



FCC TEST REPORT

REPORT NO.: RF980622H08A
MODEL NO.: O-R0002
FCC ID: TOB-OR0002
RECEIVED: June 14, 2010
TESTED: June 15 to 30, 2010
ISSUED: July 08, 2010

APPLICANT: Logitech Inc. - Canada

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1 CERTIFICATION

PRODUCT : Blaster Receiver
BRAND NAME : Logitech
MODEL NO. : O-R0002
TESTED: June 15 to 30, 2010
APPLICANT : Logitech Inc. - Canada
TEST ITEM: R&D SAMPLE
STANDARDS : 47 CFR Part 15, Subpart C (Section 15.247)
ANSI C63.4-2003

The above equipment (Model: O-R0002) 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 :  , **DATE:** July 08, 2010
(Claire Kuan, Specialist)

TECHNICAL ACCEPTANCE :  , **DATE:** July 08, 2010
(Hank Chung, Deputy Manager)

APPROVED BY :  , **DATE:** July 08, 2010
(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 Section	Test Type and Limit	Result	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit Minimum passing margin is -11.57dB at 0.345 MHz
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit
15.247(c)	Transmitter Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is -2.5 dB at 2381.38 MHz
15.203	Antenna Requirement	PASS	No antenna connector is used.

NOTE: This report is prepared for FCC class II permissive change. Only conducted emission, radiated emission and maximum peak output power were presented in this test report.

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
Radiated emissions (30MHz-1GHz) – Site B	4.00 dB
Radiated emissions (1GHz ~18GHz) – Site C	2.49 dB
Radiated emissions (18GHz ~20GHz) – Site C	2.70 dB



3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Blaster Receiver
MODEL NO.	O-R0002
FCC ID	TOB-OR0002
POWER SUPPLY	DC 5.5V from power adapter
MODULATION TYPE	O-QPSK
CARRIER FREQUENCY OF EACH CHANNEL	2405MHz ~ 2480MHz
NUMBER OF CHANNEL	16
OUTPUT POWER	2.0mW
ANTENNA TYPE	PCB printed quarter wave antenna (Antenna Gain : 2.91dBi)
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	Power adapter Mini Blaster and IR Cable (shielded, 2.57m) x2

NOTE:

1. This report is prepared for FCC class II permissive change. The difference compared with the Report No.: RF980622H08 design is as the following information:

u Chang the layout and component as following table:

-	PA2.4 BoM (New PCB)	MP BoM (Original PCB)	Remark
PCB	PA2.4	PA2.1	Change
J5	0pcs	1pcs	Del
C2	GJM1555C1H1R8CB01D	GJM1555C1H100JB01D	Change
C21	LQG15HS6N2S02D	0pcs	Add

u Chang the antenna as following table:

Original		
Antenna Type	Antenna Connector	Gain (dBi)
PCB printed quarter wave antenna	NA	2.91
Newly		
Antenna Type	Antenna Connector	Gain (dBi)
PCB printed quarter wave antenna	NA	2.91

Note: The antenna changed same type but the dimensions are slightly different.



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2. According to above conditions, only conducted emission, radiated emission test and maximum peak output power test item needs to be performed. And all data was verified to meet the requirements.

3. The EUT must be supplied with a power adapter as following table:

Brand:	Logitech
Model No.:	KSAA0550080W1US
Input power :	100-240V 50/60Hz 0.18A
Output power :	5.5V 0.8A

4. 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

Sixteen channels are provided to this EUT.

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2405	4	2425	8	2445	12	2465
1	2410	5	2430	9	2450	13	2470
2	2415	6	2435	10	2455	14	2475
3	2420	7	2440	11	2460	15	2480

NOTE:

1. Below 1 GHz, the channel 0, and 15 were pre-tested in chamber. The channel 0, worst case one, was chosen for final test.
2. Above 1 GHz, the channel 0 and 15 were tested individually.



3.3 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

EUT configure mode	Applicable to				Description
	PLC	RE<1G	RE [≥] 1G	APCM	
-	√	√	√	√	NA

Where PLC: Power Line Conducted Emission

RE<1G: Radiated Emission below 1GHz

RE[≥]1G: Radiated Emission above 1GHz

APCM: Antenna Port Conducted Measurement

Power Line Conducted Emission Test:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
0 to 15	0	O-QPSK	0.25

Radiated Emission Test (Below 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
0 to 15	0	O-QPSK	0.25

Radiated Emission Test (Above 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
0 to 15	0, 15	O-QPSK	0.25

Antenna Port Conducted Measurement:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
0 to 15	0, 7, 15	O-QPSK	0.25



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TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE ³ 1G	27deg. C, 66%RH, 1014 hPa	120Vac, 60Hz	Kent Liu
RE<1G	24deg. C, 65%RH, 1014 hPa	120Vac, 60Hz	Andy Ho
PLC	25deg. C, 64%RH, 1014 hPa	120Vac, 60Hz	Timmy Hu
APCM	25deg. C, 60%RH, 1014 hPa	120Vac, 60Hz	Kent Liu



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3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

47 CFR Part 15, Subpart C. (15.247)

ANSI C63.4 : 2003

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

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of 47 CFR Part 15, Subpart B, Class B (DoC). The test report has been issued separately.



3.5 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.

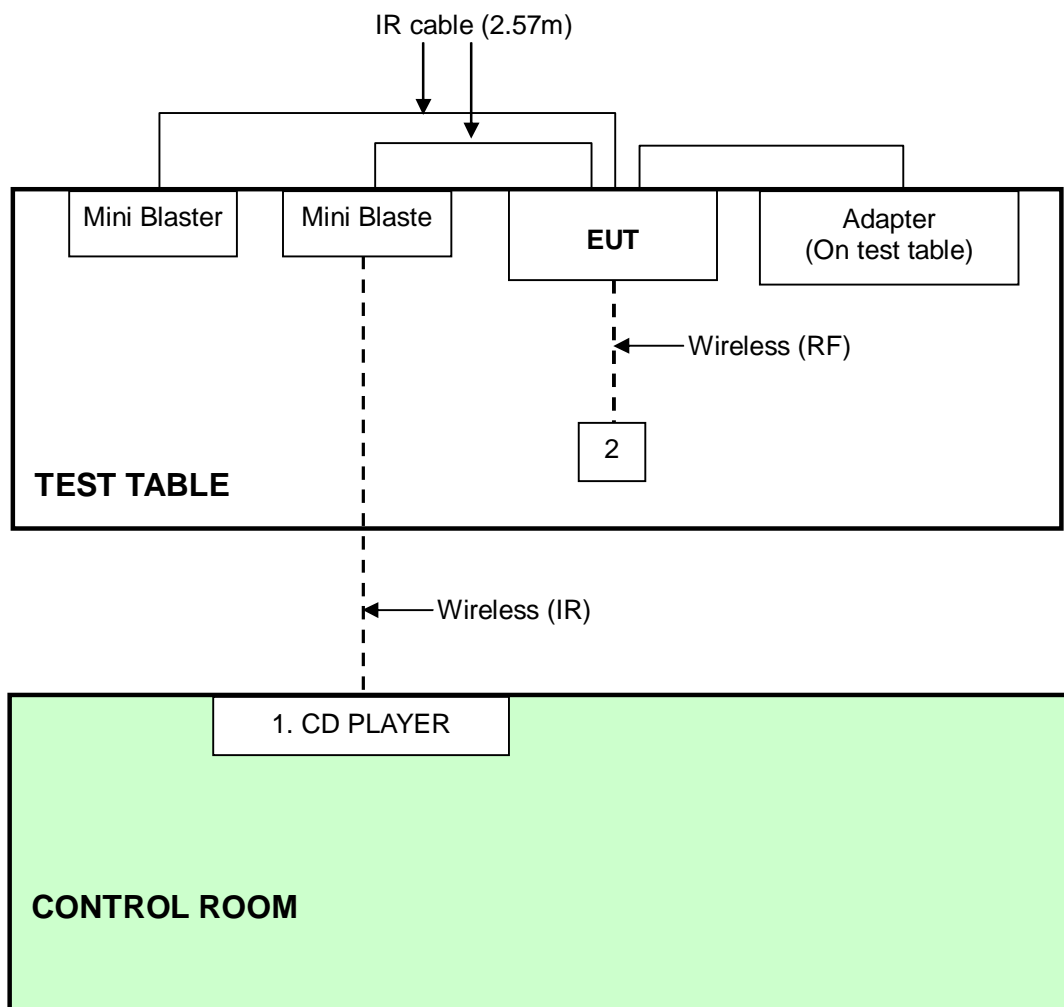
No.	Product	Brand	Model No.	Serial No.	FCC ID
1	CD PLAYER	PHILIPS	MCM240/21T	NA	NA
2	Remote control H900	Logitech	N-R0001	NA	NA

No.	Signal cable description
1	NA
2	NA

NOTE: All power cords of the above support units are non-shielded (1.8m).

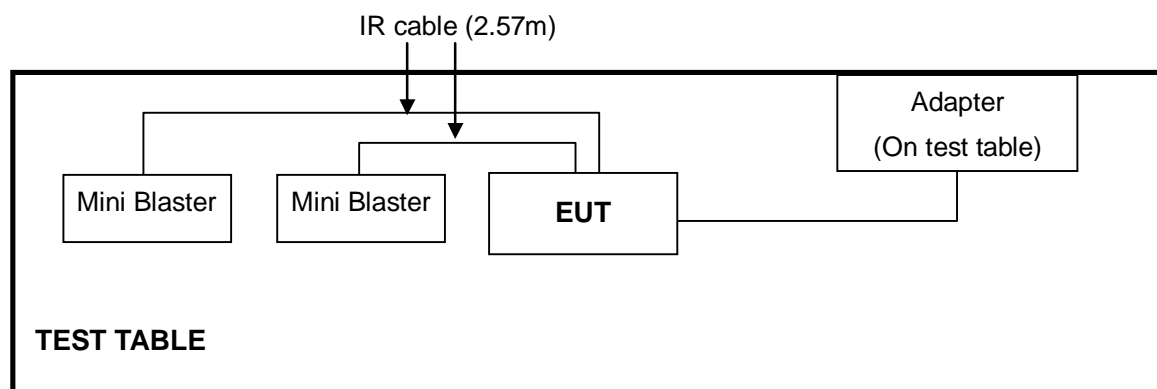
3.6 CONFIGURATION OF SYSTEM UNDER TEST

For Conducted test:



NOTE: 1. Item 2 is the remote control of the EUT.

For other test items:



4 TEST TYPES 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 DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100287	Mar. 01, 2010	Feb. 28, 2011
Line-Impedance Stabilization Network (for EUT)	NSLK 8127	8127-523	Sep. 23, 2009	Sep. 22, 2010
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100072	June 11, 2010	June 10, 2011
RF Cable (JYEBAO)	5DFB	COACAB-001	Dec. 14, 2009	Dec. 13, 2010
50 ohms Terminator	50	3	Oct. 28, 2009	Oct. 27, 2010
Software	BV ADT_Cond_V7.3.7	NA	NA	NA

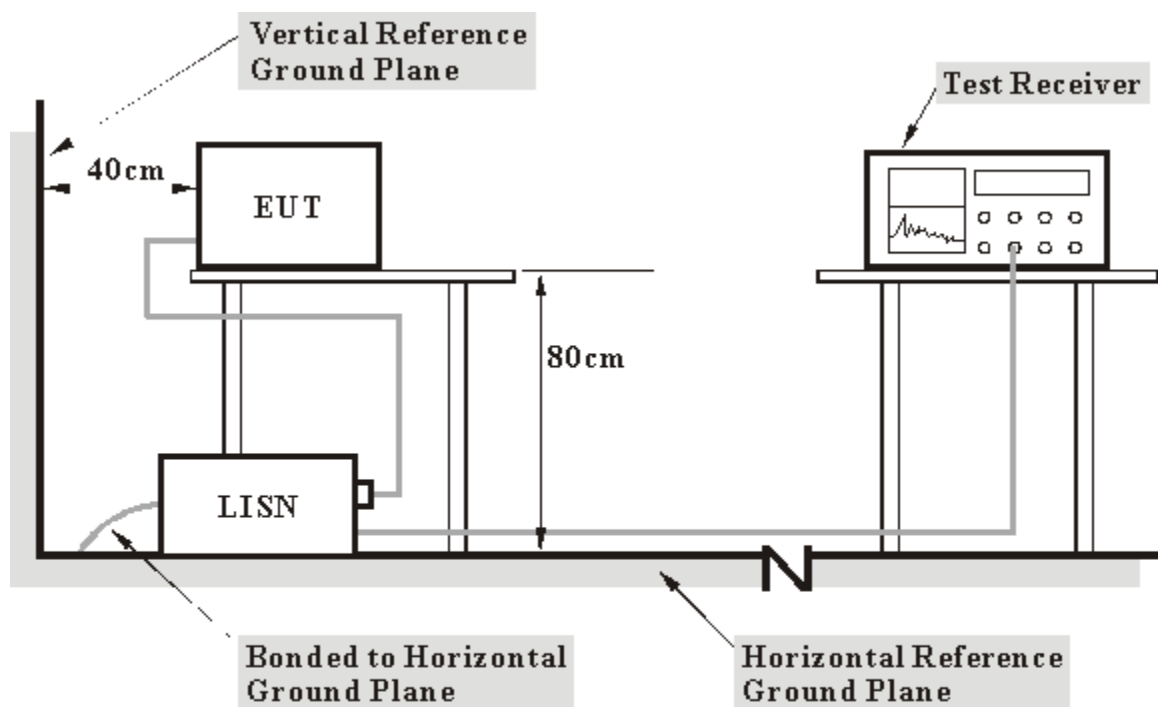
Note:

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. A.
3. The VCCI Con A Registration No. is C-817.

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 DEVIATION FROM TEST STANDARD

No deviation



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4.1.6 EUT OPERATING CONDITIONS

1. Turn on the power of EUT.
2. Set the EUT under typical use condition.
3. The EUT communicates with CD Player via Mini Blaster IR Cable.



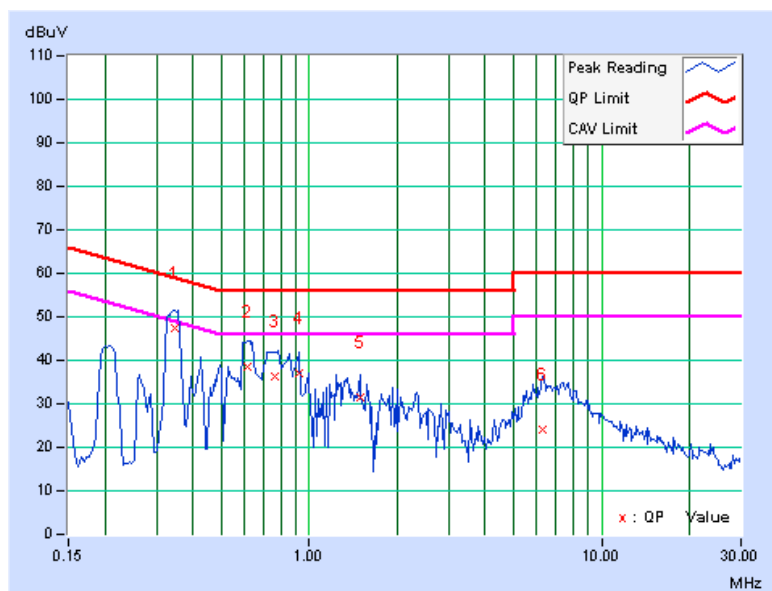
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4.1.7 TEST RESULTS

TEST MODE	Mode 1	PHASE	Line (L)
INPUT POWER (SYSTEM)	120Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	25 deg. C, 64 % RH, 1014 hPa	TESTED BY	Timmy Hu

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	0.345	0.05	47.46	-	47.51	-	59.07
2	0.611	0.11	38.57	-	38.68	-	56.00	46.00	-17.32	-
3	0.759	0.15	36.20	-	36.35	-	56.00	46.00	-19.65	-
4	0.927	0.19	36.94	-	37.13	-	56.00	46.00	-18.87	-
5	1.500	0.22	31.09	-	31.31	-	56.00	46.00	-24.69	-
6	6.281	0.34	23.57	-	23.91	-	60.00	50.00	-36.09	-

- 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.



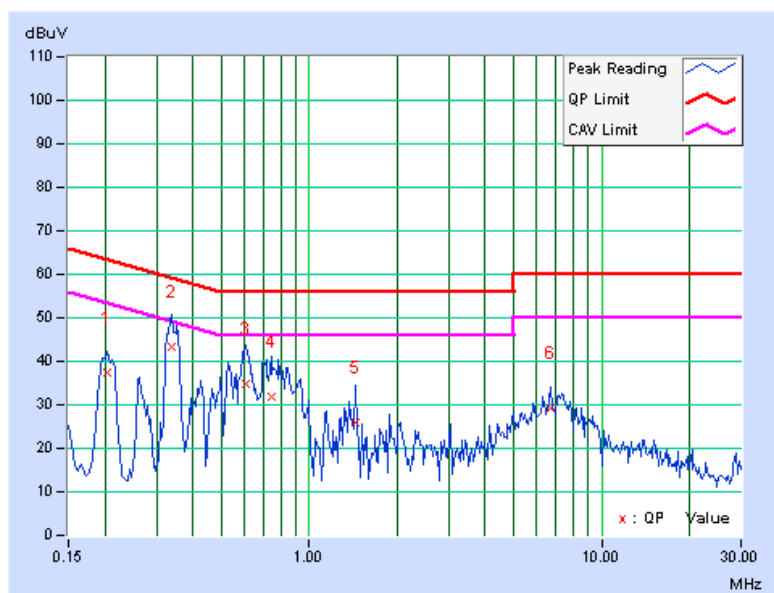


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TEST MODE	Mode 1	PHASE	Neutral (N)
INPUT POWER (SYSTEM)	120Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	25 deg. C, 64 % RH, 1014 hPa	TESTED BY	Timmy Hu

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	0.205	0.05	37.42	-	37.47	-	63.42
2	0.338	0.06	43.42	-	43.48	-	59.26	49.26	-15.79	-
3	0.603	0.11	34.55	-	34.66	-	56.00	46.00	-21.34	-
4	0.740	0.15	31.80	-	31.95	-	56.00	46.00	-24.05	-
5	1.441	0.23	25.53	-	25.76	-	56.00	46.00	-30.24	-
6	6.699	0.39	28.75	-	29.14	-	60.00	50.00	-30.86	-

- 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

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

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
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.



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4.2.2 TEST INSTRUMENTS

For below 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ADVANTEST Spectrum Analyzer	U3751	160200410	July 17, 2009	July 16, 2010
PSA Seviess Spectrum Analyzer	E4446A	MY46180622 111 115 UK6	May 12, 2010	May 11, 2011
HP Pre_Amplifier	8449B	3008A01922	Sep. 25, 2009	Sep. 24, 2010
ROHDE & SCHWARZ Test Receiver	ESVS 30	841977/002	Nov. 28, 2009	Nov. 27, 2010
SCHAFFNER(CHASE) Broadband Antenna	CBL6112B	2798	Apr. 29, 2010	Apr. 28, 2011
Schwarzbeck Horn_Antenna	BBHA9120-D1	D123	Sep. 21, 2009	Sep. 20, 2010
Schwarzbeck Horn_Antenna	BBHA 9170	9170-424	Sep. 30, 2009	Sep. 29, 2010
RF Switches	MP59B	6100175593	Sep. 01, 2009	Aug. 31, 2010
RF Cable	8DFB	STBCAB-001	Sep. 01, 2009	Aug. 31, 2010
Software	ADT_Radiated_V7.6.15.9.2	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA
CORCOM AC Filter	MRI2030	024/019	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, preamplifier (model: 8449B) and Spectrum Analyzer (model: E4446A) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Open Site No. B.
4. The VCCI Site Registration No. is R-847.
5. The FCC Site Registration No. is 92753.
6. The CANADA Site Registration No. is IC 7450G-2.



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For above 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Dec. 18, 2009	Dec. 17, 2010
Agilent PSA Spectrum Analyzer	E4446A	MY46180622	May 12 , 2010	May 11 , 2011
HP Pre_Amplifier	8449B	300801923	Nov. 02, 2009	Nov. 01, 2010
ROHDE & SCHWARZ Test Receiver	ESCS30	847124/029	Aug. 28, 2009	Aug. 27, 2010
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	Apr. 28, 2010	Apr. 27, 2011
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 18, 2009	Dec. 17, 2010
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 22, 2010	Jan. 21, 2011
R&S Loop Antenna	HFH2-Z2	100070	Feb. 03, 2010	Feb. 02, 2012
RF Switches	EMH-011	1001	NA	NA
RF CABLE (Chaintek)	Sucoflex 106	28077	Aug. 14, 2009	Aug. 13, 2010
RF Cable	8DFB	STCCAB-30M-1GHz	NA	NA
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, 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.

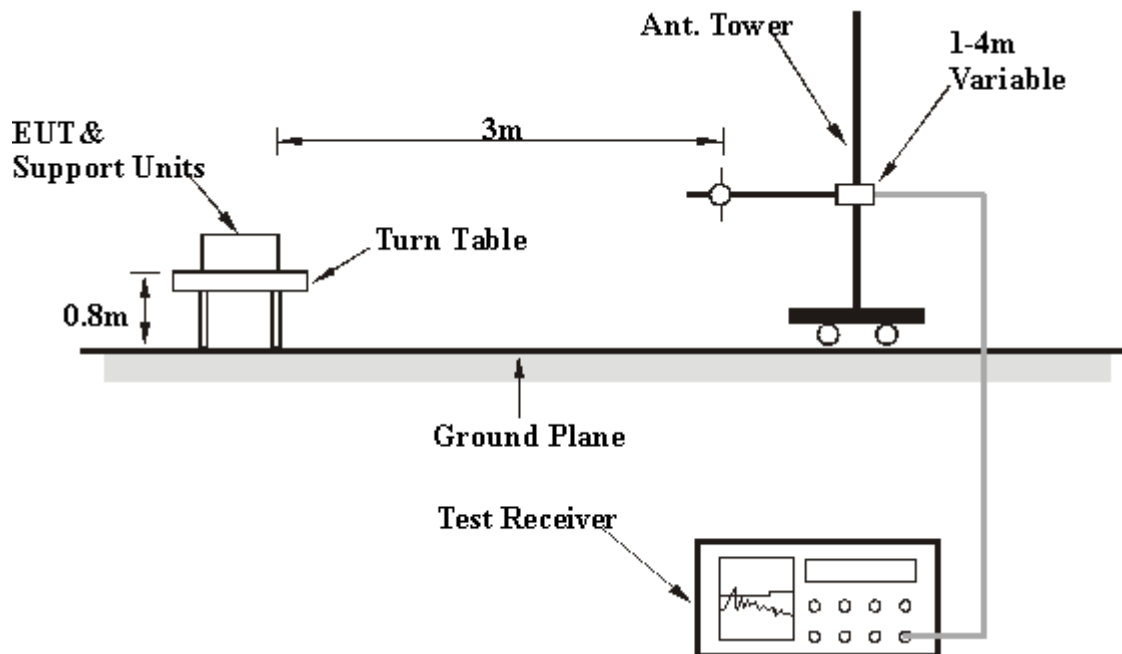
4.2.3 TEST PROCEDURES

- 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 Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency above 1GHz.

4.2.4 TEST SETUP



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

4.2.5 DEVIATION FROM TEST STANDARD

No deviation

4.2.6 EUT OPERATING CONDITIONS

1. Turn on the power of EUT.
2. Set the EUT under typical use condition.



4.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH 1014 hPa	TESTED BY	Andy Ho

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	108.78	32.8 QP	43.50	-10.7	1.22 H	201	20.48	12.34
2	120.00	31.7 QP	43.50	-11.9	1.00 H	95	18.15	13.50
3	161.79	30.4 QP	43.50	-13.1	1.05 H	224	18.69	11.71
4	258.67	29.5 QP	46.00	-16.5	1.00 H	305	15.28	14.26
5	365.89	34.8 QP	46.00	-11.2	1.00 H	149	17.30	17.46
6	600.00	29.7 QP	46.00	-16.3	1.12 H	243	7.47	22.27
7	639.60	32.5 QP	46.00	-13.5	1.34 H	256	10.18	22.32
8	960.00	33.7 QP	46.00	-12.3	1.00 H	155	8.09	25.60
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	108.78	33.0 QP	43.50	-10.5	1.00 V	224	20.65	12.34
2	120.63	27.1 QP	43.50	-16.4	1.00 V	239	13.63	13.50
3	135.91	27.8 QP	43.50	-15.7	1.13 V	264	14.27	13.50
4	143.16	32.9 QP	43.50	-10.6	1.02 V	158	19.94	12.93
5	185.01	31.7 QP	43.50	-11.8	1.00 V	179	20.19	11.51
6	276.65	34.3 QP	46.00	-11.7	1.00 V	248	19.67	14.65
7	960.00	30.7 QP	46.00	-15.3	1.22 V	225	5.12	25.60

- 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.



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ABOVE 1GHz DATA

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK)
ENVIRONMENTAL CONDITIONS	27deg. C, 66%RH 1014 hPa	TESTED BY	Kent Liu

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	2381.44	64.9 PK	74.00	-9.1	1.13 H	4	34.87	30.03
2	2381.44	50.9 AV	54.00	-3.1	1.13 H	4	20.87	30.03
3	*2405.00	96.4 PK			1.13 H	4	66.28	30.12
4	*2405.00	82.4 AV			1.13 H	4	52.28	30.12
5	4810.00	49.6 PK	74.00	-24.4	1.53 H	24	14.20	35.40
6	4810.00	35.6 AV	54.00	-18.4	1.53 H	24	0.20	35.40
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	2381.28	65.5 PK	74.00	-8.5	1.16 V	247	35.47	30.03
2	2381.28	51.5 AV	54.00	-2.5	1.16 V	247	21.47	30.03
3	*2405.00	99.2 PK			1.16 V	247	69.08	30.12
4	*2405.00	85.2 AV			1.16 V	247	55.08	30.12
5	4810.00	47.3 PK	74.00	-26.7	1.03 V	28	11.90	35.40
6	4810.00	33.3 AV	54.00	-20.7	1.03 V	28	-2.10	35.40

- 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. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The limit value is defined as per 15.247
 6. “ * “ : Fundamental frequency
 7. The average value of fundamental frequency is: Average = Peak value + $20\log(\text{Duty cycle})$ Where the duty factor is calculated from following formula: $20\log(\text{Duty cycle}) = 20\log(2.4\text{ ms} / 12.2\text{ ms}) = -14\text{ dB}$



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 15	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK)
ENVIRONMENTAL CONDITIONS	27deg. C, 66%RH 1014 hPa	TESTED BY	Kent Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

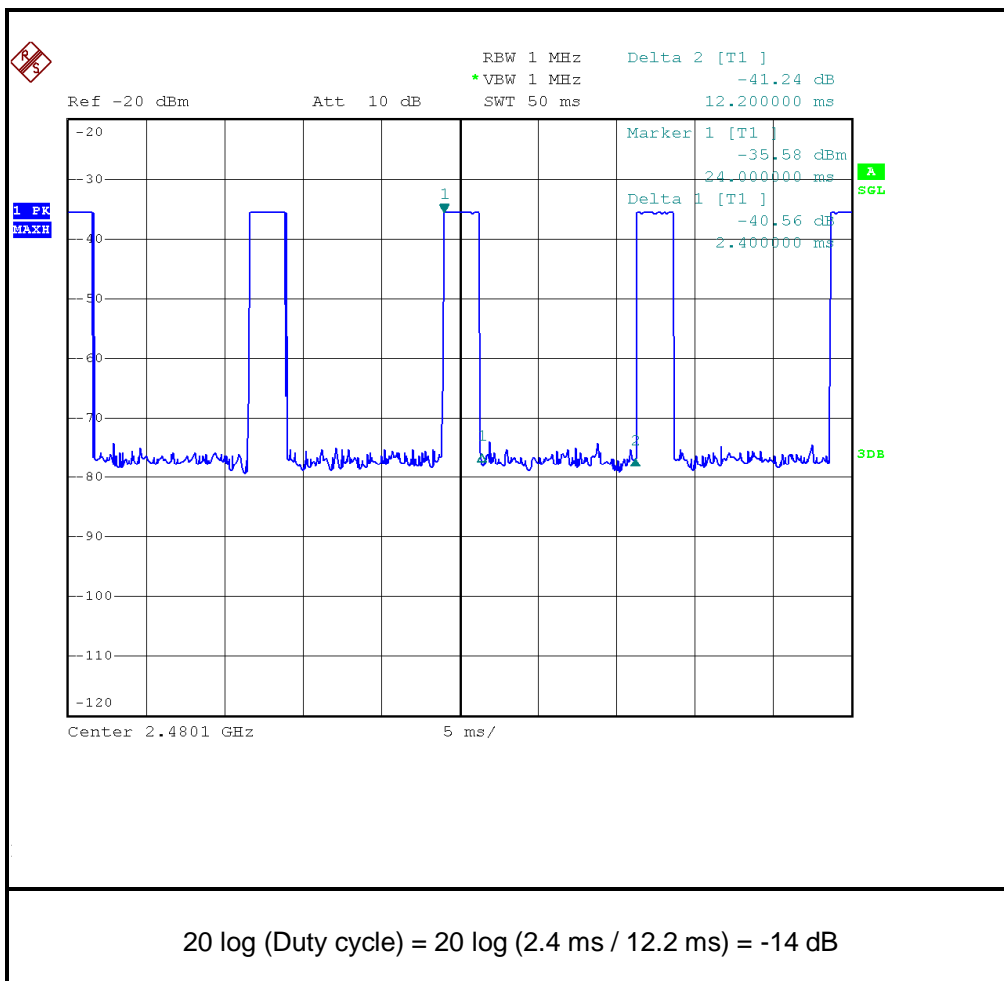
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	97.7 PK			1.09 H	1	67.29	30.41
2	*2480.00	83.7 AV			1.09 H	1	53.29	30.41
3	2483.50	61.2 PK	74.00	-12.8	1.09 H	1	30.77	30.43
4	2483.50	47.2 AV	54.00	-6.8	1.09 H	1	16.77	30.43
5	4960.00	50.8 PK	74.00	-23.2	1.60 H	241	15.12	35.68
6	4960.00	36.8 AV	54.00	-17.2	1.60 H	241	1.12	35.68
7	7440.00	50.3 PK	74.00	-23.7	1.21 H	33	8.10	42.20
8	7440.00	36.3 AV	54.00	-17.7	1.21 H	33	-5.90	42.20

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

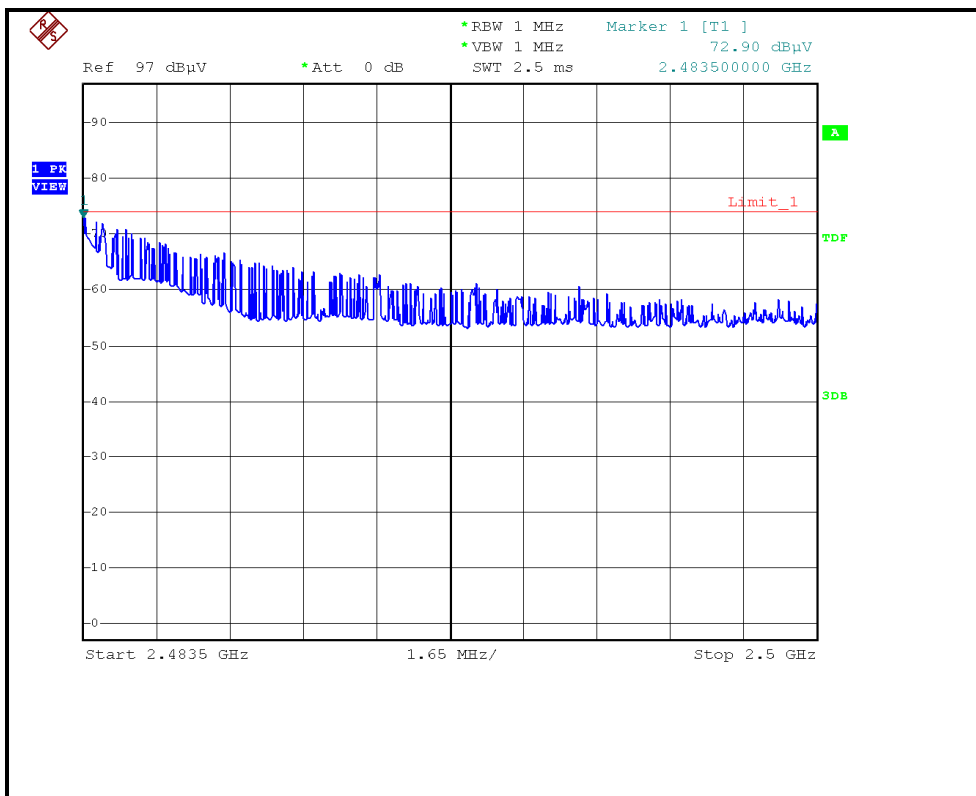
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	97.6 PK			1.14 V	248	67.19	30.41
2	*2480.00	83.6 AV			1.14 V	248	53.19	30.41
3	2483.50	61.1 PK	74.00	-12.9	1.14 V	248	30.67	30.43
4	2483.50	47.1 AV	54.00	-6.9	1.14 V	248	16.67	30.43
5	4960.00	46.1 PK	74.00	-27.9	1.37 V	86	10.42	35.68
6	4960.00	32.1 AV	54.00	-21.9	1.37 V	86	-3.58	35.68
7	7440.00	49.9 PK	74.00	-24.1	1.01 V	23	7.70	42.20
8	7440.00	36.9 AV	54.00	-17.1	1.01 V	23	-5.30	42.20

REMARKS:

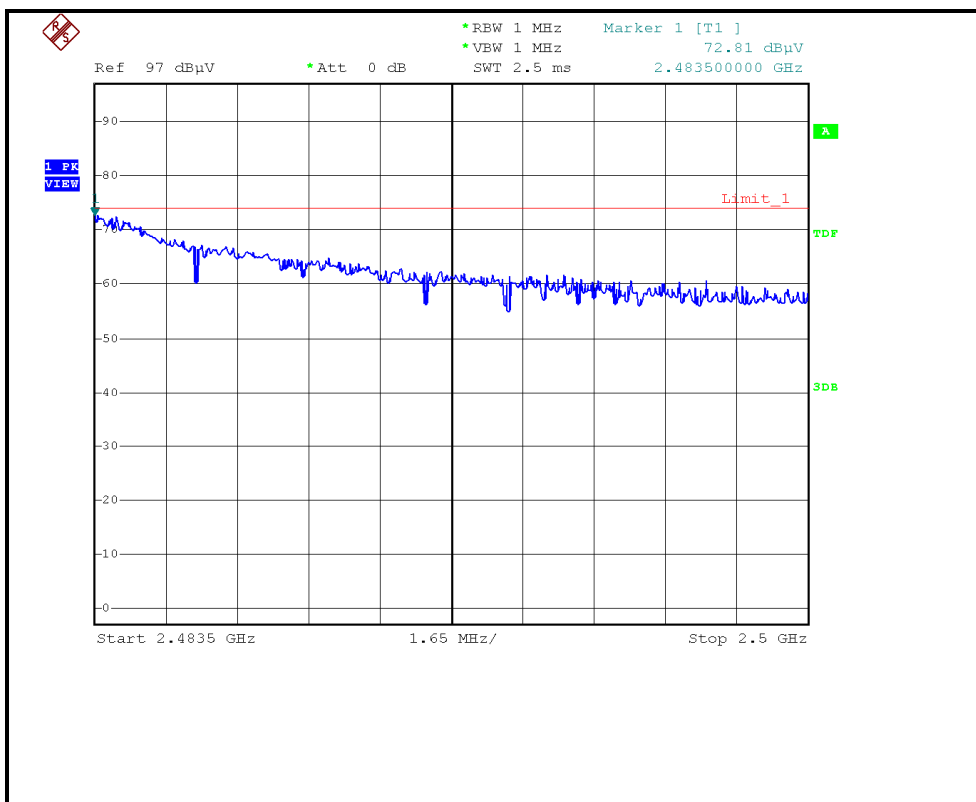
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. “ * ” : Fundamental frequency
7. The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle) Where the duty factor is calculated from following formula: 20 log (Duty cycle) = 20 log (2.4 ms / 12.2 ms) = -14 dB



RESTRICTED BANDEDGE (CH15, HORIZONTAL)



RESTRICTED BANDEDGE (CH15, VERTICAL)



4.3 MAXIMUM PEAK OUTPUT POWER

4.3.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Anritsu Power Meter	ML2495A	0824006	May 04, 2010	May 03, 2011
Pulse Power Sensor	MA2411B	0738172	May 04, 2010	May 03, 2011

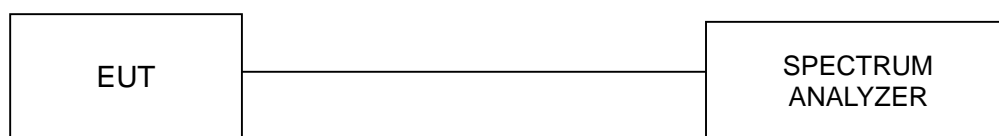
NOTE:

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

4.3.3 TEST PROCEDURES

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. The center frequency of the spectrum analyzer is set to the fundamental frequency and using 3 MHz RBW and 10 MHz VBW.
4. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
5. Repeat above procedures until all frequencies measured were complete.

4.3.4 TEST SETUP



4.3.5 DEVIATION FROM TEST STANDARD

No deviation

4.3.6 EUT OPERATING CONDITIONS

Same as Item 4.2.6



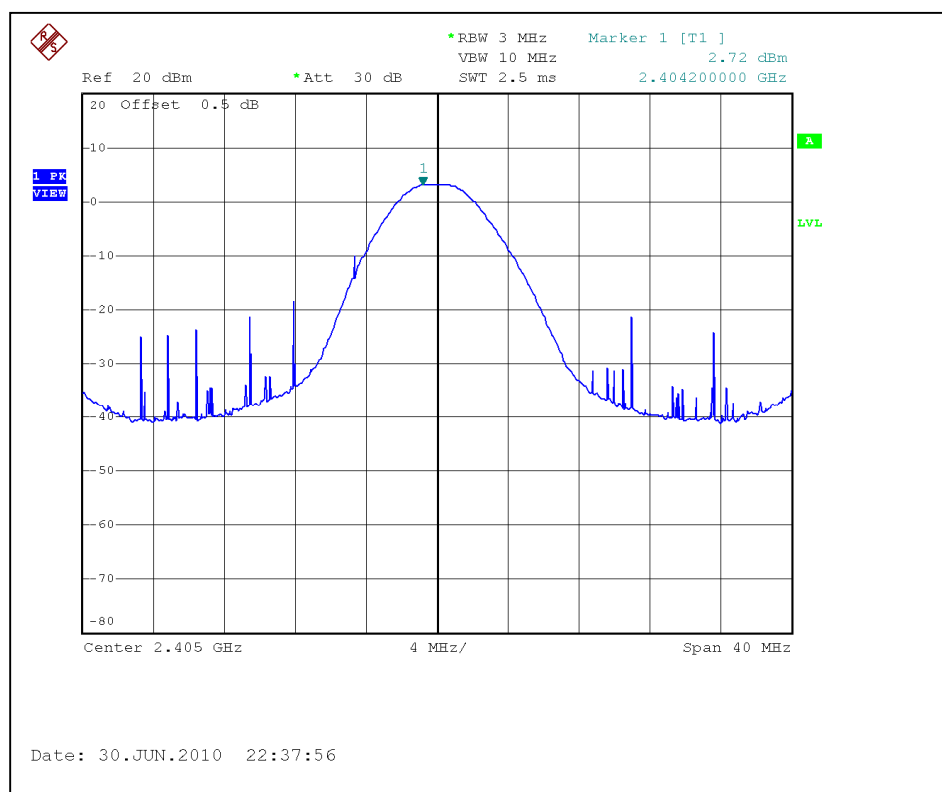
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4.3.7 TEST RESULTS

MODULATION TYPE	O-QPSK	TRANSFER RATE	0.25Mbps
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 1014hPa
TESTED BY	Kent Liu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
0	2405	1.9	2.7	30	PASS
7	2440	1.9	2.8	30	PASS
15	2480	2.0	2.8	30	PASS

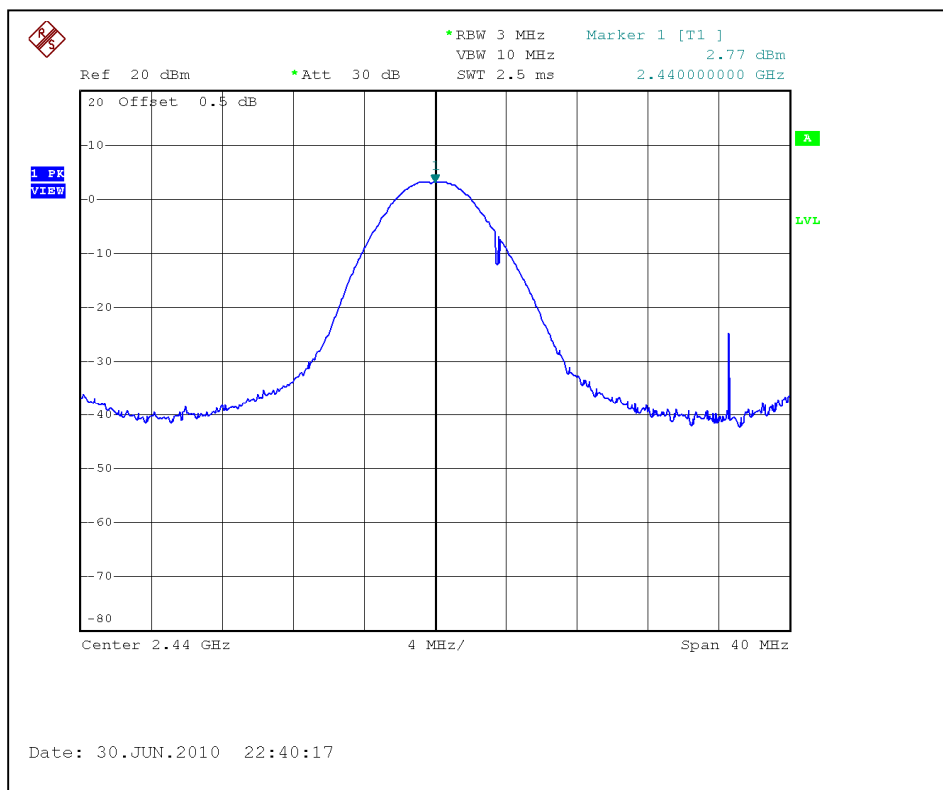
Channel 0



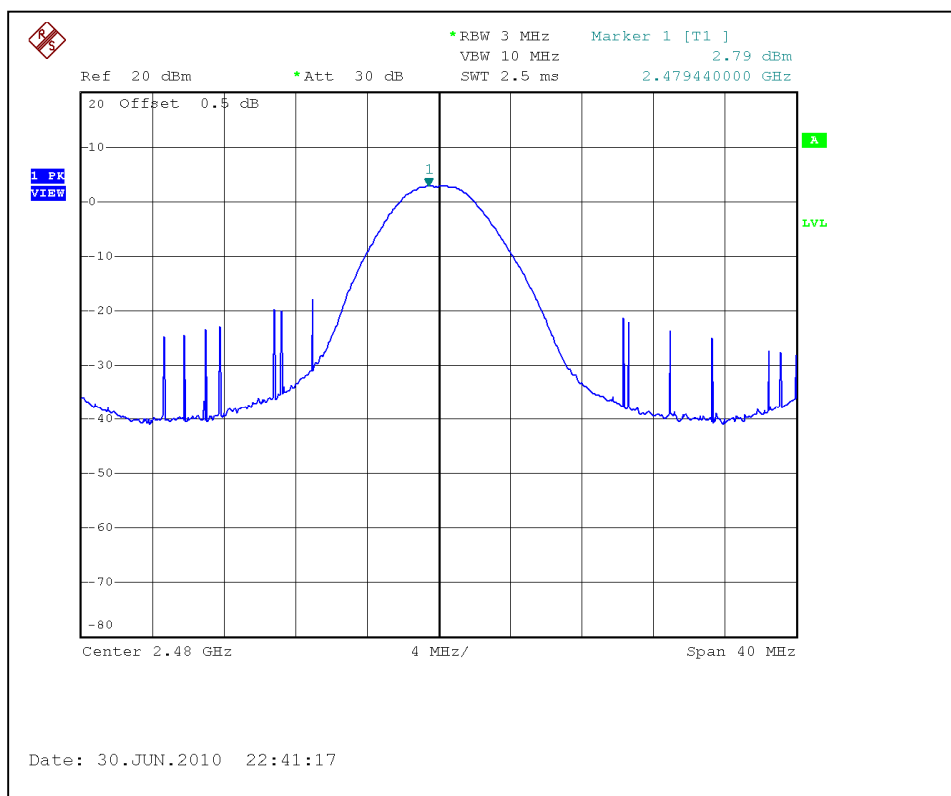


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Channel 7



Channel 15



4.4 ANTENNA REQUIREMENT

4.4.1 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.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.4.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is PCB Printed quarter wave antenna without connector. The maximum Gain of the antenna is 2.91dBi



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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 according to ISO/IEC 17025:

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: 886-2-26052943

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

Web Site: www.adt.com.tw

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



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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.

--- END ---