

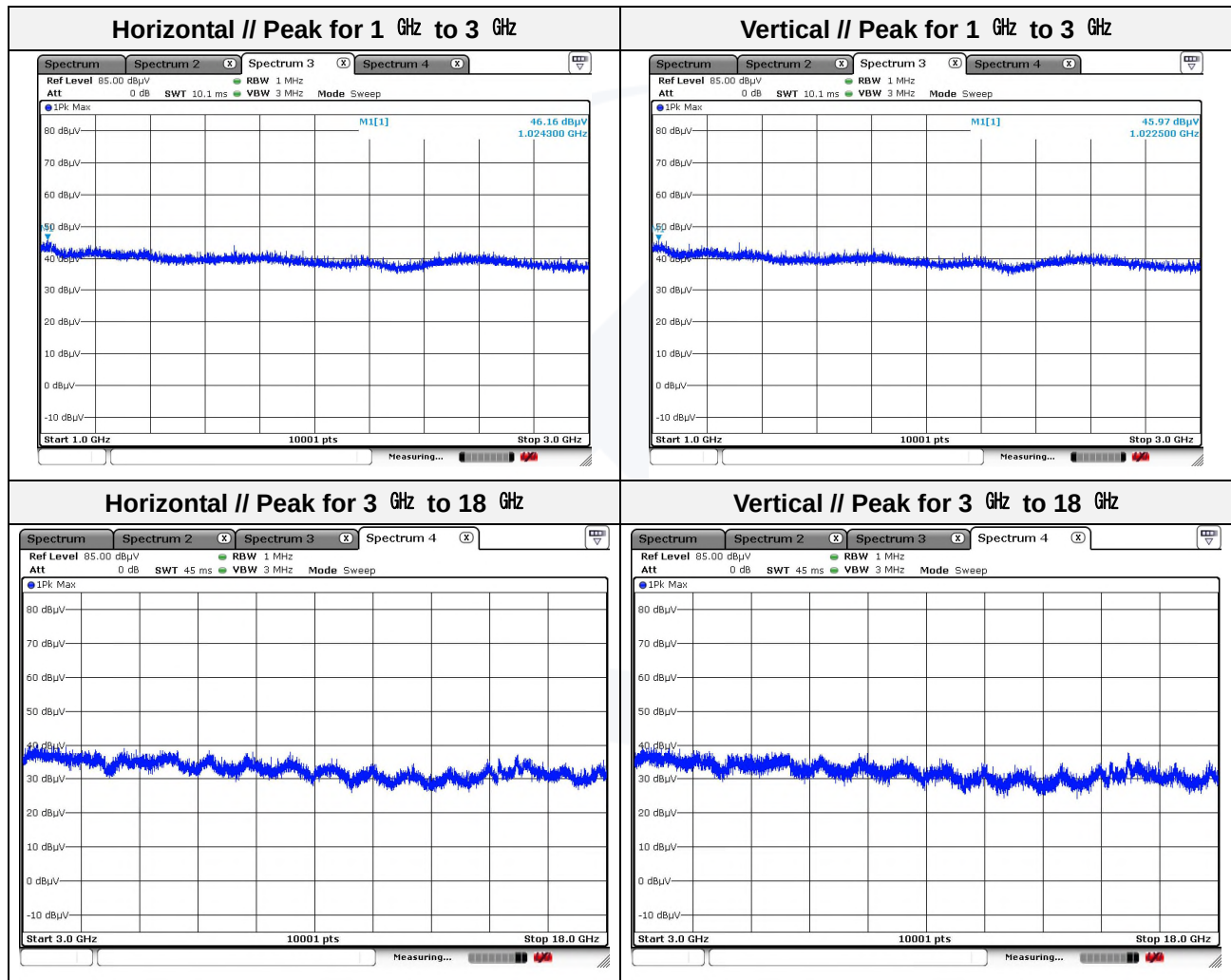


Report No. : KES-RF240904-R2

Mode: 802.11n_HT20 (MCS0)
Power: DC 11.1 V
Distance of measurement: 3 meter
Channel: 6

- Spurious

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1 022.50	45.97	Peak	V	-7.76	-	38.21	74.00	35.79
1 024.30	46.16	Peak	H	-7.75	-	38.41	74.00	35.59



Note.

1. No spurious emission were detected above 3 GHz.
2. Average test would be performed if the peak result were greater than the average limit.



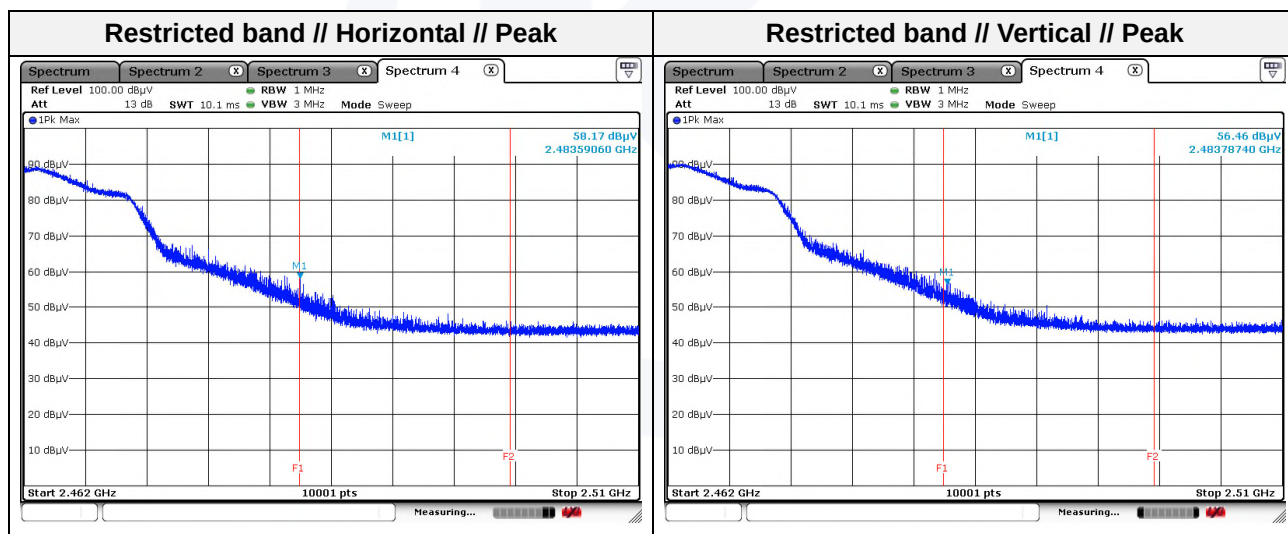
Mode: 802.11n_HT20 (MCS0)
Power: DC 11.1 V
Distance of measurement: 3 meter
Channel: 11

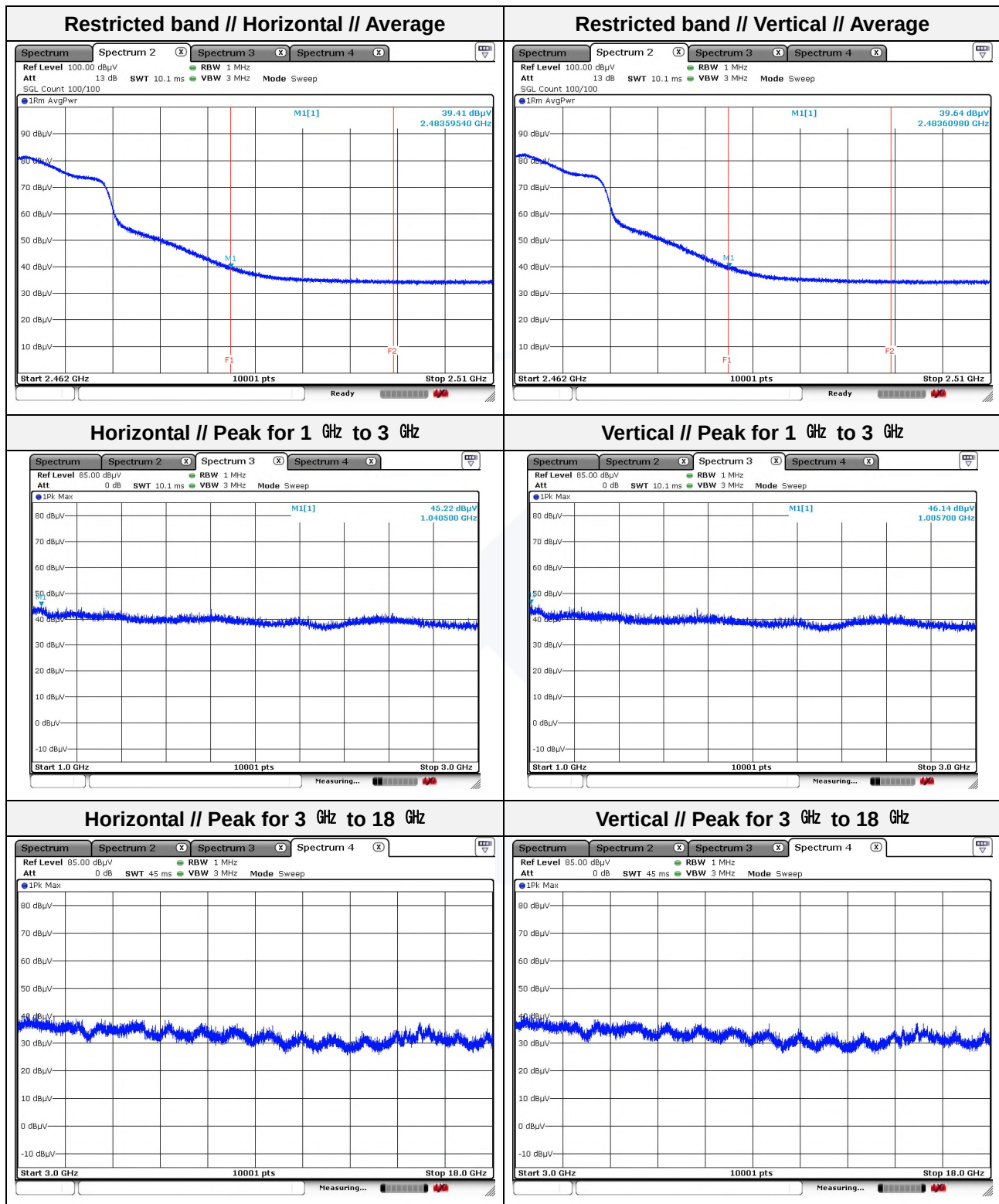
- Spurious

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1 005.70	46.14	Peak	V	-7.85	-	38.29	74.00	35.71
1 040.50	45.22	Peak	H	-7.67	-	37.55	74.00	36.45

- 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)
2 483.59	58.17	Peak	H	-1.91	-	56.26	74.00	17.74
2 483.60	39.41	Average	H	-1.91	-	37.50	54.00	16.50
2 483.79	56.46	Peak	V	-1.91	-	54.55	74.00	19.45
2 483.61	39.64	Average	V	-1.91	-	37.73	54.00	16.27





Note.

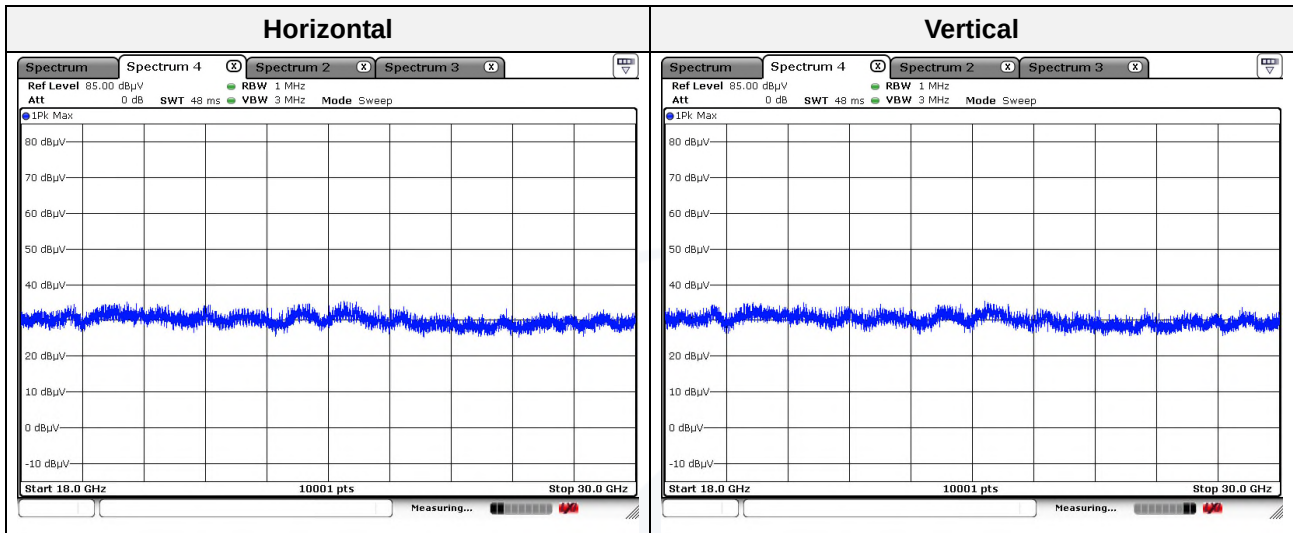
1. No spurious emission were detected above 3 GHz.
2. Average test would be performed if the peak result were greater than the average limit.



Report No. : KES-RF240904-R2

Test results (18 GHz to 30 GHz) – Worst case

Mode: LE 1 Mbps (Worst case)
Power: AC 120 V
Distance of measurement: 3 meter
Channel: 0 (Worst case)

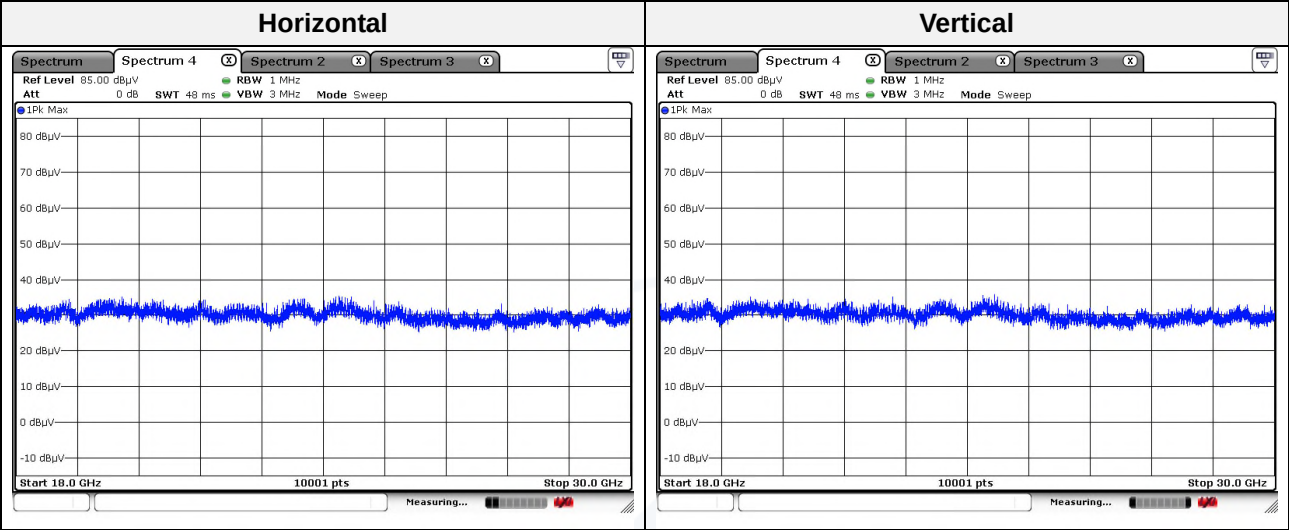


Note.

1. No spurious emission were detected above 18 GHz.



Mode:	802.11n_HT20 (MCS) (Worst case)
Power:	AC 120 V
Distance of measurement:	3 meter
Channel:	1 (Worst case)

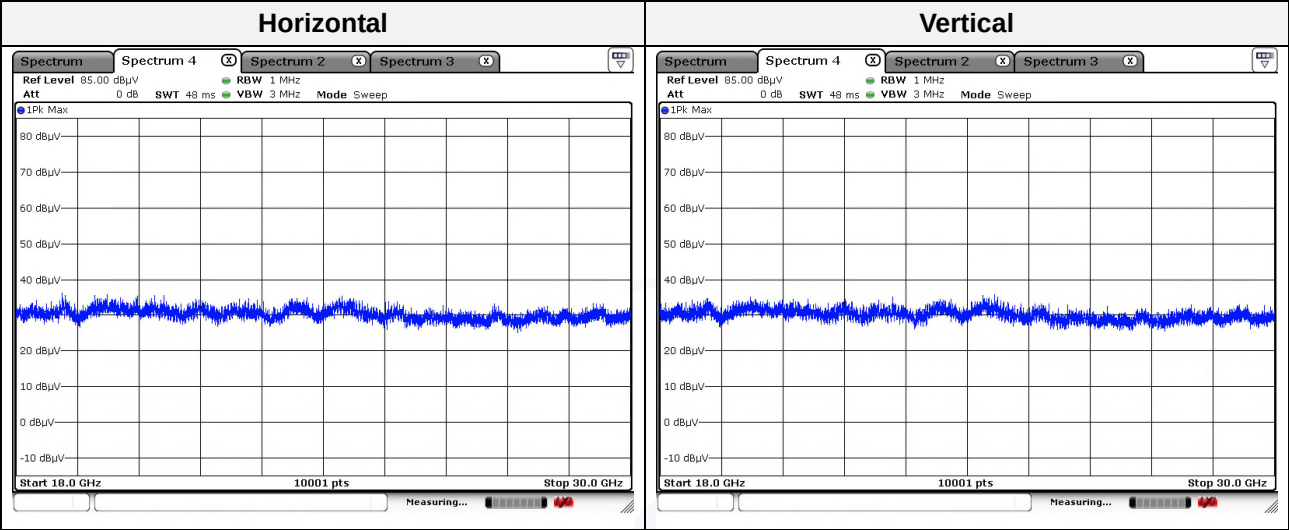


Note.

1. No spurious emission were detected above 18 GHz.



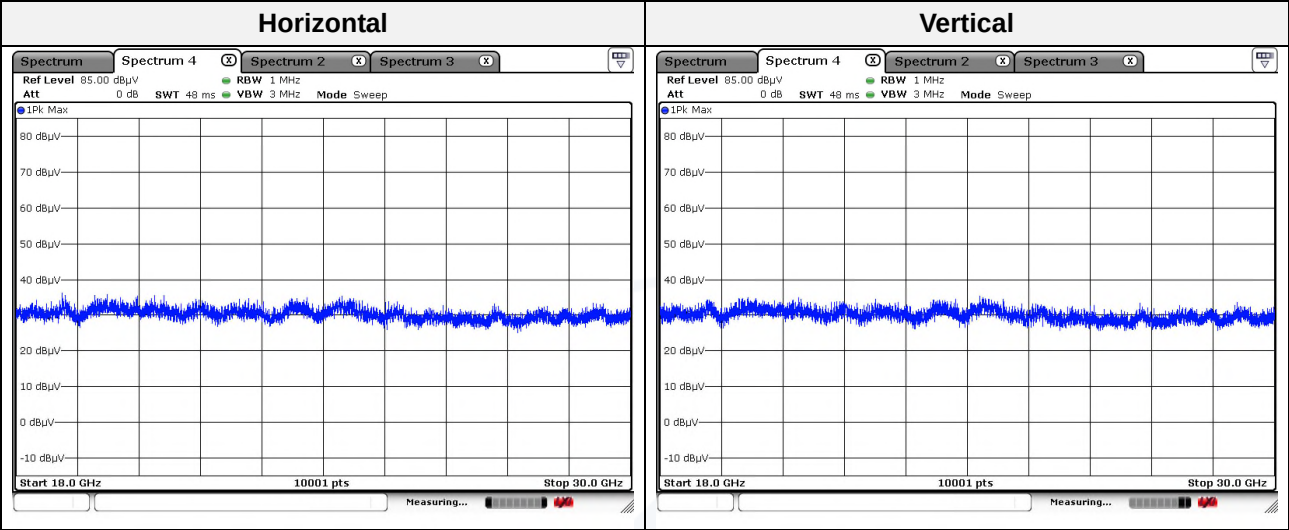
Mode:	LE 1 Mbps (Worst case)
Power:	DC 11.1 V
Distance of measurement:	3 meter
Channel:	0 (Worst case)



- Note.
1. No spurious emission were detected above 18 GHz.



Mode:	802.11n_HT20 (MCS) (Worst case)
Power:	DC 11.1 V
Distance of measurement:	3 meter
Channel:	1 (Worst case)



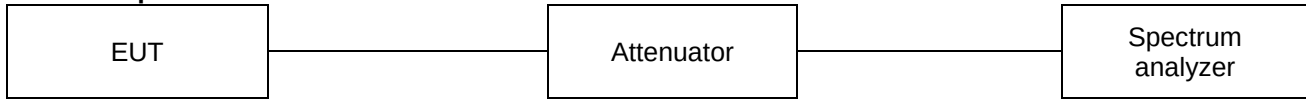
Note.

1. No spurious emission were detected above 18 GHz.



3.6. Conducted spurious emissions & band edge

Test setup



Test procedure

Band edge

For FCC, ANSI C63.10-2020 - Section 11.11

For IC, ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 - Section 11.11

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. Set the RBW = 100 kHz
4. Set the VBW = $[3 \times \text{RBW}]$.
5. Detector = Peak
6. Sweep time = auto
7. Trace mode = max hold
8. Allow trace to fully stabilize.

Out of band emissions

For FCC, ANSI C63.10-2020 - Section 11.11

For IC, ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 - Section 11.11

1. Start frequency was set to 30 MHz and stop frequency was set to 25 GHz for 2.4 GHz frequencies and 40 GHz for 5 GHz frequencies
2. Set the RBW = 100 kHz
3. Set the VBW = $[3 \times \text{RBW}]$.
4. Detector = Peak
5. Sweep time = auto
6. Trace mode = max hold
7. Allow trace to fully stabilize.

FCC Limit

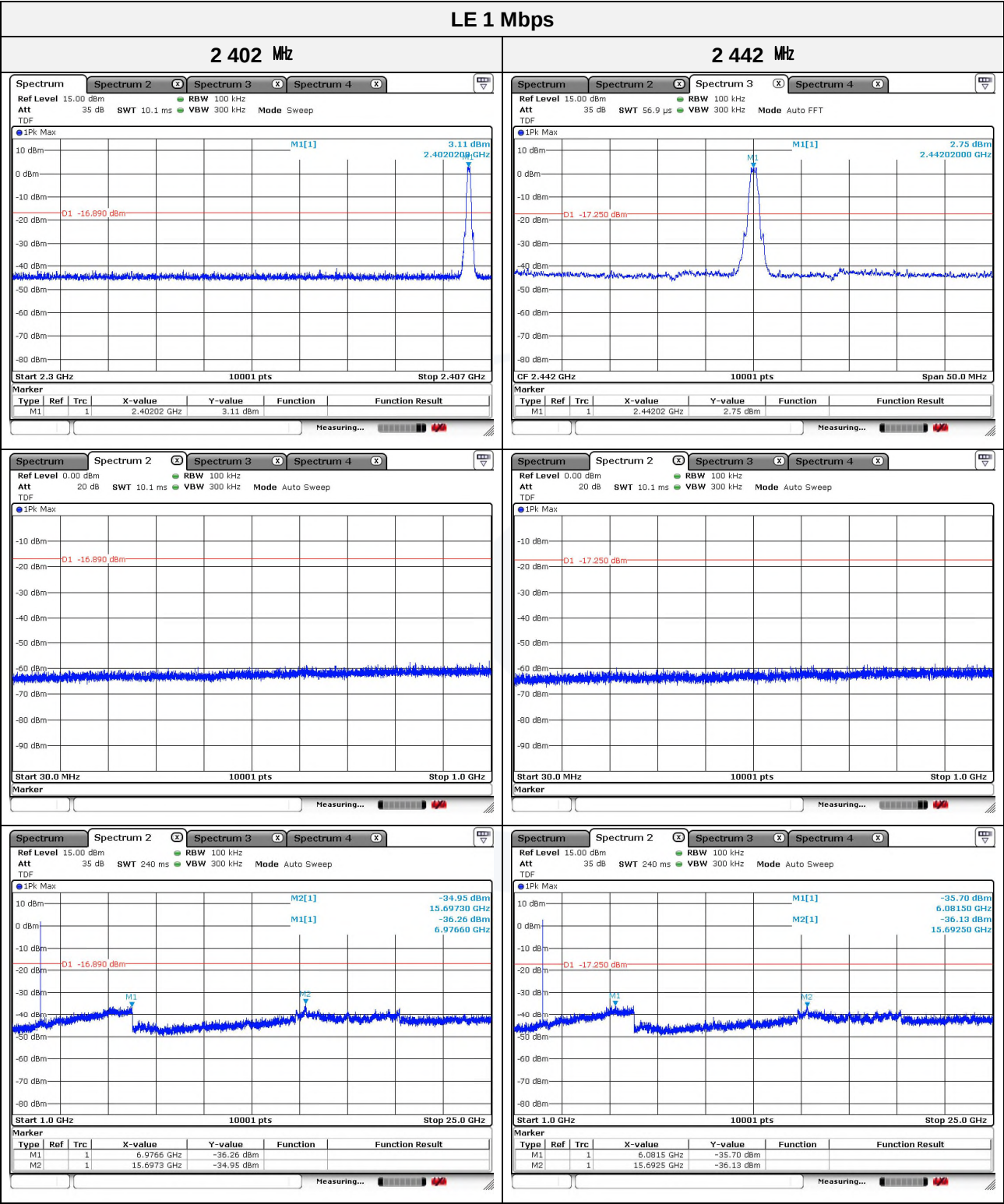
According to 15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph(b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in section 15.209(a) is not required. In addition, radiated emission which in the restricted band, as define in section 15.205(a), must also comply the radiated emission limits specified in section 15.209(a) (see section 15.205(c))

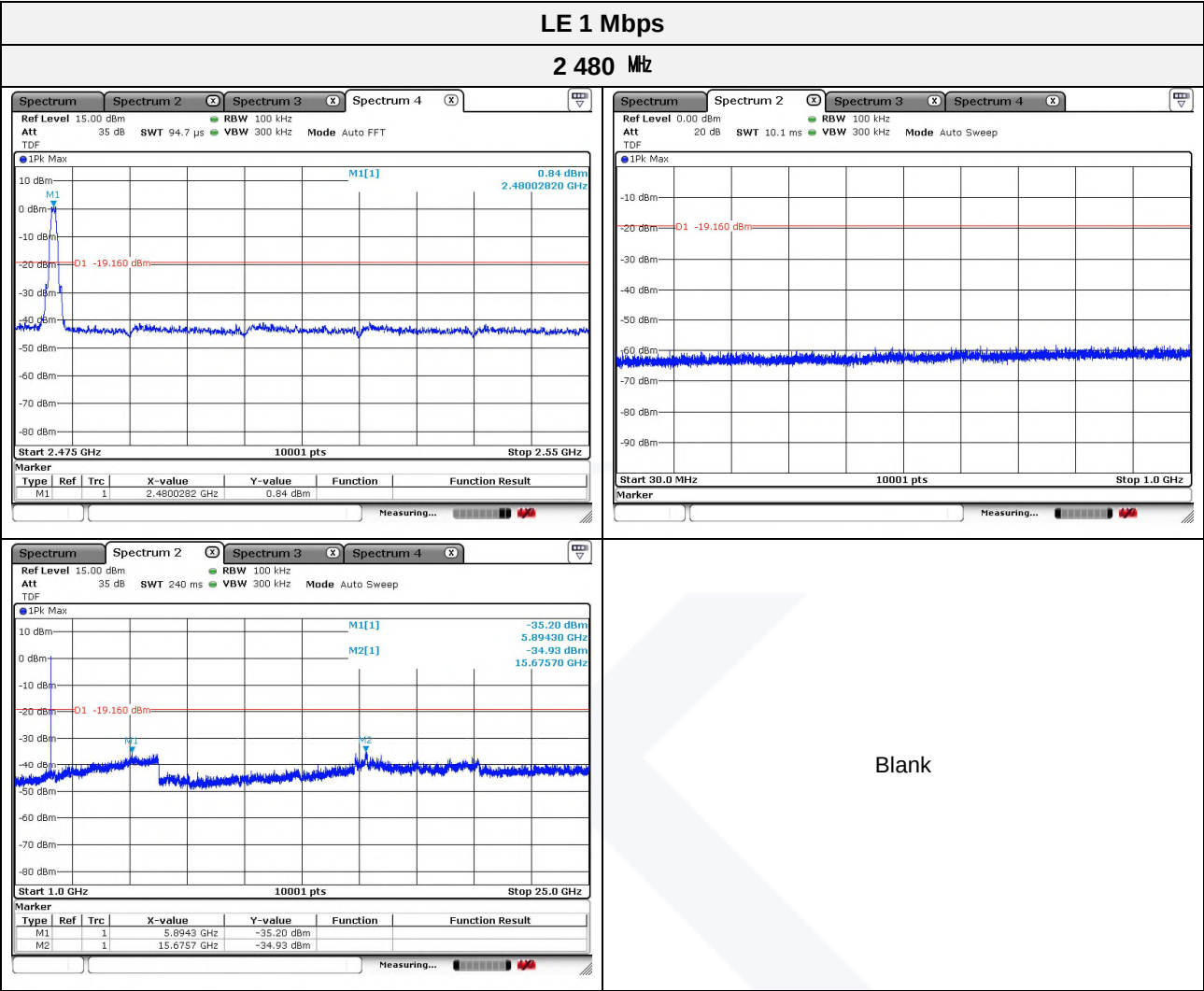
IC Limit

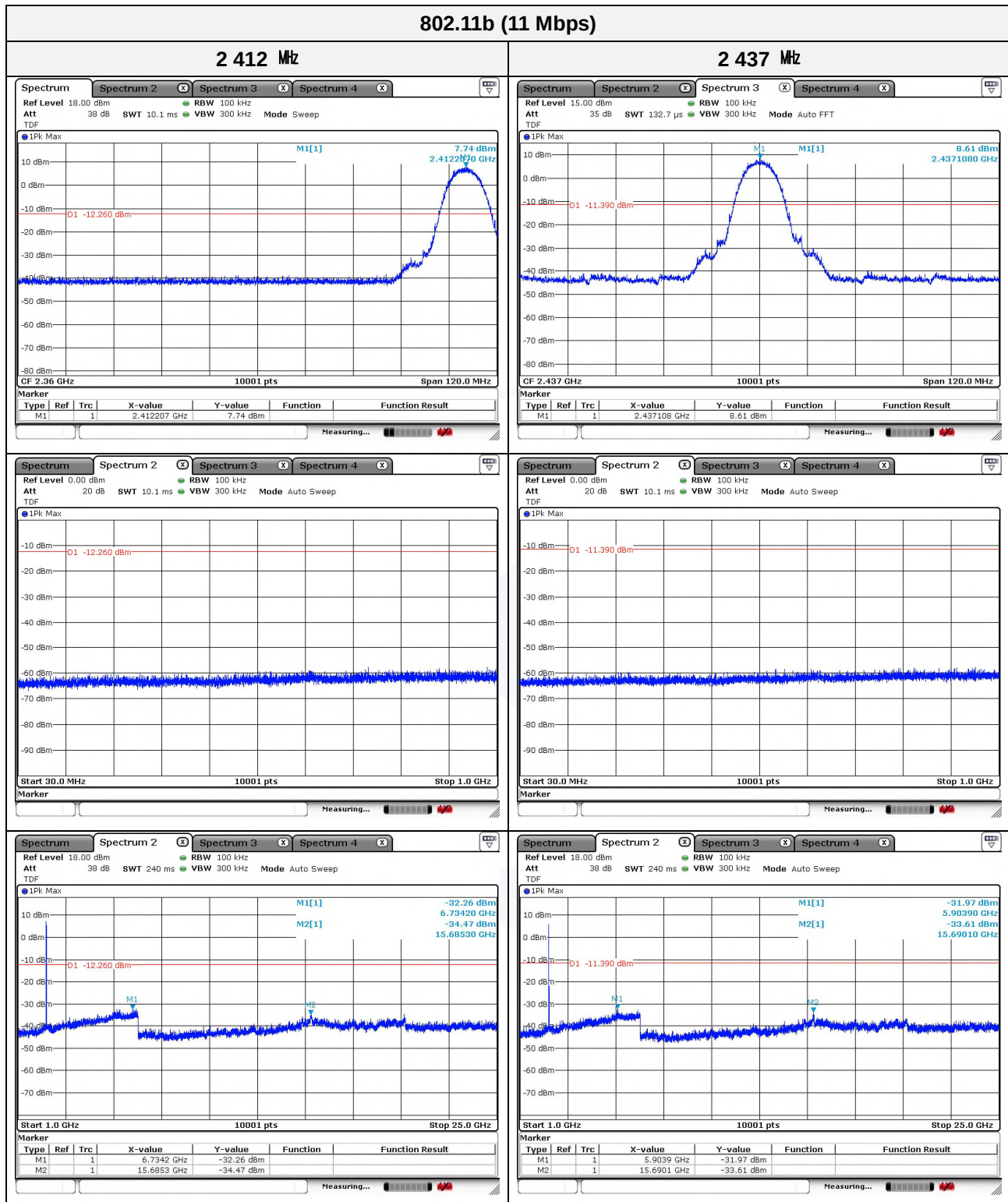
According to § RSS-247 6.6, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum device, digitally modulated device, or hybrid system is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power – based on either an RF conducted or a radiated measurement – provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 6.3.2, the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

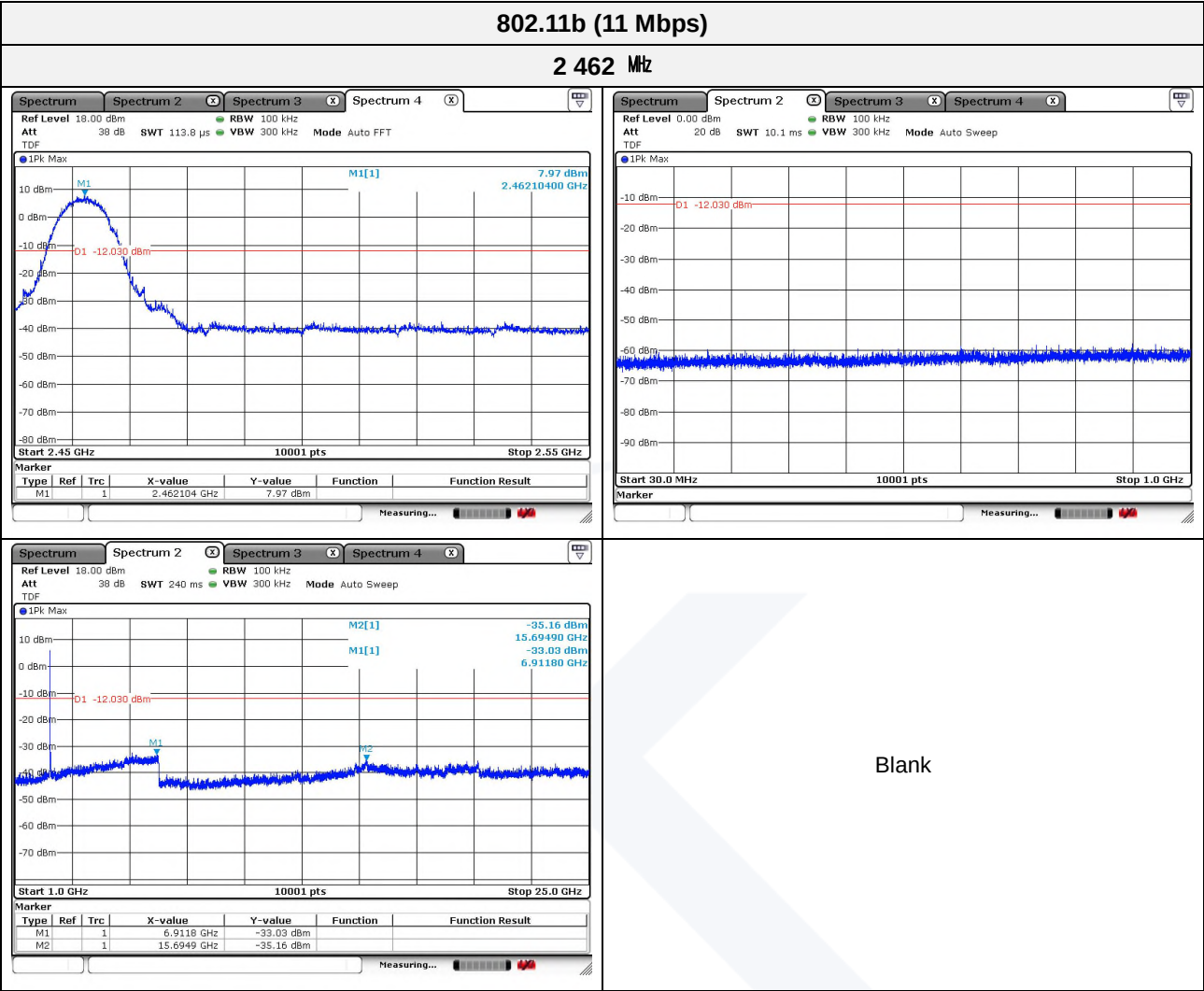


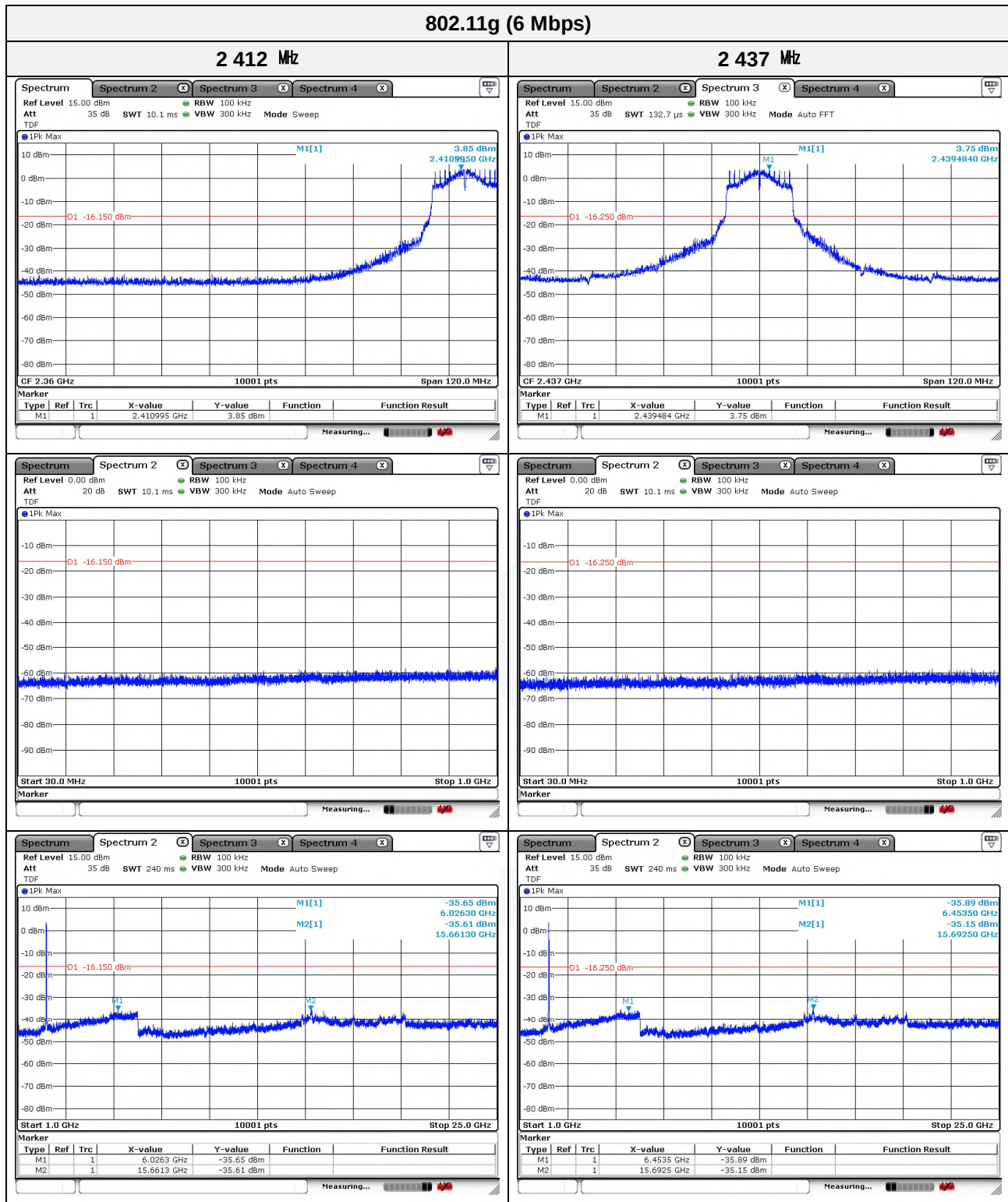
Test results

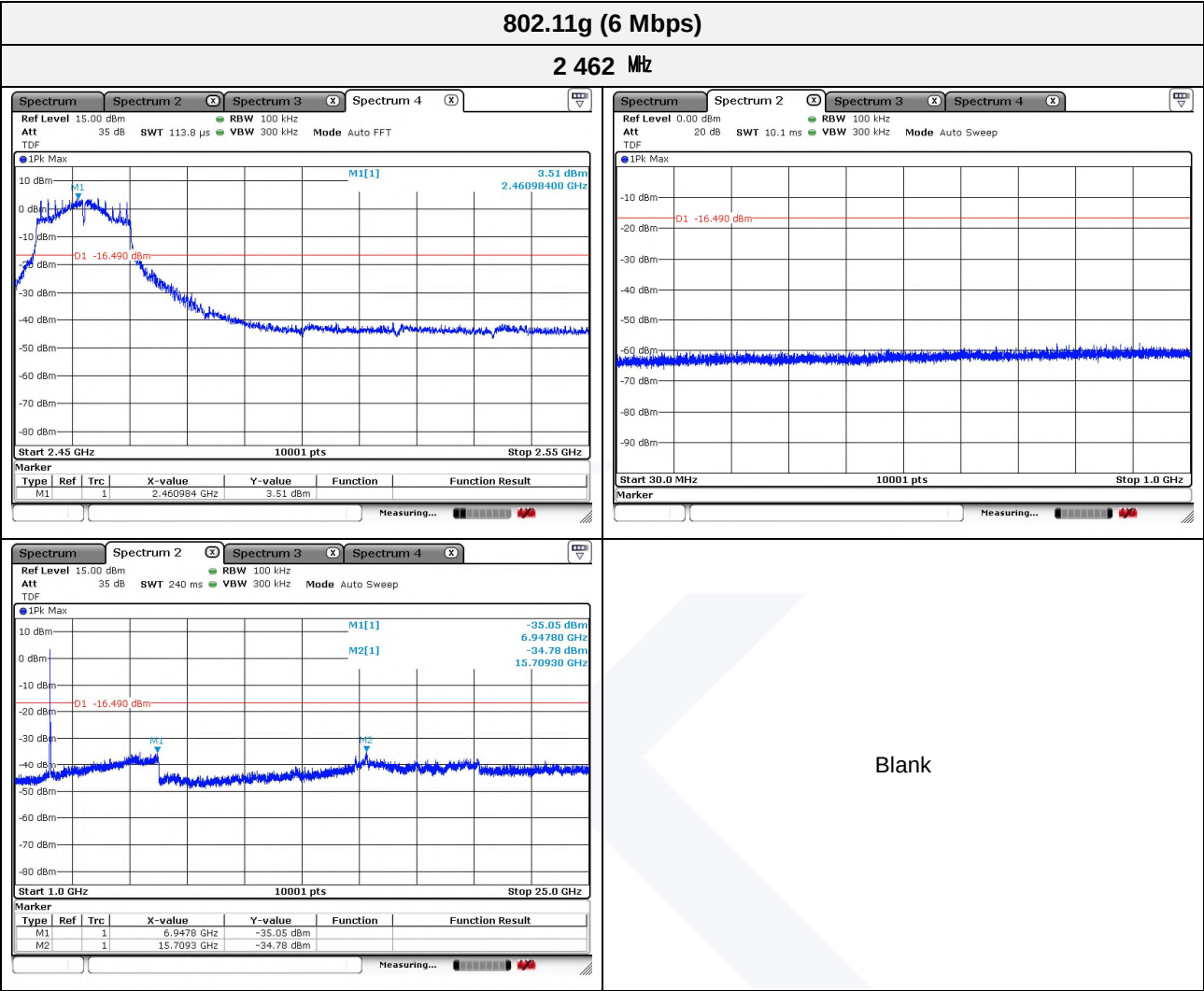


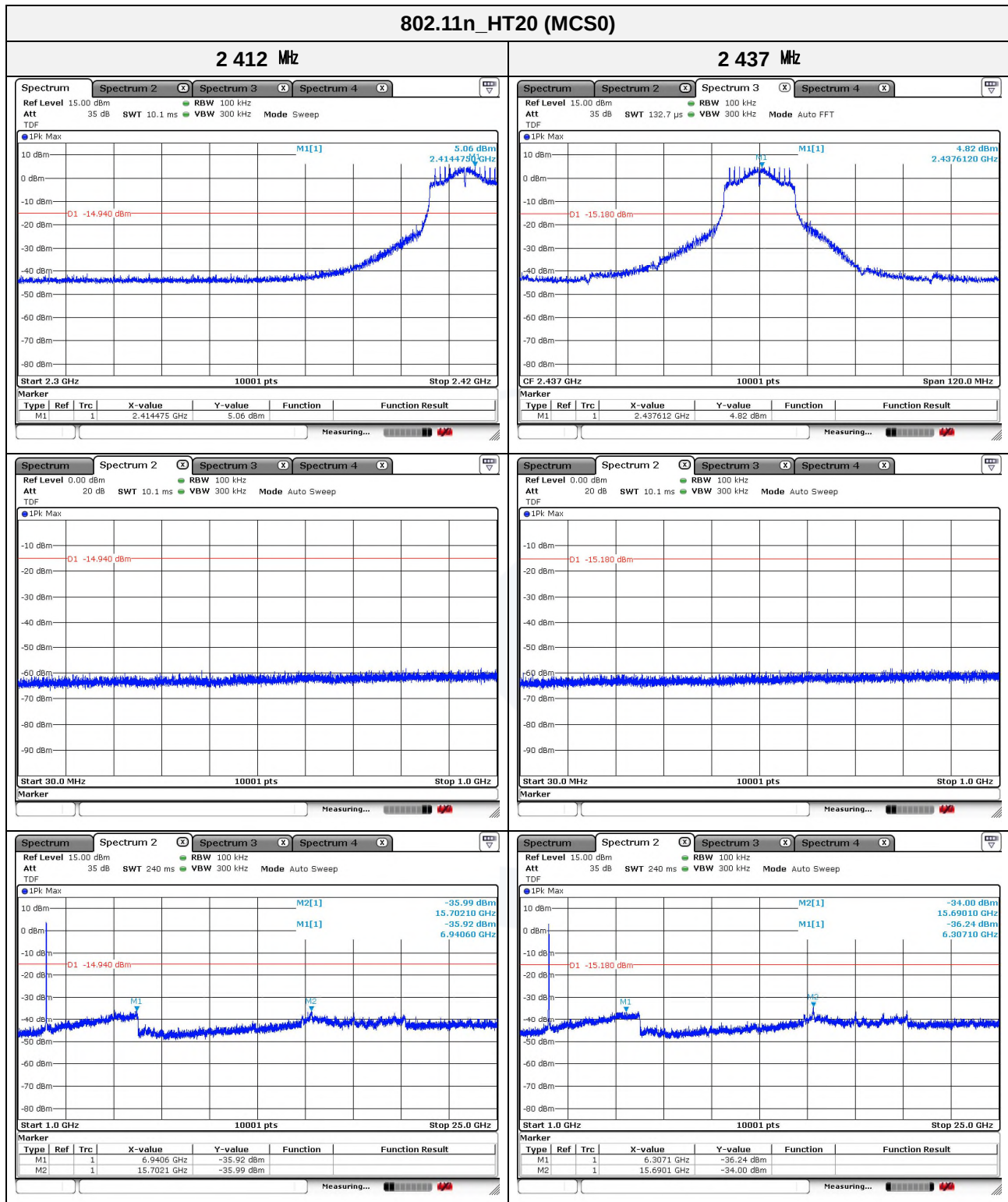


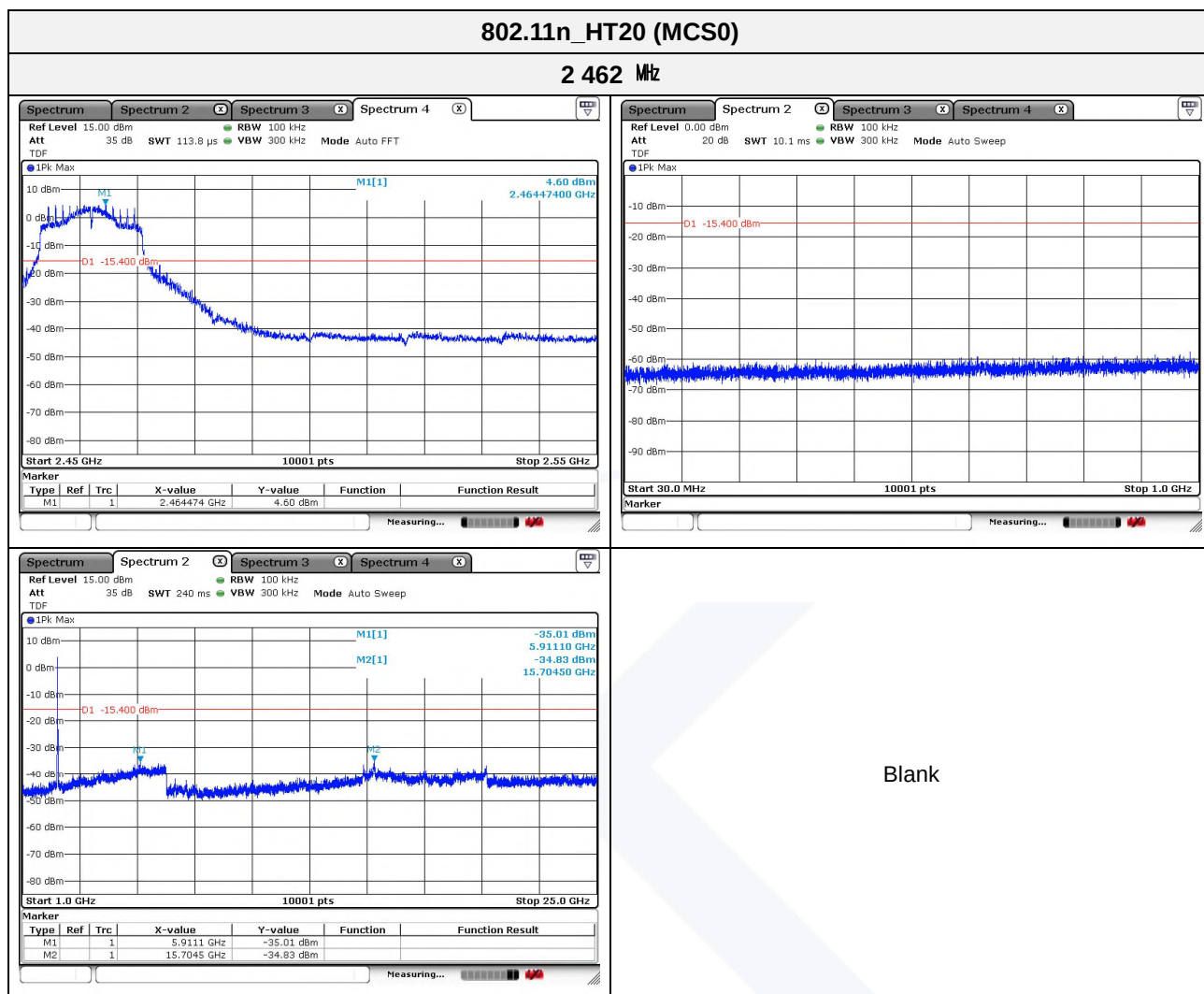














3.7. AC conducted emissions

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

IC Limit

According to RSS-Gen 8.8, Unless stated otherwise in the applicable RSS, for radio apparatus that are designed to be connected to the public utility AC power network, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the range 150 kHz to 30 MHz shall not exceed the limits in table 4, as measured using a 50 μH / 50 Ω line impedance stabilization network. This requirement applies for the radio frequency voltage measured between each power line and the ground terminal of each AC power-line mains cable of the EUT.

For an EUT that connects to the AC power lines indirectly, through another device, the requirement for compliance with the limits in table 4 shall apply at the terminals of the AC power-line mains cable of a representative support device, while it provides power to the EUT. The lower limit applies at the boundary between the frequency ranges. The device used to power the EUT shall be representative of typical applications.

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

**Test results**

Mode: LE 1 Mbps (Worst case)
Distance of measurement: 3 meter
Channel: 0 (Worst case)





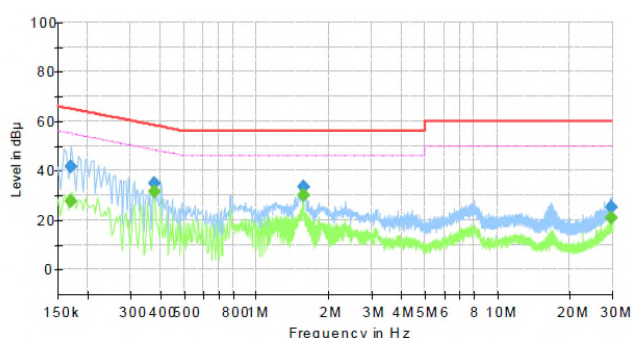
Report No. : KES-RF240904-R2

Mode: 802.11n_HT20 (Worst case)

Distance of measurement: 3 meter

Channel: 1 (Worst case)

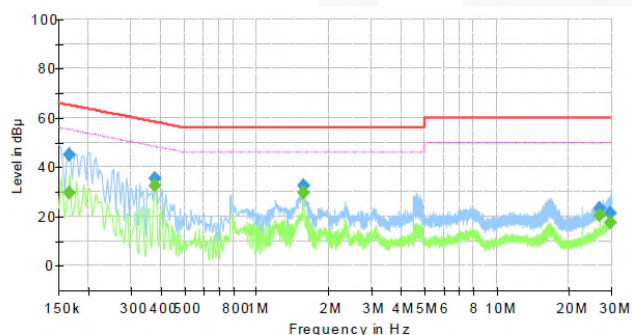
Hot Line



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.170000	---	27.70	54.96	27.26	1000.0	9.000	L1	19.5
0.170000	41.64	---	64.96	23.32	1000.0	9.000	L1	19.5
0.378000	---	31.59	48.32	16.73	1000.0	9.000	L1	19.6
0.378000	35.07	---	58.32	23.25	1000.0	9.000	L1	19.6
1.562000	---	29.99	46.00	16.01	1000.0	9.000	L1	19.6
1.562000	33.60	---	56.00	22.40	1000.0	9.000	L1	19.6
29.814000	---	20.78	50.00	29.22	1000.0	9.000	L1	20.6
29.814000	25.29	---	60.00	34.71	1000.0	9.000	L1	20.6

Neutral Line



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.169000	---	29.75	55.16	25.41	1000.0	9.000	N	19.5
0.169000	44.80	---	65.16	20.36	1000.0	9.000	N	19.5
0.378000	---	32.44	48.32	15.88	1000.0	9.000	N	19.5
0.378000	35.36	---	58.32	22.96	1000.0	9.000	N	19.5
1.562000	---	29.68	46.00	16.32	1000.0	9.000	N	19.6
1.562000	32.54	---	56.00	23.46	1000.0	9.000	N	19.6
26.822000	---	20.21	50.00	29.79	1000.0	9.000	N	20.5
26.822000	23.11	---	60.00	36.89	1000.0	9.000	N	20.5
29.758000	---	17.34	50.00	32.66	1000.0	9.000	N	20.6
29.758000	21.33	---	60.00	38.67	1000.0	9.000	N	20.6



3.8. 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	FSV30	101389	1 year	2025.04.16 2026.04.18
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
Power Meter	Anritsu	ML2495A	2010001	1 year	2025.04.15 2026.04.16
Pulse Power Sensor	Anritsu	MA2411B	1911111	1 year	2025.04.15 2026.04.16
ATTENUATOR	KEYSIGHT	8493C	82506	1 year	2026.01.13 2027.01.06
BAND REJECT FILTER	MICRO-TRONICS	BRM50702	G272	1 year	2026.01.08 2027.01.08
BAND REJECT FILTER	MICRO-TRONICS	BRM50716	G199	1 year	2026.01.08 2027.01.08
LOOP ANTENNA	TESEQ	HLA6121	66547	2 years	2026.01.22 2028.01.13
TRILOG-BROADBAND ANTENNA	Schwarzbeck	VULB 9163	714	2 years	2026.04.19
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1802	1 year	2025.11.04 2026.11.05
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA 9170550	1 year	2026.01.13 2027.01.12
Amplifier	SONOMA INSTRUMENT	310N	401123	1 year	2026.02.13 2027.02.12
PREAMPLIFIER	HP	8449B	3008A00538	1 year	2025.04.30 2026.04.30
BROADBAND AMPLIFIER	SCHWARZBECK	BBV9721	PS9721-003	1 year	2026.01.09 2027.01.12
DC POWER SUPPLY	SORENSEN	DCS40-75E	1408A02745	1 year	2026.01.08 2027.01.08
EMI Test Receiver	R & S	ESR7	101190	1 year	2025.07.29 2026.04.30
EMI Test S/W	TOYO Corporation	ES10/RE	2022.01.000	-	-
EMI Test Receiver	R&S	ESR3	101783	1 year	2026.11.03
EMI Test S/W	R&S	EMC32	9.12.00	-	-
PULSE LIMITER	R&S	ESH2-Z2	101915	1 year	2026.11.03
LISN	R&S	ENV216	101786	1 year	2026.01.09 2027.01.08



Equipment	Manufacturer	Model	Serial No.	Calibration interval	Calibration due.
Cable	-	-	#A-5	1 year	2026.01.20 2027.01.18
Cable (SR #6)	RG 400	-	-	0.5 year	2025.07.25 2026.01.25 2026.07.25
Cable (SAC #5)	SUCOFLEX106	HUBER_SUHNER	-	0.5 year	2025.07.25 2026.01.25 2026.07.25
	SUCOFLEX106	HUBER_SUHNER	-		2025.07.25 2026.01.25 2026.07.25
	LH21D/2xSMA	OSI Cable	-		2025.07.25 2026.01.25 2026.07.25
Cable (SAC #6)	TCLH21D-SMSM-2.5M 0222	OSI Cable	-	0.5 year	2025.07.25 2026.01.25 2026.07.25
	TCLH21D-NMNM-10.0M 0222	OSI Cable	-		2025.07.25 2026.01.25 2026.07.25
	TCLH21D-SMSM-7.0M 0222	OSI Cable	-		2025.07.25 2026.01.25 2026.07.25

* 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 devices

Device	Manufacturer	Model No.	Serial No.
Notebook computer	LG Electronics Inc.,	15U480	901QCCV558723

The End.