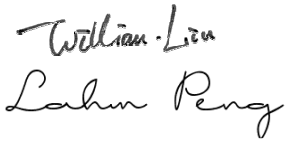
FCC Test Report

FCC Rule(s):	FCC Part 15 Subpart B
Applicant:	Neets A/S
Product Name:	Touch Panel
Model:	313-0001(Touch Panel-7B)
FCC ID:	2AM35-313-0001
Report No.:	ZKS170600143E
Tested Date:	2017-07-06
Issued Date:	2017-07-10
Tested By :	William Liu (Engineer)
Approved By:	Lahm Peng (Manager)
Prepared By:	



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1. General Information

1.1 Product Information

Applicant and Manufacturer	
Applicant:	Neets A/S
Address of Applicant:	Langballe 4 8700 Horsens Denmark
Manufacturer:	SHENZHEN SIBO INDUSTRIAL&DEVELOPMENT CO., LTD
Address of Manufacturer:	3A/F, Bld. 27, Wisdomland Business Park Guankou No.2 Rd, Nanshan
	District, Shenzhen, China

General Description of EUT	
Product Name:	Touch Panel
Model No.:	313-0001(Touch Panel-7B)
Trade Name:	Neets
Adding Model(s):	313-0002(Touch Panel-7W)
Rated Voltage:	Input: DC 48V, 500mA
Hardware Version:	Q896S_NEETS_MAIN_V2.1
Software Version:	neets-20170624_313-0001_V1.4
Highest Working Frequency:	2GHz
Note 1: The test data is gathered from a production sample, provided by the manufacturer. Note 2: The appearance color of others models listed in the report is different from main-test model 313-0001(Touch Panel-7B), but the circuit and the electronic construction do not change, declared by the manufacturer.	

1.2 Compliance Standards

Compliance Standards or Rules	
FCC Part 15 Subpart B	FEDERAL COMMUNICATIONS COMMISSION, RADIO FREQUENCY DEVICES, Unintentional Radiators
The objective of the manufacturer or applicant is to demonstrate compliance with the above standards.	
According to standards for test methodology	
ANSI C63.4-2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.
All measurements contained in this report were conducted with all above standards	
Maintenance of compliance is the responsibility of the manufacturer or applicant. Any modification of the product, which result is lowering the emission, should be checked to ensure compliance has been maintained.	

1.3 Test Facilities

Testing Lab: Global United Technology Services Co., Ltd.
The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is **L5775**.
The laboratory has been listed by US Federal Communications Commission to perform electromagnetic emission measurements. The recognition numbers of test site are **600491**.
The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are **9079A-2**.
All measurement facilities used to collect the measurement data are located at No.301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

1.4 Test Setup Information

List of Test Modes			
Test Mode	Description	Remark	
TM1	Operating	--	
TM2	--	--	
List and Details of Auxiliary Cable			
Description	Length (M)	Shielded/Unshielded	With/Without Ferrite
RJ45 Cable	1.0	Unshielded	Without Ferrite
--	--	--	--
List and Details of Auxiliary Equipment			
Description	Manufacturer	Model	Serial Number
POE Power Adaptor	GRT	GRT-480100	--
--	--	--	--
The equipment under test (EUT) was configured to measure its highest possible emission and immunity level. The test modes were adapted according to the operation manual for use.			

1.5 Measurement Uncertainty

Parameter	Conditions	Uncertainty
Conducted Disturbance	9kHz ~30MHz	±2.75 dB
Radiated Disturbance	30MHz ~ 1GHz	±4.89 dB
Radiated Disturbance	1Hz ~ 6GHz	±4.93 dB

1.6 List of Test and Measurement Instruments

Description	**Manufacturer**	**Model**	**Cal. Date**	**Due. Date**
EMI Test Receiver	R&S	ESCI 7	June. 29 2017	June. 28 2018
Coaxial Switch	ANRITSU CORP	MP59B	June. 29 2017	June. 28 2018
Artificial Mains Network	SCHWARZBECK	NSLK8127	June. 29 2017	June. 28 2018
ESU EMI Test Receiver	R&S	ESU26	June. 29 2017	June. 28 2018
BiConiLog Antenna	SCHWARZBECK	VULB9163	June. 29 2017	June. 28 2018
Double-ridged horn antenna	SCHWARZBECK	9120D	June. 29 2017	June. 28 2018
Horn Antenna	ETS-LINDGREN	3160-09	June. 29 2017	June. 28 2018
Loop Antenna	SCHWARZBECK	FMZB 1519	June. 29 2017	June. 28 2018
RF Amplifier	HP	8347A	June. 29 2017	June. 28 2018
Broadband Preamplifier	SCHWARZBECK	BBV9718	June. 29 2017	June. 28 2018
EMI Test Software	AUDIX	E3	N/A	N/A
Coaxial Cable	GTS	9kHz-1GHz	June. 29 2017	June. 28 2018
Coaxial Cable	GTS	1GHz-18GHz	June. 29 2017	June. 28 2018

2. Summary of Test Results

FCC Rules	Description of Test Items	Result
FCC Part 15.107	Conducted Emissions	Passed
FCC Part 15.109	Radiated Emissions	Passed
Passed: The EUT complies with the essential requirements in the standard Failed: The EUT does not comply with the essential requirements in the standard N/A: Not applicable		

3. Conducted Disturbance

3.1 Standard and Limit

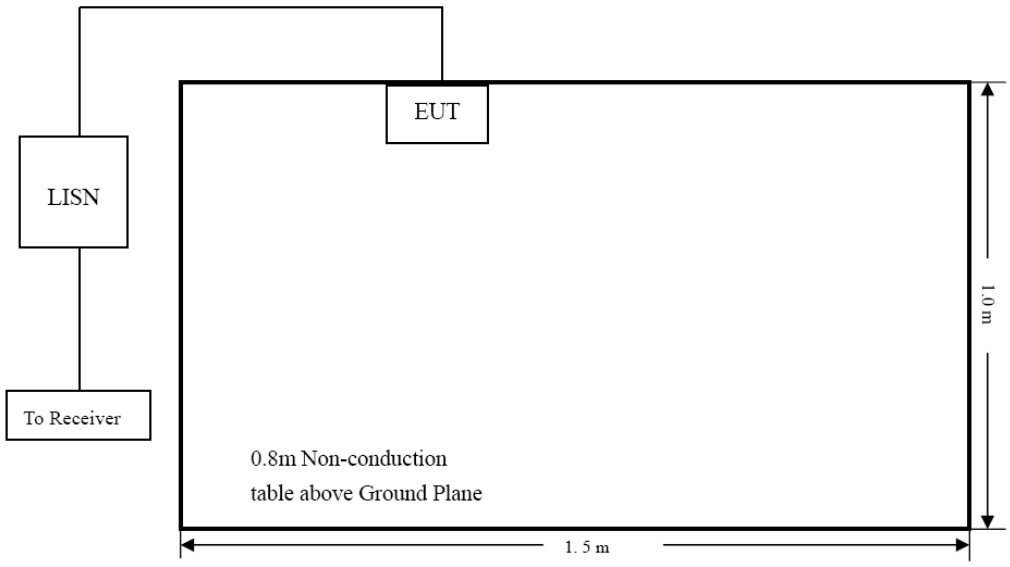
According to the rule FCC Part 15.107, Conducted limit, the limit for a class B device as below:

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50
Note 1: Decreases with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz Note 2: The lower limit applies at the band edges		

AC Power Line

3.2 Test Procedure

Test is conducting under the description of ANSI C63.4-2014 American National Standard for Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

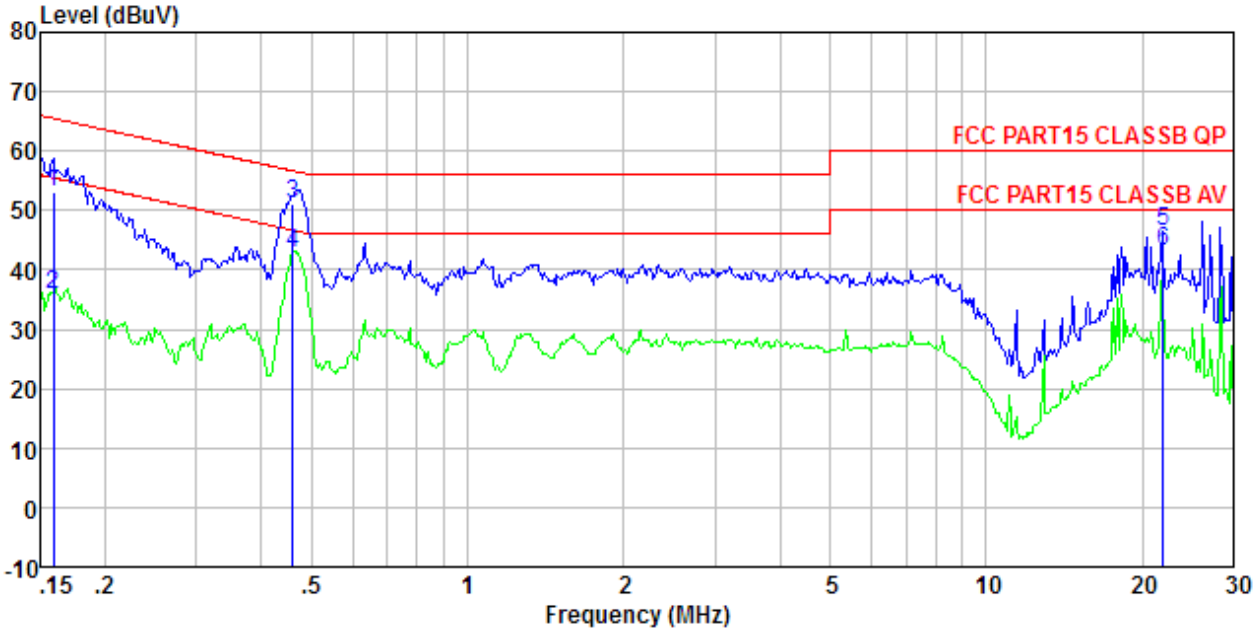


Test Setup Block Diagram

3.3 Test Data and Results

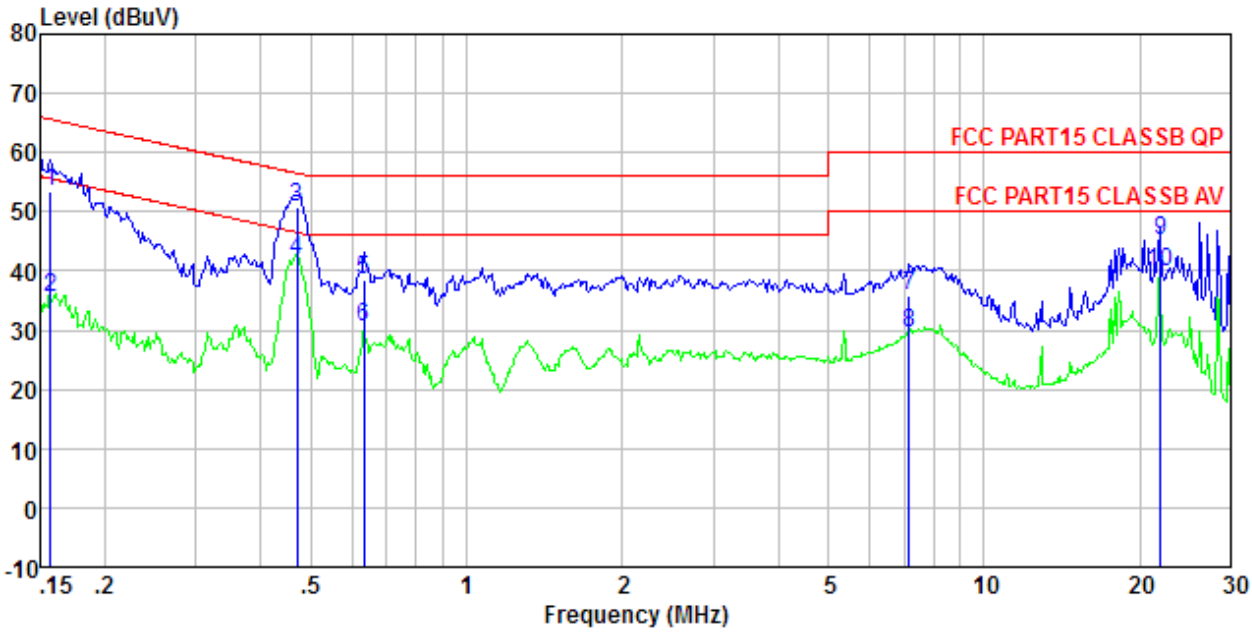
Based on all tested data, the EUT complied with the FCC Part 15.107 standard limit for a Class B device, and with the worst case as below:

Test Plots and Data of Conducted Emissions	
Tested Model:	313-0001(Touch Panel-7B)
Tested Mode:	TM1
Test Power Specification:	AC 120V/60Hz
Test Power Line:	Live
Remark:	



	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.159	52.59	0.42	0.12	53.13	65.52	-12.39	QP
2	0.159	35.20	0.42	0.12	35.74	55.52	-19.78	Average
3	0.461	50.54	0.40	0.11	51.05	56.67	-5.62	QP
4	0.461	42.32	0.40	0.11	42.83	46.67	-3.84	Average
5	21.900	46.00	0.32	0.22	46.54	60.00	-13.46	QP
6	21.900	42.59	0.32	0.22	43.13	50.00	-6.87	Average

Test Plots and Data of Conducted Emissions	
Tested Model:	313-0001(Touch Panel-7B)
Tested Mode:	TM1
Test Power Specification:	AC 120V/60Hz
Test Power Line:	Neutral
Remark:	



	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.157	52.99	0.41	0.12	53.52	65.60	-12.08	QP
2	0.157	35.13	0.41	0.12	35.66	55.60	-19.94	Average
3	0.471	50.30	0.37	0.11	50.78	56.49	-5.71	QP
4	0.471	41.48	0.37	0.11	41.96	46.49	-4.53	Average
5	0.634	38.07	0.26	0.13	38.46	56.00	-17.54	QP
6	0.634	30.12	0.26	0.13	30.51	46.00	-15.49	Average
7	7.175	35.32	0.22	0.17	35.71	60.00	-24.29	QP
8	7.175	29.19	0.22	0.17	29.58	50.00	-20.42	Average
9	21.930	44.46	0.33	0.22	45.01	60.00	-14.99	QP
10	21.930	39.40	0.33	0.22	39.95	50.00	-10.05	Average

4. Radiated Disturbance

4.1 Standard and Limit

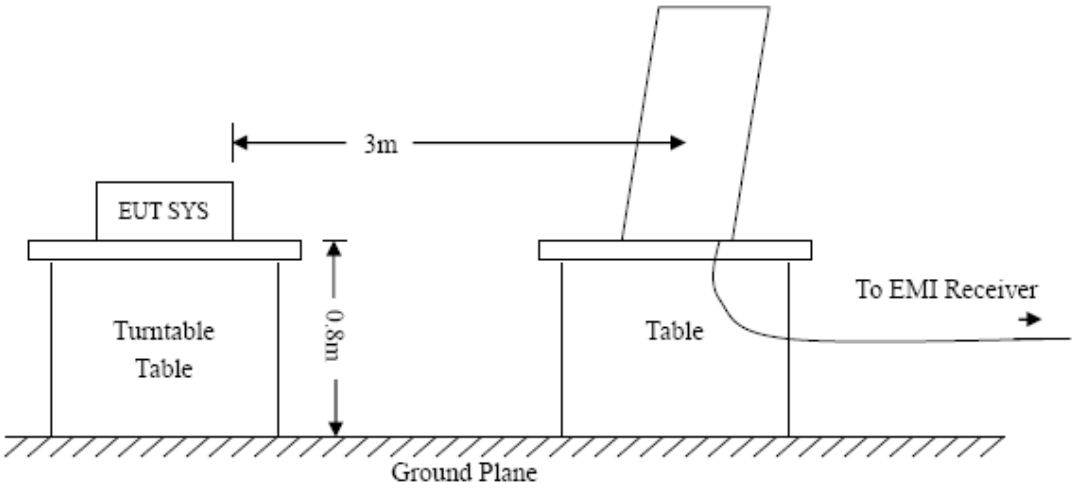
According to the rule FCC Part 15.109, Radiated emission limit, the limit for a class B device as below:

Frequency of Emission (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	
	QP	QP	AV
30-88	100	40	--
88-216	150	43.5	--
216-960	200	46	--
Above 960	500	54	74

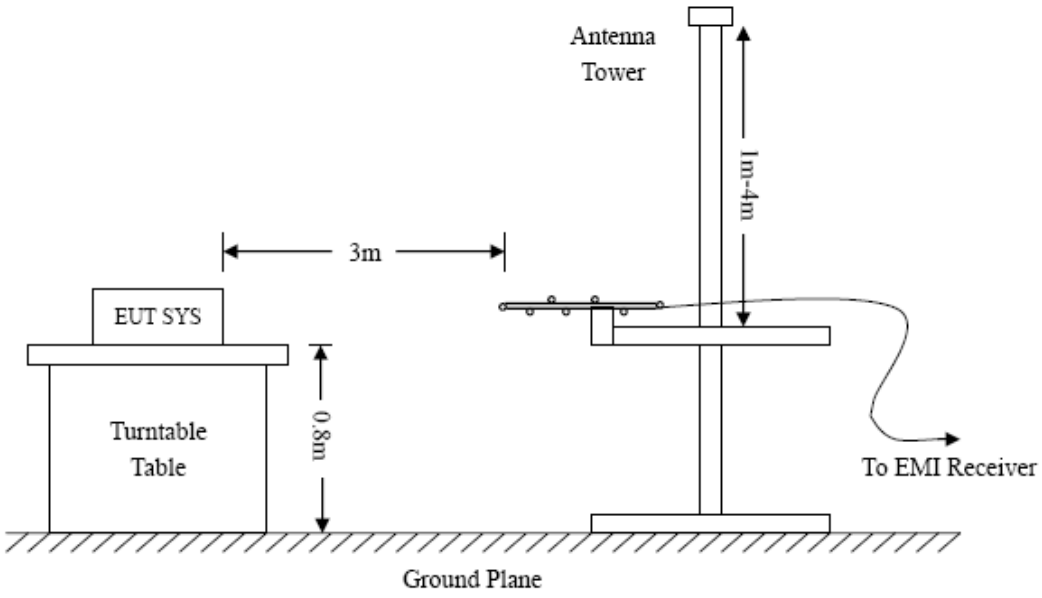
Limits at a measurement distance of 3 m

4.2 Test Procedure

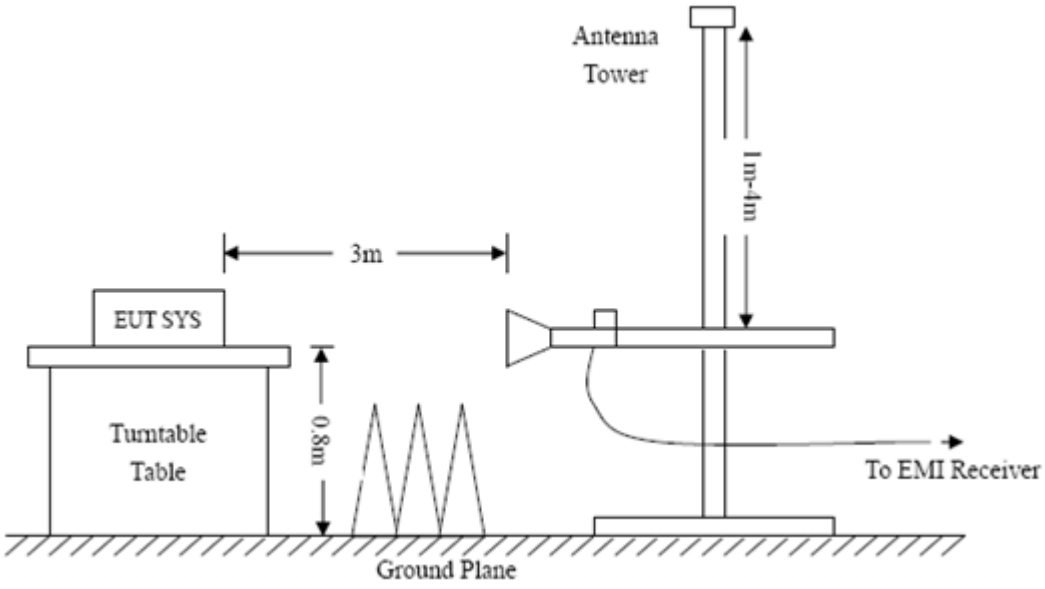
Test is conducting under the description of ANSI C63.4-2014 American National Standard for Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz. The specification used was with the FCC Part 15.109 Limit.



Test Setup Block Diagram below 30MHz



Test Setup Block Diagram for 30MHz-1GHz



Test Setup Block Diagram above 1GHz

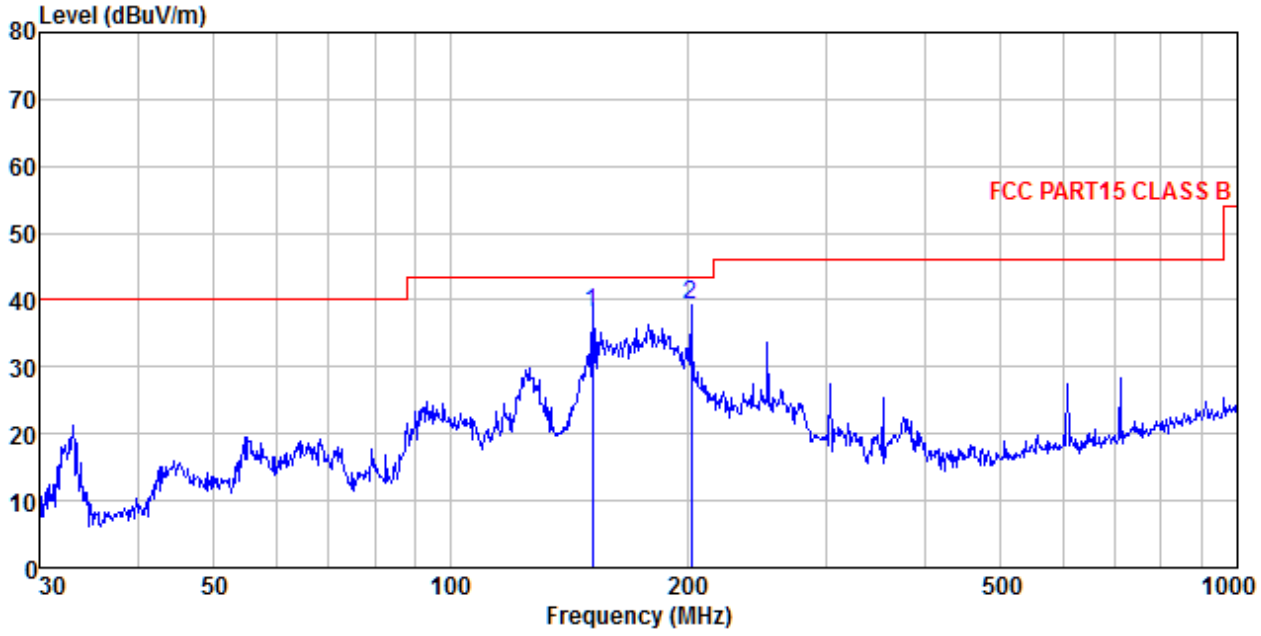
For the radiated emission test above 1GHz:
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with 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.

Frequency: 9kHz-30MHz	Frequency: 30MHz-1GHz	Frequency: Above 1GHz
RBW=10KHz,	RBW=120KHz,	RBW=1MHz,
VBW =30KHz	VBW=300KHz	VBW=3MHz(Peak), 10Hz(AV)
Sweep time= Auto	Sweep time= Auto	Sweep time= Auto
Trace = max hold	Trace = max hold	Trace = max hold
Detector function = peak	Detector function = peak, QP	Detector function = peak, AV

4.3 Test Data and Results

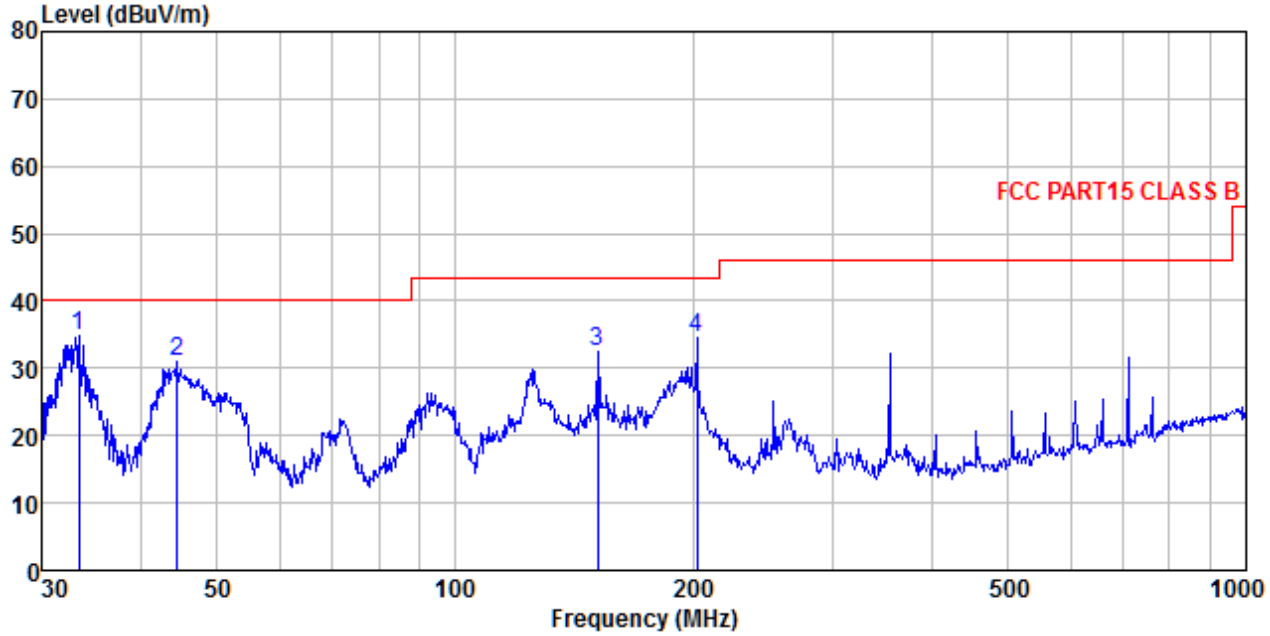
Based on all tested data, the EUT complied with the FCC Part 15.109 standard limit for a Class B device, and with the worst case as below:

Test Plots and Data of Radiated Emissions	
Tested Model:	313-0001(Touch Panel-7B)
Tested Mode:	TM1
Test Power Specification:	AC 120V/60Hz
Test Antenna Polarization:	Horizontal
Remark:	



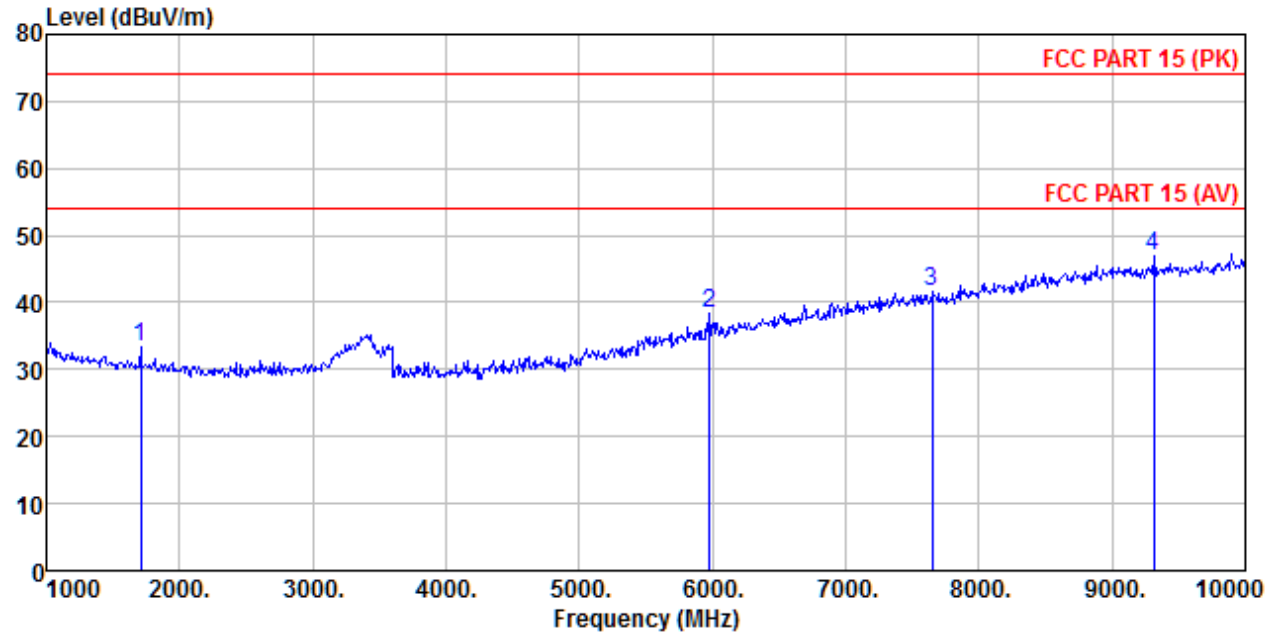
	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	151.597	58.19	7.68	29.40	1.58	38.05	43.50	-5.45	QP
2	202.100	56.47	10.30	29.22	1.85	39.40	43.50	-4.10	Peak

Test Plots and Data of Radiated Emissions	
Tested Model:	313-0001(Touch Panel-7B)
Tested Mode:	TM1
Test Power Specification:	AC 120V/60Hz
Test Antenna Polarization:	Vertical
Remark:	



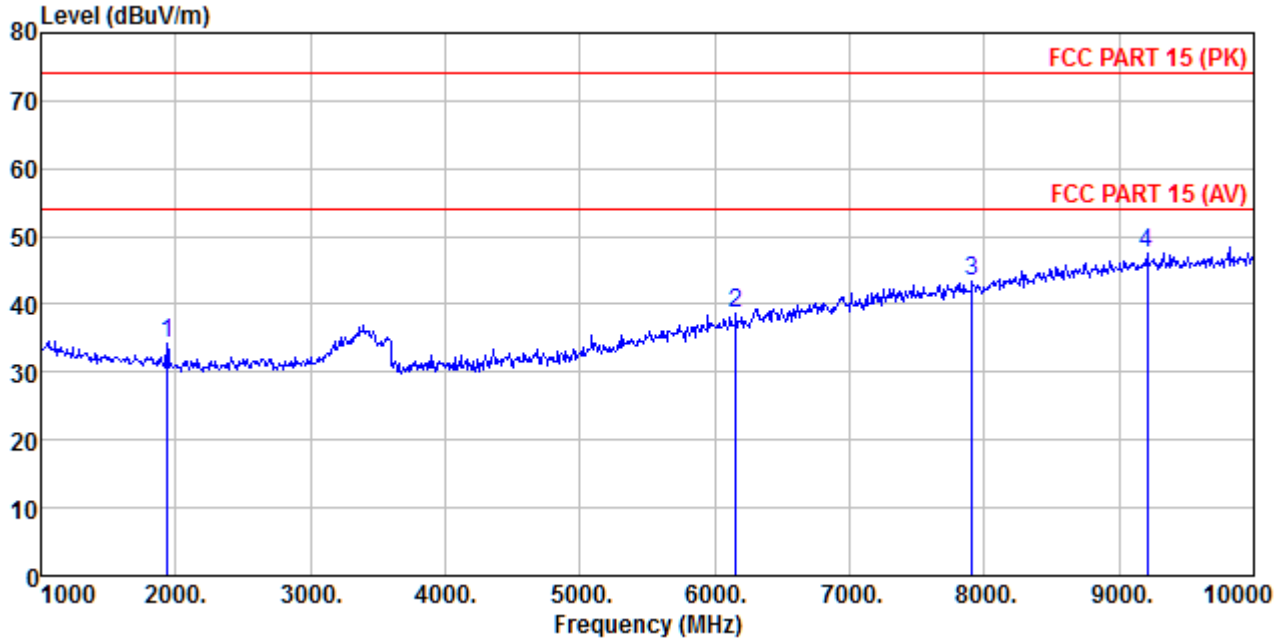
	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	33.445	53.09	11.25	30.08	0.59	34.85	40.00	-5.15	Peak
2	44.587	47.98	12.25	30.02	0.72	30.93	40.00	-9.07	Peak
3	151.597	52.49	7.68	29.40	1.58	32.35	43.50	-11.15	Peak
4	202.100	51.61	10.30	29.22	1.85	34.54	43.50	-8.96	Peak

Test Plots and Data of Radiated Emissions	
Tested Model:	313-0001(Touch Panel-7B)
Tested Mode:	TM1
Test Power Specification:	AC 120V/60Hz
Test Antenna Polarization:	Horizontal
Remark:	



	Freq	ReadLevel	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1711.000	23.91	40.82	36.23	4.81	33.31	74.00	-40.69	Peak
2	5977.000	16.77	47.61	36.32	10.18	38.24	74.00	-35.76	Peak
3	7651.000	14.37	50.71	35.48	11.91	41.51	74.00	-32.49	Peak
4	9316.000	15.58	52.21	34.76	13.91	46.94	74.00	-27.06	Peak

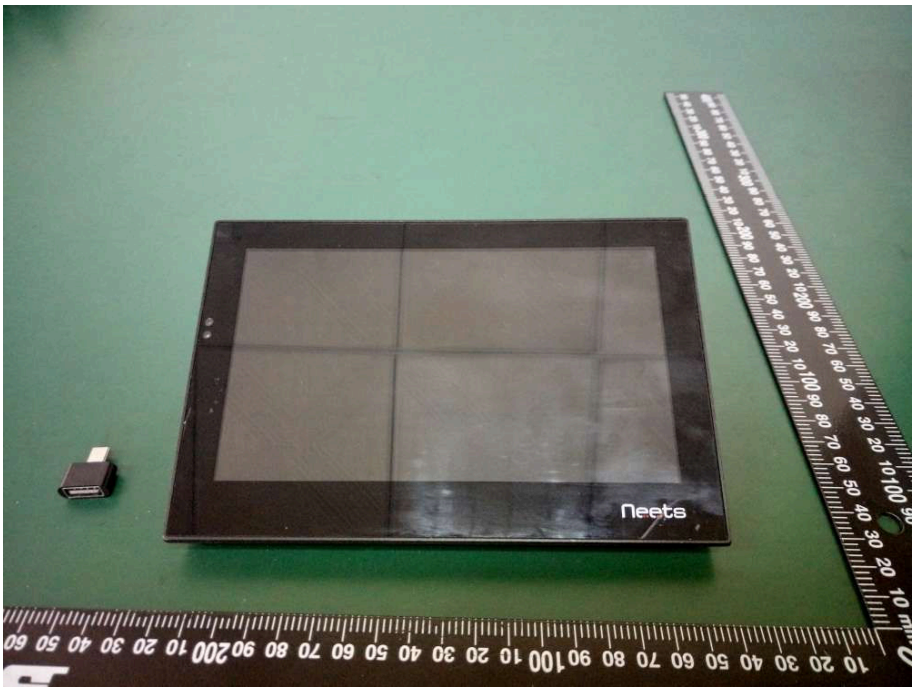
Test Plots and Data of Radiated Emissions	
Tested Model:	313-0001(Touch Panel-7B)
Tested Mode:	TM1
Test Power Specification:	AC 120V/60Hz
Test Antenna Polarization:	Vertical
Remark:	



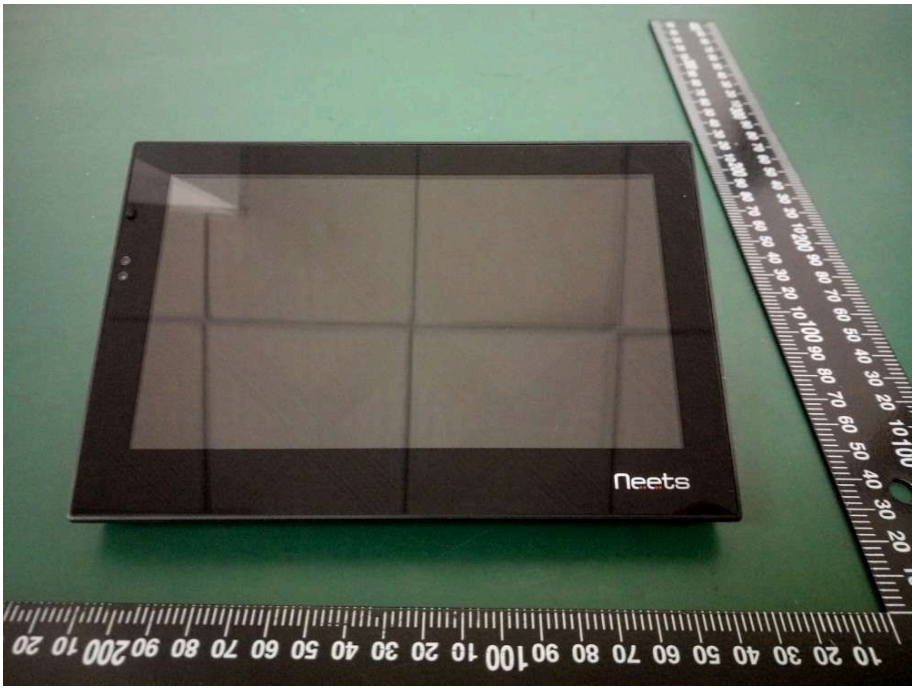
	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1936.000	37.87	25.88	34.34	4.93	34.34	74.00	-39.66	Peak
2	6157.000	27.23	33.09	32.03	10.43	38.72	74.00	-35.28	Peak
3	7912.000	25.53	37.16	31.33	12.05	43.41	74.00	-30.59	Peak
4	9208.000	28.40	37.37	32.07	13.82	47.52	74.00	-26.48	Peak

Annex A. EUT External Photos

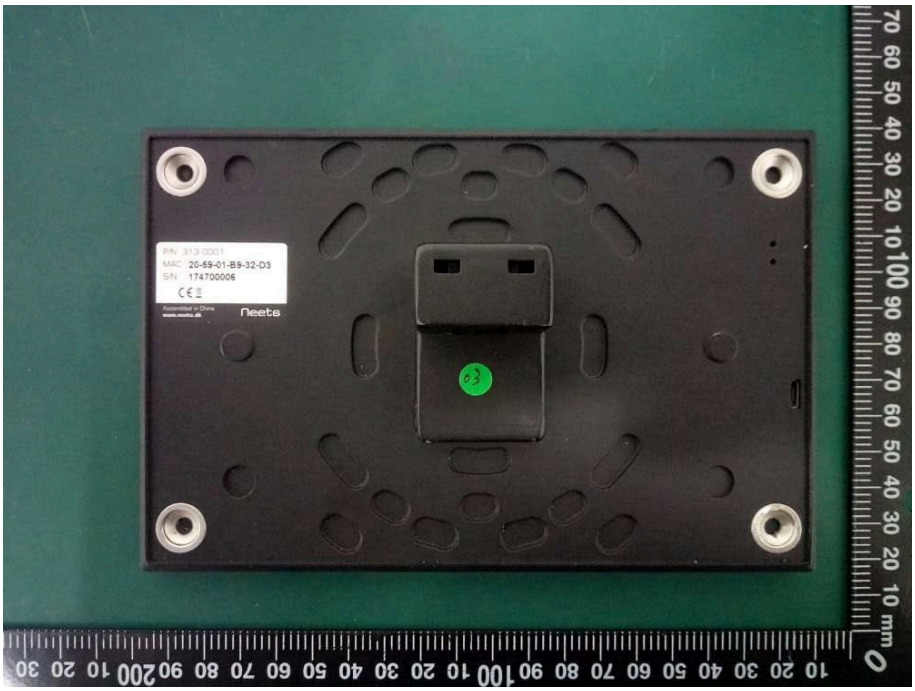
EUT View 1



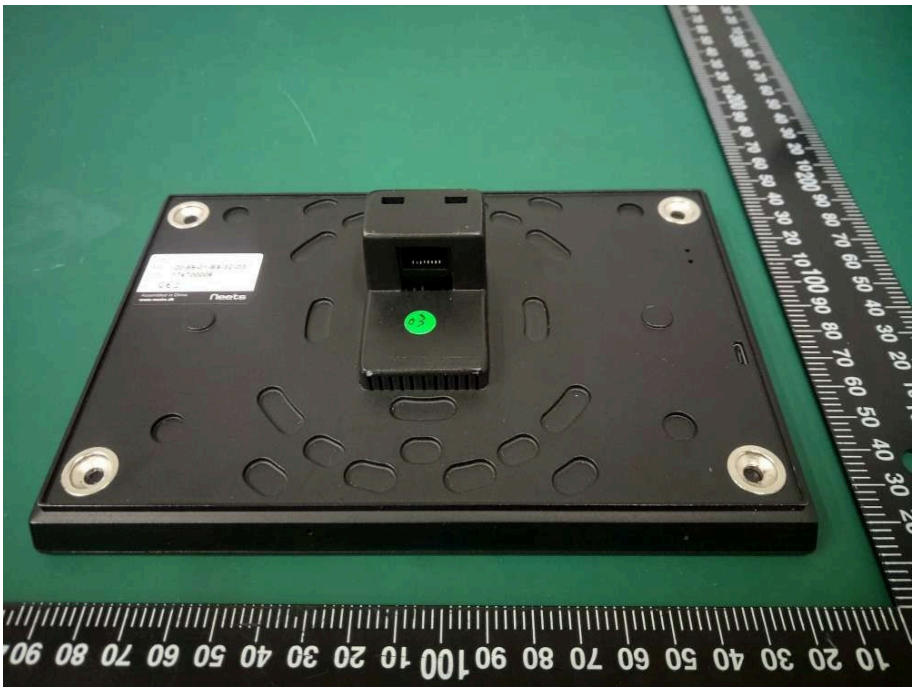
EUT View 2



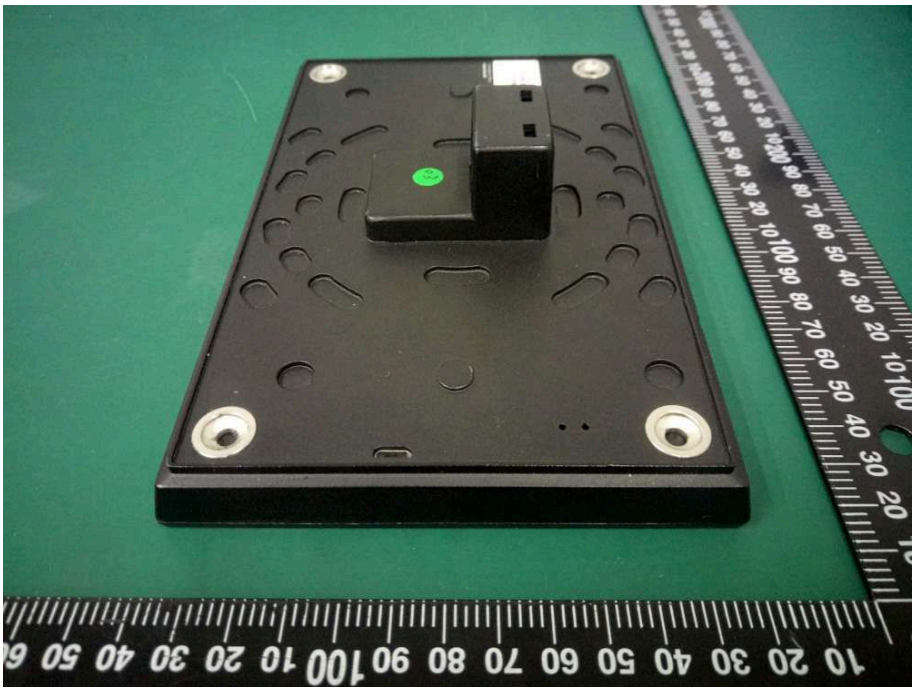
EUT View 3



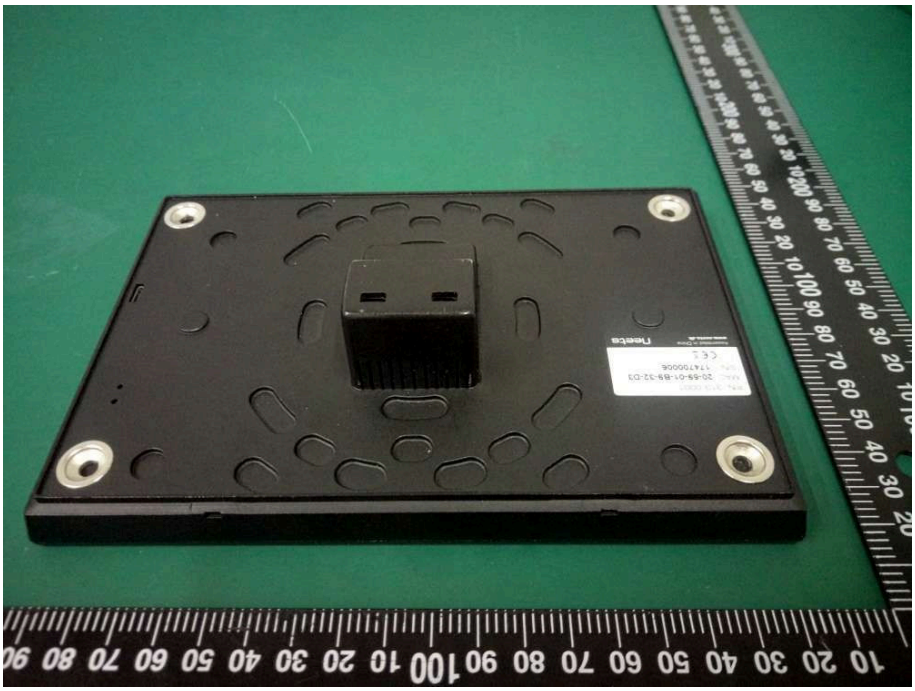
EUT View 4



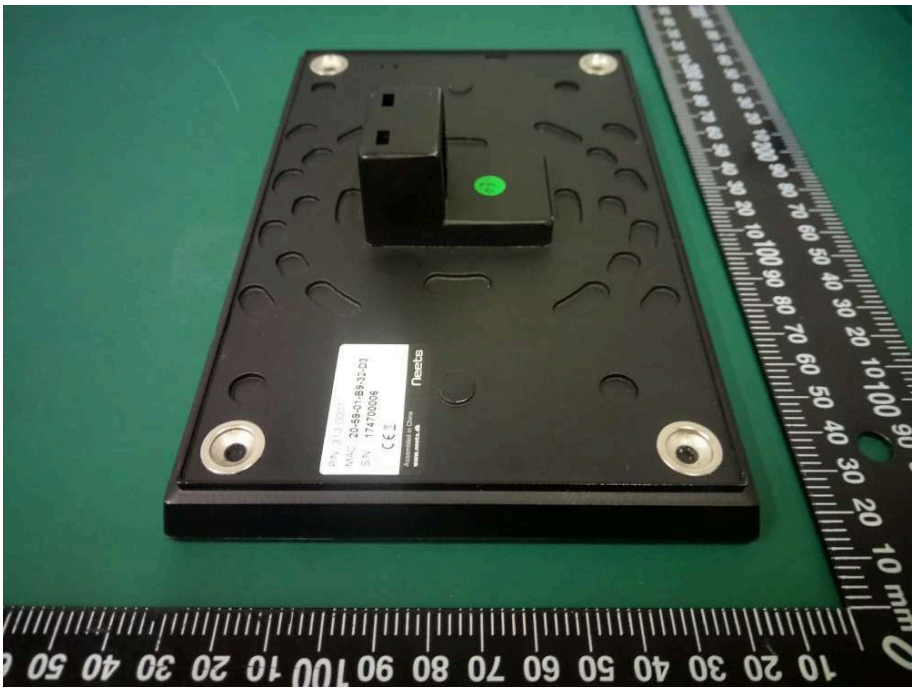
EUT View 5



EUT View 6

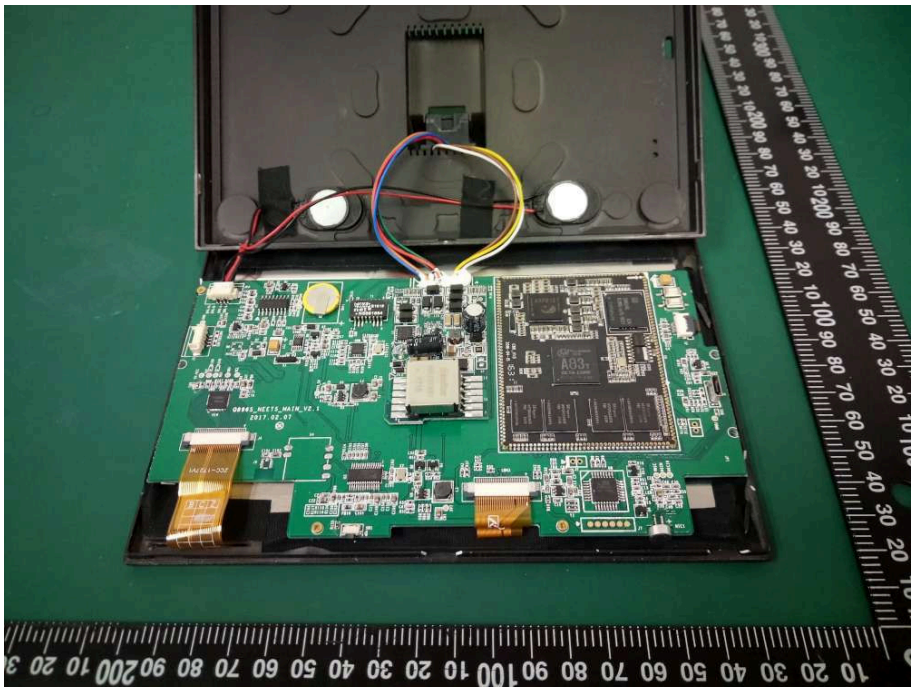


EUT View 7

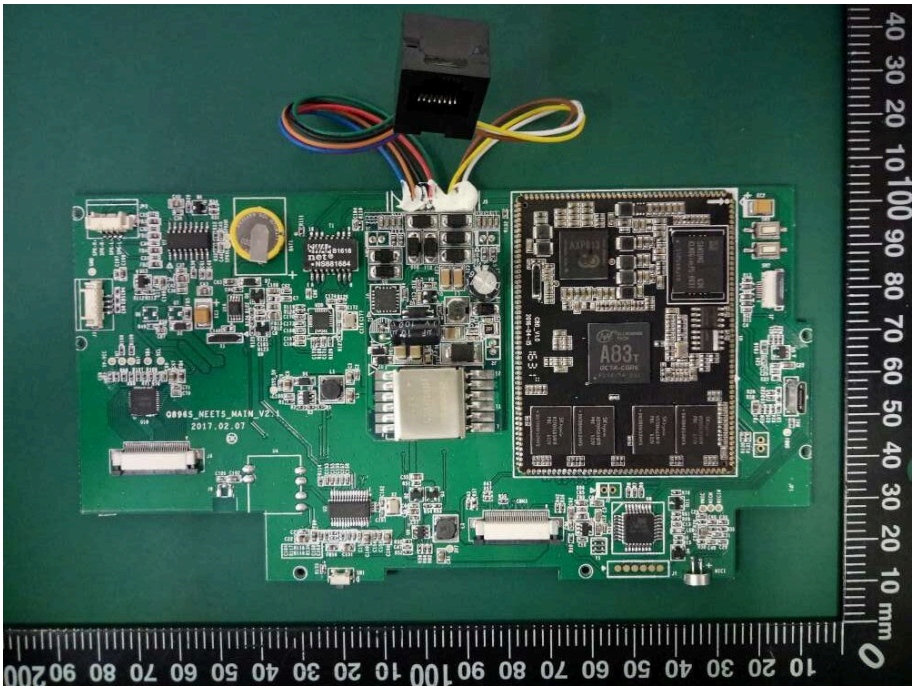


Annex B. EUT Internal Photos

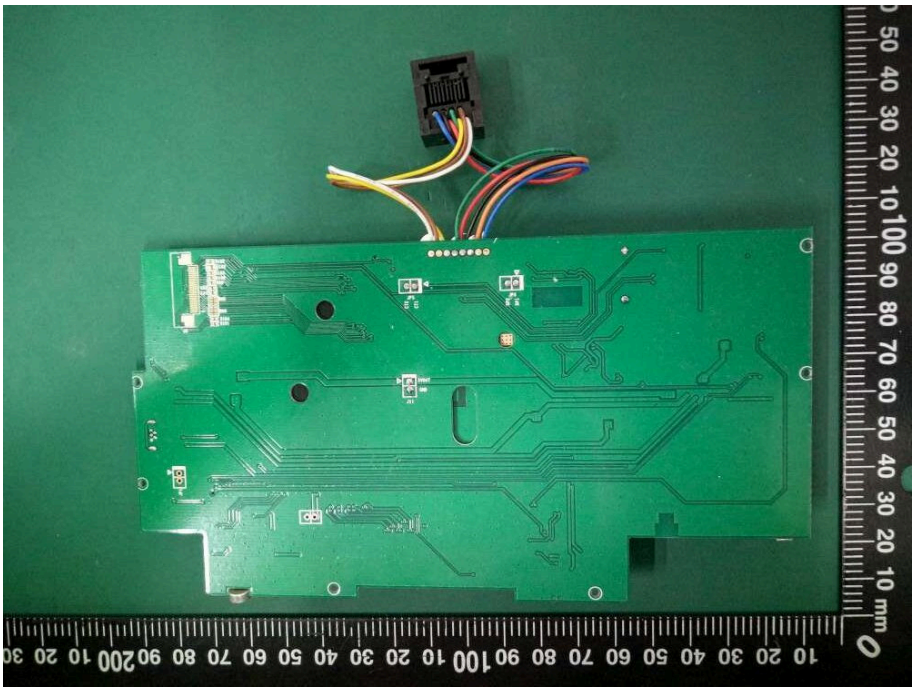
EUT Internal View 1



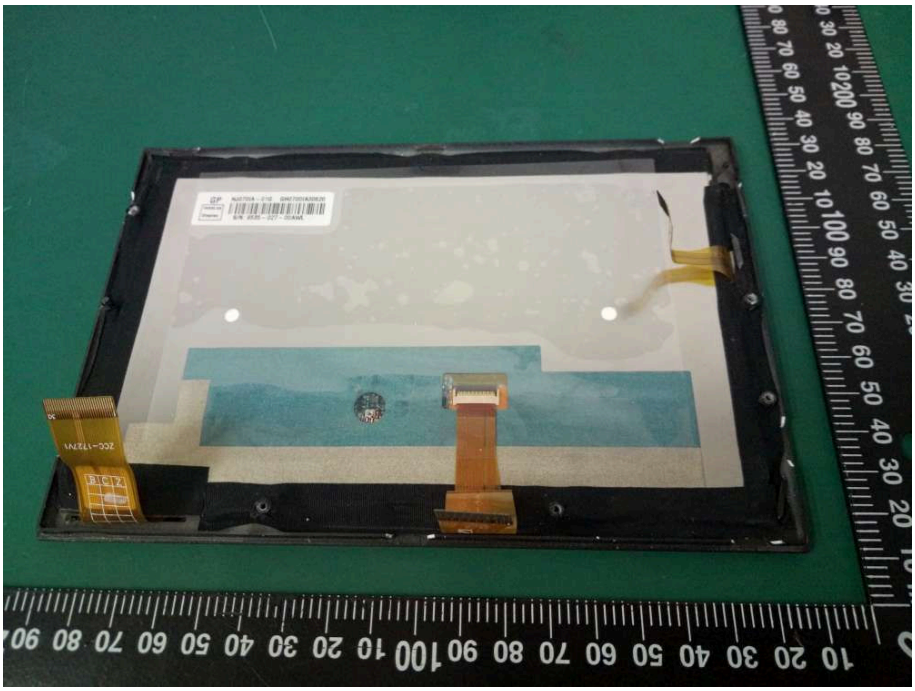
EUT Internal View 2



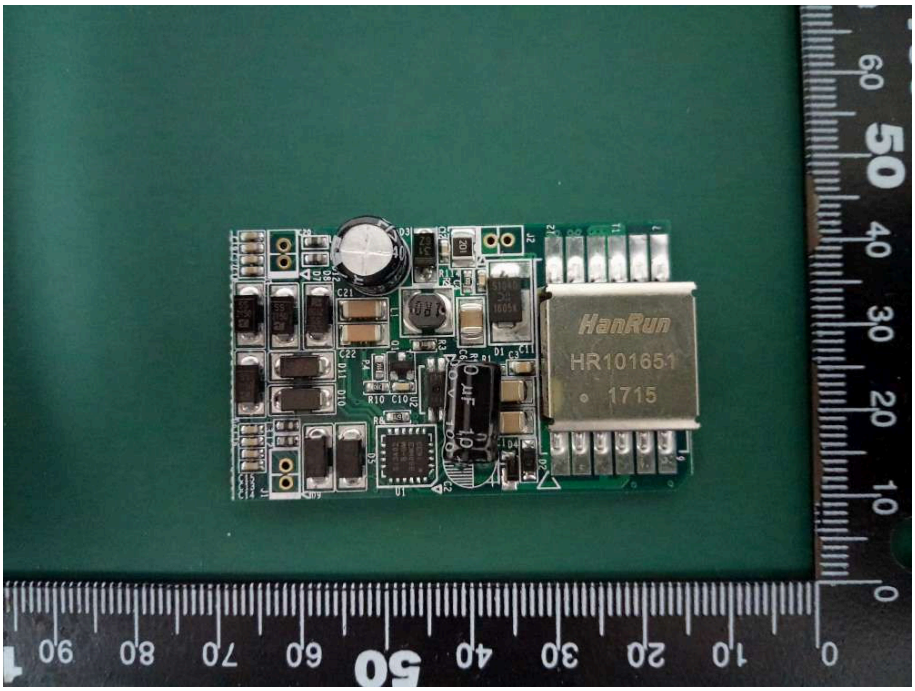
EUT Internal View 3



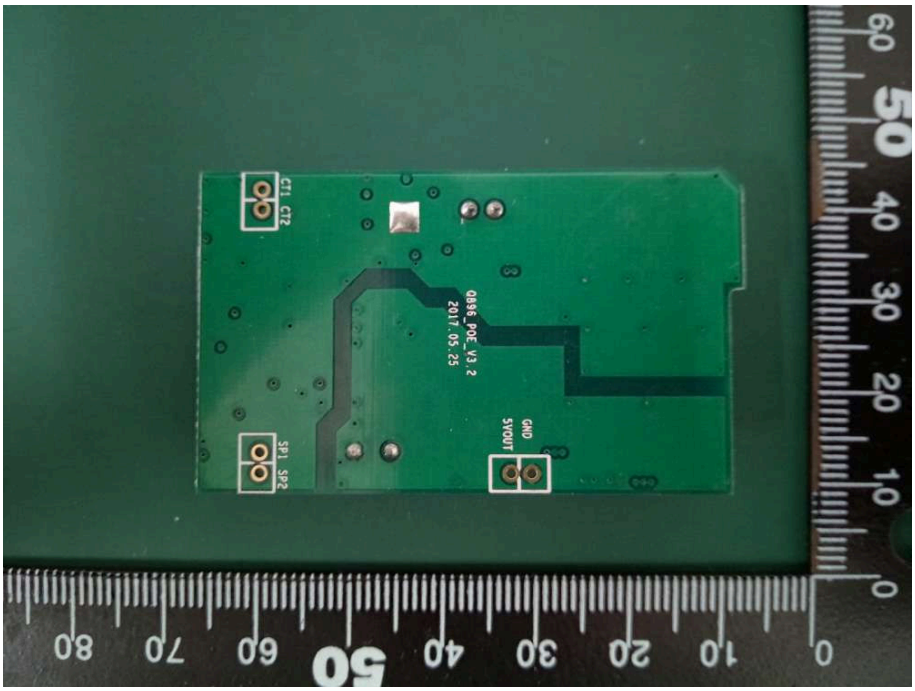
EUT Internal View 4



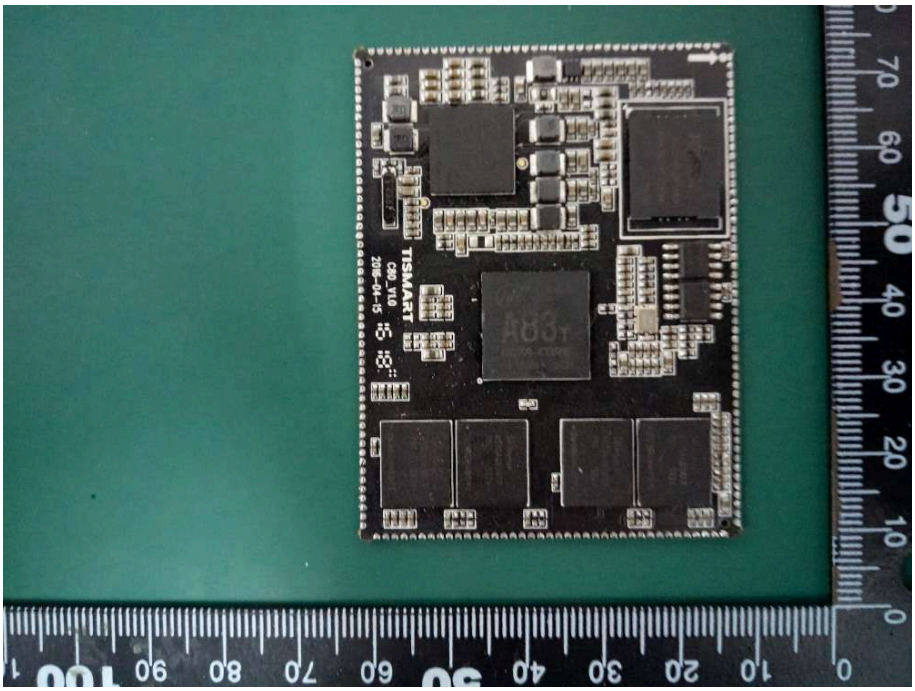
EUT Internal Module View 1



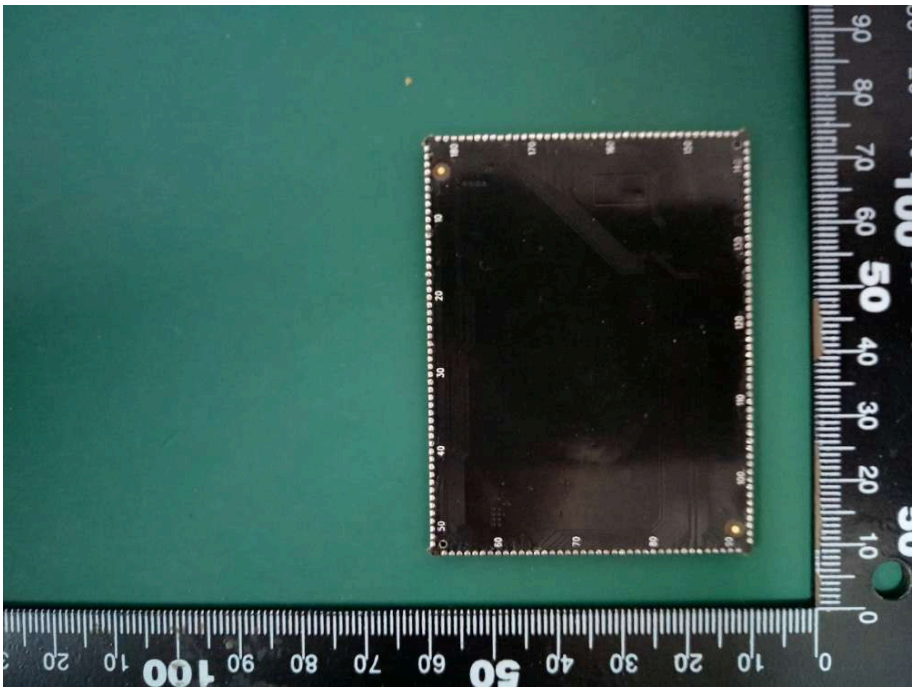
EUT Internal Module View 2



EUT Internal Module View 3



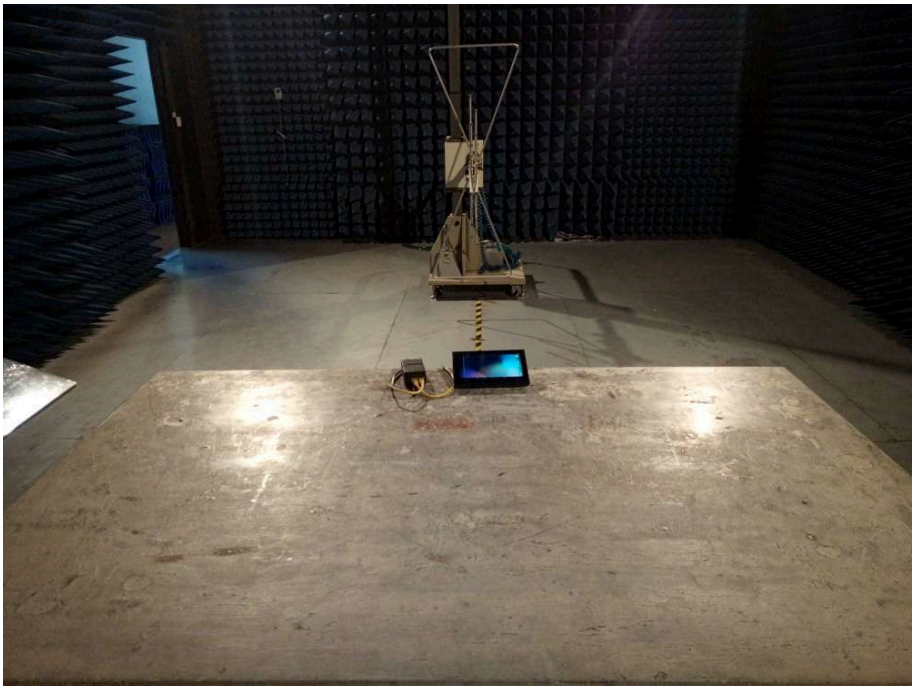
EUT Internal Module View 4



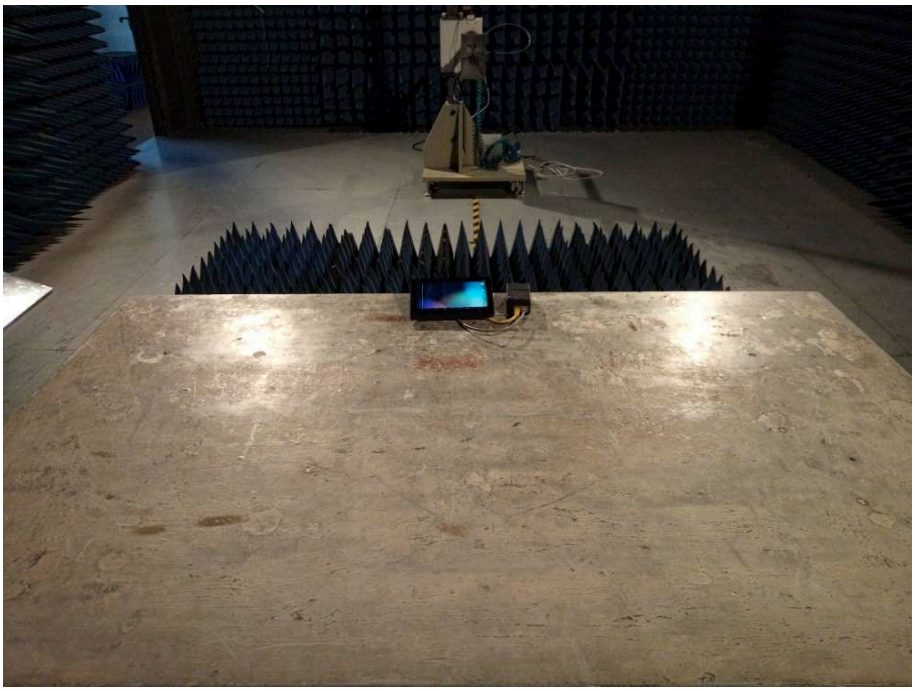
Annex C. Test Setup Photos

Conducted Emission Test View

Radiated Emission Test View 1



Radiated Emission Test View 2



Annex D. Label and Information

FCC Label Sample

FCC ID: 2AM35-313-0001 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.

FCC Label Specifications

Text is Black in color and is justified. Labels are printed in indelible ink on permanent adhesive backing or silk-screened onto the EUT or shall be affixed at a conspicuous location on the EUT. Where the EUT is constructed in two or more sections connected by wires and marketed together, the above statement is required to be affixed only to the main control unit. When the EUT is so small or for such use that it is not practicable to place the statement on it, the above information shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed.

FCC Label Location

******* END OF REPORT *******