



LCIE

Bluetooth Low Energy Template : Release July 2nd, 2021

TEST REPORT

N°: 29284424-818343-A(FILE#12605974)

Version: 02

Subject

Radio spectrum Matters (ERM) tests according to:
Japanese Radio Law for Article 2 paragraph 1 item (19)
specified radio equipment categories equipment
Article 49-20 and the relevant articles of the Ordinance Regulating
Radio Equipment and MIC Notice No.88 Appendix No.43 Test method

Issued to

SCHNEIDER ELECTRIC INDUSTRIES FRANCE L'ISLE
D'ESPAGNAC
BP 660 - ZI No.3
16340 – L'ISLE D'ESPAGNAC
FRANCE

Apparatus under test

- Product
- Trade mark
- Manufacturer
- Model under test
- Serial number

Relay Antenna, 24-240 VAC/DC, 5m cable output
Schneider Electric
Schneider Electric France
ZBRA1-V2
243600017

Conclusion

See Test Program chapter

Test date

November 17, 2025 to November 28, 2025

Test location

Moirans

Composition of document

41 pages

Document issued on

May 7, 2026

Written by :
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Tests operator

Approved by :
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Technical manager



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PUBLICATION HISTORY

Version	Date	Author	Modification
01	February 9, 2026	Majid MOURZAGH	Creation of the document
02	May 7, 2026	Majid MOURZAGH	Correction of Model name Manufacturer on page 1 and peak gain at 2dBi



SUMMARY

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1. TEST PROGRAM

References

Japanese Radio Law for Article 2 paragraph 1 item (19) categories equipment, as defined in Japanese Certification Ordinance

Radio requirement:

Description	Result - Comments			
Communication Method	☒ PASS	☐ FAIL	☐ NA	☐ NP(1)
Modulation Method	☒ PASS	☐ FAIL	☐ NA	☐ NP(1)
Frequency Band	☒ PASS	☐ FAIL	☐ NA	☐ NP(1)
Antenna Power & Antenna Power Tolerance & EIRP	☒ PASS	☐ FAIL	☐ NA	☐ NP(1)
Spread Bandwidth	☒ PASS	☐ FAIL	☐ NA	☐ NP(1)
Spread Factor	☐ PASS	☐ FAIL	☒ NA	☐ NP(1)
Occupied Bandwidth	☒ PASS	☐ FAIL	☐ NA	☐ NP(1)
Spurious Emissions Intensity	☒ PASS	☐ FAIL	☐ NA	☐ NP(1)
Limit On Secondary Spurious Emissions	☒ PASS	☐ FAIL	☒ NA	☐ NP(1)
Antenna Gain	☒ PASS	☐ FAIL	☐ NA	☐ NP(1)
Half Power Beam Angle	☐ PASS	☐ FAIL	☒ NA	☐ NP(1)
Carrier Sensing Function	☐ PASS	☐ FAIL	☒ NA	☐ NP(1)
Dwell Time	☐ PASS	☐ FAIL	☒ NA	☐ NP(1)
Number of Carrier	☐ PASS	☐ FAIL	☒ NA	☐ NP(1)
Housing Requirements	☒ PASS (2)	☐ FAIL	☐ NA	☐ NP(1)
Interference Prevention Function	☒ PASS (3)	☐ FAIL	☐ NA	☐ NP(1)

This table is a summary of test report, see conclusion of each clause of this test report for detail.

(1): Limited Program. Integration of a radio module already assessed

(2): The high-frequency section and modulation section cannot be easily opened

(3): The EUT sends a specific identification code to the wireless associated equipment

PASS: EUT complies with standard's requirement

FAIL: EUT does not comply with standard's requirement

NA: Not Applicable

NP: Test Not Performed

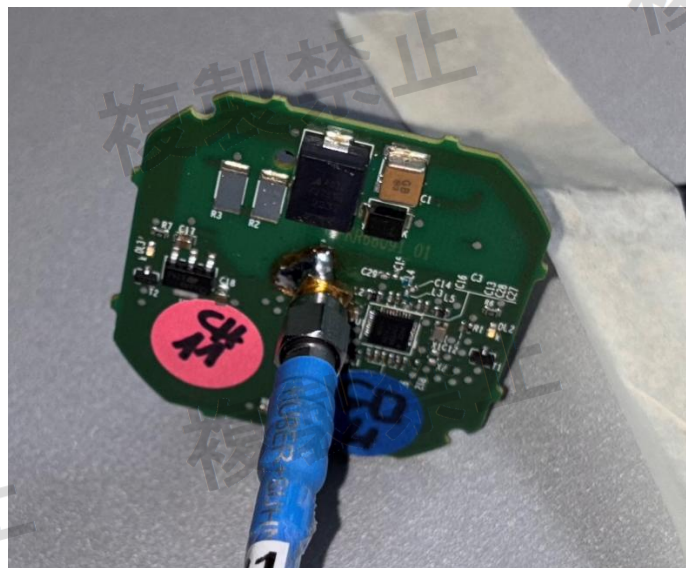
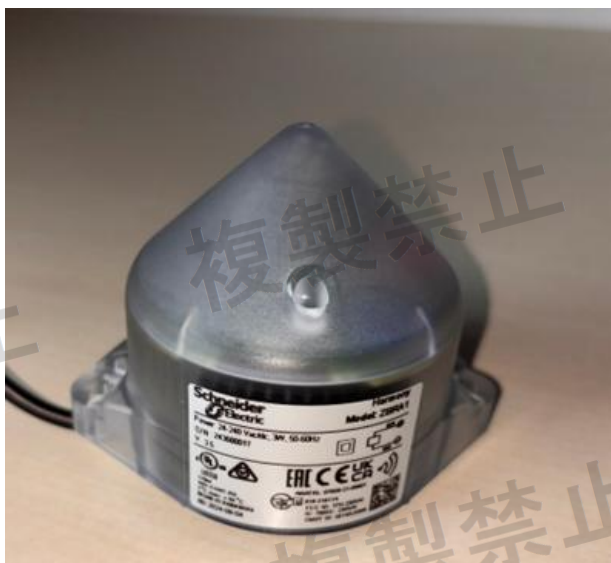
DP: Declaration of provider

2. EQUIPMENT UNDER TEST: CONFIGURATION (DECLARED BY PROVIDER)

2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT):

ZBRA1-V2 Serial Number: 243600017



Equipment Under Test

Power supply:

Name	Type	Rating	Reference / Sn	Comments
Supply1	DC	24Vdc	/	/
Supply2	AC	240Vac 50Hz	/	/

NC: Not communicated by provider

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Comments
Supply1 / Supply 2	L+N (24-240 Vac/dc : DC/ 50Hz/60Hz)	5	No	No	/

NC: Not communicated by provider

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Laptop Lenovo	L490	/	To set configuration mode
TeSys T - cable adaptateur USB RJ45	TCSMCNAM3M002P	/	Used during test blocking
Harmony Hub	ZBRN2	ID: 040EE9D9	Used during test blocking

NC: Not communicated by provider

**Software & Hardware identification:**

-Software version: Not communicated
-Hardware version: Not communicated

Equipment information:

802.15.4:	ZigBee
Chipset	EFR32MG24A010F1536IM40-BR
Frequency band:	[2400 – 2483.5] MHz
Spectrum Modulation:	DSSS
Number of Channel:	16
Spacing channel:	5MHz
Channel bandwidth:	2MHz
Antenna Type:	Internal
Antenna connector:	None
Transmit chains:	1
Receiver chains	1
Adaptivity mode:	No

CHANNEL PLAN	
Channel	Frequency (MHz)
Cmin: 11	2405
12	2410
13	2415
14	2420
15	2425
16	2430
17	2435
Cmid: 18	2440
19	2445
20	2450
21	2455
22	2460
23	2465
24	2470
25	2475
Cmax: 26	2480

DATA RATE		
Data Rate (Mbps)	Modulation Type	Worst Case Modulation
0.25	O-QPSK	☒



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2.2. RUNNING MODE

The EUT is set in the following modes during tests:

- Permanent emission with modulation on a fixed channel at the highest power
- Permanent emission without modulation on a fixed channel at the highest power

The EUT is set in the following modes during tests:

- Permanent emission with modulation on a fixed channel at the highest power
- Permanent emission without modulation on a fixed channel at the highest power
- Permanent reception

Test mode	Description of test mode
Test mode 1	Permanent emission with modulation on a fixed channel in the data rate that produced the highest power. Radio Power set at +5 dBm
Test mode 2	Permanent reception

[Documentation of UART Commands](#) **SOLO RENEWAL UART TESTER** 

COM PORT CONTROL

COM PORT: BAUD RATE: DATA BITS: STOP BITS: PARITY BITS:

☐ DTR ENABLE ☐ RTS ENABLE

COM PORT STATUS

OFF

TX Control

Radio Tests I/O Tests Pre-Pairing Setup FW & HW Setup

RADIO TESTS

0x0101: Send Radio Parameter Frame

0x0101: Send Radio Test Frame

0x0101: Send Radio Test Frame

Channel Number: 15 **2425 MHz**

Radio Power (dBm): 5

Radio Mode State: ☒ IDLE ☐ CARRIER ☐ MODULATED

0x0101: Send Radio Parameter Frame
Device ID, Channel, Radio Power

0x0104: Request Radio Parameter Frame

0x010C: Send Radio Test Frame
Channel, Radio Power, Mode State

DUT TX carrier only DUT TX modulated (PN9) DUT RX mode

TX:

RX Control

RX

HMI ZBRRRA or ZBRRRC

LED PWR LED 6 LED 5 LED 4 LED 3 LED 12

DUT RX CONTROLS

0x0108: Send Receive Mode ON Frame
Select RX Channel

0x0109: Request Receive Mode Results Frame

DUT RX RESULT

Number of Frames Received

0

Min RSSI (dBm) Max RSSI (dBm)

0 dBm 0 dBm

DUT Reply Result

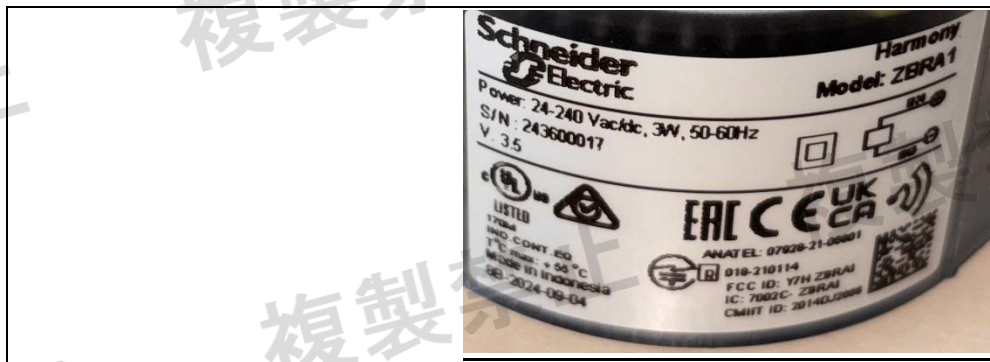
Request Result: NULL

RX:

V0.6 *Internal use only



2.3. EQUIPMENT LABELLING



2.4. EQUIPMENT MODIFICATION

☒ None ☐ Modification:

2.5. CALIBRATION DATE

The calibration intervals are extended at +4 months. This extended interval is based on the fact that there is sufficient calibration data to statistically establish a trend or based on experience of use of the test equipment to assure good measurement results for a longer period. The symbol +/- replaces the date for equipment checking before test or that have none impact on the test or that have no calibration required by the standard.

3. ANTENNA GAIN & ANTENNA PATTERN

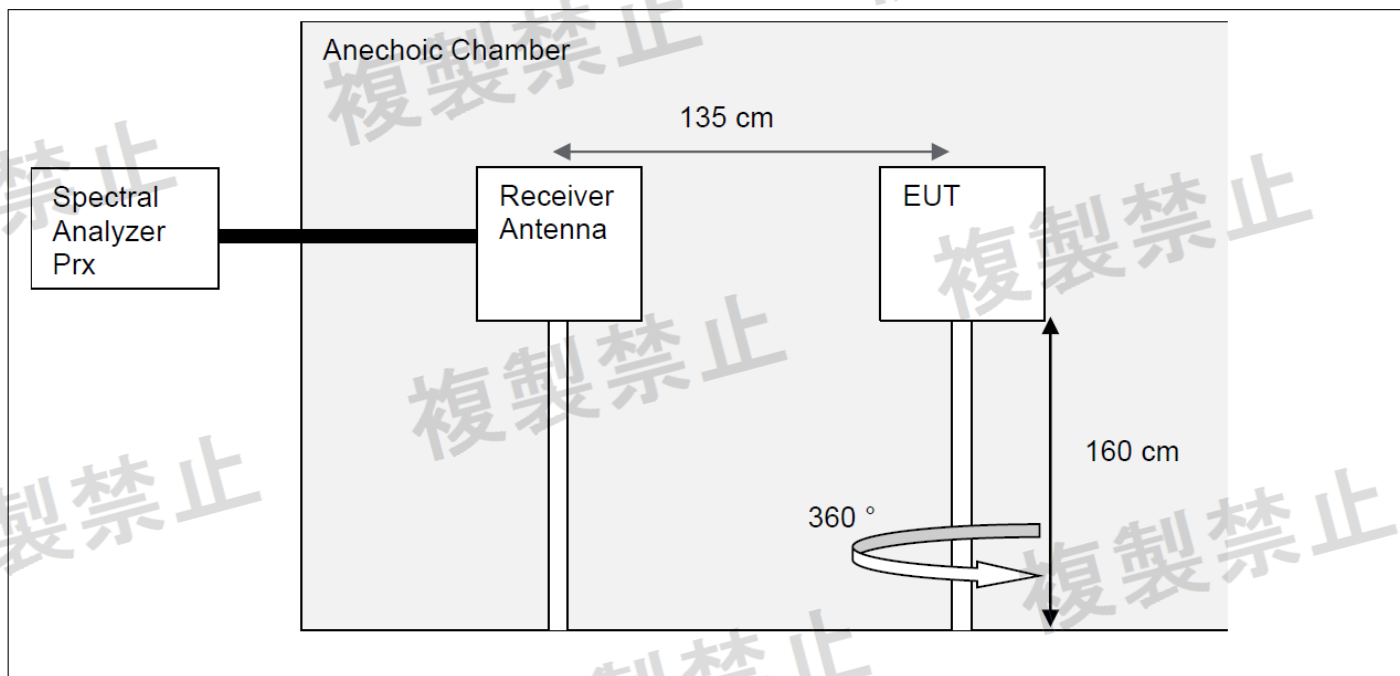
3.1. TEST CONDITIONS

Test performed by : Majid MOURZAGH
 Date of test : November 28, 2025
 Ambient temperature : 23 °C
 Relative humidity : 40 %

3.2. MANUFACTURER DECLARATION

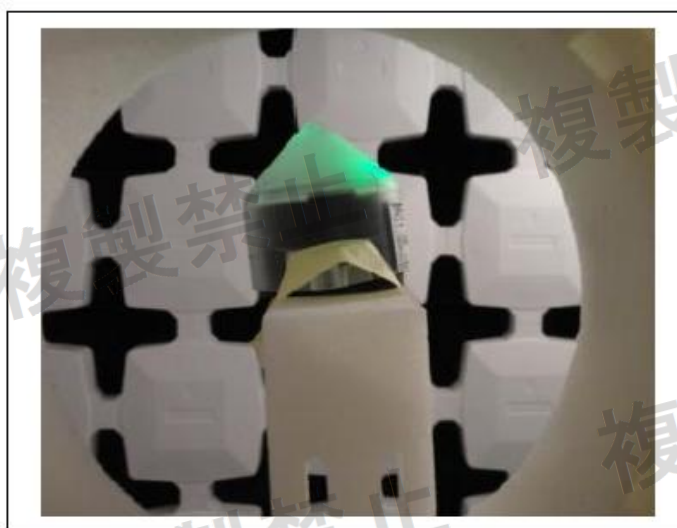
Below is the information obtained from test report INT_25-84-1_00. Provided by Schneider Electric.

- Using EUT transmitter at desired channel and mounted on a 360 ° turntable
 - Maturo
- Using a fixed antenna as receiver
- Distance between Antennas : 135 cm
- Height Antennas : 160 cm
- The Gain is measured in anechoic chamber
- Prx : Received RF power
- Ptx : Transmitted RF power



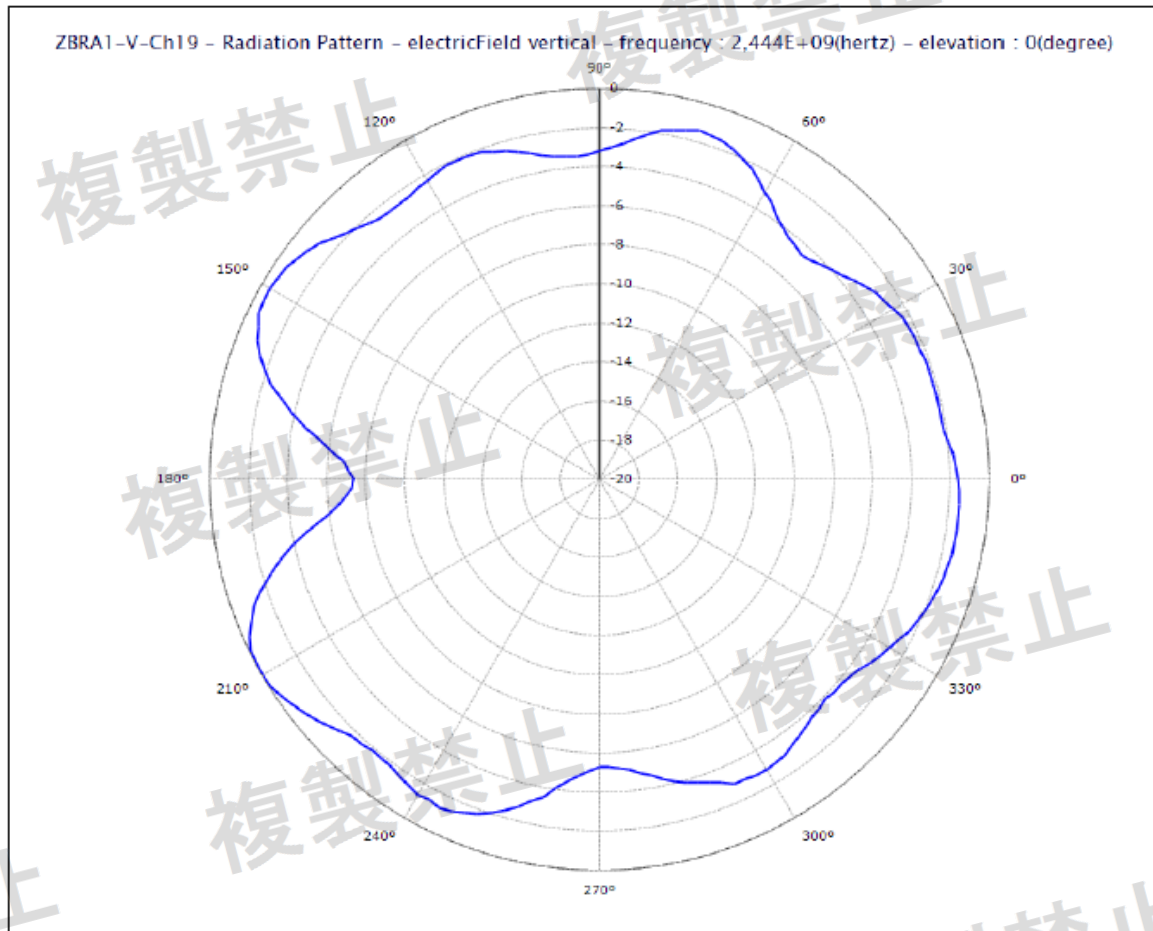


- Pattern radiation, Vertical polarisation



Measuring Radiation pattern and Antenna Gain of Zigbee channel

- Channel 19 : 2445 MHz (medium channel)



3.3. RESULTS

Antenna	2445 MHz	Specification	Sanction
Gain, dBi	2	> 0	Compliant
3dB angular, degree	134	> 120	Compliant



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4. ANTENNA POWER & TOLERANCE FOR ANTENNA POWER & EIRP

4.1. TEST CONDITIONS

Test performed by : Majid MOURZAGH
Date of test : November 17, 2025
Ambient temperature : 23 °C
Relative humidity : 39 %

4.2. TEST SETUP

- The Equipment under Test is installed:
☒ FAR ☐ On a table
- Measurement is performed with a spectrum analyzer
☒ On the EUT conducted access

The Antenna Power & Tolerance or Antenna Power are measured with a thermocouple power meter.
Mean power at the output of the transmitter (A) is deduced after correction due to RF cables loss between the EUT and the spectrum analyzer.

The Equivalent Isotropic Radiated Power (EIRP in dBm) is defined with the following formula:

$$\text{EIRP} = \text{Antenna Power} + G$$

Antenna Power (dBm): mean power at the output of the transmitter $+10 \cdot \log(1/x)$

G (dBi): Antenna gain

x: Duty cycle

Pre-scan Spectrum Analyzer Setting:

Center frequency= Test frequency
Span= Twice wider than the Occupied Bandwidth
Amplitude= Sufficient to observe the signal amplitude
RBW= 1MHz
VBW= 3MHz
Sweep= Auto
Sweep Point= 5000 points
Continue Sweep
Trace= Max Hold
Detector= Peak
Marker Search Peak

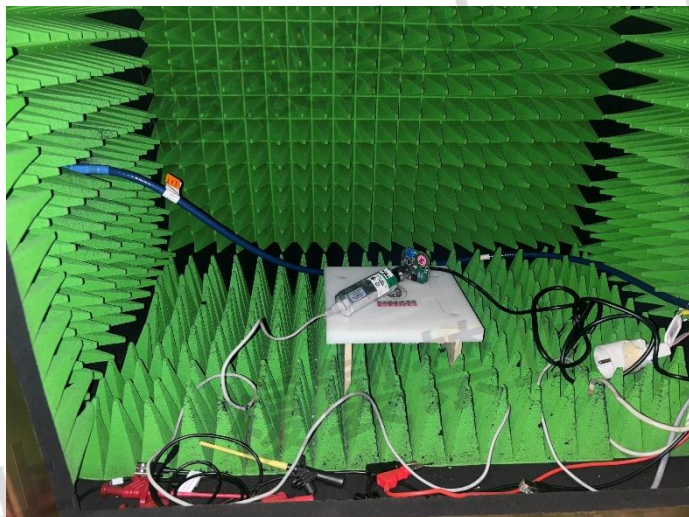
Final measurement

Spectrum Analyzer Setting:

Center frequency= Marker Search Peak during Pre-scan
Span= 0
Amplitude= Sufficient to observe the signal amplitude
RBW= 1MHz
VBW= 1MHz
Sweep= Auto
Sweep Point= 5000 points
Continuous Sweep
Trace= Clear/Write
Detector= Peak

Power Meter Setting:

Connect the Thermocouple power sensor to the IF spectrum analyzer output



Photograph for Antenna Power & Tolerance for Antenna Power

4.3. LIMIT

Antenna Power shall be 10mW or less

Tolerance for Antenna Power shall be inside +20% & -80% tolerance

EIRP shall be less 12.14dBm to 22.14dBm depending to Half Power Beam Width



4.4. TEST EQUIPMENT LIST

TEST EQUIPMENT USED							
Description	Manufacturer	Model	Identifier	Cal_Date	Cal_Due	Cal. Method	Cal. Agent name
RF Power sensor	DARE	RPR3006W	A1503032	11/25	11/26	c)	C
DC Power Supply	RS PRO	RS3005P	A7042314	(*)	(*)	N/A	N/A
Full Anechoic Room	SIEPEL	—	D3044024	(*)	(*)	N/A	N/A
Thermo-hygrometer	TESTO	608-H1	B4204120	05/25	05/26	d)	A
RADIMATION	RADIMATION	2023.2.4	L1000139	(*)	(*)	N/A	N/A
Multimeter	FLUKE	289	A1241119	05/25	05/26	d)	A

(*) : The missing dates are for equipment that was not calibrated because it was not used for measurement.

N/A: Not applicable

Calibration Agent:

A: LCIE Bureau Veritas, France

B: R&S, Germany

C: Kiwa Dare, The Netherlands

D: Element Metech AB, Sweden

Calibration Method :

a) : Calibration conducted by the National Institute of Information and Communications Technology (NICT) or a designated calibration agency under Article 102-18 paragraph.

b) : Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992) (Japan Calibration Service System).

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

d) Calibration conducted by using other equipment that listed above from a) to c)

4.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☒ None

☐ Divergence:

4.6. RESULTS

Voltage	Vmin		
Channel	Cmin	Cnom	Cmax
Antenna Power (dBm)	7	7	7
Antenna Power (mW)	5.012	5.012	5.012
Declared Antenna Power (mW)	5	5	5
Tolerance for Antenna Power (%)	0.24	0.24	0.24
EIRP (dBm)	9.00	9.00	9.00
Voltage	Vnom		
Channel	Cmin	Cnom	Cmax
Antenna Power (dBm)	6.9	6.9	6.9
Antenna Power (mW)	4.898	4.898	4.898
Declared Antenna Power (mW)	5	5	5
Tolerance for Antenna Power (%)	-2.04	-2.04	-2.04
EIRP (dBm)	8.90	8.90	8.90
Voltage	Vmax		
Channel	Cmin	Cnom	Cmax
Antenna Power (dBm)	6.8	6.8	6.8
Antenna Power (mW)	4.786	4.786	4.786
Declared Antenna Power (mW)	5	5	5
Tolerance for Antenna Power (%)	-4.27	-4.27	-4.27
EIRP (dBm)	8.80	8.80	8.80

4.7. CONCLUSION

Antenna Power, Tolerance for Antenna Power & EIRP measurement performed on the sample of the **ZBRA1-V2**, SN: **243600017**, in configuration and description presented in this test report, show levels **compliant** to the Japanese Radio Law for Article 2 paragraph 1 item 19 specified radio equipment category.

5. FREQUENCY TOLERANCE

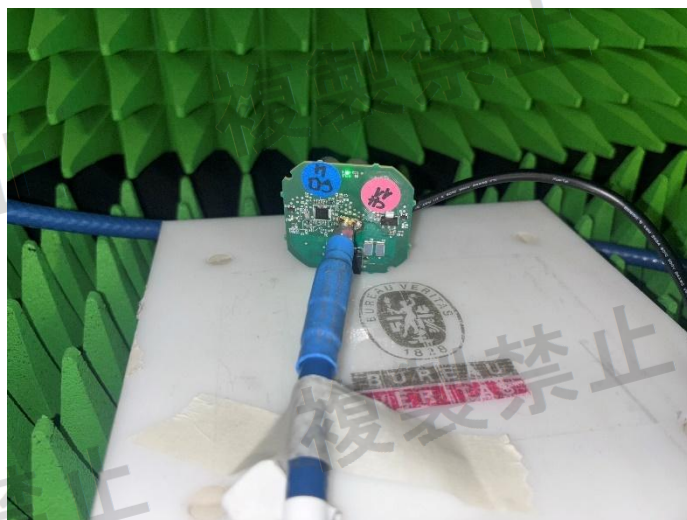
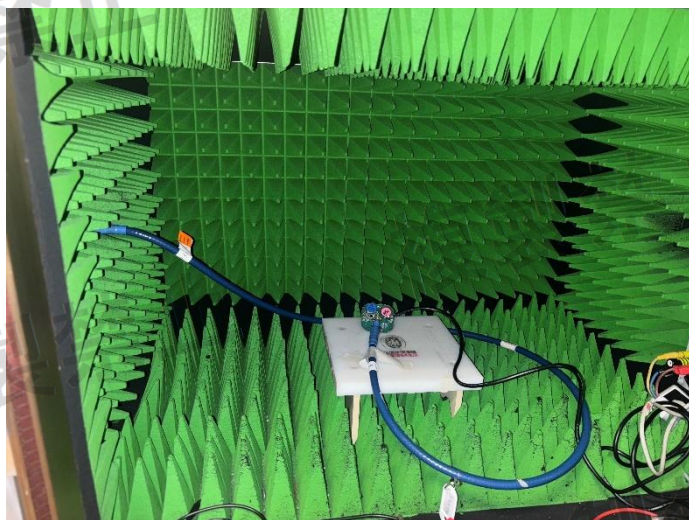
5.1. TEST CONDITIONS

Test performed by : Majid MOURZAGH
Date of test : November 24, 2025
Ambient temperature : 24 °C
Relative humidity : 33 %

5.2. TEST SETUP

- The Equipment under Test is installed:
☒ FAR ☐ On a table
- Measurement is performed with a spectrum analyzer
☒ On the EUT conducted access

Spectrum Analyzer Setting for Unmodulated Signal:
Center frequency= Test frequency
Span= 100kHz
Amplitude= Sufficient to observe the signal amplitude
RBW= 1kHz
VBW= 3kHz
Sweep= Auto
Trace= Max Hold
Detector= Peak
Counter function activated



Photograph for Frequency Tolerance

5.3. LIMIT

The Frequency Tolerance shall not exceed $\pm 50\text{ppm}$

5.4. TEST EQUIPMENT LIST

TEST EQUIPMENT USED							
Description	Manufacturer	Model	Identifier	Cal_Date	Cal_Due	Cal. Method	Cal. Agent name
Attenuator	Weinschel Associates	WA54-10-1314	A7122330	08/25	08/26	c)	D
DC Power Supply	RS PRO	RS3005P	A7042314	(*)	(*)	N/A	N/A
Multimeter	FLUKE	289	A1241119	05/25	05/26	d)	A
Full Anechoic Room	SIEPEL	—	D3044024	(*)	(*)	N/A	N/A
Spectrum analyzer	ROHDE & SCHWARZ	FSV 40	A4060059	04/25	04/26	c)	B
SMA 1.5m	SUCOFLEX	18GHz	A5329863	08/25	08/26	d)	A
SMA 1.5m	SUCOFLEX	18GHz	A5329864	01/25	01/26	d)	A
Thermo-hygrometer	TESTO	608-H1	B4204120	05/25	05/26	d)	A

(*) : The missing dates are for equipment that was not calibrated because it was not used for measurement.

N/A: Not applicable

Calibration Agent:

A: LCIE Bureau Veritas, France

B: R&S, Germany

C: Kiwa Dare, The Netherlands

D: Element Metech AB, Sweden

Calibration Method :

a) : Calibration conducted by the National Institute of Information and Communications Technology (NICT) or a designated calibration agency under Article 102-18 paragraph.

b) : Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992) (Japan Calibration Service System).

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

d) Calibration conducted by using other equipment that listed above from a) to c)

5.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

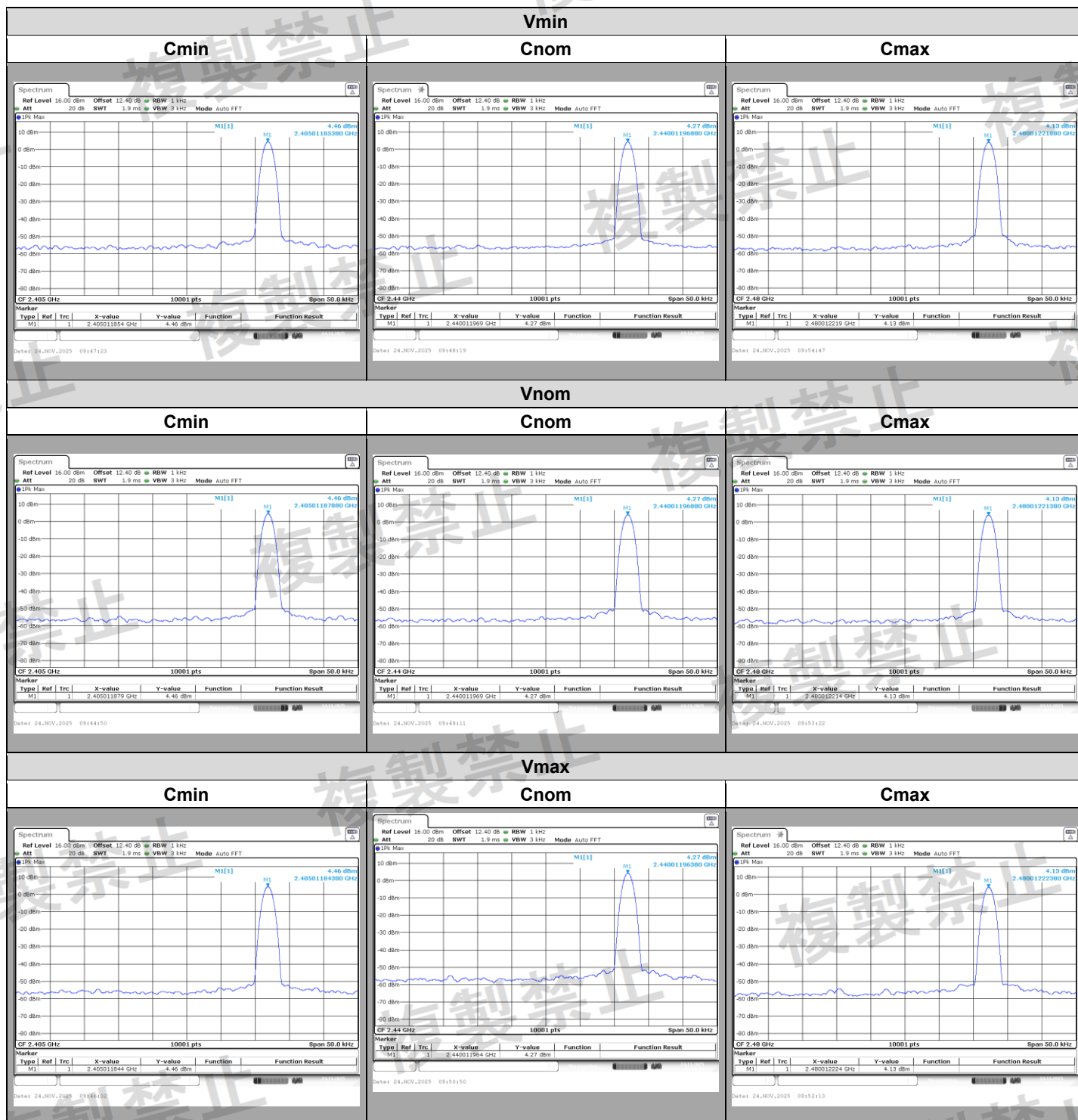
☒ None

☐ Divergence:



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5.6. RESULTS





Voltage	Vmin		
Channel	Cmin	Cnom	Cmax
Declared Frequency (MHz)	2405	2440	2480
Measured Frequency (MHz)	2405.011854	2440.011969	2480.012219
Frequency Tolerance (ppm)	4.9288	4.9053	4.9270
Limite Frequency Tolerance (ppm)	± 50	± 50	± 50
Voltage	Vnom		
Channel	Cmin	Cnom	Cmax
Declared Frequency (MHz)	2405	2440	2480
Measured Frequency (MHz)	2405.011879	2440.011969	2480.012214
Frequency Tolerance (ppm)	4.9392	4.9052	4.9250
Limite Frequency Tolerance (ppm)	± 50	± 50	± 50
Voltage	Vmax		
Channel	Cmin	Cnom	Cmax
Declared Frequency (MHz)	2405	2440	2480
Measured Frequency (MHz)	2405.011844	2440.011964	2480.012224
Frequency Tolerance (ppm)	4.9247	4.9032	4.9290
Limite Frequency Tolerance (ppm)	± 50	± 50	± 50

5.7. CONCLUSION

Frequency Tolerance measurement performed on the sample of the product **ZBRA1-V2**, SN: **243600017**, in configuration and description presented in this test report, show levels **compliant** to the Japanese Radio Law for Article 2 paragraph 1 item 19 specified radio equipment category.

6. OCCUPIED CHANNEL BANDWIDTH

6.1. TEST CONDITIONS

Test performed by : Majid MOURZAGH
Date of test : November 24, 2025
Ambient temperature : 24 °C
Relative humidity : 33 %

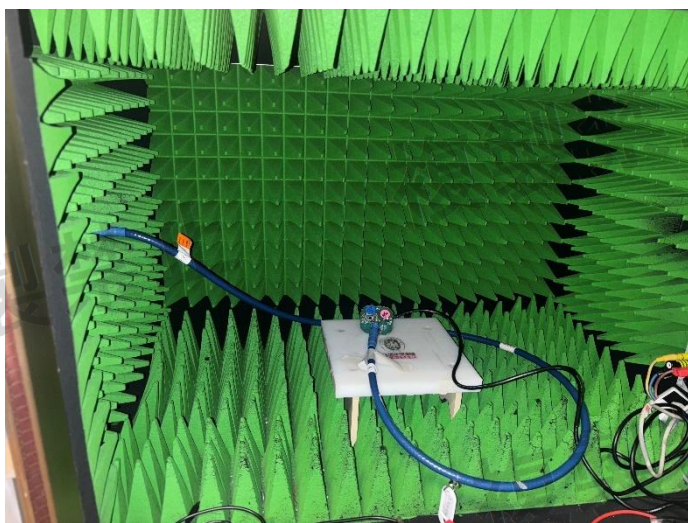
6.2. TEST SETUP

- The Equipment under Test is installed:
☒ FAR ☐ On table
- Measurement is performed with a spectrum analyzer
☒ On the EUT conducted access

The spectrum analyzer occupied bandwidth function is used to find the occupied channel bandwidth.

Set the spectrum analyzer as follows:

Center frequency: Test frequency
Frequency sweep width : About 2~3.5 times the Nominal bandwidth
RBW= 300kHz
VBW= 300kHz
Sweep= Auto
Trace= Max Hold
Detector= Peak
Occupied Bandwidth 99% activated
Spread bandwidth 90% activated



Photograph Occupied Channel Bandwidth

6.3. LIMIT

The Occupied Bandwidth shall be 26MHz or less

6.4. TEST EQUIPMENT LIST

TEST EQUIPMENT USED							
Description	Manufacturer	Model	Identifier	Cal_Date	Cal_Due	Cal. Method	Cal. Agent name
Attenuator	Weinschel Associates	WA54-10-1314	A7122330	08/25	08/26	c)	D
DC Power Supply	RS PRO	RS3005P	A7042314	(*)	(*)	N/A	N/A
Multimeter	FLUKE	289	A1241119	05/25	05/26	d)	A
Full Anechoic Room	SIEPEL	—	D3044024	(*)	(*)	N/A	N/A
Spectrum analyzer	ROHDE & SCHWARZ	FSV 40	A4060059	04/25	04/26	c)	B
SMA 1.5m	SUCOFLEX	18GHz	A5329863	08/25	08/26	d)	A
SMA 1.5m	SUCOFLEX	18GHz	A5329864	01/25	01/26	d)	A
Thermo-hygrometer	TESTO	608-H1	B4204120	05/25	05/26	d)	A

(*) : The missing dates are for equipment that was not calibrated because it was not used for measurement.

N/A: Not applicable

Calibration Agent:

A: LCIE Bureau Veritas, France

B: R&S, Germany

C: Kiwa Dare, The Netherlands

D: Element Metech AB, Sweden

Calibration Method :

a) : Calibration conducted by the National Institute of Information and Communications Technology (NICT) or a designated calibration agency under Article 102-18 paragraph.

b) : Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992) (Japan Calibration Service System).

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

d) Calibration conducted by using other equipment that listed above from a) to c)

6.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☒ None

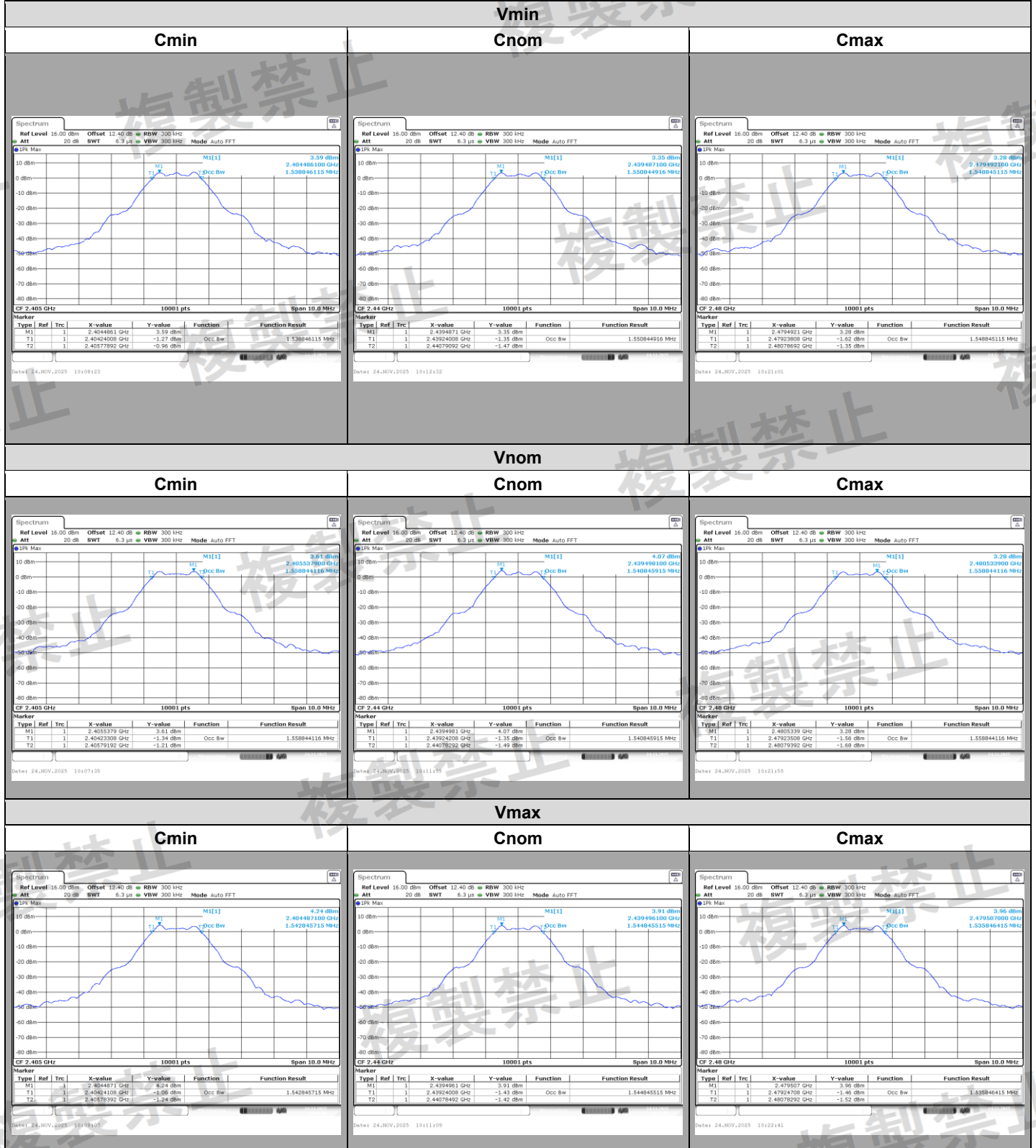
☐ Divergence:





L C I E

Spread bandwidth





Voltage	Vmin		
Channel	Cmin	Cnom	Cmax
Occupied Bandwidth (MHz)	2.295	2.302	2.311
Spread Bandwidth (MHz)	1.539	1.551	1.549
Limit (MHz)	≤ 26MHz	≤ 26MHz	≤ 26MHz
Voltage	Vnom		
Channel	Cmin	Cnom	Cmax
Occupied Bandwidth (MHz)	2.301	2.317	2.314
Spread Bandwidth (MHz)	1.559	1.541	1.559
Limit (MHz)	≤ 26MHz	≤ 26MHz	≤ 26MHz
Voltage	Vmax		
Channel	Cmin	Cnom	Cmax
Occupied Bandwidth (MHz)	2.296	2.309	2.323
Spread Bandwidth (MHz)	1.657	1.570	1.642
Limit (MHz)	≤ 26MHz	≤ 26MHz	≤ 26MHz

6.7. CONCLUSION

Occupied Channel Bandwidth measurement performed on the sample of the product. **ZBRA1-V2**, SN: **243600017**, in configuration and description presented in this test report, show levels **compliant** to the Japanese Radio Law for Article 2 paragraph 1 item 19 specified radio equipment category.

7. SPURIOUS EMISSION INTENSITY

7.1. TEST CONDITIONS

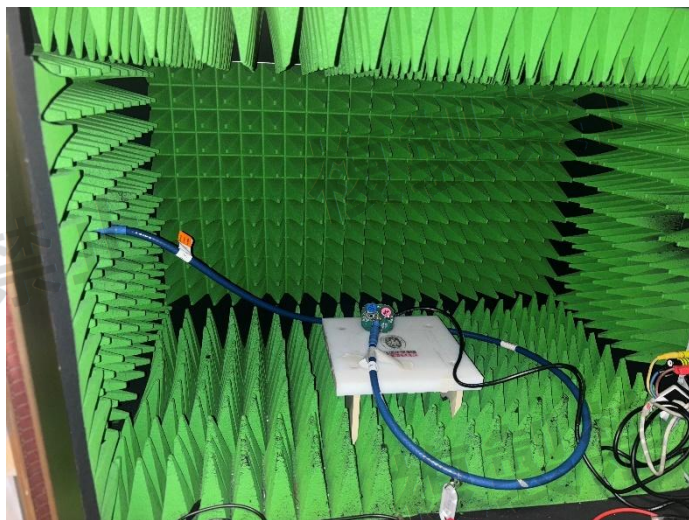
Test performed by : Majid MOURZAGH
Date of test : November 19, 2025
Ambient temperature : 23 °C
Relative humidity : 37 %

7.2. TEST SETUP

Qualification of conducted measurements (30MHz to 12.75GHz):

The power level shall be recorded as the conducted spurious emission level.

The transmitter shall be connected to a 50 Ω power attenuator. The output of the power attenuator shall be connected to a measuring receiver



Photograph for Spurious Emission Intensity



7.3. LIMIT

Spurious Emission Intensity	
Frequencies	Limit
30MHz to 2387MHz	2.5μW (-26dBm)
2387MHz to 2400MHz	25μW (-16dBm)
2483.5MHz to 2496.5MHz	25μW (-16dBm)
2496.5MHz to 12500MHz	2.5μW (-26dBm)

7.4. TEST EQUIPMENT LIST

TEST EQUIPMENT USED							
Description	Manufacturer	Model	Identifier	Cal_Date	Cal_Due	Cal. Method	Cal. Agent name
Attenuator	Weinschel Associates	WA54-10-1314	A7122330	08/25	08/26	c)	D
DC Power Supply	RS PRO	RS3005P	A7042314	(*)	(*)	N/A	N/A
Multimeter	FLUKE	289	A1241119	05/25	05/26	d)	A
Full Anechoic Room	SIEPEL	—	D3044024	(*)	(*)	N/A	N/A
Spectrum analyzer	ROHDE & SCHWARZ	FSV 40	A4060059	04/25	04/26	c)	B
SMA 1.5m	SUCOFLEX	18GHz	A5329863	08/25	08/26	d)	A
SMA 1.5m	SUCOFLEX	18GHz	A5329864	01/25	01/26	d)	A
Thermo-hygrometer	TESTO	608-H1	B4204120	05/25	05/26	d)	A

(*) : The missing dates are for equipment that was not calibrated because it was not used for measurement.

N/A: Not applicable

Calibration Agent:

A: LCIE Bureau Veritas, France

B: R&S, Germany

C: Kiwa Dare, The Netherlands

D: Element Metech AB, Sweden

Calibration Method :

a) : Calibration conducted by the National Institute of Information and Communications Technology (NICT) or a designated calibration agency under Article 102-18 paragraph.

b) : Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992) (Japan Calibration Service System).

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

d) Calibration conducted by using other equipment that listed above from a) to c)

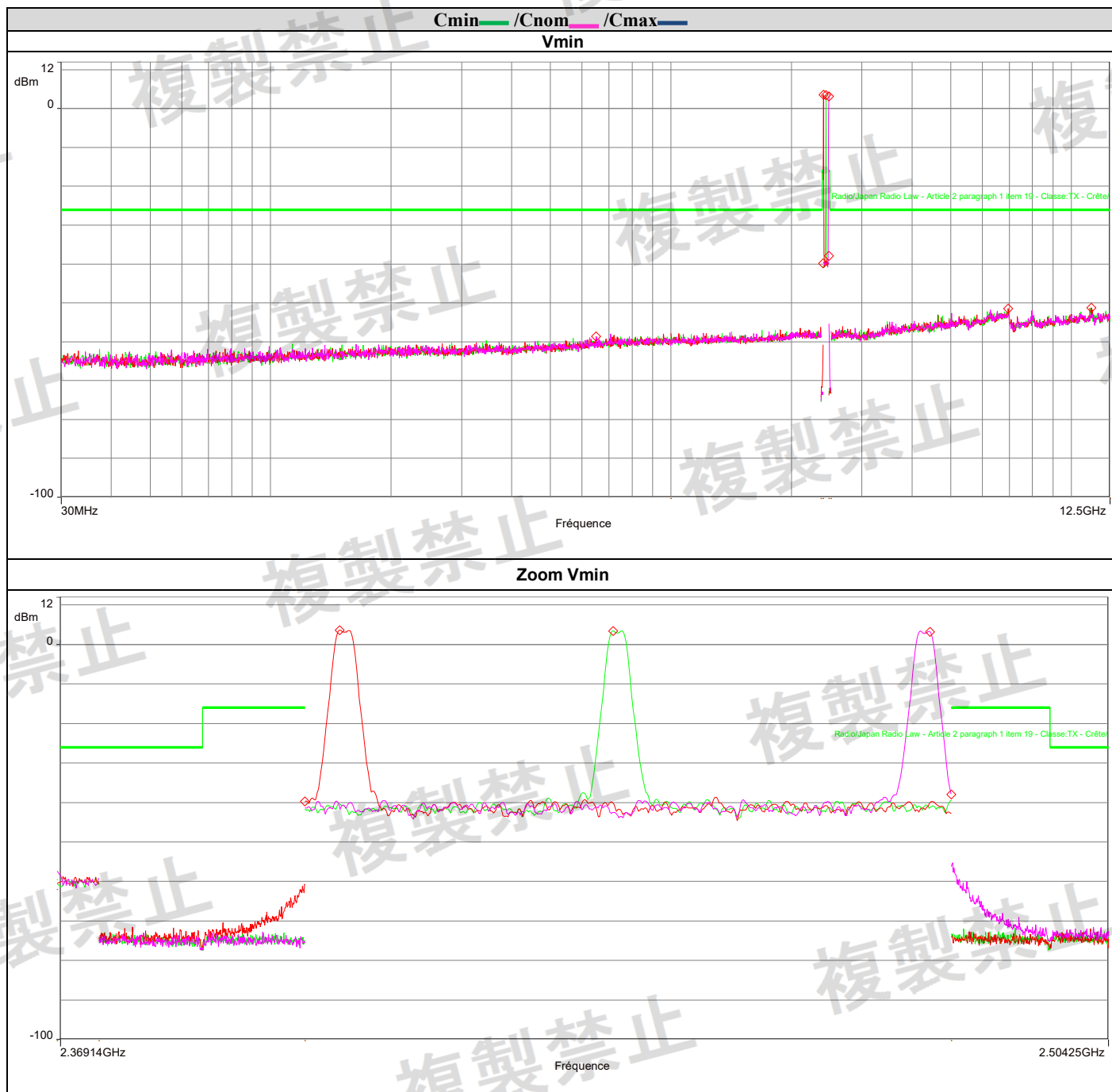
7.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☐ None ☐ Divergence:



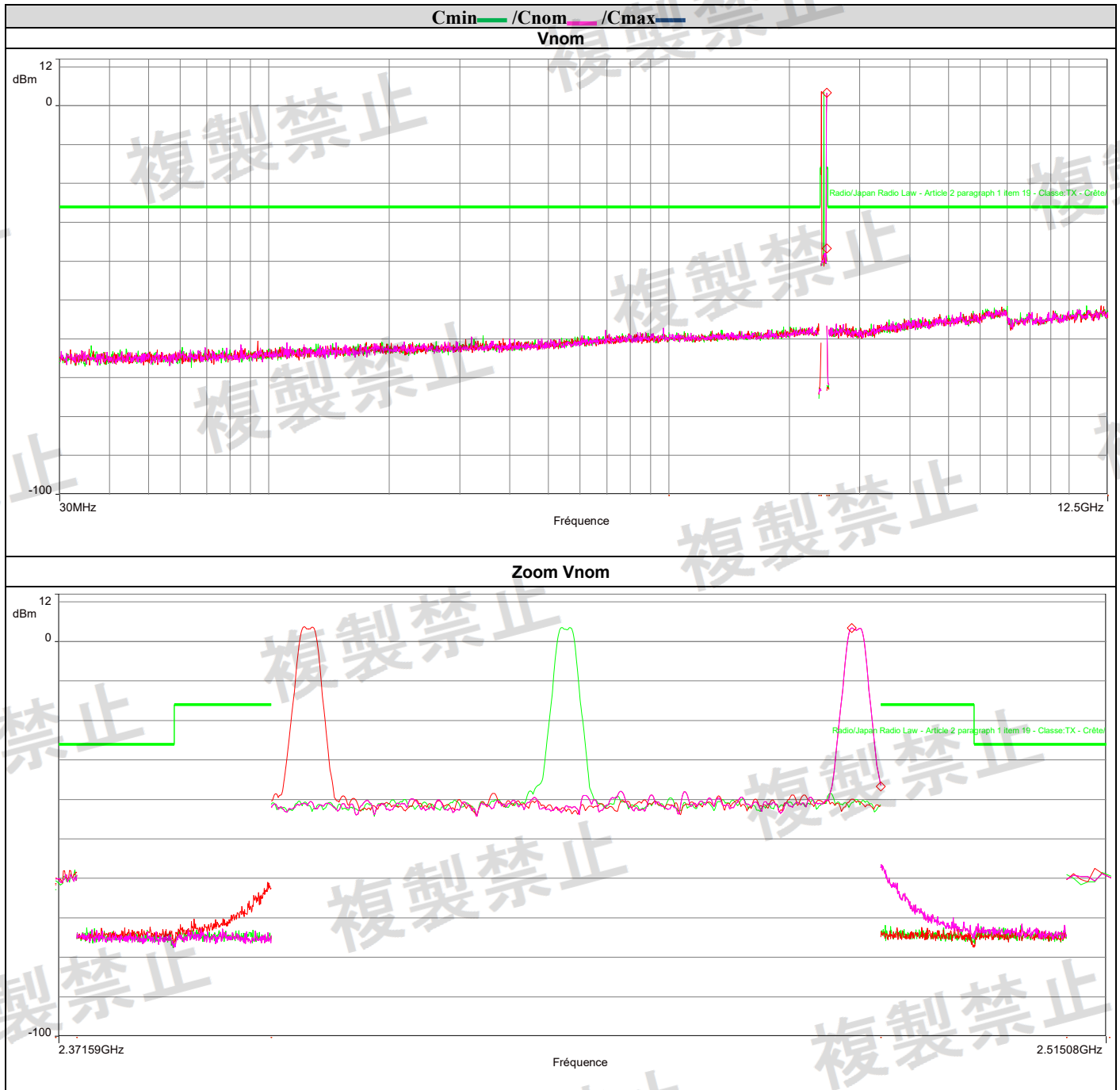
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7.6. RESULTS



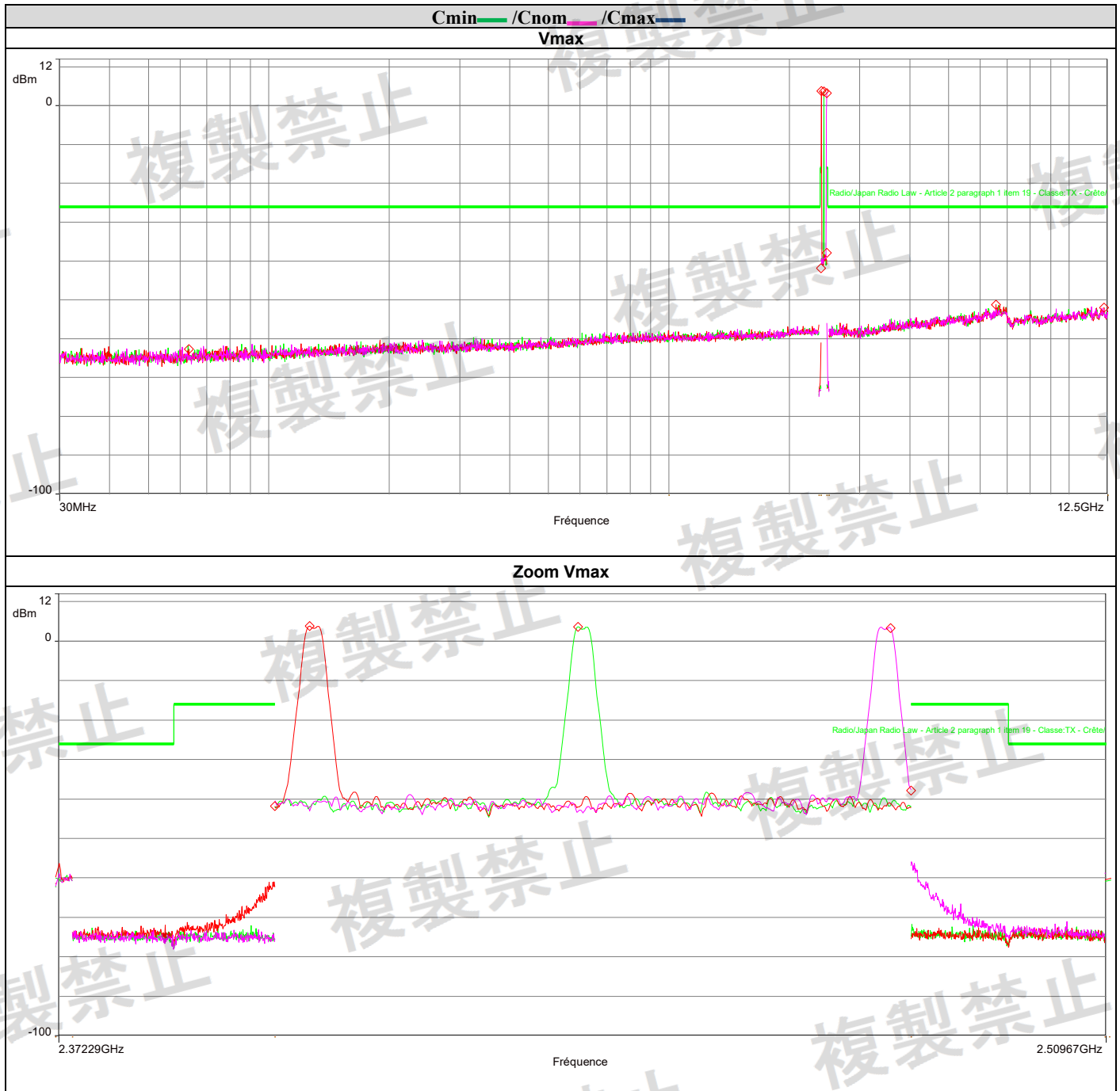


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Vmin				
Frequency (MHz)	Level (dBm)	Level (μW)	Limit (μW/MHz)	Level (μW)- Limit (μW/MHz)
650.315	-58.59	0.001	2.50	-2.50
2400.000	-39.78	0.105	25	-24.89
2402.426	3.61	2296.149		
2440.462	3.43	2202.926		
2480.711	3.17	2074.914		
2483.500	-37.05	0.197		
6956.272	-51.43	0.007	2.50	-24.99
11228.209	-51.26	0.007	2.50	-24.99

Vnom				
Frequency (MHz)	Level (dBm)	Level (μW)	Limit (μW/MHz)	Level (μW)- Limit (μW/MHz)
93.826	-60.58	0.001	2.50	-2.50
2400.000	-40.34	0.092	2.50	-2.41
2.404	3.66	2322.737		
2439.512	3.47	2223.822		
2479.425	3.40	2187.762		
2483.500	-36.78	0.210		
6786.433	-51.85	0.007	25.00	-24.99
12029.447	-51.26	0.007	25.00	-24.99

Vmax				
Frequency (MHz)	Level (dBm)	Level (μW)	Limit (μW/MHz)	Level (μW)- Limit (μW/MHz)
63.077	-62.74	0.001	2.50	-2.50
2400.000	-41.84	0.065	2.50	-2.43
2.405	3.78	2387.811		
2439.446	3.62	2301.442		
2480.736	3.25	2113.489		
2483.500	-37.92	0.161		
6565.643	-51.25	0.007	25.00	-24.99
12244.243	-51.66	0.007	25.00	-24.99

7.7. CONCLUSION

Spurious Emission Intensity measurement performed on the sample of the product. **ZBRA1-V2**, SN: **243600017**, in configuration and description presented in this test report, show levels **compliant** to the Japanese Radio Law for Article 2 paragraph 1 item 19 specified radio equipment category.

8. LIMIT ON SECONDARY RADIATED EMISSIONS

8.1. TEST CONDITIONS

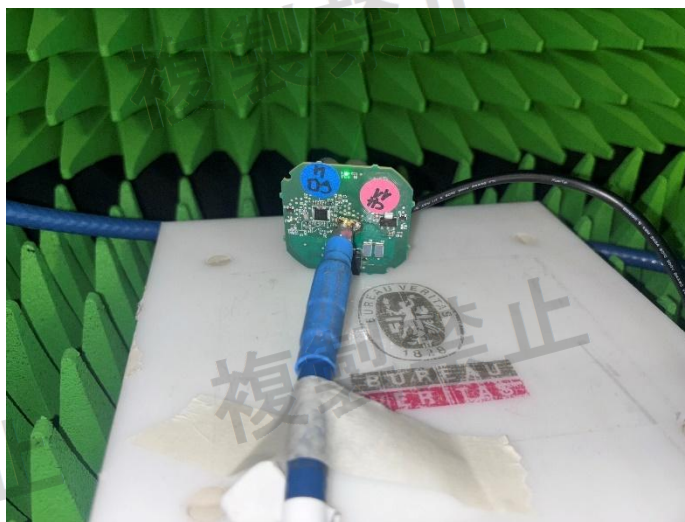
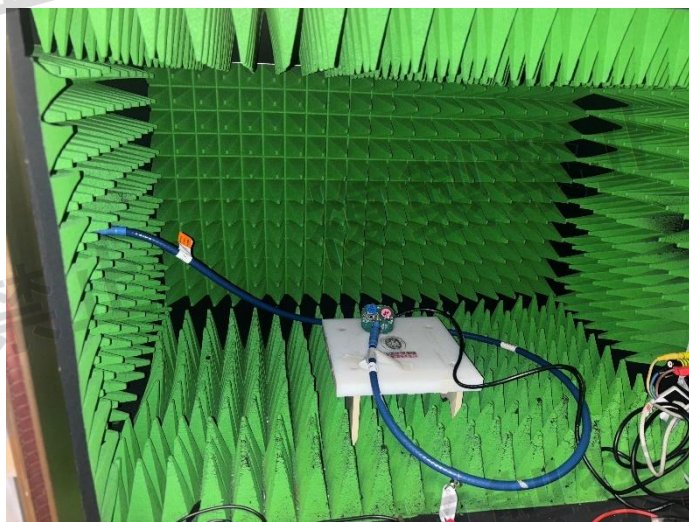
Test performed by : Majid MOURZAGH
Date of test : November 19, 2025
Ambient temperature : 23 °C
Relative humidity : 37 %

8.2. TEST SETUP

Qualification of conducted measurements (30MHz to 12.75GHz):

The power level shall be recorded as the conducted spurious emission level.

The transmitter shall be connected to a 50 Ω power attenuator. The output of the power attenuator shall be connected to a measuring receiver.



Photograph for Limit On Secondary Radiated Emissions

8.3. LIMIT

Limit On Secondary Radiated Emissions	
Frequencies	Limit
30MHz to 1GHz	4nW/100kHz
1GHz to 12.75GHz	20nW/MHz

8.4. TEST EQUIPMENT LIST

TEST EQUIPMENT USED							
Description	Manufacturer	Model	Identifier	Cal_Date	Cal_Due	Cal. Method	Cal. Agent name
Attenuator	Weinschel Associates	WA54-10-1314	A7122330	08/25	08/26	c)	D
DC Power Supply	RS PRO	RS3005P	A7042314	(*)	(*)	N/A	N/A
Multimeter	FLUKE	289	A1241119	05/25	05/26	d)	A
Full Anechoic Room	SIEPEL	—	D3044024	(*)	(*)	N/A	N/A
Spectrum analyzer	ROHDE & SCHWARZ	FSV 40	A4060059	04/25	04/26	c)	B
SMA 1.5m	SUCOFLEX	18GHz	A5329863	08/25	08/26	d)	A
SMA 1.5m	SUCOFLEX	18GHz	A5329864	01/25	01/26	d)	A
Thermo-hygrometer	TESTO	608-H1	B4204120	05/25	05/26	d)	A

(*) : The missing dates are for equipment that was not calibrated because it was not used for measurement.

N/A: Not applicable

Calibration Agent:

A: LCIE Bureau Veritas, France

B: R&S, Germany

C: Kiwa Dare, The Netherlands

D: Element Metech AB, Sweden

Calibration Method :

a) : Calibration conducted by the National Institute of Information and Communications Technology (NICT) or a designated calibration agency under Article 102-18 paragraph.

b) : Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992) (Japan Calibration Service System).

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

d) Calibration conducted by using other equipment that listed above from a) to c)

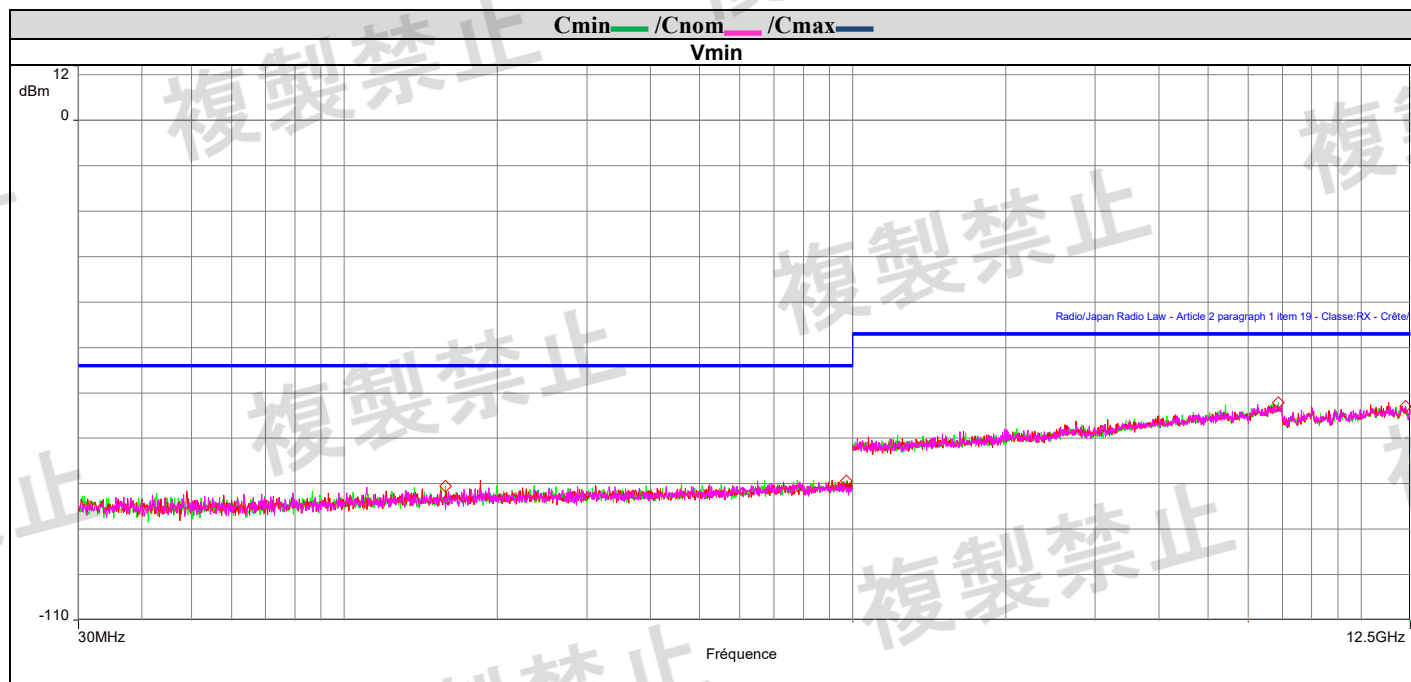
8.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☒ None

☐ Divergence:



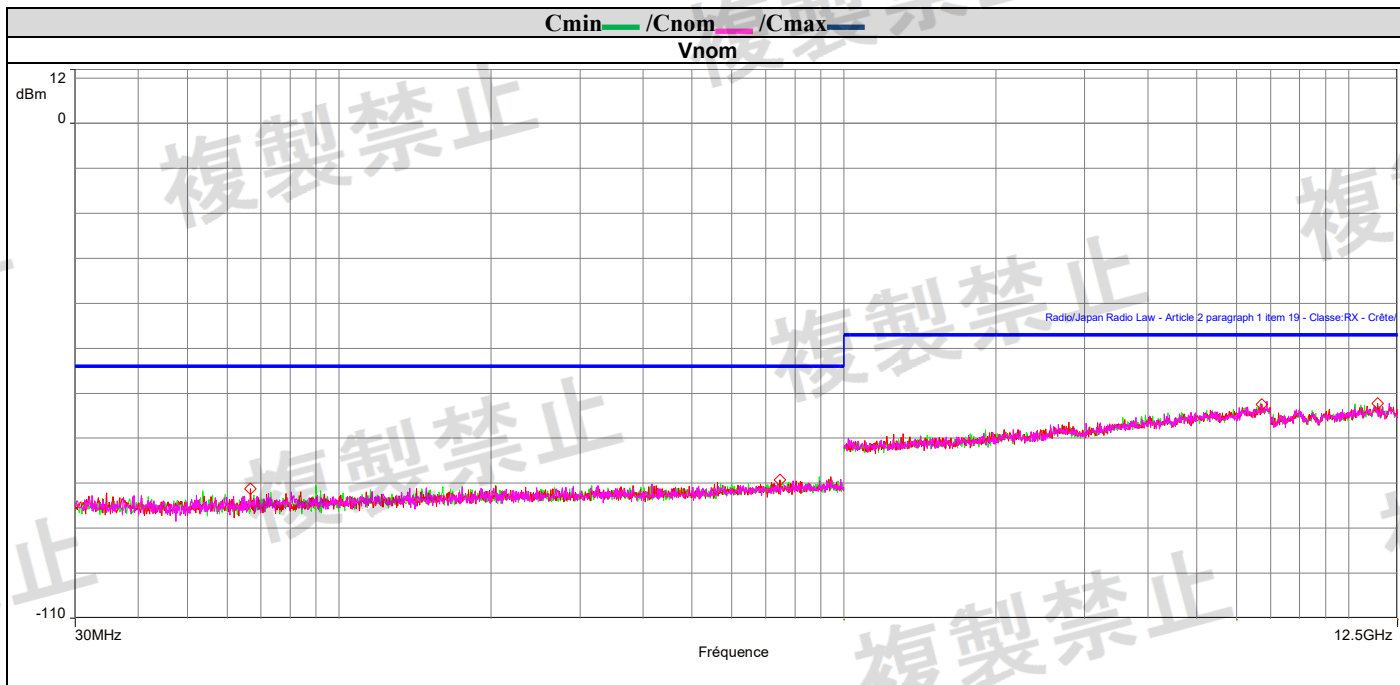
8.6. RESULTS



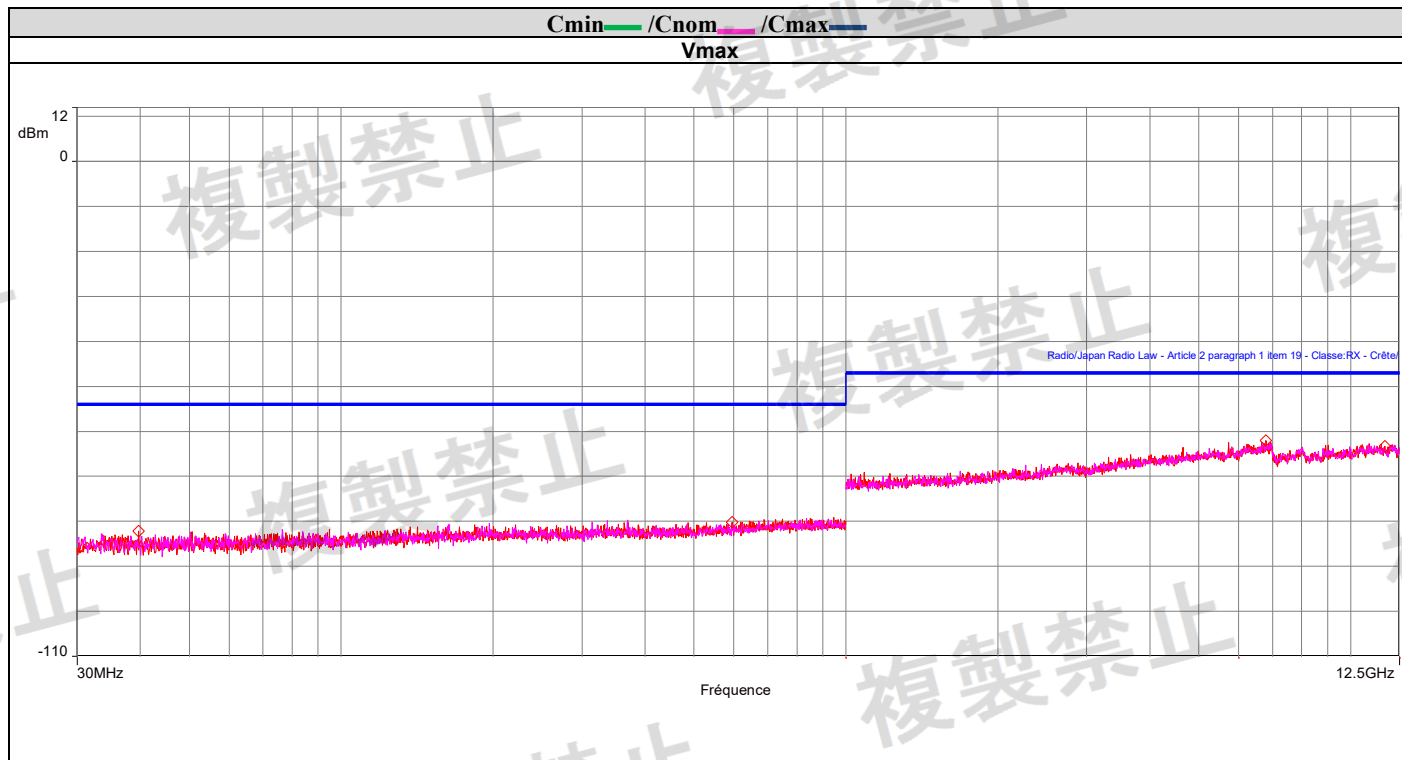
Vmin				
Frequency (MHz)	Level (dBm)	Level (nW)	Limit (nW)	Level (nW)- Limit (nW)
158.137	-80.58	0.009	4.00	-3.99
972.840	-79.38	0.012	4.00	-3.99
6876.200	-62.16	0.608	20.00	-19.39
12230.250	-62.96	0.506	20.00	-19.49



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Vnom				
Frequency (MHz)	Level (dBm)	Level (nW)	Limit (nW)	Level (nW)- Limit (nW)
66.763	-81.25	0.007	4.00	-3.99
746.733	-79.20	0.012	4.00	-3.99
6732.550	-62.53	0.558	20.00	-19.44
11401.500	-62.26	0.594	20.00	-19.41



Vmax				
Frequency (MHz)	Level (dBm)	Level (nW)	Limit (nW)	Level (nW)- Limit (nW)
39.700	-82.17	0.006	4.00	-3.99
595.704	-80.20	0.010	4.00	-3.99
6787.150	-61.99	0.632	20.00	-19.37
11677.750	-63.32	0.466	20.00	-19.53

8.7. CONCLUSION

Limit On Secondary Radiated Emissions measurement performed on the sample of the product **ZBRA1-V2**, SN: **243600017**, in configuration and description presented in this test report, show levels **compliant** to the Japanese Radio Law for Article 2 paragraph 1 item 19 specified radio equipment category.

9. RADIO INTERFERENCE PREVENTION CAPABILITY MEASUREMENT

9.1. TEST CONDITIONS

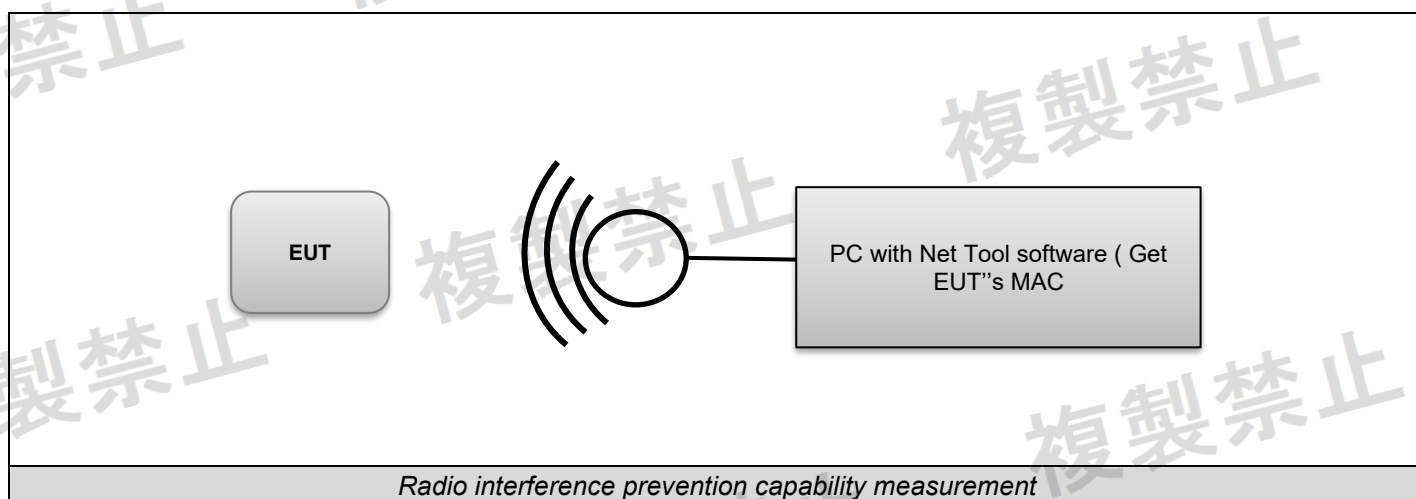
Test performed by : Majid MOURZAGH
Date of test : November 19, 2025
Ambient temperature : 23 °C
Relative humidity : 37 %

9.2. TEST SETUP

The Equipment Under Test is installed on a table.
Measurement is performed with a test fixture and **EUT was programmed to be in normal mode.**

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

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





9.3. LIMIT

Identification code shall $\geq$ 48 bits.

9.4. TEST EQUIPMENT LIST

TEST EQUIPMENT USED			
Description	Manufacturer	Model	Software used
Laptop	Lenovo	L490	Simplicity Commander Commande

9.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

9.6. RESULTS

Configuration: Normal mode

Device Utility Commands

Device Information Command

Shows detailed information about the target device.

Command Line Syntax

```
$ commander device info
```

Command Line Usage Output

```
Part Number   : EFR32MG1P233F256GM48
Die Revision  : A0
Production Ver : 0
Flash Size    : 256 kB
SRAM Size     : 32 kB
Unique ID     : 000b57000003b2f0
DONE
```

9.7. CONCLUSION

Radio interference prevention capability measurement performed on the sample of the product **ZBRA1-V2**, SN: **243600017**, in configuration and description presented in this test report, show levels **compliant** to the **Japanese Radio Law for Article 2 paragraph 1 item 19** limits.

10. CONSTRUCTION PROTECTION CONFIRMATION METHOD

10.1. TEST CONDITIONS

Test performed by : Majid MOURZAGH
 Date of test : November 19, 2025
 Ambient temperature : 23 °C
 Relative humidity : 37 %

10.2. TEST SETUP

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

No	Method
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.

10.3. LIMIT

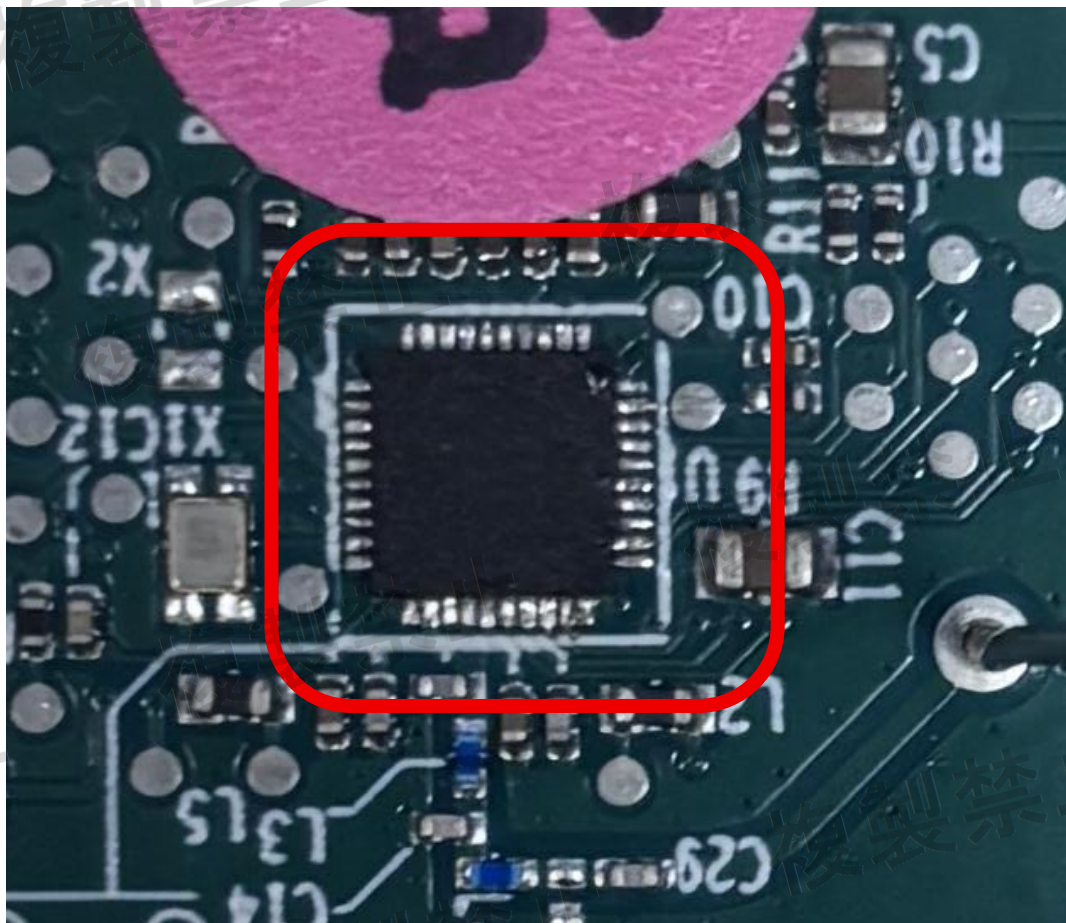
(See Article 49-20, Item 1-a of the Ordinance Regulating Radio Equipment)

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

10.4. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

10.5. RESULTS



Construction Protection Confirmation Method

No	Method	
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.	☒

10.6. CONCLUSION

Construction protection confirmation method t performed on the sample of the product **ZBRA1-V2**, SN: **243600017**, in configuration and description presented in this test report, show levels **compliant** to the **Japanese Radio Law for Article 2 paragraph 1 item 19** limits.



11. UNCERTAINTIES CHART

Kind of test	Wide uncertainty laboratory (k=2) $\pm x(\text{dB}) / (\text{Hz}) / \text{ms}$	Uncertainty limit
RF Output Power, Conducted	$\pm 0.6 \text{ dB}$	$\pm 1.5 \text{ dB}$
Power Spectral Density, Conducted	$\pm 0.6 \text{ dB}$	$\pm 3 \text{ dB}$
Unwanted Emissions, Conducted	$\pm 0.6 \text{ dB}$	$\pm 3 \text{ dB}$
All Emissions, Radiated below 1GHz	$\pm 3.9 \text{ dB}$	$\pm 6 \text{ dB}$
All Emissions, Radiated above 1GHz	$\pm 3.1 \text{ dB}$	$\pm 6 \text{ dB}$
Temperature	$\pm 0.5^\circ \text{C}$	$\pm 3^\circ \text{C}$

The uncertainty values calculated by the laboratory are lower than limit uncertainty values defined by the CISPR. The conformity of the sample is directly established by the applicable limits values. This table includes all uncertainties maximum feasible for testing in the laboratory, whether or not made in this report