



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
 Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
 Tel: +82-31-425-6200 / Fax: +82-31-424-0450
 www.kes.co.kr

Report No.:
 KES-RF1-20T0233
 Page (31) of (47)

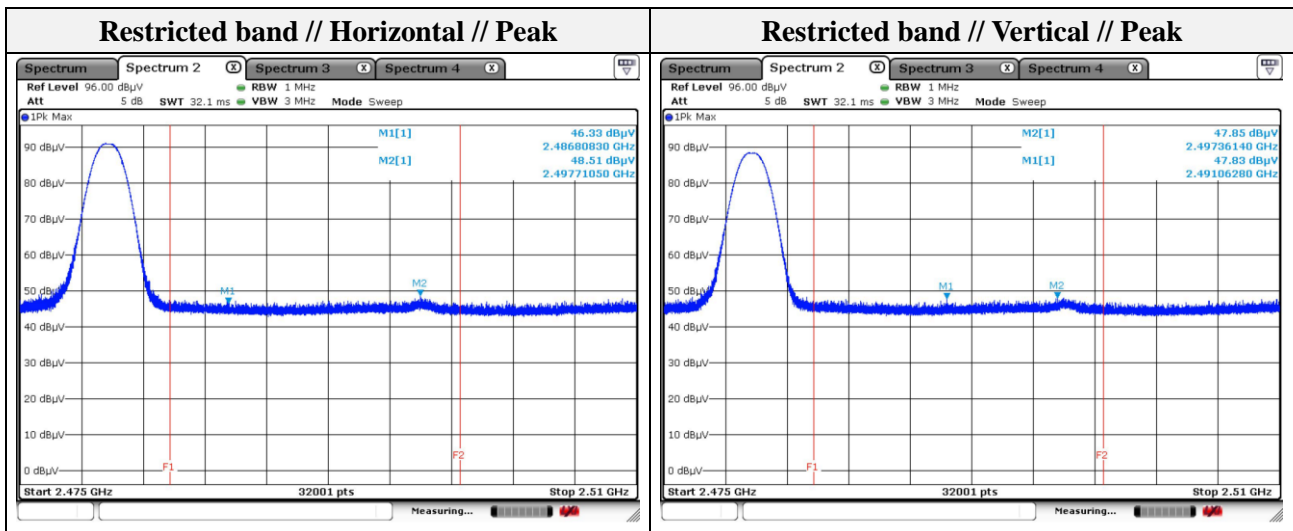
Mode: BDR
 Transfer rate: 1 Mbps
 Distance of measurement: 3 meter
 Channel: 78

- Spurious

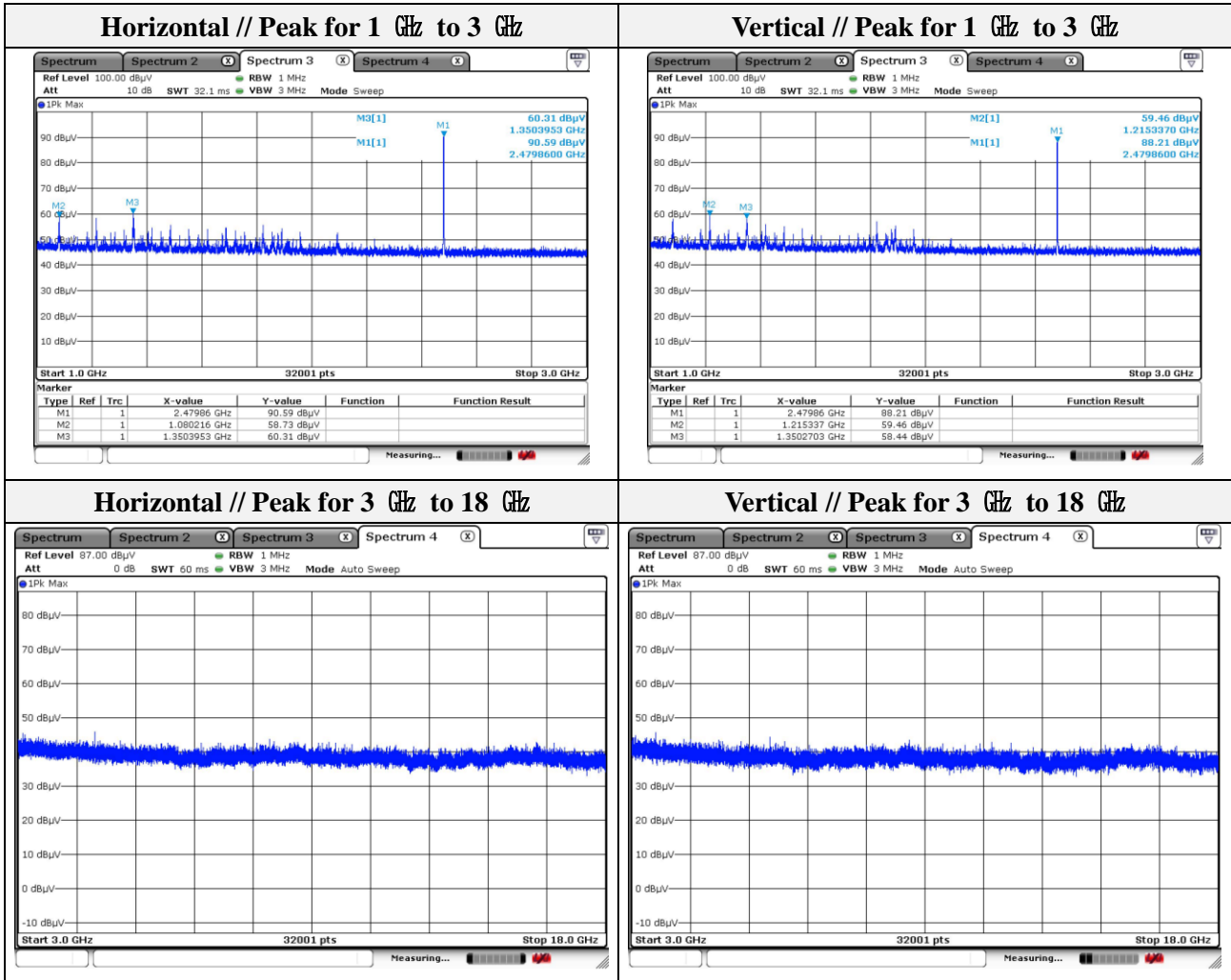
Frequency (MHz)	Level (dB μ V)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1 080.22	58.73	Peak	H	-10.73	-	48.00	74.00	26.00
1 215.34	59.46	Peak	V	-10.02	-	49.44	74.00	24.56
1 350.27	58.44	Peak	V	-9.29	-	49.15	74.00	24.85
1 350.40	60.31	Peak	H	-9.29	-	51.02	74.00	22.98

- Band edge

Frequency (MHz)	Level (dB μ V)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
2 486.81	46.33	Peak	H	-2.39	-	43.94	74.00	30.06
2 491.06	47.83	Peak	V	-2.37	-	45.46	74.00	28.54
2 497.36	47.85	Peak	V	-2.35	-	45.50	74.00	28.50
2 497.91	48.51	Peak	H	-2.34	-	46.17	74.00	27.83



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact shchoi@kes.co.kr



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.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
 Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
 Tel: +82-31-425-6200 / Fax: +82-31-424-0450
 www.kes.co.kr

Report No.:
 KES-RF1-20T0233
 Page (33) of (47)

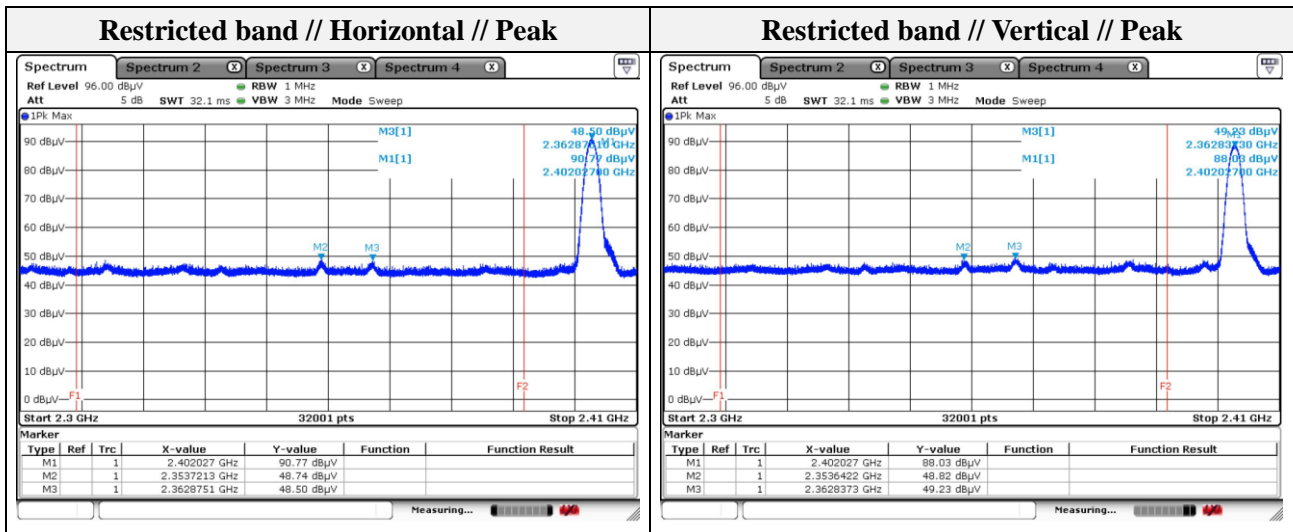
Mode: EDR
 Transfer rate: 3 Mbps(Worst case)
 Distance of measurement: 3 meter
 Channel: 00

- Spurious

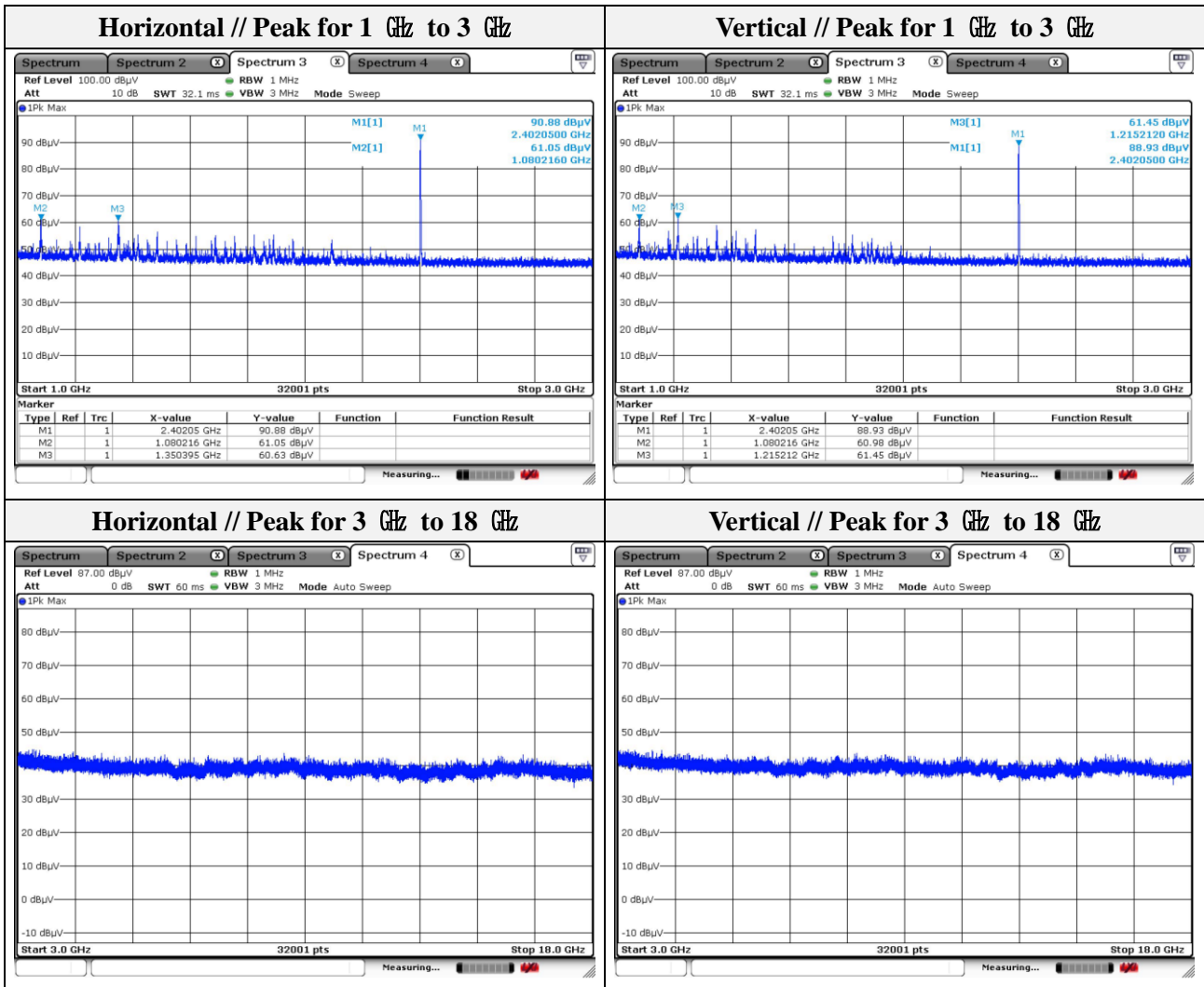
Frequency (MHz)	Level (dB μ V)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1 080.22	61.05	Peak	H	-10.73	-	50.32	74.00	23.68
1 080.22	60.98	Peak	V	-10.73	-	50.25	74.00	23.75
1 215.21	61.45	Peak	V	-10.02	-	51.43	74.00	22.57
1 350.40	60.63	Peak	H	-9.29	-	51.34	74.00	22.66

- Band edge

Frequency (MHz)	Level (dB μ V)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
2 353.64	48.82	Peak	V	-2.92	-	45.90	74.00	28.10
2 353.72	48.74	Peak	H	-2.92	-	45.82	74.00	28.18
2 362.84	49.23	Peak	V	-2.88	-	46.35	74.00	27.65
2 362.88	48.50	Peak	H	-2.88	-	45.62	74.00	28.38



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact shchoi@kes.co.kr



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.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact shchoi@kes.co.kr



KES Co., Ltd.

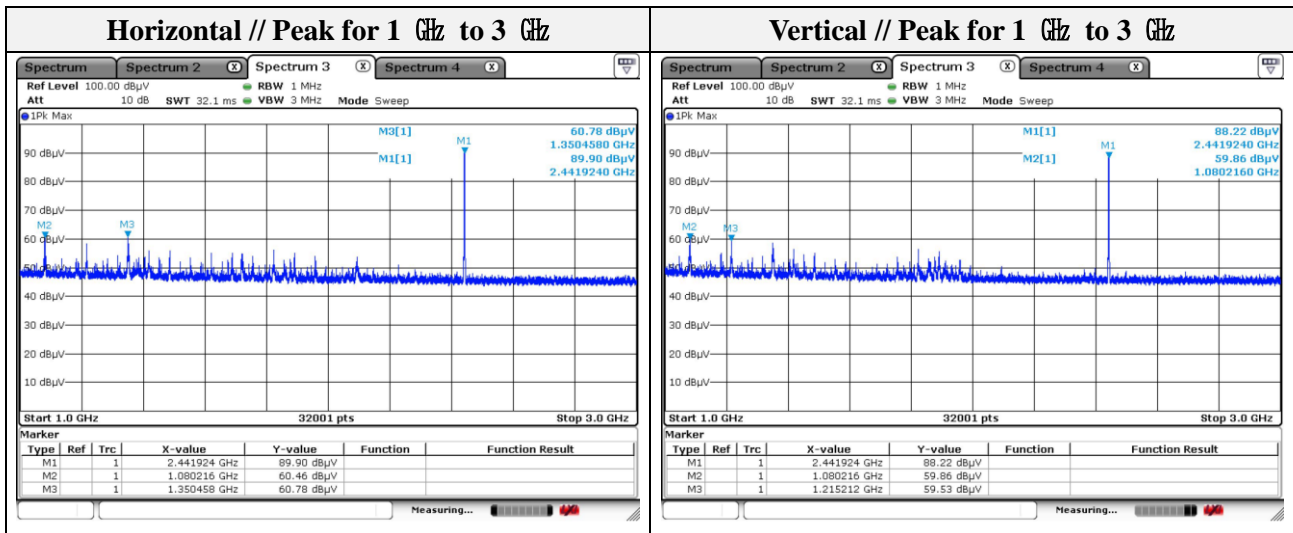
3701, 40, Simin-daero 365beon-gil,
 Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
 Tel: +82-31-425-6200 / Fax: +82-31-424-0450
 www.kes.co.kr

Report No.:
 KES-RF1-20T0233
 Page (35) of (47)

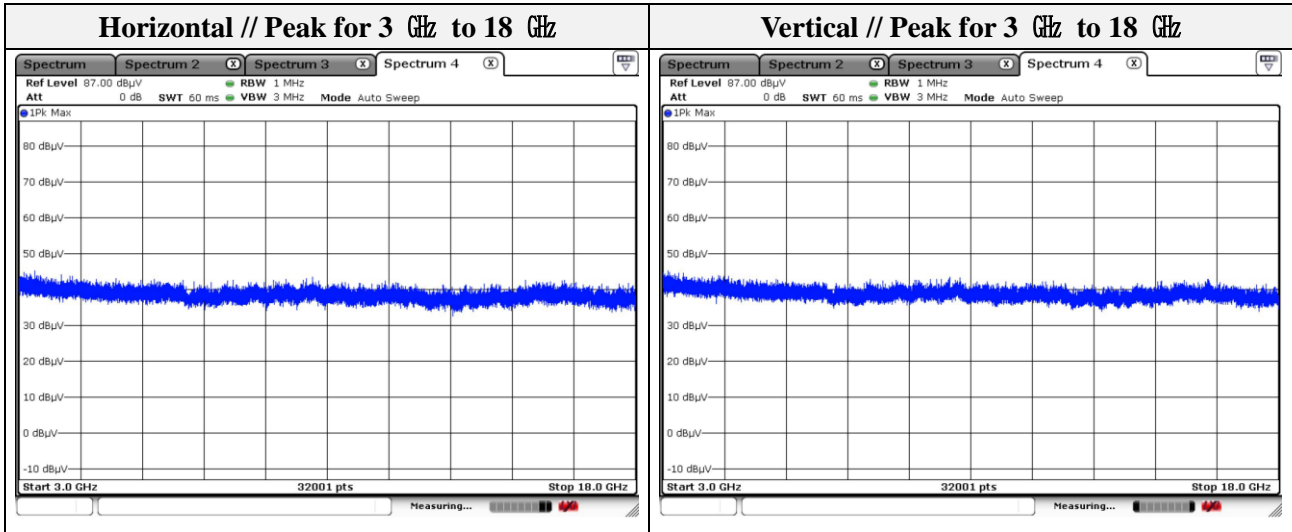
Mode: EDR
 Transfer rate: 3 Mbps(Worst case)
 Distance of measurement: 3 meter
 Channel: 40

- **Spurious**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1 080.22	60.46	Peak	H	-10.73	-	49.73	74.00	24.27
1 080.22	59.86	Peak	V	-10.73	-	49.13	74.00	24.87
1 215.21	59.53	Peak	V	-10.02	-	49.51	74.00	24.49
1 350.46	60.78	Peak	H	-9.29	-	51.49	74.00	22.51



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact shchoi@kes.co.kr



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.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
 Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
 Tel: +82-31-425-6200 / Fax: +82-31-424-0450
 www.kes.co.kr

Report No.:
 KES-RF1-20T0233
 Page (37) of (47)

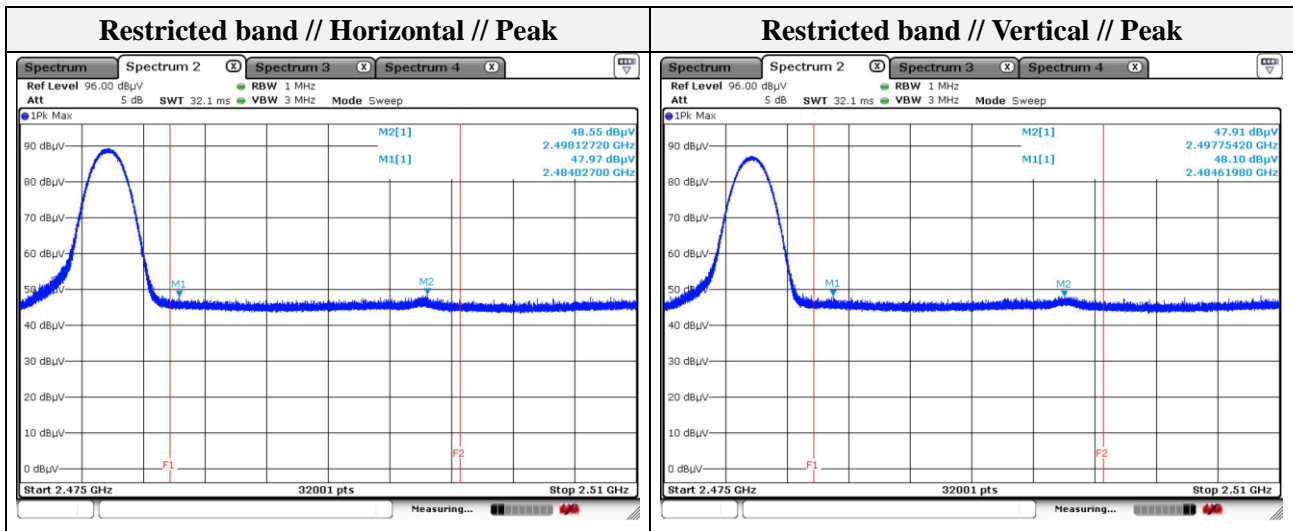
Mode: EDR
 Transfer rate: 3 Mbps(Worst case)
 Distance of measurement: 3 meter
 Channel: 78

- Spurious

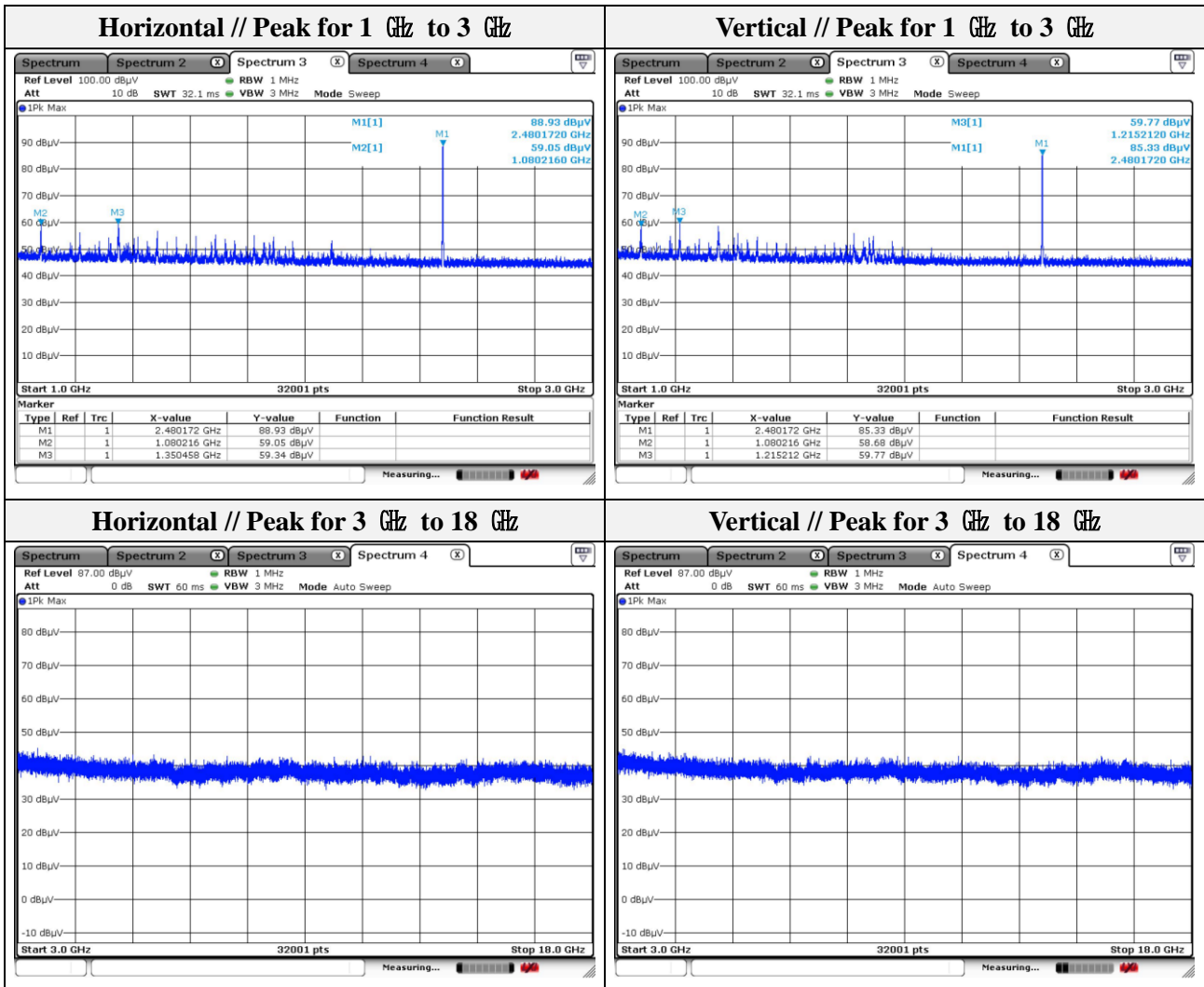
Frequency (MHz)	Level (dB μ V)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1 080.22	59.05	Peak	H	-10.73	-	48.32	74.00	25.68
1 080.22	58.68	Peak	V	-10.73	-	47.95	74.00	26.05
1 215.21	59.77	Peak	V	-10.02	-	49.75	74.00	24.25
1 350.46	59.34	Peak	H	-9.29	-	50.05	74.00	23.95

- Band edge

Frequency (MHz)	Level (dB μ V)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
2 484.03	47.97	Peak	H	-2.40	-	45.57	74.00	28.43
2 484.62	48.10	Peak	V	-2.39	-	45.71	74.00	28.29
2 497.75	47.91	Peak	V	-2.34	-	45.57	74.00	28.43
2 498.13	48.55	Peak	H	-2.34	-	46.21	74.00	27.79



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact shchoi@kes.co.kr



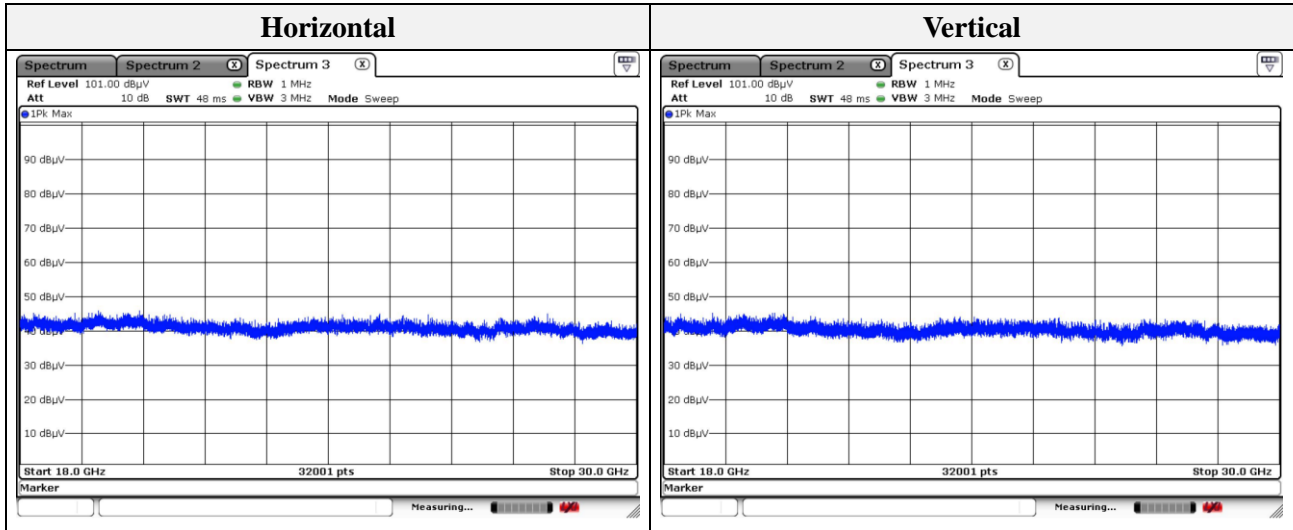
Note.

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.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact shchoi@kes.co.kr

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.

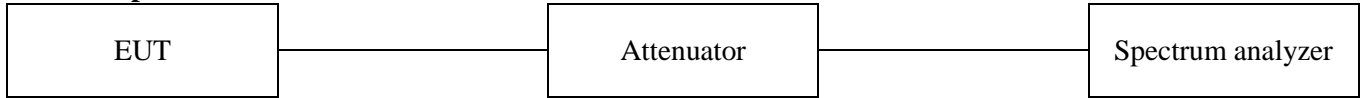
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact shchoi@kes.co.kr

3.7. Conducted band edge and out of band emissions

Test procedure

KDB 558074 v05r02 & ANSI 63.10-2013

Test setup



Test setting

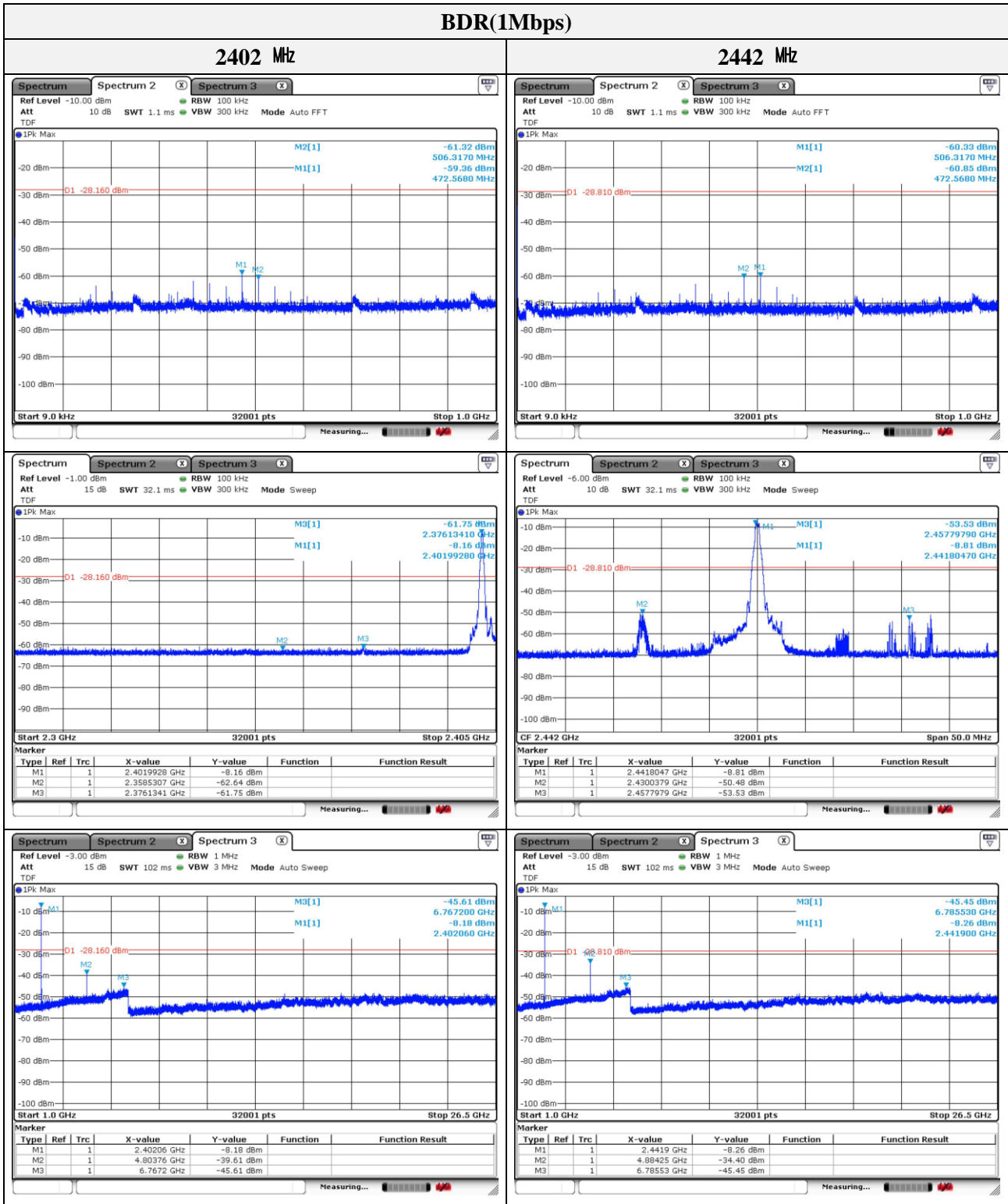
1. Span = wide enough to capture the peak level of the in-band emission and all spurious emissions(e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic.
2. RBW = 100 kHz
3. VBW \geq 300 kHz
4. Detector = Peak
5. Number of sweep points $\geq 2 \times$ Span/RBW
7. 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



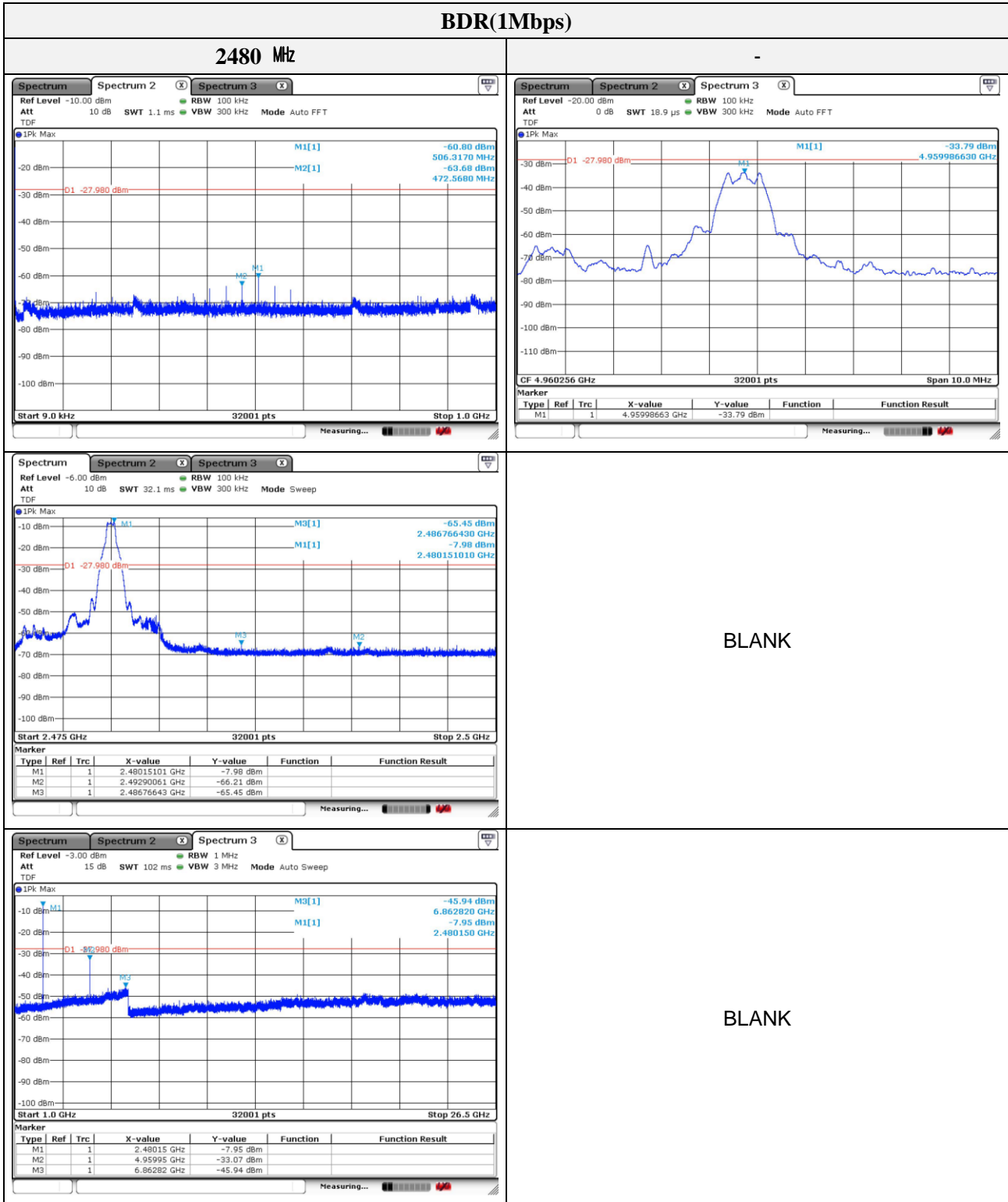
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact shchoi@kes.co.kr



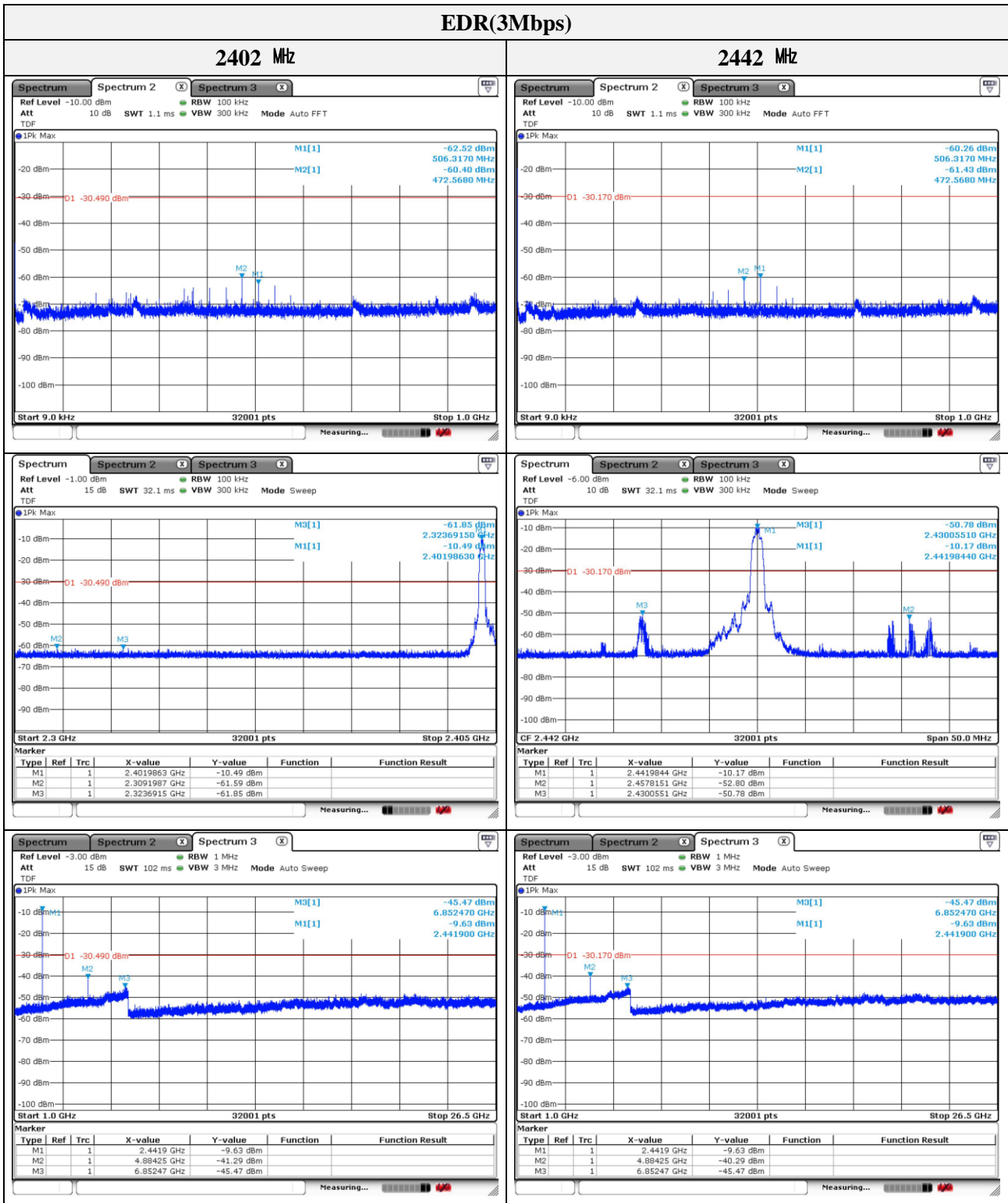
KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
 Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
 Tel: +82-31-425-6200 / Fax: +82-31-424-0450
 www.kes.co.kr

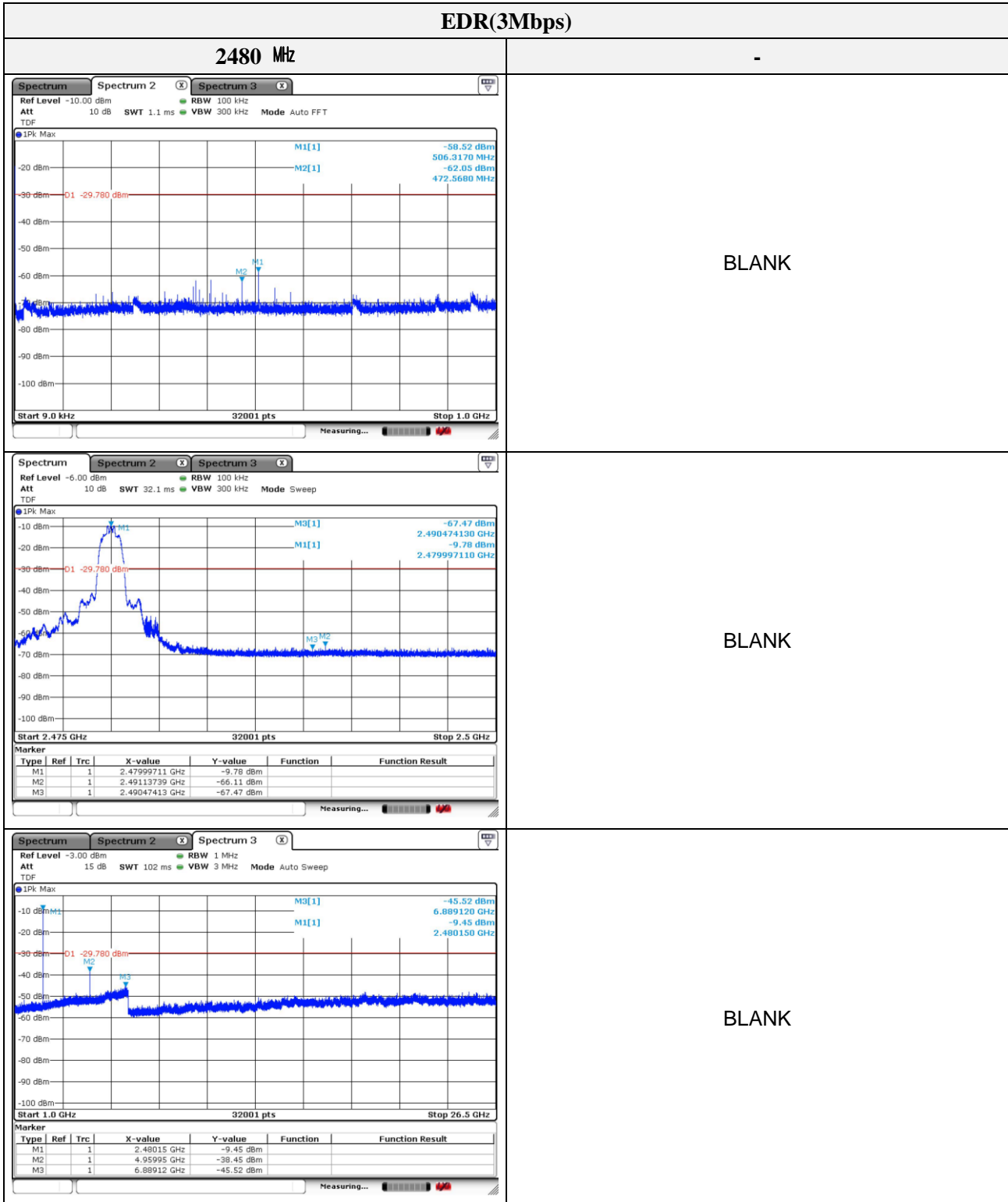
Report No.:
 KES-RF1-20T0233
 Page (42) of (47)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact shchoi@kes.co.kr



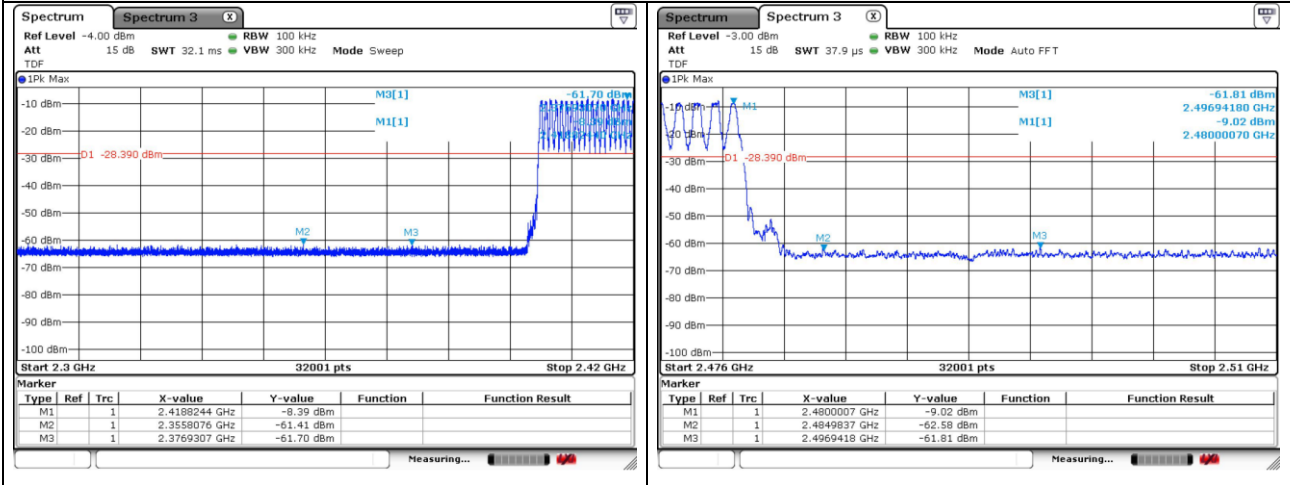
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact shchoi@kes.co.kr



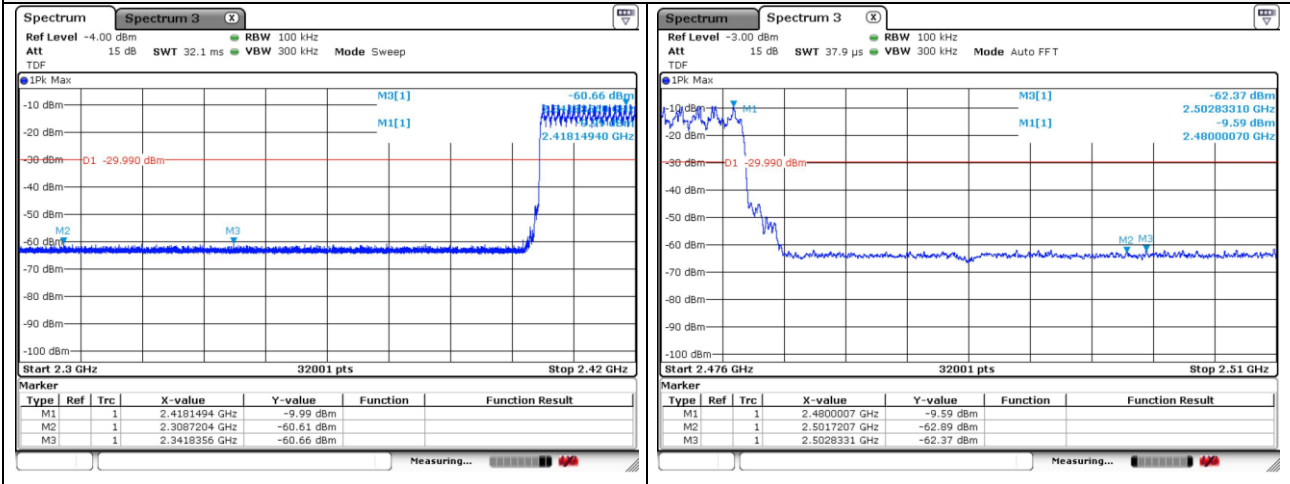
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact shchoi@kes.co.kr



Hopping mode_BDR(1Mbps)



Hopping mode_EDR(3Mbps)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact shchoi@kes.co.kr



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:
KES-RF1-20T0233
Page (46) of (47)

Appendix A. Measurement equipment

Equipment	Manufacturer	Model	Serial No.	Calibration interval	Calibration due.
Spectrum Analyzer	R&S	FSV40	101725	1 year	2021.06.24
8360B Series Swept Signal Generator	HP	83630B	3844A00786	1 year	2021.01.15
SIGNAL GENERATOR	KEYSIGHT	N5182B	MY59100115	1 year	2021.05.12
Power Meter	Anritsu	ML2495A	2010001	1 year	2021.05.12
Pulse Power Sensor	Anritsu	MA2411B	1911111	1 year	2021.05.12
Attenuator	Mini-Circuits	BW-S10-2W263+	1	1 year	2021.01.17
Attenuator	F04-C1206-01	SRT	20022403	1 year	2021.05.06
Loop Antenna	Schwarzbeck	FMZB1513	225	2 years	2021.02.15
BILOG ANTENNA	Schwarzbeck	VULB 9168	9168-461	2 years	2022.05.26
Horn Antenna	A.H	SAS-571	414	1 years	2021.01.31
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA 9170550	1 years	2021.01.20
Amplifier	SONOMA INSTRUMENT	310N	401123	1 year	2021.06.08
PREAMPLIFIER	8449B	AGILENT	8008A01640	1 year	2021.04.01
EMI Test Receiver	R&S	ESU26	100552	1 year	2021.04.01
DC Power supply	Agilent	6632B	MY43004090	1 year	2021.06.22

Peripheral devices

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

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr