

Japan Radio Test Report

Report No. : BTL-JPAP-1-2502T066
Equipment : Bb Guide
Model Name : Bb Guide
Brand Name : Bb Guide
Applicant : IHR FAC INC.
Address : 2F, NO.455, Sec. 2, Zhongqing Rd., Beitun Dist., Taichung City 406, Taiwan (R.O.C)

Radio Function : Bluetooth

Standard(s) : Article 2 Paragraph 1 Item 19 of the Certification Ordinance
MIC Notice No.88 Appendix No.43

Date of Receipt : 2025/2/18
Date of Test : 2025/3/17~ 2025/3/18
Issued Date : 2026/4/27

The above equipment has been tested and found in compliance with the requirement of the above standards by BTL Inc.

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Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** assumes no responsibility for the data provided by the Customer, any statements, inferences or generalizations drawn by the customer or others from the reports issued by **BTL**.

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BTL's laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

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REVISION HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-JPAP-1-2502T066	R00	Original Report.	2025/12/18	Invalid
BTL-JPAP-1-2502T066	R01	Revised report to address RCB's comments.	2026/2/25	Invalid
BTL-JPAP-1-2502T066	R02	Revised report to address RCB's comments.	2026/4/27	Valid

1 SUMMARY OF TEST RESULTS

Section Number	Description of Test	ORRE	Result
3.1	Frequency Tolerance	Article 5, Table 1	Pass
3.2	Occupied Bandwidth (99%) and Spread-spectrum Bandwidth (90%) / Spreading Factor (diffusion rate)	Article 6, Table 2 Article 49-20, Item1-h & 1-i	Pass
3.3	Unwanted Emission Intensity	Article 7, Table 3	Pass
3.4	Antenna Power Tolerance	Article 14	Pass
3.5	Limitation of Collateral Emission of Receiver	Article 24, Paragraph 2	Pass
3.6	Transmission Antenna Gain (EIRP Antenna Power)	Article 49-20, Item 1-e & 1-f	Pass
3.7	Transmission Radiation Angle Width (3 dB Beamwidth)	Article 49-20, Item 1-f	N/A
3.8	Radio Interference Prevention Capability	Article 9-4, Item 9-C Article 6-2, Item 3 of the Regulation for Enforcement of the Radio Law	Pass
3.9	Hopping Frequency Dwell Time	Article 49-20, Item1-k	Pass
3.10	Construction Protection Confirmation	Article 49-20, Item1-a	Pass

Statement of Conformity

The statement of conformity is based on the binary decision rule according to IEC Guide 115 and ILAC G8 "simple acceptance" principle. Without considering measurement uncertainty, its specific risk is less than 50% PFA. (PFA: Probability of False Accept)

NOTE:

- (1) "N/A" denotes test is not applicable in this Test Report.
- (2) The report format version is TP.1.1.1.

Measurement Method	MIC Notice No.88 Appendix No.43
Test Condition	Conductive, RF test program provided by the customer was used to control the operating channel as well as the output power level.

Abbreviations

For the purposes of the present document, the following abbreviations apply:

NC	Normal Condition
EC	Extreme Condition
EUT	Equipment Under Test
DS	Direct spreading
FH	Frequency hopping
OFDM	Orthogonal frequency division multiplexing

1.1 TEST FACILITY

No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

☐ SR10 ☒ SR11

1.2 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	Remark
Frequency Tolerance / 99% & 90% Bandwidth	$\pm 6.25 \times 10^{-7}$	Confidence levels of 95%
Antenna power / Unwanted Emission Strength / Secondary Radiated Emission Strength	$\pm 0.5\text{dB}$	Confidence levels of 95%
Transmission Antenna Gain	$\pm 3.72\text{dB}$	Confidence levels of 95%
Carrier Sense Capability	$\pm 0.76\text{dB}$	Confidence levels of 95%

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Environment Condition	Tested by
Frequency Tolerance	22.1 °C, 62 %	Ken Lan
Occupied Bandwidth (99%) and Spread-spectrum Bandwidth (90%) / Spreading Factor (diffusion rate)	22.1 °C, 62 %	Ken Lan
Unwanted Emission Intensity	22.1 °C, 62 %	Ken Lan
Antenna Power Tolerance	22.1 °C, 62 %	Ken Lan
Limitation of Collateral Emission of Receiver	22.1 °C, 62 %	Ken Lan
Radio Interference Prevention Capability	22.1 °C, 62 %	Ken Lan
Hopping Frequency Dwell Time	22.1 °C, 62 %	Ken Lan

2 GENERAL INFORMATION

2.1 DESCRIPTION OF EUT

Equipment	Bb Guide
Model Name	Bb Guide
Brand Name	Bb Guide
Model Difference	N/A
Power Source	DC Voltage supplied from USB Type-C port.
Power Rating	DC 5V, 0.8A
Products Covered	1 * Headset 1 * MIC 1 * Lanyard
Operation Frequency	2402 MHz ~ 2480 MHz
Modulation Type	$\pi/4$ -DQPSK, 8DPSK
Data Rate	2/3 Mbps
Occupied Bandwidth (Maximum)	78.49 MHz
Spread Bandwidth (Minimum)	71.48 MHz
Software version	V03
Hardware version	V03
Antenna Power (Rated)	2 Mbps: 0.0198 mW/MHz 3 Mbps: 0.0198 mW/MHz
Antenna Power (Maximum Conducted)	2 Mbps: 0.0198 mW/MHz 3 Mbps: 0.0198 mW/MHz
Antenna Power (AFH)	2 Mbps: 1.8967 mW/MHz 3 Mbps: 1.8880 mW/MHz
Test Model	Bb Guide
Sample Status	Engineering Sample
EUT Modification(s)	N/A

NOTE:

- (1) The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

(2) Channel List:

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

(3) Table for Filed Antenna:

Antenna	Brand	Model name	Type	Connector	Frequency Range (MHz)	Gain (dBi)
1	IHR FAC INC.	BCTR	Printing Antenna	N/A	2402 ~ 2480	0.32

- (4) The above Antenna information are derived from the antenna data sheet provided by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

2.2 DESCRIPTION OF TEST MODES

The test system was pre-tested based on the consideration of all possible combinations of EUT operation modes according to test plan.

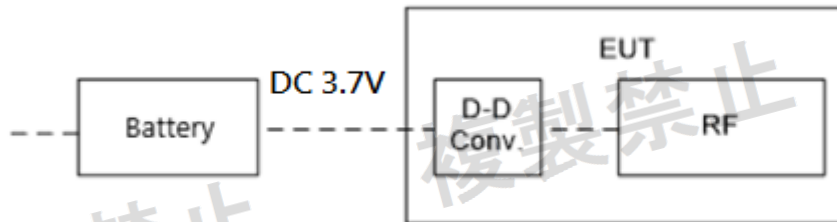
Following mode(s) was (were) found to be the worst case(s) and selected for the final test.

Test Mode	Description
1	2 Mbps_2402/2441/2480 MHz
2	3 Mbps_2402/2441/2480 MHz
3	AFH_2430/2439/2449 MHz

2.3 PARAMETERS OF TEST SOFTWARE

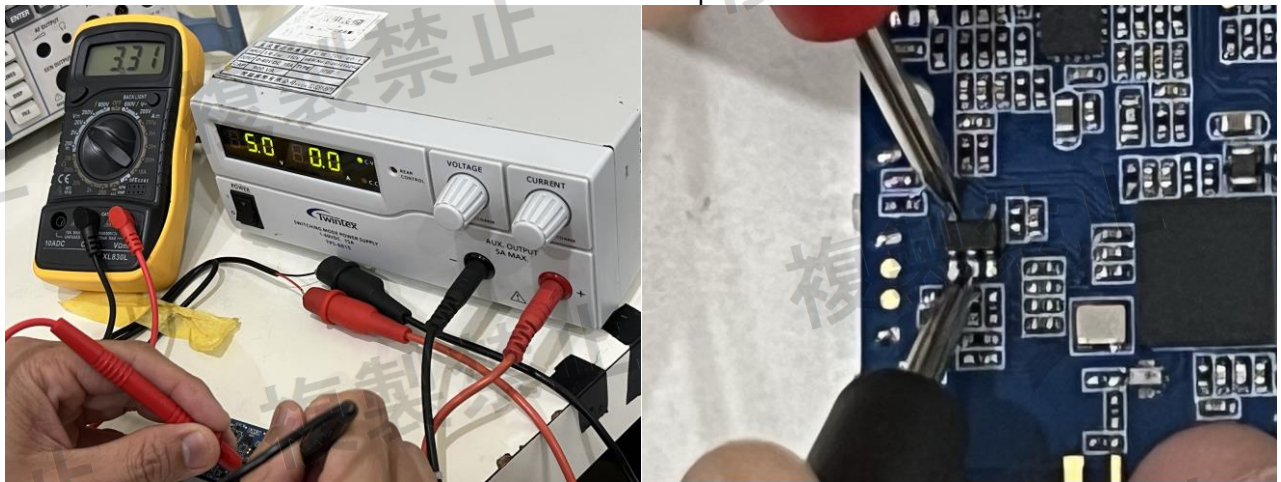
Test From Version	BlueTest3			
Test Software Version	3.3.18.2017			
Mode \ Frequency (MHz)	2402	2441	2480	Data Rate
2 Mbps	5	5	5	2 Mbps
3 Mbps	5	5	5	3 Mbps

Power Supply Voltage Fluctuation Test



Voltage fluctuation test	Normal Voltage	High Voltage + 10% of Normal Voltage	Low Voltage - 10% of Normal Voltage
Input: DC Power (V)	3.7	4.07	3.33
Output: DC Power (V)	3.31	3.31	3.31
Voltage Variation (%)	-	0.000000	0.000000

Measurement point



NOTE:

Voltage Variation (%)

$$= (\text{Output High or Low Voltage} - \text{Output Normal Voltage}) / \text{Output Normal Voltage} \times 100$$

During the input supply voltage to the EUT from the external power source is varied by $\pm 10\%$, if output voltage had been confirmed that the fluctuation of power supply to the RF circuit of EUT (excluding power source) is equal to or less than $\pm 1\%$.

Exempt extremely high and low supply voltage condition tests, EUT only operated in normal voltage to test all regulation.

3 TEST RESULTS

3.1 FREQUENCY TOLERANCE TEST

3.1.1 LIMIT

Item	Limits (See Article 5, Table 1 of the Ordinance Regulating Radio Equipment)
Frequency Tolerance	≤ 50 ppm

3.1.2 MEASURING INSTRUMENTS AND SETTING

Please refer to section 4 in this report. The following table is the setting of the spectrum.

Spectrum Parameter	Setting
Span Frequency	200 kHz
RBW / VBW	10 kHz / 10 kHz

3.1.3 TEST PROCEDURE

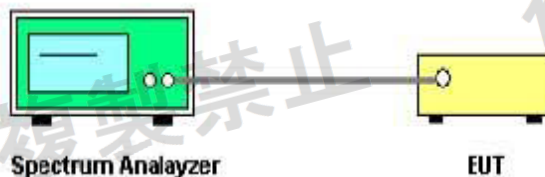
Test method which surpass to Claus 3 of Annex No.43 of MIC Notification No.88.

- Frequency accuracy of SA shall be less than 10 % of limits tolerance (5 ppm).
- Setting of SA is following as: RBW: 10 kHz / VBW: 10 kHz / SPAN: 200 kHz / AT: 30 dB / Ref: 20 dBm.
- Center Frequency: The center frequency of testing for EUT.
- Sweep time: Auto.
- Sweep mode: Continuous sweep.
- Detect mode: Positive peak.
- Mark function: Frequency Counter (Resolution 100 Hz).
- EUT have transmitted absence of modulation signal and fixed channelize. f is using the mark cursor to mark the peak frequency value , fc is declaring of channel frequency. Then the frequency error formula is $(f_c - f)/f_c \times 10^6$ ppm and the limit is less than ± 50 ppm

3.1.4 DEVIATION FROM TEST STANDARD

No deviation.

3.1.5 TEST SETUP



3.1.6 EUT OPERATING CONDITIONS

The EUT was placed on the test table and programmed in un-modulation function.

3.1.7 TEST RESULT

Please refer to the APPENDIX A.

3.2 OCCUPIED BANDWIDTH (99%) AND SPREAD-SPECTRUM BANDWIDTH (90%) / SPREADING FACTOR (DIFFUSION RATE) TEST

3.2.1 LIMIT

Item	Limits (See Article 6, Table 2 and Article 49-20, Item1-h,i of the Ordinance Regulating Radio Equipment)
Occupied Bandwidth	FHSS $\leq$ 83.5MHz; OFDM,DSSS $\leq$ 26MHz; Others $\leq$ 26MHz HT40 $\leq$ 38 MHz
Spreading Bandwidth	$\geq$ 500 kHz (FHSS, DSSS)
Spreading Factor	$\geq$ 5, Operating Frequency 2400 - 2483.5 MHz

3.2.2 MEASURING INSTRUMENTS AND SETTING

Please refer to section 4 in this report. The following table is the setting of the spectrum.

Spectrum Parameter	Setting
Span Frequency	8.35 MHz
RBW / VBW	300 kHz

3.2.3 TEST PROCEDURE

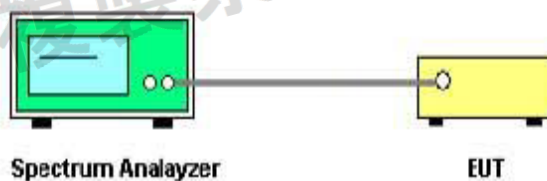
Test method which surpass to Clause 4 of Annex No.43 of MIC Notification No.88.

- Setting of SA is following as: RBW: 300 kHz / VBW: 300 kHz / SPAN: 8.35 MHz / AT: 30 dB Ref: 20 dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold.
- EUT have transmitted the maximum modulation signal and fixed channelize (For DSSS or OFDM Device) or continuous maximum power of hopping mode (For FHSS Device). SA set to 99 % of occupied bandwidth to measure occupied bandwidth. The limit is less than 26 MHz (For DSSS or OFDM Device) or 83.5 MHz (For FHSS Device).
- SA set to 90% of occupied bandwidth to measure Spread Spectrum Bandwidth and must greater than 500 kHz.
- Spread Spectrum Factor = Spread Spectrum Bandwidth / modulation rate of EUT.
- Spread Spectrum Factor limit is greater than 5.

3.2.4 DEVIATION FROM TEST STANDARD

No deviation.

3.2.5 TEST SETUP



3.2.6 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

3.2.7 TEST RESULT

Please refer to the APPENDIX B.

3.3 UNWANTED EMISSION INTENSITY TEST

3.3.1 LIMIT

Item	Limits (See Article 7, Table 3 of the Ordinance Regulating Radio Equipment)
	≤ 2.5 μW/MHz (30 MHz ≤ f ≤ 1000 MHz)
TX Spurious Emission	≤ 2.5 μW/MHz (1000 MHz ≤ f < 2387 MHz; 2496.5 MHz < f)
	≤ 25 μW/MHz (2387 MHz ≤ f < 2400 MHz) and (2483.5 MHz < f ≤ 2496.5 MHz)
Measurement range: 30 MHz - 5th harmonics	

3.3.2 MEASURING INSTRUMENTS AND SETTING

Please refer to section 4 in this report. The following table is the setting of the spectrum.

Spectrum Parameter	Setting
Attenuation	Auto
RBW	100 kHz (below 1 GHz emissions) 1 MHz (above 1 GHz emissions)
VBW	100 kHz (below 1 GHz emissions) 1 MHz (above 1 GHz emissions)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

3.3.3 TEST PROCEDURE

Test method which surpass to Clause 5 of Annex No.43 of MIC Notification No.88.

- EUT have transmitted the maximum modulation signal and fixed channelize.
- Setting of SA is following as: RBW/VBW: 100 kHz (below 1 GHz emissions) / 1 MHz (above 1 GHz emissions) / AT: 30 dB / Ref: 20 dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold.
- Setting of SA is following as 30 MHz and stop frequency 1000 MHz then to mark peak reading value + cable loss shall be less than 2.5 μW.
- Setting of SA is following as 1000 MHz and stop frequency 2387 MHz then to mark peak reading value + cable loss shall be less than 2.5 μW.
- SA adjusted to start frequency 2387 MHz and stop frequency 2400 MHz then to mark peak reading value + cable loss shall be less than 25 μW.
- SA adjusted to start frequency 2483.5 MHz and stop frequency 2496.5 MHz then to mark peak reading value + cable loss shall be less than 25 μW.
- SA adjusted to start frequency 2496.5 MHz and stop frequency 12500 MHz then to mark peak reading value + cable loss shall be less than 2.5 μW.
- Measure side band spurious as follows: For 2.4GHz band: 2374MHz~2400MHz and 2483.5MHz~2509.5MHz RBW = VBW = 30 kHz, Result_Value = Measured_Value + 15.2 [dBm].
- If the Result_Value is over the requirement, take total sum of 1MHz band centered at the spur frequency like ACLP measurement as Result_Value.

3.3.4 DEVIATION FROM TEST STANDARD

No deviation.

3.3.5 TEST SETUP



3.3.6 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

Note:

- ※1: Frequency Band 1 ($30 \text{ MHz} \leq f \leq 1000 \text{ MHz}$)
- ※2: Frequency Band 2 ($1000 \text{ MHz} \leq f \leq 2387 \text{ MHz}$)
- ※3: Frequency Band 3 ($2387 \text{ MHz} < f \leq 2400 \text{ MHz}$)
- ※4: Frequency Band 4 ($2483.5 \text{ MHz} \leq f < 2496.5 \text{ MHz}$)
- ※5: Frequency Band 5 ($2496.5 \text{ MHz} \leq f < 12.5 \text{ GHz}$)

3.3.7 TEST RESULT

Please refer to the APPENDIX C.

3.4 ANTENNA POWER TOLERANCE TEST

3.4.1 LIMIT

Item	Limits (See Article 14 and 49-20 Item 1-e of the Ordinance Regulating Radio Equipment)
Antenna Power Density	$\leq 3 \text{ mW/MHz}$ (FHSS 2427 - 2470.75 MHz) $\leq 10 \text{ mW/MHz}$ (OFDM,DSSS 2400~2483.5 MHz) $\leq 10 \text{ mW}$ (Other modulation method 2400~2483.5 MHz)
Antenna Power Error	+20% (Base on manufacturer declare antenna power density)

3.4.2 MEASURING INSTRUMENTS AND SETTING

Please refer to section 4 in this report. The following table is the setting of the spectrum.

Power Meter Parameter	Setting
Filter No.	Auto
Measurement time	0.135 s ~ 26 s
Used Average Sensor	MA2411B

3.4.3 TEST PROCEDURE

Test method which surpass to Clause 7 of Annex No.43 of MIC Notification No.88.

Step 1:

Measure the timed average power with power meter in enough number of burst.

3.4.4 DEVIATION FROM TEST STANDARD

No deviation.

3.4.5 TEST SETUP



3.4.6 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

3.4.7 TEST RESULT

Please refer to the APPENDIX D.

3.5 LIMITATION OF COLLATERAL EMISSION OF RECEIVER TEST

3.5.1 LIMIT

Item	Limits (See Article 24, Paragraph 2 of the Ordinance Regulating Radio Equipment)
RX Spurious Emission	$\leq 4 \text{ nW } (-54 \text{ dBm}) (f < 1 \text{ GHz})$
	$\leq 20 \text{ nW } (-47 \text{ dBm}) (1 \text{ GHz} \leq f)$
Measurement range: 30 MHz - 5th harmonics.	

3.5.2 MEASURING INSTRUMENTS AND SETTING

Please refer to section 4 in this report. The following table is the setting of the spectrum.

Spectrum Parameter	Setting
Attenuation	Auto
RBW	100 kHz (below 1 GHz emissions) 1 MHz (above 1 GHz emissions)
VBW	100 kHz (below 1 GHz emissions) 1 MHz (above 1 GHz emissions)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

3.5.3 TEST PROCEDURE

Test method which surpass to Clause 7 of Annex No.43 of MIC Notification No.88.

- EUT have the continuous reception mode and fixed only one channelize.
- Setting of SA is following as RBW / VBW: 100 kHz (below 1 GHz emissions) / 1 MHz (above 1 GHz emissions) AT: 0 dB / Ref: -10 dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold.
- SA set RBW: 100 kHz and VBW: 100 kHz. Then adjust to start frequency 30 MHz and stop frequency 1000 MHz. Search to mark peak reading value + cable loss shall be less than 4 nW.
- SA set RBW: 1 MHz and VBW: 1 MHz. Then adjust to start frequency 1000 MHz and stop frequency 12500 MHz. Search to mark peak reading value + cable loss shall be less than 20 nW.
- If power level of lower emissions are more than 1/10 of limit (0.4 nW for $f < 1 \text{ GHz}$, 2 nW for $f \geq 1 \text{ GHz}$), all those are to be indicated in the 2nd and 3rd lines. If others are 1/10 or less more of the limit, no necessary to be indicated.

3.5.4 DEVIATION FROM TEST STANDARD

No deviation.

3.5.5 TEST SETUP



3.5.6 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously reception mode.

Note:

※6: Frequency Band 6 ($30 \text{ MHz} \leq f < 1000 \text{ MHz}$)

※7: Frequency Band 7 ($1000 \text{ MHz} \leq f < 12.5 \text{ GHz}$)

3.5.7 TEST RESULT

Please refer to the APPENDIX E

3.6 TRANSMISSION ANTENNA GAIN (EIRP ANTENNA POWER) TEST

3.6.1 LIMIT

Item	Limits
	(See Article 49-20, Item1-f of the Ordinance Regulating Radio Equipment)
EIRP Power Density	$\leq 6.91 \text{ dBm/MHz}$ (FHSS 2427 - 2470.75 MHz)
	$\leq 12.14 \text{ dBm/MHz}$ (OFDM, DSSS 2400~2483.5 MHz)
	$\leq 12.14 \text{ dBm/MHz}$ (Other modulation method 2400~2483.5 MHz)
Note: This test item will not be applied to the transmission antenna which has a gain of 2.14 dBi or less	

3.6.2 MEASURING INSTRUMENTS AND SETTING

Please refer to section 4 in this report. The following table is the setting of the spectrum.

Power Meter Parameter	Setting
Filter No.	Auto
Measurement time	0.135 s ~ 26 s
Used Average Sensor	MA2411B

3.6.3 TEST PROCEDURE

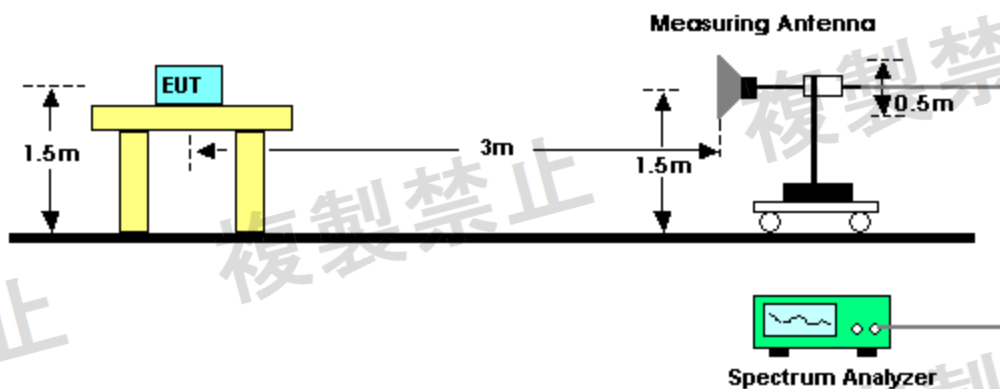
Please refer to 3.4.3 and the $\text{EIRP} = \text{PD} + \text{Gain}$.

3.6.4 DEVIATION FROM TEST STANDARD

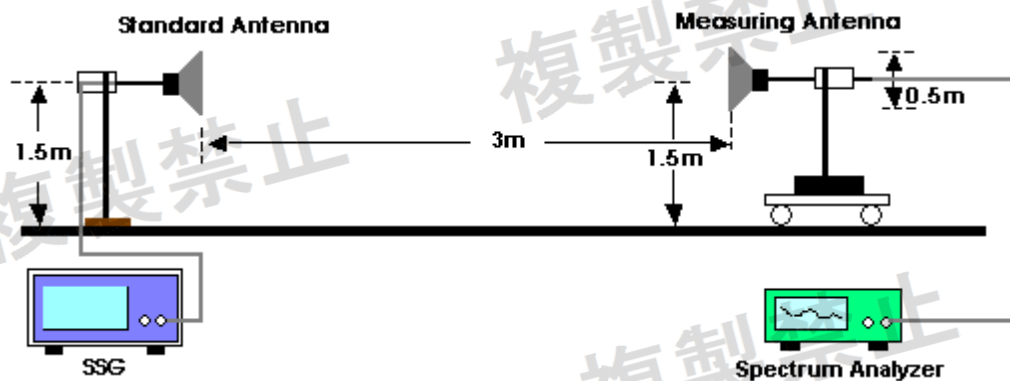
No deviation.

3.6.5 TEST SETUP

For EUT radiation measurement



For standard antenna measurement



3.6.6 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

3.6.7 TEST RESULT

Please refer to the APPENDIX D

3.7 TRANSMISSION RADIATION ANGLE WIDTH (3 DB BEAMWIDTH) TEST

3.7.1 LIMIT

Item	Limits (See Article 49-20, Item1-f of the Ordinance Regulating Radio Equipment)
3 dB antenna beamwidth	$360/A$ (If $A < 1$; then $A = 1$) $A = \{\text{EIRP Power [mW]} / 16.36 \text{ for DSSS, OFDM}\}$ or $A = \{\text{EIRP Power [mW]} / 4.9 \text{ for FHSS}\}$
Note: This test item will not be applied to the transmission antenna which has a gain of 2.14 dBi or less	

3.7.2 MEASURING INSTRUMENTS AND SETTING

Please refer to section 4 in this report. The following table is the setting of the spectrum.

Spectrum Parameter	Setting
Attenuation	Auto
Span	0 MHz
RBW	1 MHz
VBW	1 kHz
Y scale	5 dB
Detector	Peak
Trace	Max Hold

3.7.3 TEST PROCEDURE

Test method which surpass to Clause 22 of Annex No.43 of MIC Notification No.88.

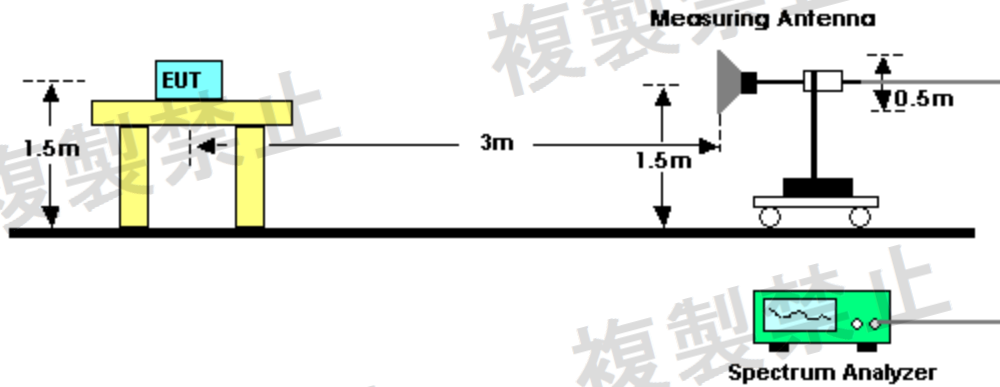
For Adjacent Channel Leakage Power:

- Set EUT and measuring antenna at the same height and roughly facing each other.
- Set spectrum analyzer with condition in section 3.7.2 and tune reference level to observe receiving signal position.
- Rotate directions of the EUT horizontally and vertically to find the maximum receiving power.
- Move the measuring antenna height up and down within ± 50 cm of EUT height and swing it to find the maximum output of measuring antenna. The output level at the spectrum analyzer is read as "E".
- Calculate permitted radiation angle in horizontal and vertical using EIRP measured in another test method.
- Calculate 3 dB antenna beam width by the formula below $360/A$ (If $A < 1$; then $A = 1$).
 $A = \{\text{EIRP Power [mW]} / 16.36 \text{ for DSSS, OFDM}\}$ or
 $A = \{\text{EIRP Power [mW]} / 4.9 \text{ for FHSS}\}$

3.7.4 DEVIATION FROM TEST STANDARD

No deviation.

3.7.5 TEST SETUP



3.7.6 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously reception mode.

Note: C : Cable loss 0 dB

3.7.7 TEST RESULT

Method of measurement:	See MIC Notice No.88 Appendix No.43 Clause 22
Results:	N/A

3.8 RADIO INTERFERENCE PREVENTION CAPABILITY TEST

3.8.1 LIMIT

Item	Limits (See Article 9-4, Item9-C of the Ordinance Regulating Radio Equipment)
Identification code	≥ 48 bits

3.8.2 MEASURING INSTRUMENTS AND SETTING

PC with NetTool	Setting
MAC IP List	MAC Scan

3.8.3 TEST PROCEDURE

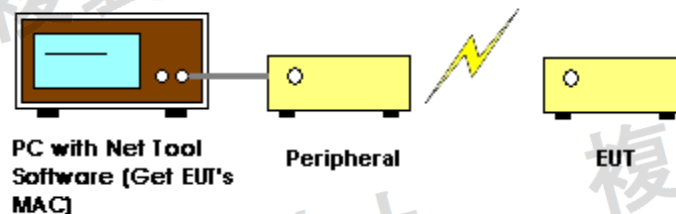
Test method which surpass to Clause 23 of Annex No.43 of MIC Notification No.88.

- a. In the case that the EUT has the function of automatically transmitting the identification code:
 - i. Transmit the predetermined identification codes form EUT.
 - ii. Check the transmitted identification codes with the demodulator.
- b. In the case of receiving the identification code:
 - i. Transmit the predetermined identification codes form the counterpart.
 - ii. Check if communication is normal.
 - iii. Transmit the signals other than predetermined ID codes form the counterpart.
 - iv. Check if the EUT stops the transmission, or if it displays that identification codes are different from the predetermined ones.

3.8.4 DEVIATION FROM TEST STANDARD

No deviation.

3.8.5 TEST SETUP



3.8.6 EUT OPERATING CONDITIONS

The EUT was programmed to be in normal transmitting mode.

3.8.7 TEST RESULT

Test Mode	TX Mode
Test Voltage	Normal Voltage
Test Result	Good (identification code: [0x001C97051508])

3.9 HOPPING FREQUENCY DWELL TIME TEST

3.9.1 LIMIT

Item	Limits (See Article 49-20, Item1-k of the Ordinance Regulating Radio Equipment)
Hopping Freq. Dwell Time	≤ 0.4 sec (In 0.4 sec x spreading rate)

3.9.2 MEASURING INSTRUMENTS AND SETTING

Please refer to section 4 in this report. The following table is the setting of the spectrum.

Spectrum Parameter	Setting
Attenuation	Auto
RBW / VBW	1 MHz
Span	0 MHz
Sweep	Continuous
Detector	Peak
Trigger mode	Video

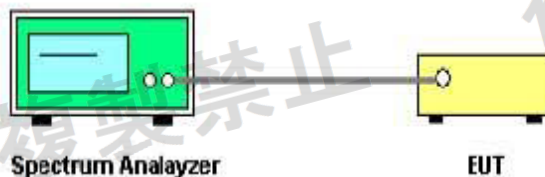
3.9.3 TEST PROCEDURE

- The transmitter output (antenna port) was connected to the spectrum analyzer.
- Set RBW of spectrum analyzer to 1 MHz and VBW to 1 MHz.
- Use a video trigger with the trigger level set to enable triggering only on full pulses.
- Sweep Time is more than once pulse time.
- Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- Measure the maximum time duration of one single pulse.
- Set the EUT for DH5, DH3 and DH1 packet transmitting.
- Measure the maximum time duration of one single pulse.
- Dwell time = [spreading rate/79] x duty-cycle x 0.4 seconds (to be determined for each mode, DH1, DH3, DH5).

3.9.4 DEVIATION FROM TEST STANDARD

No deviation.

3.9.5 TEST SETUP



3.9.6 EUT OPERATING CONDITIONS

The EUT was programmed to be in DH5/DH3/DH1 transmitting mode.

3.9.7 TEST RESULT

Please refer to the APPENDIX F.

3.10 CONSTRUCTION PROTECTION CONFIRMATION

3.10.1 LIMIT

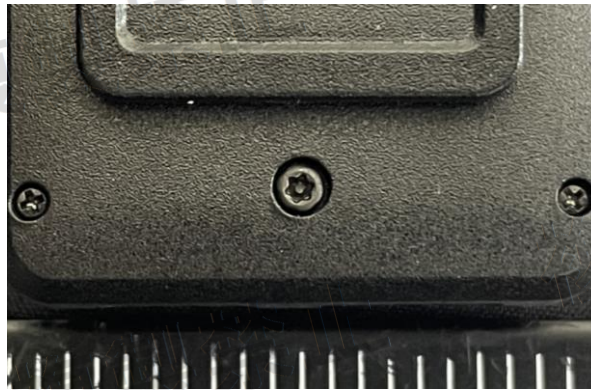
(See Article 49-20, Item1-a of the Ordinance Regulating Radio Equipment)

The high-frequency section and modulation section of the radio equipment except for the antenna system shall not be capable of being opened easily.

3.10.2 CONFIRMATION METHOD

The RF and modulation portions are protected against illegal modification as following method:

Tick the appropriate item	
X	1. Sealed with special screws.
	2. Plastic chassis is being welded using ultrasonic waves.
	3. Chassis is glued using a special adhesive.
	4. Metal covers are spot-fused.
	5. Cover is specially interlocked.
	6. RF and Modulation components are covered with shielding case and this shielding case is soldered.
	7. Shield case is welded at RF and modulation parts, and ID-ROM is welded using the BGA Method.
	8. Shield case is welded at RF and modulation parts, and ID-ROM is glued at its lead with a special adhesive
	9. Shield case is welded at RF and modulation parts, and ID-ROM is glued with a non-transparent laminating agent.
	10. RF and Modulation parts are mounted on PCB with surface mount technology, and there is no any adjustable part on PCB or adjustable parts are not exposed.



4 LIST OF MEASURING EQUIPMENTS

Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Validity Date	Calibration Agency	Remark
Single Channel Pk Power Meter	Keysight	N1911A	MY63450010	2024/9/16	2025/9/15	ETC	3(c)
Peak and Average Power Sensor	Keysight	E9327	MY63310007	2024/9/16	2025/9/15	ETC	3(c)
Spectrum Analyzer	R&S	FSP 40	100129	2025/3/27	2026/3/26	ETC	3(c)

Remark:

1. "N/A" denotes no model name, no serial no. or no calibration specified.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. (a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1).
(b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992).
(c) Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).
(d) Calibration conducted by using measuring instruments and other equipment listed in the right column of Table No. 3 attached hereto, which shall have been given any of calibration, etc. listed above from a) to c)

5 EUT TEST PHOTO

Please refer to document Appendix No.: TP-2502T066-JPAP-1 (APPENDIX-TEST PHOTOS).

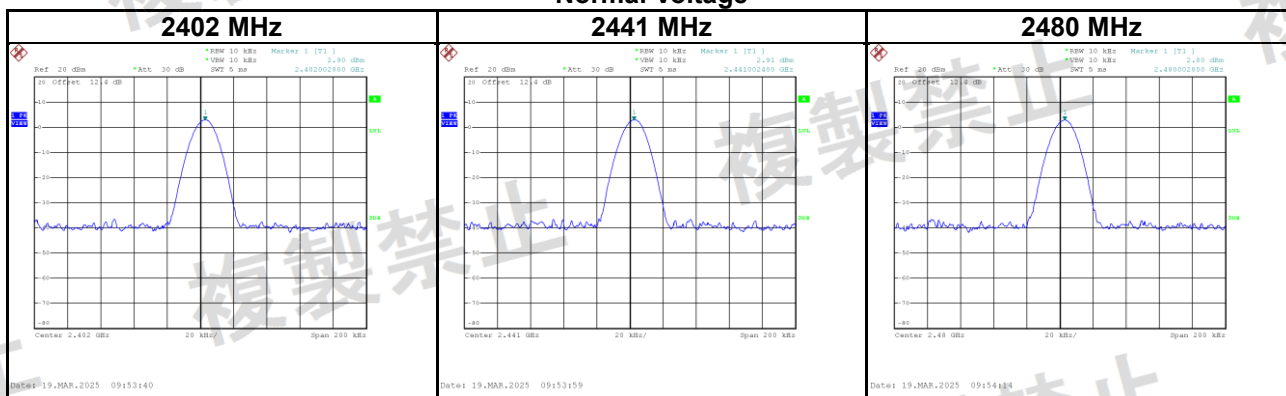
6 EUT PHOTOS

Please refer to document Appendix No.: EP-2502T066-1 (APPENDIX-EUT PHOTOS).

APPENDIX A FREQUENCY TOLERANCE

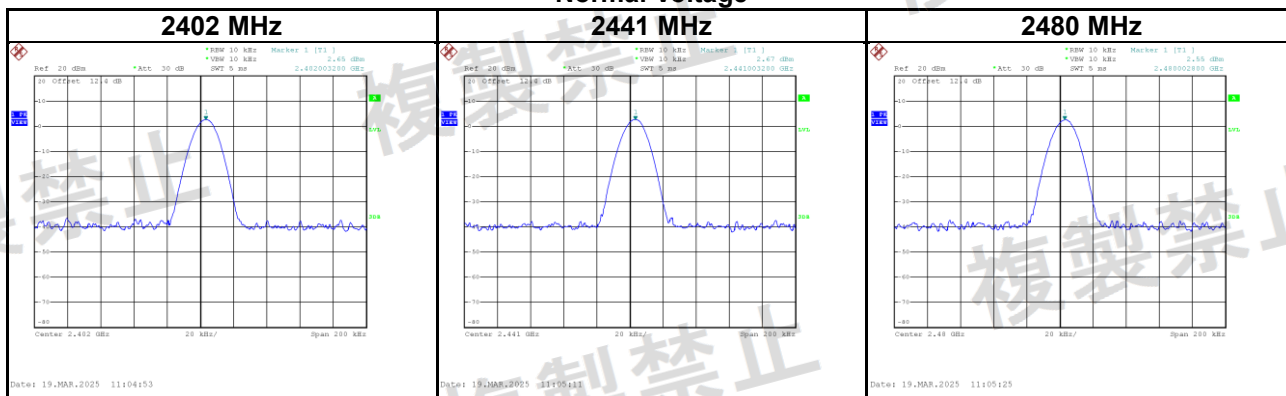
Test Mode	2 Mbps			
Test Voltage (V)	Normal Voltage			Remark
Test Frequency (MHz)	2402	2441	2480	Low/Middle/High of test frequency range
Measured Frequency (MHz)	2402.0028	2441.0024	2480.0028	
Frequency Tolerance (ppm)	1.17	0.98	1.13	Limit ≤ 50 ppm

Normal Voltage



Test Mode	3 Mbps			
Test Voltage (V)	Normal Voltage			Remark
Test Frequency (MHz)	2402	2441	2480	Low/Middle/High of test frequency range
Measured Frequency (MHz)	2402.0032	2441.0032	2480.0028	
Frequency Tolerance (ppm)	1.33	1.31	1.13	Limit ≤ 50 ppm

Normal Voltage

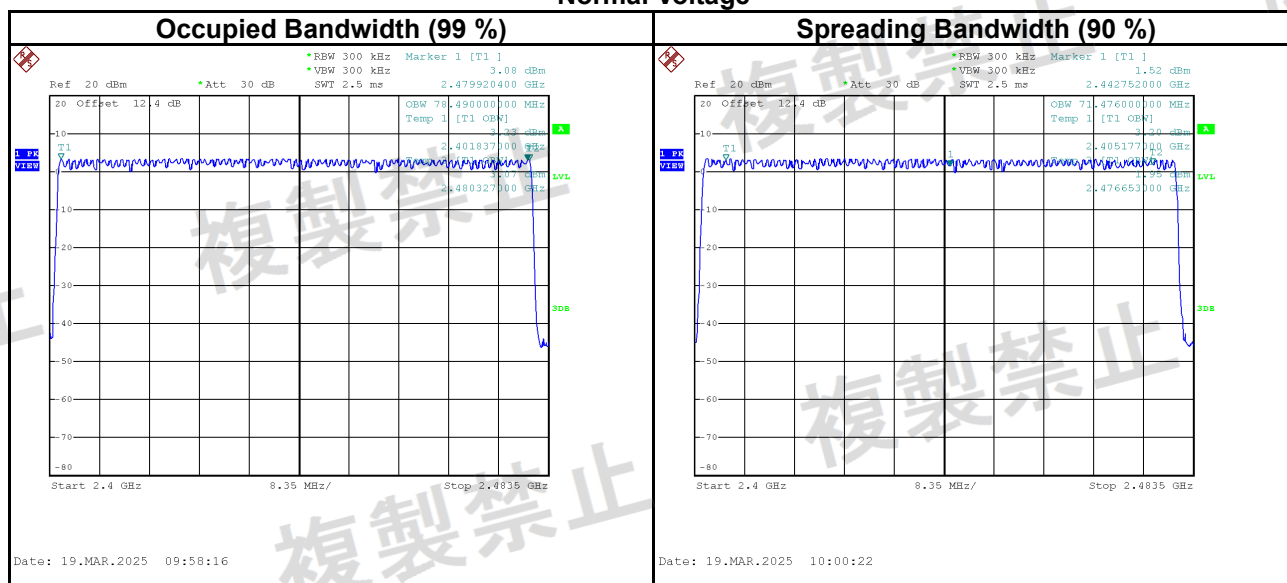


**APPENDIX B OCCUPIED BANDWIDTH (99%) AND SPREAD-
SPECTRUM BANDWIDTH (90%) / SPREADING FACTOR
(DIFFUSION RATE)**

Test Mode	2 Mbps_Hopping Mode	
Test Voltage (V)	Normal Voltage	Remark
Occupied Bandwidth (MHz)	78.49	Limit ≤ 83.5 MHz (RBW/VBW: 300 kHz)
Spreading Bandwidth (MHz)	71.48	Limit ≥ 500 kHz (FHSS, DSSS)
Spread Factor	71.48	Limit ≥ 5 (DSSS and FHSS)

Note: Spread Factor = Spread Bandwidth / TR (TR = 1)

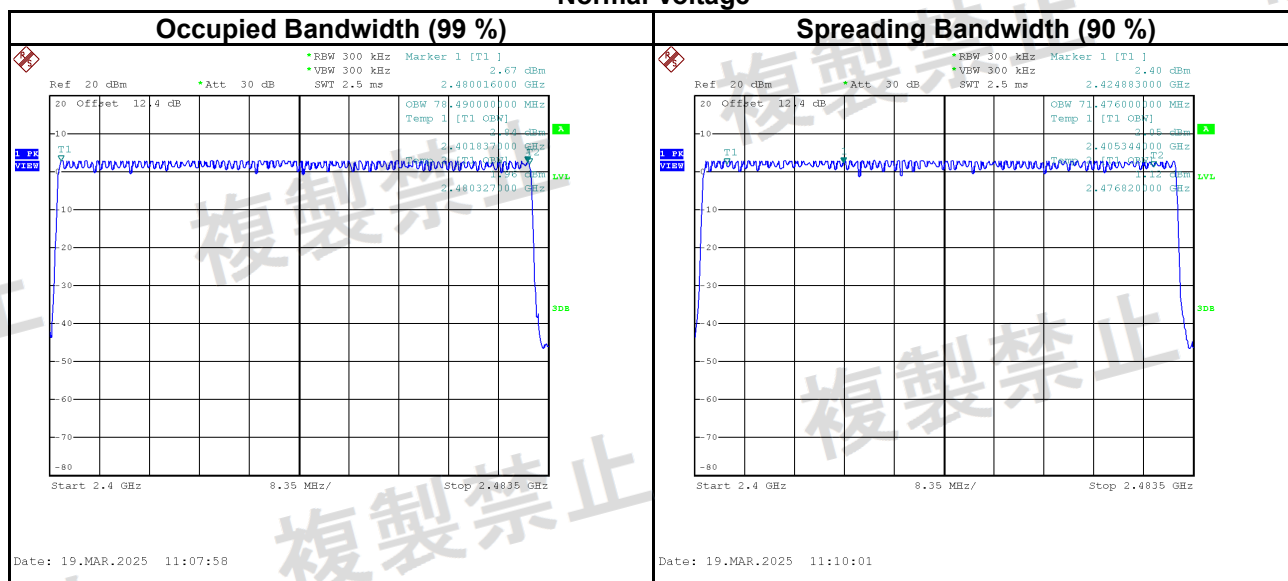
Normal Voltage



Test Mode	3 Mbps_Hopping Mode	
Test Voltage (V)	Normal Voltage	Remark
Occupied Bandwidth (MHz)	78.49	Limit ≤ 83.5 MHz (RBW/VBW: 300 kHz)
Spreading Bandwidth (MHz)	71.48	Limit ≥ 500 kHz (FHSS, DSSS)
Spread Factor	71.48	Limit ≥ 5 (DSSS and FHSS)

Note: Spread Factor = Spread Bandwidth / TR (TR = 1)

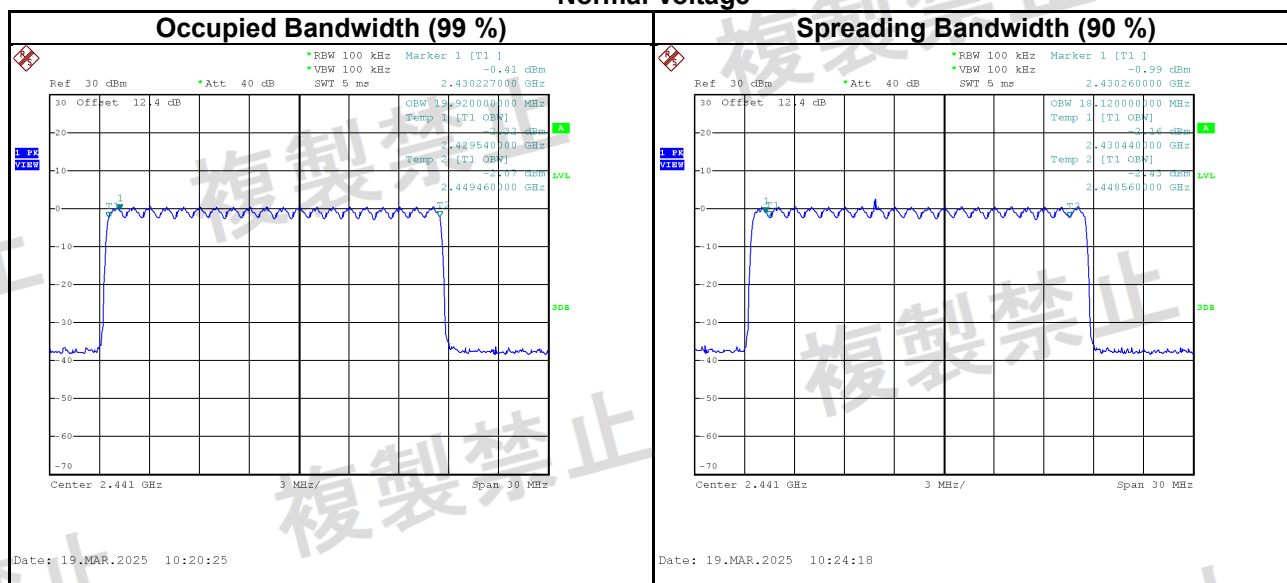
Normal Voltage



AFH mode		
Test Mode	2 Mbps_Hopping Mode	
Test Voltage (V)	Normal Voltage	Remark
Occupied Bandwidth (MHz)	19.92	Limit ≤ 26 MHz (RBW/VBW: 300 kHz)
Spreading Bandwidth (MHz)	18.12	Limit ≥ 500 kHz (FHSS, DSSS)
Spread Factor	18.12	Limit ≥ 5 (DSSS and FHSS)

Note: Spread Factor = Spread Bandwidth / TR (TR = 1)

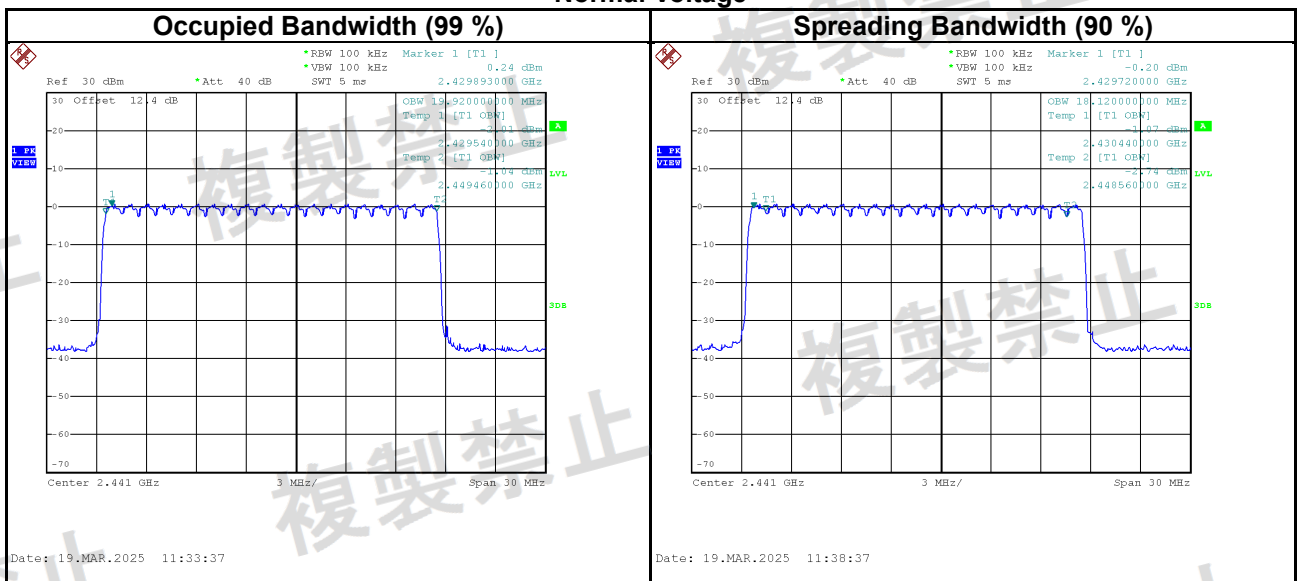
Normal Voltage



AFH mode		
Test Mode	3 Mbps_Hopping Mode	
Test Voltage (V)	Normal Voltage	Remark
Occupied Bandwidth (MHz)	19.92	Limit ≤ 26 MHz (RBW/VBW: 300 kHz)
Spreading Bandwidth (MHz)	18.12	Limit ≥ 500 kHz (FHSS, DSSS)
Spread Factor	18.12	Limit ≥ 5 (DSSS and FHSS)

Note: Spread Factor = Spread Bandwidth / TR (TR = 1)

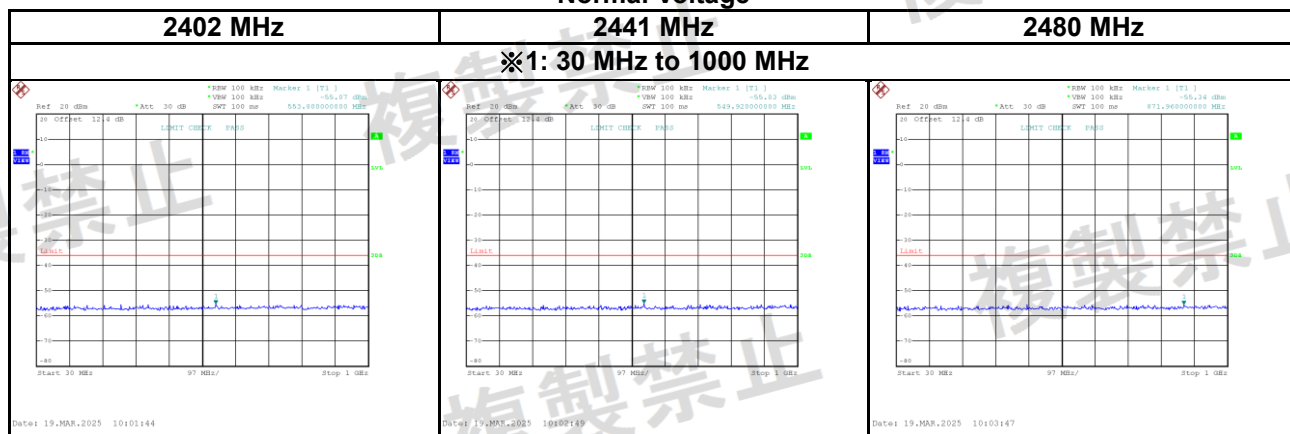
Normal Voltage



APPENDIX C UNWANTED EMISSION INTENSITY

Test Mode		2 Mbps			
Test Voltage		V	Normal Voltage		
Test Frequency		MHz	2402	2441	2480
Unwanted Emission Intensity	※1	Frequency (MHz)	553.80	549.92	871.96
		Measured (dBm/100kHz)	-55.07	-55.03	-55.34
		Measured (μW/100kHz)	0.0031	0.0031	0.0029
	※2	Frequency (MHz)	2239.98	2267.72	2253.85
		Measured (dBm/MHz)	-47.28	-47.27	-48.05
		Measured (μW/MHz)	0.0187	0.0187	0.0157
	※3	Frequency (MHz)	2399.97	2397.79	2389.37
		Measured (dBm/MHz)	-18.60	-44.82	-44.84
		Measured (μW/MHz)	13.8038	0.0330	0.0328
	※4	Frequency (MHz)	2485.79	2490.91	2483.50
		Measured (dBm/MHz)	-45.42	-45.47	-33.82
		Measured (μW/MHz)	0.0287	0.0284	0.4150
	※5	Frequency (MHz)	11959.81	12379.96	12379.96
		Measured (dBm/MHz)	-37.82	-37.80	-37.57
		Measured (μW/MHz)	0.1652	0.1660	0.1750

Normal Voltage



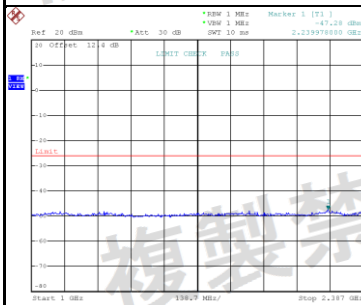
Normal Voltage

2402 MHz

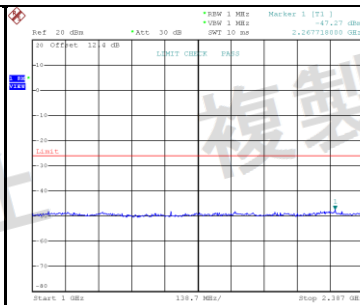
2441 MHz

2480 MHz

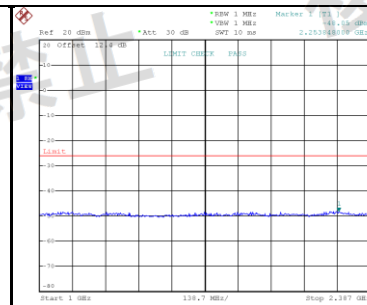
※2: 1000 MHz to 2387 MHz



Date: 19.MAR.2025 10:0154

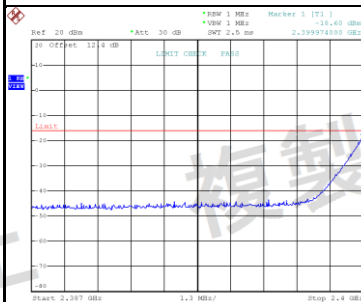


Date: 19.MAR.2025 10:0159

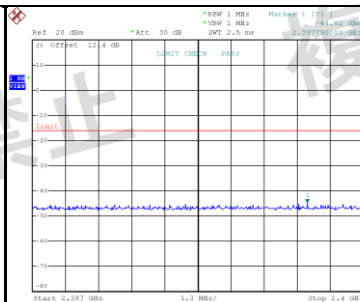


Date: 19.MAR.2025 10:0157

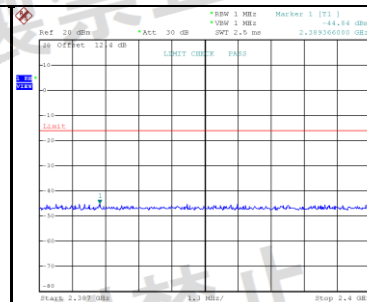
※3: 2387 MHz to 2400 MHz



Date: 19.MAR.2025 10:0204

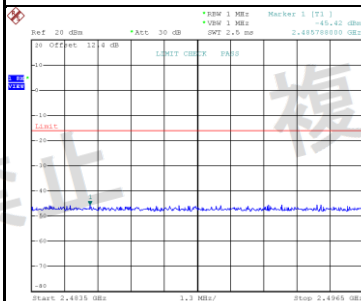


Date: 19.MAR.2025 10:0309

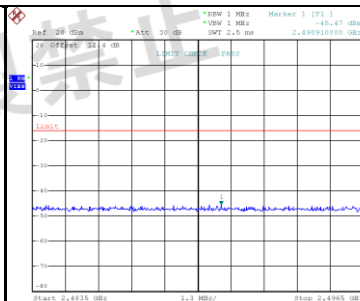


Date: 19.MAR.2025 10:0407

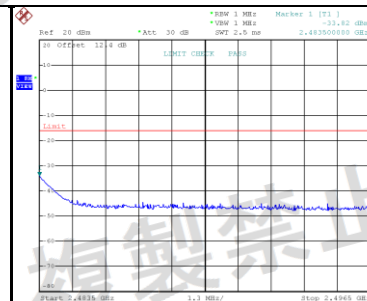
※4: 2483.5MHz to 2496.5 MHz



Date: 19.MAR.2025 10:0213

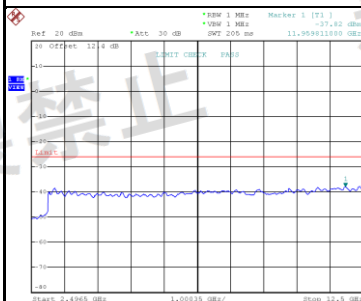


Date: 19.MAR.2025 10:0355

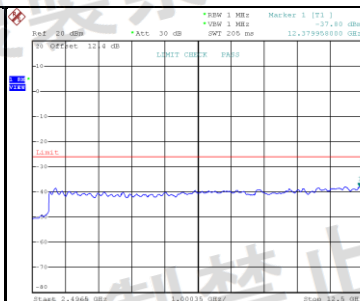


Date: 19.MAR.2025 10:0417

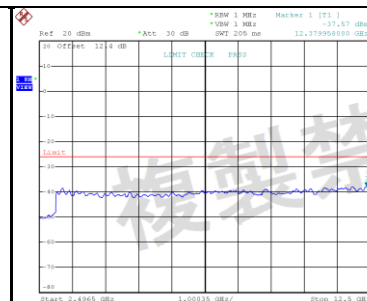
※5: 2496.5 MHz to 12500 MHz



Date: 19.MAR.2025 10:0223



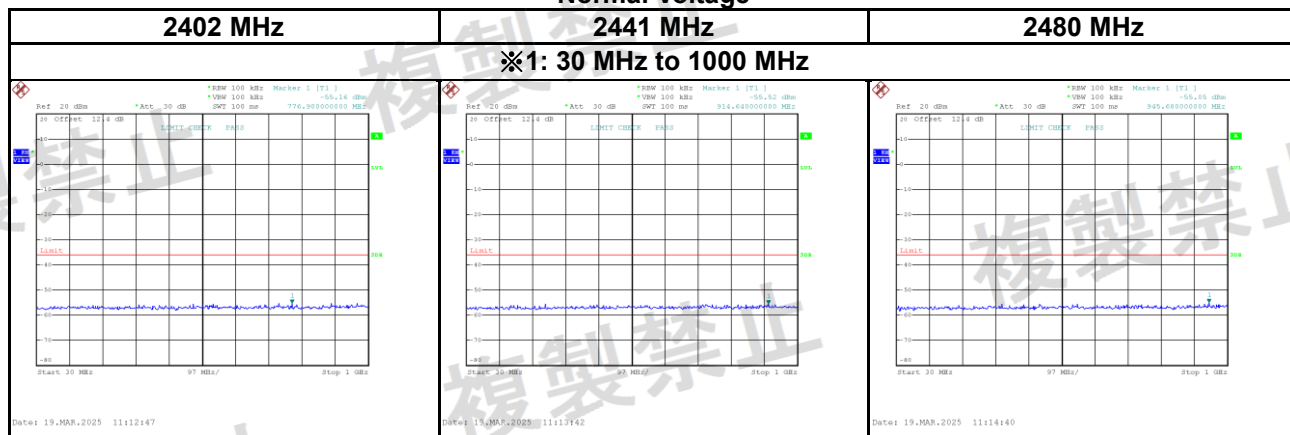
Date: 19.MAR.2025 10:0325



Date: 19.MAR.2025 10:0426

Test Mode		3 Mbps			
Test Voltage		V	Normal Voltage		
Test Frequency		MHz	2402	2441	2480
					Low/Middle/High of test frequency range
Unwanted Emission Intensity	※1	Frequency (MHz)	776.90	914.64	945.68
		Measured (dBm/100kHz)	-55.16	-55.52	-55.05
		Measured (μW/100kHz)	0.0030	0.0028	0.0031
	※2	Frequency (MHz)	1915.42	2281.59	2267.72
		Measured (dBm/MHz)	-48.02	-47.63	-48.21
		Measured (μW/MHz)	0.0158	0.0173	0.0151
	※3	Frequency (MHz)	2400.00	2387.55	2388.59
		Measured (dBm/MHz)	-19.14	-45.13	-44.49
		Measured (μW/MHz)	12.1899	0.0307	0.0356
	※4	Frequency (MHz)	2491.53	2489.14	2483.50
		Measured (dBm/MHz)	-45.71	-45.11	-34.04
		Measured (μW/MHz)	0.0269	0.0308	0.3945
	※5	Frequency (MHz)	12379.96	12379.96	12379.96
		Measured (dBm/MHz)	-38.11	-37.99	-38.04
		Measured (μW/MHz)	0.1545	0.1589	0.1570

Normal Voltage



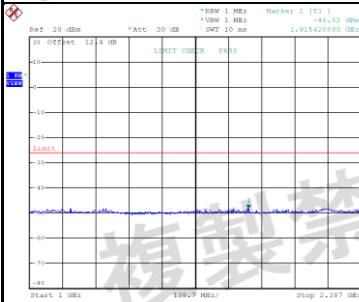
Normal Voltage

2402 MHz

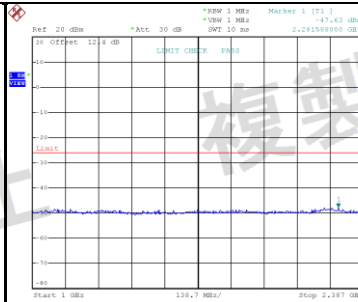
2441 MHz

2480 MHz

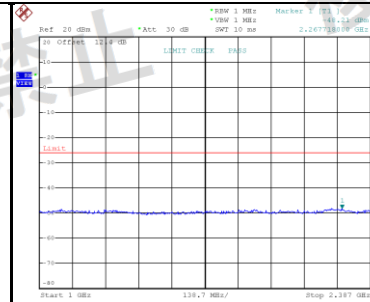
※2: 1000 MHz to 2387 MHz



Date: 19.MAR.2025 11:12:57

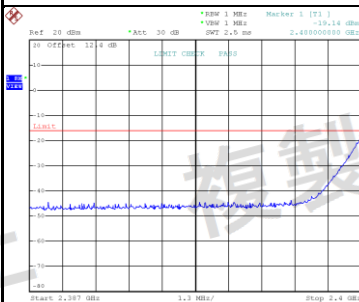


Date: 19.MAR.2025 11:13:52

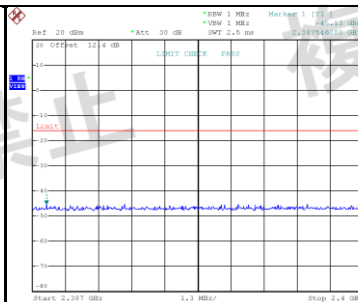


Date: 19.MAR.2025 11:14:50

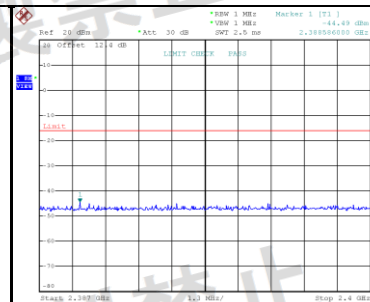
※3: 2387 MHz to 2400 MHz



Date: 19.MAR.2025 11:13:07

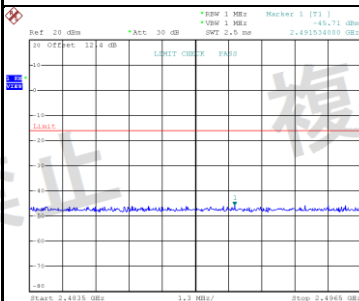


Date: 19.MAR.2025 11:14:02

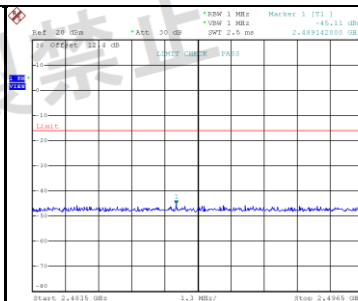


Date: 19.MAR.2025 11:15:00

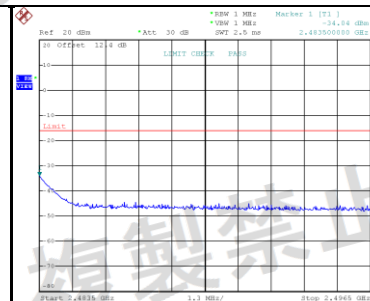
※4: 2483.5MHz to 2496.5 MHz



Date: 19.MAR.2025 11:13:16

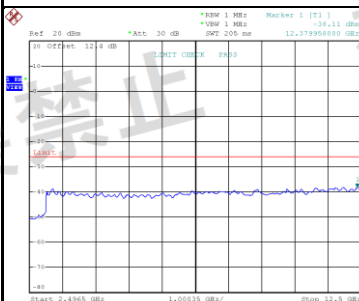


Date: 19.MAR.2025 11:14:55

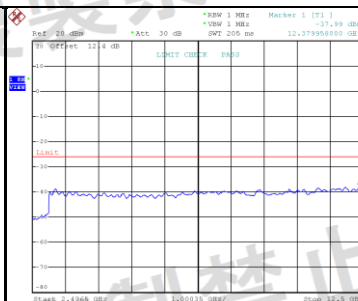


Date: 19.MAR.2025 11:15:09

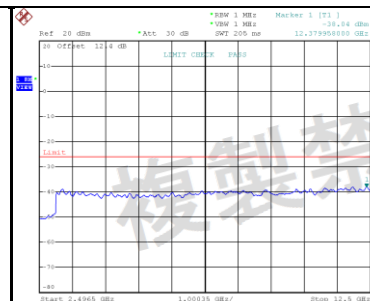
※5: 2496.5 MHz to 12500 MHz



Date: 19.MAR.2025 11:13:26



Date: 19.MAR.2025 11:14:22



Date: 19.MAR.2025 11:15:19

APPENDIX D ANTENNA POWER TOLERANCE

Test Mode	2 Mbps				
Test Voltage	V	Normal Voltage			Remark
Test Frequency	MHz	2402	2441	2480	Low/Middle/High of test frequency range
Spreading Bandwidth	MHz	71.48			
Duty Cycle	%	76.60			
Bust Rate	-	1.31			
Power Meter Raw from EUT	dBm	2.67	2.56	2.43	
	mW	1.8493	1.8030	1.7498	
Antenna Power (Conducted)	mW/MHz	0.0198	0.0193	0.0188	Limit ≤ 3 mW/MHz
Rated Power	mW/MHz	0.0198			
Antenna Power Error	%	0.00	-2.50	-5.38	Limit + 20%

Note:

79 hop Result [mW/MHz] =

$10^{(\text{Power Meter Raw (EIRP)}[\text{dBm}] / 10)} / \text{Spread-Bandwidth (90\% OBW)} [\text{MHz}] \times \text{Bust Rate}$

Bust Rate= 1/Duty Cycle

Test Mode	3 Mbps				
Test Voltage	V	Normal Voltage			Remark
Test Frequency	MHz	2402	2441	2480	Low/Middle/High of test frequency range
Spreading Bandwidth	MHz	71.48			
Duty Cycle	%	76.60			
Bust Rate	-	1.31			
Power Meter Raw from EUT	dBm	2.67	2.55	2.42	
	mW	1.8493	1.7989	1.7458	
Antenna Power (Conducted)	mW/MHz	0.0198	0.0193	0.0187	Limit ≤ 3 mW/MHz
Rated Power	mW/MHz	0.0198			
Antenna Power Error	%	0.00	-2.73	-5.59	Limit + 20%

Note:

79 hop Result [mW/MHz] =

$10^{(\text{Power Meter Raw (EIRP)}[\text{dBm}] / 10)} / \text{Spread-Bandwidth (90\% OBW)} [\text{MHz}] \times \text{Bust Rate}$

Bust Rate= 1/Duty Cycle

AFH mode					
Test Mode	2 Mbps				
Test Voltage	V	Normal Voltage			Remark
Test Frequency	MHz	2430	2439	2449	Low/Middle/High of test frequency range
Power Meter Raw from EUT	dBm	2.78	2.75	2.67	Limit ≤ 3 mW/MHz
Antenna Power (Conducted)	mW/MHz	1.8967	1.8836	1.8493	
AFH Rated Power	mW/MHz	1.8967			Limit + 20%
Antenna Power Error	%	0.00	-0.69	-2.50	

Note:

79 hop Result [mW/MHz] =

$10^{(\text{Power Meter Raw (EIRP)}[\text{dBm}] / 10)} / \text{Spread-Bandwidth (90\% OBW)} [\text{MHz}] \times \text{Bust Rate}$

Bust Rate= 1/Duty Cycle

AFH mode					
Test Mode	3 Mbps				
Test Voltage	V	Normal Voltage			Remark
Test Frequency	MHz	2430	2439	2449	Low/Middle/High of test frequency range
Power Meter Raw from EUT	dBm	2.76	2.73	2.68	Limit ≤ 3 mW/MHz
Antenna Power (Conducted)	mW/MHz	1.8880	1.8750	1.8535	
AFH Rated Power	mW/MHz	1.8880			Limit + 20%
Antenna Power Error	%	0.00	-0.69	-1.83	

Note:

79 hop Result [mW/MHz] =

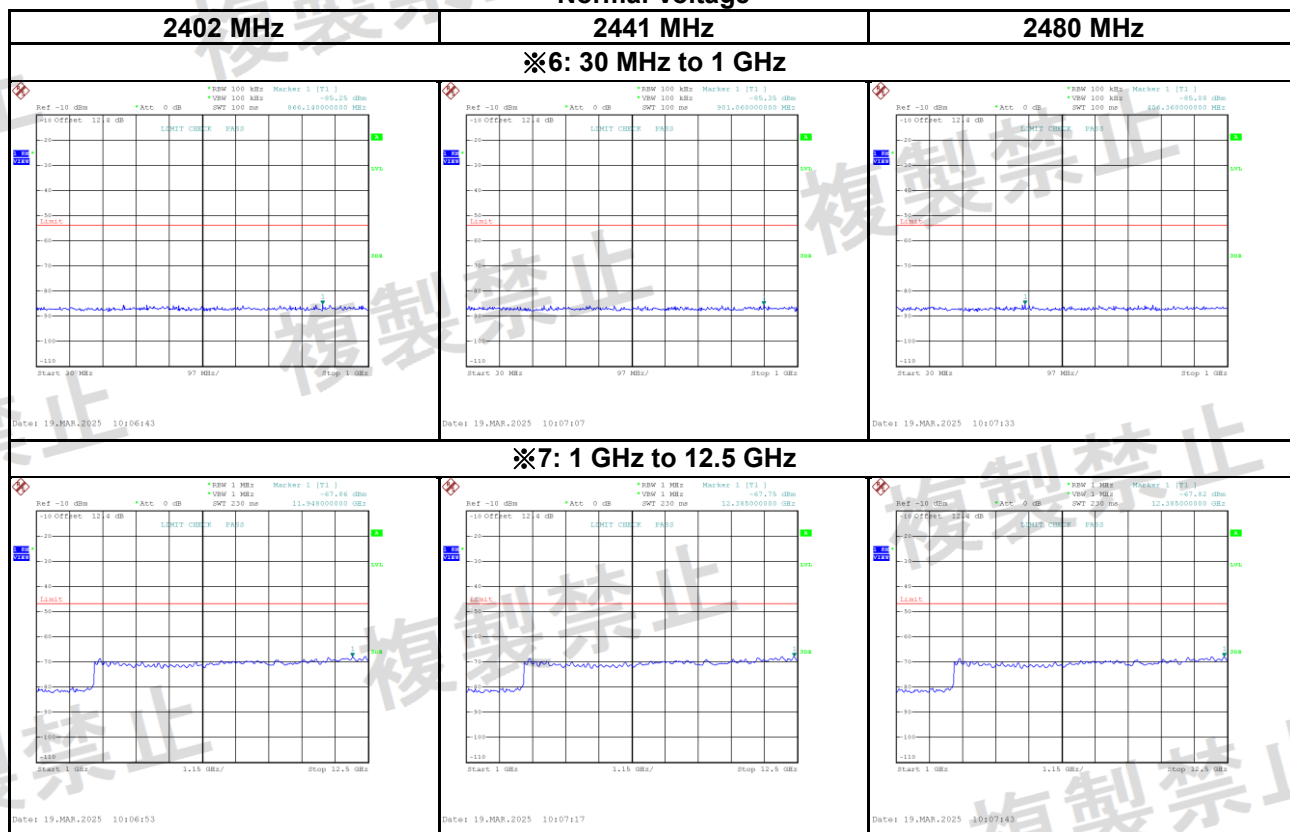
$10^{(\text{Power Meter Raw (EIRP)}[\text{dBm}] / 10)} / \text{Spread-Bandwidth (90\% OBW)} [\text{MHz}] \times \text{Bust Rate}$

Bust Rate= 1/Duty Cycle

APPENDIX E LIMITATION OF COLLATERAL EMISSION OF RECEIVER

Test Mode		2 Mbps			
Test Voltage		V	Normal Voltage		
Test Frequency		MHz	2402	2441	2480
Limitation of Collateral Emission of Receiver	※6	Frequency (MHz)	866.14	901.06	406.36
		Measured (dBm)	-85.25	-85.35	-85.08
		Measured (μW)	0.0030	0.0029	0.0031
	※7	Frequency (MHz)	11948.00	12385.00	12385.00
		Measured (dBm)	-67.86	-67.75	-67.82
		Measured (μW)	0.1637	0.1679	0.1652

Normal Voltage



Test Mode		3 Mbps			
Test Voltage		V	Normal Voltage		
Test Frequency		MHz	2402	2441	2480
Limitation of Collateral Emission of Receiver	※6	Frequency (MHz)	127.00	941.80	984.48
		Measured (dBm)	-85.28	-85.28	-85.52
		Measured (μW)	0.0030	0.0030	0.0028
	※7	Frequency (MHz)	12362.00	12385.00	12362.00
		Measured (dBm)	-67.99	-68.05	-68.10
		Measured (μW)	0.1589	0.1567	0.1549

Normal Voltage

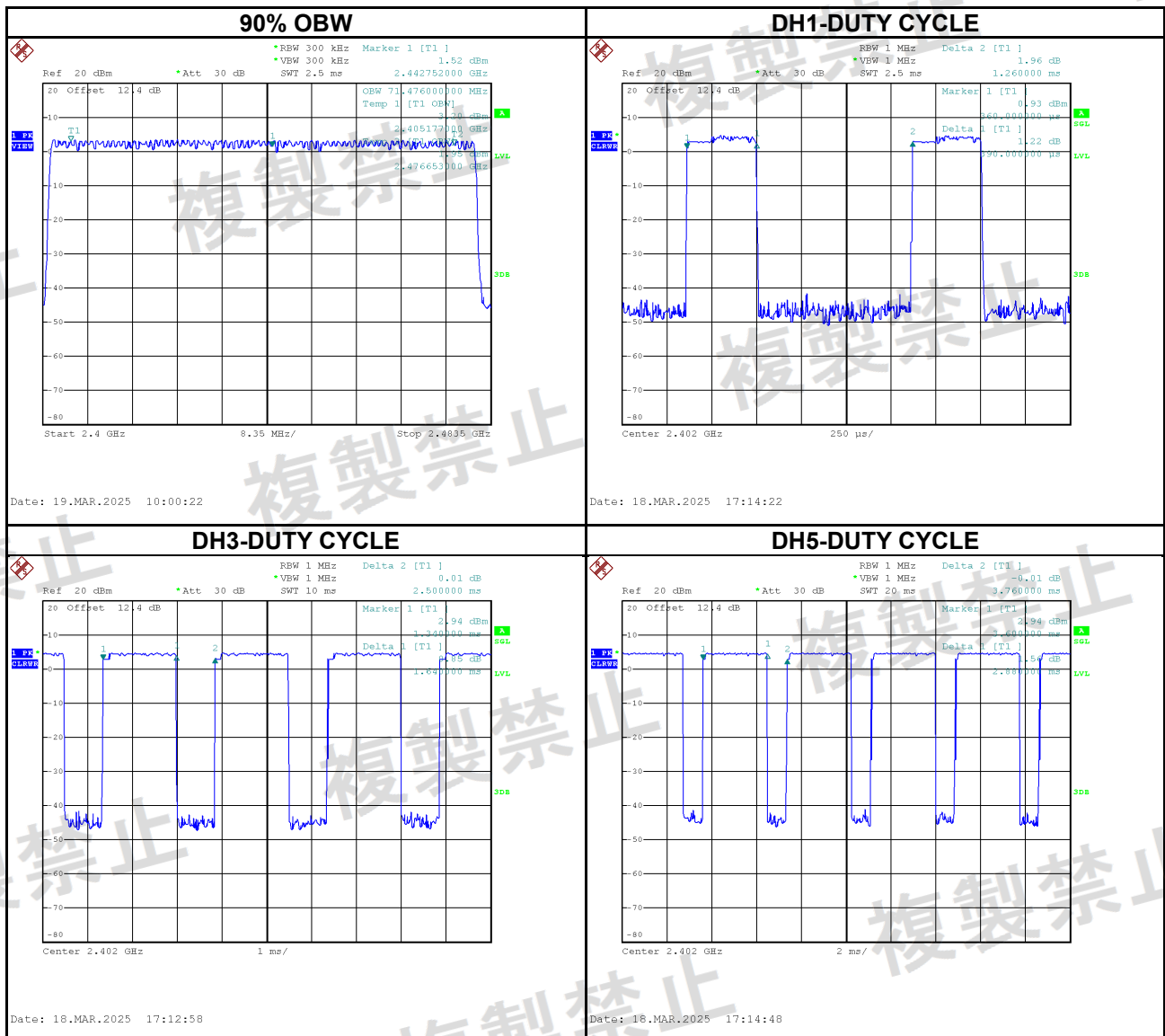


APPENDIX F HOPPING FREQUENCY DWELL TIME

Test Mode	2 Mbps_2402 MHz			
Test Voltage	V	Normal Voltage		Remark
Data Packet	90% OBW	Duty cycle	Dwell Time	Limits
	(MHz)	(%)	(s)	(s)
DH1	71.48	30.93	0.1119	0.4
DH3	71.48	65.60	0.2374	0.4
DH5	71.48	76.60	0.2772	0.4

Duty-cycle = [on time/total time] x 100%

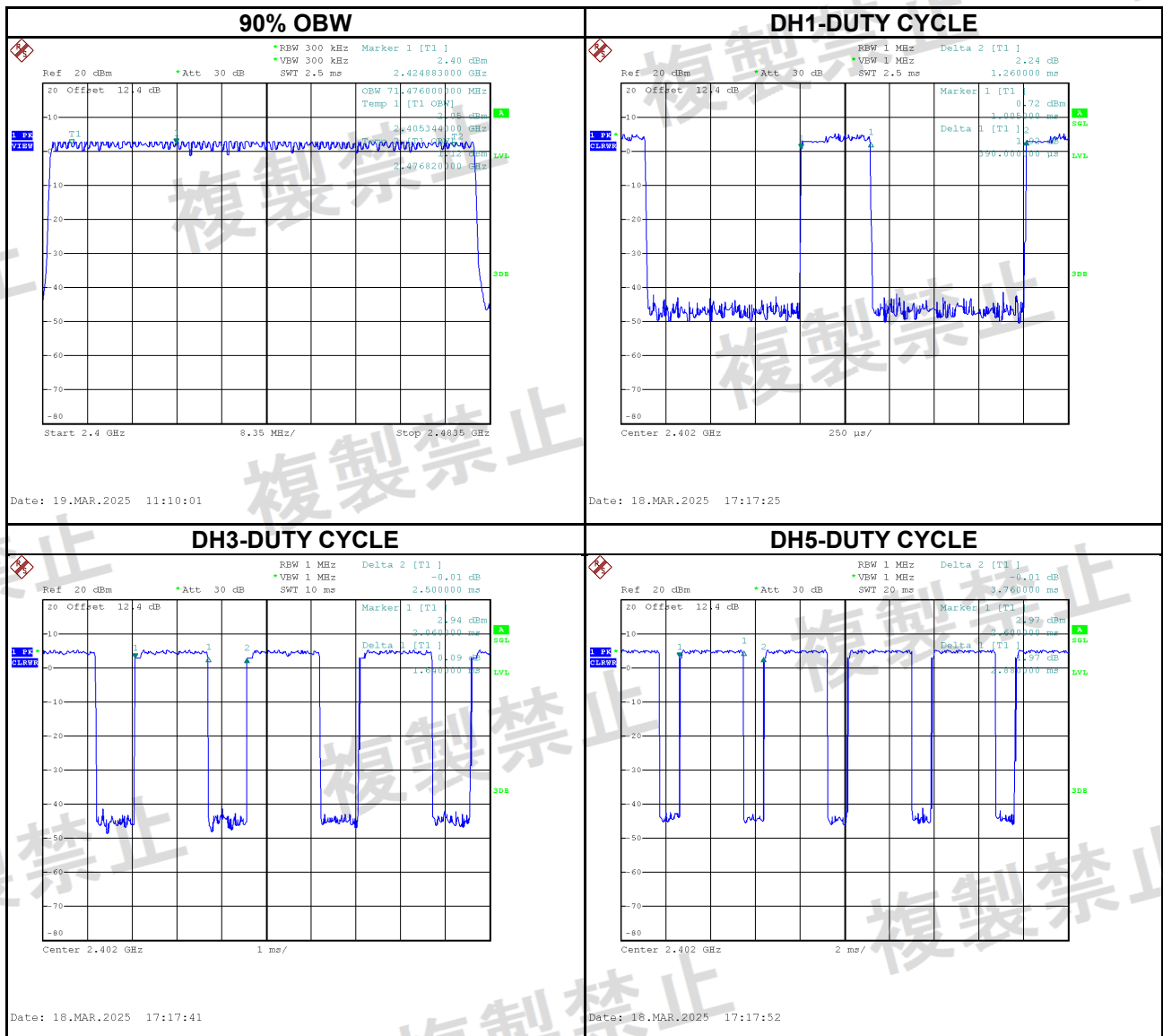
Dwell time = [spreading rate/79] x duty-cycle x 0.4 seconds



Test Mode	3 Mbps_2402 MHz			
Test Voltage	V	Normal Voltage		Remark
Data Packet	90% OBW	Duty cycle	Dwell Time	Limits
	(MHz)	(%)	(s)	(s)
DH1	71.48	30.95	0.1120	0.4
DH3	71.48	65.60	0.2374	0.4
DH5	71.48	76.60	0.2772	0.4

Duty-cycle = [on time/total time] x 100%

Dwell time = [spreading rate/79] x duty-cycle x 0.4 seconds



End of Test Report