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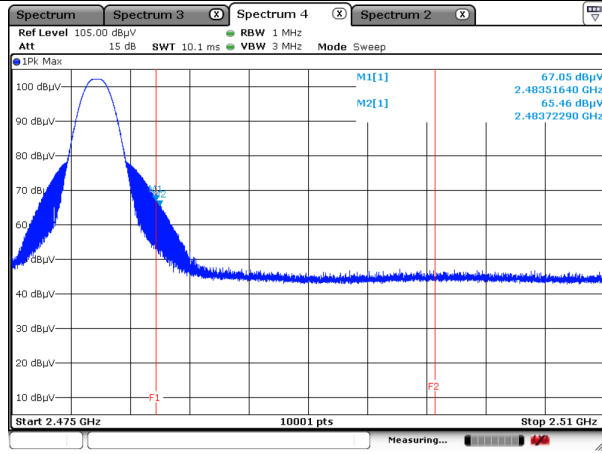
3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
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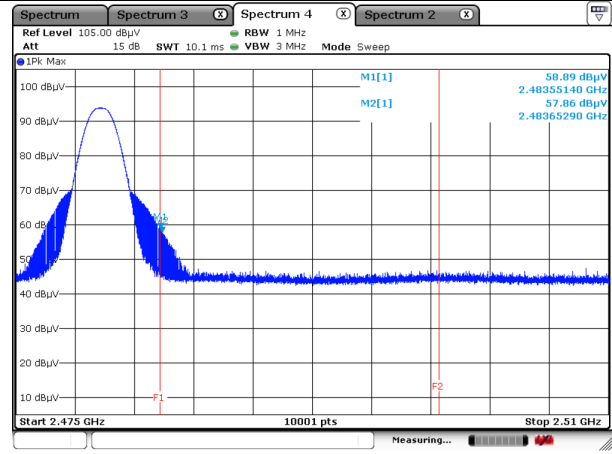
KES-RF-23T0012

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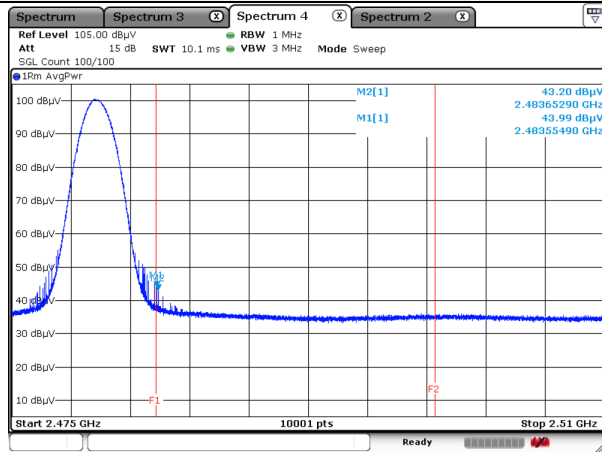
### Restricted band // Horizontal // Peak



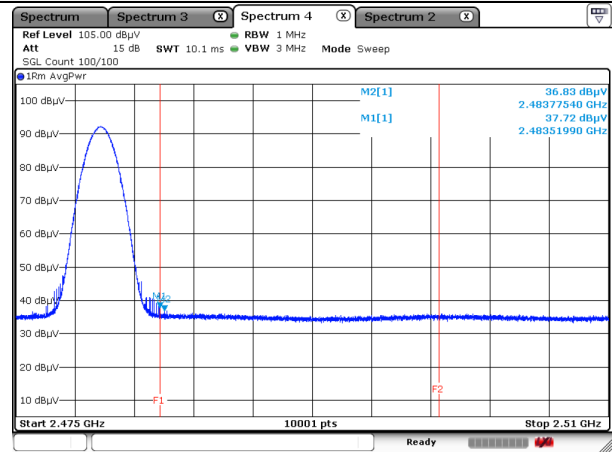
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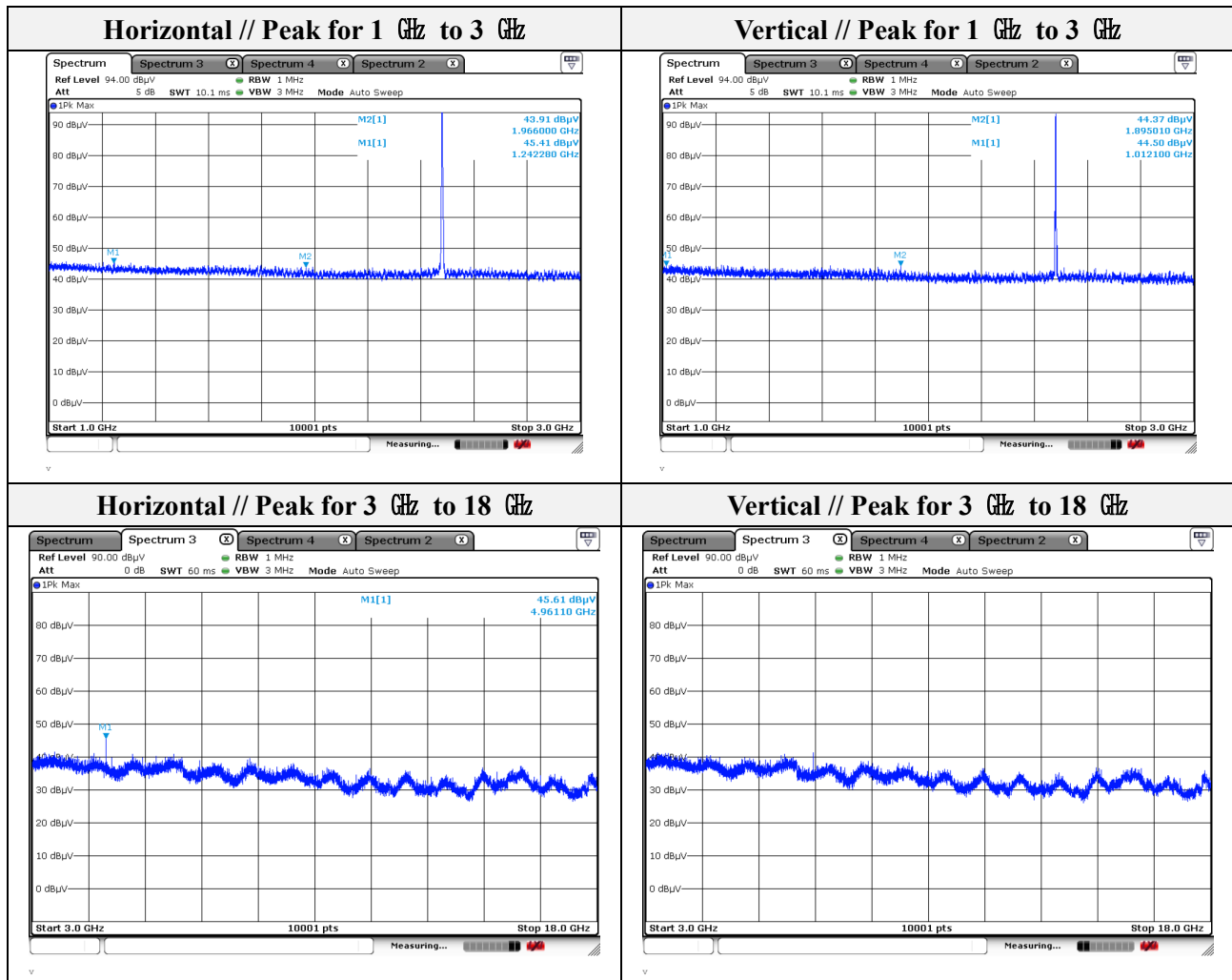
### Restricted band // Horizontal // Average



### Restricted band // Vertical // Average



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Note.

1. Average test would be performed if the peak result were greater than the average limit.



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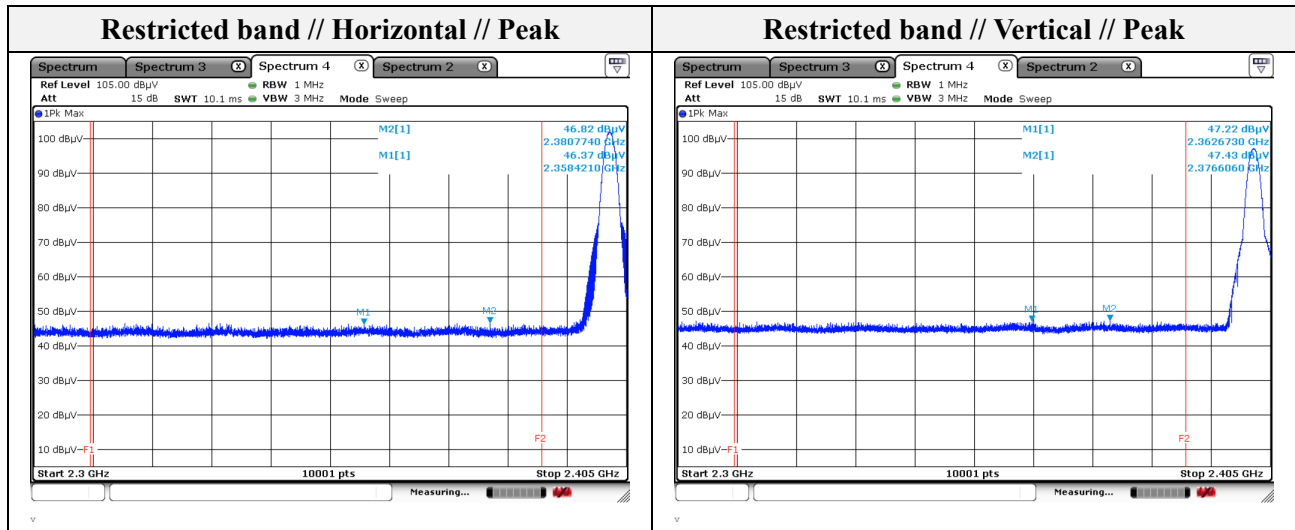
Mode: EDR  
Transfer rate: 3 Mbps(Worst case)  
Distance of measurement: 3 meter  
Channel: 00

### - Spurious

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1 030.70	44.71	Peak	H	-10.23	-	34.48	74.00	39.52
1 050.09	45.30	Peak	V	-10.11	-	35.19	74.00	38.81
1 075.89	45.19	Peak	H	-9.96	-	35.23	74.00	38.77
1 717.83	44.56	Peak	V	-5.06	-	39.50	74.00	34.50
4 805.10	46.18	Peak	H	4.71	-	50.89	74.00	23.11

### - 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)
2 358.42	46.37	Peak	H	-1.73	-	44.64	74.00	29.36
2 362.67	47.22	Peak	V	-1.72	-	45.50	74.00	28.50
2 376.60	47.43	Peak	V	-1.70	-	45.73	74.00	28.27
2 380.77	46.82	Peak	H	-1.70	-	45.12	74.00	28.88



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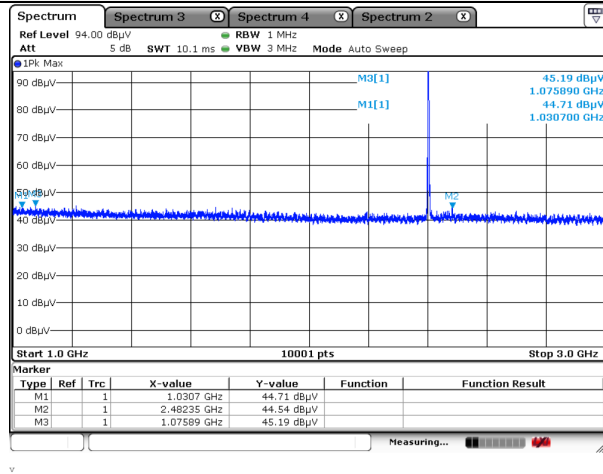
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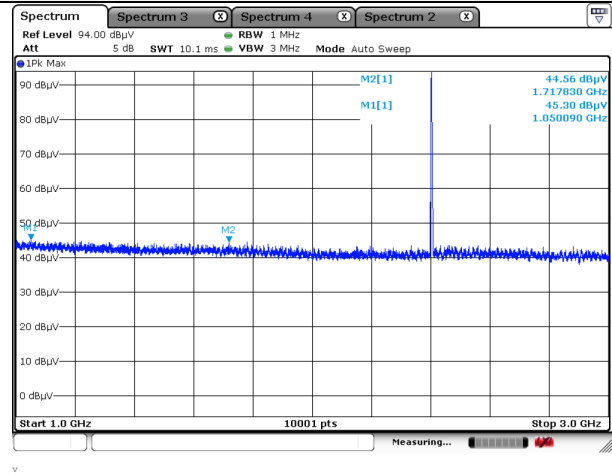
KES-RF-23T0012

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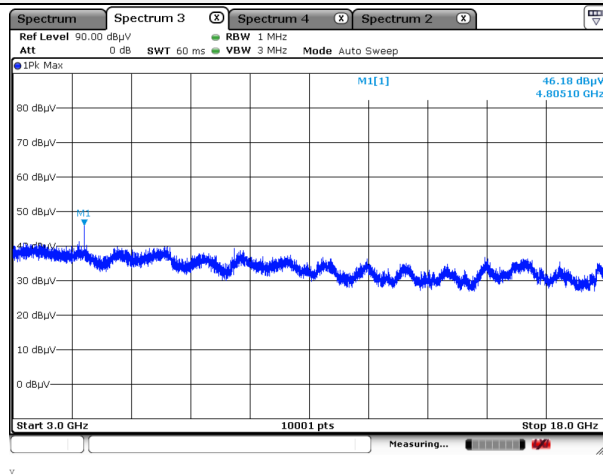
### Horizontal // Peak for 1 GHz to 3 GHz



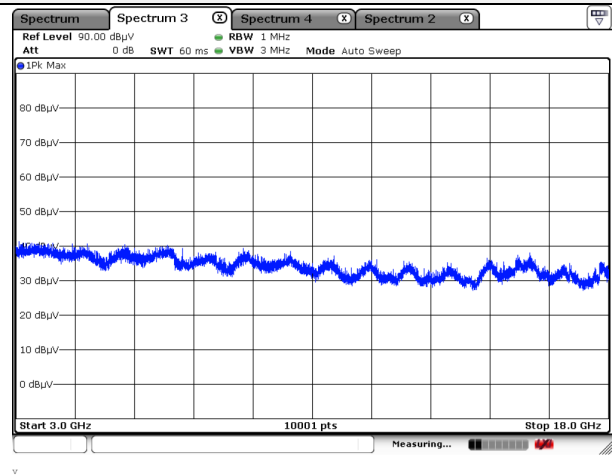
### Vertical // Peak for 1 GHz to 3 GHz



### Horizontal // Peak for 3 GHz to 18 GHz



### Vertical // Peak for 3 GHz to 18 GHz



Note.

1. Average test would be performed if the peak result were greater than the average limit.

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

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Mode: EDR  
Transfer rate: 3 Mbps(Worst case)  
Distance of measurement: 3 meter  
Channel: 40

**- Spurious**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1 052.29	44.88	Peak	H	-10.10	-	34.78	74.00	39.22
1 068.29	45.25	Peak	V	-10.00	-	35.25	74.00	38.75
1 285.27	44.82	Peak	H	-8.67	-	36.15	74.00	37.85
1 559.24	44.02	Peak	V	-6.84	-	37.18	74.00	36.82
4 884.60	47.93	Peak	H	5.32	-	53.25	74.00	20.75

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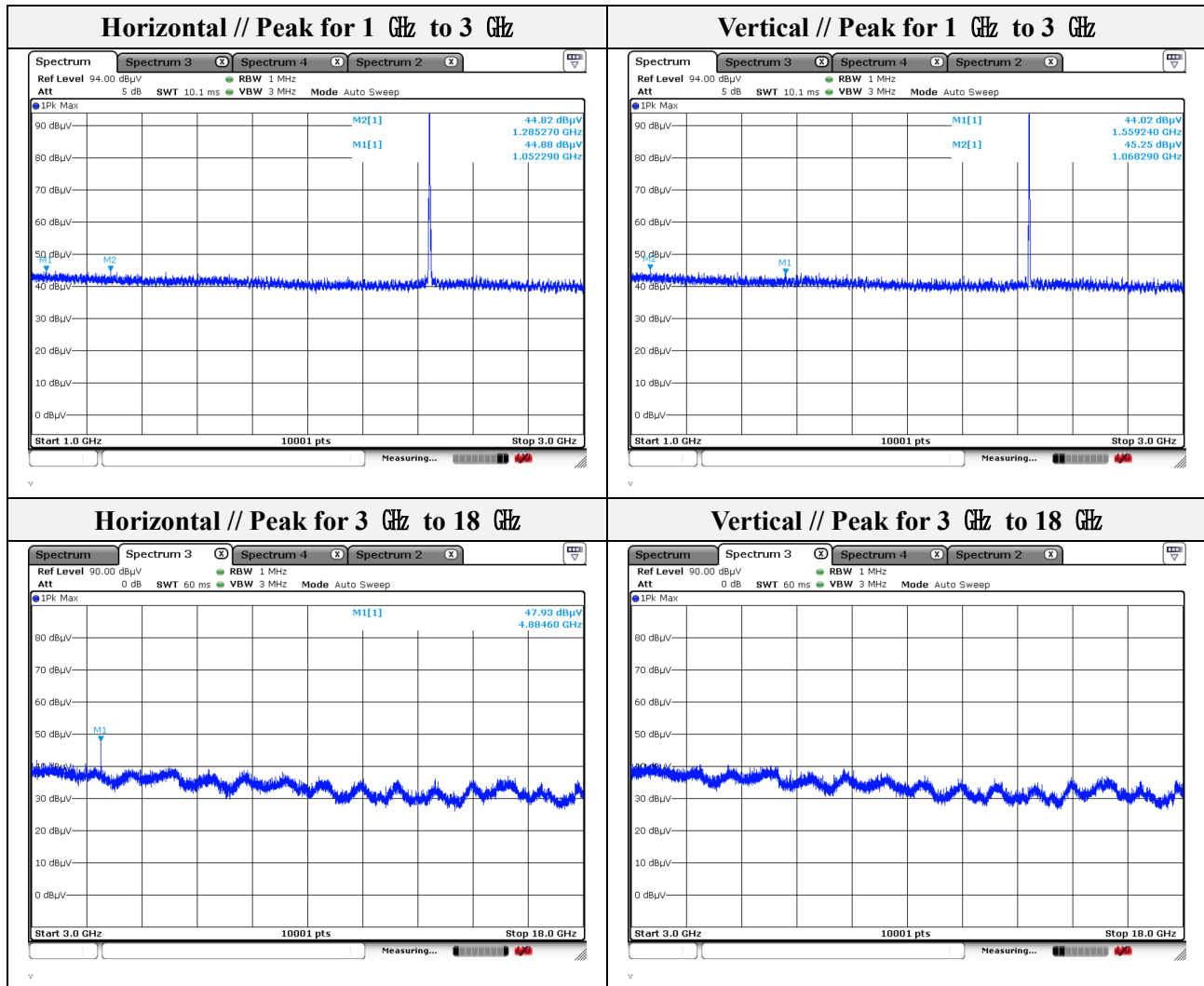
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Note.

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Mode: EDR  
Transfer rate: 3 Mbps(Worst case)  
Distance of measurement: 3 meter  
Channel: 78

**- Spurious**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1 031.10	45.08	Peak	V	-10.23	-	34.85	74.00	39.15
1 048.70	45.48	Peak	H	-10.12	-	35.36	74.00	38.64
1 073.69	44.95	Peak	H	-9.97	-	34.98	74.00	39.02
1 652.83	44.26	Peak	V	-5.81	-	38.45	74.00	35.55
4 959.60	45.93	Peak	H	5.89	-	51.82	74.00	22.18

**- 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)
2 483.50	58.72	Peak	V	-1.67	-	57.05	74.00	16.95
2 483.50	37.94	Average	V	-1.67	1.04	37.31	54.00	16.69
2 483.56	67.53	Peak	H	-1.67	-	66.53	74.00	7.47
2 483.56	44.83	Average	H	-1.67	1.04	44.2	54.00	9.80
2 483.61	66.98	Peak	H	-1.67	-	65.31	74.00	8.69
2 483.61	44.37	Average	H	-1.67	1.04	43.74	54.00	10.26
2 483.61	57.41	Peak	V	-1.67	-	55.74	74.00	18.26
2 483.61	37.75	Average	V	-1.67	1.04	37.12	54.00	16.88

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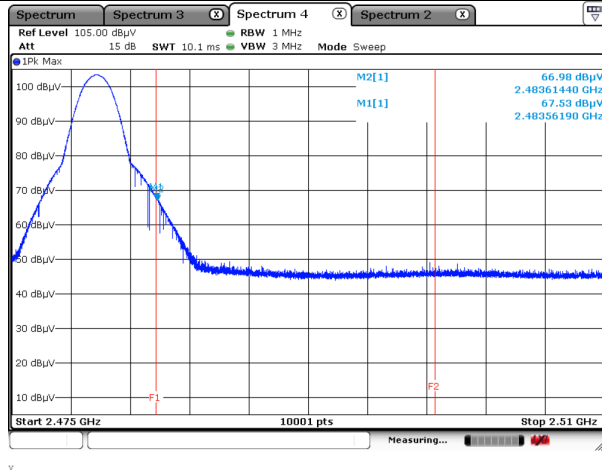
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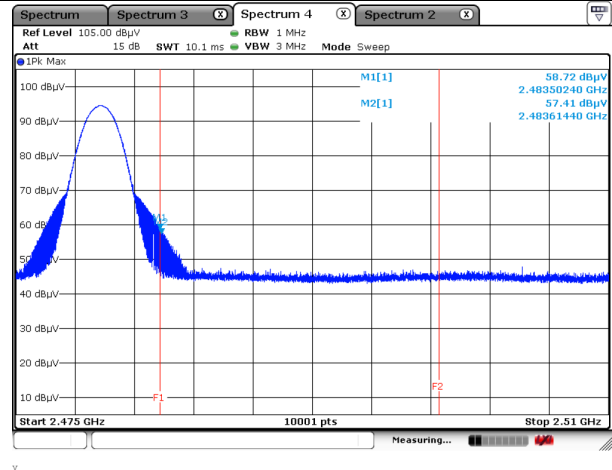
KES-RF-23T0012

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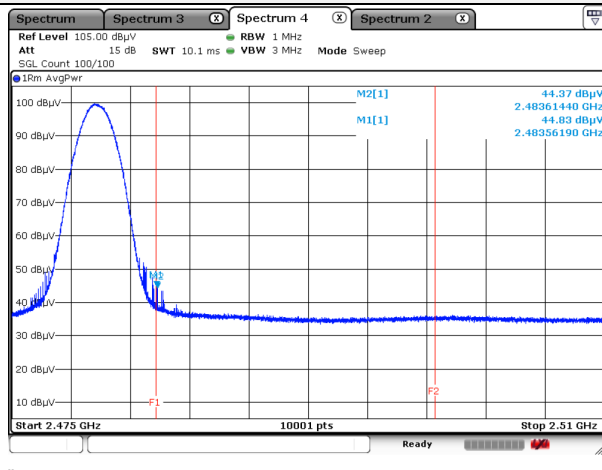
### Restricted band // Horizontal // Peak



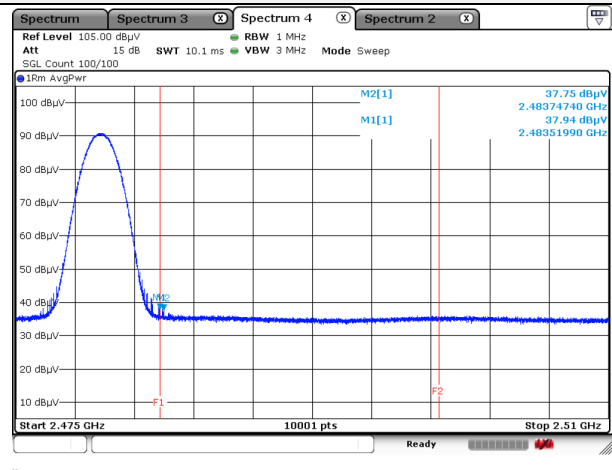
### Restricted band // Vertical // Peak



### Restricted band // Horizontal // Average



### Restricted band // Vertical // Average



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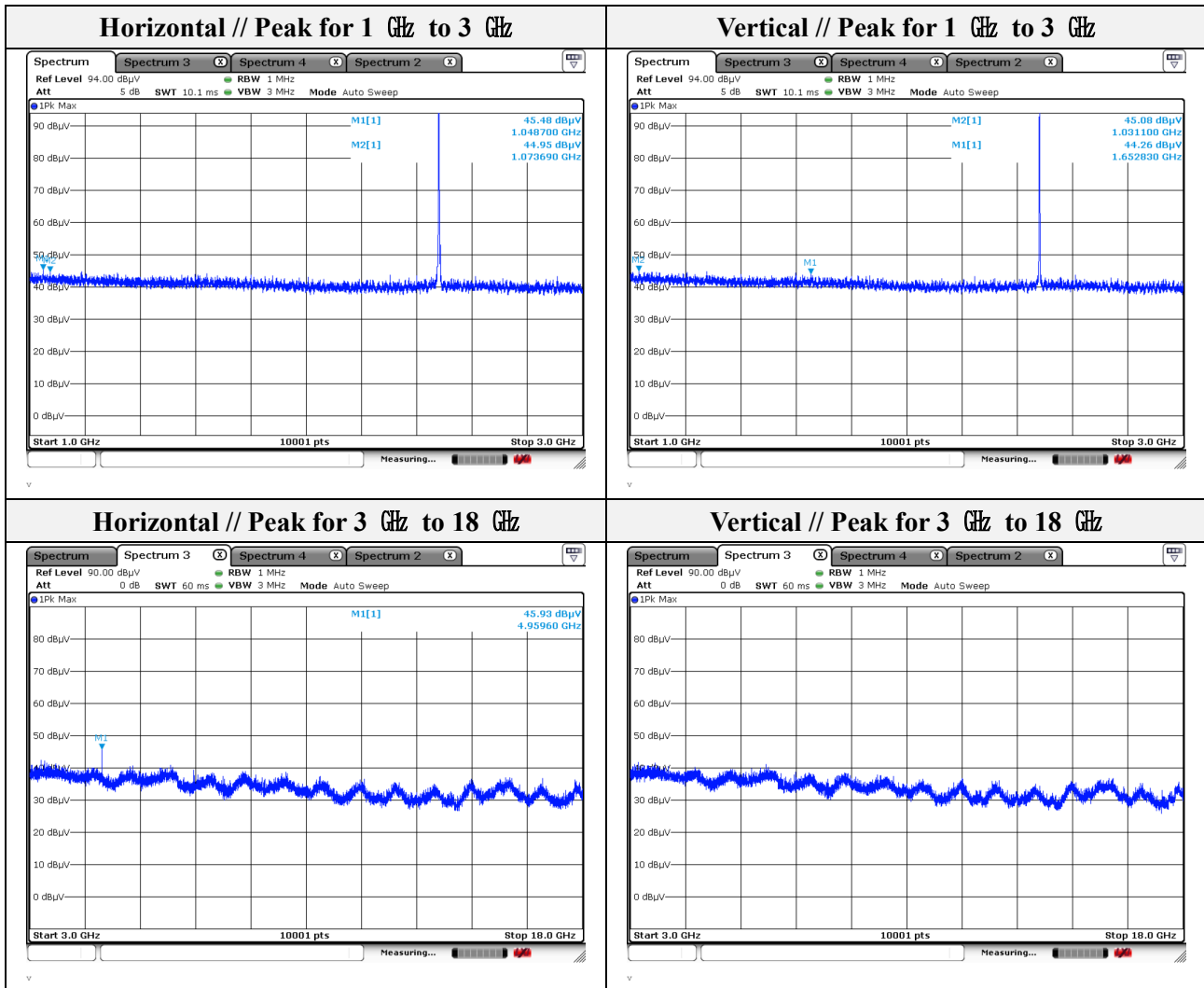
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Note.

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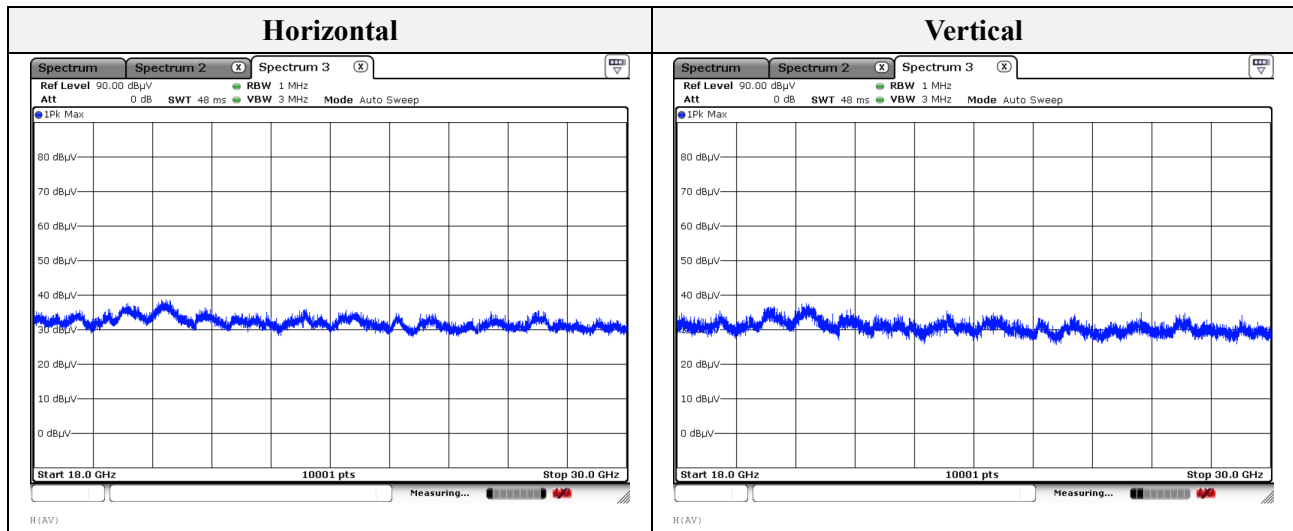
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### Test results (18 GHz to 30 GHz) – Worst case

Mode:	BDR
Transfer rate:	1 Mbps
Distance of measurement:	3 meter
Channel:	78(Worst case)



Note.

1. No spurious emission were detected above 18 GHz.

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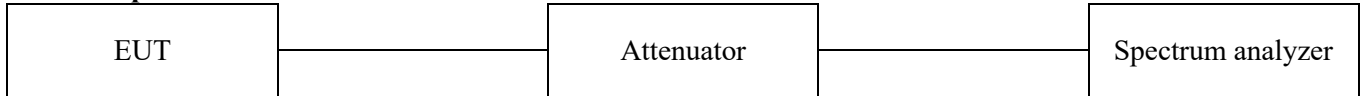
KES-QP16-F01(00-23-01-01)

### 3.7. Conducted band edge and out of band emissions

#### Test procedure

KDB 558074 v05r02 & ANSI 63.10-2013

#### Test setup



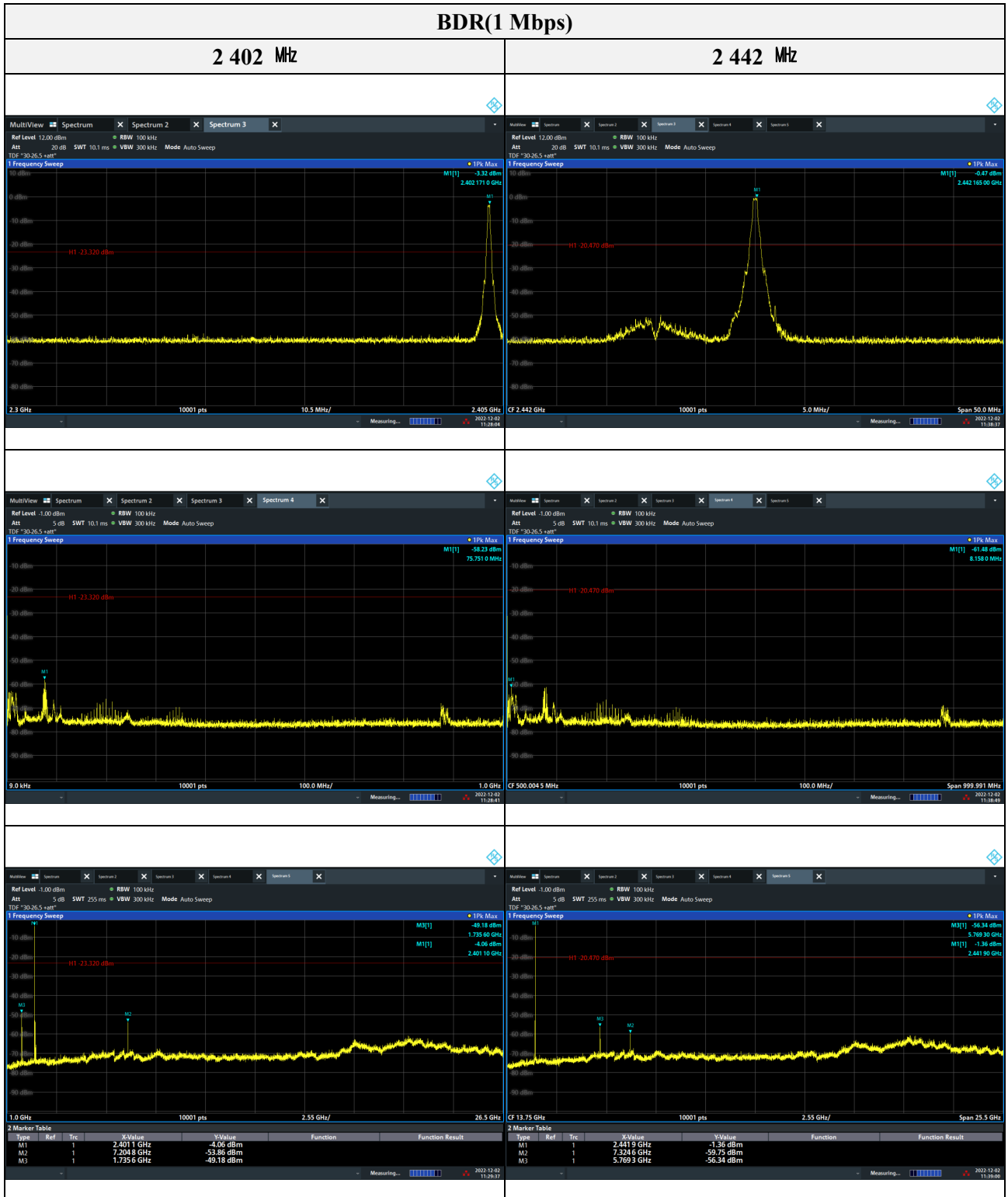
#### Test setting

1. Span = wide enough to capture the peak level of the in-band emission and all spurious emissions(e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic.
2. RBW = 100 kHz
3. VBW  $\geq$  300 kHz
4. Detector = Peak
5. Number of sweep points  $\geq 2 \times \text{Span/RBW}$
7. Trace mode = max hold
8. Sweep time = auto couple
9. The trace was allowed to stabilize

#### 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))

## Test results



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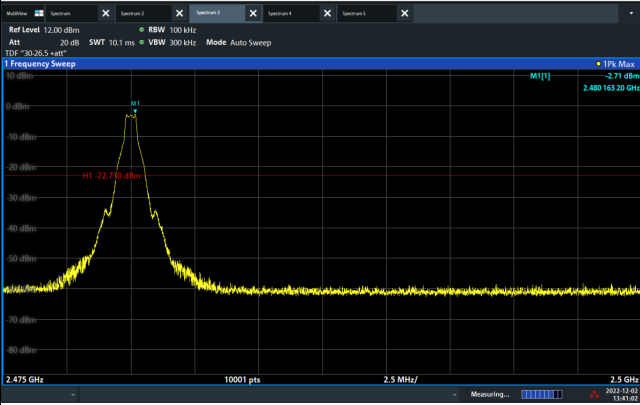
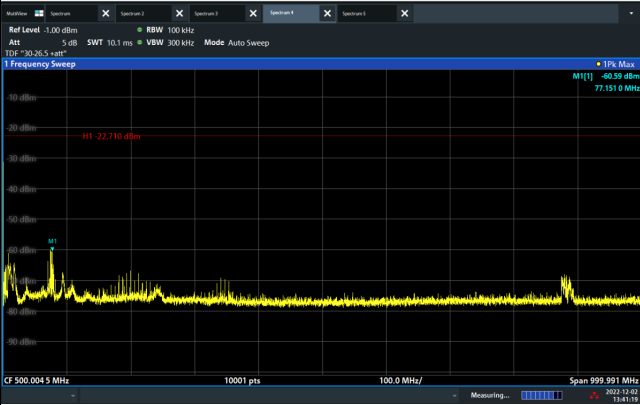
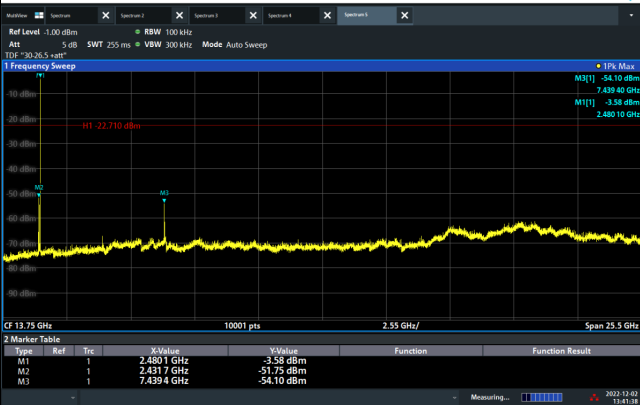
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BDR(1 Mbps)	
2 480 MHz	-
	N/A
	N/A
	N/A

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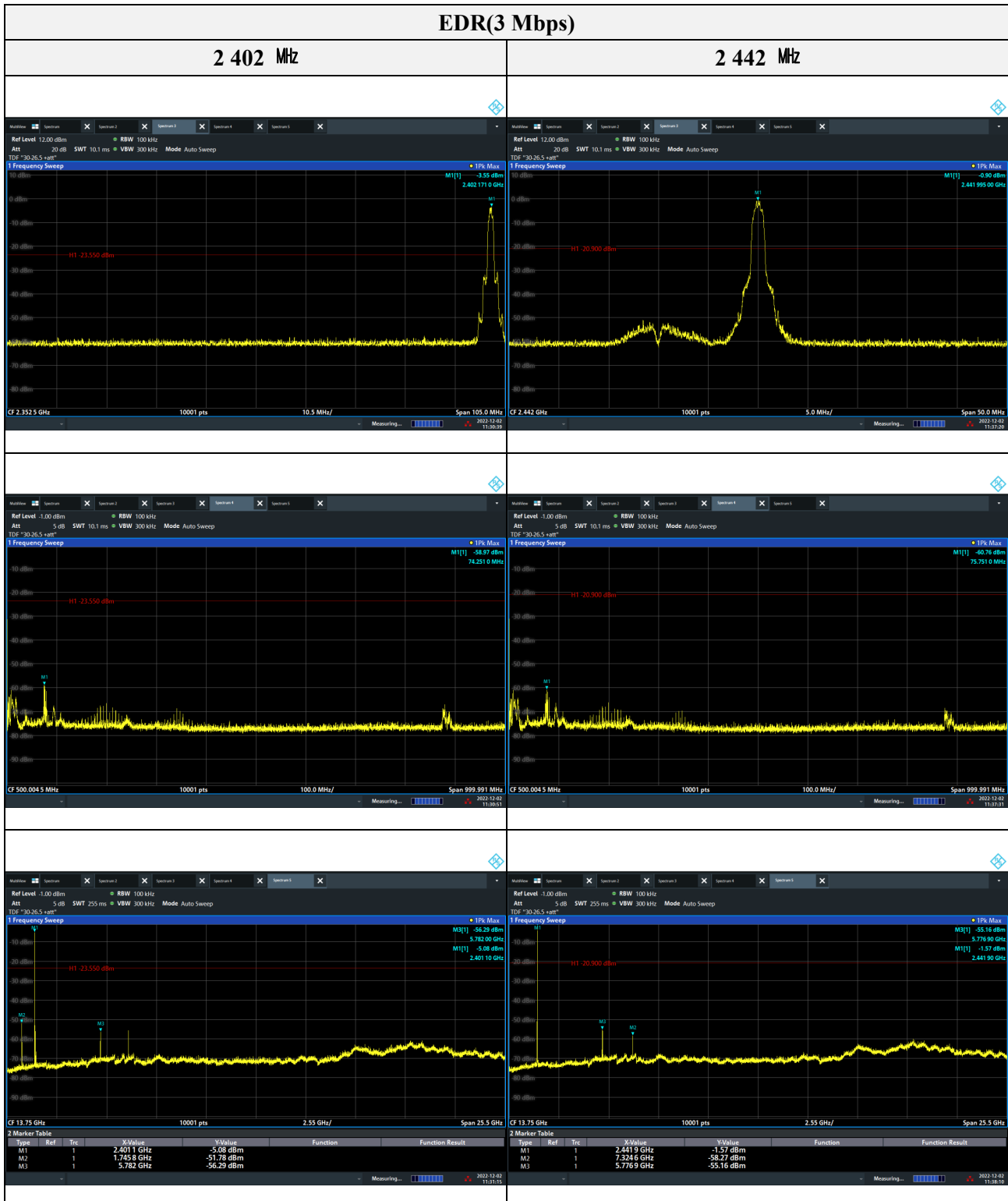
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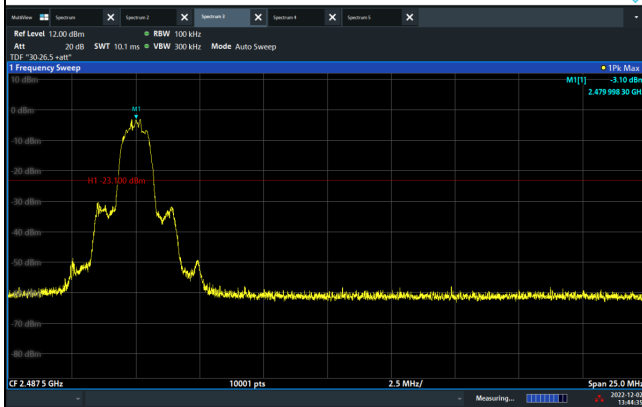
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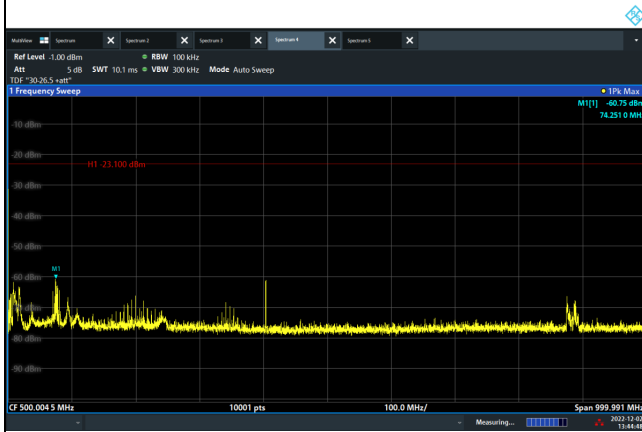
### EDR(3 Mbps)

2 480 MHz

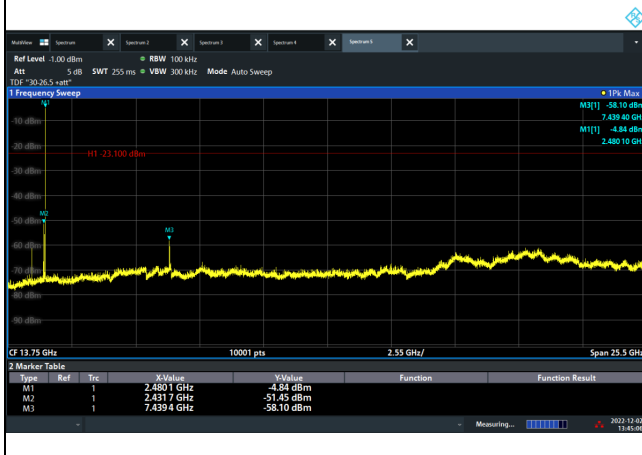
-



N/A



N/A

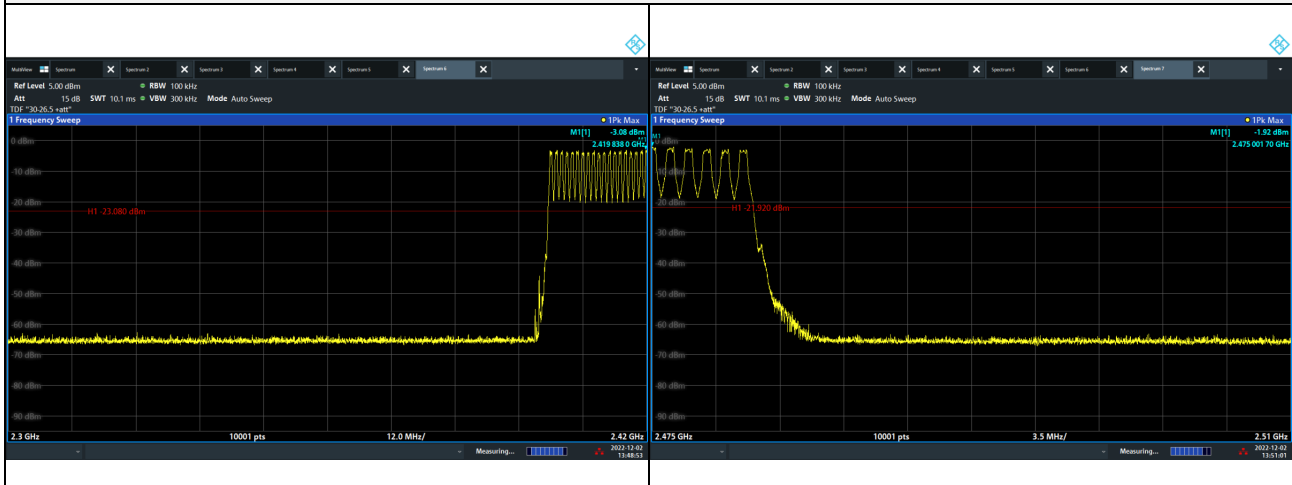


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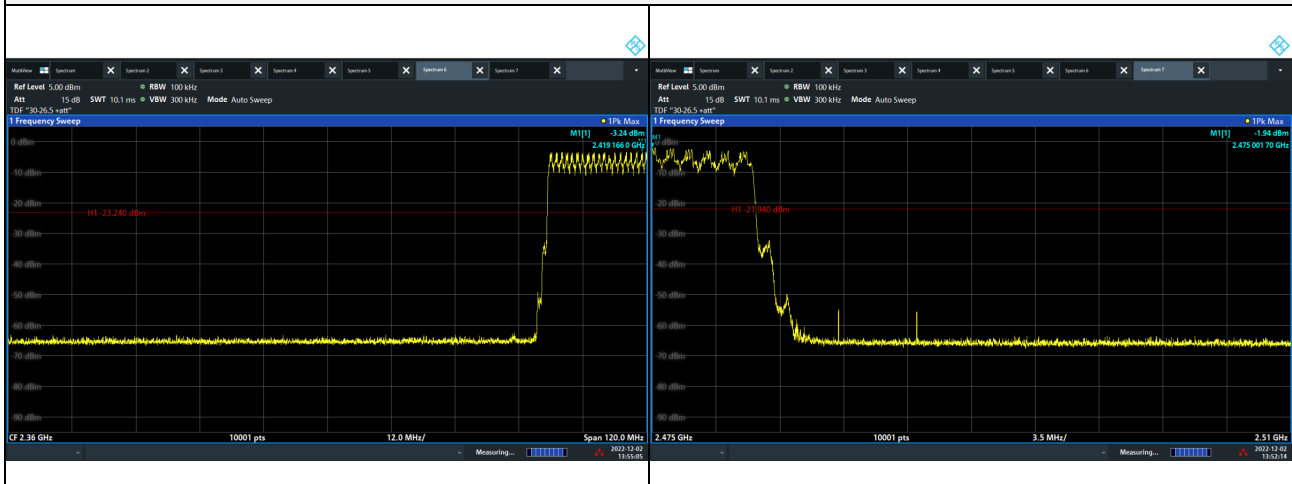
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### Hopping mode\_BDR(1 Mbps)



### Hopping mode\_EDR(3 Mbps)





### 3.8. 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



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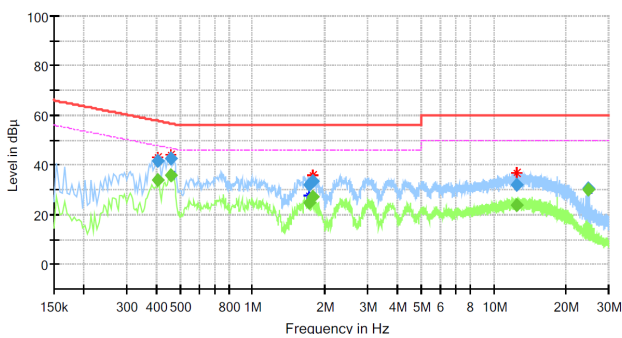
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### Test results

Mode:	EDR
Transfer rate:	3 Mbps
Distance of measurement:	3 meter
Channel:	40(Worst case)

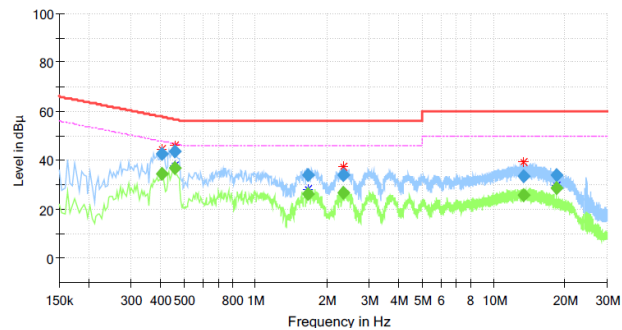
#### Hot Line



#### Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.406000	41.75	---	57.73	15.98	1000.0	9.000	L1	19.8
0.406000	---	33.86	47.73	13.87	1000.0	9.000	L1	19.8
0.458000	---	35.79	46.73	10.94	1000.0	9.000	L1	19.8
0.458000	42.70	---	56.73	14.03	1000.0	9.000	L1	19.8
1.714000	---	24.89	46.00	21.11	1000.0	9.000	L1	20.4
1.714000	32.17	---	56.00	23.83	1000.0	9.000	L1	20.4
1.778000	---	27.18	46.00	18.82	1000.0	9.000	L1	20.4
1.778000	33.26	---	56.00	22.74	1000.0	9.000	L1	20.4
12.434000	---	23.99	50.00	26.01	1000.0	9.000	L1	20.5
12.434000	31.99	---	60.00	28.01	1000.0	9.000	L1	20.5
24.578000	---	29.95	50.00	20.05	1000.0	9.000	L1	21.0
24.578000	30.65	---	60.00	29.35	1000.0	9.000	L1	21.0

#### Neutral Line



#### Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.406000	42.43	---	57.73	15.30	1000.0	9.000	N	19.8
0.406000	---	34.58	47.73	13.15	1000.0	9.000	N	19.8
0.458000	---	36.62	46.73	10.11	1000.0	9.000	N	19.8
0.458000	43.60	---	56.73	13.13	1000.0	9.000	N	19.8
1.662000	---	26.03	46.00	19.97	1000.0	9.000	N	20.4
1.662000	33.87	---	56.00	22.13	1000.0	9.000	N	20.4
2.346000	---	26.65	46.00	19.45	1000.0	9.000	N	20.4
2.346000	33.70	---	56.00	22.30	1000.0	9.000	N	20.4
13.298000	---	25.63	50.00	24.37	1000.0	9.000	N	20.5
13.298000	33.44	---	60.00	26.56	1000.0	9.000	N	20.5
18.434000	---	28.37	50.00	21.63	1000.0	9.000	N	20.8
18.434000	33.71	---	60.00	26.29	1000.0	9.000	N	20.8

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### 3.9. Antenna Requirement

According to 15.207(a), 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.

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**Appendix A. Measurement equipment**

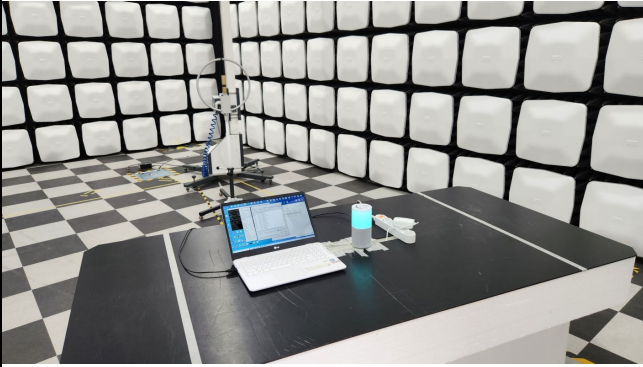
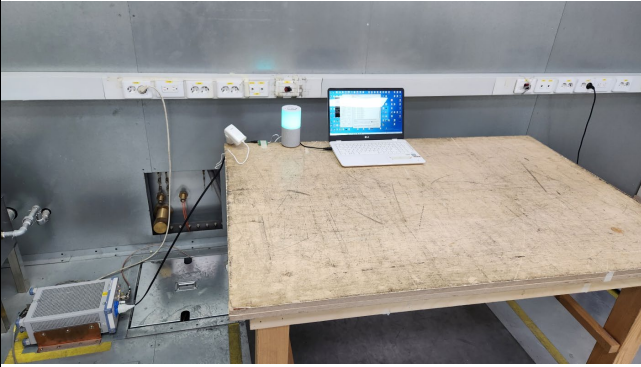
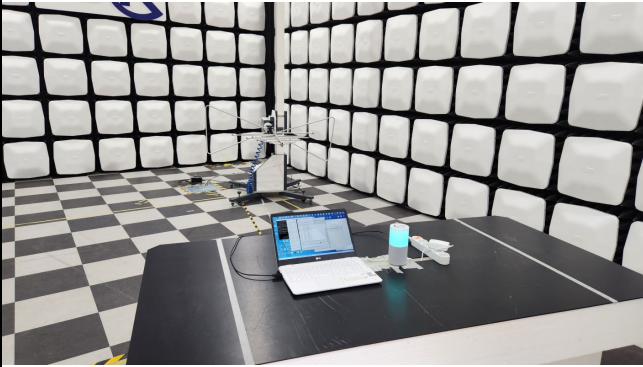
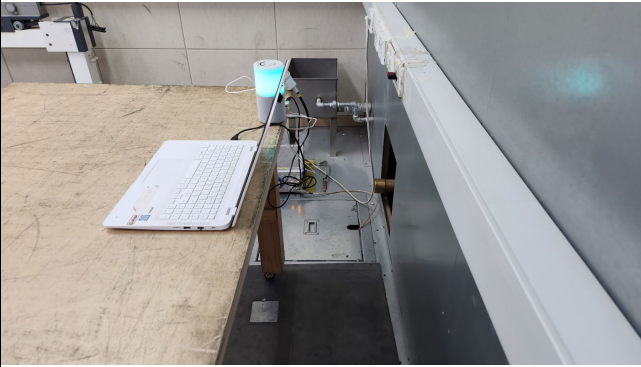
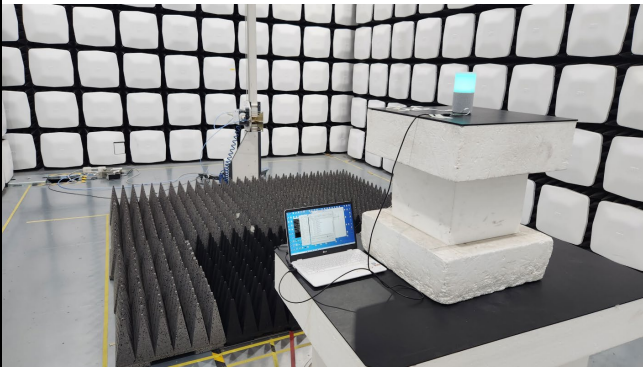
Equipment	Manufacturer	Model	Serial No.	Calibration interval	Calibration due.
Spectrum analyzer	R&S	FSV3044	101272	1 year	2023.03.14
Spectrum analyzer	R&S	FSV40-N	102194	1 year	2023.08.11
SIGNAL GENERATOR	KEYSIGHT	N5182B	MY59100115	1 year	2023.04.27
SIGNAL GENERATOR	Anritsu	68369B	002118	1 year	2023.05.13
Power Meter	Anritsu	ML2495A	2010001	1 year	2023.04.27
Pulse Power Sensor	Anritsu	MA2411B	1911111	1 year	2023.04.27
Attenuator	Mini-Circuits	BW-S10-2W263+	3	1 year	2023.01.17
Loop Antenna	Schwarzbeck	FMZB1513	225	2 years	2023.01.18
TRILOG-BROADBAND ANTENNA	Schwarzbeck	VULB 9163	714	2 years	2024.04.19
Attenuator	HUBER+SHHNER	6806.17.A	NONE	1 year	2023.04.01
Horn Antenna	A.H	SAS-571	414	1 year	2023.01.18
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA 9170550	1 year	2023.01.18
Amplifier	SONOMA INSTRUMENT	310N	100517	1 year	2023.08.01
PREAMPLIFIER	HP	8449B	3008A00538	1 year	2023.06.02
BROADBAND AMPLIFIER	SCHWARZBECK	BBV9721	PS9721-003	1 year	2023.01.17
AC POWER SOURCE/ ANALYZER	HP	6813A	3729A00754	1 year	2023.01.14
EMI Test Receiver	R&S	ESU26	100517	1 year	2023.08.01
EMI Test Receiver	R&S	ESR3	101783	1 year	2023.11.11
PULSE LIMITER	R&S	ESH2-Z2	101915	1 year	2023.11.10
BAND REJECT FILTER	MICRO-TRONICS	BRM50702	G272	1 year	2023.01.14
LISN	R&S	ENV216	101787	1 year	2023.11.10

**Peripheral devices**

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

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**Appendix B. Test setup photo**

Radiated test	Conducted test
	
	
	<p>N/A</p>

**The end of test report.**

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