# FCC Report

**Applicant:** Shenzhen Autel Intelligent Technology Co., Ltd.

**Address of Applicant:** East Gate, the 1st Floor of SZICC Bldg, Chaguang Road 1089, Xili Town, Nanshan District, Shenzhen, China

**Equipment Under Test (EUT)**

Product Name: MaxiSys

Model No.: MaxiSys

Trade Mark: AUTEL

**FCC ID:** WQ8MAXISYSMY908

**Applicable standards:** FCC CFR Title 47 Part 15 Subpart C Section 15.247:2012

**Date of sample receipt:** September 12, 2013

**Date of Test:** September 13 – November 1, 2013

**Date of report issued:** November 4, 2013

**Test Result :** PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

**Robinson Lo**
**Laboratory Manager**

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the GTS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.
This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of GTS International Electrical Approvals or testing done by GTS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by GTS International Electrical Approvals in writing.
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## 2 Version

| Version No. | Date | Description |
|---|---|---|
| *00* | *November 4, 2013* | *Original* |
| | | |
| | | |
| | | |
| | | |

| | | | |
|---|---|---|---|
| ***Prepared By:*** | hank. yan | ***Date:*** | *November 4, 2013* |
| | ***Project Engineer*** | | |
| ***Check By:*** | Hans. Hu | ***Date:*** | *November 4, 2013* |
| | ***Reviewer*** | | |

# 3 Contents

Page

**1 COVER PAGE** ..... **1**

**2 VERSION** ..... **2**

**3 CONTENTS** ..... **3**

**4 TEST SUMMARY** ..... **4**

**5 GENERAL INFORMATION** ..... **5**

5.1 CLIENT INFORMATION ..... 5
5.2 GENERAL DESCRIPTION OF EUT ..... 5
5.3 TEST MODE ..... 7
5.4 TEST FACILITY ..... 7
5.5 TEST LOCATION ..... 7
5.6 OTHER INFORMATION REQUESTED BY THE CUSTOMER ..... 7
5.7 DESCRIPTION OF SUPPORT UNITS ..... 7

**6 TEST INSTRUMENTS LIST** ..... **8**

**7 TEST RESULTS AND MEASUREMENT DATA** ..... **9**

7.1 ANTENNA REQUIREMENT ..... 9
7.2 CONDUCTED EMISSIONS ..... 10
7.3 CONDUCTED PEAK OUTPUT POWER ..... 13
7.4 20DB EMISSION BANDWIDTH ..... 17
7.5 CARRIER FREQUENCIES SEPARATION ..... 21
7.6 HOPPING CHANNEL NUMBER ..... 25
7.7 DWELL TIME ..... 26
7.8 PSEUDORANDOM FREQUENCY HOPPING SEQUENCE ..... 28
7.9 BAND EDGE ..... 29
*7.9.1 Conducted Emission Method* ..... *29*
*7.9.2 Radiated Emission Method* ..... *33*
7.10 SPURIOUS EMISSION ..... 35
*7.10.1 Conducted Emission Method* ..... *35*
*7.10.2 Radiated Emission Method* ..... *39*

**8 TEST SETUP PHOTO** ..... **45**

**9 EUT CONSTRUCTIONAL DETAILS** ..... **46**

# 4 Test Summary

| Test Item | Section in CFR 47 | Result |
|---|---|---|
| Antenna Requirement | 15.203/15.247 (c) | Pass |
| AC Power Line Conducted Emission | 15.207 | Pass |
| Conducted Peak Output Power | 15.247 (b)(1) | Pass |
| 20dB Occupied Bandwidth | 15.247 (a)(1) | Pass |
| Carrier Frequencies Separation | 15.247 (a)(1) | Pass |
| Hopping Channel Number | 15.247 (a)(1) | Pass |
| Dwell Time | 15.247 (a)(1) | Pass |
| Pseudorandom Frequency Hopping Sequence | 15.247(b)(4)&TCB Exclusion List (7 July 2002) | Pass |
| Radiated Emission | 15.205/15.209 | Pass |
| Band Edge | 15.247(d) | Pass |

*Pass: The EUT complies with the essential requirements in the standard.*

# 5 General Information

## 5.1 Client Information

| | |
|---|---|
| Applicant: | Shenzhen Autel Intelligent Technology Co., Ltd. |
| Address of Applicant: | East Gate, the 1st Floor of SZICC Bldg, Chaguang Road 1089, Xili Town, Nanshan District, Shenzhen, China |
| Manufacturer: | Shenzhen Autel Intelligent Technology Co., Ltd. |
| Address of Manufacturer: | East Gate, the 1st Floor of SZICC Bldg, Chaguang Road 1089, Xili Town, Nanshan District, Shenzhen, China |

## 5.2 General Description of EUT

| | |
|---|---|
| Product Name: | MaxiSys |
| Model No.: | MaxiSys |
| Operation Frequency: | 2402MHz~2480MHz |
| Channel numbers: | 79 |
| Channel separation: | 1MHz |
| Modulation type: | GFSK, Pi/4QPSK, 8DPSK |
| Antenna Type: | Integral antenna |
| Antenna gain: | 0.5dBi (declare by Applicant) |
| Power Supply: | Model No.:GFP361DA-1230-1<br>Input: AC 100~240V~50/60Hz 1.2A<br>Output: DC 12.0V 3.0A<br>DC 3.7V Li-ion Battery |

| Operation Frequency each of channel | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
| 1 | 2402MHz | 21 | 2422MHz | 41 | 2442MHz | 61 | 2462MHz |
| 2 | 2403MHz | 22 | 2423MHz | 42 | 2443MHz | 62 | 2463MHz |
| 3 | 2404MHz | 23 | 2424MHz | 43 | 2444MHz | 63 | 2464MHz |
| 4 | 2405MHz | 24 | 2425MHz | 44 | 2445MHz | 64 | 2465MHz |
| 5 | 2406MHz | 25 | 2426MHz | 45 | 2446MHz | 65 | 2466MHz |
| 6 | 2407MHz | 26 | 2427MHz | 46 | 2447MHz | 66 | 2467MHz |
| 7 | 2408MHz | 27 | 2428MHz | 47 | 2448MHz | 67 | 2468MHz |
| 8 | 2409MHz | 28 | 2429MHz | 48 | 2449MHz | 68 | 2469MHz |
| 9 | 2410MHz | 29 | 2430MHz | 49 | 2450MHz | 69 | 2470MHz |
| 10 | 2411MHz | 30 | 2431MHz | 50 | 2451MHz | 70 | 2471MHz |
| 11 | 2412MHz | 31 | 2432MHz | 51 | 2452MHz | 71 | 2472MHz |
| 12 | 2413MHz | 32 | 2433MHz | 52 | 2453MHz | 72 | 2473MHz |
| 13 | 2414MHz | 33 | 2434MHz | 53 | 2454MHz | 73 | 2474MHz |
| 14 | 2415MHz | 34 | 2435MHz | 54 | 2455MHz | 74 | 2475MHz |
| 15 | 2416MHz | 35 | 2436MHz | 55 | 2456MHz | 75 | 2476MHz |
| 16 | 2417MHz | 36 | 2437MHz | 56 | 2457MHz | 76 | 2477MHz |
| 17 | 2418MHz | 37 | 2438MHz | 57 | 2458MHz | 77 | 2478MHz |
| 18 | 2419MHz | 38 | 2439MHz | 58 | 2459MHz | 78 | 2479MHz |
| 19 | 2420MHz | 39 | 2440MHz | 59 | 2460MHz | 79 | 2480MHz |
| 20 | 2421MHz | 40 | 2441MHz | 60 | 2461MHz | | |

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

| Channel | Frequency |
|---|---|
| The lowest channel | 2402MHz |
| The middle channel | 2441MHz |
| The Highest channel | 2480MHz |

## 5.3 Test mode

| | |
|---|---|
| Transmitting mode | Keep the Bluetooth in continuously transmitting mode |

## 5.4 Test Facility

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

● **CNAS —Registration No.: CNAS L5775**

CNAS has accredited Global United Technology Services Co., Ltd. To ISO/IEC 17025 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.

● **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fuly described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 600491, June 28, 2013.

● **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, June 26, 2013.

## 5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.
Address: 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road Baoan District, Shenzhen, China
Tel: 0755-27798480
Fax: 0755-27798960

## 5.6 Other Information Requested by the Customer

None.

## 5.7 Description of Support Units

None.

# 6 Test Instruments list

| Radiated Emission: | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal.Date (mm-dd-yy)** | **Cal.Due date (mm-dd-yy)** |
| 1 | 3m Semi- Anechoic Chamber | ZhongYu Electron | 9.2(L)*6.2(W)* 6.4(H) | GTS250 | Mar. 29 2013 | Mar. 28 2014 |
| 2 | Control Room | ZhongYu Electron | 6.2(L)*2.5(W)* 2.4(H) | GTS251 | N/A | N/A |
| 3 | Spectrum Analyzer | Agilent | E4440A | GTS533 | Dec. 6, 2012 | Dec. 5, 2013 |
| 4 | EMI Test Receiver | Rohde & Schwarz | ESU26 | GTS203 | Jul. 02 2013 | Jul. 01 2014 |
| 5 | BiConiLog Antenna | SCHWARZBECK MESS-ELEKTRONIK | VULB9163 | GTS214 | Feb. 24 2013 | Feb. 23 2014 |
| 6 | Double -ridged waveguide horn | SCHWARZBECK MESS-ELEKTRONIK | 9120D-829 | GTS208 | June 28 2013 | June 27 2014 |
| 7 | Horn Antenna | ETS-LINDGREN | 3160 | GTS217 | Mar. 29 2013 | Mar. 28 2014 |
| 8 | EMI Test Software | AUDIX | E3 | N/A | N/A | N/A |
| 9 | Coaxial Cable | GTS | N/A | GTS213 | Mar. 30 2013 | Mar. 29 2014 |
| 10 | Coaxial Cable | GTS | N/A | GTS211 | Mar. 30 2013 | Mar. 29 2014 |
| 11 | Coaxial cable | GTS | N/A | GTS210 | Mar. 30 2013 | Mar. 29 2014 |
| 12 | Coaxial Cable | GTS | N/A | GTS212 | Mar. 30 2013 | Mar. 29 2014 |
| 13 | Amplifier(100kHz-3GHz) | HP | 8347A | GTS204 | Jul. 02 2013 | Jul. 01 2014 |
| 14 | Amplifier(2GHz-20GHz) | HP | 8349B | GTS206 | Jul. 02 2013 | Jul. 01 2014 |
| 15 | Amplifier (18-26GHz) | Rohde & Schwarz | AFS33-18002 650-30-8P-44 | GTS218 | June 28 2013 | June 27 2014 |
| 16 | Band filter | Amindeon | 82346 | GTS219 | Mar. 30 2013 | Mar. 29 2014 |

| Conducted Emission: | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal.Date (mm-dd-yy)** | **Cal.Due date (mm-dd-yy)** |
| 1 | Shielding Room | ZhongYu Electron | 7.0(L)x3.0(W)x3.0(H) | GTS264 | Sep. 07 2013 | Sep. 06 2015 |
| 2 | EMI Test Receiver | Rohde & Schwarz | ESCS30 | GTS223 | Jul. 02 2013 | Jul. 01 2014 |
| 3 | 10dB Pulse Limita | Rohde & Schwarz | N/A | GTS224 | Jul. 02 2013 | Jul. 01 2014 |
| 4 | Coaxial Switch | ANRITSU CORP | MP59B | GTS225 | Jul. 02 2013 | Jul. 01 2014 |
| 5 | LISN | SCHWARZBECK MESS-ELEKTRONIK | NSLK 8127 | GTS226 | Jul. 02 2013 | Jul. 01 2014 |
| 6 | Coaxial Cable | GTS | N/A | GTS227 | Jul. 02 2013 | Jul. 01 2014 |
| 7 | EMI Test Software | AUDIX | E3 | N/A | N/A | N/A |

| General used equipment: | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal.Date (mm-dd-yy)** | **Cal.Due date (mm-dd-yy)** |
| 1 | Barometer | ChangChun | DYM3 | GTS257 | July 09 2013 | July 08 2014 |

# 7 Test results and Measurement Data

## 7.1 Antenna requirement

| Standard requirement: | FCC Part15 C Section 15.203 /247(c) |
|---|---|

**15.203 requirement:**

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, 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.

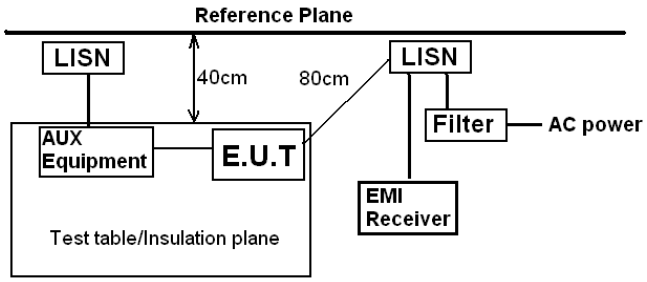
**15.247(c) (1)(i) requirement:**

(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

**E.U.T Antenna:**

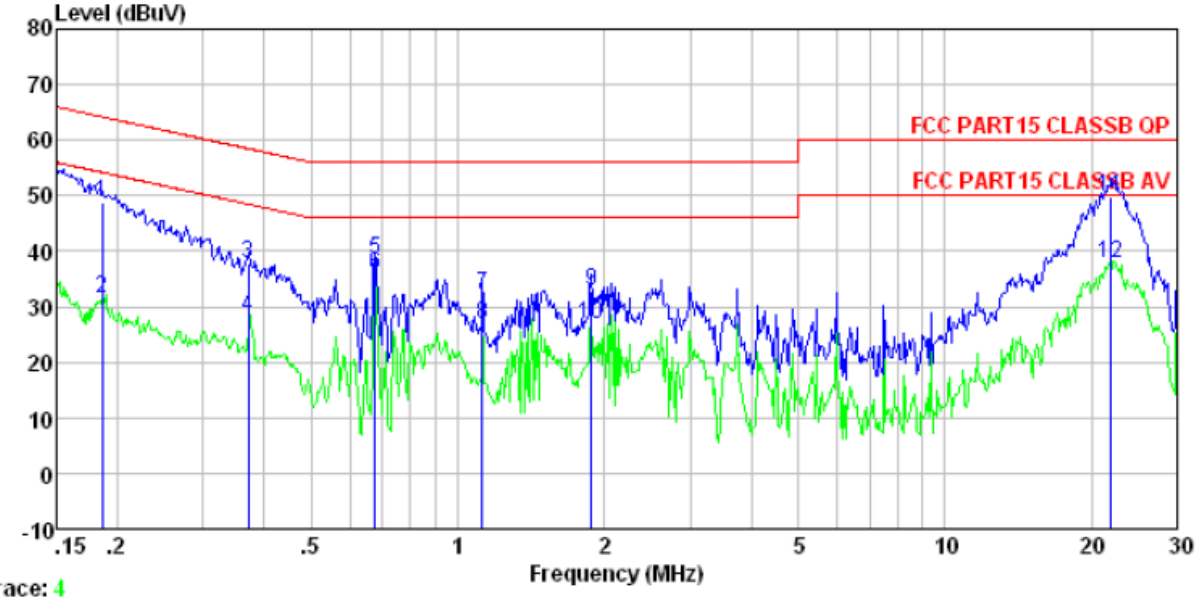
*The antenna is Integral antenna, the best case gain of the antenna is* 0.5dBi

## 7.2 Conducted Emissions

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.207 |
| Test Method: | ANSI C63.4:2003 |
| Test Frequency Range: | 150KHz to 30MHz |
| Class / Severity: | Class B |
| Receiver setup: | RBW=9KHz, VBW=30KHz, Sweep time=auto |
| Limit: | <table><tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr><tr><td>Quasi-peak</td><td>Average</td></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></tr><tr><td>5-30</td><td>60</td><td>50</td></tr></table> * Decreases with the logarithm of the frequency. |
| Test setup: |   *Remark:*<br>*E.U.T: Equipment Under Test*<br>*LISN: Line Impedence Stabilization Network*<br>*Test table height=0.8m* |
| Test procedure: | 1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.<br>2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).<br>3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement. |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.3 for details |
| Test results: | Pass |

**Measurement data:**

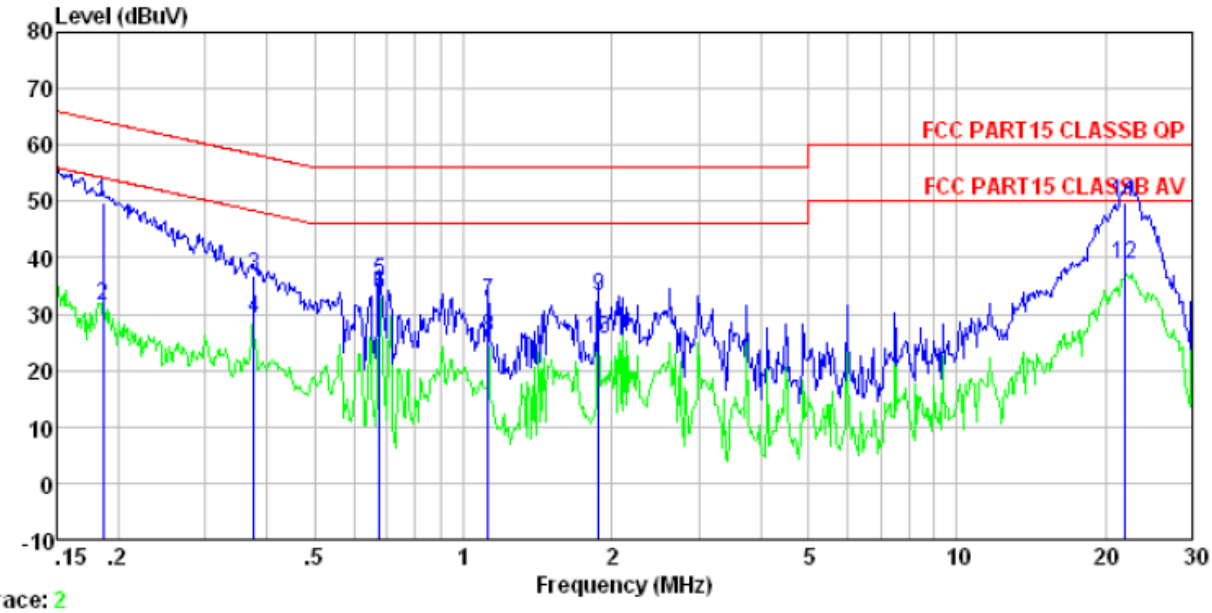
**Line:**




Condition : FCC PART15 CLASSB QP LISN-2012 LINE
Job No. : 1027RF
Test mode : Bluetooth mode
Test Engineer: Yang

| | Freq | Read Level | LISN Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dB | dBuV | dBuV | dB | |
| 1 | 0.186 | 48.85 | -0.23 | 0.10 | 48.72 | 64.20 | -15.48 | QP |
| 2 | 0.186 | 31.74 | -0.23 | 0.10 | 31.61 | 54.20 | -22.59 | Average |
| 3 | 0.371 | 38.04 | -0.22 | 0.10 | 37.92 | 58.47 | -20.55 | QP |
| 4 | 0.371 | 28.15 | -0.22 | 0.10 | 28.03 | 48.47 | -20.44 | Average |
| 5 | 0.675 | 38.51 | -0.20 | 0.10 | 38.41 | 56.00 | -17.59 | QP |
| 6 | 0.675 | 36.01 | -0.20 | 0.10 | 35.91 | 46.00 | -10.09 | Average |
| 7 | 1.123 | 32.26 | -0.21 | 0.10 | 32.15 | 56.00 | -23.85 | QP |
| 8 | 1.123 | 26.96 | -0.21 | 0.10 | 26.85 | 46.00 | -19.15 | Average |
| 9 | 1.878 | 32.87 | -0.24 | 0.10 | 32.73 | 56.00 | -23.27 | QP |
| 10 | 1.878 | 26.96 | -0.24 | 0.10 | 26.82 | 46.00 | -19.18 | Average |
| 11 | 21.946 | 50.41 | -0.68 | 0.21 | 49.94 | 60.00 | -10.06 | QP |
| 12 | 21.946 | 38.30 | -0.68 | 0.21 | 37.83 | 50.00 | -12.17 | Average |

**Neutral:**




Trace: 2

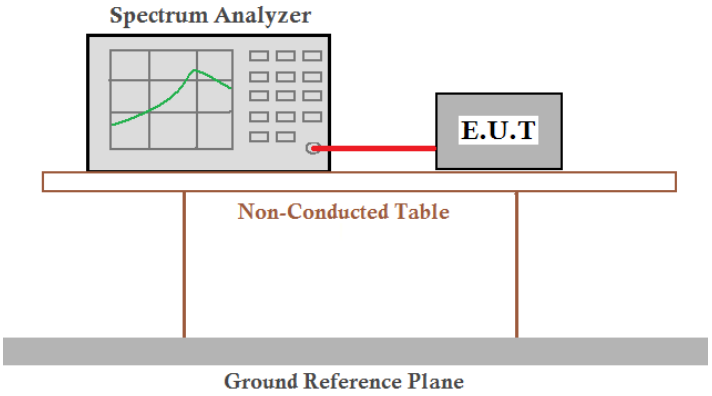
Condition : FCC PART15 CLASSB QP LISN-2012 NEUTRAL
Job No. : 1027RF
Test mode : Bluetooth mode
Test Engineer: Yang

| | Freq | Read Level | LISN Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dB | dBuV | dBuV | dB | |
| 1 | 0.186 | 49.85 | -0.09 | 0.10 | 49.86 | 64.20 | -14.34 | QP |
| 2 | 0.186 | 31.37 | -0.09 | 0.10 | 31.38 | 54.20 | -22.82 | Average |
| 3 | 0.377 | 36.94 | -0.08 | 0.10 | 36.96 | 58.34 | -21.38 | QP |
| 4 | 0.377 | 29.08 | -0.08 | 0.10 | 29.10 | 48.34 | -19.24 | Average |
| 5 | 0.675 | 35.80 | -0.08 | 0.10 | 35.82 | 56.00 | -20.18 | QP |
| 6 | 0.675 | 33.53 | -0.08 | 0.10 | 33.55 | 46.00 | -12.45 | Average |
| 7 | 1.123 | 32.05 | -0.09 | 0.10 | 32.06 | 56.00 | -23.94 | QP |
| 8 | 1.123 | 25.97 | -0.09 | 0.10 | 25.98 | 46.00 | -20.02 | Average |
| 9 | 1.878 | 33.23 | -0.11 | 0.10 | 33.22 | 56.00 | -22.78 | QP |
| 10 | 1.878 | 25.69 | -0.11 | 0.10 | 25.68 | 46.00 | -20.32 | Average |
| 11 | 21.946 | 50.25 | -0.58 | 0.21 | 49.88 | 60.00 | -10.12 | QP |
| 12 | 21.946 | 39.14 | -0.58 | 0.21 | 38.77 | 50.00 | -11.23 | Average |

*Notes:*

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level =Receiver Read level + LISN Factor + Cable Loss

## 7.3 Conducted Peak Output Power

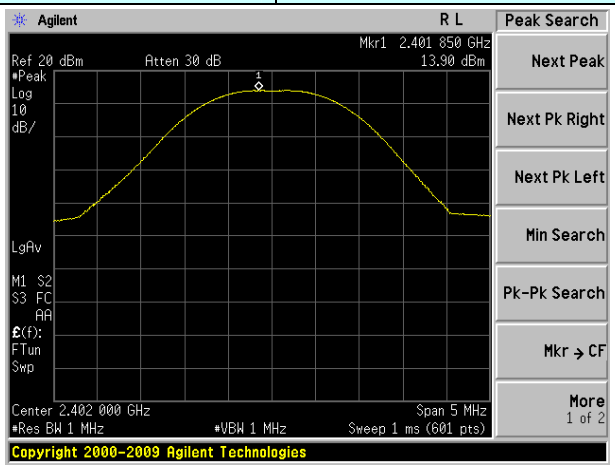
| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (b)(3) |
| Test Method: | ANSI C63.4:2003 |
| Limit: | 30dBm |
| Test setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.3 for details |
| Test results: | Pass |

**Measurement Data**

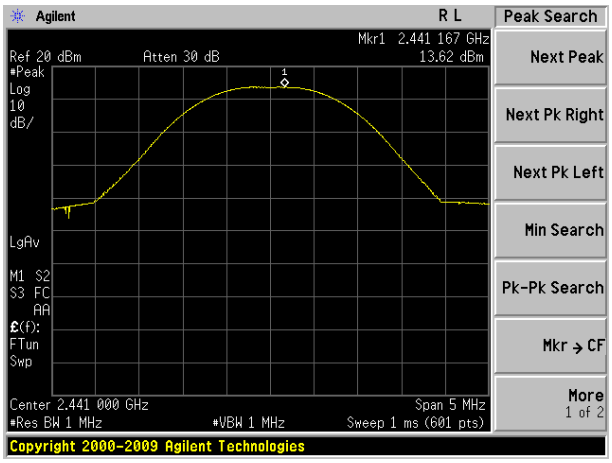
| Mode | Test channel | Peak Output Power (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|
| GFSK | Lowest | 13.90 | 30.00 | Pass |
| | Middle | 13.62 | | |
| | Highest | 14.15 | | |
| Pi/4QPSK | Lowest | 2.63 | 30.00 | Pass |
| | Middle | 2.99 | | |
| | Highest | 2.98 | | |
| 8DPSK | Lowest | 3.05 | 30.00 | Pass |
| | Middle | 3.27 | | |
| | Highest | 3.33 | | |

**Test plot as follows:**

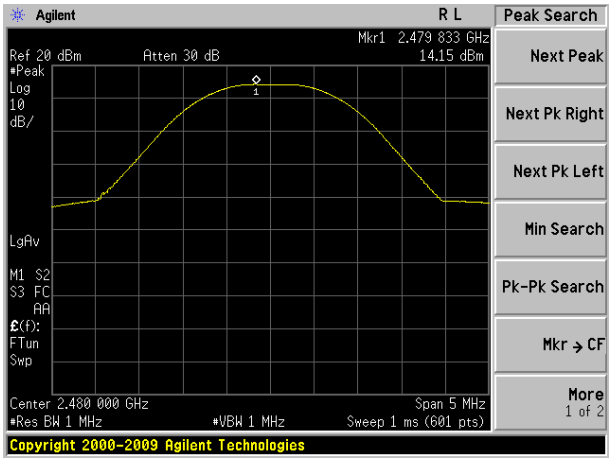
| Test mode: | GFSK mode |
|---|---|




Lowest channel

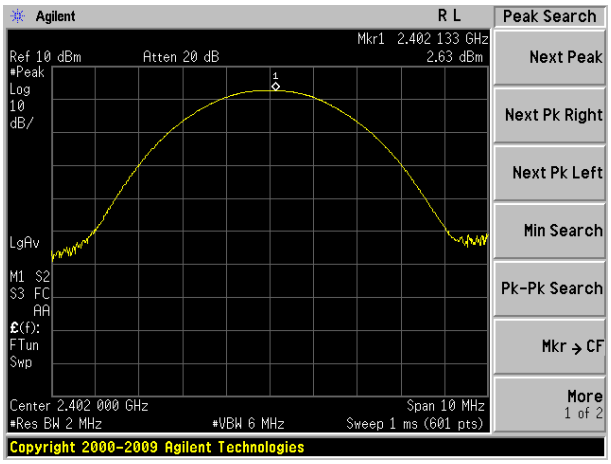



Middle channel

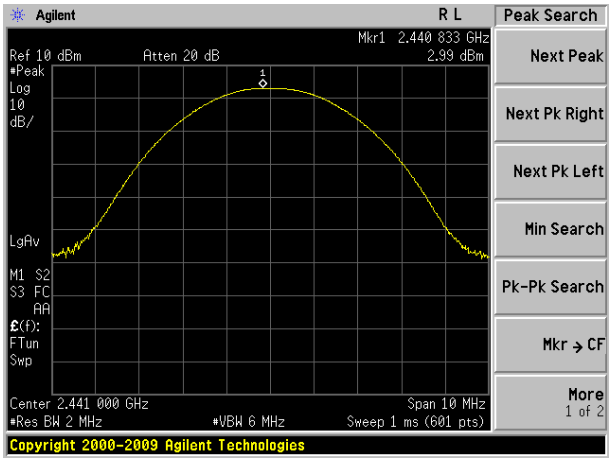



Highest channel

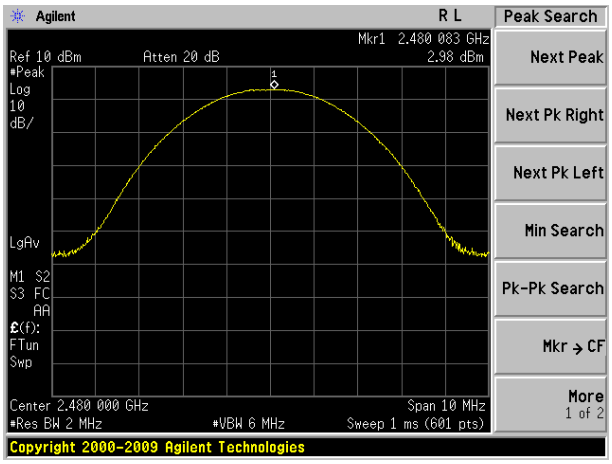
| Test mode: | Pi/4QPSK mode |
|---|---|




Lowest channel

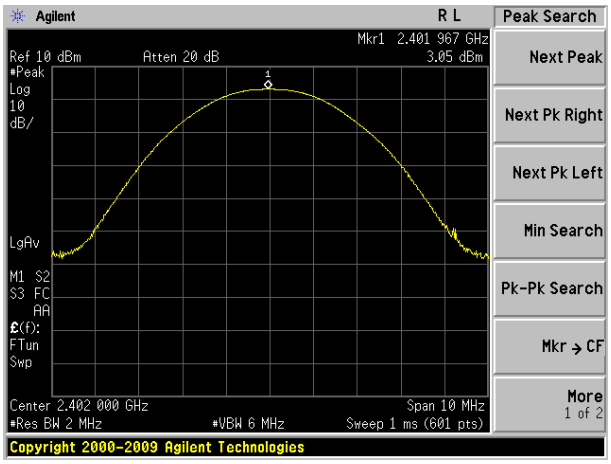



Middle channel

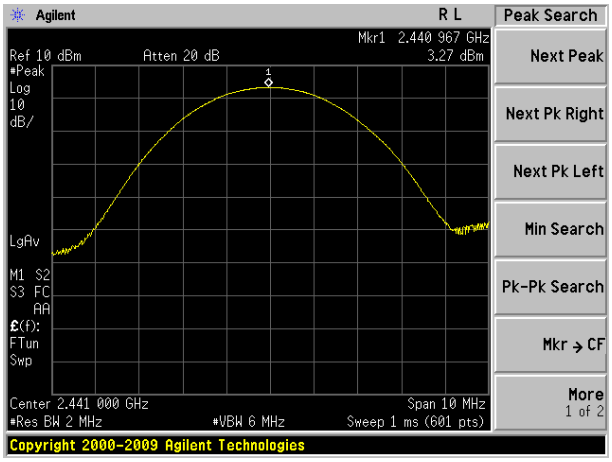



Highest channel

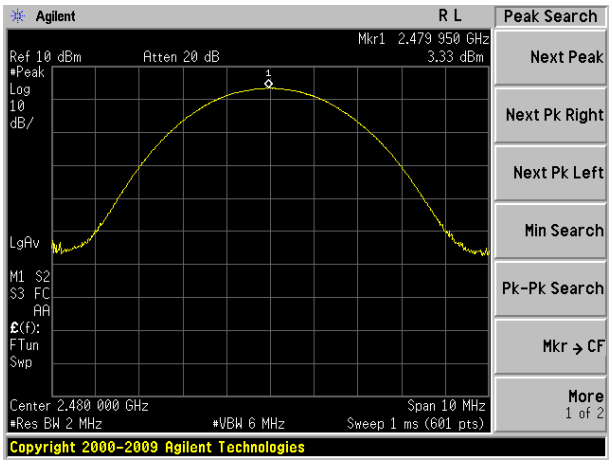
| Test mode: | 8DPSK mode |
|---|---|




Lowest channel

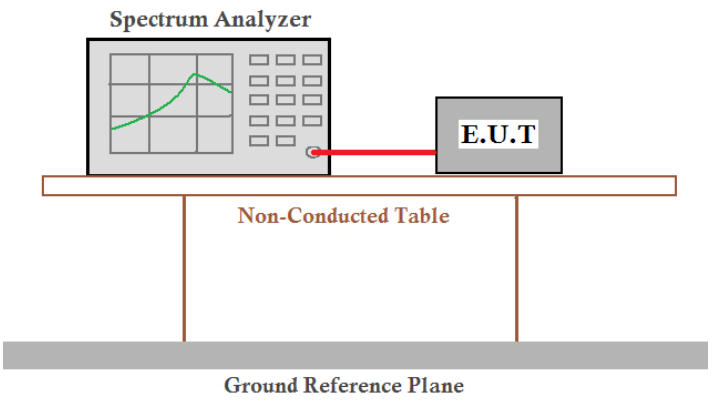



Middle channel




Highest channel

## 7.4 20dB Emission Bandwidth

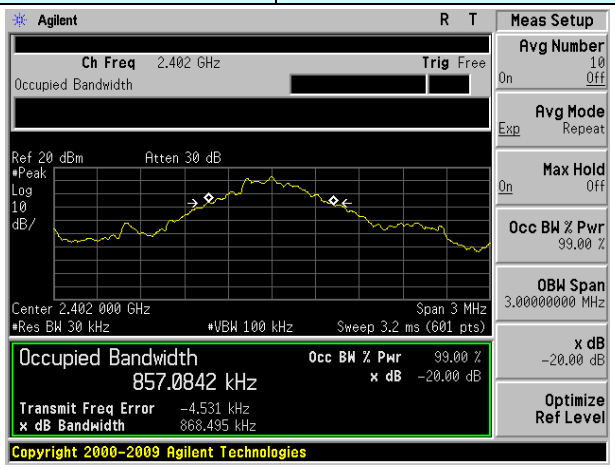
| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (a)(2) |
| Test Method: | ANSI C63.4:2003 |
| Limit: | N/A |
| Test setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.3 for details |
| Test results: | Pass |

**Measurement Data**

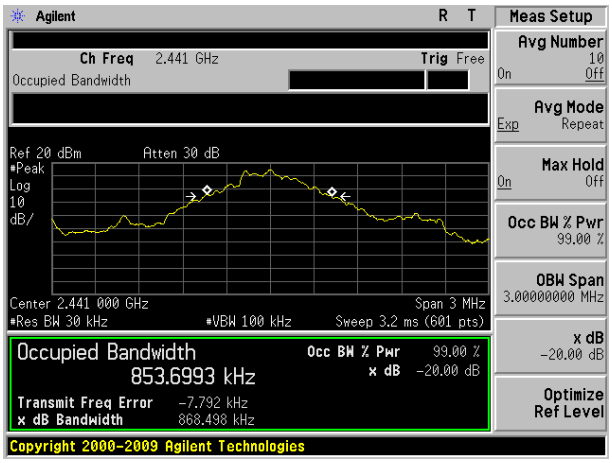
| Mode | Test channel | 20dB Emission Bandwidth (MHz) | Result |
|---|---|---|---|
| GFSK | Lowest | 0.868 | Pass |
| | Middle | 0.868 | |
| | Highest | 0.862 | |
| Pi/4QPSK | Lowest | 1.259 | Pass |
| | Middle | 1.260 | |
| | Highest | 1.263 | |
| 8DPSK | Lowest | 1.268 | Pass |
| | Middle | 1.270 | |
| | Highest | 1.267 | |

**Test plot as follows:**

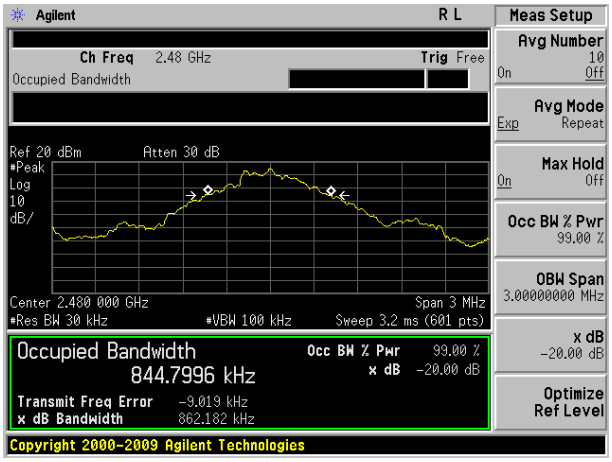
| Test mode: | GFSK mode |
|---|---|




Lowest channel

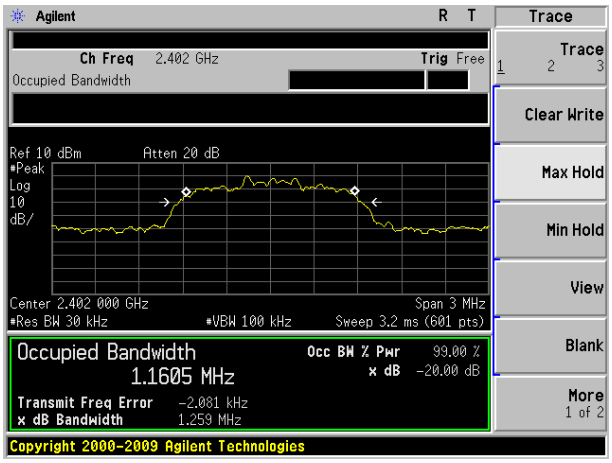



Middle channel

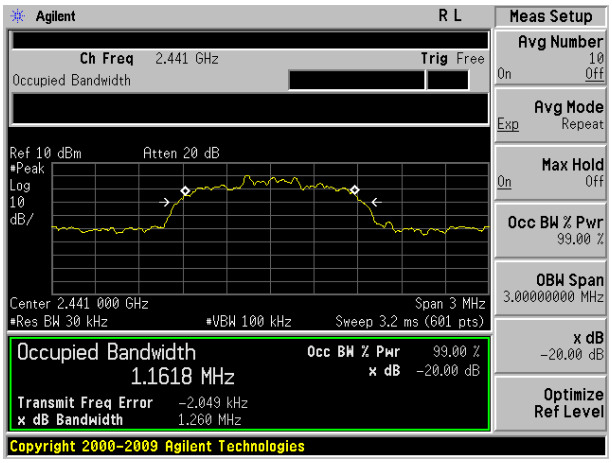



Highest channel

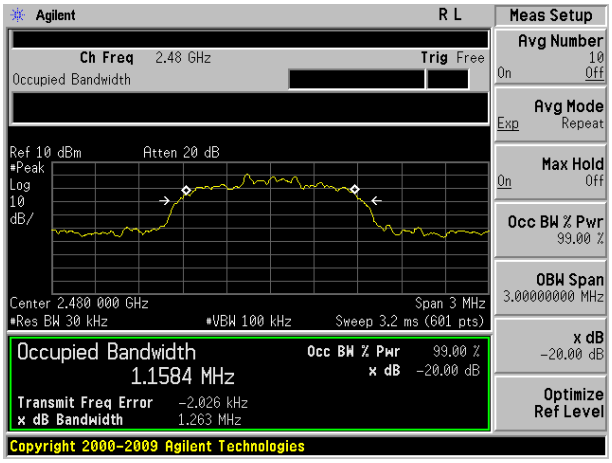
| Test mode: | Pi/4QPSK mode |
|---|---|




Lowest channel

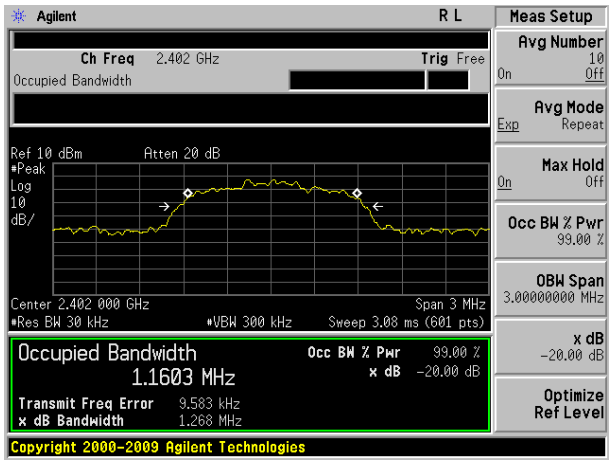



Middle channel

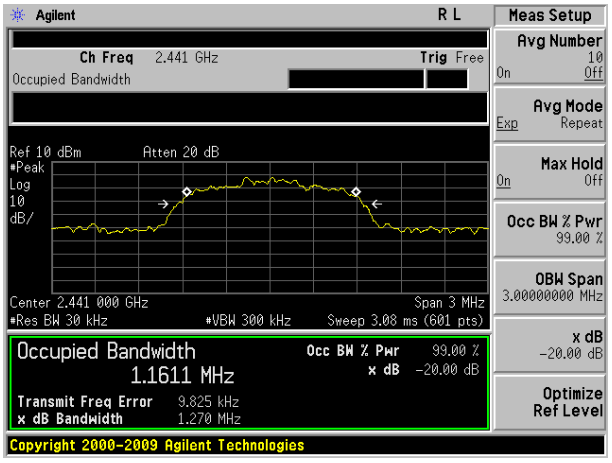



Highest channel

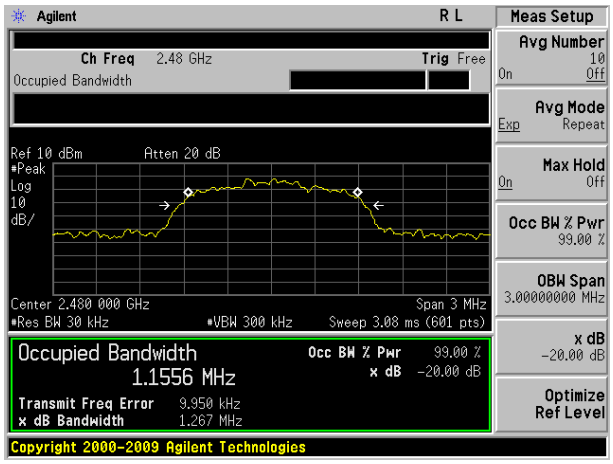
| Test mode: | 8DPSK mode |
|---|---|




Lowest channel

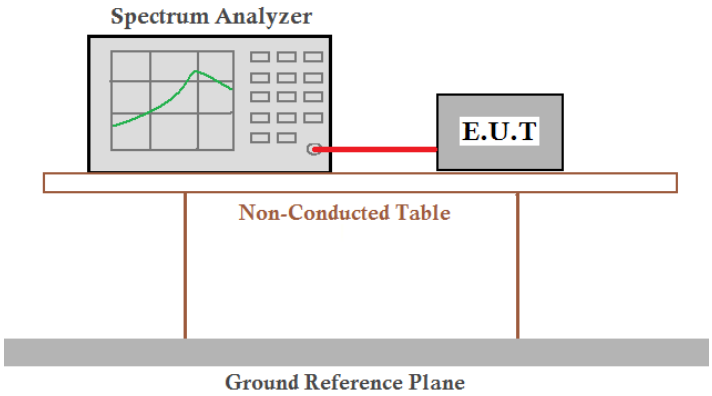



Middle channel




Highest channel

## 7.5 Carrier Frequencies Separation

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (a)(1) |
| Test Method: | ANSI C63.4:2003 |
| Receiver setup: | RBW=100KHz, VBW=300KHz, detector=Peak |
| Limit: | 0.025MHz or 2/3 of the 20dB bandwidth (whichever is greater) |
| Test setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.3 for details |
| Test results: | Pass |

**Measurement Data**

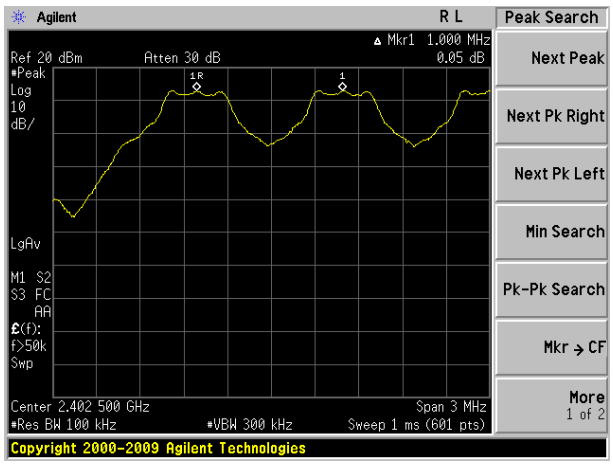
| Mode | Test channel | Carrier Frequencies Separation (kHz) | Limit (kHz) | Result |
|---|---|---|---|---|
| GFSK | Lowest | 1000 | 579 | Pass |
| | Middle | 1000 | 579 | Pass |
| | Highest | 1000 | 579 | Pass |
| Pi/4QPSK | Lowest | 1000 | 842 | Pass |
| | Middle | 1000 | 842 | Pass |
| | Highest | 1000 | 842 | Pass |
| 8DPSK | Lowest | 1000 | 847 | Pass |
| | Middle | 1000 | 847 | Pass |
| | Highest | 1000 | 847 | Pass |

*Note: According to section 7.4*

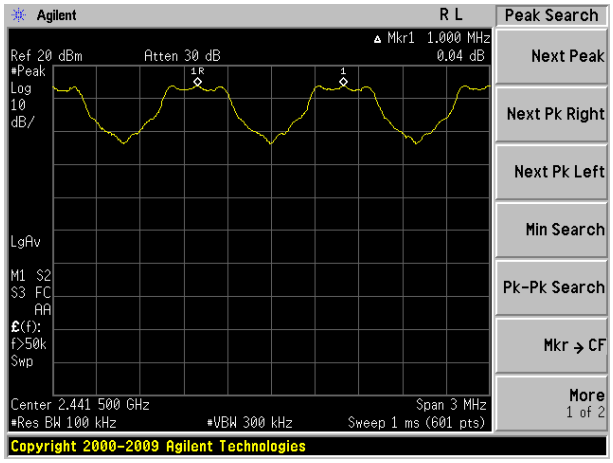
| Mode | 20dB bandwidth (kHz) (worse case) | Limit (kHz) (Carrier Frequencies Separation) |
|---|---|---|
| GFSK | 868 | 579 |
| Pi/4QPSK | 1263 | 842 |
| 8DPSK | 1206 | 847 |

**Test plot as follows:**

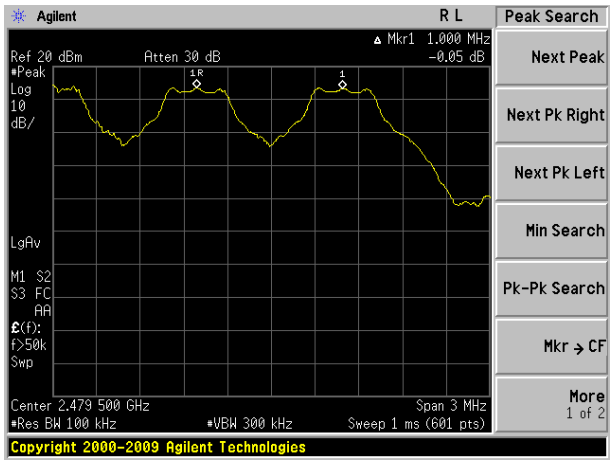
| Modulation mode: | GFSK |
|---|---|




Lowest channel

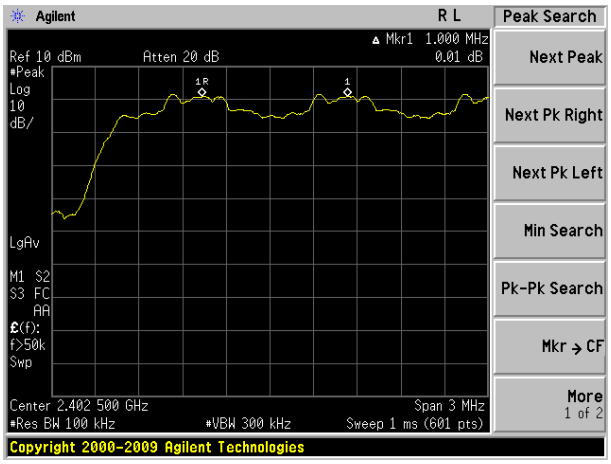



Middle channel

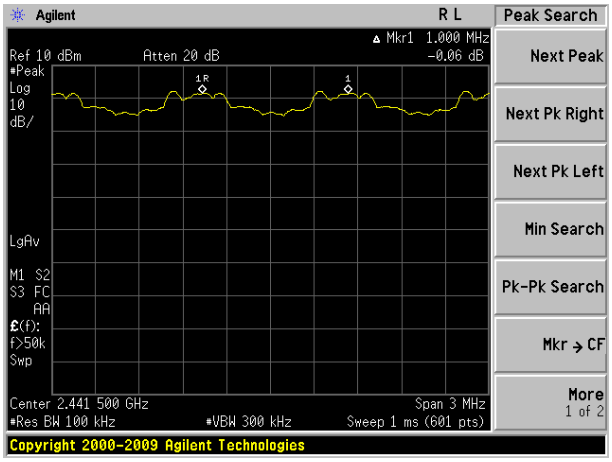



Highest channel

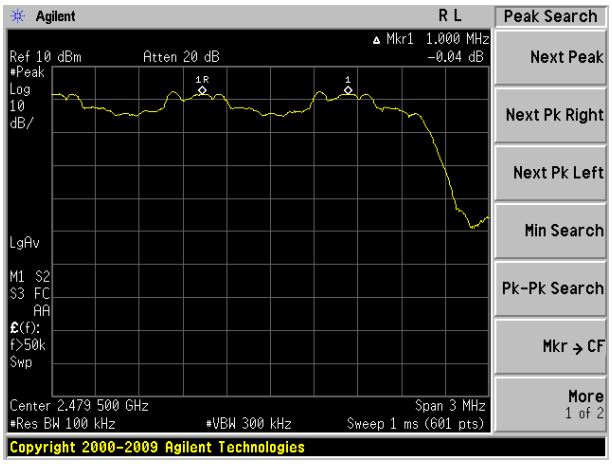
| Test mode: | Pi/4QPSK mode |
|---|---|




Lowest channel

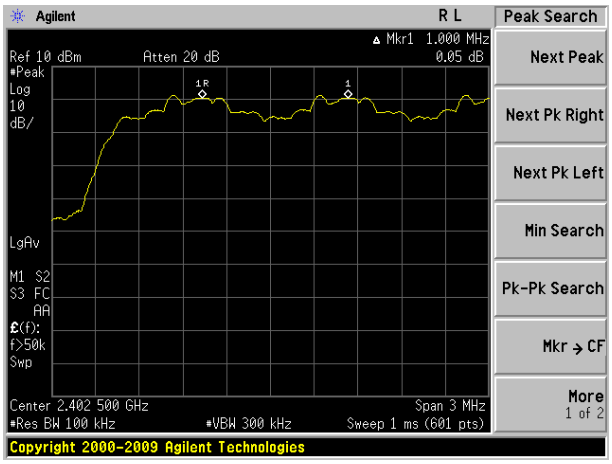



Middle channel

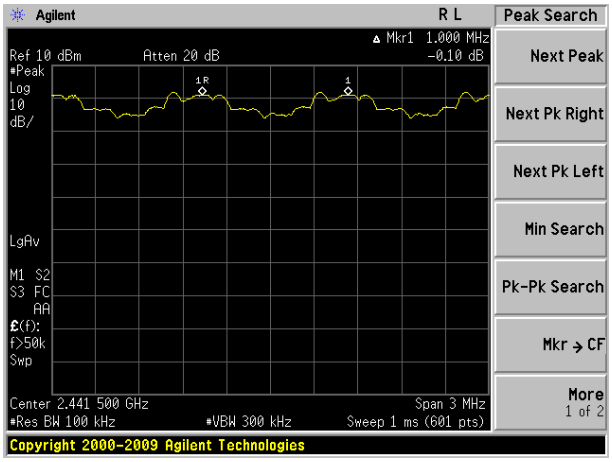



Highest channel

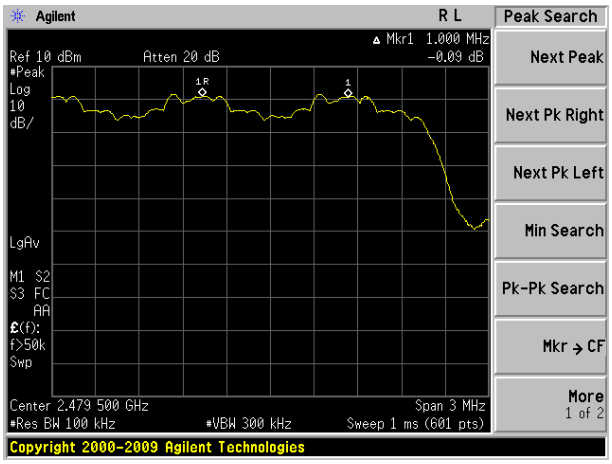
| Test mode: | 8DPSK mode |
|---|---|




Lowest channel

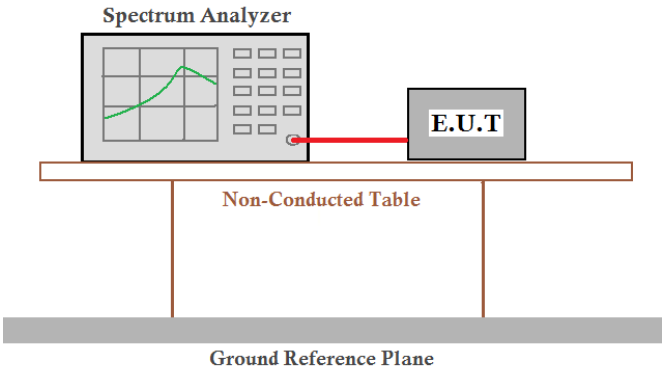



Middle channel



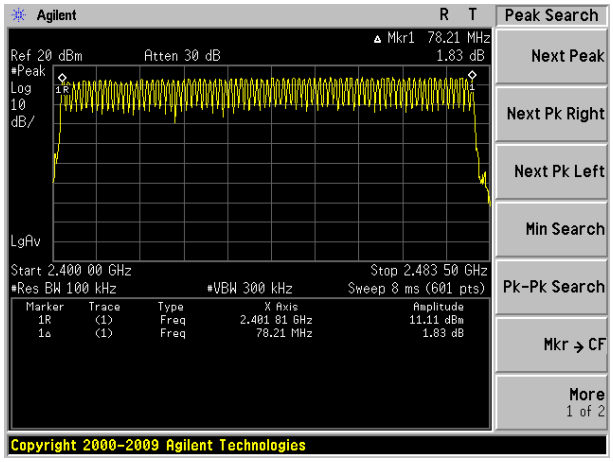

Highest channel

## 7.6 Hopping Channel Number

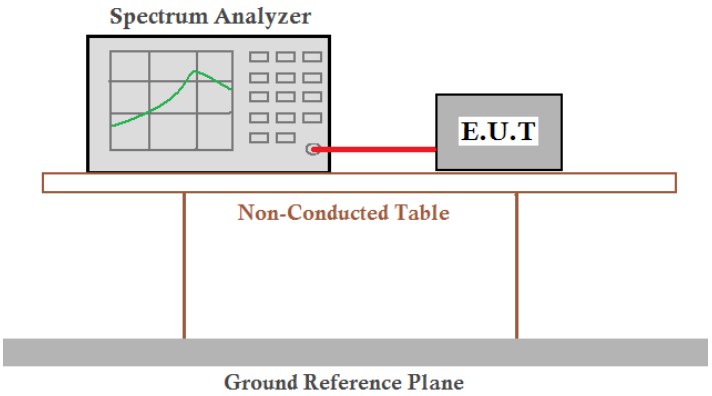
| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (a)(1) |
| Test Method: | ANSI C63.4:2003 |
| Receiver setup: | RBW=100kHz, VBW=300kHz, Frequency range=2400MHz-2483.5MHz, Detector=Peak |
| Limit: | 15 channels |
| Test setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.3 for details |
| Test results: | Pass |

**Measurement Data:**

| Mode | Hopping channel numbers | Limit | Result |
|---|---|---|---|
| GFSK | 79 | 15 | Pass |
| Pi/4QPSK | 79 | 15 | Pass |
| 8DPSK | 79 | 15 | Pass |



## 7.7 Dwell Time

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (a)(1) |
| Test Method: | ANSI C63.4:2003 |
| Receiver setup: | RBW=1MHz, VBW=1MHz, Span=0Hz, Detector=Peak |
| Limit: | 0.4 Second |
| Test setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.3 for details |
| Test results: | Pass |

**Worse case**

**Measurement Data:**

| Frequency (MHz) | Packet | Dwell time(ms) | Limit(ms) | Result |
|---|---|---|---|---|
| 2402 | DH1 | 126.40 | 400 | Pass |
| 2441 | DH3 | 264.00 | 400 | Pass |
| 2480 | DH5 | 309.33 | 400 | Pass |

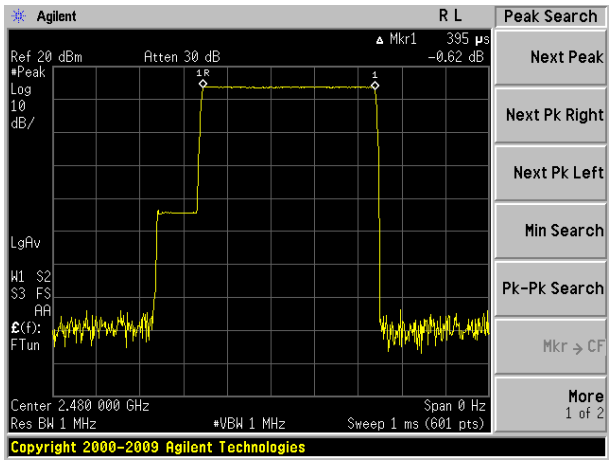
The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s

DH1 time slot=0.395(ms)*(1600/ (2*79))*31.6=126.40 ms

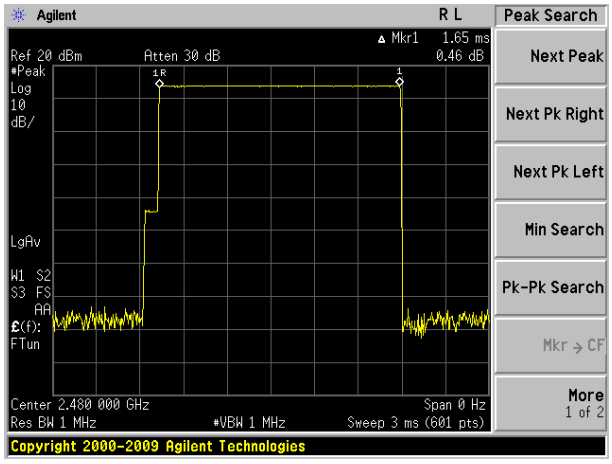
DH3 time slot=1.650(ms)*(1600/ (4*79))*31.6=264.00ms

DH5 time slot=2.90(ms)*(1600/ (6*79))*31.6=309.33ms

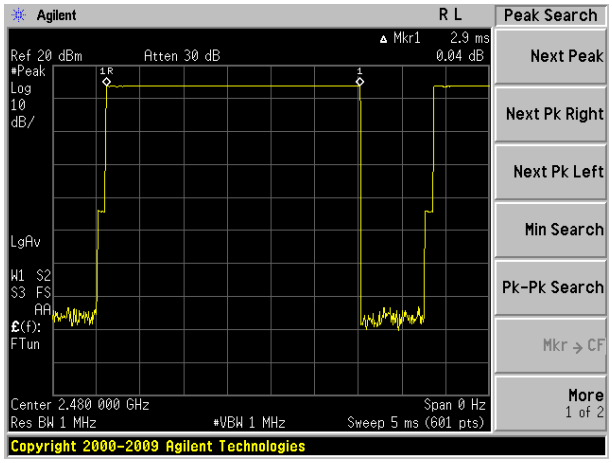
**Test plot as follows:**


Agilent
R L
Peak Search
Mkr1 395 µs
Ref 20 dBm
Atten 30 dB
-0.62 dB
#Peak
Log
10
dB/
LgAv
W1 S2
S3 FS
AA
£(f):
FTun
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 2.480 000 GHz
Span 0 Hz
Res BW 1 MHz
#VBW 1 MHz
Sweep 1 ms (601 pts)
Copyright 2000-2009 Agilent Technologies

DH1


Agilent
R L
Peak Search
Mkr1 1.65 ms
Ref 20 dBm
Atten 30 dB
0.46 dB
#Peak
Log
10
dB/
LgAv
W1 S2
S3 FS
AA
£(f):
FTun
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 2.480 000 GHz
Span 0 Hz
Res BW 1 MHz
#VBW 1 MHz
Sweep 3 ms (601 pts)
Copyright 2000-2009 Agilent Technologies

DH3


Agilent
R L
Peak Search
Mkr1 2.9 ms
Ref 20 dBm
Atten 30 dB
0.04 dB
#Peak
Log
10
dB/
LgAv
W1 S2
S3 FS
AA
£(f):
FTun
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 2.480 000 GHz
Span 0 Hz
Res BW 1 MHz
#VBW 1 MHz
Sweep 5 ms (601 pts)
Copyright 2000-2009 Agilent Technologies

DH5

## 7.8 Pseudorandom Frequency Hopping Sequence

| Test Requirement: | FCC Part15 C Section 15.247 (a)(1) requirement: |
|---|---|

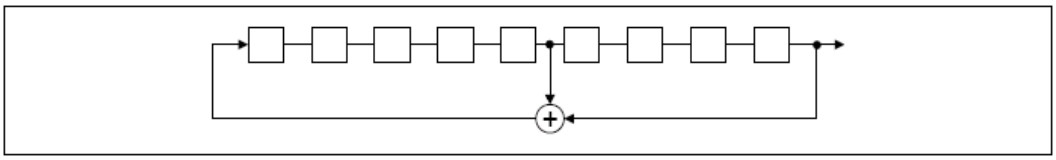
*Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.*

*Alternatively. Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.*

**EUT Pseudorandom Frequency Hopping Sequence**

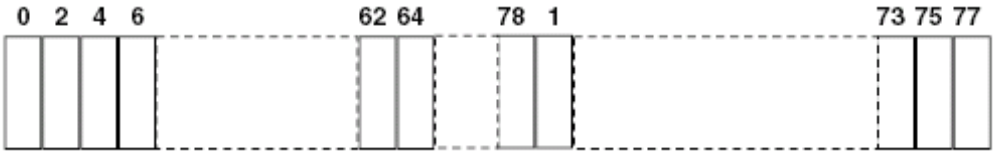
*The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized with nine ones.*

- *Number of shift register stages: 9*
- *Length of pseudo-random sequence: $2^9$ -1 = 511 bits*
- *Longest sequence of zeros: 8 (non-inverted signal)*



*Linear Feedback Shift Register for Generation of the PRBS sequence*

*An example of Pseudorandom Frequency Hopping Sequence as follow:*

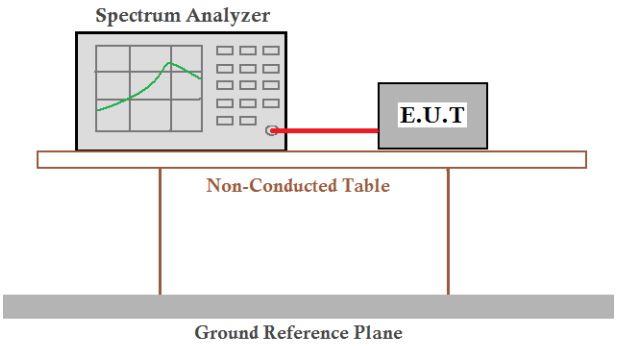



*Each frequency used equally on the average by each transmitter.*

*The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.*

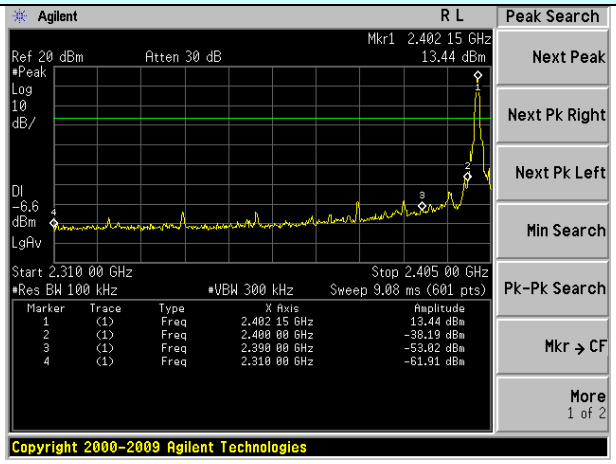
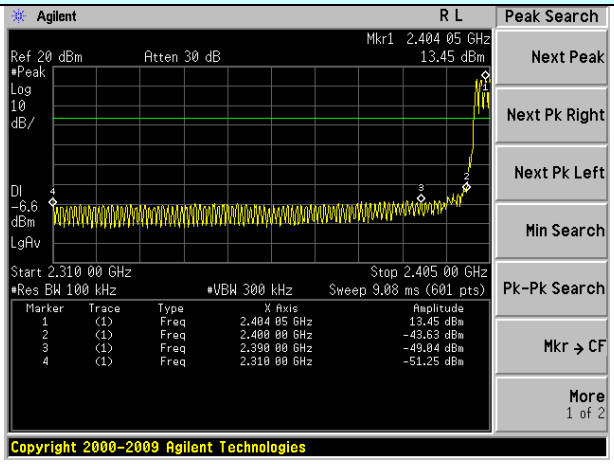
## 7.9 Band Edge

### 7.9.1 Conducted Emission Method

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (d) |
| Test Method: | ANSI C63.4:2003 |
| Receiver setup: | RBW=100kHz, VBW=300kHz, Detector=Peak |
| Limit: | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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. |
| Test setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.3 for details |
| Test results: | Pass |

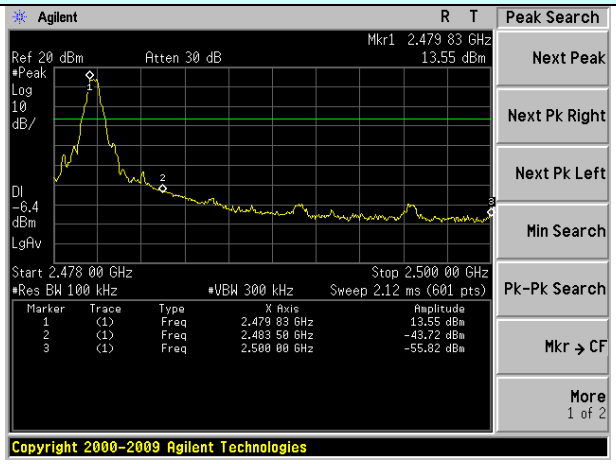
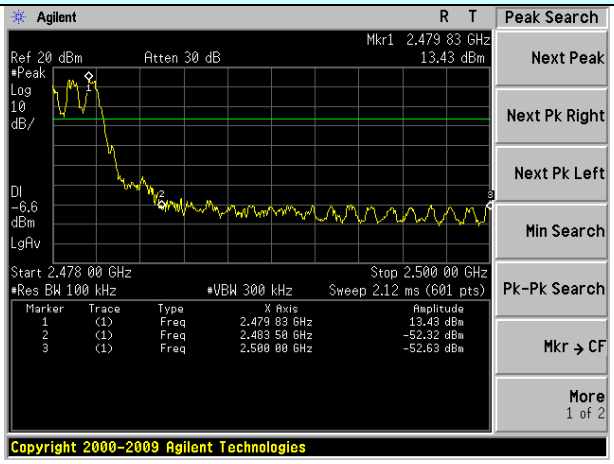
**Test plot as follows:**

**GFSK Mode:**

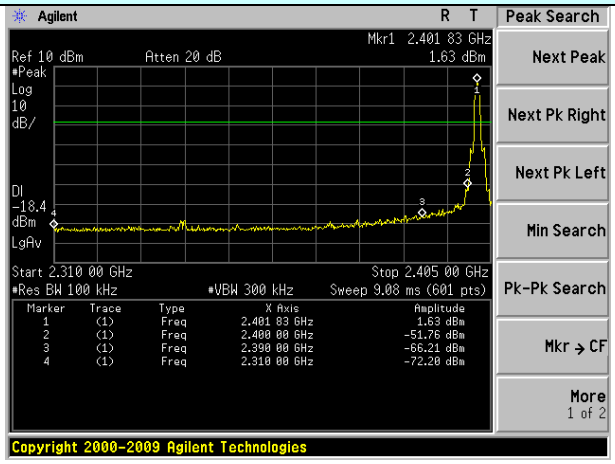
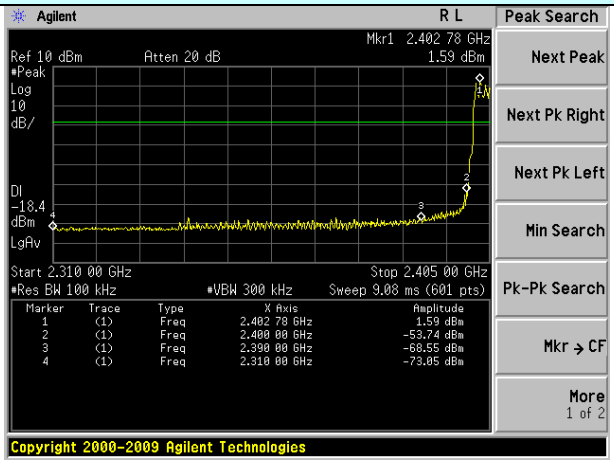
| Test channel: | Lowest channel |
|---|---|
|  |  |
| No-hopping mode | Hopping mode |





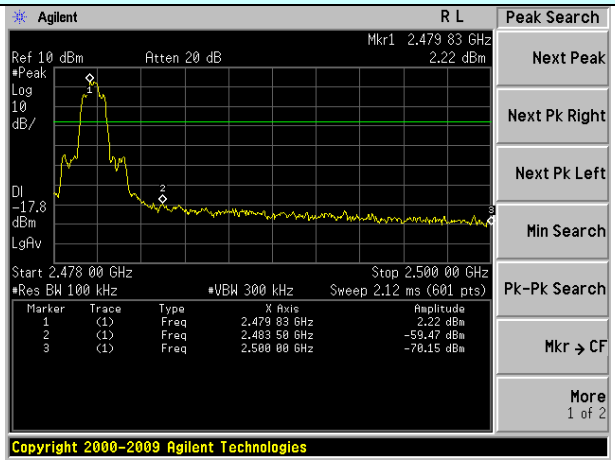
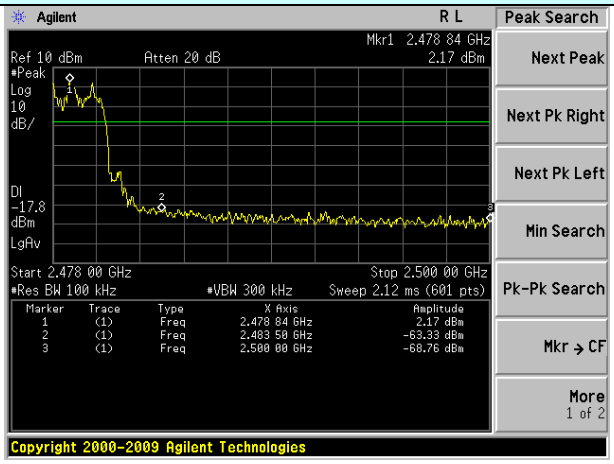
| Test channel: | Highest channel |
|---|---|
|  |  |
| No-hopping mode | Hopping mode |

**Pi/4QPSK Mode:**

| Test channel: | Lowest channel |
|---|---|
|  |  |
| No-hopping mode | Hopping mode |

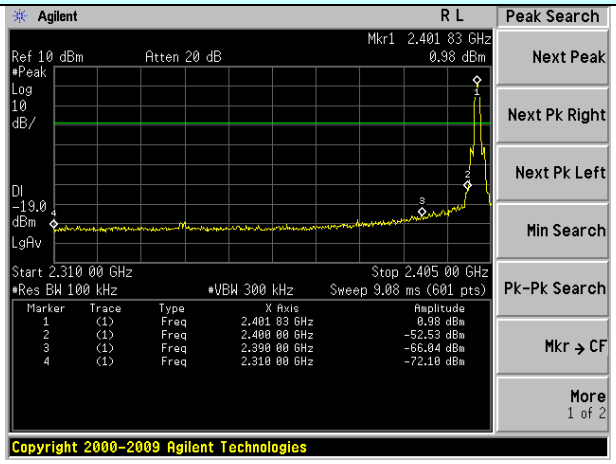




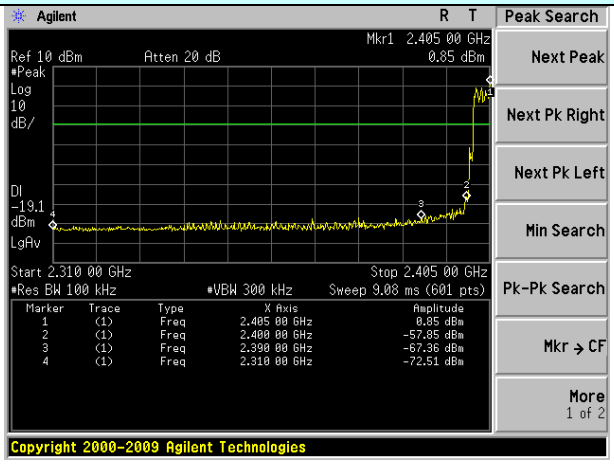
| Test channel: | Highest channel |
|---|---|
|  |  |
| No-hopping mode | Hopping mode |

**8DPSK Mode:**

| Test channel: | Lowest channel |
|---|---|

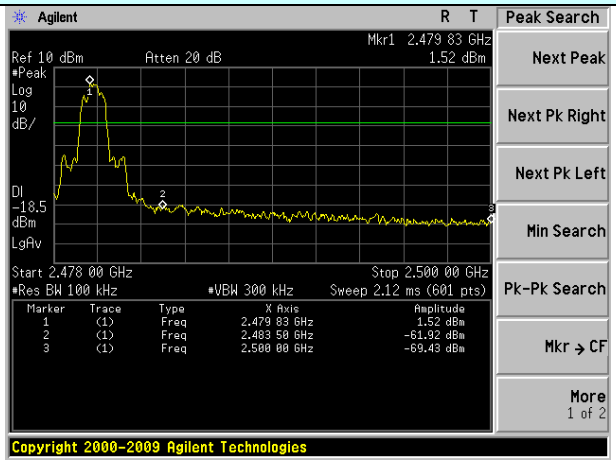



No-hopping mode

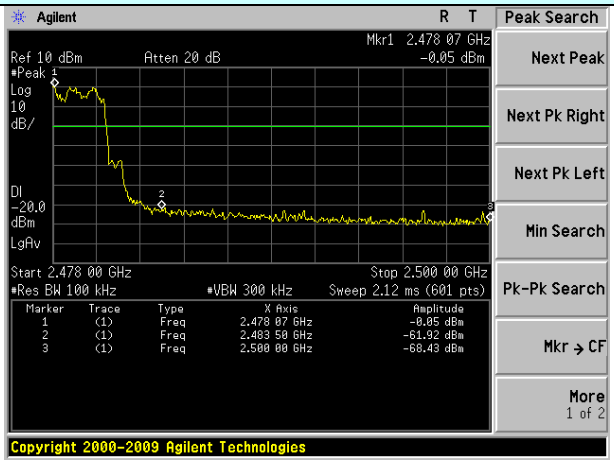



Hopping mode

| Test channel: | Highest channel |
|---|---|




No-hopping mode




Hopping mode

### 7.9.2 Radiated Emission Method

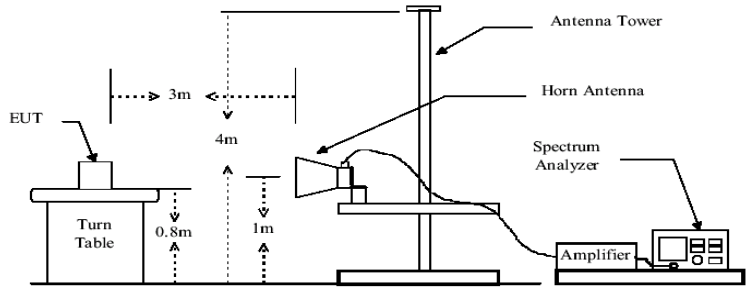
| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.209 and 15.205 |
| Test Method: | ANSI C63.4: 2003 |
| Test Frequency Range: | All restriction band have been tested, and 2.3GHz to 2.5GHz band is the worse case |
| Test site: | Measurement Distance: 3m |
| Receiver setup: | |

| Frequency | Detector | RBW | VBW | Remark |
|---|---|---|---|---|
| Above 1GHz | Peak | 1MHz | 3MHz | Peak Value |
| | Peak | 1MHz | 10Hz | Average Value |

Limit:

| Frequency | Limit (dBuV/m @3m) | Remark |
|---|---|---|
| Above 1GHz | 54.00 | Average Value |
| | 74.00 | Peak Value |

Test setup:




Test Procedure:

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

| | |
|---|---|
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.3 for details |
| Test results: | Pass |

*Remark:*
1. *During the test, pre-scan the GFSK, Pi/4QPSK, 8DPSK modulation, and found the GFSK modulation which it is worse case.*
2. *Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the X-axis which it is worse case.*

| Test channel: | Lowest |
|---|---|

**Peak value:**

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2310.00 | 46.11 | 27.59 | 5.38 | 30.18 | 48.90 | 74.00 | -25.10 | Horizontal |
| 2390.00 | 63.36 | 27.58 | 5.39 | 30.18 | 66.15 | 74.00 | -7.85 | Horizontal |
| 2310.00 | 46.96 | 27.59 | 5.38 | 30.18 | 49.75 | 74.00 | -24.25 | Vertical |
| 2390.00 | 65.74 | 27.58 | 5.39 | 30.18 | 68.53 | 74.00 | -5.47 | Vertical |

**Average value:**

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2310.00 | 35.93 | 27.59 | 5.38 | 30.18 | 38.72 | 54.00 | -15.28 | Horizontal |
| 2390.00 | 47.36 | 27.58 | 5.39 | 30.18 | 50.15 | 54.00 | -3.85 | Horizontal |
| 2310.00 | 36.10 | 27.59 | 5.38 | 30.18 | 38.89 | 54.00 | -15.11 | Vertical |
| 2390.00 | 49.31 | 27.58 | 5.39 | 30.18 | 52.10 | 54.00 | -1.90 | Vertical |

| Test channel: | Highest |
|---|---|

**Peak value:**

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2483.50 | 48.60 | 27.53 | 5.47 | 29.93 | 51.67 | 74.00 | -22.33 | Horizontal |
| 2500.00 | 47.15 | 27.55 | 5.49 | 29.93 | 50.26 | 74.00 | -23.74 | Horizontal |
| 2483.50 | 49.98 | 27.53 | 5.47 | 29.93 | 53.05 | 74.00 | -20.95 | Vertical |
| 2500.00 | 48.46 | 27.55 | 5.49 | 29.93 | 51.57 | 74.00 | -22.43 | Vertical |

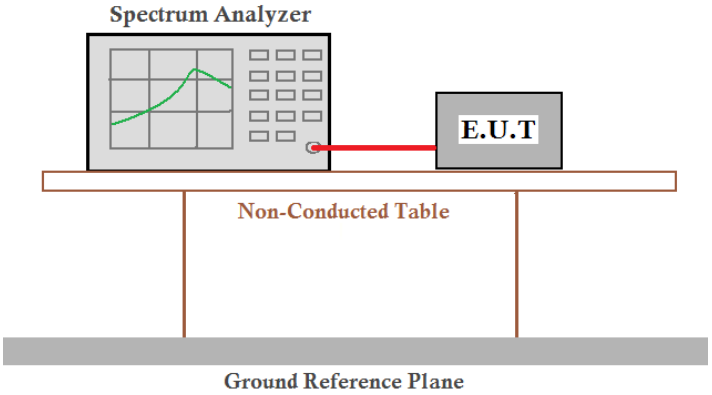
**Average value:**

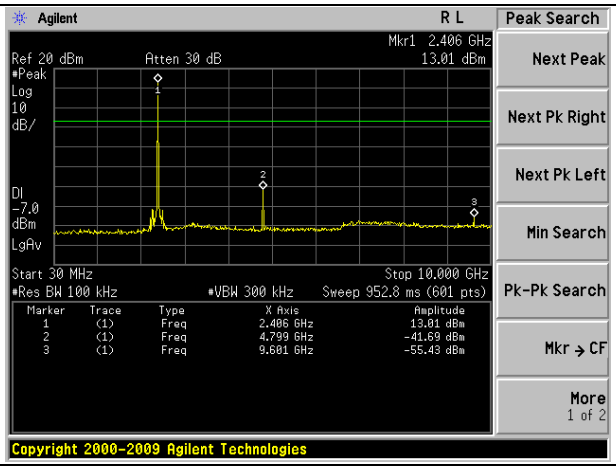
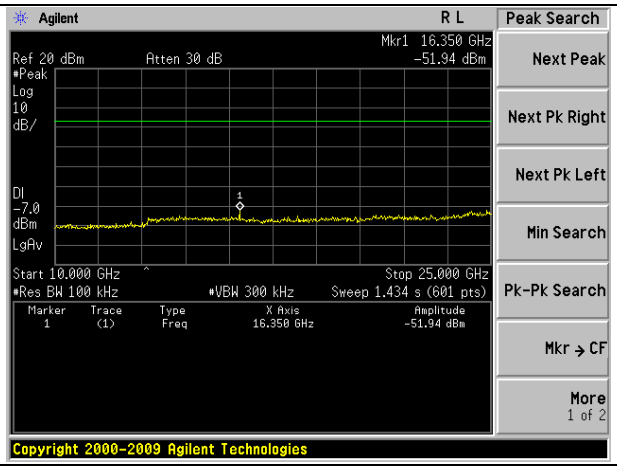
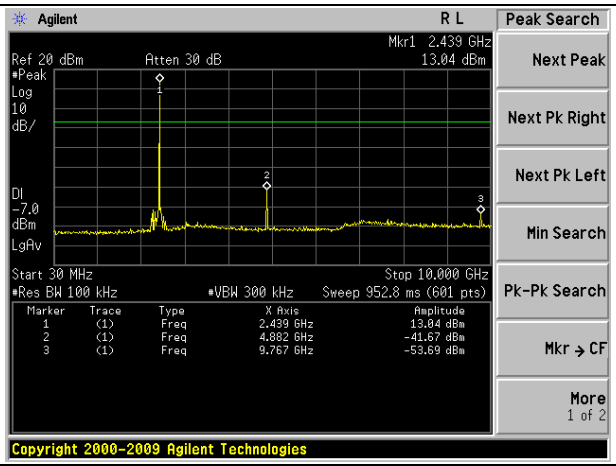
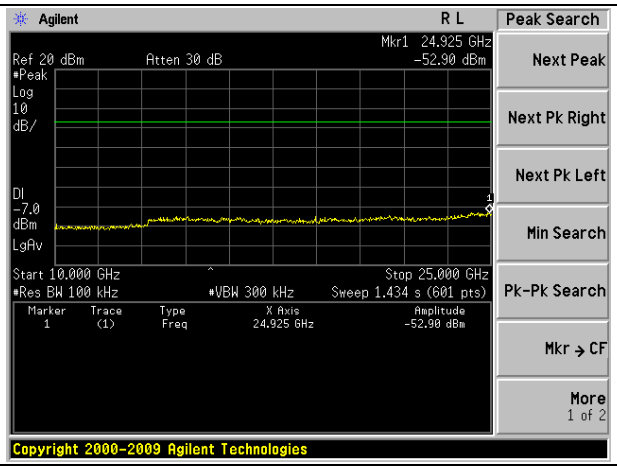
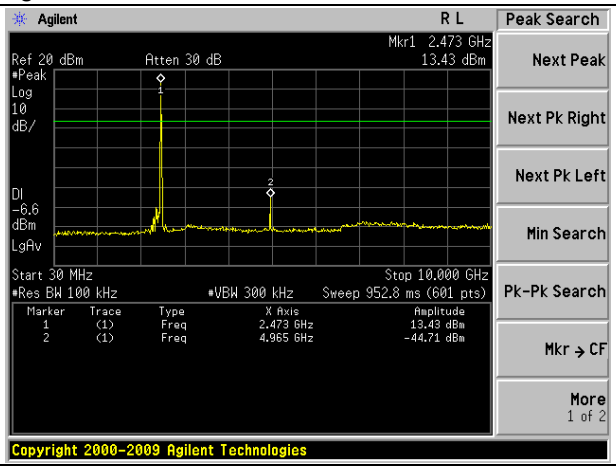
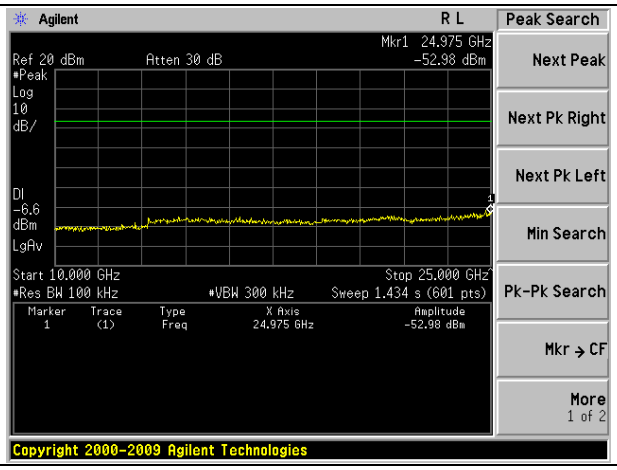
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2483.50 | 38.79 | 27.53 | 5.47 | 29.93 | 41.86 | 54.00 | -12.14 | Horizontal |
| 2500.00 | 36.33 | 27.55 | 5.49 | 29.93 | 39.44 | 54.00 | -14.56 | Horizontal |
| 2483.50 | 40.27 | 27.53 | 5.47 | 29.93 | 43.34 | 54.00 | -10.66 | Vertical |
| 2500.00 | 36.52 | 27.55 | 5.49 | 29.93 | 39.63 | 54.00 | -14.37 | Vertical |

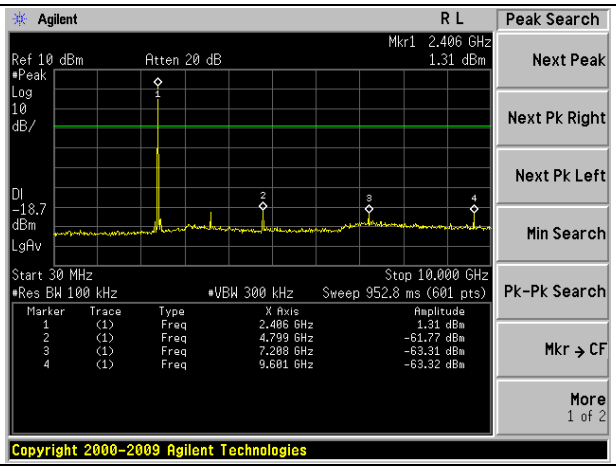
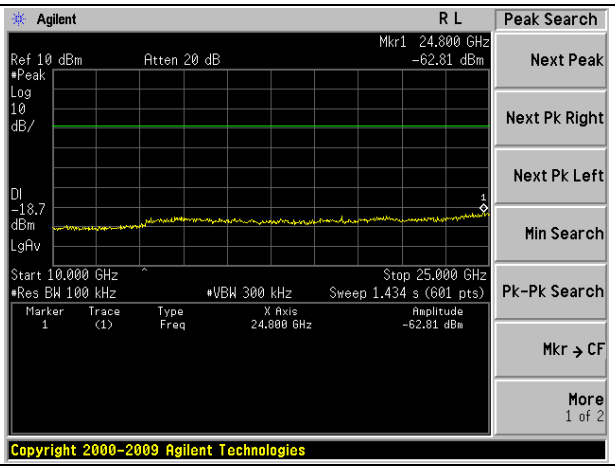
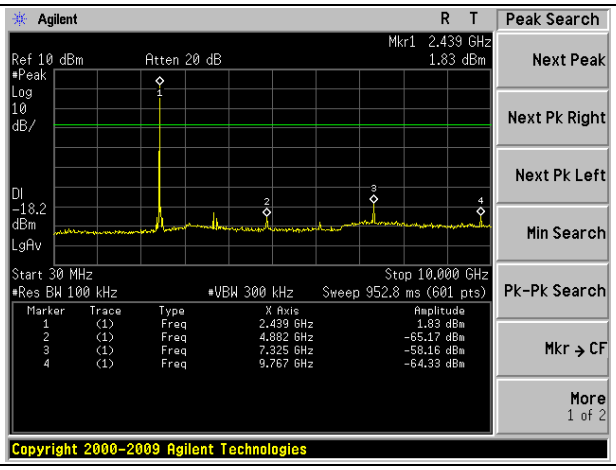
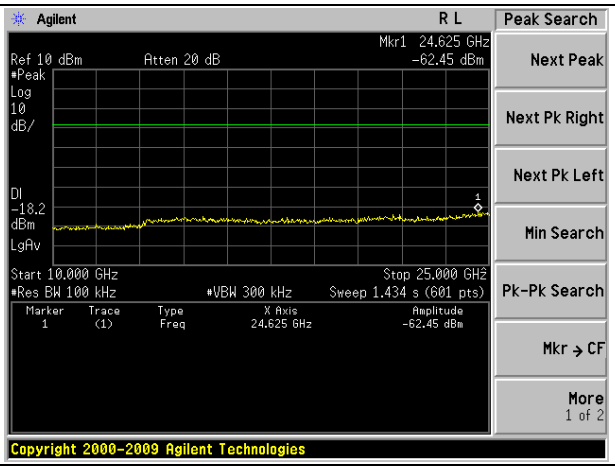
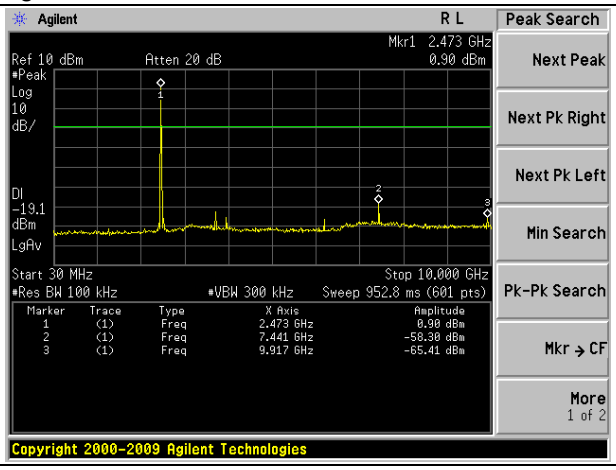
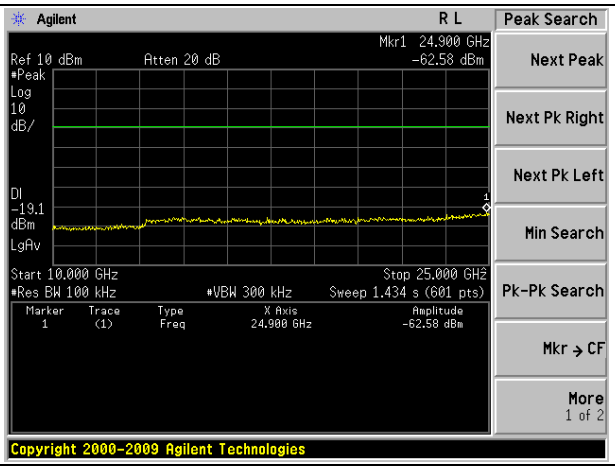
*Remark:*
1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

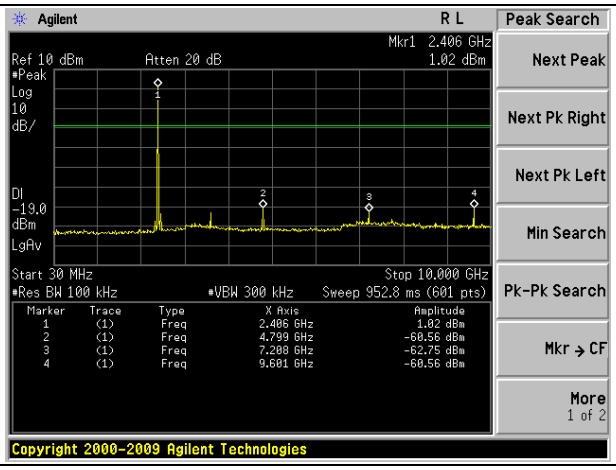
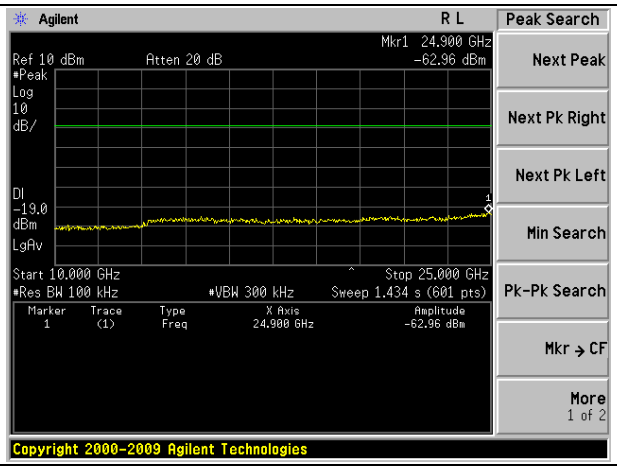
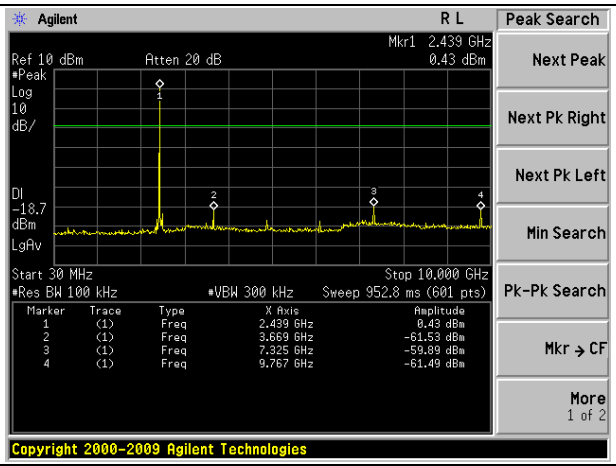
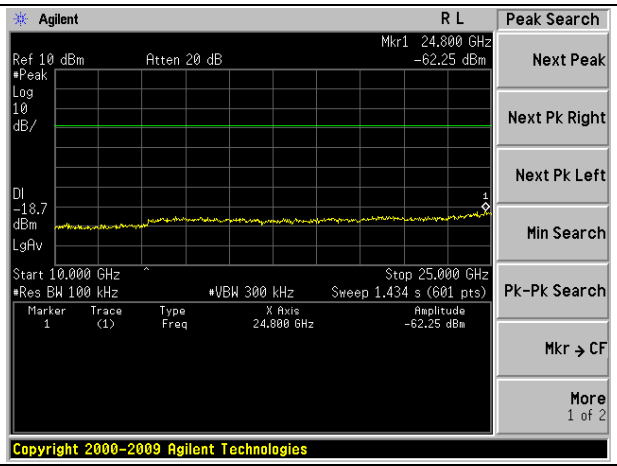
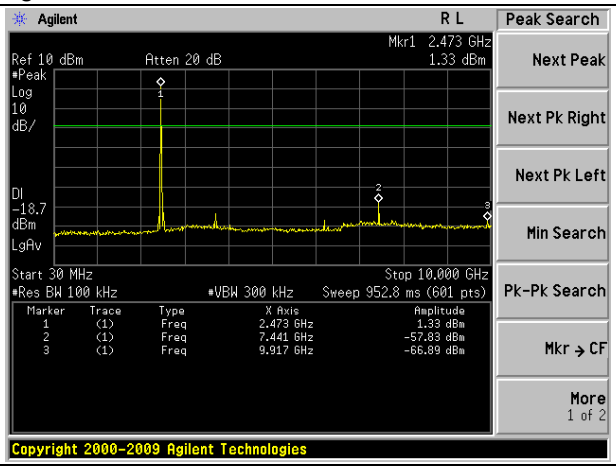
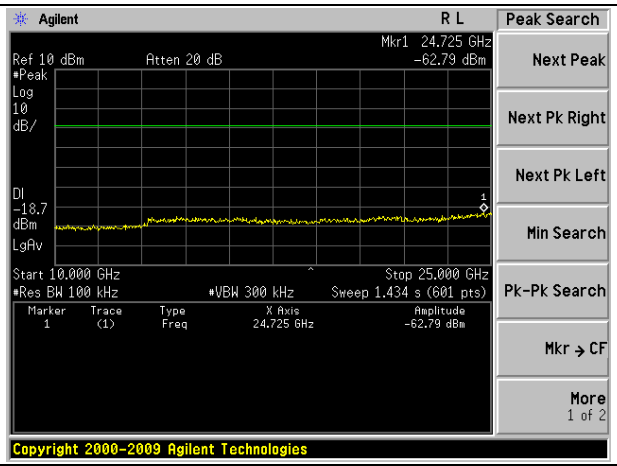
## 7.10 Spurious Emission

### 7.10.1 Conducted Emission Method

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (d) |
| Test Method: | ANSI C63.4:2003 and KDB558074 D01 Meas Guidance |
| Limit: | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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 coSSSnducted or a radiated measurement. |
| Test setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.3 for details |
| Test results: | Pass |

| Modulation Type: | GFSK |
|---|---|
| Lowest Channel | |
|  |  |
| 30MHz~10GHz | 10GHz~25GHz |
| Middle Channel | |
|  |  |
| 30MHz~10GHz | 10GHz~25GHz |
| Highest Channel | |
|  |  |
| 30MHz~10GHz | 10GHz~25GHz |

| Modulation Type: | Pi/4QPSK |
|---|---|
| Lowest Channel | |
|   |   |
| 30MHz~10GHz | 10GHz~25GHz |
| Middle Channel | |
|   |   |
| 30MHz~10GHz | 10GHz~25GHz |
| Highest Channel | |
|   |   |
| 30MHz~10GHz | 10GHz~25GHz |

| Modulation Type: | 8DPSK |
|---|---|
| Lowest Channel | |
|  |  |
| 30MHz~10GHz | 10GHz~25GHz |
| Middle Channel | |
|  |  |
| 30MHz~10GHz | 10GHz~25GHz |
| Highest Channel | |
|  |  |
| 30MHz~10GHz | 10GHz~25GHz |

### 7.10.2 Radiated Emission Method

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.209 |
| Test Method: | ANSI C63.4: 2003 |
| Test Frequency Range: | 30MHz to 25GHz |
| Test site: | Measurement Distance: 3m |

**Receiver setup:**

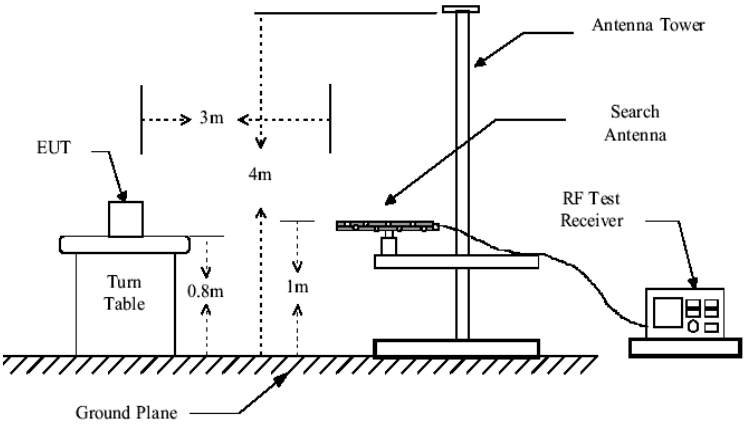
| Frequency | Detector | RBW | VBW | Remark |
|---|---|---|---|---|
| 30MHz-1GHz | Quasi-peak | 120KHz | 300KHz | Quasi-peak Value |
| Above 1GHz | Peak | 1MHz | 3MHz | Peak Value |
| | Peak | 1MHz | 10Hz | Average Value |

**Limit:**

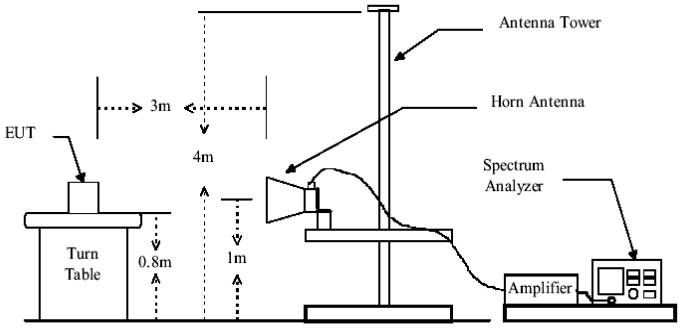
| Frequency | Limit (dBuV/m @3m) | Remark |
|---|---|---|
| 30MHz-88MHz | 40.0 | Quasi-peak Value |
| 88MHz-216MHz | 43.5 | Quasi-peak Value |
| 216MHz-960MHz | 46.0 | Quasi-peak Value |
| 960MHz-1GHz | 54.0 | Quasi-peak Value |
| Above 1GHz | 54.0 | Average Value |
| | 74.0 | Peak Value |

**Test setup:**

Below 1GHz




Above 1GHz

| | |
|---|---|
| |  |
| Test Procedure: | 1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.<br>2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.<br>3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.<br>4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.<br>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.<br>6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.3 for details |
| Test results: | Pass |

*Remark:*

1. *During the test, pre-scan the GFSK, Pi/4QPSK, 8DPSK modulation, and found the GFSK modulation which it is worse case.*
2. *Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.*

**Measurement data:**

■ **Below 1GHz**

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|---|---|---|---|---|---|---|---|---|
| 30.00 | 44.15 | 14.33 | 0.55 | 32.06 | 26.97 | 40.00 | -13.03 | Vertical |
| 36.25 | 42.96 | 14.63 | 0.62 | 32.06 | 26.15 | 40.00 | -13.85 | Vertical |
| 39.99 | 42.46 | 15.58 | 0.66 | 32.06 | 26.64 | 40.00 | -13.36 | Vertical |
| 155.91 | 52.51 | 10.51 | 1.60 | 32.00 | 32.62 | 43.50 | -10.88 | Vertical |
| 390.72 | 44.47 | 16.87 | 2.81 | 31.91 | 32.24 | 46.00 | -13.76 | Vertical |
| 576.64 | 36.41 | 20.03 | 3.63 | 31.15 | 28.92 | 46.00 | -17.08 | Vertical |
| 39.30 | 41.34 | 15.39 | 0.65 | 32.06 | 25.32 | 40.00 | -14.68 | Horizontal |
| 155.91 | 53.42 | 10.51 | 1.60 | 32.00 | 33.53 | 43.50 | -9.97 | Horizontal |
| 180.02 | 46.10 | 11.68 | 1.74 | 32.08 | 27.44 | 43.50 | -16.06 | Horizontal |
| 270.38 | 45.15 | 14.38 | 2.22 | 32.17 | 29.58 | 46.00 | -16.42 | Horizontal |
| 324.46 | 43.55 | 15.53 | 2.49 | 32.10 | 29.47 | 46.00 | -16.53 | Horizontal |
| 375.94 | 44.02 | 16.56 | 2.75 | 31.95 | 31.38 | 46.00 | -14.62 | Horizontal |

■ **Above 1GHz**

| Test channel: | Lowest |
|---|---|

**Peak value:**

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|---|---|---|---|---|---|---|---|---|
| 4804.00 | 44.44 | 31.78 | 8.60 | 32.09 | 52.73 | 74.00 | -21.27 | Vertical |
| 7206.00 | 34.91 | 36.15 | 11.65 | 32.00 | 50.71 | 74.00 | -23.29 | Vertical |
| 9608.00 | 33.91 | 37.95 | 14.14 | 31.62 | 54.38 | 74.00 | -19.62 | Vertical |
| 12010.00 | * | | | | | 74.00 | | Vertical |
| 14412.00 | * | | | | | 74.00 | | Vertical |
| 4804.00 | 47.81 | 31.78 | 8.60 | 32.09 | 56.10 | 74.00 | -17.90 | Horizontal |
| 7206.00 | 36.05 | 36.15 | 11.65 | 32.00 | 51.85 | 74.00 | -22.15 | Horizontal |
| 9608.00 | 32.60 | 37.95 | 14.14 | 31.62 | 53.07 | 74.00 | -20.93 | Horizontal |
| 12010.00 | * | | | | | 74.00 | | Horizontal |
| 14412.00 | * | | | | | 74.00 | | Horizontal |

**Average value:**

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|---|---|---|---|---|---|---|---|---|
| 4804.00 | 31.48 | 31.78 | 8.60 | 32.09 | 39.77 | 54.00 | -14.23 | Vertical |
| 7206.00 | 23.12 | 36.15 | 11.65 | 32.00 | 38.92 | 54.00 | -15.08 | Vertical |
| 9608.00 | 21.95 | 37.95 | 14.14 | 31.62 | 42.42 | 54.00 | -11.58 | Vertical |
| 12010.00 | * | | | | | 54.00 | | Vertical |
| 14412.00 | * | | | | | 54.00 | | Vertical |
| 4804.00 | 35.33 | 31.78 | 8.60 | 32.09 | 43.62 | 54.00 | -10.38 | Horizontal |
| 7206.00 | 24.80 | 36.15 | 11.65 | 32.00 | 40.60 | 54.00 | -13.40 | Horizontal |
| 9608.00 | 21.19 | 37.95 | 14.14 | 31.62 | 41.66 | 54.00 | -12.34 | Horizontal |
| 12010.00 | * | | | | | 54.00 | | Horizontal |
| 14412.00 | * | | | | | 54.00 | | Horizontal |

*Remark:*

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *"*", means this data is the too weak instrument of signal is unable to test.*

| Test channel: | Middle channel |
|---|---|

**Peak value:**

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|---|---|---|---|---|---|---|---|---|
| 4882.00 | 46.72 | 31.85 | 8.67 | 32.12 | 55.12 | 74.00 | -18.88 | Vertical |
| 7323.00 | 34.88 | 36.37 | 11.72 | 31.89 | 51.08 | 74.00 | -22.92 | Vertical |
| 9764.00 | 33.74 | 38.35 | 14.25 | 31.62 | 54.72 | 74.00 | -19.28 | Vertical |
| 12205.00 | * | | | | | 74.00 | | Vertical |
| 14646.00 | * | | | | | 74.00 | | Vertical |
| 4882.00 | 44.44 | 31.85 | 8.67 | 32.12 | 52.84 | 74.00 | -21.16 | Horizontal |
| 7323.00 | 34.18 | 36.37 | 11.72 | 31.89 | 50.38 | 74.00 | -23.62 | Horizontal |
| 9764.00 | 33.58 | 38.35 | 14.25 | 31.62 | 54.56 | 74.00 | -19.44 | Horizontal |
| 12205.00 | * | | | | | 74.00 | | Horizontal |
| 14646.00 | * | | | | | 74.00 | | Horizontal |

**Average value:**

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|---|---|---|---|---|---|---|---|---|
| 4882.00 | 32.93 | 31.85 | 8.67 | 32.12 | 41.33 | 54.00 | -12.67 | Vertical |
| 7323.00 | 22.19 | 36.37 | 11.72 | 31.89 | 38.39 | 54.00 | -15.61 | Vertical |
| 9764.00 | 22.03 | 38.35 | 14.25 | 31.62 | 43.01 | 54.00 | -10.99 | Vertical |
| 12205.00 | * | | | | | 54.00 | | Vertical |
| 14646.00 | * | | | | | 54.00 | | Vertical |
| 4882.00 | 30.97 | 31.85 | 8.67 | 32.12 | 39.37 | 54.00 | -14.63 | Horizontal |
| 7323.00 | 21.87 | 36.37 | 11.72 | 31.89 | 38.07 | 54.00 | -15.93 | Horizontal |
| 9764.00 | 21.98 | 38.35 | 14.25 | 31.62 | 42.96 | 54.00 | -11.04 | Horizontal |
| 12205.00 | * | | | | | 54.00 | | Horizontal |
| 14646.00 | * | | | | | 54.00 | | Horizontal |

*Remark:*

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *"*", means this data is the too weak instrument of signal is unable to test.*

| Test channel: | Highest channel |
|---|---|

**Peak value:**

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|---|---|---|---|---|---|---|---|---|
| 4960.00 | 44.39 | 31.93 | 8.73 | 32.16 | 52.89 | 74.00 | -21.11 | Vertical |
| 7440.00 | 35.51 | 36.59 | 11.79 | 31.78 | 52.11 | 74.00 | -21.89 | Vertical |
| 9920.00 | 34.27 | 38.81 | 14.38 | 31.88 | 55.58 | 74.00 | -18.42 | Vertical |
| 12400.00 | * | | | | | 74.00 | | Vertical |
| 14880.00 | * | | | | | 74.00 | | Vertical |
| 4960.00 | 44.00 | 31.93 | 8.73 | 32.16 | 52.50 | 74.00 | -21.50 | Horizontal |
| 7440.00 | 34.94 | 36.59 | 11.79 | 31.78 | 51.54 | 74.00 | -22.46 | Horizontal |
| 9920.00 | 34.15 | 38.81 | 14.38 | 31.88 | 55.46 | 74.00 | -18.54 | Horizontal |
| 12400.00 | * | | | | | 74.00 | | Horizontal |
| 14880.00 | * | | | | | 74.00 | | Horizontal |

**Average value:**

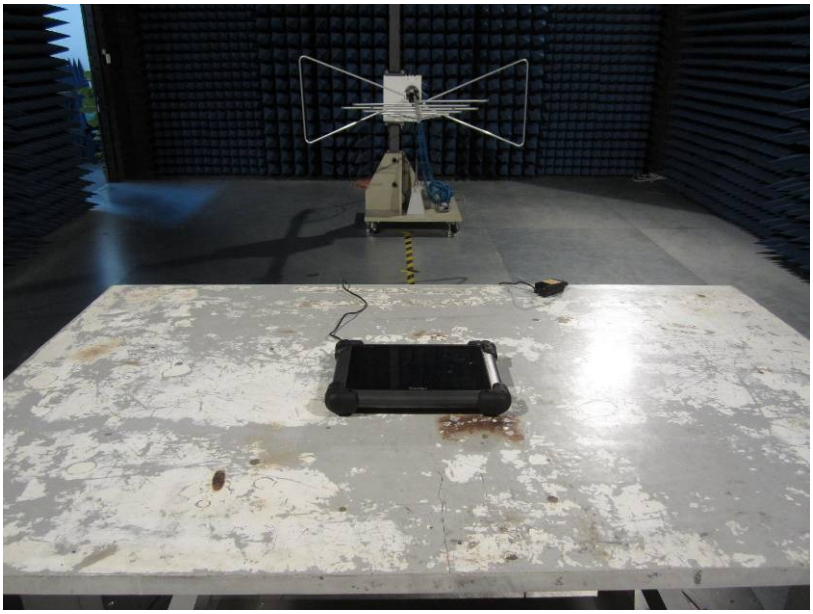
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|---|---|---|---|---|---|---|---|---|
| 4960.00 | 30.74 | 31.93 | 8.73 | 32.16 | 39.24 | 54.00 | -14.76 | Vertical |
| 7440.00 | 23.74 | 36.59 | 11.79 | 31.78 | 40.34 | 54.00 | -13.66 | Vertical |
| 9920.00 | 22.88 | 38.81 | 14.38 | 31.88 | 44.19 | 54.00 | -9.81 | Vertical |
| 12400.00 | * | | | | | 54.00 | | Vertical |
| 14880.00 | * | | | | | 54.00 | | Vertical |
| 4960.00 | 30.57 | 31.93 | 8.73 | 32.16 | 39.07 | 54.00 | -14.93 | Horizontal |
| 7440.00 | 23.48 | 36.59 | 11.79 | 31.78 | 40.08 | 54.00 | -13.92 | Horizontal |
| 9920.00 | 23.30 | 38.81 | 14.38 | 31.88 | 44.61 | 54.00 | -9.39 | Horizontal |
| 12400.00 | * | | | | | 54.00 | | Horizontal |
| 14880.00 | * | | | | | 54.00 | | Horizontal |

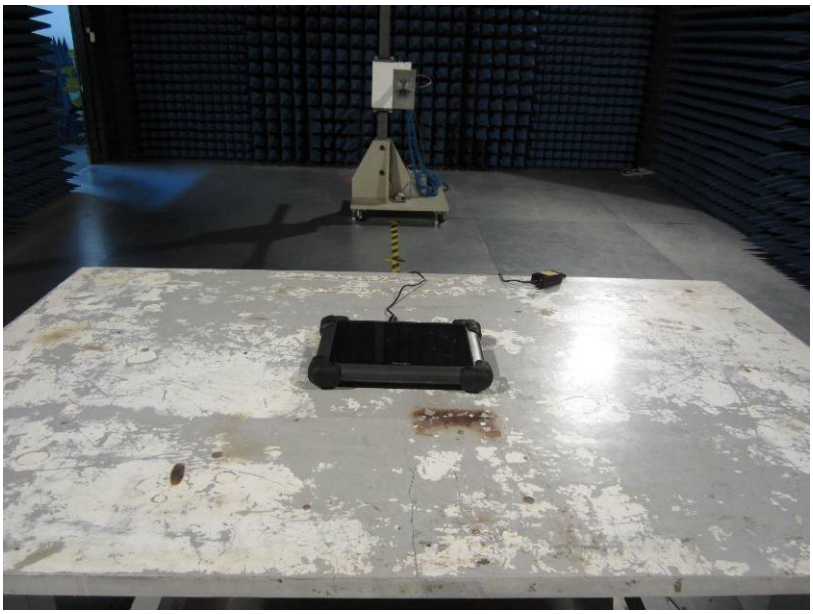
*Remark:*

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *"*", means this data is the too weak instrument of signal is unable to test.*

# 8 Test Setup Photo

Radiated Emission





Conducted Emission

# 9 EUT Constructional Details

Reference to the test report No. GTSE13070102701

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