

Test Report

Applicant : Shenzhen BITECA Electron Co.,Ltd.
Address : 6F, 7#, HuaFeng Industrial park, BaoLong NO.1 Rd, LongGang District, shenzhen city, China.
Product Name : TV Antenna
Brand Mark : N/A
Model : SW216
Extension model : SW217, SW218, HD001, HD002, HD007, HD009, HD010, HD011, HD012, HD013, HD018, HD019, HD020, D006AF, SN009, SN013, JY001, SW003, TV001
FCC ID : 2BGYE-SW216
Report Number : BLA-EMC-202406-A3001
Date of Receipt : 2024.06.13
Date of Test : 2024.06.13 to 2024.06.24
Test Standard : 47 CFR Part 15, Subpart B
Test Result : Pass

Compiled by: *Hugh*Review by: *Sueels*Approved by: *Blue Zheng*

Issued Date: 2024.06.24

BlueAsia of Technical Services(Shenzhen) Co.,Ltd.Address: Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District,
Shenzhen, Guangdong Province, China

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Revise Record

Version No.	Date	Description
01	2024.02.02	Original

1 General information

1.1 General information

Applicant	Shenzhen BITECA Electron Co.,Ltd.
Address	6F,7#,HuaFeng Industrial park,BaoLong NO.1 Rd,LongGang District,shenzhen city,China.
Manufacturer	Shenzhen BITECA Electron Co.,Ltd.
Address	6F,7#,HuaFeng Industrial park,BaoLong NO.1 Rd,LongGang District,shenzhen city,China.
Factory	N/A
Address	N/A

1.2 General description of EUT

Product name	TV Antenna
Model no.	SW216
Series model	SW217, SW218, HD001, HD002, HD007, HD009, HD010, HD011, HD012, HD013, HD018, HD019, HD020, D006AF, SN009, SN013, JY001, SW003, TV001
Power supply	Model: LX050100 INPUT: 100V-240V ~50/60Hz 0.35A OUTPUT: 5V=1A
Hardware version	N/A
Software version	N/A
<i>Note: for a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.</i>	

2 Test summary

No.	Test item	Test Method	Result	Remark
1	Radiated Emissions (above 1GHz)	ANSI C63.4:2014	Pass	
2	Radiated Emissions (30MHz-1GHz)	ANSI C63.4:2014	Pass	
3	Conducted Emissions at Mains Terminals (150kHz-30MHz)	ANSI C63.4:2014	Pass	

3 Test Configuration

3.1 Test mode

TEST MODE	TEST MODE DESCRIPTION
TM1	Keep the EUT in normal working mode
Remark: only the data of the worst mode would be recorded in this report.	

3.2 Auxiliary equipment

Device Type	Manufacturer	Model Name	Serial No.	Remark
TV	Xiaomi	N/A	N/A	From lab (No.BLA-ZC-BS-2022026)
Signal Generator DTV	ECREDIX	DSG-1000	N/A	N/A
Note: "--" mean no any auxiliary device during testing.				

3.3 Test environment

Ambient Temperature:	15 °C to 35 °C
Relative Humidity:	25 % to 75 %
Atmospheric pressure:	86 kPa to 106 kPa

4 Laboratory information

4.1 Laboratory and accreditations

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

Company name:	BlueAsia of Technical Services(Shenzhen) Co., Ltd.
Address:	Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District, Shenzhen, Guangdong Province, China
CNAS accredited no.:	L9788
A2LA Cert. No.	5071.01
Telephone:	+86-755-28682673
FAX:	+86-755-28682673

4.2 Measurement uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%)
Radiated Emission(9kHz-30MHz)	$\pm 4.34\text{dB}$
Radiated Emission(30Mz-1000MHz)	$\pm 4.24\text{dB}$
Radiated Emission(1GHz-18GHz)	$\pm 4.68\text{dB}$
AC Power Line Conducted Emission(150kHz-30MHz)	$\pm 3.45\text{dB}$

5 Test equipment

Equipment No.	Name	Model No.	Manufacture	S/N	Cal. Date	Due. Date
BLA-EMC-008	Spectrum	FSP40	R&S	100817	2023/08/30	2024/08/29
BLA-EMC-009	EMI Receiver	ESR7	R&S	101199	2023/08/30	2024/08/29
BLA-EMC-010	EMI Receiver	ESPI3	R&S	101082	2023/08/30	2024/08/29
BLA-EMC-011	LISN	ENV216	R&S	101372	2023/08/30	2024/08/29
BLA-EMC-012	broad band Antenna	VULB9168	Schwarz beck	00836 P:00227	2022/10/12	2025/10/11
BLA-EMC-013	Horn Antenna	BBHA9120D	Schwarz beck	01892	2022/09/13	2025/09/12
BLA-EMC-014	Amplifier	PA_000318G-45	SKET	PA2018043003	2023/08/30	2024/08/29
BLA-EMC-033	Impedance transformer	N-JK-3G	Dongfang Xupu	N/A	2023/08/14	2024/08/13
BLA-EMC-041	LISN	AT166-2	Atten	AKK1806000003	2023/08/30	2024/08/29
BLA-EMC-043	Loop antenna	FMZB1519B	SCHNARZBECK	00102	2022/09/14	2025/09/13
BLA-EMC-045	Impedance stable network	ISNT8-cat6	TESEQ	53580	2023/08/30	2024/08/29
BLA-EMC-046	Filter bank	2.4G/5G Filter bank	SKET	N/A	2023/07/07	2024/07/06
BLA-EMC-061	Receiver	ESPI7	R&S	101477	2023/07/07	2024/07/06
BLA-EMC-065	broadband Antenna	VULB9168	Schwarz beck	01065P	2022/12/12	2025/12/11
BLA-EMC-066	Amplifier	LNPA_30M01G-30	SKET	SK2021060801	2023/07/07	2024/07/06
BLA-EMC-086	Amplifier	LNPA_18G40G-50dB	SKET	SK2022071301	2023/08/14	2024/08/13
N/A	EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A

6 Test result

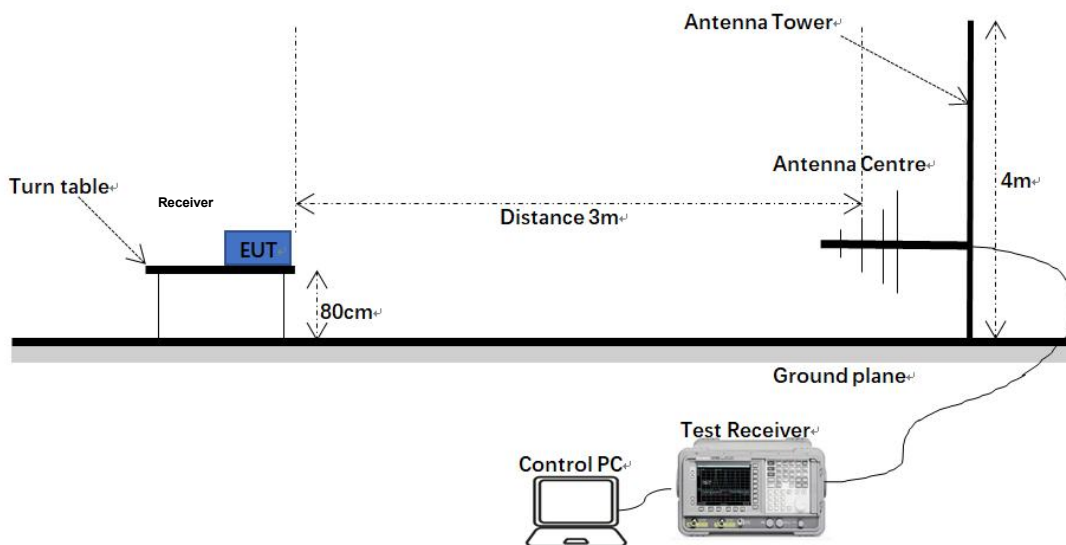
6.1 Radiated Emissions (30MHz-1GHz)

Test Standard	47 CFR Part 15, Subpart B
Test Method	ANSI C63.4:2014
Test Mode (Pre-Scan)	TM1
Test Mode (Final Test)	TM1

6.1.1 Limits

Frequency Range	Limit
30MHz -88MHz	40.0(dB μ V/m) quasi-peak
88MHz-216MHz	43.5(dB μ V/m) quasi-peak
216MHz-960MHz	46.0(dB μ V/m) quasi-peak
960MHz-1000MHz	54.0(dB μ V/m) quasi-peak

6.1.2 Test setup



Description of test setup connection:

- EUT was put on turn table in a 966 chamber room;
- The center distance of the receiving antenna is 3 meters from the EUT;
- The signal received by the receiving antenna is transmitted to the receiver through the coaxial line;
- Test receiver connected to control PC.

6.1.3 Procedure

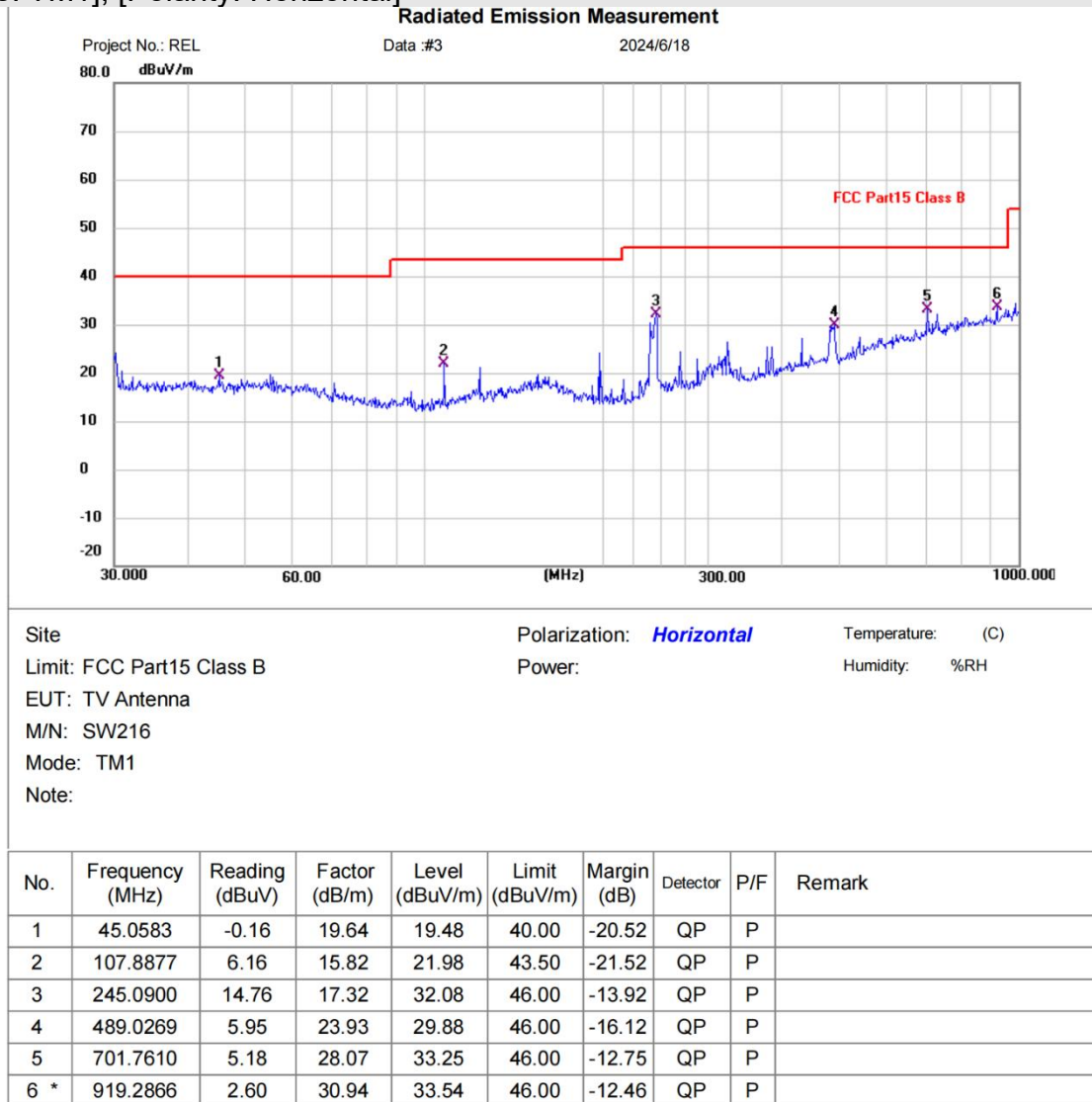
An initial pre-scan was performed in the chamber using the spectrum analyzer in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

Remark:

1. Final Level = Receiver Read level + Correct factor
2. Correct factor = Antenna Factor + Cable Loss – Preamplifier Factor
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

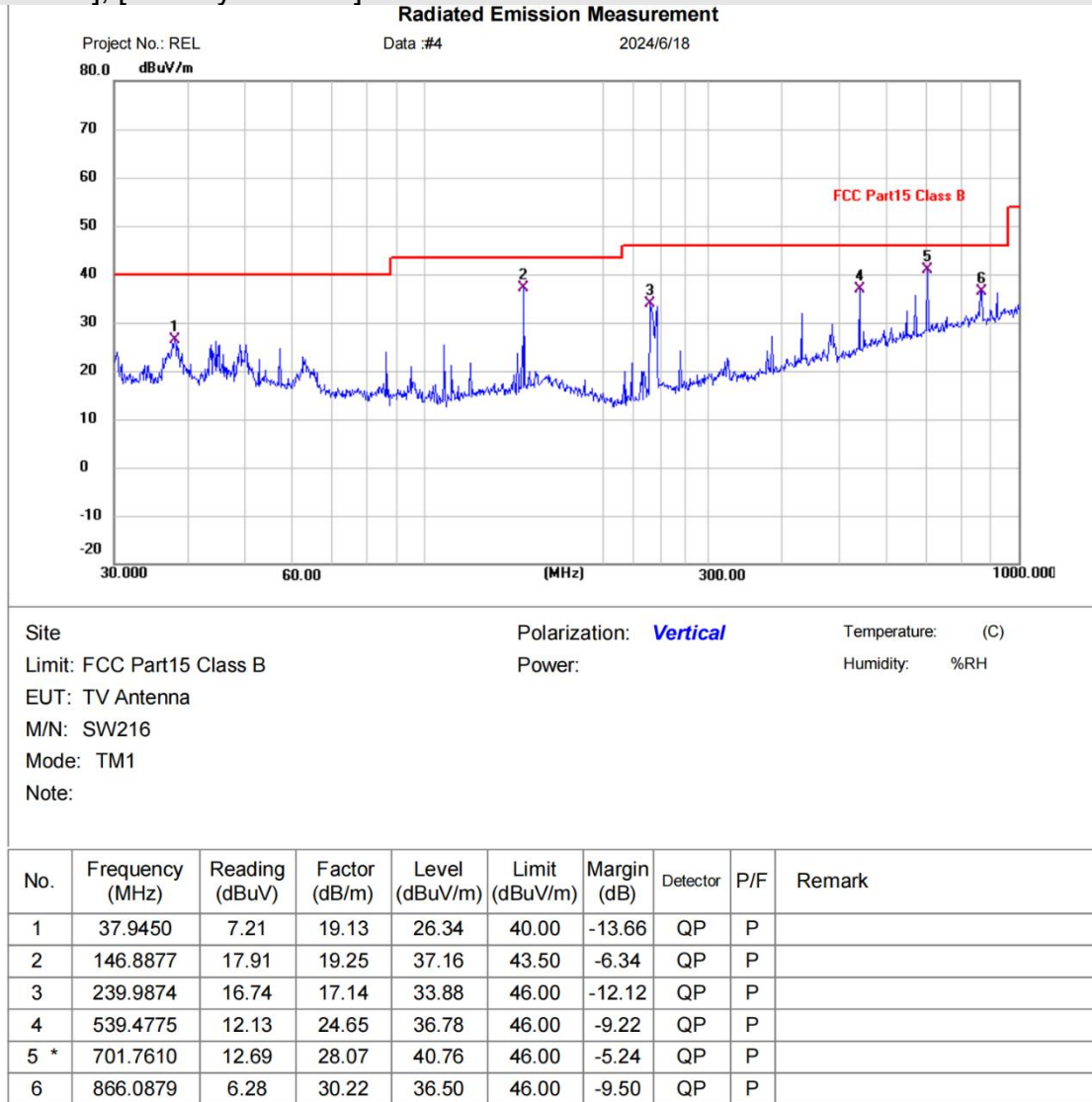
6.1.4 Test data

[TestMode: TM1]; [Polarity: Horizontal]



Test Result: Pass

[TestMode: TM1]; [Polarity: Vertical]



Test Result: Pass

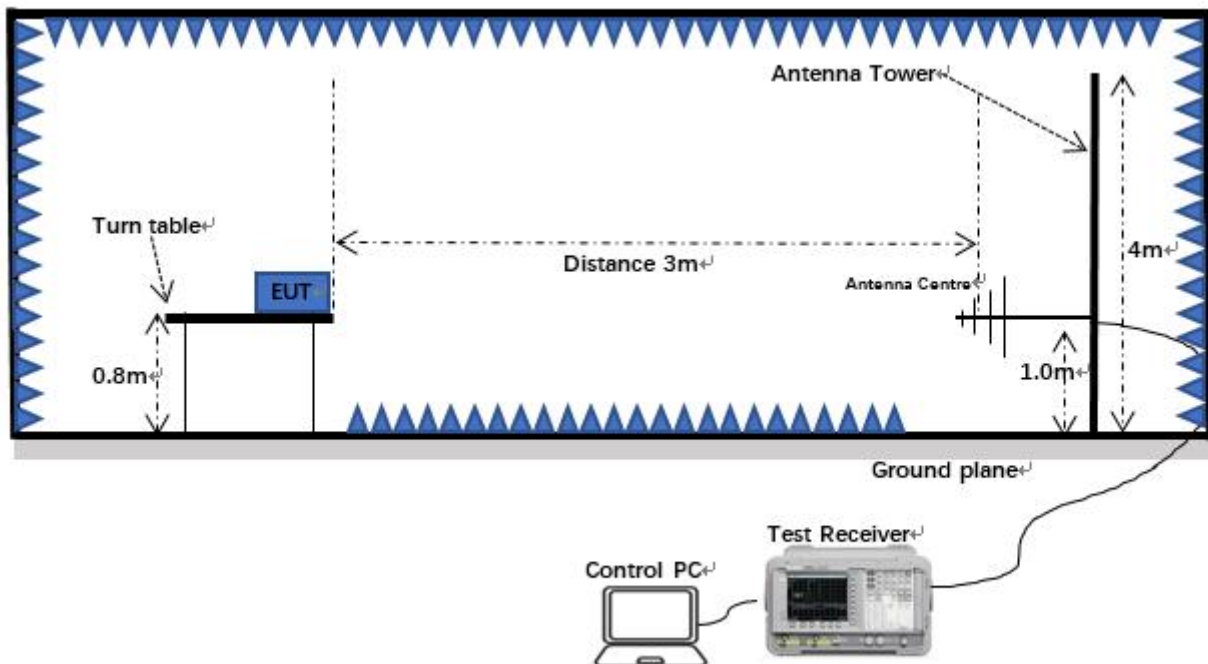
6.2 Radiated Emissions (above 1GHz)

Test Standard	47 CFR Part 15, Subpart B
Test Method	ANSI C63.4:2014
Test Mode (Pre-Scan)	TM1
Test Mode (Final Test)	TM1

6.2.1 Limits

Frequency Range	Limit
Above 1GHz	74(dBμV/m) peak, 54(dBμV/m) average

6.2.2 Test setup



Description of test setup connection:

- EUT was put on turn table in a 966 chamber room;
- The center distance of the receiving antenna is 3 meters from the EUT;
- The signal received by the receiving antenna is transmitted to the receiver through the coaxial line;
- Test receiver connected to control PC.

6.2.3 Procedure

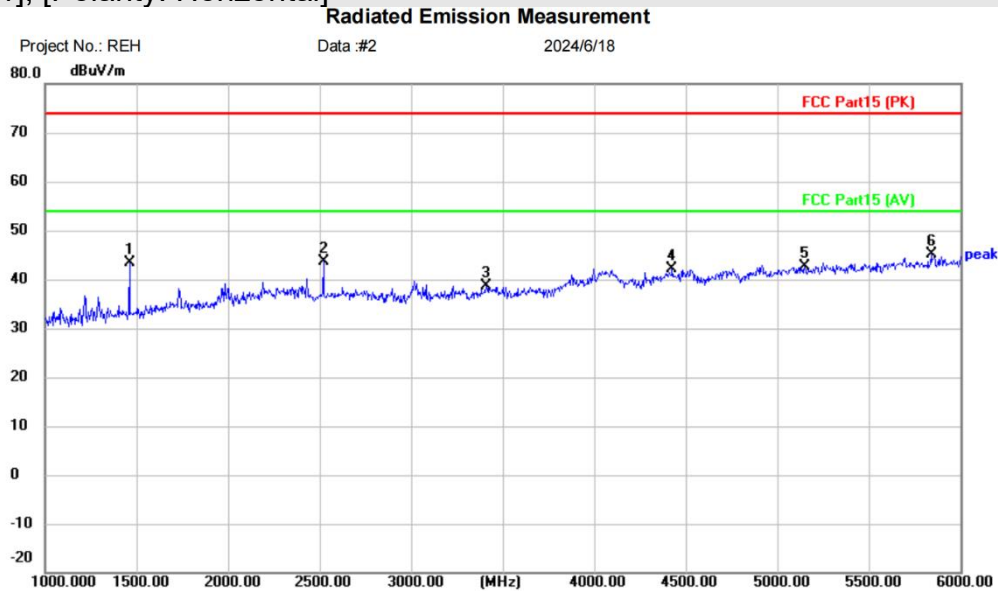
An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. The EUT was measured by Horn antenna with 2 orthogonal polarities.

Remark:

1. Final Level = Receiver Read level + Correct factor
2. Correct factor = Antenna Factor + Cable Loss – Preamplifier Factor
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

6.2.4 Test data

[TestMode: TM1]; [Polarity: Horizontal]



Site: Polarization: **Horizontal** Temperature: (C)
 Limit: FCC Part15 (PK) Power: Humidity: %RH
 EUT: TV Antenna
 M/N: SW216
 Mode: TM1
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		1460.000	51.28	-8.02	43.26	74.00	-30.74	peak	
2		2520.000	46.59	-3.05	43.54	74.00	-30.46	peak	
3		3410.000	41.50	-2.89	38.61	74.00	-35.39	peak	
4		4425.000	39.91	2.25	42.16	74.00	-31.84	peak	
5		5150.000	38.30	4.39	42.69	74.00	-31.31	peak	
6	*	5840.000	39.00	6.20	45.20	74.00	-28.80	peak	

*:Maximum data x:Over limit !:over margin

(Reference Only)

Receiver: ESR_1

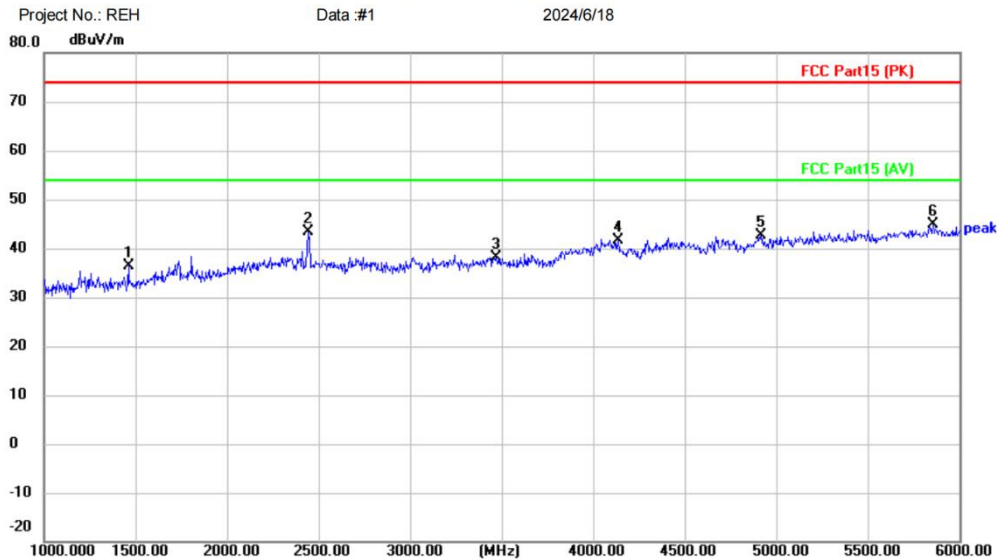
Spectrum Analyzer:

FSP40

Test Result: Pass

[TestMode: TM1]; [Polarity: Vertical]

Radiated Emission Measurement



Site: Limit: FCC Part15 (PK) EUT: TV Antenna M/N: SW216 Mode: TM1 Note:

Polarization: **Vertical** Power: Temperature: (C) Humidity: %RH

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		1460.000	44.44	-8.02	36.42	74.00	-37.58	peak	
2		2440.000	46.09	-2.72	43.37	74.00	-30.63	peak	
3		3470.000	40.58	-2.35	38.23	74.00	-35.77	peak	
4		4135.000	39.62	2.04	41.66	74.00	-32.34	peak	
5		4915.000	38.67	3.87	42.54	74.00	-31.46	peak	
6	*	5855.000	38.65	6.32	44.97	74.00	-29.03	peak	

*:Maximum data x:Over limit !:over margin (Reference Only)

Receiver: ESR_1 Spectrum Analyzer: FSP40

Test Result: Pass

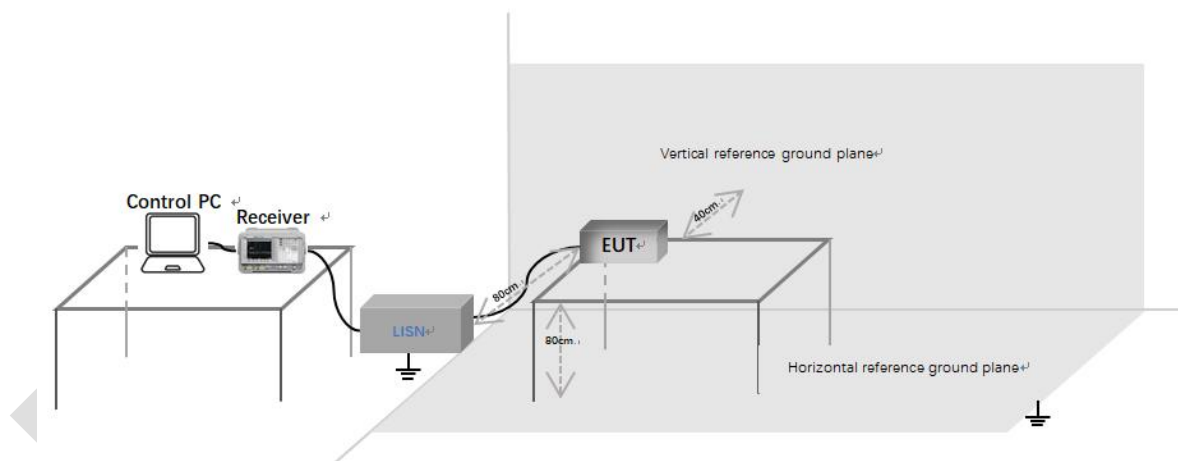
6.3 Conducted Emissions at Mains Terminals (150 kHz-30MHz)

Test Standard	47 CFR Part 15, Subpart B
Test Method	ANSI C63.4:2014
Test Mode (Pre-Scan)	TM1
Test Mode (Final Test)	TM1

6.3.1 Limits

Frequency Range	Limit
0.15M-0.5MHz	66dB(μ V)-56dB(μ V) quasi-peak, 56dB(μ V)-46dB(μ V) average
0.5M-5MHz	56dB(μ V) quasi-peak, 46dB(μ V) average
5M-30MHz	60dB(μ V) quasi-peak, 50dB(μ V) average

6.3.2 Test setup



Description of test setup connection:

- Connect the control PC to the receiver through a USB to GPIB cable;
- The receiver is connected to the LISN through a coaxial line;
- Connect the power port of LISN to the EUT.

6.3.3 Procedure

An initial pre-scan was performed with peak detector, Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

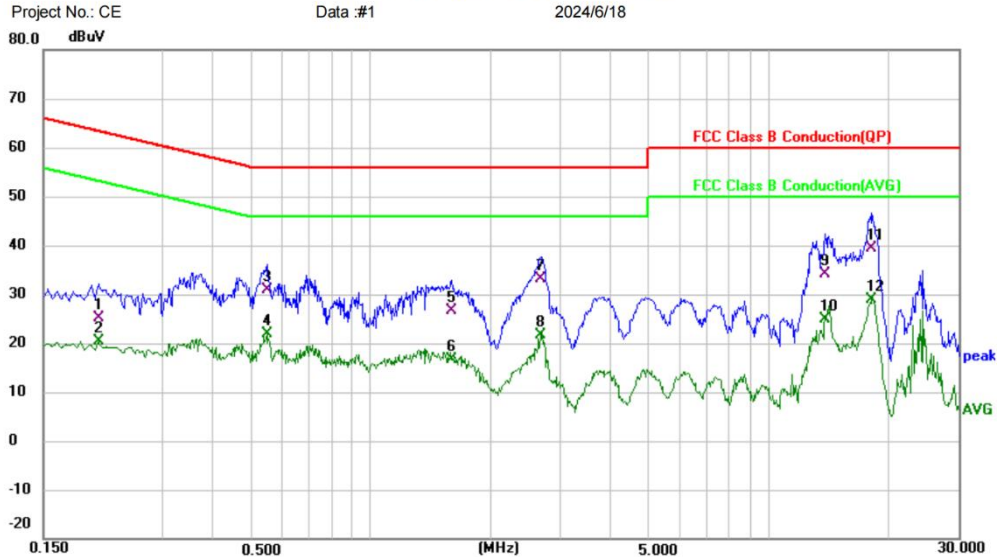
Remark:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

6.3.4 Test Data

[TestMode: TM1]; [Line: Line]; Voltage: [120V/60Hz]

Conducted Emission Measurement



Site: Phase: **L1** Temperature: (C)
Limit: FCC Class B Conduction(QP) Power: Humidity: %RH
EUT: TV Antenna Distance: RBW: 9 KHz
M/N: SW216 VBW: 30 KHz Sweep Time: 10 ms
Mode: TM1
Note:

No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree
1	0.2060	14.76	10.38	25.14	63.37	-38.23	QP		
2	0.2060	9.93	10.38	20.31	53.37	-33.06	AVG		
3	0.5460	20.90	9.87	30.77	56.00	-25.23	QP		
4	0.5460	11.93	9.87	21.80	46.00	-24.20	AVG		
5	1.5940	16.69	10.00	26.69	56.00	-29.31	QP		
6	1.5940	6.63	10.00	16.63	46.00	-29.37	AVG		
7	2.6780	22.99	10.10	33.09	56.00	-22.91	QP		
8	2.6780	11.48	10.10	21.58	46.00	-24.42	AVG		
9	13.9060	35.21	-1.14	34.07	60.00	-25.93	QP		
10	13.9060	25.97	-1.14	24.83	50.00	-25.17	AVG		
11 *	18.2220	25.10	14.18	39.28	60.00	-20.72	QP		
12	18.2220	14.74	14.18	28.92	50.00	-21.08	AVG		

*:Maximum data x:Over limit !:over margin

(Reference Only)

Receiver: ESPI_1

Spectrum Analyzer: ESPI

Test Result: Pass

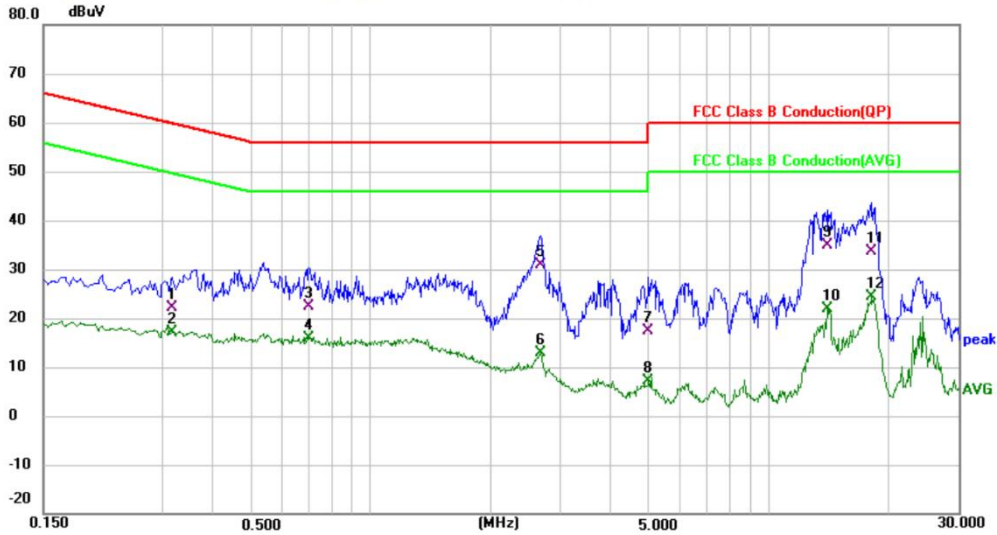
[TestMode: TM1]; [Line: Nutral] ;Voltage:[120V/60Hz]

Conducted Emission Measurement

Project No.: CE

Data :#2

2024/6/18



Site
Limit: FCC Class B Conduction(QP)
EUT: TV Antenna
M/N: SW216
Mode: TM1
Note:

Phase: **N**
Power:
Distance: RBW: 9 KHz
VBW: 30 KHz
Sweep Time: 10 ms
Temperature: (C)
Humidity: %RH

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree
1		0.3140	12.15	9.91	22.06	59.86	-37.80	QP		
2		0.3140	7.11	9.91	17.02	49.86	-32.84	AVG		
3		0.6980	12.41	9.97	22.38	56.00	-33.62	QP		
4		0.6980	5.85	9.97	15.82	46.00	-30.18	AVG		
5		2.6740	20.79	10.04	30.83	56.00	-25.17	QP		
6		2.6740	2.86	10.04	12.90	46.00	-33.10	AVG		
7		4.9940	6.91	10.36	17.27	56.00	-38.73	QP		
8		4.9940	-3.20	10.36	7.16	46.00	-38.84	AVG		
9	*	14.0300	36.28	-1.29	34.99	60.00	-25.01	QP		
10		14.0300	23.15	-1.29	21.86	50.00	-28.14	AVG		
11		18.1660	19.64	14.06	33.70	60.00	-26.30	QP		
12		18.1660	10.26	14.06	24.32	50.00	-25.68	AVG		

*:Maximum data x:Over limit !:over margin

(Reference Only)

Receiver: ESPI_1

Spectrum Analyzer: ESPI

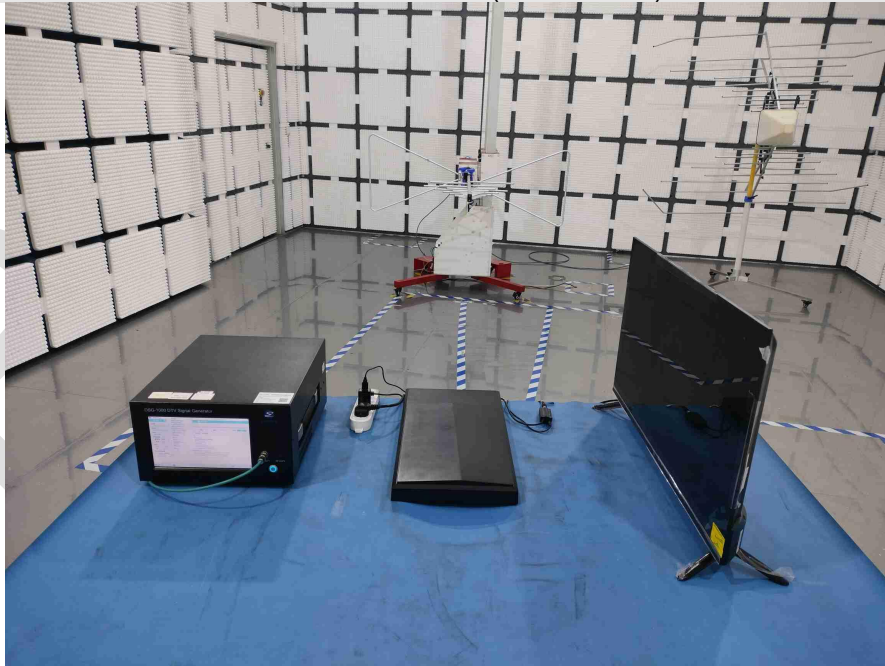
Test Result: Pass

Appendix A: photographs of test setup

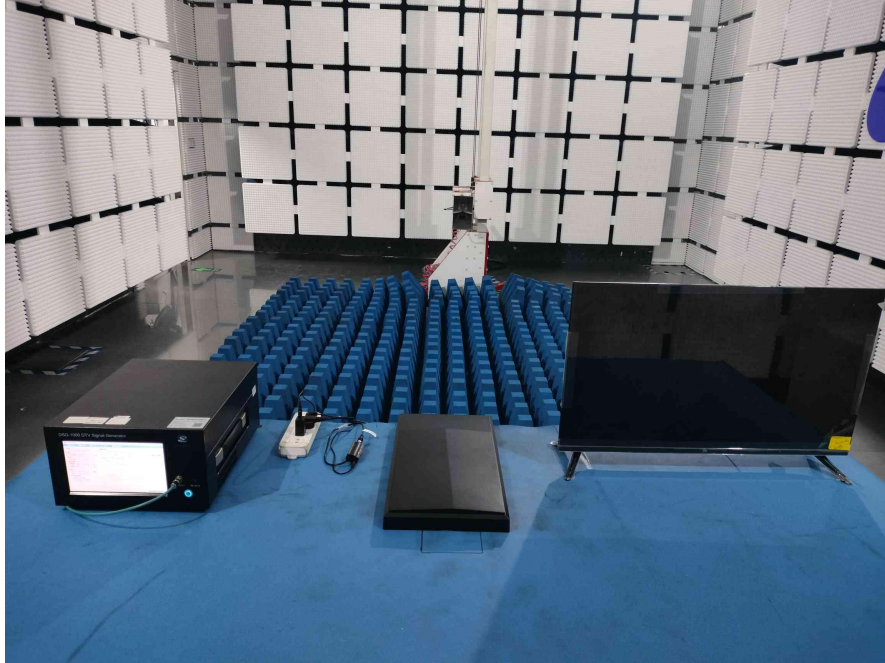
Radiated Emissions (30MHz-1GHz)



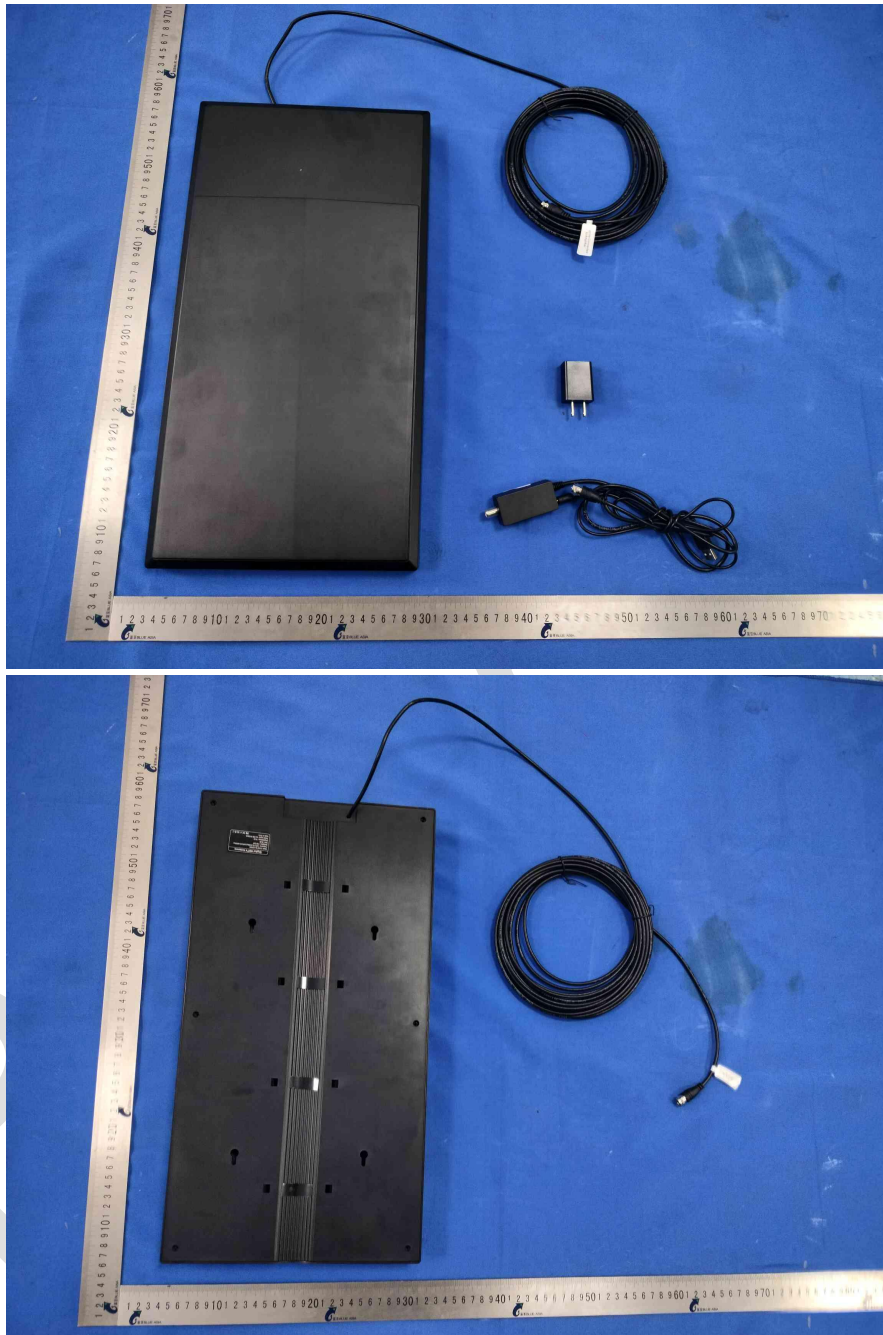
Radiated Emissions (above 1GHz)

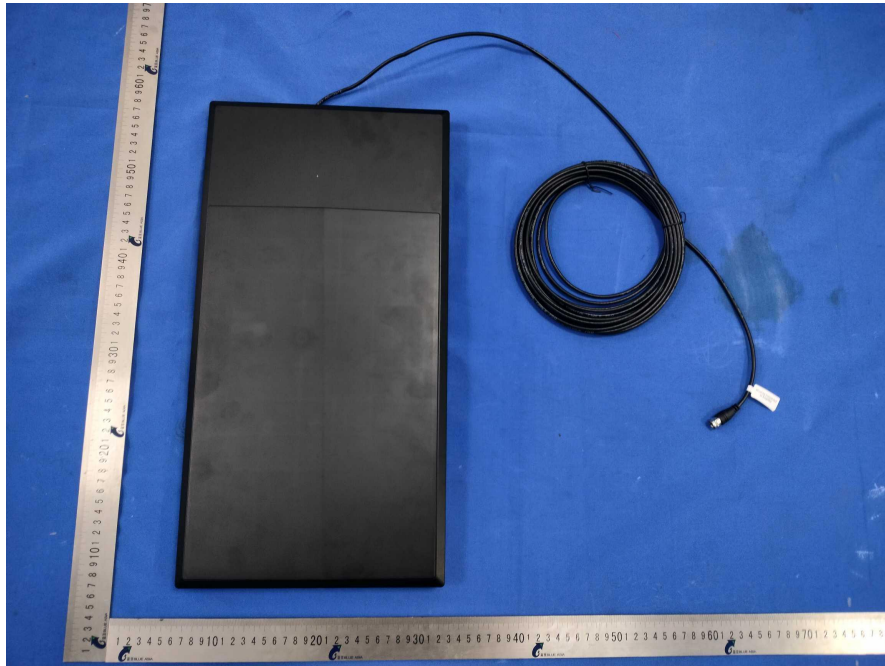


Conducted Immunity at Power Port (150kHz-80MHz)



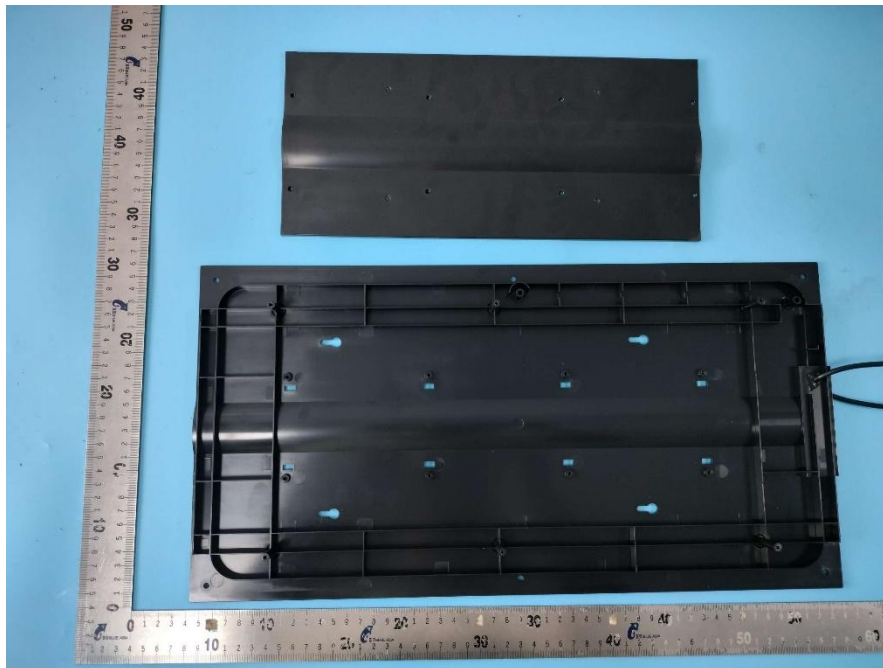
Appendix B: photographs of EUT

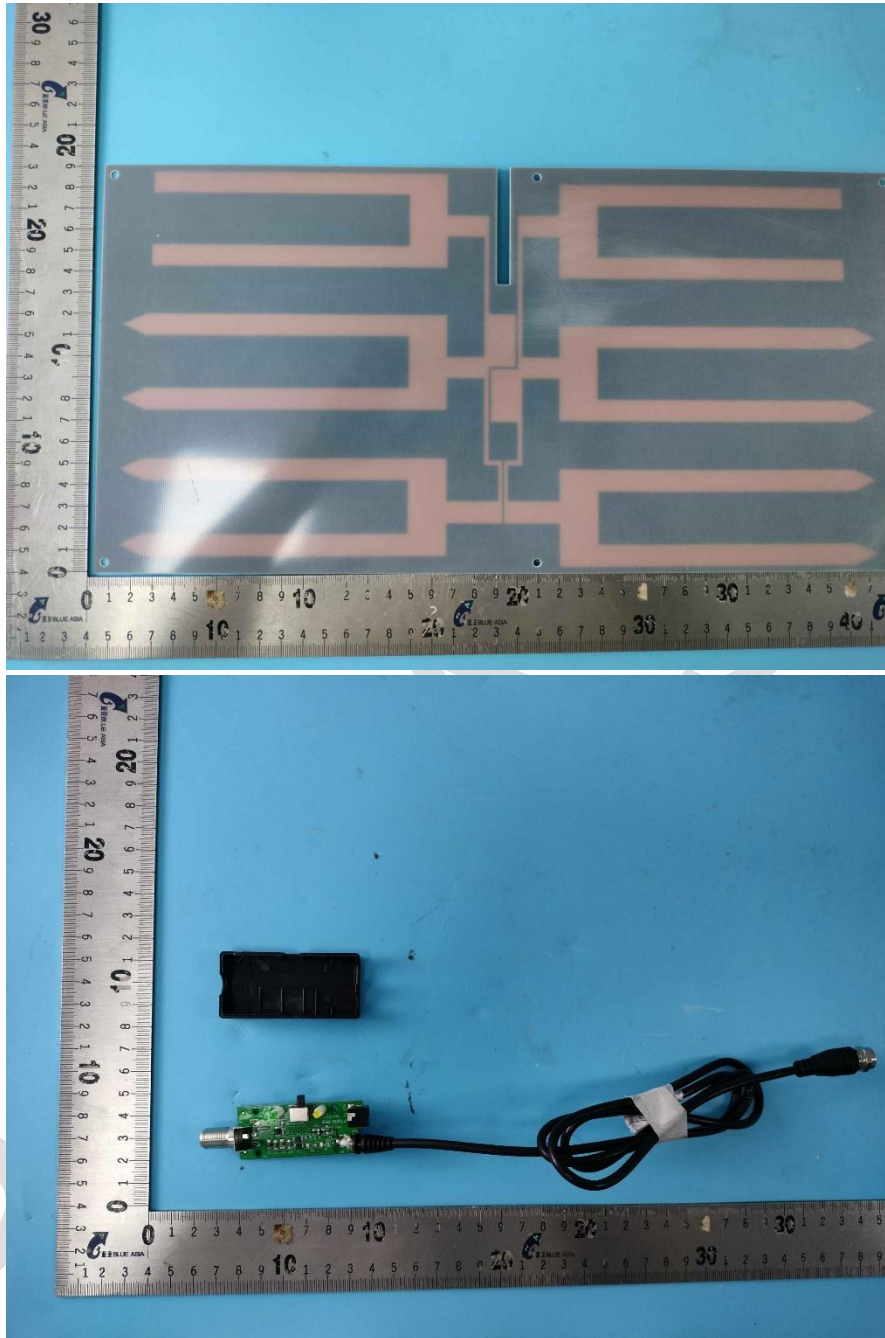


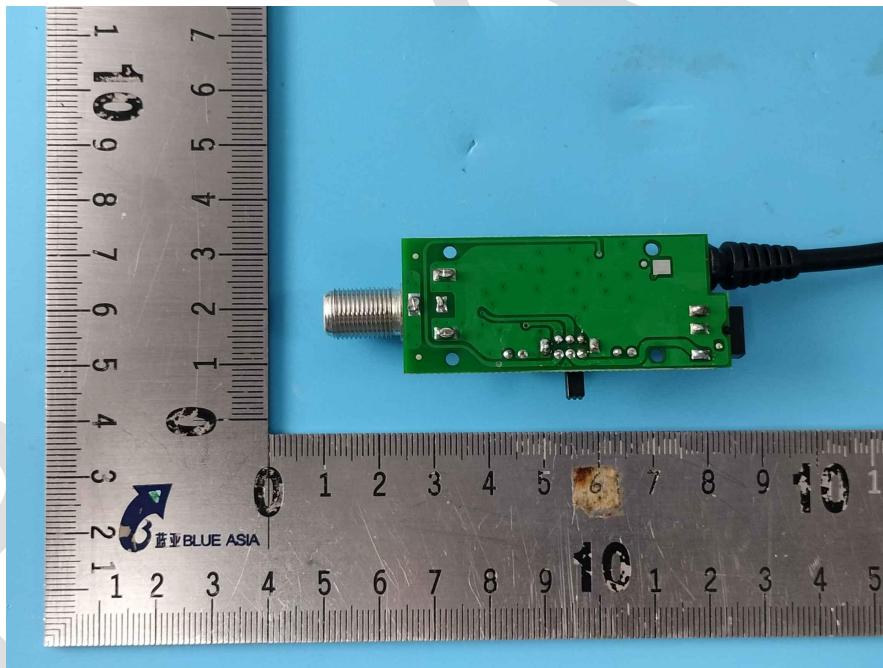
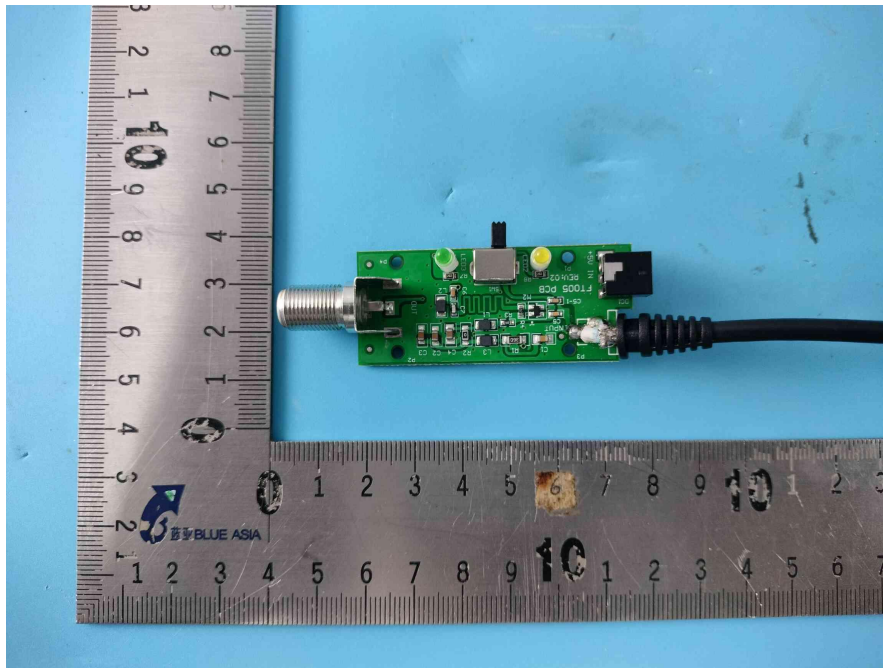


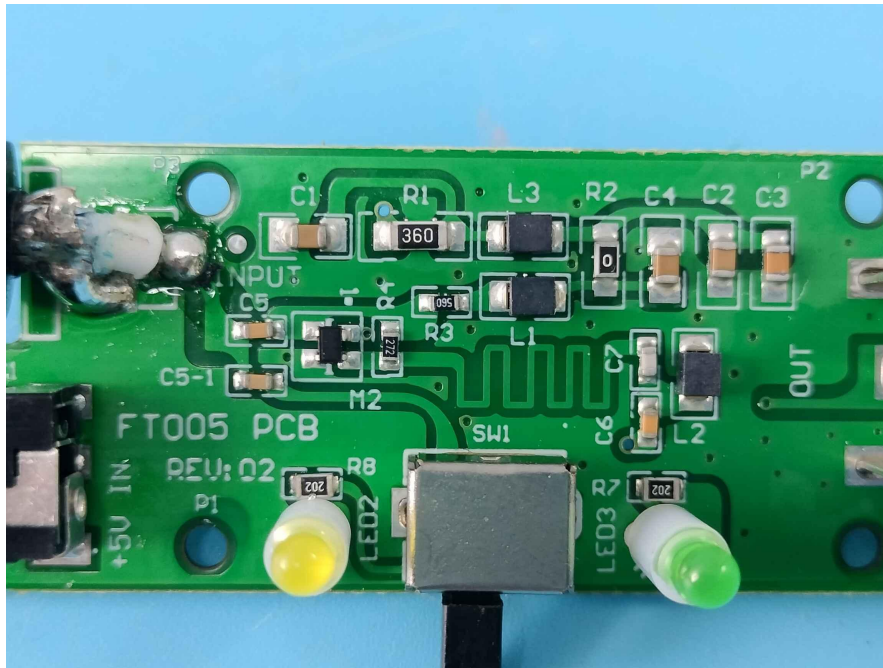












----END OF REPORT----

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