

# FCC Test Report

Client Name : Seeed Technology Co., Ltd.  
Address : 9F, G3 Building, TCL International E City,  
Zhongshanyuan Road, Nanshan District, Shenzhen,  
Guangdong Province, P.R.C  
Product Name : Grove Beginner Kit for Arduino - All-in-one Arduino  
Compatible Board with 10 Sensors and 12 Projects  
Date : Jul. 13, 2020



## Shenzhen Anbotech Compliance Laboratory Limited



# Contents

1. General Information.....	4
1.1. Client Information.....	4
1.2. Description of Device (EUT).....	4
1.3. Auxiliary Equipment Used During Test.....	4
1.4. Description of Test Mode.....	5
1.5. Test Summary.....	5
1.6. Test Equipment List.....	5
1.7. Measurement Uncertainty.....	6
1.8. Description of Test Facility.....	6
2. Radiated Emission Test.....	7
2.1. Test Standard and Limit.....	7
2.2. Test Setup.....	7
2.3. EUT Configuration on Measurement.....	7
2.4. Operating Condition of EUT.....	8
2.5. Test Procedure.....	8
2.6. Test Results.....	8
APPENDIX I -- TEST SETUP PHOTOGRAPH.....	11
APPENDIX II -- EXTERNAL PHOTOGRAPH.....	12



# TEST REPORT

Applicant : Seeed Technology Co., Ltd.  
Manufacturer : Seeed Technology Co., Ltd.  
Product Name : Grove Beginner Kit for Arduino - All-in-one Arduino Compatible Board with 10 Sensors and 12 Projects  
Model No. : Grove Beginner Kit for Arduino  
Trade Mark : Seeed Studio  
Rating(s) : DC5V, 100mA

**Test Standard(s) : FCC Rules and Regulations Part 15 Subpart B: 2019**

**Test Method(s) : ANSI C63.4-2014**

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited To determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart B Class B limits both radiated and conducted emissions. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited Is assumed full responsibility for the accuracy and completeness of these measurements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited

Date of Receipt: Jun. 17, 2020

Date of Test: Jun. 17~Jul. 02, 2020

Prepared By:

Winnie Huang

(Engineer / Winnie Huang)

Reviewer:

Well Wang

(Supervisor / Well Wang)

Approved & Authorized Signer:

Tom Chen

(Manager / Tom Chen)



## 1. General Information

### 1.1. Client Information

Applicant	:	Seeed Technology Co., Ltd.
Address	:	9F, G3 Building, TCL International E City, Zhongshanyuan Road, Nanshan District, Shenzhen, Guangdong Province, P.R.C
Manufacturer	:	Seeed Technology Co., Ltd.
Address	:	9F, G3 Building, TCL International E City, Zhongshanyuan Road, Nanshan District, Shenzhen, Guangdong Province, P.R.C
Factory	:	Seeed Technology Co., Ltd.
Address	:	9F, G3 Building, TCL International E City, Zhongshanyuan Road, Nanshan District, Shenzhen, Guangdong Province, P.R.C

### 1.2. Description of Device (EUT)

Product Name	:	Grove Beginner Kit for Arduino - All-in-one Arduino Compatible Board with 10 Sensors and 12 Projects	
Model No.	:	Grove Beginner Kit for Arduino	
Trade Mark	:	Seeed Studio	
Test Power Supply	:	DC 5V via PC	
Test Sample No.	:	1-1-1	
Product Description	:	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

Notebook	:	Manufacturer: MacBook Air
	:	Model: A1466
	:	Input: 14.85V/3.05A CMIIT ID:C02HXB48DRVC
	:	Adapter:
	:	Input: AC 100-240V, 1A, 50-60Hz Output: 14.85V/3.05A

## 1.4. Description of Test Mode

Pretest Mode	Description
Mode 1	On

For Mode 1 Block Diagram of Test Setup



## 1.5. Test Summary

Test Items	Test Mode	Status
Power Line Conducted Emission Test (150KHz To 30MHz)	/	N
Radiated Emission Test (30MHz To 1000MHz)	Mode 1	P
P) Indicates "PASS". N) Indicates "Not applicable".		

## 1.6. Test Equipment List

### Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Nov. 04, 2019	1 Year
2.	Pre-amplifier	Schwarzbeck	BBV-9745	9745-075	Nov. 04, 2019	1 Year
3.	Bilog Broadband Antenna	SCHWARZBECK	VULB 9163	01109	Nov. 01, 2019	1 Year
4.	Software Name EZ-EMC	Ferrari Technology	EMEC-3A1	N/A	N/A	N/A

### 1.7. Measurement Uncertainty

Radiation Uncertainty	:	Ur = 4.7 dB (Horizontal)
		Ur = 4.3 dB (Vertical)
Conduction Uncertainty	:	Uc = 3.4 dB
Disturbance Uncertainty	:	Ud = 3.4 dB

### 1.8. 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, September 27, 2019.

#### 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, March 07, 2019.

#### 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.518128



## 2. Radiated Emission Test

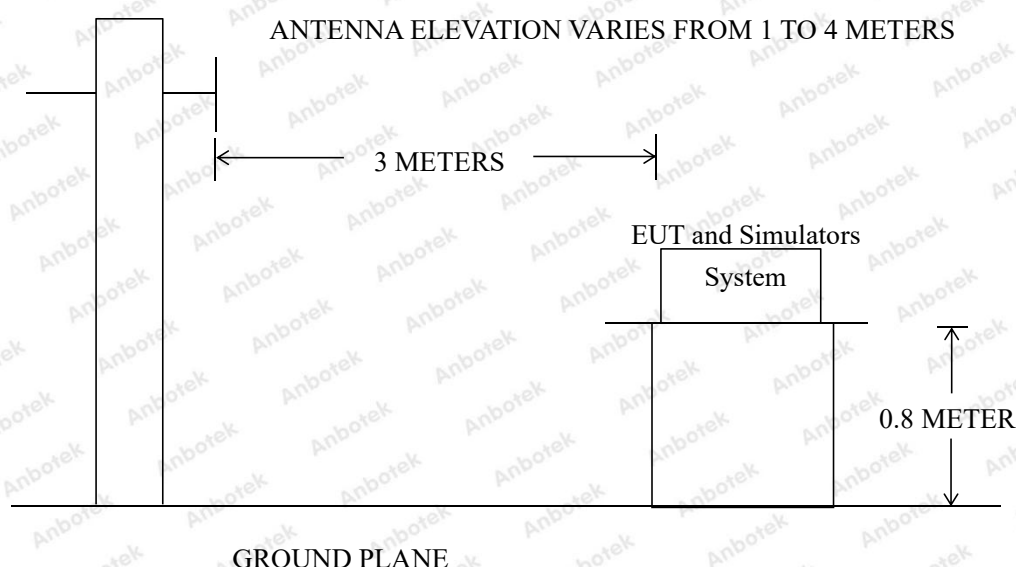
### 2.1. Test Standard and Limit

Test Standard	FCC Part 15 Subpart B
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Radiated Emission Test Limit (Subpart B Class B)

Test Limit	Frequency (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT	
			$\mu\text{V/m}$	$(\text{dB}\mu\text{V/m})$
	30 ~ 88	3	100	40
	88 ~ 216	3	150	43.5
	216 ~ 960	3	200	46
	960 ~ 1000	3	500	54
<b>Remark:</b> (1) Emission level $(\text{dB})\mu\text{V} = 20 \log \text{Emission level } \mu\text{V/m}$ (2) The smaller limit shall apply at the cross point between two frequency bands. (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.				

### 2.2. Test Setup



### 2.3. EUT Configuration on Measurement

The following equipments are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

## 2.4. Operating Condition of EUT

2.4.1. Setup the EUT as shown in Section 2.2.

2.4.2. Turn on the power of all equipments.

2.4.3. Let the EUT work in test mode and measure it.

## 2.5. Test Procedure

EUT and its simulators are placed on a turn table, which is 0.8 meter high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (Trilog Broadband Antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4-2014 on radiated emission measurement.

The bandwidth of the EMI test receiver (ESCI) is set at 120kHz.

The frequency range from 30MHz to 1000MHz is checked.

The test results are listed in Section 2.6.

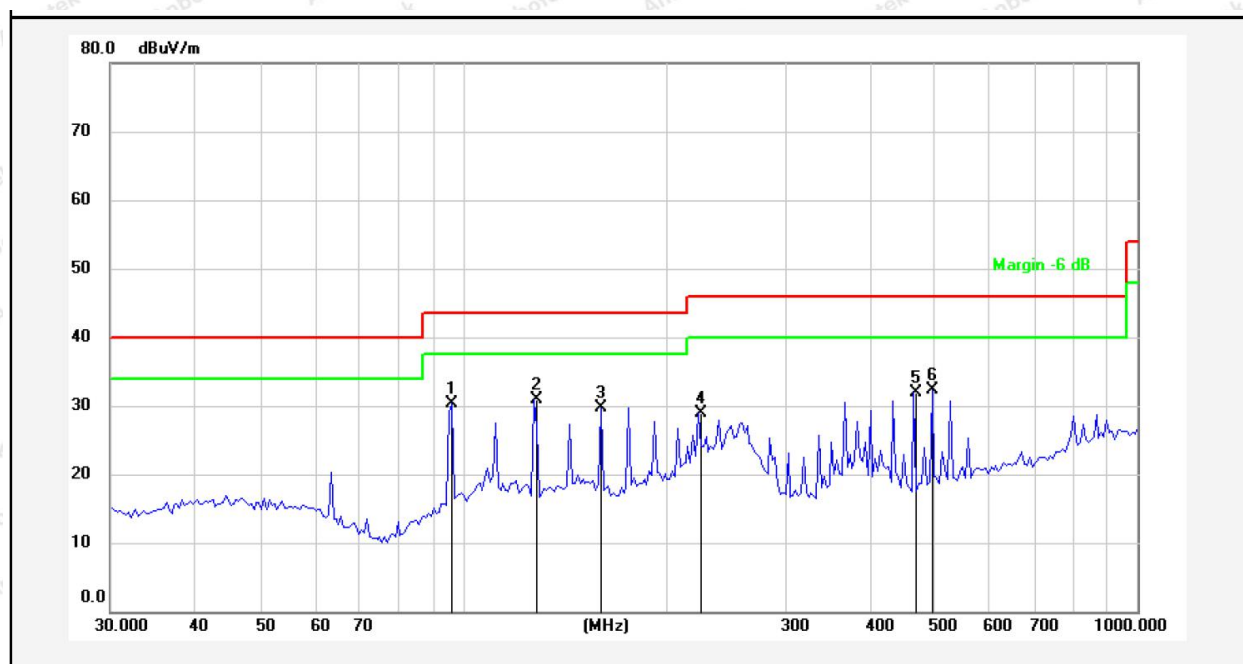
## 2.6. Test Results

**PASS**

The test curves are shown in the following pages.



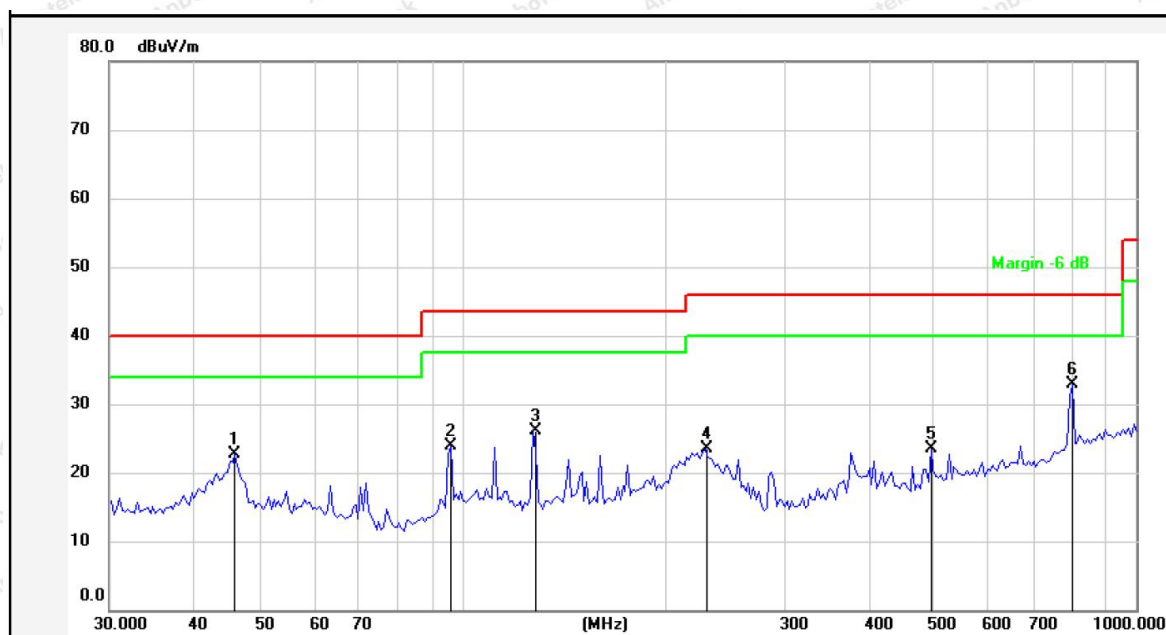
**Test item:** Radiation Test **Polarization:** Horizontal  
**Standard:** (RE)FCC Part 15 Subpart B **Power Source:** DC 5V via PC  
**Distance:** 3m **Temp.(°C)/Hum.(%RH):** 23.5( °C)/58%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor ( )	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	96.2672	46.18	-15.96	30.22	43.50	-13.28	peak			
2	127.4409	50.30	-19.39	30.91	43.50	-12.59	peak			
3	160.0648	49.68	-19.90	29.78	43.50	-13.72	peak			
4	223.3415	45.97	-16.98	28.99	46.00	-17.01	peak			
5	466.4165	46.99	-15.17	31.82	46.00	-14.18	peak			
6	495.9344	46.68	-14.38	32.30	46.00	-13.70	peak			

**Note:** Result=Reading+Factor Over Limit=Result-Limit

**Test item:** Radiation Test **Polarization:** Vertical  
**Standard:** (RE)FCC Part 15 Subpart B **Power Source:** DC 5V via PC  
**Distance:** 3m **Temp.(°C)/Hum.(%RH):** 23.5( °C)/58%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor ( )	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	46.0971	38.39	-15.68	22.71	40.00	-17.29	peak			
2	96.2672	39.77	-15.96	23.81	43.50	-19.69	peak			
3	127.4409	45.42	-19.39	26.03	43.50	-17.47	peak			
4	229.2931	40.13	-16.70	23.43	46.00	-22.57	peak			
5	495.9344	37.84	-14.38	23.46	46.00	-22.54	peak			
6	803.1933	41.79	-8.90	32.89	46.00	-13.11	peak			

**Note:** Result=Reading+Factor Over Limit=Result-Limit

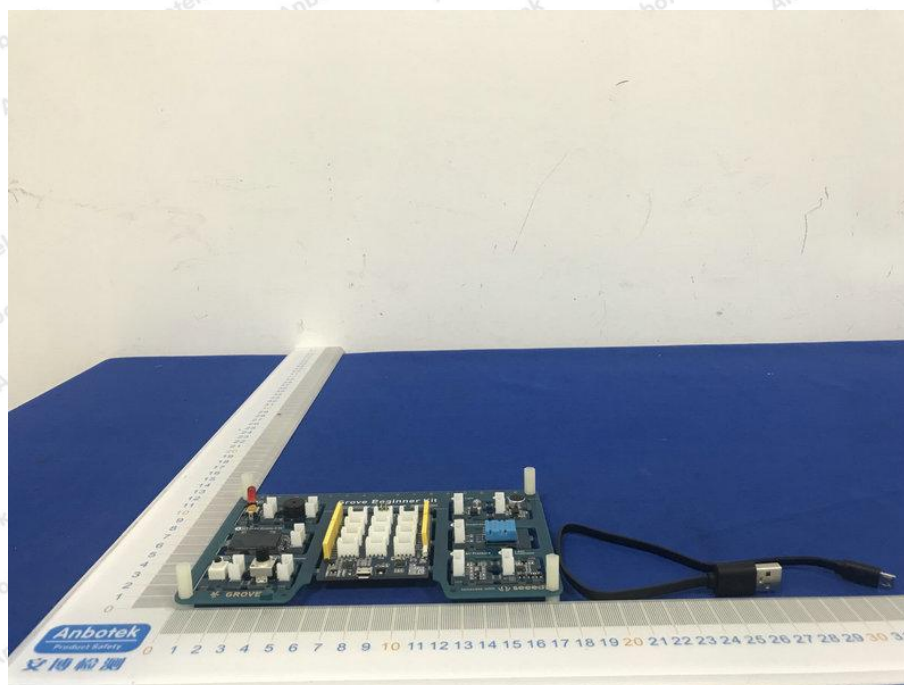
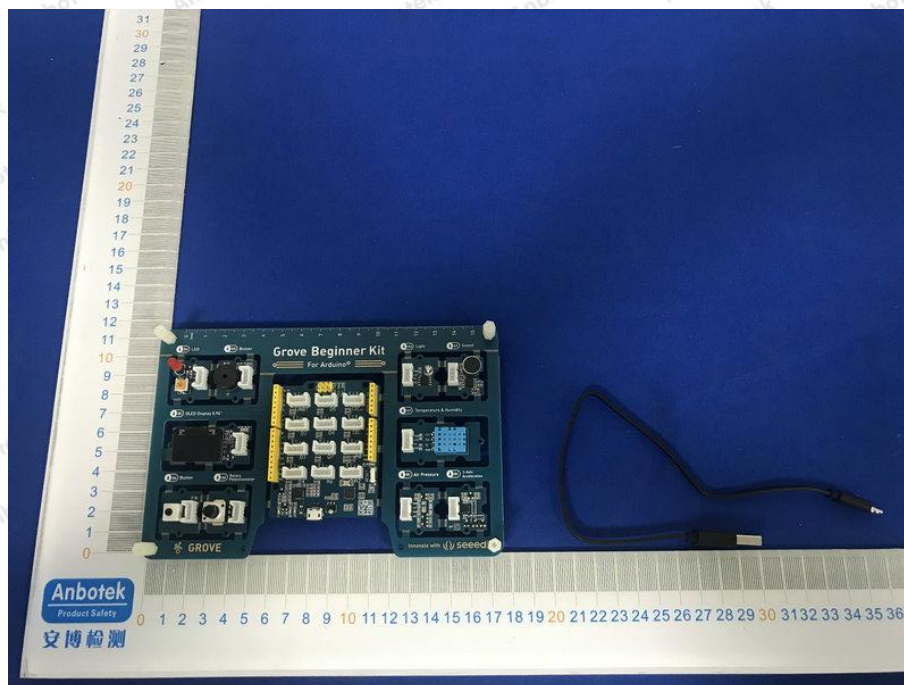


## APPENDIX I -- TEST SETUP PHOTOGRAPH

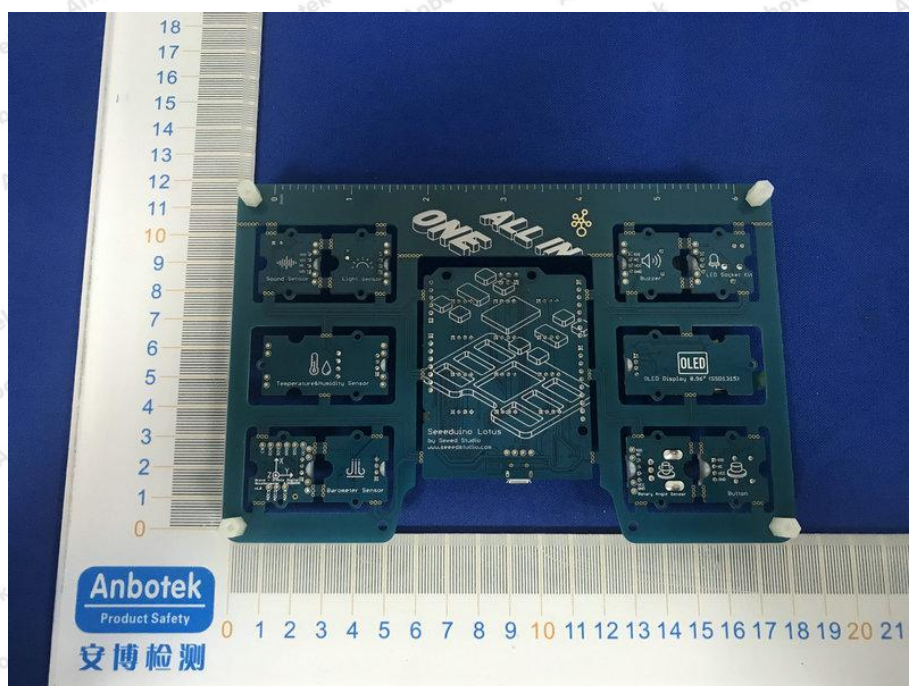
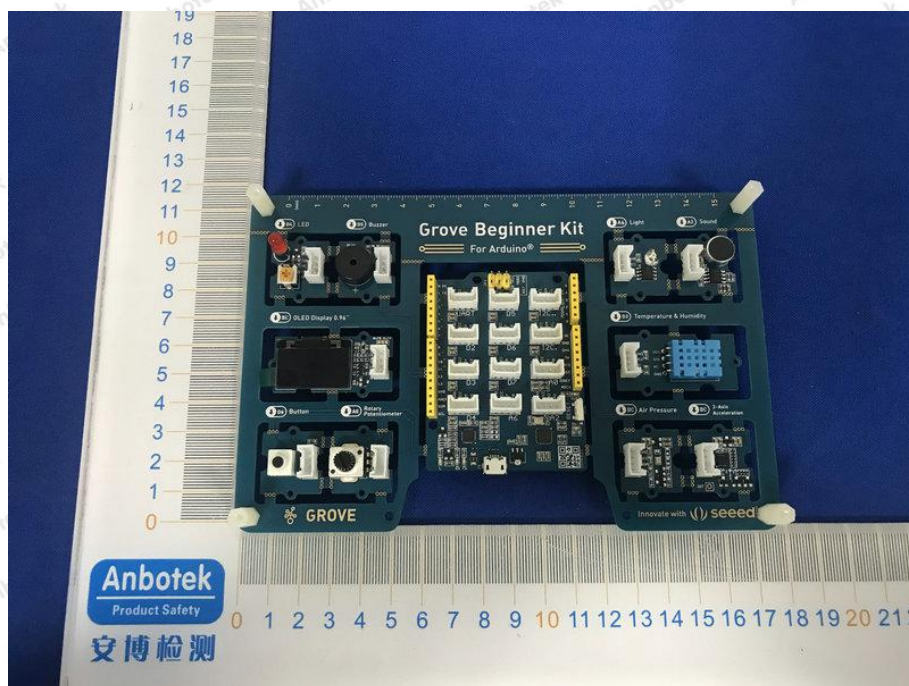
Photo of Radiated Emission Test





**APPENDIX II -- EXTERNAL PHOTOGRAPH**





----- End of Report -----