



TEST REPORT

Applicant:	Zaidtek Electronic Technology (Xiamen) Co. Ltd.
Address:	No.285 Wengjiao Road, Haicang District, Xiamen, Fujian

Manufacturer or Supplier	Zaidtek Electronic Technology (Xiamen) Co. Ltd.
Address	No.285 Wengjiao Road,Haicang District,Xiamen,Fujian
Product:	2.4 GHz Wireless Keyboard & Mouse Combo
Brand Name:	N/A
Model:	HK8065
Additional Model & Model Difference:	N/A
Date of tests:	Apr. 29, 2013 ~ Jun. 19, 2013

the tests have been carried out according to the requirements of the following standard:

IX FCC Part 15, Subpart C (Section 15.249)

CONCLUSION: The submitted sample was found to **COMPLY** with the test requirement

Tested by Glyn He	Approved by Sam Tung
Project Engineer / EMC Department	Manager / EMC Department
Glyn	The state of the s

Date: Jun. 19, 2013

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED	
RF130429N001-1	Original release	Jun. 19, 2013	

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SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.249)				
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK	
§15.203	Antenna Requirement	PASS	Compliant	
§15.207 (a)	Conducted Emission	N/A	EUT is powered by battery	
§15.205	Restricted Band of Operation	PASS	Compliant	
§15.209 §15.249(a)	Radiated Emission	PASS	Compliant	
§15.215(c)	20dB Bandwidth Test	PASS	Compliant	

2 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:

MEASUREMENT	FREQUENCY	UNCERTAINTY	
Conducted emissions	9kHz~30MHz	2.44dB	
	30MHz ~1GHz	3.64dB	
Radiated emissions	1GHz ~ 18GHz	2.26dB	
	18GHz ~ 40GHz	1.94dB	

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

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3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	2.4 GHz Wireless Keyboard & Mouse Combo
MODEL NO.	HK8065
FCC ID	YVYHYXHK8065
NOMINAL VOLTAGE	DC 3V from battery
MODULATION TYPE	GFSK
OPERATING FREQUENCY	2403-2480MHz
ANTENNA TYPE	Integral PCB antenna with 0dBi gain
I/O PORTS	N/A
CABLE SUPPLIED	N/A

NOTE: The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 DESCRIPTION OF TEST MODES

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

TESTED CHANNEL	TESTED FREQUENCY		
Low	2403 MHz		
Middle	2440 MHz		
High	2480 MHz		

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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 (15.249) ANSI C63.10-2009

All test items 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 without any other necessary accessories or support units.

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4 TEST TYPES AND RESULTS

4.1 RADIATED EMISSION MEASUREMENT

4.1.1 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	

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field strength of fundamental (milli-volts/meter)	Field strength of harmonics (micro-volts/meter)	
902-928 MHz	50	500	
2400-2483.5 MHz	50	500	
5725-5875 MHz	50	500	
24.0-24.25 GHz	250	2500	

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

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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4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer	Agilent	E4446A	MY46180622	April 24,13	April 23,14
EMI Test Receiver	Rohde&Schwarz	ESVD	847398/003	May 14,13	May 13,14
Bilog Antenna (25MHz-2GHz)	Teseq	CBL 6111D	27089	Jul. 16,12	Jul. 15,13
Bilog Antenna	Teseq	CBL 6111D	25757	Nov. 22,12	Nov. 21,13
Horn Antenna (1GHz -18GHz)	ЕМСО	3117	00062558	Oct.18,12	Oct.17,13
Pre-Amplifier (20MHz-3GHz)	EMCI	EMC 330	980095	Nov. 02,12	Nov.01,13
Pre-Amplifier (100MHz-26.5GHz)	Agilent	8449B		May 14,13	May 13,14
10m Semi-anechoic Chamber	CHANGLING	21.4m*12.1m*8 .8m	NSEMC006	Mar. 24,13	Mar. 23,14
Digital Multimeter	FLUKE	15B	A1220010D G	Oct. 31,12	Oct. 30,13
Test Software	ADT	ADT_Radiated _V7.6.15	N/A	N/A	N/A

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA and NIM/CHINA.

- 2. The test was performed in 10m Chamber.
- 3. The horn antenna are used only for the measurement of emission frequency above 1GHz if tested.

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4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meters semi-anechoic chamber. 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 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 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 of test receiver/spectrum analyzer is 1MHz 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.

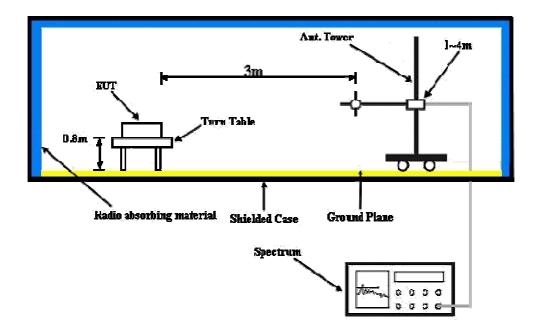
4.1.4 DEVIATION FROM TEST STANDARD

No deviation

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4.1.5 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT OPERATING CONDITIONS

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

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4.1.7 TEST RESULTS

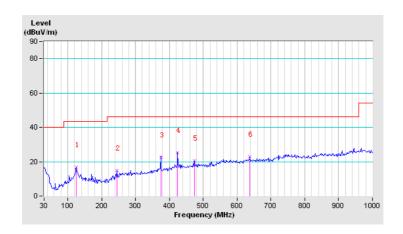
BELOW 1GHz WORST-CASE DATA

EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL TX Low Channel		FREQUENCY RANGE	Below 1000MHz	
TEST VOLTAGE	DC 3V by battery	DETECTOR FUNCTION	Quasi-Peak	

	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	125.38	16.9 QP	43.5	-26.6	1.00 H	102	3.77	13.12			
2	245.02	14.9 QP	46.0	-31.1	1.00 H	165	0.97	13.95			
3	374.35	22.4 QP	46.0	-23.6	1.00 H	140	4.62	17.81			
4	424.47	25.1 QP	46.0	-20.9	1.00 H	40	5.33	19.75			
5	474.58	20.7 QP	46.0	-25.3	1.00 H	198	-0.08	20.76			
6	637.87	23.0 QP	46.0	-23.0	1.00 H	275	-1.23	24.19			

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.



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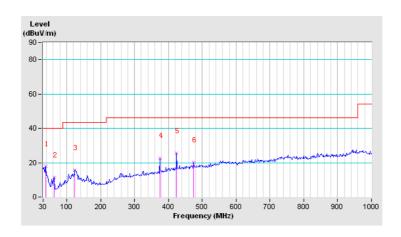


EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL TX Low Channel		FREQUENCY RANGE Below 1000MHz		
TEST VOLTAGE	DC 3V by battery	DETECTOR FUNCTION	Quasi-Peak	

	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	38.08	18.0 QP	40.0	-22.0	1.00 V	305	2.61	15.35			
2	62.33	11.5 QP	40.0	-28.5	1.00 V	129	4.69	6.85			
3	123.77	15.8 QP	43.5	-27.8	1.00 V	46	2.62	13.13			
4	374.35	22.7 QP	46.0	-23.3	1.00 V	86	4.88	17.81			
5	424.47	25.7 QP	46.0	-20.3	1.00 V	16	5.91	19.75			
6	474.58	20.0 QP	46.0	-26.0	1.00 V	177	-0.72	20.76			

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 WORST-CASE DATA:

EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL TX Low Channel		FREQUENCY RANGE 1 ~ 25GHz		
TEST VOLTAGE	DC 3V by battery	DETECTOR FUNCTION	Peak (PK) Average (AV)	

	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	2400.00	48.6 PK	74.0	-25.4	1.00 H	328	11.33	37.27		
2	2400.00	12.4 AV	54.0	-41.6	1.00 H	328	-24.87	37.27		
3	2403.00	87.3 PK	114.0	-26.7	1.00 H	328	50.03	37.27		
4	2403.00	51.1 AV	94.0	-42.9	1.00 H	328	13.83	37.27		
5	4806.00	62.5 PK	74.0	-11.5	1.00 H	268	20.89	41.61		
6	4806.00	26.3 AV	54.0	-27.7	1.00 H	268	-15.31	41.61		
		ANTENNA	POLARITY	/ & TEST DI	STANCE: V	ERTICAL A	T 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	2400.00	46.8 PK	74.0	-27.2	1.00 V	227	9.53	37.27		
2	2400.00	10.6 AV	54.0	-43.4	1.00 V	227	-26.67	37.27		
3	2403.00	77.6 PK	114.0	-36.4	1.00 V	227	40.33	37.27		
4	2403.00	41.4 AV	94.0	-52.6	1.00 V	227	4.13	37.27		
5	4806.00	63.3 PK	74.0	-10.7	1.52 V	255	21.69	41.61		
6	4806.00	27.1 AV	54.0	-26.9	1.52 V	255	-14.51	41.61		

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.
- The average value of fundamental frequency is: Average = Peak value + 20 log(Duty cycle) Where the duty factor is calculated from following formula:
 log (Duty cycle) = 20 log (7*0.22ms / 100ms) = -36.2 dB
 Please see page 16 for plotted duty.

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EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL TX Middle Channel		FREQUENCY RANGE	1 ~ 25GHz	
TEST VOLTAGE	DC 3V by battery	DETECTOR FUNCTION	Peak (PK) Average (AV)	

	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	2440.00	88.2 PK	114.0	-25.8	1.00 H	65	50.86	37.34	
2	2440.00	52.0 AV	94.0	-42.0	1.00 H	65	14.66	37.34	
3	4880.00	60.8 PK	74.0	-13.2	1.00 H	313	19.10	41.70	
4	4880.00	24.6 AV	54.0	-29.4	1.00 H	313	-17.10	41.70	
5	7320.00	59.2 PK	74.0	-14.8	1.52 H	300	13.41	45.79	
6	7320.00	23.0 AV	54.0	-31.0	1.52 H	300	-22.79	45.79	
		ANTENNA	A POLARITY	/ & TEST DI	STANCE: V	ERTICAL A	T 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	2440.00	77.4 PK	114.0	-36.6	1.00 V	227	40.06	37.34	
2	2440.00	41.2 AV	94.0	-52.8	1.00 V	227	3.86	37.34	
3	4880.00	63.6 PK	74.0	-10.4	1.00 V	199	21.90	41.70	
4	4880.00	27.3 AV	54.0	-26.7	1.00 V	199	-14.40	41.70	
5	4880.00 7320.00	27.3 AV 60.8 PK	54.0 74.0	-26.7 -13.2	1.00 V 1.24 V	199 240	-14.40 15.01	41.70 45.79	

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.
- The average value of fundamental frequency is: Average = Peak value + 20 log(Duty cycle) Where the duty factor is calculated from following formula:
 20 log (Duty cycle) = 20 log (7*0.22ms / 100ms) = -36.2 dB
 Please see page 16 for plotted duty.

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EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL TX High Channel		FREQUENCY RANGE 1 ~ 25GHz		
TEST VOLTAGE	DC 3V by battery	DETECTOR FUNCTION	Peak (PK) Average (AV)	

		ANTENNA	POLARITY &	& TEST DIS	TANCE: HO	RIZONTAL	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	86.3 PK	114.0	-27.7	1.03 H	72	48.89	37.41
2	*2480.00	50.1 AV	94.0	-43.9	1.03 H	72	12.69	37.41
3	2483.50	47.7 PK	74.0	-26.3	1.00 H	72	10.29	37.41
4	2483.50	11.5 AV	54.0	-42.5	1.00 H	72	-25.91	37.41
5	4960.00	66.8 PK	74.0	-7.2	1.32 H	298	25.00	41.80
6	4960.00	30.6 AV	54.0	-23.4	1.32 H	298	-11.20	41.80
7	7440.00	56.5 PK	74.0	-17.5	1.00 H	110	10.68	45.82
8	7440.00	20.3 AV	54.0	-33.7	1.00 H	110	-25.52	45.82
		ANTENNA	A POLARITY	/ & TEST DI	STANCE: V	ERTICAL A	T 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	77.3 PK	114.0	-36.7	1.56 V	275	39.89	37.41
2	*2480.00	41.1 AV	94.0	-52.9	1.56 V	275	3.69	37.41
3	2483.50	47.4 PK	74.0	-26.6	1.56 V	275	9.99	37.41
4	2483.50	11.2 AV	54.0	-42.8	1.56 V	275	-26.21	37.41
5	4960.00	67.4 PK	74.0	-6.6	1.49 V	236	25.60	41.80
6	4960.00	31.2 AV	54.0	-22.8	1.49 V	236	-10.60	41.80
	7440.00	60.2 PK	74.0	-13.8	1.38 V	3	14.38	45.82
7	7 440.00	00.2110	74.0	10.0	1.00 V	ŭ	1 1.00	10.02

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.
- The average value of fundamental frequency is: Average = Peak value + 20 log(Duty cycle) Where the duty factor is calculated from following formula:
 20 log (Duty cycle) = 20 log (7*0.22ms / 100ms) = -36.2 dB

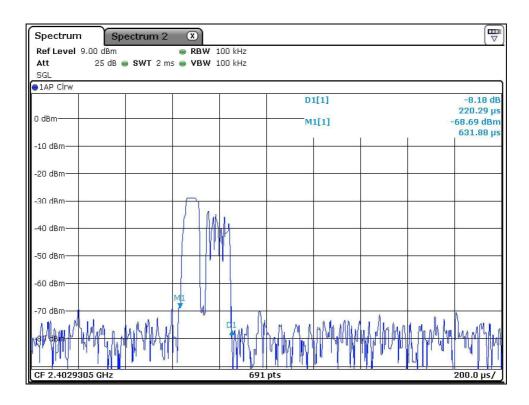
Please see page 16 for plotted duty.

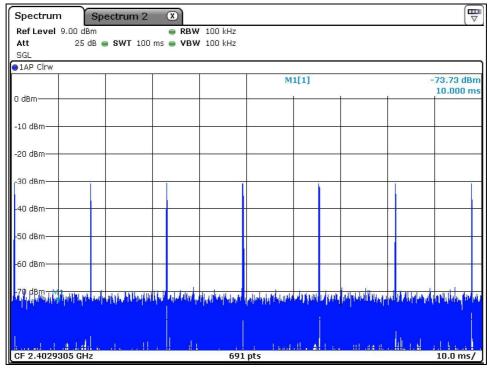
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Duty Cycle

 $20 \log (Duty cycle) = 20 \log (7*0.22ms / 100ms) = -36.2 dB$





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4.2 20dB BANDWIDTH MEASUREMENT

4.2.1 LIMITS OF 20dB BANDWIDTH MEASUREMENT

According to FCC 15.215(c), must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer	Agilent	E4446A	MY46180622	April 24,13	April 23,14
EMI Test Receiver	Rohde&Schwarz	ESVD	847398/003	May 14,13	May 13,14
Bilog Antenna (25MHz-2GHz)	Teseq	CBL 6111D	27089	Jul. 16,12	Jul. 15,13
Bilog Antenna	Teseq	CBL 6111D	25757	Nov. 22,12	Nov. 21,13
Horn Antenna (1GHz -18GHz)	ЕМСО	3117	00062558	Oct.18,12	Oct.17,13
Pre-Amplifier (20MHz-3GHz)	EMCI	EMC 330	980095	Nov. 02,12	Nov. 01,13
Pre-Amplifier (100MHz-26.5GHz)	Agilent	8449B		May 14,13	May 13,14
10m Semi-anechoic Chamber	CHANGLING	21.4m*12.1m*8 .8m	NSEMC006	Mar. 24,13	Mar. 23,14
Digital Multimeter	FLUKE	15B	A1220010D G	Oct. 31,12	Oct. 30,13
Test Software	ADT	ADT_Radiated _V7.6.15	N/A	N/A	N/A

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA and NIM/CHINA

2. The test was performed in Chamber 10m.

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4.2.3 TEST PROCEDURE

The EUT was placed on a turn table which was 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 to 4 m for horizontal and vertical polarizations.

The spectrum analyzer was receiving the maximum emission level. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

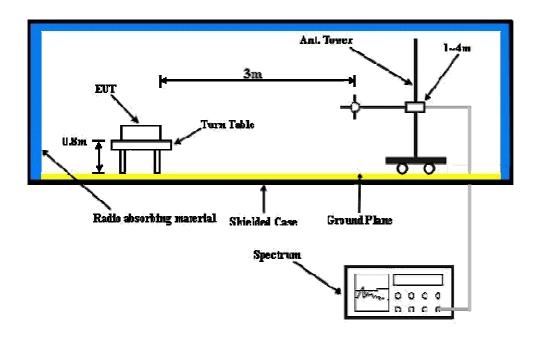
Tel: +86 769 8593 5656 Fax: +86 769 8593 1080

Email: customerservice.dg@cn.bureauveritas.com

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4.2.5 TEST SETUP



4.2.6 EUT OPERATING CONDITIONS

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

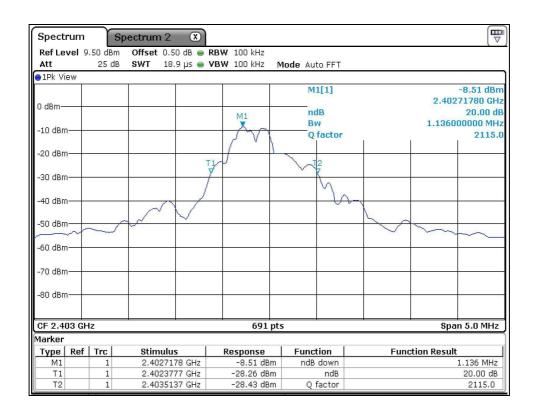
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4.2.7 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
Low	2403	1.13
Middle	2440	1.26
High	2480	1.23

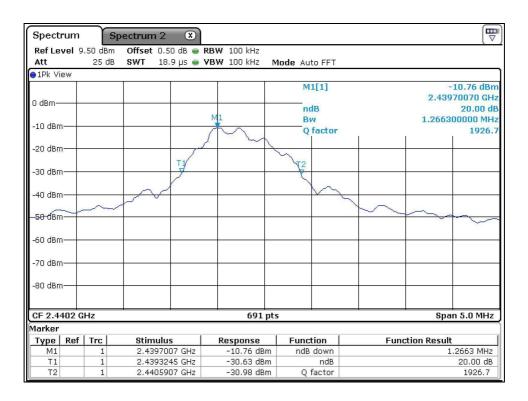
Test Data: Low channel



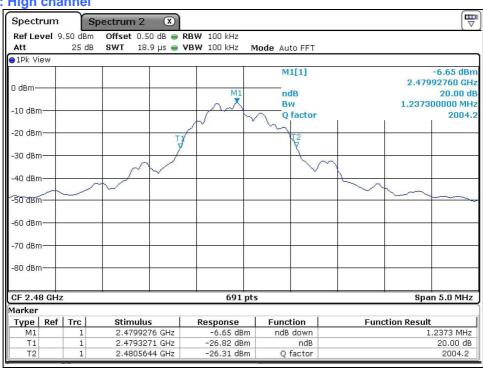
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Test Data: Middle channel



Test Data: High channel



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5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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

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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---

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