



CFR 47 FCC PART 15 SUBPART C

CERTIFICATION TEST REPORT

For

Speakerphone

MODEL NUMBER: UC BM35, BM31, UC BMXXX(X:0~9, A~Z OR BLANK)

FCC ID: 2AFG6-BM31

REPORT NUMBER: 4790311613-14

ISSUE DATE: May 25, 2022

Prepared for

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Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V0	05/25/2022	Initial Issue	



Summary of Test Results			
Clause	Test Items	FCC Rules	Test Results
1	Spurious Emission	FCC Part 15.247 (d) FCC Part 15.209 FCC Part 15.205	Pass
<p>Note:</p> <ol style="list-style-type: none">1.This test report is only published to and used by the applicant, and it is not for evidence purpose in China.2. The measurement result for the sample received is <Pass> according to < CFR 47 FCC PART 15 SUBPART C > when <Accuracy Method> decision rule is applied.3.The EUT has two independent RF Modules, each RF module supports one antenna. All the modules and antennas are identical. When we test one module, another module will be disabled.4.This report just for the Co-location for the worst radiated spurious emission of the simultaneous transmission mode of two models. The worst case configurations was selected base on the report 4790311613-9/10/11/12.			



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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: Guangzhou Shirui Electronics Co., Ltd.
 Address: 192 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology Development District, Guangzhou,Guangdong,China

Manufacturer Information

Company Name: Guangzhou Shirui Electronics Co., Ltd.
 Address: 192 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology Development District, Guangzhou,Guangdong,China

EUT Information

EUT Name: Speakerphone
 Model: UC BM35, BM31, UC BMXXX(X:0~9, A~Z OR BLANK)
 Brand: MAXHUB
 Sample Received Date: March 11, 2022
 Sample Status: Normal
 Sample ID: 4819782
 Date of Tested: March 11, 2022~ May 25, 2022

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 FCC PART 15 SUBPART C	PASS

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with KDB 558074 D01 15.247 Meas Guidance v05r02, 414788 D01 Radiated Test Site v01r01, CFR 47 FCC Part 2, CFR 47 FCC Part 15, ANSI C63.10-2013.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	<p>A2LA (Certificate No.: 4102.01) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA.</p> <p>FCC (FCC Designation No.: CN1187) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Delcaration of Conformity (DoC) and Certification rules</p> <p>ISED (Company No.: 21320) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320 and the test lab Conformity Assessment Body Identifier (CABID) is CN0046.</p> <p>VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B , the VCCI registration No. is C-20012 and T-20011</p>
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Note 1: All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

Note 2: The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

Note 3: For below 30 MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30 MHz had been correlated to measurements performed on an OFS.



4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognize national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty
Conduction emission	3.62 dB
Radiated Emission (Included Fundamental Emission) (9 kHz ~ 30 MHz)	2.2 dB
Radiated Emission (Included Fundamental Emission) (30 MHz ~ 1 GHz)	4.00 dB
Radiated Emission (Included Fundamental Emission) (1 GHz to 26 GHz)	5.78 dB (1 GHz ~ 18 GHz)
	5.23 dB (18 GHz ~ 26 GHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k=2.	



5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name:	Speakerphone		
Model Name:	UC BM35, BM31, UC BMXXX (X:0~9, A~Z OR BLANK)		
Model difference:	There are no difference except the model name.		
Product Description	Operation Frequency	2402 MHz ~ 2480 MHz	
	Modulation Type	Data Rate	
	GFSK	1Mbps	
	π/4-DQPSK	2Mbps	
	Operation Frequency	2402 MHz ~ 2480 MHz	
	Modulation Type	Data Rate	
	GFSK	1Mbps	
	GFSK	2Mbps	
Ratings	DC 7.4 V		
Note:	1.The EUT has two independent RF Modules, each RF module supports one antenna. All the modules and antennas are identical. When we test one module, another module will be disabled.		

5.2. CHANNEL LIST

BT:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	20	2422	40	2442	60	2462
01	2403	21	2423	41	2443	61	2463
02	2404	22	2424	42	2444	62	2464
03	2405	23	2425	43	2445	63	2465
04	2406	24	2426	44	2446	64	2466
05	2407	25	2427	45	2447	65	2467
06	2408	26	2428	46	2448	66	2468
07	2409	27	2429	47	2449	67	2469
08	2410	28	2430	48	2450	68	2470
09	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461	/	/

**BLE:**

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	11	2424	22	2446	33	2468
1	2404	12	2426	23	2448	34	2470
2	2406	13	2428	24	2450	35	2472
3	2408	14	2430	25	2452	36	2474
4	2410	15	2432	26	2454	37	2476
5	2412	16	2434	27	2456	38	2478
6	2414	17	2436	28	2458	39	2480
7	2416	18	2438	29	2460	/	/
8	2418	19	2440	30	2462	/	/
9	2420	20	2442	31	2464	/	/
10	2422	21	2444	32	2468	/	/

5.3. MAXIMUM PEAK OUTPUT POWER

Module 1	Test Mode	Frequency (MHz)	Channel Number	Maximum Peak Output Power (dBm)	Maximum EIRP (dBm)
	LE 1M	2402 ~ 2480	0-39[40]	1.72	4.72
	LE 2M	2402 ~ 2480	0-39[40]	1.29	4.29
	GFSK	2402 ~ 2480	0-78[79]	2.83	5.83
	π/4-DQPSK	2402 ~ 2480	0-78[79]	1.89	4.89

Module 2	Test Mode	Frequency (MHz)	Channel Number	Maximum Peak Output Power (dBm)	Maximum EIRP (dBm)
	LE 1M	2402 ~ 2480	0-39[40]	0.23	3.23
	LE 2M	2402 ~ 2480	0-39[40]	-0.26	2.74
	GFSK	2402 ~ 2480	0-78[79]	0.09	3.09
	π/4-DQPSK	2402 ~ 2480	0-78[79]	0.92	3.92

Note:

all the data base on report 4790311613-9/10/11/12.

5.4. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel	Frequency
LE 1M	CH 0(Low Channel), CH 19(MID Channel), CH 39(High Channel)	2402 MHz, 2440 MHz, 2480 MHz
LE 2M	CH 0(Low Channel), CH 19(MID Channel), CH 39(High Channel)	2402 MHz, 2440 MHz, 2480 MHz
Test Mode	Test Channel	Frequency
GFSK-DH5	CH 0(Low Channel), CH 39(MID Channel), CH 78(High Channel)	2402 MHz, 2441 MHz, 2480 MHz
Π/4-DQPSK	CH 0(Low Channel), CH 39(MID Channel), CH 78(High Channel)	2402 MHz, 2441 MHz, 2480 MHz
GFSK-DH5	Hopping	2402 MHz ~ 2480 MHz
Π/4-DQPSK	Hopping	2402 MHz ~ 2480 MHz

5.5. THE WORSE CASE POWER SETTING PARAMETER

Module 1	The Worst Case Power Setting Parameter under 2400 ~ 2483.5MHz Band				
	Test Software Version		FCC_assist 1.0.2.2		
	Modulation Type	Transmit Antenna Number	Test Software setting value		
			CH 0	CH 19	CH 39
GFSK(1Mbps)	1	default	default	default	
GFSK(2Mbps)	1	default	default	default	
		CH 00	CH 39	CH 78	
GFSK	1	9	9	9	
Π/4-DQPSK	1	9	9	9	

Module 2	The Worst Case Power Setting Parameter under 2400 ~ 2483.5MHz Band				
	Test Software Version		FCC_assist 1.0.2.2		
	Modulation Type	Transmit Antenna Number	Test Software setting value		
			CH 0	CH 19	CH 39
GFSK(1Mbps)	1	default	default	default	
GFSK(2Mbps)	1	default	default	default	
		CH 00	CH 39	CH 78	
GFSK	1	9	9	9	
Π/4-DQPSK	1	9	9	9	



5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna	Frequency (MHz)	Antenna Type	MAX Antenna Gain (dBi)
1	2402-2480	PCB	3

Note:

1.The EUT has two independent RF Modules, each RF module supports one antenna. All the modules and antennas are identical. When we test one module, another module will be disabled.

Test Mode	Transmit and Receive Mode	Description
GFSK(1Mbps)	1TX, 1RX	Chain 1 can be used as transmitting/receiving antenna.
GFSK(2Mbps)	1TX, 1RX	Chain 1 can be used as transmitting/receiving antenna.
GFSK	1TX, 1RX	Chain 1 can be used as transmitting/receiving antenna.
π/4-DQPSK	1TX, 1RX	Chain 1 can be used as transmitting/receiving antenna.

Note:

1.The value of the antenna gain was declared by customer.
2. The EUT has two independent RF Modules, each RF module supports one antenna. All the modules and antennas are identical. When we test one module, another module will be disabled.

5.7. CO-LOCATION WORST-CASE CONFIGURATIONS

Worst case	Test Mode	Channel/Frequency
Module 1	BT-DH5	2402
Module 2	BT-2DH5	2480

Note:

1:The EUT has two independent RF Modules, each RF module supports one antenna. All the modules and antennas are identical. When we test one module, another module will be disabled.

2.The co-location worst case configurations base on the report 4790311613-9/10/11/12.

5.8. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	Remarks
1	Laptop	Lenovo	E42	/
2	Laptop	Lenovo	E42	/

I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB	/	Type-C Cable	1.0	/

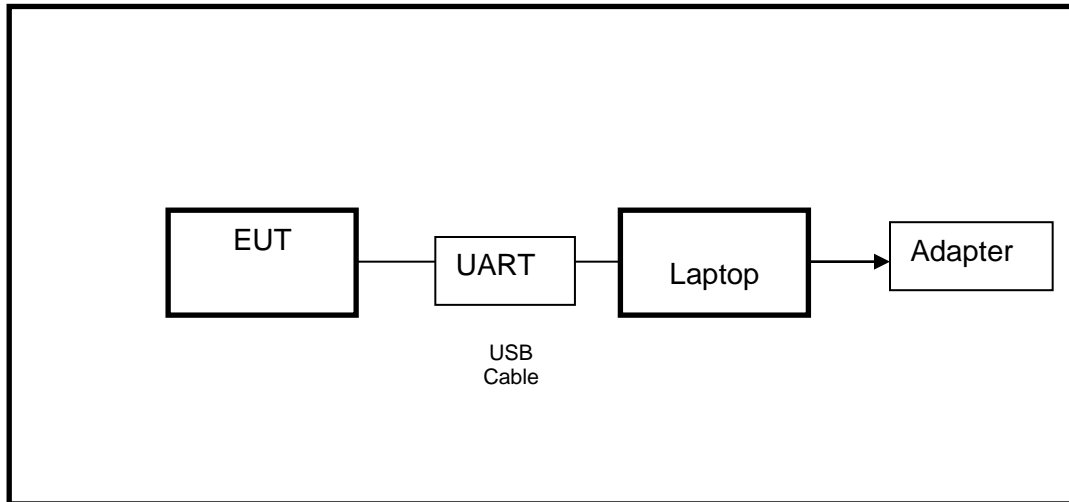
ACCESSORIES

Item	Accessory	Brand Name	Model Name	Description
/	/	/	/	/

TEST SETUP

The EUT can work in engineering mode with a software through a Laptop.

SETUP DIAGRAM FOR TESTS



Note: AC adapter only use for AC POWER LINE CONDUCTED EMISSIONS testing.



6. MEASURING INSTRUMENT AND SOFTWARE USED

Radiated Emissions					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Oct.30, 2021	Oct.29, 2022
Hybrid Log Periodic Antenna	TDK	HLP-3003C	130959	Aug.02, 2021	Aug.01, 2024
Preamplifier	HP	8447D	2944A09099	Oct.30, 2021	Oct.29, 2022
EMI Measurement Receiver	R&S	ESR26	101377	Oct.30, 2021	Oct.29, 2022
Horn Antenna	TDK	HRN-0118	130940	July 20, 2021	July 19, 2024
Preamplifier	TDK	PA-02-0118	TRS-305-00067	Oct.30, 2021	Oct.29, 2022
Horn Antenna	Schwarzbeck	BBHA9170	697	July 20, 2021	July 19, 2024
Preamplifier	TDK	PA-02-2	TRS-307-00003	Oct.31, 2021	Oct.30, 2022
Preamplifier	TDK	PA-02-3	TRS-308-00002	Oct.31, 2021	Oct.30, 2022
Loop antenna	Schwarzbeck	1519B	00008	Dec.14, 2021	Dec.14, 2024
Preamplifier	TDK	PA-02-001-3000	TRS-302-00050	Oct.31, 2021	Oct.30, 2022
Preamplifier	Mini-Circuits	ZX60-83LN-S+	SUP01201941	Oct.31, 2021	Oct.30, 2022
High Pass Filter	Wi	WHKX10-2700-3000-18000-40SS	23	Oct.31, 2021	Oct.30, 2022
Band Reject Filter	Wainwright	WRCJV8-2350-2400-2483.5-2533.5-40SS	4	Oct.31, 2021	Oct.30, 2022
Software					
Description		Manufacturer	Name	Version	
Test Software for Radiated Emissions		Farad	EZ-EMC	Ver. UL-3A1	



7. RADIATED TEST RESULTS

LIMITS

Please refer to CFR 47 FCC §15.205 and §15.209.

Radiation Disturbance Test Limit for FCC (Class B) (9 kHz-1 GHz)

Emissions radiated outside of the specified frequency bands above 30 MHz			
Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m	
		Quasi-Peak	
30 - 88	100	40	
88 - 216	150	43.5	
216 - 960	200	46	
Above 960	500	54	
Above 1000	500	Peak	Average
		74	54

FCC Emissions radiated outside of the specified frequency bands below 30 MHz		
Frequency (MHz)	Field strength (microvolts/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



FCC Restricted bands of operation refer to FCC §15.205 (a):

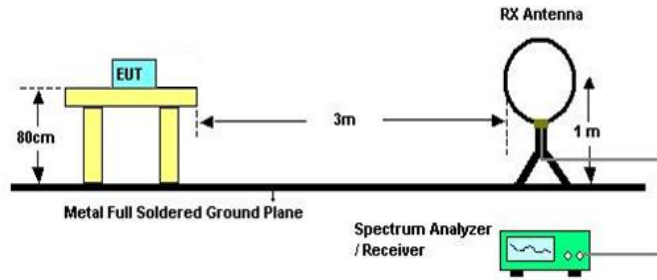
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	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)
13.36-13.41			

Note: ¹Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

²Above 38.6c

TEST SETUP AND PROCEDURE

Below 30 MHz

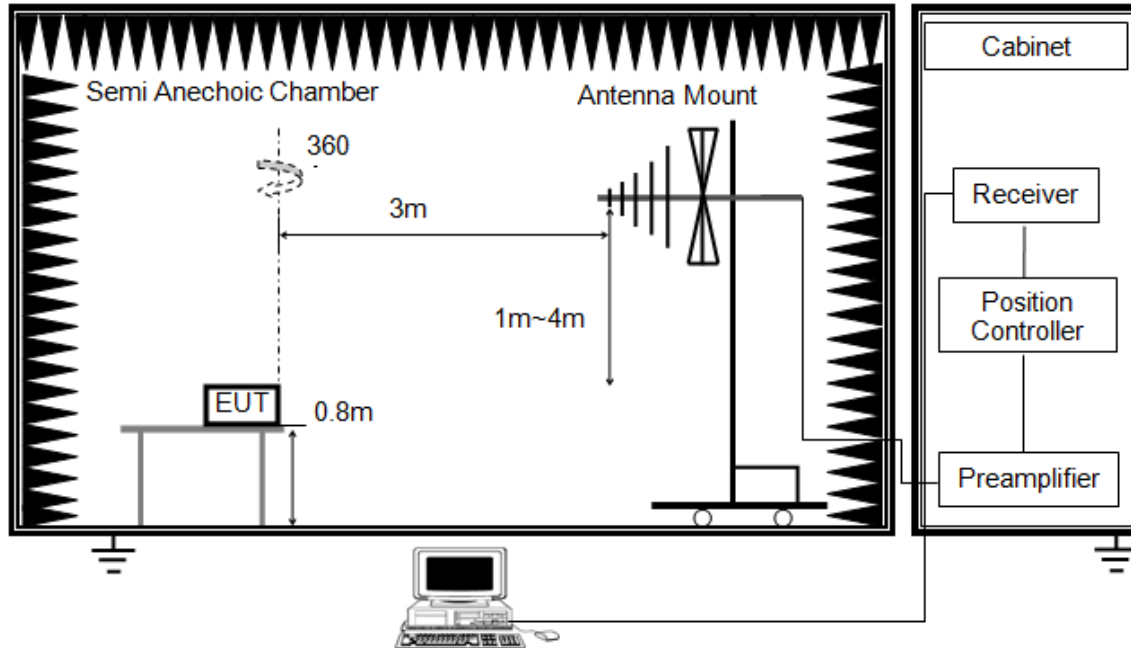


The setting of the spectrum analyser

RBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
VBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
Sweep	Auto

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.4.
2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80 cm above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1 m height antenna tower.
5. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz Radiated emission limits in these three bands are based on measurements employing an average detector.
6. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak and average detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak and average detector and reported.
7. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30m open field site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field site based on KDB 414788.
8. The limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377Ω . For example, the measurement frequency X KHz resulted in a level of Y dBuV/m, which is equivalent to $Y-51.5 = Z$ dBuA/m, which has the same margin, W dB, to the corresponding RSS-GEN Table 6 limit as it has to be 15.209(a) limit.

Below 1 GHz and above 30 MHz

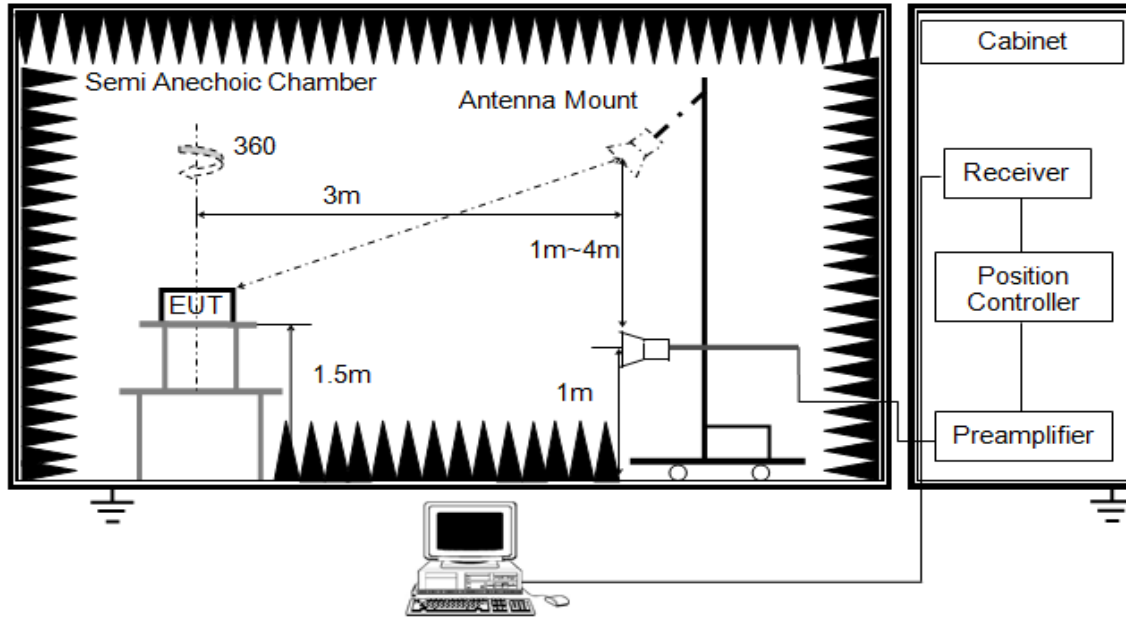


The setting of the spectrum analyser

RBW	120 kHz
VBW	300 kHz
Sweep	Auto
Detector	Peak/QP
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.5.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80 cm above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

Above 1GHz

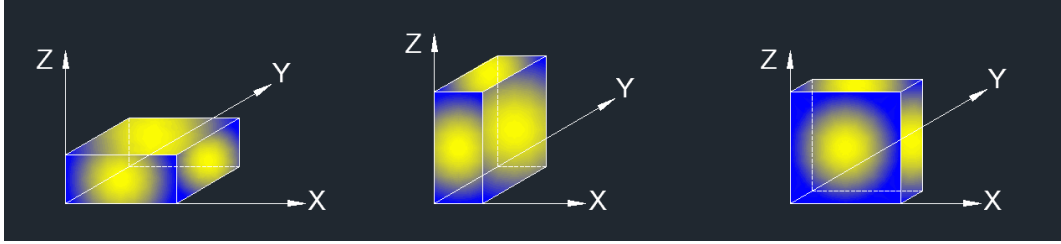


The setting of the spectrum analyser

RBW	1 MHz
VBW	PEAK: 3 MHz AVG: see note 6
Sweep	Auto
Detector	Peak
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.6.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 1.5 m above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement above 1 GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.
6. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 7.1.ON TIME AND DUTY CYCLE.

X axis, Y axis, Z axis positions:



Note 1: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

TEST ENVIRONMENT

Temperature	23.2 °C	Relative Humidity	65 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 7.4 V

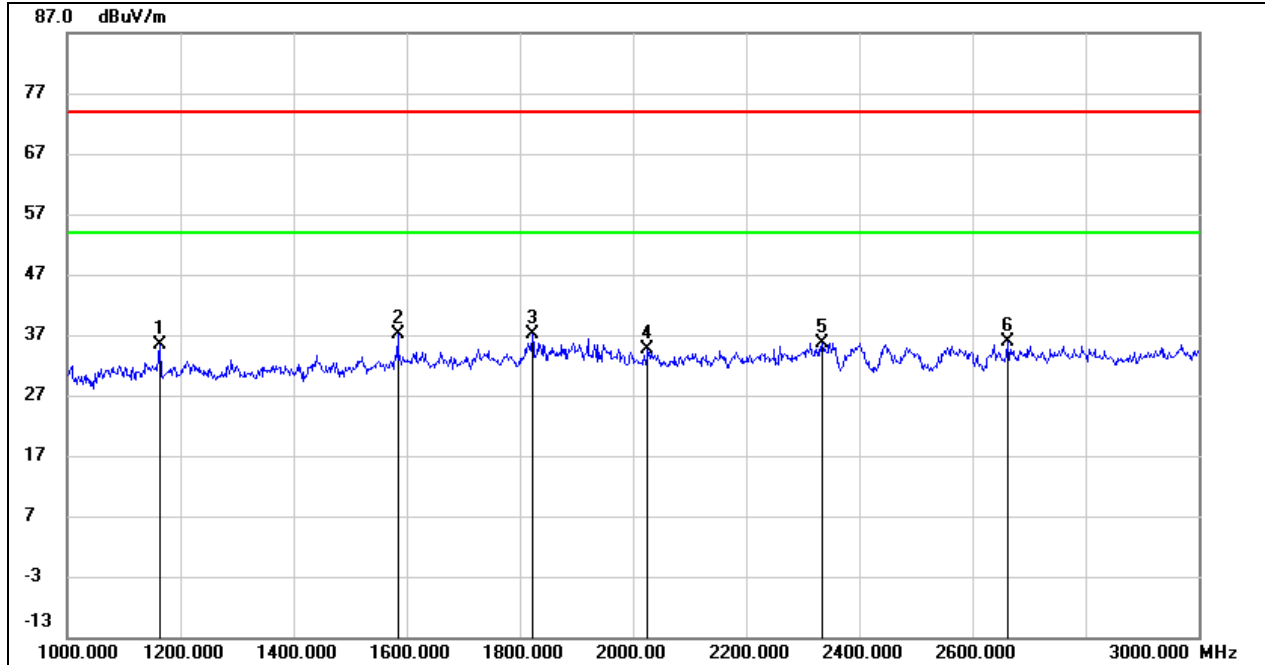
RESULTS

7.1. SPURIOUS EMISSIONS (1 GHz ~ 3 GHz)

7.1.1. Worst Radiated spurious emission test result of the simultaneous transmission

HARMONICS AND SPURIOUS EMISSIONS (HORIZONTAL)

Module 1 BT-DH5 2402MHz + Module 2 BT-2DH5-2480MHz



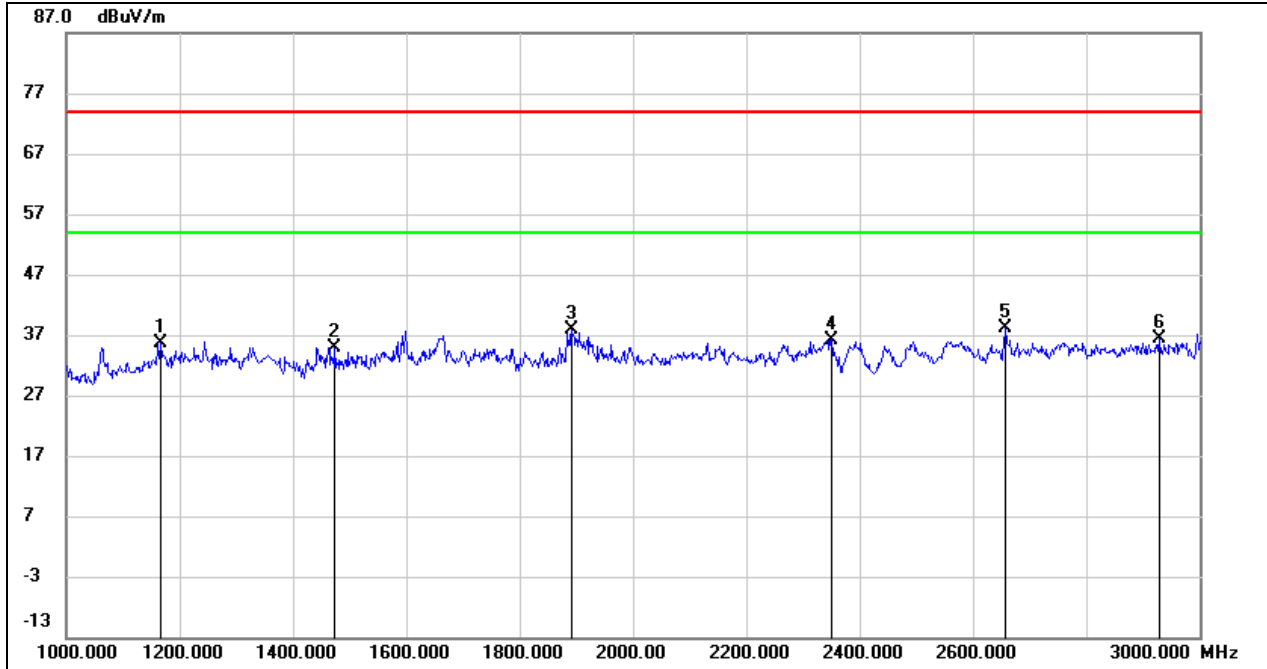
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1164.000	49.25	-13.95	35.30	74.00	-38.70	peak
2	1585.000	49.15	-11.94	37.21	74.00	-36.79	peak
3	1822.000	47.66	-10.62	37.04	74.00	-36.96	peak
4	2026.000	45.31	-10.79	34.52	74.00	-39.48	peak
5	2334.000	44.93	-9.20	35.73	74.00	-38.27	peak
6	2663.000	44.24	-8.29	35.95	74.00	-38.05	peak

Note:

1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. The co-location worst case configurations base on the report 4790311613-9/10/11/12.

HARMONICS AND SPURIOUS EMISSIONS (VERTICAL)

Module 1 BT-DH5 2402MHz + Module 2 BT-2DH5-2480MHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1166.000	49.67	-13.94	35.73	74.00	-38.27	peak
2	1475.000	47.51	-12.57	34.94	74.00	-39.06	peak
3	1893.000	48.55	-10.76	37.79	74.00	-36.21	peak
4	2350.000	45.39	-9.14	36.25	74.00	-37.75	peak
5	2658.000	46.47	-8.31	38.16	74.00	-35.84	peak
6	2929.000	43.58	-7.32	36.26	74.00	-37.74	peak

Note:

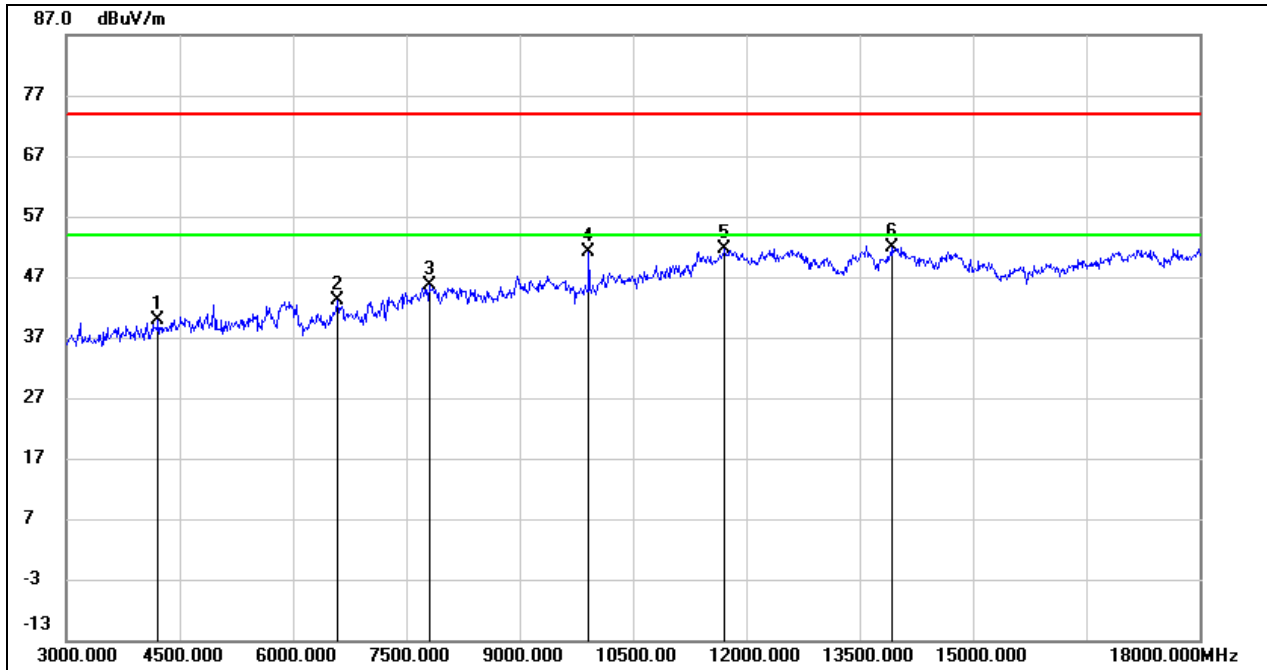
1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. The co-location worst case configurations base on the report 4790311613-9/10/11/12.

7.2. SPURIOUS EMISSIONS (3 GHz ~ 18 GHz)

7.2.1. Worst Radiated spurious emission test result of the simultaneous transmission

HARMONICS AND SPURIOUS EMISSIONS (HORIZONTAL)

Module 1 BT-DH5 2402MHz + Module 2 BT-2DH5-2480MHz

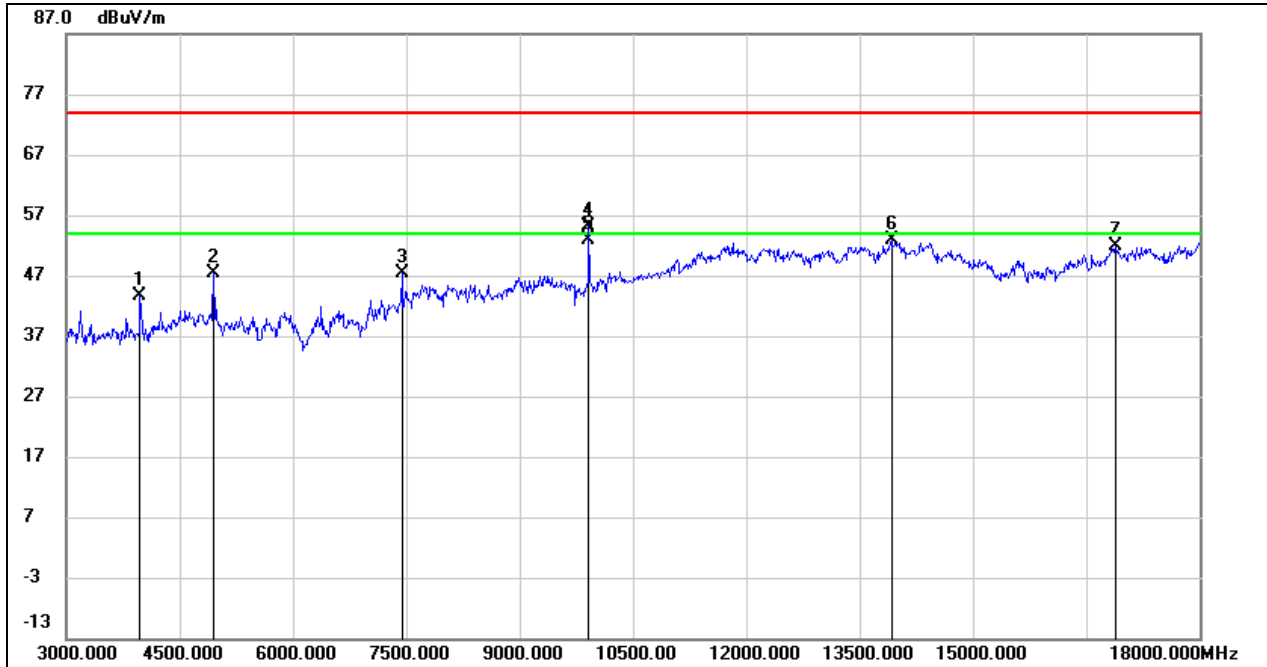


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4215.000	42.12	-2.31	39.81	74.00	-34.19	peak
2	6585.000	38.95	4.24	43.19	74.00	-30.81	peak
3	7807.500	38.42	7.13	45.55	74.00	-28.45	peak
4	9922.500	39.92	11.30	51.22	74.00	-22.78	peak
5	11722.500	34.76	16.87	51.63	74.00	-22.37	peak
6	13942.500	30.63	21.30	51.93	74.00	-22.07	peak

- Note: 1. Peak Result = Reading Level + Correct Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Peak: Peak detector.
 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
 6. The co-location worst case configurations base on the report 4790311613-9/10/11/12.

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)

Module 1 BT-DH5 2402MHz + Module 2 BT-2DH5-2480MHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3982.500	47.19	-3.61	43.58	74.00	-30.42	peak
2	4957.500	47.51	-0.18	47.33	74.00	-26.67	peak
3	7440.000	41.07	6.20	47.27	74.00	-26.73	peak
4	9922.500	43.82	11.30	55.12	74.00	-18.88	peak
5	9922.500	41.47	11.30	52.77	54.00	-1.23	AVG
6	13920.000	31.58	21.24	52.82	74.00	-21.18	peak
7	16890.000	31.71	20.10	51.81	74.00	-22.19	peak

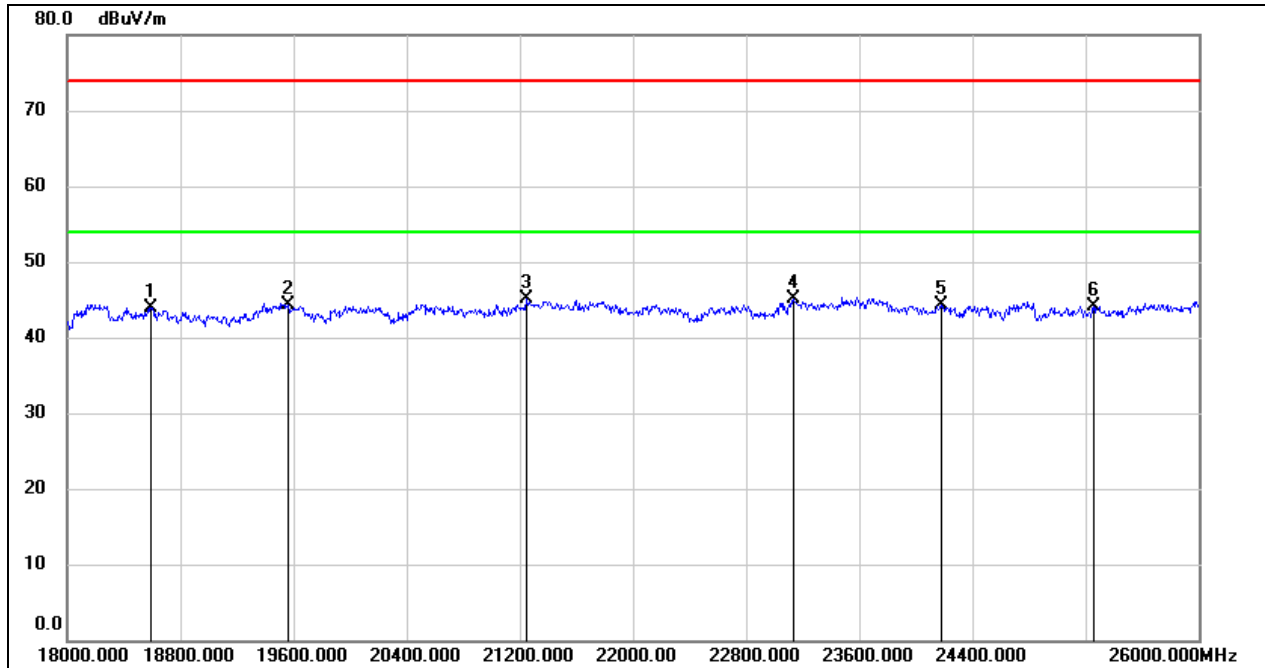
Note: 1. Peak Result = Reading Level + Correct Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Peak: Peak detector.
 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
 6. The co-location worst case configurations base on the report 4790311613-9/10/11/12.

7.3. SPURIOUS EMISSIONS (18 GHz ~ 26 GHz)

7.3.1. Worst Radiated spurious emission test result of the simultaneous transmission

SPURIOUS EMISSIONS (HORIZONTAL)

Module 1 BT-DH5 2402MHz + Module 2 BT-2DH5-2480MHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18592.000	49.25	-5.31	43.94	74.00	-30.06	peak
2	19560.000	49.86	-5.48	44.38	74.00	-29.62	peak
3	21248.000	49.79	-4.77	45.02	74.00	-28.98	peak
4	23136.000	48.43	-3.40	45.03	74.00	-28.97	peak
5	24176.000	47.19	-2.80	44.39	74.00	-29.61	peak
6	25256.000	45.79	-1.67	44.12	74.00	-29.88	peak

Note: 1. Peak Result = Reading Level + Correct Factor.

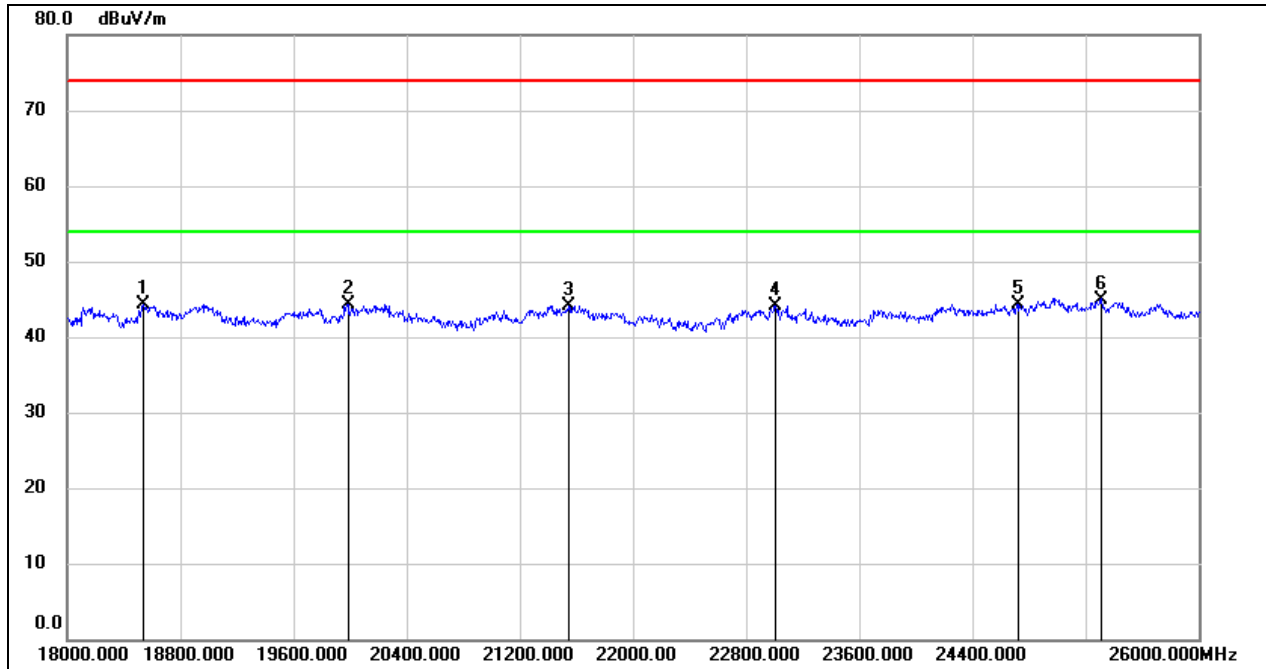
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. The co-location worst case configurations base on the report 4790311613-9/10/11/12.

SPURIOUS EMISSIONS (VERTICAL)

Module 1 BT-DH5 2402MHz + Module 2 BT-2DH5-2480MHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18536.000	49.60	-5.27	44.33	74.00	-29.67	peak
2	19984.000	49.71	-5.44	44.27	74.00	-29.73	peak
3	21544.000	48.76	-4.63	44.13	74.00	-29.87	peak
4	23008.000	47.60	-3.44	44.16	74.00	-29.84	peak
5	24720.000	46.72	-2.33	44.39	74.00	-29.61	peak
6	25312.000	46.70	-1.70	45.00	74.00	-29.00	peak

Note: 1. Peak Result = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

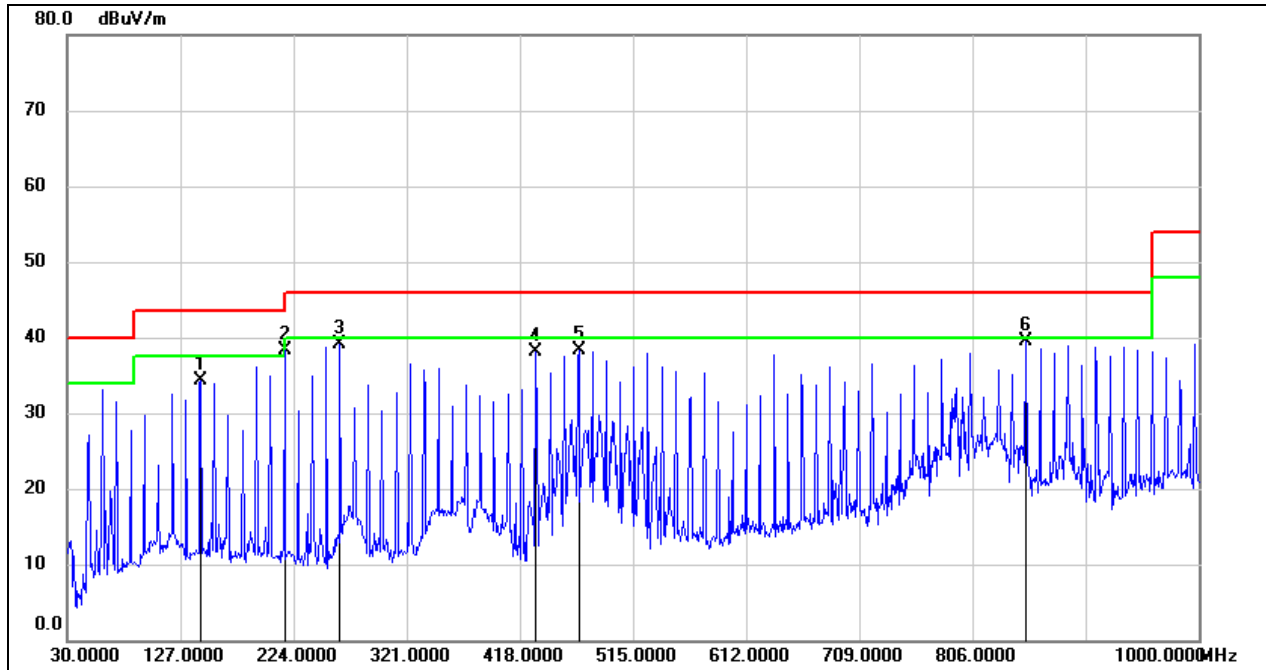
4. The co-location worst case configurations base on the report 4790311613-9/10/11/12.

7.4. SPURIOUS EMISSIONS (30 MHz ~ 1 GHz)

7.4.1. Worst Radiated spurious emission test result of the simultaneous transmission

SPURIOUS EMISSIONS (HORIZONTAL)

Module 1 BT-DH5 2402MHz + Module 2 BT-2DH5-2480MHz

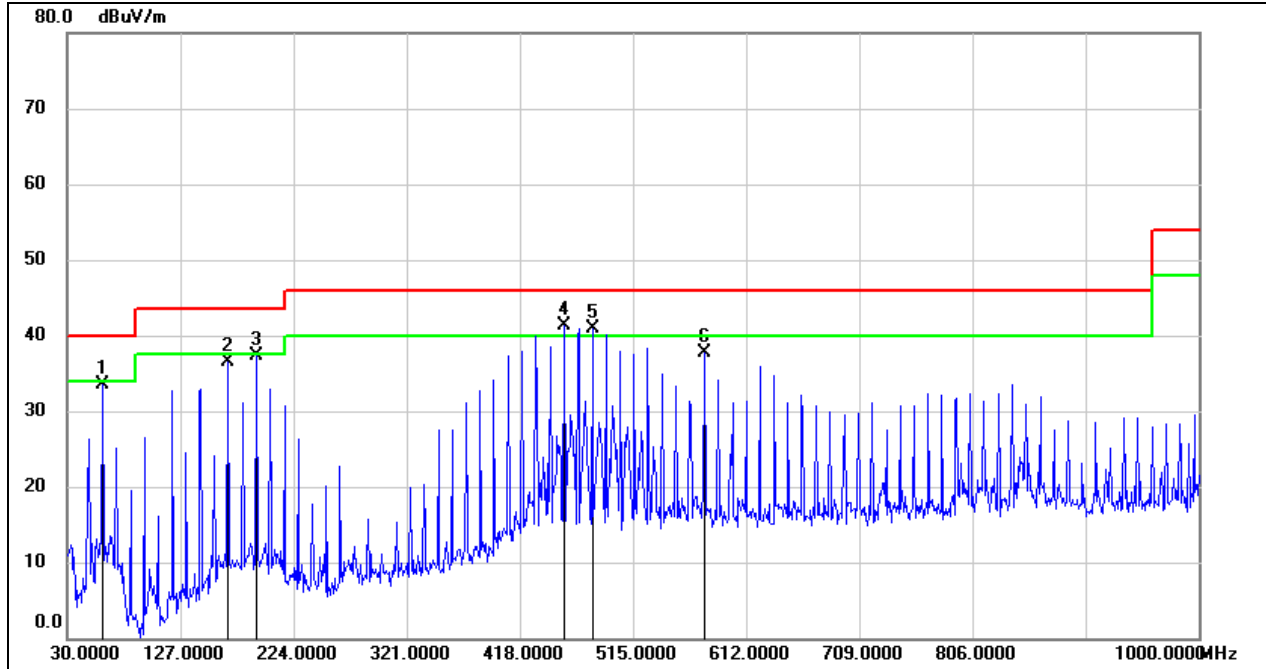


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	144.4600	53.00	-18.60	34.40	43.50	-9.10	QP
2	216.2400	56.15	-17.84	38.31	46.00	-7.69	QP
3	263.7700	57.27	-18.25	39.02	46.00	-6.98	QP
4	431.5800	50.71	-12.70	38.01	46.00	-7.99	QP
5	468.4400	50.38	-12.04	38.34	46.00	-7.66	QP
6	851.5900	45.67	-6.21	39.46	46.00	-6.54	QP

- Note: 1. Result Level = Read Level + Correct Factor.
 2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
 3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.
 4. The co-location worst case configurations base on the report 4790311613-9/10/11/12.

SPURIOUS EMISSIONS (VERTICAL)

Module 1 BT-DH5 2402MHz + Module 2 BT-2DH5-2480MHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	60.0700	54.09	-20.49	33.60	40.00	-6.40	QP
2	167.7400	53.91	-17.41	36.50	43.50	-7.00	QP
3	191.9900	53.85	-16.56	37.29	43.50	-6.21	QP
4	455.8300	53.50	-12.27	41.23	46.00	-4.77	QP
5	480.0800	52.73	-11.79	40.94	46.00	-5.06	QP
6	576.1100	47.75	-10.02	37.73	46.00	-8.27	QP

- Note: 1. Result Level = Read Level + Correct Factor.
 2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
 3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto
 4. The co-location worst case configurations base on the report 4790311613-9/10/11/12.

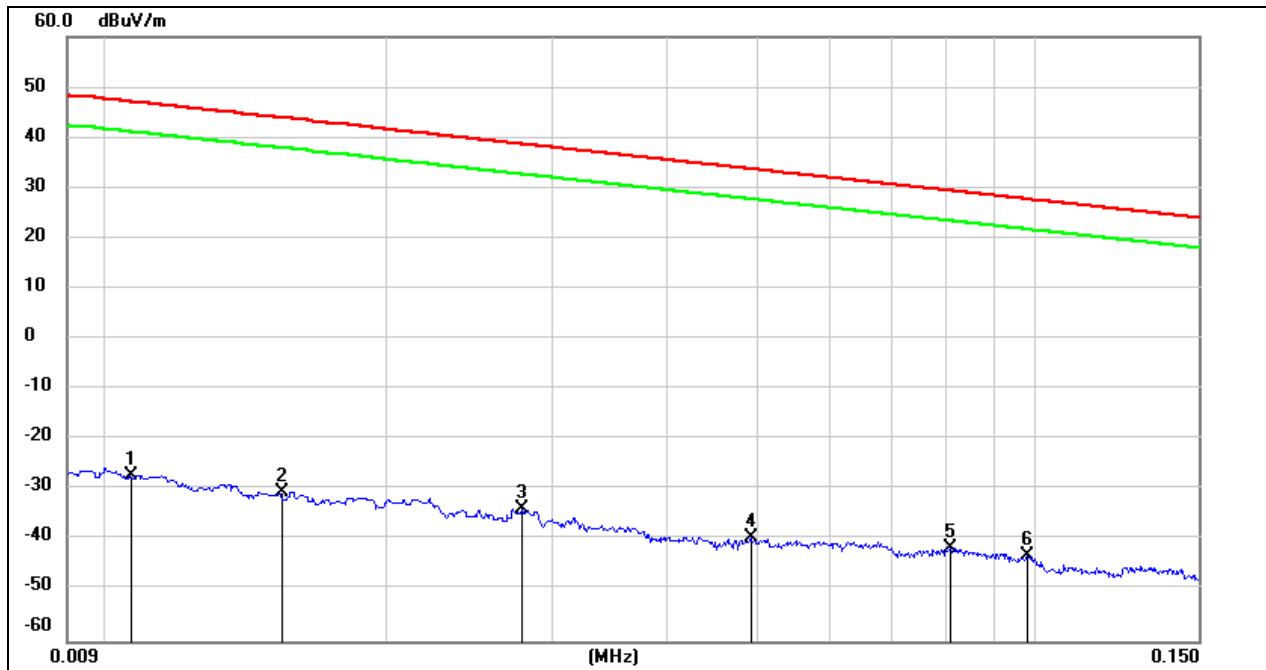
7.5. SPURIOUS EMISSIONS BELOW 30 MHz

7.5.1. Worst Radiated spurious emission test result of the simultaneous transmission

SPURIOUS EMISSIONS (LOOP ANTENNA FACE ON TO THE EUT, WORST-CASE CONFIGURATION)

Module 1 BT-DH5 2402MHz + Module 2 BT-2DH5-2480MHz

9 kHz~ 150 kHz



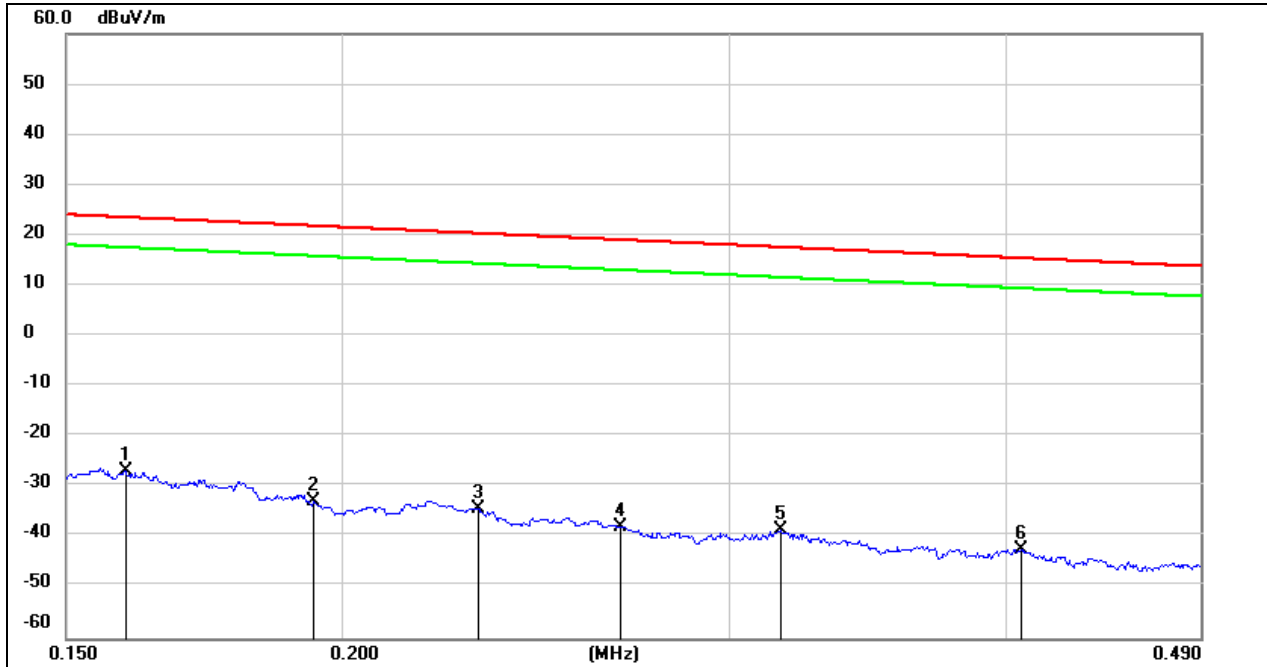
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0106	74.38	-101.39	-27.01	47.09	-74.10	peak
2	0.0154	70.94	-101.37	-30.43	43.85	-74.28	peak
3	0.0279	67.67	-101.38	-33.71	38.69	-72.40	peak
4	0.0492	62.05	-101.47	-39.42	33.76	-73.18	peak
5	0.0806	60.18	-101.63	-41.45	29.47	-70.92	peak
6	0.0981	58.77	-101.78	-43.01	27.77	-70.78	peak

Note:

1. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
2. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.
3. The co-location worst case configurations base on the report 4790311613-9/10/11/12.

150 kHz ~ 490 kHz

Module 1 BT-DH5 2402MHz + Module 2 BT-2DH5-2480MHz



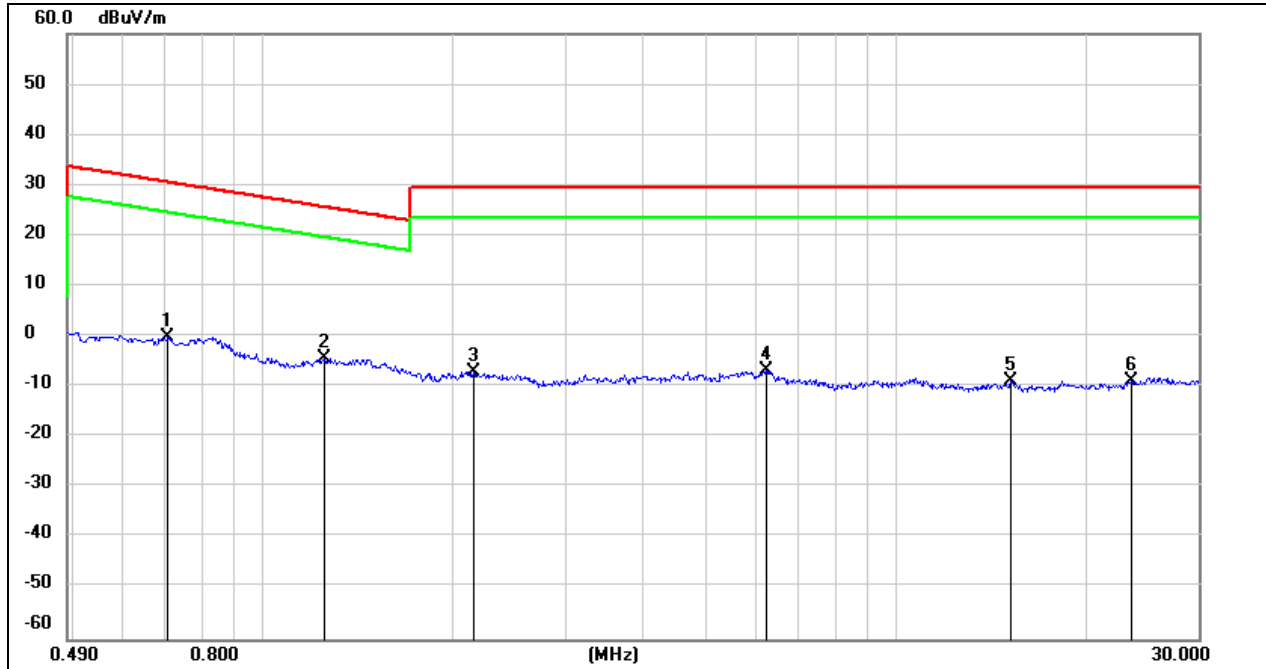
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1595	74.86	-101.65	-26.79	23.55	-50.34	peak
2	0.1942	68.81	-101.70	-32.89	21.84	-54.73	peak
3	0.2305	67.44	-101.77	-34.33	20.35	-54.68	peak
4	0.2676	64.01	-101.82	-37.81	19.05	-56.86	peak
5	0.3163	63.20	-101.87	-38.67	17.60	-56.27	peak
6	0.4062	59.64	-101.96	-42.32	15.43	-57.75	peak

Note:

1. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
2. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.
3. The co-location worst case configurations base on the report 4790311613-9/10/11/12.

490 kHz ~ 30 MHz

Module 1 BT-DH5 2402MHz + Module 2 BT-2DH5-2480MHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.7066	61.90	-62.11	-0.21	30.62	-30.83	peak
2	1.2459	57.75	-62.16	-4.41	25.70	-30.11	peak
3	2.1463	54.77	-61.79	-7.02	29.54	-36.56	peak
4	6.2445	54.63	-61.32	-6.69	29.54	-36.23	peak
5	15.1859	52.05	-61.01	-8.96	29.54	-38.50	peak
6	23.4783	51.74	-60.56	-8.82	29.54	-38.36	peak

Note:

1. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
2. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.
3. The co-location worst case configurations base on the report 4790311613-9/10/11/12.

8. Photo

8.1. External Photo

View of EUT-1



View of EUT-2



View of EUT-3

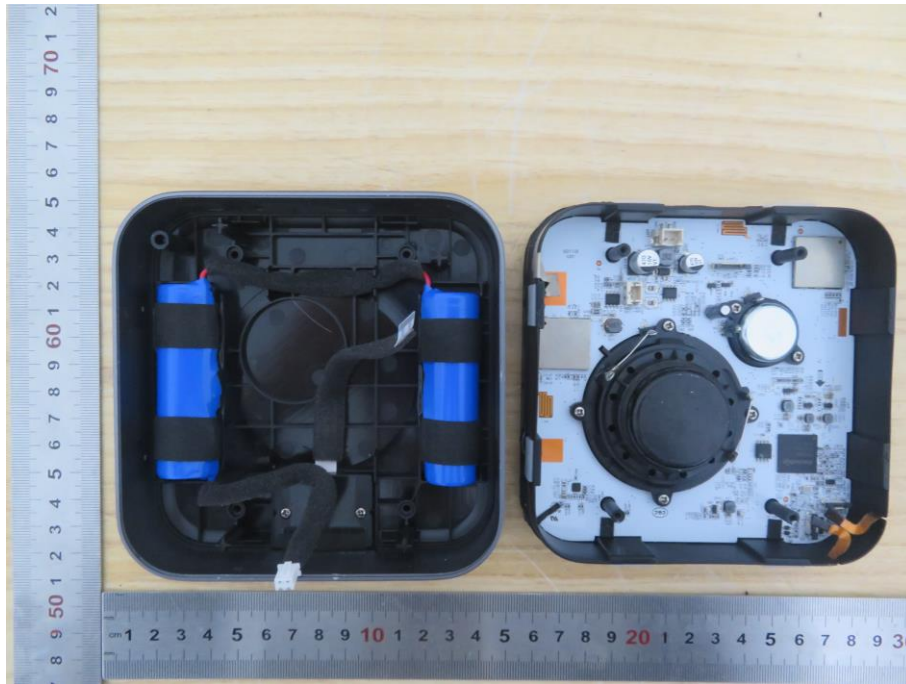


View of EUT-4

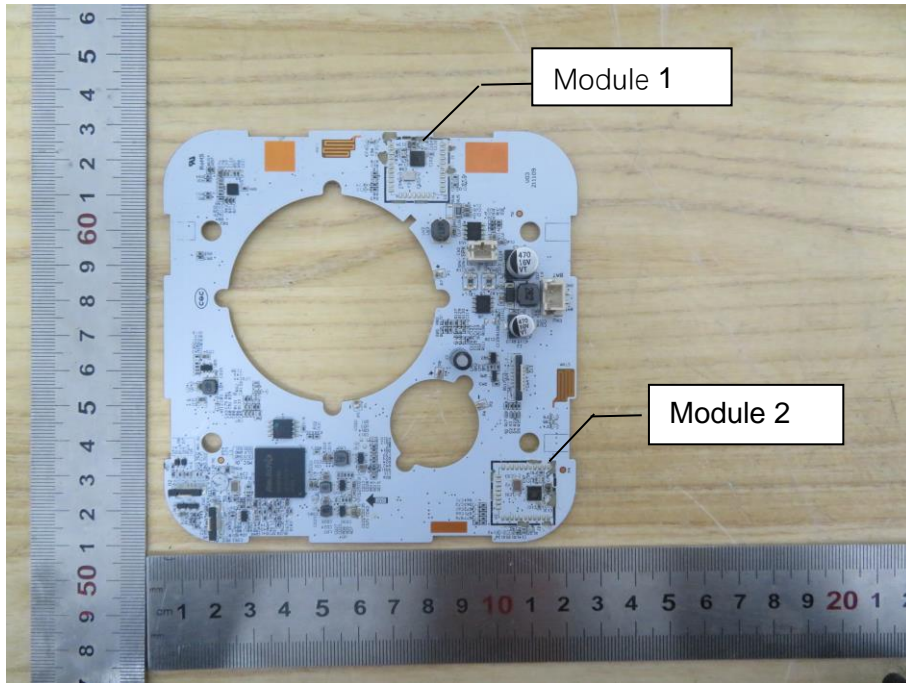


8.2. Internal Photo

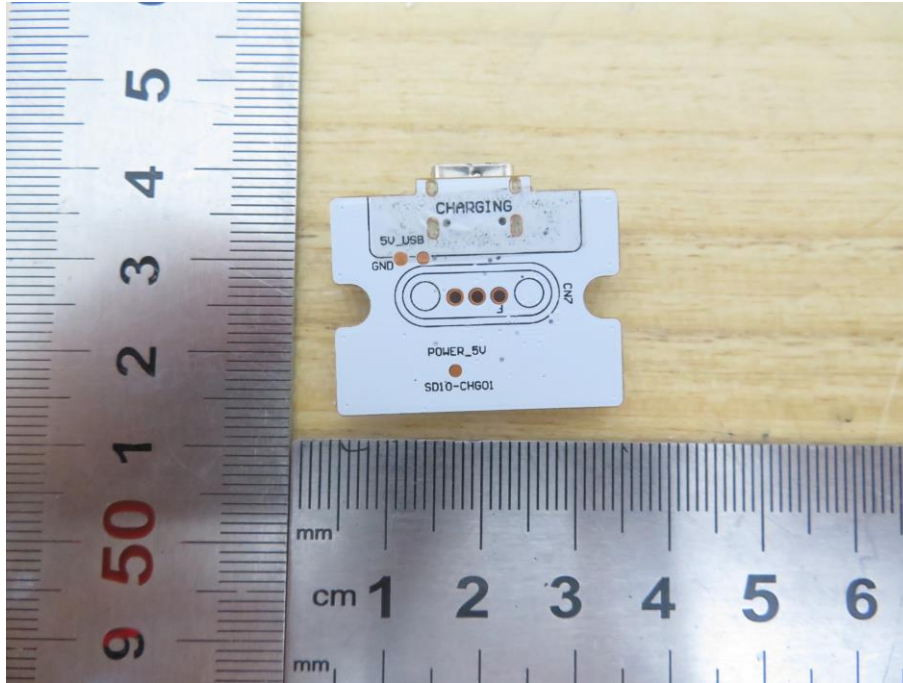
Internal View of EUT-1



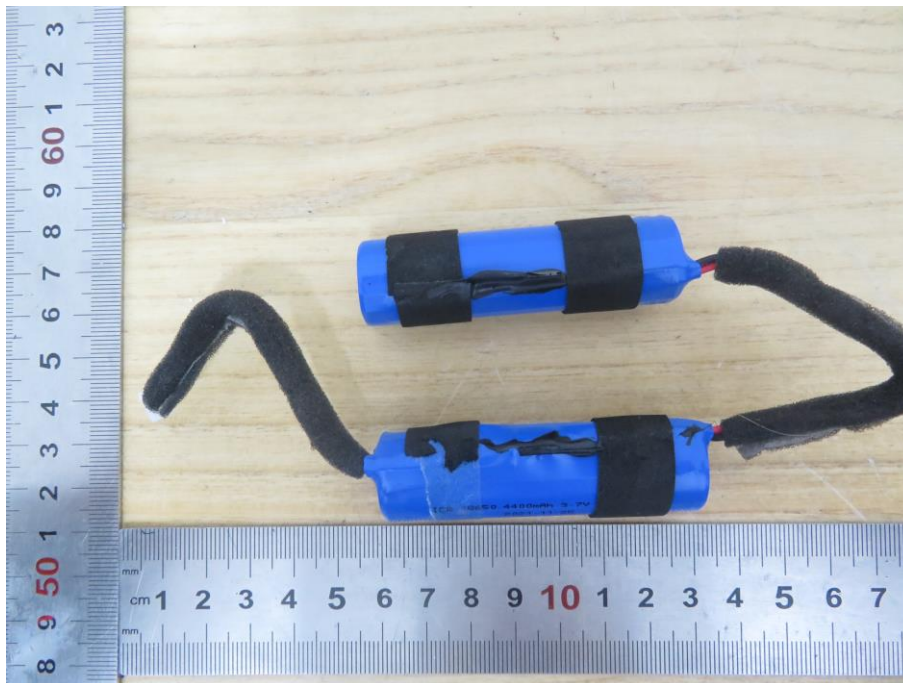
Internal View of EUT-2



Internal View of EUT-9



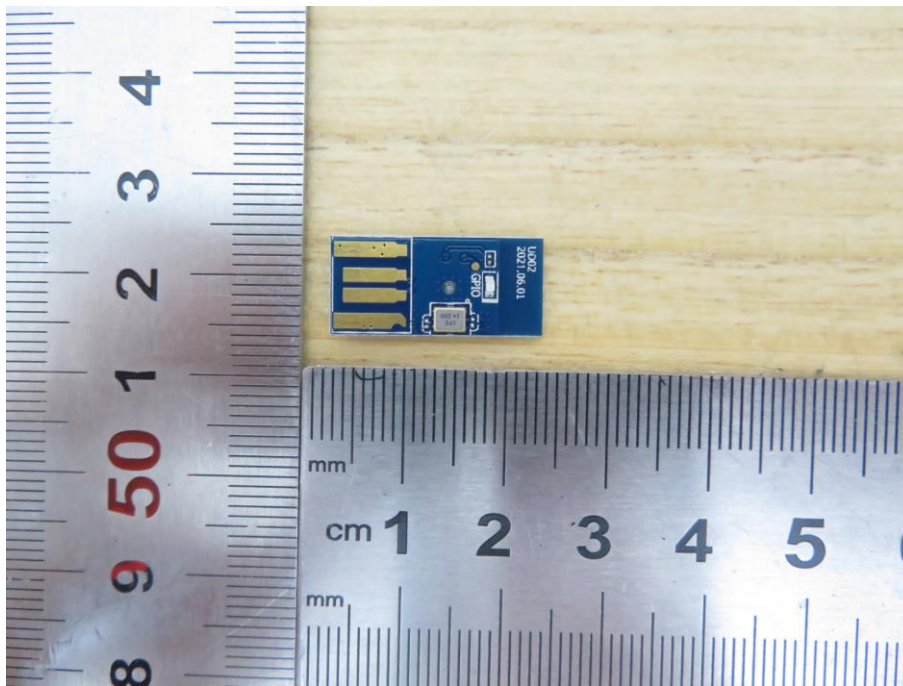
Internal View of EUT-10



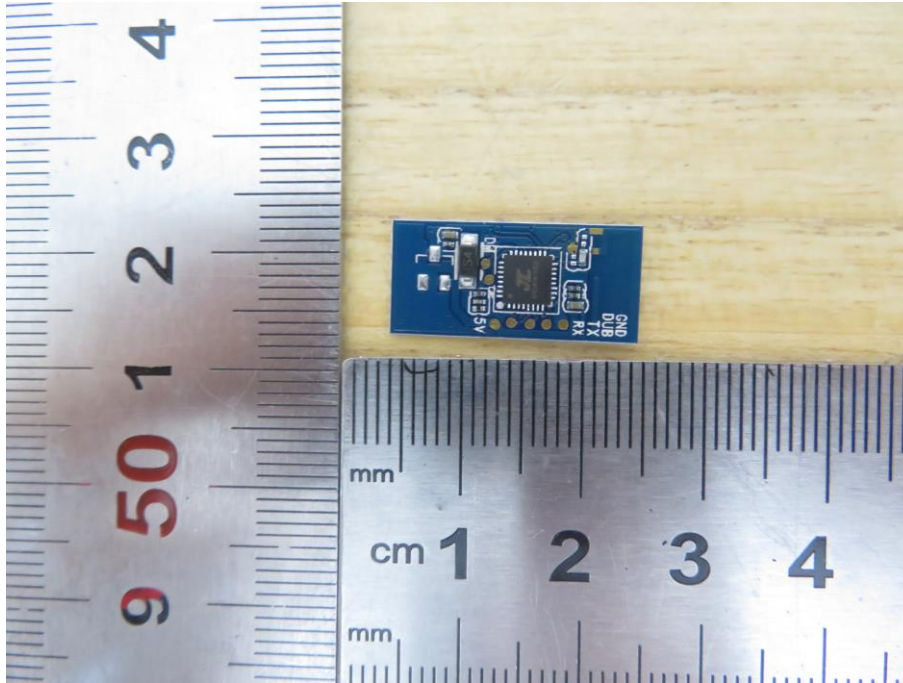
Internal View of EUT-11



Internal View of EUT-12

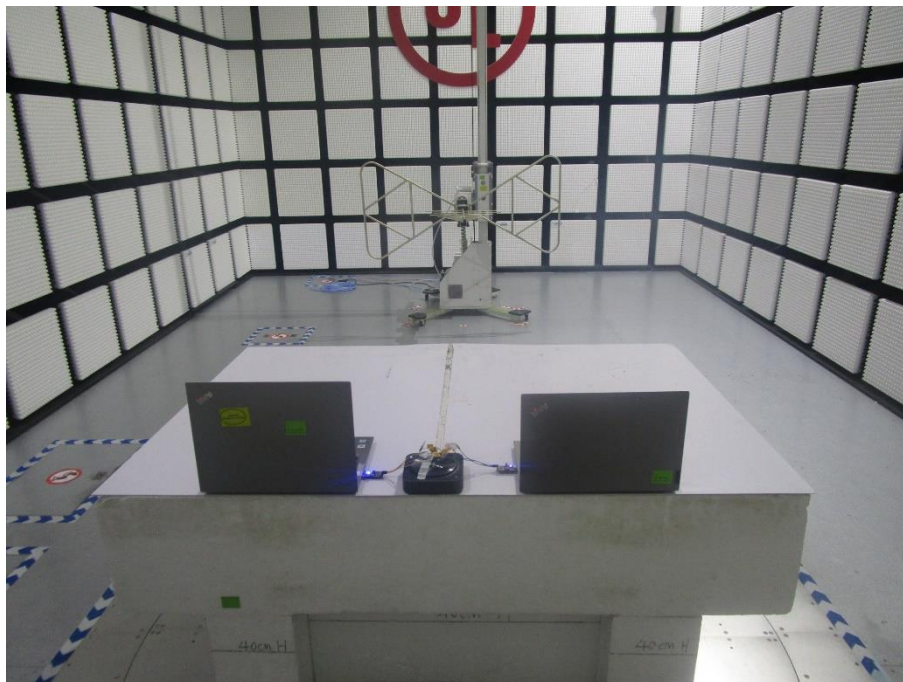


Internal View of EUT-13

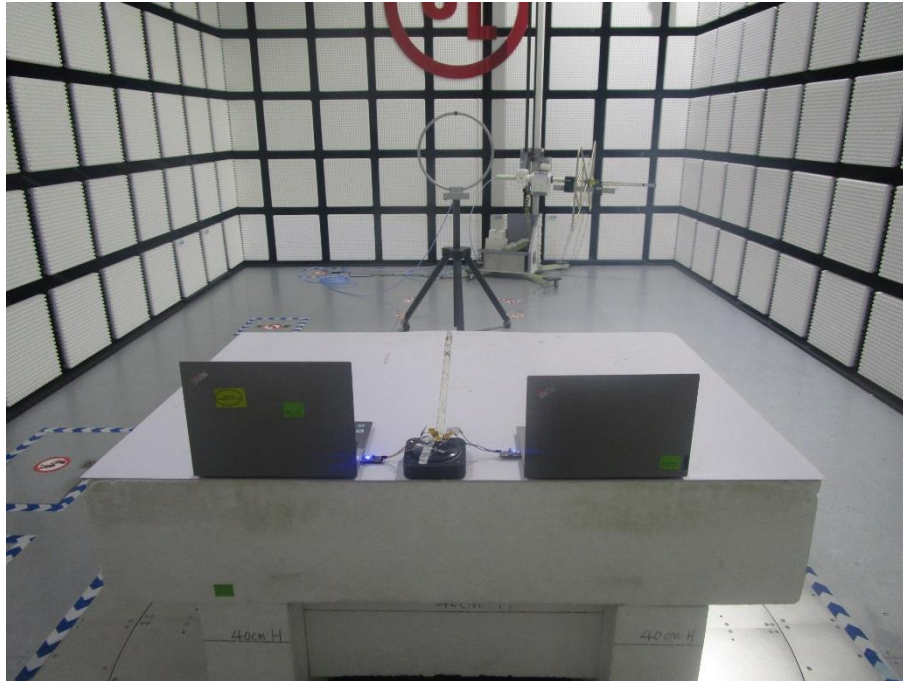


8.3. Setup Photo

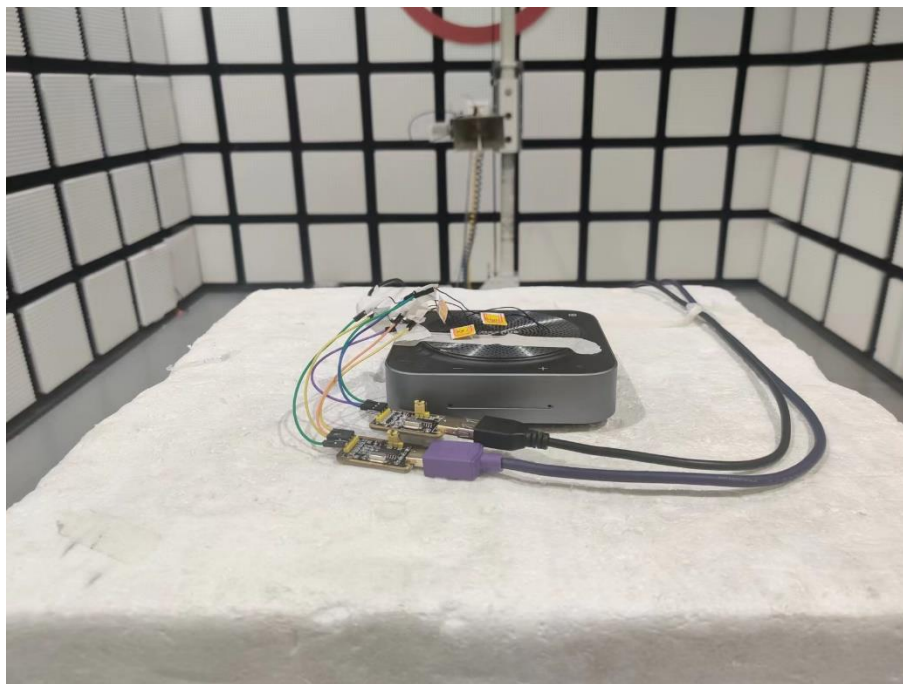
Radiated Disturbance below 1 GHz and above 30 MHz



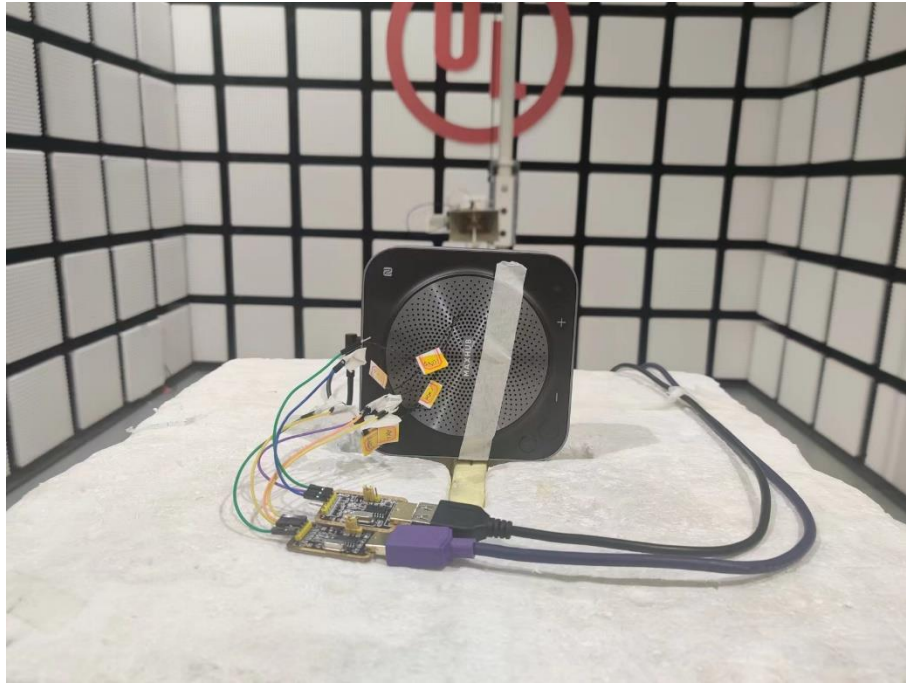
Radiated Disturbance below 30 MHz



Radiated Disturbance Setup (Above 1 GHz – X axis)



Radiated Disturbance Setup (Above 1 GHz – Y axis)



Radiated Disturbance Setup (Above 1 GHz – Z axis)



Radiated Disturbance Setup (Above 1 GHz – Worst Case)



AC Power Line Conducted Emissions setup

