

# Test Report of FCC Part 15 C for FCC Certificate

On Behalf of

## Shenzhen Roadrover Technology Co., Ltd

**FCC ID:** AJBB6241  
**Product Description:** Multifunctional Navigation and Entertainment System  
**Model No.:** B6241  
**Supplementary Model No.:** Please see General Information of this report

**Prepared for:** Shenzhen Roadrover Technology Co., Ltd  
8F, Dawning Building, Hi-tech Industrial Park, Nanshan District, Shenzhen

**Prepared by:** Bontek Compliance Testing Laboratory Ltd  
1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China  
Tel: 86-755-86337020  
Fax: 86-755-86337028

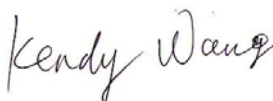
**Report No.:** BCT11JR-1734E

**Issue Date:** February 20, 2012

**Test Date:** December 2, 2011~February 20, 2012

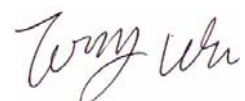
**Test by:**

**Reviewed By:**



---

Kendy Wang



---

Tony Wu

## TABLE OF CONTENTS

|   |           |
|---|-----------|
| <b>1. GENERAL INFORMATION .....</b>                         | <b>4</b>  |
| 1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)..... | 4         |
| 1.2 RELATED SUBMITTAL(S) / GRANT (S) .....                  | 5         |
| 1.3 TEST METHODOLOGY .....                                  | 5         |
| 1.4 TEST FACILITY .....                                     | 5         |
| <b>2. SYSTEM TEST CONFIGURATION.....</b>                    | <b>6</b>  |
| 2.1 EUT CONFIGURATION.....                                  | 6         |
| 2.2 EUT EXERCISE .....                                      | 6         |
| 2.3 GENERAL TEST PROCEDURES.....                            | 6         |
| 2.4 LIST OF MEASURING EQUIPMENTS USED .....                 | 7         |
| <b>3. SUMMARY OF TEST RESULTS.....</b>                      | <b>9</b>  |
| <b>4 – DISTURBANCE VOLTAGE AT THE MAINS TERMINALS .....</b> | <b>10</b> |
| 4.1 MEASUREMENT UNCERTAINTY .....                           | 10        |
| 4.2 APPLICABLE STANDARD.....                                | 10        |
| 4.4 INSTRUMENT SETUP.....                                   | 10        |
| 4.5 TEST PROCEDURE .....                                    | 11        |
| 4.6 TEST RESULT .....                                       | 11        |
| <b>5. TEST OF HOPPING CHANNEL BANDWIDTH.....</b>            | <b>22</b> |
| 5.1 APPLICABLE STANDARD.....                                | 22        |
| 5.2 EUT SETUP.....  | 22        |
| 5.3 TEST EQUIPMENT LIST AND DETAILS .....                   | 22        |
| 5.4 TEST PROCEDURE .....                                    | 22        |
| 5.5 TEST RESULT .....                                       | 22        |
| <b>6. TEST OF HOPPING CHANNEL SEPARATION .....</b>          | <b>25</b> |
| 6.1 APPLICABLE STANDARD.....                                | 25        |
| 6.2 EUT SETUP.....  | 25        |
| 6.3 TEST EQUIPMENT LIST AND DETAILS .....                   | 25        |
| 6.4 TEST PROCEDURE .....                                    | 25        |
| 6.5 TEST RESULT .....                                       | 25        |
| <b>7. TEST OF NUMBER OF HOPPING FREQUENCY .....</b>         | <b>28</b> |
| 7.1 APPLICABLE STANDARD.....                                | 28        |
| 7.2 EUT SETUP.....  | 28        |
| 7.3 TEST EQUIPMENT LIST AND DETAILS .....                   | 28        |
| 7.4 TEST PROCEDURE .....                                    | 28        |
| 7.5 TEST RESULT .....                                       | 28        |
| <b>8. TEST OF DWELL TIME OF EACH FREQUENCY .....</b>        | <b>30</b> |
| 8.1 APPLICABLE STANDARD.....                                | 30        |
| 8.2 EUT SETUP.....  | 30        |
| 8.3 TEST EQUIPMENT LIST AND DETAILS .....                   | 30        |
| 8.4 TEST PROCEDURE .....                                    | 30        |
| 8.5 TEST RESULT .....                                       | 30        |
| <b>9. TEST OF MAXIMUM PEAK OUTPUT POWER.....</b>            | <b>35</b> |
| 9.1 APPLICABLE STANDARD.....                                | 35        |
| 9.2 EUT SETUP.....  | 35        |
| 9.3 TEST EQUIPMENT LIST AND DETAILS .....                   | 35        |
| 9.4 TEST PROCEDURE .....                                    | 35        |
| 9.5 TEST RESULT .....                                       | 35        |
| <b>10. TEST OF BAND EDGES EMISSION.....</b>                 | <b>39</b> |
| 10.1 APPLICABLE STANDARD.....                               | 39        |
| 10.2 EUT SETUP .....  | 39        |
| 10.3 TEST EQUIPMENT LIST AND DETAILS .....                  | 40        |
| 10.4 TEST PROCEDURE .....                                   | 40        |
| 10.5 TEST RESULT .....                                      | 40        |

|   |           |
|---|-----------|
| <b>11. TEST OF SPURIOUS RADIATED EMISSION .....</b> | <b>42</b> |
| 11.1 APPLICABLE STANDARD.....                       | 42        |
| 11.2 EUT SETUP .....                                | 42        |
| 11.3 TEST EQUIPMENT LIST AND DETAILS .....          | 43        |
| 11.4 TEST PROCEDURE .....                           | 43        |
| 11.5 TEST RESULT .....                              | 44        |
| <b>12. ANTENNA REQUIREMENT .....</b>                | <b>50</b> |
| 12.1 STANDARD APPLICABLE.....                       | 50        |
| 12.2 ANTENNA CONNECTED CONSTRUCTION .....           | 50        |

# 1. GENERAL INFORMATION

## 1.1 Product Description for Equipment Under Test (EUT)

### Client Information

Applicant: **Shenzhen Roadrover Technology Co., Ltd**  
Address of applicant: 8F, Dawning Building, Hi-tech Industrial Park, Nanshan District, Shenzhen  
Manufacturer: **Shenzhen Roadrover Technology Co., Ltd**  
Address of manufacturer: 8F, Dawning Building, Hi-tech Industrial Park, Nanshan District, Shenzhen

### General Description of E.U.T

| Items                    | Description  |
|--------------------------|--|
| EUT Description:         | Multifunctional Navigation and Entertainment System  |
| Model No.:               | B6241  |
| Supplementary Model No.: | C6201FM,C6202HC,C6204VP,C6205NA,C6206FE,C6208HS,C6209,C6210HT,C6211KS,C6214TT,C6216NA,C6217SF,C6226KS,C6229BC,C6230D1,C6236SV,C6241TT,NV1200A4,C6505A4,C7001TC,C7002TC,C7004HC,C7006NT,C7007M6,C7008LE,C7009TR,C7013HC,C7014BE,C7020F2,C7021HF,C7023M6,C7025KF,C7026GY,C7027C7,C7028M3,C7029CC,C7032CC,C7034VX,C7035M1,C7037VT,C7040P4,C7041CQ,C7044BR,C7045CC,C7047T1,C7048P3,C7049NA,C7051A3,C7053KS,C7054SL,C7055BS,C7060LE,C7062HV,C7064HV,C7065TP,C7066H1,C7067KS,C7069TT,C7070CS,C7073M2,C7074SS,C7075CS,C7076SS,C7079BG,C7087RF,C7089HC,C7094BS,C8002HA,C8003TL,C8004TH,C8005BL,C8007HO,C8009M1,C8015FF,C8018LI,C8019LR,C8020TS,C8021B5,C8025KK,C8026HS,D2262N,I7001TC,I7002TC,I7004HC,I7009TR,I8004TH,I7037VT,I7072BA (the difference of these models is color and the size of screen) |
| Type of Modulation:      | FHSS   |
| Frequency Band:          | 2402 MHz ~ 2480 MHz  |
| Number of Channels:      | 79   |
| Channel Bandwidth:       | 1 MHz  |
| Antenna Type:            | Built-in Antenna   |
| Rated Voltage:           | DC 12 V  |

*\* The test data gathered are from the production sample provided by the manufacturer.  
\* the measurements were made pursuant to the guidelines of DA 00-705.*

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

This submittal(s) is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4 - 2009.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.207, and 15.247 rules.

## **1.3 Test Methodology**

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 - 2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. Radiated testing was performed at an antenna to EUT distance 3 meters.

## **1.4 Test Facility**

All measurement required was performed at laboratory of Bontek Compliance Testing Laboratory Ltd at 1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China.

The test facility is recognized, certified, or accredited by the following organizations:

### **FCC – Registration No.: 338263**

BONTEK COMPLIANCE TESTING LABORATORY LTD. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 338263, March, 2008.

### **IC Registration No.: 7631A**

The 3m alternate test site of BONTEK COMPLIANCE TESTING LABORATORY LTD. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 7631A on August 2009.

### **CNAS - Registration No.: L3923**

BONTEK COMPLIANCE TESTING LABORATORY LTD. to ISO/IEC 17025:25 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.The acceptance letter from the CNAS is maintained in our files: Registration:L3923,February,2009.

### **TUV - Registration No.: UA 50145371-0002**

BONTEK COMPLIANCE TESTING LABORATORY LTD. An assessment of the laboratory was conducted according to the "Procedures and Conditions for EMC Test Laboratories" with reference to EN ISO/IEC 17025 by a TUV Rheinland auditor. Audit Report NO. 17010783-001.

## **2. SYSTEM TEST CONFIGURATION**

The tests documented in this report were performed in accordance with ANSI C63.4-2009 and FCC CFR 47 Part 15 Subpart C.

### **2.1 EUT Configuration**

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

### **2.2 EUT Exercise**

The calibrated antennas used to sample the radiated field strength are mounted on a non-conductive, motorized antenna mast 3 or 10 meters from the leading edge of the turntable.

### **2.3 General Test Procedures**

**Conducted Emissions** The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 7.1 of ANSI C63.4-2009. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak detector mode.

**Radiated Emissions** The EUT is placed on a turntable, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4-2009.

## 2.4 List of Measuring Equipments Used

Test equipments list of SHENZHEN BONTEK ELECTRONIC TECHNOLOGY CO., LTD. .

| No. | Equipment                                | Manufacturer    | Model No.                  | S/N            | Calibration Date | Calibration Due Date |
|-----|--|-----------------|----------------------------|----------------|------------------|----------------------|
| 1   | EMI Test Receiver                        | R&S             | ESCI                       | 100687         | 2011-4-07        | 2012-4-06            |
| 2   | EMI Test Receiver                        | R&S             | ESPI                       | 100097         | 2011-4-07        | 2012-4-06            |
| 3   | Amplifier                                | HP              | 8447D                      | 1937A02492     | 2011-4-07        | 2012-4-06            |
| 4   | Single Power Conductor Module            | FCC             | FCC-LISN-5-50-1-01-CISPR25 | 7101           | 2011-4-07        | 2012-4-06            |
| 5   | Single Power Conductor Module            | FCC             | FCC-LISN-5-50-1-01-CISPR25 | 7102           | 2011-4-07        | 2012-4-06            |
| 6   | Power Clamp                              | SCHWARZBECK     | MDS-21                     | 3812           | 2011-4-07        | 2012-4-06            |
| 7   | Positioning Controller                   | C&C             | CC-C-1F                    | MF7802113      | N/A              | N/A                  |
| 8   | Electrostatic Discharge Simulator        | TESEQ           | NSG437                     | 125            | 2011-4-07        | 2012-4-06            |
| 9   | Fast Transient Burst Generator           | SCHAFFNER       | MODULA6150                 | 34572          | 2011-4-07        | 2012-4-06            |
| 10  | Fast Transient Noise Simulator           | Noiseken        | FNS-105AX                  | 31485          | 2011-4-07        | 2012-4-06            |
| 11  | Color TV Pattern Generator               | PHILIPS         | PM5418                     | TM209947       | N/A              | N/A                  |
| 12  | Power Frequency Magnetic Field Generator | EVERFINE        | EMS61000-8K                | 608002         | 2011-4-07        | 2012-4-06            |
| 14  | Capacitive Coupling Clamp                | TESEQ           | CDN8014                    | 25096          | 2011-4-07        | 2012-4-06            |
| 15  | High Field Biconical Antenna             | ELECTRO-METRICS | EM-6913                    | 166            | 2010-4-14        | 2012-4-13            |
| 16  | Log Periodic Antenna                     | ELECTRO-METRICS | EM-6950                    | 811            | 2010-4-14        | 2012-4-13            |
| 17  | Remote Active Vertical Antenna           | ELECTRO-METRICS | EM-6892                    | 304            | 2010-4-14        | 2012-4-13            |
| 18  | TRILOG Broadband Test-Antenna            | SCHWARZBECK     | VULB9163                   | 9163-324       | 2010-4-14        | 2012-4-13            |
| 19  | Horn Antenna                             | SCHWARZBECK     | BBHA9120A                  | B08000991-0001 | 2010-4-14        | 2012-4-13            |
| 20  | Teo Line Single Phase Module             | SCHWARZBECK     | NSLK8128                   | D-69250        | 2011-4-07        | 2012-4-06            |
| 21  | 10dB attenuator                          | SCHWARZBECK     | MTAIMP-136                 | R65.90.0001#06 | 2011-4-07        | 2012-4-06            |
| 22  | Electric bridge                          | Zentech         | 100 LCR METER              | 803024         | N/A              | N/A                  |
| 23  | RF Current Probe                         | FCC             | F-33-4                     | 80             | 2011-4-07        | 2012-4-06            |
| 24  | Triple-Loop Antenna                      | EVERFINE        | LLA-2                      | 607004         | 2011-4-07        | 2012-4-06            |
| 25  | CDN                                      | FRANKONIA       | M2+M3                      | A3027019       | 2011-4-07        | 2012-4-06            |

|    |                                |                     |             |              |           |           |
|----|--------------------------------|---------------------|-------------|--------------|-----------|-----------|
| 26 | 6dB Attenuator                 | FRANKONIA           | 75-A-FFN-06 | 1001698      | 2011-4-07 | 2012-4-06 |
| 27 | EMV-Mess-Systeme GMBH          | FRANKONIA           | FLL-75      | 1020A1109    | 2011-4-07 | 2012-4-06 |
| 28 | EM Injection Clamp             | FCC                 | F-203I-13mm | 91536        | 2011-4-07 | 2012-4-06 |
| 29 | 9KHz-2.4GHz Signal generator   | MARCONI INSTRUMENTS | 2024        | 112260/042   | 2011-4-07 | 2012-4-06 |
| 30 | Broadband Preamplifier         | SCHWARZBECK         | BBV 9718    | 9718-182     | 2011-4-07 | 2012-4-06 |
| 31 | Harmonics& Flicker Analyser    | Voltech             | PM6000      | AFC-150      | 2011-4-07 | 2012-4-06 |
| 32 | Spectrum Analyzer              | R&S                 | FSP30       | 1093.4495.30 | 2011-4-07 | 2012-4-06 |
| 33 | Temperature & Humidity Chamber | TOPSTAT             | TOS-831A    | 3438A05208   | 2011-4-07 | 2012-4-06 |



### 3. SUMMARY OF TEST RESULTS

| FCC Rules            | Description of Test              | Result |
|----------------------|----------------------------------|--------|
| 15.207               | Conducted Emission               | Pass   |
| 15.247(a)(1)         | Hopping Channel Bandwidth        | Pass   |
| 15.247(a)(1)         | Hopping Channel Separation       | Pass   |
| 15.247(a)(1)         | Number of Hopping Frequency Used | Pass   |
| 15.247(a)(1)(iii)    | Dwell Time of Each Frequency     | Pass   |
| 15.247(b)(1)         | Maximum Peak Output Power        | Pass   |
| 15.247(d)            | Band Edges Emission              | Pass   |
| 15.247(d)            | Spurious Radiated Emission       | Pass   |
| 15.203/15.247(b)/(c) | Antenna Requirement              | Pass   |

## 4 – DISTURBANCE VOLTAGE AT THE MAINS TERMINALS

### 4.1 Measurement Uncertainty

All test results complied with Section 15.207 requirements. Measurement Uncertainty is 2.4 dB.

### 4.2 Applicable Standard

Section 15.207: For a Low-power Radio-frequency Device is designed to be connected to the 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 below limits table.

| Frequency Range (MHz) | Limits ( dBuV) |         |
|-----------------------|----------------|---------|
|                       | Quasi-Peak     | Average |
| 0.150~0.500           | 66~56          | 56~46   |
| 0.500~5.000           | 56             | 46      |
| 5.000~30.00           | 60             | 50      |

Note: (1)The tighter limit shall apply at the edge between two frequency bands.

### 4.3 EUT Setup

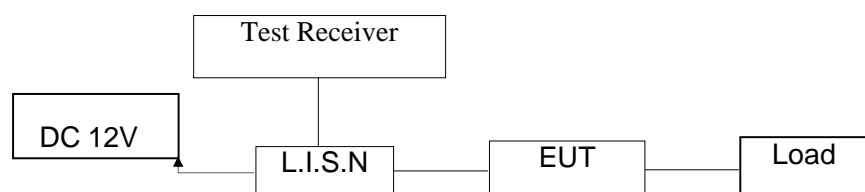
The setup of EUT is according with ANSI C63.4-2009 measurement procedure.

The EUT was placed center and the back edge of the test table.

The AV cables were draped along the test table and bundled to 30-40cm in the middle.

The spacing between the peripherals was 10 cm.

Maximum emission emitted from EUT was determined by manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation and the levels in the final result of the test were recorded with the EUT running in the operating mode that maximum emission was emitted.



### 4.4 Instrument Setup

The test receiver was set with the following configurations:

Test Receiver Setting:

Frequency Range.....150 KHz to 30 MHz  
Detector.....Peak & Quasi-Peak & Average  
Sweep Speed.....Auto  
IF Band Width.....9 KHz

#### **4.5 Test Procedure**

During the conducted emission test, the EUT power cord was connected to the auxiliary outlet of the first Artificial Mains.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

All data was recorded in the peak detection mode. Quasi-peak and Average readings were only performed when an emission was found to be marginal (within -10 dB $\mu$ V of specification limits). Quasi-peak readings are distinguished with a "**QP**". Average readings are distinguished with a "**AV**".

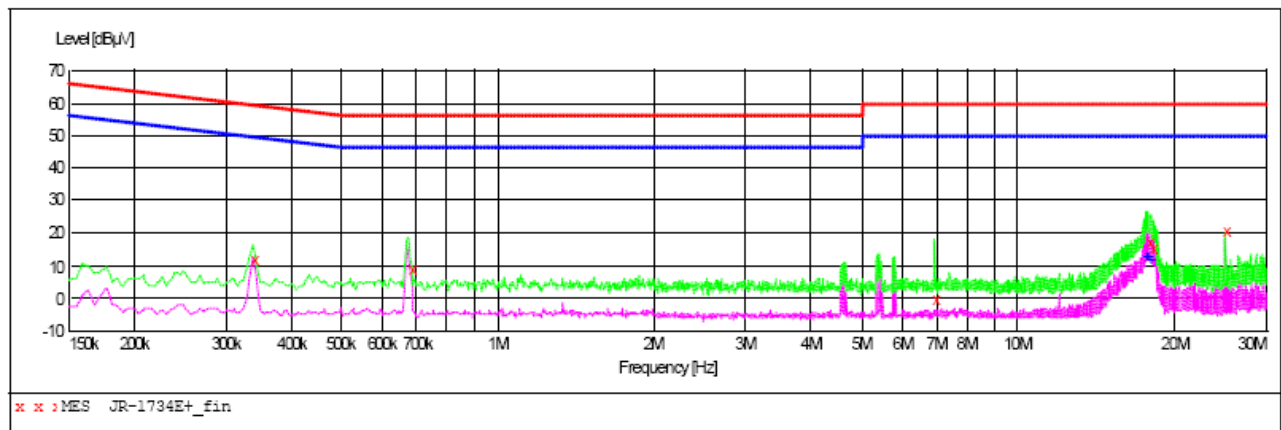
#### **4.6 Test Result**

**PASS**

## Conducted Emission Test Data

EUT: Multifunctional Navigation and Entertainment System  
M/N: B6241  
Operating Condition: FM  
Test Site: Shielded Room  
Operator: Cheng  
Test Specification: DC12V  
Comment: + Line

SCAN TABLE: "Voltage (9K-30M) FIN"  
Short Description: 150K-30M Voltage



### MEASUREMENT RESULT: "JR-1734E+\_fin"

12/28/2011 11:39

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.339000         | 11.80         | 10.2         | 59            | 47.4         | QP       | +    | GND |
| 0.676500         | 9.20          | 10.2         | 56            | 46.8         | QP       | +    | GND |
| 6.927000         | -0.10         | 10.3         | 60            | 60.1         | QP       | +    | GND |
| 17.776500        | 16.80         | 10.5         | 60            | 43.2         | QP       | +    | GND |
| 18.033000        | 15.70         | 10.6         | 60            | 44.3         | QP       | +    | GND |
| 25.003500        | 20.30         | 10.8         | 60            | 39.7         | QP       | +    | GND |

### MEASUREMENT RESULT: "JR-1734E+\_fin2"

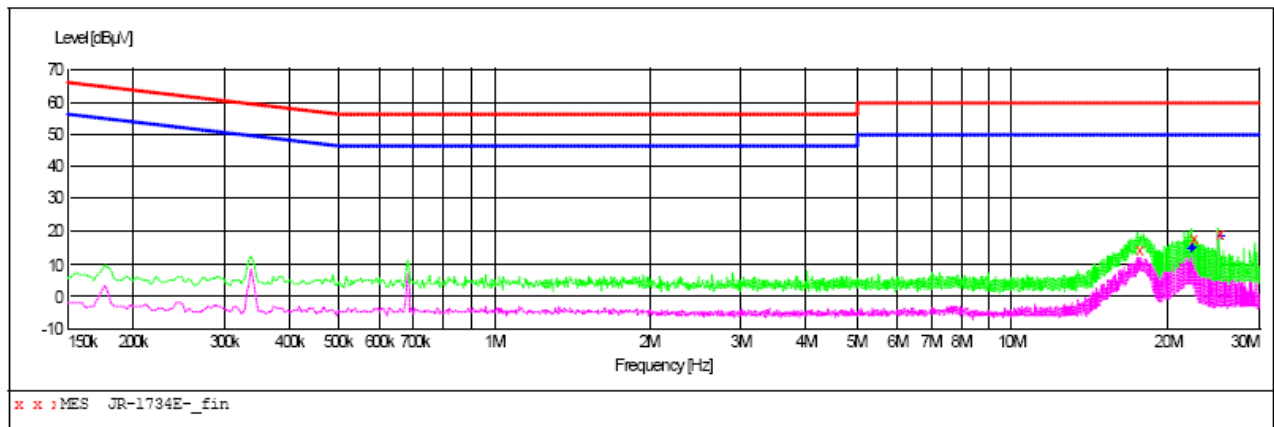
12/28/2011 11:39

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 17.650500        | 13.50         | 10.5         | 50            | 36.5         | AV       | +    | GND |
| 17.700000        | 13.20         | 10.5         | 50            | 36.8         | AV       | +    | GND |
| 17.776500        | 13.50         | 10.5         | 50            | 36.5         | AV       | +    | GND |
| 17.826000        | 13.20         | 10.5         | 50            | 36.8         | AV       | +    | GND |
| 17.902500        | 11.80         | 10.6         | 50            | 38.2         | AV       | +    | GND |

## Conducted Emission Test Data

EUT: Multifunctional Navigation and Entertainment System  
M/N: B6241  
Operating Condition: FM  
Test Site: Shielded Room  
Operator: Cheng  
Test Specification: DC12V  
Comment: - Line

SCAN TABLE: "Voltage (9K-30M)FIN"  
Short Description: 150K-30M Voltage



### MEASUREMENT RESULT: "JR-1734E-\_fin"

12/28/2011 11:42

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 17.529000        | 14.40         | 10.5         | 60            | 45.6         | QP       | -    | GND |
| 22.227000        | 17.70         | 10.7         | 60            | 42.3         | QP       | -    | GND |
| 22.276500        | 17.90         | 10.7         | 60            | 42.1         | QP       | -    | GND |
| 25.003500        | 19.30         | 10.8         | 60            | 40.7         | QP       | -    | GND |

### MEASUREMENT RESULT: "JR-1734E-\_fin2"

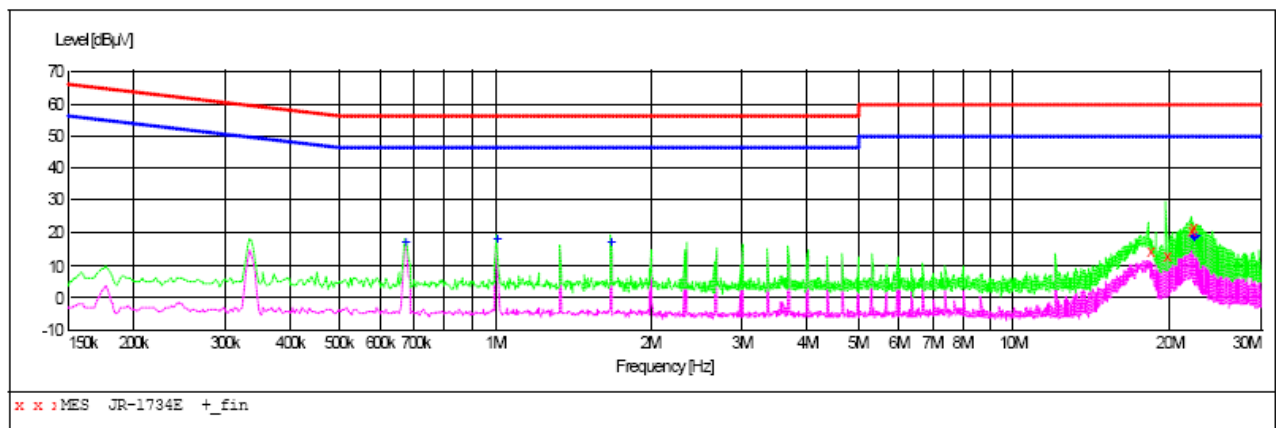
12/28/2011 11:42

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 21.952500        | 14.90         | 10.7         | 50            | 35.1         | AV       | -    | GND |
| 22.227000        | 15.30         | 10.7         | 50            | 34.7         | AV       | -    | GND |
| 22.276500        | 15.80         | 10.7         | 50            | 34.2         | AV       | -    | GND |
| 25.003500        | 18.90         | 10.8         | 50            | 31.1         | AV       | -    | GND |

## Conducted Emission Test Data

EUT: Multifunctional Navigation and Entertainment System  
M/N: B6241  
Operating Condition: DVD  
Test Site: Shielded Room  
Operator: Cheng  
Test Specification: DC12V  
Comment: + Line

SCAN TABLE: "Voltage (9K-30M)FIN"  
Short Description: 150K-30M Voltage



### MEASUREMENT RESULT: "JR-1734E+\_fin"

12/28/2011 11:26

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 18.217500        | 14.50         | 10.6         | 60            | 45.5         | QP       | +    | GND |
| 19.657500        | 12.90         | 10.6         | 60            | 47.1         | QP       | +    | GND |
| 21.822000        | 20.90         | 10.7         | 60            | 39.1         | QP       | +    | GND |
| 22.177500        | 21.70         | 10.7         | 60            | 38.3         | QP       | +    | GND |

### MEASUREMENT RESULT: "JR-1734E+\_fin2"

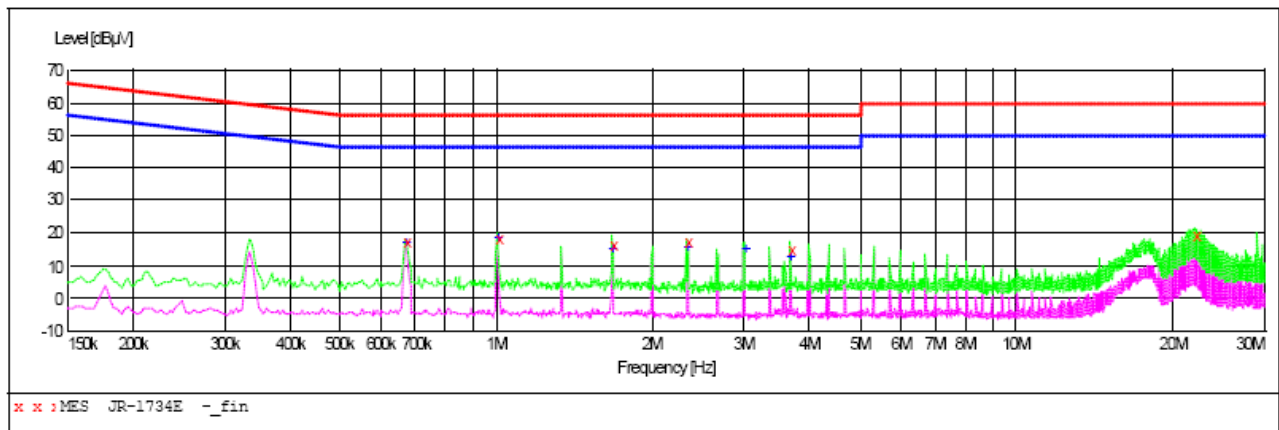
12/28/2011 11:26

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.667500         | 16.90         | 10.2         | 46            | 29.1         | AV       | +    | GND |
| 1.000500         | 18.20         | 10.1         | 46            | 27.8         | AV       | +    | GND |
| 1.671000         | 17.00         | 10.1         | 46            | 29.0         | AV       | +    | GND |
| 22.146000        | 19.60         | 10.7         | 50            | 30.4         | AV       | +    | GND |
| 22.371000        | 18.90         | 10.7         | 50            | 31.1         | AV       | +    | GND |
| 22.533000        | 19.30         | 10.7         | 50            | 30.7         | AV       | +    | GND |

## Conducted Emission Test Data

EUT: Multifunctional Navigation and Entertainment System  
M/N: B6241  
Operating Condition: DVD  
Test Site: Shielded Room  
Operator: Cheng  
Test Specification: DC12V  
Comment: - Line

SCAN TABLE: "Voltage (9K-30M)FIN"  
Short Description: 150K-30M Voltage



### MEASUREMENT RESULT: "JR-1734E -\_fin"

12/28/2011 11:29

| Frequency<br>MHz | Level<br>dBuV | Transd<br>dB | Limit<br>dBuV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.667500         | 17.00         | 10.2         | 56            | 39.0         | QP       | -    | GND |
| 1.000500         | 18.40         | 10.1         | 56            | 37.6         | QP       | -    | GND |
| 1.671000         | 16.40         | 10.1         | 56            | 39.6         | QP       | -    | GND |
| 2.337000         | 16.80         | 10.1         | 56            | 39.2         | QP       | -    | GND |
| 3.673500         | 14.90         | 10.2         | 56            | 41.1         | QP       | -    | GND |
| 22.146000        | 19.60         | 10.7         | 60            | 40.4         | QP       | -    | GND |

### MEASUREMENT RESULT: "JR-1734E -\_fin2"

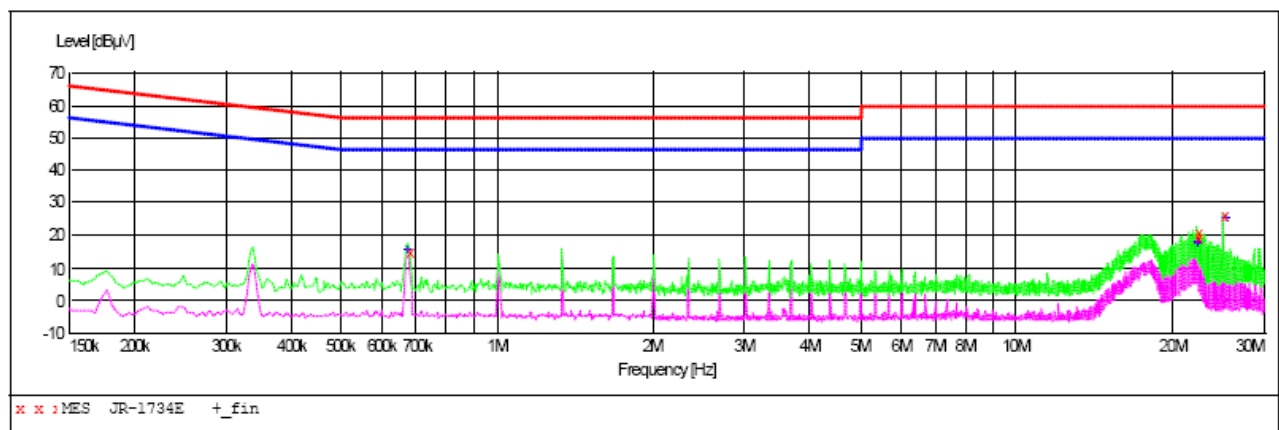
12/28/2011 11:29

| Frequency<br>MHz | Level<br>dBuV | Transd<br>dB | Limit<br>dBuV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.667500         | 17.00         | 10.2         | 46            | 29.0         | AV       | -    | GND |
| 1.000500         | 19.00         | 10.1         | 46            | 27.0         | AV       | -    | GND |
| 1.666500         | 15.90         | 10.1         | 46            | 30.1         | AV       | -    | GND |
| 2.337000         | 16.30         | 10.1         | 46            | 29.7         | AV       | -    | GND |
| 3.003000         | 15.90         | 10.1         | 46            | 30.1         | AV       | -    | GND |
| 3.673500         | 13.10         | 10.2         | 46            | 32.9         | AV       | -    | GND |

## Conducted Emission Test Data

EUT: Multifunctional Navigation and Entertainment System  
M/N: B6241  
Operating Condition: GPS  
Test Site: Shielded Room  
Operator: Cheng  
Test Specification: DC12V  
Comment: + Line

SCAN TABLE: "Voltage (9K-30M)FIN"  
Short Description: 150K-30M Voltage



### MEASUREMENT RESULT: "JR-1734E +\_fin"

12/28/2011 11:35

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.672000         | 15.10         | 10.2         | 56            | 40.9         | QP       | +    | GND |
| 22.227000        | 21.00         | 10.7         | 60            | 39.0         | QP       | +    | GND |
| 22.303500        | 19.70         | 10.7         | 60            | 40.3         | QP       | +    | GND |
| 25.003500        | 26.10         | 10.8         | 60            | 33.9         | QP       | +    | GND |

### MEASUREMENT RESULT: "JR-1734E +\_fin2"

12/28/2011 11:35

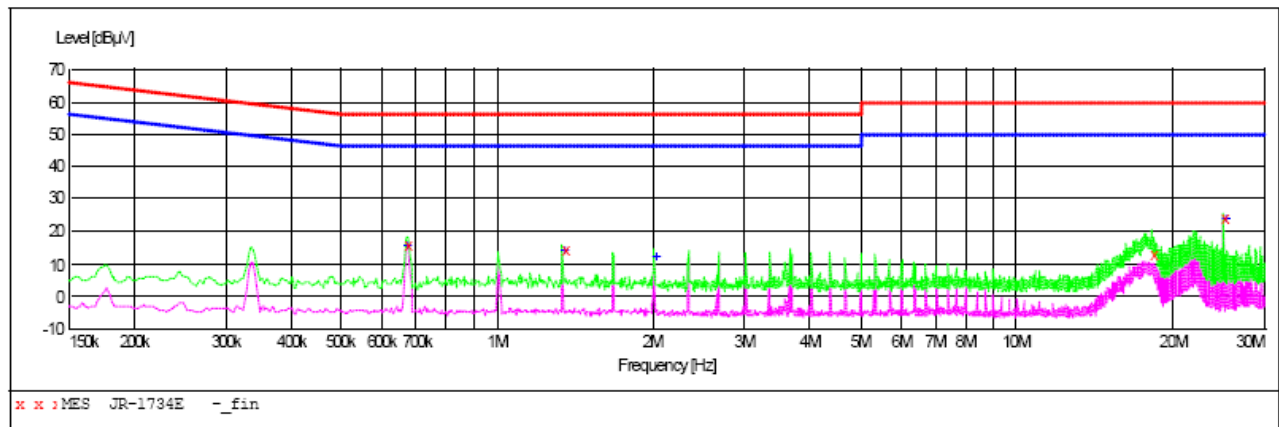
| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.667500         | 16.00         | 10.2         | 46            | 30.0         | AV       | +    | GND |
| 22.227000        | 17.80         | 10.7         | 50            | 32.2         | AV       | +    | GND |
| 22.276500        | 18.10         | 10.7         | 50            | 31.9         | AV       | +    | GND |
| 25.003500        | 25.90         | 10.8         | 50            | 24.1         | AV       | +    | GND |



## Conducted Emission Test Data

EUT: Multifunctional Navigation and Entertainment System  
M/N: B6241  
Operating Condition: GPS  
Test Site: Shielded Room  
Operator: Cheng  
Test Specification: DC12V  
Comment: - Line

SCAN TABLE: "Voltage (9K-30M)FIN"  
Short Description: 150K-30M Voltage



### MEASUREMENT RESULT: "JR-1734E -\_fin"

12/28/2011 11:33

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.667500         | 16.20         | 10.2         | 56            | 39.8         | QP       | -    | GND |
| 1.338000         | 14.70         | 10.1         | 56            | 41.3         | QP       | -    | GND |
| 18.154500        | 13.50         | 10.6         | 60            | 46.5         | QP       | -    | GND |
| 25.003500        | 24.30         | 10.8         | 60            | 35.7         | QP       | -    | GND |

### MEASUREMENT RESULT: "JR-1734E -\_fin2"

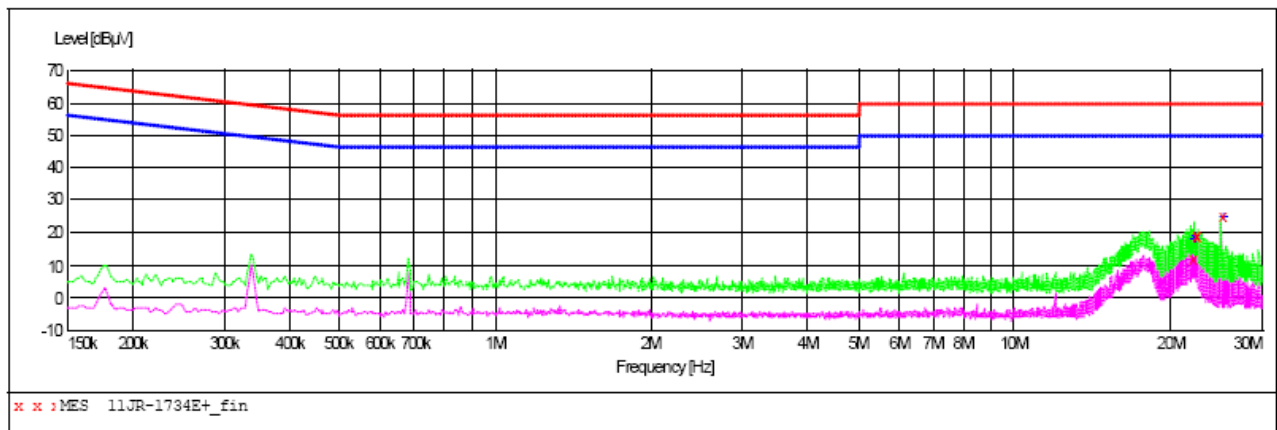
12/28/2011 11:33

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.667500         | 16.30         | 10.2         | 46            | 29.7         | AV       | -    | GND |
| 1.338000         | 14.50         | 10.1         | 46            | 31.5         | AV       | -    | GND |
| 2.008500         | 12.70         | 10.0         | 46            | 33.3         | AV       | -    | GND |
| 25.003500        | 24.20         | 10.8         | 50            | 25.8         | AV       | -    | GND |

## Conducted Emission Test Data

EUT: Multifunctional Navigation and Entertainment System  
M/N: B6241  
Operating Condition: AM  
Test Site: Shielded Room  
Operator: Cheng  
Test Specification: DC12V  
Comment: + Line

SCAN TABLE: "Voltage (9K-30M)FIN"  
Short Description: 150K-30M Voltage



### MEASUREMENT RESULT: "11JR-1734E+\_fin"

12/28/2011 11:48

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 21.975000        | 12.00         | 10.7         | 60            | 48.0         | QP       | +    | GND |
| 22.227000        | 18.90         | 10.7         | 60            | 41.1         | QP       | +    | GND |
| 22.303500        | 19.10         | 10.7         | 60            | 40.9         | QP       | +    | GND |
| 25.003500        | 25.30         | 10.8         | 60            | 34.7         | QP       | +    | GND |

### MEASUREMENT RESULT: "11JR-1734E+\_fin2"

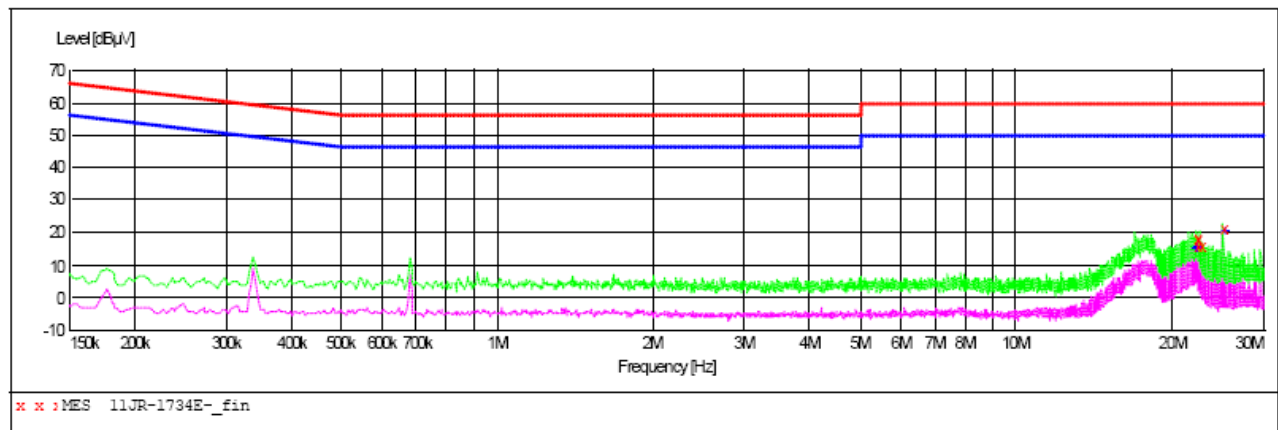
12/28/2011 11:48

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 21.903000        | 18.20         | 10.7         | 50            | 31.8         | AV       | +    | GND |
| 22.227000        | 18.60         | 10.7         | 50            | 31.4         | AV       | +    | GND |
| 22.276500        | 19.20         | 10.7         | 50            | 30.8         | AV       | +    | GND |
| 25.003500        | 25.20         | 10.8         | 50            | 24.8         | AV       | +    | GND |

## Conducted Emission Test Data

EUT: Multifunctional Navigation and Entertainment System  
M/N: B6241  
Operating Condition: AM  
Test Site: Shielded Room  
Operator: Cheng  
Test Specification: DC12V  
Comment: - Line

SCAN TABLE: "Voltage (9K-30M)FIN"  
Short Description: 150K-30M Voltage



### MEASUREMENT RESULT: "11JR-1734E-\_fin"

12/28/2011 11:46

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 22.227000        | 17.90         | 10.7         | 60            | 42.1         | QP       | -    | GND |
| 22.276500        | 18.20         | 10.7         | 60            | 41.8         | QP       | -    | GND |
| 22.353000        | 16.10         | 10.7         | 60            | 43.9         | QP       | -    | GND |
| 22.627500        | 16.10         | 10.7         | 60            | 43.9         | QP       | -    | GND |
| 25.003500        | 21.10         | 10.8         | 60            | 38.9         | QP       | -    | GND |

### MEASUREMENT RESULT: "11JR-1734E-\_fin2"

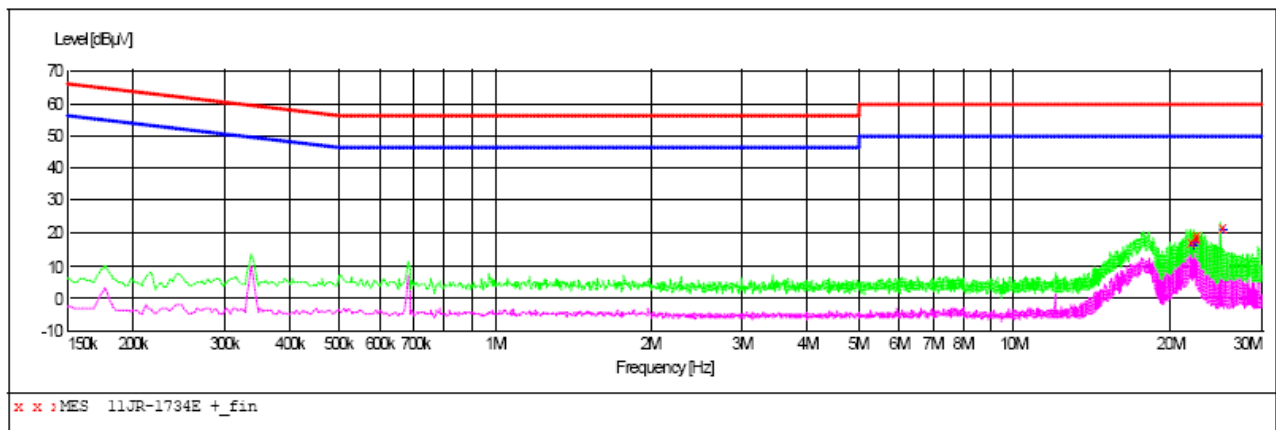
12/28/2011 11:46

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 21.903000        | 15.20         | 10.7         | 50            | 34.8         | AV       | -    | GND |
| 22.227000        | 15.60         | 10.7         | 50            | 34.4         | AV       | -    | GND |
| 22.276500        | 16.10         | 10.7         | 50            | 33.9         | AV       | -    | GND |
| 25.003500        | 20.90         | 10.8         | 50            | 29.1         | AV       | -    | GND |

## Conducted Emission Test Data

EUT: Multifunctional Navigation and Entertainment System  
M/N: B6241  
Operating Condition: USB  
Test Site: Shielded Room  
Operator: Cheng  
Test Specification: DC12V  
Comment: + Line

SCAN TABLE: "Voltage (9K-30M)FIN"  
Short Description: 150K-30M Voltage



### MEASUREMENT RESULT: "11JR-1734E+\_fin"

12/28/2011 11:54

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 21.651000        | 17.20         | 10.7         | 60            | 42.8         | QP       | +    | GND |
| 22.276500        | 19.70         | 10.7         | 60            | 40.3         | QP       | +    | GND |
| 22.303500        | 18.20         | 10.7         | 60            | 41.8         | QP       | +    | GND |
| 25.003500        | 21.70         | 10.8         | 60            | 38.3         | QP       | +    | GND |

### MEASUREMENT RESULT: "11JR-1734E+\_fin2"

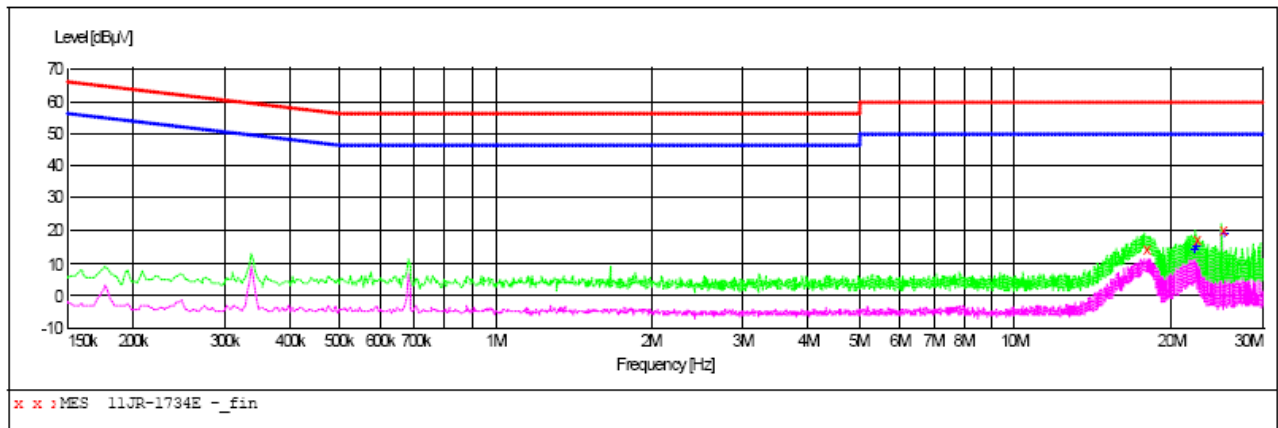
12/28/2011 11:54

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 21.925500        | 16.40         | 10.7         | 50            | 33.6         | AV       | +    | GND |
| 22.227000        | 17.00         | 10.7         | 50            | 33.0         | AV       | +    | GND |
| 22.276500        | 17.50         | 10.7         | 50            | 32.5         | AV       | +    | GND |
| 25.003500        | 21.30         | 10.8         | 50            | 28.7         | AV       | +    | GND |

## Conducted Emission Test Data

EUT: Multifunctional Navigation and Entertainment System  
M/N: B6241  
Operating Condition: USB  
Test Site: Shielded Room  
Operator: Cheng  
Test Specification: DC12V  
Comment: - Line

SCAN TABLE: "Voltage (9K-30M)FIN"  
Short Description: 150K-30M Voltage



### MEASUREMENT RESULT: "11JR-1734E -\_fin"

12/28/2011 11:56

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 17.799000        | 14.60         | 10.5         | 60            | 45.4         | QP       | -    | GND |
| 22.227000        | 17.10         | 10.7         | 60            | 42.9         | QP       | -    | GND |
| 22.276500        | 17.50         | 10.7         | 60            | 42.5         | QP       | -    | GND |
| 25.003500        | 20.10         | 10.8         | 60            | 39.9         | QP       | -    | GND |

### MEASUREMENT RESULT: "11JR-1734E -\_fin2"

12/28/2011 11:56

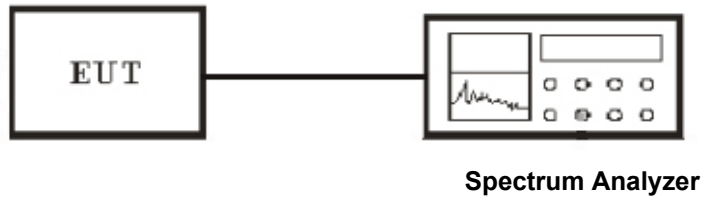
| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 21.903000        | 14.20         | 10.7         | 50            | 35.8         | AV       | -    | GND |
| 21.925500        | 14.40         | 10.7         | 50            | 35.6         | AV       | -    | GND |
| 22.276500        | 15.30         | 10.7         | 50            | 34.7         | AV       | -    | GND |
| 25.003500        | 19.80         | 10.8         | 50            | 30.2         | AV       | -    | GND |

## 5. Test of Hopping Channel Bandwidth

### 5.1 Applicable Standard

Section 15.247(a)(1): 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.

### 5.2 EUT Setup



### 5.3 Test Equipment List and Details

See section 2.4.

### 5.4 Test Procedure

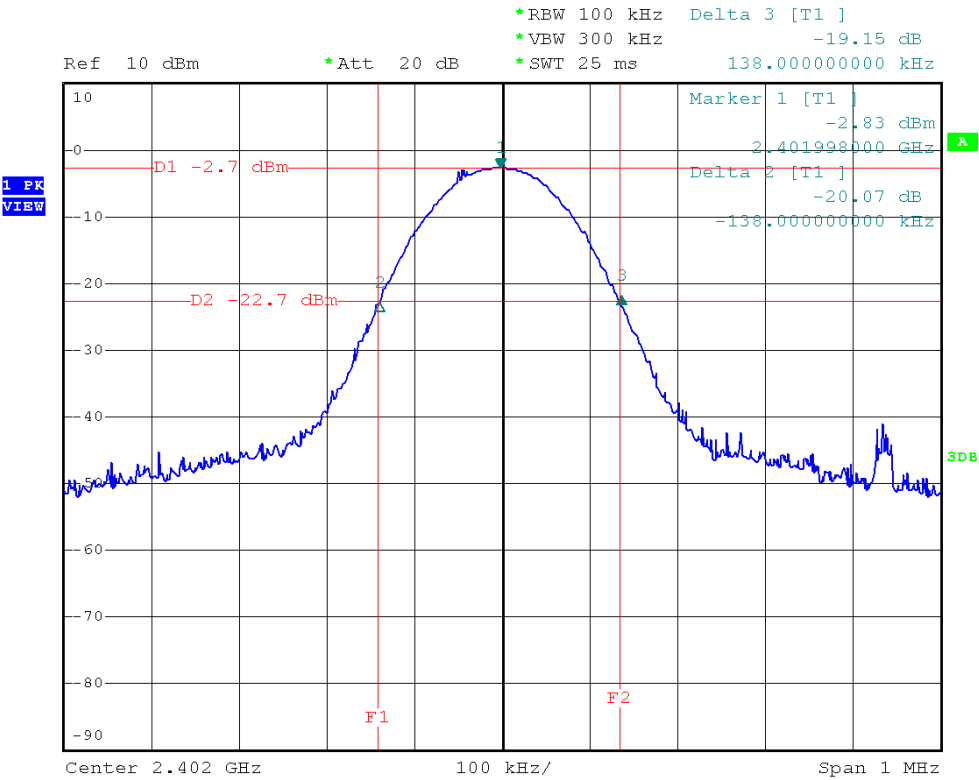
1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 30KHz and VBW to 100KHz.
3. Set Detector to Peak, Trace to Max Hold and Sweep Time is Auto.
4. The spectrum width with level higher than 20dB below the peak level.
5. Repeat above 1~3 points for the middle and highest channel of the EUT.

### 5.5 Test Result

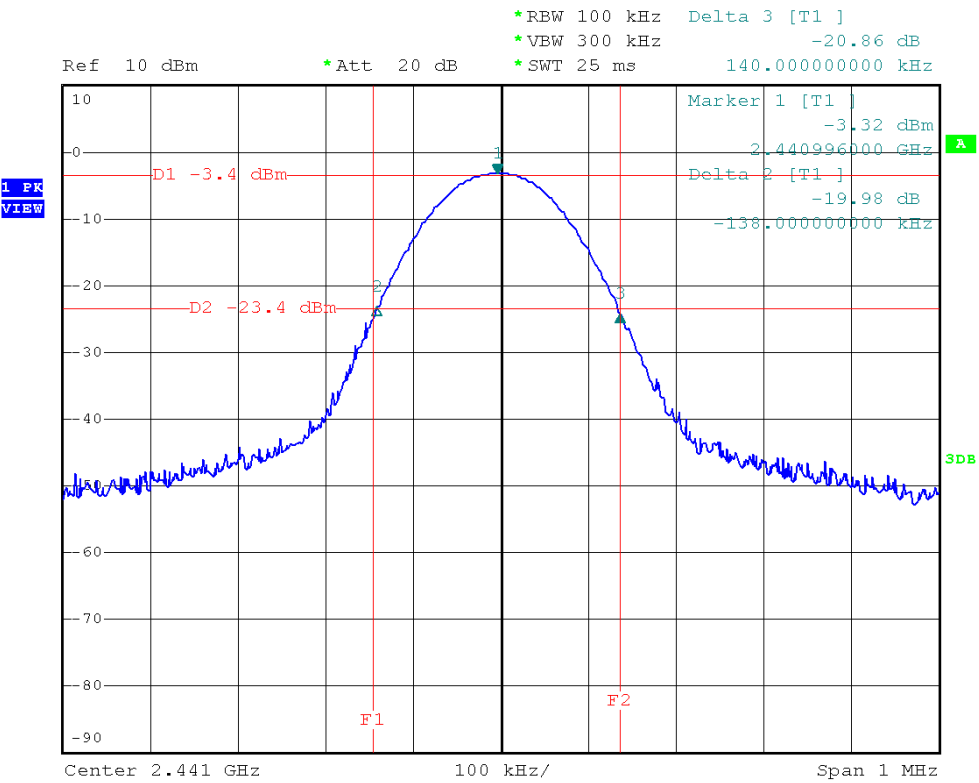
|   |  |
|---|--|
| Temperature ( °C ) : 22~23              | EUT: Multifunctional Navigation and Entertainment System |
| Humidity (%RH) : 50~54                  | M/N: B6241   |
| Barometric Pressure ( mbar ) : 950~1000 | Operation Condition: Tx Mode                             |

| Modulation Type | Channel No. | Frequency (MHz) | 20dB Bandwidth (kHz) | Min. Limit (kHz) |
|-----------------|-------------|-----------------|----------------------|------------------|
| FHSS            | Low         | 2402.00         | 276                  | >25              |
| FHSS            | Middle      | 2441.00         | 278                  | >25              |
| FHSS            | High        | 2480.00         | 274                  | >25              |

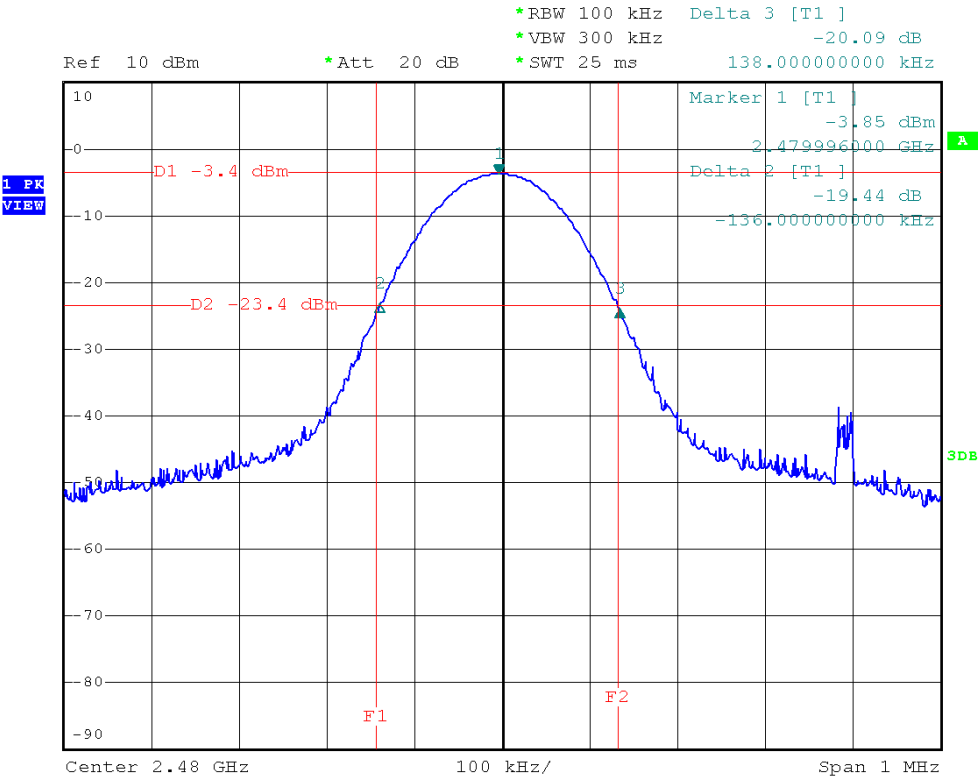
Channel Low :



Channel Middle :



Channel High :



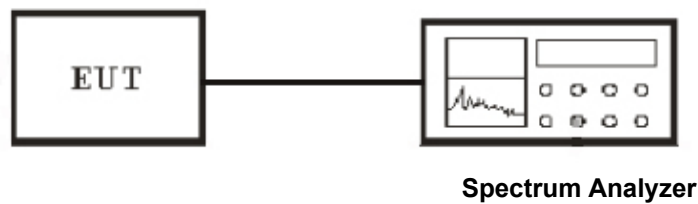


## 6. Test of Hopping Channel Separation

### 6.1 Applicable Standard

Section 15.247(a)(1): 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.

### 6.2 EUT Setup



### 6.3 Test Equipment List and Details

See section 2.4.

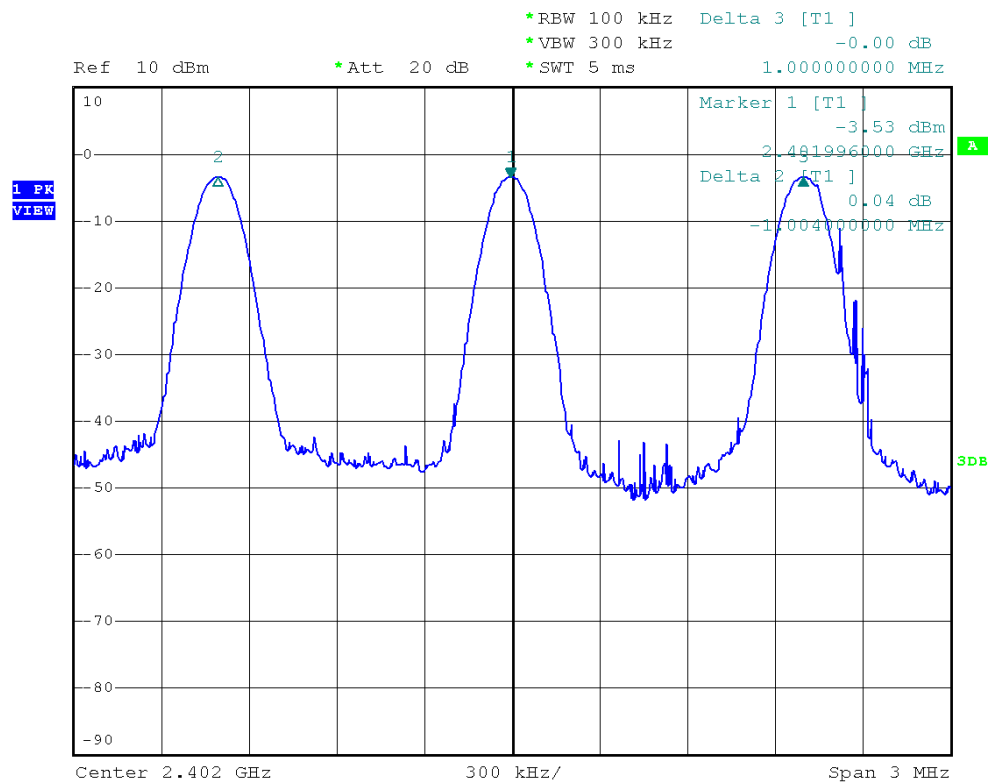
### 6.4 Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 100KHz and VBW to 100KHz.
3. Set Detector to Peak, Trace to Max Hold and Sweep Time is Auto.
4. The Hopping Channel Separation is defined as the separation between 2 neighboring hopping frequencies.
5. Repeat above 1~3 points for the middle and highest channel of the EUT.

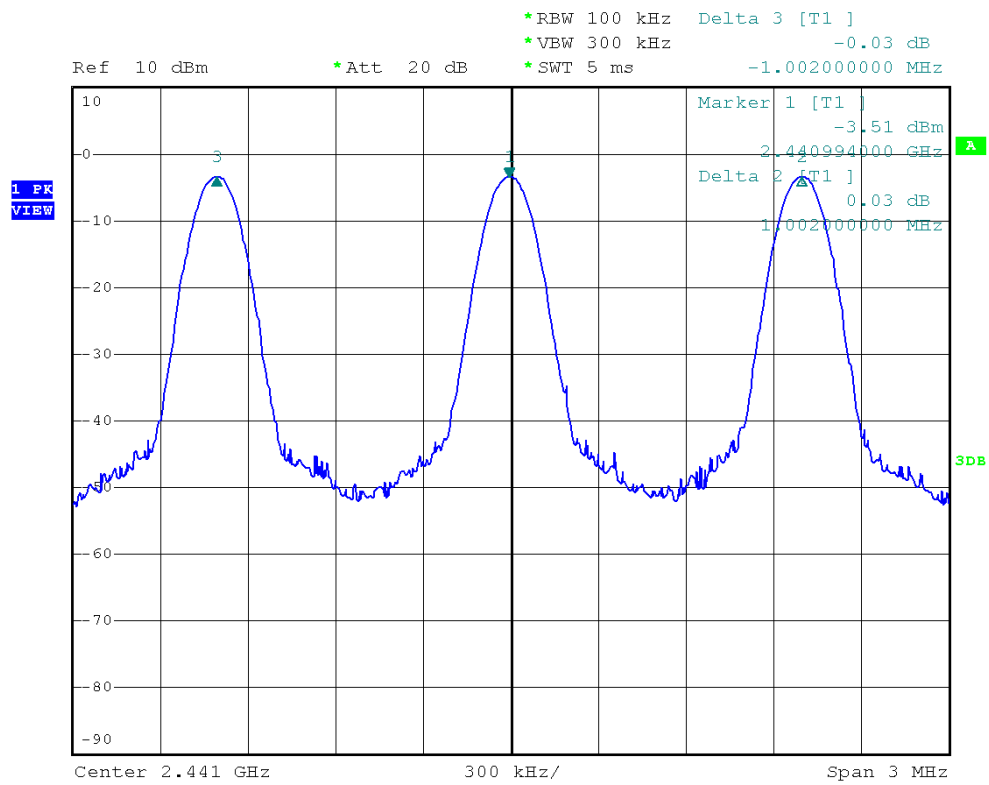
### 6.5 Test Result

|   |  |
|---|--|
| Temperature ( °C ) : 22~23              | EUT: Multifunctional Navigation and Entertainment System |
| Humidity (%RH ) : 50~54                 | M/N: B6241   |
| Barometric Pressure ( mbar ) : 950~1000 | Operation Condition: Tx Mode                             |

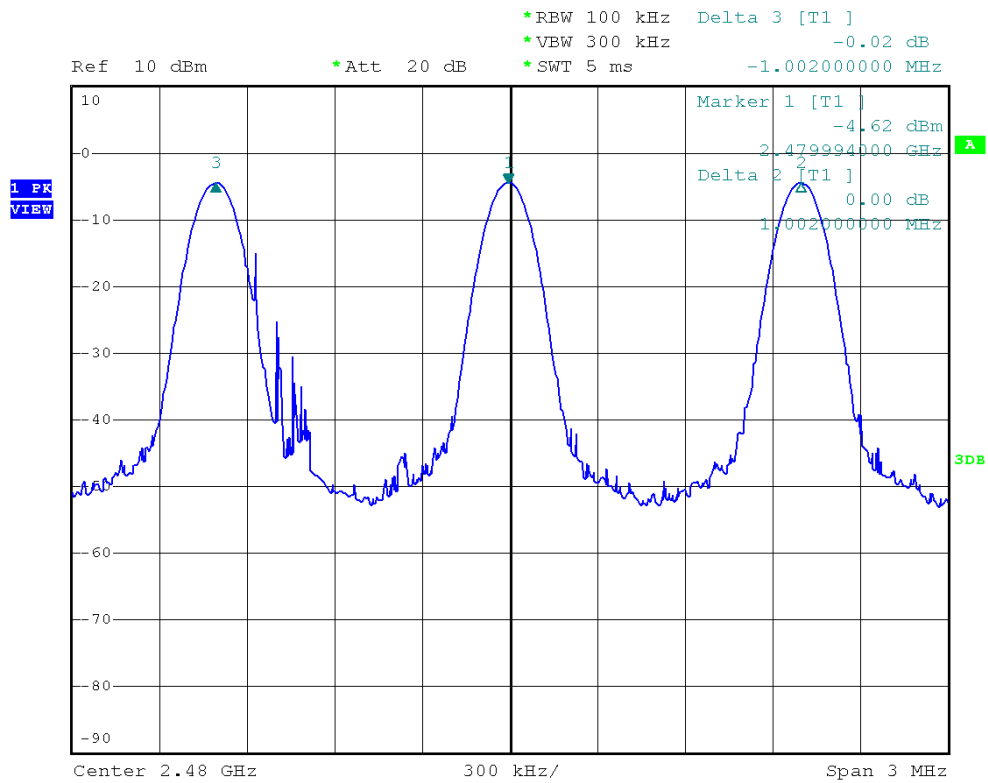
Channel Low :



Channel Middle :



Channel High :

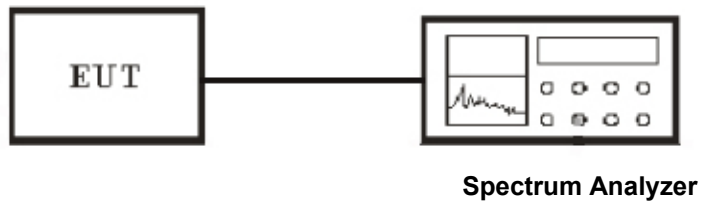


## 7. Test of Number of Hopping Frequency

### 7.1 Applicable Standard

Section 15.247(a)(1)(iii): For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 15 non-overlapping hopping channels. Frequency hopping system which use fewer than 75 hopping frequencies may employ intelligent hopping techniques to avoid interference to other transmissions. Frequency hopping system may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 non-overlapping channels are used.

### 7.2 EUT Setup



### 7.3 Test Equipment List and Details

See section 2.4.

### 7.4 Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 100KHz and VBW to 100KHz.
3. Set Detector to Peak, Trace to Max Hold and Sweep Time is Auto.
4. Observe frequency hopping in 2400MHz~2483.5MHz, there are at least 32 non-overlapping channels.
5. Repeat above 1~3 points for the middle and highest channel of the EUT.

### 7.5 Test Result

|   |  |
|---|--|
| Temperature ( °C ) : 22~23              | EUT: Multifunctional Navigation and Entertainment System |
| Humidity (%RH) : 50~54                  | M/N: B6241   |
| Barometric Pressure ( mbar ) : 950~1000 | Operation Condition: Tx Mode                             |

| Modulation Type | Frequency (MHz) | Number of Hopping Channels | Min. Limit (kHz) |
|-----------------|-----------------|----------------------------|------------------|
| FHSS            | 2402.0~2480.0   | 79                         | >15              |



\*RBW 100 kHz Marker 2 [T1 ]  
VEW 300 kHz -8.15 dBm  
SWT 10 ms 2.401670000 GHz

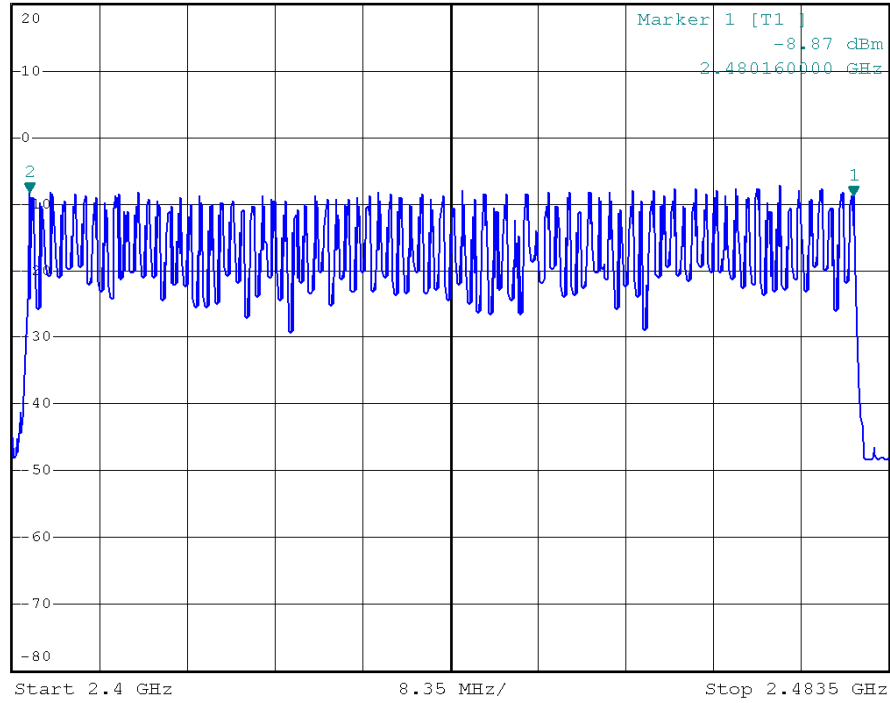
Ref 20 dBm

\*Att 40 dB

SWT 10 ms

2.401670000 GHz

1 PK  
MAXH

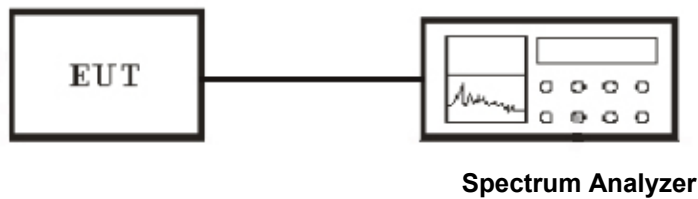


## 8. Test of Dwell Time of Each Frequency

### 8.1 Applicable Standard

Section 15.247(a)(1)(iii): For frequency hopping systems operating in the 2400-2483.5 MHz band The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4seconds multiplied by the number of hopping channels employed.

### 8.2 EUT Setup



### 8.3 Test Equipment List and Details

See section 2.4.

### 8.4 Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 1000kHz and VBW to 1000kHz.
3. Set Detector to Peak, Trace to Max Hold and Sweep Time is more than once pulse time.
4. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
5. Measure the maximum time duration of one single pulse.

### 8.5 Test Result

|   |  |
|---|--|
| Temperature ( °C ) : 22~23              | EUT: Multifunctional Navigation and Entertainment System |
| Humidity (%RH) : 50~54                  | M/N: B6241   |
| Barometric Pressure ( mbar ) : 950~1000 | Operation Condition: Tx Mode                             |

| Modulation Type | Channel No. | Frequency (MHz) | Dwell Time (ms) | Limit (ms) |
|-----------------|-------------|-----------------|-----------------|------------|
| FHSS            | Low         | 2402.00         | 115.20          | 400        |
| FHSS            | Middle      | 2441.00         | 119.04          | 400        |
| FHSS            | High        | 2480.00         | 119.04          | 400        |

A period time =  $0.4 \text{ (ms)} * 79 = 31.6 \text{ (s)}$

CH Low:

DH1 time slot =  $0.360 \text{ (ms)} * (1600/(2*79)) * 31.6 = 115.20 \text{ (ms)}$

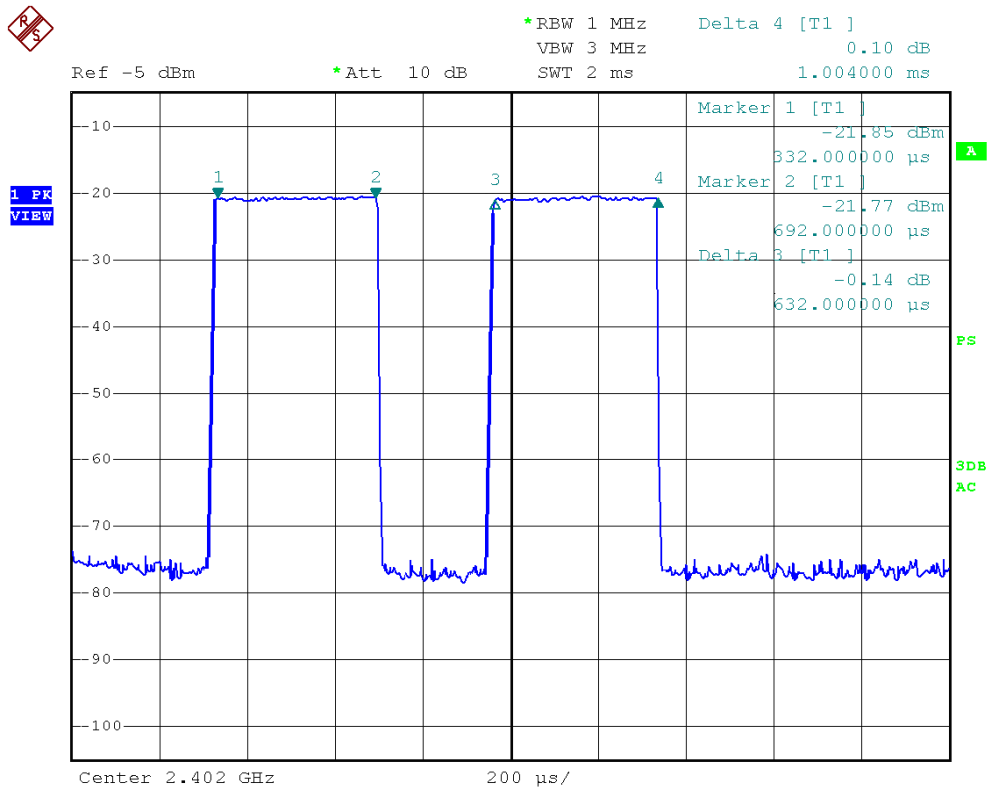
CH Mid:

DH1 time slot =  $0.372 \text{ (ms)} * (1600/(2*79)) * 31.6 = 119.04 \text{ (ms)}$

CH High:

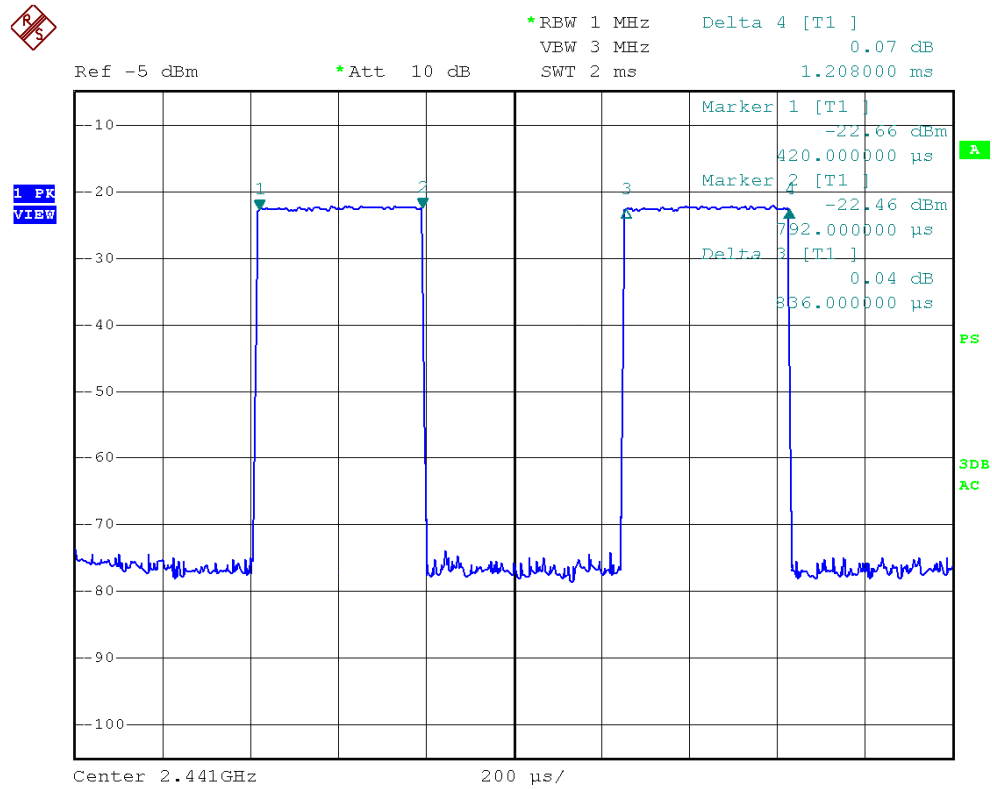
DH1 time slot =  $0.372 \text{ (ms)} * (1600/(2*79)) * 31.6 = 119.04 \text{ (ms)}$

Channel Low :

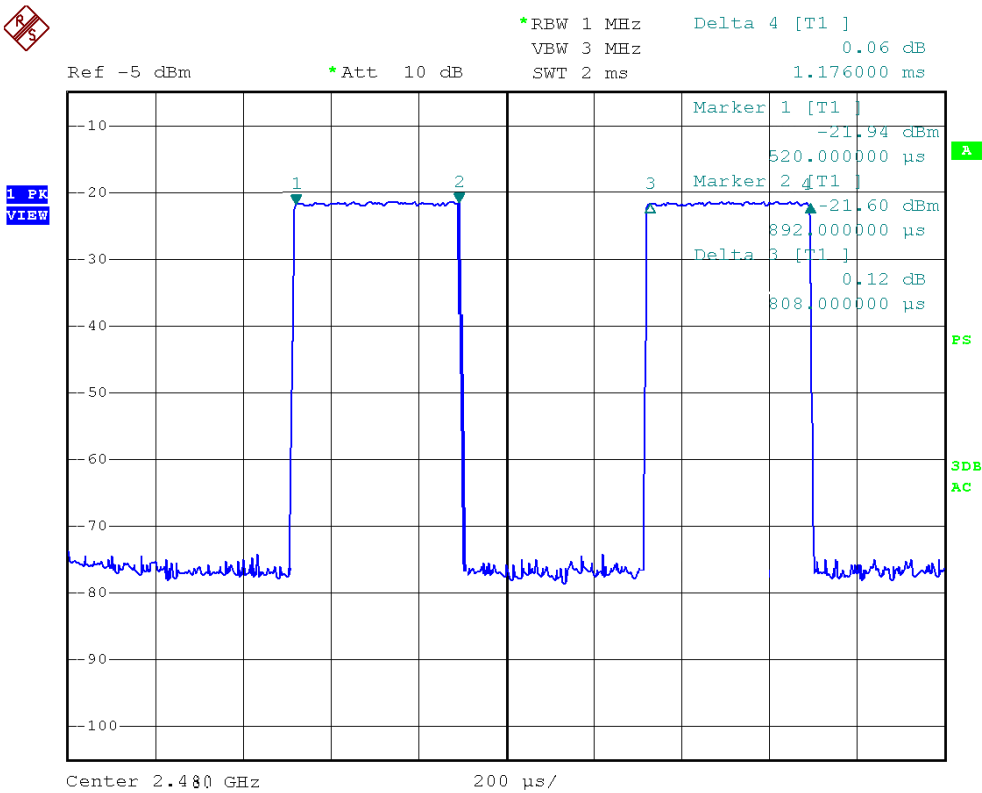




Channel Middle :



**Channel High :**

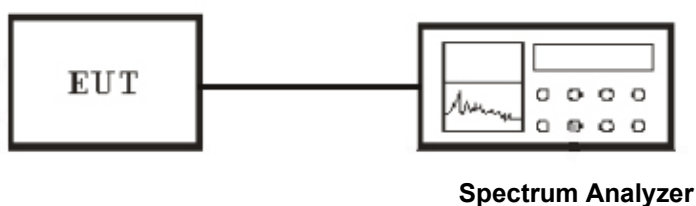


## 9. Test of Maximum Peak Output Power

### 9.1 Applicable Standard

Section 15.247(b)(1): For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels and The maximum peak output power shall not exceed 1 watt. For all other frequency hopping systems in this frequency band, The maximum peak output power shall not exceed 0.125 watt.

### 9.2 EUT Setup



### 9.3 Test Equipment List and Details

See section 2.4.

### 9.4 Test Procedure

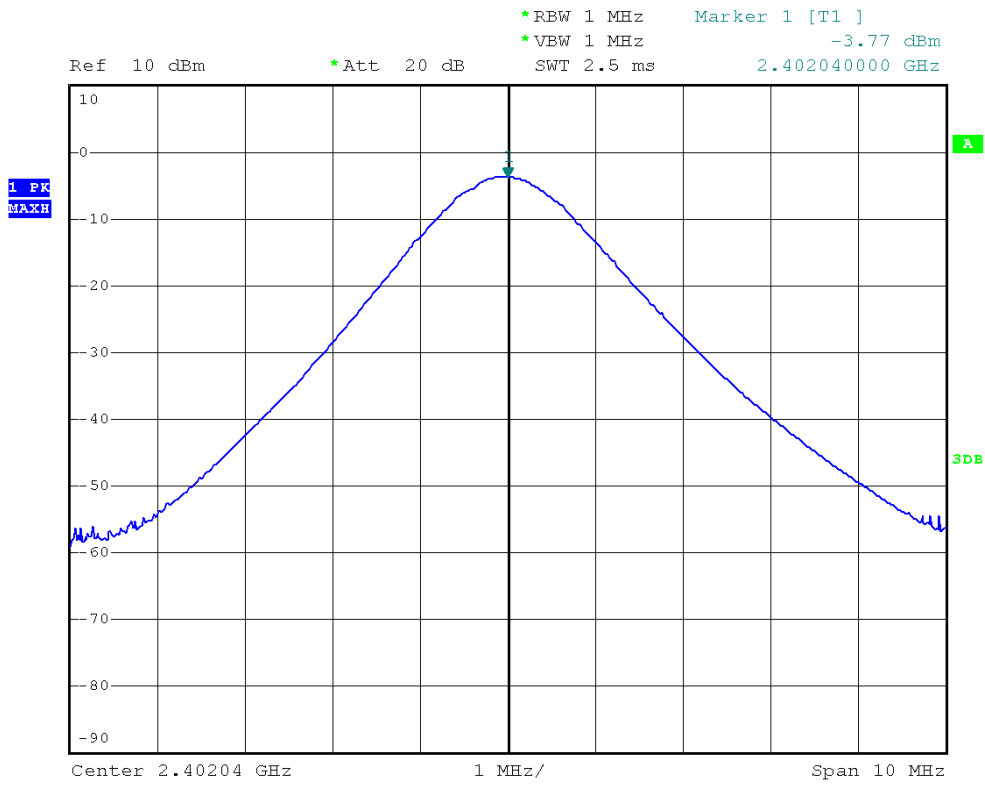
1. The transmitter output was connected to the peak power meter and recorded the peak value.
2. Peak power meter parameter set to auto attenuator and filter is the same as.
3. Repeated the 1 for the middle and highest channel of the EUT.

### 9.5 Test Result

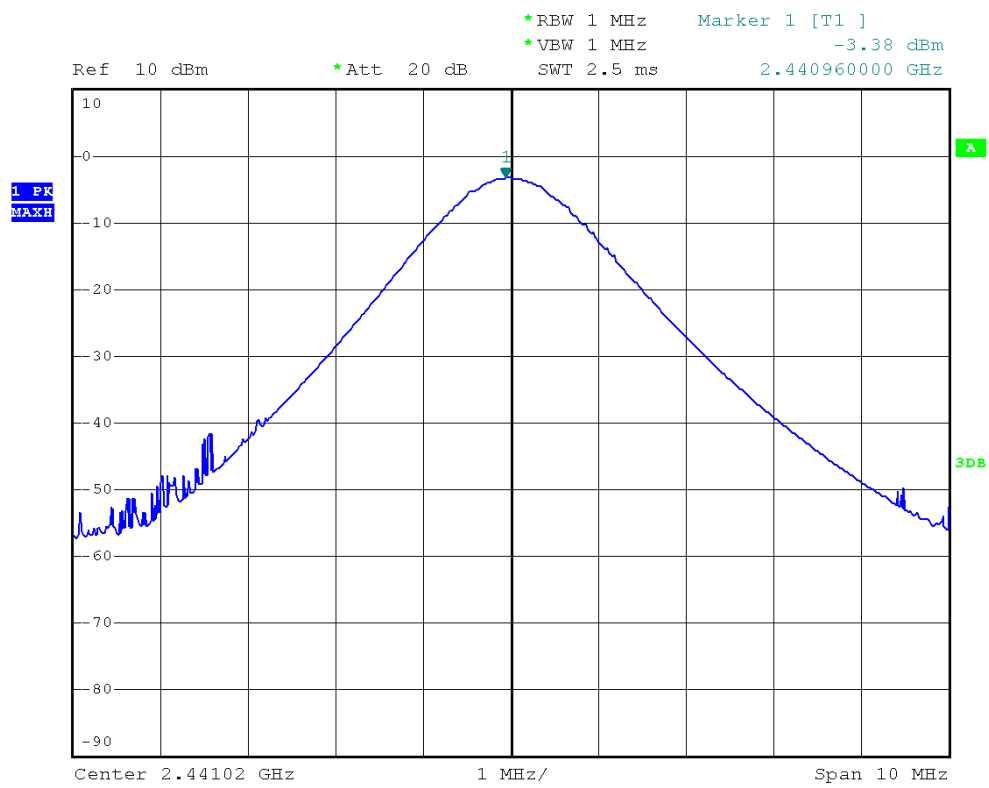
|   |  |
|---|--|
| Temperature ( °C ) : 22~23              | EUT: Multifunctional Navigation and Entertainment System |
| Humidity (%RH) : 50~54                  | M/N: B6241   |
| Barometric Pressure ( mbar ) : 950~1000 | Operation Condition: Tx Mode                             |

| Modulation Type | Channel No. | Frequency (MHz) | Output Power (dBm) | Limits (dBm) | Margin (dB) |
|-----------------|-------------|-----------------|--------------------|--------------|-------------|
| FHSS            | Low         | 2402.00         | -3.77              | 30           | 33.77       |
| FHSS            | Middle      | 2441.00         | -3.38              | 30           | 33.38       |
| FHSS            | High        | 2480.00         | -3.98              | 30           | 33.98       |

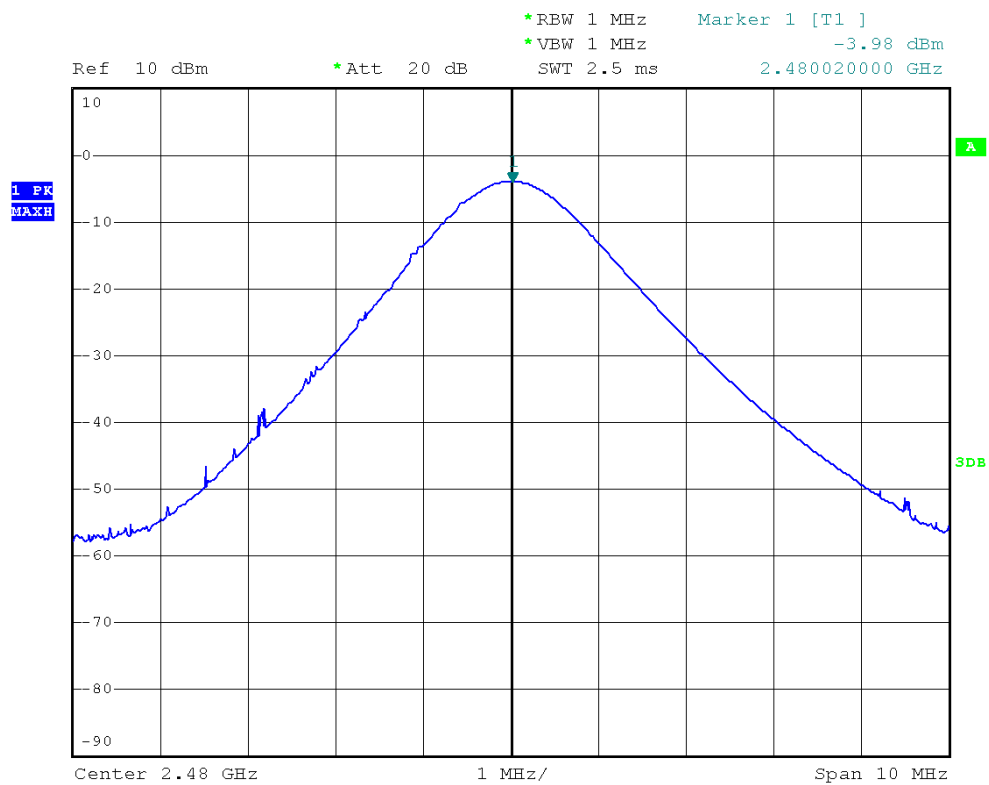
Channel Low :



Channel Middle :



Channel High :



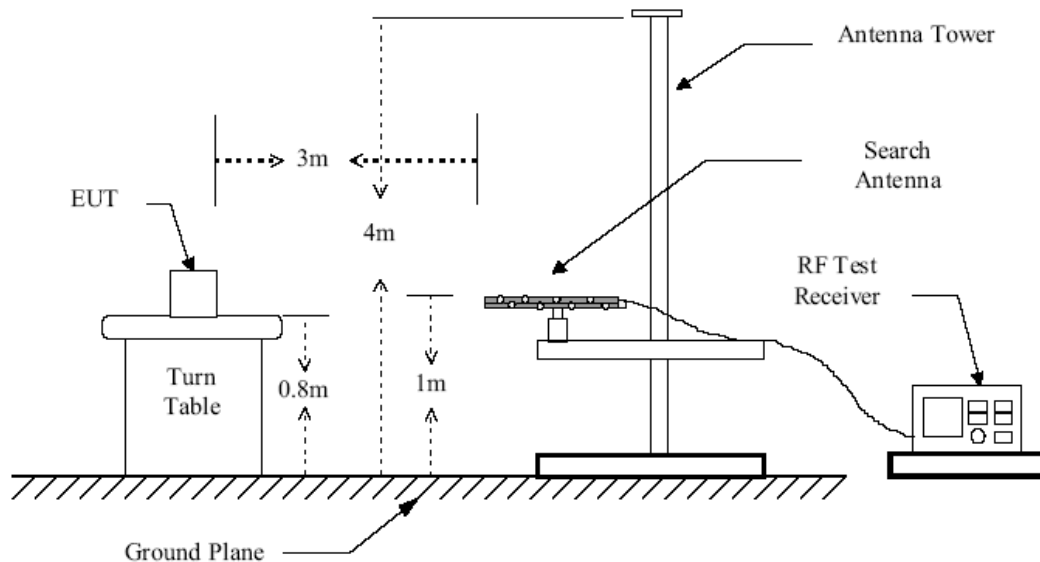
## 10. Test of Band Edges Emission

### 10.1 Applicable Standard

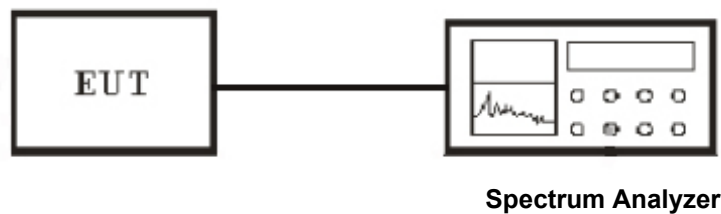
Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. In addition, radiated emissions that fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209.

### 10.2 EUT Setup

#### Radiated Measurement Setup



#### Conducted Measurement Setup



### 10.3 Test Equipment List and Details

See section 2.4.

### 10.4 Test Procedure

#### Conducted Measurement

1. The transmitter is set to the lowest channel.
2. The transmitter output was connected to the spectrum analyzer via a cable and cable loss is used as the offset of the spectrum analyzer.
3. Set both RBW and VBW of spectrum analyzer to 100KHz with convenient frequency span including 100MHz bandwidth from lower band edge. Then detector set to peak and max hold this trace.
4. The lowest band edges emission was measured and recorded.
5. The transmitter set to the highest channel and repeated 2~4.

#### Radiated Measurement

1. Configure the EUT according to ANSI C63.4-2009
2. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
4. For band edge emission, the antenna tower was scan (from 1 M to 4 M) and then the turn table was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. For band edge emission, use 1MHz VBW and 1MHz RBW for reading under AV and use 1MHz VBW and 1MHz RBW for reading under PK.

### 10.5 Test Result

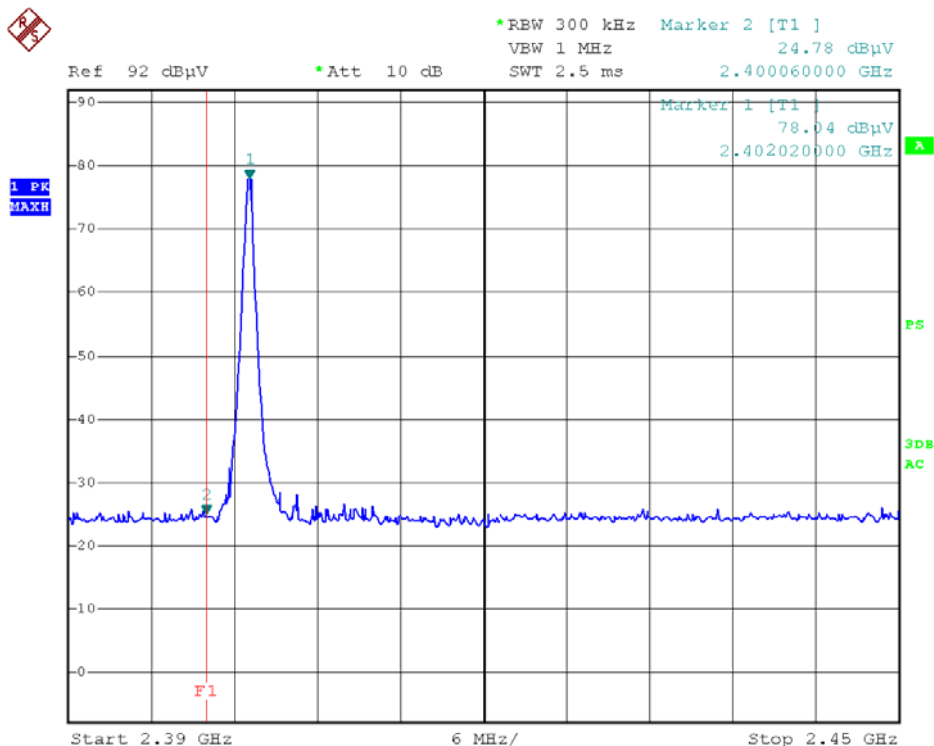
|   |  |
|---|--|
| Temperature ( °C ) : 22~23              | EUT: Multifunctional Navigation and Entertainment System |
| Humidity (%RH) : 50~54                  | M/N: B6241   |
| Barometric Pressure ( mbar ) : 950~1000 | Operation Condition: Tx Mode                             |

#### Radiated Test Result

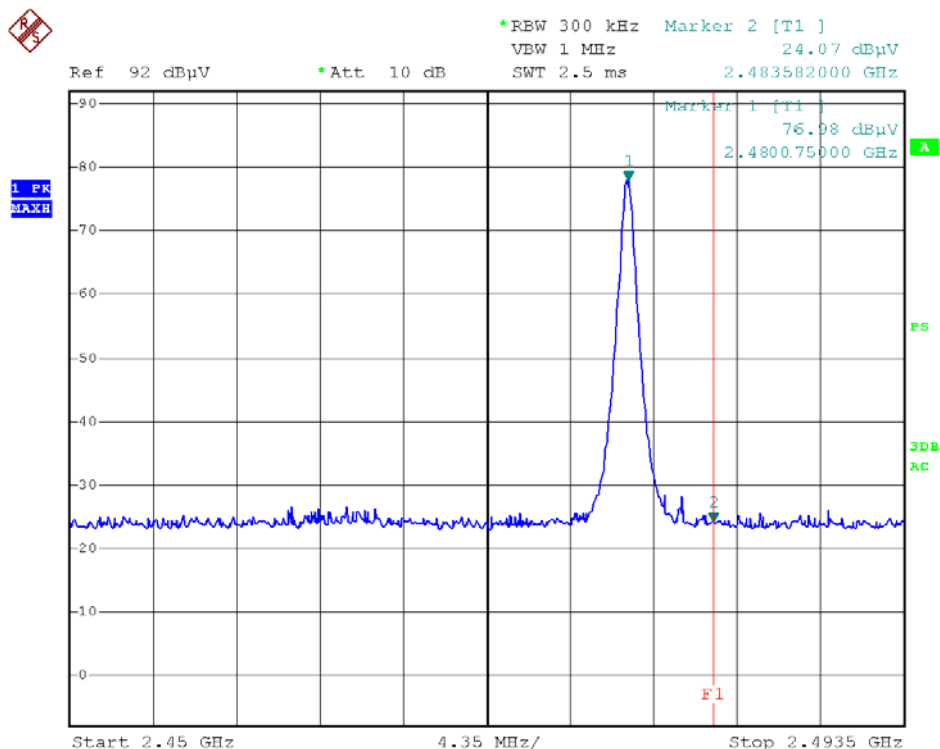
| Frequency(MHz) |
|----------------|
| <2400          |
| >2483.5        |



### The worst frequency range of Low Channel



### The worst frequency range of High Channel



## 11. Test of Spurious Radiated Emission

### 11.1 Applicable Standard

Section 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. In addition, radiated emissions that fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209.

### 11.2 EUT Setup

#### Radiated Measurement Setup

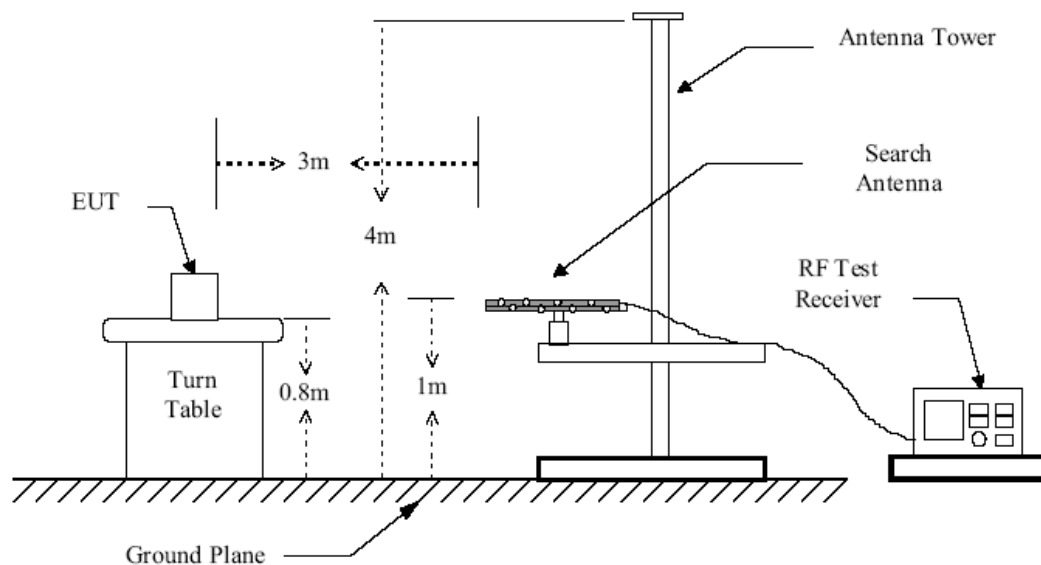


Figure 1 : Frequencies measured below 1 GHz configuration

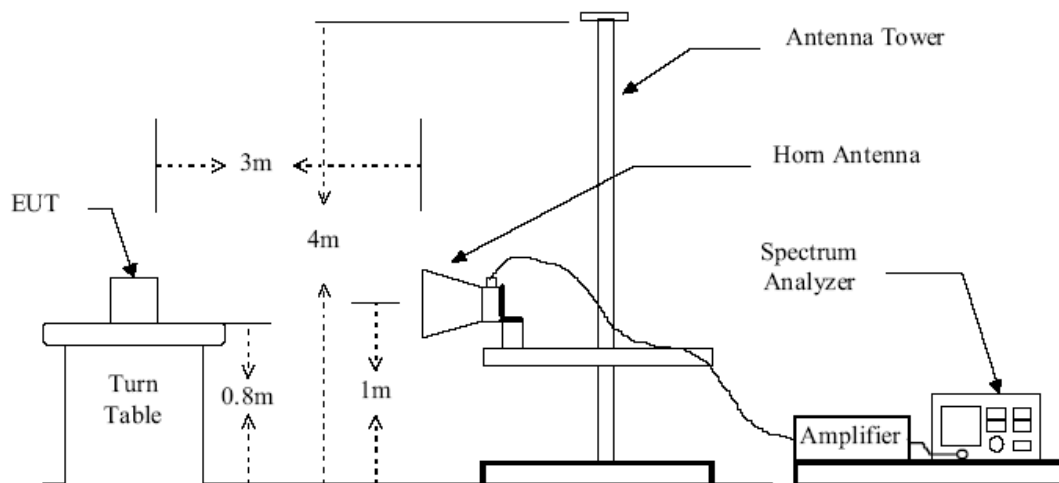
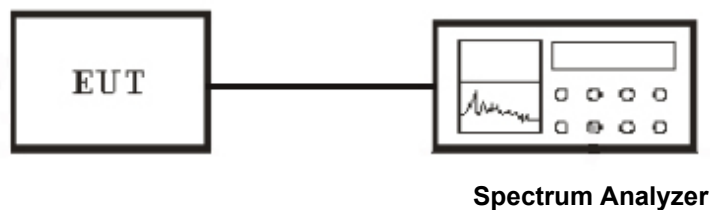


Figure 2 : Frequencies measured above 1 GHz configuration

### Conducted Measurement Setup



### 11.3 Test Equipment List and Details

See section 2.4.

### 11.4 Test Procedure

#### Radiated Measurement

1. Configure the EUT according to ANSI C63.4-2009
2. The EUT was placed on the top of the turntable 0.8 meter above ground.
3. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
4. Power on the EUT and all the supporting units.
5. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
6. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.

7. For each suspected emission, the antenna tower was scanned (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
8. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.

#### **Conducted Measurement**

1. For emission above 1GHz,conducted measurement method is used.
2. The transmitter is set to the lowest channel.
3. The transmitter output was connected to the spectrum analyzer via a cable and cable loss is used as the offset of the spectrum analyzer.
4. Set RBW to 1 MHz and VBW to 3 MHz, Then detector set to peak and max hold this trace.
5. The lowest band edges emission was measured and recorded.
6. The transmitter set to the highest channel and repeated 2~4.

#### **11.5 Test Result**

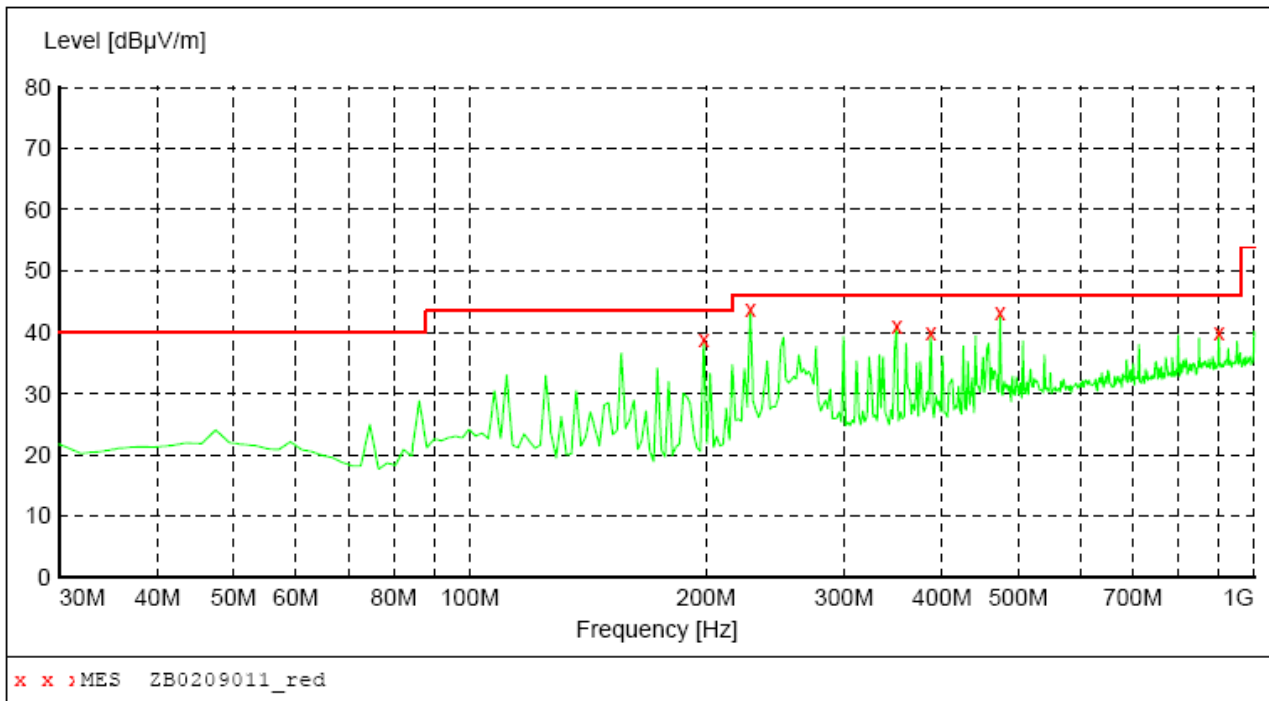
|   |  |
|---|--|
| Temperature ( °C ) : 22~23              | EUT: Multifunctional Navigation and Entertainment System |
| Humidity (%RH ) : 50~54                 | M/N: B6241   |
| Barometric Pressure ( mbar ) : 950~1000 | Operation Condition: Normal operation                    |

## Spurious Emission (30~1000MHz)

EUT: Multifunctional Navigation and Entertainment System  
M/N: B6241  
Operating Condition: Normal Operation  
Test Site: 3m CHAMBER  
Operator: Chen  
Test Specification: DC 12 V  
Comment: Polarization: Horizontal  
Tem:25°C Hum:50%

### ***SWEEP TABLE: "test (30M-1G)"***

| Short Description: |           | Field Strength |         |         |              |
|--------------------|-----------|----------------|---------|---------|--------------|
| Start              | Stop      | Detector       | Meas.   | IF      | Transducer   |
| Frequency          | Frequency |                | Time    | Bandw.  |              |
| 30.0 MHz           | 1.0 GHz   | MaxPeak        | Coupled | 100 kHz | VULB9163 NEW |



### ***MEASUREMENT RESULT: "ZB0209011\_red"***

2/9/2012 09:59

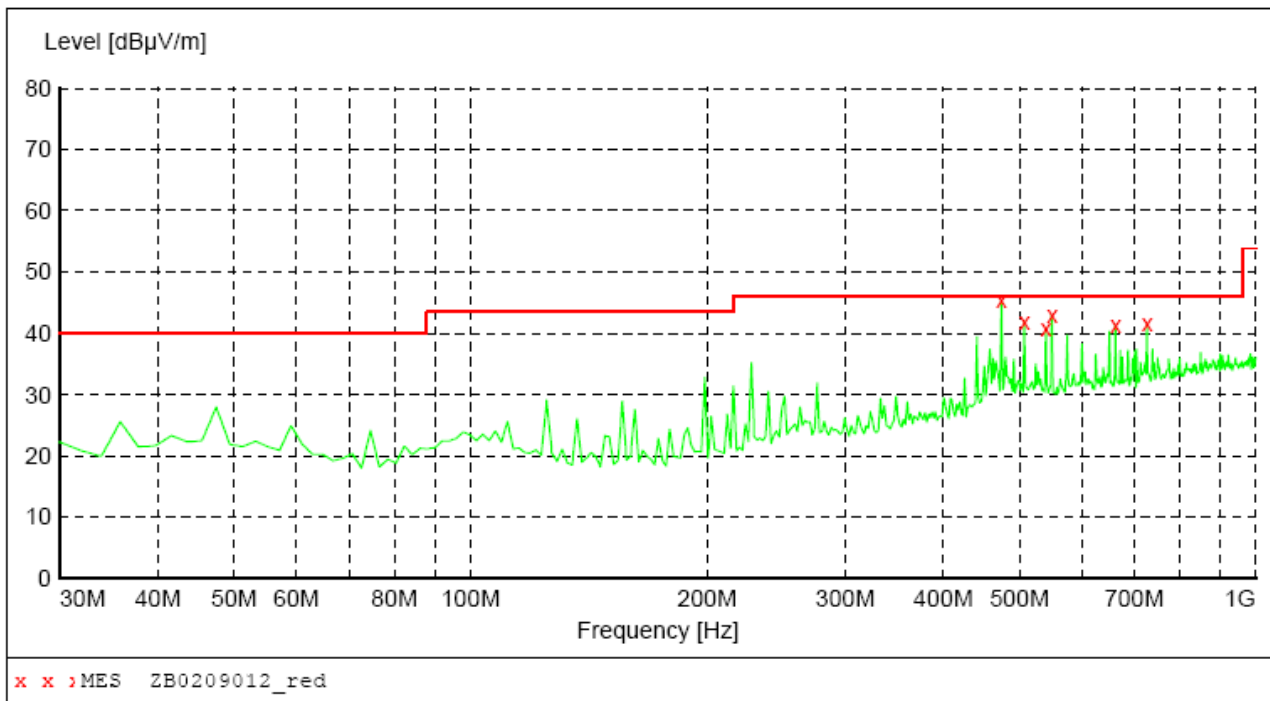
| Frequency<br>MHz | Level<br>dBμV/m | Transd<br>dB | Limit<br>dBμV/m | Margin<br>dB | Det. | Height<br>cm | Azimuth<br>deg | Polarization |
|------------------|-----------------|--------------|-----------------|--------------|------|--------------|----------------|--------------|
| 198.780000       | 38.80           | 14.9         | 43.5            | 4.7          | QP   | 100.0        | 0.00           | HORIZONTAL   |
| 227.880000       | 43.80           | 16.0         | 46.0            | 2.2          | QP   | 100.0        | 0.00           | HORIZONTAL   |
| 350.100000       | 41.10           | 20.4         | 46.0            | 4.9          | QP   | 100.0        | 0.00           | HORIZONTAL   |
| 386.960000       | 40.10           | 21.1         | 46.0            | 5.9          | QP   | 100.0        | 0.00           | HORIZONTAL   |
| 474.260000       | 43.20           | 22.9         | 46.0            | 2.8          | QP   | 100.0        | 0.00           | HORIZONTAL   |
| 901.060000       | 40.10           | 29.2         | 46.0            | 5.9          | QP   | 100.0        | 0.00           | HORIZONTAL   |

## Spurious Emission (30~1000MHz)

EUT: Multifunctional Navigation and Entertainment System  
M/N: B6241  
Operating Condition: Normal Operation  
Test Site: 3m CHAMBER  
Operator: Chen  
Test Specification: DC 12V  
Comment: Polarization: Vertical  
Tem:25°C Hum:50%

### ***SWEEP TABLE: "test (30M-1G)"***

| Short Description: |           | Field Strength |         |         |              |
|--------------------|-----------|----------------|---------|---------|--------------|
| Start              | Stop      | Detector       | Meas.   | IF      | Transducer   |
| Frequency          | Frequency |                | Time    | Bandw.  |              |
| 30.0 MHz           | 1.0 GHz   | MaxPeak        | Coupled | 100 kHz | VULB9163 NEW |



### ***MEASUREMENT RESULT: "ZB0209012\_red"***

2/9/2012 10:01

| Frequency<br>MHz | Level<br>dBμV/m | Transd<br>dB | Limit<br>dBμV/m | Margin<br>dB | Det. | Height<br>cm | Azimuth<br>deg | Polarization |
|------------------|-----------------|--------------|-----------------|--------------|------|--------------|----------------|--------------|
| 474.260000       | 45.30           | 22.9         | 46.0            | 0.7          | QP   | 100.0        | 0.00           | VERTICAL     |
| 507.240000       | 42.00           | 24.0         | 46.0            | 4.0          | QP   | 100.0        | 0.00           | VERTICAL     |
| 540.220000       | 40.90           | 24.8         | 46.0            | 5.1          | QP   | 100.0        | 0.00           | VERTICAL     |
| 549.920000       | 43.00           | 25.0         | 46.0            | 3.0          | QP   | 100.0        | 0.00           | VERTICAL     |
| 662.440000       | 41.30           | 26.3         | 46.0            | 4.7          | QP   | 100.0        | 0.00           | VERTICAL     |
| 726.460000       | 41.60           | 26.9         | 46.0            | 4.4          | QP   | 100.0        | 0.00           | VERTICAL     |

## Spurious Emission test data below 30MHz

| Frequency | Meter Reading | Antenna Factor | Cable Loss | Emission Levels | Limits   | Margin | Detector Mode |
|-----------|---------------|----------------|------------|-----------------|----------|--------|---------------|
| (MHz)     | (dBμV)        | (dB/M)         | (dB)       | (dBμV/M)        | (dBμV/M) | (dB)   | PK/QP         |
| 0.530     | 19.30         | 7.89           | 1.02       | 28.21           | 65.3     | -37.09 | QP            |
| 14.90     | 18.87         | 8.76           | 1.21       | 28.84           | 49.5     | -20.66 | QP            |
| 18.70     | 17.90         | 8.63           | 1.14       | 27.67           | 49.5     | -21.83 | QP            |
| 21.50     | 19.90         | 8.06           | 1.67       | 29.63           | 49.5     | -19.87 | QP            |

## Spurious Emission test data above 1G

| Channel Low             |                    |            |              |        |               |                |                 |              |
|-------------------------|--------------------|------------|--------------|--------|---------------|----------------|-----------------|--------------|
| Maximum Frequency (MHz) | Polarity and Level |            |              |        |               | Limit (dBμV/m) | Margin (dBμV/m) | Mark (P/Q/A) |
|                         | Polarity           | Height (m) | Reading dBμV | Transd | Result dBμV/m |                |                 |              |
| 2390.00                 | H                  | 1.00       | 30.1         | 24.3   | 54.4          | 74.0           | 19.6            | P            |
|                         |                    |            | 22.3         | 24.3   | 45.6          | 54.0           | 7.4             | A            |
| 2390.00                 | V                  | 1.00       | 32.8         | 24.3   | 57.1          | 74.0           | 16.9            | P            |
|                         |                    |            | 24.1         | 25.2   | 49.3          | 54.0           | 3.7             | A            |
| 2402.01                 | H                  | 1.00       | 68.7         | 24.3   | 93.1          | 114            | 20.9            | P            |
|                         |                    |            | 67.0         | 24.3   | 91.3          | 94             | 2.7             | A            |
| 2402.01                 | V                  | 1.00       | 68.6         | 24.8   | 93.4          | 114            | 20.6            | P            |
|                         |                    |            | 65.4         | 24.8   | 90.2          | 94             | 3.9             | A            |
| 4804.03                 | H                  | 1.00       | 21.7         | 24.3   | 46.0          | 74.0           | 28.0            | P            |
|                         |                    |            | 17.8         | 24.3   | 42.1          | 54.0           | 11.9            | A            |
| 4804.03                 | V                  | 1.00       | 25.0         | 24.3   | 49.3          | 74.0           | 24.7            | P            |
|                         |                    |            | 11.6         | 24.3   | 45.9          | 54.0           | 8.1             | A            |
| 7206.05                 | H                  | 1.00       | 23.6         | 24.3   | 47.9          | 74.0           | 26.1            | P            |
|                         |                    |            | 20.0         | 24.3   | 44.3          | 54.0           | 9.7             | A            |
| 7206.05                 | V                  | 1.00       | 25.2         | 24.8   | 50.0          | 74.0           | 24.0            | P            |
|                         |                    |            | 18.8         | 24.8   | 43.6          | 54.0           | 10.4            | A            |
| 9608.06                 | H                  | 1.00       | 21.3         | 25.1   | 46.4          | 74.0           | 27.6            | P            |
|                         |                    |            | 15.7         | 25.1   | 40.8          | 54.0           | 13.2            | A            |
| 9608.06                 | V                  | 1.00       | 21.4         | 25.1   | 46.5          | 74.0           | 27.5            | P            |
|                         |                    |            | 18.2         | 25.1   | 43.3          | 54.0           | 10.7            | A            |
| 12010.07                | ---                |            | ---          | ---    | ---           | ---            | ---             |              |
| 14412.08                | ---                |            | ---          | ---    | ---           | ---            | ---             |              |
| 16814.09                | ---                |            | ---          | ---    | ---           | ---            | ---             |              |
| 19216.11                | ---                |            | ---          | ---    | ---           | ---            | ---             |              |
| 21618.12                | ---                |            | ---          | ---    | ---           | ---            | ---             |              |
| 24020.13                | ---                |            | ---          | ---    | ---           | ---            | ---             |              |

**Remark:** 1. Transd.=Antenna Factor+Cable Loss-Pre-amplifier  
Margin = Level-Limit  
Mark: P means Peak Value, Q means Quasi Peak Value, A means Average Value  
2. Data of measurement within this frequency range shown “-” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.  
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz.  
4. The test limit distance is 3m limit

| Channel Mid             |                    |            |              |        |               |                |                 |              |
|-------------------------|--------------------|------------|--------------|--------|---------------|----------------|-----------------|--------------|
| Maximum Frequency (MHz) | Polarity and Level |            |              |        |               | Limit (dBμV/m) | Margin (dBμV/m) | Mark (P/Q/A) |
|                         | Polarity           | Height (m) | Reading dBμV | Transd | Result dBμV/m |                |                 |              |
| 2441.02                 | H                  | 1.00       | 68.8         | 24.3   | 93.1          | 114            | 20.9            | P            |
|                         |                    |            | 67.0         | 24.3   | 91.3          | 94             | 2.7             | A            |
| 2441.02                 | V                  | 1.00       | 67.4         | 24.8   | 92.2          | 114            | 22.7            | P            |
|                         |                    |            | 66.3         | 24.8   | 91.1          | 94             | 2.9             | A            |
| 4882.05                 | H                  | 1.00       | 25.1         | 24.3   | 49.4          | 74.0           | 24.6            | P            |
|                         |                    |            | 18.3         | 24.3   | 44.6          | 54.0           | 9.4             | A            |
| 4882.05                 | V                  | 1.00       | 24.4         | 24.3   | 48.7          | 74.0           | 25.3            | P            |
|                         |                    |            | 18.3         | 25.2   | 43.5          | 54.0           | 10.5            | A            |
| 7323.07                 | H                  | 1.00       | 25.4         | 25.2   | 50.6          | 74.0           | 23.4            | P            |
|                         |                    |            | 18.9         | 25.2   | 44.1          | 54.0           | 9.9             | A            |
| 7323.07                 | V                  | 1.00       | 27.1         | 25.2   | 52.3          | 74.0           | 21.7            | P            |
|                         |                    |            | 21.5         | 24.9   | 46.4          | 54.0           | 7.6             | A            |
| 9764.10                 | H                  | 1.00       | 19.4         | 24.9   | 44.3          | 74.0           | 27.9            | P            |
|                         |                    |            | 18.9         | 24.9   | 43.8          | 54.0           | 10.2            | A            |
| 9764.10                 | V                  | 1.00       | 18.3         | 25.2   | 43.5          | 74.0           | 30.5            | P            |
|                         |                    |            | 16.7         | 25.2   | 41.9          | 54.0           | 12.1            | A            |
| 12205.11                | ---                |            | ---          | ---    | ---           | ---            | ---             |              |
| 14646.13                | ---                |            | ---          | ---    | ---           | ---            | ---             |              |
| 17087.14                | ---                |            | ---          | ---    | ---           | ---            | ---             |              |
| 19528.16                | ---                |            | ---          | ---    | ---           | ---            | ---             |              |
| 21969.20                | ---                |            | ---          | ---    | ---           | ---            | ---             |              |
| 24410.21                | ---                |            | ---          | ---    | ---           | ---            | ---             |              |

**Remark:** 1. Transd.=Antenna Factor+Cable Loss-Pre-amplifier  
Margin = Level-Limit  
Mark: P means Peak Value, Q means Quasi Peak Value, A means Average Value  
2. Data of measurement within this frequency range shown “-” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.  
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz.  
4. The test limit distance is 3m limit



| Channel High   |                    |            |              |        |               |                |                 |              |
|--|--------------------|------------|--------------|--------|---------------|----------------|-----------------|--------------|
| Maximum Frequency (MHz)  | Polarity and Level |            |              |        |               | Limit (dBμV/m) | Margin (dBμV/m) | Mark (P/Q/A) |
|  | Polarity           | Height (m) | Reading dBμV | Transd | Result dBμV/m |                |                 |              |
| 2480.01  | H                  | 1.00       | 67.3         | 24.8   | 88.5          | 114.0          | 25.5            | P            |
|  |                    |            | 63.1         | 24.8   | 87.9          | 94.0           | 6.1             | A            |
| 2480.01  | V                  | 1.00       | 67.2         | 25.1   | 92.3          | 114.0          | 21.7            | P            |
|  |                    |            | 66.4         | 25.1   | 91.5          | 94.0           | 2.5             | A            |
| 2500.00  | H                  | 1.00       | 29.3         | 24.3   | 53.6          | 74.0           | 20.4            | P            |
|  |                    |            | 23.7         | 24.3   | 48.0          | 54.0           | 6.0             | A            |
| 2500.00  | V                  | 1.00       | 33.5         | 24.3   | 58.8          | 74.0           | 15.2            | P            |
|  |                    |            | 24.3         | 25.2   | 49.5          | 54.0           | 3.5             | A            |
| 4960.02  | H                  | 1.00       | 21.7         | 24.3   | 46.0          | 74.0           | 28.0            | P            |
|  |                    |            | 17.8         | 24.3   | 42.1          | 54.0           | 11.9            | A            |
| 4960.02  | V                  | 1.00       | 25.0         | 24.3   | 49.3          | 74.0           | 24.7            | P            |
|  |                    |            | 11.6         | 24.3   | 45.9          | 54.0           | 8.1             | A            |
| 7440.03  | H                  | 1.00       | 25.2         | 25.2   | 50.4          | 74.0           | 23.6            | P            |
|  |                    |            | 19.1         | 25.2   | 44.3          | 54.0           | 9.7             | A            |
| 7440.03  | V                  | 1.00       | 23.6         | 25.2   | 48.8          | 74.0           | 25.2            | P            |
|  |                    |            | 19.1         | 25.2   | 44.3          | 54.0           | 9.7             | A            |
| 9920.04  | H                  | 1.00       | 19.7         | 24.9   | 44.6          | 74.0           | 29.4            | P            |
|  |                    |            | 16.4         | 24.9   | 41.3          | 54.0           | 12.7            | A            |
| 9920.04  | V                  | 1.00       | 22.4         | 24.9   | 47.3          | 74.0           | 26.7            | P            |
|  |                    |            | 19.9         | 24.9   | 44.8          | 54.0           | 9.2             | A            |
| 12400.05   | ---                |            | ---          | ---    | ---           | ---            | ---             |              |
| 14880.06   | ---                |            | ---          | ---    | ---           | ---            | ---             |              |
| 17360.07   | ---                |            | ---          | ---    | ---           | ---            | ---             |              |
| 19840.08   | ---                |            | ---          | ---    | ---           | ---            | ---             |              |
| 22320.09   | ---                |            | ---          | ---    | ---           | ---            | ---             |              |
| 24800.10   | ---                |            | ---          | ---    | ---           | ---            | ---             |              |
| <b>Remark: 1. Transd.=Antenna Factor+Cable Loss-Pre-amplifier</b><br><b>Margin = Level-Limit</b><br><b>Mark: P means Peak Value, Q means Quasi Peak Value, A means Average Value</b><br><b>2. Data of measurement within this frequency range shown “-” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.</b><br><b>3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz.</b><br><b>4. The test limit distance is 3m limit</b> |                    |            |              |        |               |                |                 |              |

## **12. ANTENNA REQUIREMENT**

### **12.1 Standard Applicable**

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. 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 of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Section 15.247(b)/(c):

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

If the intentional radiator is used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

### **12.2 Antenna Connected Construction**

The antenna connector is designed with permanent attachment and no consideration of replacement.