



TEST REPORT

Applicant:	Dongguan Newmen Electronics Technology Co., LTD	
Address:	No.5,Xifa road, Lin village, Tangxia Town, Dongguan, Guangdong, China	

Manufacturer or Supplier	Dongguan Newmen Electronics Technology Co.,LTD
Address	No. 5 Xifa Road, Lin Village, Tangxia Town, Dongguan, Guangdong, China
Product	Wireless mouse
Brand Name	NEWMEN / IHOME
Model	MS-270
Additional Model & Model Difference:	IH-M471B; See section 3.1
Date of tests	Feb. 26 ~ Mar. 14, 2013

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

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

Tested by Venless Long Project Engineer / EMC Department	Approved by Glyn He Supervisor / EMC Department
verless	Glyn
	Date: Mar. 14, 2014

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report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF130225N001	Original release	Mar. 19, 2013
RF140310N026	Based on the original report RF130225N001 changed model, applicant, manufacturer, appearance and FCC ID, added brand name.	Mar. 14, 2014

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SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

	3 31				
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
	9kHz~30MHz	2.74dB
Radiated emissions	30MHz ~1GHz	3.64dB
Nadiated emissions	1GHz ~ 18GHz	2.20dB
	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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GENERAL INFORMATION 3

3.1 **GENERAL DESCRIPTION OF EUT**

PRODUCT	Wireless mouse
MODEL NO.	MS-270
FCC ID	V4P- MS-270
NOMINAL VOLTAGE	DC 1.5V From Battery
MODULATION TYPE	GFSK
OPERATING FREQUENCY	2406MHz-2476MHz
ANTENNA TYPE	Integral PCB antenna with 1.86dBi gain
I/O PORTS	N/A
CABLE SUPPLIED	N/A

NOTE:

- 1. Additional model IH-M471B is identical with the test model MS-270 except the model number for marketing purpose.
- 2. 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. This report is issued for changing the model, applicant, manufacturer, appearance and FCC ID, adding brand name based on the original report RF130225N001.

3.2 DESCRIPTION OF TEST MODES

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

TESTED CHANNEL	TESTED FREQUENCY
Low	2406 MHz
Middle	2447MHz
High	2476 MHz



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.

NOTE: It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (Verification). The test report has been issued separately.

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:

<u>'</u>	1 7 17	<u> </u>
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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Spectrum Analyzer ROHDE & SCHWARZ	E4446A	MY46180622	May 02, 12	May 01, 13
Test Receiver ROHDE & SCHWARZ	ESVD	847398/003	May 15,12	May 14,13
Bilog Antenna TESEQ	CBL 6111D	25758	Jul. 16,12	Jul. 15,13
Horn Antenna EMCO	3117	00062558	Oct.18,12	Oct.17,13
10m Semi-anechoic Chamber ETS-LINDGREN	21.4m*12.1m*8.8m	NSEMC006	Mar 24,12	Mar 23,13
RF Cable IMRO	IMRO-400	10m Cable 1#10m	May 16,12	May 15,13
RF Cable IMRO	IMRO-400	10m Cable 2#3m	May 16,12	May 15,13
Signal Amplifier EMCI	EMC330	980095	Nov 2,12	Nov.1,13
Pre-Amplifier HP	8449B	3008A00409	May 31,12	May 30,13
RF Cable DRAKA	M06/25-RG102	10m Cable 2#	May 16,12	May 15,13
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 Dongguan 10m Chamber.
 - 3. The horn antenna are used only for the measurement of emission frequency above 1GHz if tested.
 - 4. The FCC Site Registration No. is 502831

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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:

- 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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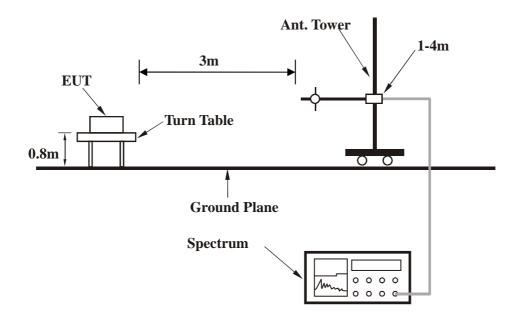
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4.1.5 TEST SETUP



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

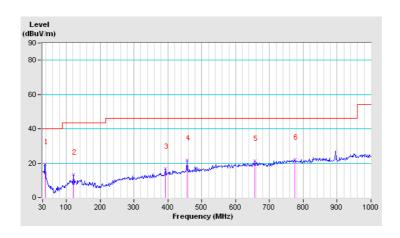
BELOW 1GHz WORST-CASE DATA

EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL	TX Low Channel	FREQUENCY RANGE	Below 1000MHz	
TEST VOLTAGE	DC 1.5\/ by battory	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	38.08	19.4 QP	40.0	-20.6	1.56 H	91	4.06	15.33		
2	120.53	13.4 QP	43.5	-30.1	1.71 H	108	0.74	12.62		
3	392.13	16.6 QP	46.0	-29.4	2.20 H	203	-0.93	17.53		
4	456.80	21.9 QP	46.0	-24.1	1.87 H	127	2.60	19.27		
5	657.27	21.2 QP	46.0	-24.8	2.01 H	142	-2.15	23.32		
6	775.28	22.0 QP	46.0	-24.0	2.02 H	221	-3.42	25.38		

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. For the test results, the EUT had been tested from 9KHz ~25GHz. But only the worst case was shown in test report.



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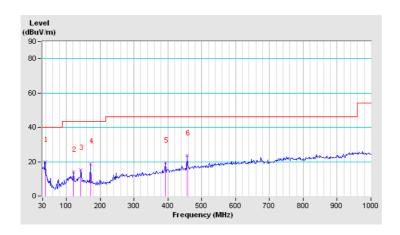


EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL	CHANNEL TX Low Channel		Below 1000MHz	
TEST VOLTAGE	IDC 1.5V by hattery	DETECTOR FUNCTION	Quasi-Peak	

	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	19.7 QP	40.0	-20.3	1.16 V	252	4.38	15.33		
2	120.53	14.2 QP	43.5	-29.3	1.76 V	320	1.60	12.62		
3	143.17	15.3 QP	43.5	-28.2	1.37 V	276	2.68	12.61		
4	172.27	18.8 QP	43.5	-24.7	1.02 V	230	7.96	10.88		
5	392.13	19.3 QP	46.0	-26.7	1.57 V	298	1.79	17.53		
6	456.80	23.8 QP	46.0	-22.3	1.00 V	196	4.48	19.27		

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. For the test results, the EUT had been tested from 9KHz ~25GHz. But only the worst case was shown in test report.



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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 1.5V 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	2400.00	48.7 PK	74.0	-25.3	1.00 H	104	12.20	36.50
2	2400.00	35.2 AV	54.0	-18.8	1.00 H	104	-1.30	36.50
3	2406.00	97.1 PK	114.0	-16.9	1.00 H	104	60.54	36.56
4	2406.00	83.6 AV	94.0	-10.4	1.00 H	104	47.04	36.56
5	4812.00	62.4 PK	74.0	-11.6	1.08 H	346	13.15	49.25
6	4812.00	48.9 AV	54.0	-5.1	1.08 H	346	-0.35	49.25
		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	2400.00	49.5 PK	74.0	-24.5	1.05 V	85	13.00	36.50
2	2400.00	36.0 AV	54.0	-18.0	1.05 V	85	-0.50	36.50
3	2406.00	80.6 PK	114.0	-33.4	1.05 V	85	44.04	36.56
4	2406.00	67.1 AV	94.0	-26.9	1.05 V	85	30.54	36.56
5	4812.00	59.8 PK	74.0	-14.2	1.02 V	230	10.55	49.25
6	4812.00	46.3 AV	54.0	-7.7	1.02 V	230	-2.95	49.25

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 (1.667 ms / 7.883 ms) = -13.5 dB
 Please see page 16 for plotted duty.

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EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL	TX Middle Channel		1 ~ 25GHz	
TEST VOLTAGE	DC 1.5V 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	2447.00	98.1 PK	114.0	-15.9	1.00 H	105	61.18	36.92
2	2447.00	84.6 AV	94.0	-9.4	1.00 H	105	47.68	36.92
3	4894.00	63.1 PK	74.0	-10.9	1.05 H	350	13.87	49.23
4	4894.00	49.6 AV	54.0	-4.4	1.05 H	350	0.37	49.23
5	7341.00	60.8 PK	74.0	-13.2	1.00 H	247	14.18	46.62
6	7341.00	47.3 AV	54.0	-6.7	1.00 H	247	0.68	46.62
		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	2447.00	82.3 PK	114.0	-31.7	1.05 V	216	45.38	36.92
2	2447.00	68.8 AV	94.0	-25.2	1.05 V	216	31.88	36.92
3	4894.00	64.5 PK	74.0	-9.5	1.00 V	64	15.27	49.23
4	4894.00	51.0 AV	54.0	-3.0	1.00 V	64	1.77	49.23
5	7341.00	63.7 PK	74.0	-10.3	1.08 V	115	17.08	46.62

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 + 20 log(Duty cycle) Where the duty factor is calculated from following formula: $20 \log (Duty \text{ cycle}) = 20 \log (1.667 \text{ ms} / 7.883 \text{ ms}) = -13.5 \text{ dB}$ 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 1.5V 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	2476.00	99.6 PK	114.0	-14.4	1.02 H	108	62.42	37.18
2	2476.00	86.1 AV	94.0	-7.9	1.02 H	108	48.92	37.18
3	2483.50	44.8 PK	74.0	-29.2	1.02 H	108	7.56	37.24
4	2483.50	31.3 AV	54.0	-22.7	1.02 H	108	-5.94	37.24
5	4952.00	64.1 PK	74.0	-9.9	1.00 H	347	14.89	49.21
6	4952.00	50.6 AV	54.0	-3.4	1.00 H	347	1.39	49.21
7	7428.00	60.4 PK	74.0	-13.6	1.03 H	250	13.71	46.69
8	7428.00	46.9 AV	54.0	-7.1	1.03 H	250	0.21	46.69
		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	2476.00	82.9 PK	114.0	-31.1	1.06 V	215	45.72	37.18
2	2476.00	69.4 AV	94.0	-24.6	1.06 V	215	32.22	37.18
3	2483.50	48.5 PK	74.0	-25.5	1.06 V	215	11.26	37.24
4	2483.50	35.0 AV	54.0	-19.0	1.06 V	215	-2.24	37.24
5	4952.00	64.5 PK	74.0	-9.5	1.00 V	66	15.29	49.21
							<u> </u>	
6	4952.00	51.0 AV	54.0	-3.0	1.00 V	66	1.79	49.21
	4952.00 7428.00	51.0 AV 63.7 PK	54.0 74.0	-3.0 -10.3	1.00 V 1.04 V	66 120	1.79 17.01	49.21 46.69

REMARKS:

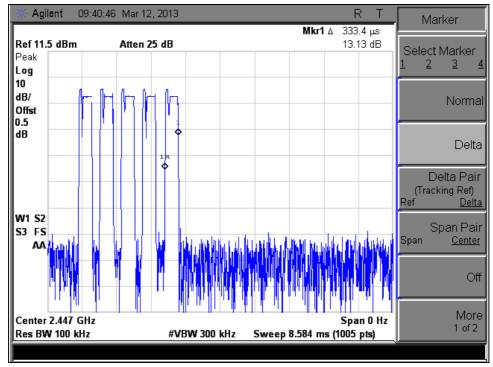
- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value.
- 5. " * ": Fundamental frequency.
- The 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 (1.667 ms / 7.883 ms) = -13.5 dB
 Please see page 16 for plotted duty.

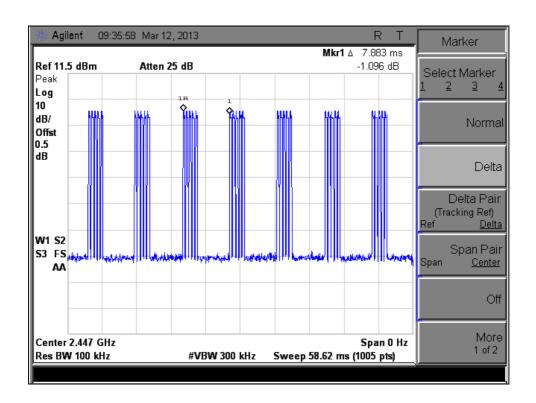
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Duty Cycle





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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.
Signal Analyzer	Rohde&Schwarz	FSV7	102331	Nov. 26,12	Nov. 25,13
Spectrum Analyzer (9KHz-25GHz)	Agilent	E7405A	MY45118807	May 14,13	May 13,14
Digital Multimeter	FLUKE	15B	A1220010D G	Oct. 31,12	Oct. 30,13
Bluetooth tester	Rohde&Schwarz	CBT	100325	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, GRGT/CHINA and NIM/CHINA.

2. The test site was performed in Oven room

4.2.3 TEST PROCEDURE

- a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. 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.
- c. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
- d. Repeat above procedures until all frequencies measured were complete.

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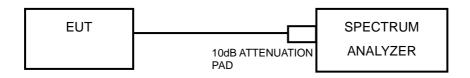
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4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

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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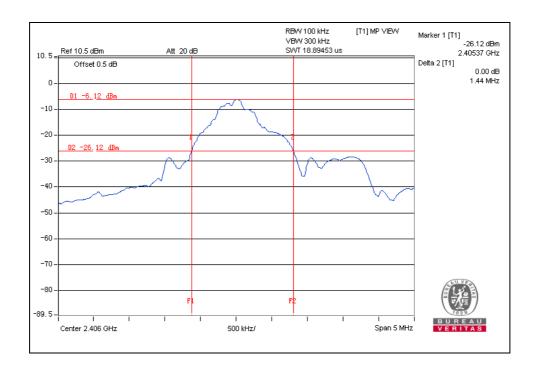
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4.2.7 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
Low	2406	1.44
Middle	2447	2.52
High	2476	2.57

Test Data: Low channel



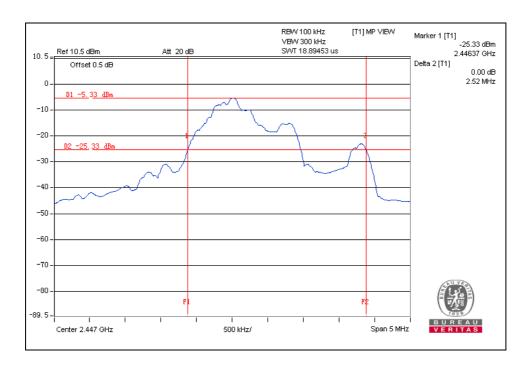
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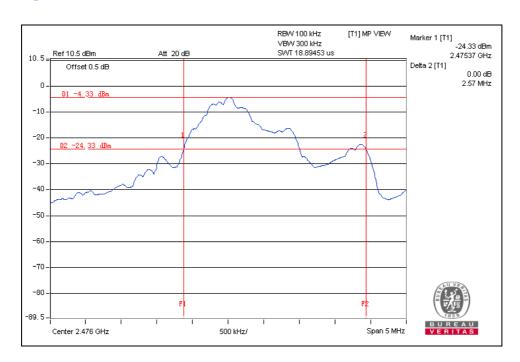
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Test Data: Middle channel



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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