

TEST REPORT

Part 15 Subpart E 15.407

Equipment under test Optical PARTICLE COUNTER

Model name GIS-PSMPC2

FCC ID A3LGIS-PSMPC2

Applicant Samsung Electronics Co Ltd

Manufacturer Samsung Electronics Co Ltd

Date of test(s) 2017.12.14 ~ 2017.12.20, 2018.01.09

Date of issue 2018.01.10

Issued to

Samsung Electronics Co Ltd

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KES-RF-17T0140-R1
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Revision history

Revision	Date of issue	Test report No.	Description
-	2017.12.22	KES-RF-17T0140	Initial
R1	2018.01.10	KES-RF-17T0140-R1	Add output power test

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1. General information

Applicant: Samsung Electronics Co Ltd
Applicant address: 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, Republic of Korea
Test site: KES Co., Ltd.
Test site address: C-3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, Korea
473-21, Gayeo-ro, Yeosu-si, Gyeonggi-do, Korea
Test Facility: FCC Accreditation Designation No.: KR0100, Registration No.: 444148
FCC rule part(s): 15.407
FCC ID: A3LGIS-PSMPC2
Test device serial No.: ☒ Production ☐ Pre-production ☐ Engineering

1.1. EUT description

Equipment under test: Optical PARTICLE COUNTER
Frequency range: 2 412 MHz ~ 2 462 MHz(802.11b)
5 745 MHz ~ 5 825 MHz(802.11a),
5 180 MHz ~ 5 240 MHz(802.11a)
Model: GIS-PSMPC2
Modulation technique: DSSS, OFDM
Number of channels: 2 412 MHz ~ 2 462 MHz(802.11b) : 11ch
5 745 MHz ~ 5 825 MHz(802.11a) : 5ch
5 180 MHz ~ 5 240 MHz(802.11a) : 4ch
Antenna specification: Dipole Antenna (2.4 GHz) // Peak gain: 3.77 dBi
Dipole Antenna (5.1 GHz) // Peak gain: 3.92 dBi
Dipole Antenna (5.8 GHz) // Peak gain: 3.07 dBi
Power source: AC 110V Adapter (Output : DC 12V / 3.5A)

Note:

- Certificated module is mounted in the EUT as following
 - Applicant: Murata Manufacturing Co., Ltd.
 - Contains FCC ID : VPYLB1GC
 - Model: Type1GC
 - RF test report number: RF160104C01, RF160104C01-1, RF160104C01-2
- This device supported only 802.11a/b mode and the installed module is completed identical as original except antenna change. And it does not support UNII 2A/2C, this band disabled by software
- The output power setting is same as original module and confirmed that RF conducted tests of original report remain valid for this filing.

1.2. Test configuration

The Samsung Electronics Co Ltd FCC ID: A3LGIS-PSMPC2 was tested per the guidance of KDB 789033 D02 v02r01. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

1.3. Device modifications

N/A

1.4. Derivation model information

N/A

1.5. Frequency/channel operations

Band1

Ch.	Frequency (MHz)	Mode
36	5 180	11a/n_HT20
.	.	.
44	5 220	11a/n_HT20
.	.	.
48	5240	11a/n_HT20

Band3

Ch.	Frequency (MHz)	Mode
149	5 745	11a/n_HT20
.	.	.
157	5 785	11a/n_HT20
.	.	.
165	5 825	11a/n_HT20

1.6. Worst case data rate

1. Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.
2. Worst-case data rates were:
UNII-1 a : 6 Mbps
UNII-3 a : 6 Mbps

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1.7. Accessory information

Equipment	Manufacturer	Model	Serial No.	Power source
AC/DC ADAPTER	POWER-TEK	SW42-12003500-W	N/A	100~240V

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2. Summary of tests

Reference	Parameter	Test results
15.407(a)	Maximum conducted output power	Pass
15.205 15.209	Radiated spurious emission	Pass
15.207	AC conducted emissions	Pass

Note:

- For conducted test, Please refers to BV Report Number :
RF160104C01, RF160104C01-1, RF160104C01-2

3. Test results

3.1. Maximum conducted output power

Test procedure

KDB 789033 D02 v02r01– Section E.3.a) or b)

Used test method is Section E.3.b)

Section E.3.a)

Method PM (Measurement using an RF average power meter):

- i. Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.
 - The EUT is configured to transmit continuously or to transmit with a constant duty cycle.
 - At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
 - The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
- ii. If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section II.B.
- iii. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
- iv. Adjust the measurement in dBm by adding $10 \log (1/x)$ where x is the duty cycle (e.g., $10 \log (1/0.25)$ if the duty cycle is 25 %).

Section E.3.b)

Method PM-G (Measurement using a gated RF average power meter):

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

Limit

Band	EUT Category		Limit
UNII-1		Outdoor access point	1 W (30 dBm)
		Indoor access point	
		Fixed point-to-point access point	
	✓	Mobile and portable client device	250 mW(24 dBm)
UNII-3	✓		1 W (30 dBm)

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Test results

Band	mode	Frequency (MHz)	Detector mode	Output power(dBm)	Limit (dBm)
UNII-1	a	5 180	AV	12.62	24.00
		5 220		12.55	
		5 240		12.56	
UNII-3	a	5 745	AV	12.15	30.00
		5 785		12.31	
		5 825		12.35	

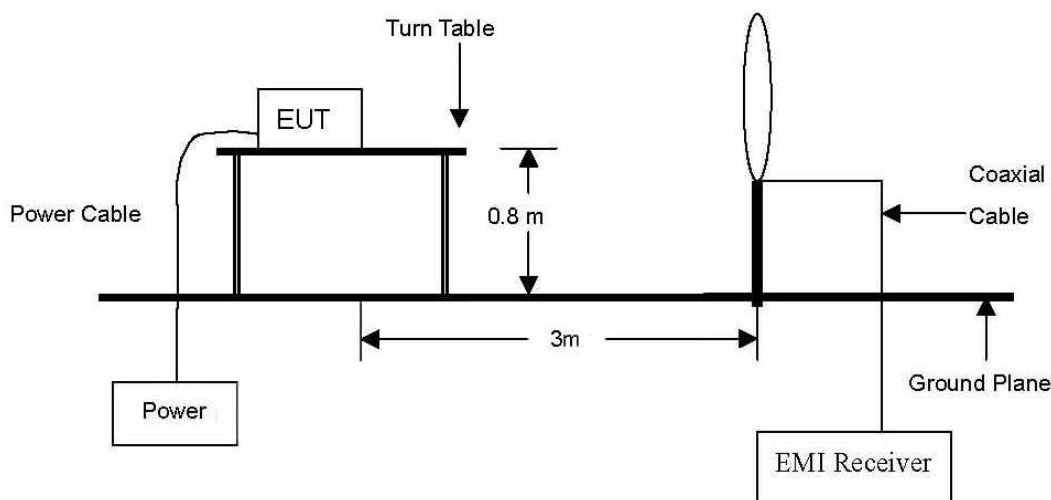
Note.

The output power test in the report is for confirmation purpose, the difference is within +/- 0.5dBm of the original module output power which is considering as measurement uncertainty.

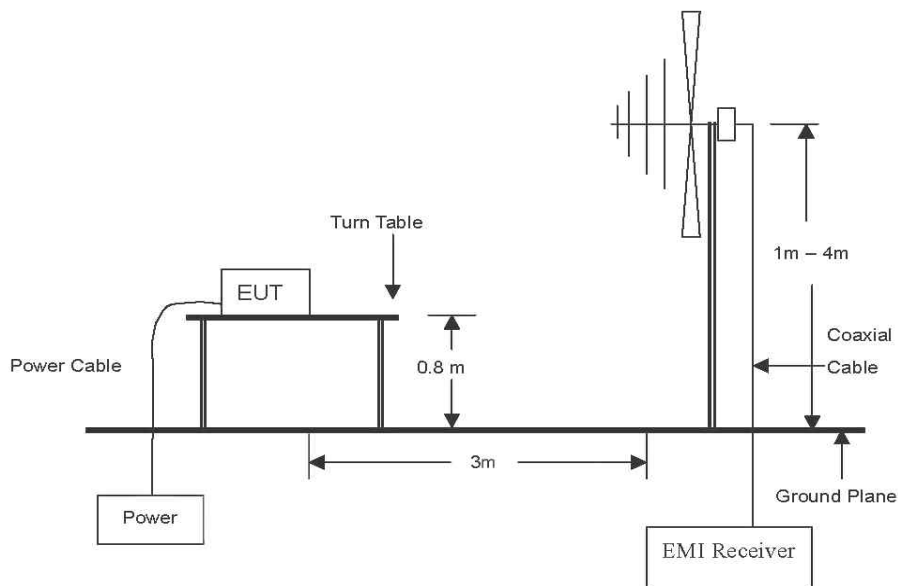
3.2. Radiated restricted band and emissions

Test setup

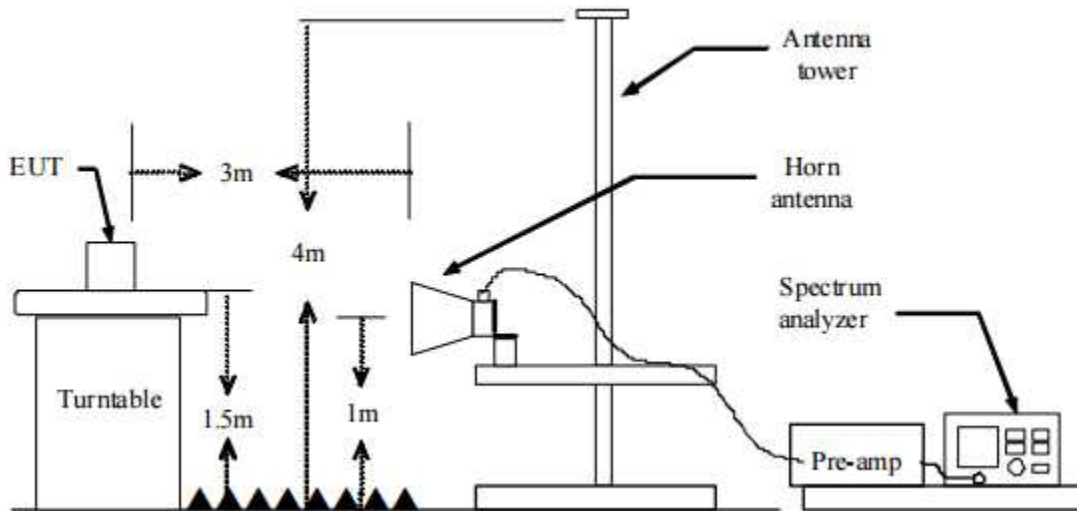
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 kHz to 30 MHz Emissions.



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



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz emissions, whichever is lower.



Test procedure below 30 MHz

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
2. 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.
3. 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.
4. The test-receiver system was set to average or quasi peak detect function and Specified Bandwidth with Maximum hold mode.

Test procedure above 30 MHz

1. Spectrum analyzer settings for $f < 1$ GHz:
 - ① Span = wide enough to fully capture the emission being measured
 - ② RBW = 100 kHz
 - ③ VBW $\geq$ RBW
 - ④ Detector = quasi peak
 - ⑤ Sweep time = auto
 - ⑥ Trace = max hold
2. Spectrum analyzer settings for $f \geq 1$ GHz: Peak
 - ① Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
 - ② RBW = 1 MHz
 - ③ VBW $\geq$ 3 MHz
 - ④ Detector = peak
 - ⑤ Sweep time = auto
 - ⑥ Trace = max hold
 - ⑦ Trace was allowed to stabilize

3. Spectrum analyzer settings for $f \geq 1$ GHz: Average

- ① Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- ② RBW = 1 MHz
- ③ VBW $\geq 3 \times$ RBW
- ④ Detector = RMS, if span/(# of points in sweep) $\leq$ (RBW/2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.
- ⑤ Averaging type = power(i.e., RMS)
 - 1) As an alternative, the detector and averaging type may be set for linear voltage averaging.
 - 2) Some instruments require linear display mode in order to use linear voltage averaging. Log or dB averaging shall not be used.
- ⑥ Sweep = auto
- ⑦ Trace = max hold
- ⑧ Perform a trace average of at least 100 traces.
- ⑨ A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle. The correction factor is computed as follows:
 - 1) If power averaging (RMS) mode was used in step ⑤, then the applicable correction factor is $10 \log(1/x)$, where x is the duty cycle.
 - 2) If linear voltage averaging mode was used in step ⑤, then the applicable correction factor is $20 \log(1/x)$, where x is the duty cycle.
 - 3) If a specific emission is demonstrated to be continuous (≥ 98 percent duty cycle) rather than turning on and off with the transmit cycle, then no duty cycle correction is required for that emission.

Note.

1. $f < 30$ MHz, extrapolation factor of 40 dB/decade of distance. $F_d = 40 \log(D_m/D_s)$
 $f \geq 30$ MHz, extrapolation factor of 20 dB/decade of distance. $F_d = 20 \log(D_m/D_s)$
Where:
 F_d = Distance factor in dB
 D_m = Measurement distance in meters
 D_s = Specification distance in meters
3. CF(Correction factors(dB)) = Antenna factor(dB/m) + Cable loss(dB) + or Amp. gain(dB) + or F_d (dB)
4. Field strength(dB μ V/m) = Level(dB μ V) + CF (dB) + or DCF(dB)
5. Margin(dB) = Limit(dB μ V/m) - Field strength(dB μ V/m)
6. Emissions below 18 GHz were measured at a 3 meter test distance while emissions above 18 GHz were measured at a 1 meter test distance with the application of a distance correction factor.
7. The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z, it was determined that **X orientation** was worst-case orientation; therefore, all final radiated testing was performed with the EUT in **X orientation**.
8. The worst-case emissions are reported however emissions whose levels were not within 20 dB of respective limits were not reported.

9. According to exploratory test no any obvious emission were detected from 9 kHz to 30 MHz. Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are test 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.

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.

According to 15.407(b), (b) Undesirable emission limits: Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band:
 - i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
 - ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.
- (5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.
- (6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in § 15.207.
- (7) The provisions of §15.205 apply to intentional radiators operating under this section.
- (8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.



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Duty cycle

Regarding to KDB 558074 D01_v04, 6.0, the maximum duty cycles of all modes were investigated and set the spectrum analyzer as below.

Set RBW $\geq$ OBW if possible; otherwise, set RBW to the largest available value. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are $> 50/T$ and the number of sweep points across duration T exceeds 100.

For the band 5.15-5.25 GHz

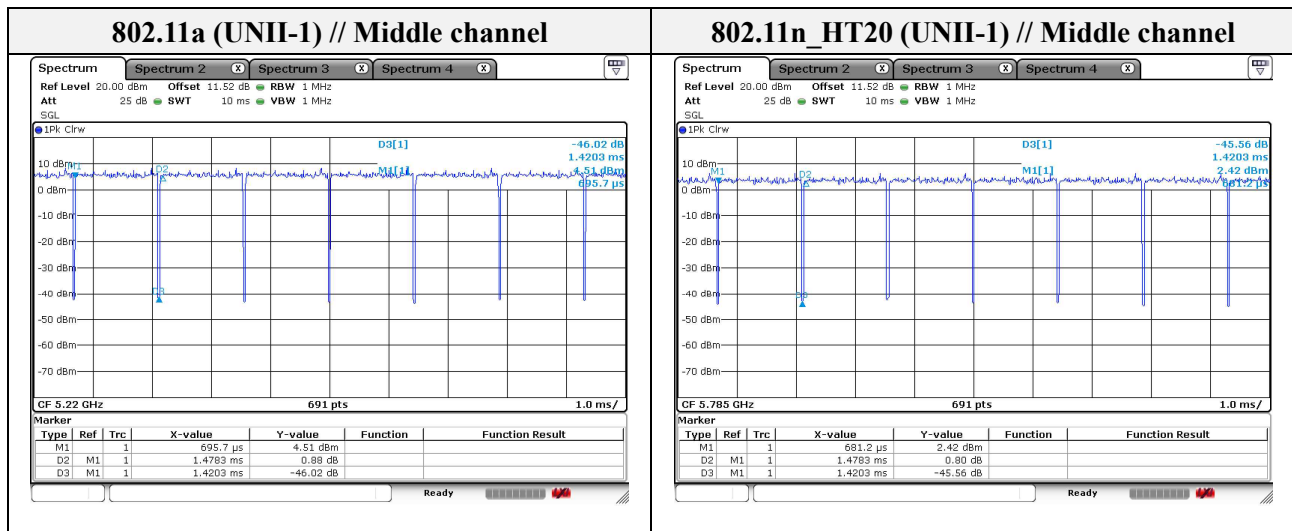
Test mode	T _{on} time (ms)	Period (ms)	Duty cycle (Linear)	Duty cycle (%)	Duty cycle correction factor (dB)
802.11a	1.420	1.478	0.961	96.1	0.17

For the band 5.725-5.85 GHz

Test mode	T _{on} time (ms)	Period (ms)	Duty cycle (Linear)	Duty cycle (%)	Duty cycle correction factor (dB)
802.11a	1.420	1.478	0.961	96.1	0.17

Duty cycle (Linear) = T_{on} time/Period

DCF(Duty cycle correction factor (dB)) = 10log(1/duty cycle)



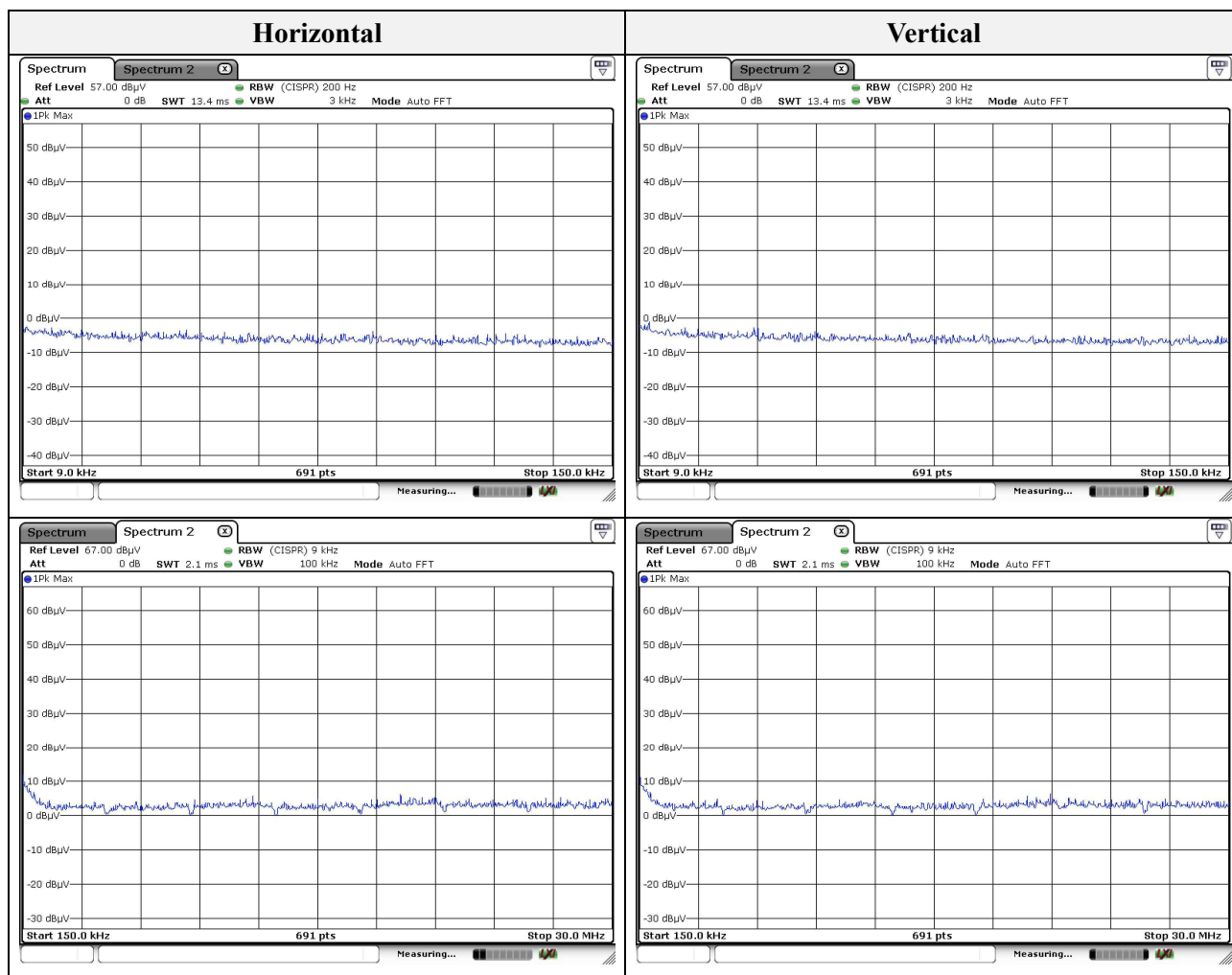
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Test results (Below 30 MHz)

Mode: UNII-1
Distance of measurement: 3 meter
Channel: 36 (Worst case)

Frequency (MHz)	Level (dB μ V)	Ant. Pol. (H/V)	CF (dB)	F _d (dB)	Field strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
No spurious emissions were detected within 20 dB of the limit							



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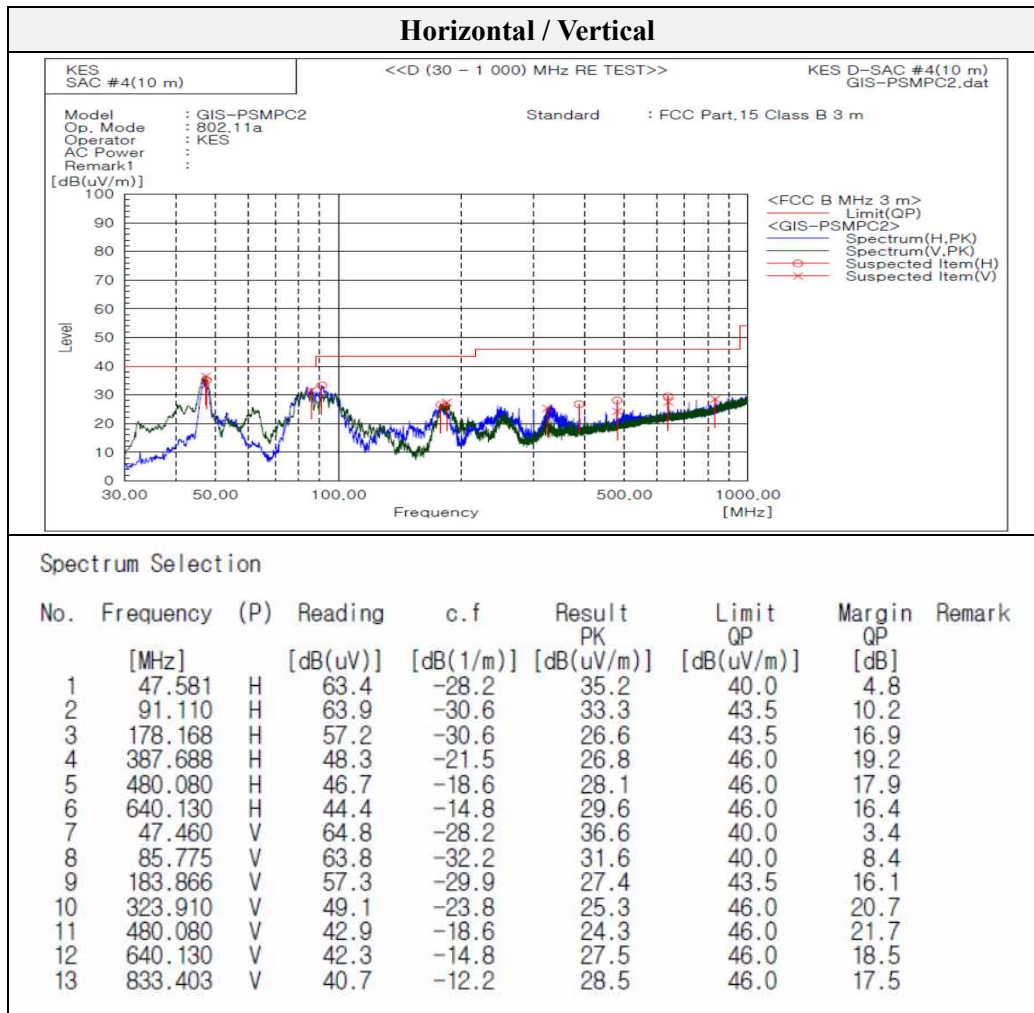
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Test results (Below 1 000 MHz)

Mode: UNII-1

Distance of measurement: 3 meter

Channel: 36 (Worst case)



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Test results (Above 1 000 MHz)

Mode: UNII-1
Distance of measurement: 3 meter
Channel: 36

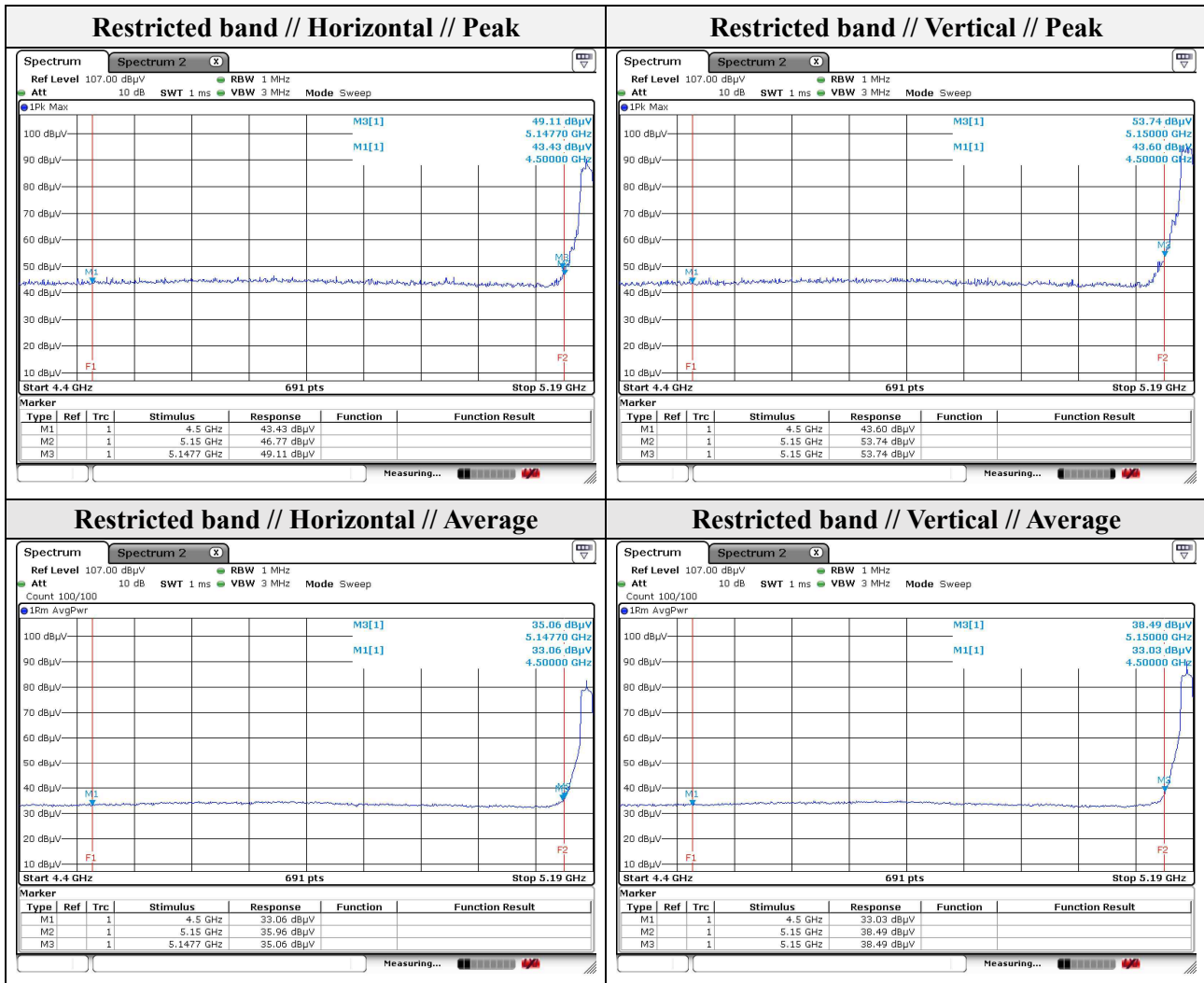
- Spurious

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1814.00	47.38	Peak	H	-2.93	-	44.45	74.00	29.55
1850.20	47.97	Peak	V	-2.55	-	45.42	74.00	28.58

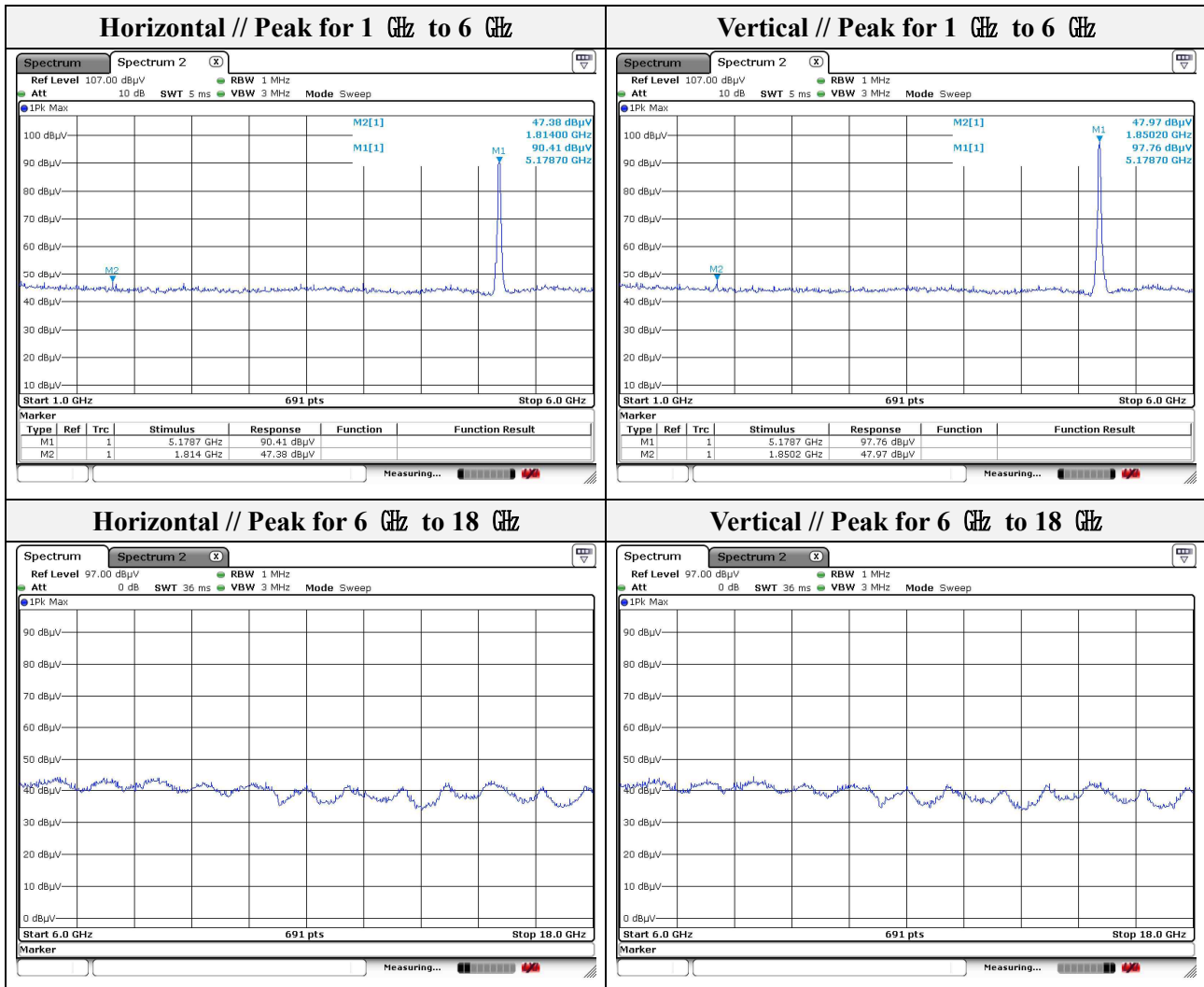
- Band edge

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5147.70	49.11	Peak	H	8.99	-	58.10	74.00	15.90
5147.70	35.06	Average	H	8.99	0.17	44.22	54.00	9.78
5150.00	53.74	Peak	V	8.99	-	62.73	74.00	11.27
5150.00	38.49	Average	V	8.99	0.17	47.65	54.00	6.35

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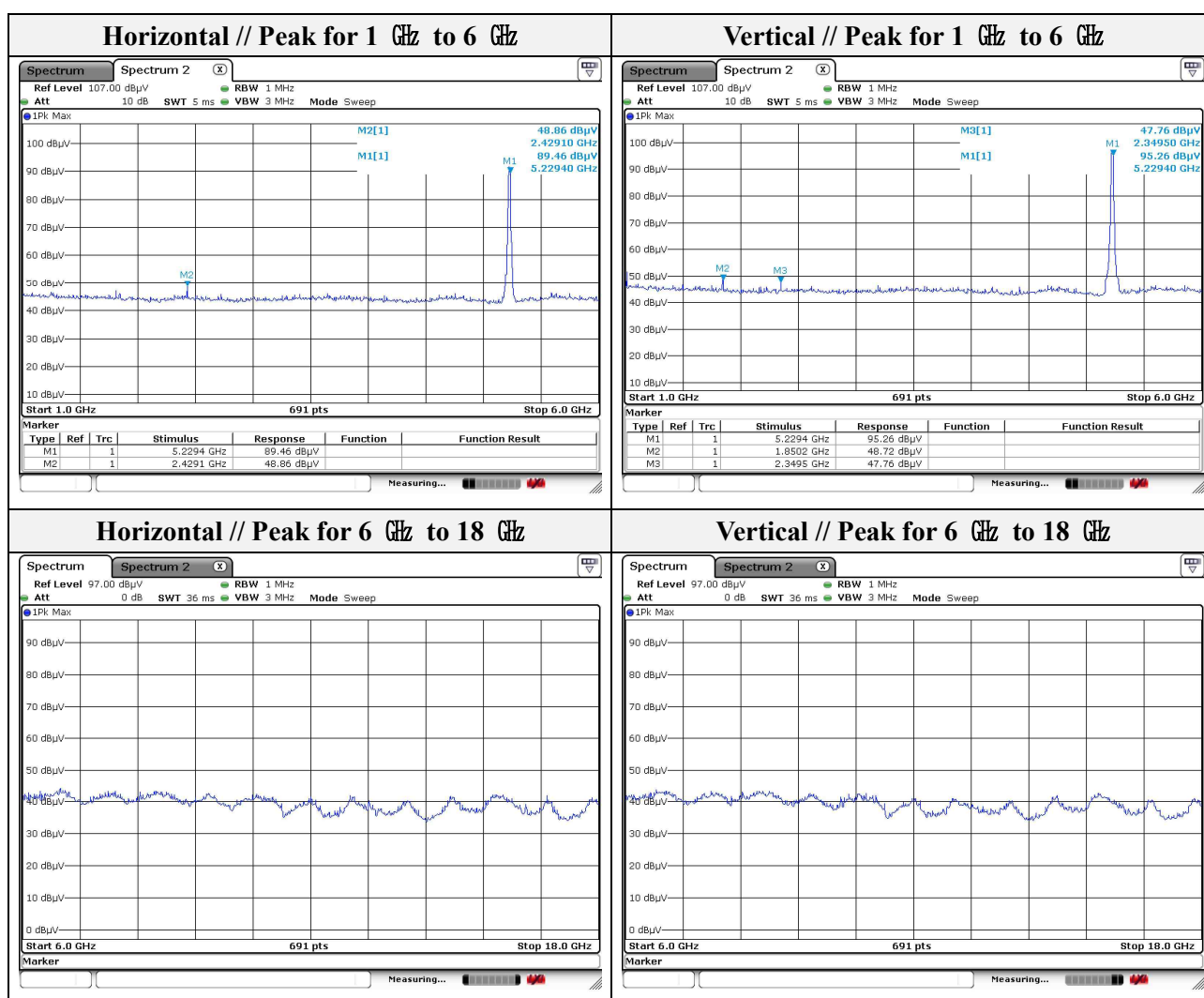
Note.

1. Average test was not performed because peak result is lower than the average limit.
2. No spurious emission were detected above 6 GHz.

Mode: UNII-1
Distance of measurement: 3 meter
Channel: 44

- Spurious

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2429.10	48.86	Peak	H	-0.15	-	48.71	74.00	25.29
1850.20	48.72	Peak	V	-2.55	-	46.17	74.00	27.83
2349.50	47.76	Peak	V	-0.30	-	47.46	74.00	26.54



Note.

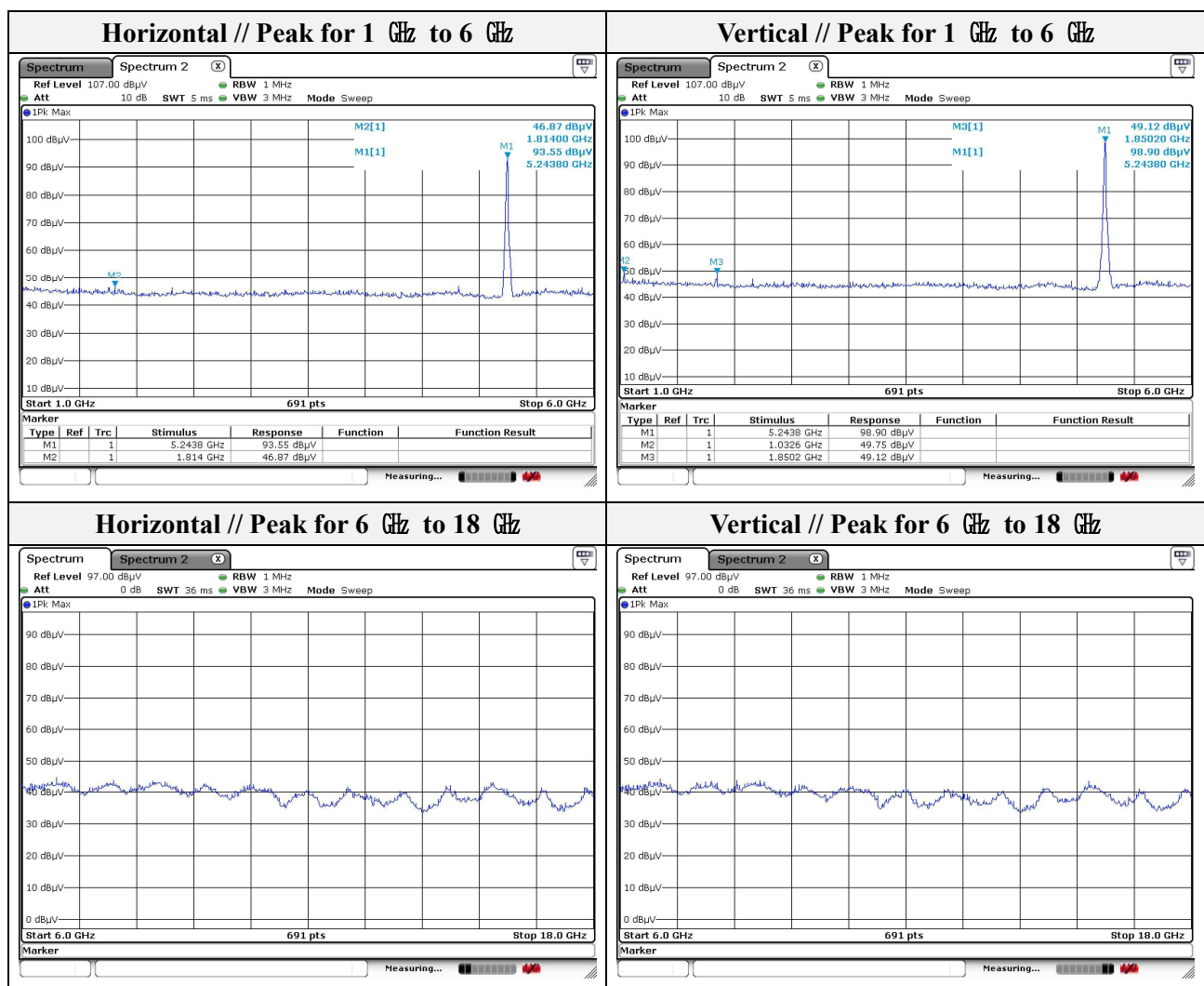
1. Average test was not performed because peak result is lower than the average limit.
2. No spurious emission were detected above 6 GHz.



Mode: UNII-1
Distance of measurement: 3 meter
Channel: 48

- Spurious

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1814.00	46.87	Peak	H	-2.93	-	43.94	74.00	30.06
1032.60	49.75	Peak	V	-8.93	-	40.82	74.00	33.18
1850.20	49.12	Peak	V	-2.55	-	46.57	74.00	27.43



Note.

1. Average test was not performed because peak result is lower than the average limit.
2. No spurious emission were detected above 6 GHz.



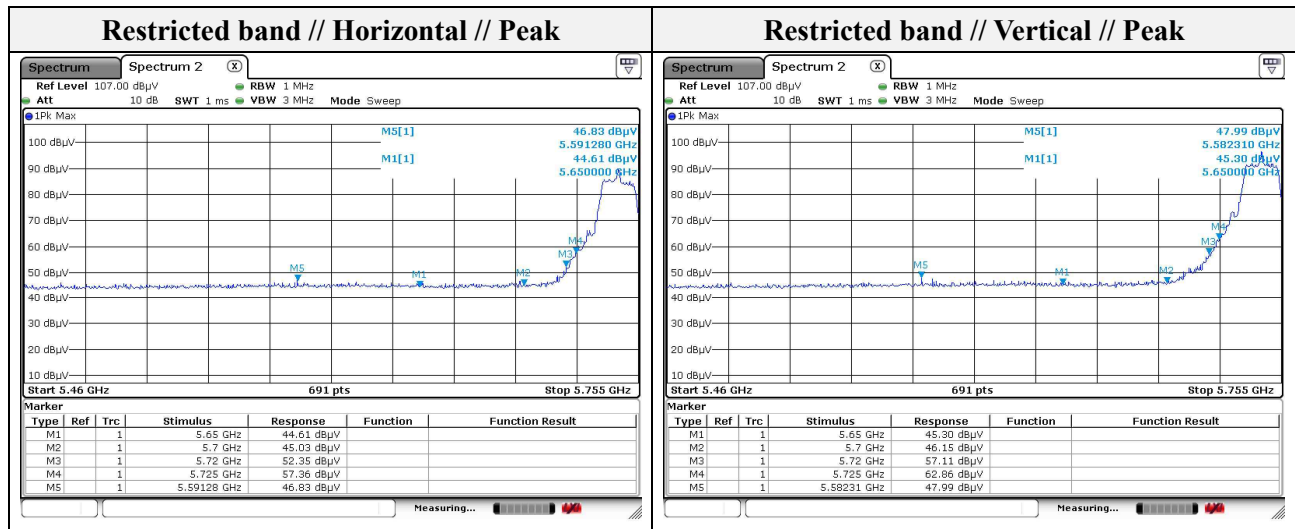
Mode: UNII-3
Distance of measurement: 3 meter
Channel: 149

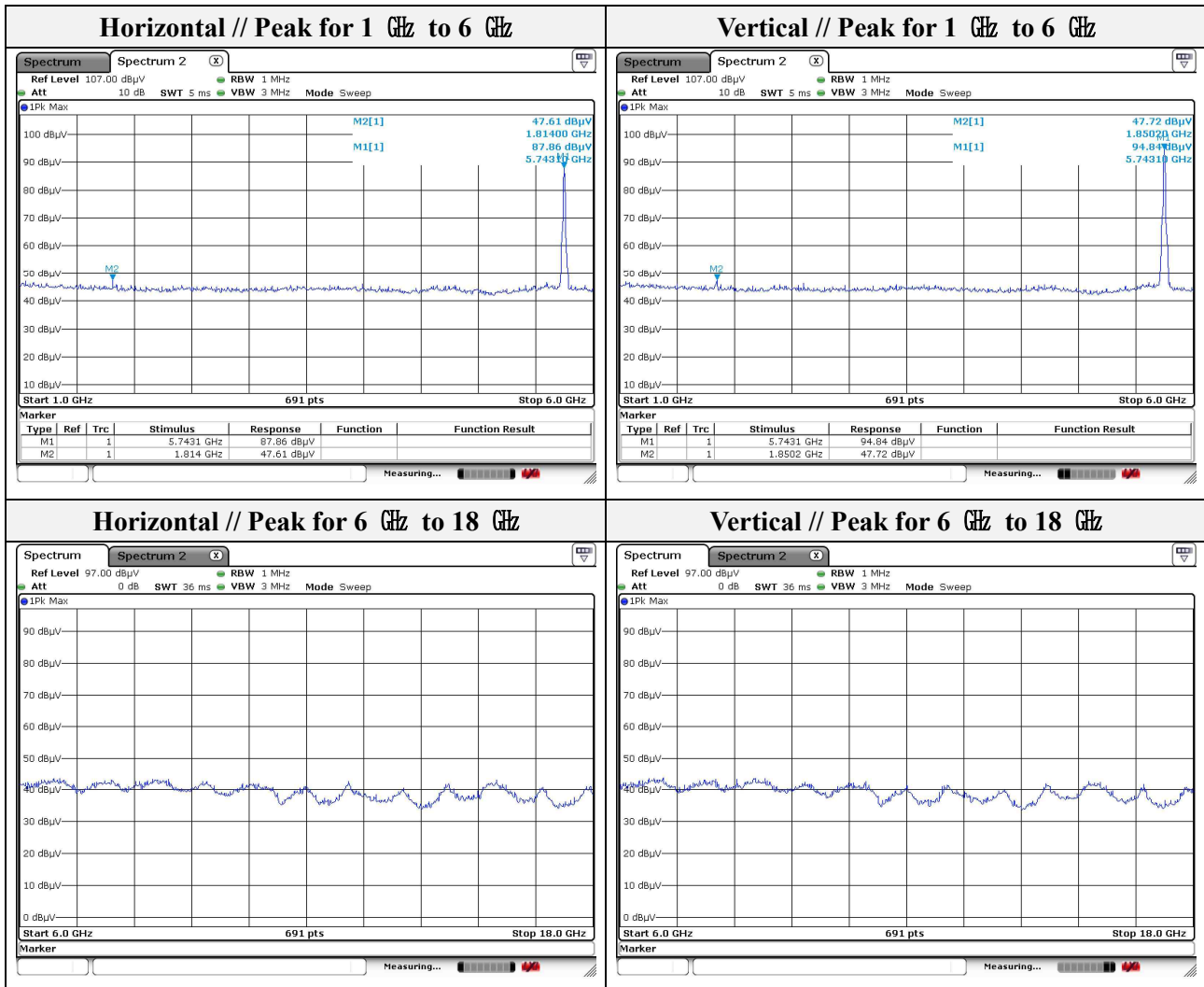
- Spurious

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1814.00	47.61	Peak	V	-2.93	-	44.68	74.00	29.32
1850.20	47.72	Peak	V	-2.55	-	45.17	74.00	28.83

- Band edge

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5725.00	57.36	Peak	H	10.87	-	68.23	122.20	53.97
5725.00	62.86	Peak	V	10.87	-	73.73	122.20	48.47





Note.

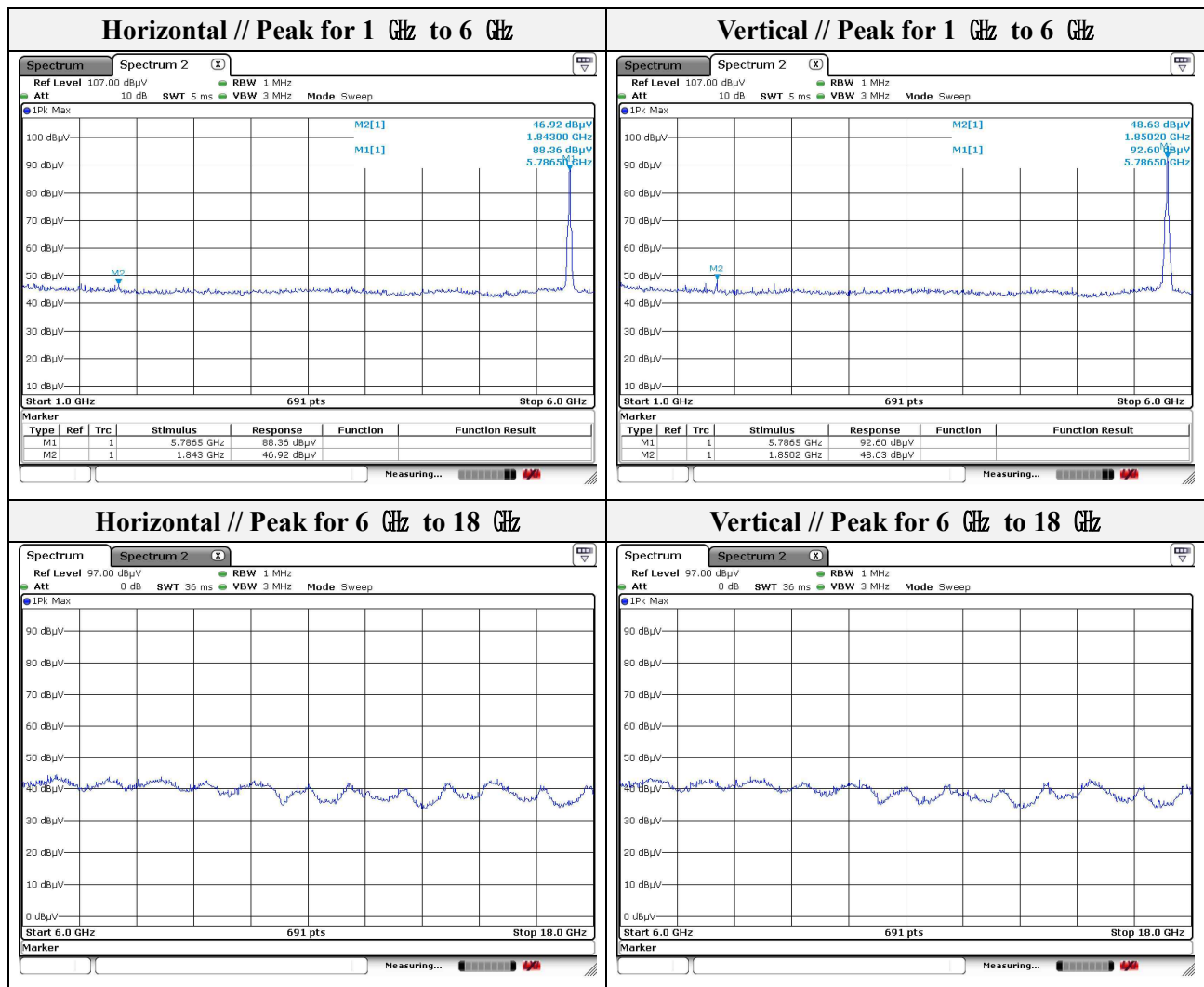
1. Average test was not performed because peak result is lower than the average limit.
2. No spurious emission were detected above 6 GHz.



Mode: UNII-3
Distance of measurement: 3 meter
Channel: 157

- Spurious

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1843.00	46.92	Peak	V	-2.62	-	44.30	74.00	29.70
1850.20	48.63	Peak	V	-2.55	-	46.08	74.00	27.92



Note.

1. Average test was not performed because peak result is lower than the average limit.
2. No spurious emission were detected above 6 GHz.



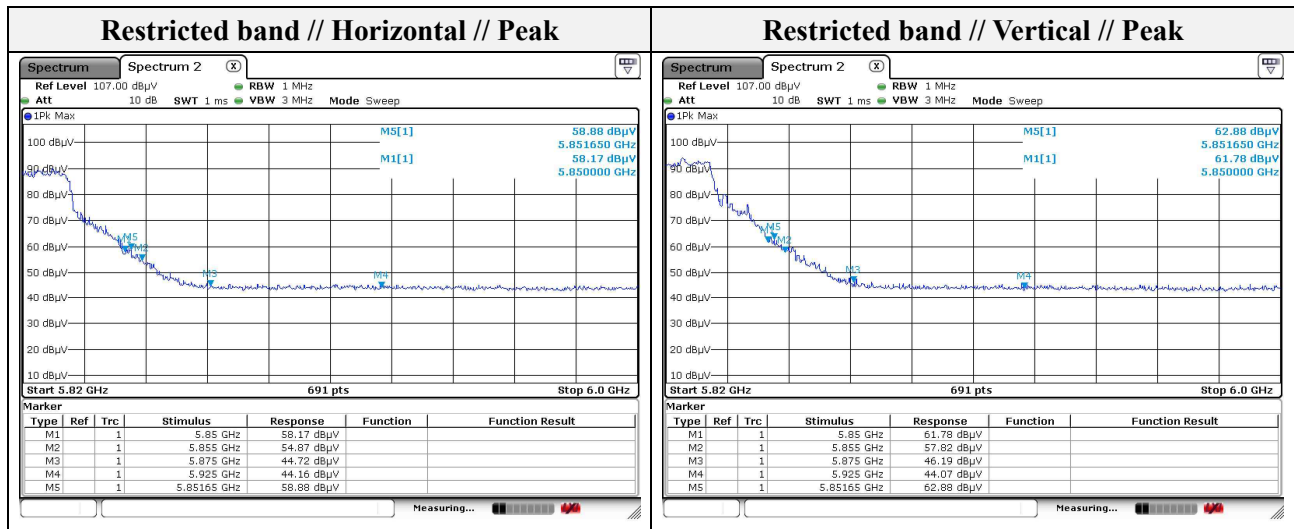
Mode: UNII-3
Distance of measurement: 3 meter
Channel: 165

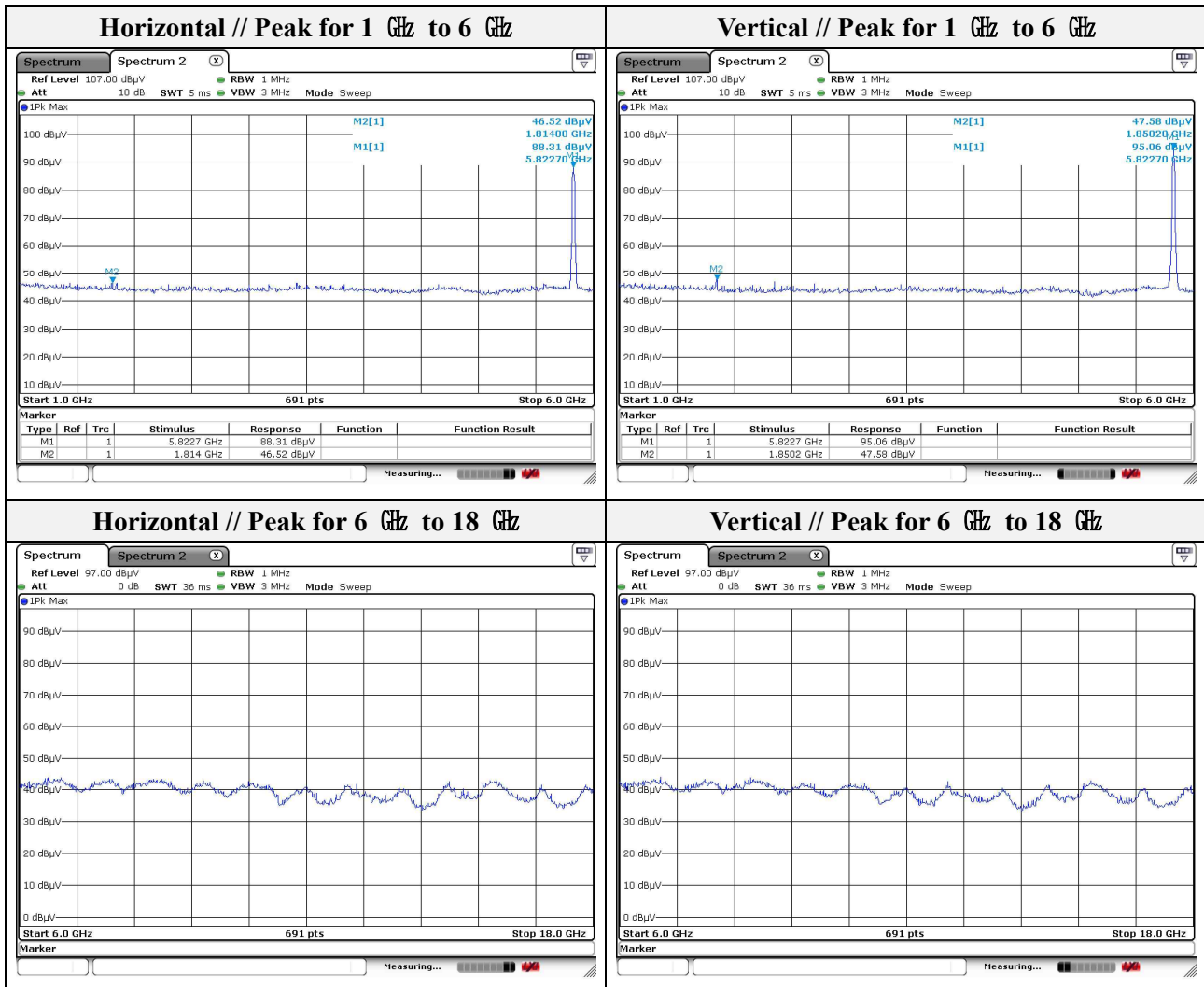
- Spurious

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1814.00	46.52	Peak	V	-2.93	-	43.59	74.00	30.41
1850.20	47.58	Peak	V	-2.55	-	45.03	74.00	28.97

- Band edge

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5851.65	58.88	Peak	H	11.78	-	70.66	118.44	47.78
5851.65	62.88	Peak	V	11.78	-	74.66	118.44	43.78





Note.

1. Average test was not performed because peak result is lower than the average limit.
2. No spurious emission were detected above 6 GHz.

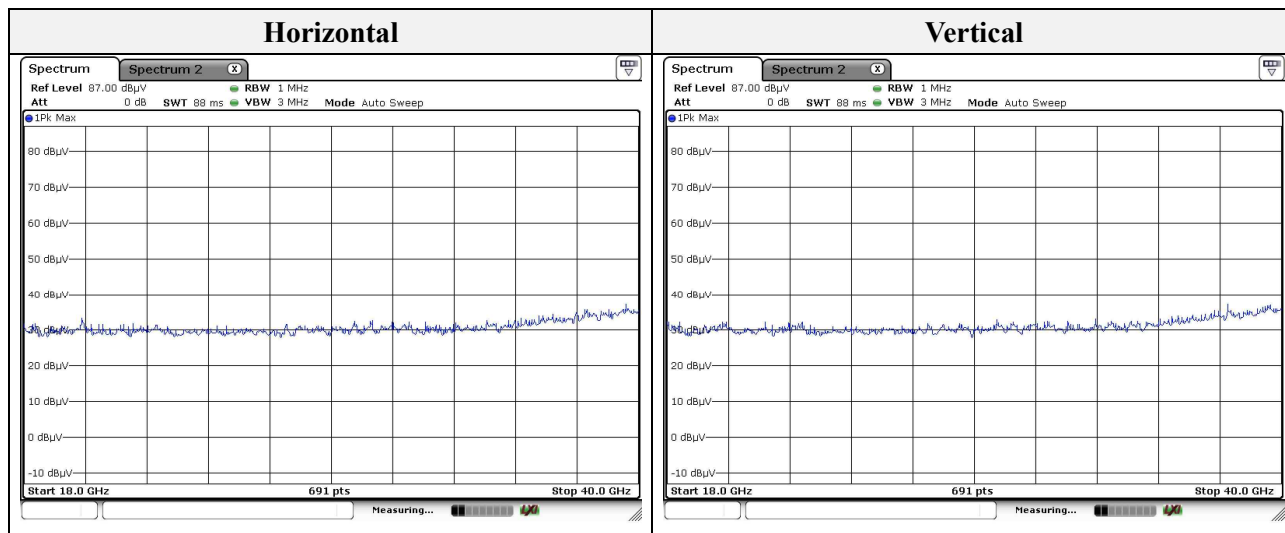


Test results (18 GHz to 40 GHz)

Mode: UNII-1

Distance of measurement: 3 meter

Channel: 36 (Worst case)



Note.

1. No spurious emission were detected above 18 GHz.

3.3. AC conducted emissions

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 (dBμV/m)	
	Quasi-peak	Average
0.15 – 0.50	66 - 56*	56 - 46*
0.50 – 5.00	56	46
5.00 – 30.0	60	50

Note.

1. All AC line conducted spurious emission are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and the appropriate frequencies. All data rates and modes were investigated for conducted spurious emission. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section.
3. Both Cable loss and LISN factor are included in measurement level(QP Level or AV Level).



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Test report No.:

KES-RF-17T0140-R1

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Test results

Hot Line

Level in dBµV

Frequency in Hz

FCC Part 15 Class B Voltage on Mains QP

FCC Part 15 Class B Voltage on Mains AV

Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.195000	---	16.29	53.82	37.53	1000.0	9.000	L1	19.5
0.195000	35.23	---	63.82	28.59	1000.0	9.000	L1	19.5
0.465000	---	19.77	46.60	26.83	1000.0	9.000	L1	19.7
0.465000	27.19	---	56.60	29.41	1000.0	9.000	L1	19.7
1.620000	---	15.83	46.00	30.17	1000.0	9.000	L1	20.2
1.620000	20.83	---	56.00	35.17	1000.0	9.000	L1	20.2
2.180000	---	15.81	46.00	30.19	1000.0	9.000	L1	20.2
2.180000	21.10	---	56.00	34.90	1000.0	9.000	L1	20.2
21.755000	---	24.57	50.00	25.43	1000.0	9.000	L1	20.4
21.755000	29.86	---	60.00	30.14	1000.0	9.000	L1	20.4
22.190000	---	24.62	50.00	25.38	1000.0	9.000	L1	20.4
22.190000	29.87	---	60.00	30.13	1000.0	9.000	L1	20.4

Neutral Line

Level in dBµV

Frequency in Hz

FCC Part 15 Class B Voltage on Mains QP

FCC Part 15 Class B Voltage on Mains AV

Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.165000	---	18.61	55.21	36.60	1000.0	9.000	N	19.5
0.165000	38.53	---	65.21	26.68	1000.0	9.000	N	19.5
0.450000	---	23.25	46.88	23.63	1000.0	9.000	N	19.7
0.450000	30.43	---	56.88	26.45	1000.0	9.000	N	19.7
1.725000	---	17.73	46.00	28.27	1000.0	9.000	N	20.2
1.725000	23.07	---	56.00	32.93	1000.0	9.000	N	20.2
2.705000	---	15.67	46.00	30.33	1000.0	9.000	N	20.2
2.705000	21.57	---	56.00	34.43	1000.0	9.000	N	20.2
21.400000	---	25.67	50.00	24.33	1000.0	9.000	N	20.5
21.400000	30.81	---	60.00	29.19	1000.0	9.000	N	20.5
21.700000	---	25.92	50.00	24.08	1000.0	9.000	N	20.5
21.700000	31.22	---	60.00	28.78	1000.0	9.000	N	20.5

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



Appendix A. Measurement equipment

Equipment	Manufacturer	Model	Serial No.	Calibration interval	Calibration due.
Spectrum Analyzer	R&S	FSV40	101002	1 year	2018.07.04
8360B Series Swept Signal Generator	HP	83630B	3844A00786	1 year	2018.01.23
Power Meter	Anritsu	ML2495A	1438001	1 year	2018.01.23
Pulse Power Sensor	Anritsu	MA2411B	1339205	1 year	2018.01.23
Attenuator	Agilent	8493C	51401	1 year	2018.07.04
AC Power Source	HP	6813A	3729A00754	1 year	2018.01.19
Loop Antenna	Schwarzbeck	FMZB1513	225	2 years	2019.05.10
Trilog-broadband antenna	SCHWARZBECK	VULB 9163	9168-714	2 years	2018.11.28
Horn Antenna	A.H	SAS-571	414	2 years	2019.02.15
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170550	2 years	2019.02.15
High Pass Filter	Wainwright Instrument Gmbh	WHJS3000-10TT	1	1 year	2018.07.03
Low Pass Filter	Wainwright Instrument Gmbh	WLK1.0/18G-10TT	1	1 year	2018.07.03
Preamplifier	HP	8449B	3008A00538	1 year	2018.01.19
Preamplifier	AGILENT	8449B	3008A01729	1 year	2018.05.31
EMI Test Receiver	R&S	ESR3	101781	1 year	2018.04.27
EMI Test Receiver	R&S	ESU26	100552	1 year	2018.04.19
LISN	R&S	ENV216	101787	1 year	2018.01.11

Peripheral devices

Device	Manufacturer	Model No.	Serial No.
Notebook Computer	LG Electronics Inc.,	LGS53	306QCZP560949
Test Board	N/A	N/A	N/A