



시험 성적서

TEST REPORT

페이지(page) : (1) / 총(Total) (28)

성적서 번호 Report No.		ICRT-TR-E260681-0A	
신청자 Client	기관명 Name	SIA Hackmotion	
	주 소 Address	Aleksandra Čaka iela 105 - 18, Rīga, LV-1011, Latvija	
시험대상품목 Sample description		Wearable sensor system	
모델명 Type description		HM-U-4	
정 격 Ratings		DC 3.7 V	
시험장소 Place of test		☒ 고정시험실(Permanent Testing Lab) ☐ 현장시험(On Site Testing) 주소지(Address): 112, 113 Hwanggeum 3-ro 7beon-gil, Hagun-ri, Yangchon-eup, Gimpo-si, Gyeonggi-do, Korea	
시험기간 Date of test		26. Feb. 2026 ~ 04. Mar. 2026	
시험방법/항목 Test Method/Item		FCC Part 15 Subpart C	
시험결과 Test Results		Refer to 3. Test Summary	
확 인 Affirmation	작성자 Tested by	기술책임자 Technical Manager	
	성명 Name Seong-Hun, Jeong	성명 Name Yong-Min, Won	

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☐ The above test report is certified that the above mentioned products have been tested for the sample.

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2026. 03. 06

주식회사 아이씨알 대표이사

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112, Hwanggeum3-ro 7beon-gil, Yangchon-eup, Gimpo-si, Gyeonggi-do, Korea / Tel: 02-6351-9001 ~ 6



Contents

1. Applicant & Manufacturer & Test Laboratory Information	4
2. Equipment under Test(EUT) Information	5
3. Test Summary	6
4. Test Result	8
5. Used equipment	28



Revision History

Issued Report No.	Issued Date	Revisions	Effect Section
ICRT-TR-E260681-0A	2026. 03. 06	Initial Issue	All



1. Applicant & Manufacturer & Test Laboratory Information

1.1 Applicant information

Applicant	SIA Hackmotion
Address	Aleksandra Čaka iela 105 – 18, Rīga, LV-1011, Latvija

1.2 Manufacturer Information

Applicant	SIA Hackmotion
Address	Aleksandra Čaka iela 105 – 18, Rīga, LV-1011, Latvija

1.3 Test Laboratory Information

Laboratory	ICR Co., Ltd.
Address	112, Hwanggeum 3-ro 7beon-gil, Hagun-ri, Yangchon-eup, Gimpo-si, Gyeonggi-do, Korea
Telephone No.	+82-2-6351-9002
Fax No.	+82-2-6351-9007
KOLAS No.	KT652
KC & FCC	KR0165

1.4 Measurement Uncertainty

Parameter	Uncertainty	Limit
Occupied Channel Bandwidth	0.14 %	±5 %
RF output power, conducted	0.85 dB	±1.5 dB
Power Spectral Density, conducted	1.44 dB	±3 dB
Unwanted Emissions, conducted	1.35 dB	±3 dB
Supply voltages	0.02 %	±3 %
Time	0.06 %	±5 %
All emissions, radiated (Under the 30 MHz)	2.10 dB	±6 dB
All emissions, radiated (Range 30 MHz ~ 1 GHz)	1.95 dB	±6 dB
All emissions, radiated (Range 1 GHz ~ 18 GHz)	2.47 dB	±6 dB
All emissions, radiated (Range 18 GHz ~ 26.5 GHz)	2.61 dB	±6 dB



2. Equipment under Test(EUT) Information

2.1 General Information

Product Name	Wearable sensor system
Model Name	HM-U-4
Additional Model Name	-
FCC ID	2BB4WHM-U-4
Power Supply	DC 3.7 V

2.2 Additional Information

Equipment Class	DTS	
Device Type	Stand-alone	
Operating Frequency	Bluetooth LE 1M	2 402 MHz ~ 2 480 MHz
RF Output Power	Bluetooth LE 1M	8.17 dBm
Number of Channel	Bluetooth LE 1M	40
Modulation Type	Bluetooth LE 1M	GFSK
Antenna Type	PCB Antenna	
Antenna Gain	1.7 dBi	



3. Test Summary

3.1 Test standards and results

FCC Part 15 Subpart C			
Clause	Test items	Applied	Results
§ 15.247 (a) (2)	6 dB Bandwidth	■	PASS
§ 15.247 (b) (3)	Maximum Conducted (Average) Output Power	■	PASS
§ 15.247 (e)	Power Spectral Density	■	PASS
§ 15.247 (d)	Conducted Spurious Emission & band Edge	■	PASS
§ 15.247 (d) & § 15.209 & § 15.205	Radiated Spurious Emission	■	PASS
§ 15.207	Power Line Conducted Emission	■	PASS

3.2 Purpose of the test

– To determine whether the equipment under test fulfills the requirements of the standards stated in FCC Part 15 Subpart C Section 15.247

3.3 Test Methodology

– Both conducted and radiated testing was performed according to the procedures in ANSI C63.10-2020. Radiated testing was performed at a distance of 3 m from EUT to the antenna.

3.4 Configuration of Test System

3.4.1 Radiated emission test

– Preliminary radiated emissions test were conducted using the procedure in ANSI C63.10-2020 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 m Semi Anechoic Chamber.

The turntable was rotated through 360 degrees and the EUT was tested by positioned three orthogonal planes to obtain the highest reading on the field strength meter. Once maximum reading was determined, the search antenna was raised and lowered in both vertical and horizontal polarization

3.4.2 Transmission mode of EUT

– During the test, the EUT transmitted in continuous transmission mode each of the low, medium, high channels



3.5 Antenna requirement

– According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section.

The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

And according to § 15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi.

Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Result: Pass

The transmitter has a **PCB Antenna**. The directional gain of the antenna is **1.7 dBi**.



4. Test Result

4.1. 6 dB Bandwidth

4.1.1 Test procedure

ANSI C63.10-2020 Clause 11.8

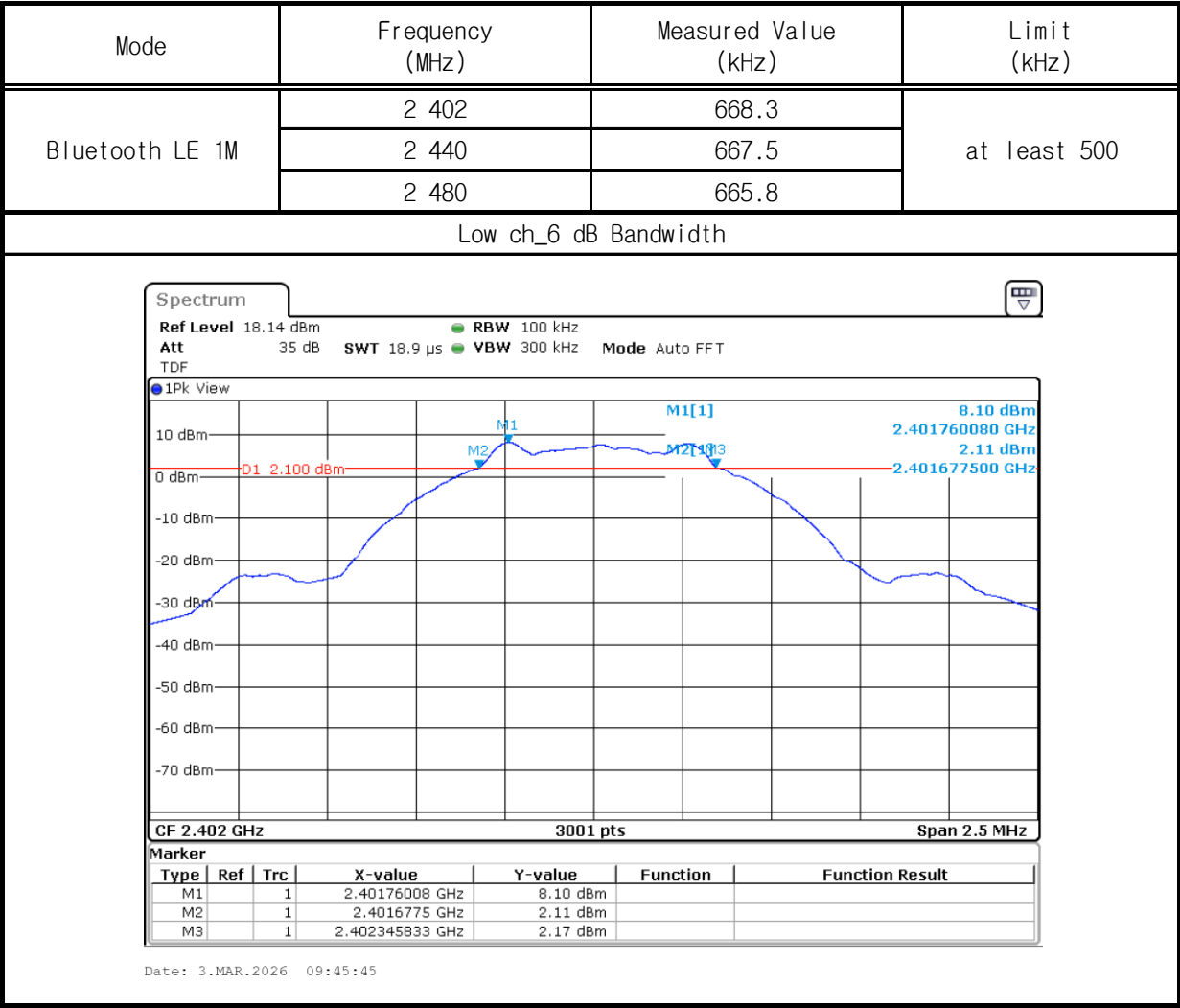
4.1.2 Limit

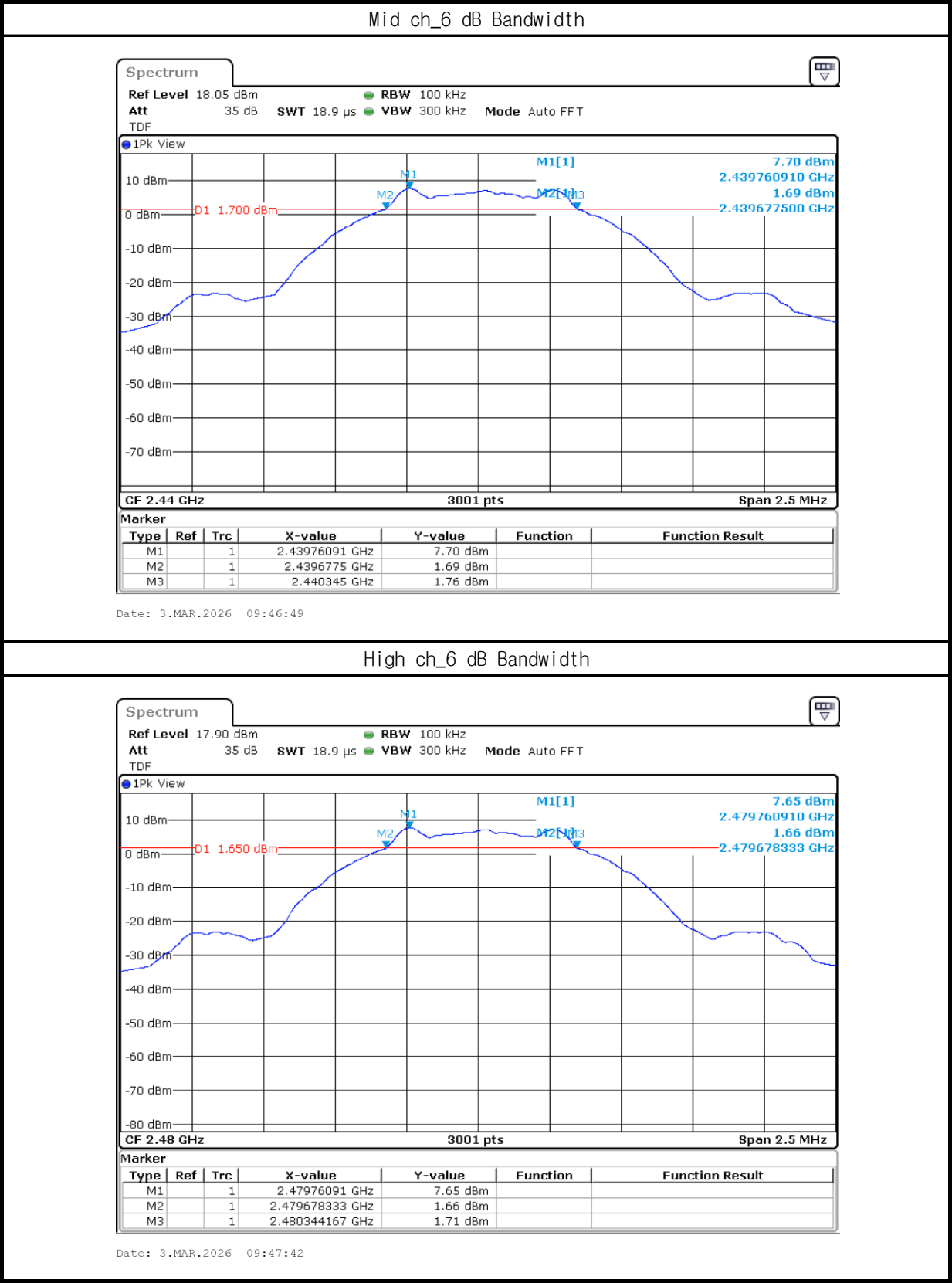
§ 15.247 (a) (2)

Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

4.1.3 Test data

Result : Pass







4.2 Maximum Conducted Output Power

4.2.1 Test procedure

ANSI C63.10-2020 Clause 11.9

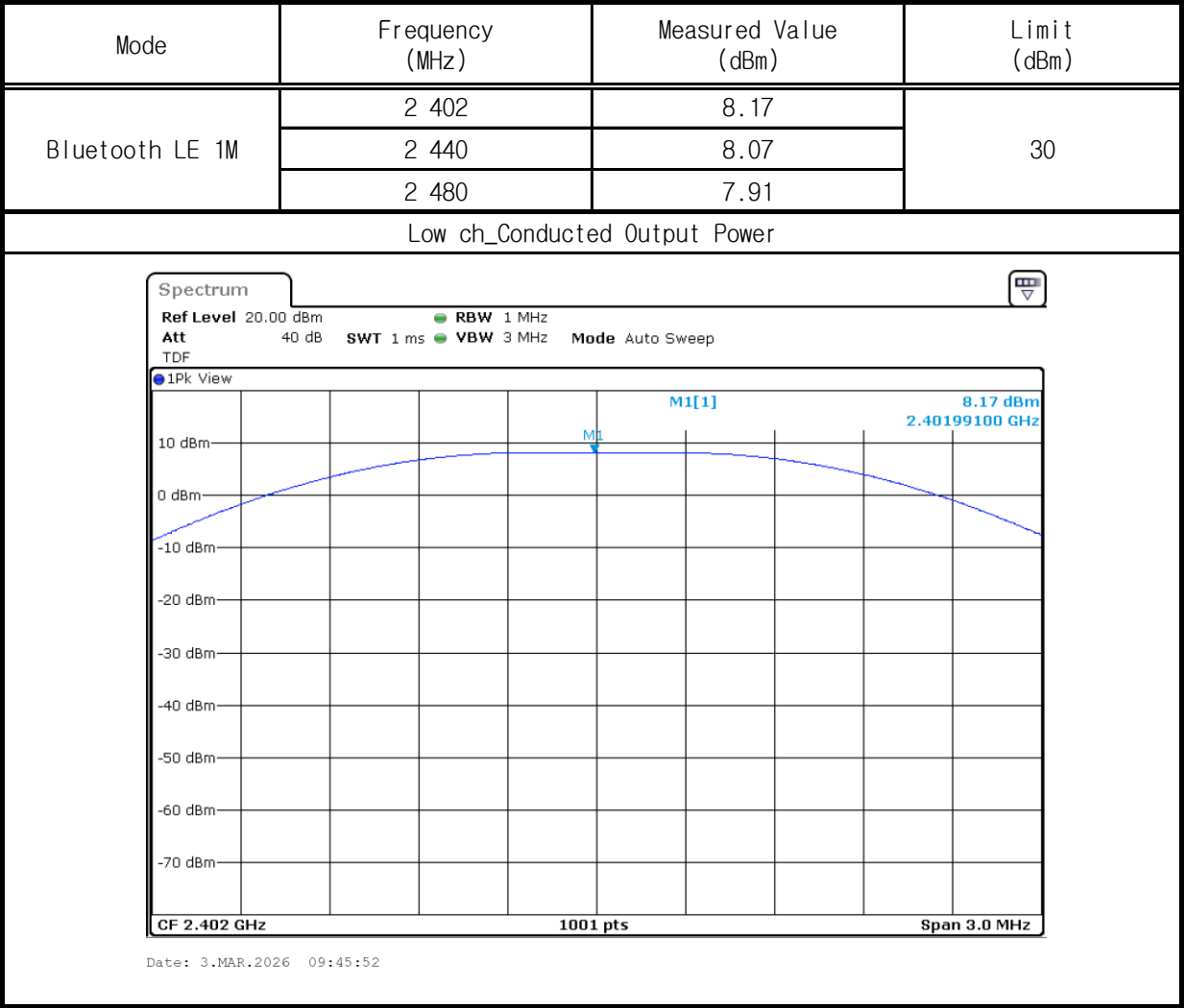
4.2.2 Limit

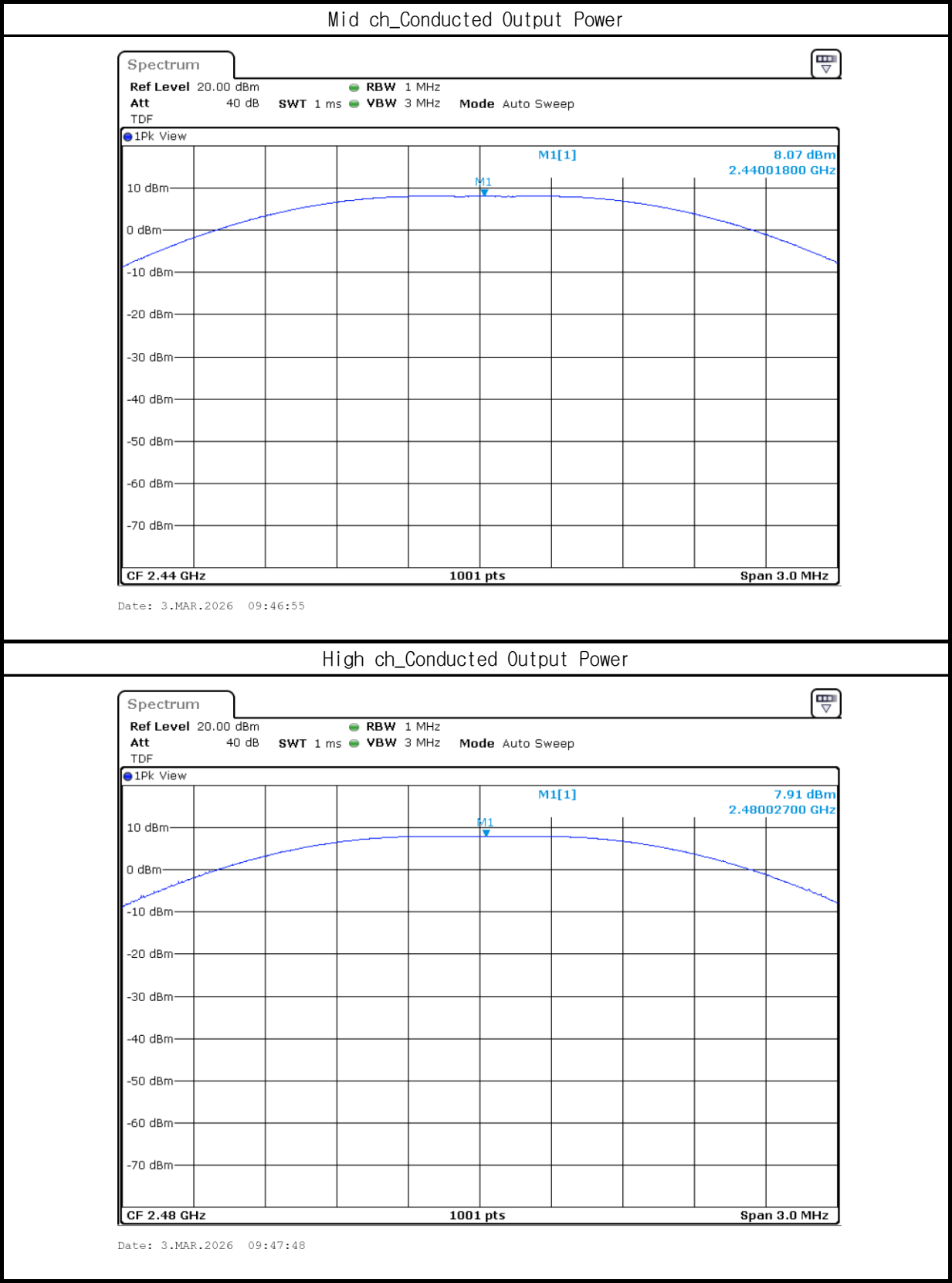
§ 15.247 (b) (3)

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

4.2.3 Test data

Result : Pass







4.3 Power Spectral Density

4.3.1 Test procedure

ANSI C63.10-2020 Clause 11.10

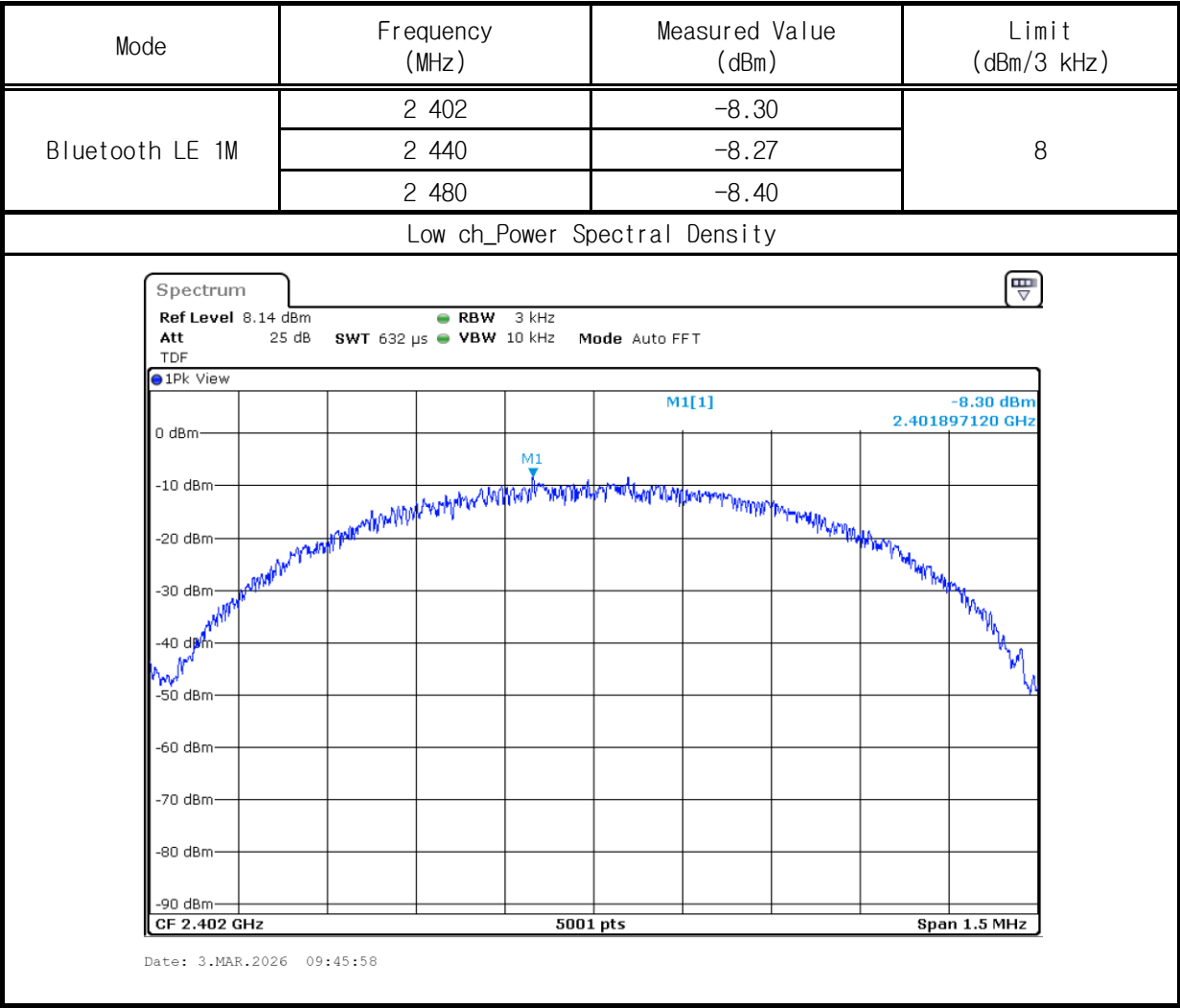
4.3.2 Limit

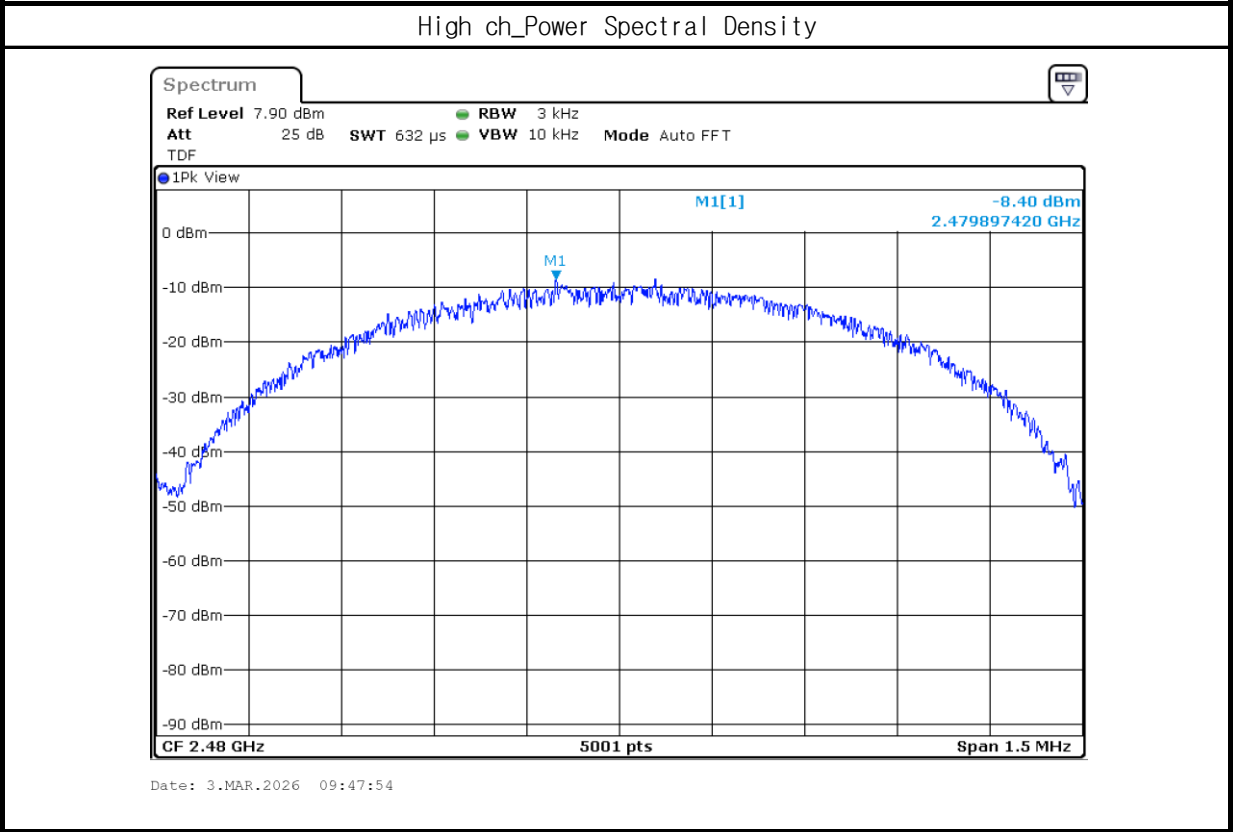
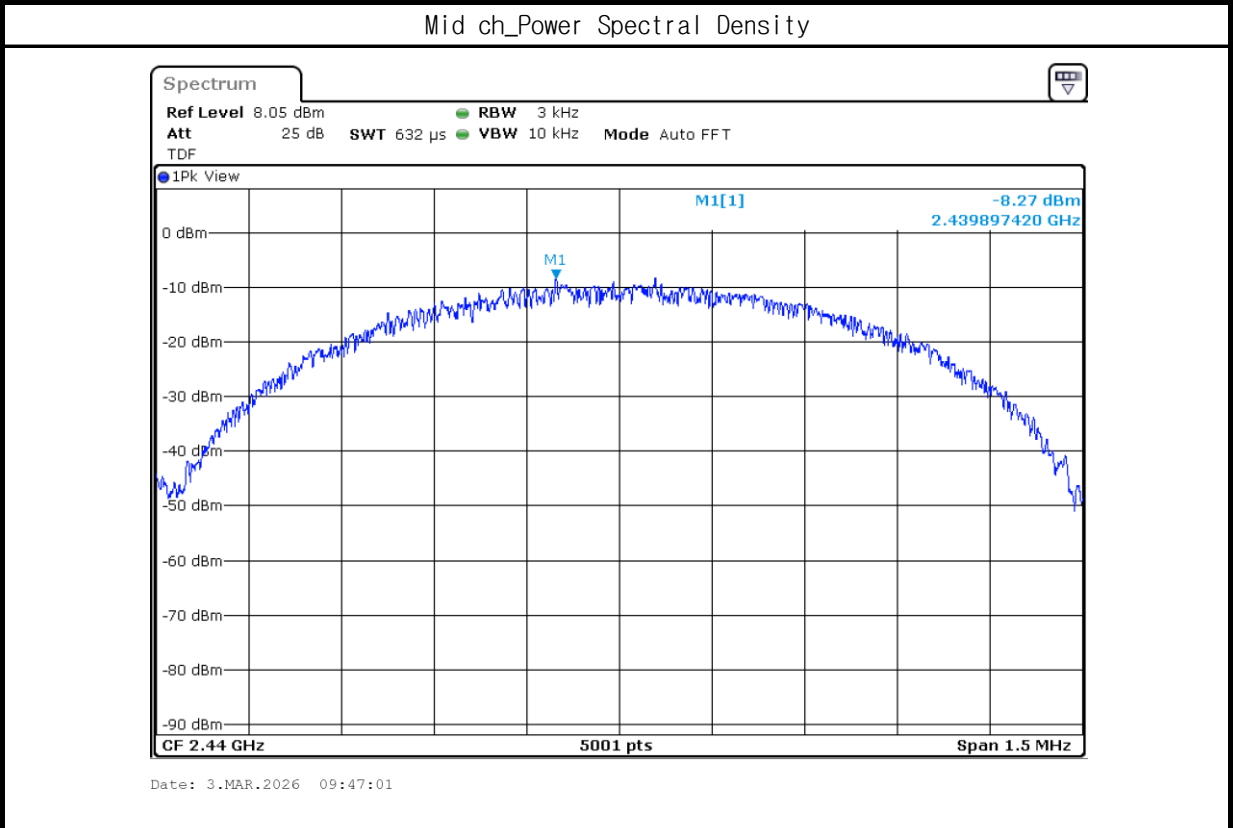
§ 15.247 (e)

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

4.3.3 Test data

Result : Pass







4.4 Conducted Spurious Emission & Band Edge

4.4.1 Test procedure

ANSI C63.10-2020 Clause 11.11, 11.12

4.4.2 Limit

§ 15.247 (d)

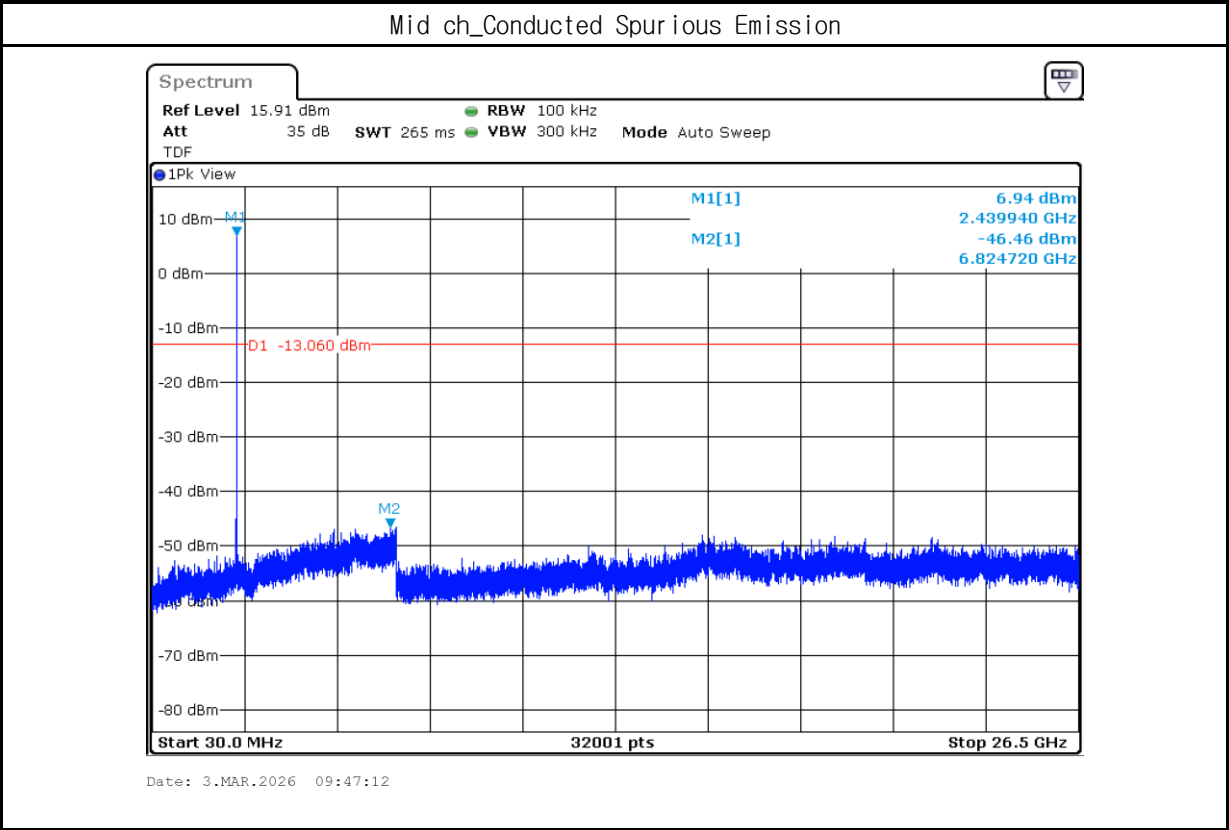
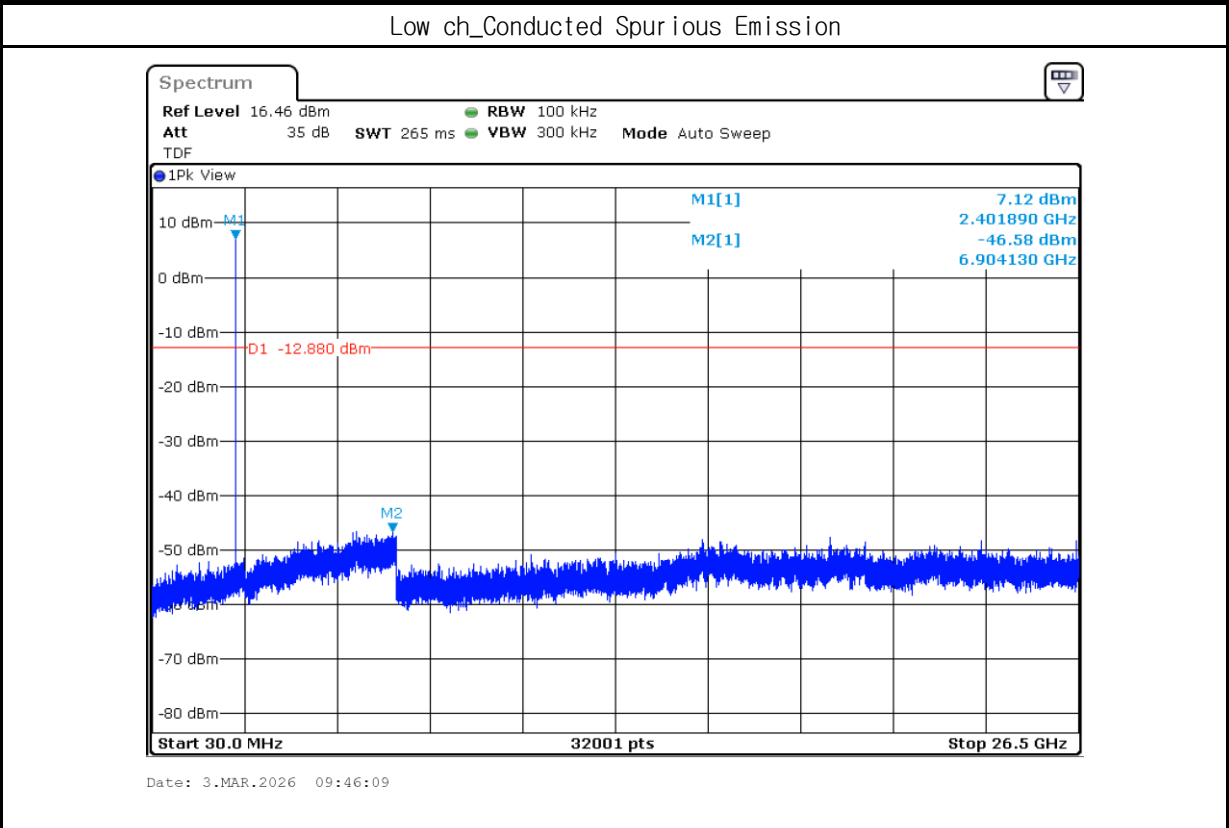
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

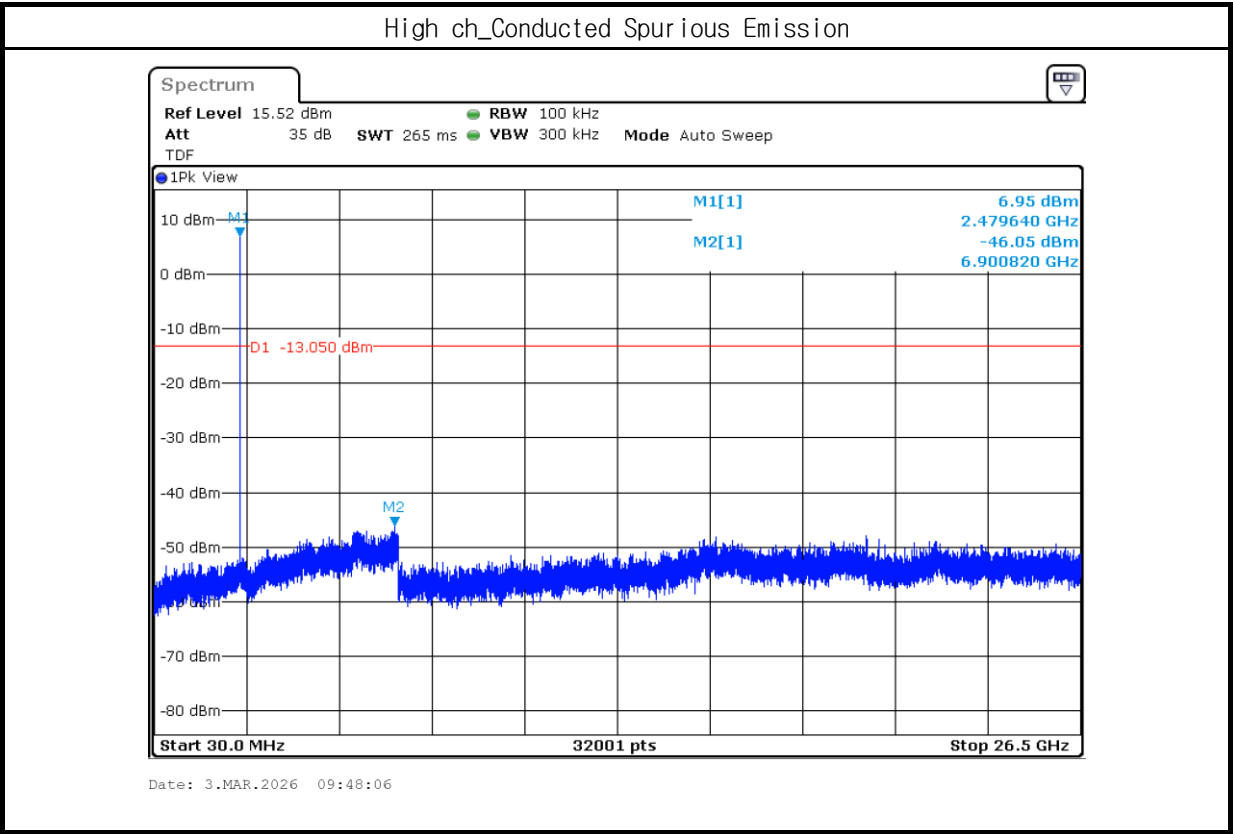
4.4.3 Test data

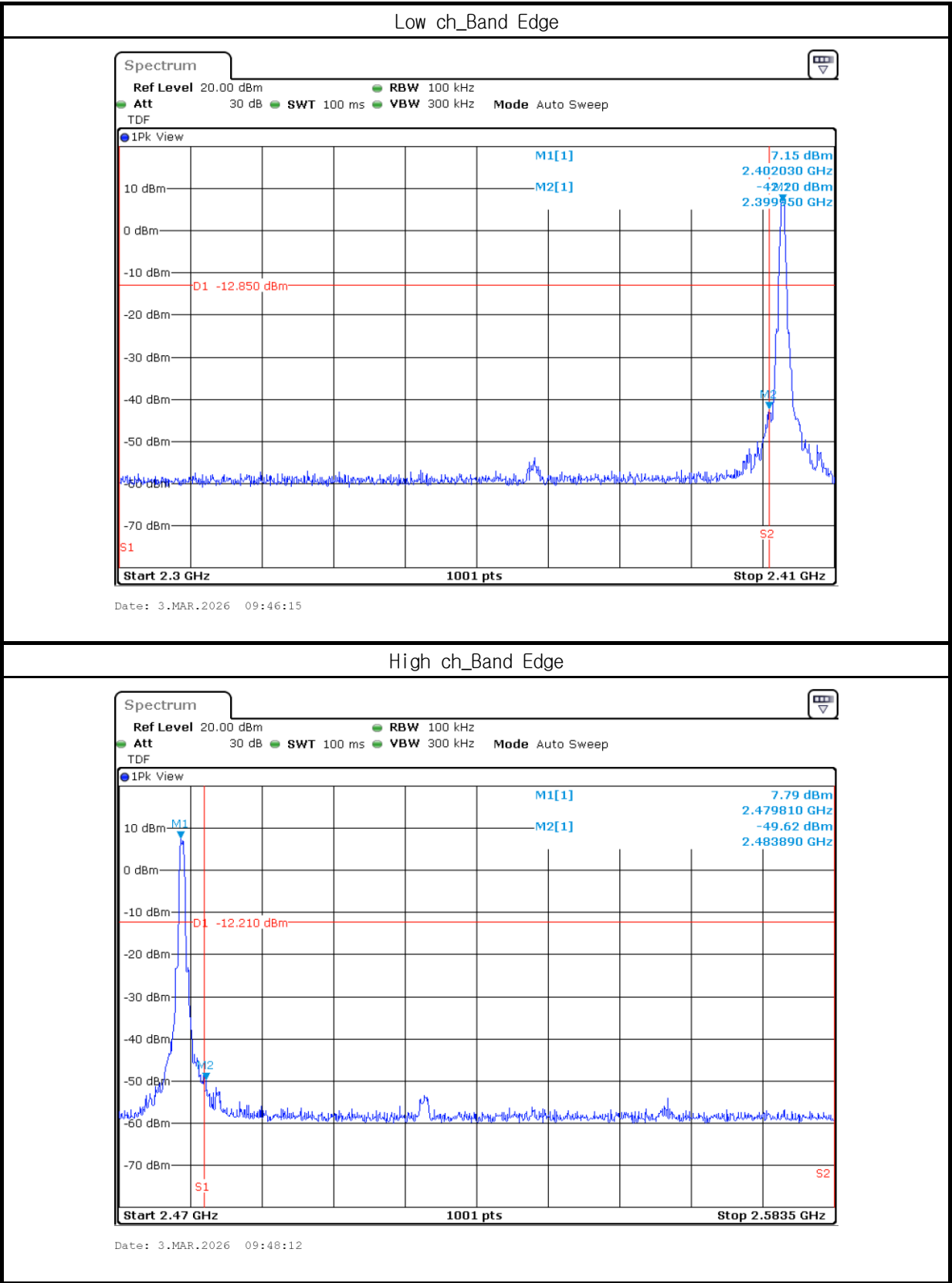
Result : Pass



Mode : Bluetooth LE 1M









4.5 Radiated Spurious Emission

4.5.1 Test procedure

ANSI C63.10-2020 Clause 11.11, 11.12

4.5.2 Limit

§ 15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

§ 15.209 Radiated emission limits; general requirements.(a)

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009–0.490	2400/F(kHz)	300
0.490–1.705	24000/F(kHz)	30
1.705–30.0	30	30
30–88	100 **	3
88–216	150 **	3
216–960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54–72 MHz, 76–88 MHz, 174–216 MHz or 470–806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.



§ 15.205 Restricted bands of operation.(a),(b)

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
¹ 0.495–0.505	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225	123–138	2200–2300	14.47–14.5
8.291–8.294	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675	156.7–156.9	2690–2900	22.01–23.12
8.41425–8.41475	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025	240–285	3345.8–3358	36.43–36.5
12.57675–12.57725	322–335.4	3600–4400	(²)
13.36–13.41			

¹ Until February 1, 1999, this restricted band shall be 0.490–0.510 MHz.

² Above 38.6

Except as provided in paragraphs (d) and (e) of this section, the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in § 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in § 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in § 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in § 15.35 apply to these measurements.



4.5.3 Test data

Result : Pass

Mode : Bluetooth LE 1M_Worst Case

- Below 30 MHz

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
0.021	43.52	QP	V	20.4	63.92	121.36	57.44	
0.046	31.86	QP	V	20.0	51.86	114.37	62.51	
0.068	30.5	QP	V	20.0	50.50	111.01	60.51	
1.601	18.94	QP	H	20.0	38.94	63.52	24.58	
13.750	10.88	QP	V	20.2	31.08	69.54	38.46	
23.976	6.08	QP	H	21.0	27.08	69.54	42.46	

- 30 MHz ~ 1 GHz

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
38.342	38.92	QP	H	-15.7	23.22	40.00	16.78	
45.229	38.05	QP	V	-14.3	23.75	40.00	16.25	
57.063	36.63	QP	H	-15.1	21.53	40.00	18.47	
104.690	33.1	QP	H	-15.9	17.2	43.52	26.32	
850.232	25.2	QP	V	-2.3	22.9	46.02	23.12	
993.792	24.89	QP	V	-0.8	24.09	53.98	29.89	



Mode : Bluetooth LE 1M

- 1 GHz Above_Low ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
2385.00	47.45	PK	V	-10.8	36.65	74.00	37.35	Restricted band
	33.74	AVG	V		22.94	54.00	31.06	
4802.90	45.22	PK	V	-2.8	42.42	74.00	31.58	2nd Harmonic
	31.59	AVG	V		28.79	54.00	25.21	
7206.70	47.60	PK	V	0.9	48.50	74.00	25.50	3rd Harmonic
	34.43	AVG	V		35.33	54.00	18.67	
9608.80	46.79	PK	V	3.5	50.29	74.00	23.71	4th Harmonic
	33.93	AVG	V		37.43	54.00	16.57	
26063.10	35.19	PK	H	9.4	44.59	74.00	29.41	
	22.48	AVG	H		31.88	54.00	22.12	

- 1 GHz Above_Mid ch

Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
4879.40	50.22	PK	V	-2.4	47.82	74.00	26.18	2nd Harmonic
	37.93	AVG	V		35.53	54.00	18.47	
7320.60	46.72	PK	V	0.9	47.62	74.00	26.38	3rd Harmonic
	33.97	AVG	V		34.87	54.00	19.13	
9760.10	47.06	PK	V	3.7	50.76	74.00	23.24	4th Harmonic
	34.38	AVG	V		38.08	54.00	15.92	
12199.60	47.61	PK	V	6.3	53.91	74.00	20.09	5th Harmonic
	34.91	AVG	V		41.21	54.00	12.79	
17671.90	53.56	PK	V	13.3	66.86	74.00	7.14	
	39.58	AVG	V		52.88	54.00	1.12	

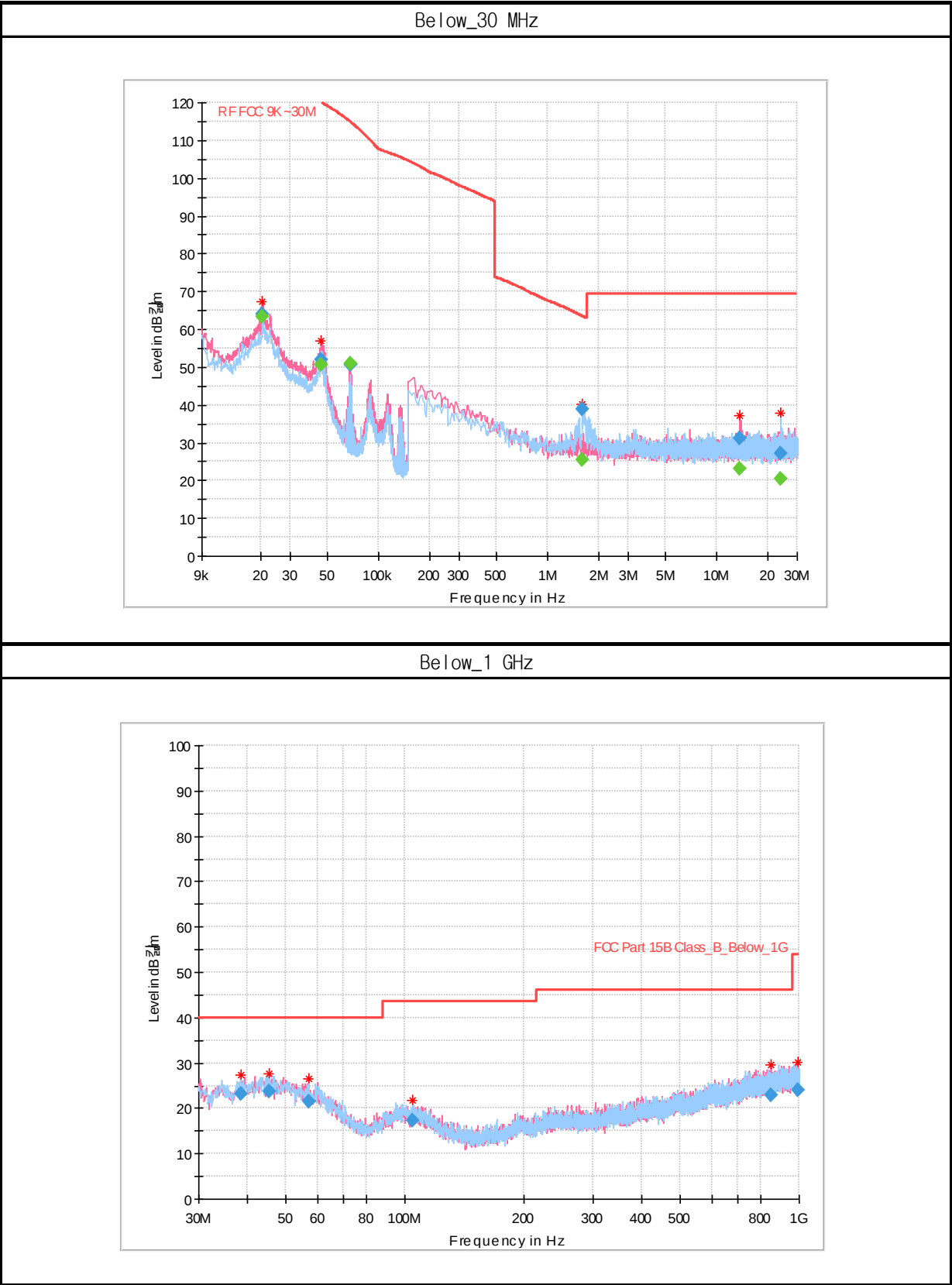
- 1 GHz Above_High ch

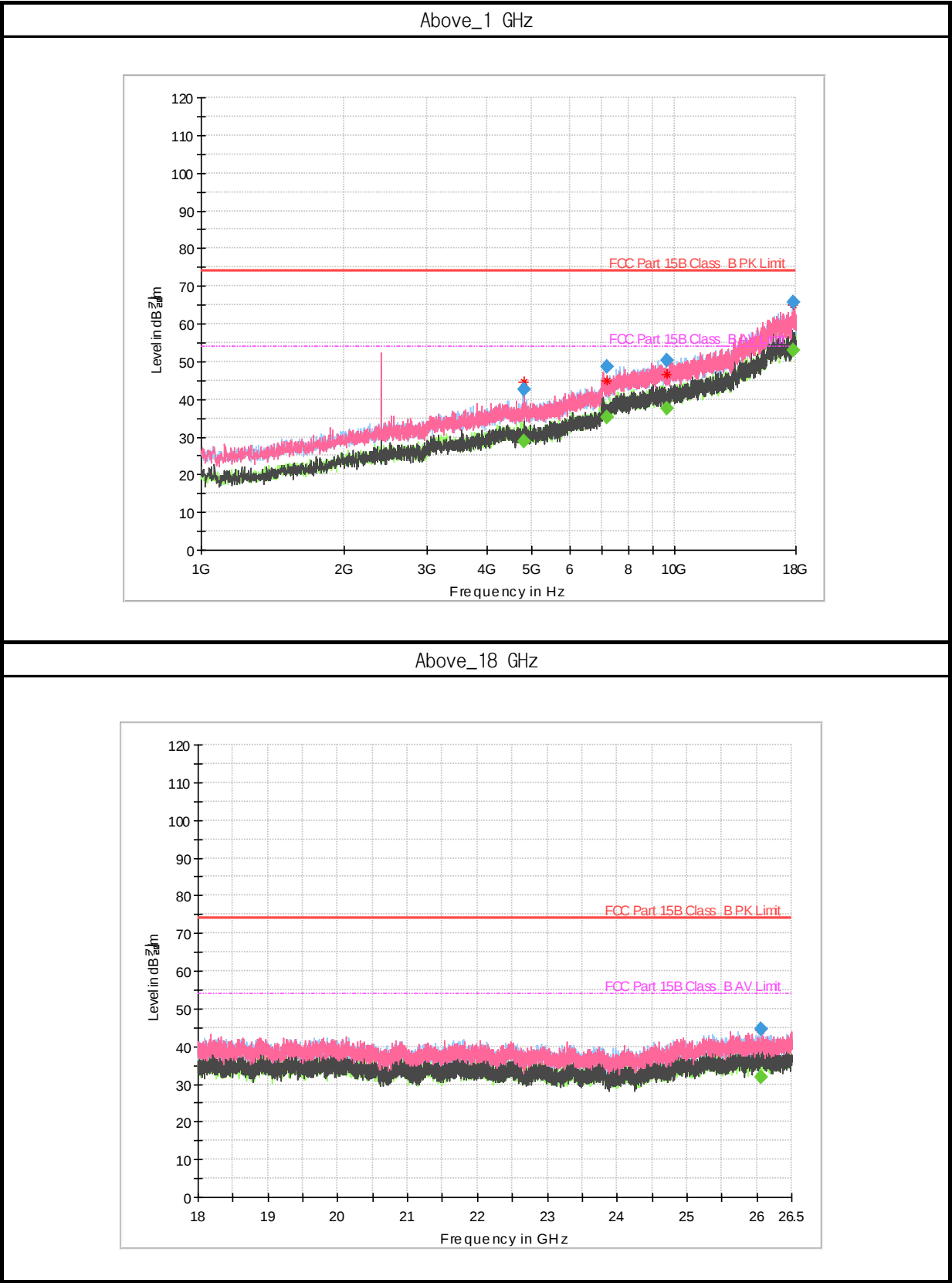
Frequency (MHz)	Reading (dBuV/m)	Detector	Pol.	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
2484.10	66.04	PK	V	-10.2	55.84	74.00	18.16	Restricted band
	40.28	AVG	V		30.08	54.00	23.92	
4959.30	50.91	PK	V	-2.3	48.61	74.00	25.39	2nd Harmonic
	38.83	AVG	V		36.53	54.00	17.47	
7439.60	47.79	PK	H	1.0	48.79	74.00	25.21	3rd Harmonic
	34.37	AVG	H		35.37	54.00	18.63	
9919.90	47.06	PK	H	4.0	51.06	74.00	22.94	4th Harmonic
	34.28	AVG	H		38.28	54.00	15.72	
17670.20	53.23	PK	H	13.3	66.53	74.00	7.47	
	39.56	AVG	H		52.86	54.00	1.14	



4.5.4 Test plot

Mode : Bluetooth LE 1M_Worst Case







4.6 Power Line Conducted Emission

4.6.1 Test procedure

ANSI C63.10-2020 Clause 6.2

4.6.2 Limit

§ 15.207 (a)

Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

*Decreases with the logarithm of the frequency.



4.6.3 Test data

Result : Pass

- L-Line Conducted Emission

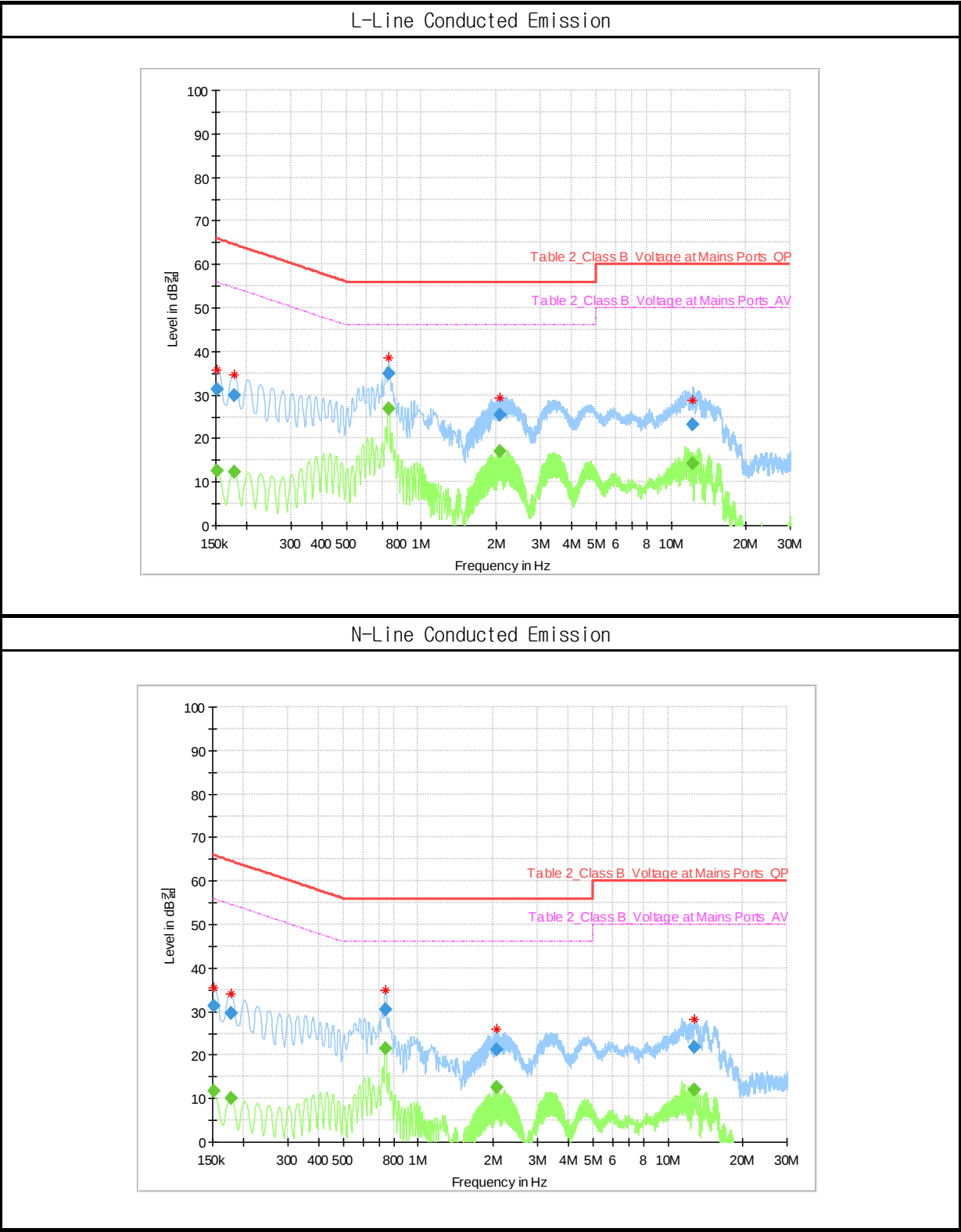
Frequency (MHz)	Reading (dBuV/m)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
0.152	21.62	QP	9.8	31.42	65.88	34.46	
	2.90	AVG		12.70	55.88	43.18	
0.177	19.91	QP	10.0	29.91	64.63	34.72	
	2.38	AVG		12.38	54.63	42.25	
0.740	25.11	QP	9.9	35.01	56.00	20.99	
	16.91	AVG		26.81	46.00	19.19	
2.067	15.66	QP	9.8	25.46	56.00	30.54	
	7.31	AVG		17.11	46.00	28.89	
12.212	13.16	QP	9.9	23.06	60.00	36.94	
	4.25	AVG		14.15	50.00	35.85	

- N-Line Conducted Emission

Frequency (MHz)	Reading (dBuV/m)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	note
0.152	21.56	QP	9.8	31.36	65.88	34.52	
	1.86	AVG		11.66	55.88	44.22	
0.177	19.70	QP	10.0	29.70	64.63	34.93	
	0.07	AVG		10.07	54.63	44.56	
0.740	20.64	QP	9.9	30.54	56.00	25.46	
	11.55	AVG		21.45	46.00	24.55	
2.069	11.46	QP	9.8	21.26	56.00	34.74	
	2.80	AVG		12.60	46.00	33.40	
12.811	11.75	QP	9.9	21.65	60.00	38.35	
	2.22	AVG		12.12	50.00	37.88	



4.6.4 Test plot





5. Used equipment

	Description	Model Name	Manufacturer	Serial Number	Next Cal
■	SIGNAL GENERATOR	SMB100A	ROHDE & SCHWARZ	180607	2027-02-24
■	SIGNAL ANALYZER	FSV40	ROHDE & SCHWARZ	101455	2027-02-23
■	DC BLOCK	PDCB-00012650-SMSF-4	PSATEK	-	2027-02-26
■	DC POWER SUPPLY	E3632A	AGILENT	MY51250107	2027-02-24
■	LOOP ANTENNA	HFH2-Z2	ROHDE & SCHWARZ	100271	2027-03-04
■	BAND REJECTION FILTER	WT-A1205-R12	WT MICROWAVE	WT171201-6-1	2027-02-24
■	TRILOG BROADBAND ANTENNA	VULB 9162	SCHWARZBECK	120	2026-12-09
■	SIGNAL CONDITIONING UNIT	SCU 08	ROHDE & SCHWARZ	100746	2026-03-24
■	EMI TEST RECEIVER	ESR 26	ROHDE & SCHWARZ	101462	2026-03-24
■	DOUBLE-RIDGED HORN ANTENNA	HF907	ROHDE & SCHWARZ	102556	2026-07-28
■	SIGNAL CONDITIONING UNIT	SCU 18	ROHDE & SCHWARZ	102342	2026-03-24
■	EMI TEST RECEIVER	ESR 26	ROHDE & SCHWARZ	101461	2026-03-24
■	HORN ANTENNA	DRH0844	RF SPIN	KV2E08A0844	2027-02-27
■	RF PRE AMPLIFIER	ELNA40-50	EXYNOD	631300	2027-02-26
■	LISN	ENV216	ROHDE & SCHWARZ	102193	2026-06-24
■	EMI TEST RECEIVER	ESR3	ROHDE & SCHWARZ	102119	2026-03-24

- END OF REPORT.