



# FCC TEST REPORT

**REPORT NO.:** RF971106L10

**MODEL NO.:** IT8000

**RECEIVED:** Nov. 06, 2008

**TESTED:** Jan. 22 ~ Mar. 10, 2009

**ISSUED:** Mar. 13, 2009

**APPLICANT:** BITATEK CO., LTD.

**ADDRESS:** 6F-1, 190, Ta-Tung Road, Sec. 3, Hsichih221,  
Taipei County, TAIWAN

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

**LAB ADDRESS:** No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou  
Hsiang, Taipei Hsien 244, Taiwan, R.O.C.

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

This test report consists of 105 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by TAF or any government agencies. The test results in the report only apply to the tested sample.





## TABLE OF CONTENTS

1.	CERTIFICATION .....	5
2.	SUMMARY OF TEST RESULTS .....	6
2.1	MEASUREMENT UNCERTAINTY .....	7
3.	GENERAL INFORMATION .....	8
3.1	GENERAL DESCRIPTION OF EUT .....	8
3.2	DESCRIPTION OF TEST MODES .....	10
3.2.1	CONFIGURATION OF SYSTEM UNDER TEST .....	11
3.2.2	TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL .....	12
3.3	GENERAL DESCRIPTION OF APPLIED STANDARDS .....	15
3.4	DESCRIPTION OF SUPPORT UNITS .....	16
4.	TEST TYPES AND RESULTS (FOR WIRELESS LAN FUNCTION) .....	17
4.1	RADIATED EMISSION MEASUREMENT .....	17
4.1.1	LIMITS OF RADIATED EMISSION MEASUREMENT .....	17
4.1.2	TEST INSTRUMENTS .....	18
4.1.3	TEST PROCEDURES .....	19
4.1.4	DEVIATION FROM TEST STANDARD .....	19
4.1.5	TEST SETUP .....	20
4.1.6	EUT OPERATING CONDITIONS .....	21
4.1.7	TEST RESULTS .....	22
4.2	CONDUCTED EMISSION MEASUREMENT .....	30
4.2.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT .....	30
4.2.2	TEST INSTRUMENTS .....	30
4.2.3	TEST PROCEDURES .....	31
4.2.4	DEVIATION FROM TEST STANDARD .....	31
4.2.5	TEST SETUP .....	32
4.2.6	EUT OPERATING CONDITIONS .....	32
4.2.7	TEST RESULTS .....	33
4.3	6dB BANDWIDTH MEASUREMENT .....	37
4.3.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT .....	37
4.3.2	TEST INSTRUMENTS .....	37
4.3.3	TEST PROCEDURE .....	37
4.3.4	DEVIATION FROM TEST STANDARD .....	37
4.3.5	TEST SETUP .....	38
4.3.6	EUT OPERATING CONDITIONS .....	38
4.3.7	TEST RESULTS .....	39
4.4	MAXIMUM PEAK OUTPUT POWER .....	43
4.4.1	LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT .....	43
4.4.2	INSTRUMENTS .....	43
4.4.3	TEST PROCEDURES .....	43
4.4.4	DEVIATION FROM TEST STANDARD .....	43
4.4.5	TEST SETUP .....	44
4.4.6	EUT OPERATING CONDITIONS .....	44
4.4.7	TEST RESULTS .....	45
4.5	POWER SPECTRAL DENSITY MEASUREMENT .....	46
4.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT .....	46
4.5.2	TEST INSTRUMENTS .....	46
4.5.3	TEST PROCEDURE .....	46
4.5.4	DEVIATION FROM TEST STANDARD .....	46
4.5.5	TEST SETUP .....	47



4.5.6	EUT OPERATING CONDITION.....	47
4.5.7	TEST RESULTS .....	48
4.6	BAND EDGES MEASUREMENT .....	52
4.6.1	LIMITS OF BAND EDGES MEASUREMENT .....	52
4.6.2	TEST INSTRUMENTS.....	52
4.6.3	TEST PROCEDURE.....	52
4.6.4	DEVIATION FROM TEST STANDARD .....	52
4.6.5	EUT OPERATING CONDITION.....	52
4.6.6	TEST RESULTS .....	53
4.7	ANTENNA REQUIREMENT .....	61
4.7.1	STANDARD APPLICABLE .....	61
4.7.2	ANTENNA CONNECTED CONSTRUCTION .....	61
5.	TEST TYPES AND RESULTS (FOR BLUETOOTH FUNCTION).....	62
5.1	RADIATED EMISSION MEASUREMENT .....	62
5.1.1	LIMITS OF RADIATED EMISSION MEASUREMENT .....	62
5.1.2	TEST INSTRUMENTS.....	63
5.1.3	TEST PROCEDURES .....	64
5.1.4	DEVIATION FROM TEST STANDARD .....	64
5.1.5	TEST SETUP.....	65
5.1.6	EUT OPERATING CONDITIONS .....	65
5.1.7	TEST RESULTS .....	66
5.2	CONDUCTED EMISSION MEASUREMENT .....	72
5.2.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT .....	72
5.2.2	TEST INSTRUMENTS.....	72
5.2.3	TEST PROCEDURES .....	73
5.2.4	DEVIATION FROM TEST STANDARD .....	73
5.2.5	TEST SETUP.....	74
5.2.6	EUT OPERATING CONDITIONS .....	74
5.2.7	TEST RESULTS .....	75
5.3	NUMBER OF HOPPING FREQUENCY USED .....	79
5.3.1	LIMIT OF HOPPING FREQUENCY USED.....	79
5.3.2	TEST INSTRUMENTS.....	79
5.3.3	TEST PROCEDURES .....	79
5.3.4	DEVIATION FROM TEST STANDARD .....	80
5.3.5	TEST SETUP.....	80
5.3.6	TEST RESULTS .....	80
5.4	DWELL TIME ON EACH CHANNEL .....	82
5.4.1	LIMIT OF DWELL TIME USED .....	82
5.4.2	TEST INSTRUMENTS.....	82
5.4.3	TEST PROCEDURES .....	82
5.4.4	DEVIATION FROM TEST STANDARD .....	82
5.4.5	TEST SETUP.....	82
5.4.6	TEST RESULTS .....	83
5.5	CHANNEL BANDWIDTH .....	87
5.5.1	LIMITS OF CHANNEL BANDWIDTH .....	87
5.5.2	TEST INSTRUMENTS.....	87
5.5.3	TEST PROCEDURE.....	87
5.5.4	DEVIATION FROM TEST STANDARD .....	87
5.5.5	TEST SETUP.....	88
5.5.6	EUT OPERATING CONDITION.....	88
5.5.7	TEST RESULTS .....	88
5.6	HOPPING CHANNEL SEPARATION .....	91



5.6.1	LIMIT OF HOPPING CHANNEL SEPARATION .....	91
5.6.2	TEST INSTRUMENTS.....	91
5.6.3	TEST PROCEDURES .....	91
5.6.4	DEVIATION FROM TEST STANDARD .....	91
5.6.5	TEST SETUP.....	91
5.6.6	TEST RESULTS .....	92
5.7	MAXIMUM PEAK OUTPUT POWER .....	94
5.7.1	LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT .....	94
5.7.2	TEST INSTRUMENTS.....	94
5.7.3	TEST PROCEDURES .....	94
5.7.4	DEVIATION FROM TEST STANDARD .....	94
5.7.5	TEST SETUP.....	95
5.7.6	EUT OPERATING CONDITION.....	95
5.7.7	TEST RESULTS .....	95
5.8	BAND EDGES MEASUREMENT .....	98
5.8.1	LIMITS OF BAND EDGES MEASUREMENT .....	98
5.8.2	TEST INSTRUMENTS.....	98
5.8.3	TEST PROCEDURE.....	98
5.8.4	DEVIATION FROM TEST STANDARD .....	98
5.8.5	EUT OPERATING CONDITION.....	98
5.8.6	TEST RESULTS .....	99
5.9	ANTENNA REQUIREMENT .....	102
5.9.1	STANDARD APPLICABLE .....	102
5.9.2	ANTENNA CONNECTED CONSTRUCTION .....	102
6.	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	103
7.	INFORMATION ON THE TESTING LABORATORIES .....	104
8.	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB.....	105



# 1. CERTIFICATION

**PRODUCT:** Portable Data Terminal  
**MODEL:** IT8000  
**BRAND:** Bitatek  
**APPLICANT:** BITATEK CO., LTD.  
**TESTED:** Jan. 22 ~ Mar. 10, 2009  
**TEST SAMPLE:** ENGINEERING SAMPLE  
**STANDARDS:** **FCC Part 15, Subpart C (Section 15.247)**  
ANSI C63.4-2003

The above equipment (model: IT8000) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**PREPARED BY** : Peggy Chen , **DATE** : Mar. 13, 2009  
Peggy Chen / Specialist

**TECHNICAL ACCEPTANCE** : Long Chen , **DATE** : Mar. 13, 2009  
Responsible for RF Long Chen / Senior Engineer

**APPROVED BY** : Gary Chang , **DATE** : Mar. 13, 2009  
Gary Chang / Assistant Manager

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

### FOR WIRELESS LAN FUNCTION

APPLIED STANDARD: FCC Part 15, Subpart C			
Standard Section	Test Type and Limit	Result	Remark
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -14.14dB at 0.201MHz.
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -1.96dB at 795.95MHz.
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.

## FOR BLUETOOTH FUNCTION

APPLIED STANDARD: FCC Part 15, Subpart C			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -14.36dB at 0.194MHz.
15.247(a)(1)(iii)	Number of Hopping Frequency Used Spec.: At least 15 channels	PASS	Meet the requirement of limit.
15.247(a)(1)(iii)	Dwell Time on Each Channel Spec.: Max. 0.4 second within 31.6 second	PASS	Meet the requirement of limit.
15.247(a)(1)	1. Hopping Channel Separation Spec. : Min. 25 kHz or 20 dB bandwidth, whichever is greater 2. Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Spec.: max. 21dBm	PASS	Meet the requirement of limit.
15.247(d)	Transmitter Radiated Emissions Spec.: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -2.24dB at 949.55MHz.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.

## 2.1 MEASUREMENT UNCERTAINTY

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44dB
Radiated emissions	30MHz ~ 200MHz	3.34dB
	200MHz ~1000MHz	3.35dB
	1GHz ~ 18GHz	2.26dB
	18GHz ~ 40GHz	1.94dB

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



### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Portable Data Terminal
<b>MODEL NO.</b>	IT8000
<b>FCC ID</b>	SPYPDT001
<b>POWER SUPPLY</b>	5.0Vdc from adapter 4.2Vdc from battery
<b>MODULATION TYPE</b>	<b>Wireless LAN:</b> CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM <b>Bluetooth:</b> GFSK for FHSS
<b>MODULATION TECHNOLOGY</b>	<b>Wireless LAN:</b> DSSS, OFDM <b>Bluetooth:</b> FHSS
<b>TRANSFER RATE</b>	<b>Wireless LAN:</b> 802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps <b>Bluetooth:</b> 1Mbps
<b>FREQUENCY RANGE</b>	2400MHz ~ 2483.5MHz
<b>NUMBER OF CHANNEL</b>	<b>Wireless LAN:</b> 11 <b>Bluetooth:</b> 79
<b>MAXIMUM OUTPUT POWER</b>	<b>Wireless LAN:</b> 201.837mW <b>Bluetooth:</b> 2.275mW
<b>ANTENNA TYPE</b>	<b>Wireless LAN:</b> Dipole antenna with 3.5dBi gain(Peak), -3dBi gain(Avg.) <b>Bluetooth:</b> Dipole antenna with 2dBi gain(Peak), -3dBi gain(Avg.)
<b>I/O PORTS</b>	Refer to user's manual
<b>DATA CABLE</b>	1.2 m shielded USB cable with one core 1.2 m shielded RS232 cable with one core (Option)
<b>ACCESSORY DEVICES</b>	Adapter, battery x 2, earphone(1.2m)



**NOTE:**

1. The EUT is a Portable Data Terminal with wireless LAN and Bluetooth functions.
2. The EUT was tested with the following adapter and batteries:

Adapter	
<b>BRAND :</b>	ENG
<b>MODEL :</b>	3A-502DA05
<b>INPUT :</b>	100-240Vac, 50-60Hz, 1.4A
<b>OUTPUT :</b>	5Vdc, 6.5A, 32.5W max
<b>POWER LINE :</b>	AC: 1.5m non-shielded cable without core DC: 1.0m non-shielded cable with one core

Battery 1	
<b>BRAND :</b>	ETICA
<b>MODEL :</b>	BP08-000470
<b>RATING :</b>	4.2Vdc, 2000mAh
Battery 2	
<b>BRAND :</b>	ETICA
<b>MODEL :</b>	BP08-000480
<b>RATING :</b>	4.2Vdc, 4000mAh

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

### 3.2 DESCRIPTION OF TEST MODES

#### FOR WIRELESS LAN FUNCTION

Eleven channels are provided to this EUT:

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

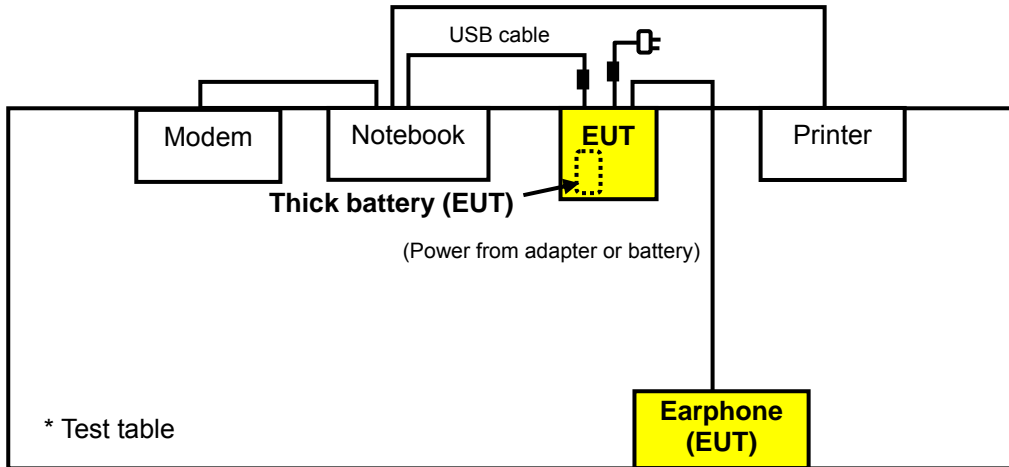
#### FOR BLUETOOTH FUNCTION

79 channels are provided to this EUT:

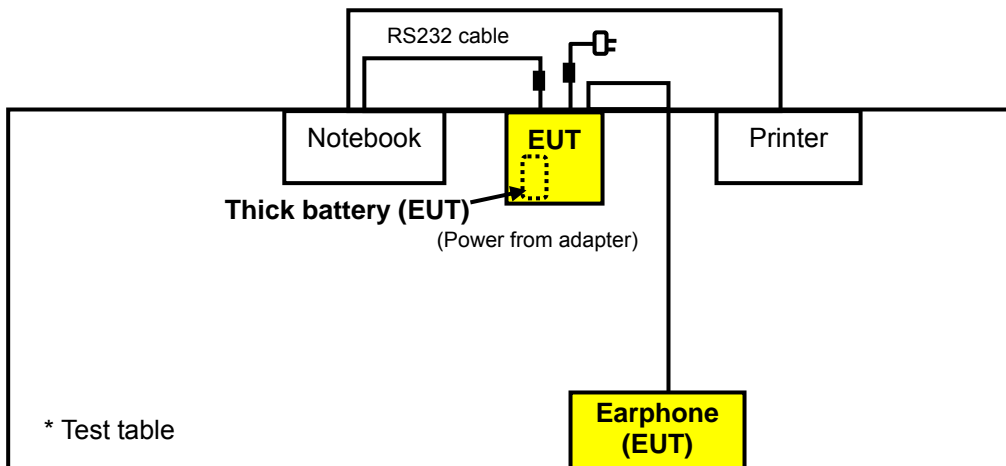
CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

### 3.2.1 CONFIGURATION OF SYSTEM UNDER TEST

#### TEST MODE A



#### TEST MODE B



### 3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

#### FOR WIRELESS LAN FUNCTION

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	APCM	
A	√	√	√	√	USB mode
B	-	√	√	-	RS232 mode

Where **PLC**: Power Line Conducted Emission

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

**RE $\geq$ 1G**: Radiated Emission above 1GHz

**APCM**: Antenna Port Conducted Measurement

**NOTE**: "-" means no effect.

#### RADIATED EMISSION TEST (ABOVE 1 GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	AXIS
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1	X
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	X

#### RADIATED EMISSION TEST (BELOW 1 GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	AXIS
A	802.11g	1 to 11	11	OFDM	BPSK	6	X
B	802.11g	1 to 11	11	OFDM	BPSK	6	X

#### POWER LINE CONDUCTED EMISSION TEST:

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11g	1 to 11	11	OFDM	BPSK	6
B	802.11g	1 to 11	11	OFDM	BPSK	6

**BANDEDGE MEASUREMENT:**

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	AXIS
A	802.11b	1 to 11	1, 11	DSSS	DBPSK	1	X
	802.11g	1 to 11	1, 11	OFDM	BPSK	6	X

**ANTENNA PORT CONDUCTED MEASUREMENT:**

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6

### FOR BLUETOOTH FUNCTION

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	APCM	
A	√	√	√	√	USB mode
B	-	√	√	-	RS232 mode

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

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

**PLC**: Power Line Conducted Emission

**APCM**: Antenna Port Conducted Measurement

**NOTE**: “-“ means no effect.

#### RADIATED EMISSION TEST (ABOVE 1 GHz):

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

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE	AXIS
A	0 to 78	0, 39, 78	FHSS	GFSK	DH5	Z

#### RADIATED EMISSION TEST (BELOW 1 GHz):

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

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE	AXIS
A	0 to 78	78	FHSS	GFSK	DH5	Z
B	0 to 78	78	FHSS	GFSK	DH5	Z

#### POWER LINE CONDUCTED EMISSION TEST:

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

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
A	0 to 78	78	FHSS	GFSK	DH5
B	0 to 78	78	FHSS	GFSK	DH5

**ANTENNA PORT CONDUCTED MEASUREMENT:**

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

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
A	0 to 78	0, 39, 78	FHSS	GFSK	DH5

**3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS**

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

**FCC Part 15, Subpart C (15.247)**

**ANSI C63.4-2003**

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

**NOTE:** The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

### 3.4 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	DELL	D600	CN-0G5152-486 43-49C-8221	FCC DoC Approved
2	MODEM	ACEEX	1414V/3	0401008248	IFAXDM1414
3	PRINTER	EPSON	LQ-300+	DCGY047265	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.2m braid shielded wire, DB25 & DB9 connector, w/o core.
3	1.8m braid shielded wire, DB25 connector, w/o core.

**NOTE:** All power cords of the above support units are non shielded (1.8m).



## 4. TEST TYPES AND RESULTS (FOR WIRELESS LAN FUNCTION)

### 4.1 RADIATED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400 / F(kHz)	300
0.490 ~ 1.705	24000 / F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

**NOTE:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100212	May 28, 2008	May 27, 2009
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Aug. 08, 2008	Aug. 07, 2009
BILOG Antenna SCHWARZBECK	VULB9168	9168-156	Apr. 25, 2008	Apr. 24, 2009
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-563	Aug. 06, 2008	Aug. 05, 2009
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170242	Jan. 06, 2009	Jan. 05, 2010
Preamplifier Agilent	8449B	3008A01911	Sep. 10, 2008	Sep. 09, 2009
Preamplifier Agilent	8447D	2944A10638	Dec. 26, 2008	Dec. 25, 2009
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	218190/4 231241/4	May 20, 2008	May 19, 2009
RF signal cable Worken	8D-FB	Cable-HYCH9-01	Aug. 09, 2008	Aug. 08, 2009
Software	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower & Turn Table Controller EMCO	2090	NA	NA	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  2. The test was performed in HwaYa Chamber 9.
  3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  4. The FCC Site Registration No. is 460141.
  5. The IC Site Registration No. is IC 7450F-4.

#### 4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its 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.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

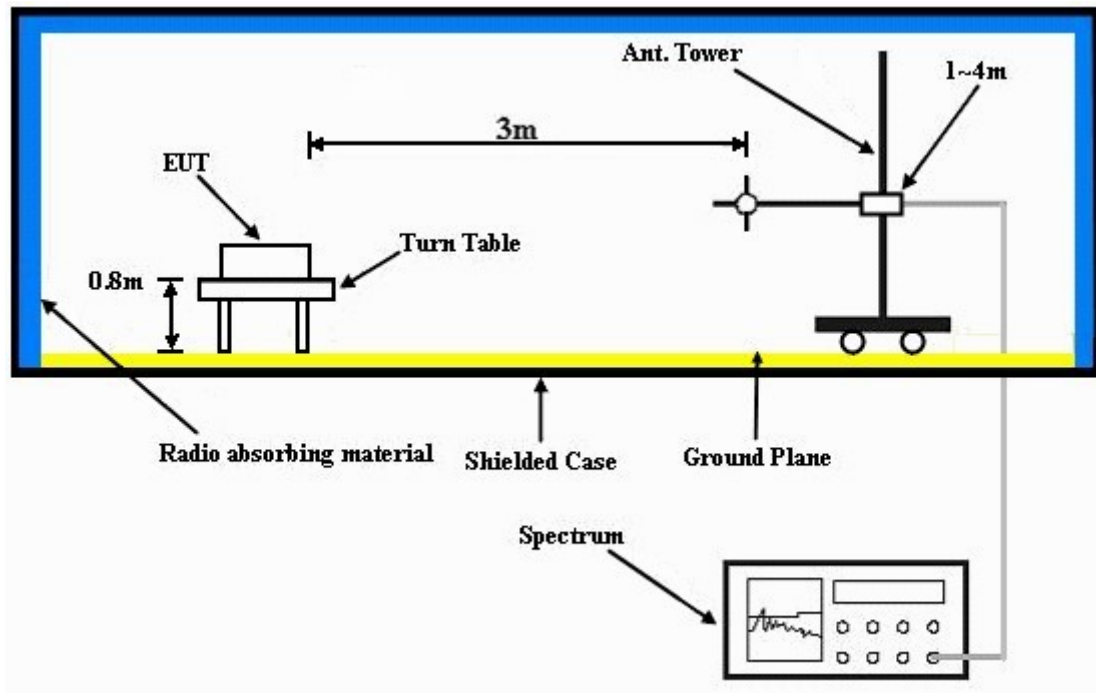
**NOTE:**

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

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.1.5 TEST SETUP



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

#### 4.1.6 EUT OPERATING CONDITIONS

##### **TEST MODE A**

- a. Connected the EUT to the Notebook system via a USB cable and placed on a testing table.
- b. The Notebook system ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- c. The necessary accessories enable the EUT in full functions.

##### **TEST MODE B**

- a. Connected the EUT to the Notebook system via an RS232 cable and placed on a testing table.
- b. The Notebook system ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- c. The necessary accessories enable the EUT in full functions.



#### 4.1.7 TEST RESULTS

##### 802.11b DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1002hPa	TESTED BY	Lori Chiu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1608.00	44.46 PK	74.00	-29.54	1.76 H	141	14.31	30.15
2	1608.00	39.41 AV	54.00	-14.59	1.76 H	141	9.26	30.15
3	2390.00	59.27 PK	74.00	-14.73	1.31 H	305	26.19	33.08
4	2390.00	48.14 AV	54.00	-5.86	1.31 H	305	15.06	33.08
5	*2412.00	107.35 PK			1.31 H	305	74.17	33.18
6	*2412.00	103.90 AV			1.31 H	305	70.72	33.18
7	4824.00	53.90 PK	74.00	-20.10	1.27 H	282	14.75	39.15
8	4824.00	50.08 AV	54.00	-3.92	1.27 H	282	10.93	39.15
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1608.00	43.88 PK	74.00	-30.12	1.14 V	342	13.73	30.15
2	1608.00	36.28 AV	54.00	-17.72	1.14 V	342	6.13	30.15
3	2390.00	57.56 PK	74.00	-16.44	1.16 V	188	24.48	33.08
4	2390.00	47.00 AV	54.00	-7.00	1.16 V	188	13.92	33.08
5	*2412.00	96.55 PK			1.16 V	188	63.37	33.18
6	*2412.00	93.21 AV			1.16 V	188	60.03	33.18
7	4824.00	52.11 PK	74.00	-21.89	1.25 V	157	12.96	39.15
8	4824.00	47.77 AV	54.00	-6.23	1.25 V	157	8.62	39.15

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1002hPa	TESTED BY	Lori Chiu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1624.00	46.12 PK	74.00	-27.88	1.20 H	126	15.91	30.21
2	1624.00	41.97 AV	54.00	-12.03	1.20 H	126	11.76	30.21
3	*2437.00	107.33 PK			1.22 H	310	74.05	33.28
4	*2437.00	103.85 AV			1.22 H	310	70.57	33.28
5	4874.00	53.99 PK	74.00	-20.01	1.02 H	128	14.85	39.14
6	4874.00	50.81 AV	54.00	-3.19	1.02 H	128	11.67	39.14
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1624.00	46.25 PK	74.00	-27.75	1.15 V	19	16.04	30.21
2	1624.00	39.91 AV	54.00	-14.09	1.15 V	19	9.70	30.21
3	*2437.00	96.84 PK			1.10 V	200	63.56	33.28
4	*2437.00	93.79 AV			1.10 V	200	60.51	33.28
5	4874.00	51.41 PK	74.00	-22.59	1.00 V	337	12.26	39.14
6	4874.00	46.42 AV	54.00	-7.58	1.00 V	337	7.27	39.14

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1002hPa	TESTED BY	Lori Chiu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#1641.00	45.39 PK	87.32	-41.93	1.03 H	70	15.12	30.27
2	#1641.00	40.42 AV	83.73	-43.31	1.03 H	70	10.15	30.27
3	*2462.00	107.32 PK			1.28 H	304	73.94	33.38
4	*2462.00	103.73 AV			1.28 H	304	70.35	33.38
5	2483.50	58.83 PK	74.00	-15.17	1.28 H	318	25.37	33.46
6	2483.50	49.50 AV	54.00	-4.50	1.28 H	318	16.04	33.46
7	4924.00	54.43 PK	74.00	-19.57	1.06 H	140	15.07	39.35
8	4924.00	51.88 AV	54.00	-2.12	1.06 H	140	12.53	39.35

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#1641.00	45.02 PK	77.30	-32.28	1.02 V	281	14.75	30.27
2	#1641.00	40.96 AV	74.18	-33.22	1.02 V	281	10.69	30.27
3	*2462.00	97.30 PK			1.00 V	347	63.92	33.38
4	*2462.00	94.18 AV			1.00 V	347	60.80	33.38
5	2483.50	58.73 PK	74.00	-15.27	1.00 V	347	25.27	33.46
6	2483.50	47.30 AV	54.00	-6.70	1.00 V	347	13.84	33.46
7	4924.00	50.80 PK	74.00	-23.20	1.15 V	325	11.44	39.35
8	4924.00	45.19 AV	54.00	-8.81	1.15 V	325	5.83	39.35

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



### 802.11g OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH 1002hPa	TESTED BY	Antony Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.06 PK	74.00	-15.94	1.34 H	308	25.62	32.44
2	2390.00	47.82 AV	54.00	-6.18	1.34 H	308	15.38	32.44
3	*2412.00	107.10 PK			1.33 H	309	74.58	32.52
4	*2412.00	96.89 AV			1.33 H	309	64.37	32.52
5	4824.00	49.48 PK	74.00	-24.52	1.00 H	103	11.18	38.30
6	4824.00	37.49 AV	54.00	-16.51	1.00 H	103	-0.81	38.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.34 PK	74.00	-15.66	1.15 V	3	25.90	32.44
2	2390.00	47.22 AV	54.00	-6.78	1.15 V	3	14.78	32.44
3	*2412.00	105.13 PK			1.16 V	1	72.61	32.52
4	*2412.00	94.95 AV			1.16 V	1	62.43	32.52
5	4824.00	51.33 PK	74.00	-22.67	1.00 V	26	13.03	38.30
6	4824.00	39.39 AV	54.00	-14.61	1.00 V	26	1.09	38.30

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH 1002hPa	TESTED BY	Antony Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	107.27 PK			1.00 H	320	74.67	32.60
2	*2437.00	96.95 AV			1.00 H	320	64.35	32.60
3	4874.00	51.08 PK	74.00	-22.92	1.02 H	360	12.58	38.50
4	4874.00	37.24 AV	54.00	-16.76	1.02 H	360	-1.26	38.50

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	105.21 PK			1.16 V	8	72.61	32.60
2	*2437.00	95.02 AV			1.16 V	8	62.42	32.60
3	4874.00	51.22 PK	74.00	-22.78	1.00 V	31	12.72	38.50
4	4874.00	38.87 AV	54.00	-15.13	1.00 V	31	0.37	38.50

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH 1002hPa	TESTED BY	Antony Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	107.17 PK			1.29 H	307	74.49	32.68
2	*2462.00	97.00 AV			1.29 H	307	64.32	32.68
3	2483.50	62.51 PK	74.00	-11.49	1.23 H	301	29.75	32.76
4	2483.50	49.71 AV	54.00	-4.29	1.23 H	301	16.95	32.76
5	4924.00	50.48 PK	74.00	-23.52	1.00 H	36	11.84	38.64
6	4924.00	37.74 AV	54.00	-16.26	1.00 H	36	-0.90	38.64
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	105.24 PK			1.10 V	259	72.56	32.68
2	*2462.00	95.11 AV			1.10 V	259	62.43	32.68
3	2483.50	61.96 PK	74.00	-12.04	1.10 V	258	29.20	32.76
4	2483.50	48.86 AV	54.00	-5.14	1.10 V	258	16.10	32.76
5	4924.00	52.20 PK	74.00	-21.80	1.00 V	26	13.56	38.64
6	4924.00	38.48 AV	54.00	-15.52	1.00 V	26	-0.16	38.64

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



A D T

**BELOW 1GHz WORST-CASE DATA : 802.11g OFDM MODULATION**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1000hPa	TESTED BY	Lori Chiu
TEST MODE	A		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	156.28	34.73 QP	43.50	-8.77	1.25 H	277	20.52	14.21
2	675.40	39.51 QP	46.00	-6.49	1.25 H	355	15.09	24.43
3	799.84	43.86 QP	46.00	-2.14	1.00 H	40	17.84	26.02
4	827.06	37.41 QP	46.00	-8.59	1.00 H	355	10.90	26.51
5	932.05	36.60 QP	46.00	-9.40	1.25 H	352	8.28	28.32
6	947.60	42.81 QP	46.00	-3.19	1.25 H	334	14.28	28.53
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	156.28	38.56 QP	43.50	-4.94	1.00 V	10	24.35	14.21
2	475.14	38.86 QP	46.00	-7.14	1.00 V	7	18.99	19.87
3	632.63	38.23 QP	46.00	-7.77	1.00 V	49	14.92	23.31
4	677.35	41.45 QP	46.00	-4.55	1.50 V	7	16.98	24.47
5	722.07	36.27 QP	46.00	-9.73	2.00 V	7	11.03	25.24
6	753.18	36.22 QP	46.00	-9.78	1.50 V	7	10.69	25.53
7	795.95	44.04 QP	46.00	-1.96	2.00 V	7	18.07	25.98
8	815.39	36.13 QP	46.00	-9.87	2.00 V	19	9.83	26.30
9	904.83	42.73 QP	46.00	-3.27	1.50 V	10	14.76	27.97
10	949.55	41.37 QP	46.00	-4.63	1.25 V	31	12.82	28.55

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1000hPa	TESTED BY	Lori Chiu
TEST MODE	B		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	675.40	38.00 QP	46.00	-8.00	1.00 H	349	13.58	24.43
2	751.23	37.02 QP	46.00	-8.98	1.00 H	22	11.51	25.51
3	799.84	39.70 QP	46.00	-6.30	2.00 H	25	13.68	26.02
4	832.89	39.68 QP	46.00	-6.32	1.50 H	70	13.07	26.62
5	902.89	42.72 QP	46.00	-3.28	2.00 H	46	14.78	27.94
6	933.99	36.83 QP	46.00	-9.17	1.00 H	352	8.48	28.35
7	947.60	42.79 QP	46.00	-3.21	1.00 H	343	14.26	28.53
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	164.06	37.57 QP	43.50	-5.93	1.25 V	10	23.50	14.07
2	473.20	36.31 QP	46.00	-9.69	1.00 V	10	16.49	19.82
3	677.35	40.65 QP	46.00	-5.35	1.25 V	10	16.18	24.47
4	694.85	36.35 QP	46.00	-9.65	1.50 V	10	11.44	24.91
5	751.23	37.35 QP	46.00	-8.65	1.50 V	4	11.84	25.51
6	799.84	38.99 QP	46.00	-7.01	1.00 V	10	12.97	26.02
7	904.83	41.34 QP	46.00	-4.66	1.25 V	43	13.37	27.97
8	949.55	42.67 QP	46.00	-3.33	1.25 V	10	14.12	28.55

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

## 4.2 CONDUCTED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Sep. 22, 2008	Sep. 21, 2009
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 31, 2008	Dec. 30, 2009
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Dec. 29, 2008	Dec. 28, 2009
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Jul. 30, 2008	Jul. 29, 2009
Software ADT	ADT_Cond_ V7.3.7	NA	NA	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  2. The test was performed in HwaYa Shielded Room 2.
  3. The VCCI Site Registration No. is C-2047.

#### 4.2.3 TEST PROCEDURES

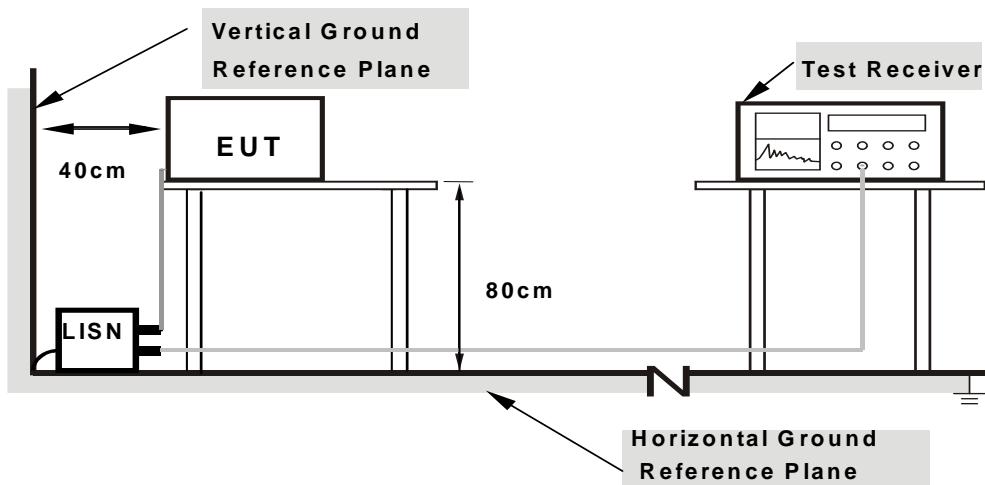
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

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

#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.2.5 TEST SETUP



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

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

#### 4.2.6 EUT OPERATING CONDITIONS

Same as item 4.1.6.



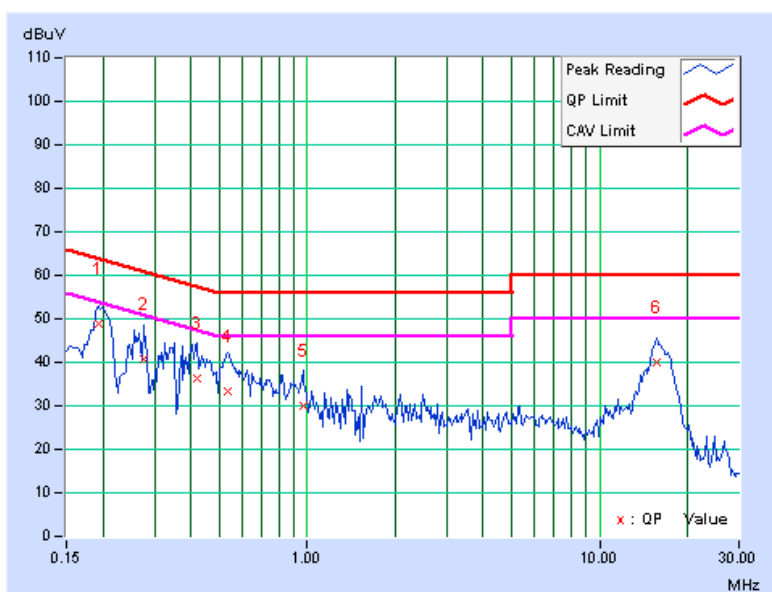
### 4.2.7 TEST RESULTS

#### CONDUCTED WORST-CASE DATA: 802.11g OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	PHASE	Line 1
MODULATION TYPE	BPSK	INPUT POWER	120Vac, 60Hz
TRANSFER RATE	6.0Mbps	6dB BANDWIDTH	9kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1012hPa	TESTED BY	Mark Liao
TEST MODE	A		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.193	0.13	48.60	-	48.73	-	63.91	53.91	-15.18	-
2	0.275	0.13	40.58	-	40.71	-	60.97	50.97	-20.25	-
3	0.420	0.14	36.00	-	36.14	-	57.46	47.46	-21.32	-
4	0.533	0.15	33.32	-	33.47	-	56.00	46.00	-22.53	-
5	0.970	0.17	29.68	-	29.85	-	56.00	46.00	-26.15	-
6	15.625	0.57	39.47	-	40.04	-	60.00	50.00	-19.96	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Emission level - Limit value
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading Value.



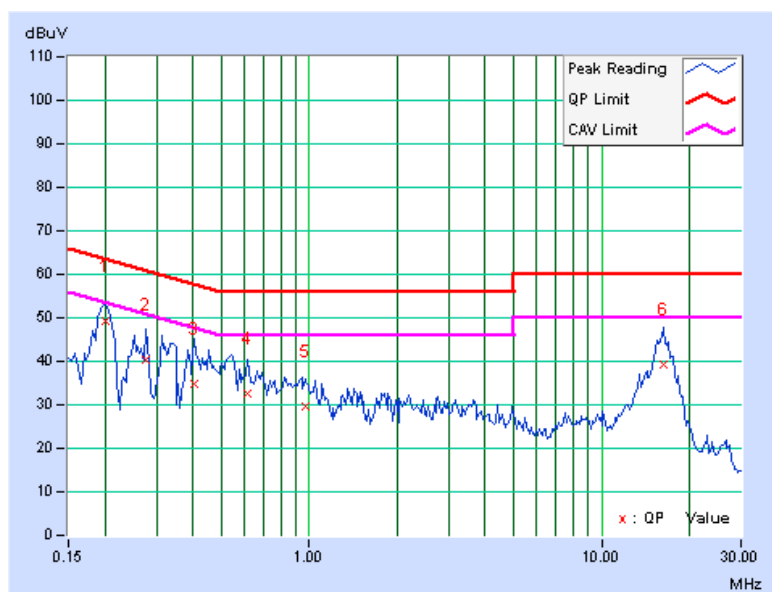


A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	PHASE	Line 2
MODULATION TYPE	BPSK	INPUT POWER	120Vac, 60Hz
TRANSFER RATE	6.0Mbps	6dB BANDWIDTH	9kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1012hPa	TESTED BY	Mark Liao
TEST MODE	A		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.201	0.13	49.31	-	49.44	-	63.58
2	0.275	0.14	40.16	-	40.30	-	60.97	50.97	-20.67	-
3	0.404	0.15	34.81	-	34.96	-	57.77	47.77	-22.81	-
4	0.615	0.16	32.28	-	32.44	-	56.00	46.00	-23.56	-
5	0.970	0.17	29.32	-	29.49	-	56.00	46.00	-26.51	-
6	16.215	0.70	38.62	-	39.32	-	60.00	50.00	-20.68	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Emission level - Limit value
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading Value.



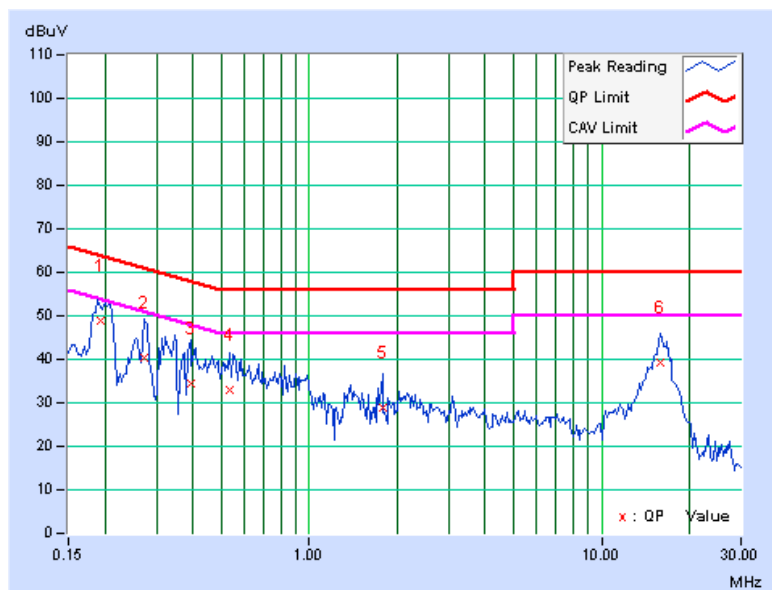


A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	PHASE	Line 1
MODULATION TYPE	BPSK	INPUT POWER	120Vac, 60Hz
TRANSFER RATE	6.0Mbps	6dB BANDWIDTH	9kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1012hPa	TESTED BY	Mark Liao
TEST MODE	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.193	0.13	48.88	-	49.01	-	63.89	53.89	-14.88	-
2	0.271	0.13	40.20	-	40.33	-	61.08	51.08	-20.75	-
3	0.392	0.14	34.40	-	34.54	-	58.02	48.02	-23.48	-
4	0.533	0.15	32.75	-	32.90	-	56.00	46.00	-23.10	-
5	1.777	0.19	28.84	-	29.03	-	56.00	46.00	-26.97	-
6	15.984	0.58	38.62	-	39.20	-	60.00	50.00	-20.80	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Emission level - Limit value
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading Value.



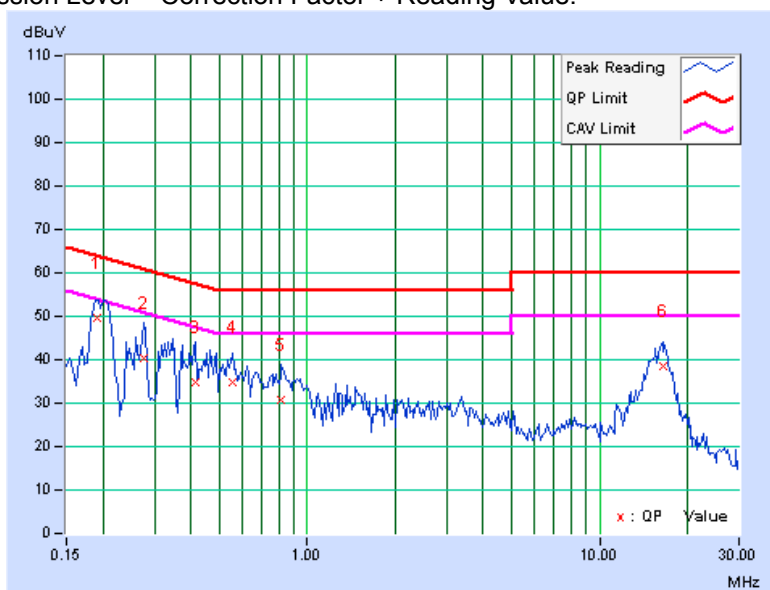


A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	PHASE	Line 2
MODULATION TYPE	BPSK	INPUT POWER	120Vac, 60Hz
TRANSFER RATE	6.0Mbps	6dB BANDWIDTH	9kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1012hPa	TESTED BY	Mark Liao
TEST MODE	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.191	0.13	49.48	-	49.61	-	64.01	54.01	-14.40	-
2	0.275	0.14	40.15	-	40.29	-	60.97	50.97	-20.68	-
3	0.416	0.15	34.80	-	34.95	-	57.54	47.54	-22.58	-
4	0.552	0.16	34.74	-	34.90	-	56.00	46.00	-21.10	-
5	0.818	0.16	30.69	-	30.85	-	56.00	46.00	-25.15	-
6	16.520	0.71	37.78	-	38.49	-	60.00	50.00	-21.51	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Emission level - Limit value
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading Value.



### 4.3 6dB BANDWIDTH MEASUREMENT

#### 4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

#### 4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
R&S SPECTRUM ANALYZER	FSP40	100041	Apr. 22, 2008	Apr. 21, 2009

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

#### 4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 300kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

### 4.3.5 TEST SETUP



### 4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

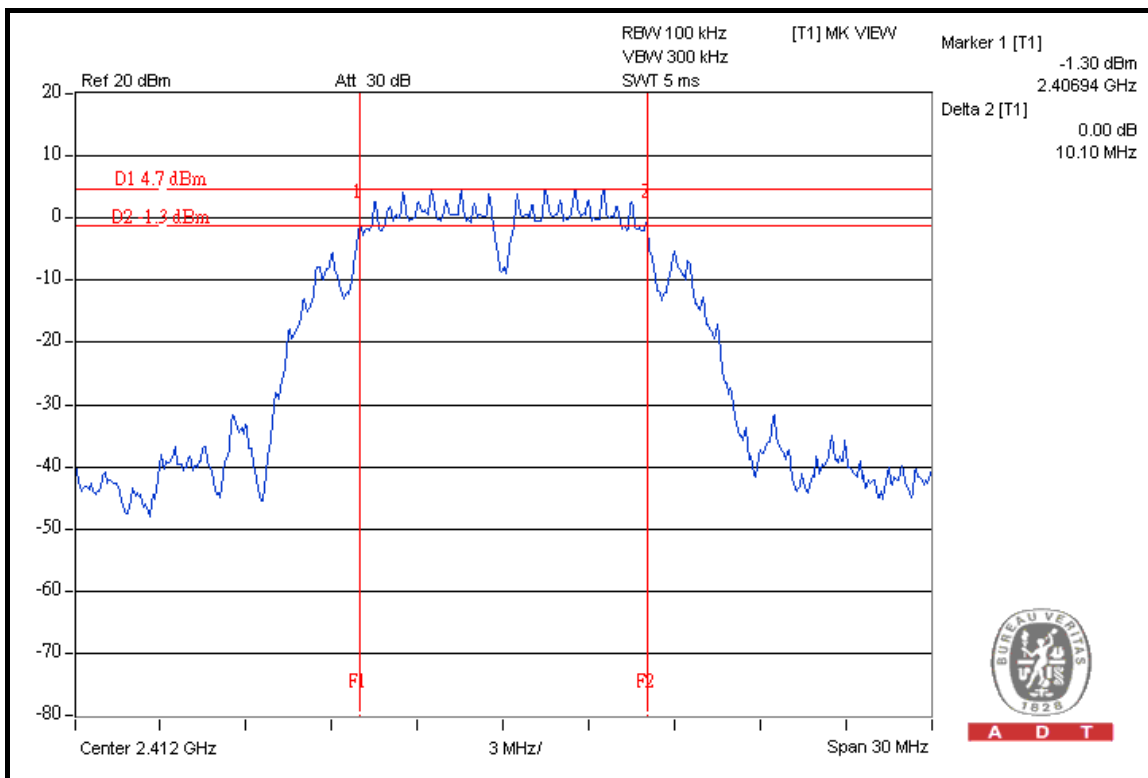
### 4.3.7 TEST RESULTS

#### 802.11b DSSS MODULATION

<b>MODULATION TYPE</b>	DBPSK	<b>TRANSFER RATE</b>	1.0Mbps
<b>INPUT POWER</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 1017hPa
<b>TEST MODE</b>	A	<b>TESTED BY</b>	Antony Lee

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	10.10	0.5	PASS
6	2437	10.14	0.5	PASS
11	2462	10.14	0.5	PASS

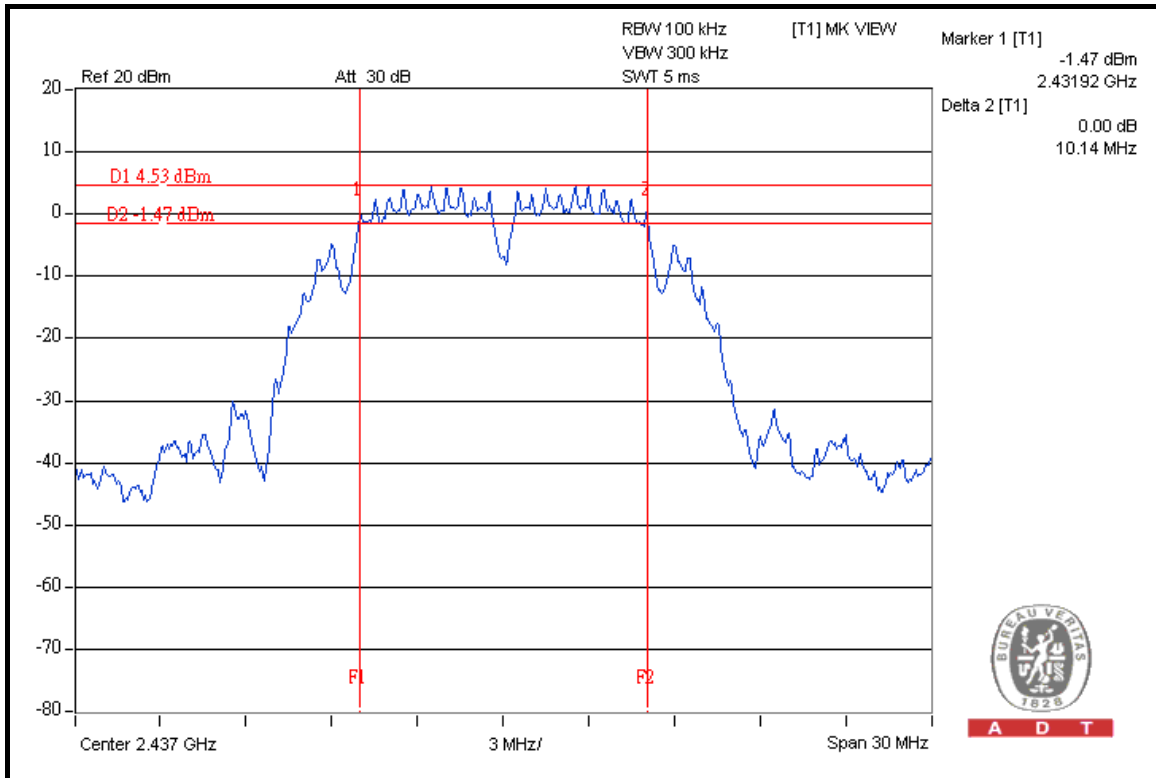
#### CH 1



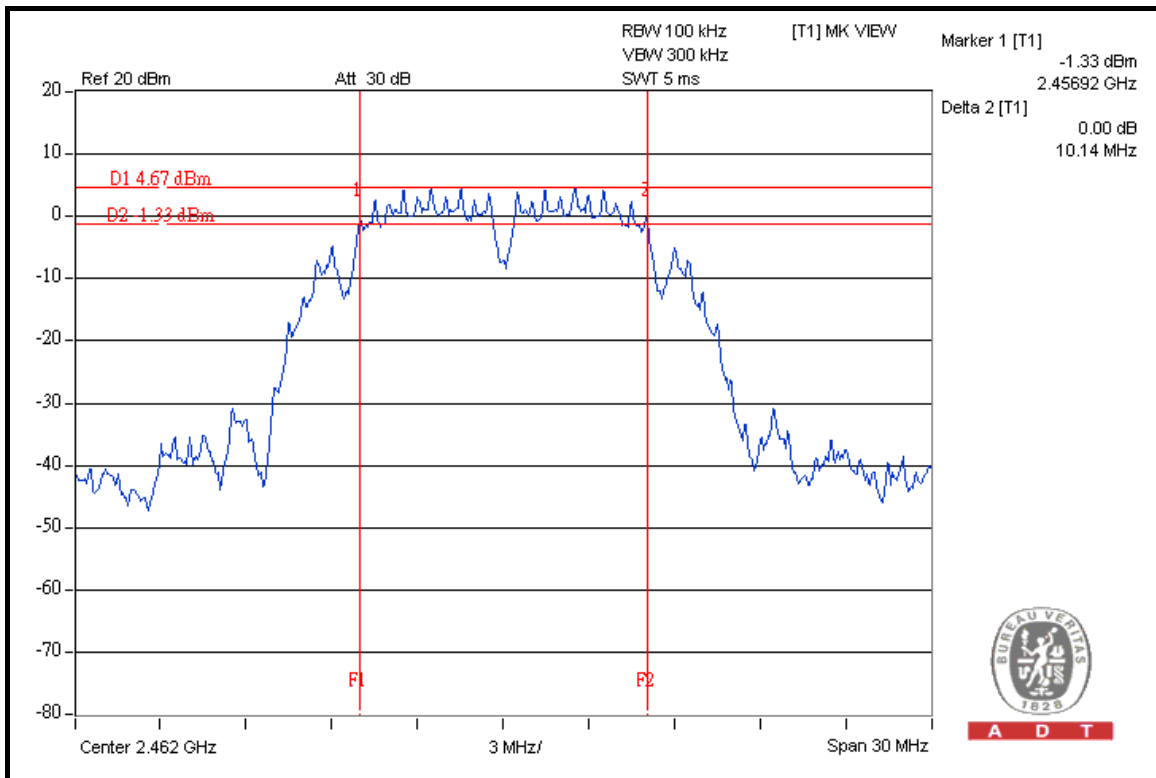


A D T

### CH 6



### CH 11







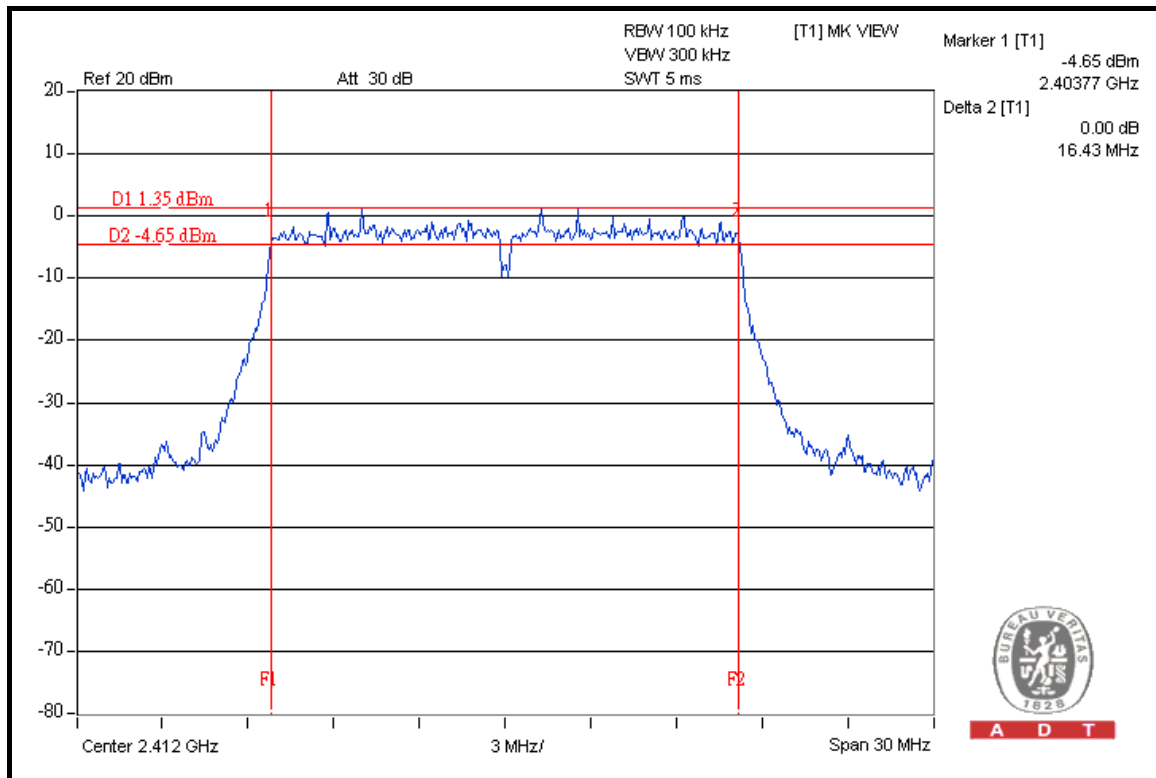
A D T

### 802.11g OFDM MODULATION

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6.0Mbps
<b>INPUT POWER</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 1017hPa
<b>TEST MODE</b>	A	<b>TESTED BY</b>	Antony Lee

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.43	0.5	PASS
6	2437	16.41	0.5	PASS
11	2462	16.44	0.5	PASS

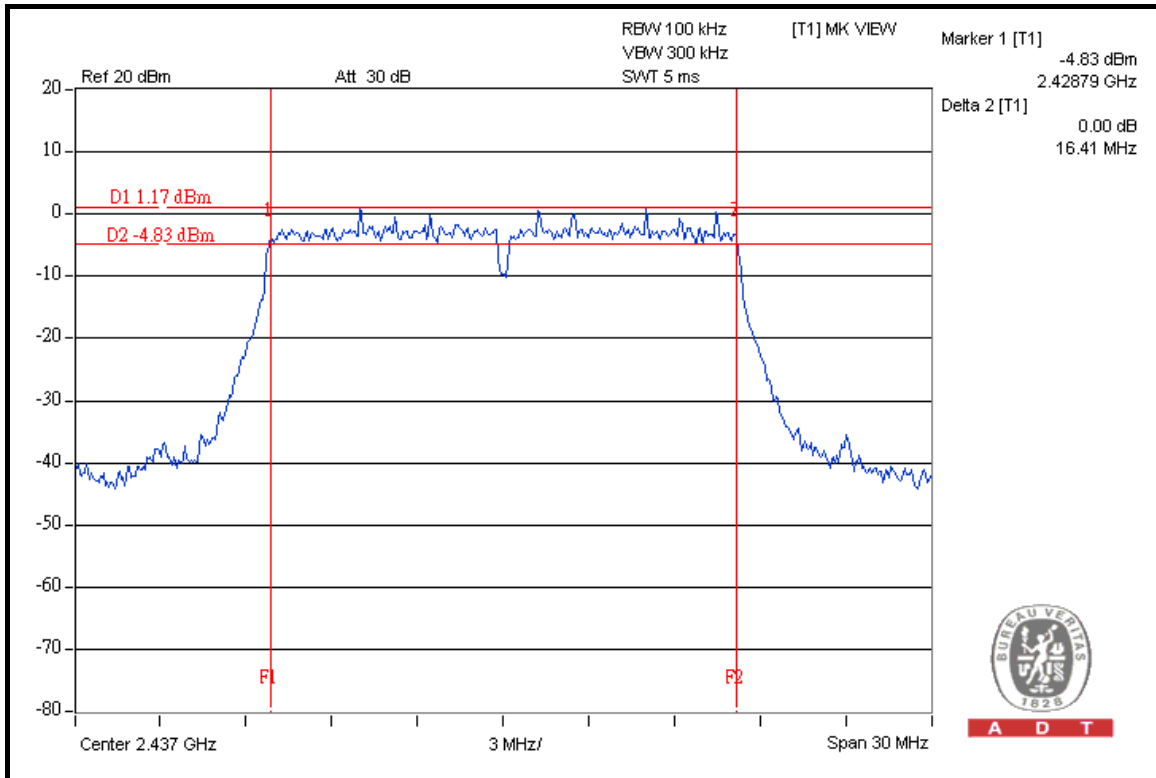
### CH 1



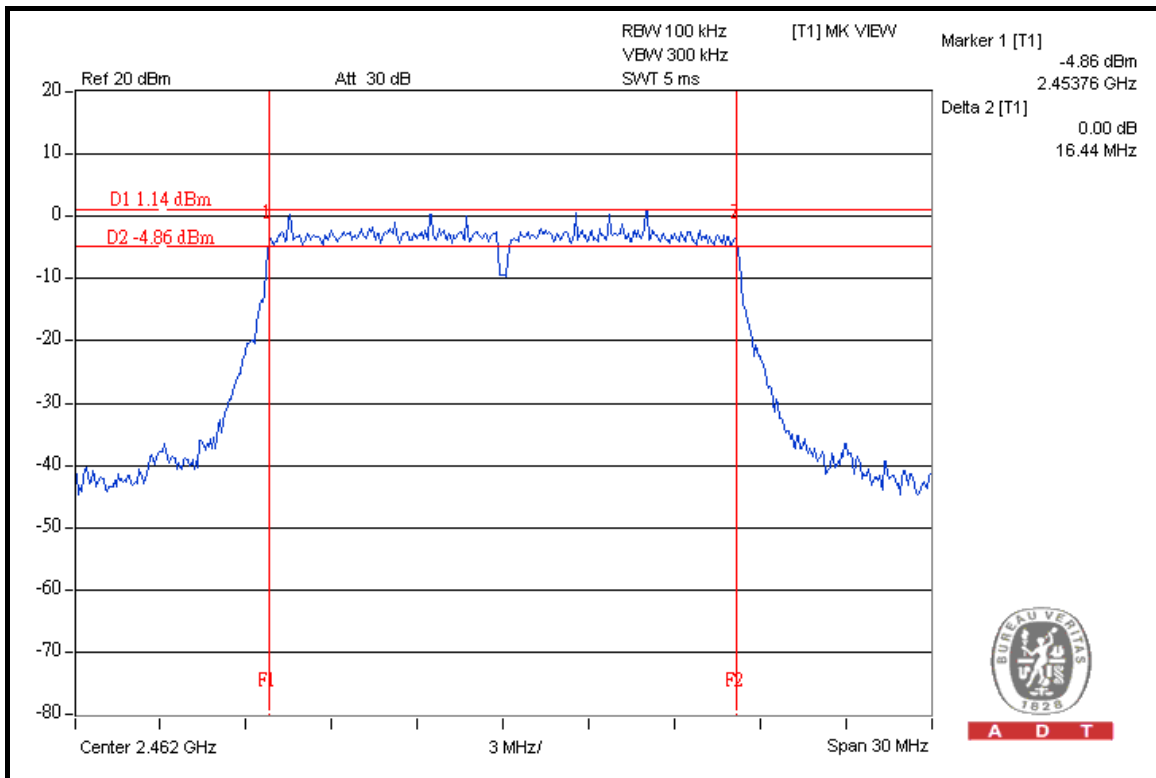


A D T

### CH 6



### CH 11



#### 4.4 MAXIMUM PEAK OUTPUT POWER

##### 4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

##### 4.4.2 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
HIGH SPEED PEAK POWER METER	ML2495A	0824012	Aug. 04, 2008	Aug. 03, 2009
POWER SENSOR	MA2444B	0738138	Aug. 04, 2008	Aug. 03, 2009

**NOTE:**

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Measurement Bandwidth of ML2495A is 65MHz greater than 6dB bandwidth of emission.

##### 4.4.3 TEST PROCEDURES

A power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

##### 4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.4.5 TEST SETUP



#### 4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.

#### 4.4.7 TEST RESULTS

##### 802.11b DSSS MODULATION

<b>MODULATION TYPE</b>	DBPSK	<b>TRANSFER RATE</b>	1.0Mbps
<b>INPUT POWER</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 1017hPa
<b>TEST MODE</b>	A	<b>TESTED BY</b>	Antony Lee

CHAN	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	56.494	17.52	30	PASS
6	2437	56.754	17.54	30	PASS
11	2462	57.016	17.56	30	PASS

##### 802.11g OFDM MODULATION

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6.0Mbps
<b>INPUT POWER</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 1017hPa
<b>TEST MODE</b>	A	<b>TESTED BY</b>	Antony Lee

CHAN	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	200.447	23.02	30	PASS
6	2437	201.372	23.04	30	PASS
11	2462	<b>201.837</b>	23.05	30	PASS



## 4.5 POWER SPECTRAL DENSITY MEASUREMENT

### 4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

### 4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
R&S SPECTRUM ANALYZER	FSP40	100041	Apr. 22, 2008	Apr. 21, 2009

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.5.3 TEST PROCEDURE

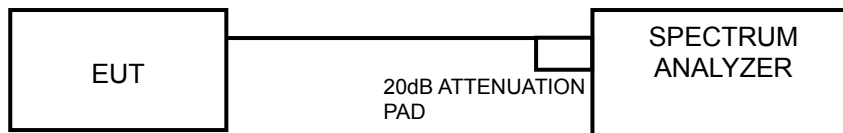
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

### 4.5.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.5.5 TEST SETUP



#### 4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6.

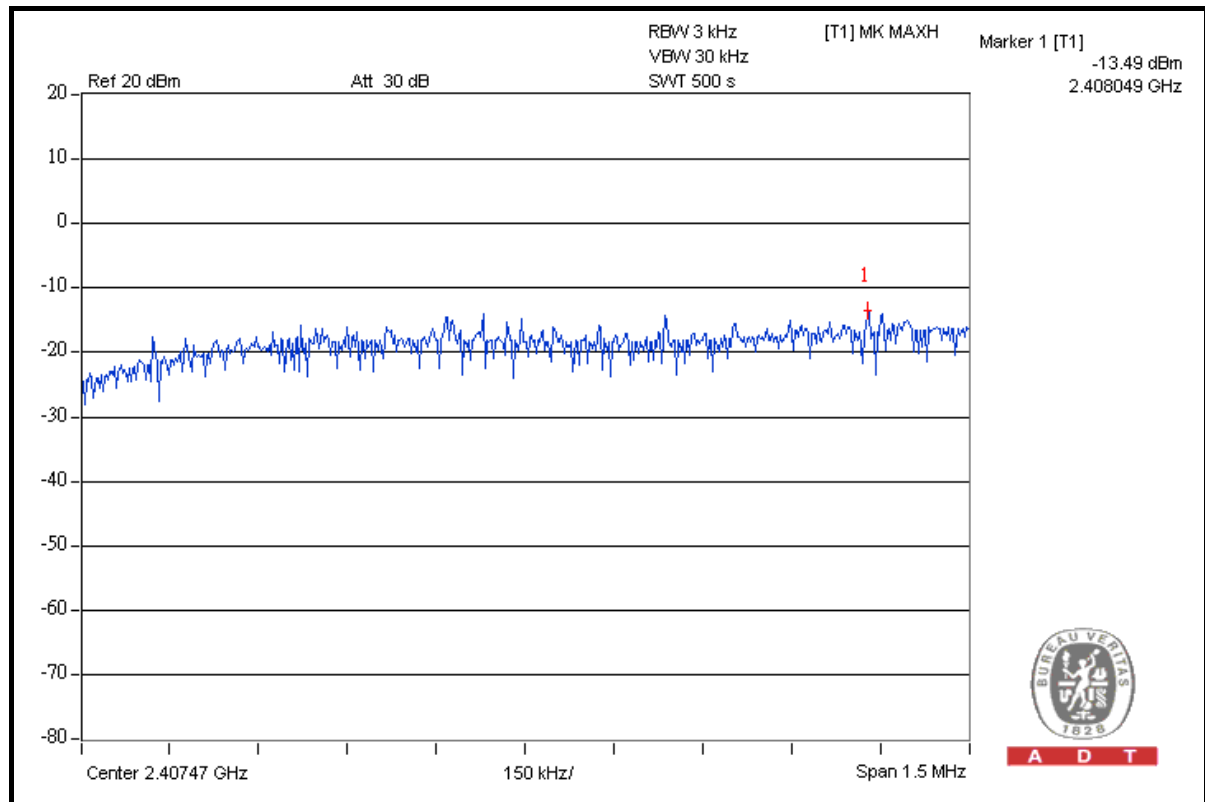
## 4.5.7 TEST RESULTS

### 802.11b DSSS MODULATION

<b>MODULATION TYPE</b>	DBPSK	<b>TRANSFER RATE</b>	1.0Mbps
<b>INPUT POWER</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 1017hPa
<b>TEST MODE</b>	A	<b>TESTED BY</b>	Antony Lee

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-13.49	8	PASS
6	2437	-13.37	8	PASS
11	2462	-13.34	8	PASS

### CH 1

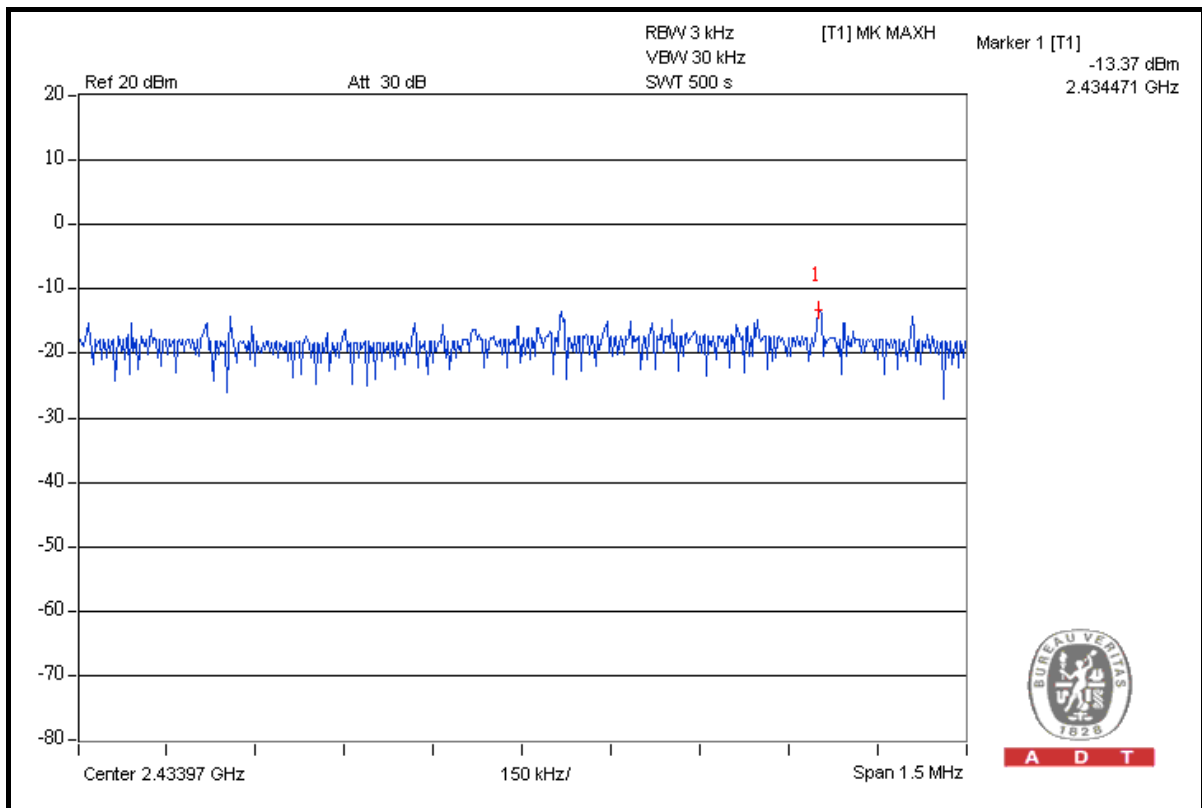




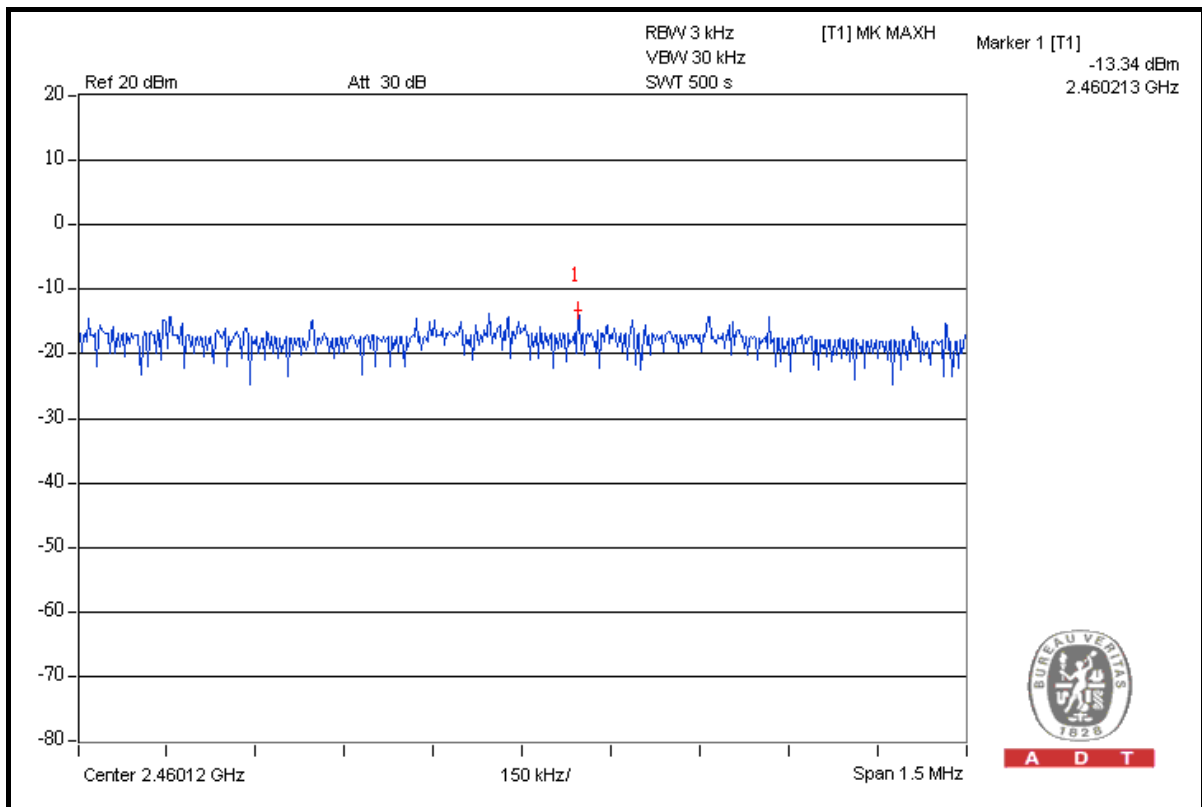


A D T

### CH 6



### CH 11





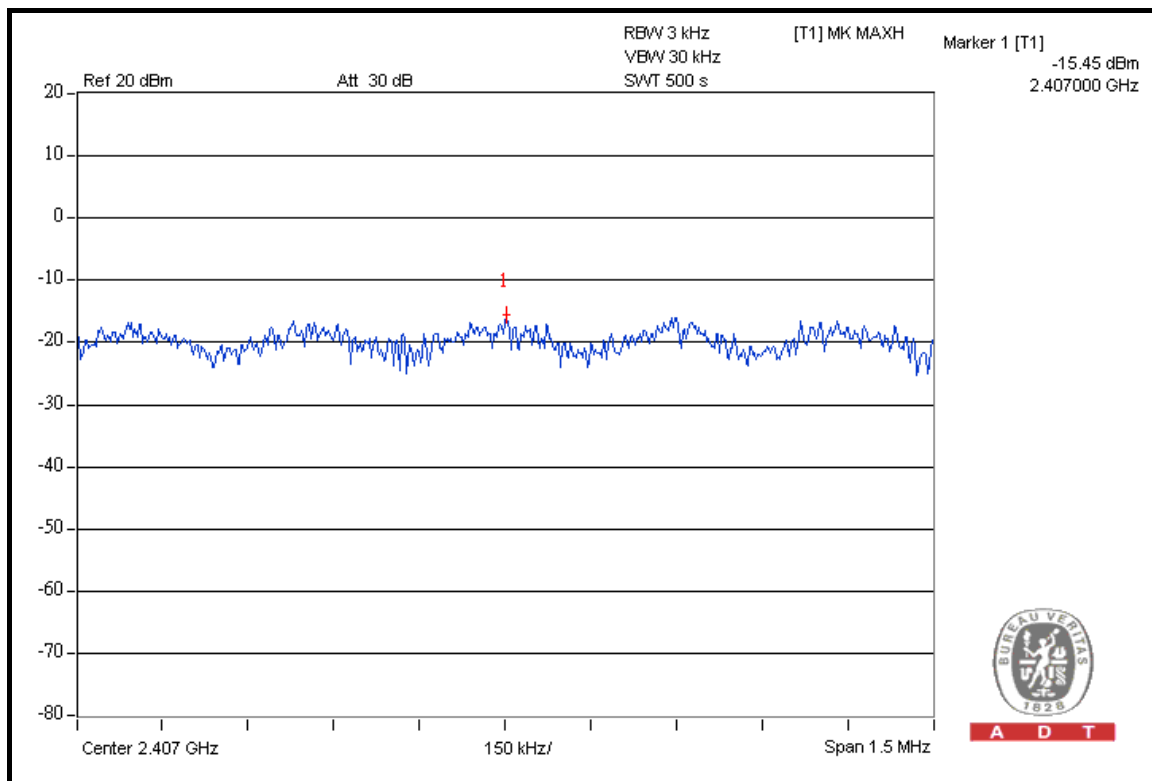
A D T

### 802.11g OFDM MODULATION

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6.0Mbps
<b>INPUT POWER</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 1017hPa
<b>TEST MODE</b>	A	<b>TESTED BY</b>	Antony Lee

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-15.45	8	PASS
6	2437	-15.56	8	PASS
11	2462	-15.51	8	PASS

### CH 1

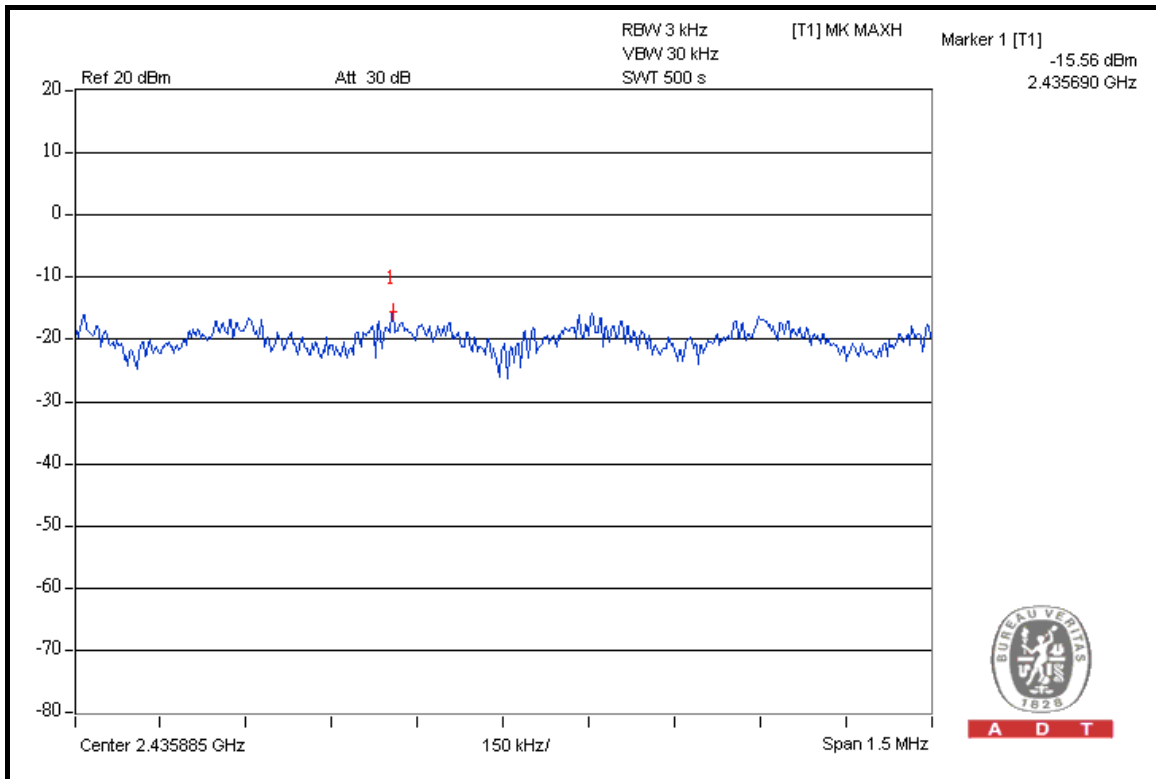


A D T



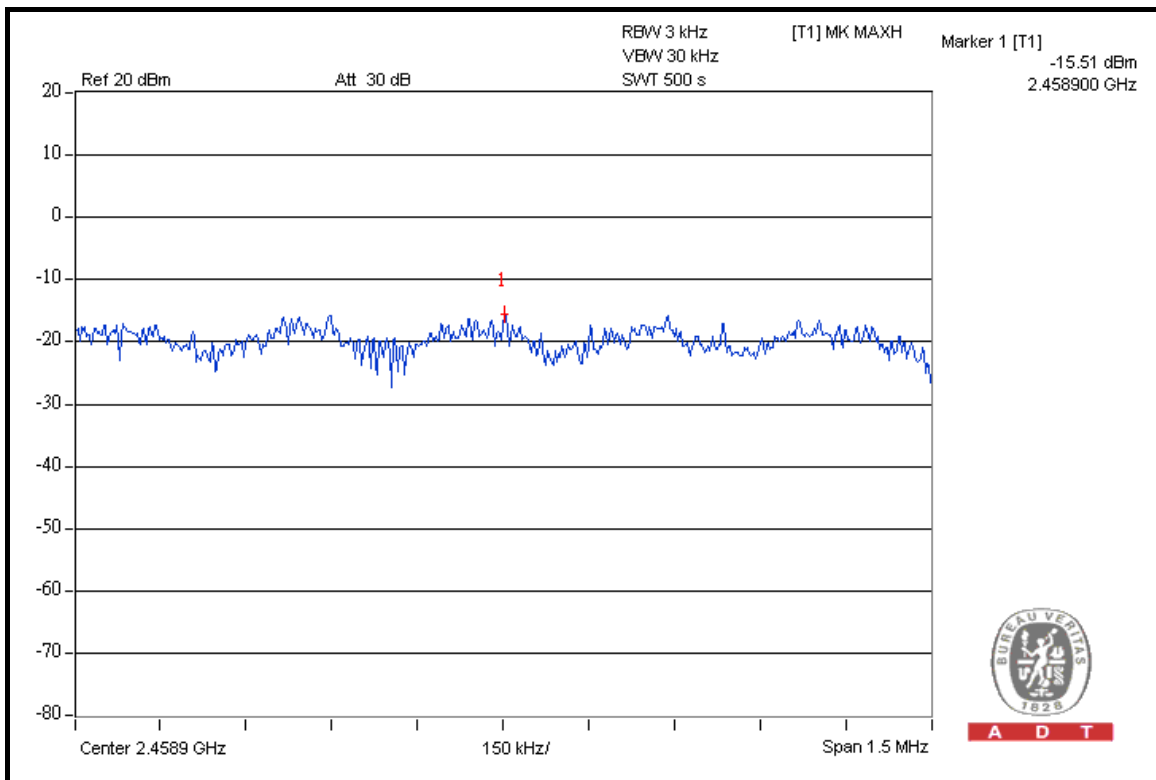
A D T

### CH 6



A D T

### CH 11



A D T

## 4.6 BAND EDGES MEASUREMENT

### 4.6.1 LIMITS OF BAND EDGES MEASUREMENT

Below  $-20\text{dB}$  of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

### 4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
R&S SPECTRUM ANALYZER	FSP40	100041	Apr. 22, 2008	Apr. 21, 2009

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.6.3 TEST PROCEDURE

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

The spectrum plots (Peak RBW = 100kHz, VBW = 300kHz; Average RBW = 1MHz, VBW = 10Hz) are attached on the following pages.

### 4.6.4 DEVIATION FROM TEST STANDARD

No deviation.

### 4.6.5 EUT OPERATING CONDITION

Same as Item 4.3.6.

#### 4.6.6 TEST RESULTS

The spectrum plots are attached on the following 12 images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

##### 802.11b DSSS MODULATION

**NOTE 1:** The band edge emission plot on the next page shows 51.26dBc between carrier maximum power and local maximum emission in restrict band (2.38620GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.1.7 is 107.35dBuV/m (Peak), so the maximum field strength in restrict band is  $107.35 - 51.26 = 56.09$ dBuV/m which is under 74dBuV/m limit.

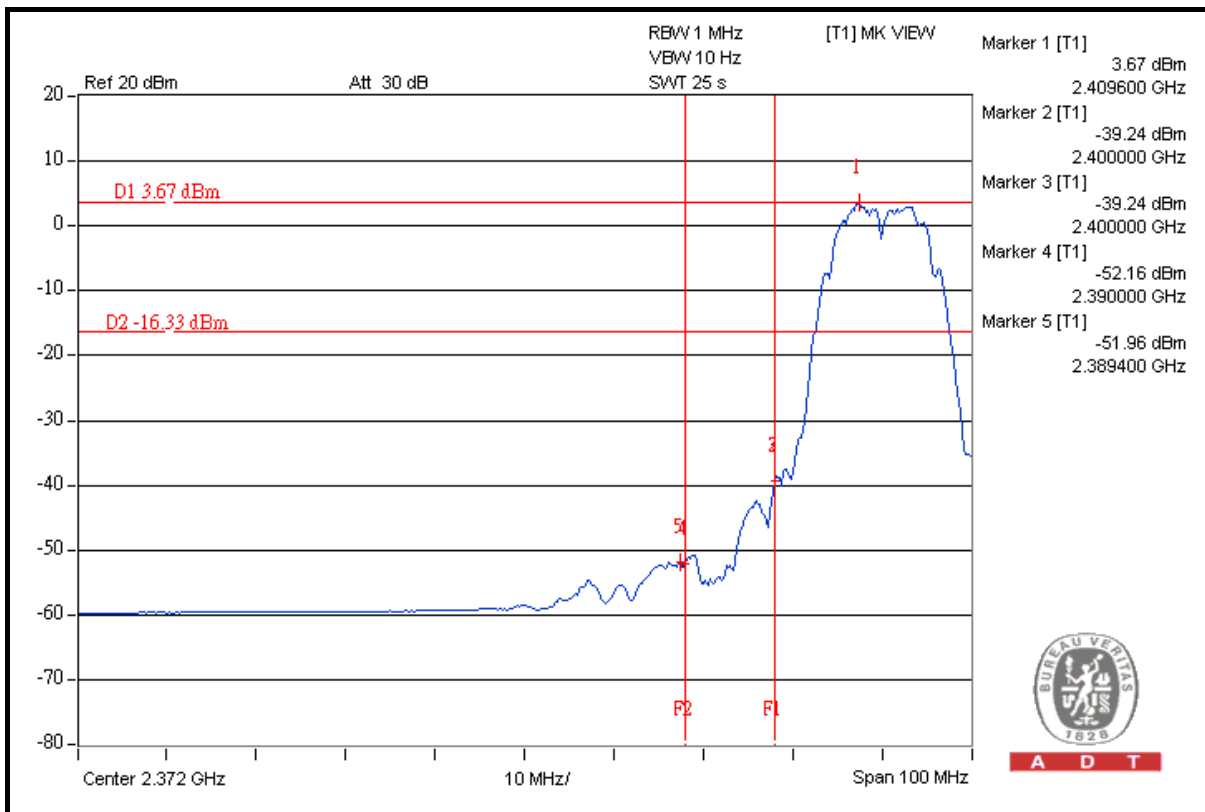
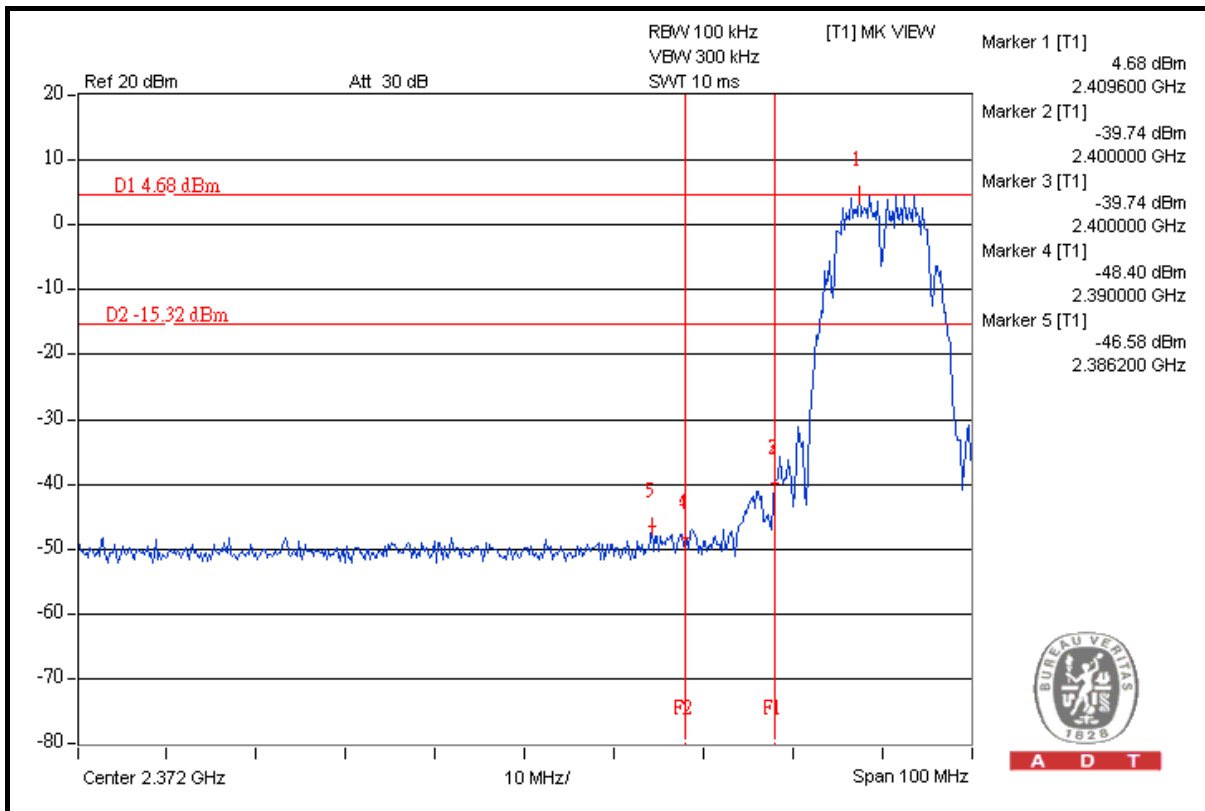
The band edge emission plot on the next page shows 55.63dBc between carrier maximum power and local maximum emission in restrict band (2.38940GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.1.7 is 103.90dBuV/m (Average), so the maximum field strength in restrict band is  $103.90 - 55.63 = 48.27$ dBuV/m which is under 54dBuV/m limit.

**NOTE 2:** The band edge emission plot on the next second page shows 51.90dBc between carrier maximum power and local maximum emission in restrict band (2.48620GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.1.7 is 107.32dBuV/m (Peak), so the maximum field strength in restrict band is  $107.32 - 51.90 = 55.42$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on the next third page shows 55.08dBc between carrier maximum power and local maximum emission in restrict band (2.48350GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.1.7 is 103.73dBuV/m (Average), so the maximum field strength in restrict band is  $103.73 - 55.08 = 48.65$ dBuV/m which is under 54dBuV/m limit.

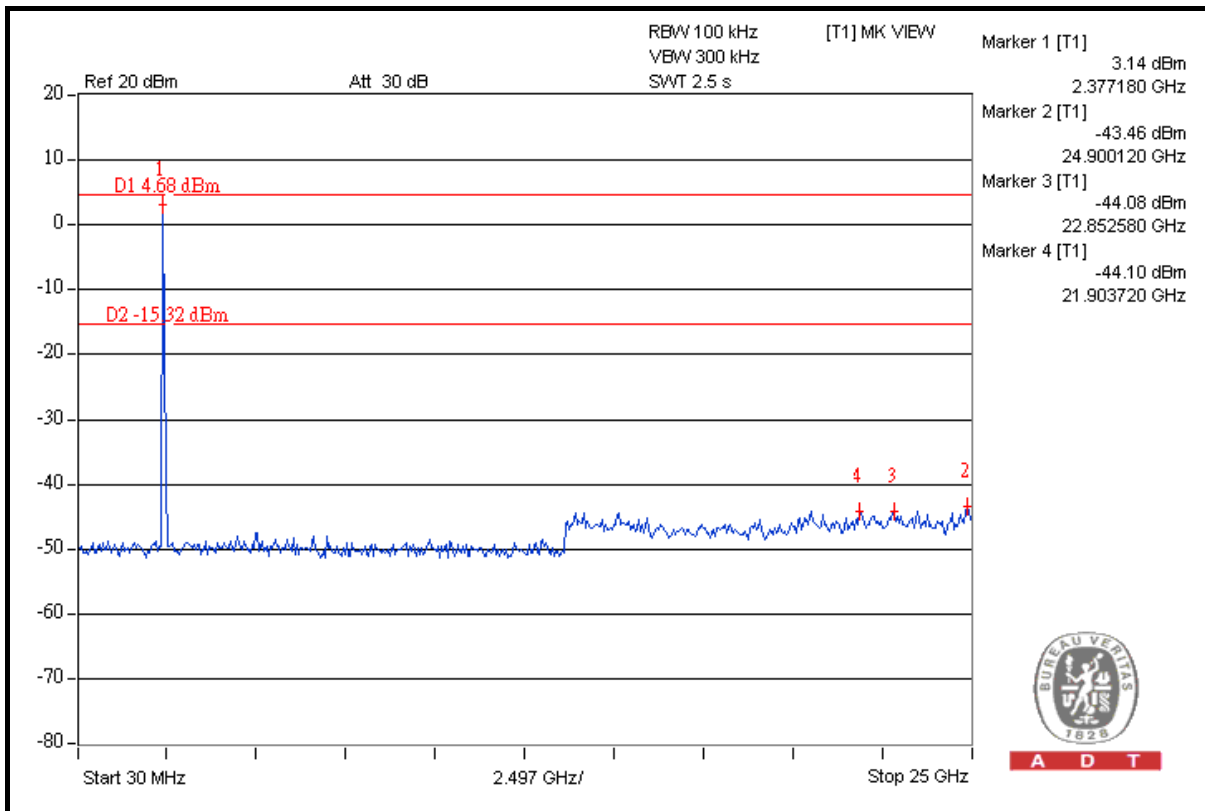


A D T

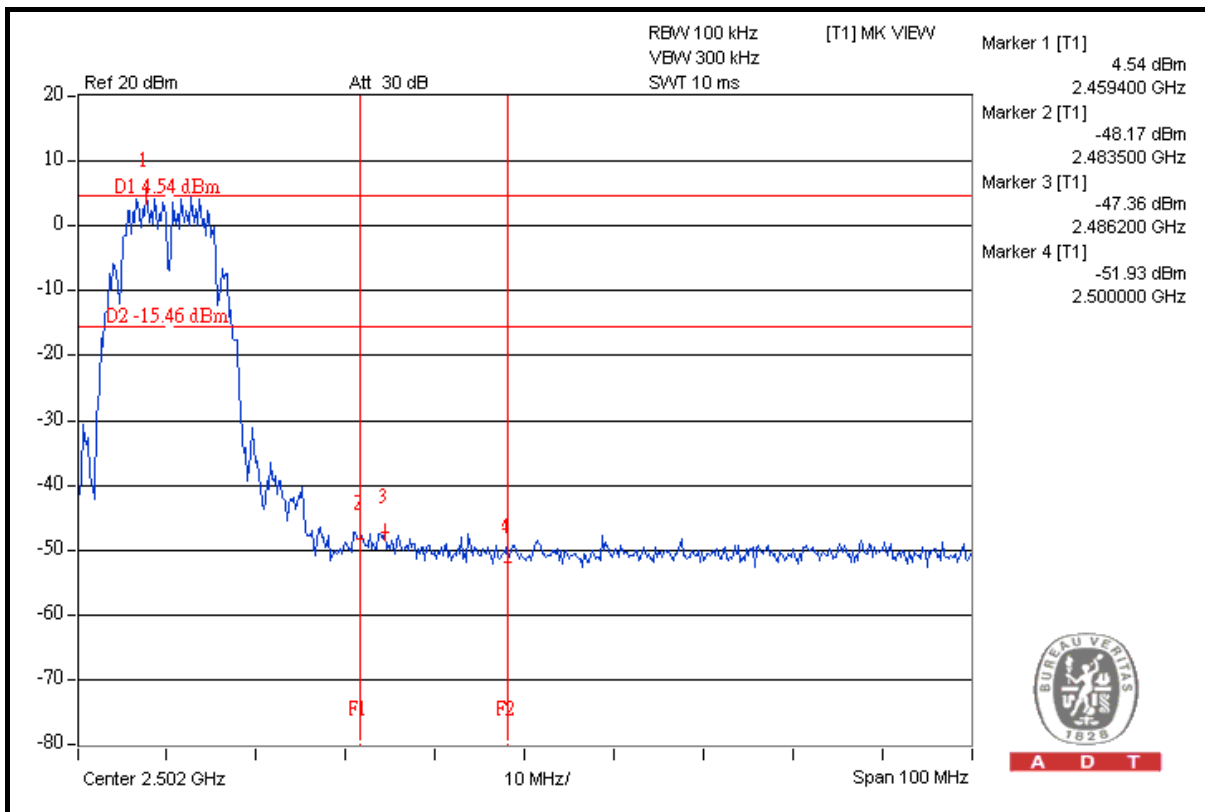




A D T



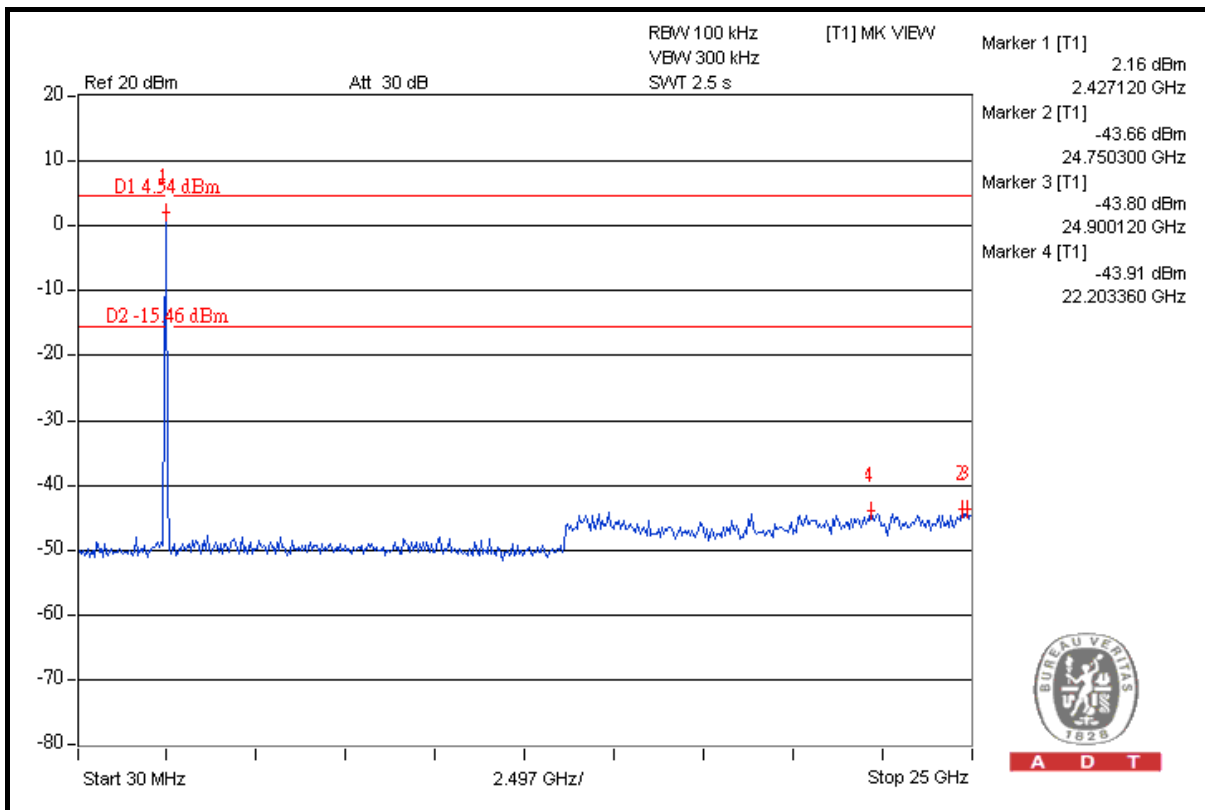
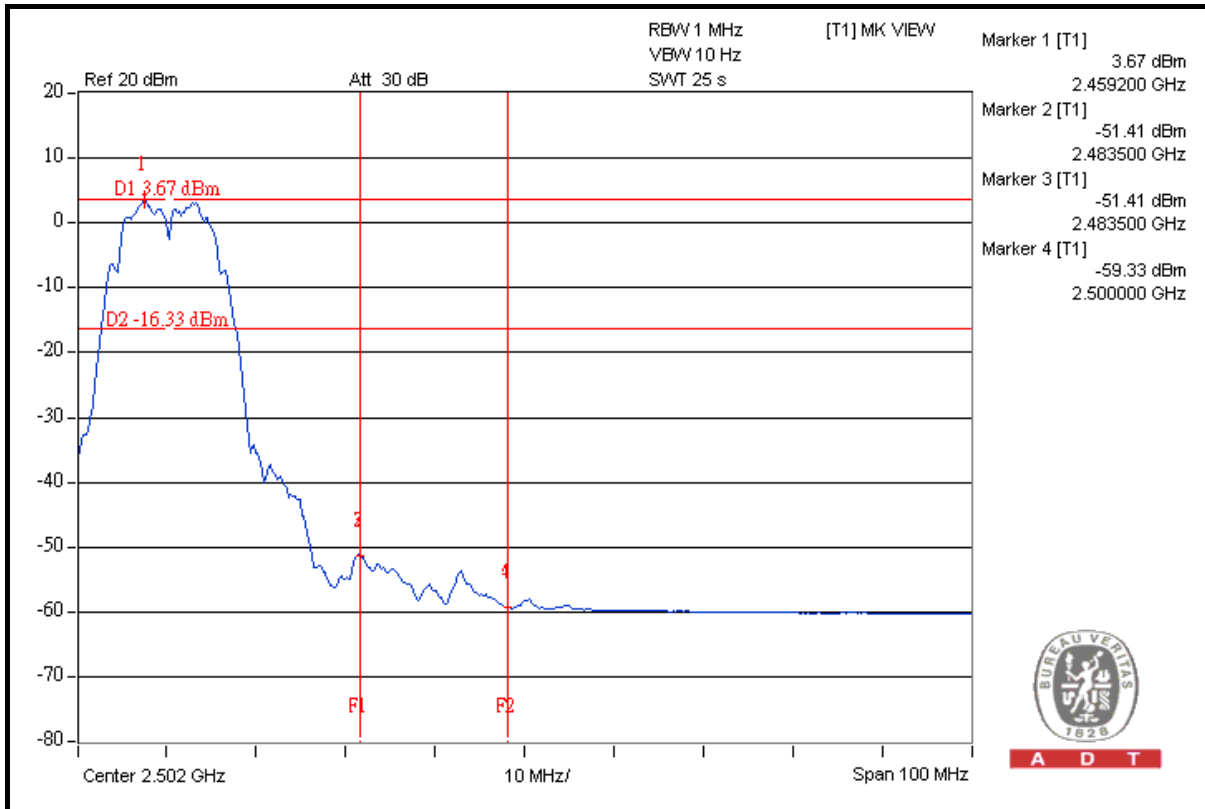
A D T



A D T



A D T





## 802.11g OFDM MODULATION

**NOTE 1:** The band edge emission plot on the next page shows 48.00dBc between carrier maximum power and local maximum emission in restrict band (2.38960GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.1.7 is 107.10dBuV/m (Peak), so the maximum field strength in restrict band is  $107.10 - 48.00 = 59.10$ dBuV/m which is under 74dBuV/m limit.

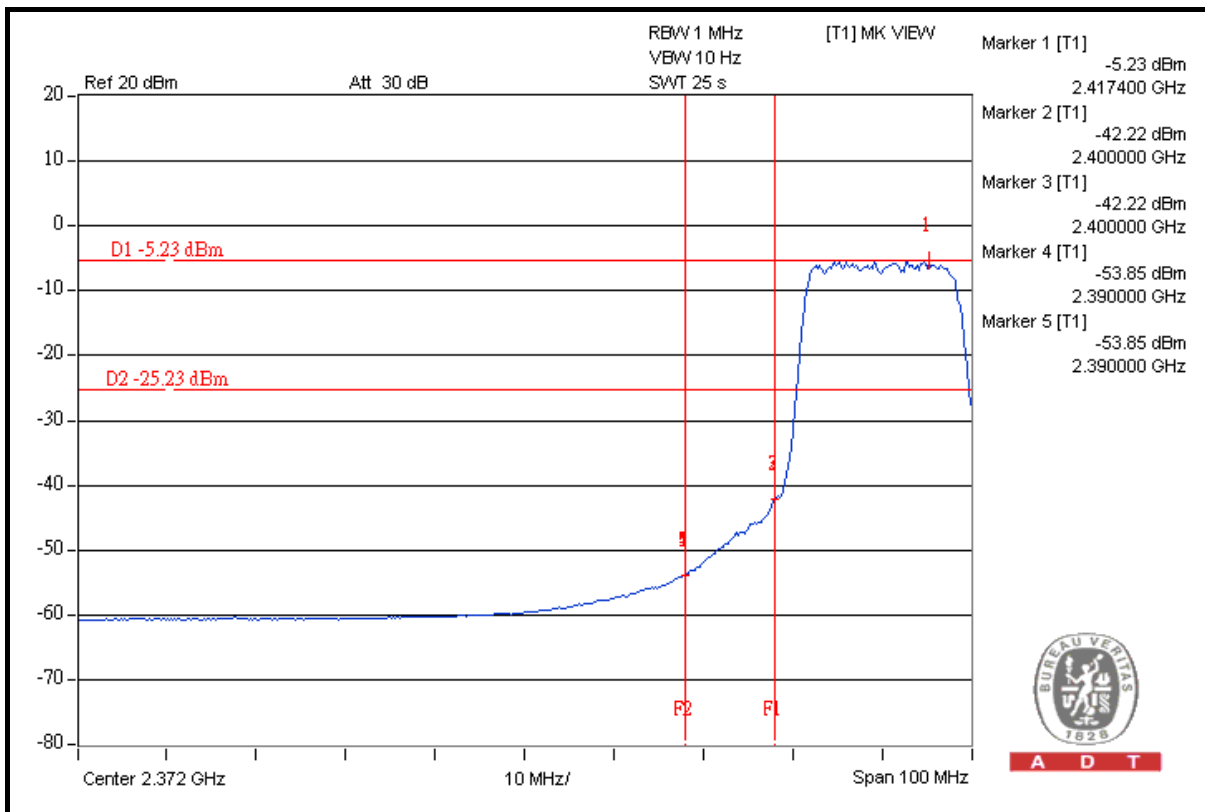
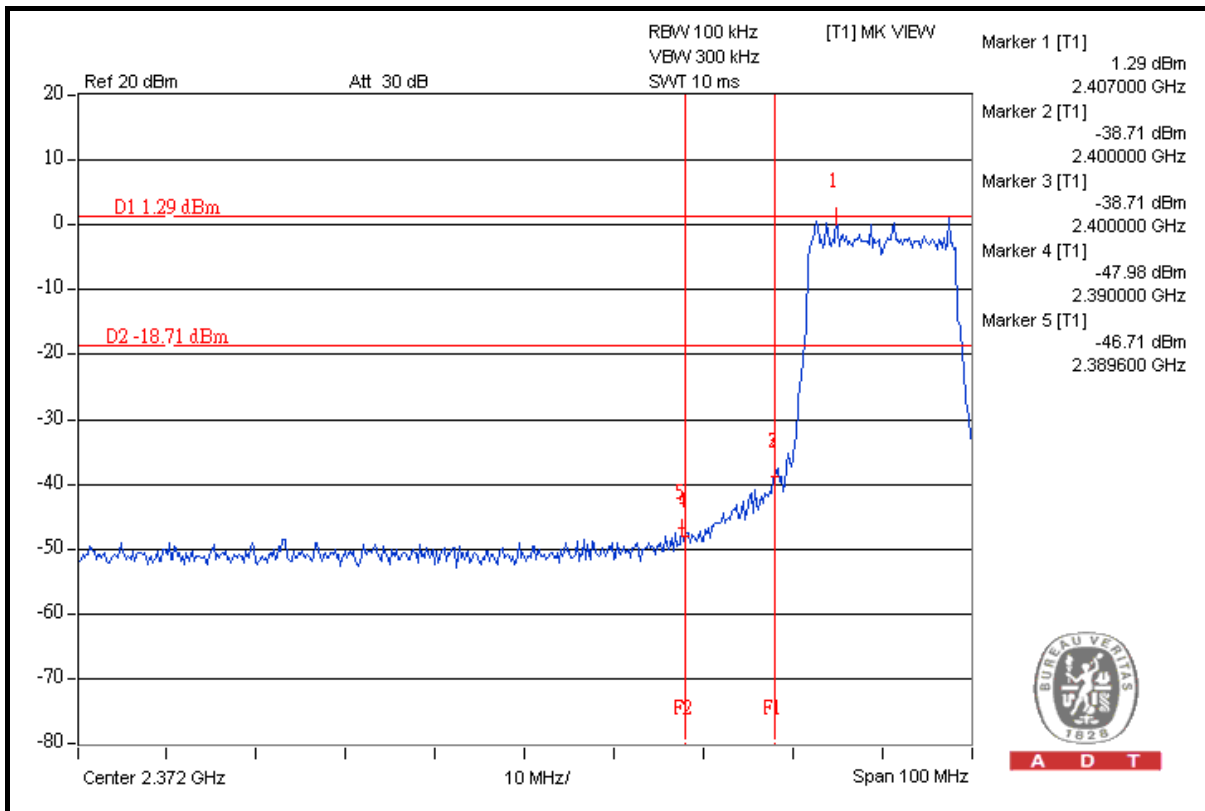
The band edge emission plot on the next page shows 48.62dBc between carrier maximum power and local maximum emission in restrict band (2.39000GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.1.7 is 96.89dBuV/m (Average), so the maximum field strength in restrict band is  $96.89 - 48.62 = 48.27$ dBuV/m which is under 54dBuV/m limit.

**NOTE 2:** The band edge emission plot on the next second page shows 48.91dBc between carrier maximum power and local maximum emission in restrict band (2.48980GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.1.7 is 107.17dBuV/m (Peak), so the maximum field strength in restrict band is  $107.17 - 48.91 = 58.26$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on the next third page shows 47.92dBc between carrier maximum power and local maximum emission in restrict band (2.48350GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.1.7 is 97.00dBuV/m (Average), so the maximum field strength in restrict band is  $97.00 - 47.92 = 49.08$ dBuV/m which is under 54dBuV/m limit.

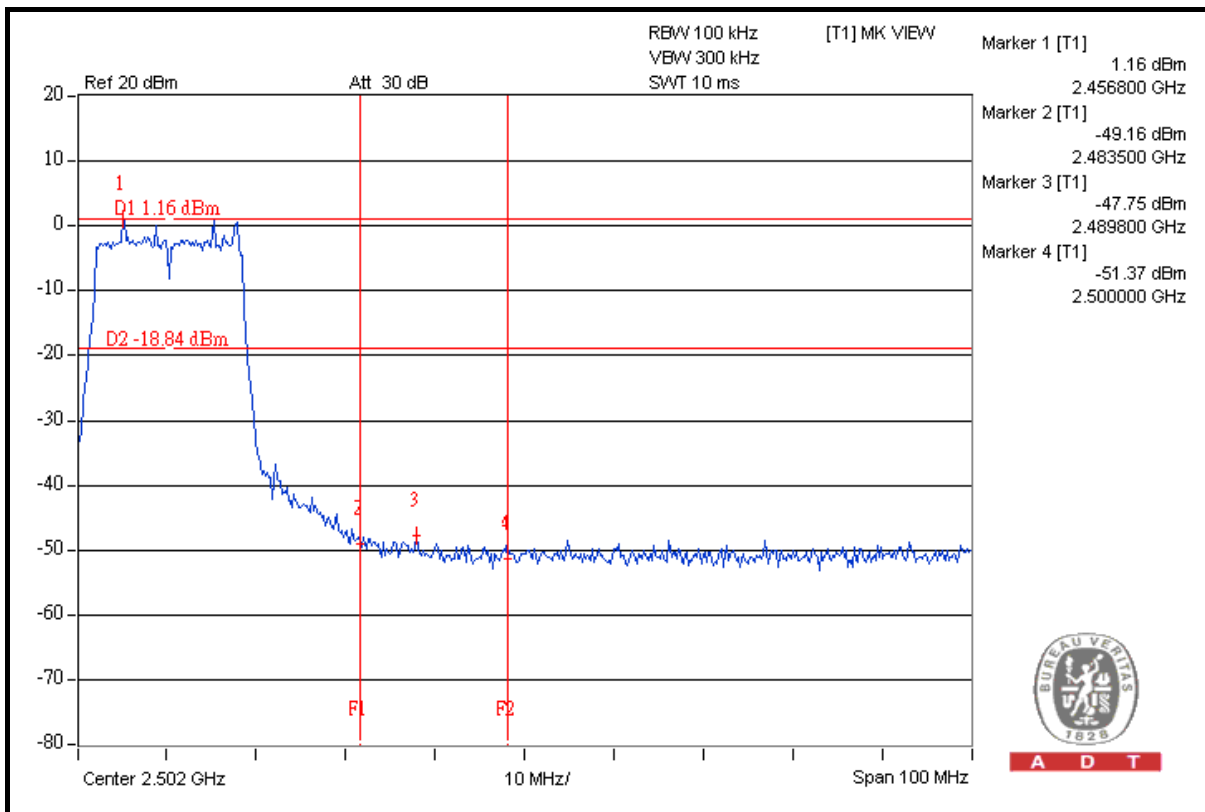
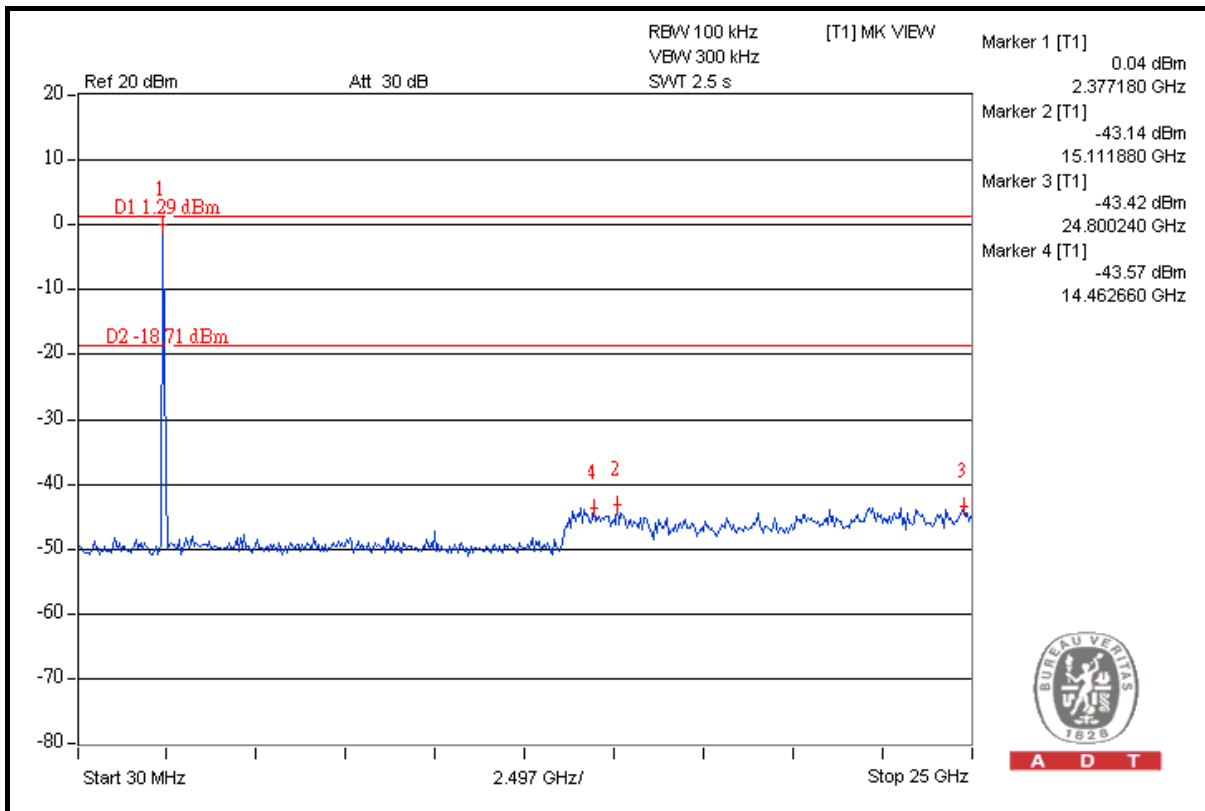


A D T



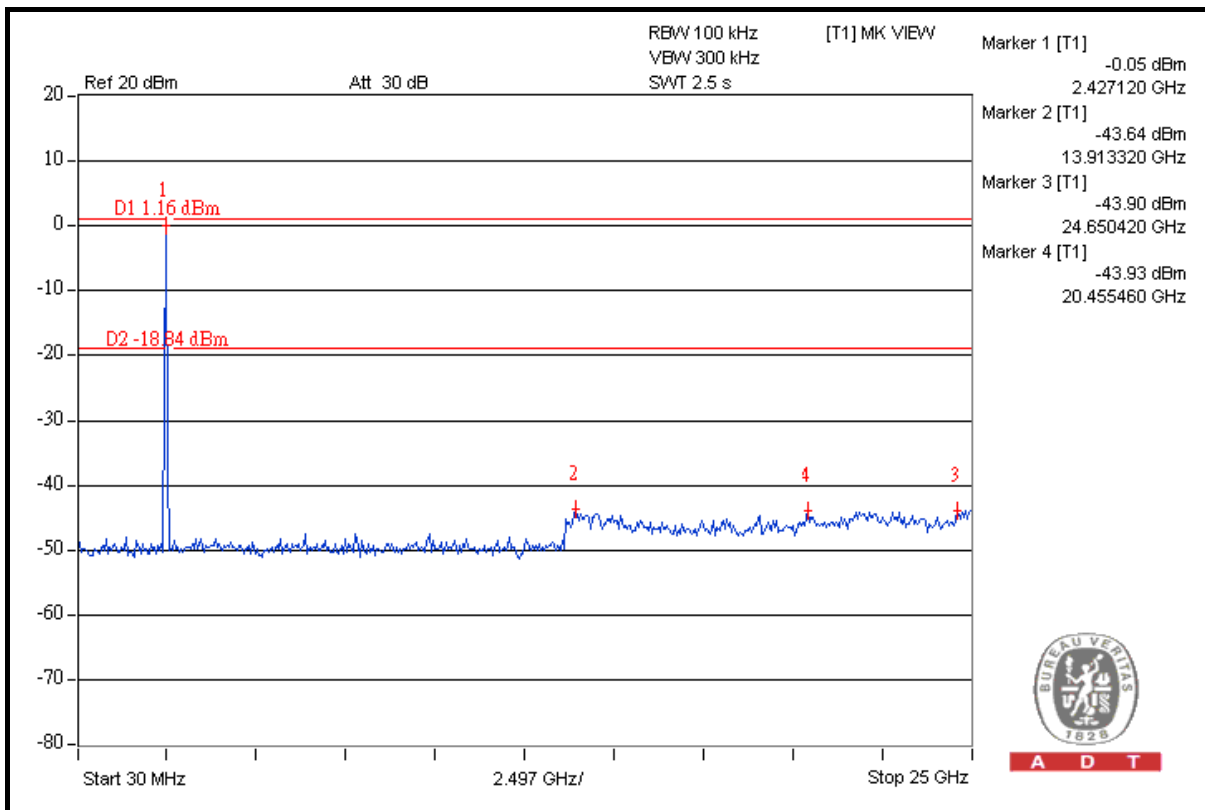
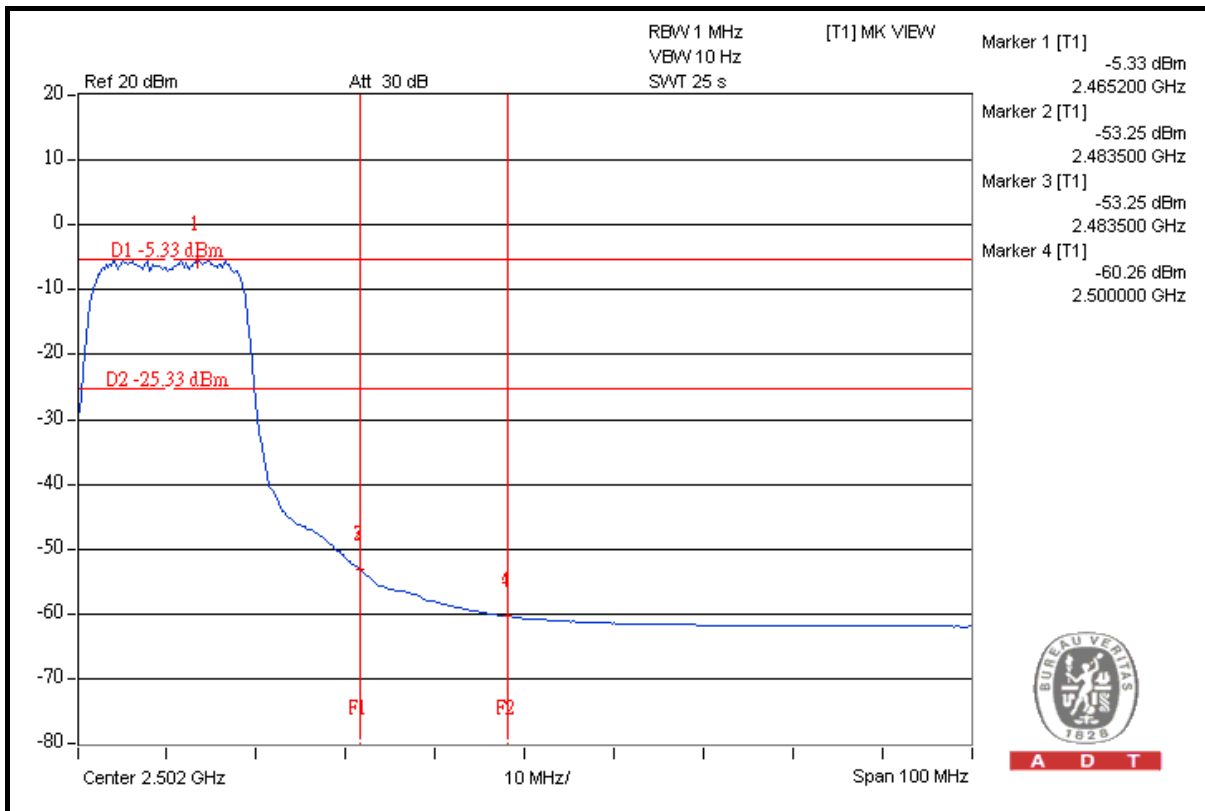


A D T





A D T



## 4.7 ANTENNA REQUIREMENT

### 4.7.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### 4.7.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is dipole antenna with dual Hirose U.FL antenna connector. The maximum Gain of the antenna is 3.5dBi.

## 5. TEST TYPES AND RESULTS (FOR BLUETOOTH FUNCTION)

### 5.1 RADIATED EMISSION MEASUREMENT

#### 5.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

**NOTE:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



## 5.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESI7	100033	Jun. 30, 2008	Jun. 29, 2009
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Apr. 22, 2008	Apr. 21, 2009
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	May 02, 2008	May 01, 2009
HORN Antenna SCHWARZBECK	9120D	9120D-209	Jun. 24, 2008	Jun. 23, 2009
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 25, 2008	Dec. 24, 2009
Preamplifier Agilent	8447D	2944A10633	Nov. 03, 2008	Nov. 02, 2009
Preamplifier Agilent	8449B	3008A01964	Oct. 23, 2008	Oct. 22, 2009
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	238141/4	May 20, 2008	May 19, 2009
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	12738/6	May 20, 2008	May 19, 2009
Software ADT.	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table ADT.	TT100.	TT93021703	NA	NA
Turn Table Controller ADT.	SC100.	SC93021703	NA	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  2. The test was performed in HwaYa Chamber 3.
  3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  4. The FCC Site Registration No. is 988962.
  5. The IC Site Registration No. is IC 7450F-3.

### 5.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its 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.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

**NOTE:**

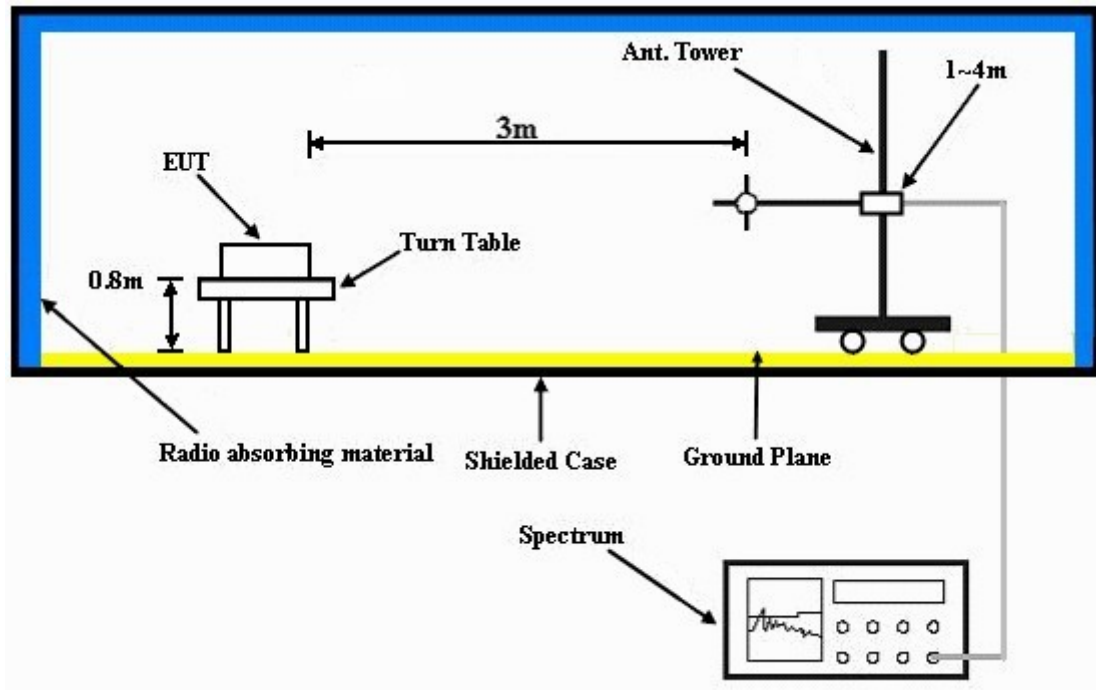
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. All modes of operation were investigated and the worst-case emissions are reported.

### 5.1.4 DEVIATION FROM TEST STANDARD

No deviation.



### 5.1.5 TEST SETUP



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

### 5.1.6 EUT OPERATING CONDITIONS

Same as 4.1.6.



## 5.1.7 TEST RESULTS

## RADIATED WORST CASE DATA: ABOVE 1GHz:

## GFSK MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1002hPa	TESTED BY	Lori Chiu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	43.87 PK	74.00	-30.13	1.07 H	245	11.43	32.44
2	2390.00	31.97 AV	54.00	-22.03	1.07 H	245	-0.47	32.44
3	2400.00	43.19 PK	74.00	-30.81	1.07 H	245	10.71	32.48
4	2400.00	13.09 AV	54.00	-40.91	1.07 H	245	-19.39	32.48
5	*2402.00	91.50 PK			1.07 H	245	59.01	32.49
6	*2402.00	61.40 AV			1.07 H	245	28.91	32.49
7	3204.00	48.31 PK	74.00	-25.69	1.00 H	123	13.65	34.66
8	3204.00	37.55 AV	54.00	-16.45	1.00 H	123	2.89	34.66
9	4804.00	56.32 PK	74.00	-17.68	1.00 H	213	18.10	38.22
10	4804.00	26.22 AV	54.00	-27.78	1.00 H	213	-12.00	38.22
11	7206.00	55.74 PK	74.00	-18.26	1.72 H	85	11.68	44.07
12	7206.00	25.64 AV	54.00	-28.36	1.72 H	85	-18.42	44.07

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “\*”: Fundamental frequency.
  6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 \* 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to:  $20\log(3.125 / 100) = -30.1$  dB.
  7. Average value = peak reading +  $20\log(\text{duty cycle})$ .



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1002hPa	TESTED BY	Lori Chiu

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	48.22 PK	74.00	-25.78	1.04 V	186	15.78	32.44
2	2390.00	35.52 AV	54.00	-18.48	1.04 V	186	3.08	32.44
3	2400.00	53.19 PK	74.00	-20.81	1.04 V	186	20.71	32.48
4	2400.00	23.09 AV	54.00	-30.91	1.04 V	186	-9.39	32.48
5	*2402.00	101.05 PK			1.03 V	190	68.56	32.49
6	*2402.00	70.95 AV			1.03 V	190	38.46	32.49
7	3204.00	48.43 PK	74.00	-25.57	1.00 V	230	13.77	34.66
8	3204.00	37.69 AV	54.00	-16.31	1.00 V	230	3.03	34.66
9	4804.00	58.05 PK	74.00	-15.95	1.35 V	142	19.83	38.22
10	4804.00	27.95 AV	54.00	-26.05	1.35 V	142	-10.27	38.22
11	7206.00	57.25 PK	74.00	-16.75	1.09 V	190	13.19	44.07
12	7206.00	27.15 AV	54.00	-26.85	1.09 V	190	-16.91	44.07

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* ”: Fundamental frequency.
  6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 \* 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to:  $20\log(3.125 / 100) = -30.1$  dB.
  7. Average value = peak reading +  $20\log(\text{duty cycle})$ .



ADT

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 39	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1002hPa	TESTED BY	Lori Chiu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2441.00	92.03 PK			1.09 H	100	59.41	32.62
2	*2441.00	61.93 AV			1.09 H	100	29.31	32.62
3	3254.00	47.20 PK	74.00	-26.80	1.04 H	336	12.49	34.71
4	3254.00	35.16 AV	54.00	-18.84	1.04 H	336	0.45	34.71
5	4882.00	54.36 PK	74.00	-19.64	1.11 H	201	15.83	38.53
6	4882.00	24.26 AV	54.00	-29.74	1.11 H	201	-14.27	38.53
7	7323.00	55.37 PK	74.00	-18.63	1.56 H	146	10.86	44.51
8	7323.00	25.27 AV	54.00	-28.73	1.56 H	146	-19.24	44.51
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2441.00	101.65 PK			1.11 V	102	69.03	32.62
2	*2441.00	71.55 AV			1.11 V	102	38.93	32.62
3	3254.00	47.74 PK	74.00	-26.26	1.02 V	220	13.03	34.71
4	3254.00	35.87 AV	54.00	-18.13	1.02 V	220	1.17	34.71
5	4882.00	53.27 PK	74.00	-20.73	1.21 V	144	14.74	38.53
6	4882.00	23.17 AV	54.00	-30.83	1.21 V	144	-15.36	38.53
7	7323.00	57.89 PK	74.00	-16.11	1.21 V	218	13.39	44.51
8	7323.00	27.79 AV	54.00	-26.21	1.21 V	218	-16.71	44.51

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* ”: Fundamental frequency.
  6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 \* 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to:  $20\log(3.125 / 100) = -30.1$  dB.
  7. Average value = peak reading +  $20\log(\text{duty cycle})$ .



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 78	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1002hPa	TESTED BY	Lori Chiu

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2480.00	92.74 PK			1.01 H	201	60.00	32.74
2	*2480.00	62.64 AV			1.01 H	201	29.90	32.74
3	2483.50	44.31 PK	74.00	-29.69	1.01 H	201	11.55	32.76
4	2483.50	14.21 AV	54.00	-39.79	1.01 H	201	-18.55	32.76
5	3306.00	47.84 PK	74.00	-26.16	1.22 H	13	13.09	34.75
6	3306.00	17.74 AV	54.00	-36.26	1.22 H	13	-17.01	34.75
7	4960.00	54.30 PK	74.00	-19.70	1.10 H	311	15.59	38.71
8	4960.00	24.20 AV	54.00	-29.80	1.10 H	311	-14.51	38.71
9	7440.00	57.66 PK	74.00	-16.34	1.07 H	6	12.91	44.75
10	7440.00	27.56 AV	54.00	-26.44	1.07 H	6	-17.19	44.75

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2480.00	102.60 PK			1.21 V	213	69.86	32.74
2	*2480.00	72.50 AV			1.21 V	213	39.76	32.74
3	2483.50	54.17 PK	74.00	-19.83	1.21 V	213	21.41	32.76
4	2483.50	24.07 AV	54.00	-29.93	1.21 V	213	-8.69	32.76
5	3306.00	47.34 PK	74.00	-26.66	1.36 V	122	12.59	34.75
6	3306.00	35.69 AV	54.00	-18.31	1.36 V	122	0.94	34.75
7	4960.00	53.49 PK	74.00	-20.51	1.31 V	141	14.78	38.71
8	4960.00	23.39 AV	54.00	-30.61	1.31 V	141	-15.32	38.71
9	7440.00	59.39 PK	74.00	-14.61	1.00 V	194	14.64	44.75
10	7440.00	29.29 AV	54.00	-24.71	1.00 V	194	-15.46	44.75

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* ”: Fundamental frequency.
  6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 \* 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to:  $20\log(3.125 / 100) = -30.1$  dB.
  7. Average value = peak reading +  $20\log(\text{duty cycle})$ .

**BELOW 1GHz WORST-CASE DATA : GFSK MODULATION**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 78	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1000hPa	TESTED BY	Lori Chiu
TEST MODE	A		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	677.35	39.38 QP	46.00	-6.62	1.25 H	340	14.91	24.47
2	751.23	38.56 QP	46.00	-7.44	1.00 H	34	13.05	25.51
3	799.84	38.43 QP	46.00	-7.57	1.00 H	43	12.41	26.02
4	827.06	36.77 QP	46.00	-9.23	1.00 H	49	10.26	26.51
5	904.83	40.72 QP	46.00	-5.28	1.00 H	340	12.75	27.97
6	949.55	43.20 QP	46.00	-2.80	1.25 H	337	14.65	28.55
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	158.22	37.61 QP	43.50	-5.89	1.25 V	10	23.35	14.27
2	480.97	39.19 QP	46.00	-6.81	1.00 V	10	19.19	20.00
3	630.69	37.62 QP	46.00	-8.38	1.00 V	37	14.37	23.26
4	675.40	41.41 QP	46.00	-4.59	1.00 V	10	16.98	24.43
5	720.12	37.11 QP	46.00	-8.89	1.25 V	7	11.89	25.22
6	751.23	38.55 QP	46.00	-7.45	1.50 V	10	13.04	25.51
7	797.89	40.79 QP	46.00	-5.21	1.25 V	7	14.79	26.00
8	937.88	37.01 QP	46.00	-8.99	1.00 V	22	8.61	28.40
9	949.55	43.76 QP	46.00	-2.24	1.00 V	10	15.20	28.55

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 78	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1000hPa	TESTED BY	Lori Chiu
TEST MODE	B		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	164.06	32.74 QP	43.50	-10.76	1.25 H	127	18.67	14.07
2	632.63	35.27 QP	46.00	-10.73	1.00 H	10	11.96	23.31
3	677.35	38.47 QP	46.00	-7.53	1.25 H	343	13.99	24.47
4	799.84	39.29 QP	46.00	-6.71	1.25 H	19	13.27	26.02
5	827.06	39.28 QP	46.00	-6.72	1.00 H	352	12.77	26.51
6	904.83	42.77 QP	46.00	-3.23	1.00 H	10	14.80	27.97
7	949.55	43.21 QP	46.00	-2.79	1.00 H	349	14.66	28.55
8	992.32	43.30 QP	54.00	-10.70	1.25 H	292	14.56	28.75
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	164.06	39.51 QP	43.50	-3.99	1.00 V	10	25.44	14.07
2	473.20	36.01 QP	46.00	-9.99	1.25 V	10	16.19	19.82
3	675.40	42.00 QP	46.00	-4.00	1.50 V	352	17.57	24.43
4	737.62	36.52 QP	46.00	-9.48	2.00 V	4	11.14	25.38
5	797.89	42.03 QP	46.00	-3.97	1.50 V	13	16.03	26.00
6	904.83	42.67 QP	46.00	-3.33	1.25 V	46	14.70	27.97
7	935.94	36.43 QP	46.00	-9.57	1.25 V	13	8.06	28.37
8	947.60	42.90 QP	46.00	-3.10	1.50 V	49	14.37	28.53

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

## 5.2 CONDUCTED EMISSION MEASUREMENT

### 5.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

### 5.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Sep. 22, 2008	Sep. 21, 2009
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 31, 2008	Dec. 30, 2009
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Dec. 29, 2008	Dec. 28, 2009
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Jul. 30, 2008	Jul. 29, 2009
Software ADT	ADT_Cond_ V7.3.7	NA	NA	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  2. The test was performed in HwaYa Shielded Room 2.
  3. The VCCI Site Registration No. is C-2047.



### 5.2.3 TEST PROCEDURES

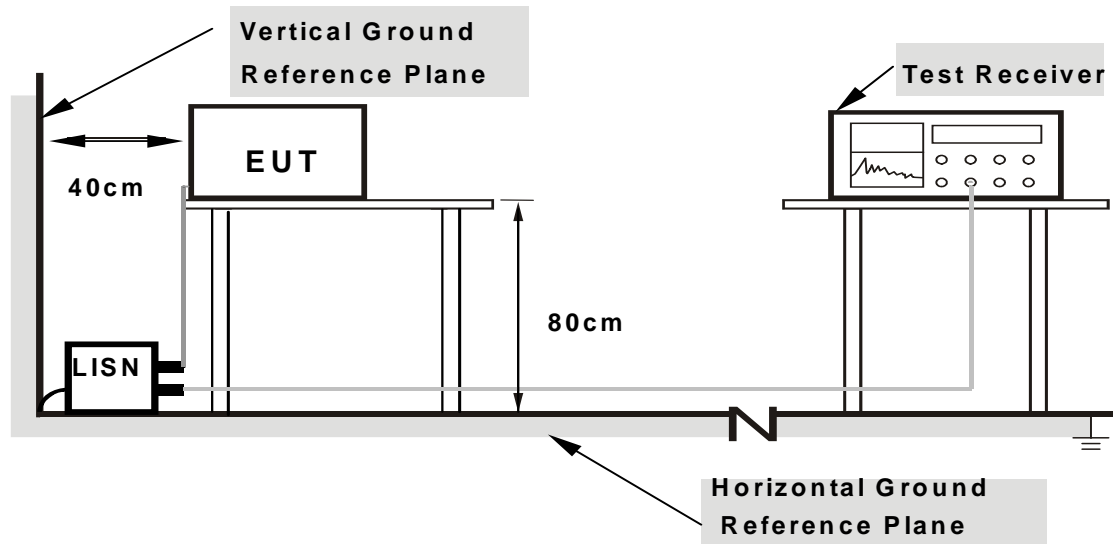
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

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

### 5.2.4 DEVIATION FROM TEST STANDARD

No deviation.

## 5.2.5 TEST SETUP



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

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

## 5.2.6 EUT OPERATING CONDITIONS

Same as 4.2.6.

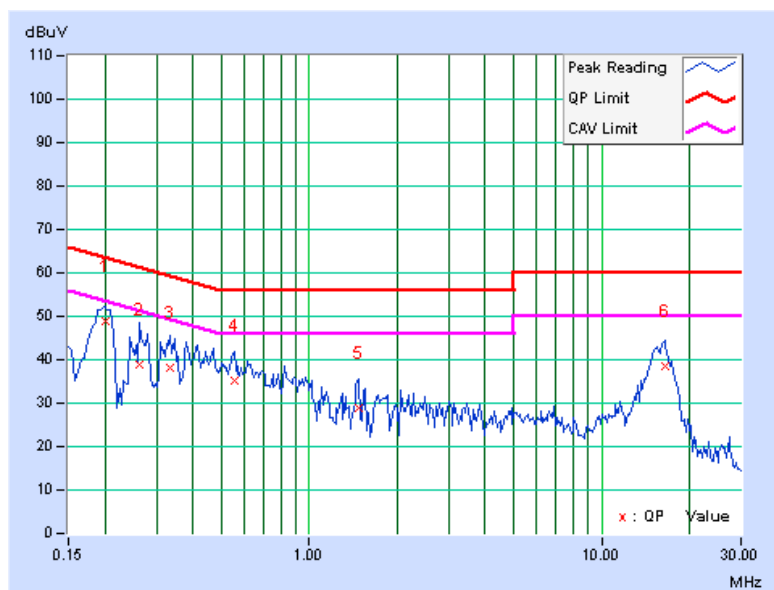
## 5.2.7 TEST RESULTS

### CONDUCTED WORST CASE DATA: GFSK MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 78	PHASE	Line 1
MODULATION TYPE	GFSK	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1012hPa	INPUT POWER	120Vac, 60 Hz
TEST MODE	A	TESTED BY	Mark Liao

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.201	0.13	48.68	-	48.81	-	63.58	53.58	-14.77	-
2	0.263	0.13	38.58	-	38.71	-	61.33	51.33	-22.61	-
3	0.334	0.14	38.03	-	38.17	-	59.36	49.36	-21.19	-
4	0.556	0.15	34.91	-	35.06	-	56.00	46.00	-20.94	-
5	1.469	0.18	28.57	-	28.75	-	56.00	46.00	-27.25	-
6	16.512	0.59	38.09	-	38.68	-	60.00	50.00	-21.32	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Emission level - Limit value
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading Value.



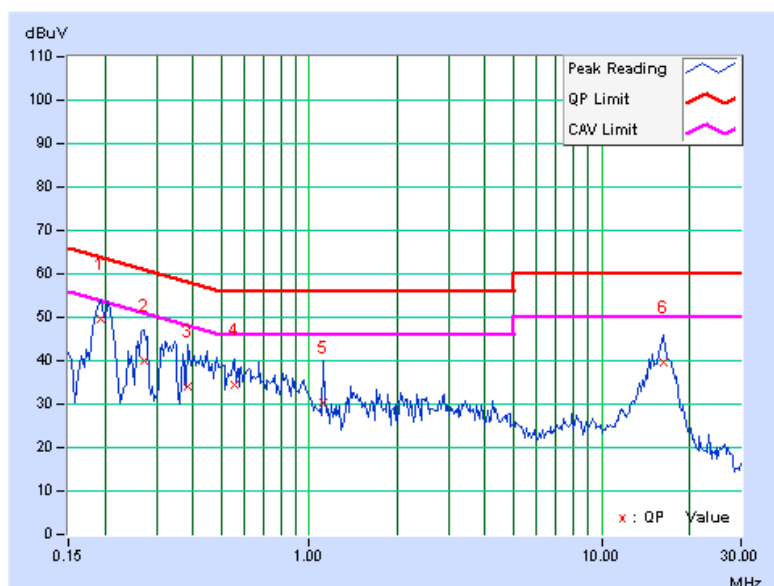


A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 78	PHASE	Line 2
MODULATION TYPE	GFSK	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1012hPa	INPUT POWER	120Vac, 60 Hz
TEST MODE	A	TESTED BY	Mark Liao

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.193	0.13	49.37	-	49.50	-	63.91
2	0.271	0.14	39.75	-	39.89	-	61.08	51.08	-21.20	-
3	0.384	0.15	33.88	-	34.03	-	58.18	48.18	-24.16	-
4	0.552	0.16	34.39	-	34.55	-	56.00	46.00	-21.45	-
5	1.113	0.17	30.34	-	30.51	-	56.00	46.00	-25.49	-
6	16.246	0.70	38.89	-	39.59	-	60.00	50.00	-20.41	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Emission level - Limit value
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading Value.



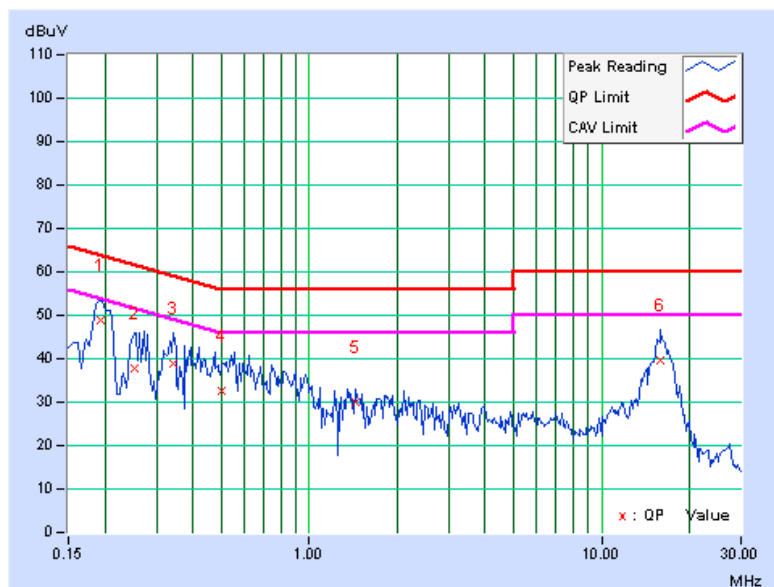


A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 78	PHASE	Line 1
MODULATION TYPE	GFSK	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1012hPa	INPUT POWER	120Vac, 60 Hz
TEST MODE	B	TESTED BY	Mark Liao

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.193	0.13	48.82	-	48.95	-	63.91
2	0.252	0.13	37.56	-	37.69	-	61.71	51.71	-24.01	-
3	0.341	0.14	38.88	-	39.02	-	59.17	49.17	-20.15	-
4	0.500	0.15	32.49	-	32.64	-	56.00	46.00	-23.36	-
5	1.434	0.18	29.97	-	30.15	-	56.00	46.00	-25.85	-
6	15.922	0.58	38.87	-	39.45	-	60.00	50.00	-20.55	-

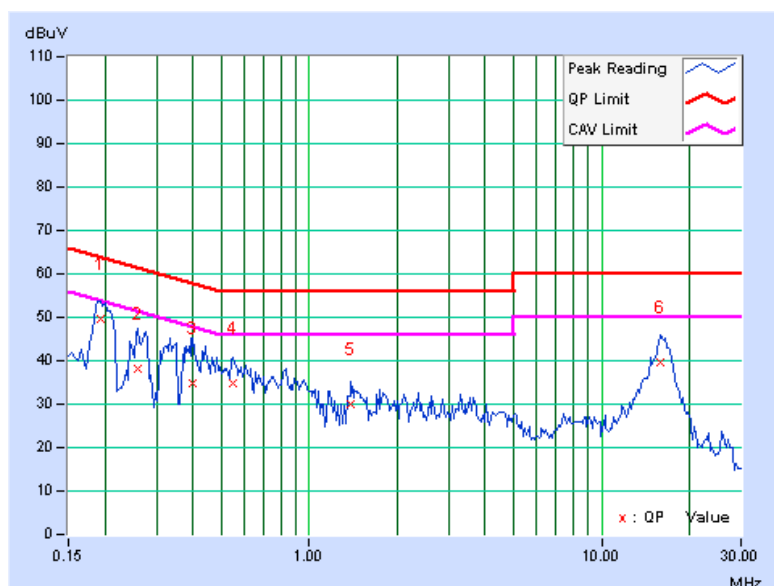
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Emission level - Limit value
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading Value.



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 78	PHASE	Line 2
MODULATION TYPE	GFSK	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1012hPa	INPUT POWER	120Vac, 60 Hz
TEST MODE	B	TESTED BY	Mark Liao

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.194	0.13	49.37	-	49.50	-	63.86	53.86	-14.36	-
2	0.259	0.14	38.12	-	38.26	-	61.45	51.45	-23.20	-
3	0.400	0.15	34.65	-	34.80	-	57.85	47.85	-23.05	-
4	0.548	0.15	34.55	-	34.70	-	56.00	46.00	-21.30	-
5	1.391	0.18	29.99	-	30.17	-	56.00	46.00	-25.83	-
6	15.980	0.70	39.11	-	39.81	-	60.00	50.00	-20.19	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Emission level - Limit value
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading Value.



### 5.3 NUMBER OF HOPPING FREQUENCY USED

#### 5.3.1 LIMIT OF HOPPING FREQUENCY USED

At least 15 channels frequencies, and should be equally spaced.

#### 5.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
R&S SPECTRUM ANALYZER	FSP40	100041	Apr. 22, 2008	Apr. 21, 2009

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

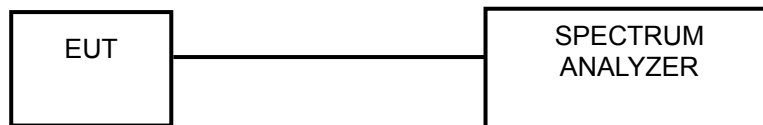
#### 5.3.3 TEST PROCEDURES

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

#### 5.3.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 5.3.5 TEST SETUP



#### 5.3.6 TEST RESULTS

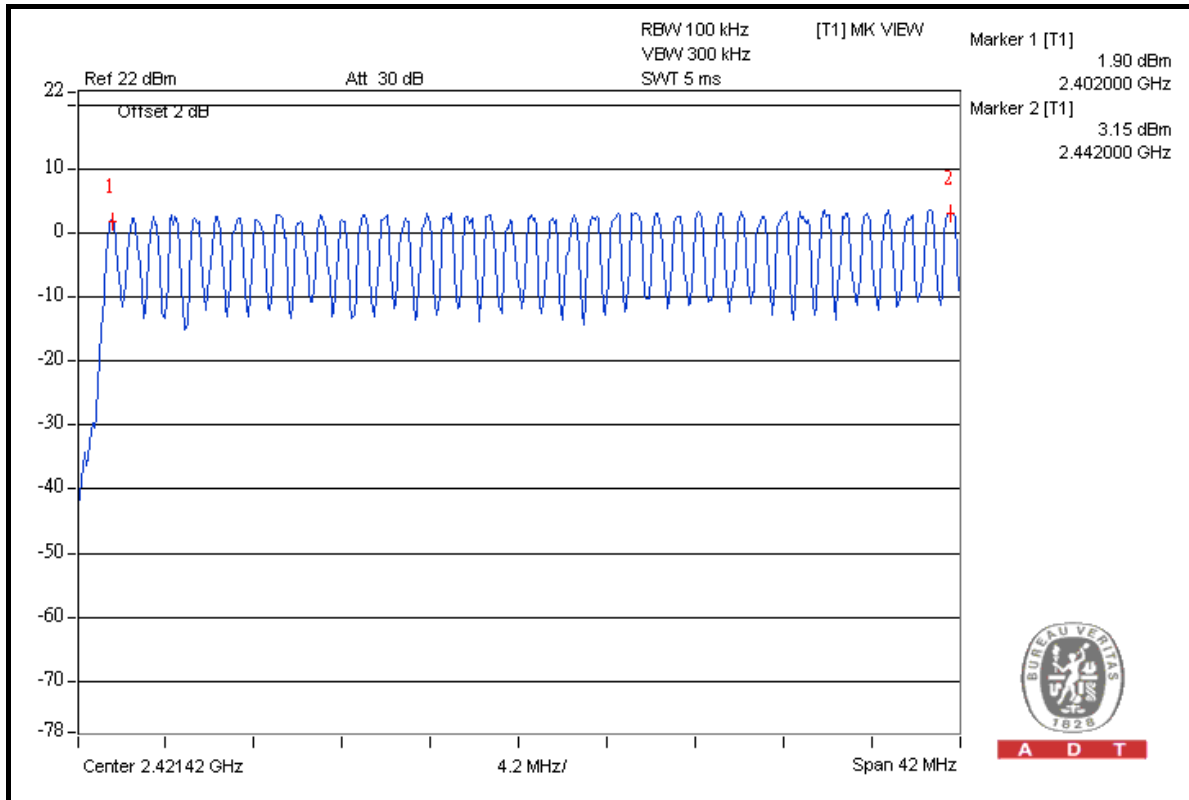
There are 79 hopping frequencies in the hopping mode. Please refer to next two pages for the test result. On the plots, it shows that the hopping frequencies are equally spaced.



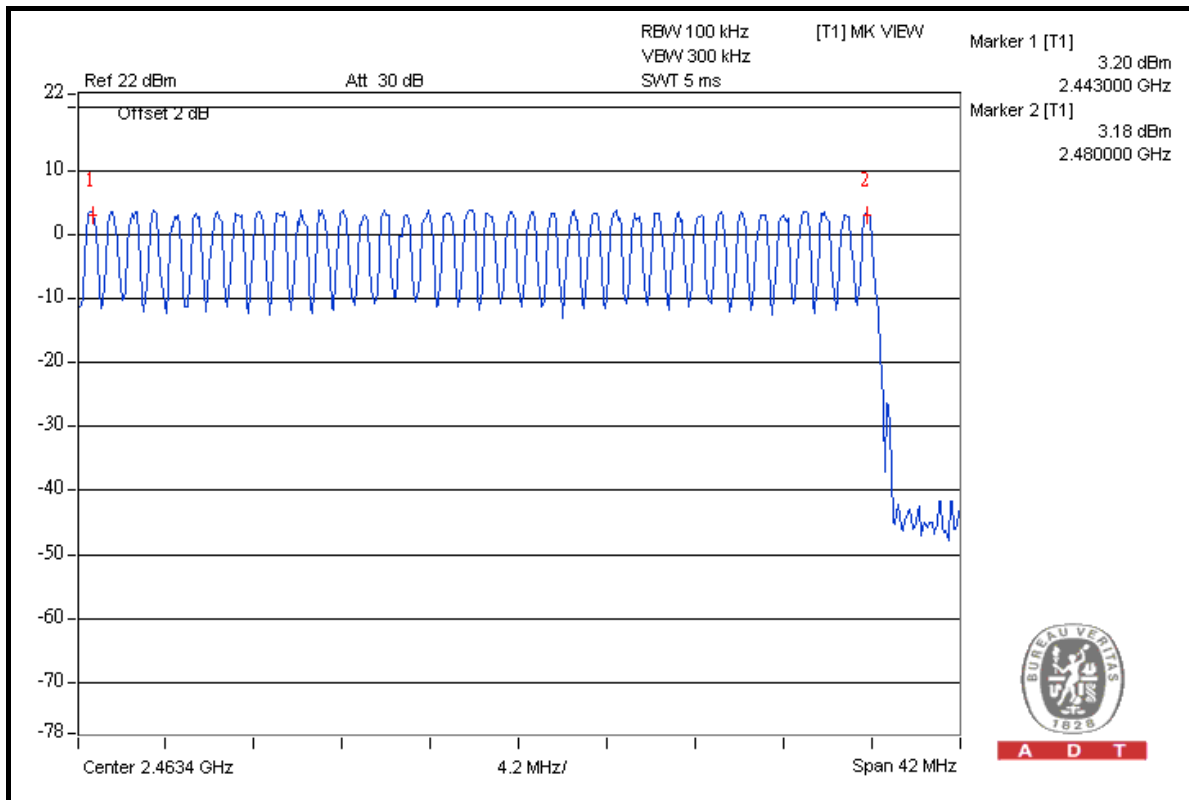


A D T

### GFSK MODULATION



A D T



A D T



## 5.4 DWELL TIME ON EACH CHANNEL

### 5.4.1 LIMIT OF DWELL TIME USED

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

### 5.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
R&S SPECTRUM ANALYZER	FSP40	100041	Apr. 22, 2008	Apr. 21, 2009

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 5.4.3 TEST PROCEDURES

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

### 5.4.4 DEVIATION FROM TEST STANDARD

No deviation.

### 5.4.5 TEST SETUP

Same as 5.3.5.

## 5.4.6 TEST RESULTS

### GFSK MODULATION

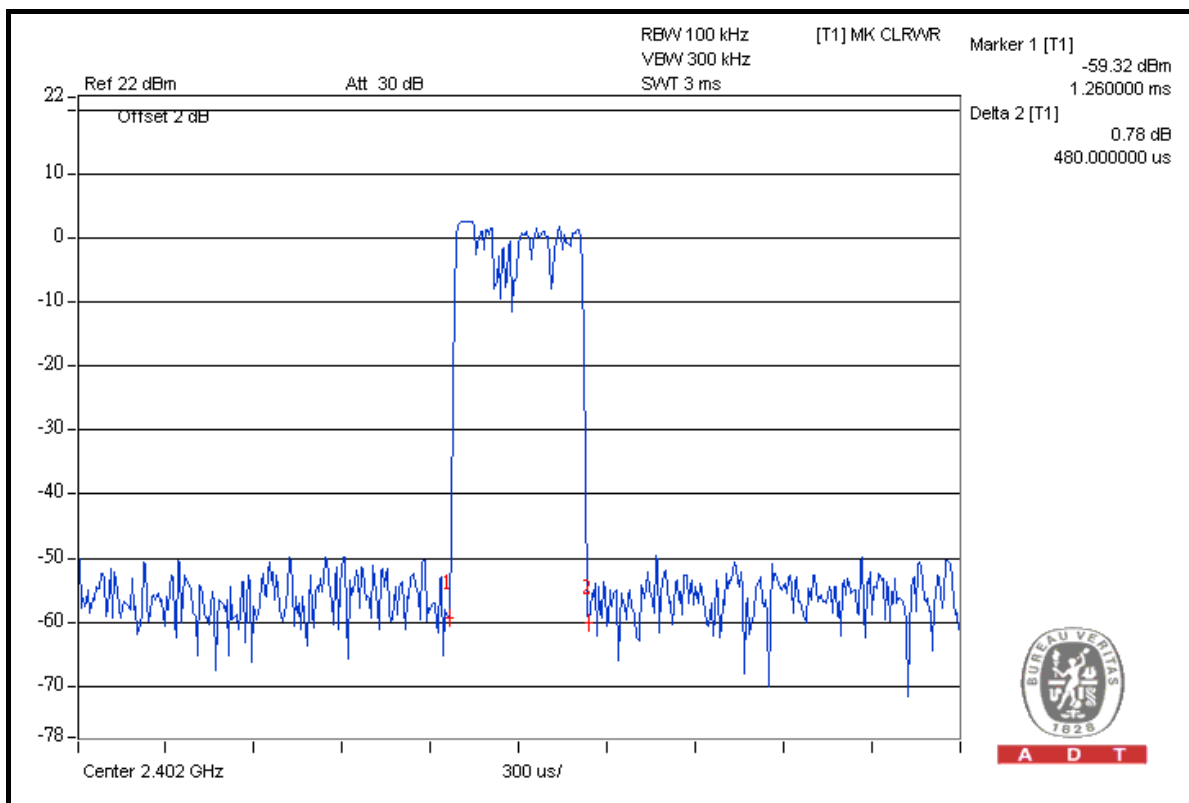
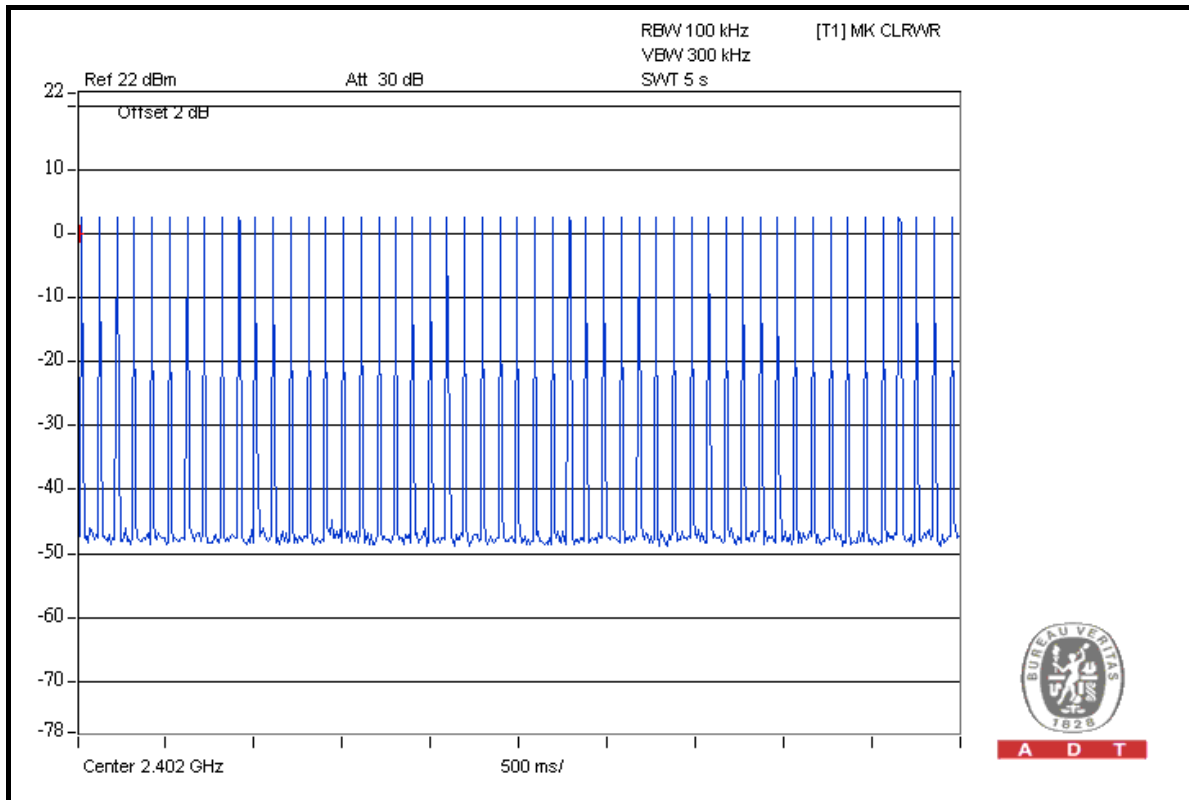
Mode	Number of transmission in a 31.6 (79Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (msec)
DH1	51 (times / 5 sec) * 6.32 = 322.32 times	0.480	154.714	400
DH3	25 (times / 5 sec) * 6.32 = 158.00 times	1.734	273.972	400
DH5	17 (times / 5 sec) * 6.32 = 107.44times	3.000	322.320	400

**NOTE:** Test plots of the transmitting time slot are shown on next 3 pages.



A D T

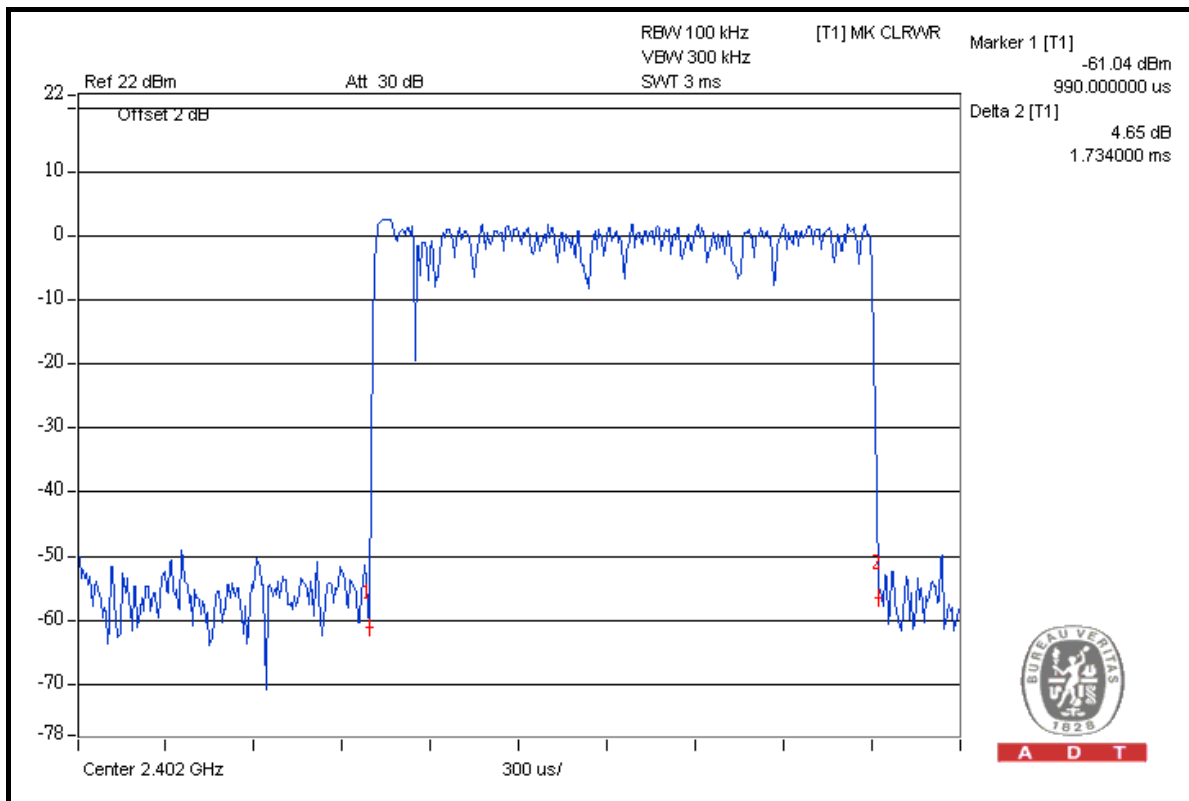
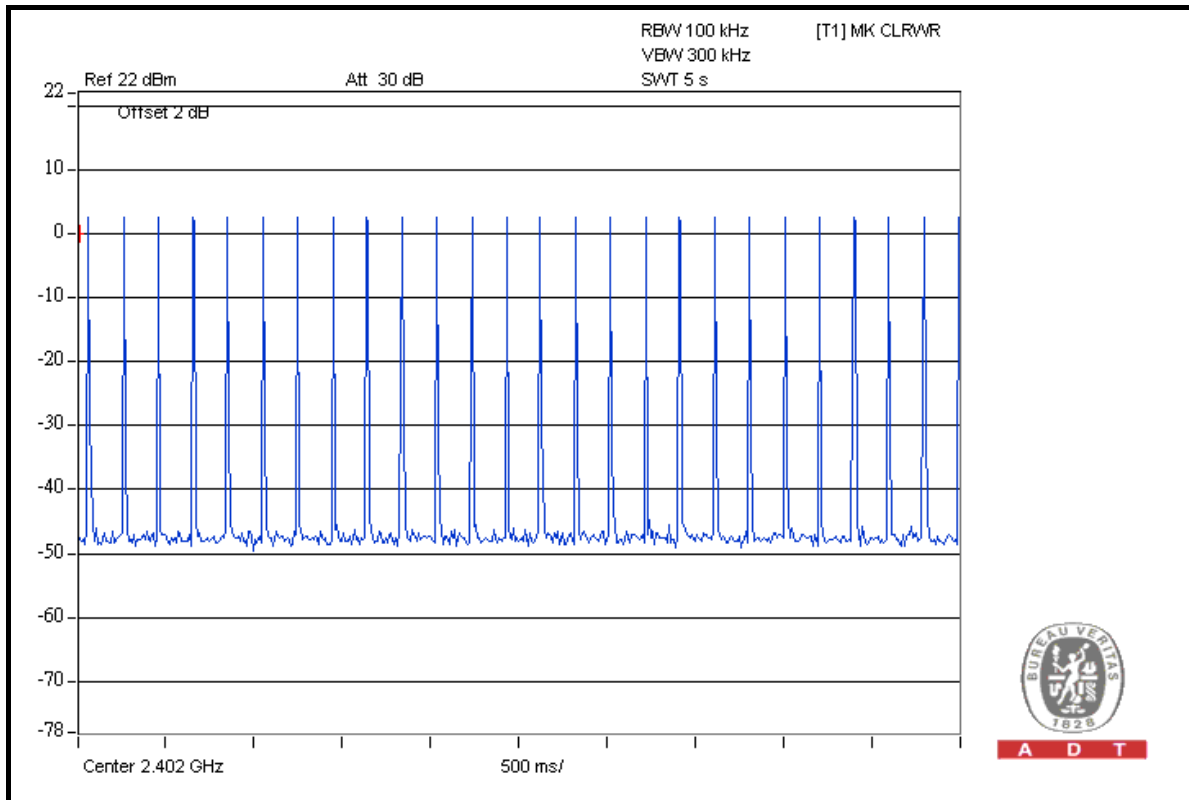
DH1





A D T

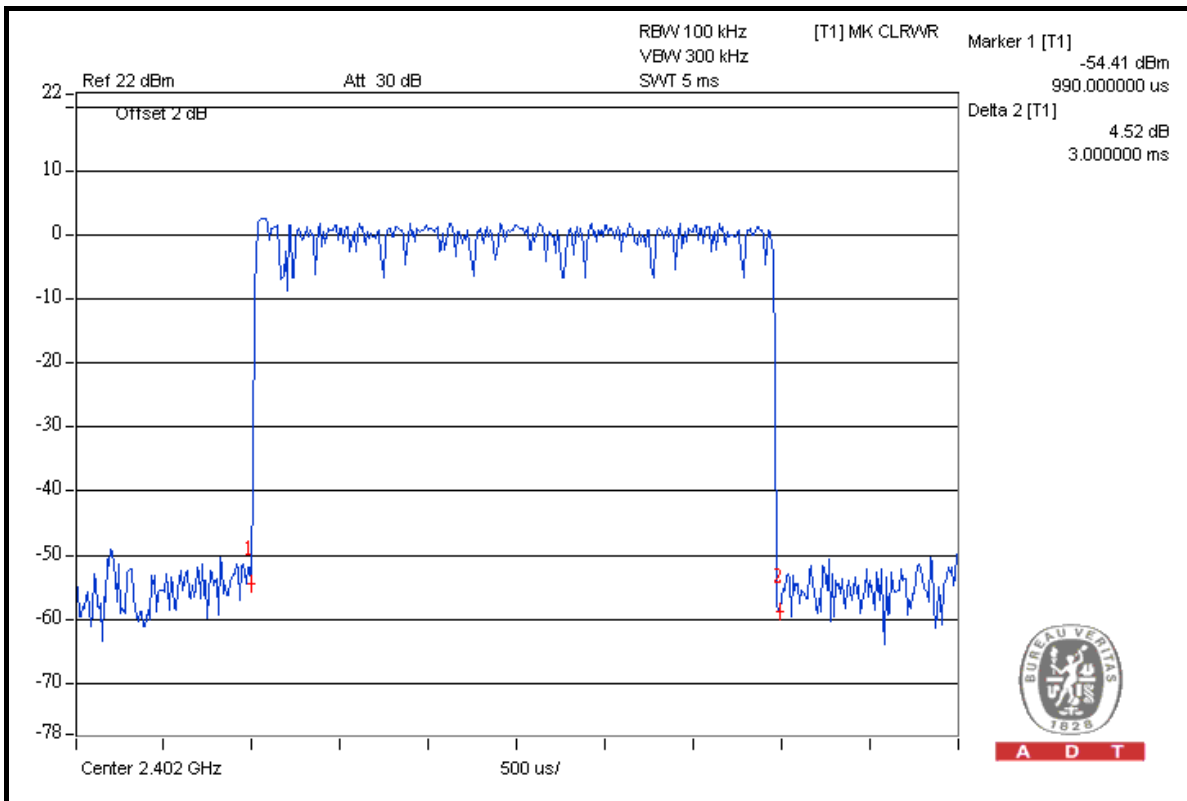
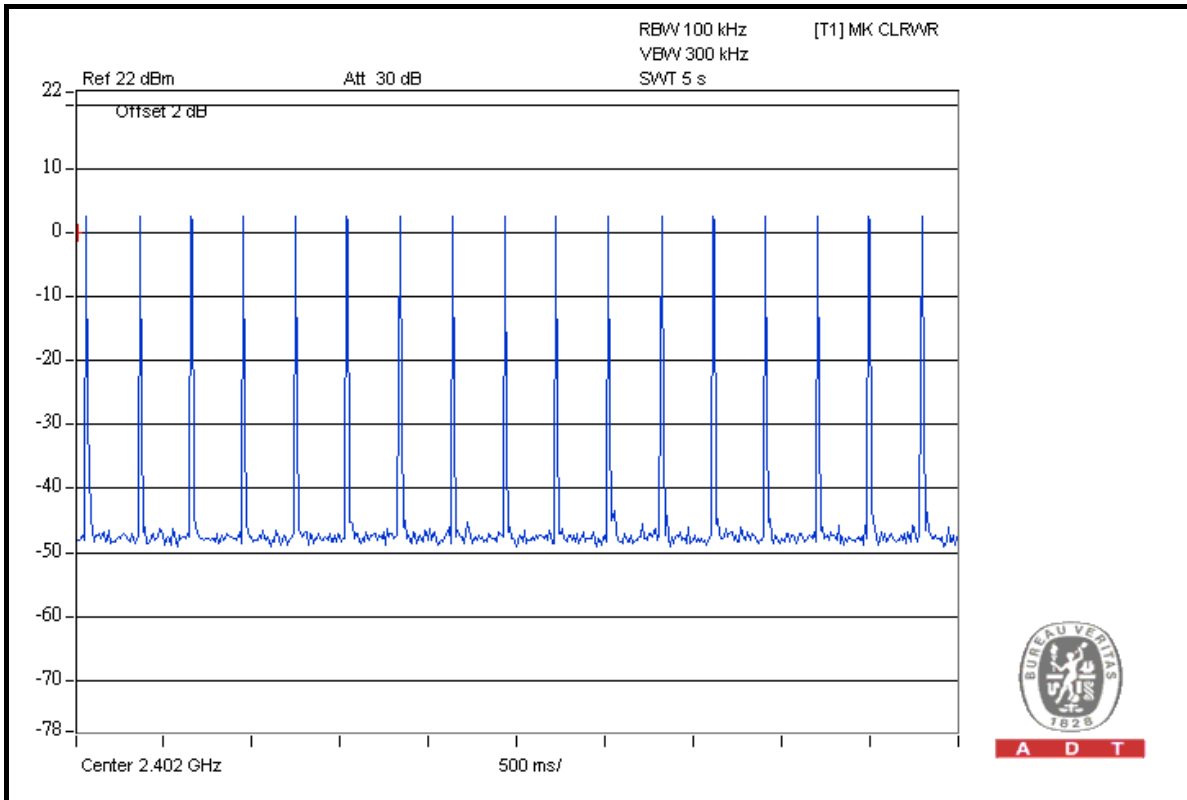
### DH3





A D T

### DH5





## 5.5 CHANNEL BANDWIDTH

### 5.5.1 LIMITS OF CHANNEL BANDWIDTH

For frequency hopping system operating in the 2400-2483.5MHz, If the 20dB bandwidth of hopping channel is greater than 25kHz, 20dB bandwidth of hopping channel shall be a minimum limit for the hopping channel separation.

### 5.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
R&S SPECTRUM ANALYZER	FSP40	100041	Apr. 22, 2008	Apr. 21, 2009

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 5.5.3 TEST PROCEDURE

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

### 5.5.4 DEVIATION FROM TEST STANDARD

No deviation.

### 5.5.5 TEST SETUP

Same as 5.3.5.

### 5.5.6 EUT OPERATING CONDITION

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

### 5.5.7 TEST RESULTS

#### GFSK MODULATION

<b>MODULATION TYPE</b>	GFSK	<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 65%RH, 1017hPa
<b>INPUT POWER</b>	120Vac, 60Hz	<b>TESTED BY</b>	Mark Liao
<b>TEST MODE</b>	A		

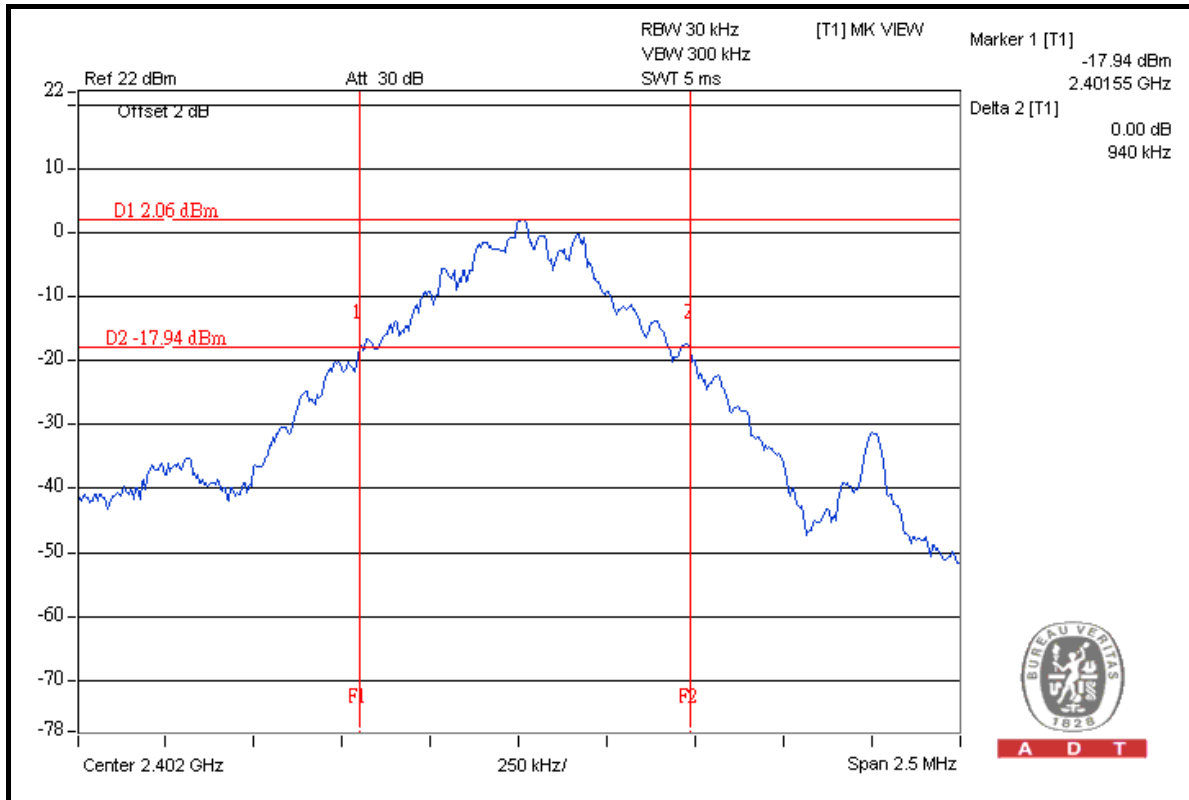
<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>20dB BANDWIDTH (MHz)</b>
0	2402	0.940
39	2441	0.931
78	2480	0.873





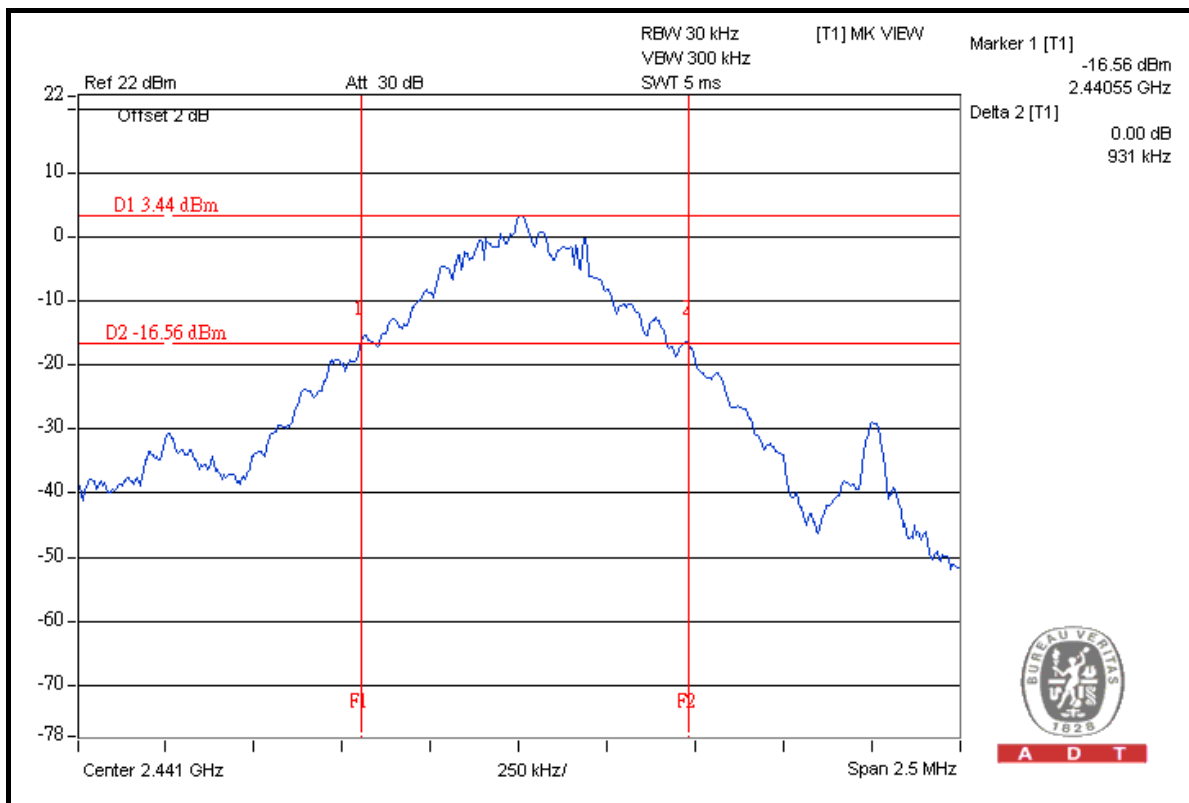
A D T

### CH 0



A D T

### CH 39

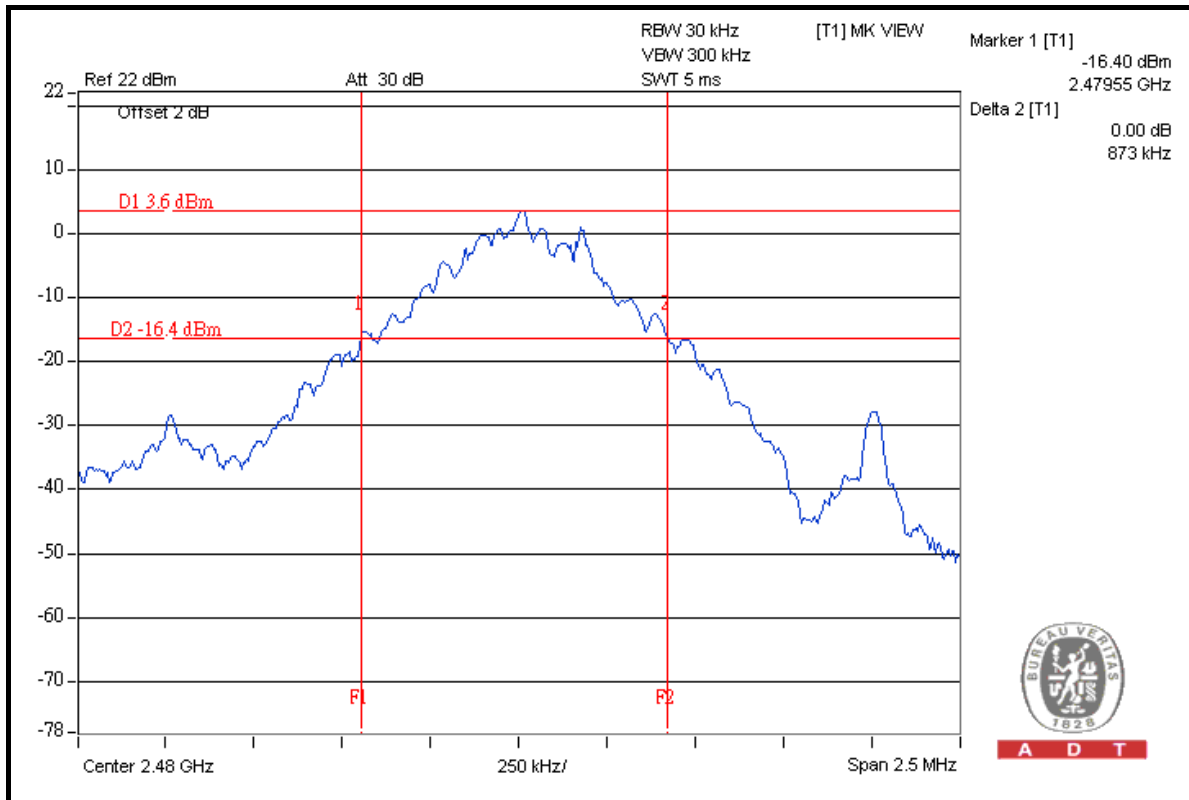


A D T



A D T

### CH 78



## 5.6 HOPPING CHANNEL SEPARATION

### 5.6.1 LIMIT OF HOPPING CHANNEL SEPARATION

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

### 5.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
R&S SPECTRUM ANALYZER	FSP40	100041	Apr. 22, 2008	Apr. 21, 2009

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 5.6.3 TEST PROCEDURES

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

### 5.6.4 DEVIATION FROM TEST STANDARD

No deviation.

### 5.6.5 TEST SETUP

Same as 5.3.5.

### 5.6.6 TEST RESULTS

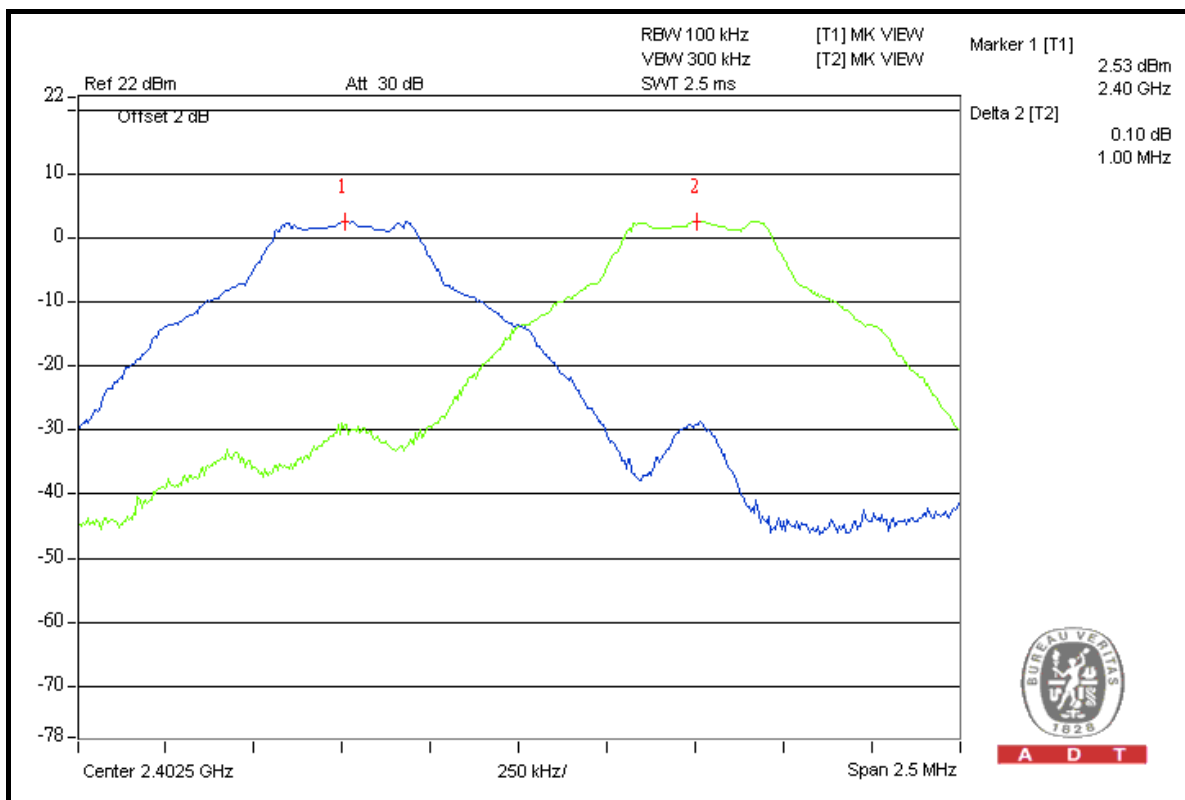
#### GFSK MODULATION

<b>MODULATION TYPE</b>	GFSK	<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 65%RH, 1017hPa
<b>INPUT POWER</b>	120Vac, 60Hz	<b>TESTED BY</b>	Lori Chiu
<b>TEST MODE</b>	A		

CHANNEL	FREQUENCY (MHz)	ADJACENT CHANNEL SEPARATION (MHz)	20dB BANDWIDTH (MHz)	PASS / FAIL
0	2402	1.000	0.940	PASS
39	2441	1.010	0.931	PASS
78	2480	1.010	0.873	PASS

**NOTE:** The minimum limit is 20dB bandwidth. Test results please refer to next two pages.

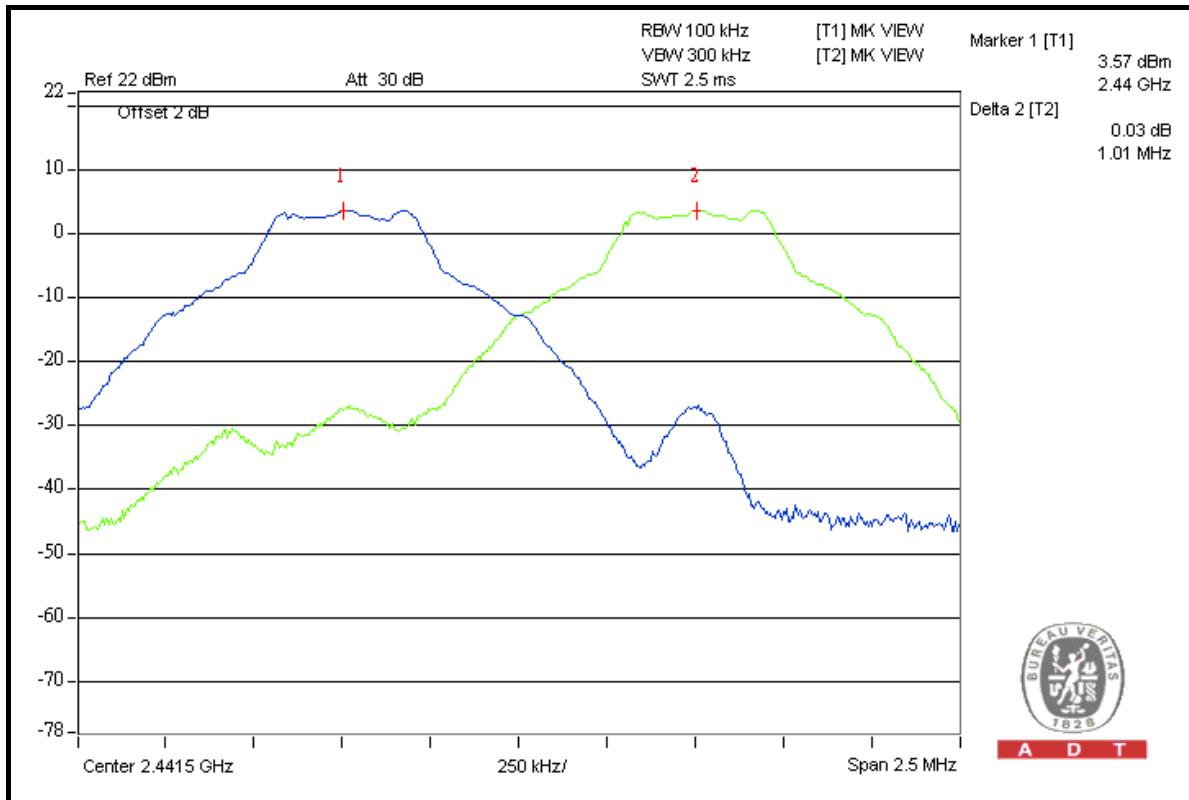
#### CH 0



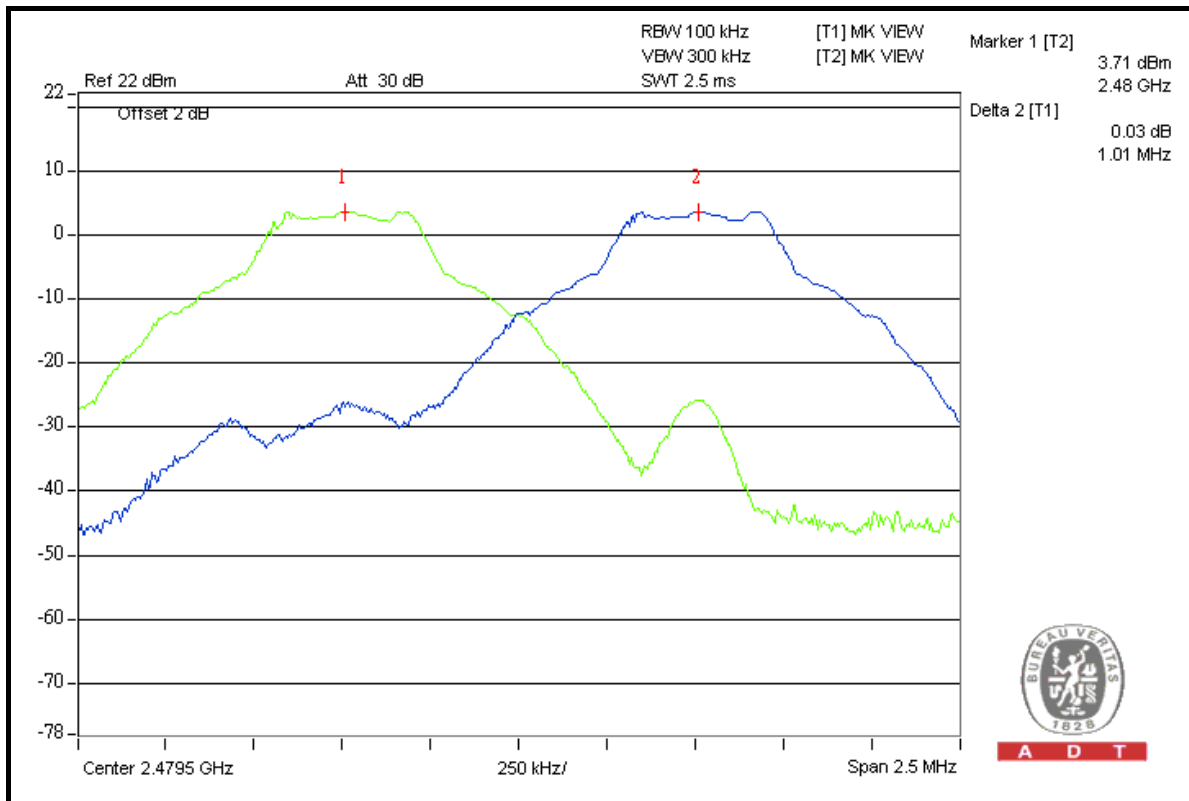


A D T

### CH 39



### CH 78



## 5.7 MAXIMUM PEAK OUTPUT POWER

### 5.7.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

### 5.7.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
R&S SPECTRUM ANALYZER	FSP40	100041	Apr. 22, 2008	Apr. 21, 2009

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 5.7.3 TEST PROCEDURES

- a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- c. The center frequency of the spectrum analyzer is set to the fundamental frequency and using 3MHz RBW and 10 MHz VBW.
- d. Measure the captured power within the band and recording the plot.
- e. Repeat above procedures until all frequencies required were complete.

### 5.7.4 DEVIATION FROM TEST STANDARD

No deviation.

### 5.7.5 TEST SETUP

Same as 5.3.5.

### 5.7.6 EUT OPERATING CONDITION

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

### 5.7.7 TEST RESULTS

#### GFSK MODULATION

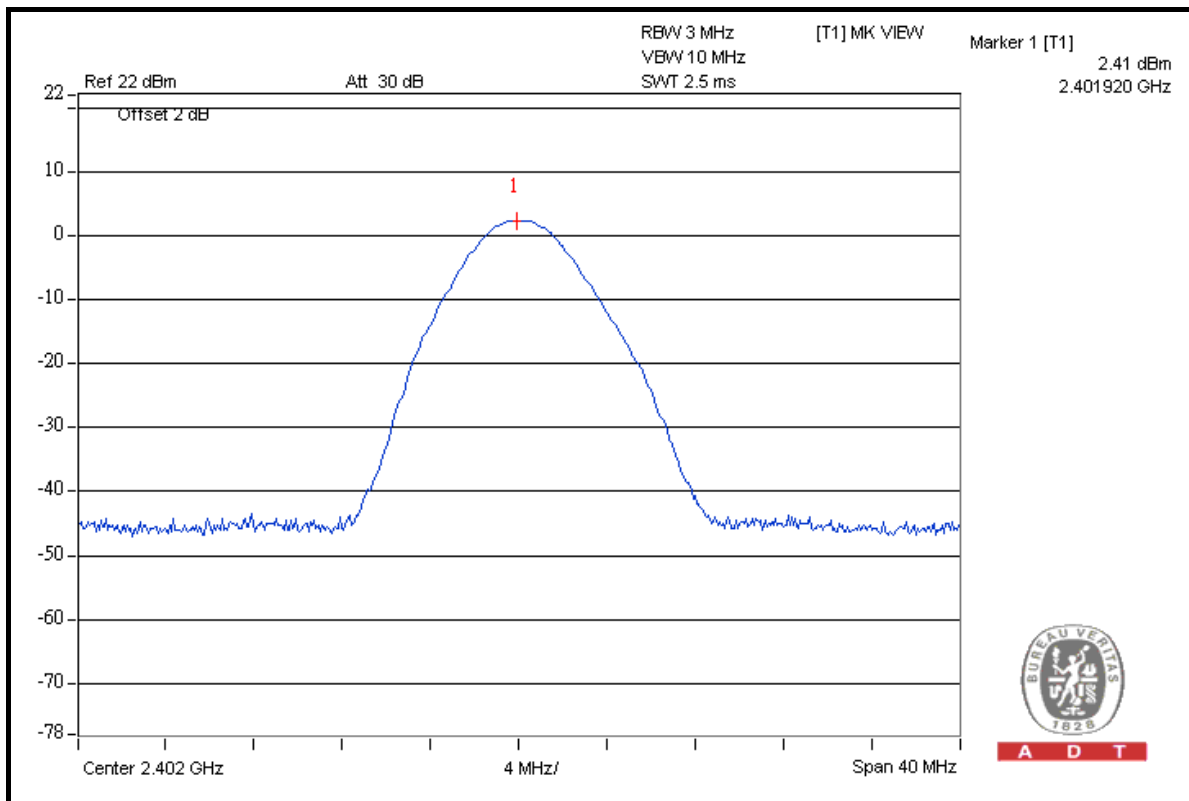
<b>MODULATION TYPE</b>	GFSK	<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 65%RH, 1017hPa
<b>INPUT POWER</b>	120Vac, 60Hz	<b>TESTED BY</b>	Lori Chiu
<b>TEST MODE</b>	A		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
0	2402	1.742	2.41	30	PASS
39	2441	2.208	3.44	30	PASS
78	2480	<b>2.275</b>	3.57	30	PASS

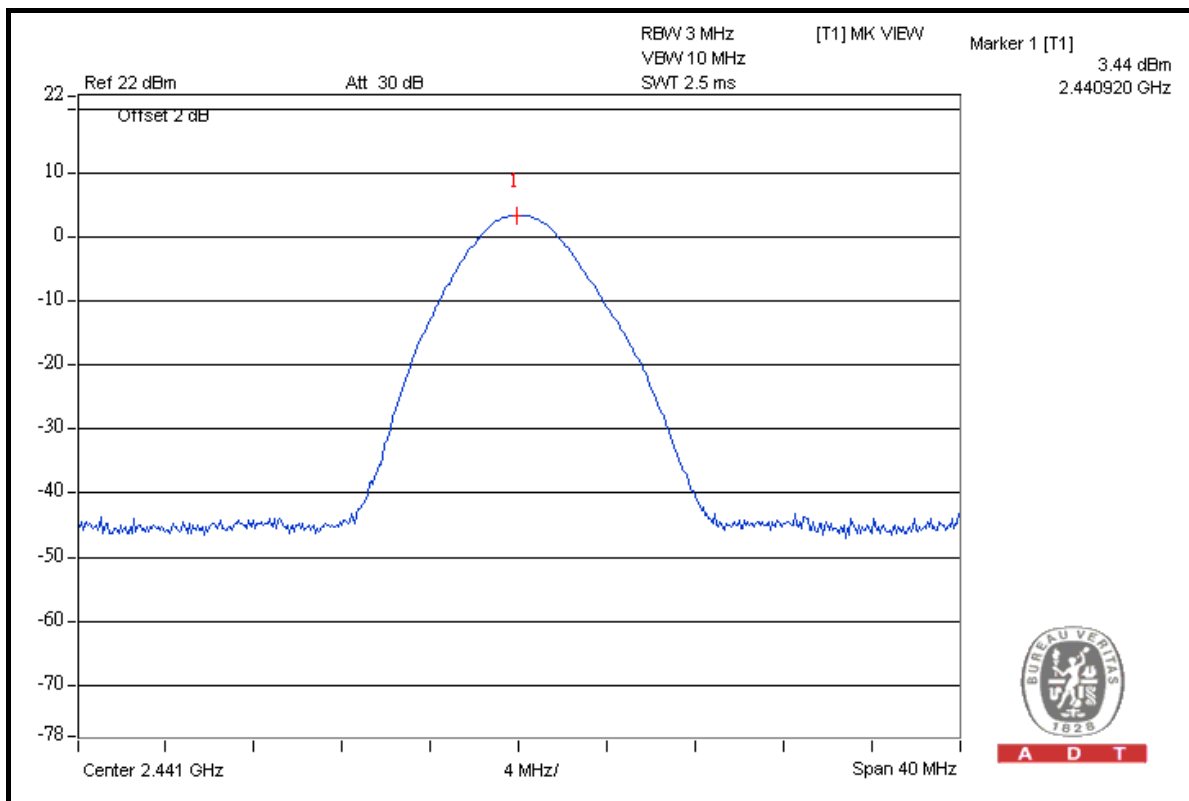


A D T

### CH 0



### CH 39

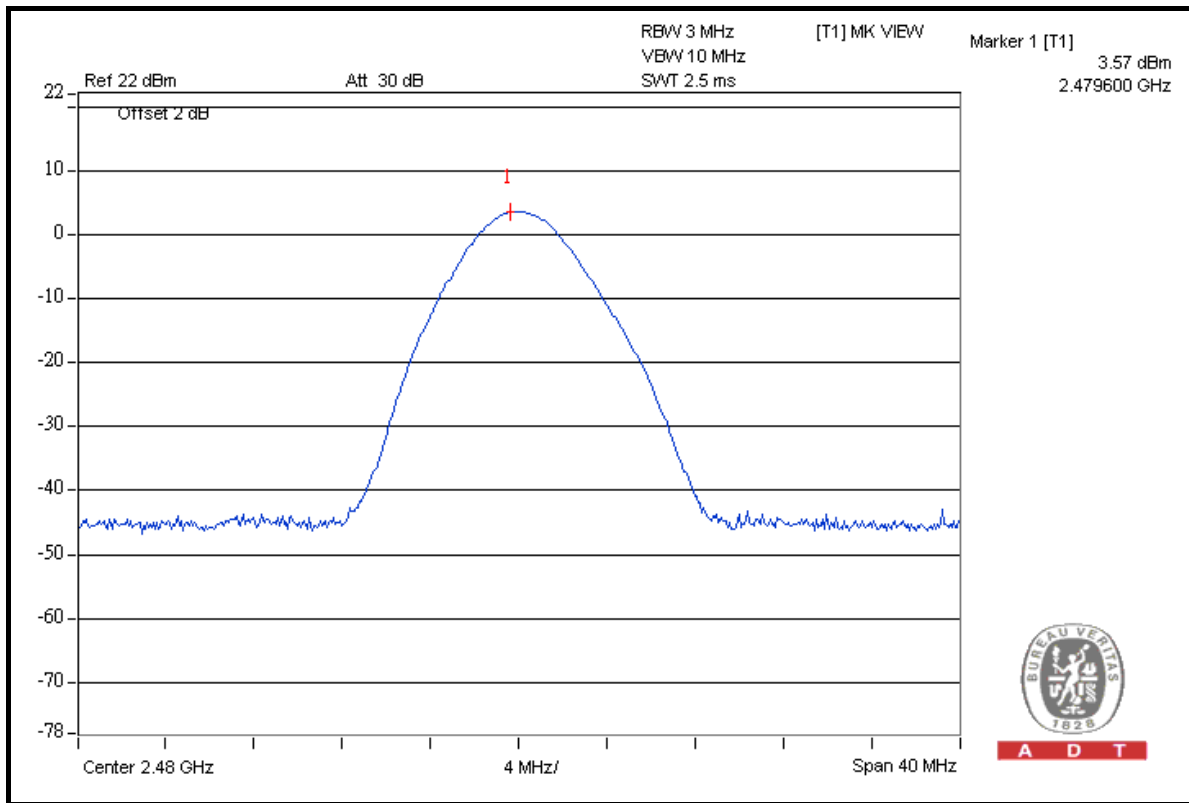






A D T

### CH 78



## 5.8 BAND EDGES MEASUREMENT

### 5.8.1 LIMITS OF BAND EDGES MEASUREMENT

Below  $-20\text{dB}$  of the highest emission level of operating band (in 100KHz RBW).

### 5.8.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
R&S SPECTRUM ANALYZER	FSP40	100041	Apr. 22, 2008	Apr. 21, 2009

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 5.8.3 TEST PROCEDURE

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

### 5.8.4 DEVIATION FROM TEST STANDARD

No deviation.

### 5.8.5 EUT OPERATING CONDITION

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

## 5.8.6 TEST RESULTS

The spectrum plots are attached on the following 4 images. D1 line indicates the highest level, D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

### GFSK MODULATION

**NOTE 1:** The band edge emission plot on the next page shows 48.26dBc between carrier maximum power and local maximum emission in restrict band (2.37960GHz). The emission of carrier strength list in the test result of channel 0 at the item 5.1.7 is 101.05dBuV/m (Peak), so the maximum field strength in restrict band is  $101.05 - 48.26 = 52.79$ dBuV/m, which is under 74dBuV/m limit.

Average value =  $52.79 - 30.10 = 22.69$ dBuV/m, which is under 54dBuV/m limit.

\*The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on  $0.625 * 5$  per 296.25 ms per channel. Therefore, the duty cycle correction factor be equal to:  $20\log(3.125/100) = -30.1$  dB.

Average value = peak reading – 30.1

**NOTE 2:** The band edge emission plot on the next second page shows 44.56dBc between carrier maximum power and local maximum emission in restrict band (2.48400GHz). The emission of carrier strength list in the test result of channel 78 at the item 5.1.7 is 102.60 dBuV/m (Peak), so the maximum field strength in restrict band is  $102.60 - 44.56 = 58.04$ dBuV/m, which is under 74 dBuV/m limit.

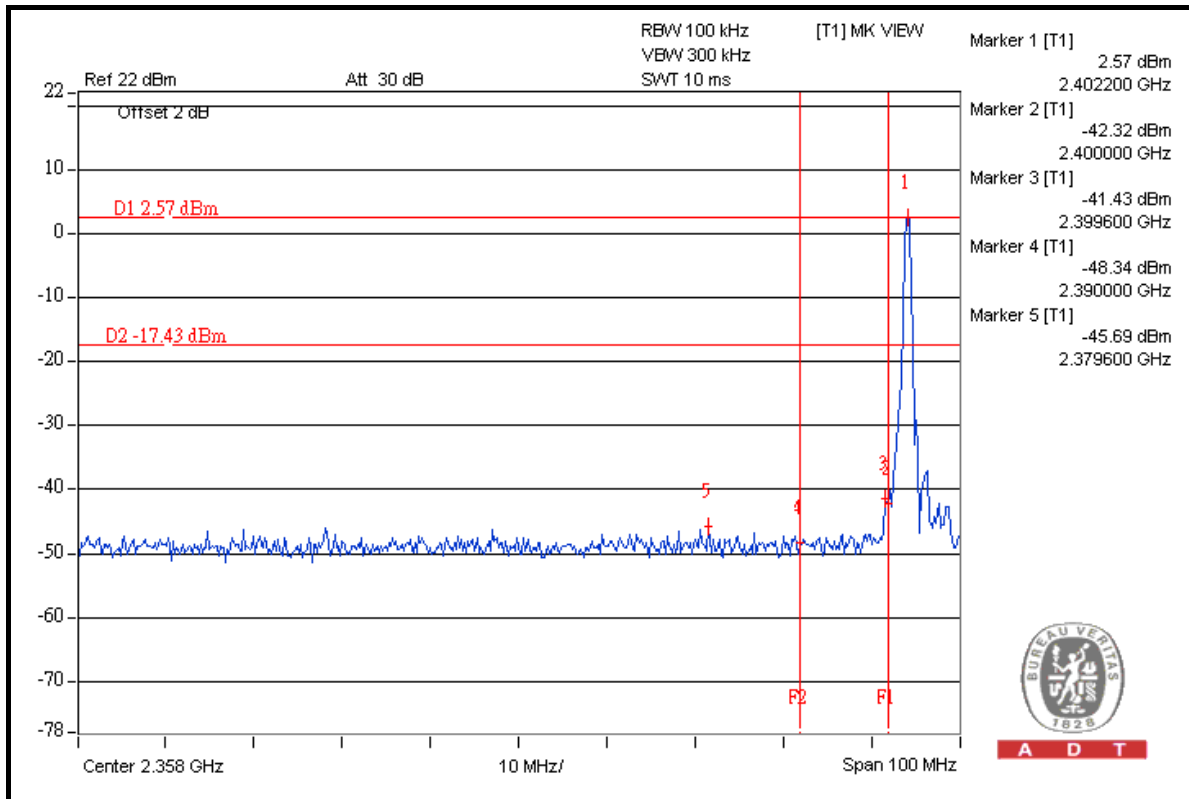
Average value =  $58.04 - 30.10 = 27.94$ dBuV/m, which is under 54dBuV/m limit.

\*The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on  $0.625 * 5$  per 296.25 ms per channel. Therefore, the duty cycle correction factor be equal to:  $20\log(3.125/100) = -30.1$  dB.

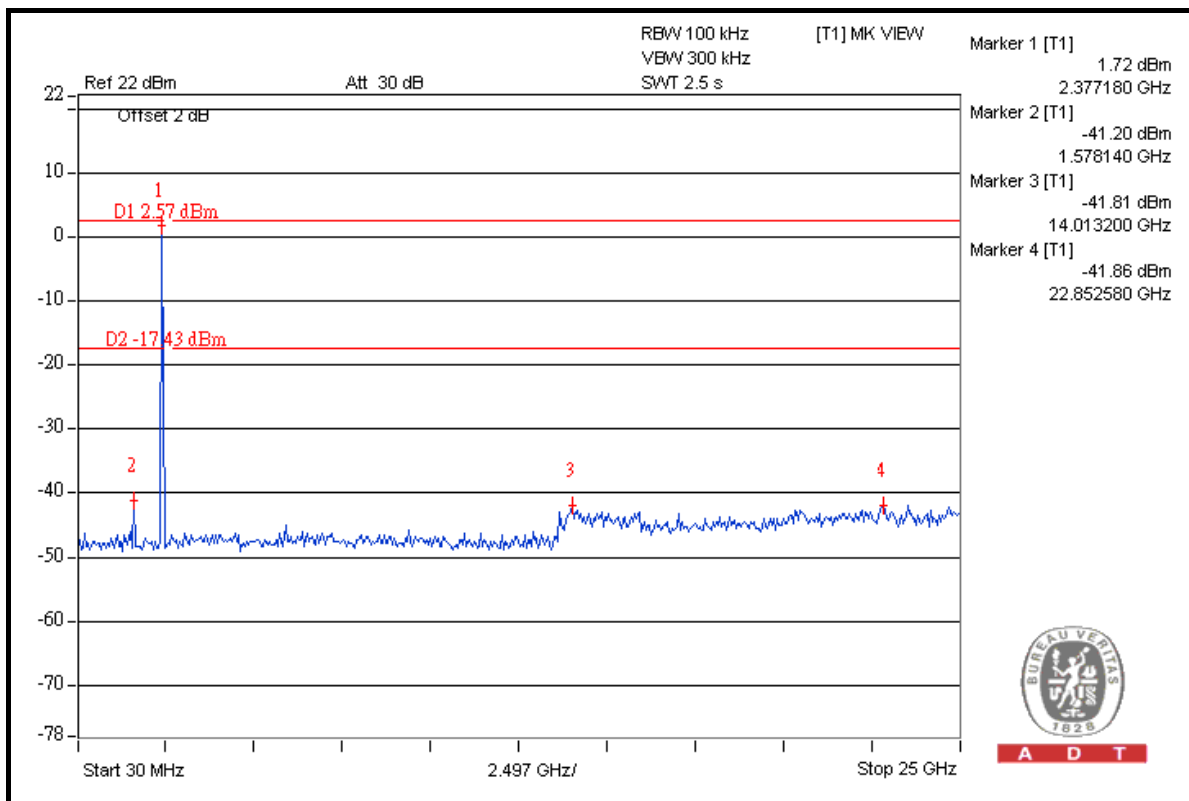
Average value = peak reading – 30.1



A D T



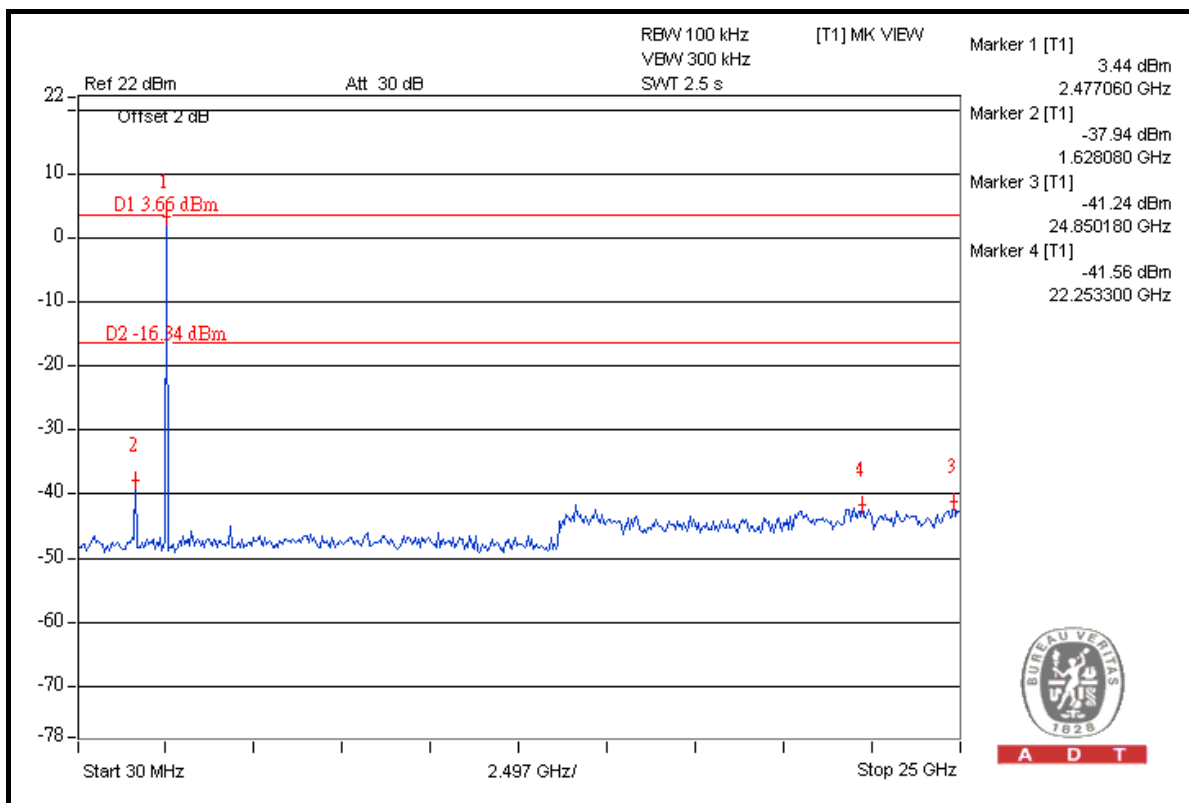
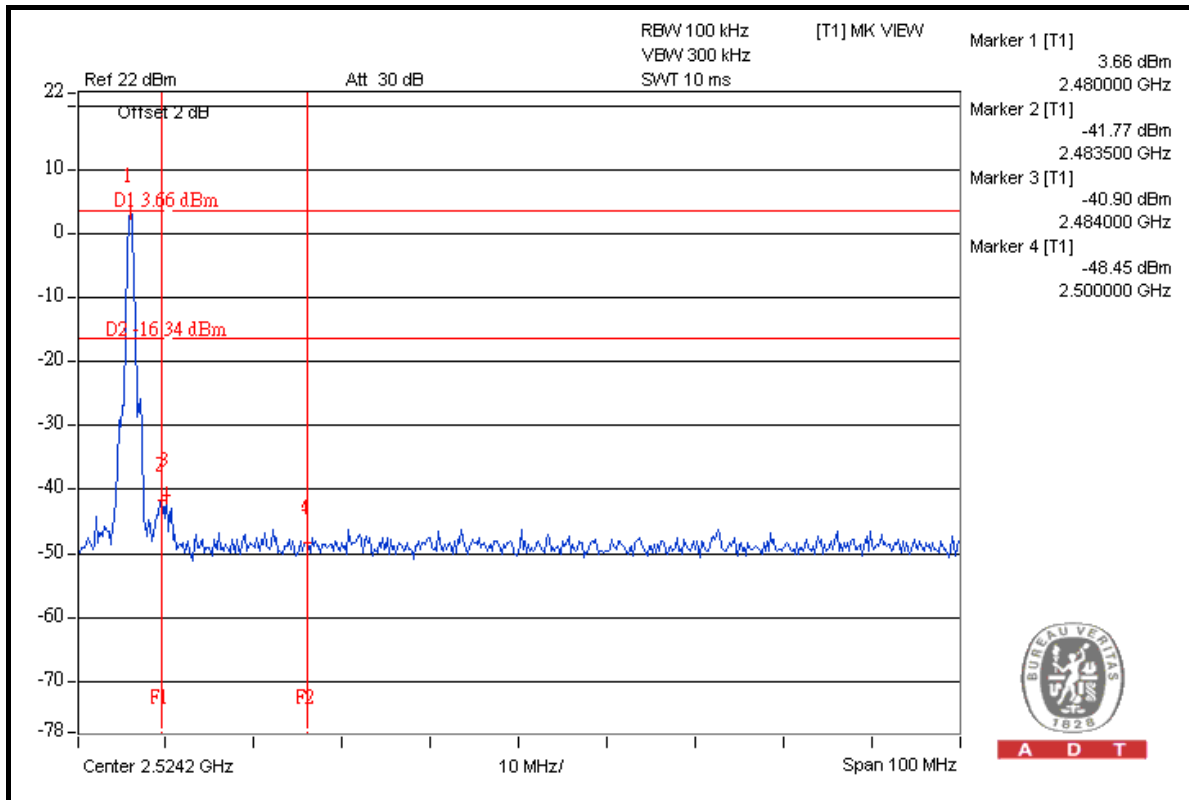
A D T



A D T



A D T



## 5.9 ANTENNA REQUIREMENT

### 5.9.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### 5.9.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is dipole antenna that with dual Hirose U.FL antenna connector. The maximum gain of this antenna is 2dBi.

## 6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



## 7. INFORMATION ON THE TESTING LABORATORIES

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

<b>USA</b>	FCC, NVLAP
<b>Germany</b>	TUV Rheinland
<b>Japan</b>	VCCI
<b>Norway</b>	NEMKO
<b>Canada</b>	INDUSTRY CANADA , CSA
<b>R.O.C.</b>	TAF, BSMI, NCC
<b>Netherlands</b>	Telefication
<b>Singapore</b>	GOST-ASIA(MOU)
<b>Russia</b>	CERTIS(MOU)

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: [www.adt.com.tw/index.5/phtml](http://www.adt.com.tw/index.5/phtml).  
If you have any comments, please feel free to contact us at the following:

**Linko EMC/RF Lab:**

Tel: 886-2-26052180

Fax: 886-2-26051924

**Hsin Chu EMC/RF Lab:**

Tel: 886-3-5935343

Fax: 886-3-5935342

**Hwa Ya EMC/RF/Safety Telecom Lab:**

Tel: 886-3-3183232

Fax: 886-3-3185050

**Web Site:** [www.adt.com.tw](http://www.adt.com.tw)

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



## **8. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB**

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

**--- END ---**