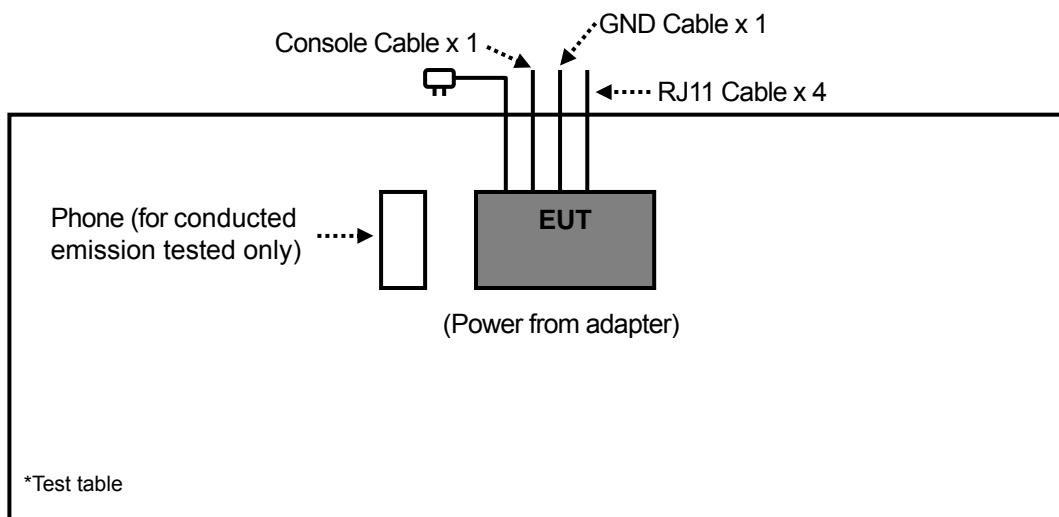
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| NO. | PRODUCT | BRAND | MODEL NO. | SERIAL NO. | FCC ID |
|-----|---------|----------|-----------|------------|--------------|
| 1 | PHONE | ENGENIUS | SP-922PRO | NA | U2M-SP922PRO |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|-----|---|
| 1 | NA |

NOTE: Item 1 was provided by client and for conducted emission tested only.

3.3.1 CONFIGURATION OF SYSTEM UNDER TEST



3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247)

ANSI C63.10-2009

All test items have been performed and recorded as per the above standards.

4. TEST TYPES AND RESULTS

4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

| FREQUENCIES (MHz) | FIELD STRENGTH (microvolts/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 |

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dB_uV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



A D T

4.1.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | DATE OF CALIBRATION | DUE DATE OF CALIBRATION |
|--|------------------------------|----------------------|---------------------|-------------------------|
| Test Receiver ROHDE & SCHWARZ | ESCS30 | 100289 | Nov. 16, 2012 | Nov. 15, 2013 |
| Spectrum Analyzer ROHDE & SCHWARZ | FSP40 | 100269 | Jan. 28, 2013 | Jan. 27, 2014 |
| BILOG Antenna SCHWARZBECK | VULB9168 | 9168-156 | Mar. 22, 2013 | Mar. 21, 2014 |
| HORN Antenna SCHWARZBECK | BBHA 9120 D | 9120D-209 | Sep. 03, 2012 | Sep. 02, 2013 |
| HORN Antenna SCHWARZBECK | BBHA 9170 | 148 | Jul. 11, 2012 | Jul. 10, 2013 |
| Loop Antenna | HFH2-Z2 | 100070 | Jan. 31, 2012 | Jan. 30, 2014 |
| Preamplifier Agilent | 8449B | 3008A01911 | Oct. 25, 2012 | Oct. 24, 2013 |
| Preamplifier Agilent | 8447D | 2944A10638 | Oct. 25, 2012 | Oct. 24, 2013 |
| RF signal cable HUBER+SUHNNER | SUCOFLEX 104 | 295013/4 283403/4 | Aug. 28, 2012 | Aug. 27, 2013 |
| RF signal cable Worken | 8D-FB | Cable-HYCH9-0 1 | Aug. 11, 2012 | Aug. 10, 2013 |
| Software BV ADT | ADT_Radiated_ V7.6.15.9.3 | NA | NA | NA |
| Antenna Tower EMCO | 2070/2080 | 512.835.4684 | NA | NA |
| Turn Table EMCO | 2087-2.03 | NA | NA | NA |
| Antenna Tower & Turn Table Controller EMCO | 2090 | NA | NA | NA |

NOTE:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in HwaYa Chamber 9.
4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
5. The FCC Site Registration No. is 215374.
6. The IC Site Registration No. is IC 7450F-9.

4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Height of receiving antenna 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.
- d. 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 rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

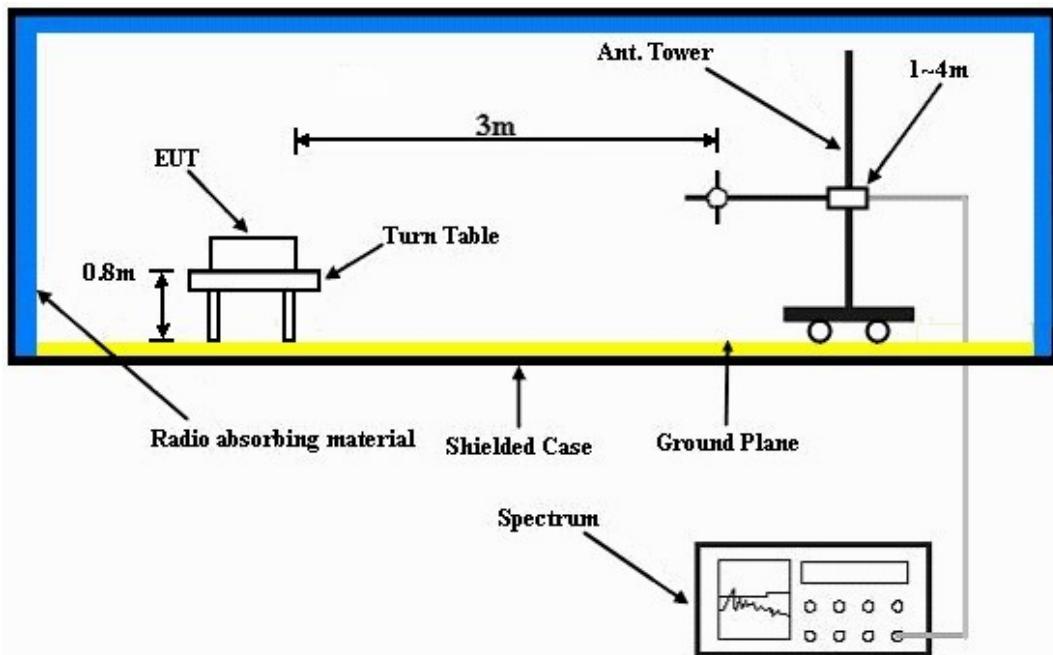
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 1kHz(Duty cycle < 98%) or 10Hz(Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

4.1.5 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT OPERATING CONDITIONS

- a. Placed the EUT on a testing table.
- b. Set the EUT under transmission condition continuously at specific channel frequency.
- c. The necessary accessories enable the system in full functions.



A D T

4.1.7 TEST RESULTS

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 1 | FREQUENCY RANGE | Below 1000MHz |
| INPUT POWER | 120Vac, 60Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 65%RH | TESTED BY | Chris Lin |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|----------------|-------------------------------|-------------------|----------------|--------------------------|----------------------------|------------------------|--------------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | #902.00 | 53.2 PK | 69.7 | -16.5 | 1.00 H | 0 | 26.30 | 26.90 |
| 2 | #902.00 | 46.7 AV | 63.2 | -16.5 | 1.00 H | 0 | 19.80 | 26.90 |
| 3 | *902.38 | 89.7 PK | | | 1.00 H | 0 | 62.80 | 26.90 |
| 4 | *902.38 | 83.2 AV | | | 1.00 H | 0 | 56.30 | 26.90 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | #902.00 | 64.5 PK | 80.7 | -16.2 | 1.00 V | 17 | 37.60 | 26.90 |
| 2 | #902.00 | 58.0 AV | 74.2 | -16.2 | 1.00 V | 17 | 31.10 | 26.90 |
| 3 | *902.38 | 100.7 PK | | | 1.00 V | 17 | 73.80 | 26.90 |
| 4 | *902.38 | 94.2 AV | | | 1.00 V | 17 | 67.30 | 26.90 |

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “*”: Fundamental frequency.
6. "#":The radiated frequency is out the restricted band.



A D T

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 25 | FREQUENCY RANGE | Below 1000MHz |
| INPUT POWER | 120Vac, 60Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 65%RH | TESTED BY | Chris Lin |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|----------------|-------------------------------|-------------------|----------------|--------------------------|----------------------------|------------------------|--------------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *914.92 | 92.2 PK | | | 1.00 H | 360 | 65.20 | 27.00 |
| 2 | *914.92 | 85.7 AV | | | 1.00 H | 360 | 58.70 | 27.00 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *914.92 | 101.1 PK | | | 1.00 V | 19 | 74.10 | 27.00 |
| 2 | *914.92 | 94.6 AV | | | 1.00 V | 19 | 67.60 | 27.00 |

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “*”: Fundamental frequency.



A D T

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 50 | FREQUENCY RANGE | Below 1000MHz |
| INPUT POWER | 120Vac, 60Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 65%RH | TESTED BY | Chris Lin |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|----------------|-------------------------------|-------------------|----------------|--------------------------|----------------------------|------------------------|--------------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *927.46 | 91.9 QP | | | 1.00 H | 2 | 64.80 | 27.10 |
| 2 | *927.46 | 85.4 QP | | | 1.00 H | 2 | 58.30 | 27.10 |
| 3 | #928.00 | 47.2 QP | 71.9 | -24.7 | 1.00 H | 2 | 20.10 | 27.10 |
| 4 | #928.00 | 40.7 QP | 65.4 | -24.7 | 1.00 H | 2 | 13.60 | 27.10 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *927.46 | 101.2 QP | | | 1.00 V | 19 | 74.10 | 27.10 |
| 2 | *927.46 | 94.7 QP | | | 1.00 V | 19 | 67.60 | 27.10 |
| 3 | #928.00 | 48.6 QP | 81.2 | -32.6 | 1.00 V | 19 | 21.50 | 27.10 |
| 4 | #928.00 | 42.1 QP | 74.7 | -32.6 | 1.00 V | 19 | 15.00 | 27.10 |

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “*”: Fundamental frequency.
6. "#": The radiated frequency is out the restricted band.



A D T

ABOVE 1GHz DATA

| EUT TEST CONDITION | | MEASUREMENT DETAIL | | |
|--------------------------|--|--------------------|--|---|
| CHANNEL | | Channel 1 | | FREQUENCY RANGE 1 ~ 10GHz |
| INPUT POWER | | 120Vac, 60Hz | | DETECTOR FUNCTION Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | | 25deg. C, 65%RH | | TESTED BY Chris Lin |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 1804.70 | 42.3 PK | 74.0 | -31.7 | 1.18 H | 304 | 9.10 | 33.20 |
| 2 | 1804.70 | 27.5 AV | 54.0 | -26.5 | 1.18 H | 304 | -5.70 | 33.20 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 1804.70 | 42.2 PK | 74.0 | -31.8 | 1.25 V | 69 | 9.00 | 33.20 |
| 2 | 1804.70 | 30.1 AV | 54.0 | -23.9 | 1.25 V | 69 | -3.10 | 33.20 |

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



A D T

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 25 | FREQUENCY RANGE | 1 ~ 10GHz |
| INPUT POWER | 120Vac, 60Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 65%RH | TESTED BY | Chris Lin |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|----------------|-------------------------------|-------------------|----------------|--------------------------|----------------------------|------------------------|--------------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 1829.80 | 41.2 PK | 74.0 | -32.8 | 1.16 H | 308 | 7.90 | 33.30 |
| 2 | 1829.80 | 27.8 AV | 54.0 | -26.2 | 1.16 H | 308 | -5.50 | 33.30 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 1829.80 | 43.2 PK | 74.0 | -30.8 | 1.15 V | 32 | 9.90 | 33.30 |
| 2 | 1829.80 | 28.8 AV | 54.0 | -25.2 | 1.15 V | 32 | -4.50 | 33.30 |

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



A D T

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 50 | FREQUENCY RANGE | 1 ~ 10GHz |
| INPUT POWER | 120Vac, 60Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 65%RH | TESTED BY | Chris Lin |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|----------------|-------------------------------|-------------------|----------------|--------------------------|----------------------------|------------------------|--------------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 1854.90 | 43.4 PK | 74.0 | -30.6 | 1.03 H | 65 | 9.90 | 33.50 |
| 2 | 1854.90 | 28.7 AV | 54.0 | -25.3 | 1.03 H | 65 | -4.80 | 33.50 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 1854.90 | 40.6 PK | 74.0 | -33.4 | 1.08 V | 65 | 7.10 | 33.50 |
| 2 | 1854.90 | 28.4 AV | 54.0 | -25.6 | 1.08 V | 65 | -5.10 | 33.50 |

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



A D T

BELOW 1GHz WORST-CASE DATA

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------|
| CHANNEL | Channel 1 | FREQUENCY RANGE | Below 1000MHz |
| INPUT POWER | 120Vac, 60Hz | DETECTOR FUNCTION | Quasi-Peak |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 65%RH | TESTED BY | Chris Lin |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|----------------|-------------------------------|-------------------|----------------|--------------------------|----------------------------|------------------------|--------------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 37.66 | 37.4 QP | 40.0 | -2.6 | 1.24 H | 236 | 23.80 | 13.60 |
| 2 | 196.77 | 35.8 QP | 43.5 | -7.7 | 1.00 H | 260 | 25.10 | 10.70 |
| 3 | 262.75 | 42.1 QP | 46.0 | -3.9 | 1.50 H | 142 | 28.80 | 13.30 |
| 4 | 295.73 | 40.4 QP | 46.0 | -5.6 | 1.50 H | 30 | 26.00 | 14.40 |
| 5 | 730.38 | 38.1 QP | 46.0 | -7.9 | 1.00 H | 197 | 13.90 | 24.20 |
| 6 | 943.83 | 45.0 QP | 46.0 | -1.0 | 1.24 H | 193 | 17.80 | 27.20 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 229.76 | 37.2 QP | 46.0 | -8.8 | 1.24 V | 332 | 25.30 | 11.90 |
| 2 | 262.75 | 36.2 QP | 46.0 | -9.8 | 1.00 V | 25 | 22.90 | 13.30 |
| 3 | 303.50 | 35.6 QP | 46.0 | -10.4 | 1.50 V | 158 | 21.00 | 14.60 |
| 4 | 565.45 | 37.1 QP | 46.0 | -8.9 | 1.00 V | 24 | 15.60 | 21.50 |
| 5 | 837.11 | 36.1 QP | 46.0 | -9.9 | 1.24 V | 276 | 10.20 | 25.90 |
| 6 | 943.83 | 45.0 QP | 46.0 | -1.0 | 1.50 V | 47 | 17.80 | 27.20 |

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



A D T

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------|
| CHANNEL | Channel 25 | FREQUENCY RANGE | Below 1000MHz |
| INPUT POWER | 120Vac, 60Hz | DETECTOR FUNCTION | Quasi-Peak |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 65%RH | TESTED BY | Chris Lin |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|----------------|-------------------------------|-------------------|----------------|--------------------------|----------------------------|------------------------|--------------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 163.79 | 31.1 QP | 43.5 | -12.4 | 1.24 H | 208 | 17.70 | 13.40 |
| 2 | 262.75 | 41.3 QP | 46.0 | -4.7 | 1.00 H | 139 | 28.00 | 13.30 |
| 3 | 336.48 | 37.4 QP | 46.0 | -8.6 | 1.50 H | 323 | 21.90 | 15.50 |
| 4 | 598.44 | 36.3 QP | 46.0 | -9.7 | 1.00 H | 216 | 13.90 | 22.40 |
| 5 | 730.38 | 37.7 QP | 46.0 | -8.3 | 1.24 H | 205 | 13.50 | 24.20 |
| 6 | 858.45 | 38.0 QP | 46.0 | -8.0 | 1.50 H | 248 | 11.80 | 26.20 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 45.42 | 38.4 QP | 40.0 | -1.6 | 1.24 V | 279 | 24.40 | 14.00 |
| 2 | 70.65 | 33.4 QP | 40.0 | -6.6 | 1.00 V | 336 | 22.20 | 11.20 |
| 3 | 229.76 | 37.0 QP | 46.0 | -9.0 | 1.50 V | 315 | 25.10 | 11.90 |
| 4 | 565.45 | 37.0 QP | 46.0 | -9.0 | 1.00 V | 8 | 15.50 | 21.50 |
| 5 | 666.35 | 35.4 QP | 46.0 | -10.6 | 1.24 V | 257 | 12.10 | 23.30 |
| 6 | 957.41 | 44.5 QP | 46.0 | -1.5 | 1.50 V | 39 | 17.20 | 27.30 |

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



A D T

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------|
| CHANNEL | Channel 50 | FREQUENCY RANGE | Below 1000MHz |
| INPUT POWER | 120Vac, 60Hz | DETECTOR FUNCTION | Quasi-Peak |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 65%RH | TESTED BY | Chris Lin |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|----------------|-------------------------------|-------------------|----------------|--------------------------|----------------------------|------------------------|--------------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 196.77 | 35.6 QP | 43.5 | -7.9 | 1.24 H | 254 | 24.90 | 10.70 |
| 2 | 262.75 | 41.8 QP | 46.0 | -4.2 | 1.50 H | 211 | 28.50 | 13.30 |
| 3 | 303.50 | 38.8 QP | 46.0 | -7.2 | 1.00 H | 295 | 24.20 | 14.60 |
| 4 | 369.47 | 33.8 QP | 46.0 | -12.2 | 1.24 H | 53 | 17.30 | 16.50 |
| 5 | 598.44 | 37.0 QP | 46.0 | -9.0 | 1.50 H | 218 | 14.60 | 22.40 |
| 6 | 730.38 | 37.6 QP | 46.0 | -8.4 | 1.24 H | 207 | 13.40 | 24.20 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 70.65 | 34.3 QP | 40.0 | -5.7 | 1.24 V | 189 | 23.10 | 11.20 |
| 2 | 229.76 | 37.1 QP | 46.0 | -8.9 | 1.00 V | 317 | 25.20 | 11.90 |
| 3 | 303.50 | 34.2 QP | 46.0 | -11.8 | 1.50 V | 159 | 19.60 | 14.60 |
| 4 | 565.45 | 36.4 QP | 46.0 | -9.6 | 1.24 V | 3 | 14.90 | 21.50 |
| 5 | 666.35 | 35.7 QP | 46.0 | -10.3 | 1.50 V | 247 | 12.40 | 23.30 |
| 6 | 850.69 | 38.8 QP | 46.0 | -7.2 | 1.00 V | 283 | 12.70 | 26.10 |

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



A D T

4.2 CONDUCTED EMISSION MEASUREMENT

4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| FREQUENCY OF EMISSION (MHz) | CONDUCTED LIMIT (dB μ V) | |
|-----------------------------|------------------------------|----------|
| | Quasi-peak | Average |
| 0.15 ~ 0.5 | 66 to 56 | 56 to 46 |
| 0.5 ~ 5 | 56 | 46 |
| 5 ~ 30 | 60 | 50 |

NOTE: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.2.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | DATE OF CALIBRATION | DUE DATE OF CALIBRATION |
|---|----------------------|----------------|---------------------|-------------------------|
| Test Receiver ROHDE & SCHWARZ | ESCS30 | 100289 | Nov. 16, 2012 | Nov. 15, 2013 |
| RF signal cable Woken | 5D-FB | Cable-HYC01-01 | Dec. 28, 2012 | Dec. 27, 2013 |
| LISN ROHDE & SCHWARZ (Peripheral) | ESH3-Z5 | 100312 | Jul. 02, 2012 | Jul. 01, 2013 |
| LISN ROHDE & SCHWARZ (EUT) | ESH3-Z5 | 835239/001 | Feb. 04, 2013 | Feb. 03, 2014 |
| Software ADT | BV ADT_Cond_V7.3.7.3 | NA | NA | NA |

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-2040.

4.2.3 TEST PROCEDURES

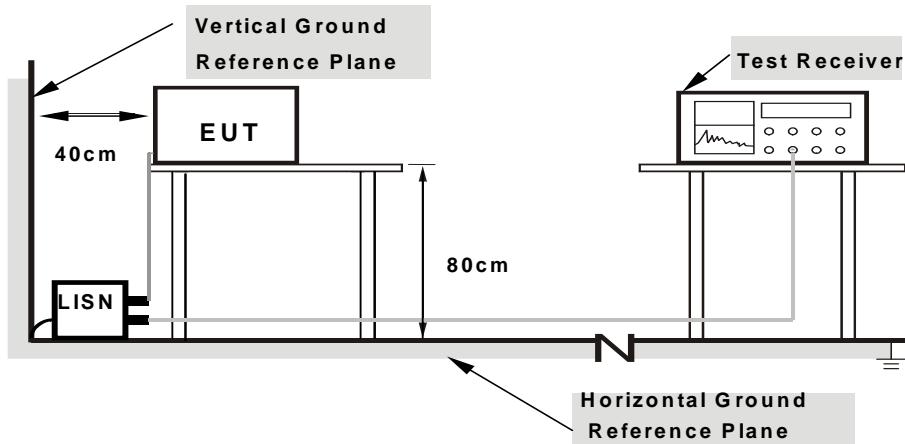
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



Note:

1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

4.2.7 TEST RESULTS

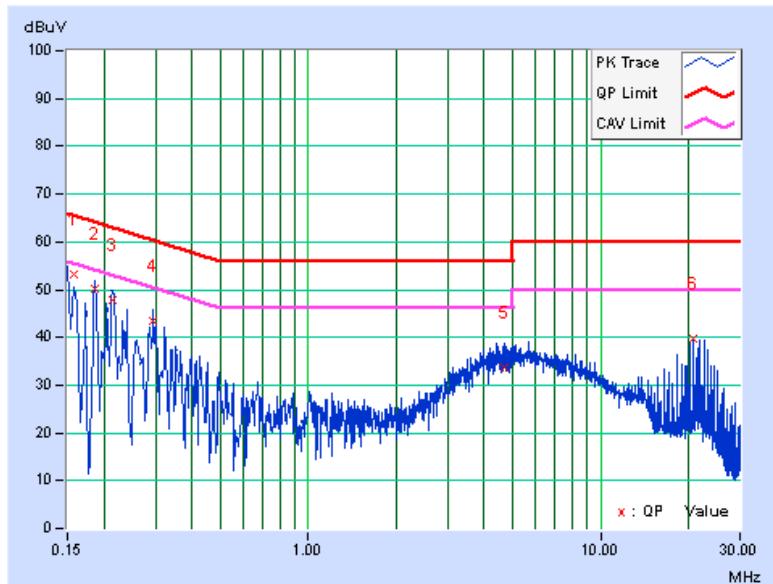
CONDUCTED WORST-CASE DATA :

| | | | |
|-----------|--------|---------------|------|
| PHASE | Line 1 | 6dB BANDWIDTH | 9kHz |
| TEST MODE | A | | |

| No | Freq. | Corr. Factor | Reading Value | | Emission Level | | Limit | | Margin | |
|----|----------|--------------|---------------|-------|----------------|-------|-----------|-------|--------|--------|
| | | | [dB (uV)] | | [dB (uV)] | | [dB (uV)] | | (dB) | |
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.15782 | 0.16 | 53.16 | 40.99 | 53.32 | 41.15 | 65.58 | 55.58 | -12.26 | -14.43 |
| 2 | 0.18519 | 0.16 | 50.15 | 38.18 | 50.31 | 38.34 | 64.25 | 54.25 | -13.94 | -15.91 |
| 3 | 0.21282 | 0.16 | 47.53 | 35.22 | 47.69 | 35.38 | 63.09 | 53.09 | -15.40 | -17.71 |
| 4 | 0.29467 | 0.19 | 43.20 | 30.74 | 43.39 | 30.93 | 60.39 | 50.39 | -17.00 | -19.46 |
| 5 | 4.68560 | 0.44 | 33.24 | 25.27 | 33.68 | 25.71 | 56.00 | 46.00 | -22.32 | -20.29 |
| 6 | 20.85736 | 1.27 | 38.49 | 35.40 | 39.76 | 36.67 | 60.00 | 50.00 | -20.24 | -13.33 |

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

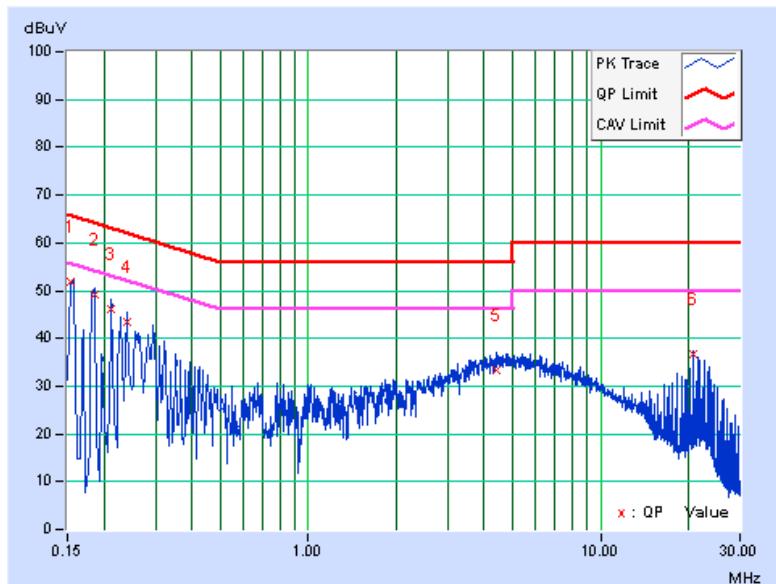


| | | | |
|-----------|--------|---------------|------|
| PHASE | Line 2 | 6dB BANDWIDTH | 9kHz |
| TEST MODE | A | | |

| No | Freq. | Corr. Factor | Reading Value | | Emission Level | | Limit | | Margin | |
|----|----------|--------------|---------------|-------|----------------|-------|-----------|-------|--------|--------|
| | | | [dB (uV)] | | [dB (uV)] | | [dB (uV)] | | (dB) | |
| | | | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.15391 | 0.17 | 51.53 | 36.73 | 51.70 | 36.90 | 65.79 | 55.79 | -14.09 | -18.89 |
| 2 | 0.18508 | 0.17 | 48.90 | 36.65 | 49.07 | 36.82 | 64.25 | 54.25 | -15.19 | -17.44 |
| 3 | 0.21256 | 0.17 | 46.03 | 34.38 | 46.20 | 34.55 | 63.10 | 53.10 | -16.90 | -18.55 |
| 4 | 0.23993 | 0.18 | 43.24 | 33.80 | 43.42 | 33.98 | 62.10 | 52.10 | -18.67 | -18.11 |
| 5 | 4.39235 | 0.39 | 32.91 | 26.52 | 33.30 | 26.91 | 56.00 | 46.00 | -22.70 | -19.09 |
| 6 | 20.86127 | 0.96 | 35.83 | 34.52 | 36.79 | 35.48 | 60.00 | 50.00 | -23.21 | -14.52 |

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

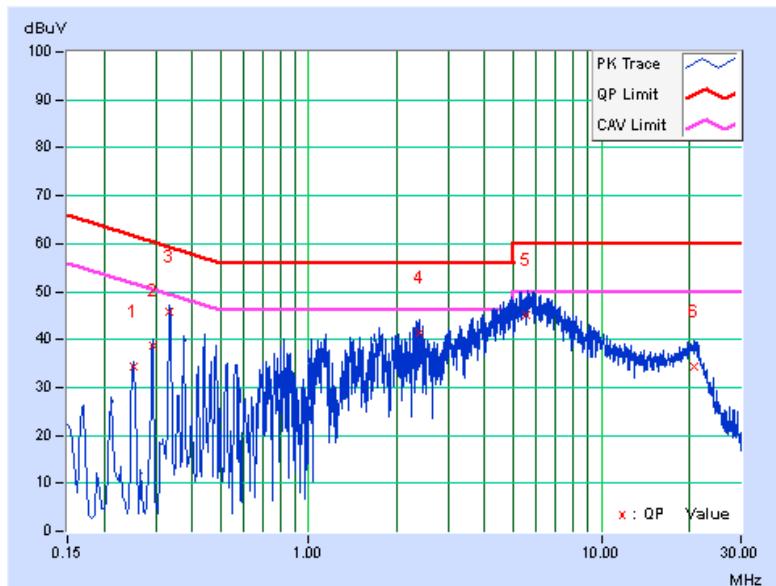


| | | | |
|-----------|--------|---------------|------|
| PHASE | Line 1 | 6dB BANDWIDTH | 9kHz |
| TEST MODE | B | | |

| No | Freq. | Corr. Factor | Reading Value | | Emission Level | | Limit | | Margin | |
|----|----------|--------------|---------------|-------|----------------|-------|-----------|-------|--------|--------|
| | | | [dB (uV)] | | [dB (uV)] | | [dB (uV)] | | (dB) | |
| | | | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.25166 | 0.18 | 34.22 | 25.16 | 34.40 | 25.34 | 61.70 | 51.70 | -27.30 | -26.36 |
| 2 | 0.29467 | 0.19 | 38.65 | 28.61 | 38.84 | 28.80 | 60.39 | 50.39 | -21.55 | -21.59 |
| 3 | 0.33396 | 0.21 | 45.46 | 33.20 | 45.67 | 33.41 | 59.35 | 49.35 | -13.69 | -15.95 |
| 4 | 2.40216 | 0.31 | 41.23 | 26.84 | 41.54 | 27.15 | 56.00 | 46.00 | -14.46 | -18.85 |
| 5 | 5.50670 | 0.48 | 44.63 | 31.82 | 45.11 | 32.30 | 60.00 | 50.00 | -14.89 | -17.70 |
| 6 | 20.69314 | 1.26 | 33.05 | 25.40 | 34.31 | 26.66 | 60.00 | 50.00 | -25.69 | -23.34 |

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

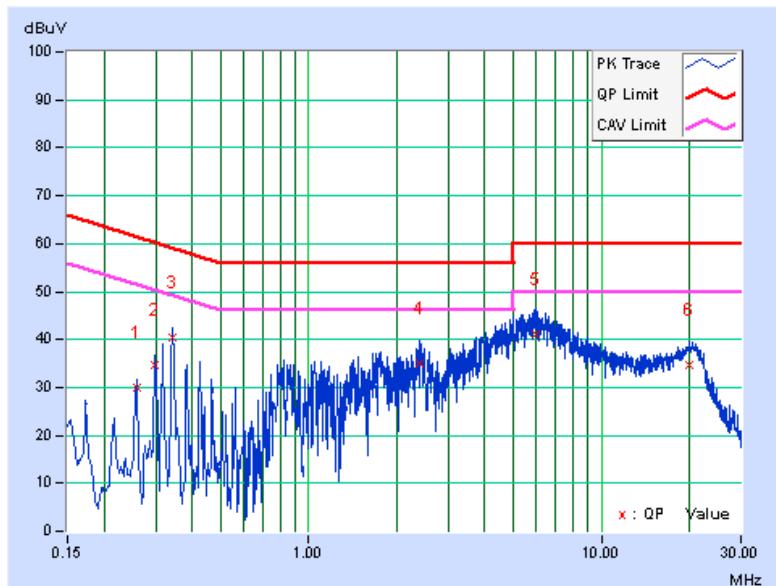


| | | | |
|-----------|--------|---------------|------|
| PHASE | Line 2 | 6dB BANDWIDTH | 9kHz |
| TEST MODE | B | | |

| No | Freq. | Corr. Factor | Reading Value | | Emission Level | | Limit | | Margin | |
|----|----------|--------------|---------------|-------|----------------|-------|-----------|-------|--------|--------|
| | | | [dB (uV)] | | [dB (uV)] | | [dB (uV)] | | (dB) | |
| | | | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.25948 | 0.19 | 29.77 | 19.34 | 29.96 | 19.53 | 61.45 | 51.45 | -31.49 | -31.92 |
| 2 | 0.29858 | 0.20 | 34.53 | 24.23 | 34.73 | 24.43 | 60.28 | 50.28 | -25.55 | -25.85 |
| 3 | 0.34159 | 0.22 | 40.18 | 28.67 | 40.40 | 28.89 | 59.16 | 49.16 | -18.76 | -20.27 |
| 4 | 2.38261 | 0.30 | 34.74 | 19.84 | 35.04 | 20.14 | 56.00 | 46.00 | -20.96 | -25.86 |
| 5 | 5.97981 | 0.45 | 40.67 | 28.76 | 41.12 | 29.21 | 60.00 | 50.00 | -18.88 | -20.79 |
| 6 | 20.07927 | 0.93 | 33.67 | 26.35 | 34.60 | 27.28 | 60.00 | 50.00 | -25.40 | -22.72 |

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

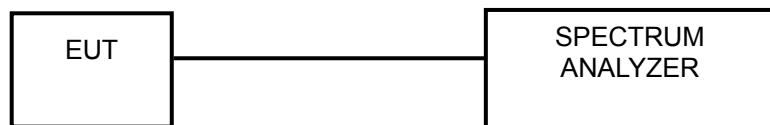


4.3 NUMBER OF HOPPING FREQUENCY USED

4.3.1 LIMIT OF HOPPING FREQUENCY USED

At least 50 channels frequencies, and should be equally spaced.

4.3.2 TEST SETUP



4.3.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.3.4 TEST PROCEDURES

- a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
- c. Set the SA on MaxHold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.
- d. Set the SA on View mode and then plot the result on SA screen.
- e. Repeat above procedures until all frequencies measured were complete.

4.3.5 DEVIATION FROM TEST STANDARD

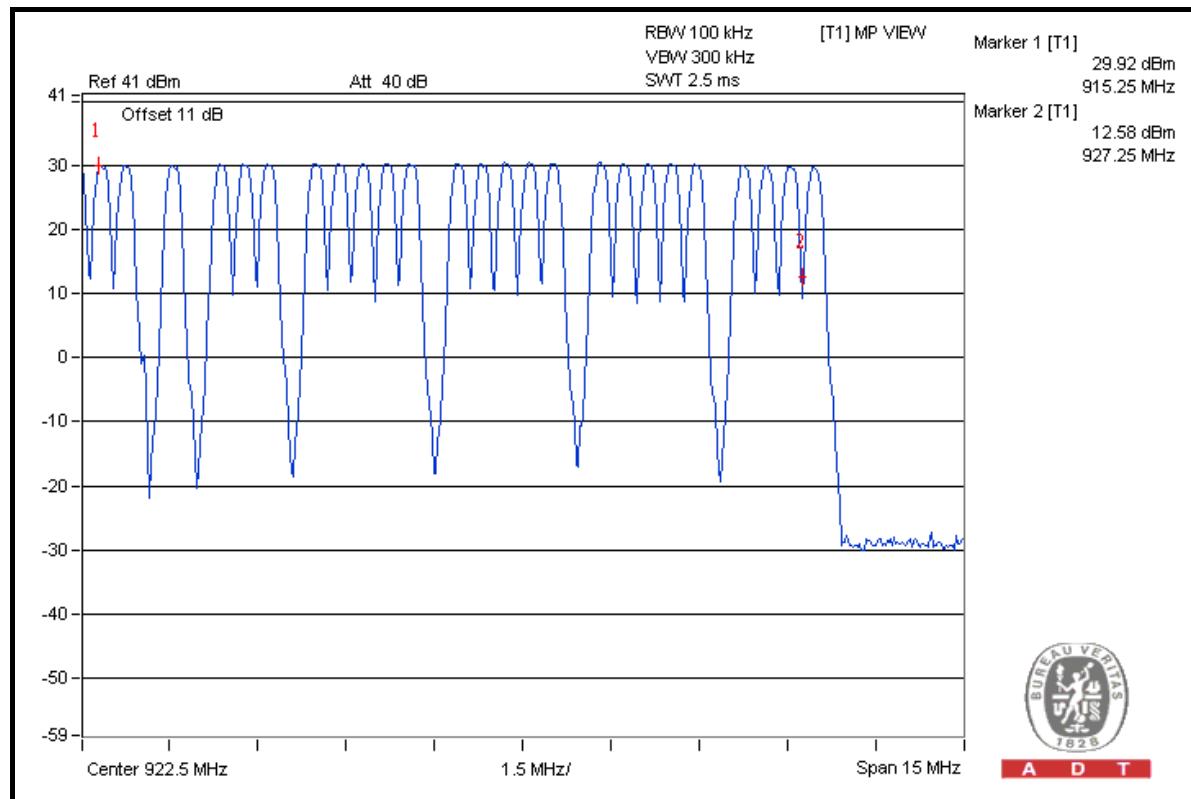
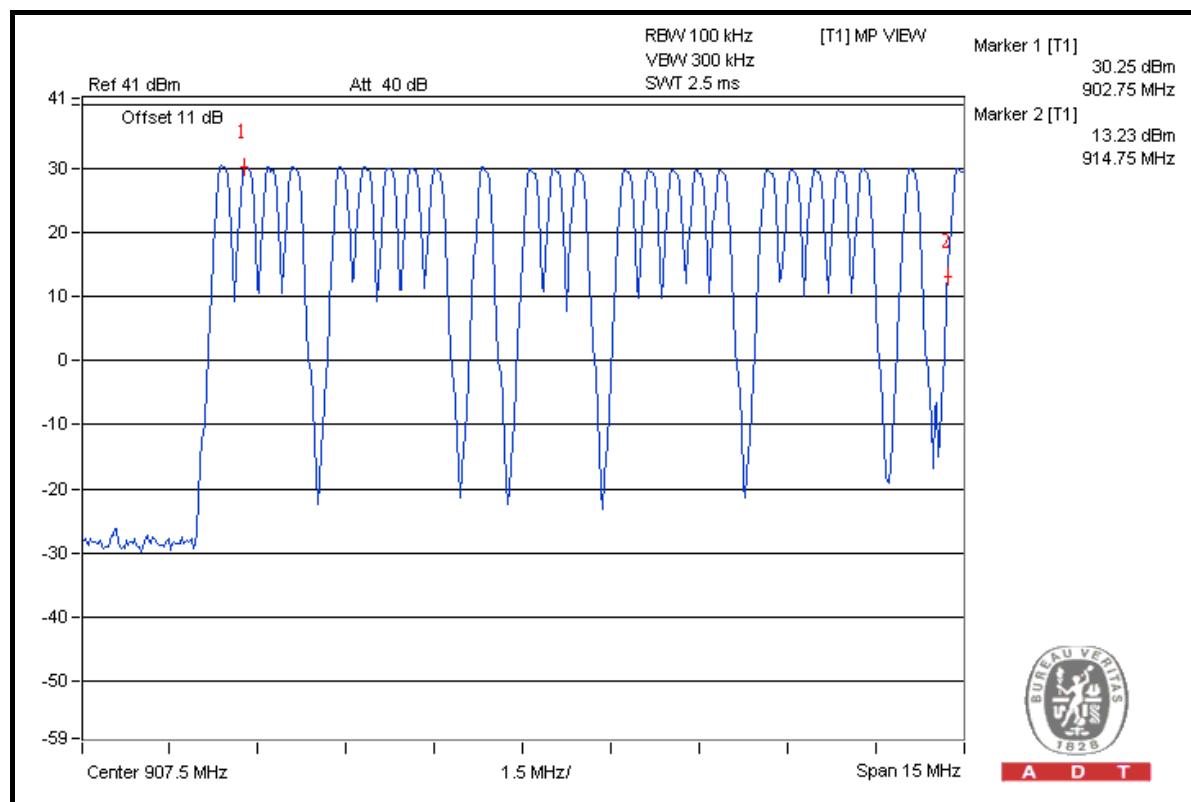
No deviation.

4.3.6 TEST RESULTS

There are 50 hopping frequencies in the hopping mode. Please refer to next page for the test result. On the plots, it shows that the hopping frequencies are equally spaced.



A D T

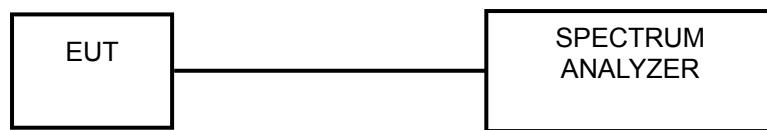


4.4 DWELL TIME ON EACH CHANNEL

4.4.1 LIMIT OF DWELL TIME USED

The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.4.4 TEST PROCEDURES

- a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
- c. Adjust the center frequency of SA on any frequency to be measured and set SA to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
- d. Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
- e. Repeat above procedures until all different time-slot modes have been completed.

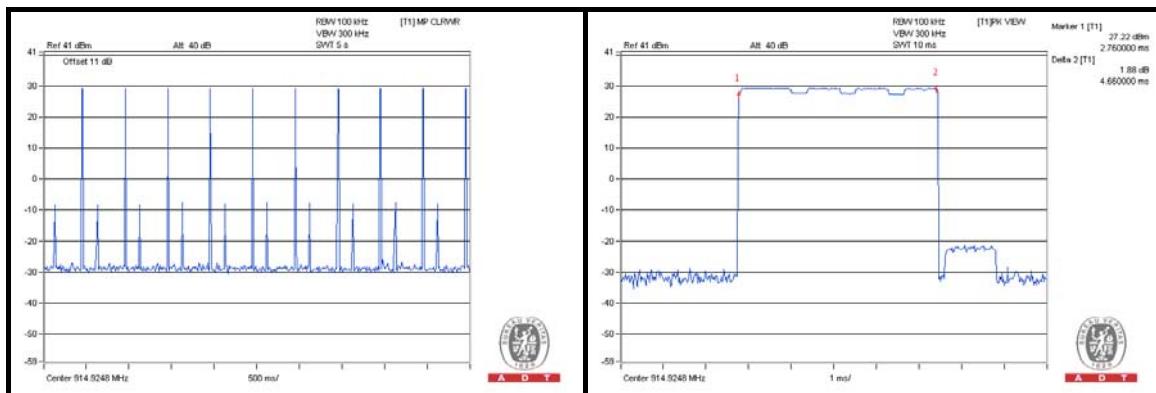
4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 TEST RESULTS

| Length of transmission time (ms) | TX Burst of 20s period | Result | Limit |
|----------------------------------|------------------------|----------------|-------------|
| 4.66 | 40 | 186.40ms / 20s | 400ms / 20s |

NOTE: Test plots of the transmitting time slot are shown on following.

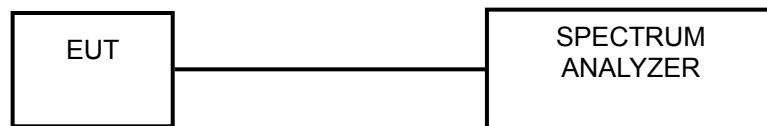


4.5 CHANNEL BANDWIDTH

4.5.1 LIMITS OF CHANNEL BANDWIDTH

The 20 dB bandwidth of the hopping channel shall be less than 250 kHz.

4.5.2 TEST SETUP



4.5.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.5.4 TEST PROCEDURE

- a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- c. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
- d. Repeat above procedures until all frequencies measured were complete.

4.5.5 DEVIATION FROM TEST STANDARD

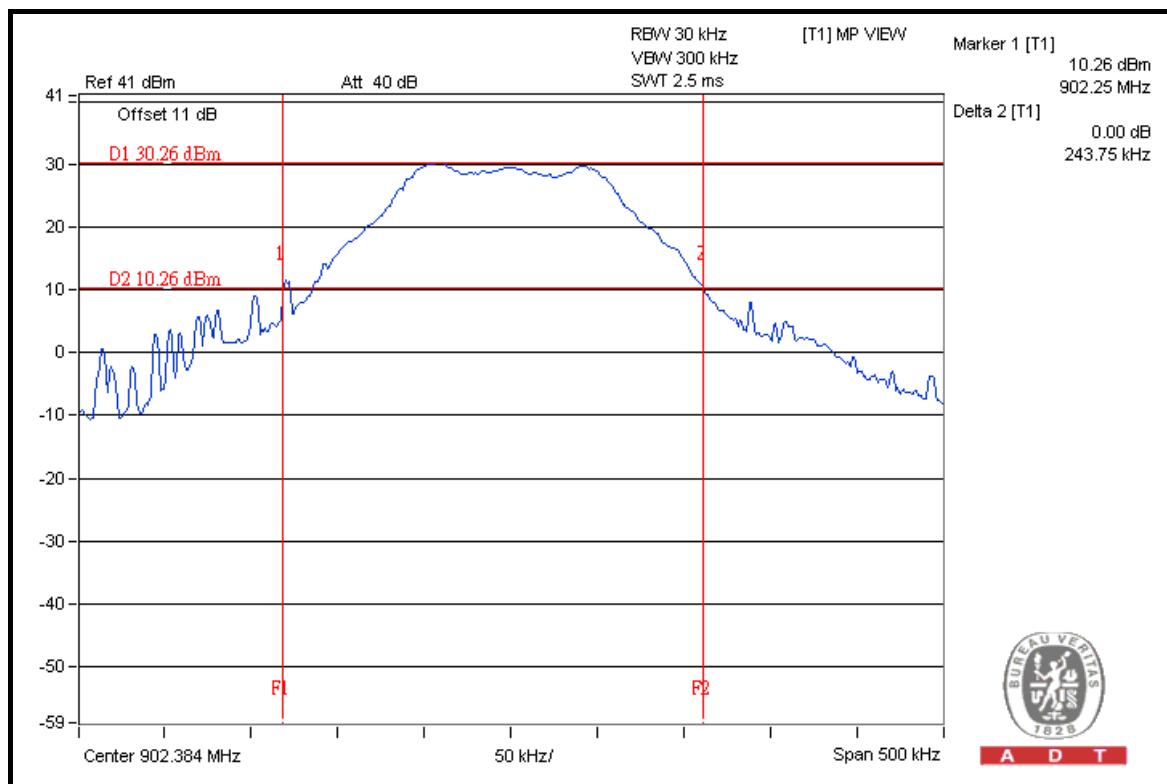
No deviation.

4.5.6 EUT OPERATING CONDITION

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.5.7 TEST RESULTS

| CHANNEL | CHANNEL FREQUENCY (MHz) | 20dB BANDWIDTH (kHz) | LIMIT (kHz) |
|---------|-------------------------|----------------------|-------------|
| 1 | 902.3840 | 243.75 | 250 |
| 25 | 914.9248 | 235.45 | 250 |
| 50 | 927.4656 | 231.92 | 250 |

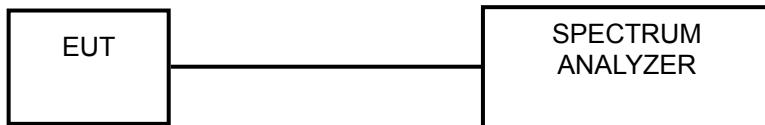


4.6 HOPPING CHANNEL SEPARATION

4.6.1 LIMIT OF HOPPING CHANNEL SEPARATION

At least 25kHz or 20dB hopping channel bandwidth (whichever is greater).

4.6.2 TEST SETUP



4.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.6.4 TEST PROCEDURES

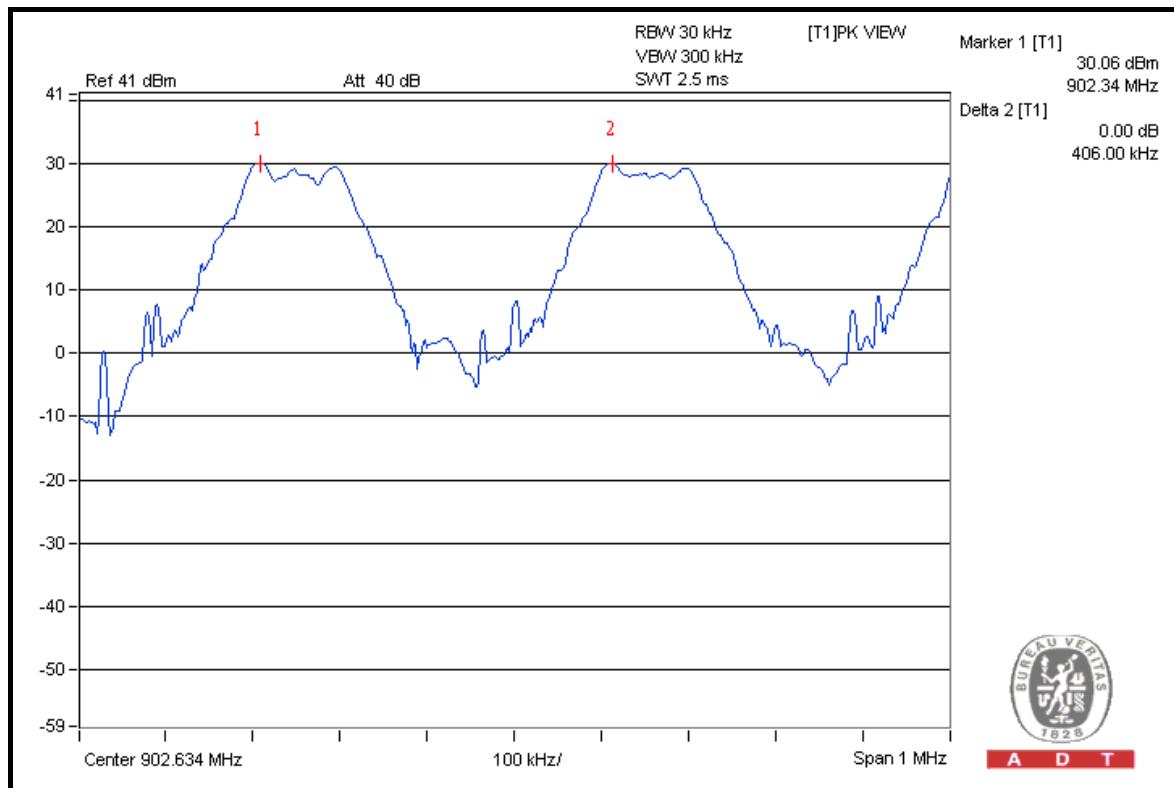
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
3. By using the MaxHold function record the separation of two adjacent channels.
4. Measure the frequency difference of these two adjacent channels by SA MARK function. And then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 TEST RESULTS

| CHANNEL | FREQUENCY (MHz) | ADJACENT CHANNEL SEPARATION (kHz) | MINIMUM LIMIT (kHz) | PASS / FAIL |
|---------|-----------------|-----------------------------------|---------------------|-------------|
| 1 | 902.3840 | 406.00 | 243.75 | PASS |
| 25 | 914.9248 | 406.00 | 243.75 | PASS |
| 50 | 927.4656 | 406.00 | 243.75 | PASS |

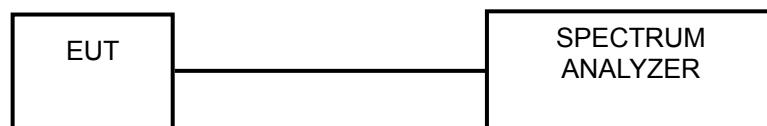


4.7 MAXIMUM OUTPUT POWER

4.7.1 LIMITS OF MAXIMUM OUTPUT POWER MEASUREMENT

The Maximum Output Power Measurement is 30dBm.

4.7.2 TEST SETUP



4.7.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.7.4 TEST PROCEDURES

- a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- c. The center frequency of the spectrum analyzer is set to the fundamental frequency and using 1MHz RBW and 3 MHz VBW.
- d. Measure the captured power within the band and recording the plot.
- e. Repeat above procedures until all frequencies required were complete.

4.7.5 DEVIATION FROM TEST STANDARD

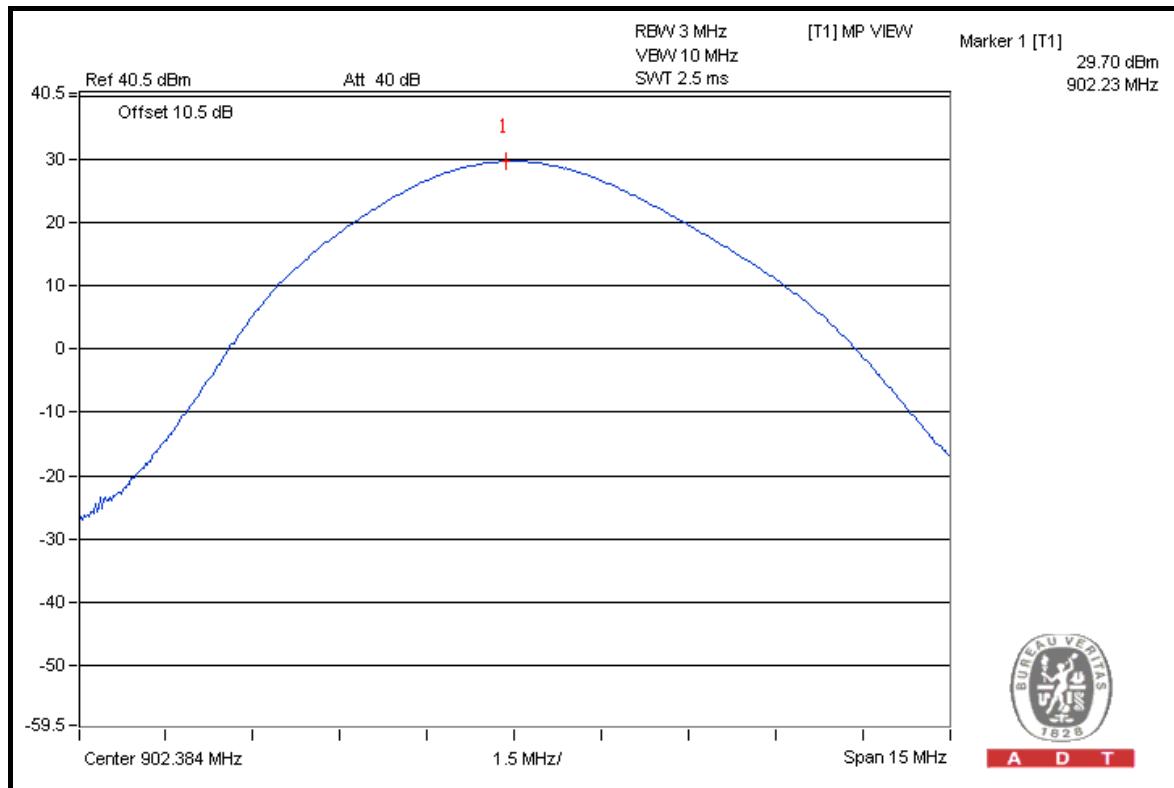
No deviation

4.7.6 EUT OPERATING CONDITION

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.7.7 TEST RESULTS

| CHANNEL | CHANNEL FREQUENCY (MHz) | POWER OUTPUT (mW) | POWER OUTPUT (dBm) | POWER LIMIT (dBm) | PASS/FAIL |
|---------|-------------------------|-------------------|--------------------|-------------------|-----------|
| 1 | 902.3840 | 933.254 | 29.70 | 30 | PASS |
| 25 | 914.9248 | 887.156 | 29.48 | 30 | PASS |
| 50 | 927.4656 | 822.243 | 29.15 | 30 | PASS |





4.8 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

4.8.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100KHz RBW).

4.8.2 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.8.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set both RBW and VBW of spectrum analyzer to 100 / 300 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

4.8.4 DEVIATION FROM TEST STANDARD

No deviation.

4.8.5 EUT OPERATING CONDITION

The software provided by client enabled the EUT to transmit and receive data at lowest and highest channel frequencies individually.

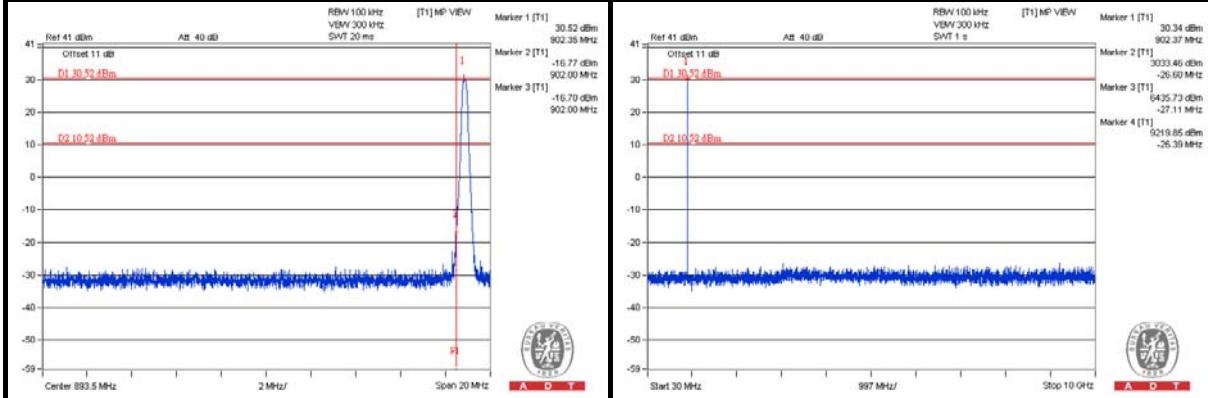
4.8.6 TEST RESULTS

The spectrum plots are attached on the following images. D1 line indicates the highest level, D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

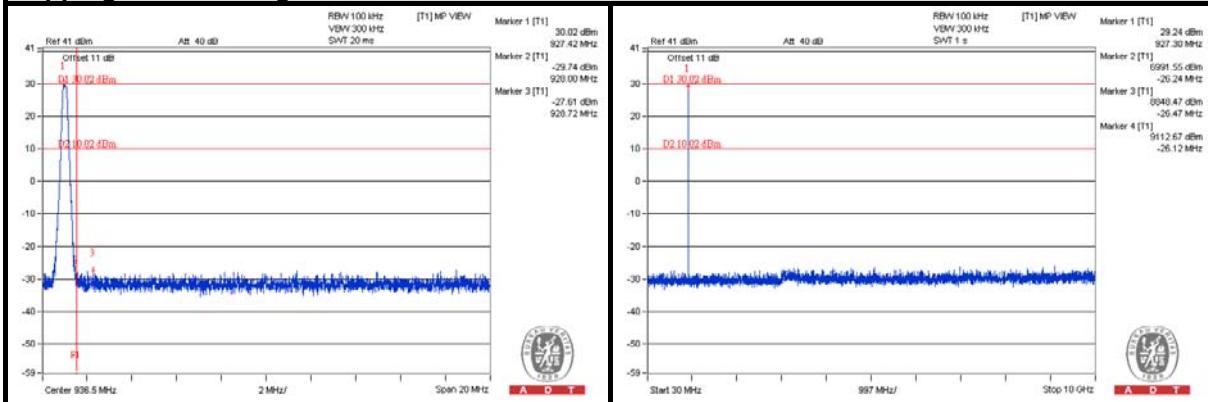


A D T

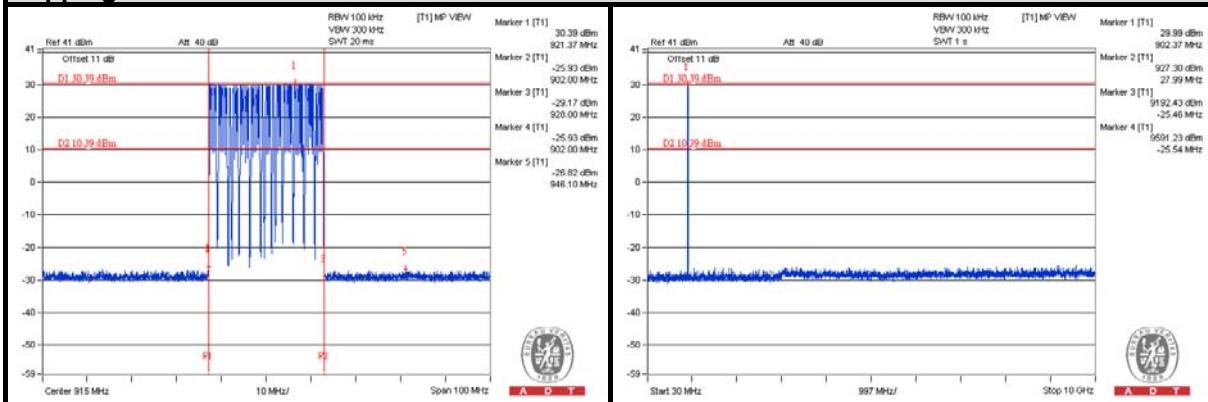
Hopping disabled_Low Channel



Hopping disabled_High Channel



Hopping enabled





5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



6. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:

Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Telecom Lab:

Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.



A D T

7. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---