



MEASUREMENT / TECHNICAL REPORT

FCC Part 15 Subpart C

Issued: March 2, 2011

Name and Address of the Applicant:	Brother Industries, Ltd. 15-1, Naeshiro-cho, Mizuho-ku, Nagoya 467-8561, Japan
Test Item:	Mobile Printer
Identification:	MW-260 TypeA
Serial No.:	E64711-C7A443314
FCC ID:	B3Q5V6201J38
Sample Receipt Date:	November 26, 2010
Test Specification:	FCC Part 15 Subpart C, 15.247
Date of Testing:	December 1, 13, 14, 15 and 16, 2010
Test Result:	PASS

Report Prepared by:	Cosmos Corporation 3571-2 Ohnoki, Watarai-cho, Watarai-gun, Mie, Japan 516-2102 Phone: +81-596-63-0707 Fax: +81-596-63-0777
---------------------	---

Tested by:

O. Itogawa
O. Itogawa, EMC Dept. EMC Engineer

Date

March 2, 2011

Reviewed by:

Y. Kawahara
Y. Kawahara, EMC Dept. EMC Manager

Date

March 2, 2011

Notes:

1. This Test Report should not be reproduced except in full, without the written approval of Cosmos Corporation.
2. All measurement data contained in this Test Report may have uncertainty. A judgment for the limitation should be taken into the count.
3. This Test Report is based on the tests made for sample provided, and it is not applicable to individual product identical to the sample.

Revision History

Revision	Issue Date	Description	Effect Page	Revised By
00	January 10, 2011	Initial Issue	-	-
01	March 2, 2011	Change of FCC ID	1	Yoshida

List of Contents	Page
1. Description of Equipment under Test.....	5
1.1 Product Description	5
1.2 Antenna Description.....	6
1.3 Accompanied Peripherals Description.....	6
2. General Information	7
2.1 Test Methodology.....	7
2.2 Test Facility	7
2.3 Traceability.....	7
3. Summary of Test Results	8
4. Test Configuration	9
4.1 15. 207 AC Power Conducted Emission in Shield Room.....	10
4.2 15. 247(d), 15.209 Transmitter Radiated Emissions, 15.209 Band Edge (Radiated)	10
4.3 All Other Test Items (Except Maximum Peak Output Power).....	11
4.4 Maximum Peak Output Power	11
4.5 Test Mode.....	11
5. Measurement Result.....	12
5.1 15. 207 AC Power Conducted Emission.....	12
5.1.1 Setting Remarks	12
5.1.2 Minimum Standard	12
5.1.3 Result	12
5.1.4 Measured Data	13
5.2 15. 247(a)(1) Spectrum Bandwidth and Channel Separation of Frequency Hopping Spread Spectrum System.....	14
5.2.1 Setting Remarks	14
5.2.2 Minimum Standard	14
5.2.3 Result	14
5.2.4 Measured Data	15
5.3 15. 247(a)(1) Number of Channels and Time of Occupancy.....	17
5.3.1 Setting Remarks	17
5.3.2 Minimum Standard	17
5.3.3 Result	17
5.3.4 Measured Data	18
5.4 15. 247(a)(2) Spectrum Bandwidth of Direct Sequence Spread Spectrum System.....	22
5.4.1 Setting Remarks	22
5.4.2 Minimum Standard	22
5.4.3 Result	22
5.4.4 Measured Data	22
5.5 15. 247(b) Maximum Peak Output Power	24
5.5.1 Setting Remarks	24
5.5.2 Minimum Standard	24

5.5.3	Result	24
5.5.4	Measured Data	25
5.6	15. 247(d) Transmitter Suprious Emissions (Conducted)	26
5.6.1	Setting Remarks	26
5.6.2	Minimum Standard	26
5.6.3	Result	26
5.6.4	Measured Data	27
5.7	15. 247(d) Transmitter Radiated Emissions (Radiated)	30
5.7.1	Setting Remarks	30
5.7.2	Minimum Standard	31
5.7.3	Result	31
5.7.4	Measured Data	32
5.8	15. 247(e) Power Spectrum Density	45
5.8.1	Setting Remarks	45
5.8.2	Minimum Standard	45
5.8.3	Result	45
5.8.4	Measured Data	46
5.9	15. 247(d) Band Edge Measurement	48
5.9.1	Setting Remarks	48
5.9.2	Minimum Standard	48
5.9.3	Result	48
5.9.4	Measured Data	49
6.	Photos	52
6.1	Photo of the EUT	52
6.2	Setup Photo (AC Power Conducted Emission)	53
6.3	Setup Photo (Radiated Emission)	54
6.4	Setup Photo (Maximum Peak Output Power)	58
6.5	Setup Photo (All Other Test Items)	58
6.6	Setup Photo (Environmental Chamber Test)	59
7.	List of Test Measurement Instruments	60
7.1	AC Power Conducted Emission	60
7.2	Radiated Emission Measurement	60
7.3	Conducted Radio Measurement	61

1. Description of Equipment under Test

1.1 Product Description

Manufacturer	Brother Industries, Ltd.
Model (referred to as the EUT)	MW-260 TypeA
Transmitter Type	☐ WLAN ☒ Bluetooth ☐ Zigbee ☐ Other ()
Nominal Voltage	DC7.4V
Type of Modulation	GFSK
Mode of Operation	☐ duplex ☐ 1/2 duplex ☒ simplex ☐ other
Type of the Equipment	☐ Stand-alone ☐ Combined Equipment ☐ Plug -In Card ☒ Other (Module Unit)
Type of the Antenna	☒ Integral ☐ external ☐ Other
Type of Power Source	☐ AC mains ☒ Dedicated AC adapter (100V to 240V) ☐ DC Voltage ☒ Battery
Type of Battery (if applicable)	Li-ion Battery
Type of Operation	☐ Continuous ☐ Burst ☒ Intermittent
Stand by Mode	☒ Available ☐ N/A
Intended Functions	Bluetooth 2.1+EDR
Bandwidth of the IF filters	N/A
Method of Communication Link	Software to make high speed packet transmitting
Frequency Band Lower Limit	2402MHz
Upper Limit	2480MHz
Frequency of Operating	2400 – 2483.5MHz
Thermal Limitation	Not specified

1.2 Antenna Description

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT.

Therefore, the equipment complies with the antenna requirement of Section 15.203.

No.	Type Name	Gain	Antenna Type	Remarks
1	AF216M245001	+1dBi (min)	Helical antenna	

1.3 Accompanied Peripherals Description

No.	Equipment Name	Manufacturer	Type Name	Serial Number	Remarks
1	Personal Computer	DELL	PP05L	CN-03U652-48643-35K-2820	
2	AC Adaptor	DELL	AA22850	CN-05U092-16291-35C-02L4	
3	Jig	TAIYO YUDEN	TE7037-1	---	
4	AC Adaptor	---	DSA-0151A-05A	---	

2. General Information

2.1 Test Methodology

All measurement subject to the present report was carried out according to the procedures in ANSI C63.4: 2003.

2.2 Test Facility

All measurement was performed in the following facility:

Cosmos Corporation EMC Lab. Ohnoki

3571-2 Ohnoki, Watarai-cho, Watarai-gun, Mie-ken 516-2102, Japan

FCC registration number: 604492

2.3 Traceability

The calibration of measurement equipment used in the test subject to the present report is designed and operated to ensure that the measurement is traceable to national standards of measurement or equivalent abroad.

3. Summary of Test Results

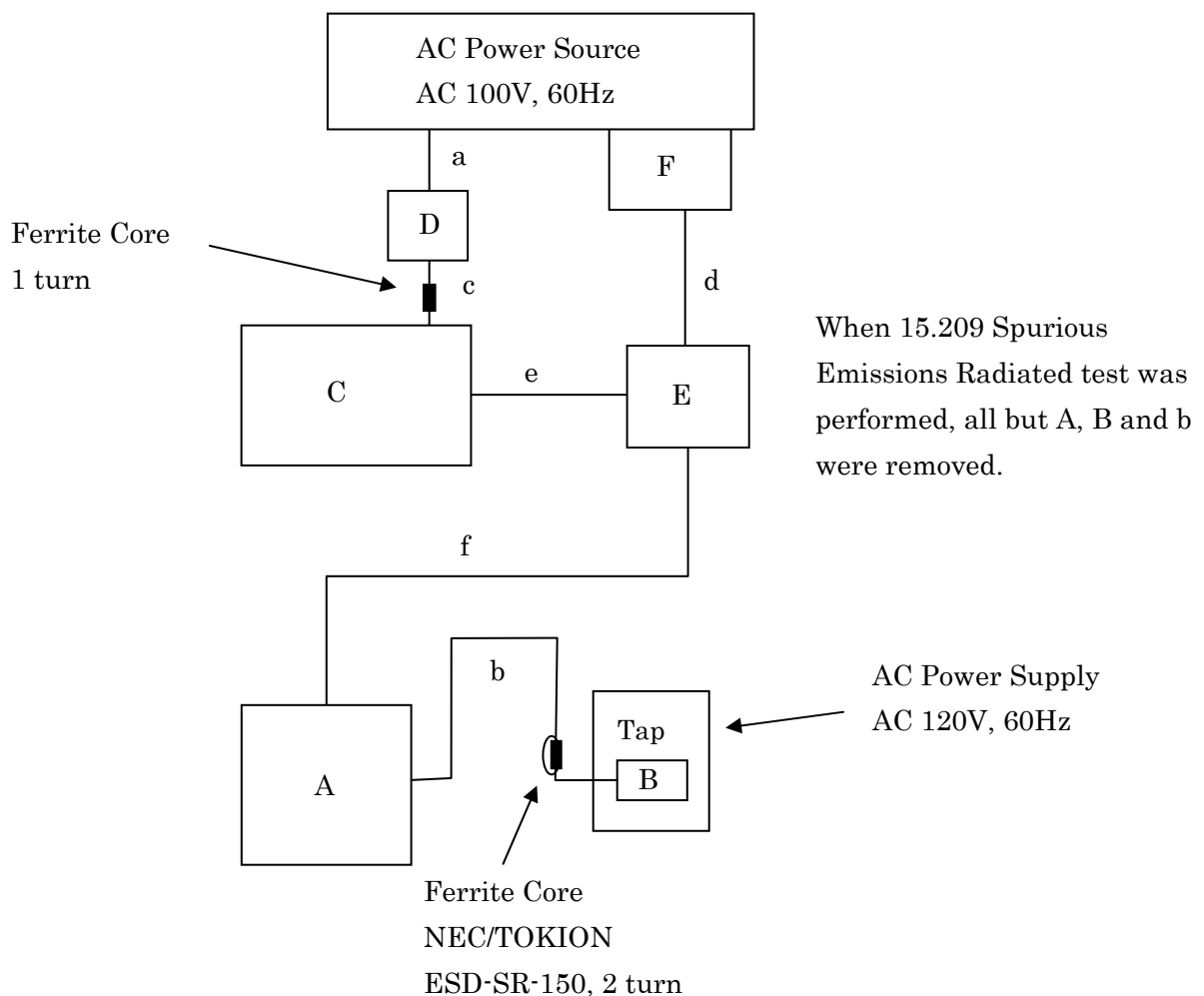
Section	Test Item	Limit	Result
15. 207	AC Power Conducted Emission	See 5.1.2	Pass
15. 247(a)(1)	Spectrum Bandwidth of Frequency Hopping Spread Spectrum System	< 1MHz if using less than 15 non-overlapping channels	Pass
15. 247(a)(1)	Channel Separation	> 2/3 of 20dB BW for systems with output power < 125mW	Pass
15. 247(a)(1)	Number of Channels	> 15 channels	Pass
15. 247(a)(1)	Time of Occupancy	< 0.4 sec in 30 sec period	Pass
15. 247(a)(2)	Spectrum Bandwidth of Direct Sequence Spread Spectrum System	Min. 500kHz	Pass
15. 247(b)	Maximum Peak Output Power	Max. 1W (30dBm)	Pass
15. 247(d) 15. 209	Transmitter Radiated Emissions	See 5.6.2 See 5.7.2	Pass
15. 247(e)	Power Spectrum Density	Max. 8dBm	Pass
15. 247(d)	Band Edge Measurement	See 5.9.2	Pass

4. Test Configuration

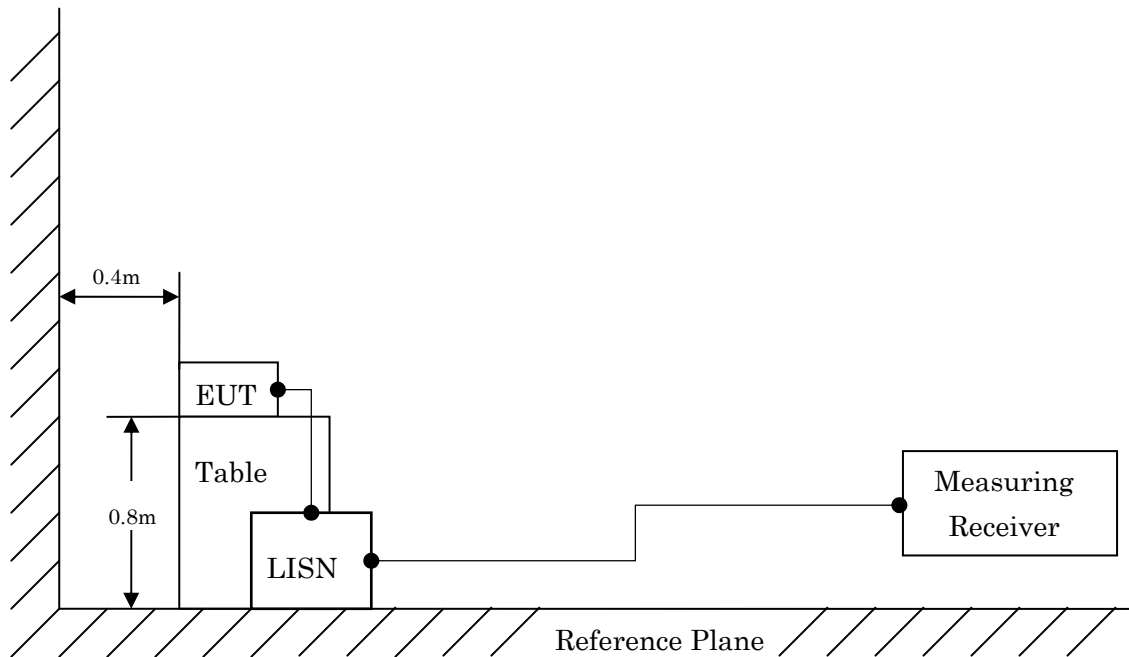
	Instrument	Model	Rating
A	Mobile Printer (EUT1)	MW-260 TypeA	DC7.4V
B	AC Adaptor (EUT2)	AD-210US	AC100V-240V, 50/60Hz, 0.3A
C	Personal Computer	PP05L	DC19.5V, 4.62A
D	AC Adaptor	AA22850	AC100V-240V, 50/60Hz, 1.5A
E	Jig	TE7037-1	DC5V
F	AC Adaptor	DSA-0151A-05A	AC100V-120V, 50/60Hz, 0.4A

	Cable	Length	Shield	Ferrite Core
a	AC Power Cable	1.0 m	No	No
b	DC Power Cable	1.8 m	No	Yes
c	DC Power Cable	1.8 m	No	Yes
d	DC Power Cable	2.0 m	No	Yes
e	RS232C Cable	1.5 m	Yes	No
f	Signal Cable	0.3 m	No	No

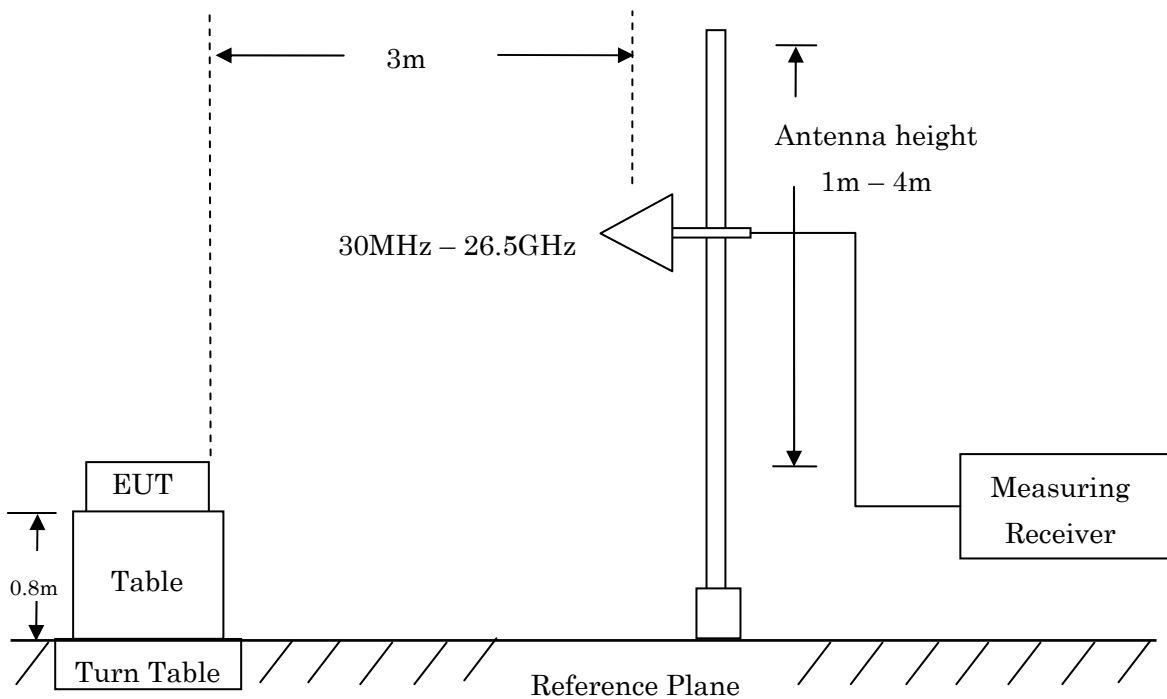
Setup diagram of tested system



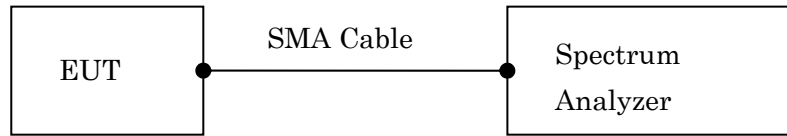
4.1 15. 207 AC Power Conducted Emission in Shield Room



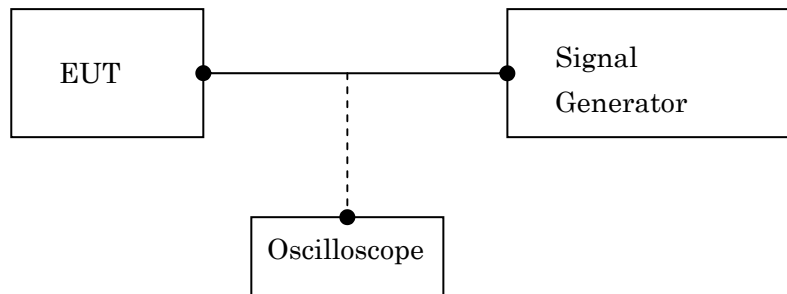
4.2 15. 247(d), 15.209 Transmitter Radiated Emissions, 15.209 Band Edge (Radiated)



4.3 All Other Test Items (Except Maximum Peak Output Power)



4.4 Maximum Peak Output Power



4.5 Test Mode

In all test configurations above, EUT makes continuous RF transmitting with manufacturer's specified power.

5. Measurement Result

5.1 15. 207 AC Power Conducted Emission

5.1.1 Setting Remarks

Configure the EUT System in accordance with ANSI C63.4-2003.

Non-conductive board (12mm thick) for EUT and non-conductive table (80cm high) for personal computer were used.

Other power cord of support equipment is connected to another LISN to isolate its emission from the measured emission of EUT.

The measuring port of LISN for support equipment was terminated by the 50Ω

Activate the EUT System and run the software prepared for the test, if necessary.

Refer to test configuration figure 4.1.

5.1.2 Minimum Standard

15. 207 (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

5.1.3 Result

EUT complies with the requirement.

Uncertainty of measurement : ± 2.26 dB

Temperature, Humidity : 25°C, 45 %

5.1.4 Measured Data

Measured Value Table

<<Conducted Emission>>

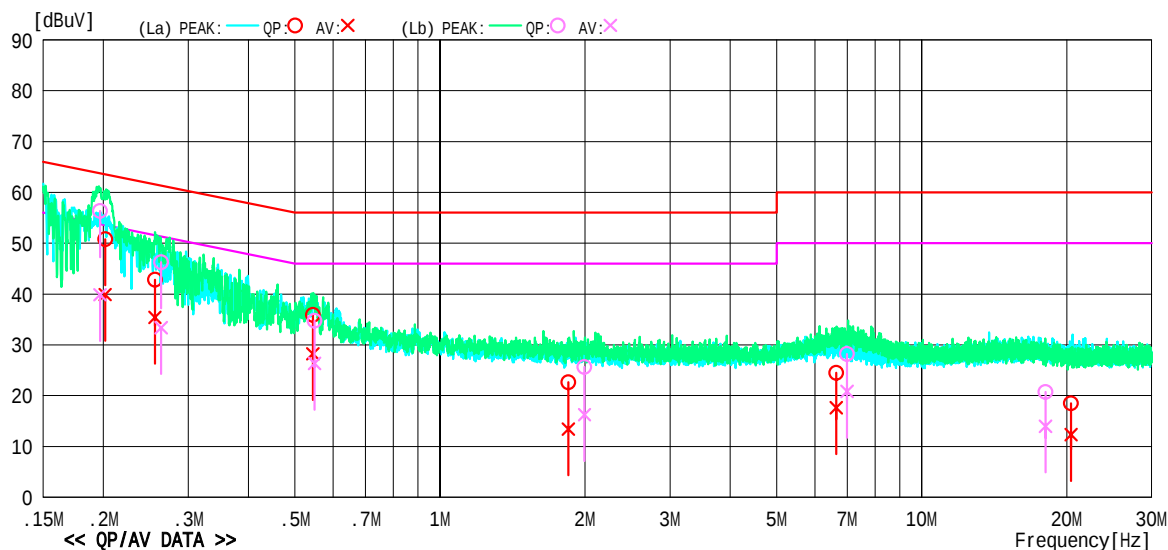
Cosmos Corporation Onoki Lab.
Date : 2010/12/14

Model Name : MW-260 TypeA/AD-210US
Serial No. : E64711-C7A443314/01
Operator : O. Itogawa
Power Supply : AC 120V, 60Hz

Job No : CJ10-099679E
Temp/Humi : 25 /45%
Condition : Operated
Remark :

Memo : RBW:9kHz(150k-30MHz)

LIMIT : FCC 15.207(QP)
FCC 15.207(AV)



No	Freq. [MHz]	Reading Level		C. Fac [dB]	Results		Limit		Margin		Phase	Comment
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
1	0.20180	40.8	29.9	10.0	50.8	39.9	63.5	53.5	12.7	13.6	La	
2	0.25600	32.7	25.3	10.1	42.8	35.4	61.6	51.6	18.8	16.2	La	
3	0.54473	25.8	18.1	10.1	35.9	28.2	56.0	46.0	20.1	17.8	La	
4	1.84616	12.5	3.3	10.1	22.6	13.4	56.0	46.0	33.4	32.6	La	
5	6.64521	14.0	7.1	10.5	24.5	17.6	60.0	50.0	35.5	32.4	La	
6	20.40365	7.6	1.4	10.9	18.5	12.3	60.0	50.0	41.5	37.7	La	
7	0.19694	46.4	29.8	10.0	56.4	39.8	63.7	53.7	7.4	13.9	Lb	
8	0.26363	36.2	23.3	10.1	46.3	33.4	61.3	51.3	15.0	17.9	Lb	
9	0.54905	24.6	16.2	10.1	34.7	26.3	56.0	46.0	21.3	19.7	Lb	
10	1.99497	15.6	6.2	10.1	25.7	16.3	56.0	46.0	30.4	29.7	Lb	
11	6.99224	17.8	10.4	10.4	28.2	20.8	60.0	50.0	31.8	29.2	Lb	
12	18.06512	10.2	3.4	10.6	20.8	14.0	60.0	50.0	39.3	36.0	Lb	

-TEPT0-DV/CE Ver1.50.0128

5.2 15. 247(a)(1) Spectrum Bandwidth and Channel Separation of Frequency Hopping Spread Spectrum System

5.2.1 Setting Remarks

- The both side of 20dB down value from peak power are measured by using delta-maker function of the spectrum analyzer.
- The spectrum analyzer is set-up as following;

✓ Frequency Span	: 10 MHz
✓ Resolution bandwidth	: 300 kHz
✓ Video bandwidth	: 300 kHz
✓ Sweep	: Auto
✓ Detector function	: Peak
✓ Trace Mode	: Max Hold

- See test configuration figure 4.2.

5.2.2 Minimum Standard

The maximum permissible 20dB bandwidth is 1MHz, unless more than 15 non-overlapping channels are employed.

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.

5.2.3 Result

EUT complies with the requirement.

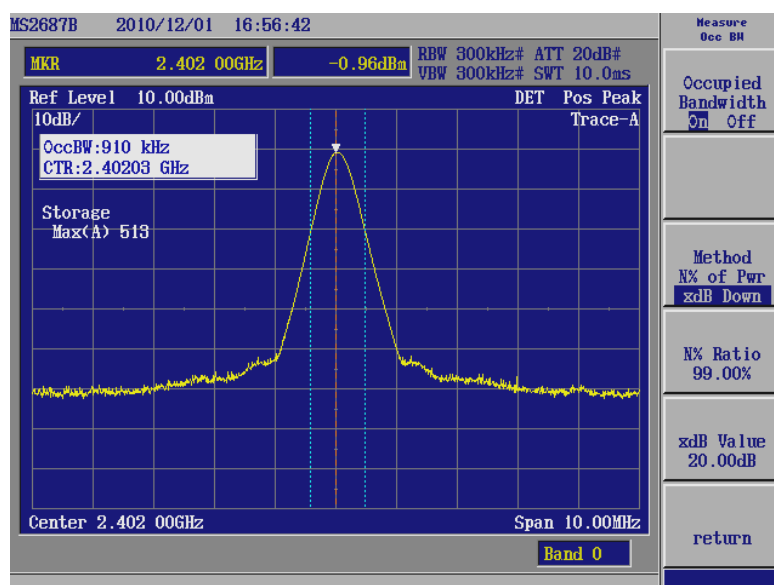
Uncertainty of measurement	: ± 1.2 dB
Temperature, Humidity	: 24 °C, 48%

5.2.4 Measured Data

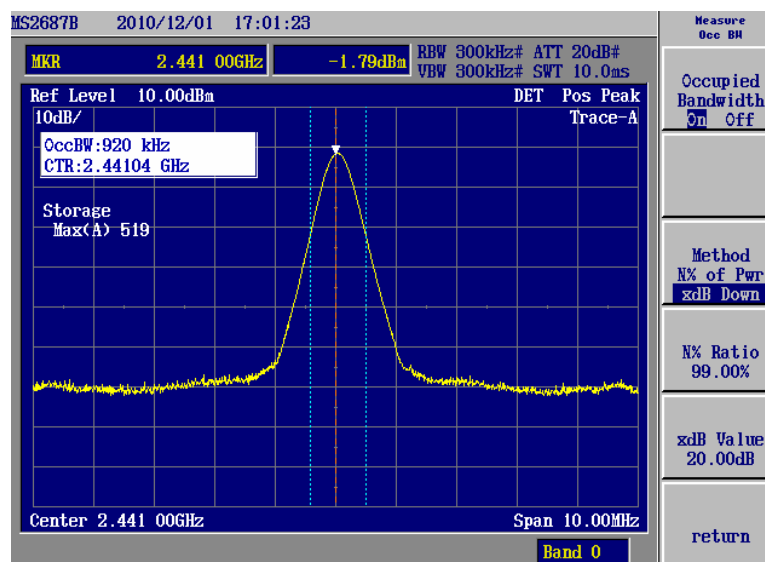
20dB Bandwidth

Frequency (MHz)	Measured Bandwidth (kHz)	Limit (MHz)
20 dB Bandwidth		
2402 (1ch)	910	---
2441 (40ch)	920	---
2480 (79ch)	920	---
Channel Separation		
Hopping Channel	1,250	>20dB Bandwidth and 25(kHz)

20 dB Bandwidth 2402MHz

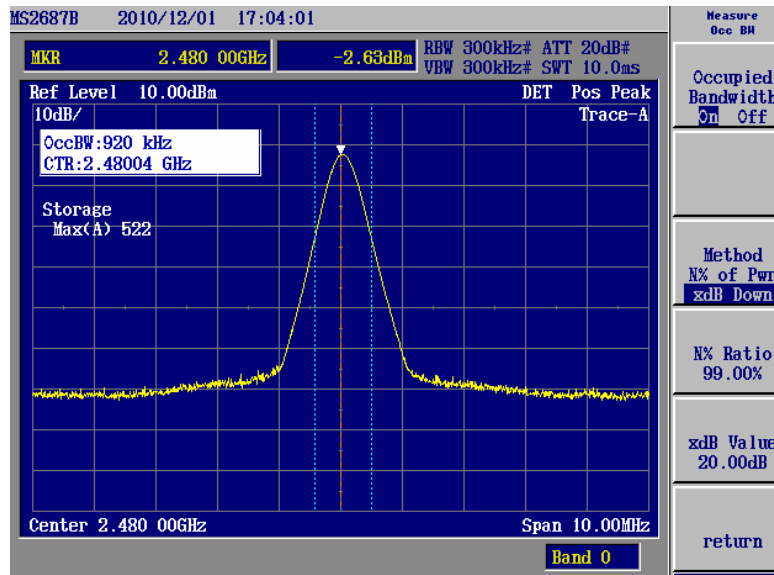


20 dB Bandwidth 2441MHz

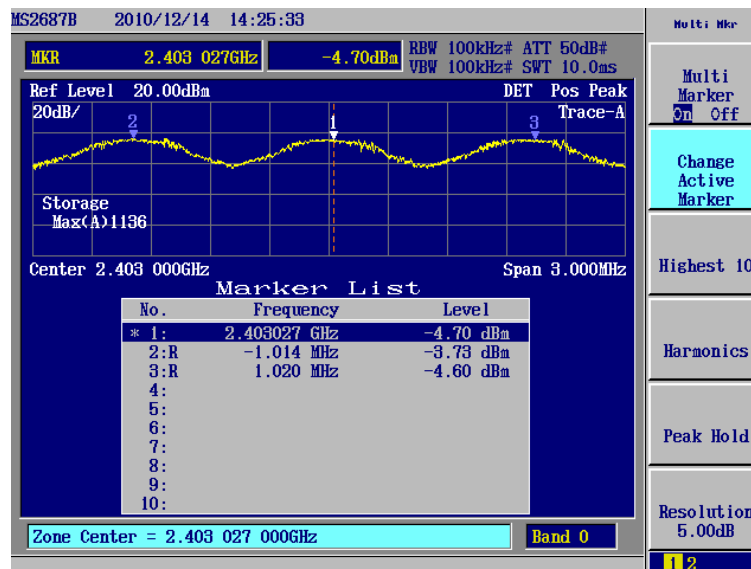


5.2.4 Measured Data (Continued)

20 dB Bandwidth 2480MHz



Channel Separation 1MHz DH5



5.3 15. 247(a)(1) Number of Channels and Time of Occupancy

5.3.1 Setting Remarks

- EUT directly connects to the spectrum analyzer via calibrated coaxial cable and a suitable attenuator.
- The Number of Channels is determined by using Max-hold of the spectrum shape of spectrum analyzer.
- Time of Occupancy is determined by using the marker-data function of spectrum analyzer.
- The spectrum analyzer is set-up as following to measure Number of Channels;

✓ Frequency Span	: 79 MHz
✓ Resolution bandwidth	: 300 kHz or 1 MHz
✓ Video bandwidth	: 300 kHz or 3 MHz
✓ Sweep Time	: Auto
✓ Detector function	: Peak
✓ Trace Mode	: Max Hold

- The spectrum analyzer is set-up as following to measure Time of Occupancy;

✓ Frequency Span	: 0 Hz
✓ Resolution bandwidth	: 1 MHz
✓ Video bandwidth	: 3 MHz
✓ Detector function	: Peak
✓ Trace Mode	: Max Hold

- See test configuration figure 4.3.

5.3.2 Minimum Standard

This frequency hopping system must employ minimum of 15 hopping channels.

The maximum permissible time of occupancy is 400 ms within the minimum time period required to hop through all channels.

5.3.3 Result

EUT complies with the requirement.

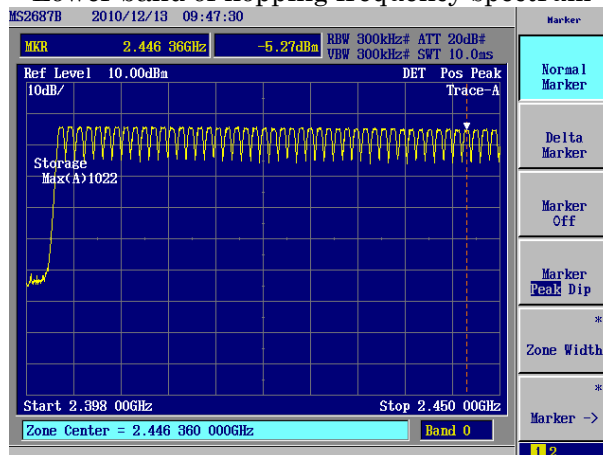
Uncertainty of measurement result: 1 usec
Temperature, Humidity : 23 °C, 49%

5.3.4 Measured Data

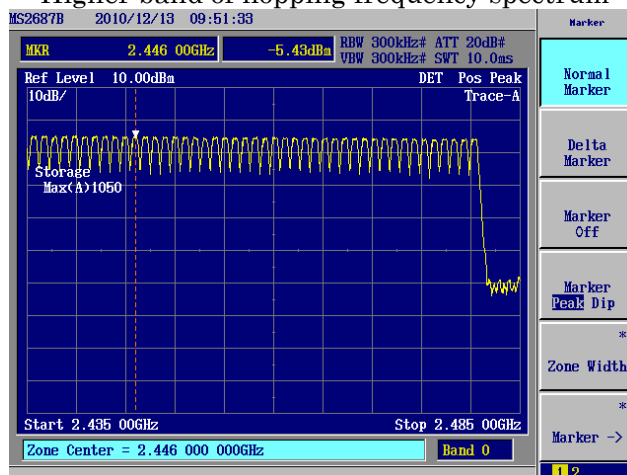
Number of Channels

DH5

Lower band of hopping frequency spectrum

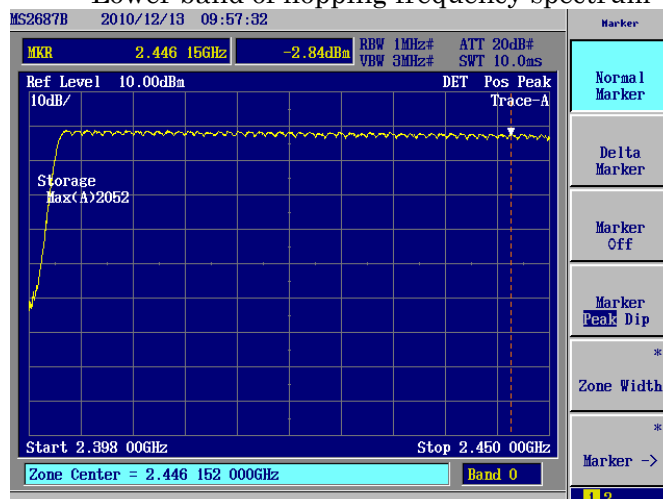


Higher band of hopping frequency spectrum



2-DH5

Lower band of hopping frequency spectrum



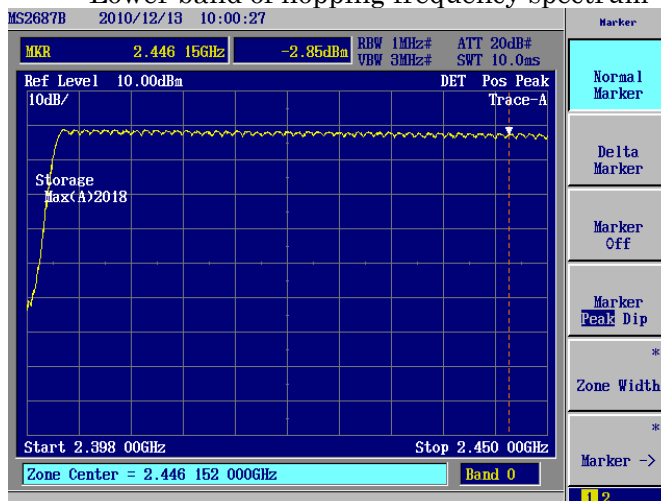
5.3.4 Measured Data (Continued)

Higher band of hopping frequency spectrum



3-DH5

Lower band of hopping frequency spectrum



Higher band of hopping frequency spectrum



5.3.4 Measured Data (Continued)
Time of Occupancy

Bluetooth (F1D 1Mbps) BASIC DH5

Frequency [MHz]	Power Supply Voltage [V]	Cycle [ms]	ON Time [ms]	Duty cycle	Dwell Time [s]	Limit [S]	Margin [S]
2441(39ch)	7.40	3.75	2.91	0.776	0.310	0.400	0.090

Bluetooth (G1D 2Mbps) EDR 2-DH5

Frequency [MHz]	Power Supply Voltage [V]	Cycle [ms]	ON Time [ms]	Duty cycle	Dwell Time [s]	Limit [S]	Margin [S]
2441(39ch)	7.40	3.75	2.91	0.776	0.310	0.400	0.090

Bluetooth (G1D 3Mbps) EDR 3-DH5

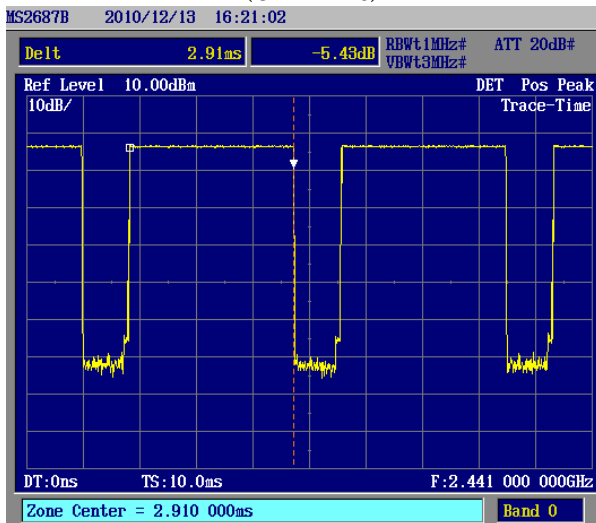
Frequency [MHz]	Power Supply Voltage [V]	Cycle [ms]	ON Time [ms]	Duty cycle	Dwell Time [s]	Limit [S]	Margin [S]
2441(39ch)	7.40	3.75	2.91	0.776	0.310	0.400	0.090

$$(0.4*79)/(79*3.75)*2.91=0.31\text{seconds}$$

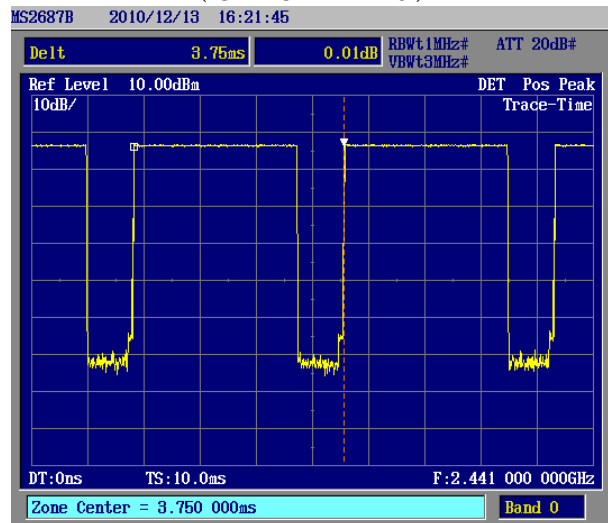
5.3.4 Measured Data (Continued)

DH5

(ON Time)

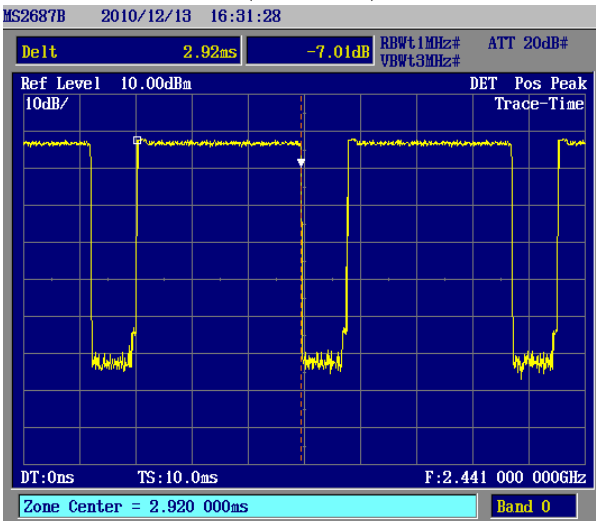


(ON+OFF Time)

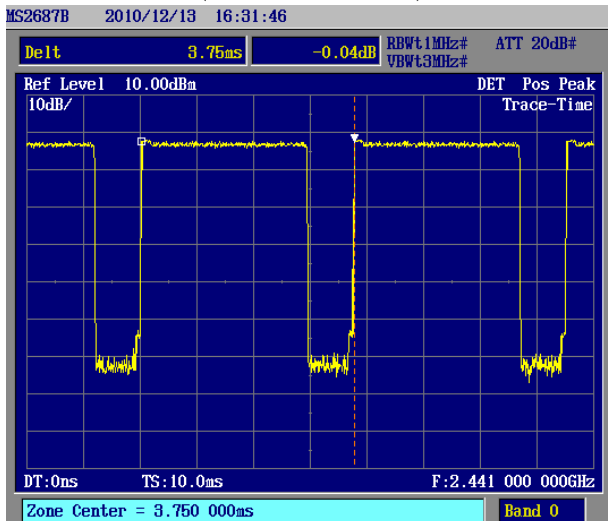


2-DH5

(ON Time)

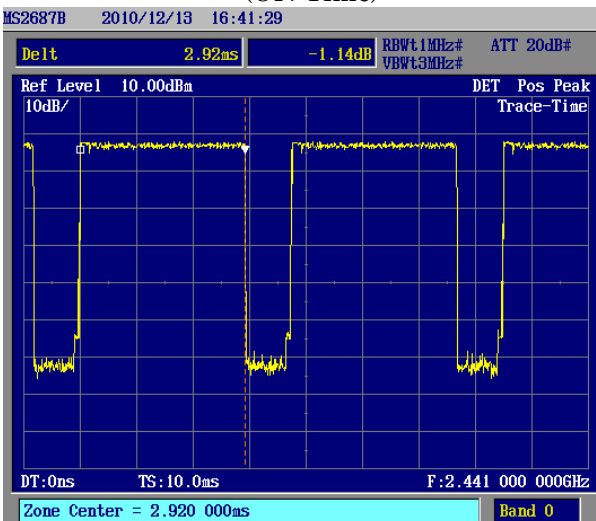


(ON+OFF Time)

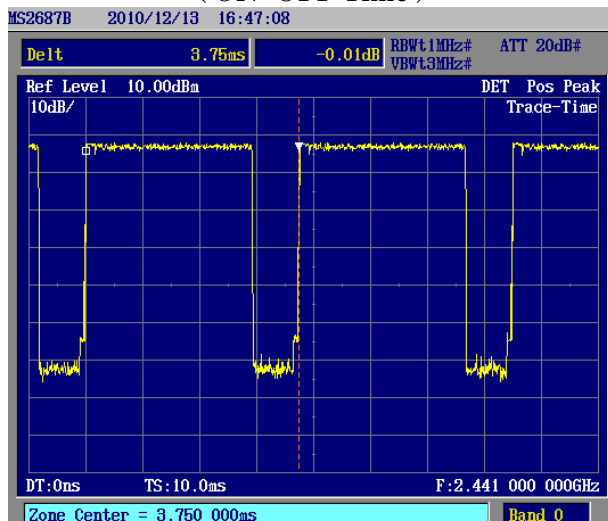


3-DH5

(ON Time)



(ON+OFF Time)



5.4 15. 247(a)(2) Spectrum Bandwidth of Direct Sequence Spread Spectrum System

5.4.1 Setting Remarks

- The both side of 6dB down value from peak power are measured by using delta-maker function of the spectrum analyzer.
- The spectrum analyzer is set-up as following;

✓ Frequency Span	: 150 MHz
✓ Resolution bandwidth	: 100 kHz
✓ Video bandwidth	: 300 kHz
✓ Sweep	: Auto
✓ Detector function	: Peak
✓ Trace Mode	: Max Hold

- See test configuration figure 4.3.

5.4.2 Minimum Standard

15.247 (a) (2) Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

5.4.3 Result

EUT complies with the requirement.

Uncertainty of measurement result: ± 0.8 dB

Temperature, Humidity : 24°C, 48 %

5.4.4 Measured Data

※ Bluetooth (F1D 1Mbps)BASIC DH5

Frequency (MHz)	Frequency Bandwidth (MHz)	Limit (MHz)	Margin (dB)
2441(39ch)	79.2	0.5	78.7

※ Bluetooth (G1D 2Mbps) EDR 2-DH5

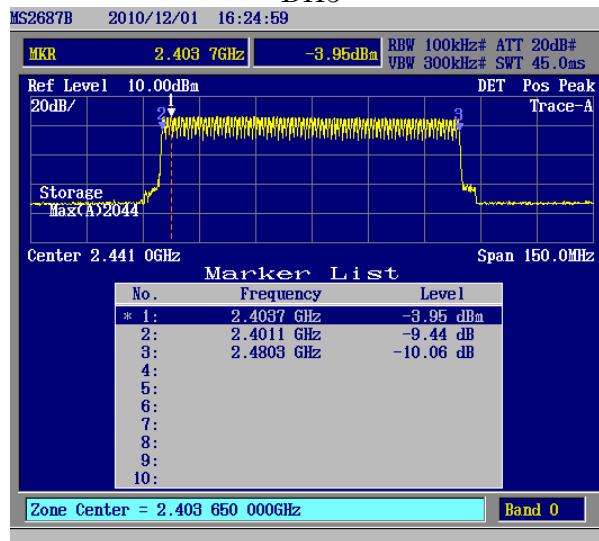
Frequency (MHz)	Frequency Bandwidth (MHz)	Limit (MHz)	Margin (dB)
2441(39ch)	79.3	0.5	78.8

※ Bluetooth (G1D 3Mbps) EDR 3-DH5

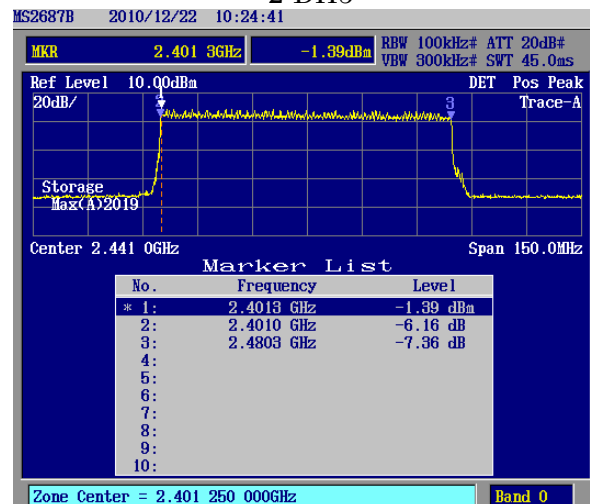
Frequency (MHz)	Frequency Bandwidth (MHz)	Limit (MHz)	Margin (dB)
2441(39ch)	79.0	0.5	78.5

5.4.4 Measured Data (Continued)

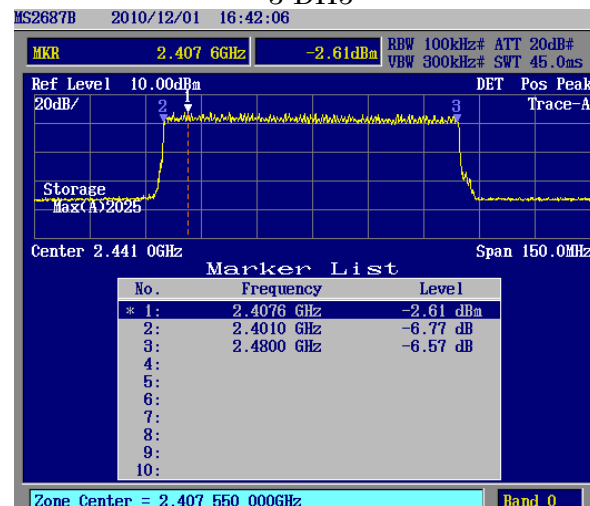
DH5



2-DH5



3-DH5



5.5 15. 247(b) Maximum Peak Output Power

5.5.1 Setting Remarks

- See test configuration figure 4.4.
- The maximum peak output power is measured as following;
 1. The diode detector is inserted between EUT and the oscilloscope.
 2. Replaced EUT by the signal generator (SG).
 3. The oscilloscope is used to read the peak response of the detector.
 4. Adjusted the frequency of SG to the fundamental frequency.
 5. Adjusted the amplitude of SG to be the same peak recorded in 2.
- The oscilloscope is set-up as following;

✓ Voltage level range	: 10 mV / Div
✓ Sampling time	: 1.00GS / s
✓ Function	: Peak search

5.5.2 Minimum Standard

The maximum peak output power shall not exceed 1 watt. If transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.5.3 Result

EUT complies with the requirement.

Uncertainty of measurement result: ± 0.5 dB

Temperature, Humidity : 23°C, 45%

5.5.4 Measured Data

※ Bluetooth (F1D 1Mbps)BASIC DH5

Frequency (MHz)	Power Supply Voltage [V]	Peak Power (dBm)	Limit (dBm)	Margin (dB)
2402(1ch)	7.40	-1.82	30	31.82
	6.29	-1.82	30	31.82
	8.51	-1.82	30	31.82
2441(39ch)	7.40	-2.50	30	32.5
	6.29	-2.50	30	32.5
	8.51	-2.50	30	32.5
2480(79ch)	7.40	-3.48	30	33.48
	6.29	-3.48	30	33.48
	8.51	-3.48	30	33.48

※ Bluetooth (G1D 2Mbps) EDR 2.3-DH5

Frequency (MHz)	Power Supply Voltage [V]	Peak Power (dBm)	Limit (dBm)	Margin (dB)
2402(1ch)	7.40	0.33	30	29.67
	6.29	0.33	30	29.67
	8.51	0.33	30	29.67
2441(39ch)	7.40	-0.40	30	30.4
	6.29	-0.40	30	30.4
	8.51	-0.40	30	30.4
2480(79ch)	7.40	-1.26	30	31.26
	6.29	-1.26	30	31.26
	8.51	-1.26	30	31.26

5.6 15. 247(d) Transmitter Suprious Emissions (Conducted)

5.6.1 Setting Remarks

- EUT directly connects to the spectrum analyzer via calibrated coaxial cable and 10 dB attenuator.
- The Spectrums are scanned from the lowest generated frequency of EUT up to the 10th harmonics by using the spectrum analyzer.
- The spectrum analyzer is set-up as following;

✓ Resolution bandwidth	: 100 kHz
✓ Video bandwidth	: 100 kHz
✓ Sweep	: Auto
✓ Detector function	: Peak
✓ Trace Mode	: Max Hold

- See test configuration figure 4.3.

5.6.2 Minimum Standard

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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required.

5.6.3 Result

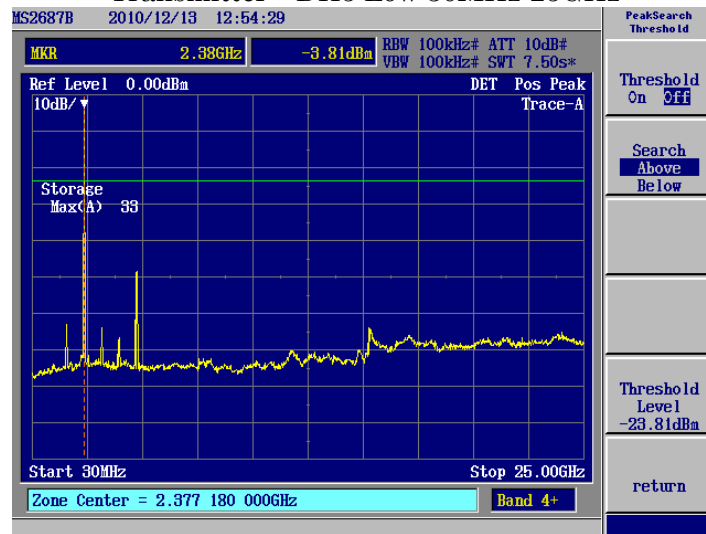
EUT complies with the requirement.

Uncertainty of measurement result: ± 0.8 dB

Temperature, Humidity : 23°C, 49%

5.6.4 Measured Data

Transmitter DH5 Low 30MHz-25GHz



Transmitter DH5 Middle 30MHz-25GHz



Transmitter DH5 High 30MHz-25GHz



5.6.4 Measured Data (Continued)

Transmitter 2-DH5 Low 30MHz-25GHz



Transmitter 2-DH5 Middle 30MHz-25GHz



Transmitter 2-DH5 High 30MHz-25GHz



5.6.4 Measured Data (Continued)

Transmitter 3-DH5 Low 30MHz-25GHz



Transmitter 3-DH5 Middle 30MHz-25GHz



Transmitter 3-DH5 High 30MHz-25GHz



5.7 15. 247(d) Transmitter Radiated Emissions (Radiated)

5.7.1 Setting Remarks

- The data lists in “5.5.4 Measured Data “ list the significant emission frequencies, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, plus the limit.
- In the frequency range between 30MHz to 25GHz (as 10th harmonics), the Electric Field Strength is measured in accordance with ANSI C63.4: 2003 and CISPR22: 1997.
- The test setup is made in accordance with ANSI C63.4: 2003.
- The antenna is measured at 1-4m height.
- The EUT is placed on the non-conductive table in the center of turntable. The height of this table is 0.8m.
- The measurement is carried out with both horizontal and vertical antenna polarization.
- The highest radiation from the equipment is recorded.
- By varying the configuration of the test sample and the cable routing, it is attempted to maximize the emission.
- The test receiver with Quasi Peak and Average detector is in compliance with CISPR 16-1:1993.
- The spectrum analyzer is set-up as following;
- The carrier level (or,noise levels) was (or were) measured at each position of all three axes X,Y and Z,and the position that has the maximum noise was determined.
- With the position,the noise levels of all the frequencies was measured.

(Frequency range : 30 - 1000 MHz)

- ✓ Resolution bandwidth : 100 kHz
- ✓ Video bandwidth : 300 kHz
- ✓ Detector function : Peak
- ✓ Trace Mode : Max Hold

(Frequency range : Above 1000 MHz)

- ✓ Resolution bandwidth : 1 MHz
- ✓ Video bandwidth : 1 MHz
- ✓ Detector function : Peak
- ✓ Trace Mode : Max Hold

- EMI Test Receiver analyzer is set-up as following;

- ✓ IF bandwidth : 120 kHz (Quasi-Peak Detector)
- ✓ IF bandwidth : 1 MHz (Average Detector)

- See test configuration figure 4.2.

5.7.2 Minimum Standard

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)).

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	24000/F (kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., § 15.231 and 15.241.

5.7.3 Result

EUT complies with the requirement.

Uncertainty of measurement result: ± 3.28 dB

Temperature, Humidity : Refer to each data table

5.7.4 Measured Data

30MHz to 1GHz

<<Radiated Emission>>

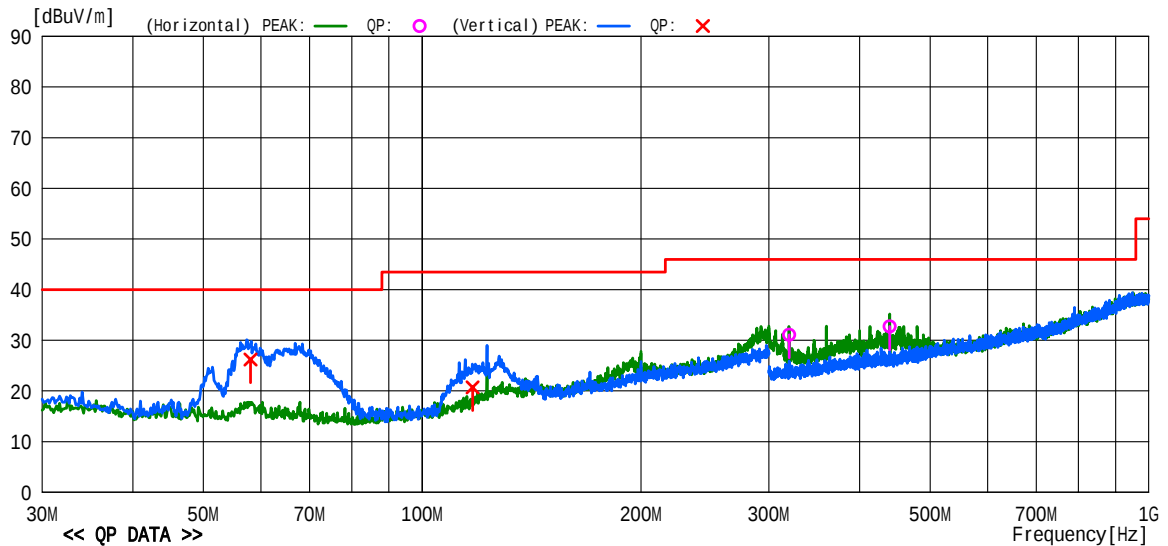
Cosmos Corporation Onoki Lab.
Date : 2010/12/13 22:19:59

Model Name : MW-260 TypeA/AD-210US
Serial No. : E64711-C7A443314/01
Operator : O. Itogawa
Power Supply : AC 120V,60Hz

Job No : CJ10-099679E
Temp./Humi. : 24 /44%
Condition : Tx 2402MHz
Remark :

Memo : RBW:30M ~ 1GHz(120kHz)

LIMIT : Fcc15C 15_209 (3m) 30MHz-1000MHz



No	Freq.	Reading	Ant.Fac	Loss	Gain	Result	Limit	Margin	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	319.944	37.1	14.7	6.9	27.6	31.1	46.0	14.9	Hori.	100	293	LP	QP
2	439.919	36.4	17.0	7.7	28.4	32.7	46.0	13.3	Hori.	100	22	LP	QP
3	58.050	40.0	10.0	4.5	28.3	26.2	40.0	13.8	Vert.	100	141	BC	QP
4	117.345	32.9	10.7	5.2	28.1	20.7	43.5	22.8	Vert.	100	140	BC	QP

-TEPTO-DV/RE Ver 1.80.0020

5.7.4 Measured Data (Continued)

<<Radiated Emission>>

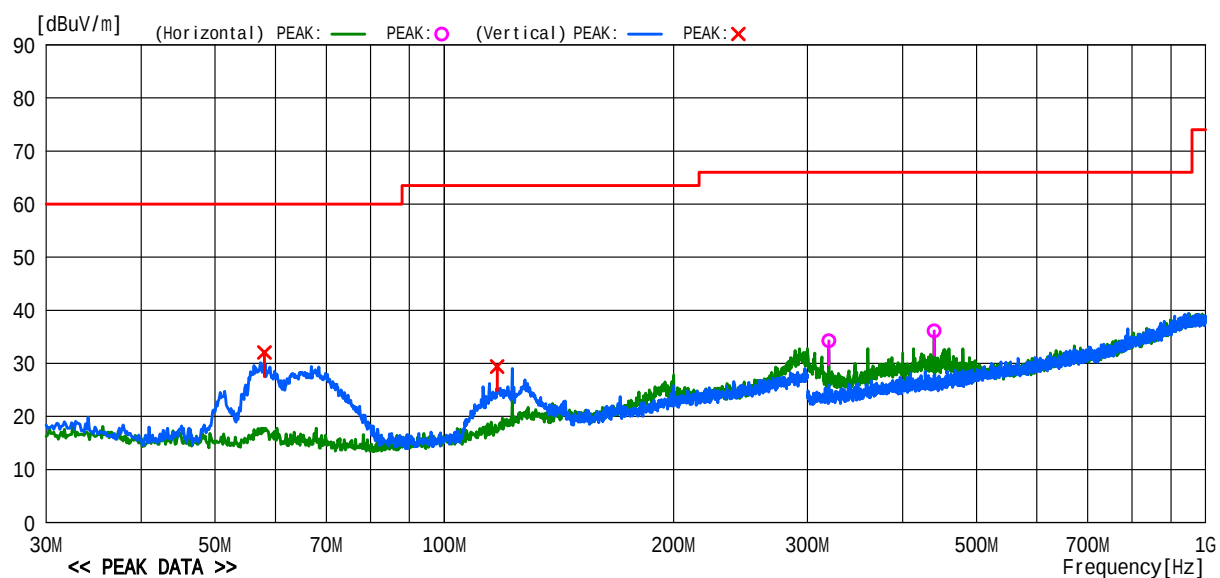
Cosmos Corporation Onoki Lab.
Date : 2010/12/13 22:19:59

Model Name : MW-260 TypeA/AD-210US
Serial No. : E64711-C7A443314/01
Operator : O.Itogawa
Power Supply : AC 120V,60Hz

Job No : CJ10-099679E
Temp./Humi. : 24 /44%
Condition : Tx 2402MHz
Remark :

Memo : RBW:30M ~ 1GHz(120kHz)

LIMIT : Fcc15C 15_209 (3m)PK 30MHz-1000MHz



5.7.4 Measured Data (Continued)

<<Radiated Emission>>

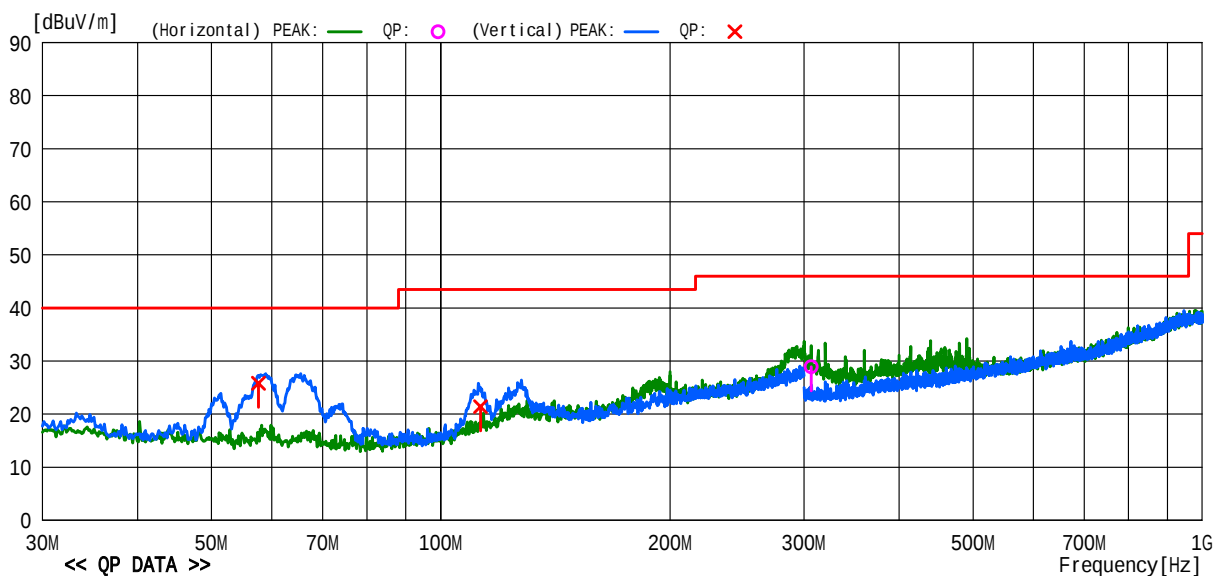
Cosmos Corporation Onoki Lab.
Date : 2010/12/13 23:13:23

Model Name : MW-260 TypeA/AD-210US
Serial No. : E64711-C7A443314/01
Operator : O. Itogawa
Power Supply : AC 120V, 60Hz

Job No : CJ10-099679E
Temp./Humi. : 24 /44%
Condition : Tx 2441MHz
Remark :

Memo : RBW:30M ~ 1GHz(120kHz)

LIMIT : Fcc15C 15_209 (3m) 30MHz-1000MHz



No	Freq.	Reading	Ant.Fac	Loss	Gain	Result	Limit	Margin	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	306.663	35.2	14.4	6.8	27.5	28.9	46.0	17.1	Hori.	100	291	LP	QP
2	57.650	39.6	10.0	4.5	28.3	25.8	40.0	14.2	Vert.	100	209	BC	QP
3	112.806	33.9	10.4	5.2	28.1	21.4	43.5	22.1	Vert.	100	204	BC	QP

-TEPT0-DV/RE Ver 1.80.0020

5.7.4 Measured Data (Continued)

<<Radiated Emission>>

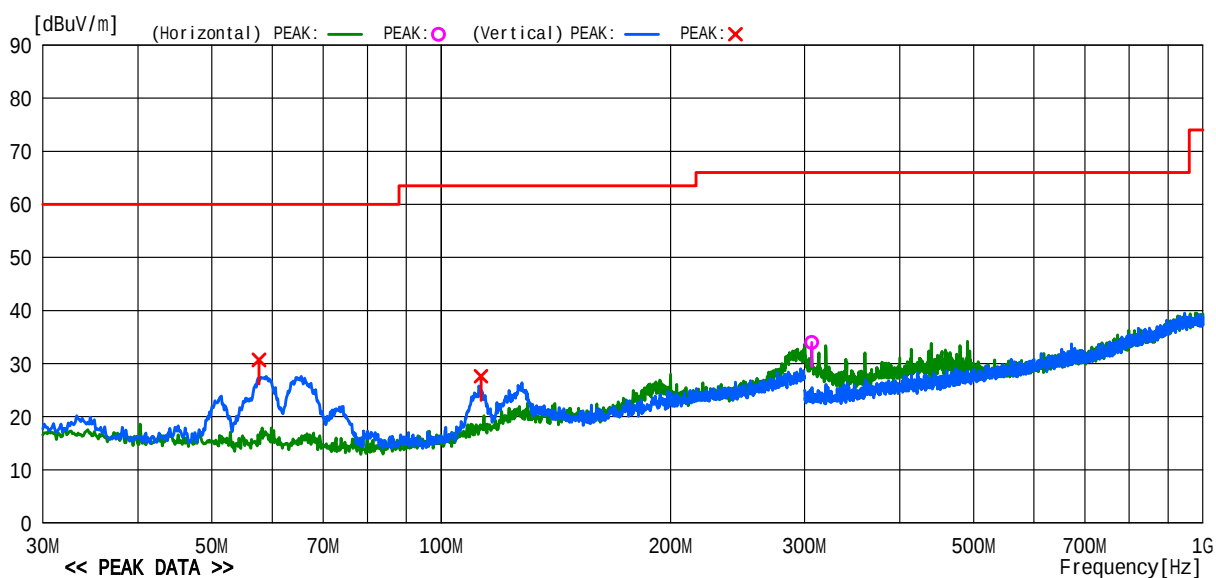
Cosmos Corporation Onoki Lab.
Date : 2010/12/13 23:13:23

Model Name : MW-260 TypeA/AD-210US
Serial No. : E64711-C7A443314/01
Operator : O. Itogawa
Power Supply : AC 120V,60Hz

Job No : CJ10-099679E
Temp./Humi. : 24 /44%
Condition : Tx 2441MHz
Remark :

Memo : RBW:30M ~ 1GHz(120kHz)

LIMIT : Fcc15C 15_209 (3m)PK 30MHz-1000MHz



No	Freq.	Reading	Ant.Fac	Loss	Gain	Result	Limit	Margin	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	306.663	40.3	14.4	6.8	27.5	34.0	66.0	32.0	Hori.	100	291	LP	PK
2	57.650	44.5	10.0	4.5	28.3	30.7	60.0	29.3	Vert.	100	209	BC	PK
3	112.806	40.1	10.4	5.2	28.1	27.6	63.5	35.9	Vert.	100	204	BC	PK

-TEPTO-DV/RE Ver 1.80.0020

5.7.4 Measured Data (Continued)

<<Radiated Emission>>

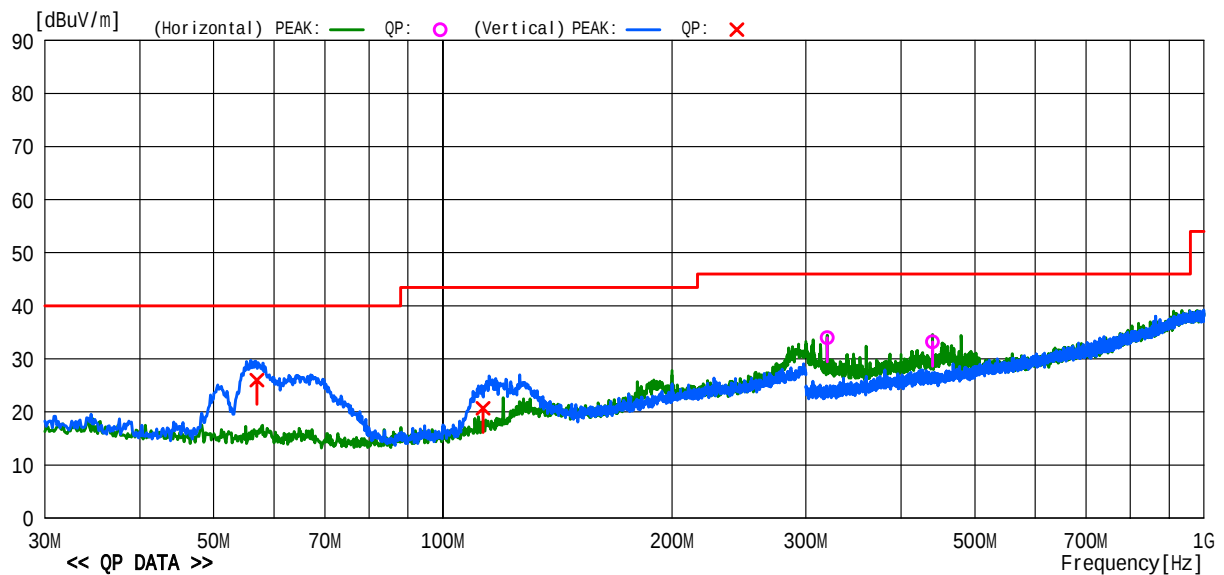
Cosmos Corporation Onoki Lab.
Date : 2010/12/13 23:50:40

Model Name : MW-260 TypeA/AD-210US
Serial No. : E64711-C7A443314/01
Operator : O. Itogawa
Power Supply : AC 120V,60Hz

Job No : CJ10-099679E
Temp./Humi. : 24 /44%
Condition : Tx 2480MHz
Remark :

Memo : RBW:30M ~ 1GHz(120kHz)

LIMIT : Fcc15C 15_209 (3m) 30MHz-1000MHz



No	Freq.	Reading	Ant. Fac	Loss	Gain	Result	Limit	Margin	Pol.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	319.946	40.0	14.7	6.9	27.6	34.0	46.0	12.0	Hori.	100	295	LP	QP
2	439.925	36.9	17.0	7.7	28.4	33.2	46.0	12.8	Hori.	100	22	LP	QP
3	56.979	39.7	10.1	4.5	28.3	26.0	40.0	14.0	Vert.	100	143	BC	QP
4	112.966	33.2	10.4	5.2	28.1	20.7	43.5	22.8	Vert.	100	208	BC	QP

-TEPTO-DV/RE Ver 1.80.0020

5.7.4 Measured Data (Continued)

<<Radiated Emission>>

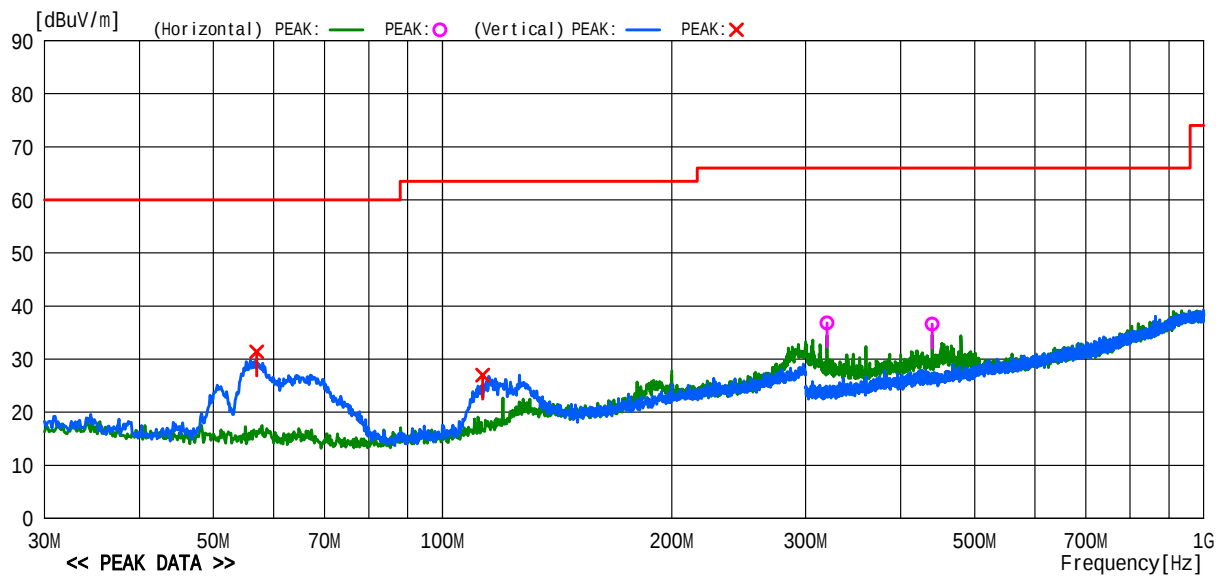
Cosmos Corporation Onoki Lab.
Date : 2010/12/13 23:50:40

Model Name : MW-260 TypeA/AD-210US
Serial No. : E64711-C7A443314/01
Operator : O.Itogawa
Power Supply : AC 120V,60Hz

Job No : CJ10-099679E
Temp./Humi. : 24 /44%
Condition : Tx 2480MHz
Remark :

Memo : RBW:30M ~ 1GHz(120kHz)

LIMIT : Fcc15C 15_209 (3m)PK 30MHz-1000MHz



No	Freq. [MHz]	Reading [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant Type	Comment
1	319.946	42.8	14.7	6.9	27.6	36.8	66.0	29.2	Hori.	100	295	LP	PK
2	439.925	40.3	17.0	7.7	28.4	36.6	66.0	29.4	Hori.	100	22	LP	PK
3	56.979	45.1	10.1	4.5	28.3	31.4	60.0	28.6	Vert.	100	143	BC	PK
4	112.966	39.5	10.4	5.2	28.1	27.0	63.5	36.5	Vert.	100	208	BC	PK

-TEPTO-DV/RE Ver 1.80.0020

5.7.4 Measured Data (Continued)

1GHz to 18GHz

RADIATED EMISSION

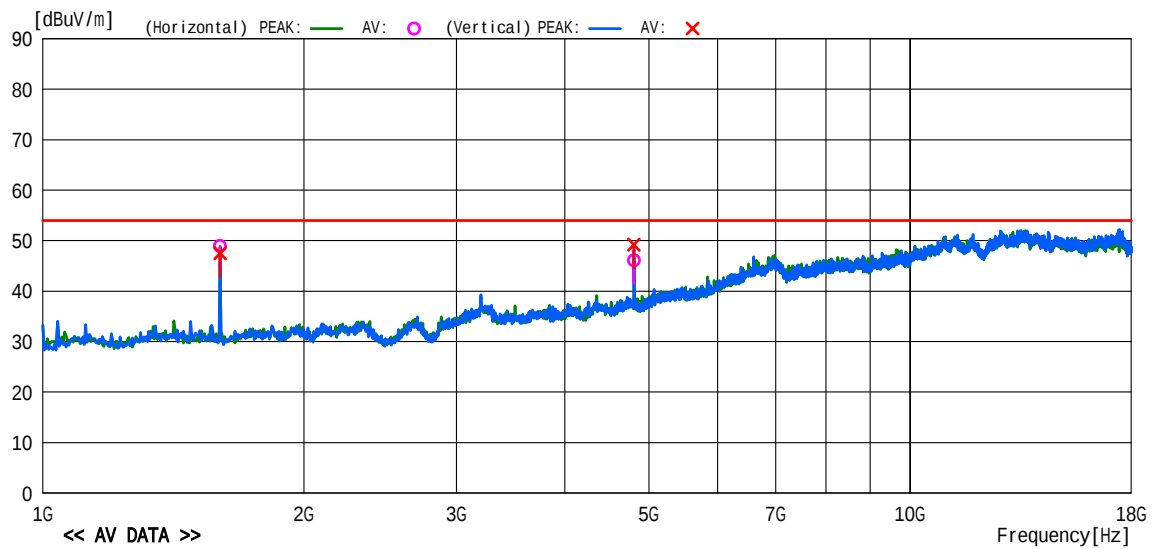
Cosmos Corporation Onoki Lab.
Date : 2010/12/15 00:44:15

Model Name : MW-260 TypeA/AD-210US
Serial No. : E64711-C7A443314/01
Operator : O. Itogawa
Power Supply : AC 120V, 60Hz

Job No. : CJ10-099679E
Temp/Humi : 25 /45%
Condition : Tx 2402MHz
Remark :

Memo : RBW:1GHz ~ (1MHz)

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(AV)



No	Freq.	Reading	Ant.Fac	Loss	Gain	Result	Limit	Margin	Pol.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	1601.335	55.3	24.8	3.5	34.7	48.9	54.0	5.1	Hori.	100	134	AV	
2	4803.951	45.1	31.0	6.3	36.3	46.1	54.0	7.9	Hori.	100	330	AV	
3	1601.325	53.9	24.8	3.5	34.7	47.5	54.0	6.5	Vert.	200	72	AV	
4	4803.951	48.2	31.0	6.3	36.3	49.2	54.0	4.8	Vert.	102	93	AV	

-TEPT0-DV/RE Ver1.80.0020

5.7.4 Measured Data (Continued)

RADIATED EMISSION

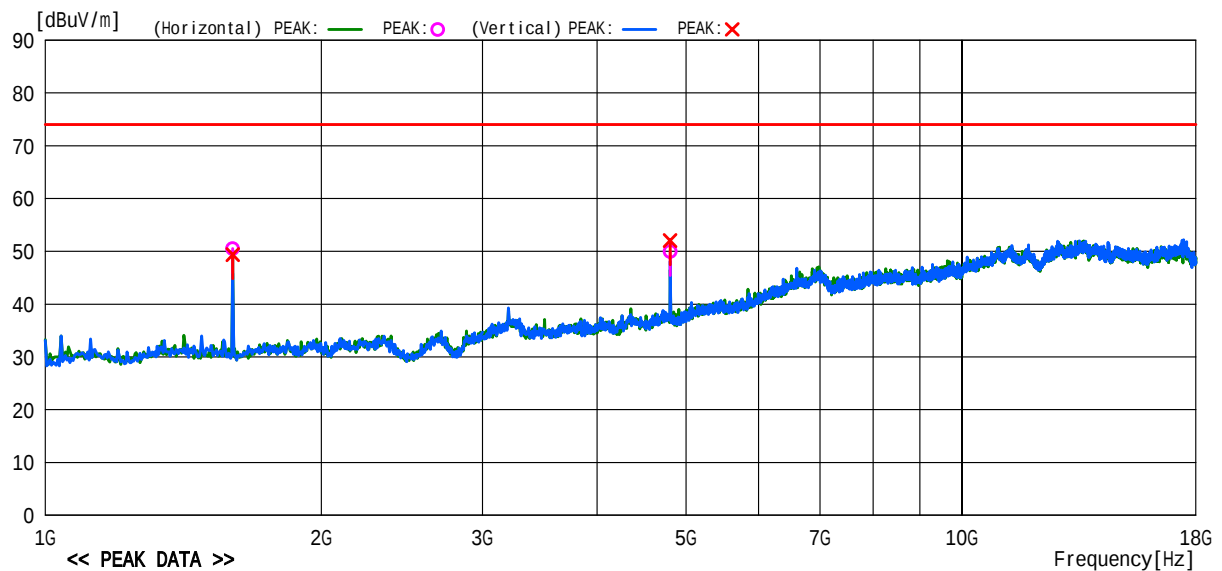
Cosmos Corporation Onoki Lab.
Date : 2010/12/15 00:44:15

Model Name : MW-260 TypeA/AD-210US
Serial No. : E64711-C7A443314/01
Operator : O. Itogawa
Power Supply : AC 120V,60Hz

Job No. : CJ10-099679E
Temp/Humi : 25 /45%
Condition : Tx 2402MHz
Remark :

Memo : RBW:1GHz ~ (1MHz)

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(PK)



No	Freq.	Reading	Ant. Fac	Loss	Gain	Result	Limit	Margin	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	1601.335	56.9	24.8	3.5	34.7	50.5	74.0	23.5	Hori.	100	134		PK
2	4803.951	49.0	31.0	6.3	36.3	50.0	74.0	24.0	Hori.	100	330		PK
3	1601.325	55.8	24.8	3.5	34.7	49.4	74.0	24.6	Vert.	200	72		PK
4	4803.951	51.0	31.0	6.3	36.3	52.0	74.0	22.0	Vert.	102	93		PK

-TEPT0-DV/RE Ver1.80.0020

5.7.4 Measured Data (Continued)

RADIATED EMISSION

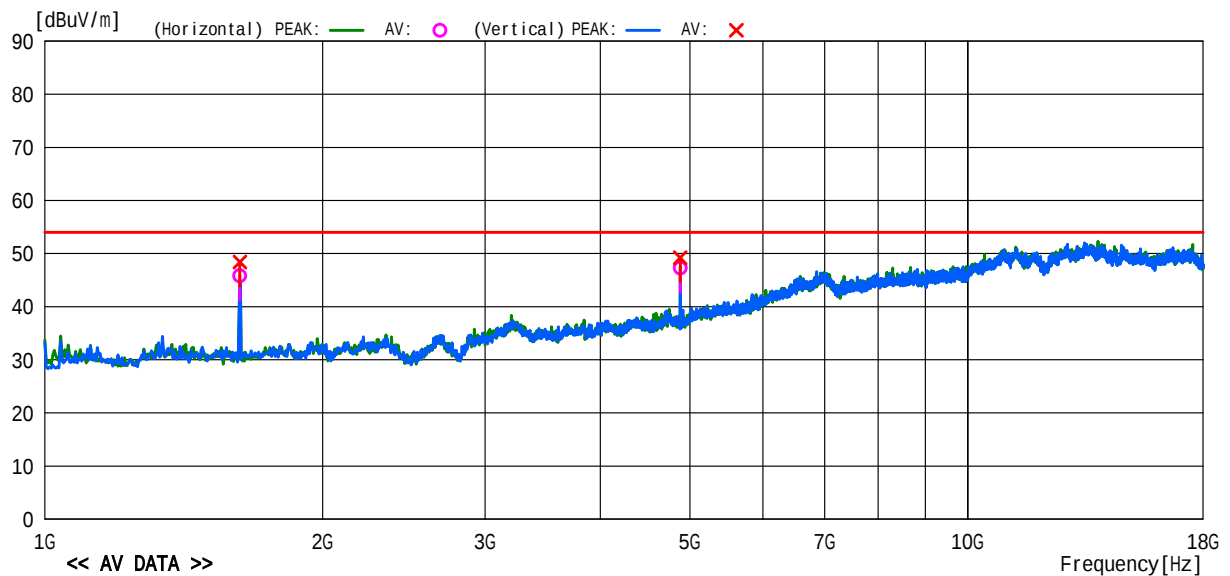
Cosmos Corporation Onoki Lab.
Date : 2010/12/15 01:30:18

Model Name : MW-260 TypeA/AD-210US
Serial No. : E64711-C7A443314/01
Operator : O. Itogawa
Power Supply : AC 120V,60Hz

Job No. : CJ10-099679E
Temp/Humi : 25 /45%
Condition : Tx 2441MHz
Remark :

Memo : RBW:1GHz ~ (1MHz)

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(AV)



No	Freq.	Reading	Ant.Fac	Loss	Gain	Result	Limit	Margin	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	1627.322	52.1	24.9	3.5	34.7	45.8	54.0	8.2	Hori.	100	113		AV
2	4881.966	46.0	31.1	6.3	36.1	47.3	54.0	6.7	Hori.	100	328		AV
3	1627.322	54.7	24.9	3.5	34.7	48.4	54.0	5.6	Vert.	142	78		AV
4	4881.966	47.9	31.1	6.3	36.1	49.2	54.0	4.8	Vert.	100	208		AV

-TEPTO-DV/RE Ver1.80.0020

5.7.4 Measured Data (Continued)

RADIATED EMISSION

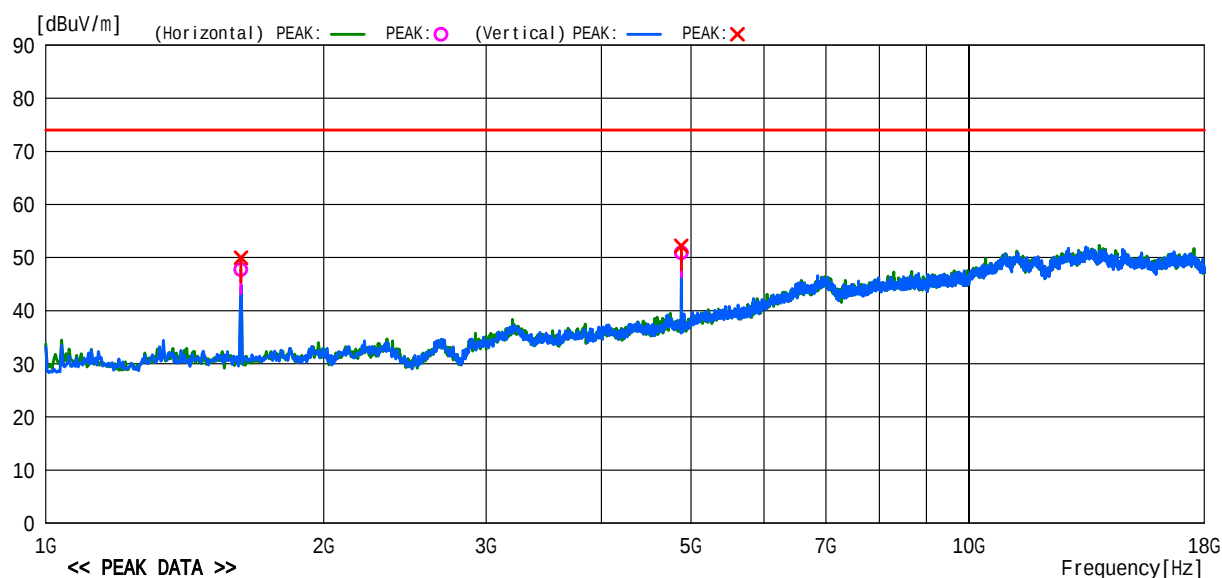
Cosmos Corporation Onoki Lab.
Date : 2010/12/15 01:30:18

Model Name : MW-260 TypeA/AD-210US
Serial No. : E64711-C7A443314/01
Operator : O.Itogawa
Power Supply : AC 120V,60Hz

Job No. : CJ10-099679E
Temp/Humi : 25 /45%
Condition : Tx 2441MHz
Remark :

Memo : RBW:1GHz ~ (1MHz)

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(PK)



No	Freq.	Reading	Ant.Fac	Loss	Gain	Result	Limit	Margin	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	1627.322	54.0	24.9	3.5	34.7	47.7	74.0	26.3	Hori.	100	113	PK	
2	4881.966	49.6	31.1	6.3	36.1	50.9	74.0	23.1	Hori.	100	328	PK	
3	1627.322	56.3	24.9	3.5	34.7	50.0	74.0	24.1	Vert.	142	78	PK	
4	4881.966	50.9	31.1	6.3	36.1	52.2	74.0	21.8	Vert.	100	208	PK	

-TEPT0-DV/RE Ver1.80.0020

5.7.4 Measured Data (Continued)

RADIATED EMISSION

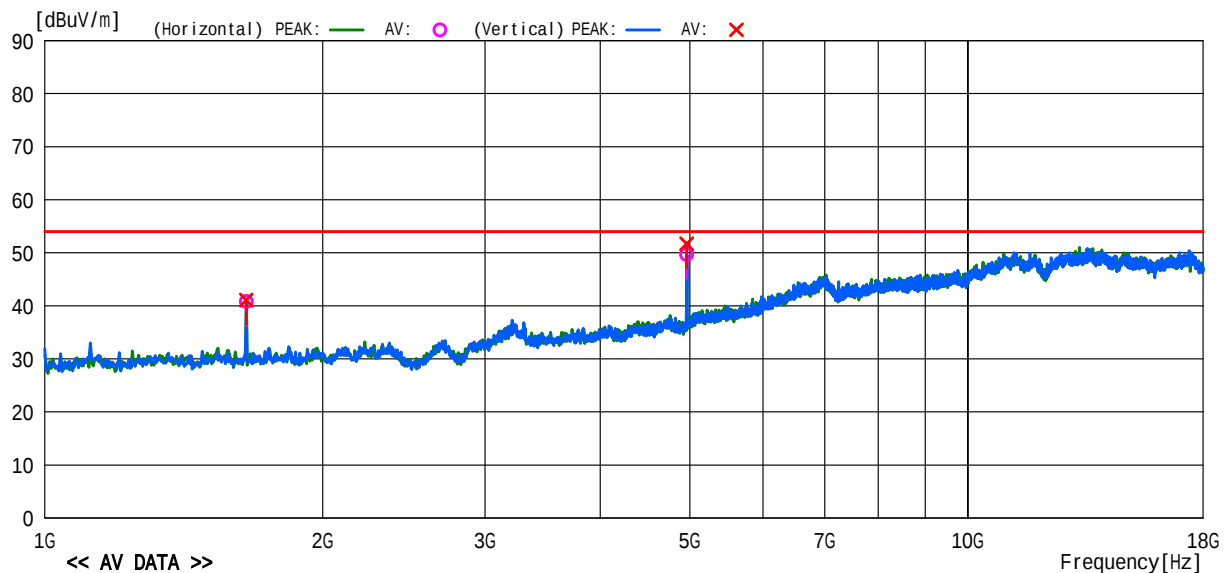
Cosmos Corporation Onoki Lab.
Date : 2010/12/15 19:37:01

Model Name : MW-260 TypeA/AD-210US
Serial No. : E64711-C7A443314/01
Operator : O. Itogawa
Power Supply : AC 120V,60Hz

Job No. : CJ10-099679E
Temp/Humi : 25 /43%
Condition : Tx 2480MHz
Remark :

Memo : RBW:1GHz ~ (1MHz)

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(AV)



No	Freq.	Reading	Ant.Fac	Loss	Gain	Result	Limit	Margin	Pola.	Height	Angle	Ant	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]	Type	
1	1653.299	47.0	24.9	3.6	34.7	40.8	54.0	13.2	Hori.	100	79		AV
2	4959.937	48.1	31.2	6.3	35.9	49.7	54.0	4.3	Hori.	103	185		AV
3	1653.309	47.3	24.9	3.6	34.7	41.1	54.0	12.9	Vert.	138	81		AV
4	4959.937	50.1	31.2	6.3	35.9	51.7	54.0	2.3	Vert.	103	193		AV

-TEPTO-DV/RE Ver1.80.0020

5.7.4 Measured Data (Continued)

RADIATED EMISSION

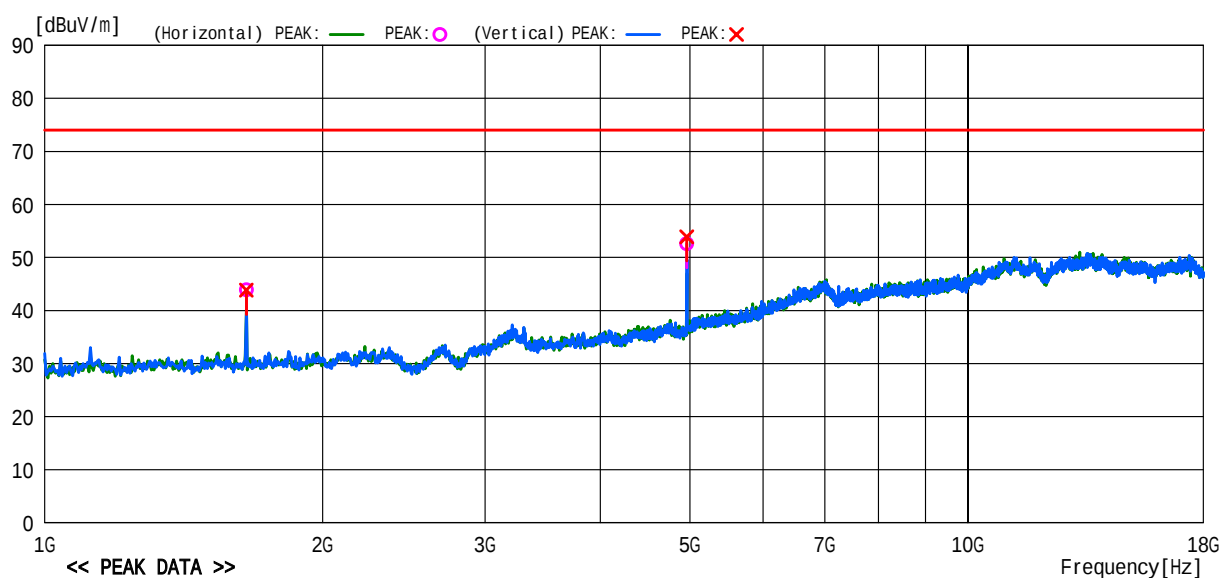
Cosmos Corporation Onoki Lab.
Date : 2010/12/15 19:37:01

Model Name : MW-260 TypeA/AD-210US
Serial No. : E64711-C7A443314/01
Operator : O. Itogawa
Power Supply : AC 120V,60Hz

Job No. : CJ10-099679E
Temp/Humi : 25 /43%
Condition : Tx 2480MHz
Remark :

Memo : RBW:1GHz ~ (1MHz)

LIMIT : FCC Subpart C 15.209 (3m) 1G-26.5GHz(PK)



7.4 Measured Data (Continued)

18GHz to 26.5GHz

No spurious emission for RF was found in 18GHz to 26.5GHz.

5.8 15. 247(e) Power Spectrum Density

5.8.1 Setting Remarks

- EUT directly connects to the spectrum analyzer via calibrated coaxial cable and 10 dB attenuator.
- The loss of the coaxial cable is maximum 1 dB.
- The peak output power is determined by using the marker-data function of spectrum analyzer.
- The spectrum analyzer is set-up as following;
 - ✓ Frequency Span : 1.5 MHz
 - ✓ Resolution bandwidth : 3 kHz
 - ✓ Video bandwidth : 3 MHz
 - ✓ Sweep : 500sec
 - ✓ Detector function : Peak
 - ✓ Trace Mode : Max Hold
- See test configuration figure 4.3.

5.8.2 Minimum Standard

15.247 (e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

5.8.3 Result

EUT complies with the requirement.

Uncertainty of measurement result: ± 0.8 dB

Temperature, Humidity : 23°C, 49%

5.8.4 Measured Data

※ Bluetooth (F1D 1Mbps)BASIC DH5

Frequency (MHz)	Correction Factor (dB)	Reading (dBm)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
2441(39ch)	0.70	-13.71	-13.01	8	21.01

※ Bluetooth (G1D 2Mbps) EDR 2-DH5

Frequency (MHz)	Correction Factor (dB)	Reading (dBm)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
2441(39ch)	0.70	-13.84	-13.14	8	21.14

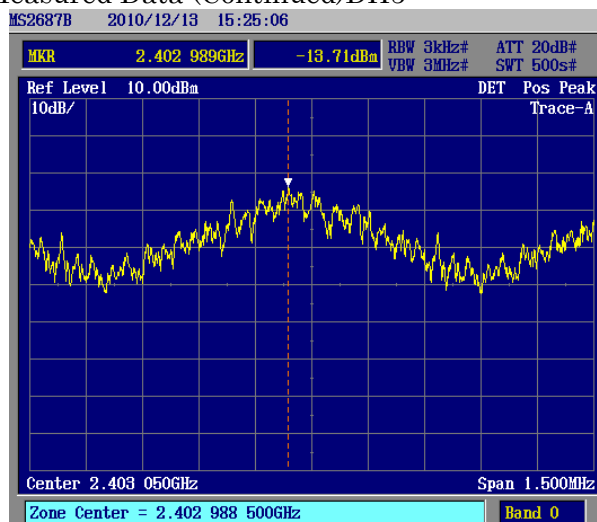
※ Bluetooth (G1D 3Mbps) EDR 3-DH5

Frequency (MHz)	Correction Factor (dB)	Reading (dBm)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
2441(39ch)	0.70	-13.81	-13.11	8	21.11

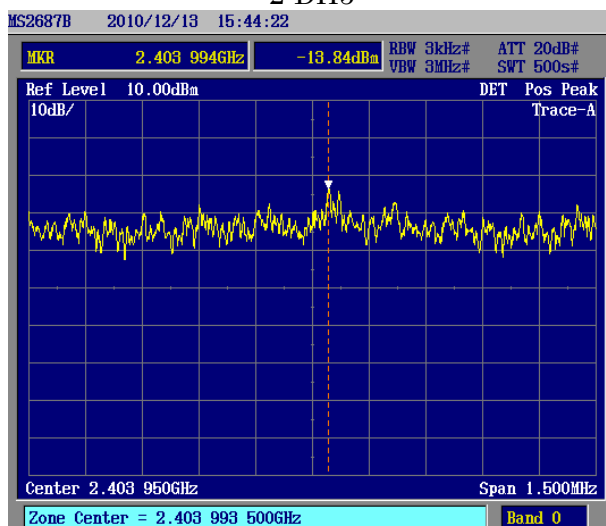
* Correction Factor = Cable Loss (dB) + External Attenuator (dB)

These data are worst.

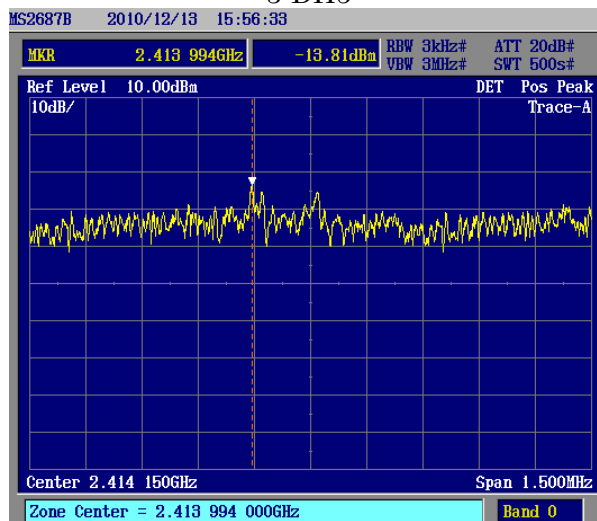
5.8.4 Measured Data (Continued)DH5



2-DH5



3-DH5



5.9 15. 247(d) Band Edge Measurement

5.9.1 Setting Remarks

- EUT directly connects to the spectrum analyzer via calibrated coaxial cable and 10 dB attenuator.
- The loss of the coaxial cable is maximum 1 dB.
- The emission at the band edge is measured by using the marker function of spectrum analyzer.
- The peak of the in-band emission is measured by using the marker to peak function of spectrum analyzer.
- This measurement is repeated in both side of the spectrum.
- The spectrum analyzer is set-up as following;
 - ✓ Frequency Span : 30MHz
 - ✓ Resolution bandwidth : 300kHz (1% of frequency span)
 - ✓ Video bandwidth : > RBW
 - ✓ Sweep : Auto
 - ✓ Detector function : Peak
 - ✓ Trace Mode : Max Hold
- Where band edge spectrum is too rough to find precise edge point, larger RBW i.e. 1MHz, 3MHz shall be applied as severer condition.
- See test configuration figure 4.2.

5.9.2 Minimum Standard

In any 100kHz bandwidth outside the frequency band in which the transmitter is operating, emissions shall be at least 20 dB below the fundamental emission or shall not exceed the following field strength limits. Emissions falling in the restricted bands of 15.205 shall not exceed the following field strength limits:

Frequency of Emission (MHz)	Limit of the band edge spurious emission (dBμV)	
Below 2,390.0	Peak	Average
Above 2,483.5	74	54

5.9.3 Result

EUT complies with the requirement.

Uncertainty of measurement result: ± 2.6 dB

Temperature, Humidity : 25°C, 43%

5.9.4 Measured Data

The band edge emissions are calculated as following;

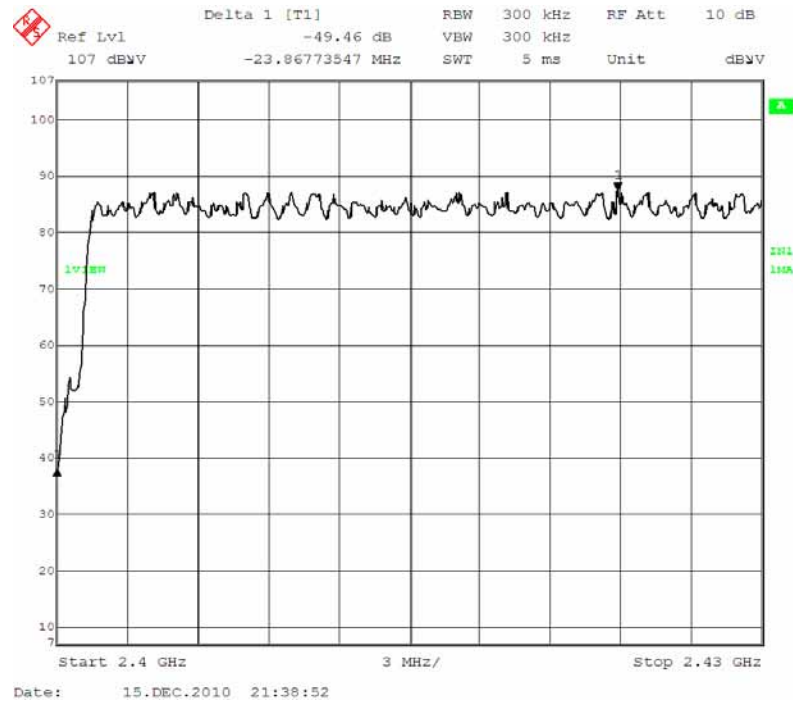
CH	Vertical		Horizontal	
	1CH (2402MHz)	79CH (2480MHz)	1CH (2402MHz)	79CH (2480MHz)
P _{max}	83.96	84.32	87.35	89.17
P _{av}	58.50	62.10	63.50	65.10
P _{dev}	48.34	42.24	49.46	44.09
P _{dav}	26.40	30.70	31.15	33.30
c.f	-3.70	-3.70	-3.70	-3.70
E _{be}	31.92	38.38	34.19	41.38
E _{av}	28.40	27.70	28.65	28.10
Limit(E _{be})	74.00	74.00	74.00	74.00
Limit(E _{av})	54.00	54.00	54.00	54.00
Margin(E _{be})	42.08	35.62	39.81	32.62
Margin(E _{av})	25.60	26.30	25.35	25.90

- P_{max} : Maximum peak power of the fundamental.
P_{av} : Average of the fundamental.
P_{dev} : The amplitude delta between the peak power and the band edge emission.
P_{dav} : The amplitude delta between the average power and the band edge emission.
E_{be} : Band edge emission.
E_{av} : Average of the band edge emission.

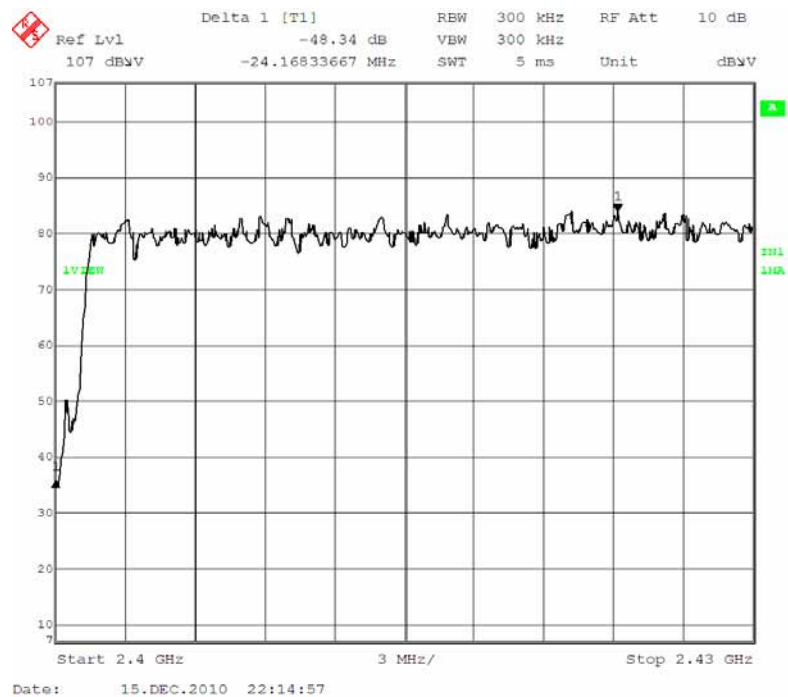
5.9.4 Measured Data (Continued)

Lower frequency of the band edge

Horizontal



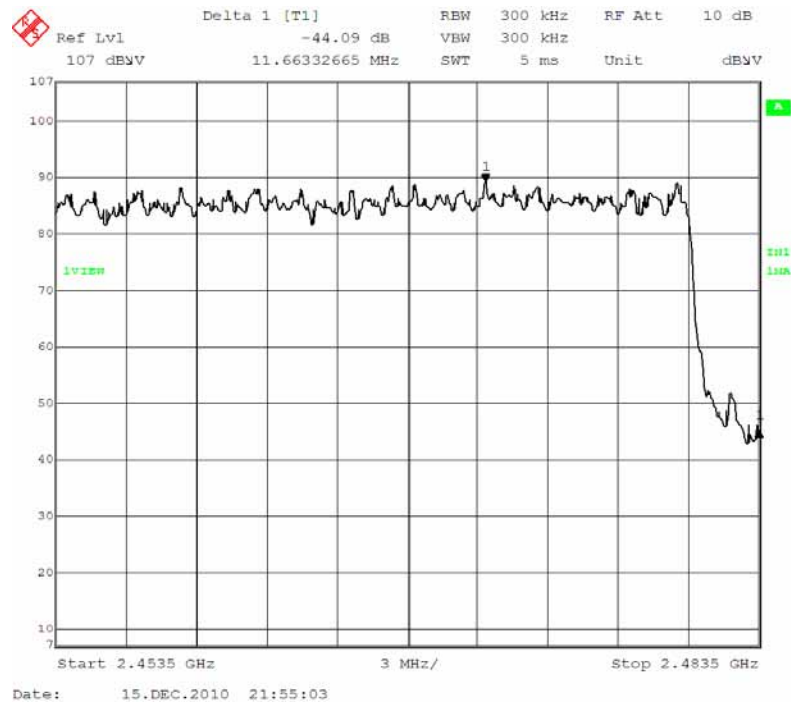
Vertical



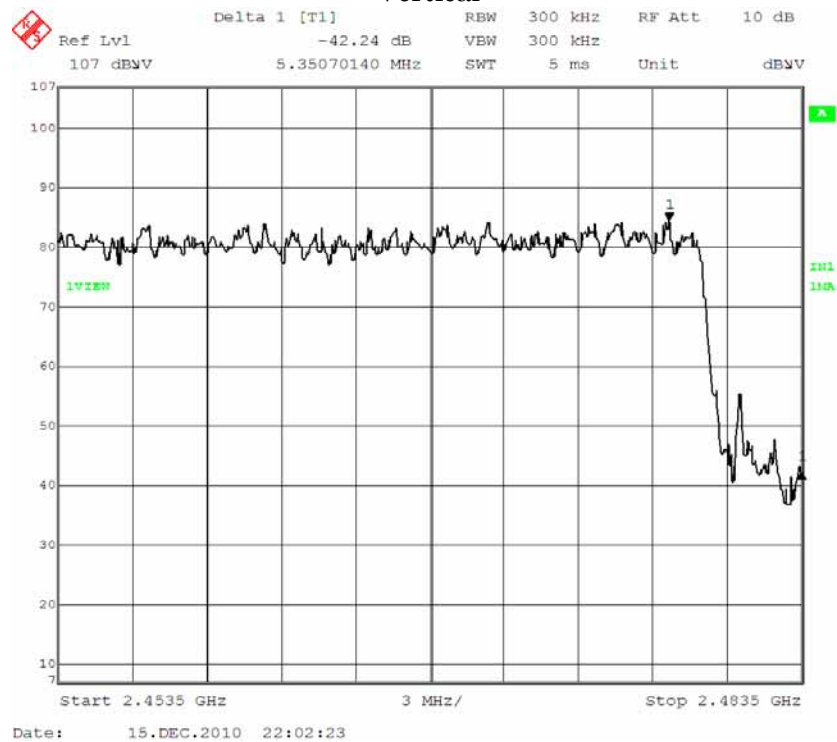
5.9.4 Measured Data (Continued)

Higher frequency of the band edge

Horizontal



Vertical



6. Photos

6.1 Photo of the EUT



6.2 Setup Photo (AC Power Conducted Emission)



6.2 Setup Photo (AC Power Conducted Emission) (Continued)



6.3 Setup Photo (Radiated Emission)
30MHz - 1GHz



6.3 Setup Photo (Radiated Emission) (Continued)



6.3 Setup Photo (Radiated Emission) (Continued)

1GHz – 18GHz



6.3 Setup Photo (Radiated Emission) (Continued)

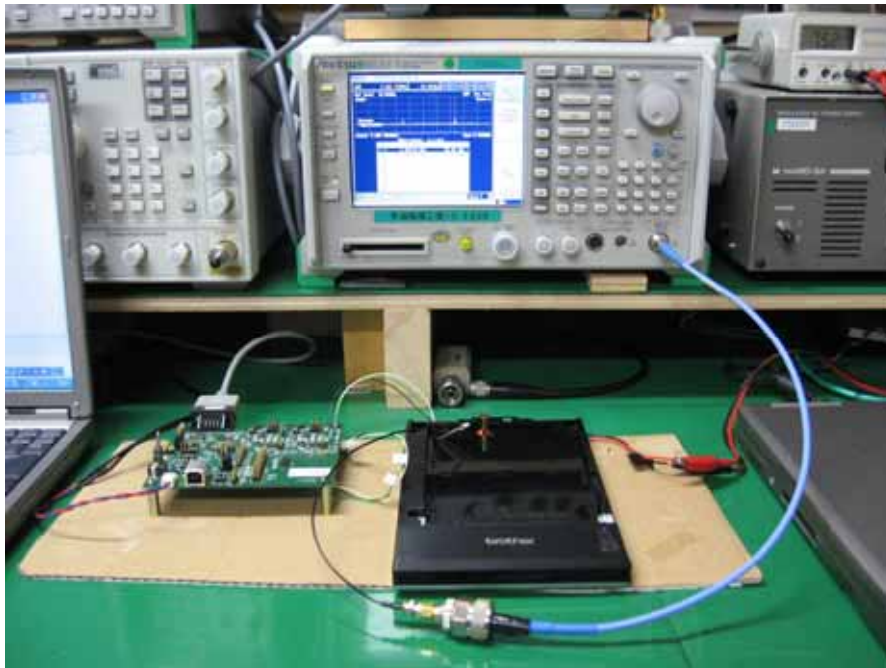
18GHz – 26.5GHz



6.4 Setup Photo (Maximum Peak Output Power)



6.5 Setup Photo (All Other Test Items)

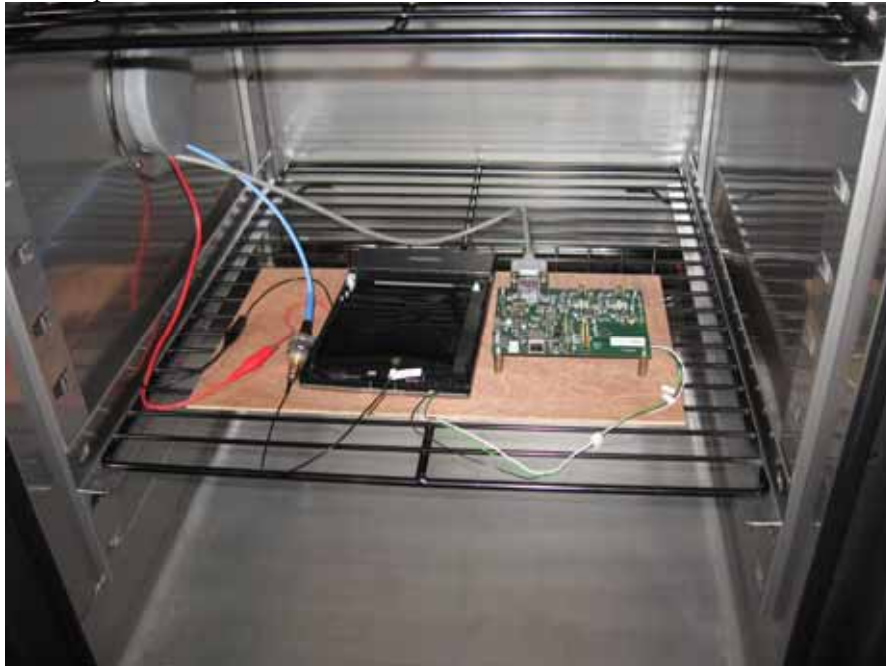


6.6 Setup Photo (Environmental Chamber Test)

Front view



Close-up



7. List of Test Measurement Instruments

7.1 AC Power Conducted Emission

Instruments	Manufacturer	Model / Type	Serial No.	Calibration Date Next Calibration
Spectrum Analyzer	ADVANTEST CORPORATION	R3132	140501174	November, 2010 November, 2011
EMI Test Receiver	ROHDE & SCHWARZ	ESCS30	100335	November, 2010 November, 2011
Artificial-Mains Network	KYORITSU CORPORATION	KNW-341F	8S-2996-1	July, 2010 July, 2011
RF Selector	TSJ	RFM-E221	3148	October, 2010 October, 2011

7.2 Radiated Emission Measurement

Instruments	Manufacturer	Model / Type	Serial No.	Calibration Date Next Calibration
Programmable AC/DC Power Source	NF Corporation	ES18000W	425779	Confirmed before Test
RF Selector	TSJ	RFM-E121	03149	October, 2010 October, 2011
EMI Test Receiver (20Hz to 40GHz)	ROHDE & SCHWARZ	ESIB40	100211	October, 2010 October, 2011
Biconical Antenna (30MHz to 300MHz)	SCHWARZBECK	VHBB9124 BBA9106	9124-311	September, 2010 September, 2011
Log-Periodic Antenna (300MHz to 1GHz)	SCHWARZBECK	UHALP9108A	645	September, 2010 September, 2011
Horn Antenna (1GHz to 12.5GHz)	SCHWARZBECK	BBHA9120D	443	October, 2010 October, 2011
Horn Antenna (12.5GHz to 18GHz)	ETS LINDGREN	3160-08	00033782	September, 2010 September, 2011
Horn Antenna (18GHz to 26.5GHz)	ETS LINDGREN	3160-09	00034723	September, 2010 September, 2011
Pre Amp (30MHz to 1GHz)	HEWLETT PACKARD	8447D	2944A07891	October, 2010 October, 2011
Pre Amp (1GHz to 12.75GHz)	TSJ	MLA-0120AM L-34	---	January, 2010 January, 2011

7.3 Conducted Radio Measurement

Instruments	Manufacturer	Model / Type	Serial No.	Calibration Date Next Calibration
DC Power Source	KIKUSUI	PAN60-6A	JK002503	---
Spectrum Analyzer	Anritsu	MS2687B	6200162706	April, 2010 April, 2011
Signal Generator	Agilent Technology	E8254A	US41140186	May, 2010 May, 2011
Oscilloscope	Tektronix	TDS794D	B031832	October, 2010 October, 2011
Diode Detector	Agilent Technology	423B	MY42241836	March, 2010 March, 2011