TEST REPORT

For

Mobile phone

In conformity with

FCC CFR 47 Part15 (October 1, 2008)

Model: F-07B

FCC ID: VQK-F07B

Test Item: Mobile phone

Report No: RY1002Z10R2

Issue Date: 10 February, 2010

Prepared for

FUJITSU LIMITED
1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki 211-8588, Japan

Prepared by

RF Technologies Ltd.
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History

Report No.	Date	Revisions	Revised By
RY1002Z10R2	10 February, 2010	Initial Issue	K. Ohnishi

1 General information

1.1 Product description

Test item	: Mobile phone
Manufacturer	: FUJITSU LIMITED
Address	: 1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki 211-8588, Japan
Model	: F-07B
FCC ID	: VQK-F07B
Serial numbers	: 3531 7003 0006 690
Fundamental Operated Frequency	: Tx/Rx Freq. (2402 - 2480 MHz)
Oscillator frequencies	: 26 MHz
Type of Modulation	: FHSS (GFSK, π/4DQPSK, 8DPSK)
RF Output Power	: 3.89dBm (measured at the antenna terminal)
Antenna Gain	: -8.00 dBi (λ/4 Monopole antenna)
Receipt date of EUT	: 1 February, 2010
Nominal power source voltages	: DC 3.7V (Battery)

1.2 Test(s) performed/ Summary of test result

Test specification(s)	: FCC CFR 47. Part 15 (October 1, 2008)
Test method(s)	: ANSI C63.4: 2003
Test(s) started	: 4 February, 2010
Test(s) completed	: 5 February, 2010
Purpose of test(s)	: Grant for Certification of FCC
Summary of test result	: Complied (RF Conducted test only)

Note: The above judgment is only based on the measurement data and it does not include the measurement uncertainty. Accordingly, the statement below is applied to the test result.
The EUT complies with the limit required in the standard in case that the margin is not less than the measurement uncertainty in the Laboratory.
Compliance of the EUT is more probable than non-compliance is case that the margin is less than the measurement uncertainty in the Laboratory.

Test engineer : K. Ohnishi
K.Ohnishi
EMC testing Department

Reviewer : T. Ikegami
T. Ikegami
Manager
EMC testing Department

1.3 Test facility

The Federal Communications Commission has reviewed the technical characteristics of the test facilities at RF Technologies Ltd., located in 472, Nippa-cho, Kohoku-ku, Yokohama, 223-0057, Japan, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948, per October 1, 2007. The description of the test facilities has been filed under registration number 319924 at the Office of the Federal Communications Commission. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.
The list of all public test facilities is available on the Internet at http://www.fcc.gov.

Registered by Voluntary Control Council for Interference by Information Technology Equipment (VCCI)
Each registered facility number is as follows;
Test site (Semi-Anechoic chamber 3m) R-2393
Test site (Shielded room) C-2617

Registered by Industry Canada (IC): The registered facility number is as follows;
Test site No. 1 (Semi-Anechoic chamber 3m): 6974A

Accredited by **National Voluntary Laboratory Accreditation Program** (NVLAP) for the emission tests stated in the scope of the certificate under Certificate Number 200780-0

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

NVLAP LAB CODE 200780-0

1.4 Measurement uncertainty

The treatment of uncertainty is based on the general matters on the definition of uncertainty in “Guide to the expression of uncertainty in measurement (GUM)” published by ISO. The Lab’s uncertainty is determined by referring UKAS Publication LAB34: 2002 “The Expression of Uncertainty in EMC Testing” and CISPR16-4-2: 2003 “Uncertainty in EMC Measurements”.
The uncertainty of the measurement result in the level of confidence of approximately 95% (k=2) is as follows;

RF Conducted level: ± 0.9 dB

1.5 Summary of test results

1.5.1 Table of test summary

Requirement of;	Section in FCC15	Result	Section in this report
1.5.1 Occupied Bandwidth (20 dB/99%)	2.1049, 15.247(a)(1)	-	2.1
1.5.2 Hopping Carrier Frequency Separation	15.247(a)(1)	Complied	2.2
1.5.3 Number of Hopping Channel	15.247(a)(1)(iii)	Complied	2.3
1.5.4 Average Time of Occupancy	15.247(a)(1)(iii)	Complied	2.4
1.5.5 Peak Output Power	15.247(a)(1)/(b)(1)	Complied	2.5
1.5.6 Conducted Spurious Emissions	15.247(d)	Complied	2.6
1.5.7 Transmitter Radiated Spurious Emissions	15.205(b)/15.209	-	-
1.5.8 Transmitter AC Power Line Conducted Emissions	15.207	-	-

1.6 Setup of equipment under test (EUT)

1.6.1 Test configuration of EUT

Equipment(s) under test:

	Item	Manufacturer	Model No.	Serial No.	Remarks
A	Mobile phone	FUJITSU LIMITED	F-07B	3531 7003 0006 690	
B	Li-ion Battery Pack	FUJITSU LIMITED	F11	AAF29118	DC3.7V / 770mAh

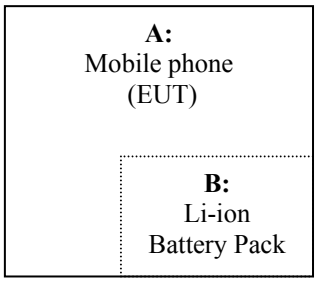
1.6.2 Operating condition:

Operating mode:

The EUT was tested under the following test mode prepared by the applicant:

(1-1) GFSK modulation, Continuous transmission with DH1/3/5 PACKET at hopping off (2402MHz)
(1-2) GFSK modulation, Continuous transmission with DH1/3/5 PACKET at hopping off (2441MHz)
(1-3) GFSK modulation, Continuous transmission with DH1/3/5 PACKET at hopping off (2480MHz)
(1-4) π/4DQPSK modulation, Continuous transmission with DH1/3/5 PACKET at hopping off (2402MHz)
(1-5) π/4DQPSK modulation, Continuous transmission with DH1/3/5 PACKET at hopping off (2441MHz)
(1-6) π/4DQPSK modulation, Continuous transmission with DH1/3/5 PACKET at hopping off (2480MHz)
(1-7) 8DPSK modulation, Continuous transmission with DH1/3/5 PACKET at hopping off (2402MHz)
(1-8) 8DPSK modulation, Continuous transmission with DH1/3/5 PACKET at hopping off (2441MHz)
(1-9) 8DPSK modulation, Continuous transmission with DH1/3/5 PACKET at hopping off (2480MHz)
(1-10) Continuous transmission with DH1/3/5 PACKET at hopping on

1.6.3 Setup diagram of tested system:



1.7 Equipment modifications

No modifications have been made to the equipment in order to achieve compliance with the applicable standards described in clause 1.2.

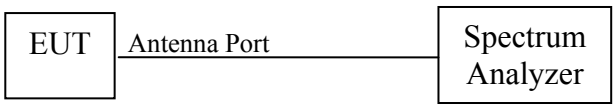
1.8 Deviation from the standard

No deviations from the standards described in clause 1.2.

2 Test procedure and test data

2.1 Occupied Bandwidth (20 dB / 99%)

Test setup
Test setup is the following drawing. The antenna port of EUT was connected to the spectrum analyzer.



Test procedure
Measurement procedures were implemented according to the method of ANSI C63.4: 2003 clauses 13.1.7.
The EUT antenna port connected to the spectrum analyzer. The RBW is set to 1% to 3% of the measured 20dB bandwidth. The VBW is set to 3 times of the RBW. The sweep time is coupled appropriate.

Limitation
There are no limitations. The measurement value is used to calculation of the limitation of the channel separation and the emission designator.

Test equipment used (refer to List of utilized test equipment)

SA06	CL26				

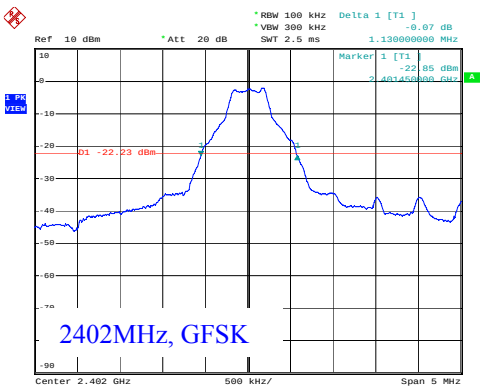
Test results

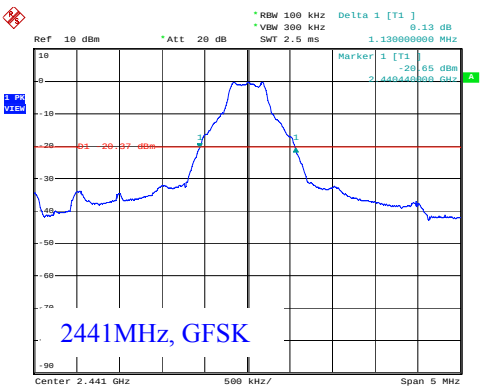
Operating Mode	Transmission Channel	Transmission Frequency	Bandwidth [MHz]	
			20dB	99%
GFSK (1Mbps)	Low (0ch)	2402	1.130	0.990
	Middle (39ch)	2441	1.130	0.990
	High (78ch)	2480	1.130	0.990
π/4DQPSK (2Mbps)	Low (0ch)	2402	1.390	1.210
	Middle (39ch)	2441	1.390	1.210
	High (78ch)	2480	1.390	1.210
8DPSK (3Mbps)	Low (0ch)	2402	1.390	1.210
	Middle (39ch)	2441	1.390	1.220
	High (78ch)	2480	1.390	1.220

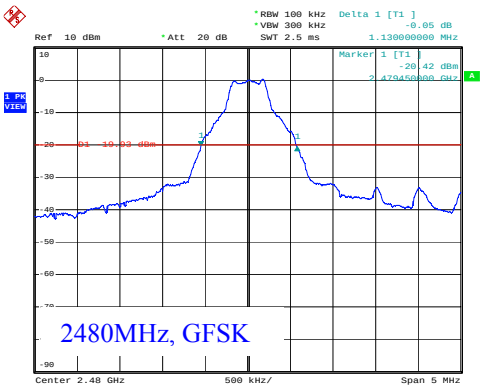
Test Data
Tested Date: 5 February, 2010

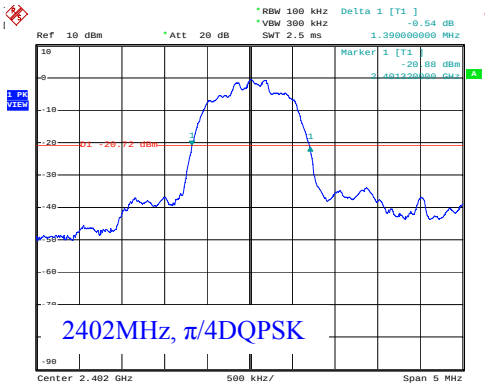
Temperature: 20 ˚C
Humidity: 22 %
Atmos. Press: 1009 hPa

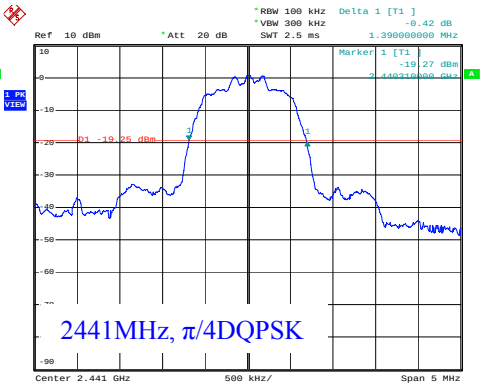
20dB Bandwidth

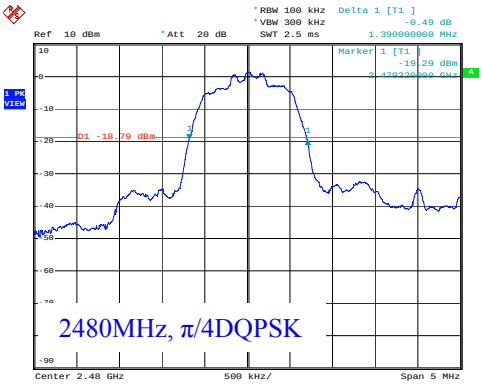


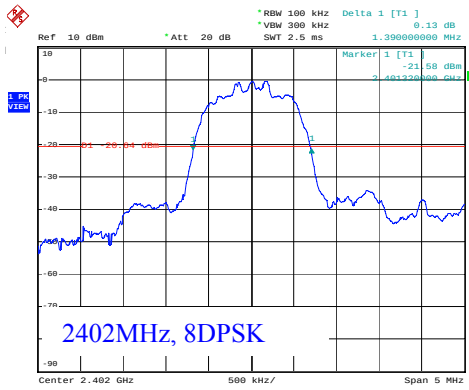


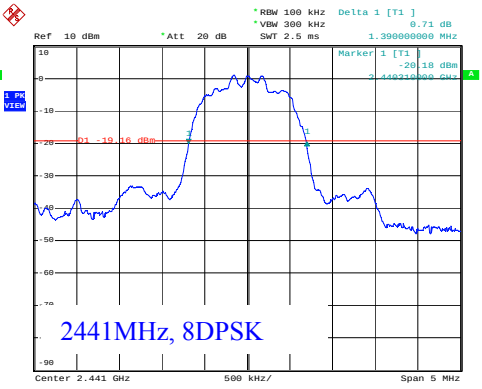


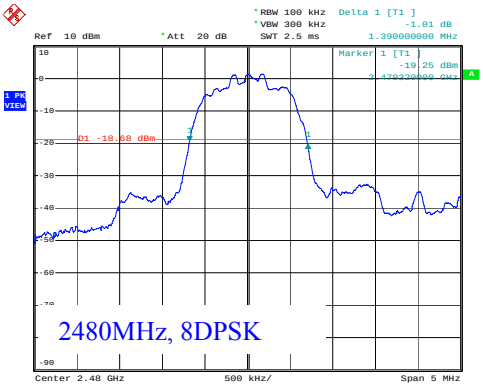




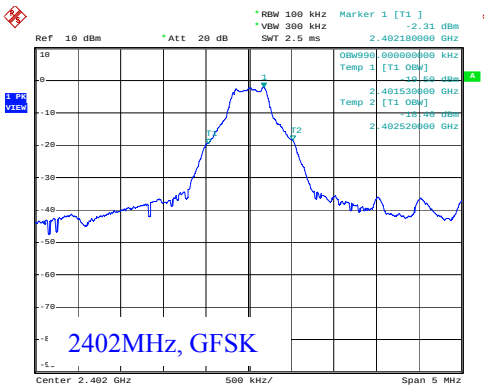


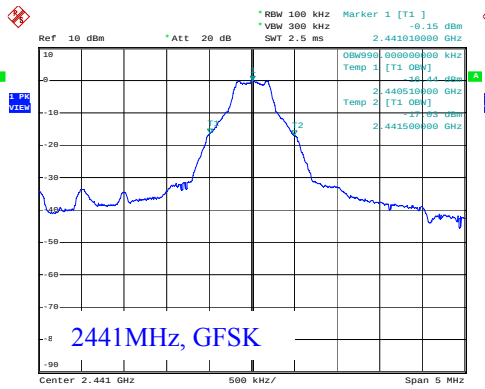


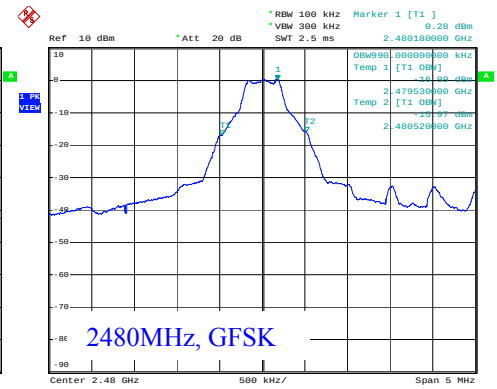


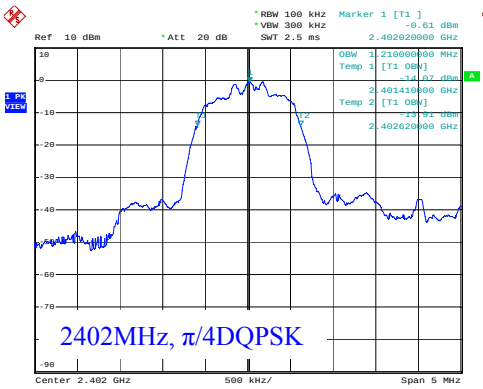


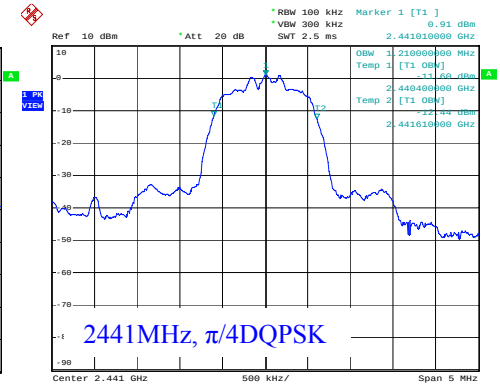
99% Occupied Bandwidth

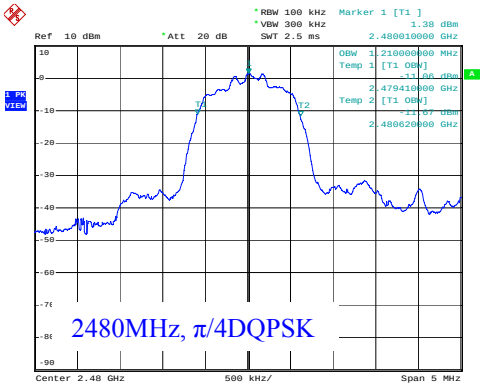


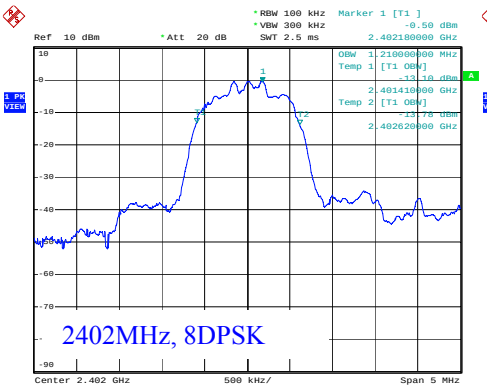


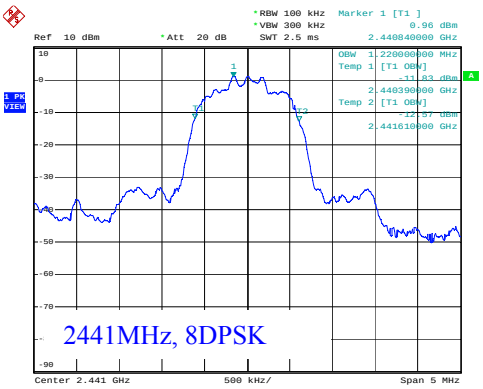


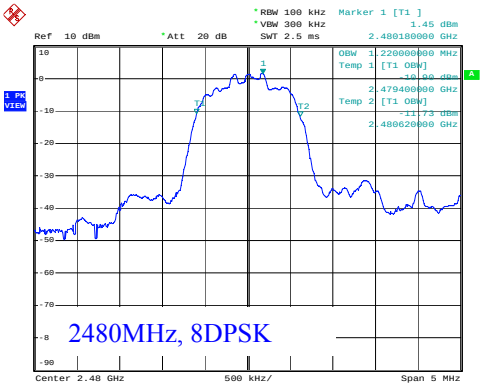






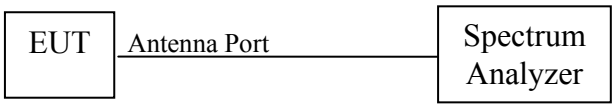






2.2 Hopping Carrier Frequency Separation

Test setup
Test setup is the following drawing. The antenna port of EUT was connected to the spectrum analyzer.



Test procedure
The EUT antenna port connected to the spectrum analyzer. The RBW is set to more than 1% of its span. The VBW is set to more than RBW. The sweep time is coupled appropriate.

Limitation
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, provided the systems operate with an output power no greater than 125 mW.

Test equipment used (refer to List of utilized test equipment)

SA06	CL26				

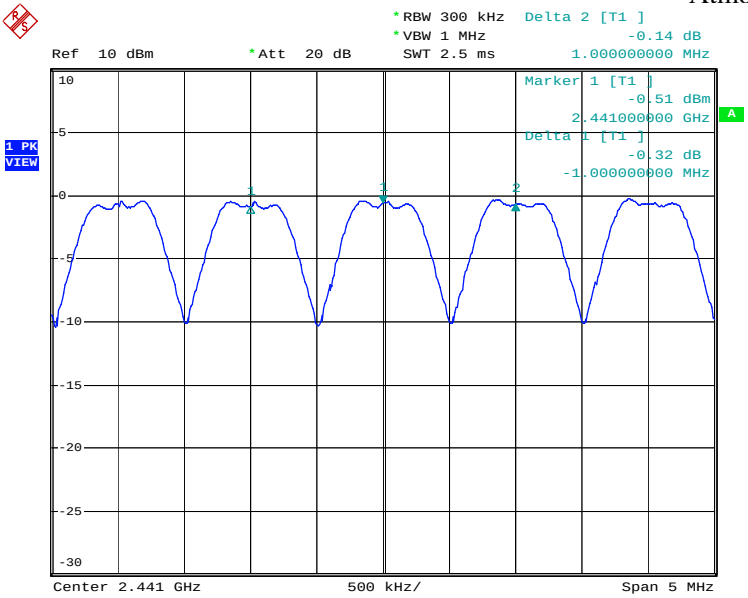
Test results – comply with the limitation

Operating Mode	Measured Channel	Measured Frequency (MHz)	Two-third of the 20dB bandwidth (MHz)	Frequency Separation (MHz)
GFSK	Middle (39ch)	2441	0.753	1.0
π/4DQPSK	Middle (39ch)	2441	0.927	1.0
8DPSK	Middle (39ch)	2441	0.927	1.0

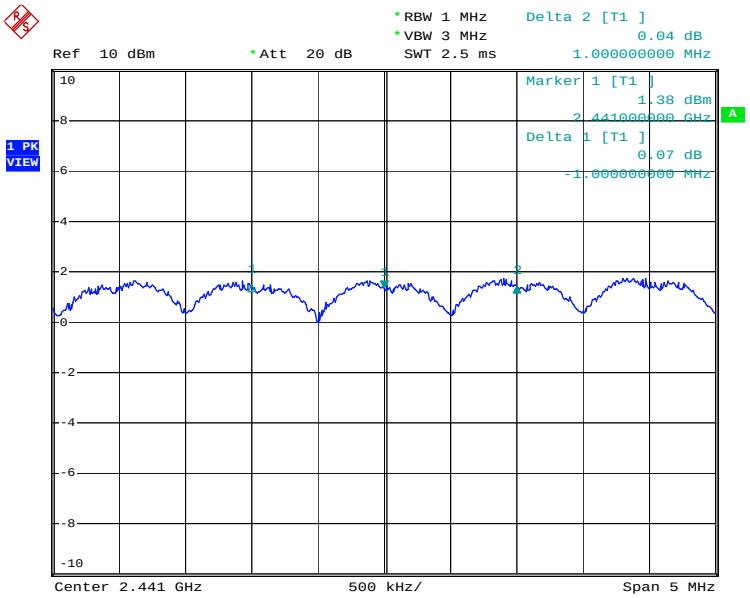
Test Data
Tested Date: 5 February, 2010

Temperature: 20 ˚C
Humidity: 22 %
Atmos. Press: 1009 hPa

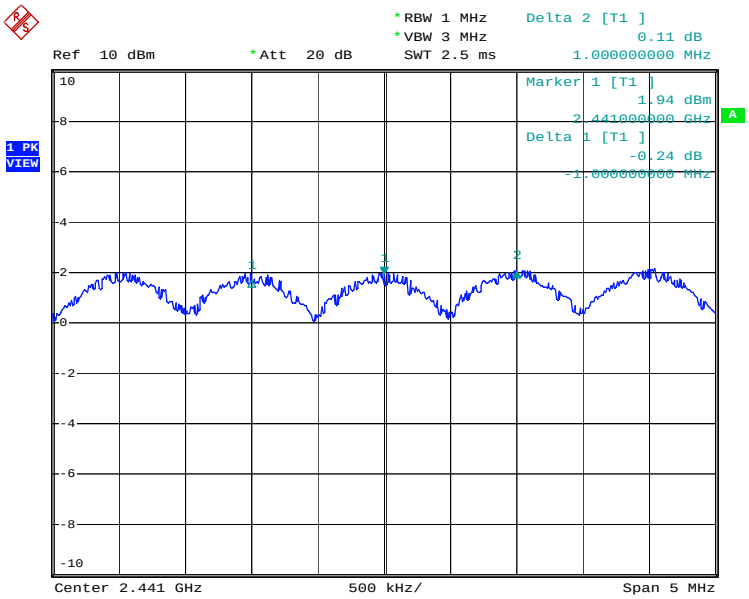
Operating mode: GFSK



Operating mode: π/4DQPSK

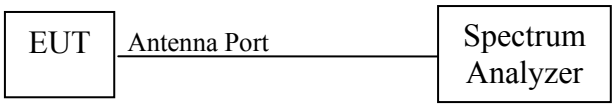


Operating mode: 8DPSK



2.3 Number of Hopping Channel

Test setup
Test setup is the following drawing. The antenna port of EUT was connected to the spectrum analyzer.



Test procedure
The EUT antenna port connected to the spectrum analyzer. The RBW is set to more than 1% of its span. The VBW is set to more than RBW. The sweep time is coupled appropriate. The span is set to cover the authorized band. The analyzer is set to MAX HOLD. The EUT is hopping operation.

Limitation
15.247(a) (1) (iii) (iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

Test equipment used (refer to List of utilized test equipment)

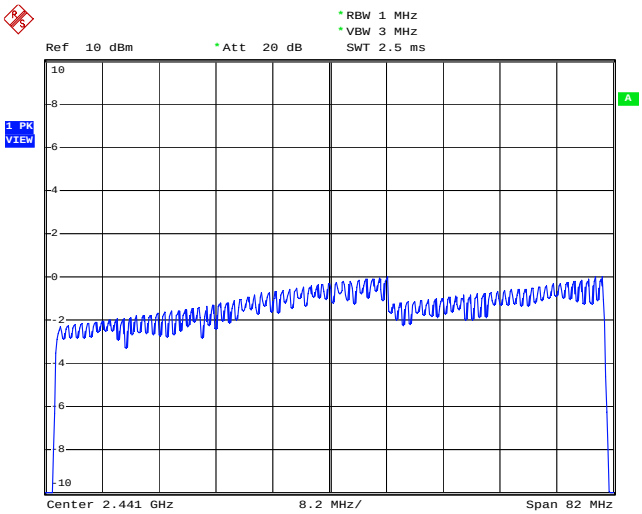
SA06	CL26				

Test results – Comply with the limitation
Hopping channel: 79 channels

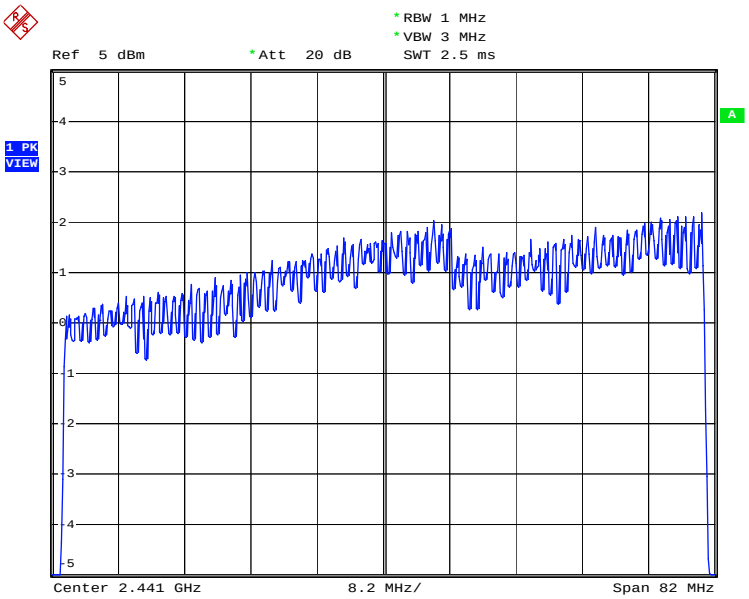
Test Data
Tested Date: 5 February, 2010

Temperature: 20 ˚C
Humidity: 22 %
Atmos. Press: 1009 hPa

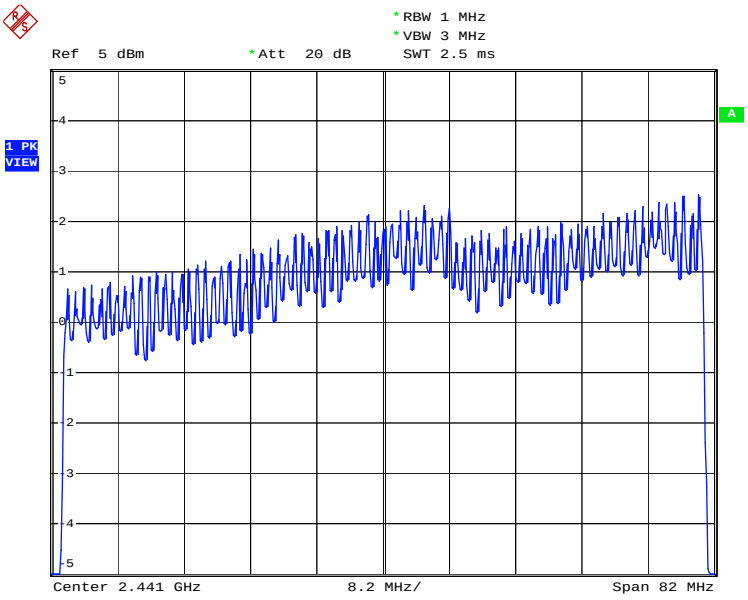
Operating mode: GFSK



Operating mode: π/4DQPSK

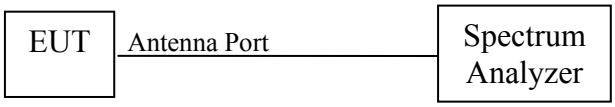


Operating mode: 8DPSK



2.4 Average Time of Occupancy

Test setup
Test setup is the following drawing. The antenna port of EUT was connected to the spectrum analyzer.



Test procedure
The EUT antenna port connected to the spectrum analyzer. The RBW is set to 1 MHz. The VBW is set to more than RBW. The sweep time is coupled appropriate. The span is set to 0 MHz and single sweep with video triggered. The EUT is hopping operation.
The average time of occupancy within the 31.6 seconds (79 channels * 0.4) is calculated as follows in accordance with Bluetooth formula;
In case of DH1: (average time of occupancy) = (pulse width) * (1600 / 2) / 79 * 31.6
In case of DH3: (average time of occupancy) = (pulse width) * (1600 / 4) / 79 * 31.6
In case of DH5: (average time of occupancy) = (pulse width) * (1600 / 6) / 79 * 31.6

Limitation
15.247(a)(1)(iii) The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

Test equipment used (refer to List of utilized test equipment)

SA06	CL26				

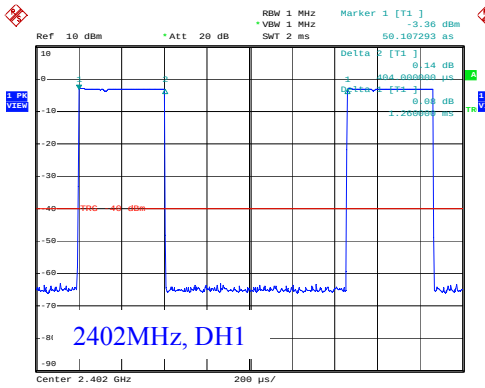
Test results – comply with the limitation.

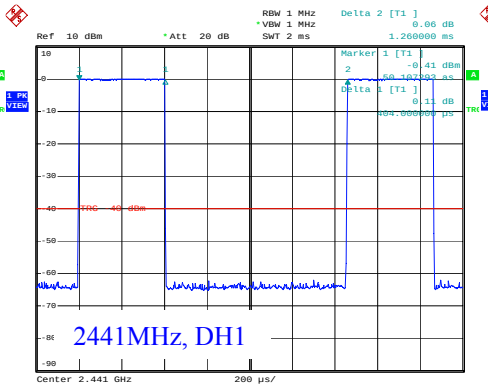
Operating Mode	Frequency [MHz]	Transmission Packet Type	Pulse width (msec)	Time of occupancy (msec)
GFSK	**2402**	DH1	0.404	129.28
		DH3	1.664	266.24
		DH5	**2.924**	**311.89**
	2441	DH1	0.404	129.28
		DH3	1.664	266.24
		DH5	**2.924**	**311.89**
	2480	DH1	0.404	129.28
		DH3	1.664	266.24
		DH5	**2.924**	**311.89**
π/4DQPSK	2402	DH1	0.416	133.12
		DH3	1.666	266.56
		DH5	2.916	311.04
	2441	DH1	0.416	133.12
		DH3	1.666	266.56
		DH5	2.916	311.04
	2480	DH1	0.416	133.12
		DH3	1.666	266.56
		DH5	2.916	311.04
8DPSK	2402	DH1	0.416	133.12
		DH3	1.666	266.56
		DH5	2.916	311.04
	2441	DH1	0.416	133.12
		DH3	1.666	266.56
		DH5	2.916	311.04
	2480	DH1	0.416	133.12
		DH3	1.666	266.56
		DH5	2.916	311.04

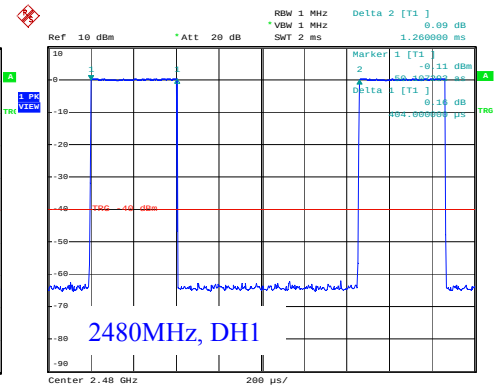
Test Data
Tested Date: 4 February, 2010

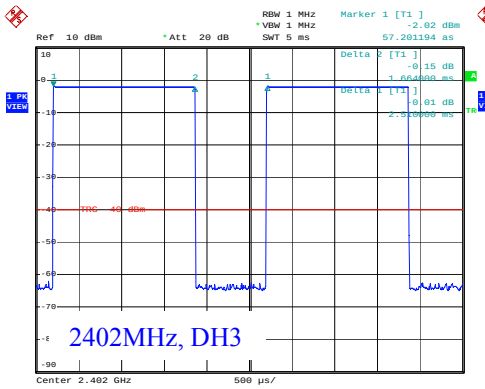
Temperature: 20 ˚C
Humidity: 28 %
Atmos. Press: 1010 hPa

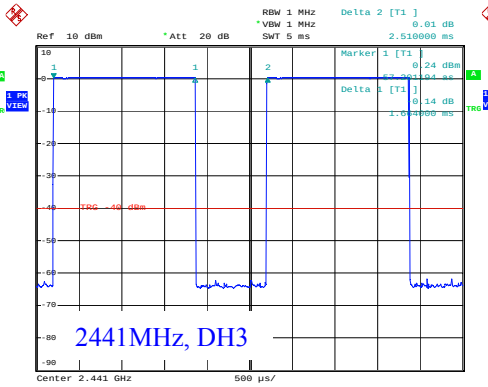
Operating mode: GFSK

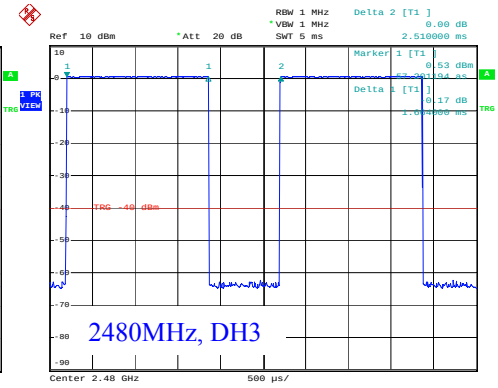


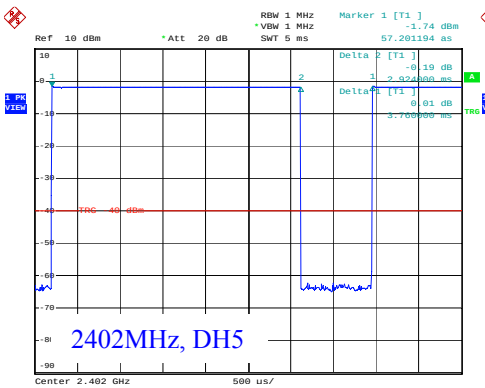


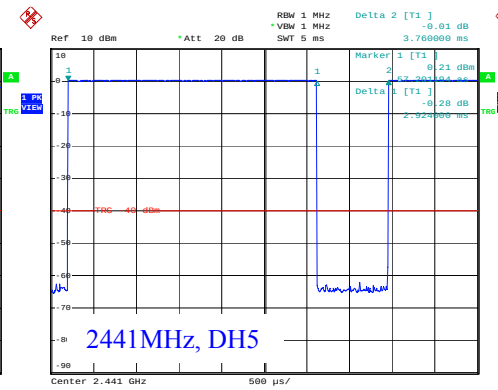


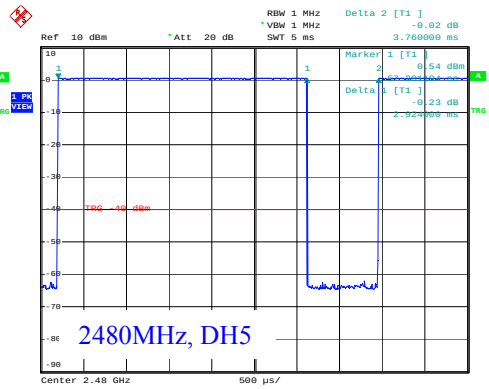




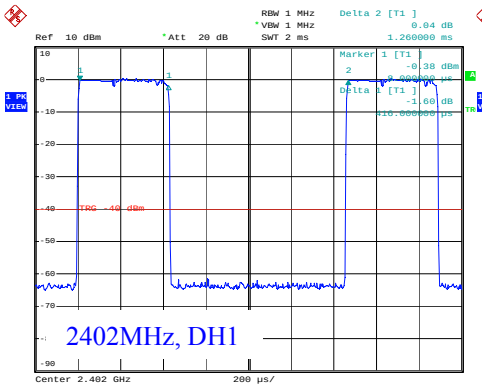


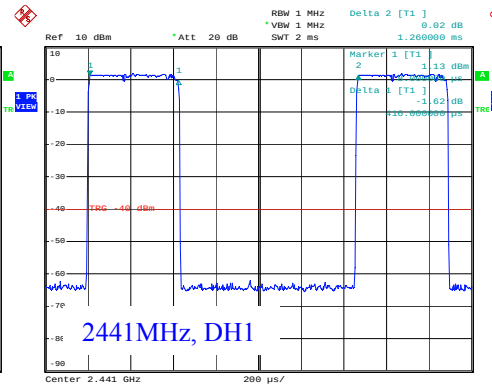


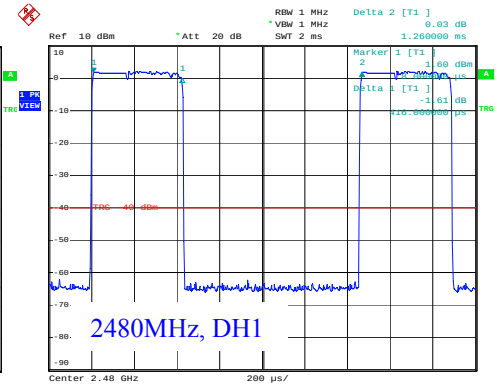


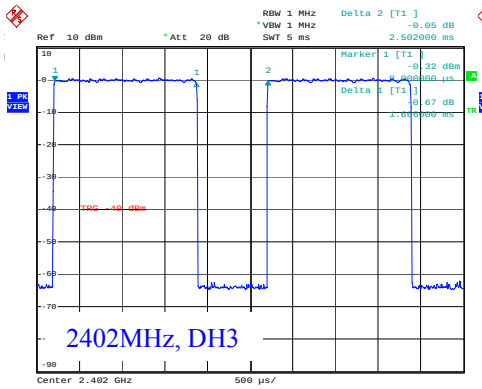


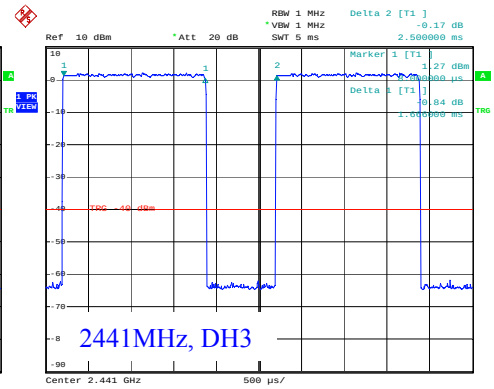
Operating mode: π/4DQPSK

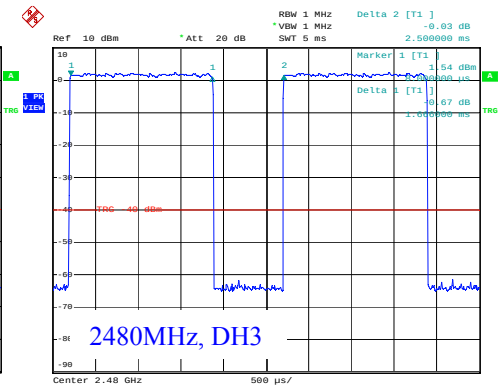


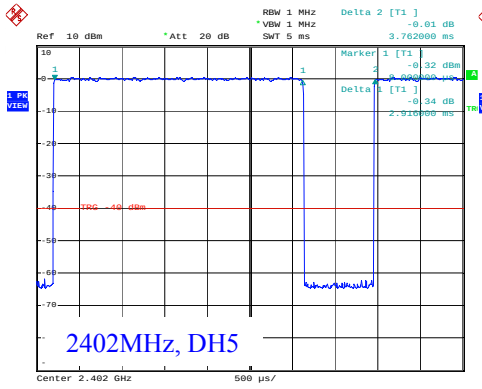


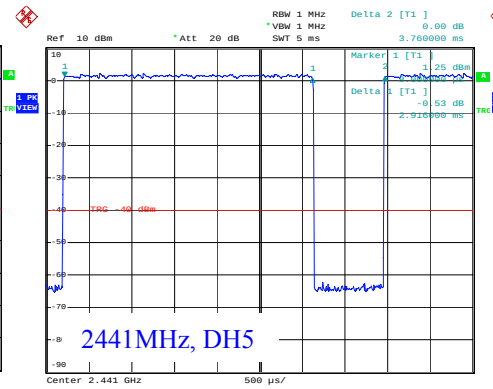


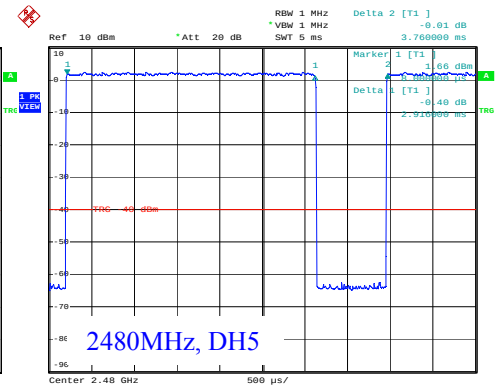




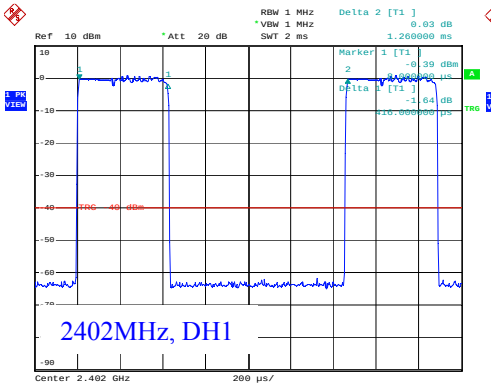


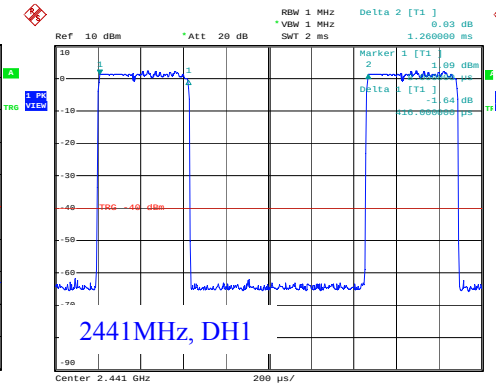


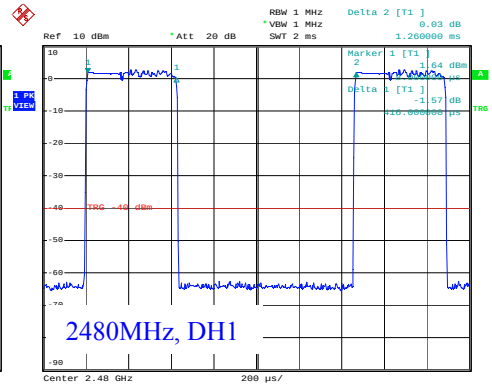


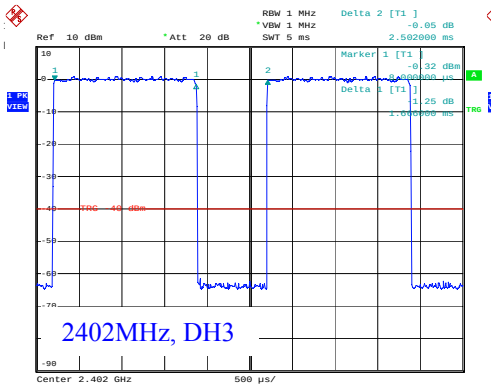


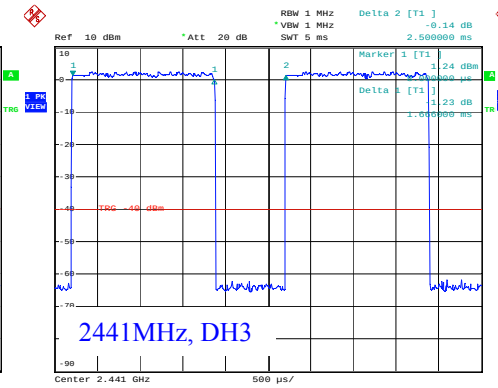
Operating mode: 8DPSK

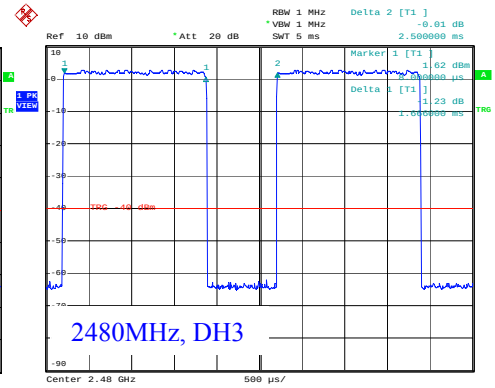


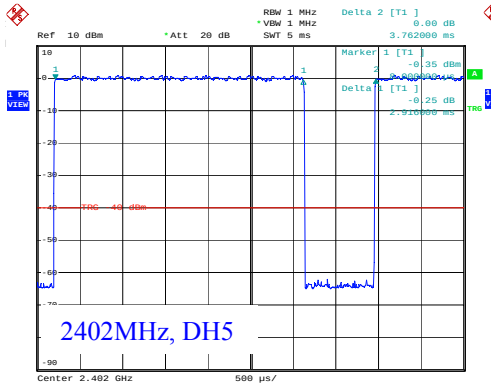


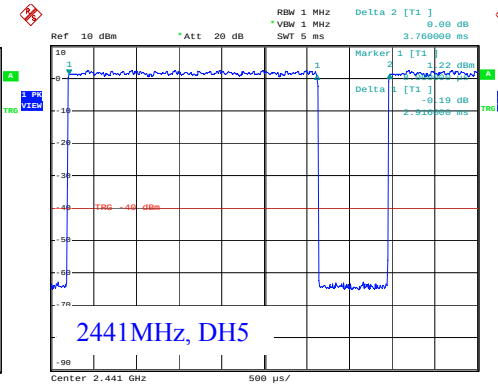


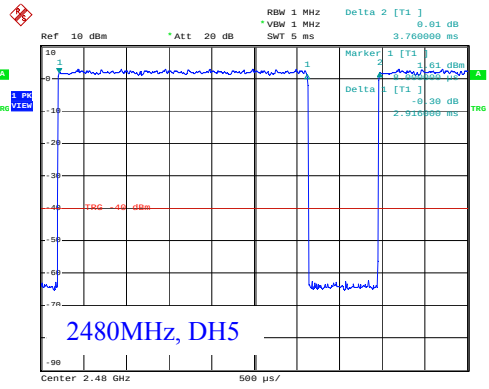






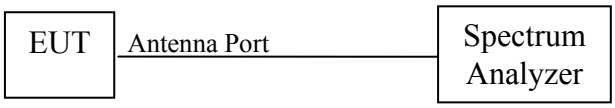






2.5 Peak Output Power

Test setup
Test setup is the following drawing. The antenna port of EUT was connected to the spectrum analyzer.



Test procedure
The EUT antenna port connected to the spectrum analyzer. The RBW is set to the greater than 20dB bandwidth. The VBW is set to three times of RBW. The sweep time is coupled appropriate. The span is set to cover the carrier output spectrum. The analyzer is set to MAX HOLD. The EUT is set measured transmission channel under hopping off mode.

Limitation
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, provided the systems operate with an output power no greater than 125 mW(21dBm).

Test equipment used (refer to List of utilized test equipment)

SA06	SA23				

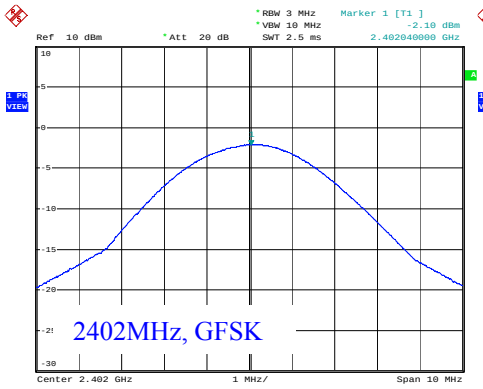
Test results – comply with the limitation.

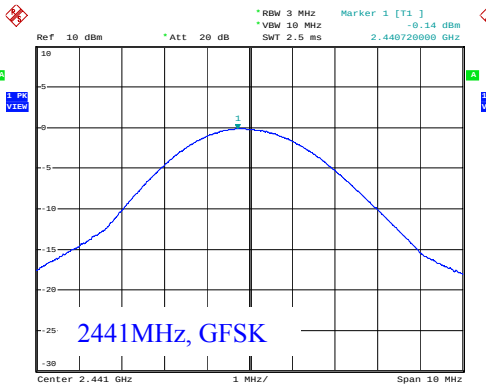
Operating Mode	Transmission Channel (Frequency: MHz)	Cable loss (dB)	Output power (dBm) [Reading]	Output power (dBm) [Result]	Output power (mW) [Result]
GFSK	Low (2402)	0.9	-2.10	-1.20	0.76
	Middle (2441)	0.9	-0.14	0.76	1.19
	High (2480)	0.9	0.16	1.06	1.28
π/4DQPSK	Low (2402)	0.9	0.58	1.48	1.41
	Middle (2441)	0.9	2.02	2.92	1.96
	High (2480)	0.9	2.50	3.40	2.19
8DPSK	Low (2402)	0.9	1.06	1.96	1.57
	Middle (2441)	0.9	2.52	3.42	2.20
	High (2480)	**0.9**	**2.99**	**3.89**	**2.45**

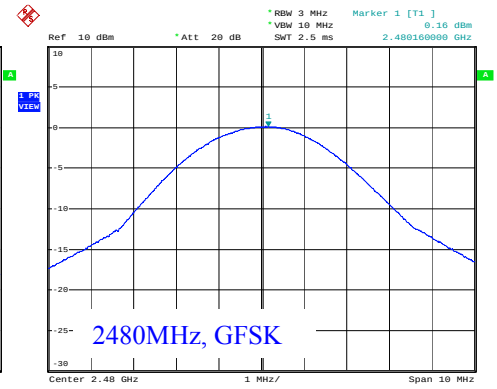
Test Data

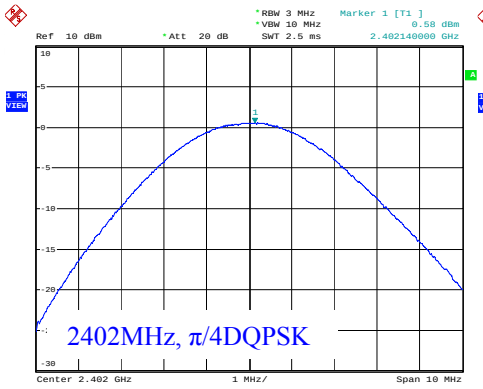
Tested Date: 5 February, 2010

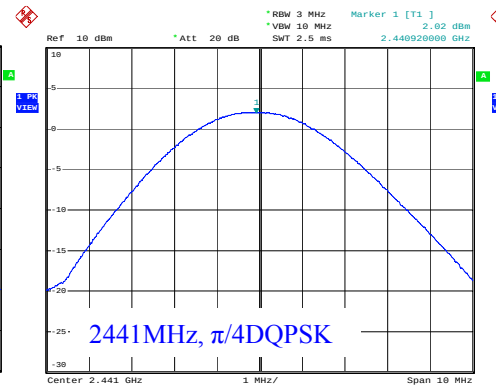
Temperature: 20 ˚C
Humidity: 22 %
Atmos. Press: 1009 hPa

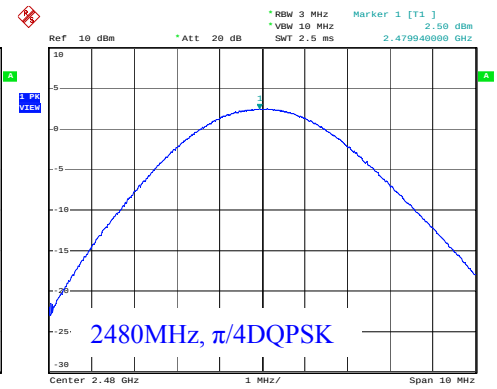


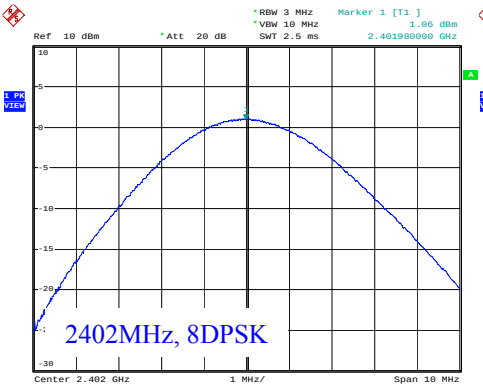


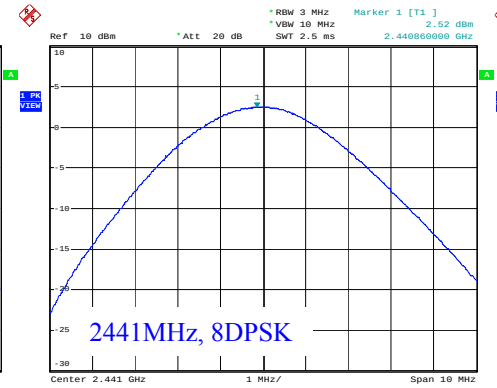


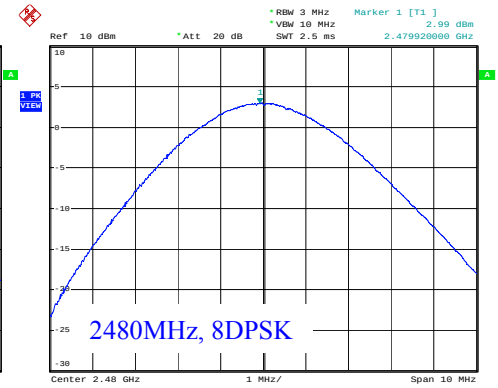






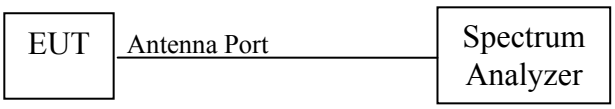






2.6 Conducted Spurious Emissions (Antenna Port)

Test setup
Test setup is the following drawing. The antenna port of EUT was connected to the spectrum analyzer.



Test procedure
The EUT antenna port connected to the spectrum analyzer. The RBW is set to 100 kHz. The VBW is set to 300 kHz. The sweep time is set to the coupled. The spectrum is cheated from 30 MHz to 25 GHz.
The EUT is set measured transmission channel under hopping off mode.

Limitation
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 equipment used (refer to List of utilized test equipment)

SA06	CL26				

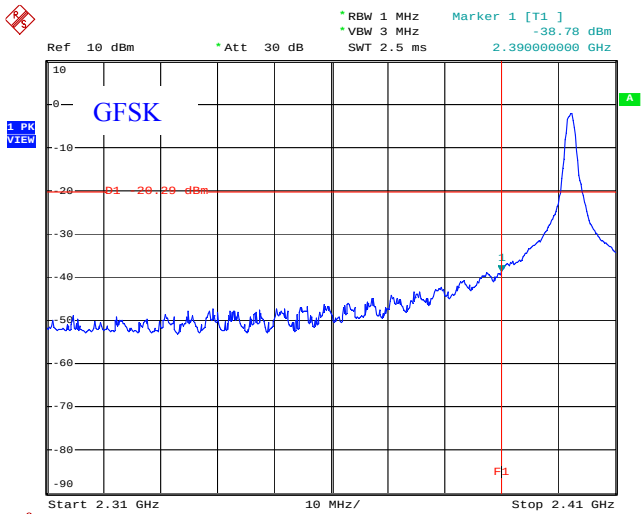
Test results – comply with the limitation.

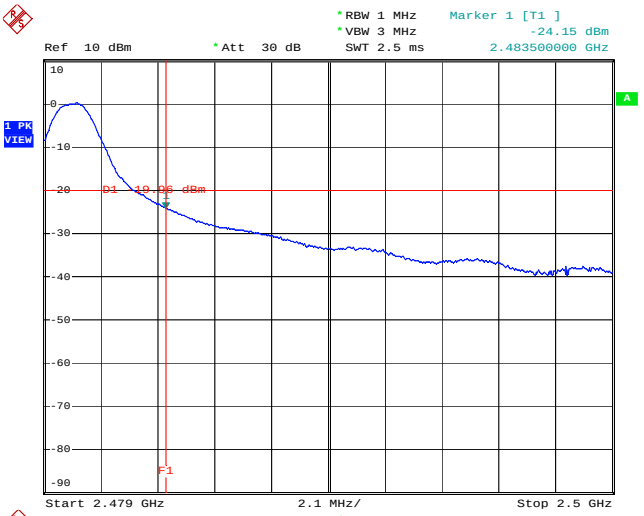
Test Data

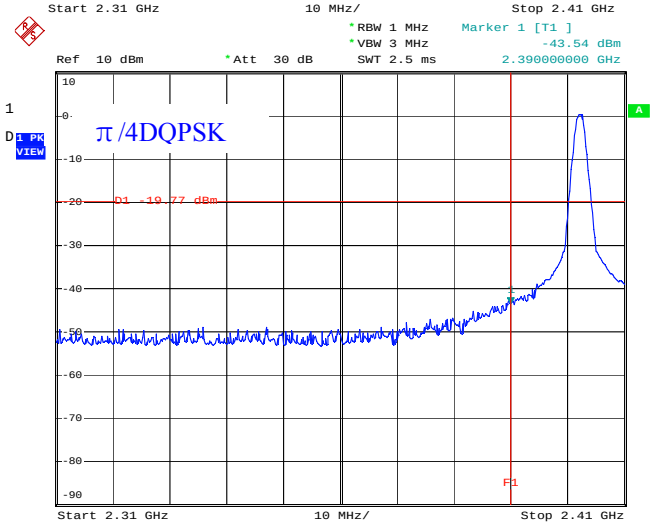
Tested Date: 5 February, 2010

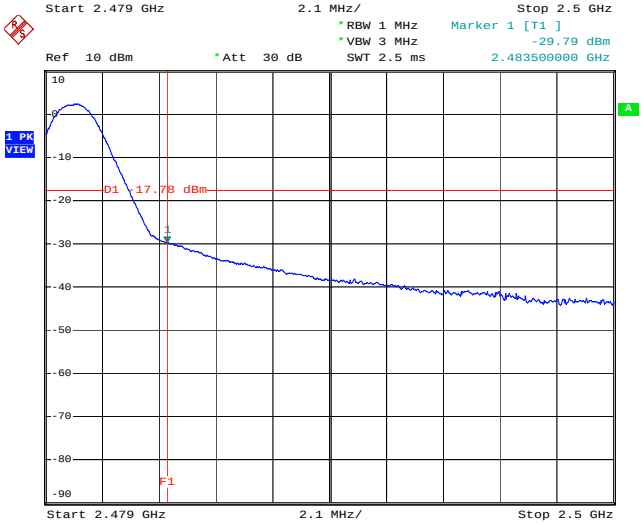
Temperature: 20 ˚C
Humidity: 22 %
Atmos. Press: 1009 hPa

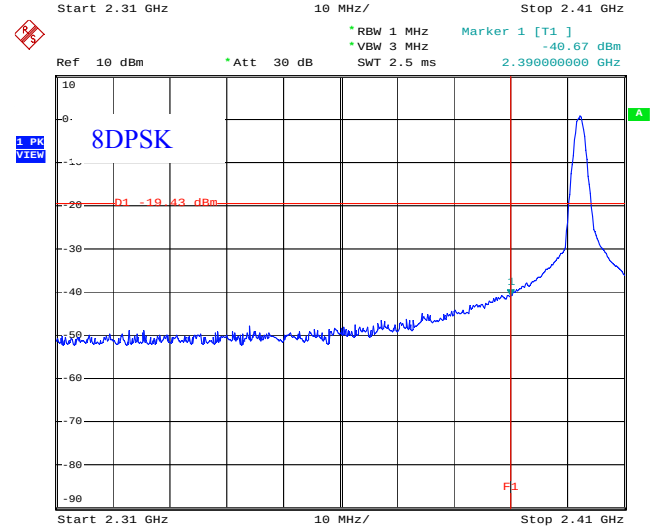
Restricted Band Edge

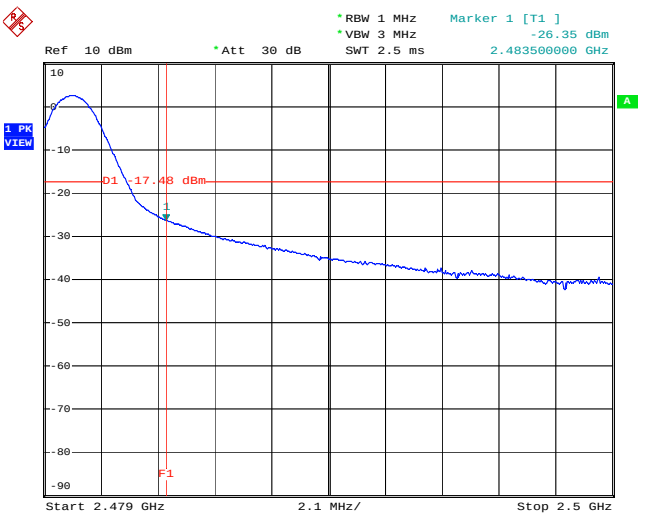












Worst Configuration (2402MHz, GFSK)