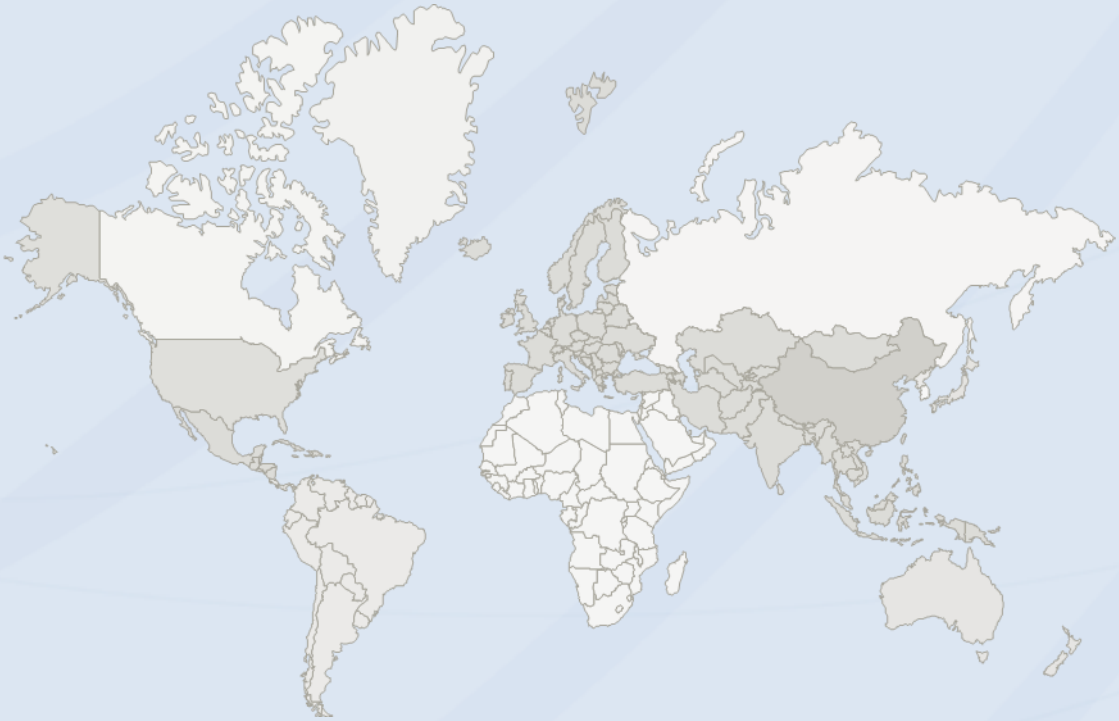
FCC TEST REPORT

Report No. ..... :	NTC-ER2011043
Applicant's name ..... :	SHENZHEN BETOP ELECTRONICS CO LTD
Address..... :	Room B0924,No.2 Building,No.8 Skyworth Innovation Valley,1st Tangtou Road, Shiyan Town, Baoan Dist., Shenzhen, Guangdong , China. 518108



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TEST REPORT DECLARE

FCC ID	:	2AYB3-HD06VCRH
Applicant	:	SHENZHEN BETOP ELECTRONICS CO LTD
Address	:	Room B0924,No.2 Building,No.8 Skyworth Innovation Valley,1st Tangtou Road, Shiyan Town, Baoan Dist., Shenzhen, Guangdong , China. 518108
Equipment under Test	:	Sensor
Model No	:	HD06VCRH
Trade Mark	:	N/A
Manufacturer	:	SHENZHEN BETOP ELECTRONICS CO LTD
Address	:	Room B0924,No.2 Building,No.8 Skyworth Innovation Valley,1st Tangtou Road, Shiyan Town, Baoan Dist., Shenzhen, Guangdong , China. 518108
Test Laboratory	:	Dongguan New Testing Centre Co., Ltd
Address	:	3F, No. 1 the 1st North Industry Road, Songshan Lake Science &Technology Park, Dongguan, Guangdong, China, 523808

Test Standard Used:

FCC Rules and Regulations Part 15 Subpart C: 2017, ANSI C63.10:2013.

We Declare:

The equipment described above is tested by Dongguan New Testing Centre Co., Ltd and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Dongguan New Testing Centre Co., Ltd is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC standards.

Report No.:	NTC-ER2011043		
Date of Test:	Nov.16, 2020 to Nov.27, 2020	**Date of Report**:	Nov.30, 2020

Prepared By: ***Approved By:***

Jeffrey Zhang

Dave

Jeffery Zhang/Engineer ***Dave Gou/LAB Manager***

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan New Testing Centre Co., Ltd

1. Summary of test results

Description of Test Item	Standard	Results
20dB Bandwidth	FCC Part 15 Subpart C:2017 ANSI C63.10:2013	PASS
Conducted Emission Test	FCC Part 15 Subpart C:2017 ANSI C63.10:2013	PASS
Radiated Emission Test	FCC Part 15 Subpart C:2017 ANSI C63.10:2013	PASS

2. General test information

2.1. Description of EUT

EUT* Name	:	Sensor
Test model	:	HD06VCRH
EUT function description	:	Please reference user manual of this device
Power supply	:	DC 12V
Trade mark	:	N/A
Operation frequency	:	5750 - 5824MHz
Antenna Type	:	PCB antenna
Antenna Gain	:	0 dBi

Note: 1,EUT is the ab. of equipment under test.

2.2. Support Equipment

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
AC/DC Adapter	yuewei	YW-212W	-	--	--

2.3. Block diagram EUT configuration for test

For EUT Tx mode:

DC Source —— EUT

2.4. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	21-24℃
Humidity range:	40-75%
Pressure range:	86-106kPa

2.5. Measurement uncertainty

Test Item	Uncertainty
Uncertainty for Conduction emission test	2.44dB
Uncertainty for Radiation Emission test (30MHz – 1GHz)	3.14 dB (Polarize: V)
	3.16 dB (Polarize: H)
Uncertainty for Radiation Emission test (1GHz – 26GHz)	4.27 dB (Polarize: V)
	4.51 dB (Polarize: H)
Uncertainty for Radiation Emission test (26GHz – 40GHz)	4.60 dB (Polarize: V)
	4.60 dB (Polarize: H)
Bandwidth	±1.2%

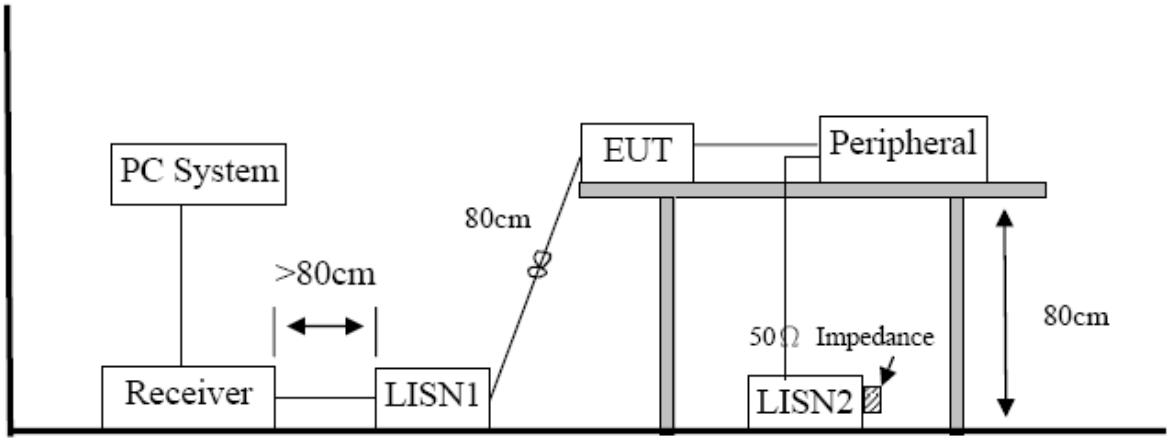
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. Power Line Conducted Emission Test

3.1. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Test Receiver	R&S	ESCS30	8341151006	2019-12-09	1 Year
2	LISN	R&S	ENV216	3650.6550.06	2020-05-25	1 Year
3	Pulse Limiter	R&S	ESH3-Z2	0357-8810.54	2020-05-25	1 Year
4	RF Cable	HUBER	SUCOFLEX100	30722/4E	2020-05-25	1 Year
5	MEASUREMENT SOFTWARE	FARAD	EZ-EMC(VER:1.1.4.2)	N/A	N/A	N/A

3.2. BLOCK DIAGRAM OF TEST SETUP



3.3. Power Line Conducted Emission Limits (Class B)

Frequency	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Note 1: * Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies.

3.4. Test Procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.3 and test equipment as described in clause 3.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.3 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

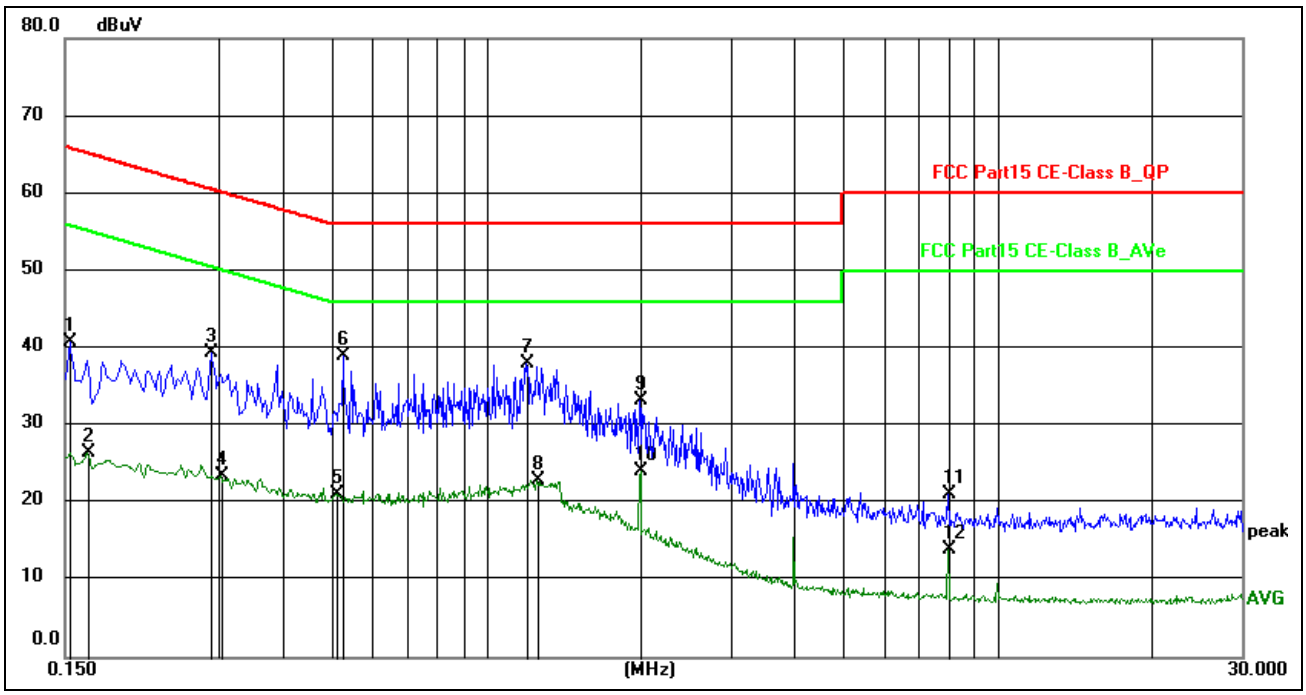
The bandwidth of test receiver is set at 9 KHz.

3.5. Test Result

PASS. (See below detailed test result)

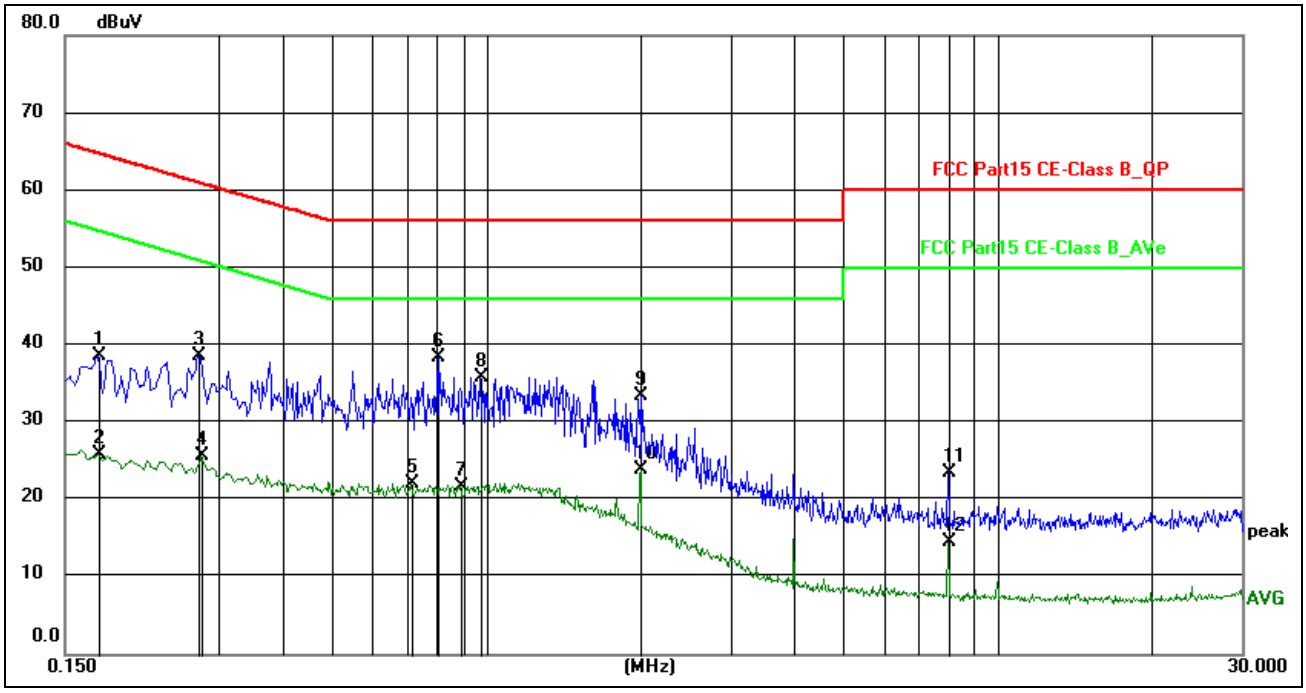
Note1: All emissions not reported below are too low against the prescribed limits.
Note2: “-----” means Peak detection; “-----” mans Average detection
Note3: Measurement = Reading Level + Factor, Margin= Measurement-Limit

Conducted Emission Test Result



Site:	**844LAB**	**Phase:L1**	**Temperature(C):24(C)**
Limit:	**FCC Part15 CE-Class B_QP**		**Humidity(%):63%**
EUT:	**SENSOR**	**Test Time:**	**2020/11/27**
M/N.:	**HD06VCRH**	**Power Rating:**	**DC 12V by adapter input 120/60Hz**
Mode:	**Tx (5787MHz-Worst Case)**	**Test Engineer:**	
Note:			

No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measure-ment(dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
1	0.1539	31.12	9.73	40.85	65.79	-24.94	peak	
2	0.1660	16.86	9.72	26.58	55.16	-28.58	AVG	
3	0.2900	29.55	9.91	39.46	60.52	-21.06	peak	
4	0.3020	13.50	9.93	23.43	50.19	-26.76	AVG	
5	0.5100	11.63	9.57	21.20	46.00	-24.80	AVG	
6 *	0.5260	29.37	9.58	38.95	56.00	-17.05	peak	
7	1.1980	28.37	9.65	38.02	56.00	-17.98	peak	
8	1.2579	13.28	9.66	22.94	46.00	-23.06	AVG	
9	1.9980	23.58	9.69	33.27	56.00	-22.73	peak	
10	2.0020	14.40	9.69	24.09	46.00	-21.91	AVG	
11	8.0020	11.20	9.97	21.17	60.00	-38.83	peak	
12	8.0020	4.12	9.97	14.09	50.00	-35.91	AVG	



Site:	**844LAB**	**Phase:N**	**Temperature(C):24(C)**
Limit:	**FCC Part15 CE-Class B_QP**		**Humidity(%):63%**
EUT:	**SENSOR**	**Test Time:**	**2020/11/27**
M/N.:	**HD06VCRH**	**Power Rating:**	**DC 12V by adapter input 120/60Hz**
Mode:	**Tx (5787MHz-Worst Case)**	**Test Engineer:**	
Note:			

No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measure-ment(dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
1	0.1740	28.98	9.71	38.69	64.77	-26.08	peak	
2	0.1740	16.13	9.71	25.84	54.77	-28.93	AVG	
3	0.2740	28.75	9.87	38.62	61.00	-22.38	peak	
4	0.2779	15.76	9.88	25.64	50.88	-25.24	AVG	
5	0.7140	12.57	9.62	22.19	46.00	-23.81	AVG	
6 *	0.8059	28.78	9.63	38.41	56.00	-17.59	peak	
7	0.8940	12.18	9.63	21.81	46.00	-24.19	AVG	
8	0.9740	26.28	9.64	35.92	56.00	-20.08	peak	
9	2.0020	23.84	9.69	33.53	56.00	-22.47	peak	
10	2.0020	14.21	9.69	23.90	46.00	-22.10	AVG	
11	8.0020	13.58	9.97	23.55	60.00	-36.45	peak	
12	8.0020	4.65	9.97	14.62	50.00	-35.38	AVG	

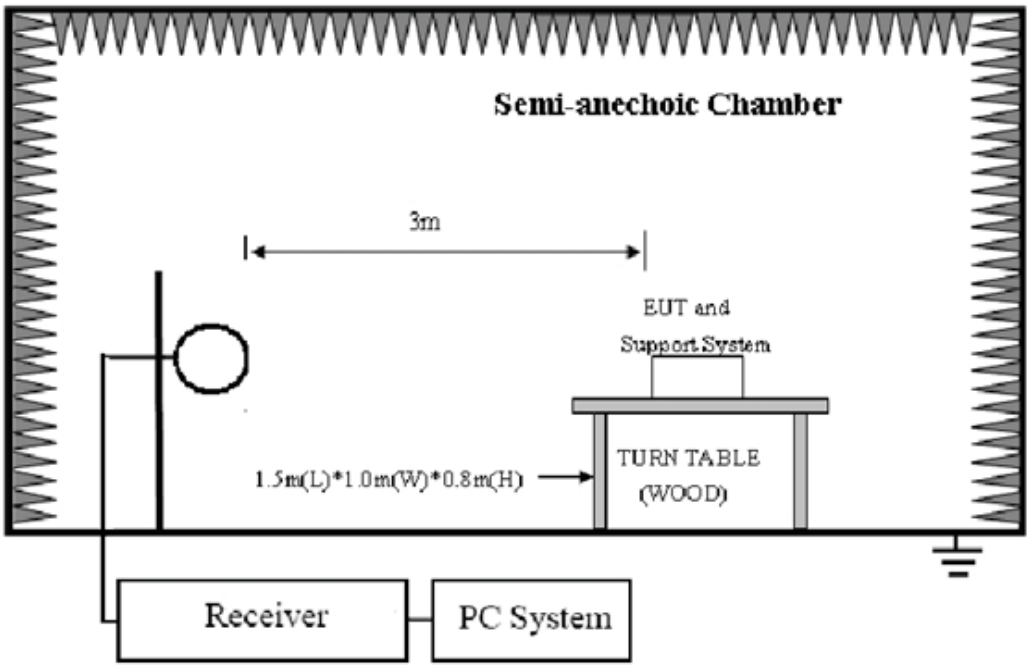
4. Radiated emission test

4.1. Test equipment

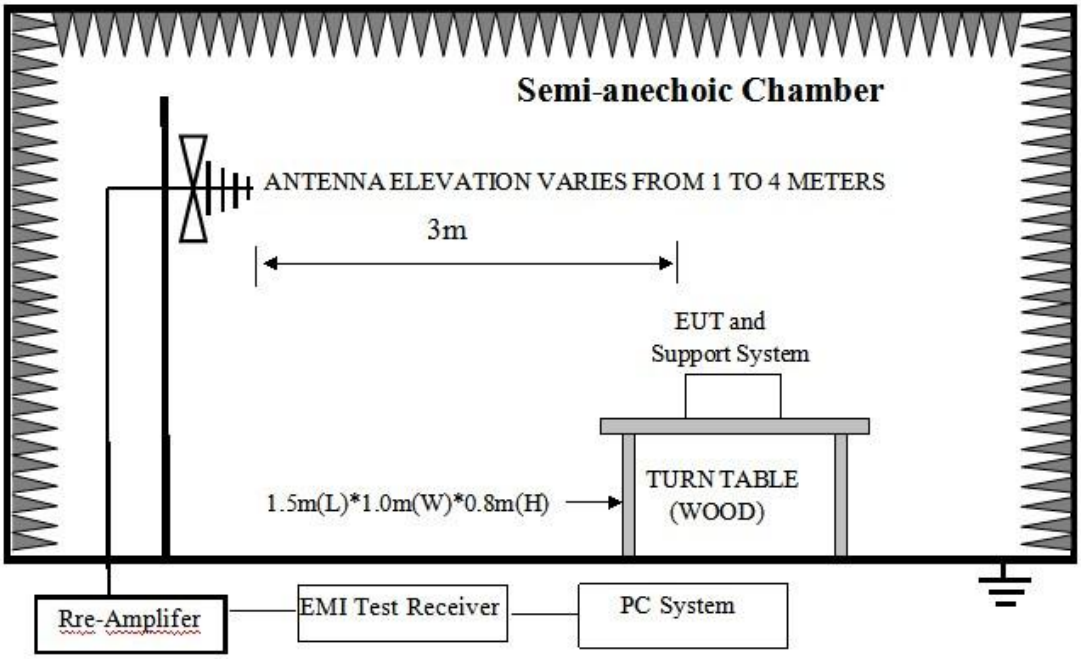
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	EMI Test Receiver	R&S	ESR	7250-304067528	2020-05-25	1Year
2	Trilog Broadband Antenna	Schwarzbeck	VULB9168	00969	2019-06-14	2 Year
3	Pre-amplifier	R&S	8447F	3113A04553	2020-05-25	1Year
4	Active Loop antenna	Schwarzbeck	FMZB-1519	1519-038	2019-05-23	2Year
5	Horn antenna	Schwarzbeck	BBHA9120D	453	2019-05-23	2Year
6	Double Ridged Horn Antenna	A.H. System	SAS-574	584	2019-05-23	2Year
7	Pre-amplifier	R&S	SCU18	105326	2020-05-25	1Year
8	RF Cable	GORE	OSQ01Q01078.7	SN15458473	2020-05-25	1Year
9	RF Cable	GORE	OSQ01Q01078.7	SN15458474	2020-05-25	1Year
10	RF Cable	ESCO	ETS-LINGREN	RFC-SMS-100-SMS-340-IN	2020-05-25	1Year
11	Measurement software	Farad	EZ-EMC(VER:1.1.4.2)	N/A	N/A	N/A

4.2. Block diagram of test setup

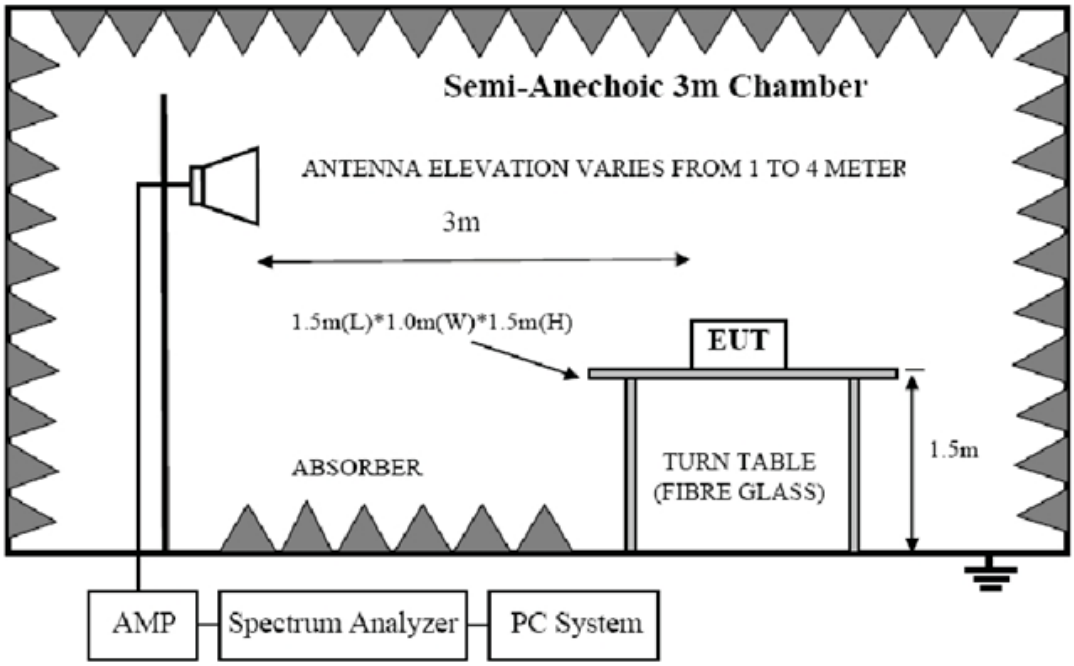
In 3m Anechoic Chamber Test Setup Diagram for 9KHz to 30MHz:



In 3m Anechoic Chamber Test Setup Diagram for 30MHz to 1GHz:



In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz:



4.3. Limit

FCC 15.205 Restricted frequency band:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])

FCC 15.109 Limit

Frequency (MHz)	Distance (Meters)	Field Strengths Limits dB(μV)/m
30--88	3	40.0
88--216	3	43.5
216--960	3	46.0
960--1000	3	54.0
Above 1GHz	3	Peak: 74.0
	3	Average:54.0

Note: (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)The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9-90KHz, 110-490KHz and above 1000MHz.Radiated emissions limits in these three bands are based on measurements employing an average detector.

(4) At frequencies below 30MHz, measurement may be performed at a distance closer then that specified, and the limit at closer measurement distance can be extrapolated by below formula:

Limit 3m(dBuV/m)= Limit30m(dBuV/m) + 40Log(30m/3m)

(5)All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.109, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.109 limits.

4.4. Test Procedure

Procedure of Preliminary Test

Configuration EUT to simulate typical usage as described in clause 2.3 and test equipment as described in clause 4.2 of this report.

Mains cables, telephone lines or other connections to auxiliary equipment located outside the test are shall drape to the floor, be fitted with ferrite clamps or ferrite tubes placed on the floor at the point where the cable reaches the floor and then routed to the place where they leave the turntable. No extension cords shall be used to mains receptacle.

EUT height should be 0.8m for below 1GHz and 1.5m for above 1GHz at ground with absorbers.

The antenna was placed at 3 meter away from the EUT as stated in ANSI C63.10. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.

The Analyzer / Receiver quickly scanned from 30MHz to 18GHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

The X, Y, Z three axial are tested and the report only the worst case.

The emissions from 9KHz to 1GHz, QP or average values were measured with EMI receiver with below RBW:

Frequency band	RBW
9KHz-150KHz	200Hz
150KHz-30MHz	9KHz
30MHz-1GHz	120KHz

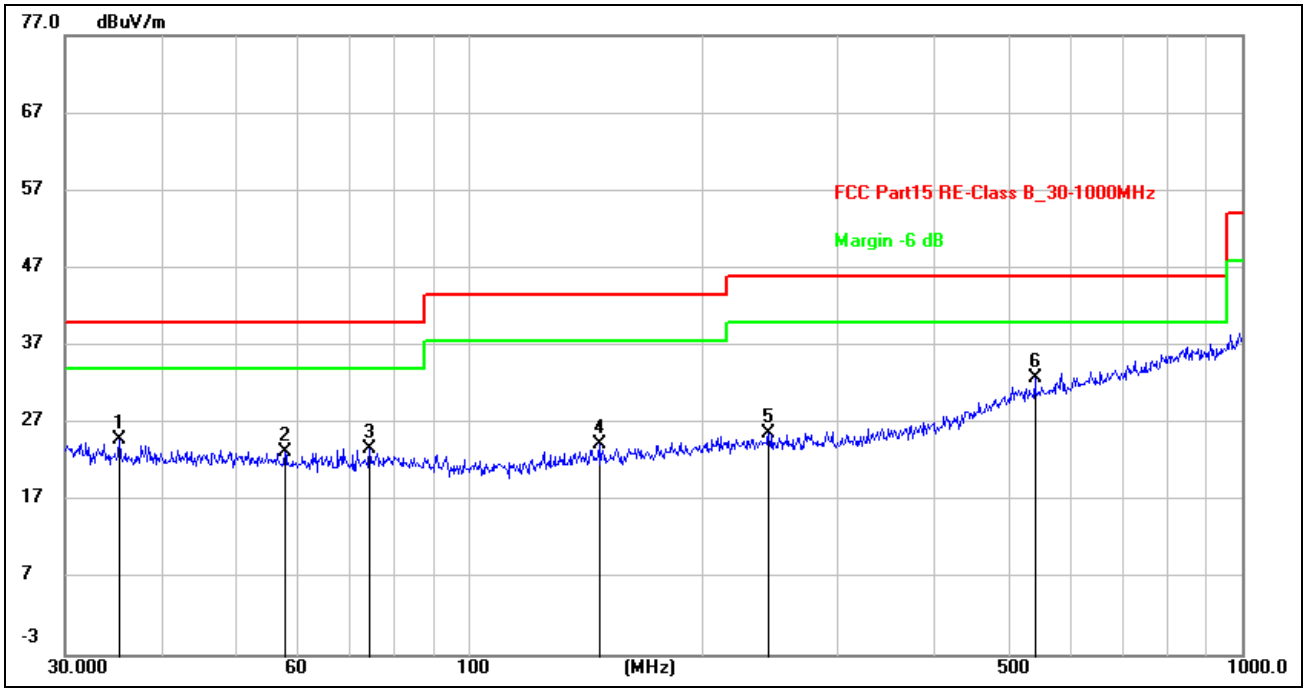
For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz, VBW is set at 3MHz for Peak measure; RMS detector RBW 1MHz VBW 3MHz for Average measure.

4.5. Test result

PASS. (See below detailed test result)

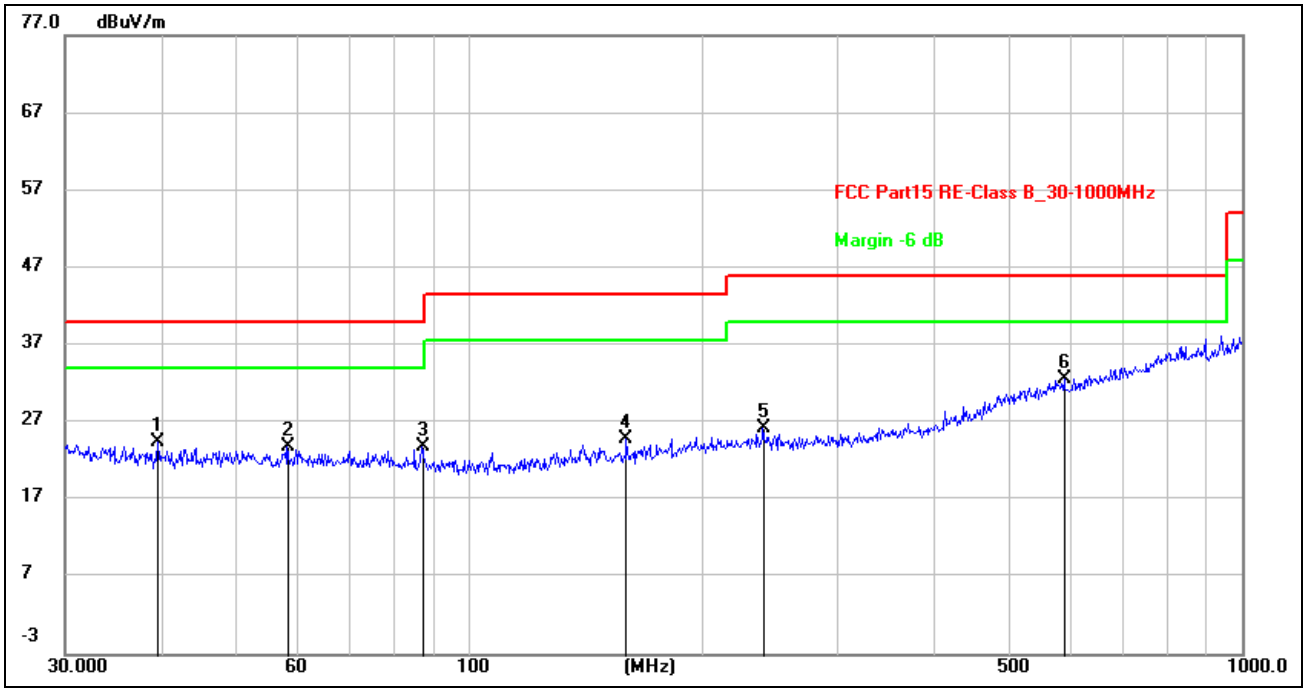
9K-30MHz: Emission detected are more than 20dB below the limit line.

Radiated Emission Test Result



Site:	**966LAB**	**Antenna::Horizontal**	**Temperature(C):24(C)**
Limit:	**FCC Part15 RE-Class B_30-1000MHz**		**Humidity(%):60%**
EUT:	**SENSOR**	**Test Time:**	**2020/11/27**
M/N.:	**HD06VCRH**	**Power Rating:**	**DC 12V by adapter input 120/60Hz**
Mode:	**Tx (5787MHz-Worst Case)**	**Test Engineer:**	
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	35.2511	11.65	13.33	24.98	40.00	-15.02	peak	200	145	
2	57.7962	10.27	12.99	23.26	40.00	-16.74	peak	200	289	
3	74.3955	11.58	12.08	23.66	40.00	-16.34	peak	200	286	
4	147.4036	11.27	12.93	24.20	43.50	-19.30	peak	100	263	
5	244.2321	11.74	13.94	25.68	46.00	-20.32	peak	100	39	
6 *	539.4775	13.55	19.27	32.82	46.00	-13.18	peak	100	333	



Site:	**966LAB**	**Antenna::Vertical**	**Temperature(C):24(C)**
Limit:	**FCC Part15 RE-Class B_30-1000MHz**		**Humidity(%):60%**
EUT:	**SENSOR**	**Test Time:**	**2020/11/27**
M/N.:	**HD06VCRH**	**Power Rating:**	**DC 12V by adapter input 120/60Hz**
Mode:	**Tx (5787MHz-Worst Case)**	**Test Engineer:**	
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	39.5757	11.33	13.18	24.51	40.00	-15.49	peak	100	356	
2	58.2030	10.83	13.00	23.83	40.00	-16.17	peak	100	24	
3	86.8068	12.77	11.12	23.89	40.00	-16.11	peak	100	72	
4	159.7844	12.05	12.92	24.97	43.50	-18.53	peak	100	173	
5	239.9874	12.29	13.93	26.22	46.00	-19.78	peak	100	0	
6 *	588.9051	12.85	19.84	32.69	46.00	-13.31	peak	200	310	

Site:	**966LAB**	**Antenna::H / V**	**Temperature(C):24(C)**
Limit:	**FCC Part 15.249**		**Humidity(%):60%**
EUT:	**SENSOR**	**Test Time:**	**2020/11/27**
M/N.:	**HD06VCRH**	**Power Rating:**	**DC 12V by adapter input 120/60Hz**
Mode:	**Tx mode (5750MHz)**	**Test Engineer:**	
Note:			

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Pre-amp (dB)	Cable lost (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detect	Antenna polarization
5150.00	49.40	31.32	40.32	11.21	51.61	74.00	-22.39	Peak	H
5150.00	40.85	31.32	40.32	11.21	43.06	54.00	-10.94	Average	H
5725.00	45.05	31.96	40.28	11.64	48.37	74.00	-25.63	Peak	H
5725.00	40.34	31.96	40.28	11.64	43.66	54.00	-10.34	Average	H
5750.00	78.67	32.11	40.26	11.68	82.20	114.00	-31.80	Peak	H
5750.00	70.75	32.11	40.26	11.68	74.28	94.00	-19.72	Average	H
5875.00	40.43	32.26	40.15	12.14	44.68	74.00	-29.32	Peak	H
5875.00	37.60	32.26	40.15	12.14	41.85	54.00	-12.15	Average	H
11500.00	32.23	39.81	40.37	16.81	48.48	74.00	-25.52	Peak	H
11500.00	26.75	39.81	40.37	16.81	43.00	54.00	-11.00	Average	H
5150.00	46.02	31.32	40.32	11.21	48.23	74.00	-25.77	Peak	V
5150.00	40.85	31.32	40.32	11.21	43.06	54.00	-10.94	Average	V
5725.00	43.27	31.96	40.28	11.64	46.59	74.00	-27.41	Peak	V
5725.00	34.99	31.96	40.28	11.64	38.31	54.00	-15.69	Average	V
5750.00	70.92	32.11	40.26	11.68	74.45	114.00	-39.55	Peak	V
5750.00	60.97	32.11	40.26	11.68	64.50	94.00	-29.50	Average	V
5875.00	46.10	32.26	40.15	12.14	50.35	74.00	-23.65	Peak	V
5875.00	36.01	32.26	40.15	12.14	40.26	54.00	-13.74	Average	V
11500.00	35.22	39.81	40.37	16.81	51.47	74.00	-22.53	Peak	V
11500.00	23.74	39.81	40.37	16.81	39.99	54.00	-14.01	Average	V

Note: 1. Result Level = Reading Level + Antenna Factor + Cable loss – Pre-amp Factor.

2. Antenna polarization: “H” means Horizontal , “V” means Vertical.

Site:	**966LAB**	**Antenna::H / V**	**Temperature(C):24(C)**
Limit:	**FCC Part 15.249**		**Humidity(%):60%**
EUT:	**SENSOR**	**Test Time:**	**2020/11/27**
M/N.:	**HD06VCRH**	**Power Rating:**	**DC 12V by adapter input 120/60Hz**
Mode:	**Tx mode (5787MHz)**	**Test Engineer:**	
Note:			

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Pre-amp (dB)	Cable lost (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detect	Antenna polarization
5150.00	49.40	31.32	40.32	11.21	51.61	74.00	-22.39	Peak	H
5150.00	42.18	31.32	40.32	11.21	44.39	54.00	-9.61	Average	H
5725.00	45.56	31.96	40.28	11.64	48.88	74.00	-25.12	Peak	H
5725.00	38.50	31.96	40.28	11.64	41.82	54.00	-12.18	Average	H
5785.00	75.13	32.11	40.26	11.68	78.66	114.00	-35.34	Peak	H
5785.00	69.29	32.11	40.26	11.68	72.82	94.00	-21.18	Average	H
5875.00	42.27	32.26	40.15	12.14	46.52	74.00	-27.48	Peak	H
5875.00	33.22	32.26	40.15	12.14	37.47	54.00	-16.53	Average	H
11570.00	34.77	39.81	40.37	16.81	51.02	74.00	-22.98	Peak	H
11570.00	25.21	39.81	40.37	16.81	41.46	54.00	-12.54	Average	H
5150.00	47.56	31.32	40.32	11.21	49.77	74.00	-24.23	Peak	V
5150.00	42.69	31.32	40.32	11.21	44.90	54.00	-9.10	Average	V
5725.00	38.89	31.96	40.28	11.64	42.21	74.00	-31.79	Peak	V
5725.00	37.53	31.96	40.28	11.64	40.85	54.00	-13.15	Average	V
5785.00	69.25	32.11	40.26	11.68	72.78	114.00	-41.22	Peak	V
5785.00	63.48	32.11	40.26	11.68	67.01	94.00	-26.99	Average	V
5875.00	43.72	32.26	40.15	12.14	47.97	74.00	-26.03	Peak	V
5875.00	39.39	32.26	40.15	12.14	43.64	54.00	-10.36	Average	V
11570.00	33.38	39.81	40.37	16.81	49.63	74.00	-24.37	Peak	V
11570.00	25.07	39.81	40.37	16.81	41.32	54.00	-12.68	Average	V

Note: 1. Result Level = Reading Level + Antenna Factor + Cable loss – Pre-amp Factor.

2. Antenna polarization: “H” means Horizontal , “V” means Vertical.

Site:	**966LAB**	**Antenna::H / V**	**Temperature(C):24(C)**
Limit:	**FCC Part 15.249**		**Humidity(%):60%**
EUT:	**SENSOR**	**Test Time:**	**2020/11/27**
M/N.:	**HD06VCRH**	**Power Rating:**	**DC 12V by adapter input 120/60Hz**
Mode:	**Tx mode (5824MHz)**	**Test Engineer:**	
Note:			

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Pre-amp (dB)	Cable lost (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detect	Antenna polarization
5150.00	49.40	31.32	40.32	11.21	51.61	74.00	-22.39	Peak	H
5150.00	42.31	31.32	40.32	11.21	44.52	54.00	-9.48	Average	H
5725.00	43.72	31.96	40.28	11.64	47.04	74.00	-26.96	Peak	H
5725.00	40.34	31.96	40.28	11.64	43.66	54.00	-10.34	Average	H
5824.00	71.13	32.11	40.26	11.68	74.66	114.00	-39.34	Peak	H
5824.00	66.29	32.11	40.26	11.68	69.82	94.00	-24.18	Average	H
5875.00	38.89	32.26	40.15	12.14	43.14	74.00	-30.86	Peak	H
5875.00	35.76	32.26	40.15	12.14	40.01	54.00	-13.99	Average	H
11648.00	36.61	39.81	40.37	16.81	52.86	74.00	-21.14	Peak	H
11648.00	24.21	39.81	40.37	16.81	40.46	54.00	-13.54	Average	H
5150.00	47.56	31.32	40.32	11.21	49.77	74.00	-24.23	Peak	V
5150.00	39.18	31.32	40.32	11.21	41.39	54.00	-12.61	Average	V
5725.00	42.27	31.96	40.28	11.64	45.59	74.00	-28.41	Peak	V
5725.00	37.53	31.96	40.28	11.64	40.85	54.00	-13.15	Average	V
5824.00	69.38	32.11	40.26	11.68	72.91	114.00	-41.09	Peak	V
5824.00	62.64	32.11	40.26	11.68	66.17	94.00	-27.83	Average	V
5875.00	47.10	32.26	40.15	12.14	51.35	74.00	-22.65	Peak	V
5875.00	35.01	32.26	40.15	12.14	39.26	54.00	-14.74	Average	V
11648.00	33.38	39.81	40.37	16.81	49.63	74.00	-24.37	Peak	V
11648.00	22.20	39.81	40.37	16.81	38.45	54.00	-15.55	Average	V

Note: 1. Result Level = Reading Level + Antenna Factor + Cable loss – Pre-amp Factor.

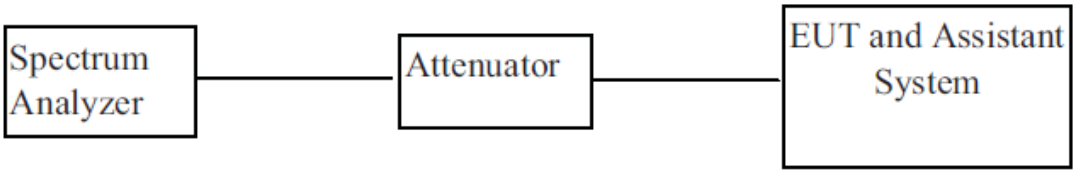
2. Antenna polarization: “H” means Horizontal , “V” means Vertical.

5. -20dB Bandwidth

5.1. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Test Receiver	R&S	ESR	7250-304067 528	2020-05-25	1 Year

5.2. BLOCK DIAGRAM OF TEST SETUP



5.3. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained

in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB

bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

5.4. Test Procedure

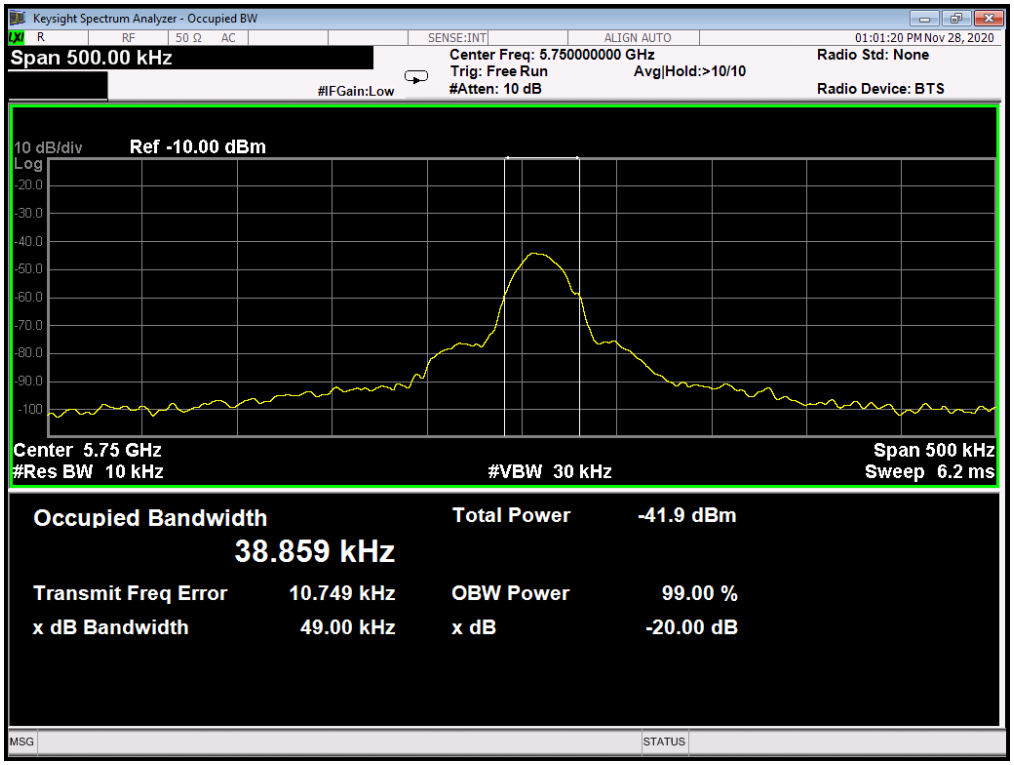
(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

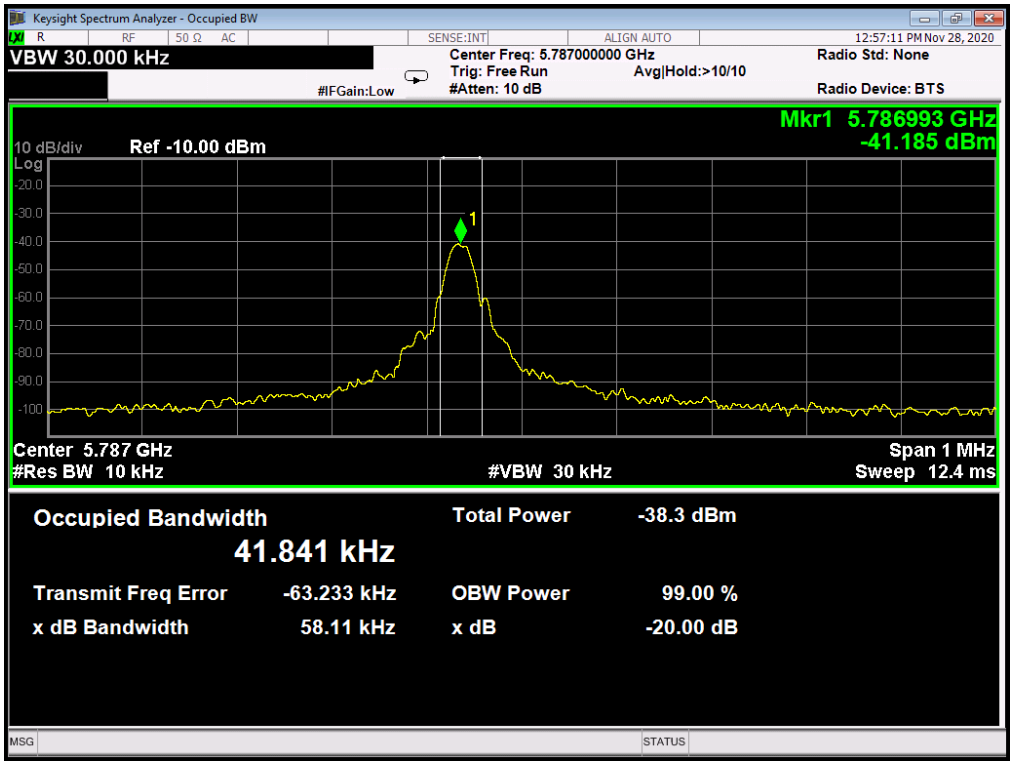
(2) The bandwidth of the fundamental frequency was measured by spectrum analyzer with 10 kHz RBW

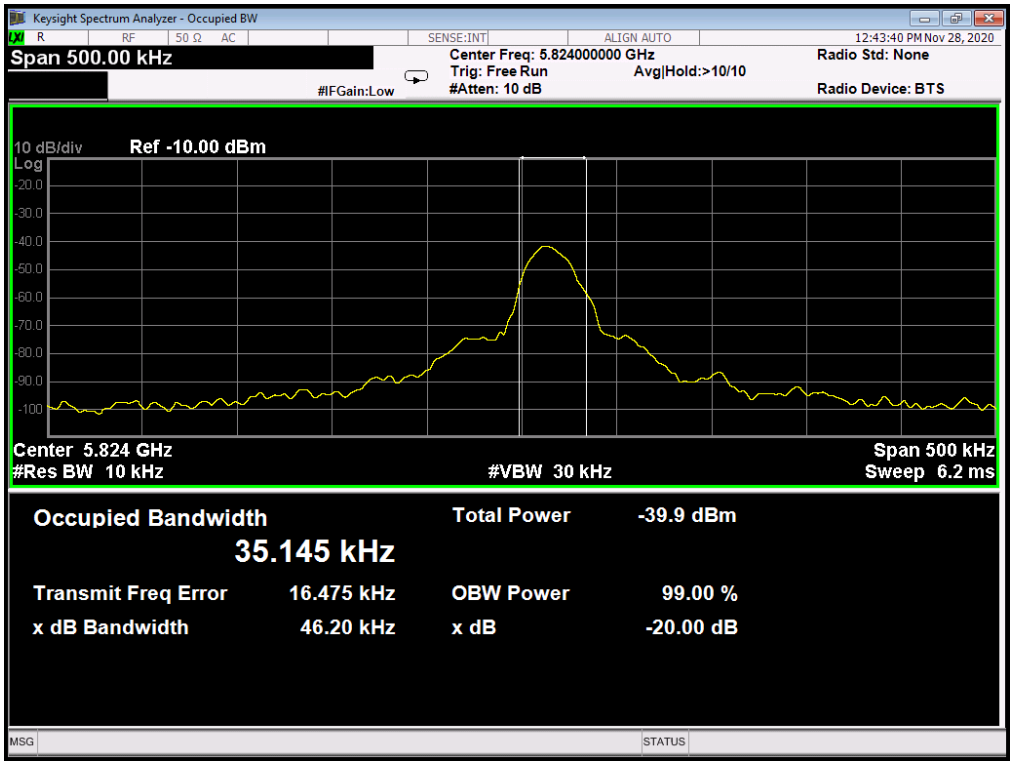
and 30 kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

5.5. Test result

Frequency	-20dB bandwidth
(MHz)	Result (KHz)
5750	49.00
5787	58.11
5824	46.20




Keysight Spectrum Analyzer - Occupied BW
VBW 30.000 kHz
Center Freq: 5.787000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 10 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
12:57:11 PM Nov 28, 2020
Mkr1 5.786993 GHz
-41.185 dBm
10 dB/div
Ref -10.00 dBm
Center 5.787 GHz
#Res BW 10 kHz
#VBW 30 kHz
Span 1 MHz
Sweep 12.4 ms
Occupied Bandwidth
41.841 kHz
Total Power -38.3 dBm
Transmit Freq Error -63.233 kHz
OBW Power 99.00 %
x dB Bandwidth 58.11 kHz
x dB -20.00 dB

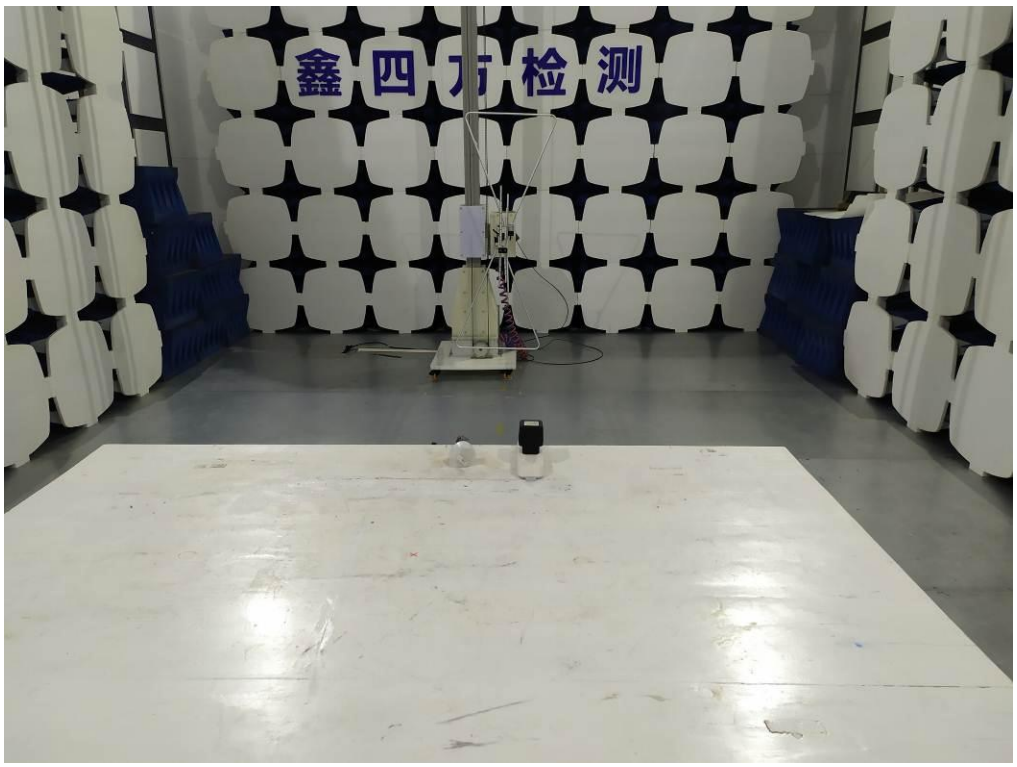

Keysight Spectrum Analyzer - Occupied BW
Span 500.00 kHz
Center Freq: 5.824000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 10 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
12:43:40 PM Nov 28, 2020
10 dB/div
Ref -10.00 dBm
Center 5.824 GHz
#Res BW 10 kHz
#VBW 30 kHz
Span 500 kHz
Sweep 6.2 ms
Occupied Bandwidth
35.145 kHz
Total Power -39.9 dBm
Transmit Freq Error 16.475 kHz
OBW Power 99.00 %
x dB Bandwidth 46.20 kHz
x dB -20.00 dB

6. Test setup photograph

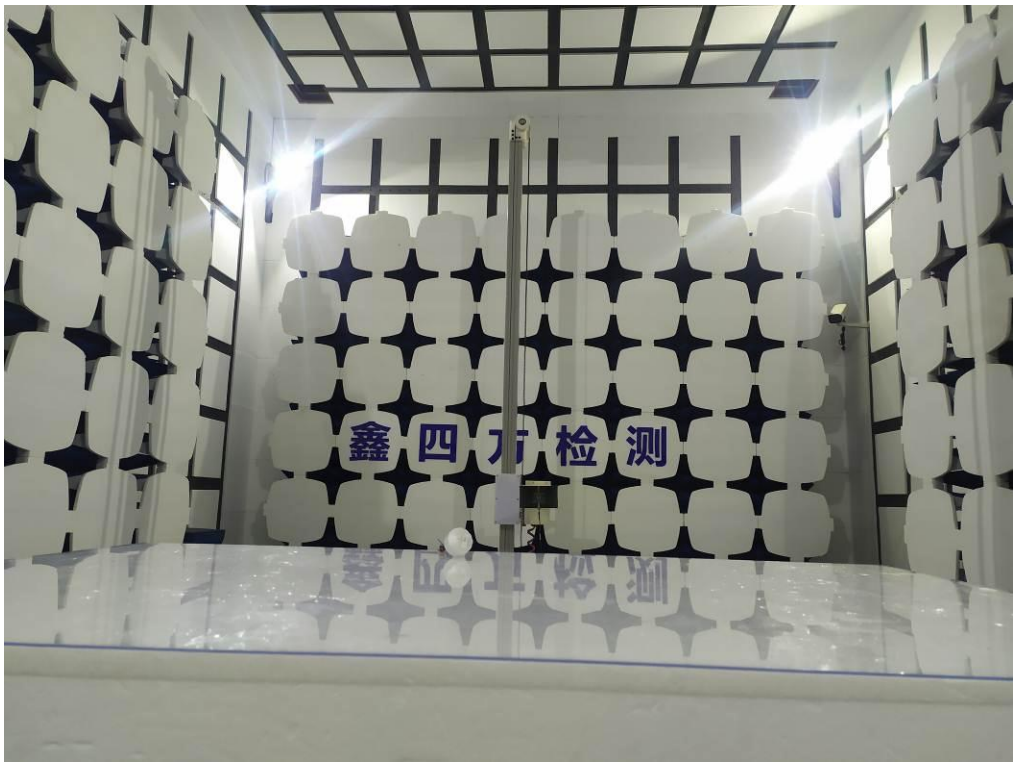
6.1. Photos of power line conducted emission test

6.2. Photos of radiated emission test

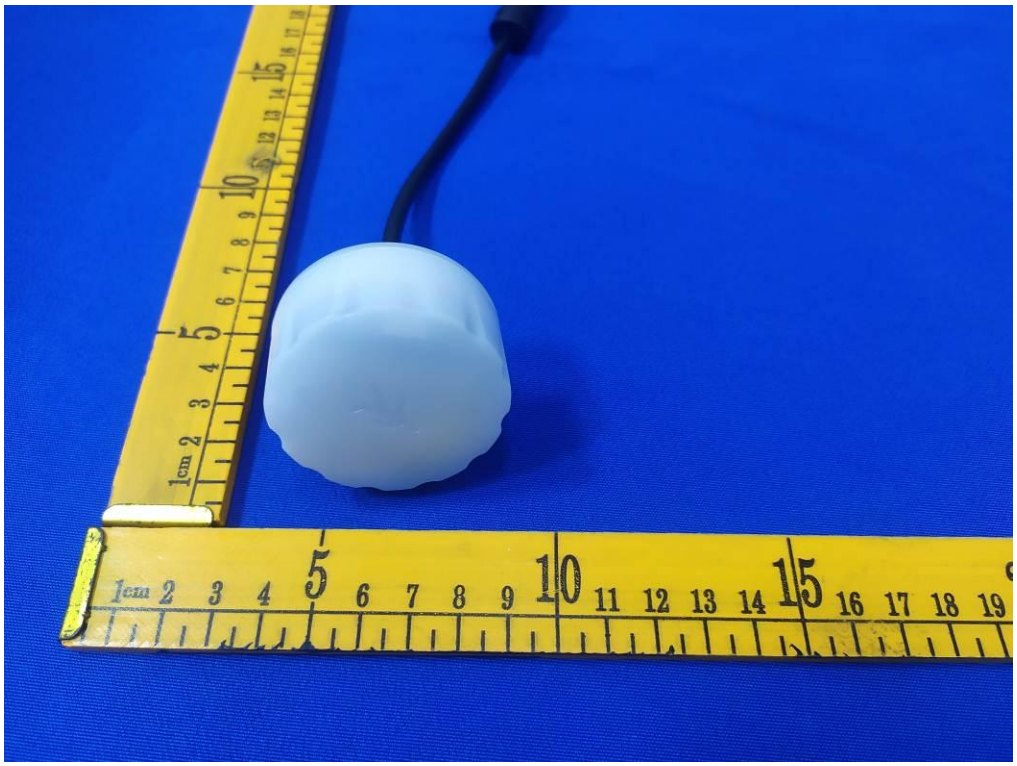
30MHz – 1GHz

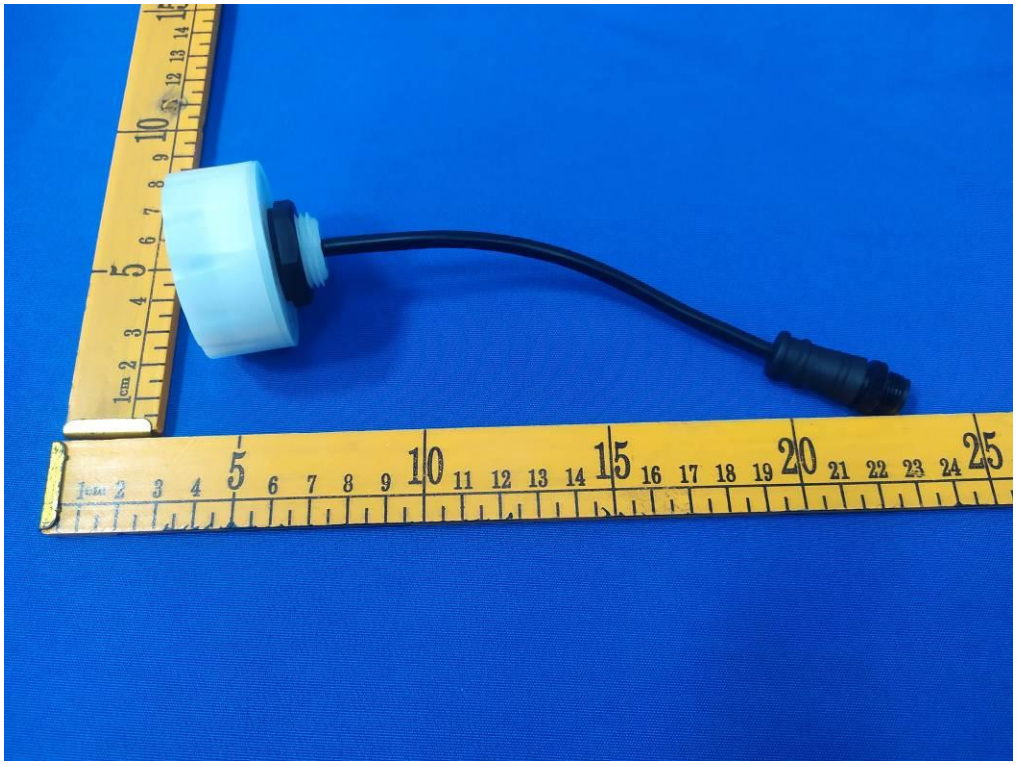


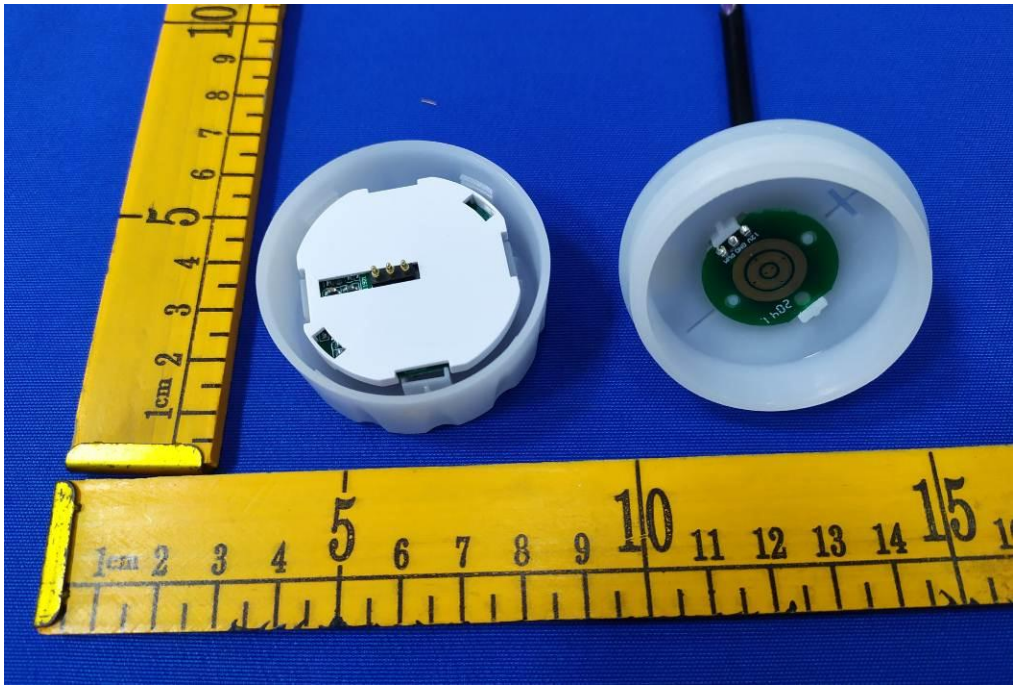
Above 1GHz

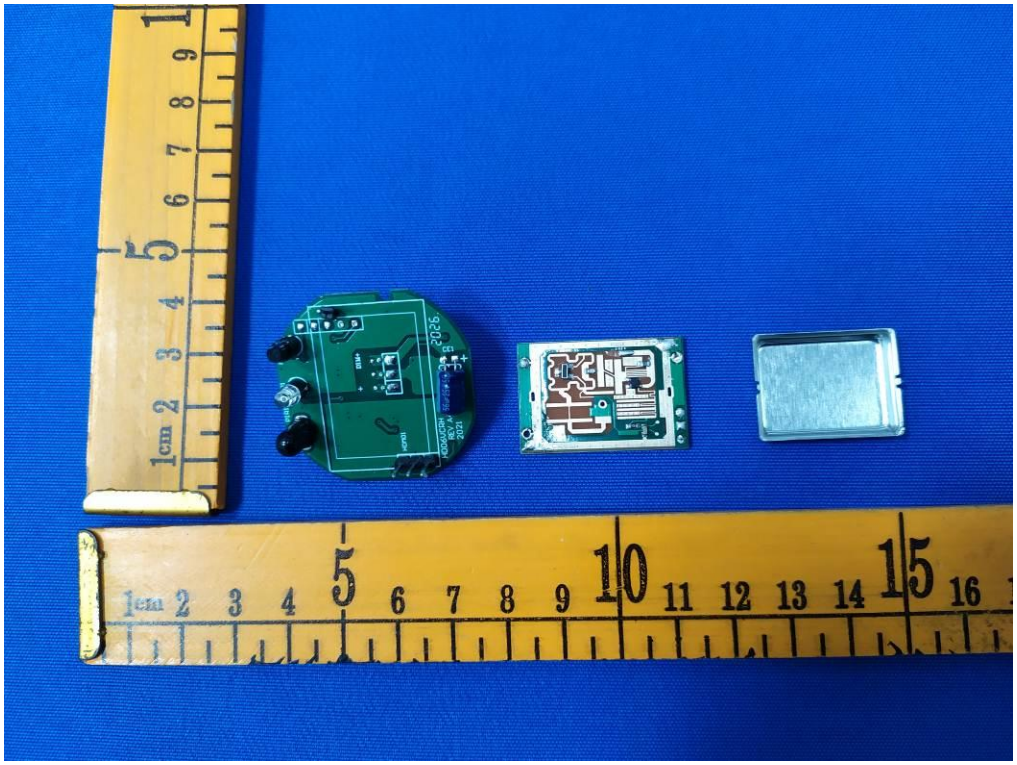


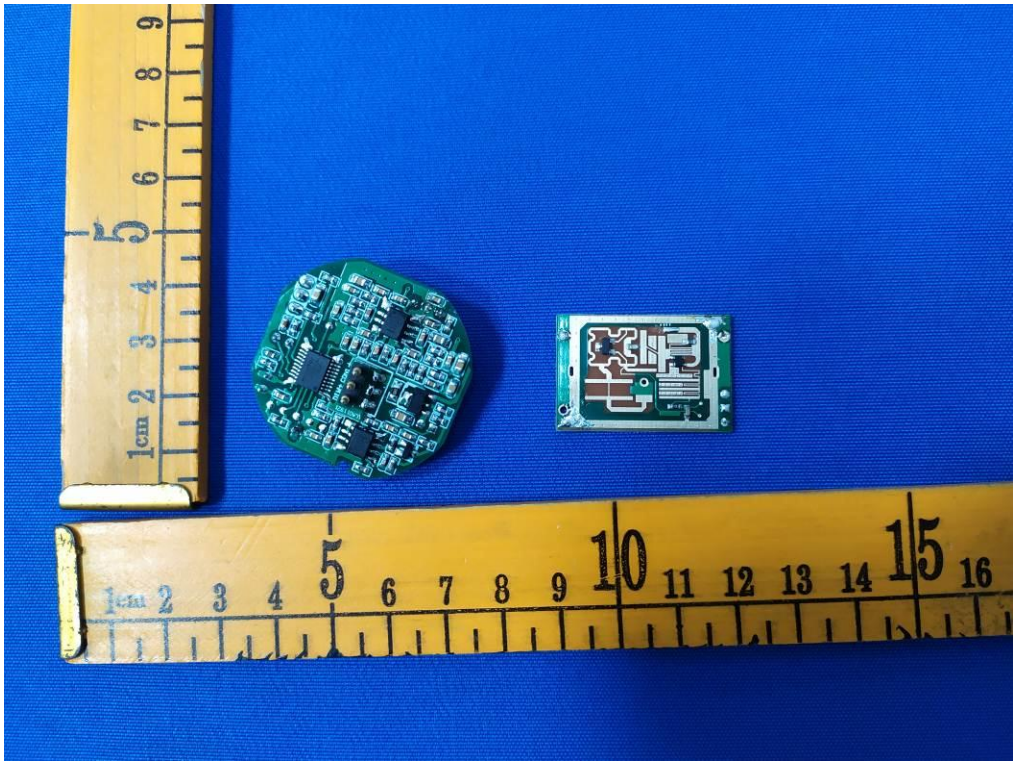
7. Photos of the EUT

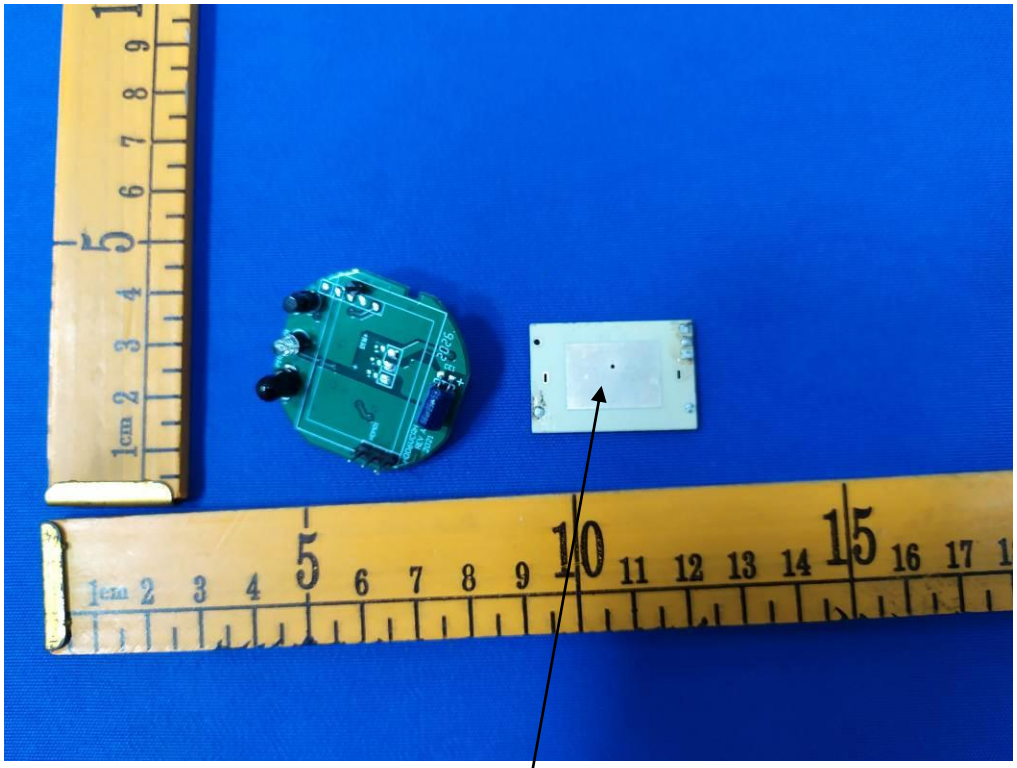












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