EMC
TEST REPORT

Report No. : EME-021144
Model No. : CWB1000
Issued Date : Oct. 14, 2002

Applicant : AboCom Systems, Inc.
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Taiwan, R.O.C.

Test By : Intertek Testing Services Taiwan Ltd.
No. 11, Ko-Tze-Nan Chia-Tung Li, Shiang-Shan District,
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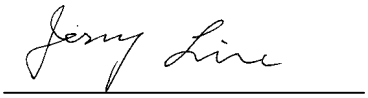
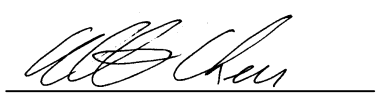
Project Engineer



Jerry Liu

Reviewed By



Elton Chen

Summary of Tests

802.11b Wireless CompactFlash card-Model: CWB1000
FCC ID: MQ4-CWB1K

Test	Reference	Results
Minimum 6dB Bandwidth test	15.247(a)(2)	Complies
Maximum Output Power test	15.247(b)	Complies
RF Antenna Conducted Spurious test	15.247(c)	Complies
Radiated Spurious Emission test	15.205, 15.209	Complies
Power Spectrum Density test	15.247(d)	Complies
Power Line Conducted Emission test	15.207	Complies

1. General information

1.1 Identification of the EUT

Manufacturer	: AboCom System, Inc.
Product	: 802.11b Wireless CompactFlash card
Model No.	: CWB1000
Frequency Range	: 2412MHz to 2462MHz
Channel Number	: 11
Frequency of Each Channel	: 2412MHz, 2417MHz, 2422MHz, 2427MHz, 2432MHz, 2437MHz, 2442MHz, 2447MHz, 2452MHz, 2457MHz, 2462MHz
Type of Modulation	: BPSK, QPSK, CCK
Power Supply	: 3.3V/5Vdc from Notebook
Power Cord	: N/A
Sample Received	: Sep. 24, 2002
Test Date(s)	: Sep. 25, 2002 to Sep. 30, 2002

A FCC DoC report has been generated for the client.

1.2 Additional information about the EUT

The 802.11b Wireless CompactFlash Card is a high-speed wireless network card that connect directly to your PDA or Notebook (with a passive adapter)—just plug it in and you’re ready to share data, printers, or high speed Internet access over your existing wireless network.

For more detail features, please refer to User's manual as file name “Installation guide.pdf”

1.3 Antenna description

The EUT uses a permanently connected antenna.

Antenna Gain : 1dBi
Antenna Type : Chip antenna
Connector Type : No antenna connector

1.4 Peripherals equipment

Peripherals	Manufacturer	Product No.	Serial No.	FCC ID
Notebook	HP	XE_3	TW20705468	FCC DoC Approved
Printer	HP	C2642A	TH86K1N2ZB	FCC DoC Approved
Modem	Dynalink	V1456VQE	00V230A00051494	FCC DoC Approved

2. Test specifications

2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 Subpart C Section §15.205、§15.207、§15.209、§15.247 and ANSI C63.4/1992.

The AC power conducted emissions was invested over the frequency range from 0.45MHz to 30MHz using a receiver bandwidth of 9kHz. (15.207 paragraph)

Radiated emissions were invested cover the frequency range from 30MHz to 1000MHz using a receiver RBW of 120kHz record QP reading, and the frequency over 1GHz using a spectrum analyzer RBW of 1MHz and 10Hz VBW record Average reading. (15.209 paragraph), the Peak reading recorded also on the report.

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of this frequency band were all meet limit requirement, thus we evaluate the EUT pass the specified test.

The EUT setup configurations please refer to the photo of test configuration in item.

2.2 Operation mode

Plug the EUT into Notebook via a PCMCIA interface card. Turn on the notebook power and then run the test program “Prism test utility” under Windows OS system.

The EUT was continuously transmit during the test.

2.3 Test equipment

Equipment	Brand	Frequency range	Model No.	Series No.	Last Cal.Date
EMI Test Receiver	Rohde & Schwarz	9kHz~2.75GHz	ESCS 30	825788/014	May 24, 2002
EMI Test Receiver	Rohde & Schwarz	20Hz~26.5GHz	ESMI	825428/005	June 10, 2002
Spectrum Analyzer	Rohde & Schwarz	9kHz~30GHz	FSP 30	100137	July 10, 2002
Spectrum Analyzer	Rohde & Schwarz	20Hz~40GHz	FSEK 30	100189	June 4, 2002
Horn Antenna	EMCO	1GHz~18GHz	3115	9906-5890	Sep. 19, 2002
Horn Antenna	SCHWARZBECK	14GHz~40GHz	BBHA 9170	159	June 20, 2002
Bilog Antenna	SCHWARZBECK	25MHz~1.7GHz	VULB 9160	3111	June 20, 2002
Turn Table	HDGmbH	N/A	DS 420S	420/669/01	N/A
Antenna Tower	HDGmbH	N/A	MA 240	240/573	N/A
Microwave Amplifier	Agilent	2GHz~26.5GHz	8348A	3111A00567	Dec. 20, 2001
RF Power Meter	Boonton	10kHz~100GHz	4231A	79401	May 22, 2002
Power Sensor	Boonton	30MHz~8GHz	51011-EMC	32482	May 25, 2002

Note:
1. The calibration interval of the above instruments is 12 months.

3. Minimum 6dB Bandwidth test

3.1 Operating environment

Temperature: 25 ℃
Relative Humidity: 59 %

3.2 Test setup & procedure

The minimum 6dB bandwidth per FCC §15.247(a)(2) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at 1MHz, the video bandwidth set at 3MHz, and the SPAN>>RBW. The test was performed at 3 channels (lowest, middle and highest channel). The minimum 6dB modulation bandwidth is in the following Table.

See Minimum 6dB Bandwidth plot as file name “Minimum 6dB Bandwidth plot.pdf”

3.3 Measured data of Minimum 6dB Bandwidth test results

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit
Low	2411.40	10.30	＞500kHz
Middle	2437.90	10.20	＞500kHz
High	2462.90	10.20	＞500kHz

4. Maximum Output Power test

4.1 Operating environment

Temperature: 22 ℃
Relative Humidity: 60 %

4.2 Test setup & procedure

The power output per FCC §15.247(b) was measured on the EUT using a 50 ohm SMA cable connected to power meter via power sensor. Power was read directly and cable loss correction (1dB) was added to the reading to obtain power at the EUT antenna terminals. The test was performed at 3 channels (lowest, middle and highest channel).

4.3 Measured data of Maximum Output Power test results

Channel	Frequency (MHz)	C.B.L. (dB)	Reading (dBm)	Power Output		Limit (W)
				(dBm)	(mW)	
Lowest	2412	1	13.62	14.62	28.97	1
Middle	2437	1	13.62	14.62	28.97	1
Highest	2462	1	13.71	14.71	29.58	1

5. RF Antenna Conducted Spurious test

5.1 Operating environment

Temperature: ℃
Relative Humidity: %

5.2 Test setup & procedure

The measurements were performed from 30MHz to 25GHz RF antenna conducted per FCC 15.247 (c) was measured from the EUT antenna port using a 50ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 300 kHz.
Harmonics and spurious noise must be at least 20dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. The table below is the results from the highest emission for each channel within the authorized band. This table was used to determine the spurious limits for each channel.

See RF Antenna Conducted plot as file name “RF Antenna Conducted plot.pdf”

5.3 Measured data of the highest RF Antenna Conducted Spurious test result

Channel	Max Spurious level at Frequency (MHz)	Spurious Emission level (dBuV)	Limit (dBuV)
Low	2039.76	71.21	87.52
Middle	2063.46	71.22	88.11
High	2091.90	71.71	87.86

Note: 1. Limit = peak power output (in 100kHz RBW) – 20dB
2. All the other emissions were very low the limit.

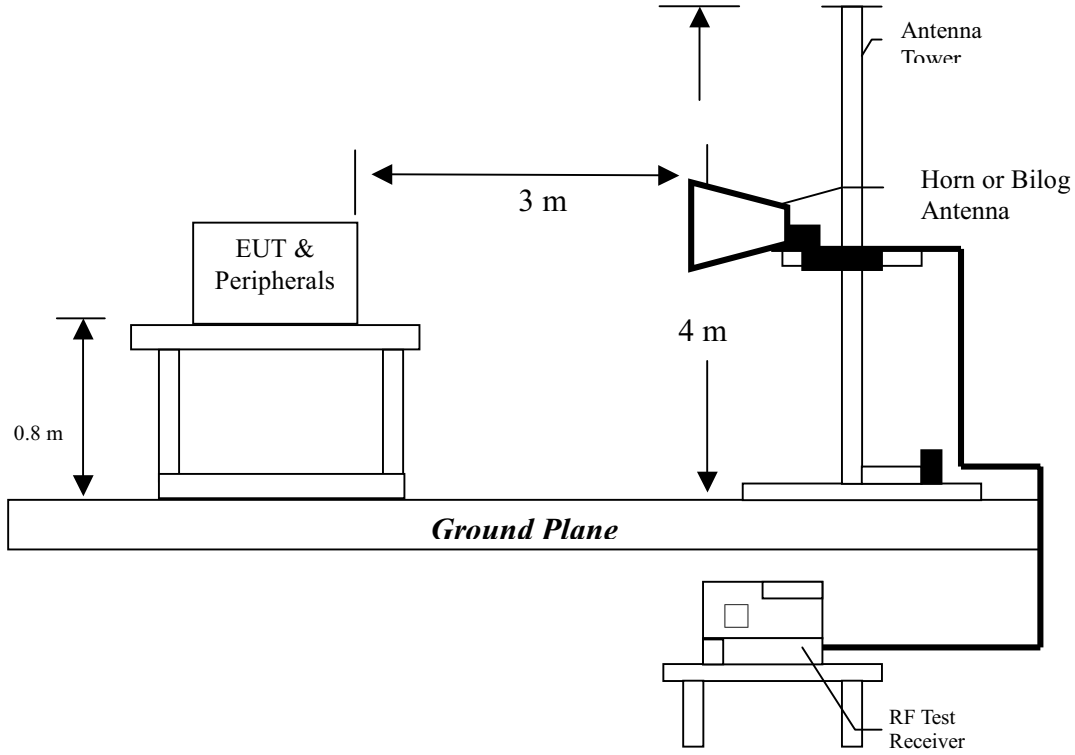
6. Radiated Emission test

6.1 Operating environment

Temperature:	25	℃
Relative Humidity:	59	%

6.2 Test setup & procedure

The Diagram below shows the test setup, which is utilized to make these measurements.



The signal is maximized through rotation and placement in the three orthogonal axes. Radiated emission measurements were performed from 30MHz to 25GHz. Spectrum Analyzer Resolution Bandwidth is 100kHz or greater for frequencies 30MHz to 1GHz, 1MHz – for frequencies above 1GHz.
The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.
The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

6.3 Emission limits

The spurious Emission shall test through the 10th harmonic. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

Frequency (MHz)	Limits (dB μ V/m@3m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Remark:
1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

Uncertainty was calculated in accordance with NAMAS NIS 81.
Expanded uncertainty (k=2) of radiated emission measurement is ±3.078 dB.

6.4 Radiated spurious emission test data

6.4.1 Measurement results: frequencies equal to or less than 1 GHz

The radiated spurious emissions at

Frequency(MHz)	Margin
662.44000	-2.50
199.75000	-1.39

are less than uncertainty. This is within the stated measurement uncertainty, this may affect compliance determined in other test arrangements.

EUT : CWB1000
Test Condition : Tx at low channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
65.89000	QP	V	10.80	17.17	27.97	40.00	-12.03
592.60000	QP	V	23.18	18.14	41.31	46.00	-4.69
662.44000	QP	V	23.88	19.62	43.50	46.00	-2.50
747.80000	QP	V	25.27	14.38	39.65	46.00	-6.35
799.21000	QP	V	26.50	9.32	35.82	46.00	-10.18
927.25000	QP	V	27.43	13.43	40.86	46.00	-5.14
199.75000	QP	H	12.59	29.52	42.11	43.50	-1.39
264.74000	QP	H	14.77	23.23	38.00	46.00	-8.00
588.72000	QP	H	23.18	18.70	41.88	46.00	-4.12
662.44000	QP	H	23.88	17.72	41.60	46.00	-4.40
747.80000	QP	H	25.27	14.87	40.14	46.00	-5.86
927.25000	QP	H	27.43	10.64	38.07	46.00	-7.93

Remark:
1.Corrected Level = Reading Level + Correction Factor－Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. “-“ means the emission is below the noise floor.

The radiated spurious emissions at

Frequency(MHz)	Margin
662.44000	-3.04
199.75000	-1.64

are less than uncertainty. This is within the stated measurement uncertainty, this may affect compliance determined in other test arrangements.

EUT : CWB1000
Test Condition : Tx at middle channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
65.89000	QP	V	10.80	17.21	28.01	40.00	-11.99
592.60000	QP	V	23.18	17.86	41.03	46.00	-4.97
662.44000	QP	V	23.88	19.08	42.96	46.00	-3.04
747.80000	QP	V	25.27	14.14	39.41	46.00	-6.59
799.21000	QP	V	26.50	8.78	35.28	46.00	-10.72
927.25000	QP	V	27.43	12.83	40.26	46.00	-5.74
199.75000	QP	H	12.59	29.27	41.86	43.50	-1.64
264.74000	QP	H	14.77	22.52	37.29	46.00	-8.71
588.72000	QP	H	23.18	18.56	41.74	46.00	-4.26
662.44000	QP	H	23.88	17.48	41.36	46.00	-4.64
747.80000	QP	H	25.27	14.62	39.89	46.00	-6.11
927.25000	QP	H	27.43	10.30	37.73	46.00	-8.27

Remark:
1.Corrected Level = Reading Level + Correction Factor－Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. “-“ means the emission is below the noise floor.

The radiated spurious emissions at

Frequency(MHz)	Margin
199.75000	-2.57

are less than uncertainty. This is within the stated measurement uncertainty, this may affect compliance determined in other test arrangements.

EUT : CWB1000
Test Condition : Tx at high channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
65.89000	QP	V	10.80	17.12	27.92	40.00	-12.08
592.60000	QP	V	23.18	19.36	42.53	46.00	-3.47
662.44000	QP	V	23.88	18.37	42.25	46.00	-3.75
747.80000	QP	V	25.27	13.84	39.11	46.00	-6.89
799.21000	QP	V	26.50	8.42	34.92	46.00	-11.08
927.25000	QP	V	27.43	12.15	39.58	46.00	-6.42
199.75000	QP	H	12.59	28.34	40.93	43.50	-2.57
264.74000	QP	H	14.77	22.11	36.88	46.00	-9.12
588.72000	QP	H	23.18	17.61	40.79	46.00	-5.21
662.44000	QP	H	23.88	16.34	40.22	46.00	-5.78
747.80000	QP	H	25.27	13.17	38.44	46.00	-7.56
927.25000	QP	H	27.43	9.63	37.06	46.00	-8.94

Remark:
1.Corrected Level = Reading Level + Correction Factor－Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. “-“ means the emission is below the noise floor.

6.4.2 Measurement results: frequency above 1GHz

EUT : CWB1000
Test Condition : Tx at low channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
2038	PK	V	0	29.36	23.19	52.55	74	-21.45
2038	AV	V	0	29.36	14.96	44.32	54	-9.68
4076	PK	V	28.02	34.59	38.73	45.3	74	-28.7
4076	AV	V	28.02	34.59	28.95	35.52	54	-18.48
6114	PK	V	28.02	37.74	42.05	51.77	74	-22.23
6114	AV	V	28.02	37.74	37.23	46.95	54	-7.05
8152	PK	V	28.02	40.05	43.75	55.78	74	-18.22
8152	AV	V	28.02	40.05	36.31	48.34	54	-5.66
10190	PK	V	28.02	41.99	-	-	74	-
10190	AV	V	28.02	41.99	-	-	54	-
4824	PK	V	28.02	35.47	42.97	50.42	74	-23.58
4824	AV	V	28.02	35.47	32.05	39.5	54	-14.5
7236	PK	V	28.02	38.42	45.63	56.03	74	-17.97
7236	AV	V	28.02	38.42	38.17	48.57	54	-5.43
9648	PK	V	28.02	41.35	40.02	53.35	74	-20.65
9648	AV	V	28.02	41.35	29.94	43.27	54	-10.73
12060	PK	V	28.02	43.38	-	-	74	-
12060	AV	V	28.02	43.38	-	-	54	-

Remark:
1.Corrected Level = Reading Level + Correction Factor－Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. “-“ means the emission is below the noise floor.

EUT : CWB1000
Test Condition : Tx at low channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
2038	PK	H	0	29.36	24.61	53.97	74	-20.03
2038	AV	H	0	29.36	18.11	47.47	54	-6.53
4076	PK	H	28.02	34.59	41.06	47.63	74	-26.37
4076	AV	H	28.02	34.59	29.33	35.9	54	-18.1
6114	PK	H	28.02	37.74	42.56	52.28	74	-21.72
6114	AV	H	28.02	37.74	35.65	45.37	54	-8.63
8152	PK	H	28.02	40.05	44.49	56.52	74	-17.48
8152	AV	H	28.02	40.05	37.13	49.16	54	-4.84
10190	PK	H	28.02	41.99	-	-	74	-
10190	AV	H	28.02	41.99	-	-	54	-
4824	PK	H	28.02	35.47	45.35	52.8	74	-21.2
4824	AV	H	28.02	35.47	34.97	42.42	54	-11.58
7236	PK	H	28.02	38.42	42.69	53.09	74	-20.91
7236	AV	H	28.02	38.42	35.63	46.03	54	-7.97
9648	PK	H	28.02	41.35	42.18	55.51	74	-18.49
9648	AV	H	28.02	41.35	30.25	43.58	54	-10.42
12060	PK	H	28.02	43.38	-	-	74	-
12060	AV	H	28.02	43.38	-	-	54	-

Remark:
1.Corrected Level = Reading Level + Correction Factor－Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. “-“ means the emission is below the noise floor.

EUT : CWB1000
Test Condition : Tx at middle channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
2063	PK	V	0	29.36	17.68	47.04	74	-26.96
2063	AV	V	0	29.36	12.15	41.51	54	-12.49
4126	PK	V	28.02	34.59	37.11	43.68	74	-30.32
4126	AV	V	28.02	34.59	27.1	33.67	54	-20.33
6189	PK	V	28.02	37.74	42.55	52.27	74	-21.73
6189	AV	V	28.02	37.74	38.49	48.21	54	-5.79
8252	PK	V	28.02	39.97	40.1	52.05	74	-21.95
8252	AV	V	28.02	39.97	30.75	42.7	54	-11.3
10315	PK	V	28.02	42.06	-	-	74	-
10315	AV	V	28.02	42.06	-	-	54	-
4874	PK	V	28.02	35.47	37.77	45.22	74	-28.78
4874	AV	V	28.02	35.47	29.24	36.69	54	-17.31
7311	PK	V	28.02	38.42	43.56	53.96	74	-20.04
7311	AV	V	28.02	38.42	37.93	48.33	54	-5.67
9748	PK	V	28.02	41.35	39.74	53.07	74	-20.93
9748	AV	V	28.02	41.35	30.16	43.49	54	-10.51
12185	PK	V	28.02	43.38	-	-	74	-
12185	AV	V	28.02	43.38	-	-	54	-

Remark:
1.Corrected Level = Reading Level + Correction Factor－Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. “-“ means the emission is below the noise floor.

EUT : CWB1000
Test Condition : Tx at middle channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
2063	PK	H	0	29.36	21.97	51.33	74	-22.67
2063	AV	H	0	29.36	18.15	47.51	54	-6.49
4126	PK	H	28.02	34.59	33.91	40.48	74	-33.52
4126	AV	H	28.02	34.59	26.46	33.03	54	-20.97
6189	PK	H	28.02	37.74	39.21	48.93	74	-25.07
6189	AV	H	28.02	37.74	32.94	42.66	54	-11.34
8252	PK	H	28.02	39.97	39.76	51.71	74	-22.29
8252	AV	H	28.02	39.97	32.21	44.16	54	-9.84
10315	PK	H	28.02	42.06	-	-	74	-
10315	AV	H	28.02	42.06	-	-	54	-
4874	PK	H	28.02	35.47	39.31	46.76	74	-27.24
4874	AV	H	28.02	35.47	29.52	36.97	54	-17.03
7311	PK	H	28.02	38.42	44.21	54.61	74	-19.39
7311	AV	H	28.02	38.42	37.63	48.03	54	-5.97
9748	PK	H	28.02	41.35	38.7	52.03	74	-21.97
9748	AV	H	28.02	41.35	30.11	43.44	54	-10.56
12185	PK	H	28.02	43.38	-	-	74	-
12185	AV	H	28.02	43.38	-	-	54	-

Remark:
1.Corrected Level = Reading Level + Correction Factor－Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. “-“ means the emission is below the noise floor.

EUT : CWB1000
Test Condition : Tx at high channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
2088	PK	V	0	29.36	20.24	49.6	74	-24.4
2088	AV	V	0	29.36	13.99	43.35	54	-10.65
4176	PK	V	28.02	34.59	40.53	47.1	74	-26.9
4176	AV	V	28.02	34.59	33.47	40.04	54	-13.96
6264	PK	V	28.02	37.74	44.21	53.93	74	-20.07
6264	AV	V	28.02	37.74	40.11	49.83	54	-4.17
8352	PK	V	28.02	39.97	40.15	52.1	74	-21.9
8352	AV	V	28.02	39.97	31.41	43.36	54	-10.64
10440	PK	V	28.02	42.21	-	-	74	-
10440	AV	V	28.02	42.21	-	-	54	-
4924	PK	V	28.02	35.47	35.29	42.74	74	-31.26
4924	AV	V	28.02	35.47	26.6	34.05	54	-19.95
7386	PK	V	28.02	38.42	41.33	51.73	74	-22.27
7386	AV	V	28.02	38.42	35.59	45.99	54	-8.01
9848	PK	V	28.02	41.55	41.33	54.86	74	-19.14
9848	AV	V	28.02	41.55	32.8	46.33	54	-7.67
12310	PK	V	28.02	43.75	-	-	74	-
12310	AV	V	28.02	43.75	-	-	54	-

Remark:
1.Corrected Level = Reading Level + Correction Factor－Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. “-“ means the emission is below the noise floor.

The radiated spurious emissions at

Frequency(MHz)	Margin
6264	-2.19

are less than uncertainty. This is within the stated measurement uncertainty, this may affect compliance determined in other test arrangements.

EUT : CWB1000
Test Condition : Tx at high channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Reading (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
2088	PK	H	0	29.36	21.6	50.96	74	-23.04
2088	AV	H	0	29.36	18.56	47.92	54	-6.08
4176	PK	H	28.02	34.59	37.61	44.18	74	-29.82
4176	AV	H	28.02	34.59	26.27	32.84	54	-21.16
6264	PK	H	28.02	37.74	45.08	54.8	74	-19.2
6264	AV	H	28.02	37.74	42.09	51.81	54	-2.19
8352	PK	H	28.02	39.97	41.99	53.94	74	-20.06
8352	AV	H	28.02	39.97	30.61	42.56	54	-11.44
10440	PK	H	28.02	42.21	-	-	74	-
10440	AV	H	28.02	42.21	-	-	54	-
4924	PK	H	28.02	35.47	42.79	50.24	74	-23.76
4924	AV	H	28.02	35.47	32.95	40.4	54	-13.6
7386	PK	H	28.02	38.42	42.55	52.95	74	-21.05
7386	AV	H	28.02	38.42	34.93	45.33	54	-8.67
9848	PK	H	28.02	41.55	41.28	54.81	74	-19.19
9848	AV	H	28.02	41.55	32.15	45.68	54	-8.32
12310	PK	H	28.02	43.75	-	-	74	-
12310	AV	H	28.02	43.75	-	-	54	-

Remark:
1.Corrected Level = Reading Level + Correction Factor－Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. “-“ means the emission is below the noise floor.

7. Power Spectrum Density test

7.1 Operating environment

Temperature: 24 ℃
Relative Humidity: 55 %

7.2 Test setup & procedure

The power spectrum density per FCC §15.247(d) was measured from the antenna port of the EUT using a 50ohm spectrum analyzer with the resolution bandwidth set at 3kHz, the video bandwidth set at 10kHz, a span of 1.5 MHz, and the sweep time set at 500 seconds. Power Density was read directly and cable loss (1dB) correction was added to the reading to obtain power at the EUT antenna terminals. The test was performed at 3 channels (lowest, middle and highest channel). The Power Spectral Density measured result is in the following table.

See Power Spectrum Density plot as file name "Power Spectrum Density plot.pdf"

7.3 Measured data of Power Spectrum Density test results

Channel	Frequency (MHz)	Measured level (dBm)	Limit (dBm)
Low	2413.54	-12.12	8
Middle	2437.98	-11.85	8
High	2462.98	-11.76	8

8. Emission on the band edge §FCC 15.247(C)

In any 100kHz bandwidth outside the frequency band in which the spread spectrum 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.

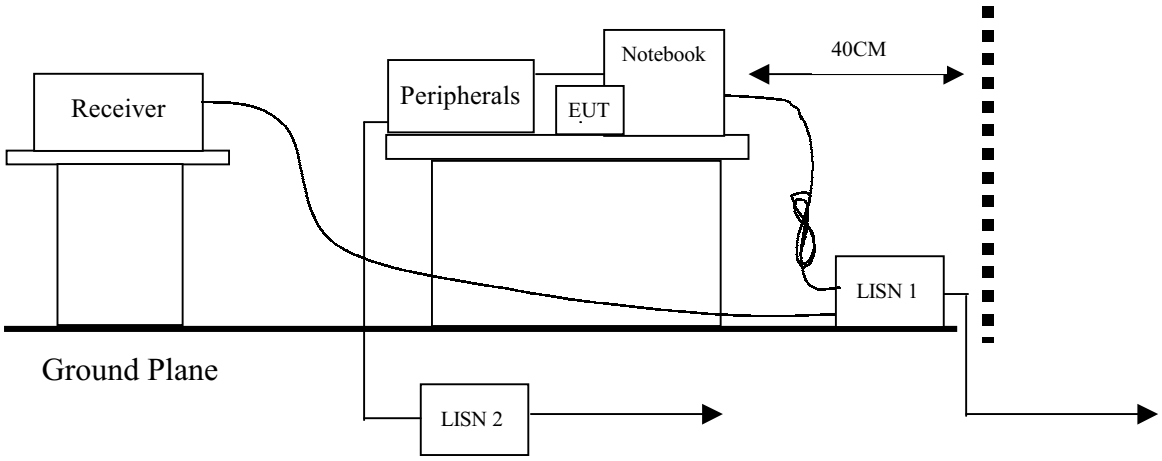
See band-edge plot as file name “Band-edge plot.pdf”.

9. Power Line Conducted Emission test §FCC 15.207

9.1 Operating environment

Temperature: 24 ℃
Relative Humidity: 55 %

9.2 Test setup & procedure



The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50 ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.
Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4/1992 on conducted measurement.
The bandwidth of the field strength meter (R & S Test Receiver ESCS 30) is set at 9kHz.

See Power Line Conducted Emission plot as file name "Power Line Conducted Emission plot.pdf".

Emission Limit

FCC Part 15 Paragraph 15.207		
Freq. (MHz)	Maximum RF Line Voltage	
	uV	dBuV
0.45 - 30	250	48.0

9.3 Power Line Conducted Emission test data

EUT : CWB1000
Test Condition : Tx at low channel

Power Line (circle)	Freq. (MHz)	Reading (dB μ V) QP	Limit (dB μ V) QP	Margin (dB) QP
LINE	0.47400	32.8	48.00	-15.20
LINE	0.53800	25.1	48.00	-22.90
LINE	0.74600	26.9	48.00	-21.10
LINE	1.01800	27.4	48.00	-20.60
LINE	1.21800	25.7	48.00	-22.30
LINE	1.49000	26.9	48.00	-21.10
NEUTRAL	0.47400	32.3	48.00	-15.70
NEUTRAL	0.54600	25.6	48.00	-22.40
NEUTRAL	1.08200	24.1	48.00	-23.90
NEUTRAL	1.15400	23.7	48.00	-24.30
NEUTRAL	1.35400	25.6	48.00	-22.40
NEUTRAL	1.89800	26.8	48.00	-21.20

Remark:
1. 1. The reading value included cable loss and LISN factor.
2. Uncertainty was calculated in accordance with NAMAS NIS 81.
   Expanded uncertainty (k=2) of conducted emission measurement is ±2.6 dB.

EUT : CWB1000
Test Condition : Tx at middle channel

Power Line (circle)	Freq. (MHz)	Reading (dB μ V) QP	Limit (dB μ V) QP	Margin (dB) QP
LINE	0.47400	32.6	48.00	-15.40
LINE	0.54600	26.0	48.00	-22.00
LINE	0.61000	25.3	48.00	-22.70
LINE	0.74600	26.8	48.00	-21.20
LINE	1.01800	27.2	48.00	-20.80
LINE	1.29000	27.2	48.00	-20.80
NEUTRAL	0.47400	31.4	48.00	-16.60
NEUTRAL	0.54600	25.0	48.00	-23.00
NEUTRAL	0.61000	22.9	48.00	-25.10
NEUTRAL	1.08200	24.4	48.00	-23.60
NEUTRAL	1.29000	24.4	48.00	-23.60
NEUTRAL	1.62600	26.4	48.00	-21.60

Remark:
1. 1. The reading value included cable loss and LISN factor.
2. Uncertainty was calculated in accordance with NAMAS NIS 81.
Expanded uncertainty (k=2) of conducted emission measurement is ±2.6 dB.

EUT : CWB1000
Test Condition : Tx at high channel

Power Line (circle)	Freq. (MHz)	Reading (dB μ V) QP	Limit (dB μ V) QP	Margin (dB) QP
LINE	0.47400	32.5	48.00	-15.50
LINE	0.53800	24.9	48.00	-23.10
LINE	0.61000	25.3	48.00	-22.70
LINE	0.67400	23.4	48.00	-24.60
LINE	0.74600	26.7	48.00	-21.30
LINE	1.01800	27.1	48.00	-20.90
NEUTRAL	0.47400	31.3	48.00	-16.70
NEUTRAL	0.54600	25.0	48.00	-23.00
NEUTRAL	0.74600	23.0	48.00	-25.00
NEUTRAL	0.88200	22.1	48.00	-25.90
NEUTRAL	1.08200	24.4	48.00	-23.60
NEUTRAL	3.18600	26.2	48.00	-21.80

Remark:
1. 1. The reading value included cable loss and LISN factor.
2. Uncertainty was calculated in accordance with NAMAS NIS 81.
Expanded uncertainty (k=2) of conducted emission measurement is ±2.6 dB.