

FCC ID. : M4Y-0325H Report No.: EME-011106
Page 1 of 25

## EMC TEST REPORT

**Report No.** : **EME-011106** 

Model No. : XI-325H

**Issued Date** : Aug. 28, 2002

**Applicant** : **Z-COM**, Inc.

7F-2, No. 9, Prosperity 1<sup>St</sup> 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.

This test report consists of 25 pages in total. It may be duplicated completely for legal use with the allowance of the applicant. It shall not be reproduced except in full, without the written approval of ITS Laboratory. The test result in this report only applies to the tested sample.

**Project Engineer** 

Approved By

Kaysi Chen

GENERAL MANAGER ETL SEMKO DIVISION

\_\_\_\_

Reviewed By

Elton Chen

FCC ID.: M4Y-0325H

Report No.: EME-011106 Page 2 of 25

## **Table of Contents**

Summary of Tests	4
1. General information	
1.2 Additional information about the EUT	5
1.3 Antenna description	6
1.4 Peripherals equipment	6
2. Test specifications	7
2.1 Test standard	
2.2 Operation mode	
2.4 Test equipment	
3. Minimum 6dB Bandwidth test	9
3.1 Operating environment	
3.2 Test setup & procedure	
3.3 Measured data of Minimum 6dB Bandwidth test results	
4. Maximum Output Power test	10
4.1 Operating environment	10
4.2 Test setup & procedure	10
4.3 Measured data of Maximum Output Power test results	10
5. RF Antenna Conducted Spurious test	11
5.1 Operating environment	11
5.2 Test setup & procedure	11
5.3 Measured data of the highest RF Antenna Conducted Spurious test result	11
6. Radiated Emission test	12
6.1 Operating environment	12
6.2 Test setup & procedure	12
6.3 Emission limits.	13
6.4 Radiated spurious emission test data	14
6.4.1 Measurement results: frequencies equal to or less than 1 GHz	14
6.4.2 Measurement results: frequency above 1GHz	17
7. Power Spectrum Density test	20
7.1 Operating environment	20
7.2 Test setup & procedure	20



_	_	_	_	
	Page	3	of	25

7.3 Measured data of Power Spectrum Density test results	20
8. Emission on the band edge §FCC 15.247(C)	21
9. Power Line Conducted Emission test §FCC 15.207	22
9.1 Operating environment	22
9.2 Test setup & procedure	22
9.3 Power Line Conducted Emission test data	23

FCC ID. : M4Y-0325H Report No.: EME-011106
Page 4 of 25

## **Summary of Tests**

# 2.4GHz wireless LAN card -Model: XI-325H FCC ID: M4Y-0325H

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

Page 5 of 25

#### 1. General information

#### 1.1 Identification of the EUT

Manufacturer : Z-COM, Inc.

Product : 2.4GHz wireless LAN card

Model No. : XI-325H

FCC ID. : M4Y-0325H

Frequency Range : 2412MHz to 2462MHz

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 : Dec. 27, 2001

Test Date(s) : Aug. 23, 2002 to Aug. 24, 2002

A FCC DoC report has been generated for the client.

#### 1.2 Additional information about the EUT

The EUT is an IEEE802.11/802.11b-compliant PCMCIA Type II DSSS wireless LAN adapter. It fully supports wireless networking under Windows 98/ME/NT/2000/XP, it can be operated in Ad-Hoc or Infrastructure network configurations. *Ad-Hoc mode* allows 11Mbps Wireless LAN PC Card users to join a Basic Service Set (i.e., peer-to-peer mode, without access point). *Infrastructure mode* allows 11Mbps Wireless PC Card users to join an Extended Basic Service Set (i.e., connect to an Access Point).

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

Page 6 of 25

## 1.3 Antenna description

The antenna is affixed to the EUT using a unique connector, which allows for replacement of a broken antenna, but DOES NOT use a standard antenna jack or electrical connector.

Antenna Gain : 0dBi max Antenna Type : Path antenna

#### 1.4 Peripherals equipment

Peripherals	Manufacturer	Product No.	Serial No.	FCC ID
Notebood	Twinhead	P79T	H0905483	FCC DoC Approved
Printer	НР	C2642A	TH86K1N2ZB	FCC DoC Approved
Modem	Aski	V1456VQE	700V23100066865	FCC DoC Approved

FCC ID. : M4Y-0325H Report No.: EME-011106
Page 7 of 25

#### 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 and turn on the power of notebook then run the test program "RF.EXE".

The EUT was continuously transmit during all the test.

FCC ID. : M4Y-0325H Report No.: EME-011106
Page 8 of 25

### 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
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.

Page 9 of 25

#### 3. Minimum 6dB Bandwidth test

#### 3.1 Operating environment

Temperature: 24  $^{\circ}$ C Relative Humidity: 52  $^{\circ}$ 

#### 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 6-dB 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	2413.40	15.40	>500kHz
Middle	2438.40	15.50	>500kHz
High	2463.40	15.50	>500kHz

FCC ID. : M4Y-0325H Report No.: EME-011106
Page 10 of 25

#### 4. Maximum Output Power test

#### **4.1 Operating environment**

Temperature: 22 °C 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	requency C.B.L. Reading		Power	Limit	
Chamici	(MHz)	(dB)	(dBm)	(dBm)	(mW)	(W)
Lowest	2412	1	22.18	23.18	207.97	1
Middle	2437	1	22.70	23.70	234.42	1
Highest	2462	1	22.51	23.51	224.39	1

FCC ID.: M4Y-0325H Report No.: EME-011106
Page 11 of 25

#### 5. RF Antenna Conducted Spurious test

#### **5.1 Operating environment**

Temperature: 24  $^{\circ}$ C Relative Humidity: 52  $^{\circ}$ 

#### 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 (dBm)	Limit (dB)
Low	2397.20	-37.10	-21.60
Middle	699.30	-40.04	-16.55
High	2483.50	-39.97	-16.57

Note: 1. Limit = peak power output (in 100kHz RBW) – 20dB

2. All the other emissions were very low the limit.

FCC ID.: M4Y-0325H Report No.: EME-011106
Page 12 of 25

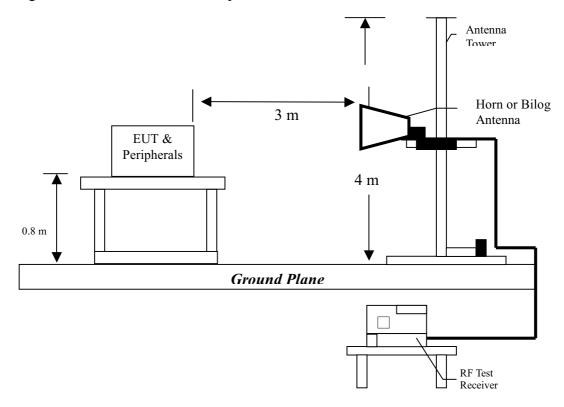
#### 6. Radiated Emission test

#### **6.1 Operating environment**

Temperature: 24  $^{\circ}$ C Relative Humidity: 52  $^{\circ}$ 

#### 6.2 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.

FCC ID. : M4Y-0325H Report No.: EME-011106
Page 13 of 25

#### **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	Limits
(MHz)	$(dB \mu V/m@3m)$
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  $\pm 3.078$  dB.

FCC ID. : M4Y-0325H Report No.: EME-011106
Page 14 of 25

#### 6.4 Radiated spurious emission test data

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

EUT : XI-325H

Test Condition : Tx at low channel

Frequency	Spectrum	Antenna	Correction	Reading	Corrected	Limit	Margin
	Analyzer	Polariz.	Factor		Reading	@ 3 m	
(MHz)	Detector	(H/V)	(dB/m)	(dBuV)	(dBuV)	(dBuV)	(dB)
44.12000	QP	V	13.00	21.10	34.10	40.00	-5.90
68.71000	QP	V	11.95	26.26	38.21	40.00	-1.79
299.85000	QP	V	14.39	26.49	40.88	46.00	-5.12
531.69000	QP	V	19.46	17.05	36.51	46.00	-9.49
654.77000	QP	V	21.49	19.56	41.05	46.00	-4.95
691.49000	QP	V	21.80	13.64	35.44	46.00	-10.56
66.11000	QP	Н	12.49	20.61	33.10	40.00	-6.90
266.03000	QP	Н	13.32	26.48	39.80	46.00	-6.20
300.14000	QP	Н	14.47	29.27	43.74	46.00	-2.26
332.87000	QP	Н	15.30	26.75	42.05	46.00	-3.95
654.25000	QP	Н	21.49	17.17	38.66	46.00	-7.34
665.91000	QP	Н	21.70	17.49	39.19	46.00	-6.81

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

Page 15 of 25

EUT : XI-325H

Test Condition : Tx at middle channel

Frequency	Spectrum	Antenna	Correction	Reading	Corrected	Limit	Margin
	Analyzer	Polariz.	Factor		Reading	@ 3 m	
(MHz)	Detector	(H/V)	(dB/m)	(dBuV)	(dBuV)	(dBuV)	(dB)
44.12000	QP	V	13.00	20.45	33.45	40.00	-6.55
68.71000	QP	V	11.95	24.86	36.81	40.00	-3.19
299.85000	QP	V	14.39	24.62	39.01	46.00	-6.99
531.69000	QP	V	19.46	18.53	37.99	46.00	-8.01
654.77000	QP	V	21.49	19.30	40.79	46.00	-5.21
691.49000	QP	V	21.80	12.35	34.15	46.00	-11.85
66.11000	QP	Н	12.49	20.17	32.66	40.00	-7.34
266.03000	QP	Н	13.32	24.53	37.85	46.00	-8.15
300.14000	QP	Н	14.47	28.41	42.88	46.00	-3.12
332.87000	QP	Н	15.30	25.41	40.71	46.00	-5.29
654.25000	QP	Н	21.49	14.56	36.05	46.00	-9.95
665.91000	QP	Н	21.70	15.21	36.91	46.00	-9.09

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

Page 16 of 25

EUT : XI-325H

Test Condition : Tx at high channel

Frequency	Spectrum	Antenna	Correction	Reading	Corrected	Limit	Margin
	Analyzer	Polariz.	Factor		Reading	@ 3 m	
(MHz)	Detector	(H/V)	(dB/m)	(dBuV)	(dBuV)	(dBuV)	(dB)
44.12000	QP	V	13.00	17.71	30.71	40.00	-9.29
68.71000	QP	V	11.95	23.93	35.88	40.00	-4.12
299.85000	QP	V	14.39	23.76	38.15	46.00	-7.85
531.69000	QP	V	19.46	16.98	36.44	46.00	-9.56
654.77000	QP	V	21.49	19.51	41.00	46.00	-5.00
691.49000	QP	V	21.80	13.97	35.77	46.00	-10.23
66.11000	QP	Н	12.49	21.32	33.81	40.00	-6.19
266.03000	QP	Н	13.32	24.72	38.04	46.00	-7.96
300.14000	QP	Н	14.47	25.78	40.25	46.00	-5.75
332.87000	QP	Н	15.30	26.31	41.61	46.00	-4.39
654.25000	QP	Н	21.49	16.49	37.98	46.00	-8.02
665.91000	QP	Н	21.70	16.52	38.22	46.00	-7.78

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



FCC ID. : M4Y-0325H Report No.: EME-011106
Page 17 of 25

## 6.4.2 Measurement results: frequency above 1GHz

EUT : XI-325H

Test Condition : Tx at low channel

Frequency	Spectrum	Antenna	Preamp	Correction	Reading	Corrected	Limit	Margin
	Analyzer	Polariz.		Factor		Reading	@ 3 m	
(MHz)	Detector	(H/V)	(dB)	(dB/m)	(dBuV)	(dBuV)	(dBuV)	(dB)
4824	PK	Н	28.02	37.9	48.71	58.59	74	-15.41
4824	AV	Н	28.02	37.9	38.77	48.65	54	-5.35
7236	PK	Н	28.02	43.26	41.85	57.09	74	-16.91
7236	AV	Н	28.02	43.26	30.02	45.26	54	-8.74
9648	PK	Н	28.02	46.8	35.22	54	74	-20
9648	AV	Н	28.02	46.8	24.61	43.39	54	-10.61
12060	PK	Н	28.02	48.57	ı	ı	74	-
12060	AV	Н	28.02	48.57	-	-	54	-
2037.75	PK	Н	0	30.79	10.75	41.54	74	-32.46
2037.75	AV	Н	0	30.79	3.51	34.3	54	-19.7
4075.5	PK	Н	28.02	37.54	36.14	45.66	74	-28.34
4075.5	AV	Н	28.02	37.54	25.44	34.96	54	-19.04
4824	PK	V	28.02	37.9	49.15	59.03	74	-14.97
4824	AV	V	28.02	37.9	39.88	49.76	54	-4.24
7236	PK	V	28.02	43.26	40.92	56.16	74	-17.84
7236	AV	V	28.02	43.26	29.16	44.4	54	-9.6
9648	PK	V	28.02	46.8	36.22	55	74	-19
9648	AV	V	28.02	46.8	23.46	42.24	54	-11.76
12060	PK	V	28.02	48.57	ı	ı	74	-
12060	AV	V	28.02	48.57	-	-	54	-
2037.75	PK	V	0	30.79	14.75	45.54	74	-28.46
2037.75	AV	V	0	30.79	9.23	40.02	54	-13.98
4075.5	PK	V	28.02	37.54	34.19	43.71	74	-30.29
4075.5	AV	V	28.02	37.54	23.91	33.43	54	-20.57

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

FCC ID. : M4Y-0325H Report No.: EME-011106
Page 18 of 25

EUT : XI-325H

Test Condition : Tx at middle channel

Frequency	Spectrum	Antenna	Preamp	Correction	Reading	Corrected	Limit	Margin
	Analyzer	Polariz.		Factor		Reading	@ 3 m	
(MHz)	Detector	(H/V)	(dB)	(dB/m)	(dBuV)	(dBuV)	(dBuV)	(dB)
4874	PK	Н	28.02	37.9	45.14	55.02	74	-18.98
4874	AV	Н	28.02	37.9	37.51	47.39	54	-6.61
7311	PK	Н	28.02	43.26	38.66	53.9	74	-20.1
7311	AV	Н	28.02	43.26	27.91	43.15	54	-10.85
9748	PK	Н	28.02	46.8	32.66	51.44	74	-22.56
9748	AV	Н	28.02	46.8	25.08	43.86	54	-10.14
12185	PK	Н	28.02	48.57	-	-	74	-
12185	AV	Н	28.02	48.57	-	1	54	-
2062.75	PK	Н	0	30.79	10.21	41	74	-33
2062.75	AV	Н	0	30.79	2.15	32.94	54	-21.06
4125.5	PK	Н	28.02	37.54	36.78	46.3	74	-27.7
4125.5	AV	Н	28.02	37.54	25.66	35.18	54	-18.82
4874	PK	V	28.02	37.9	51.44	61.32	74	-12.68
4874	AV	V	28.02	37.9	39.75	49.63	54	-4.37
7311	PK	V	28.02	43.26	41.22	56.46	74	-17.54
7311	AV	V	28.02	43.26	29.87	45.11	54	-8.89
9748	PK	V	28.02	46.8	35.79	54.57	74	-19.43
9748	AV	V	28.02	46.8	24.01	42.79	54	-11.21
12185	PK	V	28.02	48.57	-	-	74	_
12185	AV	V	28.02	48.57	-	-	54	_
2062.75	PK	V	0	30.79	14.99	45.78	74	-28.22
2062.75	AV	V	0	30.79	6.71	37.5	54	-16.5
4125.5	PK	V	28.02	37.54	36.84	46.36	74	-27.64
4125.5	AV	V	28.02	37.54	25.81	35.33	54	-18.67

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

FCC ID. : M4Y-0325H Report No.: EME-011106
Page 19 of 25

EUT : XI-325H

Test Condition : Tx at high channel

Frequency	Spectrum	Antenna	Preamp	Correction	Reading	Corrected	Limit	Margin
	Analyzer	Polariz.		Factor		Reading	@ 3 m	
(MHz)	Detector	(H/V)	(dB)	(dB/m)	(dBuV)	(dBuV)	(dBuV)	(dB)
4924	PK	Н	28.02	37.9	46.71	56.59	74	-17.41
4924	AV	Н	28.02	37.9	35.99	45.87	54	-8.13
7386	PK	Н	28.02	43.26	39.02	54.26	74	-19.74
7386	AV	Н	28.02	43.26	28.68	43.92	54	-10.08
9848	PK	Н	28.02	46.78	33.41	52.17	74	-21.83
9848	AV	Н	28.02	46.78	23.69	42.45	54	-11.55
12310	PK	Н	28.02	48.72	1	1	74	-
12310	AV	Н	28.02	48.72	ı	1	54	-
2087.75	PK	Н	0	30.79	11.29	42.08	74	-31.92
2087.75	AV	Н	0	30.79	3.65	34.44	54	-19.56
4175.5	PK	Н	28.02	37.54	37.59	47.11	74	-26.89
4175.5	AV	Н	28.02	37.54	26.8	36.32	54	-17.68
4924	PK	V	28.02	37.9	50.33	60.21	74	-13.79
4924	AV	V	28.02	37.9	39.49	49.37	54	-4.63
7386	PK	V	28.02	43.26	42.67	57.91	74	-16.09
7386	AV	V	28.02	43.26	30.95	46.19	54	-7.81
9848	PK	V	28.02	46.78	36	54.76	74	-19.24
9848	AV	V	28.02	46.78	25.21	43.97	54	-10.03
12310	PK	V	28.02	48.72	-	-	74	-
12310	AV	V	28.02	48.72	-	-	54	-
2087.75	PK	V	0	30.79	15.05	45.84	74	-28.16
2087.75	AV	V	0	30.79	4.51	35.3	54	-18.7
4175.5	PK	V	28.02	37.54	35.77	45.29	74	-28.71
4175.5	AV	V	28.02	37.54	26.82	36.34	54	-17.66

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

FCC ID.: M4Y-0325H Report No.: EME-011106
Page 20 of 25

#### 7. Power Spectrum Density test

#### 7.1 Operating environment

Temperature: 23 °C Relative Humidity: 59 %

#### 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 30kHz, a span of 1.5 MHz, and the sweep time set at 500 seconds. Power Density was read directly and cable loss (1dB)/external attenuator (10dB) 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	2413.127	-5.83	8
Middle	2438.127	-5.03	8
High	2463.127	-4.83	8

FCC ID. : M4Y-0325H Report No.: EME-011106
Page 21 of 25

#### 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".

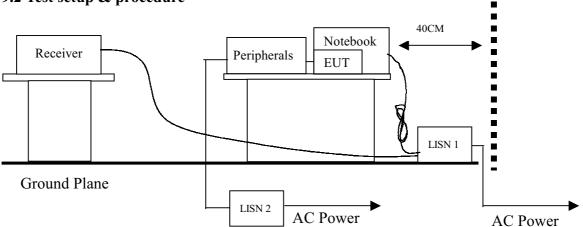
FCC ID. : M4Y-0325H Report No.: EME-011106
Page 22 of 25

#### 9. Power Line Conducted Emission test §FCC 15.207

#### 9.1 Operating environment

Temperature: 24  $^{\circ}$ C Relative Humidity: 52  $^{\circ}$ 

#### 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					
Frog (MUz)	Maximum RF Line Voltage				
Freq. (MHz)	uV	dBuV			
0.45 - 30	250	48.0			

FCC ID. : M4Y-0325H Report No.: EME-011106
Page 23 of 25

#### 9.3 Power Line Conducted Emission test data

EUT : XI-325H

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	4.13000	24.0	48.00	-24.00
LINE	5.14600	26.0	48.00	-22.00
LINE	6.24200	30.2	48.00	-17.80
LINE	6.97000	26.3	48.00	-21.70
LINE	8.07400	23.4	48.00	-24.60
LINE	19.01800	21.0	48.00	-27.00
NEUTRAL	4.31400	22.9	48.00	-25.10
NEUTRAL	4.97000	26.4	48.00	-21.60
NEUTRAL	6.61000	28.9	48.00	-19.10
NEUTRAL	8.26600	27.4	48.00	-20.60
NEUTRAL	9.49000	22.7	48.00	-25.30
NEUTRAL	19.65800	17.4	48.00	-30.60

- 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.

FCC ID. : M4Y-0325H Report No.: EME-011106
Page 24 of 25

EUT : XI-325H

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	4.59400	25.6	48.00	-22.40
LINE	6.05800	23.2	48.00	-24.80
LINE	6.70600	29.2	48.00	-18.80
LINE	7.90600	28.7	48.00	-19.30
LINE	9.21800	26.4	48.00	-21.60
LINE	19.13000	23.4	48.00	-24.60
NEUTRAL	4.59400	25.1	48.00	-22.90
NEUTRAL	5.16200	27.0	48.00	-21.00
NEUTRAL	6.33000	23.2	48.00	-24.80
NEUTRAL	7.25000	21.6	48.00	-26.40
NEUTRAL	8.84200	25.2	48.00	-22.80
NEUTRAL	18.94600	23.4	48.00	-24.60

- 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.

FCC ID. : M4Y-0325H Report No.: EME-011106
Page 25 of 25

EUT : XI-325H

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	4.70600	27.0	48.00	-21.00
LINE	5.78600	25.5	48.00	-22.50
LINE	6.89800	29.5	48.00	-18.50
LINE	7.91400	25.5	48.00	-22.50
LINE	8.64200	28.0	48.00	-20.00
LINE	19.52200	25.7	48.00	-22.30
NEUTRAL	4.60200	23.3	48.00	-24.70
NEUTRAL	5.25000	26.4	48.00	-21.60
NEUTRAL	5.79400	28.6	48.00	-19.40
NEUTRAL	7.17000	27.2	48.00	-20.80
NEUTRAL	8.57000	25.1	48.00	-22.90
NEUTRAL	20.17800	25.9	48.00	-22.10

- 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.