

# CFR 47 FCC Part 15.247

## TEST REPORT

E.U.T. : **NoteBook PC**

Trade Name : MTC ; GETAC

Model Number : 8212X

FCC ID : MAU8212A

Prepared for

### **MiTAC Technology Corp.**

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Prepared by

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2. The report prohibit used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

# Statement of Compliance

**Applicant:** MiTAC Technology Corp.  
**Manufacturer:** Getac Technology (Kunshan) Co., Ltd.  
**EUT Description:** NoteBook PC  
**Model No.:** 8212X  
**Serial No.:** N/A  
**Tested Power Supply:** 120Vac; 60Hz  
**Date of Final Test:** Nov. 28, 2007

**Configuration of Measurements and Standards Used :**

FCC Rules and Regulations Part 15 Subpart C

I HEREBY CERTIFY THAT: The EUT was setup to ANSI C63.4, 2003; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements, and the energy emitted by the device was founded to be within the limits applicable. I assume full responsibility for accuracy and completeness of these data.

- Note:** 1. The result of the testing report relate only to the item tested.  
2. The testing report shall not be reproduced expect in full, without the written approval of IETC

Report Issued: 2007/12/20

Test Engineer:   
Anya Lee

Checked:   
Danny Tang

Approved:   
Jerry Liu

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# 1 General Information

## 1.1 Description of Equipment Under Test

**Equipment Under Test** : NoteBook PC

**Model Number** : 8212X

**Serial Number** : N/A

**Type of Sample Tested** : Proto-type    Pre-Production    Mass Production

**Applicant** : **MiTAC Technology Corp.**  
9th Fl., No. 75, Ming Sheng East Road, Sec. 3, Taipei, Taiwan, R.O.C.

**Manufacturer** : **Getac Technology (Kunshan) Co., Ltd.**  
Kunshan Export Processing Zone, 215300 Jiangsu, P.R.China

**Power Adapter** : Manufacturer: Delta, M/N: ADP-45AD A, S/N: 86W0731000118  
Input: 100~240Vac, 50~60Hz, 1.2A  
Power cord: Non-shielded Detachable, 1.8 m    w/o core  
Output: 15Vdc, 3A  
Power cable: Non-shielded Un-detachable, 1.8m  w/o core

**Operating Frequency** : 2402MHz ~ 2480MHz

**Channel Number** : 79 channels

**Type of Modulation** : GFSK ;  $\pi/4$ DQPSK ; 8 DPSK

**Antenna description** : This device uses PCB Printed antenna.

Antenna Gain	:	1.31dBi
Connector type	:	U.FL

**Sample Receive date** : Nov. 12, 2007

**Date of Test** : Nov. 26~28, 2007

## 1.2 Technical Specifications

Key parts	SKU A	SKU B
Memory	Hynix 1Gbit DDR	Samsung 1Gbit DDR
CPU	Intel McCaslin - Stealey, 800MHz	
LCD Monitor	Toshiba, PI-LTD121EW6S	
Bluetooth	BTM-203B EDRV2.0 ver1.2	
HDD	Toshiba, (40GB, 1.8", PATA), Model: MK4009GAL	
ODD	TEAK, (DVDSuper-multi) DVW28ECPUBA	
Modem	Billionton, Model :RD002-D330	
Wireless LAN	AzureWave, (802.11abgn, Mini PCI-E) Model : AW-NEW770 (1024)	Askey, (802.11abg, Mini PCI-E) Model : WLL4080-D12
3G	Novatel, EU870D	None
AC/DC Adapter	Delta, ADP-45ADA	
Battery (LITHIUM)	SANYO, 6Cell, 11.1V/5.2AH	SANYO, 3CELLS, 11.1V/2.6AH

### Bluetooth Module Information

Complete 2.4GHz radio transceiver and baseband
Bluetooth™ version 2.0+ EDR compliant embedded
Bluetooth™ qualified
Small footprint (26.0mm x 14.0mm x 4.17mm)
Bluetooth™ Class 2 operation (up to 10 meter range)
Board to wire connector on Board
CSR BlueCore4-ROM, single chip Bluetooth™ system
SPI interface can upgrade firmware
Park, Sniff, Hold and Sleep low power modes
Added ESD protection circuit into module supply voltage pins to prevent electrostatic damage
Shielding mask GND layout design to reduce EMI issue
Built in a +1.8V regulator.
Programmable collaborative coexistence scheme

### 1.3 Table for Carrier Frequencies

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

## 1.4 Test Facility

- Site Description** : OATS 2    Conduction 1
- Name of Firm** : Interocean EMC Technology Corp.
- Company web** : <http://www.ietc.com.tw>
- Site 1, 2 Location** : No.5-2, Lin 1, Tin-Fu Tsun, Lin-Kou Hsiang,  
Taipei County, Taiwan, R.O.C.
- Site 3, 4 Location** : No. 12, Ruei-Shu Valley, Ruei-Ping Tsun, Lin-Kou Hsiang,  
Taipei County, Taiwan, R.O.C.
- Site Filing** :
  - Federal Communication Commissions – USA  
Registration No.: 96399 (OATS 1 & 2)  
Registration No.: 518958 (OATS 3 & 4)
  - Voluntary Control Council for Interference by Information  
Technology Equipment (VCCI) – Japan  
Registration No. (Conducted Room): C-1094  
Registration No. (Conducted Room): T-271  
Registration No. (OATS 1): R-1040  
Registration No. (OATS 2): R-1041
  - Industry Canada (IC)  
Submission: 113543
  - Japan Electrical Safety & Environment Technology Laboratories (JET)  
Registration No.: 04S03-01
- Site Accreditation** :
  - Bureau of Standards and Metrology and Inspection (BSMI) –  
Taiwan, R.O.C.  
Accreditation No.:  
SL2-IN-E-0026 for CNS13438 / CISPR22  
SL2-R1-E-0026 for CNS13439 / CISPR13  
SL2-R2-E-0026 for CNS13439 / CISPR13  
SL2-A1-E-0026 for CNS13783-1 / CISPR14-1
  - National Voluntary Laboratory Accreditation Program  
(NVLAP) - USA  
NVLAP LAB CODE 200458
  - Nemko AS  
Authorization No.: ELA 181A  
Authorization No.: ELA 181B
  - Taiwan Accreditation Foundation (TAF)  
Accrditation No.: 1113





## 1.5 Test Equipment

Instrument	Manufacturer	Model	Serial No.	Last Calibration
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100135	2007/08/03
L.I.S.N.	Schwarzbeck	NNLK8121	8121417	2007/07/17
L.I.S.N.	Rohde & Schwarz	ESH3-Z5	100176	2007/02/14
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	843602/02	2007/09/10
RF Cable	HARBOUR	RG400	CBL04	2007/08/09
Spectrum Analyzer	Agilent	8564EC	4046A00331	2007/03/29
Spectrum Analyzer	R&S	FSQ	200406	2007/03/29
Biconical Antenna	Schwarzbeck	VHA 9103	2484	2007/09/06
Log Antenna	Schwarzbeck	UHALP 9108	A 0765	2007/09/06
Pre-Amplifier	HP	8447D	2944A10321	2007/07/17
Preamplifier	Agilent	8449B	3008A01434	2007/04/03
RF Cable	Ultra Link	CBL02	CBL02	2007/05/04
Cable	IETC	CBL07	CBL07	2007/05/08
Power Meter	Anritsu	ML2495A	0736010	2007/10/29
Wide Bandwidth Sensor	Anritsu	MA2491A	0728133	2007/10/29

Note: All instrument upon which need to be calibrated are within calibration period of 1 year.

Instrument	Manufacturer	Model	Serial No.	Last Calibration
Horn Antenna	COM-POWER	AH-118	10081	2006/05/16
Horn Antenna	SCHWARZBECK	BBHA9120	9120D-583	2006/12/18

Note: All instrument upon which need to be calibrated are within calibration period of 2 year.

## 1.6 Summary of Measurement

<b>Report Clause</b>	<b>Test Parameter</b>	<b>Reference Document CFR47 Part15</b>	<b>Results</b>
2	20dB Bandwidth test	§15.247(a)(1)	Pass
3	Carrier Frequency Separation test	§15.247(a)(1)	Pass
4	Number of hopping frequencies test	§15.247(a)(1)	Pass
5	Time of Occupancy (dwell time) test	§15.247(a)(1)	Pass
6	Maximum Peak output power test	§15.247(b)	Pass
7	RF Conducted spurious emission	§15.247(c)	Pass
8	RF Radiated spurious emission test	§15.205, 15.209	Pass
9	Emission on the Band Edge test	§15.247(d)	Pass
10	AC Power Line Conducted Emission test	§15.247(b)	Pass

## **1.7 Justification**

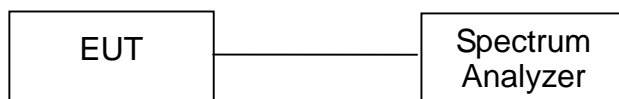
The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of the frequency band were all arrive limit requirement, thus we evaluate the EUT pass the specified test.

## 2 20dB Bandwidth test

### 2.1 Limit

No regulation limit, for reference purpose.

### 2.2 Configuration of Measurement



### 2.3 Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

The 20dB bandwidth per FCC §15.247(a)(1) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at 100 kHz, the video bandwidth  $\geq$  RBW, and the SPAN may equal to approximately 2 to 3 time the 20dB bandwidth.

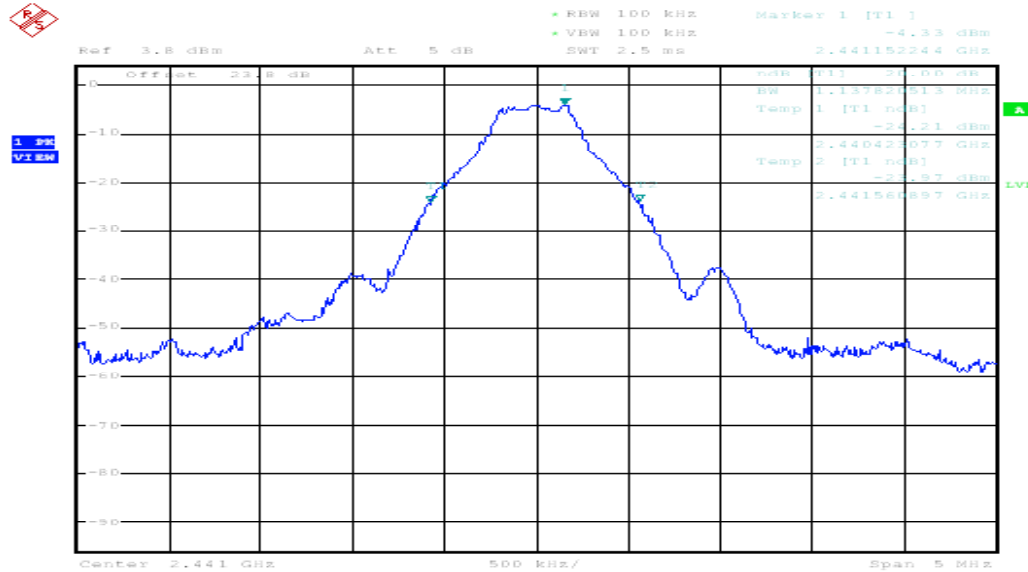
### 2.4 Test Result

**PASS.**

The final test data is shown on as following pages.

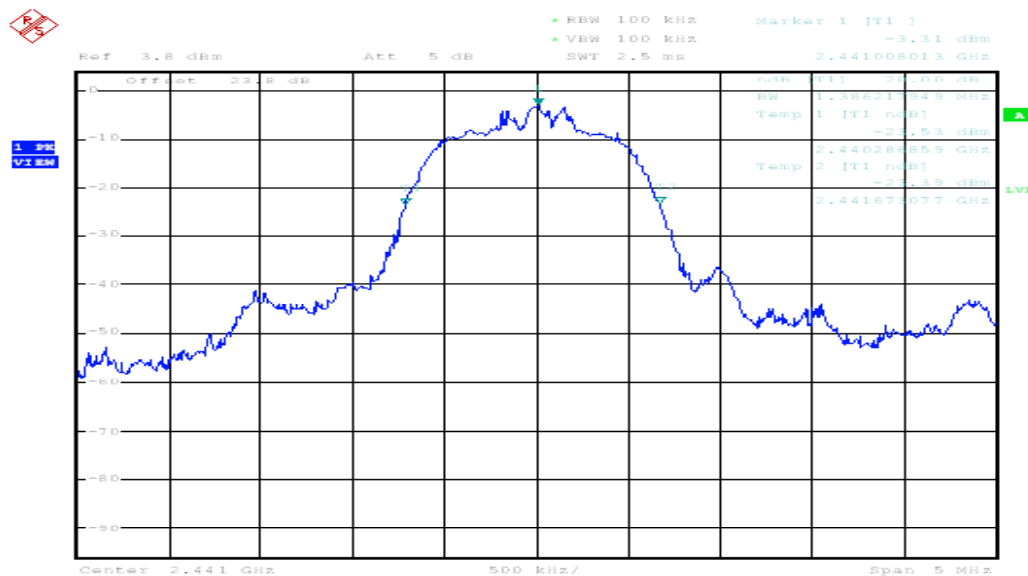
Test Mode : GFSK ; $\pi/4$ DQPSK ; 8 DQPSK			
Test CH		20dB Bandwidth (MHz)	Limit (kHz)
Modulation	Frq. (MHz)		
GFSK	2441	1.1378	>500
$\pi/4$ DQPSK	2441	1.3862	>500
8 DQPSK	2441	1.3942	>500

**2441 GFSK 20dB**



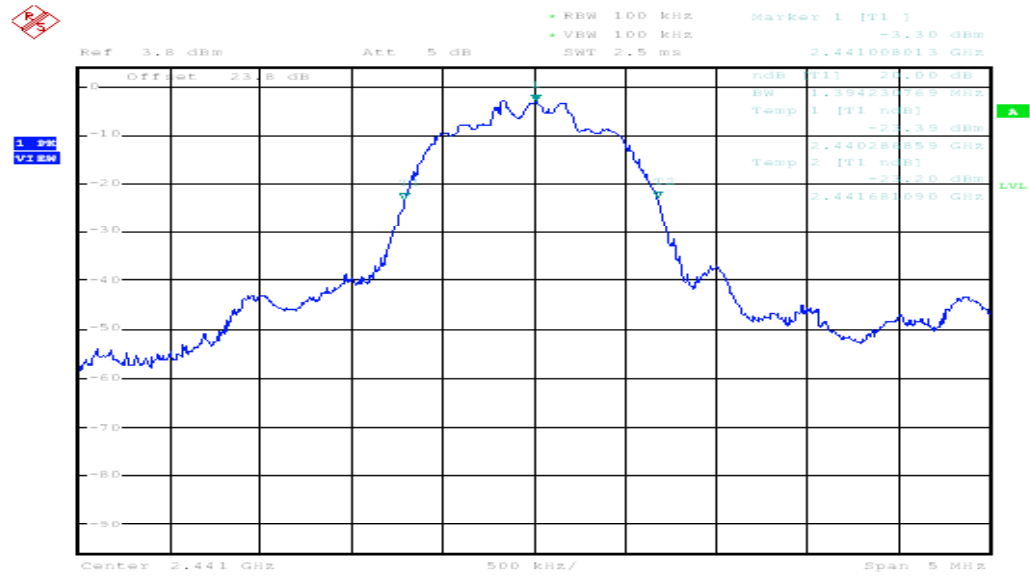
Date: 20.NOV.2007 20:12:01

**2441  $\pi/4$  DQPSK 20dB**



Date: 20.NOV.2007 20:13:36

### 2441 8DPSK 20dB



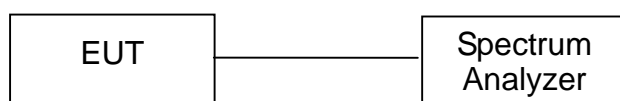
Date: 20.NOV.2007 20:15:38

### 3 Carrier Frequency Separation test

#### 3.1 Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB 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 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125mW.

#### 3.2 Configuration of Measurement



#### 3.3 Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

The carrier frequency separation per FCC Part15.247(a)(1) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at  $\geq 1\%$  of the span, the video bandwidth  $\geq$  RBW, and the SPAN was wide enough to capture the peaks of two adjacent channels.

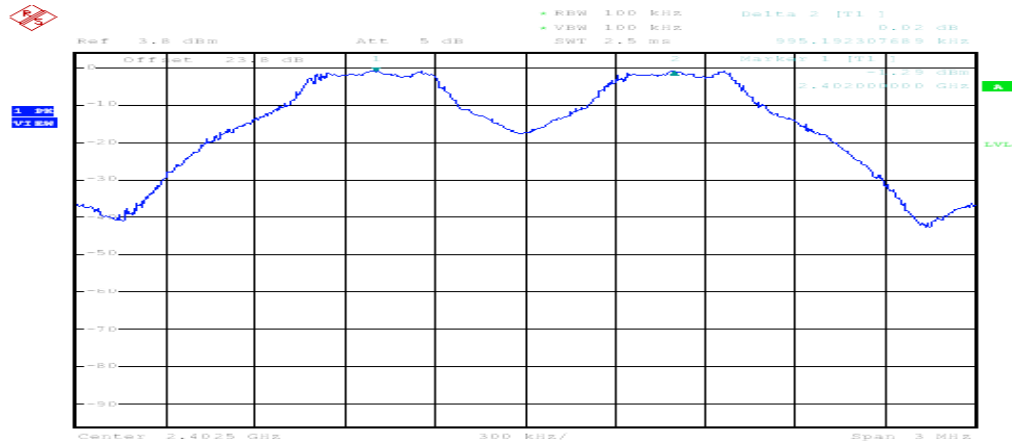
#### 3.4 Test Result

**PASS.**

The final test data is shown on as following pages.

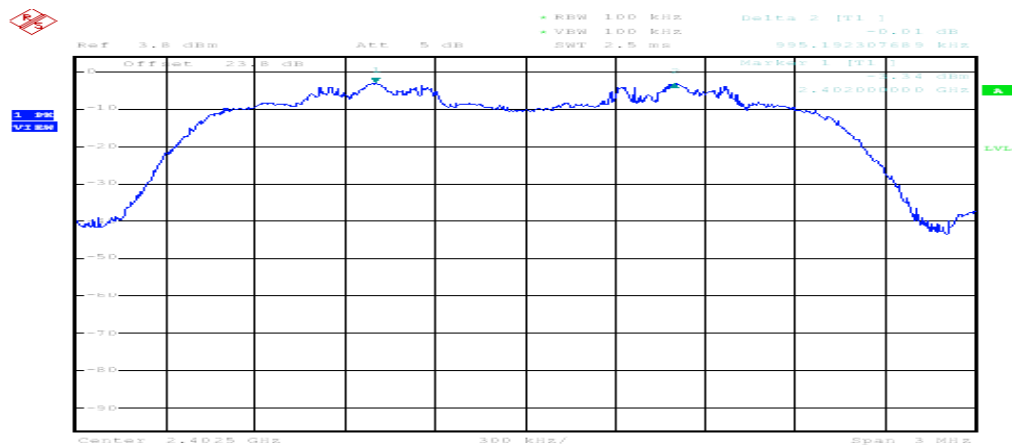
Modulation	Carrier Frequency Separation (kHz)
GFSK	995.192
$\pi/4$ DQPSK	995.192
8 DQPSK	995.192

### GFSK Separation



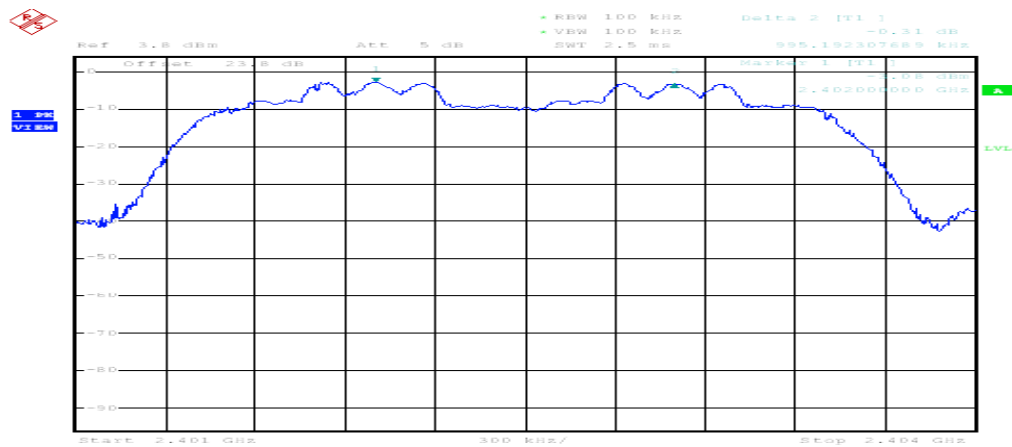
Date: 20.NOV.2007 20:28:26

### $\pi/4$ DQPSK Separation



Date: 20.NOV.2007 20:25:38

### 8 DPSK Separation

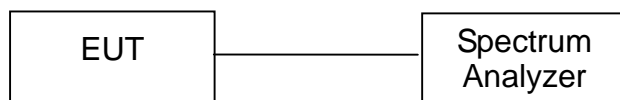


Date: 20.NOV.2007 20:22:29



## 4 Number of hopping frequencies test

### 4.1 Configuration of Measurement



### 4.2 Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

The number of hopping frequencies per FCC Part15.247(a)(1) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at  $\geq 1\%$  of the span, the video bandwidth  $\geq$  RBW, and the SPAN was the frequency band of operation.

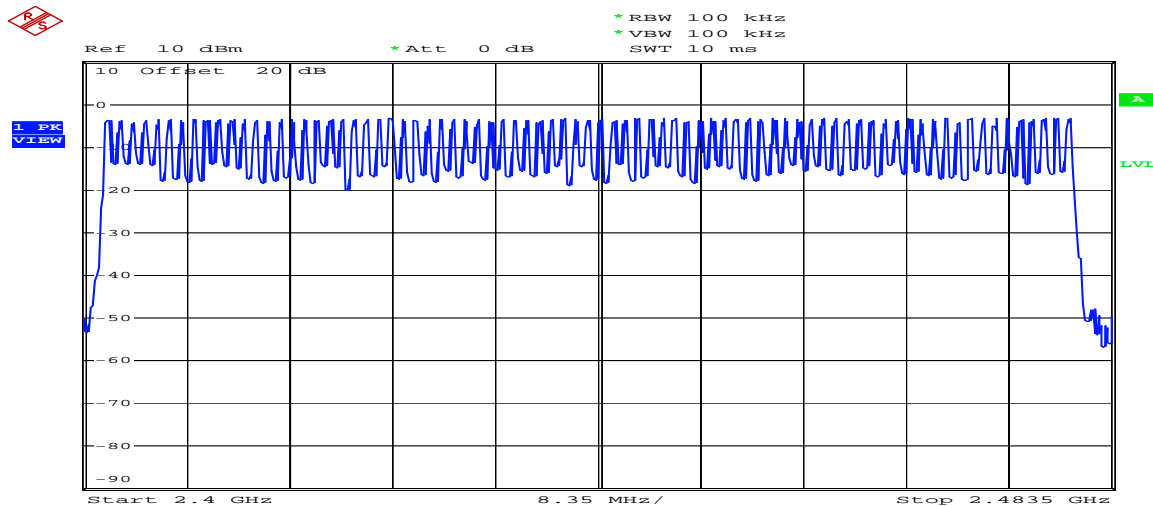
### 4.3 Test Result

**PASS.**

The final test data is shown on as following pages.

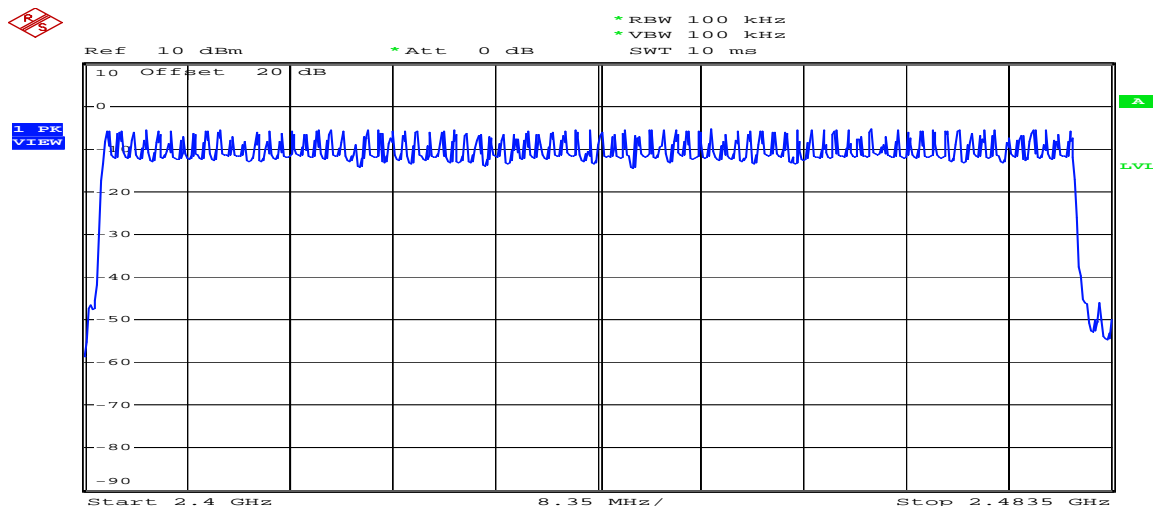
Modulation	No. of Hopping CH.
GFSK	79
$\pi/4$ DQPSK	79
8 DQPSK	79

### GFSK channel number



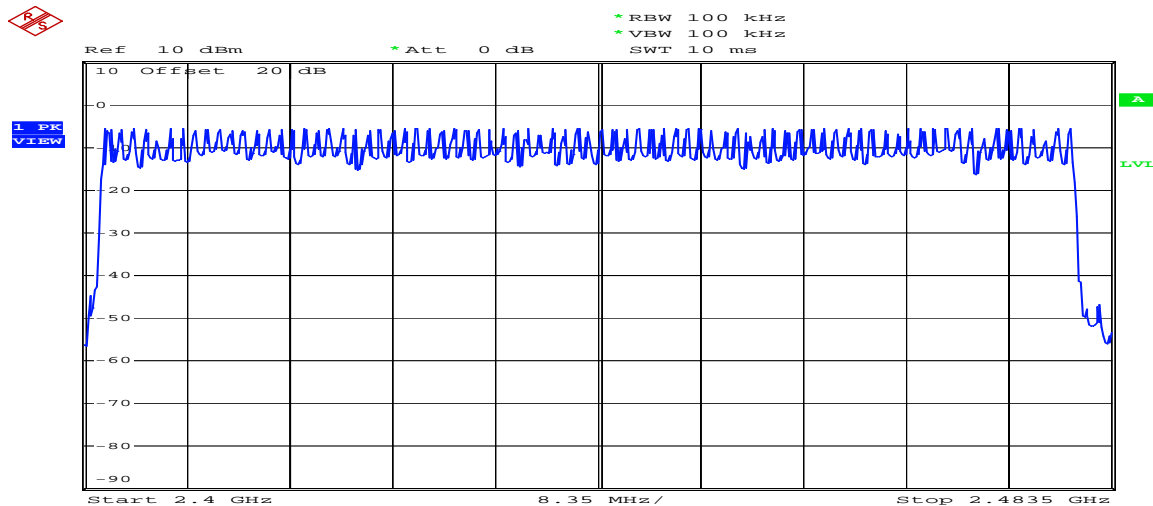
Date: 30.NOV.2007 10:48:34

### $\pi/4$ DQPSK channel number



Date: 30.NOV.2007 10:52:21

### 8 DQPSK channel number



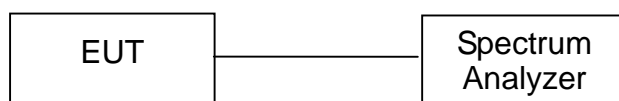
Date: 30.NOV.2007 10:56:20

## 5 Time of Occupancy (dwell time) test

### 5.1 Limit

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 second within a period of 0.4 second multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

### 5.2 Configuration of Measurement



### 5.3 Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

According to FCC Part15.247(a)(1) the time of occupancy (dwell time) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at 1MHz, the video bandwidth  $\geq$  RBW and the zero span function of spectrum analyzer was enable. The EUT has its hopping function enable.

Formula for Dwell time calculation:

Dwell time = time slot \* hop rate \* 1/s / 79 \*31.6s

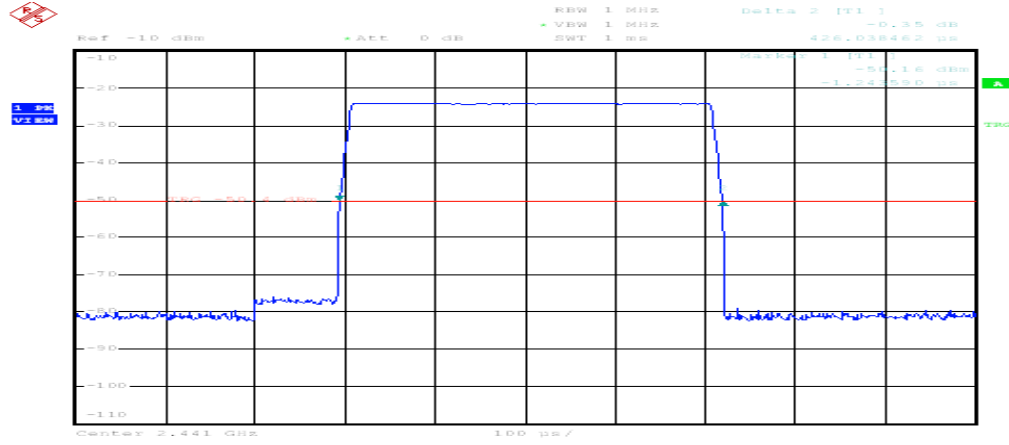
### 5.4 Test Result

**PASS.**

The final test data is shown on as following pages.

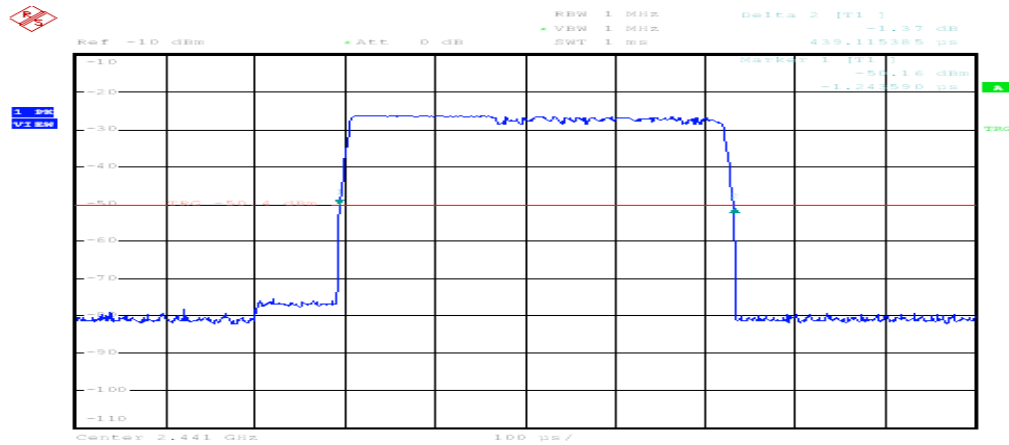
<b>Dwell Time Test</b>						
<b>Modulation Type</b>	<b>Packet Type</b>	<b>Time Slot Length (ms)</b>	<b>Hop Rate (Hz)</b>	<b>Dwell Time (s)</b>	<b>Limit (s)</b>	<b>Test Result</b>
GFSK	DH1	0.426	800	0.133	<0.4	PASS
	DH3	1.688	400	0.264	<0.4	PASS
	DH5	2.944	266	0.306	<0.4	PASS
$\pi/4$ DQPSK	DH1	0.439	800	0.137	<0.4	PASS
	DH3	1.701	400	0.266	<0.4	PASS
	DH5	2.961	266	0.308	<0.4	PASS
8 DPSK	DH1	0.432	800	0.135	<0.4	PASS
	DH3	1.701	400	0.266	<0.4	PASS
	DH5	2.96	266	0.308	<0.4	PASS

### GFSK DH1 Dwell time



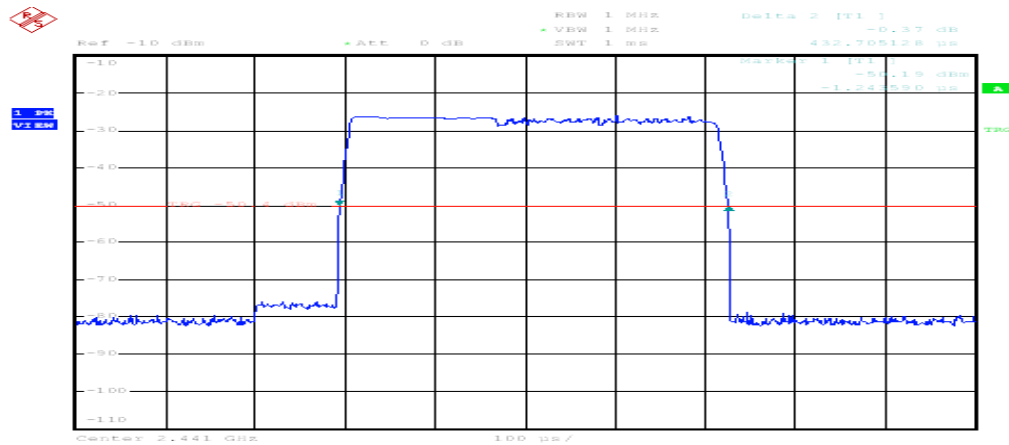
Date: 21.NOV.2007 09:40:18

### $\pi/4$ DQPSK DH1 Dwell time



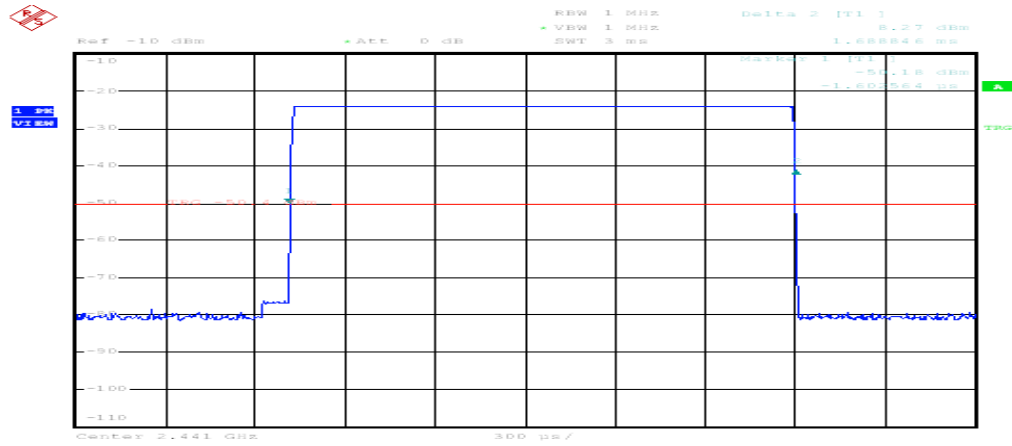
Date: 21.NOV.2007 09:42:01

### 8 DQPSK DH1 Dwell time



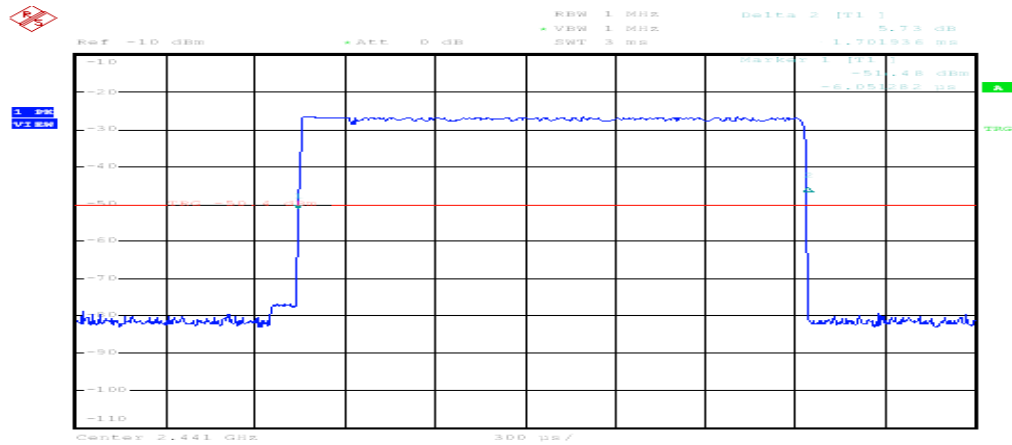
Date: 21.NOV.2007 09:43:26

### GFSK DH3 Dwell time



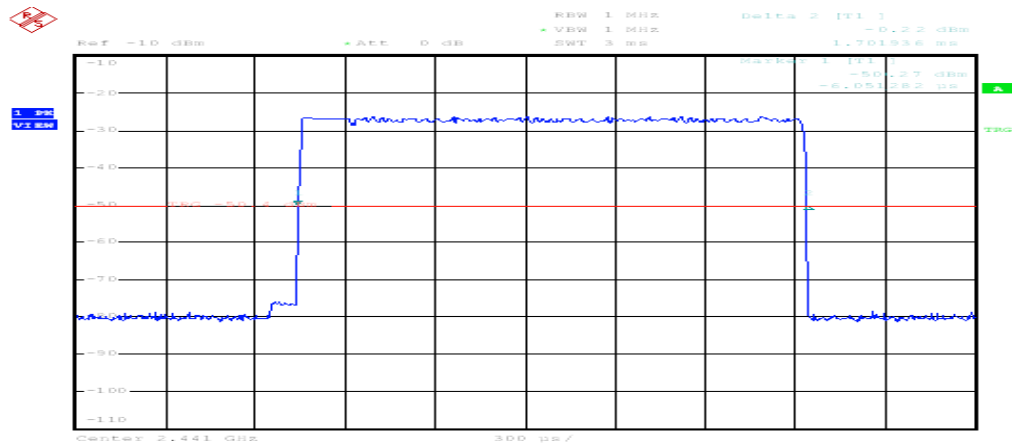
Date: 21.NOV.2007 09:35:24

### $\pi/4$ DQPSK DH3 Dwell time



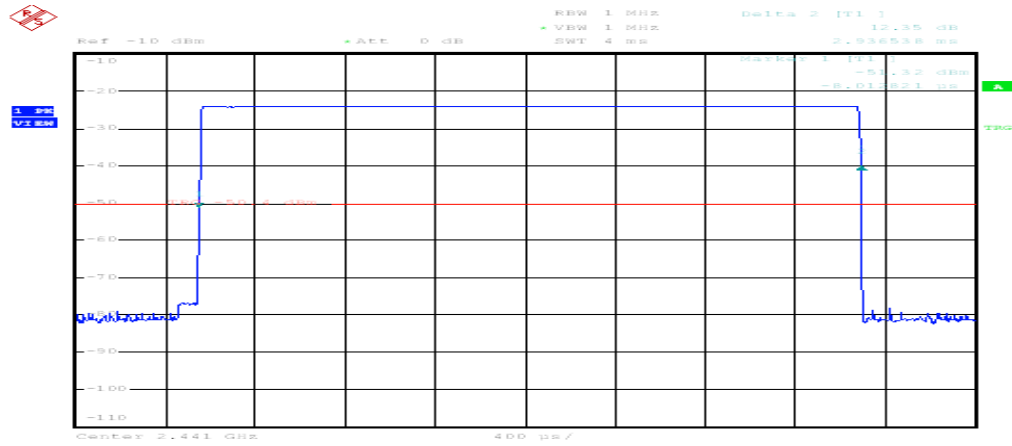
Date: 21.NOV.2007 09:44:51

### 8 DQPSK DH3 Dwell time



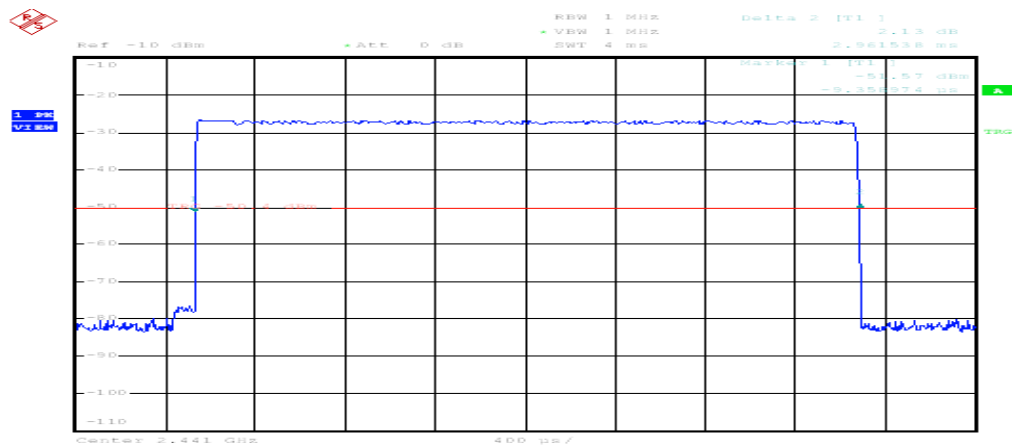
Date: 21.NOV.2007 09:45:57

### GFSK DH5 Dwell time



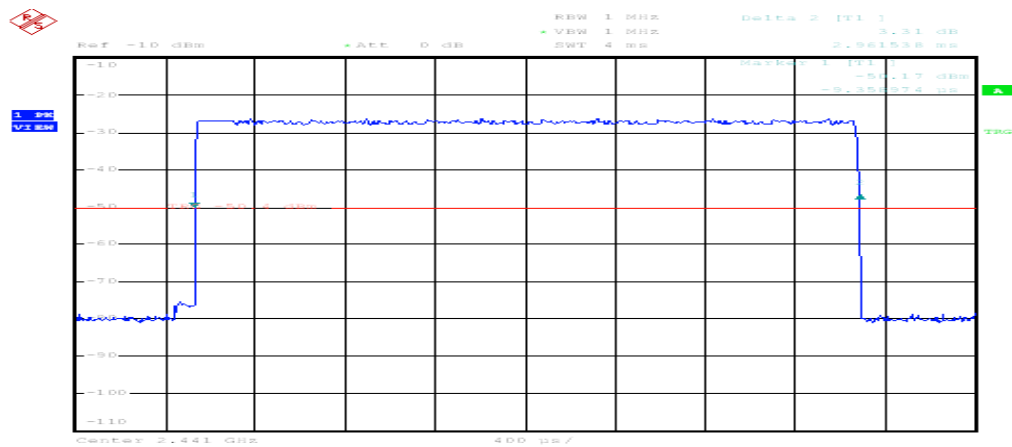
Date: 21.NOV.2007 09:37:57

### $\pi/4$ DQPSK DH5 Dwell time



Date: 21.NOV.2007 09:47:42

### 8 DQPSK DH5 Dwell time



Date: 21.NOV.2007 09:48:41

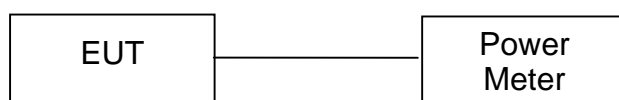
## 6 Maximum Output Power test

### 6.1 Limit

For frequency hopping systems operating in the 2400-2483.5MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1 watt.

For all other frequency hopping systems in the 2400-2483.5MHz band: 0.125 watts.

### 6.2 Configuration of Measurement



### 6.3 Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

For FCC Part 15.247(b) the power output per was measured on the EUT using a 50 ohm SMA cable connected to peak power meter via power sensor. Peak output power was read directly from power meter. The test was performed at 3 channels (lowest, middle and highest).

### 6.4 Test Result

**PASS.**

The final test data is shown on as following pages.



<b>Mode : GFSK</b>					
<b>CH</b>	<b>Frq. MHz</b>	<b>Maximum transmit power (dBm)</b>		<b>Limit (dBm)</b>	<b>Margin (dB)</b>
		<b>AV</b>	<b>PK</b>		
1	2402	1.16	2.76	30	-27.24
40	2441	1.36	2.97	30	-27.03
79	2480	1.48	3.00	30	-27.00

<b>Mode : <math>\pi/4</math> DQPSK</b>					
<b>CH</b>	<b>Frq. MHz</b>	<b>Maximum transmit power (dBm)</b>		<b>Limit (dBm)</b>	<b>Margin (dB)</b>
		<b>AV</b>	<b>PK</b>		
1	2402	0.25	2.13	30	-27.87
6	2441	0.32	2.20	30	-27.80
11	2480	0.13	2.05	30	-27.95

<b>Mode : 8 DQPSK</b>					
<b>CH</b>	<b>Frq. MHz</b>	<b>Maximum transmit power (dBm)</b>		<b>Limit (dBm)</b>	<b>Margin (dB)</b>
		<b>AV</b>	<b>PK</b>		
1	2402	-1.18	2.13	30	-27.87
6	2441	-2.82	2.20	30	-27.80
11	2480	-3.02	2.05	30	-27.95

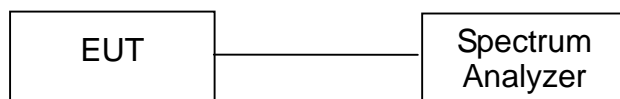
## 7 RF Conducted spurious emission

### 7.1 Limit

According to FCC Part 15.247(d) requirement :

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

### 7.2 Configuration of Measurement



### 7.3 Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

RF antenna conducted spurious emissions was measured from the EUT antenna port using a 50ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 100 kHz.

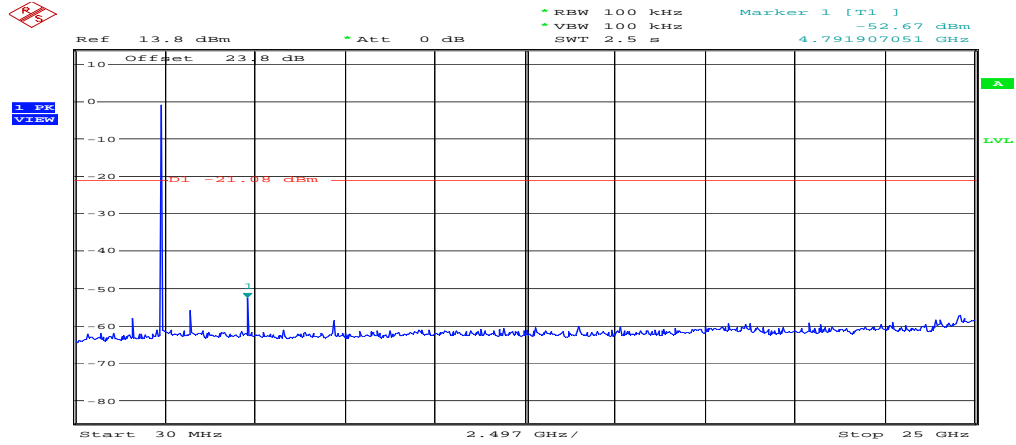
The measurements were performed from 30MHz to 25GHz.

### 7.4 Test Result

**PASS.**

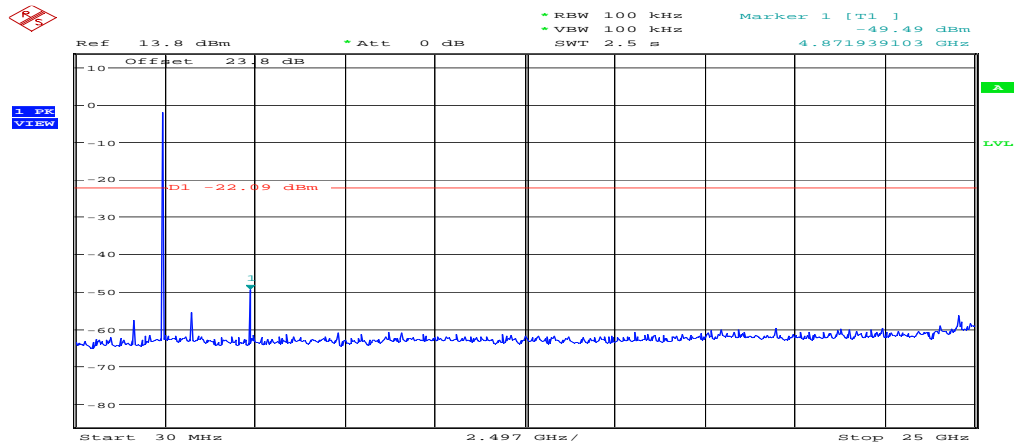
The final test data is shown on as following pages.

### GFSK 2402 Conducted spurious



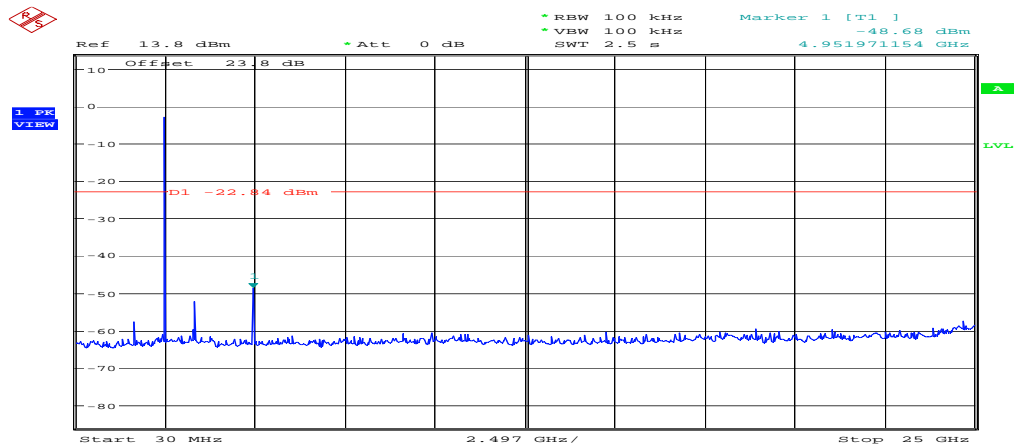
2402MHz (8 DPSK)  
Date: 22.NOV.2007 11:00:21

### GFSK 2441 Conducted spurious



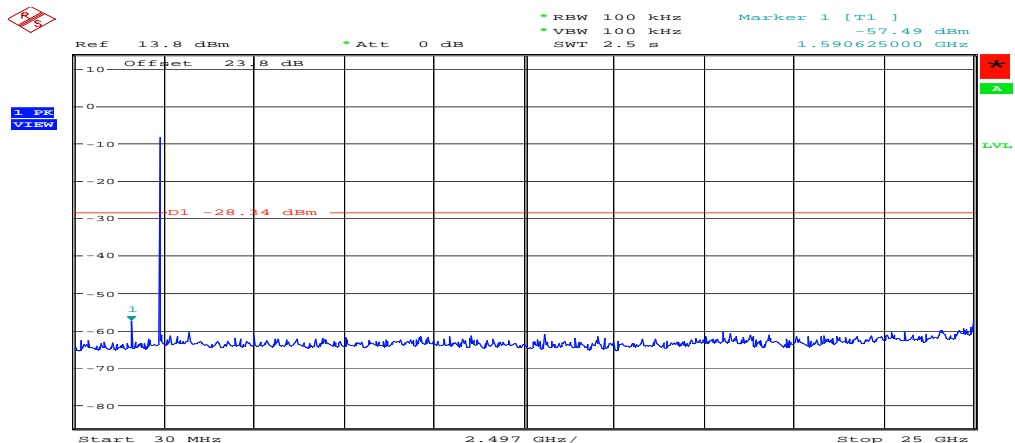
2402MHz (8 DPSK)  
Date: 22.NOV.2007 11:03:33

### GFSK 2480 Conducted spurious



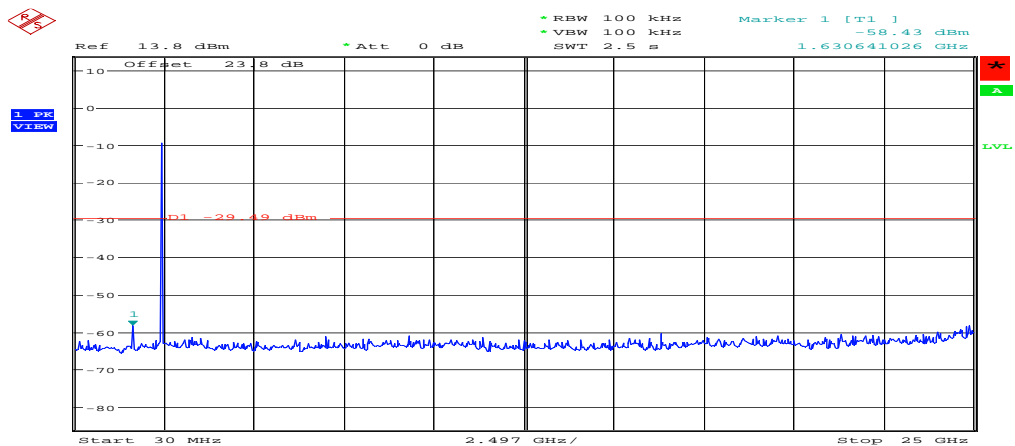
2402MHz (8 DPSK)  
Date: 22.NOV.2007 11:05:23

### $\pi/4$ DQPSK 2402 Conducted spurious



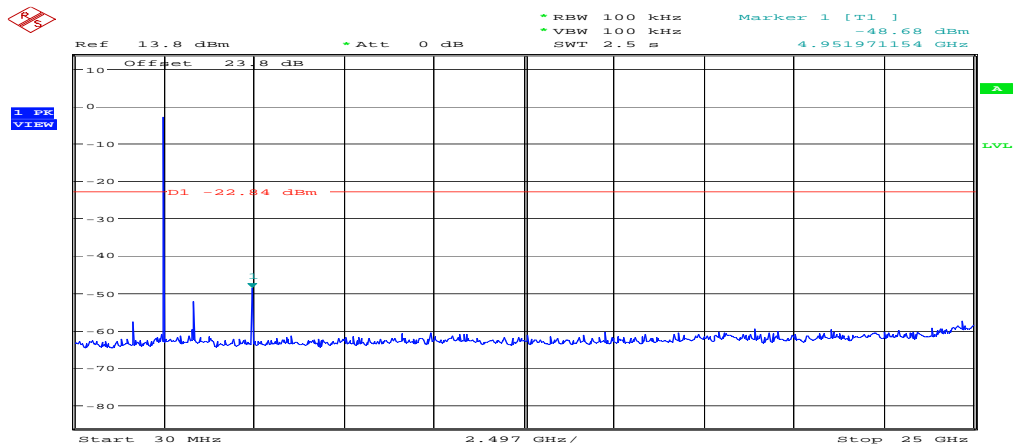
2402MHz (8 DPSK)  
Date: 22.NOV.2007 11:43:56

### $\pi/4$ DQPSK 2441 Conducted spurious



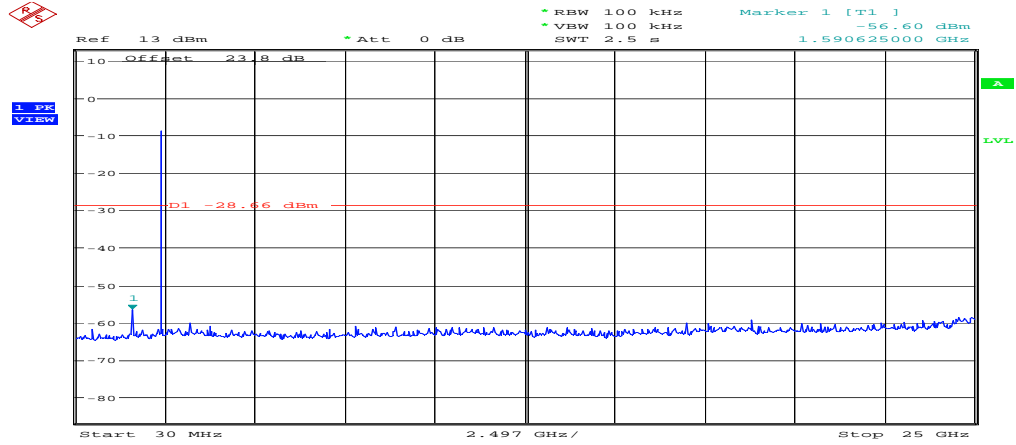
2402MHz (8 DPSK)  
Date: 22.NOV.2007 11:46:11

### $\pi/4$ DQPSK 2480 Conducted spurious



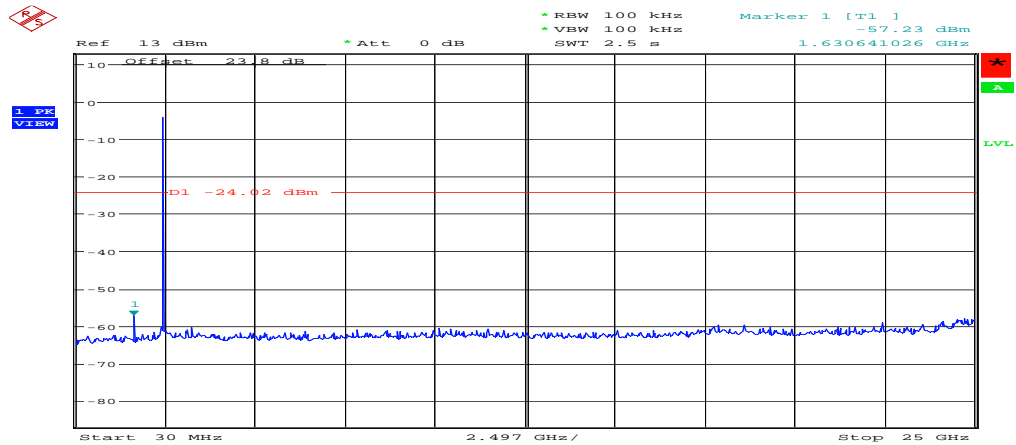
2402MHz (8 DPSK)  
Date: 22.NOV.2007 11:05:23

### 8 DQPSK 2402 Conducted spurious



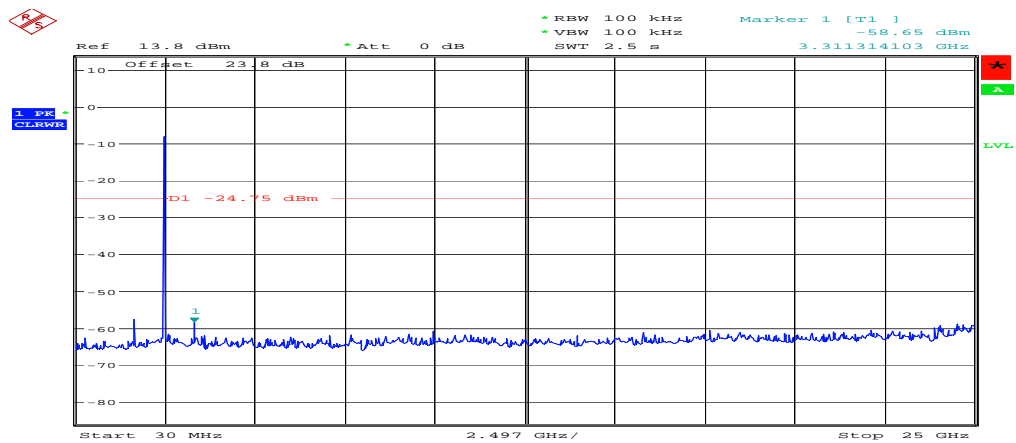
2402MHz (8 DQPSK)  
Date: 22.NOV.2007 12:04:20

### 8 DQPSK 2441 Conducted spurious



2402MHz (8 DQPSK)  
Date: 22.NOV.2007 12:02:18

### 8 DQPSK 2480 Conducted spurious



2402MHz (8 DQPSK)  
Date: 22.NOV.2007 11:58:32

## 8 RF Radiated spurious emission test

### 8.1 Limit

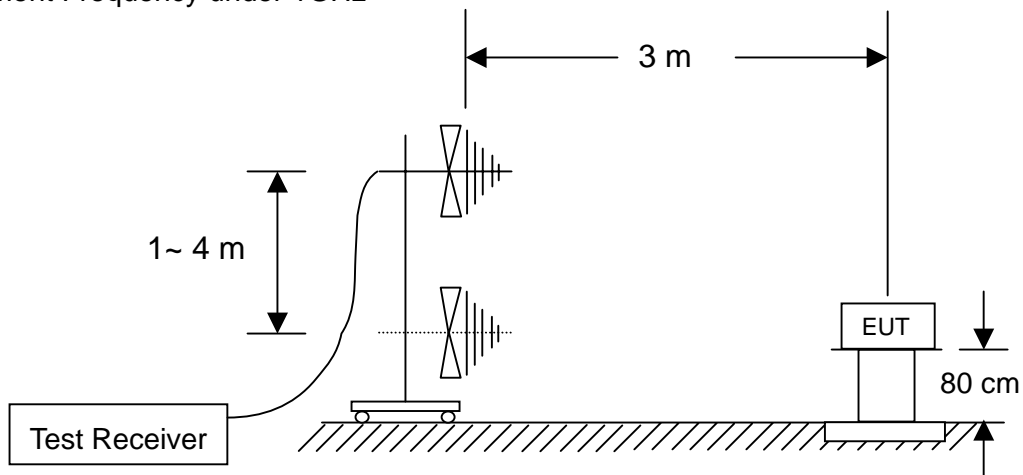
For intentional radiator, the radiated emission shall comply with FCC Part 15.209(a).

For intentional radiators, according to FCC Part 15.247 (a), operation under this provision is limited to frequency hopping and direct sequence spread spectrum, and the out band emission shall be comply with FCC Part 15.247 (c)

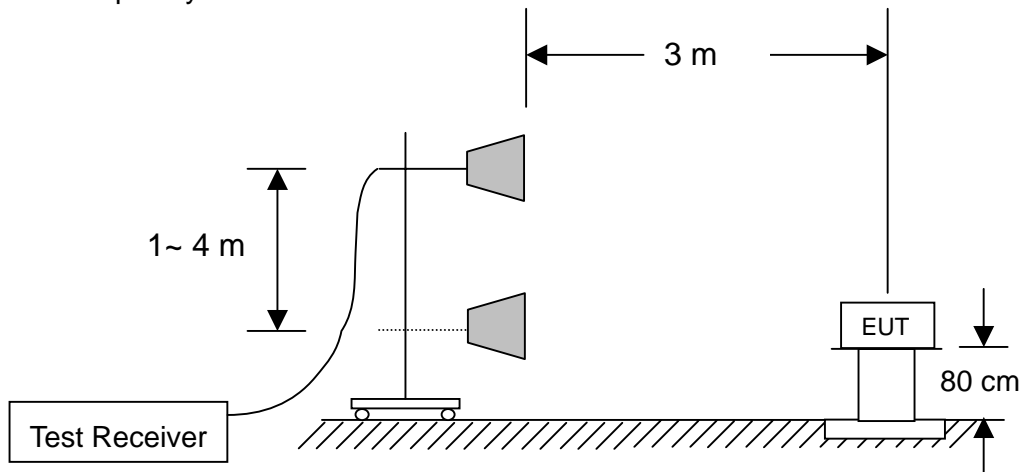
Frequency (MHz)	Field strength dB( $\mu$ V/m)	Measurement distance (meters)
1.705~30.0	29.5	30
30 ~ 88	40	3
88~216	43.5	3
216~960	46	3
Above 960	54	3

### 8.2 Configuration of Measurement

Measurement Frequency under 1GHz



Measurement Frequency above 1GHz



### 8.3 Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

Radiated emission measurements were performed from 30MHz to 25GHz. Spectrum Analyzer Resolution Bandwidth is 100kHz or greater for frequencies 30MHz to 1GHz, set 1MHz for frequencies above 1GHz.

The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and whole system. During the test, all cables were arranged to present worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meter and down to 1 meter.

### 8.4 Test Result

#### **PASS.**

The final test data is shown on as following pages.

**Remark** : After verifying GFSK,  $\pi/4$  DQPSK and 8 DPSK modulation mode, the worst case was caused at GFSK mode. The worst case was record in this report.

### Radiated Emission below 1GHz

Frequency (MHz)	Antenna Polarization	Reading (dB $\mu$ V)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Margin (dB)	Det. Mode
109.629	H	47.26	29.57	12.41	30.10	43.50	-13.40	QP
216.050	H	50.11	29.56	11.13	31.68	46.00	-14.32	QP
240.001	H	49.80	29.55	13.35	33.60	46.00	-12.40	QP
458.966	H	43.40	29.66	21.35	35.09	46.00	-10.91	QP
913.113	H	39.42	29.10	29.50	39.82	46.00	-6.18	QP
60.211	V	54.83	29.64	7.11	32.30	46.00	-7.70	QP
192.020	V	53.30	29.54	10.54	34.30	43.50	-9.20	QP
458.993	V	48.12	29.66	21.66	40.12	46.00	-5.88	QP
674.990	V	38.30	29.21	25.52	34.61	46.00	-11.39	QP
913.780	V	38.40	29.10	29.52	38.82	46.00	-7.18	QP

Remark : Corrected Level = Reading + Correction Factor – Preamp  
 Correction Factor = Antenna Factor + Cable Loss



## Radiated Emission above 1GHz

GFSK 2402MHz								
Frequency (MHz)	Antenna Polarization	Reading (dB $\mu$ V)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Margin (dB)	Det. Mode
4804.00	H	47.70	26.01	39.96	55.65	74	-18.35	PK
4804.00	H	28.09	26.01	39.96	42.04	54	-11.96	AV
4804.00	V	44.41	26.01	39.96	58.36	74	-15.64	PK
4804.00	V	25.43	26.01	39.96	39.38	54	-14.62	AV

GFSK 2441MHz								
Frequency (MHz)	Antenna Polarization	Reading (dB $\mu$ V)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Margin (dB)	Det. Mode
4882.00	H	42.38	25.99	40.01	56.40	74	-17.60	PK
4882.00	H	27.95	25.99	40.01	41.97	54	-12.03	AV
4882.00	V	45.32	25.99	40.01	59.34	74	-14.66	PK
4882.00	V	29.09	25.99	40.01	43.11	54	-10.89	AV

GFSK 2480MHz								
Frequency (MHz)	Antenna Polarization	Reading (dB $\mu$ V)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Margin (dB)	Det. Mode
4960.00	H	43.95	25.98	40.04	58.01	74	-15.99	PK
4960.00	H	33.89	25.98	40.04	47.95	54	-6.05	AV
4960.00	V	43.33	25.98	40.04	57.39	74	-16.61	PK
4960.00	V	34.09	25.98	40.04	48.15	54	-5.85	AV

Remark : Corrected Level = Reading + Correction Factor – Preamp  
 Correction Factor = Antenna Factor + Cable Loss

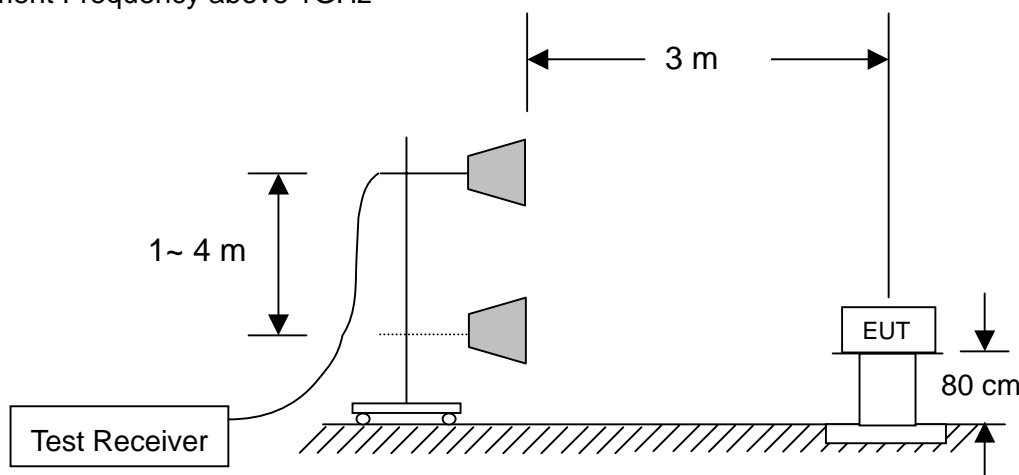
## 9 Emission on the Band Edge test

### 9.1 Limit

In any 100kHz 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.

### 9.2 Configuration of Measurement

Measurement Frequency above 1GHz



### 9.3 Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

Radiated emission measurements were performed from 30MHz to 25GHz. Spectrum Analyzer Resolution Bandwidth is 100kHz or greater for frequencies 30MHz to 1GHz, set 1MHz for frequencies above 1GHz.

The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and whole system. During the test, all cables were arranged to present worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meter and down to 1 meter.

### 9.4 Test Result

**PASS.**

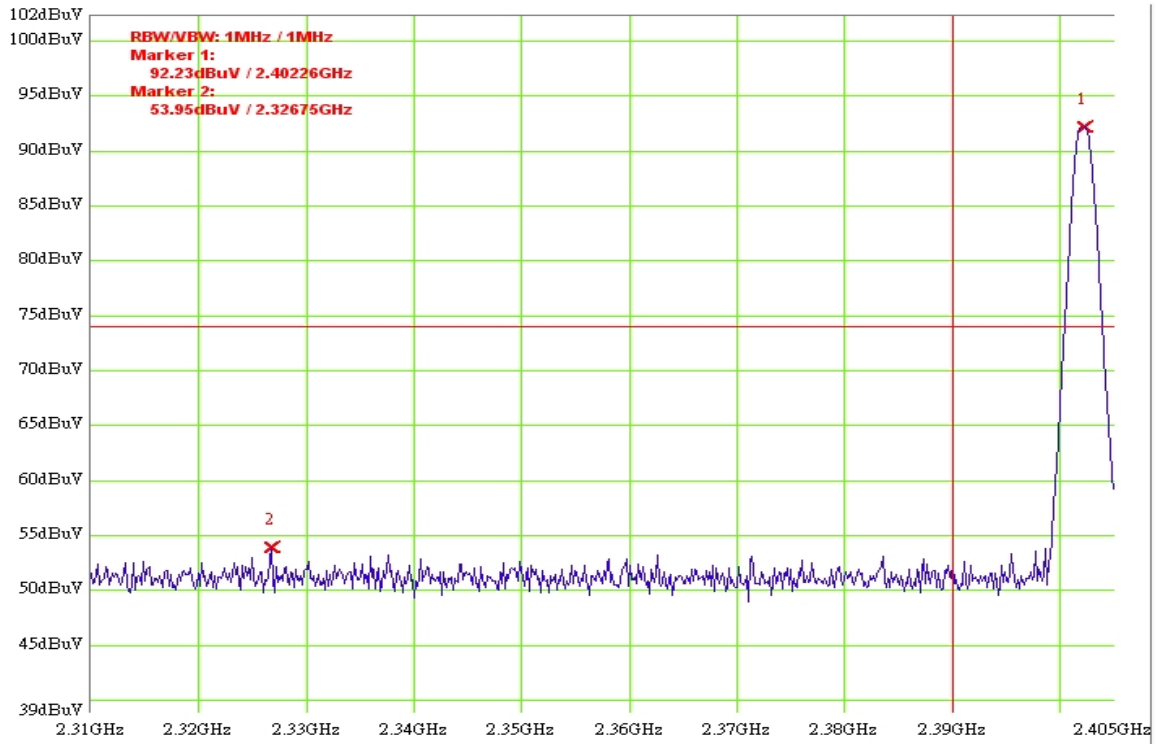
The final test data is shown on as following pages.

<b>Mode : GFSK</b>					
<b>CH</b>	<b>Restrict Freq. Band (MHz)</b>	<b>Detector Mode</b>	<b>Maximum level (dB <math>\mu</math> V/m)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
1	2310~2390	PK	53.95	74	-20.05
		AV	40.60	54	-13.40
79	2483.5~2500	PK	59.33	74	-14.67
		AV	50.79	54	-3.21

<b>Mode : <math>\pi/4</math> DQPSK</b>					
<b>CH</b>	<b>Restrict Freq. Band (MHz)</b>	<b>Detector Mode</b>	<b>Maximum level (dB <math>\mu</math> V/m)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
1	2310~2390	PK	53.95	74	-20.37
		AV	40.62	54	-13.38
79	2483.5~2500	PK	56.68	74	-17.32
		AV	46.13	54	-7.87

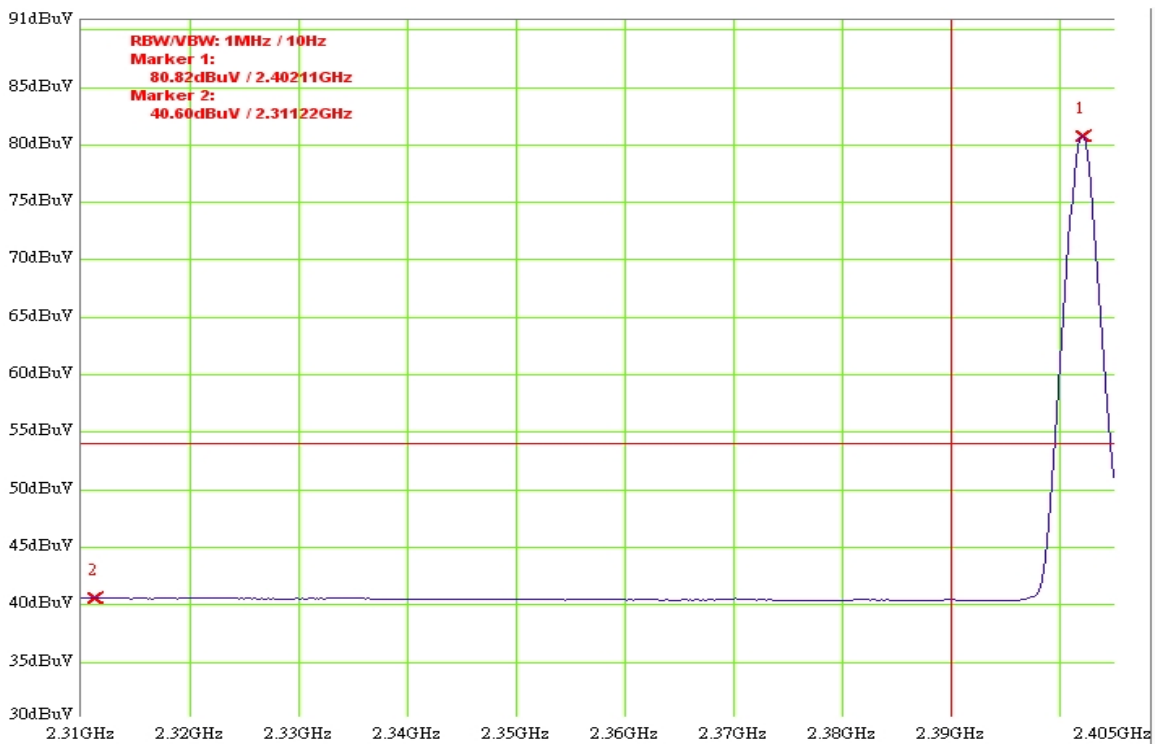
<b>Mode : 8 DQPSK</b>					
<b>CH</b>	<b>Restrict Freq. Band (MHz)</b>	<b>Detector Mode</b>	<b>Maximum level (dB <math>\mu</math> V/m)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
1	2310~2390	PK	54.26	74	-19.74
		AV	40.61	54	-13.39
79	2483.5~2500	PK	60.34	74	-13.66
		AV	47.92	54	-6.08

### GFSK CH01 PK



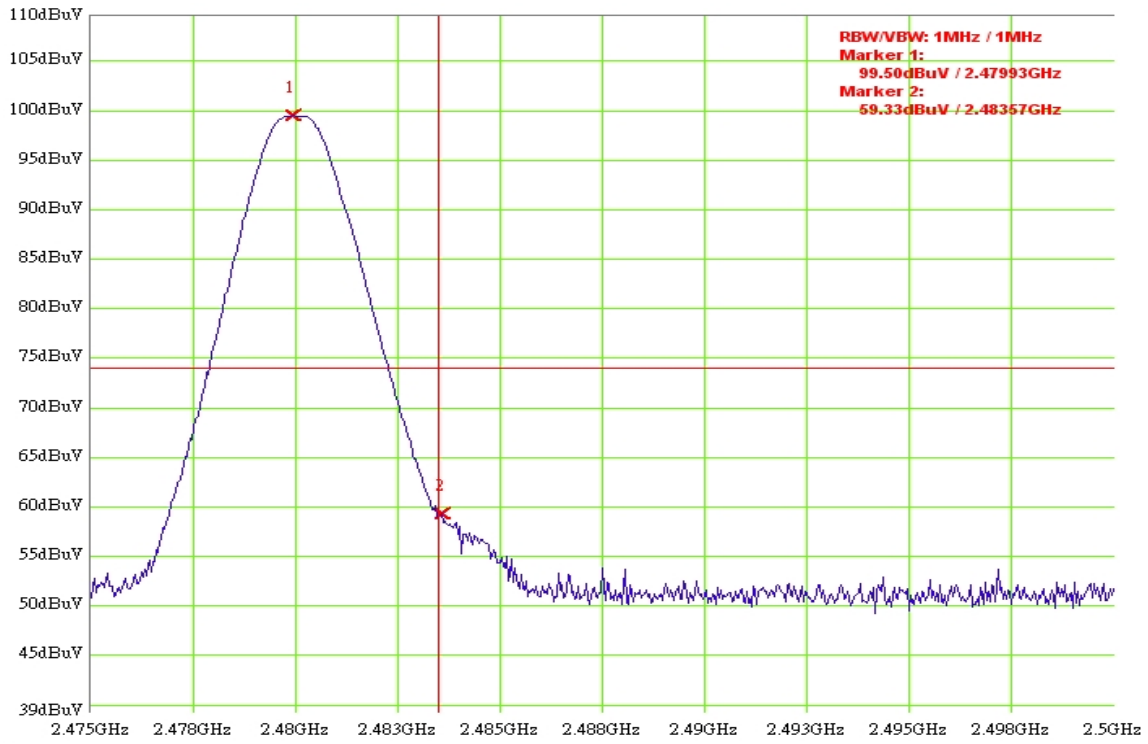
GFSK CH01 PK

### GFSK CH01 AV



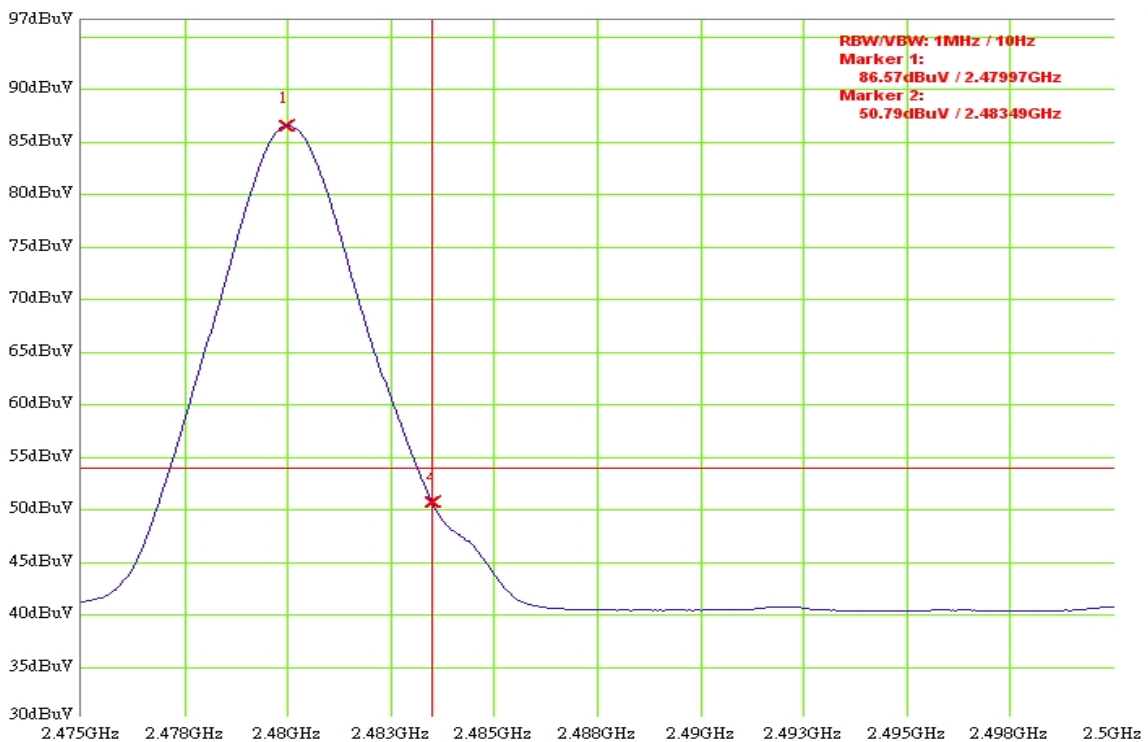
GFSK CH01 AV

### GFSK CH79 PK



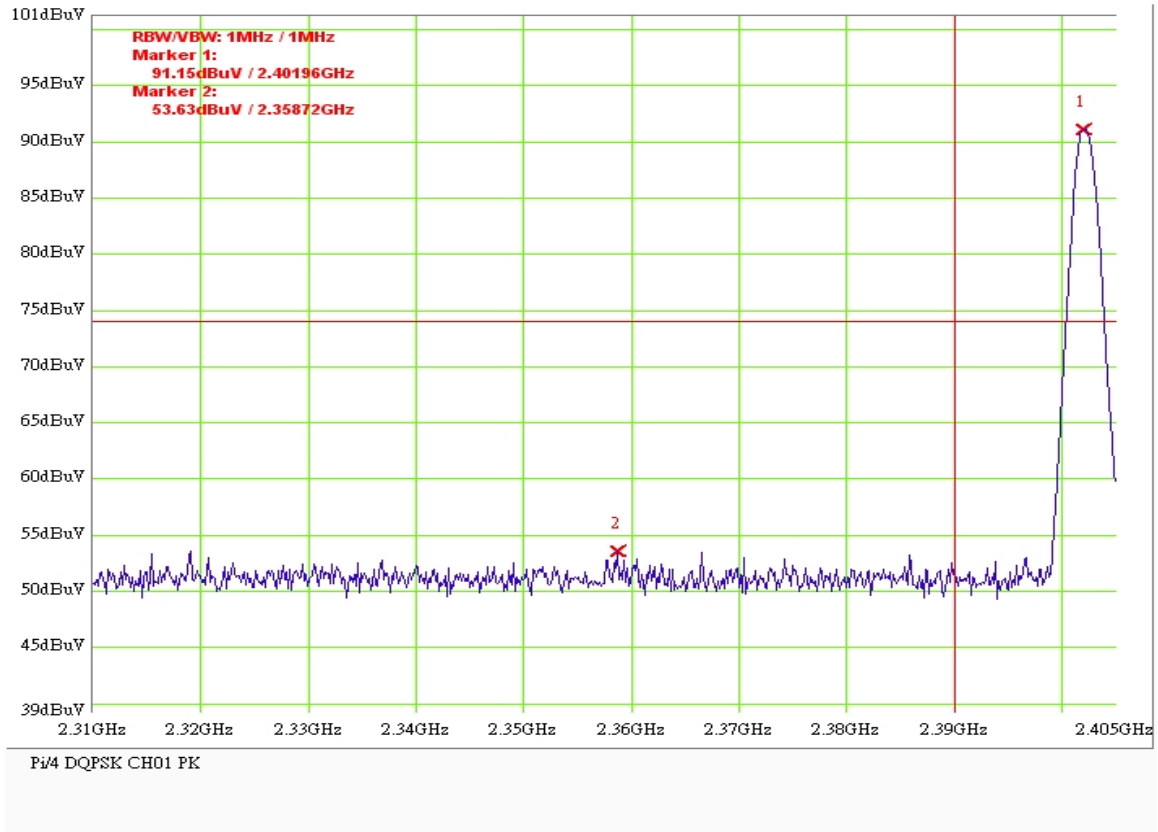
GFSK CH79 PK

### GFSK CH79 AV

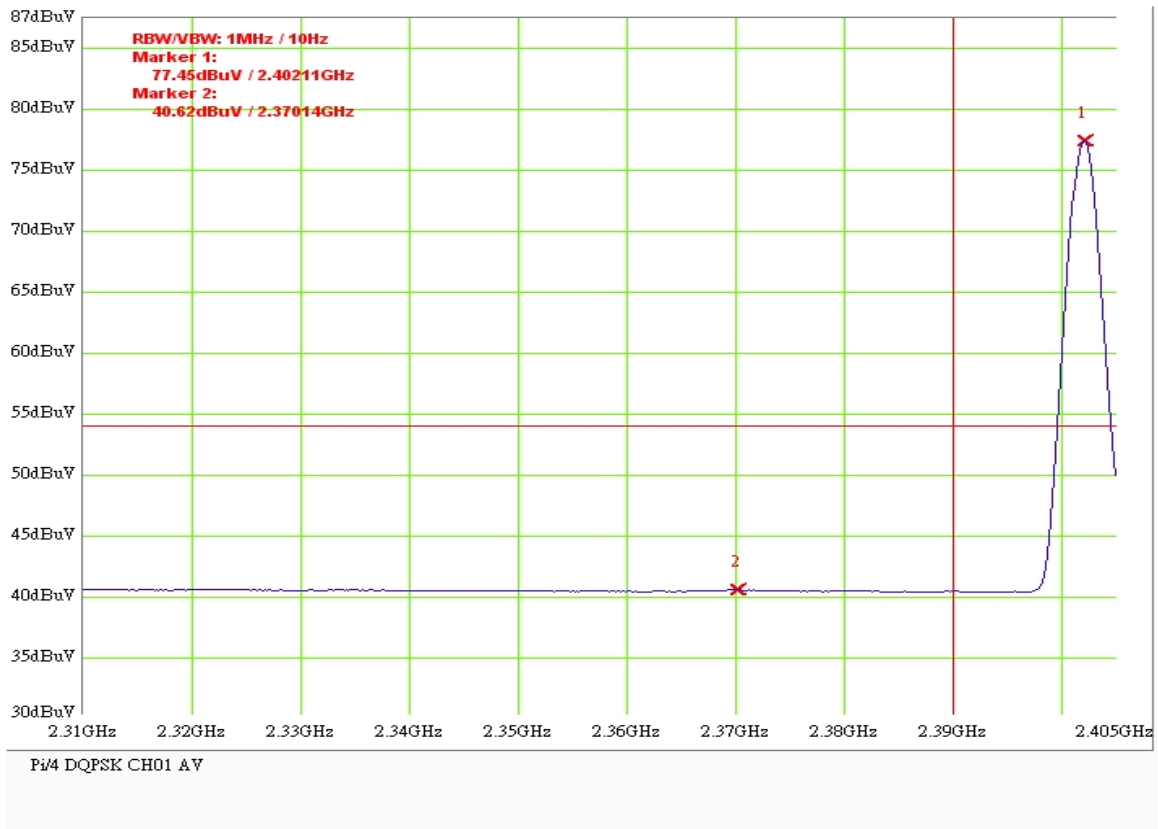


GFSK CH79 AV

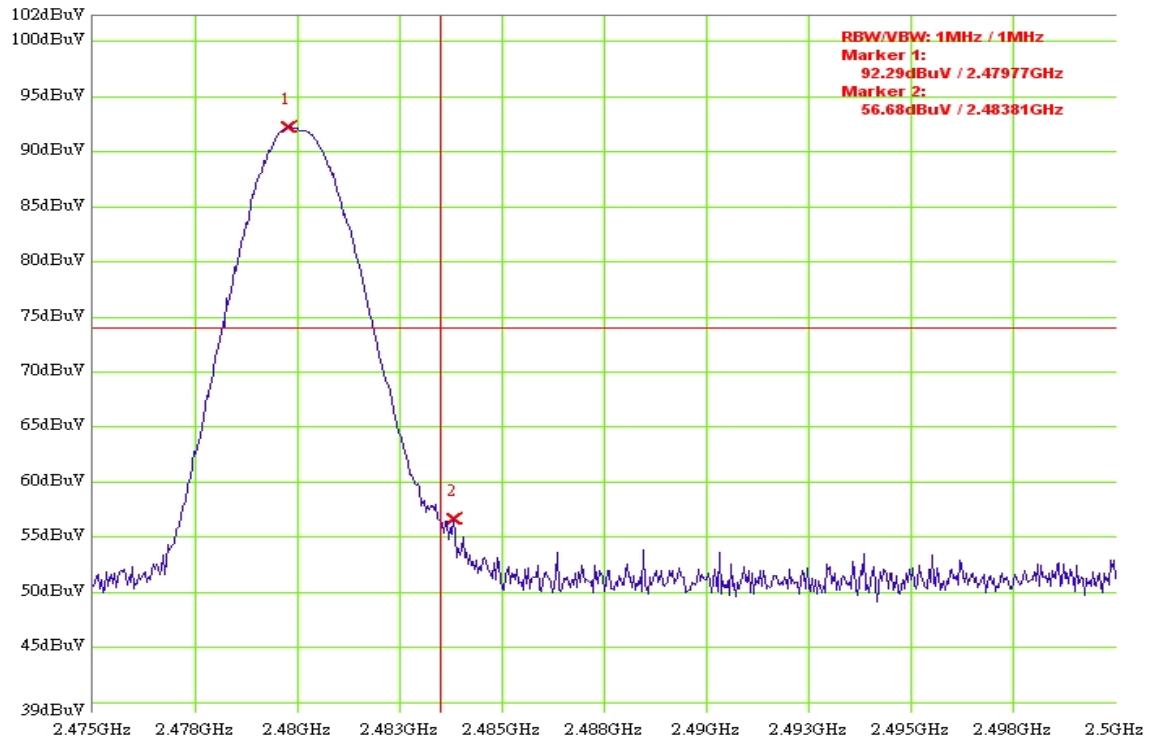
### $\pi/4$ DQPSK CH01 PK



### $\pi/4$ DQPSK CH01 AV

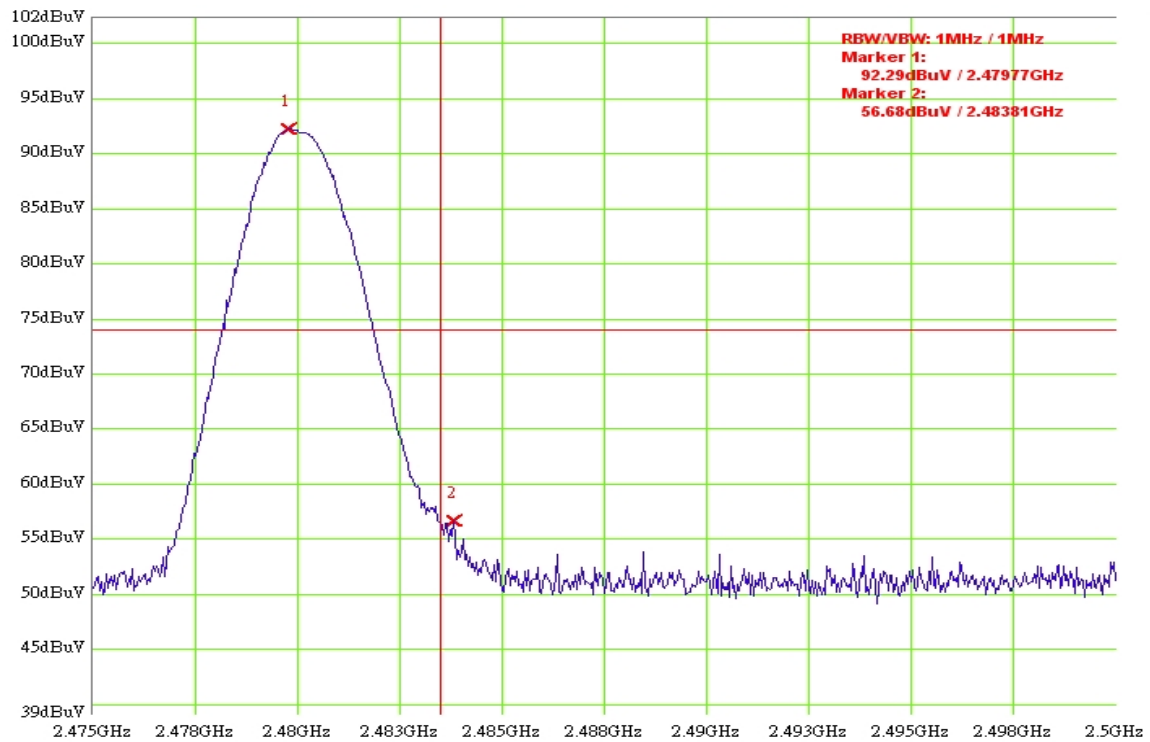


### $\pi/4$ DQPSK CH79 PK



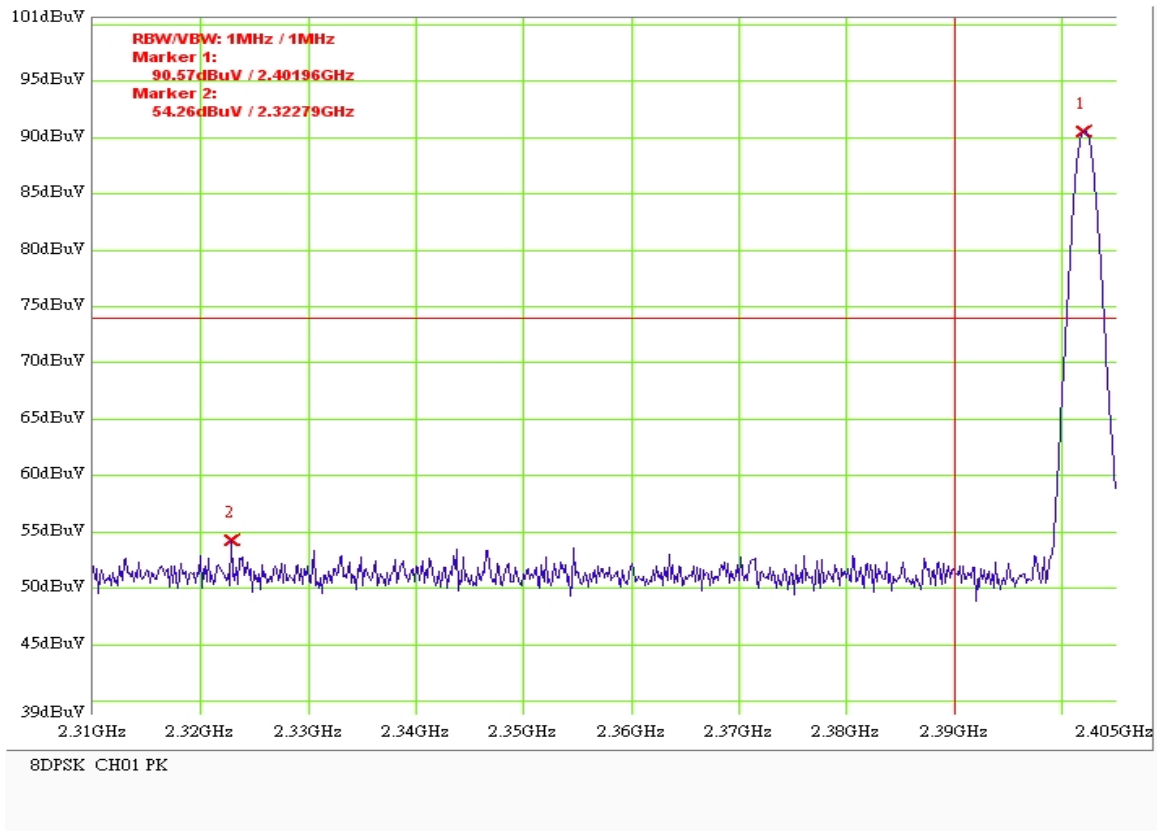
Pi/4 DQPSK CH79 PK

### $\pi/4$ DQPSK CH79 PK

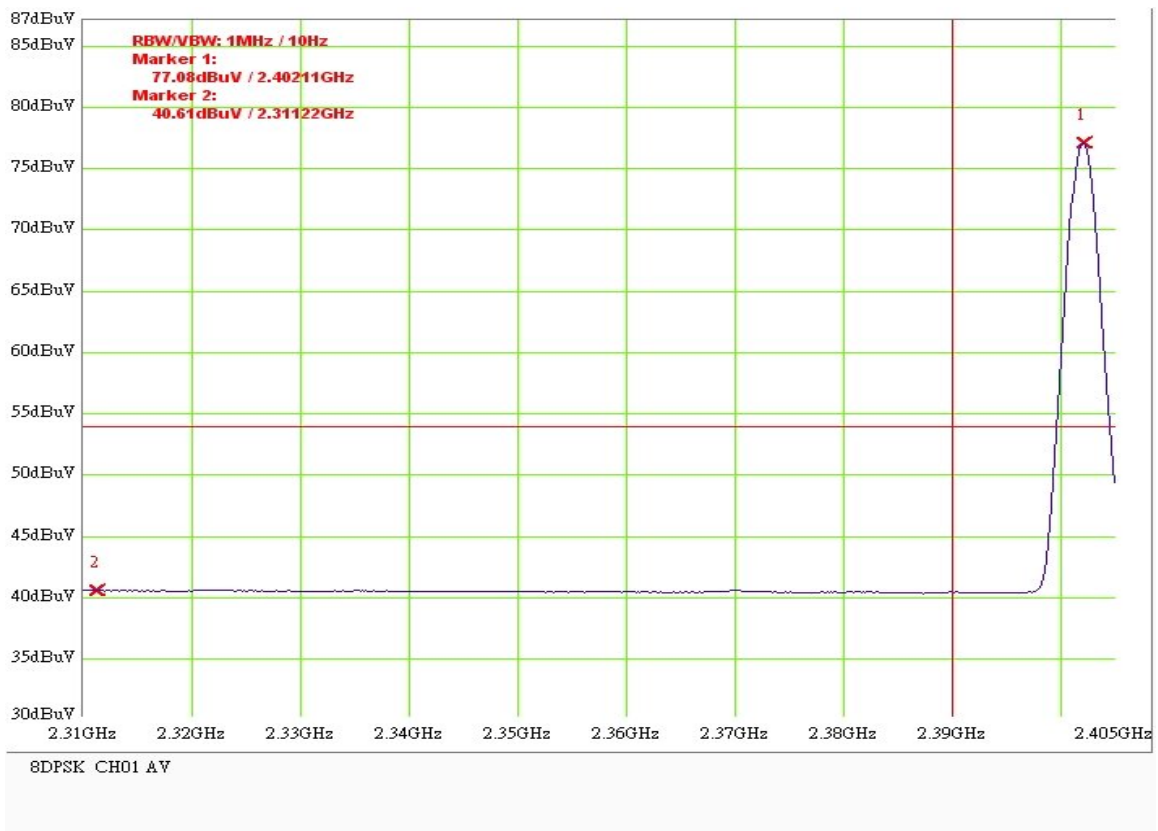


Pi/4 DQPSK CH79 PK

### 8DPSK CH01 PK

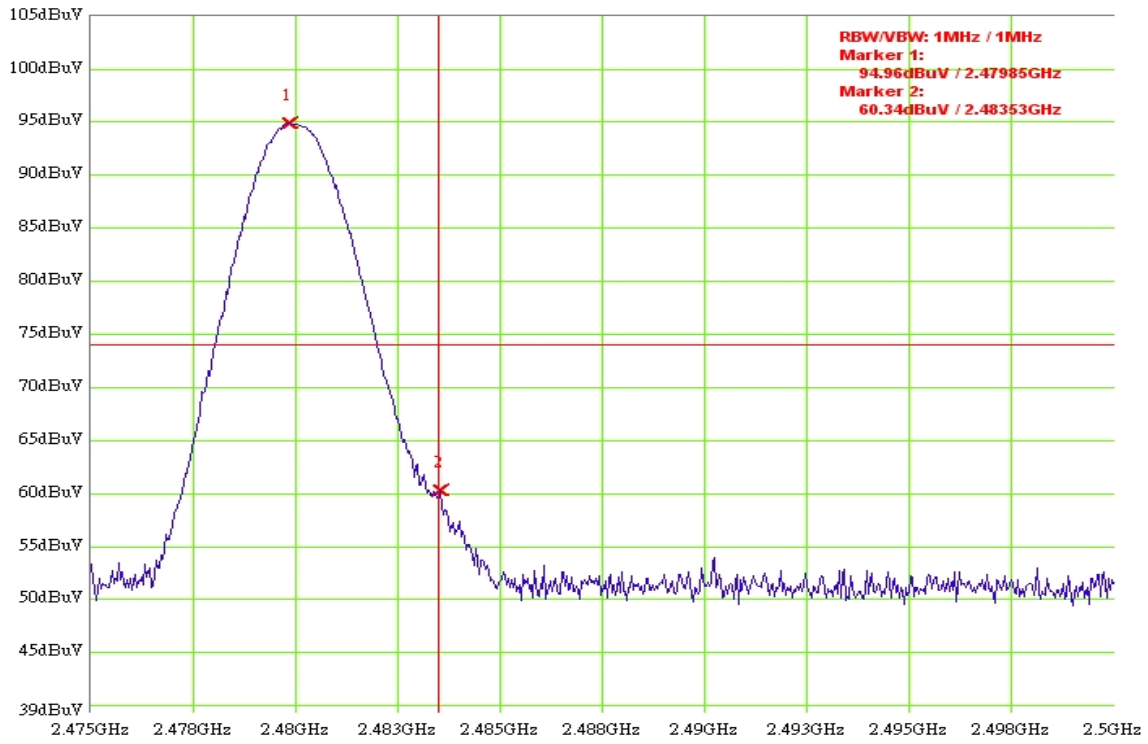


### 8DPSK CH01 AV



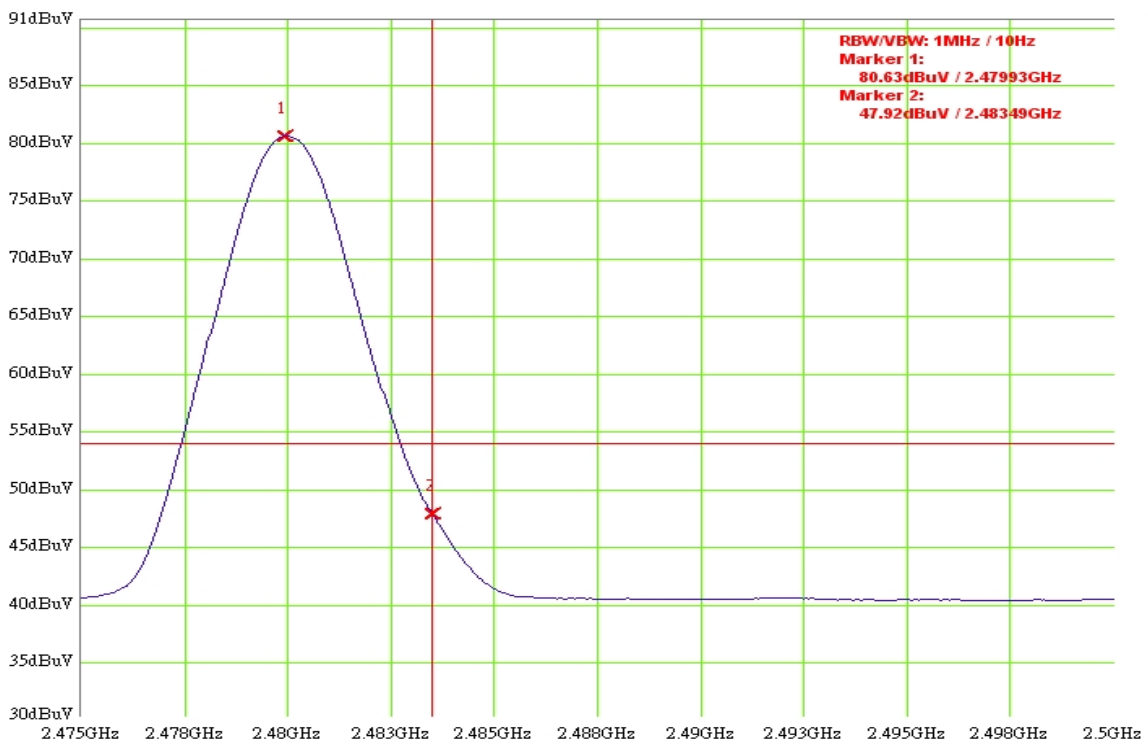


### 8DPSK CH79 PK



8DPSK CH79 PK

### 8DPSK CH79 AV



8DPSK CH79 AV

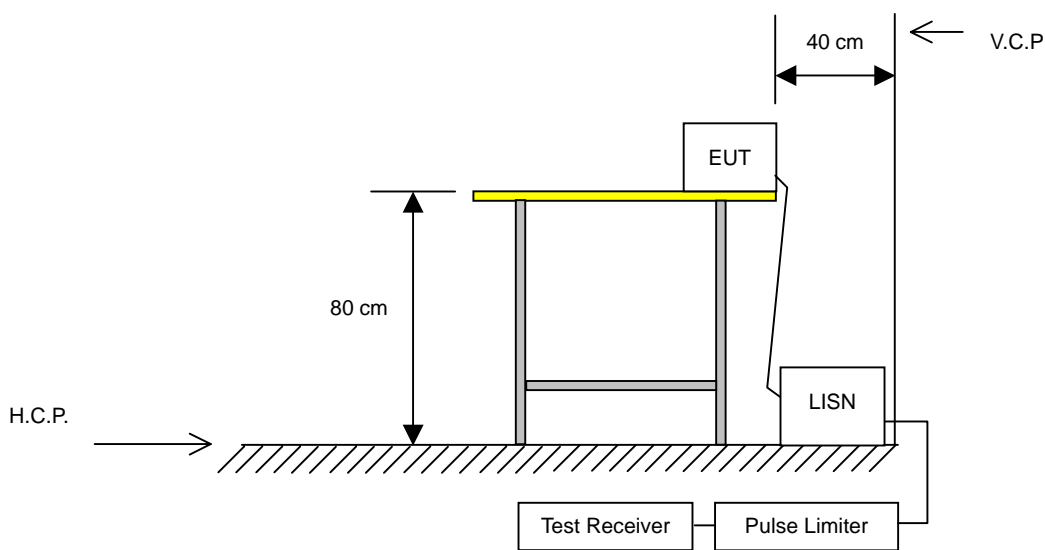
## 10 AC Power Line Conducted Emission test

### 10.1 Limit

Frequency (MHz)	Quasi-Peak (dB $\mu$ V)	Average (dB $\mu$ V)
0.15 to 0.5	66 to 56	56 to 46
> 0.5 to 5	56	46
> 5 to 30	60	50

Note : The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

### 10.2 Configuration of Measurement



### 10.3 Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

- 1) The EUT was placed 80cm height above ground on a non-conductive table and vertical conducting plane located 40cm to the rear of the EUT.
- 2) The EUT was connected to the main power through Line Impedance Stabilization Networks (LISN). This setup provided a 50ohm/50mH coupling impedance for the measuring equipment. The auxiliary equipment will place in secondary LISN.
- 3) Both sides (Line and Neutral) of AC 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.
- 4) The bandwidth of the field strength meter (R & S Test Receiver ESCS 30) is set at 9kHz.

### 10.4 Test Result

**PASS.**

The final test data is shown on as following pages.

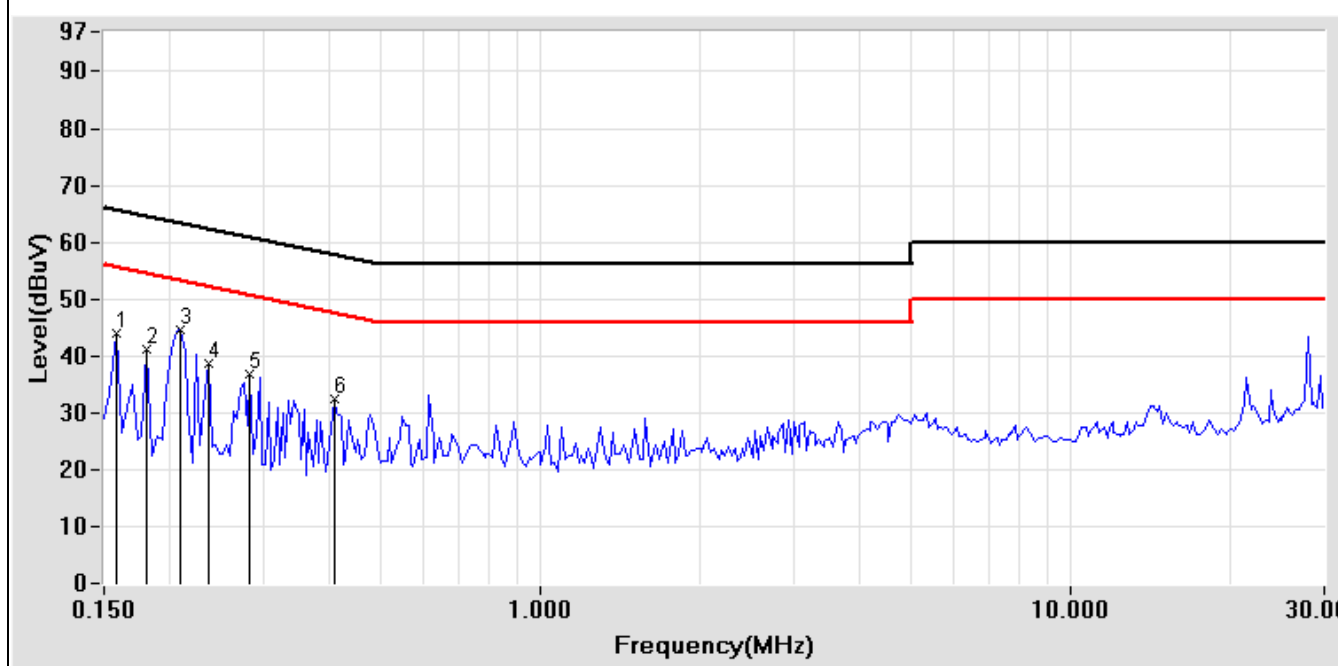
## Power Line Conducted Test Data

EUT: NoteBook PC CLIENT: MiTAC MODEL: 8212X RATING: 120V/60Hz Temperature: 23.9 °C Humidity: 55 %	POLARITY: Line DISTANCE: Serial No.: FILE/DATA# MiTAC.emi/207 OPERATOR: Raymond TEST SITE: Conduction1
--	---

Frequency (MHz)	Factor (dB)	Meter Reading (dBμV)		Emission Level (dBμV)		Limits (dBμV)		Margin (dB)	
		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.158	0.14	40.32	22.30	40.46	22.44	65.57	55.57	-25.11	-33.13
0.181	0.12	36.84	17.64	36.96	17.76	64.44	54.44	-27.48	-36.68
0.209	0.10	43.20	33.20	43.30	33.30	63.24	53.24	-19.94	-19.94
0.236	0.10	31.96	11.94	32.06	12.04	62.24	52.24	-30.18	-40.20
0.283	0.10	33.20	24.50	33.30	24.60	60.73	50.73	-27.43	-26.13
0.408	0.10	27.67	21.69	27.77	21.79	57.69	47.69	-29.92	-25.90

Remark:  
 1. All readings are Quasi-Peak and Average values.  
 2. Factor = Insertion Loss + Cable Loss.

LIMIT: CISPR 22-B(QP).LMT



Test Mode: LCD+D-Sub: 1280\*800, 60Hz (LAN: 1Gbps) (SKU A)

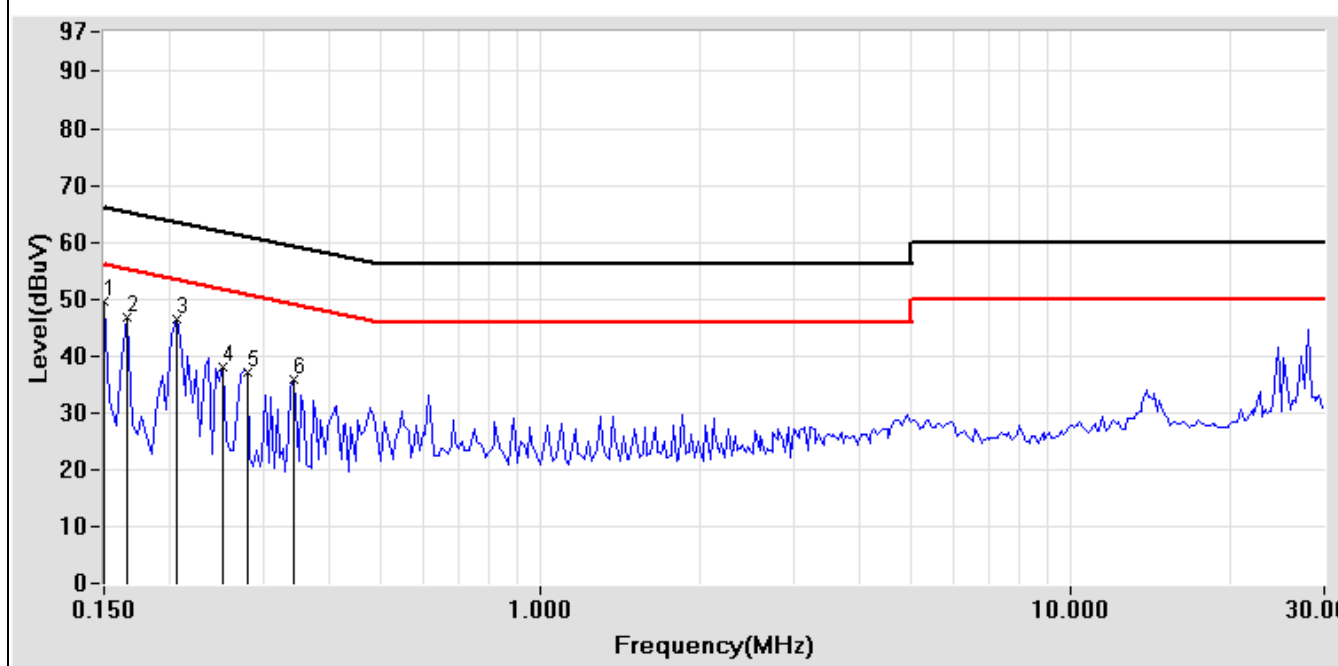
## Power Line Conducted Test Data

EUT: NoteBook PC CLIENT: MiTAC MODEL: 8212X RATING: 120V/60Hz Temperature: 23.9 °C Humidity: 55 %	POLARITY: Neutral DISTANCE: Serial No.: FILE/DATA# MiTAC.emi/206 OPERATOR: Raymond TEST SITE: Conduction1
--	--

Frequency (MHz)	Factor (dB)	Meter Reading (dBμV)		Emission Level (dBμV)		Limits (dBμV)		Margin (dB)	
		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.150	0.15	41.45	21.99	41.60	22.14	66.00	56.00	-24.40	-33.86
0.166	0.13	39.64	22.92	39.77	23.05	65.16	55.16	-25.39	-32.11
0.205	0.10	44.78	32.29	44.88	32.39	63.41	53.41	-18.53	-21.02
0.252	0.10	30.30	13.17	30.40	13.27	61.69	51.69	-31.29	-38.42
0.279	0.10	35.30	24.80	35.40	24.90	60.85	50.85	-25.45	-25.95
0.341	0.10	32.18	24.24	32.28	24.34	59.18	49.18	-26.90	-24.84

Remark:  
 1. All readings are Quasi-Peak and Average values.  
 2. Factor = Insertion Loss + Cable Loss.

LIMIT: CISPR 22-B(QP).LMT



Test Mode: LCD+D-Sub: 1280\*800, 60Hz (LAN: 1Gbps) (SKU A)

## Power Line Conducted Test Data

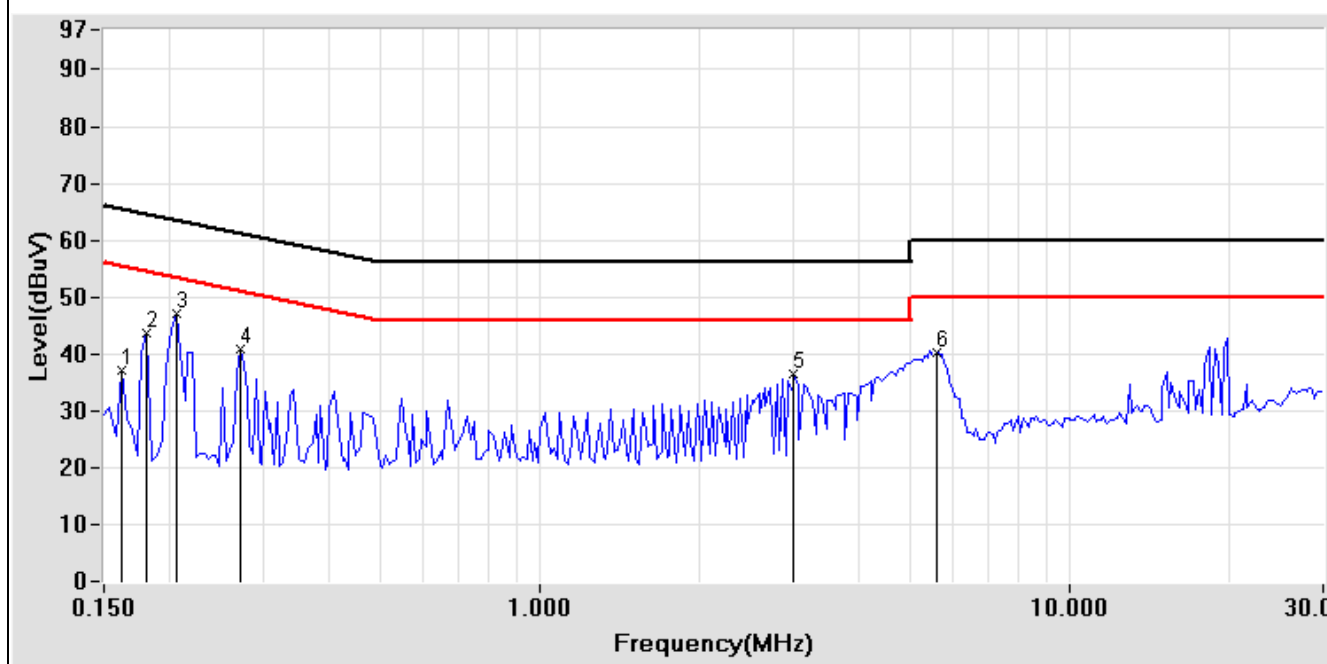
EUT: NoteBook PC CLIENT: MiTAC MODEL: 8212X RATING: 120V/60Hz Temperature: 25.0 °C Humidity: 62 %	POLARITY: Line DISTANCE: Serial No.: FILE/DATA# MiTAC.emi/198 OPERATOR: Raymond TEST SITE: Conduction1
--	---

Frequency (MHz)	Factor (dB)	Meter Reading (dBμV)		Emission Level (dBμV)		Limits (dBμV)		Margin (dB)	
		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.162	0.14	39.69	22.32	39.83	22.46	65.36	55.36	-25.53	-32.90
0.181	0.12	35.05	16.25	35.17	16.37	64.44	54.44	-29.27	-38.07
0.205	0.10	45.67	37.50	45.77	37.60	63.41	53.41	-17.64	-15.81
0.271	0.10	39.54	31.95	39.64	32.05	61.09	51.09	-21.45	-19.04
2.994	0.30	33.75	32.33	34.05	32.63	56.00	46.00	-21.95	-13.37
5.580	0.34	37.41	35.12	37.75	35.46	60.00	50.00	-22.25	-14.54

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

LIMIT: CISPR 22-B(QP).LMT



Test Mode: LCD+D-Sub: 1280\*800, 60Hz (LAN: 1Gbps) (SKU B)

## Power Line Conducted Test Data

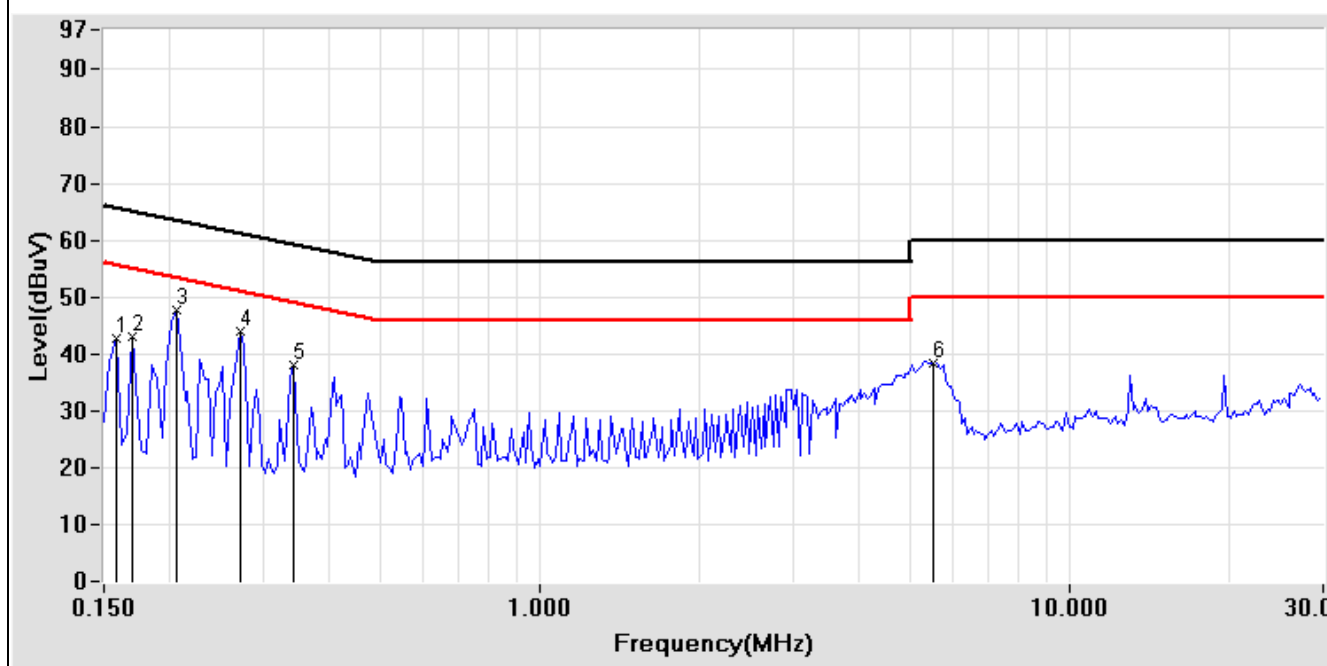
EUT: NoteBook PC CLIENT: MiTAC MODEL: 8212X RATING: 120V/60Hz Temperature: 25.0 °C Humidity: 62 %	POLARITY: Neutral DISTANCE: Serial No.: FILE/DATA# MiTAC.emi/197 OPERATOR: Raymond TEST SITE: Conduction1
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Frequency (MHz)	Factor (dB)	Meter Reading (dBμV)		Emission Level (dBμV)		Limits (dBμV)		Margin (dB)	
		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.158	0.14	41.25	21.52	41.39	21.66	65.57	55.57	-24.18	-33.91
0.170	0.13	38.13	20.32	38.26	20.45	64.96	54.96	-26.70	-34.51
0.205	0.10	47.22	38.50	47.32	38.60	63.41	53.41	-16.09	-14.81
0.271	0.10	42.56	33.97	42.66	34.07	61.09	51.09	-18.43	-17.02
0.341	0.10	33.51	25.78	33.61	25.88	59.18	49.18	-25.57	-23.30
5.494	0.36	37.50	36.20	37.86	36.56	60.00	50.00	-22.14	-13.44

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

LIMIT: CISPR 22-B(QP).LMT



Test Mode: LCD+D-Sub: 1280\*800, 60Hz (LAN: 1Gbps) (SKU B)