

FCC TEST REPORT

REPORT NO.: RF950721H03A

MODEL NO.: CRADLE A01, XAC 100

RECEIVED: July 20, 2006

TESTED: Aug. 21 to Oct. 30, 2006

ISSUED: Nov. 02, 2006

APPLICANT: XAC AUTOMATION CORP.

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SCIENCE-BASED INDUSTRIAL
PARK,HSINCHU,TAIWAN

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1 CERTIFICATION

PRODUCT : FD-RFID
BRAND NAME : First Data Corporation, XAC Automation Corporation
MODEL NO : CRADLE A01, XAC 100
TESTED: Aug. 21 to Oct. 30, 2006
APPLICANT : XAC AUTOMATION CORP.
STANDARDS : 47 CFR Part 15, Subpart C(Section 15.225)
ANSI C63.4: 2003

The above equipment (Model: CRADLE A01) has been tested by **Advance Data Technology Corporation**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Carol Liao , **DATE:** Nov. 02, 2006
(Carol Liao)

TECHNICAL ACCEPTANCE : Hank Chung , **DATE:** Nov. 02, 2006
Responsible for RF (Hank Chung)

APPROVED BY : May Chen , **DATE:** Nov. 02, 2006
(May Chen, Deputy Manager)

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: 47 CFR Part 15, Subpart C			
STANDARD PARAGRAPH	TEST TYPE	RESULT	REMARK
15.207	Conducted Emission Test	PASS	Meet the requirement of limit. Minimum passing margin is -0.29dB at 27.125MHz
15.225 / 15.209	Radiated Emission Test	PASS	Meet the requirement of limit. Minimum passing margin is -3.2 dB at 176.3 MHz
15.225	Band Edge Measurement	PASS	Operation within the band 13.110-14.010 MHz
15.225(e)	Frequency Stability Measurement	PASS	Meet the requirement of limit
15.203	Antenna Requirement	PASS	Meet the requirement

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Conducted emissions	2.26 dB
Radiated emissions (30MHz-1GHz)	2.98 dB

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	FD-RFID
MODEL NO.	CRADLE A01, XAC 100
FCC ID	MQT-CRADLE
POWER SUPPLY	5V 500mA for USB interface or 9VDC from power adapter
MODULATION TYPE	ASK
OPERATING FREQUENCY	13.56MHz
NUMBER OF CHANNEL	1
ANTENNA TYPE	PCB type antenna
DATA CABLE	USB cable x 1 (Shielded, 2.0m, with one Core) RS232 cable x 1 (Shielded, 2.0m, with one Core)
I/O PORT	USB Port x 1 RS232 Port x 1
ASSOCIATED DEVICES	NA

NOTE:

- The EUT has two brand names and two model names, which are identical to each other in all aspects except for the followings:

Brand name	Model name	Difference
First Data Corporation	CRADLE A01	For marketing requirement
XAC Automation Corporation	XAC 100	

- The EUT could be supplied with the following power adapter or USB interface:

Brand:	LEI
Model No.:	IU15-2090100-WP
Input power :	AC 100V~240V 50-60Hz; 0.5A
Output power :	9VDC 1A, nonshiedled, 1.8m with one core

3. For radiated emission test (30~1000MHz): The EUT was pre-tested under following test modes.

Test mode	Description
Mode 1	USB Mode
Mode 2	RS232 Mode

The worse emission level was found in mode A. The final test was executed under test mode with higher emission and recorded in this report individually.

4. For radiated emission test, pretest the Loop antenna was rotated about the X and Y axis during below 30MHz, the worst data was found in Y axis.
5. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

The EUT was tested under the following test modes, and its data were recorded in this report:

For Conducted Test		
Antenna installed		
Test Mode	Description	Power
Mode 1	USB Mode	USB interface
Mode 2	RS232 Mode	USB interface
Mode 3	USB Mode	power adapter
Mode 4	RS232 Mode	power adapter
Antenna is terminated with a dummy load		
Test Mode	Description	Power
Mode 5	USB Mode	USB interface
Mode 6	RS232 Mode	USB interface
Mode 7	USB Mode	power adapter
Mode 8	RS232 Mode	power adapter
For radiated emission test (30~1000MHz)		
Test Mode	Description	Power
Mode 1	USB Mode	USB interface
Mode 2	USB Mode	power adapter
For radiated emission test (below 30MHz)		
Test Mode	Description	Power
Mode 1	USB Mode	USB interface
Mode 2	RS232 Mode	USB interface

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is the transmitter part of a FD-RFID. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

47 CFR Part 15, Subpart C (Section 15.225)

ANSI C63.4-2003

All tests have been performed and recorded as per the above standards.

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

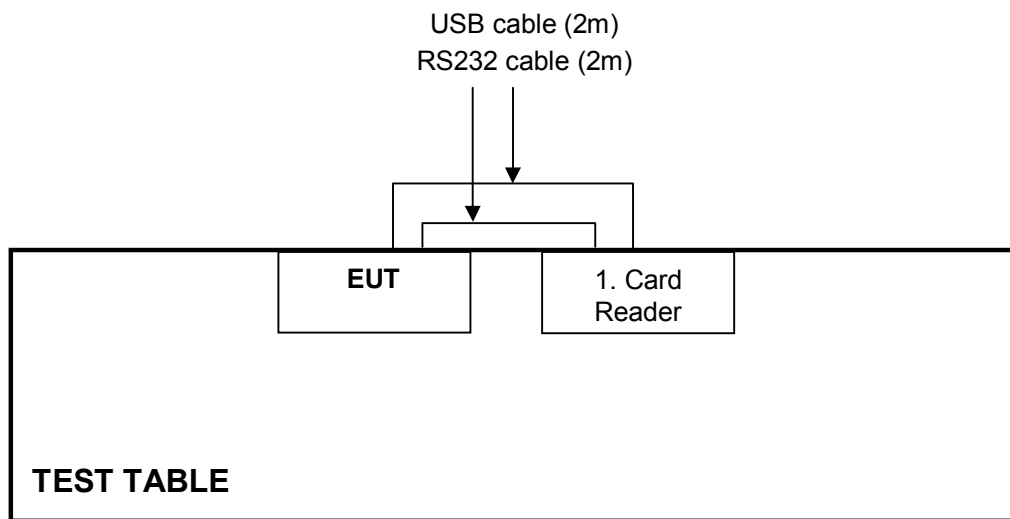
No.	Product	Brand	Model No.	Serial No.	FCC ID
1	Card Reader	FIRST DATA	FD-100	NA	FCC DoC

No.	Signal cable description
1	NA

Note: 1. All power cords of the above support units are unshielded (1.8m).

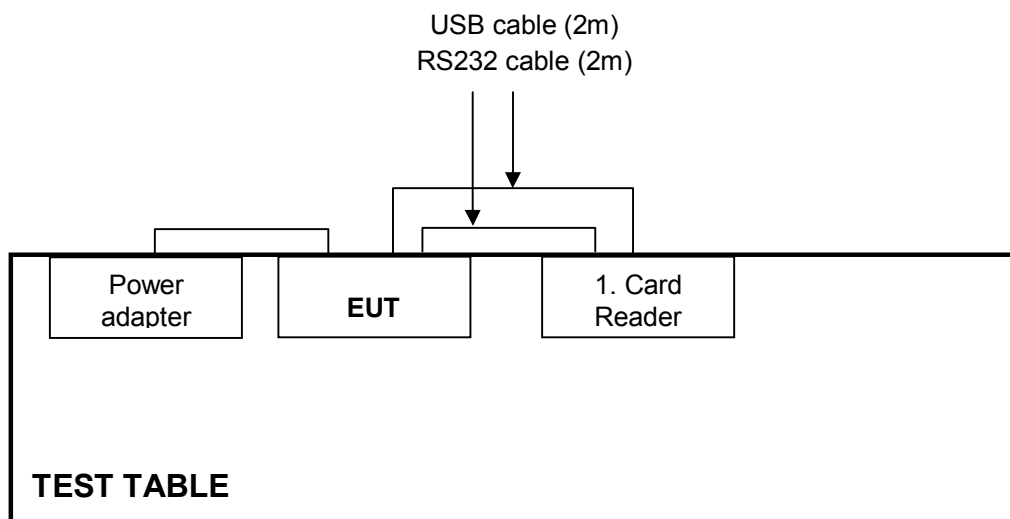
3.5 CONFIGURATION OF SYSTEM UNDER TEST

Power from USB interface



NOTE: 1. Please refer to the photos of test configuration in Item 5 also.

Power from power adapter



NOTE: 1. Please refer to the photos of test configuration in Item 5 also.

4 EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver	ESCS 30	847124/029	Dec. 15, 2006
Line-Impedance Stabilization Network(for EUT)	ENV-216	100071	Nov. 10, 2006
Line-Impedance Stabilization Network(for Peripheral)	KNW-407	8/1395/12	Jul. 18, 2007
RF Cable (JETBAO)	RG233/U	Cable_CB_01	Dec. 09, 2006
Terminator	50	2	Oct. 07, 2007
Software	ADT_Cond_V7.3.2	NA	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in ADT Shielded Room No. B.
 3. The VCCI Con B Registration No. is C-2193.

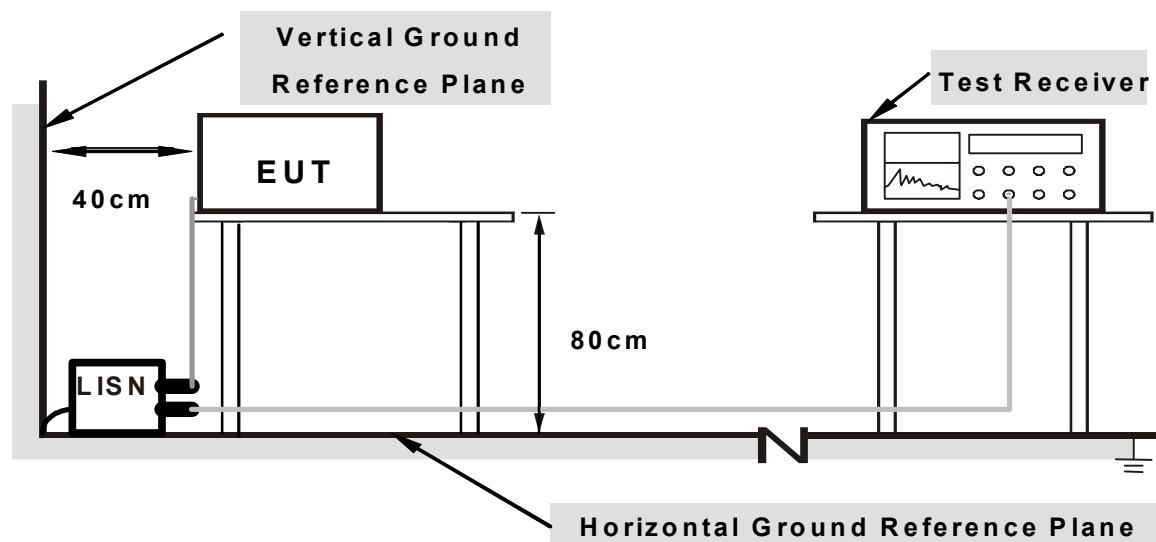
4.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission level under (Limit - 20dB) was not recorded.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.1.6 EUT OPERATING CONDITIONS

For USB Mode:

The Card Reader (support units 1) runs a test program "CradledemoUSB.exe" to enable EUT function continuously.

For RS232 Mode:

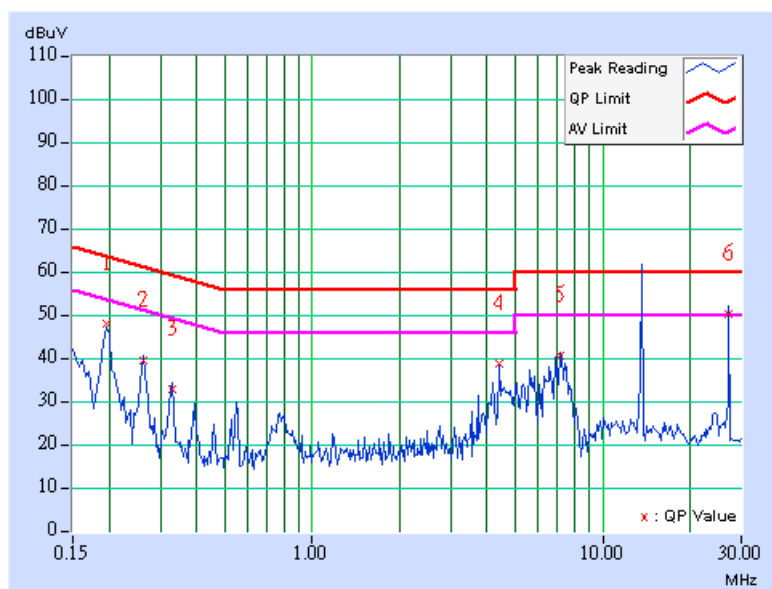
The Card Reader (support units 1) runs a test program "Cradledemo232.exe" to enable EUT function continuously.

4.1.7 TEST RESULTS

INPUT POWER (SYSTEM)	120Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 50 % RH, 960hPa	TEST MODE	Mode 1
TESTED BY	Wen Yu	PHASE	Line (L)

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.197	9.60	38.06	-	47.66	-	63.74	53.74	-16.08	-
2	0.263	9.60	29.48	-	39.08	-	61.33	51.33	-22.25	-
3	0.330	9.60	23.04	-	32.64	-	59.46	49.46	-26.82	-
4	4.402	9.71	28.92	-	38.63	-	56.00	46.00	-17.37	-
5	7.160	9.81	30.60	-	40.41	-	60.00	50.00	-19.59	-
6	27.125	10.10	40.22	39.61	50.32	49.71	60.00	50.00	-9.68	-0.29

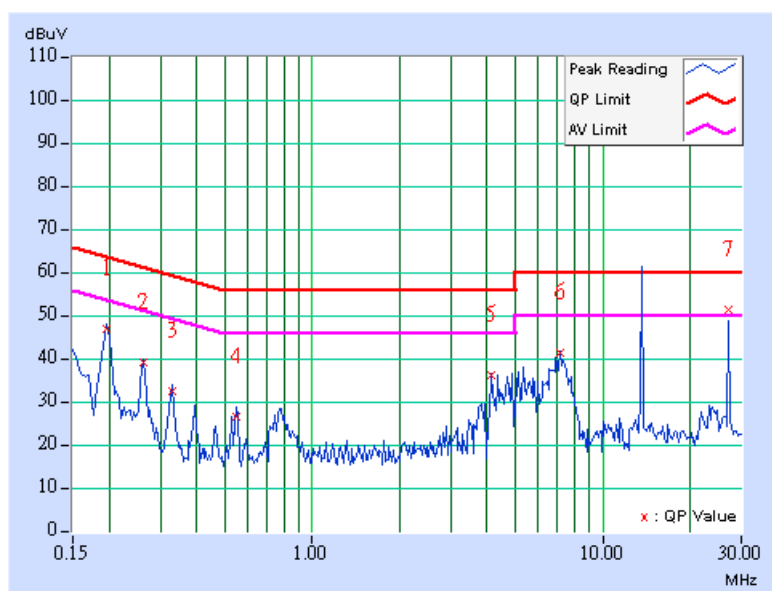
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



INPUT POWER (SYSTEM)	120Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 50 % RH, 960hPa	TEST MODE	Mode 1
TESTED BY	Wen Yu	PHASE	Neutral (N)

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.197	9.60	37.08	-	46.68	-	63.74	53.74	-17.06	-
2	0.263	9.60	28.99	-	38.59	-	61.33	51.33	-22.74	-
3	0.330	9.60	22.44	-	32.04	-	59.46	49.46	-27.42	-
4	0.548	9.60	16.58	-	26.18	-	56.00	46.00	-29.82	-
5	4.141	9.70	26.11	-	35.81	-	56.00	46.00	-20.19	-
6	7.164	9.81	31.23	-	41.04	-	60.00	50.00	-18.96	-
7	27.121	10.10	41.33	39.40	51.43	49.50	60.00	50.00	-8.57	-0.50

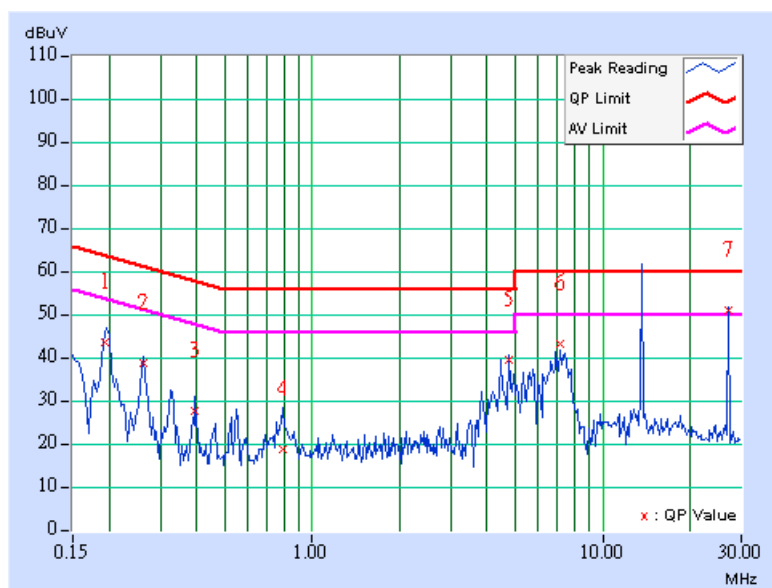
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 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



INPUT POWER (SYSTEM)	120Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 50 % RH, 960hPa	TEST MODE	Mode 2
TESTED BY	Wen Yu	PHASE	Line (L)

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.193	9.60	33.44	-	43.04	-	63.91	53.91	-20.87	-
2	0.263	9.60	28.77	-	38.37	-	61.33	51.33	-22.96	-
3	0.396	9.60	17.75	-	27.35	-	57.93	47.93	-30.58	-
4	0.791	9.60	8.79	-	18.39	-	56.00	46.00	-37.61	-
5	4.730	9.72	29.66	-	39.38	-	56.00	46.00	-16.62	-
6	7.168	9.81	33.09	-	42.90	-	60.00	50.00	-17.10	-
7	27.121	10.10	41.11	39.41	51.21	49.51	60.00	50.00	-8.79	-0.49

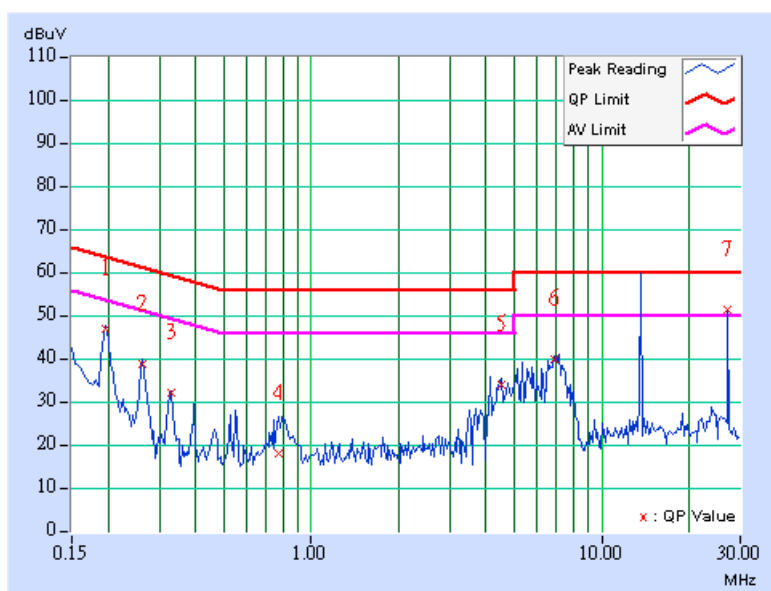
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 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



INPUT POWER (SYSTEM)	120Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 50 % RH, 960hPa	TEST MODE	Mode 2
TESTED BY	Wen Yu	PHASE	Neutral (N)

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.197	9.60	36.88	-	46.48	-	63.74	53.74	-17.26	-
2	0.263	9.60	28.81	-	38.41	-	61.33	51.33	-22.92	-
3	0.330	9.60	22.20	-	31.80	-	59.46	49.46	-27.66	-
4	0.775	9.60	7.87	-	17.47	-	56.00	46.00	-38.53	-
5	4.535	9.72	23.82	-	33.54	-	56.00	46.00	-22.46	-
6	6.836	9.79	29.84	-	39.63	-	60.00	50.00	-20.37	-
7	27.121	10.10	41.22	39.41	51.32	49.51	60.00	50.00	-8.68	-0.49

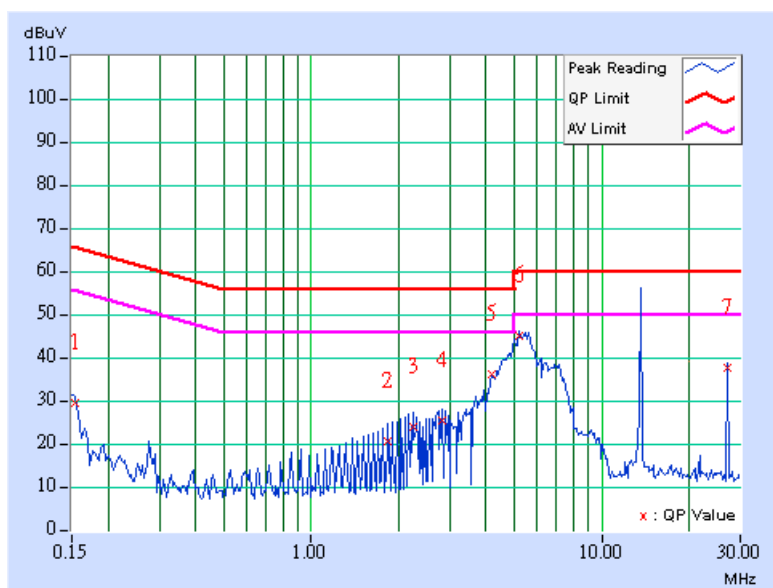
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 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



INPUT POWER (SYSTEM)	120Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 50 % RH, 960hPa	TEST MODE	Mode 3
TESTED BY	Wen Yu	PHASE	Line (L)

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.154	0.45	28.63	-	29.08	-	65.79	55.79	-36.71	-
2	1.838	0.30	19.66	-	19.96	-	56.00	46.00	-36.04	-
3	2.232	0.31	22.89	-	23.20	-	56.00	46.00	-32.80	-
4	2.826	0.34	24.65	-	24.99	-	56.00	46.00	-31.01	-
5	4.207	0.40	35.27	-	35.67	-	56.00	46.00	-20.33	-
6	5.191	0.42	44.33	-	44.75	-	60.00	50.00	-15.25	-
7	27.125	1.00	36.66	-	37.66	-	60.00	50.00	-22.34	-

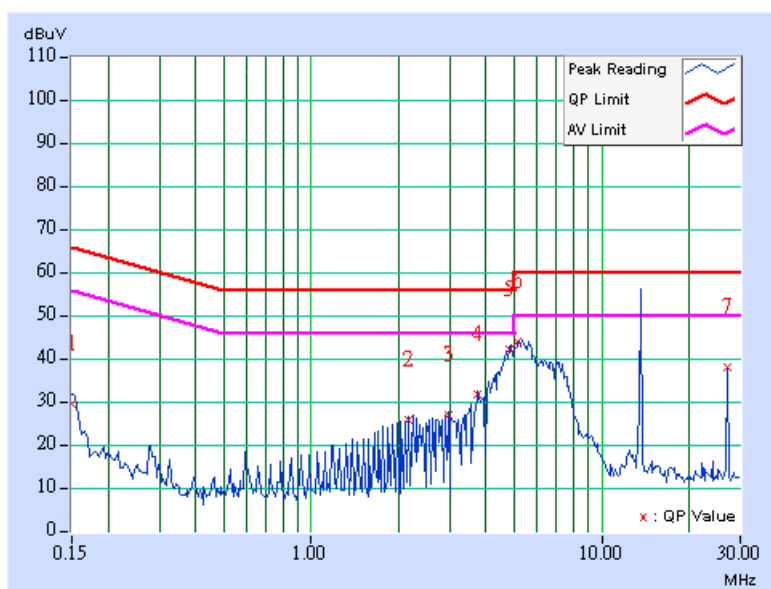
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 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



INPUT POWER (SYSTEM)	120Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 50 % RH, 960hPa	TEST MODE	Mode 3
TESTED BY	Wen Yu	PHASE	Neutral (N)

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.45	28.65	-	29.10	-	66.00	56.00	-36.90	-
2	2.170	0.40	24.82	-	25.22	-	56.00	46.00	-30.78	-
3	2.959	0.40	25.87	-	26.27	-	56.00	46.00	-29.73	-
4	3.750	0.40	30.99	-	31.39	-	56.00	46.00	-24.61	-
5	4.801	0.43	41.04	-	41.47	-	56.00	46.00	-14.53	-
6	5.129	0.44	42.95	-	43.39	-	60.00	50.00	-16.61	-
7	27.121	1.00	37.15	-	38.15	-	60.00	50.00	-21.85	-

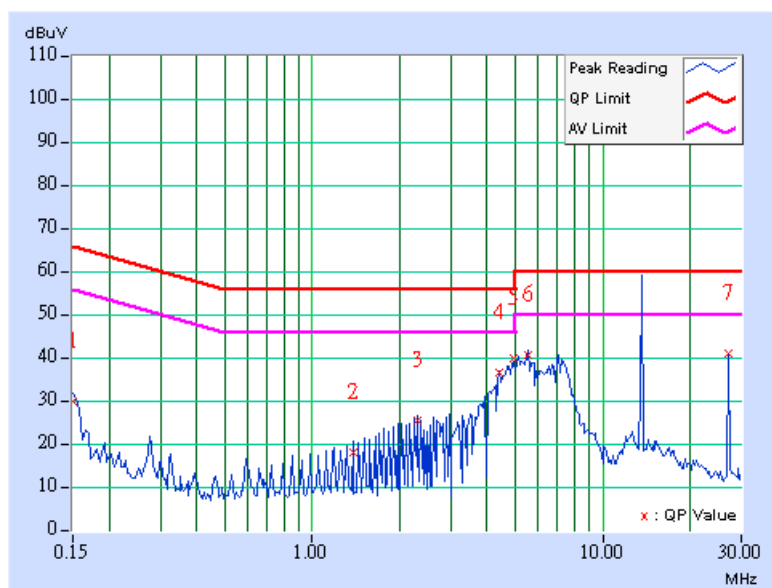
- REMARKS:**
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 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



INPUT POWER (SYSTEM)	120Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 50 % RH, 960hPa	TEST MODE	Mode 4
TESTED BY	Wen Yu	PHASE	Line (L)

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.45	28.93	-	29.38	-	66.00	56.00	-36.62	-
2	1.384	0.30	17.05	-	17.35	-	56.00	46.00	-38.65	-
3	2.302	0.32	24.66	-	24.98	-	56.00	46.00	-31.02	-
4	4.406	0.41	35.83	-	36.24	-	56.00	46.00	-19.76	-
5	4.934	0.42	38.84	-	39.26	-	56.00	46.00	-16.74	-
6	5.527	0.43	39.67	-	40.10	-	60.00	50.00	-19.90	-
7	27.121	1.00	40.01	-	41.01	-	60.00	50.00	-18.99	-

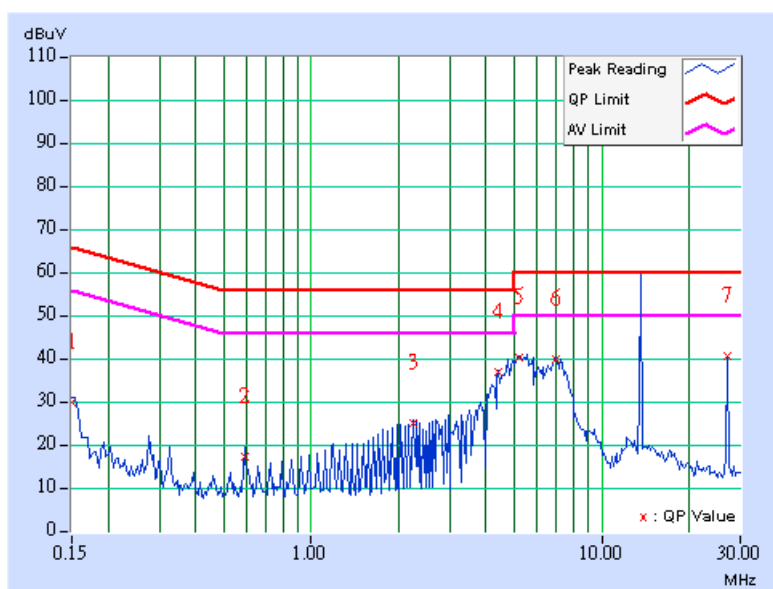
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1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



INPUT POWER (SYSTEM)	120Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 50 % RH, 960hPa	TEST MODE	Mode 4
TESTED BY	Wen Yu	PHASE	Neutral (N)

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.45	28.85	-	29.30	-	66.00	56.00	-36.70	-
2	0.591	0.33	16.58	-	16.91	-	56.00	46.00	-39.09	-
3	2.236	0.40	24.19	-	24.59	-	56.00	46.00	-31.41	-
4	4.406	0.41	36.14	-	36.55	-	56.00	46.00	-19.45	-
5	5.195	0.44	39.20	-	39.64	-	60.00	50.00	-20.36	-
6	6.973	0.50	38.88	-	39.38	-	60.00	50.00	-20.62	-
7	27.121	1.00	39.72	-	40.72	-	60.00	50.00	-19.28	-

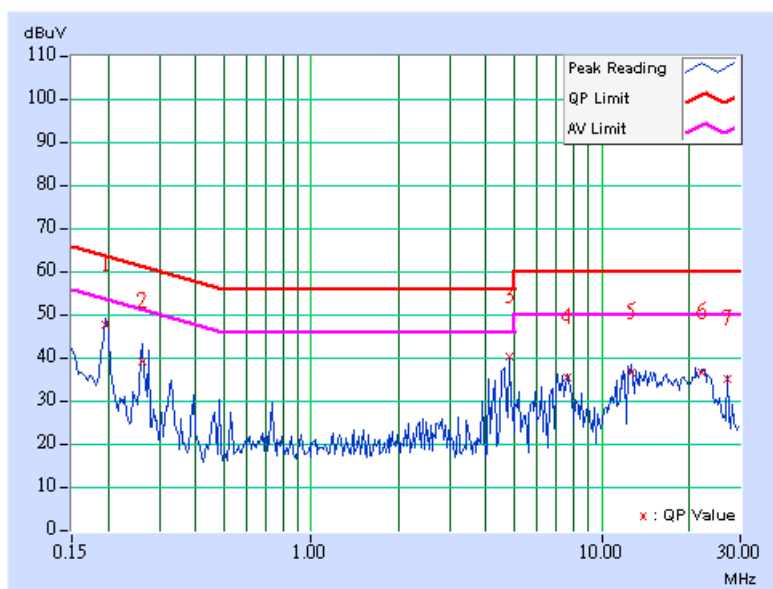
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



INPUT POWER (SYSTEM)	120Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 55 % RH, 960hPa	TEST MODE	Mode 5
TESTED BY	Moris Lin	PHASE	Line (L)

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
	1	0.197	9.60	37.68	-	47.28	-	63.74	53.74	-16.46
2	0.263	9.60	29.17	-	38.77	-	61.33	51.33	-22.56	-
3	4.801	9.73	30.20	-	39.93	-	56.00	46.00	-16.07	-
4	7.566	9.82	25.61	-	35.43	-	60.00	50.00	-24.57	-
5	12.695	10.01	26.57	-	36.58	-	60.00	50.00	-23.42	-
6	22.105	10.10	26.41	-	36.51	-	60.00	50.00	-23.49	-
7	27.121	10.10	24.90	-	35.00	-	60.00	50.00	-25.00	-

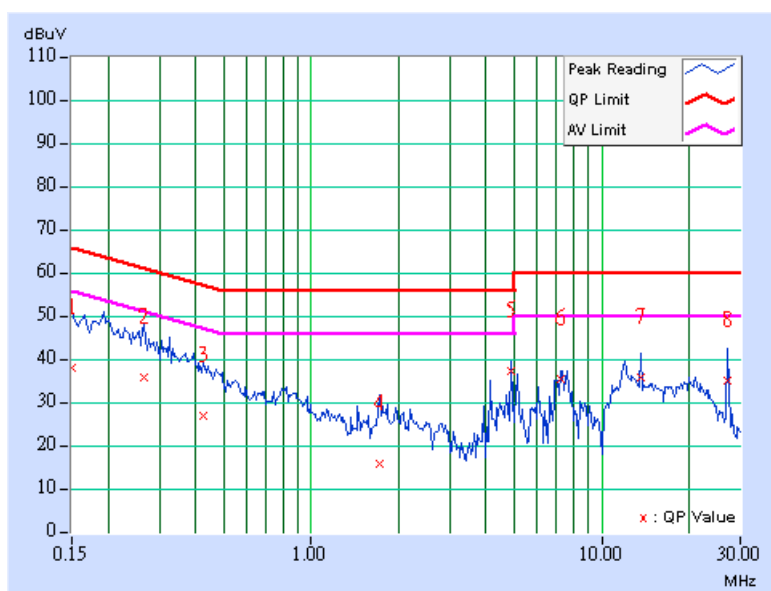
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



INPUT POWER (SYSTEM)	120Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 55 % RH, 960hPa	TEST MODE	Mode 5
TESTED BY	Moris Lin	PHASE	Neutral (N)

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	9.60	27.88	-	37.48	-	66.00	56.00	-28.52	-
2	0.267	9.60	25.81	-	35.41	-	61.20	51.20	-25.79	-
3	0.423	9.60	16.94	-	26.54	-	57.38	47.38	-30.84	-
4	1.713	9.67	5.90	-	15.57	-	56.00	46.00	-40.43	-
5	4.871	9.73	27.21	-	36.94	-	56.00	46.00	-19.06	-
6	7.238	9.81	25.63	-	35.44	-	60.00	50.00	-24.56	-
7	13.563	9.97	25.76	-	35.73	-	60.00	50.00	-24.27	-
8	27.125	10.10	24.98	-	35.08	-	60.00	50.00	-24.92	-

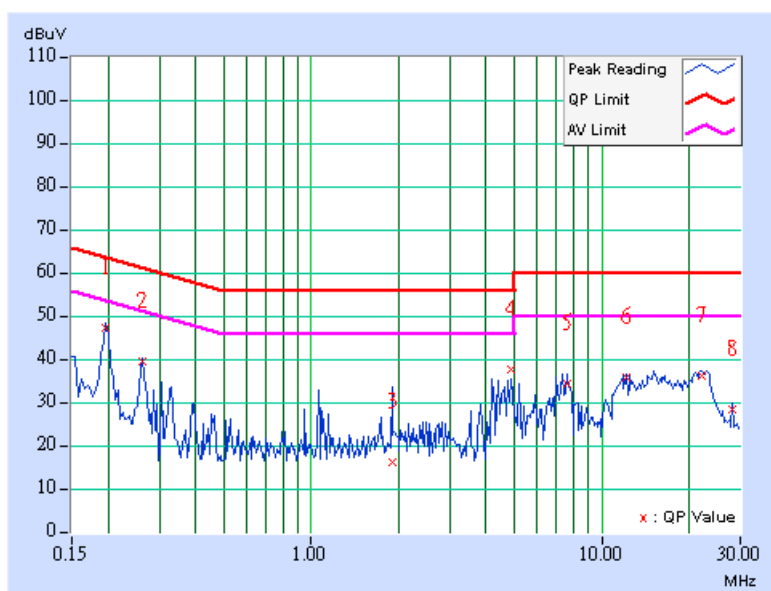
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



INPUT POWER (SYSTEM)	120Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 55 % RH, 960hPa	TEST MODE	Mode 6
TESTED BY	Moris Lin	PHASE	Line (L)

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.197	9.60	37.44	-	47.04	-	63.74	53.74	-16.70	-
2	0.263	9.60	29.42	-	39.02	-	61.33	51.33	-22.31	-
3	1.904	9.69	6.25	-	15.94	-	56.00	46.00	-40.06	-
4	4.871	9.73	27.73	-	37.46	-	56.00	46.00	-18.54	-
5	7.633	9.82	24.47	-	34.29	-	60.00	50.00	-25.71	-
6	12.172	9.99	25.72	-	35.71	-	60.00	50.00	-24.29	-
7	22.039	10.10	26.36	-	36.46	-	60.00	50.00	-23.54	-
8	28.223	10.10	18.40	-	28.50	-	60.00	50.00	-31.50	-

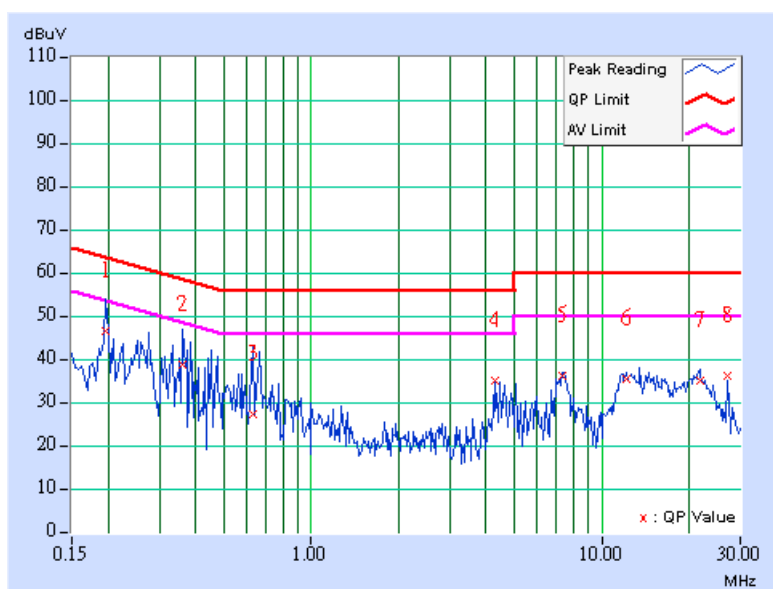
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



INPUT POWER (SYSTEM)	120Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 55 % RH, 960hPa	TEST MODE	Mode 6
TESTED BY	Moris Lin	PHASE	Neutral (N)

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.197	9.60	36.52	-	46.12	-	63.74
2	0.361	9.60	28.95	-	38.55	-	58.71	48.71	-20.16	-
3	0.634	9.60	17.20	-	26.80	-	56.00	46.00	-29.20	-
4	4.277	9.71	25.22	-	34.93	-	56.00	46.00	-21.07	-
5	7.367	9.81	26.29	-	36.10	-	60.00	50.00	-23.90	-
6	12.172	9.94	25.36	-	35.30	-	60.00	50.00	-24.70	-
7	21.777	10.10	25.16	-	35.26	-	60.00	50.00	-24.74	-
8	27.121	10.10	26.30	-	36.40	-	60.00	50.00	-23.60	-

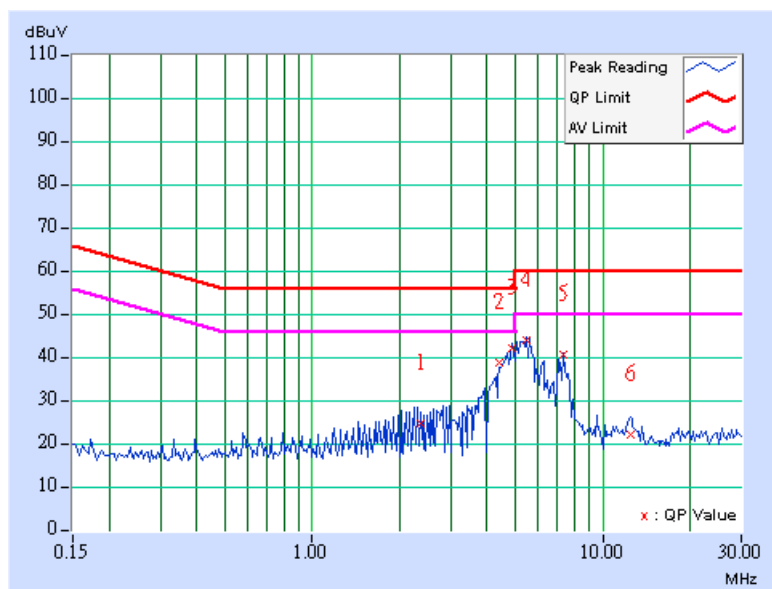
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



INPUT POWER (SYSTEM)	120Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 55 % RH, 960hPa	TEST MODE	Mode 7
TESTED BY	Moris Lin	PHASE	Line (L)

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	2.369	9.70	14.70	-	24.40	-	56.00	46.00	-31.60	-
2	4.406	9.71	28.80	-	38.51	-	56.00	46.00	-17.49	-
3	4.867	9.73	32.18	-	41.91	-	56.00	46.00	-14.09	-
4	5.461	9.75	34.11	-	43.86	-	60.00	50.00	-16.14	-
5	7.301	9.81	30.60	-	40.41	-	60.00	50.00	-19.59	-
6	12.434	10.00	12.30	-	22.30	-	60.00	50.00	-37.70	-

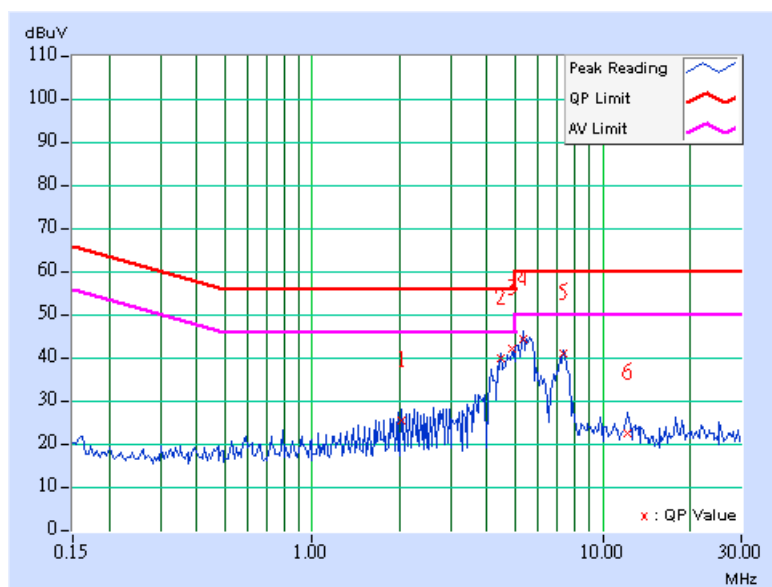
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



INPUT POWER (SYSTEM)	120Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 55 % RH, 960hPa	TEST MODE	Mode 7
TESTED BY	Moris Lin	PHASE	Neutral (N)

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	2.041	9.70	15.60	-	25.30	-	56.00	46.00	-30.70	-
2	4.473	9.72	29.97	-	39.69	-	56.00	46.00	-16.31	-
3	4.867	9.73	32.16	-	41.89	-	56.00	46.00	-14.11	-
4	5.328	9.74	34.61	-	44.35	-	60.00	50.00	-15.65	-
5	7.367	9.81	31.03	-	40.84	-	60.00	50.00	-19.16	-
6	12.238	9.94	12.57	-	22.51	-	60.00	50.00	-37.49	-

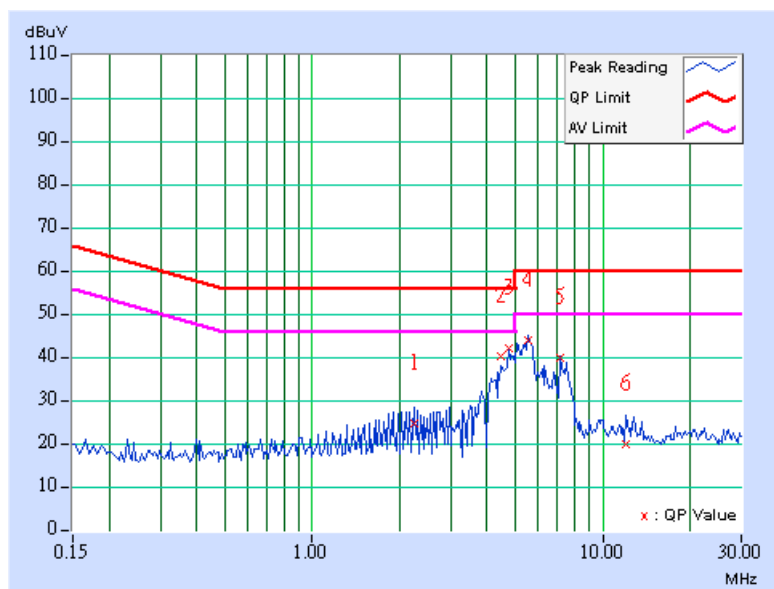
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



INPUT POWER (SYSTEM)	120Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 55 % RH, 960hPa	TEST MODE	Mode 8
TESTED BY	Moris Lin	PHASE	Line (L)

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	2.236	9.70	14.83	-	24.53	-	56.00	46.00	-31.47	-
2	4.473	9.72	30.23	-	39.95	-	56.00	46.00	-16.05	-
3	4.734	9.72	32.14	-	41.86	-	56.00	46.00	-14.14	-
4	5.523	9.75	34.22	-	43.97	-	60.00	50.00	-16.03	-
5	7.105	9.80	30.12	-	39.92	-	60.00	50.00	-20.08	-
6	12.031	9.98	10.00	-	19.98	-	60.00	50.00	-40.02	-

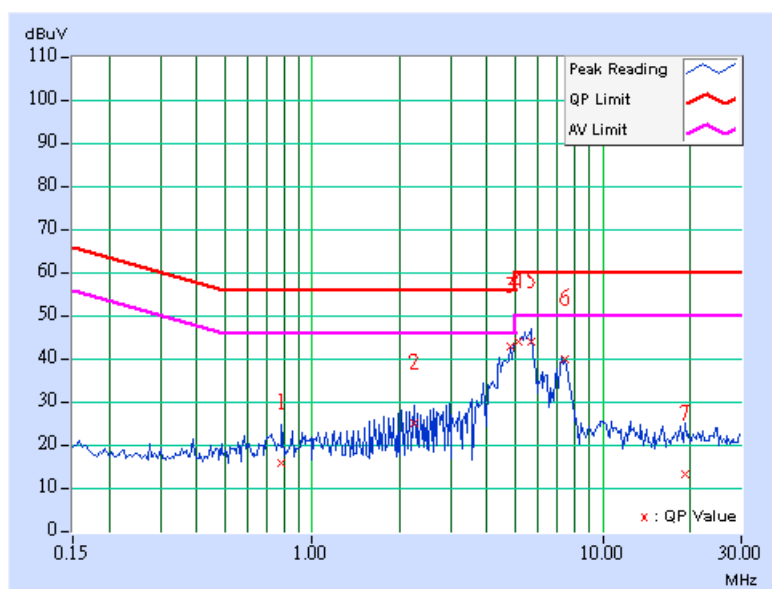
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



INPUT POWER (SYSTEM)	120Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 55 % RH, 960hPa	TEST MODE	Mode 8
TESTED BY	Moris Lin	PHASE	Neutral (N)

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.787	9.60	5.72	-	15.32	-	56.00	46.00	-40.68	-
2	2.236	9.70	15.17	-	24.87	-	56.00	46.00	-31.13	-
3	4.801	9.73	32.99	-	42.72	-	56.00	46.00	-13.28	-
4	5.129	9.74	34.12	-	43.86	-	60.00	50.00	-16.14	-
5	5.656	9.76	33.93	-	43.69	-	60.00	50.00	-16.31	-
6	7.430	9.81	29.90	-	39.71	-	60.00	50.00	-20.29	-
7	19.195	10.08	3.19	-	13.27	-	60.00	50.00	-46.73	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



4.2 RADIATED EMISSION & OCCUPIED BANDWIDTH MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

According to 15.225 the field strength of any emission within the band 13.553-13.567MHz should not exceed 15,848 micro-volts/meter at 30 meters.

Fundamental Frequency (MHz)	Field Strength of Fundamental (dBuV/m) at 3m	
	Peak	Average
13.553-13.567	124	104

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
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

As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.2.2 TEST INSTRUMENT

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ADVANTEST Spectrum Analyzer	R3271A	85060311	July 03, 2007
HP Pre_Amplifier	8449B	3008A01922	Sep. 18, 2007
ROHDE & SCHWARZ Test Receiver	ESCS30	100375	Sep. 20, 2007
CHASE Broadband Antenna	VULB9168	138	Dec. 11, 2006
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 27, 2006
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 05, 2007
SCHWARZBECK Biconical Antenna	VHBA9123	459	Jun. 08, 2009
SCHWARZBECK Periodic Antenna	UPA6108	1148	Jun. 08, 2009
R&S Loop Antenna	HFH2-Z2	881058/15	Nov. 29, 2007
RF Switches (ARNITSU)	CS-201	1565157	NA
RF CABLE (Chaintek)	SF102	22054-2	Nov. 16. 2006
RF Cable(RICHTEC)	9913-30M N-N Cable	STCCAB-30M-1 GHz	Jul. 15, 2007
Software	ADT_Radiated_V 5.14	NA	NA
CHANCE MOST Antenna Tower	AT-100	0203	NA
CHANCE MOST Turn Table	TT-100	0203	NA

- Note: 1. The calibration interval of the above test instruments is 12 months (36 months for Biconical and Periodic Antenna) and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, HP preamplifier (model: 8449B) and Spectrum Analyzer (model: R3271A) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in ADT Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 4824A-3.
7. Loop antenna was used for all emissions below 30 MHz. (For Loop antenna only)

4.2.3 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meters open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak & Average Detect Function(below 30MHz);Quasi-Peak Detect Function(30MHz~1000MHz) and Specified Bandwidth with Maximum Hold Mode.

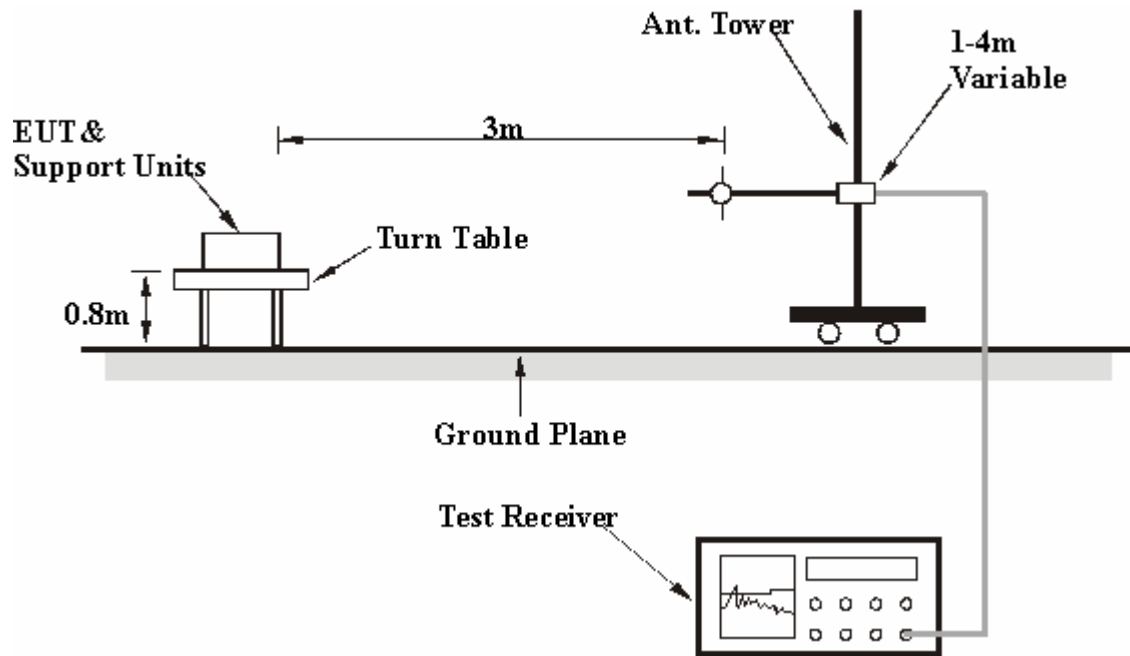
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP (RADIATED EMISSION)



For the actual test configuration, please refer to the related item in this test report - Photographs of the Test Configuration.

4.2.6 EUT OPERATING CONDITION

Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.

4.2.7 TEST RESULT (RADIATED EMISSION 30~1000MHZ)

FREQUENCY RANGE	30~ 1000 MHz	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TEST MODE	Mode 1	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak 120 kHz
ENVIRONMENTAL CONDITIONS	17 deg. C, 61 % RH, 960 hPa	TEST BY	Tony Chen

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	81.37	22.00 QP	40.00	-18.00	2.18 H	339	12.10	9.90
2	176.30	36.30 QP	43.50	-7.20	1.53 H	60	23.10	13.20
3	189.86	31.20 QP	43.50	-12.30	2.00 H	102	18.90	12.30
4	216.98	32.50 QP	46.00	-13.50	1.50 H	343	20.20	12.30
5	244.11	27.40 QP	46.00	-18.60	1.34 H	190	13.90	13.50
6	339.04	34.80 QP	46.00	-11.20	1.03 H	267	17.60	17.30
7	596.70	38.30 QP	46.00	-7.70	1.00 H	1	13.90	24.40
8	678.07	36.50 QP	46.00	-9.50	1.00 H	135	11.00	25.50
9	705.19	32.00 QP	46.00	-14.00	1.00 H	138	6.10	26.00

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	81.37	27.00 QP	40.00	-13.00	1.09 V	30	17.10	9.90
2	108.49	31.90 QP	43.50	-11.60	1.22 V	240	21.40	10.50
3	162.74	31.40 QP	43.50	-12.10	1.00 V	344	17.40	14.00
4	176.30	37.80 QP	43.50	-5.70	1.12 V	1	24.60	13.20
5	189.86	37.00 QP	43.50	-6.50	1.00 V	0	24.70	12.30
6	203.42	25.20 QP	43.50	-18.30	1.05 V	263	13.50	11.70
7	216.98	28.40 QP	46.00	-17.60	1.01 V	85	16.10	12.30
8	244.10	26.80 QP	46.00	-19.20	1.04 V	193	13.30	13.50
9	569.58	39.10 QP	46.00	-6.90	1.23 V	196	15.30	23.70
10	596.70	38.90 QP	46.00	-7.10	1.01 V	209	14.50	24.40
11	623.82	38.80 QP	46.00	-7.20	1.04 V	238	14.00	24.70
12	678.07	38.80 QP	46.00	-7.20	1.00 V	253	13.30	25.50
13	705.19	34.90 QP	46.00	-11.10	1.06 V	270	8.90	26.00

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.

FREQUENCY RANGE	30~ 1000 MHz	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TEST MODE	Mode 2	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak 120 kHz
ENVIRONMENTAL CONDITIONS	27 deg. C, 59 % RH, 960 hPa	TEST BY	Tony Chen

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	162.74	31.70 QP	43.50	-11.80	1.80 H	246	17.80	14.00
2	176.30	40.30 QP	43.50	-3.20	1.50 H	243	27.10	13.20
3	203.42	29.50 QP	43.50	-14.00	1.02 H	343	17.80	11.70
4	216.98	33.80 QP	46.00	-12.20	1.51 H	314	21.40	12.30
5	311.91	37.00 QP	46.00	-9.00	1.03 H	18	20.10	17.00
6	339.03	34.50 QP	46.00	-11.50	1.07 H	21	17.30	17.30
7	596.70	35.60 QP	46.00	-10.40	1.13 H	229	11.20	24.40
8	623.82	38.00 QP	46.00	-8.00	1.36 H	332	13.20	24.70
9	678.07	35.80 QP	46.00	-10.20	1.37 H	62	10.30	25.50
10	691.63	33.20 QP	46.00	-12.80	1.42 H	278	7.50	25.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	81.37	29.60 QP	40.00	-10.40	1.42 V	238	19.70	9.90
2	176.30	35.40 QP	43.50	-8.10	1.46 V	1	22.20	13.20
3	203.42	28.40 QP	43.50	-15.10	1.00 V	265	16.60	11.70
4	501.77	29.60 QP	46.00	-16.40	1.09 V	209	7.80	21.80
5	569.58	39.70 QP	46.00	-6.30	1.01 V	252	15.90	23.70
6	596.70	42.00 QP	46.00	-4.00	1.00 V	268	17.60	24.40
7	623.82	40.30 QP	46.00	-5.70	1.00 V	263	15.60	24.70
8	678.07	38.10 QP	46.00	-7.90	1.01 V	268	12.70	25.50
9	691.63	38.40 QP	46.00	-7.60	1.32 V	12	12.80	25.70
10	705.19	37.10 QP	46.00	-8.90	1.24 V	9	11.10	26.00

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.

4.2.8 TEST RESULT (RADIATED EMISSION BELOW 30MHZ)

FREQUENCY RANGE	Below 30MHz	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TEST MODE	Mode 1	DETECTOR FUNCTION & BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	25 deg. C, 68 % RH, 960 hPa	TEST BY	Morgan Chen

LOOP ANTENNA TEST DISTANCE: AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	9.76	58.8 QP	69.5	-10.7	1.50	79	58.3	0.50
2	*13.56	87.1 PK	124.0	-36.8	1.50	77	86.5	0.60
2	*13.56	81.1 AV	104.0	-22.8	1.50	77	80.5	0.60
3	27.12	53.2 QP	69.5	-16.3	1.50	85	52.1	1.10

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.

FREQUENCY RANGE	Below 30MHz	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TEST MODE	Mode 2	DETECTOR FUNCTION & BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	25 deg. C, 68 % RH, 960 hPa	TEST BY	Morgan Chen

LOOP ANTENNA TEST DISTANCE: AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	9.76	56.6 QP	69.5	-12.9	1.50	81	56.1	0.50
2	*13.56	86.8 PK	124.0	-37.2	1.50	9	73.7	13.10
2	*13.56	80.8 AV	104.0	-23.2	1.50	9	67.7	13.10
3	27.12	51.3 QP	69.5	-18.2	1.50	82	50.2	1.10

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.

4.3 BAND EDGES MEASUREMENT

4.3.1 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Nov. 23, 2006

NOTE:

- 1.The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
- 2.The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

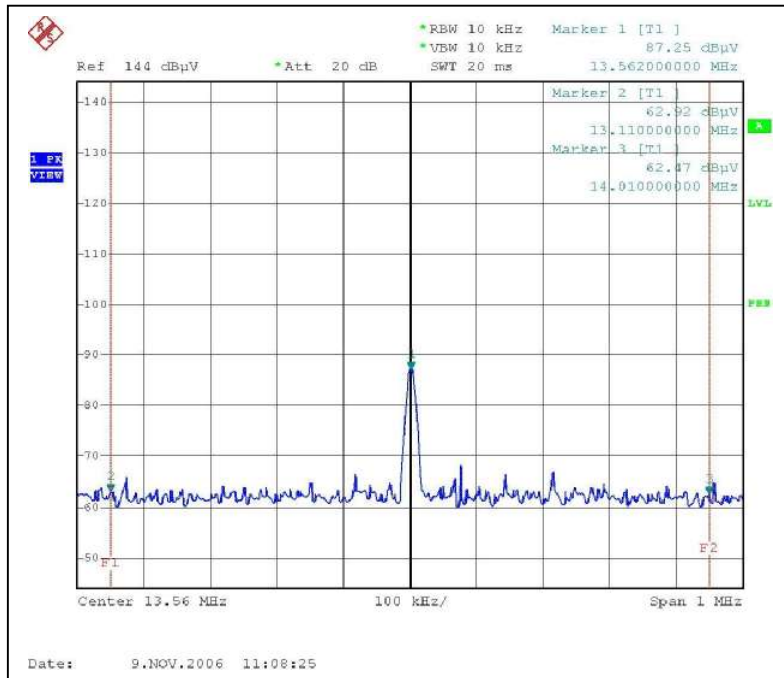
4.3.2 EUT OPERATING CONDITION

Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.

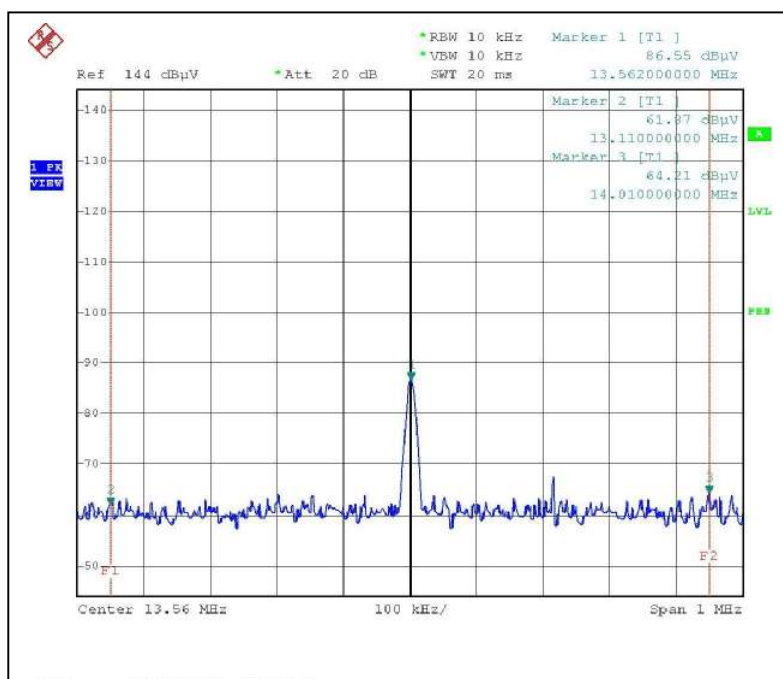
4.3.3 TEST RESULTS

The EUT was operation within the band 13.110-14.010 MHz.

For USB mode:



For RS232 mode:



4.4 FREQUENCY STABILITY

4.4.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

According to FCC 47 CFR Section 15.225(e), the frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of -20 degrees to 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

4.4.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Nov. 23, 2006

NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

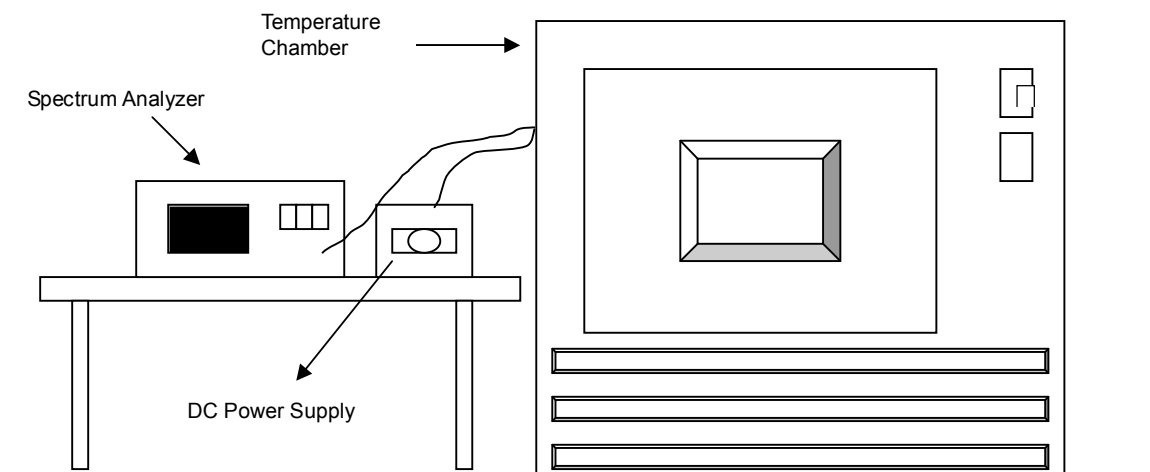
4.4.3 TEST PROCEDURE

1. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

4.4.7 TEST RESULTS

		Operating frequency: 13.56MHz				Limit : $\pm 0.01\%$	
Temp. (°C)	Power supply (VAC)	2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	120	13.561328	0.009794	13.561333	0.009830	13.5613452	0.009920
20	138	13.561321	0.009742	13.561338	0.009867	13.5613455	0.009923
	102	13.56132	0.009735	13.561339	0.009875	13.5613474	0.009937
-20	120	13.5613	0.009764	13.5613	0.009845	13.5613	0.009920

4.5 ANTENNA REQUIREMENT

4.5.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

4.5.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is PCB type antenna, on-board type plastic FPC connector.

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST (Power from USB interface)



CONDUCTED EMISSION TEST (Power from power adapter)



RADIATED EMISSION TEST (Power from USB interface)



RADIATED EMISSION TEST (Power from power adapter)



6 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	FCC, UL, A2LA
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA, CSA
R.O.C.	CNLA, BSMI, NCC
Netherlands	Telefication
Singapore	PSB, GOST-ASIA (MOU)
Russia	CERTIS (MOU)

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml.

If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:

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Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

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Fax: 886-3-3185050

Email: service@adt.com.tw

Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.

APPENDIX-A

MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.