

TEST REPORT

Reference No...... : WTD25D02041163W002
FCC ID..... : 2BMBQ-HB565PU
Applicant : HUBBLE BABY CARE LIMITED
Address : Unit 802, 8/F, Nan Fung Commercial Centre, 19 Lam Lok Street,
Kowloon Bay, Kowloon, Hong Kong, China
Manufacturer : HUBBLE BABY CARE LIMITED
Address : Unit 802, 8/F, Nan Fung Commercial Centre, 19 Lam Lok Street,
Kowloon Bay, Kowloon, Hong Kong, China
Product : BABY MONITOR-Parent Unit
Model(s) : HB565PU, HB565, Nursery Pal Glow Plus Enhanced
Standards : FCC 47CFR Part 15.247
Date of Receipt Sample.... : 2025-04-25
Date of Test : 2025-05-22 to 2025-07-07
Date of Issue : 2025-07-24
Test Result : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

Waltek Testing Group Co., Ltd.

Address: No. 77, Houjie Section, Guantai Road, Houjie Town, Dongguan City, Guangdong, China

Tel: +86-769-2267 6998

Fax: +86-769-2267 6828

Compiled by:

James Cheng

James Cheng / Project Engineer

Approved by:



Deval Qin / Designated Reviewer

2 Contents

	Page
1 COVER PAGE.....	1
2 CONTENTS	2
3 REVISION HISTORY.....	4
4 GENERAL INFORMATION.....	5
4.1 GENERAL DESCRIPTION OF E.U.T.....	5
4.2 DETAILS OF E.U.T	5
4.3 CHANNEL LIST	5
4.4 TEST FACILITY	6
4.5 SUBCONTRACTED	6
4.6 ABNORMALITIES FROM STANDARD CONDITIONS	6
4.7 TEST MODE	6
5 EQUIPMENT USED DURING TEST.....	7
5.1 EQUIPMENTS LIST	7
5.2 DESCRIPTION OF SUPPORT UNITS	8
5.3 MEASUREMENT UNCERTAINTY	8
5.4 TEST EQUIPMENT CALIBRATION	8
6 TEST SUMMARY	9
7 CONDUCTED EMISSION	10
7.1 E.U.T. OPERATION	10
7.2 EUT SETUP.....	10
7.3 MEASUREMENT DESCRIPTION.....	10
7.4 CONDUCTED EMISSION TEST RESULT	11
8 RADIATED EMISSIONS	13
8.1 EUT OPERATION	13
8.2 TEST SETUP	14
8.3 SPECTRUM ANALYZER SETUP.....	15
8.4 TEST PROCEDURE	16
8.5 CORRECTED AMPLITUDE & MARGIN CALCULATION	16
8.6 SUMMARY OF TEST RESULTS	17
9 CONDUCTED SPURIOUS EMISSIONS.....	20
9.1 TEST PROCEDURE	20
9.2 TEST RESULT	21
10 BAND EDGE MEASUREMENT.....	27
10.1 TEST PROCEDURE	27
10.2 TEST SETUP	27
10.3 TEST RESULT	28
11 20DB BANDWIDTH AND 99%BANDWIDTH MEASUREMENT	29
11.1 TEST PROCEDURE	29
11.2 TEST SETUP	29
11.3 TEST RESULT	29
12 MAXIMUM PEAK OUTPUT POWER.....	32
12.1 TEST PROCEDURE	32
12.2 TEST SETUP	32
12.3 TEST RESULT	32

13	HOPPING CHANNEL SEPARATION	34
13.1	TEST PROCEDURE	34
13.2	TEST SETUP	34
13.3	TEST RESULT	35
14	NUMBER OF HOPPING FREQUENCY	37
14.1	TEST PROCEDURE	37
14.2	TEST SETUP	37
14.3	TEST RESULT	38
15	DWELL TIME	39
15.1	TEST PROCEDURE	39
15.2	TEST SETUP	40
15.3	TEST RESULT	40
16	ANTENNA REQUIREMENT	42
17	RF EXPOSURE	42
18	PHOTOGRAPHS –TEST SETUP AND EUT PHOTOS	42

3 Revision History

Test Report No.	Date of Receipt Sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTD25D02041163W002	2025-04-25	2025-05-22 to 2025-07-07	2025-07-24	Original	-	Valid

4 General Information

4.1 General Description of E.U.T

Product: BABY MONITOR-Parent Unit
 Model(s): HB565PU, HB565, Nursery Pal Glow Plus Enhanced
 Model Description: Only the model names are different.
 The model HB565PU was tested in this report.
 Test Sample No.: 1-1/1
 Hardware Version: V02
 Software Version: 8102-03.60.34RC01

4.2 Details of E.U.T

Operation Frequency: 2402~2477MHz
 Max. RF output power: 13.97dBm
 Type of Modulation: FHSS
 Antenna installation: Brass antenna
 Antenna Gain: 1.54dBi

Note:

#: The antenna gain is provided by the applicant, and the applicant should be responsible for its authenticity, WALTERK lab has not verified the authenticity of its information.

Ratings: Input: 5V === 1.5A 7.5W
 Battery: DC 3.80V, 3000mAh, 11.40Wh
 Adapter: Model: YWK-AD050100-U
 Input: 100-240V~ 50/60Hz 0.3A
 Output: 5V=== 1000mA

4.3 Channel List

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2402	7	2420	13	2450	19	2471
2	2404	8	2425	14	2455	20	2473
3	2406	9	2430	15	2460	21	2475
4	2408	10	2435	16	2465	22	2477
5	2410	11	2440	17	2467	/	/
6	2415	12	2445	18	2469	/	/

4.4 Test Facility

The test facility has a test site registered with the following organizations:

ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.

Waltek Testing Group Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A, October 15, 2016.

FCC Designation No.: CN1201. Test Firm Registration No.: 523476.

Waltek Testing Group Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration number 523476, September 10, 2019.

4.5 Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

☐ Yes ☒ No

If Yes, list the related test items and lab information:

Test Lab: N/A

Lab address: N/A

Test items: N/A

4.6 Abnormalities from Standard Conditions

None.

4.7 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Test mode	Low channel	Middle channel	High channel
Transmitting	2402MHz	2440MHz	2477MHz

Note: The EUT has been tested under its typical operating condition. Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting. Only the worst-case data were reported.

5 Equipment Used during Test

5.1 Equipments List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date	Calibration Due Date
Conducted Emissions 1#						
1	EMI Test Receiver	R&S	ESCI	100947	2024-07-18	2025-07-17
2	LISN	R&S	ENV216	100115	2024-07-18	2025-07-17
3	Cable	Top	TYPE16(3.5M)	-	2024-07-18	2025-07-17
3m Semi-anechoic Chamber for Radiation Emissions 1#						
1	Spectrum Analyzer	R&S	FSP30	100091	2025-04-19	2026-04-18
2	Amplifier	Agilent	8447D	2944A10178	2024-07-18	2025-07-17
3	Tri-log Broadband Antenna	SCHWARZBECK	VULB9163	336	2024-07-21	2025-07-20
4	Coaxial Cable	Top	TYPE16(13M)	-	2025-04-19	2026-04-18
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120D	667	2025-01-17	2026-01-16
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	2024-07-18	2025-07-17
7	Broadband Preamplifier	COMPLIANCE	PAP-1G18	2004	2024-07-18	2025-07-17
8	Coaxial Cable	Top	ZT26-NJ-NJ-8M/FA	-	2025-04-19	2026-04-18
9	Microwave Amplifier	SCHWARZBECK	BBV 9721	100472	2024-07-18	2025-07-17
10	Coaxial Cable	Top	ZT40-2.92J-2.92J-2.0M	17100919	2025-04-19	2026-04-18
3m Semi-anechoic Chamber for Radiation Emissions 2#						
1	Test Receiver	R&S	ESCI	101296	2025-04-19	2026-04-18
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2024-11-04	2025-11-03
3	Active Loop Antenna	Com-Power	AL-130R	10160007	2025-04-21	2026-04-20
4	Amplifier	ANRITSU	MH648A	M43381	2025-04-19	2026-04-18
5	Cable	HUBER+SUHNER	CBL2	525178	2025-04-19	2026-04-18
RF Conducted Testing						
1	Spectrum Analyzer	R&S	FSP40	100501	2024-07-18	2025-07-17
2	Spectrum Analyzer	Agilent	N9020A	MY49100060	2024-07-18	2025-07-17

Test Software:

Test Item	Software name	Software version
Conduction disturbance Radiated Emission(3m)	EZ-EMC	EZ-EMC(RA-03A1-1)

5.2 Description of Support Units

Equipment	Manufacturer	Model No.	Series No.
/	/	/	/
/	/	/	/

5.3 Measurement Uncertainty

Parameter	Uncertainty
Conducted Emission	± 3.64 dB (AC mains 150KHz~30MHz)
Radiated Spurious Emissions	± 5.08 dB (Bilog antenna 30M~1000MHz)
	± 5.47 dB (Horn antenna 1000M~25000MHz)
Radio Frequency	± 1 x 10 ⁻⁷ Hz
RF Power	± 0.42 dB
RF Power Density	± 0.7dB
Conducted Spurious Emissions	± 2.76 dB (9kHz~26500MHz)
Confidence interval: 95%. Confidence factor: k=2	

5.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P. R. China.

6 Test Summary

Test Items	Test Requirement	Result
Radiated Spurious Emissions	15.205(a) 15.209 15.247(d)	PASS
Conducted Spurious emissions	15.247(d)	PASS
Band edge	15.247(d) 15.205(a)	PASS
Conducted Emission	15.207	PASS
20 dB Bandwidth and 99% Bandwidth	15.247(a)(1)	PASS
Maximum Peak Output Power	15.247(b)(1)	PASS
Frequency Separation	15.247(a)(1)	PASS
Number of Hopping Frequency	15.247(a)(1)(iii)	PASS
Dwell time	15.247(a)(1)(iii)	PASS
Antenna Requirement	15.203	Complies
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	1.1307(b)(1)	PASS

7 Conducted Emission

Test Requirement: FCC 47CFR Part 15 Section 15.207
Test Method: ANSI C63.10-2020+A1-2024
Test Result: PASS
Frequency Range: 150kHz to 30MHz
Limit:

Frequency (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15 to 0.5	66 to 56	56 to 46*
0.5 to 5.0	56	46
5.0 to 30	6	50

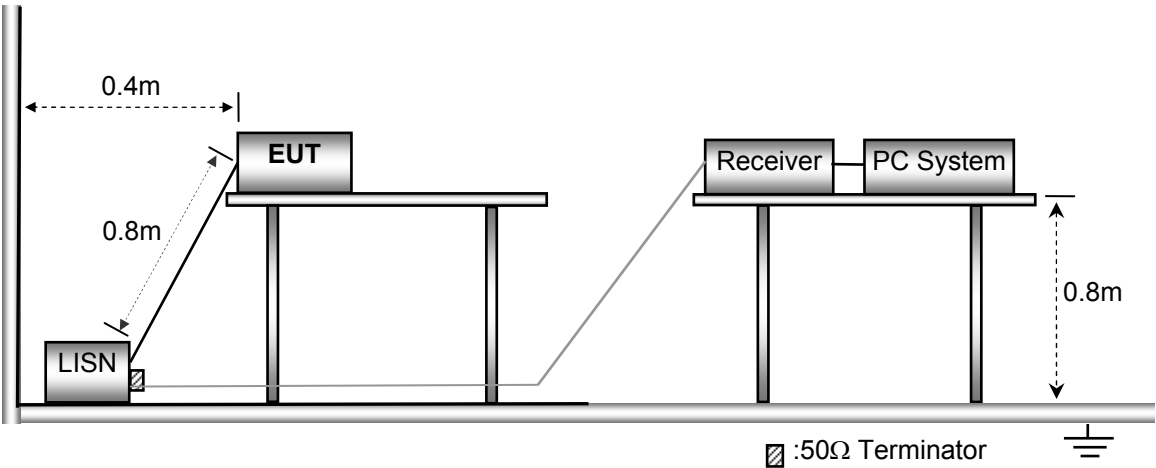
*Decreases with the logarithm of the frequency.

7.1 E.U.T. Operation

Operating Environment:
Temperature: 26.2°C
Humidity: 51.1%RH
Atmospheric Pressure: 101.2kPa
EUT Operation:
The test was performed in Transmitting mode, the worst test data were shown in the report.

7.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10-2020+A1-2024.



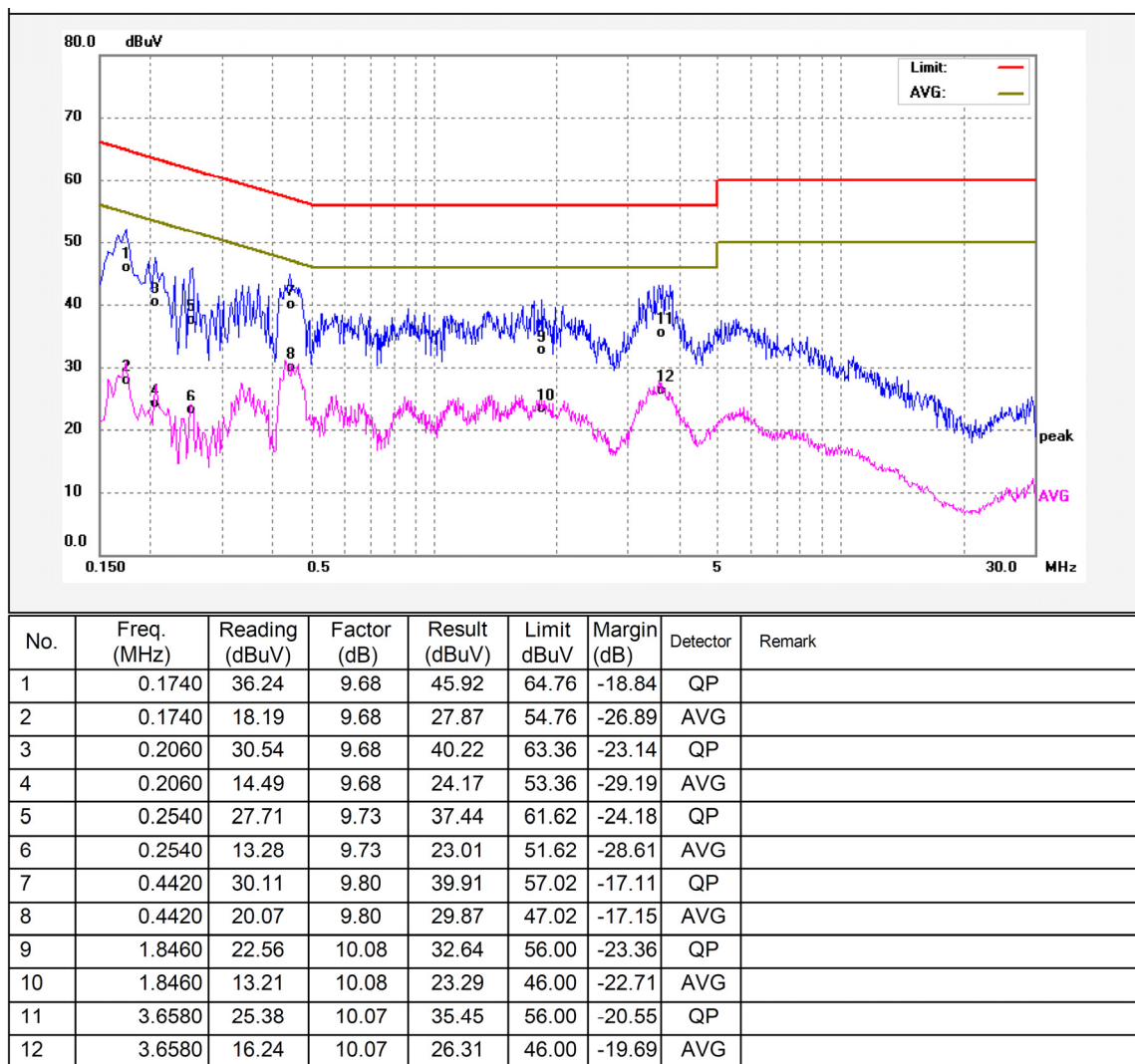
7.3 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

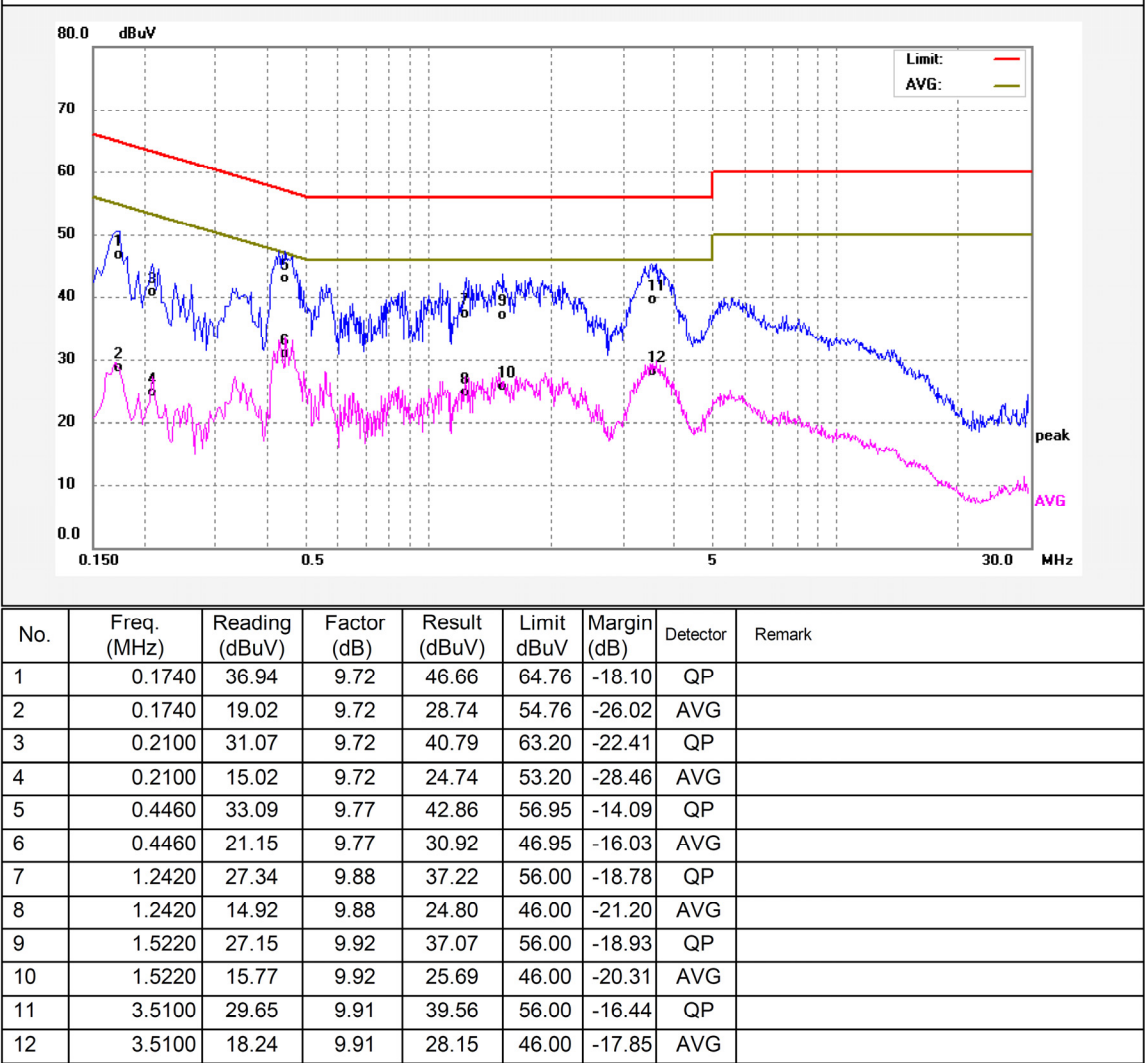
7.4 Conducted Emission Test Result

Remark: only the worst data (High channel mode) were reported

Live line:



Neutral line:



8 Radiated Emissions

Test Requirement: FCC 47CFR Part 15 Section 15.205 & 15.209 & 15.247

Test Method: ANSI C63.10-2020+A1-2024

Test Result: PASS

Measurement Distance: 3m

Limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log^{(24000/F(\text{kHz}))} + 40$
1.705 ~ 30	30	30	$100 * 30$	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

8.1 EUT Operation

Operating Environment:

Temperature: 22.3 °C

Humidity: 48.7 % RH

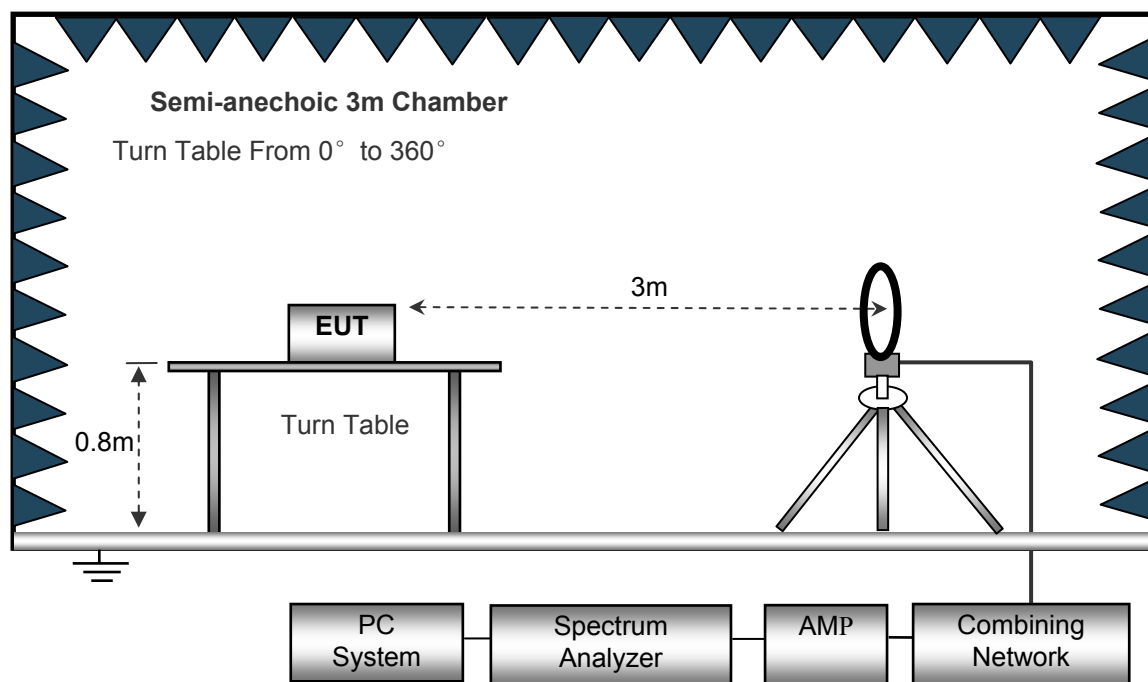
Atmospheric Pressure: 101.2kPa

EUT Operation: The test was performed in Transmitting mode, the worst test data were shown in the report.

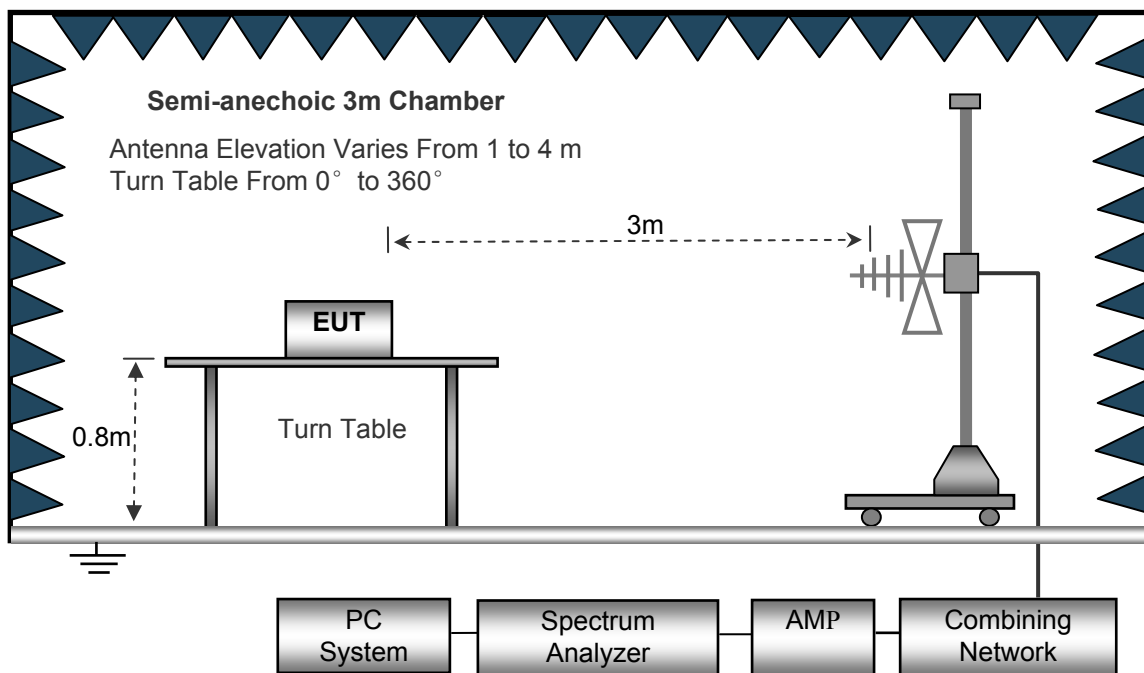
8.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10-2020+A1-2024.

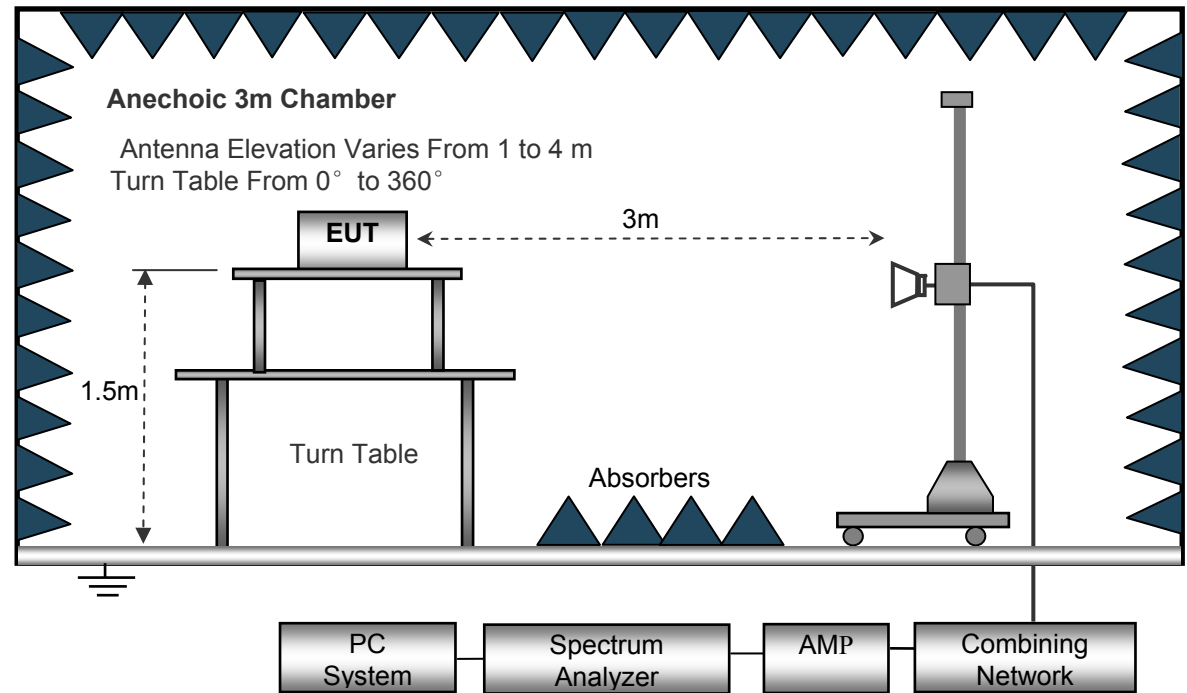
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



8.3 Spectrum Analyzer Setup

Below 30MHz

- Sweep Speed Auto
- IF Bandwidth..... 10 kHz
- Video Bandwidth..... 10 kHz
- Resolution Bandwidth 10 kHz

30MHz ~ 1GHz

- Sweep Speed Auto
- Detector PK
- Resolution Bandwidth..... 100 kHz
- Video Bandwidth..... 300 kHz

Above 1GHz

- Sweep Speed Auto
- Detector PK
- Resolution Bandwidth..... 1 MHz
- Video Bandwidth..... 3 MHz
- Detector Ave.
- Resolution Bandwidth..... 1 MHz
- Video Bandwidth..... 10 Hz

8.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane for below 1GHz and 1.5m for above 1GHz.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes(X, Y, Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.
8. For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

8.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B.

The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

8.6 Summary of Test Results

Test Frequency: 9kHz ~ 30MHz

The measurements were more than 20 dB below the limit and not reported.

Test Frequency: 30MHz ~ 8GHz

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Low Channel 2402MHz									
134.09	49.92	QP	261	1.7	H	-15.36	34.56	43.50	-8.94
134.09	47.08	QP	100	1.8	V	-15.36	31.72	43.50	-11.78
4804.00	60.76	PK	236	1.9	V	-1.06	59.70	74.00	-14.30
4804.00	47.05	Ave	236	1.9	V	-1.06	45.99	54.00	-8.01
7206.00	54.16	PK	90	1.0	H	1.33	55.49	74.00	-18.51
7206.00	41.50	Ave	90	1.0	H	1.33	42.83	54.00	-11.17

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Middle Channel 2440MHz									
134.09	49.55	QP	122	1.9	H	-15.36	34.19	43.50	-9.31
134.09	45.77	QP	246	1.8	V	-15.36	30.41	43.50	-13.09
4880.00	61.96	PK	320	1.8	V	-0.62	61.34	74.00	-12.66
4880.00	47.21	Ave	320	1.8	V	-0.62	46.59	54.00	-7.41
7320.00	52.73	PK	189	1.6	H	2.21	54.94	74.00	-19.06
7320.00	40.47	Ave	189	1.6	H	2.21	42.68	54.00	-11.32

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
High Channel 2477MHz									
134.09	49.26	QP	129	1.4	H	-15.36	33.90	43.50	-9.60
134.09	46.95	QP	232	1.3	V	-15.36	31.59	43.50	-11.91
4954.00	59.31	PK	90	1.3	V	-0.24	59.07	74.00	-14.93
4954.00	45.28	Ave	90	1.3	V	-0.24	45.04	54.00	-8.96
7431.00	52.75	PK	34	1.5	H	2.84	55.59	74.00	-18.41
7431.00	39.35	Ave	34	1.5	H	2.84	42.19	54.00	-11.81

Radiated Restricted Band Emission

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Low Channel 2402MHz									
2324.06	46.45	PK	11	1.2	V	-13.19	33.26	74.00	-40.74
2324.06	38.16	Ave	11	1.2	V	-13.19	24.97	54.00	-29.03
2382.50	42.35	PK	24	1.6	H	-13.14	29.21	74.00	-44.79
2382.50	37.59	Ave	24	1.6	H	-13.14	24.45	54.00	-29.55
2488.41	42.57	PK	163	1.7	V	-13.08	29.49	74.00	-44.51
2488.41	38.39	Ave	163	1.7	V	-13.08	25.31	54.00	-28.69

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
High Channel 2477MHz									
2347.37	45.54	PK	311	1.8	V	-13.19	32.35	74.00	-41.65
2347.37	38.51	Ave	311	1.8	V	-13.19	25.32	54.00	-28.68
2380.44	44.70	PK	21	1.8	H	-13.14	31.56	74.00	-42.44
2380.44	37.64	Ave	21	1.8	H	-13.14	24.50	54.00	-29.50
2496.27	43.99	PK	12	1.4	V	-13.08	30.91	74.00	-43.09
2496.27	38.02	Ave	12	1.4	V	-13.08	24.94	54.00	-29.06

Test Frequency: 8GHz~25GHz

The measurements were more than 20 dB below the limit and not reported.

9 Conducted Spurious Emissions

Test Requirement: FCC 47CFR Part 15 Section 15.247

Test Method: ANSI C63.10-2020+A1-2024

Test Result: PASS

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. 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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

9.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;

2. Set the spectrum analyzer:

Below 30MHz:

RBW = 100kHz, VBW = 300kHz, Sweep = auto

Detector function = peak, Trace = max hold

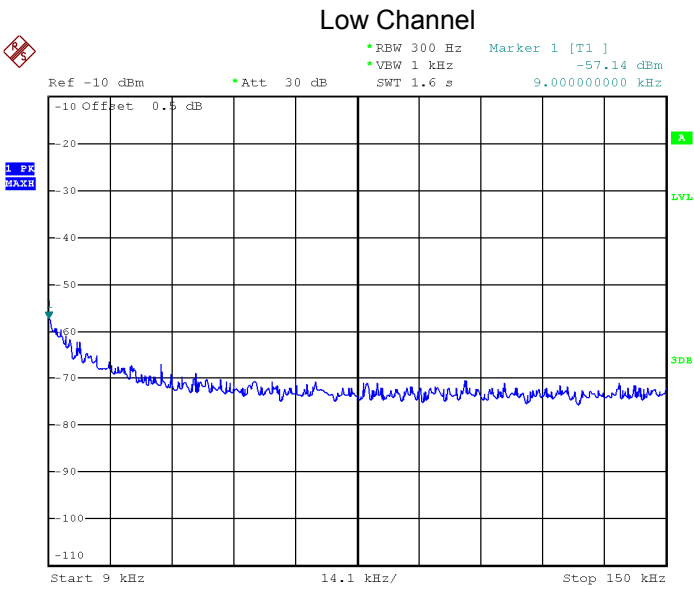
Above 30MHz:

RBW = 100kHz, VBW = 300kHz, Sweep = auto

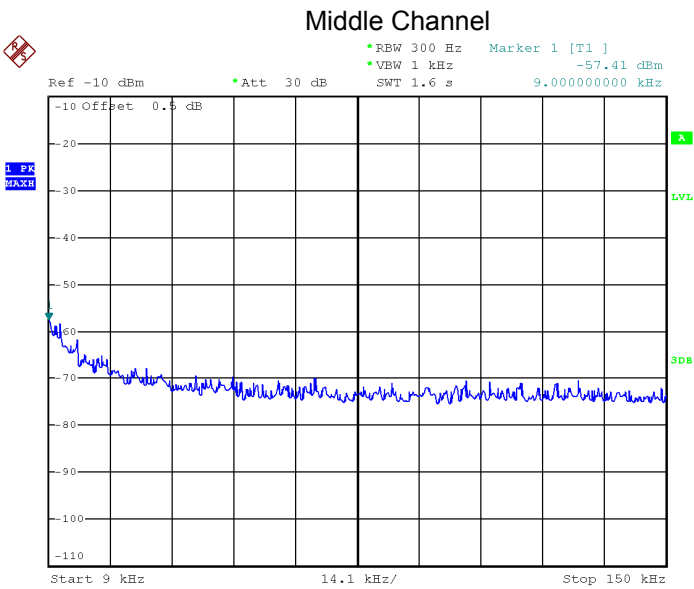
Detector function = peak, Trace = max hold

9.2 Test Result

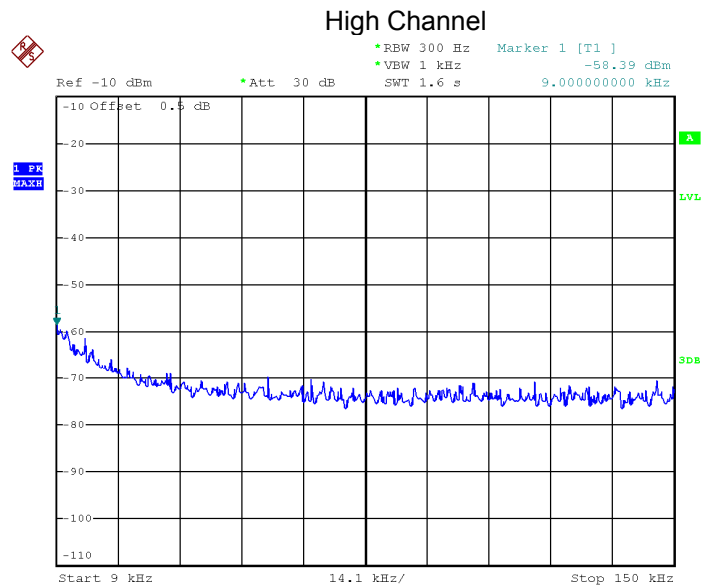
9kHz – 150kHz



Date: 3.JUL.2025 14:52:16

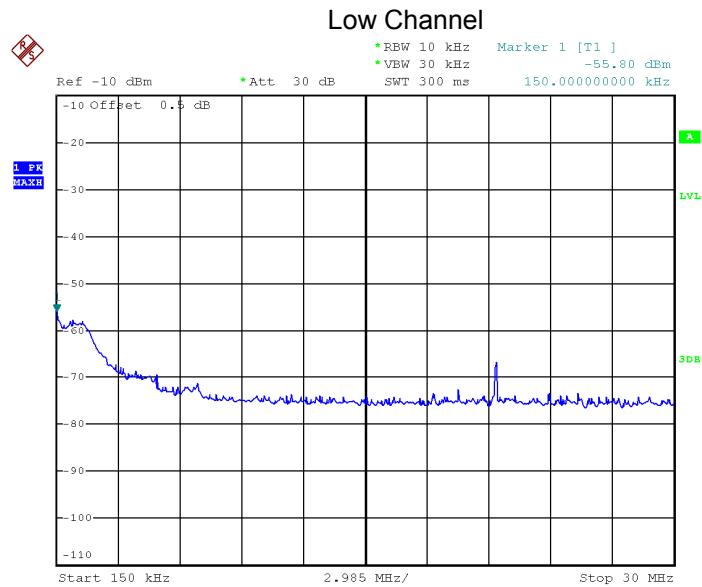


Date: 3.JUL.2025 14:53:37

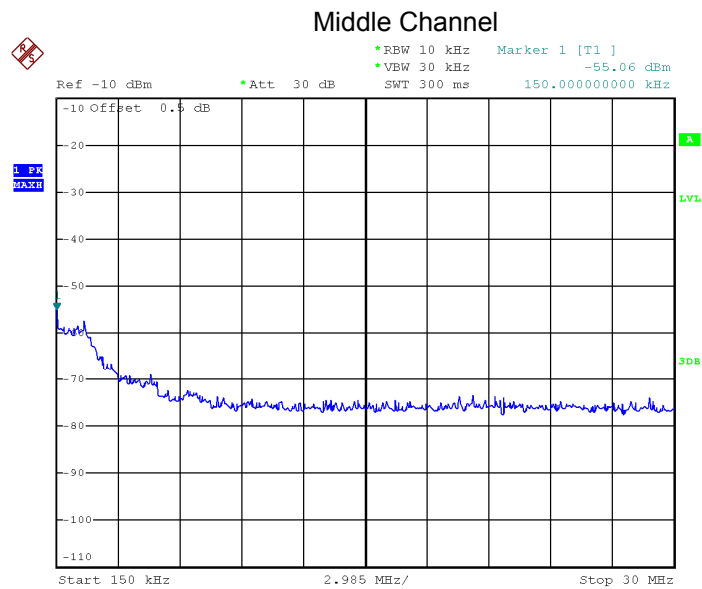


Date: 3.JUL.2025 14:54:31

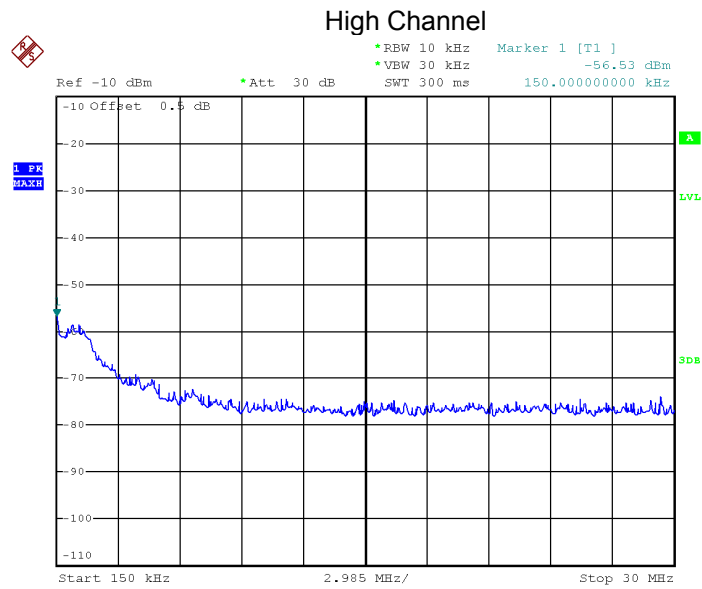
150kHz – 30MHz



Date: 3.JUL.2025 14:58:41

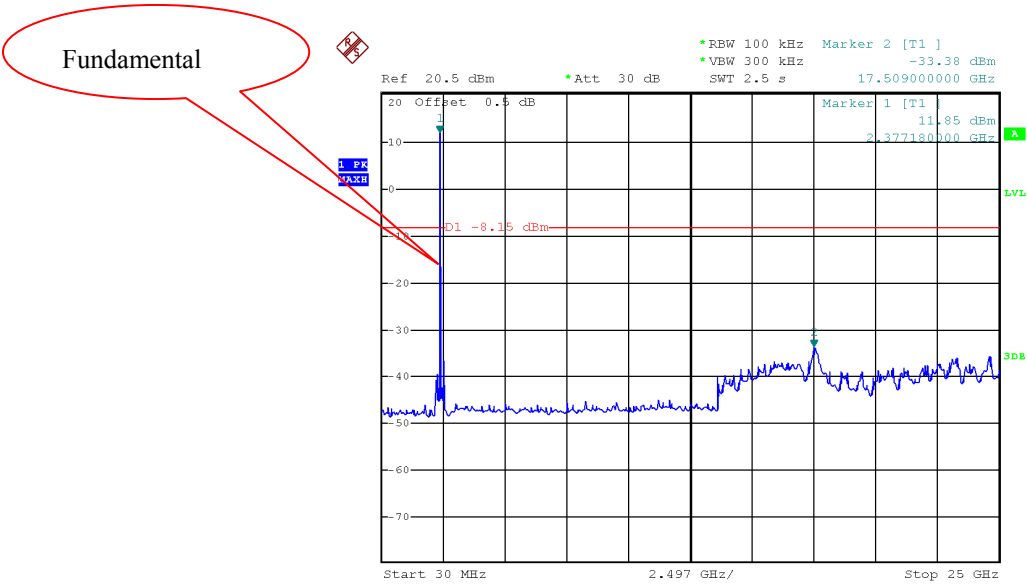


Date: 3.JUL.2025 15:00:05



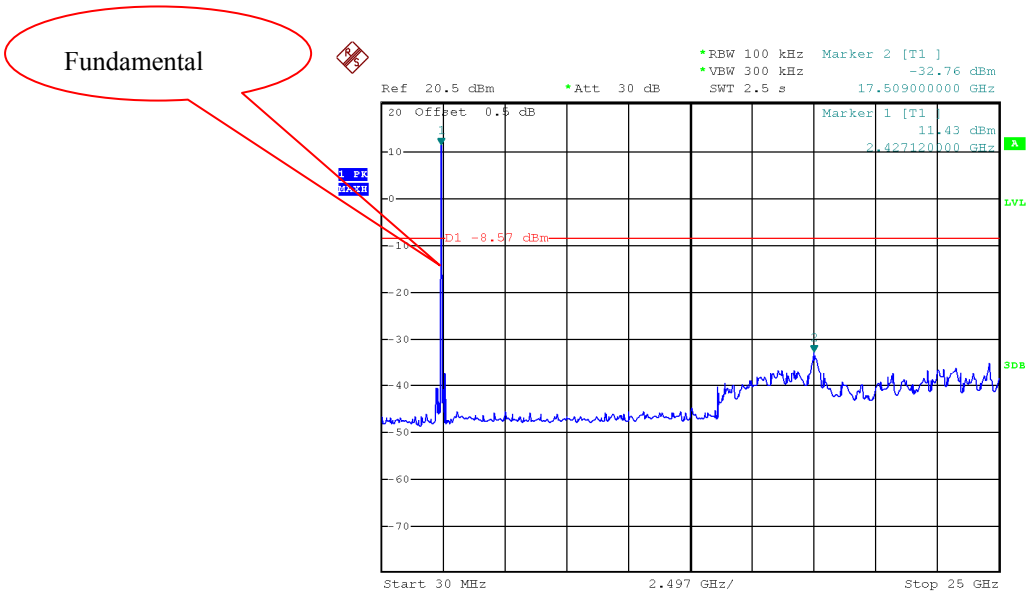
Date: 3.JUL.2025 15:00:27

30MHz – 25GHz
Low Channel



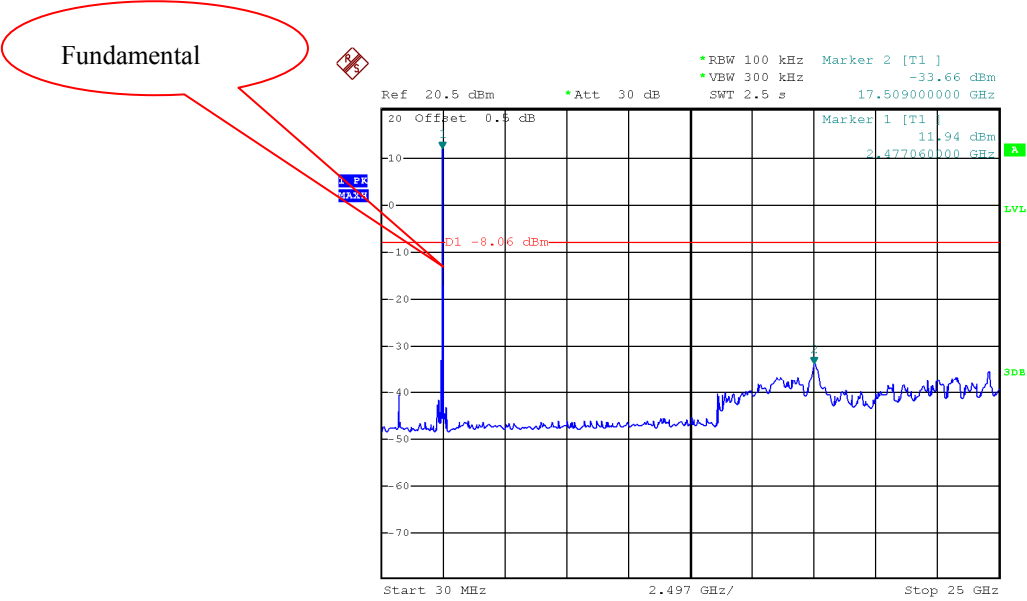
Date: 3.JUL.2025 15:07:02

Middle Channel



Date: 3.JUL.2025 15:11:56

High Channel



Date: 3.JUL.2025 15:04:20

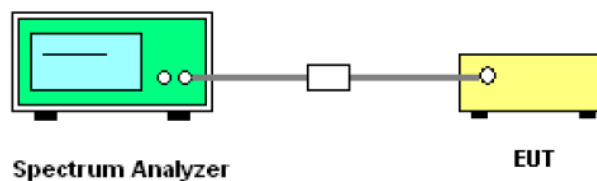
10 Band Edge Measurement

Test Requirement:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method:	ANSI C63.10-2020+A1-2024
Test Limit:	Regulation 15.247 (d),In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. 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. Attenuation below the general limits specified in §15.209(a) is not required. 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 in §15.209(a) (see §15.205(c)).
Test Mode:	Transmitting

10.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100 kHz, VBW = 300 kHz, Sweep = auto
Detector function = peak, Trace = max hold

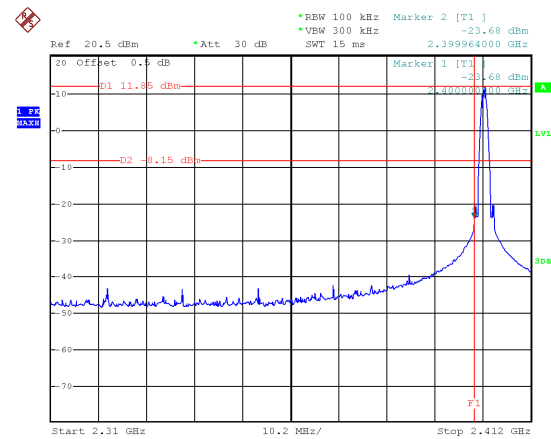
10.2 Test Setup



10.3 Test Result

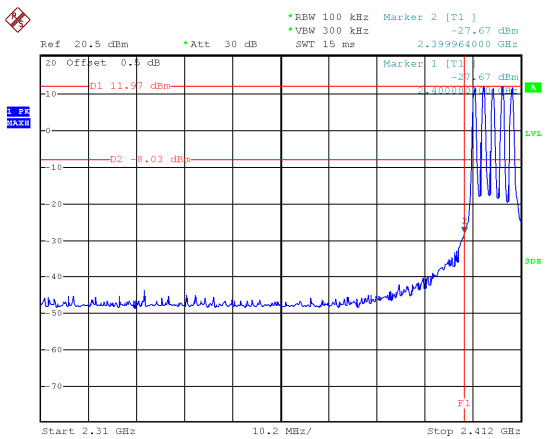
Test plots

Transmitting Band edge-left side



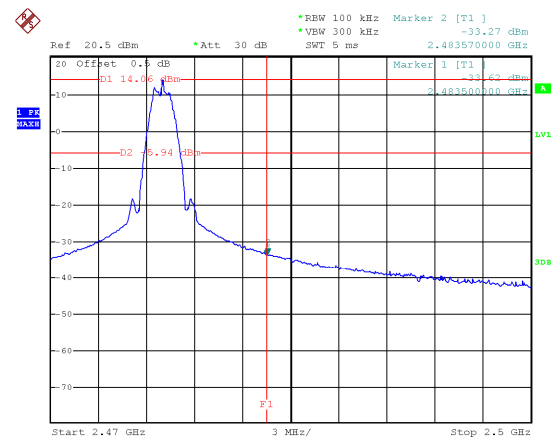
Date: 3.JUL.2025 14:44:37

Hopping Band edge-left side



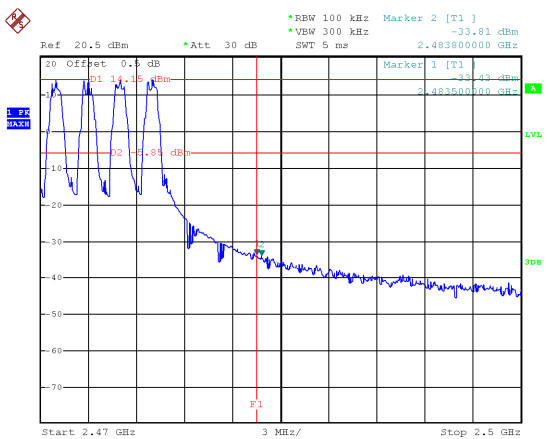
Date: 3.JUL.2025 15:30:53

Transmitting Band edge-right side



Date: 3.JUL.2025 14:48:20

Hopping Band edge-right side



Date: 3.JUL.2025 15:37:18

11 20dB Bandwidth and 99%Bandwidth Measurement

Test Requirement: FCC 47CFR Part 15 Section 15.247

Test Method: ANSI C63.10-2020+A1-2024

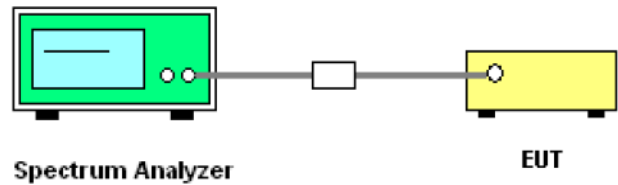
Test Limit: N/A

Test Mode: Test in fixing operating frequency at low, Middle, high channel.

11.1 Test Procedure

- 1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
- 2. Set the spectrum analyzer: RBW = 30kHz, VBW = 100kHz

11.2 Test Setup



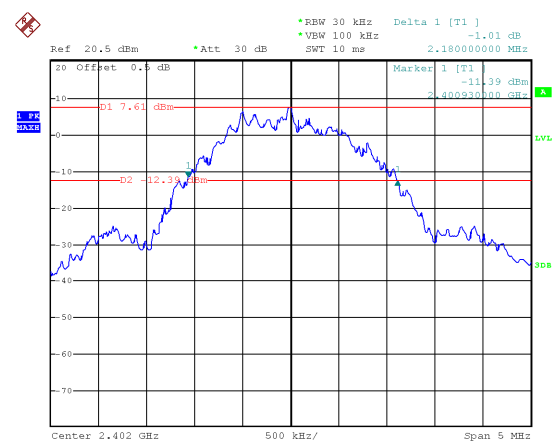
11.3 Test Result

Modulation	Test Channel	20 dB Bandwidth MHz	99% Bandwidth MHz
FHSS	Low	2.18	2.04
FHSS	Middle	2.20	2.03
FHSS	High	2.18	2.05

Test plots

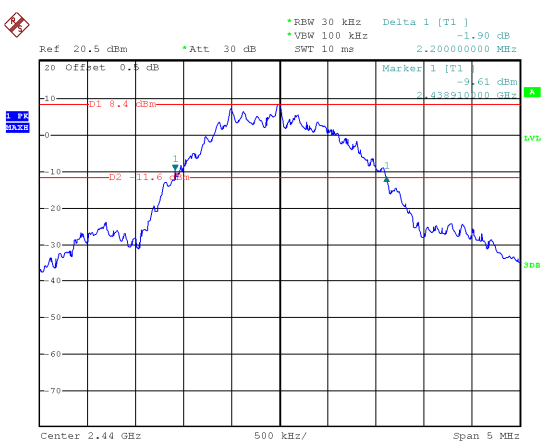
20 dB Bandwidth

Low Channel



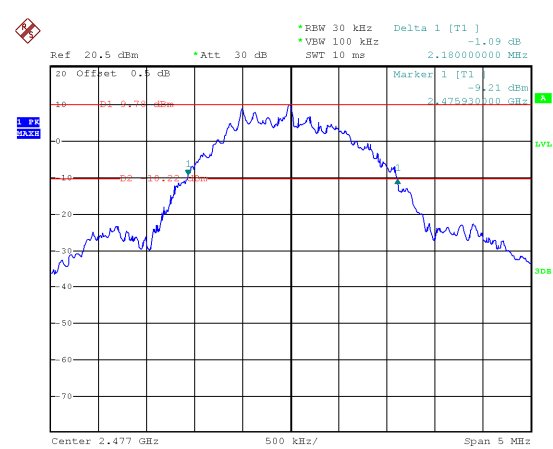
Date: 3.JUL.2025 13:54:47

Middle Channel



Date: 3.JUL.2025 13:57:18

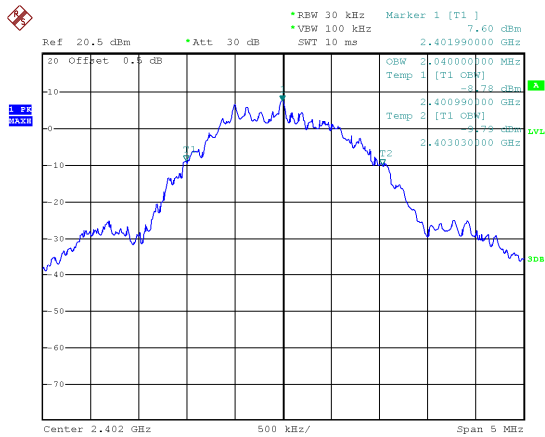
High Channel



Date: 3.JUL.2025 13:58:43

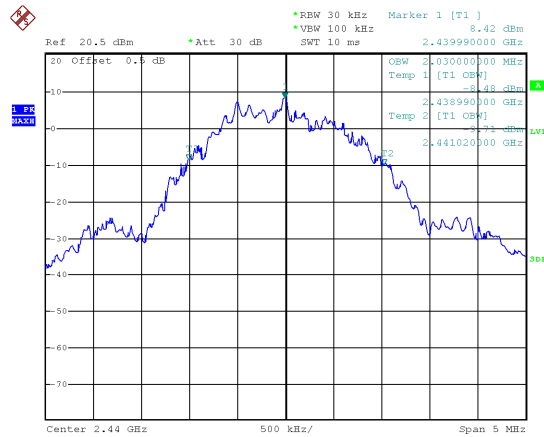
99% Bandwidth

Low Channel



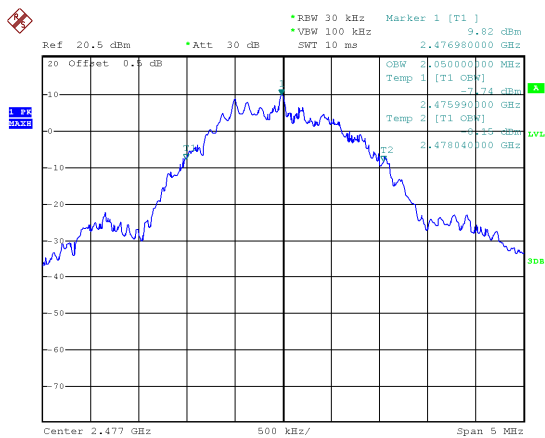
Date: 3.JUL.2025 13:49:46

Middle Channel



Date: 3.JUL.2025 13:50:34

High Channel



Date: 3.JUL.2025 13:52:34

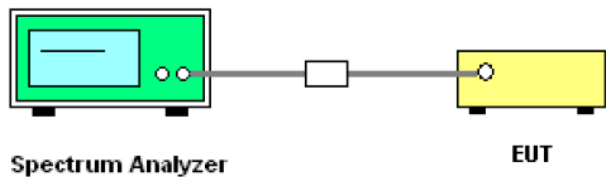
12 Maximum Peak Output Power

Test Requirement:	FCC 47CFR Part 15 Section 15.247
Test Method:	ANSI C63.10-2020+A1-2024
Test Limit:	Regulation 15.247 (a)(1), For frequency hopping systems operating in the 2400-2483.5 MHz band by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater 0.125 watts..
Test Mode:	Test in fixing operating frequency at low, Middle, high channel.

12.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 3 MHz. VBW =3 MHz. Sweep = auto; Detector Function = Peak.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

12.2 Test Setup

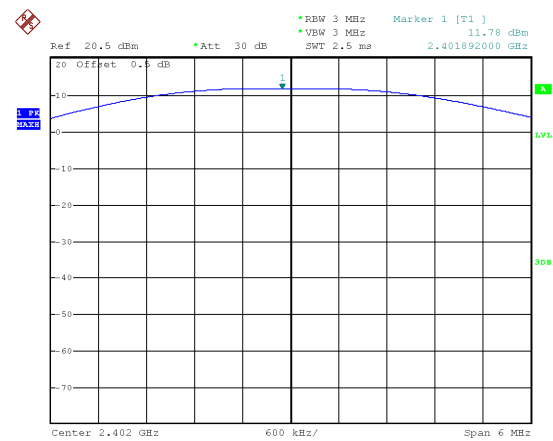


12.3 Test Result

Test Mode	Peak Power(dBm)			Limit (dBm)
	Low Channel	Middle Channel	High Channel	
FHSS	11.78	12.61	13.97	30

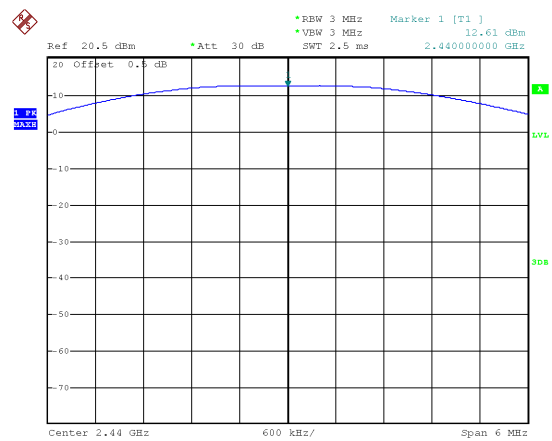
Test plots

Low Channel



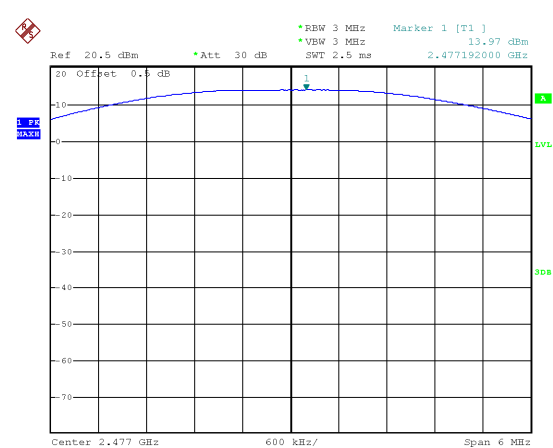
Date: 3.JUL.2025 14:00:31

Middle Channel



Date: 3.JUL.2025 14:01:24

High Channel



Date: 3.JUL.2025 14:02:57

13 Hopping Channel Separation

Test Requirement: FCC 47CFR Part 15 Section 15.247

Test Method: ANSI C63.10-2020+A1-2024

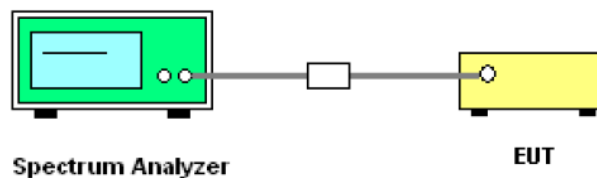
Test Limit: Regulation 15.247(a)(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping 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 power no greater than 0.125W.

Test Mode: Test in hopping transmitting operating mode.

13.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 30 kHz. VBW = 100 kHz, Span = 3MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section
Submit this plot.

13.2 Test Setup



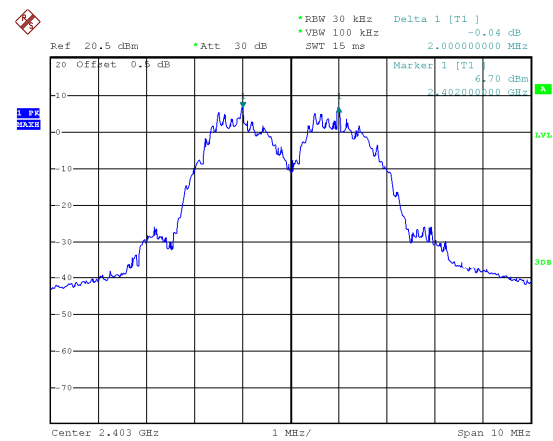
13.3 Test Result

Test result plot as follows:

Modulation	Test Channel	Test Result MHz	20dB Bandwidth MHz	Limits (2/3 20dB Bandwidth) MHz
FHSS	Low	2.00	2.18	1.453
FHSS	Middle	5.02	2.20	1.467
FHSS	High	2.00	2.18	1.453

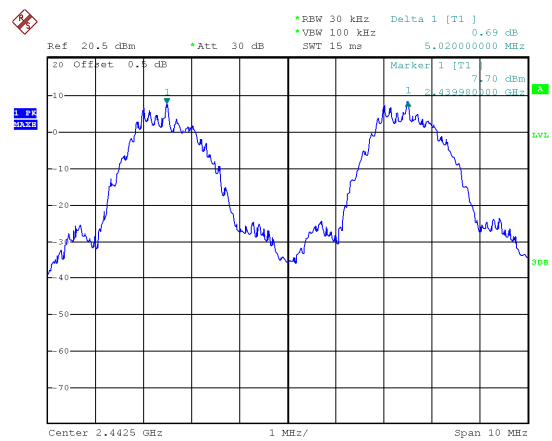
Test plots

Low Channel



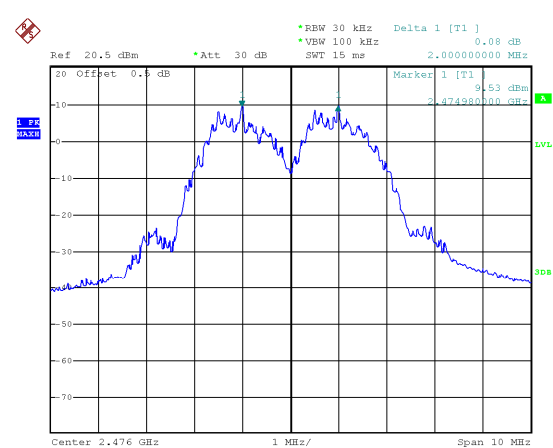
Date: 3.JUL.2025 14:26:08

Middle Channel



Date: 3.JUL.2025 14:29:37

High Channel



Date: 3.JUL.2025 14:31:41

14 Number of Hopping Frequency

Test Requirement: FCC 47CFR Part 15 Section 15.247

Test Method: ANSI C63.10-2020+A1-2024

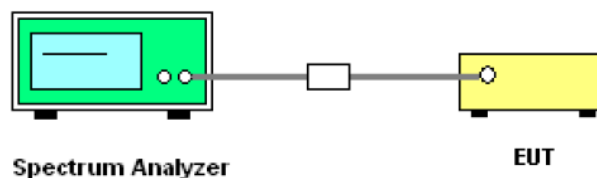
Test Limit: Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Mode: Test in hopping transmitting operating mode.

14.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100 kHz. VBW = 300 kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.
4. Set the spectrum analyzer: Start Frequency = 2.4GHz, Stop Frequency = 2.4835GHz. Sweep=auto;

14.2 Test Setup



15 Dwell Time

Test Requirement:	FCC 47CFR Part 15 Section 15.247
Test Method:	ANSI C63.10-2020+A1-2024
Test Limit:	Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.
Test Mode:	Test in hopping transmitting operating mode.

15.1 Test Procedure

- 1.Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
- 2.Set spectrum analyzer span = 0Hz. Centred on a hopping channel;
- 3.Set RBW = 1 MHz and VBW = 3MHz. Sweep = as necessary to capture the entire dwell time per hopping channel.
- 4.Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g. data rate. modulation format. etc.). repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

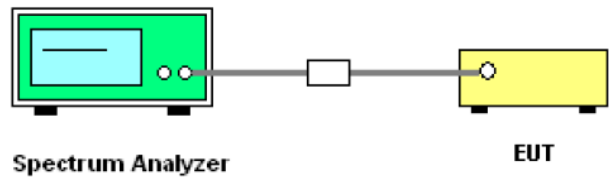
The test period: $T = 0.4(s) * 22 = 8.8 (s)$

FHSS Packet permit maximum $1600 / 22 / 6$ hops per second in each channel (5 time slots RX, 1 time slot TX).

Data Packet	Dwell Time(s)
FHSS	$1600/22/6*8.8*(MkrDelta)/1000$
Remark	Mkr Delta is single pulse time.

Dwell time = Pulse wide x (Hopping rate / Number of channels) x Period

15.2 Test Setup

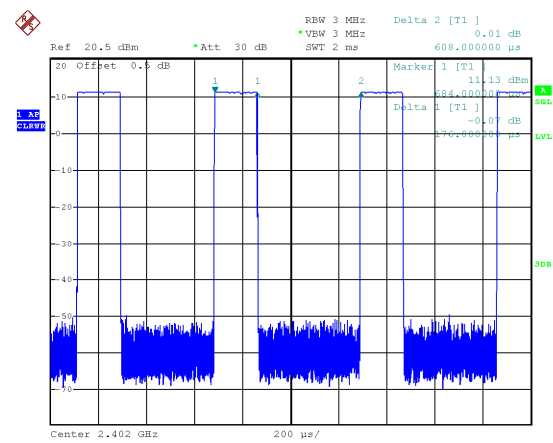


15.3 Test Result

Modulation	Channel	pulse time(ms)	Dwell Time(s)	Limits(s)
FHSS	Low	0.176	0.019	<0.4
	Middle	0.176	0.019	<0.4
	High	0.180	0.019	<0.4

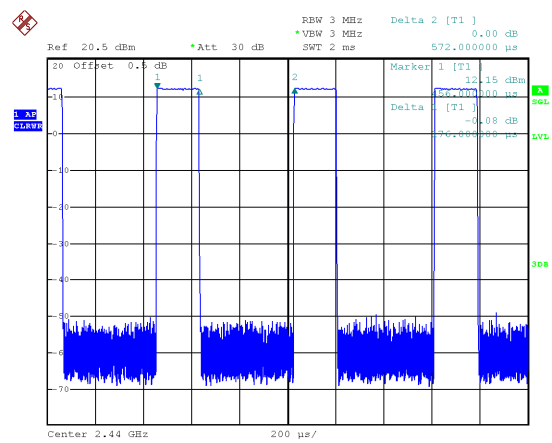
Test Plot

Low Channel



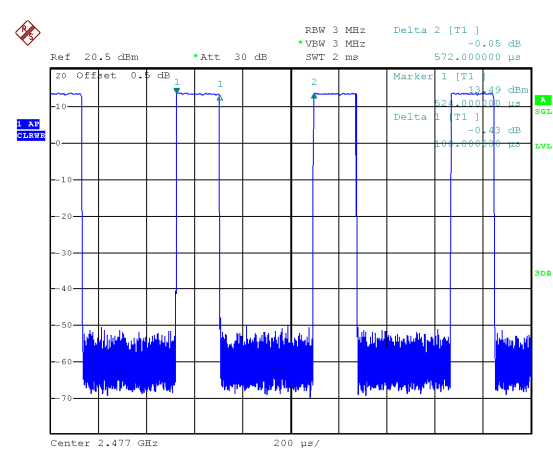
Date: 3.JUL.2025 14:06:23

Middle Channel



Date: 3.JUL.2025 14:07:47

High Channel



Date: 3.JUL.2025 14:09:02

16 Antenna Requirement

According to the FCC Part 15 Paragraph 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. This product has a Brass antenna, fulfil the requirement of this section.

Note: Please refer to EUT photos for more details.

17 RF Exposure

Note: Please refer to SAR Report: WTX25X06169278W.

18 Photographs –Test Setup and EUT Photos

Note: Please refer to appendix: Appendix-HB565PU-Photos.

=====End of Report=====