



TEST REPORT



Report No. : KES-RF250081-R2

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KES Co., Ltd.

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■ FCC TEST REPORT

1. Client

- Name : HC KOREA Co.Ltd
- Address : 601,8-3, Suncheondae 3-gil, Suncheon-si, Jeollanam-do, South Korea

2. Sample Description

- Product item : RF Reader Charging Vending Machine
- Model name : HC-KIOSK-9200
- Manufacturer etc. : SOLOMONSystem Co., Ltd.

3. Date of test : 2025.02.11 ~ 2025.12.22

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

- Address : 473-21, Gayeo-ro, Yeosu-si, Gyeonggi-do, Korea

5. Test method used : Part 15.225

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 : Myeong-Ho Lee (Signature)	Name : Yeong-Jun Cho (Signature)

[이명호]2025/12/24

[조영준]2025/12/24

2025. 12. 24.

KES Co., Ltd.

KES-QP16-F01(00-23-01-01)

KES Co., Ltd.

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
2025.10.28	KES-RF250081	Initial
2025.12.23	KES-RF250081-R1	Added note to the AC Conducted Emissions test item (page.7) Added test procedure (page.23) Added mode (page.24) Added Antenna Replaced with RF Dummy Load mode data (page.25) Revised the equipment calibration date. (page.27)
2025.12.24	KES-RF250081-R2	Revised the cable calibration date. (page.27)

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1. General information

Applicant HC KOREA Co.Ltd
Applicant address 601,8-3, Suncheondae 3-gil, Suncheon-si, Jeollanam-do, South Korea
Test site KES Co., Ltd.
Test site address ☐ #3002, #3503, #3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do,14057,Republic of Korea
☒ 473-21, Gayeo-ro, Yeosu-si, Gyeonggi-do, Korea
Test Facility FCC Accreditation Designation No.: KR0100, Registration No.: 444148
FCC rule part(s): FCC : 15.225
FCC ID: 2AU9X-HC-KIOSK-9200
Test device serial No. ☒ Production ☐ Pre-production ☐ Engineering

1.1. EUT description

Equipment under test RF Reader Charging Vending Machine
Frequency range Ant 1 : 13.559 9 Mhz (NFC)
Ant 2 : 13.561 8 Mhz (NFC)
Model HC-KIOSK-9200
Variant Model: -
Modulation technique ASK
Frequency range & Number of channels 13.559 9, 13.561 8 Mhz (NFC) : 2 ch
Antenna specification Ant 1 : Loop Antenna
Ant 2 : Loop Antenna
Power source AC 120 V
H/W Version HCKIOSK-9200 V0.1
S/W Version HCKIOSK-9200 V0.1

**1.2. Test configuration**

The **HC KOREA Co.Ltd // RF Reader Charging Vending Machine // HC-KIOSK-9200 //FCC ID: 2AU9X-HC-KIOSK-9200 //** was tested according to the specification of EUT, the EUT must comply with following standards

FCC Part 15.225
FCC Part 2
ANSI C63.10-2020

1.3. Information about derivative model

N/A

1.4. Accessory information

Equipment	Manufacturer	Model	Serial No.	Power source
NFC Card	-	-	-	-

1.5. Sample calculation

Where relevant, the following sample calculation is provided

For Radiation test :

Field strength level (dB μ V/m) = Measured level (dB μ V) + Antenna factor (dB) + Cable loss (dB) – Amplifier gain (dB)

1.6. Measurement Uncertainty

Test Item		Uncertainty
Uncertainty for Conduction emission test		2.22 dB (SHIELD ROOM #6)
Uncertainty for Radiation emission test (include Fundamental emission)	Below 1GHz	4.04 dB (SAC #6)
	Above 1GHz	5.32 dB (SAC #5)
Note. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.		



1.7. Frequency/channel operations

Ch.	Frequency (MHz)	Rate(Mbps)
01	13.559 9	NFC
02	13.561 8	





2. Summary of tests

Section in FCC Part 15 & 2	Parameter	Test results
-	99% Occupied Bandwidth	Pass
15.225(a)	The field strength of fundamental	Pass
15.225(b)(c)	The field strength of spurious emission(In-band)	Pass
15.225(d) 15.209	The field strength of spurious emission(Out-band)	Pass
2.1049	20 dB bandwidth	Pass
15.225(e)	Frequency stability	Pass
15.207	AC conducted emissions	Pass ^{Note.1}
15.203	Antenna Requirement	Pass

Note:

- The test was performed using the procedure described below
Devices Operating Below 30 MHz
For an intentional radiator with an antenna operating at or below 30 MHz, the FCC compliance can be demonstrated via measurements performed with a suitable dummy load in lieu of the antenna under the following conditions:
 - (1) the ac power line conducted tests are performed with the antenna connected to determine compliance with Section 15.207 limits outside the transmitter's fundamental emission band, and
 - (2) an additional test with a dummy load in lieu of the antenna is performed to determine compliance with Section 15.207 limits within the transmitter's fundamental emission band. For a detachable antenna, the antenna needs to be removed, and a suitable dummy load must be connected to the antenna connector. For a permanent antenna, one needs to remove the antenna and terminate the RF output with a dummy load or network that simulates the antenna in the fundamental frequency band.
 - (3) All measurements must be performed as specified in clause 6.2 of ANSI C63.10-2020.
- The product is designed so that ANT1 and ANT2 always operate simultaneously. therefore, testing was conducted with both antennas operating at the same time.



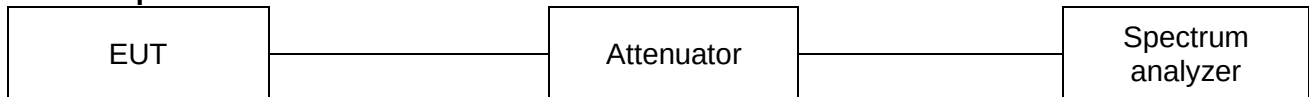
3 Test results

3.1. 99% Occupied Bandwidth

Test procedure

ANSI C63.10-2020 clause 6.9.2 and 6.9.3

Test setup

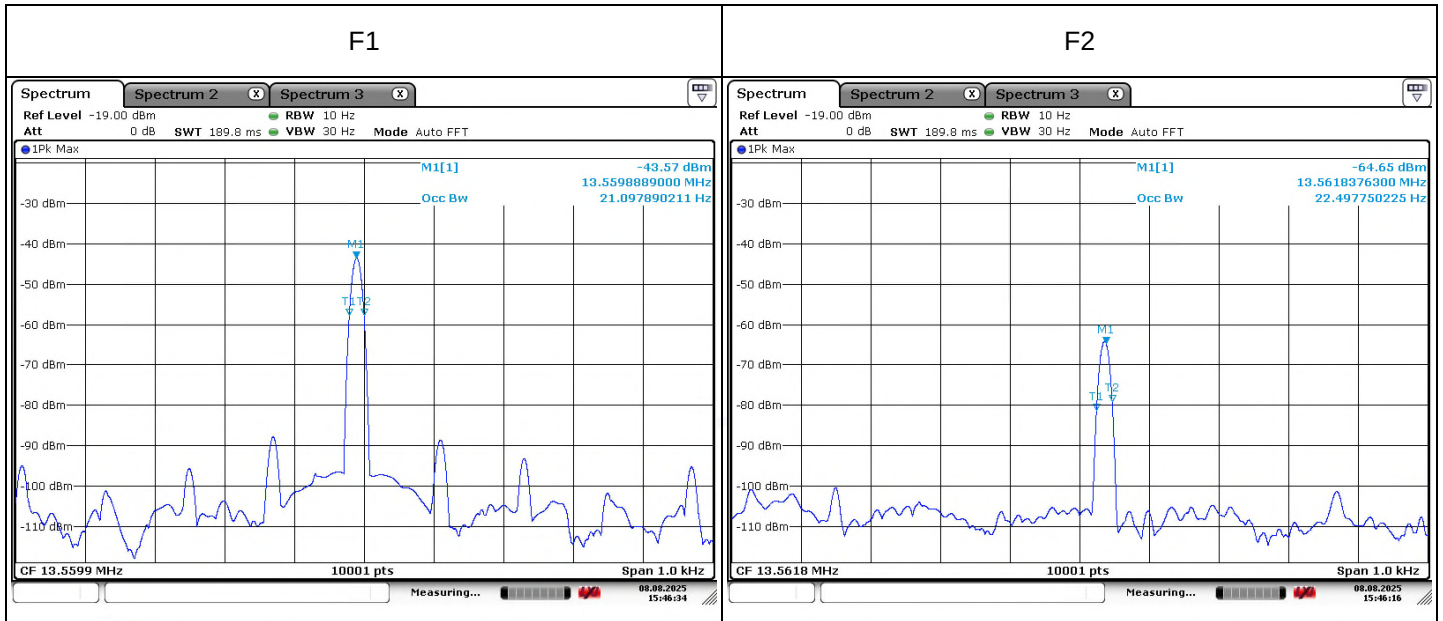


Test setting

1. Span = The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.
2. RBW = The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW
3. VBW = shall be approximately three times the RBW
4. Sweep = auto
5. Detector function = Peak
6. Trace = Max hold

Limit

None; for reporting purpose only.

**Test results****Note.**

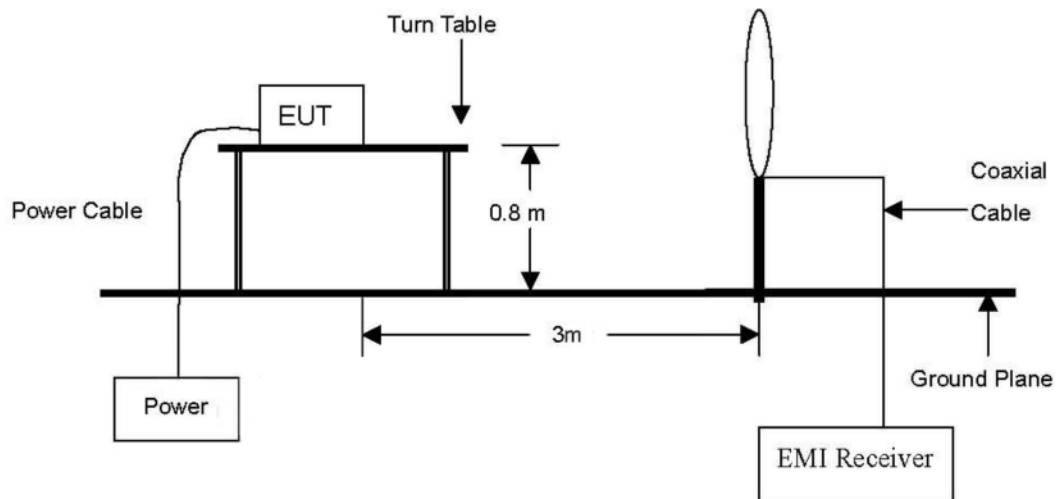
Because the measured signal is CW/CW-like, adjusting the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW.



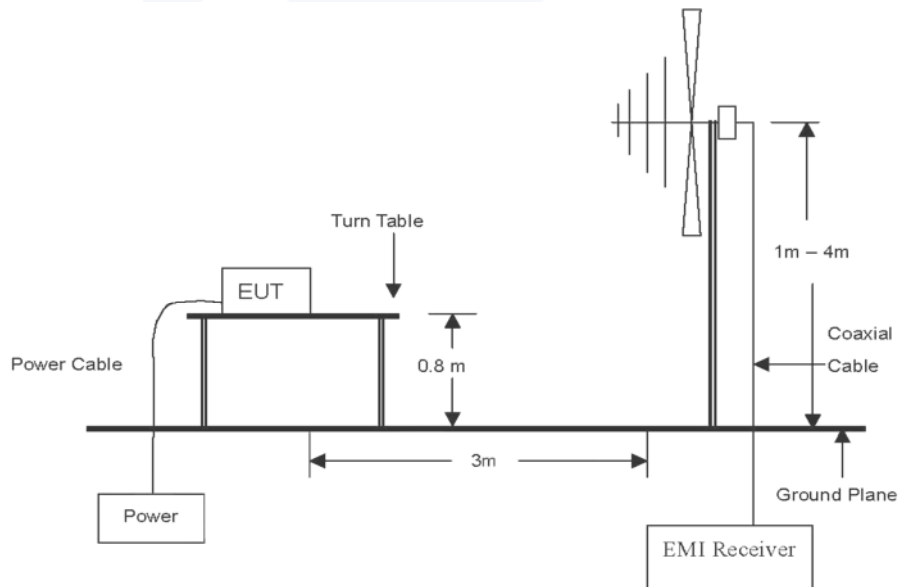
3.2. Radiated spurious emissions

Test setup

The diagram below shows the test setup that is utilized to make the measurements for emission from 9 kHz to 30 MHz Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz emissions.





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Test procedure

[9 kHz to 30 MHz]

The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. Then antenna is a loop antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement. For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to Quasi-peak function and specified bandwidth with maximum hold mode.

The spectrum analyzer is set to:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer 200 Hz for Quasi-peak detection (QP) at frequency below 9 kHz ~ 150 kHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer 9 kHz for Quasi-peak detection (QP) at frequency below 150 kHz ~ 30 MHz.

[30 MHz to 1 GHz]

The height of the measuring antenna was varied between 1 to 4 m and the table was rotated a full revolution in order to obtain maximum values of the electric field intensity.

The measurement was made in both the vertical and horizontal polarization, and the maximum value is presented in the report.

The spectrum analyzer is set to:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Peak detection (PK) or Quasi-peak detection (QP) at frequency below 1 GHz.

Note.

According to exploratory test no any obvious emission except for fundamental 13.56 MHz were detected from 9 kHz to 30 MHz. Although these test were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open field site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.



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FCC Limit

According to 15.209(a), for an intentional radiator devices, the general required of field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values :

Frequency (MHz)	Distance (Meters)	Radiated ($\mu V/m$)
0.009 ~ 0.490	300	2400/F(kHz)
0.490 ~ 1.705	30	24000/F(kHz)
1.705 ~ 30.0	30	30
30 ~ 88	3	100**
88 ~ 216	3	150**
216 ~ 960	3	200**
Above 960	3	500

**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., Sections 15.231 and 15.241.

In the section 15.225:

- (a) The field strength of any emissions within the band 13.553 ~ 13.567 MHz shall not exceed 15,848 microvolts/meter (= 84 dB $\mu V/m$) at 30 meters.
- (b) Within the bands 13.410 ~ 13.553 MHz and 13.567 ~ 13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter (=50.5 dB $\mu V/m$) at 30 meters.
- (c) Within the bands 13.110 ~ 13.410 MHz and 13.710 ~ 14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter (=40.5 dB $\mu V/m$) at 30 meters.
- (d) The field strength of any emissions appearing outside of the 13.110 ~ 14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.



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Test results for fundamental

Operating frequency: 13.559 9 MHz, 13.561 8 MHz
Distance of measurement: 3 meter

Radiated emissions		Ant.	Total factors		Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Pol.	Correction factor (dB/m)	Distance factor (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
13.559 9	32.90	H	22.57	40.00	15.47	84.00	68.53
13.559 9	27.40	V	22.57	40.00	9.97	84.00	74.03
13.561 8	47.70	H	22.57	40.00	30.27	84.00	53.73
13.561 8	44.20	V	22.57	40.00	26.77	84.00	57.23

Test results for in-band & out-band(9 kHz to 30 MHz)

Radiated emissions		Ant.	Total factors		Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Pol.	Correction factor (dB/m)	Distance factor (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
12.135 4	20.42	H	22.56	40.00	2.98	29.50	26.52
13.007 9	13.42	V	22.53	40.00	-4.05	29.50	33.55
13.351 6	19.25	H	22.55	40.00	1.80	40.50	38.70
13.361 2	12.74	V	22.55	40.00	-4.71	40.50	45.21
13.552 9	40.06	H	22.57	40.00	22.63	50.50	27.87
13.552 9	36.67	V	22.57	40.00	19.24	50.50	31.26
13.567 1	42.73	H	22.57	40.00	25.30	50.50	25.20
13.567 1	39.41	V	22.57	40.00	21.98	50.50	28.52
13.975 9	22.72	H	22.58	40.00	5.30	40.50	35.20
13.976 4	19.60	V	22.58	40.00	2.18	40.50	38.32
14.150 6	20.51	V	22.58	40.00	3.09	29.50	26.41
14.195 5	24.59	H	22.58	40.00	7.17	29.50	22.33



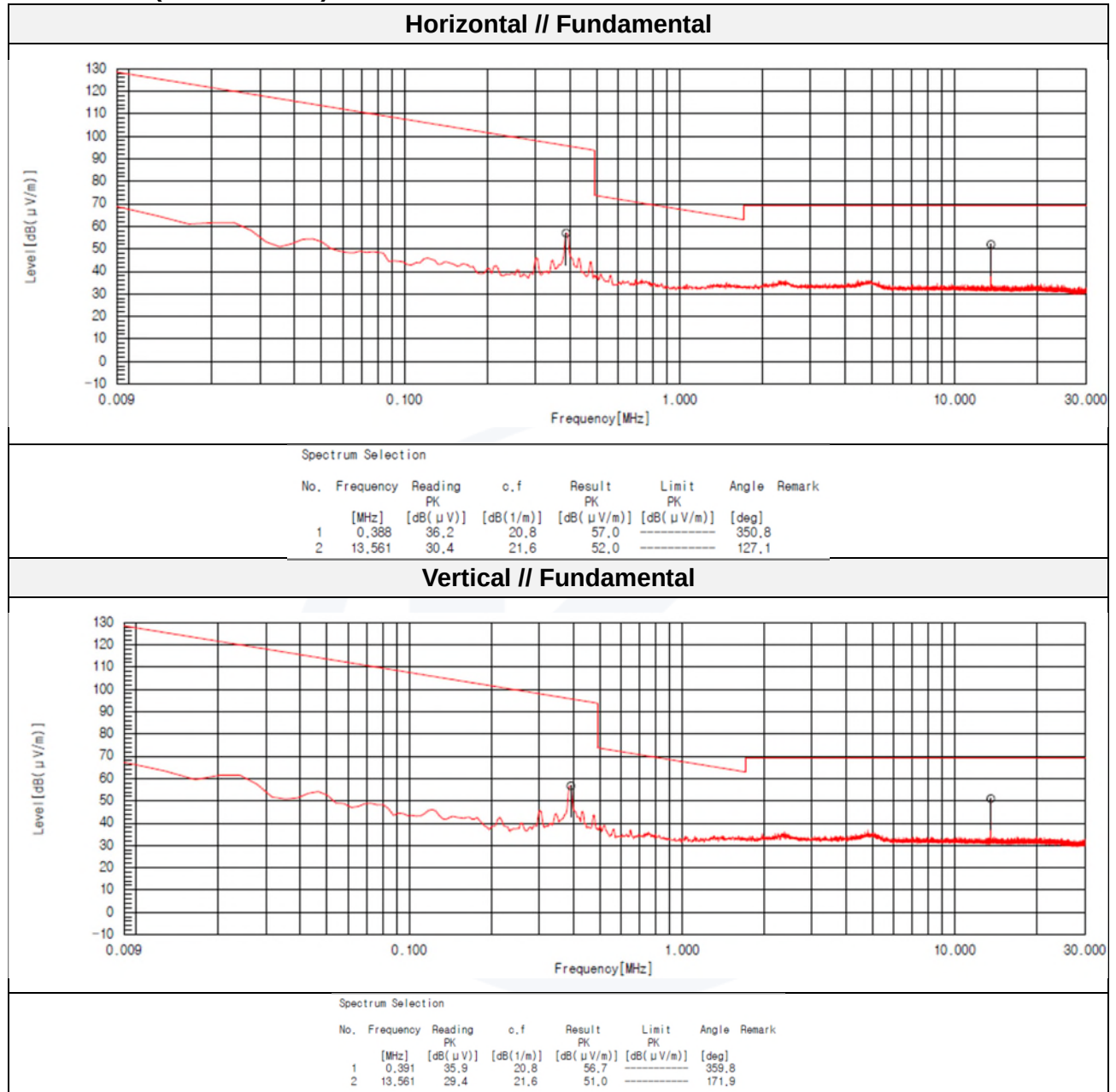
Note.

1. All measurements were performed using a loop antenna. The antenna was investigated with three polarizations, and horizontal and vertical polarizations were reported as the worst case.
2. Measurements were performed at 3m and the data was extrapolated to the specified measurement distance of 30m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in §15.31(f)(2). Extrapolation Factor = $20 \log_{10}(30/3)^2 = 40$ dB.
3. The spectrum was investigated from 9 kHz up to 30 MHz using the loop antenna. Only the emissions shown in the table above were found to be significant.
4. All measurements were recorded using a spectrum analyzer employing a quasi-peak detector.
5. Actual = Reading + Correction factors(Ant. factor + Cable loss) - Distance factor
6. Margin [dB] = Limit [dBμV/m] - Field Strength Level [dBμV/m]
7. All modes (e.g. with and without a tag) were investigated. Only the radiated emissions of the configuration (with a tag) that produced the worst case emissions are reported in this section.





Test results (9 kHz to 30 MHz)

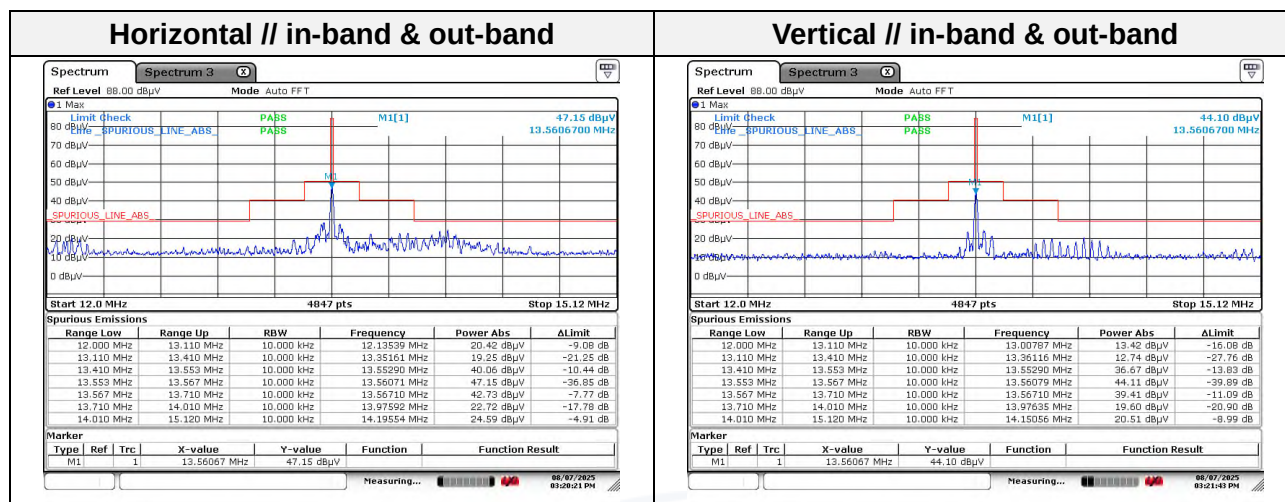


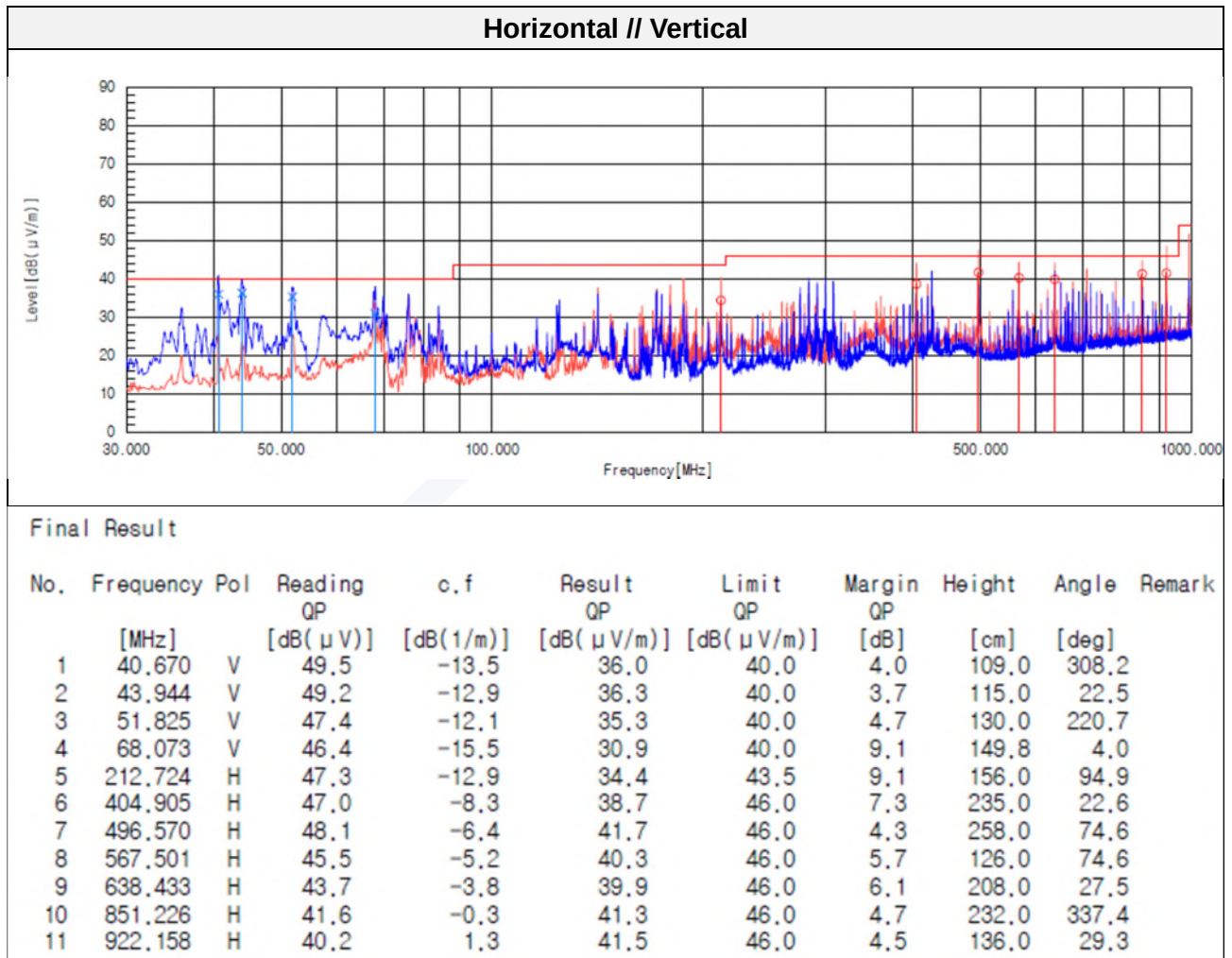
Note.

1. above data is peak result
2. The product is designed so that ANT1 and ANT2 always operate simultaneously. therefore, testing was conducted with both antennas operating at the same time.



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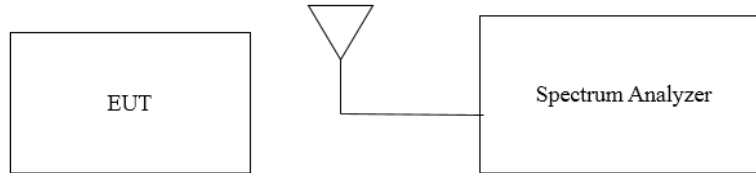
**Test results (Below 1 000 MHz)****Note.**

1. All measurements were recorded using a spectrum analyzer employing a quasi-peak detector for emissions below 960 MHz.
2. Both Vertical and Horizontal polarities of the receive antenna were evaluated with the worst case emissions being reported. Below 30 MHz the loop antenna was positioned in 3 orthogonal planes (X Front, Y side, Z top) to determine the orientation resulting in the worst case emissions.
3. The product is designed so that ANT1 and ANT2 always operate simultaneously. therefore, testing was conducted with both antennas operating at the same time.



3.3 20 dB bandwidth

Test setup



Test procedure

ANSI C63.10-2020 – Section 6.9.2

1. Spectrum analyzer frequency is set to the nominal EUT channel center frequency.
2. RBW = 1~5% OBW
3. VBW $\geq 3 \times$ RBW
4. Reference level set to keep signal from exceeding maximum input mixer for linear operation.
5. Detector = Peak
6. Trace mode = Max hold
7. Sweep = Auto couple
8. The trace was allowed to stabilize
9. Using the marker-delta function, determine the “-20 dB down amplitude” using [(highest in band spectral density) – 20 dB]
10. Set a marker at the lowest frequency of the envelope of the spectral density, such that the marker is at or slightly below the “-20 dB down amplitude” determined in Step 9.
11. Reset Marker-delta function and move the marker to other side of the emission until the delta marker amplitude is the same level as reference amplitude. The marker delta frequency reading at this point is the specified emission bandwidth.

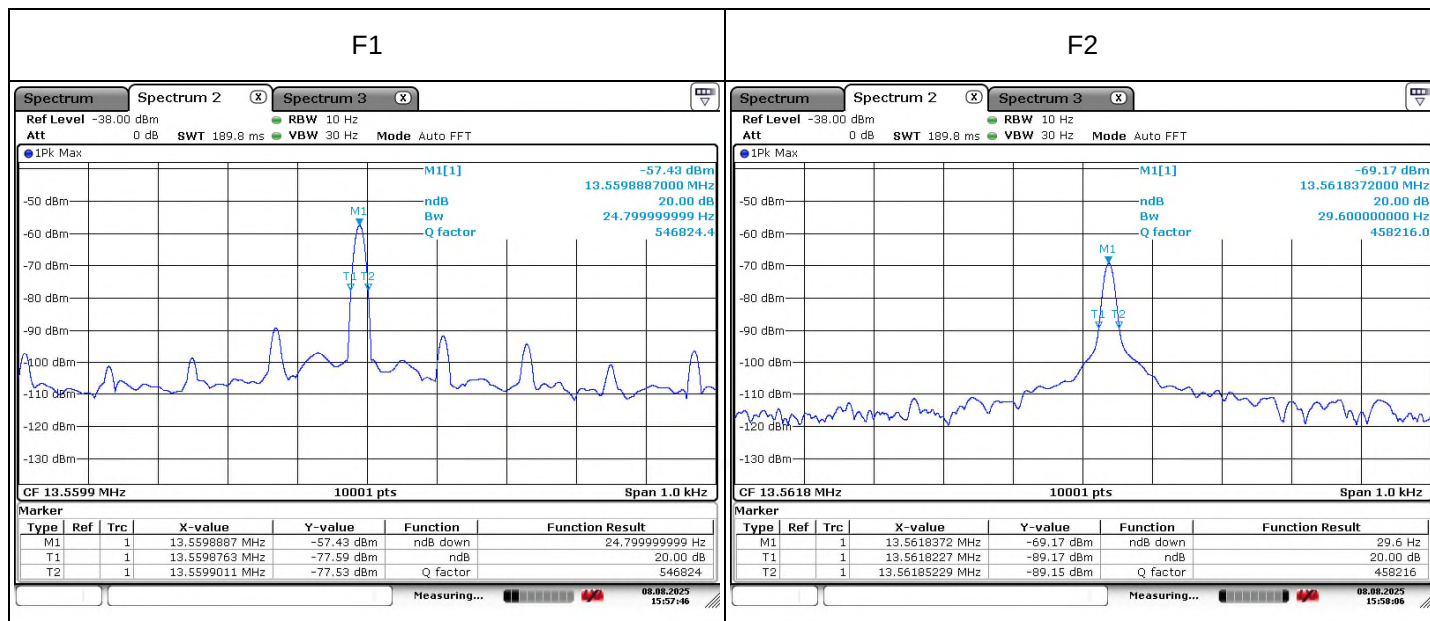
Limit

None; for reporting purpose only.



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Test results



Note.

Because the measured signal is CW/CW-like, adjusting the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW.

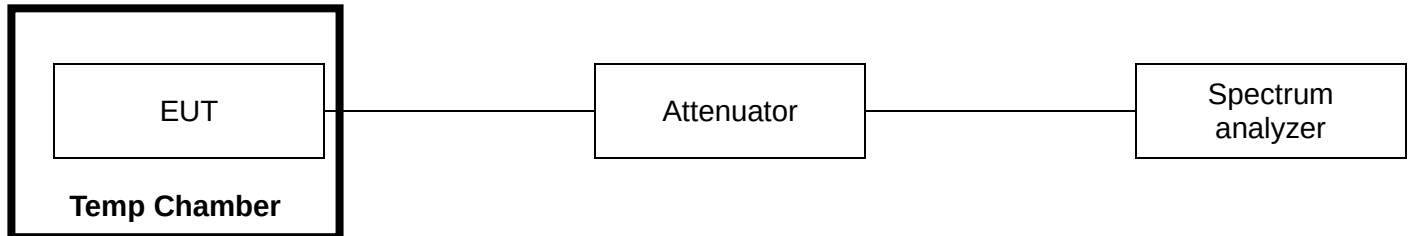


3.4. Frequency Stability

Test procedure

ANSI C63.10-2020, clause 6.8.1

Test setup



1. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.
7. While maintaining a constant temperature inside the environmental chamber, turn the EUT on and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized. Four measurements in total are made.

FCC Limit

According to §15.225 (e), the frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85 % to 115 % of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

**Test results**

Operating frequency: 13.559 9 MHz

Test voltage (%)	Test voltage (V)	Temperature (°C)	Maintaining time	Measure frequency (MHz)	Frequency deviation (Hz)	Deviation (%)
100 %	AC 120 V	-20	Startup	13559 887	-13	0.000 001 0
			2 minutes	13559 881	-19	0.000 001 4
			5 minutes	13559 882	-18	0.000 001 3
			10 minutes	13559 899	-1	0.000 000 1
		-10	Startup	13559 880	-20	0.000 001 5
			2 minutes	13559 885	-15	0.000 001 1
			5 minutes	13559 912	12	0.000 000 9
			10 minutes	13559 914	14	0.000 001 0
		0	Startup	13559 909	9	0.000 000 7
			2 minutes	13559 893	-7	0.000 000 5
			5 minutes	13559 880	-20	0.000 001 5
			10 minutes	13559 892	-8	0.000 000 6
		10	Startup	13559 892	-8	0.000 000 6
			2 minutes	13559 885	-15	0.000 001 1
			5 minutes	13559 895	-5	0.000 000 4
			10 minutes	13559 883	-17	0.000 001 3
		20	Startup	13559 887	-13	0.000 001 0
			2 minutes	13559 905	5	0.000 000 4
			5 minutes	13559 893	-7	0.000 000 5
			10 minutes	13559 886	-14	0.000 001 0
		30	Startup	13559 896	-4	0.000 000 3
			2 minutes	13559 889	-11	0.000 000 8
			5 minutes	13559 898	-2	0.000 000 1
			10 minutes	13559 905	5	0.000 000 4
		40	Startup	13559 892	-8	0.000 000 6
			2 minutes	13559 884	-16	0.000 001 2
			5 minutes	13559 881	-19	0.000 001 4
			10 minutes	13559 913	13	0.000 001 0
		50	Startup	13559 880	-20	0.000 001 5
			2 minutes	13559 880	-20	0.000 001 5
			5 minutes	13559 892	-8	0.000 000 6
			10 minutes	13559 888	-12	0.000 000 9
85 %	AC 102 V	24.5	Startup	13559 889	-11	0.000 000 8
			2 minutes	13559 890	-10	0.000 000 7
			5 minutes	13559 885	-15	0.000 001 1
			10 minutes	13559 888	-12	0.000 000 9
115 %	AC 138 V	24.5	Startup	13559 885	-15	0.000 001 1
			2 minutes	13559 885	-15	0.000 001 1
			5 minutes	13559 903	3	0.000 000 2
			10 minutes	13559 883	-17	0.000 001 3



Operating frequency: 13.561 8 MHz

Test voltage (%)	Test voltage (V)	Temperature (°C)	Maintaining time	Measure frequency (MHz)	Frequency deviation (Hz)	Deviation (%)
100 %	AC 120 V	-20	Startup	13.561 834	34	0.000 002 5
			2 minutes	13.561 815	15	0.000 001 1
			5 minutes	13.561 849	49	0.000 003 6
			10 minutes	13.561 824	24	0.000 001 8
		-10	Startup	13.561 844	44	0.000 003 2
			2 minutes	13.561 835	35	0.000 002 6
			5 minutes	13.561 826	26	0.000 001 9
			10 minutes	13.561 829	29	0.000 002 1
		0	Startup	13.561 827	27	0.000 002 0
			2 minutes	13.561 825	25	0.000 001 8
			5 minutes	13.561 837	37	0.000 002 7
			10 minutes	13.561 820	20	0.000 001 5
		10	Startup	13.561 820	20	0.000 001 5
			2 minutes	13.561 841	41	0.000 003 0
			5 minutes	13.561 837	37	0.000 002 7
			10 minutes	13.561 829	29	0.000 002 1
		20	Startup	13.561 843	43	0.000 003 2
			2 minutes	13.561 833	33	0.000 002 4
			5 minutes	13.561 812	12	0.000 000 9
			10 minutes	13.561 824	24	0.000 001 8
		30	Startup	13.561 830	30	0.000 002 2
			2 minutes	13.561 815	15	0.000 001 1
			5 minutes	13.561 818	18	0.000 001 3
			10 minutes	13.561 831	31	0.000 002 3
		40	Startup	13.561 834	34	0.000 002 5
			2 minutes	13.561 816	16	0.000 001 2
			5 minutes	13.561 819	19	0.000 001 4
			10 minutes	13.561 833	33	0.000 002 4
		50	Startup	13.561 833	33	0.000 002 4
			2 minutes	13.561 812	12	0.000 000 9
			5 minutes	13.561 846	46	0.000 003 4
			10 minutes	13.561 845	45	0.000 003 3
85 %	AC 102 V	24.5	Startup	13.561 810	10	0.000 000 7
			2 minutes	13.561 846	46	0.000 003 4
			5 minutes	13.561 841	41	0.000 003 0
			10 minutes	13.561 837	37	0.000 002 7
115 %	AC 138 V	24.5	Startup	13.561 816	16	0.000 001 2
			2 minutes	13.561 823	23	0.000 001 7
			5 minutes	13.561 829	29	0.000 002 1
			10 minutes	13.561 810	10	0.000 000 7



3.5. AC conducted emissions

Test procedure

ANSI C63.10-2020, clause 6.2, KDB 174176 D01

FCC Limit

According to 15.207(a), 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 50uH/50 ohm line impedance stabilization network (LISN). Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequencies ranges.

Frequency of Emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15 – 0.50	66 - 56*	56 - 46*
0.50 – 5.00	56	46
5.00 – 30.0	60	50

*Decreases with the logarithm of the frequency

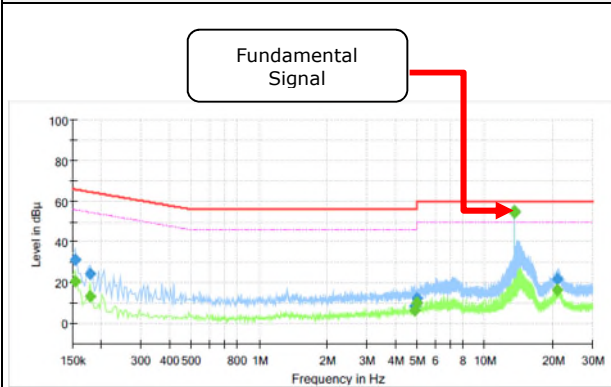


Report No. : KES-RF250081-R2

Test results

Mode : Antenna Connected – Normal Operating Configuration

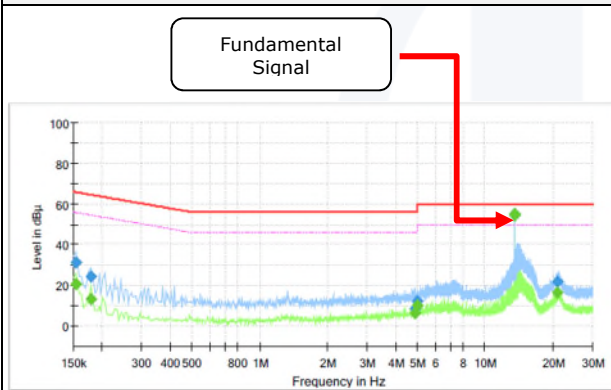
Hot Line



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.154000	31.50	---	65.78	34.28	1000.0	9.000	N	19.5
0.154000	---	20.73	55.78	35.05	1000.0	9.000	N	19.5
0.178000	---	13.35	54.58	41.23	1000.0	9.000	N	19.5
0.178000	24.28	---	64.58	40.30	1000.0	9.000	N	19.5
4.910000	8.70	---	56.00	47.30	1000.0	9.000	N	20.0
4.910000	---	6.31	46.00	39.69	1000.0	9.000	N	20.0
4.990000	---	9.92	46.00	36.08	1000.0	9.000	N	20.0
4.990000	12.32	---	56.00	43.68	1000.0	9.000	N	20.0
13.558000	55.05	---	60.00	4.95	1000.0	9.000	N	20.6
13.558000	---	55.04	50.00	-5.04	1000.0	9.000	N	20.6
13.562000	---	54.60	50.00	-4.60	1000.0	9.000	N	20.6
13.562000	54.61	---	60.00	5.39	1000.0	9.000	N	20.6
21.018000	---	16.21	50.00	33.79	1000.0	9.000	N	20.9
21.018000	21.56	---	60.00	38.44	1000.0	9.000	N	20.9

Neutral Line



Final_Result

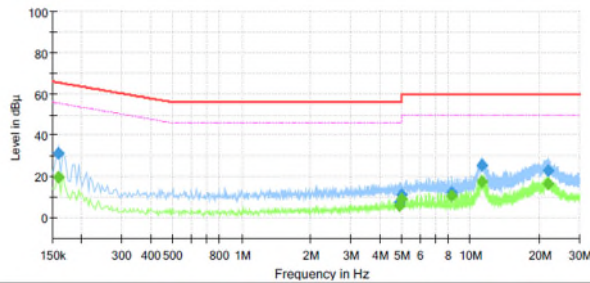
Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.154000	31.50	---	65.78	34.28	1000.0	9.000	N	19.5
0.154000	---	20.73	55.78	35.05	1000.0	9.000	N	19.5
0.178000	---	13.35	54.58	41.23	1000.0	9.000	N	19.5
0.178000	24.28	---	64.58	40.30	1000.0	9.000	N	19.5
4.910000	8.70	---	56.00	47.30	1000.0	9.000	N	20.0
4.910000	---	6.31	46.00	39.69	1000.0	9.000	N	20.0
4.990000	---	9.92	46.00	36.08	1000.0	9.000	N	20.0
4.990000	12.32	---	56.00	43.68	1000.0	9.000	N	20.0
13.558000	55.05	---	60.00	4.95	1000.0	9.000	N	20.6
13.558000	---	55.04	50.00	-5.04	1000.0	9.000	N	20.6
13.562000	---	54.60	50.00	-4.60	1000.0	9.000	N	20.6
13.562000	54.61	---	60.00	5.39	1000.0	9.000	N	20.6
21.018000	---	16.21	50.00	33.79	1000.0	9.000	N	20.9
21.018000	21.56	---	60.00	38.44	1000.0	9.000	N	20.9



Report No. : KES-RF250081-R2

Mode : Antenna Replaced with RF Dummy Load

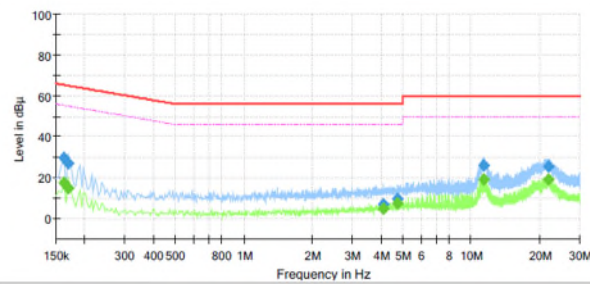
Hot Line



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.158000	31.47	---	65.57	34.10	1000.0	9.000	L1	19.7
0.158000	---	19.87	55.57	35.70	1000.0	9.000	L1	19.7
4.884000	7.52	---	56.00	48.48	1000.0	9.000	L1	20.1
4.884000	---	5.87	46.00	40.13	1000.0	9.000	L1	20.1
4.990000	11.26	---	56.00	44.74	1000.0	9.000	L1	20.1
4.990000	---	9.10	46.00	36.90	1000.0	9.000	L1	20.1
8.290000	---	10.58	50.00	39.42	1000.0	9.000	L1	20.3
8.290000	12.28	---	60.00	47.72	1000.0	9.000	L1	20.3
11.242000	---	17.56	50.00	32.44	1000.0	9.000	L1	20.5
11.242000	25.23	---	60.00	34.77	1000.0	9.000	L1	20.5
21.896000	---	16.54	50.00	33.46	1000.0	9.000	L1	21.0
21.896000	22.90	---	60.00	37.10	1000.0	9.000	L1	21.0

Neutral Line



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.162000	29.84	---	65.36	35.52	1000.0	9.000	N	19.5
0.162000	---	17.37	55.36	37.99	1000.0	9.000	N	19.5
0.170000	26.87	---	64.96	38.09	1000.0	9.000	N	19.5
0.170000	---	14.68	54.96	40.30	1000.0	9.000	N	19.5
4.098000	6.78	---	56.00	49.22	1000.0	9.000	N	19.9
4.098000	---	5.07	46.00	40.93	1000.0	9.000	N	19.9
4.722000	9.75	---	56.00	46.25	1000.0	9.000	N	20.0
4.722000	---	7.47	46.00	38.53	1000.0	9.000	N	20.0
11.394000	26.01	---	60.00	33.99	1000.0	9.000	N	20.4
11.394000	---	19.16	50.00	30.84	1000.0	9.000	N	20.4
21.784000	---	18.99	50.00	31.01	1000.0	9.000	N	21.0
21.784000	25.99	---	60.00	34.01	1000.0	9.000	N	21.0



3.6. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

**Appendix A. Measurement equipment**

Equipment	Manufacturer	Model	Serial No.	Calibration interval	Calibration due.
Spectrum analyzer	R&S	FSV40	101725	1 year	2025.06.12 2026.06.10
SIGNAL GENERATOR	KEYSIGHT	N5182B	MY59100115	1 year	2025.04.15 2026.04.16
SIGNAL GENERATOR	Anritsu	68369B	002118	1 year	2025.04.15 2026.04.21
LOOP ANTENNA	TESEQ	HLA6121	66547	2 years	2026.01.22
TRILOG-BROADBAND ANTENNA	Schwarzbeck	VULB 9163	714	2 years	2026.04.19
Attenuator	HUBER+SHHNER	6806.17.A	NONE	1 year	2025.02.13 2026.02.13
Amplifier	SONOMA INSTRUMENT	310N	401123	1 year	2025.02.13 2026.02.13
EMI Test Receiver	R&S	ESR7	101190	1 year	2025.07.29 2026.04.30
AC POWER SOURCE/ ANALYZER	HP	6813A	3729A00754	1 year	2026.01.08
EMI Test Receiver	R&S	ESR3	101783	1 year	2025.11.06 2026.11.03
PULSE LIMITER	R&S	ESH2-Z2	101915	1 year	2025.11.06 2026.11.03
LISN	R&S	ENV216	101786	1 year	2026.01.09
Temperature & Humidity Chamber	ESPEC	SH-642	93012658	1 year	2025.06.12 2026.06.10
Cable	-	-	#5	1 year	2024.11.01 2025.11.01 2026.11.01
Cable (SR #6)	RG 400	-	-	0.5 year	2025.01.25 2025.07.25 2026.01.25
Cable (SAC #5)	SUCOFLEX106	HUBER_SUHNER	-	0.5 year	2025.01.25 2025.07.25 2026.01.25
	SUCOFLEX106	HUBER_SUHNER	-	0.5 year	2025.01.25 2025.07.25 2026.01.25
	LH21D/2xSMA	OSI Cable	-	0.5 year	2025.01.25 2025.07.25 2026.01.25
	TCLH21D-SMSM-2.5M 0222	OSI Cable	-	0.5 year	2025.01.25 2025.07.25 2026.01.25
	TCLH21D-NMNM-10.0M 0222	OSI Cable	-	0.5 year	2025.01.25 2025.07.25 2026.01.25
	TCLH21D-SMSM-7.0M 0222	OSI Cable	-	0.5 year	2025.01.25 2025.07.25 2026.01.25

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



Peripheral device

Device	Manufacturer	Model No.	Serial No.
-	-	-	-

The End.

