

# FCC REPORT

Applicant: HUAWEI TECHNOLOGIES CO., LTD

Address of Applicant: Administration Building, Huawei Base, Bantian,  
Longgang District, Shenzhen 518129

Equipment Under Test (EUT)

Product Name: GSM Mobile Phone

Model No.: HUAWEI G7300

Trade Mark: HUAWEI

FCC ID: QISG7300A

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

Date of sample receipt: 03 Jan., 2012

Date of Test: 03-09 Jan., 2012

Date of report issued: 10 Jan., 2012

Test Result : PASS \*

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

Authorized Signature:



Stephen Guo  
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	10 Jan., 2012	Original

**Prepared By:**

*Collin He*

**Date:**

*10 Jan., 2012*

**Project Engineer**

**Check By:**

*Hans.Hu*

**Date:**

*10 Jan., 2012*

**Reviewer**

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## 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:	HUAWEI TECHNOLOGIES CO., LTD
Address of Applicant:	Administration Building, Huawei Base, Bantian, Longgang District, Shenzhen 518129
Manufacturer :	HUAWEI TECHNOLOGIES CO., LTD
Address of Manufacturer :	Administration Building, Huawei Base, Bantian, Longgang District, Shenzhen 518129

### 5.2 General Description of E.U.T.

Product Name:	GSM Mobile Phone
Model No.:	HUAWEI G7300
Operation Frequency:	2402MHz~2480MHz
Channel numbers:	79
Channel separation:	1MHz
Modulation type:	GFSK, Pi/4QPSK, 8DPSK
Antenna Type:	Chip antenna
Antenna gain:	0.33 dBi(declare by Applicant)
Adapter:	Trade Mark:HUAWEI Model :HS-050040U6 Input :100-240V~50/60Hz 0.2A Output: 5.0V DC,400mA
Power supply:	Li-ion Battery Trade Mark:HUA WEI Model: HBG7300 Voltage and Rated Capacity:3.7 V DC, 1300mAh

#### Remarks:

The different between HUAWEI G7300 single SIM card mobile phone and HUAWEI G7300 double SIM card mobile phone are the number of SIM card and the colour of appearance. The others are the same, which includes circuit design, PCB board, structure and all components. Only double SIM card mobile phone was performed for this test.

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

TM1	Keep the EUT in Continuous transmitting mode on fixed channels
TM2	Keep the EUT in Hopping mode on 79 channels

### 5.4 Test Facility

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

● **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen 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 files. Registration 600491, July 20, 2010.

● **Industry Canada (IC)**

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-1.

### 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: 0755-2779 8480; Fax: 0755-27798960

### 5.6 Other Information Requested by the Customer

None.

## 5.7 Test Instruments list

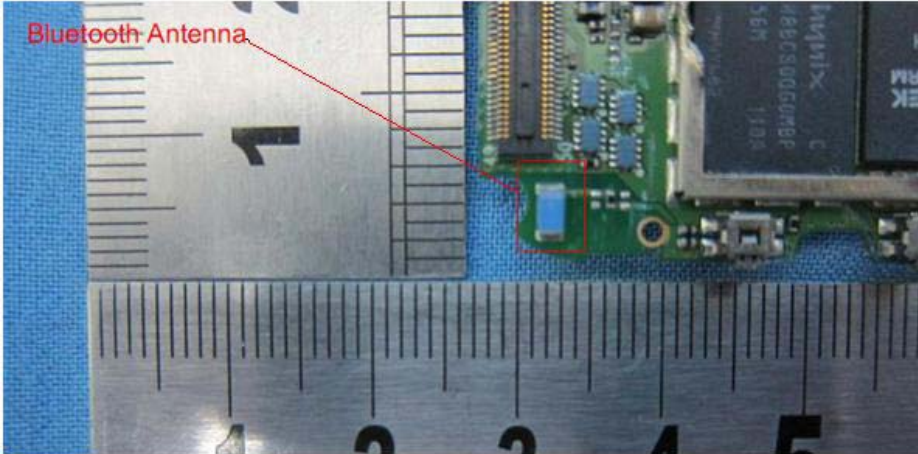
Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	Mar. 30 2011	Mar. 29 2012
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	Jul. 04 2011	Jul. 03 2012
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	Feb. 26 2011	Feb. 25 2012
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 30 2011	June 29 2012
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 30 2011	Mar. 29 2012
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	Apr. 01 2011	Mar. 31 2012
9	Coaxial Cable	GTS	N/A	GTS211	Apr. 01 2011	Mar. 31 2012
9	Coaxial cable	GTS	N/A	GTS210	Apr. 01 2011	Mar. 31 2012
11	Coaxial Cable	GTS	N/A	GTS212	Apr. 01 2011	Mar. 31 2012
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	Jul. 04 2011	Jul. 03 2012
13	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	Jul. 04 2011	Jul. 03 2012
14	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	Apr. 01 2011	Mar. 31 2012
15	Band filter	Amindeon	82346	GTS219	Apr. 01 2011	Mar. 31 2012
16	Universal radio communication tester	Rohde & Schwarz	CMU200	GTS235	May 11 2011	May 11 2012
17	Signal Generator	Rohde & Schwarz	SML03	GTS236	May 11 2011	May 11 2012
18	Temp. Humidity/ Barometer	Oregon Scientific	BA-888	GTS248	May 11 2011	May 11 2012
19	D.C. Power Supply	Instek	PS-3030	GTS232	NA	NA
20	Splitter	Agilent	11636B	GTS237	May 11 2011	May 11 2012

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)	GTS252	Jul. 04 2011	Jul. 03 2012
2	EMI Test Receiver	Rohde & Schwarz	ESCS30	GTS223	Jul. 04 2011	Jul. 03 2012
3	10dB Pulse Limita	Rohde & Schwarz	N/A	GTS224	Jul. 04 2011	Jul. 03 2012
4	LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	GTS226	Jul. 04 2011	Jul. 03 2012
5	Coaxial Cable	GTS	N/A	GTS227	Apr. 01 2011	Mar. 31 2012
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A



## 6 Test results and Measurement Data

### 6.1 Antenna requirement:

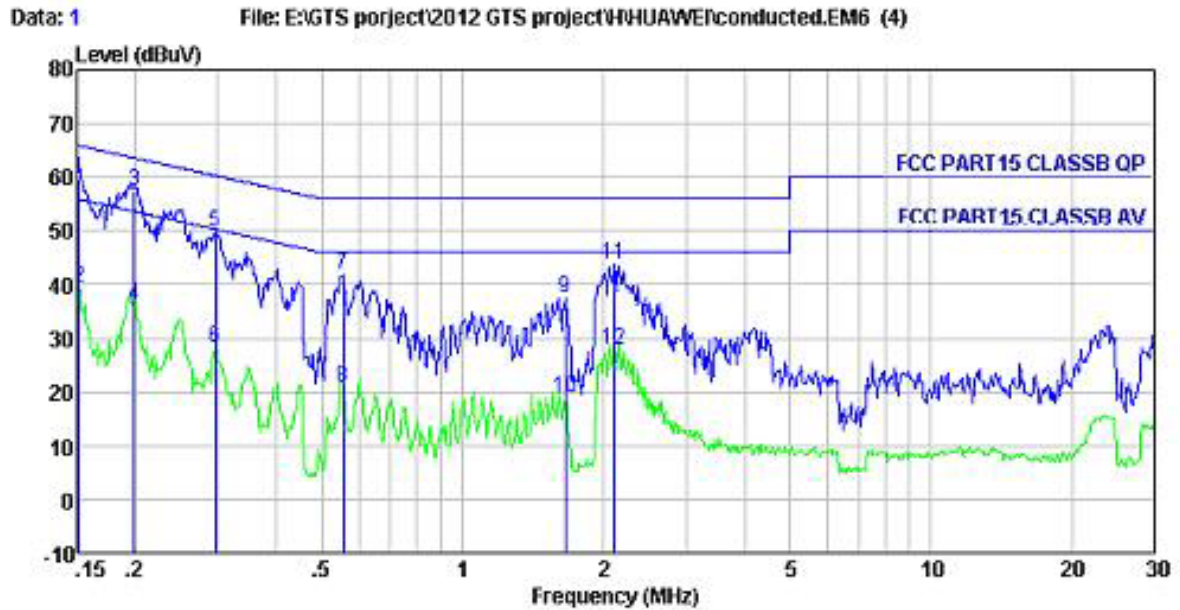
<b>Standard requirement:</b>	FCC Part15 C Section 15.203 /247(c)
<p><i>15.203 requirement:</i>  <i>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna 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.</i></p> <p><i>15.247(c) (1)(i) requirement:</i>  <i>(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.</i></p>	
<b>E.U.T Antenna:</b>	
<p><i>The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0.33 dBi.</i></p>	
	

## 6.2 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 border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBuV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <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> </tbody> </table> <p>* Decreases with the logarithm of the frequency.</p>	Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
5-30	60	50													
Test procedure	<ol style="list-style-type: none"> <li>The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment.</li> <li>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).</li> <li>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.</li> </ol>														
Test setup:	<p>Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>														
Test Instruments:	Refer to section 5.7 for details														
Test mode:	TM1														
Test results:	Pass														

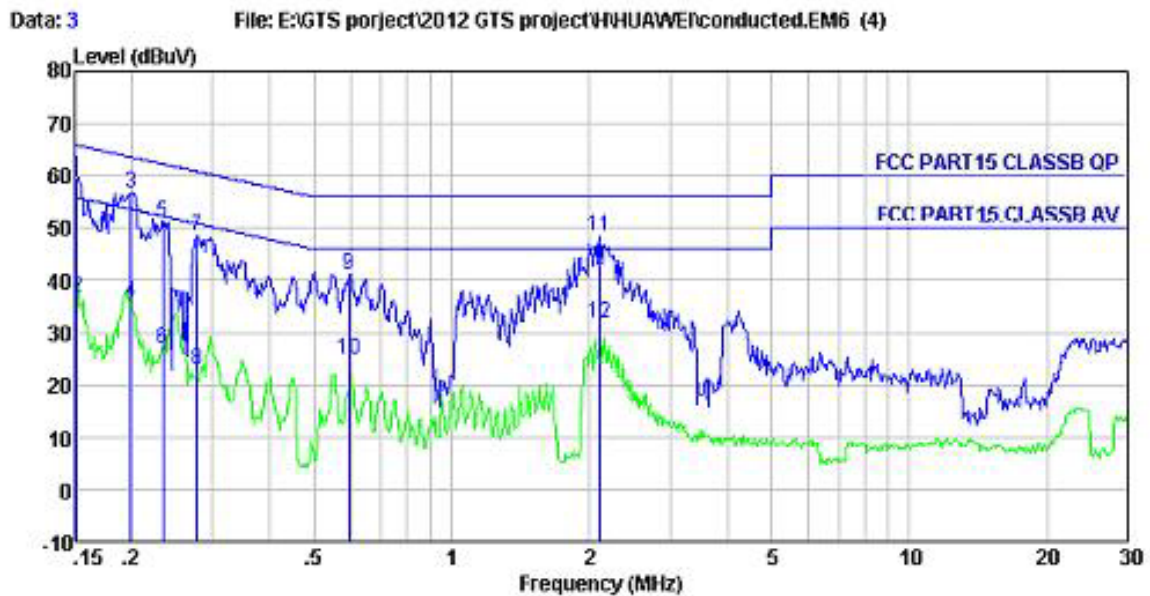
### Measurement Data

Live line:



	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.152	58.99	0.69	0.10	59.78	65.91	-6.13	QP
2	0.152	38.65	0.69	0.10	39.44	55.91	-16.47	Average
3	0.199	56.70	0.66	0.10	57.46	63.67	-6.21	QP
4	0.199	35.24	0.66	0.10	36.00	53.67	-17.67	Average
5	0.296	48.98	0.61	0.10	49.69	60.37	-10.68	QP
6	0.296	27.32	0.61	0.10	28.03	50.37	-22.34	Average
7	0.555	41.21	0.54	0.10	41.85	56.00	-14.15	QP
8	0.555	20.12	0.54	0.10	20.76	46.00	-25.24	Average
9	1.654	37.03	0.42	0.10	37.55	56.00	-18.45	QP
10	1.654	18.32	0.42	0.10	18.84	46.00	-27.16	Average
11	2.110	43.33	0.39	0.10	43.82	56.00	-12.18	QP
12	2.110	27.25	0.39	0.10	27.74	46.00	-18.26	Average

Neutral line:

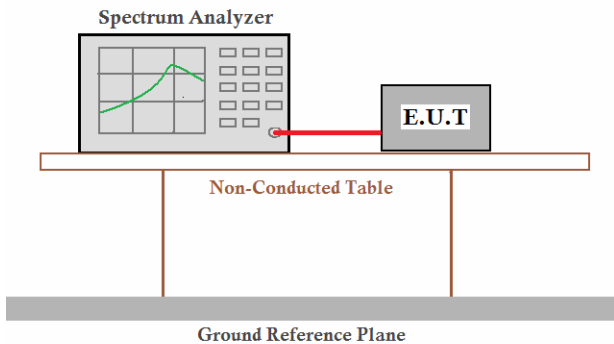


	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.152	59.05	0.69	0.10	59.84	65.91	-6.07	QP
2	0.152	36.12	0.69	0.10	36.91	55.91	-19.00	Average
3	0.199	56.12	0.66	0.10	56.88	63.67	-6.79	QP
4	0.199	35.21	0.66	0.10	35.97	53.67	-17.70	Average
5	0.234	50.52	0.64	0.10	51.26	62.30	-11.04	QP
6	0.234	26.16	0.64	0.10	26.90	52.30	-25.40	Average
7	0.277	47.83	0.62	0.10	48.55	60.90	-12.35	QP
8	0.277	22.12	0.62	0.10	22.84	50.90	-28.06	Average
9	0.595	40.64	0.53	0.10	41.27	56.00	-14.73	QP
10	0.595	24.12	0.53	0.10	24.75	46.00	-21.25	Average
11	2.099	48.03	0.40	0.10	48.53	56.00	-7.47	QP
12	2.099	31.21	0.40	0.10	31.71	46.00	-14.29	Average

Notes:

1. An initial pre-scan was performed on the live and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Measure Level = Reading level + Factor

### 6.3 Conducted Peak Output Power

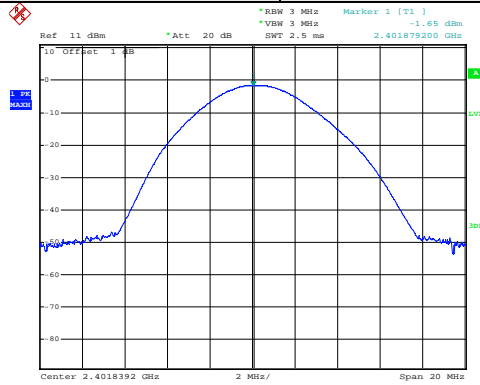
Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	ANSI C63.4:2003 and DA00-705
Receiver setup:	RBW=3MHz, VBW=3MHz, Detector=Peak
Limit:	30dBm
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	TM1
Test results:	Pass

#### Measurement Data

GFSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	-1.65	30.00	Pass
Middle	-0.94	30.00	Pass
Highest	0.54	30.00	Pass
Pi/4QPSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	-1.86	30.00	Pass
Middle	-0.92	30.00	Pass
Highest	-0.23	30.00	Pass
8DPSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	-1.75	30.00	Pass
Middle	-0.91	30.00	Pass
Highest	-0.11	30.00	Pass

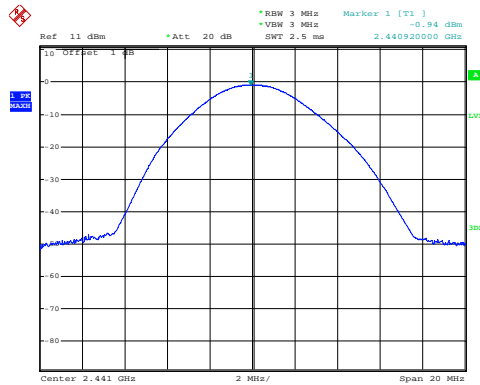
Test plot as follows:

Modulation mode: **GFSK**



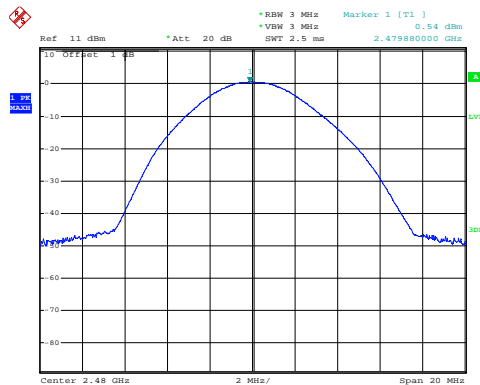
Date: 28.DEC.2011 03:00:53

### Lowest channel



Date: 28.DEC.2011 03:22:51

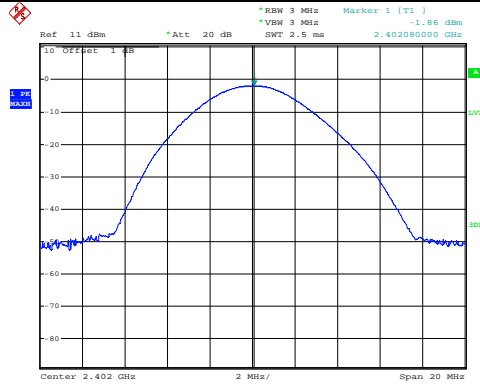
### Middle channel



Date: 28.DEC.2011 03:46:27

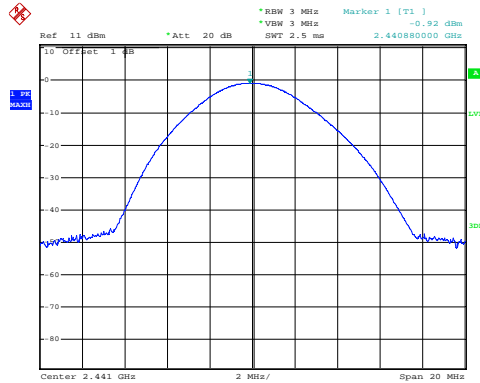
### Highest channel

Modulation mode: **Pi/4QPSK**



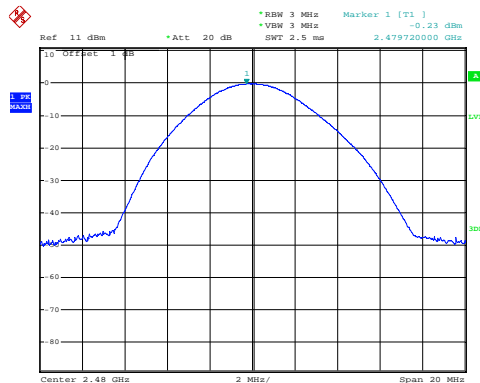
Date: 28.DEC.2011 04:09:39

### Lowest channel



Date: 28.DEC.2011 04:37:42

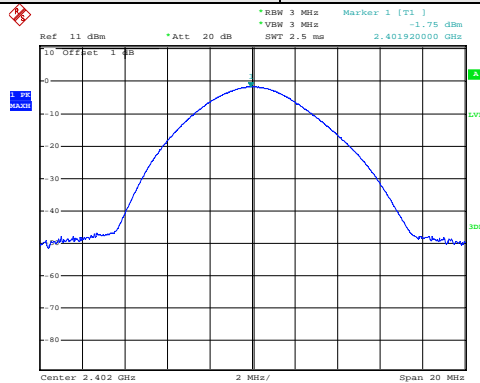
### Middle channel



Date: 28.DEC.2011 04:58:03

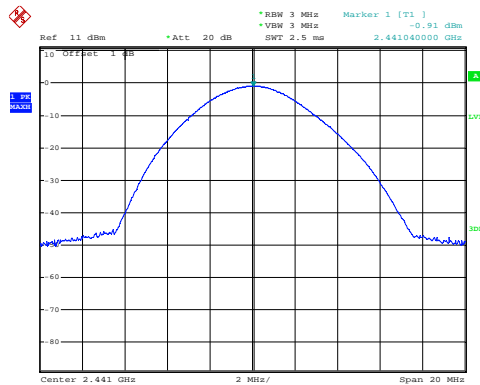
### Highest channel

Modulation mode: **8DPSK**



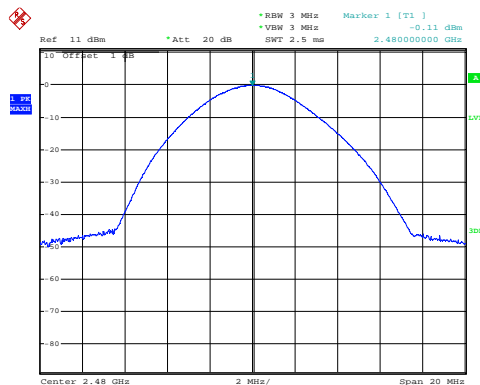
Date: 28.DEC.2011 05:09:20

### Lowest channel



Date: 28.DEC.2011 06:43:35

### Middle channel

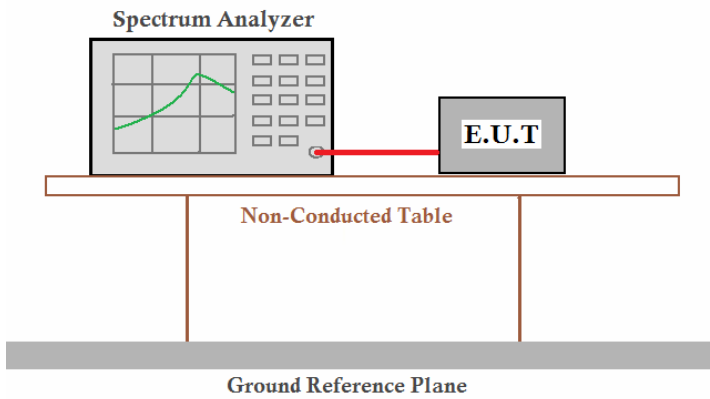


Date: 28.DEC.2011 06:49:21

### Highest channel



## 6.4 20dB Occupy Bandwidth

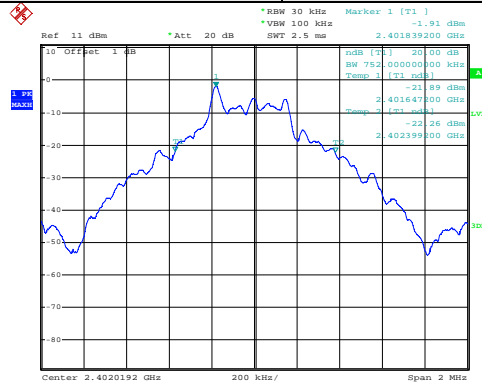
Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.4:2003 and DA00-705
Receiver setup:	RBW=30kHz, VBW=100kHz,detector=Peak
Limit:	NA
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.7 for details
Test mode:	TM1
Test results:	Pass

### Measurement Data

Test channel	20dB Occupy Bandwidth (kHz)		
	GFSK	Pi/4QPSK	8DPSK
Lowest	752	1128	1164
Middle	708	1120	1164
Highest	708	1116	1164

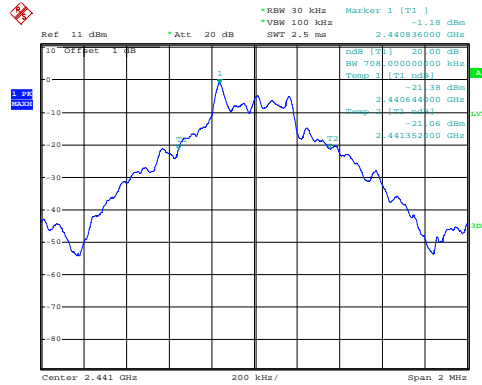
Test plot as follows:

Modulation mode: **GFSK**



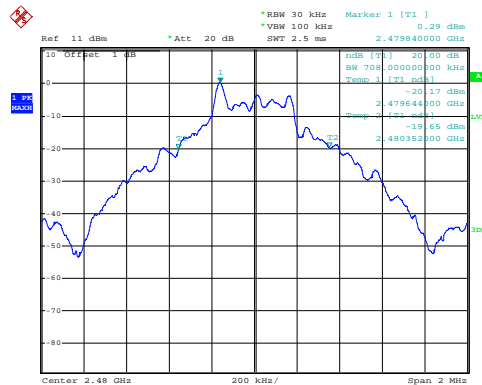
Date: 28.DEC.2011 03:08:07

Lowest channel



Date: 28.DEC.2011 03:24:03

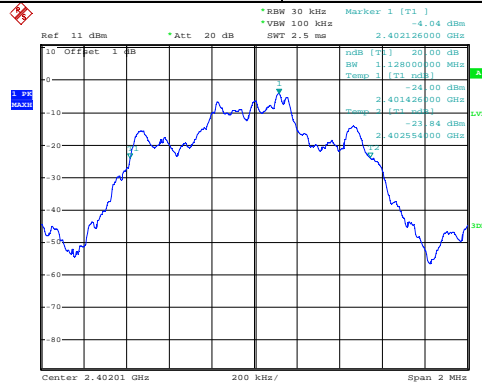
Middle channel



Date: 28.DEC.2011 03:47:25

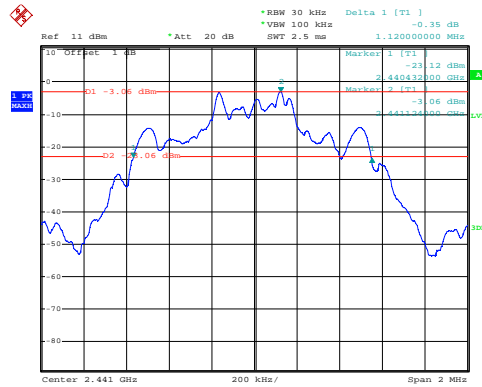
Highest channel

Modulation mode: **Pi/4QPSK**



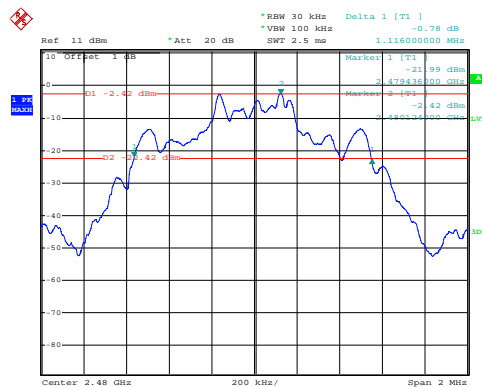
Date: 28.DEC.2011 04:12:19

### Lowest channel



Date: 28.DEC.2011 04:39:39

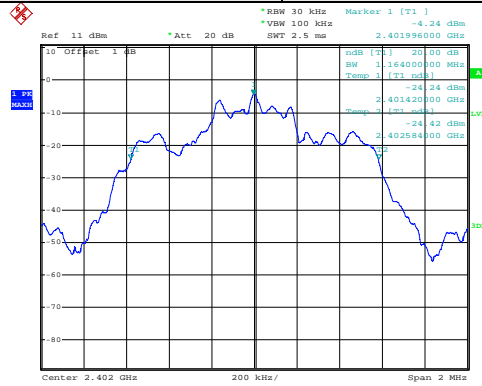
### Middle channel



Date: 28.DEC.2011 05:00:14

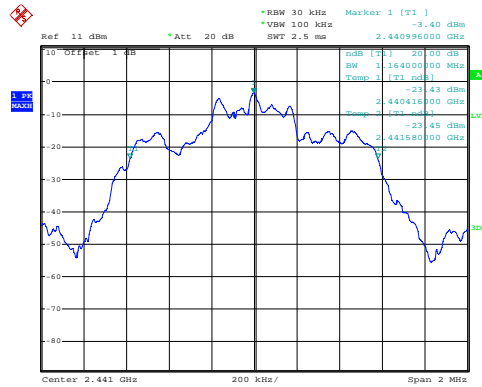
### Highest channel

Modulation mode: **8DPSK**



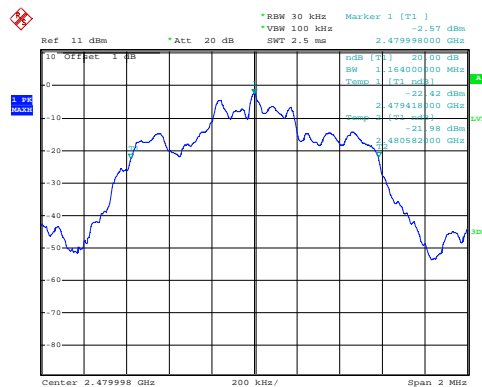
Date: 28.DEC.2011 05:10:20

### Lowest channel



Date: 28.DEC.2011 06:44:11

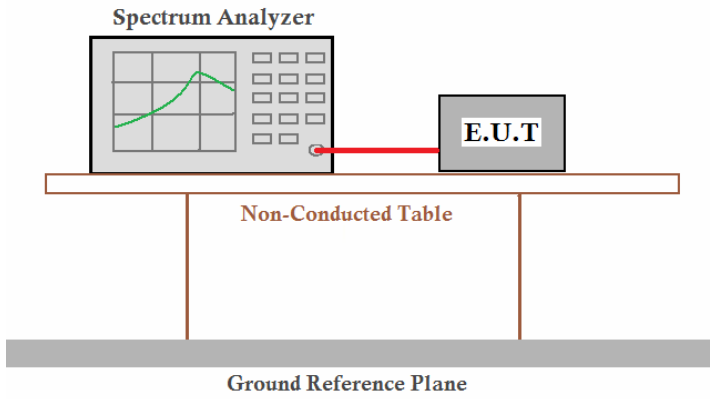
### Middle channel



Date: 28.DEC.2011 06:50:10

### Highest channel

## 6.5 Carrier Frequencies Separation

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.4:2003 and DA00-705
Receiver setup:	RBW=100kHz, VBW=300kHz, detector=Peak
Limit:	0.025MHz or 2/3 of the 20dB bandwidth (whichever is greater)
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which is supported by two legs. Below the table is a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.7 for details
Test mode:	TM2
Test results:	Pass

Measurement Data

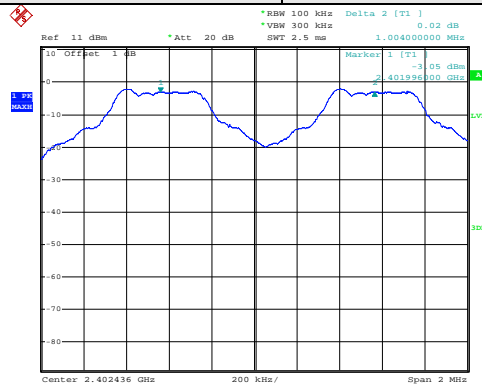
GFSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Lowest	1004	501.3	Pass
Middle	1004	501.3	Pass
Highest	1004	501.3	Pass
Pi/4QPSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Lowest	1008	752.0	Pass
Middle	1012	752.0	Pass
Highest	1004	752.0	Pass
8DPSK mode			
Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Lowest	1004	776.0	Pass
Middle	1012	776.0	Pass
Highest	1007	776.0	Pass

Note: According to section 5.4,

Mode	20dB bandwidth (kHz) (worse case)	Limit (kHz) (Carrier Frequencies Separation)
GFSK	752	501.3
PI/4QPSK	1128	752.0
8DPSK	1164	776.0

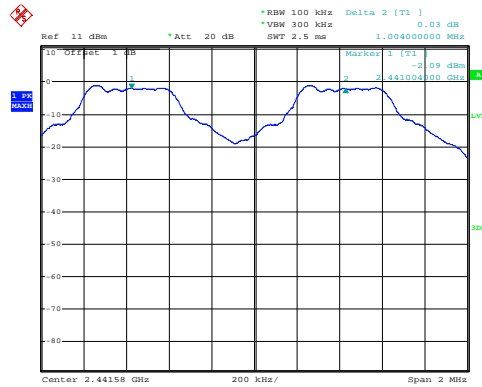
Test plots as follows:

Modulation mode: **GFSK**



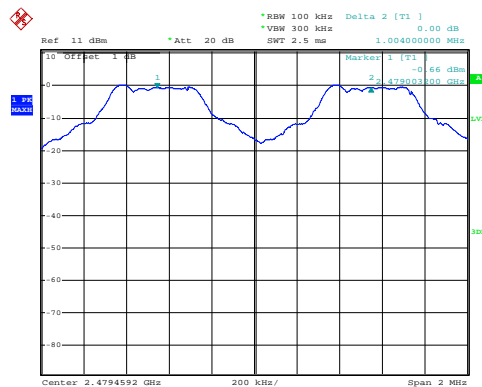
Date: 28.DEC.2011 03:20:18

### Lowest channel



Date: 28.DEC.2011 03:30:08

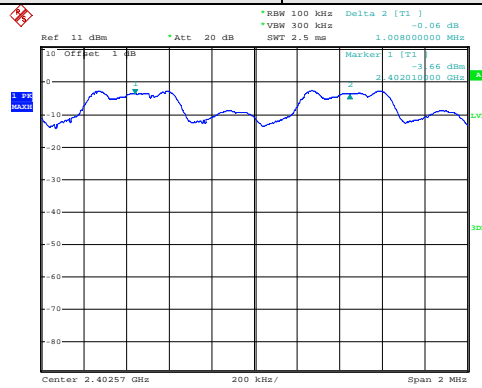
### Middle channel



Date: 28.DEC.2011 04:04:31

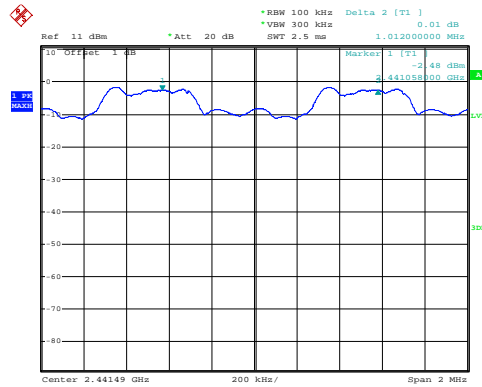
### Highest channel

Modulation mode: **Pi/4QPSK**



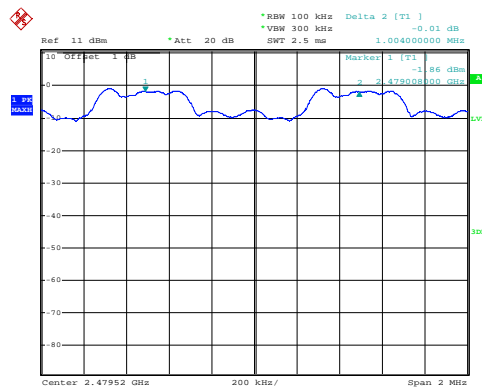
Date: 28.DEC.2011 04:35:24

### Lowest channel



Date: 28.DEC.2011 04:44:03

### Middle channel

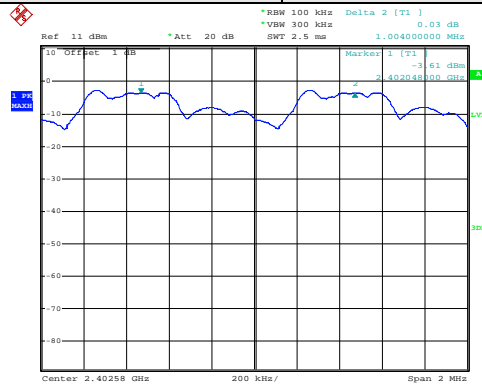


Date: 28.DEC.2011 05:04:33

### Highest channel

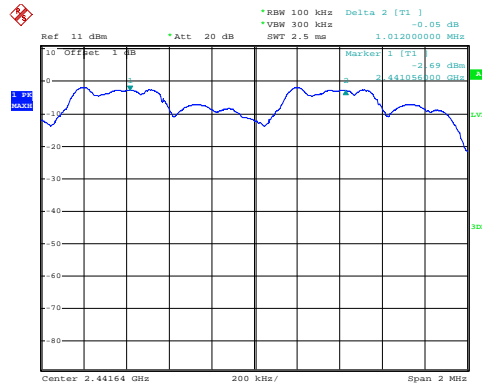


Modulation mode: **8DPSK**



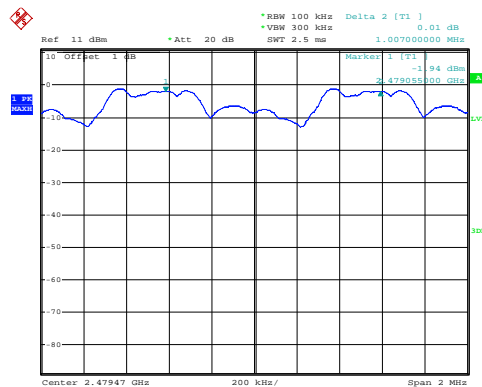
Date: 28.DEC.2011 05:15:36

### Lowest channel



Date: 28.DEC.2011 06:47:32

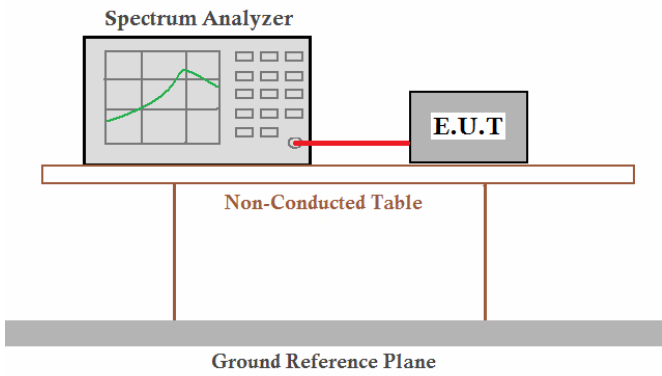
### Middle channel



Date: 28.DEC.2011 06:57:32

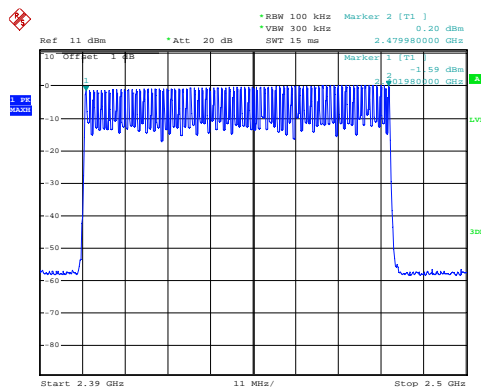
### Highest channel

## 6.6 Hopping Channel Number

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.4:2003 and DA00-705
Receiver setup:	RBW=100kHz, VBW=300kHz, Frequency range=2400MHz-2483.5MHz, Detector=Peak
Limit:	15 channels
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	TM2
Test results:	Pass

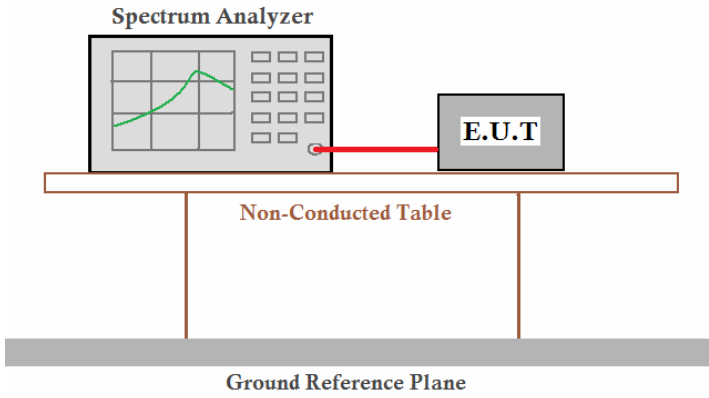
### Measurement Data:

Measurement Data		
Mode	Hopping channel numbers	Limit
GFSK, Pi/4QPSK, 8DPSK	79	15



Date: 28.DEC.2011 07:26:03

## 6.7 Dwell Time

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.4:2003 and KDB DA00-705
Receiver setup:	RBW=1MHz, VBW=1MHz, Span=0Hz, Detector=Peak
Limit:	0.4 Second
Test mode:	Hopping transmitting with all kind of modulation.
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.7 for details
Test mode:	TM2
Test results:	Pass

### Measurement Data

Mode	Packet	Dwell time (second)	Limit (second)	Result
GFSK	DH1	0.1216	0.4	Pass
	DH3	0.2624		
	DH5	0.3072		
Pi/4QPSK	2-DH1	0.1216	0.4	Pass
	2-DH3	0.2624		
	2-DH5	0.3072		
8DPSK	3-DH1	0.1216	0.4	Pass
	3-DH3	0.2624		
	3-DH5	0.3072		

### Test Result:

The test period:  $T = 0.4 \text{ Second/Channel} \times 79 \text{ Channel} = 31.6 \text{ s}$

The lowest channel (2402MHz), middle channel (2441MHz), highest channel (2480MHz) as blow

$$\text{DH1 time slot} = 0.38(\text{ms}) \times (1600 / (2 \times 79)) \times 31.6 = 121.60 \text{ ms}$$

$$\text{DH3 time slot} = 1.64(\text{ms}) \times (1600 / (4 \times 79)) \times 31.6 = 262.40\text{ms}$$

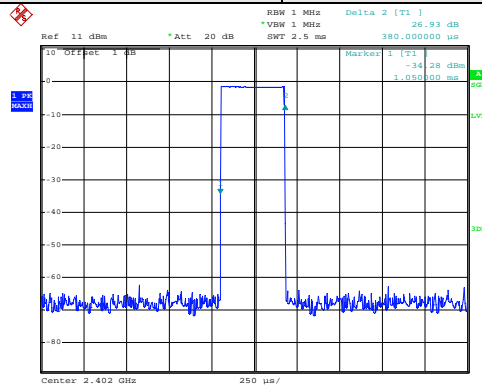
$$\text{DH5 time slot} = 2.88(\text{ms}) \times (1600 / (6 \times 79)) \times 31.6 = 307.20 \text{ ms}$$

### Test plot as follows:

Global United Technology Services Co., Ltd.  
2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road Baoan District,  
Shenzhen, China 518102

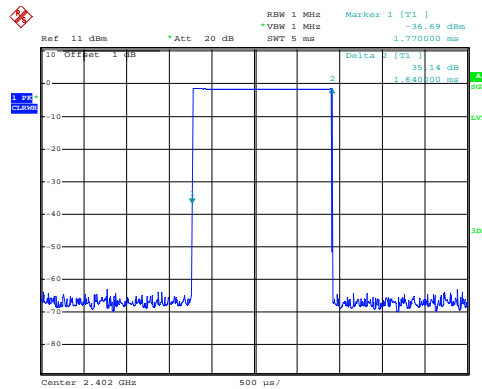
Project No.: CCIS111200012RF

Modulation mode: GFSK, Pi/4QPSK, 8DPSK



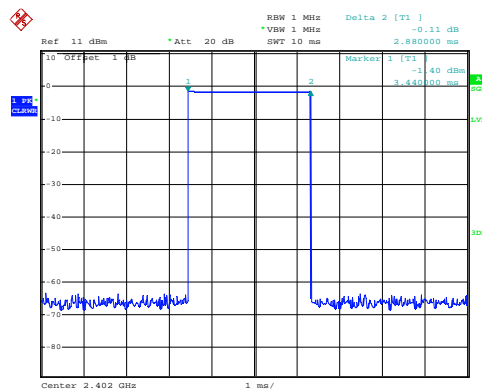
Date: 28.DEC.2011 07:00:57

### DH1, 2-DH1, 3-DH1



Date: 28.DEC.2011 07:02:50

### DH3, 2-DH3, 3-DH3



Date: 28.DEC.2011 07:03:32

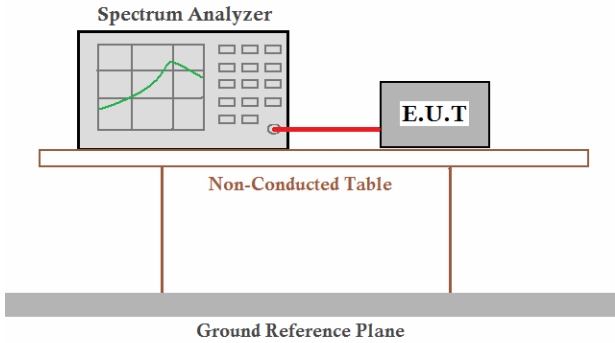
### DH5, 2-DH5, 3-DH5

## 6.8 Pseudorandom Frequency Hopping Sequence

Test Requirement:	FCC Part15 C Section 15.247 (a)(1) requirement:
<p>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.</p> <p>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.</p>	
EUT Pseudorandom Frequency Hopping Sequence	
<p>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.</p> <ul style="list-style-type: none"> <li>• Number of shift register stages: 9</li> <li>• Length of pseudo-random sequence: <math>2^9 - 1 = 511</math> bits</li> <li>• Longest sequence of zeros: 8 (non-inverted signal)</li> </ul> <div data-bbox="272 938 1326 1088" style="text-align: center;"> </div> <p style="text-align: center;"><i>Linear Feedback Shift Register for Generation of the PRBS sequence</i></p> <p>An example of Pseudorandom Frequency Hopping Sequence as follow:</p> <div data-bbox="248 1189 1243 1339" style="text-align: center;"> </div> <p>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.</p>	

## 6.9 Band Edge

### 6.9.1 Conducted Emission Method

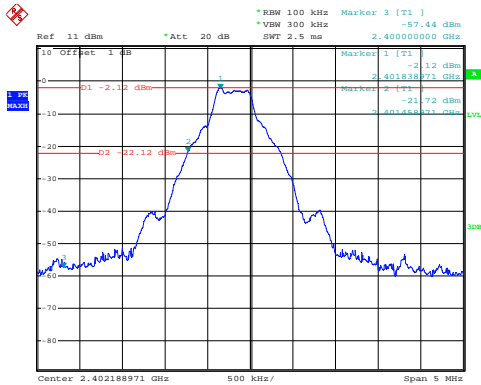
Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.4:2003 and DA00-705
Receiver setup:	RBW=100kHz, VBW=300kHz, Detector=Peak
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is 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:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.7 for details
Test mode:	TM1&TM2
Test results:	Pass

Remark:

During test the item, Pre-scan the GFSK, Pi/4QPSK, 8DPSK modulation, and found the GFSK modulation which it is worse case.

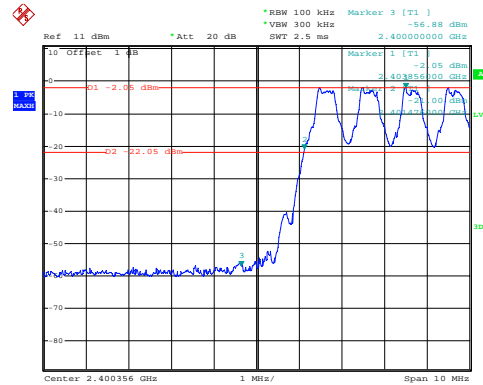
Test plot as follows:

Modulation mode:	GFSK
Test channel:	Lowest channel



Date: 28.DEC.2011 03:12:47

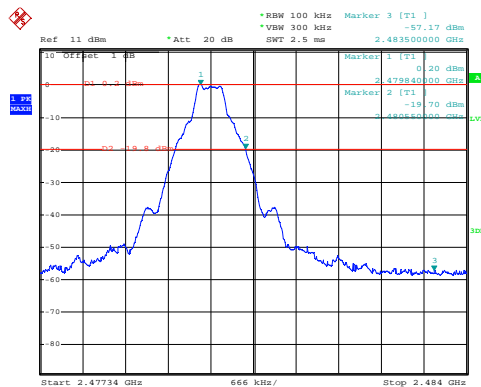
No-hopping mode



Date: 28.DEC.2011 03:17:45

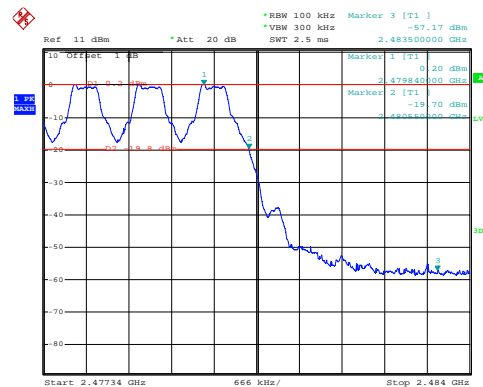
Hopping mode

Test channel:	Highest channel
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Date: 28.DEC.2011 03:59:23

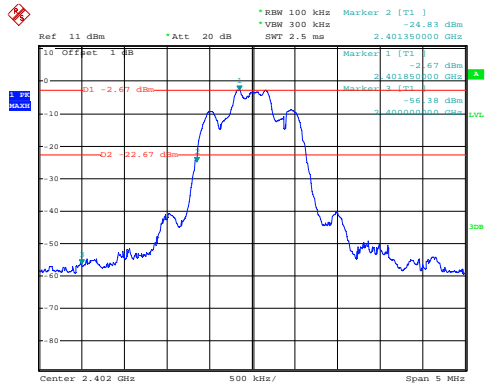
No-hopping mode



Date: 28.DEC.2011 04:02:33

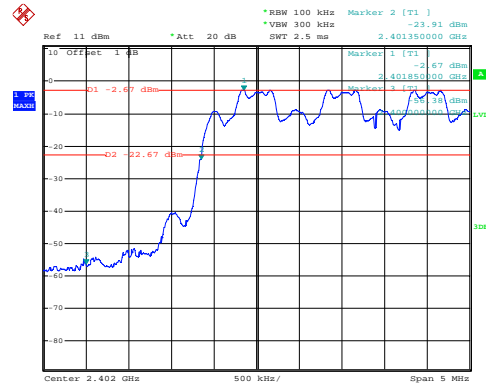
Hopping mode

Modulation mode:	Pi/4QPSK
Test channel:	Lowest channel



Date: 28.DEC.2011 04:18:18

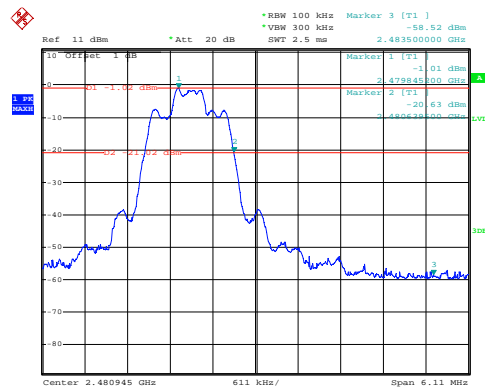
No-hopping mode



Date: 28.DEC.2011 04:27:05

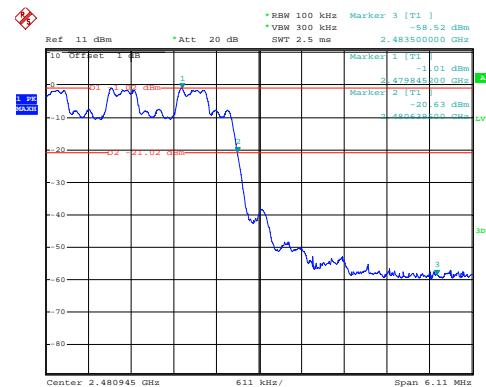
Hopping mode

Test channel:	Highest channel
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Date: 28.DEC.2011 05:05:56

No-hopping mode

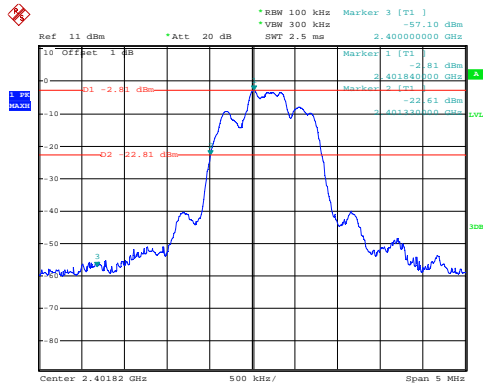


Date: 28.DEC.2011 05:06:56

Hopping mode

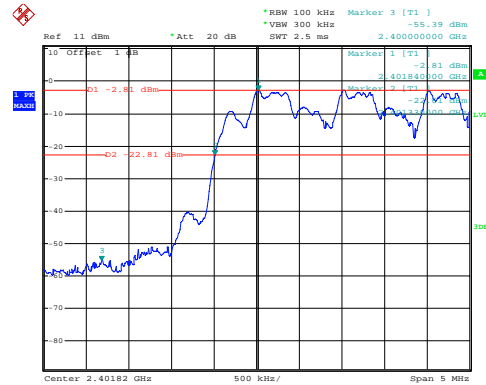


Modulation mode:	8DPSK
Test channel:	Lowest channel



Date: 28.DEC.2011 06:41:08

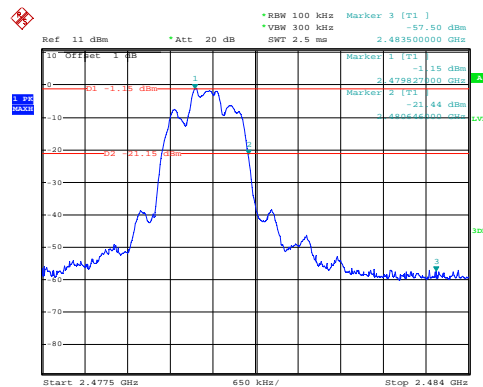
No-hopping mode



Date: 28.DEC.2011 06:42:11

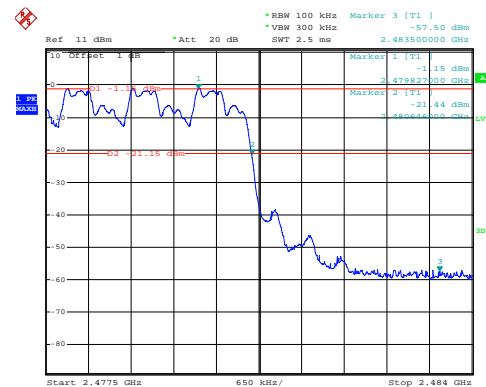
Hopping mode

Test channel:	Highest channel
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Date: 28.DEC.2011 06:54:09

No-hopping mode



Date: 28.DEC.2011 06:55:39

Hopping mode

## 6.9.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209 and 15.205														
Test Method:	ANSI C63.4: 2003														
Test Frequency Range:	2.3GHz to 2.5GHz														
Test site:	Measurement Distance: 3m														
Receiver setup:	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Detector</th> <th>RBW</th> <th>VBW</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Above 1GHz</td> <td>Peak</td> <td>1MHz</td> <td>3MHz</td> <td>Peak Value</td> </tr> <tr> <td>Peak</td> <td>1MHz</td> <td>10Hz</td> <td>Average Value</td> </tr> </tbody> </table>	Frequency	Detector	RBW	VBW	Remark	Above 1GHz	Peak	1MHz	3MHz	Peak Value	Peak	1MHz	10Hz	Average Value
Frequency	Detector	RBW	VBW	Remark											
Above 1GHz	Peak	1MHz	3MHz	Peak Value											
	Peak	1MHz	10Hz	Average Value											
Limit:	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Limit (dBuV/m @3m)</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Above 1GHz</td> <td>54.00</td> <td>Average Value</td> </tr> <tr> <td>74.00</td> <td>Peak Value</td> </tr> </tbody> </table>	Frequency	Limit (dBuV/m @3m)	Remark	Above 1GHz	54.00	Average Value	74.00	Peak Value						
Frequency	Limit (dBuV/m @3m)	Remark													
Above 1GHz	54.00	Average Value													
	74.00	Peak Value													
Test Procedure:	<ol style="list-style-type: none"> <li>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.</li> <li>The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>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.</li> <li>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.</li> <li>The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>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.</li> </ol>														
Test setup:															
Test Instruments:	Refer to section 5.7 for details														
Test mode:	TM1														
Test results:	Passed														

Remark:

During test the item, Pre-scan the GFSK, Pi/4QPSK, 8DPSK modulation, and found the GFSK modulation which it is worse case.

Test channel:		Lowest			Level:		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	64.63	27.58	3.81	34.83	61.19	74.00	-12.81	Horizontal
2390.00	65.24	27.58	3.81	34.83	61.68	74.00	-12.32	Vertical

Test channel:		Lowest			Level:		Average	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	51.89	27.58	3.81	34.83	48.45	54.00	-5.55	Horizontal
2390.00	51.89	27.58	3.81	34.83	48.45	54.00	-5.55	Vertical

Test channel:		Highest			Level:		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	63.77	27.52	3.89	34.86	60.32	74.00	-13.68	Horizontal
2483.75	66.67	27.52	3.89	34.86	63.22	74.00	-10.78	Vertical

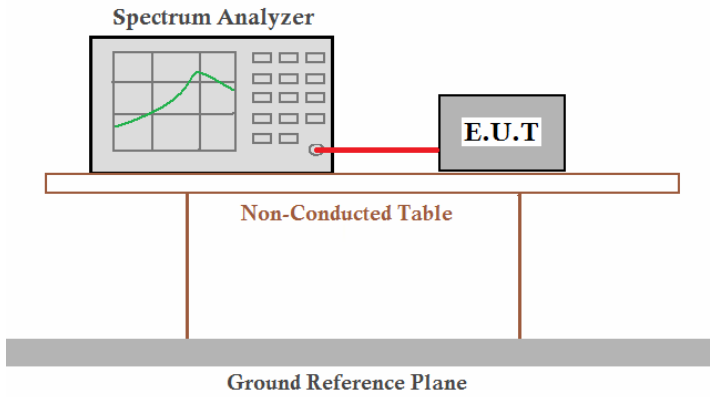
Test channel:		Highest			Level:		Average	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	52.26	27.52	3.89	34.86	48.81	54.00	-5.19	Horizontal
2483.50	52.31	27.52	3.89	34.86	48.86	54.00	-5.14	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.

## 6.10 Spurious Emission

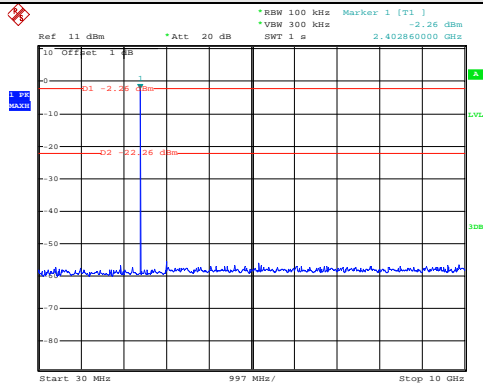
### 6.10.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.4:2003 and DA00-705
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:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which is supported by two legs. Below the table is a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.7 for details
Test mode:	TM1
Test results:	Pass

Remark:

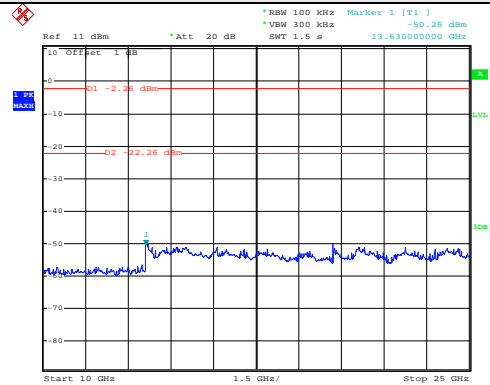
During test the item, Pre-scan the GFSK, Pi/4QPSK, 8DPSK modulation, and found the GFSK modulation which it is worse case.

Test channel:	Lowest channel
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Date: 28.DEC.2011 03:14:13

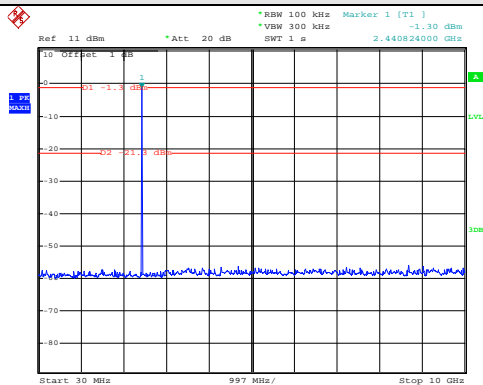
30MHz~10GHz



Date: 28.DEC.2011 03:14:31

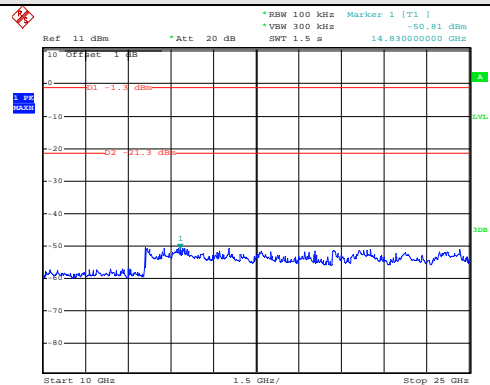
10GHz~25GHz

Test channel:	Middle channel
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Date: 28.DEC.2011 03:26:15

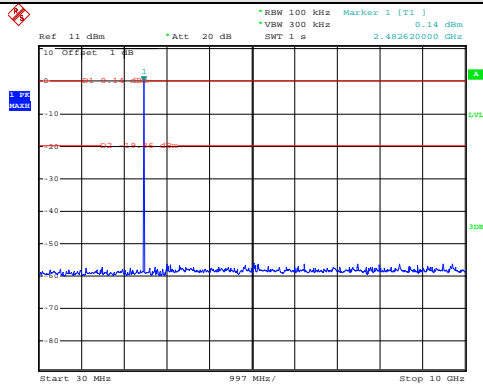
30MHz~10GHz



Date: 28.DEC.2011 03:26:36

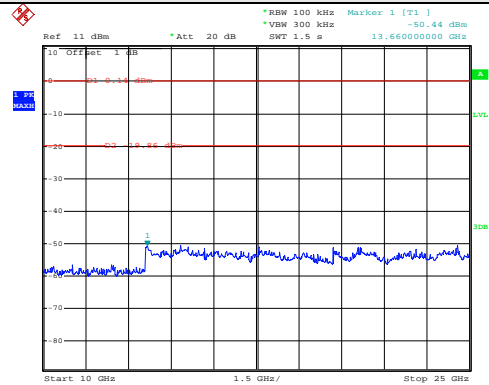
10GHz~25GHz

Test channel:	Highest channel
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Date: 28.DEC.2011 03:49:17

30MHz~10GHz

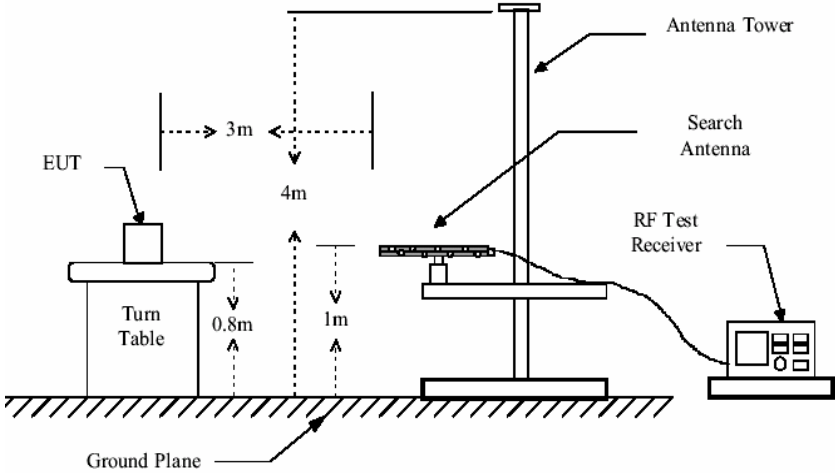
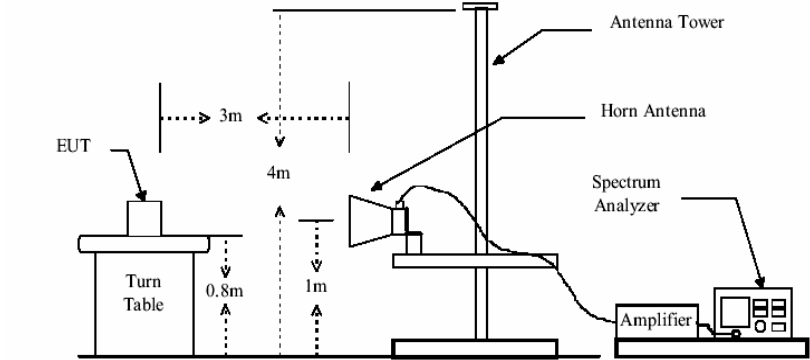


Date: 28.DEC.2011 03:49:34

10GHz~25GHz

## 6.10.2 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	100KHz	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 Procedure:	<ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>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.</li> </ol>				

<p>Test setup:</p>	<p>Below 1GHz</p>  <p>Above 1GHz</p> 
<p>Test Instruments:</p>	<p>Refer to section 5.7 for details</p>
<p>Test mode:</p>	<p>TM1</p>
<p>Test results:</p>	<p>Pass</p>

Remark:

During test the item, Pre-scan the GFSK, Pi/4QPSK, 8DPSK modulation, and found the GFSK modulation which it is worse case.



**30MHz~1GHz**

Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
77.87	46.80	11.26	0.42	31.83	26.65	40.00	-13.35	Vertical
129.92	47.08	9.03	0.56	31.86	24.81	43.50	-18.69	Vertical
181.92	52.93	9.84	0.67	32.17	31.27	43.50	-12.23	Vertical
207.85	45.48	10.81	0.74	32.27	24.76	43.50	-18.74	Vertical
234.17	52.54	11.83	0.85	32.28	32.94	46.00	-13.06	Vertical
77.87	46.90	11.26	0.42	31.83	26.75	40.00	-13.25	Horizontal
129.92	53.66	9.03	0.56	31.86	31.39	43.50	-12.11	Horizontal
181.92	46.50	9.84	0.67	32.17	24.84	43.50	-18.66	Horizontal
207.85	48.54	10.81	0.74	32.27	27.82	43.50	-15.68	Horizontal
234.17	50.70	11.83	0.85	32.28	31.10	46.00	-14.90	Horizontal

**Above 1GHz**

Test channel:	Lowest	Level:	Peak
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Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	46.60	31.53	5.87	35.46	48.54	74.00	-25.46	Vertical
7206.00	52.82	36.47	7.08	35.32	61.05	74.00	-12.95	Vertical
9608.00	45.20	38.10	9.01	35.72	56.59	74.00	-17.41	Vertical
12010.00	*					74.00		Vertical
14412.00	*					74.00		Vertical
4804.00	45.28	31.53	5.87	35.46	47.22	74.00	-26.78	Horizontal
7206.00	48.74	36.47	7.08	35.32	56.97	74.00	-17.03	Horizontal
9608.00	43.40	38.10	9.01	35.72	54.79	74.00	-19.21	Horizontal
12010.00	*					74.00		Horizontal
14412.00	*					74.00		Horizontal

Test channel:	Lowest	Level:	Average
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Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	26.35	31.53	5.87	35.46	28.29	54.00	-25.71	Vertical
7206.00	32.16	36.47	7.08	35.32	40.39	54.00	-13.61	Vertical
9608.00	29.38	38.10	9.01	35.72	40.77	54.00	-13.23	Vertical
12010.00	*					54.00		Vertical
14412.00	*					54.00		Vertical
4804.00	26.35	31.53	5.87	35.46	28.29	54.00	-25.71	Horizontal
7206.00	32.62	36.47	7.08	35.32	40.85	54.00	-13.15	Horizontal
9608.00	26.38	38.10	9.01	35.72	37.77	54.00	-16.23	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. “\*”, means this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

Test channel:	Middle	Level:	Peak
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Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4882.00	45.44	31.58	5.91	35.48	47.45	74.00	-26.55	Vertical
7323.00	45.49	36.47	7.14	35.27	53.83	74.00	-20.17	Vertical
9764.00	46.97	38.45	9.06	35.75	58.73	74.00	-15.27	Vertical
12205.00	*					74.00		Vertical
14480.00	*					74.00		Vertical
4882.00	44.03	31.58	5.91	35.48	46.04	74.00	-27.96	Horizontal
7323.00	44.26	36.47	7.14	35.27	52.60	74.00	-21.40	Horizontal
9764.00	45.97	38.45	9.06	35.75	57.73	74.00	-16.27	Horizontal
12205.00	*					74.00		Horizontal
14480.00	*					74.00		Horizontal

Test channel:	Middle	Level:	Average
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Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4882.00	28.35	31.58	5.91	35.48	30.36	54.00	-23.64	Vertical
7323.00	29.57	36.47	7.14	35.27	37.91	54.00	-16.09	Vertical
9764.00	29.32	38.45	9.06	35.75	41.08	54.00	-12.92	Vertical
12205.00	*					54.00		Vertical
14480.00	*					54.00		Vertical
4882.00	26.35	31.58	5.91	35.48	28.36	54.00	-25.64	Horizontal
7323.00	27.32	36.47	7.14	35.27	35.66	54.00	-18.34	Horizontal
9764.00	31.25	38.45	9.06	35.75	43.01	54.00	-10.99	Horizontal
12205.00	*					54.00		Horizontal
14480.00	*					54.00		Horizontal

Remark:

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

Test channel:	Highest	Level:	Peak
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Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	45.68	31.69	5.97	35.49	47.85	74.00	-26.15	Vertical
7440.00	46.41	36.60	7.18	35.23	54.96	74.00	-19.04	Vertical
9920.00	45.61	38.66	9.11	35.78	57.60	74.00	-16.40	Vertical
12400.00	*					74.00		Vertical
14646.00	*					74.00		Vertical
4960.00	44.87	31.69	5.97	35.49	47.04	74.00	-26.96	Horizontal
7440.00	45.47	36.60	7.18	35.23	54.02	74.00	-19.98	Horizontal
9920.00	44.57	38.66	9.11	35.78	56.56	74.00	-17.44	Horizontal
12400.00	*					74.00		Horizontal
14646.00	*					74.00		Horizontal

Test channel:	Highest	Level:	Average
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Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	28.16	31.69	5.97	35.49	30.33	54.00	-23.67	Vertical
7440.00	32.26	36.60	7.18	35.23	40.81	54.00	-13.19	Vertical
9920.00	29.46	38.66	9.11	35.78	41.45	54.00	-12.55	Vertical
12400.00	*					54.00		Vertical
14646.00	*					54.00		Vertical
4960.00	25.26	31.69	5.97	35.49	27.43	54.00	-26.57	Horizontal
7440.00	31.20	36.60	7.18	35.23	39.75	54.00	-14.25	Horizontal
9920.00	26.35	38.66	9.11	35.78	38.34	54.00	-15.66	Horizontal
12400.00	*					54.00		Horizontal
14646.00	*					54.00		Horizontal

Remark:

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