TEST REPORT

For

Wireless LAN

In conformity with

FCC CFR 47 Part15 / RSS-210, RSS-Gen

Test Item: Wireless LAN

Model Number: GN-1050

FCC ID / IC Certification No: BJI-GN1050 / 1004C-GN1050

Report No: RY0712Z12R1B

Issue Date: 18 January 2008

Prepared for

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6-78, Minami-cho, Mishima, Shizuoka 411-8520, Japan

Prepared by

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Revision History

Rev.	Date	Revisions	Revised By
-	12 December 2007	Initial Issue	K. Ohnishi
B	18 January 2008	P.11: p.16 -> p.13 P.11: Correction of mistake in table. P.12: Replacement with correct graph P.28: p.16 -> p.13 P.28: Correction of mistake in table and remove the emission results of Host device. P.29: Replacement with correct graph	K.Ohnishi

1 General information

1.1 Product description

Test item	: Wireless LAN
Manufacturer	: Toshiba TEC Corporation
Address	: 6-78, Minami-cho, Mishima, Shizuoka 411-8520, Japan
Model Number	: GN-1050
FCC ID	: BJI-GN1050
IC Certification No	: 1004C-GN1050
Operating frequency range	: TX/RX Freq. (2412 - 2462 MHz)
Type of Modulation	: 802.11b: DBPSK, DQPSK, and CCK
	: 802.11g: OFDM
Receipt date of EUT	: 6 December 2007
Power Supply	: AC 115V 60 Hz

1.2 Test(s) performed/ Summary of test result

Test specification(s)	: FCC CFR 47. Part 15 / RSS-210 Issue 7, RSS-Gen Issue 2
Test method(s)	: ANSI C63.4: 2003
Test(s) started	: 6 December 2007
Test(s) completed	: 7 December 2007
Summary of test result	: Complied

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

Reviewer : T. Ikegami
T. Ikegami

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 23, 2000.
The description of the test facilities has been filed under registration number 879401 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

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;

Conducted emission: +/- 3.5 dB (10 kHz - 150 kHz), +/- 3.6 dB (150 kHz - 30 MHz)
Radiated emission (9 kHz - 30MHz): +/- 3.2 dB
Radiated emission (30MHz - 1000MHz): +/- 4.6 dB
Radiated emission (above 1000MHz): +/- 4.6 dB

1.5 Summary of test results

1.5.1 Table of test summary

Requirement of;	**Section in FCC15**	**Section in RSS-210/ RSS-Gen**	**Result**	**Section in this report**
1.5.1 Average Output power	15.247(a)(1)/(b)(1)	-	Complied	2.2
1.5.2 Transmitter Radiated Spurious Emissions	15.205(b)/15.209	RSS-210 A8.5	Complied	2.3
1.5.3 Transmitter AC Power Line Conducted Emissions	15.207	RSS-Gen 7.2.2	Complied	2.4
1.5.4 Receiver Radiated Spurious Emissions	15.109	RSS-Gen 6	Complied	2.5

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.
A	Wireless LAN	Toshiba TEC Corporation	GN-1050	-

Support Equipment(s):

	Item	Manufacturer	Model No.	Serial No.
B	Multifunctional Digital System	Toshiba TEC Corporation	FC-4520C	-
C	Laptop PC	TOSHIBA CORPORATION	S5/280PNKW	9203364AJ
D	AC Adaptor	TOSHIBA CORPORATION	ADP-45XH	PA3153U-1ACA

Connected cable(s):

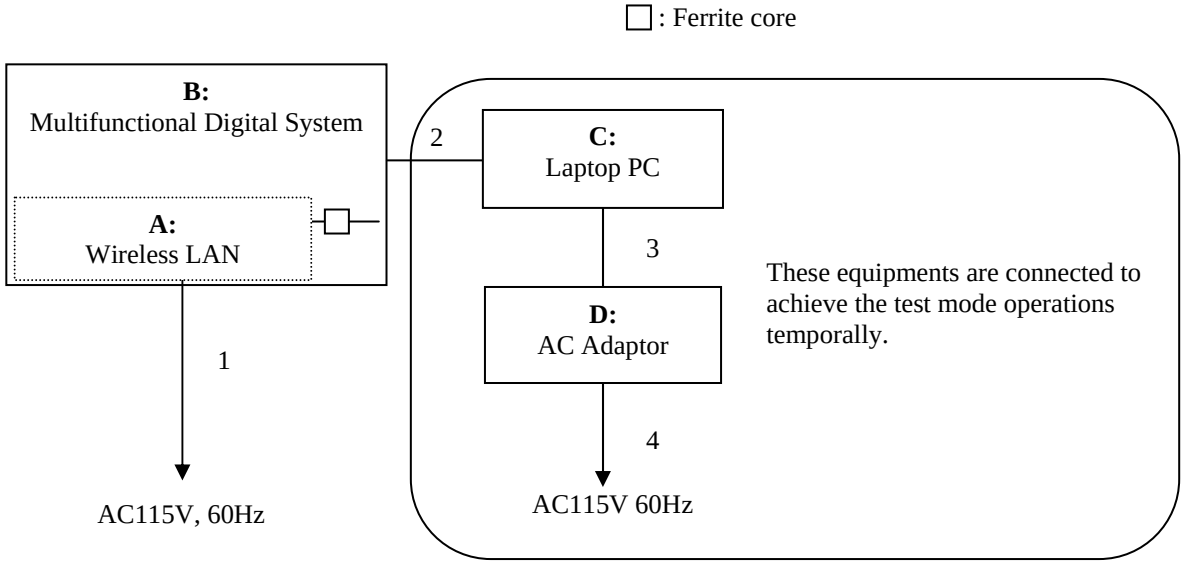
No.	Item	Identification (Manu.e.t.c)	Shielded YES / NO	Ferrite Core YES / NO	Connector Type Shielded YES / NO	Length (m)
1	AC power cable	H05VV-F	No	No	Yes	1.9
2	LAN cable	-	No	No	No	10.0
3	DC power cable	WORLDTEC	No	No	No	1.8
4	AC power cable	HEWTECH	No	No	No	1.9

Note: The Multifunctional Digital System has the following family models:
- FC-2820C (mono: 28ppm/color: 28ppm)
- FC-2830C (mono: 35ppm/color: 28ppm)
- FC-3520C (mono: 35ppm/color: 35ppm)
- FC-3530C (mono: 45ppm/color: 35ppm)
- FC-4520C (mono: 45ppm/color: 45ppm)

1.6.2 Operating condition:

Operation of the EUT: Continuous transmission and reception under the test mode.
Power supply: AC 115V 60Hz

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

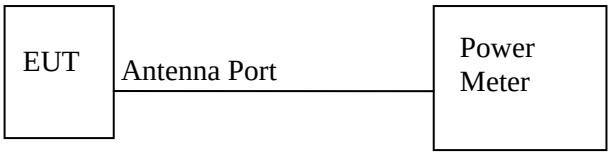
1.8 Deviation from the standard

No deviations from the standards described in clause 1.2

2 Test procedure and test data

2.1 Average Output Power

Test setup
Test setup is the following drawing. The antenna port of EUT was connected to the power meter.



Test procedure
The EUT antenna port connected to the power meter. The correction factor is set to the power meter in order to correct of the connected cable loss.

Limitation
There are no limitations.

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

PM03					

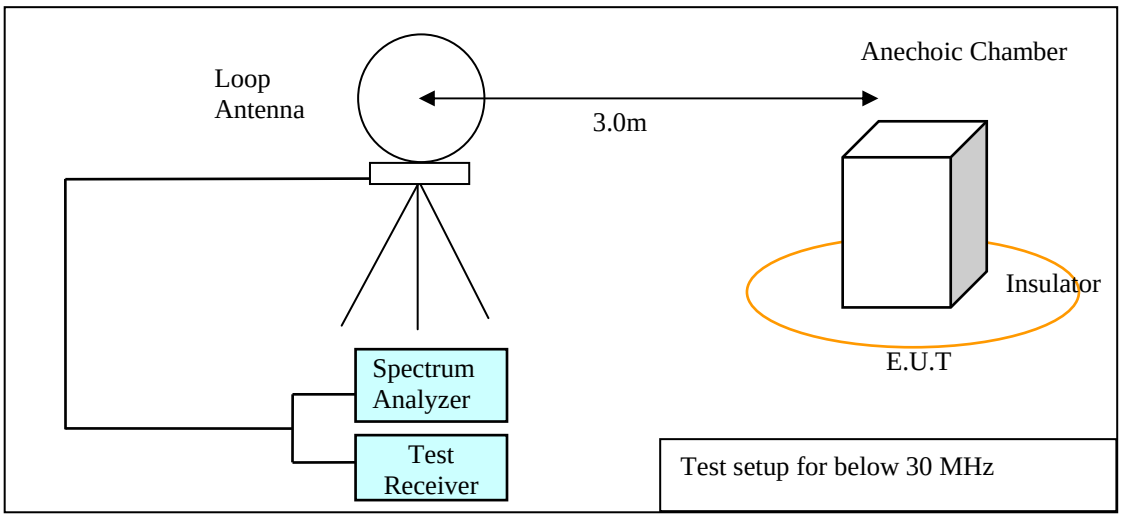
Test results – No non-compliance

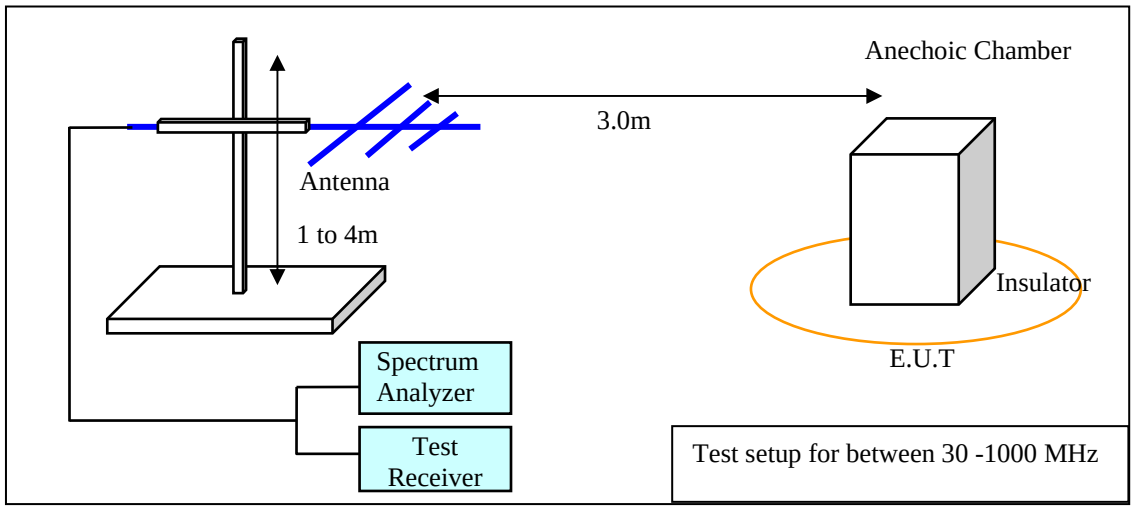
Transmission Channel	Transmission Frequency (MHz)	Output power (dBm)	
		802.11b	802.11g
Low	2412	21.20	17.18
Middle	2437	20.60	20.72
High	2462	20.57	17.33

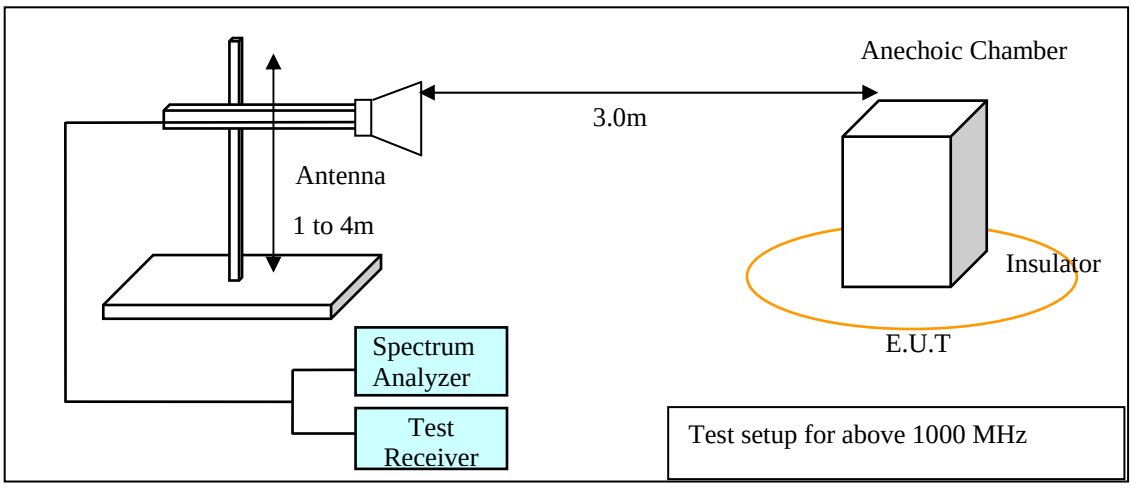
2.2 Transmitter Radiated spurious emissions

Test setup

Test setup was implemented according to the method of ANSI C63.4: 2003 clause 6 “General requirements for EUT equipment arrangements and operation”, clause 8.2 and Annex H.3 “Radiated emission measurements setup”.







Test procedure

Measurement procedures were implemented according to the method of ANSI C63.4: 2003 clauses 8.2.
The measurement antenna to EUT distance is 3 meters. The turn table is rotated for 360 degrees to determine the maximum emission level.
In the frequency range of 9 kHz to 30 MHz, a calibrated loop antenna was positioned with its plane vertical at the distance 3m from the EUT with an extrapolation of corrected distance factor and rotated about its vertical axis for maximum response at each azimuth about the EUT. For certain applications, the loop antenna also needs to be positioned horizontally. The center of the loop shall be 1 m above the ground.
In the frequency above 30 MHz, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.
EUT is placed at the worst orientation. The spectrum analyzer and receiver is set to the followings;

Below 30 MHz:	RBW=10 kHz, VBW= 30 kHz Final measurement is carried out receiver RBW=9 kHz QP
Between 30 - 1000 MHz:	RBW=100 kHz, VBW= 300 kHz Final measurement is carried out receiver RBW=120 kHz QP
Above 1000 MHz:	Peak measurement- RBW=1 MHz, VBW= 1 MHz Average measurement – RBW=1 MHz, VBW=10 Hz

Applicable rule and limitation

§15.205 restricted bands of operation

Except as shown in paragraph 15.205 (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.490 - 0.510	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(1)

15.205(b) except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

15.209(a) except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
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

In the emission table above, the tighter limit applies at the band edges.
The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz.
Radiated emission limits in the above bands are based on measurements employing an average detector.

Test results - Complied with requirement.

Test Data

2.2.1 Below 30 MHz (Worst case)

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

AC01	LP01	CL11	SA06	TR04

Tested Date: December 7 2007

Temperature: 21 ˚C
Humidity: 36 %
Atmos. Press: 1012 hPa

Result
There is no spurious emissions grater than noise floor.

2.2.2 30 – 1000 MHz (Worst case)

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

AC01	BA03	CL11	PR03	SA06	TR04

Wireless LAN (Applicable limitation: Class B)

Tested Date: December 7 2007

Temperature: 21 ˚C
Humidity: 36 %
Atmos. Press: 1012 hPa

No.	Frequency [MHz]	Reading [dBuV]	Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna Polarization
1	77.940	53.9	6.8	4.8	29.8	35.7	40.0	4.3	Vert.
2	78.022	44.6	6.9	4.8	29.8	26.5	40.0	13.5	Hori.
3	100.650	41.9	10.2	5.1	29.8	27.4	43.5	16.1	Hori.
4	148.128	37.1	10.7	5.7	29.7	23.8	43.5	19.7	Vert.
5	250.039	44.2	12.7	6.6	29.8	33.7	46.0	12.3	Hori.
6	260.110	54.9	12.8	6.7	29.8	44.6	46.0	1.4	Vert.
7	260.401	38.5	12.8	6.7	29.8	28.2	46.0	17.8	Hori.
8	399.989	51.6	15.8	7.8	30.0	45.2	46.0	0.8	Vert.
9	799.978	43.5	22.0	10.2	29.9	45.8	46.0	0.2	Hori.
10	799.978	41.6	22.0	10.2	29.9	43.9	46.0	2.1	Vert.
11	933.308	45.8	24.4	11.0	29.2	52.0	46.0	-6.0	Vert.
12	933.309	48.4	24.4	11.0	29.2	54.6	46.0	-8.6	Hori.

Note1: Spurious emissions at 933.30MHz (No.11, 12) is not caused by wireless LAN. Please refer to p.13 in this report.

Calculation method

The Correction Factors and RESULT are calculated as followings.

Correction Factor [dB] = FACTOR [dB/m] + LOSS [dB] – GAIN [dB]

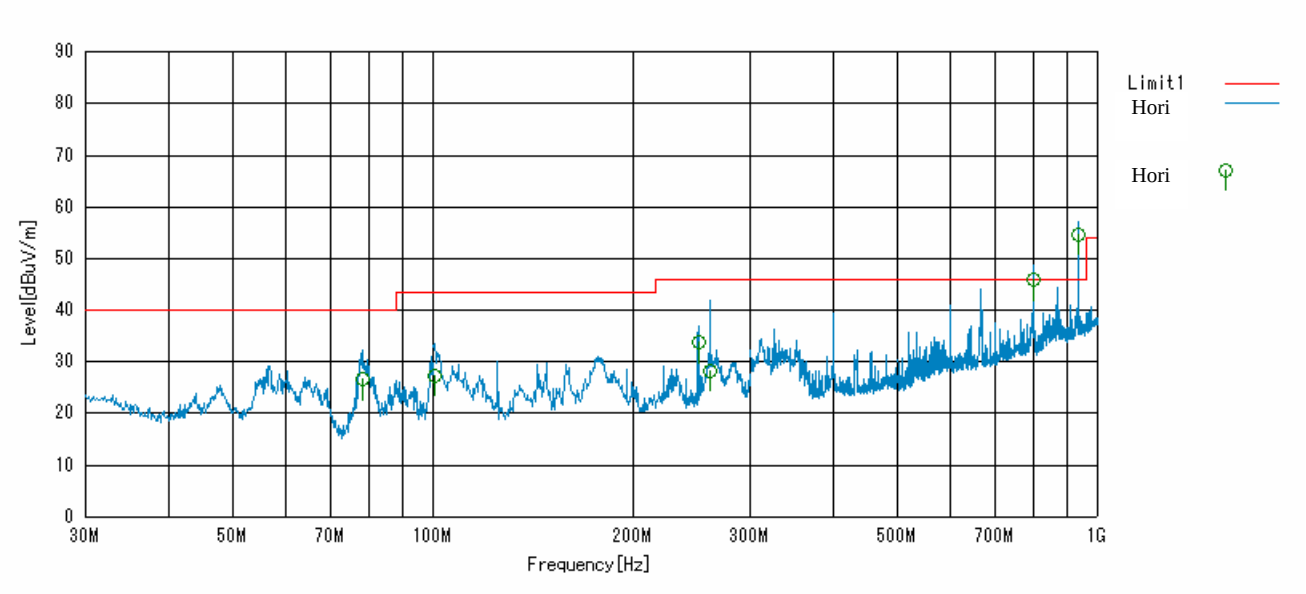
RESULT [dBuV/m] =READING [dBuV] + Correction Factor [dB]

Sample calculation at 77.940 MHz vertical result as follow:

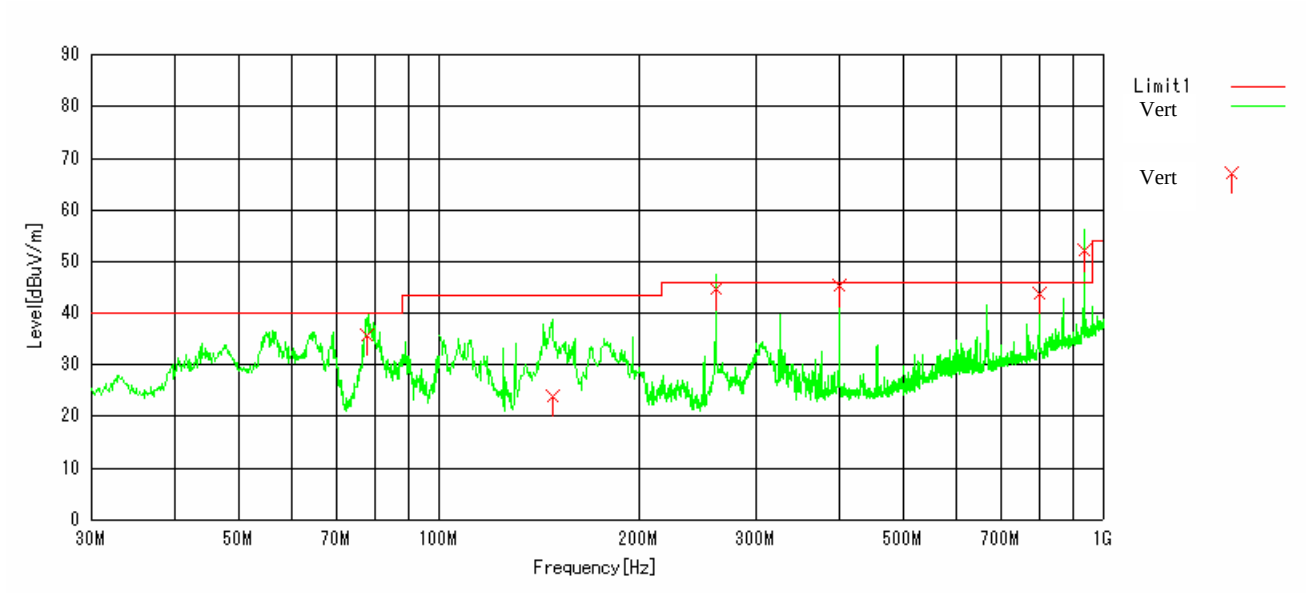
Result [dBuV/m] = Reading + C.F = 53.9 + 6.8 + 4.8 - 29.8 = 35.7
Margin = Limit – Result = 40.0 – 35.7 = 4.3 [dB]

Graphical express of test result (30MHz-1000MHz)

Antenna polarization: Horizontal



Antenna polarization: Vertical



Host Device: Multifunctional Digital System (Applicable limitation: Class A)

Tested Date: December 7 2007

Temperature: 21 ˚C
Humidity: 36 %
Atmos. Press: 1012 hPa

No.	Frequency [MHz]	Reading [dBuV]	Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna Polarization
1	87.460	51.1	8.0	5.0	29.8	34.3	49.5	15.2	Vert.
2	260.110	53.7	12.8	6.7	29.8	43.4	56.9	13.5	Vert.
3	639.999	52.6	20.7	9.4	30.0	52.7	56.9	4.2	Hori.
4	866.643	39.6	23.1	10.7	29.6	43.8	56.9	13.1	Hori.
5	933.308	47.8	24.4	11.0	29.2	54.0	56.9	2.9	Hori.
6	933.308	46.7	24.4	11.0	29.2	52.9	56.9	4.0	Vert.

Calculation method

The Correction Factors and RESULT are calculated as followings.

Correction Factor [dB] = FACTOR [dB/m] + LOSS [dB] – GAIN [dB]

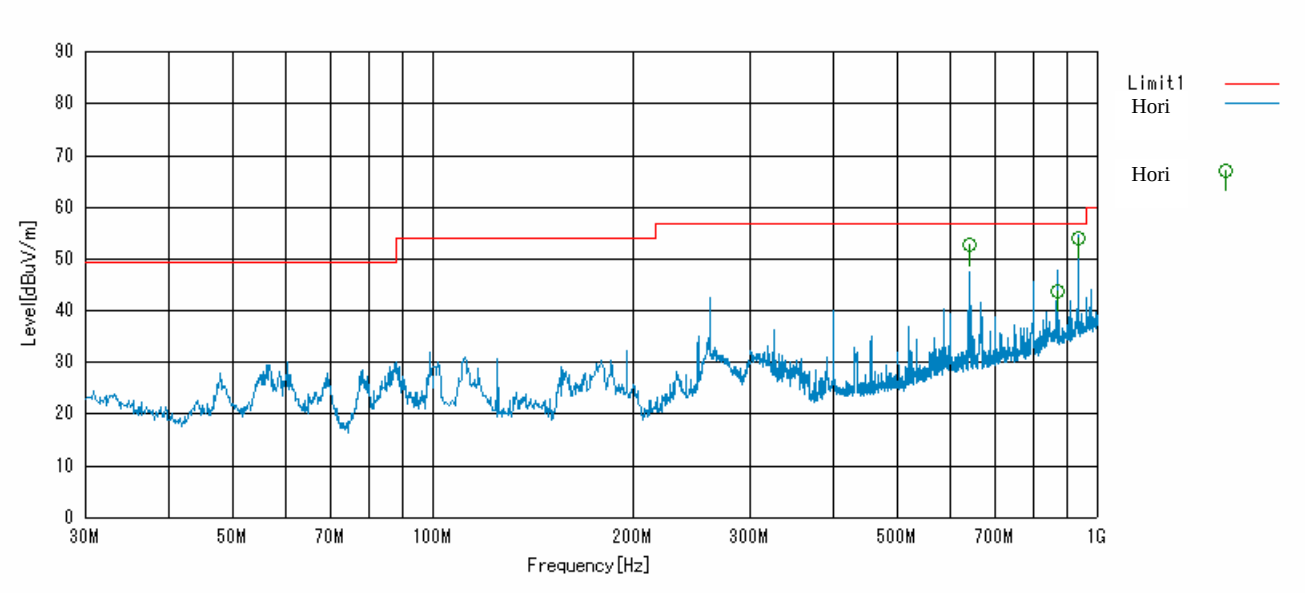
RESULT [dBuV/m] =READING [dBuV] + Correction Factor [dB]

Sample calculation at 87.460 MHz vertical result as follow:

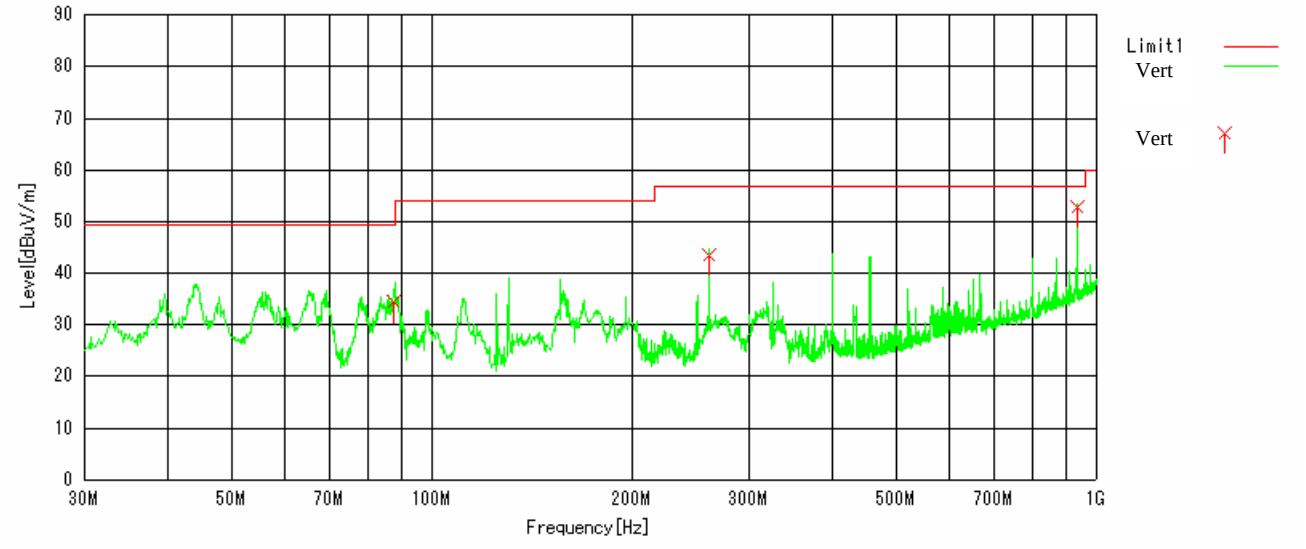
Result [dBuV/m] = Reading + C.F = 51.1 + 8.0 + 5.0 - 29.8 = 34.3
Margin = Limit – Result = 49.5 – 34.3 = 15.2 [dB]

Graphical express of test result (30MHz-1000MHz)

Antenna polarization: Horizontal



Antenna polarization: Vertical



2.2.3 Above 1000 MHz (Worst case)

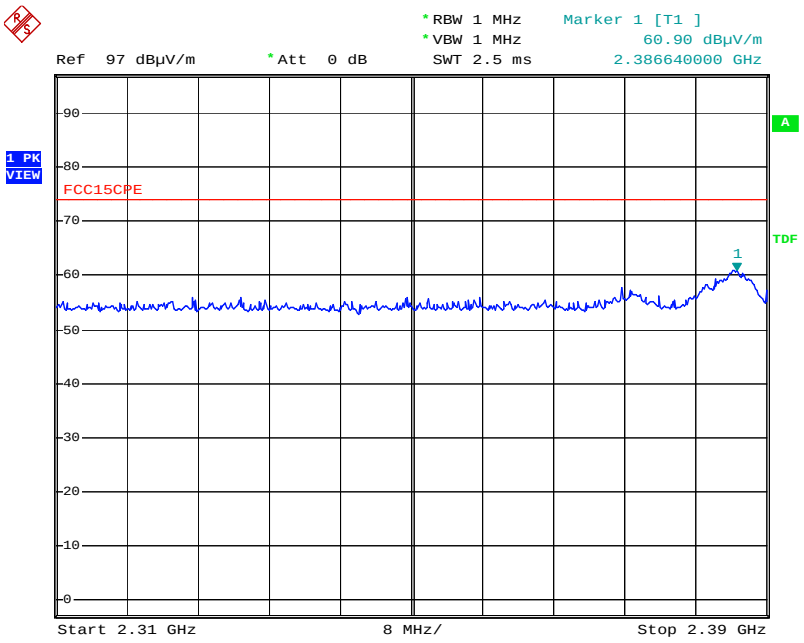
Test equipment used (refer to List of utilized test equipment)

AC01	HPF1	PR04	SH01	SA06	CL21	CL22	DH02

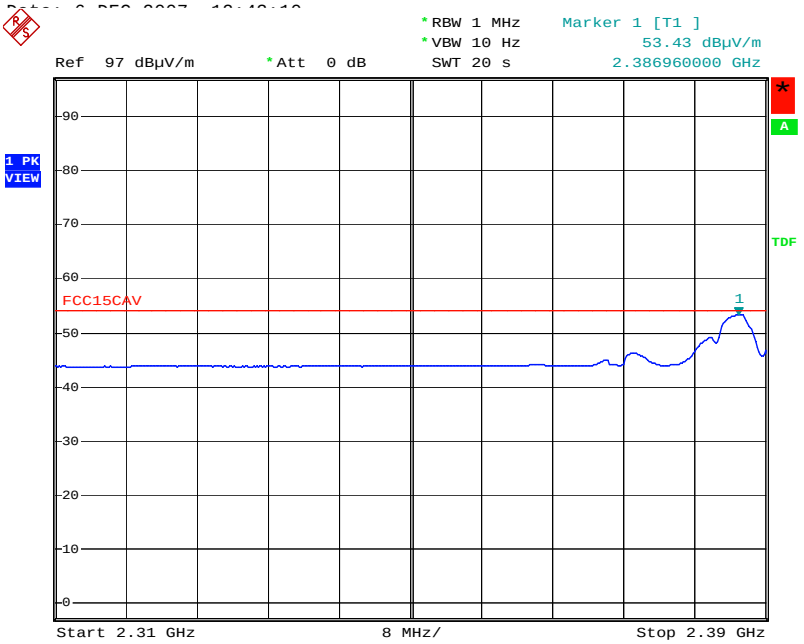
Tested Date: December 6 2007

Temperature: 20 ˚C
Humidity: 31 %
Atmos. Press: 1013 h

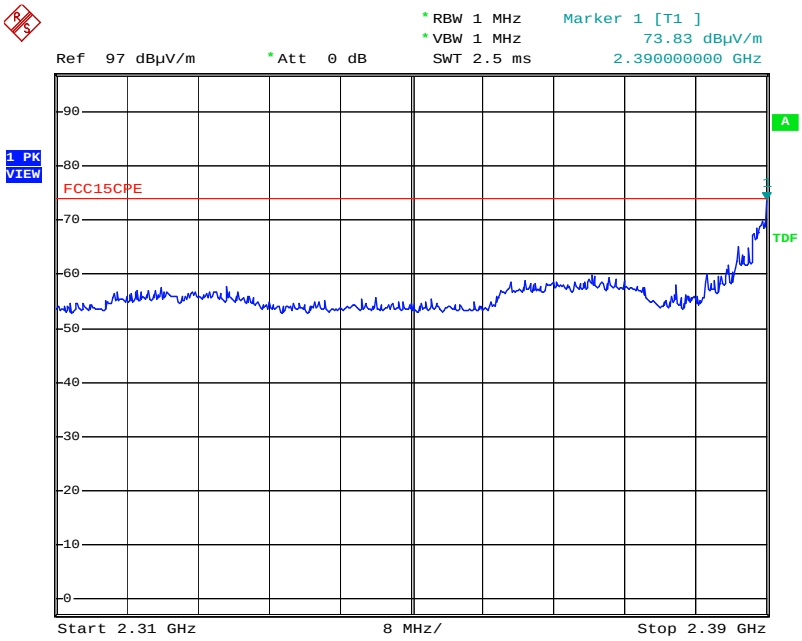
Restricted Band Edge (802.11b: Low channel, Horizontal, Peak)



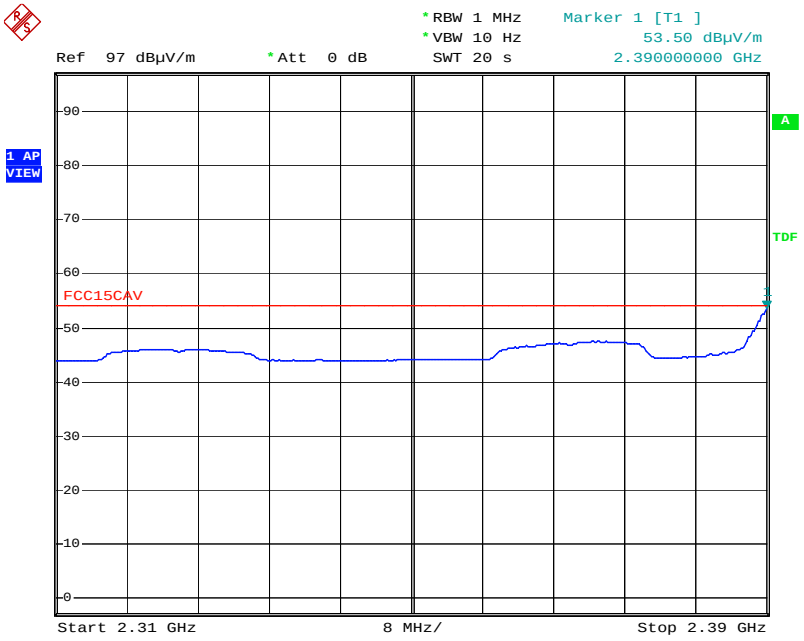
Restricted Band Edge (802.11b: Low channel, Horizontal, Average)



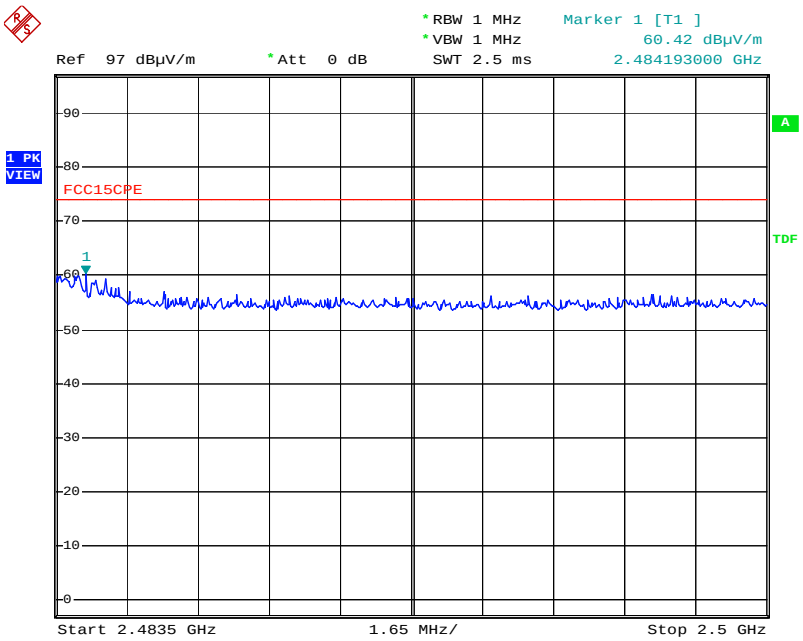
Restricted Band Edge (802.11b: Low channel, Vertical, Peak)



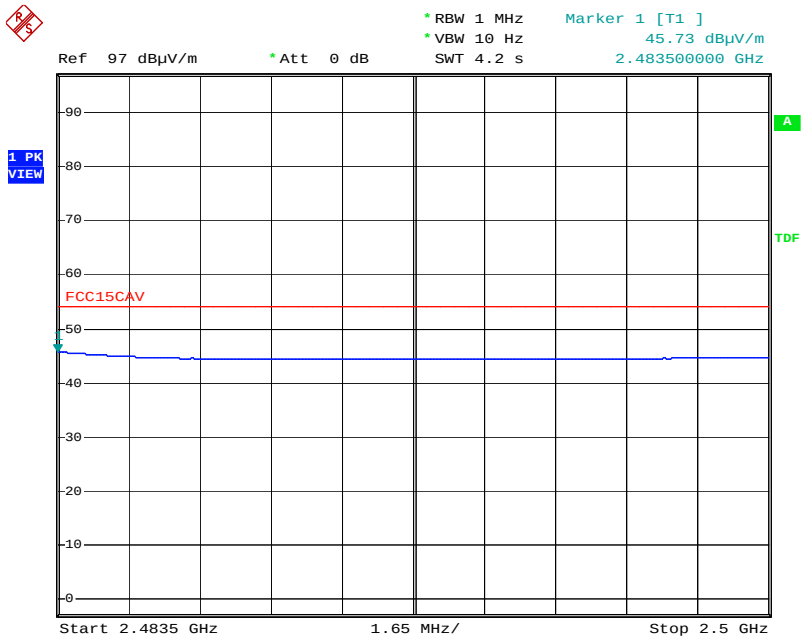
Restricted Band Edge (802.11b: Low channel, Vertical, Average)



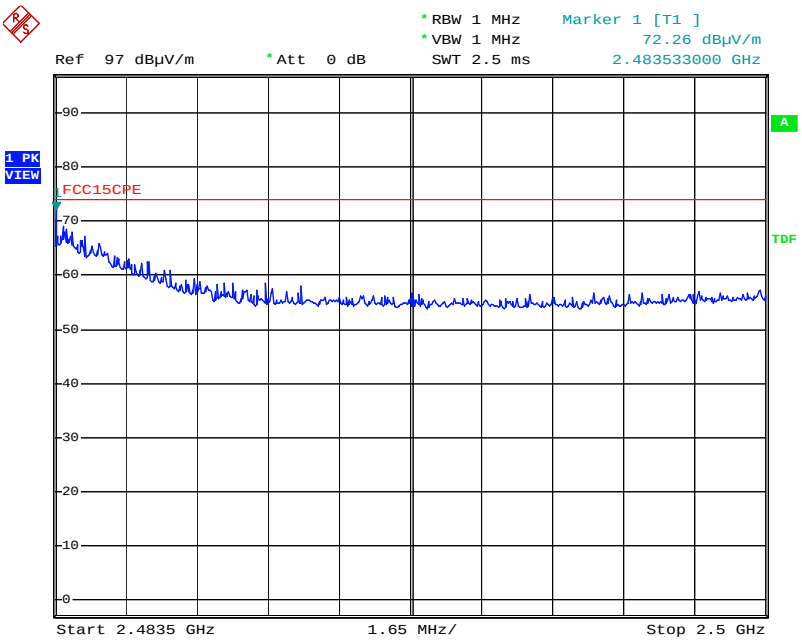
Restricted Band Edge (802.11b: High channel, Horizontal, Peak)



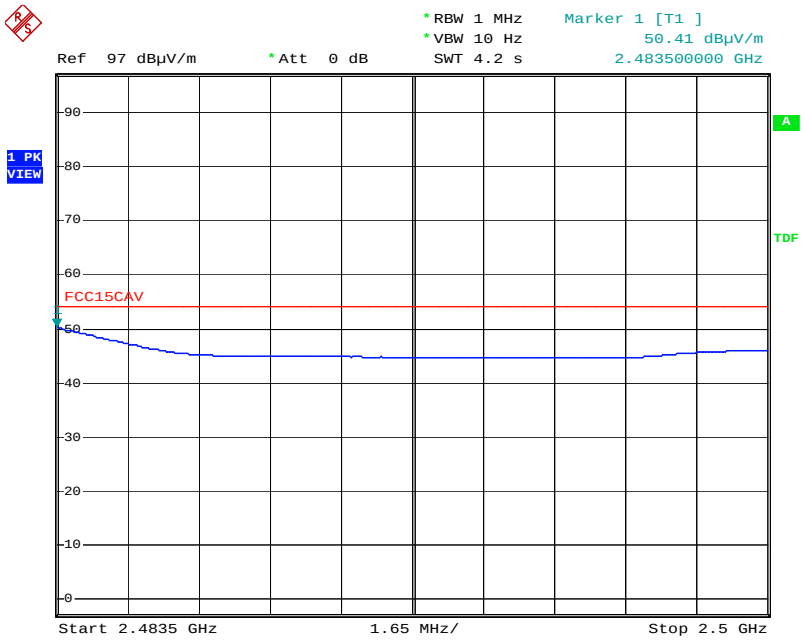
Restricted Band Edge (802.11b: High channel, Horizontal, Average)



Restricted Band Edge (802.11b: High channel, Vertical, Peak)



Restricted Band Edge (802.11b: High channel, Vertical, Average)



Harmonics and Spurious Emission above 1000 MHz

TX CH (MHz)	H/V	Freq. (MHz)	Factor (dB)	Meter Reading (dBuV)		Limit (dBuV)		Result (dBuV/m)		Margin (dB)	
				Ave.	Peak.	Ave.	Peak.	Ave.	Peak.	Ave.	Peak
2412 (Low)	Hori	4824	6.7	30.27	43.76	54.0	74.0	36.97	50.46	17.03	23.54
	Hori	7236	10.8	32.02	45.65	54.0	74.0	42.82	56.45	11.18	17.55
	Vert	4824	6.7	30.30	43.31	54.0	74.0	37.00	50.01	17.00	23.99
	Vert	7236	10.8	32.27	45.22	54.0	74.0	43.07	56.02	10.93	17.98
2437 (Mid)	Hori	4874	6.7	30.02	43.21	54.0	74.0	36.72	49.91	17.28	24.09
	Hori	7311	10.8	32.10	45.36	54.0	74.0	42.9	56.16	11.10	17.84
	Vert	4874	6.7	30.48	43.46	54.0	74.0	37.18	50.16	16.82	23.84
	Vert	7311	10.8	32.09	46.16	54.0	74.0	42.89	56.96	11.11	17.04
2462 (High)	Hori	4924	6.7	30.50	43.51	54.0	74.0	37.20	50.21	16.80	23.79
	Hori	7386	10.8	32.26	45.21	54.0	74.0	43.06	56.01	10.94	17.99
	Vert	4924	6.7	30.95	43.50	54.0	74.0	37.65	50.20	16.35	23.80
	Vert	7386	10.8	32.25	45.74	54.0	74.0	43.05	56.54	10.95	17.46

Note1: This frequency is in the restriction band therefore it is applied the 15.209 Radiated emission limits, general requirements.

Calculation method

The RESULT is calculated as followings.

Factor [dB] = Antenna Factor [dB/m] + Cable Loss [dB] - Amp gain [dB]
RESULT [dBuV/m] =READING [dBuV] + Factor [dB]

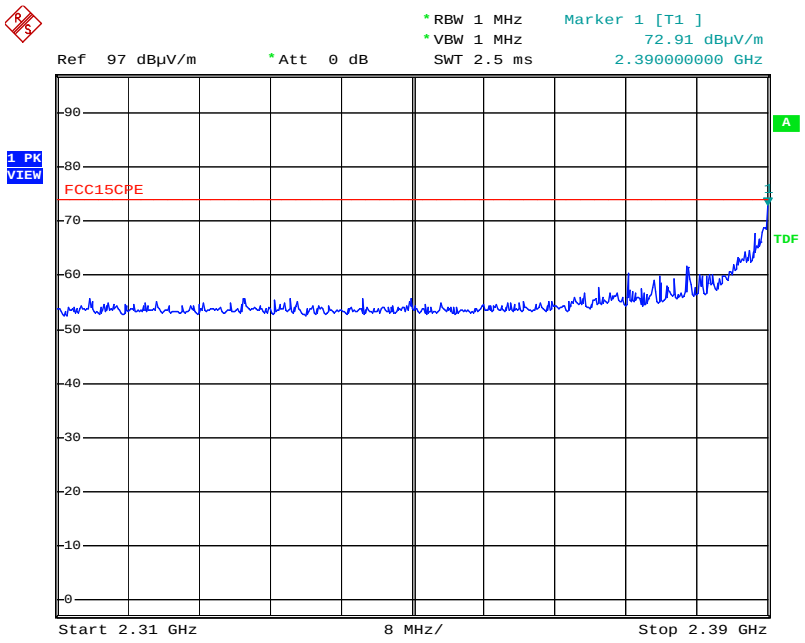
Sample calculation at 4824 MHz result on the Hori / Ave as follow:

Result [dBuV/m] = Reading + Factor = 30.27 + 6.7 = 36.97
Margin = Limit – Result = 54.0 – 36.97 = 17.03 [dB]

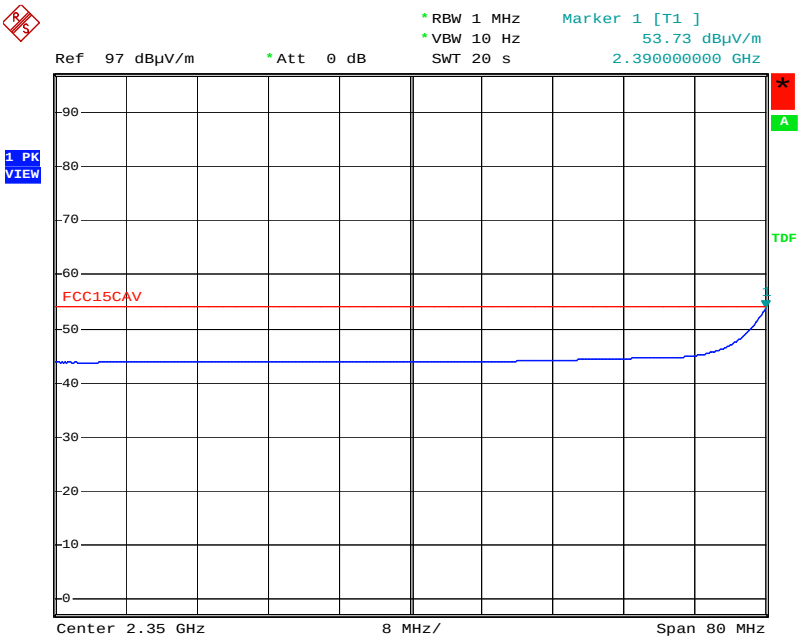
Tested Date: December 6 2007

Temperature: 20 ˚C
Humidity: 31 %
Atmos. Press: 1013 h

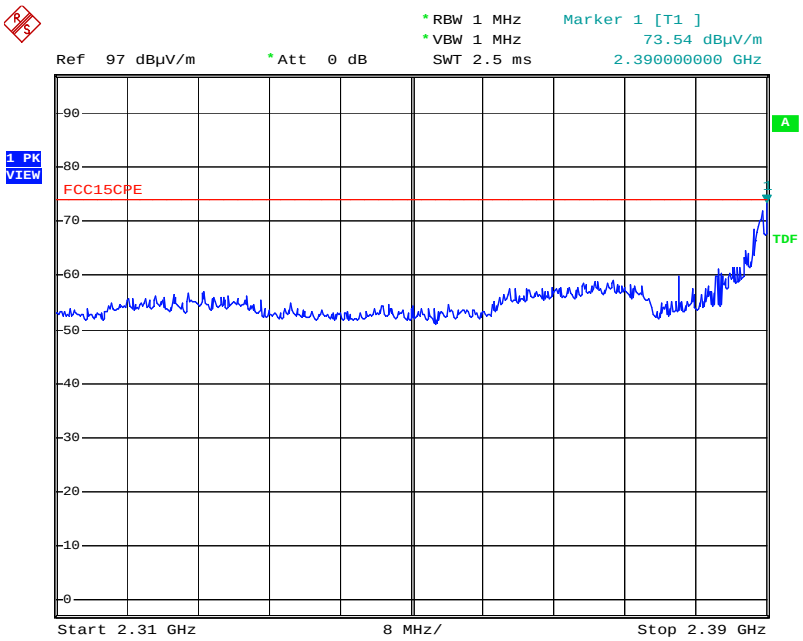
Restricted Band Edge (802.11g: Low channel, Horizontal, Peak)



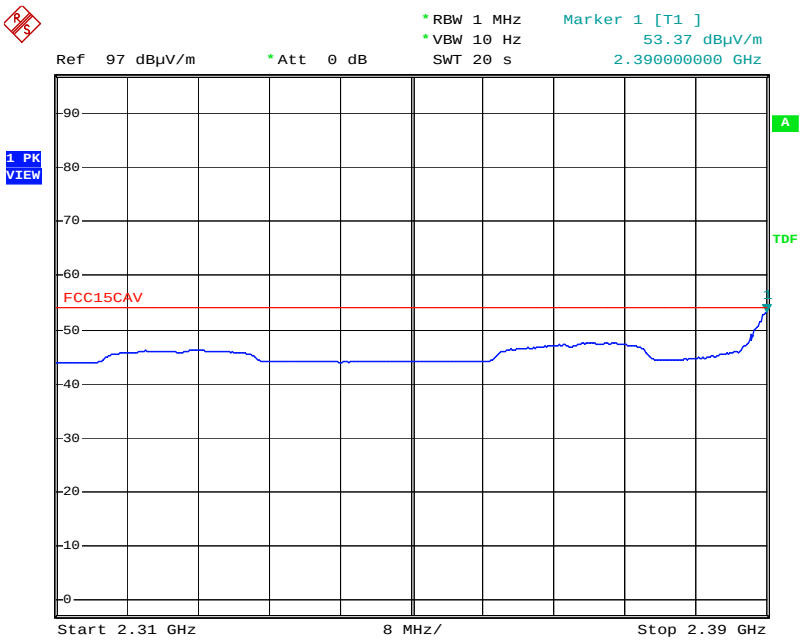
Restricted Band Edge (802.11g: Low channel, Horizontal, Average)



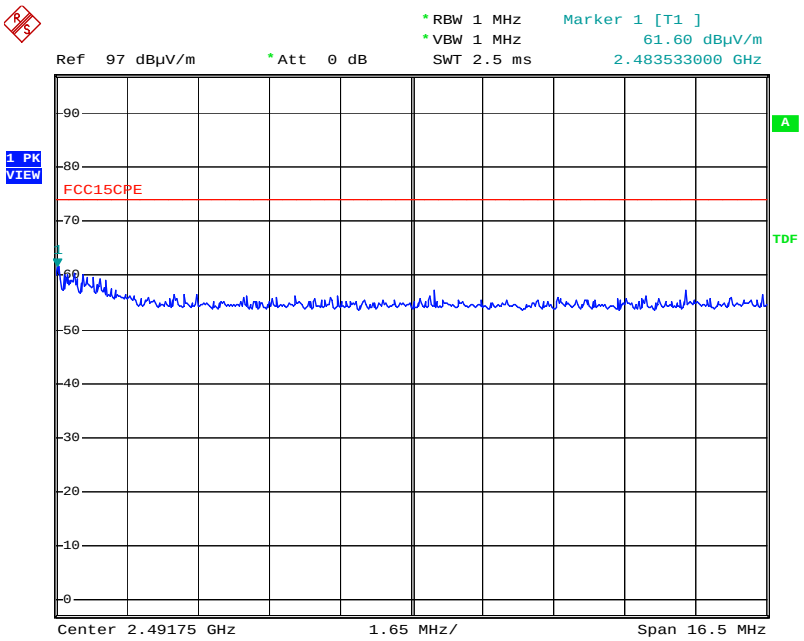
Restricted Band Edge (802.11g: Low channel, Vertical, Peak)



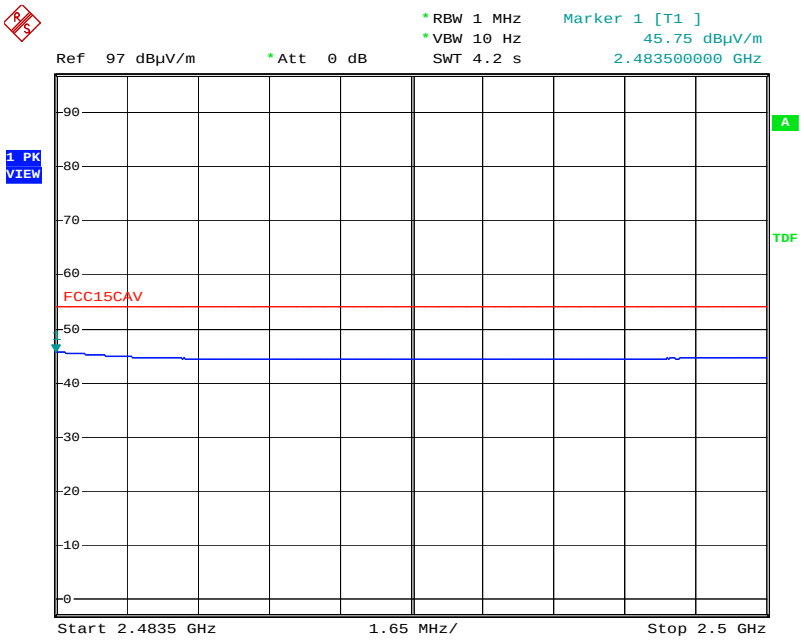
Restricted Band Edge (802.11g: Low channel, Vertical, Average)



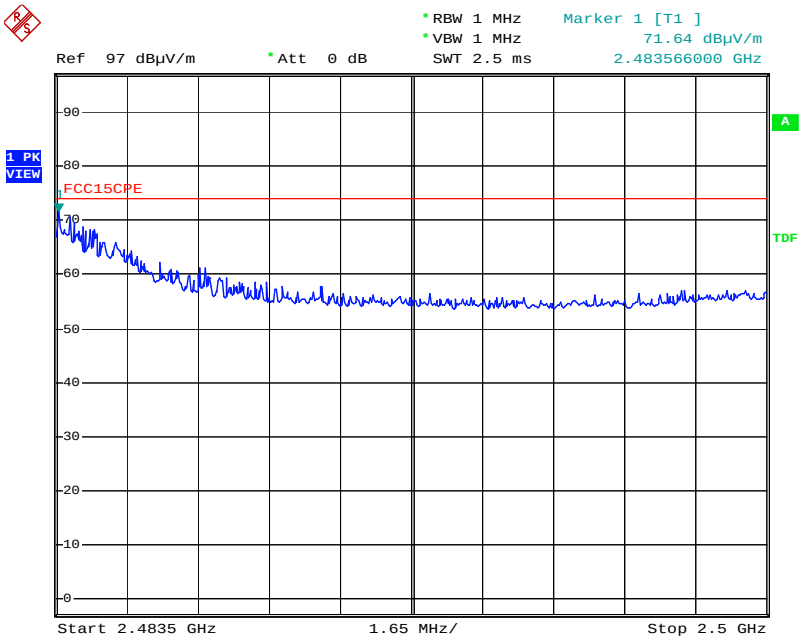
Restricted Band Edge (802.11g: High channel, Horizontal, Peak)



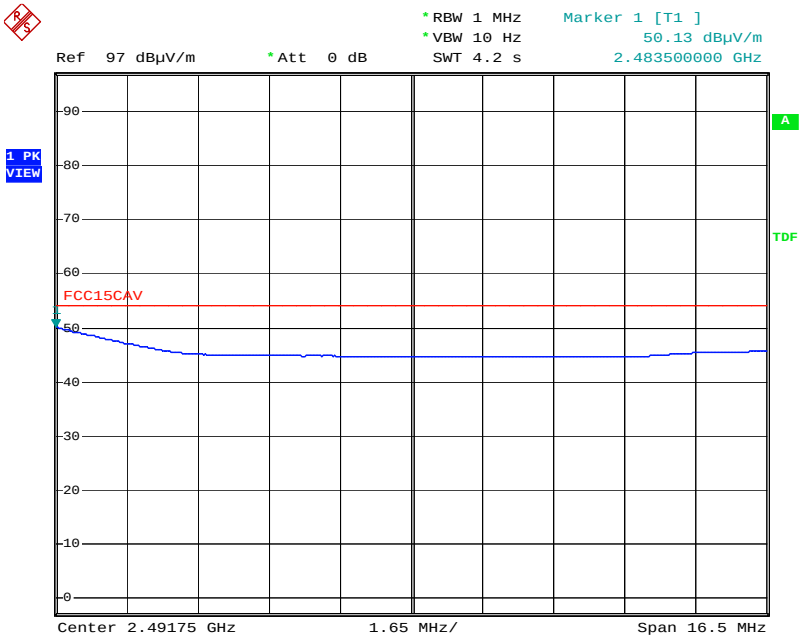
Restricted Band Edge (802.11g: High channel, Horizontal, Average)



Restricted Band Edge (802.11g: High channel, Vertical, Peak)



Restricted Band Edge (802.11g: High channel, Vertical, Average)



Harmonics and Spurious Emission above 1000 MHz

TX CH (MHz)	H/V	Freq. (MHz)	Factor (dB)	Meter Reading (dBuV)		Limit (dBuV)		Result (dBuV/m)		Margin (dB)	
				Ave.	Peak.	Ave.	Peak.	Ave.	Peak.	Ave.	Peak
2412 (Low)	Hori	4824	6.7	30.02	41.97	54.0	74.0	36.72	48.67	17.28	25.33
	Hori	7236	10.8	31.99	44.49	54.0	74.0	42.79	55.29	11.21	18.71
	Vert	4824	6.7	30.03	41.46	54.0	74.0	36.73	48.16	17.27	25.84
	Vert	7236	10.8	32.07	44.53	54.0	74.0	42.87	55.33	11.13	18.67
2437 (Mid)	Hori	4874	6.7	29.88	42.11	54.0	74.0	36.58	48.81	17.42	25.19
	Hori	7311	10.8	32.23	46.33	54.0	74.0	43.03	57.13	10.97	16.87
	Vert	4874	6.7	30.15	42.07	54.0	74.0	36.85	48.77	17.15	25.23
	Vert	7311	10.8	32.27	45.86	54.0	74.0	43.07	56.66	10.93	17.34
2462 (High)	Hori	4924	6.7	30.25	43.68	54.0	74.0	36.95	50.38	17.05	23.62
	Hori	7386	10.8	32.33	45.76	54.0	74.0	43.13	56.56	10.87	17.44
	Vert	4924	6.7	30.22	43.99	54.0	74.0	36.92	50.69	17.08	23.31
	Vert	7386	10.8	32.35	46.09	54.0	74.0	43.15	56.89	10.85	17.11

Note1: This frequency is in the restriction band therefore it is applied the 15.209 Radiated emission limits, general requirements.

Calculation method

The RESULT is calculated as followings.

Factor [dB] = Antenna Factor [dB/m] + Cable Loss [dB] - Amp gain [dB]
RESULT [dBuV/m] =READING [dBuV] + Factor [dB]

Sample calculation at 4824 MHz result on the Hori / Ave as follow:

Result [dBuV/m] = Reading + Factor = 30.02 + 6.7 = 36.72
Margin = Limit – Result = 54.0 – 36.72 = 17.28 [dB]

2.3 Transmitter AC power line conducted emissions

Test setup
Test setup was implemented according to the method of ANSI C63.4: 2003 clause 6 “General requirements for EUT equipment arrangements and operation” and Annex H.1 “AC power line conducted emission measurements setup”.

Test procedure
Measurement procedures were implemented according to the method of ANSI C63.4: 2003 clauses 7, clause 13.1.3 and Annex H.2 “AC power line conducted emission measurements”.
Exploratory measurements were used the spectrum analyzer to identify the frequency of the emission that has the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable positions, and with a typical system equipment configuration and arrangement.
Final ac power line conducted emission measurements were performed based on the exploratory tests.
The EUT cable configuration and arrangement and mode of operation that produced the emission with the highest amplitude relative to the limit are selected for the final measurement.
When the measurement value is grater than average limitation the average detection measurements were performed.

Applicable rule and limitation

§15.207 (a) AC power line conducted limits

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.
The lower limit applies at the band edges.

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

TR04	PL01	LN05 for EUT	LN06 for EUT	SA06	CL11

Test results - Complied with requirement.

Test Data

Tested Date: December 7 2007

Temperature: 21 ˚C
Humidity: 36 %
Atmos. Press: 1012 hPa

Continuous Transmission (Worst case configuration)

No	Frequency [MHz]	Reading		C.F. [dB]	Result		Limit		Margin		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]	
1	0.185	45.3	25.1	0.2	45.5	25.3	64.3	54.3	18.8	29.0	N
2	0.186	42.8	25.3	0.2	43.0	25.5	64.2	54.2	21.2	28.7	L
3	0.278	26.7	10.5	0.2	26.9	10.7	60.9	50.9	34.0	40.2	L
4	0.279	23.6	7.3	0.2	23.8	7.5	60.8	50.8	37.0	43.3	N
5	7.663	32.7	32.6	0.5	33.2	33.1	60.0	50.0	26.8	16.9	N
6	7.785	33.1	33.1	0.5	33.6	33.6	60.0	50.0	26.4	16.4	L
7	9.739	35.7	35.6	0.6	36.3	36.2	60.0	50.0	23.7	13.8	N
8	9.739	35.9	35.9	0.6	36.5	36.5	60.0	50.0	23.5	13.5	L
9	21.662	27.7	26.6	1.0	28.7	27.6	60.0	50.0	31.3	22.4	N
10	21.662	27.9	26.8	1.0	28.9	27.8	60.0	50.0	31.1	22.2	L

The power line conducted emission voltage is calculated by adding the LISN factor and Cable loss attenuation from the measured reading. The calculation is as follows:

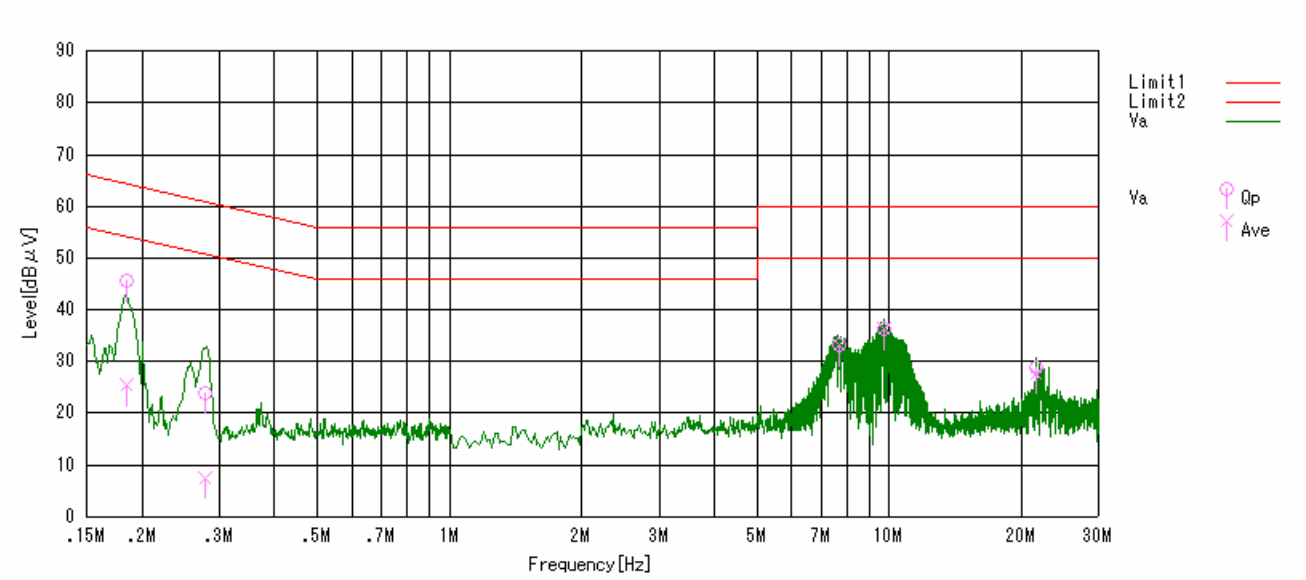
Result = Reading + C. F
where C.F = LISN Factor + Cable Loss [dB]

Sample calculation at 0.185MHz Ave / N phase result as follow:

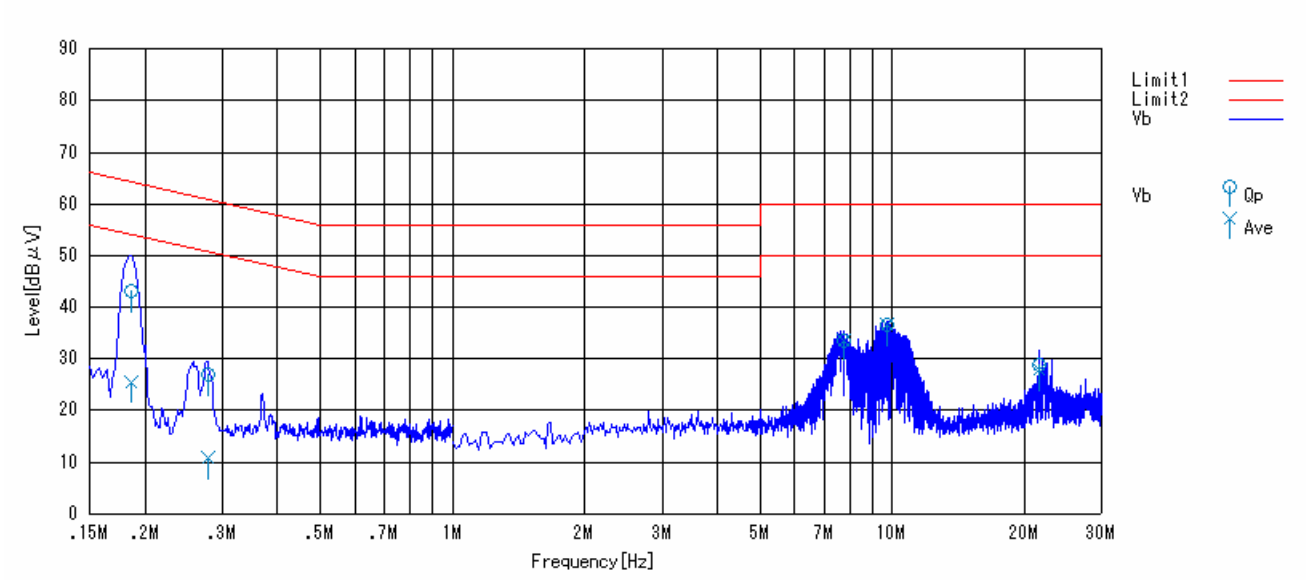
Result [dBuV] = Reading + C.F = 25.1 + 0.2 = 25.3 [dBuV]
Margin = Limit – Result = 54.3 – 25.3 = 29.0 [dBuV]

Graphical express of test result (0.15 MHz-30MHz)

AC Power line conducted emission. (Phase N)



AC Power line conducted emission. (Phase L)



2.4 Receiver Radiated spurious emissions

Test setup - Same as clause 2.3

Test procedure - Same as clause 2.3

Applicable rule and limitation at 3m
§15.109 radiated emission limitation

Frequency (MHz)	Measurement Distance (m)	Field Strength (uV/m)	Field Strength (dBuV/m)
30 – 88	3	100	40.0
88 –216	3	150	43.5
216 – 960	3	200	46.0
Above 960	3	500	54.0

In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector.

Test results - Complied with requirement.

2.4.1 Between 30 – 1000 MHz (Worst case)

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

AC01	BA03	CL11	PR03	SA06	TR04

Test Data

Tested Date: December 7 2007

Temperature: 21 ˚C
Humidity: 36 %
Atmos. Press: 1012 hPa

No.	Frequency [MHz]	Reading [dBuV]	Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna Polarization
1	87.460	50.6	8.0	5.0	29.8	33.8	40.0	6.2	Vert.
2	260.110	53.2	12.8	6.7	29.8	42.9	46.0	3.1	Vert.
3	866.643	39.1	23.1	10.7	29.6	43.3	46.0	2.7	Hori.

.

Calculation method

The Correction Factors and RESULT are calculated as followings.

Correction Factor [dB/m] = FACTOR [dB/m] + LOSS [dB] – GAIN [dB]

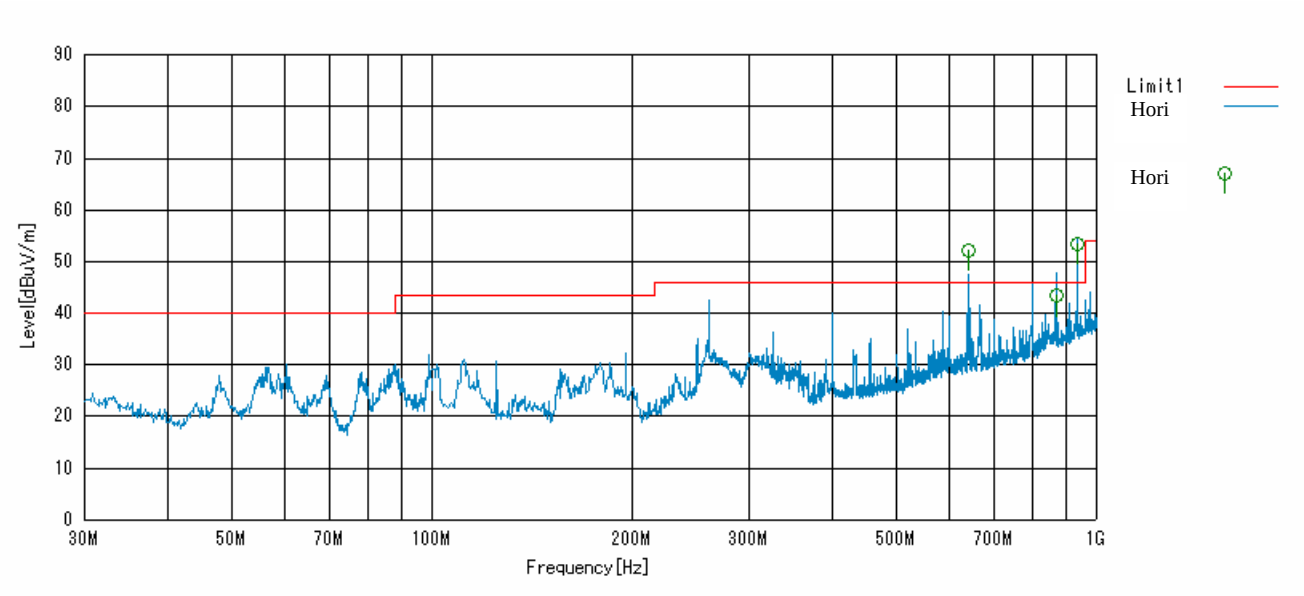
RESULT [dBuV/m] =READING [dBuV] + Correction Factor [dB/m]

Sample calculation at 87.460 MHz Vertical result as follow:

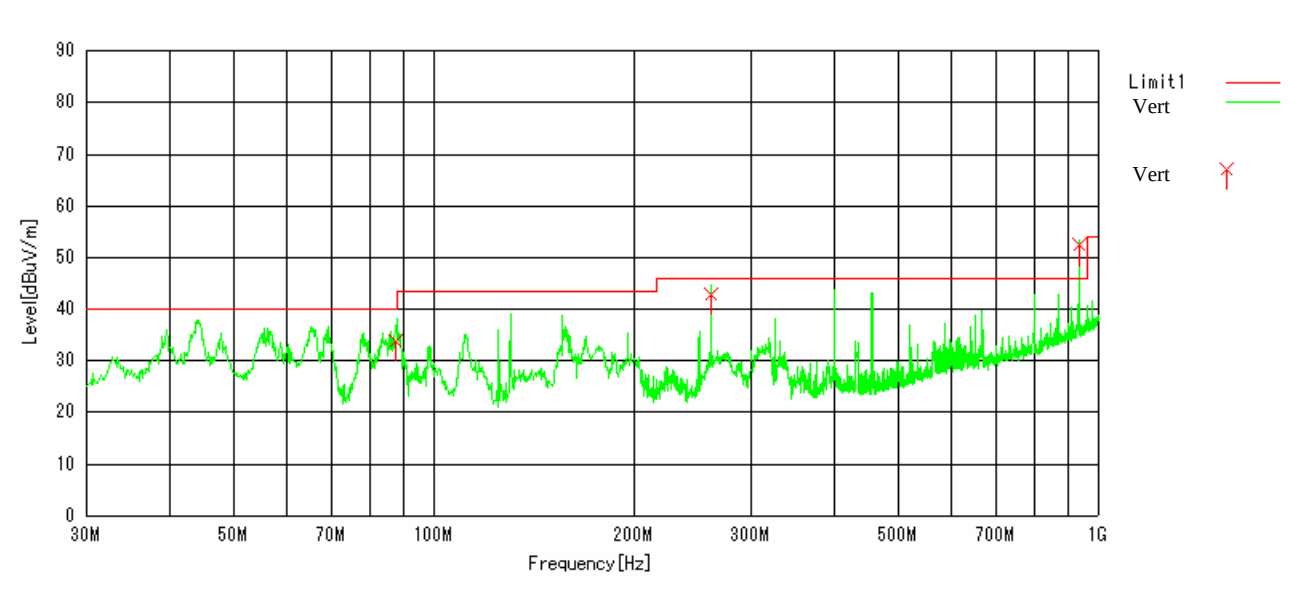
Result [dBuV/m] = Reading + C.F = 50.6 + 8.0 + 5.0 – 29.8 = 33.8
Margin = Limit – Result = 40.0 – 33.8 = 6.2 [dBuV/m]

Graphical express of test result (30MHz-1000MHz)

Antenna polarization: Horizontal



Antenna polarization: Vertical



Note:
Spurious emissions at 639.99, 933.30MHz is not caused by wireless LAN. Please refer to p.13 in this report

2.4.2 Above 1000 MHz (Worst case)

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

AC01	PR04	SH01	SA06	CL21	CL22	DH02	HPF1

Tested Date: December 7 2007

Temperature: 21 ˚C
Humidity: 36 %
Atmos. Press: 1012 hPa

Result
There are no spurious emissions greater than noise floor.

4 List of utilized test equipment/ calibration

RFT ID No.	Kind of Equipment and Precision	Manufacturer	Model No.	Serial Number	Calibration Date	Calibrated until
AC01	Anechoic Chamber	Japan Shiled Closure	203397C	-	2007/5/8	2008/5/6
BA03	Bilogical Antenna	CAHSE	CBL6111	1309	2007/5/14	2008/5/12
CL11	Antenna Cable	RFT	-	-	2007/6/12	2008/6/10
CL21	RF Cable 0.5m	SUCOFLEX	SF104PE	48772/4PE	2007/5/25	2008/5/23
CL22	RF Cable 2.0m	SUCOFLEX	SF104	274755/4	2007/5/25	2008/5/23
HPF1	High Pass Filter (3500MHz)	TOKIMEC	TF323DCA	603	2007/6/8	2008/6/6
LN05	LISN	Kyoritsu	KNW-407	8-1773-2	2007/5/14	2008/5/12
LN06	LISN	Kyoritsu	KNW-407	8-1773-3	2007/5/14	2008/5/12
LP01	Loop Antenna	EMCO	6502	3436	2007/6/8	2008/6/6
PL01	Pulse Limiter	PMM	PL-01	0000J10109	2007/1/30	2008/1/29
PM03	Power Meter	Anritsu	ML2438A	99070001	2007/8/7	2008/8/5
PR03	Pre. Amplifier	Anritsu	HM648A	M41984	2007/5/14	2008/5/12
PR04	Pre. Amplifier (1-26G)	RFT	LNP126	060208-01	2007/6/8	2008/6/6
SA06	Spectrum Analyzer (F/W: 3.60 SP1)	Rohde & Schwarz	FSP40	100071	2007/10/25	2008/10/23
DH02	DRG Horn Antenna	A.H. Systems	SAS-200/571	239	2007/4/20	2009/4/18
SH01	Standard Horn Antenna (18-26G)	A.H. Systems	SAS-572	208	2006/5/3	2008/5/1
TR04	Test Receiver (F/W : 3.82 SP1)	Rohde & Schwarz	ESCI	100447	2007/9/19	2008/9/17

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