

# TEST REPORT

Report number: Z071C-10289

Issue Date: October 18, 2010

The device, as described herewith, was tested pursuant to applicable test procedure indicated below and complies with the requirements of;

**FCC Part15 Subpart C / IC RSS-210**  
**- Class II Permissive Change -**

The test results are traceable to the international or national standards.

Applicant	:	MITSUMI ELECTRIC CO., LTD.
Equipment under test (EUT)	:	Wireless LAN Module
FCC ID	:	EW4DWMW028
IC Certification Number	:	4250A-DWMW028
Model Number	:	DWM-W028
Serial Number	:	0424AA
EUT Condition	:	Production

Test procedure : ANSI C63.4-2003  
Date of test : October 12, 15, 16, 2010  
Test place : 10m Semi-anechoic chamber, 3m Semi-anechoic chamber  
Test results : Complied

Zacta Technology Corporation certifies that no party to the application is subject to a denial of federal benefits that include FCC benefits, pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 853(a).

The results in this report are applicable only to the samples tested.  
This report shall not be re-produced except in full without the written approval of ZACTA Technology Corporation.

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

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## 1. Summary of Test

### 1.1 Purpose of test

This test report is issued for the purpose of the re-testing due to addition of the following host device.  
PARTNER-CTR Debugger.

### 1.2 Standards

CFR47 FCC Part 15 Subpart C, RSS-210

### 1.3 Summary of test results

Table-A presents the list of the measurement items for Spread Spectrum, Frequency hopping devices under FCC Part 15 Subpart C and Industry Canada RSS-210 Issue 7.

Table-A: List of the measurements

Test Items Section	Test Items	Condition	Result
	Transmit mode [Tx]:		
15.247(a)(2) RSS-210 A8.2(a)	Occupied Bandwidth (6dB Bandwidth)	Conducted	N/A
RSS-Gen 4.6.1	99% Occupied bandwidth	Conducted	N/A
15.247(b)(1) 15.31(e) RSS-210 A8.4(2)	Maximum Peak Output Power - Conducted -	Conducted	N/A
15.247(d) RSS-210 A8.5	Band Edge Compliance of RF Conducted Emissions	Conducted	N/A
15.247(d) RSS-210 A8.5 RSS-Gen 4.9, 4.10	Spurious Emissions	Conducted Radiated	N/A Pass
15.247(d) 15.205 15.209 RSS-210 2.2	Restricted Bands of Operation	Radiated	Pass
15.247(e) RSS-210 A8.2(b)	Transmitter power spectral density	Conducted	N/A
15.207 RSS-Gen 7.2.2	AC Power Line Conducted Emissions 150kHz – 30MHz	Conducted	Pass

### 1.4 Deviation from the standard

None

### 1.5 Modification to the EUT by laboratory

None

### 1.6 Test Plan

All the tests in this test report are performed according to Test plan number: 12607884A at TUV Rheinland.

## 2. Equipment description

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### 2.1 General Description of equipment

EUT is Wireless LAN Module.

### 2.2 EUT information

Applicant	MITSUMI ELECTRIC CO., LTD.	
	:	1601, Sakai, Atsugi-shi, Kanagawa-ken 243-8533, Japan
	:	Phone: +81-46-230-3333 Fax: +81-46-230-3547
Equipment under test (EUT)	:	Wireless LAN Module
Host device	:	PARTNER-CTR Debugger
Trade name	:	MITSUMI
Model Number	:	DWM-W028
Serial Number	:	0424AA
EUT condition	:	Production
Max frequency	:	480MHz
Power ratings	:	AC 120V 60Hz (for host)
Size	:	247.0 x 91.8 x 165.3 (mm)
Environment	:	Indoor use
Thermal limitation	:	5°C to 35°C
Operating mode	:	Tx mode / Rx mode
Variation of the family model(s)	:	N/A
[RF Specification]		
Protocol	:	IEEE802.11b, IEEE802.11g
Spread method	:	DSSS, OFDM
Frequency Range	:	2412MHz – 2472MHz
Number of FR Channels	:	13 Channels
Symbol rate on channel	:	<u>1</u> , 2, 5.5, <u>11</u> Mbps (IEEE802.11b)
	:	6, 9, <u>12</u> , <u>18</u> , <u>24</u> , 36, 48, 54Mbps (IEEE802.11g)     _: Tested rate
Channel Separation	:	5MHz
Antenna (Rx and Tx)	:	Dipole antenna
Antenna gain	:	2.62dBi
RF type	:	Transceiver
Intended use	:	Data transmission
RF emission type designator	:	G1D (IEEE802.11b)
	:	G1D (IEEE802.11g)

### *2.3 Operating channels and frequencies*

<b>Channel</b>	<b>Frequency[MHz]</b>
1	2412
2	2417
3	2422
4	2427
5	2432
6	2437
7	2442
8	2447
9	2453
10	2457
11	2462
12	2467
13	2472

## 2.4 Description of Test modes

-Radiated Measurement-

Results of the original report, Maximum Peak Output Power of the worst rates are as follows.

Tested Channel	Data Rate	
	11b	11g
2412MHz (Low)	11Mbps	12Mbps
2442MHz (Mid)	11Mbps	18Mbps
2472MHz (High)	1Mbps	24Mbps

The field strength of spurious emission was measured at each position of all three axes X, Y and Z compare the level, and the maximum noise.

The worst emission was found in X axis and the worst case recorded.

## 2.5 Operating mode

### 【Tx mode】

- i) Test program set up
- ii) Select a test mode
  - Operating frequency: CH.1, 7, 13
  - Tx speed: 1, 2, 5.5, 11Mbps (IEEE802.11b).
  - 6, 9, 12, 18, 24, 36, 48, 54Mbps (IEEE802.11g)
  - Tx mode
- iii) Start test mode

### 【Rx mode】

- i) Test program set up
- ii) Select a test mode
  - Operating frequency: CH.7
  - Rx mode
- iii) Start test mode

### 3. Configuration information

#### 3.1 EUT and Peripheral(s) used

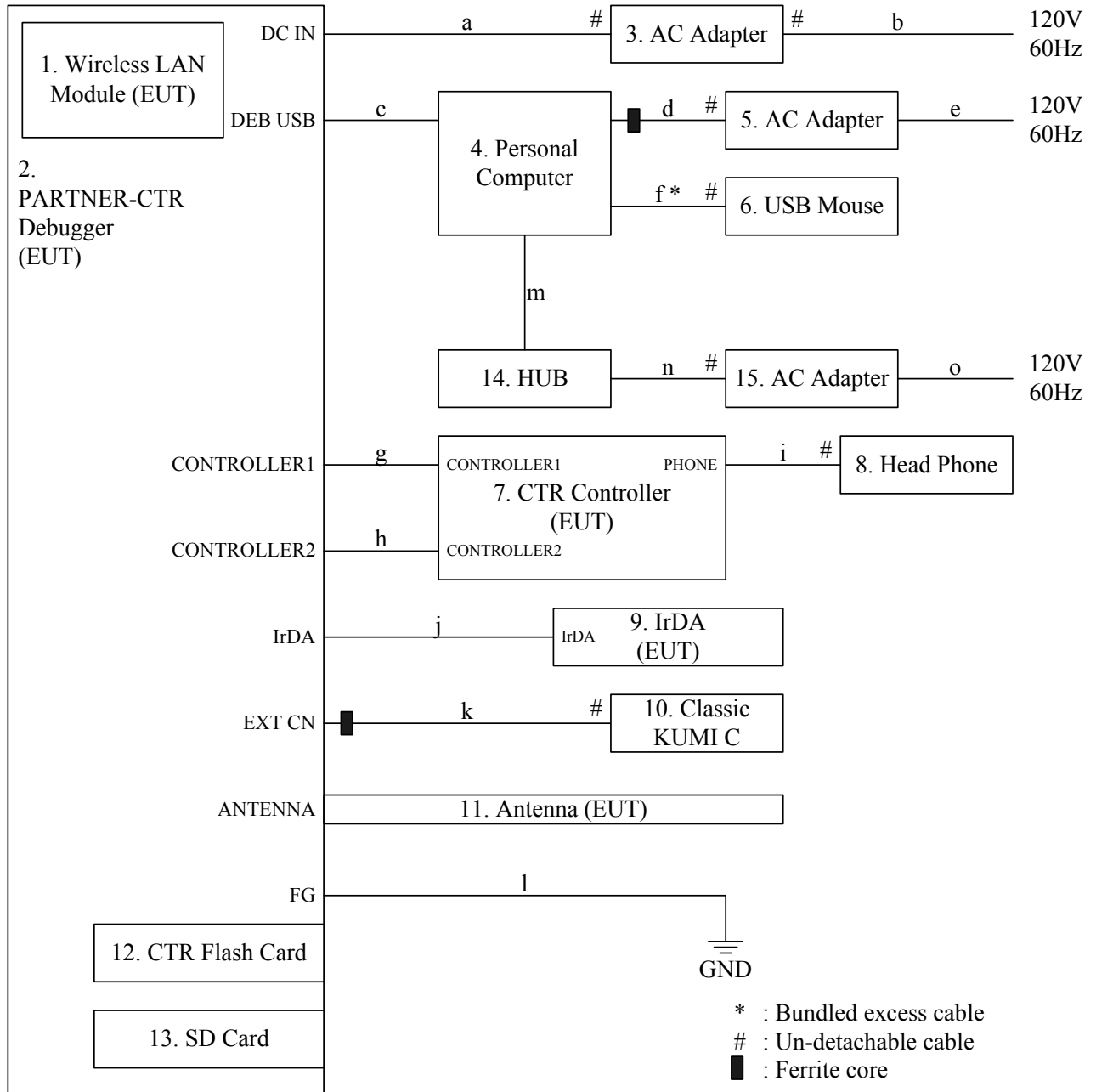
No.	Equipment	Company	Model No.	Serial No.	DoC / FCC ID	Comment
1	Wireless LAN Module	MITSUMI	DWM-W028	0424AA	N/A	EUT
2	PARTNER-CTR	KMC	Debugger	N/A	N/A	EUT
3	AC Adapter for EUT	Nintendo	RVL-002(USA)	D61TA30	N/A	Accessory
4	Personal Computer	Lenovo	2958	29585PJMP19DM	DoC	-
5	AC Adapter for PC	Lenovo	PA-1650-52LC	11S36001678 ZZ400004NLV	N/A	-
6	USB Mouse	Logitech	M-UV96	HCA54004847	DoC	-
7	CTR Controller	KMC	CTRC-02	BBB00000324	N/A	EUT
8	Head Phone	N/A	N/A	N/A	N/A	-
9	IrDA	KMC	CTR09B-IR-01	N/A	N/A	EUT
10	Classic KUMI C	N/A	RVL-005(-05)	N/A	N/A	Accessory
11	Antenna	DIAMOND ANTENNA CORPORATION	DN57 2.4GHz SMA-PR	N/A	N/A	EUT
12	CTR Flash Card	Nintendo	E203344	N/A	N/A	16G
13	SD Card	PQI	QSDS-2G	N/A	N/A	2G
14	HUB	Juniper NETWORKS	NS-5XT-107-05	0052112001472	DoC	-
15	AC Adapter for HUB	CUI INC	EPA-121DA-12	N/A	N/A	-

#### 3.2 Cable(s) information

No.	Cable	Length[m]	Shield	Connector	Comment
a	DC cable	0.9	No	Plastic	-
b	AC power cord for EUT AC Adapter	1.8	No	Plastic	-
c	USB cable	1.5	Yes	Metal	-
d	DC cable	1.8	No	Plastic	-
e	AC power cord for PC AC Adapter (No.4)	1.8	No	Plastic	-
f	USB Mouse cable	1.8	Yes	Metal	-
g	Controller cable	1.0	Yes	Metal	-
h	Controller cable	1.0	Yes	Metal	-
i	Head Phone cable	1.6	No	Plastic	-
j	IrDA cable	0.5	No	Plastic	-
k	Classic KUMI C cable	0.9	No	Plastic	-
l	FG cable	3.2	No	-	-
m	LAN cable	1.0	No	Plastic	-
n	DC cable	1.85	No	Plastic	-
o	AC power cord for HUB AC adapter	1.8	No	Plastic	-



### 3.3 System configuration



Note1: Numbers assigned to equipment or cables on this diagram correspond to the list in “3.1 Equipment(s) used” and “3.2 Cable(s) used”.

Note2: One ferrite core of DC cable (Lenovo/PA-1650-52LC) (No.d) is an accessory of AC Adapter (No.5).

Note3: One ferrite core (KITAGAWA/RFC-4) of Classic KUMI C cable (No.k) is an accessory of EUT (No.2).

## **4. Test Type and Results**

### ***4.1 Spurious Emissions - Radiated - (9kHz - 25GHz)***

#### ***4.1.1 Test Procedure [ FCC 15.205/209/247(d), IC RSS-210 A8.5, RSS-Gen 4.9&4.10 ]***

Radiated emission measurements are performed at 3m distance with the broadband antenna (Loop antenna, TRILOG antenna, and double-ridged guide antenna). The antenna is positioned both the horizontal and vertical planes of polarization and height is varied 1 to 4 meters and stopped at height producing the maximum emission. As for the Loop antenna, it is positioned with its plane vertical, and the center of the Loop is 1.0meter above the ground plane. Frequency Range: 9kHz –1GHz is scanned and investigated with the test receiver, and above 1GHz, with the spectrum analyzer. The detector function of the test receiver is set to CISPR Quasi-peak mode and the bandwidth is set to 120kHz. Peak and average detectors are used for measurements above 1GHz. The bandwidth of the spectrum analyzer is set to 1MHz.

The EUT and support equipment are placed on a 1meter x 2meter surface, 0.8meter height FRP table. The turntable is rotated by 360 degrees and stopped at azimuth of producing the maximum emission.

Interconnecting cables, which hanging closer than 40cm to the horizontal metal ground plane are bundled its excess in center. The highest fundamental frequency generated in the EUT is 2402-2480MHz, therefore the frequency was investigated up to 25GHz, as specified in CFR section 15.33, and at least six highest emissions are reported. The test results represent the worst-case emission for each emission with manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation.

Sufficient time for the EUT, support equipment, and test equipment are allowed in order for them to warm up to their normal operating condition.

The spectrum analyzer is set to:

- Peak: RBW=1MHz, VBW=1MHz, Span=0Hz, Sweep=auto
- Average: RBW=1MHz, VBW=10Hz, Span=0Hz, Sweep=auto

The EUT was set to operate with following conditions.

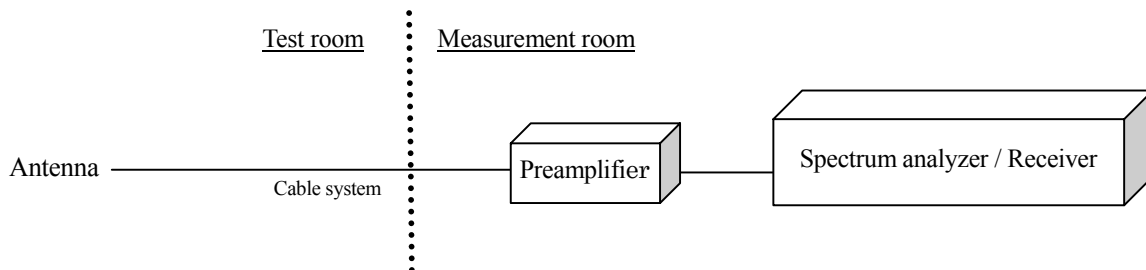
- ch 1 (low), ch 7 (mid), ch 13(high)

The test mode of EUT is as follows.

- Tx mode, ch 1 (low), ch 7 (mid), ch 13(high)
- Rx mode, ch 7 (mid)

#### ***4.1.2 Measurement Setup***

##### **Test configuration for Spurious emissions**



### 4.1.3 Limit of Spurious Emission Measurement

Frequency [MHz]	Field Strength	
	[uV/m]	[dBuV/m]
0.009 – 0.490	2400 / F [kHz]	20logE [uV/m]
0.490 – 1.705	24000 / F [kHz]	20logE [uV/m]
1.705-30	30	29.5
30 – 88	100	40.0
88 – 216	150	43.5
216 – 960	200	46.0
Above 960	500	54.0

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level [dBuV/m] = 20 log Emission [uV/m]
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

### 4.1.4 Sample of field strength calculation

**Spurious Emission**       $\text{dB}\mu\text{V} / \text{m} = 20\log_{10} (\mu\text{V}/\text{m})$

Limit @147.6MHz = 150μV/m = 43.5dBμV/m
Reading = 42.8dBμV
Ant. Factor + Cable Loss - Amp. Gain = 14.2 + 3.0 - 30.0 = -12.8dB
Total = 42.8 - 12.8 = 30.0dBμV/m
Margin = 43.5 - 30.0 = <u>13.5dB</u>

### 4.1.5 Measurement Results

**Test Personnel:**

Tested by:                     Taiki Watanabe                    

Date : Oct. 12, 15, 2010  
 Temperature : 22.9-23.2 [°C]  
 Humidity : 55.5-56.8 [%]  
 Test place : 3m Semi-anechoic chamber

**Spurious Emissions - Radiated-**

**11b Tx Channel Low**

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c. f [dB(1/m)]	Result QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
1	33.292	V	43.7	-10.9	32.8	40.0	7.2	100.0	249.0
2	120.000	H	45.4	-10.8	34.6	43.5	8.9	280.0	185.0
3	184.336	H	49.2	-10.2	39.0	43.5	4.5	224.0	100.0
4	268.120	H	54.0	-8.7	45.3	46.0	0.7 *	114.0	315.0
5	469.205	H	46.9	-3.6	43.3	46.0	2.7	100.0	99.0
6	536.233	V	42.2	-2.3	39.9	46.0	6.1	189.0	15.0
7	569.755	H	41.5	-1.5	40.0	46.0	6.0	182.0	28.0
8	720.572	H	35.6	0.7	36.3	46.0	9.7	100.0	229.0
9	938.418	H	38.1	4.8	42.9	46.0	3.1	100.0	44.0

No.	Frequency [MHz]	(P)	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c. f [dB(1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [°]
1	1297.333	H		62.5	-6.8		55.7	74.0		18.3	106.0	169.0
2	1297.333	H	36.8		-6.8	30.0		54.0	25.3		106.0	169.0
3	1499.250	V		60.6	-6.6		54.0	74.0		20.0	142.0	19.0
4	1499.250	V	36.3		-6.6	29.7		54.0	25.4		142.0	19.0
5	1596.967	V		60.6	-5.9		54.7	74.0		19.3	100.0	98.0
6	1596.967	V	37.4		-5.9	31.5		54.0	23.7		100.0	98.0
7	1696.100	H		57.3	-5.4		51.9	74.0		22.1	109.0	158.0
8	1696.100	H	35.1		-5.4	29.7		54.0	25.7		109.0	158.0
9	4824.000	H		43.5	6.1		49.6	74.0		24.4	131.0	107.0
10	4824.000	H	30.4		6.1	36.5		54.0	18.2		131.0	107.0

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable - Amp)]
2. No emissions were detected in frequency range 9kHz to 30MHz at the 3 meters distance.
3. \*: The worst emission. (The noise due to the host device.)

**Spurious Emissions - Radiated-**

**11b Tx Channel Middle**

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c. f [dB(1/m)]	Result QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
1	33.300	V	43.7	-10.9	32.8	40.0	7.2	100.0	233.0
2	36.048	V	40.4	-10.6	29.8	40.0	10.2	100.0	193.0
3	99.895	H	47.0	-12.8	34.2	43.5	9.3	299.0	198.0
4	120.006	H	46.0	-10.8	35.2	43.5	8.3	278.0	196.0
5	184.330	H	49.4	-10.2	39.2	43.5	4.3	196.0	100.0
6	268.116	H	53.8	-8.7	45.1	46.0	0.9 *	114.0	312.0
7	351.906	H	46.6	-6.5	40.1	46.0	5.9	100.0	261.0
8	536.232	H	45.1	-2.3	42.8	46.0	3.2	148.0	346.0
9	552.994	V	39.3	-2.0	37.3	46.0	8.7	165.0	325.0
10	720.571	H	36.0	0.7	36.7	46.0	9.3	111.0	226.0
11	938.422	H	37.9	4.8	42.7	46.0	3.3	100.0	44.0

No.	Frequency [MHz]	(P)	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c. f [dB(1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [°]
1	1298.667	H	36.7	60.5	-6.8	29.9	53.7	74.0	25.4	20.3	106.0	172.0
2	1298.667	H	36.7	60.5	-6.8	29.9	53.7	74.0	25.4	20.3	106.0	172.0
3	1498.000	V	37.2	62.1	-6.6	30.6	55.5	74.0	23.4	18.5	107.0	163.0
4	1498.000	V	37.2	62.1	-6.6	30.6	55.5	74.0	23.4	18.5	107.0	163.0
5	1597.900	V	39.6	60.7	-5.9	33.7	54.8	74.0	21.5	19.2	100.0	97.0
6	1597.900	V	39.6	60.7	-5.9	33.7	54.8	74.0	21.5	19.2	100.0	97.0
7	1894.750	H	34.9	55.3	-2.8	32.1	52.5	74.0	23.9	21.5	106.0	130.0
8	1894.750	H	34.9	55.3	-2.8	32.1	52.5	74.0	23.9	21.5	106.0	130.0
9	4884.000	H	30.1	43.5	6.5	36.6	50.0	74.0	18.2	24.0	158.0	106.0
10	4884.000	H	30.1	43.5	6.5	36.6	50.0	74.0	18.2	24.0	158.0	106.0

Note:

1. Emission Level (Margin) = Limit – [Reading + Factor (Antenna + Cable - Amp)]
2. No emissions were detected in frequency range 9kHz to 30MHz at the 3 meters distance.
3. \*: The worst emission. (The noise due to the host device.)

**Spurious Emissions - Radiated-**

**11b Tx Channel High**

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c. f [dB(1/m)]	Result QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
1	33.293	V	43.8	-10.9	32.9	40.0	7.1	100.0	237.0
2	36.047	V	39.4	-10.6	28.8	40.0	11.2	100.0	197.0
3	120.014	H	46.1	-10.8	35.3	43.5	8.2	282.0	187.0
4	184.325	H	49.1	-10.2	38.9	43.5	4.6	215.0	96.0
5	251.351	H	47.2	-9.1	38.1	46.0	7.9	100.0	309.0
6	268.121	H	53.8	-8.7	45.1	46.0	0.9 *	100.0	320.0
7	351.906	H	46.6	-6.5	40.1	46.0	5.9	100.0	261.0
8	435.693	H	47.0	-4.2	42.8	46.0	3.2	100.0	109.0
9	536.235	V	43.9	-2.3	41.6	46.0	4.4	186.0	319.0
10	569.760	H	41.3	-1.5	39.8	46.0	6.2	192.0	28.0
11	921.663	H	34.6	4.4	39.0	46.0	7.0	100.0	8.0
12	938.419	H	37.8	4.8	42.6	46.0	3.4	100.0	301.0

No.	Frequency [MHz]	(P)	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c. f [dB(1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [°]
1	1294.600	H		60.8	-6.8		54.0	74.0		20.0	100.0	168.0
2	1294.600	H	42.1		-6.8	35.3		54.0	20.0		100.0	168.0
3	1297.917	V		60.2	-6.8		53.4	74.0		20.6	100.0	44.0
4	1297.917	V	36.4		-6.8	29.6		54.0	25.7		100.0	44.0
5	1599.400	V		61.2	-5.9		55.3	74.0		18.7	100.0	99.0
6	1599.400	V	37.3		-5.9	31.4		54.0	23.8		100.0	99.0
7	1894.500	H		57.5	-2.8		54.7	74.0		19.3	100.0	156.0
8	1894.500	H	34.9		-2.8	32.1		54.0	23.9		100.0	156.0
9	4944.000	H		43.6	6.5		50.1	74.0		23.9	158.0	101.0
10	4944.000	H	30.3		6.5	36.8		54.0	17.9		158.0	101.0

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable - Amp)]
2. No emissions were detected in frequency range 9kHz to 30MHz at the 3 meters distance.
3. \*: The worst emission. (The noise due to the host device.)

**Spurious Emissions - Radiated-**

**11g Tx Channel Low**

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c. f [dB(1/m)]	Result QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
1	33.205	V	47.3	-10.9	36.4	40.0	3.6 *	100.0	81.0
2	36.041	V	44.7	-10.6	34.1	40.0	5.9	100.0	100.0
3	98.371	V	41.1	-13.2	27.9	43.5	15.6	100.0	111.0
4	184.335	H	47.8	-10.2	37.6	43.5	5.9	179.0	69.0
5	201.093	V	45.6	-11.2	34.4	43.5	9.1	100.0	329.0
6	251.373	H	48.9	-9.1	39.8	46.0	6.2	150.0	305.0
7	268.110	H	47.4	-8.7	38.7	46.0	7.3	157.0	281.0
8	368.668	H	44.3	-6.0	38.3	46.0	7.7	100.0	108.0
9	435.681	H	46.6	-4.2	42.4	46.0	3.6 *	100.0	98.0
10	938.406	H	37.6	4.8	42.4	46.0	3.6 *	122.0	265.0

No.	Frequency [MHz]	(P)	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c. f [dB(1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [°]
1	1297.367	V	36.9	59.6	-6.8	30.1	52.8	74.0	23.9	21.2	121.0	80.0
2	1297.367	V	36.9	59.6	-6.8	30.1	52.8	74.0	23.9	21.2	121.0	80.0
3	1594.067	H	36.7	53.9	-6.0	30.7	47.9	74.0	23.3	26.1	100.0	268.0
4	1594.067	H	36.7	53.9	-6.0	30.7	47.9	74.0	23.3	26.1	100.0	268.0
5	1595.867	V	39.1	57.7	-5.9	33.2	51.8	74.0	20.8	22.2	100.0	89.0
6	1595.867	V	39.1	57.7	-5.9	33.2	51.8	74.0	20.8	22.2	100.0	89.0
7	1892.833	H	35.2	58.6	-2.9	32.3	55.7	74.0	21.7	18.3	100.0	180.0
8	1892.833	H	35.2	58.6	-2.9	32.3	55.7	74.0	21.7	18.3	100.0	180.0
9	4824.000	H	30.5	43.8	6.1	36.6	49.9	74.0	17.4	24.1	151.0	111.0
10	4824.000	H	30.5	43.8	6.1	36.6	49.9	74.0	17.4	24.1	151.0	111.0

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable - Amp)]
2. No emissions were detected in frequency range 9kHz to 30MHz at the 3 meters distance.
3. \*: The worst emission. (The noise due to the host device.)

**Spurious Emissions - Radiated-**

**11g Tx Channel Middle**

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c. f [dB(1/m)]	Result QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
1	33.206	V	43.5	-10.9	32.6	40.0	7.4	100.0	225.0
2	36.050	V	39.8	-10.6	29.2	40.0	10.8	104.0	223.0
3	184.337	H	49.3	-10.2	39.1	43.5	4.4	176.0	91.0
4	251.373	H	48.5	-9.1	39.4	46.0	6.6	153.0	67.0
5	268.119	H	54.0	-8.7	45.3	46.0	0.7 *	100.0	314.0
6	351.901	H	46.7	-6.5	40.2	46.0	5.8	100.0	263.0
7	435.693	H	47.3	-4.2	43.1	46.0	2.9	100.0	101.0
8	536.237	H	46.1	-2.3	43.8	46.0	2.2	173.0	343.0
9	854.620	H	36.4	2.9	39.3	46.0	6.7	100.0	39.0
10	938.413	H	38.0	4.8	42.8	46.0	3.2	100.0	302.0

No.	Frequency [MHz]	(P)	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c. f [dB(1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [°]
1	1294.167	V	36.7	59.7	-6.8	29.9	52.9	74.0	25.4	21.1	100.0	42.0
2	1294.167	V	36.7	59.7	-6.8	29.9	52.9	74.0	25.4	21.1	100.0	42.0
3	1397.333	H	34.9	57.0	-6.7	28.2	50.3	74.0	27.1	23.7	100.0	94.0
4	1397.333	H	34.9	57.0	-6.7	28.2	50.3	74.0	27.1	23.7	100.0	94.0
5	1598.000	V	38.5	61.6	-5.9	32.6	55.7	74.0	22.6	18.3	100.0	98.0
6	1598.000	V	38.5	61.6	-5.9	32.6	55.7	74.0	22.6	18.3	100.0	98.0
7	1598.733	H	36.6	56.0	-5.9	30.7	50.1	74.0	24.5	23.9	100.0	85.0
8	1598.733	H	36.6	56.0	-5.9	30.7	50.1	74.0	24.5	23.9	100.0	85.0
9	4884.000	H	30.1	43.4	6.5	36.6	49.9	74.0	18.2	24.1	156.0	103.0
10	4884.000	H	30.1	43.4	6.5	36.6	49.9	74.0	18.2	24.1	156.0	103.0

Note:

1. Emission Level (Margin) = Limit – [Reading + Factor (Antenna + Cable - Amp)]
2. No emissions were detected in frequency range 9kHz to 30MHz at the 3 meters distance.
3. \*: The worst emission. (The noise due to the host device.)



**Spurious Emissions - Radiated-**

**11g Tx Channel High**

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c. f [dB(1/m)]	Result QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
1	33.206	V	43.5	-10.9	32.6	40.0	7.4	100.0	225.0
2	36.050	V	39.8	-10.6	29.2	40.0	10.8	104.0	223.0
3	99.895	H	47.2	-12.8	34.4	43.5	9.1	283.0	197.0
4	120.012	H	46.0	-10.8	35.2	43.5	8.3	264.0	183.0
5	184.334	H	48.8	-10.2	38.6	43.5	4.9	188.0	90.0
6	251.355	H	47.2	-9.1	38.1	46.0	7.9	100.0	310.0
7	268.120	H	53.9	-8.7	45.2	46.0	0.8 *	100.0	316.0
8	335.143	H	45.3	-6.8	38.5	46.0	7.5	100.0	42.0
9	351.902	H	46.5	-6.5	40.0	46.0	6.0	100.0	262.0
10	435.695	H	47.0	-4.2	42.8	46.0	3.2	100.0	105.0
11	536.227	H	45.3	-2.3	43.0	46.0	3.0	156.0	341.0
12	854.631	H	36.5	2.9	39.4	46.0	6.6	100.0	128.0
13	938.409	H	37.8	4.8	42.6	46.0	3.4	100.0	45.0

No.	Frequency [MHz]	(P)	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c. f [dB(1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [°]
1	1294.600	H		60.8	-6.8		54.0	74.0		20.0	100.0	168.0
2	1294.600	H	42.1		-6.8	35.3		54.0	20.0		100.0	168.0
3	1297.917	V		60.2	-6.8		53.4	74.0		20.6	100.0	44.0
4	1297.917	V	36.4		-6.8	29.6		54.0	25.7		100.0	44.0
5	1598.617	H		57.5	-5.9		51.6	74.0		22.4	100.0	81.0
6	1598.617	H	37.4		-5.9	31.5		54.0	23.7		100.0	81.0
7	1598.733	V		61.0	-5.9		55.1	74.0		18.9	100.0	98.0
8	1598.733	V	38.6		-5.9	32.7		54.0	22.5		100.0	98.0
9	4944.000	H		44.0	6.5		50.5	74.0		23.5	139.0	100.0
10	4944.000	H	30.3		6.5	36.8		54.0	17.9		139.0	100.0

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable - Amp)]
2. No emissions were detected in frequency range 9kHz to 30MHz at the 3 meters distance.
3. \*: The worst emission. (The noise due to the host device.)

**Spurious Emissions - Radiated-**

**Rx Channel Middle**

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c. f [dB(1/m)]	Result QP [dB(μV/m)]	Limit [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
1	33.207	V	48.5	-10.9	37.6	40.0	2.4	100.0	113.0
2	36.039	V	44.9	-10.6	34.3	40.0	5.7	100.0	101.0
3	99.902	H	47.7	-12.8	34.9	43.5	8.6	298.0	43.0
4	184.316	H	46.3	-10.2	36.1	43.5	7.4	227.0	282.0
5	201.093	V	45.6	-11.2	34.4	43.5	9.1	100.0	329.0
6	251.336	H	48.5	-9.1	39.4	46.0	6.6	150.0	299.0
7	268.116	H	47.1	-8.7	38.4	46.0	7.6	133.0	221.0
8	368.668	H	44.3	-6.0	38.3	46.0	7.7	100.0	108.0
9	435.692	H	45.6	-4.2	41.4	46.0	4.6	100.0	292.0
10	499.440	V	31.8	-3.0	28.8	46.0	17.2	149.0	185.0
11	536.239	H	44.9	-2.3	42.6	46.0	3.4	100.0	40.0
12	938.420	H	38.5	4.8	43.3	46.0	2.7	116.0	152.0

No.	Frequency [MHz]	(P)	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c. f [dB(1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [°]
1	1297.367	V		59.0	-7.4		51.6	74.0		22.4	100.0	92.0
2	1297.367	V	35.5		-7.4	28.1		54.0	25.9		100.0	92.0
3	1299.300	H		59.4	-7.4		52.0	74.0		22.0	149.0	165.0
4	1299.300	H	36.4		-7.4	29.0		54.0	25.0		149.0	165.0
5	1596.200	V		59.4	-6.5		52.9	74.0		21.1	138.0	90.0
6	1596.200	V	41.1		-6.5	34.6		54.0	19.4		138.0	90.0
7	1893.233	H		60.5	-3.8		56.7	74.0		17.3	100.0	175.0
8	1893.233	H	35.8		-3.8	32.0		54.0	22.0		100.0	175.0
9	2400.450	H		52.4	-2.2		50.2	74.0		23.8	100.0	238.0
10	2400.450	H	46.1		-2.2	43.9		54.0	10.1		100.0	238.0
11	2400.450	V		59.0	-2.2		56.8	74.0		17.2	101.0	175.0
12	2400.450	V	54.9		-2.2	52.7		54.0	1.3 *		101.0	175.0

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable - Amp)]
2. No emissions were detected in frequency range 9kHz to 30MHz at the 3 meters distance.
3. \*: The worst emission. (The noise due to the host device.)

## 4.2 Restricted Band of Operation

### 4.2.1 Test Procedure [ FCC 15.205, 15.209, 15.247(d), IC RSS-210 2.2 ]

The peak power is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to:

- Peak: RBW=1MHz, VBW=1MHz, Span=50MHz, 60MHz Sweep=auto
- Average: RBW=1MHz, VBW=10Hz, Span=50MHz, 60MHz Sweep=auto

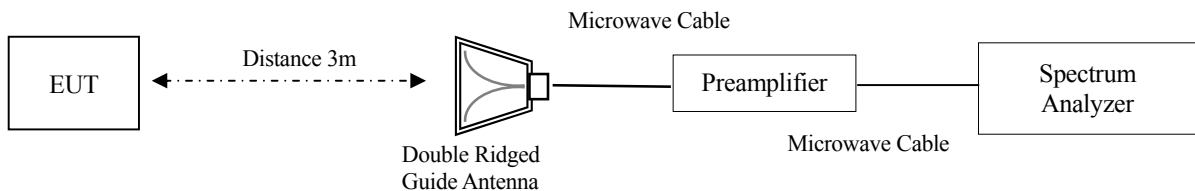
The EUT was set to operate with following conditions.

- ch 1 (low), ch 13 (high)]

The test mode of EUT is as follows.

- Tx mode

### 4.2.2 Measurement Setup



### 4.2.3 Limit of Restricted Band of Operation

Emission at the boundary of the restricted band provided by 15.205 shall be lower than 15.209 limit.

### 4.2.4 Measurement Result

Modulation	Channel	Frequency[MHz]	Results Chart	PASS / FAIL
11b	1	2412.0	See the Trace Data	PASS
	13	2472.0	See the Trace Data	PASS
11g	1	2412.0	See the Trace Data	PASS
	13	2472.0	See the Trace Data	PASS

### 4.2.5 Trace Data

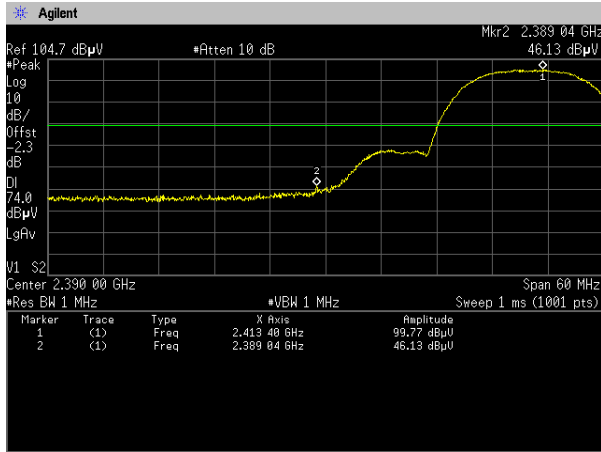
**Test Personnel:**

Tested by: Hiroaki Suzuki

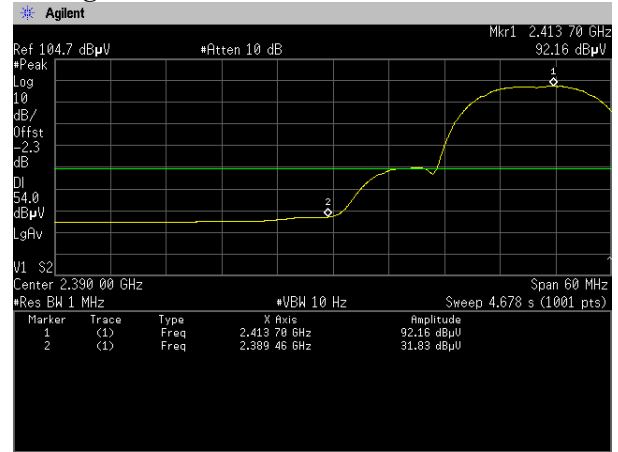
Date : Oct. 16, 2010  
 Temperature : 23.6 [°C]  
 Humidity : 49.1 [%]  
 Test place : 3m Semi-anechoic chamber

**Restricted Band of Operation**

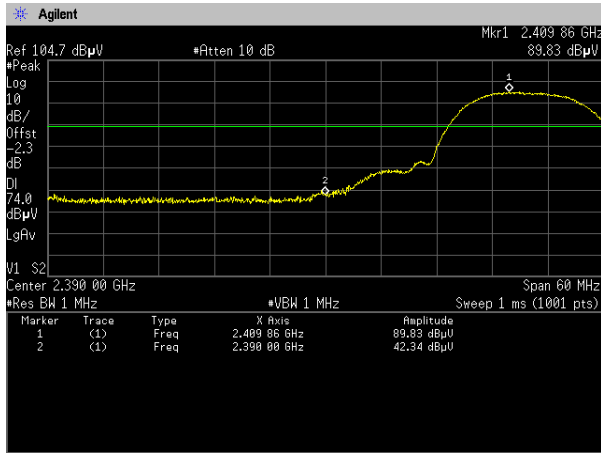
**Frequency: 2390.0MHz -Horizontal- [11b]  
Peak**



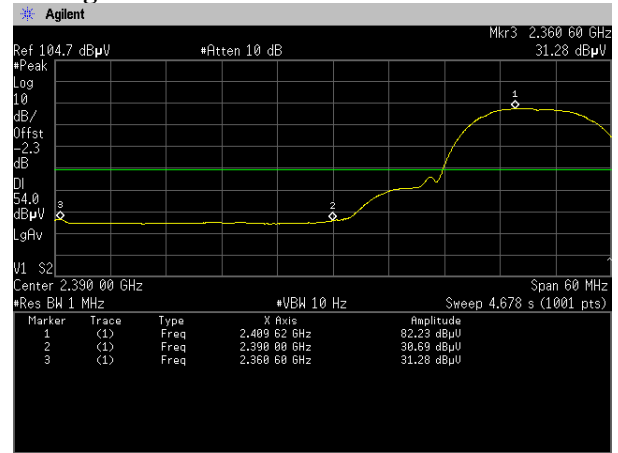
**Average**



**Frequency: 2390.0MHz -Vertical- [11b]  
Peak**

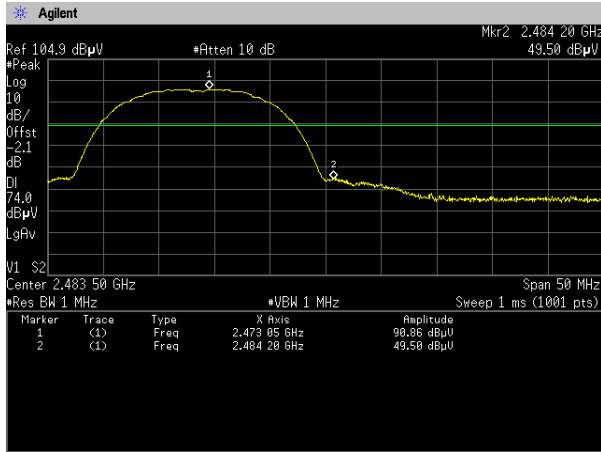


**Average**

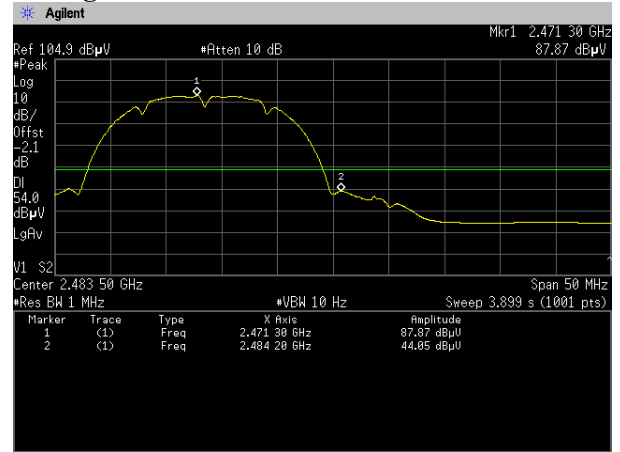


**Restricted Band of Operation**

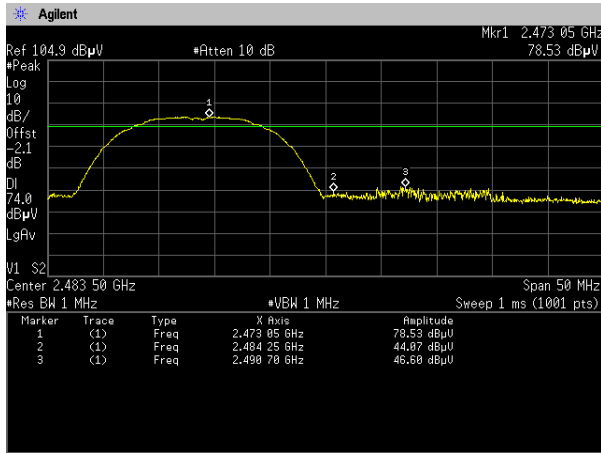
**Frequency: 2483.5MHz -Horizontal- [11b]  
Peak**



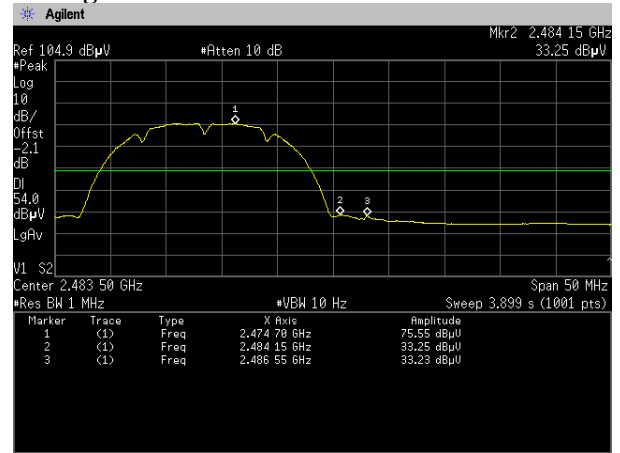
**Average**



**Frequency: 2483.5MHz -Vertical- [11b]  
Peak**

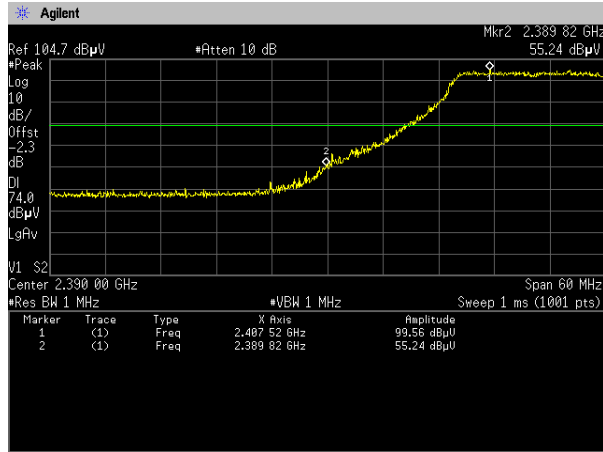


**Average**

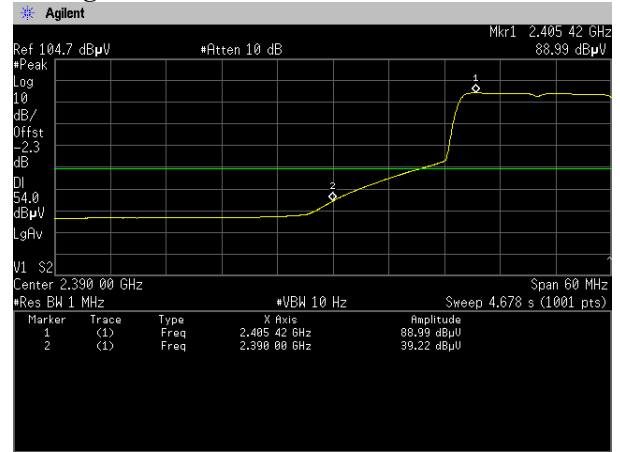


**Restricted Band of Operation**

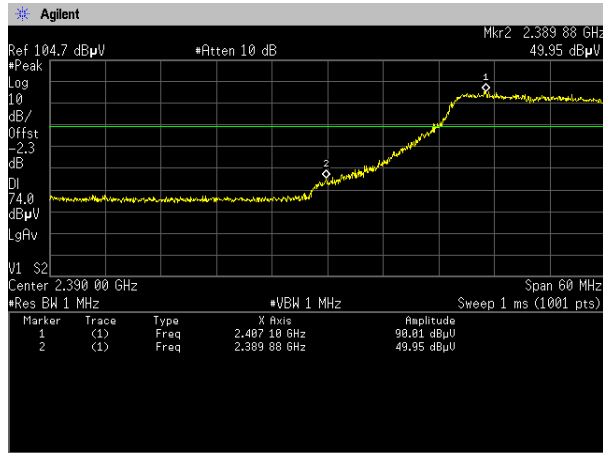
**Frequency: 2390.0MHz -Horizontal- [11g]**  
**Peak**



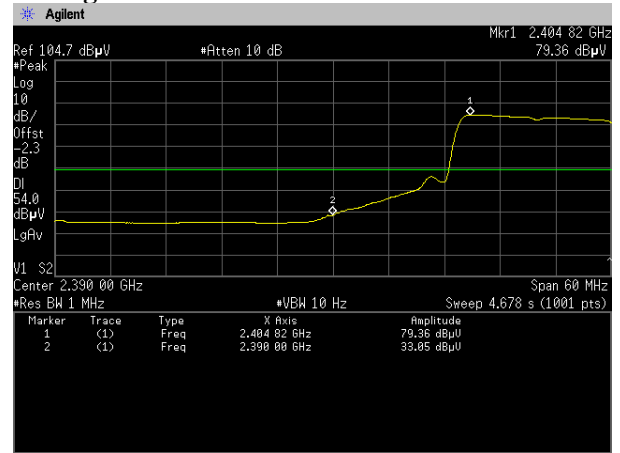
**Average**



**Frequency: 2390.0MHz -Vertical- [11g]**  
**Peak**

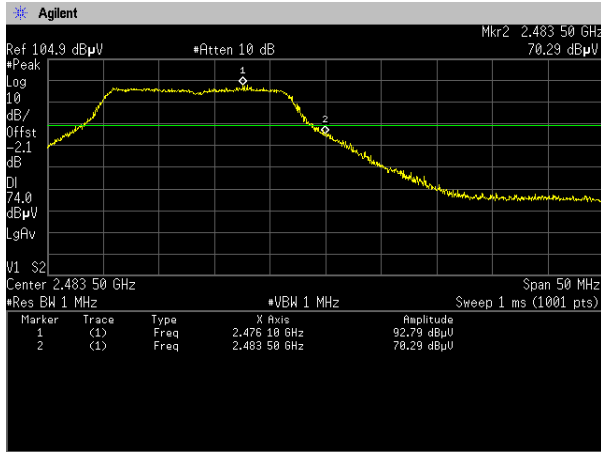


**Average**

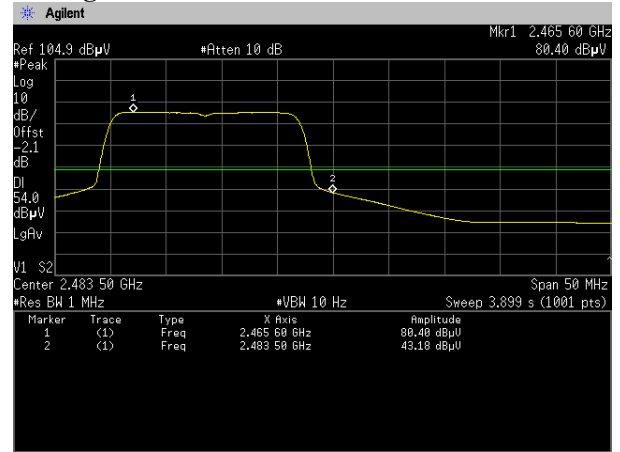


**Restricted Band of Operation**

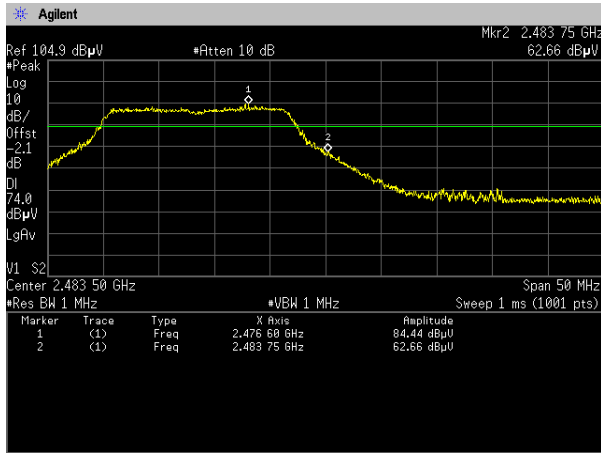
**Frequency: 2483.5MHz -Horizontal- [11g]**  
**Peak**



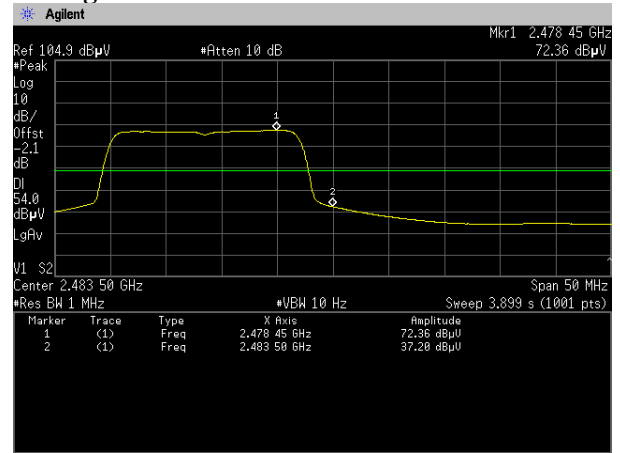
**Average**



**Frequency: 2483.5MHz -Vertical- [11g]**  
**Peak**



**Average**



### 4.3 AC power line Conducted Emissions

#### 4.3.1 Test Procedure [ FCC 15.207, IC RSS-Gen 7.2.2 ]

Conducted emission at AC mains port measurements are performed at 10m Semi-anechoic chamber according to ANSI C63.4 section 7.

EUT and support equipment are placed on FRP table of 2.0m(W) × 1.0m(D) × 0.8m(H) in size. EUT is connected to 50Ω/50μH Line impedance Stabilization network (LISN) which is placed on reference ground plane, and was placed 80cm away from EUT. Excess of AC power cable is bundled in center. Vertical Metal Reference Plane 3.0m (W) × 2.0m (H) in size is placed 0.4m away from EUT. LISN for peripheral is terminated in 50Ω.

EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Maximum emission configuration is determined by manipulating the EUT, support equipment, interconnecting cables. Then, emission measurements are performed with test receiver in above setting to each current-carrying conductor of the mains port. Sufficient time for EUT, support equipment and test equipment are provided in order for them to warm up to their normal operating condition.

Frequency range:

- 0.15MHz to 30MHz

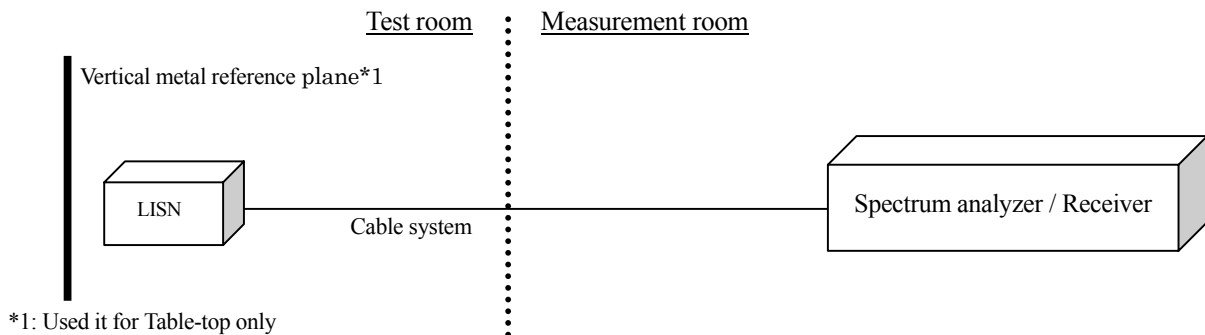
The Test receiver is set to:

Detector: Quasi-peak, Average

Bandwidth: 9kHz

#### 4.3.2 Measurement Setup

##### Test configuration for AC power line Conducted Emissions





### ***4.3.3 Limit of AC power line Conducted Emissions Measurement***

Frequency	Limit	
	QP(dBμV)	AV(dBμV)
0.15MHz to 0.5MHz	66 to 56*	56 to 46*
0.5MHz to 5MHz	56	46
5MHz to 30MHz	60	50

\*: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

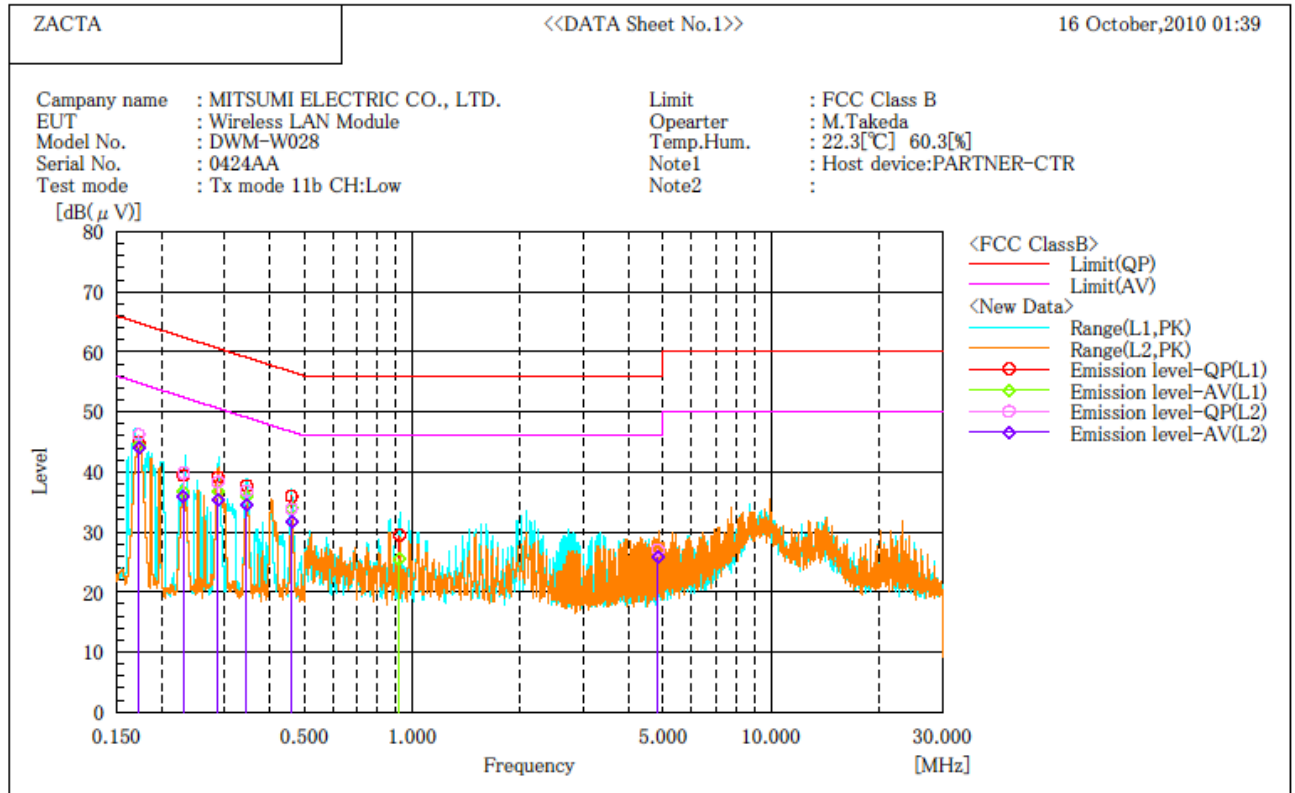
### ***4.3.4 Calculation method***

Emission level = Reading + (LISN. factor + Cable system loss)

Margin = Limit – Emission level

### 4.3.5 Measurement Result

#### 11b Tx Channel Low



#### Final Result

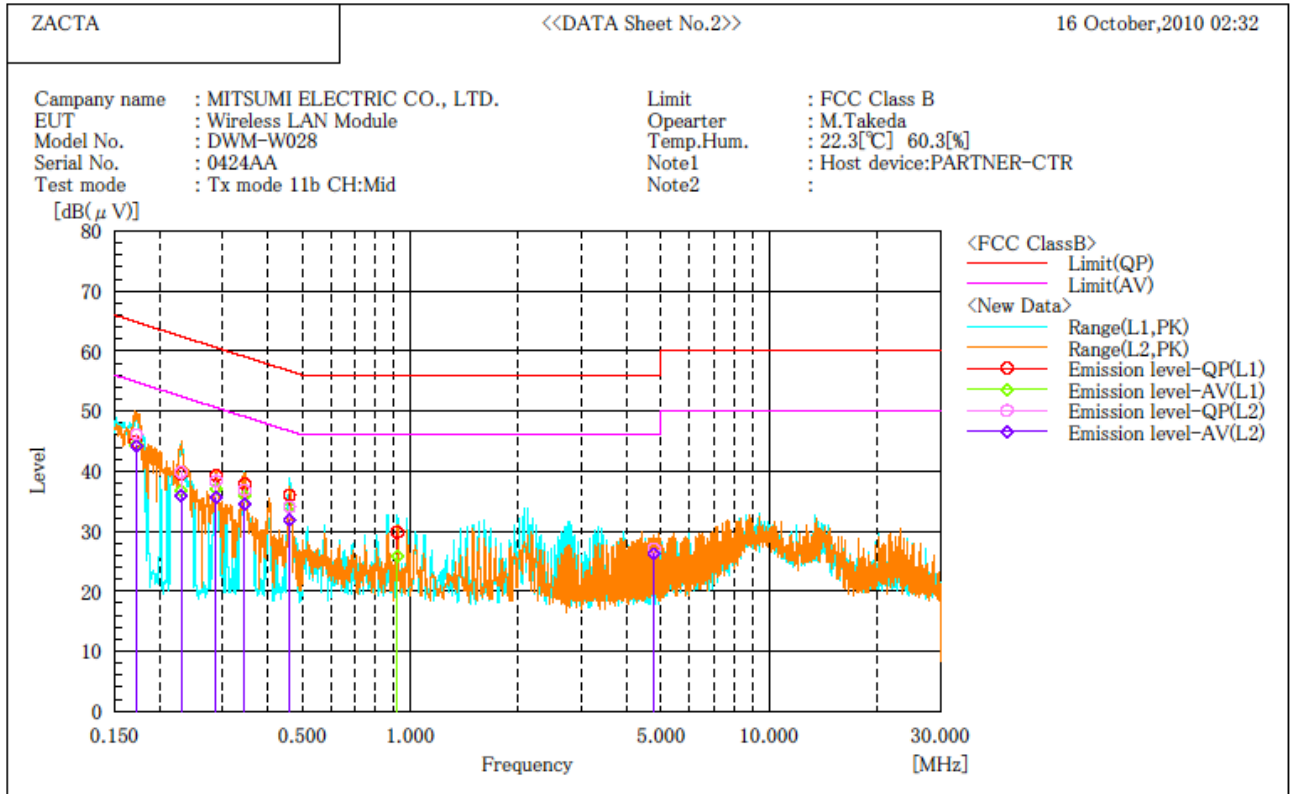
##### --- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.173	34.8	34.3	10.1	44.9	44.4	64.8	54.8	19.9	10.4
2	0.230	29.4	26.6	10.0	39.4	36.6	62.4	52.4	23.0	15.8
3	0.288	29.1	26.8	10.0	39.1	36.8	60.6	50.6	21.5	13.8
4	0.346	27.7	25.8	10.0	37.7	35.8	59.1	49.1	21.4	13.3
5	0.461	25.9	23.9	10.0	35.9	33.9	56.7	46.7	20.8	12.8
6	0.922	19.3	15.3	10.1	29.4	25.4	56.0	46.0	26.6	20.6

##### --- L2 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.173	36.1	33.9	10.1	46.2	44.0	64.8	54.8	18.6	10.8
2	0.231	29.8	25.9	10.0	39.8	35.9	62.4	52.4	22.6	16.5
3	0.288	28.3	25.4	10.0	38.3	35.4	60.6	50.6	22.3	15.2
4	0.346	26.8	24.4	10.0	36.8	34.4	59.1	49.1	22.3	14.7
5	0.461	23.8	21.7	10.0	33.8	31.7	56.7	46.7	22.9	15.0
6	4.844	16.6	15.3	10.4	27.0	25.7	56.0	46.0	29.0	20.3

11b Tx Channel Middle



Final Result

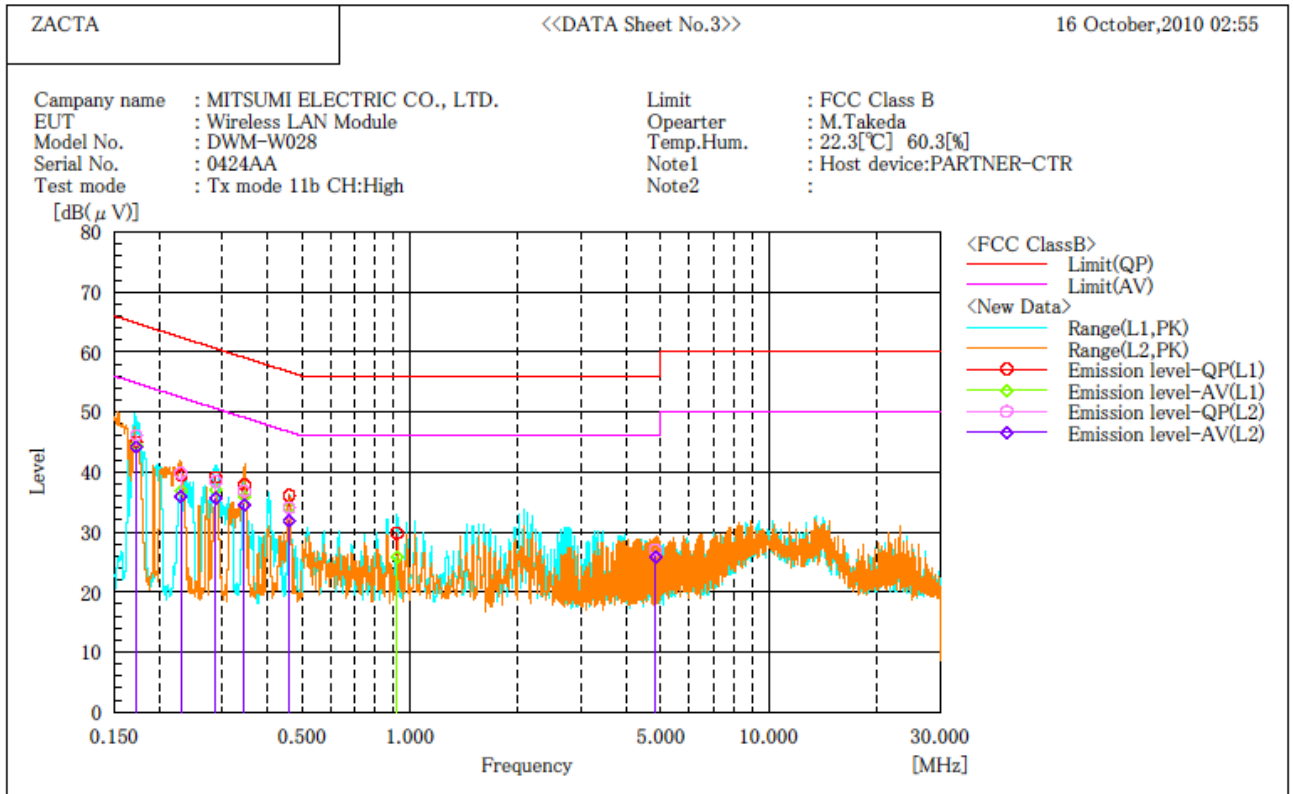
--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.172	34.8	34.3	10.1	44.9	44.4	64.9	54.9	20.0	10.5
2	0.230	29.5	26.8	10.0	39.5	36.8	62.4	52.4	22.9	15.6
3	0.288	29.2	27.0	10.0	39.2	37.0	60.6	50.6	21.4	13.6
4	0.346	27.8	25.9	10.0	37.8	35.9	59.1	49.1	21.3	13.2
5	0.461	26.0	24.0	10.0	36.0	34.0	56.7	46.7	20.7	12.7
6	0.922	19.7	15.7	10.1	29.8	25.8	56.0	46.0	26.2	20.2

--- L2 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.173	36.0	34.0	10.1	46.1	44.1	64.8	54.8	18.7	10.7
2	0.230	29.8	26.0	10.0	39.8	36.0	62.4	52.4	22.6	16.4
3	0.288	28.3	25.6	10.0	38.3	35.6	60.6	50.6	22.3	15.0
4	0.346	26.8	24.5	10.0	36.8	34.5	59.1	49.1	22.3	14.6
5	0.461	24.0	21.9	10.0	34.0	31.9	56.7	46.7	22.7	14.8
6	4.784	16.6	15.8	10.4	27.0	26.2	56.0	46.0	29.0	19.8

11b Tx Channel High



Final Result

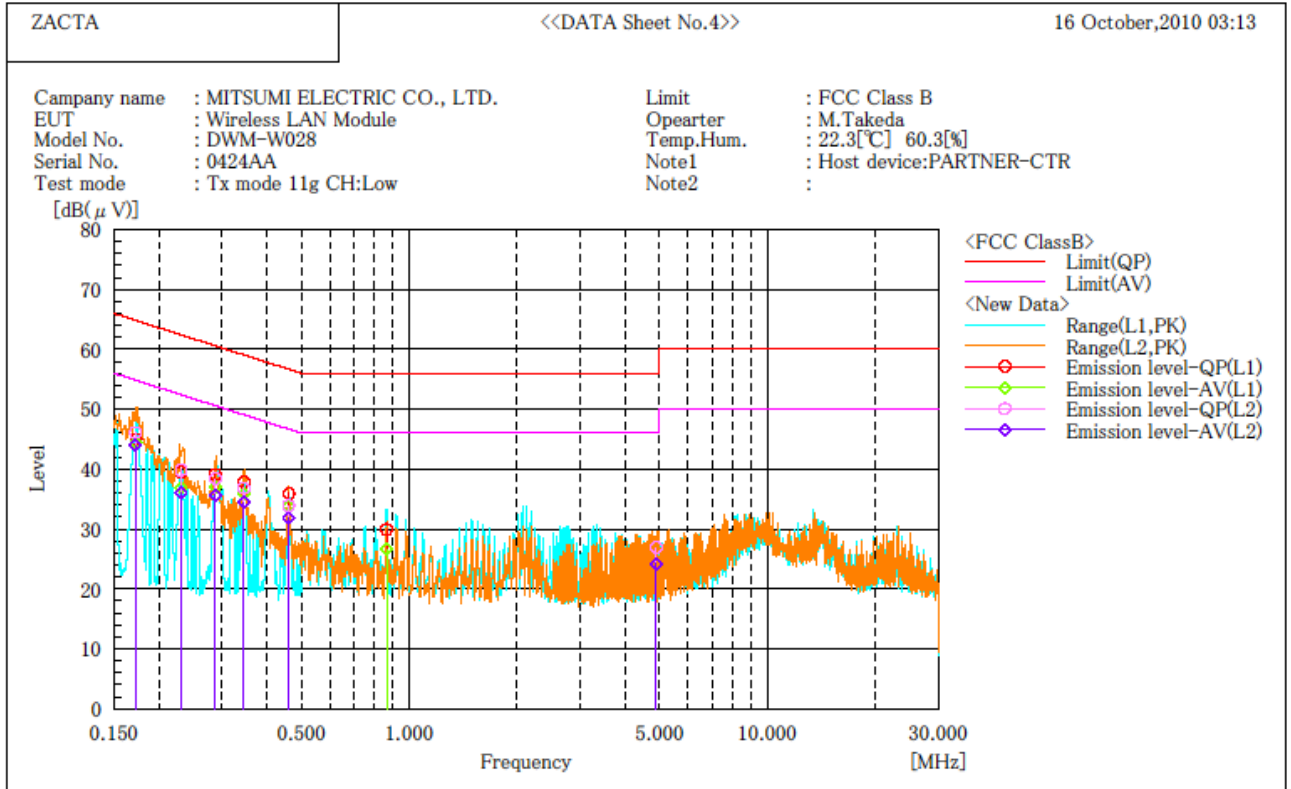
--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.173	34.9	34.4	10.1	45.0	44.5	64.8	54.8	19.8	10.3
2	0.231	29.4	26.8	10.0	39.4	36.8	62.4	52.4	23.0	15.6
3	0.288	29.1	26.9	10.0	39.1	36.9	60.6	50.6	21.5	13.7
4	0.346	27.8	25.9	10.0	37.8	35.9	59.1	49.1	21.3	13.2
5	0.461	26.1	24.1	10.0	36.1	34.1	56.7	46.7	20.6	12.6
6	0.922	19.7	15.7	10.1	29.8	25.8	56.0	46.0	26.2	20.2

--- L2 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.173	36.0	34.0	10.1	46.1	44.1	64.8	54.8	18.7	10.7
2	0.230	29.8	26.0	10.0	39.8	36.0	62.4	52.4	22.6	16.4
3	0.288	28.4	25.6	10.0	38.4	35.6	60.6	50.6	22.2	15.0
4	0.346	26.8	24.5	10.0	36.8	34.5	59.1	49.1	22.3	14.6
5	0.461	24.0	21.9	10.0	34.0	31.9	56.7	46.7	22.7	14.8
6	4.842	16.6	15.4	10.4	27.0	25.8	56.0	46.0	29.0	20.2

11g Tx Channel Low



Final Result

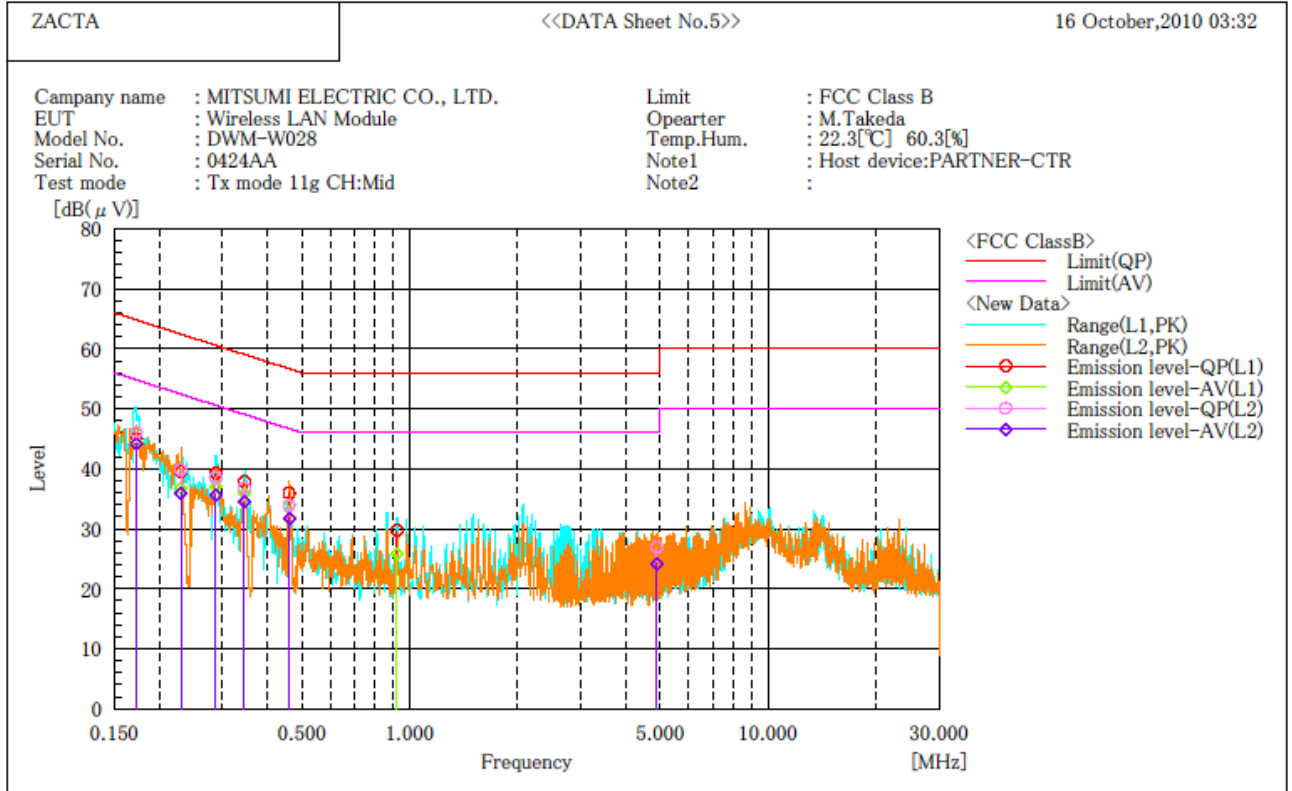
--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.173	34.9	34.4	10.1	45.0	44.5	64.8	54.8	19.8	10.3
2	0.231	29.5	26.8	10.0	39.5	36.8	62.4	52.4	22.9	15.6
3	0.288	29.1	27.0	10.0	39.1	37.0	60.6	50.6	21.5	13.6
4	0.346	27.8	25.9	10.0	37.8	35.9	59.1	49.1	21.3	13.2
5	0.462	25.9	23.8	10.0	35.9	33.8	56.7	46.7	20.8	12.9
6	0.865	19.8	16.5	10.1	29.9	26.6	56.0	46.0	26.1	19.4

--- L2 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.172	36.0	33.9	10.1	46.1	44.0	64.9	54.9	18.8	10.9
2	0.231	29.8	26.1	10.0	39.8	36.1	62.4	52.4	22.6	16.3
3	0.288	28.4	25.7	10.0	38.4	35.7	60.6	50.6	22.2	14.9
4	0.346	26.8	24.4	10.0	36.8	34.4	59.1	49.1	22.3	14.7
5	0.461	23.9	21.8	10.0	33.9	31.8	56.7	46.7	22.8	14.9
6	4.899	16.5	13.8	10.4	26.9	24.2	56.0	46.0	29.1	21.8

11g Tx Channel Middle



Final Result

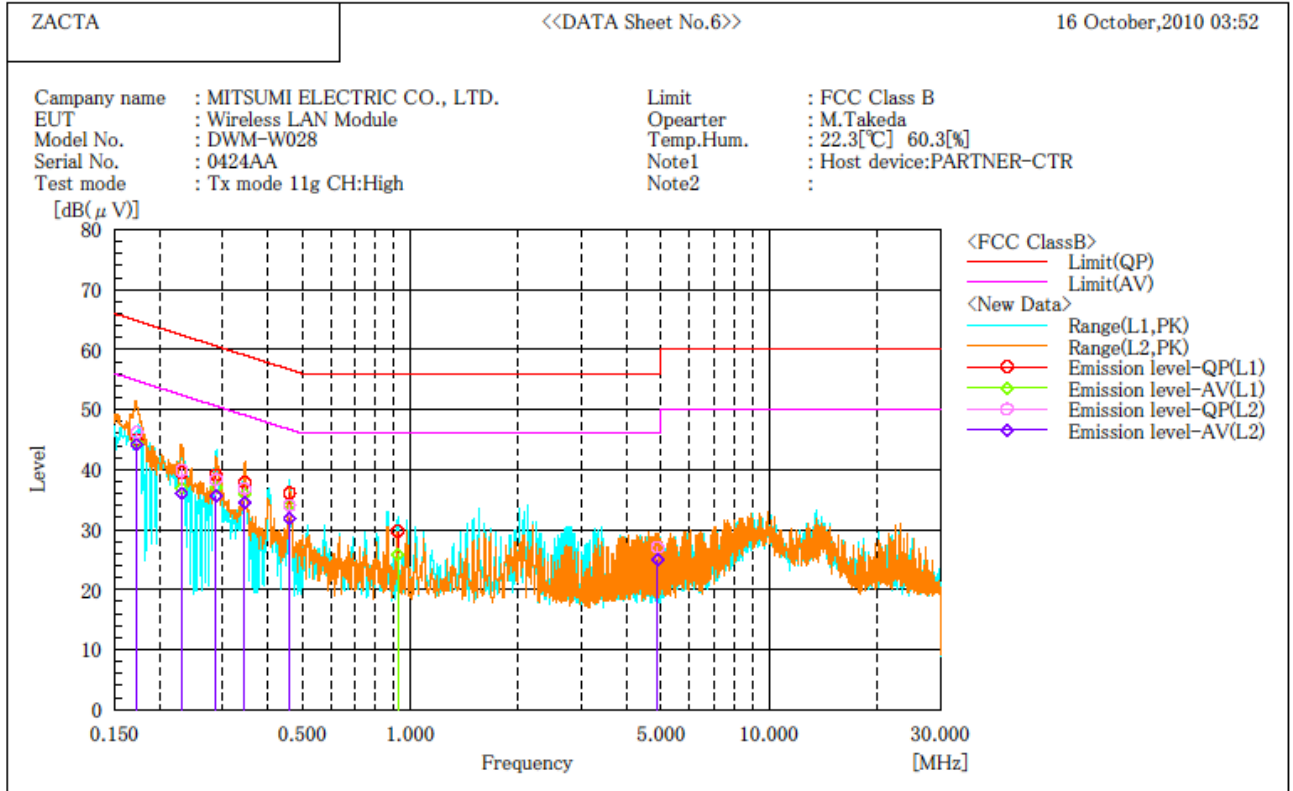
--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.173	34.9	34.4	10.1	45.0	44.5	64.8	54.8	19.8	10.3
2	0.230	29.5	26.8	10.0	39.5	36.8	62.4	52.4	22.9	15.6
3	0.288	29.2	27.0	10.0	39.2	37.0	60.6	50.6	21.4	13.6
4	0.346	27.8	25.9	10.0	37.8	35.9	59.1	49.1	21.3	13.2
5	0.461	25.9	23.9	10.0	35.9	33.9	56.7	46.7	20.8	12.8
6	0.922	19.6	15.6	10.1	29.7	25.7	56.0	46.0	26.3	20.3

--- L2 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.173	36.0	34.0	10.1	46.1	44.1	64.8	54.8	18.7	10.7
2	0.230	29.8	26.0	10.0	39.8	36.0	62.4	52.4	22.6	16.4
3	0.288	28.5	25.7	10.0	38.5	35.7	60.6	50.6	22.1	14.9
4	0.346	26.8	24.4	10.0	36.8	34.4	59.1	49.1	22.3	14.7
5	0.461	23.9	21.7	10.0	33.9	31.7	56.7	46.7	22.8	15.0
6	4.899	16.5	13.8	10.4	26.9	24.2	56.0	46.0	29.1	21.8

11g Tx Channel High



Final Result

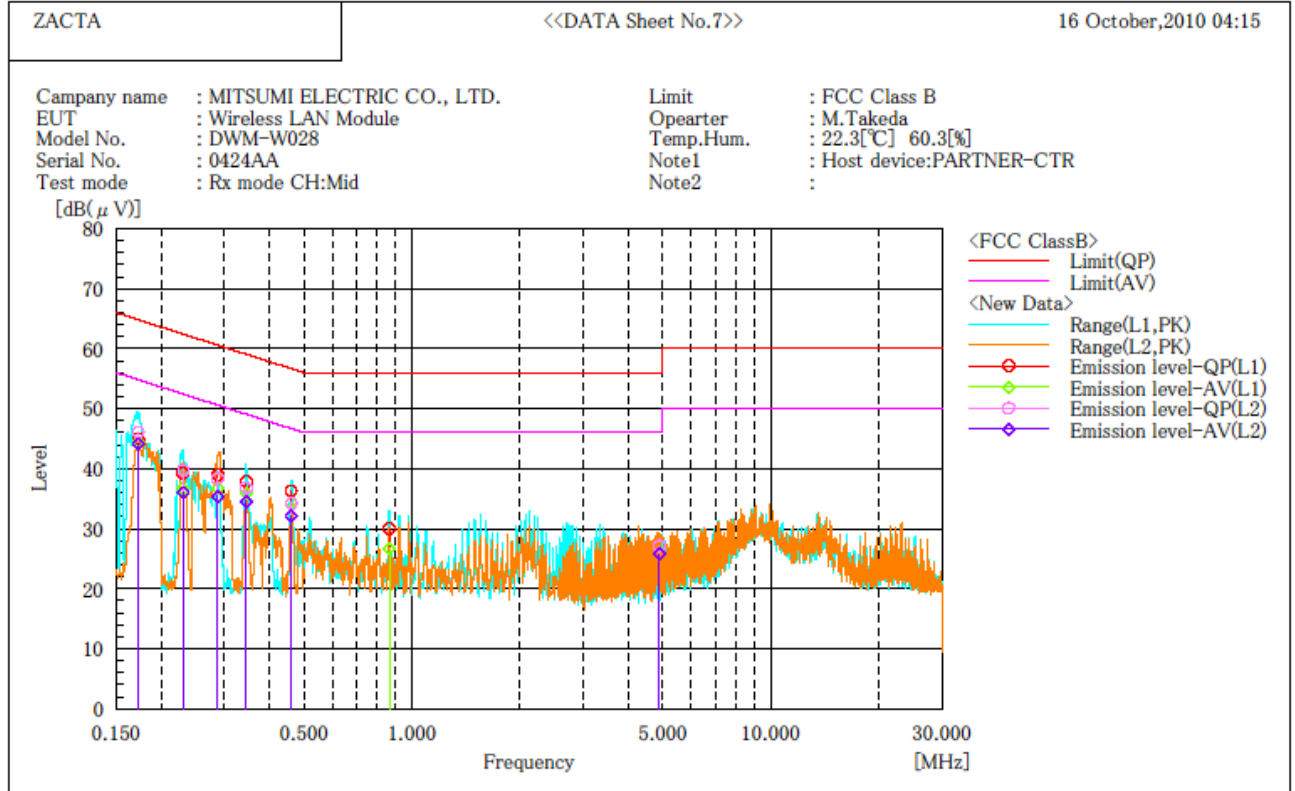
--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.173	34.9	34.4	10.1	45.0	44.5	64.8	54.8	19.8	10.3
2	0.231	29.5	26.8	10.0	39.5	36.8	62.4	52.4	22.9	15.6
3	0.288	29.1	26.9	10.0	39.1	36.9	60.6	50.6	21.5	13.7
4	0.346	27.8	25.9	10.0	37.8	35.9	59.1	49.1	21.3	13.2
5	0.461	26.1	24.0	10.0	36.1	34.0	56.7	46.7	20.6	12.7
6	0.923	19.6	15.7	10.1	29.7	25.8	56.0	46.0	26.3	20.2

--- L2 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.173	36.1	34.0	10.1	46.2	44.1	64.8	54.8	18.6	10.7
2	0.231	29.8	26.0	10.0	39.8	36.0	62.4	52.4	22.6	16.4
3	0.288	28.3	25.5	10.0	38.3	35.5	60.6	50.6	22.3	15.1
4	0.346	26.8	24.5	10.0	36.8	34.5	59.1	49.1	22.3	14.6
5	0.461	24.0	21.9	10.0	34.0	31.9	56.7	46.7	22.7	14.8
6	4.899	16.6	14.5	10.4	27.0	24.9	56.0	46.0	29.0	21.1

Rx Channel Middle



Final Result

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.173	34.8	34.4	10.1	44.9	44.5	64.8	54.8	19.9	10.3
2	0.230	29.3	26.6	10.0	39.3	36.6	62.4	52.4	23.1	15.8
3	0.288	29.0	26.8	10.0	39.0	36.8	60.6	50.6	21.6	13.8
4	0.346	27.8	26.0	10.0	37.8	36.0	59.1	49.1	21.3	13.1
5	0.461	26.3	24.3	10.0	36.3	34.3	56.7	46.7	20.4	12.4
6	0.865	19.9	16.6	10.1	30.0	26.7	56.0	46.0	26.0	19.3

--- L2 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.173	36.0	34.0	10.1	46.1	44.1	64.8	54.8	18.7	10.7
2	0.231	29.7	26.0	10.0	39.7	36.0	62.4	52.4	22.7	16.4
3	0.288	28.3	25.4	10.0	38.3	35.4	60.6	50.6	22.3	15.2
4	0.346	26.8	24.5	10.0	36.8	34.5	59.1	49.1	22.3	14.6
5	0.462	24.2	22.1	10.0	34.2	32.1	56.7	46.7	22.5	14.6
6	4.899	16.7	15.3	10.4	27.1	25.7	56.0	46.0	28.9	20.3



#### ***4.4 Antenna requirement***

According to FCC section 15.203., an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.  
The EUT has an external antenna with SMA Reverse Connector, which was installed by manufacture.

## ***5. Uncertainty of measurement***

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Expanded uncertainties stated were calculated with a coverage Factor  $k=2$ .

Please note that these results are not taken into account when determining compliance or non-compliance with test result.

<b>Test item</b>	<b>Measurement uncertainty</b>
Conducted emission at mains port	$\pm 3.0\text{dB}$
Radiated emission (9kHz - 30MHz)	$\pm 4.4\text{dB}$
Radiated emission (30MHz – 1000MHz)	$\pm 4.5\text{dB}$
Radiated emission (1000MHz – 26GHz)	$\pm 3.9\text{dB}$

## 6. Laboratory description

**6.1 Location:** ZACTA Technology Corporation Yonezawa Testing Center  
4149-7 Hachimanpara 5-chome Yonezawa-shi Yamagata 992-1128 Japan  
Phone: +81-238-28-2880 Fax: +81-238-28-2888

### 6.2 Facility filing information:

1) NVLAP accreditation: NVLAP Lab. code: 200306-0

2) FCC filing:

Site name	Registration Number	Expiry Date
Site 2, Site3	91065	November 19, 2011
3m Semi-anechoic chamber 10m Semi-anechoic chamber Shielded room No.1	540072	February 16, 2013

3) Industry Canada Oats site filing:

Site name	Sites on file: Oats 3m/10m	Expiry Date
Site 2	4224A-2	February 16, 2012
Site 3	4224A-3	February 16, 2012
3m Semi-anechoic chamber	4224A-4	February 16, 2012
10m Semi-anechoic chamber	4224A-5	February 16, 2012

4) VCCI site filing:

Site name	Radiated emission	Conducted Emission for mains port	Expiry Date	Conducted emission for telecom port	Expiry Date
Site 2	R-137	C-133	Nov. 16, 2011	T-1477	Oct. 8, 2011
Site 3	R-138	C-134	Nov. 16, 2011	T-1478	Oct. 8, 2011
10m Semi-anechoic chamber	R-2480	C-2722	Jul. 3, 2011	T-1474	Oct. 8, 2011
3m Semi-anechoic chamber	R-2481	C-2723	Jul. 3, 2011	T-1475	Oct. 8, 2011
Shielded room No.1	-	C-2724	Jul. 3, 2011	T-1476	Oct. 8, 2011

5) Intertek authorization:

Authorized as an EMC test laboratory.

6) TUV Rheinland authorization:

Authorized as an EMC test laboratory.

7) BUREAU VERITAS certification:

Certified as an EMC test laboratory.

## Appendix A: Test equipment

### List of Measuring Instruments

Equipment	Company	Model No.	Serial No.	Cal. due	Cal. date
Spectrum Analyzer (3Hz – 42.98GHz)	Agilent Technologies	E4447A	MY46180188	Mar. 2011	Mar. 4, 2010
Preamplifier (100kHz-1.2GHz)	ANRITSU	MH648A	M96057	Jun. 2011	Jun. 12, 2010
Preamplifier (1GHz-26.5GHz)	Agilent Technologies	8449B	3008A01008	Dec. 2010	Dec. 11, 2009
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	Jun. 2011	Jun. 9, 2010
EMI Receiver	ROHDE&SCHWARZ	ESCI	100451	May 2011	May 28, 2010
Loop antenna	ROHDE&SCHWARZ	HFH2-Z2	892246/010	Feb.2011	Feb. 25, 2010
TRILOG Antenna	Schwarzbeck	VULB9160	9160-3218	Apr. 2011	Apr. 14, 2010
Attenuator (6dB)	TME	CFA-01NPJ-6	N/A(S274)	Jun. 2011	Jun. 12, 2010
Double Ridged Guide Antenna	EMCO	3115	4328	Dec. 2010	Dec. 10, 2008
Broad-Band Horn antenna	Schwarzbeck	BBHA9170	BBHA9170189	Apr. 2013	Apr. 20, 2010
Preamplifier	TSJ	MLA-1840-B03-35	1240332	Apr. 2013	Apr. 20, 2010
Attenuator	TYC	BA-PJ-10	N/A(S345)	Apr.2011	Apr. 26, 2010
Line impedance stabilization network for EUT	Kyoritsu Electrical Works, Ltd.	KNW-407F	8-2003-1	May 2011	May 28, 2010
Line impedance stabilization network for peripheral	Kyoritsu Electrical Works, Ltd.	KNW-242F	8-1973-1	Mar 2011	Mar. 12, 2010
Microwave cable	SUHNER	SUCOFLEX104/9m	322082/4	Sep. 2011	Sep. 14, 2010
Microwave cable	SUHNER	SUCOFLEX104/1m	322085/4	Sep. 2011	Sep. 14, 2010
Microwave cable	SUHNER	SUCOFLEX104/1.5m	317222/4	Sep. 2011	Sep. 14, 2010
Microwave cable	SUHNER	SUCOFLEX106/12m	41624/6	Sep. 2011	Sep. 14, 2010
Microwave cable	SUHNER	SUCOFLEX104/9m	322083/4	Oct. 2011	Oct. 6, 2010
Microwave cable	SUHNER	SUCOFLEX104/1m	322084/4	Oct. 2011	Oct. 6, 2010
Microwave cable	SUHNER	SUCOFLEX104/1.5m	317226/4	Oct. 2011	Oct. 6, 2010
Microwave cable	SUHNER	SUCOFLEX106/7m	41625/6	Oct. 2011	Oct. 6, 2010
Notch filter	Micro-Tronics	BRM50702	045	Oct. 2011	Oct. 6, 2010
50Ω terminator	HRS	UG-88/U	N/A(S061)	Mar.2011	Mar. 5, 2010
PC	DELL	DIMENSION E521	85465BX	N/A	N/A
PC	DELL	DIMENSION E521	75465BX	N/A	N/A
Software	TOYO Corporation	EP5/RE-AJ	0611193/V3.4	N/A	N/A
3m Semi an-echoic Chamber	TOKIN	N/A	N/A (9002-NSA)	May 2011	May 18, 2010
10m Semi an-echoic Chamber	TOKIN	N/A	N/A (9001-NSA10m)	May 2011	May 20, 2010

\*The calibrations of the above equipment are traceable to NIST or equivalent standards of the reference organizations.