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TEST REPORT

Part 15 Subpart C 15.247

Equipment under test	Digital Flat Panel X-ray Detector	
Model name	PEDRA-1417MC	
Variant Model name	PEDRA-1417MG, DET14-MCD1, DET14-MGD1	
FCC ID	2AXRZPEDRA-1417M	
Applicant	RADISEN CO., LTD	
Manufacturer	RADISEN CO., LTD	
Factory	RADISEN CO., LTD /	
ractory	Marketech International Corp.	
Date of test(s)	2020.09.07. ~ 2020.09.15	
Date of issue	2020.09.16	

Issued to

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Revision history

Revision	Date of issue	Test report No.	Description
-	2020.09.16	KES-RF1-20T0154	Initial



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1. General info	ormation
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Test Facility	FCC Accreditation Designation No.: KR0100, Registration No.: 444148
FCC rule part(s):	15.247
FCC ID:	2AXRZPEDRA-1417M
Test device serial No.:	➢ Production □ Pre-production □ Engineering

General information



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1.1. EUT description

Equipment under test	Digital Flat Panel X-ray Detector		
Frequency range &	2 412 Mz ~ 2 462 Mz (802.11b/g/n_HT20) : 11 ch		
Number of channels	2 422 MHz ~ 2 452 MHz (802.11n_HT40) : 7 ch		
	UNII-1 5 180 MHz ~ 5 240 MHz (802.11a/n_HT20) : 4 ch		
	5 190 MHz ~ 5 230 MHz (802.11n_HT40) : 2 ch		
	5 210 Mz (802.11ac_VHT80) : 1 ch		
	UNII-3 5 745 Mz ~ 5 825 Mz (802.11a/n_HT20) : 5 ch		
	5 755 MHz ~ 5 795 MHz (802.11n_HT40) : 2 ch		
	5 775 MHz (802.11ac_VHT80) : 1 ch		
Model:	PEDRA-1417MC		
Variant Model name	PEDRA-1417MG, DET14-MCD1, DET14-MGD1		
Modulation technique	WIFI : DSSS, OFDM		
Antenna specification			
ANT0	2.4 GHz Antenna type : PCB antenna, Peak gain : 1.9 dBi		
ANT1	2.4 GHz Antenna type : PCB antenna, Peak gain : -1.6 dBi		
ANT0	5 GHz Antenna type :: PCB antenna, Peak gain(UNII-1) : -1.8 dBi		
	Peak gain(UNII-3) : -2.9 dBi		
ANT1	5 GHz Antenna type :: PCB antenna, Peak gain(UNII-1): -1.1 dBi		
	Peak gain(UNII-3) : -2.0 dBi		
Power source	AC 120 V (AC/DC adaptor output 15 V)		
H/W version	1.1.0		
S/W version	1.0.x.x		



1.2. Test configuration

The <u>**RADISEN CO., LTD**</u> // **PEDRA-1417MC** // **FCC ID: 2AXRZPEDRA-1417M** was tested per the guidance of KDB 558074 D01 v05r02, ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

1.3. Device modifications

N/A

1.4. Frequency/channel operations

Ch.	Frequency (Mz)	Mode
01	2412	802.11b/g/n_HT20
06	2437	802.11b/g/n_HT20
·		· .
11	2462	802.11b/g/n_HT20

Ch.	Frequency (Mz)	Mode
03	2422	802.11n_HT40
06	2437	802.11n_HT40
09	2452	802.11n_HT40

1.5. 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:
- 3. 802.11b: 1.0 Mbps
- 802.11g_HT20: <u>6.0 Mbps</u> 802.11n_HT20: <u>7.2 Mbps</u> 802.11n_HT40: <u>15.0 Mbps</u>

1.6. Accessory information

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

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1.7. Information about Variant Model name

Model name	Scintillator type
PEDRA-1417MC	CsI:Tl (Direct)
PEDRA-1417MG	GD2O2S:Tb
DET14-MCD1	CsI:Tl (Direct)
DET14-MGD1	GD2O2S:Tb

1.8. Antenna information

Mode	SISO		MIMO
Ivioue	Antenna 0	Antenna 1	Antenna 0+1
802.11b	v	~	×
802.11g	v	~	×
802.11n_HT20	v	v	 ✓
802.11n_HT40	v	~	~
802.11a	v	 ✓ 	×
802.11an_HT20	v	v	 ✓
802.11an_HT40	v	v	 ✓
802.11ac_VHT80	v	~	 ✓

 \checkmark = Support; \times = Not support

WiFi Antenna Model :

WIFI DUAL BAND ANTENNA_1 (ANT0), WIFI DUAL BAND ANTENNA_2(ANT1),

Anto Gain (dBi)	Ant1 Gain (dBi)	Note
1.9	-1.6	2 412 to 2 462 MHz
-1.8	-1.1	5 180 to 5 240 MHz
-2.9	-2.0	5 745 to 5 825 MHz

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1.9. 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.

 $Offset(dB) = RF \ cable \ loss(dB) + attenuator \ factor(dB).$ $= 0.87 + 10 = 10.87 \ (dB)$

1.10. Measurement Uncertainty

Test Item	Uncertainty					
Uncertainty for Conduction en	2.46 dB					
Uncertainty for Radiation emission test	Below 1GHz	4.40 dB				
(include Fundamental emission)	Above 10Hz	5.94 dB				
Note. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence						
level using a coverage factor of k=2.	-					



2. Summary of tests	
---------------------	--

Reference	Parameter	Test results
15.247(a)(2)	6 dB bandwidth	N/A ^(Note1)
15.247(b)(3)	Output power	Pass
15.247(e)	Power spectral density	N/A ^(Note1)
15.205 15.209	Radiated restricted band and emission	Pass
15.247(d)	Conducted spurious emission and band edge	N/A ^(Note1)
15.207(a)	AC conducted emissions	Pass

Note :

1) Please Refer to the approved Module Report (Report No.: RF180828C26A) for result of existing test items.



3. Test results

3.1. Output power

Test procedure

ANSI C63.10 –section 11.9.1.3 and 11.9.2.3.2

Test setup

FUT	Attenuetor	Power meter,
EUI	Attenuator	Power sensor

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 Mz, 2 400~2 483.5 Mz, and 5 725~5 850 Mz 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.



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Test results								
Measured output power (dBm)								
	Ant.	2412 MHz		2437	7 MHz	2462	2 MHz	
Mode	Port	Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)	
802.11b	Ant 0	16.13	18.80	16.70	19.31	16.74	19.30	
802.110	Ant 1	16.79	19.37	16.71	19.22	16.61	19.13	
<u>802 11a</u>	Ant 0	12.32	21.21	13.07	21.64	13.42	21.84	
802.11g	Ant 1	13.10	22.06	13.25	22.15	13.17	22.05	
	Ant 0	9.49	18.79	9.78	18.93	9.35	17.99	
802.11n _HT20	Ant 1	10.90	19.62	9.59	18.27	10.11	18.50	
	SUM	13.26	22.24	12.70	21.62	12.76	21.26	

Measured output power (dBm)								
		2422 MHz		2437	7 MHz	2452 MHz		
Mode		Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)	
	Ant 0	7.70	16.45	8.32	17.13	8.04	17.10	
802.11n _HT40	Ant 1	8.53	17.36	8.22	16.92	8.47	17.24	
	SUM	11.15	19.94	11.28	20.04	11.27	20.18	

Note.

1. Sum = $10\log(10^{Ant0/10} + 10^{Ant1/10} \cdots 10^{Ant N/10})$

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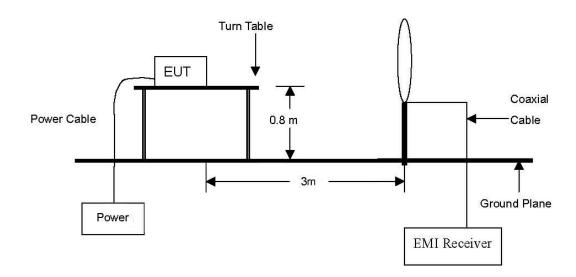
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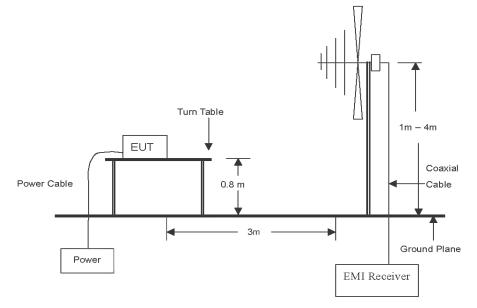
3.2. Radiated restricted band and emissions

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.

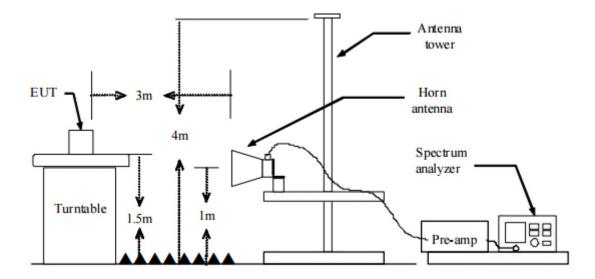


The diagram below shows the test setup that is utilized to make the measurements for emission from 30 Mz to 1 GHz emissions.





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 Mz

- 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 Mz

- 1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- 2. The antenna is a bi-log antenna, a horn antenna ,and its height are varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- 3. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
- **4.** The test receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 5. Spectrum analyzer settings for f < 1 GHz:
 - ① Span = wide enough to fully capture the emission being measured
 - ② **RBW** = 100 kHz
 - ③ VBW \ge RBW
 - ④ Detector = quasi peak

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- \bigcirc Sweep time = auto
- 6 Trace = max hold
- 6. Spectrum analyzer settings for $f \ge 1$ GHz: Peak
 - ① Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
 - 2 RBW = 1 MHz
 - ③ VBW \ge 3 ML
 - (4) Detector = peak
 - (5) Sweep time = auto
 - 6 Trace = max hold
 - \bigcirc Trace was allowed to stabilize
- 7. Spectrum analyzer settings for $f \ge 1$ GHz: Average
 - ① Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
 - 2 RBW = 1 Mz
 - (3) $VBW \ge 3 \times RBW$
 - (4) Detector = RMS, if span/(# of points in sweep) \leq (RBW/2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.
 - (5) Averaging type = power(i.e., RMS)
 - 1) As an alternative, the detector and averaging type may be set for linear voltage averaging.
 - 2) Some instruments require linear display mode in order to use linear voltage averaging. Log or dB averaging shall not be used.
 - 6 Sweep = auto
 - \bigcirc Trace = max hold
 - 8 Perform a trace average of at least 100 traces.
 - (9) A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle. The correction factor is computed as follows:
 - 1) If power averaging (RMS) mode was used in step (5), then the applicable correction factor is $10 \log(1/x)$, where x is the duty cycle.
 - 2) If linear voltage averaging mode was used in step (5), then the applicable correction factor is 20 log(1/x), where x is the duty cycle.
 - 3) If a specific emission is demonstrated to be continuous (≥ 98 percent duty cycle) rather than turning on and off with the transmit cycle, then no duty cycle correction is required for that emission.



Note.

- 1. 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. $F_d = 20\log(D_m/Ds)$ Where:
 - F_d = Distance factor in dB
 - D_m = Measurement distance in meters
 - D_s = Specification distance in meters
- 3. $CF(Correction factors(dB)) = Antenna factor(dB/m) + Cable loss(dB) + or Amp. gain(dB) + or F_d(dB)$
- 8. Field strength($dB\mu N/m$) = Level($dB\mu N$) + CF (dB) + or DCF(dB)
- 9. Margin(dB) = Limit(dB μ N/m) Field strength(dB μ N/m)
- 10. 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.
- 7. 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>.
- 8. The worst-case emissions are reported however emissions whose levels were not within 20 dB of respective limits were not reported.
- 9. All channels, modes (e.g. 802.11b/g/n (20 Mz BW)), and modulations/data rates were investigated among DTS band. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.
- 10. According to exploratory test no any obvious emission were detected from 9 kHz to 30 MHz. Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are 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.

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 ~ 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 $54 \sim 72$ Mb, $76 \sim 88$ Mb, $174 \sim 216$ Mb or $470 \sim 806$ Mb. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

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Duty cycle

Regarding to KDB 558074 D01_v04, 6.0, the maximum duty cycles of all modes were investigated and set the spectrum analyzer as below.

Set RBW \geq OBW if possible; otherwise, set RBW to the largest available value. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100.

Test mode	T _{on} time (ms)	Period (ms)	Duty cycle (Linear)	Duty cycle (%)	Duty cycle correction factor (dB)
802.11b	10	10	1	100	0.00
802.11g	10	10	1	100	0.00
802.11n(HT20)	10	10	1	100	0.00
802.11n(HT40)	10	10	1	100	0.00

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

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

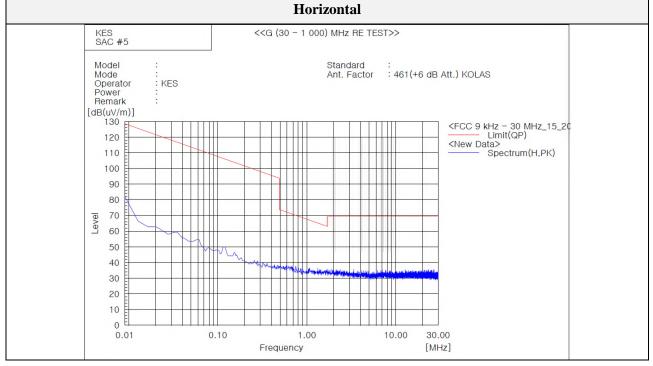
	802.11b	802.11g						
Spectrum Spectrum	2 8		Spectrum Spectrum 2 (8)					
Ref Level 17.00 dBm	RBW 1 MHz	(-)	Ref Level 17.00 d	Bm 🛛 🖷 RB'	W 1 MHz			
	loms 🖷 VBW 1 MHz			dē 🖷 SWT 10 ms 🖷 VB	W 1 MHz			
SGL TDF 1Pk Max			SGL TDF					
	M1[1]	11.71 dBrN				M1[1]		3,17 dB
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30 ubm			-30 dem-					
40 d8m-			-40 d8m					
			10.00					
50 dBm			-50 dBm					
50 dBm-			-60 dBm-					+
70 dBm			-70 dBm-					
80 dBm			-80 dBm					
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	802.11n(HT20)			80)2.11n(H	Г40)		
and the second s								fr.
Spectrum Spectrum	2 (8)		Spectrum	Spectrum 2 🛞				ſ
Ref Level 17.00 dBm	BBW 1 MHz		Ref Level 17.00 d	Bm 😐 RB	W 1 MHz			1
RefLevel 17.00 dBm Att 35 dB = SWT 1			Ref Level 17.00 d Att 35					(
RefLevel 17.00 dBm Att 35 dB = SWT 1 SGL TDF	BBW 1 MHz		Ref Level 17.00 d	Bm 😐 RB				(
RefLevel 17.00 dBm Att 35 dB = SWT 1 SGL TDF	BBW 1 MHz	1.78 dBm	Ref Level 17.00 d Att 35 SGL TDF	Bm 😐 RB		M1[1]		-5,59 dB
Ref Level 17.00 dBm Att 35 dB SWT 1 SGL TDF 1Pk Max	● RBW 1 MHz L0 ms ● VBW 1 MHz		Ref Level 17.00 d Att 35 SGL TDF	Bm 😐 RB		M1[1]	10	-5,59 de
Ref Level 17.00 dBm	● RBW 1 MHz L0 ms ● VBW 1 MHz	1.78 dBm	Ref Level 17.00 d Att 35 SGL TDF IPk Max 10 dBm	Bm RB dB SWT 10 ms VB	W 1 MHz			-5,59 dB
RefLevel 17.00 dBm Att 35 dB swr 1 SGL TDF 1Pk: Mas 0 dBm 0 dBm	■ RBW 1 MHz 10 ms ■ VBW 1 MHz M1(1) M1(1) M1(1)	1.70 dBm 10.000000 ms na aptres i inte kombar ativ	Ref Level 17.00 d Att 35 SGL TDF IPk Max 10 dBm	Bm RB dB SWT 10 ms VB	W 1 MHz			-5,59 dt
Ref Level 17.00 dBm Att 35 dB SWT 1 SGL TDF TRk: Mas 0 dBm 1 def Adult 31 (51) 4 def Adult 4 def Adult 31 (51) 4 def Adult 31 (51) 4 def Adult 4	■ RBW 1 MHz 10 ms ■ VBW 1 MHz M1(1) M1(1) M1(1)	1.78 dBm	Ref Level 17.00 d Att 35 SGL TDF IPI: Mail 10 dBm	Bm RB dB SWT 10 ms VB	W 1 MHz	the albeed by colored	lina Alfred Adhara M	-5,59 dB
ReFLevel 17.00 dBm Att 35 dB swr 1 SGL TDF SIRK Maa 0 dBm Upon Mouth at y a tyley nik koety (r	■ RBW 1 MHz 10 ms ■ VBW 1 MHz M1(1) M1(1) M1(1)	1.70 dBm 10.000000 ms na aptres i inte kombar ativ	Ref Level 17.00 d Att 35 SGL TDF IPI: Mail 10 dBm	Bm RB dB SWT 10 ms VB	W 1 MHz	the albeed by colored		-5,59 dB
Ref Level 17:00 ctam Mt 35 dB 9 SWT 3 S dB 9 SWT 3 O dBm Aver Aver Aver Aver Aver Aver Aver Aver	■ RBW 1 MHz 10 ms ■ VBW 1 MHz M1(1) M1(1) M1(1)	1.70 dBm 10.000000 ms na aptres i inte kombar ativ	Ref Level 17.00 d Att 35 SGL TD ⁶ ● 1Pi: Mais 10 dBm 0 dBm 1 and 10 dBm	Bm RB dB SWT 10 ms VB	W 1 MHz	the albeed by colored	lina Alfred Adhara M	-5,59 dt
Ref Level 17.00 dBm Att 35 dB SWT 1 SGL TDF IFK-Mas 0 dBm 0 dBm fred Algebra to 10 book algebra	■ RBW 1 MHz 10 ms ■ VBW 1 MHz M1(1) M1(1) M1(1)	1.70 dBm 10.000000 ms na aptres i inte kombar ativ	Ref Level 17.00 d Att 35 SGL TDF IPI: Mail 10 dBm	Bm RB dB SWT 10 ms VB	W 1 MHz	the albeed by colored	lina Alfred Adhara M	-5,59 dB
Ref Level 17:00 dBm Att 35 dB 9 9WT 3 Sci. TDF IPK Mas 0 dBm Atom Abu 0 Att Att And Abu 0 Atom Abu 0 Att Att Abu 0 Atom Abu 0 Att Abu 0 Atom Abu 0	■ RBW 1 MHz 10 ms ■ VBW 1 MHz M1(1) M1(1) M1(1)	1.70 dBm 10.000000 ms na aptres i inte kombar ativ	Ref Level 17.00 d Att 35 SGL TD ⁶ ● 1Pi: Mais 10 dBm 0 dBm 1 and 10 dBm	Bm RB dB SWT 10 ms VB	W 1 MHz	the albeed by colored	lina Alfred Adhara M	-5,59 dt
Ref Level 17:00 dBm Att 35 dB 9 9WT 3 Sci. TDF IPK Mas 0 dBm Atom Abu 0 Att Att And Abu 0 Atom Abu 0 Att Att Abu 0 Atom Abu 0 Att Abu 0 Atom Abu 0	■ RBW 1 MHz 10 ms ■ VBW 1 MHz M1(1) M1(1) M1(1)	1.70 dBm 10.000000 ms na aptres i inte kombar ativ	Ref Level 17.00 d Att 35 SGL TDF IPI: Main 10 dBm 0 dBm - 0 dBm - 20 dBm	Bm RB dB SWT 10 ms VB	W 1 MHz	the albeed by colored	lina Alfred Adhara M	-5,59 dt
Ref Level 17:00 cmm Att 35 dB = 9WT 1 35 dB = 9WT 1 1PK Maa 0 dBm 1 dBm 4 dB	■ RBW 1 MHz 10 ms ■ VBW 1 MHz M1(1) M1(1) M1(1)	1.70 dBm 10.000000 ms na aptres i inte kombar ativ	Ref Level 17.00 d Att 35 SGL TDF IPI: Main 10 dBm 0 dBm - 0 dBm - 20 dBm	Bm RB dB SWT 10 ms VB	W 1 MHz	the albeed by colored	lina Alfred Adhara M	-5,59 dB
Ref Level 17:00 ctam Mtt 35 dB 9 9WT 1 35 dB 9 9WT 1 1PE Mai 0 dBm 10 dBm 20 dBm 20 dBm 40 dBm 40 dBm	■ RBW 1 MHz 10 ms ■ VBW 1 MHz M1(1) M1(1) M1(1)	1.70 dBm 10.000000 ms na aptres i inte kombar ativ	Ref Level 17.00 d Att 35 SGL TDF 10 ● 1Pk Mai 10 10 dBm 10 0 dBm 10 -20 dBm -30 dBm -40 dBm -40 dBm	Bm RB dB SWT 10 ms VB	W 1 MHz	the albeed by colored	lina Alfred Adhara M	-5,59 dt
ter Level 17.00 dbm Mt 35 db 9 9WT 1 35 db 9 9WT 1 D dbm ber And D the Attended ber And ber And D the Attended ber Attended ber And D the Attended ber Attended ber And D the Attended ber Attended ber Attended ber Attended 20 dbm 40 dbm	■ RBW 1 MHz 10 ms ■ VBW 1 MHz M1(1) M1(1) M1(1)	1.70 dBm 10.000000 ms na aptres i inte kombar ativ	Ref Level 17.00 d Att 35 SGL TDF IPI: Mas 10 dBm Duffer Att Add Add 20 dBm -30 dBm	Bm RB dB SWT 10 ms VB	W 1 MHz	the albeed by colored	lina Alfred Adhara M	-5,59 dt
tef Level 17.00 dBm 35 dB • 9WT J S6 UTOF IPK Main 0 dBm 0 dBm 20 dBm 20 dBm 30 dBm 50 dBm 50 dBm 50 dBm	■ RBW 1 MHz 10 ms ■ VBW 1 MHz M1(1) M1(1) M1(1)	1.70 dBm 10.000000 ms na aptres i inte kombar ativ	Ref Level 17.00 d Att 35 SGL TDF IPIC Max 10 dBm	Bm RB dB SWT 10 ms VB	W 1 MHz	the albeed by colored	lina Alfred Adhara M	-5,59 dt
tef Level 17.00 dBm 35 dB • 9WT J S6 UTOF IPK Main 0 dBm 0 dBm 20 dBm 20 dBm 30 dBm 50 dBm 50 dBm 50 dBm	■ RBW 1 MHz 10 ms ■ VBW 1 MHz M1(1) M1(1) M1(1)	1.70 dBm 10.000000 ms na aptres i inte kombar ativ	Ref Level 17.00 d Att 35 SGL TDF 10 ● 1Pk Mai 10 10 dBm 10 0 dBm 10 -20 dBm -30 dBm -40 dBm -40 dBm	Bm RB dB SWT 10 ms VB		the albeed by colored	lina Alfred Alfred Alfred Alfred	-5,59 di
Level 17.00 dbm 35 db • BWT 3 35 db • BWT 3 D dbm 0 dbm 0 dbm 10 dbm	■ RBW 1 MHz 10 ms ■ VBW 1 MHz M1(1) M1(1) M1(1)	1.70 dBm 10.000000 ms na aptres i inte kombar ativ	Ref Level 17.00 d Att 35 SGL TDF SGL TDF IP/ Rem 10 dBm 0/28m 10 dBm -20 dBm -30 dBm -30 dBm -50 dBm -50 dBm	Bm RB dB SWT 10 ms VB		the albeed by colored	lina Alfred Alfred Alfred Alfred	-5,59 di
ter Level 17.00 dbm Mt 35 db 9 9WT 1 35 db 9 9WT 1 D dbm ber And D the Attended ber And ber And D the Attended ber Attended ber And D the Attended ber Attended ber And D the Attended ber Attended ber Attended ber Attended 20 dbm 40 dbm	■ RBW 1 MHz 10 ms ■ VBW 1 MHz M1(1) M1(1) M1(1)	1.70 dBm 10.000000 ms na aptres i inte kombar ativ	Ref Level 17.00 d Att 35 SGL TDF IPIC Max 10 dBm	Bm RB dB SWT 10 ms VB		the albeed by colored	lina Alfred Alfred Alfred Alfred	-5,59 di
ter Level 17.00 dam Nt 35 dB 9 9WT 1 35 dB 9 9WT 1 D dBm 0 dB	■ RBW 1 MHz 10 ms ■ VBW 1 MHz M1(1) M1(1) M1(1)	1.70 dBm 10.000000 ms na aptres i inte kombar ativ	Ref Level 17.00 d Att 35 SGL TDF 35 IPL Mail 10 dBm 10 dBm 10 dBm -20 dBm -30 dBm -30 dBm -60 dBm -70 dBm -70 dBm	Bm RB dB SWT 10 ms VB		the albeed by colored	lina Alfred Alfred Alfred Alfred	-5,59 di
Level 17.00 dbm 35 db • evel 17.00 dbm 35 db • evel 17.00 dbm 35 db • evel 17.00 dbm UPE Nam 0 dBm 0 dBm 0 dbm 10 dBm 10 dbm	■ RBW 1 MHz 10 ms ■ VBW 1 MHz M1(1) M1(1) M1(1)	1.70 dBm 10.000000 ms na aptres i inte kombar ativ	Ref Level 17.00 d Att 35 SGL TDF SGL TDF IP/ Rem 10 dBm 0/28m 10 dBm -20 dBm -30 dBm -30 dBm -50 dBm -50 dBm	Bm RB dB SWT 10 ms VB		the albeed by colored	lina Alfred Alfred Alfred Alfred	-5,59 di

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Test results (Below 30 Mz))
Mode:	802.11n_HT20 (Worst case)
Distance of measurement:	3 meter
Channel:	1 (Worst case)



No spurious emission were detected below 30 Mz.



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Test re	esults (Below	v 1 000) MHz) - V	Vorst case						
Mode:			802.11	802.11n_HT20 (Worst case)						
Distan	ce of measure	ement:	: 3 mete	3 meter						
Chann	el:		1 (Wo	1 (Worst case)						
				Но	orizontal // V	ertical				
KES SAC #5					< <g (30="" -="" 000)="" 1="" mhz="" re<="" td=""><td>TEST>></td><td></td><td></td><td>2,4G b</td><td>30-1GHz,dat</td></g>	TEST>>			2,4G b	30-1GHz,dat
Model Mode Operato Power Remark [d	: B(uV/m)]				Standard Ant, Fact	: FCC or : 461) Part.15 Class B 3m (+6 dB Att.) KOLAS			
Ioval	130	0,00	44-44-44-44-44-44-44-44-44-44-44-44-44-	0 Frequen		500,00		Spec	(GP) trum(H,PK) trum(V,PK) trum(V,PK) ected ltem(V) sected ltem(V)	
Spec No.	trum Select Frequency		Reading	c.f	Result	Limit	Margin	Height	Angle	Remark
1 2 3 4 5 6 7 8	[MHz] 94.869 104.933 140.095 140.216 180.108 182.048 224.606 224.606	V V H V H H V V	dB(uV)] 46.6 42.5 46.4 38.1 39.4 44.7 55.4 40.0	[dB(1/m)] -18.4 -16.8 -13.0 -13.0 -14.3 -14.3 -15.3 -15.3	PK [dB(uV/m)] 28.2 25.7 33.4 25.1 25.1 30.2 40.1 24.7	QP [dB(uV/m)] 43.5 43.5 43.5 43.5 43.5 43.5 43.5 46.0 46.0	QP [dB] 15.3 17.8 10.1 18.4 13.3 5.9 21.3	[cm] 150.0 100.0 400.0 400.0 100.0 200.0 200.0 100.0	[deg] 74.9 357.0 347.5 70.1 358.3 353.5 12.5 134.3	

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

- Spurious

opuno								
Frequency (Mbz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1125.09	50.58	Peak	Н	-11.27	-	39.31	74.00	34.69
1124.69	49.16	Peak	V	-11.28	-	37.88	74.00	36.12

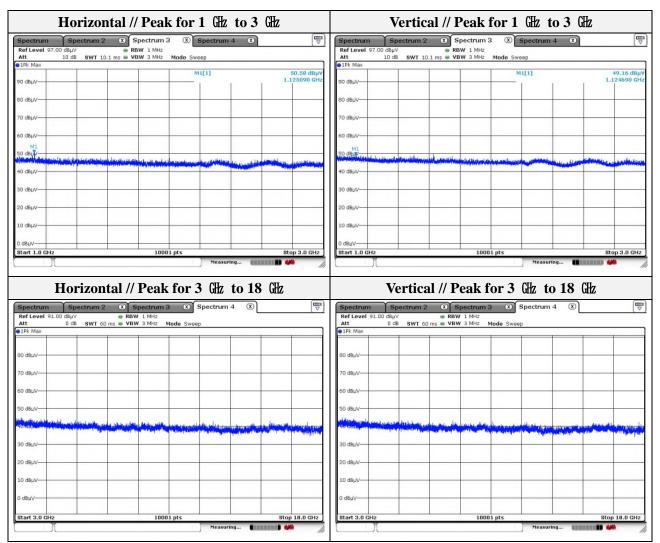
- Band edge

Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
2398.39	49.10	Peak	Н	-7.13	-	41.97	74.00	32.03
2398.03	50.19	Peak	V	-7.14	-	43.05	74.00	30.95

Spectrum 2 8		E Series (Series (Ser	Spectrum			(The second seco
Ref Level 97.00 dBµV	RBW 1 MHz		Ref Level 97.00 dBµV	RBW 1 MH;		(
	VBW 3 MHz Mode Sweep			SWT 10.1 ms 🖷 VBW 3 MH:	Mode Sweep	
1Pk Max			 1Pk Max 			
0 dBµV	M1[1]	49.10 dBµV 2.3983880 GHz	90 dBµV-		M1[1]	50.19 dBp 2.3980290 G
0 dBuV		\sim	80 dBuV-			
			OU ODDA			
0 dBµV			70 dBµV-			
D dBµV			60 dBµV-			
0 dBµV		M1	50 dBµV-			MI
and the second	and all the last of the last o	and the optimited in a state of the optimited in the optited in the optimited in the optimited in the optimi	40 dBLV	and deliver and and an interest of the second s	an define a give definition of a server	-
0 dBµV			40 dbµv-			
0 dBµV			30 dBµV			
0 dBµV			20 dBµV-			
0 dBµV			10 dBµV-			
dBuV F1		F2	0 dBuy			F2
tart 2.3 GHz	10001 pts	Stop 2.412 GHz	Start 2.3 GHz	10	001 pts	Stop 2.412 GF



Test report No.: KES-RF1-20T0154 Page (20) of (43)



Note.

1. No spurious emission were detected above 3 GHz.

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

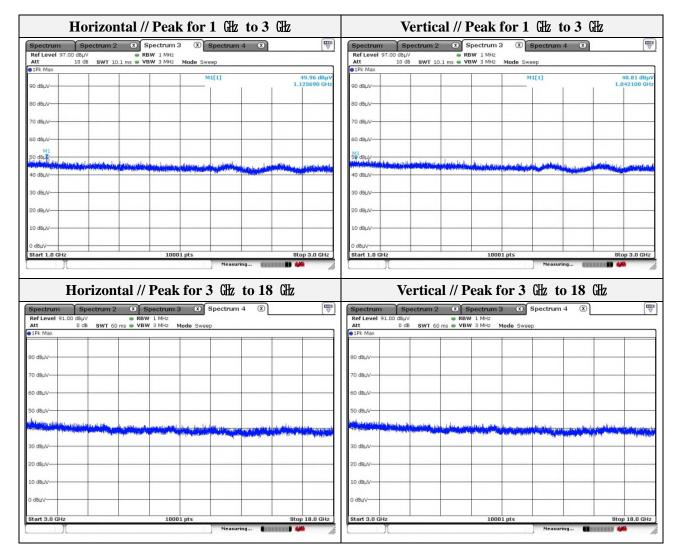


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Mode:	802.11b
Distance of measurement:	3 meter
Channel:	06

- Spurious

Opuilo								
Frequency (Mbz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1125.69	49.96	Peak	Н	-11.27	-	38.69	74.00	35.31
1042.10	48.81	Peak	V	-11.31	-	37.50	74.00	36.50



Note.

1. No spurious emission were detected above 3 GHz.

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

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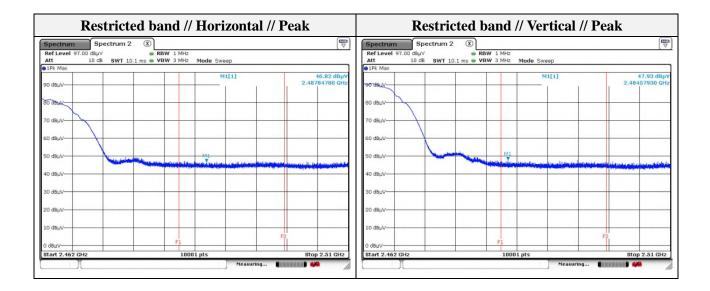
Mode:	802.11b
Distance of measurement:	3 meter
Channel:	11

- Spurious

Frequency (Mz)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1125.09	50.08	Peak	Н	-11.27	-	38.81	74.00	35.19
1125.49	48.39	Peak	V	-11.27	-	37.12	74.00	36.88

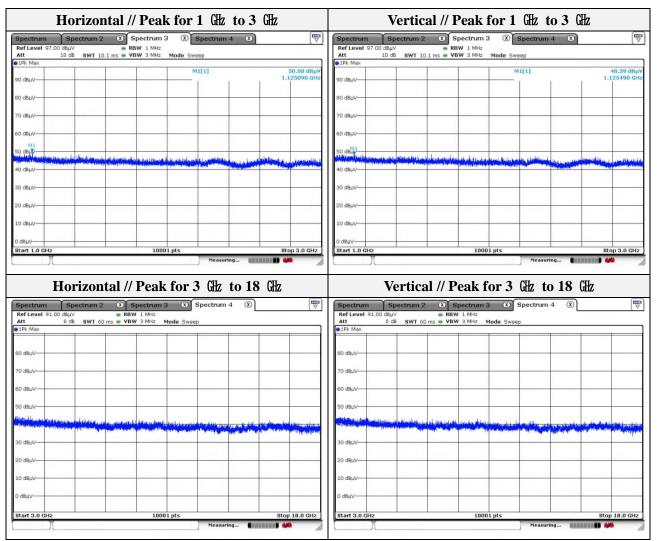
- Band edge

Frequency (Mbz)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµN/m)	Margin (dB)
2487.85	46.82	Peak	Н	-7.57	-	39.25	74.00	34.75
2484.58	47.93	Peak	V	-7.55	-	40.38	74.00	33.62





Test report No.: KES-RF1-20T0154 Page (23) of (43)



Note.

1. No spurious emission were detected above 3 GHz.

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

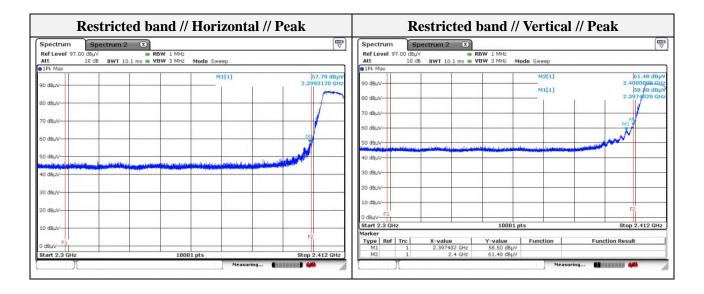


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Mode:	802.11g
Distance of measurement:	3 meter
Channel:	01

- Spurio	us							
Frequency (Mz)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1125.09	51.14	Peak	Н	-11.27	-	39.87	74.00	34.13
1019.50	50.35	Peak	V	-11.32	-	39.03	74.00	34.97

- Band e	dge							
Frequency (MLz)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
2399.32	57.79	Peak	Н	-7.14	-	50.65	74.00	23.35
2397.40	58.50	Peak	V	-7.13	-	51.37	74.00	22.63
2397.40	41.13	Average	V	-7.13	-	34.00	54.00	20.00
2400.00	61.48	Peak	V	-7.14	-	54.34	74.00	19.66
2400.00	46.19	Average	V	-7.14	-	39.05	54.00	14.95





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Restricted band // Horizontal // Avera	ige	Restricted band // Vertical // Average						
		Ref Level 97.00 dB Att 10	ВµV IdB SWT 10.1 ms	RBW 1 MHz	Mode Sweep			
		SGL Count 100/100 IRm AvgPwr	1					
		90 dBµV-			M2[1]		46.19 dBµ\ 2.4000000 GH	
		90 dBµV-			M1[1]		41.13 dBp	
		70 dBµV						
		60 dBµV-						
NT/A		50 dBµV-					MI	
N/A		40 dBµV					and the second s	
		30 d6µV						
		20 dBµV-						
		10 dBµV					F2	
		0 dBµV					Stop 2.412 GHz	
		Start 2.3 GHz Marker			31 pts			
		Type Ref Trc M1 1	X-value 2.397402 GF			Functio	n Result	
		M2 1	2.4 Gł	z 46.19 dB		leady		
	1							
Horizontal // Peak for 1 GHz to 3 GHz					for 1 GHz			
Spectrum Spectrum 2 X Spectrum 3 X Spectrum 4 X Ref Level 97.00 dBµV ■ RBW 1 MHz		Ref Level 97.00 dB	βμV	Spectrum		um 4 🕐		
Att 10 dB SWT 10.1 ms VBW 3 MHz Mode Sweep			dB SWT 10.1 ms	VBW 3 MHz	Mode Sweep			
M1[1]	51.14 dBpV				M1[1]		50.35 dBp	
90 dBµV	1.125090 GHz	90 dBµV					1.019500 GH	
80 dBµV		80 dBµV				_		
70 dBµV		70 dBuV						
		re autr						
60 dBµV		60 dBµV						
		50 dBuV				_		
40 dBuV	and the second second second	40 dBµV				William In the little	Andrease International	
40 dBpv-		40 GBDV						
30 dBµV		30 dBµV						
20 dBµV		20 dBµV						
10 dBµV		10 dBµV						
		To oppo						
0 dBµV	Stop 3.0 GHz	0 dBµV Start 1.0 GHz		1000	01 pts		Stop 3.0 GHz	
						ssuring		
Horizontal // Peak for 3 GHz to 18 G	łz.	T	Vertical /	/ Peak f	for 3 GHz	to 18 (#	7.	
Spectrum 2 3 Spectrum 3 3 Spectrum 4 3		Spectrum	Spectrum 2	x) Spectrum			- 	
Ref Level 91.00 dBµV @ RBW 1 MHz Att 0 dB SWT 60 ms VBW 3 MHz Mode Sweep			dB SWT 60 ms	RBW 1 MHz VBW 3 MHz	Mode Sweep			
1Pk Max		• 1Pk Max						
80 dBµV-		80 dBµV						
70 dBµV		70 dBµV						
60 dBµV		60 dBµV						
50 dBµV		50 dBµV-						
and the state of a	in the late	Martin Sully add a	distance of the	and an in			all all a	
A CONTRACT OF A CO	A STATISTICS AND A	LACENSER STATEMENTS			A state of the state of the state of the		TANK BE DEPENDENT OF THE PARTY	
30 dBµV		30 dBµV-						
20 dBj/V		20 dBµV-						
		10 dBµV						
10 dBµV								
0 dBuV		0 dBµV						
0 d8µV								
	Stop 18.0 GHz	0 dBµV		1000	01 pts	suring	Stop 18.0 GHz	

Note.

1. No spurious emission were detected above 3 GHz.

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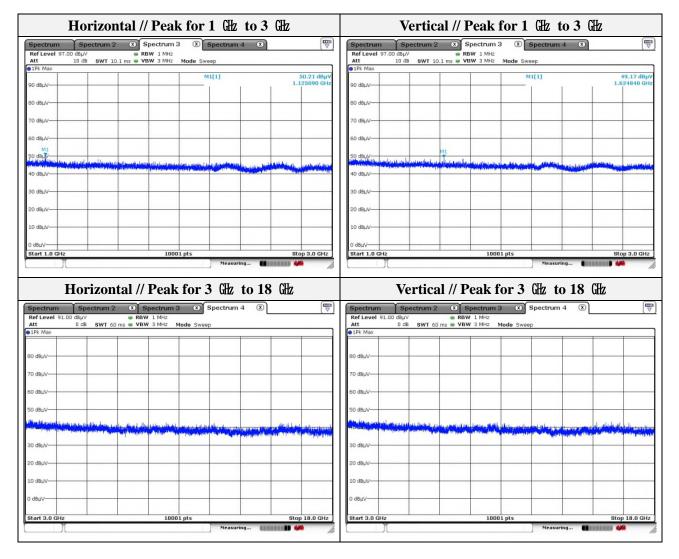


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Mode:	802.11g
Distance of measurement:	3 meter
Channel:	06

- Spurious

Spario								
Frequency (Mbz)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1125.09	50.21	Peak	Н	-11.27	-	38.94	74.00	35.06
1624.84	49.17	Peak	V	-7.15	-	42.02	74.00	31.98



Note.

1. No spurious emission were detected above 3 GHz.

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

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

- Spurious

Frequency (MLz)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1125.29	49.74	Peak	Н	-11.27	-	38.47	74.00	35.53
1078.49	48.89	Peak	V	-11.30	-	37.59	74.00	36.41

- Band edge

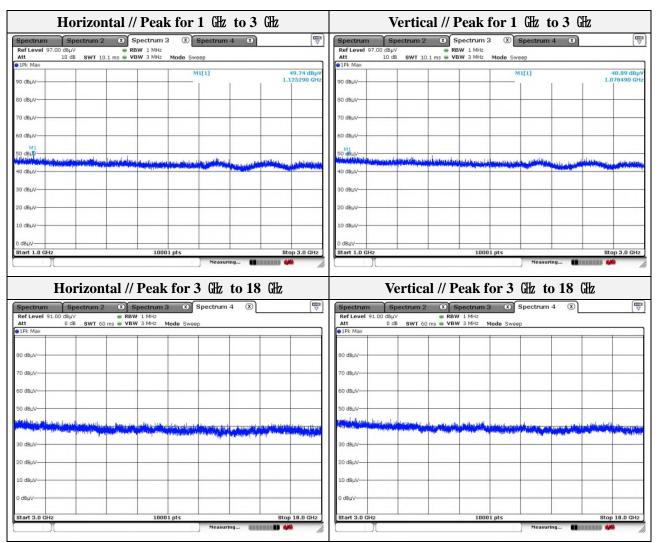
2 ana t								
Frequency (Mbz)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
2483.71	49.98	Peak	Н	-7.55	-	42.43	74.00	31.57
2483.77	53.96	Peak	V	-7.55	-	46.41	74.00	27.59

Spectrum Spectrum 2	8	1	Spectrum Spectrum 2 (3)					
RefLevel 97.00 dBµV Att 10 dB SWT 10.1 r	RBW 1 MHz Sweep Sweep		Ref Level 97.00 dBμV Att 10 dB 9	RBW 1 MHz WT 10.1 ms VBW 3 MHz	Mode Sweep			
1Pk Max			1Pk Max			· · · · · · · · · · · · · · · · · · ·		
90 dBµV	M1[1]	49.98 dBµV 2.48371060 GHz	90.450A		M1[1]	53.96 dBp 2.48377300 GH		
In appr			80 dBµV-					
70 dBµV			70 dBµV					
No. of Concession, Name	N21		50 dBµV	In the second se	Contrast Line Mailed and a started			
0 dBµV			40 dBµV			Andrew States and Andrew States		
ю dвµV			30 dBµV-					
20 dBµV			20 dBµV-					
L0 d8μV	F1	F2	10 dBµV	F1		F2		
0 dBµV	r.		0 dBµV	F1				

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Note.

1. No spurious emission were detected above 3 GHz.

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



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

- Spurious

Frequency (Mbz)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1124.89	50.81	Peak	Н	-11.28	-	39.53	74.00	34.47
1625.24	49.25	Peak	V	-7.15	-	42.10	74.00	31.90

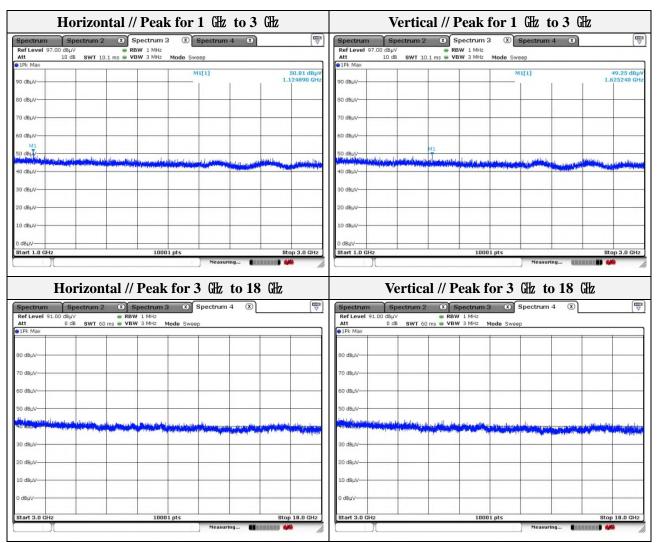
- Band edge

Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
2399.99	56.80	Peak	Н	-7.14	-	49.66	74.00	24.34
2400.00	59.23	Peak	V	-7.14	-	52.09	74.00	21.91

Spectrum Spectrum 2	8		Spectrum Spe	ctrum 2 (X)		6
Ref Level 97.00 dBµV	BW 1 MHz	()	Ref Level 97.00 dBµV	RBW 1 MHz		1
	ms 🖷 VBW 3 MHz Mode Sweep			SWT 10.1 ms - VBW 3 MHz 1	Mode Sweep	
1Pk Max			 1Pk Max 			
0 dBµV·	M1[1]	56.80 dBµV 2.3999890 GHz	90 dBµV-		M1[1]	59.23 dB 2.4000000 G
o deuv		m	80 daµV			
0 d6uV			70 dBuV			
0 dBuV		603	60 dBuV			M
D dBµV			50 dBµV-			
i initia di anti di la constante di la constant O dBuV			40 dBµV		Hadden and a state of the second	
D dBuV			30 dBµV			
0 dBuV			20 dBuV			
0 dBµV		F2	10 dBµV			F2
dBµV- tart 2.3 GHz	10001 pts	Stop 2.412 GHz	0 dBµV Start 2,3 GHz	10001	pts	Stop 2.412 GH
arker			Marker			
Type Ref Trc X-value M1 1 2.39998	Y-value Function GHz 56.80 dBuV	Function Result	Type Ref Trc	2.4 GHz 59.23 dBu	Function	Function Result



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Note.

1. No spurious emission were detected above 3 GHz.

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



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 Test report No.: KES-RF1-20T0154 Page (31) of (43)

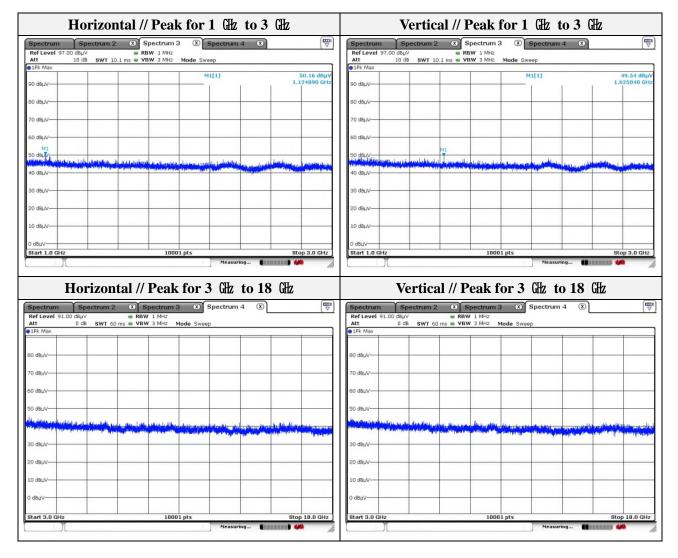
Mode:	802.11n(HT20)
Distance of measurement:	3 meter

Channel:

06

- Spurious

- Spurio	us							
Frequency (Mz)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1124.89	50.16	Peak	Н	-11.28	-	38.88	74.00	35.12
1625.04	49.54	Peak	V	-7.15	-	42.39	74.00	31.61



Note.

1. No spurious emission were detected above 3 GHz.

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

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Test report No .: KES-RF1-20T0154 Page (32) of (43)

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

Channel:

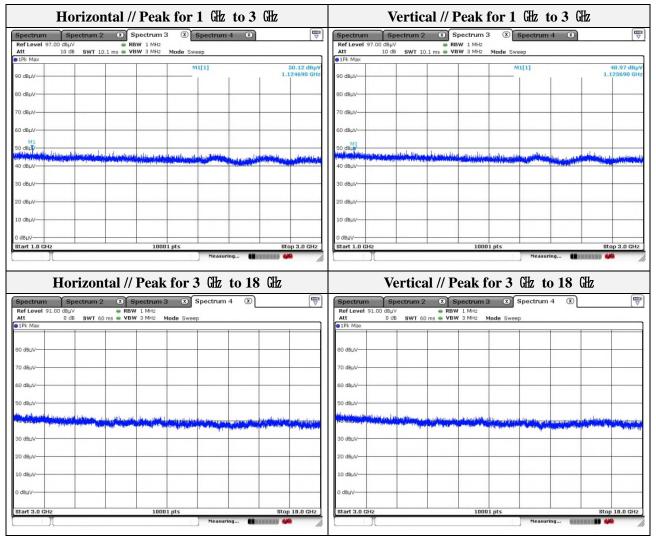
- Spurio	us							
Frequency (MLz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1124.69	50.12	Peak	Н	-11.28	-	38.84	74.00	35.16
1125.69	48.97	Peak	V	-11.27	-	37.70	74.00	36.30

Band edge _

Frequency (Mz)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµV/m)	Margin (dB)
2485.12	53.29	Peak	Н	-7.55	-	45.74	74.00	28.26
2485.66	54.03	Peak	Н	-7.55	-	46.48	74.00	27.52
2485.16	47.85	Peak	V	-7.55	-	40.30	74.00	33.70

Spectrum Spectrum	2 3		Spectrum Spectrum 2	8	(m
Ref Level 97.00 dBµV	RBW 1 MHz		Ref Level 97.00 dBµV	RBW 1 MHz	
Att 10 dB SWT	10.1 ms 🖷 VBW 3 MHz Mode Sweep		Att 10 dB SWT 10.1 r	ms 🖷 VBW 3 MHz Mode Sweep	
	M2[1]	54.03 dBµV 2.46566400 GHz 53.29 dBµV 2.48512170 GHz	90 dBµV	M1[1]	47.85 dBj 2.48515530 Gi
70 dBµV			80 dBµV		
0 dBµV	M2	and the state of the	60 dBµV-	MI	
0 dBµV			40 dBµV		nin alamidini ana salariya yayan dada
D dBµV			30 dBµV		
dBuV	F1	F2	10 dBµV		F2
start 2,462 GHz	10001 pts	Stop 2.51 GHz	0 dBµV-	F1	
			Start 2,462 GHz Marker	10001 pts	Stop 2.51 GH





Note.

1. No spurious emission were detected above 3 GHz.

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



Test report No.: KES-RF1-20T0154 Page (34) of (43)

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

- Spurious

Frequency (Mz)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1125.09	50.02	Peak	(H / V) H	-11.27	-	38.75	(dDµV/III) 74.00	35.25
1625.04	48.89	Peak	V	-7.15	-	41.74	74.00	32.26

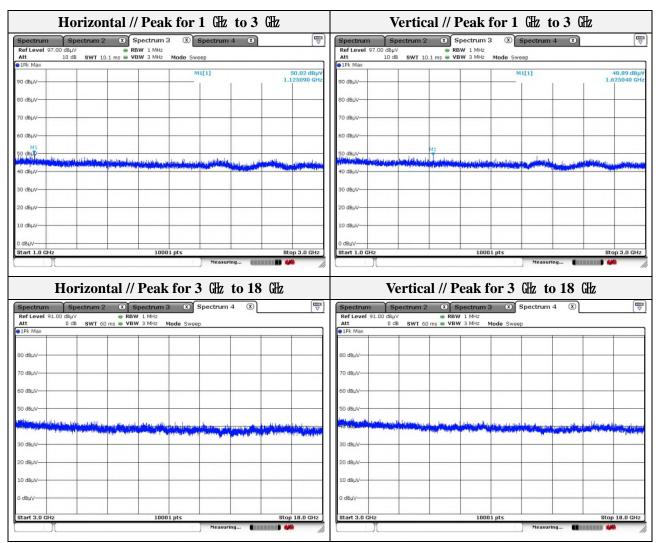
- Band edge

2 ana c								
Frequency (MHz)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2399.94	56.32	Peak	Н	-7.14	-	49.18	74.00	24.82
2399.98	56.11	Peak	V	-7.14	-	48.97	74.00	25.03

Spectrum 2 X			Spectrum Spectrum 2	8	9
Ref Level 97.00 dBµV	RBW 1 MHz		Ref Level 97.00 dBµV	RBW 1 MHz	
	VBW 3 MHz Mode Sweep			ns 🖷 VBW 3 MHz Mode Sweep	
1Pk Max			• 1Pk Max		
0 dBµV	M1[1]	56.32 dBµV 2.3999400 GHz	90 dBµV	M1[1]	56.11 dB 2.3999760 Gi
O dBµV		manan	80 dBµV		man
0 dBµV			70 dBµV		
0 dBµV			60 dBµV		
O dBµV	takin in a sanatakin a sanatakin da sa sanatakina.		50 dBµV		
o dBµV			40 dBµV		
0 dBµV			30 dBµV		
0 dBµV			20 dBµV		
0 dBµV			10 dBµV		
dBµV F1		F2	0 dBµV		F2
tart 2.3 GHz	10001 pts	Stop 2.422 GHz	Start 2.3 GHz	10001 pts	Stop 2.422 GH
arker	Y-value Function	Function Result	Marker Type Ref Trc X-value	Y-value Function	Function Result



Test report No.: KES-RF1-20T0154 Page (35) of (43)



Note.

1. No spurious emission were detected above 3 GHz.

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



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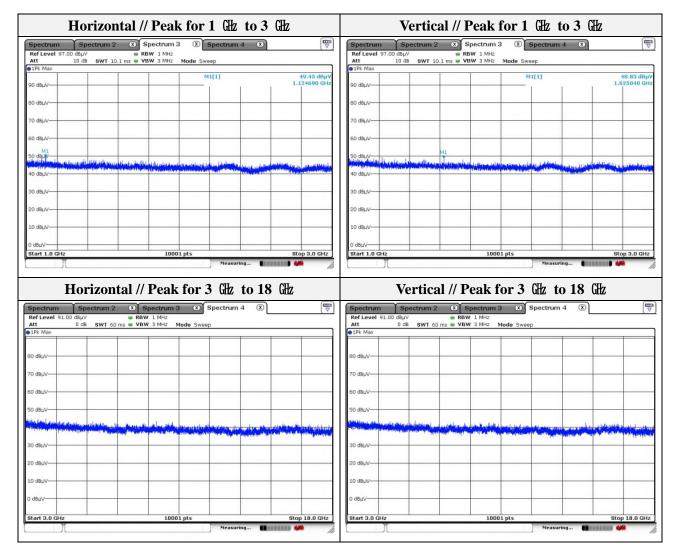
Mode:	802.11n(HT40)
Distance of measurement:	3 meter

Channel:

06

- Spurious

Sparro								
Frequency (Mbz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1124.69	49.45	Peak	Н	-11.28	-	38.17	74.00	35.83
1625.04	48.83	Peak	V	-7.15	-	41.68	74.00	32.32



Note.

1. No spurious emission were detected above 3 GHz.

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

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Mode:	802.11n(HT40)
Distance of measurement:	3 meter
Channel:	09

- Spurious Frequency Level

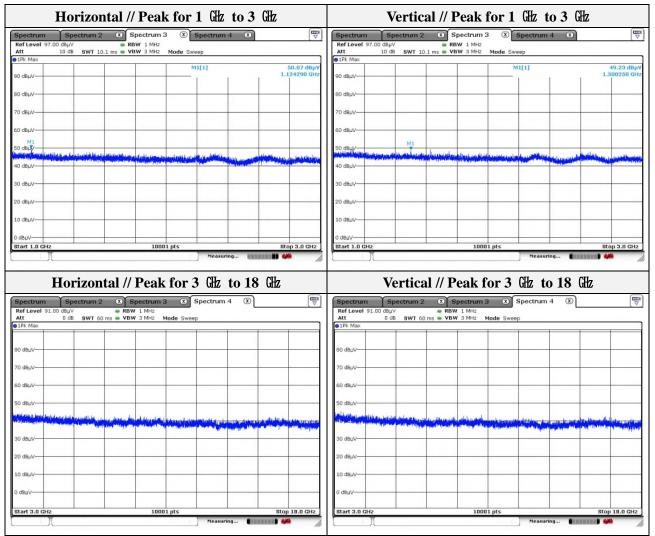
Frequency (Mbz)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1124.29	50.07	Peak	Н	-11.28	-	38.79	74.00	35.21
1500.25	49.23	Peak	V	-9.05	-	40.18	74.00	33.82

- Band edge

Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
2483.88	51.87	Peak	Н	-7.55	-	44.32	74.00	29.68
2486.19	47.58	Peak	V	-7.56	-	40.02	74.00	33.98

Spectrum 2 🛞			Spectrum Spectrum	m 2 🗷		E C
Att 10 dB SWT 10.1 ms 🖷	RBW 1 MHz VBW 3 MHz Mode Sweep			BBW 1 MHz T 10.1 ms WBW 3 MHz	Mode Sweep	
1Pk Max			 1Pk Max 			
o daµv	M1[1]	51.87 dBjiV 2.48387950 GHz	90 dBµV-		M1[1]	47.58 dBp 2.48618760 GH
and the second second			prosper and	~		
o deµv			70 dBµV-			
o daµv			60 dBµV-			
о dвµV	Manager and the state of the st	CONTRACT OF LAND	50 dBµV		M1	Rent Martin Land Land Land
ið dBµV			40 dBµV			
10 dвµV			30 dBµV-			
0 dBµV			20 dBµV-			
0 dвµV		F2	10 dвµV			
) dBµV	F1		0 dBµV		F1	F2
Start 2,452 GHz	10001 pts	Stop 2.51 GHz	Start 2,452 GHz	1000	1 pts	Stop 2,51 GH
larker			Marker			
Type Ref Trc X-value	Y-value Function	Function Result	Type Ref Trc X-V	value Y-value	Function	Function Result





Note.

1. No spurious emission were detected above 3 GHz.

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



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Vertical

Mode

x s

trum 3 🛞 Spectrum 4

(x)

Test results (18 GHz to 30	(壯) – Worst case
Mode:	802.11n_HT20
Distance of measurement:	3 meter
Channel:	1 (Worst case)

 Horizontal

 Spectrum
 Spectrum

1Pk Max				e 1Pk Max		
30 dBµV				80 dBµV		
0 dBµV				70 dBµV		
50 dBµV			hit is a	S0 dBµV		
30 dBuV		understation of the first of the second s	AND	30 d6µV		
0 d8µV				20 dBµV		
dBµV				0 d8µV		
start 18.0 GHz	1	0001 pts	Stop 30.0 GHz	Start 18.0 GHz	10001 pts	Stop 30.0 G
		Heasurin	9 ()))))))))))			Heasuring

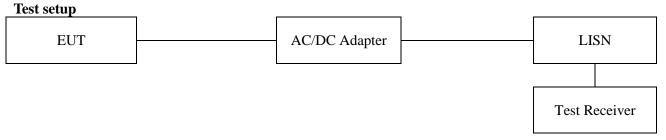
Note.

1. No spurious emission were detected above 18 GHz.



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3.2 AC conducted emissions



Limit

According to 15.207(a), for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50uH/50 ohm line impedance stabilization network (LISN). Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequencies ranges.

Frequency of Emission (Mg)	Conducted limit (dBµN/m)			
Frequency of Emission (Mz)	Quasi-peak	Average		
0.15 - 0.50	66 - 56*	56 - 46*		
0.50 - 5.00	56	46		
5.00 - 30.0	60	50		

Note:

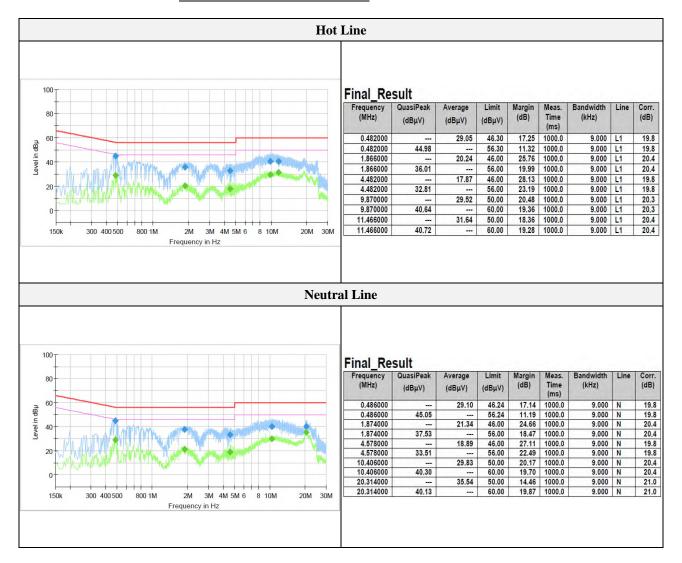
- 1. All AC line conducted spurious emission are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and the appropriate frequencies. All data rates and modes were investigated for conducted spurious emission. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section.
- 2. Both Cable loss and LISN factor are included in measurement level(QP Level or AV Level).



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Test results

Mode:	802.11b (Worst case)	
Distance of measurement:	3 meter	
Channel:	1 (Worst case)	





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Appendix A. Meas Equipment	urement equipme	Model	Serial No.	Calibration	Calibration
				interval	due.
EMI TEST RECEIVER	ESU26	Rohde & Schwarz	100552	1 year	2021.04.01
SPECTRUM ANALYZ ER	R&S	FSV40	101725	1 year	2021.06.22
8360B Series Swept Signal Generator	HP	83630B	3844A00786	1 year	2021.01.15
SIGNAL GENERATOR	KEYSIGHT	N5182B	MY59100115	1 year	2021.05.12
Power Meter	Anritsu	ML2495A	1438001	1 year	2021.05.12
Pulse Power Sensor	Anritsu	MA2411B	1339205	1 year	2021.05.12
DC POWER SUPPLY	SORENSEN	DCS40-75E	1408A02745	1 year	2021.01.15
ATTENUATOR	Mini-Circuits	BW-S10-2W263+	1	1 year	2021.01.17
Loop Antenna	Schwarzbeck	FMZB1513	225	2 years	2021.02.15
BILOG ANTENNA	VULB 9168	SCHWARZBECK	9168-461	2 years	2022.05.26
HORN ANTENNA	A.H.	SAS-571	414	1 years	2021.01.31
BAND REJECT FILTER	MICRO-TRONICS	BRM50702	G272	1 year	2021.01.15
BAND REJECT FILTER	MICRO-TRONICS	BRM50716	G199	1 year	2021.01.15
AMPLIFIER	310N	SONOMA INSTRUMENT	401123	1 year	2021.06.08
PREAMPLIFIER	8449B	AGILENT	8008A01640	1 year	2021.04.01
ATTENUATOR	F04-C1206-01	SRT	20022403	1 year	2021.05.06
EMI Test Receiver	R&S	ESR3	101781	1 year	2021.01.20
EMI Test Receiver	R&S	ESU26	100552	1 year	2021.04.01
Pulse Limiter	R&S	ESH3-Z2	101915	1 year	2021.01.02
LISN	R&S	ENV216	101787	1 year	2021.01.02

Appendix A. Measurement equipment

Peripheral devices

Device	Manufacturer	Model No.	Serial No.	
Notebook computer	LG Electronics Inc.,	15UD590	904QCSF564006	
Test Jig Board	N/A	N/A	N/A	

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