APPLICATION FOR CERTIFICATION

On Behalf of

Intel Corporation

Notebook

Models No.: HSBUB-SDS

FCC ID: RMXHSBUB-SDS

IC: 1000V-HSBUBSDS

Brand: Intel

Prepared for : Intel Corporation
2200 Mission College Blvd.
Santa Clara, CA 95054-1549, USA

Prepared By : AUDIX Technology Corporation
EMC Department
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File Number : C1M1212198
Report Number : EM-F1020099
Date of Test : Dec. 25, 2012 ~ Feb. 01, 2013
Date of Report : Feb. 04, 2013

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TEST REPORT CERTIFICATION

Applicant	:	Intel Corporation
EUT Description	:	Notebook
FCC ID	**:**	**RMXHSBUB-SDS**
IC	**:**	**1000V-HSBUBSDS**
	(A) Model No.	: HSBUB-SDS
	(B) Serial No.	: N/A
	(C) Brand	: Intel
	(D) Power Supply	: DC 19V
	(E) Test Voltage	: AC 120V, 60Hz (Via AC Adapter)

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C, Oct 2012
(FCC CFR 47 Part 15C, §15.205, §15.207, §15.209 and §15.247)
ANSI C63.4/2003
FCC Public Notice DA 00-705, Mar. 2000

Industry Canada Rules and Regulations RSS-Gen (Issue 3), December 2010 and RSS-210 (Issue 8), December 2010

The device described above was tested by AUDIX Technology Corporation to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 Subpart C and Canada RSS-Gen, RSS-210 limits.

The measurement results are contained in this test report and AUDIX Technology Corporation is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC Part 15 and Industry Canada RSS-Gen, RSS-210 standards.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX Technology Corporation.

Date of Test : Dec. 25, 2013 ~ Feb. 01, 2013 Date of Report : Feb. 04, 2013

Producer : Tina Huang
(Tina Huang/Administrator)

Signatory : Leon Liu for
(Leon Liu/Deputy General Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Product	Notebook
Model Number	HSBUB-SDS
Serial Number	N/A
Brand Name	Intel
Applicant	Intel Corporation 2200 Mission College Blvd, Santa Clara, CA 95054-1549, USA
Mini HDMI Dongle	Cable: Non-Shielded, Detachable, 0.18m
HDMI Cable	Non-Shielded, Detachable, 1.8m
FCC ID	RMXHSBUB-SDS
IC	1000V-HSBUBSDS
Fundamental Range	802.11b/g: 2412MHz ~ 2462MHz 802.11a: 5180MHz ~ 5240MHz (UNII Band I) and 5260MHz ~ 5320MHz (UNII Band II) and 5500MHz ~ 5700MHz (UNII Band III) and 5745MHz ~ 5825MHz (UNII Band IV) 5250MHz ~ 5350MHz, 5470MHz ~ 5725MHz (DFS Function, Slave/no In service monitor, no Ad-Hoc mode) 802.11n-HT20: 2412MHz ~ 2462MHz and 5180MHz ~ 5240MHz (UNII Band I) and 5260MHz ~ 5320MHz (UNII Band II) and 5500MHz ~ 5700MHz (UNII Band III) and 5745MHz ~ 5825MHz (UNII Band IV) 5250MHz ~ 5350MHz, 5470MHz ~ 5725MHz (DFS Function, Slave/no In service monitor, no Ad-Hoc mode) 802.11n-HT40: 2422MHz ~ 2452MHz and 5190MHz ~ 5230MHz (UNII Band I) and 5270MHz ~ 5310MHz (UNII Band II) and 5510MHz ~ 5670MHz (UNII Band III) and 5755MHz ~ 5795MHz (UNII Band IV) 5250MHz ~ 5350MHz, 5470MHz ~ 5725MHz (DFS Function, Slave/no In service monitor, no Ad-Hoc mode) BT and BT Low Energy: 2402MHz ~ 2480MHz

Fundamental Range	GPRS/EGPRS 850: UL: 824MHz to 849MHz DL: 869MHz to 894MHz GPRS/EGPRS 1900: UL: 1850MHz to 1910MHz DL: 1930MHz to 1990MHz WCDMA Band: Band II: UL: 1850MHz to 1910MHz; DL: 1930MHz to 1990MHz Band IV: UL: 1710MHz to 1755MHz; DL: 2110MHz to 2115MHz Band V: UL: 824MHz to 849MHz; DL: 869MHz to 894MHz NFC: 13.56MHz
Frequency Channel	802.11b/g: 11 channels 802.11a: UNII Band I: 4channels UNII Band II: 4 channels UNII Band III: 8 channels UNII Band IV: 4 channels 802.11n-HT20: 2.4GHz: 11 channels 2.4G UNI Band I: 4channels UNII Band II: 4 channels UNII Band III: 8 channels UNII Band IV: 4 channels 802.11n-HT40: 2.4GHz: 7 channels UNII Band I: 2channels UNII Band II: 2 channels UNII Band III: 5 channels UNII Band IV: 3 channels Bluetooth: 79 channels (GFSK,π/4DQPSK, 8-DPSK) 40 channels (Low Energy) GPRS/EGPRS 850: CH 128- CH 251 GPRS/EGPRS 1900: CH 512-CH 810 WCDMA Band: Band II: UL: CH 9262-CH9538; DL: CH 9662-CH9938 Band IV: UL: CH 1312-CH1513; DL: CH 1537-CH1738 Band V: UL: CH 4132-CH4233; DL: CH 4357-CH4458 NFC: 1 Channel
Radio Technology	802.11b: DSSS Modulation (DBPSK/DQPSK/CCK) 802.11g: OFDM Modulation (BPSK/QPSK/16QAM/64QAM) 802.11a: OFDM Modulation (BPSK/QPSK/16QAM/64QAM) 802.11n: OFDM Modulation (MIMO) (BPSK/QPSK/16QAM/64QAM) Bluetooth: FHSS (GFSK,π/4DQPSK, 8-DPSK) DSSS (Low Energy) WCDMA/HSPA/HSUPA/HSUPA+ GSM/GPRS/EDGE GPS/AGPS

Data Transfer Rate	802.11b: 1/2/5.5/11Mbps 802.11a/g: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps Bluetooth: 1/2/3Mbps GSM:DL 14.4kbps/UL 14.4kbps GPRS: DL 85.6kbps/UL 85.6kbps EGPRS:DL 236.8kbps/UL 236.8kpbs WCDMA CS: DL 64kbps/UL 64kpbs WCDMA PS: DL 384kbps/UL 384kbps HSPA+:DL 21.6Mbps/UL 5.76Mpbs
Date of Receipt of Sample	Dec. 18, 2012
Date of Test	Dec. 25, 2012 ~ Feb. 01, 2013

Note: This EUT has 2.4GHz (WLAN, BT and Low Energy), 5GHz, GPRS/EGPRS, WCDMA and NFC function. See below for related test reports based on radio functionality.

1. The 2.4GHz (WLAN and Low Energy) & 5.8GHz (UNII Band IV) function has been test in other report of EM-F1020109.
2. The 5GHz (UNII Band II, III & IV) function has been test in other report of EM-F1020110.
3. The DFS function has been test in other report of EM-F1020111.
4. The NFC function has been test in other report of EM-F1020112.

1.2. Antenna Information

Antenna Part Number	Manufacture	Antenna Type	Peak Gain	
			Frequency	Max Gain
Project Name: Harris Beach WLAN Antenna (Main) Part Number: 1556570	TE Connectivity	PIFA	2400MHz	1.24dBi
			2442MHz	0.63dBi
			2484MHz	1.93dBi
			5150MHz	0.74dBi
			5250MHz	0.64dBi
			5350MHz	0.24dBi
			5470MHz	-0.54dBi
			5600MHz	-0.20dBi
			5725MHz	-0.55dBi
			5785MHz	0.84dBi
			5800MHz	0.03dBi
			5850MHz	-0.29dBi
Project Name: Harris Beach WLAN/BT Antenna (AUX) Part Number: 1556568	TE Connectivity	PIFA	2400MHz	0.75dBi
			2442MHz	1.39dBi
			2484MHz	1.82dBi
			5150MHz	1.79dBi
			5250MHz	0.79dBi
			5350MHz	1.27dBi
			5470MHz	0.72dBi
			5600MHz	0.36dBi
			5725MHz	1.31dBi
			5785MHz	1.86dBi
			5800MHz	3.04dBi
			5850MHz	2.45dBi

Antenna Part Number	Manufacture	Antenna Type	Peak Gain	
			Frequency (TX)	Max Gain
Project Name: Harris Beach WWAN Antenna (Main) Part Number: 1556567	TE Connectivity	PIFA	704MHz	-2.04dBi
			710MHz	-1.57dBi
			716MHz	-1.45dBi
			777MHz	-2.31dBi
			782MHz	-2.22dBi
			787MHz	-2.61dBi
			832MHz	-2.42dBi
			847MHz	-3.26dBi
			862MHz	-3.20dBi
			824MHz	-3.44dBi
			836MHz	-4.03dBi
			849MHz	-3.89dBi
			880MHz	-2.79dBi
			900MHz	-2.71dBi
			915MHz	-3.08dBi
			1710MHz	-4.09dBi
			1750MHz	-3.34dBi
			1785MHz	-3.77dBi
			1710MHz	-3.69dBi
			1732MHz	-3.43dBi
			1755MHz	-3.34dBi
			1850MHz	-3.88dBi
			1880MHz	-2.86dBi
			1910MHz	-2.97dBi
			1920MHz	-3.30dBi
			1950MHz	-3.28dBi
			1980MHz	-2.86dBi
			2500MHz	-1.90dBi
			2535MHz	-2.29dBi
			2570MHz	-2.08dBi

Antenna Part Number	Manufacture	Antenna Type	Peak Gain (dBi)	
			Frequency (RX)	Max Gain
Project Name: Harris Beach WWAN Antenna (AUX) Part Number: 1556569	TE Connectivity	PIFA	1575MHz	-3.67dBi
			1602MHz	-3.71dBi

1.3. Description of Key Component Lists

1.3.1. For the All Component Lists

Item		Supplier	Description	Character
System		Microsoft	Windows 8	---
Main Board		Flex	832-FIG-ITLH-G71865-400	PCBA for NB shuold not be listed separately
LCD Panel		Chimei Innolux Corp	N133HSE-EXX	13.3 inches TFT Type
CPU		Intel	---	Up to 3.3GHz
Graphics		Intel	Intel® HD Graphics with DX11	---
Memory		Samsung	---	4GB
SSD		Samsung	#1 MZ-C****** #2 MZ-D****** #3 MZ-E****** #4 MZ-N****** (* can be 0-9, A-Z, blank, slash or dash for different market purpose)	128GB
Keyboard		Kunshan YingHui Precision Electronic Co.	YH-BH12LCxx (xx=01 for US language; 02 for SP language)	--
Battery Pack		Getac Technology Corp	HB FFRD	7.5V, 7100 mAh, 53.25Whr
Web Camera		CHICONY Electronics Co., Ltd.	CKFCF01	---
WLAN+BT Combo Module		Broadcom	AW-NB136	IEEE 802.11a/b/g+ 2X2 n Bluetooth 4.0+Low Energy
WWAN		Huawei	MU736	WCDMA/HSDPA/HSUPA /HSPA GSM/GPRS/EDGE, GPS/A-GPS
WWAN Antenna	Main	TE Connectivity Ltd.	1556567	---
	AUX		1556569	---
WiFi/BT Antenna	Main	TE Connectivity Ltd.	1556570	--
	AUX		1556568	---
AC Adapter #1		Chicony	A12-045N2A	I/P: 100-240V~, 1.3A 50-60Hz O/P: 19V, 2.37A
		DC Power Cord: Non-Shielded, Undetached, 1.0m AC Power Cord: Non-Shielded, Detached, 1.8m		
AC Adapter #2		Delta	ADP-45BE AA	I/P: 100-240V~, 1.3A 50-60Hz O/P: 20V, 2.25A
		DC Power Cord: Non-Shielded, Undetached, 1.0m AC Power Cord: Non-Shielded, Detached, 1.8m		

Remark: For a more detailed features description, please refer to the manufacturer's specifications or the user manual.

1.3.2. For the EUT Test Configuration

Configuration	**SKU #1**
System	Microsoft, Windows 8
Main Board	Flex, 832-FIG-ITLH-G71865-400
LCD Panel	Chimei Innolux Corp., N133HSE-EXX
CPU	Intel, i7-4650U
Graphics	Intel, Intel® HD Graphics with DX11
Memory	Samsung, K4E8E304EB-EGCE, 4GB
SSD	Samsung, MZNTD128HAGM
Keyboard	YH-BH12LC01
Battery Pack	Getac Technology Corp, M/N HB FFRD
Web Camera	CHICONY Electronics Co., Ltd., CKFCF01
WLAN+BT Combo Module	Broadcom, M/N AW-NB136
WWAN	Huawei, M/N MU736
WLAN/BT Antenna	Main: TE Connectivity Ltd., 1556570 AUX: TE Connectivity Ltd., 1556570
WWAN Antenna	Main: TE Connectivity Ltd., 1556567 AUX: TE Connectivity Ltd., 1556569
AC Adapter	Chicony, M/N A12-045N2A
Resolution	1920*1080

1.4. Tested Supporting System Details

1.4.1. Support Peripheral Unit

No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Monitor	DELL	U3011T	CN-0C34G2-74445-29I-031L	FCC DoC Approved
2.	USB 3.0 External HDD	BUFFALO	HD-LBU3	55292020409776	FCC DoC Approved
3.	USB Mouse	DELL	MS111-T	CN-0KW2YH-71616-282-0XYP	FCC DoC Approved
4.	Earphone	APPLE	N/A	N/A	N/A
5.	SD Card	ADATA	AD4GSDHC4-S	N/A	N/A
6.	SIM Card	Taiwan Mobile	0907 41 003894 5	N/A	N/A
7.	AP Server	LG	Di-624	F34U177001194	KA2DI624D2
8.	Bluetooth Headset	INNOSTAR	IH-05	N/A	UU9MBH200

1.4.2. Cable Lists

No.	Signal Cable Description Of The Above Support Units
1.	N/A
2.	USB Cable: Shielded, Detachable, 1.0m
3.	USB Cable: Shielded, Undetachable, 1.8m
4.	Earphone Cable: Non-Shielded, Detachable, 0.9m
5.	N/A
6.	N/A
7.	N/A
8.	N/A

Note：1. Support Unit 1: Power Cord: Non-Shielded, Detachable, 1.8m

2. Support Unit 2 AC Adapter: BUFFALO, M/N: WA-18H12, S/N: 219019279;
   Cord: Non-Shielded, Undetachable, 1.5m

3 Support Unit 7 AC Adapter: D-Link, M/N: AM-91000A;
   Cord: Non-Shielded, Detachable, 1.8m

4. The support units (7-8) are communicated partner system.

1.5. Description of Test Facility

Name of Firm	:	**AUDIX Technology Corporation** **EMC Department** No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan, R.O.C.
Test Location & Facility (C7AC)	:	**No. 7 Shielded Room** No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan, R.O.C. **Semi-Anechoic Chamber** No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan, R.O.C. May 11, 2012 Renewal on Federal Communication Commission Registration Number: 90993
NVLAP Lab. Code	:	200077-0
TAF Accreditation No	:	1724

1.6. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Conduction Test	150kHz~30MHz	±1.73dB
Radiation Test (Distance: 3m)	30MHz~300MHz	±2.91dB
	300MHz~1000MHz	±2.94dB
	Above 1GHz	± 5.02dB

Remark **:** Uncertainty = $ku_c(y)$

Test Item	Uncertainty
20dB Bandwidth	± 0.2kHz
Carrier Frequency Separation	± 0.2kHz
Time Of Occupancy	± 0.03sec
Maximum peak Output power	± 0.52dBm
Emission Limitations	± 0.13dB
Band Edges	± 0.13dB

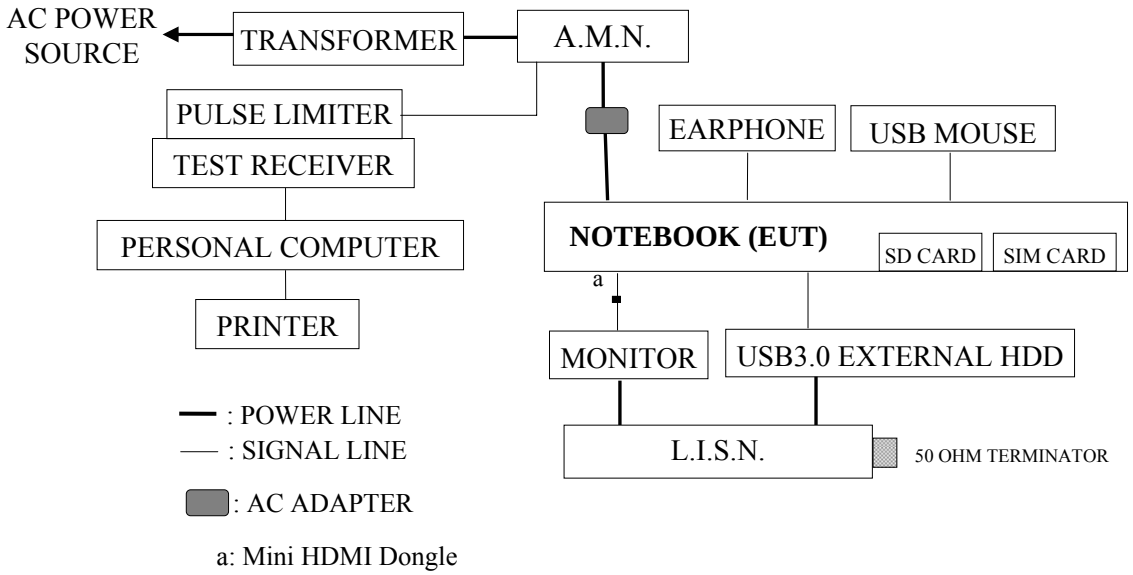
2. POWERLINE CONDUCTED EMISSION MEASUREMENT

2.1. Test Equipment

The following test equipment were used during the power line conducted measurement**:** (No. 7 Shielded Room)

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101276	Apr. 30, 12'	Apr. 29, 13'
2.	A.M.N.	R&S	ENV4200	100169	May 04, 12'	May 03, 13'
3.	L.I.S.N.	Kyoritsu	KNW-407	8-881-13	Feb. 01, 12'	Jan. 31, 13'
4.	Pulse Limiter	R&S	ESH3-Z2	101495	Mar. 26, 12'	Mar. 25, 13'

2.2. Block Diagram of Test Setup



2.3. Powerline Conducted Emission Limit (§15.207, RSS-Gen §7.2.2/Table 2)

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level	Average Level
150kHz ~ 500kHz	66 ~ 56 dBμV	56 ~ 46 dBμV
500kHz ~ 5MHz	56 dBμV	46 dBμV
5MHz ~ 30MHz	60 dBμV	50 dBμV

Remark1.: If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary.

2.: The lower limit applies at the band edges.

2.4. Operating Condition of EUT

2.4.1. Setup the EUT and simulator as shown on 2.2.

2.4.2. Turn on the power of all equipment.

2.4.3. Set to EUT (Notebook) on transmitting and receiving during all testing.

2.5. Test Procedure

The EUT link AC adapter was put on table which was above the ground by 80cm and its AC adapter's power cord was connected to power mains through an Artificial Mains Network (A.M.N.). This provided a 50 ohm coupling impedance for the measuring equipment. (Please refer to the block diagram of the test setup and photographs.) Both sides of A.C. line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions simulators of the interface cables should be manipulated according to FCC ANSI C63.4-2003 , RSS-Gen and RSS-210 during conducted measurement.

The bandwidth of the R & S Test Receiver ESCI was set at 10kHz.

The frequency range from 150kHz to 30MHz was checked.

All the final readings from Test Receiver were measured with the Quasi-Peak detector and Average detector. (Remark: If the Average limit is met when using a Quasi-Peak detector, the Average detector is unnecessary)

2.6. Powerline Conducted Emission Measurement Results

PASSED. All emissions not reported below are too low against the prescribed limits.

The EUT was measured during this section testing and all the test results are listed in next pages.

EUT：Notebook Model No.：HSBUB-SDS

Test Date: Dec. 25, 2012 Temperature: 25℃ Humidity: 52%

The details are as follows：

Mode	Reference Test Data	
	Neutral	Line
1.	# 4	# 3

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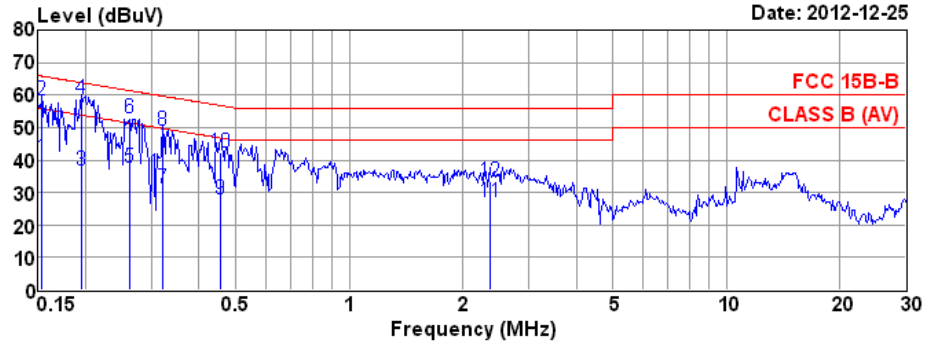

Site no. : No.7 Shielded Room Data no. : 4
Dis. / Ant. : ENV4200 Ant. pol. : NEUTRAL
Limit : FCC 15B-B
Env. / Ins. : 25*C / 52% ESCI (1276) Engineer : Fate
EUT : HSBUB-SDS
Power Rating : 120Vac/60Hz
Test Mode : Operating

	Freq. (MHz)	AMN. Factor (dB)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.15	10.23	9.92	20.48	40.63	55.82	15.19	Average
2	0.15	10.23	9.92	38.10	58.25	65.82	7.57	QP
3	0.19	10.23	9.93	16.57	36.73	53.84	17.11	Average
4	0.19	10.23	9.93	38.65	58.81	63.84	5.03	QP
5	0.26	10.21	9.95	17.54	37.70	51.38	13.68	Average
6	0.26	10.21	9.95	32.62	52.78	61.38	8.60	QP
7	0.32	10.19	9.96	10.98	31.13	49.66	18.53	Average
8	0.32	10.19	9.96	28.89	49.04	59.66	10.62	QP
9	0.46	10.17	9.98	7.87	28.02	46.76	18.74	Average
10	0.46	10.17	9.98	22.28	42.43	56.76	14.33	QP
11	2.36	10.14	10.00	6.83	26.97	46.00	19.03	Average
12	2.36	10.14	10.00	13.29	33.43	56.00	22.57	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Reading.
2. If the average limit is met when using a quasi-peak detector the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

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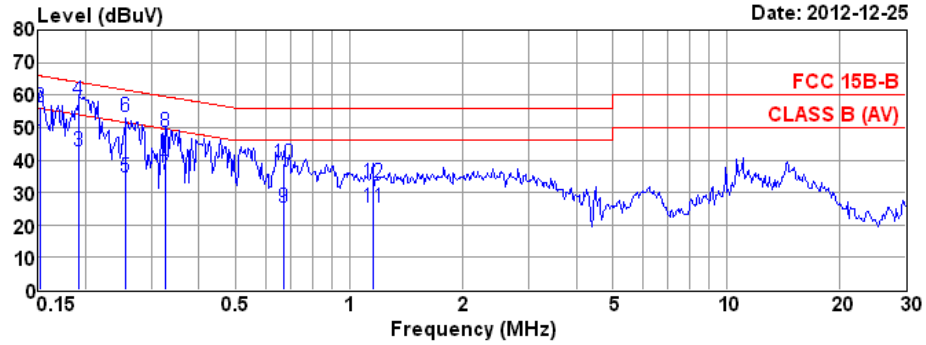


Site no. : No.7 Shielded Room Data no. : 3
Dis. / Ant. : ENV4200 Ant. pol. : LINE
Limit : FCC 15B-B
Env. / Ins. : 25*C / 52% ESCI (1276) Engineer : Fate
EUT : HSBUB-SDS
Power Rating : 120Vac/60Hz
Test Mode : Operating

	Freq. (MHz)	AMN. Factor (dB)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.15	10.22	9.92	25.10	45.24	55.91	10.67	Average
2	0.15	10.22	9.92	36.25	56.39	65.91	9.52	QP
3	0.19	10.24	9.93	22.73	42.90	53.93	11.03	Average
4	0.19	10.24	9.93	38.38	58.55	63.93	5.38	QP
5	0.26	10.23	9.95	14.65	34.83	51.56	16.73	Average
6	0.26	10.23	9.95	33.06	53.24	61.56	8.32	QP
7	0.33	10.21	9.96	15.50	35.67	49.57	13.90	Average
8	0.33	10.21	9.96	28.65	48.82	59.57	10.75	QP
9	0.67	10.19	9.99	5.06	25.24	46.00	20.76	Average
10	0.67	10.19	9.99	18.76	38.94	56.00	17.06	QP
11	1.15	10.18	10.00	5.19	25.37	46.00	20.63	Average
12	1.15	10.18	10.00	12.71	32.89	56.00	23.11	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Reading.
2. If the average limit is met when using a quasi-peak detector the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

3. RADIATED EMISSION MEASUREMENT

3.1. Test Equipment

The following test equipment was used during the radiated emission measurement:

3.1.1. For Frequency Range 30MHz~1000MHz (at Semi-Anechoic Chamber)

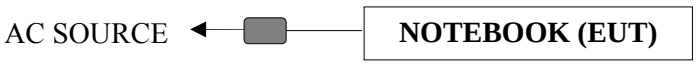
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	Aug. 08, 12'	Aug. 06, 13'
2.	Test Receiver	R & S	ESCS30	100338	Jul. 04, 12'	Jul. 03, 13'
3.	Amplifier	HP	8447D	2944A06305	Feb. 13, 12'	Feb. 12, 13'
4.	Biconical Antenna	CHASE	VBA6106A	1264	Mar. 03, 12'	Mar. 02, 13'
5.	Log Periodic Antenna	Schwarzbeck	UHALP9108-A	0810	Mar. 03, 12'	Mar. 02, 13'

3.1.2. For Frequency Above 1GHz (at Semi-Anechoic Chamber)

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	Aug. 07, 12'	Aug. 06, 13'
2.	Test Receiver	R & S	ESCS30	100338	Jul. 04, 12'	Jul. 03, 13'
3.	Pre-Amplifier	HP	8449B	3008A02678	Mar. 07, 12'	Mar. 06, 13'
4.	2.4GHz Notch Filter	EWT	EWT-14-0070-R1	G2	Feb. 14, 12'	Feb. 13, 13'
5.	3.5G High Pass Filter	HP	84300-80038	005	Dec. 14, 12'	Dec. 13, 13'
6.	Horn Antenna	EMCO	3115	9112-3775	May 09, 12'	May 08, 13'
7.	Horn Antenna	EMCO	3116	2653	Oct. 15, 12'	Oct. 14, 13'

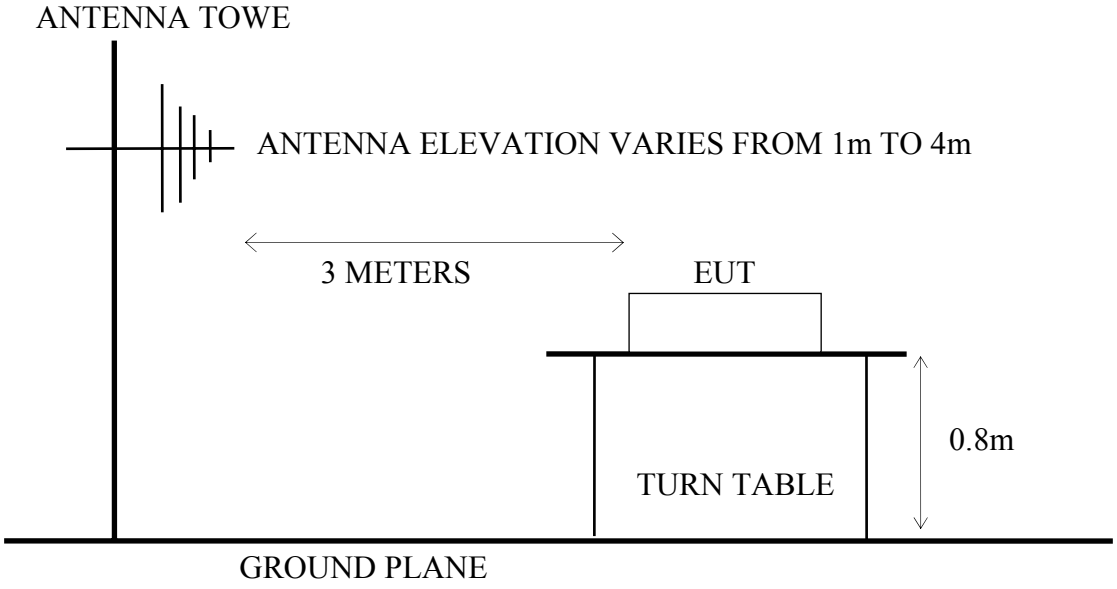
3.2. Block Diagram of Test Setup

3.2.1. Block Diagram of connection between EUT and simulators

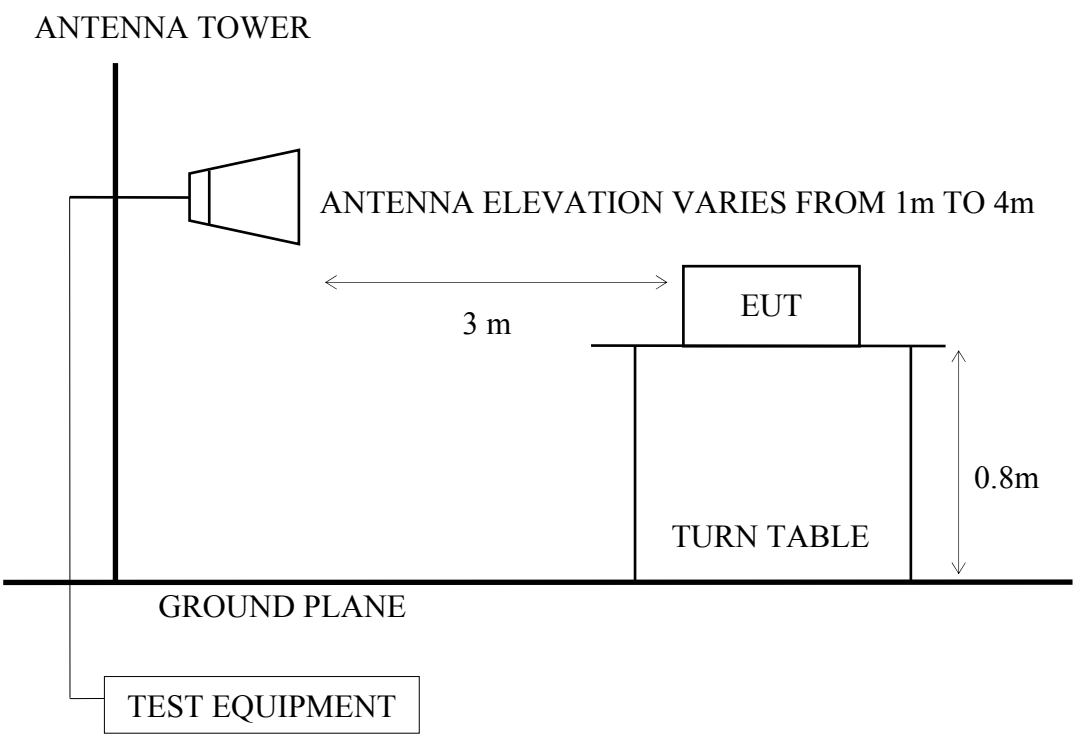


: AC Adapter

3.2.2. Semi-Anechoic Chamber (3m) Setup Diagram for 30-1000MHz



3.2.3. Semi-Anechoic Chamber (3m) Setup Diagram for above 1GHz



3.3. Radiated Emission Limits (§15.209, RSS-210 §2.7/Table 2)

Frequency MHz	Distance Meters	Field Strengths Limits	
		μV/m	dBμV/m
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0
Above 1000	3	74.0 dBμV/m (Peak) 54.0 dBμV/m (Average)	

Remark： (1) Emission level (dBμV/m) = 20 log Emission level (μV/m)
(2) The tighter limit applies at the edge between two frequency bands.
(3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
(4) The limits in this table are based on CFR 47 Part 15.205(a)(b) and Part 15.209 (a).
(5) The over 1GHz limit, FCC limit is used based on CFR 47 Part 15.35 (b) and Part 15.205(b) & Part 15.209(e) and Part 15.207(c).

3.4. Operating Condition of EUT

3.4.1. Set up the EUT (Notebook) and simulator as shown on 3.2.1.

3.4.2. To turn on the power of all equipments.

3.4.3. The **EUT (Notebook)** set to continuously transmit signals at 2402MHz, 2441MHz and 2480MHz during all test time. (The test program is WIN8App)

3.5. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set 3 meters away from the receiving antenna which was mounted on an antenna tower. The antenna moved up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna such as calibrated biconical and log-periodical antenna or horn antenna were used as a receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to FCC ANSI C63.4-2003, RSS-Gen and RSS-210 regulation, and the measurement guideline was according to FCC Public Notice DA 00-705.

The bandwidth of the R&S Test Receiver ESCS30 was set at 120kHz. (For 30MHz to 1000MHz)

The resolution bandwidth and video bandwidth of test spectrum analyzer is 1MHz for peak detection (PK) at frequency above 1GHz.

The resolution bandwidth of test spectrum analyzer is 1MHz and the video bandwidth is 10Hz for average detection (AV) at frequency above 1GHz.

The frequency range from 30MHz to 40GHz (Up to 10^{th} harmonics from fundamental frequency) was checked.

Above 1GHz was measured with peak and average detector. For frequency from 1GHz to 40GHz, we checked it in 1 meter distance and with a shorter cable 2 meter instead of original's. There is no signal exist.

Pursuant to ANSI C63.4 8.3.1.2, when peak value complies with the average limit, we didn't perform measurement in average detector.

3.6. Radiated Emission Measurement Results

PASSED. (All the emissions not reported below are too low against the prescribed limits.)

EUT：Notebook M/N：HSBUB-SDS

Test Date: Feb. 01, 2013 Temperature: 26℃ Humidity: 61%

For Frequency Range 30MHz-1000MHz:

[Note: We performed testing of the highest data rate.]

The EUT linked to AC adapter with the following test modes were tested during the testing and all the test results are listed in section 3.6.1.

No.	Test Mode and Frequency		Reference Test Data No.	
			Horizontal	Vertical
1.	Transmitting	2402MHz (CH0)	# 2	# 1
2.		2441MHz (CH39)	# 2	# 1
3.		2480MHz (CH78)	# 2	# 1

Type of modulation: 8-DPSK.
All above final readings were measured with Quasi-Peak detector.

For Frequency Range above 1GHz:

[Note: We performed testing of the highest data rate.]

The EUT linked to AC adapter with following test modes was performed during this section testing and all the test results are listed in section 3.6.2.

Mode	Chnnel	Frequency	Test Mode	Position	Test Frequency Range
1.	00	2402MHz	Transmit	Stand	**1000-2680MHz***
2.					**2680-5500MHz***
3.					5500-18000MHz
4.					18000-25000MHz
5.	39	2441MHz	Transmit	Stand	**1000-2680MHz***
6.					**2680-5500MHz***
7.					5500-18000MHz
8.					18000-25000MHz
9.	78	2480MHz	Transmit	Stand	**1000-2680MHz***
10.					**2680-5500MHz***
11.					5500-18000MHz
12.					18000-25000MHz

Type of modulation: 8-DPSK.

Note: 1. Above all final readings were measured with Peak detector.
2. For measurements above 1GHz to 2.68GHz or 2.68GHz-5.5GHz, the peak measured value complies with the average limit, it is unnecessary to perform an average measurement. (According to ANSI C63.4-2003 section 8.3.1.2)
3. The emissions (up to 40GHz) not reported are too low to be measured.

For Restricted Bands:

[Note: We performed testing of the highest data rate.]

The EUT linked to AC adapter was tested in restricted bands and all the test results are listed in section 3.6.3. (The restricted bands defined in part 15.205(a))

No.	Test Mode and Frequency		Reference Test Data No.	
			Horizontal	Vertical
1.	Transmitting	2402MHz (CH0)	# 2	# 1
2.		2480MHz (CH78)	# 4	# 3

Type of modulation: 8-DPSK.

3.6.1. Frequency Range 30MHz-1000MHz Measurement Result

Transmit, Frequency: 2402MHz (8-DPSK)

```
Site no.      : A/C Chamber                  Data no.  : 2
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : HORIZONTAL
Limit         : FCC PART-15C
Env. / Ins.   : E4446A 26℃/61%                          □jianlun_hung
EUT           : HSBUB-SDS
Power Rating  : AC120 / 60Hz
Test Mode     : TX2402
```

Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
240.330	23.10	3.40	4.10	30.60	46.00	15.40	Peak
337.800	15.09	4.25	7.66	27.00	46.00	19.00	Peak
481.300	18.74	6.10	5.20	30.04	46.00	15.96	Peak
672.400	22.85	6.40	4.35	33.60	46.00	12.40	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

```
Site no.      : A/C Chamber                  Data no.  : 1
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : VERTICAL
Limit         : FCC PART-15C
Env. / Ins.   : E4446A 26℃/61%                          □jianlun_hung
EUT           : HSBUB-SDS
Power Rating  : AC120 / 60Hz
Test Mode     : TX2402
```

Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
102.630	17.40	2.10	13.58	33.08	43.50	10.42	Peak
399.400	17.69	4.80	8.31	30.80	46.00	15.20	Peak
481.300	18.74	6.10	6.79	31.63	46.00	14.37	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Transmit, Frequency: 2441MHz (8-DPSK)

```
Site no.      : A/C Chamber                  Data no.  : 2
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : HORIZONTAL
Limit         : FCC PART-15C
Env. / Ins.   : E4446A 26℃/61%                          □jianlun_hung
EUT           : HSBUB-SDS
Power Rating  : AC120 / 60Hz
Test Mode     : TX2441
```

Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
223.590	21.96	3.30	5.78	31.04	46.00	14.96	Peak
481.300	18.74	6.10	5.44	30.28	46.00	15.72	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

```
Site no.      : A/C Chamber                  Data no.  : 1
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : VERTICAL
Limit         : FCC PART-15C
Env. / Ins.   : E4446A 26℃/61%                          □jianlun_hung
EUT           : HSBUB-SDS
Power Rating  : AC120 / 60Hz
Test Mode     : TX2441
```

Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
93.990	16.37	2.00	14.21	32.58	43.50	10.92	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Transmit, Frequency: 2480MHz (8-DPSK)

```
Site no.      : A/C Chamber                  Data no.  : 2
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : HORIZONTAL
Limit         : FCC PART-15C
Env. / Ins.   : E4446A 26℃/61%                          □jianlun_hung
EUT           : HSBUB-SDS
Power Rating  : AC120 / 60Hz
Test Mode     : TX2480
```

Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
240.330	23.10	3.40	3.98	30.48	46.00	15.52	Peak
672.400	22.85	6.40	5.21	34.46	46.00	11.54	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

```
Site no.      : A/C Chamber                  Data no.  : 1
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : VERTICAL
Limit         : FCC PART-15C
Env. / Ins.   : E4446A 26℃/61%                          □jianlun_hung
EUT           : HSBUB-SDS
Power Rating  : AC120 / 60Hz
Test Mode     : TX2480
```

Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
93.180	16.25	2.00	9.58	27.83	43.50	15.67	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

3.6.2. For Above 1GHz Frequency Range Measurement Results

Date of Test: Feb. 01, 2013 Temperature: 26℃

EUT: Notebook Humidity: 61%

Test Mode: Transmitting Mode, Frequency: 2402MHz, 8-DPSK

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading Horizontal (dBμV)	Emission Level Horizontal (dBμV/m)	Limits (dBμV/m)	Margin (dB)
3207.340	30.77	7.36	14.53	52.66	74.00	21.34

Remarks: 1. Emission level=Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.
3. All final readings of measurement were with Peak values.
4. The pre-amplifier factor has been subtracted by test program actively.

Emission Frequency (MHz)	Peak Value (dB/m)	Duty Cycle Correction Factor (dB)	Average Value (dBμV/m)	Limit (dBμV/m)	Margin (dB)
3207.34	52.66	-30.54	22.12	54.00	31.88

Remarks: 1. Duty Cycle Correction Factor =
20log(dwell time/100ms)=20log(2.970ms/100ms)=-30.54
2. Average value=Peak value+ Duty Cycle Correction Factor
3. All final readings of measurement were with Average values.
4. The pre-amplifier factor has been subtracted by test program actively.

Date of Test: Feb. 01, 2013 Temperature: 26℃

EUT: Notebook Humidity: 61%

Test Mode: Transmitting Mode, Frequency: 2402MHz, 8-DPSK

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading Vertical (dBμV)	Emission Level Vertical (dBμV/m)	Limits (dBμV/m)	Margin (dB)
1599.760	26.08	6.14	17.34	49.55	74.00	24.45
3207.340	30.77	7.36	13.98	52.11	74.00	21.89

Remarks: 1. Emission level=Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.
3. All final readings of measurement were with Peak values.
4. The pre-amplifier factor has been subtracted by test program actively.

Emission Frequency (MHz)	Peak Value (dB/m)	Duty Cycle Correction Factor (dB)	Average Value (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1599.76	49.55	-30.54	19.01	54.00	34.99
3207.34	52.11	-30.54	21.57	54.00	32.43

Remarks: 1. Duty Cycle Correction Factor =
20log(dwell time/100ms)=20log(2.970ms/100ms)=-30.54
2. Average value=Peak value+ Duty Cycle Correction Factor
3. All final readings of measurement were with Average values.
4. The pre-amplifier factor has been subtracted by test program actively.

Date of Test: Feb. 01, 2013 Temperature: 26℃

EUT: Notebook Humidity: 61%

Test Mode: Transmitting Mode, Frequency: 2441MHz, 8-DPSK

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading Horizontal (dBμV)	Emission Level Horizontal (dBμV/m)	Limits (dBμV/m)	Margin (dB)
3255.280	30.87	7.40	10.08	48.34	74.00	25.66

Remarks: 1. Emission level=Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.
3. All final readings of measurement were with Peak values.
4. The pre-amplifier factor has been subtracted by test program actively.

Emission Frequency (MHz)	Peak Value (dB/m)	Duty Cycle Correction Factor (dB)	Average Value (dBμV/m)	Limit (dBμV/m)	Margin (dB)
3255.28	48.34	-30.54	17.80	54.00	36.20

Remarks: 1. Duty Cycle Correction Factor =
20log(dwell time/100ms)=20log(2.970ms/100ms)=-30.54
2. Average value=Peak value+ Duty Cycle Correction Factor
3. All final readings of measurement were with Average values.
4. The pre-amplifier factor has been subtracted by test program actively.

Date of Test: Feb. 01, 2013 Temperature: 26℃

EUT: Notebook Humidity: 61%

Test Mode: Transmitting Mode, Frequency: 2441MHz, 8-DPSK

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading Vertical (dBμV)	Emission Level Vertical (dBμV/m)	Limits (dBμV/m)	Margin (dB)
1599.760	26.08	6.14	18.51	50.72	74.00	23.28
2649.760	29.21	6.71	16.14	52.06	74.00	21.94
3255.280	30.87	7.40	12.15	50.41	74.00	23.59

Remarks: 1. Emission level=Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.
3. All final readings of measurement were with Peak values.
4. The pre-amplifier factor has been subtracted by test program actively.

Emission Frequency (MHz)	Peak Value (dB/m)	Duty Cycle Correction Factor (dB)	Average Value (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1599.76	50.72	-30.54	20.18	54.00	33.82
2649.76	52.06	-30.54	21.52	54.00	32.48
3255.28	50.41	-30.54	19.87	54.00	34.13

Remarks: 1. Duty Cycle Correction Factor =
20log(dwell time/100ms)=20log(2.970ms/100ms)=-30.54
2. Average value=Peak value+ Duty Cycle Correction Factor
3. All final readings of measurement were with Average values.
4. The pre-amplifier factor has been subtracted by test program actively.

Date of Test: Feb. 01, 2013 Temperature: 26℃

EUT: Notebook Humidity: 61%

Test Mode: Transmitting Mode, Frequency: 2480MHz, 8-DPSK

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading Horizontal (dBμV)	Emission Level Horizontal (dBμV/m)	Limits (dBμV/m)	Margin (dB)
1599.760	26.08	6.14	14.89	47.10	74.00	26.90
3311.680	30.96	7.49	9.93	48.37	74.00	25.63

Remarks: 1. Emission level=Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.
3. All final readings of measurement were with Peak values.
4. The pre-amplifier factor has been subtracted by test program actively.

Emission Frequency (MHz)	Peak Value (dB/m)	Duty Cycle Correction Factor (dB)	Average Value (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1599.76	47.1	-30.54	16.56	54.00	37.44
3311.68	48.37	-30.54	17.83	54.00	36.17

Remarks: 1. Duty Cycle Correction Factor =
20log(dwell time/100ms)=20log(2.970ms/100ms)=-30.54
2. Average value=Peak value+ Duty Cycle Correction Factor
3. All final readings of measurement were with Average values.
4. The pre-amplifier factor has been subtracted by test program actively.

Date of Test: Feb. 01, 2013 Temperature: 26℃

EUT: Notebook Humidity: 61%

Test Mode: Transmitting Mode, Frequency: 2480MHz, 8-DPSK

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading Vertical (dBμV)	Emission Level Vertical (dBμV/m)	Limits (dBμV/m)	Margin (dB)
1599.760	26.08	6.14	13.01	45.22	74.00	28.78
3311.680	30.96	7.49	8.76	47.20	74.00	26.80

Remarks: 1. Emission level=Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.
3. All final readings of measurement were with Peak values.
4. The pre-amplifier factor has been subtracted by test program actively.

Emission Frequency (MHz)	Peak Value (dB/m)	Duty Cycle Correction Factor (dB)	Average Value (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1599.76	45.22	-30.54	14.68	54.00	39.32
3311.68	47.20	-30.54	16.66	54.00	37.34

Remarks: 1. Duty Cycle Correction Factor =
20log(dwell time/100ms)=20log(2.970ms/100ms)=-30.54
2. Average value=Peak value+ Duty Cycle Correction Factor
3. All final readings of measurement were with Average values.
4. The pre-amplifier factor has been subtracted by test program actively.

3.6.3. Restricted Bands Measurement Results

Date of Test: Feb. 01, 2013 Temperature: 26℃

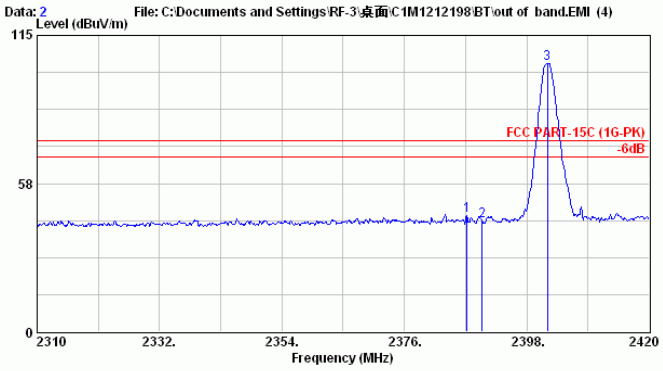
EUT: Notebook Humidity: 61%

Test Mode: Transmit, Frequency: 2402MHz, 8-DPSK

	Emission Frequency	Antenna Factor	Cable Loss	Meter Reading Horizontal	Emission Level Horizontal	Limits	Margin
	(MHz)	(dB/m)	(dB)	(dBμV)	(dBμV/m)	(dBμV/m)	(dB)
Peak *	2387.220	28.47	6.33	10.35	45.15	74.00	28.85

	Emission Frequency	Peak Value	Duty Cycle Correction Factor	Average Value	Limit	Margin
	(MHz)	(dB/m)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Average *	2387.220	45.15	-30.54	14.61	54.00	39.39

Remark ：
1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. Low frequency section (spurious in the restricted band 2310-2420MHz).
3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.
4. Duty Cycle Correction Factor = 20log(dwell time/100ms)=20log(2.970ms/100ms)=-30.54
5. The pre-amplifier factor has been subtracted by test program actively.




```
Site no.      : A/C Chamber                Data no.  : 2
Dis. / Ant.   : 3m   3115(4927)            Ant. pol. : HORIZONTAL
Limit         : FCC PART-15C (1G-PK)
Env. / Ins.   : E4446A 26℃/61%                       □jianlun_hung
EUT           : HSBUB-SDS
Power Rating  : AC120 / 60Hz
Test Mode     : TX2402
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark	
1	2387.220	28.47	6.33	10.35	45.15	74.00	28.85	Peak	
2	2390.000	28.47	6.34	8.16	42.97	74.00	31.03	Peak	
3	2401.740	28.47	6.35	69.42	104.24	74.00	-30.24	Peak	@

```
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
         2. The emission levels that are 20dB below the official
            limit are not reported.
```

Date of Test: Feb. 01, 2013 Temperature: 26℃

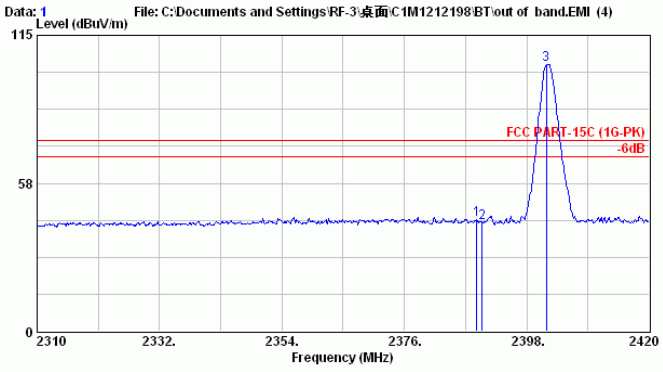
EUT: Notebook Humidity: 61%

Test Mode: Transmit, Frequency: 2402MHz, 8-DPSK

	Emission Frequency	Antenna Factor	Cable Loss	Meter Reading Vertical	Emission Level Vertical	Limits	Margin
	(MHz)	(dB/m)	(dB)	(dBμV)	(dBμV/m)	(dBμV/m)	(dB)
Peak *	2388.980	28.47	6.34	8.37	43.18	74.00	30.82

	Emission Frequency	Peak Value	Duty Cycle Correction Factor	Average Value	Limit	Margin
	(MHz)	(dB/m)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Average *	2388.980	43.18	-30.54	12.64	54.00	41.36

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. Low frequency section (spurious in the restricted band 2310-2420MHz).
3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.
4. Duty Cycle Correction Factor = 20log(dwell time/100ms)=20log(2.970ms/100ms)=-30.54
5. The pre-amplifier factor has been subtracted by test program actively.



Site no. : A/C Chamber Data no. : 1
Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
Limit : FCC PART-15C (1G-PK)
Env. / Ins. : E4446A 26℃/61% □jianlun_hung
EUT : HSBUB-SDS
Power Rating : AC120 / 60Hz
Test Mode : TX2402

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	2388.980	28.47	6.34	8.37	43.18	74.00	30.82	Peak
2	2390.000	28.47	6.34	7.47	42.28	74.00	31.72	Peak
3	2401.520	28.47	6.35	68.95	103.77	74.00	-29.77	Peak @

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Date of Test: Feb. 01, 2013 Temperature: 26℃

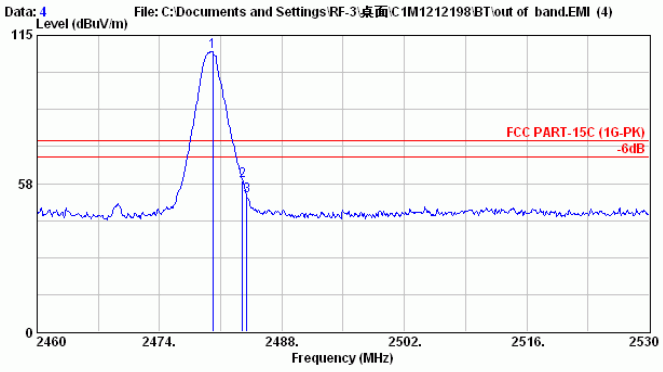
EUT: Notebook Humidity: 61%

Test Mode: Transmit, Frequency: 2480MHz, 8-DPSK

	Emission Frequency	Antenna Factor	Cable Loss	Meter Reading Horizontal	Emission Level Horizontal	Limits	Margin
	(MHz)	(dB/m)	(dB)	(dBμV)	(dBμV/m)	(dBμV/m)	(dB)
Peak *	2483.500	28.66	6.45	23.48	58.59	74.00	15.41

	Emission Frequency	Peak Value	Duty Cycle Correction Factor	Average Value	Limit	Margin
	(MHz)	(dB/m)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Average *	2483.500	58.59	-30.54	28.05	54.00	25.95

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. Low frequency section (spurious in the restricted band 2460-2530MHz).
3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.
4. Duty Cycle Correction Factor = 20log(dwell time/100ms)=20log(2.970ms/100ms)=-30.54
5. The pre-amplifier factor has been subtracted by test program actively.




```
Site no.      : A/C Chamber                Data no.  : 4
Dis. / Ant.   : 3m   3115(4927)            Ant. pol. : HORIZONTAL
Limit         : FCC PART-15C (1G-PK)
Env. / Ins.   : E4446A 26℃/61%                       □jianlun_hung
EUT           : HSBUB-SDS
Power Rating  : AC120 / 60Hz
Test Mode     : TX2480
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark	
1	2480.090	28.66	6.44	73.69	108.79	74.00	-34.79	Peak	@
2	2483.500	28.66	6.45	23.48	58.59	74.00	15.41	Peak	
3	2484.010	28.66	6.45	17.61	52.73	74.00	21.27	Peak	

```
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
         2. The emission levels that are 20dB below the official
            limit are not reported.
```

Date of Test: Feb. 01, 2013 Temperature: 26℃

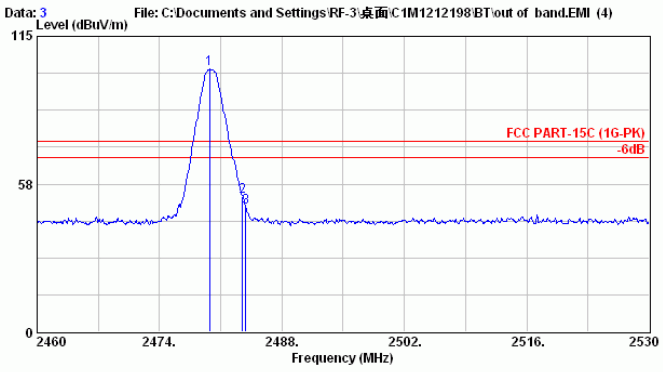
EUT: Notebook Humidity: 61%

Test Mode: Transmit, Frequency: 2480MHz, 8-DPSK

	Emission Frequency	Antenna Factor	Cable Loss	Meter Reading Vertical	Emission Level Vertical	Limits	Margin
	(MHz)	(dB/m)	(dB)	(dBμV)	(dBμV/m)	(dBμV/m)	(dB)
Peak *	2483.500	28.66	6.45	17.49	52.60	74.00	21.40

	Emission Frequency	Peak Value	Duty Cycle Correction Factor	Average Value	Limit	Margin
	(MHz)	(dB/m)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Average *	2483.500	52.60	-30.54	22.06	54.00	31.94

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. Low frequency section (spurious in the restricted band 2460-2530MHz).
3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.
4. Duty Cycle Correction Factor = 20log(dwell time/100ms)=20log(2.970ms/100ms)=-30.54
5. The pre-amplifier factor has been subtracted by test program actively.




```
Site no.      : A/C Chamber                Data no.  : 3
Dis. / Ant.   : 3m   3115(4927)            Ant. pol. : VERTICAL
Limit         : FCC PART-15C (1G-PK)
Env. / Ins.   : E4446A 26℃/61%                       □jianlun_hung
EUT           : HSBUB-SDS
Power Rating  : AC120 / 60Hz
Test Mode     : TX2480
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark	
1	2479.740	28.66	6.44	67.06	102.16	74.00	-28.16	Peak	X
2	2483.500	28.66	6.45	17.49	52.60	74.00	21.40	Peak	
3	2483.870	28.66	6.45	13.49	48.61	74.00	25.39	Peak	

```
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
         2. The emission levels that are 20dB below the official
            limit are not reported.
```

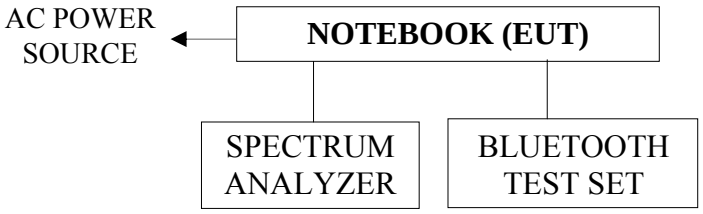
4. 20dB BANDWIDTH MEASUREMENT

4.1. Test Equipment

The following test equipment was used during the 20dB bandwidth measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	Oct. 17, 12'	Oct. 16, 13'
2.	Bluetooth Test Set	Anritsu	MT8852B	6K00005697	Mar. 21, 12'	Mar. 20, 13'

4.2. Block Diagram of Test Setup



4.3. Specification Limits [§15.247(a)(1), RSS-210 §A8.2 (a)]

Alternatively, frequency hopping systems operating in the 2400-2483.5MHz band may have hopping channel carrier frequencies that are separated by 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater.

4.4. Operating Condition of EUT

The test program "WIN8App" for Lowe Energy was used to enable the EUT to transmit data at different channel frequency individually.

4.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. The RBW of the fundamental frequency was measure by spectrum analyzer 1% of the 20dB bandwidth and the setting equal to RBW and VBW is equal to RBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.
The measurement guideline was according to FCC Public Notice DA 00-705.

4.6. Test Results

PASSED. All the test results are attached in next pages.

[Note: We performed testing of the highest and lowest data rate.]

EUT: Notebook M/N: HSBUB-SDS

Test Date: Jan. 23, 2013 Temperature: 24℃ Humidity: 50%

4.6.1. Type of Modulation: 8-DPSK

No.	Channel	Test Frequency	**20dB Bandwidth**	**2/3 (20dB Bandwidth)**
1.	0	2402MHz	**1.275MHz**	**0.850MHz**
2.	39	2441MHz	**1.275MHz**	**0.850MHz**
3.	78	2480MHz	**1.275MHz**	**0.850MHz**

The maximum two-thirds of the 20dB bandwidth shall be at maximum 0.850MHz.

4.6.2. Type of Modulation: GFSK

No.	Channel	Test Frequency	**20dB Bandwidth**	**2/3 (20dB Bandwidth)**
1.	0	2402MHz	**924kHz**	**616kHz**
2.	39	2441MHz	**924kHz**	**616kHz**
3.	78	2480MHz	**924kHz**	**616kHz**

The maximum two-thirds of the 20dB bandwidth shall be at maximum 616kHz.

Figure 1: 8-DPSK, Channel 0, Frequency: 2402MHz

Figure 2: 8-DPSK, Channel 39, Frequency: 2441MHz

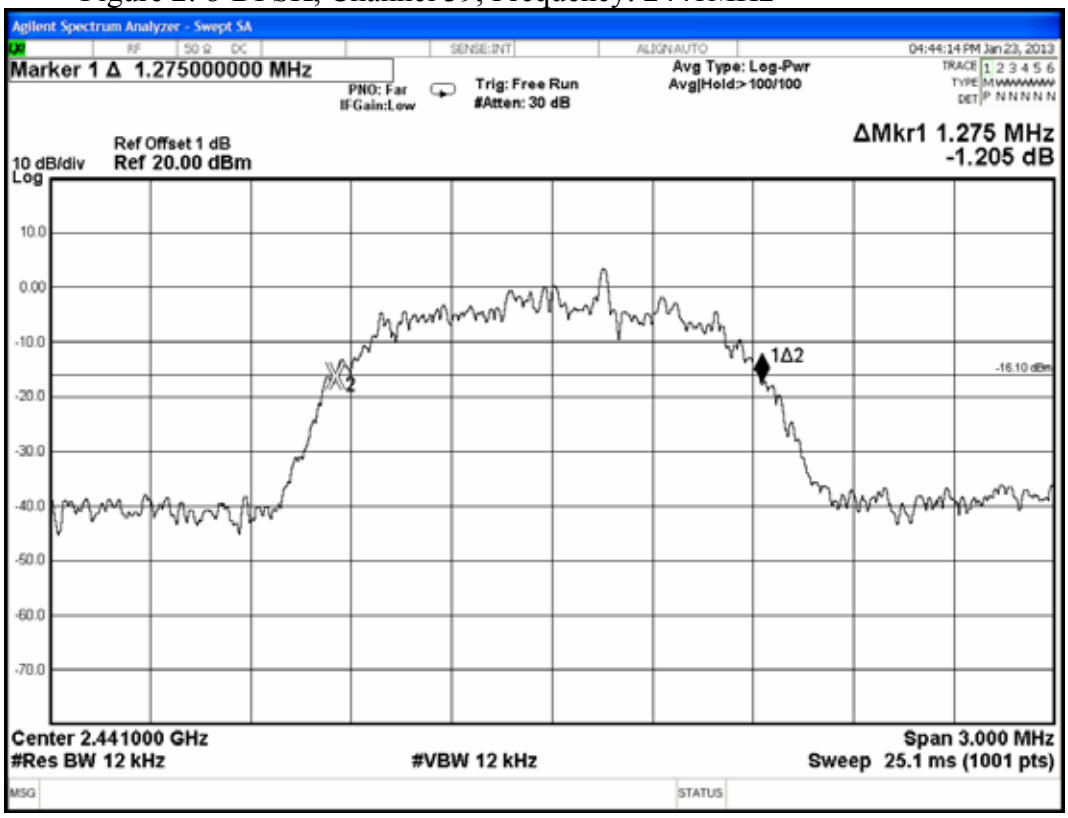


Figure 3: 8-DPSK, Channel 78, Frequency: 2480MHz

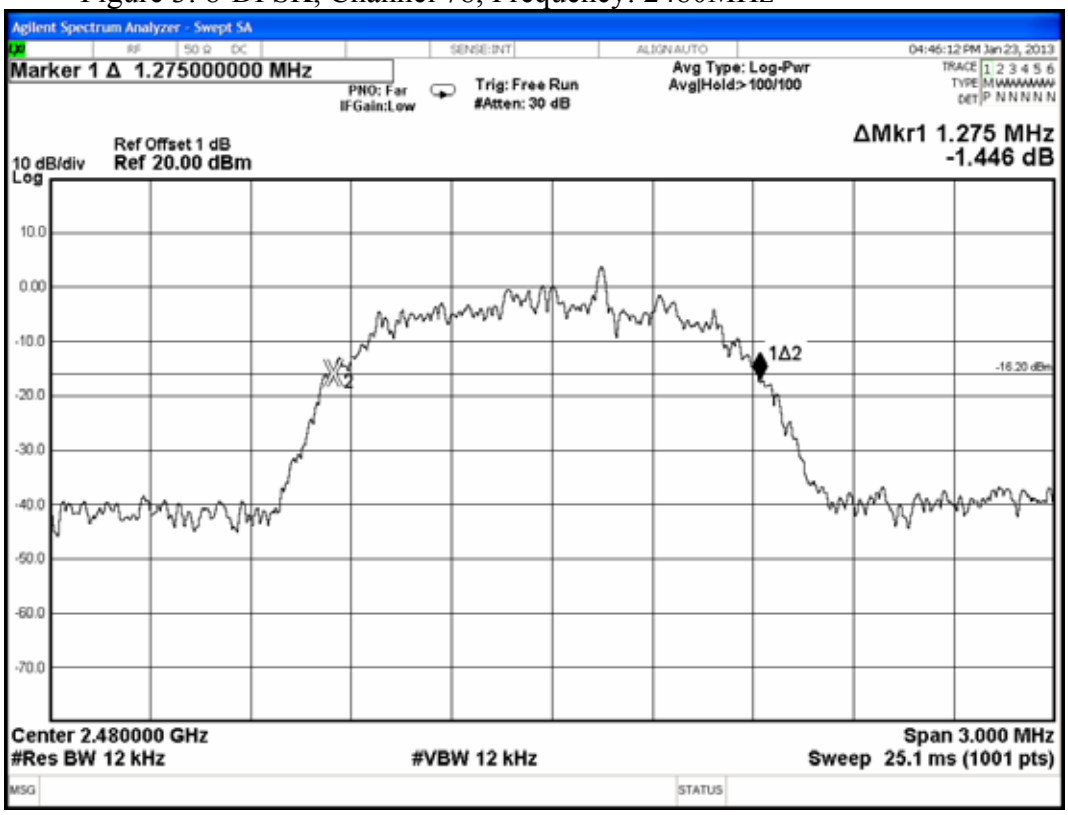


Figure 4: GFSK, Channel 0, Frequency: 2402MHz

Figure 5: GFSK, Channel 39, Frequency: 2441MHz

Figure 6: GFSK, Channel 78, Frequency: 2480MHz

5. CARRIER FREQUENCY SEPARATION MEASUREMENT

5.1. Test Equipment

The following test equipment was used during the carrier frequency separation measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	Oct. 17, 12'	Oct. 16, 13'
2.	Bluetooth Test Set	Anritsu	MT8852B	6K00005697	Mar. 21, 12'	Mar. 20, 13'

5.2. Block Diagram of Test Setup

The same as section.4.2.

5.3. Specification Limits [§15.247(a)(1), RSS-210 §A8.2 (b)]

Alternatively, frequency hopping systems operating in the 2400-2483.5MHz band may have hopping channel carrier frequencies that are separated by 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output no greater than 125mW.

5.4. Operating Condition of EUT

Same as carrier frequency separation measurement which was listed in section 4.4.

5.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. The channel separation was measure by spectrum analyzer with RBW equal to 1% of the span. The video bandwidth not to be smaller than resolution bandwidth, the peak was mark on adjacent bandwidth, the between of peak is carrier frequency separation.
The measurement guideline was according to FCC Public Notice DA 00-705.

5.6. Test Results

PASSED. All the test results are attached in next pages.

[Note: We performed testing of the highest and lowest data rate.]

EUT: Notebook M/N: HSBUB-SDS

Test Date: Jan. 23, 2013 Temperature: 24℃ Humidity: 50%

5.6.1. Type of Modulation: 8-DPSK

1. 2402MHz adjacent channel of carrier frequency separation: 1.008MHz。
2. 2441MHz adjacent channel of right carrier frequency separation: 1.008MHz。
3. 2441MHz adjacent channel of left carrier frequency separation: 1.008MHz。
4. 2480MHz adjacent channel of carrier frequency separation: 1.008MHz。

[Above values have met the requirement as specified in section 4.3: frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.]

5.6.2. Type of Modulation: GFSK

1. 2402MHz adjacent channel of carrier frequency separation: 1.000MHz。
2. 2441MHz adjacent channel of right carrier frequency separation: 100MHz。
3. 2441MHz adjacent channel of left carrier frequency separation: 1.000MHz。
4. 2480MHz adjacent channel of carrier frequency separation: 1.000MHz。

[Above values have met the requirement as specified in section 4.3: frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.]

Figure 1: 8-DPSK, 2402MHz adjacent channel of carrier frequency separation

Figure 2: 8-DPSK, 2441MHz adjacent channel of right carrier frequency separation

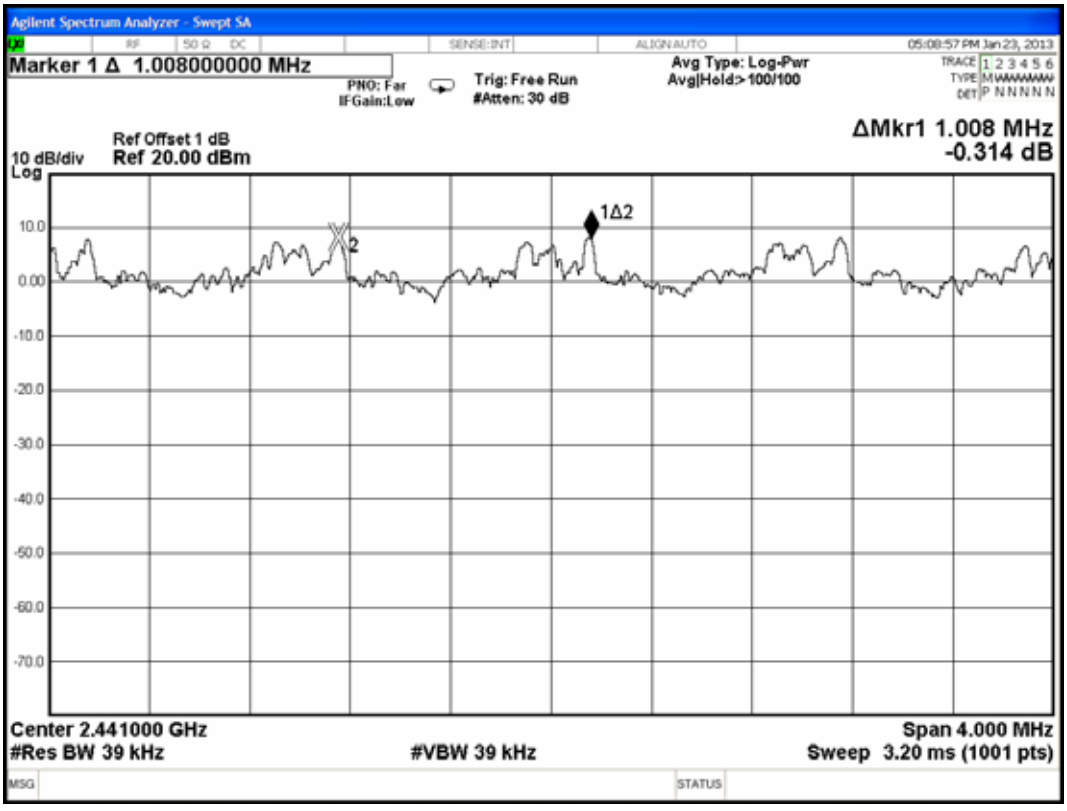


Figure 3: 8-DPSK, 2441MHz adjacent channel of left carrier frequency separation

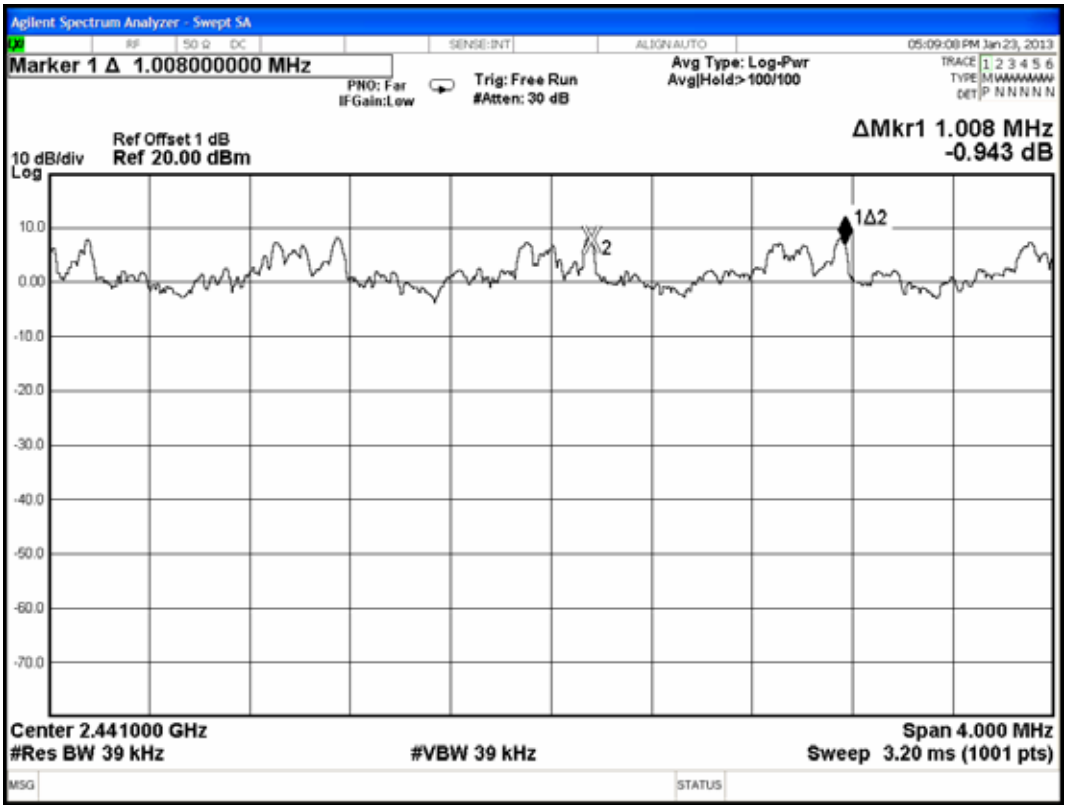


Figure 4: 8-DPSK, 2480MHz adjacent channel of carrier frequency separation

Figure 5: GFSK, 2402MHz adjacent channel of carrier frequency separation

Figure 6: GFSK, 2441MHz adjacent channel of right carrier frequency separation

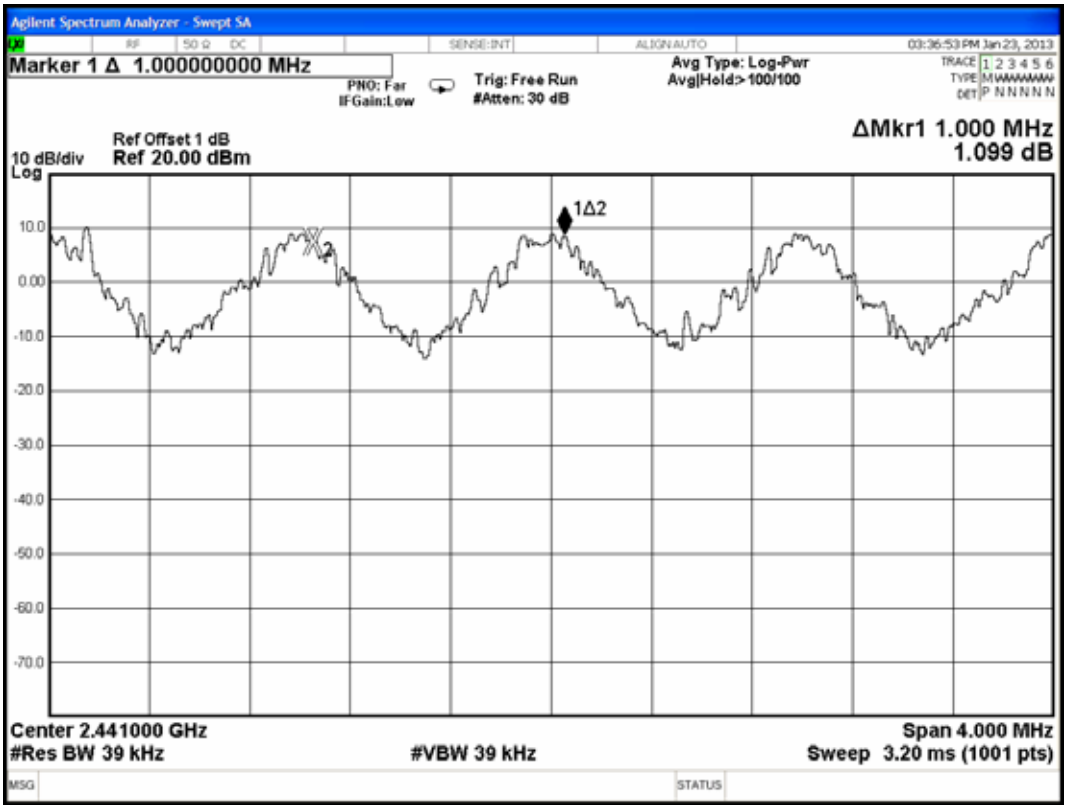


Figure 7: GFSK, 2441MHz adjacent channel of left carrier frequency separation

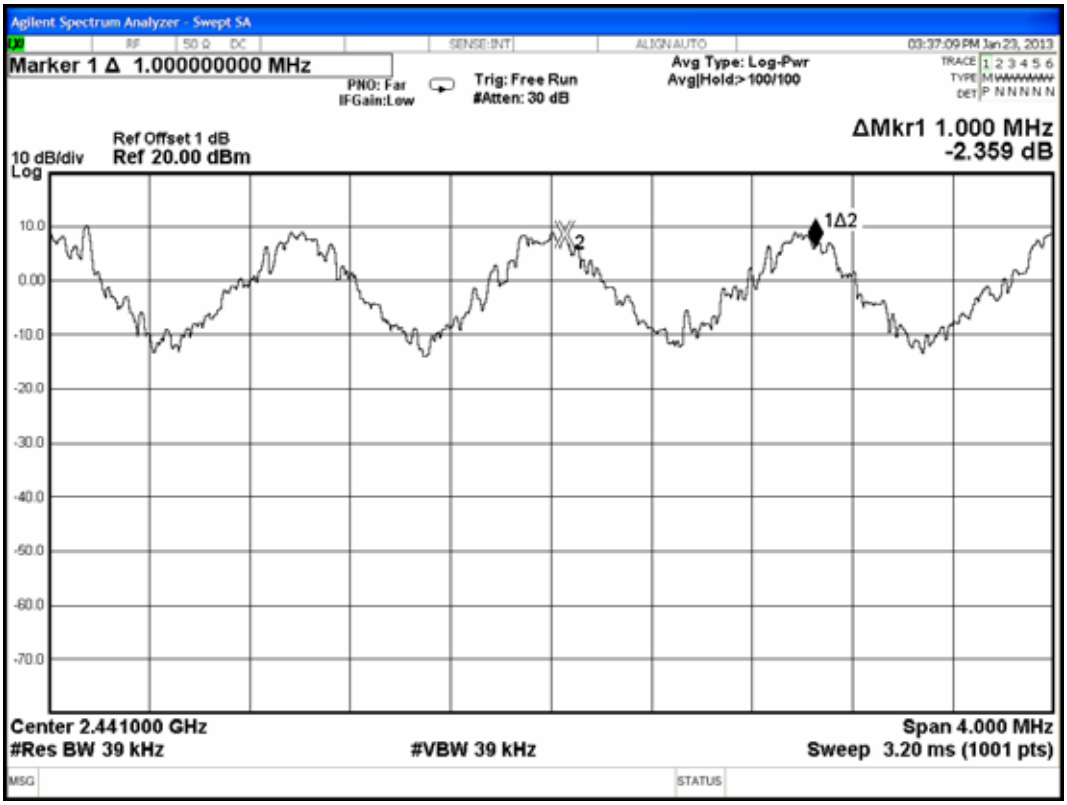


Figure 8: GFSK, 2480MHz adjacent channel of carrier frequency separation

6. TIME OF OCCUPANCY MEASUREMENT

6.1. Test Equipment

The following test equipment was used during the time of occupancy measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	Oct. 17, 12'	Oct. 16, 13'
2.	Bluetooth Test Set	Anritsu	MT8852B	6K00005697	Mar. 21, 12'	Mar. 20, 13'

6.2. Block Diagram of Test Setup

The same as section.4.2.

6.3. Specification Limits [§15.247(a)(1)(iii), RSS-210 §A8.2 (d)]

Frequency hopping systems in the 2400-2483.5MHz shall use at least 15 non-overlapping channels. 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 number of hopping channels employed.

6.4. Operating Condition of EUT

Same as carrier frequency separation measurement which was listed in section 4.4.

6.5. Test Procedure

The EUT was connected to the notebook. The bandwidth of the fundamental frequency was measure by spectrum analyzer with 1MHz RBW and 1MHz VBW. VBW≥RBW ; Span=zero span.
Centred on a hopping channel sweep=as necessary to capture the entire dwell time per hopping channel ; Detector function=peak ; Trace=Max hold
The measurement guideline was according to FCC Public Notice DA 00-705.

6.6. Test Results

PASSED. All the test results are attached in next pages.

[Note: We performed testing of the highest and lowest data rate.]

EUT: Notebook M/N: HSBUB-SDS

Test Date: Jan. 16, 2013 Temperature: 25℃ Humidity: 60%

6.6.1. Type of Modulation：8-DPSK, Test Frequency：2402MHz

Duty cycle: 79channels*0.4 seconds = 31.6 seconds

3DH1 : For each 5 seconds of 49 channels appearance, the longest time of occupancy for each of 31.6 seconds is:

49 channels*31.6 seconds/5* 0.455ms = 140.90ms (<400ms)

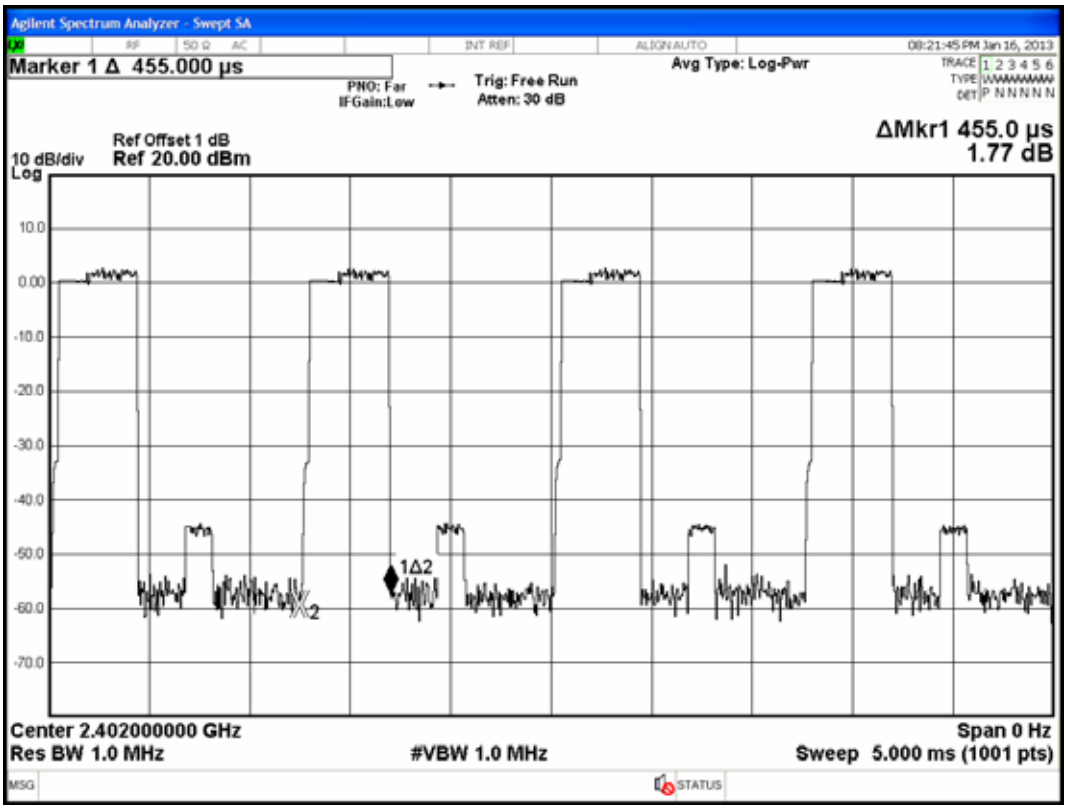
3DH3 : For each 5 seconds of 28 channels appearance, the longest time of occupancy for each of 31.6 seconds is:

28 channels*31.6 seconds/5* 1.70ms = 300.83ms (<400ms)

3DH5 : For each 5 seconds of 17 channels appearance, the longest time of occupancy for each of 31.6 seconds is:

17 channels*31.6 seconds/5*2.96ms = 318.02ms (<400ms)

Figure 1: 8-DPSK, 2402MHz, 3DH1



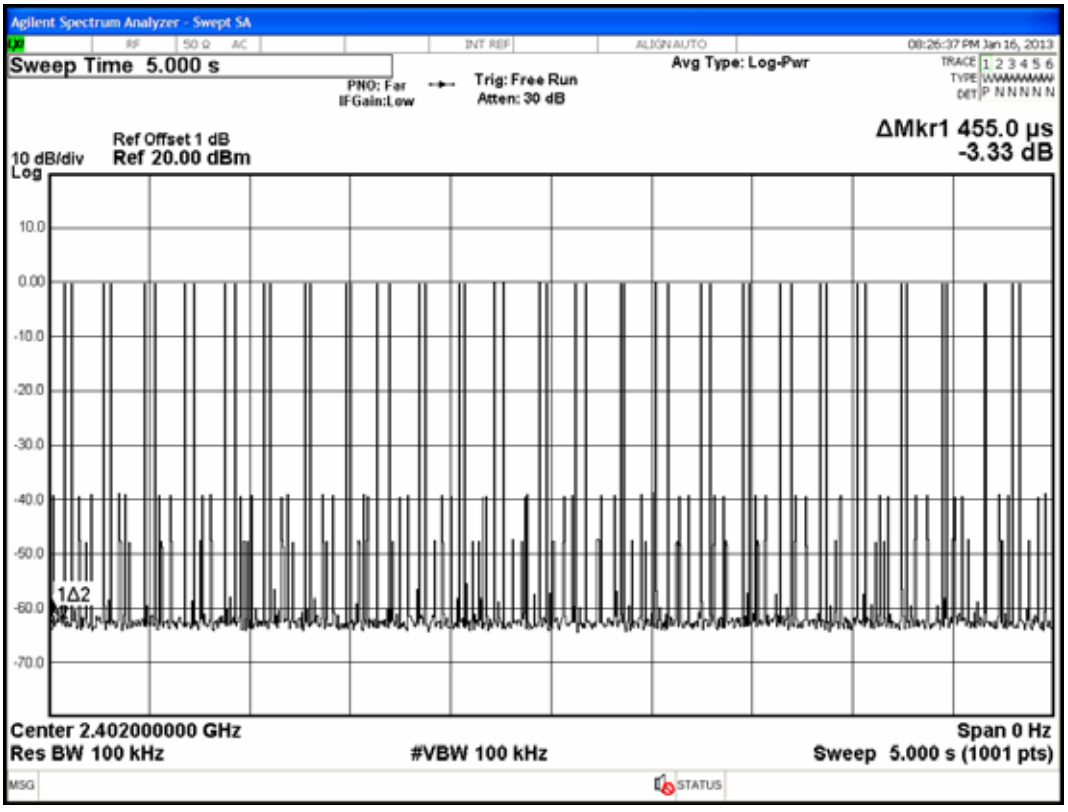
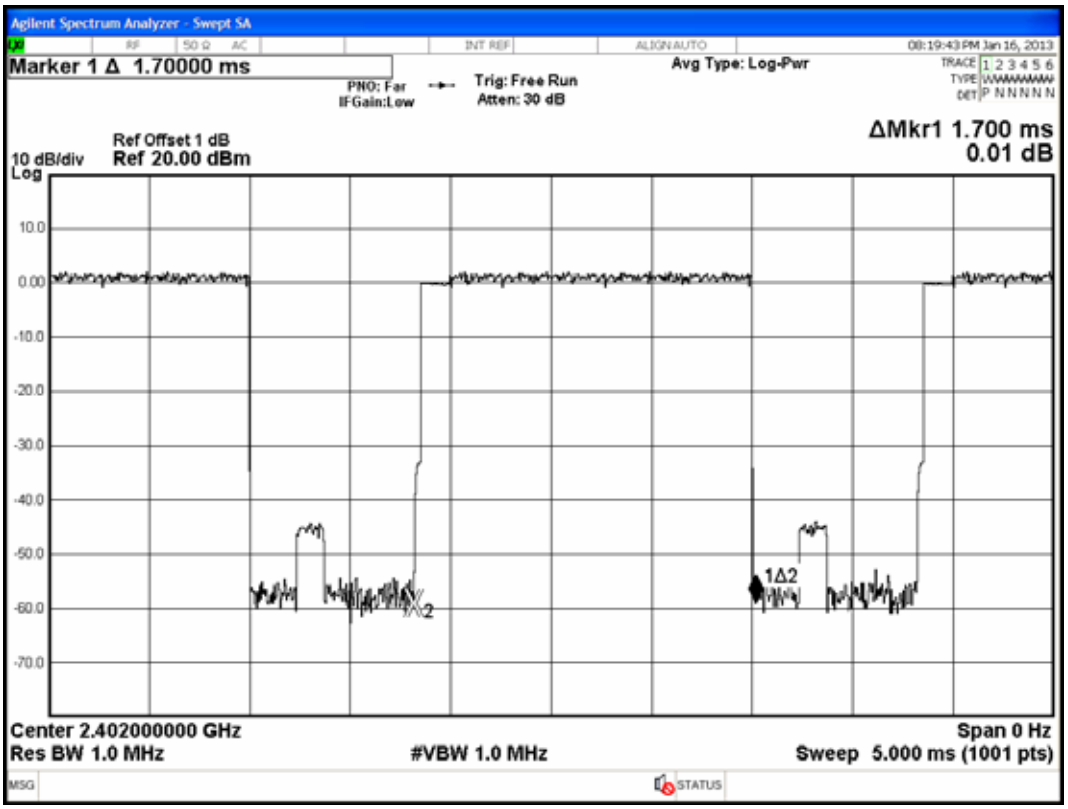


Figure 2: 8-DPSK, 2404MHz, 3DH3



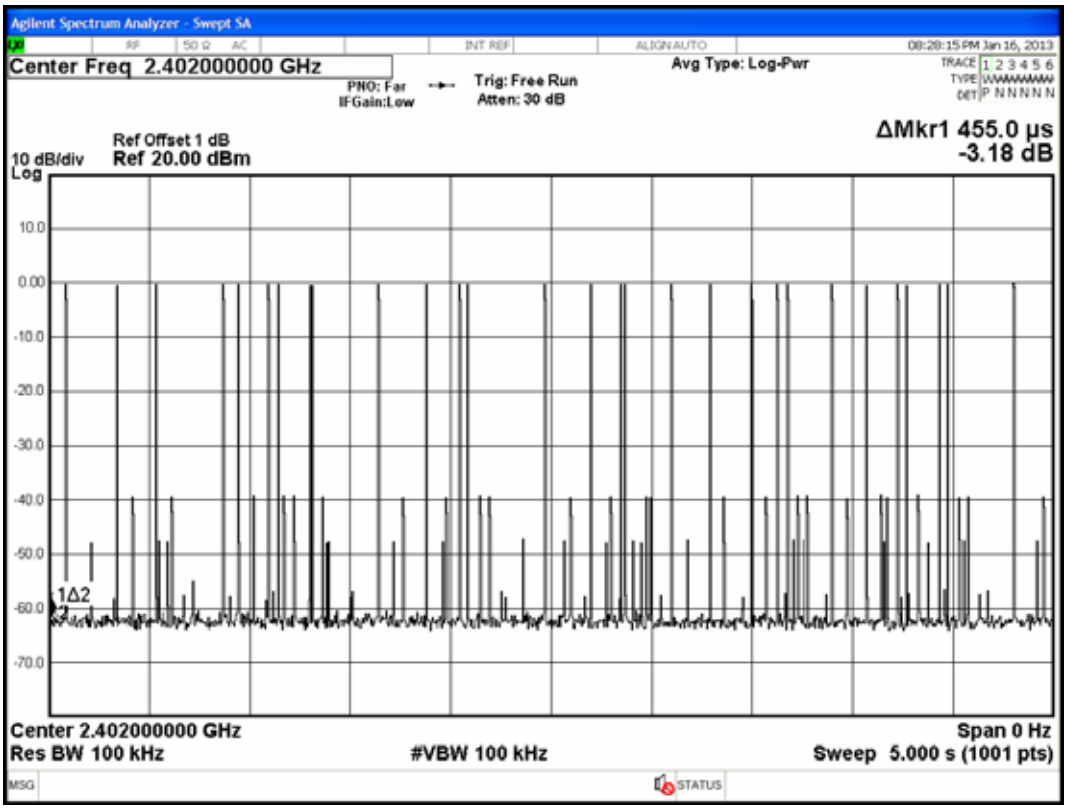
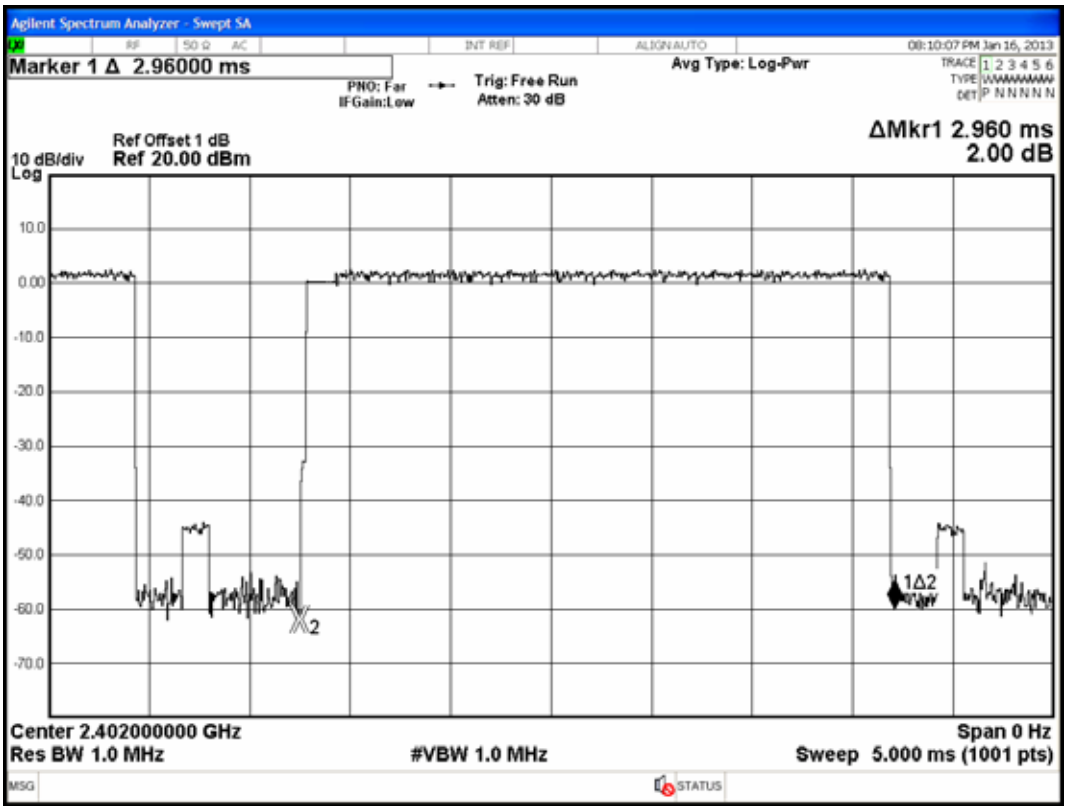
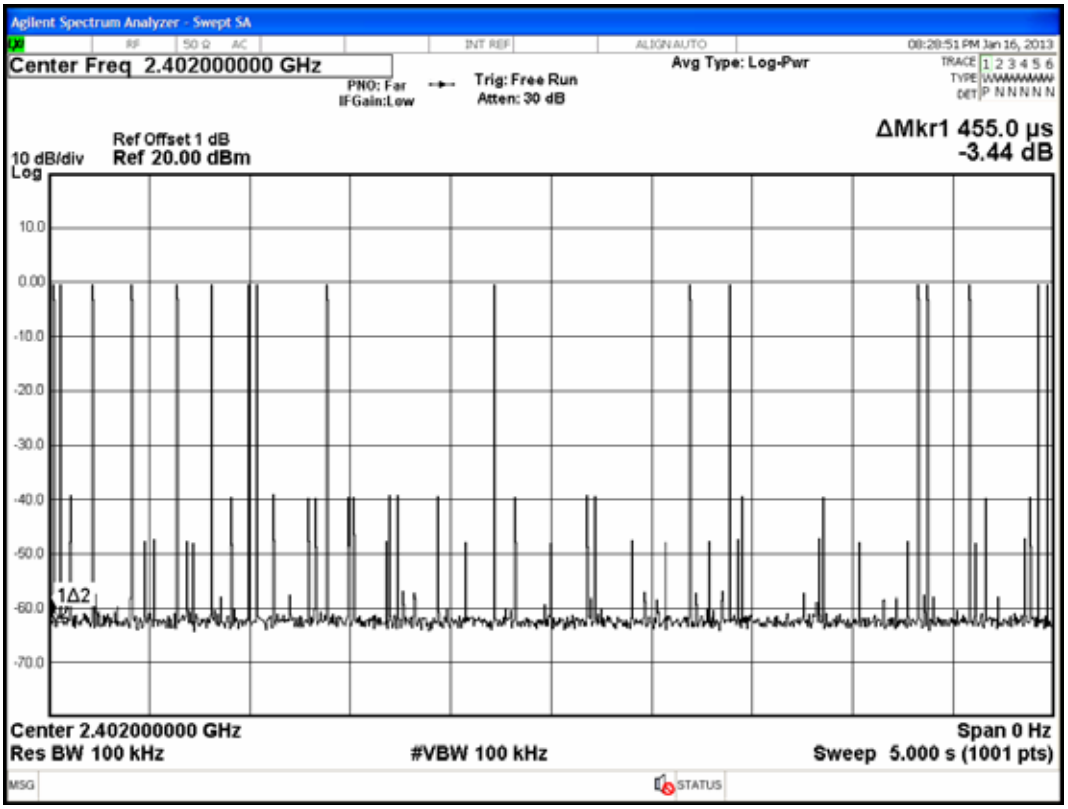


Figure 3: 8-DPSK, 2402MHz, 3DH5





6.6.2. Type of Modulation：8-DPSK, Test Frequency：2441MHz

Duty cycle: 79channels*0.4 seconds = 31.6 seconds

3DH1 : For each 5 seconds of 50 channels appearance, the longest time of occupancy for each of 31.6 seconds is:

50 channels*31.6 seconds/5* 0.445ms = 140.62ms (<400ms)

3DH3 : For each 5 seconds of 23 channels appearance, the longest time of occupancy for each of 31.6 seconds is:

23 channels*31.6 seconds/5* 1.695ms = 246.39ms (<400ms)

3DH5 : For each 5 seconds of 18 channels appearance, the longest time of occupancy for each of 31.6 seconds is:

18 channels*31.6 seconds/5*2.955ms = 336.16ms (<400ms)

Figure 1: 8-DPSK, 2441MHz, 3DH1

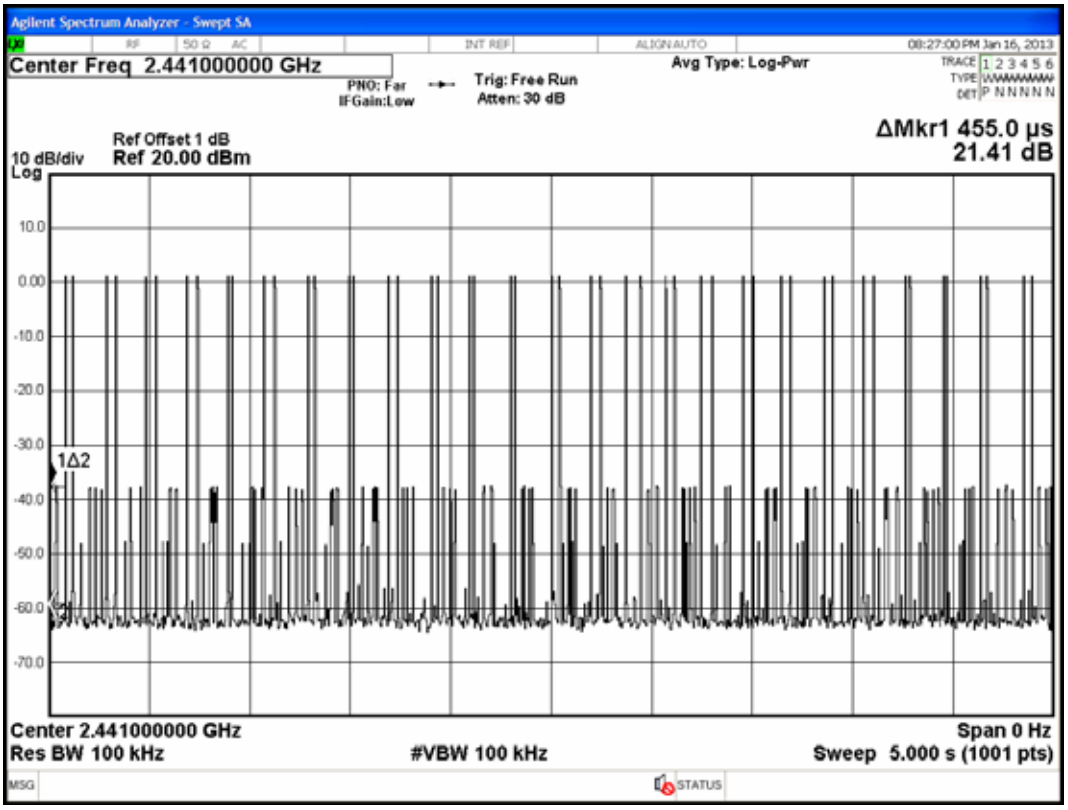
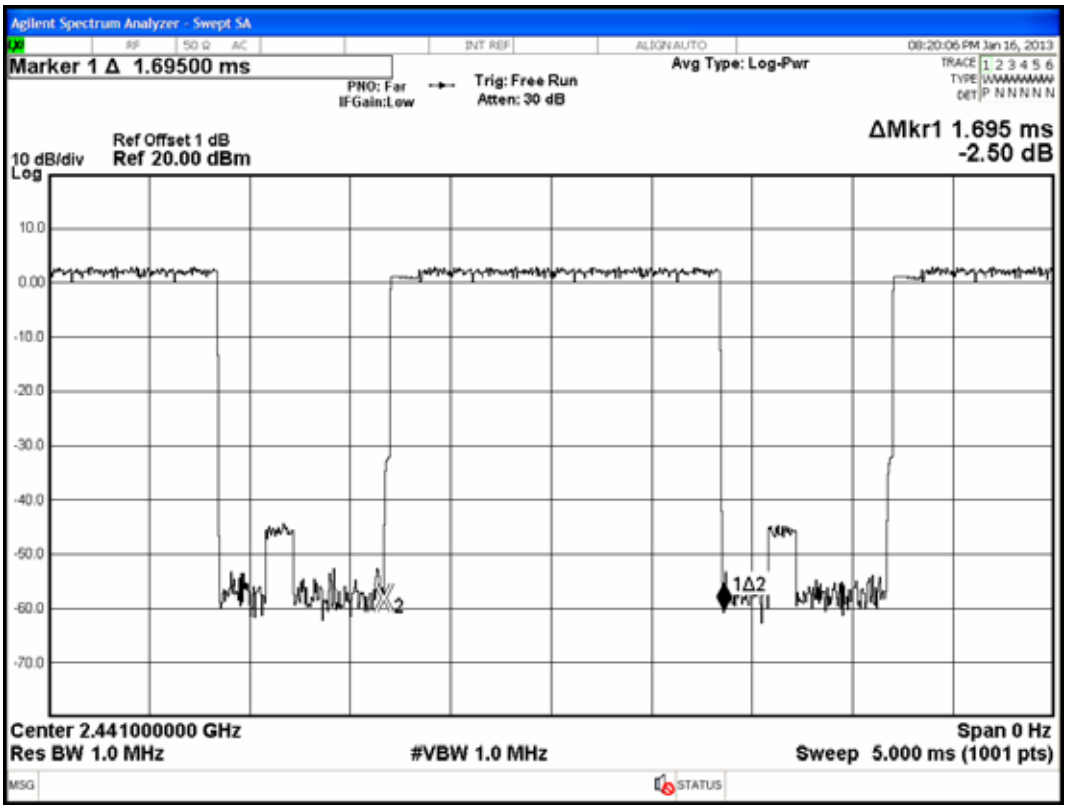


Figure 2: 8-DPSK, 2441MHz, 3DH3



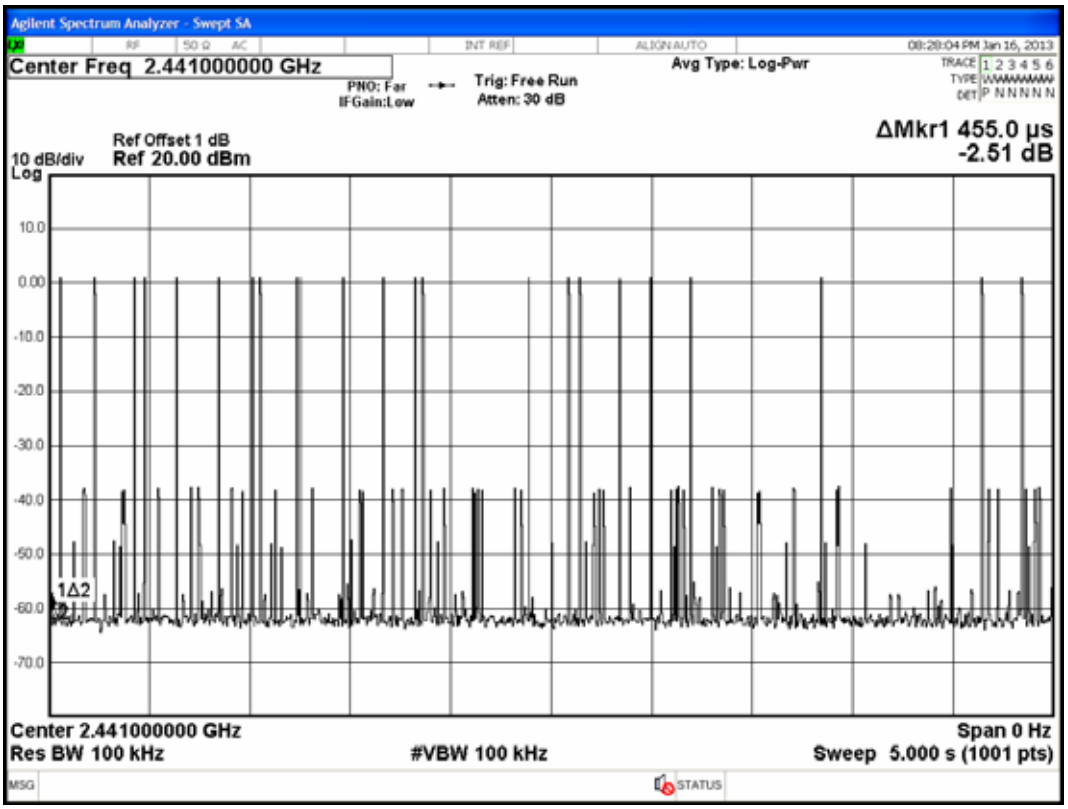
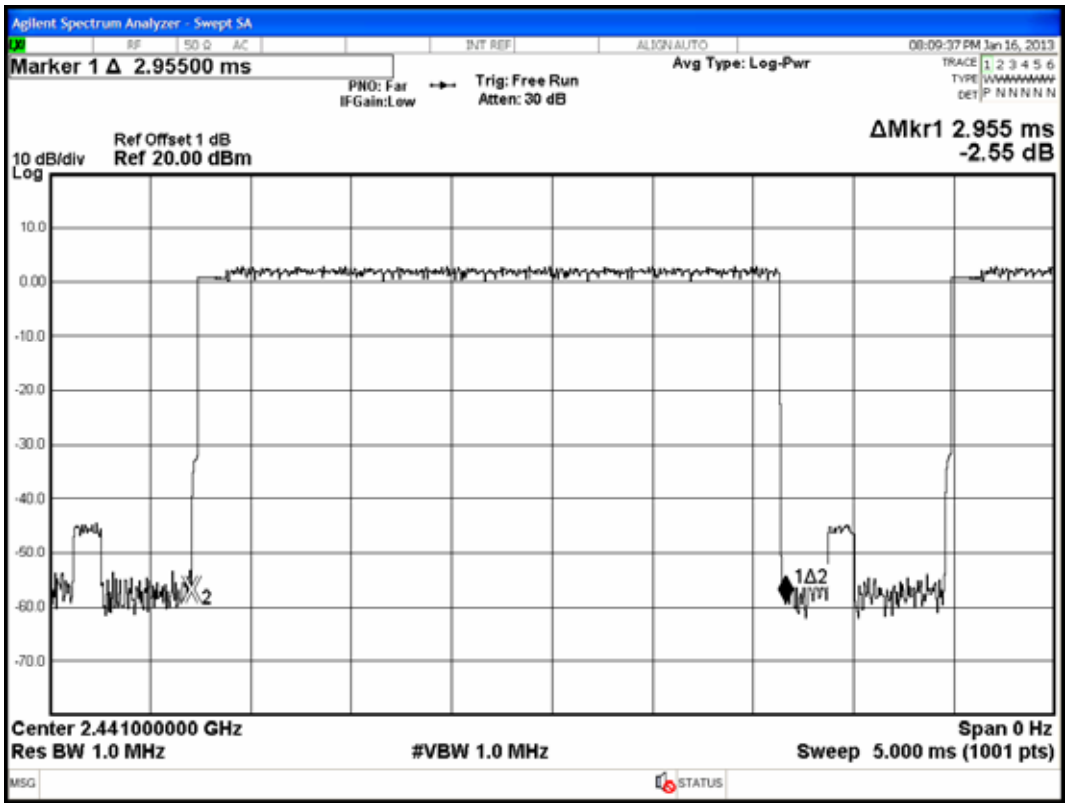
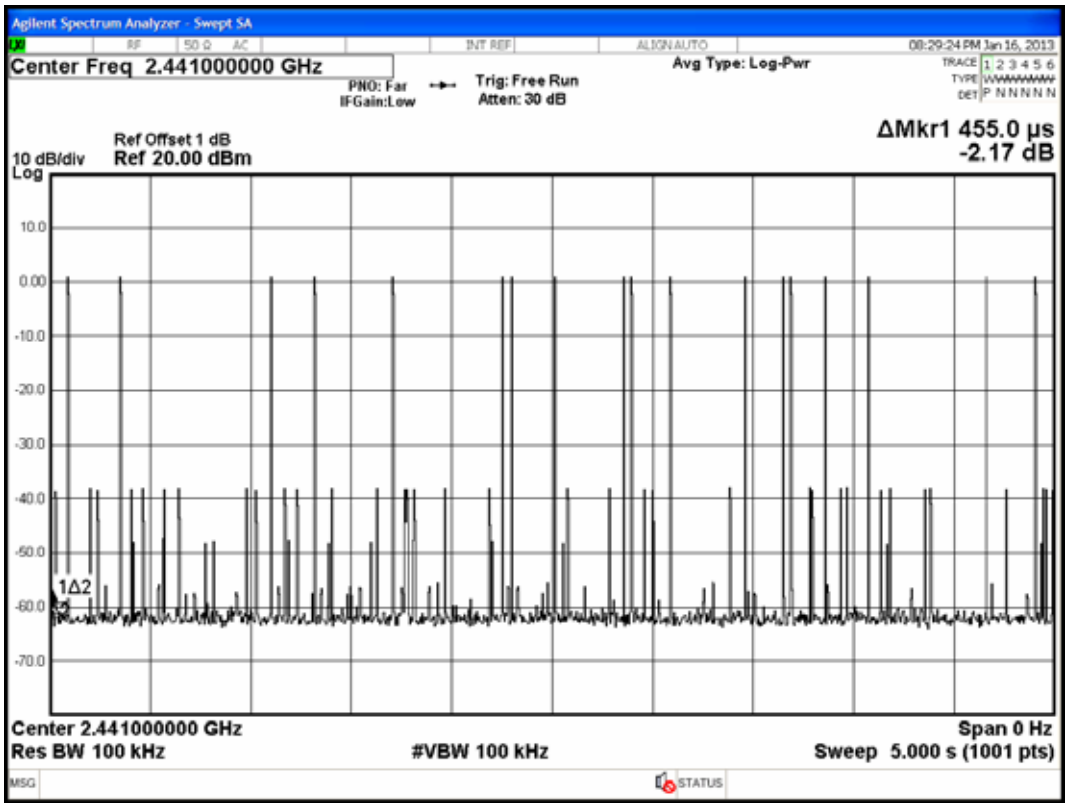


Figure 3: 8-DPSK, 2441MHz, 3DH5





6.6.3. Type of Modulation：8-DPSK, Test Frequency：2480MHz

Duty cycle: 79channels*0.4 seconds = 31.6 seconds

3DH1 : For each 5 seconds of 51 channels appearance, the longest time of occupancy for each of 31.6 seconds is:

51 channels*31.6 seconds/5* 0.44ms = 141.82ms (<400ms)

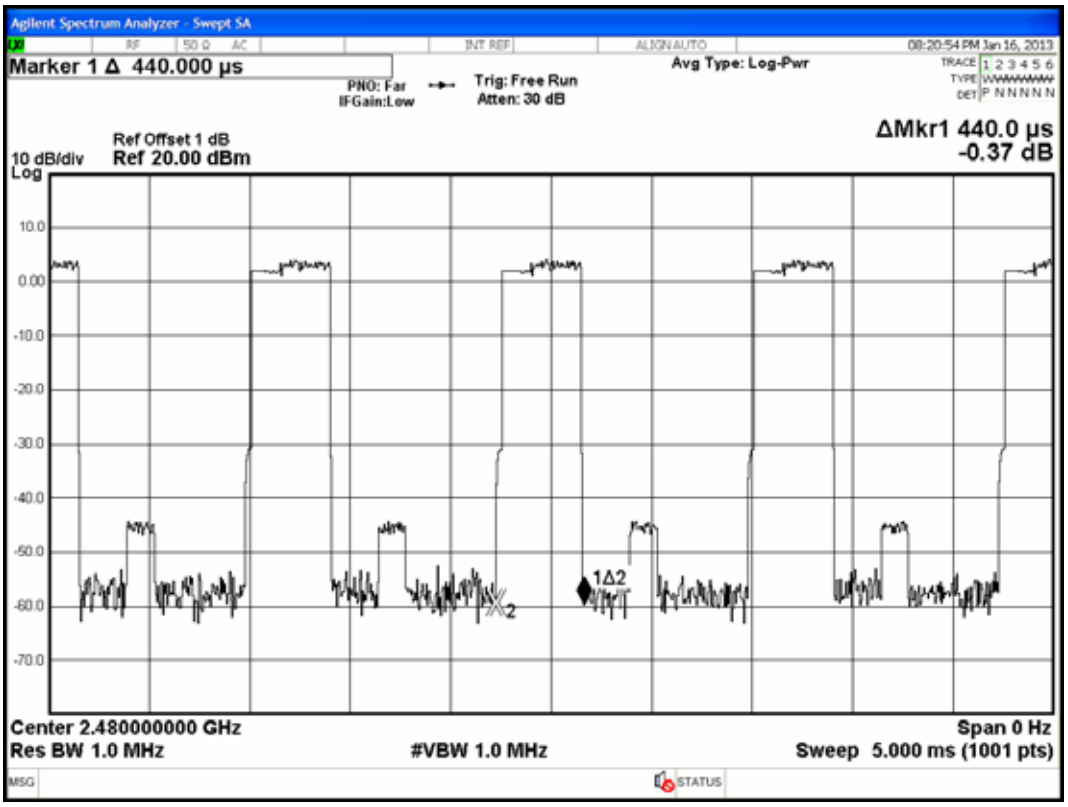
3DH3 : For each 5 seconds of 25 channels appearance, the longest time of occupancy for each of 31.6 seconds is:

25 channels*31.6 seconds/5* 1.695ms = 267.81ms (<400ms)

3DH5 : For each 5 seconds of 18 channels appearance, the longest time of occupancy for each of 31.6 seconds is:

18 channels*31.6 seconds/5*2.97ms = 337.97ms (<400ms)

Figure 1: 8-DPSK, 2480MHz, 3DH1



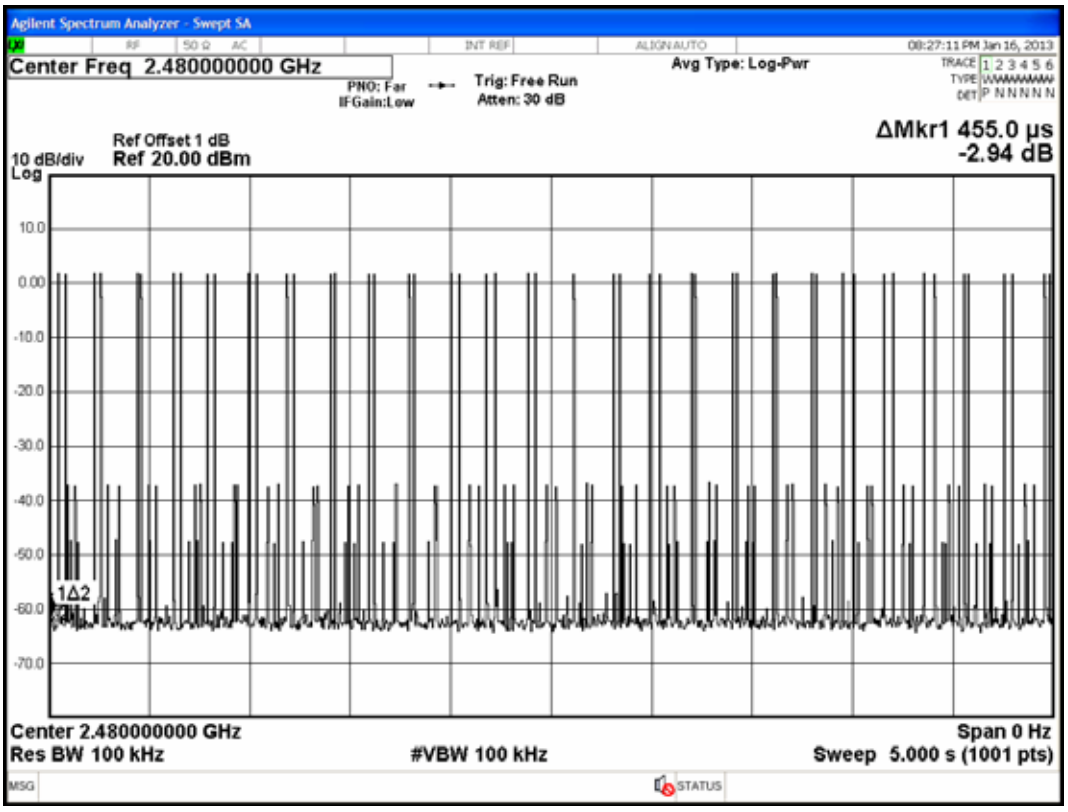
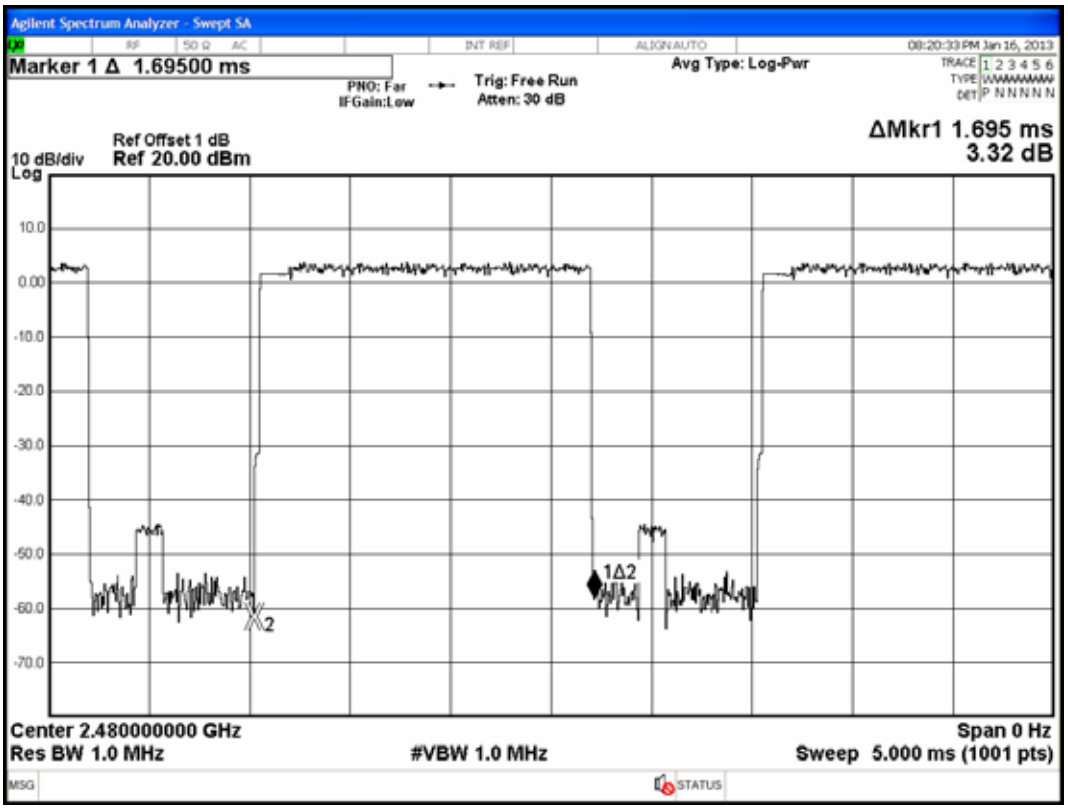


Figure 2: 8-DPSK, 2480MHz, 3DH3



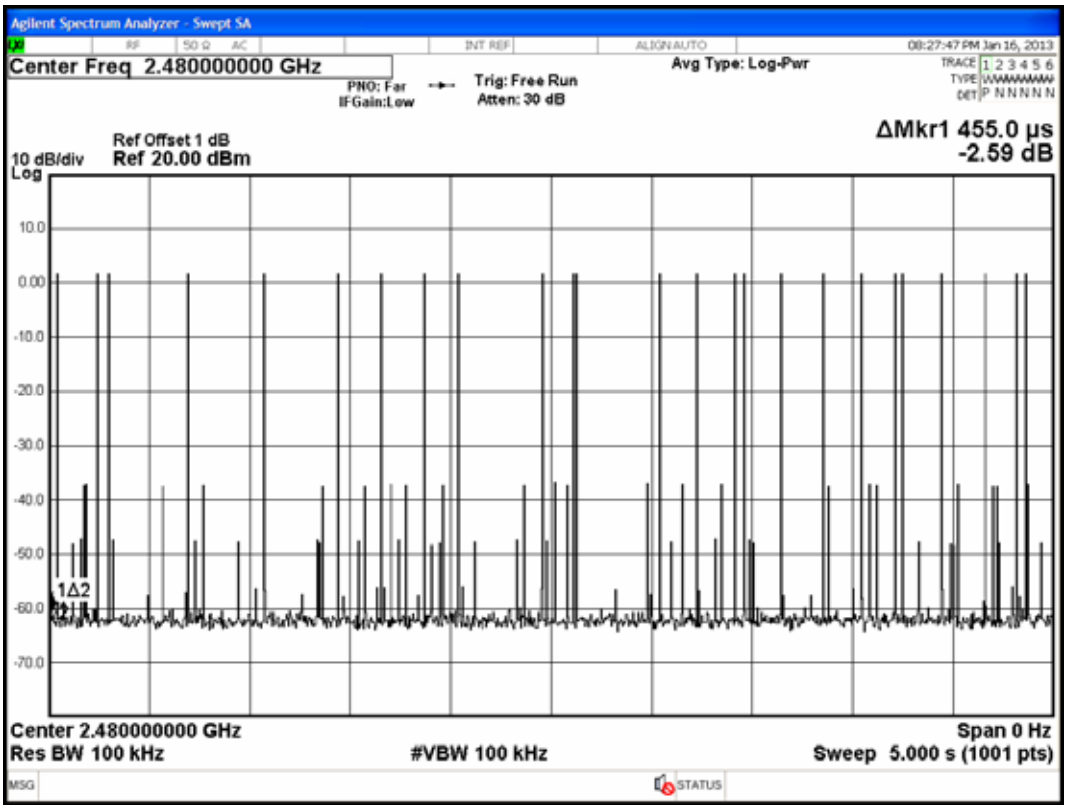
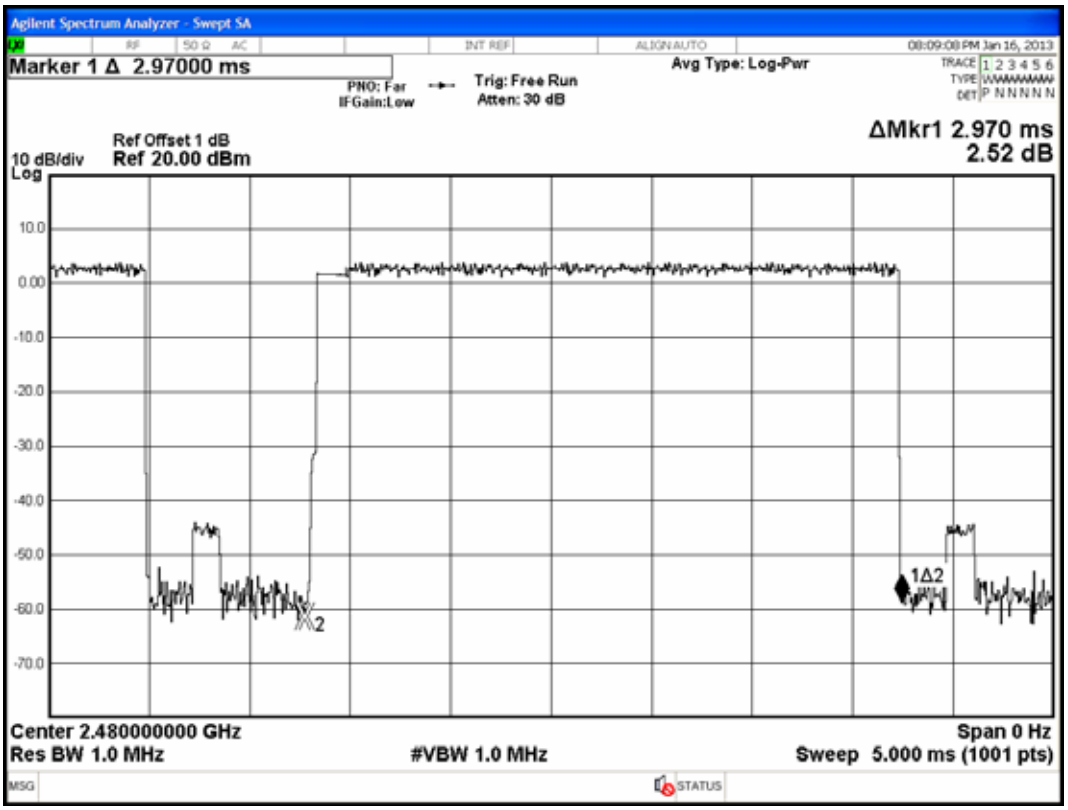
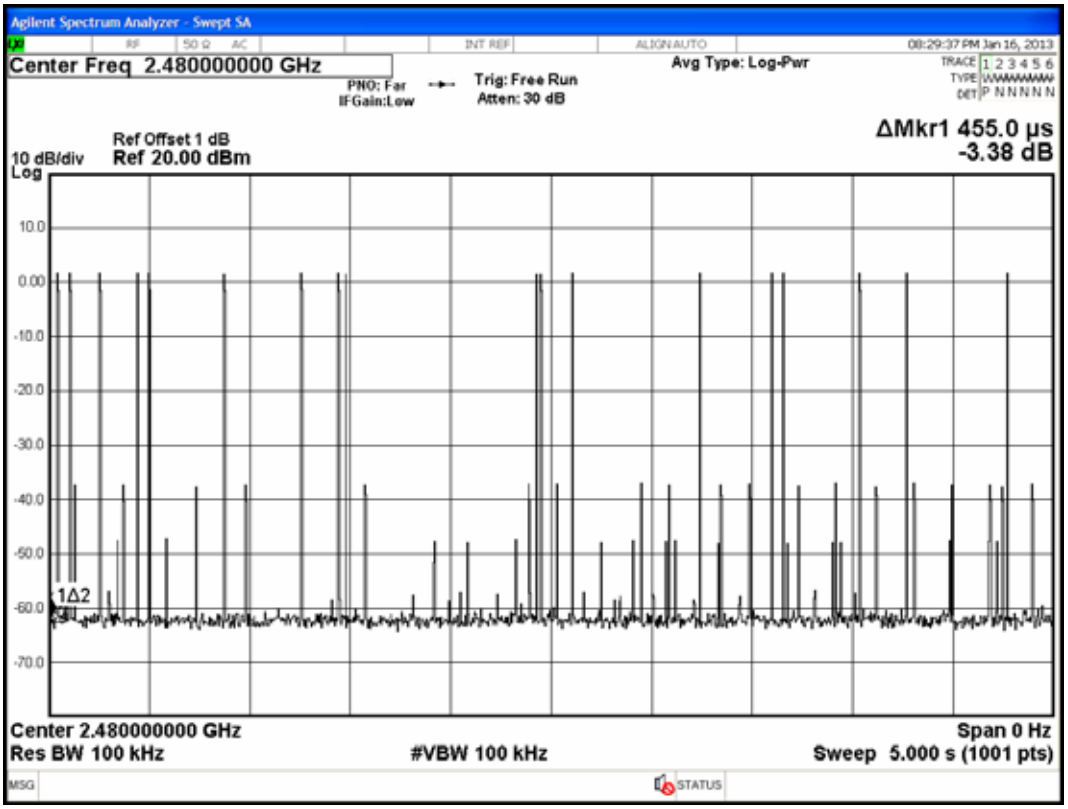


Figure 3: 8-DPSK, 2480MHz, 3DH5





6.6.4. Type of Modulation：GFSK, Test Frequency：2402MHz

Duty cycle: 79channels*0.4 seconds = 31.6 seconds

DH1 : For each 5 seconds of 48 channels appearance, the longest time of occupancy for each of 31.6 seconds is:

48 channels*31.6 seconds/5* 0.43ms = 130.44ms (<400ms)

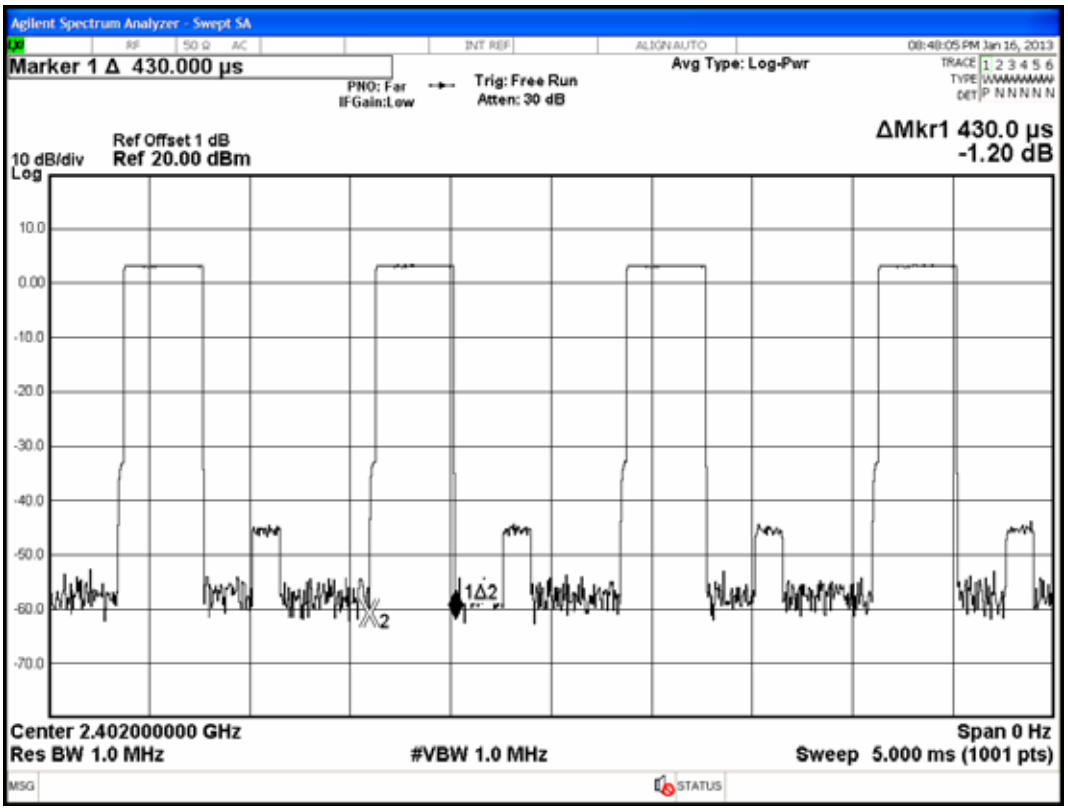
DH3 : For each 5 seconds of 25 channels appearance, the longest time of occupancy for each of 31.6 seconds is:

25 channels*31.6 seconds/5* 1.71ms = 270.18ms (<400ms)

DH5 : For each 5 seconds of 17 channels appearance, the longest time of occupancy for each of 31.6 seconds is:

17 channels*31.6 seconds/5*2.95ms = 316.95ms (<400ms)

Figure 4: GFSK, 2402MHz, DH1



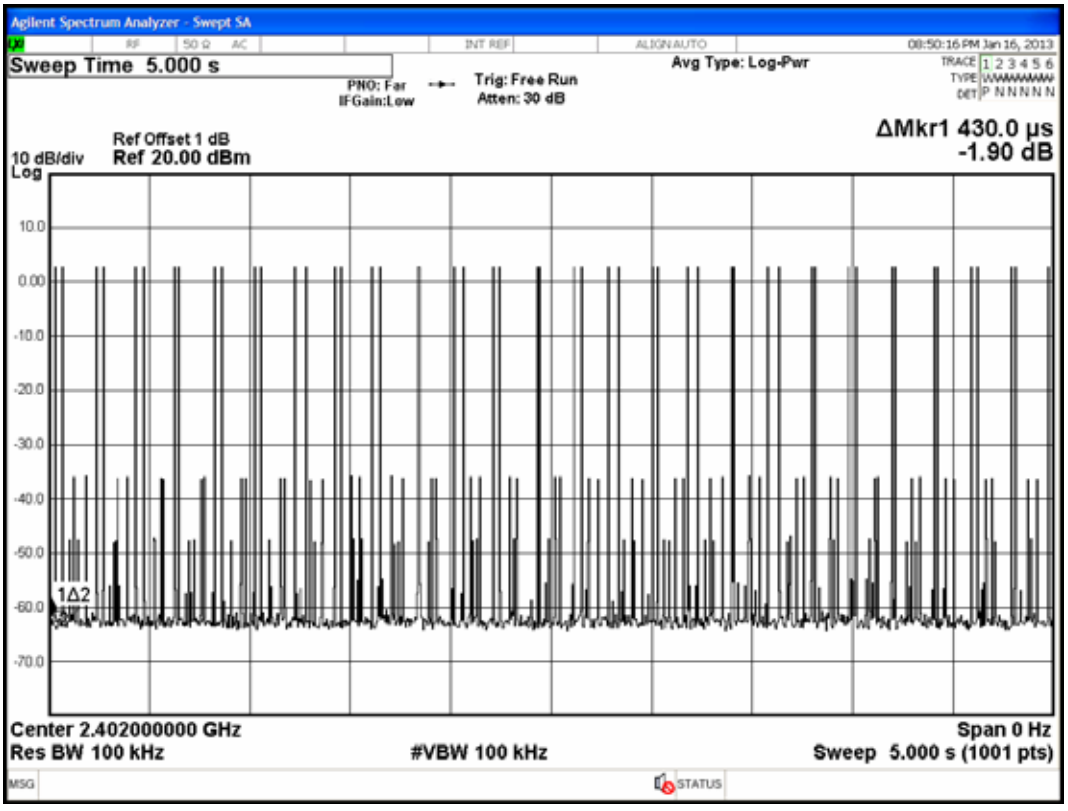


Figure 5: GFSK, 2402MHz, DH3

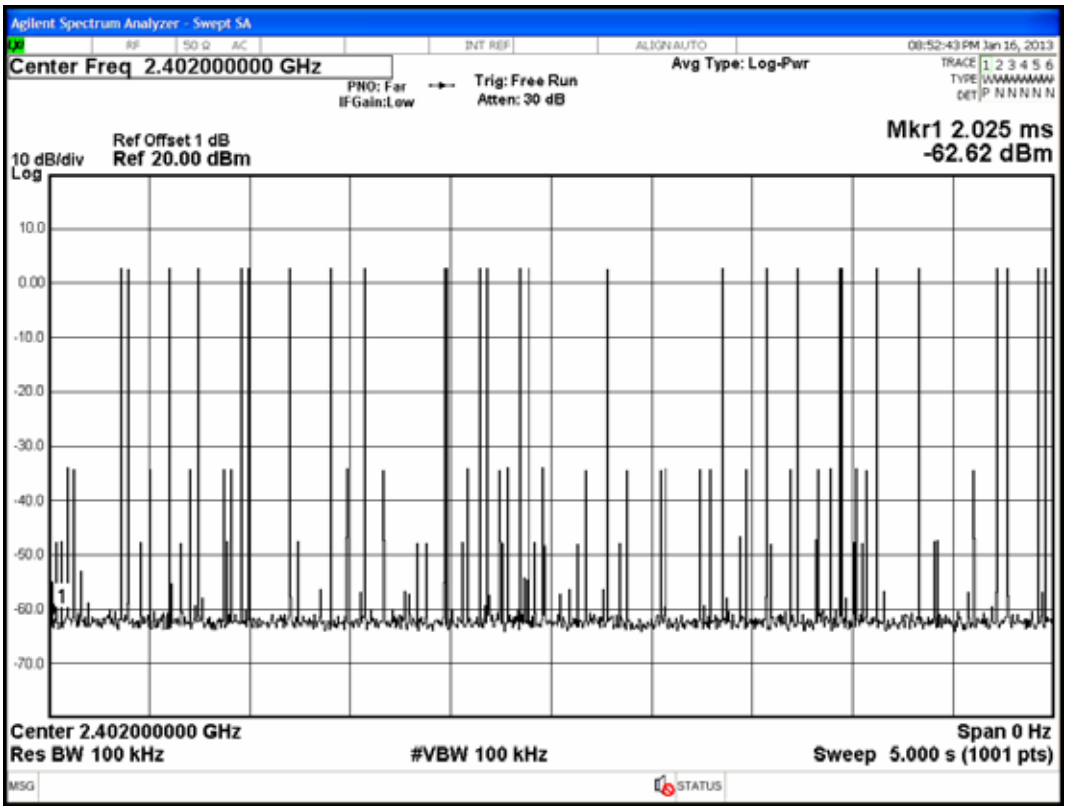
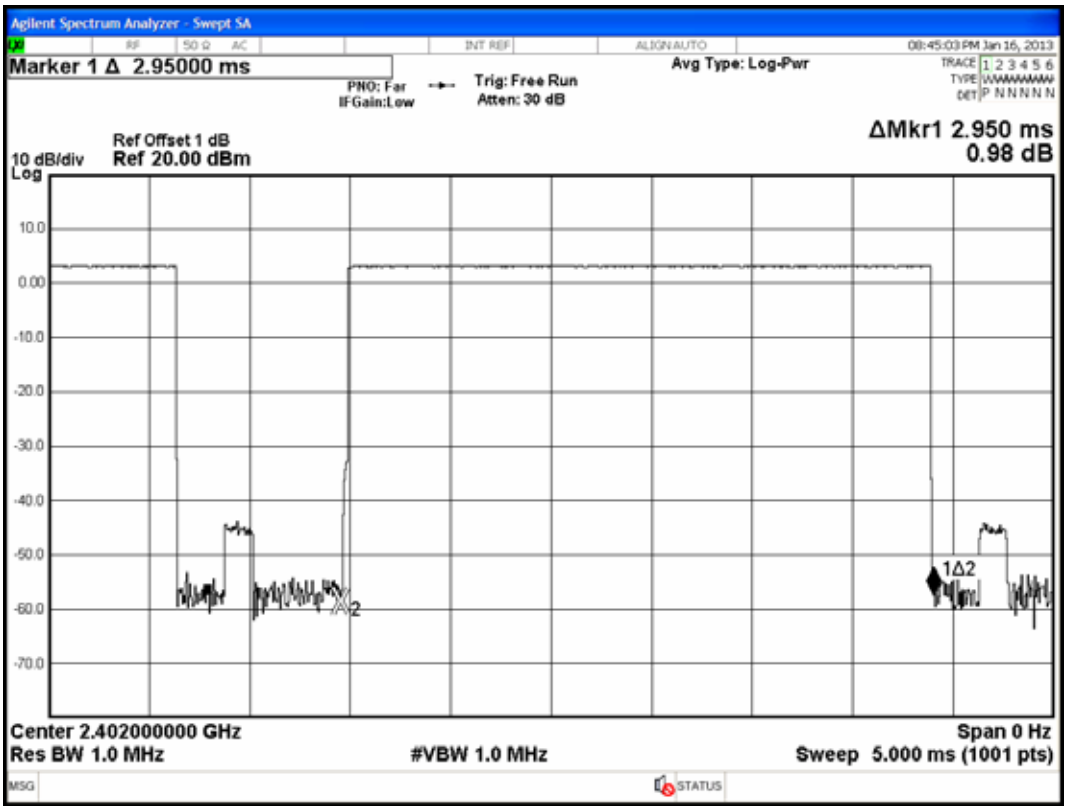
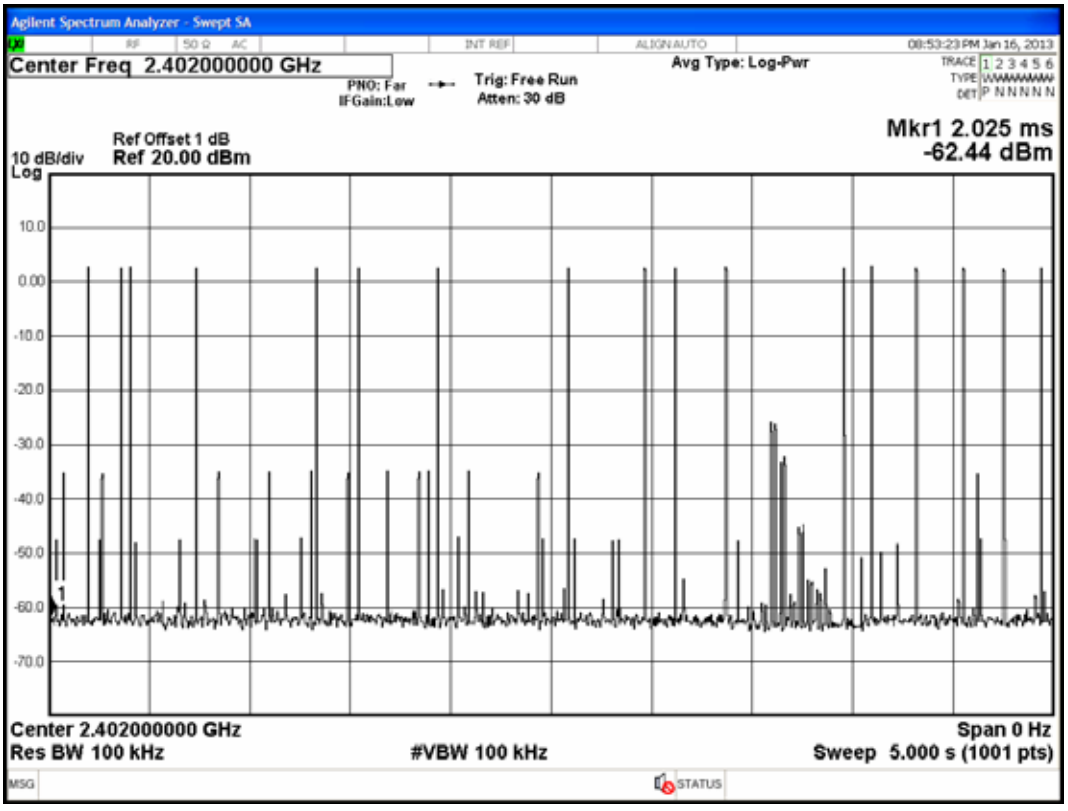


Figure 6: GFSK, 2402MHz, DH5





6.6.5. Type of Modulation：GFSK, Test Frequency：2441MHz

Duty cycle: 79channels*0.4 seconds = 31.6 seconds

DH1 : For each 5 seconds of 50 channels appearance, the longest time of occupancy for each of 31.6 seconds is:

50 channels*31.6 seconds/5* 0.455ms = 143.78ms (<400ms)

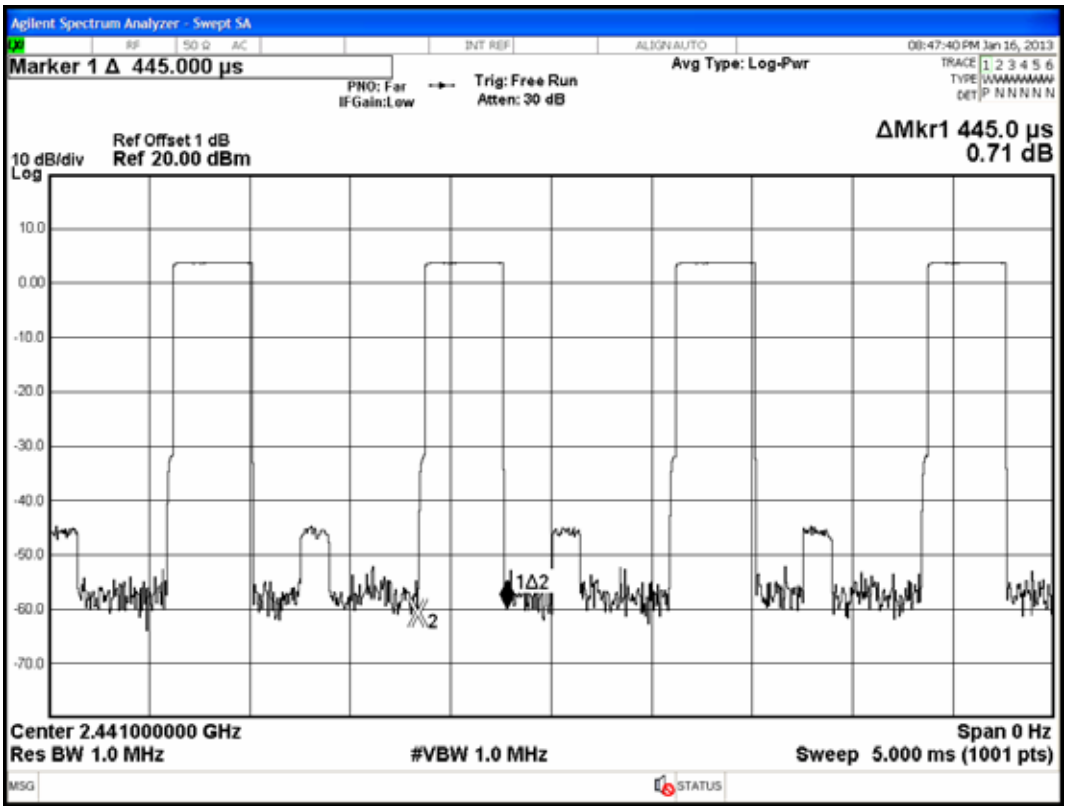
DH3 : For each 5 seconds of 25 channels appearance, the longest time of occupancy for each of 31.6 seconds is:

25 channels*31.6 seconds/5* 1.685ms = 266.23ms (<400ms)

DH5 : For each 5 seconds of 16 channels appearance, the longest time of occupancy for each of 31.6 seconds is:

16 channels*31.6 seconds/5*2.94ms = 297.29ms (<400ms)

Figure 4: GFSK, 2441MHz, DH1



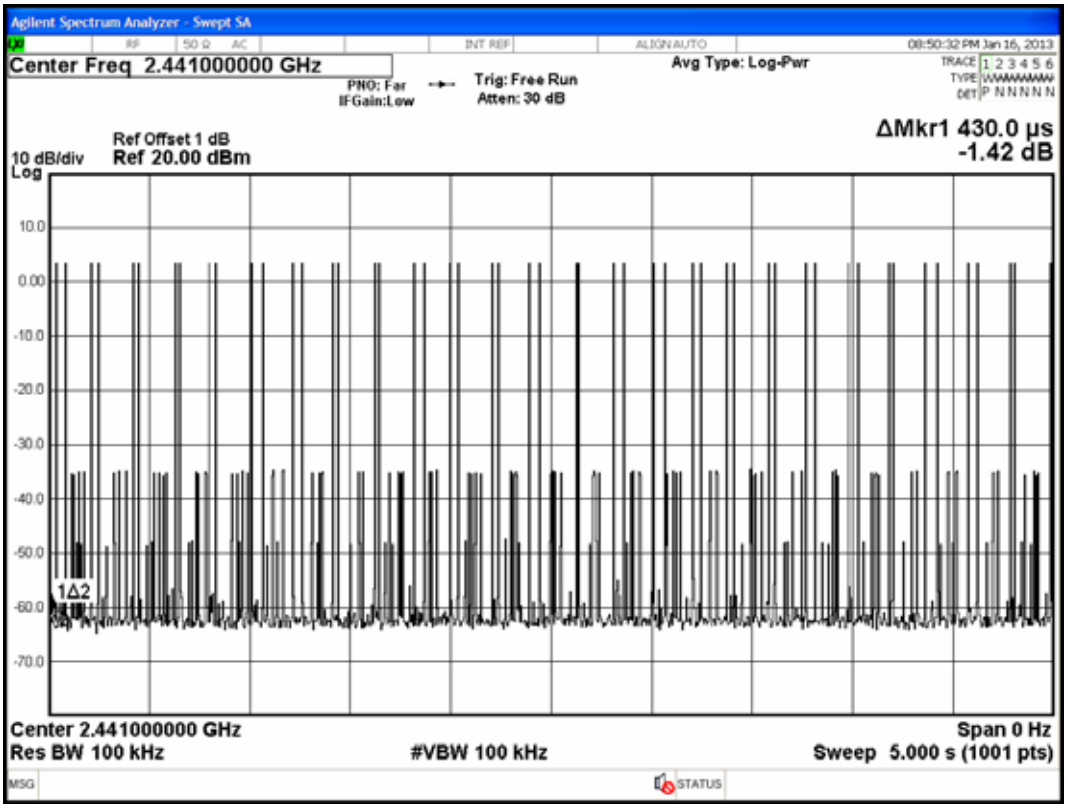


Figure 5: GFSK, 2441MHz, DH3

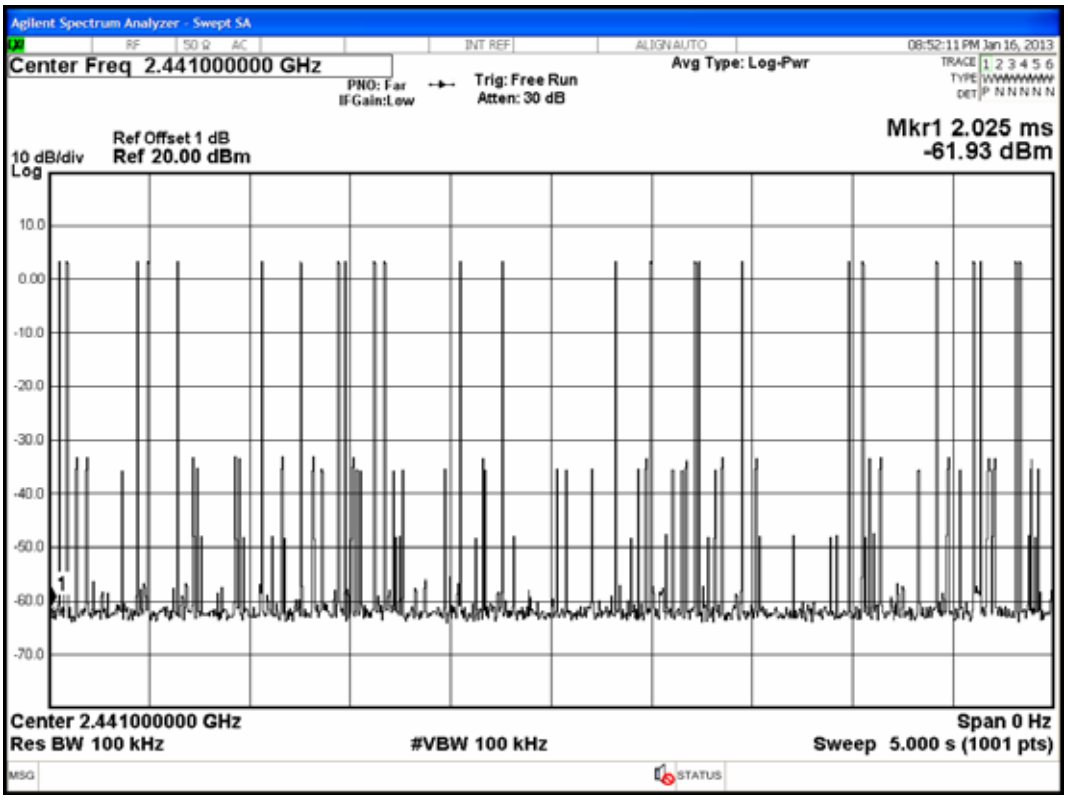
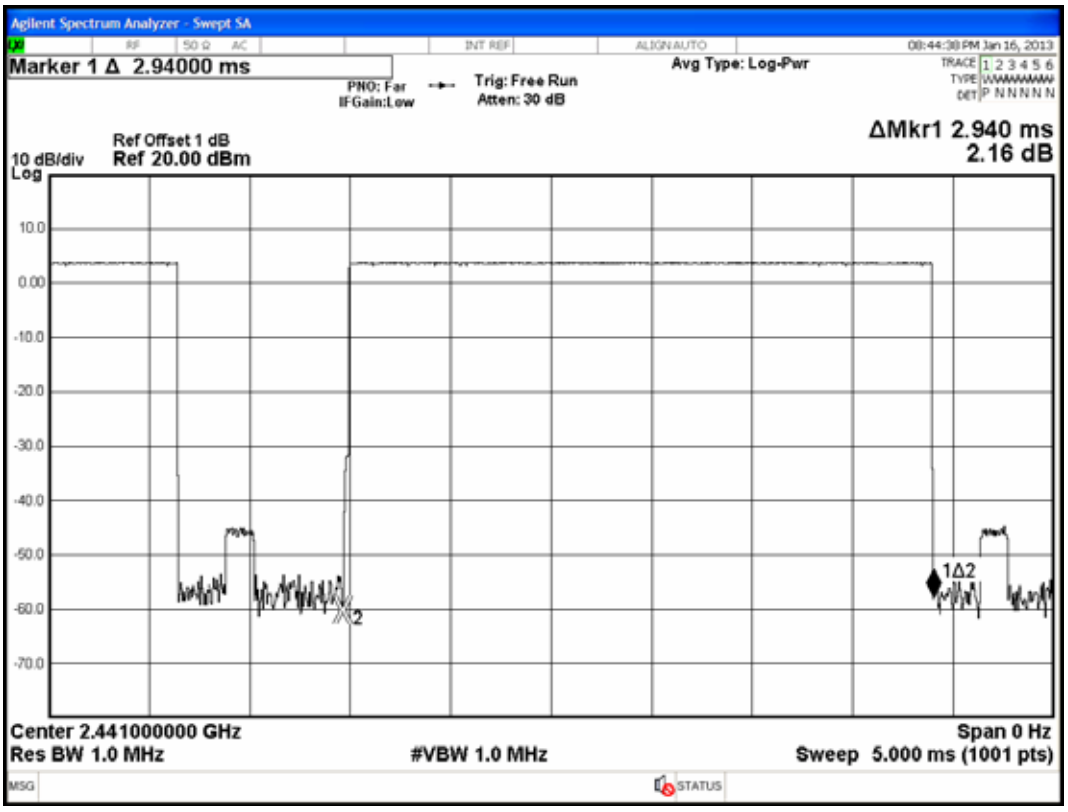
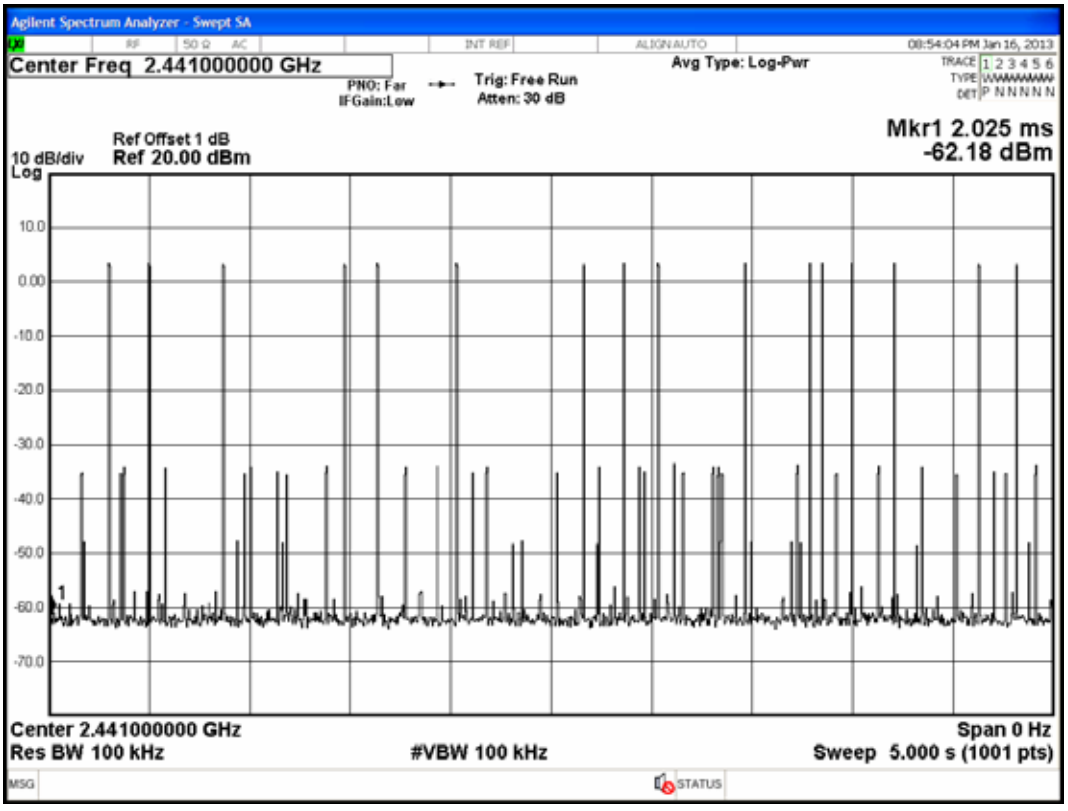


Figure 6: GFSK, 2441MHz, DH5





6.6.6. Type of Modulation：GFSK, Test Frequency：2480MHz

Duty cycle: 79channels*0.4 seconds = 31.6 seconds

DH1 : For each 5 seconds of 49 channels appearance, the longest time of occupancy for each of 31.6 seconds is:

49 channels*31.6 seconds/5* 0.44ms = 136.26ms (<400ms)

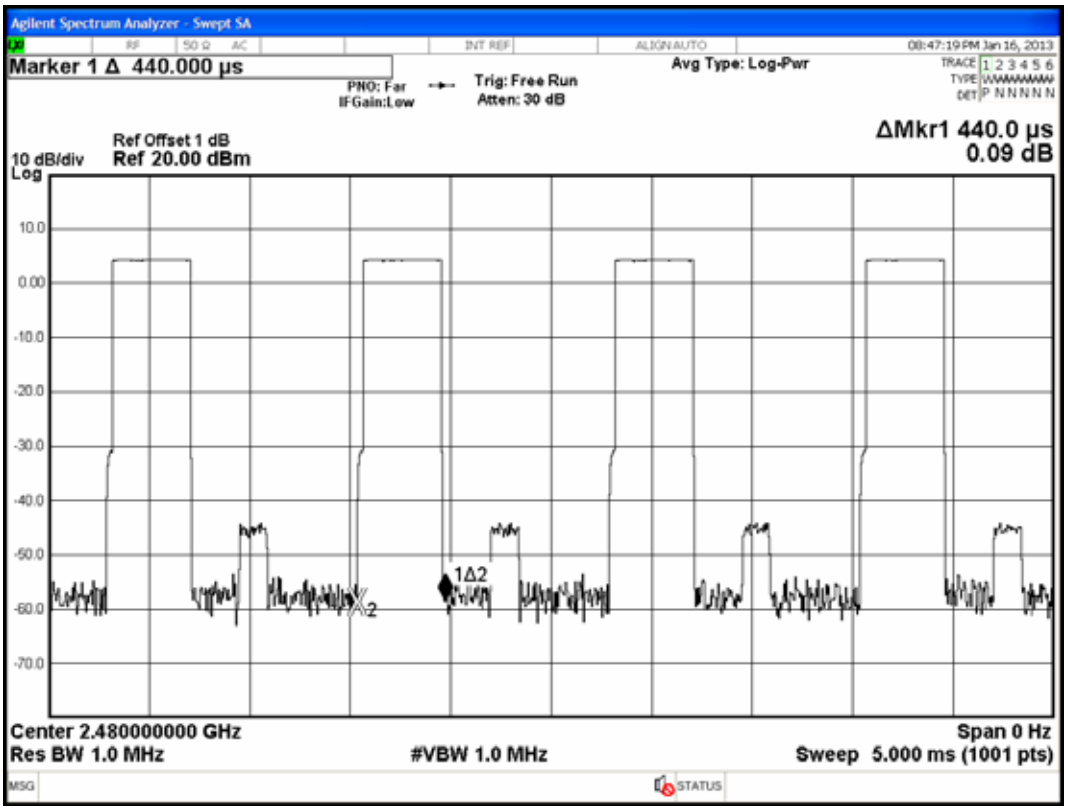
DH3 : For each 5 seconds of 24 channels appearance, the longest time of occupancy for each of 31.6 seconds is:

24 channels*31.6 seconds/5* 1.685ms = 255.58ms (<400ms)

DH5 : For each 5 seconds of 17 channels appearance, the longest time of occupancy for each of 31.6 seconds is:

17 channels*31.6 seconds/5*2.935ms = 315.34ms (<400ms)

Figure 4: GFSK, 2480MHz, DH1



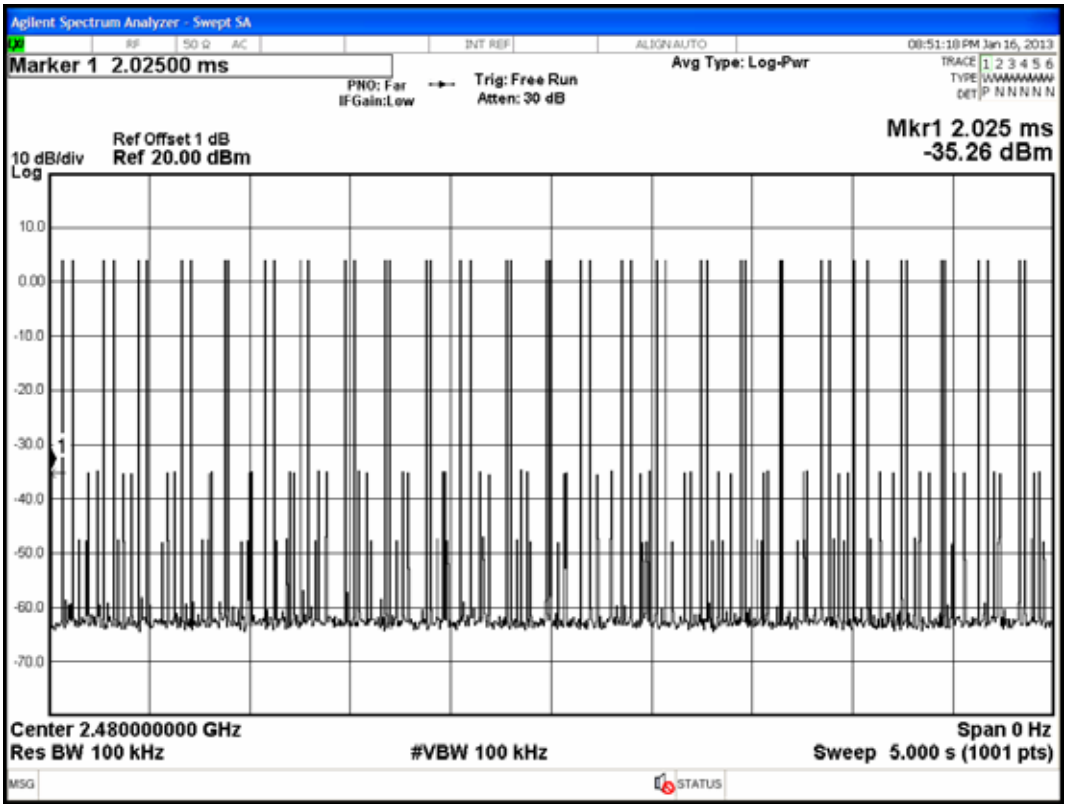


Figure 5: GFSK, 2480MHz, DH3

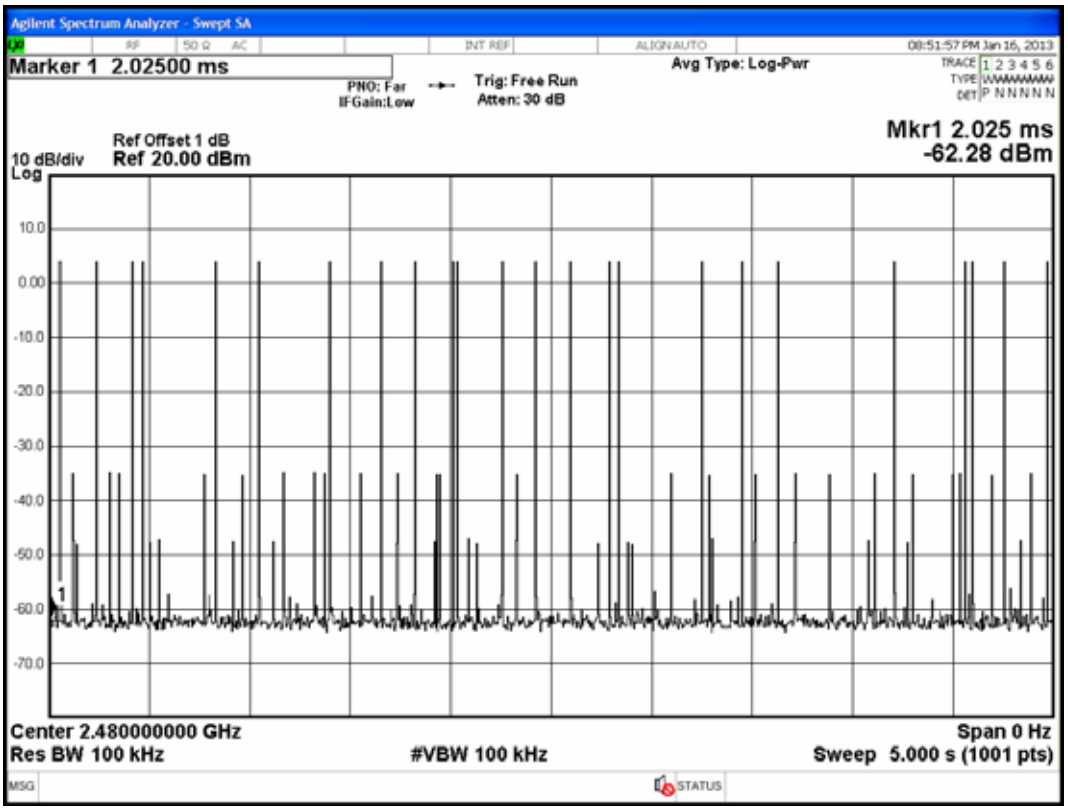
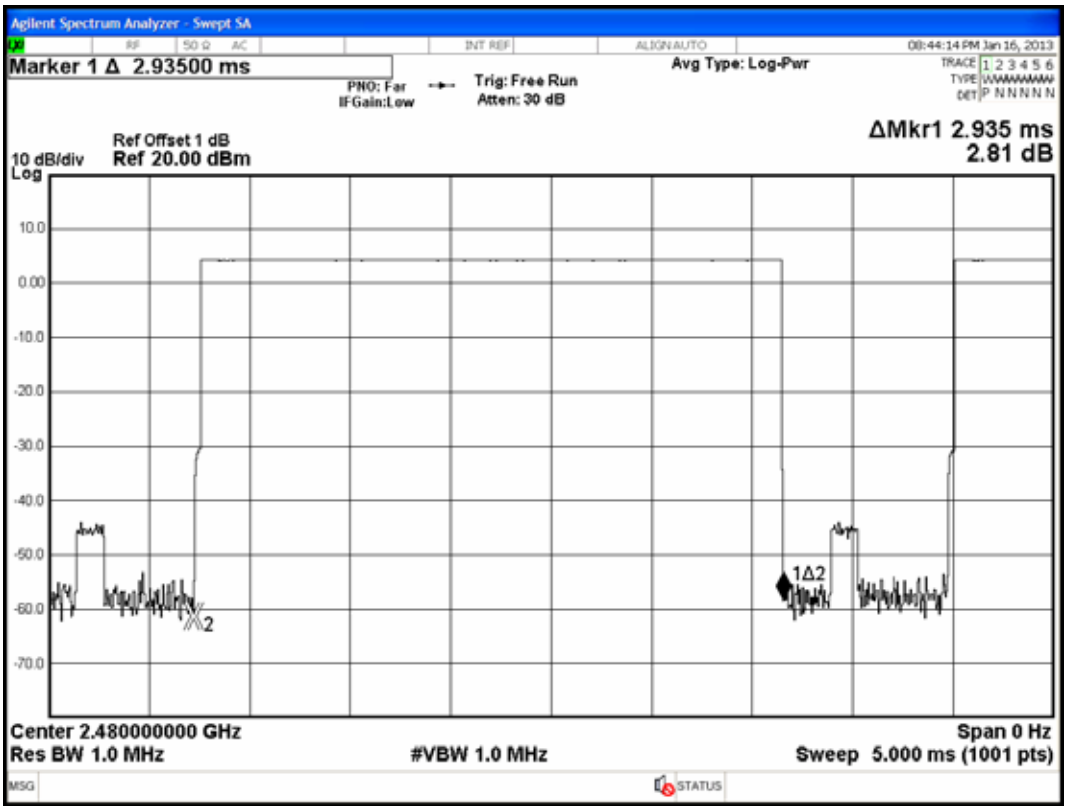
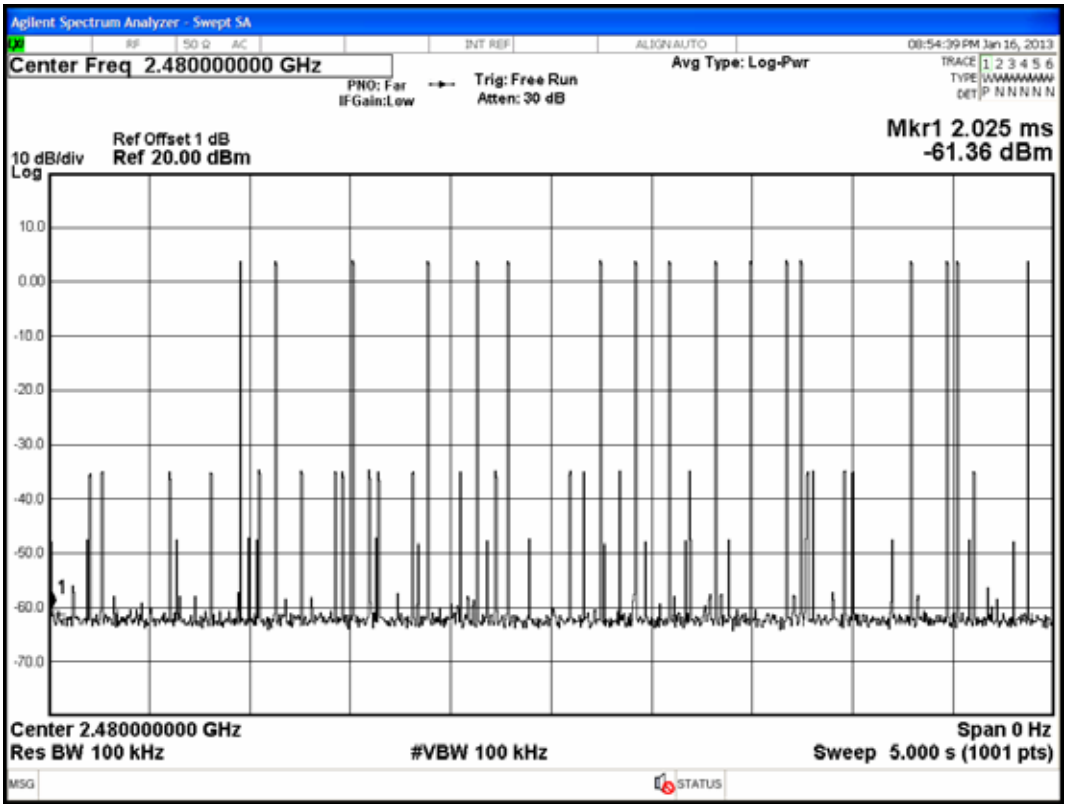


Figure 6: GFSK, 2480MHz, DH5





7. NUMBER OF HOPPING CHANNELS MEASUREMENT

7.1. Test Equipment

The following test equipment was used during the number of hopping channels measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	Oct. 17, 12'	Oct. 16, 13'
2.	Bluetooth Test Set	Anritsu	MT8852B	6K00005697	Mar. 21, 12'	Mar. 20, 13'

7.2. Block Diagram of Test Setup

The same as section.4.2.

7.3. Specification Limits [§15.247(a)(1)(iii), RSS-210 §A8.2 (d)]

Frequency hopping systems which use fewer than 20 hopping frequencies may employ intelligent hopping techniques to avoid interference to other transmissions. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 non-overlapping channels.

7.4. Operating Condition of EUT

Same as carrier frequency separation measurement which was listed in section 4.4.

7.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with 100kHz RBW and 100kHz VBW. Sweep=Auto ; Detector function=peak ; Trace=Max hold
The measurement guideline was according to FCC Public Notice DA 00-705.

7.6. Test Results

PASSED. All the test results are attached in next page.

[Note: We performed testing of the highest and lowest data rate.]

EUT: Notebook M/N: HSBUB-SDS

Test Date Jan. 23, 2013 Temperature: 24℃ Humidity: 50%

7.6.1. Type of Modulation: 8-DPSK

The number hopping channel is 79.

7.6.2. Type of Modulation: GFSK

The number hopping channel is 79.

Figure 1: 8-DPSK

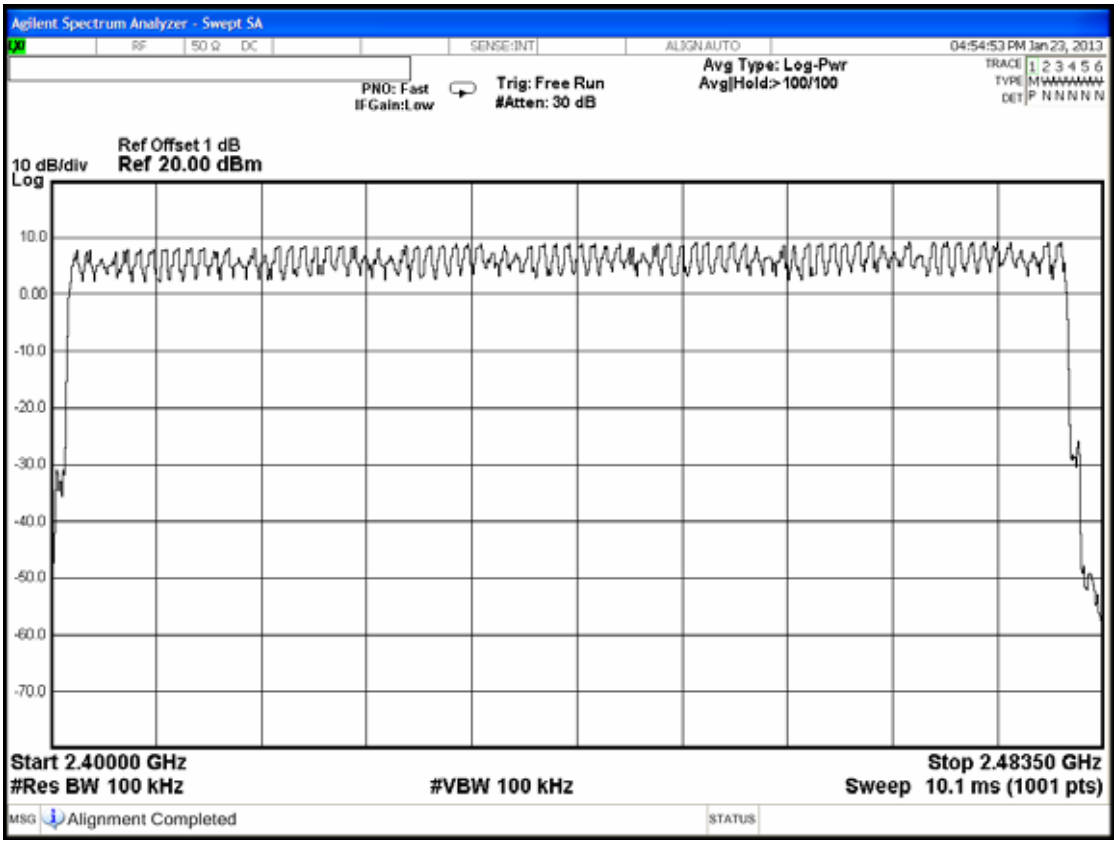
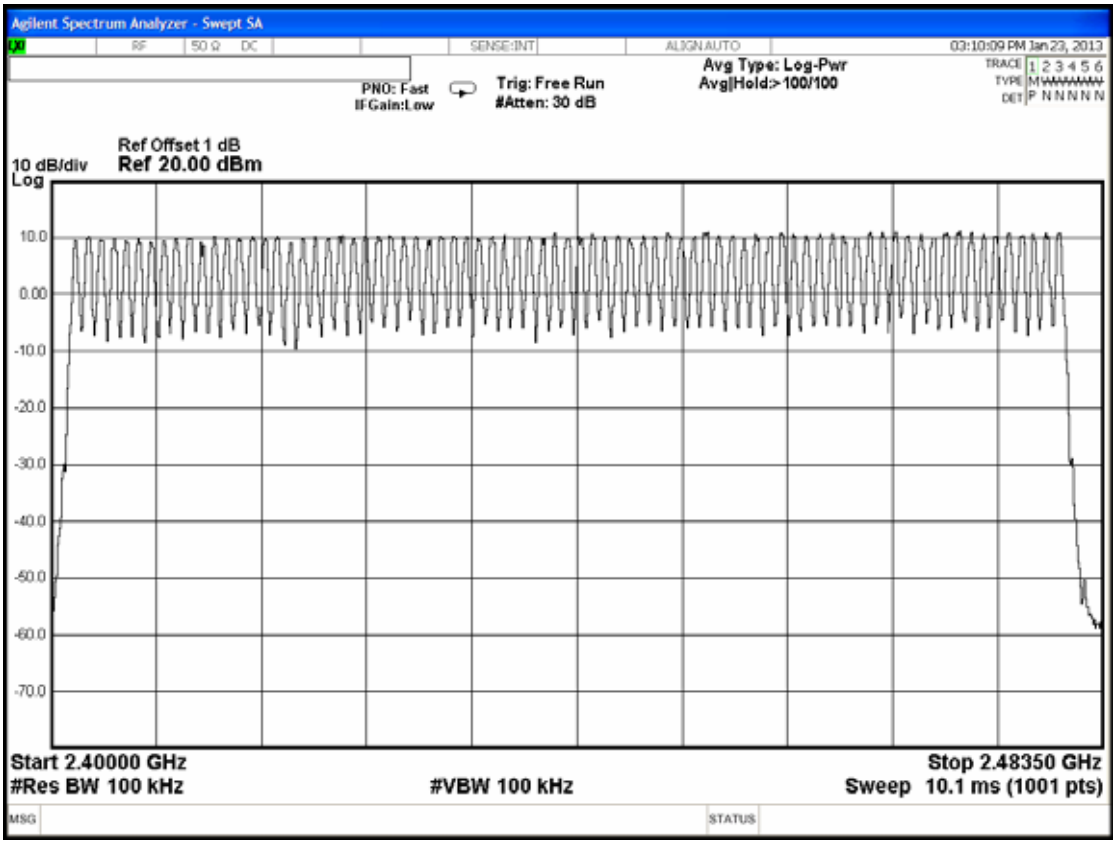


Figure 2: GFSK



8. MAXIMUM PEAK OUTPUT POWER MEASUREMENT

8.1. Test Equipment

The following test equipment was used during the maximum peak output power measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	Oct. 17, 12’	Oct. 16, 13’
2.	Bluetooth Test Set	Anritsu	MT8852B	6K00005697	Mar. 21, 12’	Mar. 20, 13’

8.2. Block Diagram of Test Setup

The same as section.4.2.

8.3. Specification Limits [§15.247(b)-(1), RSS-210 §A8.4 (2)]

The Limits of maximum Peak Output Power for frequency hopping systems in 2400-2483.5MHz is: 0.125Watt. (21dBm)

8.4. Operating Condition of EUT

Same as carrier frequency separation measurement which was listed in 4.4 .

8.5. Test Procedure

The transmitter output was connected to the spectrum analyzer.
Span can encompass the waveform
RBW>EBW
VBW≧RBW
Sweep=5MHz
The measurement guideline was according to FCC Public Notice DA 00-705.

8.6. Test Results

PASSED. All the test results are listed below

.

[Note: We performed testing of the highest and lowest data rate.]

EUT: Notebook M/N: HSBUB-SDS

Test Date: Jan. 23, 2013 Temperature: 24℃ Humidity: 50%

8.6.1.Type of Modulation: 8-DPSK

No.	Channel	Test Frequency	**Peak Output Power**	Limit
1.	0	2402MHz	**10.360dBm**	21dBm
2.	39	2441MHz	**11.164dBm**	21dBm
3.	78	2480MHz	**11.379dBm**	21dBm

8.6.2.Type of Modulation: GFSK

No.	Channel	Test Frequency	**Peak Output Power**	Limit
1.	0	2402MHz	**10.223dBm**	21dBm
2.	39	2441MHz	**10.904dBm**	21dBm
3.	78	2480MHz	**11.053dBm**	21dBm

Figure 1: 8-DPSK, Channel 0, Frequency: 2402MHz

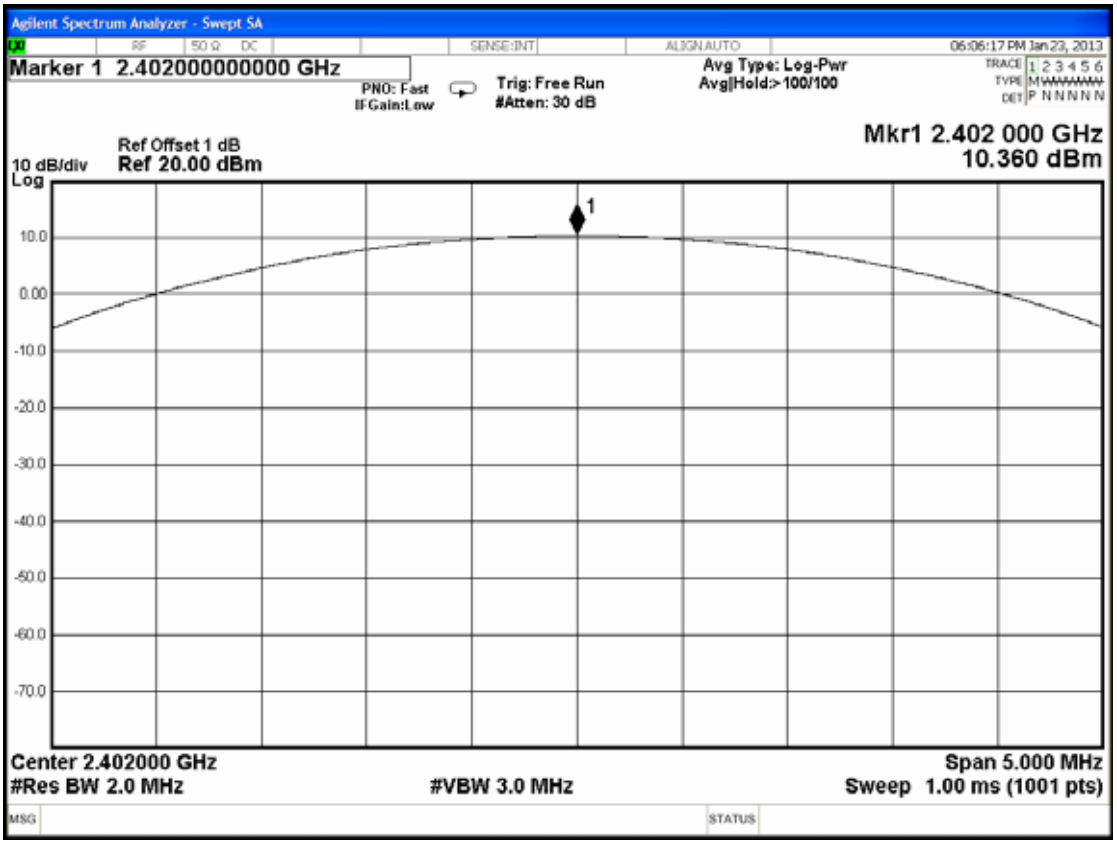


Figure 2: 8-DPSK, Channel 39, Frequency: 2441MHz

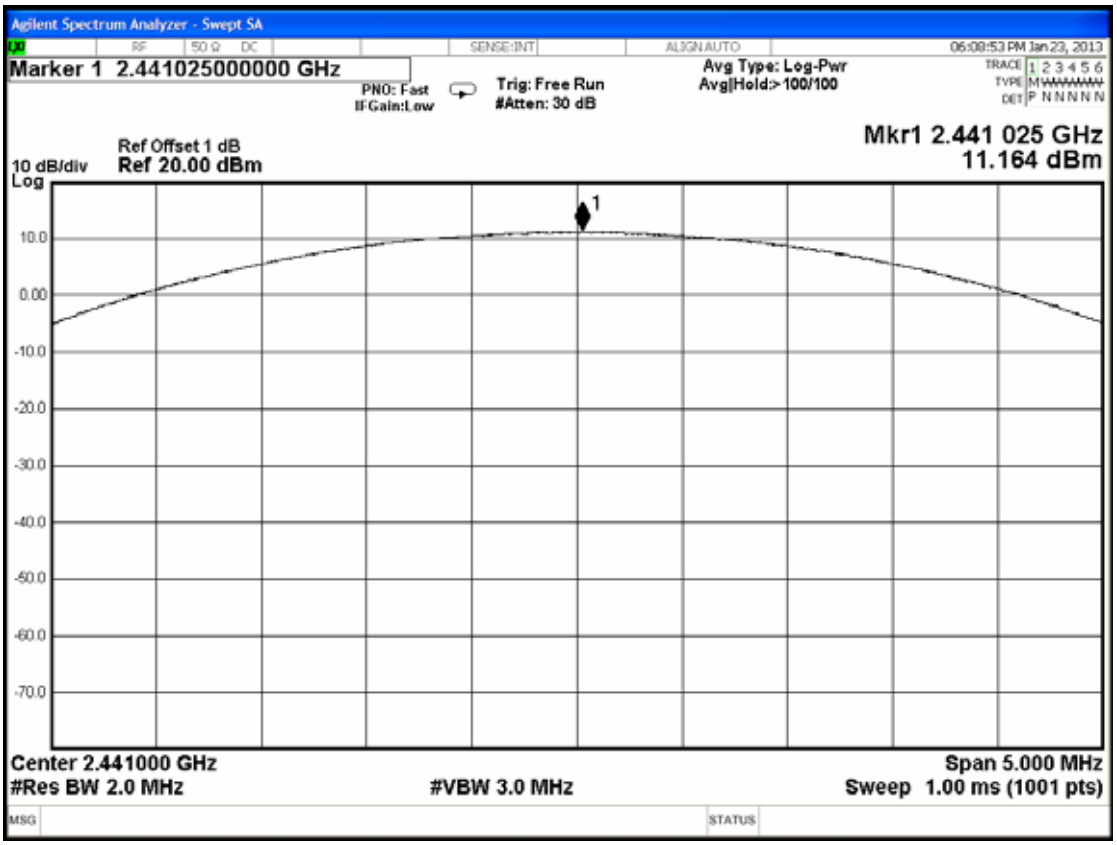


Figure 3: 8-DPSK, Channel 78, Frequency: 2480MHz

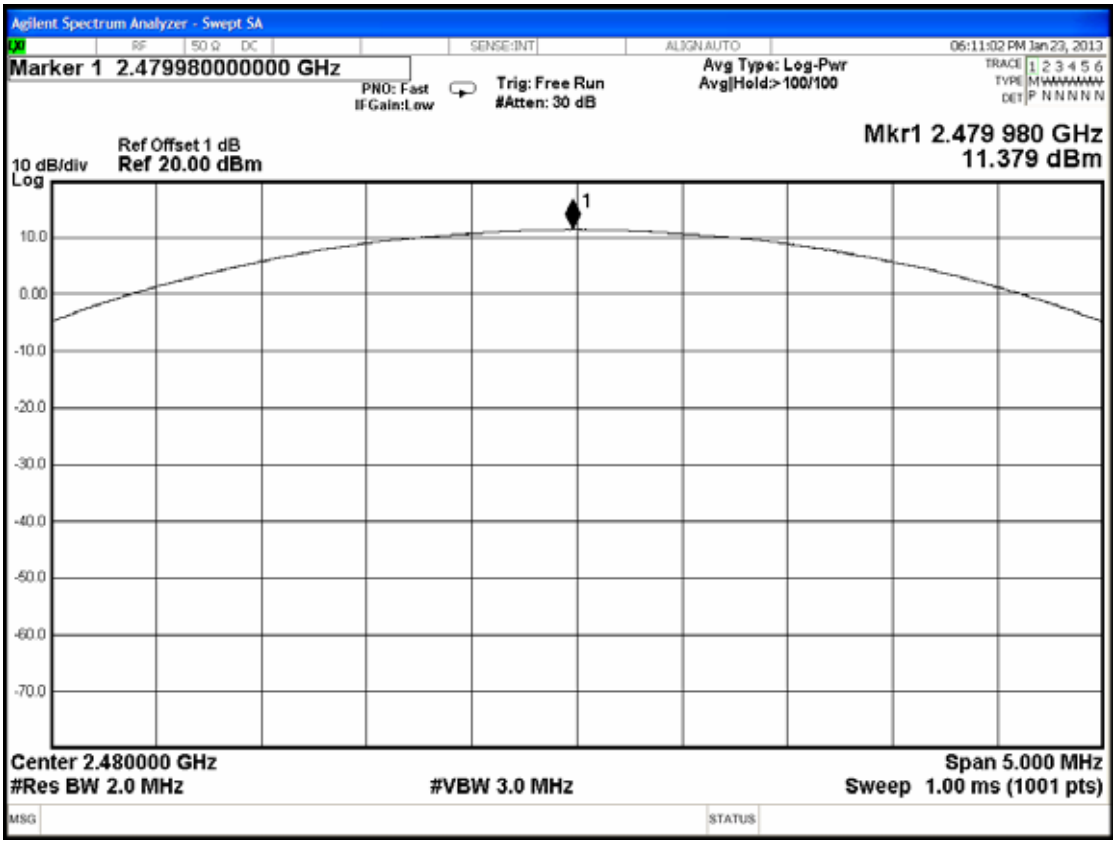


Figure 4: GFSK, Channel 0, Frequency: 2402MHz

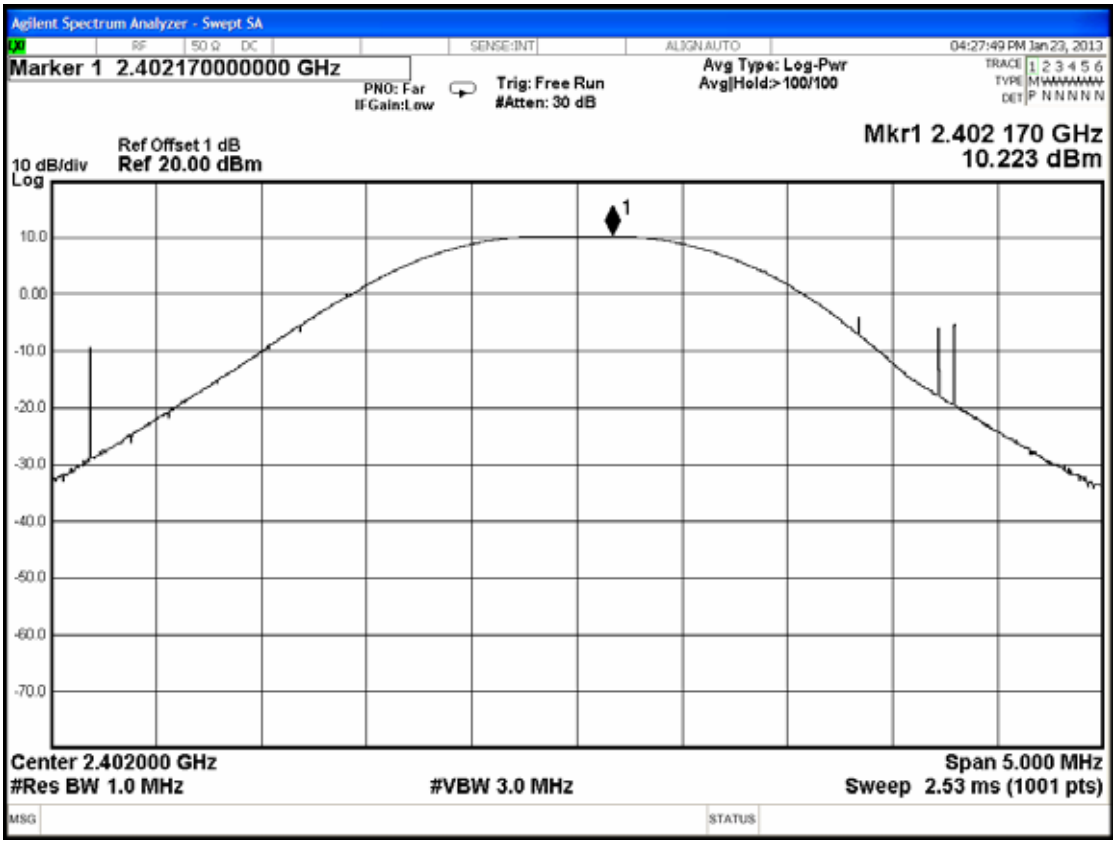


Figure 5: GFSK, Channel 39, Frequency: 2441MHz

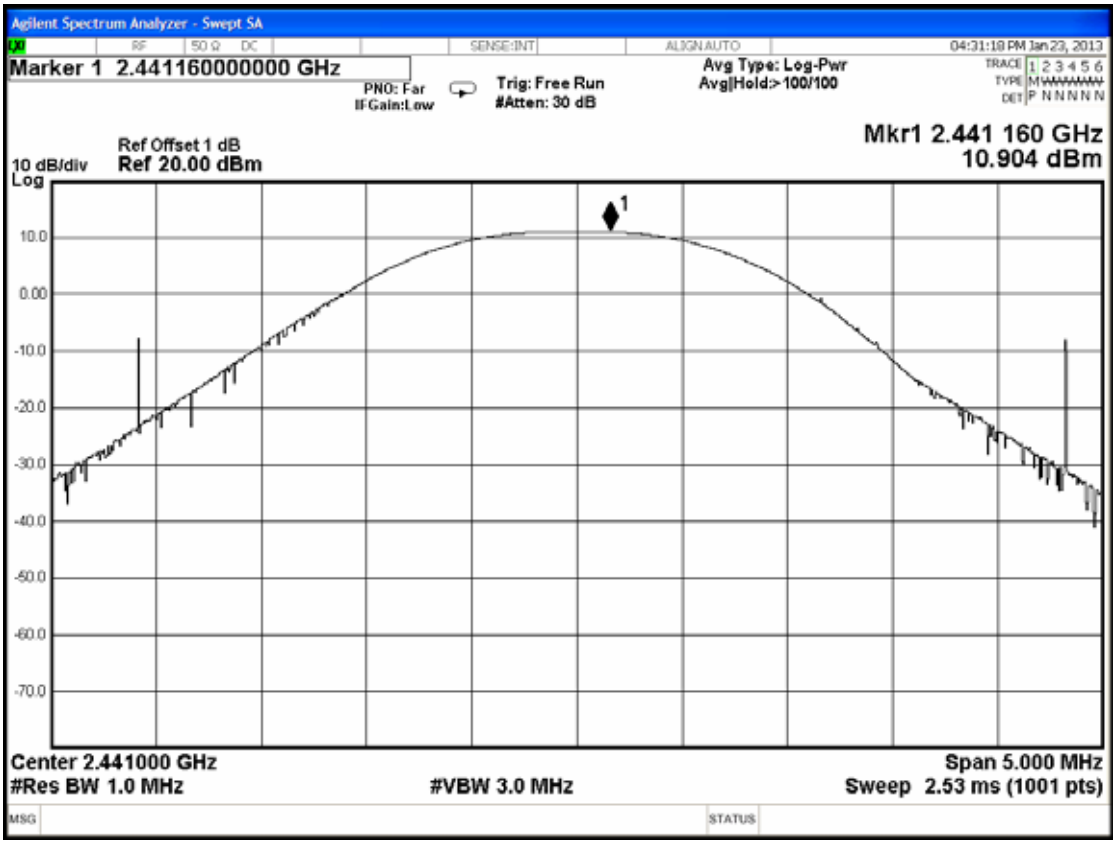
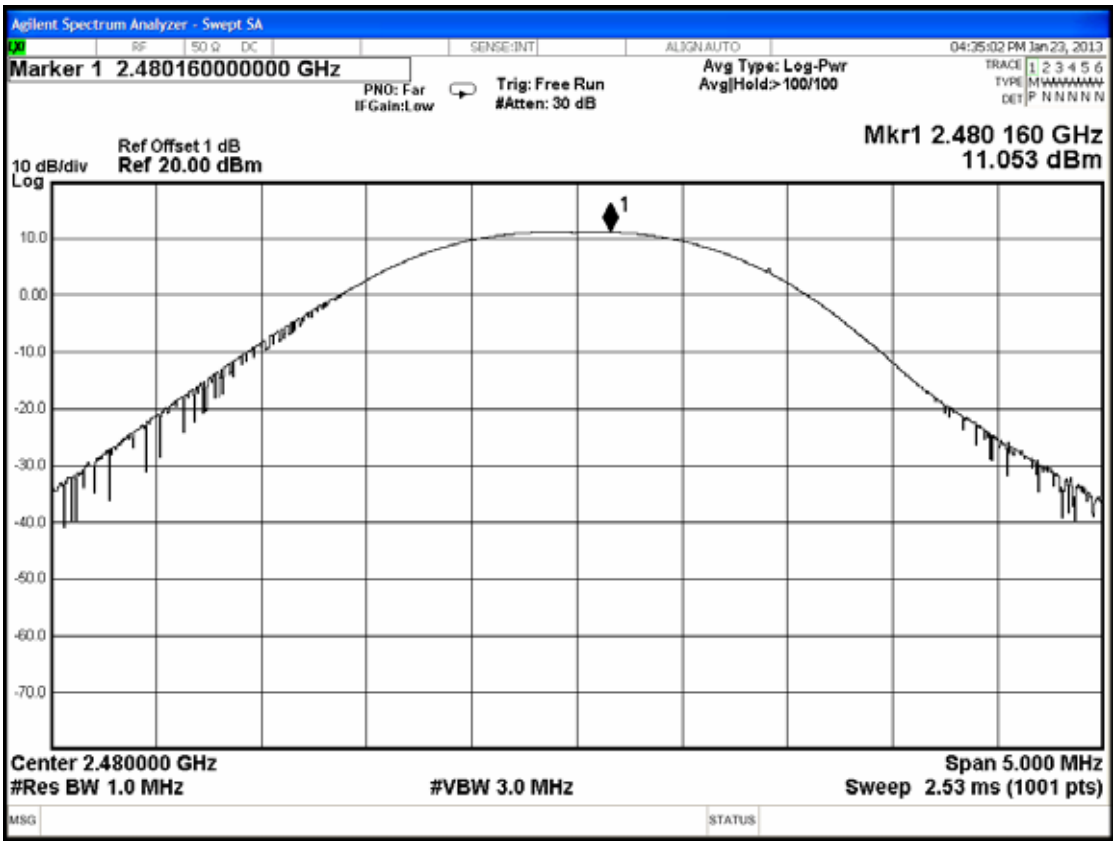


Figure 6: GFSK, Channel 78, Frequency: 2480MHz



9. EMISSION LIMITATIONS MEASUREMENT

9.1. Test Equipment

The following test equipment was used during the emission limitations test：

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	Oct. 17, 12’	Oct. 16, 13’
2.	Bluetooth Test Set	Anritsu	MT8852B	6K00005697	Mar. 21, 12’	Mar. 20, 13’

9.2. Block Diagram of Test Setup

The same as section.4.2.

9.3. Specification Limits (§15.247(c), RSS-210 §A8.5)

9.3.1. In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (See Section 15.205(c)).(※This test result attaching to §3.6.3)

9.3.2. The reference level for determining limit of emission limitations is according to the value measured indicated in plots at section 8.6.

9.4. Operating Condition of EUT

Same as carrier frequency separation measurement which was listed in section 4.4.

9.5. Test Procedure

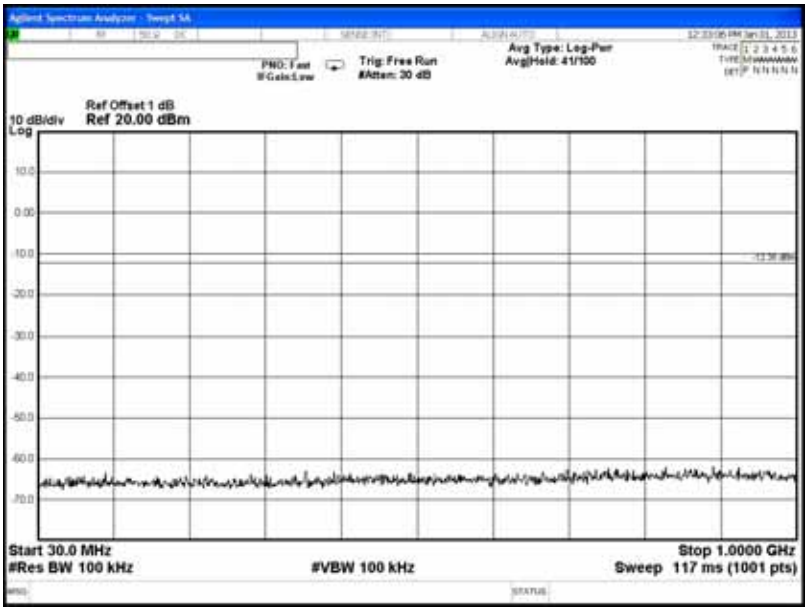
The transmitter output was connected to the spectrum analyzer. Set both RBW and VBW of spectrum analyzer to 100kHz with suitable frequency span including 100kHz bandwidth from band edge.
The measurement guideline was according to FCC Public Notice DA 00-705.

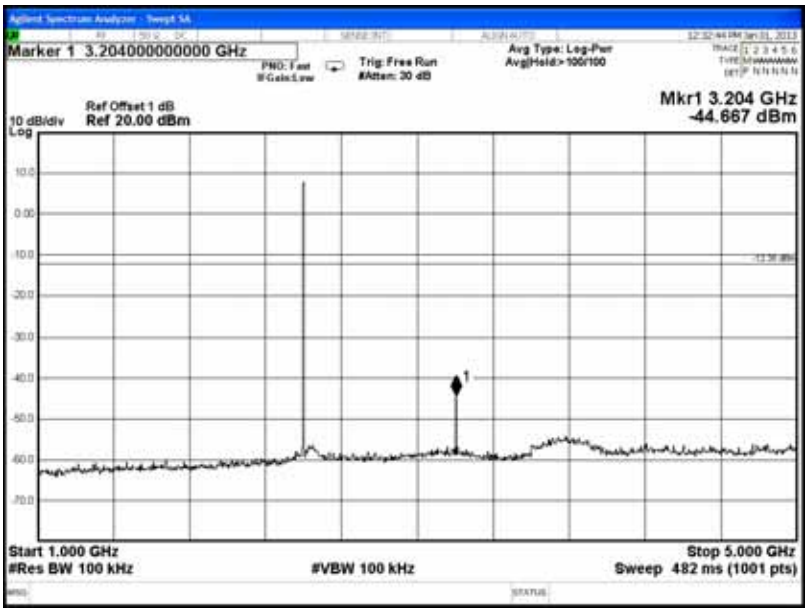
9.6. Test Results

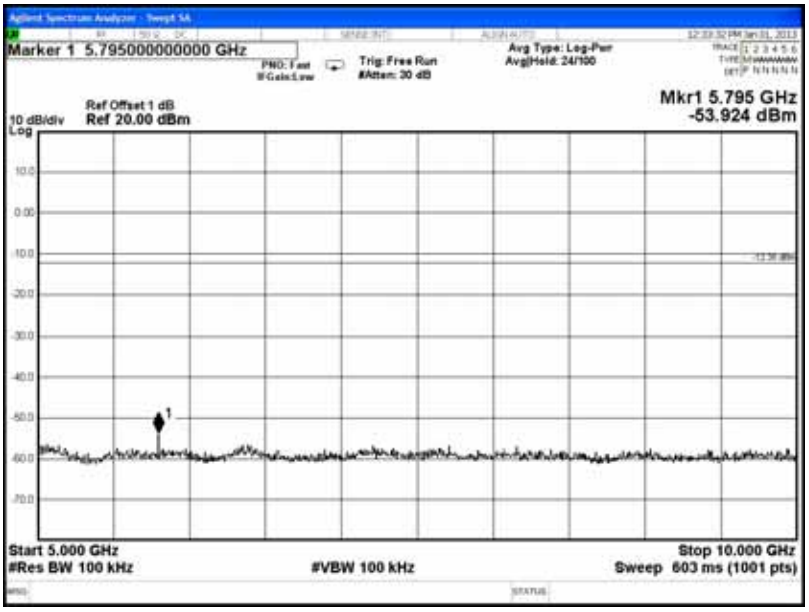
PASSED. The testing data was attached in the next pages.

Test Date: Jan. 31, 2012 Temperature : 24℃ Humidity : 60%

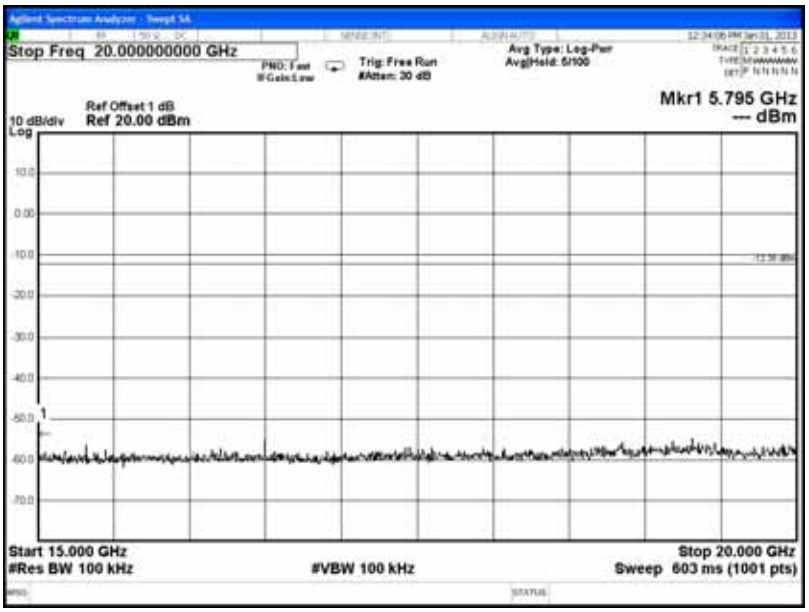
8-DPSK, Channel 0, Frequency: 2402MHz

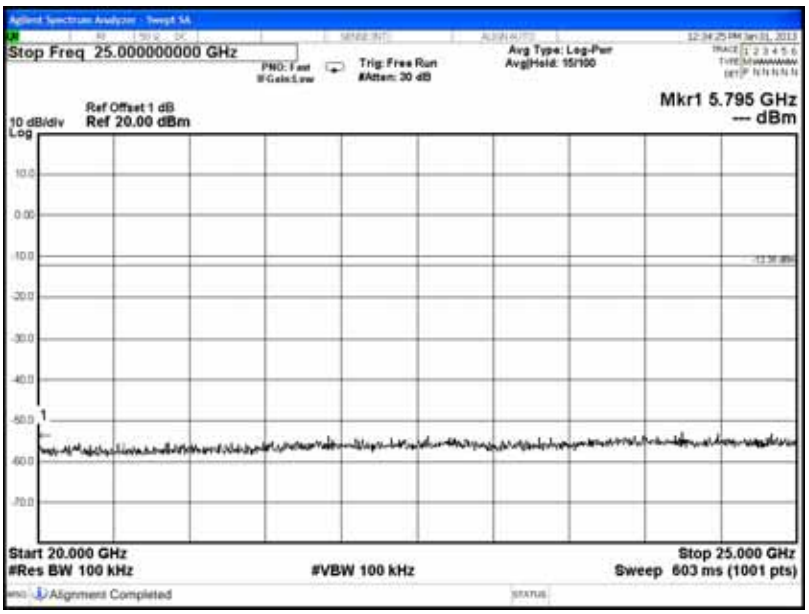




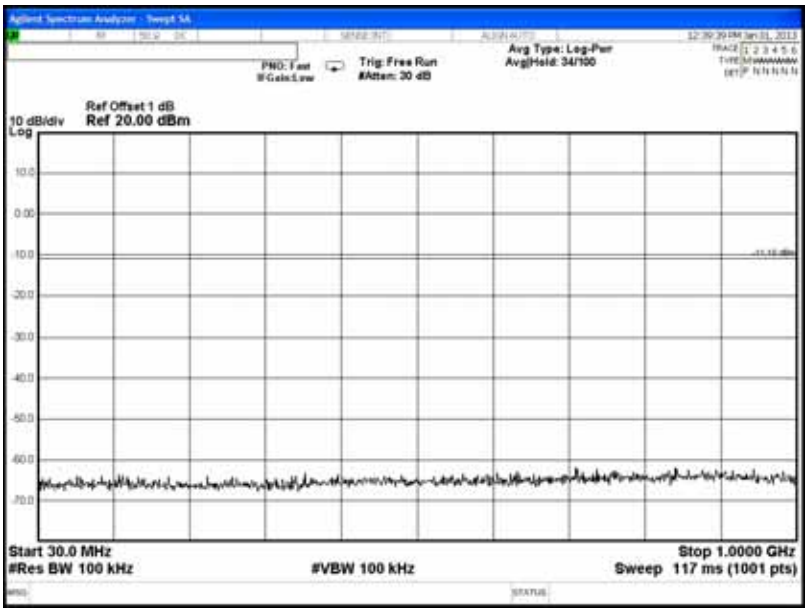


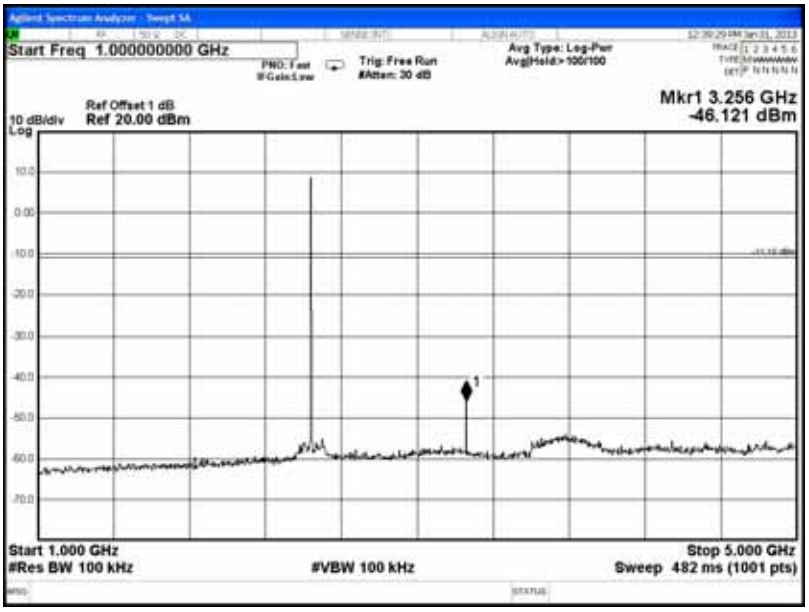

Agilent Spectrum Analyzer - Swept SA
Stop Freq 15.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 21/100
Mkr1 5.795 GHz
--- dBm
Ref Offset 1 dB
10 dB/div
Ref 20.00 dBm
Log
Start 10.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 15.000 GHz
Sweep 603 ms (1001 pts)

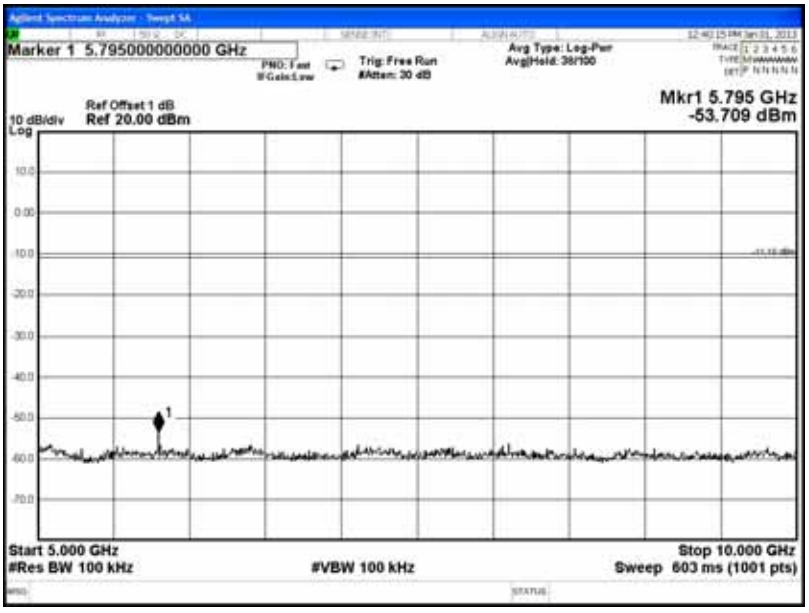

Agilent Spectrum Analyzer - Swept SA
Stop Freq 20.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 5/100
Mkr1 5.795 GHz
--- dBm
Ref Offset 1 dB
10 dB/div
Ref 20.00 dBm
Log
Start 15.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 20.000 GHz
Sweep 603 ms (1001 pts)

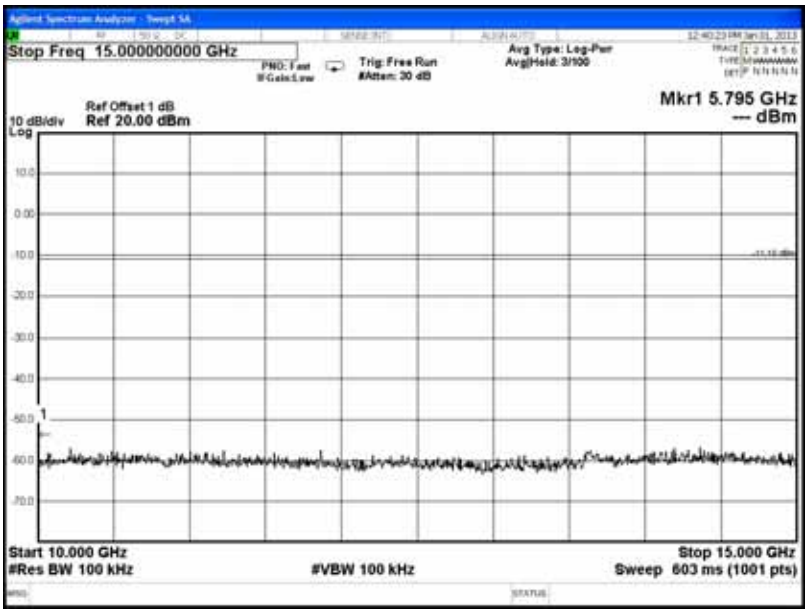

Agilent Spectrum Analyzer - Swept SA
Stop Freq 25.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 15/100
Mkr1 5.795 GHz
--- dBm
Ref Offset 1 dB
10 dB/div
Ref 20.00 dBm
Log
Start 20.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 25.000 GHz
Sweep 603 ms (1001 pts)
Alignment Completed

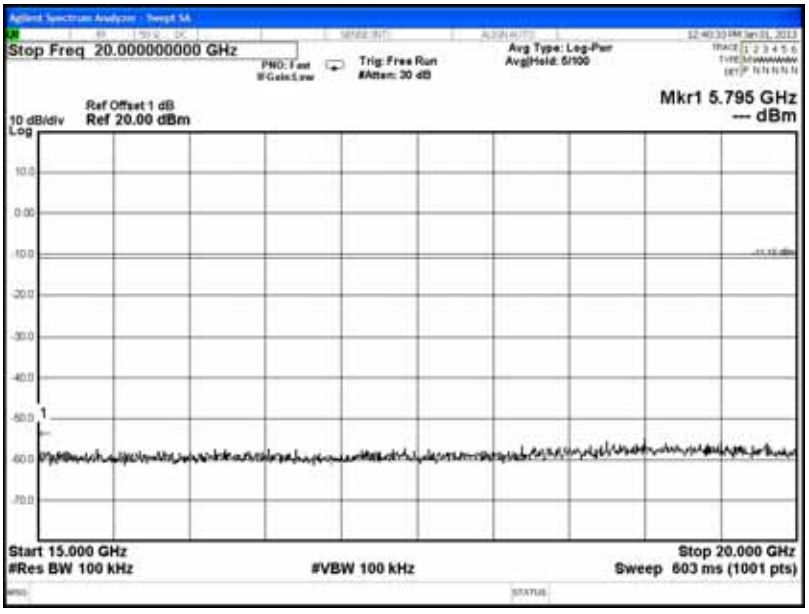
8-DPSK, Channel 39, Frequency: 2441MHz

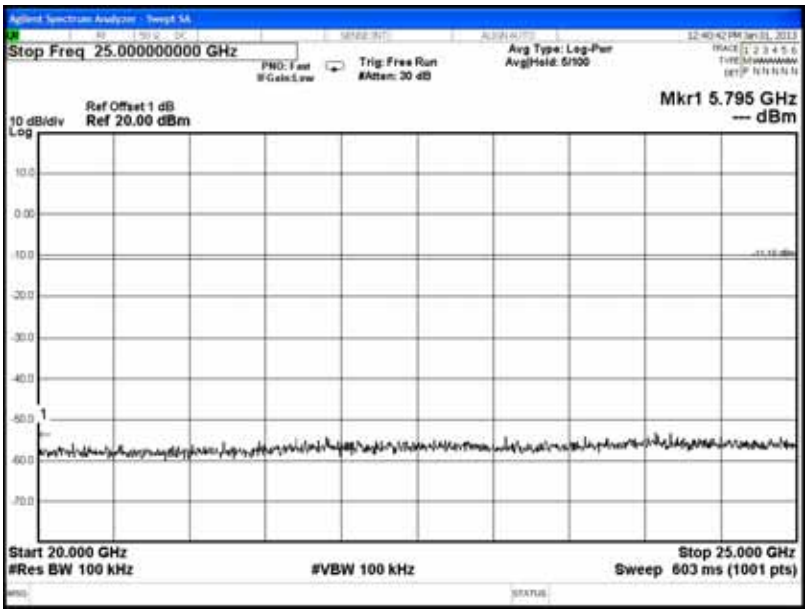




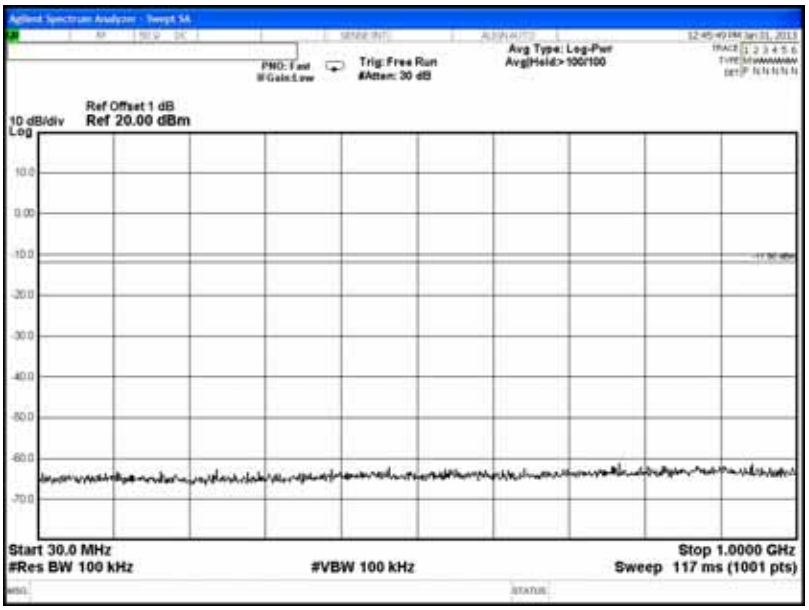


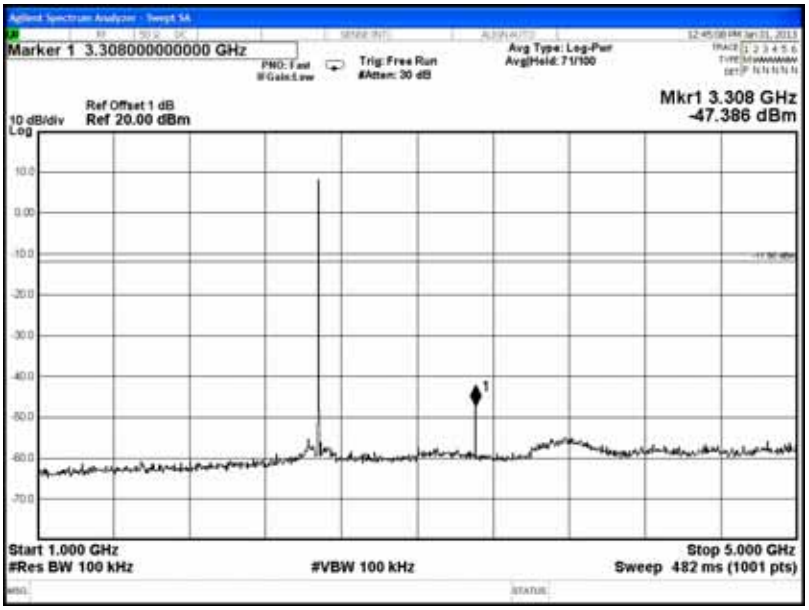

Agilent Spectrum Analyzer - Swept SA
Stop Freq 15.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 3/100
Mkr1 5.795 GHz
--- dBm
Ref Offset 1 dB
10 dB/div
Log
Ref 20.00 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 15.000 GHz
Sweep 603 ms (1001 pts)

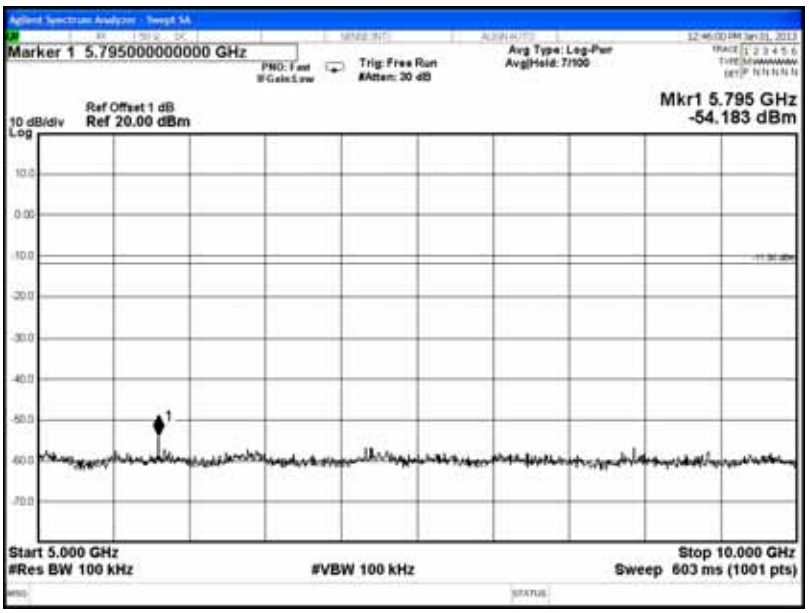

Agilent Spectrum Analyzer - Swept SA
Stop Freq 20.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 5/100
Mkr1 5.795 GHz
--- dBm
Ref Offset 1 dB
10 dB/div
Log
Ref 20.00 dBm
Start 15.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 20.000 GHz
Sweep 603 ms (1001 pts)

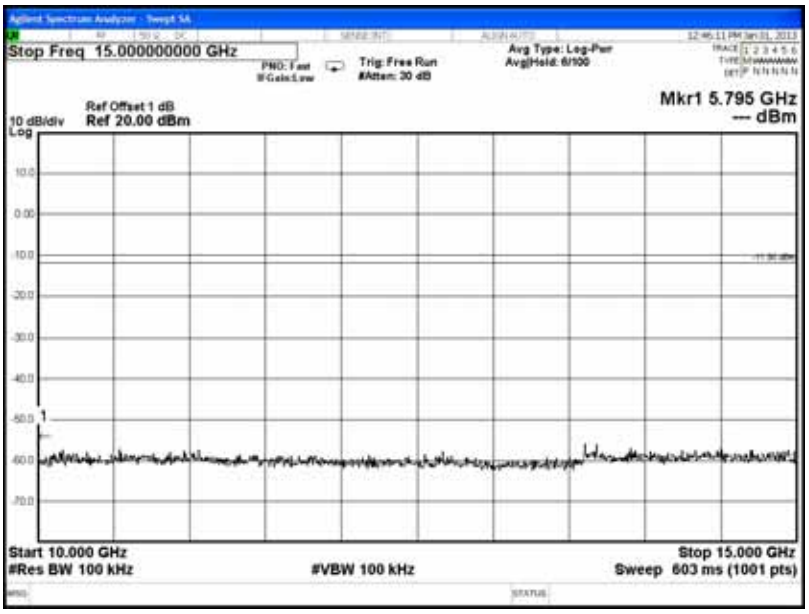

Agilent Spectrum Analyzer - Swept SA
Stop Freq 25.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 5/100
Mkr1 5.795 GHz
--- dBm
Ref Offset 1 dB
10 dB/div
Log
Ref 20.00 dBm
Start 20.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 25.000 GHz
Sweep 603 ms (1001 pts)

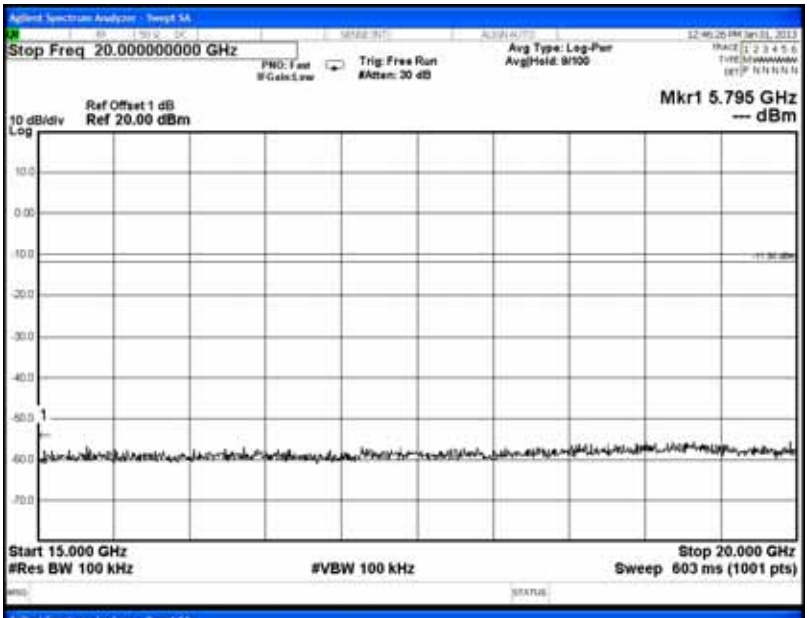
8-DPSK, Channel 78, Frequency: 2480MHz

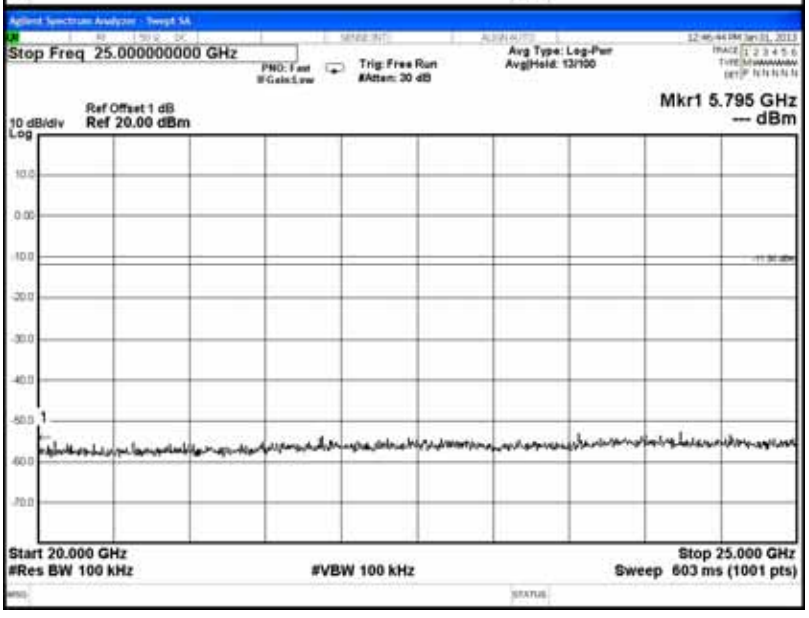




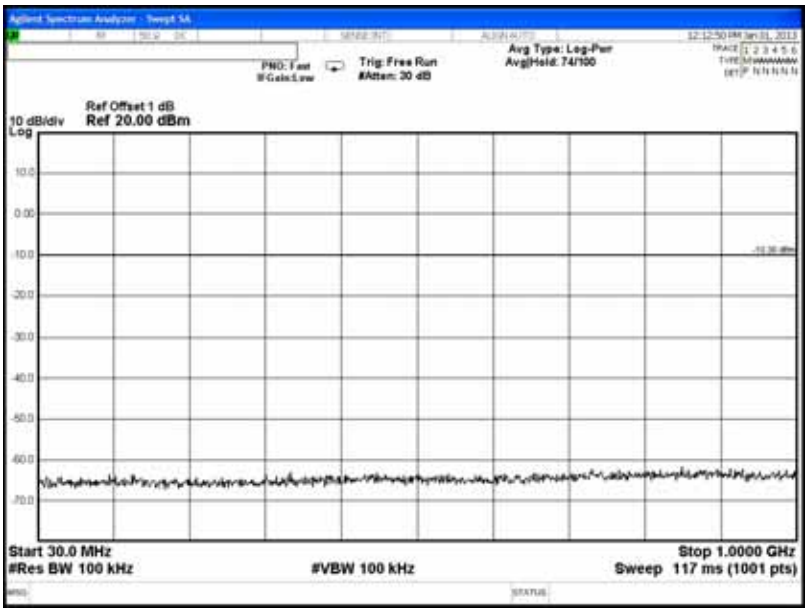


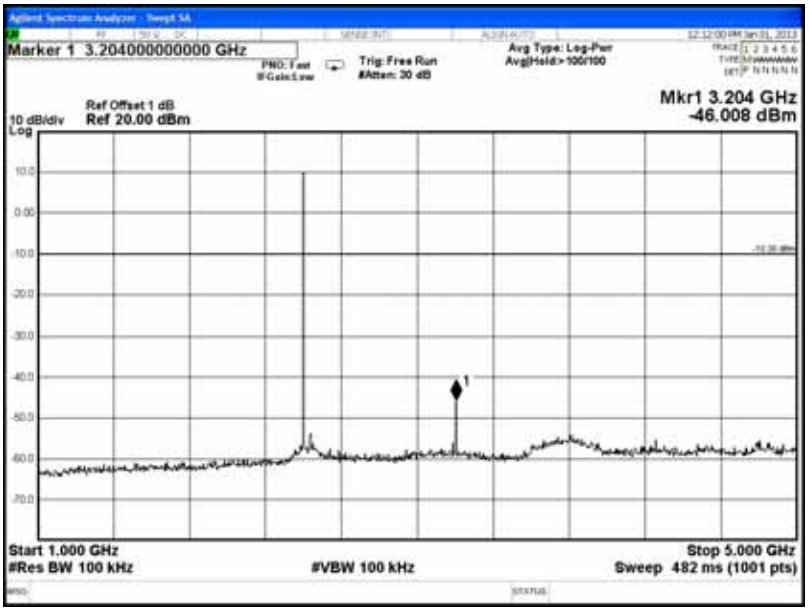

Agilent Spectrum Analyzer - Swept SA
Stop Freq 15.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 6/100
Mkr1 5.795 GHz
--- dBm
Ref Offset 1 dB
10 dB/div
Ref 20.00 dBm
Log
Start 10.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 15.000 GHz
Sweep 603 ms (1001 pts)

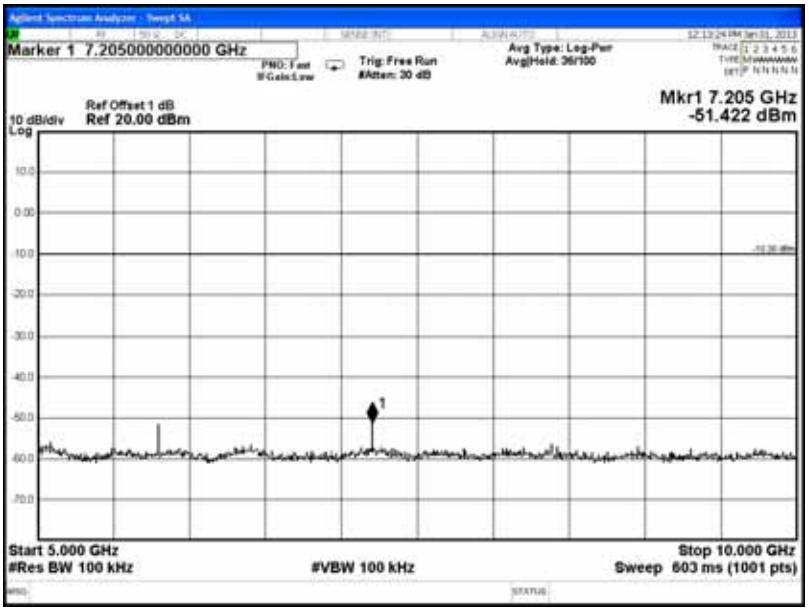

Agilent Spectrum Analyzer - Swept SA
Stop Freq 20.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 9/100
Mkr1 5.795 GHz
--- dBm
Ref Offset 1 dB
10 dB/div
Ref 20.00 dBm
Log
Start 15.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 20.000 GHz
Sweep 603 ms (1001 pts)

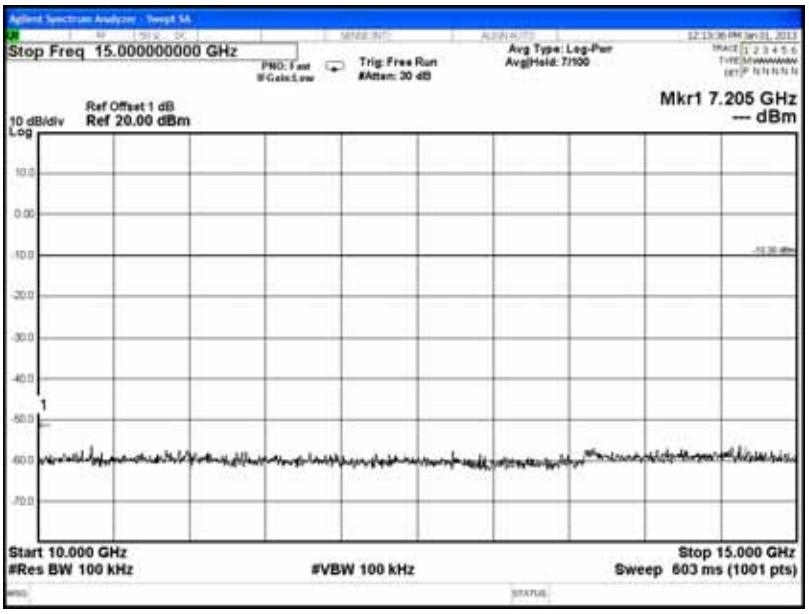

Agilent Spectrum Analyzer - Swept SA
Stop Freq 25.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 13/100
Mkr1 5.795 GHz
--- dBm
Ref Offset 1 dB
10 dB/div
Ref 20.00 dBm
Log
Start 20.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 25.000 GHz
Sweep 603 ms (1001 pts)

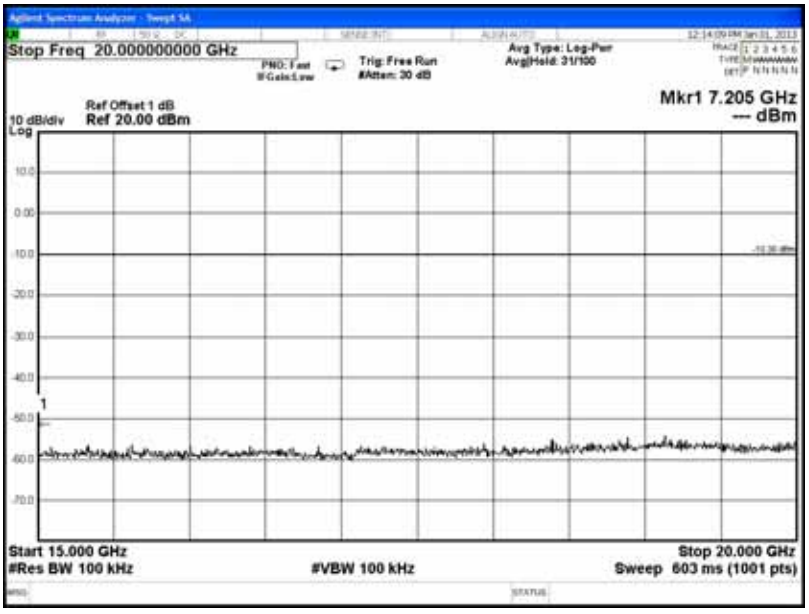
GFSK, Channel 0, Frequency: 2402MHz





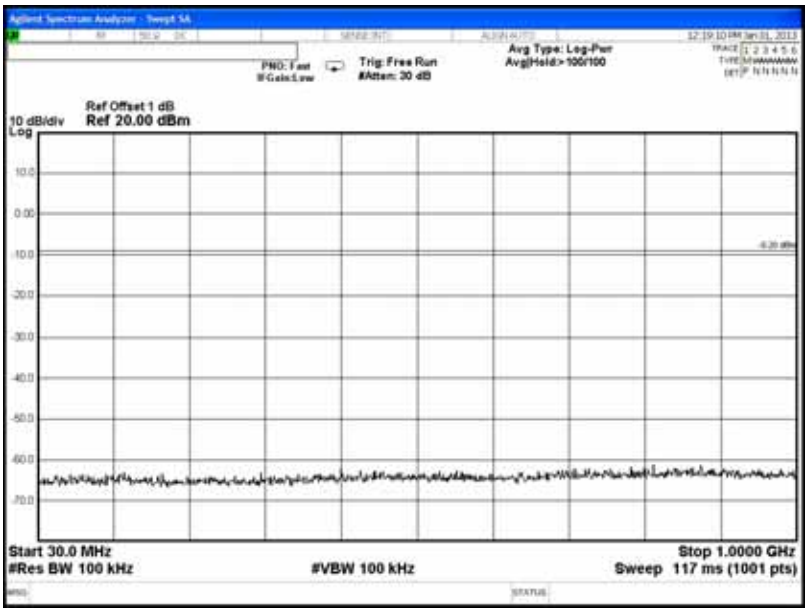


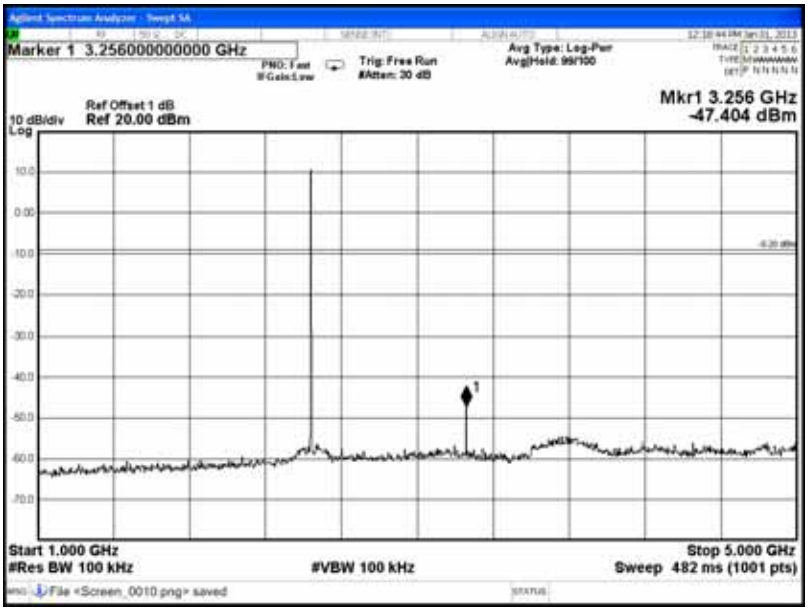

Agilent Spectrum Analyzer - Swept SA
Stop Freq 15.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 7/100
Mkr1 7.205 GHz
--- dBm
Ref Offset 1 dB
10 dB/div
Log
Ref 20.00 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 15.000 GHz
Sweep 603 ms (1001 pts)

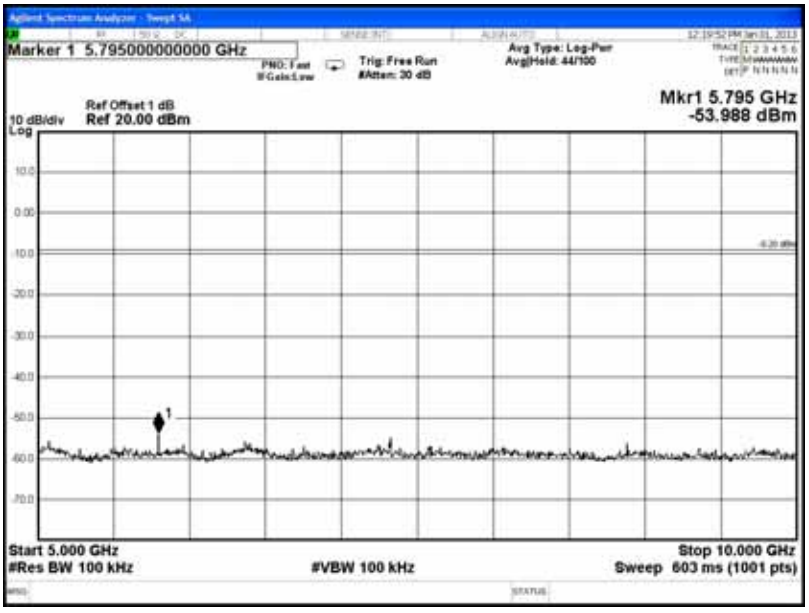

Agilent Spectrum Analyzer - Swept SA
Stop Freq 20.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 31/100
Mkr1 7.205 GHz
--- dBm
Ref Offset 1 dB
10 dB/div
Log
Ref 20.00 dBm
Start 15.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 20.000 GHz
Sweep 603 ms (1001 pts)

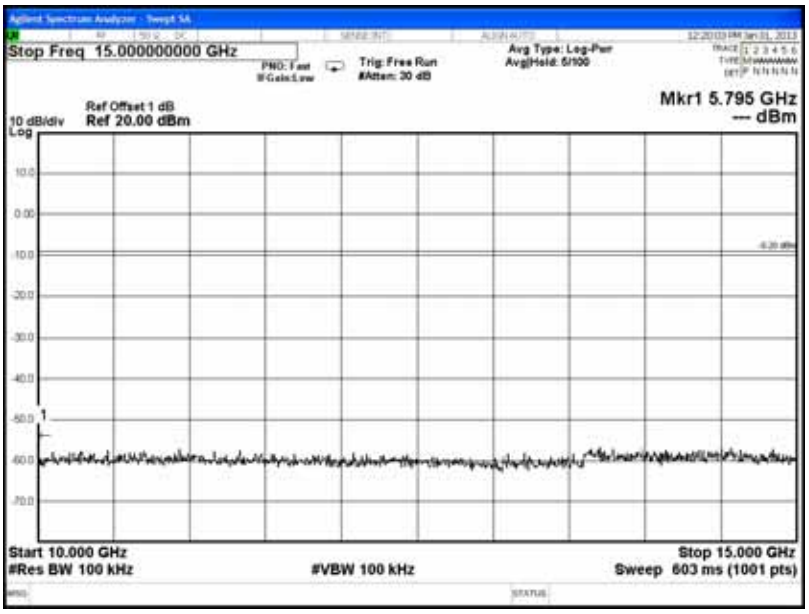

Agilent Spectrum Analyzer - Swept SA
Stop Freq 25.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 5/100
Mkr1 7.205 GHz
--- dBm
Ref Offset 1 dB
10 dB/div
Log
Ref 20.00 dBm
Start 20.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 25.000 GHz
Sweep 603 ms (1001 pts)

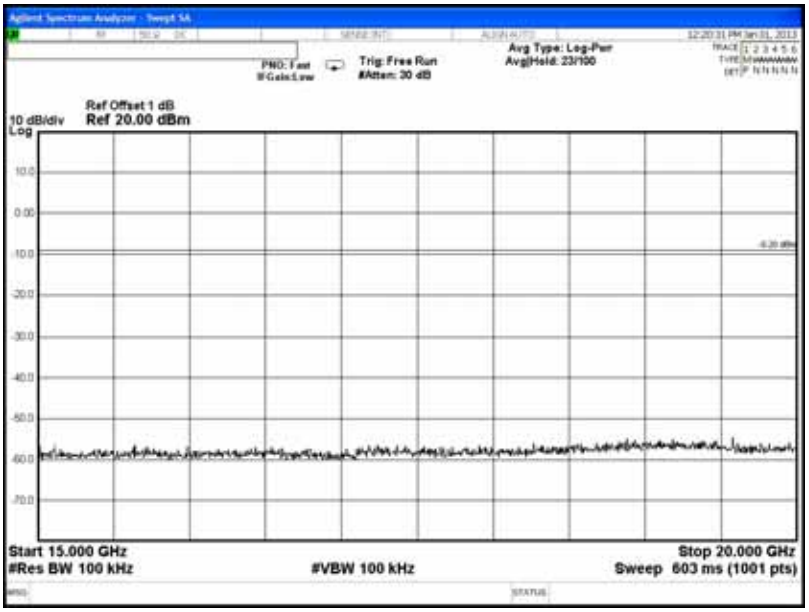
GFSK, Channel 39, Frequency: 2441MHz

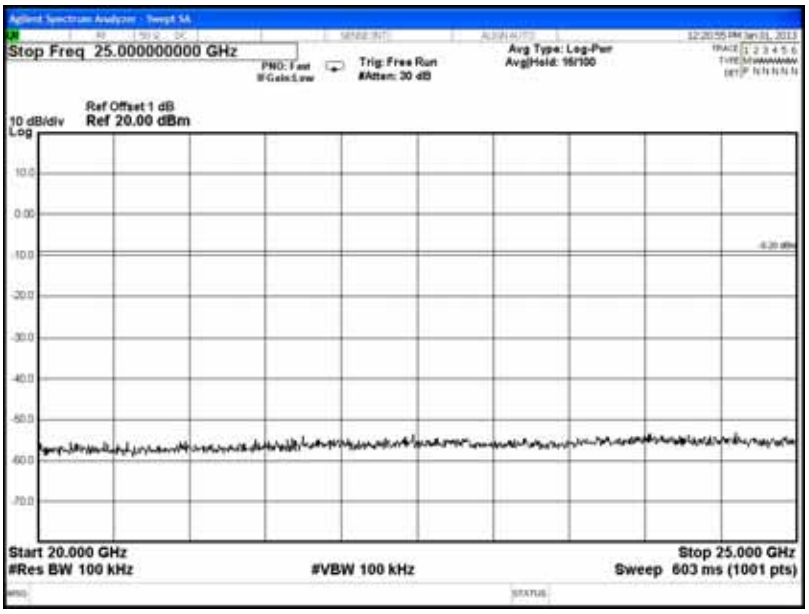




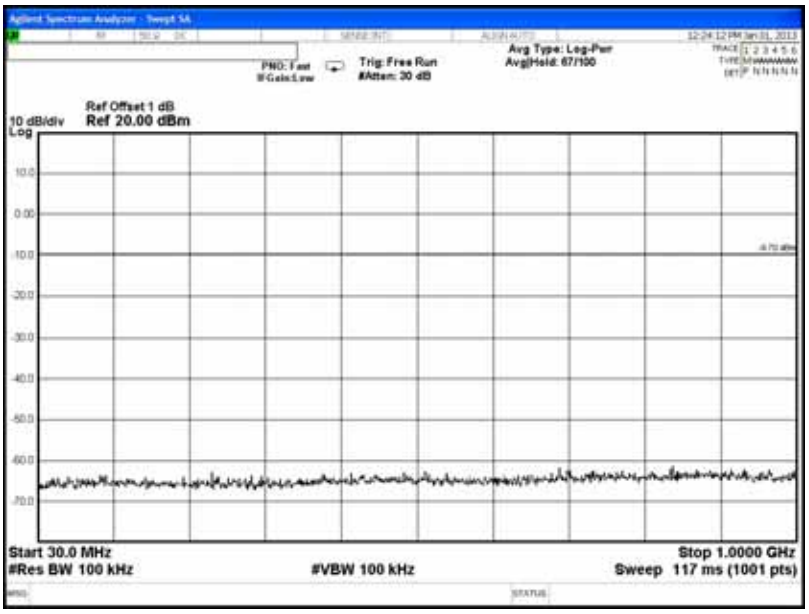


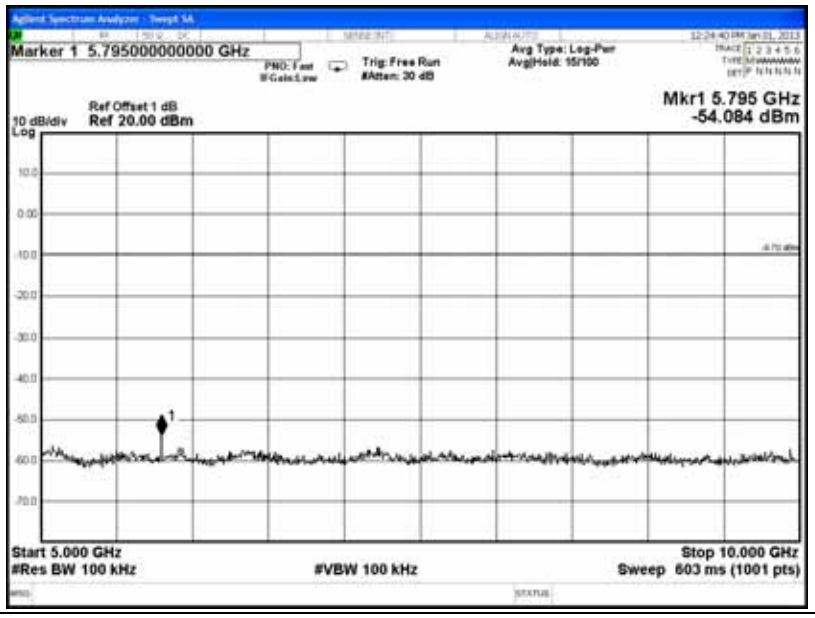

Stop Freq 15.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 5/100
Mkr1 5.795 GHz
--- dBm
Ref Offset 1 dB
10 dB/div
Log
Ref 20.00 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 15.000 GHz
Sweep 603 ms (1001 pts)

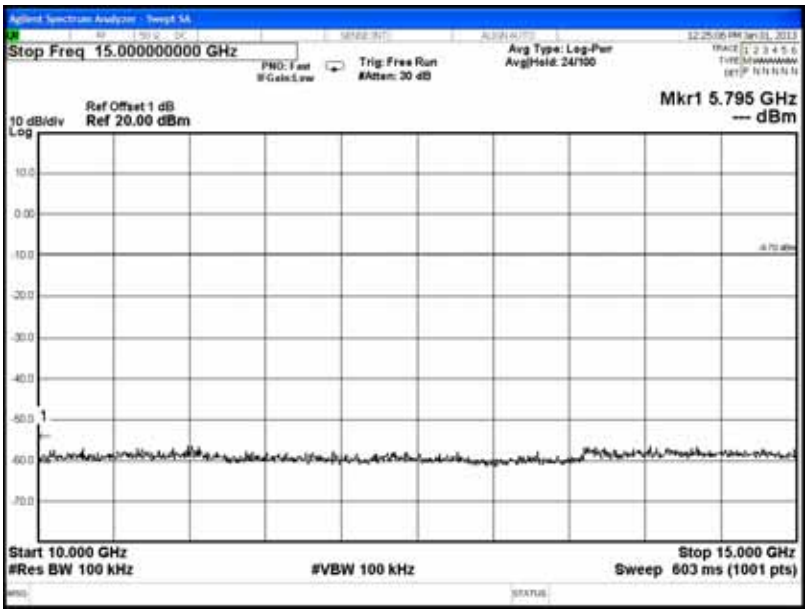

PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 23/100
Ref Offset 1 dB
10 dB/div
Log
Ref 20.00 dBm
Start 15.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 20.000 GHz
Sweep 603 ms (1001 pts)

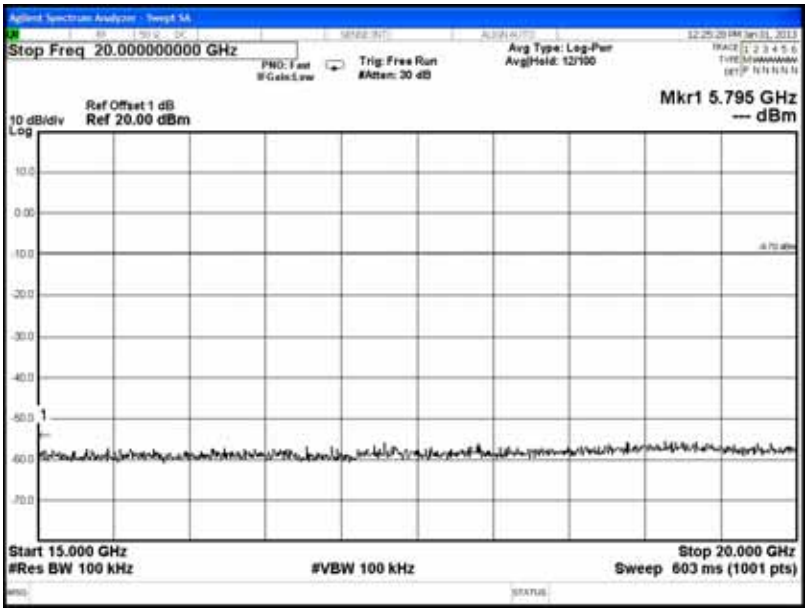

Stop Freq 25.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 16/100
Ref Offset 1 dB
10 dB/div
Log
Ref 20.00 dBm
Start 20.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 25.000 GHz
Sweep 603 ms (1001 pts)

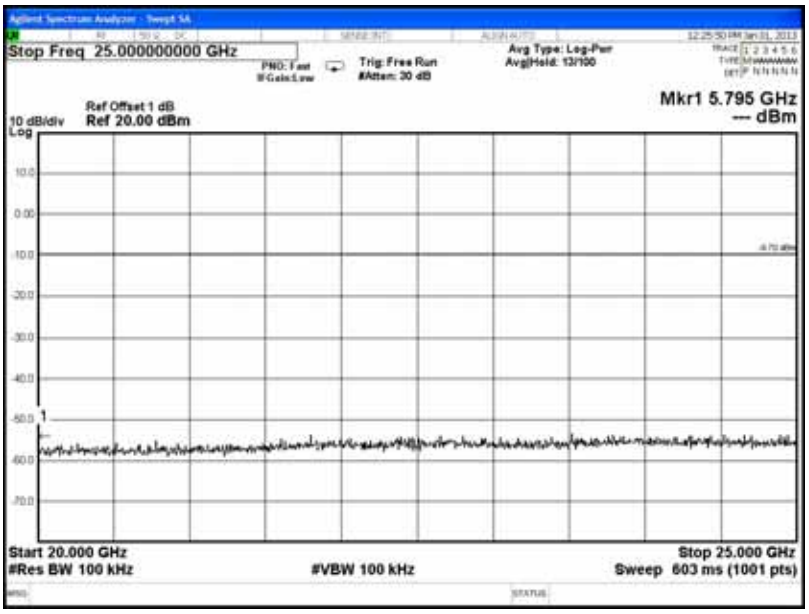
GFSK, Channel 78, Frequency: 2480MHz






Agilent Spectrum Analyzer - Swept SA
Stop Freq 15.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 24/100
Mkr1 5.795 GHz
--- dBm
Ref Offset 1 dB
10 dB/div
Log
Ref 20.00 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 15.000 GHz
Sweep 603 ms (1001 pts)


Agilent Spectrum Analyzer - Swept SA
Stop Freq 20.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 12/100
Mkr1 5.795 GHz
--- dBm
Ref Offset 1 dB
10 dB/div
Log
Ref 20.00 dBm
Start 15.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 20.000 GHz
Sweep 603 ms (1001 pts)


Agilent Spectrum Analyzer - Swept SA
Stop Freq 25.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 13/100
Mkr1 5.795 GHz
--- dBm
Ref Offset 1 dB
10 dB/div
Log
Ref 20.00 dBm
Start 20.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 25.000 GHz
Sweep 603 ms (1001 pts)

10. BAND EDGES MEASUREMENT

10.1. Test Equipment

The following test equipment was used during the band edges measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	Oct. 17, 12'	Oct. 16, 13'
2.	Bluetooth Test Set	Anritsu	MT8852B	6K00005697	Mar. 21, 12'	Mar. 20, 13'

10.2. Block Diagram of Test Setup

The same as section.4.2.

10.3. Specification Limits [§15.247(c), RSS-210 §A8.5]

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (See Section 15.205(c)). (※This test result attaching to §3.6.3)

10.4. Operating Condition of EUT

Same as carrier frequency separation measurement which was listed in section 4.4.

10.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. Set both RBW and VBW of spectrum analyzer to 100kHz with suitable frequency span including 100kHz bandwidth from band edge.
The measurement guideline was according to FCC Public Notice DA 00-705.

10.6. Test Results

PASSED. The testing data was attached in the next pages.

[Note: We performed testing of the highest and lowest data rate.]

EUT: Notebook M/N: HSBUB-SDS

Test Date: Jan. 23, 2013 Temperature: 24℃ Humidity: 50%

10.6.1. Type of Modulation: 8-DPSK

1. Below Band edge : The highest emission level is -51.367dBm on 2.39990GHz。
2. Upper Band edge: The highest emission level is -55.283dBm on 2.48360GHz。

10.6.2. Type of Modulation: GFSK

1. Below Band edge : The highest emission level is -49.777dBm on 2.39990GHz。
2. Upper Band edge: The highest emission level is -56.308dBm on 2.48360GHz。

Figure 1: 8-DPSK, Below Band edge

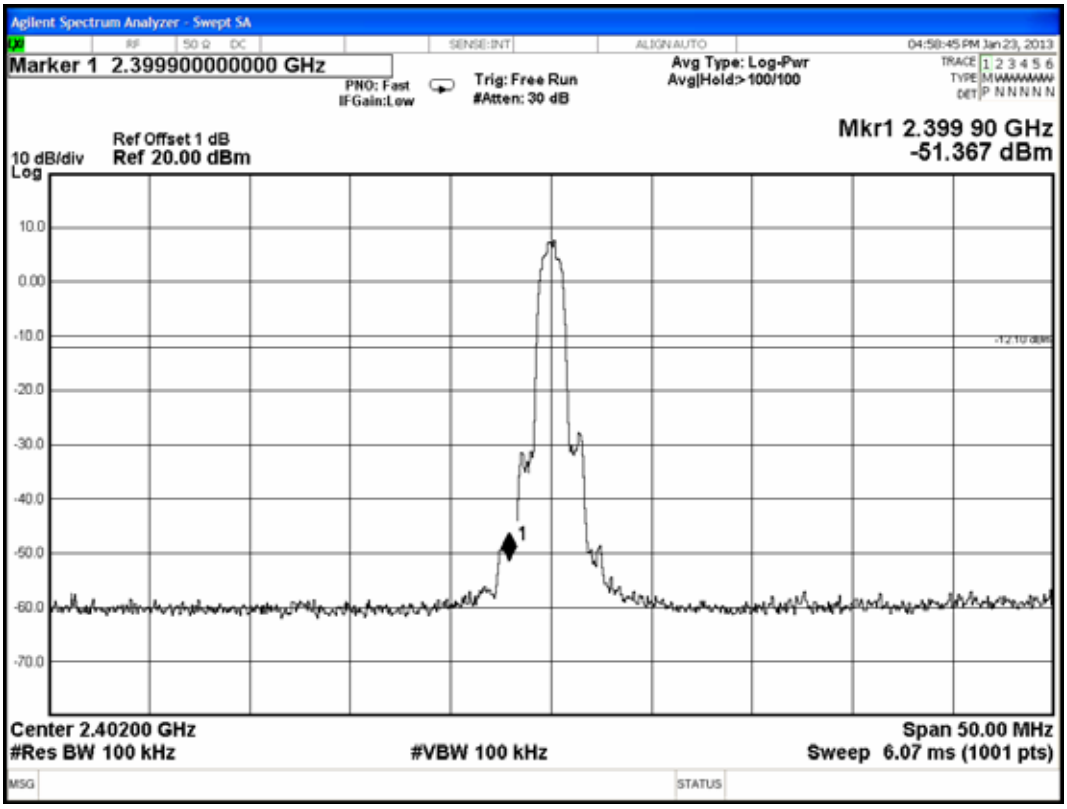


Figure 2: 8-DPSK, Upper Band edge

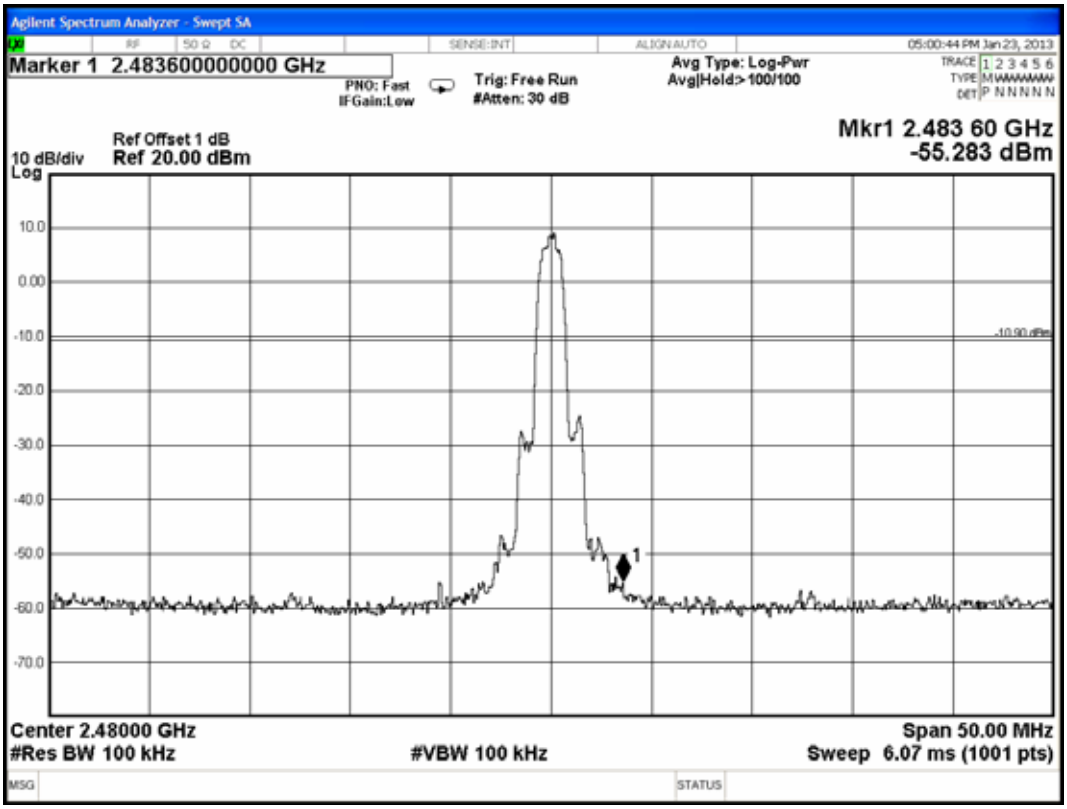


Figure 3: GFSK, Below Band edge

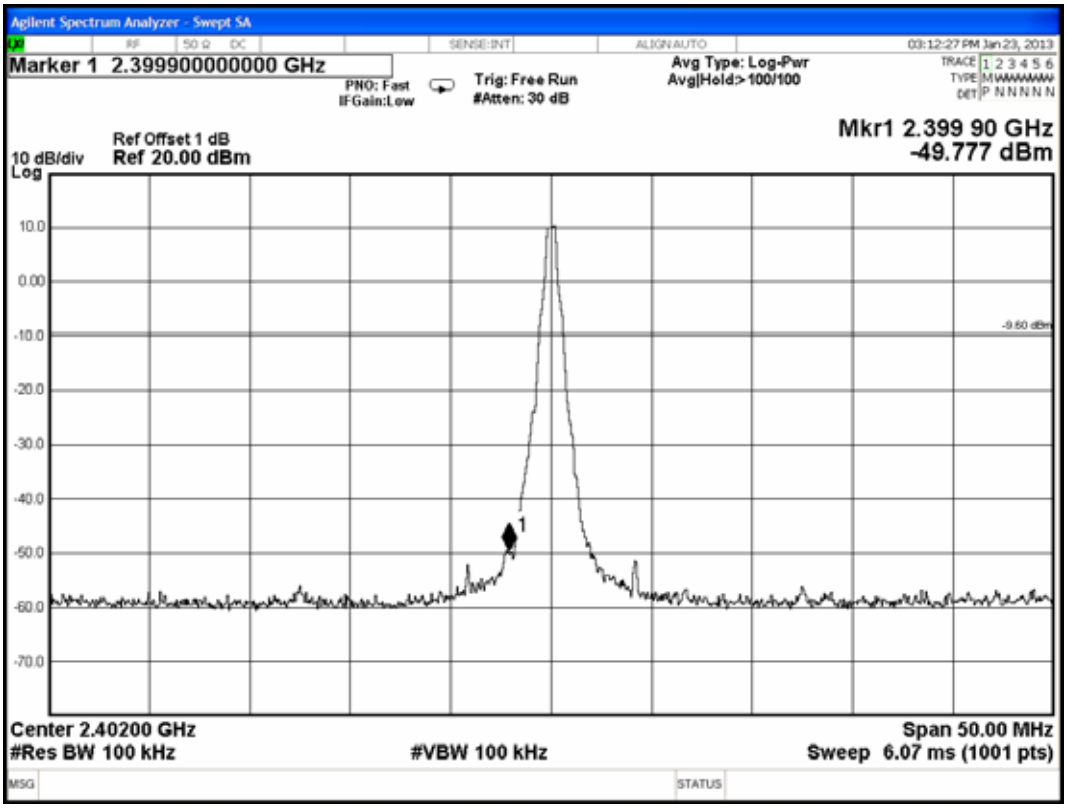
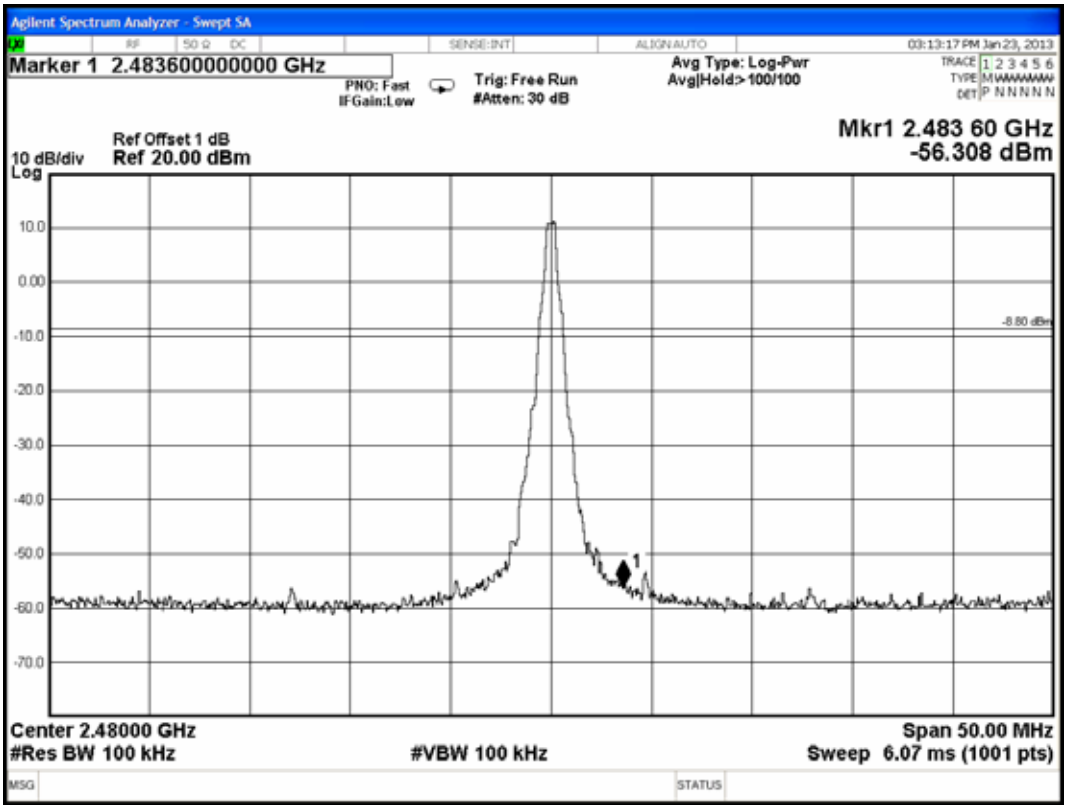


Figure 4: GFSK, Upper Band edge



11.DEVIATION TO TEST SPECIFICATIONS

【NONE】

12. PHOTOGRAPHS

12.1. Photos of Conducted Disturbance Measurement

FRONT VIEW OF CONDUCTED MEASUREMENT

BACK VIEW OF CONDUCTED MEASUREMENT

12.2. Photos of Radiated Emission Measurement at Semi-Anechoic Chamber

12.2.1. Frequency Range 30MHz-1GHz

12.2.2. Frequency Range Above 1GHz

12.3. Photo of Section RF Conducted Measurement