

TEST REPORT

CSA Group Korea Ltd. 155, Osan-Ro, Mohyeon-eup, Cheoin-Gu, Yongin-Si, Gyeonggi-Do 16885 Republic of Korea www.csagroup.org	Report No.: CSA-26-R-0048-R2 Page (1) of (24)	
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1. Report No. : CSA-26-R-0048-R2

2. Applicant

- Name : YG PLUS, INC.
- Address : 10, Gukjegeumyung-ro, Yeongdeungpo-gu, Seoul, Republic of Korea

3. Test item

- Product Name : BIGBANG OFFICIAL LIGHT STICK Ver.5
- Model Name : BIGBANG OFFICIAL LIGHT STICK Ver.5

4. Manufacturer

- Name : TIX Inc.
- Address : 617, 416, Hwagok-ro, Gangseo-gu, Seoul, Republic of Korea

5. Date of Test: 2026-07-28 to 2026-07-30

6. Test Method used: MIC notification No.88 of 2004, Annex 43

7. Technical Standard: Article 2 paragraph 1 item 19

8. Test Result : ☒ Pass ☐ Fail

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

Affirmation	Tested by	Technical Manager
	Name : Sungjung Kim (Signature) 	Name : Changwin Lee (Signature) 

2026-08-24

CSA Group Korea Ltd.

As a test result of the sample which was submitted from the client, this report does not guarantee the whole product quality. This test report should not be used and copied without a written agreement by CSA Group Korea Ltd.

REPORT REVISION HISTORY

Date	Revision	Page No
2026-08-13	Originally issued	-
2026-08-19	Rev.01 (Correcting Antenna power error)	15
2026-08-24	Rev.02 (Correcting Antenna power error)	15

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1. General Information

1.1. Applicant information

Applicant: YG PLUS, INC.
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Telephone: +82-2-3140-4600
Fax: -
E-mail: hunigood@ygmail.net
Contact name: Dong-hun Lee

Manufacturer: TIX Inc.
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Telephone: +82-10-6377-0648
Fax: +82-02-783-9761
E-mail: tim.ryu@tixinc.kr
Contact name: tim.Ryu

1.2. Laboratory information

Address

CSA Group Korea Ltd. (Yongin Lab.)

155, Osan-Ro, Mohyeon-eup, Cheoin-Gu, Yongin-Si, Gyeonggi-Do 16885 Republic of Korea

Telephone Number: +82-2-6371-6600

KOLAS : KT1213

FCC&IC MRA Accredited Test Designation No. : KR0175

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1.3 Description of EUT

Product Name	BIGBANG OFFICIAL LIGHT STICK Ver.5
Model Name	BIGBANG OFFICIAL LIGHT STICK Ver.5
Usage	Light Stick
Serial Number	Proto type
Modulation type	GFSK
Emission type	F1D
Maximum output power	0.600 mW
Operation Frequency	2 402 MHz ~ 2 480 MHz
Number of Channels	40
Operation temperature	-20°C to +50°C
Power Source	DC 4.5 V
Antenna Description	Internal pattern Antenna, gain : -1.024 dBi
Remark	1. The above DUT's information was declared by manufacturer. Please refer to the specifications or user manual for more detailed description. 2. When the input voltage to receiver RF circuit varies below $\pm 1\%$ as the input voltage from the external power supply to the receiver varies $\pm 10\%$ (excluding power supply).

1.4 System Configuration for Test

1.4.1 Characteristics of equipment

The Equipment Under Test (EUT) contains the following capabilities: This equipment is Lightstick. The detailed explanation is refer as user manual.

1.4.2 Used peripherals list

Description	Model No.	Serial No.	Manufacture	Remark
Notebook	NT750XEW	KSEU99YT6000RSR	Samsung	
Adapter	EP-TA845 V01	None	Samsung	For notebook
Jig	Burning Tool	None	Telink	For EUT

1.4.3 Product Modification

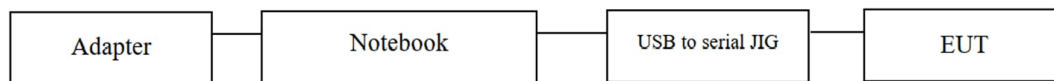
N/A

1.4.4 Operating Mode

Constantly transmitting with a modulated carrier at maximum power on the low, middle and high channels

1.4.5 Test Setup of EUT

The measurements were taken in continuous transmit mode using the test mode which controlled by Non_Signaling_TEST_v2.1. The test command and the test Jig and cables were provided by the applicant.



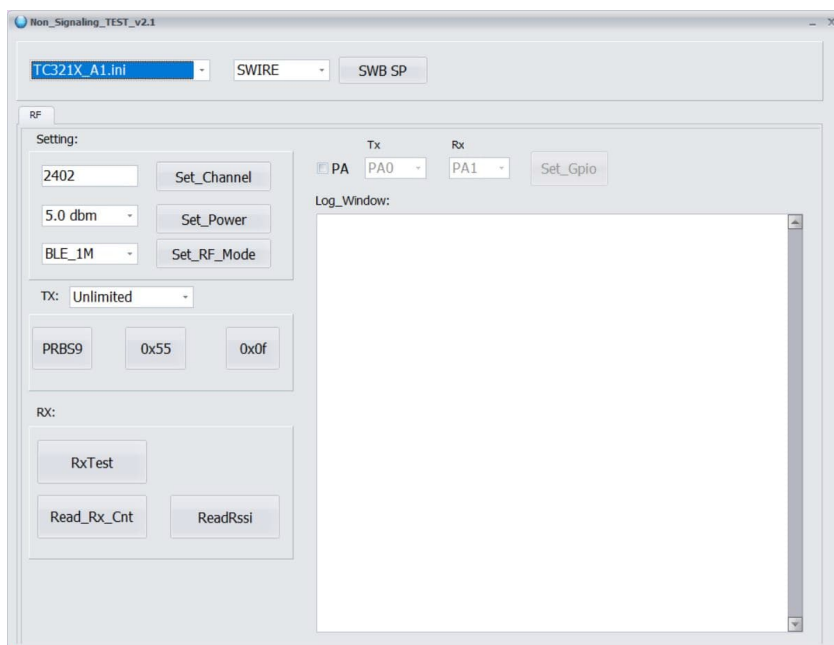
1.4.6 Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel.

☐ Tx Power setting value during test

Band	Rate	Tx Power setting value(dBm)		
		Low	Middle	High
2.4 GHz	1M(37 Byte)	5.0	5.0	5.0

☐ Tx Program



1.4.7 Table for Carrier Frequencies

Channel	Frequency [MHz]	Channel	Frequency [MHz]	Channel	Frequency [MHz]	Channel	Frequency [MHz]
1	2 402	11	2 422	21	2 442	31	2 462
2	2 404	12	2 424	22	2 444	32	2 464
3	2 406	13	2 426	23	2 446	33	2 466
4	2 408	14	2 428	24	2 448	34	2 468
5	2 410	15	2 430	25	2 450	35	2 470
6	2 412	16	2 432	26	2 452	36	2 472
7	2 414	17	2 434	27	2 454	37	2 474
8	2 416	18	2 436	28	2 456	38	2 476
9	2 418	19	2 438	29	2 458	39	2 478
10	2 420	20	2 440	30	2 460	40	2 480

1.5 Test Equipment List

Type	Manufacturer	Model	S/N	Calibration Company	Calibration Address	Calibration By	Cal.Date	Next.Cal. Date	Calibration Method
Spectrum Analyzer	ROHDE & SCHWARZ	FSV40	101404	KCLAB	6-113, Gundeul-ro, Moga-myeon, Icheon-si, Gyeonggi-do, Republic of Korea	Yoon Kwe Hwan	2025-10-02	2026-10-02	C)
Signal Generator	ROHDE & SCHWARZ	SMB100B	105988	KCLAB		Yoon Kwe Hwan	2025-10-02	2026-10-02	C)
DC Power Supply	ROHDE & SCHWARZ	NGL201	100791	KCLAB		Yoon Kwe Hwan	2026-04-23	2027-04-23	C)
Digital Multimeter	HIOKI	3280-10F	2310B9354	KCLAB		Yoon Kwe Hwan	2026-04-24	2027-04-24	C)
Digital thermometer	SATO	PC-5410TRH	545509	KCLAB		Lee Seung Chan	2025-12-06	2026-12-06	C)

Note:

- 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)

1.6 Summary of Test Results

Test items	Measurement uncertainty
RF Output Power	0.94 dB (95 % Confidence level, $k = 2$)
Power spectral density	0.94 dB (95 % Confidence level, $k = 2$)
Occupied channel bandwidth	0.040 % (95 % Confidence level, $k = 2$)
Transmitter unwanted emissions in the out-of-band domain	1.04 dB (95 % Confidence level, $k = 2$)
Transmitter unwanted emissions in the spurious domain (1 GHz Below)	5.82 dB (The confidence level is about 95 %, $k = 2$)
Transmitter unwanted emissions in the spurious domain (1 GHz Above)	5.02 dB (The confidence level is about 95 %, $k = 2$)
Receiver Spurious Emissions(1 GHz Below)	5.82 dB (The confidence level is about 95 %, $k = 2$)
Receiver Spurious Emissions(1 GHz Above)	5.02 dB (The confidence level is about 95 %, $k = 2$)

1.7 Summary of Test Results

Description of Test	MIC Rule	Reference Clause	Used	Test Result
Frequency Tolerance	Article 2, Paragraph 1, Item 19	Clause 5.1	☒	C
Occupied Bandwidth (99 %) Spread Bandwidth (90 %)	Article 2, Paragraph 1, Item 19	Clause 5.2	☒	C
Antenna Power	Article 2, Paragraph 1, Item 19	Clause 5.3	☒	C
Unwanted emission strength	Article 2, Paragraph 1, Item 19	Clause 5.4	☒	C
RX spurious emission	Article 2, Paragraph 1, Item 19	Clause 5.5	☒	C
Interference Prevention Function	Article 2, Paragraph 1, Item 19	Clause 5.6	☒	C
Compliance/pass : The EUT complies with the essential requirements in the standard. Not Compliance : The EUT does not comply with the essential requirements in the standard. N/A : The test was not applicable in the standard.				

Procedure Reference

MIC Notice No. 88 Appendix No. 43

2. Measurement Results

2.1. Frequency tolerance

2.1.1 Measurement 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

2.1.2 Test Setup



2.1.3 Limit

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

2.1.4 Test environment conditions

• Ambient temperature : (20 ~ 21) °C • Relative Humidity : (45 ~ 46) % R.H.

2.1.5 Measurement Result

LE 1M

Voltage	Frequency [MHz]	Measured Frequency		Limit	Test results
		[MHz]	[ppm]	[ppm]	
DC 4.50 V	2 402	2 401.936	-26.597	50	Compliance
	2 440	2 439.945	-22.740	50	Compliance
	2 480	2 479.944	-22.736	50	Compliance

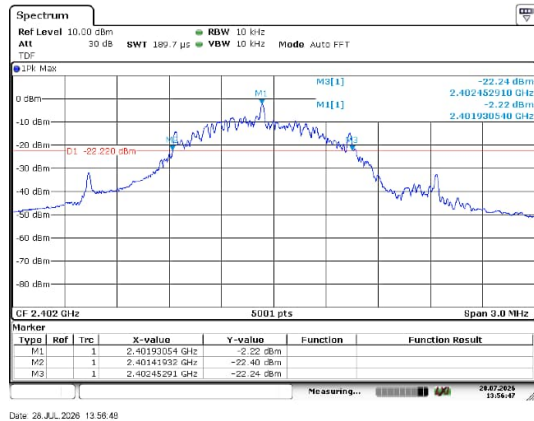
*ppm = [((Measured value (MHz) – Operating frequency (MHz))/ Operating frequency (MHz))] x 10-6

2.1.6 Test Plot

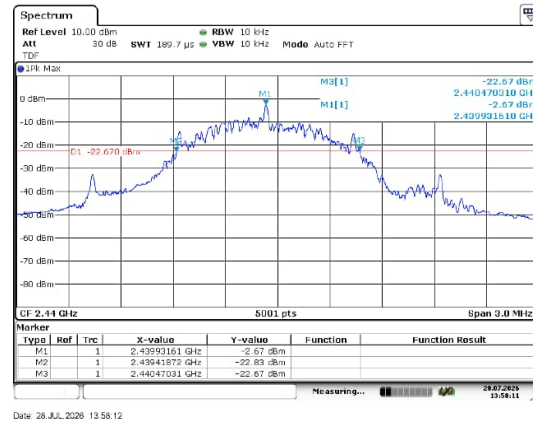
Normal Voltage

LE 1M

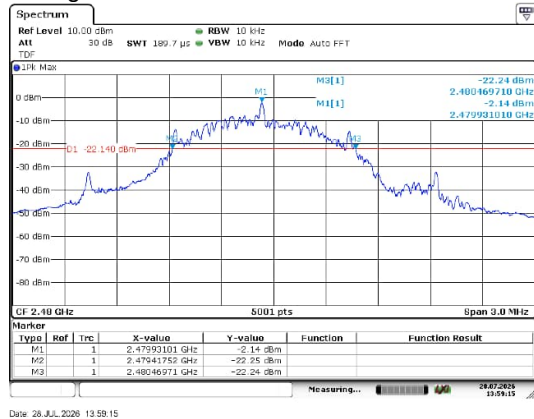
Ch. Low



Ch. Middle



Ch. High



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

2.2.1 Measurement 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: 10 MHz

Sweep time: Auto

Detector mode: Positive Peak

Trace Mode: Max. hold

2.2.2 Test Setup



2.2.3 Limit

Occupied Bandwidth (99 %): 26 MHz or less

Spread Bandwidth (90 %): 500 kHz more

Spreading Factor: 5 or more

2.2.4 Test environment conditions

• Ambient temperature : (20 ~ 21) °C • Relative Humidity : (45 ~ 46) % R.H.

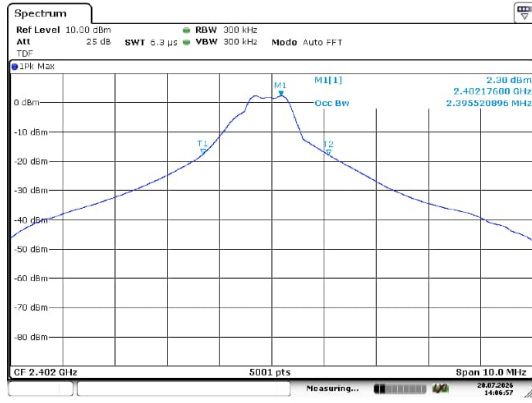
2.2.5 Measurement Result

LE 1M

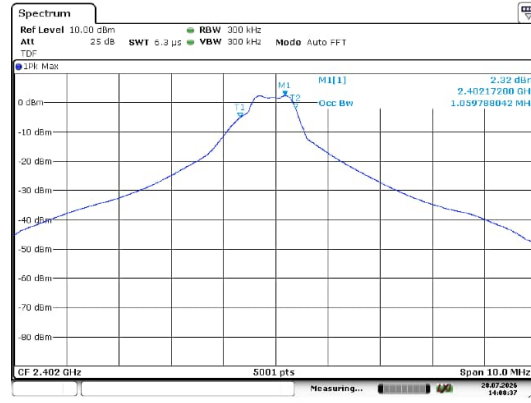
Voltage	2 402 MHz	2 440 MHz	2 480 MHz	Limit	Test results
	99 % [MHz]	99 % [MHz]	99 % [MHz]		
DC 4.50 V	2.396	2.296	2.188	26 MHz or less	Compliance
Voltage	90 % [MHz]	90 % [MHz]	90 % [MHz]	Limit	Test results
DC 4.50 V	1.060	1.040	1.032	500 kHz or more	Compliance

2.2.6 Test Plot Normal Voltage LE 1M

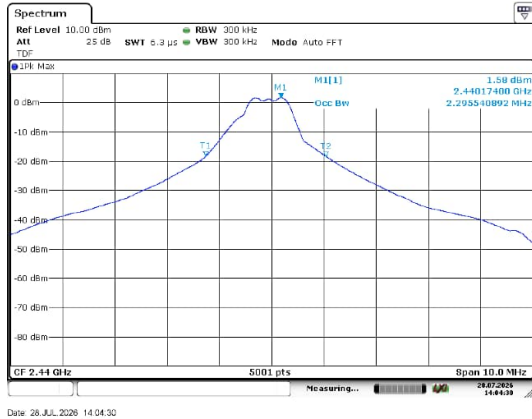
99 %
 Ch. Low



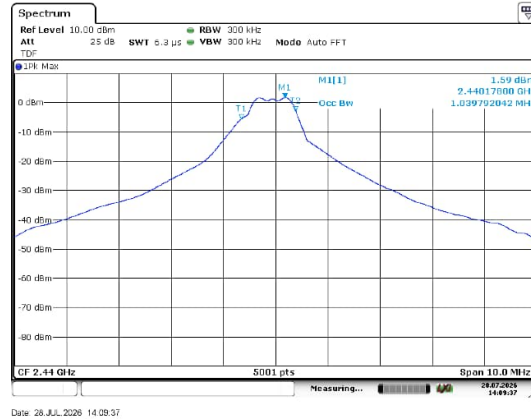
90 %
 Ch. Low



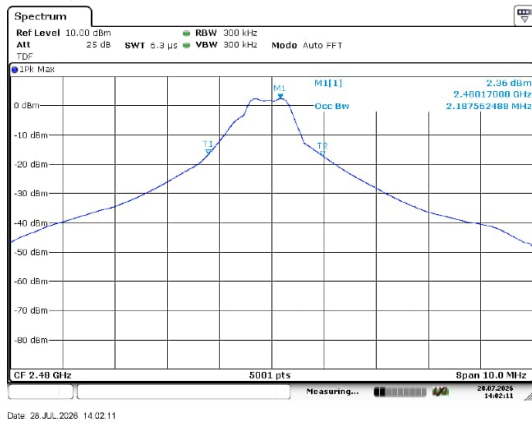
Ch. Middle



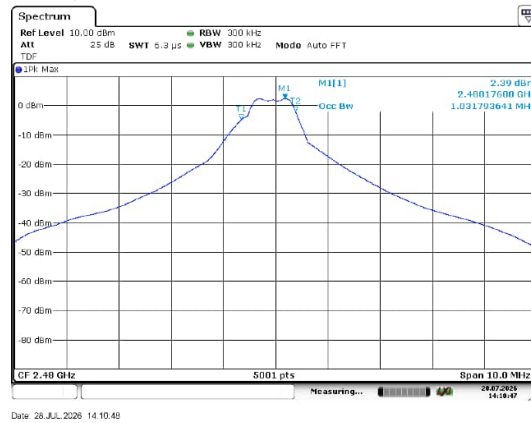
Ch. Middle



Ch. High



Ch. High



2.3. Antenna Power

2.3.1 Measurement Procedure

The transmitter output is connected to the Spectrum analyzer.

Setting the spectrum analyzer is as follows.

Center Frequency: Operating frequency

Resolution BW: 3 MHz(greater than 99% OBW)

Video BW: 3 MHz

Span: 5 MHz

Sweep time: Auto

Detector mode: RMS

Trace Mode: Max. hold

Measurement Function: Integrated Power (Total Power within 99% OBW)

2.3.2 Test Setup



2.3.3 Limit

Output power: 0.01 W or Below

Output power tolerance: -80 ~ 20 %

2.3.4 Test environment conditions

- Ambient temperature : (20 ~ 21) °C • Relative Humidity : (45 ~ 46) % R.H.

2.3.5 Measurement Result

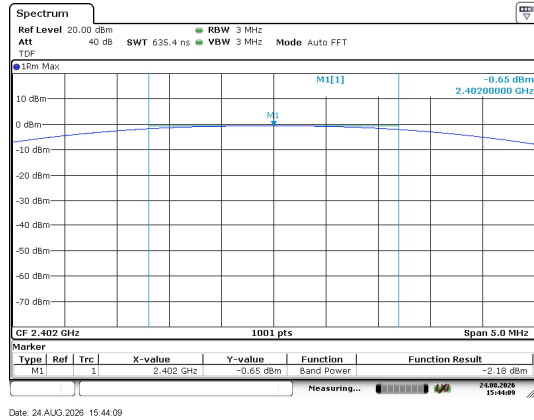
LE 1M

Voltage	Frequency [MHz]	Measure value		Power tolerance [%]
		[dBm]	[mW]	
DC 4.50 V	2 402	-2.180	0.605	+0.890
	2 440	-2.780	0.527	-12.128
	2 480	-1.770	0.665	+10.879
Declared power [mW]		0.600		
Antenna gain [dBi]		-1.024		
Limit		-80 ~ 20 %		

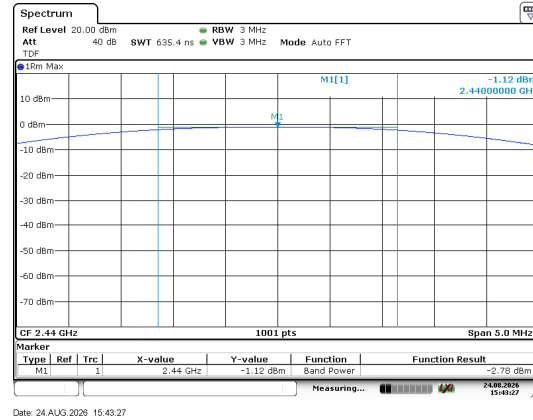
* Power tolerance (%) = [(Measure value – Declared power) / Declared power] x 100

2.3.6 Test Plot Normal Voltage LE 1M

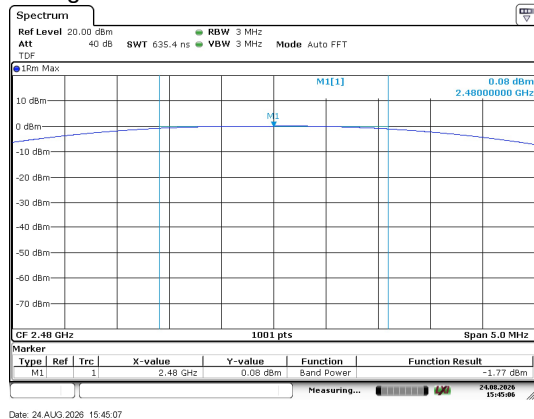
Ch. Low



Ch. Middle



Ch. High



2.4. Unwanted emission strength

2.4.1 Measurement Procedure

Connect transmitter output to the spectrum analyzer input port.

The EUT should be transmitting at hopping mode

Unwanted emission strength is measured by following setting:

Set the spectrum analyzer RBW: 1 MHz, VBW: same as RBW, Sweep time: auto
Start: 30 MHz, Stop: 2 387 MHz. Sweep mode: single and mark highest level.

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.

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.

Set the spectrum analyzer RBW: 1 MHz, VBW: 1 MHz, Sweep time: auto
Start: 2 496.5 MHz, Stop: 12.5 GHz. Sweep mode: single and mark highest level.

Detector mode : Peak mode.

2.4.2 Test Setup



2.4.3 Limit

Spurious Emission/Unwanted Emission Strength Spurious area	30 MHz ~ 2 387 MHz : 2.5 uW/MHz or less 2 387 MHz ~ 2 400 MHz : 25 uW/MHz or less 2 483.5 MHz ~ 2 496.5 MHz : 25 uW/MHz or less 2 496.5 MHz ~ 12.5 GHz : 2.5 uW/MHz or less
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2.4.4 Test environment conditions

- Ambient temperature : (20 ~ 21) °C • Relative Humidity : (45 ~ 46) % R.H.

2.4.5 Measurement Result

LE 1M

Voltage	Frequency [MHz]	Frequency Range [MHz]	Measure value			Limit [uW/MHz]
			[MHz]	[dBm]	[uW/MHz]	
DC 4.50 V	2 402	30 ~ 2 387	2 353.819	-42.26	0.059	2.5
		2 387 ~ 2 400	2 400.000	-28.85	1.303	25
		2 483.5 ~ 2 496.5	2 494.309	-40.75	0.084	25
		2 496.5 ~ 12 500	12 000.841	-28.70	1.349	2.5
	2 440	30 ~ 2 387	2 368.255	-50.24	0.009	2.5
		2 387 ~ 2 400	2 392.098	-40.59	0.087	25
		2 483.5 ~ 2 496.5	2 487.702	-36.82	0.208	25
		2 496.5 ~ 12 500	12 198.730	-29.65	1.084	2.5
	2 480	30 ~ 2 387	2 383.354	-53.96	0.004	2.5
		2 387 ~ 2 400	2 397.390	-53.35	0.005	25
		2 483.5 ~ 2 496.5	2 483.500	-27.66	1.714	25
		2 496.5 ~ 12 500	7 439.330	-30.74	0.843	2.5

* Measure value [uW/MHz] = $10^{(\text{Measure value[dBm]} / 10)} * 1000$

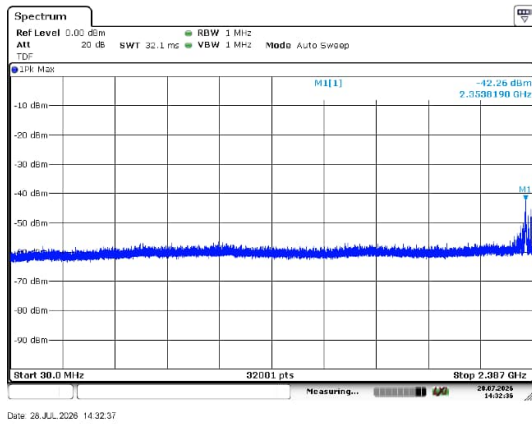
2.4.6 Test Plot

Normal Voltage

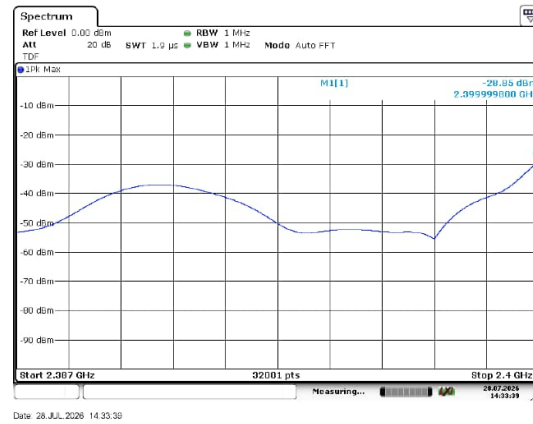
LE 1M

Low Channel

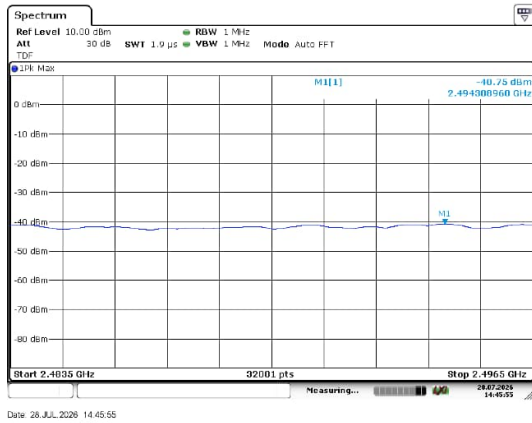
30 MHz ~ 2 387 MHz



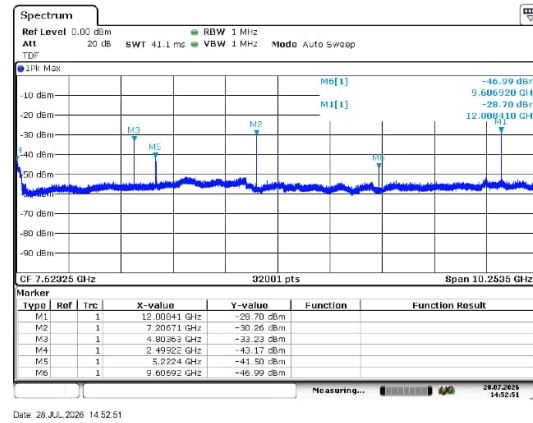
2 387 MHz ~ 2 400 MHz



2483.5 MHz ~ 2 496.5 MHz

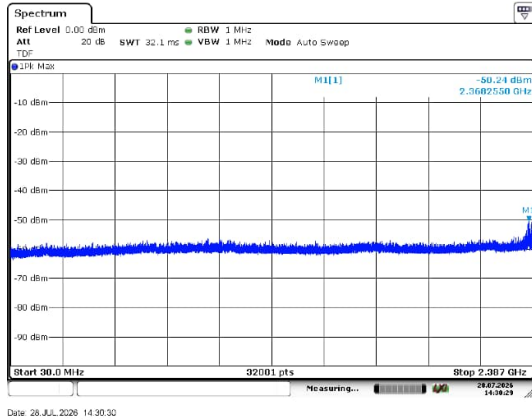


2 496.5 MHz ~ 12 500 MHz

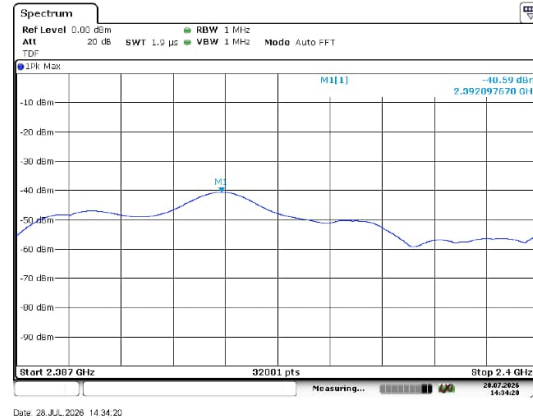


Middle Channel

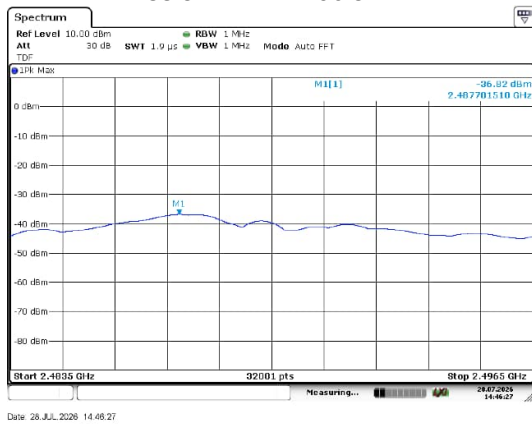
30 MHz ~ 2 387 MHz



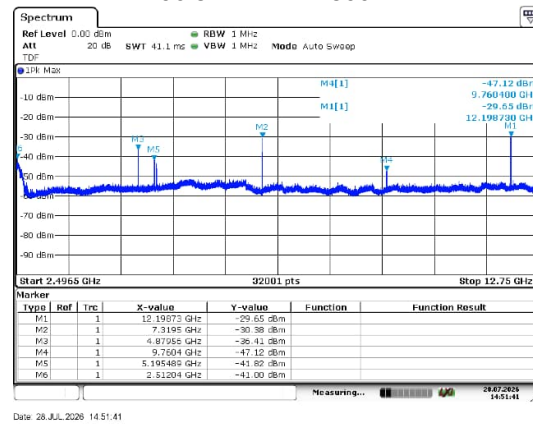
2 387 MHz ~ 2 400 MHz



2483.5 MHz ~ 2 496.5 MHz

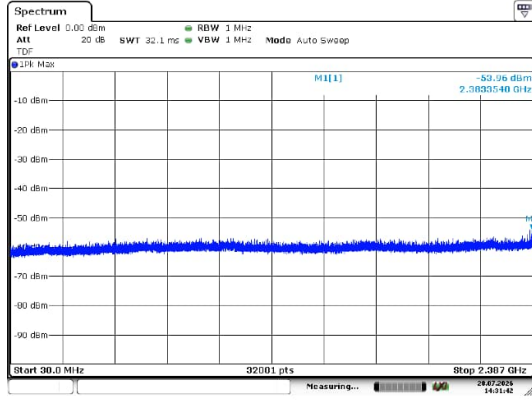


2 496.5 MHz ~ 12 500 MHz

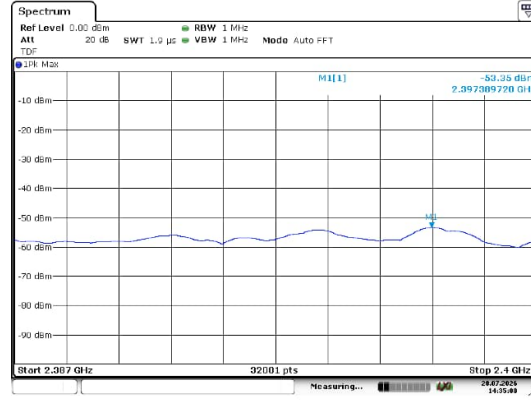


High Channel

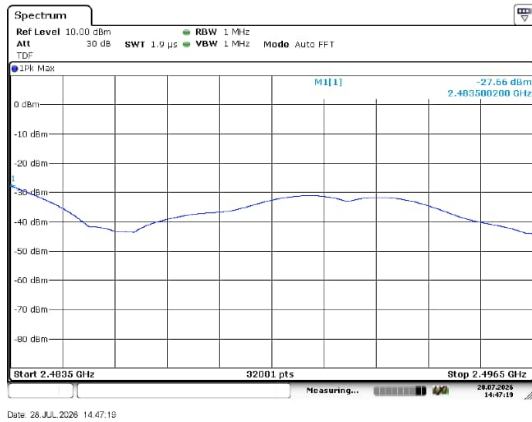
30 MHz ~ 2 387 MHz



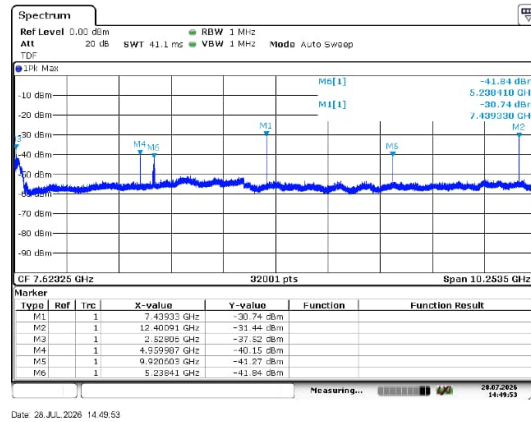
2 387 MHz ~ 2 400 MHz



2483.5 MHz ~ 2 496.5 MHz



2 496.5 MHz ~ 12 500 MHz



2.5. RX spurious emission

2.5.1 Measurement Procedure

Connect transmitter output to the spectrum analyzer input port.

The EUT should be transmitting at hopping mode

Unwanted emission strength is measured by following setting:

Set the spectrum analyzer RBW: 100 kHz, VBW: 300 kHz, Sweep time: auto
Start: 30 MHz, Stop: 1 000 MHz. Max hold view and mark highest level.

Set the spectrum analyzer RBW: 1 MHz, VBW: 1 MHz, Sweep time: auto
Start: 1 000 MHz, Stop: 12.5 GHz. Max hold view and mark highest level.

Detector mode : Peak mode.

2.5.2 Test Setup



2.5.3 Limit

Below 1 GHz: 4 nW (-55 dBm) or less

Above 1 GHz: 20 nW (-48 dBm) or less

2.5.4 Test environment conditions

- Ambient temperature : (20 ~ 21) °C • Relative Humidity : (45 ~ 46) % R.H.

2.5.5 Measurement Result

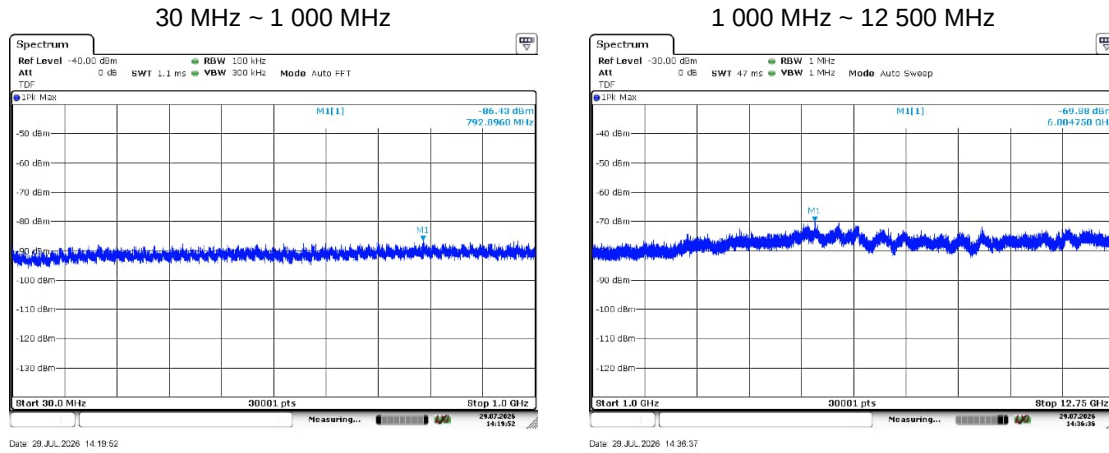
LE 1M

Voltage	Frequency [MHz]	Frequency Range [MHz]	Measure value			Limit [nW]
			[MHz]	[dBm]	[nW]	
DC 4.50 V	2 402	30 ~ 1 000	792.896	-86.43	0.002	4
		1 000 ~ 12 500	6 004.750	-69.88	0.103	20
	2 440	30 ~ 1 000	742.425	-85.98	0.003	4
		1 000 ~ 12 500	6 493.920	-69.18	0.121	20
	2 480	30 ~ 1 000	881.680	-85.99	0.003	4
		1 000 ~ 12 500	6 482.560	-70.22	0.095	20

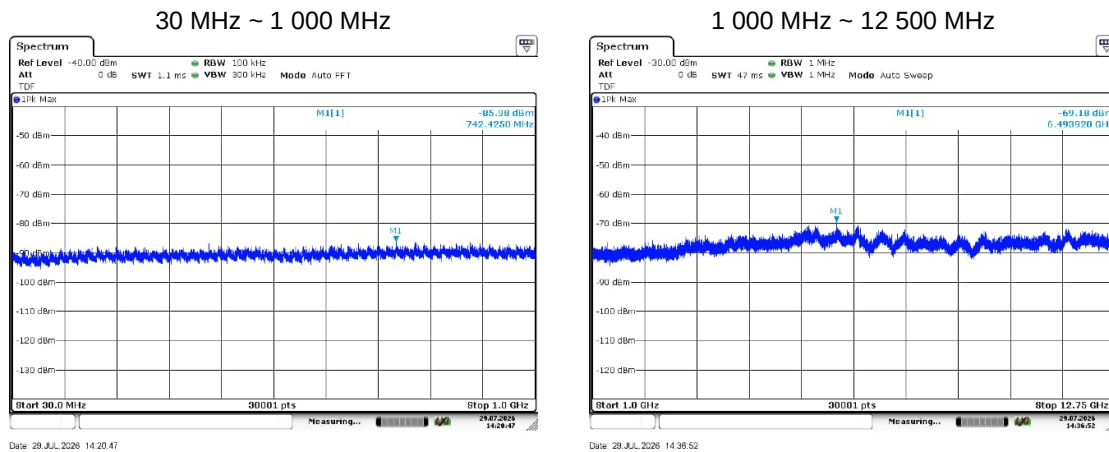
* Measure value [nW] = $10^{(\text{Measure value [dBm]} / 10)} * 1000000$

2.5.6 Test Plot
Normal Voltage
LE 1M

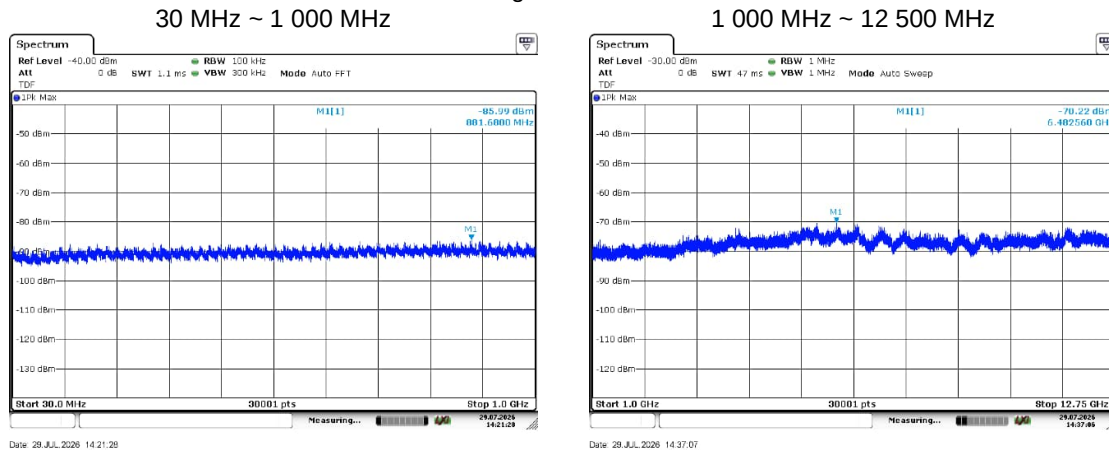
Low Channel



Middle Channel

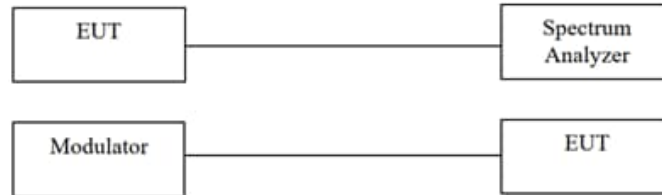


High Channel



2.6. Interference prevention function

2.6.1 Test Setup



2.6.2 Limit

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

2.6.3 Test environment conditions

- Ambient temperature : (20 ~ 21) °C • Relative Humidity : (45 ~ 46) % R.H.

2.6.4 Measurement Result

Test Power:	Normal Voltage
Test Mode:	LE
Test Result:	Good