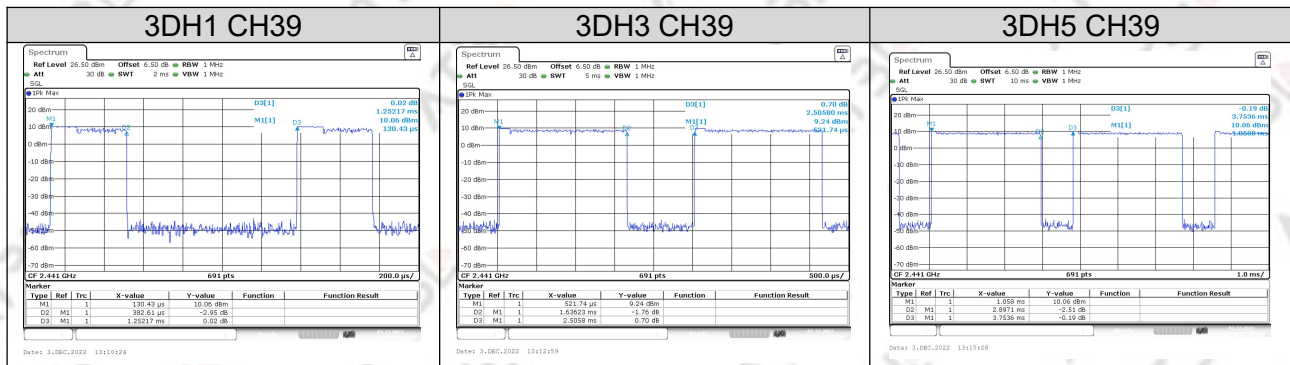


Temperature:	25°C	Relative Humidity:	50%
Test Mode:	8DPSK(3Mbps)– 3DH1/3DH3/3DH5	Test Voltage:	DC 19V

Data Packet	Channel	pulse time(ms)	Dwell Time(s)	Limits(s)
3DH1	2441	0.38261	0.1224	0.4
3DH3	2441	1.63623	0.2618	0.4
3DH5	2441	2.8971	0.3090	0.4



7. HOPPING CHANNEL SEPARATION MEASUREMENT

7.1 LIMIT

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> 20 dB Bandwidth or Channel Separation
RB	30 kHz (20dB Bandwidth) / 30 kHz (Channel Separation)
VB	100 kHz (20dB Bandwidth) / 100 kHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

7.2 TEST PROCEDURE

- The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
- The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for 20 dB bandwidth measurement.
- The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for channel separation measurement.

7.3 TEST SETUP



7.4 EUT OPERATION CONDITIONS

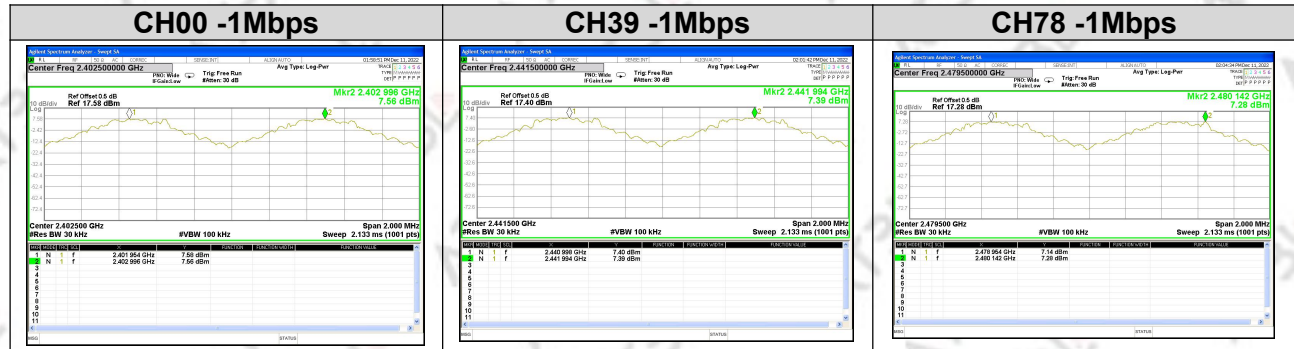
The EUT was programmed to be in continuously transmitting mode.

7.5 TEST RESULTS

Temperature:	25°C	Relative Humidity:	50%
Test Mode:	CH00 / CH39 / CH78 (GFSK(1Mbps) Mode)	Test Voltage:	DC 19V

Frequency	Mark1 Frequency (MHz)	Mark2 Frequency (MHz)	Ch. Separation (MHz)	Limit (MHz)	Result
2402 MHz	2401.954	2402.996	1.042	0.8421	Complies
2441 MHz	2440.998	2441.994	0.996	0.8145	Complies
2480 MHz	2478.954	2480.142	1.188	0.8142	Complies

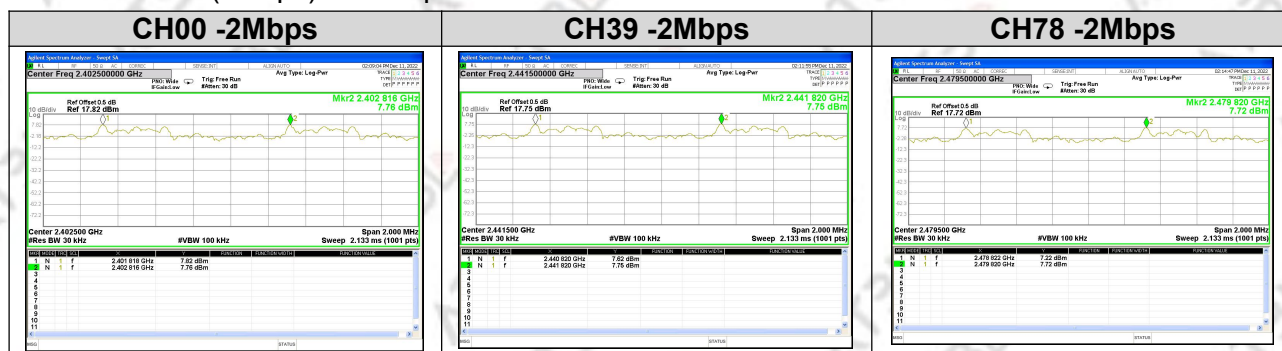
For GFSK: Ch. Separation Limits: > 20dB bandwidth



Temperature:	25°C	Relative Humidity:	50%
Test Mode:	CH00 / CH39 /CH78 ($\pi/4$ -DQPSK(2Mbps) Mode)	Test Voltage:	DC 19V

Frequency	Mark1 Frequency (MHz)	Mark2 Frequency (MHz)	Ch. Separation (MHz)	Limit (MHz)	Result
2402 MHz	2401.818	2402.816	0.998	0.8107	Complies
2441 MHz	2440.820	2441.820	1.000	0.8093	Complies
2480 MHz	2478.822	2479.820	0.998	0.8100	Complies

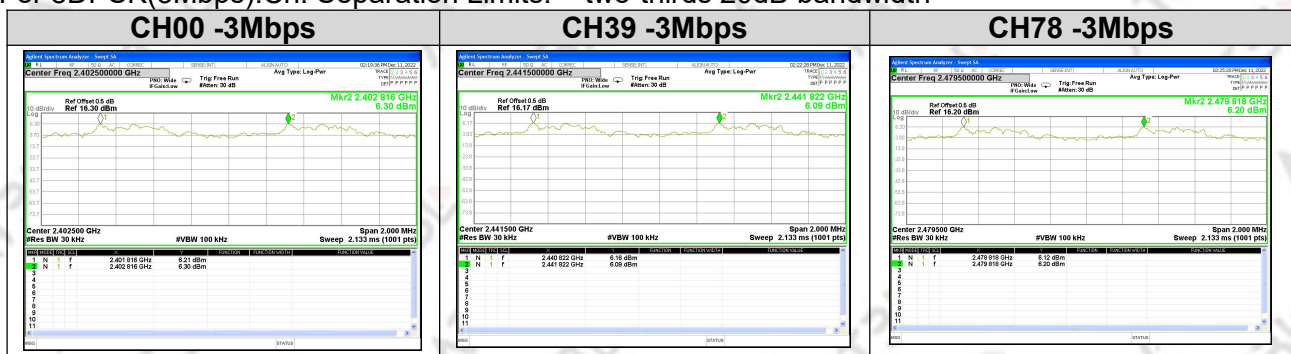
For $\pi/4$ -DQPSK(2Mbps): Ch. Separation Limits: > two-thirds 20dB bandwidth



Temperature:	25°C	Relative Humidity:	50%
Test Mode:	CH00 / CH39 /CH78 (8DPSK(3Mbps)Mode)	Test Voltage:	DC 19V

Frequency	Mark1 Frequency (MHz)	Mark2 Frequency (MHz)	Ch. Separation (MHz)	Limit (MHz)	Result
2402 MHz	2401.816	2402.816	1.000	0.8133	Complies
2441 MHz	2440.822	2441.822	1.000	0.8127	Complies
2480 MHz	2478.818	2479.818	1.000	0.8127	Complies

For 8DPSK(3Mbps):Ch. Separation Limits: > two-thirds 20dB bandwidth



8. BANDWIDTH TEST

8.1 LIMIT

FCC Part15 15.247,Subpart C				
Section	Test Item	Limit	FrequencyRange (MHz)	Result
15.247(a)(1)	Bandwidth	N/A	2400-2483.5	PASS

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	30 kHz (20dB Bandwidth) / 30 kHz (Channel Separation)
VB	100 kHz (20dB Bandwidth) / 100 kHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

8.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- Spectrum Setting: RBW= 30kHz, VBW=100kHz, Sweep time = Auto.

8.3 TEST SETUP



8.4 EUT OPERATION CONDITIONS

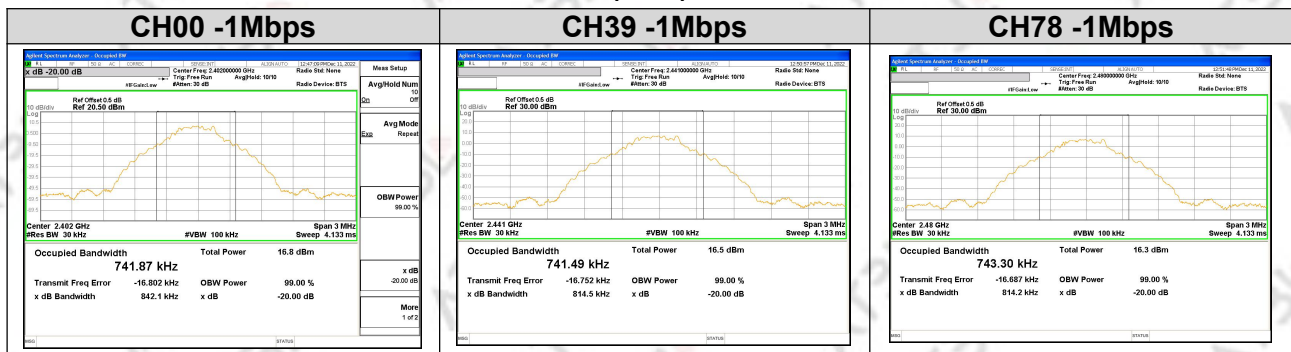
Please refer to section 3.1.4 of this report.

8.5 TEST RESULTS

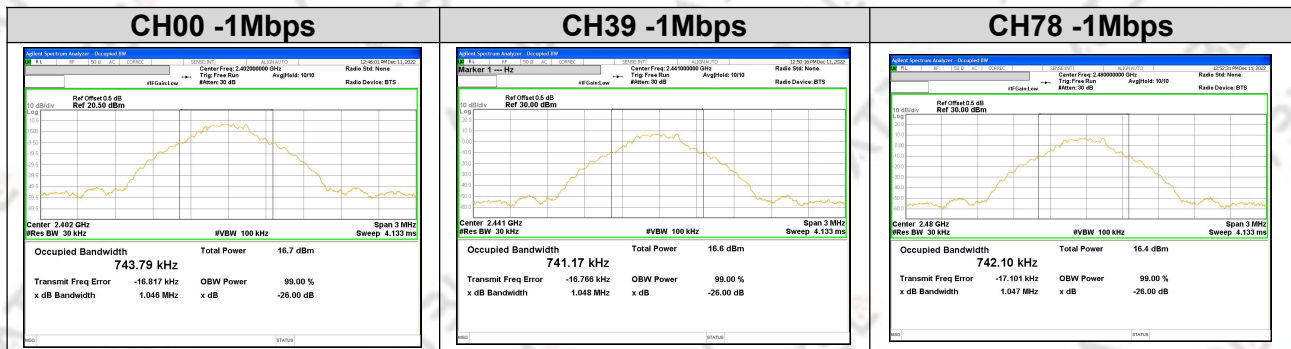
Temperature:	25°C	Relative Humidity:	50%
Test Mode:	GFSK(1Mbps) CH00 / CH39 /CH78	Test Voltage:	DC 19V

Frequency	20dB Bandwidth (MHz)	99% Bandwidth (MHz)	Result
2402 MHz	0.8421	0.7438	PASS
2441 MHz	0.8145	0.7412	PASS
2480 MHz	0.8142	0.7421	PASS

20dB Bandwidth (MHz)



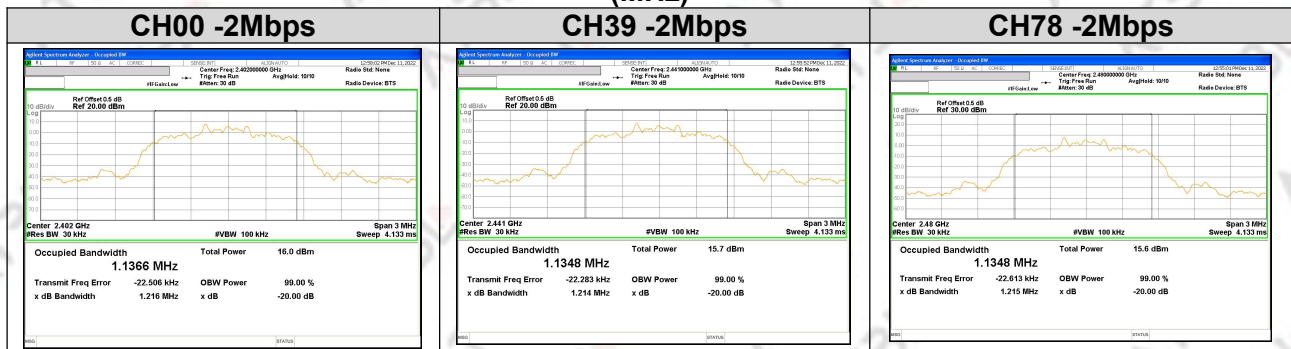
99% Bandwidth (MHz)



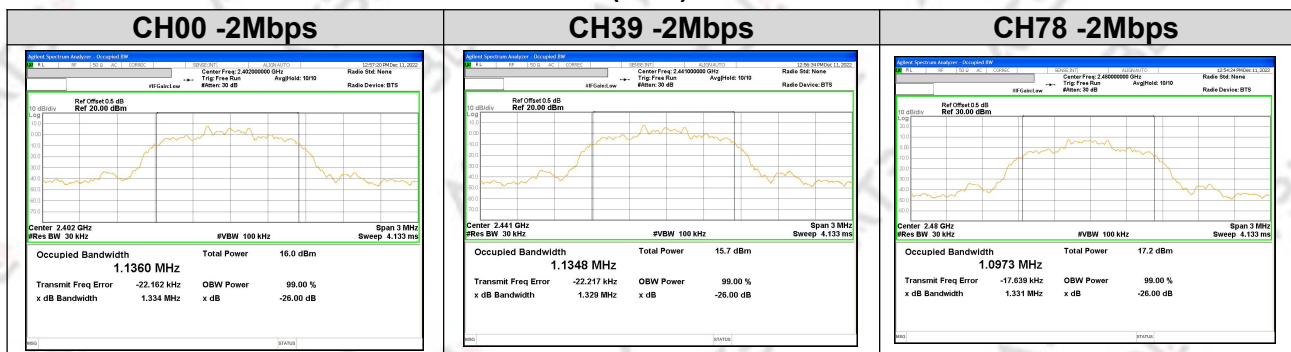
Temperature:	25°C	Relative Humidity:	50%
Test Mode:	$\pi/4$ -DQPSK(2Mbps) CH00 / CH39 / CH78	Test Voltage:	DC 19V

Frequency	20dB Bandwidth (MHz)	99% Bandwidth (MHz)	Result
2402 MHz	1.216	1.1360	PASS
2441 MHz	1.214	1.1348	PASS
2480 MHz	1.215	1.0973	PASS

20dB Bandwidth (MHz)



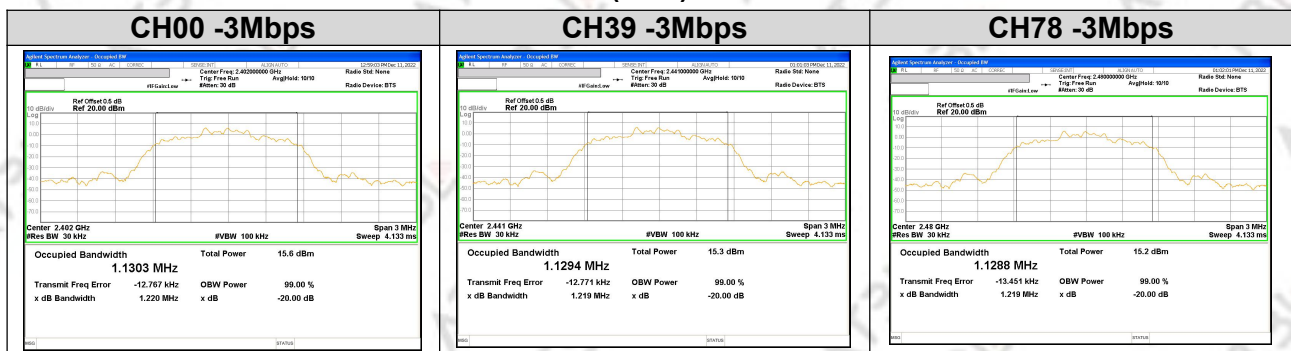
99% Bandwidth (MHz)



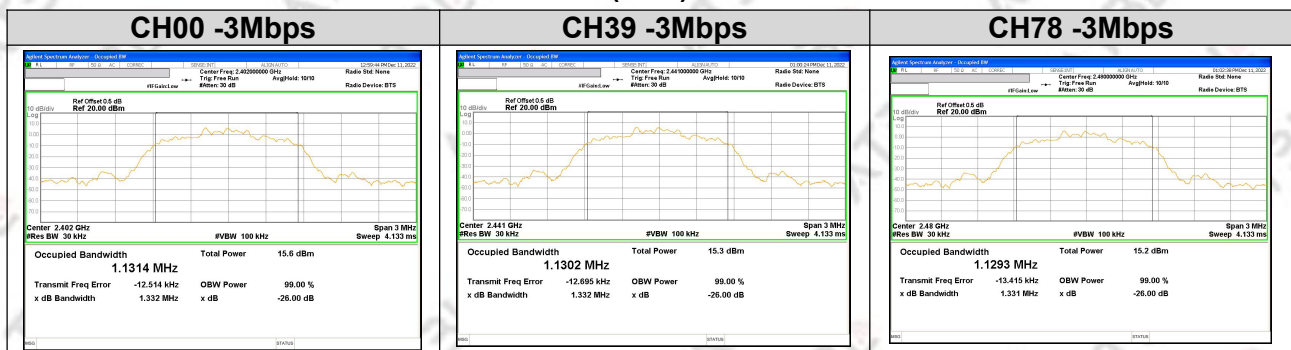
Temperature:	25°C	Relative Humidity:	50%
Test Mode:	8DPSK(3Mbps) CH00 / CH39 / CH78	Test Voltage:	DC 19V

Frequency	20dB Bandwidth (MHz)	99% Bandwidth (MHz)	Result
2402 MHz	1.220	1.1314	PASS
2441 MHz	1.219	1.1302	PASS
2480 MHz	1.219	1.1293	PASS

20dB Bandwidth (MHz)



99% Bandwidth (MHz)



9. OUTPUT POWER TEST

9.1 LIMIT

FCC Part 15.247				
Section	Test Item	Limit	FrequencyRange (MHz)	Result
15.247 (a)(1)&(b)(1)	Output Power	1 W or 0.125W	2400-2483.5	PASS
		if channel separation > 2/3 bandwidth provided the systems operate with an output power no greater than 125 mW(20.97dBm)		

9.2 TEST PROCEDURE

This is an RF-conducted test to evaluate maximum peak output power. Use a direct connection between the antenna port of the unlicensed wireless device and the spectrum analyzer, through suitable attenuation. The hopping shall be disabled for this test:

a) Use the following spectrum analyzer settings:

- 1) Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.
- 2) RBW > 20 dB bandwidth of the emission being measured.
- 3) VBW ≥ RBW.
- 4) Sweep: Auto.
- 5) Detector function: Peak.
- 6) Trace: Max hold.

b) Allow trace to stabilize.

c) Use the marker-to-peak function to set the marker to the peak of the emission.

d) The indicated level is the peak output power, after any corrections for external attenuators and cables.

e) A plot of the test results and setup description shall be included in the test report.

NOTE—A peak responding power meter may be used, where the power meter and sensor system video bandwidth is greater than the occupied bandwidth of the unlicensed wireless device, rather than a spectrum analyzer.

PKPM1 Peak power meter method:

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DSS bandwidth and shall use a fast-responding diode detector.

9.3 TEST SETUP



9.4 EUT OPERATION CONDITIONS

Please refer to section 3.1.4 of this report.

9.5 TEST RESULTS

Temperature:	25°C	Relative Humidity:	50%
Test Voltage:	DC 19V		

Conducted Power

Mode	Channel Number	Frequency (MHz)	Peak Power	Average Power	Limit
			(dBm)	(dBm)	(dBm)
GFSK(1M)	0	2402	10.07	9.79	30.00
	39	2441	10.03	9.75	30.00
	78	2480	9.96	9.89	30.00

Mode	Channel Number	Frequency (MHz)	Peak Power	Average Power	Limit
			(dBm)	(dBm)	(dBm)
$\pi/4$ -DQPSK (2M)	0	2402	9.72	8.18	30.00
	39	2441	10.06	8.32	30.00
	78	2480	9.76	8.22	30.00

Mode	Channel Number	Frequency (MHz)	Peak Power	Average Power	Limit
			(dBm)	(dBm)	(dBm)
8-DPSK(3M)	0	2402	9.83	8.10	30.00
	39	2441	10.00	8.39	30.00
	78	2480	9.94	8.28	30.00

Power(EIRP)

Mode	Channel Number	Frequency (MHz)	Peak Power	Power(EIRP)	Limit
			(dBm)	(dBm)	(dBm)
GFSK(1M)	0	2402	10.07	11.52	36.00
	39	2441	10.03	11.48	36.00
	78	2480	9.96	11.41	36.00

Mode	Channel Number	Frequency (MHz)	Peak Power	Average Power	Limit
			(dBm)	(dBm)	(dBm)
$\pi/4$ -DQPSK (2M)	0	2402	9.72	11.17	36.00
	39	2441	10.06	11.51	36.00
	78	2480	9.76	11.21	36.00

Mode	Channel Number	Frequency (MHz)	Peak Power	Average Power	Limit
			(dBm)	(dBm)	(dBm)
8-DPSK(3M)	0	2402	9.83	11.28	36.00
	39	2441	10.00	11.45	36.00
	78	2480	9.94	11.39	36.00

10. ANTENNA REQUIREMENT

10.1 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.

10.2 EUT ANTENNA

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

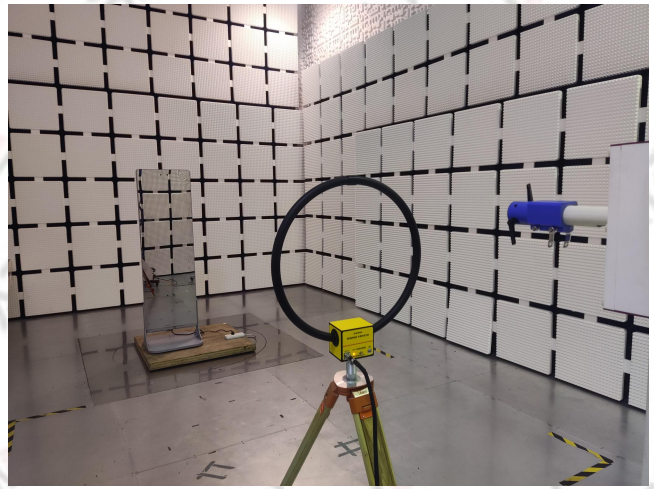
APPENDIX-PHOTOS OF TEST SETUP

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

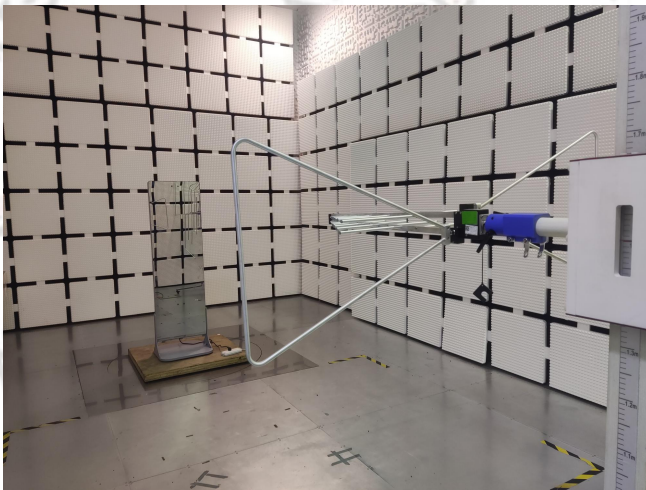
AC Power Line Conducted Emissions



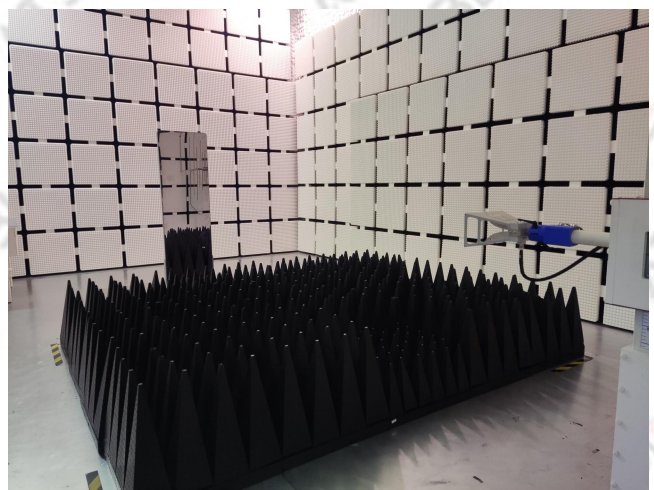
Radiated Emissions for 9kHz~30MHz



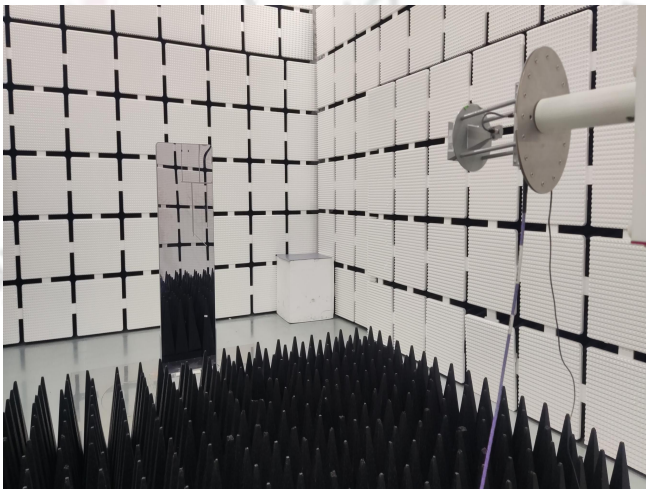
Radiated Emissions for 30MHz~1GHz



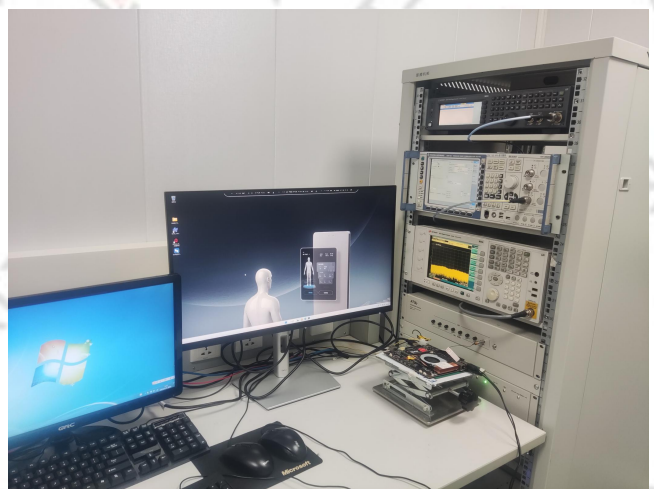
Radiated Emissions for 1GHz~18GHz



Radiated Emissions for above 18GHz



Conducted for RF



*****END OF THE REPORT*****