

CANADA TEST REPORT

REPORT NO.: IC950424H01

MODEL NO.: C-UAQ-55

RECEIVED: April 24, 2006

TESTED: April 26, 2006

ISSUED: April 28, 2006

APPLICANT: LOGITECH FAR EAST LTD.

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1 CERTIFICATION

PRODUCT : 2.4GHz Transceiver
BRAND NAME : Logitech
MODEL NO : C-UAQ-55
TESTED: April 26, 2006
APPLICANT : LOGITECH FAR EAST LTD.
STANDARDS : 47 CFR Part 15, Subpart C (Section 15.249),
ANSI C63.4 : 2003
Canada RSS-210 issue 6
Canada RSS-Gen issue 1

The above equipment (Model: C-UAQ-55) 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 : Midoli Peng , **DATE:** April 28, 2006
(Midoli Peng)

TECHNICAL ACCEPTANCE : Hank Chung , **DATE:** April 28, 2006
Responsible for RF (Hank Chung)

APPROVED BY : May Chen , **DATE:** April 28, 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 ; RSS-210; RSS-Gen					
Standard Section			Test Type and Limit	Result	REMARK
RSS-210	RSS-Gen	47 CFR Part 15			
	7.2.2	15.207	AC Power Conducted Emission	PASS	Minimum passing margin is -14.98 dB at 0.176 MHz
A2.9	-	15.249	Transmitter Radiated Emissions FCC Limit: Table 15.209 RSS-210 Limit: Table 2	PASS	Minimum passing margin is -6.6dB at 2441.00MHz
		-	Receiver Radiated Emissions RSS-210 Limit: Table 2	PASS	Minimum passing margin is -7.1dB at 9616.00MHz
A2.9	-	15.249	Band Edge Measurement Limit: 50 dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	2.4GHz Transceiver
MODEL NO.	C-UAQ-55
FCC ID	4418A-212480
POWER SUPPLY	DC 5V from host equipment
MODULATION TYPE	GFSK
CARRIER FREQUENCY OF EACH CHANNEL	2402MHz ~ 2479MHz
NUMBER OF CHANNEL	78
ANTENNA TYPE	PCB meander line strip antenna with 0.67dBi antenna gain
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

1. 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

Seventy-eight channels are provided in this EUT.

Channel	Frequency (MHz)										
1	2402	15	2416	29	2430	43	2444	57	2458	71	2472
2	2403	16	2417	30	2431	44	2445	58	2459	72	2473
3	2404	17	2418	31	2431	45	2446	59	2460	73	2474
4	2405	18	2419	32	2433	46	2447	60	2461	74	2475
5	2406	19	2420	33	2434	47	2448	61	2462	75	2476
6	2407	20	2421	34	2435	48	2449	62	2463	76	2477
7	2408	21	2422	35	2436	49	2450	63	2464	77	2478
8	2409	22	2423	36	2437	50	2451	64	2465	78	2479
9	2410	23	2424	37	2438	51	2452	65	2466		
10	2411	24	2425	38	2439	52	2453	66	2467		
11	2412	25	2426	39	2440	53	2454	67	2468		
12	2413	26	2427	40	2441	54	2455	68	2469		
13	2414	27	2428	41	2442	55	2456	69	2470		
14	2415	28	2429	42	2443	56	2457	70	2471		

NOTE:

1. Below 1 GHz, the channel 1, 40, and 78 were pre-tested in chamber. The channel 78, worst case one, was chosen for final test.
2. Below 1 GHz, the receiving mode had show equal or better than Tx mode during the pre-scan and hence the Tx mode data is re-used for Receiving-mode worst-case data.
3. Above 1 GHz, the channel 1, 40, and 78 were tested individually.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is the transmitter part of an 2.4GHz Transceiver. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

47 CFR Part 15, Subpart C (Section 15.249)

ANSI C63.4: 2003

Canada RSS-210 issue 6

Canada RSS-Gen issue 1

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

3.4 DESCRIPTION OF SUPPORT UNITS

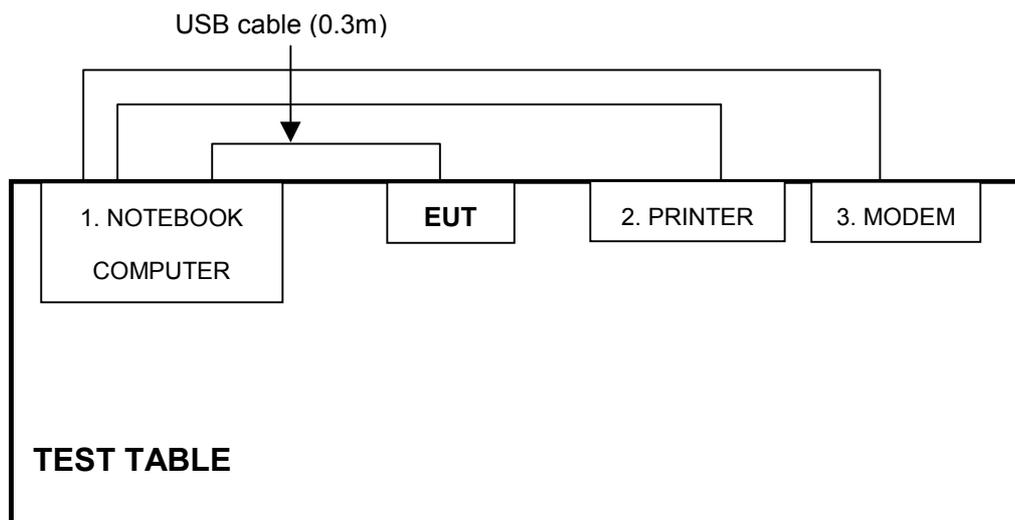
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	NOTEBOOK COMPUTER	Dell	PP01L	TW-09c748-12800-165-3171	DoC
2	PRINTER	HP	C2642A	MY79F1C3MZ	B94C2642X
3	MODEM	ACEEX	1414	0206026775	IFAXDM1414

No.	Signal cable description
1	NA
2	1.8 m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core.
3	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.

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

3.5 CONFIGURATION OF SYSTEM UNDER TEST



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

4 TEST PROCEDURES AND RESULTS

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. 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

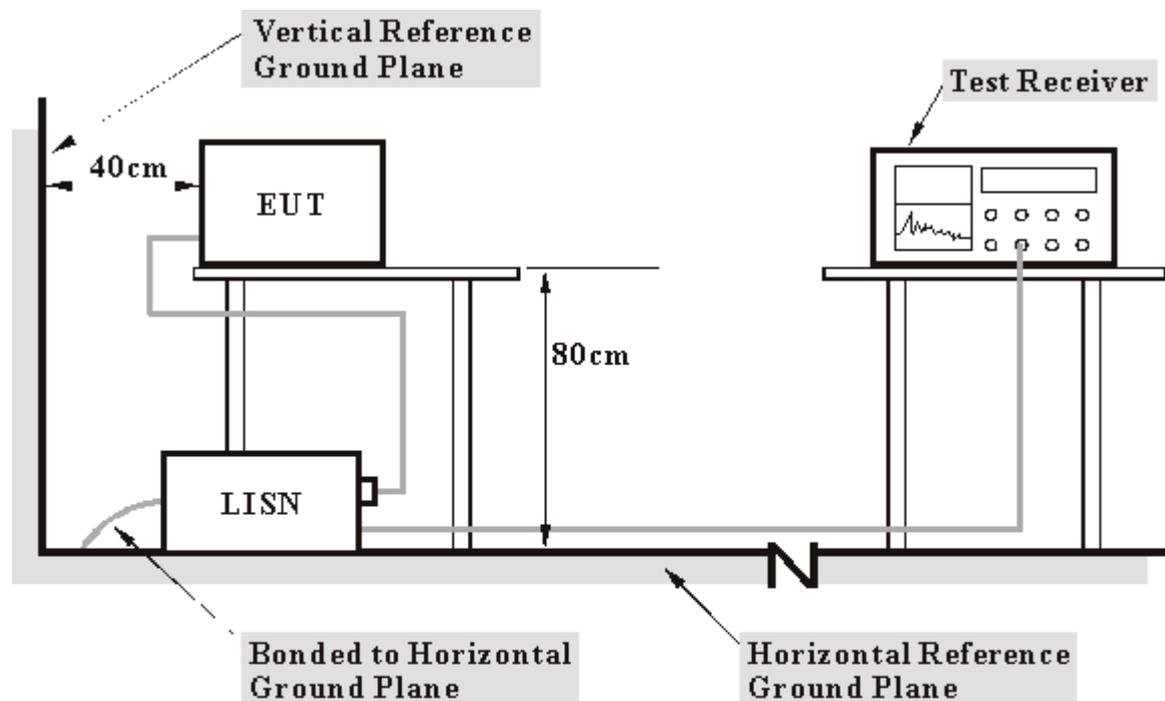
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Sep. 19, 2006
Line-Impedance Stabilization Network(for EUT)	ENV-216	100071	Nov. 10, 2006
ROHDE & SCHWARZ LISN	KNW-407	8/1395/12	Jul. 19, 2006
RF Signal Cable	RG233/U	Cable_CA_02	Dec. 10, 2006
Terminator(for KYORITSU)	50	2	Oct. 08, 2006
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

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



- Note:**
- Support units were connected to second LISN.
 - 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.

4.1.5 EUT OPERATING CONDITIONS

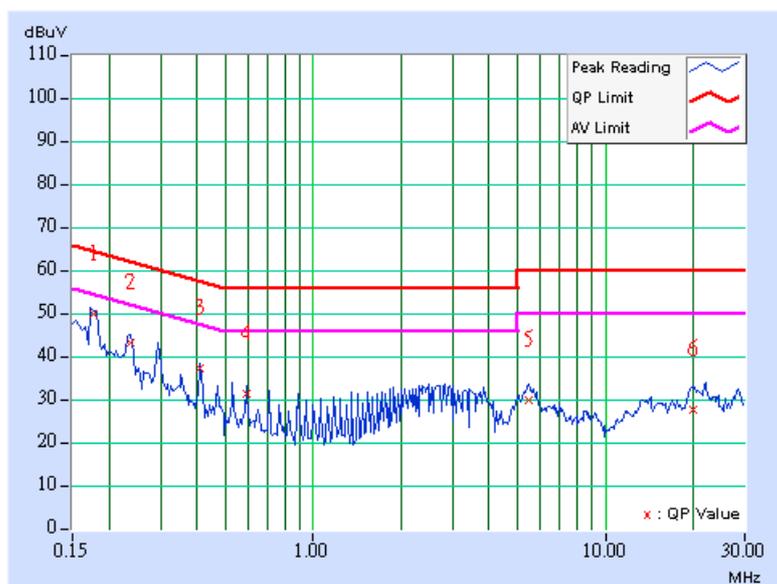
- a. Connected the EUT to test board and placed on the testing table.
- b. The support unit 1 (Notebook computer) ran a test program “Wireless USB Certification-Bridge Control” to enable EUT under transmission condition continuously at specific channel frequency.

4.1.6 TEST RESULTS

INPUT POWER (SYSTEM)	120Vac, 60 Hz	6DB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 65%RH, 969 hPa	PHASE	Line (L)
TESTED BY	Sky Liao		

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	0.176	9.60	40.07	-	49.67	-	64.65	54.65	-14.98	-
2	0.236	9.60	33.31	-	42.91	-	62.24	52.24	-19.33	-
3	0.412	9.60	27.47	-	37.07	-	57.61	47.61	-20.54	-
4	0.591	9.60	21.52	-	31.12	-	56.00	46.00	-24.88	-
5	5.488	9.75	20.06	-	29.81	-	60.00	50.00	-30.19	-
6	19.887	10.10	17.61	-	27.71	-	60.00	50.00	-32.29	-

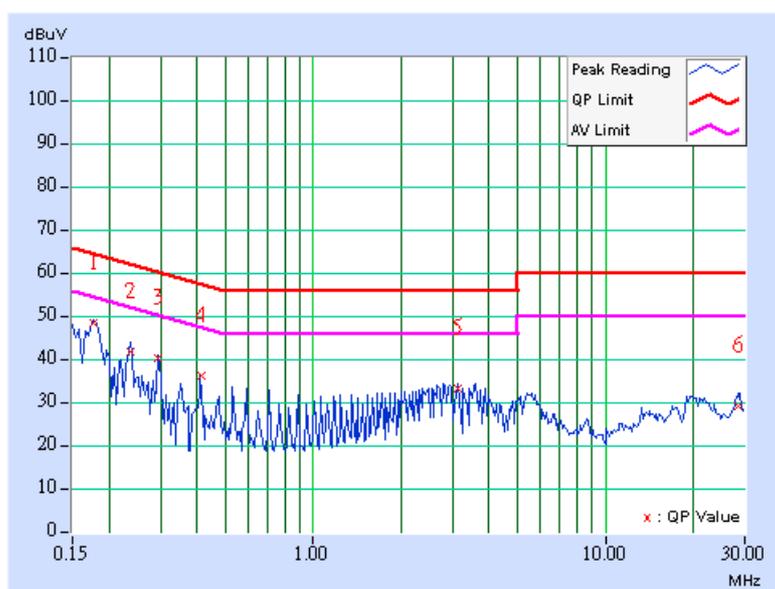
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = 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, 65%RH, 969 hPa	PHASE	Neutral (N)
TESTED BY	Sky Liao		

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	0.177	9.60	38.51	-	48.11	-	64.61	54.61	-16.50	-
2	0.236	9.60	31.78	-	41.38	-	62.24	52.24	-20.86	-
3	0.295	9.60	30.32	-	39.92	-	60.40	50.40	-20.48	-
4	0.414	9.60	26.02	-	35.62	-	57.56	47.56	-21.94	-
5	3.132	9.70	23.06	-	32.76	-	56.00	46.00	-23.24	-
6	28.336	10.10	19.15	-	29.25	-	60.00	50.00	-30.75	-

- 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 MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

According to 15.249 the field strength of emissions from intentional radiators operated under these frequencies bands shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (dBuV/m)	
	Peak	Average
2400 ~ 2483.5	114	94
	Field Strength of Harmonics (dBuV/m)	
	74	54

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 (RSS-210 table 2&3) 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 UNTIL
ADVANTEST Spectrum Analyzer	R3271A	85060311	July 07, 2006
HP Pre_Amplifier	8449B	3008A01922	Oct. 02, 2006
ROHDE & SCHWARZ Test Receiver	ESCS30	100287	Dec. 08, 2006
CHASE Broadband Antenna	VULB9168	138	Dec. 21, 2006
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 11, 2006
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 05, 2007
SCHWARZBECK Biconical Antenna	VHBA9123	459	Jun. 26, 2006
SCHWARZBECK Periodic Antenna	UPA6108	1148	Jun. 26, 2006
RF Switches (ARNITSU)	CS-201	1565157	NA
RF CABLE (Chaintek) 1GHz-20GHz	SF102	22054-2	Nov. 16. 2006
RF Cable(RICHTEC)	9913-30M	STCCAB-30M- 1GHz-021	Jul. 16, 2006
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 Periodic Antenna) and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The horn antenna and HP preamplifier (model: 8449B) 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 4824-3.
 7. The following table is for the measurement uncertainty, which is calculated as per the document 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
Radiated emissions (30MHz-1GHz)	2.98 dB
Radiated emissions (1GHz ~18GHz)	2.21 dB
Radiated emissions (18GHz ~20GHz)	1.88 dB

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 meter 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 Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

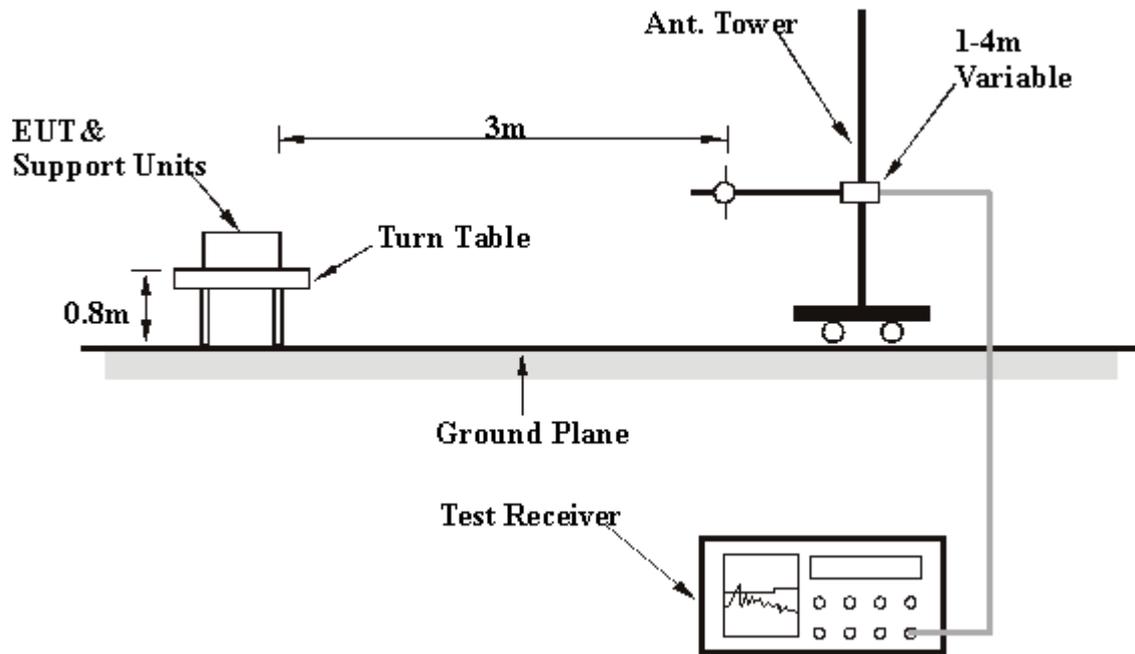
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.5

4.2.7 TEST RESULTS - FOR TRANSMITTER PART

MODE	Channel 78	INPUT POWER	120Vac, 60 Hz
FREQUENCY RANGE	30-1000 MHz	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	22 deg. C, 72%RH, 970 hPa	TESTED BY	Sky Liao

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	240.01	31.10 QP	46.00	-14.90	1.28 H	327	17.70	13.30
2	400.00	31.00 QP	46.00	-15.00	1.28 H	127	12.00	19.00
3	480.04	26.50 QP	46.00	-19.50	1.00 H	74	5.30	21.20
4	599.99	28.70 QP	46.00	-17.30	1.00 H	59	4.30	24.50
5	720.05	32.10 QP	46.00	-13.90	1.17 H	16	5.70	26.40
6	799.99	30.80 QP	46.00	-15.20	1.54 H	187	3.30	27.60
7	960.07	28.00 QP	54.00	-26.00	1.31 H	51	-1.90	29.90

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	240.01	26.40 QP	46.00	-19.60	1.00 V	252	13.10	13.30
2	399.99	29.50 QP	46.00	-16.50	1.00 V	351	10.40	19.00
3	480.04	27.60 QP	46.00	-18.40	1.26 V	21	6.40	21.20
4	599.99	27.50 QP	46.00	-18.50	1.11 V	122	3.10	24.50
5	720.04	29.80 QP	46.00	-16.20	1.01 V	20	3.40	26.40
6	960.05	27.90 QP	54.00	-26.10	1.22 V	151	-2.00	29.90

- 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.

MODE	Channel 1	INPUT POWER	120Vac, 60 Hz
FREQUENCY RANGE	1000~25000MHz	DETECTOR FUNCTION & BANDWIDTH	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	22 deg. C, 72%RH, 970 hPa	TESTED BY	Sky Liao

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	2390.00	47.30 PK	74.00	-26.70	1.02 H	303	17.60	29.70
1	2390.00	39.10 AV	54.00	-14.90	1.02 H	303	9.40	29.70
2	*2402.00	95.30 PK	114.00	-18.70	1.02 H	303	65.50	29.80
2	*2402.00	87.10 AV	94.00	-6.90	1.02 H	303	57.30	29.80
3	4804.00	46.80 PK	74.00	-27.20	1.27 H	338	11.80	35.00
3	4804.00	38.60 AV	54.00	-15.40	1.27 H	338	3.60	35.00
4	7206.00	54.00 PK	74.00	-20.00	1.38 H	253	13.50	40.40
4	7206.00	45.80 AV	54.00	-8.20	1.38 H	253	5.30	40.40

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	2390.00	47.40 PK	74.00	-26.60	1.00 V	332	17.70	29.70
1	2390.00	39.20 AV	54.00	-14.80	1.00 V	332	9.50	29.70
2	*2402.00	95.40 PK	114.00	-18.60	1.00 V	332	65.60	29.80
2	*2402.00	87.20 AV	94.00	-6.80	1.00 V	332	57.40	29.80
3	4804.00	47.40 PK	74.00	-26.60	1.10 V	275	12.40	35.00
3	4804.00	39.20 AV	54.00	-14.80	1.10 V	275	4.20	35.00
4	7206.00	53.90 PK	74.00	-20.10	1.12 V	250	13.40	40.40
4	7206.00	45.80 AV	54.00	-8.20	1.12 V	250	5.30	40.40

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. Margin value = Emission level - Limit value
4. “ * “ : Fundamental frequency
5. The other emission levels were very low against the limit.

MODE	Channel 40	INPUT POWER	120Vac, 60 Hz
FREQUENCY RANGE	1000~25000MHz	DETECTOR FUNCTION & BANDWIDTH	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	22 deg. C, 72%RH, 970 hPa	TESTED BY	Sky Liao

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	*2441.00	95.60 PK	114.0	-18.40	1.03 H	300	65.70	29.90
1	*2441.00	87.40 AV	94.0	-6.60	1.03 H	300	57.50	29.90
2	4882.00	47.50 PK	74.00	-26.50	1.20 H	321	12.10	35.30
2	4882.00	39.30 AV	54.00	-14.70	1.20 H	321	3.90	35.30
3	7323.00	54.10 PK	74.00	-19.90	1.53 H	255	13.40	40.70
3	7323.00	45.90 AV	54.00	-8.10	1.53 H	255	5.20	40.70

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	*2441.00	95.10 PK	114.0	-18.90	1.00 V	333	65.20	29.90
1	*2441.00	86.90 AV	94.0	-7.10	1.00 V	333	57.00	29.90
2	4882.00	48.50 PK	74.00	-25.50	1.05 V	264	13.10	35.30
2	4882.00	40.30 AV	54.00	-13.70	1.05 V	264	4.90	35.30
3	7323.00	54.00 PK	74.00	-20.00	1.10 V	225	13.30	40.70
3	7323.00	45.80 AV	54.00	-8.20	1.10 V	225	5.10	40.70

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. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

MODE	Channel 78	INPUT POWER	120Vac, 60 Hz
FREQUENCY RANGE	1000~25000MHz	DETECTOR FUNCTION & BANDWIDTH	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	22 deg. C, 72%RH, 970 hPa	TESTED BY	Sky Liao

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	*2479.00	95.40 PK	114.0	-18.60	1.00 H	300	65.30	30.10
1	*2479.00	87.20 AV	94.0	-6.80	1.00 H	300	57.10	30.10
2	2483.50	49.00 PK	74.00	-25.00	1.00 H	300	18.90	30.10
2	2483.50	40.80 AV	54.00	-13.20	1.00 H	300	10.70	30.10
3	4958.00	47.60 PK	74.00	-26.40	1.00 H	20	11.90	35.70
3	4958.00	39.40 AV	54.00	-14.60	1.00 H	20	3.70	35.70
4	7437.00	53.50 PK	74.00	-20.50	1.61 H	258	12.50	40.90
4	7437.00	45.30 AV	54.00	-8.70	1.61 H	258	4.30	40.90

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	*2479.00	93.70 PK	114.0	-20.30	1.22 V	328	63.60	30.10
1	*2479.00	85.50 AV	94.0	-8.50	1.22 V	328	55.40	30.10
2	2483.50	47.30 PK	74.00	-26.70	1.22 V	328	17.20	30.10
2	2483.50	39.10 AV	54.00	-14.90	1.22 V	328	9.00	30.10
3	4958.00	49.20 PK	74.00	-24.80	1.06 V	270	13.50	35.70
3	4958.00	41.00 AV	54.00	-13.00	1.06 V	270	5.30	35.70
4	7437.00	54.00 PK	74.00	-20.00	1.08 V	244	13.00	40.90
4	7437.00	45.80 AV	54.00	-8.20	1.08 V	244	4.80	40.90

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. Margin value = Emission level - Limit value
4. “ * “ : Fundamental frequency
5. The other emission levels were very low against the limit.

4.2.8 TEST RESULTS - FOR RECEIVER PART

MODE	Channel 78	INPUT POWER	120Vac, 60 Hz
FREQUENCY RANGE	30-1000 MHz	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	22 deg. C, 72%RH, 970 hPa	TESTED BY	Sky Liao

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	240.01	31.10 QP	46.00	-14.90	1.28 H	327	17.70	13.30
2	400.00	31.00 QP	46.00	-15.00	1.28 H	127	12.00	19.00
3	480.04	26.50 QP	46.00	-19.50	1.00 H	74	5.30	21.20
4	599.99	28.70 QP	46.00	-17.30	1.00 H	59	4.30	24.50
5	720.05	32.10 QP	46.00	-13.90	1.17 H	16	5.70	26.40
6	799.99	30.80 QP	46.00	-15.20	1.54 H	187	3.30	27.60
7	960.07	28.00 QP	54.00	-26.00	1.31 H	51	-1.90	29.90

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	240.01	26.40 QP	46.00	-19.60	1.00 V	252	13.10	13.30
2	399.99	29.50 QP	46.00	-16.50	1.00 V	351	10.40	19.00
3	480.04	27.60 QP	46.00	-18.40	1.26 V	21	6.40	21.20
4	599.99	27.50 QP	46.00	-18.50	1.11 V	122	3.10	24.50
5	720.04	29.80 QP	46.00	-16.20	1.01 V	20	3.40	26.40
6	960.05	27.90 QP	54.00	-26.10	1.22 V	151	-2.00	29.90

- 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.

MODE	Channel 1	INPUT POWER	120Vac, 60 Hz
FREQUENCY RANGE	1000~12500MHz	DETECTOR FUNCTION & BANDWIDTH	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	22 deg. C, 72%RH, 970 hPa	TESTED BY	Sky Liao

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	4804.00	47.20 PK	74.00	-26.80	1.00 H	10	12.20	35.00
1	4804.00	39.20 AV	54.00	-14.80	1.00 H	10	4.20	35.00
2	9616.00	54.40 PK	74.00	-19.60	1.05 H	22	10.50	43.90
2	9616.00	46.50 AV	54.00	-7.50	1.05 H	22	2.60	43.90

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	4808.00	45.70 PK	74.00	-28.30	1.00 V	117	10.60	35.00
1	4808.00	37.90 AV	54.00	-16.10	1.00 V	117	2.80	35.00
2	9616.00	54.90 PK	74.00	-19.10	1.20 V	360	11.00	43.90
2	9616.00	46.90 AV	54.00	-7.10	1.20 V	360	3.00	43.90

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.

MODE	Channel 40	INPUT POWER	120Vac, 60 Hz
FREQUENCY RANGE	1000~12500MHz	DETECTOR FUNCTION & BANDWIDTH	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	22 deg. C, 72%RH, 970 hPa	TESTED BY	Sky Liao

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	4886.00	47.20 PK	74.00	-26.80	1.00 H	14	11.80	35.40
1	4886.00	39.40 AV	54.00	-14.60	1.00 H	14	4.00	35.40
2	9772.00	54.40 PK	74.00	-19.60	1.18 H	48	10.80	43.60
2	9772.00	46.50 AV	54.00	-7.50	1.18 H	48	2.90	43.60

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	4886.00	45.80 PK	74.00	-28.20	1.12 V	102	10.40	35.40
1	4886.00	37.80 AV	54.00	-16.20	1.12 V	102	2.40	35.40
2	9772.00	54.50 PK	74.00	-19.50	1.28 V	266	10.90	43.60
2	9772.00	46.70 AV	54.00	-7.30	1.28 V	266	3.10	43.60

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.

MODE	Channel 78	INPUT POWER	120Vac, 60 Hz
FREQUENCY RANGE	1000~12500MHz	DETECTOR FUNCTION & BANDWIDTH	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	22 deg. C, 72%RH, 970 hPa	TESTED BY	Sky Liao

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	4962.00	47.00 PK	74.00	-27.00	1.00 H	10	11.30	35.70
1	4962.00	39.20 AV	54.00	-14.80	1.00 H	10	3.50	35.70
2	9924.00	53.60 PK	74.00	-20.40	1.22 H	28	10.30	43.30
2	9924.00	45.90 AV	54.00	-8.10	1.22 H	28	2.60	43.30

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	4962.00	37.90 PK	74.00	-36.10	1.30 V	330	2.20	35.70
1	4962.00	45.70 AV	54.00	-8.30	1.30 V	330	10.00	35.70
2	9924.00	53.90 PK	74.00	-20.10	1.15 V	254	10.60	43.30
2	9924.00	46.10 AV	54.00	-7.90	1.15 V	254	2.80	43.30

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 20dB BANDWIDTH MEASUREMENT

1.5.1 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.

1.5.2 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 100kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

1.5.3 TEST SETUP



1.5.4 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

1.5.5 TEST RESULTS

INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	22deg. C, 72%RH, 970hPa
TESTED BY	Sky Liao		

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
1	2402	1.268
40	2441	1.268
78	2479	1.268

4.4 BAND EDGES MEASUREMENT

4.4.1 LIMITS OF BAND EDGES MEASUREMENT

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

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.
- 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

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

4.4.4 DEVIATION FROM TEST STANDARD

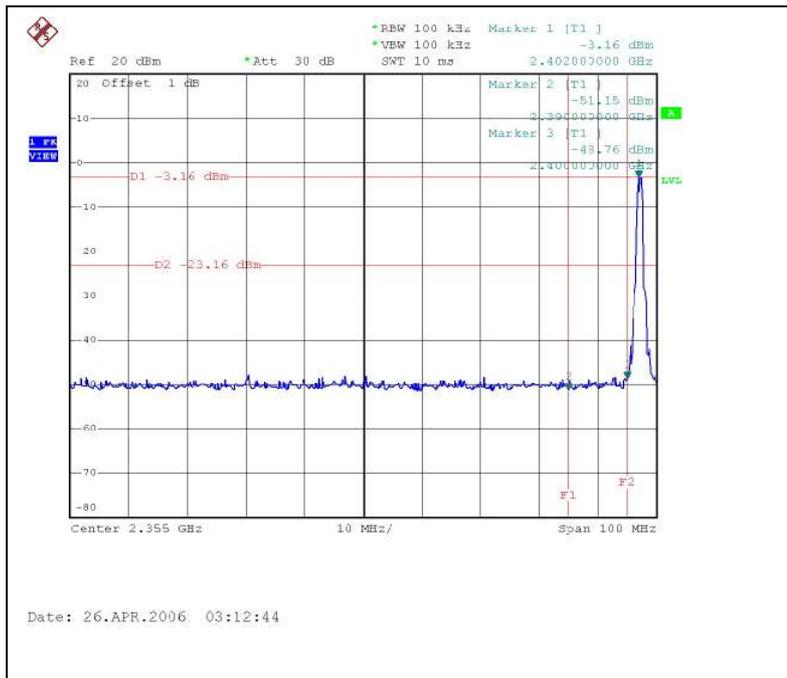
No deviation

4.4.5 EUT OPERATING CONDITION

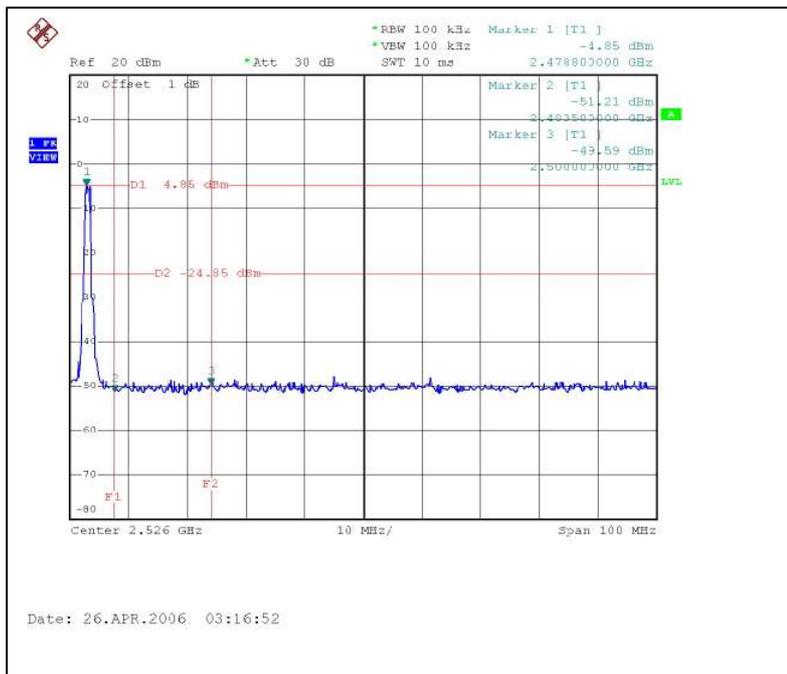
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.4.6 TEST RESULTS

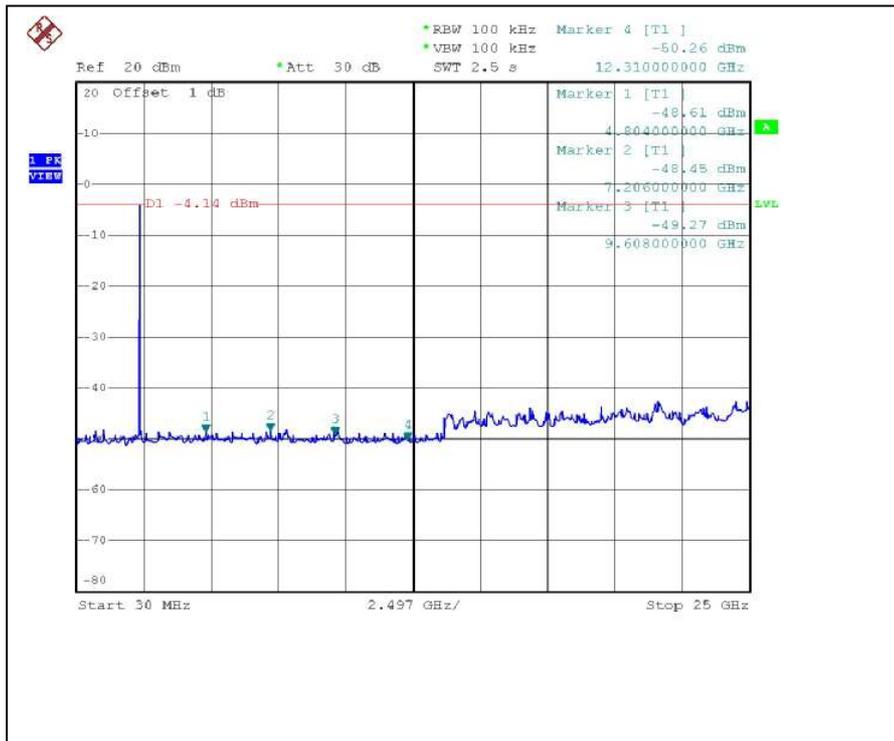
Emissions radiated outside of the specified frequency bands, please refer pages form 14 to 26 for met the requirement of the general radiated emission limits in § 15.209. CH1



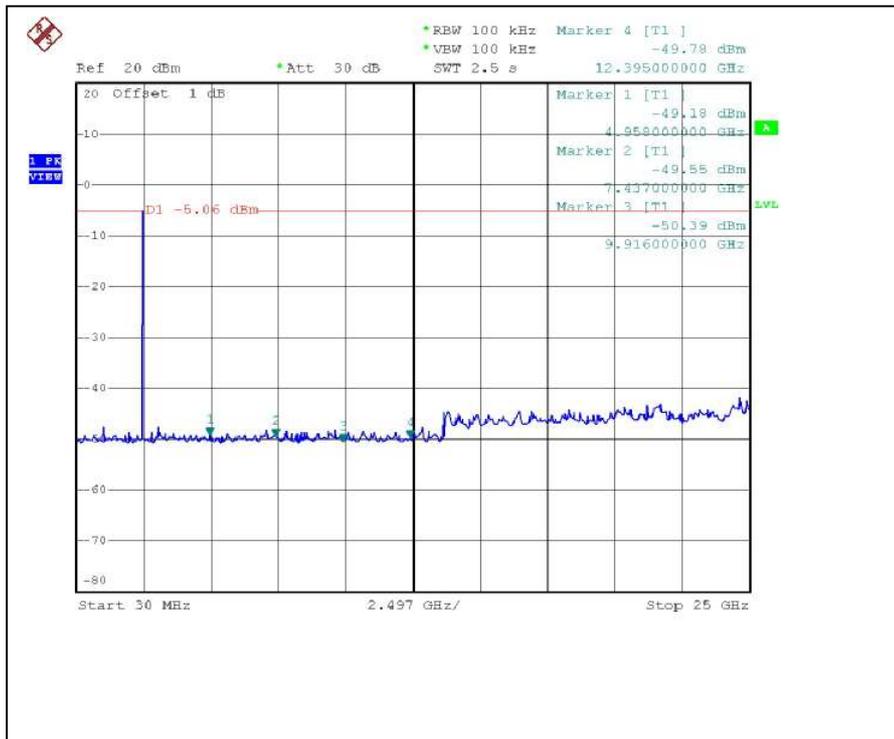
CH78



CH1



CH78



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, DGT
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:

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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.