



4, Songju-ro 236beon-gil, Yangji-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do,
17159, Korea

Tel: +82-31-323-6008 Fax: +82-31-323-6010

<http://www.ltalab.com>

JAPAN MIC Test Report

Dates of Tests: Sep 16 2025 ~ Dec 19, 2025

Test Site : LTA CO., LTD

Model No.

NCRB54N01VI

APPLICANT

Nucode Co., Ltd.

Manufacturing Description : Bluetooth Module
Manufacturer : Nucode Co., Ltd.
Model name : NCRB54N01VI
Variant Model name : NCRB54N01VC, NCRB54N01AC, NCRB54N01AI
NCRB54N01C, NCRB54N01H
Test Device Serial No.: : Identical prototype
Standard : Article 2, Paragraph 1, item 19
Frequency Range : 2402 MHz ~ 2480 MHz
Data of issue : Jan 13, 2026

This test report is issued under the authority of:

The test was supervised by:

Eun-Hwan Jung, Manager

In-Sun Lee, Test Engineer

This test result only responds to the tested sample. It is not allowed to copy this report even partly without the allowance of the test laboratory.

This test report is not related to KS Q ISO/IEC 17025 and KOLAS accreditation.

Revision history

Revision	Date of issue	Description	Revised by
--	Jan 13 ,2026	Initial	-

TABLE OF CONTENTS

1.	Applicant Information-----	4
2.	Summary of test results-----	5
3.	Frequency tolerance-----	6
4.	Occupied bandwidth (99%) & Spread Bandwidth (90%)-----	8
5.	Antenna power-----	11
6.	Unwanted emission strength-----	12
7.	RX spurious emission-----	17
8.	Interference prevention function-----	19
9.	CONSTRUCTION PROTECTION CONFIRMATION METHOD-----	20
	Test Photo -----	22
	APPENDIX -----	23
	APPENDIX TEST EQUIPMENT USED FOR TESTS-----	23

1. Applicant Information**1.1. Details of applicant**

Applicant : Nucode Co., Ltd.
 Address : 704ho Gasan Digital 1ro Geumcheon-Gu, Seoul, South Korea
 Contact Person : Kwanhyeong Lee
 TEL / FAX : +82-10-5061-5233 / +82-2-6442-5233

1.2. Manufacturer Information

Manufacturer : Nucode Co., Ltd.
 Address : 704ho Gasan Digital 1ro Geumcheon-Gu, Seoul, South Korea
 TEL / FAX : +82-10-5061-5233 / +82-2-6442-5233

1.3. EUT Description

Kind of product	Bluetooth Module
Model name	NCRB54N01VI
Serial Number	N/A
Power supply	DC 3.3 V
Frequency range	2 402 MHz ~ 2 480 MHz (BLE)
RF output power	0.003 6 W
Modulation technique	GFSK
Number of channels	40 ch.
Antenna gain	PCB Pattern Ant Max Gain : 5.0 dBi

Test Conditions	Voltage(V)
Normal Voltage	VNOR 3.30
Low Voltage	VNOR 2.97
High Voltage	VNOR 3.63

2. Summary of Test results

The EUT has been tested according to the following specifications

Section in Radio equipment regulations	Description of Test	Results
RE 5 Table No. 1	Frequency Tolerance	C
RE 6 Table No. 2	Occupied Bandwidth (99%) & Spread Bandwidth (90%)	C
RE 14, RE 49.20	Antenna power	C
RE 7	Unwanted emission strength	C
RE 24	RX spurious emission	C
RLE 6-2, RE 9-4	Interference Prevention Function	C

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Standard: Article 2, Paragraph 1, item 19.

MIC Notice Number 88, Annex 43

3 Frequency tolerance

3.1 Test setup



3.2 Limit

$\pm 50 \times 10^{-6}$ (50 ppm or below)

3.3 Test procedure

The transmitter output is connected to the Spectrum analyzer	
Setting the spectrum analyzer is as follows.	
Center frequency	Operating frequency
Resolution BW	10 kHz
Video BW	10 kHz
Span	1 MHz
Sweep time	Auto
Detector mode	Positive peak
Trace mode	Max. hold

3.4 Test results

Ambient temperature: 24℃ Relative humidity: 49% R.H

Test mode : BLE

Test voltage	Test Frequency	Measured value (MHz)	Tolerance (ppm)	Result	Limit
Normal Voltage	Low frequency	2402.020	8.41	Pass	± 50 ppm
	Middle frequency	2440.021	8.47	Pass	
	High frequency	2480.008	3.17	Pass	
Low Voltage	Low frequency	2402.006	2.50	Pass	
	Middle frequency	2440.006	2.46	Pass	
	High frequency	2480.004	1.61	Pass	
High Voltage	Low frequency	2402.012	4.95	Pass	
	Middle frequency	2440.015	6.26	Pass	
	High frequency	2480.013	5.37	Pass	

*** Remark**

$$FT \text{ (ppm)} = [(Measured \text{ value (MHz)} - Operating \text{ frequency (MHz)}) / Operating \text{ frequency (MHz)}] \times 10^6$$

4. Occupied bandwidth (99%) & Spread Bandwidth (90%)

4.1 Test setup



4.2 Limit

Occupied Bandwidth (99%):	26 MHz or less
Spread Bandwidth (90%)	500 kHz more

4.3 Test procedure

The transmitter output is connected to the Spectrum analyzer	
Setting the spectrum analyzer is as follows.	
Center frequency	Operating frequency
Resolution BW	300 KHz
Video BW	300 KHz
Span	5 MHz
Sweep time	Auto
Detector mode	Positive peak
Trace mode	Max. hold

4.4 Test results

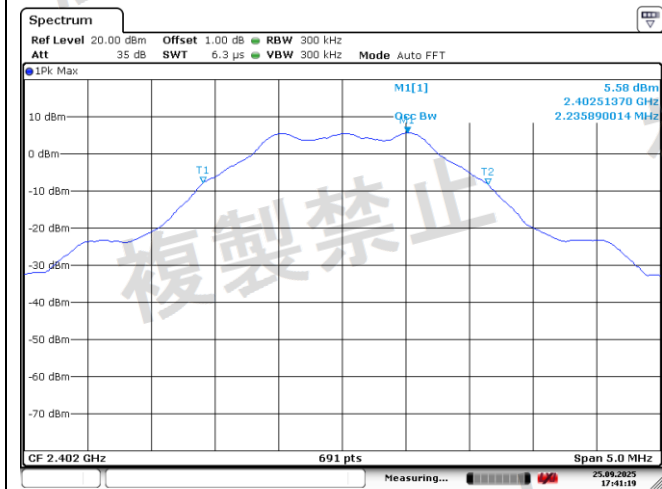
Ambient temperature: 24 °C Relative humidity: 49% R.H.

Test mode : BLE

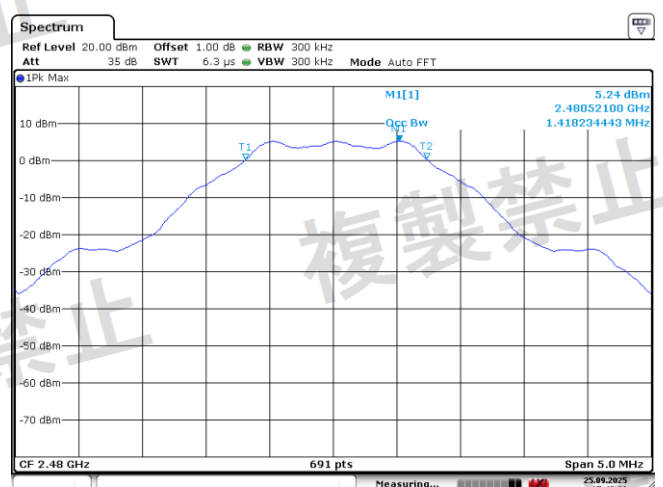
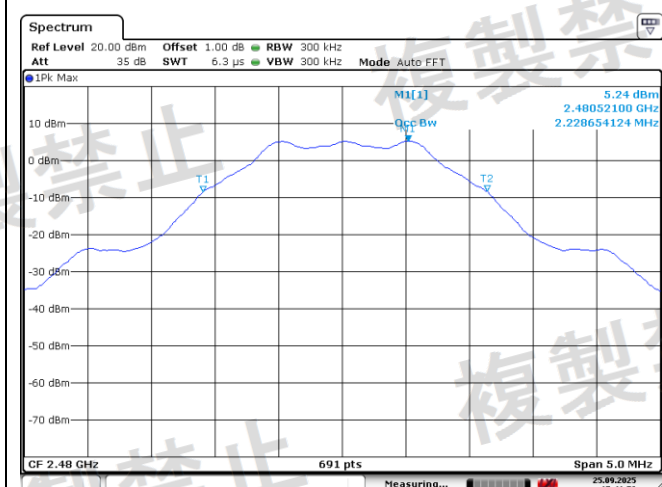
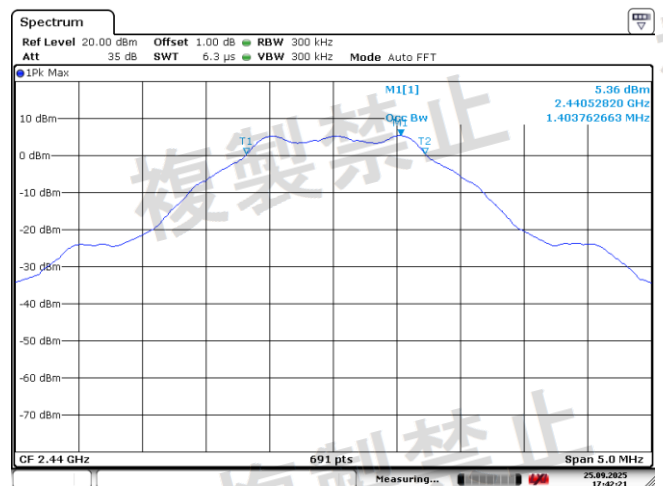
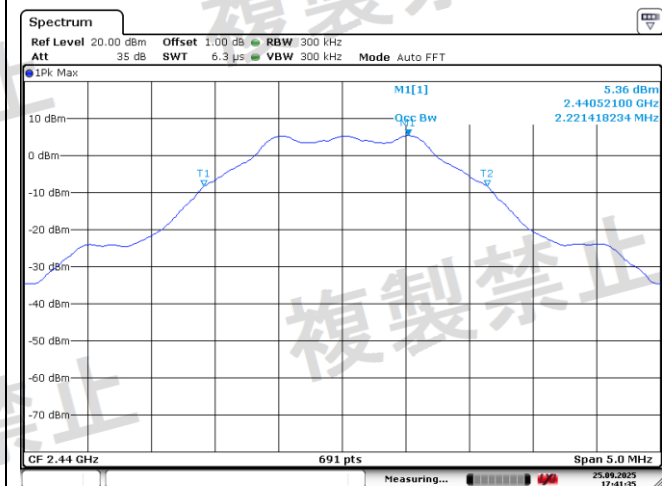
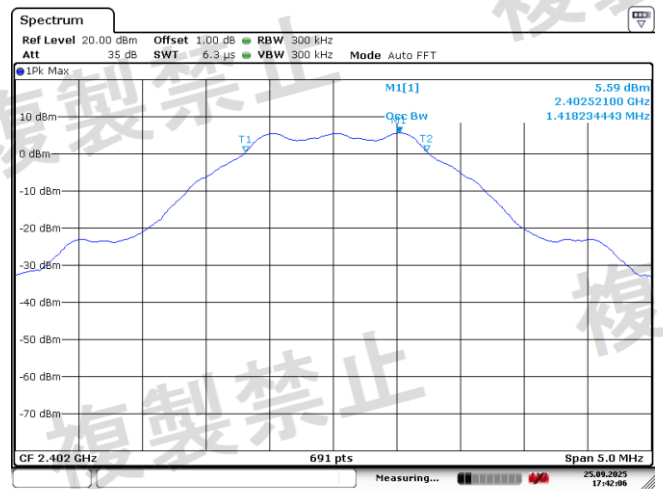
Test voltage	2,402 MHz	2,440 MHz	2,480 MHz	Result	Limit
	99% (MHz)	99% (MHz)	99% (MHz)		
Normal Voltage	2.24	2.22	2.23	Pass	26 MHz or less
Low Voltage	2.23	2.23	2.24	Pass	
High Voltage	2.25	2.23	2.22	Pass	
Test voltage	90% (MHz)	90% (MHz)	90% (MHz)		
Normal Voltage	1.42	1.40	1.42	Pass	500 kHz or more
Low Voltage	1.41	1.39	1.42	Pass	
High Voltage	1.42	1.40	1.41	Pass	

Test Mode : BLE / Low, Middle, High (Nomal Voltage)

99 % OBW



90 % OBW



5. Antenna power

5.1 Test setup



5.2 Limit

Output power: 0.01 W or Below

Output power tolerance: Maximum +20 %, Minimum -80 %

5.3 Test procedure

1. The transmitter output is connected to the Spectrum Analyzer
2. Setting the EUT is operating frequency.

5.4 Test results

Ambient temperature: 24℃ Relative humidity: 49% R.H.

Test mode : BLE

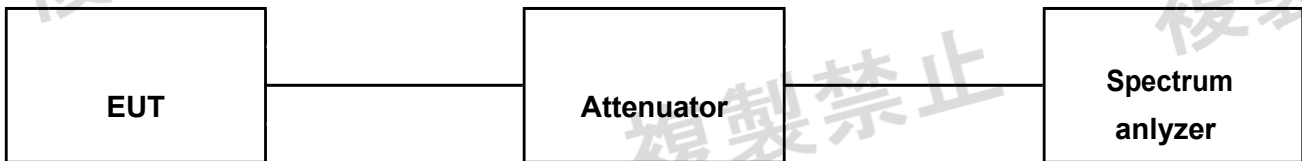
Result : Pass

Test voltage (DC)	Frequency (MHz)	Measure value	Power tolerance(%)
		(mW)	
Normal Voltage	2 402	3.59	19.64
	2 440	3.41	13.73
	2 480	3.32	10.63
Low Voltage	2 402	3.61	20.24
	2 440	3.46	15.22
	2 480	3.33	11.01
High Voltage	2 402	3.63	20.90
	2 440	3.44	14.65
	2 480	3.34	11.34
Declared power(W)		0.003 6 (0.001 8 ~ 0.003 96)	
Antenna gain(dBi)		5.0 dBi	
Limit		-80 ~ 20 %	

Remark: Power tolerance (%) = {[Output power- Declared power] ÷ Declared power} ×100

6. Unwanted emission strength

6.1 Test setup



6.2 Limit

Item	Limits
	(See Article 7, Table 3 of the Ordinance Regulating Radio Equipment)
TX	$\leq 2.5 \mu\text{W/MHz} (-26 \text{ dBm/MHz})$ ($30\text{MHz} \leq f \leq 1000\text{MHz}$)
Spurious	$\leq 2.5 \mu\text{W/MHz}$ ($1000\text{MHz} \leq f < 2387\text{MHz}$; $2496.5\text{MHz} < f$)
Emission	$\leq 25 \mu\text{W/MHz} (-16 \text{ dBm/MHz})$ ($2387\text{MHz} \leq f < 2400\text{MHz}$) and ($2483.5\text{MHz} < f \leq 2496.5\text{MHz}$)
Measurement range: 30MHz - 5 th harmonics	

6.3 Test procedure

1. Connect transmitter output to the spectrum analyzer input port.
2. The EUT should be transmitting at hopping mode
3. Unwanted emission strength is measured by following setting:
4. Set the spectrum analyzer RBW: 1 MHz (above 1 GHz), 1 MHz (below 1 GHz), VBW: same as RBW
Sweep time : auto, Start : 30 MHz, Stop : 1 000 MHz. Sweep mode: single and mark highest level.
5. Set the spectrum analyzer RBW: 1 MHz, VBW: 1 MHz, Sweep time: auto, Start: 1 000 MHz, Stop: 2 387 MHz Sweep mode: single and mark highest level.
6. Set the spectrum analyzer RBW: 1 MHz, VBW: 1 MHz, Sweep time: auto, Start: 2 387 MHz, Stop: 2 400 MHz Sweep mode: single and mark highest level.
7. Set the spectrum analyzer RBW: 1 MHz, VBW: 1 MHz, Sweep time: auto, Start: 2 483.5 MHz, Stop: 2 496.5 MHz Sweep mode: single and mark highest level.
8. Set the spectrum analyzer RBW: 1 MHz, VBW: 1 MHz, Sweep time: auto, Start: 2 496.5 MHz, Stop: 26 GHz Sweep mode: single and mark highest level.
9. Detector mode: Peak mode.

6.4 Test results

Ambient temperature: 24℃ Relative humidity: 49% R.H.

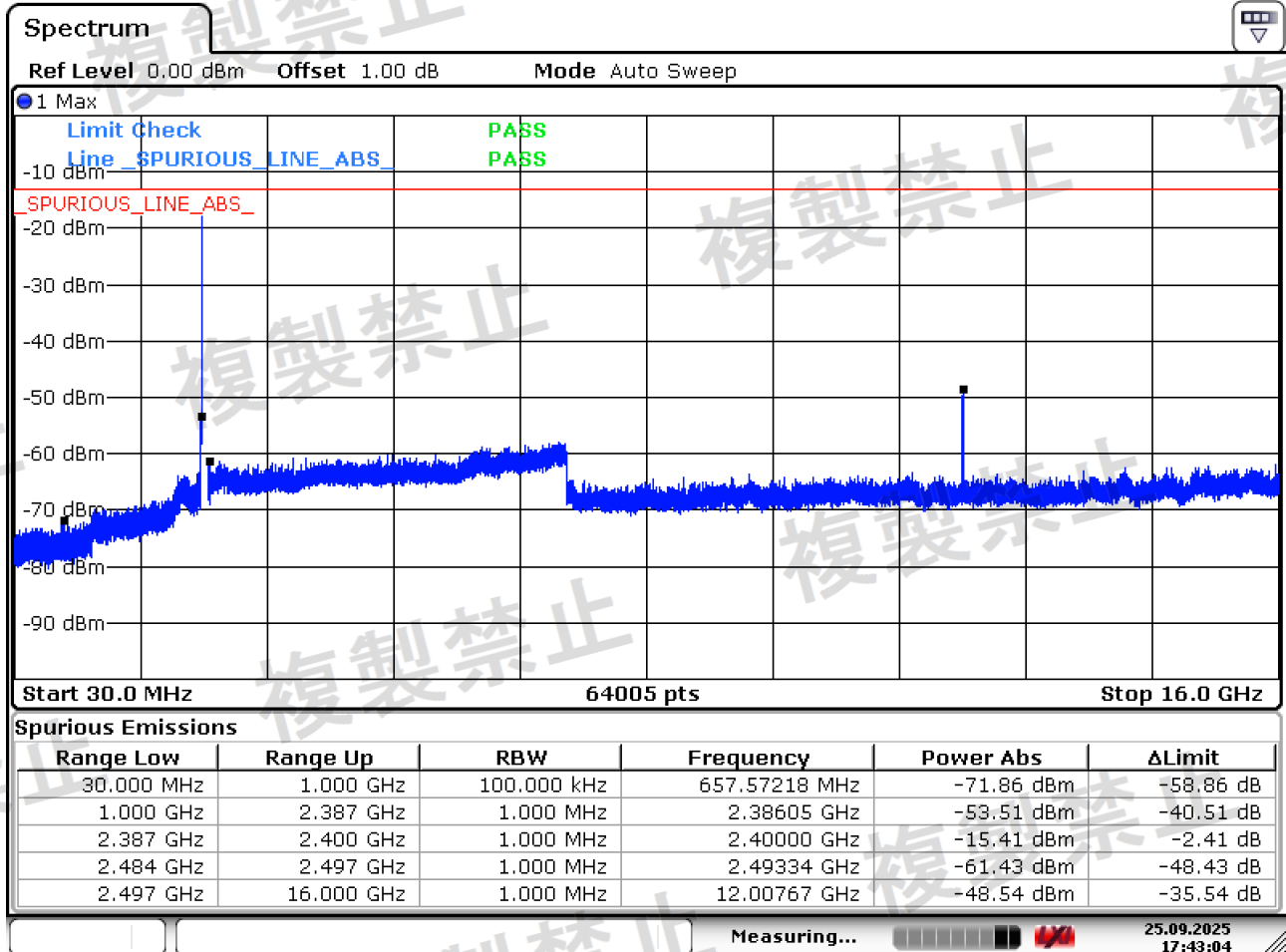
Result : Pass

mode : BLE

Voltage	Frequency	Frequency Range	Result			Limit
V	MHz	MHz	MHz	dBm	μW/MHz	μW/MHz
-10 % (DC 2.97 V)	2402	30 ~ 2387	2386.11	-53.21	0.0048	2.5
		2387 ~ 2400	2400.02	-15.25	29.8297	25
		2483.5 ~ 2496.5	2493.39	-61.09	0.0008	25
		2496.5 ~ 12500	12007.71	-48.24	0.0150	2.5
	2440	30 ~ 2387	2191.58	-62.53	0.0006	2.5
		2387 ~ 2400	2397.34	-59.44	0.0011	25
		2483.5 ~ 2496.5	2488.92	-60.48	0.0009	25
		2496.5 ~ 12500	12198.02	-46.24	0.0238	2.5
	2480	30 ~ 2387	2224.52	-61.54	0.0007	2.5
		2387 ~ 2400	2391.85	-60.46	0.0009	25
		2483.5 ~ 2496.5	2483.70	-32.63	0.5461	25
		2496.5 ~ 12500	12402.64	-50.95	0.0080	2.5
0 % (DC 3.30 V)	2402	30 ~ 2387	2386.05	-53.51	0.0045	2.5
		2387 ~ 2400	2400.00	-15.41	28.7740	25
		2483.5 ~ 2496.5	2493.34	-61.43	0.0007	25
		2496.5 ~ 12500	12007.67	-48.54	0.0140	2.5
	2440	30 ~ 2387	2191.54	-62.85	0.0005	2.5
		2387 ~ 2400	2397.28	-59.76	0.0011	25
		2483.5 ~ 2496.5	2488.89	-60.85	0.0008	25
		2496.5 ~ 12500	12197.97	-46.40	0.0229	2.5
	2480	30 ~ 2387	2224.48	-61.85	0.0007	2.5
		2387 ~ 2400	2391.83	-60.76	0.0008	25
		2483.5 ~ 2496.5	2483.68	-32.82	0.5224	25
		2496.5 ~ 12500	12402.62	-51.31	0.0074	2.5
+10 % (DC 3.63 V)	2402	30 ~ 2387	2386.07	-53.35	0.0046	2.5
		2387 ~ 2400	2400.04	-15.19	30.2375	25
		2483.5 ~ 2496.5	2493.37	-61.22	0.0008	25
		2496.5 ~ 12500	12007.69	-48.43	0.0144	2.5
	2440	30 ~ 2387	2191.60	-62.62	0.0005	2.5
		2387 ~ 2400	2397.33	-59.59	0.0011	25
		2483.5 ~ 2496.5	2488.93	-60.68	0.0009	25
		2496.5 ~ 12500	12198.00	-46.23	0.0238	2.5

2480	30 ~ 2387	2224.54	-61.63	0.0007	2.5
	2387 ~ 2400	2391.85	-60.54	0.0009	25
	2483.5 ~ 2496.5	2483.71	-32.58	0.5527	25
	2496.5 ~ 12500	12402.66	-51.22	0.0076	2.5

Test Mode : BLE / CH1 (Nomal Voltage)

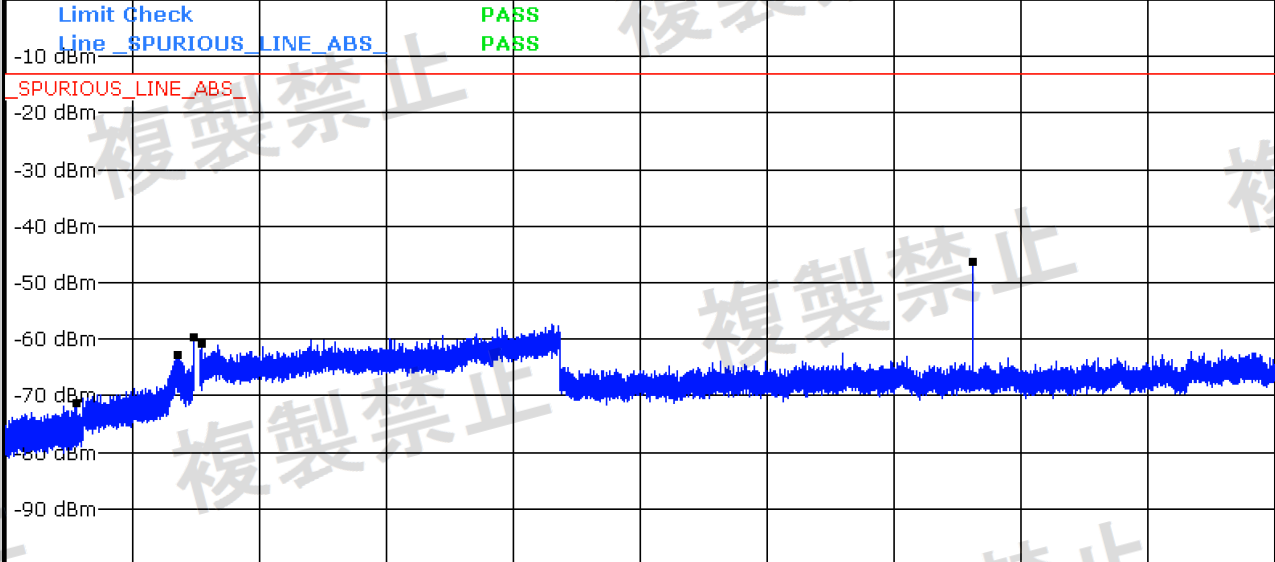


Test Mode : BLE / CH19 (Nomal Voltage)

Spectrum

Ref Level 0.00 dBm Offset 1.00 dB Mode Auto Sweep

1 Max



Start 30.0 MHz

64005 pts

Stop 16.0 GHz

Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	100.000 kHz	925.37995 MHz	-71.35 dBm	-58.35 dB
1.000 GHz	2.387 GHz	1.000 MHz	2.19154 GHz	-62.85 dBm	-49.85 dB
2.387 GHz	2.400 GHz	1.000 MHz	2.39728 GHz	-59.76 dBm	-46.76 dB
2.484 GHz	2.497 GHz	1.000 MHz	2.48889 GHz	-60.85 dBm	-47.85 dB
2.497 GHz	16.000 GHz	1.000 MHz	12.19797 GHz	-46.40 dBm	-33.40 dB

Measuring...

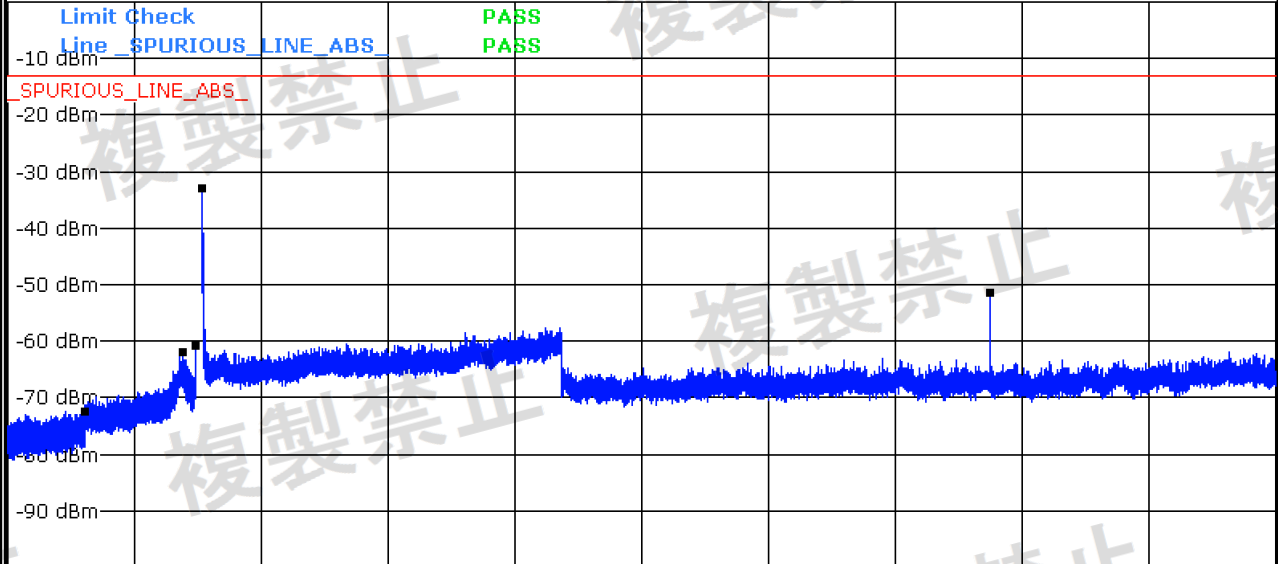
25.09.2025
17:43:24

Test Mode : BLE / CH39 (Nomal Voltage)

Spectrum

Ref Level 0.00 dBm Offset 1.00 dB Mode Auto Sweep

1 Max



Start 30.0 MHz

64005 pts

Stop 16.0 GHz

Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	100.000 kHz	999.57568 MHz	-72.49 dBm	-59.49 dB
1.000 GHz	2.387 GHz	1.000 MHz	2.22448 GHz	-61.85 dBm	-48.85 dB
2.387 GHz	2.400 GHz	1.000 MHz	2.39183 GHz	-60.76 dBm	-47.76 dB
2.484 GHz	2.497 GHz	1.000 MHz	2.48368 GHz	-32.82 dBm	-19.82 dB
2.497 GHz	16.000 GHz	1.000 MHz	12.40262 GHz	-51.31 dBm	-38.31 dB

Measuring...

25.09.2025
17:43:40

7. RX spurious emission

7.1 Test setup



7.2 Limit

Below 1 GHz: 4 nW (- 54 dBm) or less

Above 1 GHz: 20 nW (- 47 dBm) or less

7.3 Test procedure

1. Connect transmitter output to the spectrum analyzer input port
2. The EUT should be transmitting at low, middle and high channel.
3. RX spurious emission is measured by following setting:
4. Set the spectrum analyzer RBW: 100 kHz, VBW: 100 kHz, Sweep: Auto, Start: 30 MHz, Stop: 1 000 MHz. Max hold view, mark highest level.
5. Set the spectrum analyzer RBW: 1 MHz, VBW: 1 MHz, Sweep: Auto, Start: 1 000 MHz, Stop: 12.5 GHz. Max hold view, mark highest level.
6. Detector mode: Peak mode

7.4 Test results

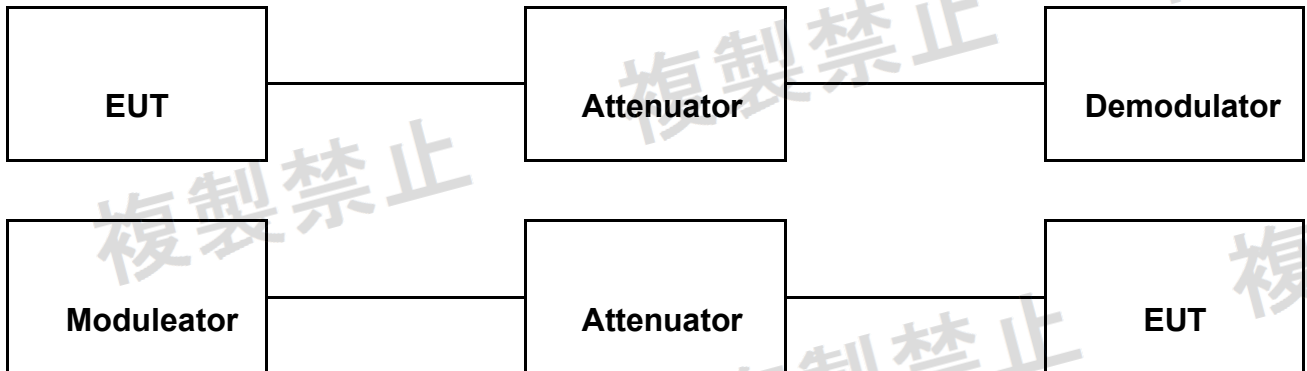
Ambient temperature: 24℃ Relative humidity: 49% R.H

Test mode : BLE

Voltage	Measurement Frequency	Frequency Range	Result			Limit
V	MHz	MHz	MHz	dBm	nW	nW
Normal Voltage	2402	30 ~ 1000	63.99	-82.41	0.006	4
		1000 ~ 12750	6413.52	-73.83	0.041	20
	2440	30 ~ 1000	63.99	-82.36	0.006	4
		1000 ~ 12750	6890.50	-73.90	0.041	20
	2480	30 ~ 1000	63.96	-82.33	0.006	4
		1000 ~ 12750	6970.00	-73.56	0.044	20

8 Interference prevention function

8.1 Test Setup



8.2 Limit

Radio equipment used mainly on the same premises and automatically transmits or receives identification code

8.3 Test results

Ambient temperature: 24℃ Relative humidity: 49% R.H.

Test Power:	Normal Voltage
Test Mode:	BLE
Test Result:	Good (identification code: [385CFBFFEDDC54E])

9. CONSTRUCTION PROTECTION CONFIRMATION METHOD

9.1 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.

9.2 CONFIRMATION METHOD

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

Tick the appropriate box	
	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.
O	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.

Measurement Uncertainty

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with ETSI TR 100 028-1 [1], ETSI TS 103 051 [2] and ETSI TS 103 052 [3] and shall correspond to an expansion factor (coverage factor) $k = 1,96$ or $k = 2$ (which provide confidence levels of respectively 95 % and 95,45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Parameter	Uncertainty
Occupied Bandwidth	± 0.348 MHz
RF output power, conducted	± 0.120 dB
Power Spectral Density, conducted	± 0.120 dB
Unwanted Emissions, conducted	± 0.350 dB
All emissions, radiated	± 6 dB
Temperature	± 0.5 °C
Supply voltages	± 8.7 mV
Time	± 0.0003 s

Test Photo



APPENDIX

TEST EQUIPMENT USED FOR TESTS

Calibration was conducted by HCT, a nationally accredited calibration laboratory in Korea.

	Use	Description	Model No.	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
1		SIGNAL ANALYZER (10 Hz ~ 40 GHz)	FSV40	101259	R&S	2025-03-06	2026-03-06
2		SIGNAL ANALYZER (10 Hz ~ 40 GHz)	FSV40	101367	R&S	2025-11-17	2026-11-17
3	■	SIGNAL ANALYZER (10 Hz ~ 30 GHz)	FSV30	100757	R&S	2025-09-08	2026-09-08
4	■	VECTOR SIGNAL GENERATOR	SMBV100A	255081	HP	2025-03-08	2026-03-07
5		SYNTHESIZED CW GENERATOR	83711B	US34490456	HP	2025-03-08	2026-03-07
6		Attenuator (3 dB)	8491A	37822	HP	2025-08-19	2026-08-19
7		Attenuator (10 dB)	8491A	63196	HP	2025-08-19	2026-08-19
8		EMI Test Receiver (~7 GHz)	ESCI7	100722	R&S	2025-08-18	2026-08-18
9		RF Amplifier (~1.3 GHz)	8447D OPT 010	2944A07684	HP	—	N/A
10		RF Amplifier (1~26.5 GHz)	8449B	3008A02126	HP	2025-03-05	2026-03-05
11		Horn Antenna (1~18 GHz)	3115	00114105	ETS	2025-03-10	2026-03-10
12		DRG Horn (Small)	3116B	81109	ETS-Lindgren	2024-03-08	2026-03-08
13		DRG Horn (Small)	3116B	133350	ETS-Lindgren	2024-03-08	2026-03-08
14		TRILOG Antenna	VULB 9160	9160-3237	SCHWARZBEC K	2024-03-08	2026-03-08
15		Temp.Humidity Data Logger	SK-L200TH II A	00801	SATO	2025-03-08	2026-03-07
16		Splitter (SMA)	ZFSC-2-2500	SF61780032 6	Mini-Circuits	2025-03-08	2026-03-07
17	■	DC Power Supply	6674A	3637A01657	Agilent	2025-03-08	2026-03-07
18		Power Meter	EPM-441A	GB32481702	HP	2025-03-08	2026-03-07
19		Power Sensor	8481A	3318A94972	HP	2025-08-18	2026-08-18
20		Audio Analyzer	8903B	3729A18901	HP	2025-08-18	2026-08-18
21		Modulation Analyzer	8901B	3749A05878	HP	2025-08-19	2026-08-19
22		TEMP & HUMIDITY Chamber	YJ-500	LTAS06041	JinYoung Tech	2025-03-05	2026-03-05
23	■	Constant Temp & Humidity Test Chamber	SJ-503H	SJ10051301	SJ	2025-08-18	2026-08-18
24		Stop Watch	HS-3	812Q08R	CASIO	2024-03-14	2026-03-14
25		LISN	KNW-407	8-1430-1	Kyoritsu	2025-03-08	2026-03-07