



# FCC TEST REPORT

**REPORT NO.:** RF990507D01-1

**MODEL NO.:** 1461

**RECEIVED:** May 7, 2010

**TESTED:** May 13 ~ 19, 2010

**ISSUED:** May 24, 2010

**APPLICANT:** Microsoft Corporation

**ADDRESS:** One Microsoft Way Redmond, WA 98052-6399

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

**LAB LOCATION:** No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang,  
Taipei Hsien, 244 Taiwan

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# 1. CERTIFICATION

**PRODUCT:** Wireless Transceiver  
**BRAND NAME:** Microsoft®  
**MODEL NO.:** 1461  
**APPLICANT:** Microsoft Corporation  
**TESTED:** May 13 ~ 19, 2010  
**TEST ITEM:** ENGINEERING SAMPLE  
**STANDARDS:** FCC Part 15, Subpart C (Section 15.249)  
ANSI C63.4-2003

The above equipment 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** : Celia Chen , **DATE:** May 24, 2010  
( Celia Chen / Senior Specialist )

**TECHNICAL ACCEPTANCE** : Jamison Chan , **DATE:** May 24, 2010  
Responsible for RF ( Jamison Chan / Supervisor )

**APPROVED BY** : Ken Liu , **DATE:** May 24, 2010  
( Ken Liu / Assistant Manager )

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

<b>APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.249)</b>			
<b>STANDARD SECTION</b>	<b>TEST TYPE AND LIMIT</b>	<b>RESULT</b>	<b>REMARK</b>
15.207	Conducted Emission Test	PASS	Minimum passing margin is -17.07dB at 0.150MHz
15.209 15.249 15.249 (d)	Radiated Emission Test Band Edge Measurement Limit: 50dB less than the peak value of fundamental frequency or meet radiated emission limit in section 12.209	PASS	Minimum passing margin is -6.7dB at 171.46MHz

### 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.

<b>Measurement</b>	<b>Frequency</b>	<b>Uncertainty</b>
Conducted emissions	150kHz ~ 30MHz	2.41 dB
Radiated emissions	30MHz ~ 1GHz	3.67 dB
	Above 1GHz	2.89 dB

### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>EUT</b>	Wireless Transceiver
<b>MODEL NO.</b>	1461
<b>FCC ID</b>	C3K1461
<b>POWER SUPPLY</b>	5Vdc from host equipment
<b>MODULATION TYPE</b>	GFSK
<b>OPERATING FREQUENCY</b>	2403MHz ~ 2480MHz
<b>NUMBER OF CHANNEL</b>	24
<b>ANTENNA TYPE</b>	PCB Strip antenna with -2.75dBi gain
<b>ANTENNA CONNECTOR</b>	N/A
<b>DATA CABLE</b>	N/A
<b>I/O PORTS</b>	USB port
<b>ASSOCIATED DEVICES</b>	N/A

#### NOTE:

1. The EUT is a transceiver.
2. The EUT has serial samples, which are defined as their serial no. as follows:

Product	Model No.	Serial no.
Wireless Transceiver	1461	1
		2
		3

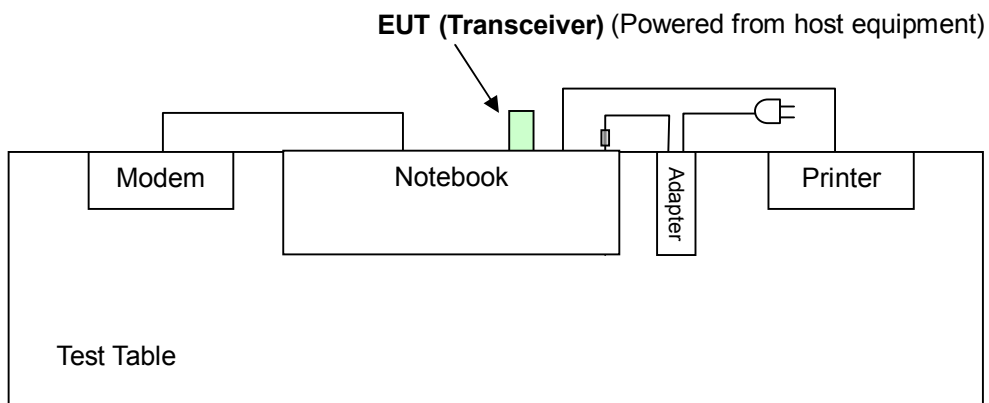
3. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

### 3.2 DESCRIPTION OF TEST MODES

24 channels are provided to this EUT:

Channel Group	Channel	Frequency (MHz)	Channel Group	Channel	Frequency (MHz)
Subset A	0	2403	Subset D	12	2405
	1	2419		13	2425
	2	2478		14	2444
	3	2468		15	2452
Subset B	4	2429	Subset E	16	2423
	5	2450		17	2446
	6	2470		18	2456
	7	2480		19	2474
Subset C	8	2421	Subset F	20	2417
	9	2431		21	2427
	10	2472		22	2448
	11	2454		23	2476

#### 3.2.1 CONFIGURATION OF SYSTEM UNDER TEST





### 3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

EUT configure mode	Applicable to					Description
	PLC	RE<1G	RE≥1G	FT	BM	
-	√	√	√	√	√	-

Where PLC: Power Line Conducted Emission RE<1G RE: Radiated Emission below 1GHz  
 RE≥1G: Radiated Emission above 1GHz FT: Frequency Tolerance  
 BM: Bandedge Measurement

#### POWER LINE CONDUCTED EMISSION TEST:

Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	SERIAL NO.	MODULATION TYPE
0 to 23	0	3	GFSK

#### RADIATED EMISSION TEST (BELOW 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations 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	SERIAL NO.	MODULATION TYPE
0 to 23	0	1, 2, 3	GFSK

#### RADIATED EMISSION TEST (ABOVE 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations 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	SERIAL NO.	MODULATION TYPE
0 to 23	0, 14, 7	1, 2, 3	GFSK

#### FREQUENCY TOLERANCE:

- 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	SERIAL NO.	MODULATION TYPE
0 to 23	0, 14, 7	3	GFSK



**BANDEDGE MEASUREMENT:**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations 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	SERIAL NO.	MODULATION TYPE
0 to 23	0, 7	3	GFSK

**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
PLC	24deg. C, 77% RH, 1010hPa	120Vac, 60Hz	Nick Chen
RE $\geq$ 1G	23deg. C, 82% RH, 1010hPa	120Vac, 60Hz	Nick Chen
RE $<$ 1G	23deg. C, 82% RH, 1010hPa	120Vac, 60Hz	Nick Chen
FT	23deg. C, 63% RH, 1009hPa	120Vac, 60Hz	Nick Chen
BM	23deg. C, 82% RH, 1010hPa	120Vac, 60Hz	Nick Chen

### 3.3 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:

FCC Part 15, Subpart C (Section 15.249)

ANSI C63.4-2003

All test items 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 FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

### 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	PP05L	20375526736	FCC DoC Approved
2	PRINTER	EPSON	LQ-300+	DCGY017054	FCC DoC Approved
3	MODEM	ACEEX	1414	980020520	IFAXDM1414

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A
2	1.8m 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:** All power cords of the above support units are non-shielded (1.8m).

## 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 $\mu$ 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 A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100276	Dec. 15, 2009	Dec. 14, 2010
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	100218	Nov. 24, 2009	Nov. 23, 2010
LISN With Adapter (for EUT)	AD10	C10Ada-001	Nov. 24, 2009	Nov. 23, 2010
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100219	Nov. 23, 2009	Nov. 22, 2010
Software	ADT_Cond_V7.3.7	NA	NA	NA
Software	ADT_ISN_V7.3.7	NA	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C10.01	Feb. 23, 2010	Feb. 22, 2011
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010773	Feb. 23, 2010	Feb. 22, 2011

- 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. 10.
  3. The VCCI Site Registration No. C-1852.

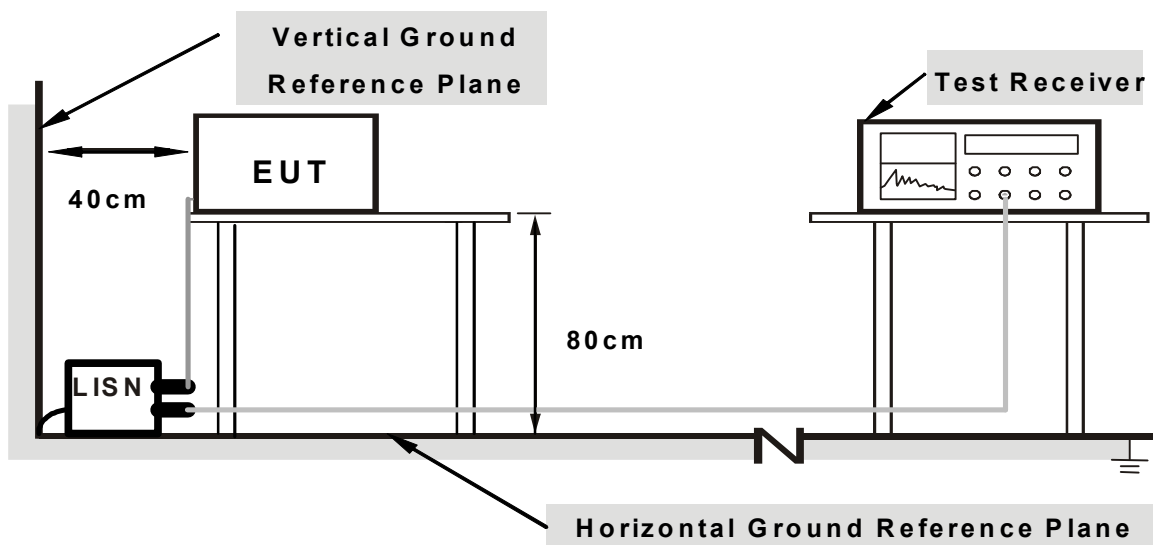
### 4.1.3 TEST PROCEDURES

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

### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

### 4.1.5 TEST SETUP



- Note:**
- Support units were connected to second LISN.
  - Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

#### 4.1.6 EUT OPERATING CONDITIONS

- a. Connected the EUT to a notebook placed on a testing table.
- b. The notebook ran a test program (provided by manufacturer) to enable EUT under transmission/receiving condition continuously at specific channel frequency.
- c. The notebook sent messages to printer and the printer printed them out.
- d. The notebook sent messages to modem.
- e. Repeated c ~ e.

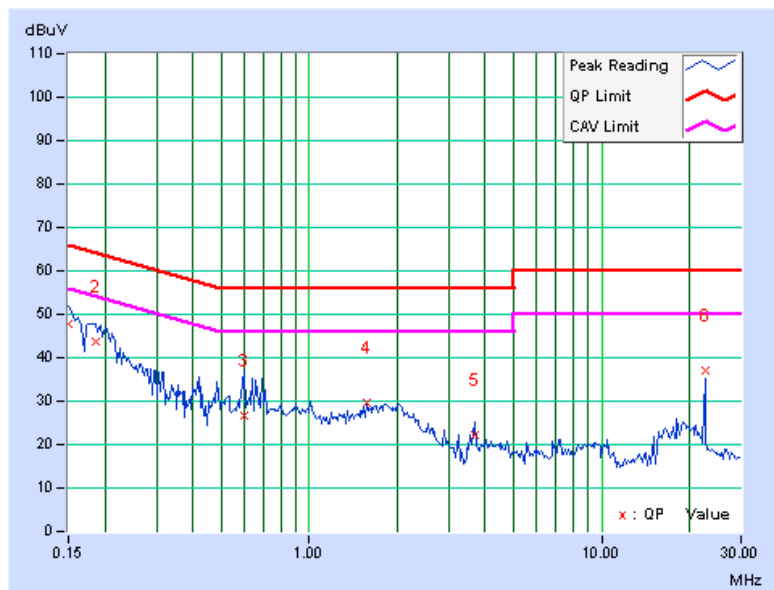
### 4.1.7 TEST RESULTS

#### CONDUCTED WORST CASE DATA

PHASE	Line 1	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.19	47.55	-	47.74	-	66.00	56.00	-18.26	-
2	0.185	0.19	43.56	-	43.75	-	64.25	54.25	-20.50	-
3	0.599	0.30	26.21	-	26.51	-	56.00	46.00	-29.49	-
4	1.578	0.33	29.42	-	29.75	-	56.00	46.00	-26.25	-
5	3.687	0.47	21.64	-	22.11	-	56.00	46.00	-33.89	-
6	22.570	1.30	35.71	-	37.01	-	60.00	50.00	-22.99	-

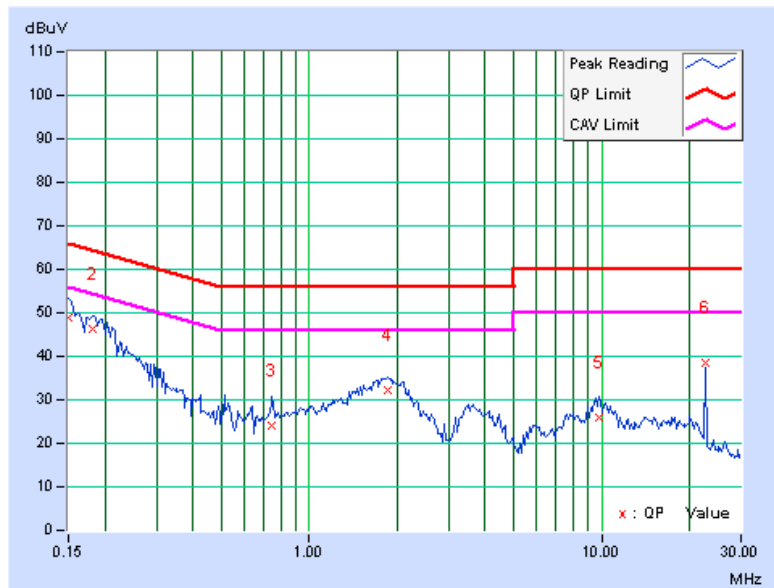
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



<b>PHASE</b>	Line 2	<b>6dB BANDWIDTH</b>	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.29	48.64	-	48.93	-	66.00	56.00	-17.07	-
2	0.181	0.28	46.18	-	46.46	-	64.45	54.45	-17.99	-
3	0.747	0.39	23.69	-	24.08	-	56.00	46.00	-31.92	-
4	1.851	0.41	31.93	-	32.34	-	56.00	46.00	-23.66	-
5	9.776	0.69	25.35	-	26.04	-	60.00	50.00	-33.96	-
6	22.570	1.06	37.35	-	38.41	-	60.00	50.00	-21.59	-

- 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.



## 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, 15.249 as following:

15.209 Limit		
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
15.249 Limit		
Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902 ~ 928 MHz	50	500
2400 ~ 2483.5 MHz	50	500
5725 ~ 5875 MHz	50	500
24 ~ 24.25 GHz	250	2500

**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.





## 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	May 06, 2010	May 05, 2011
HP Preamplifier	8449B	3008A01924	Aug. 31, 2009	Aug. 30, 2010
HP Preamplifier	8449B	3008A01292	Aug. 10, 2009	Aug. 09, 2010
ROHDE & SCHWARZ TEST RECEIVER	ESU26	100005	Jun. 06, 2009	Jun. 05, 2010
Schwarzbeck Antenna	VULB 9168	137	Apr. 29, 2010	Apr. 28, 2011
Schwarzbeck Antenna	VHBA 9123	480	Apr. 29, 2010	Apr. 28, 2011
EMCO Horn Antenna	3115	6714	Oct. 26, 2009	Oct. 25, 2010
EMCO Horn Antenna	3115	9312-4192	Apr. 23, 2010	Apr. 22, 2011
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	ADT_Radiated_V 7.6.15.9.2	NA	NA	NA
SUHNER RF cable	SF104-26.5	CABLE-CH6-17m -01	Aug. 20, 2009	Aug. 19, 2010
ROHDE & SCHWARZ Spectrum Analyzer	FSP 40	100036	Apr. 06, 2010	Apr. 05, 2011

- NOTE:**
1. The calibration interval of the above test instruments is 12/24 months. 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 Chamber No. 6.
  4. The Industry Canada Reference No. IC 7450E-6.
  5. The FCC Site Registration No. is 447212.

## 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 3 meter semi-anechoic chamber room. 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 height of antenna 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 quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak method or average method as specified and then reported in data sheet.

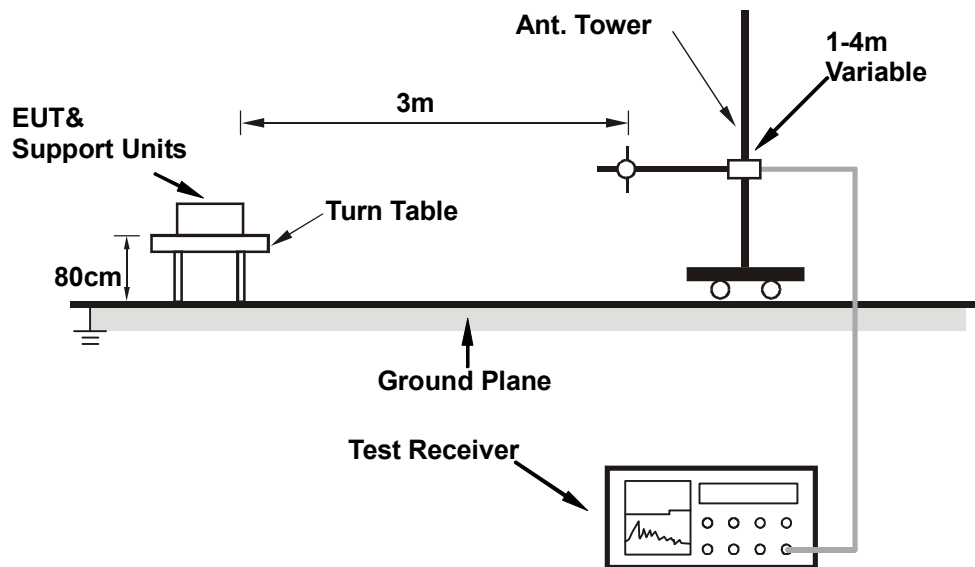
### NOTE:

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 of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

## 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

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

## 4.2.7 TEST RESULTS

### ABOVE 1GHz DATA (For Fundamental, Harmonics)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 82%RH 1010 hPa	TESTED BY	Nick Chen
SERIAL NO.	3		

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	*2403.00	96.4 PK	114.0	-17.6	1.03 H	267	64.80	31.60
2	*2403.00	59.9 AV	94.0	-34.1	1.03 H	267	28.30	31.60
3	4806.00	46.7 PK	74.0	-27.3	1.00 H	253	9.04	37.67
4	4806.00	10.2AV	54.0	-43.8	1.00 H	253	-27.47	37.67
5	7209.00	52.6 PK	74.0	-21.4	1.00 H	261	8.82	43.78
6	7209.00	16.1 AV	54.0	-37.9	1.00 H	261	-27.68	43.78
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	*2403.00	93.6 PK	114.0	-20.4	1.00 V	117	61.97	31.60
2	*2403.00	57.1 AV	94.0	-36.9	1.00 V	117	25.50	31.60
3	4806.00	47.9 PK	74.0	-26.1	1.00 V	335	10.20	37.67
4	4806.00	11.4 AV	54.0	-42.6	1.00 V	335	-26.27	37.67
5	7209.00	52.6 PK	74.0	-21.4	1.00 V	330	8.80	43.78
6	7209.00	16.1 AV	54.0	-37.9	1.00 V	330	-27.68	43.78

- 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
  6. The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle) Where the duty factor is calculated from following formula:  
 $20 \log (\text{Duty cycle}) = 20 \log (0.115 \text{ ms} \cdot 13 / 100 \text{ ms}) = -36.5 \text{ dB}$   
 Please see page 23 for plotted duty.



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 14	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 82%RH 1010 hPa	TESTED BY	Nick Chen
SERIAL NO.	3		

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	*2444.00	96.5 PK	114.0	-17.5	1.00 H	248	64.70	31.76
2	*2444.00	60.0 AV	94.0	-34.0	1.00 H	248	28.24	31.76
3	4888.00	47.0 PK	74.0	-27.0	1.03 H	242	9.06	37.96
4	4888.00	10.5 AV	54.0	-43.5	1.03 H	242	-27.46	37.96
5	7332.00	52.9 PK	74.0	-21.1	1.01 H	232	8.73	44.19
6	7332.00	16.4 AV	54.0	-37.6	1.01 H	232	-27.79	44.19
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	*2444.00	93.8 PK	114.0	-20.2	1.00 V	181	62.03	31.76
2	*2444.00	57.3 AV	94.0	-36.7	1.00 V	181	25.54	31.76
3	4888.00	47.3 PK	74.0	-26.7	1.10 V	335	9.32	37.96
4	4888.00	10.8 AV	54.0	-43.2	1.10 V	335	-27.16	37.96
5	7332.00	53.1 PK	74.0	-20.9	1.00 V	341	8.91	44.19
6	7332.00	16.6 AV	54.0	-37.4	1.00 V	341	-27.59	44.19

**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
6. The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle) Where the duty factor is calculated from following formula:  
 $20 \log (\text{Duty cycle}) = 20 \log (0.115 \text{ ms} \cdot 13 / 100 \text{ ms}) = -36.5 \text{ dB}$   
 Please see page 23 for plotted duty.

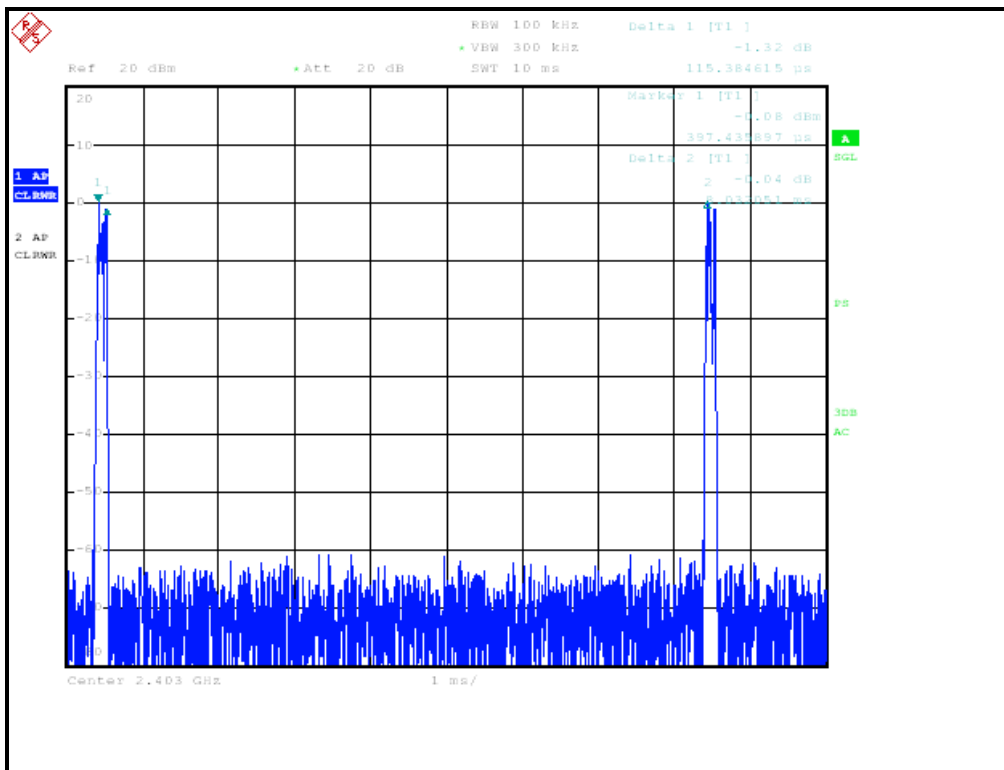
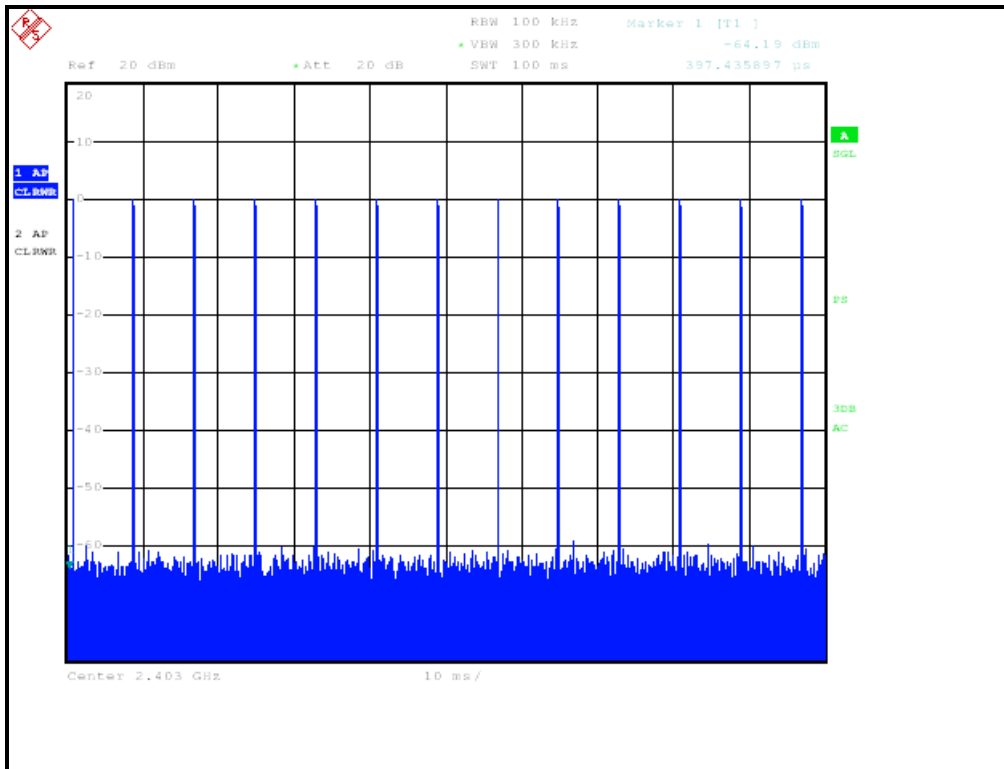


EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 7	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 82%RH 1010 hPa	TESTED BY	Nick Chen
SERIAL NO.	3		

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	95.5 PK	114.0	-18.5	1.00 H	244	63.62	31.89
2	*2480.00	59.0 AV	94.0	-35.0	1.00 H	244	27.11	31.89
3	4960.00	47.4 PK	74.0	-26.6	1.03 H	248	9.31	38.10
4	4960.00	10.9 AV	54.0	-43.1	1.03 H	248	-27.20	38.10
5	7440.00	53.3 PK	74.0	-20.7	1.00 H	243	8.83	44.48
6	7440.00	16.8 AV	54.0	-33.1	1.00 H	243	-27.68	44.48
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	93.2 PK	114.0	-20.8	1.00 V	177	61.35	31.89
2	*2480.00	56.7 AV	94.0	-37.3	1.00 V	177	24.81	31.89
3	4960.00	47.3 PK	74.0	-26.7	1.00 V	316	9.17	38.10
4	4960.00	10.8 AV	54.0	-43.2	1.00 V	316	-27.3	38.10
5	7440.00	53.2 PK	74.0	-20.8	1.00 V	326	8.70	44.48
6	7440.00	16.7 AV	54.0	-37.3	1.00 V	326	-27.78	44.48

**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
6. The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle) Where the duty factor is calculated from following formula:  
 $20 \log (\text{Duty cycle}) = 20 \log (0.115 \text{ ms} \cdot 13 / 100 \text{ ms}) = -36.5 \text{ dB}$   
 Please see page 23 for plotted duty.



$$20 \log (\text{Duty cycle}) = 20 \log (0.115 \text{ ms} \cdot 13 / 100 \text{ ms}) = -36.5 \text{ dB}$$



A D T

**ABOVE 1GHz DATA (For Spurious Emission)**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 82%RH 1010 hPa	TESTED BY	Nick Chen
SERIAL NO.	1		

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	1201.00	39.9 PK	74.0	-34.1	1.00 H	180	11.89	28.01
2	1201.00	27.5 AV	54.0	-26.5	1.00 H	180	-0.55	28.01
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	1201.00	39.8 PK	74.0	-34.2	1.03 V	248	11.80	28.01
2	1201.00	27.2 AV	54.0	-26.8	1.03 V	248	-0.79	28.01

- 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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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 14	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 82%RH 1010 hPa	TESTED BY	Nick Chen
SERIAL NO.	1		

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	1221.00	39.8 PK	74.0	-34.2	1.08 H	246	11.72	28.06
2	1221.00	26.3 AV	54.0	-27.7	1.08 H	246	-1.78	28.06
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	1221.00	39.7 PK	74.0	-34.3	1.09 V	138	11.66	28.06
2	1221.00	28.1 AV	54.0	-25.9	1.09 V	138	0.00	28.06

- 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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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 7	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 82%RH 1010 hPa	TESTED BY	Nick Chen
SERIAL NO.	1		

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	1239.00	39.9 PK	74.0	-34.1	1.00 H	283	11.75	28.11
2	1239.00	26.3 AV	54.0	-27.7	1.00 H	283	-1.80	28.11
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	1239.00	37.9 PK	74.0	-36.1	1.05 V	157	9.82	28.11
2	1239.00	26.1 AV	54.0	-27.9	1.05 V	157	-2.00	28.11

- 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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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 82%RH 1010 hPa	TESTED BY	Nick Chen
SERIAL NO.	2		

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	1201.00	39.9 PK	74.0	-34.1	1.11 H	196	11.92	28.01
2	1201.00	27.5 AV	54.0	-26.5	1.11 H	196	-0.47	28.01
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	1201.00	39.8 PK	74.0	-34.2	1.06 V	255	11.82	28.01
2	1201.00	27.2 AV	54.0	-26.8	1.06 V	255	-0.85	28.01

- 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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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 14	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 82%RH 1010 hPa	TESTED BY	Nick Chen
SERIAL NO.	2		

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	1221.00	39.8 PK	74.0	-34.2	1.09 H	284	11.77	28.06
2	1221.00	26.4 AV	54.0	-27.6	1.09 H	284	-1.63	28.06
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	1221.00	39.7 PK	74.0	-34.3	1.06 V	128	11.62	28.06
2	1221.00	28.0 AV	54.0	-26.0	1.06 V	128	-0.03	28.06

- 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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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 7	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 82%RH 1010 hPa	TESTED BY	Nick Chen
SERIAL NO.	2		

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	1239.00	39.9 PK	74.0	-34.1	1.02 H	277	11.82	28.11
2	1239.00	26.0 AV	54.0	-28.0	1.02 H	277	-2.10	28.11
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	1239.00	37.9 PK	74.0	-36.1	1.06 V	173	9.79	28.11
2	1239.00	25.9 AV	54.0	-28.2	1.06 V	173	-2.26	28.11

- 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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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 82%RH 1010 hPa	TESTED BY	Nick Chen
SERIAL NO.	3		

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	1201.00	39.8 PK	74.0	-34.2	1.02 H	263	11.77	28.01
2	1201.00	27.1 AV	54.0	-26.9	1.02 H	263	-0.93	28.01
3	2390.00	63.4 PK	74.0	-10.6	1.03 H	267	31.85	31.55
4	2390.00	46.0 AV	54.0	-8.0	1.03 H	267	14.43	31.55
5	2400.00	53.8 PK	74.0	-20.2	1.03 H	267	22.21	31.59
6	2400.00	17.3 AV	54.0	-36.7	1.03 H	267	-14.29	31.59
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	1201.00	41.5 PK	74.0	-32.5	1.01 V	148	13.49	28.01
2	1201.00	26.8 AV	54.0	-27.3	1.01 V	148	-1.26	28.01
3	2390.00	61.6 PK	74.0	-12.4	1.00 V	117	30.04	31.55
4	2390.00	45.9 AV	54.0	-8.1	1.00 V	117	14.37	31.55
5	2400.00	51.0 PK	74.0	-23.0	1.00 V	117	19.38	31.59
6	2400.00	14.5 AV	54.0	-39.5	1.00 V	117	-17.09	31.59

- 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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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 14	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 82%RH 1010 hPa	TESTED BY	Nick Chen
SERIAL NO.	3		

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	1221.00	39.8 PK	74.0	-34.2	1.00 H	277	11.71	28.06
2	1221.00	26.2 AV	54.0	-27.8	1.00 H	277	-1.87	28.06
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	1221.00	39.5 PK	74.0	-34.5	1.02 V	139	11.44	28.06
2	1221.00	27.7 AV	54.0	-26.4	1.02 V	139	-0.42	28.06

- 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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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 7	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 82%RH 1010 hPa	TESTED BY	Nick Chen
SERIAL NO.	3		

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	1239.00	39.8 PK	74.0	-34.2	1.03 H	283	11.71	28.11
2	1239.00	25.9 AV	54.0	-28.1	1.03 H	283	-2.23	28.11
3	2483.50	54.1 PK	74.0	-19.9	1.00 H	244	22.20	31.91
4	2483.50	17.6 AV	54.0	-36.4	1.00 H	244	-14.31	31.91
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	1239.00	37.7 PK	74.0	-36.3	1.03 V	154	9.62	28.11
2	1239.00	25.4 AV	54.0	-28.6	1.03 V	154	-2.69	28.11
3	2483.50	51.8 PK	74.0	-22.2	1.00 V	177	19.93	31.91
4	2483.50	15.3 AV	54.0	-38.7	1.00 V	177	-16.61	31.91

- 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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**BELOW 1GHz WORST-CASE DATA**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	23deg. C, 82%RH 1010 hPa	TESTED BY	Nick Chen
SERIAL NO.	1		

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	107.72	34.0 QP	43.5	-9.5	1.27 H	244	24.16	9.85
2	149.70	36.4 QP	43.5	-7.1	1.05 H	112	22.04	14.40
3	166.79	35.4 QP	43.5	-8.1	1.03 H	88	21.53	13.89
4	249.18	36.4 QP	46.0	-9.6	1.18 H	265	23.37	13.02
5	266.28	34.8 QP	46.0	-11.2	1.36 H	70	21.05	13.79
6	300.48	34.1 QP	46.0	-11.9	1.22 H	76	18.64	15.45
7	734.18	34.8 QP	46.0	-11.2	1.03 H	238	9.30	25.48
8	867.87	34.6 QP	46.0	-11.5	1.25 H	181	6.92	27.63
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	37.77	27.5 QP	40.0	-12.5	1.08 V	85	14.60	12.90
2	73.53	32.8 QP	40.0	-7.3	1.26 V	10	21.43	11.32
3	118.61	32.6 QP	43.5	-11.0	1.08 V	10	21.35	11.20
4	149.70	31.4 QP	43.5	-12.1	1.33 V	10	17.02	14.40
5	162.13	32.0 QP	43.5	-11.6	1.28 V	154	17.99	13.96
6	249.18	38.9 QP	46.0	-7.1	1.03 V	184	25.88	13.02
7	455.93	34.1 QP	46.0	-11.9	1.25 V	166	14.34	19.80

- 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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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	23deg. C, 82%RH 1010 hPa	TESTED BY	Nick Chen
SERIAL NO.	2		

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	107.72	34.2 QP	43.5	-9.3	1.09 H	271	24.38	9.85
2	171.46	36.9 QP	43.5	-6.7	1.11 H	103	23.04	13.81
3	266.28	36.4 QP	46.0	-9.6	1.23 H	55	22.65	13.79
4	455.93	33.7 QP	46.0	-12.3	1.06 H	202	13.94	19.80
5	667.34	35.7 QP	46.0	-10.3	1.22 H	214	11.37	24.31
6	734.18	34.6 QP	46.0	-11.4	1.27 H	283	9.15	25.48
7	867.87	33.3 QP	46.0	-12.7	1.20 H	163	5.71	27.63

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	92.18	32.3 QP	43.5	-11.2	1.08 V	10	23.99	8.27
2	118.61	31.4 QP	43.5	-12.1	1.03 V	10	20.19	11.20
3	149.70	33.5 QP	43.5	-10.0	1.28 V	82	19.09	14.40
4	162.13	33.7 QP	43.5	-9.8	1.33 V	154	19.71	13.96
5	249.18	38.8 QP	46.0	-7.2	1.06 V	190	25.78	13.02
6	300.48	34.9 QP	46.0	-11.1	1.44 V	97	19.47	15.45
7	455.93	34.3 QP	46.0	-11.7	1.26 V	184	14.52	19.80
8	902.07	33.9 QP	46.0	-12.1	1.00 V	256	5.82	28.06

- 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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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	23deg. C, 82%RH 1010 hPa	TESTED BY	Nick Chen
SERIAL NO.	3		

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	107.72	33.8 QP	43.5	-9.7	1.12 H	262	23.92	9.85
2	266.28	34.4 QP	46.0	-11.6	1.23 H	244	20.57	13.79
3	300.48	35.5 QP	46.0	-10.6	1.37 H	358	20.00	15.45
4	455.93	33.9 QP	46.0	-12.1	1.26 H	154	14.11	19.80
5	521.22	33.5 QP	46.0	-12.5	1.21 H	196	11.97	21.56
6	734.18	35.6 QP	46.0	-10.4	1.03 H	235	10.12	25.48
7	867.87	33.4 QP	46.0	-12.6	1.11 H	175	5.75	27.63

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	73.53	31.5 QP	40.0	-8.6	1.16 V	1	20.13	11.32
2	104.62	32.1 QP	43.5	-11.4	1.23 V	31	22.63	9.46
3	137.26	33.6 QP	43.5	-9.9	1.28 V	247	20.34	13.23
4	162.13	32.5 QP	43.5	-11.0	1.24 V	181	18.56	13.96
5	249.18	38.4 QP	46.0	-7.6	1.06 V	178	25.38	13.02
6	455.93	34.8 QP	46.0	-11.3	1.13 V	184	14.95	19.80
7	902.07	33.1 QP	46.0	-12.9	1.00 V	241	5.00	28.06

- 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 FREQUENCY TOLERANCE MEASUREMENT

#### 4.3.1 LIMITS OF FREQUENCY TOLERANCE MEASUREMENT

Limit :  $\pm 0.001\%$

#### 4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSP 40	100036	Apr. 06, 2010	Apr. 05, 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 PROCEDURE

The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.001\%$  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. For battery operated equipment, the equipment tests shall be performed using a new battery.

#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.3.5 EUT OPERATING CONDITION

Same as Item 4.2.6



### 4.3.6 TEST RESULTS

<b>SERIAL NO.</b>	3		
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>CHANNEL</b>	0, 14, 7

#### CH 0

TEST CONDITION		Carrier Frequency (MHz)	Frequency Drift (kHz)	Frequency error (%)
Tnom(°C)	20	Vnom(V)	2402.9974	0
Tmin(°C)	-20	Vmin(V)	2403.0063	8.9
		Vmax(V)	2403.0069	9.5
Tmax(°C)	55	Vmin(V)	2402.9855	-11.9
		Vmax(V)	2402.9859	-11.5
Limit : ±0.001%				

#### CH 14

TEST CONDITION		Carrier Frequency (MHz)	Frequency Drift (kHz)	Frequency error (%)
Tnom(°C)	20	Vnom(V)	2443.9979	0
Tmin(°C)	-20	Vmin(V)	2444.0067	8.80
		Vmax(V)	2444.0069	9.00
Tmax(°C)	55	Vmin(V)	2443.9854	-12.50
		Vmax(V)	2443.9857	-12.20
Limit : ±0.001%				

#### CH 7

TEST CONDITION		Carrier Frequency (MHz)	Frequency Drift (kHz)	Frequency error (%)
Tnom(°C)	20	Vnom(V)	2479.9998	0
Tmin(°C)	-20	Vmin(V)	2480.0063	6.50
		Vmax(V)	2480.0065	6.70
Tmax(°C)	55	Vmin(V)	2479.9843	-15.50
		Vmax(V)	2479.9846	-15.20
Limit : ±0.001%				

## 4.4 BAND EDGES MEASUREMENT

### 4.4.1 LIMITS OF BAND EDGES MEASUREMENT

Below -50dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

### 4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSP 40	100036	Apr. 06, 2010	Apr. 05, 2011

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

### 4.4.3 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 and 300 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots are attached on the following pages.

### 4.4.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.4.5 EUT OPERATING CONDITION

Same as Item 4.2.6

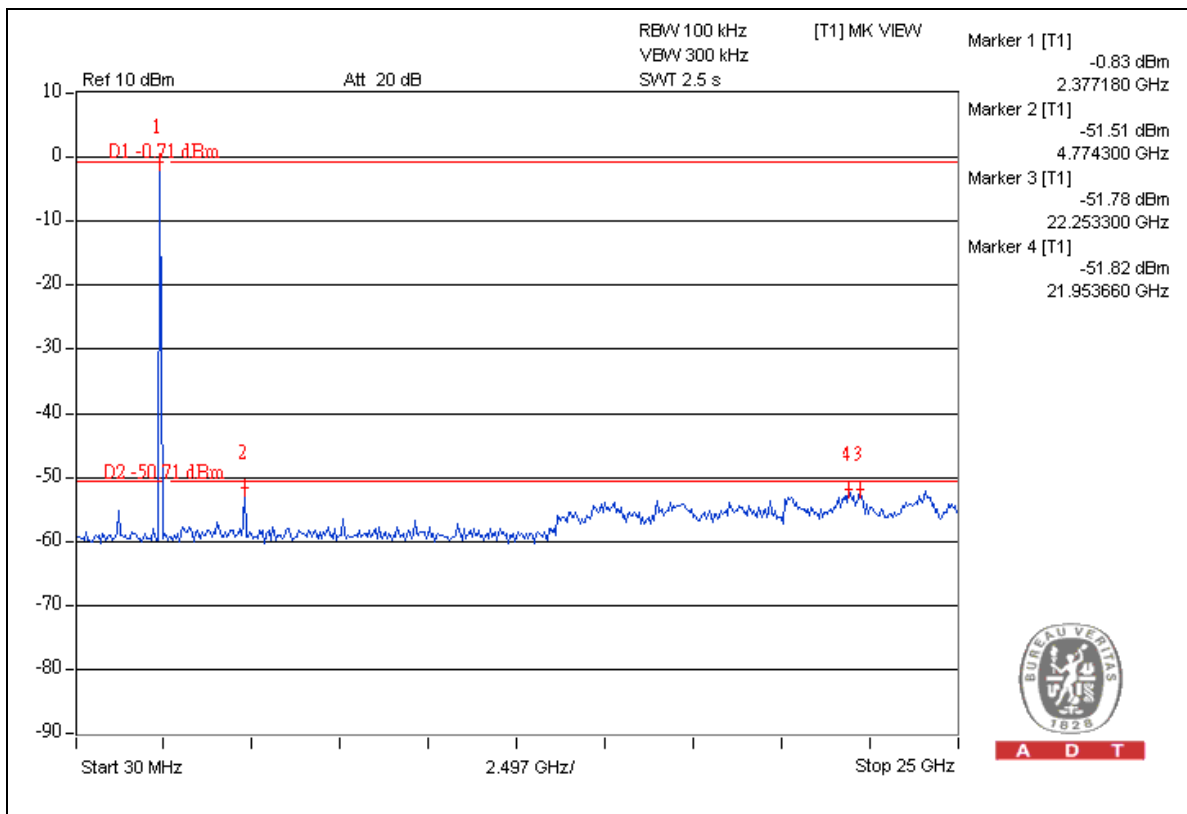
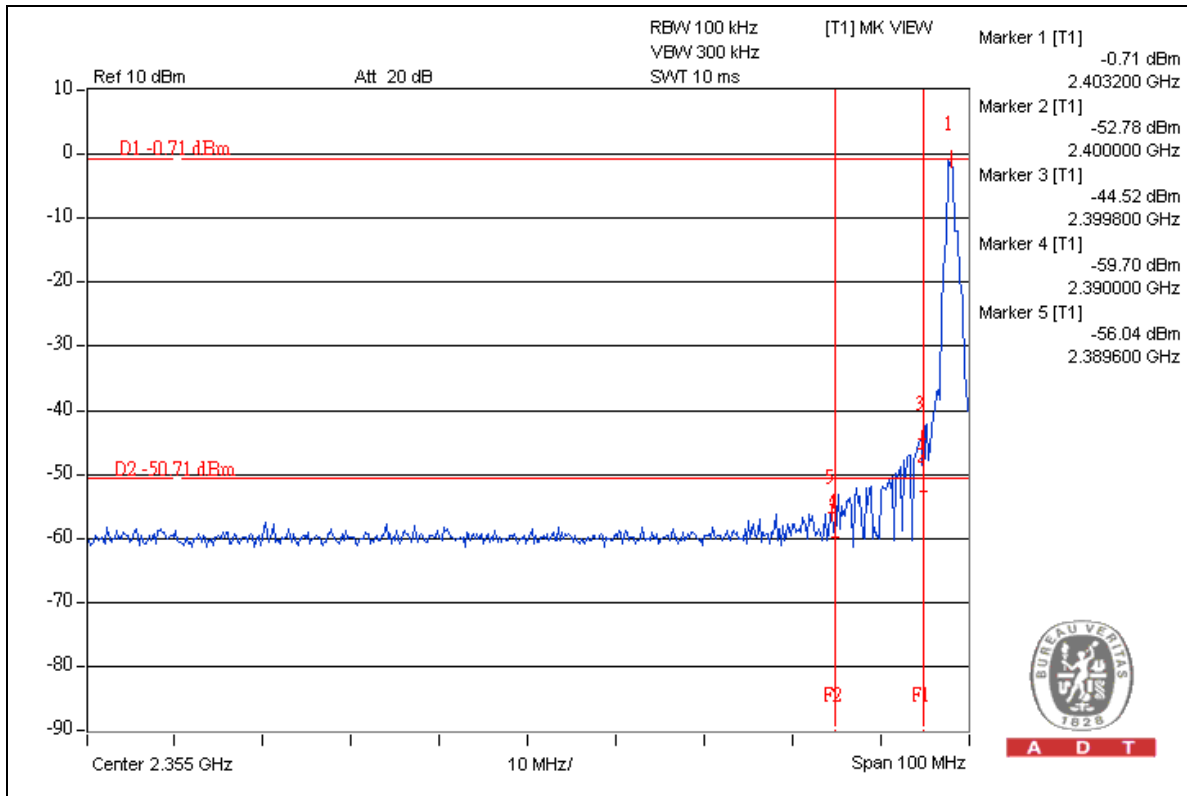
### 4.4.6 TEST RESULTS

The spectrum plots are attached on the following 4 images. D1 line indicates the highest level, and D2 line indicates the 50dB offset below D1. It shows compliance with the requirement in part 15.249(d).



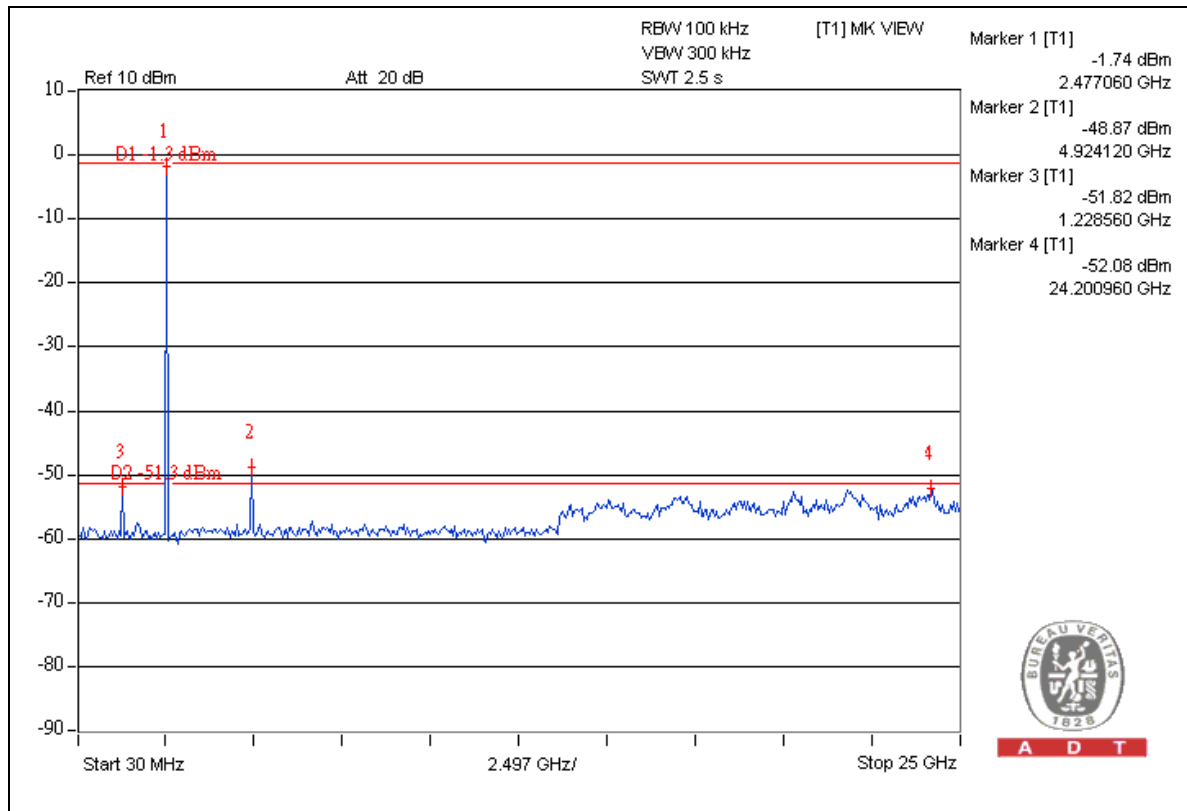
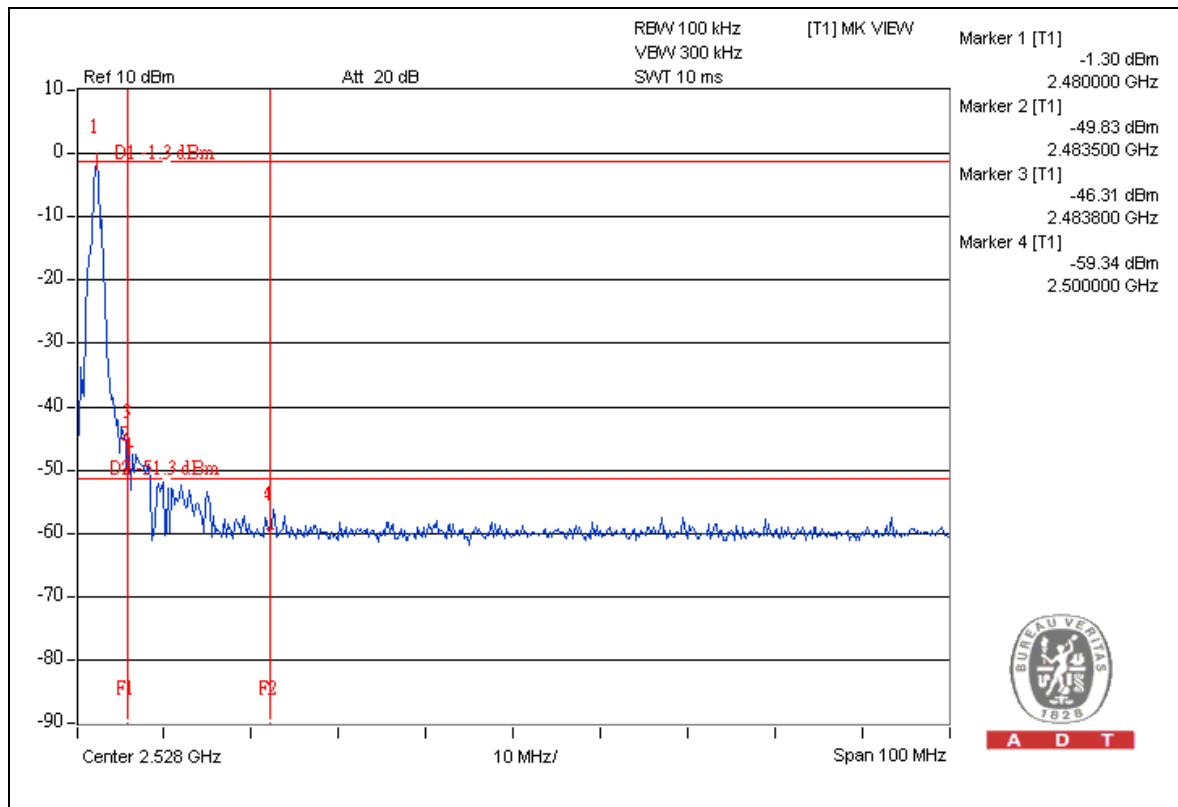
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SERIAL NO.: 3





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## 5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



## 6. 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](http://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

**Web Site:** [www.adt.com.tw](http://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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## **7. 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---**