FCC TEST REPORT
(For Bluetooth)

REPORT NO.:	RF960822L02-3
MODEL NO.:	Pegaso P40-2001
RECEIVED:	Aug. 22, 2007
TESTED:	Aug. 23 ~ Sep. 11, 2007
ISSUED:	Sep. 14, 2007

APPLICANT:	Datalogic Mobile Inc.
ADDRESS:	1505 Westec Dr. Eugene, Oregon 97402 USA

ISSUED BY:	Advance Data Technology Corporation
LAB ADDRESS:	No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang 244, Taipei Hsien, 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.

Testing Laboratory
0528

ACCREDITED
No.: 2177-01

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1. CERTIFICATION

PRODUCT:	Portable Data Terminal
MODEL:	Pegaso P40-2001
BRAND:	Datalogic
APPLICANT:	Datalogic Mobile Inc.
TESTED:	Aug. 23 ~ Sep. 11, 2007
TEST SAMPLE:	ENGINEERING SAMPLE
STANDARDS:	**FCC Part 15, Subpart C (Section 15.247),** ANSI C63.4-2003

The above equipment (Model: Pegaso P40-2001) has been tested by **Advance Data Technology Corporation,** 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 : Rennie Wang , **DATE:** Sep. 14, 2007
Rennie Wang / Senior Specialist

TECHNICAL ACCEPTANCE : Long Chen , **DATE:** Sep. 14, 2007
Responsible for RF
Long Chen / Senior Engineer

APPROVED BY : Gary Chang , **DATE:** Sep. 14, 2007
Gary Chang / Assistant Manager

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

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 –16.88dB at 3.070MHz
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 –1.14dB at 1627.00MHz
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.

NOTE: If The Frequency Hopping System operating in 2400-2483.5MHz band and the output power less than 125mW. The hopping channel carrier frequencies separated by a minimum of 25kHz or two-thirds of the 20dB bandwidth of hopping channel whichever is greater.

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	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.34 dB
	200MHz ~1000MHz	3.35 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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

EUT	Portable Data Terminal
MODEL NO.	Pegaso P40-2001
FCC ID	U4SPD
POWER SUPPLY	3.7Vdc from rechargeable lithium battery 5.0Vdc from power adapter
MODULATION TYPE	Wireless LAN: CCK, DQPSK,DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM Bluetooth: GFSK, π /4-DQPSK, 8DPSK
MODULATION TECHNOLOGY	DSSS, OFDM, FHSS
TRANSFER RATE	Wireless LAN: 802.11b:11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps Bluetooth: 1/2/3Mbps
FREQUENCY RANGE	2400 ~ 2483.5MHz
NUMBER OF CHANNEL	Wireless LAN: 11 Bluetooth: 79
CHANNEL SPACING	Wireless LAN: 5MHz Bluetooth: 1MHz
OUTPUT POWER	Wireless LAN: 51.050mW Bluetooth: 1.312mW
ANTENNA TYPE	Wireless LAN: PCB antenna with 1.96dBi gain PIFA antenna with 2.69dBi gain Bluetooth: SMD antenna with 4.10dBi gain
DATA CABLE	1.5m shielded USB cable with charger port without core
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	Adapter, lithium battery x2

NOTE:

1. The EUT is a Portable Data Terminal with wireless LAN, Bluetooth and mobile phone functions. This report is only covered the functions of Bluetooth. The wireless LAN function is covered in another test report (Report no.: RF960822L02-1). For GSM850 function is covered in another test report, which standard used is Part 22. And the PCS1900 mobile phone function is covered in another test report, which standard used is FCC Part 24.
2. The communicated functions of EUT listed as below:

		GSM850MHz	PCS1900MHz	With 802.11b/g & bluetooth
2G	GPRS	√	√	
	EDGE	√	√	

3. The EUT have two lithium batteries listed as below:

BATTERY 1:		BATTERY 2:	
BRAND:	ETI	**BRAND:**	ETI
MODEL:	4006-0337	**MODEL:**	4006-0338
RATING:	3.7Vdc, 3300mAh	**RATING:**	3.7Vdc, 2200mAh

****** After pre-tested both batteries, found battery 1 was the worse, therefore all the test results came out from this.

4. The EUT was operated with following power adapter:

BRAND:	PHIHONG
MODEL:	PSA15R-050P
INPUT:	100-240Vac, 50-60Hz, 0.5A
OUTPUT:	5.0Vdc, 3.0A
POWER LINE:	1.8m non-shielded cable with one core

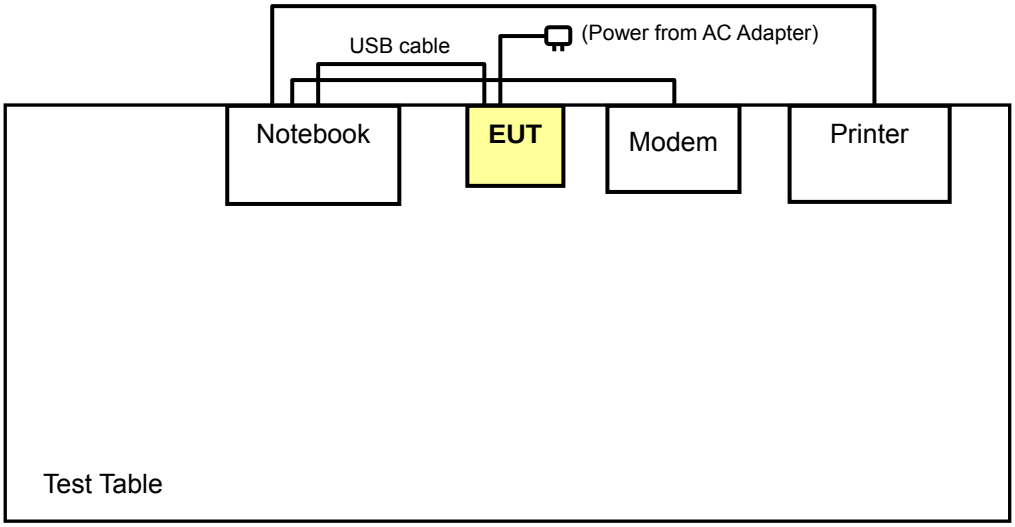
5. The EUT operates in the 2.4GHz frequency spectrum and complies with 802.11b & 802.11g techniques.
6. Bluetooth technology is used in this EUT.
7. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

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	2431	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



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	PLC	RE<1G	RE≥1G	APCM	
-	√	√	√	√	-

Where **PLC:** Power Line Conducted Emission **RE<1G RE:** Radiated Emission below 1GHz
RE≥1G: Radiated Emission above 1GHz **APCM:** Antenna Port Conducted Measurement

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
-	0 to 78	0, 39, 78	FHSS	GFSK	DH5

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, 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
-	0 to 78	0	FHSS	8DPSK	DH5	Y

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, 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
-	0 to 78	0, 39, 78	FHSS	GFSK	DH5	Y
-	0 to 78	0, 39, 78	FHSS	8DPSK	DH5	Y

BANDEDGE 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
-	0 to 78	0, 78	FHSS	GFSK	DH5
-	0 to 78	0, 78	FHSS	8DPSK	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
-	0 to 78	0, 39, 78	FHSS	GFSK	DH5
-	0 to 78	0, 39, 78	FHSS	8DPSK	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 COMPUTER	DELL	PP05L	16484462992	E2K24CLNS
2	PRINTER	EPSON	LQ-300+	DCGY054147	FCC DoC Approved
3	MODEM	ACEEX	1414V/3	0401008269	IFAXDM1414

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	2.0m shielded USB cable
2	1.8m braid shielded wire , DB25 connector , w/o core.
3	1.2m braid shielded wire , DB25 & DB9 connector , w/o core.

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

4. TEST TYPES AND RESULTS

5.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	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.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Sep. 25, 2007
RF signal cable Woken	5D-FB	Cable-HYCO3-01	Jan. 06, 2008
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Jan. 08, 2008
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Jan. 16, 2008
Software ADT	ADT_Cond_V3	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.

4.1.3 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.

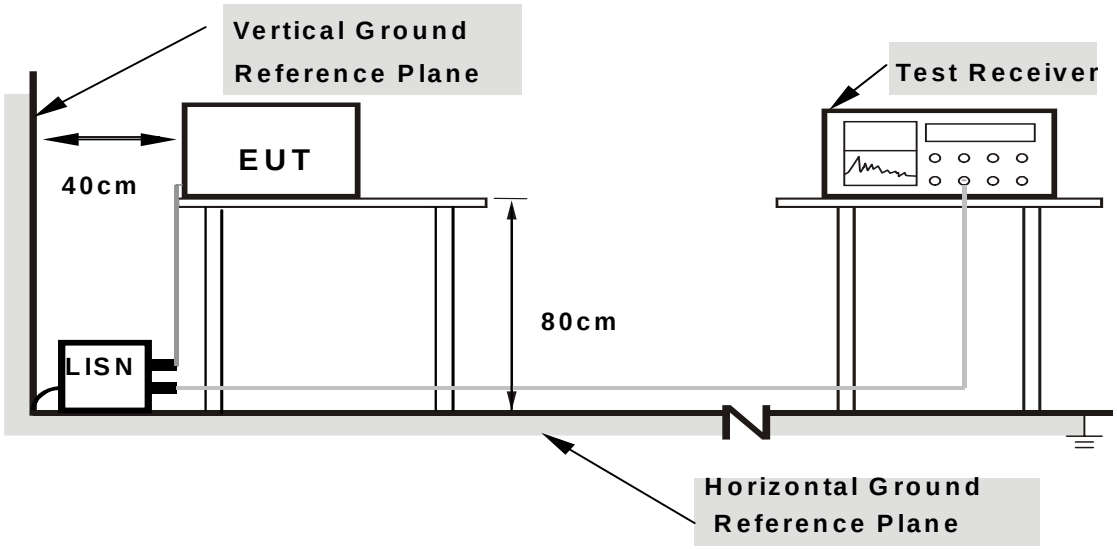
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 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).

4.1.6 EUT OPERATING CONDITIONS

a. Connected EUT with notebook system via USB cable and placed on a testing table.

b. The notebook system ran a test program (provided by manufacturer) to enable EUT under transmitting condition continuously at specific channel frequency.

c. The necessary accessories enable the system in full functions.

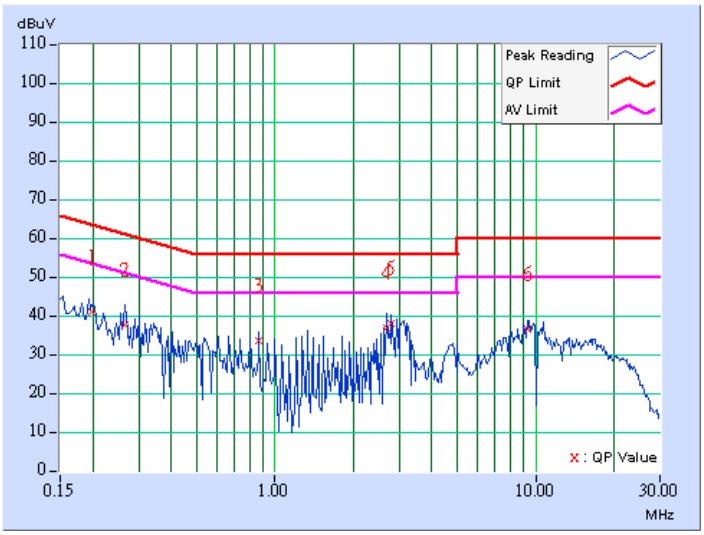
4.1.7 TEST RESULTS

CONDUCTED WORST CASE DATA

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	PHASE	Line 1
MODULATION TYPE	GFSK	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	26deg. C, 68%RH, 991hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Dean Wang		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.199	0.10	40.78	-	40.88	-	63.64	53.64	-22.76	-
2	0.267	0.10	37.45	-	37.55	-	61.20	51.20	-23.65	-
3	0.869	0.11	33.56	-	33.67	-	56.00	46.00	-22.33	-
4	2.669	0.24	36.62	-	36.86	-	56.00	46.00	-19.14	-
5	2.805	0.24	37.86	-	38.10	-	56.00	46.00	-17.90	-
6	9.344	0.32	36.19	-	36.51	-	60.00	50.00	-23.49	-

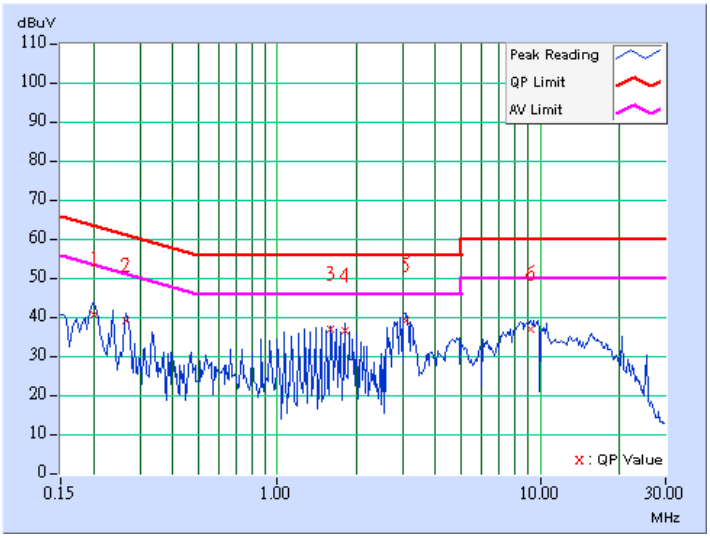
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	PHASE	Line 2
MODULATION TYPE	GFSK	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	26deg. C, 68%RH, 991hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Dean Wang		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.201	0.10	40.31	-	40.41	-	63.58	53.58	-23.17	-
2	0.267	0.10	38.97	-	39.07	-	61.20	51.20	-22.13	-
3	1.602	0.22	36.48	-	36.70	-	56.00	46.00	-19.30	-
4	1.802	0.22	36.31	-	36.53	-	56.00	46.00	-19.47	-
5	3.070	0.25	38.79	-	39.04	-	56.00	46.00	-16.96	-
6	9.211	0.41	36.50	-	36.91	-	60.00	50.00	-23.09	-

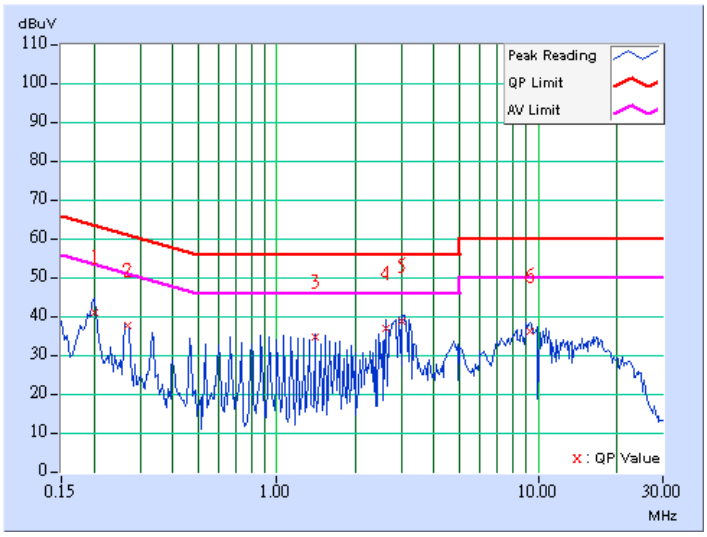
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 39	PHASE	Line 1
MODULATION TYPE	GFSK	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	26deg. C, 68%RH, 991hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Dean Wang		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.201	0.10	40.82	-	40.92	-	63.58	53.58	-22.66	-
2	0.268	0.10	37.31	-	37.41	-	61.19	51.19	-23.78	-
3	1.402	0.15	34.40	-	34.55	-	56.00	46.00	-21.45	-
4	2.603	0.24	36.73	-	36.97	-	56.00	46.00	-19.03	-
5	3.004	0.25	38.62	-	38.87	-	56.00	46.00	-17.13	-
6	9.344	0.32	35.88	-	36.20	-	60.00	50.00	-23.80	-

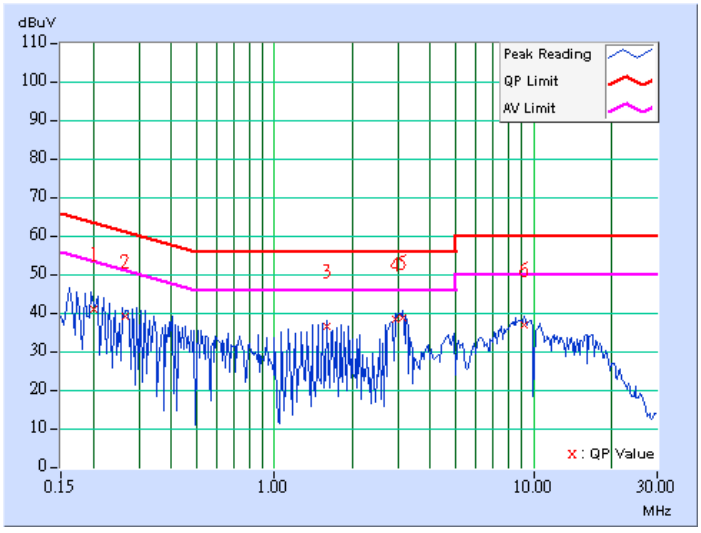
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 39	PHASE	Line 2
MODULATION TYPE	GFSK	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	26deg. C, 68%RH, 991hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Dean Wang		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.200	0.10	40.88	-	40.98	-	63.61	53.61	-22.63	-
2	0.267	0.10	38.99	-	39.09	-	61.20	51.20	-22.11	-
3	1.602	0.22	36.42	-	36.64	-	56.00	46.00	-19.36	-
4	2.938	0.25	38.02	-	38.27	-	56.00	46.00	-17.73	-
5	3.137	0.25	38.39	-	38.64	-	56.00	46.00	-17.36	-
6	9.211	0.41	36.56	-	36.97	-	60.00	50.00	-23.03	-

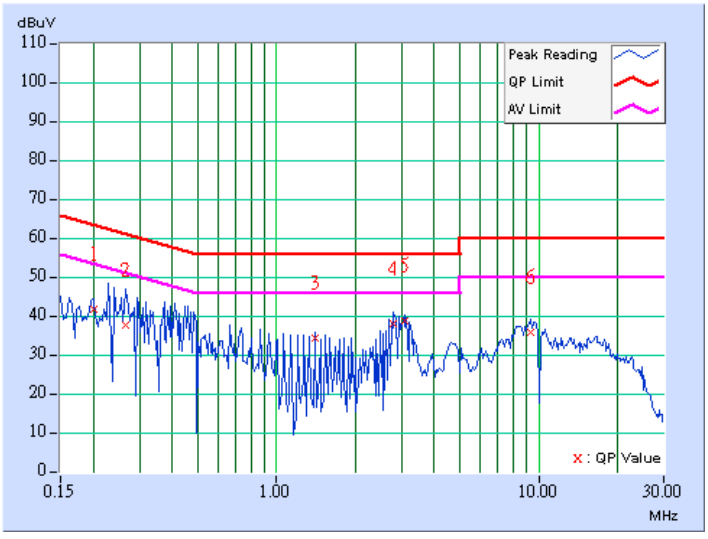
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission 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 1
MODULATION TYPE	GFSK	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	26deg. C, 68%RH, 991hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Dean Wang		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.201	0.10	41.56	-	41.66	-	63.58	53.58	-21.92	-
2	0.267	0.10	37.41	-	37.51	-	61.20	51.20	-23.69	-
3	1.402	0.15	34.20	-	34.35	-	56.00	46.00	-21.65	-
4	2.805	0.24	37.68	-	37.92	-	56.00	46.00	-18.08	-
5	3.070	0.25	38.57	-	38.82	-	56.00	46.00	-17.18	-
6	9.277	0.32	35.52	-	35.84	-	60.00	50.00	-24.16	-

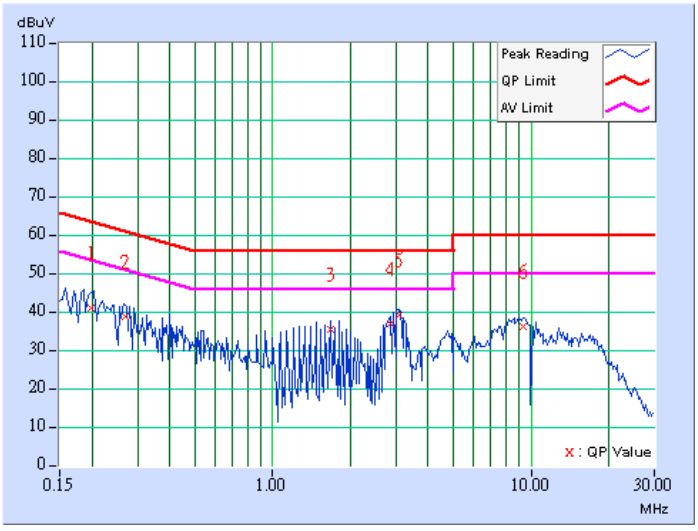
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission 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	26deg. C, 68%RH, 991hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Dean Wang		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.199	0.10	40.78	-	40.88	-	63.64	53.64	-22.76	-
2	0.268	0.10	38.58	-	38.68	-	61.17	51.17	-22.49	-
3	1.669	0.22	35.14	-	35.36	-	56.00	46.00	-20.64	-
4	2.871	0.25	36.61	-	36.86	-	56.00	46.00	-19.14	-
5	**3.070**	**0.25**	**38.87**	**-**	**39.12**	**-**	**56.00**	**46.00**	**-16.88**	**-**
6	9.345	0.41	35.94	-	36.35	-	60.00	50.00	-23.65	-

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.



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 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.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Jul. 27, 2008
Spectrum Analyzer ROHDE & SCHWARZ	FSPegaso P40-2001	100025	Oct. 05, 2007
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	May 31, 2008
HORN Antenna SCHWARZBECK	9120D	9120D-209	Jun. 28, 2008
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 28, 2007
Preamplifier Agilent	8447D	2944A10633	Oct. 26, 2007
Preamplifier Agilent	8449B	3008A01964	Oct. 26, 2007
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	238137/4	Dec. 11, 2007
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	233233/4	Nov. 14, 2007
Software ADT.	ADT_Radiated_V7.6	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA
Turn Table ADT.	TT100.	TT93021703	NA
Turn Table Controller ADT.	SC100.	SC93021703	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 VCCI Site Registration No. is R-237.
5. The IC Site Registration No. is IC3789B-3.

4.2.3 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.

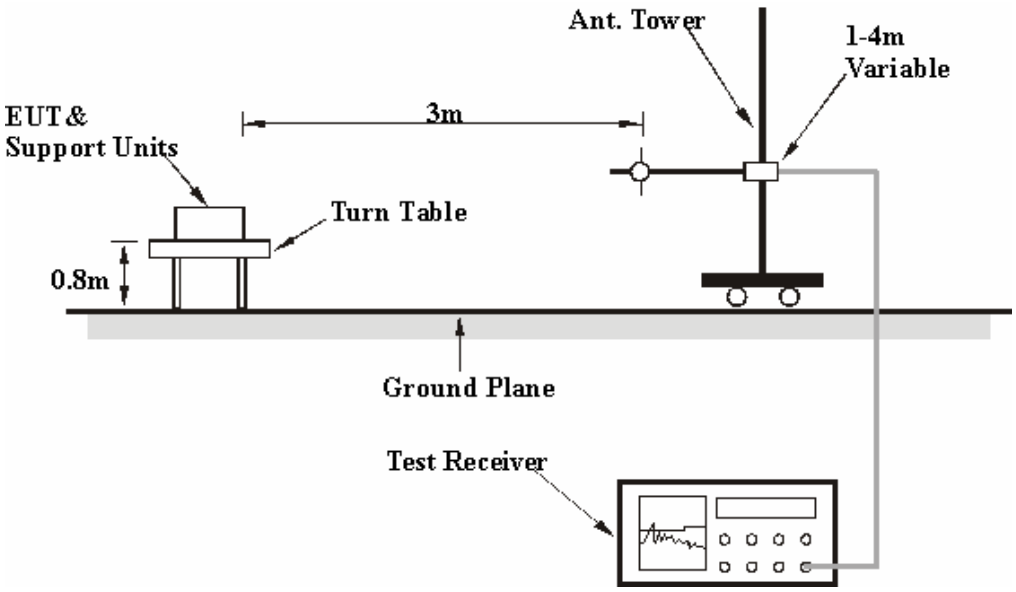
NOTE:

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.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

4.2.7 TEST RESULTS

RADIATED BELOW 1GHz WORST-CASE DATA: 8DPSK MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	**FREQUENCY RANGE**	Below 1000MHz
MODULATION TYPE	8DPSK	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 998hPa	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
TESTED BY	Brad Wu		

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	199.05	26.47 QP	43.50	-17.03	1.50 H	295	15.13	11.34
2	397.37	26.88 QP	46.00	-19.12	1.00 H	13	9.31	17.58
3	467.36	37.61 QP	46.00	-8.39	1.50 H	154	17.90	19.71
4	593.74	34.22 QP	46.00	-11.78	1.00 H	289	11.91	22.31
5	665.68	32.20 QP	46.00	-13.80	1.00 H	277	8.42	23.78
6	865.94	38.00 QP	46.00	-8.00	1.00 H	157	10.84	27.16

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	64.90	27.10 QP	40.00	-12.90	1.00 V	241	13.75	13.35
2	132.95	29.80 QP	43.50	-13.70	1.50 V	343	16.44	13.36
3	364.32	25.47 QP	46.00	-20.53	1.00 V	307	8.67	16.81
4	465.42	34.71 QP	46.00	-11.29	1.50 V	229	15.04	19.67
5	733.73	32.11 QP	46.00	-13.89	1.00 V	130	6.93	25.18
6	865.94	34.21 QP	46.00	-11.79	1.00 V	208	7.05	27.16

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.

RADIATED ABOVE 1GHz DATA: GFSK MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	GFSK	DETECTOR FUNCTION	Peak (PK) Average (AV)
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH, 998hPa
TESTED BY	Morgan Chen		

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	1602.000	56.74 PK	74.00	-17.26	1.00 H	359	26.33	30.41
2	1602.000	47.67 AV	54.00	-6.33	1.00 H	359	17.26	30.41
3	2390.000	47.55 PK	74.00	-26.45	1.03 H	28	15.31	32.24
4	2390.000	43.15 AV	54.00	-10.85	1.03 H	28	10.91	32.24
5	*2402.000	97.55 PK			1.03 H	28	65.26	32.29
6	*2402.000	67.45 AV			1.03 H	28	35.16	32.29
7	4804.000	58.69 PK	74.00	-15.31	1.10 H	225	20.63	38.06
8	4804.000	28.59 AV	54.00	-25.41	1.10 H	225	-9.47	38.06

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	1602.000	55.46 PK	74.00	-18.54	1.00 V	266	25.05	30.41
2	1602.000	50.17 AV	54.00	-3.83	1.00 V	266	19.76	30.41
3	2390.000	43.25 PK	74.00	-30.75	1.29 V	1	11.01	32.24
4	2390.000	40.11 AV	54.00	-13.89	1.29 V	1	7.87	32.24
5	*2402.000	94.75 PK			1.29 V	1	62.46	32.29
6	*2402.000	64.65 AV			1.29 V	1	32.36	32.29
7	4804.000	60.98 PK	74.00	-13.02	1.00 V	0	22.92	38.06
8	4804.000	30.88 AV	54.00	-23.12	1.00 V	0	-7.18	38.06

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: 20log(3.125 / 100)= -30.1 dB.
7. Average value = peak reading + 20log(duty cycle).

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 39	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	GFSK	DETECTOR FUNCTION	Peak (PK) Average (AV)
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH, 998hPa
TESTED BY	Morgan Chen		

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	1627.000	56.48 PK	74.00	-17.52	1.02 H	345	26.05	30.43
2	1627.000	47.29 AV	54.00	-6.71	1.02 H	345	16.86	30.43
3	*2441.000	97.36 PK			1.05 H	31	64.94	32.42
4	*2441.000	67.26 AV			1.05 H	31	34.84	32.42
5	4882.000	58.86 PK	74.00	-15.14	1.08 H	269	20.51	38.35
6	4882.000	28.76 AV	54.00	-25.24	1.08 H	269	-9.59	38.35

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	1627.000	55.63 PK	74.00	-18.37	1.12 V	256	25.20	30.43
2	1627.000	50.30 AV	54.00	-3.70	1.12 V	256	19.87	30.43
3	*2441.000	94.68 PK			1.28 V	3	62.26	32.42
4	*2441.000	64.58 AV			1.28 V	3	32.16	32.42
5	4882.000	61.14 PK	74.00	-12.86	1.02 V	256	22.79	38.35
6	4882.000	31.04 AV	54.00	-22.96	1.02 V	256	-7.31	38.35

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 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: 20log(3.125 / 100)= -30.1 dB.
7. Average value = peak reading + 20log(duty cycle).

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 78	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	GFSK	DETECTOR FUNCTION	Peak (PK) Average (AV)
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH, 998hPa
TESTED BY	Morgan Chen		

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	1654.000	52.60 PK	74.00	-21.40	1.17 H	292	22.14	30.46
2	1654.000	50.94 AV	54.00	-3.06	1.17 H	292	20.48	30.46
3	*2480.000	97.38 PK			1.08 H	13	64.84	32.54
4	*2480.000	67.28 AV			1.08 H	13	34.74	32.54
5	2483.500	48.62 PK	74.00	-25.38	1.00 H	315	16.06	32.56
6	2483.500	44.25 AV	54.00	-9.75	1.00 H	315	11.69	32.56
7	4960.000	58.38 PK	74.00	-15.62	1.00 H	35	19.86	38.52
8	4960.000	28.28 AV	54.00	-25.72	1.00 H	35	-10.24	38.52

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	1654.000	53.97 PK	74.00	-20.03	1.00 V	255	23.51	30.46
2	1654.000	52.27 AV	54.00	-1.73	1.00 V	255	21.81	30.46
3	*2480.000	94.67 PK			1.22 V	3	62.13	32.54
4	*2480.000	64.57 AV			1.22 V	3	32.03	32.54
5	2483.500	44.55 PK	74.00	-29.45	1.22 V	3	11.99	32.56
6	2483.500	41.20 AV	54.00	-12.80	1.22 V	3	8.64	32.56
7	4960.000	60.53 PK	74.00	-13.47	1.22 V	1	22.01	38.52
8	4960.000	30.43 AV	54.00	-23.57	1.22 V	1	-8.09	38.52

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: 20log(3.125 / 100)= -30.1 dB.
7. Average value = peak reading + 20log(duty cycle).

8DPSK MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	8DPSK	DETECTOR FUNCTION	Peak (PK) Average (AV)
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH, 998hPa
TESTED BY	Morgan Chen		

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	1602.000	50.87 PK	74.00	-23.13	1.26 H	324	20.46	30.41
2	1602.000	48.64 AV	54.00	-5.36	1.26 H	324	18.23	30.41
3	2390.000	50.85 PK	74.00	-23.15	1.16 H	227	18.61	32.24
4	2390.000	45.77 AV	54.00	-8.23	1.16 H	227	13.53	32.24
5	*2402.000	93.95 PK			1.16 H	227	61.66	32.29
6	*2402.000	63.85 AV			1.16 H	227	31.56	32.29
7	4804.000	56.11 PK	74.00	-17.89	1.00 H	18	18.05	38.06
8	4804.000	26.01 AV	54.00	-27.99	1.00 H	18	-12.05	38.06

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	1602.000	53.91 PK	74.00	-20.09	1.02 V	259	23.50	30.41
2	1602.000	51.41 AV	54.00	-2.59	1.02 V	259	21.00	30.41
3	2390.000	49.02 PK	74.00	-24.98	1.00 V	13	16.78	32.24
4	2390.000	45.11 AV	54.00	-8.89	1.00 V	13	12.87	32.24
5	*2402.000	92.68 PK			1.00 V	13	60.39	32.29
6	*2402.000	62.58 AV			1.00 V	13	30.29	32.29
7	4804.000	57.35 PK	74.00	-16.65	1.00 V	32	19.29	38.06
8	4804.000	27.25 AV	54.00	-26.75	1.00 V	32	-10.81	38.06

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: 20log(3.125 / 100)= -30.1 dB.
7. Average value = peak reading + 20log(duty cycle).

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 39	**FREQUENCY RANGE**	1 ~ 25GHz
MODULATION TYPE	8DPSK	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	25deg. C, 68%RH, 998hPa
TESTED BY	Morgan Chen		

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	1627.000	52.96 PK	74.00	-21.04	1.13 H	245	22.53	30.43
2	1627.000	50.45 AV	54.00	-3.55	1.13 H	245	20.02	30.43
3	*2441.000	94.14 PK			1.00 H	30	61.72	32.42
4	*2441.000	64.04 AV			1.00 H	30	31.62	32.42
5	4882.000	56.48 PK	74.00	-17.52	1.21 H	360	18.13	38.35
6	4882.000	26.38 AV	54.00	-27.62	1.21 H	360	-11.97	38.35

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	1627.000	54.68 PK	74.00	-19.32	1.13 V	236	24.25	30.43
2	**1627.000**	**52.86 AV**	**54.00**	**-1.14**	**1.13 V**	**236**	**22.43**	**30.43**
3	*2441.000	92.58 PK			1.16 V	42	60.16	32.42
4	*2441.000	62.48 AV			1.16 V	42	30.06	32.42
5	4882.000	58.66 PK	74.00	-15.34	1.01 V	46	20.31	38.35
6	4882.000	28.56 AV	54.00	-25.44	1.01 V	46	-9.79	38.35

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 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: 20log(3.125 / 100)= -30.1 dB.
7. Average value = peak reading + 20log(duty cycle).

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 78	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	8DPSK	DETECTOR FUNCTION	Peak (PK) Average (AV)
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH, 998hPa
TESTED BY	Morgan Chen		

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	1654.000	52.84 PK	74.00	-21.16	1.00 H	228	22.38	30.46
2	1654.000	50.31 AV	54.00	-3.69	1.00 H	228	19.85	30.46
3	*2480.000	94.11 PK			1.00 H	23	61.57	32.54
4	*2480.000	64.01 AV			1.00 H	23	31.47	32.54
5	2483.500	54.68 PK	74.00	-19.32	1.00 H	23	22.12	32.56
6	2483.500	49.70 AV	54.00	-4.30	1.00 H	23	17.14	32.56
7	4960.000	56.95 PK	74.00	-17.05	1.00 H	22	18.43	38.52
8	4960.000	26.85 AV	54.00	-27.15	1.00 H	22	-11.67	38.52

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	1654.000	54.40 PK	74.00	-19.60	1.00 V	254	23.94	30.46
2	1654.000	52.81 AV	54.00	-1.19	1.00 V	254	22.35	30.46
3	*2480.000	92.98 PK			1.15 V	35	60.44	32.54
4	*2480.000	62.88 AV			1.15 V	35	30.34	32.54
5	2483.500	52.85 PK	74.00	-21.15	1.15 V	35	20.29	32.56
6	2483.500	47.58 AV	54.00	-6.42	1.15 V	35	15.02	32.56
7	4960.000	58.81 PK	74.00	-15.19	1.00 V	32	20.29	38.52
8	4960.000	28.71 AV	54.00	-25.29	1.00 V	32	-9.81	38.52

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: 20log(3.125 / 100)= -30.1 dB.
7. Average value = peak reading + 20log(duty cycle).

4.3 NUMBER OF HOPPING FREQUENCY USED

4.3.1 LIMIT OF HOPPING FREQUENCY USED

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

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSPegaso P40-2001	100040	Jun. 28, 2008

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 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.

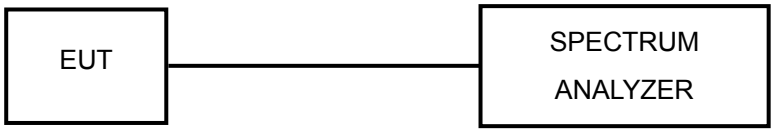
d. Set the SA on View mode and then plot the result on SA screen.

e. Repeat above procedures until all frequencies measured were complete.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

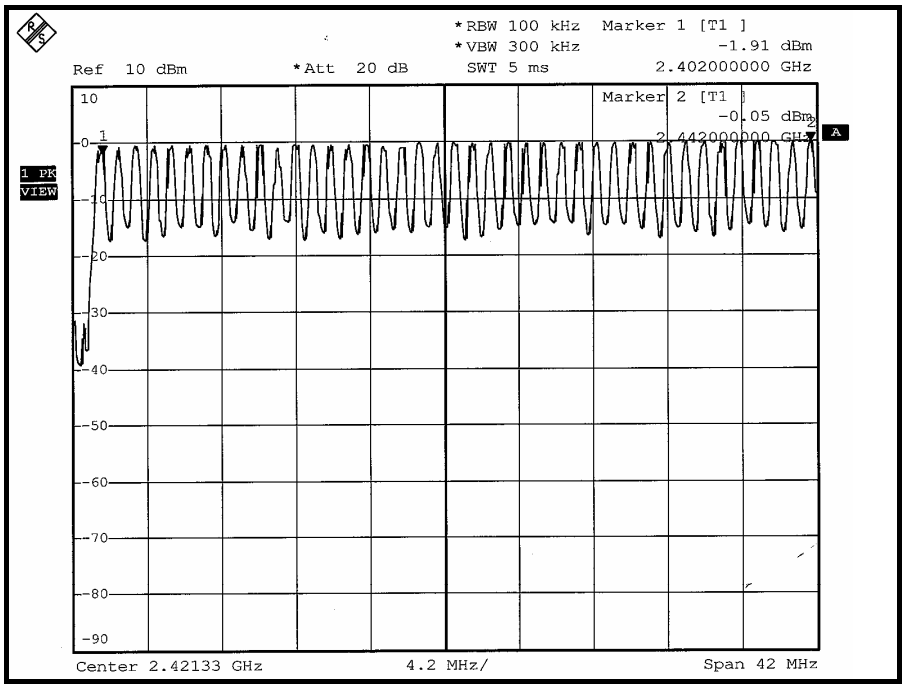
4.3.5 TEST SETUP

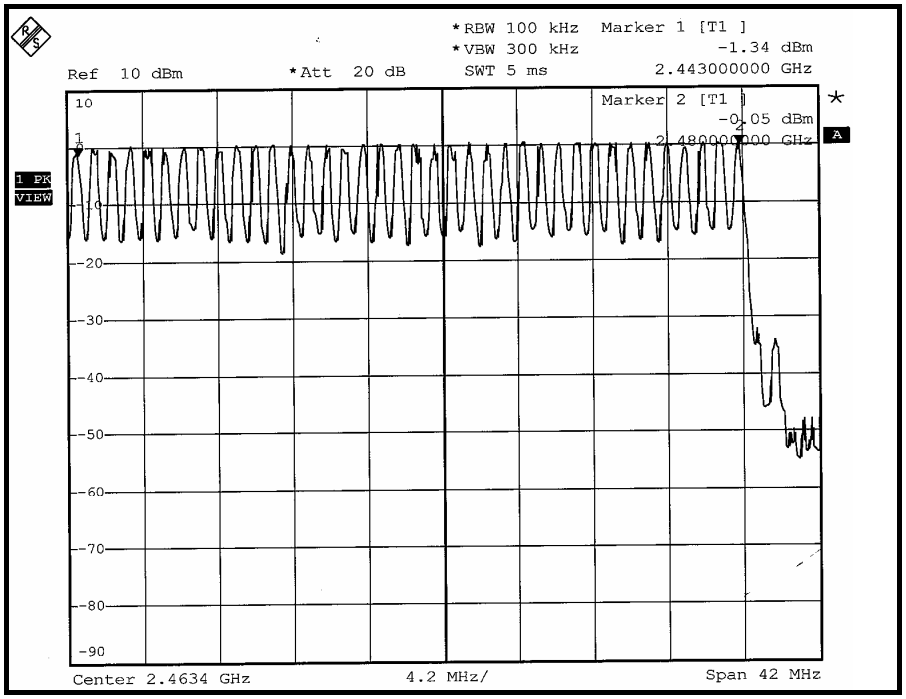


4.3.6 TEST RESULTS

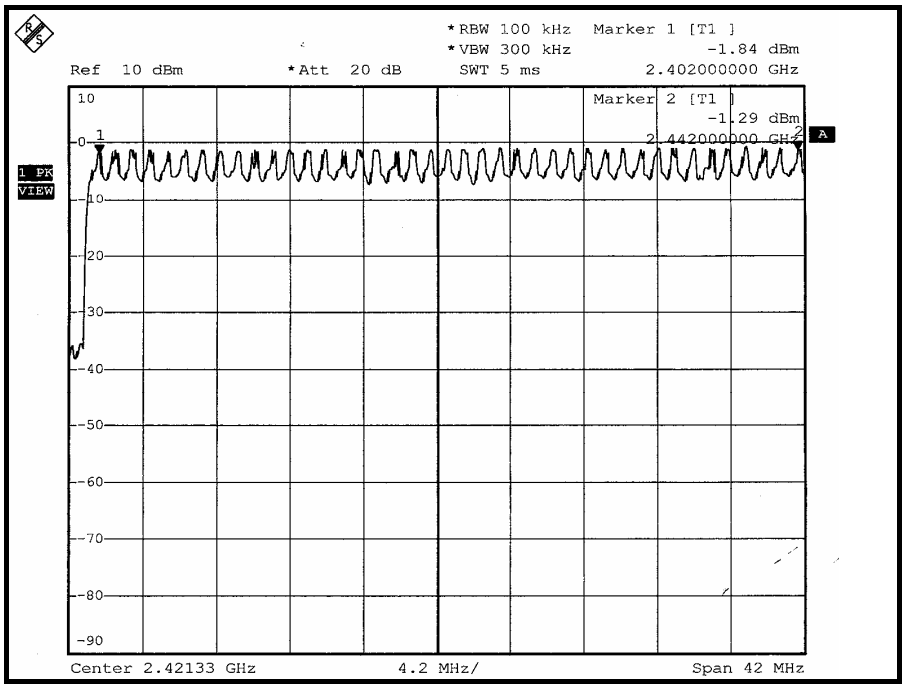
There are 79 hopping frequencies in the hopping mode. Please refer to next two pages for the test result. On the plots, it shows that the hopping frequencies are equally spaced.

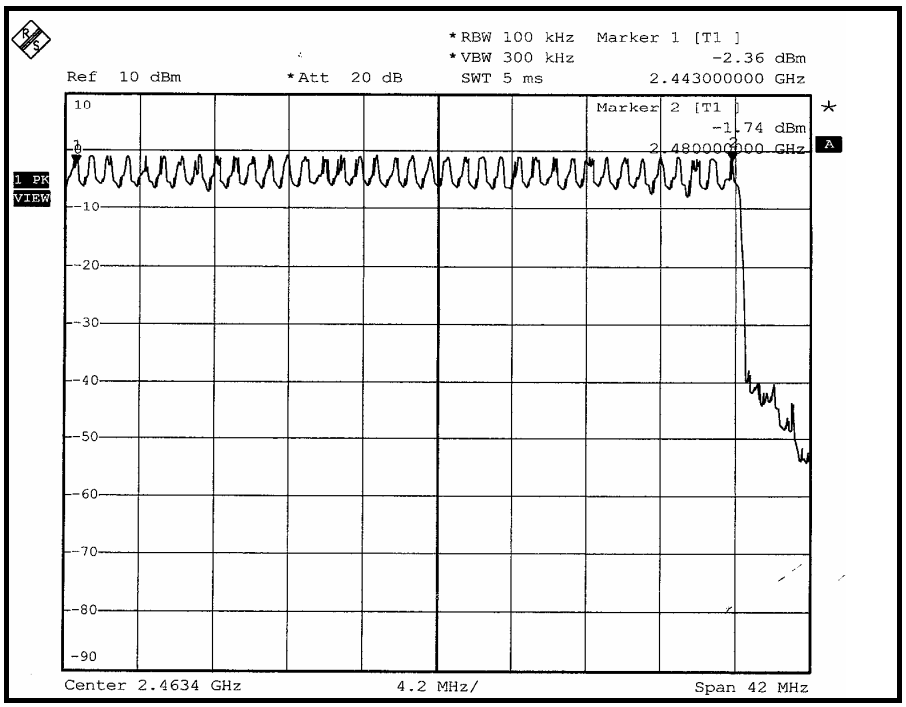
GFSK MODULATION





8DPSK MODULATION





4.4 DWELL TIME ON EACH CHANNEL

4.4.1 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.

4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSPegaso P40-2001	100040	Jun. 28, 2008

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

4.4.3 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.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

4.4.5 TEST SETUP

Same as 4.3.5.

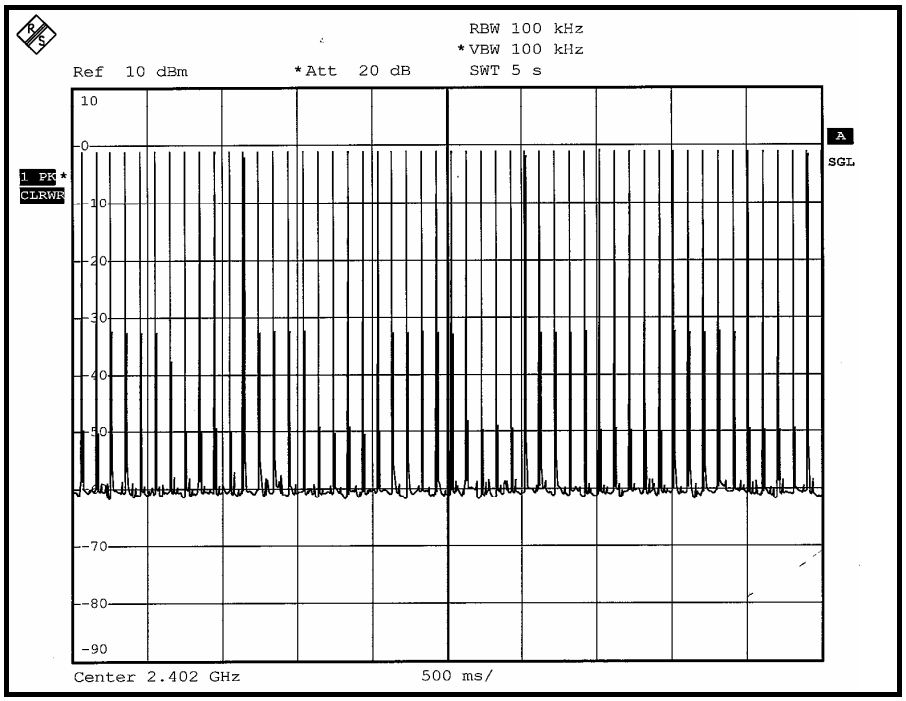
4.4.6 TEST RESULTS

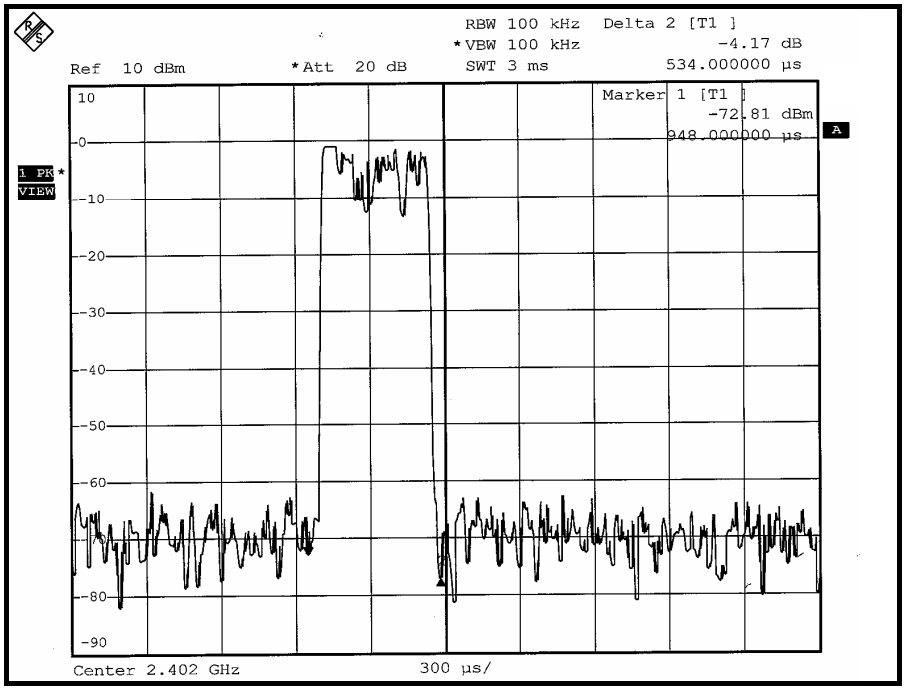
GFSK MODULATION

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	0.534	172.119	400
DH3	25 (times / 5 sec) * 6.32 = 158.00times	1.788	282.504	400
DH5	17 (times / 5 sec) * 6.32 = 107.44 times	3.024	324.899	400

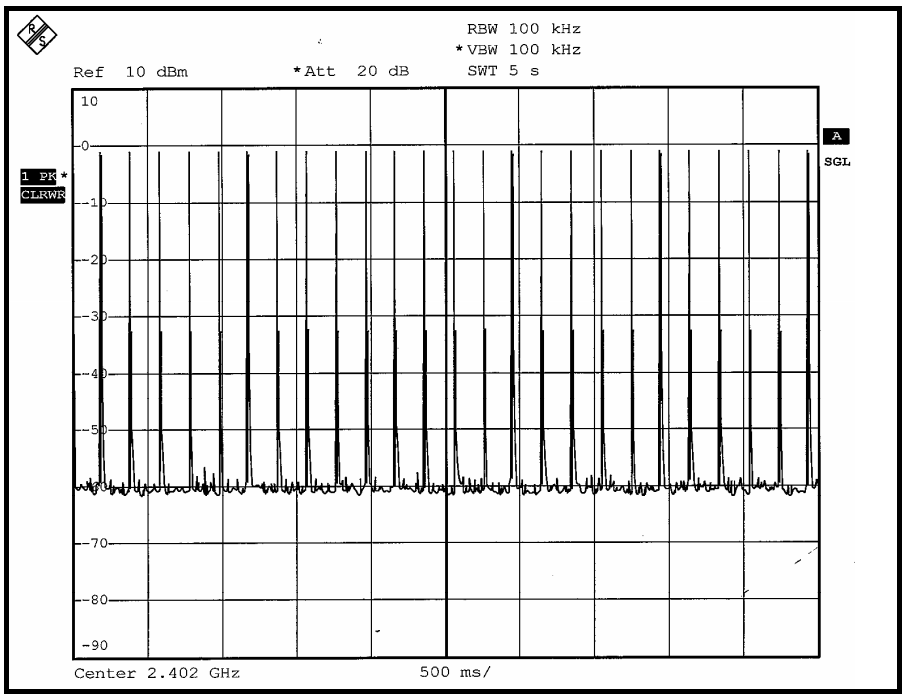
NOTE: Test plots of the transmitting time slot are shown on next 3 pages.

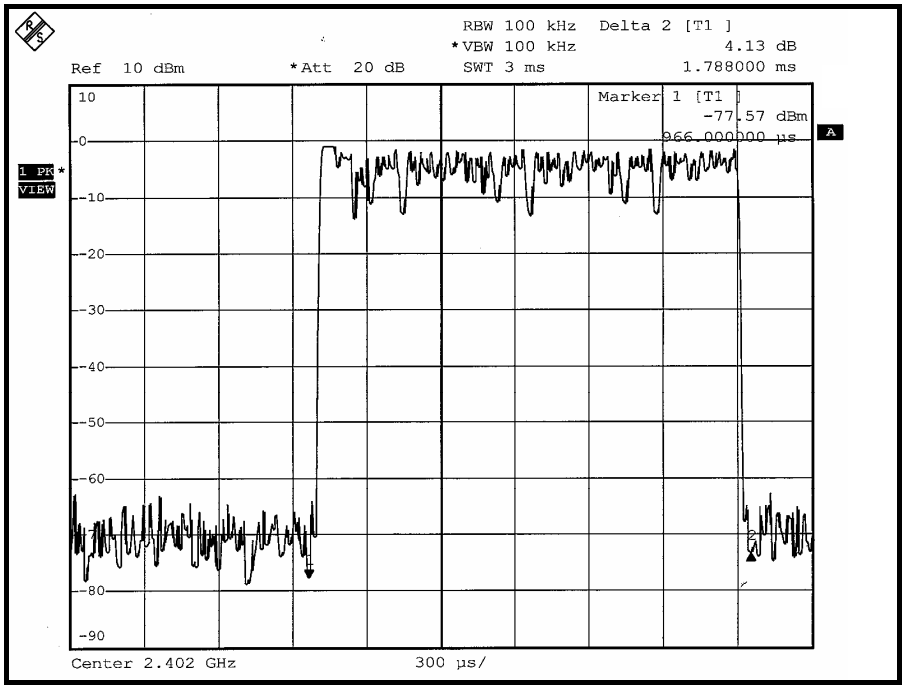
DH1


RBW 100 kHz
*VBW 100 kHz
Ref 10 dBm
*Att 20 dB
SWT 5 s
1 PK*
CLRWR
A
SGL
10
0
-10
-20
-30
-40
-50
-70
-80
-90
Center 2.402 GHz
500 ms/

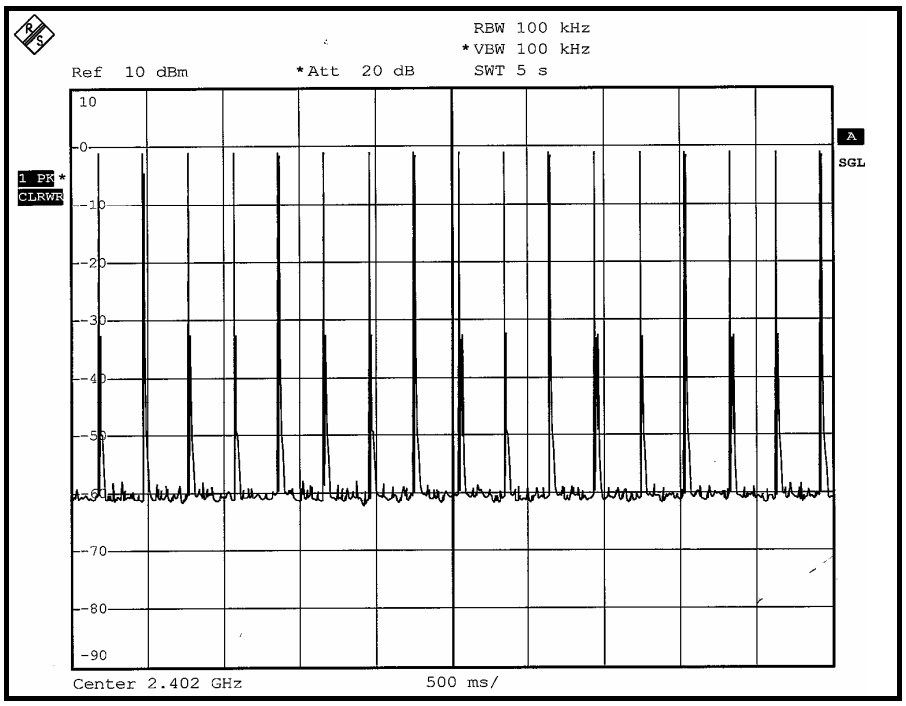

RBW 100 kHz
Delta 2 [T1]
*VBW 100 kHz
-4.17 dB
Ref 10 dBm
*Att 20 dB
SWT 3 ms
534.000000 µs
Marker 1 [T1]
-72.81 dBm
948.000000 µs
1 PK*
VIEW
A
10
0
-10
-20
-30
-40
-50
-60
-80
-90
Center 2.402 GHz
300 µs/

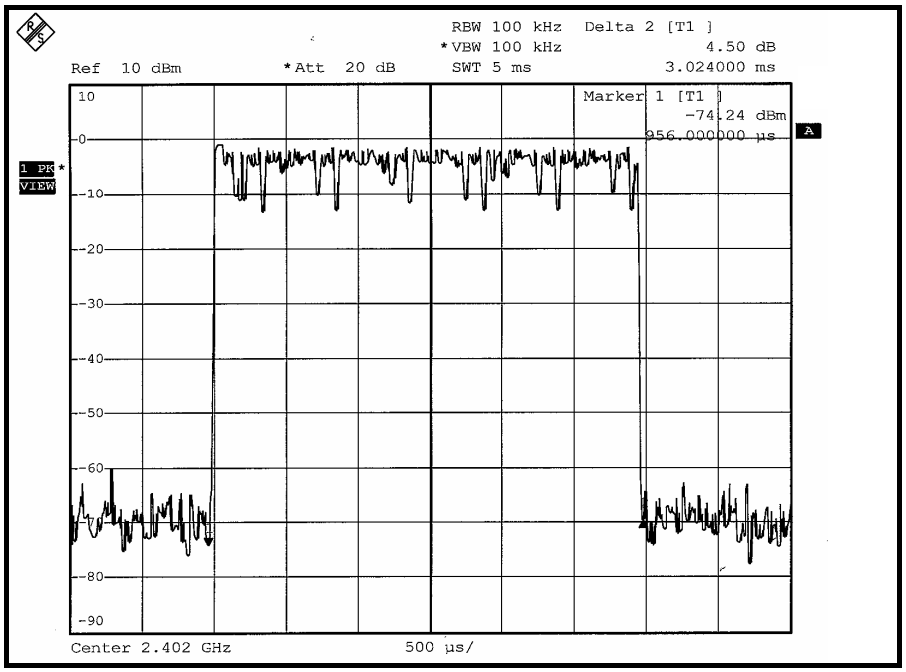
DH3


RBW 100 kHz
*VBW 100 kHz
Ref 10 dBm
*Att 20 dB
SWT 5 s
10
0
-10
-20
-30
-40
-50
-70
-80
-90
1 PK*
CLRWR
A
SGL
Center 2.402 GHz
500 ms/


RBW 100 kHz
Delta 2 [T1]
*VBW 100 kHz
4.13 dB
Ref 10 dBm
*Att 20 dB
SWT 3 ms
1.788000 ms
Marker 1 [T1]
-77.57 dBm
966.000000 µs
10
0
-10
-20
-30
-40
-50
-60
-80
-90
1 PK*
VIEW
A
Center 2.402 GHz
300 µs/

DH5


RBW 100 kHz
*VBW 100 kHz
Ref 10 dBm
*Att 20 dB
SWT 5 s
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
1 PK *
CLRWR
A
SGL
Center 2.402 GHz
500 ms/

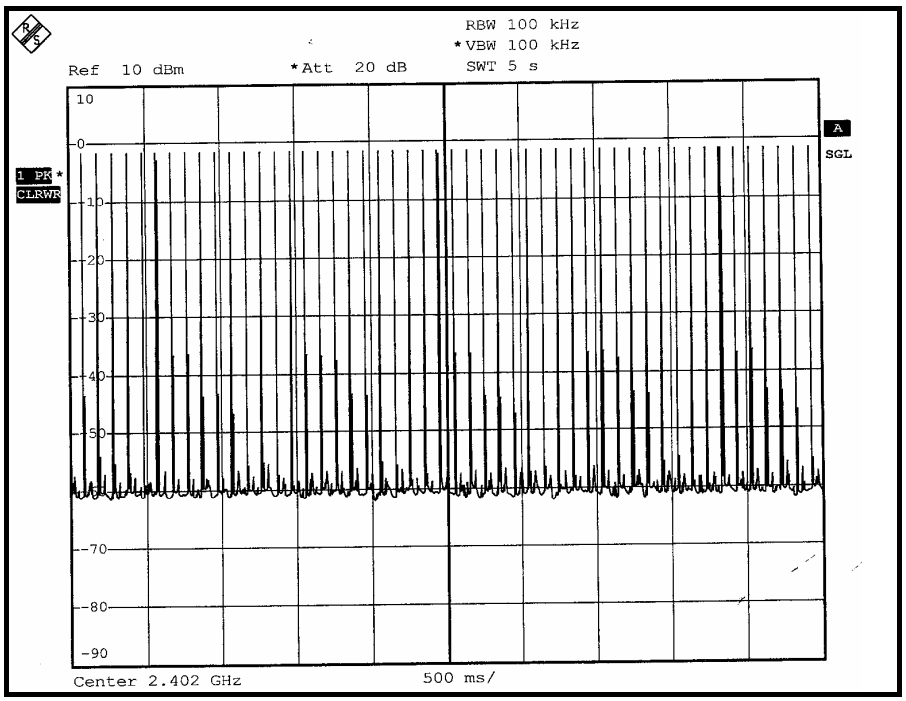

RBW 100 kHz
Delta 2 [T1]
*VBW 100 kHz
4.50 dB
Ref 10 dBm
*Att 20 dB
SWT 5 ms
3.024000 ms
Marker 1 [T1]
-74.24 dBm
956.000000 µs
10
0
-10
-20
-30
-40
-50
-60
-80
-90
1 PK *
VIEW
A
Center 2.402 GHz
500 µs/

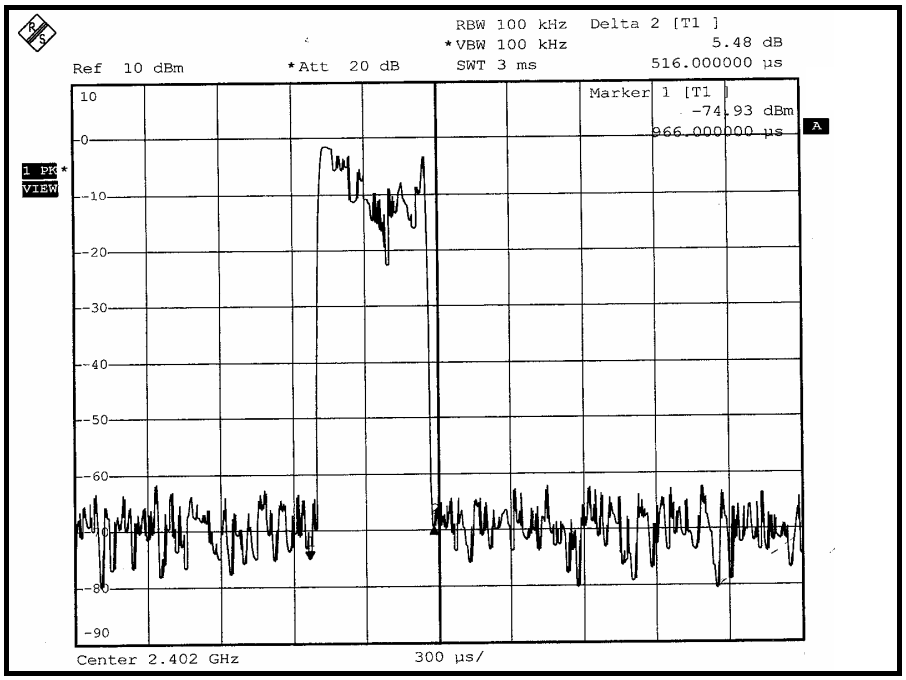
8DPSK MODULATION

Mode	Number of transmission in a 31.6 (79Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (msec)
DH1	50 (times / 5 sec) * 6.32 = 316.00 times	0.516	163.056	400
DH3	25 (times / 5 sec) * 6.32 = 158.00 times	1.794	283.452	400
DH5	17 (times / 5 sec) * 6.32 = 107.44 times	3.070	329.841	400

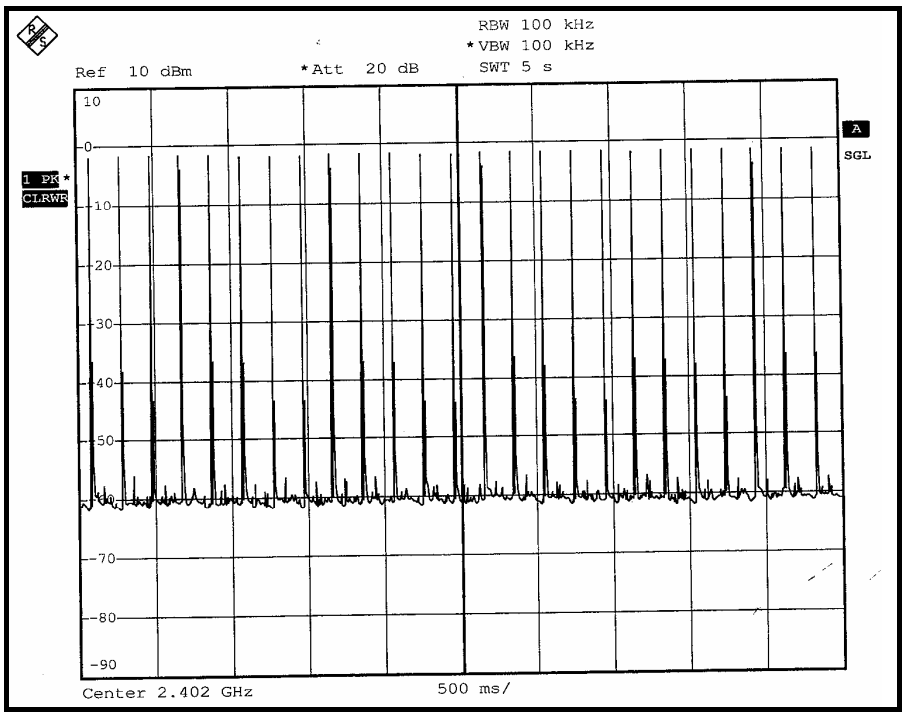
NOTE: Test plots of the transmitting time slot are shown on next 3 pages.

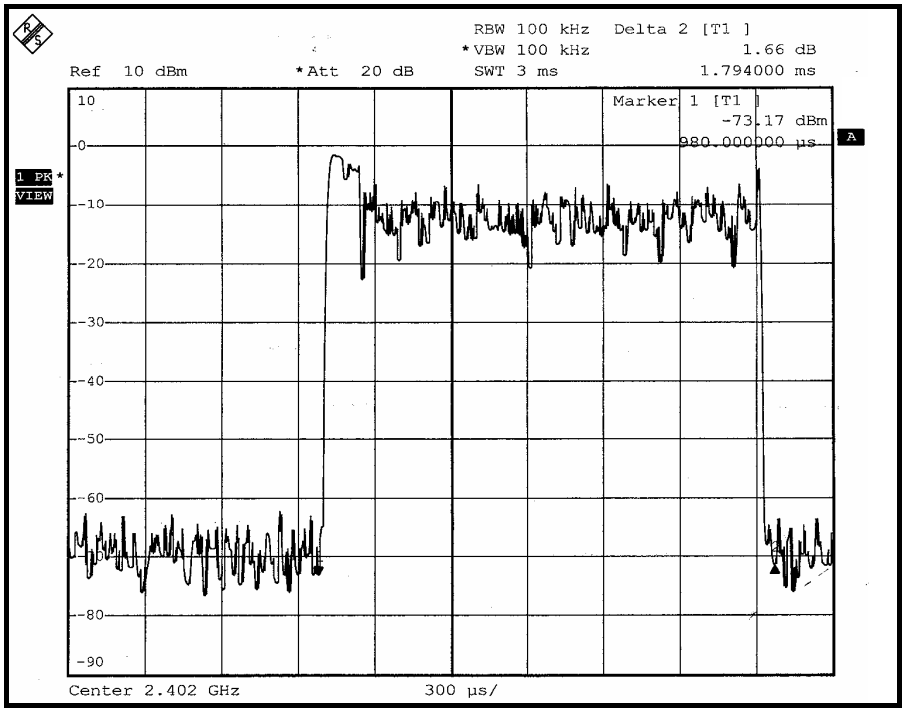
DH1


RBW 100 kHz
*VBW 100 kHz
Ref 10 dBm
*Att 20 dB
SWT 5 s
10
0
-10
-20
-30
-40
-50
-70
-80
-90
1 PK*
CLRWR
A
SGL
Center 2.402 GHz
500 ms/

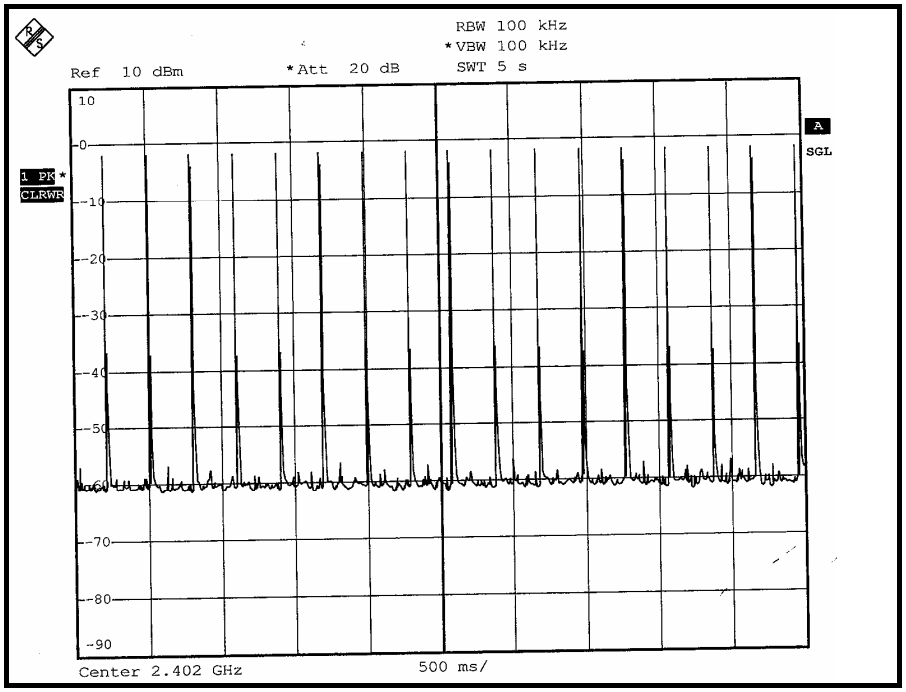

RBW 100 kHz
Delta 2 [T1]
*VBW 100 kHz
5.48 dB
Ref 10 dBm
*Att 20 dB
SWT 3 ms
516.000000 µs
Marker 1 [T1]
-74.93 dBm
966.000000 µs
10
0
-10
-20
-30
-40
-50
-60
-80
-90
1 PK*
VIEW
A
Center 2.402 GHz
300 µs/

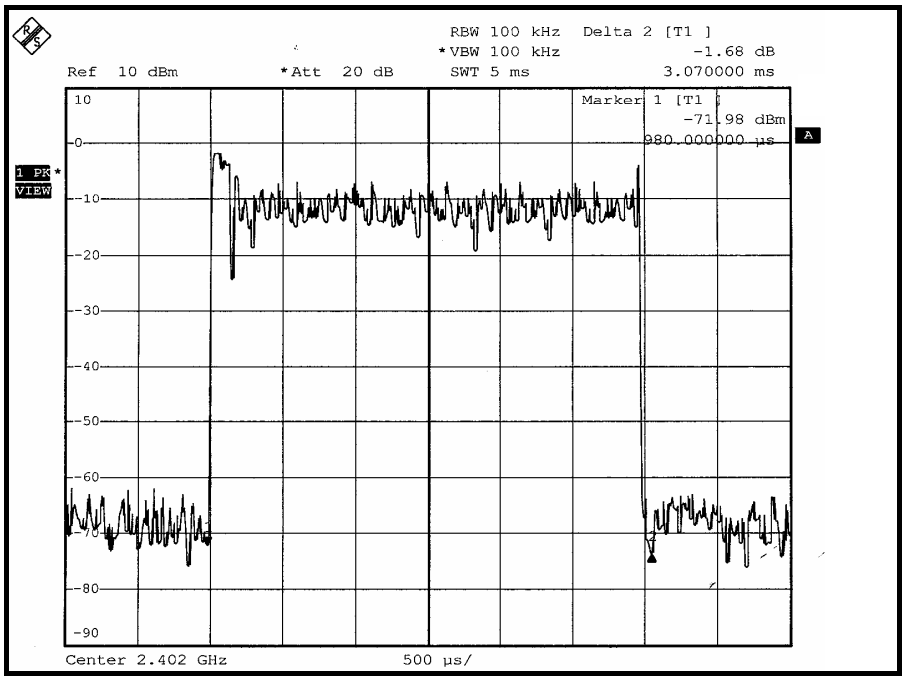
DH3


RBW 100 kHz
*VBW 100 kHz
Ref 10 dBm
*Att 20 dB
SWT 5 s
10
0
-10
-20
-30
-40
-50
-70
-80
-90
1 PK*
CLRWR
A
SGL
Center 2.402 GHz
500 ms/


RBW 100 kHz
Delta 2 [T1]
*VBW 100 kHz
1.66 dB
Ref 10 dBm
*Att 20 dB
SWT 3 ms
1.794000 ms
Marker 1 [T1]
-73.17 dBm
980.000000 µs
10
0
-10
-20
-30
-40
-50
-60
-80
-90
1 PK*
VIEW
A
Center 2.402 GHz
300 µs/

DH5


RBW 100 kHz
*VBW 100 kHz
Ref 10 dBm
*Att 20 dB
SWT 5 s
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
1 PK*
CLRWR
A
SGL
Center 2.402 GHz
500 ms/


RBW 100 kHz
Delta 2 [T1]
*VBW 100 kHz
-1.68 dB
Ref 10 dBm
*Att 20 dB
SWT 5 ms
3.070000 ms
Marker 1 [T1]
-71.98 dBm
980.000000 µs
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
1 PK*
VIEW
A
Center 2.402 GHz
500 µs/

4.5 CHANNEL BANDWIDTH

4.5.1 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, two-thirds 20dBbandwidth of hopping channel shell be a minimum limit for the hopping channel separation.

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSPegaso P40-2001	100040	Jun. 28, 2008

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

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.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation.

4.5.5 TEST SETUP

Same as 4.3.5.

4.5.6 EUT OPERATING CONDITION

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

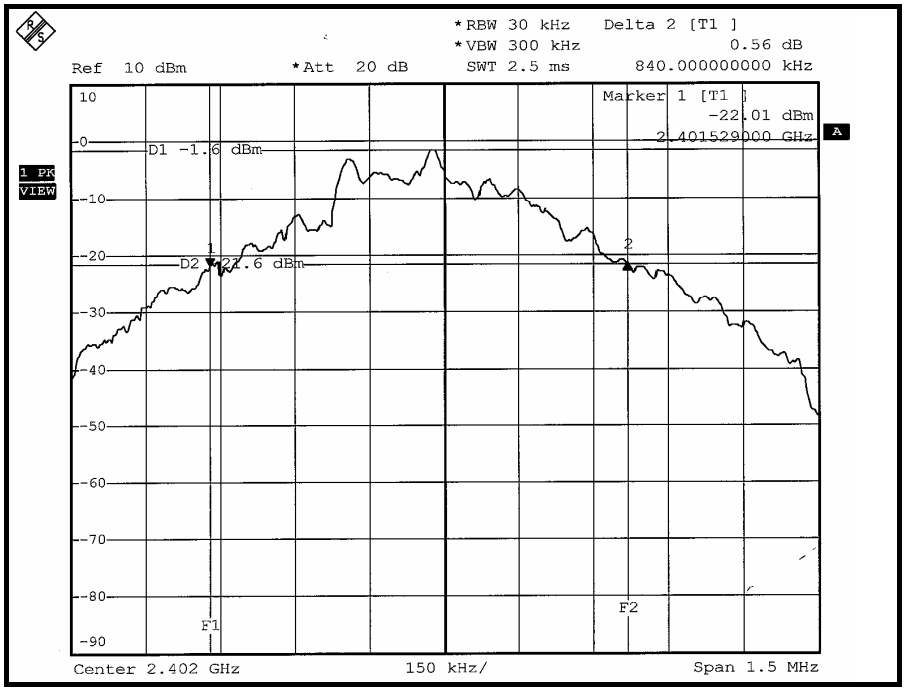
4.5.7 TEST RESULTS

GFSK MODULATION

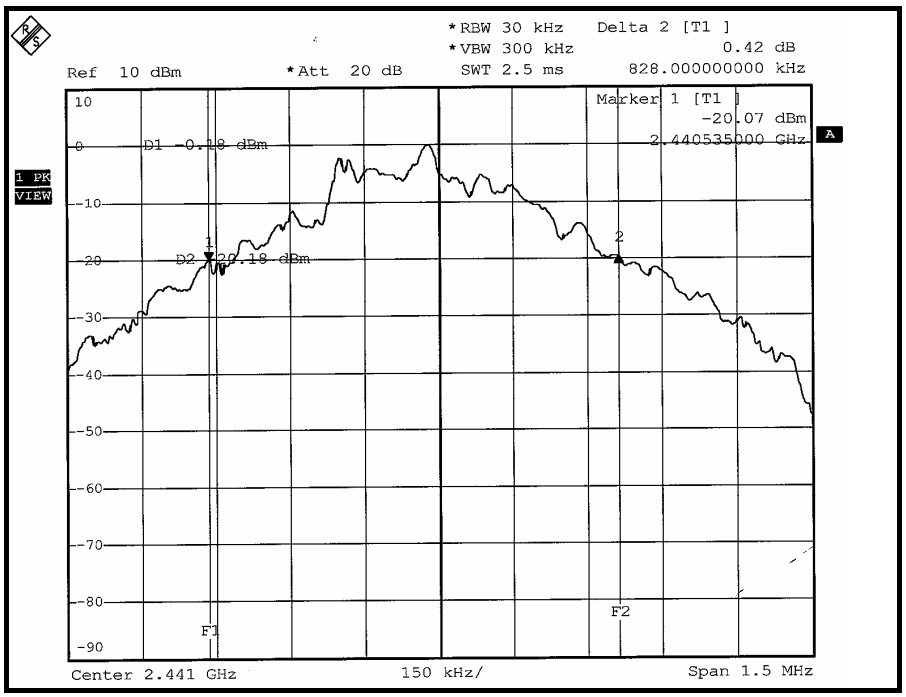
MODULATION TYPE	GFSK	**ENVIRONMENTAL CONDITIONS**	25deg. C, 65%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TESTED BY**	Long Chen

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
0	2402	0.840
39	2441	0.828
78	2480	0.831

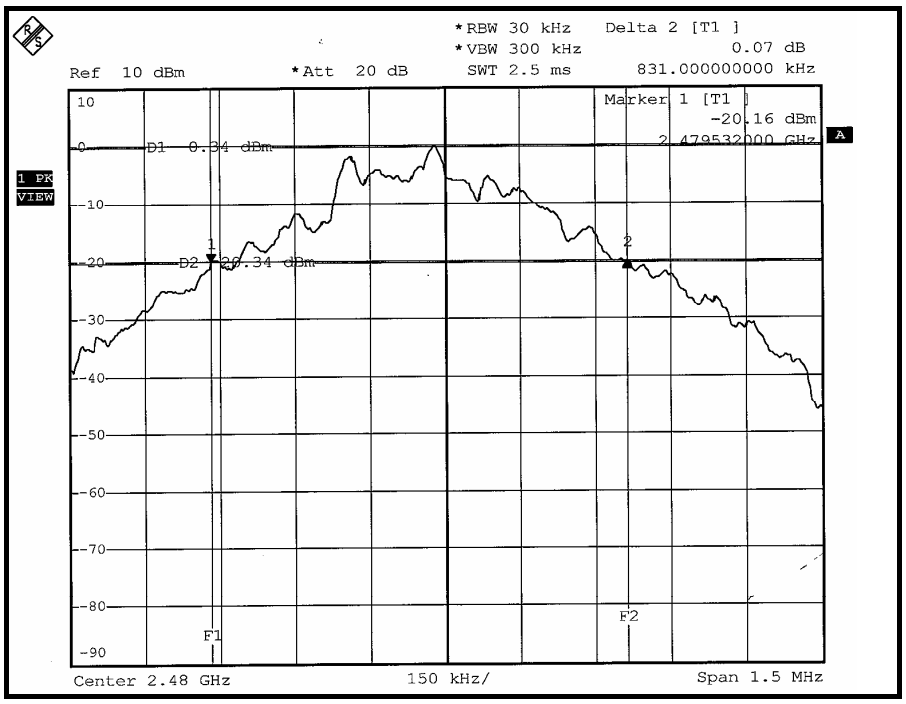
CH 0


*RBW 30 kHz
*VBW 300 kHz
SWT 2.5 ms
Delta 2 [T1]
0.56 dB
840.000000000 kHz
Ref 10 dBm
*Att 20 dB
Marker 1 [T1]
-22.01 dBm
2.401529000 GHz
D1 -1.6 dBm
D2 -21.6 dBm
1 PK VIEW
A
F1
F2
Center 2.402 GHz
150 kHz/
Span 1.5 MHz

CH 39


*RBW 30 kHz
*VBW 300 kHz
SWT 2.5 ms
Delta 2 [T1]
0.42 dB
828.000000000 kHz
Ref 10 dBm
*Att 20 dB
Marker 1 [T1]
-20.07 dBm
2.440535000 GHz
D1 -0.18 dBm
D2 -20.18 dBm
1 PK VIEW
A
F1
F2
Center 2.441 GHz
150 kHz/
Span 1.5 MHz

CH 78

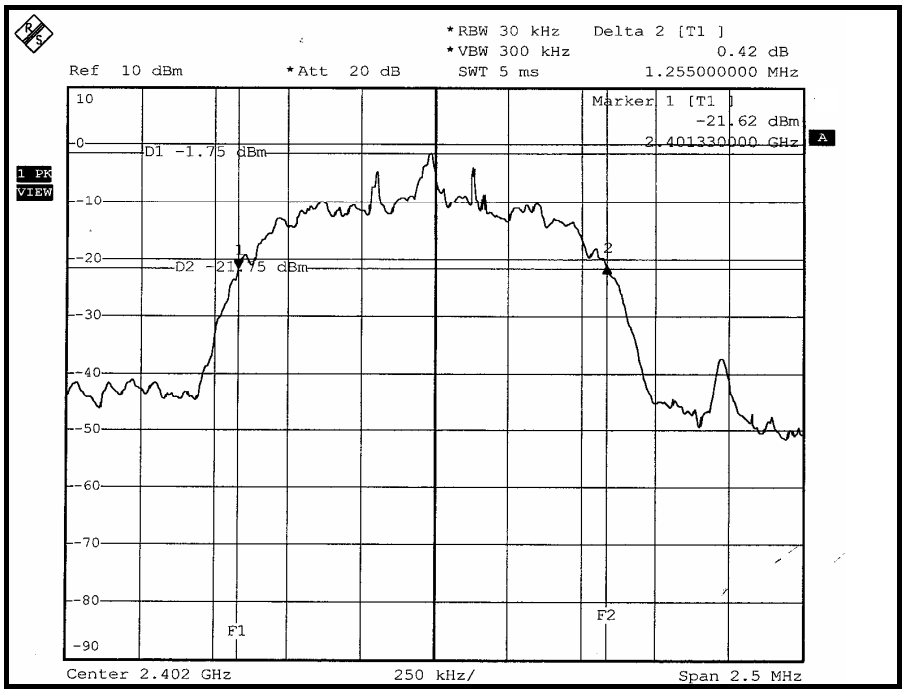

*RBW 30 kHz
*VBW 300 kHz
SWT 2.5 ms
Delta 2 [T1]
0.07 dB
831.000000000 kHz
Ref 10 dBm
*Att 20 dB
Marker 1 [T1]
-20.16 dBm
2.479532000 GHz
1 PK
VIEW
A
D1 0.34 dBm
D2 -20.34 dBm
F1
F2
Center 2.48 GHz
150 kHz/
Span 1.5 MHz

8DPSK MODULATION

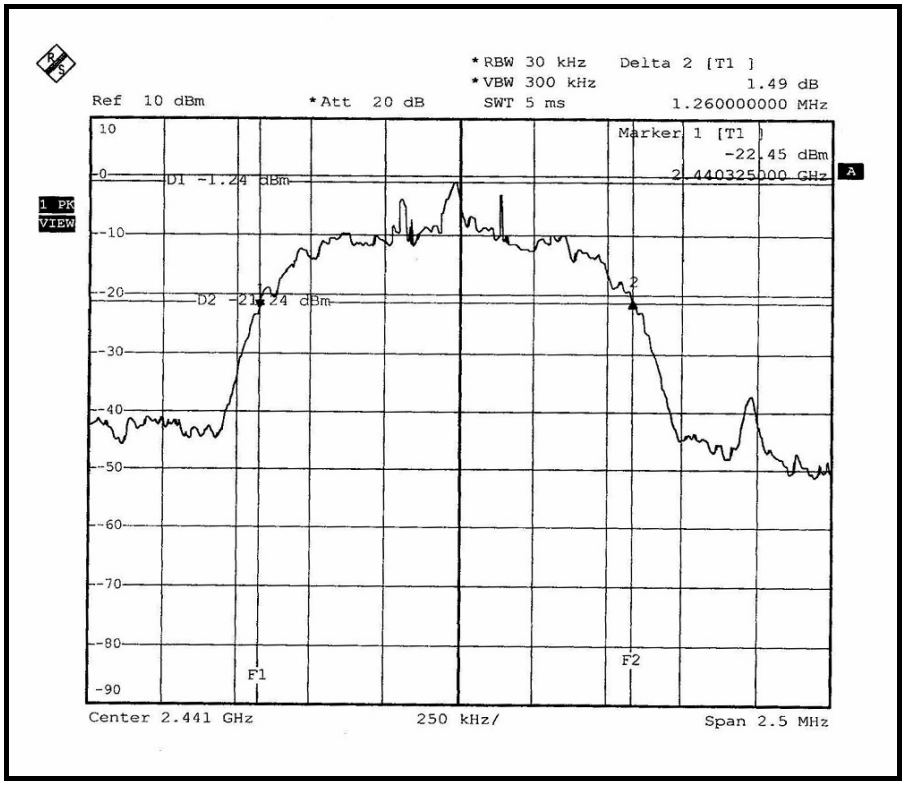
MODULATION TYPE	8DPSK	**ENVIRONMENTAL CONDITIONS**	25deg. C, 65%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TESTED BY**	Long Chen

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
0	2402	1.255
39	2441	1.260
78	2480	1.260

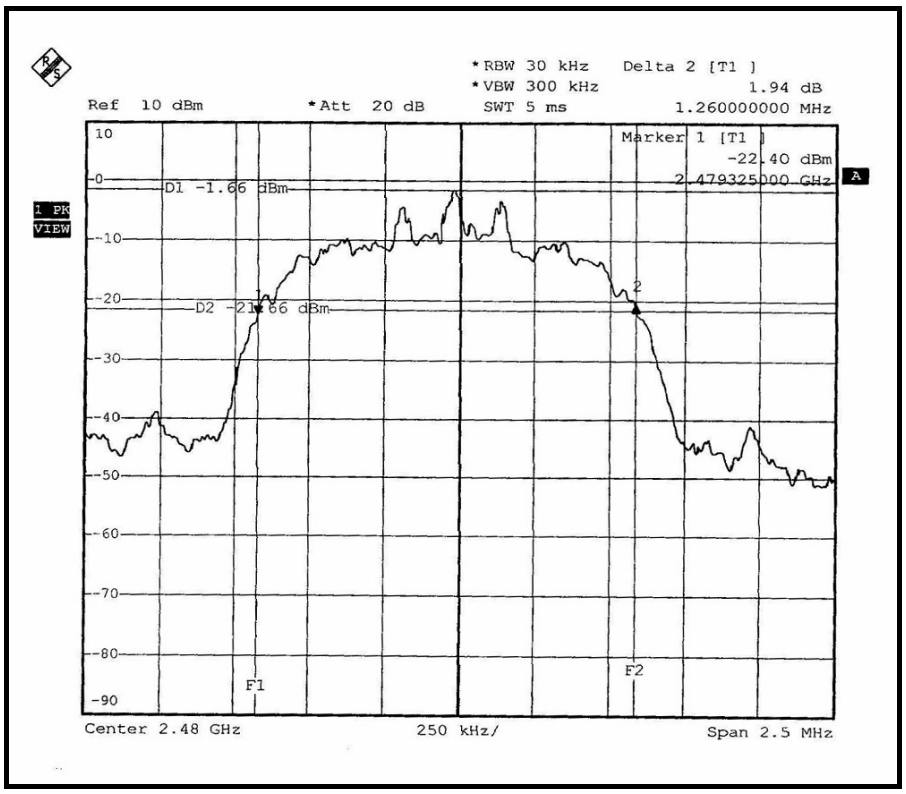
CH 0


*RBW 30 kHz
*VBW 300 kHz
SWT 5 ms
Delta 2 [T1]
0.42 dB
1.255000000 MHz
Ref 10 dBm
*Att 20 dB
Marker 1 [T1]
-21.62 dBm
2.401330000 GHz
D1 -1.75 dBm
D2 -21.75 dBm
1 PK
VIEW
A
F1
F2
Center 2.402 GHz
250 kHz/
Span 2.5 MHz

CH 39


*RBW 30 kHz
*VBW 300 kHz
SWT 5 ms
Delta 2 [T1]
1.49 dB
1.260000000 MHz
Ref 10 dBm
*Att 20 dB
Marker 1 [T1]
-22.45 dBm
2.440325000 GHz
D1 -1.24 dBm
D2 -21.24 dBm
1 PK
VIEW
A
F1
F2
Center 2.441 GHz
250 kHz/
Span 2.5 MHz

CH 78


*RBW 30 kHz
*VBW 300 kHz
SWT 5 ms
Delta 2 [T1]
1.94 dB
1.260000000 MHz
Ref 10 dBm
*Att 20 dB
Marker 1 [T1]
-22.40 dBm
2.479325000 GHz
D1 -1.66 dBm
D2 -21.66 dBm
1 PK VIEW
A
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
F1
F2
Center 2.48 GHz
250 kHz/
Span 2.5 MHz

4.6 HOPPING CHANNEL SEPARATION

4.6.1 LIMIT OF HOPPING CHANNEL SEPARATION

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

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSPegaso P40-2001	100040	Jun. 28, 2008

NOTES: 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 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.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation.

4.6.5 TEST SETUP

Same as 4.3.5

4.6.6 TEST RESULTS

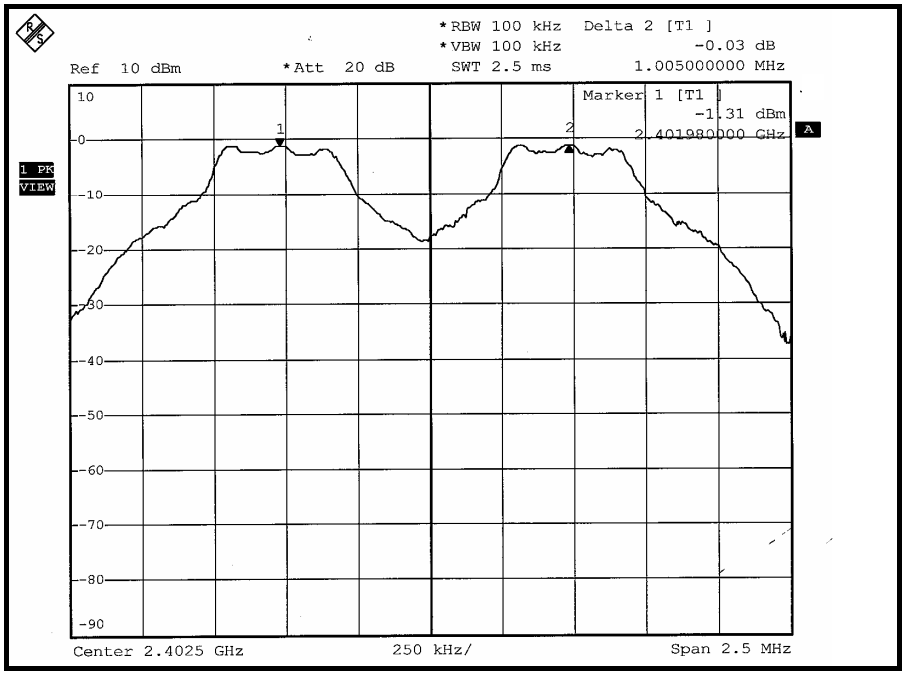
GFSK MODULATION

MODULATION TYPE	GFSK	**ENVIRONMENTAL CONDITIONS**	25deg. C, 65%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TESTED BY**	Long Chen

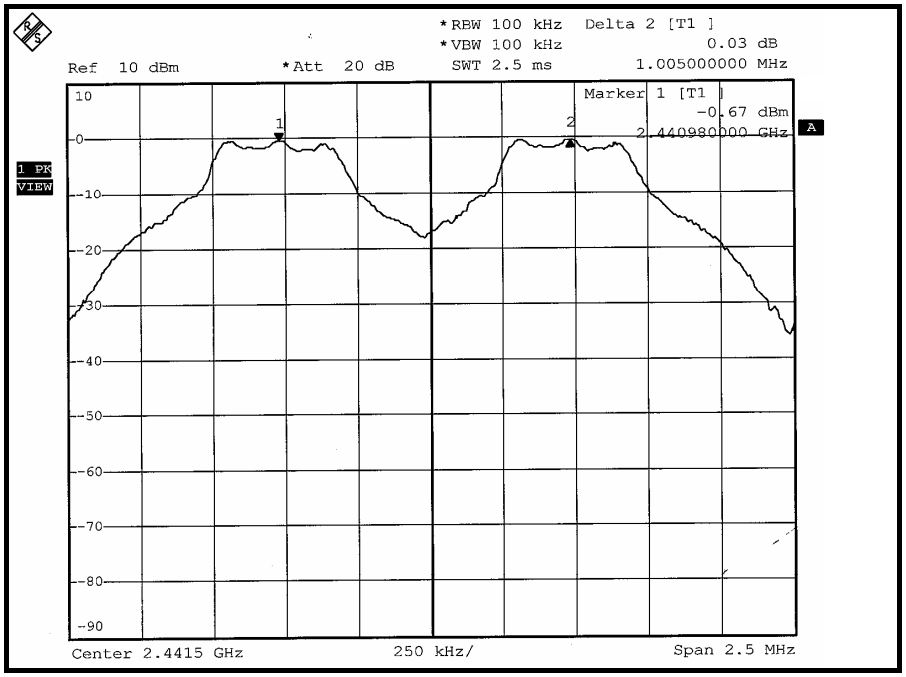
CHANNEL	FREQUENCY (MHz)	ADJACENT CHANNEL SEPARATION (MHz)	20dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	2402	1.005	0.840	0.560	PASS
39	2441	1.005	0.828	0.552	PASS
78	2480	1.005	0.831	0.554	PASS

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

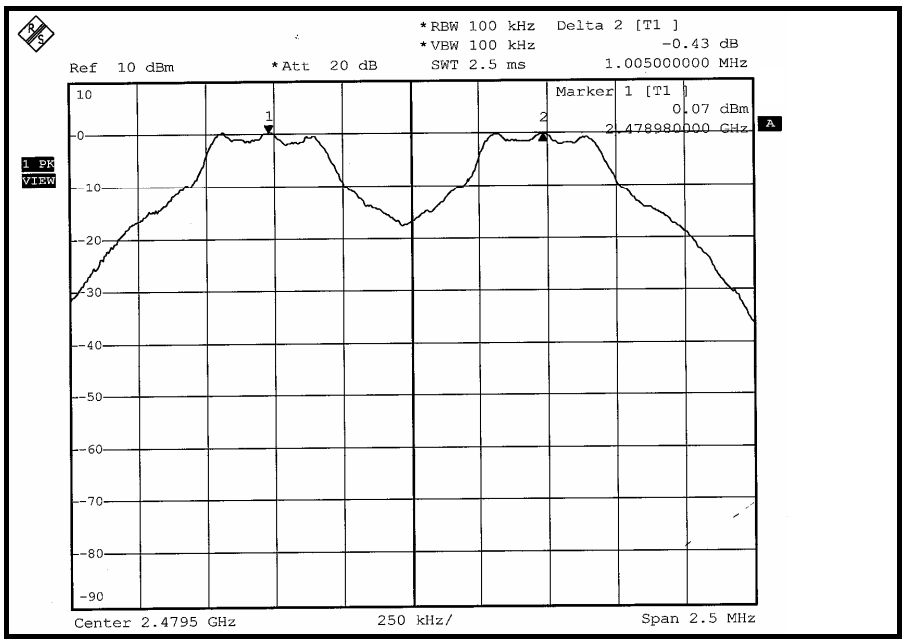
CH 0


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 ms
Delta 2 [T1]
-0.03 dB
1.005000000 MHz
Ref 10 dBm
*Att 20 dB
Marker 1 [T1]
-1.31 dBm
2.401980000 GHz
1 PK
VIEW
A
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.4025 GHz
250 kHz/
Span 2.5 MHz

CH 39


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 ms
Delta 2 [T1]
0.03 dB
1.005000000 MHz
Ref 10 dBm
*Att 20 dB
Marker 1 [T1]
-0.67 dBm
2.440980000 GHz
1 PK
VIEW
A
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.4415 GHz
250 kHz/
Span 2.5 MHz

CH 78


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 ms
Delta 2 [T1]
-0.43 dB
1.005000000 MHz
Ref 10 dBm
*Att 20 dB
Marker 1 [T1]
0.07 dBm
2.478980000 GHz
1 PK
VIEW
A
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.4795 GHz
250 kHz/
Span 2.5 MHz

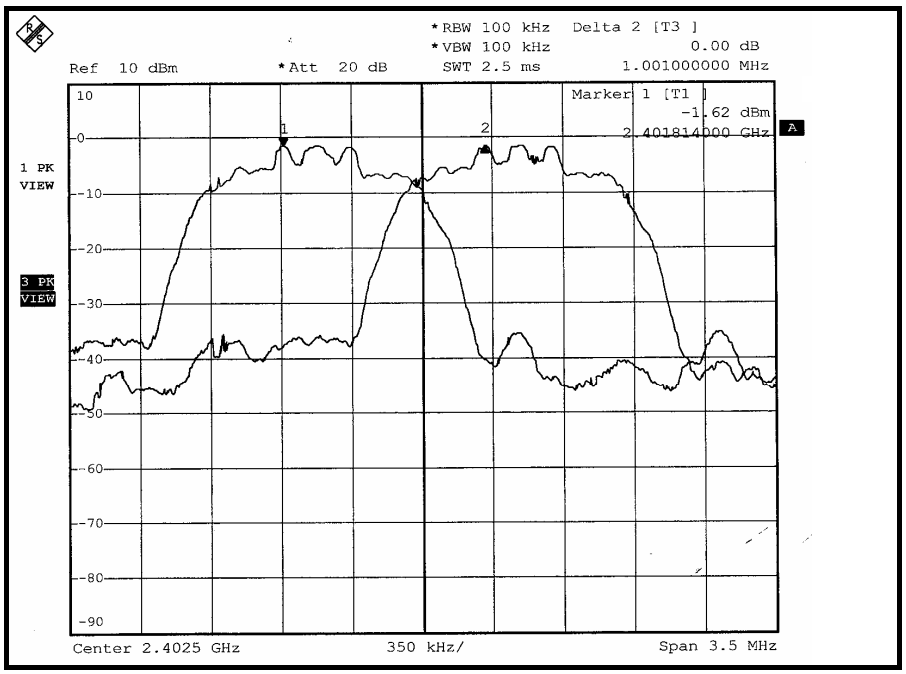
8DPSK MODULATION

MODULATION TYPE	8DPSK	**ENVIRONMENTAL CONDITIONS**	25deg. C, 65%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TESTED BY**	Long Chen

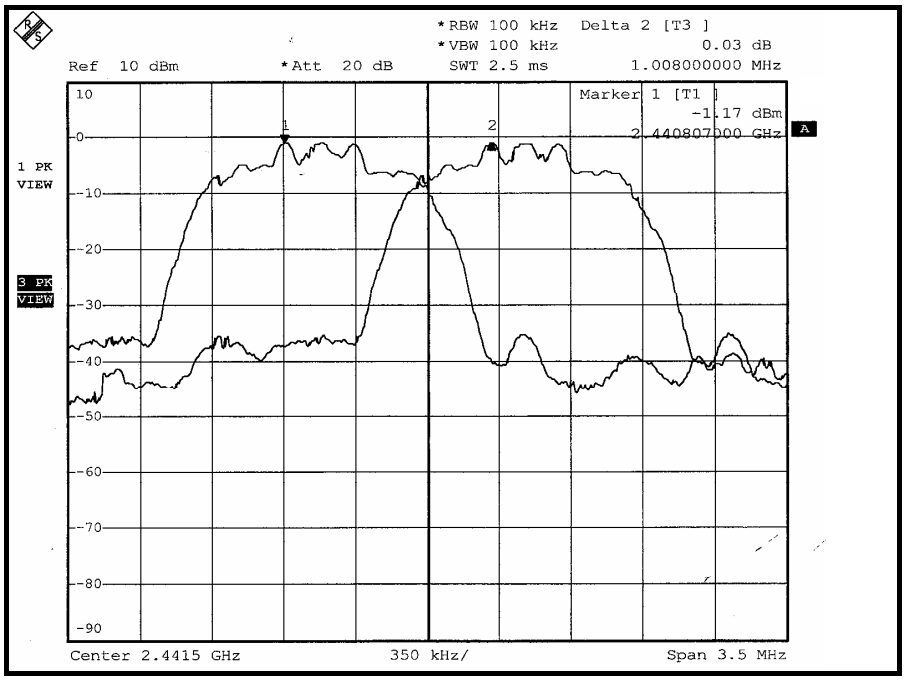
CHANNEL	FREQUENCY (MHz)	ADJACENT CHANNEL SEPARATION (MHz)	20dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	2402	1.001	1.255	0.837	PASS
39	2441	1.008	1.260	0.840	PASS
78	2480	1.001	1.260	0.840	PASS

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

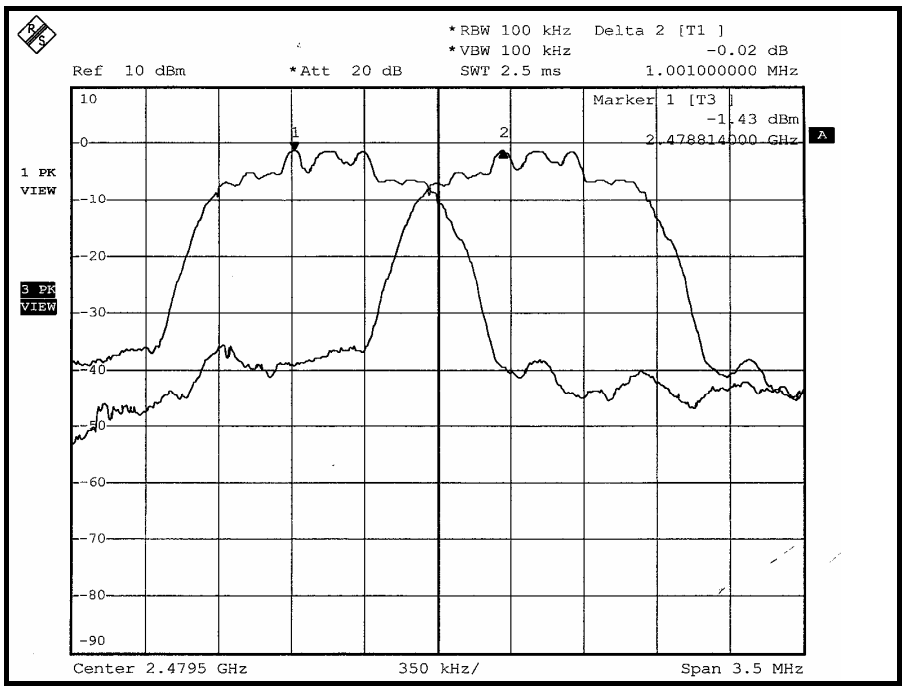
CH 0


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 ms
Delta 2 [T3]
0.00 dB
1.001000000 MHz
Ref 10 dBm
*Att 20 dB
Marker 1 [T1]
-1.62 dBm
2.401814000 GHz
1 PK VIEW
3 PK VIEW
Center 2.4025 GHz
350 kHz/
Span 3.5 MHz

CH 39


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 ms
Delta 2 [T3]
0.03 dB
1.008000000 MHz
Ref 10 dBm
*Att 20 dB
Marker 1 [T1]
-1.17 dBm
2.440807000 GHz
1 PK VIEW
3 PK VIEW
Center 2.4415 GHz
350 kHz/
Span 3.5 MHz

CH 78


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 ms
Delta 2 [T1]
-0.02 dB
1.001000000 MHz
Ref 10 dBm
*Att 20 dB
Marker 1 [T3]
-1.43 dBm
2.478814000 GHz
1 PK VIEW
3 PK VIEW
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.4795 GHz
350 kHz/
Span 3.5 MHz

4.7 MAXIMUM PEAK OUTPUT POWER

4.7.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 125mW.

4.7.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
SPECTRUM ANALYEER	FSPegaso P40-2001	100040	Jun. 28, 2008

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

4.7.3 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.

4.7.4 DEVIATION FROM TEST STANDARD

No deviation

4.7.5 TEST SETUP

Same as 4.3.5.

4.7.6 EUT OPERATING CONDITION

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

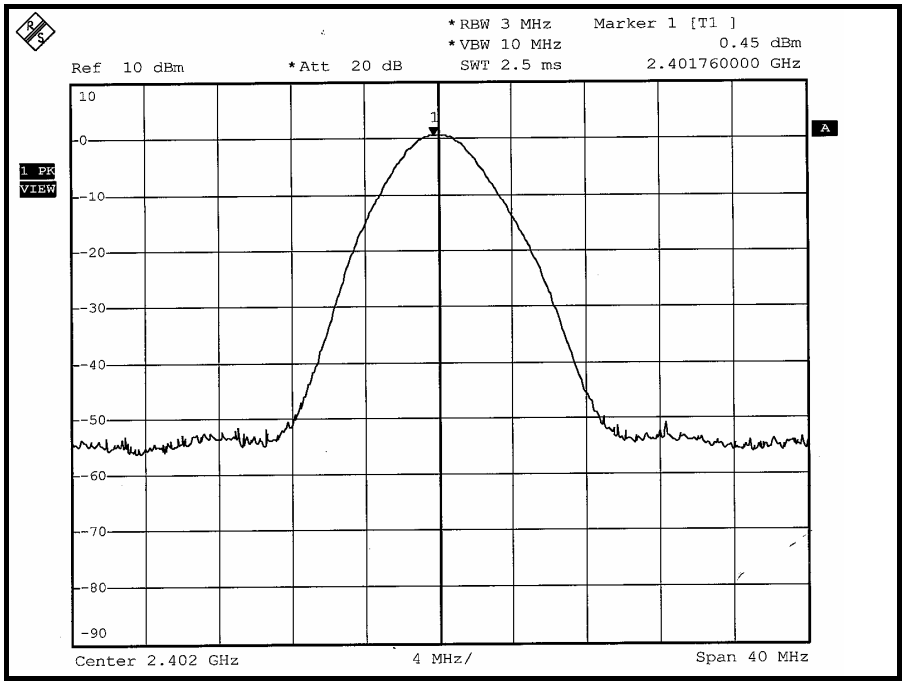
4.7.7 TEST RESULTS

GFSK MODULATION

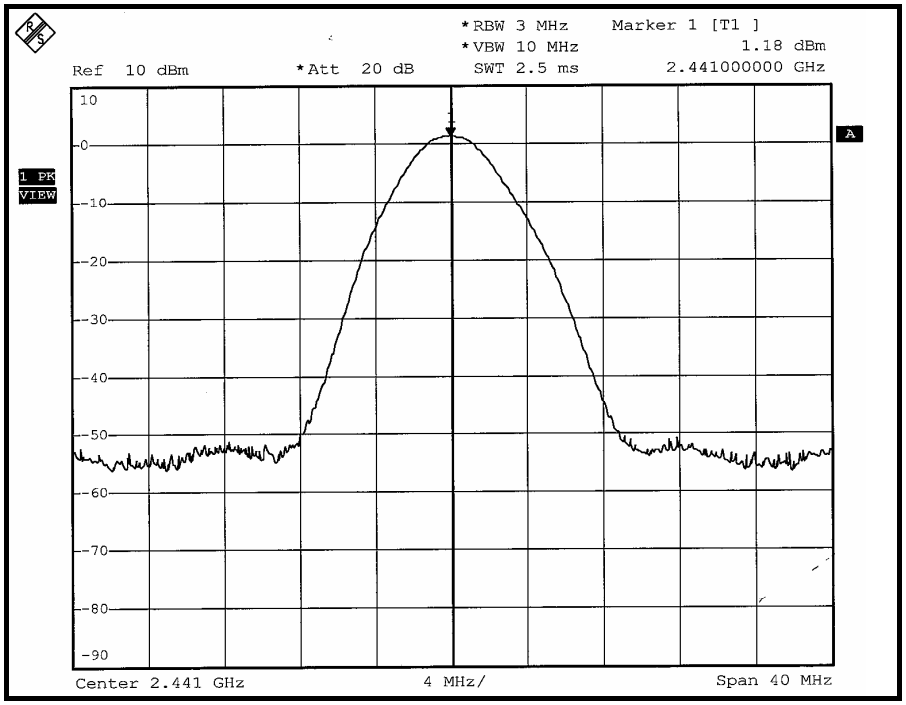
MODULATION TYPE	GFSK	**ENVIRONMENTAL CONDITIONS**	25deg. C, 65%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TESTED BY**	Long Chen

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (mW)	PASS/FAIL
0	2402	1.109	0.45	125	PASS
39	2441	1.312	1.18	125	PASS
78	2480	1.205	0.81	125	PASS

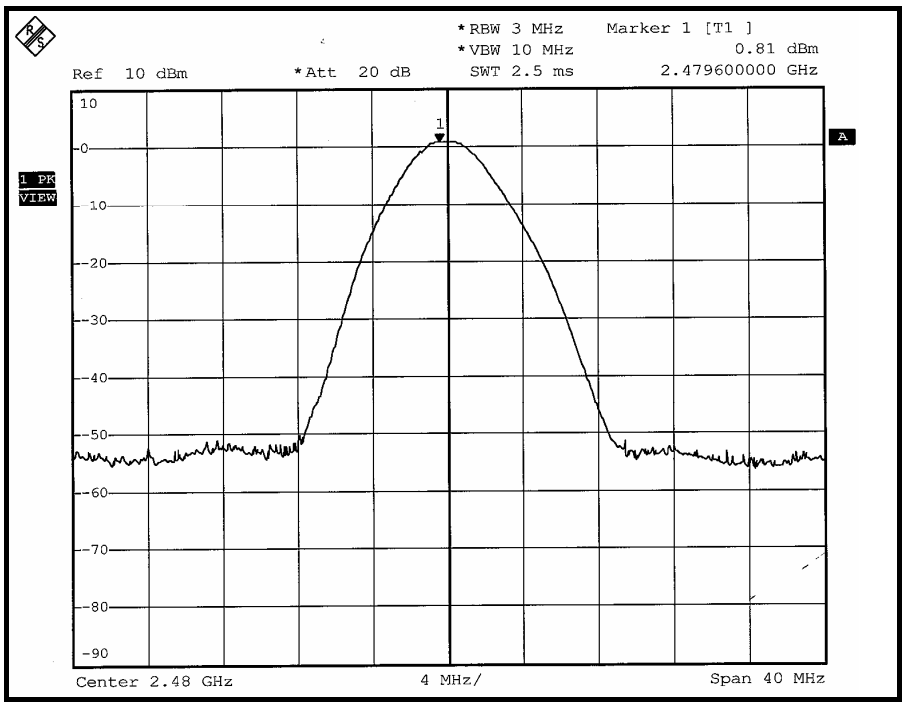
CH 0


*RBW 3 MHz
*VBW 10 MHz
SWT 2.5 ms
Marker 1 [T1]
0.45 dBm
2.401760000 GHz
Ref 10 dBm
*Att 20 dB
1 PK
VIEW
A
Center 2.402 GHz
4 MHz/
Span 40 MHz

CH 39


*RBW 3 MHz
*VBW 10 MHz
SWT 2.5 ms
Marker 1 [T1]
1.18 dBm
2.441000000 GHz
Ref 10 dBm
*Att 20 dB
1 PK
VIEW
A
Center 2.441 GHz
4 MHz/
Span 40 MHz

CH 78

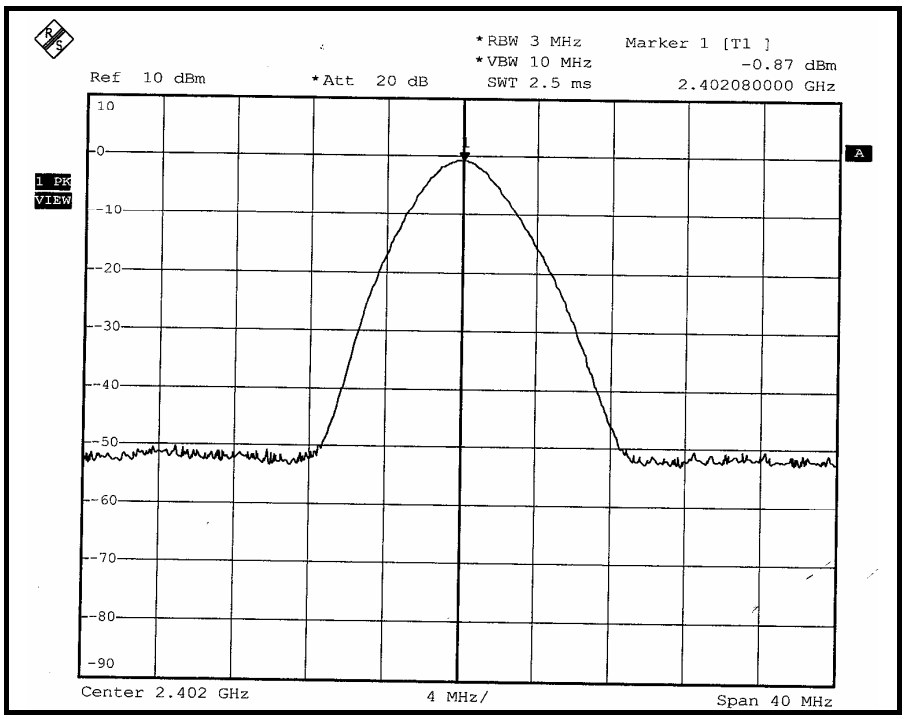

*RBW 3 MHz
*VBW 10 MHz
SWT 2.5 ms
Marker 1 [T1]
0.81 dBm
2.479600000 GHz
Ref 10 dBm
*Att 20 dB
1 PK
VIEW
A
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.48 GHz
4 MHz/
Span 40 MHz

8DPSK MODULATION

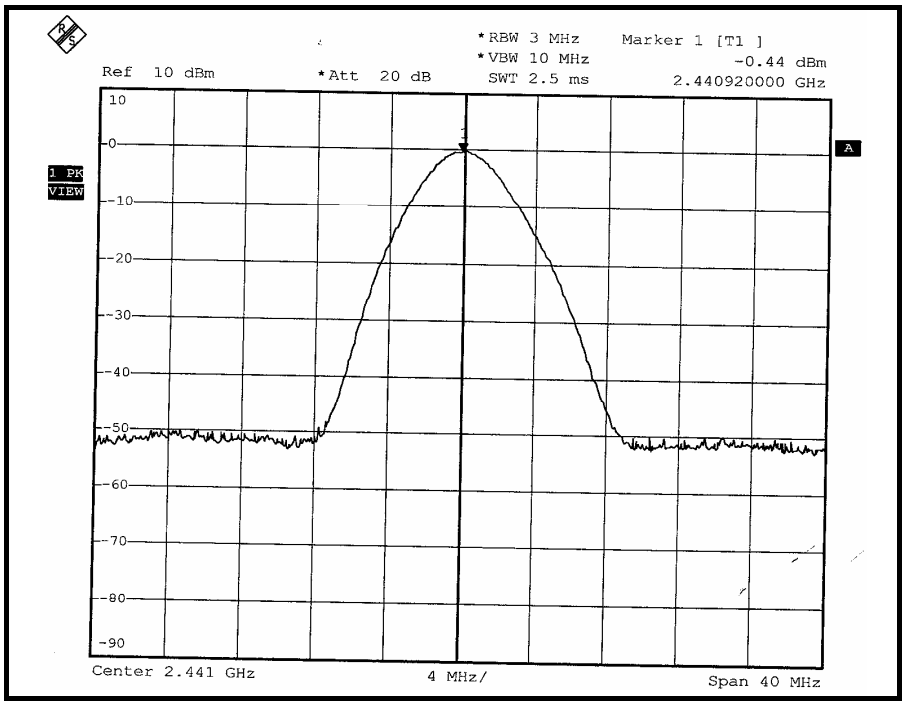
MODULATION TYPE	8DPSK	**ENVIRONMENTAL CONDITIONS**	25deg. C, 65%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TESTED BY**	Long Chen

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (mW)	PASS/FAIL
0	2402	0.818	-0.87	125	PASS
39	2441	0.904	-0.44	125	PASS
78	2480	0.838	-0.77	125	PASS

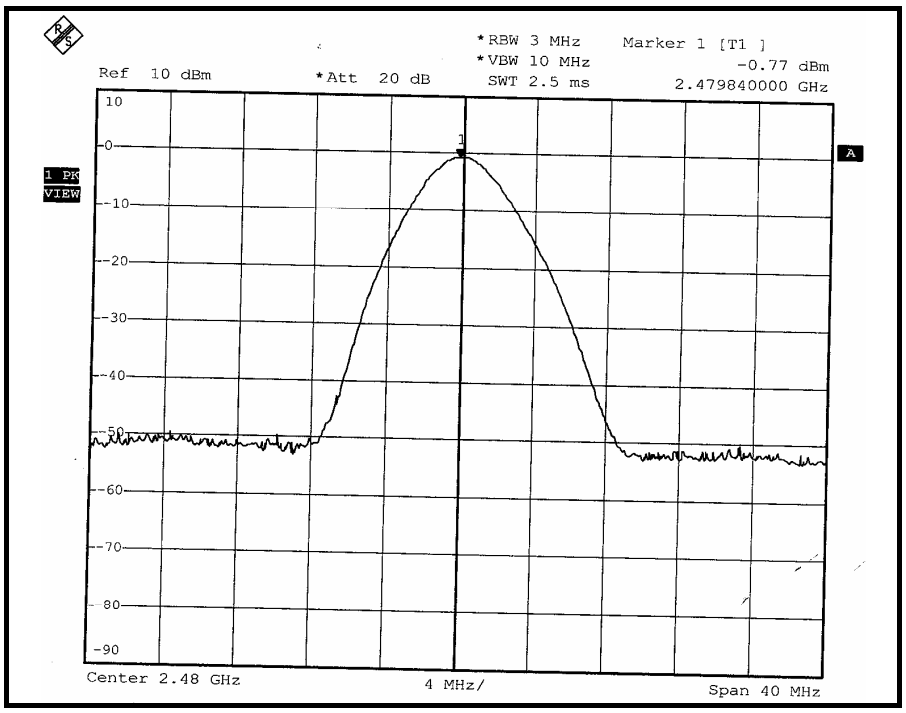
CH 0


*RBW 3 MHz
*VBW 10 MHz
SWT 2.5 ms
Marker 1 [T1]
-0.87 dBm
2.402080000 GHz
Ref 10 dBm
*Att 20 dB
1 PK
VIEW
A
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.402 GHz
4 MHz/
Span 40 MHz

CH 39


*RBW 3 MHz
*VBW 10 MHz
SWT 2.5 ms
Marker 1 [T1]
-0.44 dBm
2.440920000 GHz
Ref 10 dBm
*Att 20 dB
1 PK
VIEW
A
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.441 GHz
4 MHz/
Span 40 MHz

CH 78


*RBW 3 MHz
*VBW 10 MHz
SWT 2.5 ms
Marker 1 [T1]
-0.77 dBm
2.479840000 GHz
Ref 10 dBm
*Att 20 dB
1 PK
VIEW
A
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.48 GHz
4 MHz/
Span 40 MHz

4.8 BAND EDGES MEASUREMENT

4.8.1 LIMITS OF BAND EDGES MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100KHz RBW).

4.8.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSPegaso P40-2001	100040	Jun. 28, 2008

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

4.8.3 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.

4.8.4 DEVIATION FROM TEST STANDARD

No deviation.

4.8.5 EUT OPERATING CONDITION

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

4.8.6 TEST RESULTS

The spectrum plots are attached on the following 8 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 57.62dBc between carrier maximum power and local maximum emission in restrict band (2.36732GHz). The emission of carrier strength list in the test result of channel 0 at the item 4.2.7 is 97.55dBuV/m (Peak), so the maximum field strength in restrict band is 97.55 – 57.62 = 39.93dBuV/m, which is under 74 dBuV/m limit.

Average value = 39.93 – 30.10 = 9.83dBuV/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: 20log(3.125/100)= -30.1 dB.

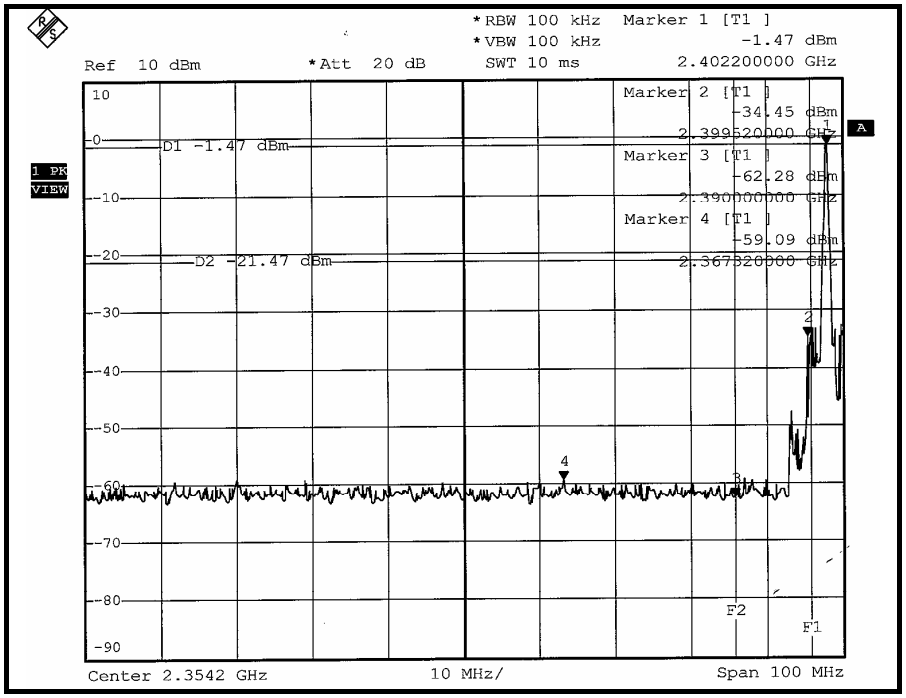
Average value = peak reading – 30.1

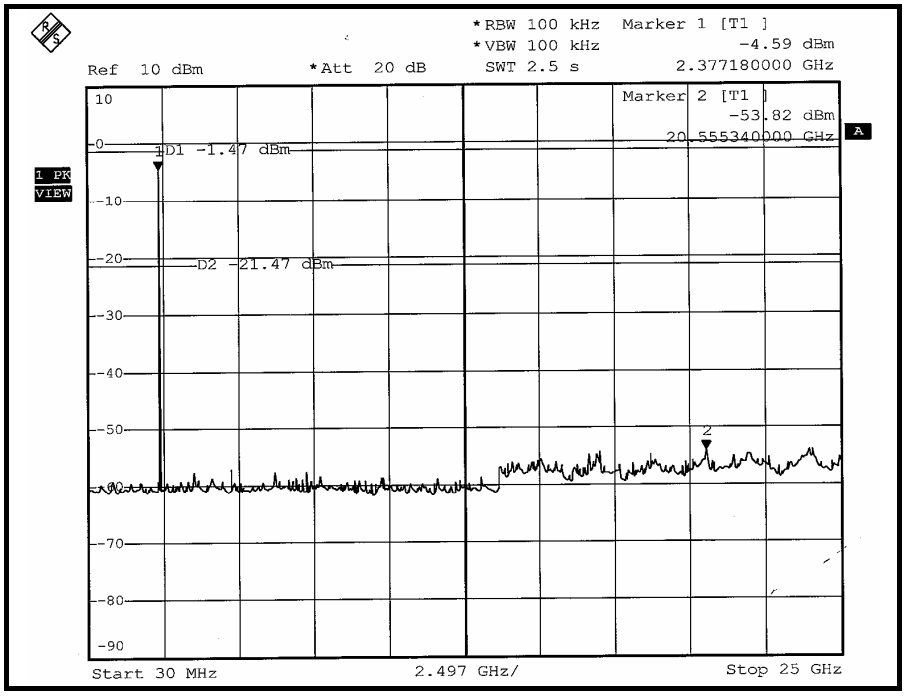
NOTE 2: The band edge emission plot on the next second page shows 48.23dBc between carrier maximum power and local maximum emission in restrict band (2.48446GHz). The emission of carrier strength list in the test result of channel 78 at the item 4.2.7 is 97.38dBuV/m (Peak), so the maximum field strength in restrict band is 97.38 – 48.23 = 49.15dBuV/m, which is under 74 dBuV/m limit.

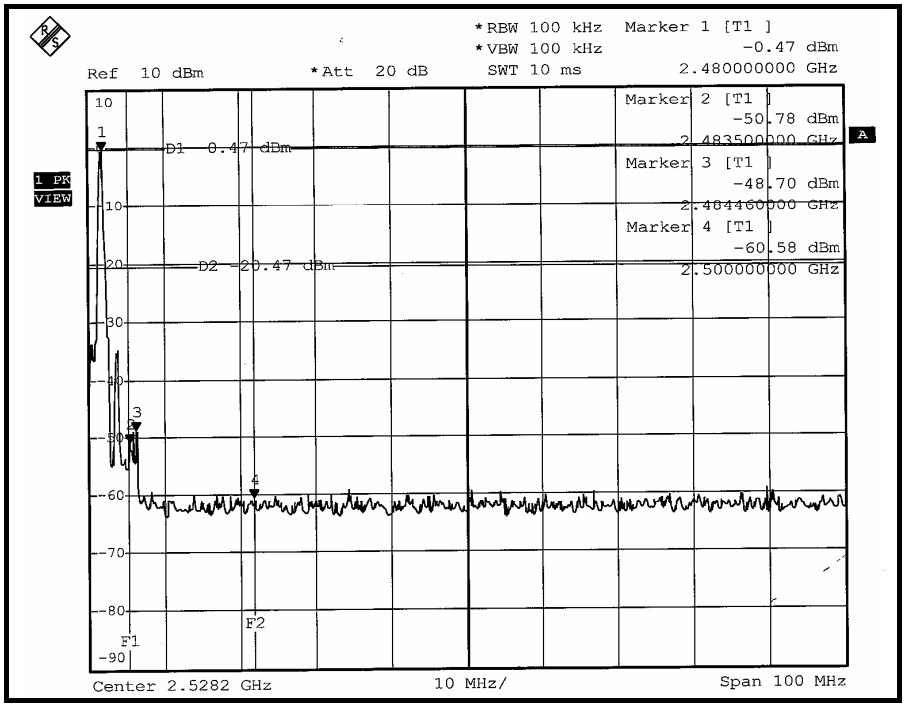
Average value = 49.15 – 30.10 = 19.05dBuV/m, which is under 54dBuV/m limit.

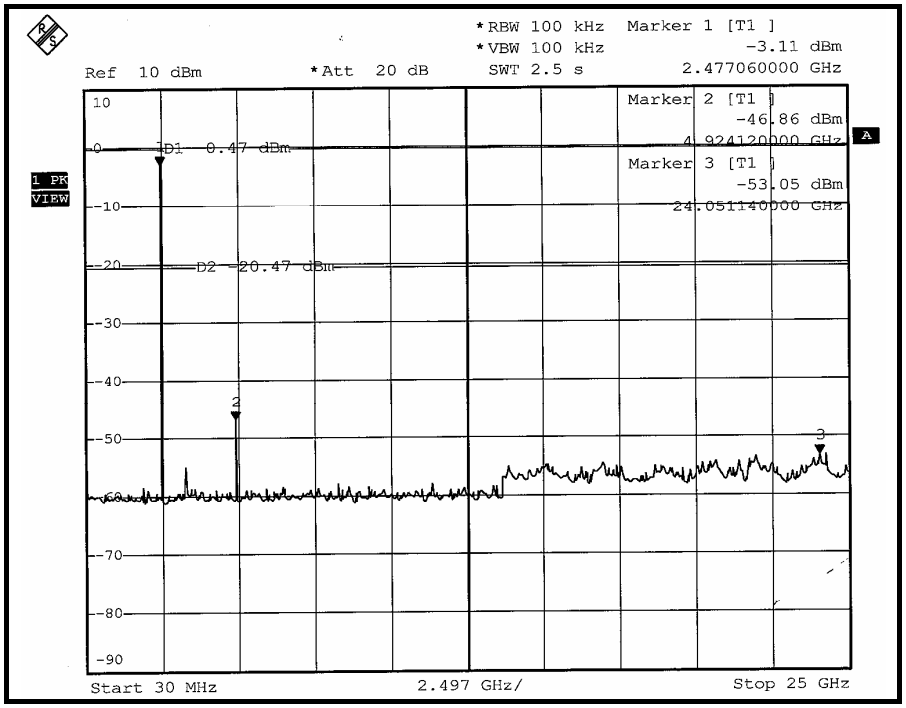
*The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle correction factor be equal to: 20log(3.125/100)= -30.1 dB.

Average value = peak reading – 30.1


*RBW 100 kHz
*VBW 100 kHz
Ref 10 dBm
*Att 20 dB
SWT 10 ms
Marker 1 [T1]
-1.47 dBm
2.402200000 GHz
Marker 2 [T1]
-34.45 dBm
2.399520000 GHz
Marker 3 [T1]
-62.28 dBm
2.390000000 GHz
Marker 4 [T1]
-59.09 dBm
2.367320000 GHz
D1 -1.47 dBm
D2 -21.47 dBm
1 PK
VIEW
A
F2
F1
Center 2.3542 GHz
10 MHz/
Span 100 MHz


*RBW 100 kHz
*VBW 100 kHz
Ref 10 dBm
*Att 20 dB
SWT 2.5 s
Marker 1 [T1]
-4.59 dBm
2.377180000 GHz
Marker 2 [T1]
-53.82 dBm
20.555340000 GHz
D1 -1.47 dBm
D2 -21.47 dBm
1 PK
VIEW
A
Start 30 MHz
2.497 GHz/
Stop 25 GHz


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
-0.47 dBm
2.480000000 GHz
Ref 10 dBm
*Att 20 dB
Marker 2 [T1]
-50.78 dBm
2.483500000 GHz
Marker 3 [T1]
-48.70 dBm
2.484460000 GHz
Marker 4 [T1]
-60.58 dBm
2.500000000 GHz
1 PK
VIEW
D1 -0.47 dBm
D2 -20.47 dBm
F1
F2
Center 2.5282 GHz
10 MHz/
Span 100 MHz


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 1 [T1]
-3.11 dBm
2.477060000 GHz
Ref 10 dBm
*Att 20 dB
Marker 2 [T1]
-46.86 dBm
4.924120000 GHz
Marker 3 [T1]
-53.05 dBm
24.051140000 GHz
1 PK
VIEW
D1 -0.47 dBm
D2 -20.47 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz

8DPSK MODULATION

NOTE 1: The band edge emission plot on the next page shows 56.98dBc between carrier maximum power and local maximum emission in restrict band (2.38048GHz). The emission of carrier strength list in the test result of channel 0 at the item 4.2.7 is 93.95dBuV/m (Peak), so the maximum field strength in restrict band is 93.95 – 56.98 = 36.97dBuV/m, which is under 74 dBuV/m limit.

Average value = 36.97 – 30.10 = 6.87dBuV/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 be equal to: 20log(3.125/100)= -30.1 dB.

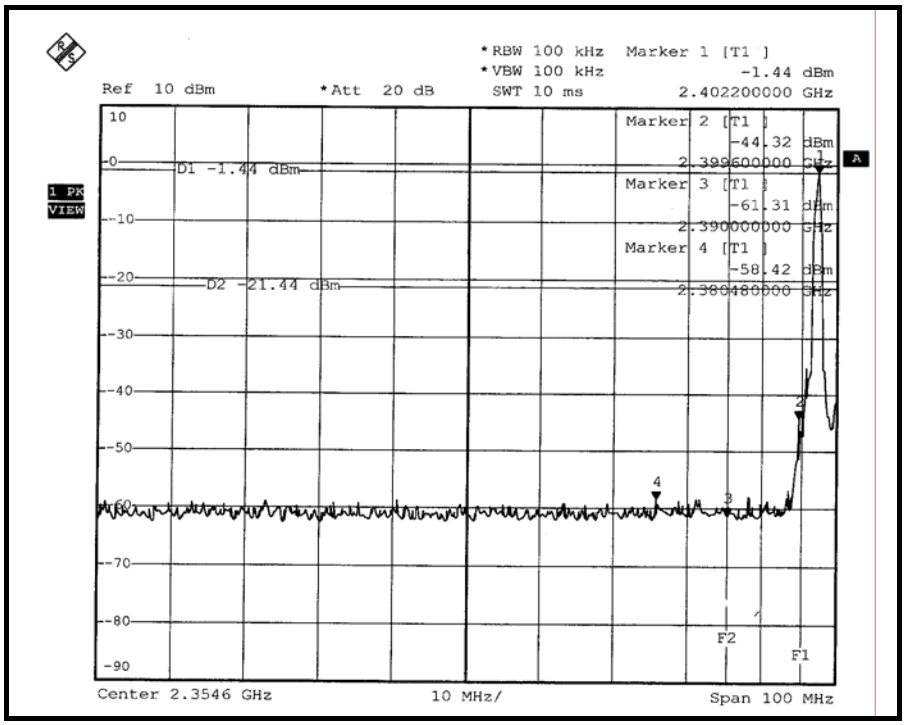
Average value = peak reading – 30.1

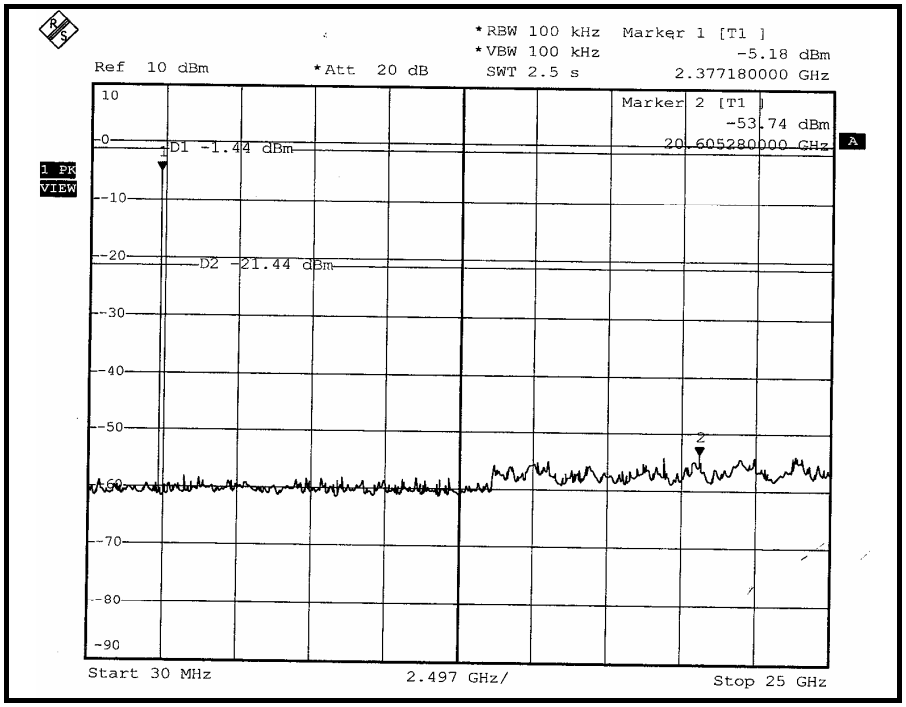
NOTE 2: The band edge emission plot on the next second page shows 47.01dBc between carrier maximum power and local maximum emission in restrict band (2.48350GHz). The emission of carrier strength list in the test result of channel 78 at the item 4.2.7 is 94.11dBuV/m (Peak), so the maximum field strength in restrict band is 94.11 – 47.01 = 47.10dBuV/m, which is under 74 dBuV/m limit.

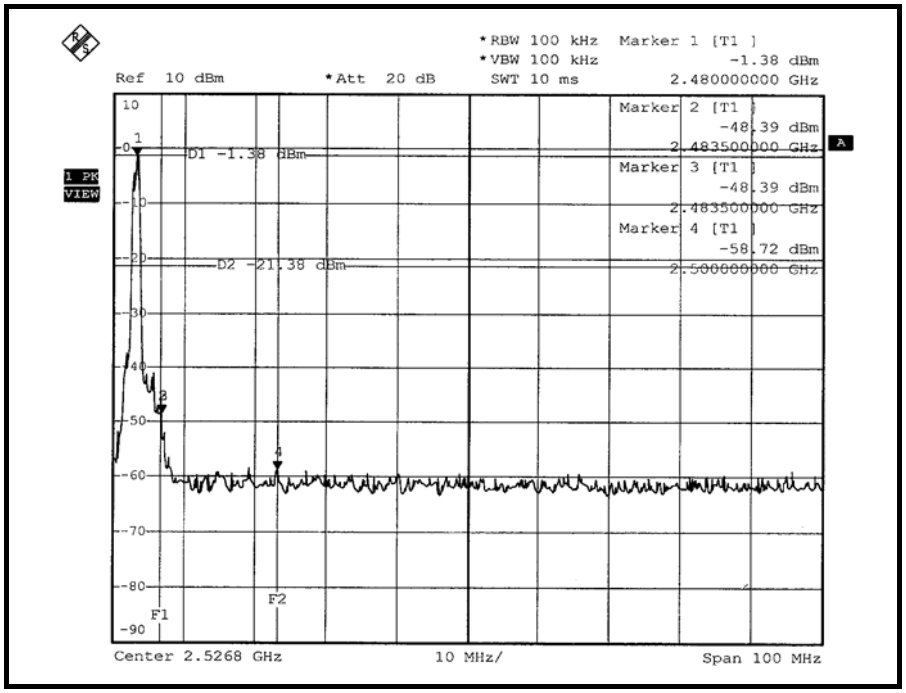
Average value = 47.10 – 30.10 = 17.00dBuV/m, which is under 54dBuV/m limit.

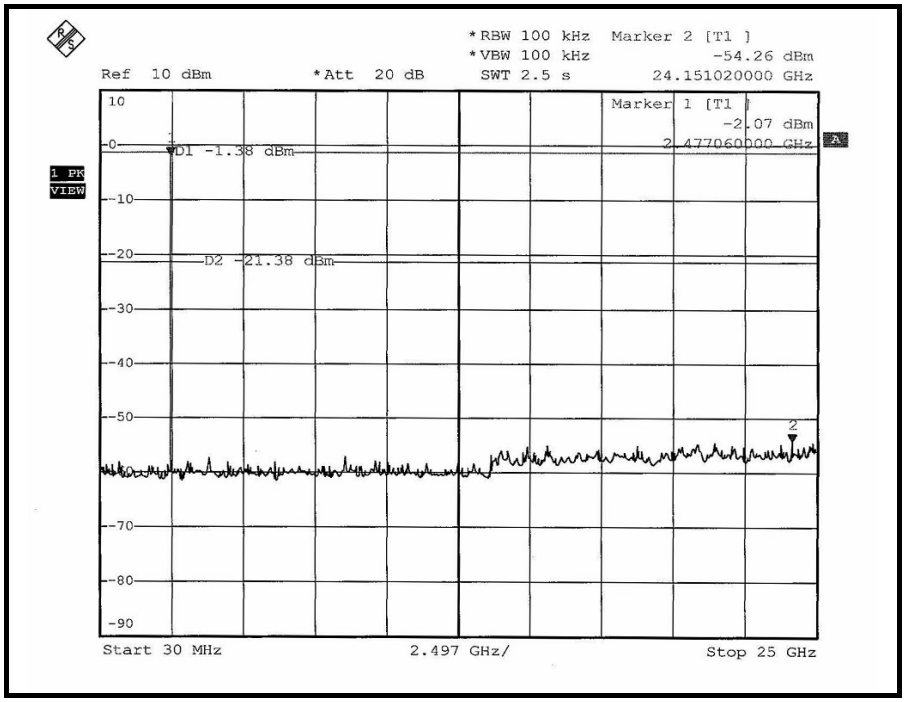
*The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle be equal to: 20log(3.125/100)= -30.1 dB.

Average value = peak reading – 30.1


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
-1.44 dBm
2.402200000 GHz
Ref 10 dBm
*Att 20 dB
Marker 2 [T1]
-44.32 dBm
2.399600000 GHz
Marker 3 [T1]
-61.31 dBm
2.390000000 GHz
Marker 4 [T1]
-58.42 dBm
2.380480000 GHz
D1 -1.44 dBm
D2 -21.44 dBm
1 PK
VIEW
F2
F1
Center 2.3546 GHz
10 MHz/
Span 100 MHz


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 1 [T1]
-5.18 dBm
2.377180000 GHz
Ref 10 dBm
*Att 20 dB
Marker 2 [T1]
-53.74 dBm
20.605280000 GHz
D1 -1.44 dBm
D2 -21.44 dBm
1 PK
VIEW
Start 30 MHz
2.497 GHz/
Stop 25 GHz


*RBW 100 kHz
*VBW 100 kHz
Ref 10 dBm
*Att 20 dB
SWT 10 ms
Marker 1 [T1]
-1.38 dBm
2.480000000 GHz
Marker 2 [T1]
-48.39 dBm
2.483500000 GHz
Marker 3 [T1]
-48.39 dBm
2.483500000 GHz
Marker 4 [T1]
-58.72 dBm
2.500000000 GHz
D1 -1.38 dBm
D2 -21.38 dBm
1 PK
VIEW
F1
F2
Center 2.5268 GHz
10 MHz/
Span 100 MHz


*RBW 100 kHz
*VBW 100 kHz
Ref 10 dBm
*Att 20 dB
SWT 2.5 s
Marker 2 [T1]
-54.26 dBm
24.151020000 GHz
Marker 1 [T1]
-2.07 dBm
2.477060000 GHz
D1 -1.38 dBm
D2 -21.38 dBm
1 PK
VIEW
Start 30 MHz
2.497 GHz/
Stop 25 GHz

4.9 ANTENNA REQUIREMENT

4.9.1 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.

4.9.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is SMD antenna without antenna connector. The maximum gain of this antenna is 4.1dBi.

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

6. INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., 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.

USA	FCC, UL, A2LA
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA , CSA
R.O.C.	TAF, BSMI, NCC
Netherlands	Telefication
Singapore	GOST-ASIA(MOU)
Russia	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. 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:
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Web Site: www.adt.com.tw

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

7. 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.