FCC Part 15C Test Report
FCC ID: 2BDEW-DC02

Applicant:	SHENZHEN YESSYS TECHNOLOGY CO., LTD
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Manufacturer:	SHENZHEN YESSYS TECHNOLOGY CO., LTD
Address:	Room 1307,Building 31, Lianchuang Science And Technology Park, No. 21 Bulan Road Xialilang Community, Nanwan Street,Longgang District, Shenzhen, China
EUT:	Signal collector
Trade Mark:	N/A
Model Number:	DC02, DC03
Date of Receipt:	Oct. 19, 2023
Test Date:	Oct. 19, 2023 - Oct. 30, 2023
Date of Report:	Oct. 30, 2023
Prepared By:	Shenzhen DL Testing Technology Co., Ltd.
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Applicable Standards:	FCC PART 15 C 15.247 ANSI C63.10:2013
Test Result:	Pass
Report Number:	DL-20231027027E

Prepared (Test Engineer):	Alisa Song
Reviewer (Supervisor):	Jack Bu
Approved (Manager):	Jade Yang

This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Shenzhen DL Testing Technology Co., Ltd.

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.205, 15.209, 15.247(d)	Radiated Spurious Emission	PASS	
15.205, 15.247(d)	Band Edge Emission& Conducted Spurious Emissions	PASS	
15.247(b)	Peak Output Power	PASS	
15.247(a)(2)	6dB Bandwidth	PASS	
15.247(e)	Power Spectral Density	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

1.1 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **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** %。

No.	Item	Uncertainty
1	Conducted Emission Test	±2.56dB
2	RF power,conducted	±0.42dB
3	Spurious emissions,conducted	±2.76dB
4	All emissions,radiated(<1G)	±3.65dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%
8	6dB Bandwidth	±0.2MHz

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product Name:	Signal collector
Trademark	N/A
Model No.:	DC02, DC03
Model Difference	All samples are the same except the model name and outlook color, so we prepare " DC02" for test only.
Operation Frequency:	2405~2480 MHz
Channel numbers:	16 Channels
Channel separation:	5MHz
Modulation technology:	GFSK
Antenna Type:	External Antenna
Antenna gain:	2.49 dBi
Power supply:	DC 7.5V from adapter
Adapter:	Model: XSC-0751000SCN Input: 100-240V~ 50/60Hz 0.4A Output: 7.5V⎓ 1A

Note:

1.For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.The EUT's all information provided by client.

2. Channel List

Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2405	09	2445
02	2410	10	2450
03	2415	11	2455
04	2420	12	2460
05	2425	13	2465
06	2430	14	2470
07	2435	15	2475
08	2440	16	2480

2.2 DESCRIPTION OF TEST MODES

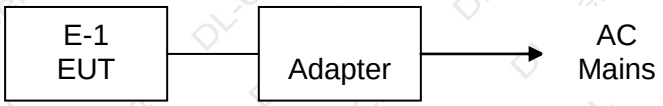
To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	CH01
Mode 2	CH09
Mode 3	CH16
Mode 4	Link Mode
For Conducted Emission	
Final Test Mode	Description
Mode 4	Link Mode
For Radiated Emission	
Final Test Mode	Description
Mode 1	CH01
Mode 2	CH09
Mode 3	CH16
Mode 4	Link Mode

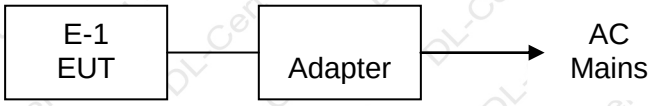
Note: 1. The measurements are performed at the highest, middle, lowest available channels.
2. During the test, the duty cycle >98%, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



Conducted Spurious Emission Test



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Model/Type No.	Series No.	Note
E-1	Signal collector	DC02	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

(1) For detachable type I/O cable should be specified the length in cm in『Length』column.

2.5 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

During testing, channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the end product.

Test software Version	Test program: TEST_V1.0.2		
Frequency	2405 MHz	2445 MHz	2480 MHz

2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation test, Band-edge test and 6db bandwidth test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4408B	MY50140780	Nov. 05, 2022	Nov. 04, 2023
2	Test Receiver (9kHz-7GHz)	R&S	ESRP7	101393	Nov. 05, 2022	Nov. 04, 2023
3	Bilog Antenna (30MHz-1GHz)	R&S	VULB9162	00306	Nov. 05, 2022	Nov. 04, 2023
4	Horn Antenna (1GHz-18GHz)	Schwarzbeck	BBHA9120D	02139	Nov. 05, 2022	Nov. 04, 2023
5	Horn Antenna (18GHz-40GHz)	A.H. Systems	SAS-574	588	Nov. 05, 2022	Nov. 04, 2023
6	Amplifier (9KHz-6GHz)	Schwarzbeck	BBV9743B	00153	Nov. 05, 2022	Nov. 04, 2023
7	Amplifier (1GHz-18GHz)	EMEC	EM01G8GA	00270	Nov. 05, 2022	Nov. 04, 2023
8	Amplifier (18GHz-40GHz)	Quanjuda	DLE-161	97	Nov. 05, 2022	Nov. 04, 2023
9	Loop Antenna (9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	Nov. 05, 2022	Nov. 04, 2023
10	RF cables1 (9kHz-1GHz)	ChengYu	966	004	Nov. 05, 2022	Nov. 04, 2023
11	RF cables2 (1GHz-40GHz)	ChengYu	966	003	Nov. 05, 2022	Nov. 04, 2023
12	Antenna connector	Florida RF Labs	N/A	RF 01#	Nov. 05, 2022	Nov. 04, 2023
13	Power probe	KEYSIGHT	U2021XA	MY55210018	Nov. 05, 2022	Nov. 04, 2023
14	Signal Analyzer 9kHz-26.5GHz	Agilent	N9020A	MY55370280	Nov. 05, 2022	Nov. 04, 2023
15	Test Receiver 20kHz-40GHz	R&S	ESU 40	100376	Nov. 05, 2022	Nov. 04, 2023
16	D.C. Power Supply	LongWei	PS-305D	010964729	Nov. 05, 2022	Nov. 04, 2023
17	Power Meter	Agilent	E4419B	A0015468	Nov. 05, 2022	Nov. 04, 2023

Conduction Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	843 Shielded Room	ChengYu	843 Room	843	Sep. 20, 2022	Sep. 19, 2025
2	EMI Receiver	R&S	ESR	101421	Nov. 05, 2022	Nov. 04, 2023
3	LISN	R&S	ENV216	102417	Nov. 05, 2022	Nov. 04, 2023
4	843 Cable 1#	ChengYu	CE Cable	001	Nov. 05, 2022	Nov. 04, 2023

Other

Item	Name	Manufacturer	Model	Software version
1	EMC Conduction Test System	FALA	EZ_EMC	EMC-CON 3A1.1
2	EMC radiation test system	FALA	EZ_EMC	FA-03A2
3	RF test system	MAIWEI	MTS8310	2.0.0.0
4	RF communication test system	MAIWEI	MTS8200	2.0.0.0

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Limit (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.50	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

a. The EUT was placed 0.8 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.

b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

c. 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.

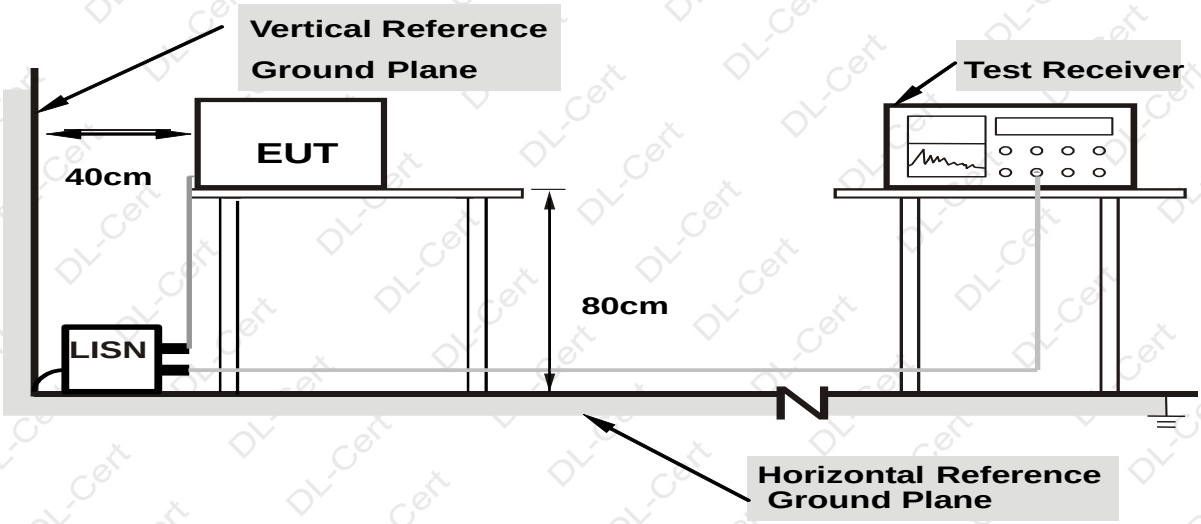
d. LISN at least 80 cm from nearest part of EUT chassis.

e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



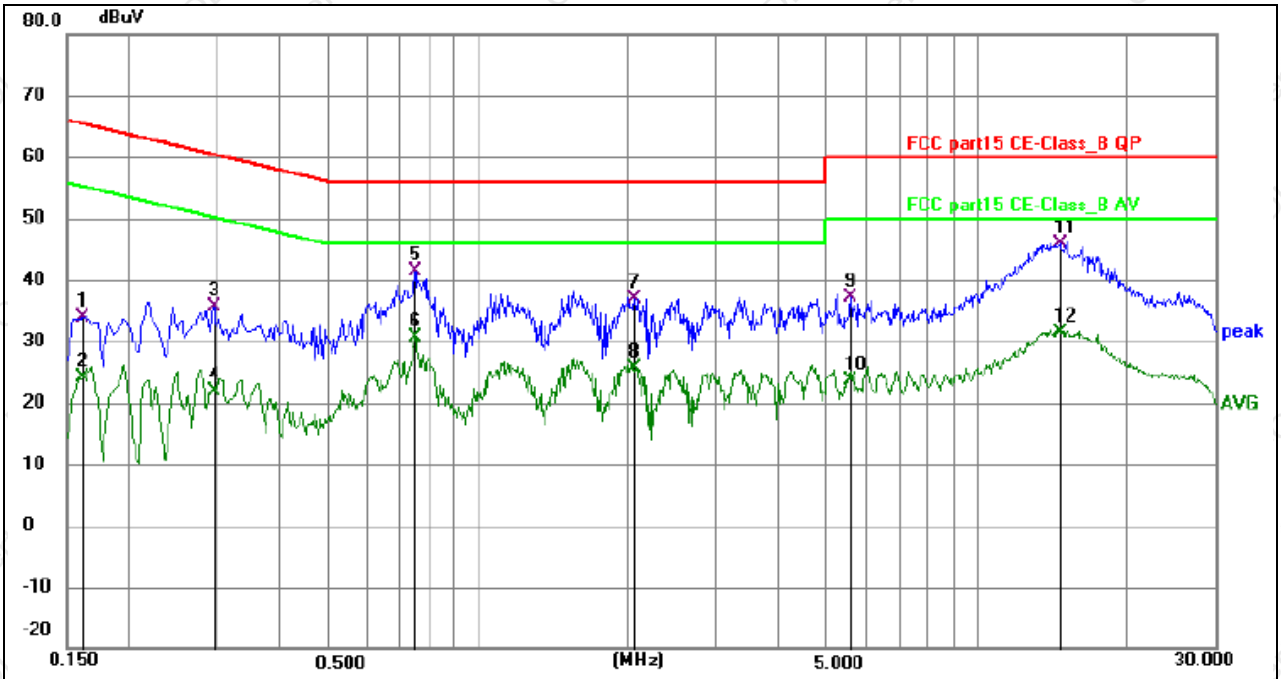
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.
We pretest AC 120V and AC 230V, the worst voltage was AC 120V and the data recording in the report.

3.1.6 TEST RESULTS

Temperature:	25 ℃	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	L
Test Voltage :	AC 120V/60Hz	Test Mode:	Mode 4

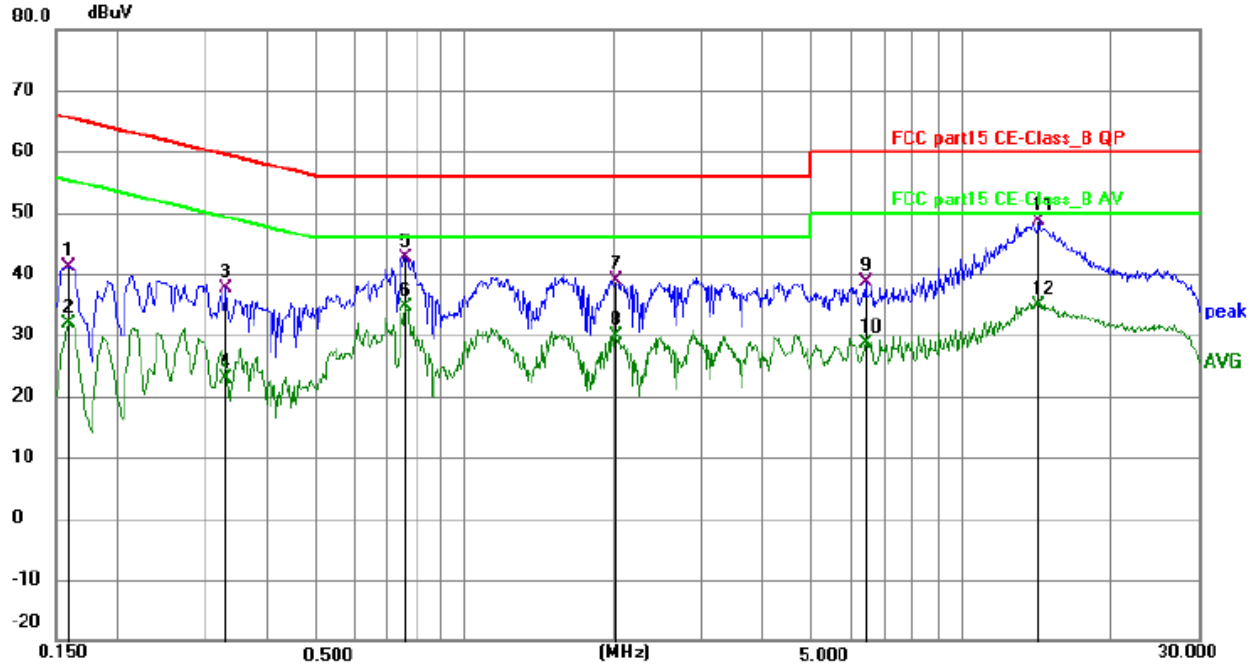


Remark:

Margin = Limit – Level, Correct Factor = Cable lose + LISN insertion loss, Level= Reading + Correct factor

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.161500	23.64	10.26	33.90	65.39	-31.49	QP	P	
2	0.161500	13.77	10.26	24.03	55.39	-31.36	AVG	P	
3	0.294000	26.56	9.04	35.60	60.41	-24.81	QP	P	
4	0.294000	12.79	9.04	21.83	50.41	-28.58	AVG	P	
5	0.748500	31.93	9.37	41.30	56.00	-14.70	QP	P	
6	0.748500	21.15	9.37	30.52	46.00	-15.48	AVG	P	
7	2.057900	27.12	9.79	36.91	56.00	-19.09	QP	P	
8	2.057900	15.78	9.79	25.57	46.00	-20.43	AVG	P	
9	5.581500	27.39	9.69	37.08	60.00	-22.92	QP	P	
10	5.581500	13.98	9.69	23.67	50.00	-26.33	AVG	P	
11 *	14.626500	35.87	10.11	45.98	60.00	-14.02	QP	P	
12	14.626500	21.34	10.11	31.45	50.00	-18.55	AVG	P	

Temperature:	25 ℃	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	N
Test Voltage :	AC 120V/60Hz	Test Mode:	Mode 4



Remark:

Margin = Limit – Level, Correct Factor = Cable lose + LISN insertion loss, Level= Reading + Correct factor

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.159000	31.05	10.08	41.13	65.52	-24.39	QP	P	
2	0.159000	21.90	10.08	31.98	55.52	-23.54	AVG	P	
3	0.330000	28.43	9.10	37.53	59.45	-21.92	QP	P	
4	0.330000	13.78	9.10	22.88	49.45	-26.57	AVG	P	
5	0.762000	33.51	9.23	42.74	56.00	-13.26	QP	P	
6	0.762000	25.46	9.23	34.69	46.00	-11.31	AVG	P	
7	2.017500	29.00	9.84	38.84	56.00	-17.16	QP	P	
8	2.017500	20.04	9.84	29.88	46.00	-16.12	AVG	P	
9	6.400500	28.85	9.84	38.69	60.00	-21.31	QP	P	
10	6.400500	18.83	9.84	28.67	50.00	-21.33	AVG	P	
11 *	14.257500	38.49	10.24	48.73	60.00	-11.27	QP	P	
12	14.257500	24.75	10.24	34.99	50.00	-15.01	AVG	P	

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	25GHz
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

Below 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 0.8 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).
h. Test the EUT in the lowest channel, the middle channel, the Highest channel

Note:

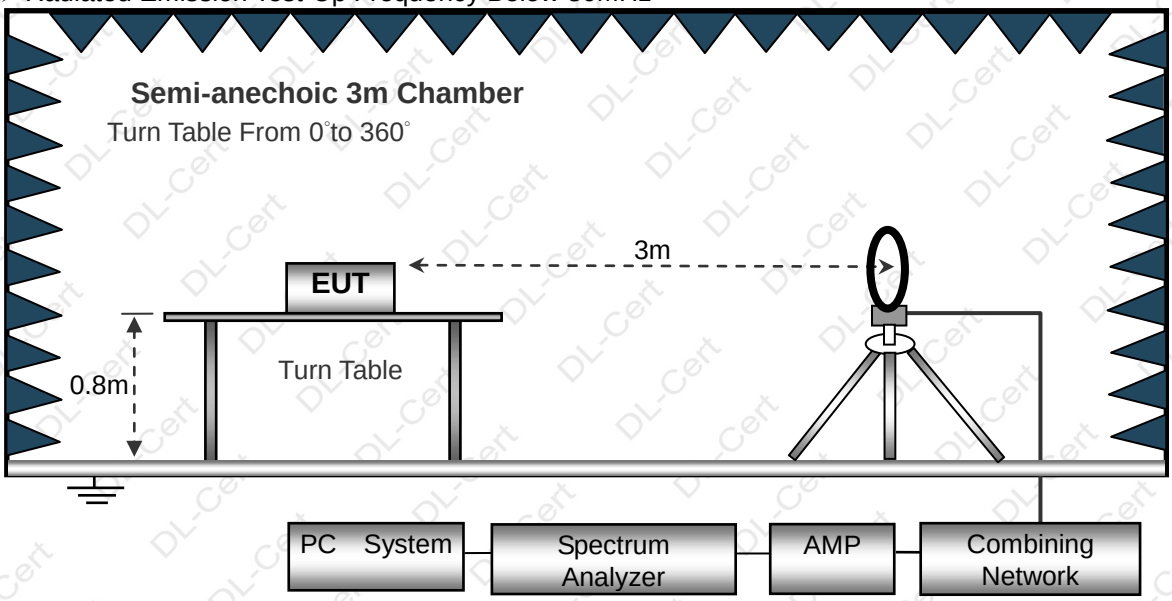
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

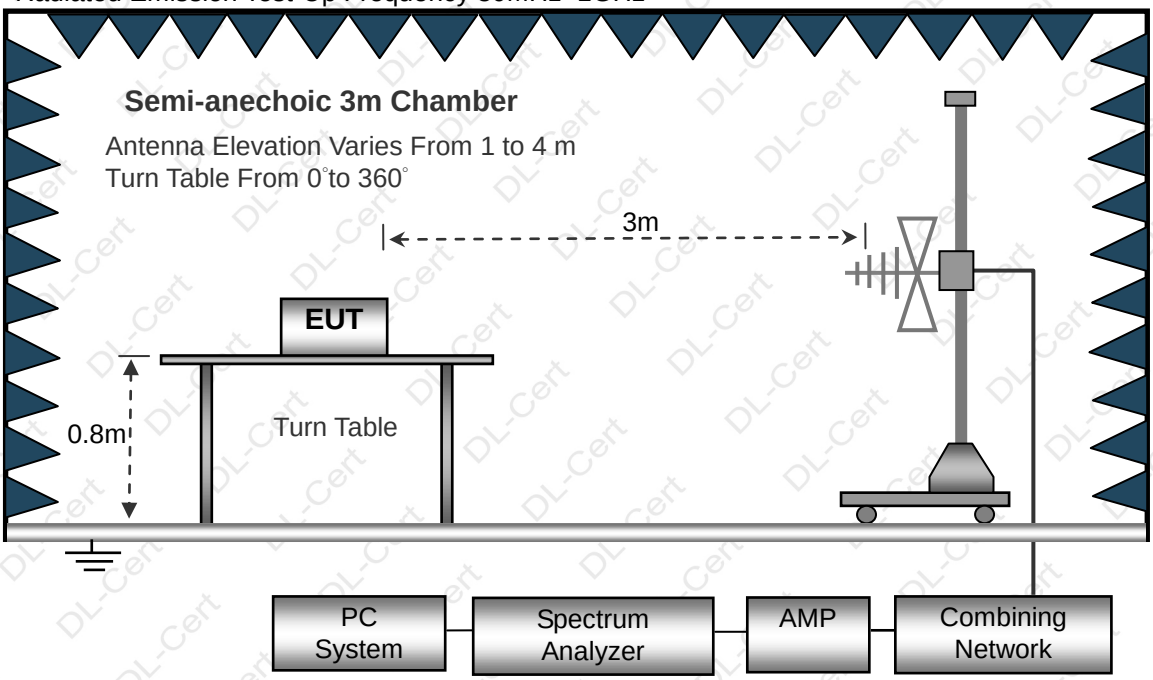
No deviation

3.2.4 TEST SETUP

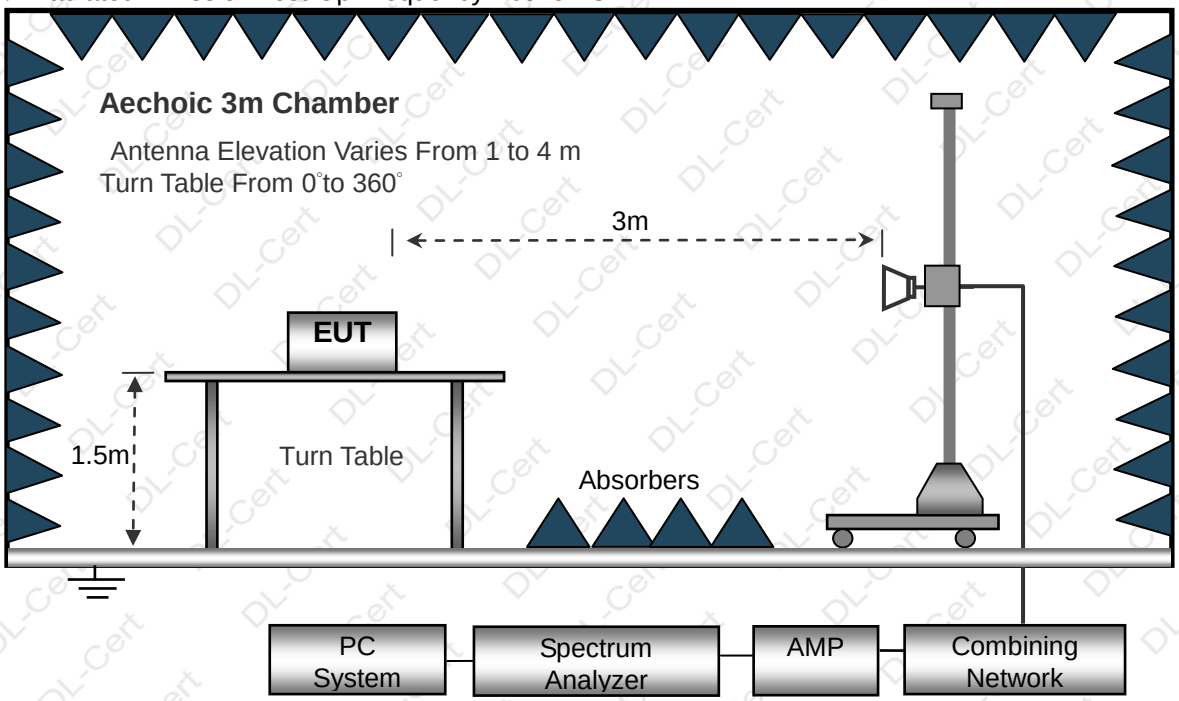
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)

Temperature:	20℃	Relative Humidtity:	48%
Pressure:	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	Mode 4	Polarization :	--

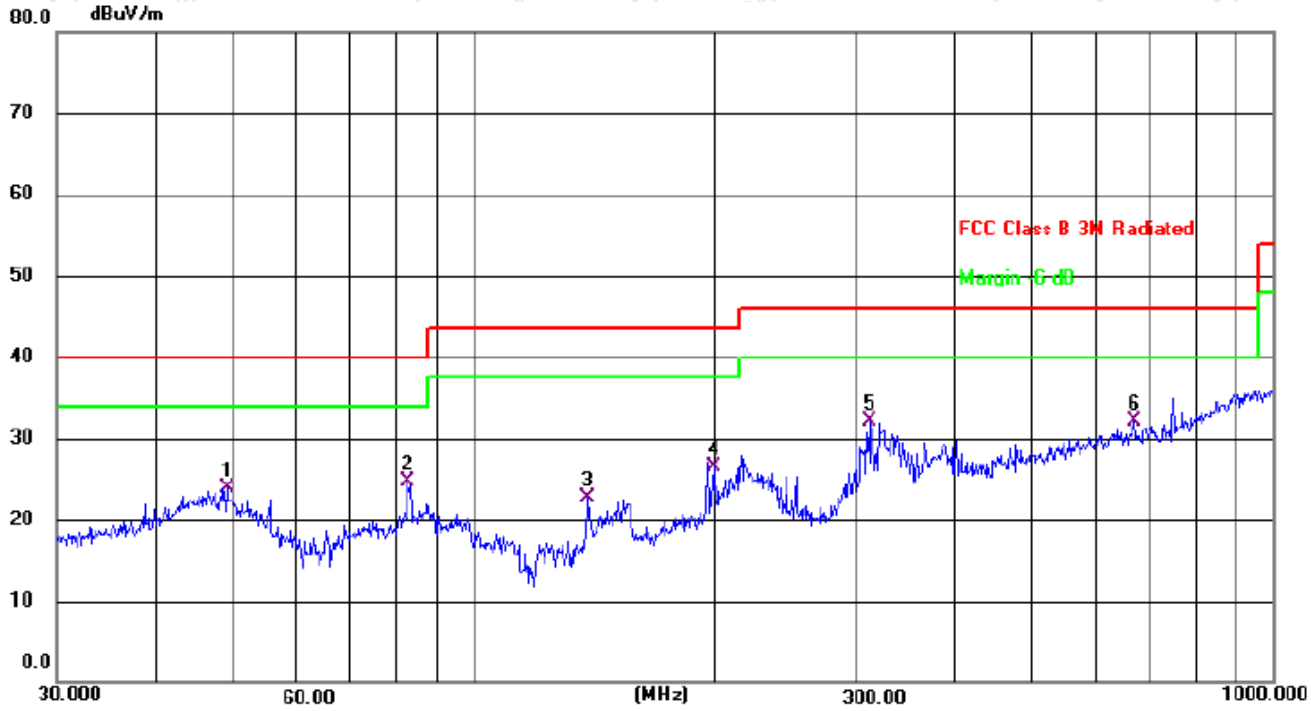
Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

Temperature:	26℃	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization :	Horizontal
Test Voltage :	AC 120V/60Hz		
Test Mode :	Mode 4		



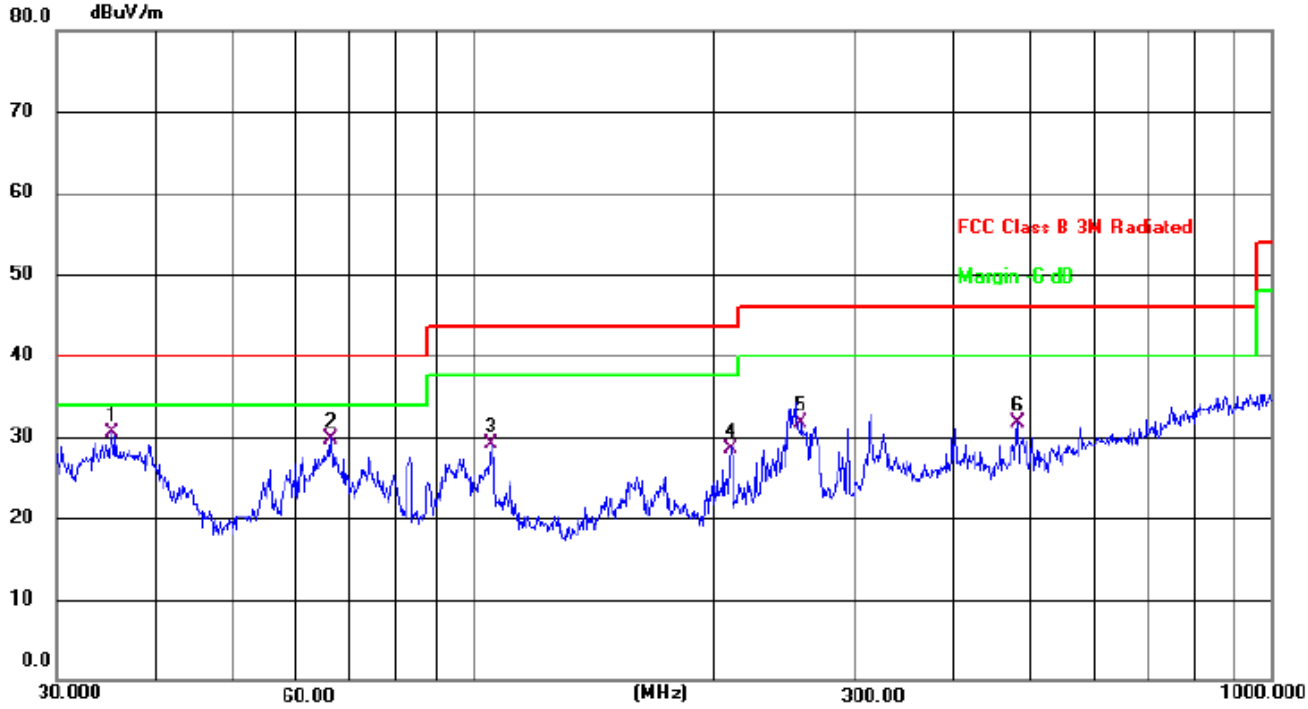
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		49.0144	35.49	-11.54	23.95	40.00	-16.05	QP
2		82.6478	41.60	-16.99	24.61	40.00	-15.39	QP
3		138.8734	38.79	-16.04	22.75	43.50	-20.75	QP
4		199.9855	39.44	-12.90	26.54	43.50	-16.96	QP
5	*	313.2760	42.00	-9.86	32.14	46.00	-13.86	QP
6		670.4891	35.53	-3.50	32.03	46.00	-13.97	QP

Remark:

Correct Factor = Cable loss + Antenna factor – Preamplifier;

Level = Reading Level + Correct Factor; Margin = Level - Limit;

Temperature:	26℃	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization :	Vertical
Test Voltage :	AC 120V/60Hz		
Test Mode :	Mode 4		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	35.2511	44.34	-13.84	30.50	40.00	-9.50	QP
2		66.2660	44.35	-14.55	29.80	40.00	-10.20	QP
3		105.2716	43.19	-14.00	29.19	43.50	-14.31	QP
4		210.0481	41.15	-12.55	28.60	43.50	-14.90	QP
5		257.4221	42.69	-11.00	31.69	46.00	-14.31	QP
6		480.5276	38.68	-6.97	31.71	46.00	-14.29	QP

Remark:

Correct Factor = Cable loss + Antenna factor – Preamplifier;

Level = Reading Level + Correct Factor; Margin = Level - Limit;

3.2.8 TEST RESULTS (1GHZ~25GHZ)

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2405									
V	4810	67.72	50.65	6.88	31.29	55.24	74.00	-18.76	PK
V	4810	55.26	50.65	6.88	31.29	42.78	54.00	-11.22	AV
V	7215	66.83	49.98	7.16	36.63	60.64	74.00	-13.36	PK
V	7215	46.29	49.98	7.16	36.63	40.10	54.00	-13.90	AV
V	16113	48.65	51.53	11.34	41.52	49.98	74.00	-24.02	PK
H	4810	66.50	50.65	6.88	31.29	54.02	74.00	-19.98	PK
H	4810	55.07	50.65	6.88	31.29	42.59	54.00	-11.41	AV
H	7215	69.21	49.98	7.16	36.63	63.02	74.00	-10.98	PK
H	7215	45.80	49.98	7.16	36.63	39.61	54.00	-14.39	AV
H	16113	48.26	51.53	11.34	41.52	49.59	74.00	-24.41	PK
operation frequency:2445									
V	4890	67.12	50.67	6.89	31.38	54.72	74.00	-19.28	PK
V	4890	55.27	50.67	6.89	31.38	42.87	54.00	-11.13	AV
V	7335	69.07	50.02	7.24	36.63	62.92	74.00	-11.08	PK
V	7335	46.07	50.02	7.24	36.63	39.92	54.00	-14.08	AV
V	16113	48.16	51.53	11.34	41.52	49.49	74.00	-24.51	PK
H	4890	66.58	50.67	6.89	31.38	54.18	74.00	-19.82	PK
H	4890	55.45	50.67	6.89	31.38	43.05	54.00	-10.95	AV
H	7335	69.53	50.02	7.24	36.63	63.38	74.00	-10.62	PK
H	7335	47.17	50.02	7.24	36.63	41.02	54.00	-12.98	AV
H	16113	48.28	51.53	11.34	41.52	49.61	74.00	-24.39	PK
operation frequency:2480									
V	4960	68.22	50.79	6.83	31.36	55.62	74.00	-18.38	PK
V	4960	55.28	50.79	6.83	31.36	42.68	54.00	-11.32	AV
V	7440	69.42	50.11	7.25	36.58	63.14	74.00	-10.86	PK
V	7440	46.56	50.11	7.25	36.58	40.28	54.00	-13.72	AV
V	16113	49.27	51.53	11.34	41.52	50.60	74.00	-23.40	PK
H	4960	67.59	50.79	6.83	31.36	54.99	74.00	-19.01	PK
H	4960	55.55	50.79	6.83	31.36	42.95	54.00	-11.05	AV
H	7440	67.08	50.11	7.25	36.58	60.80	74.00	-13.20	PK
H	7440	48.19	50.11	7.25	36.58	41.91	54.00	-12.09	AV
H	16113	49.55	51.53	11.34	41.52	50.88	74.00	-23.12	PK

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
   Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

3.3 RADIATED BAND EMISSION MEASUREMENT

3.3.1 TEST REQUIREMENT:

FCC Part15 C Section 15.209 and 15.205

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	2300MHz
Stop Frequency	2520
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

3.3.2 TEST PROCEDURE

Above 1GHz test procedure as below:

a. 1. The EUT was placed on the top of a rotating table 0.1 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

g. Test the EUT in the lowest channel,the Highest channel

Note:

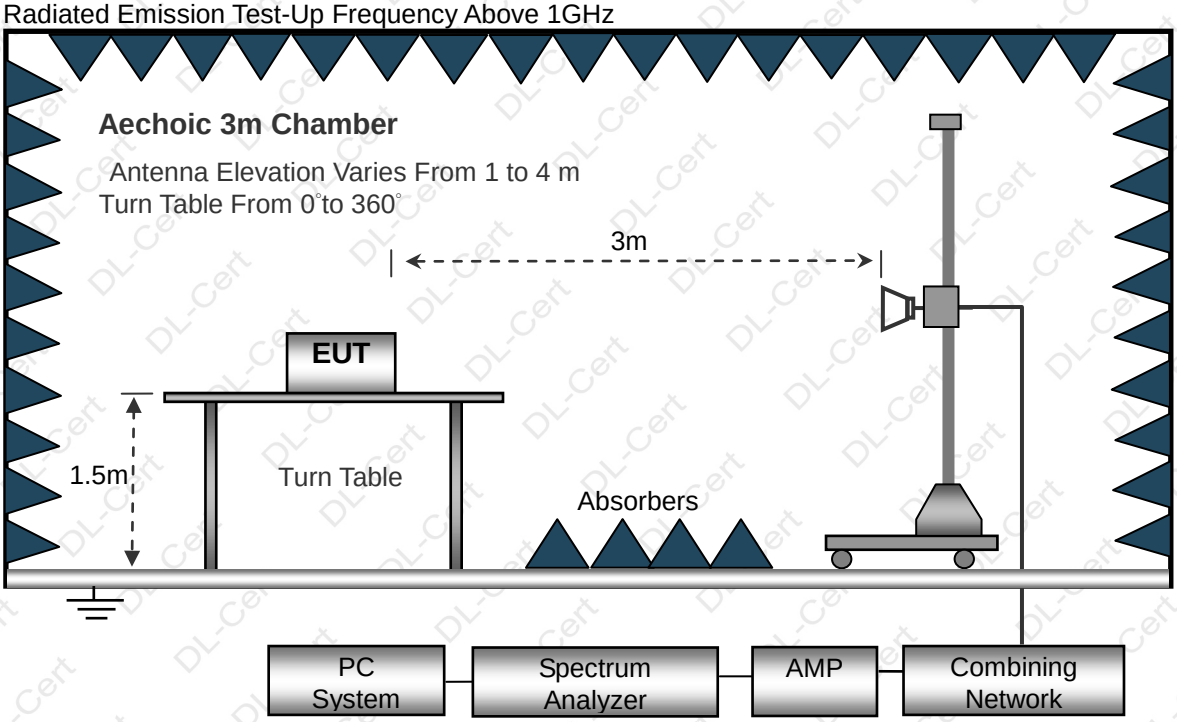
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

3.3.3 DEVIATION FROM TEST STANDARD

No deviation

3.3.4 TEST SETUP

Radiated Emission Test-Up Frequency Above 1GHz



3.3.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

3.3.6 TEST RESULT

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2405									
V	2390	76.13	52.12	2.73	27.38	54.12	74.00	-19.88	PK
V	2390	65.48	52.12	2.73	27.38	43.47	54.00	-10.53	AV
V	2400	76.24	52.16	2.78	27.41	54.27	74.00	-19.73	PK
V	2400	64.17	52.16	2.78	27.41	42.20	54.00	-11.80	AV
H	2390	76.76	52.12	2.73	27.38	54.75	74.00	-19.25	PK
H	2390	65.74	52.12	2.73	27.38	43.73	54.00	-10.27	AV
H	2400	76.55	52.16	2.78	27.41	54.58	74.00	-19.42	PK
H	2400	65.59	52.16	2.78	27.41	43.62	54.00	-10.38	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2480									
V	2483.5	76.16	52.23	2.86	27.44	54.23	74.00	-19.77	PK
V	2483.5	65.62	52.23	2.86	27.44	43.69	54.00	-10.31	AV
V	2500	76.21	52.26	2.88	27.49	54.32	74.00	-19.68	PK
V	2500	64.09	52.26	2.88	27.49	42.20	54.00	-11.80	AV
H	2483.5	76.72	52.23	2.86	27.44	54.79	74.00	-19.21	PK
H	2483.5	65.49	52.23	2.86	27.44	43.56	54.00	-10.44	AV
H	2500	76.28	52.26	2.88	27.49	54.39	74.00	-19.61	PK
H	2500	65.23	52.26	2.88	27.49	43.34	54.00	-10.66	AV

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
   Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

3.4 CONDUCTED BAND EDGE EMISSION&CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074 D0115.247 Meas Guidance v05r02

3.4.1 APPLICABLE STANDARD

in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in§15.205(a), must also comply with the radiated emission limits specified in15.209(a).
If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

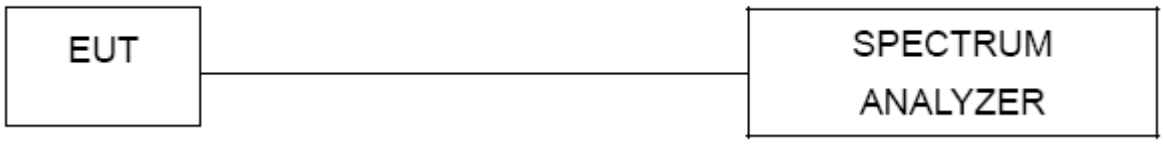
3.4.2 TEST PROCEDURE

Using the following spectrum analyzer setting:
Set the RBW = 100KHz.
Set the VBW = 300KHz.
Sweep time = auto couple.
Detector function = peak.
Trace mode = max hold.
Allow trace to fully stabilize.

3.4.3 DEVIATION FROM STANDARD

No deviation.

3.4.4 TEST SETUP



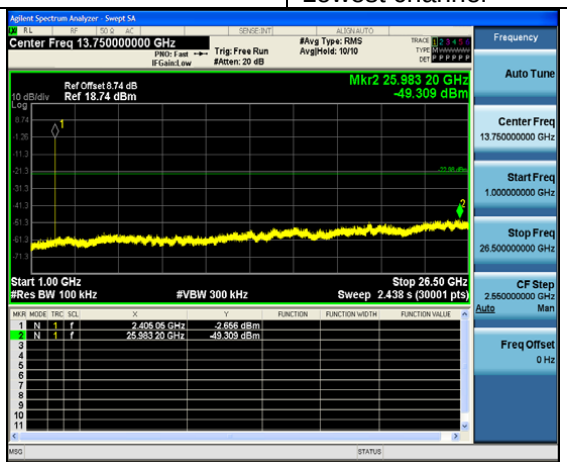
3.4.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

3.4.6 TEST RESULTS

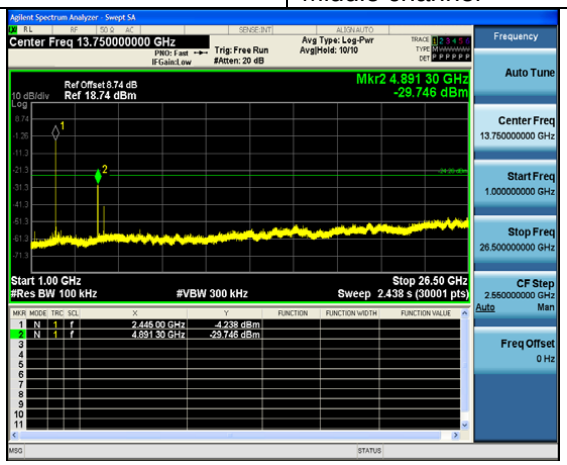
For Conducted Spurious

Test channel:	Lowest channel



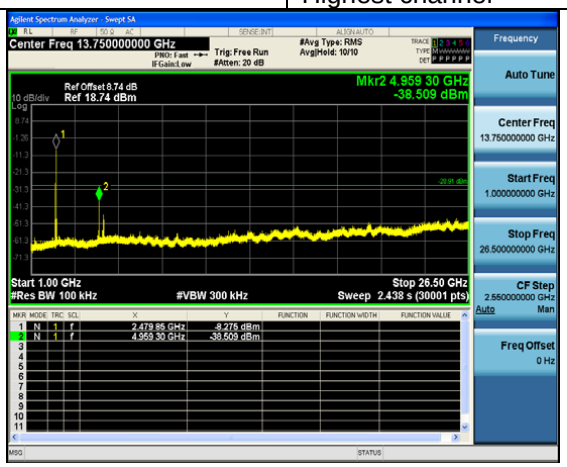
0.03GHz~26.5GHz

Test channel:	Middle channel



0.03GHz~26.5GHz

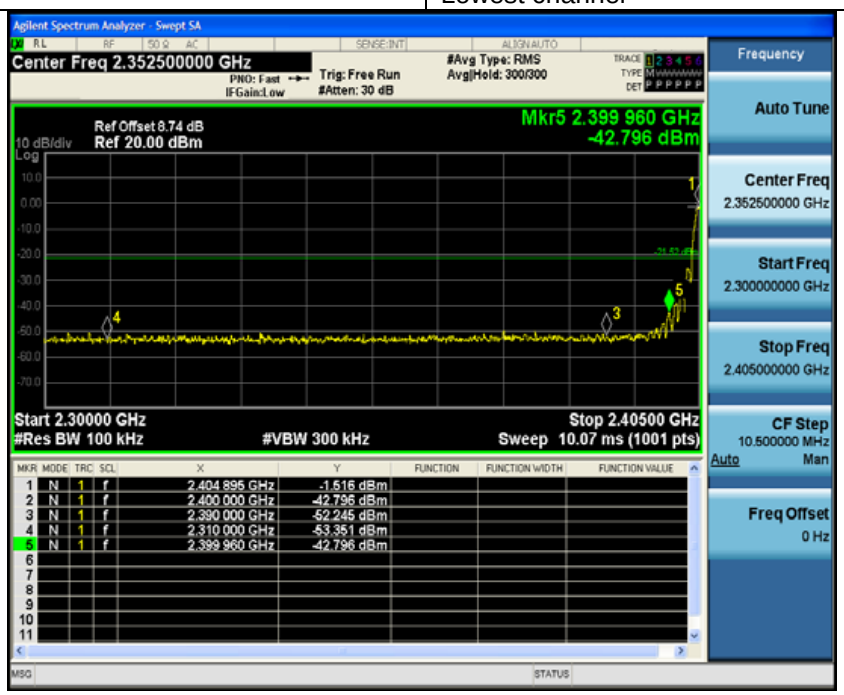
Test channel:	Highest channel



0.03GHz~26.5GHz

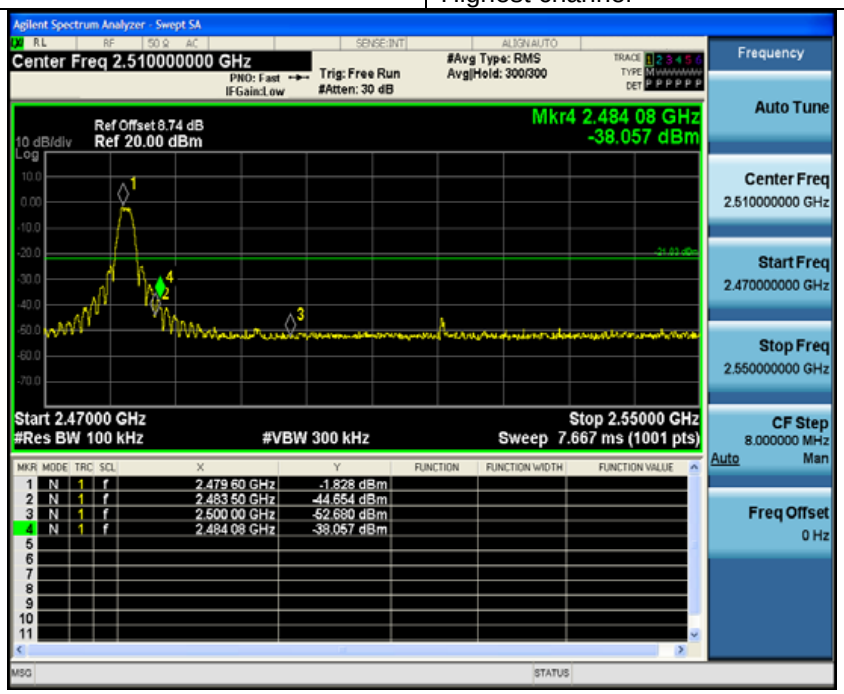
For Conducted Band

Test channel:	Lowest channel



2405 MHz

Test channel:	Highest channel



0.03GHz~26.5GHz

4. PEAK OUTPUT POWER

4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

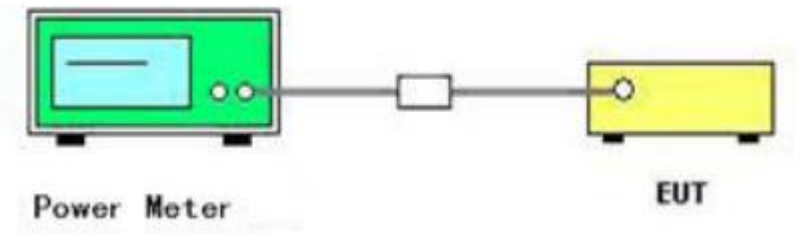
4.1.1 TEST PROCEDURE

a.The EUT was directly connected to the power meter and antenna output port as show in the block diagram below.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



4.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

4.1.5 TEST RESULTS

Temperature:	25 ℃	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage :	AC 120V/60Hz

Test Channel	Channel Frequency (MHz)	Peak Output Power (dBm)	LIMIT (dBm)
Low	2405	6.26	30.00
Middle	2445	6.68	30.00
High	2480	5.92	30.00

5. POWER SPECTRAL DENSITY TEST

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	= the frequency band of operation
RB	RBW ≥ 3kHz
VB	VBW ≥ 3RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

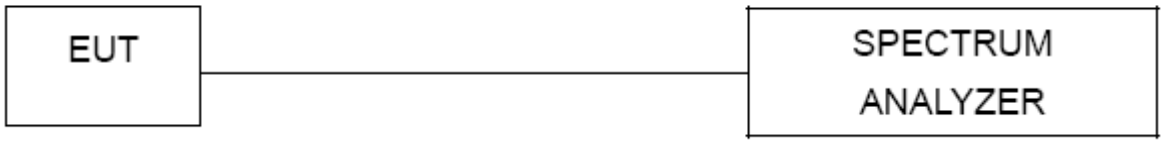
5.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP

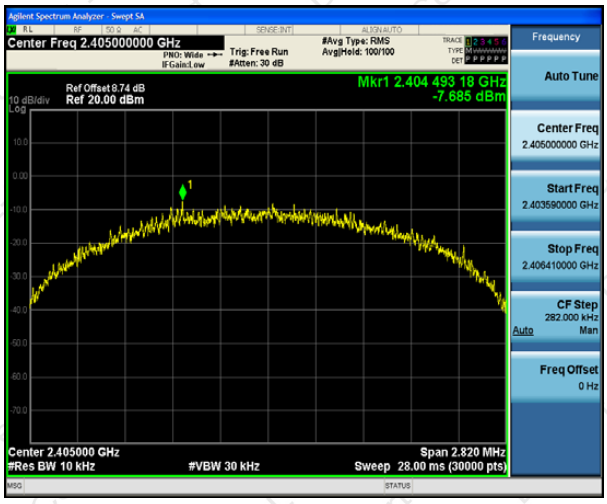


5.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

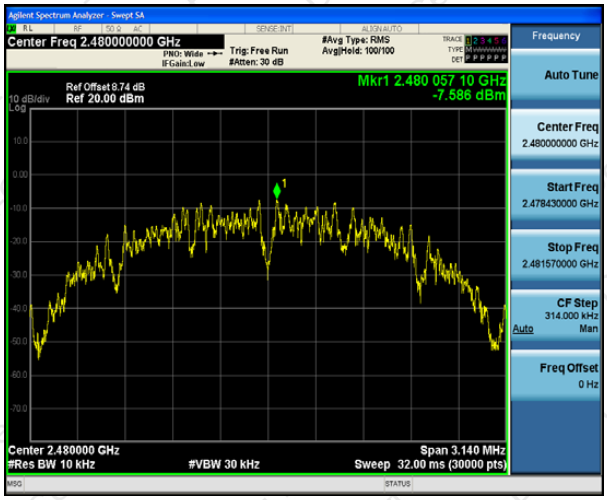
5.1.5 TEST RESULTS

Test Channel	Channel Frequency (MHz)	Level (dBm/10KHz)	10log (3/10)	Reading Level (dBm/3kHz)	Limit (dBm/3kHz)	Result
Low	2405	-7.69	-5.23	-12.92	8	PASS
Middle	2445	-6.99	-5.23	-12.22	8	PASS
High	2480	-7.59	-5.23	-12.82	8	PASS



2405MHz

2445MHz



2480MHz

6. 6DB BANDWIDTH TEST

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range(MHz)	Result
15.247(a)(2)	Bandwidth	>= 500KHz (6dB bandwidth)	2400-2483.5	PASS

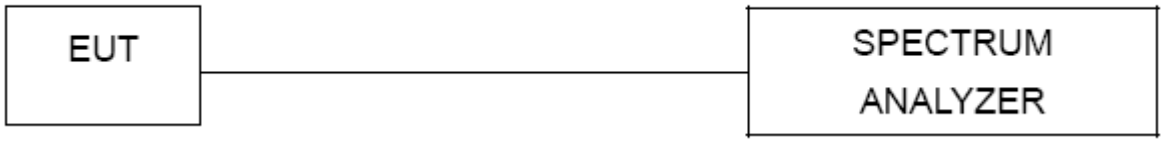
6.1.1 TEST PROCEDURE

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP

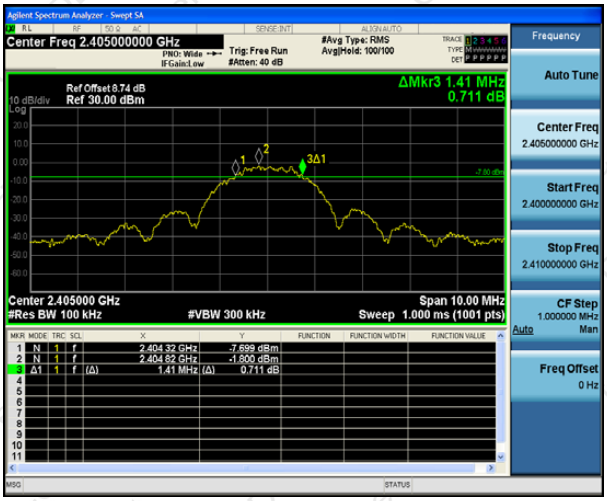


6.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

6.1.5 TEST RESULTS

Test Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
Low	2405	1.410	0.5	Pass
Middle	2445	1.490	0.5	Pass
High	2480	1.570	0.5	Pass



2405MHz

2445MHz

2480MHz

7. ANTENNA REQUIREMENT

7.1 STANDARD REQUIREMENT

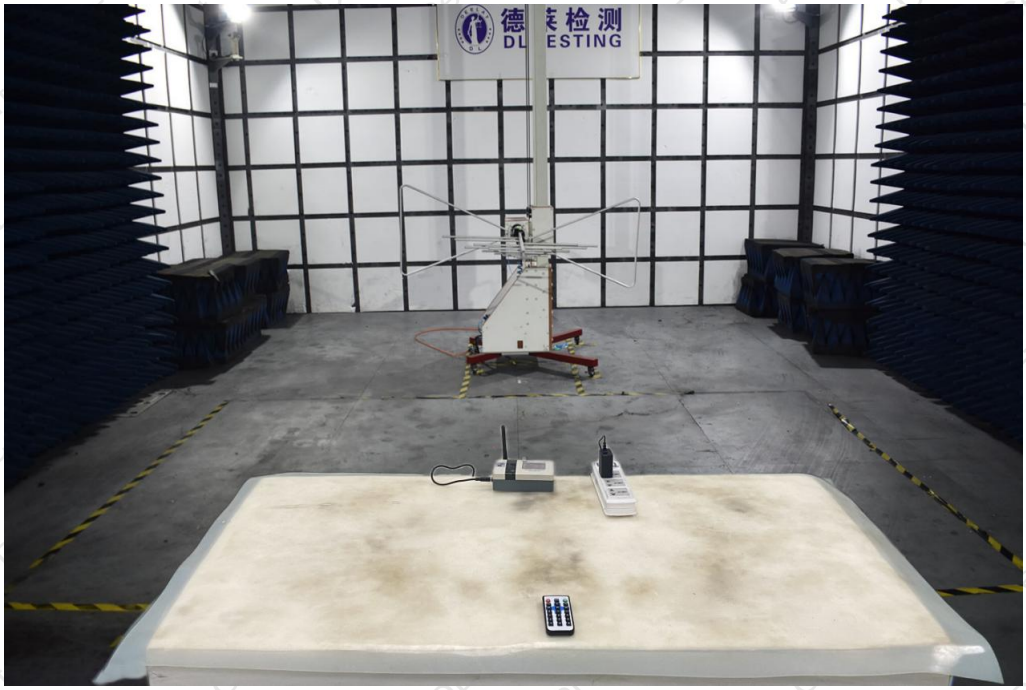
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

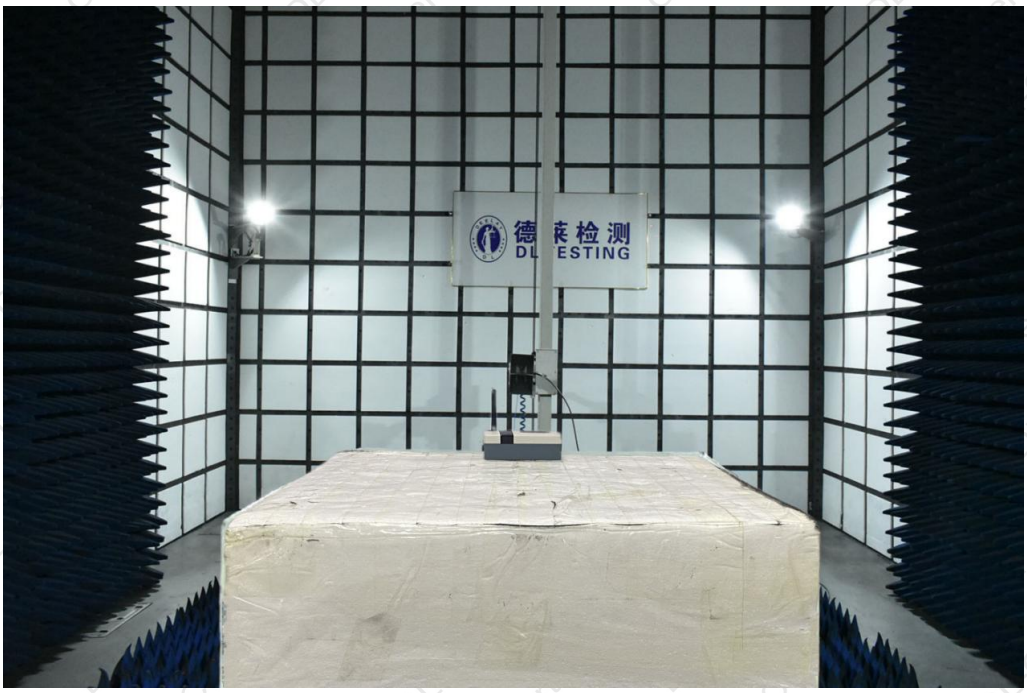
7.2 EUT ANTENNA

The EUT antenna is External Antenna, It comply with the standard requirement.

8. TEST SEUUP PHOTO

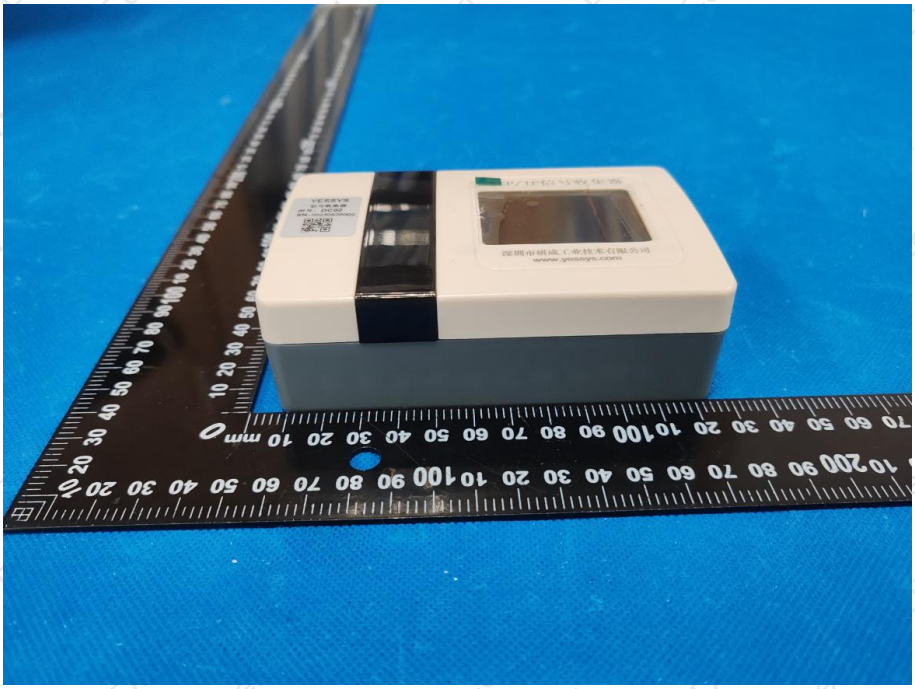
Radiated Measurement Photos

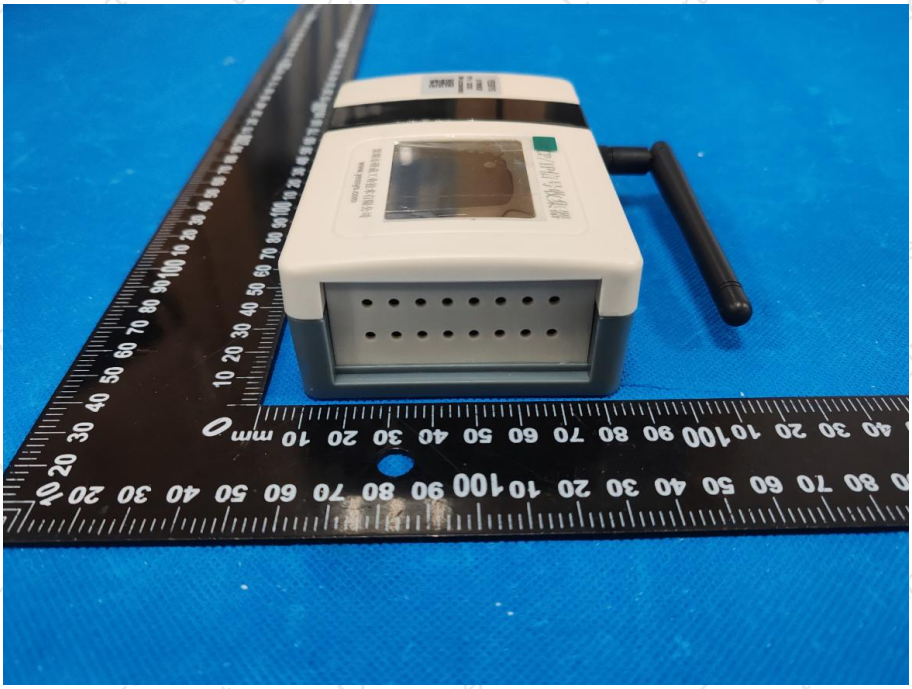


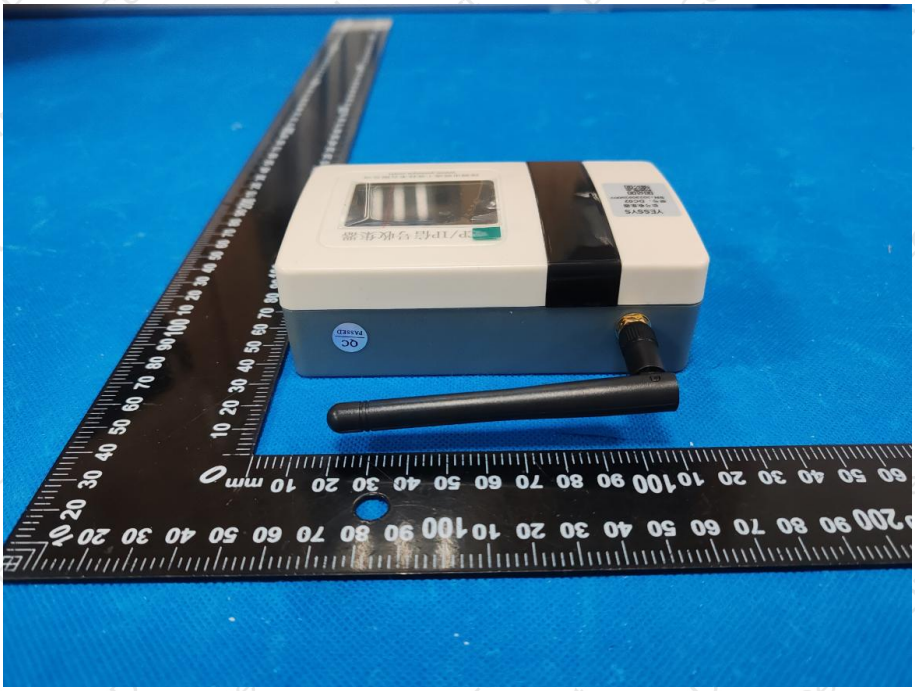


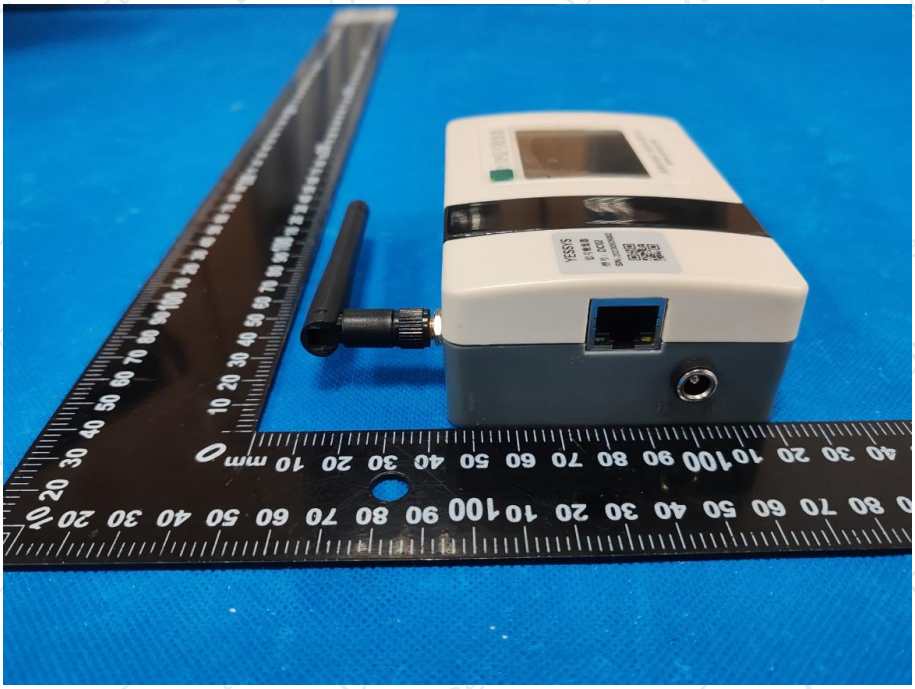
Conducted Measurement Photos

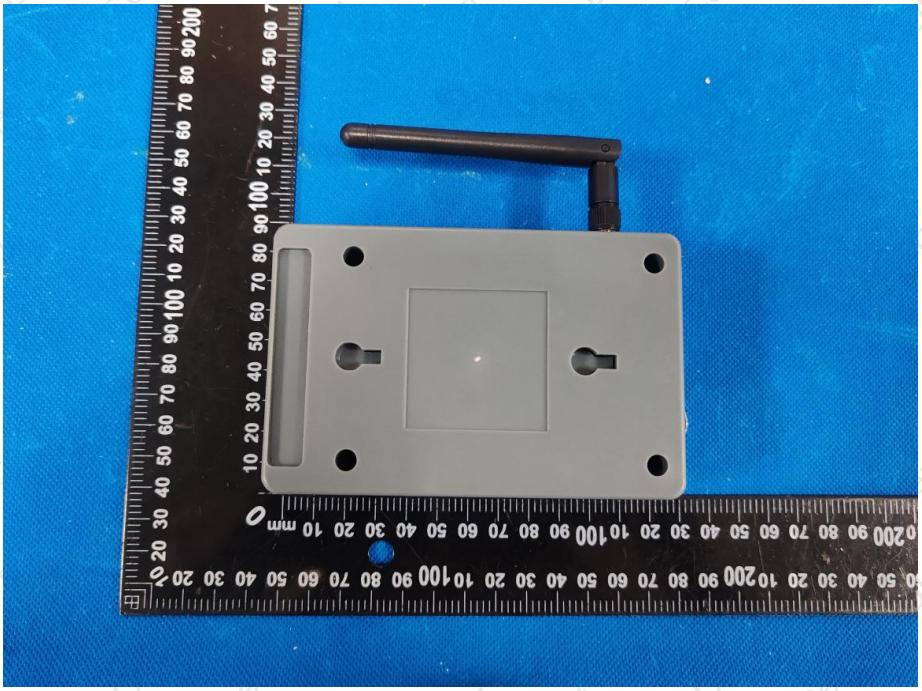
9. EUT PHOTO

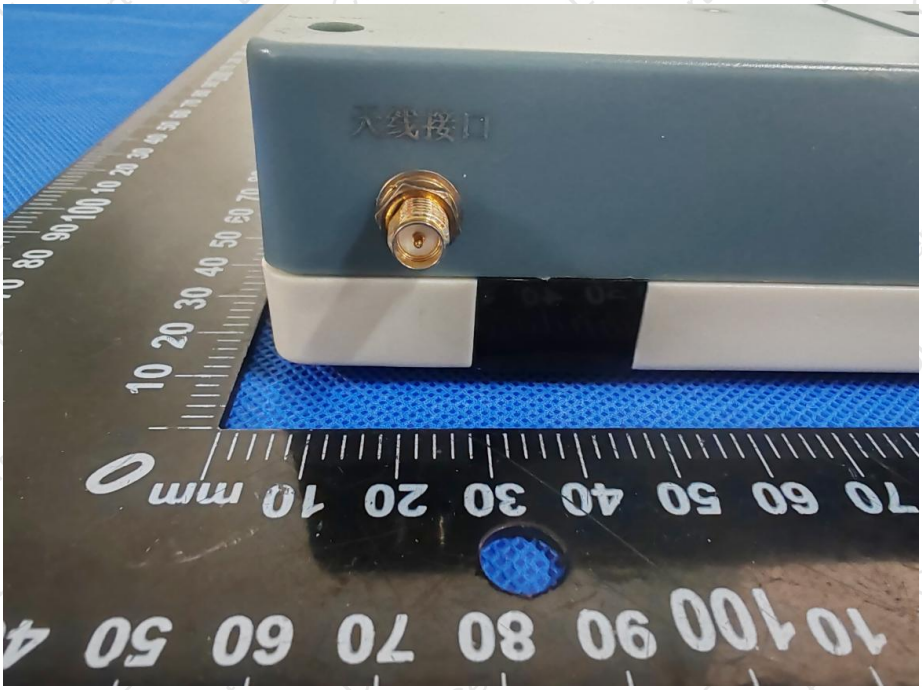








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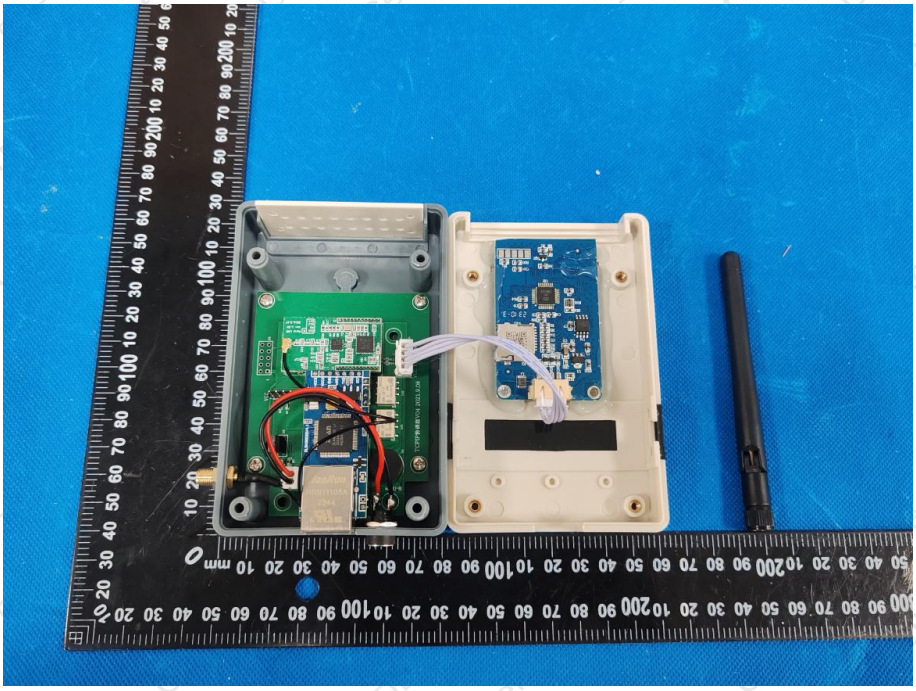

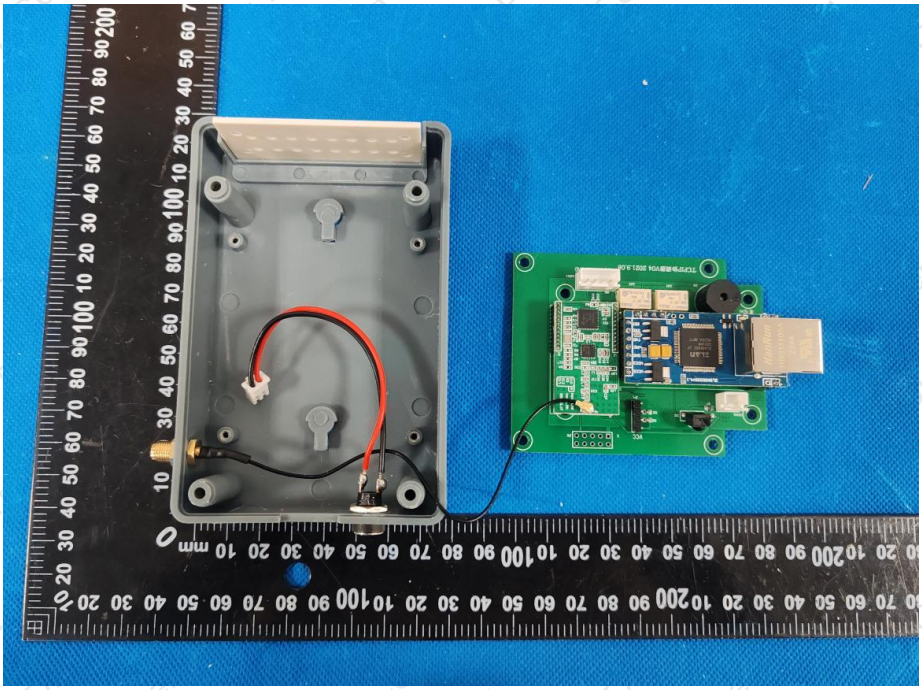

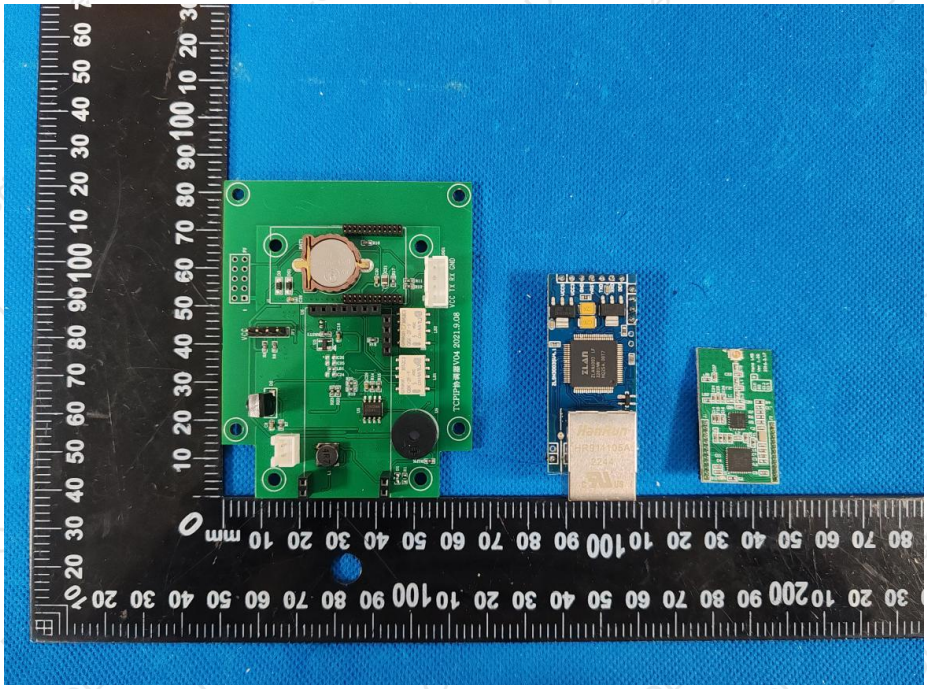

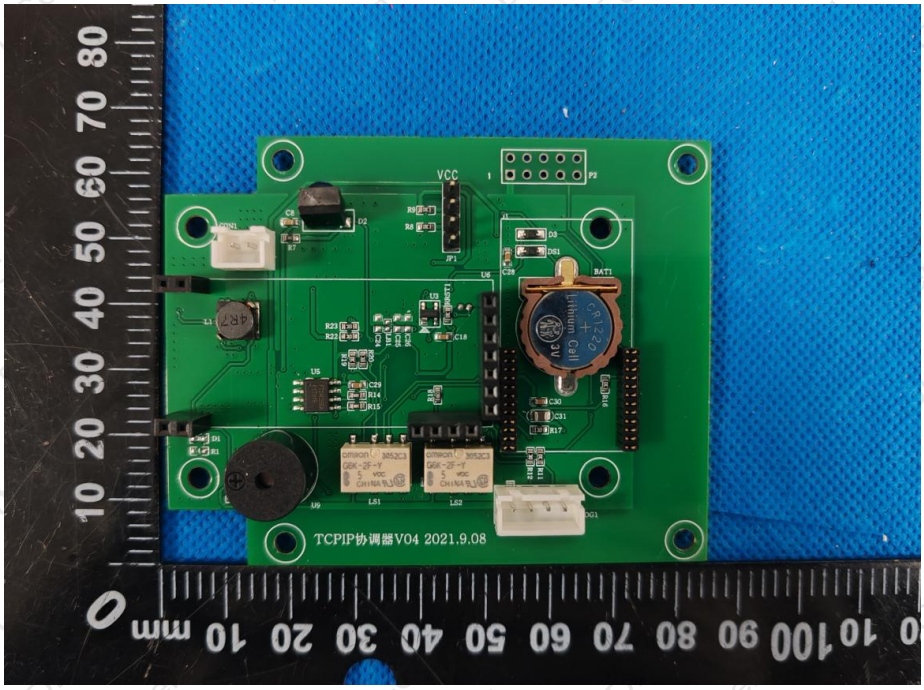
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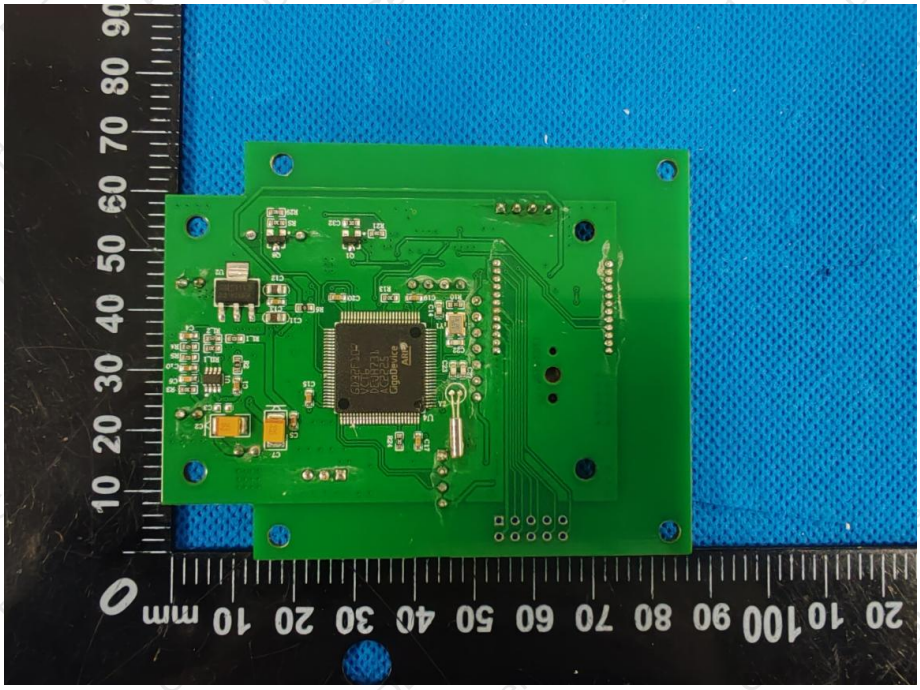

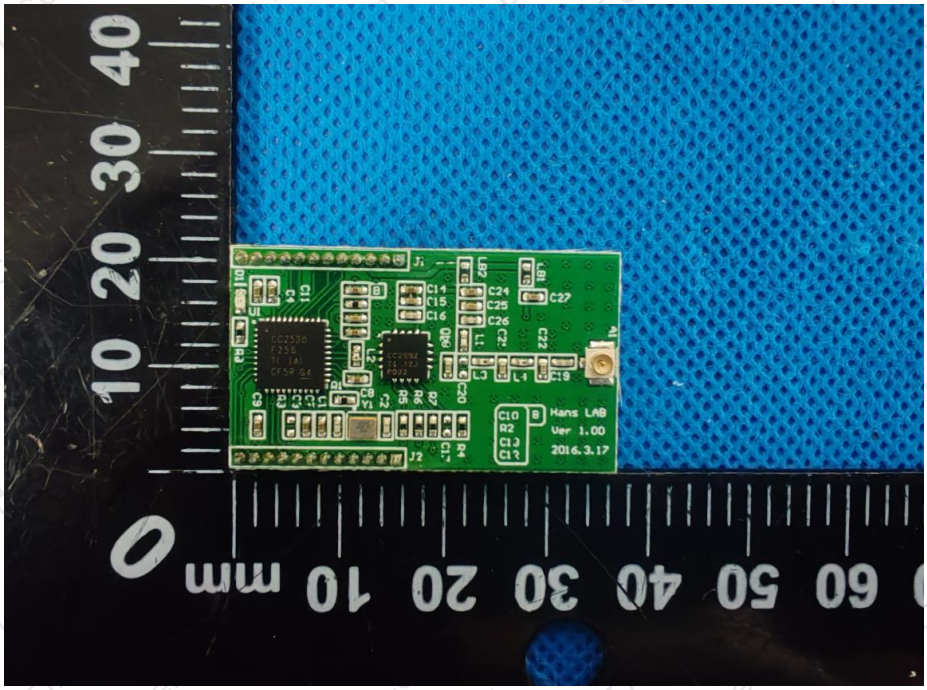
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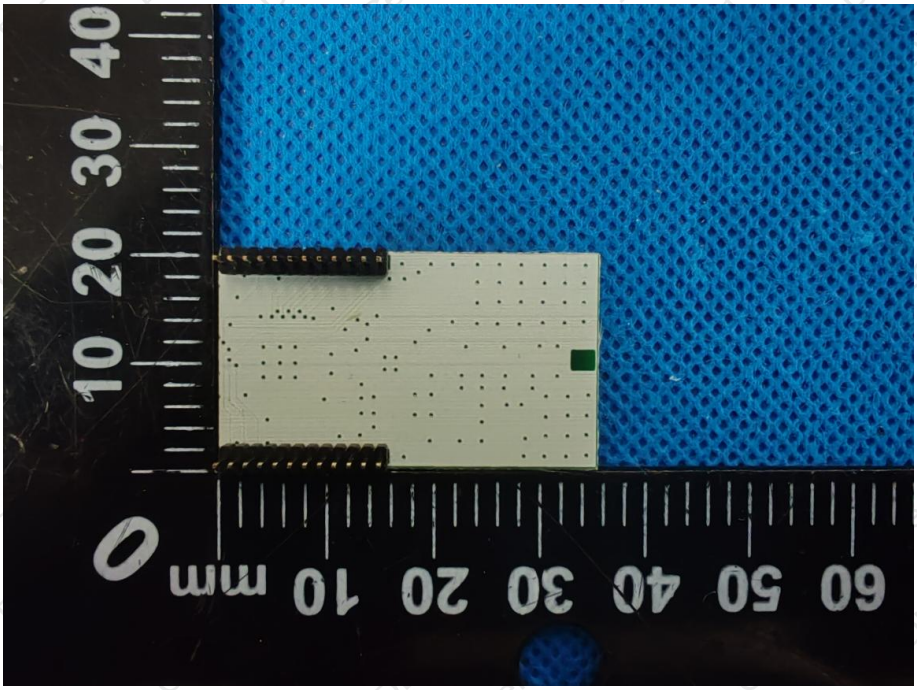

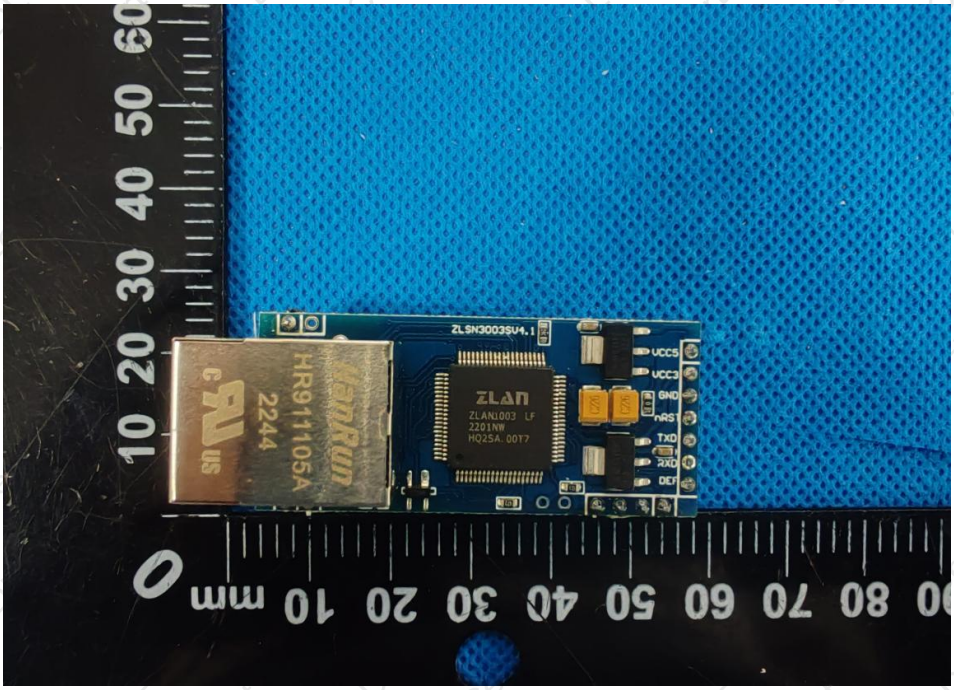
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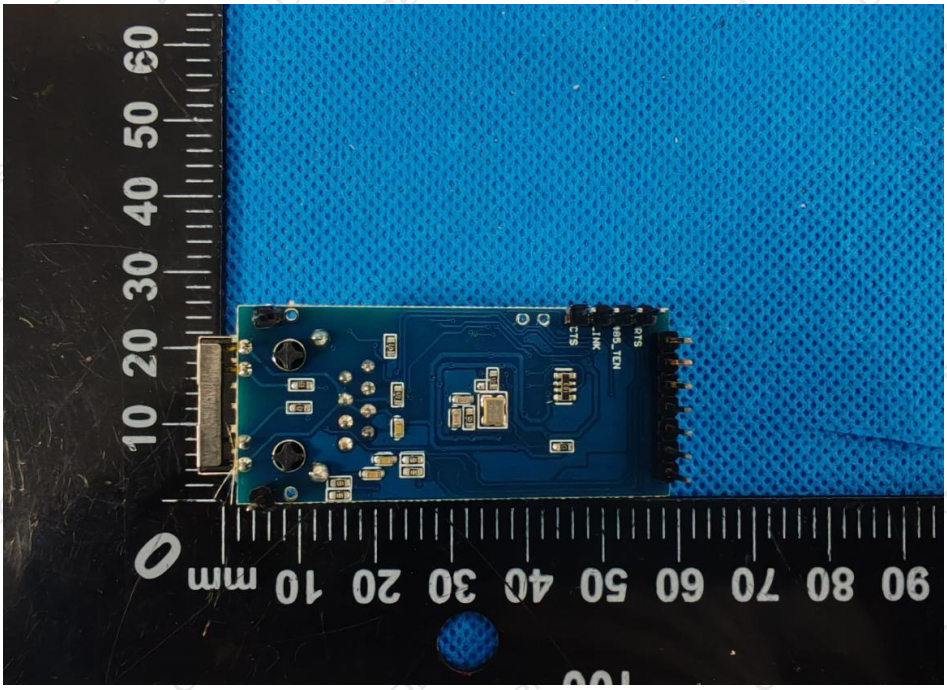

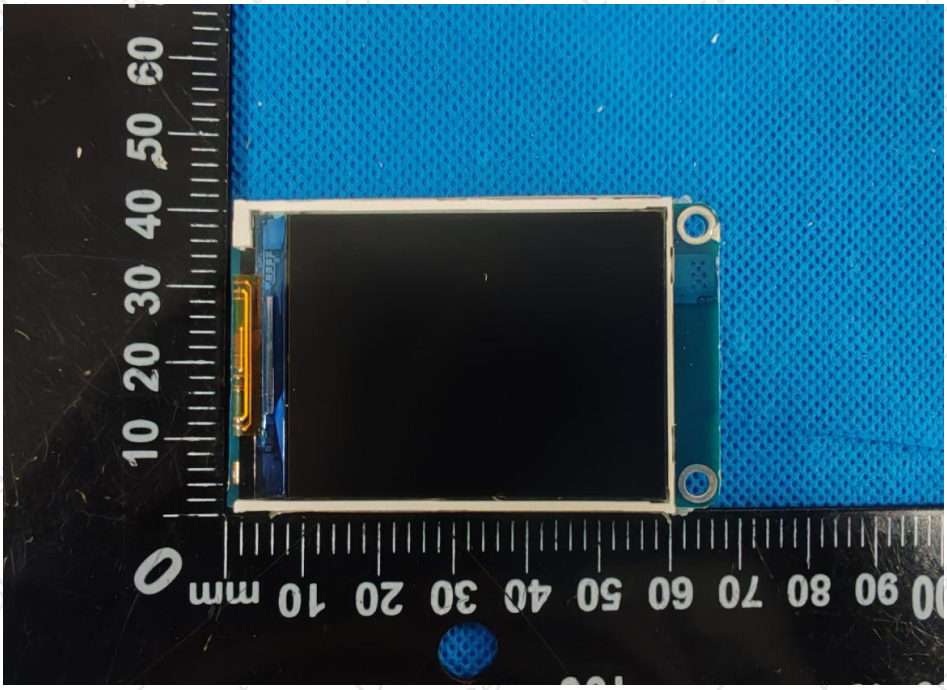

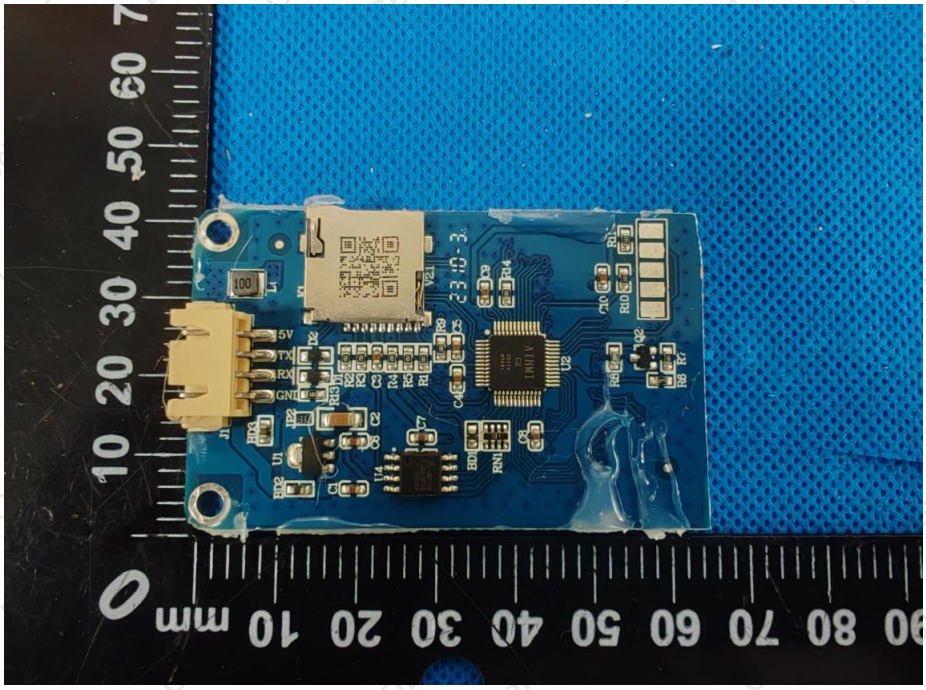

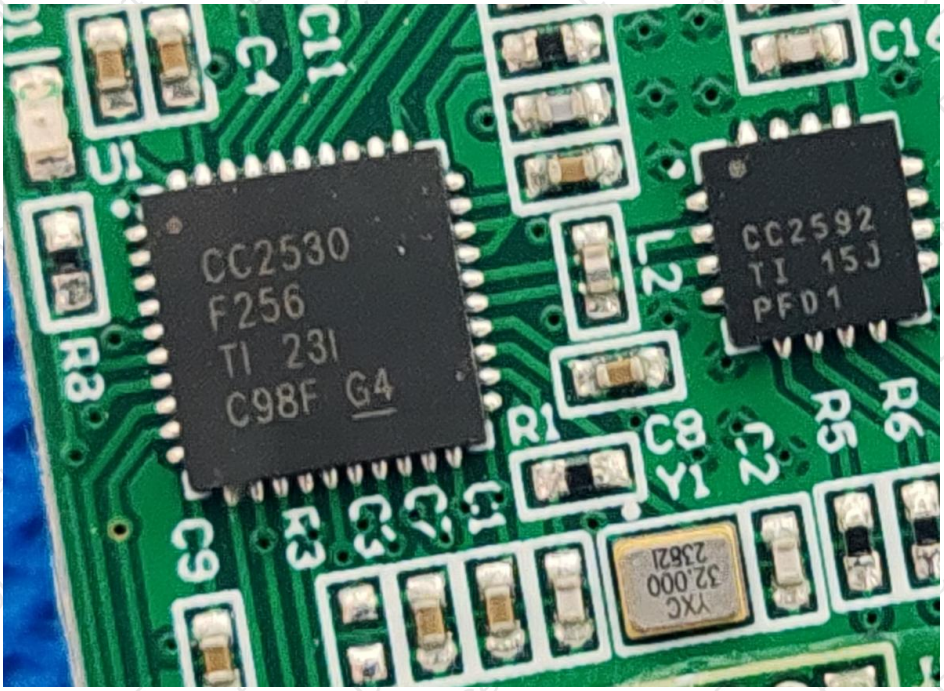
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