

TEST REPORT

Applicant:	KYE SYSTEMS CORP.
Address:	No. 492, Sec. 5, Chongxin Rd., Sanchong Dist., New Taipei City 24160, Taiwan (R.O.C.)

Manufacturer or Supplier	Dongguan Kunying Computer Products Co., Ltd
Address	Baodun Industrial District, Houjie Town, Dongguan City, Guangdong Province, 523961 China
Product:	wireless keyboard
Brand Name:	Genius
Model:	Smart KM-8100/K
Additional Model & Model Difference	Smart KM-8200/K, Smart KM-8300/K, Smart KM-8500/K, etc. See section 3.1
Date of tests:	Jan. 26, 2018 ~ Mar. 19, 2018

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

☒ FCC Part 15, Subpart C, Section 15.249

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

Tested by Andy Zhu Project Engineer / EMC Department	Approved by Glyn He Supervisor / EMC Department
	
	Date: Jan. 21, 2019

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Test Report No.: RF180126N040

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF180126N040	Original release	Jan. 21, 2019

1 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	No antenna connector is used
§15.207 (a)	Conducted Emission	N/A	Powered from 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
Radiated emissions	9KHz ~ 30MHz	2.90dB
	30MHz ~ 1GMHz	3.83dB
	1GHz ~ 18GHz	4.93dB
	18GHz ~ 40GHz	4.80dB

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

	be 0-9 & A-Z), Smart KB-XXXXXX(X can be 0-9 & A-Z), Smart KB-XX/K(X can be 0-9 & A-Z), Smart KB-XXX/K(X can be 0-9 & A-Z), Smart KB-XXXX/K(X can be 0-9 & A-Z), Smart KB-XXXXX/K(X can be 0-9 & A-Z), Smart KB-XXXXXX/K(X can be 0-9 & A-Z), SlimStar KB-XX(X can be 0-9 & A-Z), SlimStar KB-XXX(X can be 0-9 & A-Z), SlimStar KB-XXXX(X can be 0-9 & A-Z), SlimStar KB-XXXXX(X can be 0-9 & A-Z), SlimStar KB-XXXXXX(X can be 0-9 & A-Z), SlimStar KB-XX/K(X can be 0-9 & A-Z), SlimStar KB-XXX/K(X can be 0-9 & A-Z), SlimStar KB-XXXX/K(X can be 0-9 & A-Z), SlimStar KB-XXXXX/K(X can be 0-9 & A-Z), SlimStar KB-XXXXXX/K(X can be 0-9 & A-Z), Smart SlimStar KB-XX(X can be 0-9 & A-Z), Smart SlimStar KB-XXX(X can be 0-9 & A-Z), Smart SlimStar KB-XXXX(X can be 0-9 & A-Z), Smart SlimStar KB-XXXXX(X can be 0-9 & A-Z), Smart SlimStar KB-XXXXXX(X can be 0-9 & A-Z), Smart SlimStar KB-XX/K(X can be 0-9 & A-Z), Smart SlimStar KB-XXX/K(X can be 0-9 & A-Z), Smart SlimStar KB-XXXX/K(X can be 0-9 & A-Z), Smart SlimStar KB-XXXXX/K(X can be 0-9 & A-Z), KB-XX(X can be 0-9 & A-Z), KB-XXX(X can be 0-9 & A-Z), KB-XXXX(X can be 0-9 & A-Z), KB-XXXXX(X can be 0-9 & A-Z), KB-XXXXXX(X can be 0-9 & A-Z), KB-XX/K(X can be 0-9 & A-Z), KB-XXX/K(X can be 0-9 & A-Z), KB-XXXX/K(X can be 0-9 & A-Z), KB-XXXXX/K(X can be 0-9 & A-Z), KB-XXXXXX/K(X can be 0-9 & A-Z)
FCC ID	FSUGKZHL
NOMINAL VOLTAGE	DC 1.5V (1.5V*AAA*1) from Battery
MODULATION TECHNOLOGY	GFSK
OPERATING FREQUENCY	2407-2477MHz
ANTENNA TYPE	PCB Antenna, with 0dBi gain
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	N/A

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions, but only the worst case was shown in test report.
3. Please refer to the EUT photo document (Reference No.: 180126N040) for detailed product photo.
4. Additional models (see about table) are identical with the test model Smart KM-8100/K except the appearance and model name for trading purpose.

3.2 DESCRIPTION OF TEST MODES

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and packet type. The worst case was found when the EUT was positioned on X axis for radiated emission. The EUT was tested under the following mode.

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE<1G	RE≥1G	PLC	BW	
A	√	√	-	√	DC 1.5V from fully Battery

Where **RE<1G**: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission

RE≥1G: Radiated Emission above 1GHz
BW: 20db bandwidth

NOTE: No need to concern of Conducted Emission due to the EUT is powered by battery.

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

TESTED CHANNEL	TESTED FREQUENCY
Low	2407 MHz
Middle	2440 MHz
High	2477 MHz

Channel List

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
1	2407	5	2421	9	2440	13	2455,
2	2408	6	2428	10	2441	14	2467,
3	2410	7	2435	11	2442	15	2468
4	2414	8	2437	12	2449,	16	2477

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE	25deg. C, 55%RH	DC 1.5V from fully Battery	Hardy
BW	25deg. C, 55%RH	DC 1.5V from fully Battery	Hardy
PLC	-	-	-

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 C63.10-2013

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

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.



4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESU40	100449	Mar. 11,18	Mar. 10,19
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV7	102331	Nov. 04,17	Nov. 03,18
Active Loop Antenna (9KHz -30MHz)	SCHWARZBECK	FMZB 1519B	1519B-045	May 31,17	May 30,18
Amplifier (9KHz -1GHz)	Burgeon	BPA-530	100210	Apr. 05,17	Apr. 04,18
Bilog Antenna (20MHz -2GHz)	Teseq	CBL 6111D	30643	Jul. 28, 17	Jul. 27, 18
Horn Antenna (1GHz -18GHz)	ETS -Lindgren	3117	00062558	May 19,17	May 18,18
Horn Antenna (18GHz -40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170242	Mar. 15,18	Mar. 14,19
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	Mar. 06,18	Mar. 05,19
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A
Broadband Preamplifier (1GHz~18GHz)	SCHWARZBECK	BBV9718	305	Mar. 06,18	Mar. 05,19
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 08,17	Nov. 07,18
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A

NOTE:

1. The test was performed in 966 Chamber.
2. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 749762.

4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 1.5 meters (above 1GHz) and 0.8 meters (below 1GHz) above the ground at a 3 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. For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.
- g. 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:

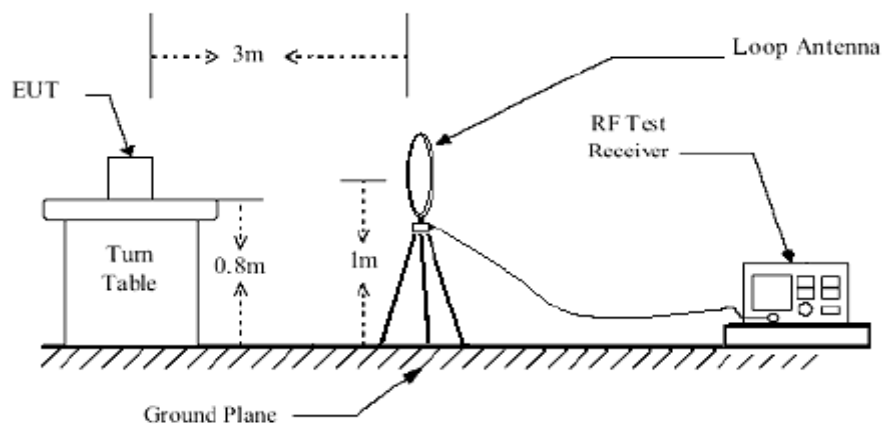
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution 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.
5. The testing of the EUT was performed on all 3 orthogonal axes; the worst-case test configuration was reported on the file test setup photo.

4.1.4 DEVIATION FROM TEST STANDARD

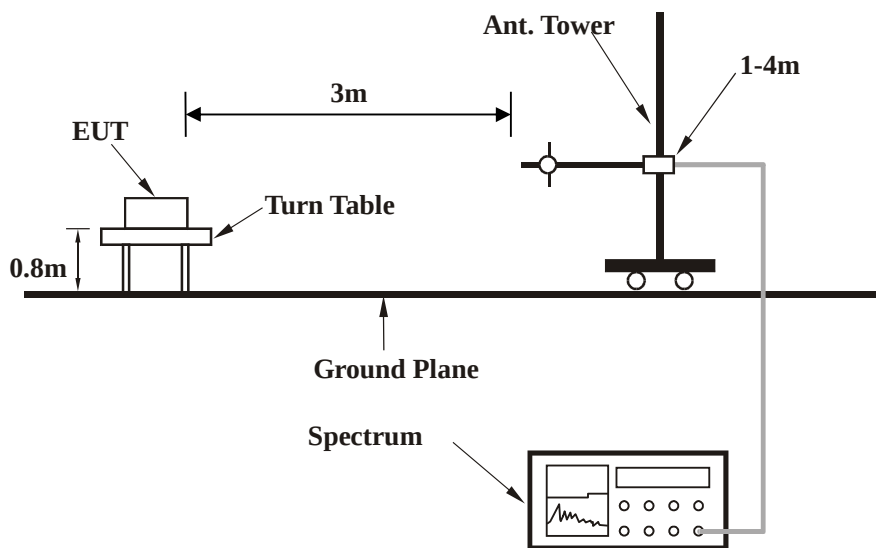
No deviation.

4.1.5 TEST SETUP

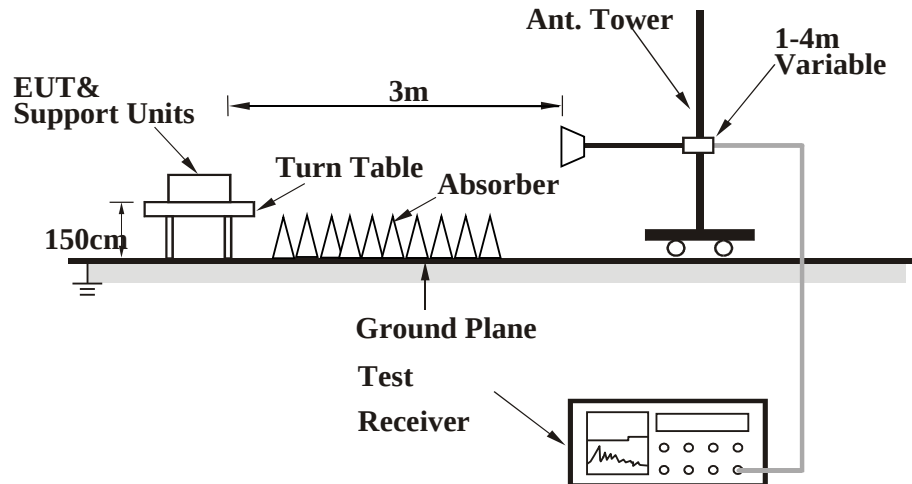
Below 30MHz test setup



Below 1GHz test setup



Above 1GHz test setup



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

4.1.6 EUT OPERATING CONDITIONS

- Turned on the power of all equipment.
- EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

4.1.7 TEST RESULTS

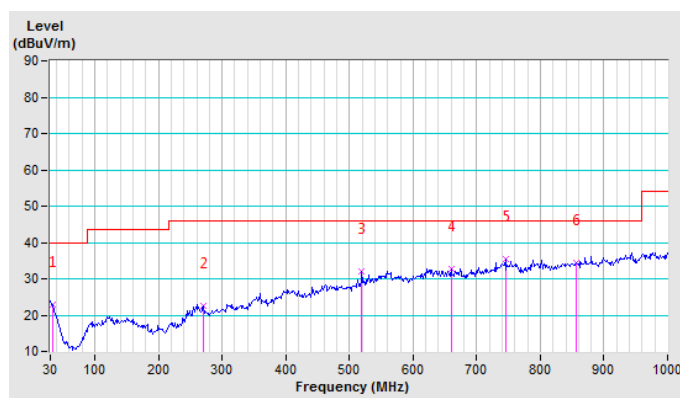
BELOW 1GHz WORST-CASE DATA

CHANNEL	TX Middle Channel	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9KHz ~ 1GHz		

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	34.66	23.04 QP	40.00	-16.96	1.00 V	90	30.79	-7.75
2	270.95	22.52 QP	46.00	-23.48	1.00 V	88	30.03	-7.51
3	519.66	32.00 QP	46.00	-14.00	1.00 V	170	31.58	0.42
4	659.57	32.64 QP	46.00	-13.36	1.00 V	49	29.58	3.06
5	745.06	35.42 QP	46.00	-10.58	1.00 V	300	30.32	5.10
6	856.99	34.51 QP	46.00	-11.49	1.00 V	280	29.21	5.30

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.

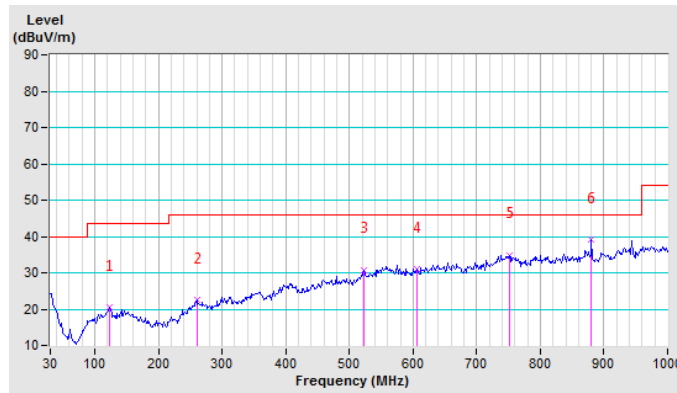


CHANNEL	TX Middle Channel	DETECTOR	Quasi-Peak (QP)
FREQUENCY RANGE	9KHz ~ 1GHz	FUNCTION	

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	123.27	20.41 QP	43.50	-23.09	1.00 V	29	31.22	-10.81
2	260.06	22.45 QP	46.00	-23.55	1.00 V	99	29.20	-6.75
3	522.77	30.74 QP	46.00	-15.26	1.00 V	68	30.28	0.46
4	606.71	30.93 QP	46.00	-15.07	1.00 V	180	29.21	1.72
5	751.28	34.91 QP	46.00	-11.09	1.00 V	279	29.94	4.97
6	880.30	39.04 QP	46.00	-6.96	1.00 V	264	33.58	5.46

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 emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.



ABOVE 1GHz WORST-CASE DATA:

CHANNEL	TX Low Channel	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	Average (AV)

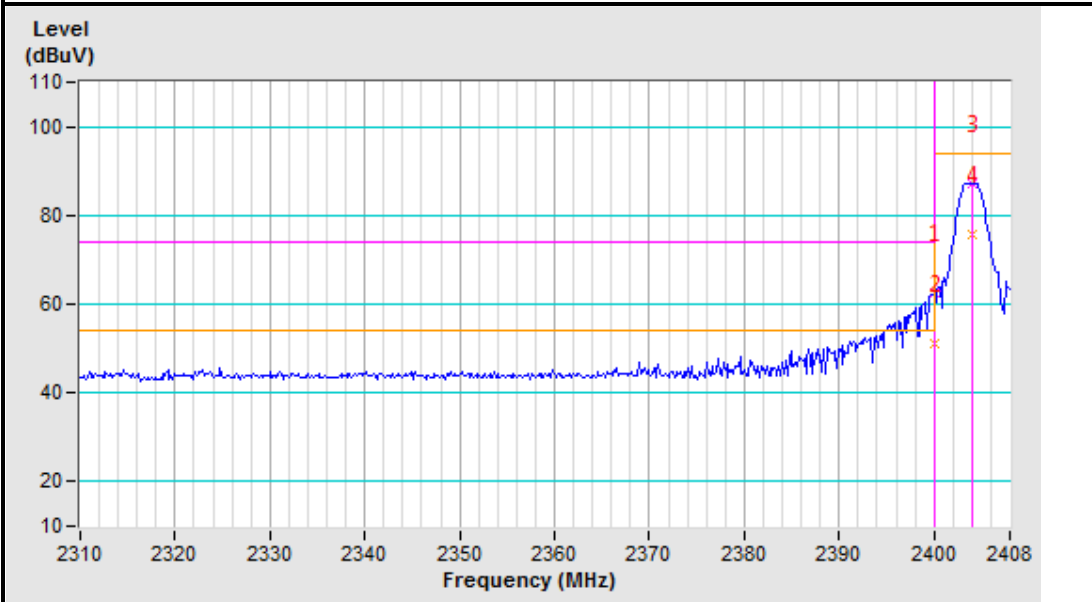
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2400.00	62.48 PK	74.00	-11.52	1.36 H	100	59.35	3.13
2	2400.00	45.42 AV	54.00	-8.58	1.36 H	100	42.29	3.13
3	*2407.00	87.09 PK	114.00	-26.91	1.30 H	269	77.82	3.16
4	*2407.00	70.03 AV	94.00	-23.97	1.30 H	269	66.87	3.16
5	4814.00	52.28 PK	74.00	-21.72	1.02 H	225	46.21	6.07
6	4814.00	35.22 AV	54.00	-18.78	1.02 H	225	29.15	6.07
7	7221.00	58.66 PK	74.00	-15.34	1.30 H	269	47.19	11.47
8	7221.00	41.60 AV	54.00	-12.40	1.30 H	269	30.13	11.47
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	2400.00	56.32 PK	74.00	-17.68	2.46 V	165	53.19	3.13
2	2400.00	39.26 AV	54.00	-14.74	2.46 V	165	36.13	3.13
3	*2407.00	80.25 PK	114.00	-33.75	1.30 V	269	77.09	3.16
4	*2407.00	63.19 AV	94.00	-30.81	1.30 V	269	60.03	3.16
5	4814.00	51.57 PK	74.00	-22.43	1.02 V	225	45.50	6.07
6	4814.00	34.51 AV	54.00	-19.49	1.02 V	225	28.44	6.07
7	7221.00	57.65 PK	74.00	-16.35	1.02 V	147	46.18	11.47
8	7221.00	40.59 AV	54.00	-13.41	1.02 V	147	29.12	11.47

REMARKS:

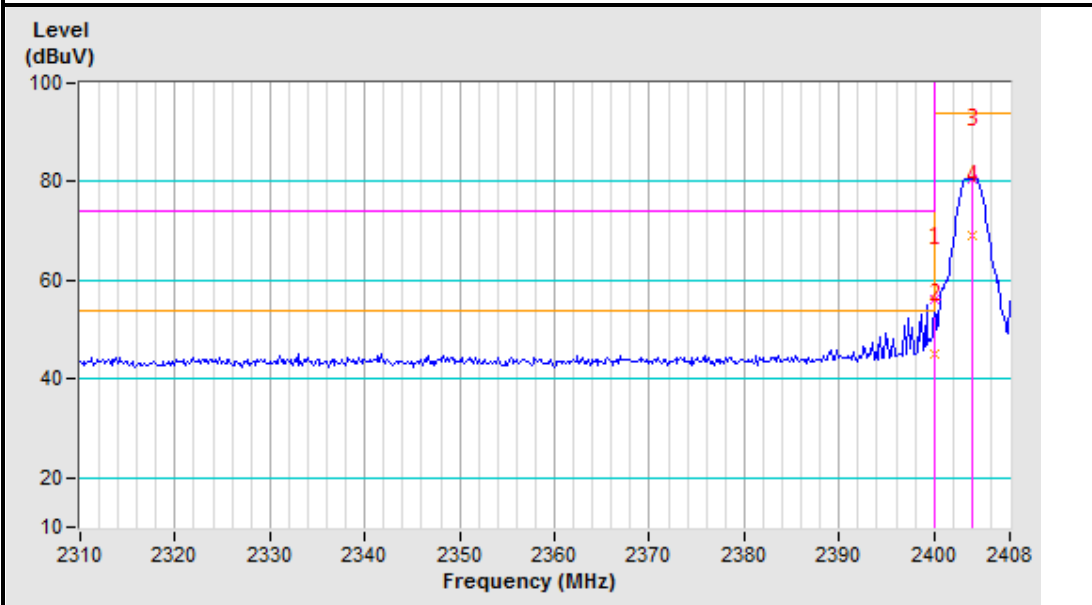
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

Band edge Plot

2407MHz Horizontal



2407MHz Vertical



CHANNEL	TX Middle Channel	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		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	82.69 PK	114.00	-31.31	1.20 H	147	79.41	3.28
2	*2440.00	65.63 AV	94.00	-28.37	1.20 H	147	62.35	3.28
3	4880.00	49.98 PK	74.00	-24.02	1.30 H	216	43.77	6.21
4	4880.00	32.92 AV	54.00	-21.08	1.30 H	216	26.71	6.21
5	7320.00	58.96 PK	74.00	-15.04	1.30 H	269	47.22	11.74
6	7320.00	41.90 AV	54.00	-12.10	1.30 H	269	30.16	11.74
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	*2440.00	81.07 PK	114.00	-32.93	1.35 V	258	77.79	3.28
2	*2440.00	64.01 AV	94.00	-29.99	1.35 V	258	60.73	3.28
3	4880.00	51.02 PK	74.00	-22.98	1.02 V	147	44.81	6.21
4	4880.00	33.96 AV	54.00	-20.04	1.02 V	147	27.75	6.21
5	7320.00	58.54 PK	74.00	-15.46	1.02 V	147	46.80	11.74
6	7320.00	41.48 AV	54.00	-12.52	1.02 V	147	29.74	11.74

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 emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

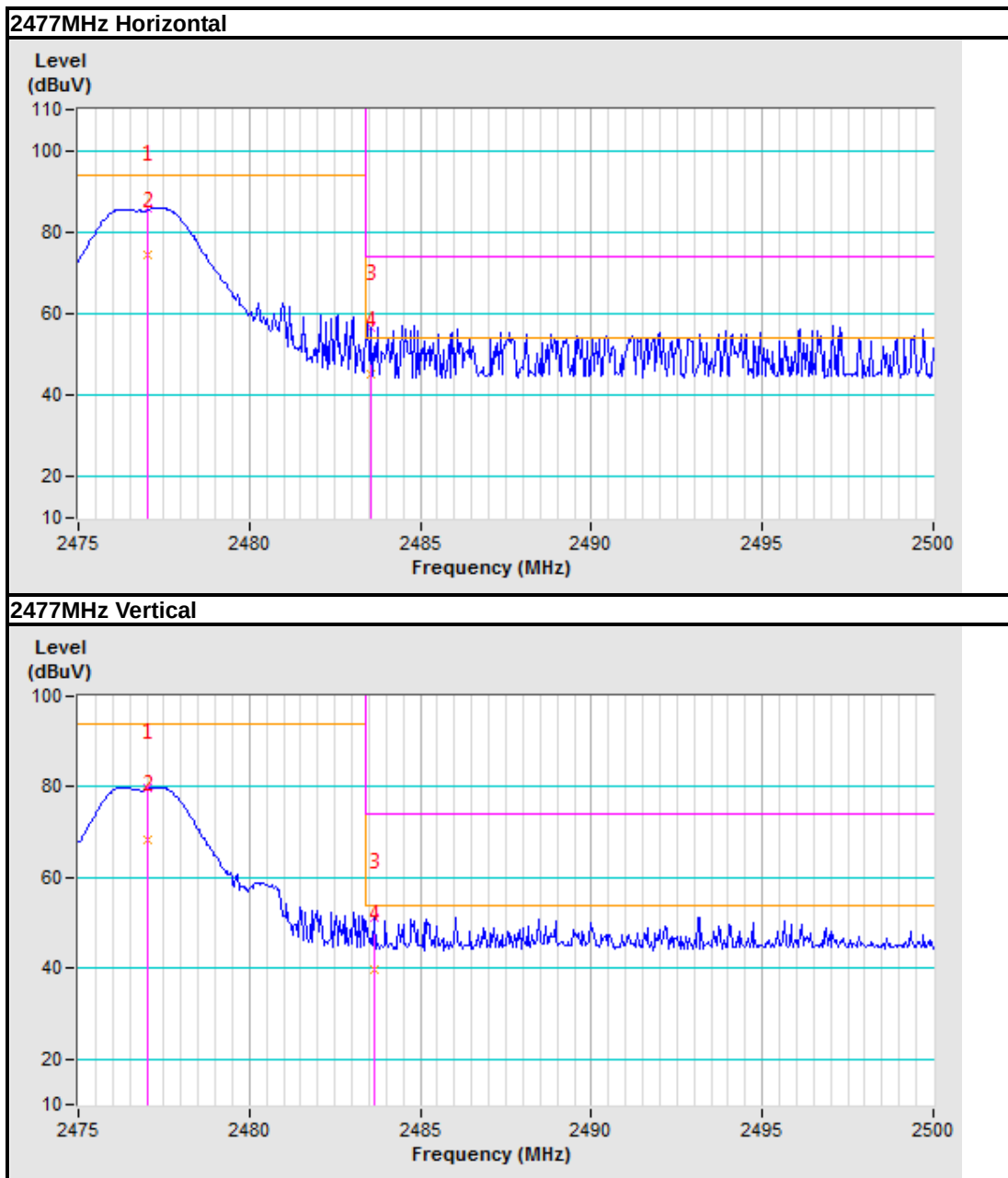
CHANNEL	TX High Channel	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	*2477.00	85.69 PK	114.00	-28.31	1.02 H	215	82.28	3.41
2	*2477.00	68.63 AV	94.00	-25.37	1.02 H	215	65.22	3.41
3	2483.50	56.68 PK	74.00	-17.32	1.30 H	214	53.24	3.44
4	2483.50	39.62 AV	54.00	-14.38	1.30 H	214	36.18	3.44
5	5954.00	51.27 PK	74.00	-22.73	1.30 H	260	42.96	8.31
6	5954.00	34.21 AV	54.00	-19.79	1.30 H	260	25.90	8.31
7	7431.00	59.68 PK	74.00	-14.32	1.30 H	269	47.62	12.06
8	7431.00	42.62 AV	54.00	-11.38	1.30 H	269	30.56	12.06
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	*2477.00	79.69 PK	114.00	-34.31	1.30 V	269	76.28	3.41
2	*2477.00	62.63 AV	94.00	-31.37	1.30 V	269	59.22	3.41
3	2483.50	51.19 PK	74.00	-22.81	1.30 V	269	47.75	3.44
4	2483.50	34.13 AV	54.00	-19.87	1.30 V	269	30.69	3.44
5	5954.00	49.69 PK	74.00	-24.31	1.30 V	245	41.38	8.31
6	5954.00	32.63 AV	54.00	-21.37	1.30 V	245	24.32	8.31
7	7431.00	57.25 PK	74.00	-16.75	1.25 V	241	45.19	12.06
8	7431.00	40.19 AV	54.00	-13.81	1.25 V	241	28.13	12.06

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 emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

Band edge Plot



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.
Power Sensor	Keysight	U2021XA	MY55060016	May 19,17	May 18,18
Power Sensor	Keysight	U2021XA	MY55060018	May 19,17	May 18,18
Power Meter	Anritsu	ML2495A	1139001	Nov. 04,17	Nov. 03,18
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 21, 17	Oct.20, 18
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.05, 17	Sep. 04,18
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 08,17	Nov. 07,18
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 04,17	Nov. 03,18
Signal Generator	Agilent	N5183A	MY50140980	Jan. 02,18	Jan. 01,19
Agile Signal Generator	Agilent	8645A	Agilent	Sep.01, 17	Aug.31, 18
Spectrum Analyzer	Keysight	N9020A	MY55400499	Apr. 10,17	Apr. 09,18
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Jan. 02,18	Jan. 01,19
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A	N/A
DC Source	Keysight	E3642A	MY56146098	N/A	N/A

NOTE:

1. The test was performed in RF Oven room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

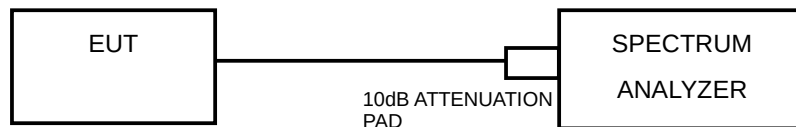
4.2.3 TEST PROCEDURE

- 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.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



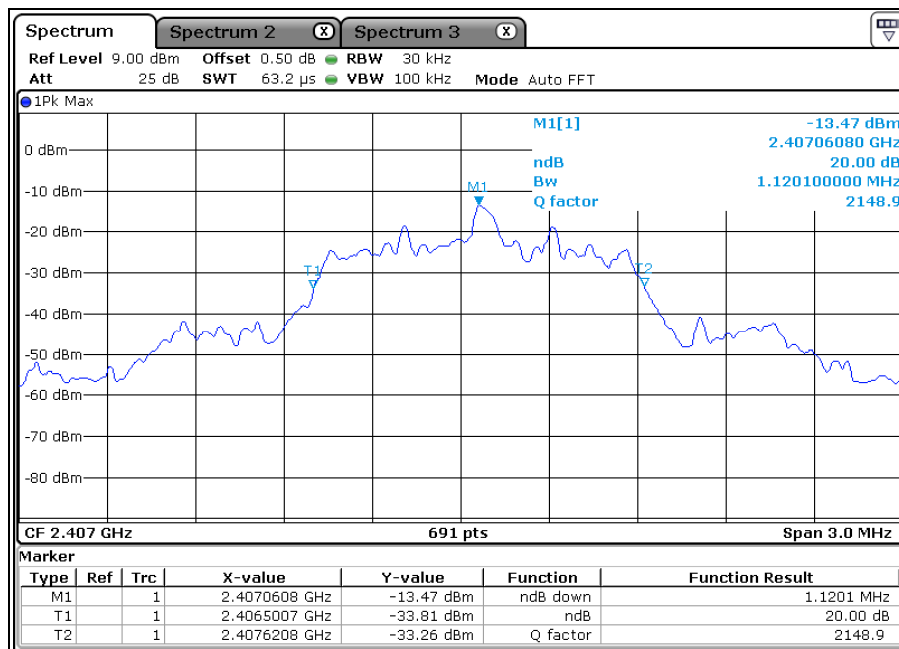
4.2.6 EUT OPERATING CONDITIONS

- a) Turned on the power of all equipment.
- b) EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

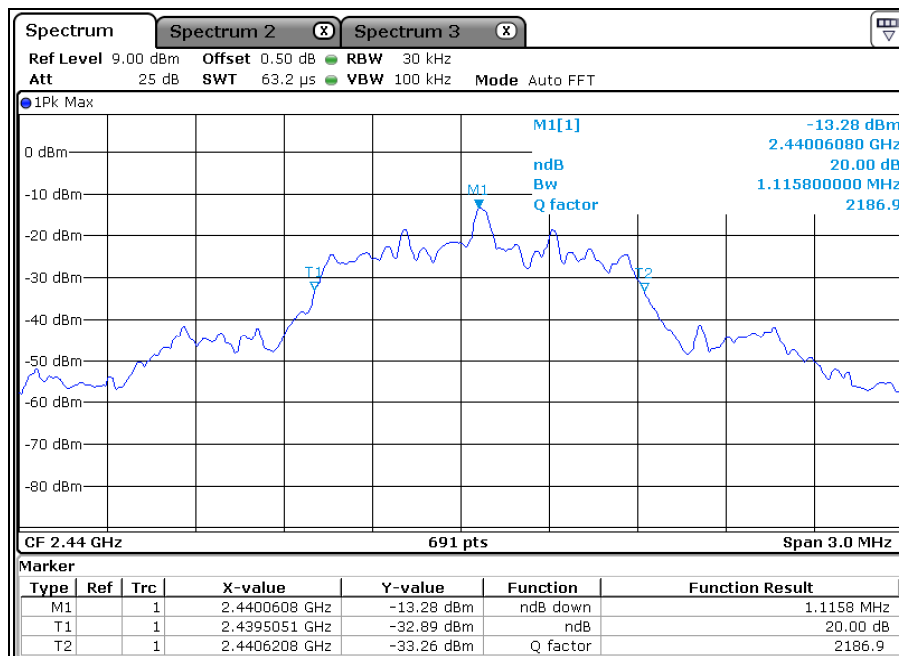
4.2.7 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
Low	2407	1.1201
Middle	2440	1.1158
High	2477	1.1158

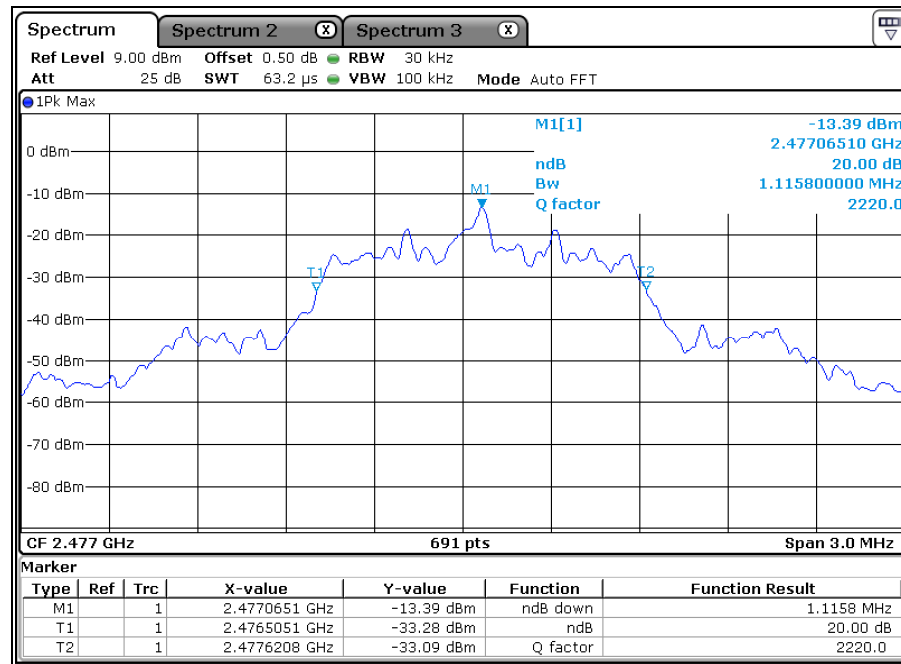
Test Data: Low channel



Test Data: Middle channel



Test Data: High channel



5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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---