FCC TEST REPORT

REPORT NO.: RF980331H02

MODEL NO.: 8002R, FD-30

RECEIVED: March 31, 2009

TESTED: April 20 to 24, 2009

ISSUED: April 24, 2009

APPLICANT: XAC AUTOMATION CORP.

ADDRESS: 4F, No. 30, INDUSTRY E. RD. IX, SCIENCE-BASED INDUSTRIAL PARK,HSINCHU,TAIWAN

ISSUED BY: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

TEST LOCATION: No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan

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1 CERTIFICATION

PRODUCT :	PinPad
BRAND NAME :	XAC, FDC
MODEL NO. :	8002R, FD-30
TESTED :	April 20 to 24, 2009
TEST SAMPLE :	ENGINEERING SAMPLE
APPLICANT :	XAC AUTOMATION CORP.
STANDARDS :	47 CFR Part 15, Subpart C(Section 15.225) ANSI C63.4: 2003

The above equipment (Model: 8002R) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, 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:** April 24, 2009
(Carol Liao, Specialist)

TECHNICAL ACCEPTANCE : , **DATE:** April 24, 2009
Responsible for RF
(Hank Chung, Deputy Manager)

APPROVED BY : , **DATE:** April 24, 2009
(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 -14.18dB at 13.561MHz
15.225 / 15.209	Radiated Emission Test	PASS	Meet the requirement of limit. Minimum passing margin is -0.30 dB at 40.68 MHz
15.225 / 15.215	Operating Frequency 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 16-4-2:

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

Measurement	Value
Conducted Emission	2.44 dB
Radiated emissions (30MHz-1GHz)	3.94 dB

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	PinPad
MODEL NO.	8002R, FD-30
FCC ID	MQT-FD30
POWER SUPPLY	DC 5V/400mA for RJ-45 to USB cable DC 12V/200mA for RJ-45 to RJ12 cable
MODULATION TYPE	ASK 100% and ASK 10%
CARRIER FREQUENCY OF EACH CHANNEL	13.56MHz
NUMBER OF CHANNEL	1
ANTENNA TYPE	PCB type antenna
DATA CABLE	RJ-45 to RJ12 cable x 1 (Unshielded, 2.1m, with two cores) RJ-45 to USB cable x 1 (Unshielded, 2.1m, with two cores)
I/O PORTS	RJ-45 Port x 1
ASSOCIATED DEVICES	NA

NOTE:

1. The EUT has two brand names and two model names which are identical to each other in all aspects except for the following:

Brand	Model No.	Difference
XAC	8002R	For marketing requirement
FDC	FD-30	

From the above models, model: **8002R** was selected as representative model for the test and its data was recorded in this report.

2. 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:

Test Mode	Description
Mode 1	RJ-45 to USB cable Mode
Mode 2	RJ-45 to RJ12 cable Mode

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a PinPad. 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.

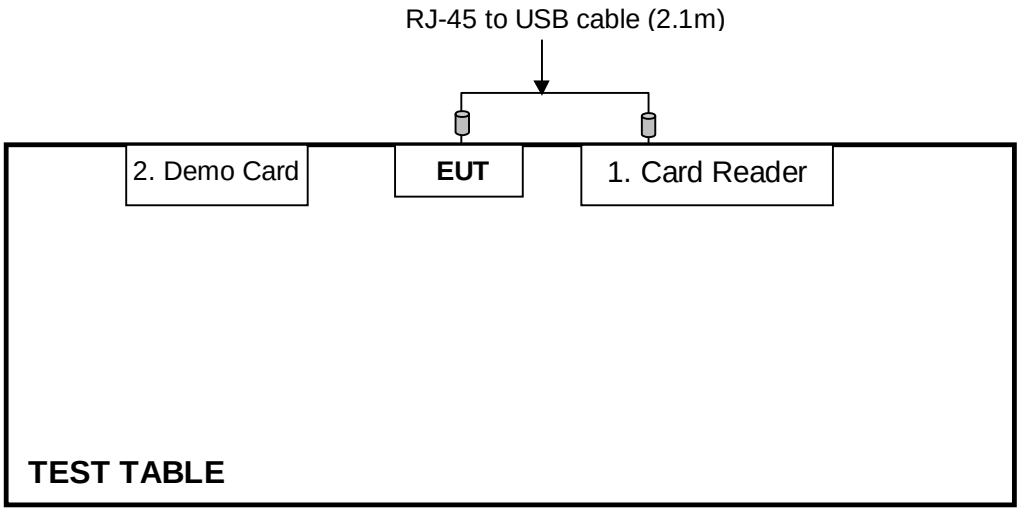
No.	Product	Brand	Model No.	Serial No.	FCC ID
1	Card Reader	DELTA	FD-100	LT0000000099	NA
2	Demo Card	ATMEL	XAC09	NA	NA

No.	Signal cable description
1	NA
2	NA

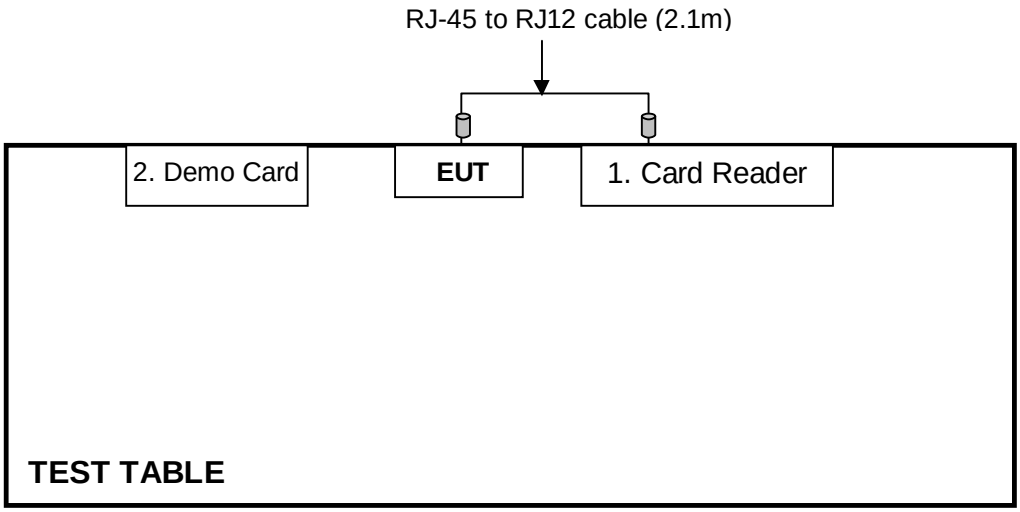
Note: 1. All power cords of the above support units are unshielded (1.8m).

3.5 CONFIGURATION OF SYSTEM UNDER TEST

For RJ-45 to USB cable Mode:



For RJ-45 to RJ12 cable Mode:



4 TEST PROCEDURES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. All emanations from a class 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 DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Mar. 23, 2009	Mar. 22, 2010
Line-Impedance Stabilization Network (for EUT)	ENV-216	100071	Nov. 26, 2008	Nov. 25, 2009
Line-Impedance Stabilization Network (for Peripheral)	ESH3-Z5	848773/004	Nov. 05, 2008	Nov. 04, 2009
RF Cable (JYEBAO)	5DFB	COBCAB-001	Aug. 15, 2008	Aug. 14, 2009
50 ohms Terminator	50	3	Nov. 05, 2008	Nov. 04, 2009
Software	BV ADT_Cond_V7.3.7	NA	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 Shielded Room No. B.
3 The VCCI Con B Registration No. is C-2193.

4.1.3 TEST PROCEDURES

a. The EUT/HOST was placed 0.4 meters from the conducting wall of the shielded room with EUT/HOST 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.

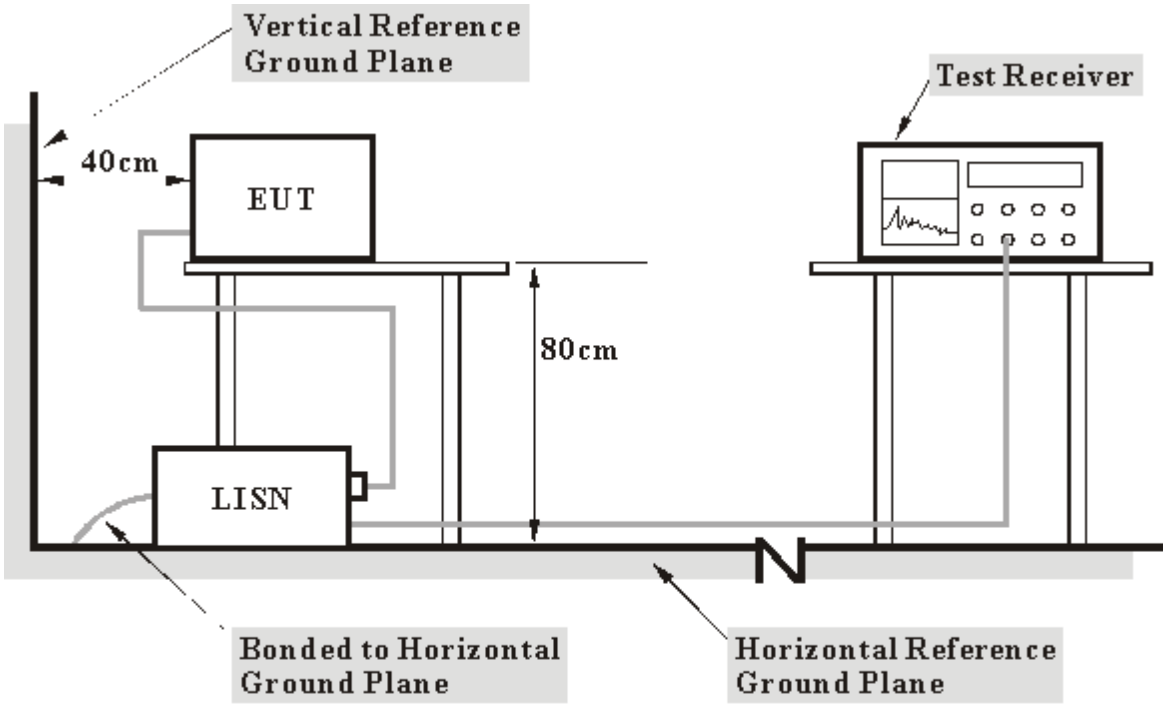
b. Both lines of the power mains connected to the EUT/HOST were checked for maximum conducted interference.

c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported

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) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

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

4.1.6 EUT OPERATING CONDITIONS

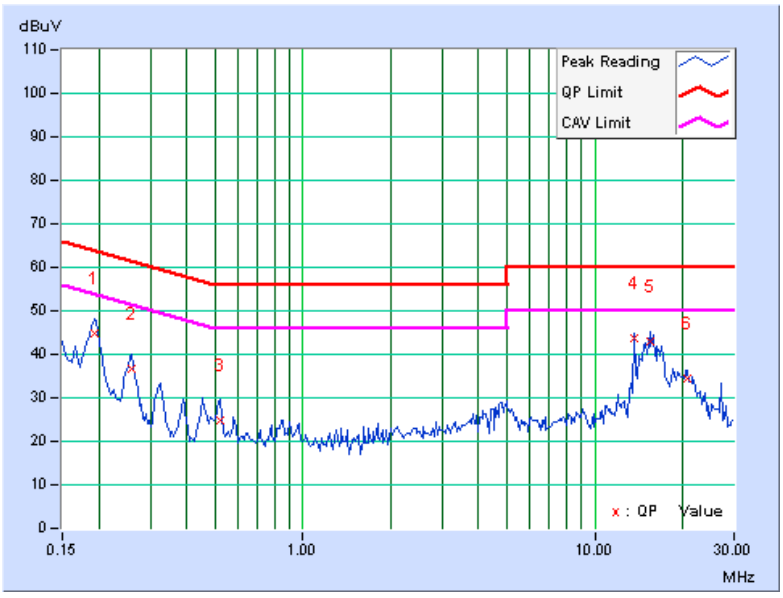
The Card Reader (support units 1) runs a test program " 8002RFIDTEST.exe " to enable EUT function continuously.

4.1.7 TEST RESULTS

INPUT POWER (SYSTEM)	120Vac, 60 Hz	**6DB BANDWIDTH**	9 kHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 64%RH, 965 hPa	**PHASE**	Line (L)
TEST MODE	Mode 1	**TESTED BY**	Rex Huang

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.193	9.80	35.06	-	44.86	-	63.91	53.91	-19.05	-
2	0.259	9.87	26.78	-	36.65	-	61.45	51.45	-24.80	-
3	0.521	9.98	14.72	-	24.70	-	56.00	46.00	-31.30	-
4	13.562	10.00	33.66	-	43.66	-	60.00	50.00	-16.34	-
5	15.414	10.02	32.94	-	42.96	-	60.00	50.00	-17.04	-
6	20.762	10.09	24.33	-	34.42	-	60.00	50.00	-25.58	-

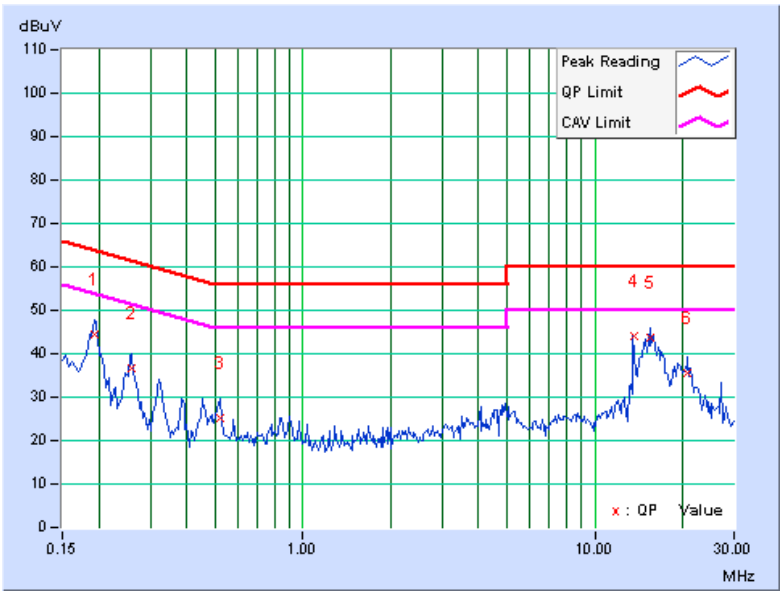
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



INPUT POWER (SYSTEM)	120Vac, 60 Hz	**6DB BANDWIDTH**	9 kHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 64%RH, 965 hPa	**PHASE**	Neutral (N)
TEST MODE	Mode 1	**TESTED BY**	Rex Huang

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.193	9.78	34.74	-	44.52	-	63.91	53.91	-19.39	-
2	0.259	9.85	26.66	-	36.51	-	61.45	51.45	-24.94	-
3	0.521	9.97	15.22	-	25.19	-	56.00	46.00	-30.81	-
4	13.561	10.04	34.06	-	44.10	-	60.00	50.00	-15.90	-
5	15.412	10.09	33.59	-	43.68	-	60.00	50.00	-16.32	-
6	20.773	10.22	25.19	-	35.41	-	60.00	50.00	-24.59	-

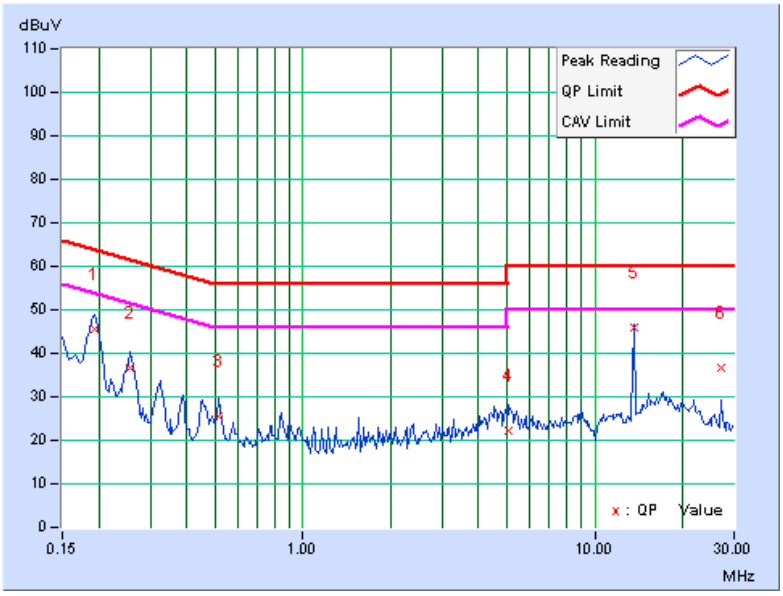
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



INPUT POWER (SYSTEM)	120Vac, 60 Hz	**6DB BANDWIDTH**	9 kHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 64%RH, 965 hPa	**PHASE**	Line (L)
TEST MODE	Mode 2	**TESTED BY**	Rex Huang

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.193	9.80	35.93	-	45.73	-	63.91	53.91	-18.18	-
2	0.255	9.86	26.96	-	36.82	-	61.58	51.58	-24.75	-
3	0.517	9.98	15.69	-	25.67	-	56.00	46.00	-30.33	-
4	5.094	9.88	12.32	-	22.20	-	60.00	50.00	-37.80	-
5	**13.561**	**10.00**	**35.82**	**-**	**45.82**	**-**	**60.00**	**50.00**	**-14.18**	**-**
6	27.121	10.14	26.71	-	36.85	-	60.00	50.00	-23.15	-

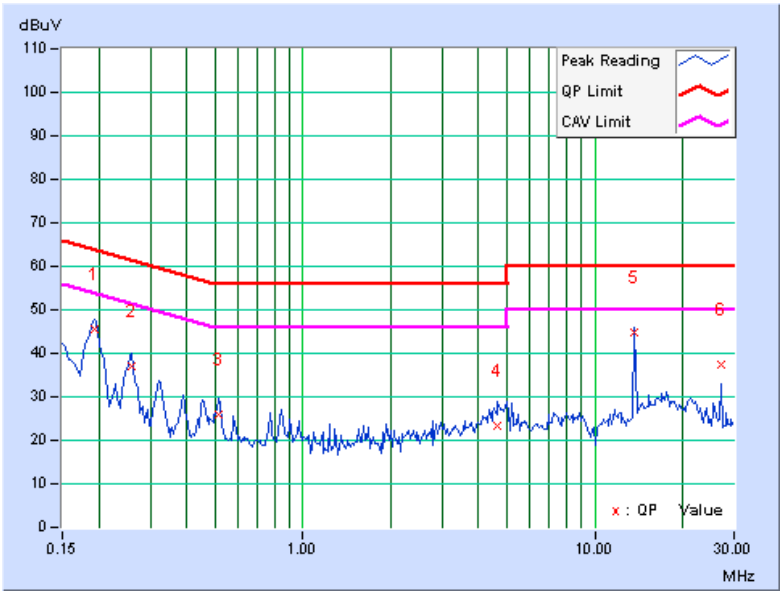
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



INPUT POWER (SYSTEM)	120Vac, 60 Hz	**6DB BANDWIDTH**	9 kHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 64%RH, 965 hPa	**PHASE**	Neutral (N)
TEST MODE	Mode 2	**TESTED BY**	Rex Huang

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.193	9.78	35.63	-	45.41	-	63.91	53.91	-18.50	-
2	0.259	9.85	27.28	-	37.13	-	61.45	51.45	-24.32	-
3	0.517	9.97	16.14	-	26.11	-	56.00	46.00	-29.89	-
4	4.637	9.86	13.61	-	23.47	-	56.00	46.00	-32.53	-
5	13.563	10.04	34.88	-	44.92	-	60.00	50.00	-15.08	-
6	27.121	10.31	27.27	-	37.58	-	60.00	50.00	-22.42	-

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.
7. Perform the AC line Conducted test with the permanent antenna



4.2 RADIATED EMISSION & OCCUPIED BANDWIDTH EASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

According to 15.225(a) 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 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Dec. 9, 2008	Dec. 8, 2009
HP Pre_Amplifier	8449B	3008A01923	Nov. 10, 2008	Nov. 9, 2009
ROHDE & SCHWARZ Test Receiver	ESCS30	847124/029	Sep. 9, 2008	Sep. 8, 2009
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	April 30, 2008	April 29, 2009
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 09, 2008	Dec. 08, 2009
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 22, 2009	Jan. 21, 2010
R&S Loop Antenna	HFH2-Z2	100070	Jan. 14, 2008	Jan. 13, 2010
RF Switches	EMH-011	08009	Oct. 07, 2008	Oct. 06, 2009
RF CABLE (Chaintek)	Sucoflex 106	28077	Aug. 15, 2008	Aug. 14, 2009
RF Cable	8DFB	STCCAB-30M-1GHz	Oct. 07, 2008	Oct. 06, 2009
Software	ADT_Radiated_V7.6.15.9.2	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	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 horn antenna, HP preamplifier (model: 8449B) and Spectrum Analyzer (model: FSP40) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in 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 7450G-3.
7. Loop antenna was used for all emissions below 30 MHz.
8. The Loop antenna calibration interval of the above test instruments is 24 months.

4.2.3 TEST PROCEDURES

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.

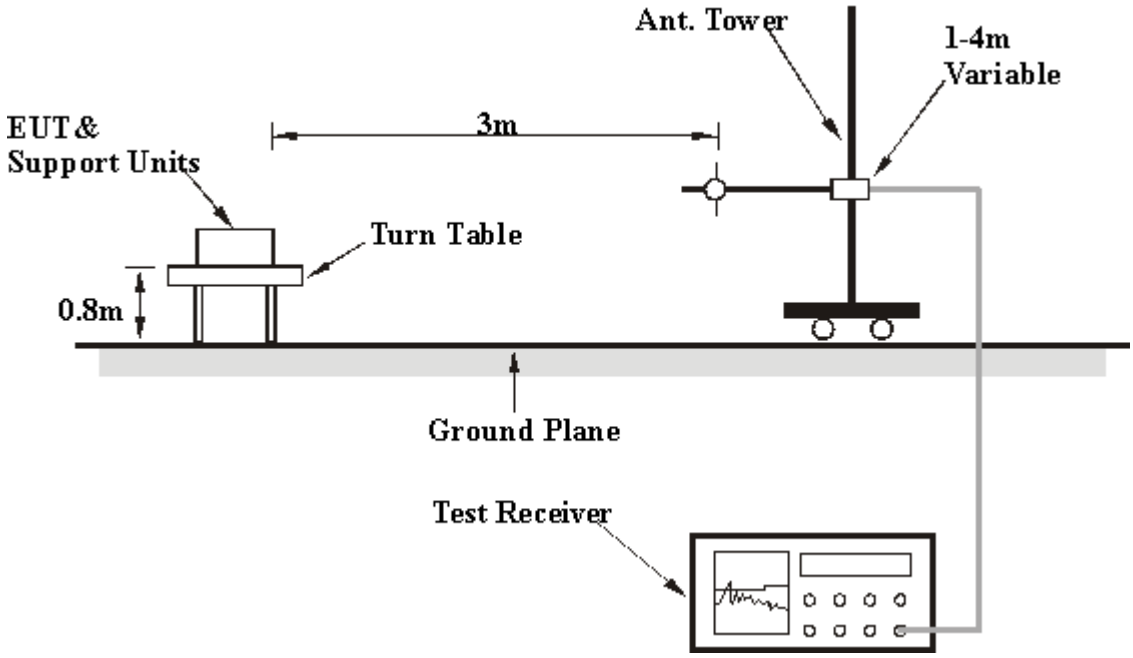
NOTE:

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 CONDITIONS

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

4.2.7 TEST RESULTS (RADIATED EMISSION BELOW 30MHZ)

EUT TEST CONDITION		MEASUREMENT DETAIL	
INPUT POWER	120Vac, 60 Hz	**FREQUENCY RANGE**	9KHz - 30MHz
ENVIRONMENTAL CONDITIONS	21deg. C, 63%RH 965hPa	**DETECTOR FUNCTION**	Quasi-Peak (QP)
TEST MODE	Mode 1	**TESTED BY**	Wen Yu

LOOP ANTENNA TEST DISTANCE: AT 3 M (X AXIS)								
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	*13.56	66.10 QP	104.00	-37.90	1.00	95	52.72	13.38
2	27.12	41.80 QP	49.54	-7.74	1.00	263	28.38	13.42
LOOP ANTENNA TEST DISTANCE: AT 3 M (Y AXIS)								
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	*13.56	72.10 QP	104.00	-31.90	1.00	175	58.72	13.38
2	27.12	29.20 QP	49.54	-20.34	1.00	282	15.78	13.42

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.
5. " * ": Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
INPUT POWER	120Vac, 60 Hz	FREQUENCY RANGE	9KHz - 30MHz
ENVIRONMENTAL CONDITIONS	21deg. C, 63%RH 965hPa	DETECTOR FUNCTION	Quasi-Peak (QP)
TEST MODE	Mode 2	TESTED BY	Wen Yu

LOOP ANTENNA TEST DISTANCE: AT 3 M (X AXIS)								
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	*13.56	69.00 QP	104.00	-35.00	1.00	96	55.62	13.38
2	27.12	34.40 QP	49.54	-15.14	1.00	63	20.98	13.42
LOOP ANTENNA TEST DISTANCE: AT 3 M (Y AXIS)								
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	*13.56	73.00 QP	104.00	-31.00	1.00	180	59.63	13.38
2	27.12	25.40 QP	49.54	-24.14	1.00	185	11.98	13.42

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.
5. " * ": Fundamental frequency.

4.2.8 TEST RESULTS (RADIATED EMISSION 30~1000MHZ)

EUT TEST CONDITION		MEASUREMENT DETAIL	
INPUT POWER	120Vac, 60 Hz	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 63%RH 965hPa	DETECTOR FUNCTION	Quasi-Peak
TEST MODE	Mode 1	TESTED BY	Wen Yu

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	40.68	32.30 QP	40.00	-7.70	1.93 H	228	19.05	13.25
2	81.36	31.50 QP	40.00	-8.50	2.74 H	288	19.58	11.92
3	122.04	32.25 QP	43.50	-11.25	1.54 H	24	18.30	13.95
4	189.85	38.52 QP	43.50	-4.98	1.24 H	244	24.75	13.77
5	216.97	36.34 QP	46.00	-9.66	1.17 H	335	22.53	13.81
6	244.09	35.24 QP	46.00	-10.76	1.07 H	279	20.11	15.13
7	271.21	39.04 QP	46.00	-6.96	1.00 H	253	22.90	16.14
8	298.34	34.13 QP	46.00	-11.87	1.12 H	351	17.16	16.97
9	759.36	40.24 QP	46.00	-5.76	2.01 H	24	11.50	28.74
10	772.92	41.23 QP	46.00	-4.77	1.65 H	245	12.09	29.14
11	827.16	42.21 QP	46.00	-3.79	1.54 H	7	12.00	30.21
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	40.68	37.91 QP	40.00	-2.09	1.00 V	184	24.66	13.25
2	54.24	34.23 QP	40.00	-5.77	1.30 V	32	19.89	14.34
3	81.36	33.25 QP	40.00	-6.75	1.40 V	26	21.33	11.92
4	86.23	26.90 QP	40.00	-13.10	1.60 V	24	14.84	12.06
5	122.03	26.90 QP	43.50	-16.60	1.47 V	54	12.95	13.95
6	135.60	29.60 QP	43.50	-13.90	1.03 V	223	14.87	14.73
7	189.85	30.68 QP	43.50	-12.82	1.45 V	189	16.91	13.77
8	379.69	37.69 QP	46.00	-8.31	1.54 V	84	17.39	20.30
9	474.62	27.21 QP	46.00	-18.79	1.02 V	123	4.94	22.27
10	600.00	26.41 QP	46.00	-19.59	1.00 V	187	1.64	24.77

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
INPUT POWER	120Vac, 60 Hz	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 63%RH 965hPa	DETECTOR FUNCTION	Quasi-Peak
TEST MODE	Mode 2	TESTED BY	Wen Yu

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	40.68	25.50 QP	40.00	-14.50	1.95 H	148	12.25	13.25
2	54.24	26.17 QP	40.00	-13.83	2.41 H	250	11.83	14.34
3	81.36	31.85 QP	40.00	-8.15	2.45 H	113	19.93	11.92
4	122.05	29.49 QP	43.50	-14.01	1.82 H	86	15.54	13.95
5	135.60	28.24 QP	43.50	-15.26	1.02 H	24	13.51	14.73
6	162.73	32.80 QP	43.50	-10.70	2.31 H	11	17.01	15.79
7	189.85	34.95 QP	43.50	-8.55	2.20 H	20	21.18	13.77
8	216.97	36.07 QP	46.00	-9.93	1.18 H	324	22.26	13.81
9	244.09	36.29 QP	46.00	-9.71	1.15 H	285	21.16	15.13
10	284.76	33.65 QP	46.00	-12.35	1.54 H	25	17.10	16.55
11	745.84	37.83 QP	46.00	-8.17	1.18 H	323	9.49	28.34
12	771.92	38.20 QP	46.00	-7.80	1.24 H	54	9.09	29.11
13	800.08	40.25 QP	46.00	-5.75	1.22 H	321	10.31	29.94
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	**40.68**	**39.70 QP**	**40.00**	**-0.30**	**1.00 V**	**234**	**26.45**	**13.25**
2	54.24	36.71 QP	40.00	-3.29	1.29 V	19	22.37	14.34
3	81.36	32.92 QP	40.00	-7.08	1.37 V	19	21.00	11.92
4	86.22	25.09 QP	40.00	-14.91	1.49 V	336	13.03	12.06
5	122.04	25.00 QP	43.50	-18.50	1.02 V	11	11.05	13.95
6	135.60	28.20 QP	43.50	-15.30	1.02 V	21	13.47	14.73
7	189.85	29.07 QP	43.50	-14.43	1.00 V	19	15.30	13.77
8	379.69	36.20 QP	46.00	-9.80	1.54 V	24	15.90	20.30
9	474.62	28.20 QP	46.00	-17.80	1.54 V	25	5.93	22.27
10	600.00	27.82 QP	46.00	-18.18	1.00 V	201	3.05	24.77

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 OPERATING FREQUENCY MEASUREMENT

4.3.1 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated DATE	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 09, 2008	Dec. 08, 2009

NOTE:

1.The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

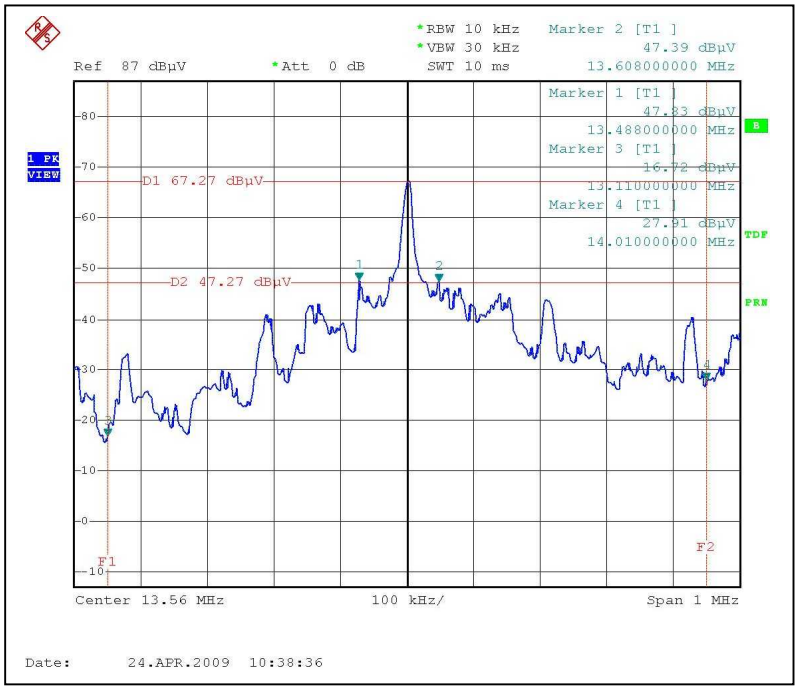
4.3.2 EUT OPERATING CONDITION

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

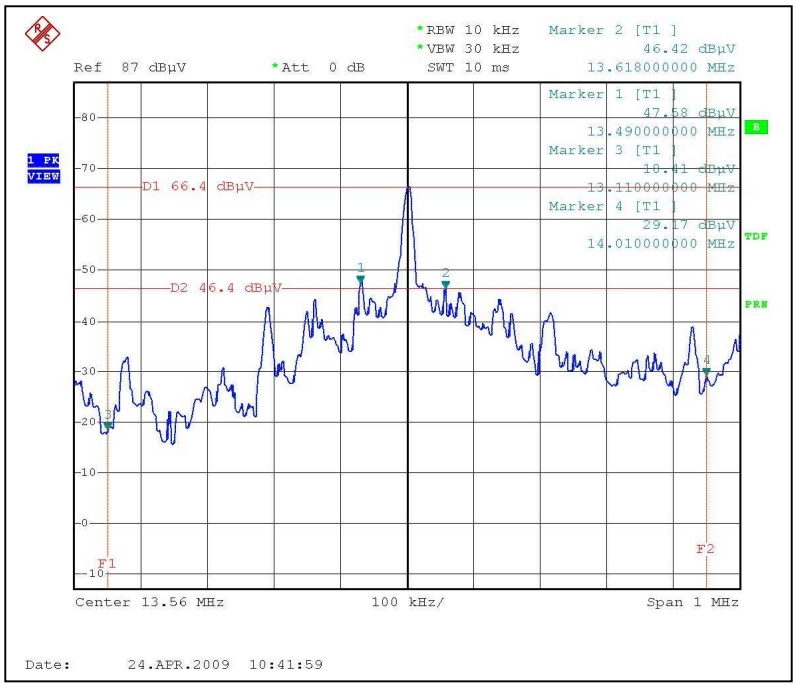
4.3.3 TEST RESULTS

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

For RJ-45 to USB cable Mode:



For RJ-45 to RJ12 cable 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 DATE	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 09, 2008	Dec. 08, 2009

NOTE:

1.The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

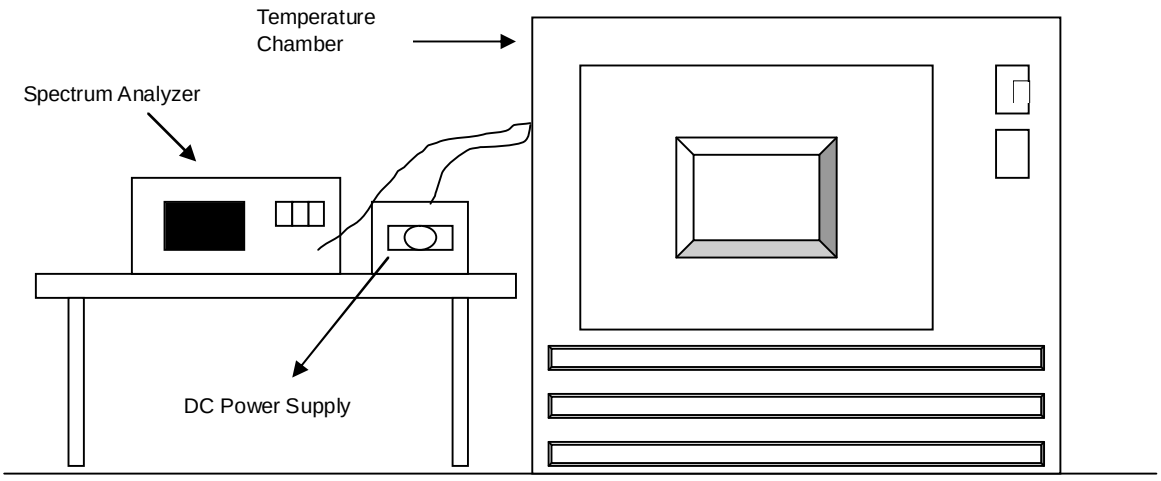
4.4.3 TEST PROCEDURE

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 : ± 0.01%			
Temp. (℃)	Power supply (VAC)	2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	120	13.56083	0.006121	13.56082	0.006047	13.56085	0.006268
40	120	13.56085	0.006268	13.56084	0.006195	13.56081	0.005973
30	120	13.56074	0.005457	13.56077	0.005678	13.56074	0.005457
20	132	13.56084	0.006195	13.56088	0.006490	13.56089	0.006563
	120	13.56083	0.006121	13.56085	0.006268	13.56086	0.006342
	108	13.56085	0.006268	13.56087	0.006416	13.56084	0.006195
10	120	13.56087	0.006416	13.56082	0.006047	13.56081	0.005973
0	120	13.56088	0.006490	13.56083	0.006121	13.56087	0.006416
-10	120	13.56092	0.006785	13.56090	0.006637	13.56082	0.006047
-20	120	13.56094	0.006932	13.56092	0.006785	13.56091	0.006711

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 INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, 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, NVLAP
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA, CSA
R.O.C.	TAF, BSMI, NCC
Netherlands	Telefication
Singapore	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:
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab:
Tel: 886-3-3183232
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.

6 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.

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