



TEST REPORT



Report No. : KES-RF260356-R1

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KES Co., Ltd.

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■ J-MIC TEST REPORT

1. Client

- Name : HUINNO Co., Ltd.
- Address : 3F, 4F, 19, Apgujeong-ro 79-gil, Gangnam-gu, Seoul, South Korea

2. Sample Description

- Product item : MEMO Patch M
- Model name : MPT-E08R-UNC02
- Manufacturer etc. : HUINNO Co., Ltd.

3. Date of test : 2026.06.23 ~ 2026.08.12

4. Location of Test : ☒ Permanent Testing Lab ☐ On Site Testing

- Address : 473-21, Gayeo-ro, Yeoju-si, Gyeonggi-do, 12658, Rep. of Korea

5. Test method used : MIC Notice No.88 Appendix No.43.

6. Test result : PASS

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

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This test report is not related to KOLAS accreditation.

Affirmation	Tested by	Technical Manager
	Name : Gu-Bong, Kang (Signature)	Name : Yeong-Jun Cho (Signature)

[김구봉]2026/08/21

[조영준]2026/08/21

2026. 08. 21.

KES Co., Ltd.



REPORT REVISION HISTORY

Date	Test Report No.	Revision History
2026.08.14	KES-RF260356	Initial
2026.08.21	KES-RF260356-R1	Corrected Test Setup & Test procedure at '3.3 RF output power'

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1. General information

Applicant: HUINNO Co., Ltd.
Applicant address: 3F, 4F, 19, Apgujeong-ro 79-gil, Gangnam-gu, Seoul, South Korea
Test site: KES Co., Ltd.
Test site address: ☐ #3002, #3503, #3701, 40, Simin-daero365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Rep. of Korea
☒ 473-21, Gayeo-ro, Yeoju-si, Gyeonggi-do, 12658, Rep. of Korea
Standard: ARIB STD-T66
J-MIC Radio law: Article 2 Paragraph 1 of Item 19
Test device serial No.: ☒ Production ☐ Pre-production ☐ Engineering

1.1. EUT description

Equipment under test: MEMO Patch M
Frequency range & Number of channels: 2 402 Mhz ~ 2 480 Mhz (LE 1/2 Mbps) : 40 ch
Model: MPT-E08R-UNC02
Modulation technique: GFSK
Antenna specification: Chip Antenna // Peak gain: 1.99 dBi
Power source: DC 3.0 V (Battery)
H/W version: 1.0.0
S/W version: 1.3.0
F/W version: 1.0.0

**1.2. Information about derivative model**

N/A

1.3. Accessory information

Equipment	Manufacturer	Model	Serial No.	Power source
MEMO Patch M	HUINNO Co., Ltd.	MPT-E08R-UNC02	-	DC 3.0 V (Battery)
Electrode Bracket	-	-	-	-
Battery Cover Opener	-	-	-	-
Quick Guide	-	-	-	-

1.4. Device modifications

N/A

1.5. Worst case data rate

N/A

1.6. Measurement Uncertainty

Test Item	Uncertainty
Uncertainty for Conducted Frequency Tolerance test	10 Hz
Uncertainty for Conducted Bandwidth test	385 420 Hz
Uncertainty for Conducted Output power test	1.06 dB
Uncertainty for Conducted Transmitter Spurious Emission test	0.85 dB
Note. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.	



1.7. Sample calculation

Where relevant, the following sample calculation is provided
For all conducted test items :

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 0.65 + 20 = 20.65 \text{ (dB)}\end{aligned}$$

For Radiation test :

$$\text{Field strength level (dB } \mu\text{V/m)} = \text{Measured level (dB } \mu\text{V)} + \text{Antenna factor (dB)} + \text{Cable loss (dB)} - \text{Amplifier gain (dB)}$$

1.8 Frequency/channel operations

Ch.	Frequency (MHz)	Mode
00	2 402	LE 1 Mbps LE 2 Mbps
:	:	:
39	2 480	LE 1 Mbps LE 2 Mbps

Note.

This test report is prepared according to the requirements of ISO/IEC 17025.

1.9. Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- Standards:
Certification Ordinance Article 2 Clause 1 Item19
- Test Methods:
Ministry of Internal Affairs and Communications Notification Article 88 Appendix 43 Certification



2. Summary of tests

Parameter	Test results
Frequency Tolerance	Pass
Occupied Bandwidth	Pass
RF Output Power	Pass
Transmitter Spurious Emission	Pass
Secondary radiated emissions	Pass
Anti-interference function	Pass

Note:

1. By the request of the applicant, test was performed with condition below:

Mode	Frequency (MHz)	Power Setting value
LE 1 Mbps	2 402 MHz ~ 2 480 MHz	8
LE 2 Mbps	2 402 MHz ~ 2 480 MHz	8



3. Test results

3.1. Frequency tolerance

Test setup



Test procedure

- (1) In case of unmodulated wave (serial or continuous burst), measure the frequency with frequency counter directly.
- (2) In case of burst wave, measure sufficient time and average with measured results.
- (3) In case of others, measure characteristic frequency with spectrum analyzer.

Limit

Permission deviation $\pm 50 \times 10^{-6}$

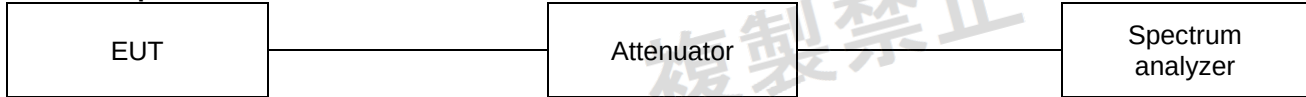
Test results

Test voltage		Test mode	Frequency (MHz)	Measure frequency (MHz)	Frequency deviation (Hz)	Deviation (ppm)	Verdict
(%)	(V)						
110	DC 3.3	LE 1 Mbps	2 402	2 402.011 747	11 747	4.89	Pass
100	DC 3.0			2 402.011 907	11 907	4.96	Pass
90	DC 2.7			2 402.011 777	11 777	4.90	Pass
110	DC 3.3		2 480	2 480.011 861	11 861	4.78	Pass
100	DC 3.0			2 480.011 914	11 914	4.80	Pass
90	DC 2.7			2 480.011 938	11 938	4.81	Pass
110	DC 3.3	LE 2 Mbps	2 402	2 402.011 720	11 720	4.88	Pass
100	DC 3.0			2 402.011 687	11 687	4.87	Pass
90	DC 2.7			2 402.011 666	11 666	4.86	Pass
110	DC 3.3		2 480	2 480.011 881	11 881	4.79	Pass
100	DC 3.0			2 480.011 902	11 902	4.80	Pass
90	DC 2.7			2 480.011 955	11 955	4.82	Pass



3.2. Occupied Bandwidth

Test setup



Test procedure

Spectrum analyzer is set as follows.

Center frequency : Test frequency

Sweep frequency range : 2 to 3.5 times of tolerances

Resolution bandwidth : Tolerance 3% of the facilities provided in the rules

Video bandwidth : Similar resolution bandwidth

Y axis scale : 10 dB/Div

Input level : Well above the noise level of Spectrum analyzer

Sweep time : The minimum time that measurement accuracy is guaranteed (In case of burst wave, one burst includes per sample)

Sweep mode : Continuous Sweep

Detection mode : Positive Peak (Note)

Display mode : Max Hold (Note)

Note: in case of OFDM and except burst wave is as follows.

Average processing times : More than 10 times

Detection mode : Sample

Limit

Equal or less than 26 MHz.

Test results

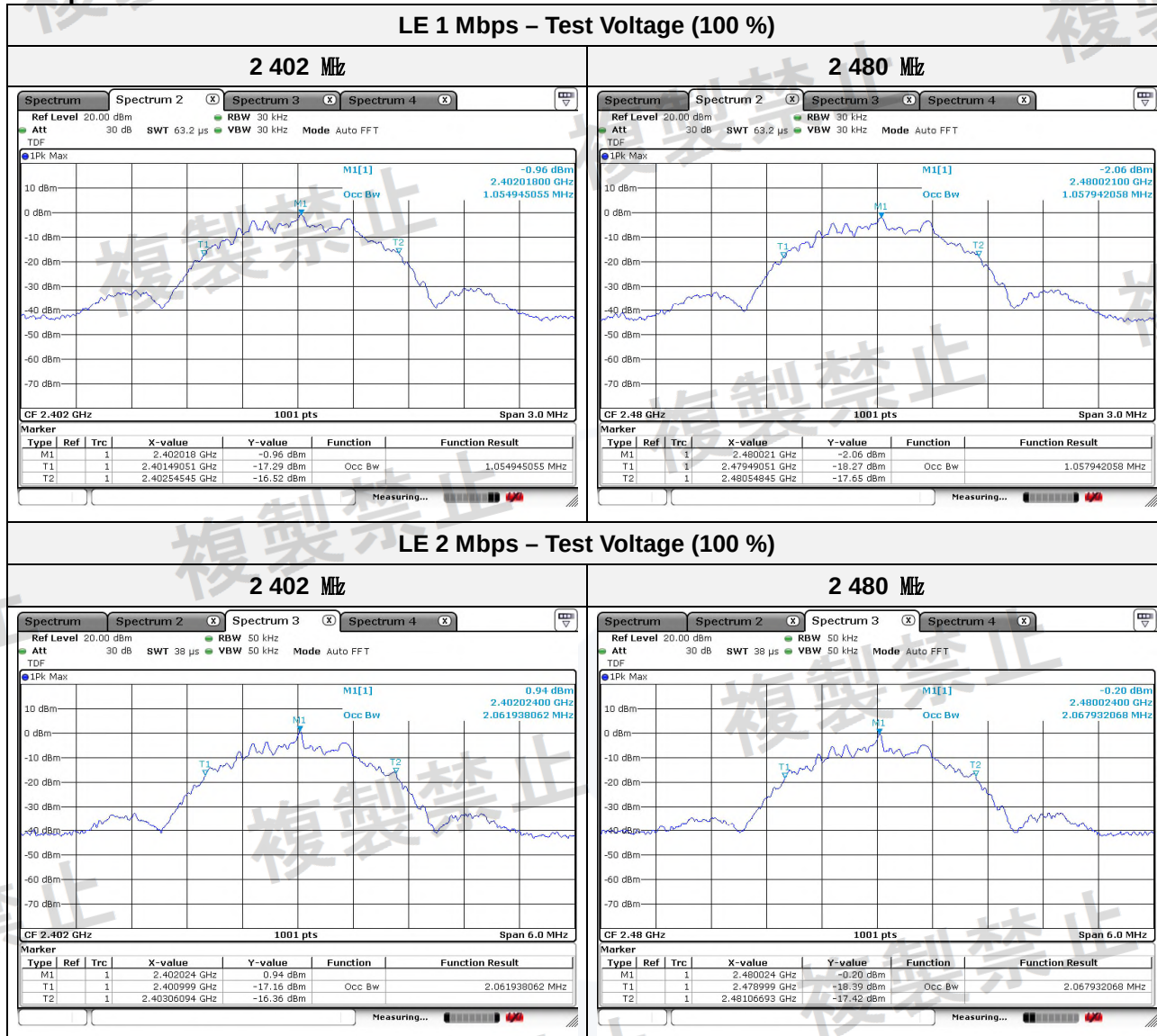
Test voltage		Test mode	Occupied Bandwidth (MHz)		Verdict
(%)	(V)		Frequency (2 402 MHz)	Frequency (2 480 MHz)	
110	DC 3.3	LE 1 Mbps	1.06	1.06	Pass
100	DC 3.0		1.05	1.06	Pass
90	DC 2.7		1.05	1.06	Pass
110	DC 3.3	LE 2 Mbps	2.07	2.08	Pass
100	DC 3.0		2.06	2.07	Pass
90	DC 2.7		2.06	2.07	Pass



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Test plots





3.3. RF output power

Test setup



Test procedure

Appendix 43, 3.4.4 Measurement Procedure, (3) Other

a) Measure "TOTAL RF POWER" (connect an attenuator if required)

b) In case of continuous wave, antenna power is "TOTAL RF POWER"

In case of burst wave, antenna power is "TOTAL RF POWER" × "TX output time ratio"

Limit

Test mode	Rated power (mW)	Upper(mW) / +20%	Limit (mW)
LE 1 Mbps	10.0	12.0	10.0
LE 2 Mbps	10.0	12.0	10.0



Test results

Test voltage		Test mode	Frequency (MHz)	Output power (dBm)	Output power (mW)	E.I.R.P (dBm)	E.I.R.P (mW)	Deviation (%)	Verdict
(%)	(V)								
110	DC 3.3	LE 1 Mbps	2 402	1.10	1.29	3.09	2.04	-87.12	Pass
100	DC 3.0		2 402	1.08	1.28	3.07	2.03	-87.18	Pass
90	DC 2.7		2 402	1.09	1.29	3.08	2.03	-87.15	Pass
110	DC 3.3		2 480	-0.20	0.95	1.79	1.51	-90.45	Pass
100	DC 3.0		2 480	-0.19	0.96	1.80	1.51	-90.43	Pass
90	DC 2.7		2 480	-0.18	0.96	1.81	1.52	-90.41	Pass
110	DC 3.3	LE 2 Mbps	2 402	1.11	1.29	3.10	2.04	-87.09	Pass
100	DC 3.0		2 402	1.09	1.29	3.08	2.03	-87.15	Pass
90	DC 2.7		2 402	1.09	1.29	3.08	2.03	-87.15	Pass
110	DC 3.3		2 480	-0.28	0.94	1.71	1.48	-90.62	Pass
100	DC 3.0		2 480	-0.32	0.93	1.67	1.47	-90.71	Pass
90	DC 2.7		2 480	-0.29	0.94	1.70	1.48	-90.65	Pass

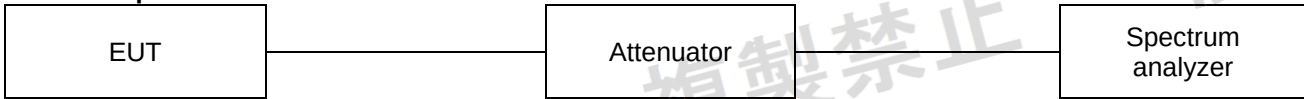
Note.

1. Output power is the result which the Burst Ratio is calculated.
2. E.I.R.P : Output power data + Ant. Max peak gain
3. Antenna gain : 1.99 dBi



3.4. Transmitter spurious emissions

Test setup



Test procedure

Setting of spectrum analyzer to measure spurious emission is as follows.

Sweep frequency range : $2\,387\text{ MHz} > f$ and $2\,496.5\text{ MHz} < f$,

$2\,387\text{ MHz} \leq f \leq 2\,400\text{ MHz}$ and $2\,483.5\text{ MHz} < f \leq 2\,496.5\text{ MHz}$

Resolution bandwidth : 1 MHz

Video bandwidth : Similar resolution bandwidth

Sweep time : The minimum time guaranteed measurement accuracy

Y axis scale : 10 dB/Div

Sweep mode : Single sweep

Detection mode : Positive Peak

Display mode : Maxhold

Limit

1. Less than $2\,387\text{ MHz}$: Equal or less than $2.5\mu\text{W/MHz}$ ($\approx -26\text{ dBm}$)
2. $2\,387\text{ MHz} \sim 2\,400\text{ MHz}$: Equal or less than $25\mu\text{W/MHz}$ ($\approx -16\text{ dBm}$)
3. $2\,483.5\text{ MHz} \sim 2\,496.5\text{ MHz}$: Equal or less than $25\mu\text{W/MHz}$ ($\approx -16\text{ dBm}$)
4. More than $2\,496.5\text{ MHz}$: Equal or less than $2.5\mu\text{W/MHz}$ ($\approx -26\text{ dBm}$)



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Test results

Test item: Less than 2 387 MHz

Test voltage		Test mode	Frequency (MHz)	Measure frequency (MHz)	Level (dBm)	Level (μ W/MHz)	Verdict
(%)	(V)						
110	DC 3.3	LE 1 Mbps	2 402	2 211.58	-58.23	0.002	Pass
100	DC 3.0		2 402	2 317.54	-57.48	0.002	Pass
90	DC 2.7		2 402	1 036.61	-58.59	0.001	Pass
110	DC 3.3		2 480	2 183.32	-58.56	0.001	Pass
100	DC 3.0		2 480	1 396.87	-57.50	0.002	Pass
90	DC 2.7		2 480	1 090.77	-58.97	0.001	Pass
110	DC 3.3	LE 2 Mbps	2 402	2 075.01	-57.71	0.002	Pass
100	DC 3.0		2 402	1 912.54	-57.87	0.002	Pass
90	DC 2.7		2 402	2 197.45	-58.08	0.002	Pass
110	DC 3.3		2 480	2 218.64	-57.74	0.002	Pass
100	DC 3.0		2 480	2 171.55	-58.55	0.001	Pass
90	DC 2.7		2 480	2 206.87	-57.77	0.002	Pass

Test item: 2 387 MHz ~ 2 400 MHz

Test voltage		Test mode	Frequency (MHz)	Measure frequency (MHz)	Level (dBm)	Level (μ W/MHz)	Verdict
(%)	(V)						
110	DC 3.3	LE 1 Mbps	2 402	2 399.99	-31.30	0.741	Pass
100	DC 3.0		2 402	2 399.99	-30.50	0.891	Pass
90	DC 2.7		2 402	2 399.99	-30.75	0.841	Pass
110	DC 3.3		2 480	2 399.72	-54.46	0.004	Pass
100	DC 3.0		2 480	2 399.63	-54.50	0.004	Pass
90	DC 2.7		2 480	2 399.92	-54.71	0.003	Pass
110	DC 3.3	LE 2 Mbps	2 402	2 399.99	-19.82	10.423	Pass
100	DC 3.0		2 402	2 399.99	-19.89	10.257	Pass
90	DC 2.7		2 402	2 399.99	-19.53	11.143	Pass
110	DC 3.3		2 480	2 399.73	-53.86	0.004	Pass
100	DC 3.0		2 480	2 399.82	-54.91	0.003	Pass
90	DC 2.7		2 480	2 399.27	-55.22	0.003	Pass

**Test item: 2 483.5 MHz ~ 2 496.5 MHz**

Test voltage		Test mode	Frequency (MHz)	Measure frequency (MHz)	Level (dBm)	Level (μ W/MHz)	Verdict
(%)	(V)						
110	DC 3.3	LE 1 Mbps	2 402	2 485.84	-56.02	0.003	Pass
100	DC 3.0		2 402	2 485.66	-55.54	0.003	Pass
90	DC 2.7		2 402	2 486.00	-56.02	0.003	Pass
110	DC 3.3		2 480	2 484.81	-44.48	0.036	Pass
100	DC 3.0		2 480	2 483.58	-40.88	0.082	Pass
90	DC 2.7		2 480	2 483.86	-42.74	0.053	Pass
110	DC 3.3	LE 2 Mbps	2 402	2 486.16	-56.05	0.002	Pass
100	DC 3.0		2 402	2 486.21	-55.56	0.003	Pass
90	DC 2.7		2 402	2 492.70	-55.53	0.003	Pass
110	DC 3.3		2 480	2 483.61	-42.84	0.052	Pass
100	DC 3.0		2 480	2 483.53	-42.36	0.058	Pass
90	DC 2.7		2 480	2 483.52	-42.85	0.052	Pass

Test item: More than 2 496.5 MHz

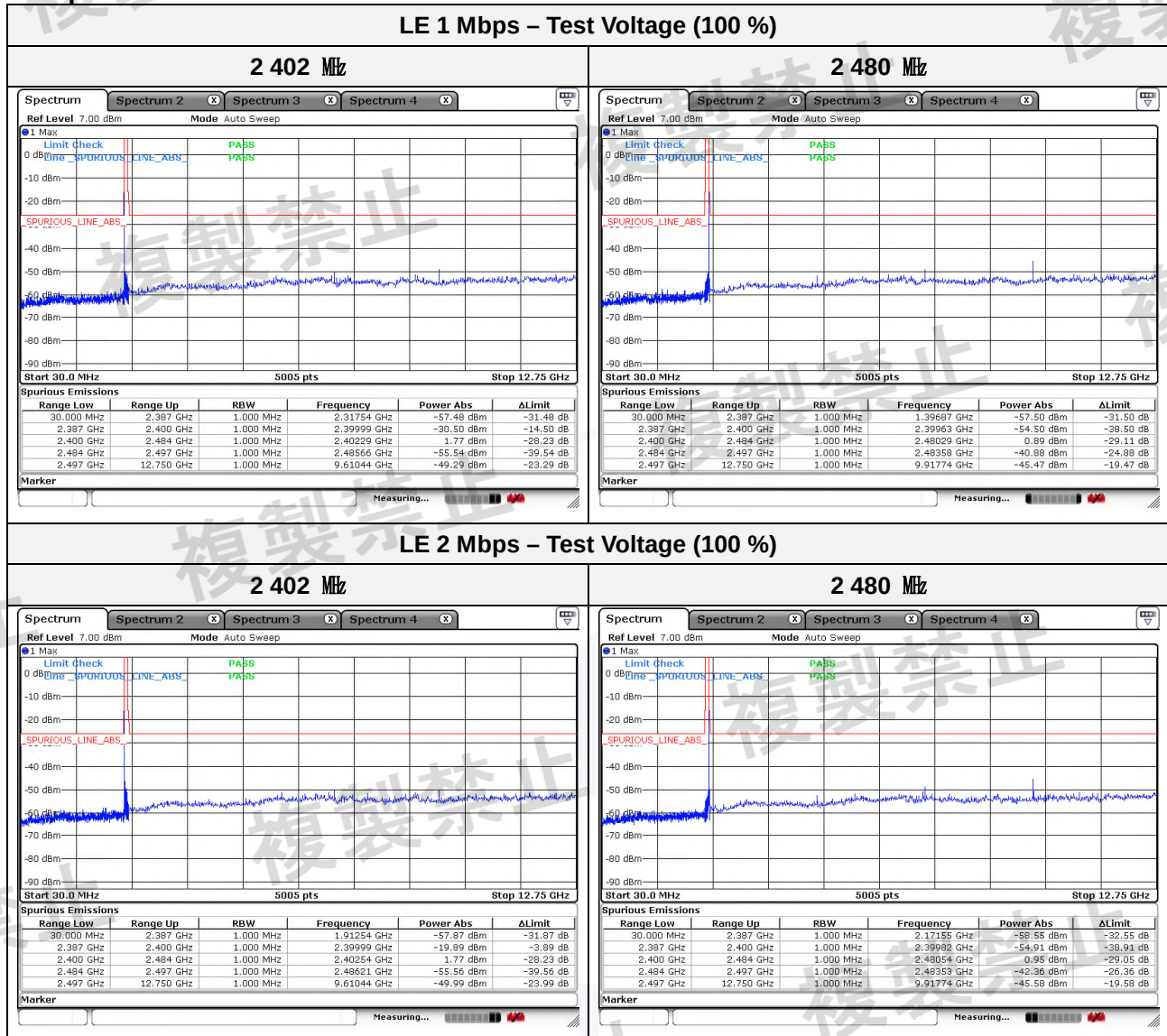
Test voltage		Test mode	Frequency (MHz)	Measure frequency (MHz)	Level (dBm)	Level (μ W/MHz)	Verdict
(%)	(V)						
110	DC 3.3	LE 1 Mbps	2 402	9 610.44	-49.53	0.011	Pass
100	DC 3.0		2 402	9 610.44	-49.29	0.012	Pass
90	DC 2.7		2 402	9 610.44	-49.58	0.011	Pass
110	DC 3.3		2 480	9 917.74	-44.77	0.033	Pass
100	DC 3.0		2 480	9 917.74	-45.47	0.028	Pass
90	DC 2.7		2 480	9 917.74	-45.37	0.029	Pass
110	DC 3.3	LE 2 Mbps	2 402	9 610.44	-50.66	0.009	Pass
100	DC 3.0		2 402	9 610.44	-49.99	0.010	Pass
90	DC 2.7		2 402	9 610.44	-49.31	0.012	Pass
110	DC 3.3		2 480	9 917.74	-45.55	0.028	Pass
100	DC 3.0		2 480	9 917.74	-45.58	0.028	Pass
90	DC 2.7		2 480	9 917.74	-45.26	0.030	Pass



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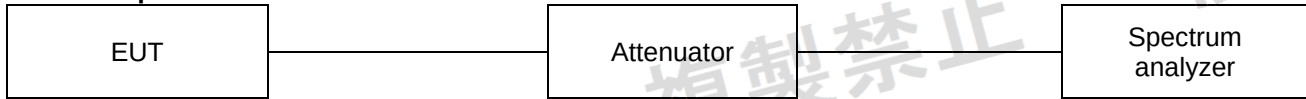
Test plots





3.5. Secondary radiated emissions

Test setup



Test procedure

(1) Setting of spectrum analyzer is as follows while searching a spurious emission.

Sweep frequency range : From 30 MHz up to 12.5 GHz

Resolution bandwidth : Less than 1 GHz : 100 kHz, 1 GHz or more : 1 MHz

Video bandwidth : Same as resolution bandwidth

Sweep time : The minimum time guaranteed measurement accuracy

Y axis scale : 10 dB/Div

Sweep mode : Single sweep

Detection mode : Positive Peak

(2) Setting of spectrum analyzer is as follows while measuring a spurious emission.

Center frequency : Detected spurious frequency

Sweep frequency range : 0 Hz

Resolution bandwidth : Less than 1 GHz : 100 kHz, 1 GHz or more : 1 MHz

Video bandwidth : Same as resolution bandwidth

Sweep time : The minimum time guaranteed measurement accuracy

Y axis scale : 10 dB/Div

Sweep mode : Single sweep

Detection mode : Sample

Limit

1. Less than 1 GHz : Equal or less than 4 nW($\approx$ -53.98 dBm)

2. 1 GHz ~ less than 12.5 GHz : Equal or less than 20 nW($\approx$ -46.99 dBm)



Test results

Test item: Below 1 GHz

Test voltage		Test mode	Frequency (MHz)	Measure frequency (MHz)	Level (dBm)	Level (nW)	Verdict
(%)	(V)						
110	DC 3.3	LE 1 Mbps	2 402	694.99	-87.52	0.000 002	Pass
100	DC 3.0		2 402	880.86	-88.00	0.000 002	Pass
90	DC 2.7		2 402	907.41	-87.85	0.000 002	Pass
110	DC 3.3		2 480	927.78	-88.42	0.000 001	Pass
100	DC 3.0		2 480	783.65	-87.41	0.000 002	Pass
90	DC 2.7		2 480	602.24	-87.92	0.000 002	Pass
110	DC 3.3	LE 2 Mbps	2 402	873.62	-87.89	0.000 002	Pass
100	DC 3.0		2 402	834.61	-88.17	0.000 002	Pass
90	DC 2.7		2 402	960.94	-87.77	0.000 002	Pass
110	DC 3.3		2 480	346.77	-88.31	0.000 001	Pass
100	DC 3.0		2 480	964.37	-87.62	0.000 002	Pass
90	DC 2.7		2 480	818.21	-87.30	0.000 002	Pass

Test item: Above 1 GHz

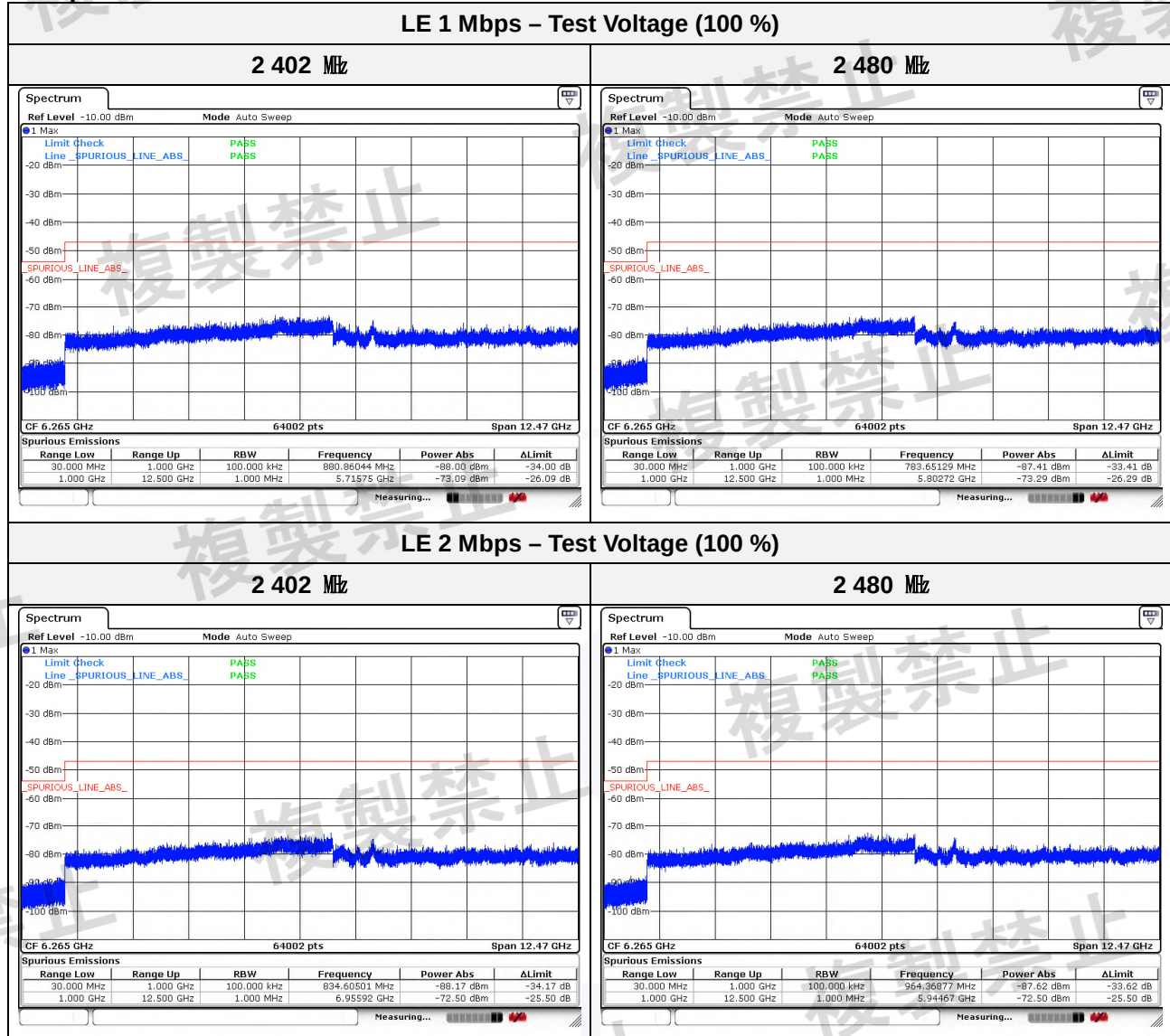
Test voltage		Test mode	Frequency (MHz)	Measure frequency (MHz)	Level (dBm)	Level (nW)	Verdict
(%)	(V)						
110	DC 3.3	LE 1 Mbps	2 402	6 743.53	-72.22	0.000 060	Pass
100	DC 3.0		2 402	5 715.75	-73.09	0.000 049	Pass
90	DC 2.7		2 402	5 805.59	-72.78	0.000 053	Pass
110	DC 3.3		2 480	6 991.49	-72.76	0.000 053	Pass
100	DC 3.0		2 480	5 802.72	-73.29	0.000 047	Pass
90	DC 2.7		2 480	6 620.99	-72.91	0.000 051	Pass
110	DC 3.3	LE 2 Mbps	2 402	5 850.15	-72.14	0.000 061	Pass
100	DC 3.0		2 402	6 955.92	-72.50	0.000 056	Pass
90	DC 2.7		2 402	7 898.17	-72.96	0.000 051	Pass
110	DC 3.3		2 480	5 839.73	-72.87	0.000 052	Pass
100	DC 3.0		2 480	5 944.67	-72.50	0.000 056	Pass
90	DC 2.7		2 480	5 948.26	-73.18	0.000 048	Pass



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Test plots





3.6. Anti-interference function

Test setup



Limit

The identification code shall be 48 bits long.

Test results

Test voltage (V)	Identification code	Verdict
DC 3.0	FE:3B:5C:CF:2C:26	Pass



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Appendix A. Measurement equipment

Equipment 24-2 paragraph4 「ハ」	Manufacturer	Model	Serial No.	Calibration Interval	Calibration Lab	Calibration due.
Spectrum analyzer	R&S	FSVA40	101578	1 year	HCT	2026.09.19
SIGNAL GENERATOR	KEYSIGHT	N5182B	MY59100115	1 year	HCT	2027.04.02
SIGNAL GENERATOR	Anritsu	68369B	002118	1 year	HCT	2027.04.02
Power Meter	Anritsu	ML2495A	2010001	1 year	HCT	2027.04.02
Pulse Power Sensor	Anritsu	MA2411B	1911111	1 year	HCT	2027.04.02
TRUE RMS MULTIMETER	FLUKE	17B	45411826WS	1 year	HCT	2027.06.11
DC POWER SUPPLY	AGILENT	6632B	MY43004090	1 year	HCT	2027.06.08

* Statement of Traceability: KES Co., Ltd. attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

- 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)

Note: The underlined item indicates the calibration method applied for this test.

Peripheral devices

Device	Manufacturer	Model No.	Serial No.
Notebook computer	LG Electronics Inc.,	LGS53	306QCZP560949

The End.