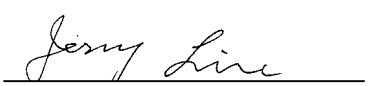
EMC
TEST REPORT

Report No. : EME-020955
Model No. : XI-815
Issued Date : Oct. 14, 2002

Applicant : Z-COM, Inc.
7F-2, No.9, Prosperity 1St RD., Science-Based Industrial Park, Hsinchu, Taiwan R.O.C.

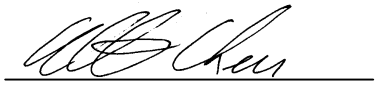
Test By : Intertek Testing Services Taiwan Ltd.
No. 11, Ko-Tze-Nan Chia-Tung Li, Shiang-Shan District, Hsinchu, Taiwan, R.O.C.

Project Engineer



Jerry Liu

Reviewed By



Elton Chen

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Summary of Tests

2.4GHz Compact Flash Card-Model: XI-815
FCC ID: M4Y-00815

Test	Reference	Results
Radiated Spurious Emission test	15.205, 15.209	Complies

1. General information

1.1 Identification of the EUT

Manufacturer	: Z-COM, Inc.
Product	: 2.4GHz Compact Flash Card
Model No.	: XI-815
FCC ID.	: M4Y-00815
Frequency Range	: 2412~2462 MHz
Channel Number	: 11 Channels
Frequency of Each Channel	: 2412MHz, 2417MHz, 2422MHz, 2427MHz, 2432MHz, 2437MHz, 2442MHz, 2447MHz, 2452MHz, 2457MHz, 2462MHz
Type of Modulation	: CCK (11Mps, 5.5Mbps), DQPSK (2Mbps), DBPSK (1Mbps)
Power Supply	: 3.3/5Vdc
Power Cord	: N/A
Sample Received	: Aug. 16, 2002
Test Date(s)	: Aug. 19, 2002 to Aug. 21, 2002

A FCC DoC report has been generated for the client.

1.2 Additional information about the EUT

The EUT is11Mbps IEEE 802.11b Wireless LAN Compact Flash Adapter, it is a standard CF interface adapter integrated with wireless LAN technology. It provides you the easiest, fastest, way to access your wireless and wired network. The Wireless Compact Flash Adapter, which utilizes the latest advancement of PC industry – Compact Flash technology, allows you to install and use the card reader easier than ever before. 11Mbps data rate gives equivalent Ethernet speed to access corporate network or the Internet in a wireless environment. When installed, 11Mbps Wireless LAN Compact Flash Adapter is able to communicate with any 802.11 and 802.11b compliant products.

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 : 0dBi
Antenna Type : PIFA

1.4 Peripherals equipment

Notebook

Product No.	: 2609
Serial No.	: BA-ZHNHN
Manufacturer	: IBM

2. Test specifications

2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 Subpart C Section §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 to CF Card Simulator. Turn on the power of notebook then run the test program “RF.EXE”.

Select the wanted mode (Continuously Transmit) to perform all the tests.

2.4 Test equipment

Equipment	Brand	Frequency range	Model No.	Series No.	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
Horn Antenna	EMCO	1GHz~18GHz	3115	9906-5822	Sep. 10, 2001
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

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

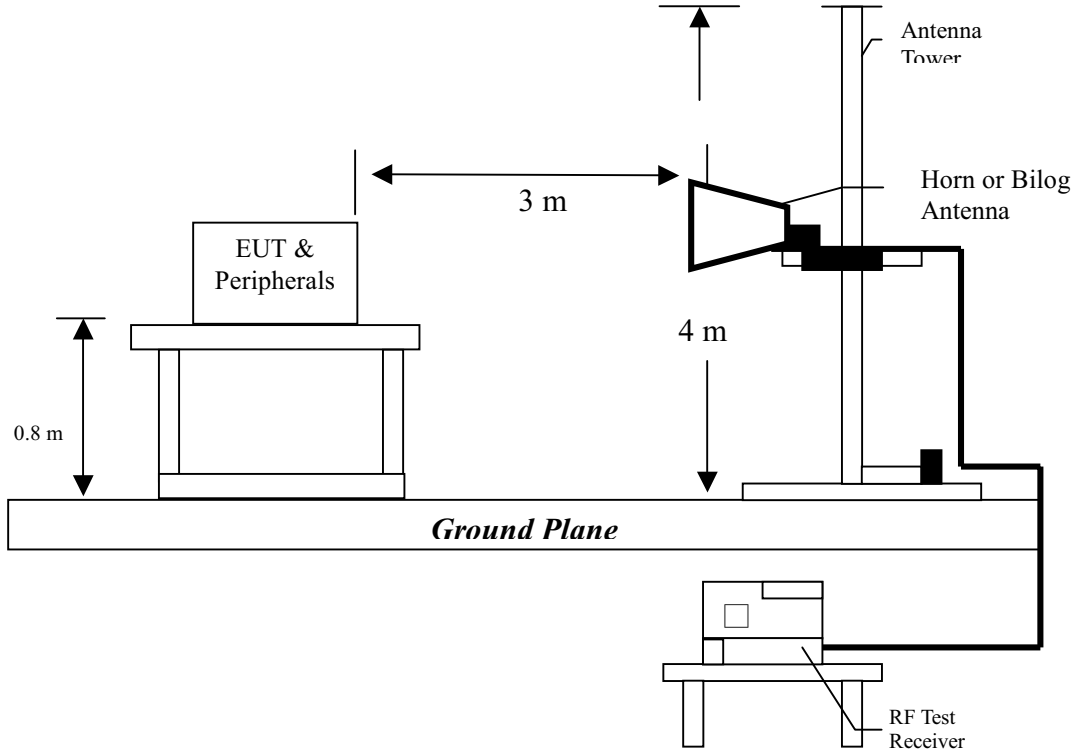
3. Radiated Emission test

3.1 Operating environment

Temperature:	24	℃
Relative Humidity:	55	%

3.2 Test setup & procedure

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



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.

3.3 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.

3.4 Radiated spurious emission test data

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

EUT : XI-815
Worst Case 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)
38.1	PK	V	12.9	21.9	34.8	40	-5.2
43	PK	V	13	23.3	36.3	40	-3.7
66.7	PK	V	12.3	24.3	36.6	40	-3.4
690.6	PK	V	21.8	16.8	38.6	46	-7.4
720	PK	V	22.5	16.2	38.7	46	-7.3
732.6	PK	V	22.9	16.1	39	46	-7
66.7	PK	H	12.3	18.4	30.7	40	-9.3
283.8	PK	H	14.2	22.8	37	46	-9
314	PK	H	14.8	24.5	39.3	46	-6.7
333.6	PK	H	15.4	24.1	39.5	46	-6.5
431.6	PK	H	17.7	19.1	36.8	46	-9.2
732.6	PK	H	22.9	17.2	40.1	46	-5.9

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

3.4.2 Measurement results: frequency above 1GHz

EUT : XI-815
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	30.79	17.04	47.83	74	-26.17
2038	AV	V	0	30.79	8.9	39.69	54	-14.31
4076	PK	V	28.02	37.54	42.92	52.44	74	-21.56
4076	AV	V	28.02	37.54	35.66	45.18	54	-8.82
6114	PK	V	28.02	41.82	39.35	53.15	74	-20.85
6114	AV	V	28.02	41.82	29.7	43.5	54	-10.5
8152	PK	V	28.02	44.95	41.08	58.01	74	-15.99
8152	AV	V	28.02	44.95	28.54	45.47	54	-8.53
10190	PK	V	28.02	46.81	-	-	74	-
10190	AV	V	28.02	46.81	-	-	54	-
4824	PK	V	28.02	37.9	42.03	51.91	74	-22.09
4824	AV	V	28.02	37.9	28.19	38.07	54	-15.93
7236	PK	V	28.02	43.26	37.93	53.17	74	-20.83
7236	AV	V	28.02	43.26	26.91	42.15	54	-11.85
9648	PK	V	28.02	46.8	40.28	59.06	74	-14.94
9648	AV	V	28.02	46.8	27.36	46.14	54	-7.86
12060	PK	V	28.02	48.57	-	-	74	-
12060	AV	V	28.02	48.57	-	-	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 : XI-815
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	30.79	17.71	48.5	74	-25.5
2038	AV	H	0	30.79	7.7	38.49	54	-15.51
4076	PK	H	28.02	37.54	41.27	50.79	74	-23.21
4076	AV	H	28.02	37.54	34.47	43.99	54	-10.01
6114	PK	H	28.02	41.82	38.67	52.47	74	-21.53
6114	AV	H	28.02	41.82	26.3	40.1	54	-13.9
8152	PK	H	28.02	44.95	39.06	55.99	74	-18.01
8152	AV	H	28.02	44.95	28.88	45.81	54	-8.19
10190	PK	H	28.02	46.81	-	-	74	-
10190	AV	H	28.02	46.81	-	-	54	-
4824	PK	H	28.02	37.9	38.08	47.96	74	-26.04
4824	AV	H	28.02	37.9	27.98	37.86	54	-16.14
7236	PK	H	28.02	43.26	38.54	53.78	74	-20.22
7236	AV	H	28.02	43.26	27.32	42.56	54	-11.44
9648	PK	H	28.02	46.8	40.4	59.18	74	-14.82
9648	AV	H	28.02	46.8	27.96	46.74	54	-7.26
12060	PK	H	28.02	48.57	-	-	74	-
12060	AV	H	28.02	48.57	-	-	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 : XI-815
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	30.79	17.4	48.19	74	-25.81
2063	AV	V	0	30.79	7.54	38.33	54	-15.67
4126	PK	V	28.02	37.54	41.31	50.83	74	-23.17
4126	AV	V	28.02	37.54	35.43	44.95	54	-9.05
6189	PK	V	28.02	41.82	40.44	54.24	74	-19.76
6189	AV	V	28.02	41.82	30.91	44.71	54	-9.29
8252	PK	V	28.02	45.12	36.89	53.99	74	-20.01
8252	AV	V	28.02	45.12	27.89	44.99	54	-9.01
10315	PK	V	28.02	46.97	-	-	74	-
10315	AV	V	28.02	46.97	-	-	54	-
4874	PK	V	28.02	37.9	36.31	46.19	74	-27.81
4874	AV	V	28.02	37.9	26.38	36.26	54	-17.74
7311	PK	V	28.02	43.26	37.76	53	74	-21
7311	AV	V	28.02	43.26	27.19	42.43	54	-11.57
9748	PK	V	28.02	46.8	-	-	74	-
9748	AV	V	28.02	46.8	-	-	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 : XI-815
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	30.79	16.95	47.74	74	-26.26
2063	AV	H	0	30.79	6.55	37.34	54	-16.66
4126	PK	H	28.02	37.54	43.74	53.26	74	-20.74
4126	AV	H	28.02	37.54	39.74	49.26	54	-4.74
6189	PK	H	28.02	41.82	40.4	54.2	74	-19.8
6189	AV	H	28.02	41.82	27.73	41.53	54	-12.47
8252	PK	H	28.02	45.12	40.28	57.38	74	-16.62
8252	AV	H	28.02	45.12	27.36	44.46	54	-9.54
10315	PK	H	28.02	46.97	-	-	74	-
10315	AV	H	28.02	46.97	-	-	54	-
4874	PK	H	28.02	37.9	37.21	47.09	74	-26.91
4874	AV	H	28.02	37.9	26.28	36.16	54	-17.84
7311	PK	H	28.02	43.26	36.78	52.02	74	-21.98
7311	AV	H	28.02	43.26	27.15	42.39	54	-11.61
9748	PK	H	28.02	46.8	-	-	74	-
9748	AV	H	28.02	46.8	-	-	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 : XI-815
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	30.79	18.5	49.29	74	-24.71
2088	AV	V	0	30.79	9.8	40.59	54	-13.41
4176	PK	V	28.02	37.54	44.05	53.57	74	-20.43
4176	AV	V	28.02	37.54	38.48	48	54	-6
6264	PK	V	28.02	41.98	41.17	55.13	74	-18.87
6264	AV	V	28.02	41.98	32.51	46.47	54	-7.53
8352	PK	V	28.02	45.12	37.73	54.83	74	-19.17
8352	AV	V	28.02	45.12	27.89	44.99	54	-9.01
10440	PK	V	28.02	47.03	-	-	74	-
10440	AV	V	28.02	47.03	-	-	54	-
4924	PK	V	28.02	37.9	35.91	45.79	74	-28.21
4924	AV	V	28.02	37.9	26.25	36.13	54	-17.87
7386	PK	V	28.02	43.26	39.86	55.1	74	-18.9
7386	AV	V	28.02	43.26	26.9	42.14	54	-11.86
9848	PK	V	28.02	46.78	-	-	74	-
9848	AV	V	28.02	46.78	-	-	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 : XI-815
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	30.79	17.48	48.27	74	-25.73
2088	AV	H	0	30.79	8.97	39.76	54	-14.24
4176	PK	H	28.02	37.54	42.69	52.21	74	-21.79
4176	AV	H	28.02	37.54	37.63	47.15	54	-6.85
6264	PK	H	28.02	41.98	40.52	54.48	74	-19.52
6264	AV	H	28.02	41.98	29.34	43.3	54	-10.7
8352	PK	H	28.02	45.12	37.13	54.23	74	-19.77
8352	AV	H	28.02	45.12	26.77	43.87	54	-10.13
10440	PK	H	28.02	47.03	-	-	74	-
10440	AV	H	28.02	47.03	-	-	54	-
4924	PK	H	28.02	37.9	37.87	47.75	74	-26.25
4924	AV	H	28.02	37.9	26.26	36.14	54	-17.86
7386	PK	H	28.02	43.26	35.96	51.2	74	-22.8
7386	AV	H	28.02	43.26	26.76	42	54	-12
9848	PK	H	28.02	46.78	-	-	74	-
9848	AV	H	28.02	46.78	-	-	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.