FCC Test Report

Part 15 subpart C

Client Information:

Applicant:	Guangzhou Maipai Electronics Co.,Ltd.
Applicant add.:	Room 202,No.94,Shinan Road,Xianchong Village,Qiaonan Street, Panyu District of Guangzhou.

Product Information:

Product Name:	USB port(USB dongle)
Model No.:	USB KM-224W
Derivative model No.:	USB KM-211W
Brand Name:	N/A

Standards: CFR 47 FCC PART 15 SUBPART C:2013 section 249

Prepared By:

Dongguan Yaxu (AiT) Technology Limited

Add. : No. 22, Jinqianling Third Street, Jitigang, Huangjiang, Dongguan, Guangdong, China.

Date of Receipt:	Aug. 24, 2015	Date of Test:	Aug. 24~ 28, 2015
Date of Issue:	Aug. 28, 2015	Test Result:	Pass

This device described above has been tested by Dongguan Yaxu (AiT) Technology Limited, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
ATT SZ commissioned AiT(Dongguan) to test the device described above, and then AiT(Dongguan) use the UTL(Dongguan)'s test site do this case.
This test report must not be used by the client to claim product endorsement by any agency of the U.S. government.

Reviewed by: Seal-Chen **Approved by:**

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2 Test Summary

2.1 Compliance with FCC Part 15 subpart C

Test	Test Requirement	Standard Paragraph	Result
Field Strength of Fundamental	FCC PART 15 C section 15.249 (a)	ANSI C63.10: Clause 6.6	PASS
Field Strength of Unwanted Emissions	FCC PART 15 C section 15.249 (a) section 15.249 (d)	ANSI C63.10: Clause 6.4, 6.6 and 6.7	PASS
Band Edges	FCC PART 15 C section 15.249 (d)	ANSI C63.10: Clause 6.9.2	PASS
Occupied Bandwidth	FCC PART 15 C section 15.215(c)	ANSI C63.10: Clause 6.9.1	PASS
Conducted Emissions at Mains Terminals	FCC PART 15 C section 15.207	ANSI C63.10: Clause 6.2	PASS

Remark:

EUT: In this whole report EUT means Equipment Under Test.
Tx: In this whole report Tx (or tx) means Transmitter.
Rx: In this whole report Rx (or rx) means Receiver.
RF: In this whole report RF means Radio Frequency.
ANSI C63.10: the detail version is ANSI C63.10:2009 in the whole report.

Model description:

According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference being the model name.

Therefore only one model **USB KM-224W** was tested in this report.

2.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, the maximum value of the uncertainty as below:

No.	Item	Uncertainty
1	Conducted Emission Test	1.20dB
2	Radiated Emission Test	3.30dB
3	RF power,conducted	0.16dB
4	RF power density,conducted	0.24dB
5	Spurious emissions,conducted	0.21dB
6	All emissions,radiated(<1G)	4.68dB
7	All emissions,radiated(>1G)	4.89dB

3 Test Facility

.FCC- Registration No: 713614

DONGGUAN UTL ELECTRONIC TECHNOLOGY CO., LTD.
1F,Hengzheng Bldg, North Road of Station, Nancheng District, Dongguan, Guangdong, China.

3.1 Deviation from standard

None

3.2 Abnormalities from standard conditions

None

4 General Information

4.1 General Description of EUT

Manufacturer:	Guangzhou Maipai Electronics Co.,Ltd.
Manufacturer Address:	Room 202,No.94,Shinan Road,Xianchong Village,Qiaonan Street, Panyu District of Guangzhou.
EUT Name:	USB port(USB dongle)
Model No.:	USB KM-224W
FCC ID:	2AFVEUSBTX
Operation frequency:	2402 MHz to 2480 MHz
Number of channel:	40 channels
Modulation Type and Antenna Type:	MSK, PCB antenna
Antenna Gain:	0 dBi
Brand Name:	N/A
Serial No:	N/A
Derivative model No.:	USB KM-211W
Power Supply Range:	DC 5.0V
Power Supply:	DC 5.0V from Laptop , AC 120V/60Hz for laptop adapter
Power Cord:	N/A
Signal Cable:	N/A
HW:	ASY_MA659R1E5_V1.0
SW:	V1.1

4.2 Test Location

All tests were performed at:

DONGGUAN UTL ELECTRONIC TECHNOLOGY CO., LTD.
1F,Hengzheng Bldg, North Road of Station, Nancheng District, Dongguan, Guangdong, China

Description of Channel:			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	20	2442
01	2404	21	2444
02	2406	22	2446
03	2408	23	2448
04	2410	24	2450
05	2412	25	2452
06	2414	26	2454
07	2416	27	2456
08	2418	28	2458
09	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

5 Description of Test conditions

5.1 E.U.T. Operation

Test Voltage: DC 5.0V from Laptop , AC 120V/60Hz for laptop adapter

Temperature: 20.0 -25.0 °C

Humidity: 38-50 % RH

Atmospheric Pressure: 1000 -1010 mbar

Test frequencies and frequency range: According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

According to the 15.33 (a) For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in the following table:

Number of fundamental frequencies to be tested in EUT transmit band

Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
1 MHz or less	1	Middle
1 MHz to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

Frequency range of radiated emission measurements

Lowest frequency generated in the device	Upper frequency range of measurement
9 kHz to below 10 GHz	10th harmonic of highest fundamental frequency or to 40 GHz, whichever is lower
At or above 10 GHz to below 30 GHz	5th harmonic of highest fundamental frequency or to 100 GHz, whichever is lower
At or above 30 GHz	5th harmonic of highest fundamental frequency or to 200 GHz, whichever is lower, unless otherwise specified

5.2 EUT Peripheral List

No.	Equipment	Manufacturer	Model No.	Serial No.	Power cord	signal cable
1	N/A	N/A	N/A	N/A	N/A	N/A

5.3 Test Peripheral List

No.	Equipment	Manufacturer	EMC Compliance	Model No.	Serial No.	Power cord	signal cable
1	Lap top	ASUS	FCC	X401A	X16-96072	N/A	N/A
2	Adapter (laptop)	ASUS	FCC	EXA0703YH	N/A	1.8m/unshielded /detachable	N/A

6 Equipments List for All Test Items

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Spectrum Analyzer	ADVANTEST	R3182	150900201	2015.06.29	2016.06.28
2	EMI Measuring Receiver	R&S	ESR	101660	2014.12.12	2015.12.11
3	Low Noise Pre Amplifier	Tsj	MLA-10K01-B01-27	1205323	2015.06.29	2016.06.28
4	Low Noise Pre Amplifier	Tsj	MLA-0120-A02-34	2648A04738	2014.12.02	2015.12.01
5	TRILOG Super Broadband test Antenna	SCHWARZBECK	VULB9160	9160-3206	2014.12.03	2015.12.02
6	Broadband Horn Antenna	SCHWARZBECK	BBHA9120D	452	2014.12.03	2015.12.02
7	SHF-EHF Horn	SCHWARZBECK	BBHA9170	BBHA9170367	2014.12.03	2015.12.02
8	Loop Antenna	ARA	PLA-1030/B	1029	2015.03.20	2016.03.19
9	Radiated Cable 1#（30MHz-1GHz）	FUJIKURA	5D-2W	01	2015.01.04	2016.01.03
10	Radiated Cable 2#（1GHz -25GHz）	FUJIKURA	10D2W	02	2014.12.25	2015.12.24
11	Conducted Cable 1#(9KHz-30MHz)	FUJIKURA	1D-2W	01	2015.01.04	2016.01.03
12	SMA Antenna connector	Dosin	Dosin-SMA	N/A	N/A	N/A
13	EMI Test Receiver	R&S	ESCI	100124	2015.06.20	2016.06.19
14	LISN	Kyoritsu	KNW-242	8-837-4	2015.06.20	2016.06.19
15	LISN	Kyoritsu	KNW-407	8-1789-4	2015.06.20	2016.06.19
16	Pulse limiter	R&S	ESH3-Z2	0357.8810.54	2014.12.01	2015.11.30
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2014.09.25	2015.09.24
Note: The SMA antenna connector is soldered on the PCB board in order to perform conducted tests and this SMA antenna connector is listed in the equipment list.						

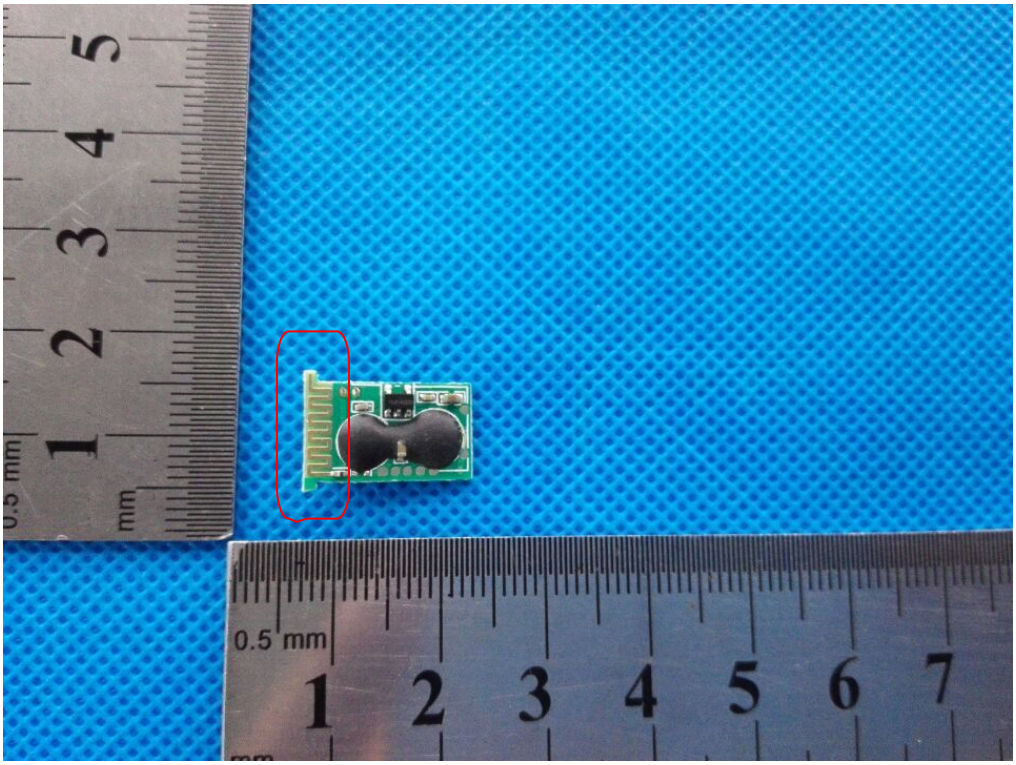
7 Test Result

7.1 Antenna Requirement

Standard requirement

EUT Antenna

The antenna is PCB antenna and no consideration of replacement. The maximum gain of the antenna is 0 dBi.



Test result: The unit does meet the FCC requirements.

7.2 Field Strength of Fundamental& Field Strength of Unwanted Emissions& Band Edge

Test Requirement: FCC Part15 C section 15.249

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (dBμV/m @ 3m)	Field Strength of Harmonics (dBμV/m @ 3m)
902 to 928	94.0	54.0
2400 to 2483.5	94.0	54.0
5725 to 5875	94.0	54.0
24000 to 24250	108.0	68.0

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Limits: The fundamental frequency rang is in the frequency band of the EUT is 2402 MHz ~ 2480 MHz.

The limit for AVG field strength dBμV/m for the fundamental frequency = 94.0 dBμV/m.

The limit for Peak field strength dBμV/m for the fundamental frequency = 114.0 dBμV/m.

No fundamental is allowed in the restricted bands.

The limit for AVG field strength dBμV/m for the harmonics and other above 1G frequencies = 54.0 dBμV/m.

The limit for Peak field strength dBμV/m for the harmonics and other above 1G frequencies = 74.0 dBμV/m.

Test Method: ANSI C63.10: Clause 6.4, 6.6 and 6.7 for Field Strength of Fundamental& Field Strength of Unwanted Emissions

ANSI C63.10: Clause 6.9.2 for Band Edge

Status: Pre-test the EUT in continuous transmitting mode with setup as stand-alone in X, Y, Z threes axes, found the worst case is X axes and report the data.

Measurement Distance: 3m (Semi-Anechoic Chamber)

Frequency range: 9 kHz – 25 GHz for transmitting mode.

Test instrumentation resolution bandwidth
9 kHz (9 kHz - 30 MHz), 120 kHz (30 MHz - 1000 MHz), 1 MHz (1000 MHz – 25 GHz)

Detector: For PK and QP value:

RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz

VBW ≥ RBW

Sweep = auto

Detector function = peak

Trace = max hold

For AV value:

RBW = 1 MHz for f ≥ 1 GHz,

VBW =10 Hz

Sweep = auto

Detector function = peak

Trace = max hold

Test Procedure:

1)9 kHz to 30 MHz emissions:

For testing performed with the loop antenna, testing was performed in accordance to ANSI C63.10. The centre of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT, During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane.

2)30 MHz to 1 GHz emissions:

For testing performed with the bi-log type antenna, testing was performed in accordance to ANSI C63.10. The measurement is performed with the EUT rotated 360º, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

3)1 GHz to 25 GHz emissions:

Test site with RF absorbing material covering the ground plane that met the site validation criterion called out in CISPR 16-1-4:2007 was used to perform radiated emission test above 1 GHz.

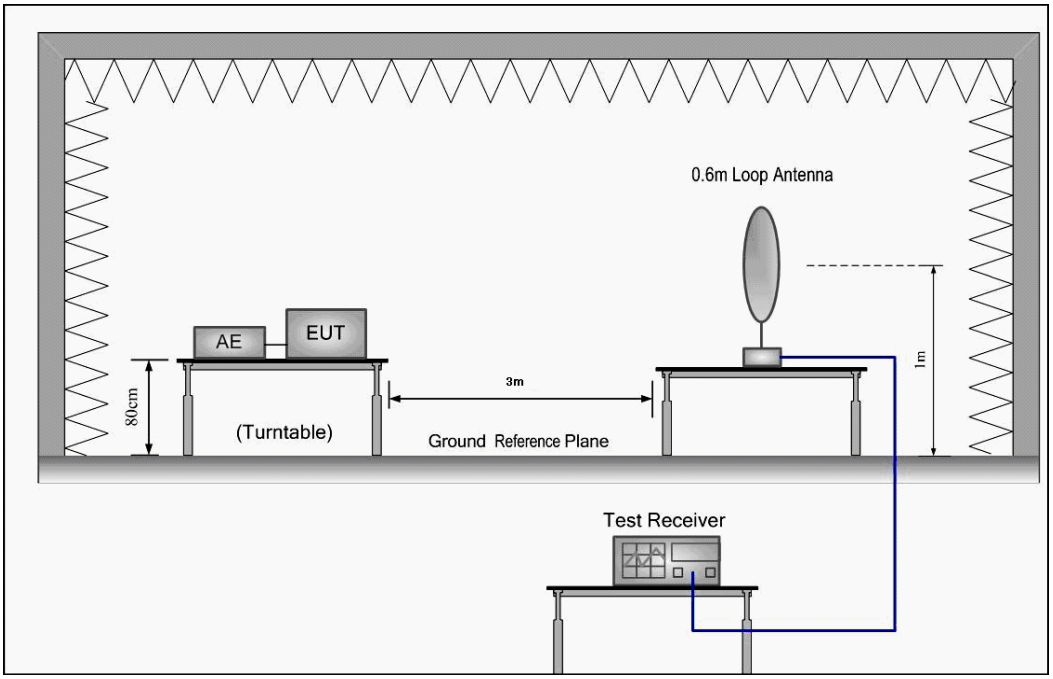
For testing performed with the horn antenna, testing was performed in accordance to ANSI C63.10. The measurement is performed with the EUT rotated 360º, the antenna height scan between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

For the radiated emission test above 1GHz:

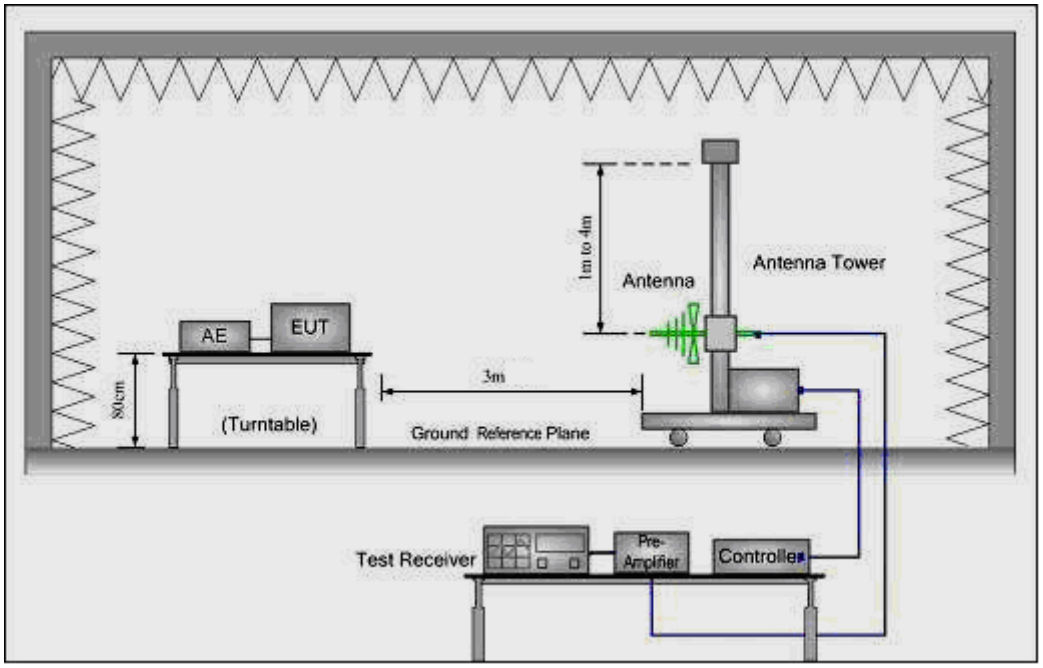
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

Test Configuration:

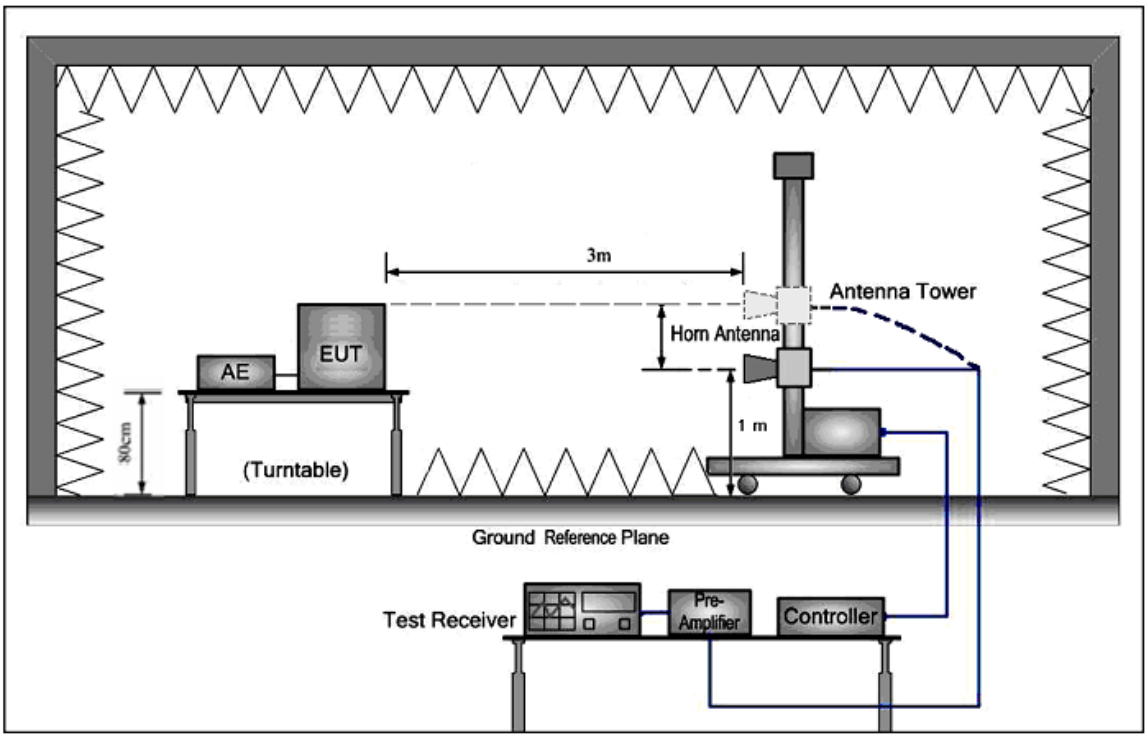
1) 9 kHz to 30 MHz emissions:



2) 30 MHz to 1 GHz emissions:



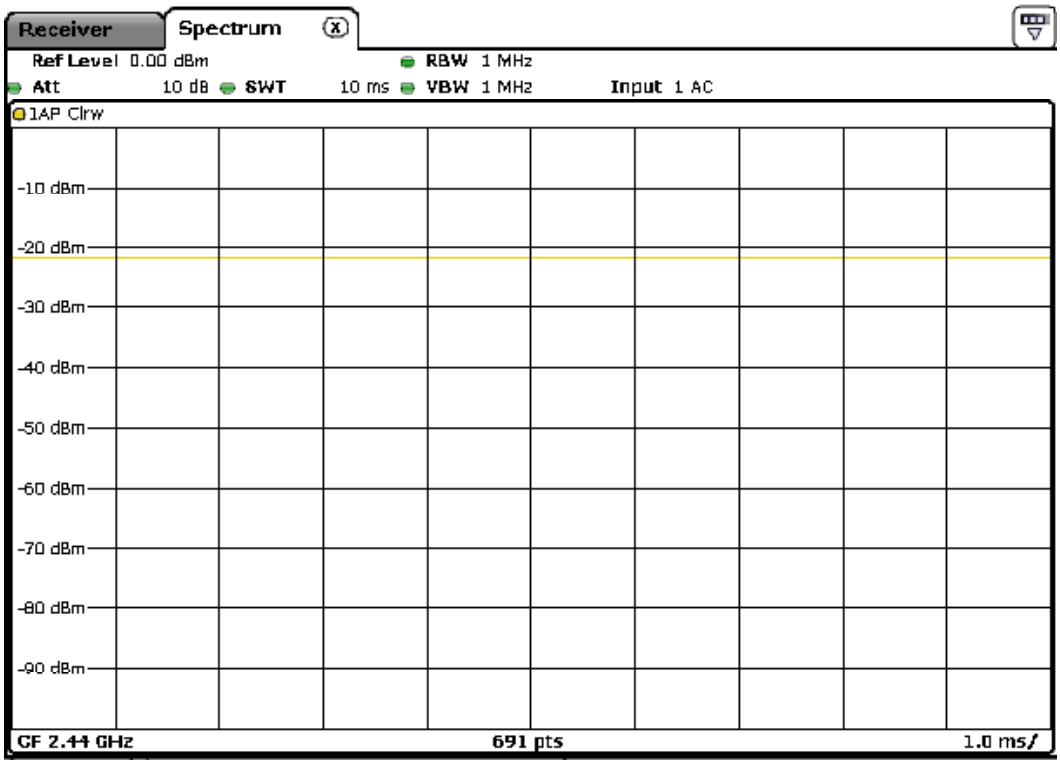
3) 1 GHz to 10 GHz emissions:



The field strength is calculated by adding the Antenna Factor, Cable Loss & Per-amplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Loss – Preamplifier Factor

7.2.1 Duty cycle measurement:



7.2.2 Fundamental field strength measurement:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type	Antenna polarization
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		
2402.000	93.10	-5.68	87.42	114.00	-26.58	Peak	V
2402.000	80.27	-5.68	74.59	94.00	-19.41	AVG	V
2402.000	94.37	-5.68	88.69	114.00	-25.31	Peak	H
2402.000	81.25	-5.68	75.57	94.00	-18.43	AVG	H
2440.000	95.91	-5.36	90.55	114.00	-23.45	Peak	V
2440.000	83.74	-5.36	78.38	94.00	-15.62	AVG	V
2440.000	95.80	-5.36	90.44	114.00	-23.56	Peak	H
2440.000	82.66	-5.36	77.30	94.00	-16.70	AVG	H
2480.000	94.12	-5.01	89.11	114.00	-24.89	Peak	V
2480.000	81.65	-5.01	76.64	94.00	-17.36	AVG	V
2480.000	94.50	-5.01	89.49	114.00	-24.51	Peak	H
2480.000	82.68	-5.01	77.67	94.00	-16.33	AVG	H

Note: Measurement Level = Reading Level + Factor
Factor=Ant Factor + Cable Loss– Pre-amplifier.

7.2.3 Radiated Emissions Test Data

9 kHz~30 MHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement

The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

30 MHz~1 GHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement

EUT：	USB port(USB dongle)	Model Name ：	USB KM-224W
Temperature：	25 ℃	Test Data	2015-08-25
Pressure：	1010 hPa	Relative Humidity：	60%
Test Mode ：	TX 2440 (worse-case)	Test Voltage ：	DC 5.0V from Laptop
Measurement Distance	3 m	Frenqucy Range	30MHz to 1GHz
RBW/VBW	100KHz / 300KHz for spectrum, RBW=120KHz for receiver.		

(a) Antenna polarization: Horizontal

Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Type
50.2324	41.42	-24.52	16.90	40.00	-23.10	QUASI-PEAK
107.5101	43.63	-25.70	17.93	43.50	-25.57	QUASI-PEAK
184.4898	40.15	-21.54	18.61	43.50	-24.89	QUASI-PEAK
295.1469	39.84	-20.22	19.62	46.00	-26.38	QUASI-PEAK
519.0649	43.45	-14.95	28.50	46.00	-17.50	QUASI-PEAK
701.7610	40.34	-9.80	30.54	46.00	-15.46	QUASI-PEAK

(b) Antenna polarization: Vertical

Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Type
43.2017	42.48	-24.67	17.81	40.00	-22.19	QUASI-PEAK
107.5101	46.38	-25.70	20.68	43.50	-22.82	QUASI-PEAK
183.2005	41.98	-20.94	21.04	43.50	-22.46	QUASI-PEAK
294.1137	42.43	-20.18	22.25	46.00	-23.75	QUASI-PEAK
434.0651	45.96	-15.70	30.26	46.00	-15.74	QUASI-PEAK
912.8620	44.74	-6.72	38.02	46.00	-7.98	QUASI-PEAK

Note:

Measurement Level = Reading Level + Factor

Factor=Ant Factor + Cable Loss– Pre-amplifier.

Above 1GHz Field Strength of Unwanted Emissions Measurement

EUT：	USB port(USB dongle)	Model Name ：	USB KM-224W
Temperature：	25 ℃	Test Data	2015-08-25
Pressure：	1010 hPa	Relative Humidity：	60%
Test Mode ：	TX mode	Test Voltage ：	DC 5.0V from Laptop
Measurement Distance	3 m	Frenqucy Range	1GHz to 25GHz
RBW/VBW	1MHz/1MHz for Peak, 1MHz/10Hz for Average. non-restricted band: 100KHz/300KHz for Peak.		

(a) Antenna polarization: Horizontal

Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Type
4804.000	52.65	5.06	57.71	74.00	-16.29	PEAK
4804.000	40.13	5.06	45.19	54.00	-8.81	AVERAGE
7206.000	45.39	7.03	52.42	74.00	-21.58	PEAK
7206.000	32.51	7.03	39.54	54.00	-14.46	AVERAGE
9608.000	37.08	10.63	47.71	74.00	-26.29	PEAK
9608.000	24.12	10.63	34.75	54.00	-19.25	AVERAGE

(b) Antenna polarization: Vertical

Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Type
4804.000	51.36	5.06	56.42	74.00	-17.58	PEAK
4804.000	36.24	5.06	41.30	54.00	-12.70	AVERAGE
7206.000	45.20	7.03	52.23	74.00	-21.77	PEAK
7206.000	31.35	7.03	38.38	54.00	-15.62	AVERAGE
9608.000	35.66	10.63	46.29	74.00	-27.71	PEAK
9608.000	22.43	10.63	33.06	54.00	-20.94	AVERAGE

Note:

10~25GHz at least have 20dB margin. No recording in the test report.

Measurement Level = Reading Level + Factor

Factor=Ant Factor + Cable Loss– Pre-amplifier.

Low Channel: 2402 MHz

(a) Antenna polarization: Horizontal

Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Type
4880.0000	49.54	5.14	54.68	74.00	-19.32	PEAK
4880.0000	36.15	5.14	41.29	54.00	-12.71	AVERAGE
7320.0000	40.85	7.52	48.37	74.00	-25.63	PEAK
7320.0000	28.01	7.52	35.53	54.00	-18.47	AVERAGE
9760.0000	34.74	11.36	46.10	74.00	-27.90	PEAK
9760.0000	21.02	11.36	32.38	54.00	-21.62	AVERAGE

(b) Antenna polarization: Vertical

Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Type
4880.0000	50.01	5.14	55.15	74.00	-18.85	PEAK
4880.0000	36.29	5.14	41.43	54.00	-12.57	AVERAGE
7320.0000	40.53	7.52	48.05	74.00	-25.95	PEAK
7320.0000	25.86	7.52	33.38	54.00	-20.62	AVERAGE
9760.0000	33.78	11.36	45.14	74.00	-28.86	PEAK
9760.0000	21.31	11.36	32.67	54.00	-21.33	AVERAGE

Note:

10~25GHz at least have 20dB margin. No recording in the test report.

Measurement Level = Reading Level + Factor

Factor=Ant Factor + Cable Loss– Pre-amplifier.

Middle Channel: 2440 MHz

(a) Antenna polarization: Horizontal

Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Type
4960.000	50.17	5.22	55.39	74.00	-18.61	PEAK
4960.000	36.32	5.22	41.54	54.00	-12.46	AVERAGE
7440.000	42.73	8.06	50.79	74.00	-23.21	PEAK
7440.000	26.57	8.06	34.63	54.00	-19.37	AVERAGE
9920.000	35.78	12.10	47.88	74.00	-26.12	PEAK
9920.000	22.04	12.10	34.14	54.00	-19.86	AVERAGE

(b) Antenna polarization: Vertical

Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Type
4960.000	52.67	5.22	57.89	74.00	-16.11	PEAK
4960.000	36.10	5.22	41.32	54.00	-12.68	AVERAGE
7440.000	40.14	8.06	48.20	74.00	-25.80	PEAK
7440.000	25.35	8.06	33.41	54.00	-20.59	AVERAGE
9920.000	33.75	12.10	45.85	74.00	-28.15	PEAK
9920.000	22.14	12.10	34.24	54.00	-19.76	AVERAGE

Note:

10~25GHz at least have 20dB margin. No recording in the test report.

Measurement Level = Reading Level + Factor

Factor=Ant Factor + Cable Loss– Pre-amplifier.

High Channel: 2480 MHz

7.2.4 Band Edge Measurement:

Ant.Pol. H/V	Freq. (MHz)	Reading		Ant/CF CF(dB)	Act		Limit	
		Peak (dBuv)	AV (dBuv)		Peak (dBuv/m)	AV (dBuv/m)	Peak (dBuv/m)	AV (dBuv/m)
Lowest 2402 MHz								
V	2400.00	42.53	32.08	-5.72	36.81	26.36	74.00	54.00
H	2400.00	43.05	32.73	-5.72	37.33	27.01	74.00	54.00
Highest 2480 MHz								
V	2483.50	42.76	31.05	-4.98	37.78	26.07	74.00	54.00
H	2483.50	43.17	31.76	-4.98	38.19	26.78	74.00	54.00

Remark:

1). The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Loss –Preamplifier Factor.

Test result: The unit does meet the FCC requirements.

7.2.5 Restricted Bands Measurement:

EUT：	USB port(USB dongle)	Model Name ：	USB KM-224W
Temperature：	25 ℃	Test Data	2015-08-25
Pressure：	1010 hPa	Relative Humidity：	60%
Test Mode ：	TX mode	Test Voltage ：	DC 5.0V from Laptop
Note：	1. The transmitter was setup to transmit at the lowest channel. Then the field strength was measured at 2310-2390 MHz. 2. The transmitter was setup to transmit at the highest channel. Then the field strength was measured at 2483.5-2500 MHz. 3. The data of 2390MHz and 2483.5MHz was the worst.		

Ant.Pol. H/V	Freq. (MHz)	Reading		Ant/CF CF(dB)	Act		Limit	
		Peak (dBuv)	AV (dBuv)		Peak (dBuv/m)	AV (dBuv/m)	Peak (dBuv/m)	AV (dBuv/m)
V	2390.00	43.58	32.10	-5.79	37.79	26.31	74.00	54.00
H	2390.00	44.21	33.52	-5.79	38.42	27.73	74.00	54.00
V	2483.50	43.65	31.05	-4.98	38.67	26.07	74.00	54.00
H	2483.50	42.34	32.76	-4.98	37.36	27.78	74.00	54.00

Remark：

(1) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode.

(2) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

(3) Corr.Factor = Antenna Factor + Cable Loss – Pre-amplifier.

7.3 Occupied Bandwidth

Test Requirement: FCC Part 15 C section 15.215

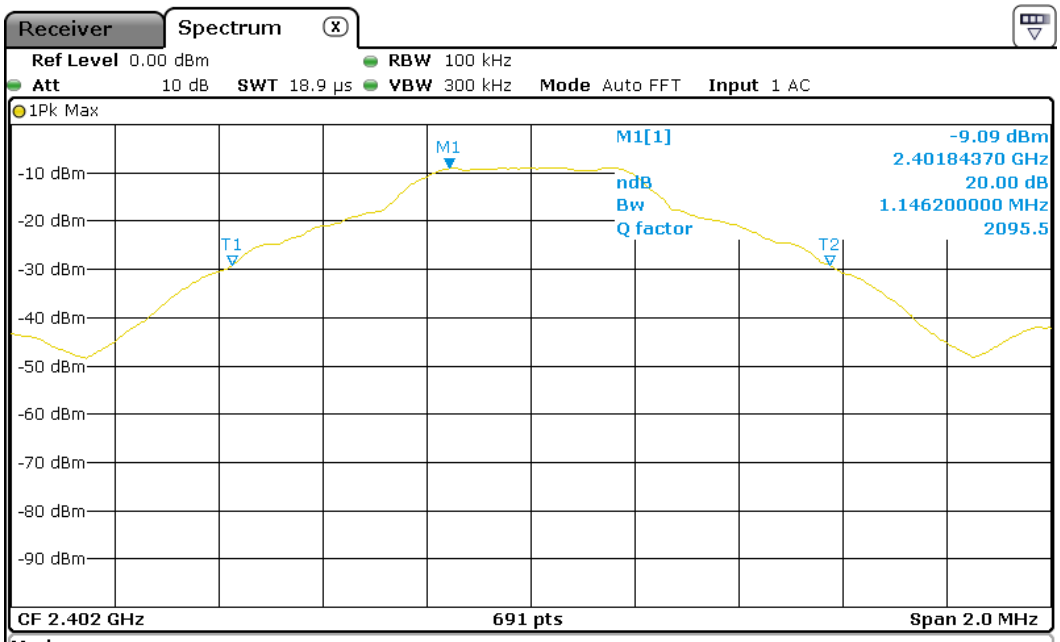
(c)Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

Test Method: ANSI C63.10: Clause 6.9.1

Operation within the band 2402 MHz to 2480 MHz

Method of measurement: A small sample of the transmitter output was fed into the Spectrum Analyzer and the attached plot was taken.

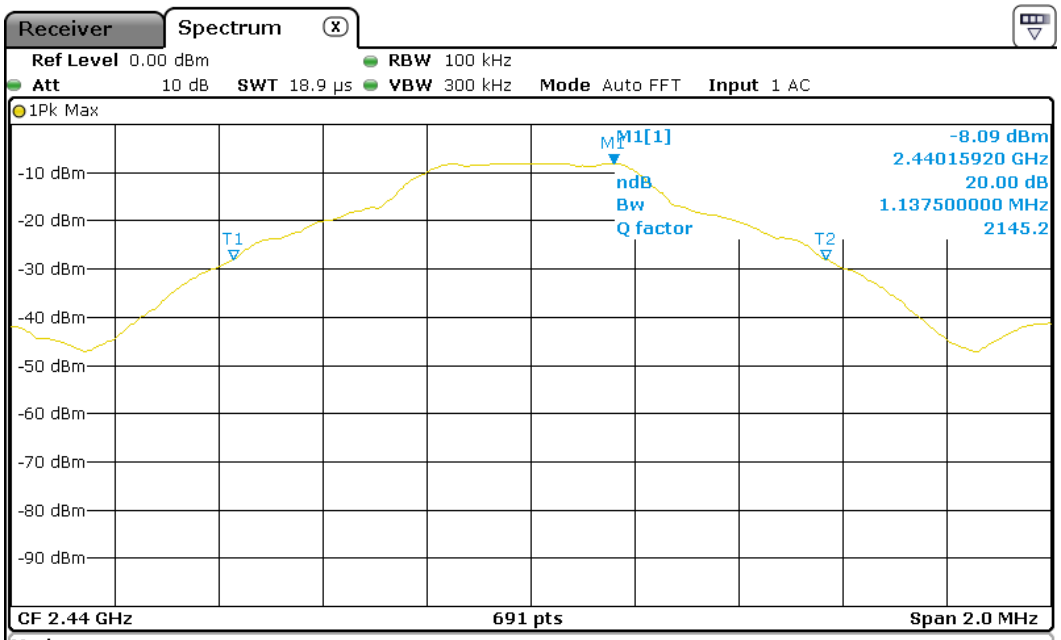
Test in the frequency 2402MHz (20 dB bandwidth)



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4018437 GHz	-9.09 dBm	ndB down	1.1462 MHz
T1		1	2.4014269 GHz	-29.21 dBm	ndB	20.00 dB
T2		1	2.4025731 GHz	-29.16 dBm	Q factor	2095.5

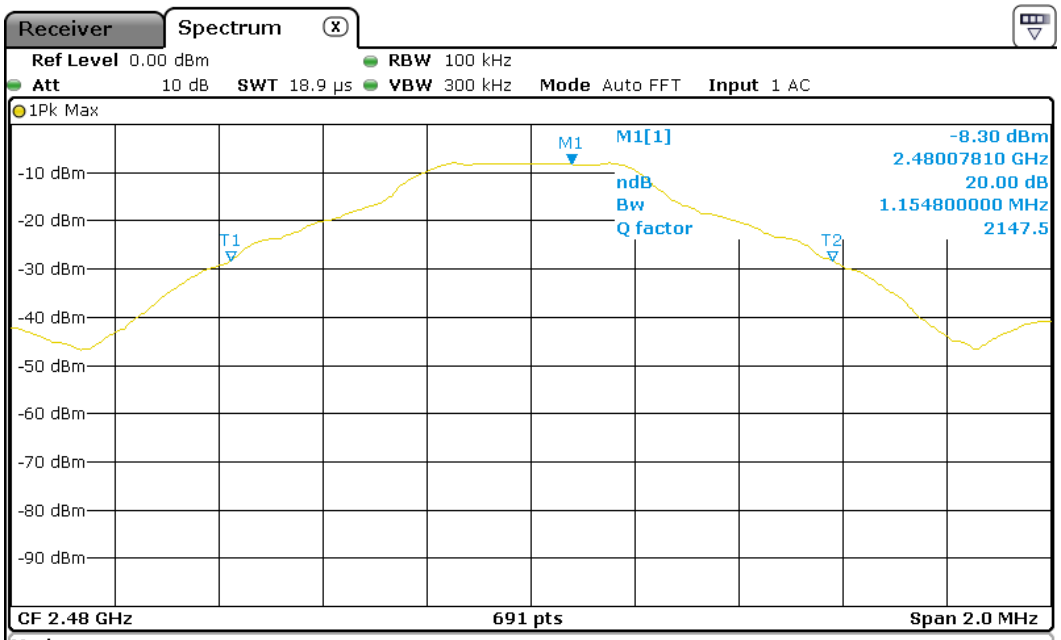
Test in the frequency 2440MHz (20 dB bandwidth)



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4401592 GHz	-8.09 dBm	ndB down	1.1375 MHz
T1		1	2.4394298 GHz	-28.09 dBm	ndB	20.00 dB
T2		1	2.4405673 GHz	-28.06 dBm	Q factor	2145.2

Test in the frequency 2480MHz (20 dB bandwidth)



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4800781 GHz	-8.30 dBm	ndB down	1.1548 MHz
T1		1	2.479424 GHz	-28.28 dBm	ndB	20.00 dB
T2		1	2.4805789 GHz	-28.29 dBm	Q factor	2147.5

7.4 Conduction Emissions Measurement

7.4.1 Applied procedures / Limit

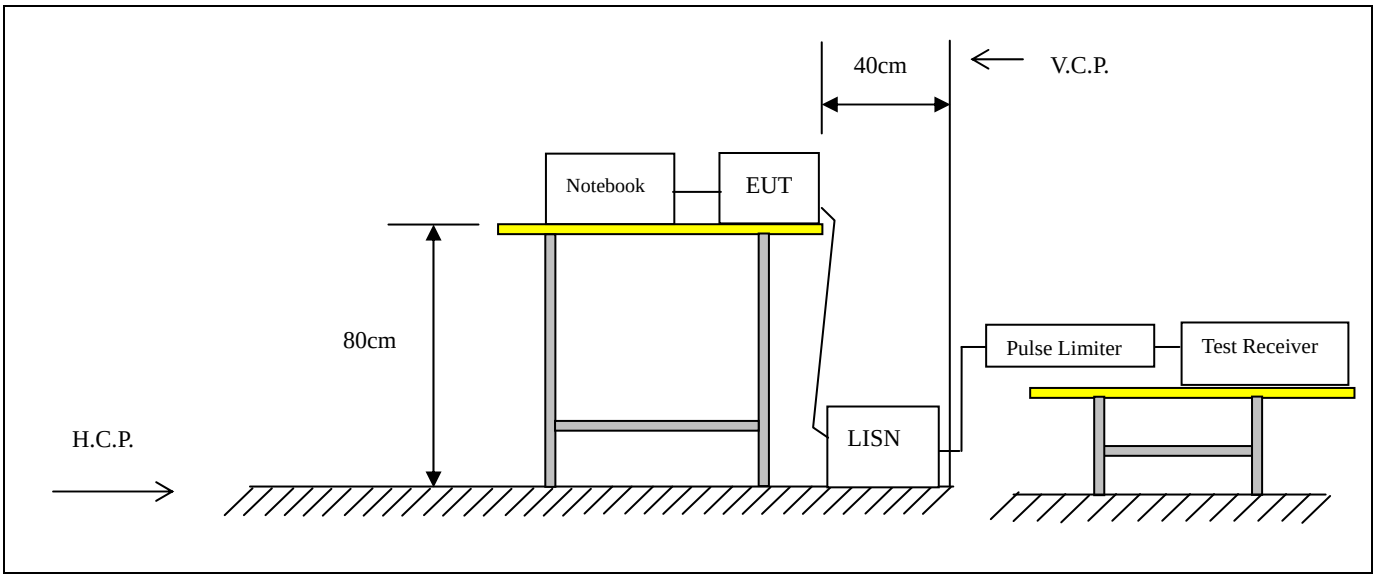
Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

Note: Decreases with the logarithm of the frequency.

7.4.2 Test procedure

EUT was placed upon a wooden test table 0.8m above the horizontal metal reference plane and 0.4m from the vertical ground plane, and it was connected to an AMN. The closest distance between the boundary of the EUT and the surface of the AMN is 0.8m. All peripherals were connected to another AMN, and placed at a distance of 10cm from each other. A spectrum and receiver was connected to the RF output port of the AMN. Both average and quasi-peak value were detected.

7.4.3 Test setup

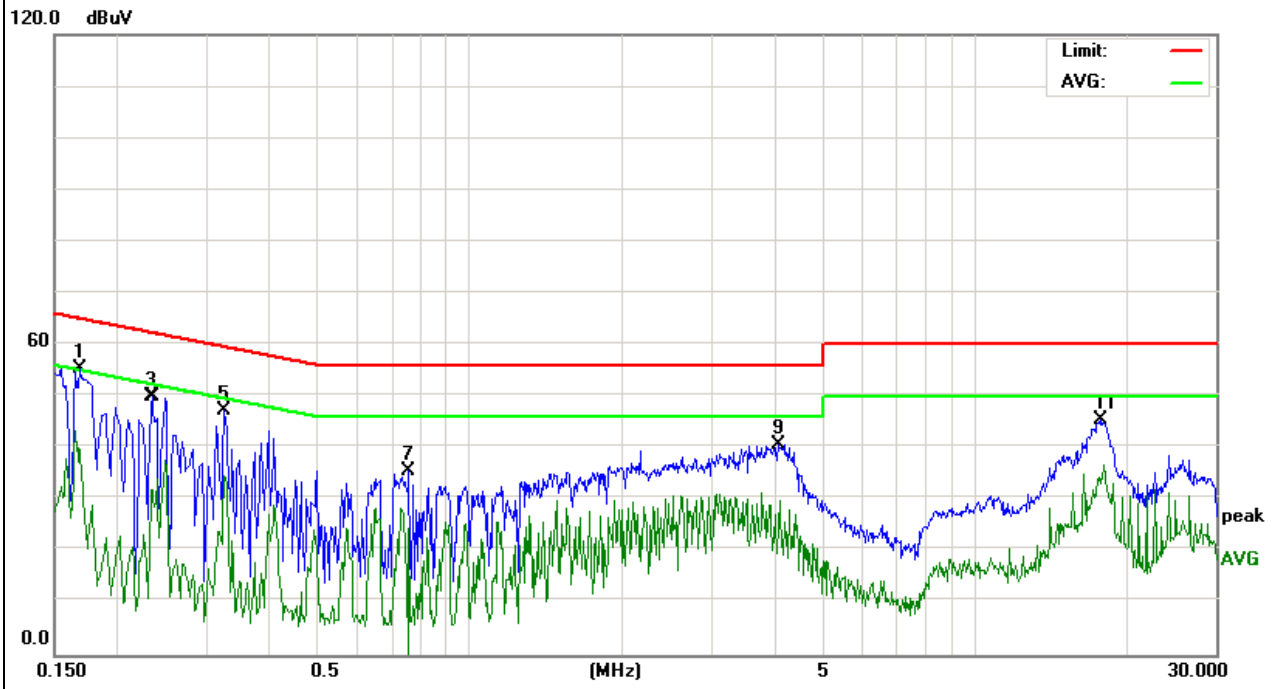


7.4.4 Test results

EUT:	USB port(USB dongle)	Model Name :	USB KM-224W
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	1010hPa	Test Date :	2015-08-25
Test Mode:	TX (worst case)	Phase :	Line
Test Voltage :	DC 5.0V from Laptop , AC 120V/60Hz for adapter		

Frequency	Factor	Meter Reading (dBμV)		Emission Level (dBμV)		Limits (dBμV)		Margin (dB)	
(MHz)	(dB)	QP	Average	QP	Average	QP	Average	QP	Average
0.1685	11.57	43.93	31.84	55.50	43.41	65.03	55.03	-9.53	-11.62
0.2340	10.94	38.93	23.25	49.87	34.19	62.30	52.30	-12.43	-18.11
0.3260	10.15	37.18	24.47	47.33	34.62	59.55	49.55	-12.22	-14.93
0.7580	9.93	25.57	14.52	35.50	24.45	56.00	46.00	-20.50	-21.55
4.0819	10.00	30.77	19.83	40.77	29.83	56.00	46.00	-15.23	-16.17
17.8297	10.49	34.86	26.14	45.35	36.63	60.00	50.00	-14.65	-13.37

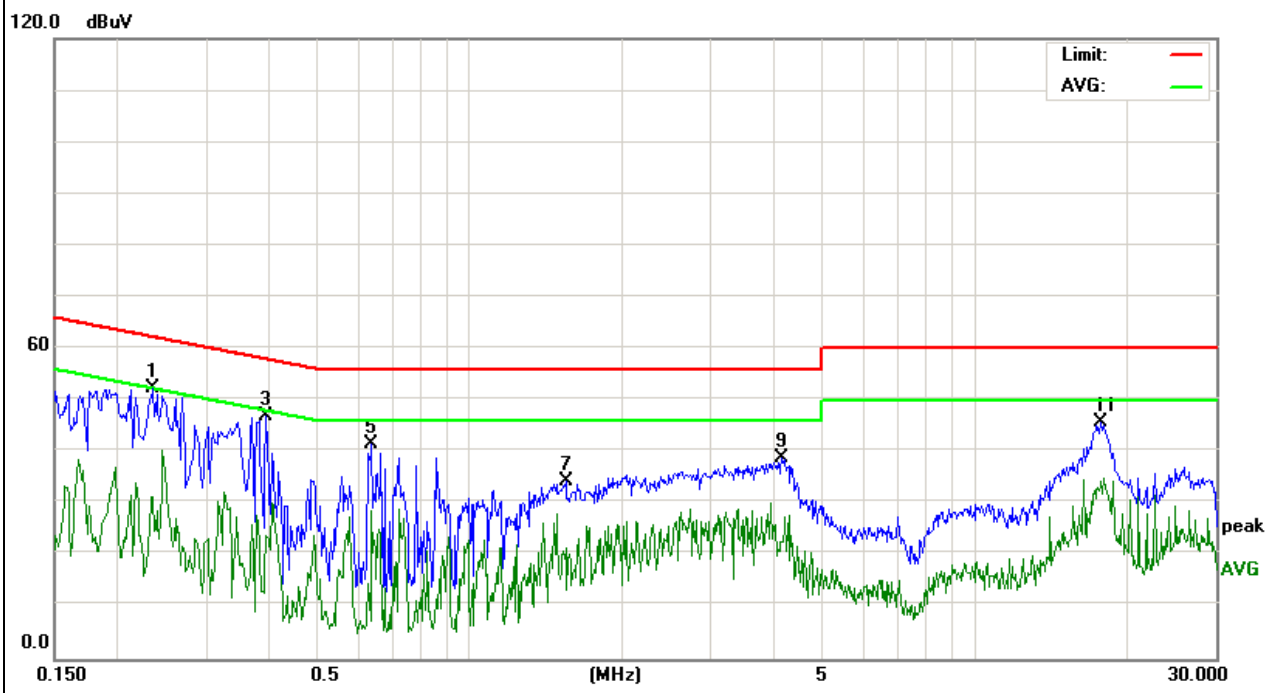
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = LISN factor + Cable Loss + Pulse limiter.



EUT：	USB port(USB dongle)	Model Name ：	USB KM-224W
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Test Date :	2015-08-25
Test Mode：	TX (worst case)	Phase :	Neutral
Test Voltage ：	DC 5.0V from Laptop , AC 120V/60Hz for adapter		

Frequency	Factor	Meter Reading (dBμV)		Emission Level (dBμV)		Limits (dBμV)		Margin (dB)	
(MHz)	(dB)	QP	Average	QP	Average	QP	Average	QP	Average
0.2353	10.93	41.41	20.41	52.34	31.34	62.26	52.26	-9.92	-20.92
0.3940	10.10	36.96	19.91	47.06	30.01	57.98	47.98	-10.92	-17.97
0.6380	9.96	31.64	18.60	41.60	28.56	56.00	46.00	-14.40	-17.44
1.5500	9.93	24.45	13.50	34.38	23.43	56.00	46.00	-21.62	-22.57
4.1539	10.00	28.83	17.78	38.83	27.78	56.00	46.00	-17.17	-18.22
17.7939	10.49	35.22	24.57	45.71	35.06	60.00	50.00	-14.29	-14.94

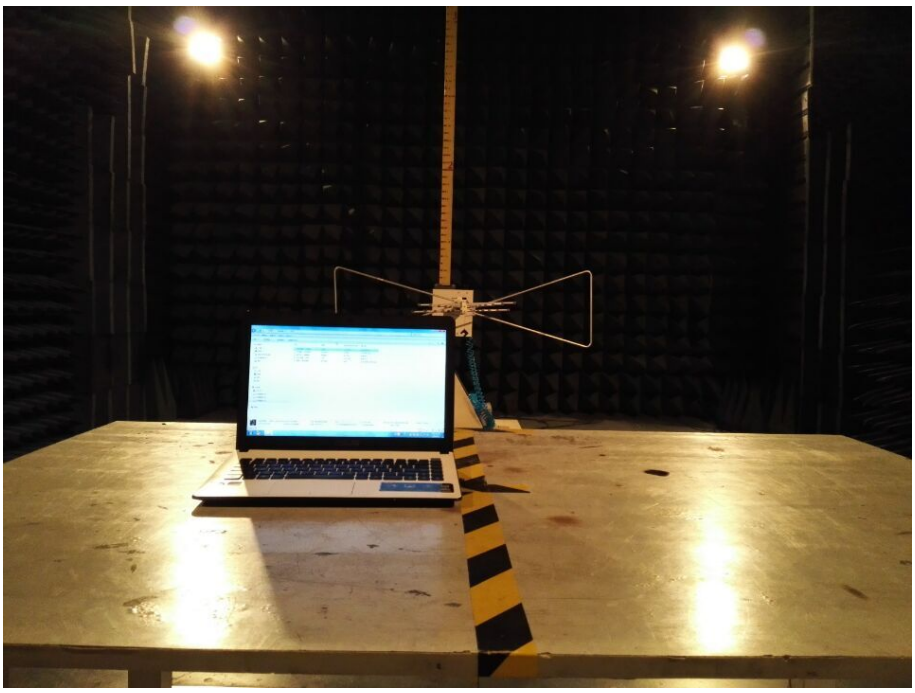
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = LISN factor + Cable Loss + Pulse limiter.



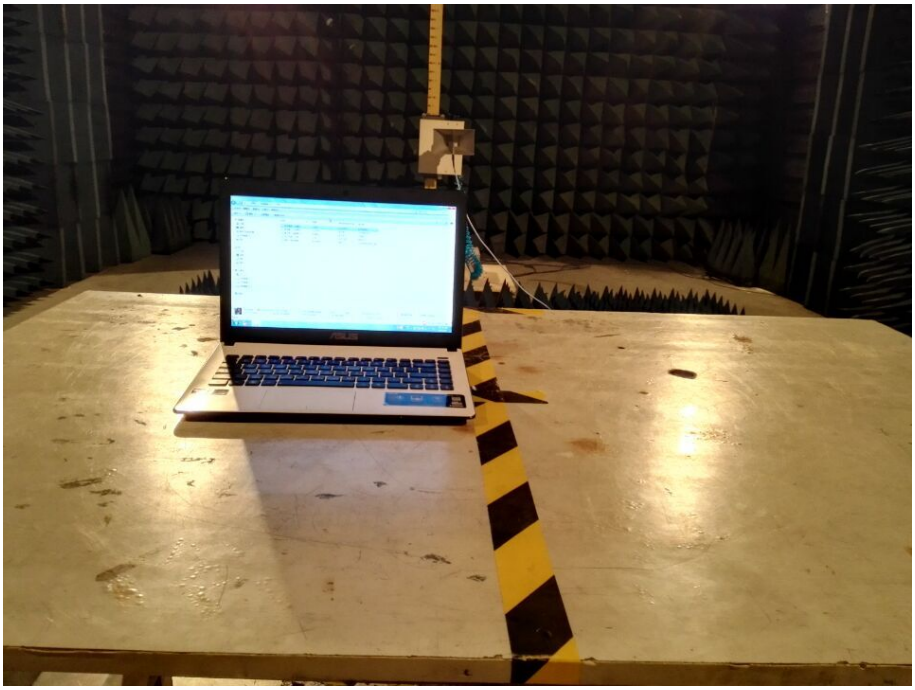
8 Photographs

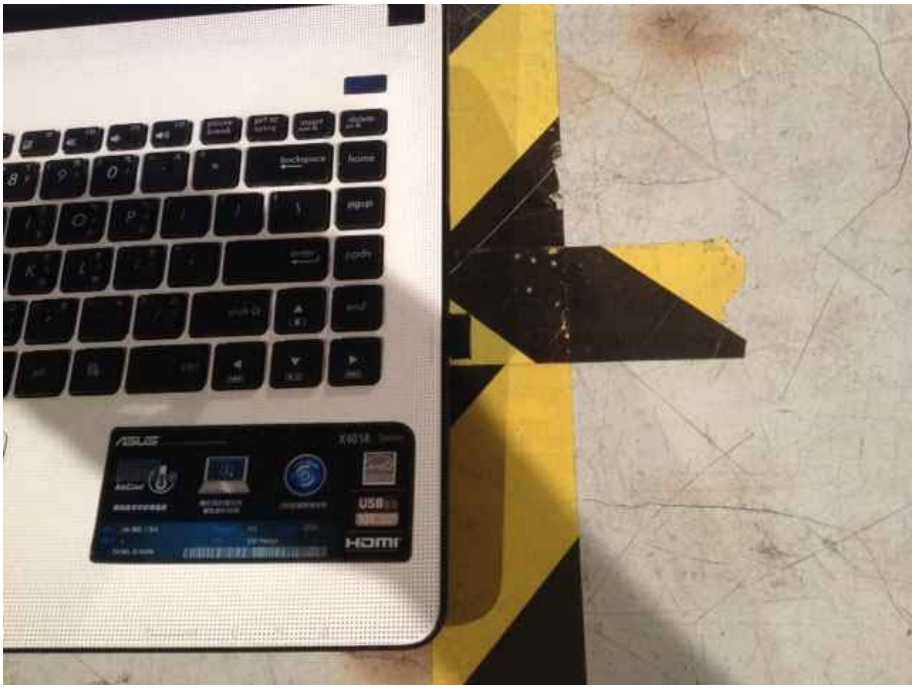
8.1 Radiated Emission Test Setup

Below 1G



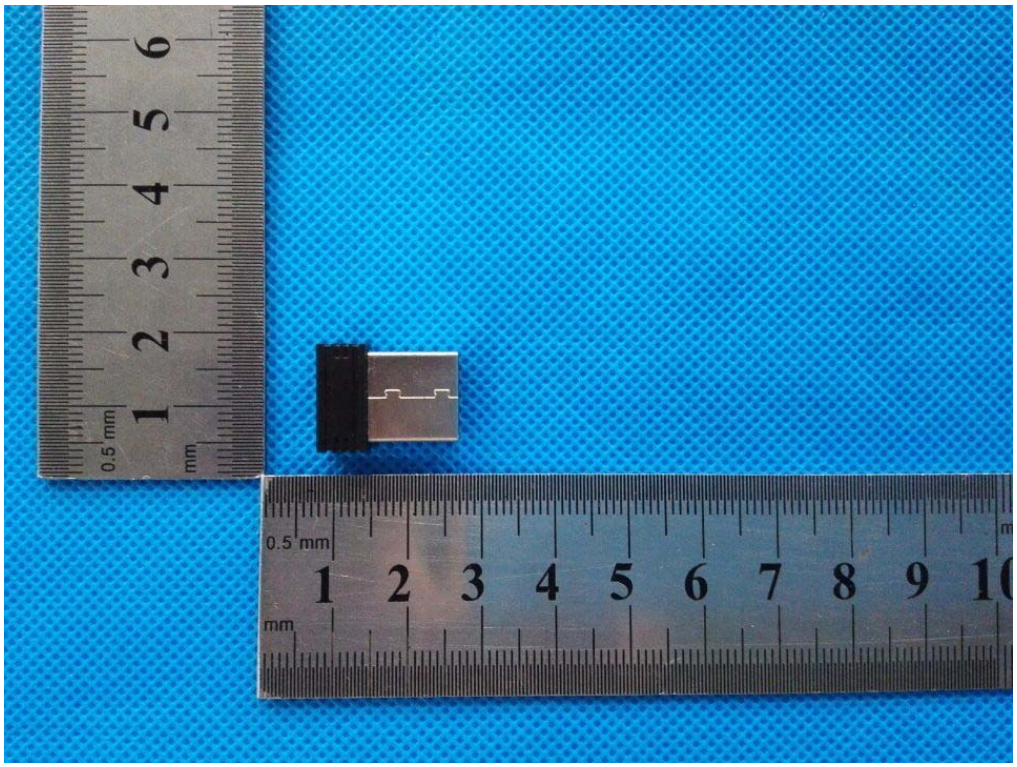
Above 1G

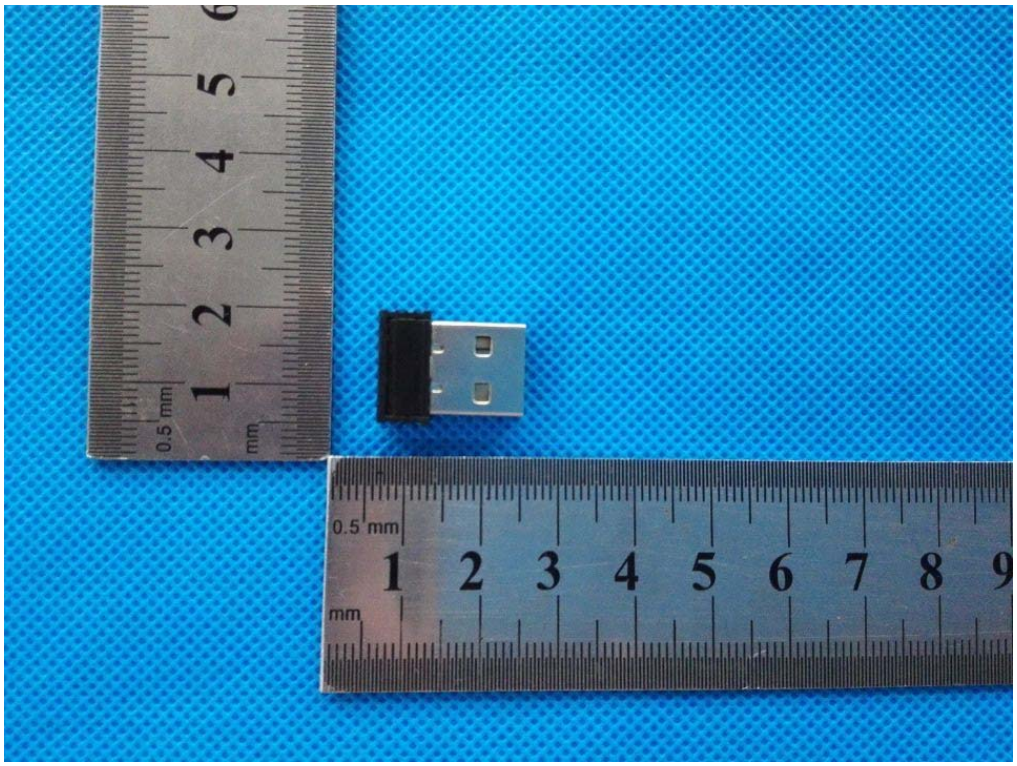


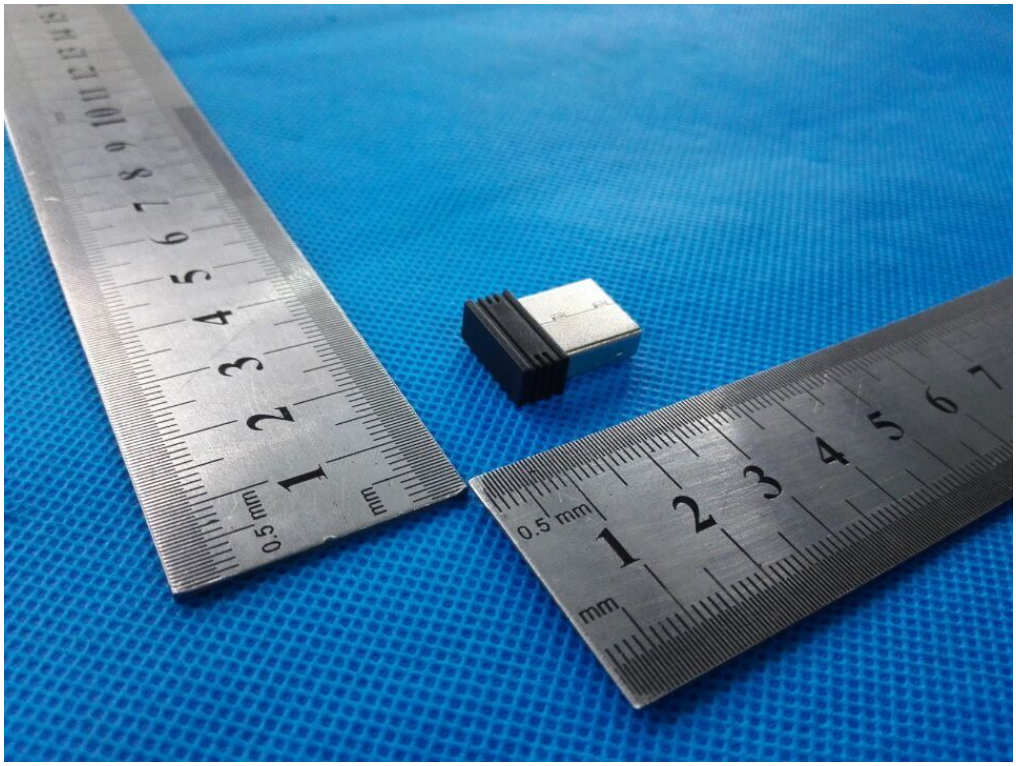


8.2 Conducted Measurement Photos

9 EUT Constructional Details



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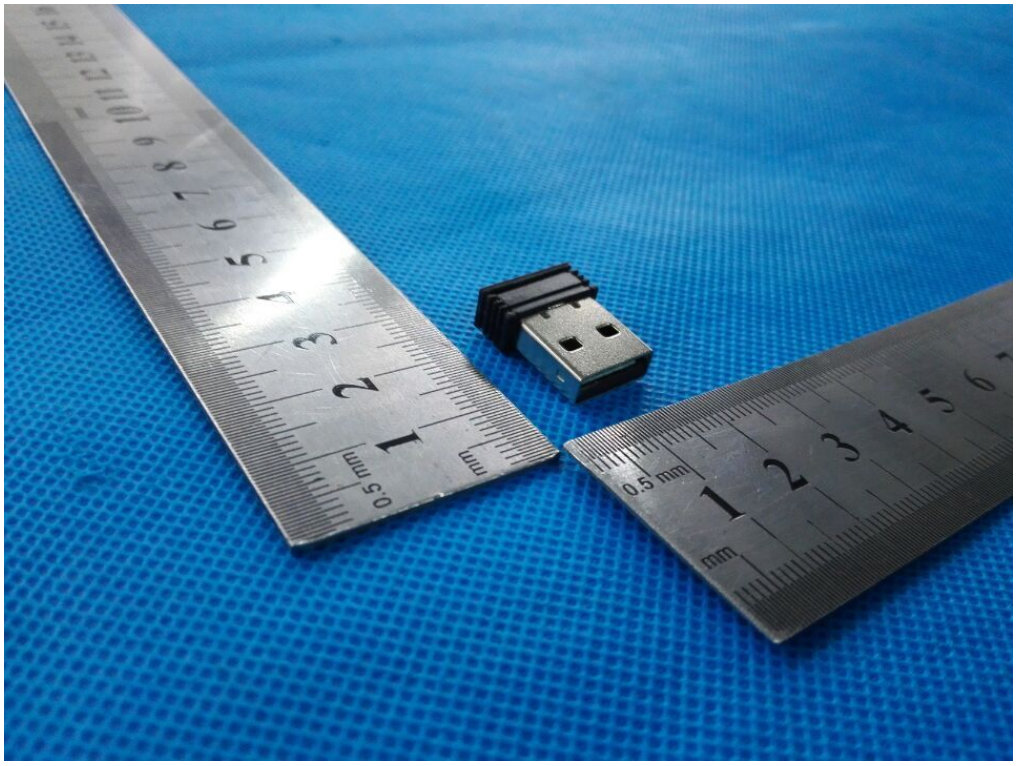
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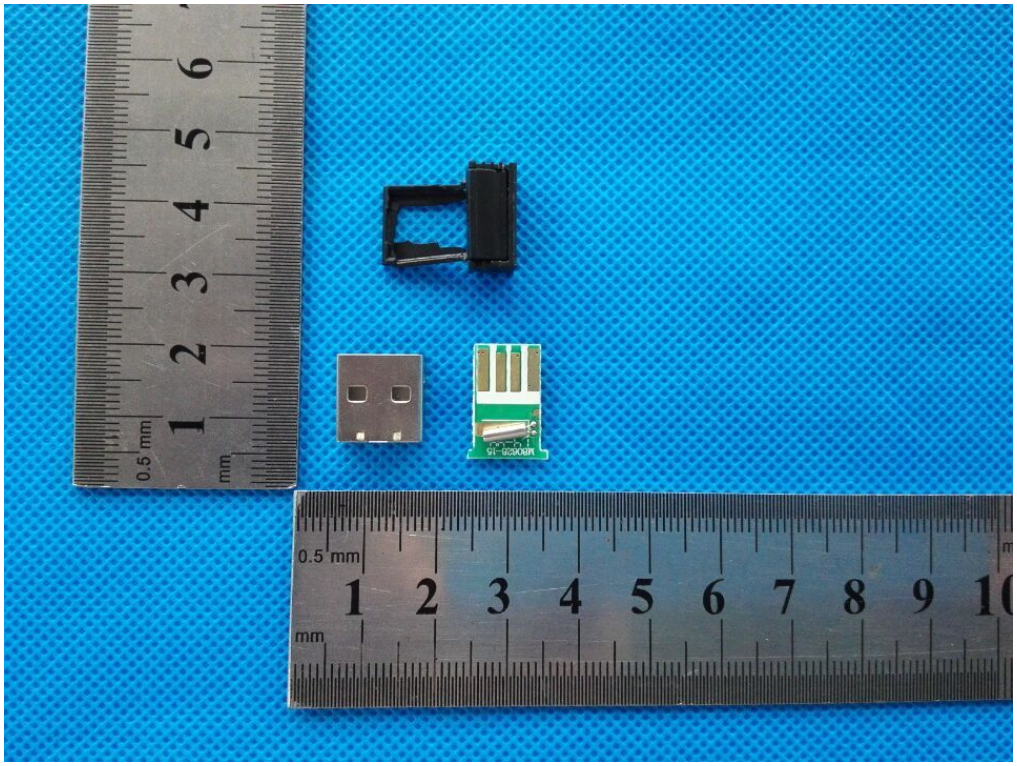

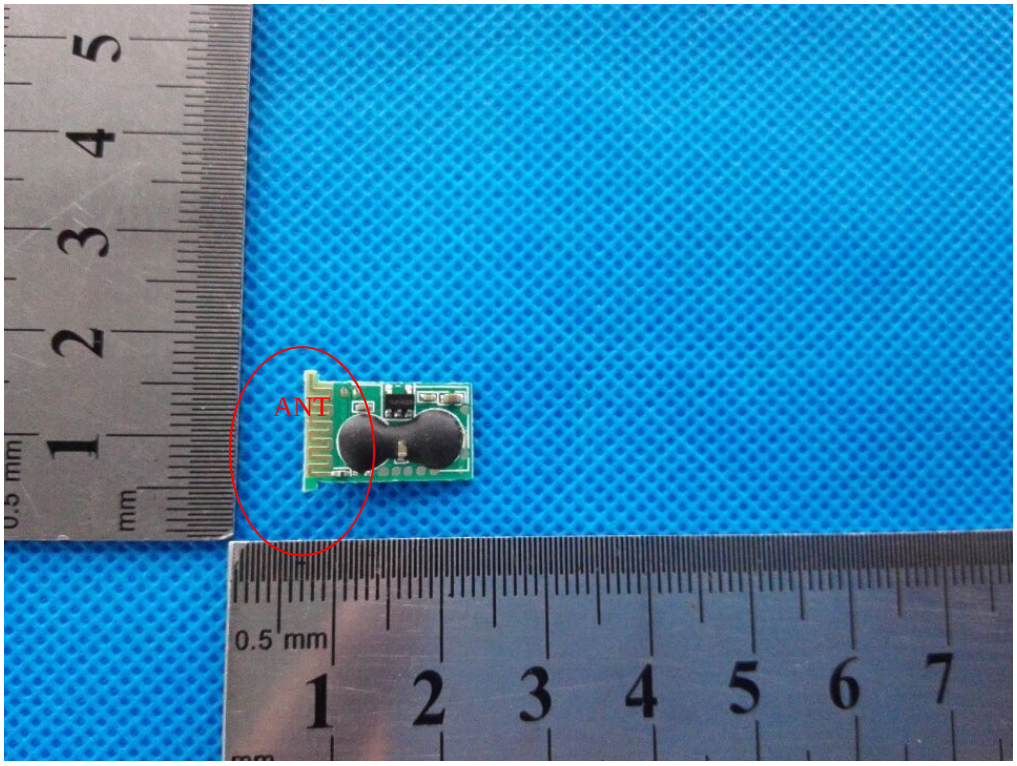
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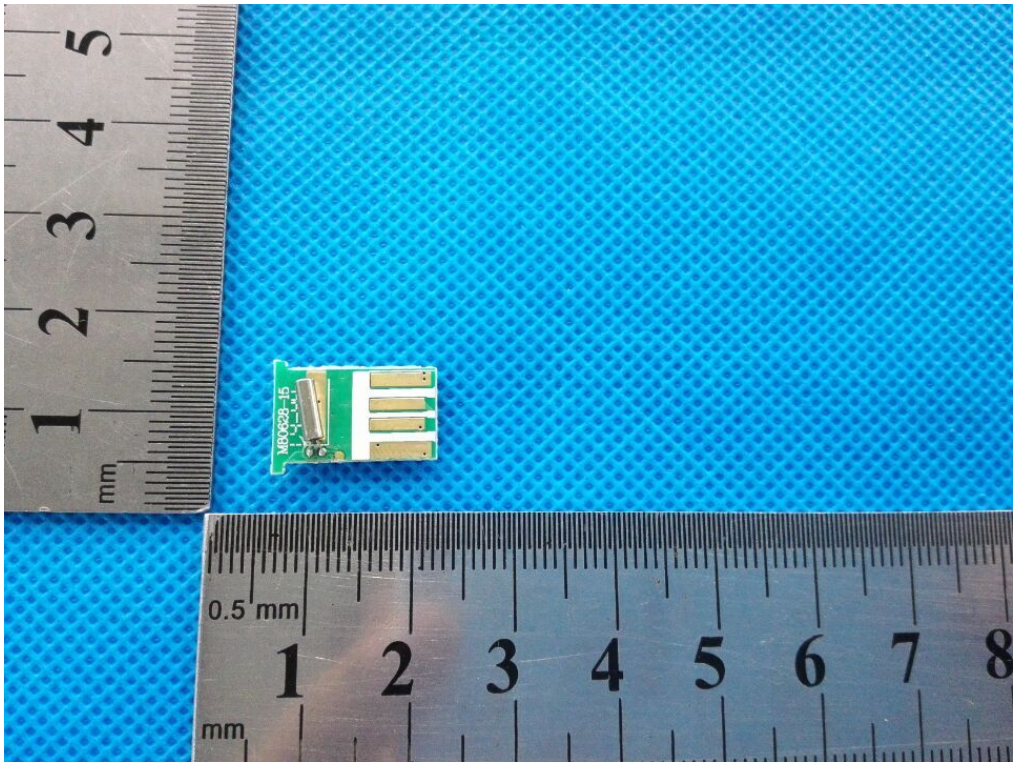

End of report