

Report No.: KES-RF-20T0112 Page (1) of (55)

TEST REPORT

Part 15 Subpart C 15.247 & RSS-247 (Issue 2)

Equipment under test CAR DASH CAM

Model name DVR-C310R

FCC ID 2ADTG-DVRC310R

IC 12594A-DVRC310R

Applicant THINKWARE CORPORATION

Manufacturer THINKWARE CORPORATION

Date of test(s) 2020.06.29 ~ 2020.07.03

Date of issue 2020.07.07

Issued to THINKWARE CORPORATION

A, 9FL, Samwhan Hipex, 240, Pangyoyeok-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, South Korea Tel: +82-10-2320-7248

Issued by

KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si,

Gyeonggi-do, 14057, Korea

473-21, Gayeo-ro, Yeoju-si, Gyeonggi-do, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450

Test and report completed by :	Report approval by :
22	lee
Jang-yeon, Hwang Test engineer	Young-Jin, Lee Technical manager

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



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-RF-20T0112 Page (2) of (55)

Revision history

Revision	Date of issue	Test report No.	Description
-	2020.07.07	KES-RF-20T0112	Initial



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-RF-20T0112 Page (3) of (55)

TABLE OF CONTENTS

1.	General in	ıformation	4
	1.1.	EUT description	4
	1.2.	Test configuration	4
	1.3.	Device modifications	
	1.4.	Accessory information	4
	1.5.	Measurement results explanation example	
	1.6.	Measurement Uncertainty	5
	1.7.	Frequency/channel operations	5
	1.8.	Worst case data rate	5
2.	Summary	of tests	6
3.	Test result	ts	
	3.1.	99% Occupied Bandwidth	7
	3.2.	6 dB bandwidth	. 10
	3.3.	Output power	. 14
	3.4.	Power spectral density	
	3.5.	Radiated restricted band and emissions	
	3.6	Conducted spurious emissions & band edge	. 49
App	endix A.	Measurement equipment	
App	endix B.	Test setup photos	. 55



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-RF-20T0112 Page (4) of (55)

1. General information

THINKWARE CORPORATION			
A, 9FL, Samwhan Hipex, 240, Pangyoyeok-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, South Korea			
KES Co., Ltd.			
3701, 40, Simin-daero 365beor	n-gil, Dongan-gu, Anyang-si,		
Gyeonggi-do, 14057, Korea			
473-21, Gayeo-ro, Yeoju-si, Gy	veonggi-do, Korea		
FCC Accreditation Designation	No.: KR0100, Registration No.:	444148	
ISED Registration No.: 23298			
15.247 / RSS-247			
2ADTG-DVRC310R			
12594A-DVRC310R			
Production	Pre-production	Engineering	
	A, 9FL, Samwhan Hipex, 240, Gyeonggi-do, South Korea KES Co., Ltd. 3701, 40, Simin-daero 365beor Gyeonggi-do, 14057, Korea 473-21, Gayeo-ro, Yeoju-si, Gy FCC Accreditation Designation ISED Registration No.: 23298 15.247 / RSS-247 2ADTG-DVRC310R 12594A-DVRC310R	A, 9FL, Samwhan Hipex, 240, Pangyoyeok-ro, Bundang-gu, Se Gyeonggi-do, South Korea KES Co., Ltd. 3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea 473-21, Gayeo-ro, Yeoju-si, Gyeonggi-do, Korea FCC Accreditation Designation No.: KR0100, Registration No.: ISED Registration No.: 23298 15.247 / RSS-247 2ADTG-DVRC310R 12594A-DVRC310R	

1.1. EUT description

Equipment under test	THINKWARE DASH CAM
Frequency range	$2 412$ MHz $\sim 2 462$ MHz $(11b/g/n_HT20)$
	2 422 MHz ~ 2 452 MHz (11n_HT40)
Model:	DVR-C310R
Modulation technique	DSSS, OFDM
Number of channels	2412 MHz ~ 2462 MHz $(11b/g/n_HT20): 11ch$
	2 422 MHz ~ 2 452 MHz $(11n_HT40)$: 9 ch
Antenna specification	Antenna type(2.46Hz WIFI) : Chip antenna, Peak gain : 1.99 dBi
Power source	DC 12 V
H/W version	BASIC_PP_V3.0
S/W version	V0.13

1.2. Test configuration

The <u>THINKWARE CORPORATION // DVR-C310S // FCC ID: 2ADTG-DVRC310R // IC : 12594A-DVRC310R</u> 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 2 and RSS-Gen Issue 5 KDB 558074 D01 v05 r02 ANSI C63.10-2013

1.3. Device modifications

N/A

1.4. Accessory information

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



1.5. Measurement results explanation example

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).= 1.40 + 10.00 = 11.40 (dB)

1.6. Measurement Uncertainty

Test Item		Uncertainty
Uncertainty for Conduction emission test		2.46 dB
Uncertainty for Radiation emission test	Below 1 GHz	4.40 dB
(include Fundamental emission)	Above 1GHz	5.94 dB
Note. This uncertainty represents an expanded uncertainty expressed at approximately the 95%		

confidence level using a coverage factor of k=2.

1.7. Frequency/channel operations

Ch.	Frequency (Mtz)	Mode
01	2 412	802.11b/g/n_HT20
		· · ·
06	2 437	802.11b/g/n_HT20
·		· .
11	2 462	802.11b/g/n_HT20

Ch.	Frequency (Mtz)	Mode
03	2 422	802.11n_HT40
		· · ·
06	2 437	802.11n_HT40
09	2 452	802.11n_HT40

1.8. Worst case data rate

- 1. Radiated emission was performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.
- 2. Worst-case data rates were:
- 802.11b: <u>1 Mbps</u>
- 802.11g: <u>6 Mbps</u>
- 802.11n_HT20: MCS0
- 802.11n_HT40: <u>MCS0</u>

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



Report No.: KES-RF-20T0112 Page (6) of (55)

2. Summary of tests

Section in FCC Part 15	Section in RSS-247 & Gen	Parameter	Test results
-	RSS-Gen 6.6	26 dB bandwidth & 99 % bandwidth	Pass
15.247(a)(2)	RSS-247 5.2 (a) RSS-247 6.2.4	6 dB bandwidth	Pass
15.247(b)(3)	RSS-247 5.4 (d) RSS-247 6.2.4.1	Output power	Pass
15.247(e)	RSS-247 5.2 (b) RSS-247 6.2.4.1	Power spectral density	Pass
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	Pass
15.207(a)	RSS-Gen 8.8	AC conducted emissions Pa	



3. Test results 3.1. 99% Occupied Bandwidth Test procedure ANSI C63.10-2013

Test setup

	Attenuator	Secondaria analyzan
EUI	Attenuator	Spectrum analyzer

Limit

None; for reporting purpose only.

Test results

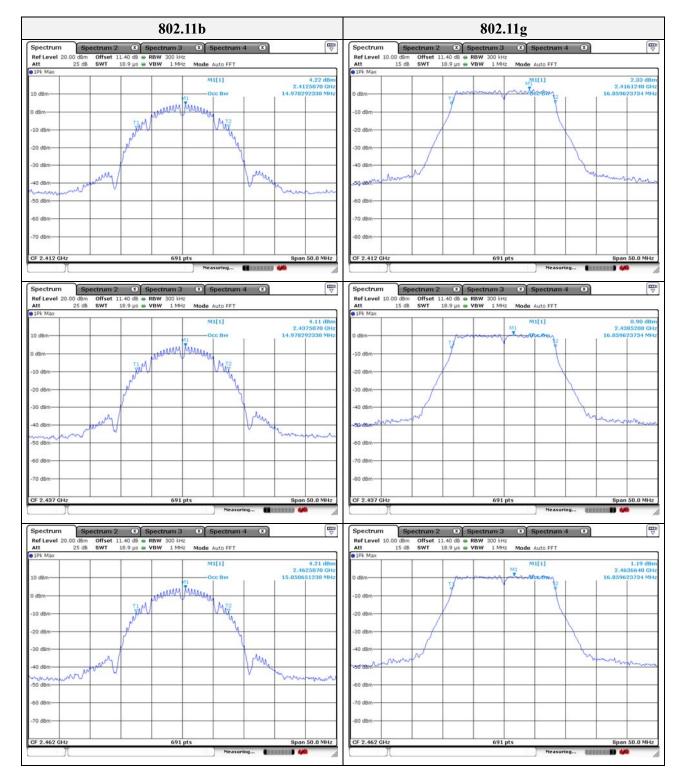
	99 % bandwidth of 20 Mz bandwidth			
	Measured 99 % bandwidth(\#z)			Limit(Mz)
Frequency(Mtz)	802.11b	802.11g	802.11n	LIIIII(MK)
2412	14.98	16.86	17.87	
2437	14.98	16.86	17.87	-
2462	15.05	16.86	17.87	

99 % bandwidth of 40 Mz bandwidth			
Measured 99 % bandwidth(Mz)			
Frequency(Mz)	Frequency(MHz) 802.11n Limit(MHz)		
2422	35.89		
2437	35.89	-	
2452	36.00		



Report No.: KES-RF-20T0112 Page (8) of (55)

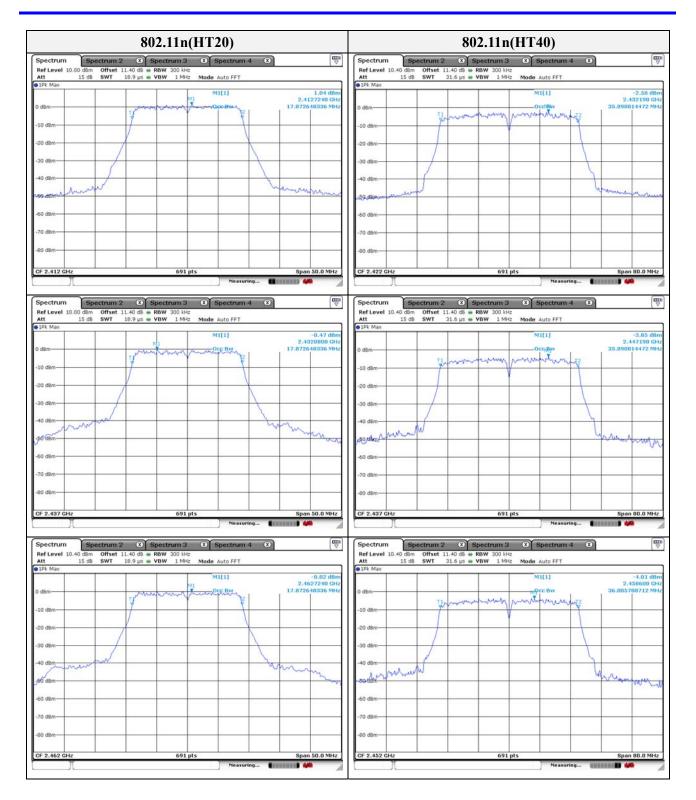
Test plots



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



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-RF-20T0112 Page (9) of (55)



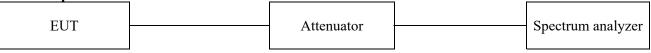


Report No.: KES-RF-20T0112 Page (10) of (55)

3.2. 6 dB bandwidth

Test procedure ANSI C63.10 – section 11.8

Test setup



ANSI C63.10-2013 - Section 11.8.1

- 1. RBW = 100 kHz.
- 2. VBW 3 \times RBW.
- 3. Detector = peak.
- 4. Trace mode = max hold.
- 5. Sweep = auto couple.
- 6. Allow the trace to stabilize
- 7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

ANSI C63.10-2013 - Section 11.8.2

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described in 11.8.1 (i.e., RBW = 100 kHz, VBW \geq 3 × RBW, and peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be \geq 6 dB.

Limit

According to \$15.247(a)(2), systems using digital modulation techniques may operate $902 \sim 928$ MHz, $2400 \sim 2483.5$ MHz, and $5725 \sim 5850$ MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

According to RSS-247 5.2 (a), the minimum 6 dB bandwidth shall be 500 kHz.



Report No.: KES-RF-20T0112 Page (11) of (55)

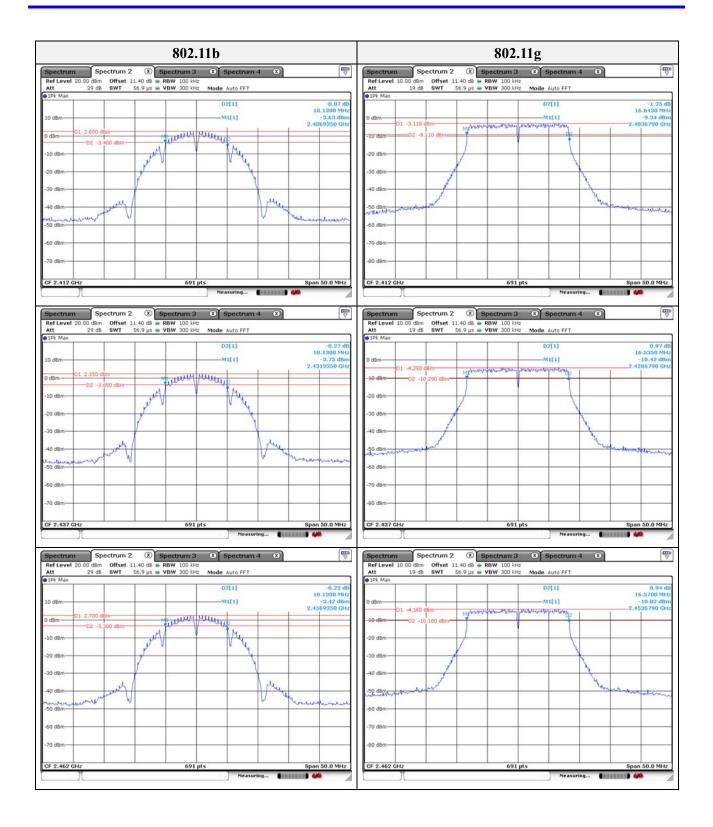
Test results

6 dB bandwidth of 20 MHz bandwidth								
	Measured 6 dB bandwidth(Mz)							
Frequency(MHz)	Limit(Mz)							
2412	10.13	16.64	17.80					
2437	10.13	16.54	17.84	0.5				
2462	10.13	16.57	17.80					

6 dB bandwidth of 40 MHz bandwidth					
Measured 6 dB bandwidth(Mz)					
Frequency(M/z) 802.11n Limit(M/z)					
2422	36.58				
2437	36.51	0.5			
2452	36.56				

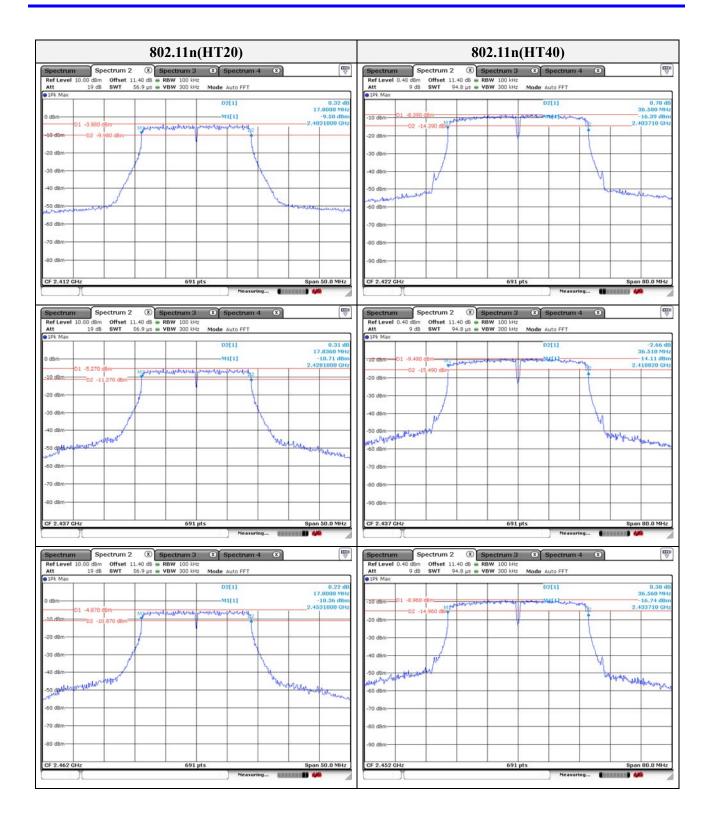


3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-RF-20T0112 Page (12) of (55)





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-RF-20T0112 Page (13) of (55)





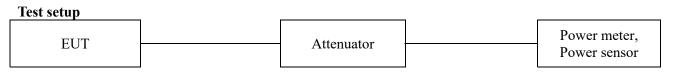
Tel: +82-31-425-6200 / Fax: +82-31-424-0450

www.kes.co.kr

3.3. Output power

Test procedure

ANSI C63.10 – section 11.9.1.1 or section 11.9.1.3 and 11.9.2.3.2



ANSI C63.10 - Section 11.9.1.1

This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth.

- 1. Set the RBW DTS bandwidth.
- 2. Set VBW $3 \times RBW$.
- 3. Set span $3 \times RBW$
- 4. Sweep time = auto couple
- 5. Detector = peak
- 6. Trace mode = max hold
- 7. Allow trace to fully stabilize
- 8. Use peak marker function to determine the peak amplitude level

ANSI C63.10 - 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 ba ndwidth and shall utilize a fast-responding diode detector.

ANSI C63.10 - 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. Since this 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 MHz, 2 400~2 483.5 MHz, and 5 725~5 850 MHz 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.

According to \$15.247(b)(4), The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmit-ting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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



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 1W. 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 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 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.



Report No.: KES-RF-20T0112 Page (16) of (55)

Test results

Measured output power (dBm)						
Mada	2412 Młz		2437 Mtz		2462 MHz	
Mode	Peak	Average	Peak	Average	Peak	Average
11b	15.64	13.34	15.21	12.87	15.58	13.30
11g	20.86	10.89	20.23	10.60	20.55	10.86
11n_HT 20	19.77	10.48	18.99	10.15	18.94	10.18
Mada	2422	2 MHz	243'	7 MHz	245	2 MHz
Mode	Peak	Average	Peak	Average	Peak	Average
11n_HT 40	18.15	9.48	17.73	9.04	17.40	8.98



Report No.: KES-RF-20T0112 Page (17) of (55)

3.4. Power spectral density

Test procedure

ANSI C63.10 - section 11.10.2

Test setup

EUT	Attenuator	Spectrum analyzer
-----	------------	-------------------

ANSI C63.10 – section 11.10.2

- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. Set the span to 1.5 times the DTS channel bandwidth.
- 3. Set the RBW : 3 kHz RBW 100 kHz
- 4. Set the VBW \geq 3 × RBW.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.
- 9. Use the peak marker function to determine the maximum amplitude level within the RBW.
- 10. If measured value exceeds limit, reduce RBW(no less than 3 kHz) and repeat.

Limit

According to §15.247(e), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

According to RSS-247 5.2 (b), The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of Section 5.4(d), (i.e. the power spectral density shall be determined using the same method as is used to determine the conducted output power).



Report No.: KES-RF-20T0112 Page (18) of (55)

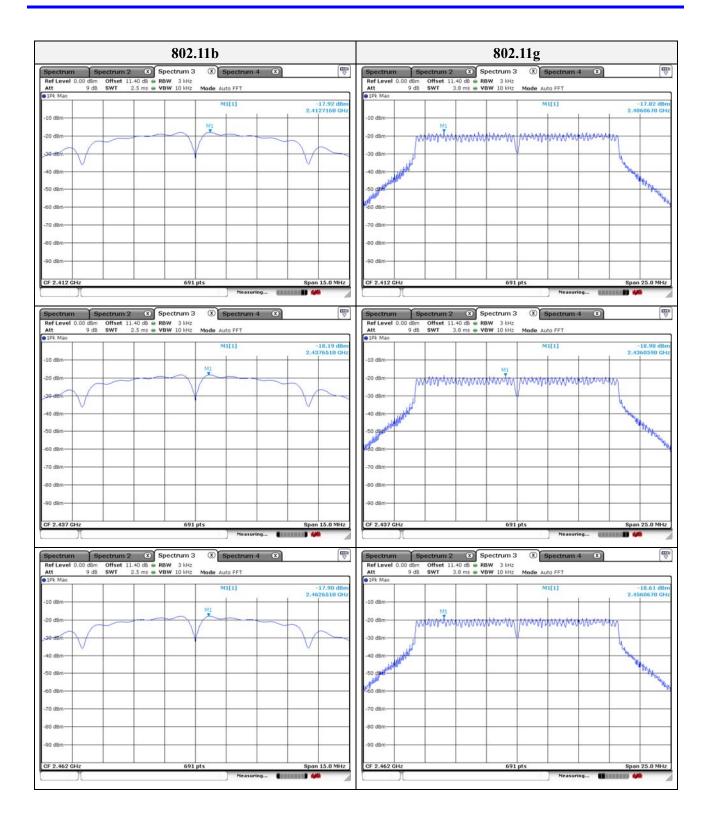
Test results

PSD of 20 Mz bandwidth						
	Limit(dBm/3kHz)					
Frequency(Mz)						
2412	-17.92	-17.82	-18.21			
2437	-18.19	-18.98	-19.18	8		
2462	-17.90	-18.61	-18.79			

PSD of 40 Mz bandwidth							
Μ	Measured PDS(dBm/3kHz)						
Frequency(Mz)	Frequency(Mz) 802.11n Limit(dBm)						
2422	-19.43						
2437	-20.33	8					
2452	-20.10						

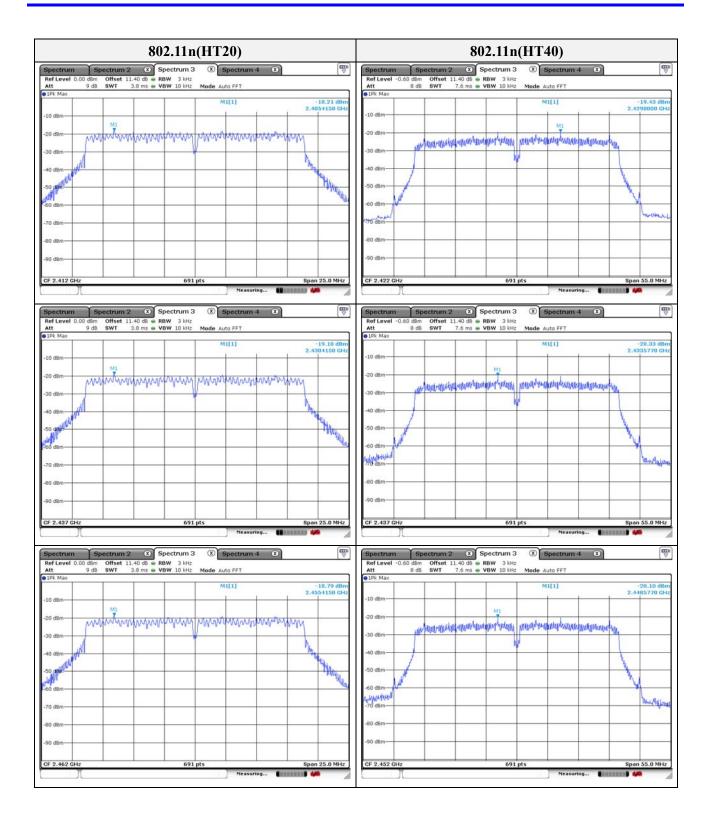


3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-RF-20T0112 Page (19) of (55)





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-RF-20T0112 Page (20) of (55)

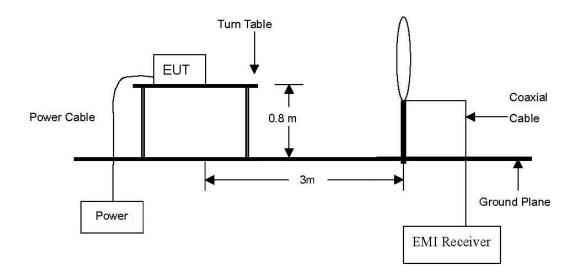




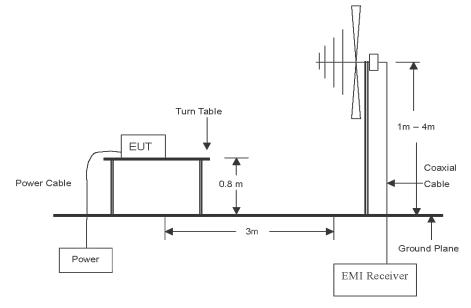
3.5. Radiated restricted band and emissions

Test setup

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

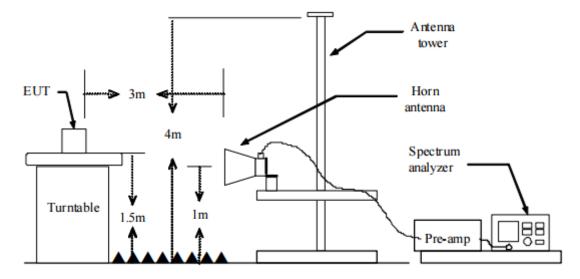


The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz emissions.





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



Test procedure below 30 MHz

- 1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- 2. Then antenna is a loop antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement.
- 3. We have done x, y, z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in detecting antenna.
- 4. 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.
- 5. The test-receiver system was set to average or quasi peak detect function and Specified Bandwidth with Maximum hold mode.

Test procedure above 30 MHz

1. Spectrum analyzer settings for f < 1 GHz:

Span = wide enough to fully capture the emission being measured

RBW = 100 kHz VBW RBW Detector = quasi peak Sweep time = auto Trace = max hold

2. Spectrum analyzer settings for f = 1 GHz: Peak

Analyzer center frequency was set to the frequency of the radiated spurious emission of interest RBW = 1 MHz

VBW 3 MHz Detector = peak Sweep time = auto Trace = max hold Trace was allowed to stabilize

> 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



Report No.: KES-RF-20T0112 Page (23) of (55)

3. Spectrum analyzer settings for f = 1 GHz: Average

Analyzer center frequency was set to the frequency of the radiated spurious emission of interest RBW = 1 MHz

 $VBW \ge 3 \times RBW$

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.

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.

Sweep = auto

Trace = max hold

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 $(1 1) \log(1/x)$, where x is the duty cycle.
- 2) If linear voltage averaging mode was used in step $x = 10^{-1}$, then the applicable correction factor is $20 \log(1/x)$, where x is the duty cycle.
- 3) If a specific emission is demonstrated to be continuous (98 percent duty cycle) rather than turning on and off with the transmit cycle, then no duty cycle correction is required for that emission.

Note.

- 1. The loop antenna was investigated with three polarizations, and horizontal and vertical polarizations were reported as the worst case.
- 2. f < 30 MHz, extrapolation factor of 40 dB/decade of distance. $F_d = 40\log(D_m/Ds)$

 $f \ge 30$ MHz, 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
- 3. $CF(Correction factors(dB)) = Antenna factor(dB/m) + Cable loss(dB) + or Amp. gain(dB) + or F_d(dB)$
- 4. Field strength($dB\mu V/m$) = Level($dB\mu V$) + CF (dB) + or DCF(dB)
- 5. Margin(dB) = Limit(dB μ V/m) Field strength(dB μ V/m)
- 6. Emissions below 18 GHz were measured at a 3 meter test distance while emissions above 18 GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 5. 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 9kHz to 30MHz. Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open field test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

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.



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 (Mz)	Distance (Meters)	Radiated (µV/m)
0.009 ~ 0.490	300	2400/F(kHz)
0.490 ~ 1.705	30	24000/F(kHz)
$1.705 \sim 30.0$	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 $54 \sim 72$ MHz, $76 \sim 88$ MHz, $174 \sim 216$ MHz or $470 \sim 806$ MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

According to 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 (Mz)	Distance (Meters)	Radiated (μV/m)
$0.009 \sim 0.490$	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

* Unless otherwise specified, for all frequencies greater than 1 GHz, the radiated emission limits for licenceexempt 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.

Test mode	Ton time (s)	Period (s)	Duty cycle (Linear)	Duty cycle (%)	Duty cycle correction factor (dB)
802.11b	10	10	1.00	100	0
802.11g	10	10	1.00	100	0
802.11n(HT20)	10	10	1.00	100	0
802.11n(HT40)	10	10	1.00	100	0

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

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

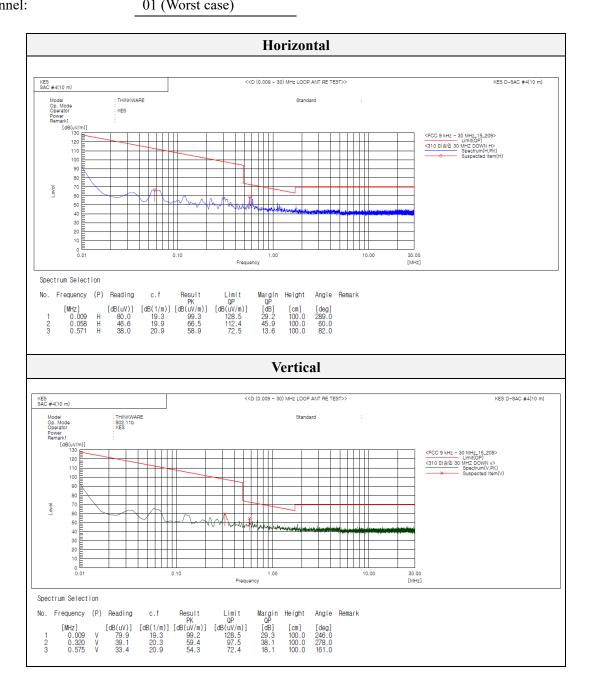


This report shall not be reproduced except in full, without the written approval of KES Co., Ltd. The results shown in this test report refer only to the sample(s) tested unless otherwise stated. The authenticity of the test report, contact shchoi@kes.co.kr



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-RF-20T0112 Page (26) of (55)

Test results (Below 30 M	Ь)
Mode:	802.11b
Distance of measurement:	3 meter
Channel:	01 (Worst case)



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



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-RF-20T0112 Page (27) of (55)

Test results (Below 1 000	MH Z)
Mode:	802.11b
Distance of measurement:	3 meter
Channel:	01 (Worst case)

				Horizonta	// Vertical				
KES SAC #4(10 m)				< <d (30="" -="" 00<="" 1="" th=""><th>00) MHz RE TEST>></th><th></th><th></th><th></th><th>KES D-SAC #4(10 m)</th></d>	00) MHz RE TEST>>				KES D-SAC #4(10 m)
Model Op. Mode Operator Power Remark1 [dB(uV/m)]	: THINKWARE 3 802.11b L KES	310			Standard Ant.Factor	: FCC Part.15 : 715(+6 dB),	Class B 3 m KOLAS		
	50.00		Ala	Frequency	500.		C < PC	Spec	(QP) trum(H.PK) trum(V.PK) ected item(H) ected item(V)
No. Frequence [MHz] 1 76.80 2 210.90 3 215.99 4 242.91 5 296.99 6 431.94 7 34.24 8 39.70 9 92.32 10 215.99 11 269.95 12 845.16	[d)3 H)5 H)8 H 15 H 15 H 14 H 14 V 23 V 23 V 23 V 24 V	Reading 18(uV)] 58.4 62.2 61.7 58.2 60.8 50.5 57.1 56.7 58.4 56.1 55.8 43.5	c.f [dB(1/m)] -27.9 -22.1 -21.8 -21.1 -20.0 -16.3 -25.5 -23.6 -24.8 -21.8 -21.8 -20.8 -8.6	Result PK [dB(uV/m)] 30.5 40.1 39.9 37.1 40.8 34.2 31.6 33.1 33.6 34.3 35.0 34.9	Limit QP [dB(uV/m)] 40.0 43.5 43.5 46.0 46.0 46.0 40.0 40.0 43.5 43.5 43.5 46.0 46.0	Margin QP [dB] 9.5 3.6 8.9 5.2 11.8 8.4 6.9 9.9 9.2 11.0 11.1	Height [cm] 400.0 100.0 100.0 100.0 100.0 100.0 150.0 150.0 150.0 150.0	Angle [deg] 172.0 101.0 170.0 166.0 307.0 307.0 307.0 307.0 167.0 96.0 981.0 81.0	Remark



Report No.: KES-RF-20T0112 Page (28) of (55)

Margin

(**dB**)

31.77

27.28

29.31

30.50

22.47

21.64

Test results (Above 1 000 Mz)

Mode:	802.11b
Distance of measurement:	3 meter
Channel:	01

Spurious Frequency Level Ant. Pol. CF DCF Field strength Limit **Detect mode** (MHz) $(dB\mu V)$ (H/V) (dB) (**dB**) $(dB\mu V/m)$ $(dB\mu V/m)$ 1033.30 42.23 50.68 -8.45 74.00 Peak Η -2121.60 47.40 Peak Η -0.68 -46.72 74.00 1195.40 52.23 V -7.54 44.69 74.00 Peak -1400.90 49.72 Peak V -6.22 43.50 74.00 -4824.00 44.39 Peak Η 7.14 -51.53 74.00 Peak V 4747.00 45.80 6.56 52.36 74.00 _

Band edge

Duna e								
Frequency (Mtz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV /m)	Margin (dB)
2360.87	45.20	Peak	Н	-0.19	-	45.01	74.00	28.99
2388.65	48.66	Peak	V	-0.14	-	48.52	74.00	25.48

	pectrum 2 🙁 Spectrum	n 3 🛞 Spectrum 4 🔅	× 💬	Spectrum Sp	ectrum 2 🙁 Spe	ctrum 3 🛞 Spect	rum 4 💌	1	
Ref Level 107.00 d				Ref Level 107.00 dB					
Att 1: 1Pk Max	0 dB SWT 17 µs . VBW 3 MHz	Mode Auto FFT		Att 10	d8 SWT 17 µs VBW	3 MHz Mode Auto FFT			
PIPK MdX	1 1 1	M3[1]	45.20 d8µV	The way		M3[1]			48.66 dBu
100 dauv		cont x1	2,360870 GHz	100 d8uV		(a)(1)			2.388650 GH
		M1[1]	43.39 HBUV			M1[1]			43.45 (44)
Vu8b 06			2,610000 CH2	90 d8µV			12	21	2 010000 G
							1		
80 dBµV				80 dBµV-				1 /	
70 dBuV				70 dBuV-					
o uppy				70 06pv					
60 dBuV				60 d8uV					_
			~				Man	2	
50 dBµV		113 170		50 dBµV			10007	nd -	
mon	mannen	monter	~	moun	munum	month	m		
40 dBµV		mun		40 dBµV	······································	man	m	-	
40 dBµV		-manana		40 dBµV-	······································	man			
40 dBµV				40 dBµV			~~~		
40 dBµV 30 dBµV 20 dBµV				40 dBµV-					
40 dBµV		P2		40 dBµV-			F2		
40 dBµV 30 dBµV 20 dBµV				40 dBµV-					
40 dBµV			Stop 2.42 GHz	40 dBµV		691 pts		8	op 2.42 GHz
40 dBµV	6	F2	Stop 2.42 GHz	40 dBµV 30 dBµV 20 dBµV 10 dBµV Start 2.3 GHz Marker		691 pts	F2		
40 dBµV 30 dBµV 20 dBµV 10 dBµV 51 art 2.3 GHz 1arker Type Ref Trc	6 Stimulus Respons	91 pts se Function		40 dBuV 30 dBuV 20 dBuV 10 dBuV Start 2.3 GHz Marker Type Ref Trc	Stimulus R	691 pts	F2	Sinction Res	
40 dBµV 30 dBµV 20 dBµV 10 dBµV 51 dBµV 51 dBµV	6	91 pts Function ddp/	Stop 2.42 GHz	40 dBµV 30 dBµV 20 dBµV 10 dBµV Start 2.3 GHz Marker	Stimulus R 2.31 GHz	691 pts	F2		



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-RF-20T0112 Page (29) of (55)

Ref Level 100.00 dBµV	m 3 (X) Spectrum 4 (X) RBW 1 MHz	Spectrum 2	×		ectrum S		Spectrum 4 RBW 1 MHz	ı ⊗ sp	ectrum 2	×		⊽
Att 10 dB	SWT 2 ms - VBW 3 MHz Mode	Auto Sweep			tt 1	0 dB SWT 2 ms .	VBW 3 MHz	Mode Auto S	Sweep			
1Pk Max					Pk Max	· · · · ·		4				
Courses and the second		M3[1]		40 dBµV 160 GHz	10000			M2	[1] J	MI		23 dBµV 540 GHz
0 dBuV		M1[1]	95.6	90 J5 dBµV	dBuV-			M1	[1]		94.0	07 dBµV
i0 dBuV			2.409	960 GHz	dBµV-						2.409	960 GH2
SSS3855 7					5480 Y							
0 dBµV				- 70	dBµV	+ + -						
0 dBuV				60	dBuV-							
2					MP	MB						
B deuv	northing marken and we are	Firemwaren k	hormonie	499	dBuV-	Jeanimeen	melandra	henrie	mane	horman		10.00
i0 dBµV		and the second s	and and a second a	40	dBuV			margar 10 m	J	- martin	and a state of the	1435.
0 dBµV				30	dBµV							
0 dBµV				20	dBµV	+	-				-	
0 dBuV				10	dBµV-	-						
tart 1.0 GHz	691 pts	- I I -	Stop 3	.0 GHz St	art 1.0 GHz		691	pts			Stop 3	.0 GHz
arker		Function	Function Result		rker rpe Ref Trc	New York Control of Control	ALC: 10.00	Functi		0000000	on Result	
	ntal // Peak fo	r 3 GHz 1	to 18 GHz	T Spec		ertical //]	Peak f		Measuring GHZ to pectrum 2) 18 (GHz	A (
ctrum Spectrum	BW 1 MHz	r 3 GHz 1	to 18 GHz	Ref	trum Spo	ectrum 3 🛞	Spectrum 4 RBW 1 MHz	ı ⊗ĭs	GHZ to) 18 (
ctrum Spectrum	n 3 🛞 Spectrum 4 🔅	r 3 GHz 1	to 18 GHz		trum Spe evel 100.00 dBj 10 d	ectrum 3 🛞	Spectrum 4 RBW 1 MHz	ı ⊗ĭs	GHZ to) 18 (
ctrum Spectrum f Level 100.00 dBμV 10 dB St	BW 1 MHz	r 3 GHz 1	to 18 GHz	Ref Att 14.39 d8µV	trum Spe evel 100.00 dBj 10 d	ectrum 3 🛞	Spectrum 4 RBW 1 MHz	Mode Auto	GHZ to) 18 (GHz	15.80 di
Ctrum Spectrum f Level 100.00 dBµV 10 dB St Max	BW 1 MHz	r 3 GHz 1 Spectrum 2 Auto Sweep	to 18 GHz	Ref Att 14.39 dBpV 4.8240 GHz	trum Spe evel 100.00 dB, 10 dax	ectrum 3 🛞	Spectrum 4 RBW 1 MHz	Mode Auto	GHZ to pectrum 2 o Sweep) 18 (GHz	15.80 di
ctrum Spectrum f Level 100.00 dBμV 10 dB St	BW 1 MHz	r 3 GHz 1 Spectrum 2 Auto Sweep	to 18 GHz	Ref Att 14.39 d8µV	trum Spe evel 100.00 dB, 10 dax	ectrum 3 🛞	Spectrum 4 RBW 1 MHz	Mode Auto	GHZ to pectrum 2 o Sweep) 18 (GHz	15.80 di
Spectrum Spectrum f Level 100.00 dBµV 10 dB St Max 10 dB St BµV 10 dB St	BW 1 MHz	r 3 GHz 1 Spectrum 2 Auto Sweep	to 18 GHz	Ref Att ● 1Pk ● 1Pk ● 4.39 dBµV ● 1Pk • 6240 GHz 90 dB	trum Spo evel 100.00 dBj 10 dax	ectrum 3 🛞	Spectrum 4 RBW 1 MHz	Mode Auto	GHZ to pectrum 2 o Sweep) 18 (GHz	15.80 di
Ctrum Spectrum f Level 100.00 dBµV 10 dB St Max	BW 1 MHz	r 3 GHz 1 Spectrum 2 Auto Sweep	to 18 GHz	Ref Att 14.39 dBpV 4.8240 GHz	trum Spo evel 100.00 dBj 10 dax	ectrum 3 🛞	Spectrum 4 RBW 1 MHz	Mode Auto	GHZ to pectrum 2 o Sweep) 18 (GHz	15.80 di
Spectrum Spectrum FLevel 100.00 dBµV 10 dB st 10 dB st 10 dB st Max 10 dB st BµV 10 dB st	BW 1 MHz	r 3 GHz 1 Spectrum 2 Auto Sweep	to 18 GHz	Ref Att ● 1Pk ● 1Pk ● 4.39 dBµV ● 1Pk • 6240 GHz 90 dB	Spectrum Spectrum .evel 100.00 dB, 100 //ax ////////////////////////////////////	ectrum 3 🛞	Spectrum 4 RBW 1 MHz	Mode Auto	GHZ to pectrum 2 o Sweep) 18 (GHz	15.80 di
Spectrum Spectrum FLevel 100.00 dBµV 10 dB st 10 dB st 10 dB st Max 10 dB st BµV 10 dB st	BW 1 MHz	r 3 GHz 1 Spectrum 2 Auto Sweep	to 18 GHz	Ref #4.39 dBpV .8240 GHz 90 dB 80 dB	Spectrum Spectrum .evel 100.00 dB, 100 //ax ////////////////////////////////////	ectrum 3 🛞	Spectrum 4 RBW 1 MHz	Mode Auto	GHZ to pectrum 2 o Sweep) 18 (GHz	15.80 di
Spectrum Spectrum I uevel 100.00 dBµV 10 dB st 10 dB st 10 dB st 10 yv 10 dB st	BW 1 MHz	r 3 GHz 1 Spectrum 2 Auto Sweep	to 18 GHz	Ref #4.39 dBpV .8240 GHz 90 dB 80 dB	Spectrum Spectrum 100.00 dBj 10 dBj 10 dBj 10 dBj N N N N	ectrum 3 🛞	Spectrum 4 RBW 1 MHz	Mode Auto	GHZ to pectrum 2 o Sweep) 18 (GHz	15.80 di
Spectrum Spectrum I uevel 100.00 dBµV 10 dB st 10 dB st 10 dB st 10 yv 10 dB st	BW 1 MHz	r 3 GHz 1 Spectrum 2 Auto Sweep	to 18 GHz	Rof Att ■ 14.39 dBµV ● 1Pk ● 240 GHz 90 dB ● 0 dB 70 dB	Spectrum Spectrum 100.00 dBj 10 dBj 10 dBj 10 dBj N N N N	ectrum 3 🛞	Spectrum 4 RBW 1 MHz	Mode Auto	GHZ to pectrum 2 o Sweep) 18 (GHz	15.80 di
Spectrum Spectrum I Lovel 100.00 dBµV 10 dB st Max 10 dB st BµV 10 dB st Jup 10 dB st	Spectrum 4 0 RBW 1 MHz VT 45 ms • VBW 3 MHz Mode	r 3 GHz 1 Spectrum 2 Auto Sweep		Rof Att ■ 14.39 dBµV ● 1Pk ● 240 GHz 90 dB ● 0 dB 70 dB	Spectrum Spectrum .evel 100.00 dBj 10 dax 10 d W 10 d W 10 d W 10 d	ectrum 3 🛞	Spectrum 4 RBW 1 MHz	Mode Auto	GHZ to pectrum 2 o Sweep) 18 (GHz	95.80 di 4,7470 (
Spectrum Spectrum I uvel 100.00 dbµV 10 db st Max 10 db st BµV 10 db st	Spectrum 4 0 RBW 1 MHz VT 45 ms • VBW 3 MHz VBW 3 MHz Mode	r 3 GHz 1 Spectrum 2 Auto Sweep	to 18 GHz	Rof	trum Sp4 .evel 100.00 dB, 104 104 N 104	ectrum 3 🛞	Spectrum 4 RBW 1 MHz	Mode Auto	GHZ to pectrum 2 o Sweep) 18 (GHz	95.80 di 4,7470 (
Spectrum Spectrum I uvel 100.00 dBµV 10 dB st 10 dB st 10 dB st 10 dB st <td< td=""><td>Spectrum 4 0 RBW 1 MHz VT 45 ms • VBW 3 MHz VBW 3 MHz Mode</td><td>r 3 GHz 1 Spectrum 2 A Auto Sweep M1[1]</td><td></td><td>Rof Att +.39 dBµV ● 1Pk +.8240 GHz 90 d8 80 d8 70 d8 60 d8 60 d8</td><td>trum Sp4 .evel 100.00 dB, 104 104 N 104</td><td>ectrum 3 🛞</td><td>Spectrum 4 RBW 1 MHz VBW 3 MHz</td><td>Mode Auto</td><td>GHZ to pectrum 2 > Sweep</td><td>) 18 (</td><td>GHz</td><td>95.80 di 4,7470 (</td></td<>	Spectrum 4 0 RBW 1 MHz VT 45 ms • VBW 3 MHz VBW 3 MHz Mode	r 3 GHz 1 Spectrum 2 A Auto Sweep M1[1]		Rof Att +.39 dBµV ● 1Pk +.8240 GHz 90 d8 80 d8 70 d8 60 d8 60 d8	trum Sp4 .evel 100.00 dB, 104 104 N 104	ectrum 3 🛞	Spectrum 4 RBW 1 MHz VBW 3 MHz	Mode Auto	GHZ to pectrum 2 > Sweep) 18 (GHz	95.80 di 4,7470 (
Spectrum Spectrum I uvel 100.00 dBµV 10.00 dBµV 10.00 dBµV 10.00 dBµV	Spectrum 4 0 RBW 1 MHz VT 45 ms • VBW 3 MHz VBW 3 MHz Mode	r 3 GHz 1 Spectrum 2 A Auto Sweep M1[1]		i4.39 dBµV 90 dB 0.0240 GHz 90 dB 80 dB 70 dB 60 dB 50 dB 60 dB 50 dB	trum Sp4 .evel 100.00 dв, 10 .db 10	ectrum 3 🛞	Spectrum 4 RBW 1 MHz VBW 3 MHz	Mode Auto	GHZ to pectrum 2 > Sweep) 18 (GHz	95.80 di 4,7470 (
Spectrum Spectrum I uvel 100.00 dbµV 10 db st Max 10 db st BµV 10 db st JµV 10 db st	Spectrum 4 0 RBW 1 MHz VT 45 ms • VBW 3 MHz VBW 3 MHz Mode	r 3 GHz 1 Spectrum 2 A Auto Sweep M1[1]		Rof	trum Sp4 .evel 100.00 dв, 10 .db 10	ectrum 3 🛞	Spectrum 4 RBW 1 MHz VBW 3 MHz	Mode Auto	GHZ to pectrum 2 > Sweep) 18 (GHz	95.80 di 4,7470 (
Spectrum Spectrum I uvel 100.00 dBµV 10 dB st Max 10 dB st suv 10 dB st	Spectrum 4 0 RBW 1 MHz VT 45 ms • VBW 3 MHz VBW 3 MHz Mode	r 3 GHz 1 Spectrum 2 A Auto Sweep M1[1]		14.30 dBpV 90 dB 9124 90 dB 90 dB 90 dB	Trum Sp4 .evel 100.00 dBy 10 10 Max 10 N 10	ectrum 3 🛞	Spectrum 4 RBW 1 MHz VBW 3 MHz	Mode Auto	GHZ to pectrum 2 > Sweep) 18 (GHz	95.80 di 4,7470 (
Spectrum Spectrum I uvel 100.00 dBµV 10.00 dBµV 10.00 dBµV 10.00 dBµV	Spectrum 4 0 RBW 1 MHz VT 45 ms • VBW 3 MHz VBW 3 MHz Mode	r 3 GHz 1 Spectrum 2 A Auto Sweep M1[1]		i4.39 dBµV 90 dB 0.8240 GHz 90 dB 90 dB 80 dB 70 dB 60 dB 60 dB 50 dB 60 dB 50 dB	Trum Sp4 .evel 100.00 dBy 10 10 Max 10 N 10	ectrum 3 🛞	Spectrum 4 RBW 1 MHz VBW 3 MHz	Mode Auto	GHZ to pectrum 2 > Sweep) 18 (GHz	95.80 di 4,7470 (
Spectrum Spectrum Level 100.00 dbµV 10 db st 10 db st 10 db st µV 10 db st	Spectrum 4 0 RBW 1 MHz VT 45 ms • VBW 3 MHz VBW 3 MHz Mode	r 3 GHz 1 Spectrum 2 A Auto Sweep M1[1]		III.39 dBµV 80 dBµV .82.40 GHz 90 dB 90 dB 80 dB 70 dB 60 dB 10 dB 50 dB 10 dB 20 dB	trum Sp4 .evel 100.00 dB, 100.00 B, 100.00 B, 100.00 B, 100.00 B, 100.00 B, 100.000	ectrum 3 🛞	Spectrum 4 RBW 1 MHz VBW 3 MHz	Mode Auto	GHZ to pectrum 2 > Sweep) 18 (GHz	95.80 di 4,7470 (
Spectrum Spectrum Level 100.00 dbµV 10 db st 10 db st 10 db st W 10 db st	Spectrum 4 0 RBW 1 MHz VT 45 ms • VBW 3 MHz VBW 3 MHz Mode	r 3 GHz 1 Spectrum 2 A Auto Sweep M1[1]		14.30 dBpV 90 dB 9124 90 dB 90 dB 90 dB	trum Sp4 .evel 100.00 dB, 100.00 B, 100.00 B, 100.00 B, 100.00 B, 100.00 B, 100.000	ectrum 3 🛞	Spectrum 4 RBW 1 MHz VBW 3 MHz	Mode Auto	GHZ to pectrum 2 > Sweep) 18 (GHz	95.80 di 4,7470 (
Spectrum Spectrum Lavel 100.00 dBµV 10 dB st 10 dB st 10 dB st µV 10 dB st	Spectrum 4 0 RBW 1 MHz VT 45 ms • VBW 3 MHz VBW 3 MHz Mode	r 3 GHz 1 Spectrum 2 A Auto Sweep M1[1]	to 18 GHz	14.30 dBpV 90 dB 91% 90 dB 90 dB 90 dB 90 dB	trum Sp4 .evel 100.00 dB, 100.00 B, 100.00 B, 100.00 B, 100.00 B, 100.00 B, 100.000	ectrum 3 🛞	Spectrum 4 RBW 1 MHz VBW 3 MHz	Mode Auto	GHZ to pectrum 2 > Sweep) 18 (GHz	95.80 di 4,7470 (



Report No .: KES-RF-20T0112 Page (30) of (55)

Mode:	802.11b
Distance of measurement:	3 meter
Channel:	06

- Spurio	us							
Frequency (Mz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2121.50	51.89	Peak	Н	-0.68	-	51.21	74.00	22.79
1013.00	56.36	Peak	V	-8.57	-	47.79	74.00	26.21
2159.10	48.73	Peak	V	-0.60	-	48.13	74.00	25.87
4961.00	44.39	Peak	Н	8.15	-	52.54	74.00	21.46
4961.00	44.68	Peak	V	8.15	-	52.83	74.00	21.17

pectrum Spectru		Spectrum 2	2 🛞		Contraction of the second second second			Spectrum 2	×)	
Ref Level 105.00 dBµV Att 10 dB	RBW 1 MHz SWT 2 ms VBW 3 MHz M	Inde Auto Sween			Ref Level 107.00 d	18μV = RBW 0 d8 SWT 2 ms = VBV	V 1 MHz V 3 MHz Mode Auto	Sweep		
LPk Max	ant 2 ms . ron 3 mm p	idde Hoto Sweep			1Pk Max	14 - 14 - 14 - 14 - 14 - 14 - 14 - 14 -	2/	10000	5.00 M	
		D2[1]	M1	-45.42 dB	100 dBuV		M	3[1] M1	56	36 dBµV 300 GHz
Vu8b 00		M1[1]	*	-315.50 MHz 97.31 d8µV			M	1[1]	95	92 dBµV
dBuV	-	MILLI		2.43700 GHz	90 dBµV			1 1	2.43	700 GHz
0.046.0				1000	80 dBuV			1		
49hA				-	100000					
d8µV-			-		70 dBµV					
					60 dBµV					_
dBµV-					SO HRIAN		ne.	alle.		
dBuV-		DZ			Epider murren	an angel manager	maluntumet	wanter 4	mathematica	- ilei
	man have mark ment	new hope unal	4 Whennergen	an marine marine	40 dBµV-					
dBµV					30 d8µV				_	
dBuV					00.40.41					
00014					20 dBµV					
dBµV					10 dBµV					
10.41					Start 1.0 GHz Marker		691 pts		Stop	3.0 GHz
dBµV-				0.0.011	Type Ref Trc	Stimulus	Response Func	tion	Function Result	
rt 1.0 GHz ker	691 p	15	St	top 3.0 GHz	M1 1 D2 M1 1	2.437 GHz -277.9 MHz	95.92 dBµV -47.19 dB			
me Ref Trc St M1 1	imulus Response	Function	Function Resu	lt	M3 1	1.013 GHz	56.36 dBµV			
Horiz	2:437 GHz 97.31 dBp/ -315.5 MHz 97.31 dBp/ -45.42 dB	for 3 GHz				ertical // Pe			18 GHz	
	-315.5 MHz -45.42 dt ontal // Peak Jm 3 Spectrum 4 RBW 1 MHz	for 3 GHz			Spectrum Spe Ref Level 100.00 dBp	ectrum 3 🛞 Spe	ectrum 4 🗶	GHZ to		
	-315.5 MHz -45.42 dt ontal // Peak Jm 3 (2) Spectrum 4	for 3 GHz			Spectrum Spe Ref Level 100.00 dBp	ectrum 3 🛞 Spe	ectrum 4 🗶	GHZ to	18 GHz	4
D2 M1 1 HOriz Rectrum Spectru tef Level 100.00 dBµV tt 10 dB	-315.5 MHz -45.42 dt ontal // Peak Jm 3 Spectrum 4 RBW 1 MHz	for 3 GHz		44.39 d8µV	Spectrum Spe Ref Level 100.00 dBp Att 10 d	ectrum 3 🛞 Spe	ectrum 4 (8) 1 W 1 MHz W 3 MHz Mode Aut	GHZ to	18 GHz	44.68 di
D2 M1 1 HOriz Hectrum Spectro for Level 100.00 dBµV tt 10 dB	-315.5 MHz -45.42 dt ontal // Peak Jm 3 Spectrum 4 RBW 1 MHz	Spectrum 2 Mode Auto Sweep			Spectrum Spe Ref Level 100.00 dB, Att 10 d 1Pk Max	ectrum 3 🛞 Spe	ectrum 4 (8) 1 W 1 MHz W 3 MHz Mode Aut	GHZ to Spectrum 2	18 GHz	44.68 d8
D2 M1 1 HOriz	-315.5 MHz -45.42 dt ontal // Peak Jm 3 Spectrum 4 RBW 1 MHz	Spectrum 2 Mode Auto Sweep		44.39 d8µV	Spectrum Spe Ref Level 100.00 dBp Att 10 d	ectrum 3 🛞 Spe	ectrum 4 (8) 1 W 1 MHz W 3 MHz Mode Aut	GHZ to Spectrum 2	18 GHz	44.68 d
D2 M1 1 HOriz ectrum Spectri of Lovel 100.00 dBµV tt 10 db tk Max dBµV	-315.5 MHz -45.42 dt ontal // Peak Jm 3 Spectrum 4 RBW 1 MHz	Spectrum 2 Mode Auto Sweep		44.39 d8µV	Spectrum Spe Ref Level 100.00 dB, Att 10 d 1Pk Max	ectrum 3 🛞 Spe	ectrum 4 (8) 1 W 1 MHz W 3 MHz Mode Aut	GHZ to Spectrum 2	18 GHz	44.68 di
MI I Horiz	-315.5 MHz -45.42 dt ontal // Peak Jm 3 Spectrum 4 RBW 1 MHz	Spectrum 2 Mode Auto Sweep		44.39 d8µV	Spectrum Spectrum Ref Level 100.00 dB, 10 dB, • Att 10 dB, • 1Pk Max 90 dB,W	ectrum 3 🛞 Spe	ectrum 4 (8) 1 W 1 MHz W 3 MHz Mode Aut	GHZ to Spectrum 2	18 GHz	44.68 di
D2 M1 1 Horiz Spectric of Level 100.00 dby/ the spectric spectring spectric spectring spectric spectring spectric	-315.5 MHz -45.42 dt ontal // Peak Jm 3 Spectrum 4 RBW 1 MHz	Spectrum 2 Mode Auto Sweep		44.39 d8µV	Spectrum Spectrum Ref Level 100.00 dB, 10 dB, • Att 10 dB, • 1Pk Max 90 dB,W	ectrum 3 🛞 Spe	ectrum 4 (8) 1 W 1 MHz W 3 MHz Mode Aut	GHZ to Spectrum 2	18 GHz	44.68 di
D2 M1 1 Horiz Spectra of Level 100.00 dBy/ Spectra tt 10 dB k Max SBu/ SBu/ SBu/	-315.5 MHz -45.42 dt ontal // Peak Jm 3 Spectrum 4 RBW 1 MHz	Spectrum 2 Mode Auto Sweep		44.39 d8µV	Spectrum Spectrum Ref Level 100.00 dB, # Att 10 c0 # Att 10 c0 # IPK Max 90 dBµV 90 dBµV 90 dBµV 70 dBµV 90 dBµV	ectrum 3 🛞 Spe	ectrum 4 (8) 1 W 1 MHz W 3 MHz Mode Aut	GHZ to Spectrum 2	18 GHz	44.68 di
M1 1 Horiz Horiz ectrum Spectra of Lovel 100,00 dBµV 10 dB k Max 10 dB dBµV 10 dB dBµV 10 dB	-315.5 MHz -45.42 dt ontal // Peak Jm 3 Spectrum 4 RBW 1 MHz	Spectrum 2 Mode Auto Sweep		44.39 d8µV	Spectrum Spectrum Ref Level 100.00 dBµ 10 dBµ 0 1Pk Max 90 dBµV 80 dBµV 80 dBµV	ectrum 3 🛞 Spe	ectrum 4 (8) 1 W 1 MHz W 3 MHz Mode Aut	GHZ to Spectrum 2	18 GHz	44.68 di
D2 M1 1 Horiz Boctrum Spectrum of Lavel 100.00 dBµV ttt 10 dB k Max dBµV dBµV dBµV dBµV dBµV dBµV dBµV	-315.5 MHz -45.42 dt ontal // Peak Jm 3 Spectrum 4 RBW 1 MHz	Spectrum 2 Mode Auto Sweep		44.39 d8µV	Spectrum Spectrum Ref Level 100.00 dBy # Att 10 d # Ph: Max 90 dBy/v 80 dBy/v 90 dBy/v 70 dBy/v 60 dBy/v	ectrum 3 🛞 Spe	ectrum 4 (8) 1 W 1 MHz W 3 MHz Mode Aut	GHZ to Spectrum 2	18 GHz	44.68 di
02 M1 1 Thoriz Spectric of Level 100.00 dbp/ tit 10.00 dbp/ 10 db Spectric dbp/ dbp/ dbp/ dbp/ dbp/ dbp/ dbp/ dbp/ dbp/ dbp/ dbp/ dbp/ dbp/ dbp/ dbp/ dbp/ dbp/	-315.5 MHz +45.42 df ontal // Peak am 3 (*) Spectrum 4 #RW 1 MHz SWT 45 ms * VBW 3 MHz	Spectrum 2 Mode Auto Sweep		44.39 dBµV 4.9610 GHz	Spectrum Spectrum Ref Level 100.00 dB, # Att 10 c0 # Att 10 c0 # IPK Max 90 dBµV 90 dBµV 90 dBµV 70 dBµV 90 dBµV	ectrum 3 (E) Spy V RBV 55 SWT 45 ms = VBV	ectrum 4 (8) 1 W 1 MHz W 3 MHz Mode Aut	GHZ to Spectrum 2		44.68 dt
D2 M1 1 Horiz Spectrum of Level 100.00 dby/ the Max 10 db M1 dby/ db	-315.5 MHz -45.42 dt ontal // Peak Jm 3 Spectrum 4 RBW 1 MHz	Spectrum 2 Mode Auto Sweep		44.39 dBpV 4.9610 GHz	Spectrum Spectrum Ref Level 100.00 dB, w Att 100.00 dB, w Att 9 IPk Max 90 dB, W 90 dB, W 90 dB, W 70 dB, W 90 dB, W 50 dB, W M1	ectrum 3 🛞 Spe	ectrum 4 (8) 1 W 1 MHz W 3 MHz Mode Aut	GHZ to Spectrum 2	18 GHz	44.68 di 4.9610
D2 M1 1 Horiz Spectrum of Level 100.00 dby/ the Max 10 db M1 dby/ db	-315.5 MHz +45.42 df ontal // Peak am 3 (*) Spectrum 4 #RW 1 MHz SWT 45 ms * VBW 3 MHz	Spectrum 2 Mode Auto Sweep		44.39 dBµV 4.9610 GHz	Spectrum Spectrum Ref Level 100.00 dBy # Att 10 d # Ph: Max 90 dBy/v 80 dBy/v 90 dBy/v 70 dBy/v 60 dBy/v	ectrum 3 (E) Spy V RBV 55 SWT 45 ms = VBV	ectrum 4 (8) 1 W 1 MHz W 3 MHz Mode Aut	GHZ to Spectrum 2		44.68 dt
D2 M1 1 Horiz Spectri ectrum Spectri of Lovel 100.00 dbjv tt 10 db k Max dbjv 10 db dbjv 0 db	-315.5 MHz +45.42 df ontal // Peak am 3 (*) Spectrum 4 #RW 1 MHz SWT 45 ms * VBW 3 MHz	Spectrum 2 Mode Auto Sweep		44.39 dBµV 4.9610 GHz	Spectrum Spectrum Ref Level 100.00 dB, # Att 100 dB, 100	ectrum 3 (E) Spy V RBV 55 SWT 45 ms = VBV	ectrum 4 (8) 1 W 1 MHz W 3 MHz Mode Aut	GHZ to Spectrum 2		44.68 dt
D2 M1 1 Horiz Spectri ectrum Spectri of Lovel 100.00 dbjv tt 10 db k Max dbjv 10 db dbjv 0 db	-315.5 MHz +45.42 df ontal // Peak am 3 (*) Spectrum 4 #RW 1 MHz SWT 45 ms * VBW 3 MHz	Spectrum 2 Mode Auto Sweep		44.39 dBµV 4.9610 GHz	Spectrum Spectrum Ref Level 100.00 dB, w Att 100.00 dB, w Att 9 IPk Max 90 dB, W 90 dB, W 90 dB, W 70 dB, W 90 dB, W 50 dB, W M1	ectrum 3 (E) Spy V RBV 55 SWT 45 ms = VBV	ectrum 4 (8) 1 W 1 MHz W 3 MHz Mode Aut	GHZ to Spectrum 2		44.68 dt
D2 M1 1 Horiz Bectrum Spectrum of Level 100.00 dBµV the colspan="2">the colspan="2">the colspan="2">Colspan="2" Colspan="2">Colspan="2" Colspan="2"	-315.5 MHz +45.42 df ontal // Peak am 3 (*) Spectrum 4 #RW 1 MHz SWT 45 ms * VBW 3 MHz	Spectrum 2 Mode Auto Sweep		44.39 dBµV 4.9610 GHz	Spectrum Spectrum Ref Level 100.00 dB, # Att 100 dB, 100	ectrum 3 (E) Spy V RBV 55 SWT 45 ms = VBV	ectrum 4 (8) 1 W 1 MHz W 3 MHz Mode Aut	GHZ to Spectrum 2		44.68 dt
D2 M1 1 Horiz Burning Colspan="2">Spectrum of Level 100.00 dBµV Spectrum Spectrum <td>-315.5 MHz +45.42 df ontal // Peak am 3 (*) Spectrum 4 #RW 1 MHz SWT 45 ms * VBW 3 MHz</td> <td>Spectrum 2 Mode Auto Sweep</td> <td></td> <td>44.39 dBµV 4.9610 GHz</td> <td>Spectrum Spectrum Ref Level 100.00 dB, att 100.00 dB, 00 dB, att 90 dB, 00 d</td> <td>ectrum 3 (E) Spy V RBV 55 SWT 45 ms = VBV</td> <td>ectrum 4 (8) 1 W 1 MHz W 3 MHz Mode Aut</td> <td>GHZ to Spectrum 2</td> <td></td> <td>44.68 dt</td>	-315.5 MHz +45.42 df ontal // Peak am 3 (*) Spectrum 4 #RW 1 MHz SWT 45 ms * VBW 3 MHz	Spectrum 2 Mode Auto Sweep		44.39 dBµV 4.9610 GHz	Spectrum Spectrum Ref Level 100.00 dB, att 100.00 dB, 00 dB, att 90 dB, 00 d	ectrum 3 (E) Spy V RBV 55 SWT 45 ms = VBV	ectrum 4 (8) 1 W 1 MHz W 3 MHz Mode Aut	GHZ to Spectrum 2		44.68 dt
D2 M1 1 Horiz Spectrum Spectrum of Lovel 100.00 dby/ the way Spectrum Spectrum <td< td=""><td>-315.5 MHz +45.42 df ontal // Peak am 3 (*) Spectrum 4 #RW 1 MHz SWT 45 ms * VBW 3 MHz</td><td>Spectrum 2 Mode Auto Sweep</td><td></td><td>44.39 dBµV 4.9610 GHz</td><td>Spectrum Spectrum Ref Level 100.00 dB, att 100.00 dB, 00 dB, att 90 dB, 00 d</td><td>ectrum 3 (E) Spy V RBV 55 SWT 45 ms = VBV</td><td>ectrum 4 (8) 1 W 1 MHz W 3 MHz Mode Aut</td><td>GHZ to Spectrum 2</td><td></td><td>44.68 dt</td></td<>	-315.5 MHz +45.42 df ontal // Peak am 3 (*) Spectrum 4 #RW 1 MHz SWT 45 ms * VBW 3 MHz	Spectrum 2 Mode Auto Sweep		44.39 dBµV 4.9610 GHz	Spectrum Spectrum Ref Level 100.00 dB, att 100.00 dB, 00 dB, att 90 dB, 00 d	ectrum 3 (E) Spy V RBV 55 SWT 45 ms = VBV	ectrum 4 (8) 1 W 1 MHz W 3 MHz Mode Aut	GHZ to Spectrum 2		44.68 dt
02 M1 1 Whoriz Horiz Bectrum Spectrum of Level 100.00 dbµV the Max Wax dbµV	-315.5 MHz +45.42 df ontal // Peak am 3 (*) Spectrum 4 #RW 1 MHz SWT 45 ms * VBW 3 MHz	for 3 GHz	2 3	44.39 dBµV 4.9610 GHz	Spectrum Spectrum Ref Level 100.00 dB, w Att 100.00 dB, w Att 9 IPk Max 90 dBµ/ 90 dBµ/ 90 dBµ/ 80 dBµ/ 90 dBµ/ 60 dBµ/ 90 dBµ/ 50 dBµ/ 10 dBµ/ 40 dBµ/ 10 dBµ/ 30 dBµ/ 10 dBµ/ 40 dBµ/ 10 dBµ/ 20 dBµ/ 10 dBµ/	ectrum 3 (E) Spy V RBV 55 SWT 45 ms = VBV	ectrum 4 (8) 1 W 1 MHz W 3 MHz Mode Aut	GHZ to Spectrum 2		44.68 d 4.9610

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



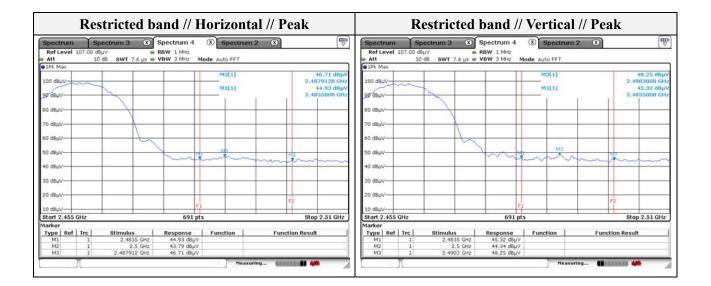
3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-RF-20T0112 Page (31) of (55)

Mode:	802.11b
Distance of measurement:	3 meter
Channel:	11

- Spurio	us							
Frequency (MHz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV /m)	Margin (dB)
1007.20	51.56	Peak	Н	-8.60	-	42.96	74.00	31.04
2130.20	49.16	Peak	Н	-0.66	-	48.50	74.00	25.50
1175.10	51.08	Peak	V	-7.65	-	43.43	74.00	30.57
2121.60	51.45	Peak	V	-0.68	-	50.77	74.00	23.23
4924.00	44.25	Peak	Н	7.88	-	52.13	74.00	21.87
4924.00	45.97	Peak	V	7.88	-	53.85	74.00	20.15

- Band edge

Frequency (Mtz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV /m)	Margin (dB)
2487.91	46.71	Peak	Н	0.08	-	46.79	74.00	27.21
2490.30	48.25	Peak	V	0.09	-	48.34	74.00	25.66



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



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-RF-20T0112 Page (32) of (55)

Spectrum Spectrum 3 Ref Level 100.00 d8µV Att 10 d8 SWT	Spectrum 4 Spectrum	ectrum 2 🛞		Ref Level 100.0		Spectrum 4 RBW 1 MHz VBW 3 MHz Mo	Spectrur	n 2 🗷		
1Pk Max	15			PlPk Max			10000			
	Mat	1] T M1	47.40 dBpV 2.12160 GHz				M2[1]	T MI		23 dBµV 540 GHz
0 dBµV	MI	11	95.85 dBpV	90 dBµV		+ +	M1[1]		94.	.87 dBpV
0 dBµV		27 A	2.40960 GHz	80 dBuV			1.101 77 1.11		2.40	960 GH2
S24880 C				ou sopr						
0 dBµV				70 dBµV						
0 dBuV				60 dBµV-						
3	MO			MP	Ma					
BUV-	month marken the second	maren konnes		BD dBUV	de file mensioner	mensional	markenin	1 ann		40.00
0 dBµV	the second second second second	Maglun		40 dBµV-		and the second of the second of the second s	the a succession	A		alight dates
0 dBµV										
n gehn				30 dBµV						
0 dBµV				20 dBµV		+ +			-	
0 dBuV				10 dBuV						
o depr				ao oope						
tart 1.0 GHz	691 pts		Stop 3.0 GHz	Start 1.0 GHz		691 pt	5	-	Stop 3	3.0 GHz
arker ype Ref Trc Stimuli	is Response Functio	10 W. 1000	tion Result	Marker Type Ref Trc	Stimulus	Response	Function	10.01	ction Result	
	al // Peak for 3	GHz to 18			ertical // 1		r 3 GHz	to 18	GHz	
Ctrum Spectrum 3		GHz to 18		Spectrum S Ref Level 100.00	Spectrum 3 🛞	Spectrum 4 RBW 1 MHz	r 3 GHz	to 18		
ctrum Spectrum 3 Level 100.00 dBμV 10 dB SWT 4	Spectrum 4 (X) Sp RBW 1 MHz S ms • VBW 3 MHz Mode Auto	GHz to 18 Dectrum 2 (*) Sweep	8 GHz Ţ	Spectrum S Ref Level 100.00	Spectrum 3 🛞	Spectrum 4 RBW 1 MHz	r 3 GHz Spectru Node Auto Sweep	to 18	GHz	
Ctrum Spectrum 3	Spectrum 4 Sp BW 1 MHz	GHz to 18 Dectrum 2 (*) Sweep	8 GHz 	Spectrum Ref Level 100.00 (Att 1	Spectrum 3 🛞	Spectrum 4 RBW 1 MHz	r 3 GHz	to 18	GHz	45.80 d
ctrum Spectrum 3 Level 100.00 dBμV 10 dB SWT 4	Spectrum 4 (X) Sp RBW 1 MHz S ms • VBW 3 MHz Mode Auto	GHz to 18 Dectrum 2 (*) Sweep	8 GHz Ţ	Spectrum Ref Level 100.00 (Att 1	Spectrum 3 🛞	Spectrum 4 RBW 1 MHz	r 3 GHz Spectru Node Auto Sweep	to 18	GHz	45.80 d
с trum Spectrum 3 Level 100.00 dBµV 10 dB SWT 4 Мах	Spectrum 4 (X) Sp RBW 1 MHz S ms • VBW 3 MHz Mode Auto	GHz to 18 Dectrum 2 (*) Sweep	8 GHz 	Spectrum S Ref Level 100.00 (Att 1 PPk Max	Spectrum 3 🛞	Spectrum 4 RBW 1 MHz	r 3 GHz Spectru Node Auto Sweep	to 18	GHz	
Spectrum 3 Level 100.00 d8µV 10 d8 swr 4 Max	Spectrum 4 (X) Sp RBW 1 MHz S ms • VBW 3 MHz Mode Auto	GHz to 18 Dectrum 2 (*) Sweep	8 GHz 	Spectrum S Ref Level 100.00 (Att 1 PPk Max	Spectrum 3 🛞	Spectrum 4 RBW 1 MHz	r 3 GHz Spectru Node Auto Sweep	to 18	GHz	45.80 d
Spectrum 3 Level 100.00 d8µV 10 d8 swr 4 Max	Spectrum 4 (X) Sp RBW 1 MHz S ms • VBW 3 MHz Mode Auto	GHz to 18 Dectrum 2 (*) Sweep	8 GHz 	Spectrum S Ref Level 100.00 (Att 1 • Att 1 1 • IPk Max 90 dBµV 90 dBµV 1	Spectrum 3 🛞	Spectrum 4 RBW 1 MHz	r 3 GHz Spectru Node Auto Sweep	to 18	GHz	
Spectrum 3 Level 100.00 dBµV 10 dB SWT 4 Max	Spectrum 4 (X) Sp RBW 1 MHz S ms • VBW 3 MHz Mode Auto	GHz to 18 Dectrum 2 (*) Sweep	8 GHz 	Spectrum S Ref Level 100.00 (Att 1 • Att 1 1 • IPk Max 90 dBµV 90 dBµV 1	Spectrum 3 🛞	Spectrum 4 RBW 1 MHz	r 3 GHz Spectru Node Auto Sweep	to 18	GHz	45.80 d
Spectrum 3 Level 100.00 dBµV 10 dB SWT 4 Max	Spectrum 4 (X) Sp RBW 1 MHz S ms • VBW 3 MHz Mode Auto	GHz to 18 Dectrum 2 (*) Sweep	8 GHz 	Spectrum S Rof Level 100.00 Att IPk Max 1 IPk Max 90 90 dBµV 80 dBµV	Spectrum 3 🛞	Spectrum 4 RBW 1 MHz	r 3 GHz Spectru Node Auto Sweep	to 18	GHz	45.80 d
Spectrum 3 Level 100.00 dBµV 10 dB SWT 4 uv uv uv	Spectrum 4 (X) Sp RBW 1 MHz S ms • VBW 3 MHz Mode Auto	GHz to 18 Dectrum 2 (*) Sweep	8 GHz 	Spectrum S Rof Level 100.00 Att IPk Max 1 IPk Max 90 90 dBµV 80 dBµV	Spectrum 3 🛞	Spectrum 4 RBW 1 MHz	r 3 GHz Spectru Node Auto Sweep	to 18	GHz	
Spectrum 3 'Level 100.00 dBµV 10 dB swr 4 Max 'Level 100.00 dBµV 10 dB swr 4 JgV 'Level 100.00 dBµV JgV JgV JgV JgV	Spectrum 4 (X) Sp RBW 1 MHz S ms • VBW 3 MHz Mode Auto	GHz to 18 Dectrum 2 (*) Sweep	8 GHz 	Spectrum S Ref Level 100.00 + + Att - • 1Pk Max - 90 dBµV - 80 dBµV - 70 dBµV - 60 dBµV -	Spectrum 3 🛞	Spectrum 4 RBW 1 MHz	r 3 GHz Spectru Node Auto Sweep	to 18	GHz	45.80 d
Spectrum Spectrum 3 Level 10.00 dBµV 10 B swr 4 Max 10 dB swr 4 10 4 10 4 10 4 10 4 10 10 4 10	Spectrum 4 Spectrum 4 Spectrum 4 Sms VBW 3 MHz Mode Auto M1	GHz to 18 weetrum 2 • • • • • • • • • • • • • • • • • •	8 GHz	Spectrum S Ref Lavel 100.00 att # Att 1 # IPk Max 9 90 dBµV 80 dBµV 80 dBµV 70 dBµV	Spectrum 3 🛞	Spectrum 4 RBW 1 MHz VBW 3 MHz M	r 3 GHz © Spectru Inde Auto Sweep MI[1]	to 18	GHz	45.80 di 4.7470
Spectrum 3 'Level 100.00 dbµV 10 db SWT 4 Max IW IW IW IW IW IW IW IW	Spectrum 4 (X) Sp RBW 1 MHz S ms • VBW 3 MHz Mode Auto	GHz to 18 weetrum 2 • • • • • • • • • • • • • • • • • •	8 GHz 	Spectrum S Rof Level 100.00 Att Image: spectrum of the spectr	Spectrum 3 🛞	Spectrum 4 RBW 1 MHz VBW 3 MHz M	r 3 GHz Spectru Node Auto Sweep	to 18	GHz	45.80 di 4.7470
Spectrum 3 Level 100.00 dBµV 10 dB SWT 4 Max UV UV UV UV UV UV UV UV UV	Spectrum 4 Spectrum 4 Spectrum 4 Sms VBW 3 MHz Mode Auto M1	GHz to 18 weetrum 2 • • • • • • • • • • • • • • • • • •	8 GHz	Spectrum S Ref Level 100.00 + + Att - • 1Pk Max - 90 dBµV - 80 dBµV - 70 dBµV - 60 dBµV -	Spectrum 3 🛞	Spectrum 4 RBW 1 MHz VBW 3 MHz M	r 3 GHz © Spectru Inde Auto Sweep MI[1]	to 18	GHz	45.80 dt
Spectrum 3 Level 100.00 dBµV 10 dB SWT 4 Max uv	Spectrum 4 Spectrum 4 Spectrum 4 Sms VBW 3 MHz Mode Auto M1	GHz to 18 weetrum 2 • • • • • • • • • • • • • • • • • •	8 GHz	Spectrum S Ref Level 100.00 Att Image: spectrum of the spectr	Spectrum 3 🛞	Spectrum 4 RBW 1 MHz VBW 3 MHz M	r 3 GHz © Spectru Inde Auto Sweep MI[1]	to 18	GHz	95.80 dt 4.7470 (
Spectrum 3 Level 100.00 dBµV 10 dB SWT 4 Max uv	Spectrum 4 Spectrum 4 Spectrum 4 Sms VBW 3 MHz Mode Auto M1	GHz to 18 weetrum 2 • • • • • • • • • • • • • • • • • •	8 GHz	Spectrum S Rof Level 100.00 Att Image: spectrum of the spectr	Spectrum 3 🛞	Spectrum 4 RBW 1 MHz VBW 3 MHz M	r 3 GHz © Spectru Inde Auto Sweep MI[1]	to 18	GHz	45.80 di 4.7470
Spectrum 3 Level 100.00 dBµV 10 dB SWT 4 Max uv	Spectrum 4 Spectrum 4 Spectrum 4 Sms VBW 3 MHz Mode Auto M1	GHz to 18 weetrum 2 • • • • • • • • • • • • • • • • • •	8 GHz	Spectrum S Ref Level 100.00 Att Image: spectrum of the spectr	Spectrum 3 🛞	Spectrum 4 RBW 1 MHz VBW 3 MHz M	r 3 GHz © Spectru Inde Auto Sweep MI[1]	to 18	GHz	45.80 di 4.7470
Spectrum 3 Level 100.00 dBµV 10 dB SWT 4 Max	Spectrum 4 Spectrum 4 Spectrum 4 Sms VBW 3 MHz Mode Auto M1	GHz to 18 weetrum 2 • • • • • • • • • • • • • • • • • •	8 GHz	Spectrum S Ref Lavel 100.00 Att 1 ● IPk Max 9 Bu/ 1 80 dBu/ 80 dBu/ 1 1 70 dBu/ 60 dBu/ 1 1 50 dBu/ 10 1 1 30 dBu/ 1 1 1	Spectrum 3 🛞	Spectrum 4 RBW 1 MHz VBW 3 MHz M	r 3 GHz © Spectru Inde Auto Sweep MI[1]	to 18	GHz	45.80 di 4.7470
Spectrum 3 Level 100.00 dBµV 10 dB SWT 4 Max uv	Spectrum 4 Spectrum 4 Spectrum 4 Sms VBW 3 MHz Mode Auto M1	GHz to 18	8 GHz	Spectrum S Rof Lavel 100.00 Att 9 JPk. Max 1 90 dBµV 0 90 dBµV 0 70 dBµV 0 50 dBµV 0 20 dBµV 0 20 dBµV 0 20 dBµV 1 20 dBµV 2	Spectrum 3 🛞	Spectrum 4 RBW 1 MHz VBW 3 MHz M	r 3 GHz © Spectru Inde Auto Sweep MI[1]	to 18	GHz	45.80 di 4.7470
Spectrum 3 Level 100.00 dBµV 10 dB SWT 4 Max N	Spectrum 4 Spectrum 4 Spectrum 4 Sms VBW 3 MHz Mode Auto M1	GHz to 18	8 GHz	Spectrum S Ref Lavel 100.00 Att 1 ● IPk Max 9 Bu/ 1 80 dBu/ 80 dBu/ 1 1 70 dBu/ 60 dBu/ 1 1 50 dBu/ 10 1 1 30 dBu/ 1 1 1	Spectrum 3 🛞	Spectrum 4 RBW 1 MHz VBW 3 MHz M	r 3 GHz © Spectru Inde Auto Sweep MI[1]	to 18	GHz	4.7470
Spectrum 3 Lovel 100.00 dBµV 10 dB SWT 4 40 dB SWT 4	Spectrum 4 Spectrum 4 Spectrum 4 Sms VBW 3 MHz Mode Auto M1	GHz to 18	8 GHz	Spectrum S Rof Lavel 100.00 Att 9 JPk. Max 1 90 dBµV 0 90 dBµV 0 70 dBµV 0 50 dBµV 0 20 dBµV 0 20 dBµV 0 20 dBµV 1 20 dBµV 2	Spectrum 3 🛞	Spectrum 4 RBW 1 MHz VBW 3 MHz M	r 3 GHz © Spectru tode Auto Sweep MI[1]	to 18	GHz	4.7470



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

Mode:	802.11g
Distance of measurement:	3 meter
Channel:	01

- Spurio	us							
Frequency (MHz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1015.90	51.29	Peak	Н	-8.55	-	42.74	74.00	31.26
2121.60	49.57	Peak	Н	-0.68	-	48.89	74.00	25.11
1004.30	54.20	Peak	V	-8.62	-	45.58	74.00	28.42
2121.60	50.36	Peak	V	-0.68	-	49.68	74.00	24.32
4824.00	44.76	Peak	Н	7.14	-	51.90	74.00	22.10
4824.00	44.59	Peak	V	7.14	-	51.73	74.00	22.27

Band edge Field strength DCF Margin Frequency Level Ant. Pol. CF Limit **Detect mode** (MHz) $(dB\mu V)$ (H/V) (dB) (dB) $(dB\mu V/m)$ $(dB\mu V/m)$ (dB) 2389.52 50.79 74.00 50.92 Peak -0.13 23.21 Н _ V 2389.35 53.59 Peak -0.13 -53.46 74.00 20.54

-	ectrum 3 🛛 🛞 Spectrum 4	Spectrum 2	×		ctrum 3 🙁 Spectrum 4	Spectrum 2	8
Ref Level 107.00 dE Att 10	μV	Mode Auto FFT		Ref Level 107.00 dBµ' Att 10 d	W	lode Auto FFT	
1Pk Max				IPk Max		and the second	
		M3[1] M1[1]	50.92 dBµV 2.389520 GHz 43.20 dBûV	100 d8µV		M3[1] M1[1]	53.59 dBp 2.389350 G
0 dBµV		MIII	2.310000 GH2	90 dBµV			2.310000 GH
0 dBµV				80 dBµV			
0 dBµV				70 dBµV			
0 d8µV		hag	M	60 dBµV			me ha
1/11	mmmmmmm	mm		50 dBuV	mmmmm	man	
) dBµV				30 dBµV			
0 dBµV		F2		20 d8µV			F2
0 dBuV				10 dBµV			
art 2.3 GHz	691	pts	Stop 2.42 GHz	Start 2.3 GHz	691 p	ts	Stop 2.42 GH
orker				Marker			
vpe Ref Trc	2.31 GHz 43.20 dB		Function Result	Type Ref Trc M1 1	Stimulus Response 2.31 GHz 43.04 dBµV 2.39 GHz 53.22 dBµV	Function	Function Result

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



Report No .: KES-RF-20T0112 Page (34) of (55)

0 dby// M2[1] 40.57 dby/ 0 dby// 2.12160 GHz 10 dby// 2.12160 GHz 10 dby// 2.12160 GHz 10 dby// 2.12160 GHz 10 dby// 10 dby// <th>54.20 dBy 1.0040 GF 94.54 dBy 2.40520 GH</th>	54.20 dBy 1.0040 GF 94.54 dBy 2.40520 GH
00 dBuV M1[1] 94.40 dBuV M3[1] 00 dBuV M2[1] 49.57 dBuV 00 dBuV M2[1] 2.12160 dHz 00 dBuV M2[1] 2.12160 dHz 00 dBuV M2[1] 2.12160 dHz 00 dBuV M2[1] M3 00 dBuV M3 M3 00 dBuV M3 M4 00	1.00430 GH 94.34 dBp 2.40520 GH
00 dBu/- 0	1.00430 GH 94.34 dBp 2.40520 GH
0 dBy/	2.40520 GH
0 dB _W	Stop 3.0 GHz
0 dB ₄ /	Stop 3.0 GHz
0 db// 0 <td>Stop 3.0 GHz</td>	Stop 3.0 GHz
0 dBu/ 0 dBu/	Stop 3.0 GHz
1 BUV 10	Stop 3.0 GHz
Multi-instrumentation Multi-instrumentation Multi-instrumentation 0 dBy/- 0 dBy/- 0 dBy/- 10 dBy/- 0 d	Stop 3.0 GHz
0 dB/V 0 dB/V<	Stop 3.0 GHz
0 dBuV 0 dBuV 20 dBuV 20 dBuV 0 dBuV 0 dBuV 10 dBuV 10 dBuV 10 dBuV arker 50 dBuV arker 691 pts Stort 1.0 GHz 691 pts Stort 1.0 GHz 691 pts Type [Ref Trc Stimulus Response Function Function Result	
0 dBuV 0 dBuV 20 dBuV 20 dBuV 0 dBuV 0 dBuV 10 dBuV 10 dBuV 10 dBuV arker 50 dBuV arker 691 pts Stort 1.0 GHz 691 pts Stort 1.0 GHz 691 pts Type [Ref Trc Stimulus Response Function Function Result	
D diply 10 diply 10 diply chr1.0 GHz 691 pts Stop 3.0 GHz arker Stop 1.0 GHz 691 pts arker Type [Ref Trc Stimulus Response Function Function Result	
tart 1.0 GHz 691 pts Stop 3.0 GHz Start 1.0 GHz 691 pts 5 arker Yape Ref Trc Stimulus Response Function Function Result Type Ref Trc Stimulus Response Function Function Res	
arker Yype Ref Trc Stimulus Response Function Function Result Type Ref Trc Stimulus Response Function Function Res	
Type Ref Trc Stimulus Response Function Function Result Type Ref Trc Stimulus Response Function Function Result	
ype Ref Trc Stimulus Response Function Function Result Type Ref Trc Stimulus Response Function Function Result Mile 1 2,4107 CM 44 Add Add Add Add Add Add Add Add Add	
Spectrum	
Max PIPk Max	
Max Φ1Pk Max Φ1Pk Max Μ1[1] 44.76 dBμV	44.59 d 4.8240
Max e 1Pk Max	44.59 d 4.8240
Max UV 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
Max Max W1[1] 44.76 dBµV 4.8240 GHz 90 dBµV 90 dBµV 90 dBµV 90 dBµV 90 dBµV 90 dBµV 90 dBµV 90 dBµV 90 dBµV	
Max Max M1[1] 44.76 dBµV 4.0240 GHz 90 dBµV 80 dBµV 90 dBµV	
Max Mil1] 44.76 dBµV 4.9240 GHz 90 dBµV 80 dBµV 80 dBµV 11] 12	
Max Milli 44.76 dBµV 4.0240 GHz 90 dBµV 90 dBµV 70 dBµV 70 dBµV 10 10 10 10 10 10 10 1	
Max Max W1[1] 44.76 dBµV 4.0240 GH2 90 dBµV 90 dBµV 90 dBµV 70 dBµV 70 dBµV 10 10 10 10 10 10 10 1	
Max Max WI[1] 44.76 dBµV 4.0240 GHz 90 dBµV 80 dBµV 80 dBµV 10 1 10	4,8240
Max M1[1] 44.76 dBµV M1[1]	
Max MI[1] 44.76 dBµV MI[1] uv 4.0240 GHz 90 dBµV 019k Max uv 4.0240 GHz 019k Max 019k Max uv 4.0240 GHz 019k Max 019k Max uv 019k Max 019k Max 019k Max 019k Max uv 019k Max 019k Max 019k Max 019k Max uv 019k Max 019k Max 019k Max <td< td=""><td>4,8240</td></td<>	4,8240
Max MI[1] 44.76 dBµV MI[1]	4,8240
Max MI[1] 44.76 dBµV MI[1] uv 4.0240 GHz 90 dBµV 019k Max uv 4.0240 GHz 019k Max 019k Max uv 4.0240 GHz 019k Max 019k Max uv 019k Max 019k Max 019k Max 019k Max uv 019k Max 019k Max 019k Max 019k Max uv 019k Max 019k Max 019k Max <td< td=""><td>4,8240</td></td<>	4,8240
Max M1[1] 41.76. dbp/ 4.0240 ortz uV 1 10.240 ortz uV 1 1	4,8240
Max MI[1] 44.76 dBµV MI[1]	4,8240
Max Wax W W W W W W M1[1] 4.76 day 4.76 day 90 day W 00 day W 00 day W 00 day 00 day	4,8240
Max Max Max Mili	4,8240



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-RF-20T0112 Page (35) of (55)

Mode:	802.11g
Distance of measurement:	3 meter
Channel:	06

- Spurio	us							
Frequency (MHz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2121.60	52.39	Peak	Н	-0.68	-	51.71	74.00	22.29
2518.10	51.18	Peak	Н	0.17	-	51.35	74.00	22.65
1033.30	54.66	Peak	V	-8.45	-	46.21	74.00	27.79
2358.90	49.53	Peak	V	-0.19	-	49.34	74.00	24.66
4874.00	43.91	Peak	Н	7.51	-	51.42	74.00	22.58
4874.00	44.37	Peak	V	7.51	-	51.88	74.00	22.12

Spectrum Sp Ref Level 107.00 d	100 J - 100	Spectrum 4	× Spectru	n 2 🛞		Spectrum S Ref Level 107.00 c	Contraction (1999)	Spectrum 4	Spectrum	n2 🗷	a a
	dB SWT 2 ms . V		de Auto Sweep				0 dB SWT 2 ms =		de Auto Sweep		
1Pk Max	19		1000		LOUIS LOUIS	1Pk Max	14 - 14 - 14 - 14 - 14 - 14 - 14 - 14 -		1000		
100 d8µV			M3[1] M1[1]	MI	51,18 dBµV 2,51810 GHz 97,72 dBµV 2,43990 GHz	100 dBµV			M3[1] M1[1]	MI	54,66 dB 1.03330 G 96,70 dB 2,44570 G
60 dBuV		-				80 dBµV					
70 dBµV						70 dBµV					
60 dBuV			M2	M3		AB dBuV				2	
SD dBuV	manum	meaning	manuerolan	at the two ways		Sought men		man and and	when when	A warman	manan
40 dBuV						40 dBµV					
30 dBµV						30 dBµV				+ +	
20 dBµV						20 dBµV					
10 dBµV-						10 dBµV-					
Start 1.0 GHz		691 pt	5		Stop 3.0 GHz	Start 1.0 GHz		691 pt	5		Stop 3.0 GH
Marker Type Ref Trc M1 1 M2 1 M3 1	Stimulus 2.4399 GHz 2.1216 GHz 2.5181 GHz	Response 97.72 dBμV 52.39 dBμV 51.18 dBμV	Function	Function Re	esult	Marker Type Ref Trc M1 1 M2 1 M3 1	Stimulus 2.4457 GHz 2.3589 GHz 1.0333 GHz	Response 96.78 dBµV 49.53 dBµV 54.66 dBµV	Function	Functio	n Result
N			Mean	uring Electron	**				Meas	uring (1999)	
Hor	izontal //	Peak	for 3 G	z to 18 G	hz	Ve	rtical // l	Peak fo	r3GHz	to 18 (Hz
				m 2 🛞	₫		ectrum 3 🛞	Spectrum 4	× Spectru	m 2 🛞	

1Pk Max		e 1Pk M	lax			
	M1[1]	43.91 d8µV 4.8740 GHz			M1[1]	44.37 dBpV 4.8740 GHz
90 dBuV		90 dB	v			
80 d8µV		80 dB ₄	v			
70 d8µV		70 dB ₆	v			
60 d8µV		60 dBi	v			
50 dBµV M1	N	50 des	S M1	5		a manufanter and
40 dBµV	around when when when when when when when when	to des	weather and the way of the	man and and a service of the	- manufactures	mannen
30 d8µV		30 dB	v			
20 dBµV		20 dB _k	v			
10 dBµV		10 dB ₁	v-			
Start 3.0 GHz	691 pts	Stop 18.0 GHz Start	3.0 GHz	691 pt		Stop 18.0 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



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

Mode:	802.11g
Distance of measurement:	3 meter
Channel:	11

- Spurio	us							
Frequency (MHz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2121.60	51.04	Peak	Н	-0.68	-	50.36	74.00	23.64
2544.10	52.02	Peak	Н	0.27	-	52.29	74.00	21.71
1000.00	56.05	Peak	V	-8.64	-	47.41	74.00	26.59
2121.60	49.02	Peak	V	-0.68	-	48.34	74.00	25.66
4924.00	44.75	Peak	Н	7.88	-	52.63	74.00	21.37
4924.00	44.38	Peak	V	7.88	-	52.26	74.00	21.74

Band edge

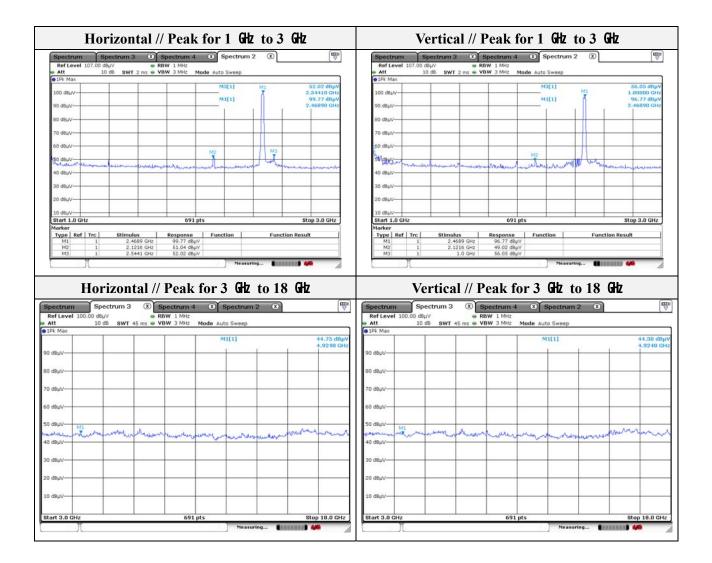
Frequency (Mz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2489.43	49.13	Peak	Н	0.09	-	49.22	74.00	24.78
2491.26	48.64	Peak	V	0.09	-	48.73	74.00	25.27

Spectrum Sp	ectrum 3 💌	Spectrum 4	Spectrum :	2 🗴	Spectrum	Sp	ectrum 3 🛛 🕱	Spectrum 4	(X) Spectrum	2 (*)	2
Ref Level 107.00 di		RBW 1 MHz		i i i i i i i i i i i i i i i i i i i	Ref Level			RBW 1 MHz			
Att 10 1Pk Max	dB SWT 7.6 µs 🖷	VBW 3 MHz M	ode Auto FFT		Att 1Pk Max	10 (d8 SWT 7.6 µs 🖷	VBW 3 MHz N	Iode Auto FFT		
IPK MdX		1 11	M3[1]	49.13 dBuV	The way			1 11	M3[1]		48.64 dBu
100 dBµV-	100			2.4894250 GHz	100 d8µV-						2.4912550 GH
			M1[1]	49.10 d8µV		~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		M1[1]		48.25 dBp
PO dBuV			_	2.4835000 GHz	90 dBhA					7. 7.	2.4835000 GF
30 dBµV-					80 dBµV-						
70 dBuV					70 dBuV						
o depr					/ C Copt					1 11	
0 dBµV	5				60 dBµV			_		+++	
		MI	M3					m w	M3	No.	
50 dBµV			mitim	man the mark	50 dBµV			~	mont	- nemt	the
40 dBuV					40 d8uV						~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
o osha					40 0604						
Vueb 06	-		-	C	30 dBuV						
0.000										1 11	
20 d8µV					20 d8µV					+	
- 17 m A12		F1		F2	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -					F2	
10 dBµV		1 I			10 dBµV-						
Start 2.455 GHz		691 pts		Stop 2.51 GHz	Start 2.455	GHz		691 pt	s		Stop 2.51 GHz
1arker					Marker	Land .					
Type Ref Trc	Stimulus 2.4835 GHz	49.10 dBuV	Function	Function Result	Type Ref	Trc	2.4835 GHz	48.25 dBµV	Function	Functio	in Result
M2 1	2.4035 GHz	46.46 dBµV			M2	1	2.4035 GHz	48.38 dBµV			
M3 1	2.489425 GHz	49.13 dBµV			M3	1	2.491255 GHz	48.64 dBµV			

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



Report No.: KES-RF-20T0112 Page (37) of (55)





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

Mode:	802.11n(HT20)
Distance of measurement:	3 meter
Channel:	01

- Spurio	us							
Frequency (MHz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1010.10	50.41	Peak	Н	-8.58	-	41.83	74.00	32.17
2127.40	49.30	Peak	Н	-0.67	-	48.63	74.00	25.37
1030.40	51.73	Peak	V	-8.47	-	43.26	74.00	30.74
2121.60	51.21	Peak	V	-0.68	-	50.53	74.00	23.47
4824.00	44.37	Peak	Н	7.14	-	51.51	74.00	22.49
4824.00	43.84	Peak	V	7.14	-	50.98	74.00	23.02

Band edge DCF Margin Frequency Level Ant. Pol. CF Field strength Limit **Detect mode** (MHz) $(dB\mu V)$ (H/V) (dB) (dB) $(dB\mu V/m)$ $(dB\mu V/m)$ (dB) 2388.65 45.30 74.00 28.70 45.44 Peak -0.14 Н _ V 52.22 2353.05 52.43 Peak -0.21 -74.00 21.78

the second se	ectrum 3 🛞 Spectrum		× (***		ectrum 3 🛛 🛞 Spectr	and a second second	m 2 🛞
Ref Level 107.00 dB Att 10	μV			Ref Level 107.00 dB	UV RBW 11 dB SWT 17 US VBW 31		
1Pk Max				O 1Pk Max			
100 d8µV		M3[1] M1[1]	45.44 dBpV 2.388650 GHz	100 d8µV		M3[1]	52.43 dBµ 2.353050 GH
90 dBµV-			2.310000 GHz	90 dBµV-		mili	2.319000 GH
30 dBµV				80 dBµV-			
70 dBµV-				70 dBµV-			
0 dBµV(zt		198		50 dBuV	M		12 miles
O dBµV				40 dBµV-	mmmmmm	M CALMAN	
i0 dBµV				30 dBµV	/		
20 dBµV		F2	2	20 d8µV			F2
Start 2.3 GHz	69	91 pts	Stop 2.42 GHz	Start 2.3 GHz		691 pts	Stop 2.42 GHz
larker				Marker			
Type Ref Trc M1 1 M2 1 M3 1	Stimulus Respons 2.31 GHz 44.37 c 2.39 GHz 44.53 c 2.38865 GHz 45.44 c	18µV 18µV	Function Result	Type Ref Trc M1 1 M2 1 M3 1	2.39 GHz 51.	onse Function 48 dBµV 89 dBµV 89 dBµV 43 dBµV	Function Result



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-RF-20T0112 Page (39) of (55)

Ref Level 107.00 dBµV	RBW 1 MHz		×	Ref	Level 107.00 dB	uV 🖷 RE	Spectrum 4 SW 1 MHz			×)	[Ţ
Att 10 dB SV 1Pk Max	VT 2 ms VBW 3 MHz Mode A	uto Sweep		Att IPk		dB SWT 2 ms 🖷 VI	SW 3 MHz	Mode Auto Swe	ер		
IPK max		M3[1]	50.4	1 dBpV	max		1	M3[1]	-		51.73 dBpV
00 dBhA		M1[1] J		10 GHz 100 d	BLIV		-	MILLI	MI		1.03040 GHz 94.34 dBµV
0 dBµV		- MILI		90 dB	uv-		-	MILII	h		2.41970 GHz
									1	-	
Vu8b 0				80 dB							
0 dBµV				70 dB	uV		-				
0 dBµV				60 dB	μV		-	-		_	
0 dBµV	M		1.2	90 dg	0.00			M2			
the contraction of the court	have a present and the second second	- chandel	when requirements	aurent	annorth	en communication	Manner	method	And All	walnumbling	manun
0 dBuV				40 dB	uv-						
0 dBµV				30 dB	μV			-			
0 dBµV				20 dB	uv-						
0 dBuV				10 dB							
itart 1.0 GHz	691 pts		Stop 3.		1.0 GHz		691	pts		5	top 3.0 GHz
arker		unction	Function Result	Marke		Stimulus	Response		22	Function Res	
	ntal // Peak for		to 18 GHz			rtical // P		or 3 GH		18 GHz	
f Level 100.00 dBµV	3 Spectrum 4 (X	• 3 GHz t	to 18 GHz		Im Spec	trum 3 🛞 🔊	pectrum 4 3W 1 MHz	or 3 G	to 2		
ctrum Spectrum 3 f Level 100.00 dBμV 10 dB sw1	3 🛞 Spectrum 4 📧	• 3 GHz t Spectrum 2 Auto Sweep	to 18 GHz	Ref Le Att 1Pk Mai	im Spec vel 100.00 dBμV 10 dB	trum 3 🛞 S	pectrum 4 3W 1 MHz	Or 3 GH	to a	18 GHz	
f Level 100.00 dBµV	3 Spectrum 4 (X	• 3 GHz t	to 18 GHz	Att 4.37 dBpV	im Spec vel 100.00 dBμV 10 dB	trum 3 🛞 🔊	pectrum 4 3W 1 MHz	or 3 G	to a	18 GHz	43.84 d
Ctrum Spectrum : Level 100.00 dBµV 10 dB swi Max	3 Spectrum 4 (X	• 3 GHz t Spectrum 2 Auto Sweep	to 18 GHz	Ref Le Att 1Pk Mai	im Spec vel 100.00 dBμV 10 dB	trum 3 🛞 🔊	pectrum 4 3W 1 MHz	Or 3 GH	to a	18 GHz	43.84 di 4,8240 (
Spectrum Spectrum ?Level 100.00 dBµV 10 dB swn Max	3 Spectrum 4 (X	• 3 GHz t Spectrum 2 Auto Sweep	to 18 GHz	Ref Le ▲ Att ● 1Pk Ma: ● 1Pk Ma: ● 240 GHz 90 d8µV-	im Spec vel 100.00 dBμV 10 dB	trum 3 🛞 🔊	pectrum 4 3W 1 MHz	Or 3 GH	to a	18 GHz	43.84 d
Spectrum Spectrum 'Level 100.00 dBµV 10 dB sW1 Max	3 Spectrum 4 (X	• 3 GHz t Spectrum 2 Auto Sweep	to 18 GHz	Ref Le Att 19k Mai 4.37 dBpV .8240 GHz	im Spec vel 100.00 dBμV 10 dB	trum 3 🛞 🔊	pectrum 4 3W 1 MHz	Or 3 GH	to a	18 GHz	43.84 d
Spectrum Spectrum Level 100.00 dBµV 10 dB SWI Max 10 dB SWI upv 10 dB SWI	3 Spectrum 4 (X	• 3 GHz t Spectrum 2 Auto Sweep	to 18 GHz	4.37 dBµV 8240 GHz 90 dBµV- 80 dBµV-	im Spec vel 100.00 dBμV 10 dB	trum 3 🛞 🔊	pectrum 4 3W 1 MHz	Or 3 GH	to a	18 GHz	43.84 d
Spectrum Spectrum Level 100.00 dBµV 10 dB SWI Max 10 dB SWI µV 10 dB SWI	3 Spectrum 4 (X	• 3 GHz t Spectrum 2 Auto Sweep	to 18 GHz	Ref Le ▲ Att ● 1Pk Ma: ● 1Pk Ma: ● 240 GHz 90 d8µV-	im Spec vel 100.00 dBμV 10 dB	trum 3 🛞 🔊	pectrum 4 3W 1 MHz	Or 3 GH	to a	18 GHz	43.84 d
Spectrum Spectrum Level 100.00 dBµV 10 dB sw1 Max 10 dB sw1 µV 10 dB sw1 µV 10 dB sw1	3 Spectrum 4 (X	• 3 GHz t Spectrum 2 Auto Sweep	to 18 GHz	4.37 dBµV 8240 GHz 90 dBµV- 80 dBµV-	im Spec vel 100.00 dBμV 10 dB	trum 3 🛞 🔊	pectrum 4 3W 1 MHz	Or 3 GH	to a	18 GHz	43.84 d
Spectrum Spectrum 'Level 100.00 dBµV 10 dB swi Max 10 dB swi Igy 10 dB swi Igy 10 dB swi	3 Spectrum 4 (X	• 3 GHz t Spectrum 2 Auto Sweep	to 18 GHz	Rof Le 4.37 dBµV 0.240 GHz 90 dBµV- 80 dBµV- 80 dBµV- 70 dBµV- 60 dBµV-	im Spec vel 100.00 dBμV 10 dB	trum 3 🛞 🔊	pectrum 4 3W 1 MHz	Or 3 GH	to a	18 GHz	43.84 d
Spectrum Spectrum I Level 100.00 dBµV 10 dB SWI Max 340 340 340 340 340 340 340 340 401	3 Spectrum 4 (X	• 3 GHz t Spectrum 2 Auto Sweep	s 18 GHz		im Spec vel 100.00 dBμV 10 dB	trum 3 () S R SWT 45 ms = V	pectrum 4 SW 1 MHz SW 3 MHz	Or 3 GH	to a		43.84 (1
Spectrum : Level 100.00 dBµV 10 dB SWI Max 10 dB 10// 10 dB 10//	3 Spectrum 4 (X	• 3 GHz t Spectrum 2 Auto Sweep	to 18 GHz	Ref Leg * Att 0.2740 CHz 90 dbµ/- 90 dbµ/- 90 dbµ/- 00 dbµ/- 60 dbµ/- 50 dbµ/- 50 dbµ/-	im Spec vel 100.00 dBμV 10 dB	trum 3 🛞 🔊	pectrum 4 BW 1 MHz BW 3 MHz	Or 3 GH	to a	18 GHz	43.84 (0
Spectrum Spectrum 'Level 100.00 dBµV 10 dB swi Max 10 dB swi Igy 10 dB swi Igy 10 dB swi	3 Spectrum 4 (X	• 3 GHz t Spectrum 2 Auto Sweep	s 18 GHz		im Spec vel 100.00 dBμV 10 dB	trum 3 () S R SWT 45 ms = V	pectrum 4 BW 1 MHz BW 3 MHz	Mode Auto Sy Mode Auto Sy Mil[1]	trum 2		43.84 (0
Spectrum : Level 100.00 dBµV 10 dB sw1 Max	3 Spectrum 4 (X	• 3 GHz t Spectrum 2 Auto Sweep	s 18 GHz	Ref Leg * Att 0.2740 CHz 90 dbµ/- 90 dbµ/- 90 dbµ/- 00 dbµ/- 60 dbµ/- 50 dbµ/- 50 dbµ/-	im Spec vel 100.00 dBμV 10 dB	trum 3 () S R SWT 45 ms = V	pectrum 4 BW 1 MHz BW 3 MHz	Mode Auto Sy Mode Auto Sy Mil[1]	trum 2		43.84 (1
Spectrum : Level 100.00 dBµV 10 dB sw1 Max	3 Spectrum 4 (X	• 3 GHz t Spectrum 2 Auto Sweep	s 18 GHz	Ref Leg 4.37 dBµV 90 dBµV-	im Spec vel 100.00 dBμV 10 dB	trum 3 () S R SWT 45 ms = V	pectrum 4 BW 1 MHz BW 3 MHz	Mode Auto Sy Mode Auto Sy Mil[1]	trum 2		43.84 (1
Spectrum : Level 100.00 dBµV 10 dB SWI Max 10 dB 10// 10 dB 10//	3 Spectrum 4 (X	• 3 GHz t Spectrum 2 Auto Sweep	s 18 GHz	Ref Leg 4.37 dBµV 90 dBµV-	im Spec vel 100.00 dBμV 10 dB	trum 3 () S R SWT 45 ms = V	pectrum 4 BW 1 MHz BW 3 MHz	Mode Auto Sy Mode Auto Sy Mil[1]	trum 2		43.84 (0
Spectrum : Level 100.00 dBµV 10 db swr Max uv	3 Spectrum 4 (X	• 3 GHz t Spectrum 2 Auto Sweep	s 18 GHz	Ref Le ● Att ● 19k Mai ● 19k Mai ● 10k	im Spec vel 100.00 dBμV 10 dB	trum 3 () S R SWT 45 ms = V	pectrum 4 BW 1 MHz BW 3 MHz	Mode Auto Sy Mode Auto Sy Mil[1]	trum 2		43.84 d 4,8240
Spectrum Spectrum Level 100.00 dBµV 10 dB Sw1 W 0	3 Spectrum 4 (X	• 3 GHz t Spectrum 2 Auto Sweep	s 18 GHz	Rof Le 4.37 dByV 0.240 GHz 90 dByV- 80 dByV- 80 dByV- 70 dByV- 60 dByV- 50 dByV- 30 dByV- 30 dByV-	im Spec vel 100.00 dBμV 10 dB	trum 3 () S R SWT 45 ms = V	pectrum 4 BW 1 MHz BW 3 MHz	Mode Auto Sy Mode Auto Sy Mil[1]	trum 2		43.84 (0
Spectrum Spectrum Level 100.00 dBµV 10 dB swith Max 0 0 0 MV 0 0 0	3 Spectrum 4 (X	• 3 GHz t Spectrum 2 Auto Sweep	CO 18 GHz	Ref Le ● Att ● 19k Mai ● 19k Mai ● 10k	Imm Spect rel 100.00 dBµ/ 10 dB 10 dB c 10 dB	trum 3 () S R SWT 45 ms = V	pectrum 4 BW 1 MHz BW 3 MHz	Or 3 GH	trum 2		43.84 d 4,8240



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

Mode:	802.11n(HT20)
Distance of measurement:	3 meter
Channel:	06

- Spurio	us							
Frequency (MHz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1010.10	52.93	Peak	Н	-8.58	-	44.35	74.00	29.65
2127.40	51.08	Peak	Н	-0.67	-	50.41	74.00	23.59
1027.50	52.93	Peak	V	-8.48	-	44.45	74.00	29.55
2127.40	48.62	Peak	V	-0.67	-	47.95	74.00	26.05
4874.00	44.41	Peak	Н	7.51	-	51.92	74.00	22.08
4874.00	44.71	Peak	V	7.51	-	52.22	74.00	21.78

Spectrum	Spectrum 3 🛞	Spectrum 4	Spectrum 2	2 🛞		Spectrun	n Sp	ectrum 3 🛛 🛞	Spectrum 4	× Spectrun	n2 🛞	E
Ref Level 107.0		RBW 1 MHz	-				107.00 dB		BW 1 MHz			
Att 1Pk Max	10 dB SWT 2 ms 🖷 🕅	VBW 3 MHz Mode	Auto Sweep			Att IPk Max	10	dB SWT 2 ms 🖷 V	BW 3 MHZ MO	de Auto Sweep		
	T T	1 1	M1[1]		95.91 dBpV		<u> </u>			M3[1]		52.93 dBj
100 dBµV			M2[1]	MI	2.44280 GHz 51.08 dBuV	100 dBµV-	-		+ +	MILLI	241	1.02750 GF 95.01 dBt
90 dBµV			math	1	2.12740 GHz	90 dBuV				milit	1	2.44280 G
			1 1								1.	
eo dauv-						80 dBhA						
70 dBµV						70 dBµV						
60 dBuV						60 dBuV-				-	2 C	
on notiv			12.			M3				M2	7	
D dBuV				thereauch		SDIdBuV-		Encountry of the second second		A shale	Although	
40 dBuV		mannen	herenau	muchan	and the second second	40 dBuV	or and date	Hornouneru	monenership	and the second s	a marine	up we when
30 dBuV						30 dBµV			+ +		+ +	
20 dBuV			_			20 dBµV-						
10 dBµV Start 1.0 GHz		691 pts			Stop 3.0 GHz	10 dBµV-	Hz		691 pt			Stop 3.0 GH
Marker	a second constant	071 pts			otop oto une	Marker		warmen warmen all and	or p.			otop oto un
Type Ref Trc			unction	Function Res	sult	Type Re		Stimulus	Response	Function	Function	n Result
M1 1 M2 1		95.91 dBµV 51.08 dBµV				M1 M2	1	2.4428 GHz 2.1274 GHz	95.01 dBµV 48.62 dBµV			
M3 1	1.0101 GHz	52.93 dBµV				M3	1	1.0275 GHz	52.93 dBµV			
J			Measuri	ng (1111111)	444][Meas	uring 🚺	11 1 444
				ALL MARKED AND AND		10	1.1 F.N.					
TT.		D I. C	. 2 AP	4. 10 /	I -		¥7		I. C.		4. 10 (16
HO	rizontal //	Peak IO	r y unz	to 18 u			ve	rtical // P	еак 10	rounz	to 18 u	NZ.
		a	Ya	a (0)	(m)	6				a la la	- D	
			Spectrum	2 (8)		Spectrum	100 Mar		pectrum 4	Spectru	m 2 🙁	
of Level 100.00	18µV	RBW 1 MHz VBW 3 MHz Mode	Auto Sweep			Ref Level 1 Att	00.00 dBµV 10 dB		BW 1 MHz BW 3 MHz M	ode Auto Sweep		
tt 1							10 08	OTTI 75 115 . Y	Part of the last			

1			Heasuring	
Start 3.0 GHz 691 pts	Stop 18.0 GHz Measuring	Start 3.0 GHz	691 pts St Measuring	op 18.0 GH
10 dBµV-		10 dBµV		
20 dBµV		20 dBµV		
10 dBµV		30 dBµV		
10 dBuV	and and a second and and a second	40 dBµV	approximation and a second and a	
10 dBUV MI	norman management marken	50 dB/V MI whomas Miner	many my munimental	norm
0 dBµV		60 dBµV		-
70 dBuV		70 d8µV		
10 dBµV		80 dBµV		
0 dBuV		90 dBµV		
	M1[1] 44.41 dBpV 4.8740 GHz		MI(1)	44.71 dBj 4.8740 Gł

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



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

Mode:	802.11n(HT20)
Distance of measurement:	3 meter
Channel:	11

- Spurio	us							
Frequency (Mz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1000.00	51.93	Peak	Н	-8.64	-	43.29	74.00	30.71
2127.40	49.82	Peak	Н	-0.67	-	49.15	74.00	24.85
1018.80	56.45	Peak	V	-8.53	-	47.92	74.00	26.08
2127.40	49.57	Peak	V	-0.67	-	48.90	74.00	25.10
4924.00	44.85	Peak	Н	7.88	-	52.73	74.00	21.27
4924.00	44.47	Peak	V	7.88	-	52.35	74.00	21.65

Band edge

_

Frequency (MHz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2484.41	50.78	Peak	Н	0.08	-	50.86	74.00	23.14
2484.25	50.32	Peak	V	0.07	-	50.39	74.00	23.61

Spectrum Sp	ectrum 3 🛞 Spe	ectrum 4 🛞 Spectru	m 2 🙁 🕎	Spectrum	pectrum 3 🛛 🛞	Spectrum 4	(X) Spectrum	2 (*)
Ref Level 107.00 de		W 1 MHz		Ref Level 107.00 d		RBW 1 MHz		
	dB SWT 7.6 µs . VB	W 3 MHz Mode Auto FFT			0 dB SWT 7.6 µs 🖷	VBW 3 MHz M	ode Auto FFT	
• 1Pk Max				1Pk Max				
100 dBuV		M3[1]	50.78 dBµV 2.4844100 GHz	100 d8uV-			M3[1]	50.32 dBp 2.4842510 G
	m	M1[1]	48.37 dBuV	100 0800			M1[1]	48.03 dBt
O dBuV		cont al	2,4835000 GHz	90 dBuV	m		(artr)	2,4835000 G
10000000			1					1 1
BO dBµV				80 dBµV				
- 22						1 11		
70 dBµV				70 dBµV				++
20122000				10002000		- II		
60 dBµV				60 dBµV	1			
50 dBuV		MIX	MO	50 dBuV		M	13	M2
50 UDDV			mon	30 0604			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mann
40 d8uV-				40 d8uV-				
COLORA DE								
30 dBµV	-			30 dBµV-				
						1 11		
20 d8µV				20 d8µV				
10 dBuV		F1	P2	10 dBuV		F1		12
Start 2.455 GHz		691 pts	Stop 2.51 GHz	Start 2.455 GHz		691 pt		Stop 2.51 GH
Marker		031 pts	stup 2.31 GH2	Marker		691 pc		5top 2.51 GH
Type Ref Trc	Stimulus F	Response Function	Function Result	Type Ref Trc	Stimulus	Response	Function	Function Result
M1 1	2,4835 GHz	48.37 dBuV	r unceron Ausure	M1 1	2.4835 GHz	48.03 dBµV	runcion	r unceron Result
M2 1	2.5 GHz	46.91 dBµV		M2 1	2.5 GHz	47.02 dBµV		
M3 1	2.48441 GHz	50.78 dBµV		M3 1	2.484251 GHz	50.32 dBµV		

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



Report No.: KES-RF-20T0112 Page (42) of (55)

Ref Level 107.00 dBµV	Spectrum 4 Spectru BBW 1 MHz		Ref Level 107.00 dB	ectrum 3 (8) Spectrum 4 μV	Spectrum 2	®
Att 10 dB SWT 2	2 ms 🖷 VBW 3 MHz Mode Auto Sweep		Att 10 IPk Max	dB SWT 2 ms = VBW 3 MHz M	ode Auto Sweep	
	M3[1]	51,93 dBpV	PK max		M3[1]	56.45 dBp
100 dBµV	M1[1]	M1 1.08000 GHz 95.43 dBµV	100 dBµV		M1[1]	M1 1.01880 GH
0 dBµV	MIII	2.46600 GHz	90 dBµV		mili	2.46020 GH
to dauv-			80 dBuV			
0 dBµV			70 dBµV			
0 dBµV			50 dBµV			
0 dBuV	M2		PerdBuv		MZ	
and the second s	man marker and her guess	and whomen more service and	and the second	when an and when have been a	und limenster -	1 how also marchenton
0 dBµV			40 dBµV-			
0 dBµV			30 dBµV			
0 dBµV			20 dBµV			
0 dBµV			10 dBµV	· · · · · · · · · · · · · · · · · · ·		
tart 1.0 GHz	691 pts	Stop 3.0 GHz	Start 1.0 GHz	691 p	ts	Stop 3.0 GHz
arker Iype Ref Trc Stimulus	s Response Function	Function Result	Marker Type Ref Trc	Stimulus Response	Function	Function Result
	al // Peak for 3 G			rtical // Peak fo		
Ctrum Spectrum 3	al // Peak for 3 G	rum 2 8		ctrum 3 (8) Spectrum 4	Spectrum 2	
Ctrum Spectrum 3 Level 100.00 dBµV 10 dB SWT 45	Spectrum 4 Spectrum 4 Source Spectrum 4 BW 1 MHz ms • VBW 3 MHz Mode Auto Swee	rum 2 🗶 🕎	Spectrum Spec Ref Level 100.00 dBµV	ctrum 3 (8) Spectrum 4	Spectrum 2 Iode Auto Sweep	8
Ctrum Spectrum 3	Spectrum 4 Spectrum 4 RBW 1 MHz	rum 2 8	Spectrum Spec Ref Level 100.00 dBµV Att 10 dB	ctrum 3 (8) Spectrum 4	Spectrum 2	44.47 d
Ctrum Spectrum 3 Level 100.00 dBµV 10 dB SWT 45	Spectrum 4 Spectrum 4 Source Spectrum 4 BW 1 MHz ms • VBW 3 MHz Mode Auto Swee	rum 2 ③ 🕎	Spectrum Spec Ref Level 100.00 dBµV Att 10 dB	ctrum 3 (8) Spectrum 4	Spectrum 2 Iode Auto Sweep	44.47 d
Spectrum Spectrum 3 Level 100.00 dBµV 10 dB SWT 45 Max	Spectrum 4 Spectrum 4 Solution RBW 1 MHz ms • VBW 3 MHz Mode Auto Swee	rum 2 ③ 🕎	Spectrum Spectrum Rof Level 100.00 dBµV Att 10 dB 10 dB 90 dBµV	ctrum 3 (8) Spectrum 4	Spectrum 2 Iode Auto Sweep	44.47 d
Spectrum Spectrum 3 Level 100.00 dBµV 10 dB SWT 45 Max	Spectrum 4 Spectrum 4 Solution RBW 1 MHz ms • VBW 3 MHz Mode Auto Swee	rum 2 3 🕎	Spectrum Spec Ref Level 100.00 dBµV Att 10 dB P1Pk Max	ctrum 3 (8) Spectrum 4	Spectrum 2 Iode Auto Sweep	44.47 d
Spectrum 3 Level 100.00 dBµV 10 dB SWT 45 Max	Spectrum 4 Spectrum 4 Solution RBW 1 MHz ms • VBW 3 MHz Mode Auto Swee	rum 2 3 🕎	Spectrum Spectrum Rof Level 100.00 dBµV Att 10 dB 10 dB 90 dBµV	ctrum 3 (8) Spectrum 4	Spectrum 2 Iode Auto Sweep	44.47 d
Spectrum Spectrum 3 Level 100,00 dBµV 10 dB swr 45 Max	Spectrum 4 Spectrum 4 Solution RBW 1 MHz ms • VBW 3 MHz Mode Auto Swee	rum 2 3 🕎	Spectrum Spect Ref Level 100.00 dBµV att att 10 dB PIPk Max 90 dBµV 80 dBµV B0 dBµV	ctrum 3 (8) Spectrum 4	Spectrum 2 Iode Auto Sweep	44.47 d
Spectrum Spectrum 3 Level 100,00 dBµV 10 dB swr 45 Max	Spectrum 4 Spectrum 4 Solution RBW 1 MHz ms • VBW 3 MHz Mode Auto Swee	rum 2 3 🕎	Spectrum Spect Ref Level 100.00 dBµV att att 10 dB PIPk Max 90 dBµV 80 dBµV B0 dBµV	ctrum 3 (8) Spectrum 4	Spectrum 2 Iode Auto Sweep	
Spectrum 3 Level 100.00 dBµV 10 dB SWT 45 Max uV uV uV uV uV	Spectrum 4 Spectrum 4 Solution RBW 1 MHz ms • VBW 3 MHz Mode Auto Swee	rum 2 3 🕎	Spectrum Spectrum Ref Level 100.00 dBµV 0 dB • Att 10 dB • IPk Max 90 dBµV 80 dBµV 90 dBµV 60 dBµV 60 dBµV	ctrum 3 (8) Spectrum 4	Spectrum 2 Iode Auto Sweep	44.47 d
Spectrum Spectrum 3 Level 10.00 dBµV 10 dB swr 45 Max 0 10 dB swr 45 uV 0 10 dB 10 dB	Spectrum 4 S	rum 2 2 () ep 44.85 dBpV 4.0240 GHz 4.0240 GHz	Spectrum Spect Ref Level 100.00 dBµV 0 dB ● 1Pk. Max 10 dB 90 dBµV 0 80 dBµV 0 70 dBµV 0 60 dBµV 50 dBµV	ctrum 3 ② Spectrum 4 /	Spectrum 2 Spectrum 2 Mi[1]	44.47 d 4.9240
Spectrum 3 Level 100.00 dBµV 10 dB SWT 45 Max UV UV UV UV UV	Spectrum 4 S	rum 2 3 🕎	Spectrum Spect Ref Level 100.00 dBµV att ● IPk. Max 10 dB 90 dBµV b0 dBµV 70 dBµV b0 dBµV 70 dBµV b0 dBµV 50 dBµV b0 dBµV 50 dBµV b0 dBµV	Ctrum 3 Spectrum 4 Strum 4 SWT 45 ms VBW 3 M4z	Spectrum 2 Iode Auto Sweep	44.47 d 4.9240
Spectrum Spectrum 3 Level 100.00 68,1V 10 8 WT 45 Max 0 0 8 WT 45 0	Spectrum 4 S	rum 2 2 () ep 44.85 dBpV 4.0240 GHz 4.0240 GHz	Spectrum Spectrum Ref Level 100.00 dBµV att • IPk Max 90 dBµV 90 dBµV att 70 dBµV att 50 dBµV att 70 dBµV att 80 dBµV att 90 dBµV att	ctrum 3 ② Spectrum 4 /	Spectrum 2 Spectrum 2 Mi[1]	44.47 d 4.9240
Spectrum Spectrum 3 Level 10.00 dBµV 10 BWT 45 Max 0 BWT 45 BWT 45 UV 0 BWT 0 BWT 45	Spectrum 4 S	rum 2 2 () ep 44.85 dBpV 4.0240 GHz 4.0240 GHz	Spectrum Spectrum Ref Level 100.00 dBµV att • IPk Max 90 dBµV 90 dBµV att 70 dBµV att 50 dBµV att 70 dBµV att 80 dBµV att 90 dBµV att	ctrum 3 ② Spectrum 4 /	Spectrum 2 Spectrum 2 Mi[1]	44.47 d 4.9240
Spectrum Spectrum 3 Level 100.00 dBµV 10 dB 8WT 45 Max 10 dB 8WT 45 10 dB 10 dB Max 10 dB 9WT 45 10 dB 10 d	Spectrum 4 S	rum 2 2 () ep 44.85 dBpV 4.0240 GHz 4.0240 GHz	Spectrum Spectrum Rof Level 100.00 dBµV 10 dB ● IPk Max 90 dBµV 80 dBµV 90 dBµV 70 dBµV 60 dBµV 50 dBµV 10 dBµV 30 dBµV 10 dBµV	ctrum 3 ② Spectrum 4 /	Spectrum 2 Spectrum 2 Mi[1]	44.47 d 4.9240
Spectrum Spectrum 3 Level 100.00 68,1V 10 8 WT 45 Max 0 0 8 WT 45 0	Spectrum 4 S	rum 2 2 () sp 	Spectrum Spectrum Ref Level 100.00 dBµV 0 dB ● IPk Max 10 dB 90 dBµV 0 80 dBµV 0 60 dBµV 10 50 dBµV 10 40 dBµV 10	ctrum 3 ② Spectrum 4 /	Spectrum 2 Spectrum 2 Mi[1]	44.47 d 4.9240
Spectrum Spectrum 3 Level 100.00 dB _J V 10 dB SWT 45 Max 0 0 0 UV 0 0 0	Spectrum 4 S	rum 2 2 () sp 	Spectrum Spect Ref Level 100.00 dBµV 0 dB Att 10 dB PIPk Max 90 dBµV 90 dBµV 90 dBµV 70 dBµV 90 dBµV 30 dBµV 101 dBµV 90 dBµV 101 dBµV 20 dBµV 101 dBµV 20 dBµV 101 dBµV 20 dBµV 101 dBµV	ctrum 3 ② Spectrum 4 /	Spectrum 2 Spectrum 2 Mi[1]	44.47 d 4.9240
trum Spectrum 3 Level 100.00 dBµV 10 dB sWT 45 Max 0 N 0	Spectrum 4 S	rum 2 2 () sp 	Spectrum Spectrum Rof Level 100.00 dBµV 10 dB ● IPk Max 90 dBµV 80 dBµV 90 dBµV 70 dBµV 60 dBµV 50 dBµV 10 dBµV 30 dBµV 10 dBµV	ctrum 3 ② Spectrum 4 /	Spectrum 2 Spectrum 2 Mi[1]	44.47 d 4.9240
Spectrum Spectrum 3 Level 100.00 dBµV 10 dB 8WT 45 Max 0 0 10 dB 10 dB UV 0 0 0 10 dB 10 dB UV 0 0 0 0 10 dB 10 d	Spectrum 4 S	rum 2 2 () sp 	Spectrum Spect Ref Level 100.00 dBµV 0 dB Att 10 dB PIPk Max 90 dBµV 90 dBµV 90 dBµV 70 dBµV 90 dBµV 30 dBµV 101 dBµV 90 dBµV 101 dBµV 20 dBµV 101 dBµV 20 dBµV 101 dBµV 20 dBµV 101 dBµV	ctrum 3 ② Spectrum 4 /	Spectrum 2 Spectrum 2 Mi[1]	+4.47 4.9240

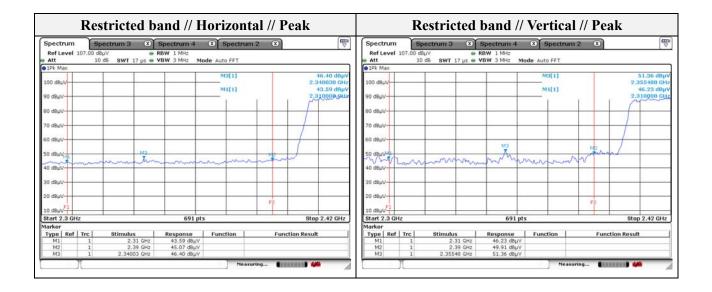


3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr

Mode:	802.11n(HT40)
Distance of measurement:	3 meter
Channel:	03

- Spurio	us							
Frequency (MHz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1004.30	50.10	Peak	Н	-8.62	-	41.48	74.00	32.52
2127.40	51.33	Peak	Н	-0.67	-	50.66	74.00	23.34
1000.00	55.74	Peak	V	-8.64	-	47.10	74.00	26.90
2127.40	50.28	Peak	V	-0.67	-	49.61	74.00	24.39
4844.00	43.75	Peak	Н	7.29	-	51.04	74.00	22.96
4844.00	44.00	Peak	V	7.29	-	51.29	74.00	22.71

Band edge Frequency Level Ant. Pol. CF DCF Field strength Limit Margin **Detect mode** (MHz) $(dB\mu V)$ (H/V) (dB) (dB) $(dB\mu V/m)$ $(dB\mu N/m)$ (dB) 2340.03 46.40 -0.23 46.17 74.00 27.83 Peak Η _ V 2355.48 51.36 Peak -0.20 51.16 74.00 22.84 -





Report No .: KES-RF-20T0112 Page (44) of (55)

Spectrum 3 Ref Level 107.00 d8uV	Spectrum 4 Spectrum	ectrum 2 🗷		Spectrum Ref Level 107.00		ectrum 4 🛞	Spectrum 2	®	
Att 10 dB SWT	2 ms - VBW 3 MHz Mode Auto Sw	veep		e Att	10 dB SWT 2 ms . VBN		o Sweep		
1Pk Max	Mata	1	50.10 dBuV	1Pk Max	1 1	N	13[1]		55,74 dBuV
100 dBLV			1.00430 GHz	100 dBµV-					1.00000 GHz
90 dBuV	M1[1	u 5	91.70 dBpV 2.41970 GHz	90 dBuV-		N	41[1] MI		90.87 dBpV 2.42840 GHz
0.000			and the other states of				1 1	1	
0 dBµV				80 d8µV					
0 dBµV	+ + + +			70 dBµV					
0 dBµV				60 dBµV-				-	-
D 40-41	M2			150 years		MZ		Arrest	
P dBuV	- another work and land	normal manner	and and a superior and		ano ano many march	burnagenal	water	125 Merthamarray	imme
0 dBµV				40 dBuV-					
0 dBµV				30 dBµV			-		
0 dBuV				20 dBµV-					
ID dBµV	691 pts		Stop 3.0 GHz	10 dBµV Stort 1.0 GHz		691 pts		8	top 3.0 GHz
arker Fype Ref Trc Stimuk	int or manufacture sectorements	n Function R		Marker Type Ref Trc	Stimulus		ction	Function Res	
n Horizont	243 GHz 50.10 dByv		GHz		ertical // Po			18 GHz	
Horizont	al // Peak for 3	GHz to 18 ectrum 2 (8)		Vo Spectrum Sp Ref Level 100.00 de	ectrum 3 (Sp hpV @ RB	ectrum 4 🛛 🗙	GHz to Spectrum 2	1000	
Horizont	al // Peak for 3	GHz to 18 ectrum 2 (3) Sweep	GHz (#2	Vo Spectrum Sp Ref Level 100.00 de	ectrum 3 🛞 Sp	ectrum 4 (X) W 1 MHz W 3 MHz Mode Au	GHZ to Spectrum 2 Ito Sweep	18 GHz	
Horizont	al // Peak for 3	GHz to 18 ectrum 2 (3) Sweep	GHz (☆ 43.75 d8µV	Spectrum Sp Ref Level 100.00 dB Att 10	ectrum 3 (Sp hpV @ RB	ectrum 4 (X) W 1 MHz W 3 MHz Mode Au	GHz to Spectrum 2	18 GHz	441.00 di
Horizont	al // Peak for 3	GHz to 18 ectrum 2 (3) Sweep	GHz (#2	Spectrum Sp Ref Level 100.00 dB Att 10	ectrum 3 (Sp hpV @ RB	ectrum 4 (X) W 1 MHz W 3 MHz Mode Au	GHZ to Spectrum 2 Ito Sweep	18 GHz	4-4.00 dt 4.8440 (
Horizont Spectrum 3 Nevel 100.00 dbµV 10 db swr 4 Max	al // Peak for 3	GHz to 18 ectrum 2 (3) Sweep	GHz (☆ 43.75 d8µV	Spectrum Spectrum Ref Level 100.00 dt Att 10 IPk Max 90 dt	ectrum 3 (Sp hpV @ RB	ectrum 4 (X) W 1 MHz W 3 MHz Mode Au	GHZ to Spectrum 2 Ito Sweep	18 GHz	441.00 di
Horizont Spectrum 3 Nevel 100.00 dbµV 10 db swr 4 Max	al // Peak for 3	GHz to 18 ectrum 2 (3) Sweep	GHz (☆ 43.75 d8µV	Spectrum Sp Ref Level 100.00 de Att 100 1Pk Max	ectrum 3 (Sp hpV @ RB	ectrum 4 (X) W 1 MHz W 3 MHz Mode Au	GHZ to Spectrum 2 Ito Sweep	18 GHz	441.00 di
Horizont trum Spectrum 3 Level 100.00 dBµV 10 dB swr 4 Max	al // Peak for 3	GHz to 18 ectrum 2 (3) Sweep	GHz (☆ 43.75 d8µV	Spectrum Spectrum Ref Level 100.00 dt Att 10 IPk Max 90 dt	ectrum 3 (Sp hpV @ RB	ectrum 4 (X) W 1 MHz W 3 MHz Mode Au	GHZ to Spectrum 2 Ito Sweep	18 GHz	441.00 di
Horizont trum Spectrum 3 Level 100.00 dBµV 10 dB swr 4 Max	al // Peak for 3	GHz to 18 ectrum 2 (3) Sweep	GHz (☆ 43.75 d8µV	Spectrum Spectrum Ref Level 100.00 dE Max @ IPk Max 00 dBµV B0 dBµV B0 dBµV	ectrum 3 (Sp hpV @ RB	ectrum 4 (X) W 1 MHz W 3 MHz Mode Au	GHZ to Spectrum 2 Ito Sweep	18 GHz	441.00 di
Horizont	al // Peak for 3	GHz to 18 ectrum 2 (3) Sweep	GHz (☆ 43.75 d8µV	Spectrum Spectrum Ref Level 100.00 dE Max @ IPk Max 00 dBµV B0 dBµV B0 dBµV	ectrum 3 (Sp hpV @ RB	ectrum 4 (X) W 1 MHz W 3 MHz Mode Au	GHZ to Spectrum 2 Ito Sweep	18 GHz	441.00 di
Horizont	al // Peak for 3	GHz to 18 ectrum 2 (3) Sweep	GHz (☆ 43.75 d8µV	Spectrum Sp Ref Level 300.00 de MI 10 INK Max 90 deµv 80 deµv 90 deµv 70 deµv 60 deµv	ectrum 3 (Sp hpV @ RB	ectrum 4 (X) W 1 MHz W 3 MHz Mode Au	GHZ to Spectrum 2 Ito Sweep	18 GHz	441.00 di
Horizont	sal // Peak for 3	GHz to 18 (GHZ (TT) 43.75 dBµV 4.8440 GHz	Spectrum Sp Ref Level 100.00 db • IPK Max • IPK 00 • IDK Max 90 dbµv 80 dbµv 70 dbµv	ectrum 3 ③ Sp µV e R81 d8 swT 45 ms e VB	ectrum 4 ③) W 1 M4z W 3 M4z Mode Au	GHz to Spectrum 2 ito Sweep M1(1)		44.00 dl 4.8440 d
Horizont trum Spectrum 3 Lavel 100.00 dbµ ¹ 10 db swr 4 Max 40 40 40 40 40 40 40 40 40 40	sal // Peak for 3	GHz to 18 (GHz (☆ 43.75 d8µV	Spectrum Spectrum Ref Level 100.00 dE Att 0 IPk Max 90 dBµV 80 dBµV 90 dBµV 70 dBµV 60 dBµV 50 dBµV 50 dBµV	ectrum 3 (Sp hpV @ RB	ectrum 4 ③) W 1 MHz W 3 MHz Mode Au	GHz to Spectrum 2 ito Sweep M1(1)	18 GHz	44.00 dl 4.8440 d
Horizont	sal // Peak for 3	GHz to 18 (GHZ (TT) 43.75 dBµV 4.8440 GHz	Spectrum Sp Ref Level 300.00 de MI 10 INK Max 90 deµv 80 deµv 90 deµv 70 deµv 60 deµv	ectrum 3 ③ Sp µV e R81 d8 swT 45 ms e VB	ectrum 4 ③) W 1 M4z W 3 M4z Mode Au	GHz to Spectrum 2 ito Sweep M1(1)		44.00 dl 4.8440 d
Horizont	sal // Peak for 3	GHz to 18 (GHZ (TT) 43.75 dBµV 4.8440 GHz	Spectrum Spectrum Ref Level 100.00 dE Att 0 IPk Max 90 dBµV 80 dBµV 90 dBµV 70 dBµV 60 dBµV 50 dBµV 50 dBµV	ectrum 3 ③ Sp µV e R83 d8 swT 45 ms e VB	ectrum 4 ③) W 1 M4z W 3 M4z Mode Au	GHz to Spectrum 2 ito Sweep M1(1)		44.00 di 4,8440 (
Horizont trum Spectrum 3 Level 100.00 dbµ/ 10 db swr 4 Max W W W W W W W W W W W W W	sal // Peak for 3	GHz to 18 (GHZ (TT) 43.75 dBµV 4.8440 GHz	Spectrum Spectrum Reflexel 100.00 dB Att 10 90 dBµV 90 dBµV 80 dBµV 90 dBµV 70 dBµV 60 dBµV 50 dBµV 50 dBµV 30 dBµV 30 dBµV	ectrum 3 ③ Sp µV e R83 d8 swT 45 ms e VB	ectrum 4 ③) W 1 M4z W 3 M4z Mode Au	GHz to Spectrum 2 ito Sweep M1(1)		44.00 dl 4.8440 d
Horizont	sal // Peak for 3	GHz to 18 (GHZ (TT) 43.75 dBµV 4.8440 GHz	Spectrum Sp Ref Level 100.00 db 10 IPIX Max 10 IPIX Max 90 90 dbµv 80 70 dbµv 90 60 dbµv 90 90 dbµv <td< td=""><td>ectrum 3 ③ Sp µV e R83 d8 swT 45 ms e VB</td><td>ectrum 4 ③) W 1 M4z W 3 M4z Mode Au</td><td>GHz to Spectrum 2 ito Sweep M1(1)</td><td></td><td>44.00 dl 4.8440 d</td></td<>	ectrum 3 ③ Sp µV e R83 d8 swT 45 ms e VB	ectrum 4 ③) W 1 M4z W 3 M4z Mode Au	GHz to Spectrum 2 ito Sweep M1(1)		44.00 dl 4.8440 d
Horizont	sal // Peak for 3	GHz to 18 (GHZ (TT) 43.75 dBµV 4.8440 GHz	Spectrum Spectrum Reftevel 100.00 de Att 10 0 DPL Max 90 90 deµv 60 70 deµv 60 30 deµv 90 30 deµv 10	ectrum 3 ③ Sp µV e R83 d8 swT 45 ms e VB	ectrum 4 ③) W 1 M4z W 3 M4z Mode Au	GHz to Spectrum 2 ito Sweep M1(1)		44.00 dl 4.8440 d
Horizont	sal // Peak for 3	GHz to 18 (GHZ (TT) 43.75 dBµV 4.8440 GHz	Spectrum Spectrum Reflexel 100.00 dB Att 10 90 dBµV 90 dBµV 80 dBµV 90 dBµV 70 dBµV 60 dBµV 50 dBµV 50 dBµV 30 dBµV 30 dBµV	ectrum 3 ③ Sp µV e R83 d8 swT 45 ms e VB	ectrum 4 ③) W 1 M4z W 3 M4z Mode Au	GHz to Spectrum 2 ito Sweep M1(1)		+4.00 d +.8440



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-RF-20T0112 Page (45) of (55)

Mode:	802.11n(HT40)
Distance of measurement:	3 meter
Channel:	06

- Spurio	us							
Frequency (MHz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1004.30	50.96	Peak	Н	-8.62	-	42.34	74.00	31.66
2127.40	49.81	Peak	Н	-0.67	-	49.14	74.00	24.86
1010.10	52.02	Peak	V	-8.58	-	43.44	74.00	30.56
2127.40	48.58	Peak	V	-0.67	-	47.91	74.00	26.09
4874.00	44.28	Peak	Н	7.51	-	51.79	74.00	22.21
4874.00	44.88	Peak	V	7.51	-	52.39	74.00	21.61

× (4 🛞 Spectrum 2	Spectrum 4	ectrum 3	im S	Spectr		×	rum 2	× Spectr	pectrum 4	×s	ectrum 3	Sp	pectrum
·		RBW 1 MHz		rel 107.00 d						W 1 MHz				Ref Level
	Mode Auto Sweep	VBW 3 MHz	dB SWT 2 ms		Att 1Pk Ma			(p	de Auto Sweep	W 3 MHZ MC	2 ms 🖷 VB	dB SWT	10	Att LPk Max
52.02 dB	M3[1]			1		50.96 dBµV			M3[1]		1			
1.01010 G 1 91.27 dB	MILTI MI			-	100 dBµ	1.00430 GHz 92.22 dBuV	1	M	MILTI					0 dBuV
2.44280 G		_		-	90 dBµV	2.44570 GHz		. 7			-	-		dBµV-
					00 40-41									dayar
					80 dBhA									0 dBuV
				-	70 dBµW			<u> </u>		+ +	-			dBuV
	· · · · · · · · · · · · · · · · · · ·			-	60 dBuV								_	dBuV
	MD				13				M2					and a
tyment		munan		A Laboratoria	Capacita HX	and the second second	time		I			Processing states) dBµV
how and	the work when the second	and the second	and the second second	- waters	40 dBuV	weathrow it	- Men	Land	mound	munore	mound	provena	munit	dBuV-
			<u> </u>	-	30 dBµV									0 dBuV
					20 dBµV									dBuV
Stop 3.0 GH	1 pts	691		LCH2	10 dBµV Start 1	Stop 3.0 GHz				691 pt	1	-	12	art 1.0 G
atup 3.0 Gr	1 p/3	691		unz.	Marker	arap ara unz			,	091 pt			14	art 1.0 Gr
Function Result		Response	Stimulus	Ref Trc	Type	ault	Function Re	1	Function	Response		Stimul	Trc	ype Ref
			2.4428 GH 2.1274 GH	1	M1 M2			-		92.22 dBµV 49.81 dBµV	57 GHz		1	M1 M2
			1.0101 GH	1	M3					50.96 dBµV	H43 GHz		1	M3
	Measuring			1		444		teasuring	Me				1	
A CONTRACTOR OF A CONTRACT							Sec. 2							
10 /11				X 7		L	10.0	ML /			1 11			1
18 UHZ	for 3 GHz to 1	Peak f	rtıcal //	Ve		12	:o 18 G	JHZ t	or 3 6	Peak 1	al // .	izont	Hori	
		~				6							~	
x	4 🗴 Spectrum 2	Spectrum 4	ctrum 3 🛞	Spe	Spectrun		*	trum 2	Spect	ectrum 4	× S(ctrum 3	Spec	trum
		RBW 1 MHz		100.00 dBp						W 1 MHz				Level 10
	Mode Auto Sweep	RBW 1 MHz	/	Committee of the local division of the local	A CONTRACTOR OF A CONTRACTOR A	[7	w.		ode Auto Swe	W 1 MHz	_	/	0.00 dBµV	

												-							
						1[1]			44.28 dBpV 4.8740 GHz						M	1[1]			44.88 dBp/ 4.8740 GH
dBuV										90 dBµV		<u> </u>	-						
dBµV	-									80 d8µV									
dBµV				-		-	-			70 d8µV						-		-	-
dBµV	-									60 dBµV		-	-			-			-
dBuv M	12 marchen	when	hum	henry	arthur a	un	a sue tout	low	mind	50 dBµV	M1	weener	when we	minun	as here a	-		multim	man
dBµV			- 2000 V							40 dBµV		00.00	A LATA O		- un	and the case of	Real Proventing		
dBµV										30 dBµV									
dBµV										20 dBµV									
dBµV										10 dBµV			-						-
irt 3.0 GHz				691	pts			Sto	p 18.0 GHz	Start 3.0 G	Hz		-	691	pts			Sto	p 18.0 GHz
						Measur	ing 🚺		a //)[Measur	ing 🚺		

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



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

Mode:	802.11n(HT40)
Distance of measurement:	3 meter
Channel:	9

- Spurio	us							
Frequency (Mtz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1015.90	51.92	Peak	Н	-8.55	-	43.37	74.00	30.63
2127.40	50.55	Peak	Н	-0.67	-	49.88	74.00	24.12
1013.00	56.08	Peak	V	-8.57	-	47.51	74.00	26.49
2124.50	50.35	Peak	V	-0.67	-	49.68	74.00	24.32
4904.00	44.11	Peak	Н	7.73	-	51.84	74.00	22.16
4904.00	44.00	Peak	V	7.73	-	51.73	74.00	22.27

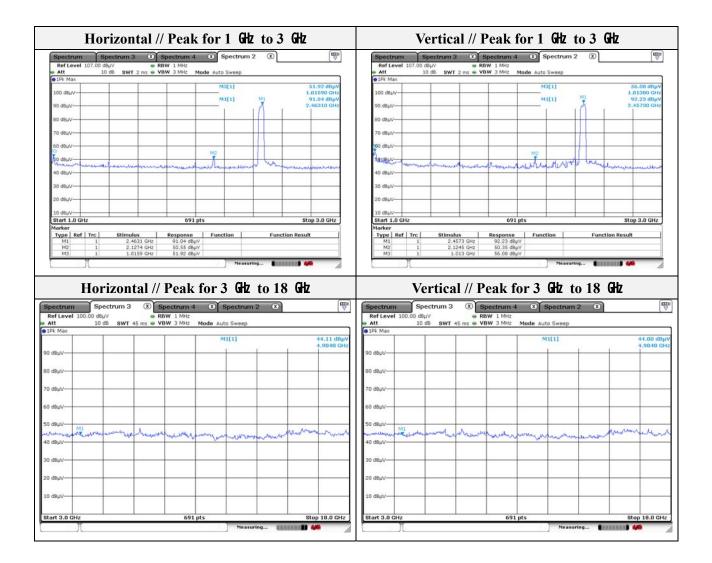
Band edge DCF Margin Frequency Level Ant. Pol. CF Field strength Limit **Detect mode** (MHz) $(dB\mu V)$ (H/V) (dB) (dB) $(dB\mu V/m)$ $(dB\mu V/m)$ (dB) 2487.04 0.08 48.70 74.00 25.30 48.62 Peak Н _ V 47.71 2484.57 47.63 Peak 0.08 -74.00 26.29

Spectrum Sp	ectrum 3 🛛 🛪	Spectrum 4	Spectrum 2	2 (8)	Spectrum	Spec	trum 3 🙁	Spectrum 4	(I) Spectrum	2 (*)	
Ref Level 107.00 d		RBW 1 MHz				107.00 dBµV		RBW 1 MHz			
Att 10 1Pk Max	d8 SWT 7.6 µs 🖷	VBW 3 MHz M	ode Auto FFT		Att IPk Max	10 dB	SWT 7.6 µs 🖷	VBW 3 MHz N	tode Auto FFT		
AFR PRO			M3[1]	48.63	2 dBµV			1 1	M3[1]		47.63 dBp
100 d8µV		+ +		2.487037							2.4845690 GH
			M1[1]		4 dBpV				M1[1]		46.44 dBp
70 88µV	mag			2.483500	90 GHz	- V	m			70 7	2.4835000 GH
0.40.41					80 dBuV						
i0 dBµV					BU GBHA		V				
0 dBµV					70 dBuV						
o oppr		1 11			/ o objit					1 11	
0 dBµV		+ ++			60 dBµV-					+++	
			MR				X				
50 dBµV		mit	intern	man	50 dBµV-			m n	the same	Loop H	
10.02007			1000,000,000,000,000,000,000,000,000,00	- man	1000					1 m 1 F	a the m
40 dBµV					40 dBµV			-			
30 dBuV	-			5	30 dBuV						
io oppy					20.00044						
0 d8µV					20 d8µV-					++	
				F2	10000					F2	
0 dBµV		F1			10 dBµV-			-		++	
Start 2.455 GHz		691 pt:		Stop 2.5	1 GHz Start 2.455	GHz		691 pt	5		Stop 2.51 GHz
larker					Marker						
Type Ref Trc	Stimulus	Response	Function	Function Result	Type Ref		Stimulus	Response	Function	Function	n Result
M1 1 M2 1	2,4835 GHz 2,5 GHz	48.54 dBµV 46.10 dBµV			M1 M2	1	2.4835 GHz 2.5 GHz	46.44 dBµV 45.29 dBµV			
M2 1 M3 1	2.5 GHz 2.487037 GHz	48.62 dBuV			M2 M3	1	2.484569 GHz	47.63 dBuV			

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



Report No.: KES-RF-20T0112 Page (47) of (55)





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-RF-20T0112 Page (48) of (55)

Test results (18 GHz to 26.5 GHz) – Worst case

Mode: 802.11b

Distance of measurement: 3 meter

Channel:

1 (Worst case)

	Horizontal			Vertical	
Spectrum Ref Level 93.00 dBµV Att 6 dB SWT 36 ms	RBW 1 MHz WOV 3 MHz Mode Auto Sweep		Spectrum Ref Level 93.00 dBµV Att 6 dB SWT 36	RBW 1 MHz ms VBW 3 MHz Mode Auto Sweep	
• 1Pk Max			1Pk Max		
90 d8µV			90 d8µV-		
V48b 08			V48b 08		
70 dBµV			70 dBµV		
60 dBµV			60 dBµV		
50 dBµV			50 d8µV		
40 dBUV	museukamun	en e	40 dBuV	an mar and a second and a second	monumenta
30 d8µV			30 d8µV		
20 d8µV			20 d8µV-		
10 d8µV			10 d8µV		
0 d8µV			0 d8µV		
Start 18.0 GHz	691 pts	Stop 30.0 GHz	Start 18.0 GHz	691 pts	Stop 30.0 GHz
	Measuring	sector se)()	And a second	ssoring 🚺 🚧 🎢

Note.

No spurious emission were detected above 18 GHz.



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

3.6 Conducted spurious emissions & band edge

Test setup	_		
EUT		Attenuator	Spectrum analyzer

Test procedure

Band edge

ANSI C63.10 – Section 11.11

- 1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
- 2. Span was set large enough so as to capture all out of band emissions near the band edge
- 3. RBW = 100 kHz
- 4. VBW = 300 kHz
- 5. Detector = Peak
- 6. Trace mode = max hold
- 7. Sweep time = auto
- 8. The trace was allowed to stabilize

Out of band emissions

ANSI C63.10 - Section 11.11

- 1. Start frequency was set to 30 MHz and stop frequency was set to 25 GHz for 2.4 GHz frequencies and 40 GHz for 5 GHz frequencies
- 2. RBW = 100 kHz
- 3. VBW = 300 kHz
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep time = auto couple
- 7. The trace was allowed to stabilize

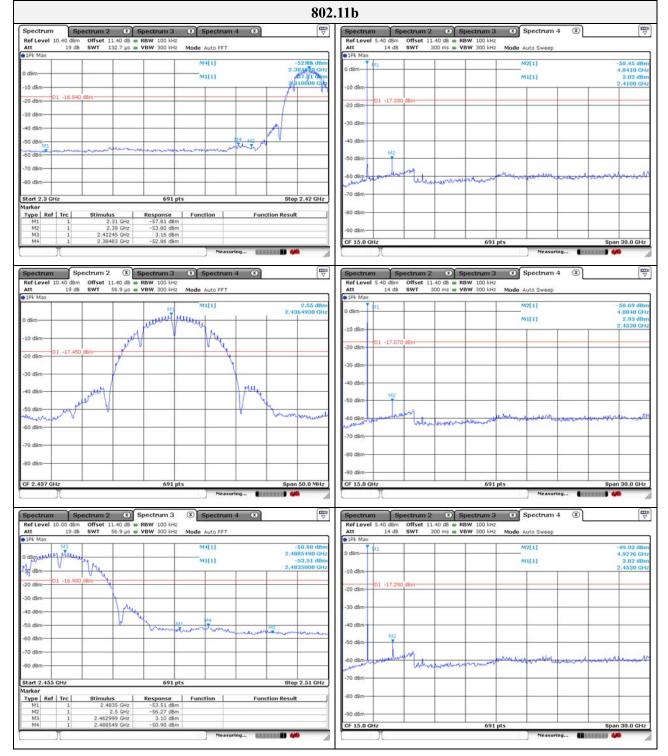
Limit

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))



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-RF-20T0112 Page (50) of (55)

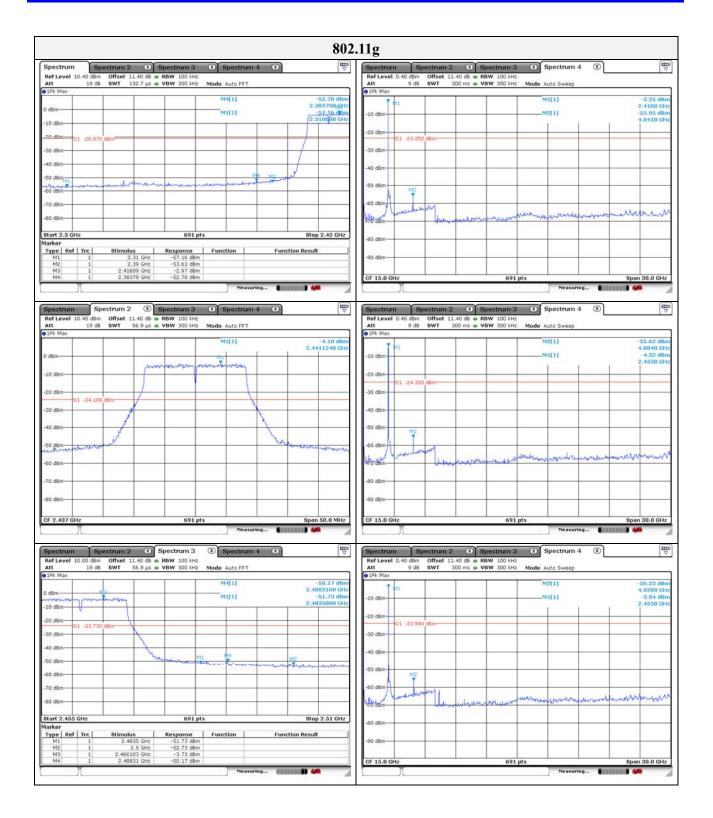
Test results



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



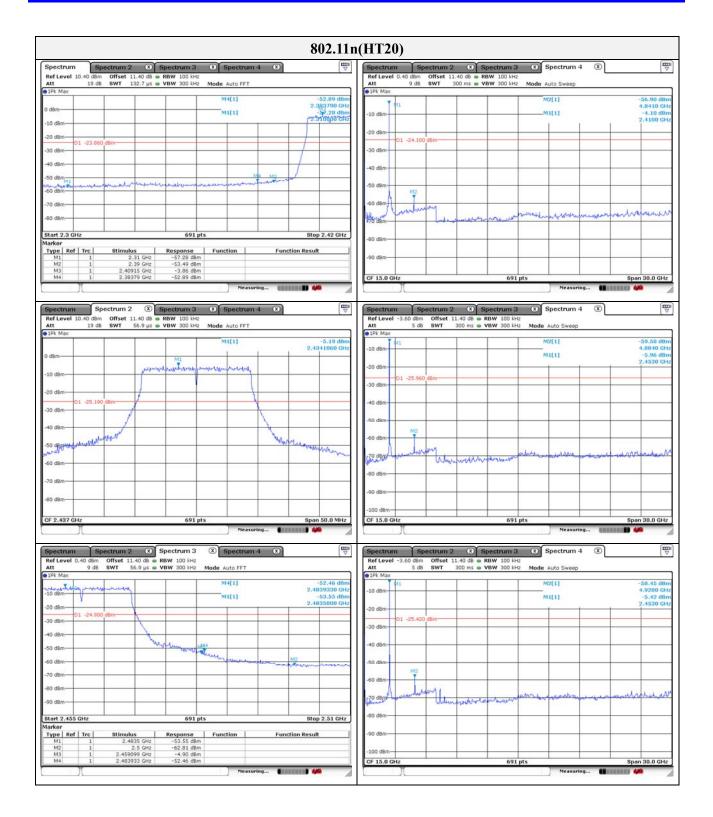
3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-RF-20T0112 Page (51) of (55)



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



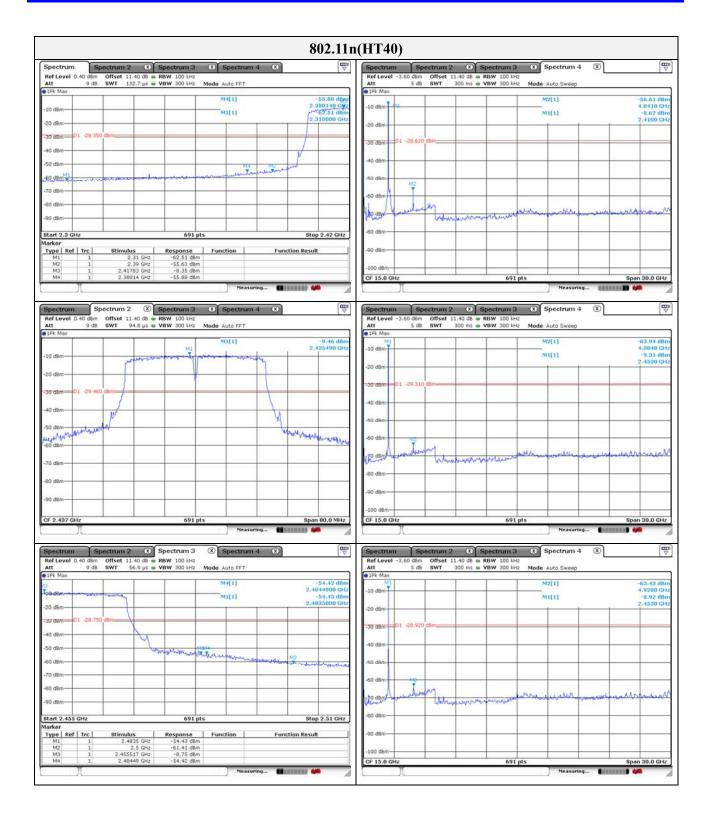
3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-RF-20T0112 Page (52) of (55)



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



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-RF-20T0112 Page (53) of (55)





Report No.: KES-RF-20T0112 Page (54) of (55)

Equipment	Manufacturer	Model	Serial No.	Calibration interval	Calibration due.
Spectrum Analyzer	R&S	FSV30	101389	1 year	2021.01.15
8360B Series Swept Signal Generator	HP	83630B	3844A00786	1 year	2021.01.15
DC Power Supply	Agilent	6632B	US36351824	1 year	2021.01.14
Power Meter	Anritsu	ML2495A	1438001	1 year	2021.01.14
Pulse Power Sensor	Anritsu	MA2411B	1339205	1 year	2021.01.14
Attenuator	KEYSIGHT	8493C	82506	1 year	2021.01.14
Loop Antenna	Schwarzbeck	FMZB1513	225	2 years	2021.02.15
Trilog-broadband antenna	SCHWARZBECK	VULB 9163	715	2 years	2020.09.20
Horn Antenna	A.H	SAS-571	414	2 years	2021.02.11
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA 9170550	2 years	2021.02.19
Preamplifier	R&S	SCU01	100603	1 year	2020.11.25
Preamplifier	AGILENT	8449B	3008A01742	1 year	2021.01.02
EMI Test Receiver	R&S	ESU26	100551	1 year	2021.04.01
EMI TEST RECEIVER	R & S	ESR3	101781	1 year	2021.01.10
PULSE LIMITER	R & S	ESH3-Z2	101915	1 year	2021.01.02

Appendix A. Measurement equipment

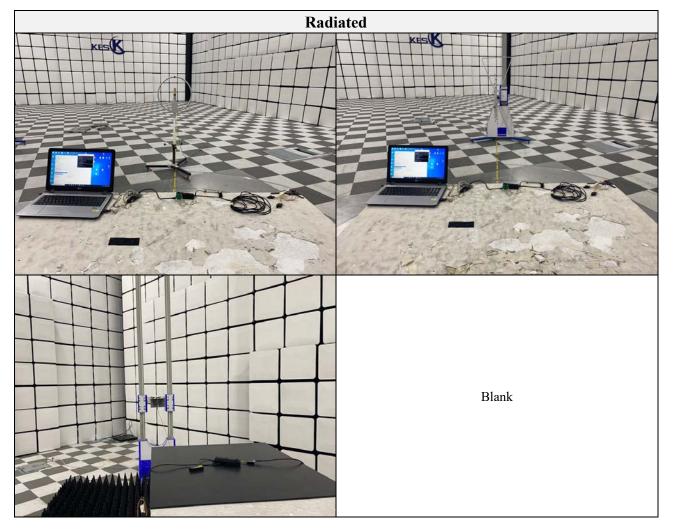
Peripheral devices

Device	Manufacturer	Model No.	Serial No.	
Notebook computer	LG Electronics Inc.,	LGS53	306QCZP560949	



Report No.: KES-RF-20T0112 Page (55) of (55)

Appendix B. Test setup photos



The end of test report.