HCT.CO., LTD.

Product Compliance Division, EMC Team

SAN 136-1, AMI-RI , BUBAL-EUP, ICHEON-SI, KYOUNKI-DO, 467-701, KOREA

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CERTIFICATE OF COMPLIANCE

FCC PART 15.247 Certification

Applicant Name:

Hyundai Autonet Co., Ltd.

Address:

San 136-1, Ami-ri, Bubal-eub, Ichon-si, Kyoungki-do, 467-701 Korea

Date of Testing:

July 16, 2008

Test Site/Location:

HCT.CO., LTD., San 139-1 Ami-ri, Bubal-eup, Icheon-si, Kyungki-do, Korea

Test Report No.: HCT-R08-127

HCT FRN: 0005866421

FCC ID:	**PINPA710TDUSB**
IC:	**4018A-PA710TDCSB**
APPLICANT:	**Hyundai Autonet Co., Ltd.**

Model(s):	PA710TDUSB
EUT Type:	Car Audio Bluetooth
Max. RF Output Power:	1.66 dBm(1.46 mW)
Frequency Range:	2402 - 2480 MHz (Bluetooth)
Modulation type	GFSK(Normal), PSK(EDR)
FCC Classification:	FCC Part 15 Frequency Hopping Spread Spectrum Transceiver
FCC Rule Part(s):	Part 15 subpart C 15.247
IC Registration No.	6228A (Thru Lab. & Engineering)

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT.CO., LTD. Certifies that no party to this application has been denied FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)

Hyo Sun Kwak

Report prepared by

: Hyo Sun Kwak

Test engineer of RF Part

Sang Jun Lee

Approved by

: Sang Jun Lee

Manager of RF Part

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1. GENERAL INFORMATION

Applicant:	Hyundai Autonet Co., Ltd. San 136-1, Ami-ri, Bubal-eub, Ichon-si, Kyoungki-do, 467-701 Korea
FCC ID:	PINPA710TDUSB
IC:	4018A-PA710TDCSB
EUT:	Car Audio Bluetooth
Model:	PA710TDUSB
Date of Test:	July 16, 2008
Contact person:	Name: Yong Bin Kim Phone #: +82-31-639-1589 Fax #: +82-31-636-4138
Place of Tests:	Conducted Test: HCT Co., LTD. Icheon, Kyounki-Do, Korea Radiated Test: Thru Lab. & Engineering: Yoju-Gun Kyounggi-Do. Korea (IC Recognition no: IC 6228A)

2. EUT DESCRIPTION

Product	Car Audio Bluetooth
Model Name	PA710TDUSB
Power Supply	DC 12 V
Frequency Range	2402 ~ 2480 MHz
Transmit Power	1.66 dBm(1.46 mW)
Modulation Type	GFSK(Normal), PSK(EDR)
Modulation Technique	FHSS
Number of Channels	79 Channels
Antenna Specification	Manufacturer: Auto-Electronic co., Ltd Antenna type: Chip Antenna Peak Gain : 0 dBi

3. TEST METHODOLOGY

The measurement procedure described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz(ANSI C63.4-2003) and FCC Public Notice DA 00-705 dated March 30, 2000 entitled “Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems” were used in the measurement of the **Hyundai Autonet Co., Ltd. Car Audio Bluetooth FCC ID: PINPA710TDUSB**

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version :2003) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version: 2003)

3.4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel low, mid and high with highest data rate (worst case) is chosen for full testing.

4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The open area test site and conducted measurement facility used to collect the radiated data are located at the 254-1,Maekok-Ri, Hobup-Myun, Ichon-Si, Kyoungki-Do, 467-701, KOREA. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2003) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated July 6, 2006(Registration Number: 90661)

§ NOTE: Radiated Emission test using OATS in performed by our subcontract

'THRU Lab & Engineering' (IC Recognition no: IC 6228A)

Below test items were performed by THRU Lab & Engineering.

7.6.1Radiated Spurious Emissions

7.6.2 Receiver Spurious Emissions

7.6.3 Radiated Restricted Band Edge Measurements

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

6. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

* The antennas of this E.U.T are permanently attached.

*The E.U.T Complies with the requirement of §15.203

7. FCC PART 15.247 REQUIREMENTS

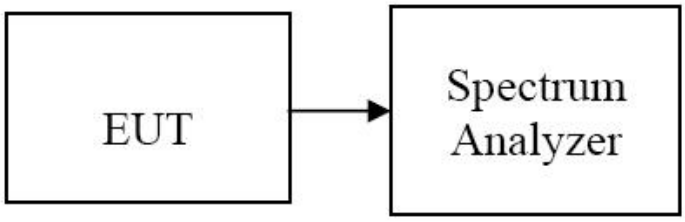
7.1 PEAK POWER

LIMIT

The maximum peak output power of the intentional radiator shall not exceed the following:

1. For systems using digital modulation in the bands of 902 ~ 928 MHz, 2400 ~ 2483.5 MHz, and 5725 ~ 5850 MHz: 1 watt.
2. Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer. The Spectrum Analyzer is set to the peak detector mode.

1. Span = 2 MHz(GFSK) / 5 MHz(8DPSK)
2. RBW = 1 MHz(GFSK) / 3 MHz(8DPSK)
3. VBW = 1 MHz(GFSK) / 3 MHz(8DPSK)
4. Sweep = auto
5. Packet type= DH5

TEST RESULTS

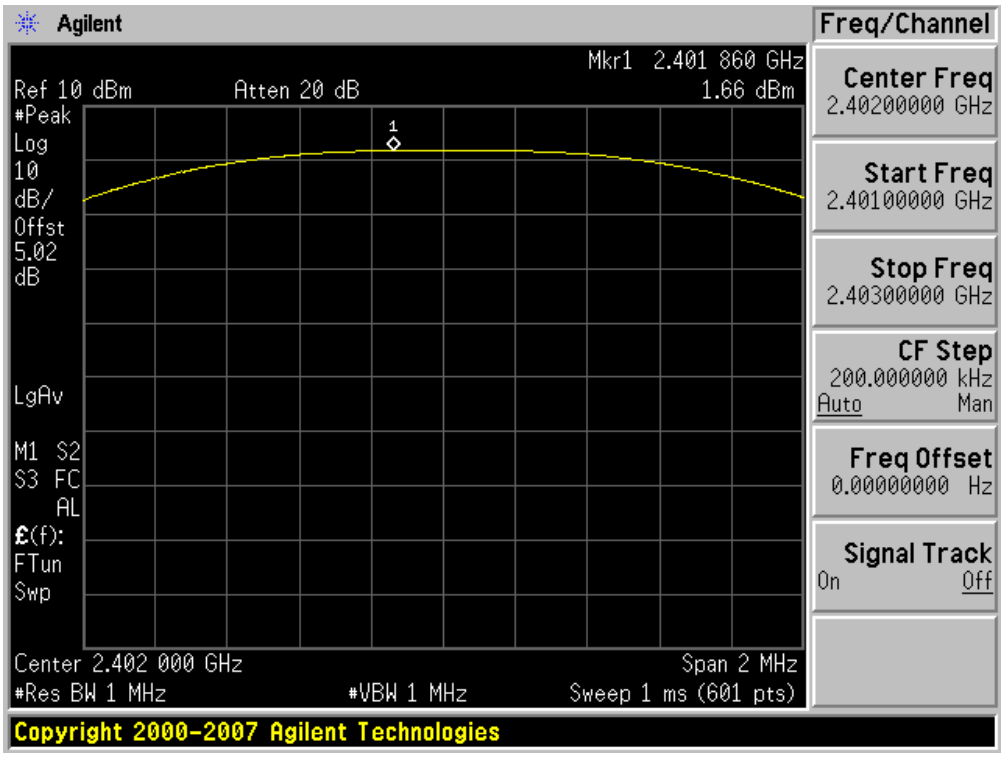
No non-compliance noted

Test Data

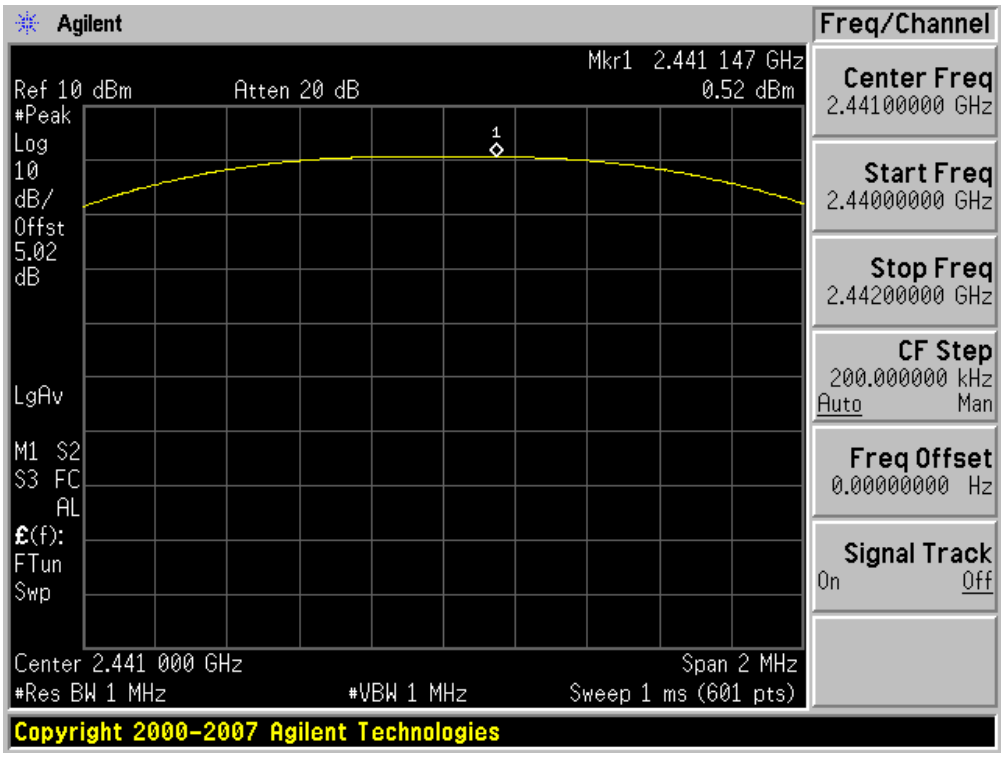
Channel	Frequency (MHz)	Output Power(GFSK)		Output Power(8DPSK)		Limit (W)	Result
		(dBm)	(mW)	(dBm)	(mW)		
Low	2402	1.66	1.46	1.50	1.41	1	PASS
Mid	2441	0.52	1.12	0.89	1.22		PASS
High	2480	-0.32	0.92	-0.44	0.90		PASS

Test Plots

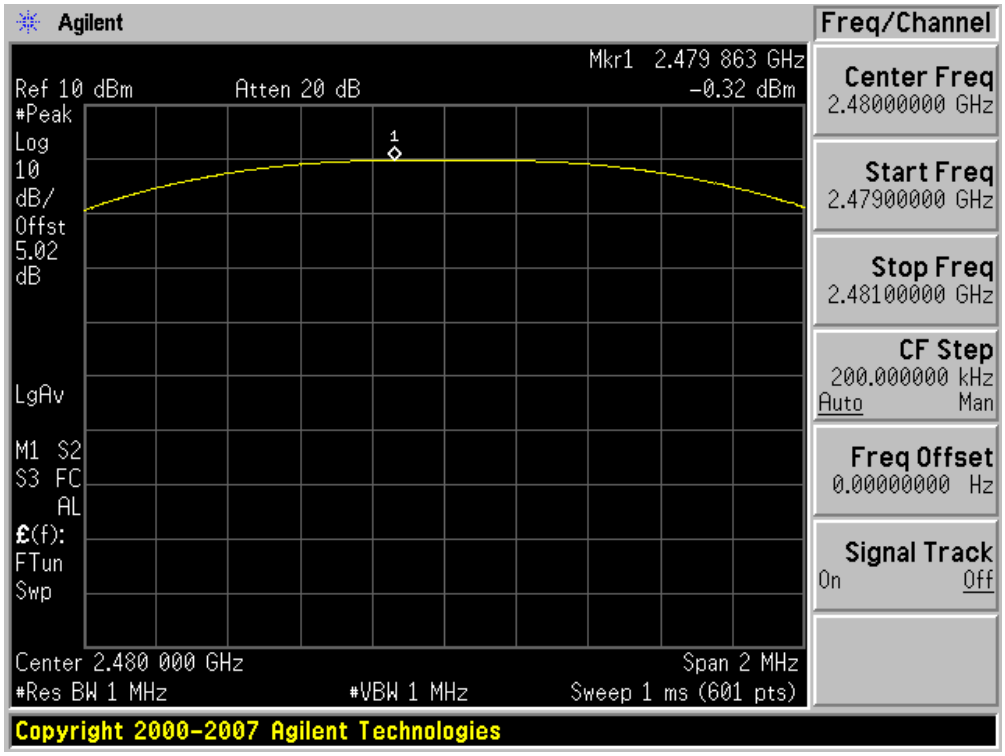
Peak Power (Low CH)



Peak Power (Mid CH)

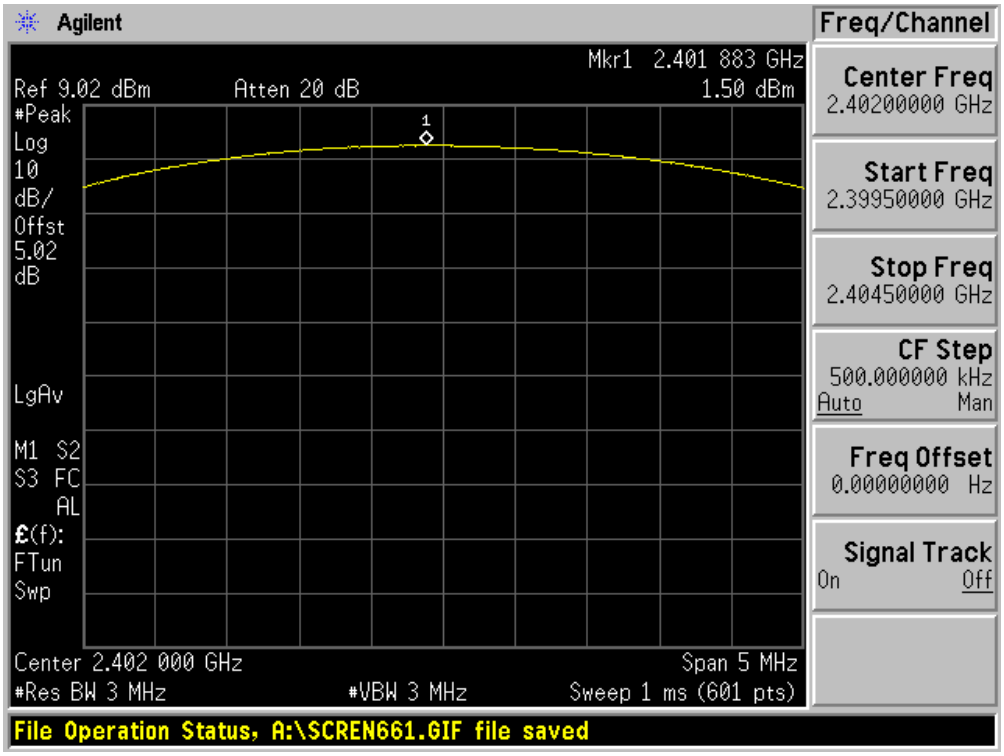


Peak Power (High CH)

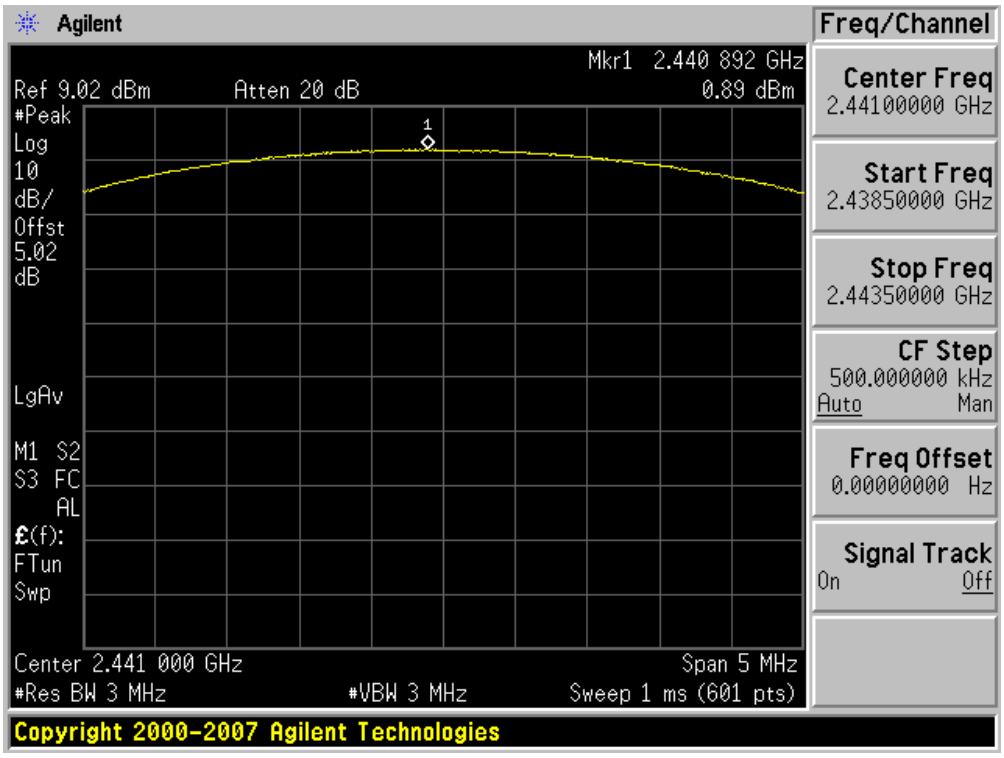


(8DPSK)

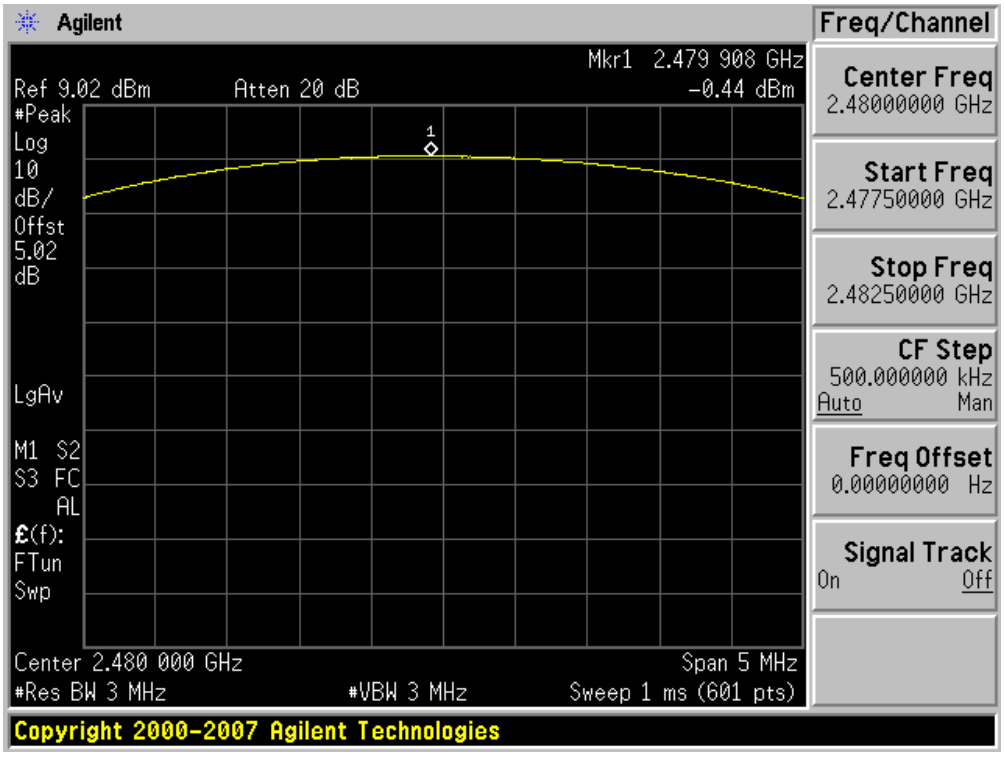
Peak Power (Low CH)



Peak Power (Mid CH)



Peak Power (High CH)

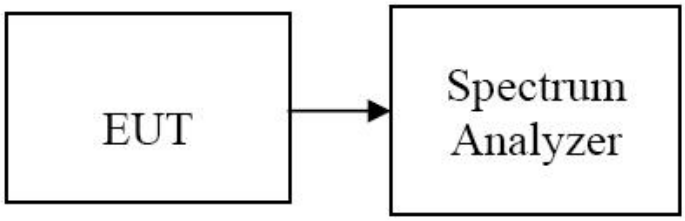


7.2 BAND EDGES MEASUREMENT

LIMIT

According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

Test Configuration



TEST PROCEDURE

The spectrum analyzer is set to :

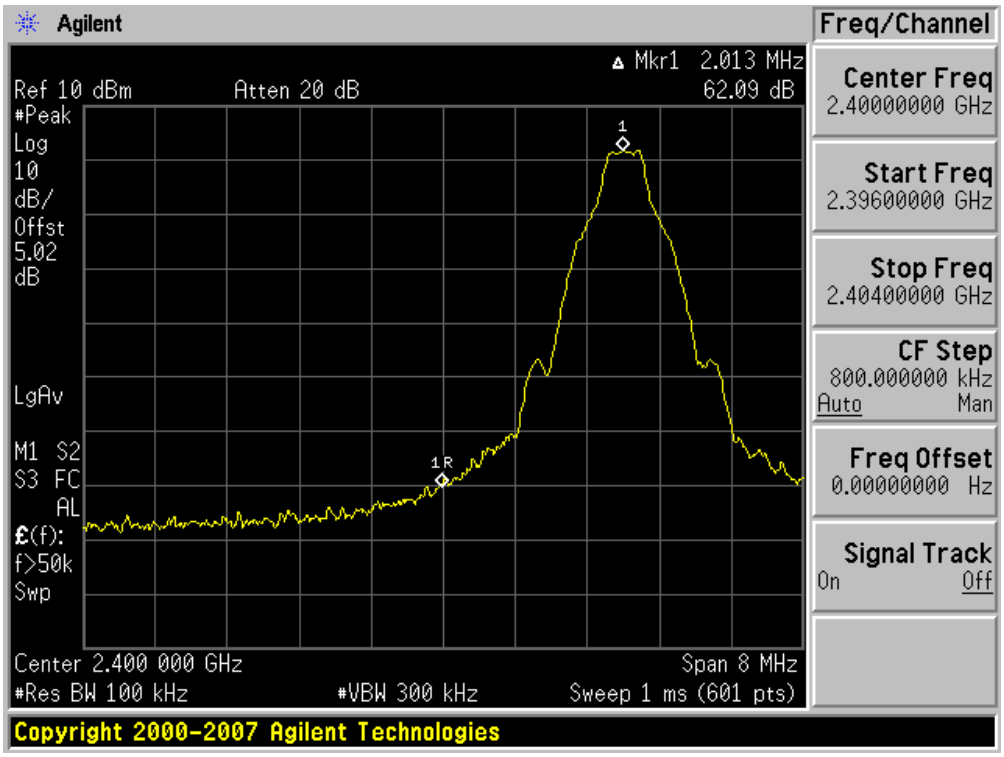
1. Span = 8 MHz
2. RBW = 100 kHz
3. VBW = 300 kHz
4. Sweep = auto
5. Detector Mode = Peak

TEST RESULTS

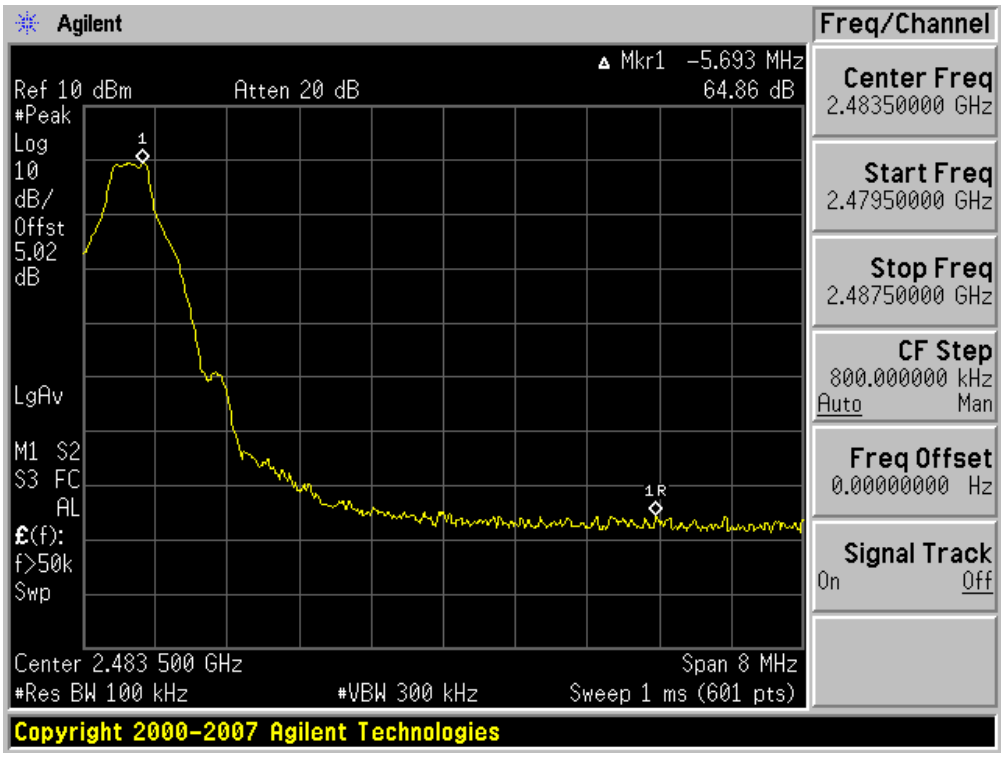
See attached.

Test Data (GFSK)

Band Edges (Low- CH)

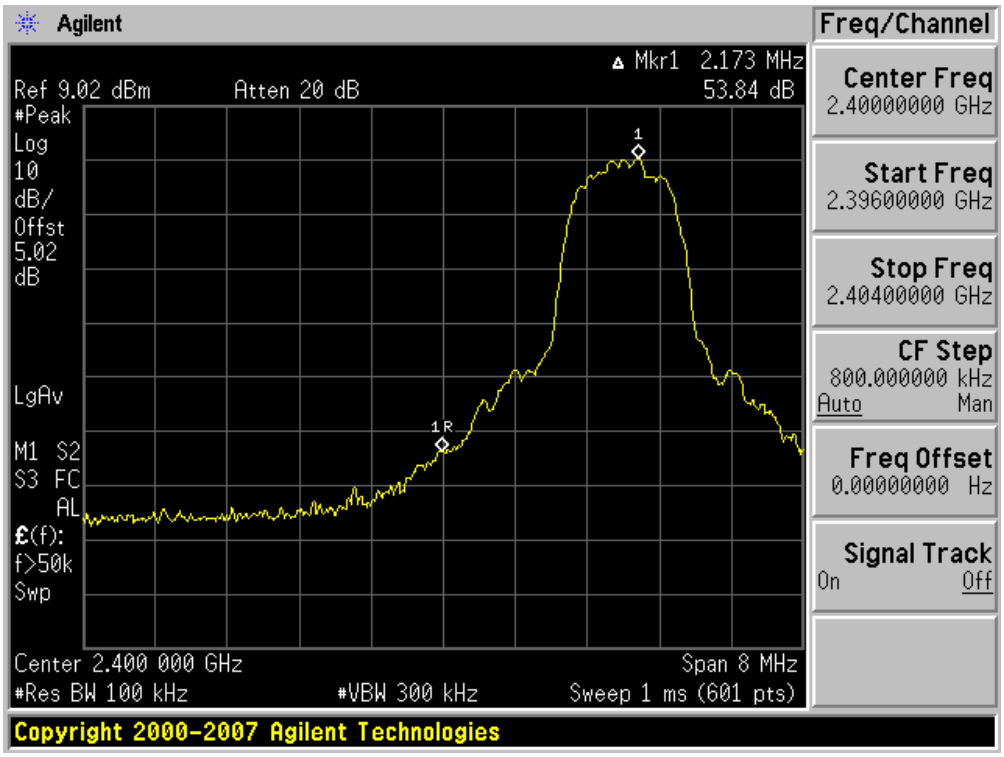


Band Edges (High-CH)

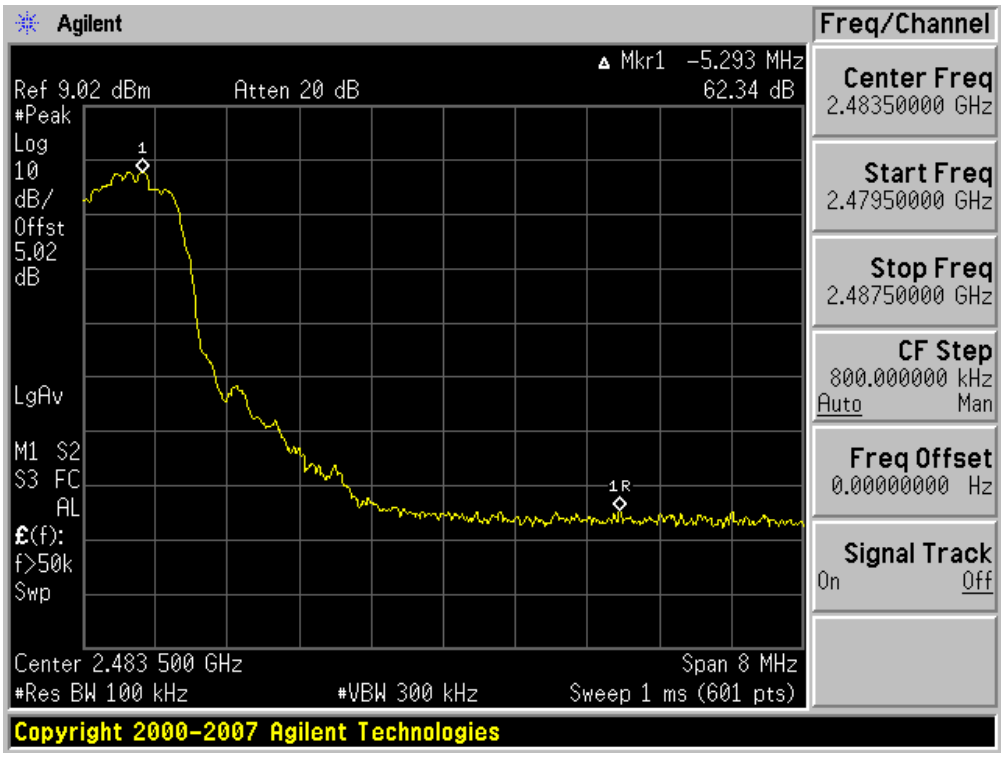


Test Data (8DPSK)

Band Edges (Low- CH)



Band Edges (High-CH)

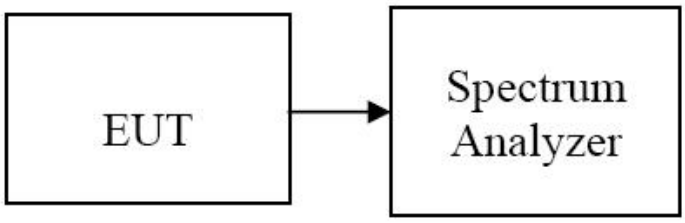


7.3 FREQUENCY SEPARATION / OCCUPIED BANDWIDTH (99% BW)

LIMIT

According to §15.247(a)(1), 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.

Test Configuration



TEST PROCEDURE

The spectrum analyzer is set to :

1. Span = 3 MHz
2. RBW = 30 kHz
3. VBW = 100 kHz
4. Sweep = auto

The trace was allowed to stabilize. The marker-delta function was used to determine the separation between the peaks of the adjacent channels.

TEST RESULTS

No non-compliance noted

Test Data

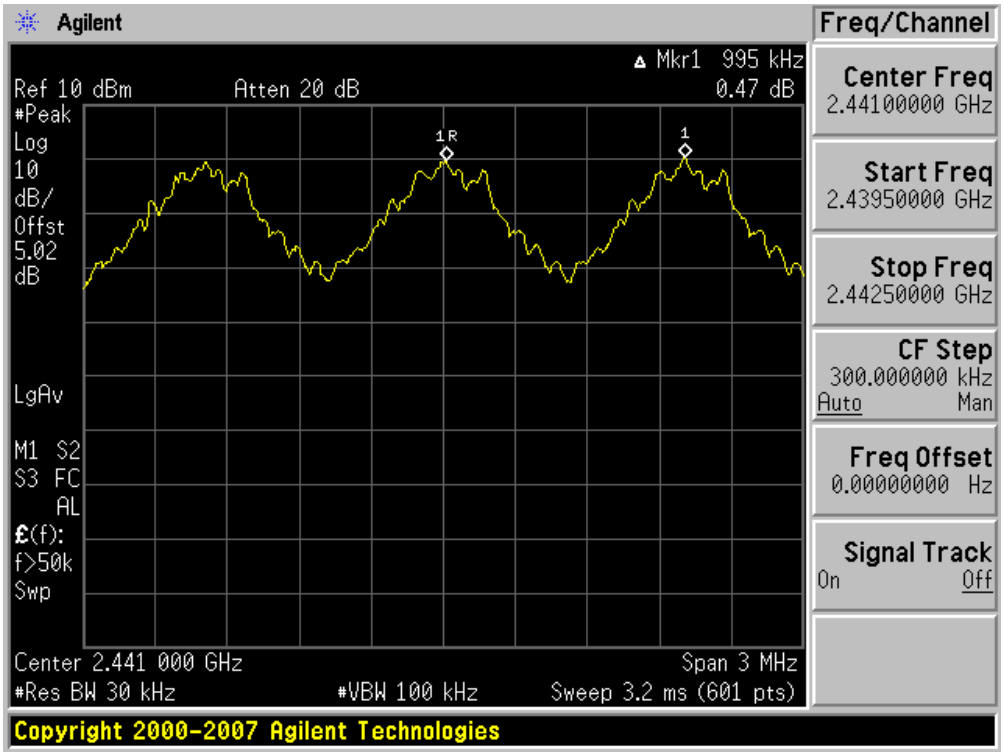
Channel Separation (kHz)		20dB Bandwidth (kHz)			Limit (kHz)	Result
GFSK	8DPSK	Channel	GFSK	8DPSK		
995	1000	Low CH	930	1298	>25	Pass
		Middle CH	946	1300		
		High CH	935	1294		

Occupied Bandwidth (99% BW)

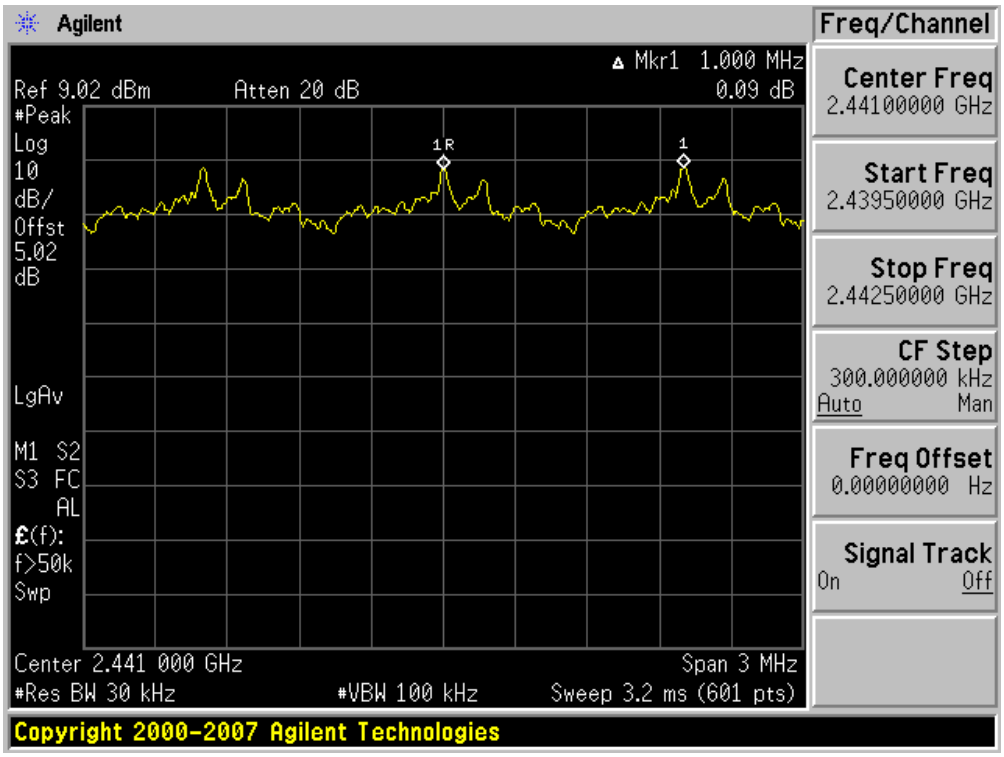
99% BW (KHz)			Result
Channel	GFSK	8DPSK	
Low CH	878	1181	Pass
Middle CH	875	1184	
High CH	880	1187	

Test Plot

Measurement of Channel Separation(GFSK)



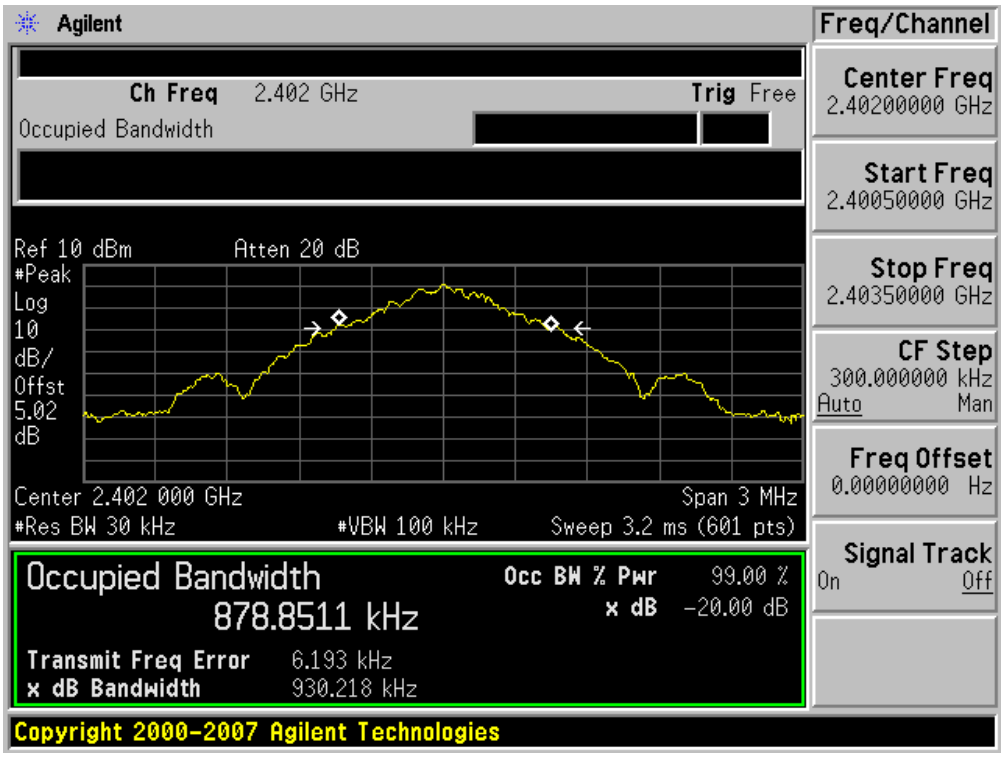
Measurement of Channel Separation(8DPSK)



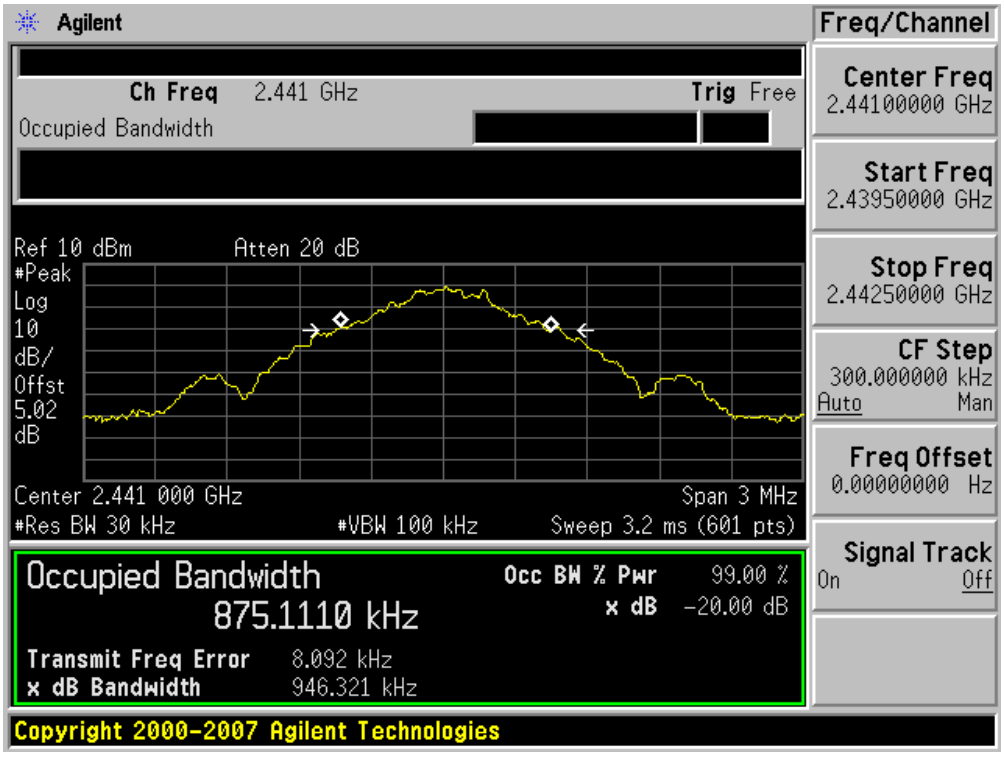
Test Plot (GFSK)

20 dB bandwidth

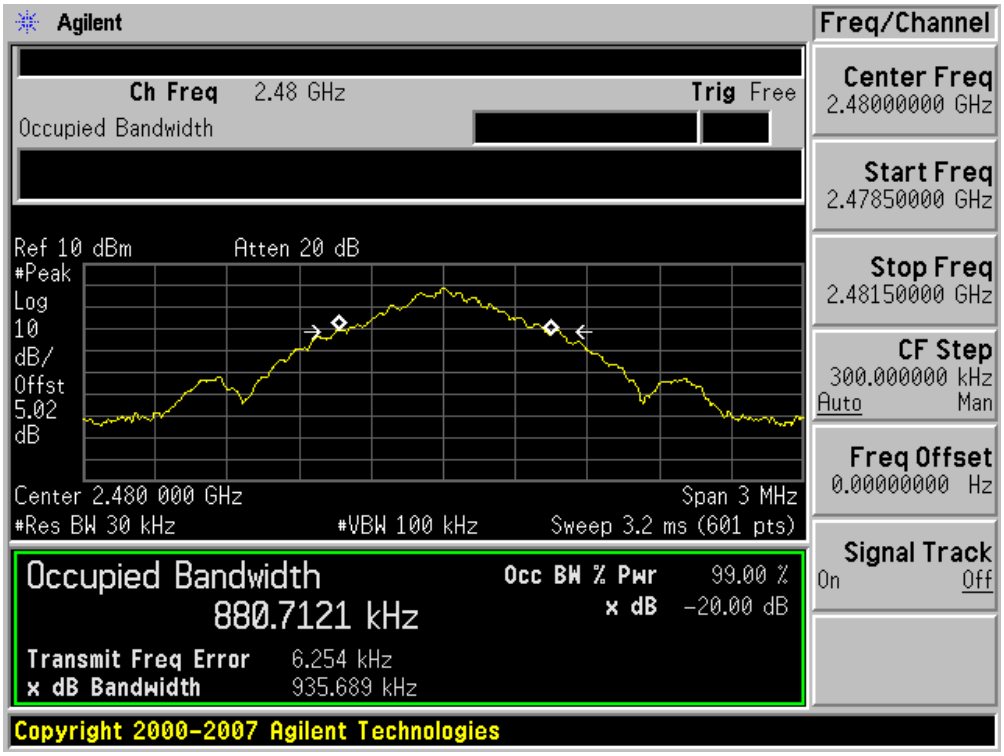
(Low CH)



(Mid CH)



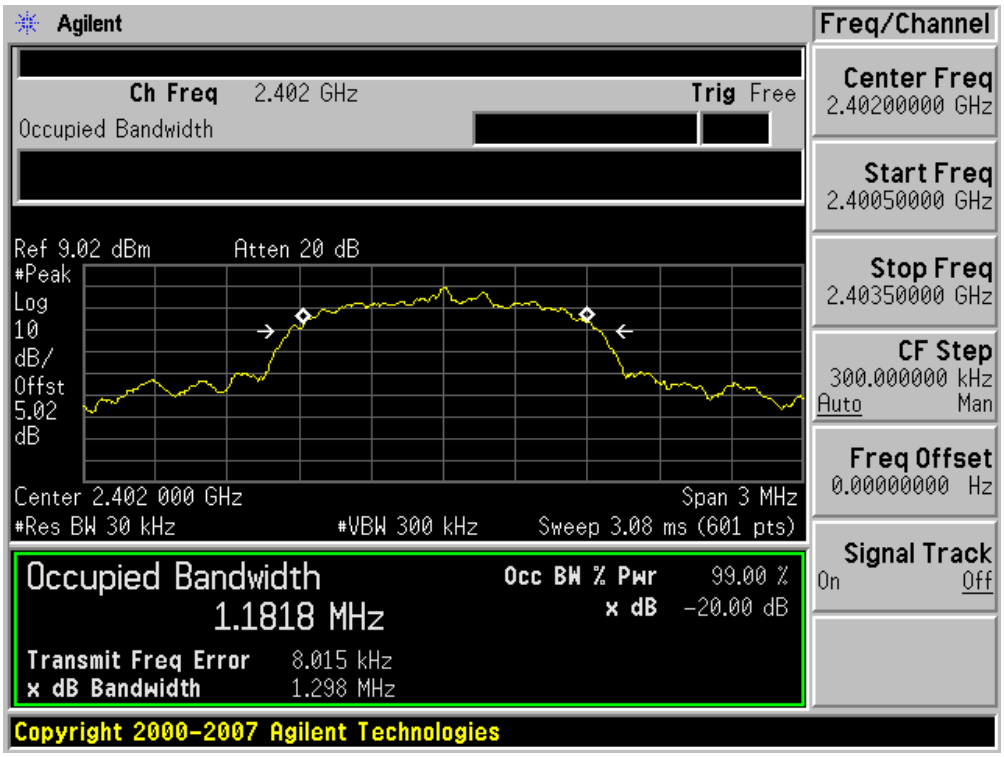
(High CH)



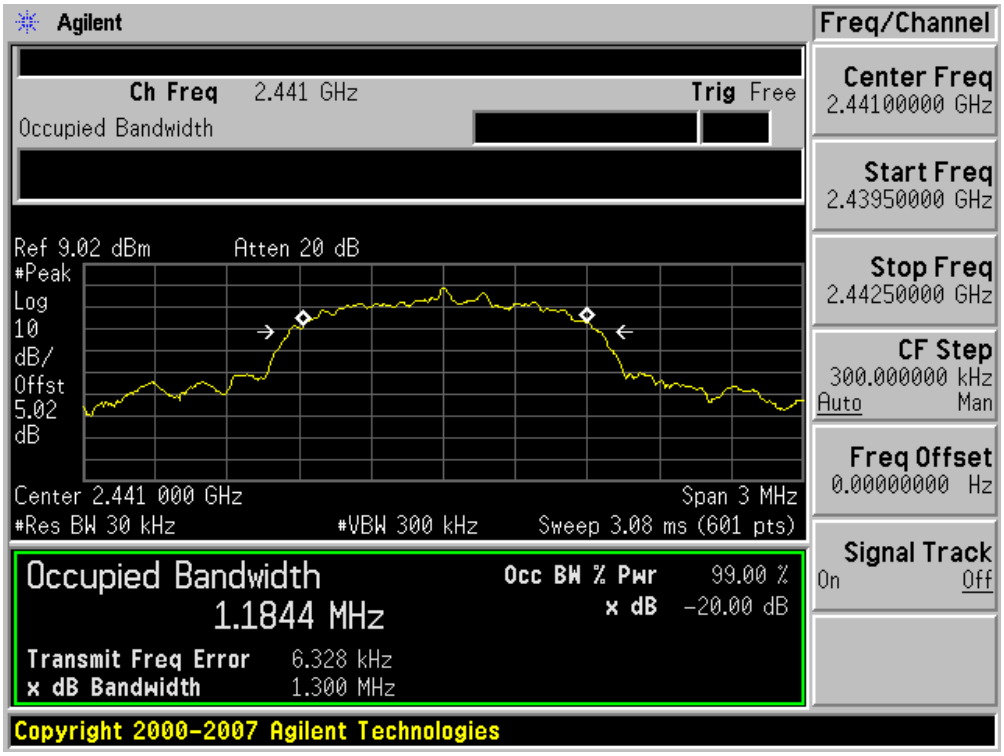
Test Plot (8DPSK)

20 dB bandwidth

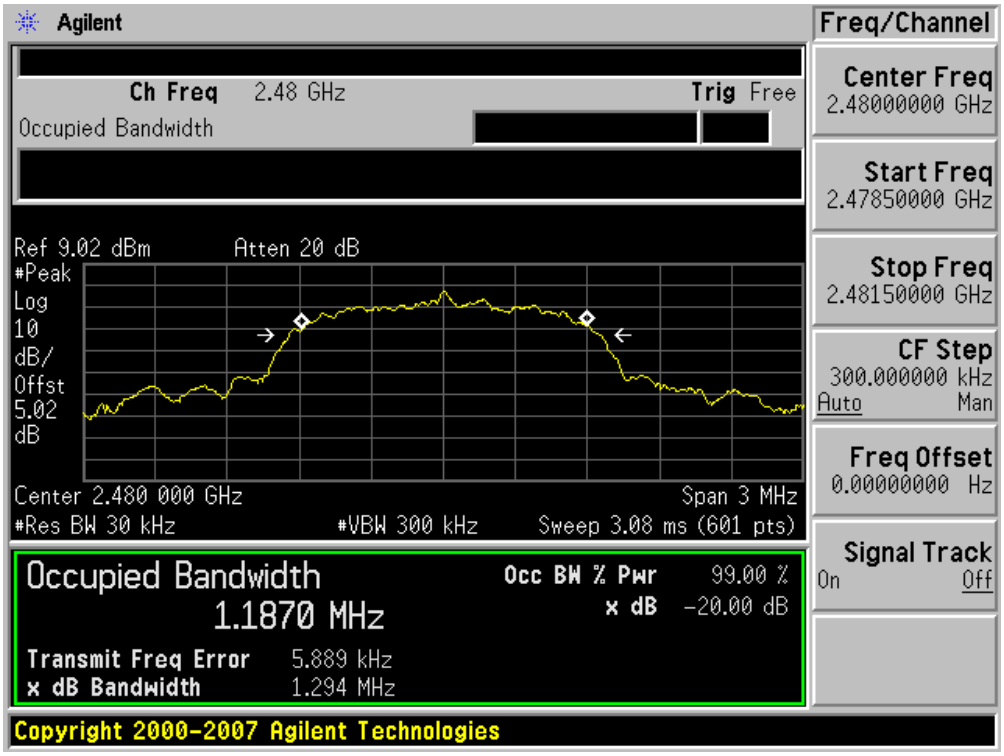
(Low CH)



(Mid CH)



(High CH)

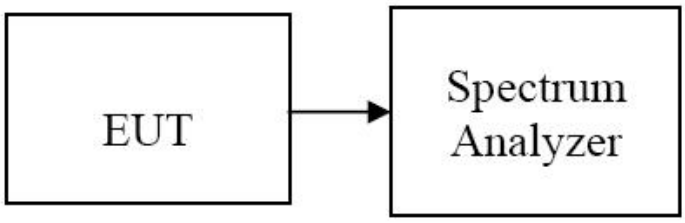


7.4 NUMBER OF HOPPING FREQUENCY

LIMIT

According to §15.247(a)(1)(ii), Frequency hopping systems operating in the 2400 MHz ~ 2483.5 MHz bands shall use at least 15 hopping frequencies.

Test Configuration



TEST PROCEDURE

The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer was set to :

1. Span = the frequency band of operation (Start = 2400 MHz, Stop = 2483.5 MHz)
2. RBW = 300 kHz
3. VBW = 300 kHz
4. Sweep = auto

The trace was allowed to stabilize.

TEST RESULTS

No non-compliance noted

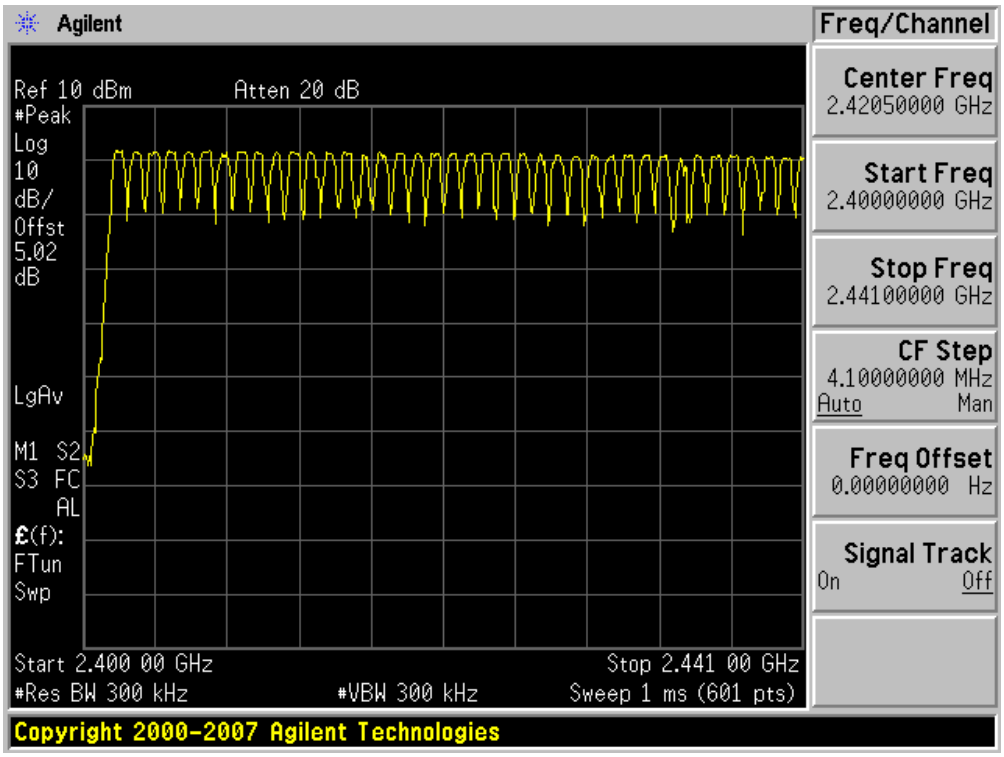
Test Data

Result (No. of CH)	Limit (No. of CH)	Result
79	>75	Pass

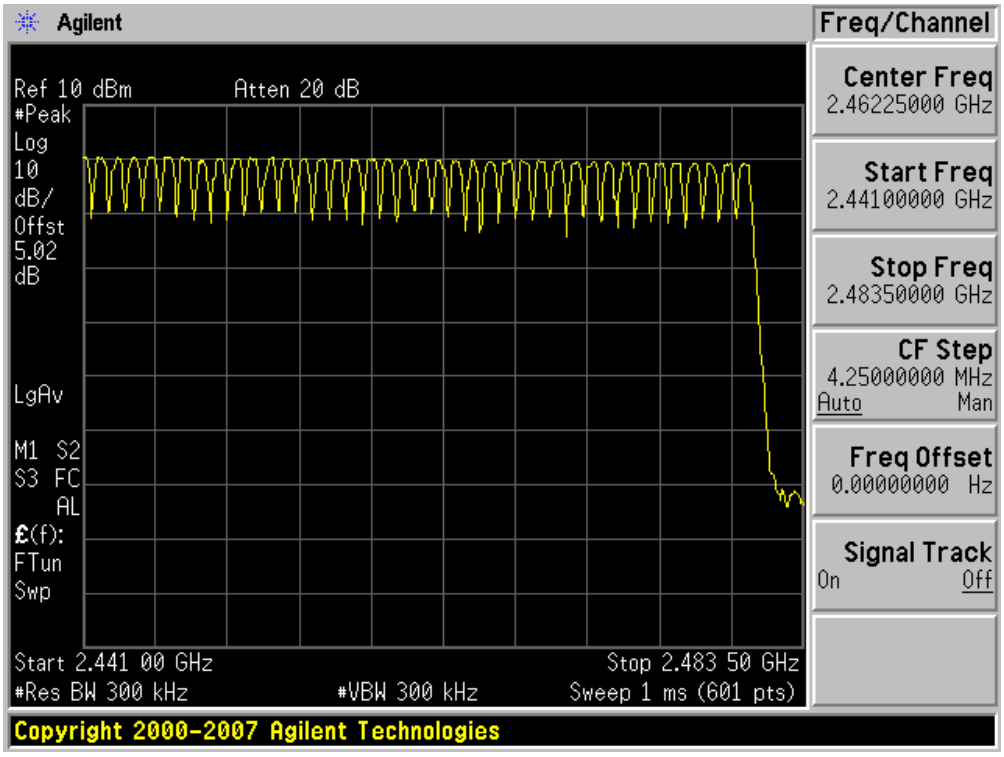
Test Plot

Number of Channels (GFSK)

2.4 GHz – 2.441 GHz

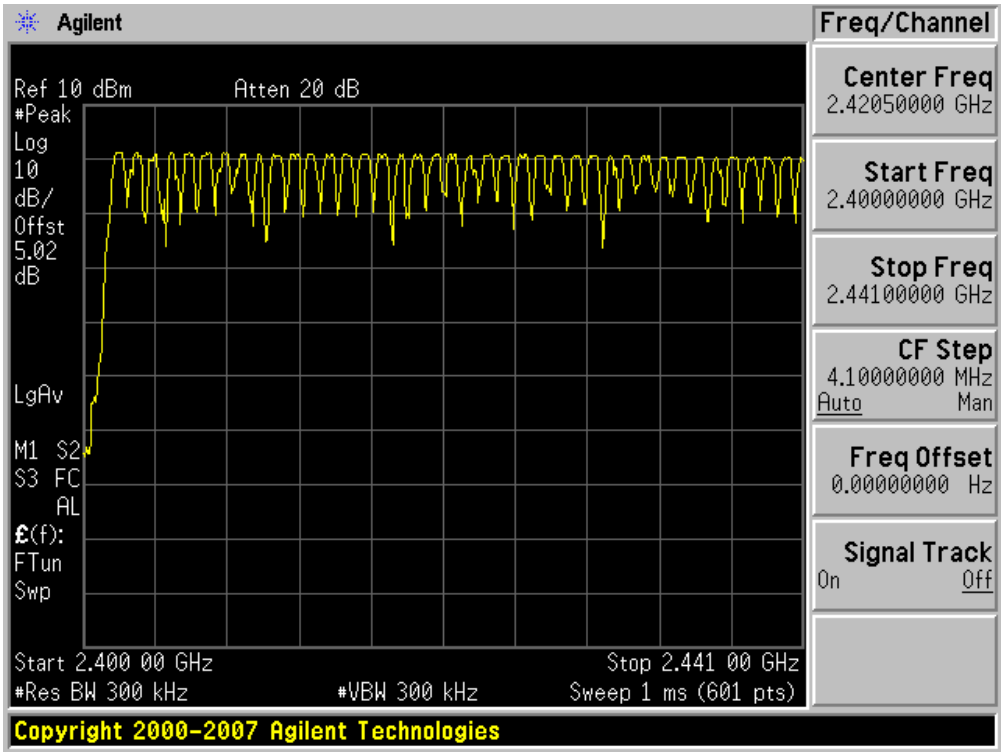


2.441 GHz – 2.4835 GHz

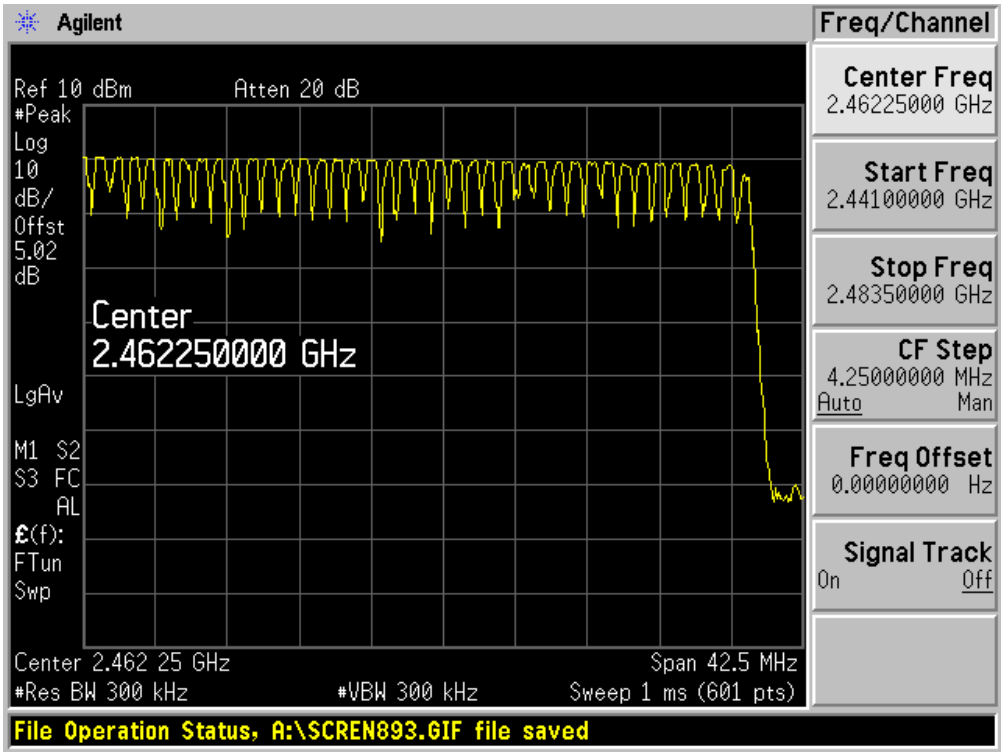


Number of Channels (8DPSK)

2.4 GHz – 2.441 GHz



2.441 GHz – 2.4835 GHz

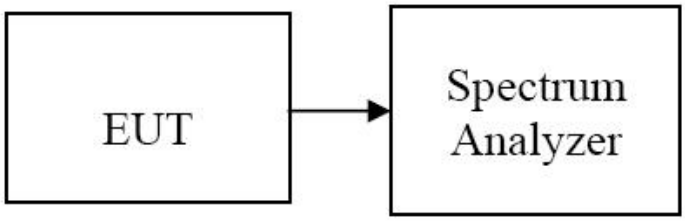


7.5 TIME OF OCCUPANCY (DWELL TIME)

LIMIT

According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400 MHz ~ 2483.5 MHz bands. The average time of occupancy on any channels shall not greater than 0.4 s within a period 0.4 s multiplied by the number of hopping channels employed.

Test Configuration



TEST PROCEDURE

EUT was set to transmit the longest packet type (DH5)

1. Span = zero span
2. RBW = 1 MHz
3. VBW = 1 MHz
4. Sweep = as necessary to capture the entire dwell time per channel

The marker-delta function was used to determine the dwell time.

TEST RESULTS

See the table.

DH 5(The longest packet type for GFSK)

CH Mid : 2.896 * (1600/6)/79 * 31.6 = 308.9 (ms)

3-DH 5(The longest packet type for 8DPSK)

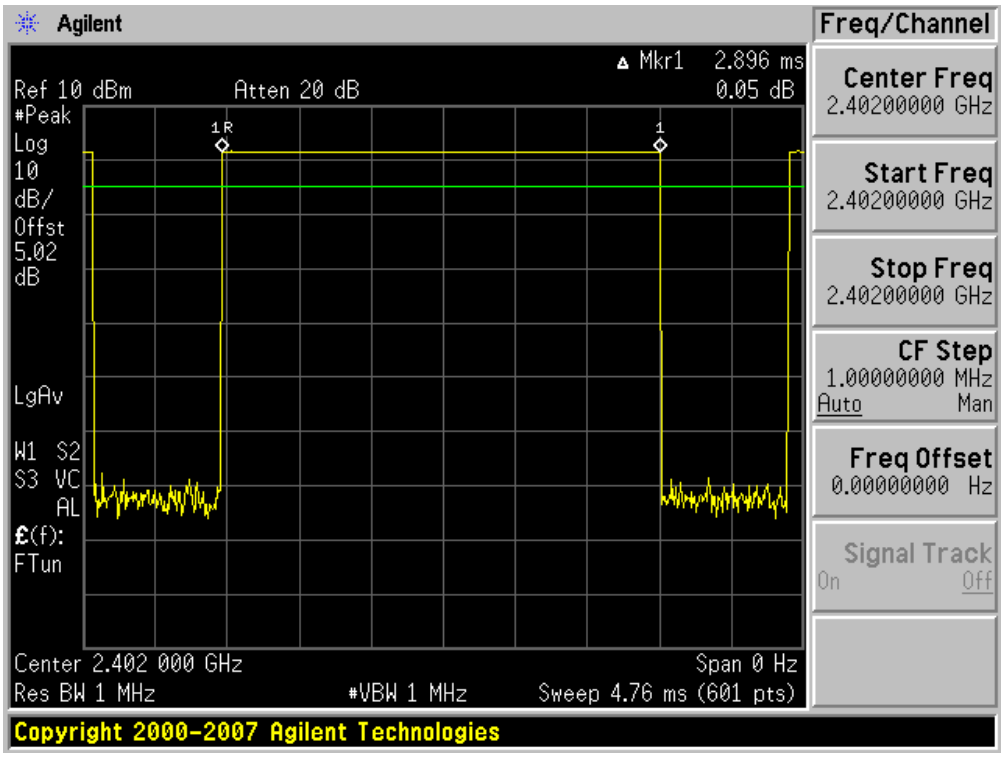
CH Mid : 2.888 * (1600/6)/79 * 31.6 = 308.0 (ms)

Channel	Pulse Time (ms)		Total of Dwell (ms)		Period Time (s)	Limit (ms)	Result
	GFSK	8DPSK	GFSK	8DPSK			
Low	2.896	2.896	308.9	308.9	31.6	400	PASS
Mid	2.896	2.888	308.9	308.0	31.6		PASS
High	2.896	2.896	308.9	308.9	31.6		PASS

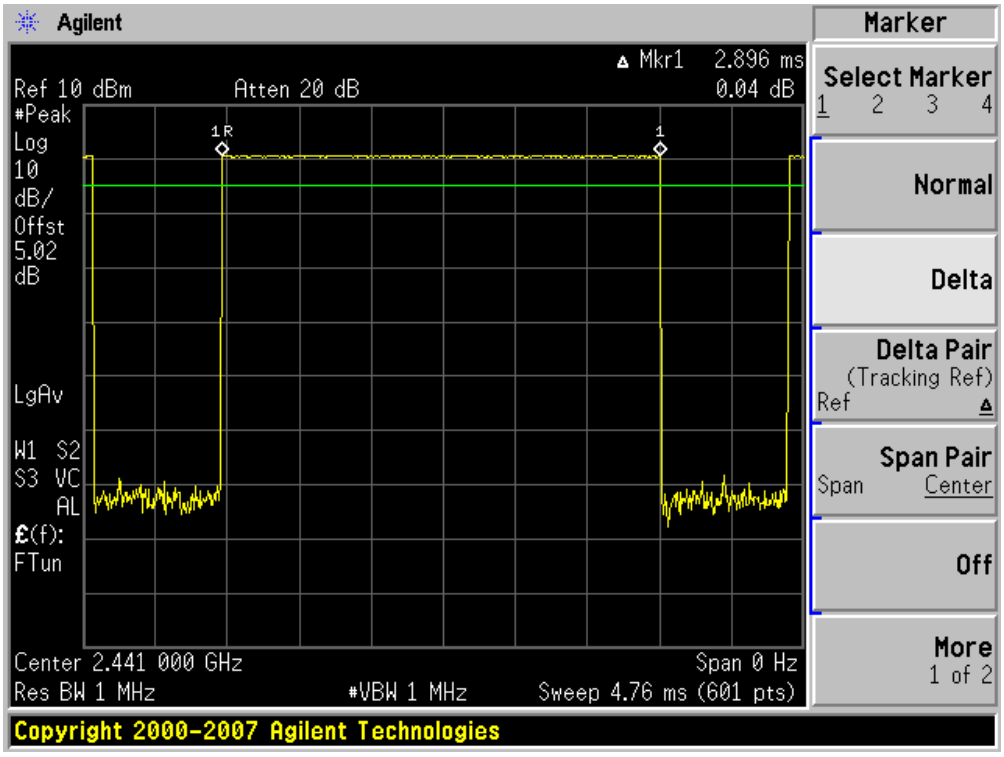
Test Plots (GFSK)

DH 5

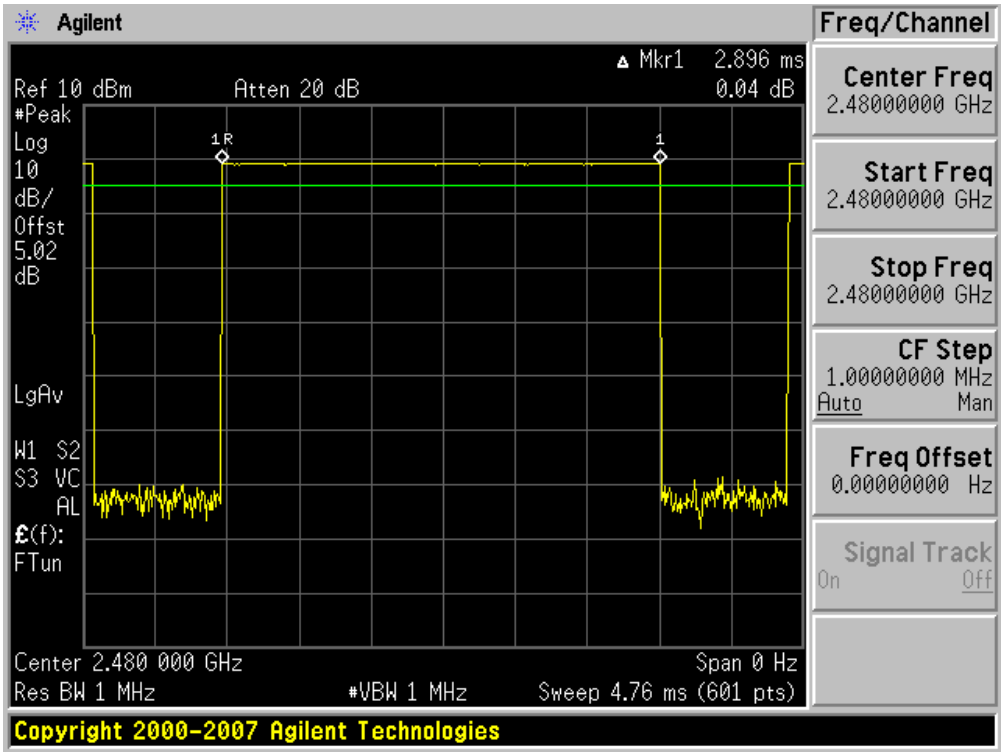
(Low CH)



(Mid CH)



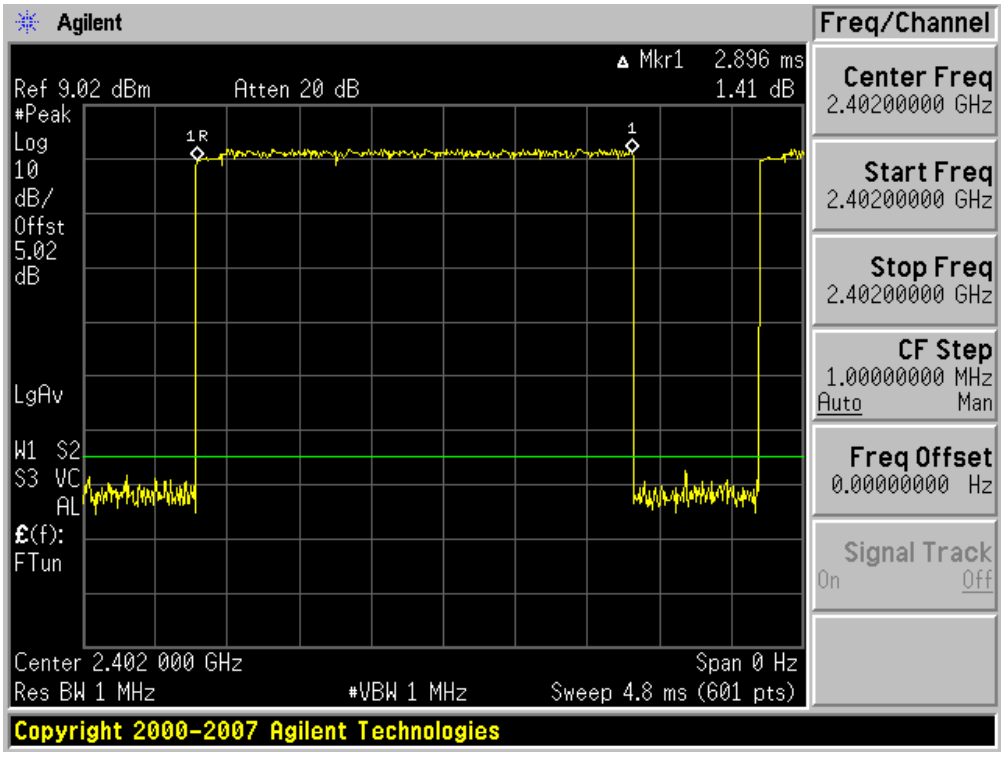
(CH High)



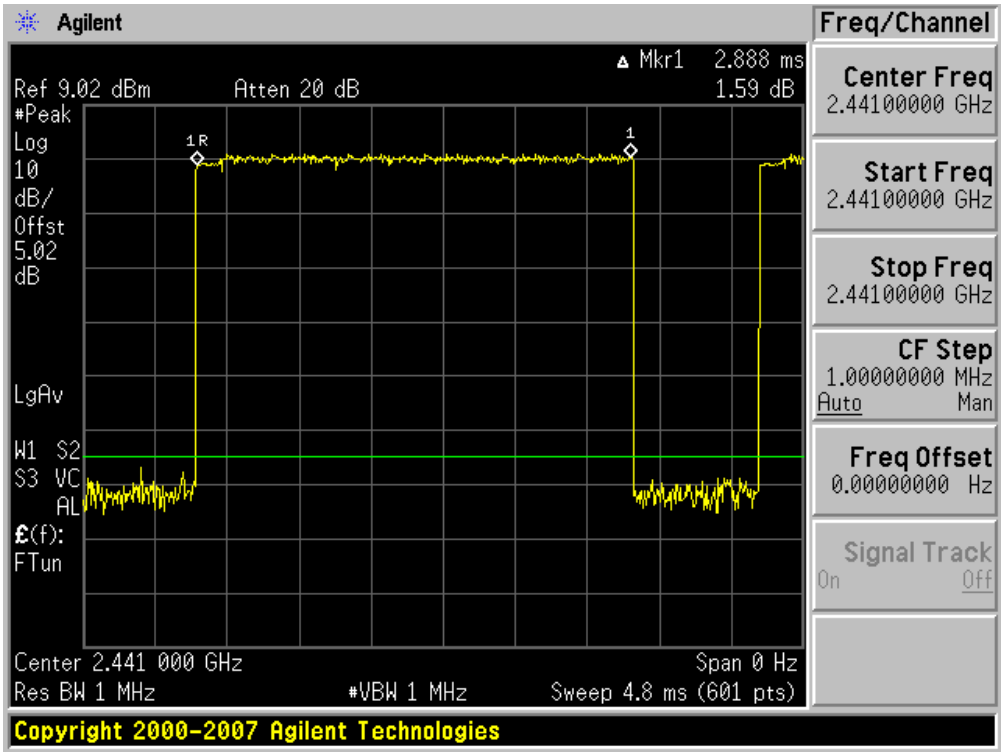
Test Plots (8DPSK)

3-DH 5

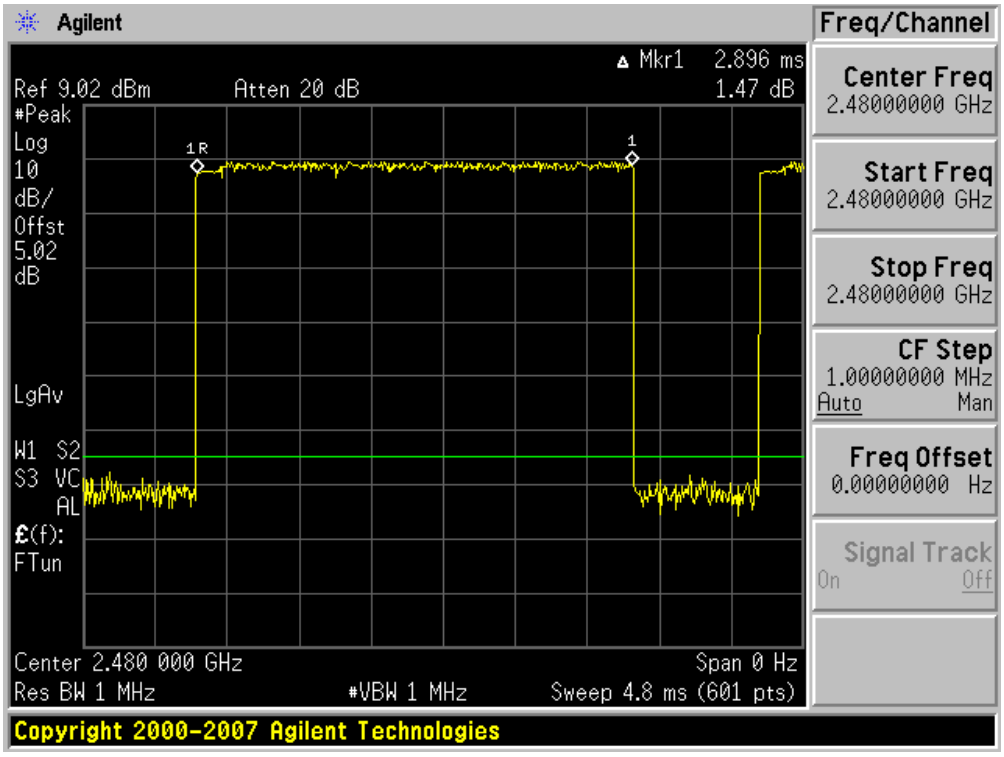
(Low CH)



(Mid CH)



(CH High)



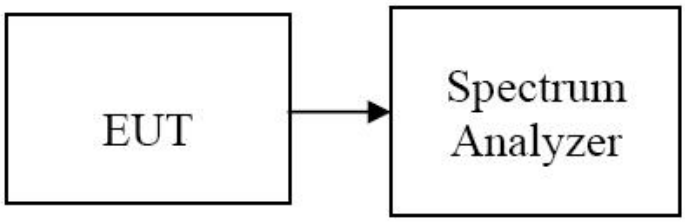
7.6 SPURIOUS EMISSIONS

7.6.1 Conducted Spurious Measurement

LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the 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)).

Test Configuration



TEST PROCEDURE

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.
Detector Mode is set to a peak detector Mode.

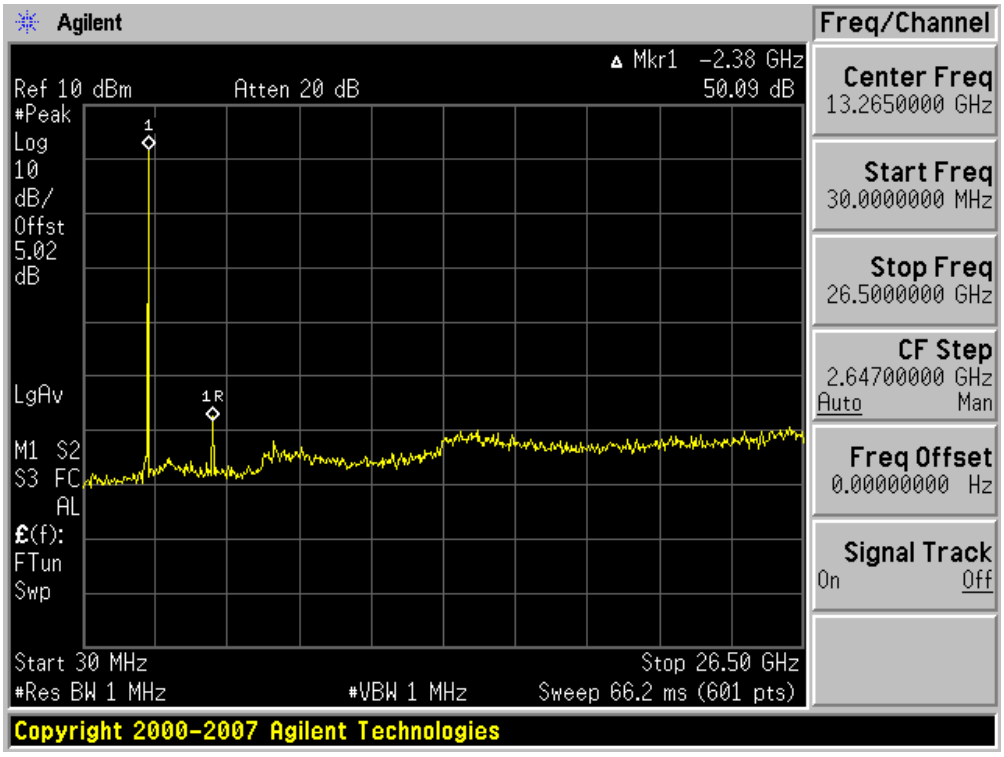
Measurements are made over the 30 MHz to 26 GHz range with the transmitter set to the lowest, middle, and highest channels.

TEST RESULTS

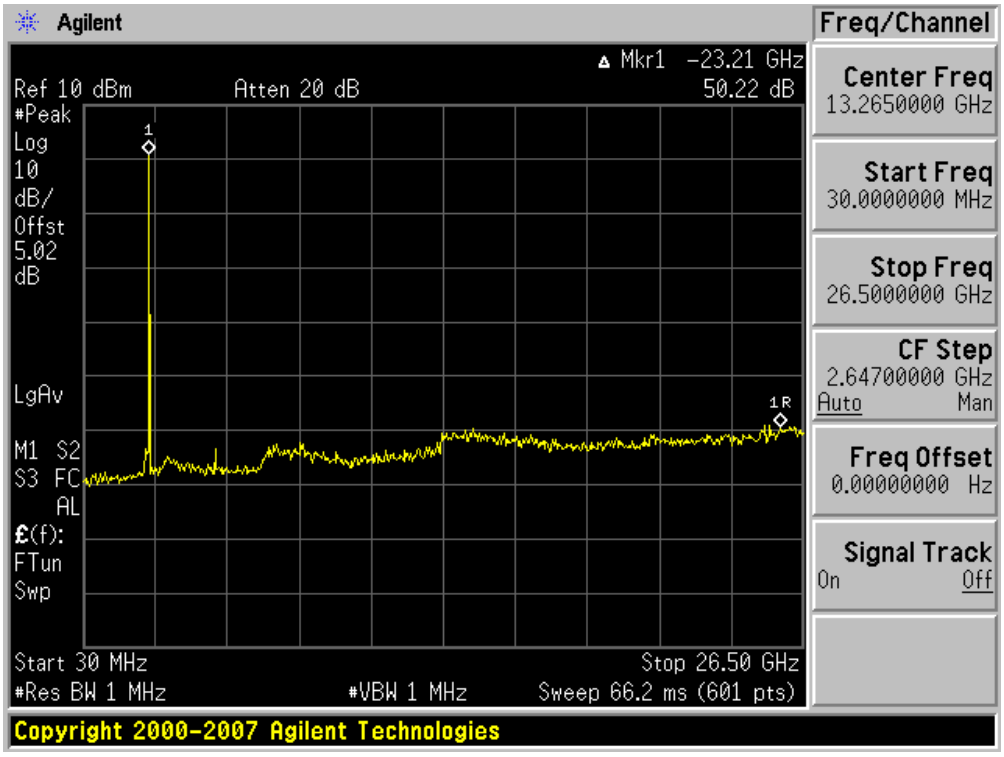
No non-compliance noted

Test Plots (GFSK)

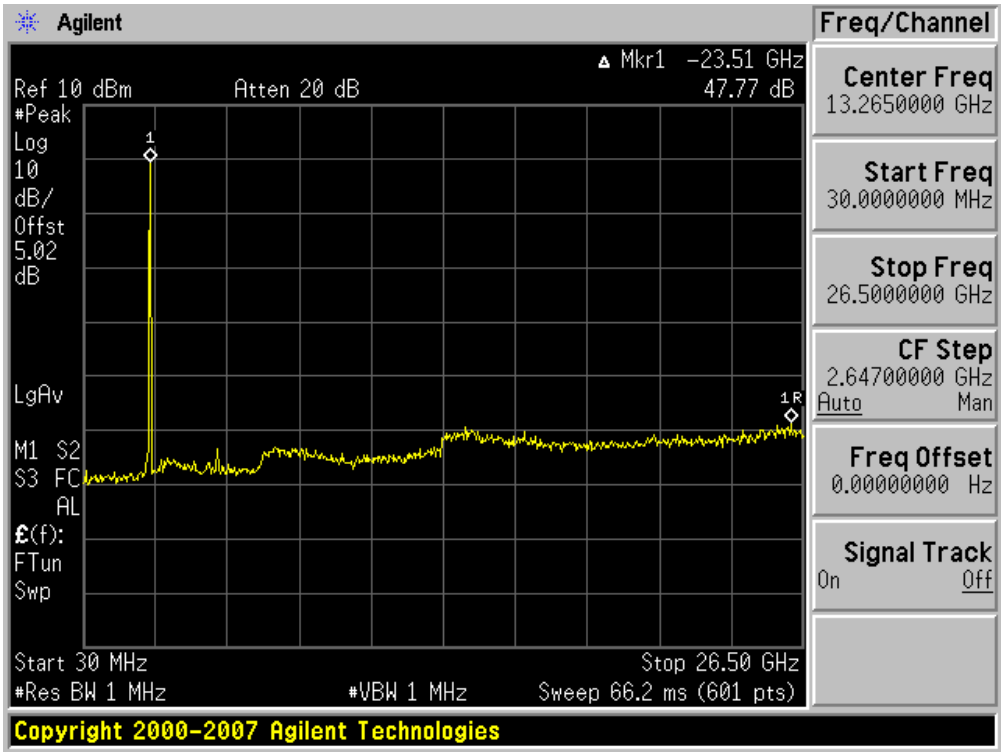
(Low CH)



(Mid CH)

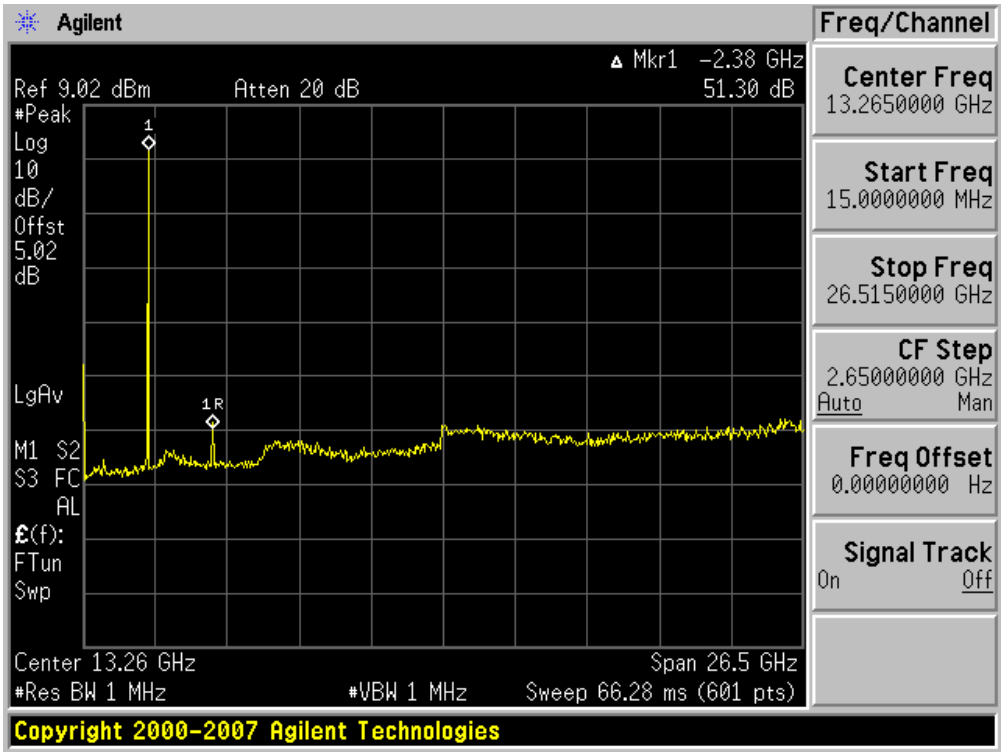


(High CH)

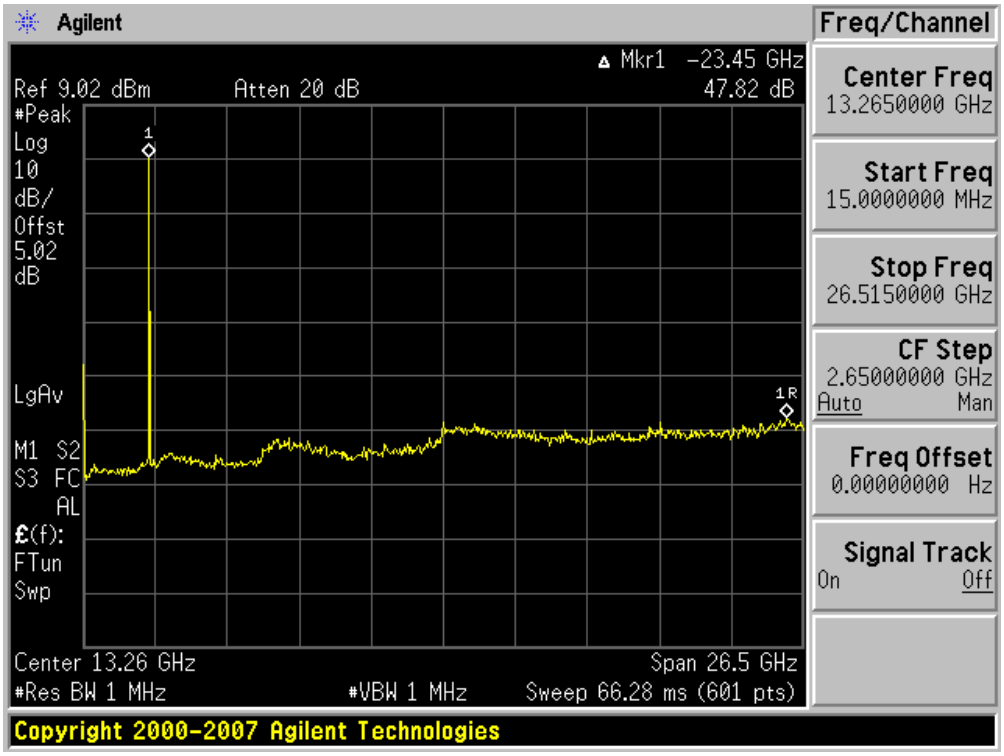


Test Plots (8DPSK)

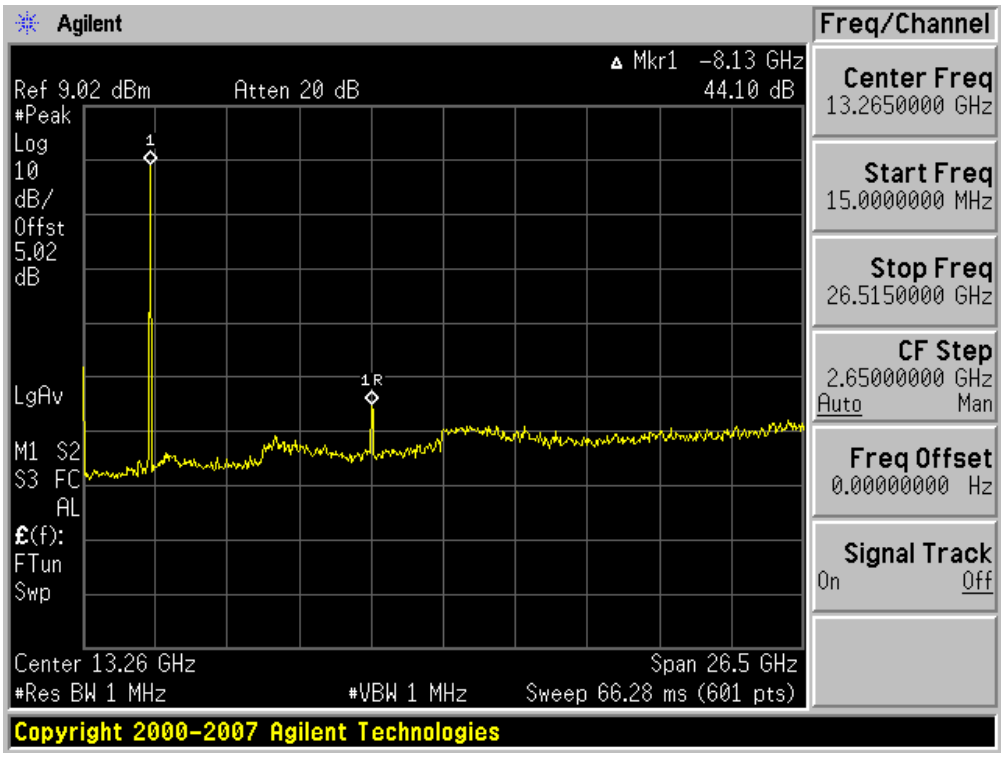
(Low CH)



(Mid CH)



(High CH)



7.6.2 Radiated Spurious Emissions

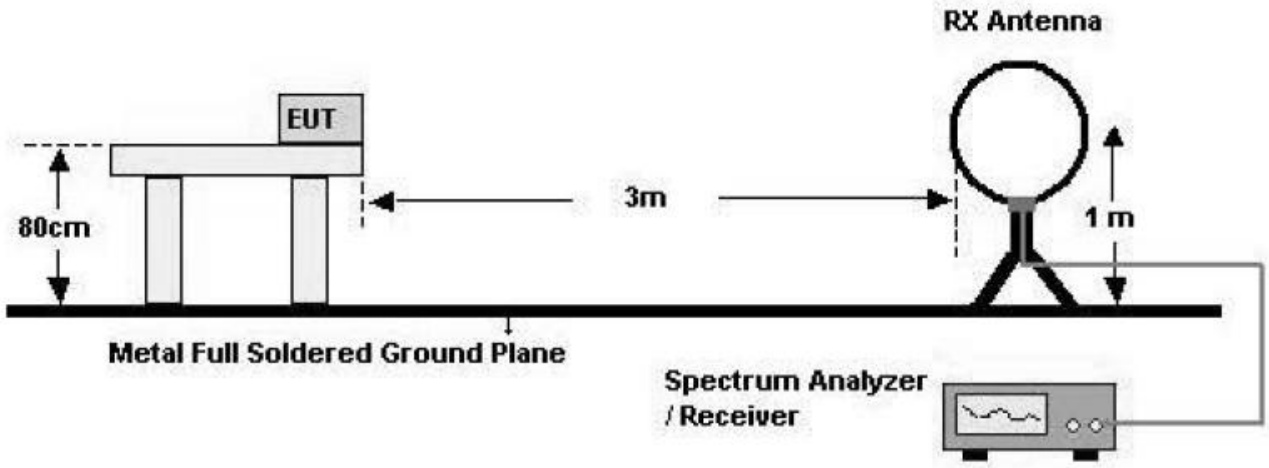
LIMIT

1. 20dBc in any 100kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed

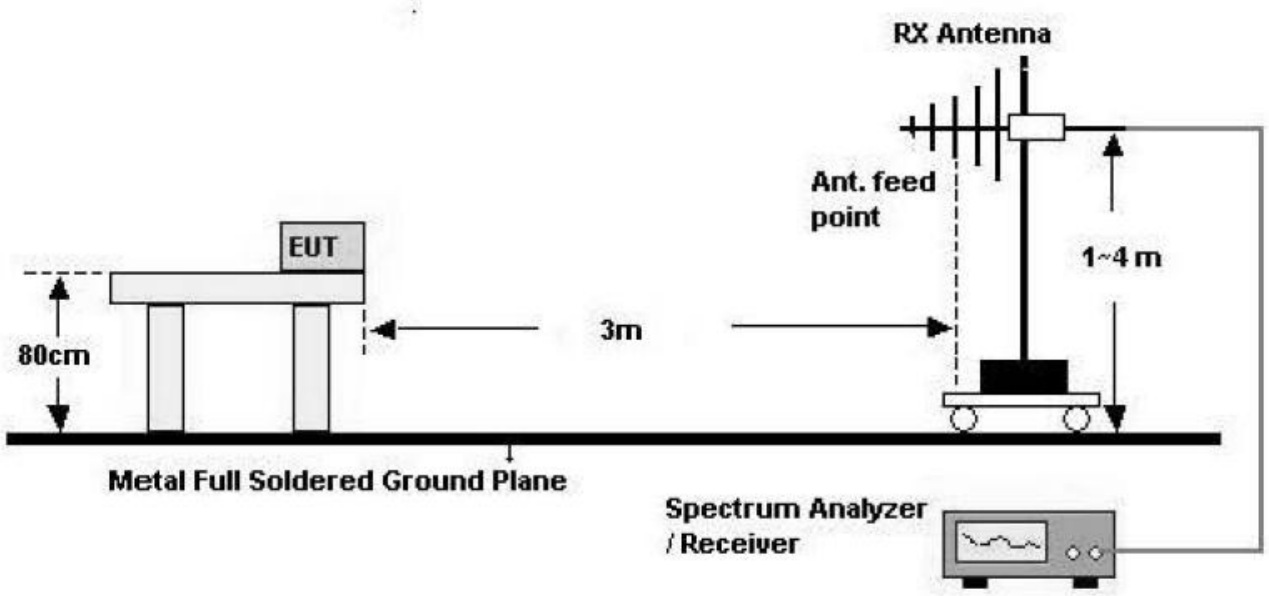
Frequency (MHz)	Field Strength (mV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

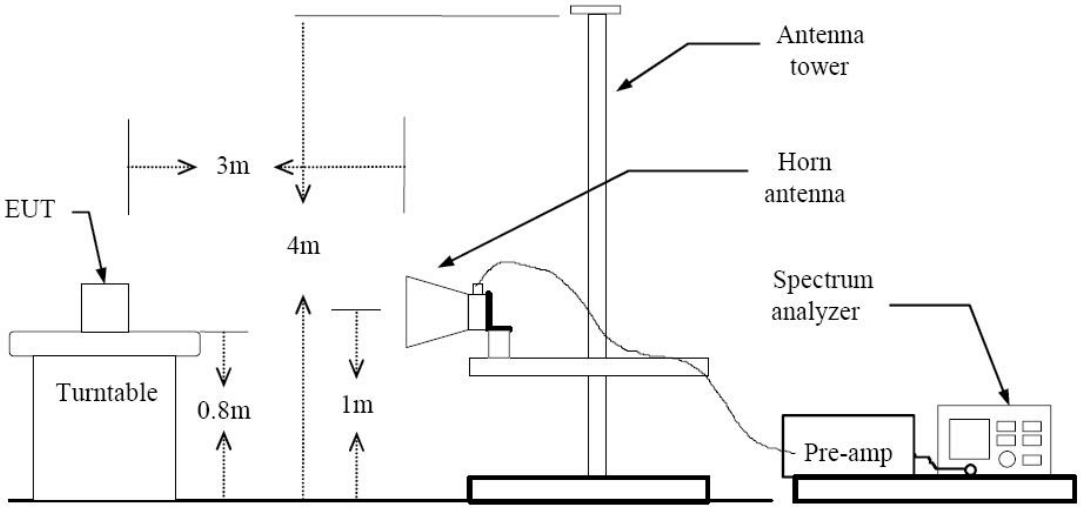
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8 m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Link

Notes:

1. Measuring frequencies from 9 kHz to the 30MHz.
2. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
3. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)
4. Limit line = specific Limits (dBuV) + Distance extrapolation factor

TEST RESULTS

Below 1 GHz

Operation Mode: Normal Link

Frequency MHz	Reading dBuV	Ant. Factor dB/m	Cable Loss dB	ANT POL (H/V)	Total dBuV/m	Limit dBuV/m	Margin dB
270.0	24.6	11.9	4.0	H	40.1	46.0	5.9
280.2	20.0	12.2	4.0	H	36.0	46.0	10.0
600.0	10.1	19.1	5.7	V	34.5	46.0	11.5
71.9	17.9	10.6	1.9	V	30.2	40.0	9.8
240.0	21.7	10.8	3.7	H	36.0	46.0	10.0
300.0	20.7	12.9	4.2	H	38.0	46.0	8.0

Notes:

1. Measuring frequencies from 30 MHz to the 1 GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Quasi peak detector mode.

Above 1 GHz

Operation Mode: CH Low (Normal)

Frequency [MHz]	Reading dBuV	※A.F+CL-AMP GAIN [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4804	48.27	-5.54	H	42.73	74	31.27	PK
4804	37.87	-5.54	H	32.33	54	21.67	AV
7206	46.50	-0.02	H	46.48	74	27.53	PK
7206	33.43	-0.02	H	33.41	54	20.60	AV
4804	48.89	-5.54	V	43.35	74	30.65	PK
4804	39.48	-5.54	V	33.94	54	20.06	AV
7206	46.65	-0.02	V	46.63	74	27.38	PK
7206	33.44	-0.02	V	33.42	54	20.59	AV

※ A·F: ANTENNA FACTOR

C·L: CABLE LOSS

AMP GAIN: AMPLIFIER GAIN

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:

a. Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.

b. AV Setting 1 GH z- 26 GHz, RBW = 1 MHz, VBW = 10 Hz.

Operation Mode: CH Mid (Normal)

Frequency [MHz]	Reading dBuV	※A.F+CL-AMP GAIN. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4882	52.78	-5.33	H	47.45	74	26.55	PK
4882	36.16	-5.33	H	30.83	54	23.17	AV
7323	46.46	0.20	H	46.67	74	27.34	PK
7323	33.53	0.20	H	33.74	54	20.27	AV
4882	47.38	-5.33	V	42.05	74	31.95	PK
4882	36.34	-5.33	V	31.01	54	22.99	AV
7323	46.23	0.20	V	46.44	74	27.57	PK
7323	33.52	0.20	V	33.73	54	20.28	AV

※ A·F: ANTENNA FACTOR

C·L: CABLE LOSS

AMP GAIN: AMPLIFIER GAIN

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
   a. Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
   b. AV Setting 1 GH z- 26 GHz, RBW = 1 MHz, VBW = 10 Hz.

Operation Mode: CH High (Normal)

Frequency [MHz]	Reading dBuV	※A.F+CL-AMP GAIN [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4960	47.33	-5.12	H	42.21	74	31.79	PK
4960	34.21	-5.12	H	29.09	54	24.91	AV
7440	47.33	0.44	H	47.77	74	26.24	PK
7440	34.65	0.44	H	35.09	54	18.92	AV
4960	47.22	-5.12	V	42.10	74	31.90	PK
4960	34.76	-5.12	V	29.64	54	24.36	AV
7440	47.93	0.44	V	48.37	74	25.64	PK
7440	34.64	0.44	V	35.08	54	18.93	AV

※ A·F: ANTENNA FACTOR

C·L: CABLE LOSS

AMP GAIN: AMPLIFIER GAIN

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
   a. Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MH.
   b. AV Setting 1 GH z- 26 GHz, RBW = 1 MHz, VBW = 10 Hz.

7.6.3 Receiver Spurious Emissions

FCC Rule(s)	§15.109 (see Table Below)
Test Requirements:	Emission Level shall not exceed §15.109 limits
Operating conditions:	Under normal test conditions
Method of testing:	Radiated
S/A. Settings:	F < 1 GHz: RBW: 120 kHz, VBW: 120 kHz (Quasi Peak) F > 1 GHz: RBW: 1 MHz, VBW: 1 MHz (Peak)
Mode of operation:	Receive

Frequency (MHz)	Field Strength (mV/m)	Measurement Distance (m)
30 - 88	100 (40 dBuV)	3
88 - 216	150 (43.5 dBuV))	3
216 - 960	200 (46 dBuV)	3
Above 960	500 (54 dBuV)	3

Operation Mode: Receive:

30 MHz ~ 1 GHz

Frequency MHz	Reading dBuV	Ant. Factor dB/m	Cable Loss dB	ANT POL (H/V)	Total dBuV/m	Limit dBuV/m	Margin dB
270.0	18.7	17.9	4.0	H	40.5	46.0	5.5
280.2	14.0	18.2	4.0	H	36.2	46.0	9.8
600.0	10.7	18.5	5.7	V	34.9	46.0	11.1
71.9	21.3	7.2	1.9	V	30.4	40.0	9.6
240.0	16.8	15.7	3.7	H	36.2	46.0	9.8
300.0	12.9	20.7	4.2	H	37.8	46.0	8.2

Above 1 GHz

Frequency MHz	Reading dBuV	Ant. Factor dB/m	Cable Loss dB	ANT POL (H/V)	Total dBuV/m	Limit dBuV/m	Margin dB
No Critical peaks found							

7.6.4 Radiated Restricted Band Edge Measurements

Test Requirements and limit, §15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the 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).

Operation Mode:	Normal
Operating Frequency	2402MHz, 2480MHz
Channel No.	CH 0, CH 78

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2340.08	47.48	-10.37	V	37.11	74	36.89	PK
2340.08	38.95	-10.37	V	28.58	54	25.42	AV
2340.40	46.74	-10.37	H	36.37	74	37.63	PK
2340.40	38.89	-10.37	H	28.52	54	25.48	AV
2487.86	46.17	-9.74	V	36.43	74	37.57	PK
2487.86	33.27	-9.74	V	23.53	54	30.47	AV
2492.54	46.53	-9.72	H	36.81	74	37.19	PK
2492.54	36.40	-9.72	H	26.68	54	27.32	AV

Notes:

1. Spectrum setting:
   a. Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
   b. AV Setting 1 GHz-26 GHz, RBW=1 MHz, VBW= 10 Hz.

8. LIST OF TEST EQUIPMENT

Manufacturer	Model / Equipment	Calibration Date	Cal Interval	Calibration Due	Serial No.
Rohde & Schwarz	ESCI/ EMI Test Receiver	08/24/ 2007	Annual	08/24/ 2008	100033
Rohde & Schwarz	ESH2-Z5/ LISN	04/20/2007	Annual	04/20/2009	861741/013
Rohde & Schwarz	ESH3-Z6/ LISN	03/19/2007	Annual	03/19/2009	100329
Schwarzbeck	VULB 9160/ TRILOG Antenna	04/20/2007	Biennial	04/20/2009	9160-3150
HD	MA240/ Antenna Position Tower	N/A	N/A	N/A	556
EMCO	1050/ Turn Table	N/A	N/A	N/A	114
HD GmbH	HD 100/ Controller	N/A	N/A	N/A	13
HD GmbH	KMS 560/ SlideBar	N/A	N/A	N/A	12
Rohde & Schwarz	ESH3-Z2/ PULSE LIMITER	10/03/2007	Annual	10/03/2008	375.8810.352
MITEQ	AMF-60-0010 1800-35-20P	01/15/2008	Annual	01/15/2009	1200937
Schwarzbeck	BBHA 9120D/ Horn Antenna	03/30/2007	Biennial	03/30/2009	147
Schwarzbeck	BBHA9170/ SHF-EHF Horn Antenna	03/20/2007	Biennial	03/20/2009	BBHA9170342
Rohde & Schwarz	6502/Loop Antenna	12/26/2007	Biennial	12/26/2009	9009-2536
Rohde & Schwarz	FSP30/Spectrum Analyzer	07/31/2008	Annual	07/31/2009	839117/011
Agilent	E4440A/Spectrum Analyzer	01/08/2008	Annual	01/08/2009	US45303008
Agilent	E4416A /Power Meter	01/22/2008	Annual	01/22/2009	GB41291412
Wainwright Instrument	WHF3.3/18G-10EF / High Pass Filter	06/28/2007	Annual	06/28/2009	1
Hewlett Packard	11636B/Power Divider	01/14/2008	Annual	01/14/2009	11377
DIGITAL	EP-3010 /DC POWER SUPPLY	01/10/2008	Annual	01/10/2009	3110117

THRU Lab & Engineering

No	Description	Manufacturer	Model No.	Serial No.	Due Cal.	Used
1	Test Receiver	Rohde & Schwarz	ESHS 10	862970/018	2009. 05. 13	☒
2	Test Receiver	Rohde & Schwarz	ESVS 10	826008/014	2009. 06. 20.	☒
3	Spectrum Analyzer	Hewlett Packard	8566B	2311A02394	2009.06. 10.	☒
4	Spectrum Display	Hewlett Packard	85662A	2542A12429	2009. 06. 10.	☒
5	Preamplifier	Hewlett Packard	8447F	2805A02570	2009. 05. 26	☒
6	Preamplifier	A.H. Systems	PAM-0118	164	2009. 04. 28.	☒
7	Biconical Antenna	Eaton Corp.	94455-1	0977	2010. 07. 03	☐
8	Biconical Antenna	EMCO	3104C	9111-2468	2010. 07. 07.	☒
9	Log Periodic	EMCO	3146	2051	2010. 06. 05.	☒
10	Horn antenna	A.H. Systems	SAS-571	414	2009. 07. 17.	☒
11	Horn antenna	A.H. Systems	SAS-571	781	2009. 07. 17.	☐
12	Loop Antenna	Rohde & Schwarz	HFH2-Z2.335.4711.	826532/006	2009. 01. 31.	☒
13	Dipole Antenna	Rohde & Schwarz	VHAP	574	2010. 07. 08	☐
14	Dipole Antenna	Rohde & Schwarz	VHAP	575	2010. 07. 17.	☐
15	Dipole Antenna	Rohde & Schwarz	UHAP	546	2010. 07. 08	☒
16	Dipole Antenna	Rohde & Schwarz	UHAP	547	2010. 07. 17.	☒
17	Signal Generator	Hewlett Packard	8673D	2708A00448	2009. 06. 10.	☒
18	Spectrum Analyzer	Advantest Corp.	R3261C	61720208	2009. 06. 10.	☐
19	LISN	EMCO	3825/2	9111-1912	2008. 12. 12.	☒
20	LISN	Kyoritsu	KNW-242	8-923-2	2009. 06. 05.	☒
21	Modulation Analyzer	Hewlett Packard	8901B	3438A05094	2009. 05. 29.	☐
22	Waveform Generator	Hewlett Packard	33120A	US34001190	2009. 05. 29.	☐
23	Audio analyzer	Hewlett Packard	8903B	3011A12915	2009. 05. 29.	☐