

TEST REPORT



Report No. : RF-230696 Page **1** / **87** **KES Co., Ltd.** #3002, #3503, #3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Republic of Korea Tel : +82-31-425-6200, Fax : +82-31-425-6200

■ FCC&IC TEST REPORT

1. Client

- Name : THINKWARE CORPORATION
- Address : A, 9FL., Samwhan Hipex, 240, Pangyoyeok-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, South Korea
- 2. Sample Description
 - Product item : Q850
 - \circ Model name : Q850
 - Manufacturer etc. : THINKWARE CORPORATION
- 3. Date of test : 2023.12.20 ~ 2024.01.08
- **4. Location of Test :** ☑ Permanent Testing Lab □ On Site Testing ○ Adress : 473-21, Gayeo-ro, Yeoju-si, Gyeonggi-do, Korea
- 5. Test method used : Part 15.247 & RSS-247 (Issue 3)
- 6. Test result : PASS

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This laboratory is not accredited for the test results marked*. This test report is not related to KOLAS accreditation.

Affirmation	Tested by	,		Technical Manager	
		Bong-Seok Kim	(Signature)	Name: Yeong-Jun Cho	(Signature)

2024. 01. 18.

KES Co., Ltd.

Accredited by KOLAS, Republic of KOREA

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

KES Co., Ltd.



REPORT REVISION HISTORY

Date	Test Report No.	Revision History
2024.01.18	RF-230696	Initial

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Use of uncertainty of measurement for decisions on conformity (decision rule):

■ No decision rule is specified by the standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty("simple acceptance" decision rule, previously known as "accuracy method").

Other (to be specified, for example when required by the standard or client)



Page 3 / 87

TABLE OF CONTENTS

1.	General	information	4
	1.1.	EUT description	4
	1.2.	Test configuration	5
	1.3.	Information about derivative model	5
	1.4.	Accessory information	5
	1.5.	Sample calculation	5
	1.6.	Measurement Uncertainty	5
	1.7.	Frequency/channel operations	6
2.		y of tests	7
3.	Test resu	, Ilts	8
	3.1.	Output power	8
	3.2.	Radiated restricted band and emissions	
	3.3.	Antenna Requirement	86
App	endix A.	Measurement equipment	87



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

KES Co., Ltd.



1. General information

Applicant:	THINKWARE CORPORATION
Applicant address:	A, 9FL., Samwhan Hipex, 240, Pangyoyeok-ro, Bundang-gu, Seongnam-si,Gyeonggi-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, Yeoju-si, Gyeonggi-do, Korea
Test Facility	FCC Accreditation Designation No.: KR0100, Registration No.: 444148
	ISED Registration No.: 23298
FCC rule part(s):	FCC: 15.247
IC rule part(s):	IC : RSS-247
FCC ID:	2ADTG-Q850
IC ID:	12594A-Q850
Test device serial No.:	☑ Production ☐ Pre-production ☐ Engineering
1.1. EUT description	on
Equipment under test	Q850
Frequency range	2 402 MHz ~ 2 480 MHz (LE 1 Mbps)
	2 412 MHz ~ 2 462 MHz (802.11b,g,n_HT20)
	2 422 MHz ~ 2 452 MHz (802.11n_HT40)
Model	Q850
Variant Model:	-
Modulation technique	GFSK, DSSS, OFDM
Number of channels	2 402 MHz ~ 2 480 MHz (LE 1 Mbps) : 40 ch
	2 412 MHz ~ 2 462 MHz (802.11b,g,n_HT20) : 11 ch

	2 422 MHz ~ 2 452 MHz (802.11n_HT40) : 7 cH	n
na specification	Chip Antenna // Peak gain: 1.99 dBi	

Antenna specification	Chip Antenna // Peak
Power source	DC 12 V / 24 V
H/W Version	V3.0
S/W Version	V0.93
S/N	VIBN60016042A



1.2. Test configuration

The THINKWARE CORPORATION // Q850 // Q850 // FCC ID: 2ADTG-Q850 // IC ID: 12594A-Q850

was tested according to the specification of EUT, the EUT must comply with following standards and KDB documents.

FCC Part 15.247 ISED RSS-247 Issue 3 and RSS-Gen Issue 5 KDB 558074 D01 v05 r02 ANSI C63.10-2013

1.3. Information about derivative model

N/A

1.4. Accessory information

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

1.5. Sample calculation

Where relevant, the following sample calculation is provided For all conducted test items :

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor

between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB). = 0.70 + 10 = 10.70 (dB)

For Radiation test :

Field strength level ($^{dB}\mu$ /m) = Measured level ($^{dB}\mu$) + Antenna factor (dB) + Cable loss (dB) – Amplifier gain (dB)

1.6. Measurement Uncertainty

Test Item		Uncertainty
Uncertainty for Conduction er	2.22 dB (SHIELD ROOM #6)	
Uncertainty for Radiation emission test	Below 10Hz	4.04 dB(SAC #6)
(include Fundamental emission)	Above 1 GHz	5.32 dB(SAC #5)
Note. This uncertainty represents an expanded uncertainty expressed at approximate confidence level using a coverage factor of k=2.		



1.7. Frequency/channel operations

Ch.	Frequency (Mb)	Rate(Mbps)
00	2 402	LE 1 Mbps
20	2 442	LE 1 Mbps
39	2 480	LE 1 Mbps

Ch.	Frequency (Mb)	Rate(Mbps)
01	2 412	802.11b,g,n_HT20
07	2 442	802.11b,g,n_HT20
:		
11	2 462	802.11b,g,n_HT20

Ch.	Frequency (Mb)	Rate(Mbps)
03	2 422	802.11n_HT40
:	:	
07	2 442	802.11n_HT40
· · ·		:
09	2 452	802.11n_HT40



2. Summary of tests

Section in FCC Part 15	Section in RSS-247 & Gen	Test description	Test results
-	RSS-Gen 6.7	99% Occupied bandwidth	N/T ^{note1}
15.247(a)(2)	RSS-247 5.2(a)	6 dB bandwidth	N/T note1
15.247(b)(3)	RSS-247 5.4(d)	Output power	Pass
15.247(e)	RSS-247 5.2(b)	Power spectral density	N/T note1
15.205 15.209	RSS-247 5.5 RSS-Gen 8.9,8,10	Radiated restricted band and emission	Pass
15.247(d)	RSS-247 5.5	Conducted spurious emission and band edge	N/T ^{note1}
15.207(a)	RSS-Gen 8.8	AC Conducted emissions	N/T note2
15.203 -		Antenna Requirement	Pass note3

N/T: Not Tested

Note

1. This product is equipped with an approved module, please refer to Module Report below for details. Report No.

FCC : BLA-EMC-202203-A9202, BLA-EMC-202203-A9201

IC : A2303382-C02-R07, A2303382-C02-R08

2. This EUT is a product that operates using only DC power.

3. Please check the antenna spec. for the Antenna Requirement.

Page 7 / 87



3. Test results

.1. Output power Test procedure

ANSI C63.10-2013 - Section 11.9.1.3 and 11.9.2.3.2

Test setup



ANSI C63.10-2013 - Section 11.9.1.3

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.

ANSI C63.10-2013 - Section 11.9.2.3.2

Alternatively, 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. Because the measurement is made only during the ON time of the transmitter, no duty cycle correction is required.

Limit

According to \$15.247(b)(3), For systems using digital modulation in the 902~928 Mb, 2 400~2 483.5 Mb, and 5 725~5 850 Mb bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted out-put power. Maximum Conducted Out-put Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

Limit

According to RSS-247 5.4 (d), For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e).

As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power. The maximum conducted output power is the total transmit power delivered to all antennas and antenna elements, averaged across all symbols in the signalling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or transmitting at a reduced power level. If multiple modes of operation are implemented, the maximum conducted output power is the highest total transmit power occurring in any mode.

`



Test results

<u>DC 12 V</u>

	2 402 M⊞z		2 442 M比		2 480 MHz	
Mode	Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)
LE 1 Mbps	0.43	0.73	0.23	0.55	-0.10	0.24

	2 412 Mb		2 437 M比		2 462 Mb	
Mode	Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)
802.11b	10.08	13.41	9.91	13.25	9.76	13.11
802.11g	6.40	16.38	6.38	16.21	6.29	16.41
802.11n_HT20	6.15	16.10	6.15	15.69	6.10	16.04

2 422 Mz		2 M⊞z	2 43	7 MHz	2 452 Mb	
Mode	Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)
802.11n_HT40	5.98	16.05	6.06	15.62	6.12	15.70

<u>DC 24 V</u>

	2 40	2 M⊞z	2 44	2 M⊞z	2 48	O MHz
Mode	Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)
LE 1 Mbps	0.70	1.13	0.52	0.97	0.12	0.46

	2 412 M₺		2 437 Mb		2 462 Mb	
Mode	Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)
802.11b	10.76	14.15	10.68	14.08	10.52	13.89
802.11g	6.72	16.71	6.77	16.44	6.78	16.04
802.11n_HT20	6.47	15.75	6.57	16.48	6.54	15.79

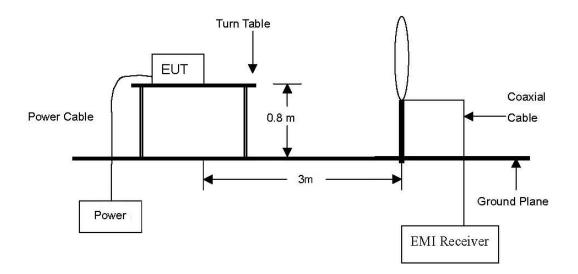
2 422 MHz		2 43	7 M±z	2 452 M / z		
Mode	Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)
802.11n_HT40	6.70	15.83	6.71	16.69	6.59	16.31



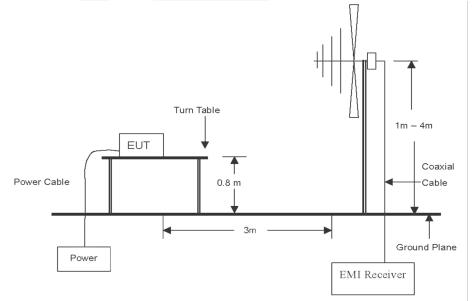
3.2. Radiated restricted band and emissions

Test setup

30 Mt Emissions.

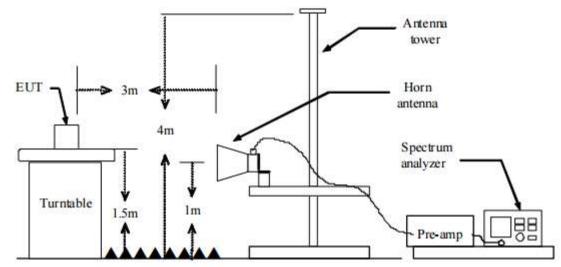


The diagram below shows the test setup that is utilized to make the measurements for emission from 30 Mz to 1 Gz emissions.



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

Radiated emissions from the EUT were measured according to the dictates in section 11.11 & 11.12 of ANSI C63.10-2013.

Test procedure below 30 Mb

- 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, ground parallel and perpendicular of the antenna are set to make the measurement. It was determined that **parallel** was worst-case orientation; therefore, all final radiated testing was performed with the EUT in **parallel**.
- 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 ₩ ~ 1 000 ₩

- 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. The antenna is a bi-log antenna, a horn antenna, and its height are varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations 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 antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
- 4. The test receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.



Test procedure above 1 000 Mb

- 1. The EUT was placed on the top of a rotating table 1.5 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. The antenna is a bi-log antenna, a horn antenna, and its height are varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations 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 antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
- 4. The test receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 5. Spectrum analyzer settings for f < 1 GHz:
 - ① Span = wide enough to fully capture the emission being measured
 - ② **RBW = 100** kHz
 - ③ VBW ≥ RBW
 - ④ Detector = quasi peak
 - 5 Sweep time = auto
 - 6 Trace = max hold
- 6. Spectrum analyzer settings for $f \ge 1$ GHz: Peak
 - ① Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
 - ② RBW = 1 Mb
 - ③ VBW ≥ 3 M±
 - ④ Detector = peak
 - 5 Sweep time = auto
 - 6 Trace = max hold
 - \bigcirc Trace was allowed to stabilize

Page 12 / 87



- 7. Spectrum analyzer settings for $f \ge 1$ GHz: Average
 - ① Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
 - ② RBW = 1 M±
 - ③ VBW ≥ 3 × RBW
 - ④ Detector = RMS, if span/(# of points in sweep) ≤ (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
 - \bigcirc Trace = max hold
 - (8) Perform a trace average of at least 100 traces. 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.

- f <30 Mb, extrapolation factor of 40 dB/decade of distance. F_d = 40log(D_m/Ds) f ≥30 Mb, extrapolation factor of 20 dB/decade of distance. F_d = 20log(D_m/Ds) Where:
 - F_d = Distance factor in dB
 - D_m = Measurement distance in meters
 - D_s = Specification distance in meters
- 2. Field strength($dB\mu N/m$) = Level($dB\mu N$) + CF (dB) + or DCF(dB)
- 3. Margin(dB) = Limit(dB μ V/m) Field strength(dB μ V/m)
- 4. 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.
- The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z, it was determined that <u>X orientation</u> was worst-case orientation; therefore, all final radiated testing was performed with the EUT in <u>X orientation</u>.
- 6. The worst-case emissions are reported however emissions whose levels were not within 20 dB of respective limits were not reported.
- 7. According to exploratory test no any obvious emission were detected from 9 kHz to 30 MHz. Although these tests were performed other than open field 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.

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 (Mb)	Distance (Meters)	Radiated (µN/m)
0.009 ~ 0.490	300	2 400/F(kHz)
0.490 ~ 1.705	30	24 000/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 $54 \sim 72 \text{ Mz}$, $76 \sim 88 \text{ Mz}$, $174 \sim 216 \text{ Mz}$ or $470 \sim 806 \text{ Mz}$. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

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



Limit

According to RSS-Gen, Except when the requirements applicable to a given device state otherwise, emissions from licence-exempt transmitters shall comply with the field strength limits :

Frequency (Mb)	Distance (Meters)	Radiated (µN/m)
0.009 ~ 0.490	300	2 400 / F(kllz)
0.490 ~ 1.705	30	24 000 / F(kHz)
1.705 ~ 30.0	30	30
30 ~ 88	3	100
88 ~ 216	3	150
216 ~ 960	3	200
Above 960*	3	500

* Unless otherwise specified, for all frequencies greater than 1 GHz, the radiated emission limits for licence-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a linear average detector function having a minimum resolution bandwidth of 1 MHz. If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for such factors as pulse desensitization to ensure the peak emission is less than 20 dB above the average limit.

Note: Transmitting devices are not permitted in restricted frequency bands unless stated otherwise in the specific RSS.



Duty cycle

Regarding to KDB 558074 D01_v05 r02, 6. Measurements of duty cycle and transmission duration shall be performed using one of the following techniques:

a) A diode detector and an oscilloscope that together have sufficiently short response time to permit accurate measurements of the on- and off-times of the transmitted signal.

b) The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on- and off-times of the transmitted signal.

Mode	T _{on} time (ាs)	Period (ms)	Duty cycle (Linear)	Duty cycle (%)	Duty cycle correction factor (dB)
LE 1 Mbps	0.39	0.63	0.62	62.40	2.05
802.11b	30.00	30.00	1.00	100.00	0
802.11g	30.00	30.00	1.00	100.00	0
802.11n_HT20	30.00	30.00	1.00	100.00	0
802.11n_HT40	30.00	30.00	1.00	100.00	0

Duty cycle (Linear) = Ton time/Period

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



Page 17 / 87

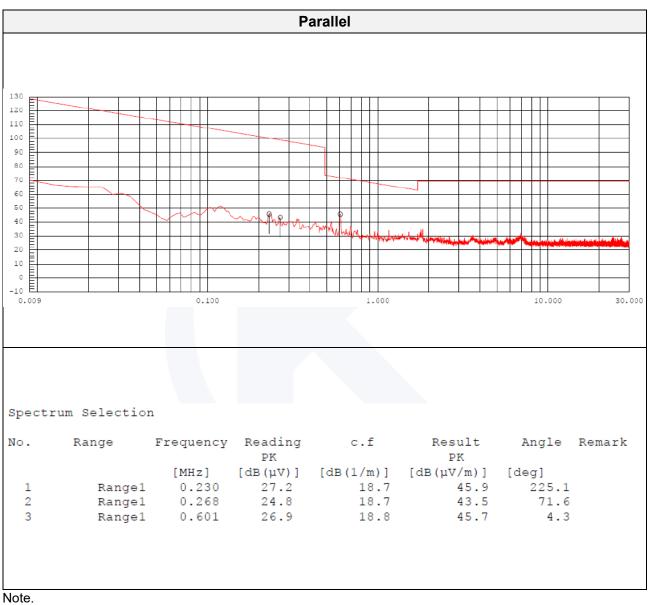


KES-QP16-F01(00-23-01-01)

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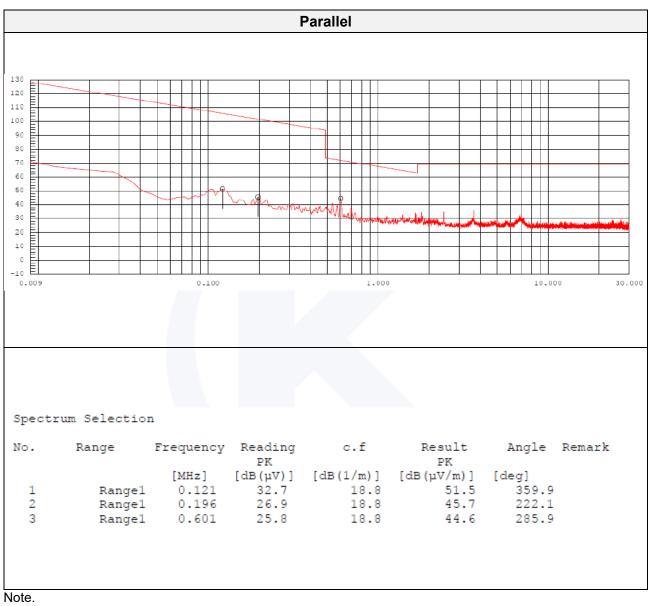
Test results (Below 30 Mb)Mode:LE 1 Mbps_DC 12 VDistance of measurement:3 meterChannel:00 (Worst case)



1. No spurious emission were detected under 30 Mb, the above test result is the peak result.

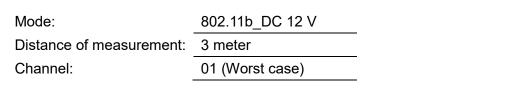


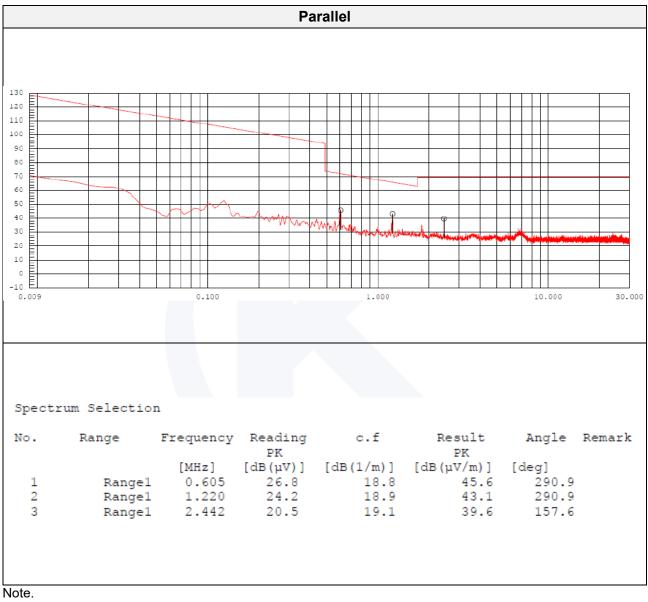
Mode:	LE 1 Mbps_DC 24 V
Distance of measurement:	3 meter
Channel:	00 (Worst case)



1. No spurious emission were detected under 30 Mtz, the above test result is the peak result.



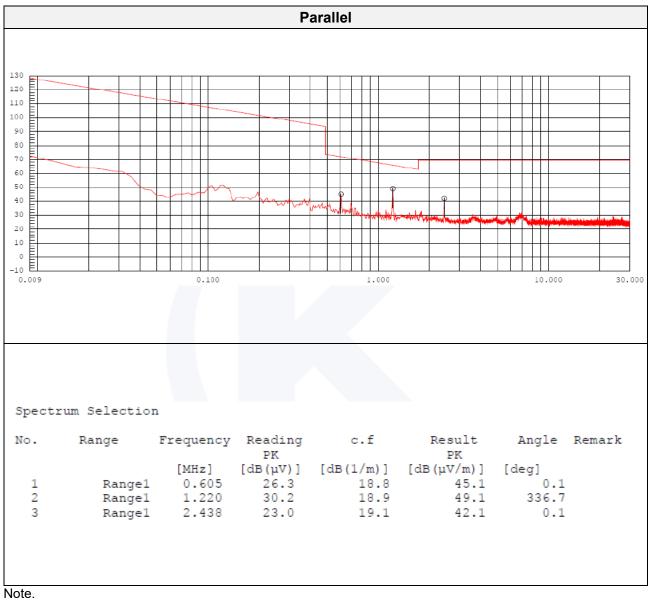




1. No spurious emission were detected under 30 Mb, the above test result is the peak result.



Mode:	802.11b_DC 24 V
Distance of measurement:	3 meter
Channel:	01 (Worst case)



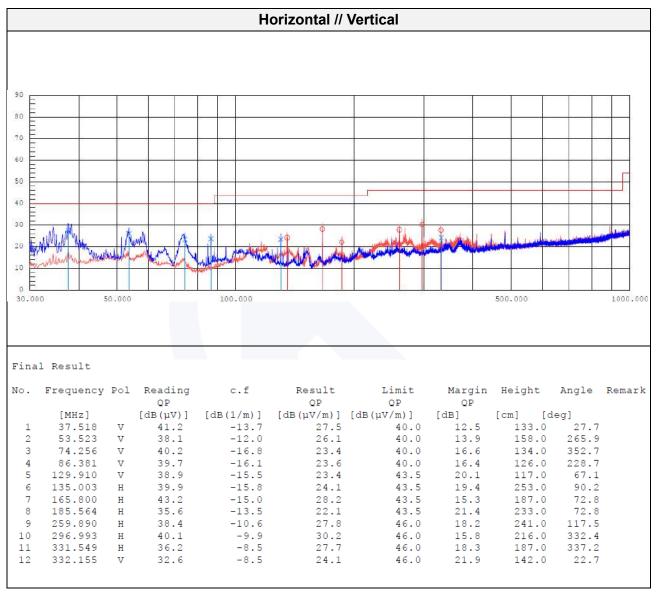
1. No spurious emission were detected under 30 Mtz, the above test result is the peak result.

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



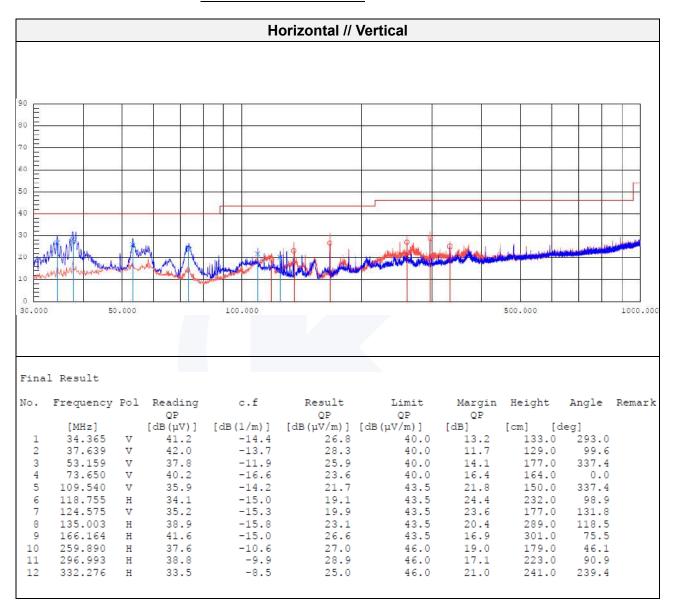
Test results (Below 1 000 Mz)

Mode:	LE 1 Mbps_DC 12 V
Distance of measurement:	3 meter
Channel:	00 (Worst case)



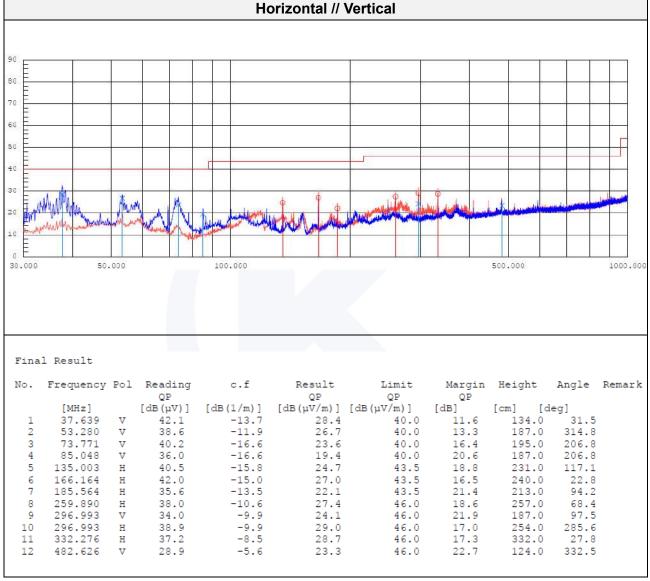


	LE 1 Mbps_DC 24 V				
Distance of measurement:	3 meter				
Channel:	00 (Worst case)				



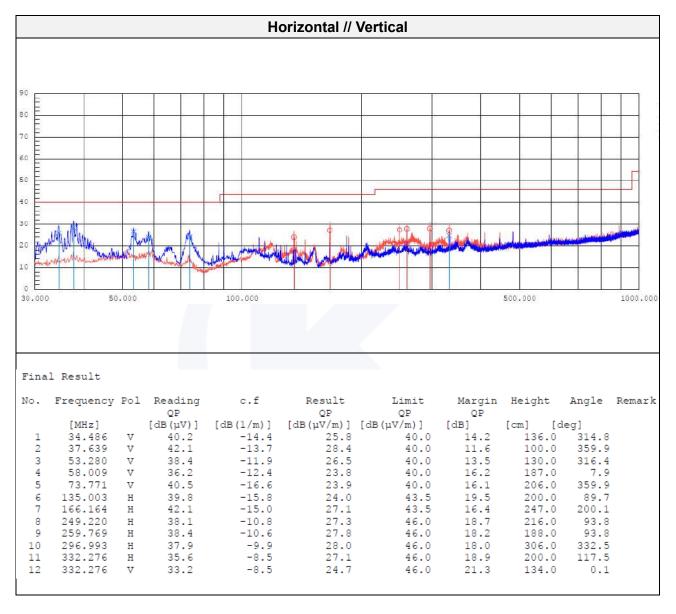


Mode:	802.11b_DC 12 V
Distance of measurement:	3 meter
Channel:	01 (Worst case)





Mode:	802.11b_ DC 24 V
Distance of measurement:	3 meter
Channel:	01 (Worst case)





Page 26 / 87

Test results (Above 1 000 ₩z)

LE 1 Mbps_DC 12 V			
3 meter			
00			

Spurious

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Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 331.40	46.36	Peak	Н	-7.32	-	39.04	74.00	34.96
1 615.10	42.92	Peak	V	-5.09	-	37.83	74.00	36.17

Band edge

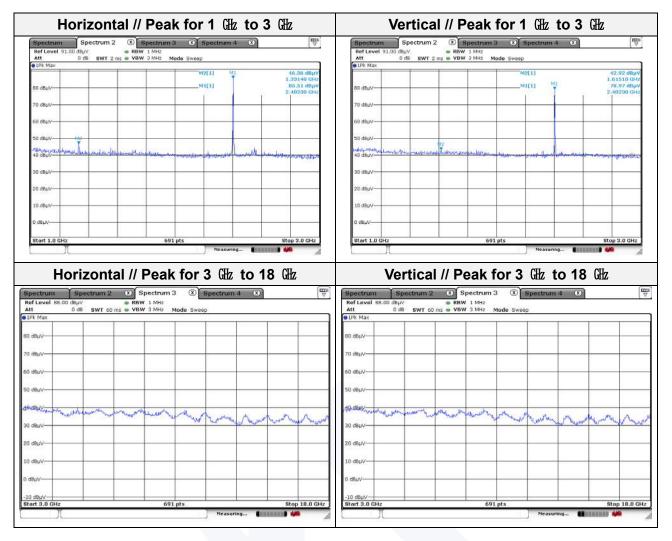
Build ou	90							
Frequency (쌘)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
2 389.54	43.35	Peak	Н	-0.73	-	42.62	74.00	31.38
2 390.00	43.17	Peak	V	-0.73	-	42.44	74.00	31.56

Spectrum	Spectrum 2 X	Spectrum 3	Spectrum 4	ו		Spectrum	Spectrum 2	(X) Spectrum	3 🛞 Spectrum	4 (8)		1
Ref Level 97.00		RBW 1 MHz				Ref Level 9		RBW 1 MHz	53+53 (1995) (1997)			100
Att 1Pk Max	0 dB SWT 1 ms 🖶 V	BW 3 MHz Mode	Sweep			Att IPk Max	0 dB SWT 1 r	ns 🖶 VBW 3 MHz	Mode Sweep			
APS INGA			M2[1]		43.35 dBuV	APE Man			M2[1]		4	3.17 dBp
Vu8b 0			and the second se		2.389540 GHz	90 dBuV						90000 Gi
			M1[1]		85.32 denv				M1[1]			8.64 dBj
RD dBuV			-	-	2.401730 GHz	80 dBuV	-			1	2.40	02340 6
0.00063					-1X	5.5.65553						1
0 dBuV-						70 dBuV						1
0 dBuV						60 dBuV			-	1		1
0.000.0												1
0 dBuV					10	50 dBuV						1
				MP	1						M2	1
a opposite and and	man les bie bie and	ut- Auber works - A	a martin provention	much		40.000		male mark way and	and the second states and a se	and the second second	When	<u> </u>
CONTRACTOR - ANALY	and all a hard beauty		2026-05			CONTRACTOR OF THE	and the second second second	State Landston	a second s			
0 deuv				_		30 dBuV						
D dBuV				_		20 dBuV						
0000000												
0 dBuV				_		10 dBuV						
				F2							F2	
dBuV-F1						0 dBuV				-		6
tart 2.3 GHz		691 pts			op 2.405 GHz	Start 2.3 GHz			1 pts	1. 1.		2.405 GH



Page 27 / 87





Note.

1. No spurious emission were detected above 3 GHz.

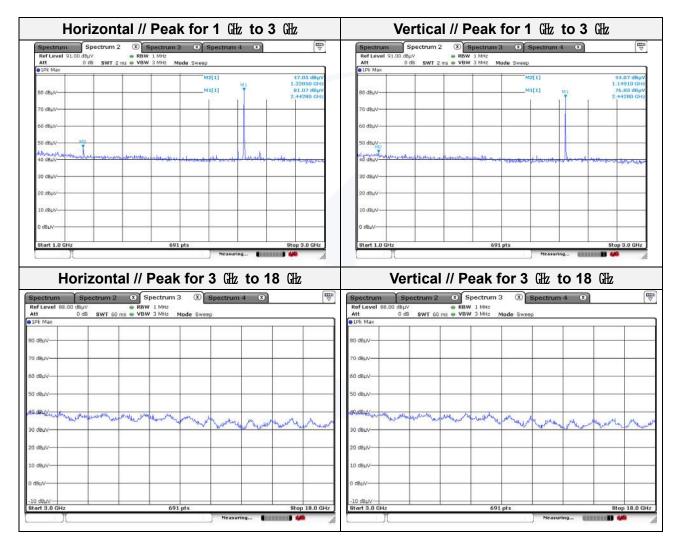
2. Average test would be performed if the peak result were greater than the average limit.



Mode:	LE 1 Mbps_DC 12 V
Distance of measurement:	3 meter
Channel:	20

Spurious

Frequency (Mb)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 149.10	44.07	Peak	V	-8.56	-	35.51	74.00	38.49
1 328.50	47.05	Peak	Н	-7.34	-	39.71	74.00	34.29



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:	LE 1 Mbps_DC 12 V
Distance of measurement:	3 meter
Channel:	39

- Spurious

Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 328.50	45.76	Peak	Н	-7.34	-	38.42	74.00	35.58
1 331.40	43.98	Peak	V	-7.32	-	36.66	74.00	37.34

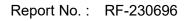
Band edge

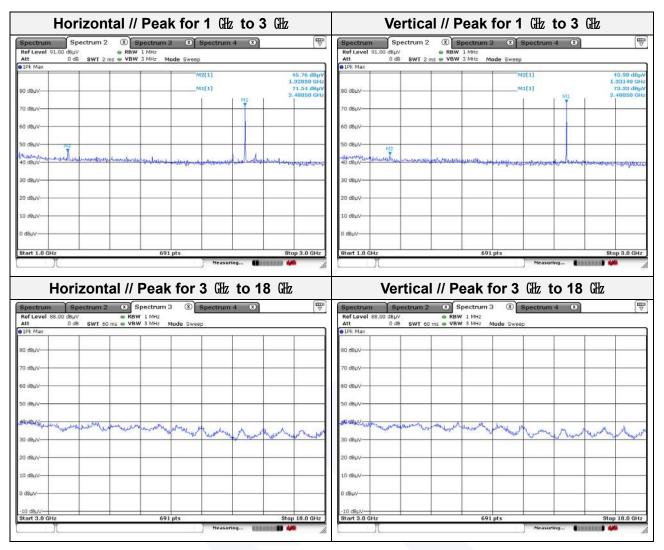
Balla Va	gv							
Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dB _µ V/m)	Limit (dBµN/m)	Margin (dB)
2 483.50	53.39	Peak	н	-0.57	-	52.82	74.00	21.18
2 483.50	50.01	Peak	V	-0.57	-	49.44	74.00	24.56

ctrum Sr	ectrum 2	Spectrum 3	Spectrum 4	x) 🕎	Spectrum	Spectrum 2	Spectrum :	3 🛞 Spectrum	14 🗵
fLevel 97.00 dBp t 0 c		RBW 1 MHz s VBW 3 MHz M	ode Sweep		Ref Level S		RBW 1 MHz ms VBW 3 MHz	Mode Sweep	
Max					IPk Max				
8µV			M2[1] M1[1]	53.39 dBµV 2.4835000 GHz 74.78 dBµV	90 d8µV			M2[1]	50.01 d 2.4835000 73.11 d
				2.4802920 GHz	80 dBµV				2.4798290
вич-					70 dBµV				
вич-	a vie				50 d8µV	100 mg			
BhA	mb	www.deamer.	- Antolio and the state of the state	and the second second second	40 d8µV	Manual	a mananakanakanakanakanakanakanakanakanaka	100000 mary west war	a and the second se
BµV					30 dBµV				
BuV					20 dBuV				
BμV			F2		10 dBµV	F1		F	2
494 GHz		691		Span 32.0 MHz	CF 2,494 GH		201	pts	Span 32.0 M



Page **30** / **87**





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.



Test results (18 $ m G\!$	z)			
Mode:	LE 1 Mbps_DC 12 V			
Distance of measurement:	3 meter			
Channel:	00 (Worst case)			

	Horizontal Pea	ak	Vertical Peak					
Spectrum Spectrum 2 Ref Level 91.00 dBµV Att 0 dB SWT 48	RBW 1 MHz	trum 4 🛞 🕎	Spectrum Ref Level 91 Att		Spectrum 3 RBW 1 MHz		4 🛞	
e 1pk Max	ms WBW 3 MHz Mode Sweep		• 1Pk Max	U DB SWI 48 n	is 🖶 VBW 3 MHz 🛛 Mic	ode sweep		_
B0 dBµV			00 dBµV					_
70 d8µV			70 dBµV					+
60 dbµV			60 dBµV					_
50 d8µV			50 dBµV					_
40 deuv	Mulmin manual perminent	work madel and the second and and	40 dBuV	ghaland an age of the game of the	managenter	and an inter with the second	Sharen Margaren	hip and in the second
20 dBµV			20 dBµV					
10 dBµV			10 dBµV					
0 d8µV			0 dBuV					_
Start 18.0 GHz	691 pts	Stop 30.0 GHz	Start 18.0 GH	z	691 p	its	s	top 30.0 GHz
π		Measuring 🚺 🗰 🥢				Measurir	19 (11111111)	40

Note.

No spurious emission were detected above 18 $\,{\rm Ghz}$



Mode:	802.11b_DC 12 V
Distance of measurement:	3 meter
Channel:	01

Spurious

Frequency (Mb)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 331.40	44.96	Peak	Н	-7.32	-	37.64	74.00	36.36
1 334.30	46.21	Peak	V	-7.30	-	38.91	74.00	35.09

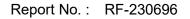
Band edge

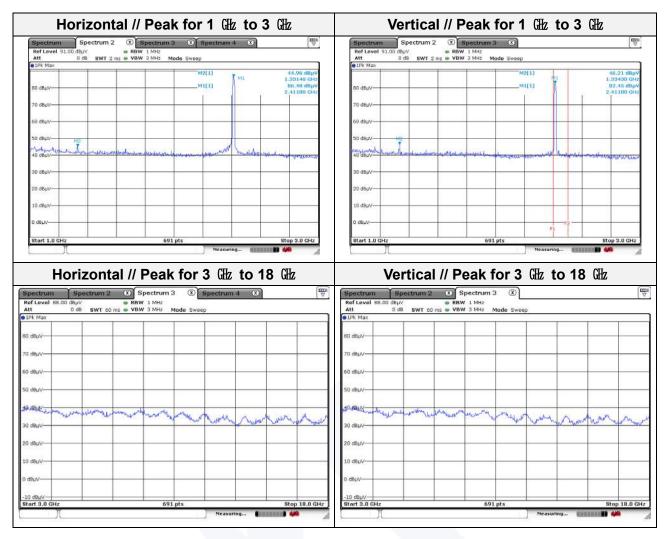
Balla Va	90							
Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµ∛/m)	Margin (dB)
2 367.35	43.80	Peak	V	-0.77	-	43.03	74.00	30.97
2 389.35	47.83	Peak	Н	-0.73	-	47.10	74.00	26.90

Spectrum Spect	rum 2 🔿 Spectrui	m 3 🛞 Spectrum 4 👘	X	Spectrum			a a
Ref Level 97.00 d8µ∨ Att 0 d8	RBW 1 MHz SWT 1 ms # VBW 3 MHz			Ref Level 97.00 c	BµV ⊕ RBW 0 dB SWT 1 ms ⊕ VBW		
1Pk Max	SWI 1 ms . VBW 3 MHz	Mode sweep		Att 1Pk Max	olda SWI1ms ⊕ VBW	3 MHz Mode Sweep	
o dahA		M2[1]	47.83 dBµV 2.389350 GHz 87.42 dBs ²	90 d8µV		M2[1]	43.80 dBp 2.367346 GF 84.35 dB)
) dвµV			2.41062Ø GHz	80 dBµV			2.410620/0
I dBµV				70 d8µ√			
19µV-				60 d8µV			
dBµV		monomenous	when	50 d8µV		M2	
CBUV CBUV	- and a property and an and a second	ntownoon when the		Hardepyrn Handlanna	wind have an apron	and - succession ter where	medunantical
dBµV				30 d8µV			
dBuV				20 dBuV			
d8µV-			P2	10 d8µV-			P
dBuV F1				0 dBuV			



Page 33 / 87





Note.

1. No spurious emission were detected above 3 GHz.

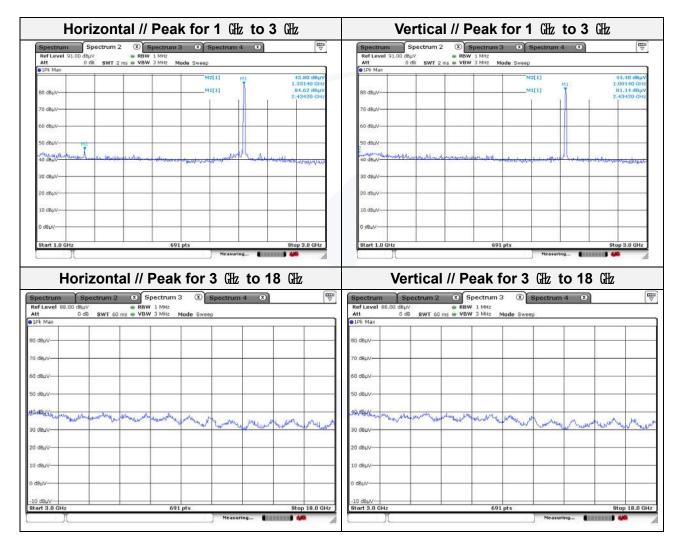
2. Average test would be performed if the peak result were greater than the average limit.



Mode:	802.11b_DC 12 V
Distance of measurement:	3 meter
Channel:	06

Spurious

Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 001.40	44.40	Peak	V	-9.59	-	34.81	74.00	39.19
1 331.40	45.80	Peak	Н	-7.32	-	38.48	74.00	35.52



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:	802.11b_DC 12 V
Distance of measurement:	3 meter
Channel:	11

- Spurious

opanoad								
Frequency (Mb)	Level (dB#V)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 152.00	44.25	Peak	Н	-8.54	-	35.71	74.00	38.29
1 331.40	44.15	Peak	V	-7.32	-	36.83	74.00	37.17

Band edge

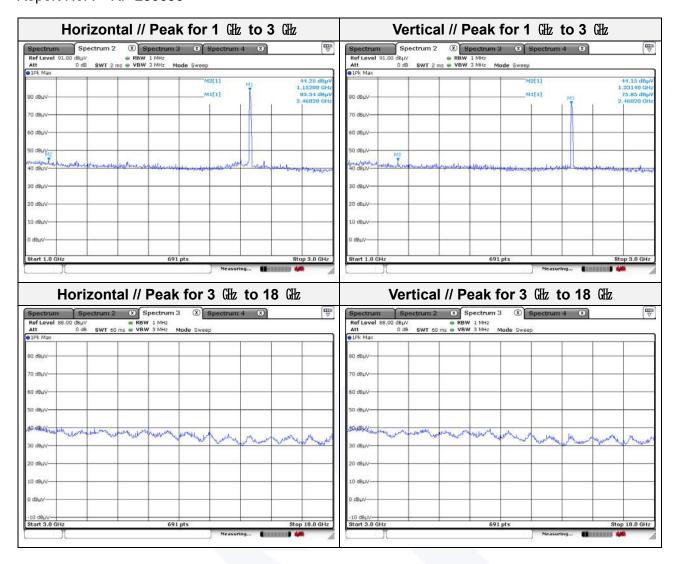
_

Bulla Va	<u> </u>							
Frequency (Mb)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dB _µ V/m)	Limit (dBµN/m)	Margin (dB)
2 486.42	43.21	Peak	н	-0.57	-	42.64	74.00	31.36
2 488.15	42.28	Peak	V	-0.56	-	41.72	74.00	32.28

Spectrum	Spectrum 2	Spectrum 3	B Spectrum 4	3	Spectrum	Spectrum 2	Spectrum 3	Spectrum 4 (X)	
Ref Level 97.		S BW 1 MHz S WOW 3 MHz N	Indo Swaan		Ref Level 97		■ RBW 1 MHz ms ■ VBW 3 MHz Mg	de Cuese	
1Pk Max	ULB SWI 1 III	S & ADM S MUT 14	lode sweep		Pk Max	DUB SWI1	TIS WYDW SINNE MU	de sweep	
0 dauv-			M2[1] M1[1]	43.21 dBµV 2.4864170 GHz 81.66 dBµV	90 d8µV-			M2[1] M1[1]	42.28 dBj 2.4881530 Gi 74.97 dBj
D DBbV				2.4620350 GHz	80 dBhA	-			2.4633550 Gł
	(Z				70 dBµV	6			
о авил			· /· /·		60 dBµV				
0 dBµV			412		50 dBµV			MS	
) dBµV	haventure	Mentral and a sume	Instance of the stratery on	midentialitation	40 d8µV	Jannethum	when the second s	M2 march delper upon	and the second second
0 dBµV					30 dBµV				
0 dBµV					20 dBµV				
0 d8µV					10 d8µV				
dBuV-		E1		12	0 dBuV		F1		[



Page 36 / 87



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.



Test results (18 \mathbb{G} to 30 \mathbb{G}	z)
Mode:	802.11b_DC 12 V
Distance of measurement:	3 meter
Channel:	01 (Worst case)

	Но	orizontal l	Peak				Vertica	al Peal	(
Ref Level 91.00 de	sμv 😐 F	Spectrum 3 (X) BW 1 MH2 /BW 3 MH2 Mode Swi	Spectrum 4 🛞		Spectrum Ref Level 91 Att		Spectrum BW 1 MHz ms VBW 3 MHz		ctrum 4 🛞		(
• 1Pk Max	00 SW1 +8 ms	BW 3 MH2 Mode SW	ep		9 1Pk Max	0 08 SW1 +8	ms w vow a mez	Mode sweep			
80 d8µV					80 dBµV						
70 dBµV					70 dBµV						
50 d8µV		_			50 d8µV						
40 dBuV	uchilde work in	alequer ande	an water water the standard the	للهاب بالمسرحي المدرية القسوليهان	40 dBµV	remember	howhy wh	when in which	and the forest of a former	Line March	- Mark
20 dBµV					20 dBµV						
10 dBµV					10 dBµV						
Start 18.0 GHz		691 pts		Stop 30.0 GHz	Start 18.0 GH	z	69	L pts		Stop 30.0	0 GH2
Л			Measuring	lin 🖡 🦇 🥼					Measuring 📗		

Note.

No spurious emission were detected above 18 $\,{\rm Ghz}$



Mode:	802.11g_DC 12 V
Distance of measurement:	3 meter
Channel:	01

- Spurious

Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 001.40	45.54	Peak	V	-9.59	-	35.95	74.00	38.05
1 088.30	46.45	Peak	Н	-8.99	-	37.46	74.00	36.54

Band edge

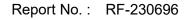
_

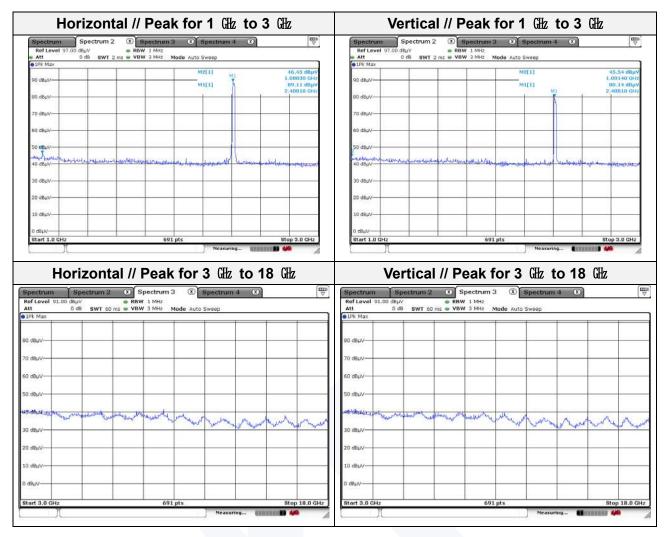
Bana Va	<u> </u>							
Frequency (畑)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµN/m)	Margin (dB)
2 368.48	41.07	Peak	V	-0.77	-	40.30	74.00	33.70
2 381.41	43.64	Peak	Н	-0.74	-	42.90	74.00	31.10

Spectrum	Spectrum 2	Spectrum 3	Spectrum 4	×	Spe ∀	ctrum	Spectrum 2	(X) Spectrum	3 🛞 Spectrur	n4 🛞		
Ref Level 97		RBW 1 MHz 5.2 µs	Mode Auto FFT		Ref Att	Level 97.00		RBW 1 MHz	Mode Auto FFT			
1Pk Max		Contrast of the second second			● 1Pk			the second second second	Southern Mar 2000 Cor			
PO d8µV			M2[1]	2.3	83.64 dBµV 81410 GHz 89.60 dBpv	μv			M2[1]		2,368 82	1.07 dBµ i8480 GH 2.06 dBµ
io deµv				2.4	80 de	μV				1 1	2.40	17386 (24
70 dBµV-					70 de	μV						<u> </u>
0 dBµV-					60 d9	μv						
0 dBµV			M	e	50 d8	μV			M2		~	
	a confront have	maghine	- man man	Martin	.40.dB	- Van	Samar	and from	manyan	Jung	~~~~	
I dBµV					30 de							
0 dBuV					20 de	£000						
dBuV				F2	0 dB	F1				P	2	
tart 2.3 GHz		691				2.3 GHz			pts		Stop 2.4	



Page 39 / 87





Note.

1. No spurious emission were detected above 3 GHz.

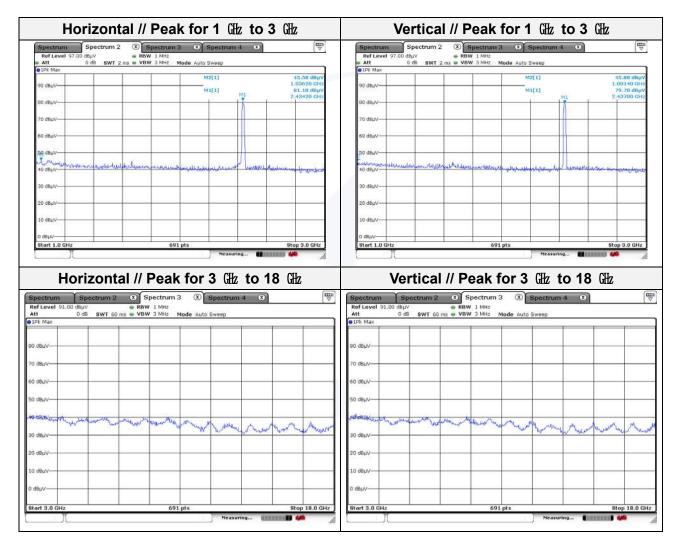
2. Average test would be performed if the peak result were greater than the average limit.



Mode:	802.11g_DC 12 V
Distance of measurement:	3 meter
Channel:	06

Spurious

Frequency (Mb)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1 001.40	45.88	Peak	V	-9.59	-	36.29	74.00	37.71
1 036.20	45.58	Peak	Н	-9.35	-	36.23	74.00	37.77



Note.

- 1. No spurious emission were detected above 3 $\,{\rm Ghz}$.
- 2. Average test would be performed if the peak result were greater than the average limit.



Mode:	802.11g_DC 12 V
Distance of measurement:	3 meter
Channel:	11

- Spurious

epaneat								
Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 088.30	46.27	Peak	Н	-8.99	-	37.28	74.00	36.72
1 117.20	44.79	Peak	V	-8.79	-	36.00	74.00	38.00

Band edge

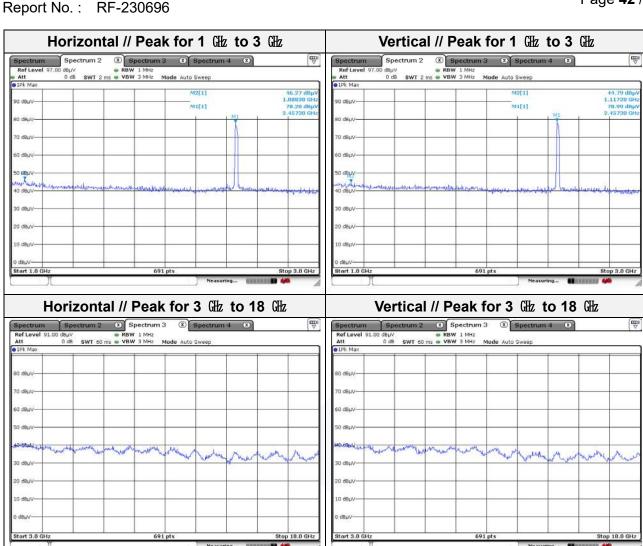
_

Bulla Va	3°							
Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dB _µ V/m)	Limit (dBµN/m)	Margin (dB)
2 489.33	41.92	Peak	Н	-0.56	-	41.36	74.00	32.64
2 491.14	42.74	Peak	V	-0.56	-	42.85	74.00	31.15

Spectrum	Spectrum 2	X Spectr	um 3 💌	Spectrum	14 X			Spectrum	Spe	ctrum 2	X Spec	trum 3	(X) Spectrur	n4 🗶	9
Ref Level 97.		e RBW 1N					1	Ref Level			RBW 1				h
1Pk Max	0 dB SWT 7.5	µs ⊎ vew a w	IHZ Mode Au	to FFT				Att Pk Max	U dB	SW1 7.5	J5 🖶 VHW 3	MH2 M	ode Auto FFT		
PO dBµV-				M2[1]		2.48	41.92 dBµV 193340 GHz 75.99 dBµV	90 d8µV-					M2[1]		42.74 dBj 2.4911400 GF 77.60 dBs
D deuv				milil	n - 4		43270 GHz	ad dayv-					milil	10 m	2.4635630 G
								autreht.	~						
0 dBµV-				+				70 dBµV-	1					+ +	
0 dBµV				-		-		60 dBµV							
50 dBµV				0				50 dBµV					40		
0 d8µV	- ~	<u></u>	MP		mw			40 d8µV		Jose					
0 dBµV	_							30 dBµV							
0 dBuV								20 dBuV							
0 d8µV	_							10 dBµV						-	
dBuV-		E	1	-	F2			0 dBuV-		_	_	F1		F2	



Page 42 / 87



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.

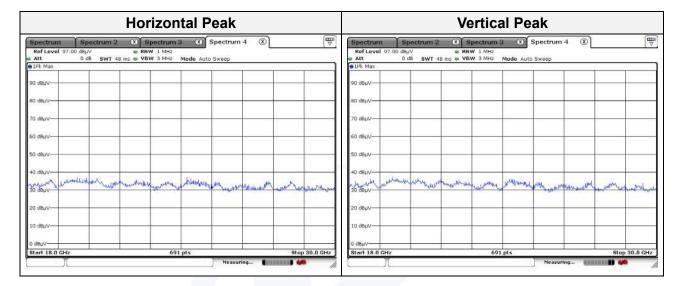
KES-QP16-F01(00-23-01-01)

KES Co., Ltd.

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).



Test results (18 础 to 30 础)							
Mode:	802.11g_DC 12 V						
Distance of measurement:	3 meter						
Channel:	01 (Worst case)						



Note.

No spurious emission were detected above 18 GHz.



Mode:	802.11n_HT20_DC 12 V
Distance of measurement:	3 meter
Channel:	01

- Spurious

opunout								
Frequency (₩z)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 036.20	46.01	Peak	Н	-9.35	-	36.66	74.00	37.34
1 073.80	44.34	Peak	V	-9.09	-	35.25	74.00	38.75

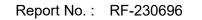
Band edge

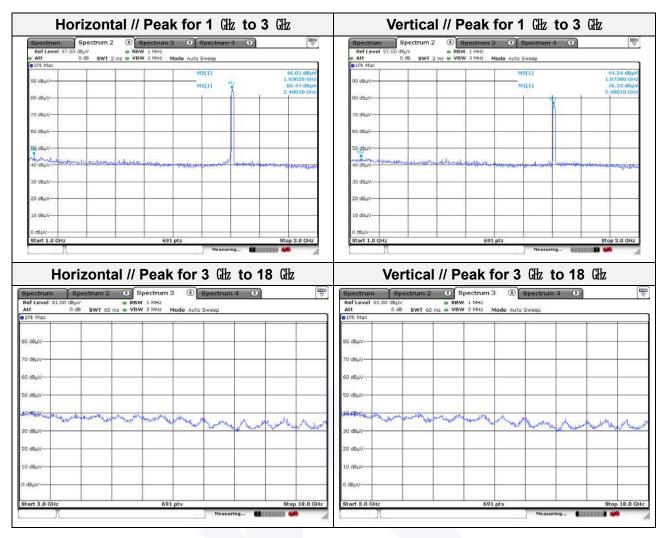
Balla Va	90							
Frequency (Mb)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dB _µ V/m)	Limit (dBµN/m)	Margin (dB)
2 380.80	42.53	Peak	н	-0.74	-	41.79	74.00	32.21
2 381.45	41.68	Peak	V	-0.74	-	40.94	74.00	33.06

Spectrum	Spectrum 2	Spectrum 3	(X) Spectrur	n4 🛞			Spectrum	Spectrun	12 🗶 Sp	ectrum 3	x) Spectrum	n4 🛞		H S
Ref Level 97. Att		■ RBW 1 MHz 2 µs ■ VBW 3 MHz	Mode Auto FFT				Ref Level &		● RBN T 15.2 µs ● VBN	VIMHz VIMHz Mod	e Auto FFT			
1Pk Max		10 march 10					1Pk Max				and a store of the			
90 dBµV			M2[1]		2.3	12.53 dBµV 80800 GHz 85.86 dBµV	90 d8µV-	_			M2[1]		2.3	41.68 dBµ 181450 GH 76.41 dBµ
во авру-		-		1	2.4	07700 GHS	80 dBµV		-			1	2.4	107700 GH
70 dBµV							70 dBµV-							\int
0 dBµV							60 dBhA							1-
ia dibina				M2	-AM		50 dBµV					M2	20	1
Q. GBAD Some of Con	mon	and the same	mon	the same	0		A9.984X	harrow	man	mander	more	- Juns	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
0 dBµV-							30 dBµV							-
0 dBuV							20 dBhA							-
0 dBµV				E CONTRACTOR	2		10 d8µV					E CONTRACTOR	2	
dBuV F1			-		-		0 dBuV		-		-			



Page 45 / 87





Note.

1. No spurious emission were detected above 3 GHz.

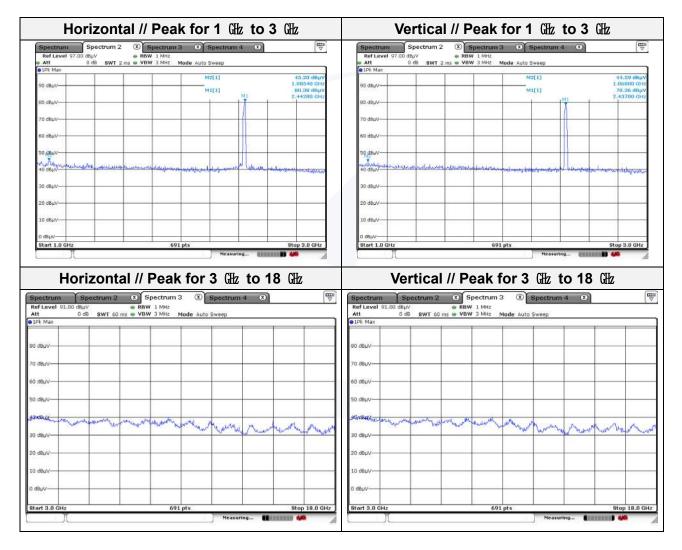
2. Average test would be performed if the peak result were greater than the average limit.



Mode:	802.11n_HT20_DC 12 V
Distance of measurement:	3 meter
Channel:	06

Spurious

opanioa	-							
Frequency (朏)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 068.00	44.59	Peak	V	-9.13	-	35.46	74.00	38.54
1 085.40	45.20	Peak	Н	-9.01	-	36.19	74.00	37.81



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.



Page 47 / 87

Mode:	802.11n_HT20_DC 12 V	
Distance of measurement:	3 meter	
Channel:	11	

- Spurious

Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 001.40	46.80	Peak	V	-9.59	-	37.21	74.00	36.79
1 099.90	45.16	Peak	Н	-8.91	-	36.25	74.00	37.75

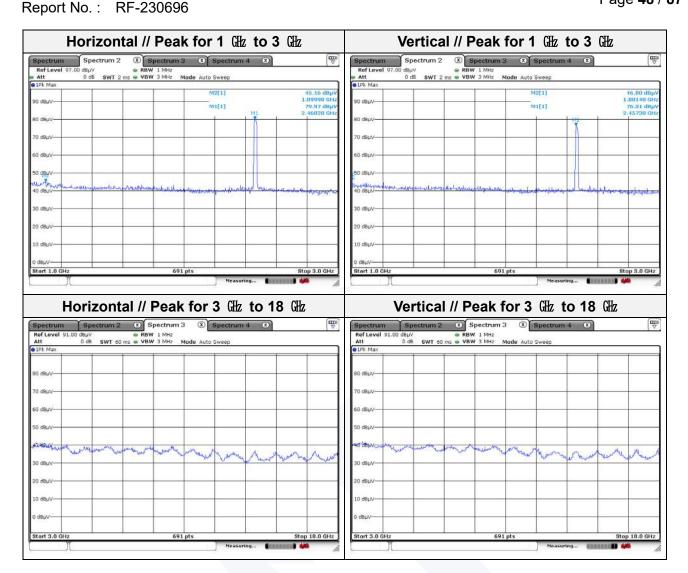
Band edge

Bulla Va	90							
Frequency (Mb)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dB _µ V/m)	Limit (dBµN/m)	Margin (dB)
2 484.33	42.51	Peak	н	-0.57	-	41.94	74.00	32.06
2 494.34	42.17	Peak	V	-0.56	-	41.61	74.00	32.39

pectrum	Spectrum 2	🗶 🕅 St	ectrum 3	⊧ (X) €	Spectrum	4 🛛			Spectrum	Spec	strum 2	X Spe	ctrum	3 X)	Spectrum	4 🛛		
Ref Level 97.0	0 dBµ∨ 0 dB SWT 7		V 1 MHz					1	Ref Level 9			· RBW		Mode Aut	-			1
Pk Max	UDB SWI/	.5 µ5 ₩ ¥84	W 3 MHZ	Mode Auto	FFI				IPk Max	U OB	SW1 7.5	JS 🖷 VBW	3 MHZ	Mode Aut) FF I			
dBuV					2[1]		2.48	42.51 dBµV 143330 GHz 80.00 dBµV	90 d8µV-	-		_			2[1]		2.49	42.17 dBp 43360 GF 76.30 dBp
M1 BUV						P 4	2.46	59250 GHz	BONDBUV			-	-			-	2.46	39100 Gł
dBuV									70 dBuV	~								
dBuV	N								60 dBuV	1								
000035	1.								0.00003	1								
dBµV			M2						50 dBµV	1					M2			
dBµV		h			m	~~~			40 d8µV		V			h and		-		~~
dBµV	_								30 dBµV				+					
dBuV	_		_						20 dBuV				-	-				
d8µV	_								10 d8µV				-	-				
BuV-			F1			F2	1		o dauv				F1			F2		



Page **48** / **87**



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.

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

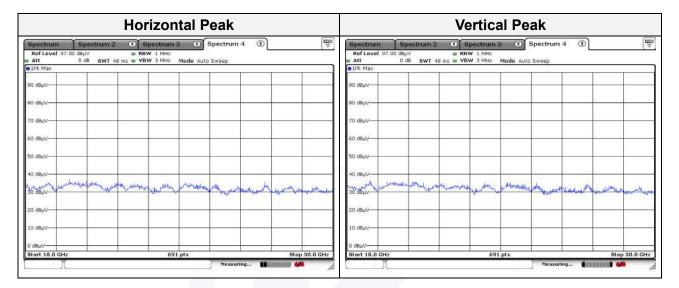
The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).



Channel:

Test results (18 🕮 to 30 @	z)
Mode:	802.11n_HT20_DC 12 V
Distance of measurement:	3 meter

01 (Worst case)



Note.

No spurious emission were detected above 18 GHz.



Mode:	802.11n_HT40_DC 12 V
Distance of measurement:	3 meter
Channel:	03

- Spurious

opunout								
Frequency (₩z)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 001.40	45.72	Peak	V	-9.59	-	36.13	74.00	37.87
1 091.20	45.09	Peak	Н	-8.97	-	36.12	74.00	37.88

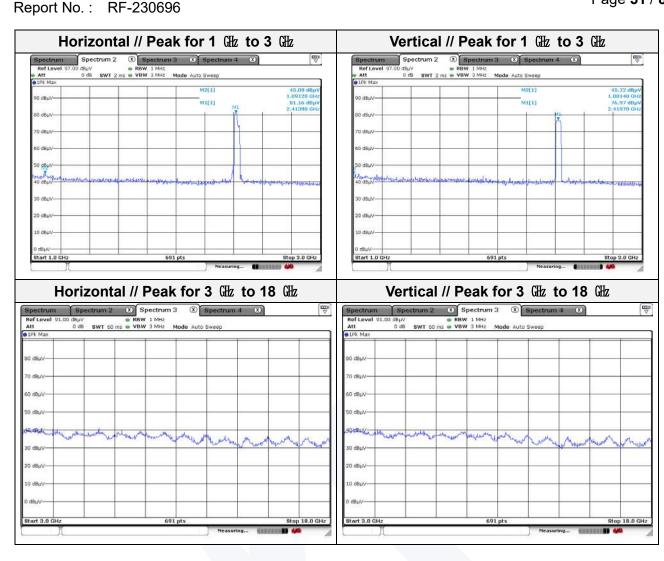
Band edge

Bulla Va	90							
Frequency (Mb)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dB _µ V/m)	Limit (dBµN/m)	Margin (dB)
2 364.71	41.52	Peak	V	-0.78	-	40.74	74.00	33.26
2 366.75	43.73	Peak	Н	-0.77	-	42.96	74.00	31.04

Spectrum	Spectrum 2	Spectrum 3	Spectrum	14 🛞		Spectrum	Spectrum 2	Spectrum	3 Spectrum	1 (X)
Ref Level 97.0		RBW 1 MHz 1 us WBW 3 MHz	Mode Auto FFT		11000	Ref Level	97.00 dBµ∨ 0 dB SWT 1	RBW 1 MHz 7.1 us VBW 3 MHz		
1Pk Max				100		• 1Pk Max				
90 d8µV			M2[1]		43.73 dBµV 2.366750 GHz 81.09 dBµV	90 d8µV			M2[1]	41.52 dB 2.364710 G 77.28 dB
RD dBµV					2.414859 GHz	80 dBµV				2.418380 G
70 dBµV						70 dBµV				
0 dBµV			· · · · · · · · · · · · · · · · · · ·			60 d8µV				
0 dBµV			M2 Amo	mont		50 dBµV			M2	am
deuv	an and a construction of the	-V 4 10- 10- 11	1440			30 depv	monimu	man	the way of the second s	~~~
) dBuV						20 dBuV-				
d8µV				62		10 d8µV-				F2
dBuV		601		1	Stop 2.422 GHz	0 dBuV			1 pts	\$2 Stop 2.422 GH



Page 51 / 87



Note.

1. No spurious emission were detected above 3 GHz.

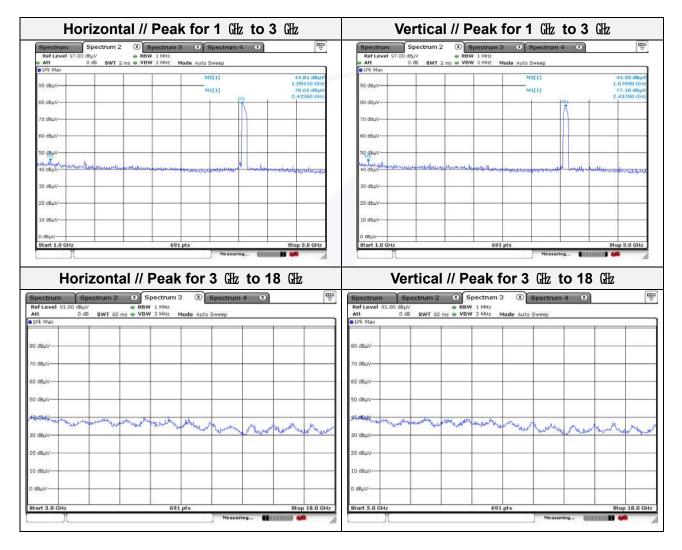
2. Average test would be performed if the peak result were greater than the average limit.



Mode:	802.11n_HT40_DC 12 V
Distance of measurement:	3 meter
Channel:	06

Spurious

epaneae								
Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 070.90	44.30	Peak	V	-9.11	-	35.19	74.00	38.81
1 094.10	44.81	Peak	Н	-8.95	-	35.86	74.00	38.14



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_HT40_DC 12 V	
Distance of measurement:	3 meter	
Channel:	09	

- Spurious

epaneat								
Frequency (₩z)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 024.60	46.00	Peak	Н	-9.43	-	36.57	74.00	37.43
1 120.10	45.45	Peak	V	-8.77	-	36.68	74.00	37.32

Band edge

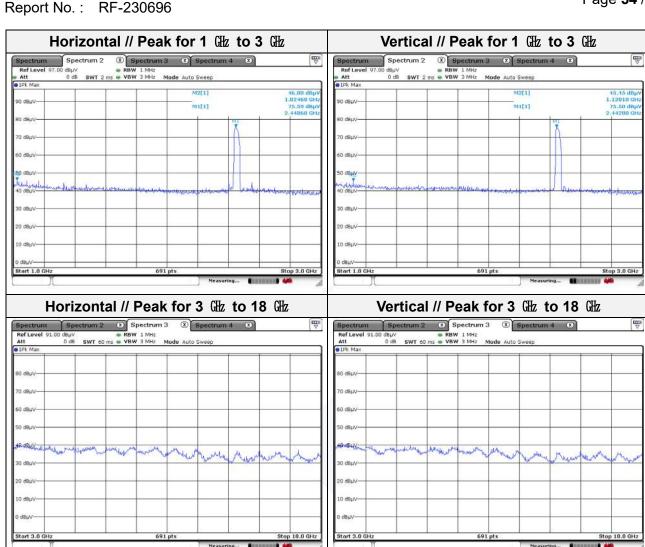
_

Bulla Va	9~							
Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dB _µ V/m)	Limit (dBµN/m)	Margin (dB)
2 490.07	42.02	Peak	н	-0.56	-	41.46	74.00	32.54
2 492.00	42.56	Peak	V	-0.56	-	42.00	74.00	32.00

Spectrum	Spectrum 2	X Spectrur	n3 🗵	Spectrum	4 X			Spectrum	Spectrum 2	× Sr	ectrum 3	× Spe	ctrum 4	X		
Ref Level 97	0 dB SWT 9.5 L	RBW 1 MH					1	Ref Level 97	0 dBµV 0 dB SWT 9.		V 1 MHz					
1Pk Max	0 00 SW1 9.51		- Moue /	AULO PP I				IPk Max	0 UB SWI 9.	s hs 🖷 🚛	A 2 MUTE 14	IUUB AUTO FF				
PO deµV				M2[1] M1[1]			42,02 dBµV 900650 GHz 74,61 dBµV 538050 GHz	90 d8µV				M2[1 M1[1			2.491	2.56 dBµ (9960 GH 3.92 dBµ 48120 GH
an dayv								BD dBµV								orte an
O dBµV	And I							-70 dBµV-	- Mary					-		
0 d8µV						-		60 dBµV						-		
ia dibha			_	MZ		-		50 d8µV					M2	-		
io dapv		- marine	-m-	-mis	- m	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		40 d8µV		N	m	n		m	m	
0 dBµV								30 dBµV						-		
20 dBµV						-		50 qBnA						_		
0 dBµV						F2		10 d8µV						E	2	
dBuV-			F1		-			0 dBuV-		-	-	F1	-		-	



Page 54 / 87



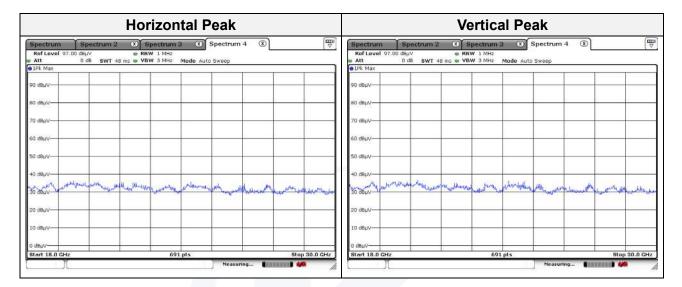
Note.

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.



Test results (18 础 to 30 础)							
Mode:	802.11n_HT40_DC 12 V						
Distance of measurement:	3 meter						
Channel:	09 (Worst case)						



Note.

No spurious emission were detected above 18 GHz.



Mode:	LE 1 Mbps_DC 24 V
Distance of measurement:	3 meter
Channel:	00

- Spurious

epaneat								
Frequency (ᢂ᠋ᢧ)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 105.60	45.10	Peak	V	-8.87	-	36.23	74.00	37.77
1 334.30	48.02	Peak	Н	-7.30	-	40.72	74.00	33.28

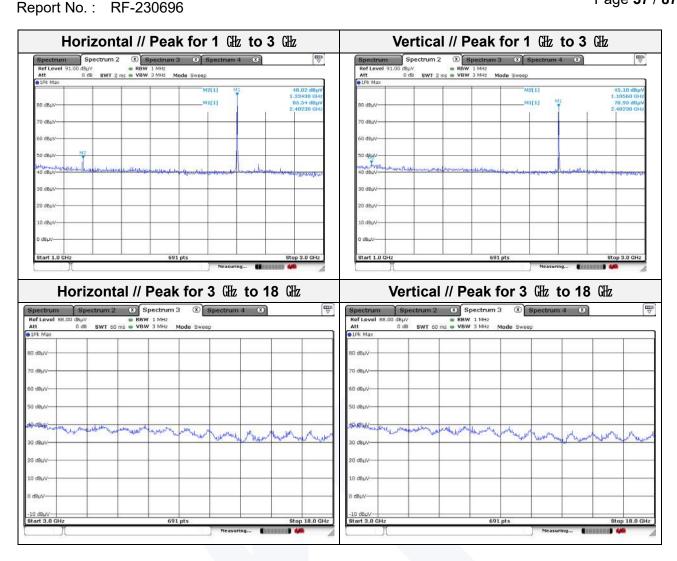
Band edge

Balla Va	gv							
Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dB _µ V/m)	Limit (dBµN/m)	Margin (dB)
2 353.84	43.32	Peak	н	-0.80	-	42.52	74.00	31.48
2 365.72	41.99	Peak	V	-0.77	-	41.22	74.00	32.78

Spectrum	Spectrum 2	Spectrum 3	Spectrum 4			Spectrum	Spectrum 2	Spectrum 3	Spectrum 4	×	
Ref Level 97.		RBW 1 MHz ns WBW 3 MHz M	Inde Sween		1.000.00	RefLevel 97.		RBW 1 MHz VBW 3 MHz Mod	le Swaan		
1Pk Max						1Pk Max			C. CARTER		
90 dBµV			M2[1]		43.32 dBµV 2.353840 GHz 85.11 dBav	90 d8µV			M2[1]		41.99 dB 2.365720 G 78.55 dB
RD dBµV					2.401880	80 dBµV					2.402340 G
70 dBµV					\rightarrow	70 dBµV					
i0 dBhA			· · · · · ·			60 dBµV			2		
iO dBµV			In summer	- allow for a south the	Lar	50 d8µV			M2		
dededitorialization		to one and the second second	and the state of the second of the			-43-88814-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4	Astronomer and Astronom	- And the second second	and the second s	المرور والملكة المليمي	Land
30 dBµV-						30 dBµV-					
20 dBuV						20 dBuV					
0 dBµV				F	2	10 d8µV					F2
dBuV-F1						0 dBuV-F1					



Page 57 / 87



Note.

1. No spurious emission were detected above 3 GHz.

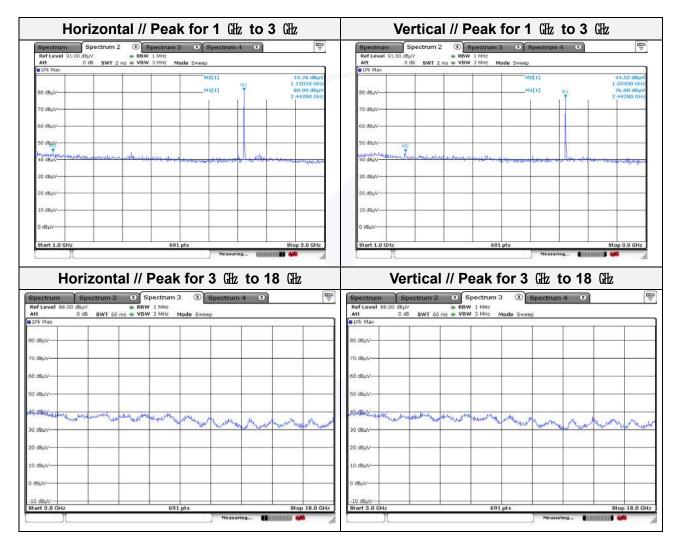
2. Average test would be performed if the peak result were greater than the average limit.



Mode:	LE 1 Mbps_DC 24 V
Distance of measurement:	3 meter
Channel:	20

Spurious

Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 120.10	44.76	Peak	Н	-8.77	-	35.99	74.00	38.01
1 334.30	44.52	Peak	V	-7.30	-	37.22	74.00	36.78



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:	LE 1 Mbps_DC 24 V
Distance of measurement:	3 meter
Channel:	39

- Spurious

Fr	equency (M±)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1	001.45	47.83	Peak	Н	-9.59	-	38.24	74.00	35.76
1	096.06	44.00	Peak	V	-8.93	-	35.07	74.00	38.93

Band edge

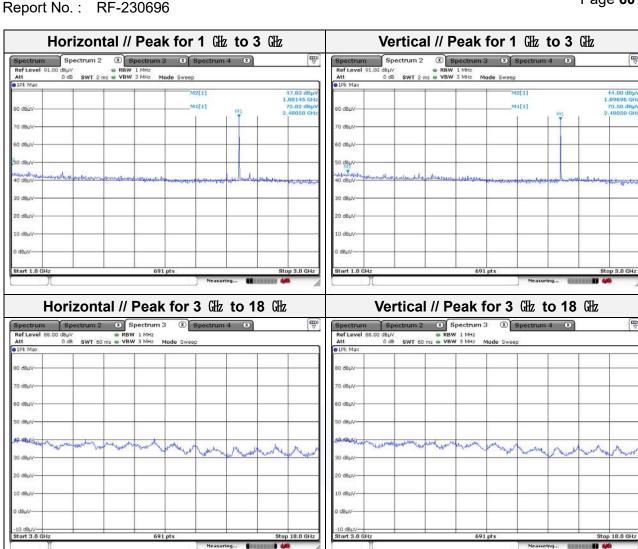
Bulla ca	ge							
Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dB _µ V/m)	Limit (dBµN/m)	Margin (dB)
2 483.50	53.33	Peak	Н	-0.57	-	52.76	74.00	21.24
2 483.50	49.15	Peak	V	-0.57	-	49.25	74.00	24.75

Spectrum	Spectrum 2	Spectrum 3	Spectrum 4		Spectrum	Spectrum	2 X Spectrum	3 🛞 Spectrum	n4 🛛	E ⇒
Ref Level 97.		■ RBW 1 MHz ms ■ VBW 3 MHz M	ode Sween		Ref Level		■ RBW 1 MHz 1 ms ■ VBW 3 MHz	Mode Sween		
1Pk Max			and an entry		1Pk Max			and the part of		
io daµv			M1[1] M2[1]	74,77 dBµV 2,4803390 GHz 53,33 dBµV 2,4835000 GHz	90 d8µV			M2[1]	0.77	49.15 dBµ 4835000 GH 73.06 dBµ 4803390 GH
io deux					80 dBµV					
	VMP .		·		KO deuv					
0 d8µV	and and the state	mandederstationary	المراجع		50 dBµV	The American	in all all and a state over the group of	un hunder	A at a territor	la tronsition
) dBµV					30 dBµV					
1 dBuV	-				20 dBuV	_				_
dBµV			F2		10 d8µV			F	2	_
dBuV-	F1				0 dBuV-	F1				



Page 60 / 87

de E



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.



ēst results (18 础 to 30 础)						
Mode:	LE 1 Mbps_DC 24 V					
Distance of measurement:	3 meter					
Channel:	00 (Worst case)					

	Horizontal Pea	k			Vertica	l Peak		
Spectrum Spectrum 2 Ref Level 01.00 d8μV Att Att 0 d8 SWT 48	Spectrum 3 S	trum 4 🛞 🕎	Spectrum Ref Level 91.		Spectrum 3 RBW 1 MH2 VBW 3 MH2 MH2		• ®]	
e 1Pk Max	ms • VBW 3 MHz Mode sweep		• 1Pk Max	0 08 SW1 48 n	is w vow a minz w	ode sweep		_
80 dBµV			80 dBµV					
60 dBµV			60 dBµV					
40 080V	and have proved and a standard and the same	and the second and a	40 dBuV	arener and and a	and and a second and	windowedday or way and all all	ian man	
20 dBµV			20 dBµV					
0 dBµV-			0 dBuV					
Start 18.0 GHz	691 pts	Stop 30.0 GHz	Start 18.0 GH		691	pts Measurin		op 30.0 GHz

Note.

No spurious emission were detected above 18 $\,{\rm Ghz}$



Mode:	802.11b_DC 24 V
Distance of measurement:	3 meter
Channel:	01

Spurious

Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 152.00	43.94	Peak	V	-8.54	-	35.40	74.00	38.60
1 328.50	45.25	Peak	Н	-7.34	-	37.91	74.00	36.09

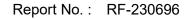
Band edge

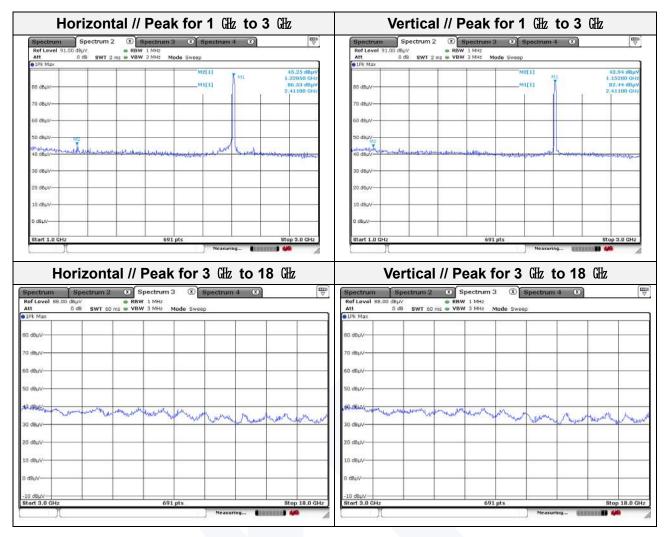
Balla Va	90							
Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµ∛/m)	Margin (dB)
2 382.91	43.05	Peak	V	-0.74	-	42.31	74.00	31.69
2 386.63	47.49	Peak	Н	-0.73	-	46.76	74.00	27.24

Spectrum	Spectrum 2 🕚 Spectr	rum 3 💌 Spectrum 4 🔅	3	Spectrum	Spectrum 2 💌	Spectrum 3 🙁 🔊 S	pectrum 4 🙁	(2
Ref Level 97.	0 dB SWT 1 ms • VBW 3 MH			Ref Level 97		W 1 MHz W 3 MHz Mode Sweep		11.52
1Pk Max	0 00 SWI 1 115 @ 46W 5 111	12 Mode Sweep		Plpk Max	U UB SWI 1 115 W VD	w similar Mode sweep		
Vulab Ok		M2[1] M1[1]	47,49 dBµV 2,386630 GMz 87,35 dBµ4	90 d8µV		M2 M1	See	43.05 dBp 2.382910 GF 82.00 dBp
o daµv			2.41062# GHz	80 dBµV				2.410620 G
) dBµV				70 dBµV-				
I dBµV-				60 dBµV		<u> </u>		
0 dBµV		i adaus	I manner and	50 dBµV			M2	
Notice And	lease worth highly mathematical and the second	wedgement and have		-40 -delastatunda	ment of the surgery were diter	and the state of t		unany
I dBµV				30 dBµV				
dBuV				20 dBuV-				
dBµV-				10 d8µV				
Buy F1			P2	0 dBuV			F	2



Page 63 / 87





Note.

1. No spurious emission were detected above 3 GHz.

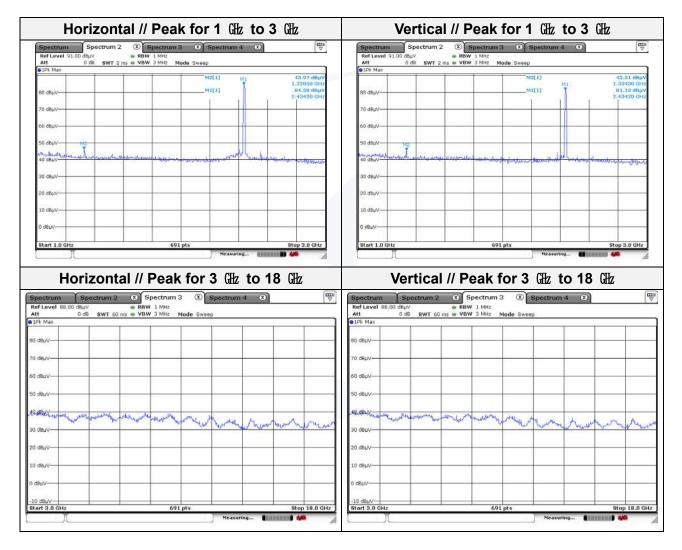
2. Average test would be performed if the peak result were greater than the average limit.



Mode:	802.11b_DC 24 V
Distance of measurement:	3 meter
Channel:	06

Spurious

Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 328.50	45.97	Peak	Н	-7.34	-	38.63	74.00	35.37
1 334.30	45.31	Peak	V	-7.30	-	38.01	74.00	35.99



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:	802.11b_DC 24 V
Distance of measurement:	3 meter
Channel:	11

- Spurious

epaneat								
Frequency (쌘)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 154.85	44.45	Peak	V	-8.52	-	35.93	74.00	38.07
1 331.40	44.36	Peak	Н	-7.32	-	37.04	74.00	36.96

Band edge

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1.0	Balla ea								
	Frequency (Mb)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dB _µ V/m)	Limit (dBµN/m)	Margin (dB)
	2 490.38	42.86	Peak	V	-0.56	-	42.30	74.00	31.70
	2 490.93	42.82	Peak	Н	-0.56	-	42.26	74.00	31.74

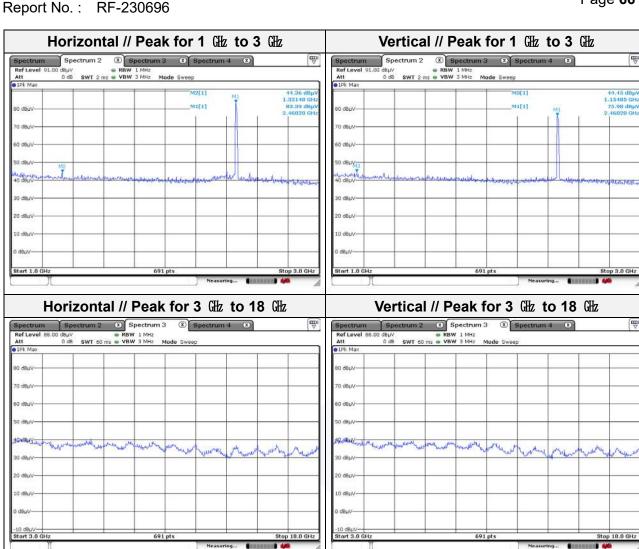
Spectrum	Spectrum 2	Spectrum 3	3 (X) Spectrum 4	3 🖤	Spectrum	Spectrum 2	X Spectrum 3	(X) Spectrum 4 (X)	
Ref Level 97.		👄 RBW 1 MHz			Ref Level 97		RBW 1 MHz	arran and an	
Att 1Pk Max	0 dB SWT 1 m	IS IN VBW 3 MHz N	lode Sweep		Att IPk Max	0 dB SWT 1 n	ns 🖶 VBW 3 MHz Mor	le Sweep	
TTEK Max			M2[1]	42.82 dBµV	The max			M2[1]	42,86 dBu
Vueb or			INAL I	2.4909320 GHz	90 dBuV			THAT'S A	2.4903760 GF
			M1[1]	81.81 dBµV	Po sept			M1[1]	75.10 dBj
D dBoV-			10 T	2.4620350 GHz	80.dBuV				2.4634930 G
a mape	-				The second second				
0 dBuV	<u></u>				70 dBuV				
					NO OBPY	§			
0 dBuV	1		· · · · · · · · · · · · · · · · · · ·	-	60 dBuV	X			
o depv	1				00 00010	1			
ið dBuV	X				50 dBuV	1			
o popre			142		SO DOLA	10		MS	
0 deuv	Jundenland	Herender and advant	mounder sources	warman sider almas	40 d8uV-	manuscher	Manninganu	manuf the man of the same	AL MALES AND SALES
					100000 C				V. II
0 dBuV					30 dBuV				
					se aspr				
0 dBuV					20 dBuV				
0.000									
0 dBuV					10 dBuV				
				F2				F2	
dBuV-		E1		1	0 dBuV-		F1		(
tart 2,462 GH		691		Stop 2.51 GHz	Start 2,462 GH		691 pt		Stop 2.51 GH



Page 66 / 87

E ⇒

691 p



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.



Test results (18 础 to 30 础)					
Mode:	802.11b_DC 24 V				
Distance of measurement:	3 meter				
Channel:	01 (Worst case)				

	н	orizonta	al Peak		Vertical Peak								
Spectrum Spectrum 3 Spectrum 4 Imm Ref Level 01.00 dBµV ● RBW 1 MHz ● RBW 1 MHz ● RBW 1 MHz Att 0 dB SWT 48 ms ● VBW 3 MHz Mode Sweep ●							Spectrum 2	Spectrum BW 1 MHz ms VBW 3 MHz		Spectrum 4	®		
e 1Pk Max	0 00 SW1 40 ms e		e sweep			Att Pk Max	5 UD SW1 40	nis e vov s mitz	Mode swe				
BO dBuV						80 d8µV							
70 dBµV						70 dBµV							
50 dBµV						50 dBµV			_				
40 dBuV	Mour man when the set	mather way w	webber the wordt	and March	maran and	40 dBuV	when when we	a shurner	an mener	man	www	mallon horald	فبريطاحمس
20 dBµV						20 dBµV							
10 dBµV						10 dBµV							
0 dBµV						0 dBµV			_				
Start 18.0 GHz		691 pt	0	Ste	op 30.0 GHz	Start 18.0 GH	z	6	01 pts	-		Stop 3	30.0 GHz
Л			Measur	ing (11011111)	// /					Measurin	KIN		

Note.

No spurious emission were detected above 18 $\,{\rm Ghz}$



Mode:	802.11g_DC 24 V
Distance of measurement:	3 meter
Channel:	01

- Spurious

epaneat								
Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 001.40	48.99	Peak	V	-9.59	-	39.40	74.00	34.60
1 094.10	46.44	Peak	Н	-8.95	-	37.49	74.00	36.51

Band edge

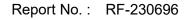
_

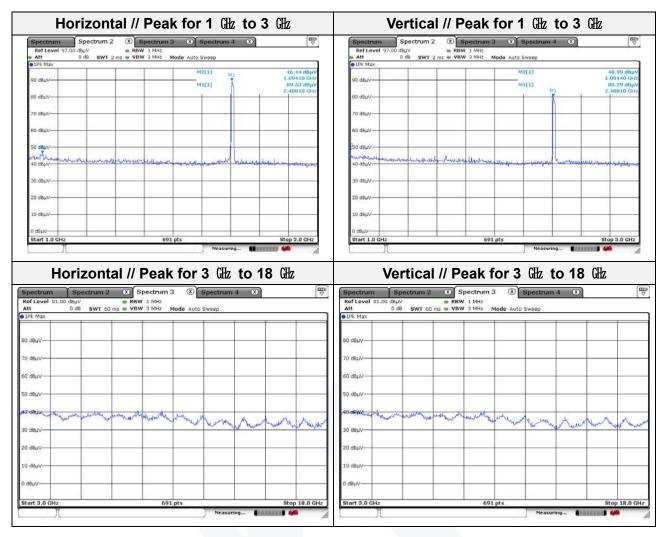
Bulla Va	<u> </u>							
Frequency (Mb)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµN/m)	Margin (dB)
2 365.89	41.46	Peak	V	-0.77	-	40.69	74.00	33.31
2 387.12	43.89	Peak	Н	-0.73	-	43.16	74.00	30.84

Spectrum	Spectrum 2	Spectrum 3	Spectrum 4			Spectrum	Spectrum 2	Spectrum 3	Spectrum	4 🗶		
Ref Level 97.		RBW 1 MHz 2 US VBW 3 MHz (Mode Auto FFT			Ref Level 97.00		RBW 1 MHz S VBW 3 MHz	Mode Auto FFT			
1Pk Max		11707 - T		1411		1Pk Max		We do not a series of the seri				
i0 dahA			M2[1]	2	43.89 dBµV .387120/dHz 87.97.48px	90 d8µV-			M2[1]		2,36	H1.46 dBµ 65890 GH 30.05 dBu
o deµv				2	.408950 GH2	80 d8µV	-	-				07220 6
) d8µV-						70 dBµV-	_					1
deuv						60 d8µV-						1
i dBµV				M2 N	4	50 d8µV			640			-
depunt-of-		myner	manna	mont		10 ABAYANNA	mon	mon	man	www	m	
dBµV						30 d8µV-						
dBuV						20 dBuV						
d8µV-				F2		10 d8µV-	_			Pa	2	
dBuv F1					-	0 dBuV			-			



Page 69 / 87





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.

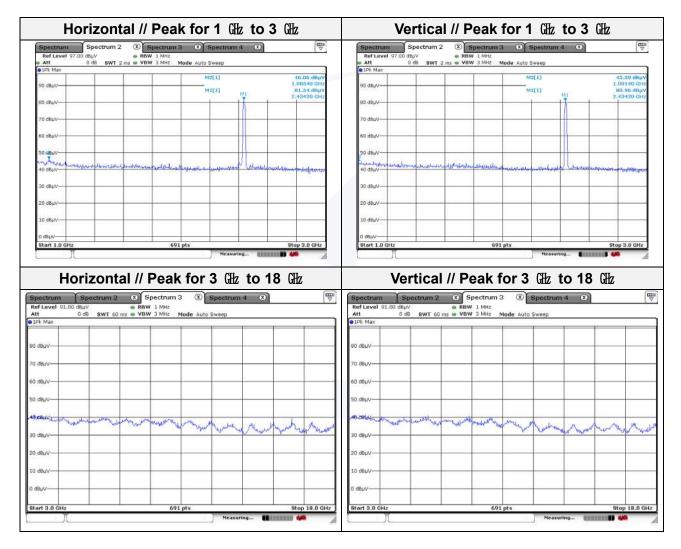


Mode:	802.11g_DC 24 V
Distance of measurement:	3 meter
Channel:	06

Spurious

_

Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 001.40	45.39	Peak	V	-9.59	-	35.80	74.00	38.20
1 085.40	46.06	Peak	Н	-9.01	-	37.05	74.00	36.95



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:	802.11g_DC 24 V
Distance of measurement:	3 meter
Channel:	11

- Spurious

opanoad								
Frequency (Mb)	Level (dB#V)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 001.40	45.25	Peak	V	-9.59	-	35.66	74.00	38.34
1 024.60	45.41	Peak	Н	-9.43	-	35.98	74.00	38.02

Band edge

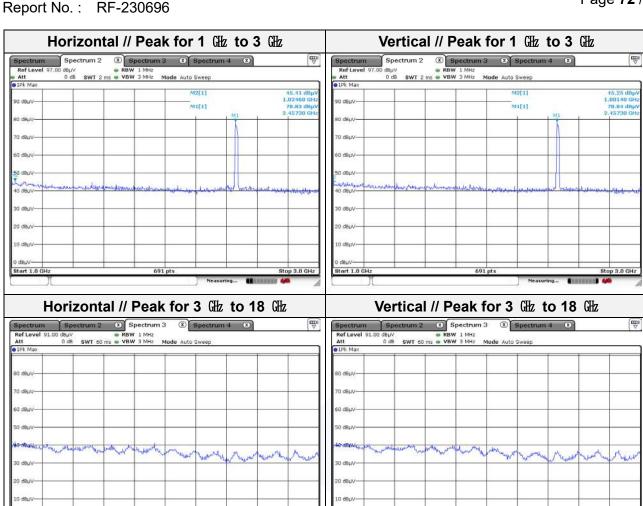
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Bulla Va	3°							
Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dB _µ V/m)	Limit (dBµN/m)	Margin (dB)
2 489.82	43.75	Peak	н	-0.56	-	43.19	74.00	30.81
2 491.07	42.11	Peak	V	-0.56	-	42.22	74.00	31.78

Spectrum	Spectrun	12 (8) 1	Spectrum	13 X	Spectrum	n4 🛛			Spectrum	Spe	ctrum 2	×s	pectrum	3 X)	Spectrum	14 X		100 V
Ref Level 97			BW 1 MHz						Ref Level				W 1 MHz					
Att 1Pk Max	0 dB SW	r 7.5 µs 🖶 VI	BW 3 MHz	Mode Aut	o FFT				Att 1pk Max	0 dB	SWT 7	S µs 🖶 VB	W 3 MHz	Mode AL	to FFT			
				1	12[1]			43.75 dBµV							M2[1]		4	2.11 dBp
PO dBuV					C.S.c.			998210 GHz	90 dBµV						Contraction of the second			10710 GF
					11[1]			75.82 dBµV 531460 GHz							M1[1]			6.96 dBj 37020 Gi
R\$1dBµV	_	-		-	1	1		torioo and	sd/dauv-			-			1	1 1		HOLD GI
In									1 m	~								
0 dBµV-	1		+ +						70 dBµV							+ +		
										1								
3 dBhA	k				-	-	-		60 dBµV	1		-		-	-	1 1		
	N									P	1							
0 dBµV				(M2					50 dBµV		1				100	1 1		
		m		X		1000000-					1	2			12 T			
0 dBpV	~		41010	aprent.		dore	() man		40 d8µV		000			V	42.00	- Val		
2																		
NUBBY				-					30 dBµV					-				
0 dBuV									20 dBuV						_			
									20 0600									
U dBuV									10 d8uV-									
o oop t						F2			to only t							F2		
dBuV-			F1			Ĩ			0 dBuV-		_	-	F1			Ĩ		5
tart 2,462 GH	1.)1 pts			Ctor	2.51 GHz	Start 2,462	011+			60	1 pts		1 1	Oton	2.51 GH



Page 72 / 87



Note.

1. No spurious emission were detected above 3 GHz.

691 pt

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

Stop 18.0 GHz

-

art 3.0 (

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

KES Co., Ltd.

18.0 GHz

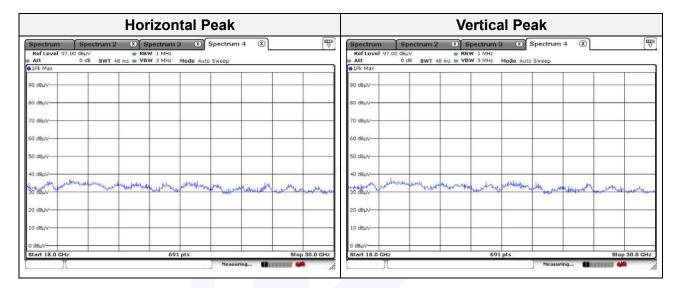
-

691 pf

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).



Test results (18 础 to 30 础)								
Mode:	802.11g_DC 24 V							
Distance of measurement:	3 meter							
Channel:	11 (Worst case)							



Note.

No spurious emission were detected above 18 GHz.



Mode:	802.11n_HT20_DC 24 V
Distance of measurement:	3 meter
Channel:	01

- Spurious

opunout								
Frequency (₩z)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 085.40	44.67	Peak	V	-9.01	-	35.66	74.00	38.34
1 091.20	45.21	Peak	Н	-8.97	-	36.24	74.00	37.76

Band edge

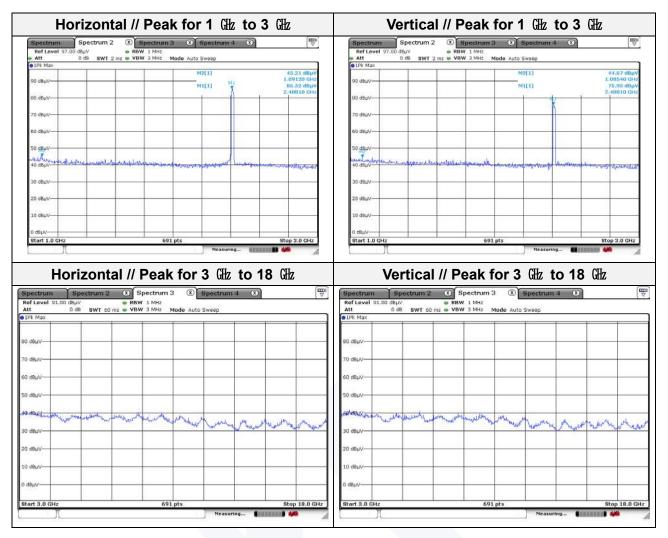
Balla Va	gv							
Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dB _µ V/m)	Limit (dBµN/m)	Margin (dB)
2 380.31	40.88	Peak	V	-0.75	-	40.13	74.00	33.87
2 381.93	42.28	Peak	Н	-0.74	-	41.54	74.00	32.46

9		m 4 💌	(X) Spectrum	Spectrum 3	×s	Spectrum 2	Spectrum			14 X	(X) Spectrum	pectrum 3	2 (8) 5	Spectrum 2	ctrum
			de Auto FFT	BW 1 MHz BW 3 MHz M			Ref Level 97 Att				ode Auto FFT	SWIIMHz SWI3MHz M			fLevel 97.0
			in the second				1Pk Max				analised sectors				Max
40.88 dBj 2.380310 GF 76.55 dBs	2,		M2[1]		-		90 d8µV	2.28 dBµV 81930 GHz 85.86 d B µV	2.3		M2[1]				auv-
2.407540 G	2.	1	-				во авµу	08186 GHL	2.4	1			-	-	sµV
-							70 dBµV							_	ЗиV
							60 dBµV					-	-	-	λην-
_							50 dBµV			100				_	βµV
V	www	Man	mym	m	mon	mont	40.48404000		mos	The	mary man		- month	mon	anin m
			100				30 dBµV							_	auv-
							20 dBµV							_	w.
		1.00		-			10 d8µV							_	suv-
top 2.412 GH	P2			691 pt			0 dBuV	2.412 GHz	P2			601 pt			N F1



Page 75 / 87





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.

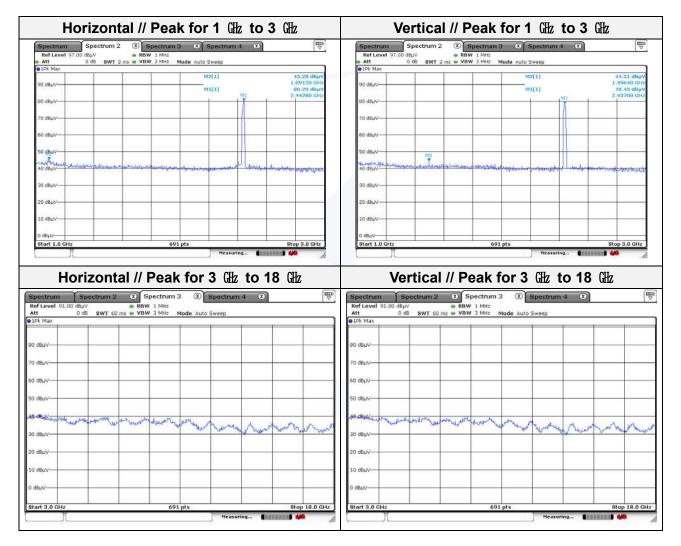
KES-QP16-F01(00-23-01-01)



Mode:	802.11n_HT20_DC 24 V
Distance of measurement:	3 meter
Channel:	06

Spurious

Frequency (Mbz)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 091.20	45.20	Peak	Н	-8.97	-	36.23	74.00	37.77
1 496.40	44.31	Peak	V	-6.23	-	38.08	74.00	35.92



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.



Page 77 / 87

Mode:	802.11n_HT20_DC 24 V	
Distance of measurement:	3 meter	-
Channel:	11	_

- Spurious

Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 088.30	46.23	Peak	Н	-8.99	-	37.24	74.00	36.76
1 542.70	44.23	Peak	V	-5.79	-	38.44	74.00	35.56

Band edge

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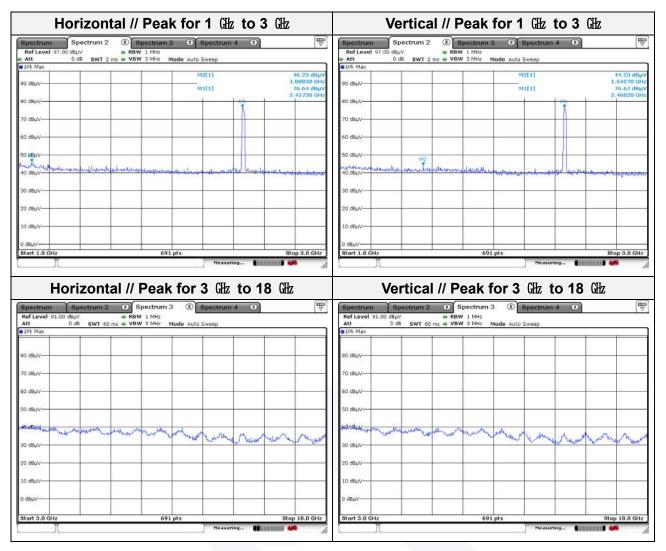
Balla Va	9~							
Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dB _µ V/m)	Limit (dBµN/m)	Margin (dB)
2 489.33	42.87	Peak	Н	-0.56	-	42.31	74.00	31.69
2 493.29	42.16	Peak	V	-0.56	-	41.60	74.00	32.40

Spectrum	Spectrum 2	X Spe	ectrum 3	× *	Spectrum	4 X			Spectrum	Spe	ctrum 2	× SI	ectrum	3 X)	Spectrum	4 X		1
Ref Level 97		S US S VBW		Mode Juite	FFT.				Ref Level				1 MHz	Mode	to FFT			1
PIPk Max	0 00 3WI 1.	o µo • • • •	J INI LL	HOUS MOLO	rr I				Pk Max	0 00	own ra	5 p5 6 101	. J mitt	MODE AS	to FF1			
90 d8µV-					2[1] 1[1]		2.48	42.87 dBµV 993340 GHz 75.64 dBµV	90 d8µV-						M1[1] M2[1]		2.463	6.53 dBµ 34930 GH 2.10 dBµ
BD dRHV	-			-			2.40	-46050 GHz	801dBµV	-	-				1	1	2.493	32940 GH
0 dBµV-	7								70 dBµV−	7			-	-				
dBµV			-						60 d8µV				-					
I dBµV			-	M2					50 dBµV	_			-		M2			
I d8µV	- You			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		-v-		2	40 d8µV	-	Lo	~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	ma	- A			
dBµV			-						30 dBµV						-			
dBuV			-						20 dBuV	-								
d8µV						F2			10 d8µV	-				-		F2		
dBuV-	-	-	F1	_	4	- 1	1	-	0 dBµV-	-	_		F1	-	-			



Page 78 / 87



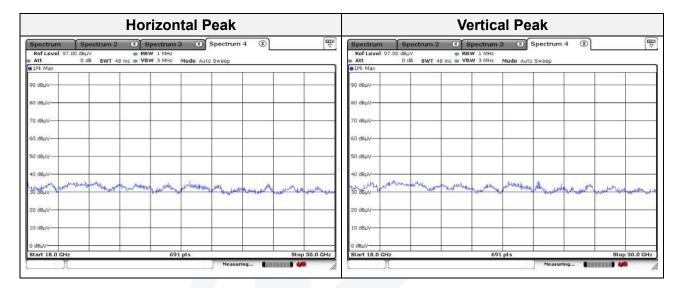


Note.

- 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.



Test results (18 🕮 to 30 🕅	z)
Mode:	802.11n_HT20_DC 24 V
Distance of measurement:	3 meter
Channel:	06 (Worst case)



Note.

No spurious emission were detected above 18 GHz.



Mode:	802.11n_HT40_DC 24 V
Distance of measurement:	3 meter
Channel:	03

- Spurious

epanoae								
Frequency (ᢂ᠋ᢧ)			Ant. Pol. (H/V)	CF DCF (dB) (dB)		Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 018.80	44.49	Peak	V	-9.47	-	35.02	74.00	38.98
1 088.30	44.50	Peak	Н	-8.99	-	35.51	74.00	38.49

Band edge

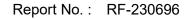
_

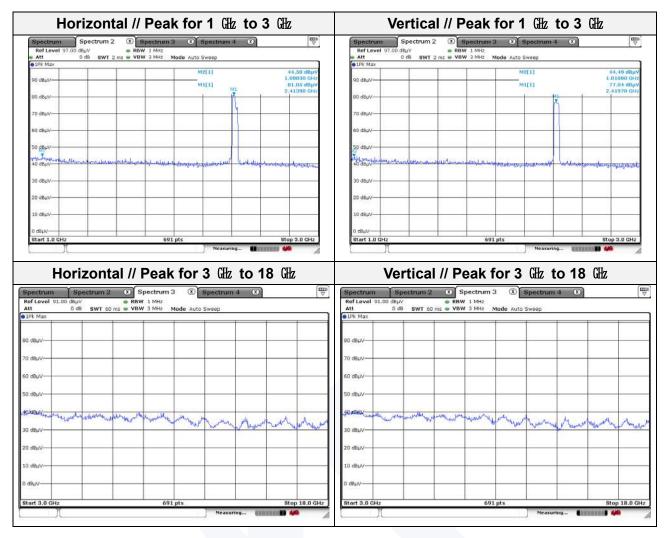
Bulla Va	<u> </u>							
Frequency (Mb)	Level Detect (dBµN) mode				CF DCF (dB) (dB)		Limit (dBµN/m)	Margin (dB)
2 326.22	41.55	Peak	V	-0.85	-	40.70	74.00	33.30
2 388.72	42.66	Peak	Н	-0.73	-	41.93	74.00	32.07

_			Horizon		Uui	_				ed b			litioui		oun	
Spectrum	Spectrum 2	Spectrum 3	Spectrum	14 🗷			Spectrur	n S	pectrum 2	× Sp	ectrum 3	× 5	pectrum -	1 (X)		
Ref Level 97.		RBW 1 MHz					Ref Leve	1 97.00 dB			W 1 MHz					
Att 1Pk Max	U UB SWI 1/	1 µs 🖷 VBW 3 MHz	Mode Auto FFT				Pk Max	0	dB SWT 1	/.1 µs 🖷 ¥B	W 3 MHZ	MODE AUT	0 FF 1			
			M2[1]			42.66 dBµV					-	MS	2[1]			41.55 dBp
Vullab 04			MILI			188720 GHz 81.21 dBuV	90 dBµV-					M	1[1]			326220 GH 77.54 dBu
						09380 GHz	2002000									419260 GH
Vµ8b Cl					600	Y	80 dBµV								~	X
10 dBuV							70 dBuV									
i0 dBµV					1		60 dBµV-	-	-				-	-		
50 dBµV-				Ma	1		50 dBµV-							-		
10 gener	-	mon	DOMAN AMAN	1×mm	~		40 (19)0 (-	X				-	in	nn	-
Barrow Www	www.	manan	1-0-0-0				Decements	n	Anon		m	Court	Assessed and	2-	-	
30 dBµV	_						30 dBµV-									
0 dBuV							20 dBuV		1							-
0 dBuV							10 dBuV							_		
				F2			and suppress							F2		
dBuV-F1		_					0 dBuV		-				-	-	-	-
start 2.3 GHz		691	pts		Stop	2.422 GHz	Start 2.3 (Hz	1		691	pts			Stop	2.422 GHz



Page 81 / 87





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.

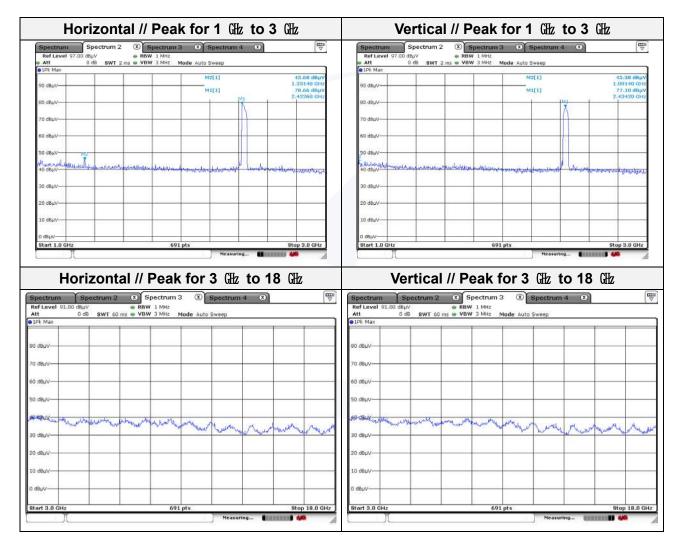
KES-QP16-F01(00-23-01-01)



Mode:	802.11n_HT40_DC 24 V
Distance of measurement:	3 meter
Channel:	06

Spurious

• p an a									
Frequenc (毗)			Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)	
1 001.40	45.38	Peak	V	-9.59	-	35.79	74.00	38.21	
1 331.40	45.68	Peak	Н	-7.32	-	38.36	74.00	35.64	



Note.

- 1. No spurious emission were detected above 3 $\, \mathrm{Ghz}$.
- 2. Average test would be performed if the peak result were greater than the average limit.



Mode:	802.11n_HT40_DC 24 V	
Distance of measurement:	3 meter	-
Channel:	9	-

- Spurious

Frequency (Mb)			Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1 163.50	44.93	Peak	V	-8.46	-	36.47	74.00	37.53
1 334.30	45.58	Peak	Н	-7.30	-	38.28	74.00	35.72

Band edge

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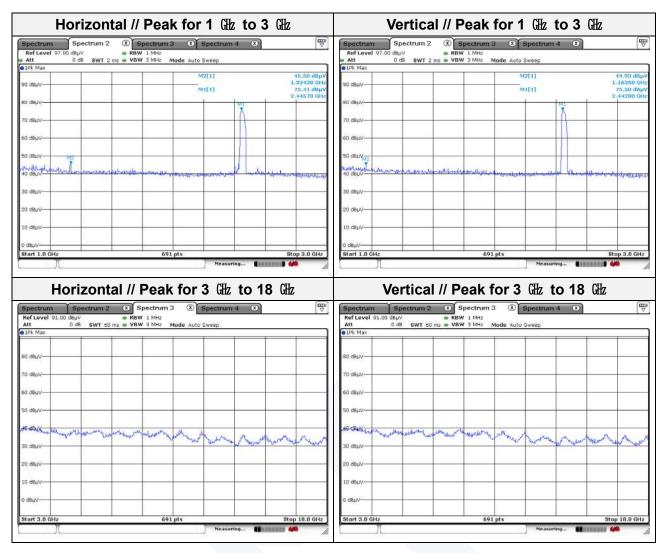
1.0	Balla ea									
	Frequency (Mb)	LevelDetect(dBµN)mode		Ant. Pol. (H/V)	CF DCF (dB) (dB)		Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)	
	2 490.82	40.95	Peak	Н	-0.56	-	40.39	74.00	33.61	
	2 496.78	42.67	Peak	V	-0.55	-	42.12	74.00	31.88	

Spectrum	Spectrum 2	× Sp	ectrum 3	x	Spectrum	4 🛞			Spectrum	Spec	trum 2 🛛 💌	Spectrum	3 X	Spectrum	14 ×		("
Ref Level 97 Att	0 dB SWT 9.5	RBW		Mode Au	IN FET				Ref Level S		SWT 9.5 US	RBW 1 MHz	Mode 4	uto FET			
1Pk Max	0 00 3 41 5.5	ps - 101	- Strinter 1	HOUE AU	O FF I				9 1Pk Max	0 00	341 3.5 ps 8	- Criteria	Mode A				
io daµv					M2[1] M1[1]			40.95 dBµV 4908210 GHz 74.20 dBµV 4541400 GHz	90 d8µV					M2[1]		2.496	2.67 dBp 57800 GF 4.29 dBp 40560 GF
M1							2.0	1011100 012				1				2.454	0300 0
0 dBµV	Jen J	6							-⊅0 d8µV	1	~						
0 d8µV									50 d8µV								
) d8µV		1	~~~~	~~~~~	M2	-	~~~~		40 d8µV		1	-		-A-	M2		
dBµV				_					30 d8µV			_					
0 dBuV				_			-		20 d8µV			-					
0 d8µV						-	F2		10 d8µV					-		F2	
dBuV-				F1	-	-			0 dBuV-	-		-	F1	-	-	+	-



Page 84 / 87





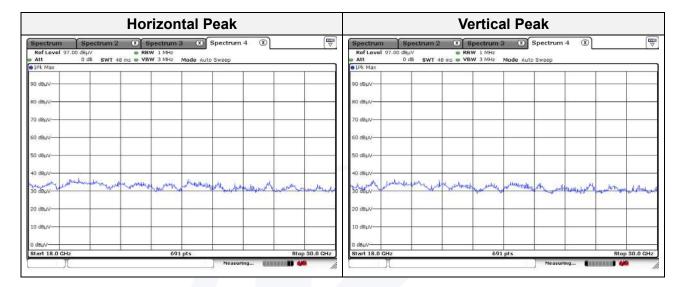
Note.

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.



Test results (18 GHz to 30 GHz	z)
Mode:	802.11n_HT40_DC 24 V
Distance of measurement:	3 meter
Channel:	06 (Worst case)



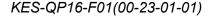
Note.

No spurious emission were detected above 18 GHz.



3.3. 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.





Equipment	Manufacturer	Model	Serial No.	Calibration interval	Calibration due.
SPECTRUM ANALYZER	R&S	FSV3044	101272	1 year	2024.03.16
SPECTRUM ANALYZER	R&S	FSV40	101725	1 year	2024.06.15
SIGNAL GENERATOR	KEYSIGHT	N5182B	MY59100115	1 year	2024.04.19
SIGNAL GENERATOR	Anritsu	68369B	002118	1 year	2024.05.12
Power Meter	Anritsu	ML2495A	2010001	1 year	2024.04.19
Pulse Power Sensor	Anritsu	MA2411B	1911111	1 year	2024.04.18
ATTENUATOR	Mini-Circuits	BW-S10-2W263+	1	1 year	2024.01.13
		511 616 211200	•	i your	2025.01.15
BAND REJECT FILTER	MICRO-TRONICS	BRM50702	G272	1 year	2024.01.12 2025.01.12
EMI TEST RECEIVER	R&S	ESU26	100517	1 year	2024.07.31
LOOP ANTENNA	Schwarzbeck	FMZB1513	1513-257	2 years	2024.11.16
BILOG ANTENNA	Schwarzbeck	VULB 9163	714	2 years	2024.04.19
DC POWER SUPPLY	SORENSEN	DCS40-75E	1408A02745	1 year	2024.01.12 2025.01.12
Attenuator	HUBER+SHHNER	6806.17.A	NONE	1 year	2024.03.21
Horn Antenna	A.H.	SAS-571	414	1 year	2024.01.16 2025.01.16
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA 9170550	1 year	2024.01.16 2025.01.16
Amplifier	SONOMA INSTRUMENT	310N	186549	1 year	2024.03.21
PREAMPLIFIER	HP	8449B	3008A00538	1 year	2024.05.31
BROADBAND AMPLIFIER	SCHWARZBECK	BBV9721	PS9721-003	1 year	2024.01.16 2025.01.15

Appendix A. Measurement equipment

* 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.,	LGS53	306QCZP560949

The end of test report

The authenticity of this test report can be found on the verification page of our website (www.kes.co.kr).