



## FCC TEST REPORT

On Behalf of

Finetooling Technology ( Guangzhou ) Co.,Ltd

5½ Digital Multimeter

Model No.: FT3550

Prepared for : Finetooling Technology ( Guangzhou ) Co.,Ltd  
Address : Building 3, No. 88, Chunfen Road, Huangpu District,  
Guangzhou City, Guangdong Province

Prepared By : Shenzhen PSI Testing Co., Ltd.  
1-2F, Building 5, Yudafu Industrial Park, No. 10,  
Address : Xingye West Road, Shajing Street, Bao'an District, Shenzhen,  
Guangdong, China 518104

Report Number : psi2310073-C01-R01  
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## TABLE OF CONTENTS

Description	Page
<b>1. General Information .....</b>	<b>5</b>
1.1. Description of Device (EUT) .....	5
1.2. Accessories of Device (EUT).....	5
1.3. Tested Supporting System Details.....	6
1.4. Block Diagram of Connection Between EUT and Simulators.....	6
<b>2. Summary of Standards And Results .....</b>	<b>7</b>
2.1. Description of Standards and Results .....	7
2.2. Test Mode Description .....	8
2.3. Test Equipment List.....	9
2.4. Test Facility .....	10
2.5. Measurement Uncertainty.....	10
<b>3. Power Line Conducted Emission Test .....</b>	<b>11</b>
3.1. Test Limits .....	11
3.2. Block Diagram of Test Setup.....	11
3.3. Configuration of EUT on Test .....	12
3.4. Operating Condition of EUT.....	12
3.5. Test Procedure.....	12
3.6. Test Results.....	13
<b>4. Radiated Emission Test .....</b>	<b>16</b>
4.1. Test Limit .....	16
4.2. Block Diagram of Test Setup.....	17
4.3. Configuration of EUT on Test .....	18
4.4. Operating Condition of EUT.....	18
4.5. Test Procedure.....	18
4.6. Test Results.....	19
<b>5. Photograph.....</b>	<b>25</b>
5.1. Photos of Radiated Emission Test (In Semi Anechoic Chamber) .....	25
5.2. Photos of Radiated Emission Test( Above 1G ) .....	25
5.3. Photos of Power Line Conducted Emission Test .....	26
<b>6. Photos of The EUT .....</b>	<b>27</b>

## TEST REPORT DECLARATION

Applicant : Finetooling Technology (Guangzhou) Co.,Ltd  
Address : Building 3, No. 88, Chunfen Road, Huangpu District,  
Guangzhou City, Guangdong Province  
Manufacturer : Finetooling Technology (Guangzhou) Co.,Ltd  
Address : Building 3, No. 88, Chunfen Road, Huangpu District,  
Guangzhou City, Guangdong Province

EUT Description : 5½ Digital Multimeter

(A) Model No. : FT3550

(B) Trademark :



Measurement Standard Used:

### FCC Rules and Regulations Part 15 Subpart B Class B, ANSI C63.4:2014

The device described above is tested by Shenzhen PSI Testing Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test results are contained in this test report and Shenzhen PSI Testing Co., Ltd. is assumed full responsibility for the accuracy and completeness of test. Also, this report shows that the EUT is technically compliant with the FCC Part15 requirements.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen PSI Testing Co., Ltd.

Tested by (name + signature).....: Jensen Wang  
Test Engineer

Approved by (name + signature).....: Simple Guan  
Project Manager

Date of issue.....: November 05, 2023

## Revision History

Revision	IssueDate	Revisions	Revised By
REV0	November 05, 2023	Initial released Issue	Jensen Wang



## 1. General Information

### 1.1. Description of Device (EUT)

Product Name : 5½ Digital Multimeter

Model Number : FT3550

Diff : N/A

Highest Frequency : More than 108MHz

EUT information : Input: AC 120V/60Hz

Trademark :  **Fine Tooling**  
广州市方通科技有限责任公司

Software version : N/A

Hardware version : N/A

### 1.2. Accessories of Device (EUT)

Power Source	:	Adapter
Manufacturer	:	QUANHUAZHINENG
Model	:	CD264
Ratings	:	Input: AC 100-240V, 50/60Hz Output: DC 12V 2A

### 1.3. Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number	Certification or SDOC
1	PC	DELL	Latitude 3490	4SBN0Y2	/
2	Load	/	/	/	/
3	/	/	/	/	/
4	/	/	/	/	/

### 1.4. Block Diagram of Connection Between EUT and Simulators



Signal Cable Description of the above Support Units

No.	Port Name	Cable	Length	Shielded (Yes or No)	Detachable (Yes or No)
(a)	USB	USB Cable	N/A	No	Yes
	RJ45	RJ45 Cable	N/A	No	Yes

## 2. Summary of Standards And Results

### 2.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

EMISSION			
Description of Test Item	Standard	Limits	Results
Power Line Conducted Emission Test	FCC Part 15.107 ANSI C63.4:2014	Class B	P
Radiated Emission Test	FCC Part 15.109 ANSI C63.4:2014	Class B	P
<p>Note: 1. P is an abbreviation for Pass.</p> <p>2. F is an abbreviation for Fail.</p> <p>3. N/A is an abbreviation for Not Applicable.</p> <p>4. Conclusion determination rules of this report: Unless there are clear provisions on measurement uncertainty in the standard or customer requirements, decision by actual test data without considering measurement uncertainty.</p>			

## 2.2. Test Mode Description

For Power Line Conducted Emission Test		
Mode No.	Test Mode	Test Voltage
※1.	Measure	AC 120V/60Hz
2.	Standby	AC 120V/60Hz
Note: ※is worst case mode, and this report only reflected the worst case mode.		

For Radiated Emission Test		
Mode No.	Test Mode	Test Voltage
※1.	Measure	AC 120V/60Hz
2.	Standby	AC 120V/60Hz
Note: ※is worst case mode, and this report only reflected the worst case mode.		





### 2.3. Test Equipment List

For Power Line Conducted Emission Test Equipment:

Item	Equipment	Manufacturer	Model No.	Serial No.	Firmware Version	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde&Schwarz	ESCI 7	101032/003	4.42 SP3	2022.12.30	1 Year
2.	L.I.S.N.	Rohde&Schwarz	ENV 216	102282	/	2022.12.30	1 Year
3.	L.I.S.N.	RFT	NNB111	13835240	/	2023.05.04	1 Year

For Frequency Range 30MHz~1GHz Radiated Emission Test Equipment:

Item	Equipment	Manufacturer	Model No.	Serial No.	Firmware Version	Last Cal.	Cal. Interval
1.	9*6*6 anechoic chamber	SKET	9*6*6	/	/	2022.12.20	3 Year
2.	Test Receiver	Rohde&Schwarz	ESCI 7	101032/003	4.42 SP3	2022.12.30	1 Year
3.	Bilog Antenna	Schwarzbeck	VULB 9168	01448	/	2022.12.26	2 Year
4.	6dB Fixed Attenuator	SKET	AP_DC01G-2W-N-6dB	SK2020053101	/	2022.12.30	1 Year

For Frequency Range above 1GHz Radiated Emission Test Equipment:

Item	Equipment	Manufacturer	Model No.	Serial No.	Firmware Version	Last Cal.	Cal. Interval
1.	9*6*6 anechoic chamber	SKET	9*6*6	/	/	2022.12.20	3 Year
2.	Spectrum Analyzer	Rohde&Schwarz	FSV-40N	101648	3.70	2022.12.30	1 Year
3.	Horn Antenna	Schwarz beck	BBHA 9120 D	02706	/	2022.12.26	2 Year
4.	Amplifier	SKET	LAPA_01G18G-45dB	SK2022032901	/	2023.12.30	1 Year

For Test Software Information

Item	Software Name	Manufacturer	Version
RE	EZ-EMC	Farad	PSI-3A1
CE	EZ-EMC	Farad	PSI-3A1

## 2.4. Test Facility

Shenzhen PSI Testing Co., Ltd.

1-2F, Building 5, Yudafu Industrial Park, No. 10, Xingye West Road, Shajing Street, Bao'an District, Shenzhen, Guangdong, China 518104

## 2.5. Measurement Uncertainty

Test Item	Uncertainty
Uncertainty for Conduction emission test	2.17dB
Uncertainty for Radiation Emission test(<1G)	2.74 dB (Distance: 3m Polarize: V)
	2.76 dB (Distance: 3m Polarize: H)
Uncertainty for Radiation Emission test(1G~6G)	4.02 dB
Uncertainty for Radiation Emission test(6G~18G)	4.30 dB
(95% confidence levels, k=2)	

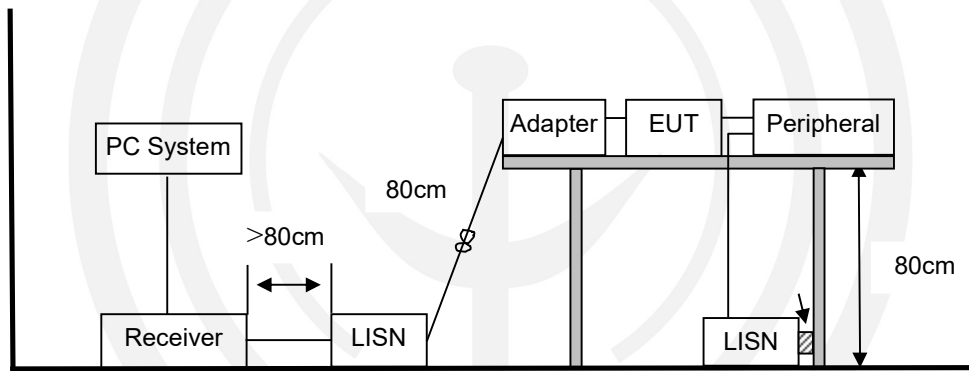
### 3. Power Line Conducted Emission Test

#### 3.1. Test Limits

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB( $\mu$ V)	Average Level dB( $\mu$ V)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

- Notes:
1. Emission level=Read level+LISN factor+Preamp factor+Cable loss
  2. \*Decreasing linearly with logarithm of frequency.
  3. The lower limit shall apply at the transition frequencies.

#### 3.2. Block Diagram of Test Setup



### 3.3. Configuration of EUT on Test

The following equipment are installed on Power Line Conducted Emission Test to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

### 3.4. Operating Condition of EUT

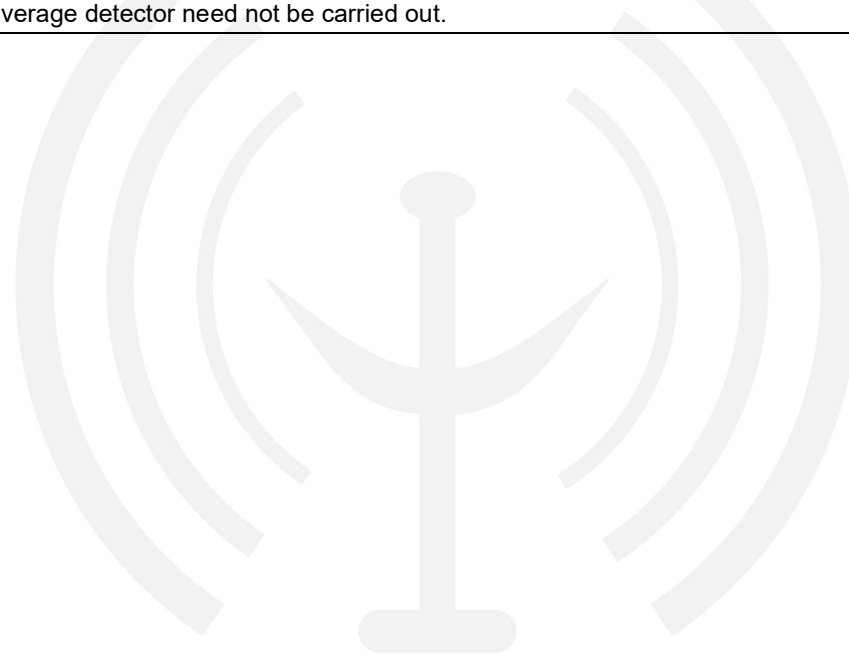
- (1) Setup the EUT as shown as Section 3.2.
- (2) Turn on the power of all equipment.
- (3) Let the EUT work in test mode and 15 minutes before taking the test.

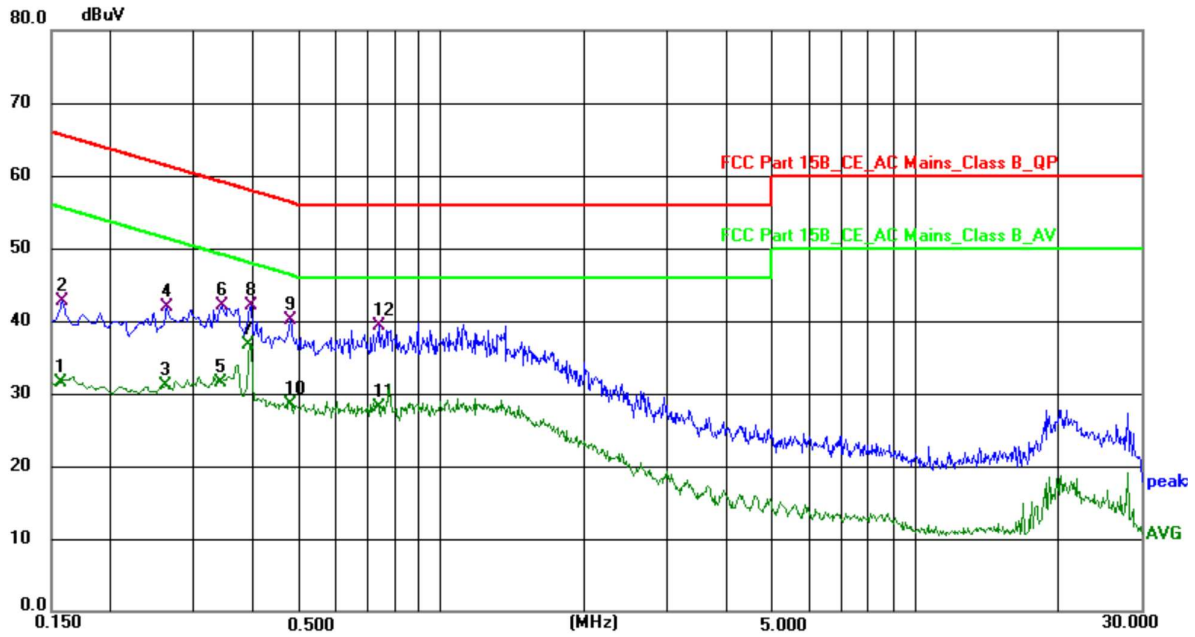
### 3.5. Test Procedure

- (1) The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#). This provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#2). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4:2014 on conducted Emission test.
- (2) The frequency range from 150kHz to 30MHz is checked, the bandwidth of test receiver (R&S TEST RECEIVER ESCI) is set at 9kHz.

### 3.6. Test Results

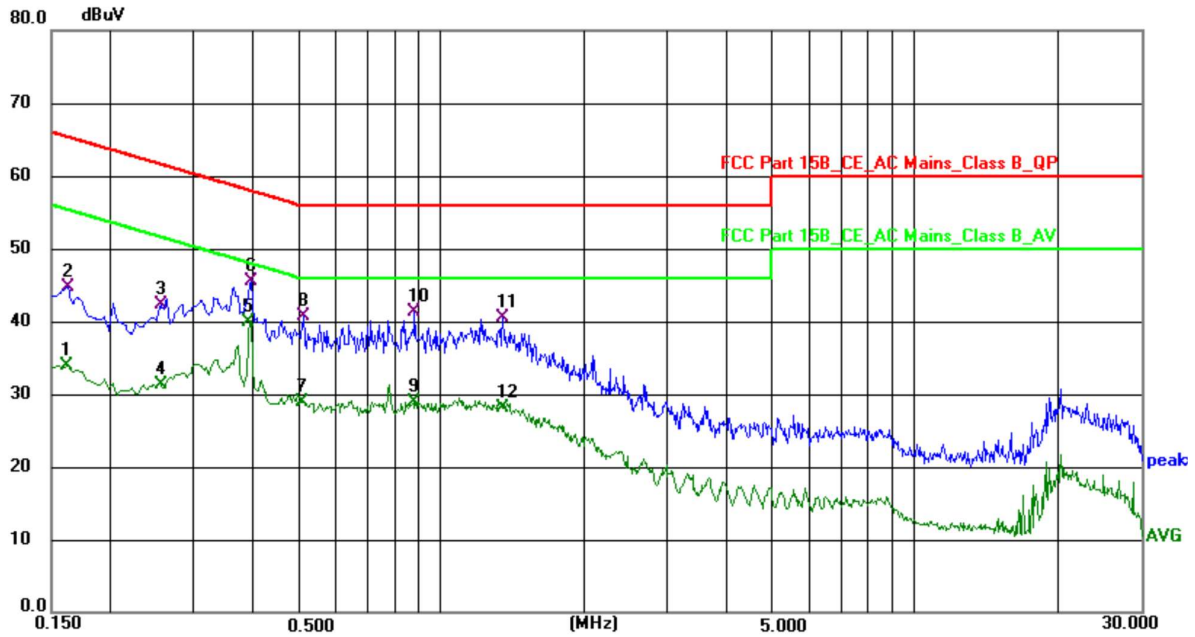
Test Date	: 2023.11.03	Temperature	: 24℃
Test Engineer	: Jensen Wang	Humidity	: 56%
M/N	: FT3550		
Test Mode	: Mode 1		
Test Results	: <b>PASS</b>		
Note: <ol style="list-style-type: none"><li>1. The test results are listed in next pages.</li><li>2. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector and quasi-peak detector need not be carried out.</li><li>3. If the limits for the measurement with the average detector are met when using a receiver with a quasi-peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.</li></ol>			



**Polarity: N**

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1564	21.77	9.81	31.58	55.65	-24.07	AVG	P
2	0.1580	32.81	9.82	42.63	65.57	-22.94	QP	P
3	0.2615	21.19	9.88	31.07	51.38	-20.31	AVG	P
4	0.2620	32.10	9.88	41.98	61.37	-19.39	QP	P
5	0.3410	21.86	9.69	31.55	49.18	-17.63	AVG	P
6	0.3420	32.42	9.68	42.10	59.15	-17.05	QP	P
7 *	0.3933	27.04	9.57	36.61	47.99	-11.38	AVG	P
8	0.3940	32.59	9.56	42.15	57.98	-15.83	QP	P
9	0.4780	30.31	9.73	40.04	56.37	-16.33	QP	P
10	0.4780	18.73	9.73	28.46	46.37	-17.91	AVG	P
11	0.7380	18.35	9.75	28.10	46.00	-17.90	AVG	P
12	0.7420	29.56	9.74	39.30	56.00	-16.70	QP	P

## Polarity: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1615	23.89	9.94	33.83	55.39	-21.56	AVG	P
2	0.1620	34.83	9.94	44.77	65.36	-20.59	QP	P
3	0.2540	32.25	9.97	42.22	61.63	-19.41	QP	P
4	0.2562	21.27	9.97	31.24	51.55	-20.31	AVG	P
5 *	0.3933	30.19	9.64	39.83	47.99	-8.16	AVG	P
6	0.3940	35.77	9.64	45.41	57.98	-12.57	QP	P
7	0.5074	19.02	9.89	28.91	46.00	-17.09	AVG	P
8	0.5100	30.83	9.89	40.72	56.00	-15.28	QP	P
9	0.8740	19.43	9.42	28.85	46.00	-17.15	AVG	P
10	0.8780	31.82	9.42	41.24	56.00	-14.76	QP	P
11	1.3500	31.07	9.40	40.47	56.00	-15.53	QP	P
12	1.3500	18.67	9.40	28.07	46.00	-17.93	AVG	P

## 4. Radiated Emission Test

### 4.1. Test Limit

Frequency MHz			Distance (Meters)	Limits dB(μV)
30	~	88	3	40.0
88	~	216	3	43.5
216	~	960	3	46.0
960	~	1000	3	54.0
Above 1GHz			3	74(Peak) 54(Average)

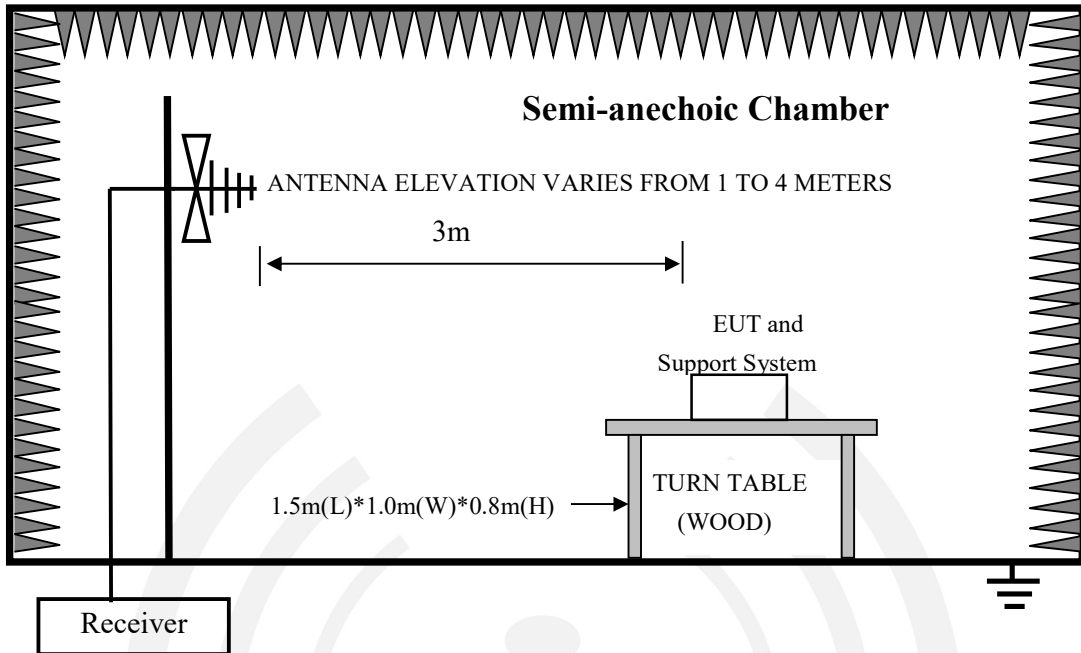
- Notes:
1. The smaller limit shall apply at the cross point between two frequency bands.
  2. Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.
  3. Frequency range of radiated measurements:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705-108	1000
108-500	2000
500-1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

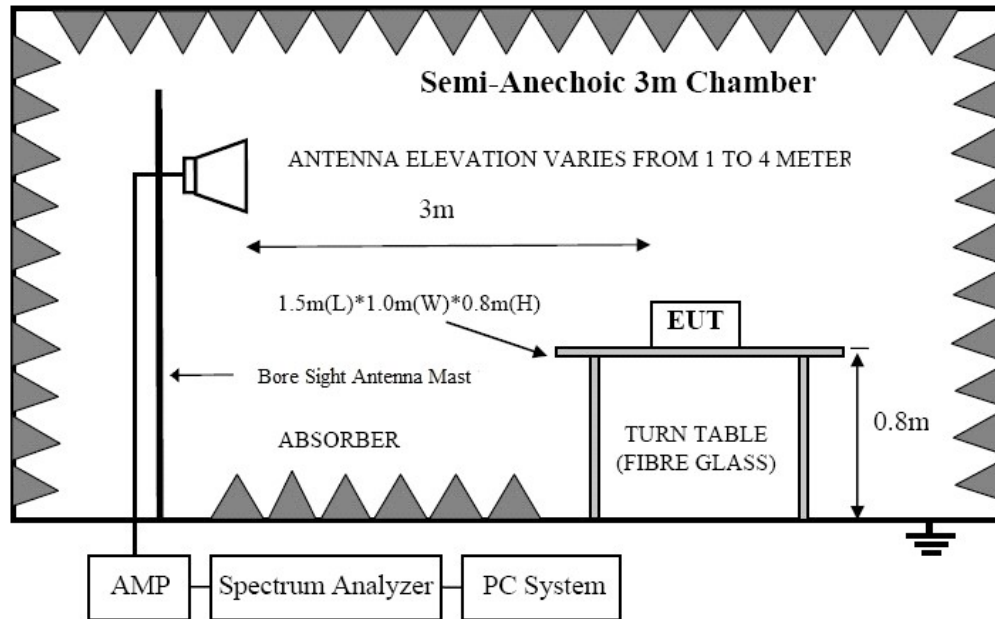


## 4.2. Block Diagram of Test Setup

In Semi Anechoic Chamber (3m) Test Setup Diagram for 30MHz~1000MHz



In Semi Anechoic Chamber (3m) Test Setup Diagram for Above 1GHz



### 4.3. Configuration of EUT on Test

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

### 4.4. Operating Condition of EUT

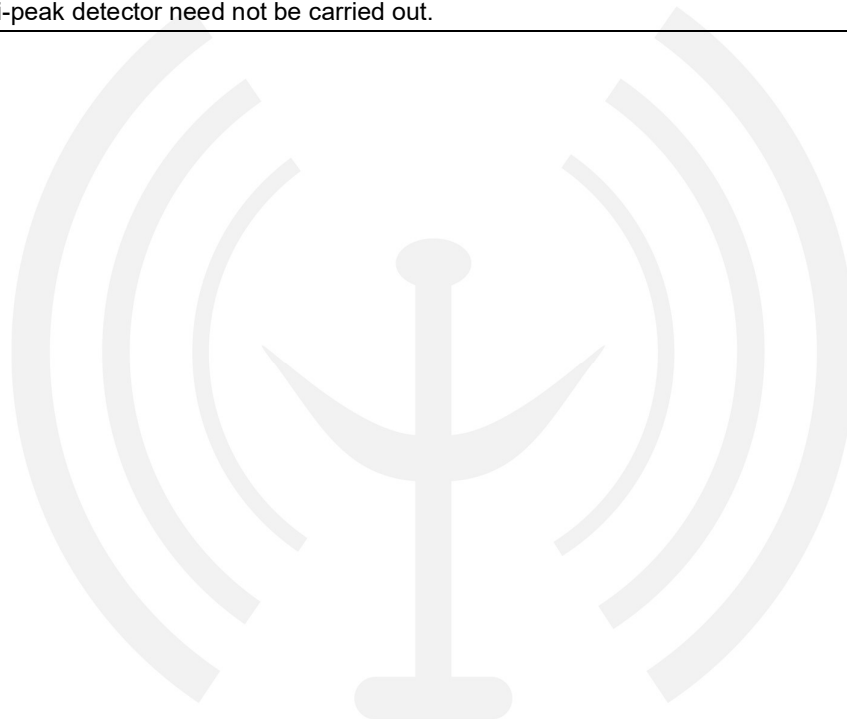
- (1) Setup the EUT as shown as Section 4.2.
- (2) Turn on the power of all equipment.
- (3) Let the EUT work in test mode and 15 minutes before taking the test.

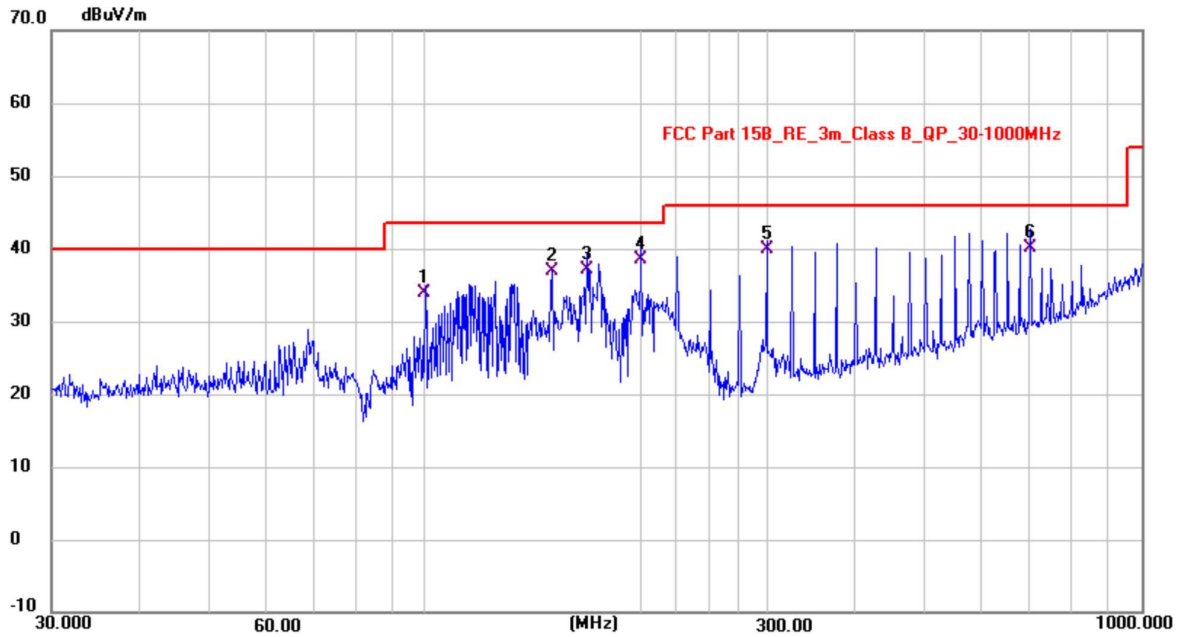
### 4.5. Test Procedure

- (1) The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber. An antenna was located 3m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4:2014 on Radiated Emission test.
- (2) 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.
- (3) The frequency range from 30MHz to 1000MHz is checked, the bandwidth of test receiver (R&S TEST RECEIVER ESR) is set at 120kHz.
- (4) The frequency range from above 1GHz is checked, the bandwidth of spectrum analyzer (Analyzer Spectrum Analyzer FSV-40N) is set at 1MHz.
- (5) The frequency range from 30MHz to 1000MHz was pre-scanned with a peak detector and all final readings of measurement from Test Receiver are Quasi-Peak values, the frequency range above 1GHz was pre-scanned with a peak detector and all final readings of measurement from Spectrum Analyzer are peak and average values checked, all measurement distance is 3m in 3m semi anechoic chamber.

#### 4.6. Test Results

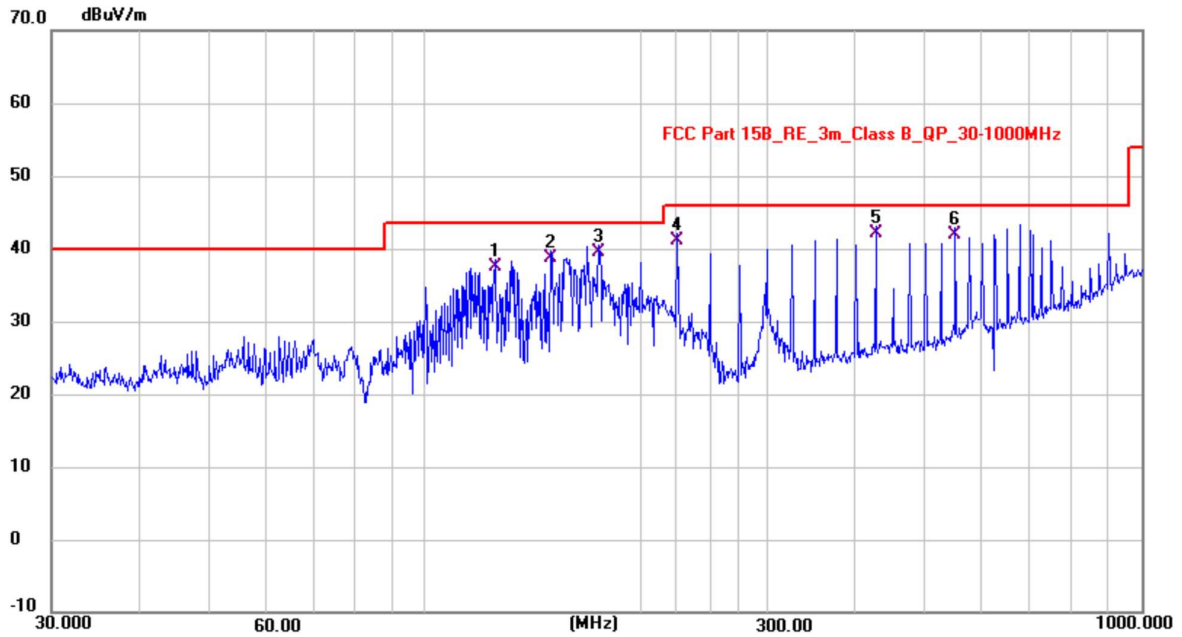
Frequency Range	: 30MHz~1000MHz		
Test Date	: 2023.11.03	Temperature	: 24℃
Test Engineer	: Jensen Wang	Humidity	: 56%
M/A	: FT3550		
Test Mode	: Mode 1		
Test Results	: <b>PASS</b>		
Note:	<ol style="list-style-type: none"><li>1. The test results are listed in next pages.</li><li>2. If the limits for the measurement with the quasi-peak detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet limits and the measurement with the quasi-peak detector need not be carried out.</li></ol>		



**Antenna polarity: Horizontal**

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F
1	100.0090	24.34	9.54	33.88	43.50	-9.62	QP			P
2	150.0107	23.94	13.04	36.98	43.50	-6.52	QP			P
3	167.9713	24.65	12.47	37.12	43.50	-6.38	QP			P
4 *	200.0732	28.52	10.02	38.54	43.50	-4.96	QP			P
5	299.9725	26.21	13.66	39.87	46.00	-6.13	QP			P
6	700.2246	18.14	21.97	40.11	46.00	-5.89	QP			P

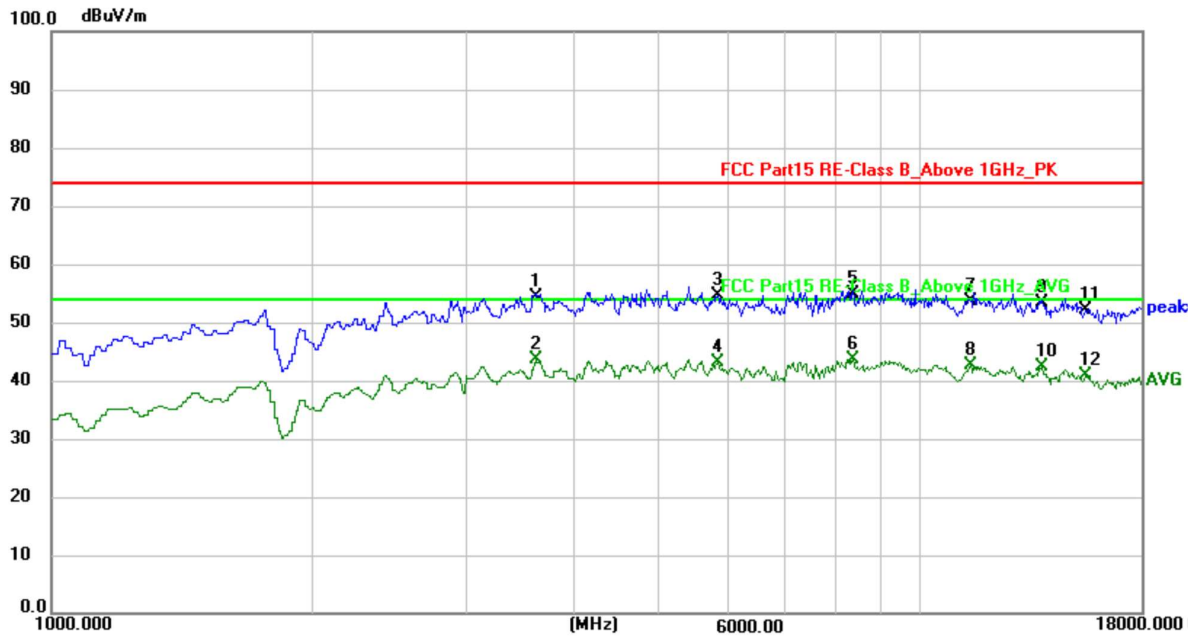
### Antenna polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F
1	125.0065	25.72	11.82	37.54	43.50	-5.96	QP			P
2	149.9450	25.74	13.04	38.78	43.50	-4.72	QP			P
3	175.0365	27.76	11.78	39.54	43.50	-3.96	QP			P
4	225.0116	30.06	11.05	41.11	46.00	-4.89	QP			P
5 *	425.0280	25.39	16.72	42.11	46.00	-3.89	QP			P
6	550.2239	22.37	19.50	41.87	46.00	-4.13	QP			P

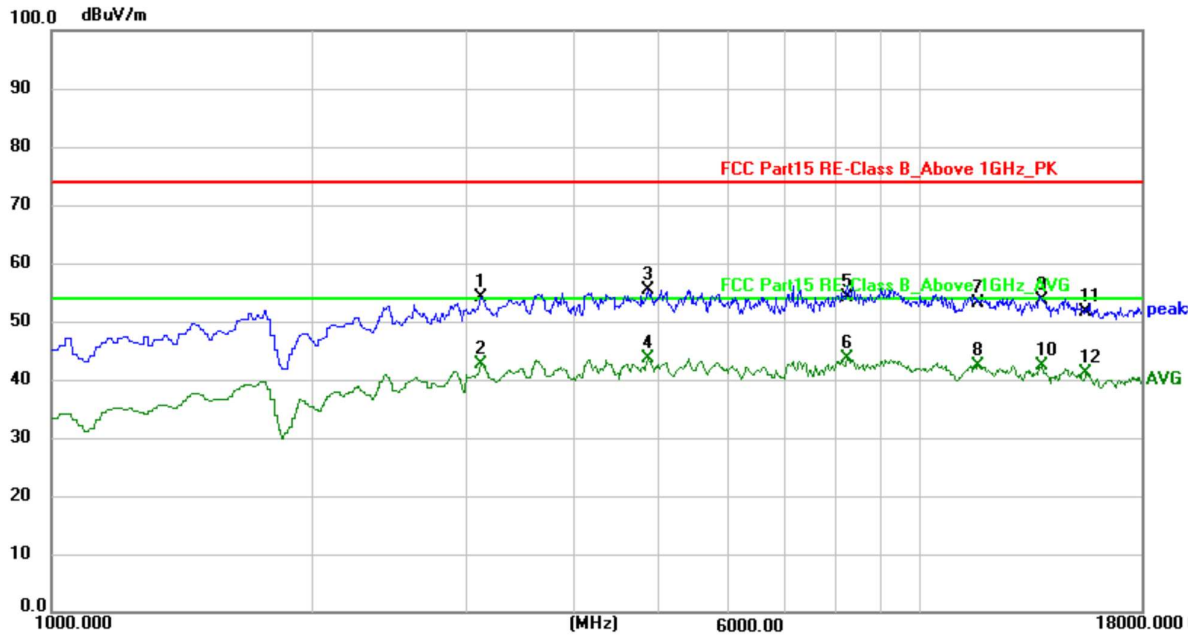
Frequency Range	: Above 1GHz		
Test Date	: 2023.11.03	Temperature	: 24℃
Test Engineer	: Jensen Wang	Humidity	: 56%
M/N	: FT3550		
Test Mode	: Mode 1		
Test Results	: <b>PASS</b>		
Note:	1. The test results are listed in next pages.		
	2. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector and quasi-peak detector need not be carried out.		



**Antenna polarity: Horizontal**

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F
1	3618.000	77.32	-22.84	54.48	74.00	-19.52	peak	100	0	P
2 *	3618.000	66.49	-22.84	43.65	54.00	-10.35	AVG	100	0	P
3	5845.000	73.38	-18.70	54.68	74.00	-19.32	peak	100	0	P
4	5845.000	61.80	-18.70	43.10	54.00	-10.90	AVG	100	0	P
5	8361.000	67.86	-12.90	54.96	74.00	-19.04	peak	100	0	P
6	8361.000	56.44	-12.90	43.54	54.00	-10.46	AVG	100	0	P
7	11404.000	64.02	-10.41	53.61	74.00	-20.39	peak	100	0	P
8	11404.000	52.96	-10.41	42.55	54.00	-11.45	AVG	100	0	P
9	13801.000	61.68	-8.42	53.26	74.00	-20.74	peak	100	0	P
10	13801.000	50.92	-8.42	42.50	54.00	-11.50	AVG	100	0	P
11	15518.000	60.90	-8.89	52.01	74.00	-21.99	peak	100	0	P
12	15518.000	49.76	-8.89	40.87	54.00	-13.13	AVG	100	0	P

### Antenna polarity: Vertical

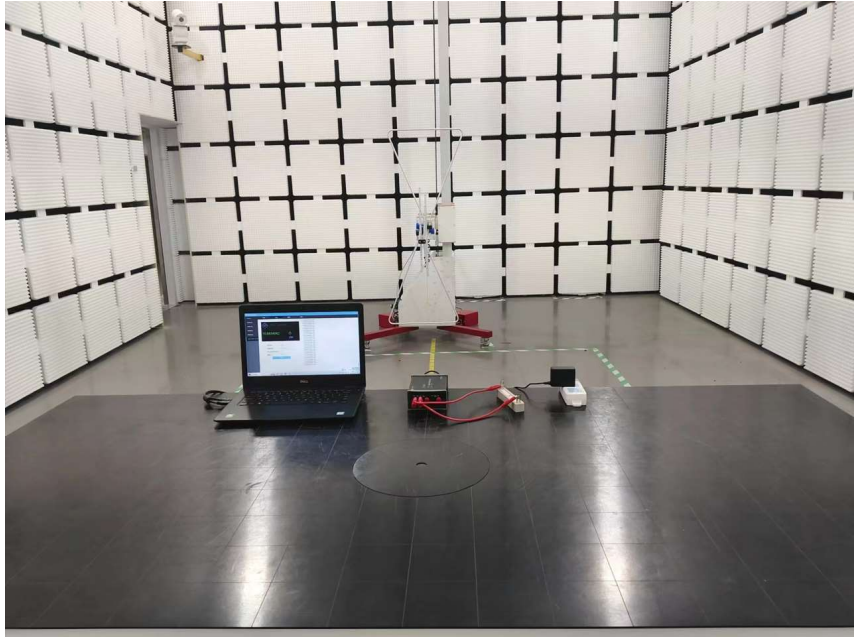


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F
1	3125.000	78.05	-23.97	54.08	74.00	-19.92	peak	100	360	P
2	3125.000	66.48	-23.97	42.51	54.00	-11.49	AVG	100	360	P
3	4859.000	83.00	-27.64	55.36	74.00	-18.64	peak	100	360	P
4	4859.000	71.18	-27.64	43.54	54.00	-10.46	AVG	100	360	P
5	8242.000	67.07	-13.00	54.07	74.00	-19.93	peak	100	360	P
6 *	8242.000	56.62	-13.00	43.62	54.00	-10.38	AVG	100	360	P
7	11642.000	63.57	-10.39	53.18	74.00	-20.82	peak	100	360	P
8	11642.000	52.77	-10.39	42.38	54.00	-11.62	AVG	100	360	P
9	13801.000	61.97	-8.42	53.55	74.00	-20.45	peak	100	360	P
10	13801.000	50.89	-8.42	42.47	54.00	-11.53	AVG	100	360	P
11	15518.000	60.59	-8.89	51.70	74.00	-22.30	peak	100	360	P
12	15518.000	49.90	-8.89	41.01	54.00	-12.99	AVG	100	360	P

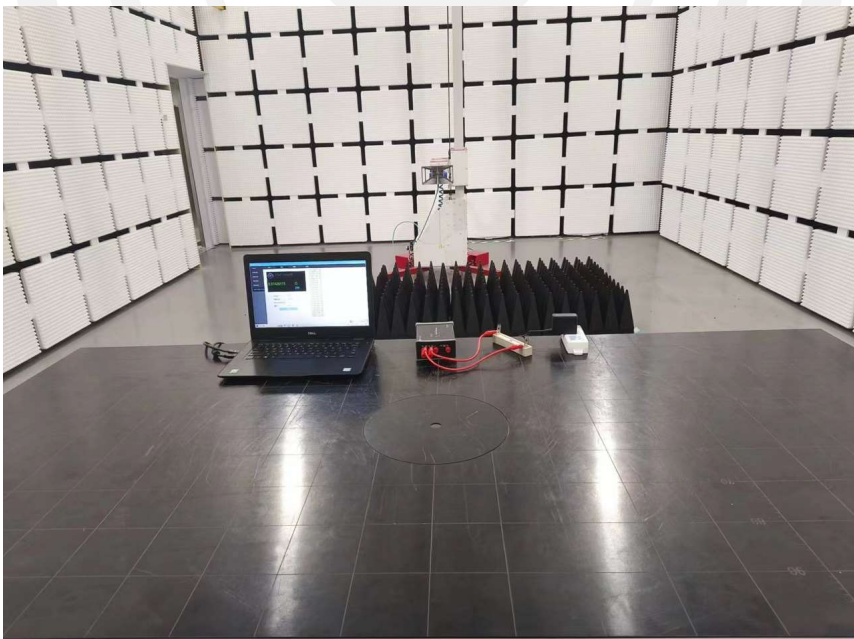


## 5. Photograph

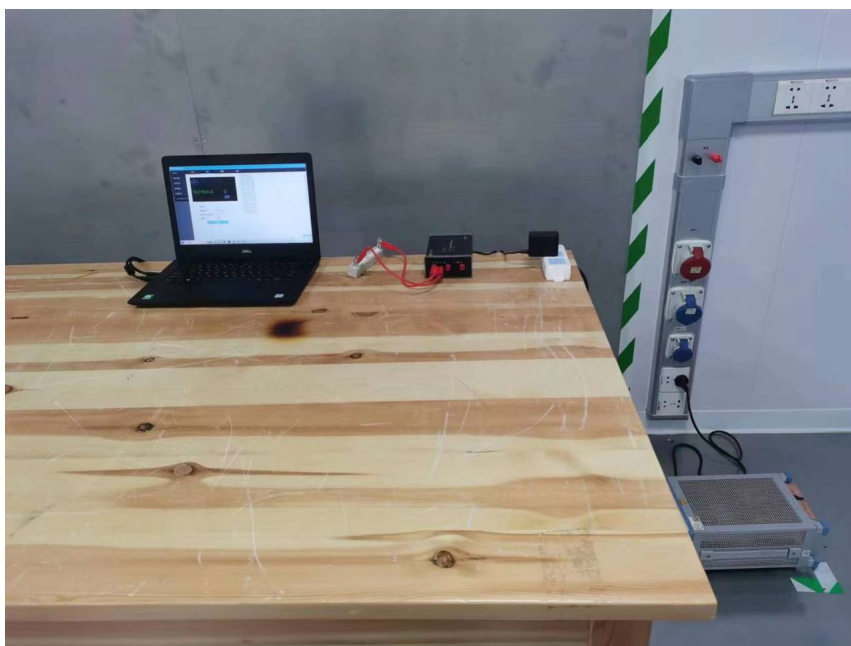
### 5.1.Photos of Radiated Emission Test (In Semi Anechoic Chamber)



### 5.2.Photos of Radiated Emission Test( Above 1G )



### 5.3. Photos of Power Line Conducted Emission Test



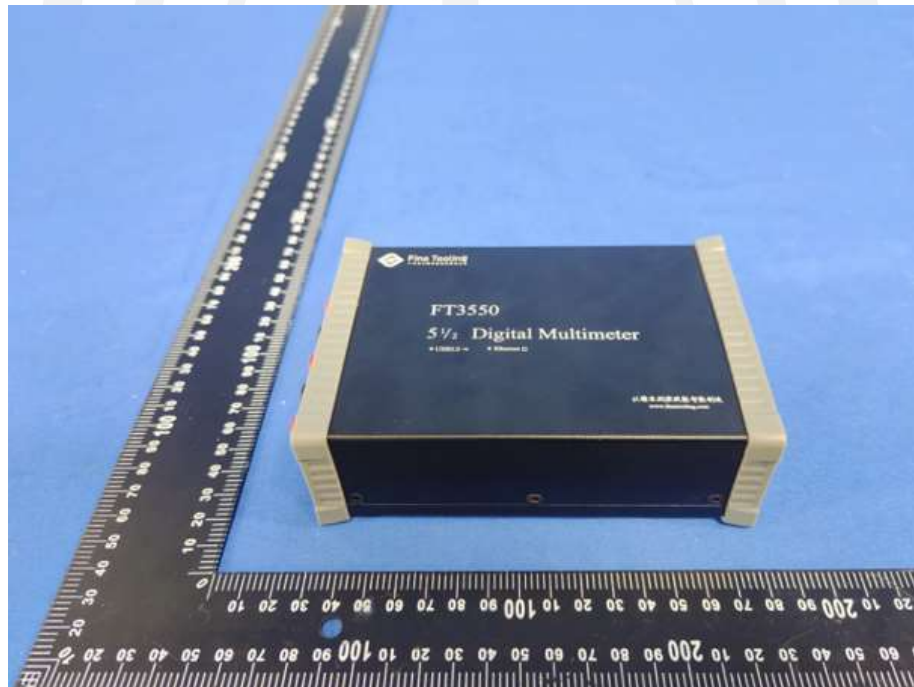
## 6. Photos of The EUT



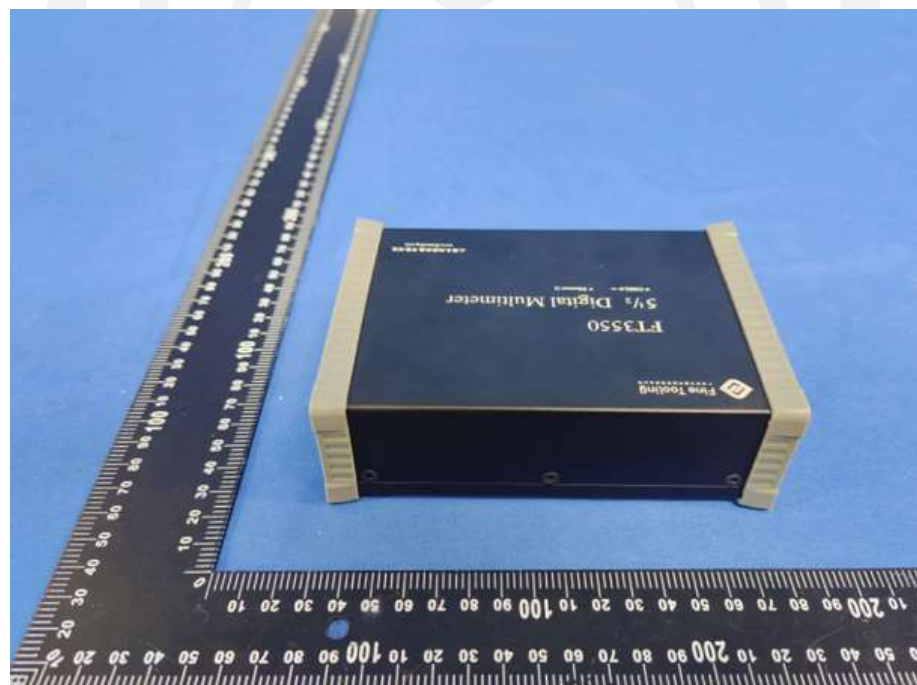
EUT View

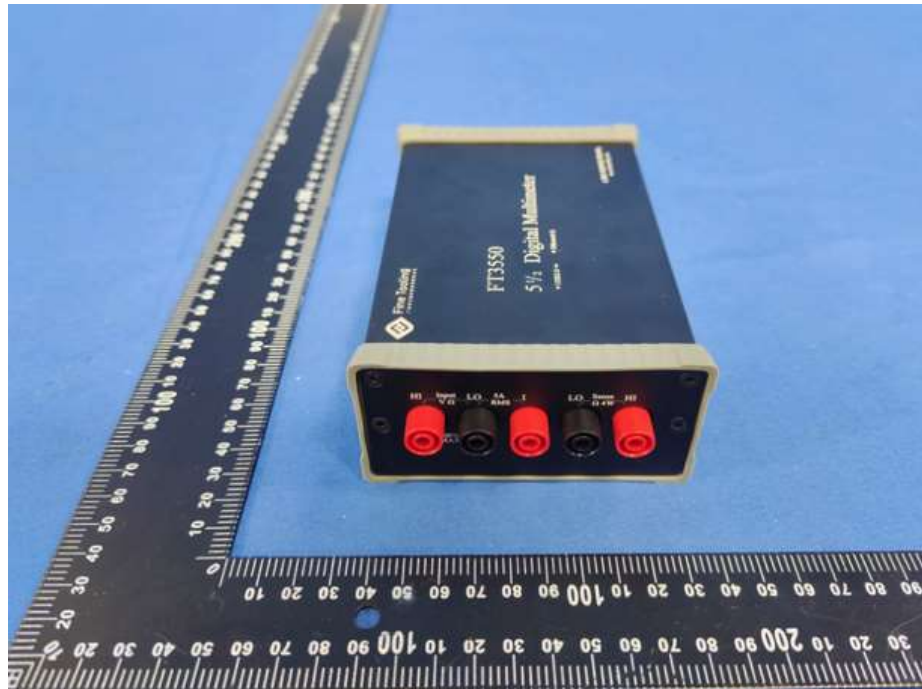


EUT View

**EUT View****EUT View**



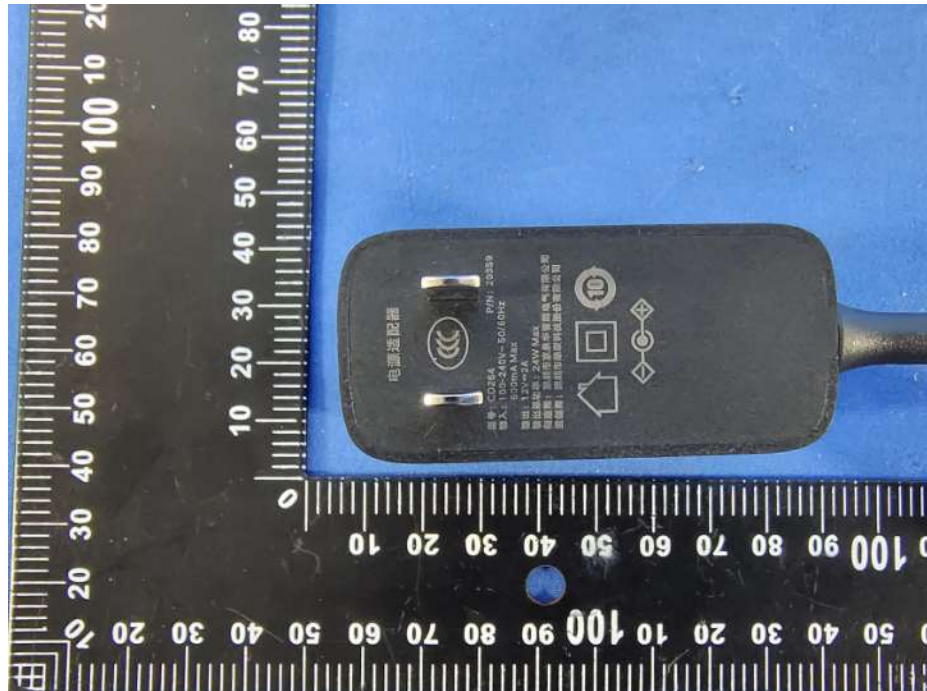
**EUT View****EUT View**



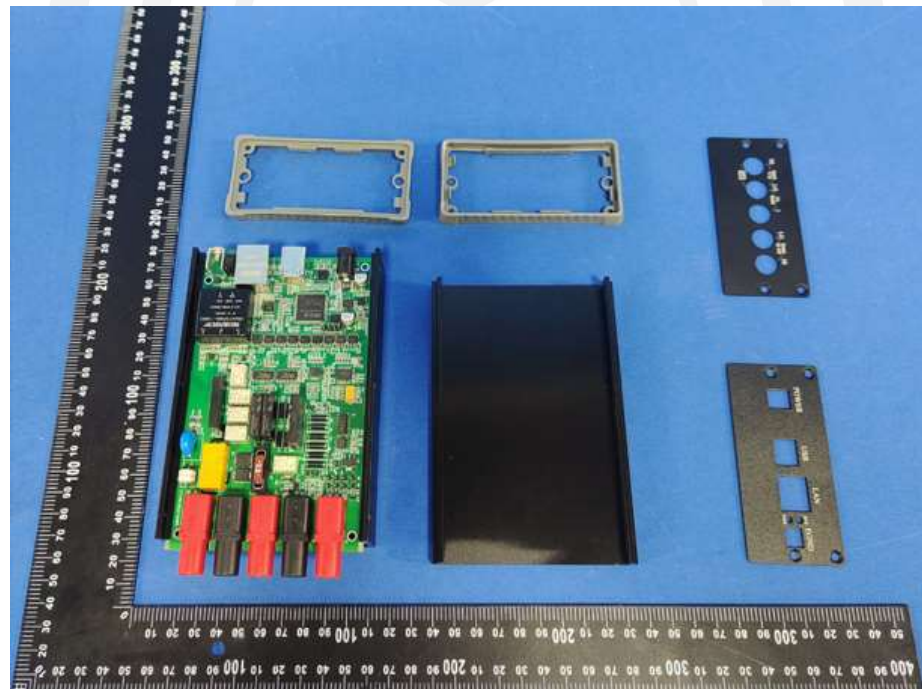
EUT View



EUT View

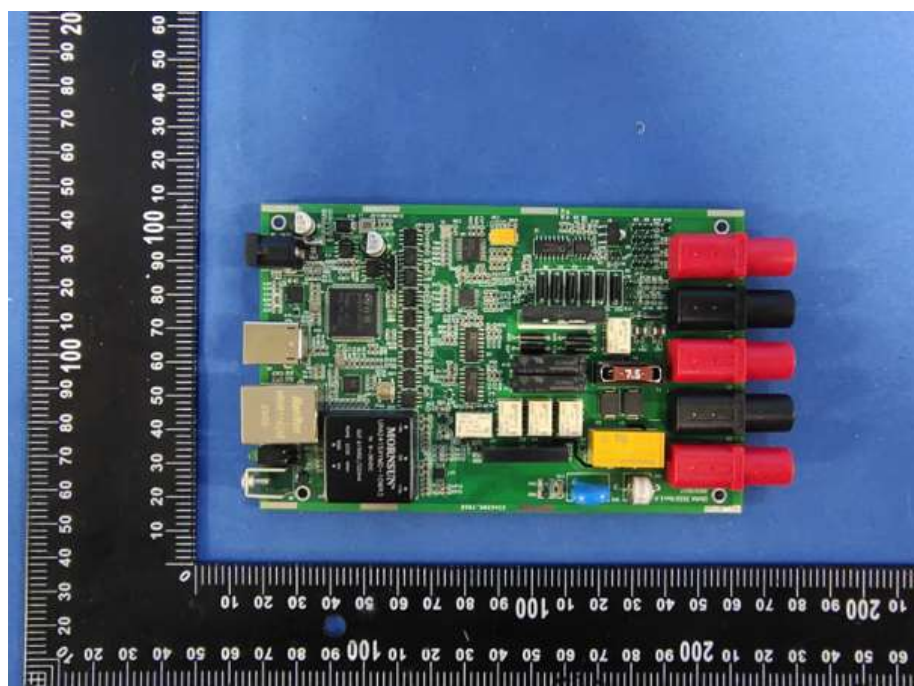


EUT View

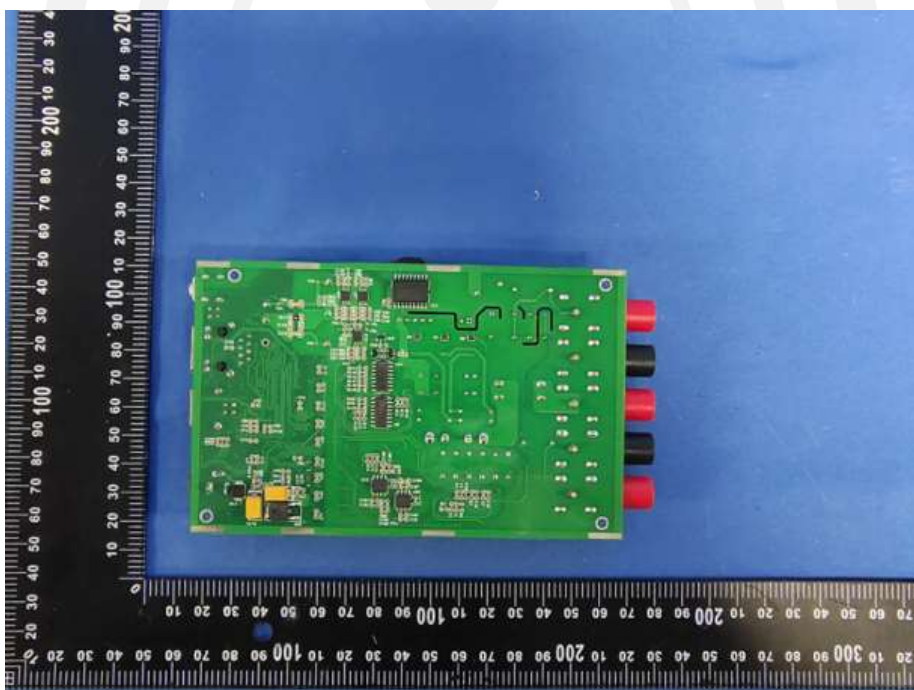


EUT View





EUT View



EUT View

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