

FCC Part 15B Test Report

Report No. : TB-FCC184353
Applicant : North-south Technology Industrial (Shenzhen) Co., Ltd.
Equipment Under Test (EUT)
EUT Name : DOOR ALARM
Model No. : NB06
Series Model No. : NB07, NB08, NB09, NB10, NB12, NB15, NB18.
Brand Name : Nooberone
Receipt Date : 2021-10-27
Test Date : 2021-10-28 to 2021-11-04
Issue Date : 2021-11-04
Standards : FCC 47 CFR Part 15 Subpart B
Conclusions : **PASS**

In the configuration tested, the EUT complied with the standards specified above
The EUT technically complies with the FCC requirements.

Test/Witness Engineer :

Joy

Engineer Supervisor :

IVAN SU

Engineer Manager :

Ray Lai



This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

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Revision History

Report No.	Version	Description	Issued Date
TB-FCC184353	Rev.01	Initial issue of report	2021-11-04

1. General Information

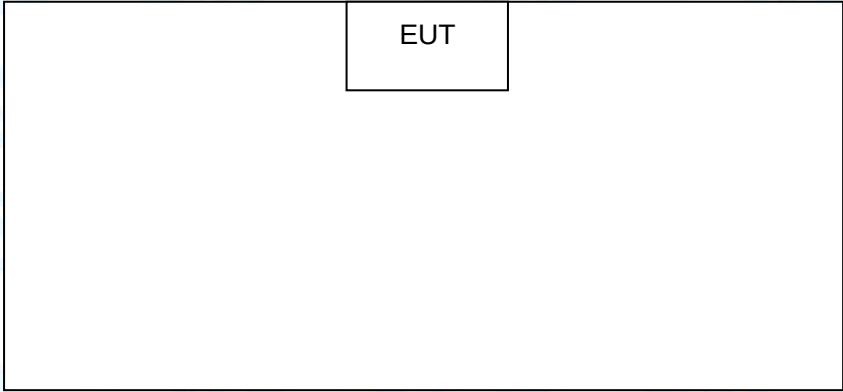
1.1 Client Information

Applicant	:	North-south Technology Industrial (Shenzhen) Co., Ltd.
Address	:	416, Building E, Shunxing Industrial Zone, No. 10, Zhongxing Road, Ma'antang Community, Bantian Street, Longgang District, Shenzhen, China
Manufacturer	:	North-south Technology Industrial (Shenzhen) Co., Ltd.
Address	:	416, Building E, Shunxing Industrial Zone, No. 10, Zhongxing Road, Ma'antang Community, Bantian Street, Longgang District, Shenzhen, China

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	DOOR ALARM
Model(s)	:	NB06, NB07, NB08, NB09, NB10, NB12, NB15, NB18.
Model Difference	:	All these models are identical in the same PCB layout and electrical circuit, the only difference is model name for commercial, therefore, testing was performed with NB06 only.
Brand Name	:	Nooberone
Power Supply	:	DC 4.5V from battery
Equipment	:	☐ Class A ☒ Class B
Class A Equipment: the Equipment is not intended primarily for use in a residential environment.		
Class B Equipment: the Equipment is intended primarily for use in a residential environment.		

1.3 Block Diagram Showing The Configuration of System Tested



1.4 Description of Support Units

Equipment Information				
Name	Model	S/N	Manufacturer	Used “√”
----	----	----	----	----
Cable Information				
Number	Shielded Type	Ferrite Core	Length	Note
----	----	----	----	----
Note: N/A				

1.5 Description of Test Mode

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 follow was evaluated respectively.

For Conducted Test	
Final Test Mode	Description
/	/
For Radiated Test	
Final Test Mode	Description
Mode 1	Working Mode

1.6 Test standards

The objective is to determine compliance with FCC Part 15, Subpart B, and section 15.107, 15.109 rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.7 Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1A/F., Building 6, Rundongsheng Industrial Zone, Longzhu, Xixiang, Bao'an District, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

A2LA Certificate No.: 4750.01

The laboratory has been accredited by American Association for Laboratory Accreditation(A2LA) to ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the technical competence in the field of Electrical Testing. And the A2LA Certificate No.: 4750.01. FCC Accredited Test Site Number: 854351.

IC Registration No.: (11950A)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A.

1.8 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

Test	Parameters	Expanded Uncertainty (U_{Lab})	Expanded Uncertainty (U_{Cispr})
Conducted Emission	Level Accuracy: 9kHz~150kHz 150kHz to 30MHz	± 3.50 dB ± 3.10 dB	± 4.0 dB ± 3.6 dB
Radiated Emission	Level Accuracy: Above 1000MHz	± 4.50 dB	N/A
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	± 4.40 dB	± 5.2 dB

2. Test Summary

Test Items	Test Requirement	Test Method	Result
Conducted Emission	FCC 47 CFR Part 15 Section 15.107	ANSI C63.4-2014	N/A
Radiated Emission	FCC 47 CFR Part 15 Section 15.109	ANSI C63.4-2014	Pass
Note: N/A is an abbreviation for Not Applicable.			

3. Test Software

Test Item	Test Software	Manufacturer	Version No.
Radiation Emission	EZ-EMC	EZ	FA-03A2RE

4. Test Equipment Used

Radiation Emission Test					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due Date
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102197	Jul. 02, 2021	Jul. 01, 2022
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Jul. 02, 2021	Jul. 01, 2022
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 01, 2020	Feb.28, 2022
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 01, 2020	Feb.28, 2022
Horn Antenna	SCHWARZBECK	BBHA 9170	1118	May. 20, 2021	May. 19, 2022
Loop Antenna	SCHWARZBECK	FMZB 1519 B	1519B-059	Jul. 06, 2021	Jul. 05, 2022
Pre-amplifier	SONOMA	310N	185903	Feb. 25, 2021	Feb.24, 2022
Pre-amplifier	HP	8449B	3008A00849	Feb. 25, 2021	Feb.24, 2022
HF Amplifier	Tonscend	TAP0184050	AP21C806129	Sep. 03, 2021	Sep. 02, 2022

5. Label Requirements&Statement Requirements

☒ Class B

Label Requirements

Class B digital device subject to certification by the FCC shall carry a warning label which includes the following statement:

***** WARNING *****

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

☐ Class A

Statement Requirements

The operator's manual for a Class A digital device shall contain the following statements or their equivalent:

***** WARNING *****

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment This equipment generates, uses, and can radiate radio frequency energy and, if not installed and uses in accordance with the instruction manual, may cause harmful interference to radio communications Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Notice: The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equivalent.

If the EUT was tested with special shielded cables the operator's manual for such product shall also contain the following statements or their equivalent:

Shielded interface cables and/or AC power cord, if any, must be used in order to comply with the emission limits.

6. Conducted Emission Test

6.1 Test Standard and Limit

6.1.1 Test Standard

FCC Part 15.107

6.1.2. Test Limit

Conducted Emission Test Limit (Class A)

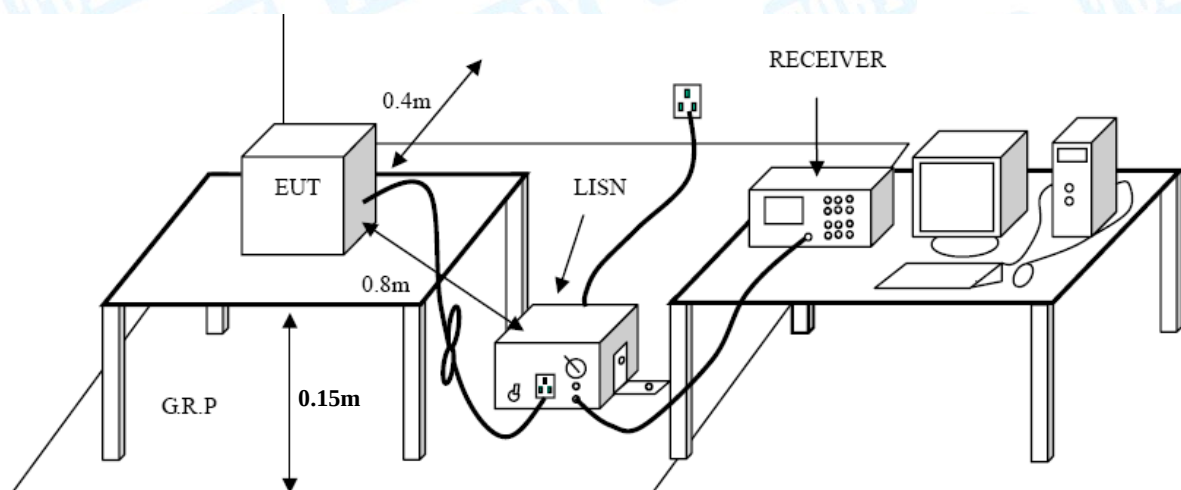
Frequency (MHz)	Maximum RF Line Voltage (dB μ V)	
	Quasi-peak Level	Average Level
0.15~0.50	79	66
0.50~30	73	60

Conducted Emission Test Limit (Class B)

Frequency (MHz)	Maximum RF Line Voltage (dB μ V)	
	Quasi-peak Level	Average Level
0.15~0.5	66 ~ 56 *	56 ~ 46 *
0.50~5	56	46
5~30	60	50

*decreasing linearly with logarithm of the frequency

6.2 Test Setup



6.3 Test Procedure

The EUT was placed 0.15 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

The cables shall be insulated (by up to 15 cm) from the horizontal ground reference plane, and shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN at least 80 cm from nearest part of EUT chassis.

The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

6.4 Deviation From Test Standard

No deviation

6.5 Test Data

This test is not applicable.

7. Radiated Emission Test

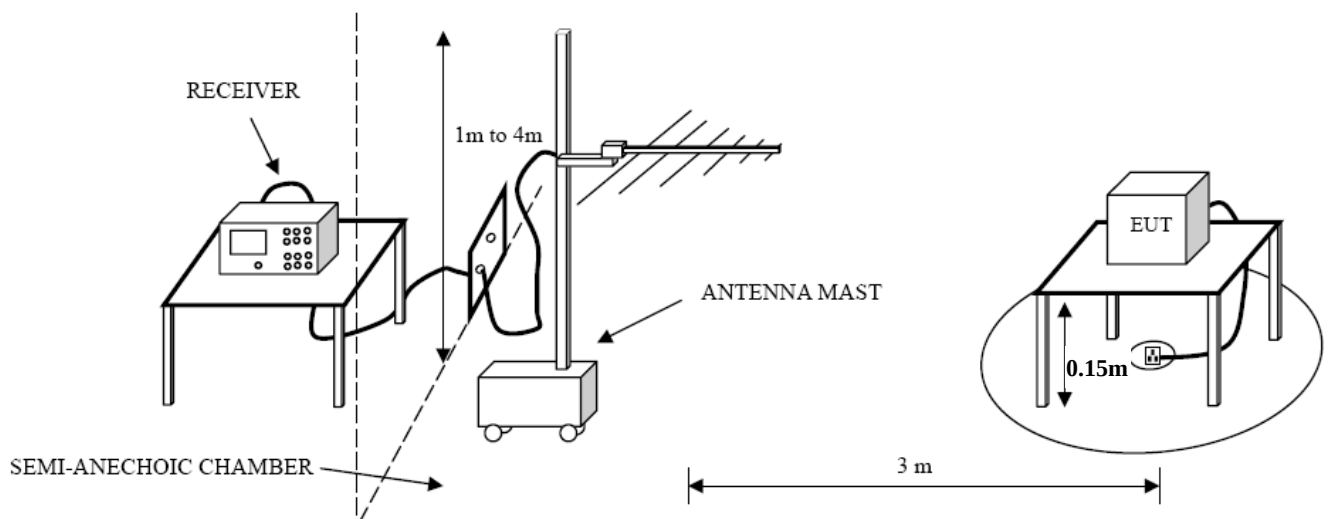
7.1 Test Standard and Limit

7.1.1 Test Standard
FCC Part 15.109

7.1.2 Test Limit

Radiated Emission Test Limit (Class A)	
Frequency MHz	Field Strengths Limits dB(μ V/m)
30 ~ 88	49.0
88 ~ 216	53.5
216 ~ 960	56.4
960 ~ 1000	59.5
Radiated Emission Test Limit (Class B)	
Frequency MHz	Field Strengths Limits dB(μ V/m)
30 ~ 88	40.0
88 ~ 216	43.5
216 ~ 960	46.0
960 ~ 1000	54.0
* The lower limit shall apply at the transition frequency.	
* The test distance is 3m.	

7.2 Test Setup



7.3 Test Procedure

The EUT was placed on the top of a rotating table which is 0.15 meters above the ground. EUT is set 3.0 meters away from the receiving antenna that mounted on a antenna tower. The table was rotated 360 degrees to determine the position of the highest radiation, the antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

Measurements shall be made with a quasi-peak measuring receiver in the frequency range 30MHz to 1000MHz. If the Peak Mode measured value compliance with and lower than quasi-peak mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.

7.4 Deviation From Test Standard

No deviation

7.5 Test Data

Please refer to the Attachment A.

8. Photographs - Constructional Details

Photo 1 Appearance of EUT



Photo 2 Appearance of EUT

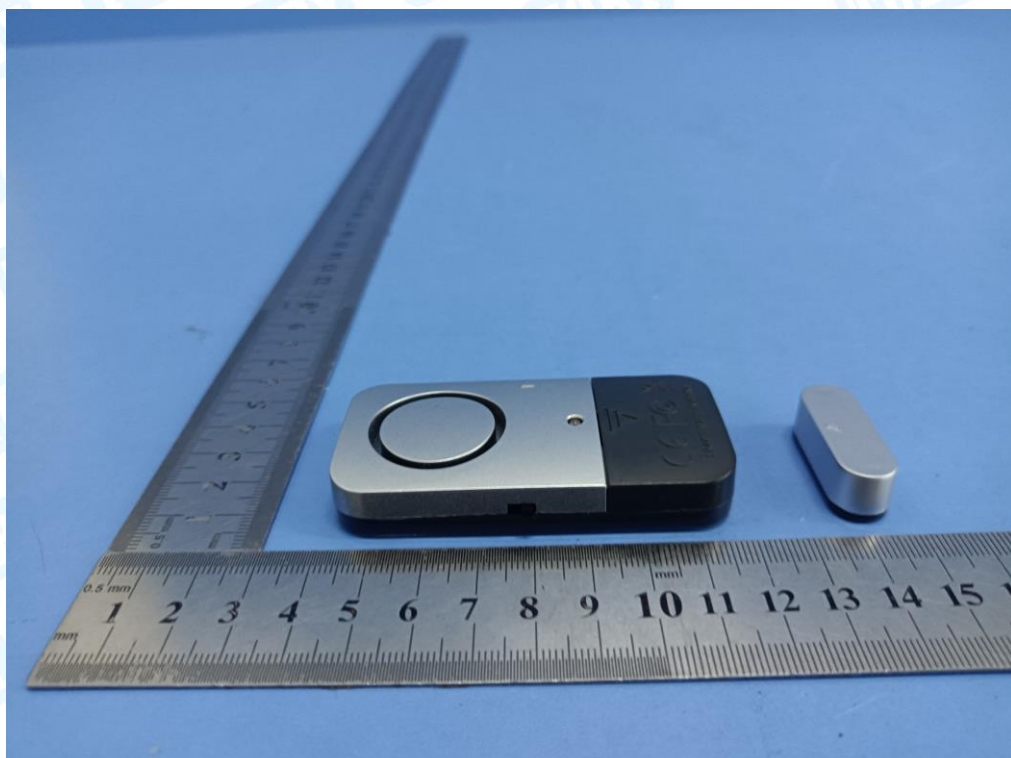


Photo 3 Appearance of EUT



Photo 4 Internal of EUT



Photo 5 Appearance of PCB

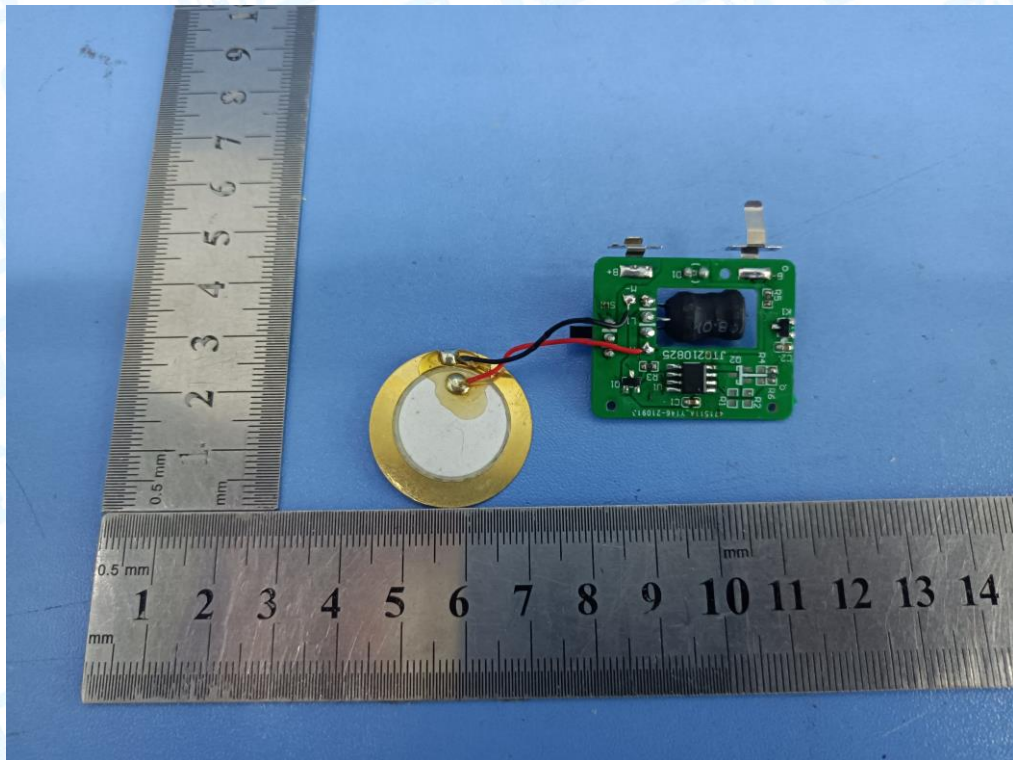


Photo 6 Appearance of PCB

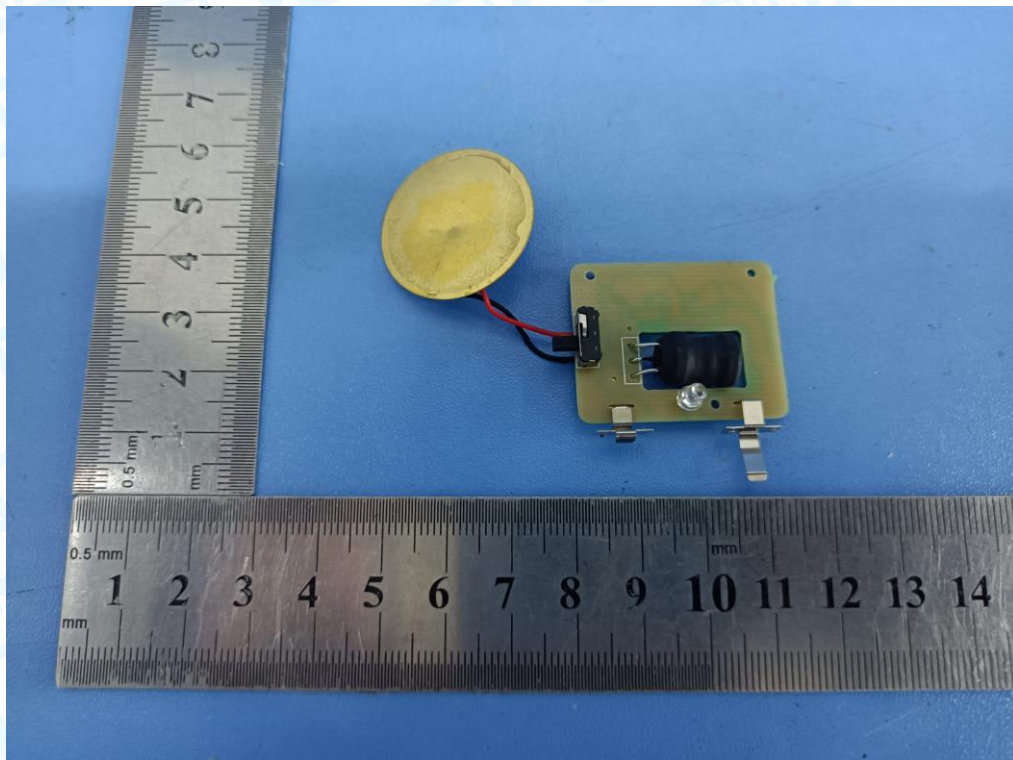


Photo 7 Appearance of Battery



9. Photographs - Test Setup

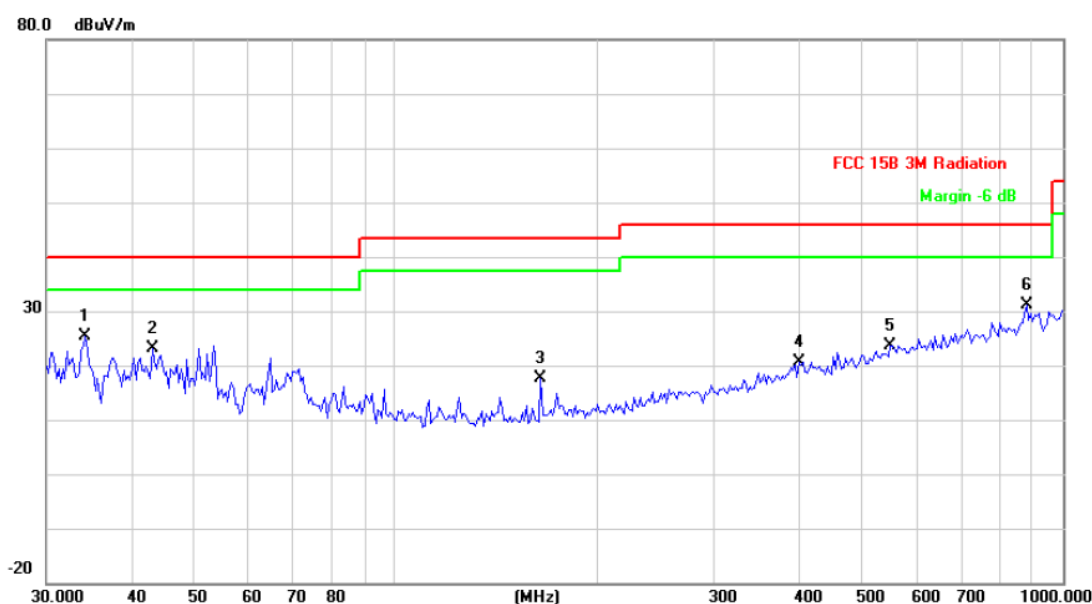
Radiated Emission Test Setup



Attachment A--Radiated Emission Test Data

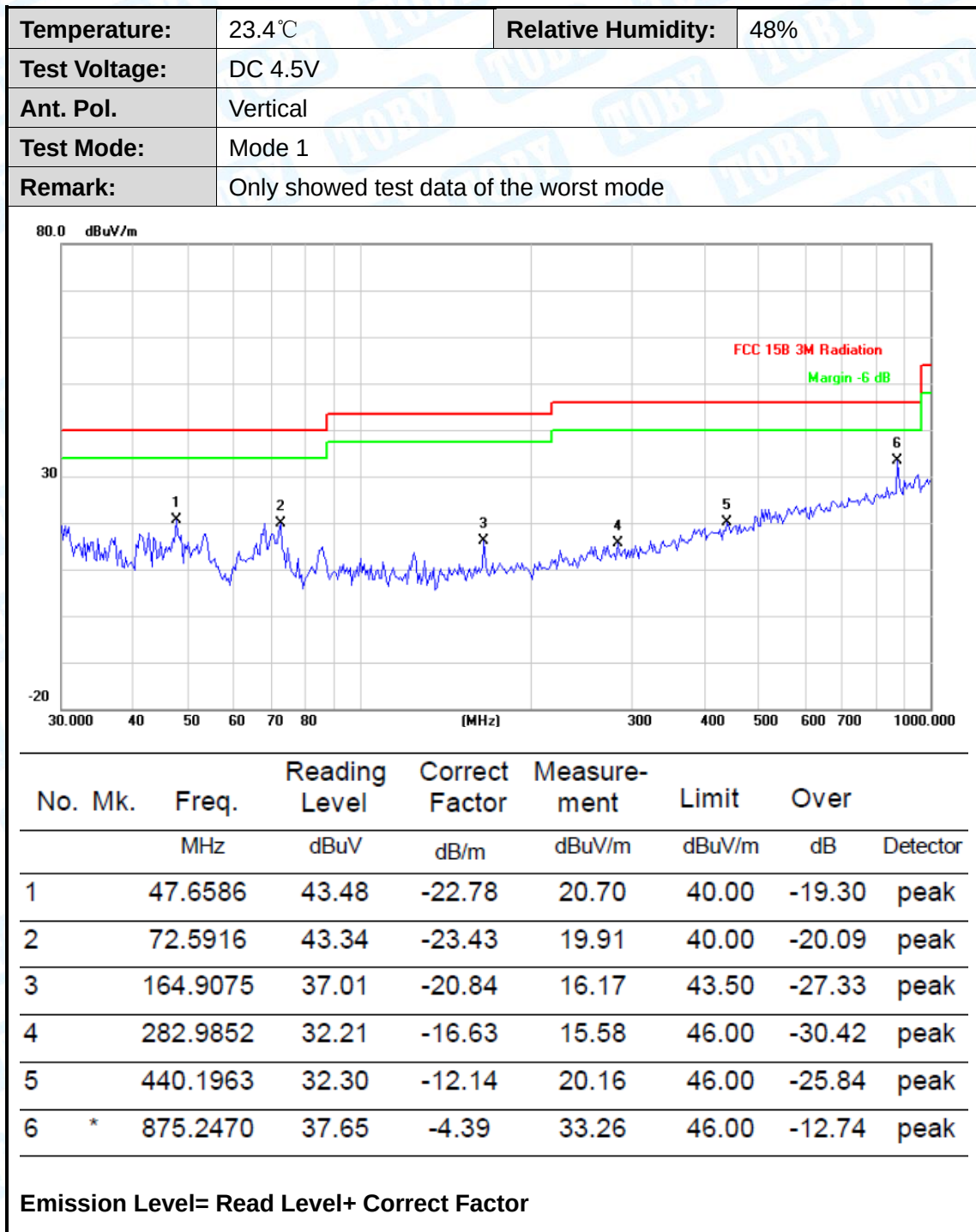
----Below 1G

Temperature:	23.4℃	Relative Humidity:	48%
Test Voltage:	DC 4.5V		
Ant. Pol.	Horizontal		
Test Mode:	Mode 1		
Remark:	Only showed test data of the worst mode		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	*	34.2760	41.88	-16.60	25.28	40.00	-14.72	peak
2		43.2017	44.24	-21.03	23.21	40.00	-16.79	peak
3		164.9075	38.43	-20.84	17.59	43.50	-25.91	peak
4		401.8385	32.93	-12.38	20.55	46.00	-25.45	peak
5		550.9480	32.76	-9.07	23.69	46.00	-22.31	peak
6		881.4067	35.28	-4.14	31.14	46.00	-14.86	peak

Emission Level= Read Level+ Correct Factor



-----END OF REPORT-----