FCC TEST REPORT

Client Name	:	ACCO Brands, Inc.
Address	:	4 Corporate Drive, Lake Zurich, Illinois 60047, United States
Product Name	:	ORBIT WIRELESS MOBILE TRACKBALL RECEIVER
Date	:	Apr. 12, 2022

Shenzhen Anbotek Compliance Laboratory Limited

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TEST REPORT

Applicant	:	ACCO Brands, Inc.
Manufacturer	:	ACCO Brands, Inc.
Product Name	:	ORBIT WIRELESS MOBILE TRACKBALL RECEIVER
Model No.	:	M01592-D
Trade Mark	:	Kensington
Rating(s)	:	Input: DC 5V, 30mA
Test Standard(s)	**:**	**FCC Part15 Subpart C, Section 15.247**
Test Method(s)	**:**	**ANSI C63.10: 2020**

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart C requirements.
This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of receipt	Jan. 18, 2022
Date of Test	Jan. 18~26, 2022
Prepared by	(TuTu Hong)
Approved & Authorized Signer	(Kingkong Jin)

1. General Information

1.1. Client Information

Applicant	:	ACCO Brands, Inc.
Address	:	4 Corporate Drive, Lake Zurich, Illinois 60047, United States
Manufacturer	:	ACCO Brands, Inc.
Address	:	4 Corporate Drive, Lake Zurich, Illinois 60047, United States

1.2. Description of Device (EUT)

Product Name	:	ORBIT WIRELESS MOBILE TRACKBALL RECEIVER	
Model No.	:	M01592-D	
Trade Mark	:	Kensington	
Test Power Supply	:	DC 5V from PC/ DC 5V from PC input AC 120V/60Hz	
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)	
Product Description	:	Operation Frequency:	2403~2480MHz
		Number of Channel:	16 Channels
		Modulation Type:	GFSK
		Antenna Type:	PCB Antenna
		Antenna Gain(Peak):	-1dBi (Provide by customer)
		Adapter:	N/A
Remark: 1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.			

1.3. Auxiliary Equipment Used During Test

AppleMacBook	:	Model: A1708 Input: 20.3V/3A CMIIT ID:2016AJ5746
Adapter		Input: AC 100-240V, 1.5A, 50-60Hz Output: 20.3V/3A (USB PD) or 9V/3A(USB PD) or 5.2V/2.4A

1.4. Description of Test Modes

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

TEST MODE:

Mode 1	GFSK	CH01	TX Only
Mode 2		CH09	
Mode 3		CH16	
Note: (1) The measurements are performed at the highest, middle, lowest available channels.			

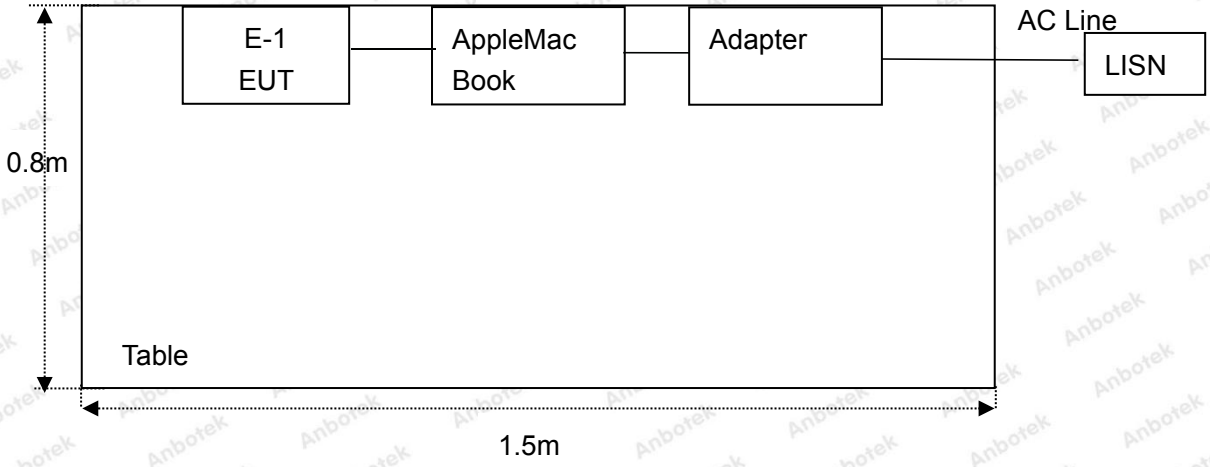
1.5. List of channels

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
01	2403	05	2422	09	2441	13	2463
02	2407	06	2426	10	2445	14	2466
03	2414	07	2436	11	2453	15	2473
04	2419	08	2439	12	2459	16	2480

Note:
1. The engineering test program was provided and the EUT was programmed to be in continuously transmitting mode.

1.6. Description Of Test Setup

CE



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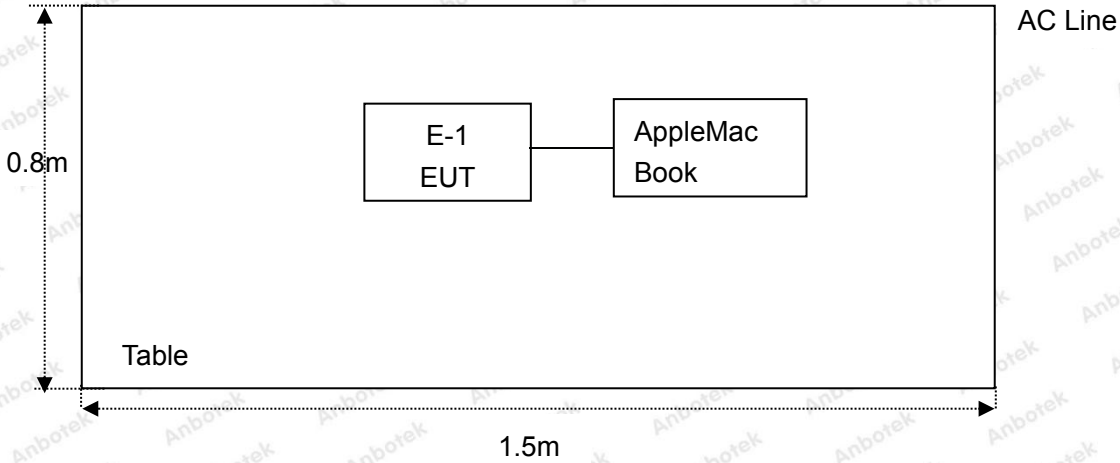


1.7. Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Three Phase V-type Artificial Power Network	CYBERTEK	EM5040DT	E215040DT001	Jul 05, 2021	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 22, 2021	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	Oct. 22, 2021	1 Year
4.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Oct. 22, 2021	1 Year
5.	MAX Spectrum Analysis	Agilent	N9020A	MY51170037	Oct. 22, 2021	1 Year
6.	Preamplifier	SKET Electronic	BK1G18G30D	KD17503	Oct. 22, 2021	1 Year
7.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Oct. 22, 2021	2 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Oct. 22, 2021	2 Year
9.	Loop Antenna	Schwarzbeck	FMZB1519B	00053	Oct. 22, 2021	2 Year
10.	Horn Antenna	A-INFO	LB-180400-KF	J211060628	Oct. 22, 2021	2 Year
11.	Pre-amplifier	SONOMA	310N	186860	Oct. 22, 2021	1 Year
12.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
13.	RF Test Control System	YIHENG	YH3000	2017430	Oct. 22, 2021	1 Year
14.	Power Sensor	DAER	RPR3006W	15I00041SN045	Oct. 22, 2021	1 Year
15.	Power Sensor	DAER	RPR3006W	15I00041SN046	Oct. 22, 2021	1 Year
16.	MXA Spectrum Analysis	KEYSIGHT	N9020A	MY53280032	Oct. 22, 2021	1 Year
17.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Oct. 22, 2021	1 Year
18.	Signal Generator	Agilent	E4421B	MY41000743	Oct. 22, 2021	1 Year
19.	DC Power Supply	IVYTECH	IV3605	1804D360510	Oct. 22, 2021	1 Year
20.	Constant Temperature Humidity Chamber	ZHONGJIAN	ZJ-KHWS80B	N/A	Oct. 22, 2021	1 Year

1.8. Measurement Uncertainty

Radiation Uncertainty	:	Ur = 3.9 dB (Horizontal)
		Ur = 3.8 dB (Vertical)
Conduction Uncertainty	:	Uc = 3.4 dB

1.9. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 184111

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 184111.

ISED-Registration No.: 8058A

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A.

Test Location

Shenzhen Anbotek Compliance Laboratory Limited.
1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518102

2. Summary of Test Results

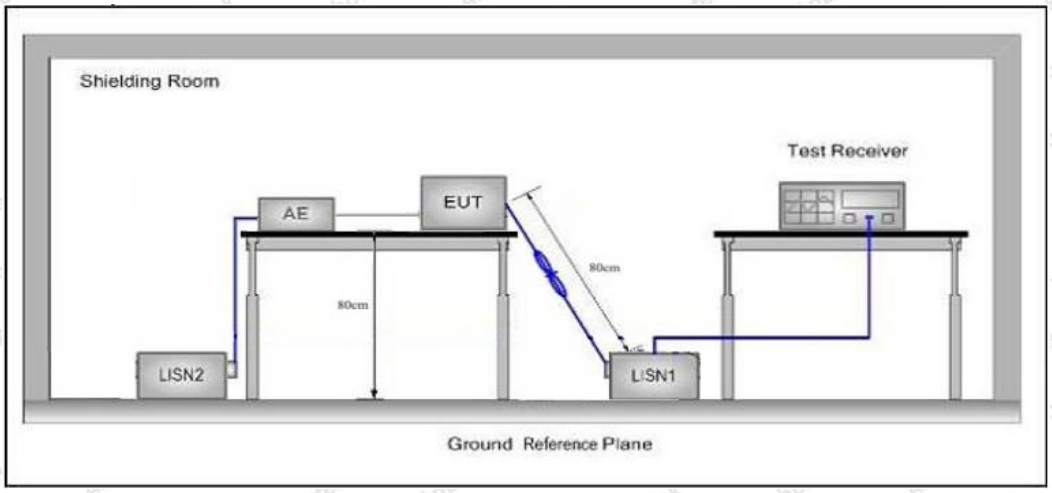
Standard Section	Test Item	Result
15.203/15.247(c)	Antenna Requirement	PASS
15.207	Conducted Emission	PASS
15.205/15.209	Spurious Emission	PASS
15.247(b)(1)	Conducted Peak Output Power	PASS
15.247(a)(1)	20dB Occupied Bandwidth	PASS
15.247(a)(1)	Carrier Frequencies Separation	PASS
15.247(a)(1)	Hopping Channel Number	PASS
15.247(a)(1)	Dwell Time	PASS
15.247(d)	Band Edge	PASS
Remark: “N/A” is an abbreviation for Not Applicable.		

3. Conducted Emission Test

3.1. Test Standard and Limit

Test Standard	FCC Part15 Section 15.207		
Test Limit	Frequency	Maximum RF Line Voltage (dBuV)	
		Quasi-peak Level	Average Level
	150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
	500kHz~5MHz	56	46
	5MHz~30MHz	60	50
Remark: (1) *Decreasing linearly with logarithm of the frequency. (2) The lower limit shall apply at the transition frequency.			

3.2. Test Setup



3.3. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.10: 2020 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

3.4. Test Data

During the test, pre-scan all modes, and found the “low CH” which is the worst case, only the worst case is recorded in the report.

Conducted Emission Test Data

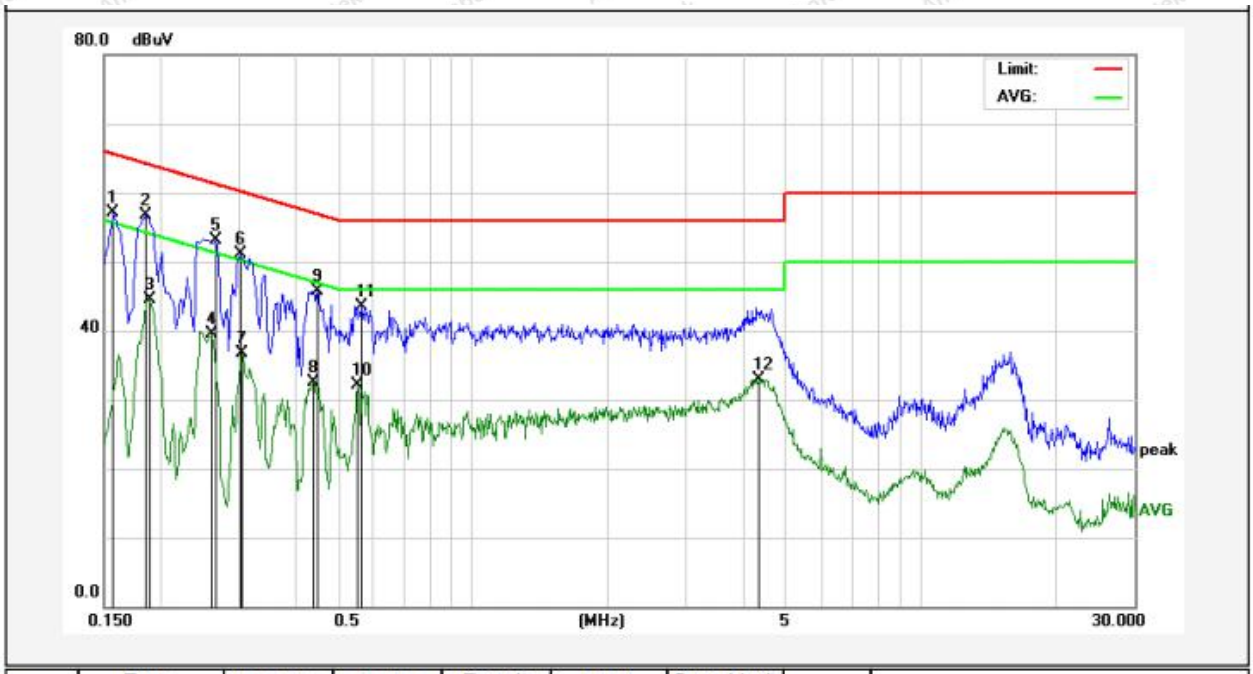
Test Site: 1# Shielded Room

Operating Condition: Mode 1

Test Specification: DC 5V from PC input AC 120V/60Hz

Comment: Live Line

Tem.: 23.4℃ Hum.: 46%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1580	56.90	0.12	57.02	65.56	-8.54	QP	
2	0.1860	56.52	0.12	56.64	64.21	-7.57	QP	
3	0.1900	44.30	0.12	44.42	54.03	-9.61	AVG	
4	0.2620	39.39	0.13	39.52	51.36	-11.84	AVG	
5	0.2660	52.97	0.13	53.10	61.24	-8.14	QP	
6	0.3020	50.98	0.13	51.11	60.19	-9.08	QP	
7	0.3060	36.53	0.13	36.66	50.08	-13.42	AVG	
8	0.4420	32.44	0.13	32.57	47.02	-14.45	AVG	
9	0.4500	45.48	0.13	45.61	56.87	-11.26	QP	
10	0.5540	32.04	0.15	32.19	46.00	-13.81	AVG	
11	0.5660	43.44	0.15	43.59	56.00	-12.41	QP	
12	4.3380	32.87	0.11	32.98	46.00	-13.02	AVG	

Address: 1/F., Building D, Sogood Science and Technology Park, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.
Tel:(86) 755-26066440 Fax: (86) 755-26014772 Email: service@anbotek.com
Hotline 400-003-0500
www.anbotek.com

Conducted Emission Test Data

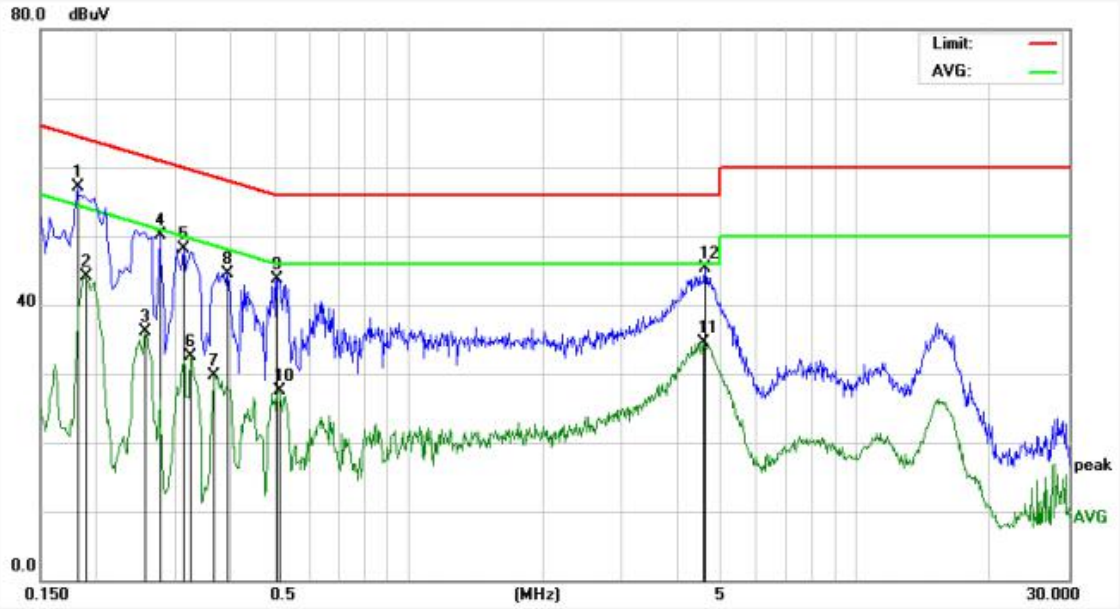
Test Site: 1# Shielded Room

Operating Condition: Mode 1

Test Specification: DC 5V from PC input AC 120V/60Hz

Comment: Neutral Line

Tem.: 23.4℃ Hum.: 46%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1819	57.06	0.12	57.18	64.39	-7.21	QP	
2	0.1900	44.06	0.12	44.18	54.03	-9.85	AVG	
3	0.2580	36.02	0.13	36.15	51.49	-15.34	AVG	
4	0.2779	49.89	0.13	50.02	60.88	-10.86	QP	
5	0.3140	48.05	0.13	48.18	59.86	-11.68	QP	
6	0.3260	32.45	0.12	32.57	49.55	-16.98	AVG	
7	0.3660	29.56	0.12	29.68	48.59	-18.91	AVG	
8	0.3940	44.34	0.11	44.45	57.98	-13.53	QP	
9	0.5100	43.57	0.15	43.72	56.00	-12.28	QP	
10	0.5140	27.43	0.15	27.58	46.00	-18.42	AVG	
11	4.5580	34.32	0.11	34.43	46.00	-11.57	AVG	
12	4.6180	45.17	0.11	45.28	56.00	-10.72	QP	

4. Radiation Spurious Emission and Band Edge

4.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.209 and 15.205				
Test Limit	Frequency (MHz)	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz~0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz~88MHz	100	40.0	Quasi-peak	3
	88MHz~216MHz	150	43.5	Quasi-peak	3
	216MHz~960MHz	200	46.0	Quasi-peak	3
	960MHz~1000MHz	500	54.0	Quasi-peak	3
	Above 1000MHz	500	54.0	Average	3
		-	74.0	Peak	3

Remark:
(1)The lower limit shall apply at the transition frequency.
(2) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

4.2. Test Setup

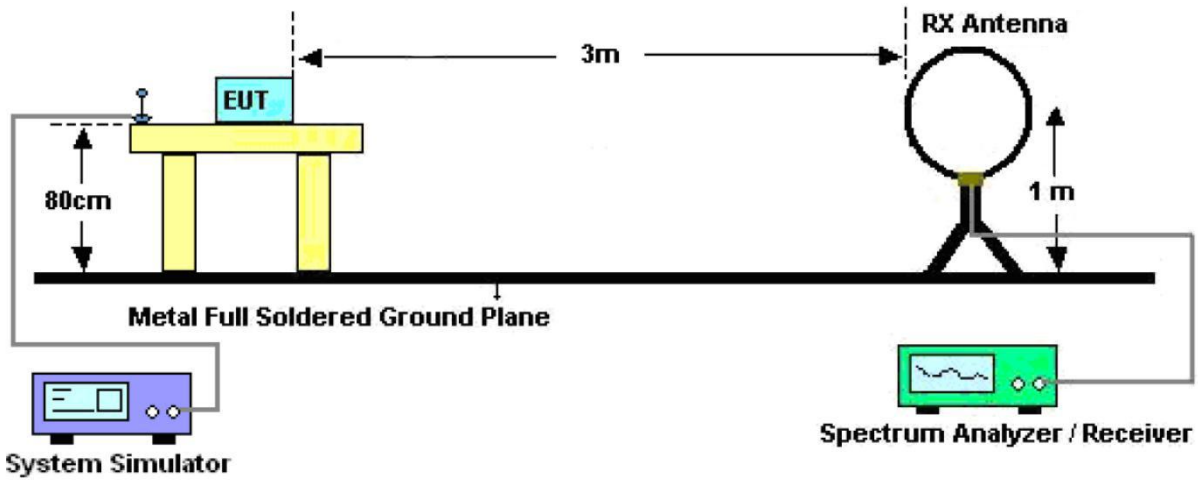


Figure 1. Below 30MHz

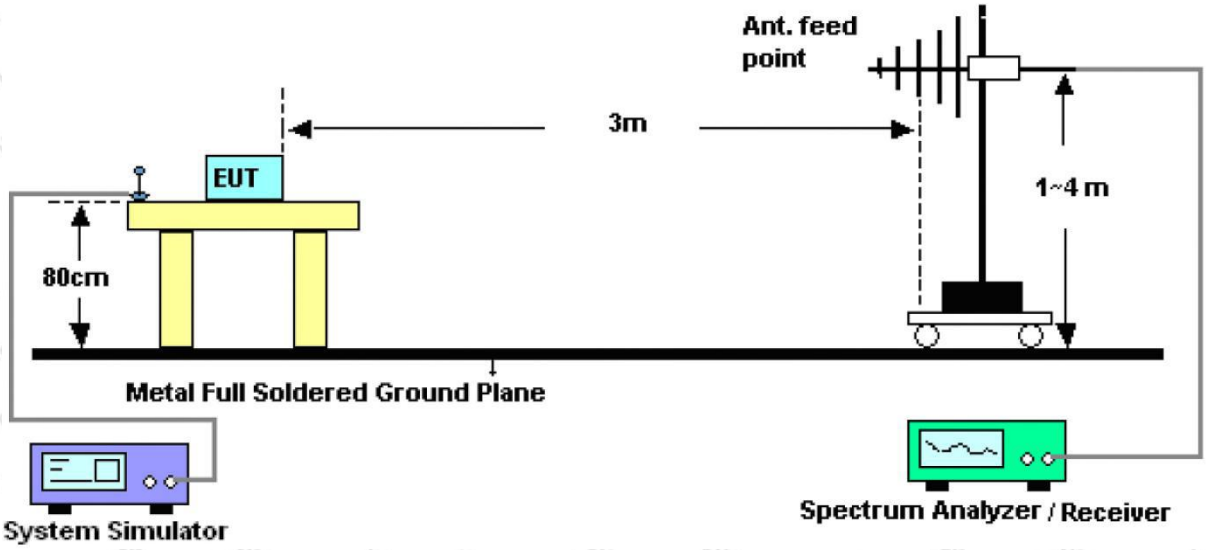


Figure 2. 30MHz to 1GHz

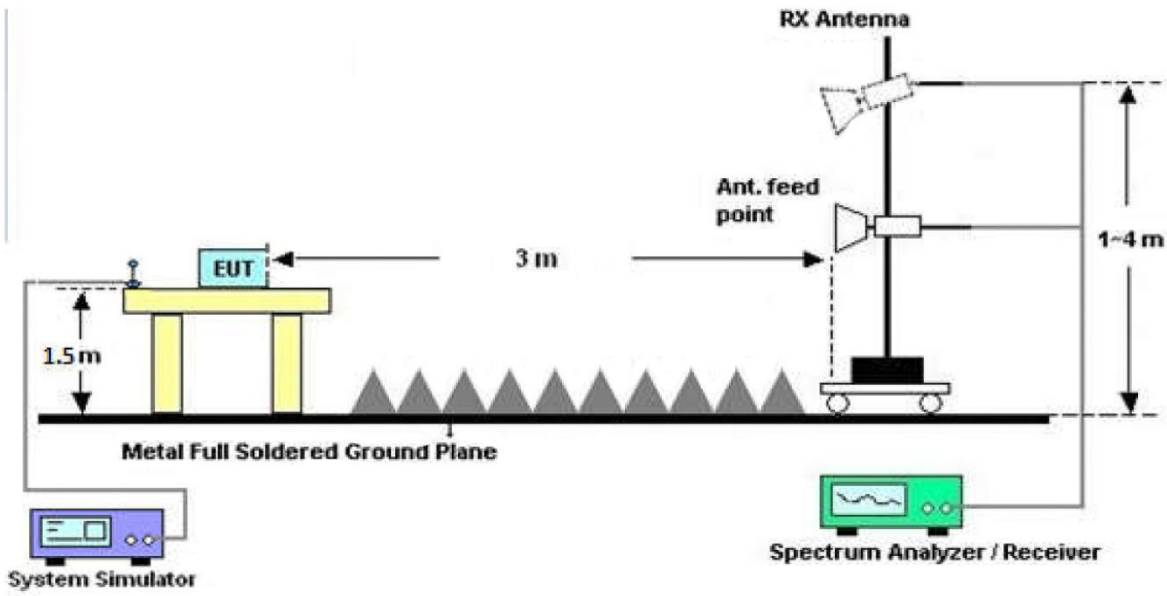


Figure 3. Above 1 GHz

4.3. Test Procedure

For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane.
For above 1GHz: The EUT is placed on a turntable, which is 1.5m above the ground plane.
The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Rotated the EUT through three orthogonal axes to determine the maximum emissions, both horizontal and vertical polarization of the antenna are set on test. The EUT is tested in 9*6*6 Chamber. The device is evaluated in xyz orientation.
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.

For 9kHz to 150kHz, Set the spectrum analyzer as:
RBW = 200Hz, VBW =1kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 150kHz to 30MHz, Set the spectrum analyzer as:
RBW = 9KHz, VBW =30kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 30MHz to 1000MHz, Set the spectrum analyzer as:
RBW = 100kHz, VBW =300kHz,Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For above 1GHz,Set the spectrum analyzer as:
RBW =1MHz, VBW =1MHz, Detector= Peak, Trace mode= Max hold, Sweep- auto couple.
RBW =1MHz, VBW =10Hz, Detector= Average, Trace mode= Max hold, Sweep- auto couple.

4.4. Test Data

PASS

During the test, pre-scan all the Modes, and found Low channel (TX) which is the worst case, only the worst case is recorded in the report.

The test results of 9kHz-30MHz was attenuated more than 20dB below the permissible limits, so the results don't record in the report.

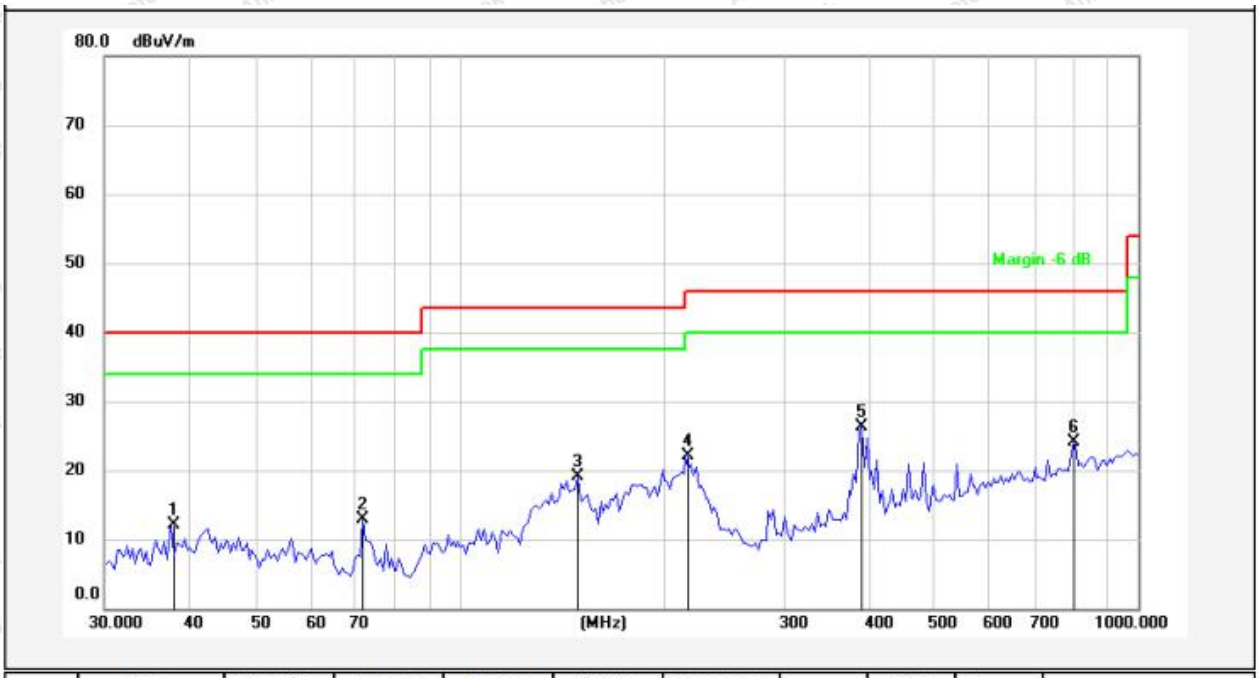
Test Results (30~1000MHz)

Test Mode: Mode 1

Power Source: DC 5V from PC

Polarization: Vertical

Temp.(℃)/Hum.(%RH): 22.8℃/49%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	37.6798	29.54	-17.41	12.13	40.00	-27.87	QP			
2	72.0841	34.66	-21.66	13.00	40.00	-27.00	QP			
3	149.2238	40.25	-21.14	19.11	43.50	-24.39	QP			
4	215.6456	39.67	-17.52	22.15	43.50	-21.35	QP			
5	391.4082	38.97	-12.63	26.34	46.00	-19.66	QP			
6	803.1933	29.86	-5.85	24.01	46.00	-21.99	QP			

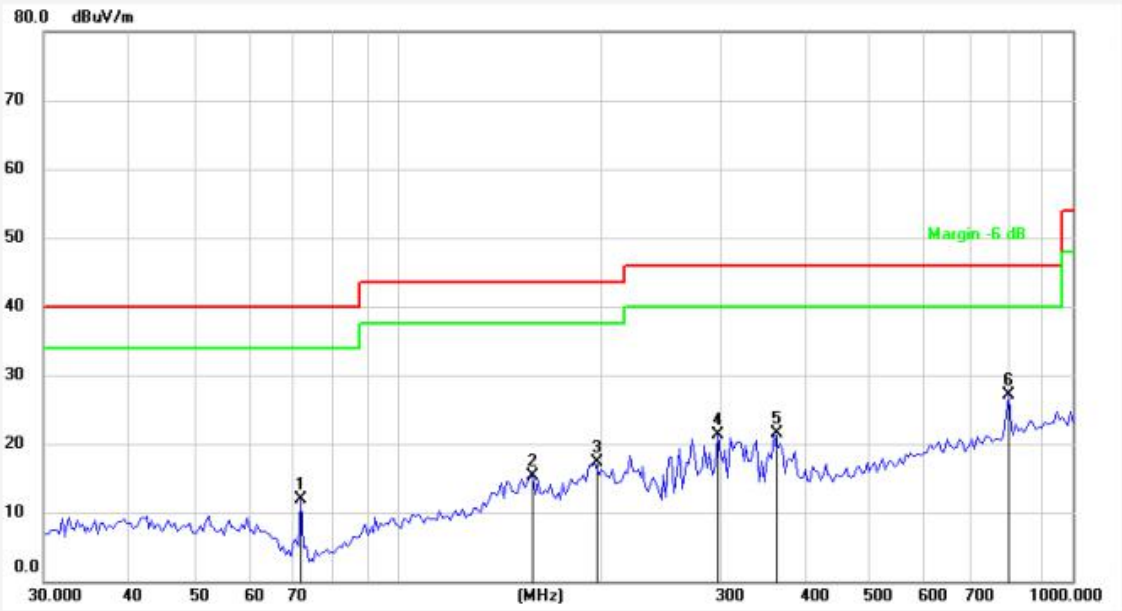
Test Results (30~1000MHz)

Test Mode: Mode 1

Power Source: DC 5V from PC

Polarization: Horizontal

Temp.(℃)/Hum.(%RH): 22.8℃/49%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	72.0843	33.57	-21.66	11.91	40.00	-28.09	QP			
2	158.6677	35.85	-20.60	15.25	43.50	-28.25	QP			
3	195.8220	35.71	-18.43	17.28	43.50	-26.22	QP			
4	298.2681	36.16	-14.89	21.27	46.00	-24.73	QP			
5	361.7139	34.87	-13.34	21.53	46.00	-24.47	QP			
6	803.1933	32.89	-5.85	27.04	46.00	-18.96	QP			

Test Results (1GHz-25GHz)

Test Mode: 2403MHz	Test channel: Lowest

Peak value:						
Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4806.00	27.41	15.27	42.68	74.00	-31.32	Vertical
7209.00	27.65	18.09	45.74	74.00	-28.26	Vertical
9612.00	28.14	23.76	51.90	74.00	-22.10	Vertical
12015.00	*			74.00		Vertical
14418.00	*			74.00		Vertical
4806.00	27.16	15.27	42.43	74.00	-31.57	Horizontal
7209.00	27.79	18.09	45.88	74.00	-28.12	Horizontal
9612.00	27.66	23.76	51.42	74.00	-22.58	Horizontal
12015.00	*			74.00		Horizontal
14418.00	*			74.00		Horizontal
Average value:						
Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4806.00	15.68	15.27	30.95	54.00	-23.05	Vertical
7209.00	16.70	18.09	34.79	54.00	-19.21	Vertical
9612.00	17.61	23.76	41.37	54.00	-12.63	Vertical
12015.00	*			54.00		Vertical
14418.00	*			54.00		Vertical
4806.00	15.49	15.27	30.76	54.00	-23.24	Horizontal
7209.00	16.82	18.09	34.91	54.00	-19.09	Horizontal
9612.00	17.17	23.76	40.93	54.00	-13.07	Horizontal
12015.00	*			54.00		Horizontal
14418.00	*			54.00		Horizontal

Test Results (1GHz-25GHz)

Test Mode: 2441MHz	Test channel: Middle

Peak value:						
Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4882.00	26.96	15.42	42.38	74.00	-31.62	Vertical
7323.00	27.62	18.02	45.64	74.00	-28.36	Vertical
9764.00	27.64	23.80	51.44	74.00	-22.56	Vertical
12205.00	*			74.00		Vertical
14646.00	*			74.00		Vertical
4882.00	26.97	15.42	42.39	74.00	-31.61	Horizontal
7323.00	27.66	18.02	45.68	74.00	-28.32	Horizontal
9764.00	27.38	23.80	51.18	74.00	-22.82	Horizontal
12205.00	*			74.00		Horizontal
14646.00	*			74.00		Horizontal
Average value:						
Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4882.00	15.77	15.42	31.19	54.00	-22.81	Vertical
7323.00	16.56	18.02	34.58	54.00	-19.42	Vertical
9764.00	17.46	23.80	41.26	54.00	-12.74	Vertical
12205.00	*			54.00		Vertical
14646.00	*			54.00		Vertical
4882.00	15.60	15.42	31.02	54.00	-22.98	Horizontal
7323.00	17.17	18.02	35.19	54.00	-18.81	Horizontal
9764.00	17.47	23.80	41.27	54.00	-12.73	Horizontal
12205.00	*			54.00		Horizontal
14646.00	*			54.00		Horizontal

Test Results (1GHz-25GHz)

Test Mode: 2480MHz	Test channel: Highest

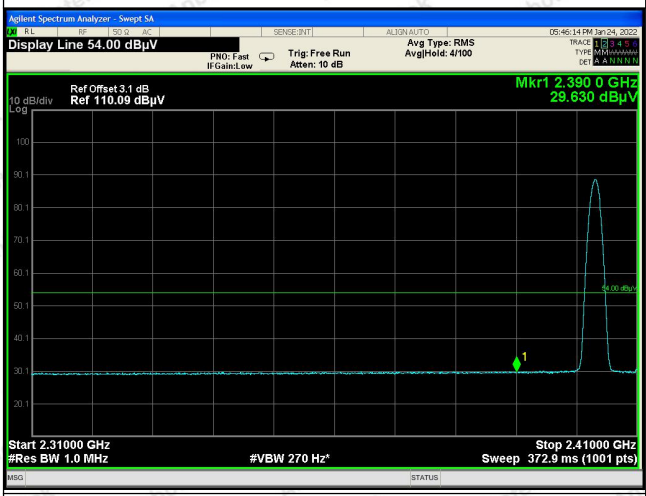
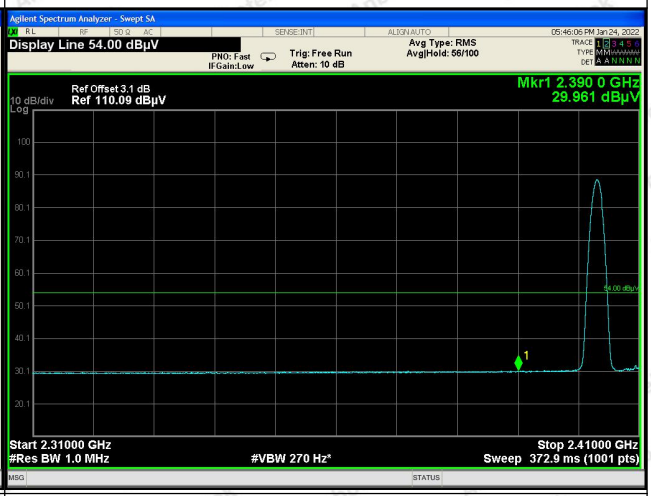
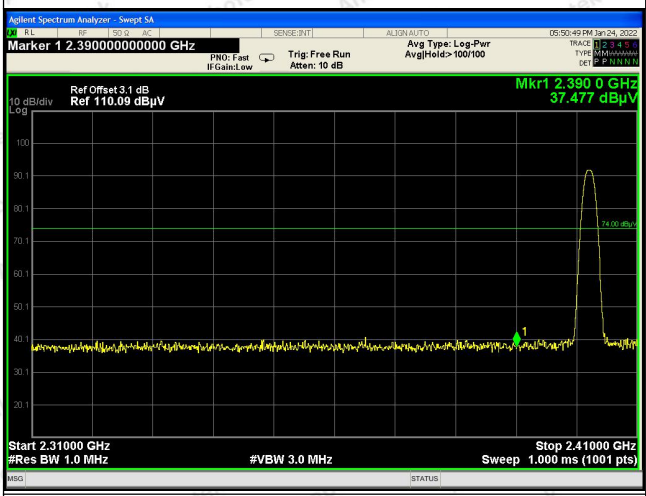
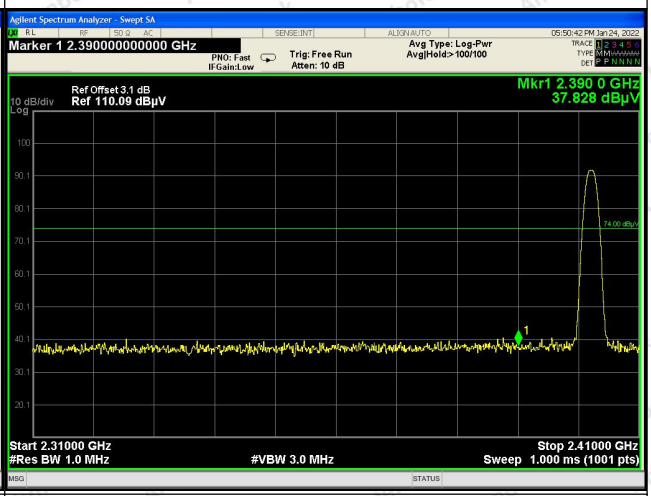
Peak value:						
Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4960.00	27.09	15.58	42.67	74.00	-31.33	Vertical
7440.00	27.78	17.93	45.71	74.00	-28.29	Vertical
9920.00	28.34	23.83	52.17	74.00	-21.83	Vertical
12400.00	*			74.00		Vertical
14880.00	*			74.00		Vertical
4960.00	27.11	15.58	42.69	74.00	-31.31	Horizontal
7440.00	27.87	17.93	45.80	74.00	-28.20	Horizontal
9920.00	27.76	23.83	51.59	74.00	-22.41	Horizontal
12400.00	*			74.00		Horizontal
14880.00	*			74.00		Horizontal
Average value:						
Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4960.00	16.89	15.58	32.47	54.00	-21.53	Vertical
7440.00	17.83	17.93	35.76	54.00	-18.24	Vertical
9920.00	18.11	23.83	41.94	54.00	-12.06	Vertical
12400.00	*			54.00		Vertical
14880.00	*			54.00		Vertical
4960.00	16.78	15.58	32.36	54.00	-21.64	Horizontal
7440.00	17.97	17.93	35.90	54.00	-18.10	Horizontal
9920.00	17.62	23.83	41.45	54.00	-12.55	Horizontal
12400.00	*			54.00		Horizontal
14880.00	*			54.00		Horizontal

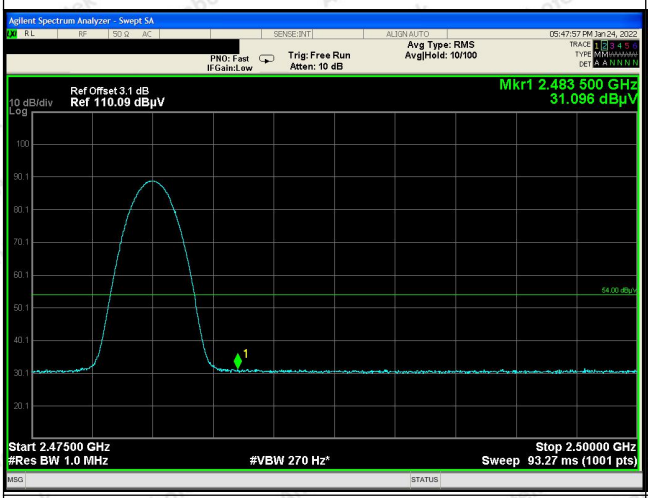
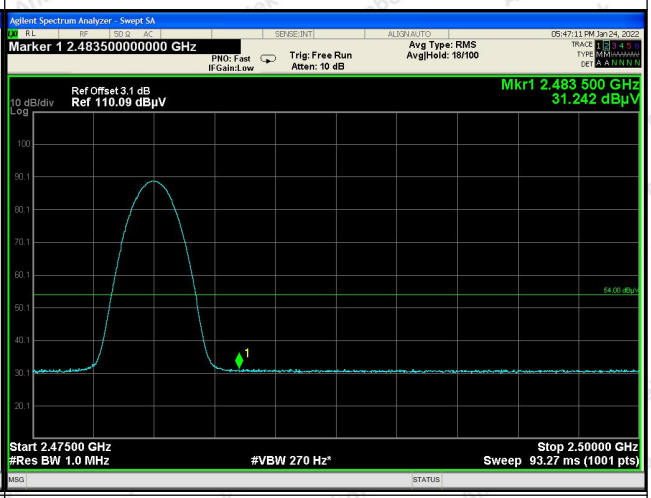
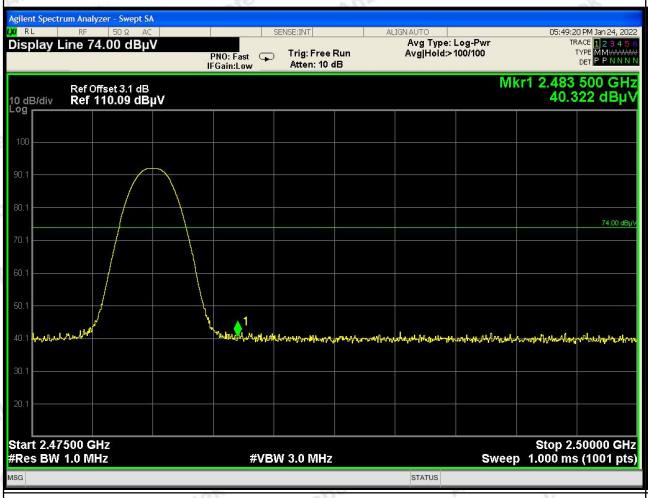
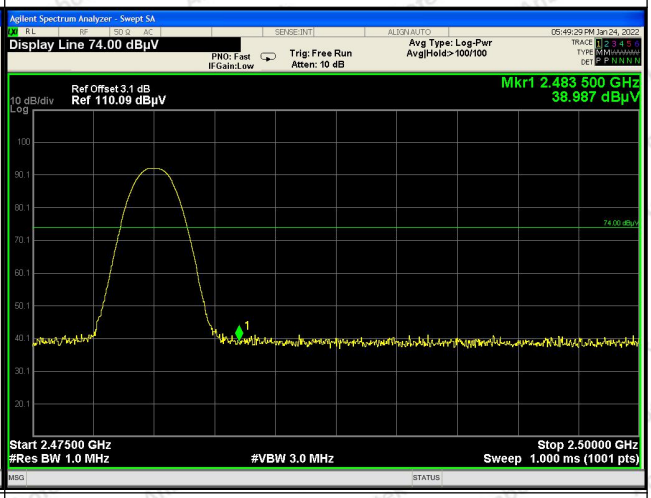
Remark:

1. Level =Reading+ Factor

2. "*" means the test results were attenuated more than 20dB below the permissible limits, so the results don't record in the report.

Radiated Band Edge:

Test Mode: CH01	Test channel: Lowest
	
Average Value(Vertical)	Average Value(Horizontal)
	
Peak Value(Vertical)	Peak Value(Horizontal)

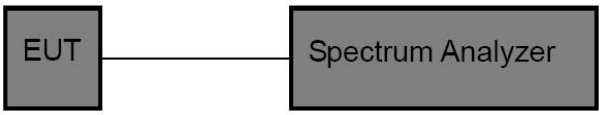
Test Mode: CH16	Test channel: Highest
	
Average Value(Vertical)	Average Value(Horizontal)
	
Peak Value(Vertical)	Peak Value(Horizontal)

5. Maximum Peak Output Power Test

5.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (a)(1)
Test Limit	125mW

5.2. Test Setup



5.3. Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above,
2. Spectrum Setting:
   RBW > the 20 dB bandwidth of the emission being measured
   Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel
   VBW ≥ RBW
   Sweep = auto
   Detector function = peak
   Trace = max hold

5.4. Test Data

Pass

Please refer to Appendix C of the Appendix Test Data.

Additional test for duty cycle.

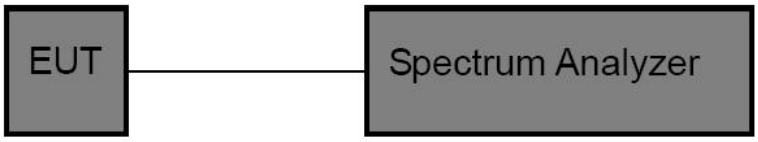
Please refer to Appendix I of the Appendix Test Data.

6. 20DB Occupy Bandwidth Test

6.1. Test Standard

Test Standard	FCC Part15 C Section 15.247 (a)(1)

6.2. Test Setup



6.3. Test Procedure

Using the following spectrum analyzer settings:

1. Span= approximately 2 to 3 times the 20dB bandwidth, centered on a hopping channel.
2. Set the RBW = 30 kHz.
3. Set the VBW = 100 kHz.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

6.4. Test Data

Pass

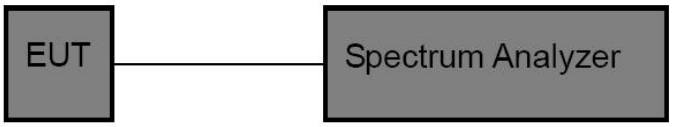
Please refer to Appendix A&B of the Appendix Test Data.

7. Carrier Frequency Separation Test

7.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (a)(1)
Test Limit	>25KHz or >two-thirds of the 20 dB bandwidth

7.2. Test Setup



7.3. Test Procedure

The EUT must have its hopping function enabled. Using the following spectrum analyzer settings:

1. Span= Wide enough to capture the peaks of two adjacent channels
2. Set the RBW = 100 kHz.
3. Set the VBW = 300 kHz.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

7.4. Test Data

Pass

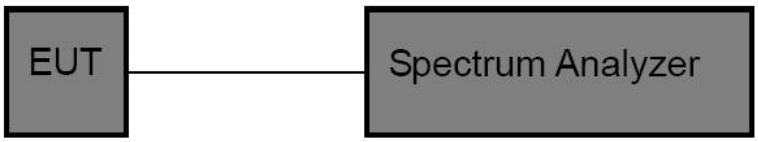
Please refer to Appendix D of the Appendix Test Data.

8. Number of Hopping Channel Test

8.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (a)(1)
Test Limit	>15 channels

8.2. Test Setup



8.3. Test Procedure

The EUT must have its hopping function enabled. Using the following spectrum analyzer setting:

1. Span= the frequency band of operation
2. Set the RBW = 100kHz.
3. Set the VBW = 300kHz.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

8.4. Test Data

Pass

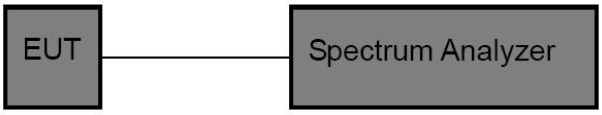
Please refer to Appendix F of the Appendix Test Data.

9. Dwell Time Test

9.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (a)(1)
Test Limit	0.4 sec

9.2. Test Setup



9.3. Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span= zero span, centered on a hopping channel
2. Set the RBW = 1 MHz.
3. Set the VBW = 3 MHz.
4. Sweep time = as necessary to capture the entire dwell time per hopping channel.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

9.4. Test Data

Pass

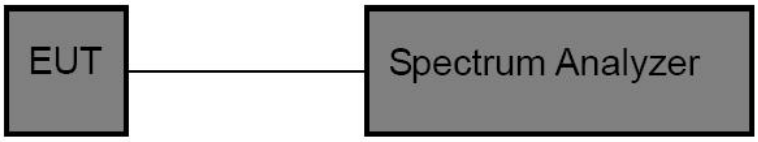
Please refer to Appendix E of the Appendix Test Data.

10. 100kHz Bandwidth of Frequency Band Edge Requirement

10.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (d)
Test Limit	in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a).

10.2. Test Setup



10.3. Test Procedure

The EUT must have its hopping/Non-hopping function enabled. Using the following spectrum analyzer setting:

1. Set the RBW = 100kHz.
2. Set the VBW = 300kHz.
3. Sweep time = auto couple.
4. Detector function = peak.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.

10.4. Test Data

Pass

Please refer to Appendix G&H of the Appendix Test Data.

11. Antenna Requirement

11.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203 /247(c)
Requirement	1) 15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 2) 15.247(c) (1)(i) requirement: Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

11.2. Antenna Connected Construction

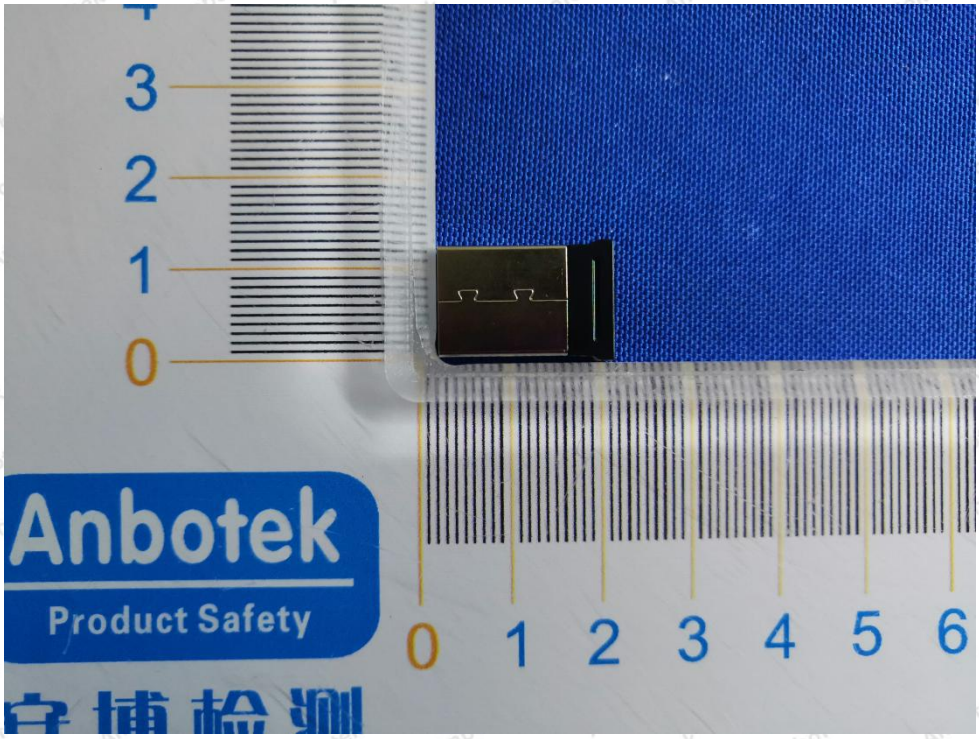
The antenna is PCB Antenna which permanently attached, and the best case gain of the antenna is -1dBi. It complies with the standard requirement.

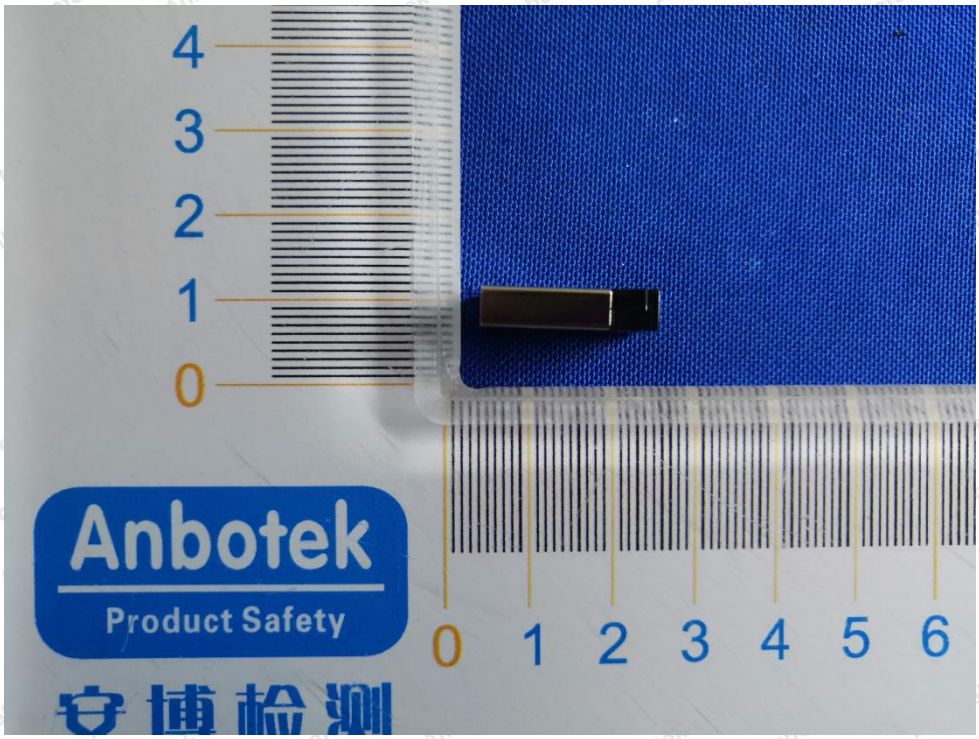
APPENDIX I -- TEST SETUP PHOTOGRAPH

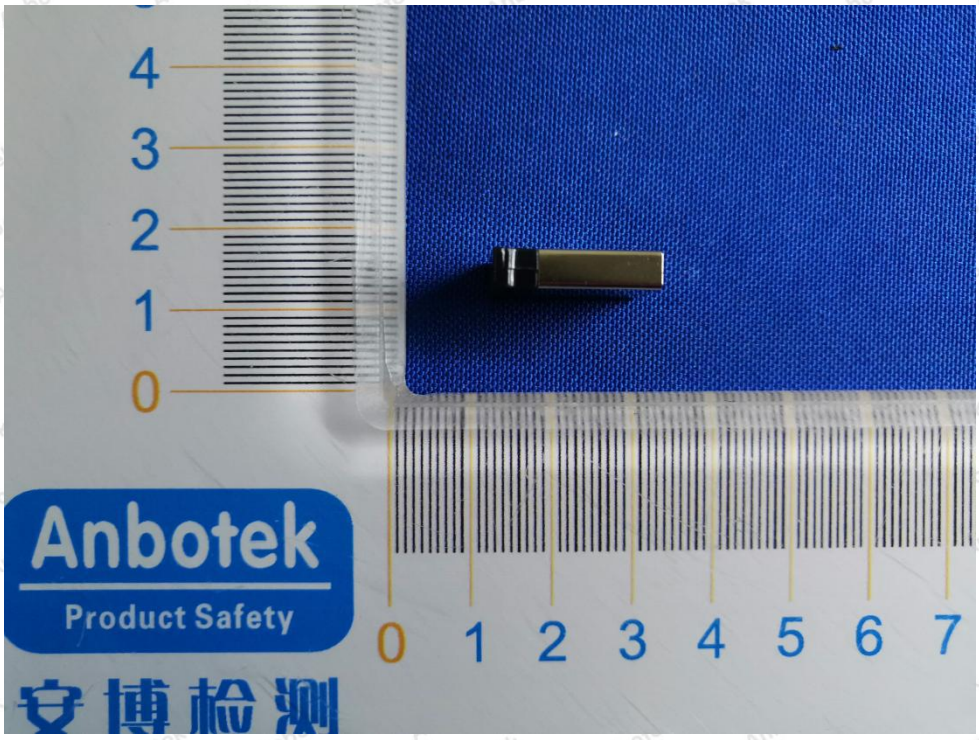
Photo of Conducted Emission Measurement

Photo of Radiation Emission Test

APPENDIX II -- EXTERNAL PHOTOGRAPH




4
3
2
1
0
Anbotek
Product Safety
0 1 2 3 4 5 6
安博检测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3
2
1
0
Anbotek
Product Safety
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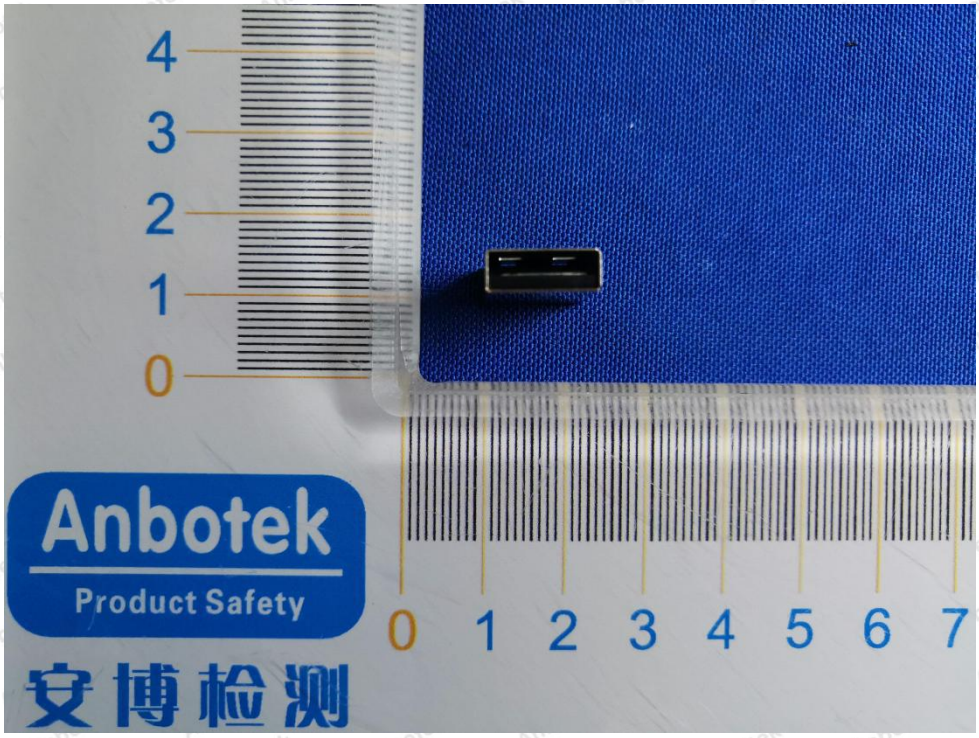
安博检测


4
3
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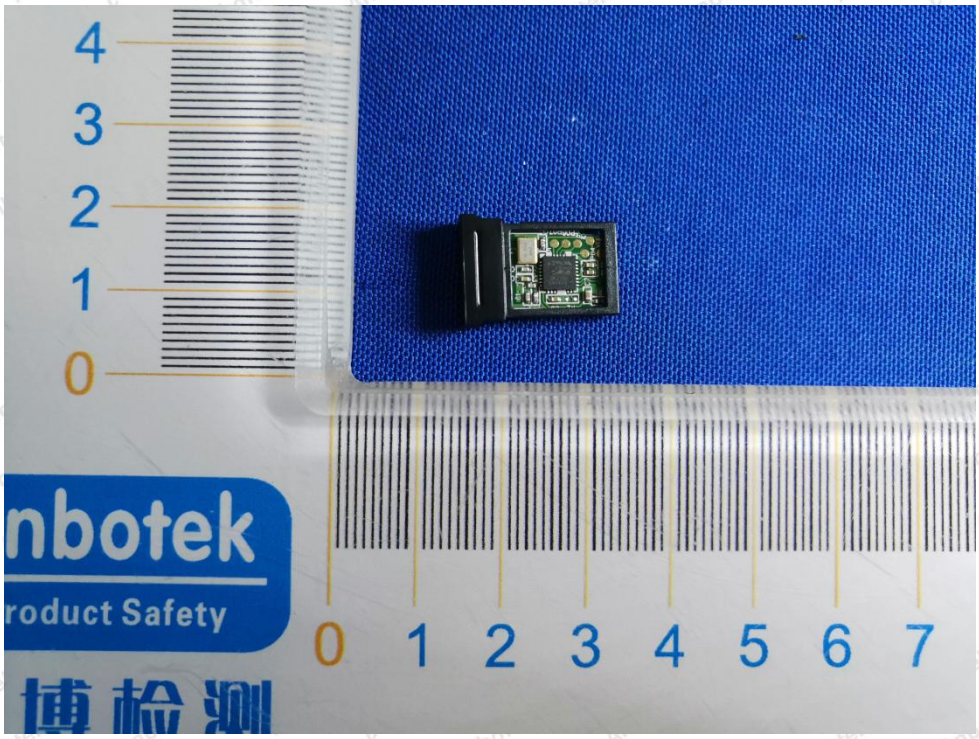
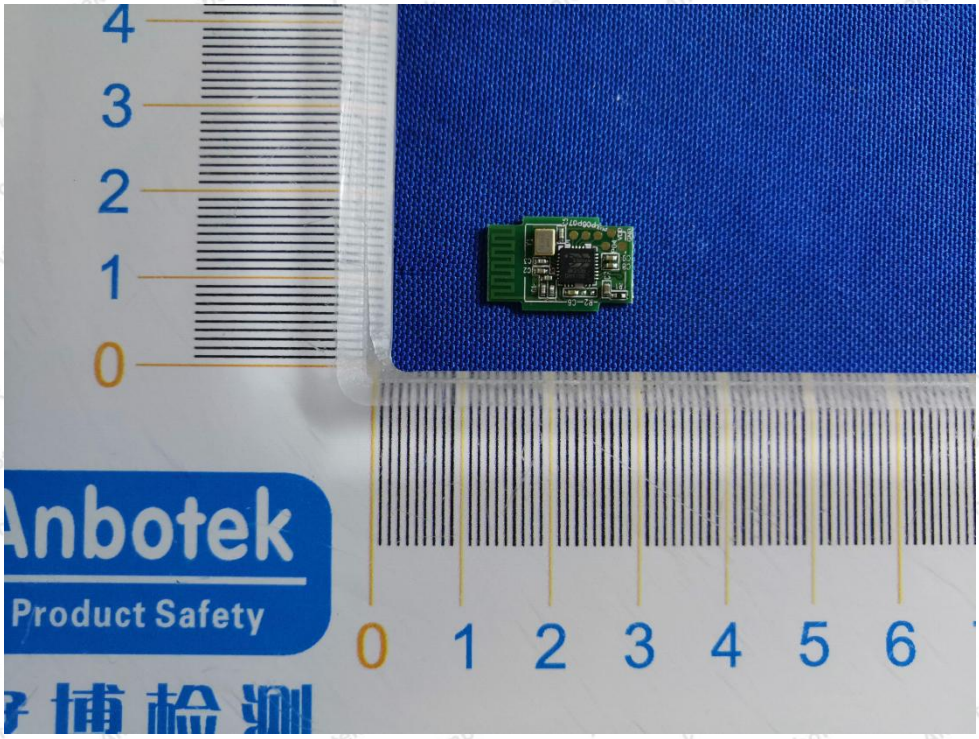
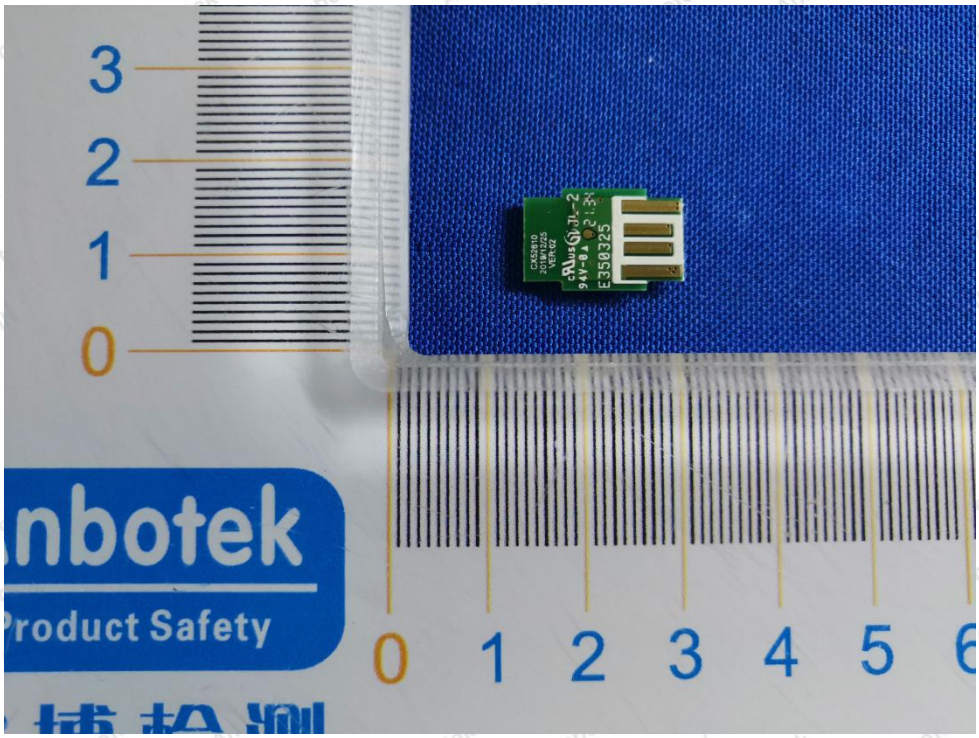
Anbotek
Product Safety
安博检测
0 1 2 3 4 5 6 7

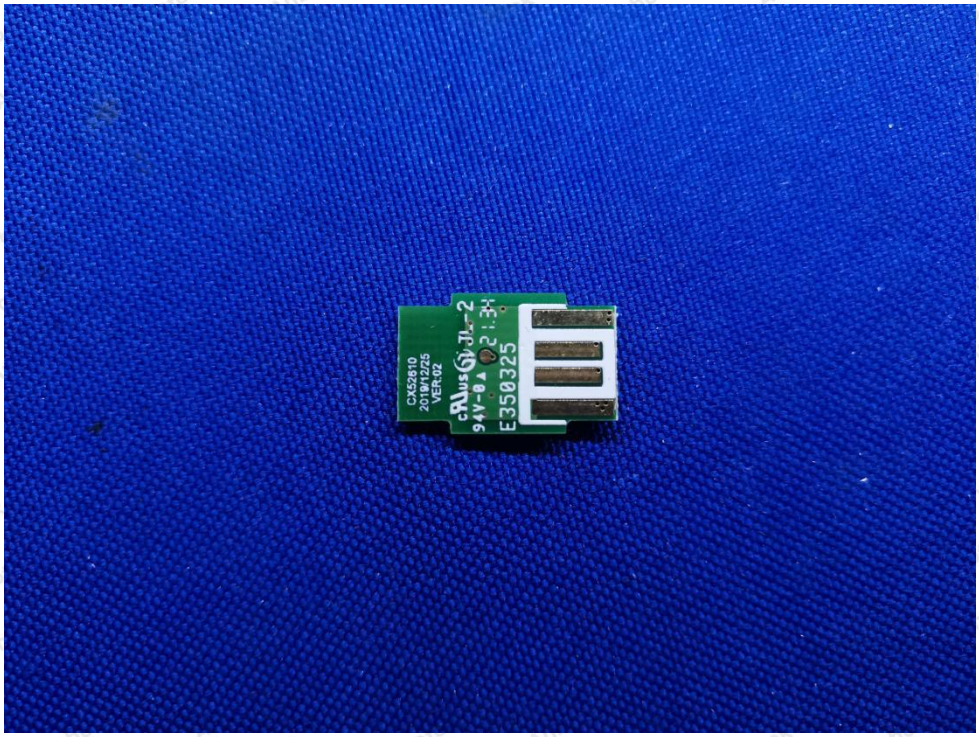
4
3
2
1
0
Anbotek
Product Safety
安博检测
0 1 2 3 4 5 6

APPENDIX III -- INTERNAL PHOTOGRAPH

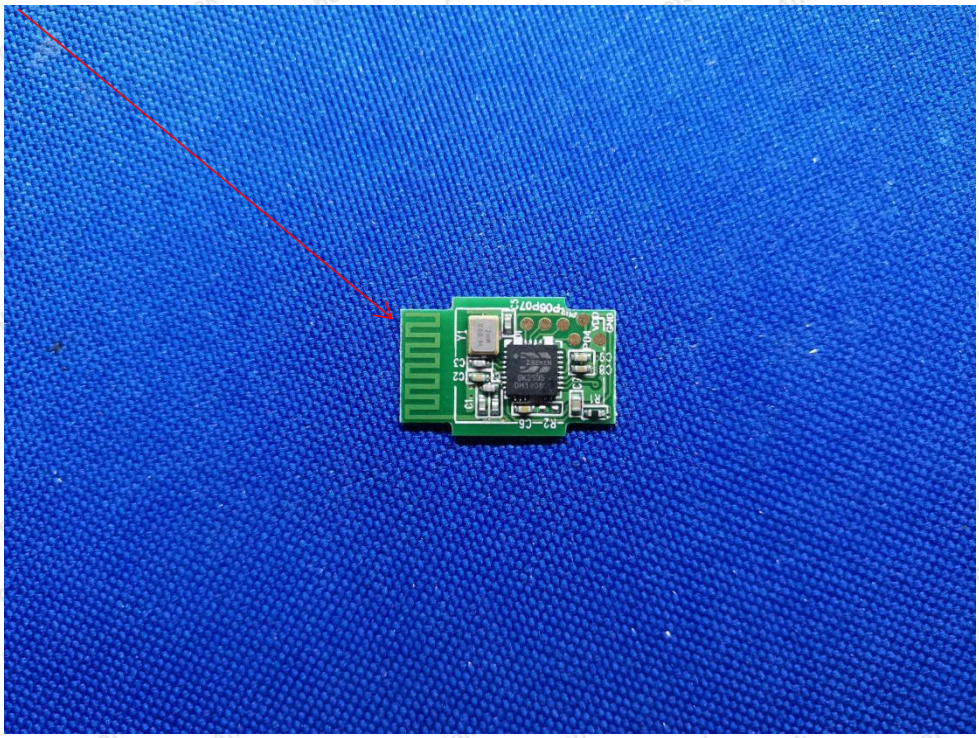





3
2
1
0
nbotek
Product Safety
0 1 2 3 4 5 6
E350325


CX52810
2019/12/25
VER.02
E350325

ANT



APPENDIX IV – Appendix Test Data