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TEST REPORT Part 15 Subpart C 15.247

Equipment under test BABY CAMERA

Model name SEP-5001RDN

Derivative model SEP-5002RDN

FCC ID NLMSEP5001RDN

Applicant Hanwha Techwin Co., Ltd.

Manufacturer RDI Technology (Shenzhen) Co., Ltd.

Date of test(s) 2017.01.02 ~ 2017.01.09

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Issued to

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Revision history

Revision	Date of issue	Test report No.	Description
-	2017.01.09	KES-RF-17T0004	Initial



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1. General information

Applicant:	Hanwha Techwin Co., Ltd.					
Applicant address:	1204, Changwon-daero, Se	1204, Changwon-daero, Seongsan-gu, Changwon-si				
	Gyeongsangnam-do, South	Gyeongsangnam-do, South Korea				
Test site:	KES Co., Ltd.					
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	473-29, Gayeo-ro, Yeoju-si, Gyeonggi-do, Korea					
FCC rule part(s):	15.247					
FCC ID:	NLMSEP5001RDN					
Test device serial No.:	Production	Pre-production	Engineering			

1.1. EUT description

Equipment under test	BABY CAMERA
Frequency range	$FHSS: 2\;408\;\;\text{Mz}\;\sim 2\;468\;\;\text{Mz}$
	$WIFI: 2\;412\;\;\text{Mz}\;\sim 2\;462\;\;\text{Mz}\;\;(11b/g/n_HT20)$
	$2\ 422\ \text{Mz} \sim 2\ 452\ \text{Mz}(11n_HT40)$
Modulation technique	FHSS, GFSK
	WIFI : DSSS, OFDM
Number of channels	FHSS : 16
	WIFI : 11(802.11b/g/n_HT20), 7(802.11n_HT40)
Antenna specification	Antenna type: Dipole, Peak gain: 2 dBi
Power source	AC 120 V (Adapter)

1.2. Test configuration

The **Hanwha Techwin Co., Ltd. BABY CAMERA FCC ID: NLMSEP5001RDN** was tested per the guidance of KDB 558074 D01 v03r05. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

1.3. Accessory information

Applicant	Equipment	Manufacturer	Model	Power source
Hanwha Techwin Co., Ltd.	Environment Sensor	RDI Technology (Shenzhen) Co., Ltd.	SEA-SE10	DC 5V(Mini USB)

1.4. Device modifications

N/A

1.5. Derivation model information

The circuit diagram and software of the basic model(SEP-5001RDN) and derivative(SEP-5002RDN) are fundamentally the same. But the derivative is being blocked sensor port.

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1.6. 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

1.7. Worst case data rate

- 1. Radiated emission and power line conducted emission were 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: <u>MCS0</u> 802.11n_HT40: <u>MCS0</u>



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2. Summary of	tests	
Reference	Parameter	Test results
15.247(a)(2)	6 dB bandwidth	Pass
15.247(b)(3)	Peak output power	Pass
15.247(e)	Power spectral density	Pass
15.205 15.209	Radiated restricted band and emission	Pass
15.247(d)	Conducted spurious emission and band edge	Pass
15.207(a)	AC conducted emissions	Pass



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3. Test results

3.1. 6 dB bandwidth

Test procedure

KDB 558074 D01 v03r05 – Section 8.1 or 8.2 Used test method is section 8.1.

Section 8.1

- 1. RBW = 100 kHz.
- 2. VBW \geq 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.

Section 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 above (i.e., RBW = 100 kHz, $VBW \ge 3 \times RBW$, 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 $\ge 6 \text{ dB}$.

Limit

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



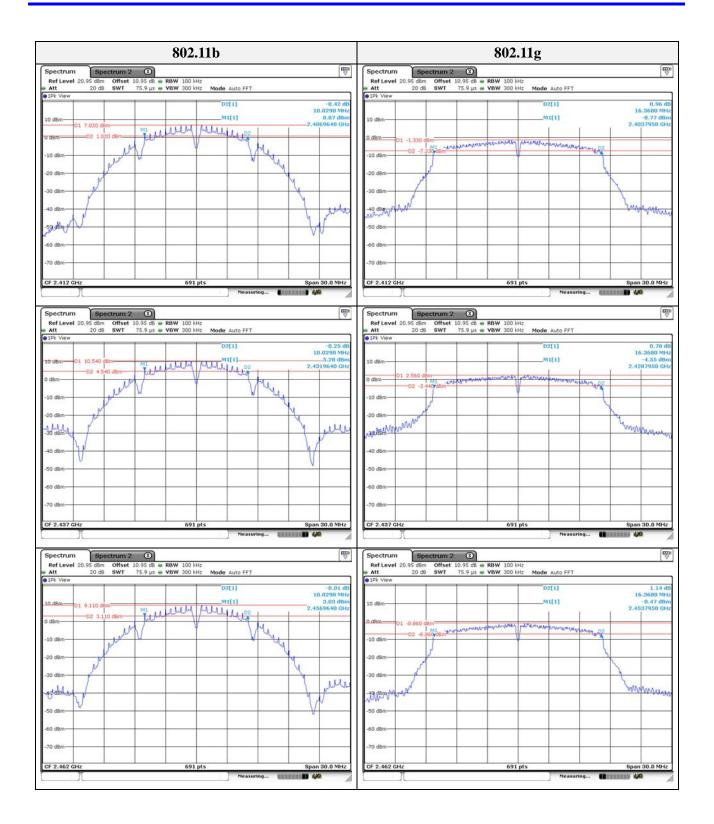
Test results

6 dB bandwidth of 20 Mz bandwidth							
	Limit(Mb)						
Frequency(Mz)	Frequency(Mb) 802.11b 802.11g 802.11n						
2 412	10.029	16.368	17.583				
2 437	10.029	16.368	17.583	0.5			
2 462	10.029	16.368	17.583				

6 dB bandwidth of 40 Mz bandwidth					
Measured 6 dB bandwidth(Mz)					
Frequency(Mb)802.11nLimit(Mb)					
2 422	36.120				
2 437	36.120	0.5			
2 452	36.120				

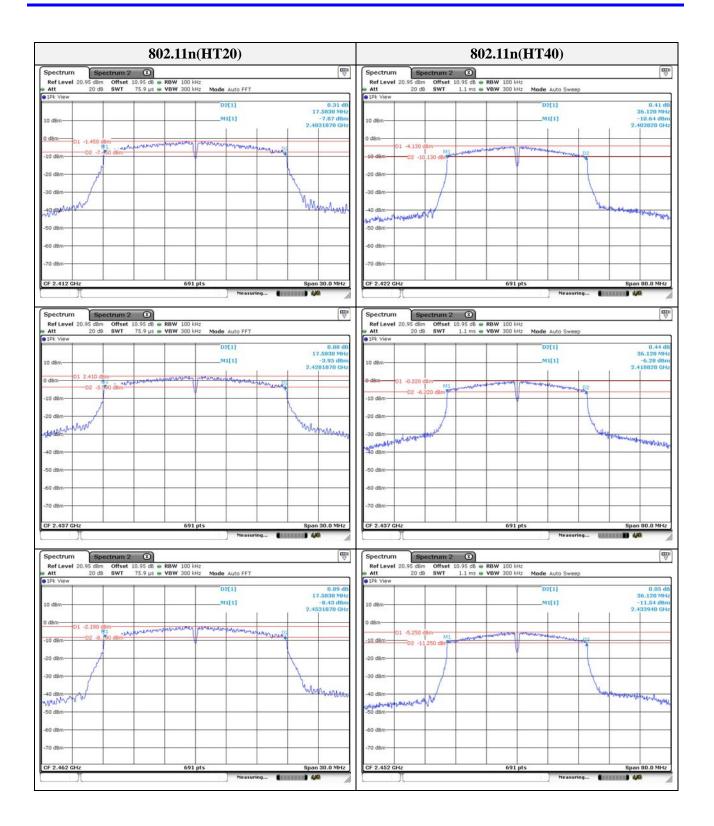


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3.2. Output power

Test procedure

KDB 558074 D01 v03r05 - section 9.1.1 or 9.1.2 Used test method is section 9.1.2.

Section 9.1.1

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

- 1. Set the RBW \geq DTS bandwidth.
- 2. Set VBW \geq 3 \times RBW.
- 3. Set span \geq 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

Section 9.1.2

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.

Limit

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

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)						
Mada	2412 MHz		2437 MHz		2467 Mb	
Mode	Peak	Average	Peak	Average	Peak	Average
11b	18.26	16.31	19.40	17.50	20.03	18.16
11g	21.85	12.75	23.37	15.68	21.14	11.09
11n	22.66	12.55	23.74	15.53	22.13	10.95
Mode	242	2 MHz	243'	7 MHz	245	2 MHz
	Peak	Average	Peak	Average	Peak	Average
11n	21.82	11.31	23.54	15.38	21.70	10.61



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3.3. Power spectral density Test procedure KDB 558074 D01 v03r05- section 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 \leq RBW \leq 100 kHz
- 4. Set the VBW \geq 3 \times 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.
- 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.



Test results

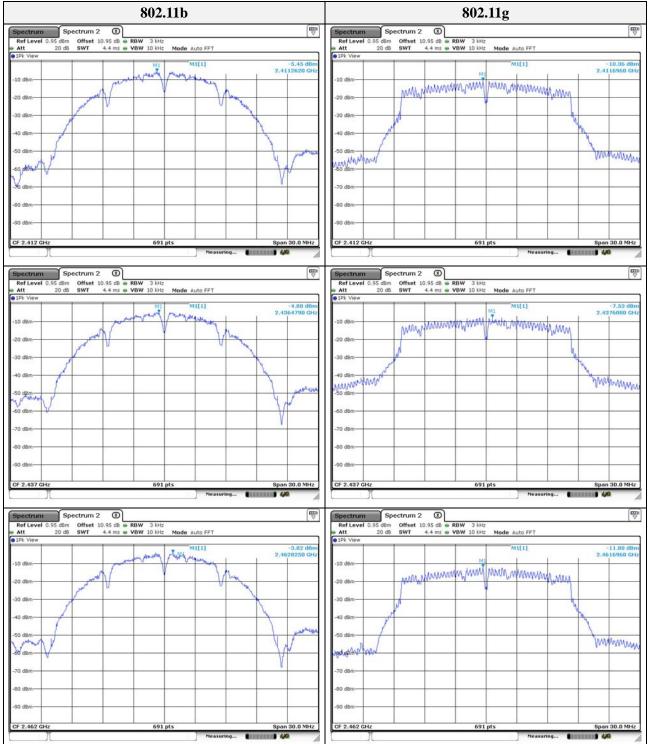
PSD of 20 Mz bandwidth							
	Measured PDS(dBm)						
Frequency(Mz)	Frequency(Mb) 802.11b 802.11g 802.11n						
2412	-5.45	-10.36	-11.22				
2437	-4.88	-7.53	-7.94	8			
2462	-3.82	-11.88	-12.29				

PSD of 40 Mz bandwidth									
Measured PDS(dBm)									
Frequency(Mz)	Frequency(Mz)802.11nLimit(dBm)								
2422	-14.68								
2437	-10.28	8							
2452	2452 -15.72								



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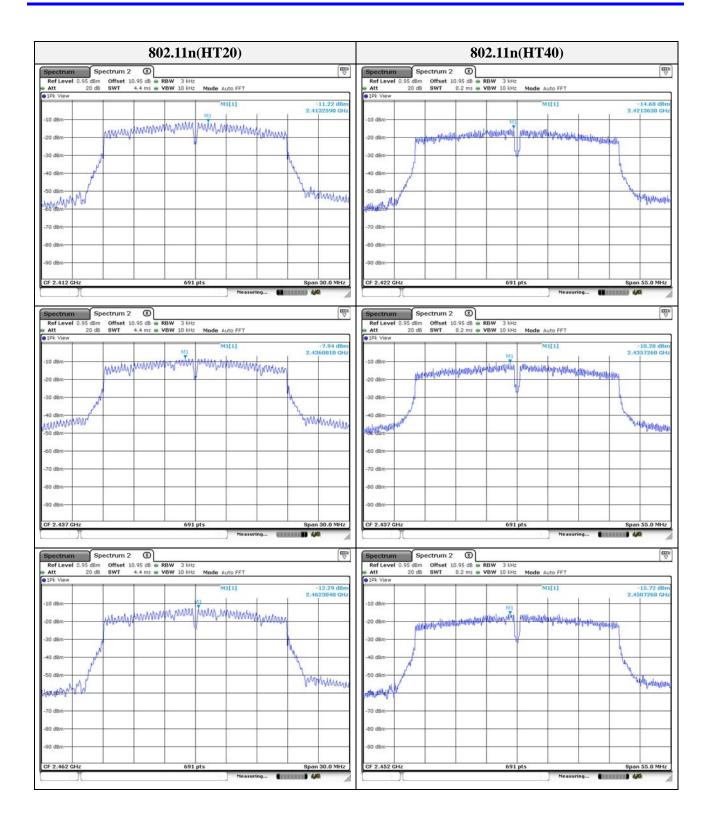
SISO



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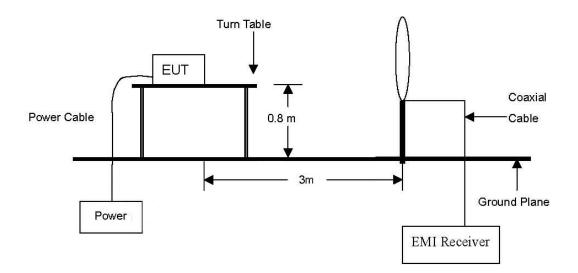




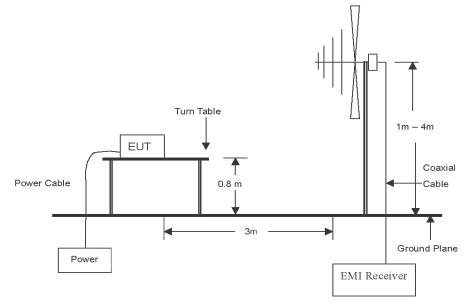
3.4. Radiated restricted band and emissions

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.

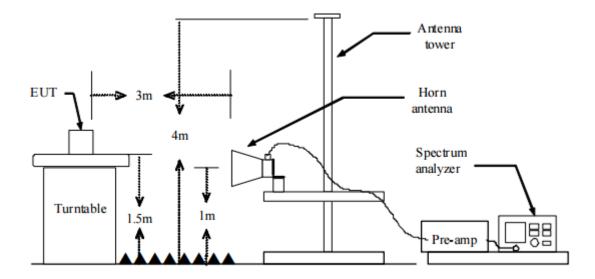


The diagram below shows the test setup that is utilized to make the measurements for emission from 30 Mz to 1 Gz emissions.





The diagram below shows the test setup that is utilized to make the measurements for emission from 1 \mathbb{G} to the tenth harmonic of the highest fundamental frequency or to 40 \mathbb{G} 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. For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading.
- 4. The test-receiver system was set to average or quasi peak detect function and Specified Bandwidth with Maximum hold mode.

Test procedure above 30 Mz

- 1. Spectrum analyzer settings for f < 1 GHz:
 - (1) Span = wide enough to fully capture the emission being measured
 - \bigcirc RBW = 100 kHz
 - ③ VBW \ge RBW
 - ④ Detector = quasi peak
 - (5) Sweep time = auto
 - \bigcirc Trace = max hold
- 2. 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 Mz
 - ③ VBW \ge 3 Mz
 - (4) Detector = peak
 - \bigcirc Sweep time = auto
 - 6 Trace = max hold
 - \bigcirc Trace was allowed to stabilize



- 3. 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

 - (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.
 - ④ 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. $F_d = 40\log(D_m/D_s)$

 $f \ge 30$ 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. $CF(Correction factors(dB)) = Antenna factor(dB/m) + Cable loss(dB) + or Amp. gain(dB) + or F_d(dB)$
- 4. Field strength($dB\mu V/m$) = Level($dB\mu V$) + CF (dB) + or DCF(dB)
- 5. Margin(dB) = Limit(dB μ /m) Field strength(dB μ /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.
- 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.

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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.



Duty cycle

Regarding to KDB 558074 D01_v03r05, 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	Ton time (ms)	Period (ms)	Duty cycle (Linear)	Duty cycle (%)	Duty cycle correction factor (dB)
802.11b	10.00	10.00	1	100	0
802.11g	10.00	10.00	1	100	0
802.11n(HT20)	10.00	10.00	1	100	0
802.11n(HT40)	10.00	10.00	1	100	0

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

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

	802.11b // Middle chanı	nel	802.11g // Middle channel					
Spectrum		E la	² Spectrum ²					
Ref Level 35.95 da	offset 10.95 dB . RBW 10 MHz		Ref Level 35.6	95 dBm Offset 10.95 dB	· RBW 10 MHz		[*	
	dB 🖷 SWT 10 ms 🖷 VBW 10 MHz		- Att	35 dB 🖷 SWT 10 ms	VBW 10 MHz			
1Pk Clrw			1Pk Clrw				1 1	
30 dBm			30 dBm					
			chesmon was shad	nontrenselvenesserver	mannehante	approximation and	muchan	
-20 d8m			20 dBm					
10 dBm-			10 d8m-					
0 dBm			0 dBm-					
-10 dBm			-10 d8m					
-10 0011			-10 0011					
-20 dBm			-20 dBm					
-30 d8m			-30 dBm					
-40 dBm			-40 d8m					
-50 d8m-			-50 dBm-					
-60 d8m			-60 dBm		-	-		
CF 2.442 GHz	691 pts	1.0 ms/	CF 2.442 GHz		691 pts		1.0 ms/	
Marker			Marker					
0	Measurin	9 (*******) 4/0				Measuring 🚺	AND 10 10 10 10 10 10 10 10 10 10 10 10 10	
Spectrum Ref Level 35.95 dt			Spectrum Ref Level 35.9	802.11n(H S dBm Offset 10.95 dB	 RBW 10 MHz 		(m	
	dB 🖶 SWT 10 ms 🖶 VBW 10 MHz		Att	35 dB 🖷 SWT 10 ms	VBW 10 MHz			
1Pk Clrw			• 1Pk Clrw					
30 dBm			30 dBm					
20 dBm	and a second and	14-marine-restances	and many marks	and so all show when the second second	manus med services	muner	man man	
20 d8m-			20 d8m					
10 dBm			10 dBm					
0 dBm-			0 dBm-					
-10 d8m			-10 dBm					
-20 dBm			-20 dBm					
-30 dBm			-30 d8m					
			Job dami					
-40 dBm			-40 d8m					
-50 dBm			-50 dBm					
-60 d8m-			-60 d8m	_		-		
CF 2.442 GHz	691 pts	1.0 ms/	CF 2.442 GHz		691 pts		1.0 ms/	
Marker			Marker					
	Measurin	9 ()))))))))))				Measuring 🚺	440	

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Test results (Below 30 Mz))
Mode:	802.11n(HT20)
Distance of measurement:	3 meter
Channel:	06(Worst case)

Frequency	Level	Ant. Pol.	CF	Fd	Field strength	Limit	Margin	
(MHz)	(dBµV)	(H / V)	(dB)	(dB)	$(dB\mu V/m)$	$(dB\mu V/m)$	(dB)	
	No spurious emissions were detected within 20 dB of the limit							

Horizontal					Vertical					
Spectrum Spectrum 2	8			Spectrum			-100			9
Ref Level 57.00 d8μ∨ Att 0 d8 SWT 13	RBW (6dB) 200 H: A md P VBW 3 kH	Z Mode Auto FFT		Ref Level	57.00 dBµV 0 dB SWT 13.4 ms	RBW (6dB) 200 RBW 3	0 Hz kHz Mode Auto	FET		
1Pk View	,+ ms • VDW 3 km	Mode Auto FF1		1Pk View	0 00 SW1 13.4 ms	• VBW 3	KH2 MODE AUto	(FF)		_
		M1[1]		/4 dBµV			M1[1]			-1.05 dBp
50 dBµV			95.2	210 kHz 50 dBµV		-		Ĩ.	ř l	94.600 kł
40 dBµV				40 dBµV				_		
30 dBµV				30 dBµV		-		-		
20 dBuV				20 dBuV						
10 dBuV-				10 dBµV		-				
0 dBµV		Ma		0 dBµV			811			
		X					1			
-10 dBuy	and mary manual and	with more and	athener the more	-10 dBµV	when we we they are	and have been and the	march Lunin	whenter	Allerenter	MURALIN
-20 dBuV-			and the second	-20 dBµV-						
20 0800				-20 GBHA						
-30 dBµV				-30 dBµV				-	-	
40 dBµV	691 pts		Stop 150	-40 dBµV-	17	691 p	**		Stop	150.0 kHz
Type Ref Trc Stimulus	Response 21 kHz -2.74 dBµV	Function Heasuring.	Function Result	Type Ref M1	Trc Stimulus 1 94.6 kHz	Response -1.05 dBµV	7	suring 🚺		
Type Ref Trc Stimulus M1 1 95.2 Spectrum Spectrum 2	21 kHz −2.74 dBµV			M1	1 94.6 kHz	-1.05 dBµV	Mea	suring 📶		•
Type Ref Trc Stimulus M1 1 95.2 Spectrum Spectrum 2 Ref Level 67.00 dbµ/v Att 0 d8 SWT 2.1	 21 kHz -2.74 dBµV (8) (6dB) 9 kHz 			Spectrum Ref Level	1 94.6 kHz	-1.05 dBµV	Mea			•
Type Ref Trc Stimulus M1 1 95.2 Spectrum Spectrum 2 Ref Level 67.00 dbµ/v Att 0 d8 SWT 2.1	 21 kHz -2.74 dBµV (8) (6dB) 9 kHz) Measuring.		Spectrum Ref Level	1 94.6 kHz	-1.05 dBµV	Mea			•
M1 1 95.2 Spectrum Spectrum 2 Ref Level 67.00 dBµV	 21 kHz -2.74 dBµV (8) (6dB) 9 kHz) Measuring.		Spectrum Ref Level	1 94.6 kHz	-1.05 dBµV	Mea			
Spectrum	 21 kHz -2.74 dBµV (8) (6dB) 9 kHz) Measuring.		Image: Spectrum Ref Level Att ● 1pk View 60 d8µV	1 94.6 kHz	-1.05 dBµV	Mea			•
Spectrum Spectrum 2 Ref Level 67.00 dBµV Att 0 dB 0 dB SWT 2.1	 21 kHz -2.74 dBµV (8) (6dB) 9 kHz) Measuring.			1 94.6 kHz	-1.05 dBµV	Mea			•
Spectrum Spectrum Spectrum Spectrum Spectrum Spectrum Ref Level 67.00 dbµV 0 db SWT 2.1 hIP: View 0 db LµV 50 dbµV 0 db LµV	 21 kHz -2.74 dBµV (8) (6dB) 9 kHz) Measuring.			1 94.6 kHz	-1.05 dBµV	Mea			•
Spectrum	 21 kHz -2.74 dBµV (8) (6dB) 9 kHz) Measuring.		Image: Spectrum Ref Level Att ● 1pk View 60 d8µV	1 94.6 kHz	-1.05 dBµV	Mea			•
Spectrum Spectrum 2 Ref Level 67.00 dBµV 0 dB v BlbK View 0 dB swr 2.1 90 dBµV 0 dB swr 2.1	 21 kHz -2.74 dBµV (8) (6dB) 9 kHz) Measuring.			1 94.6 kHz	-1.05 dBµV	Mea			•
Type [Ref] Trc Stimulus M1 1 95.2 Spectrum Spectrum 2 Ref Level 67.00 dbµV Att 0 dB SWT 2.1 1Pk View 50 dbµV 50 dbµV 0 30 dbµV 0	 21 kHz -2.74 dBµV (8) (6dB) 9 kHz) Measuring.			1 94.6 kHz	-1.05 dBµV	Mea			•
Spectrum Spectrum 2 Ref Level 67.00 dBµV 0 dB v BlbK View 0 dB swr 2.1 90 dBµV 0 dB swr 2.1	 21 kHz -2.74 dBµV (8) (6dB) 9 kHz) Measuring.		M1 Image: Spectrum Ref Level 0 dBµ/ 50 dBµ/ 40 dBµ/	1 94.6 kHz	-1.05 dBµV	Mea			•
Type Ref Trc Stimulus M1 1 95.2 Spectrum Spectrum 2 Ref Level 67.00 dbµV Att 0 db SWT 2.1 1 11Pk View SWT 2.1 50 50 dbµV 50 10 dbµV 1 20 dbµV 1	 21 kHz -2.74 dBµV (8) (6dB) 9 kHz) Measuring.		Image: Control of the sector of th	1 94.6 kHz	-1.05 dBµV	Mea			•
Type Ref Trc Stimulus M1 1 95.2 Spectrum Spectrum 2 Ref Level 67.00 dbuv Att 0 db SwT 2.1 119k View 0 db uv SwT 2.1 10 dbuv 0 db uv SwT 2.1 10 dbuv 0 db uv 1 10 dbuv 1 1 10 dbuv 1 1 10 dbuv 1 1	Control Contro Control Control Control Control Control Control Control Control Co) Measuring.		Image: Control of the sector of th	Spectrum 2 ③ Spectrum 2 ③ O dBµV O dB SWT 2.1 ms	-1.05 dBµV	Mea	T		•
Type [Ref] Trc Stimulus M1 1 95.2 Spectrum Spectrum 2 Ref Level 67.00 dbµV Att 0 db SWT 2.1 11Pk View 0 db SWT 2.1 50 dbµV 0 60.0 10 dbµV 0 0 10 dbµV 0 0 10 dbµV 0 0.0 10 dbµV 0 0.0	Control Contro Control Control Control Control Control Control Control Control Co	Mode Auto FFT		Image: Control of the sector of th	1 94.6 kHz	-1.05 dBµV	Mea	T		(E
Type Ref Trc Stimulus M1 1 95.2 Spectrum Spectrum 2 Spectrum 2 Ref Level 67.00 dBµV Att 0 d5 SWT 2.1 1Pk View 0 d5 SWT 2.1 10 dBµV 0 0 SWT 2.1	Control Contro Control Control Control Control Control Control Control Control Co	Mode Auto FFT		M1 Spectrum Ref Level 60 dBuV 50 dBuV 40 dBuV 20 dBuV 10 dBuV 20 dBuV 0 dBuV 0 dBuV 0 dBuV 0 dBuV	Spectrum 2 ③ Spectrum 2 ③ O dBµV O dB SWT 2.1 ms	-1.05 dBµV	Mea	T		[¤
Type Ref Trc Stimulus M1 1 95.2 M1 95.2 95.2 Spectrum Spectrum 2 Ref Level 67.00 dBµV Att 0 d5 SWT 2.1 1Pk View 0 d5 SWT 2.1 50 dBµV 0 0 30 dBµV 0 0 10 dBµV 0 0 10 dBµV 0 0 10 dBµV 0 0	Control Contro Control Control Control Control Control Control Control Control Co	Mode Auto FFT		Image: Control of the sector of th	Spectrum 2 ③ Spectrum 2 ③ O dBµV O dB SWT 2.1 ms	-1.05 dBµV	Mea	T		•
Type Ref Trc Stimulus M1 1 95.2 Spectrum Spectrum 2 Spectrum 2 Ref Level 67.00 dbu' 0 Att 0 dbu' 19k View 0 SWT 2.1 19k View 0 dbu' 10 dbu' 0	Control Contro Control Control Control Control Control Control Control Control Co	Mode Auto FFT		M1 Spectrum Ref Level 0 dBµV 50 dBµV 40 dBµV 20 dBµV 10 dBµV 20 dBµV 10 dBµV 10 dBµV	Spectrum 2 ③ Spectrum 2 ③ O dBµV O dB SWT 2.1 ms	-1.05 dBµV	Mea	T		[¤
Spectrum Spectrum 2 Ref Level 67.00 dBµV 0 dB Att 0 dB SWT 2.1 1Pk View 0 dB SWT 2.1 30 dBµV 0 SWT 2.1	Control Contro Control Control Control Control Control Control Control Control Co	Mode Auto FFT		M1 Spectrum Ref Level 60 dBuV 50 dBuV 40 dBuV 20 dBuV 10 dBuV 20 dBuV 0 dBuV 0 dBuV 0 dBuV 0 dBuV	Spectrum 2 ③ Spectrum 2 ③ O dBµV O dB SWT 2.1 ms	-1.05 dBµV	Mea	T		[¤
Type Ref Trc Stimulus M1 1 95.2 Spectrum Spectrum 2 Spectrum 2 Ref Level 67.00 dbuv 0 db No 0 db V SWT 2.1 19k: View 0 SWT 2.1 19k: View 0 0 00 dbuV 0 0 <t< td=""><td>Control Control Contro Control Control Control Control Control Control Control Control Co</td><td>Mode Auto FFT</td><td></td><td>M1 Image: Constraint of the second second</td><td>Spectrum 2 ③ Spectrum 2 ③ O dBµV O dB SWT 2.1 ms</td><td>-1.05 dBµV</td><td>Mea</td><td>T</td><td></td><td>(E</td></t<>	Control Contro Control Control Control Control Control Control Control Control Co	Mode Auto FFT		M1 Image: Constraint of the second	Spectrum 2 ③ Spectrum 2 ③ O dBµV O dB SWT 2.1 ms	-1.05 dBµV	Mea	T		(E
Type Ref Trc Stimulus Mil M1 1 95.2 Spectrum Spectrum 2 Spectrum 2 Ref Level 67.00 dBuV 0 dB 0 dB SWT 2.1 1Pk View 0 dB SWT 2.1 10 dBuV 0 dB SWT 2.1 10 dBuV 0 0 20 dBuV 0 0 30 dBuV 0 0	Control Contro Control Control Control Control Control Control Control Control Co	Mode Auto FFT		M1 Spectrum Ref Level 0.15k View 60 dBµV 50 dBµV 40 dBµV 20 dBµV 30 dBµV 40 dBµV 30 dBµV 20 dBµV 30 dBµV	1 94.6 kHz 67.00 dByV 0 dB SWT 2.1 ms 0 dB SWT 2.1 ms	-1.05 dBµV	Mode Auto FF	T		(E
Type [Ref] Trc Stimulus M1 1 95.2 M1 0.5.2 95.2 Spectrum Spectrum 2 Ref Level 67.00 dBµV Att 0.dB SWT 2.1 JPR View 0.dB SWT 2.1 30 dBµV 0.dB SWT 2.1 40 dBµV 0.0 0.0 30 dBµV 0.0 0.0 10 dBµV 0.0 0.0 10 dBµV 0.0 0.0 10 dBµV 0.0 0.0	RBW (668) 9 kHz S RBW (668) 9 kHz ms VBW 100 kHz Aluchoo cooligue 14	Mode Auto FFT		M1 Spectrum Ref Level 0.15k View 60 dBµV 50 dBµV 40 dBµV 20 dBµV 20 dBµV 20 dBµV 20 dBµV 20 dBµV 20 dBµV 40 dBµV 20 dBµV 20 dBµV -10 dBµV -20 dBµV -30 dBµV	1 94.6 kHz 67.00 dByV 0 dB SWT 2.1 ms 0 dB SWT 2.1 ms	-1.05 dBµV	Mode Auto FF	T	Stop	(C

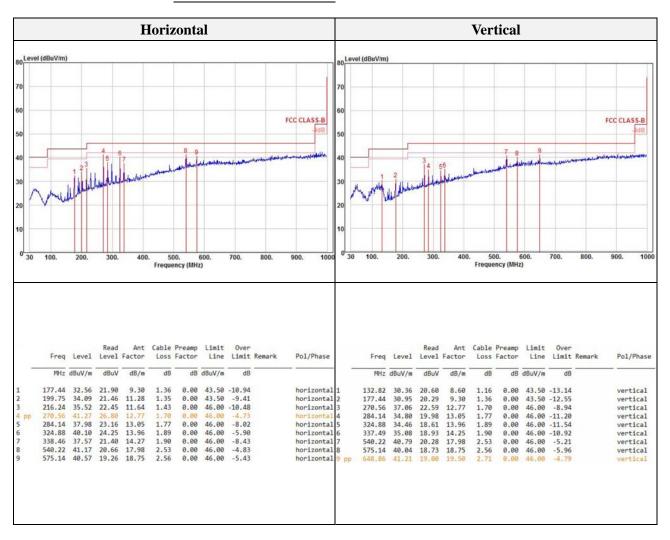


Channel:

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Test results (Below 1 000	ML) – Worst case
Mode:	802.11n(HT20)
Distance of measurement:	3 meter

06(Worst case)





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Test results	(Above	1 000	MHz)
---------------------	--------	-------	------

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

Frequency Level CF DCF Field strength Limit Margin Ant. Pol. **Detect mode** (MHz) $(dB\mu V)$ (H/V) (dB) (dB) $(dB\mu N/m)$ $(dB\mu V/m)$ (dB)1542.70 54.27 47.22 26.78 -7.05 74.00 Peak Η -1551.40 57.26 Peak V -6.97 -50.29 74.00 23.71 V 2000.00 56.17 Peak -2.91 53.26 74.00 20.74 -2346.06 53.97 Peak V -1.95 52.02 74.00 21.98 -2347.11 52.98 Peak Н -1.95 -51.03 74.00 22.97 2347.30 51.82 Peak Η -1.95 49.87 74.00 24.13 -2347.30 55.51 Peak V -1.95 53.56 74.00 20.44 -

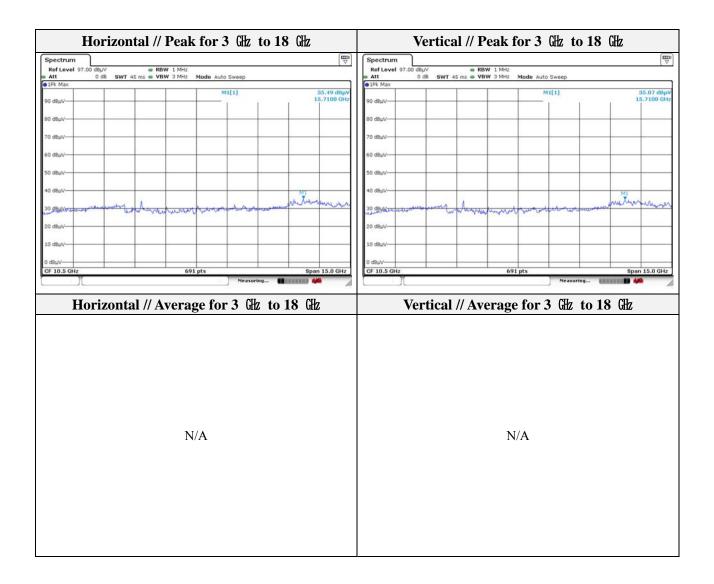
Restricted band // Horizontal // Peak				R	estricted band	// Vertical /	/ Peak
Spectrum Spectru	m 2 🛞		Ē	Spectrum	pectrum 2 🛞		
	BW 1 MHz SWT 17 ps VBW 3 MHz	Mode Auto FFT			BμV	Mode Auto FFT	Å
1Pk View				1Pk View			
110 d8µV		M1[1]	52.98 dBpV 2.347110 GHz	110 d8µV		M1[1]	53.97 dBp 2.346060 GH
100 deuv				100 dBµV			m
90 dBµV				90 dBµV			
80 dBµV				80 dBµV			
70 dBµV				70 dBµV-			
60 dBµV	M			60 dBµV-	MI		
50 dBµV	monthing	min	mont	50 dBµV	manuthin	mmm	m
40 d8µV				40 d8µV			
30 dBµV			F2	30 dBµV			F2
20 dBµV				20 dBµV			
CF 2.36 GHz	691	pts	Span 120.0 MHz	CF 2.36 GHz	69	1 pts	Span 120.0 MH
	imulus Response 2.34711 GHz 52.98 dB	Function	Function Result	Marker Type Ref Trc M1 1	Stimulus Response		Function Result
)[Measuring	(11111) 🖬 🦇 🏼			Measuring	



Buv 2.34720 Gir 110 dBuv 2. Buv 111 dBuv 110 dBuv 2.	Restricted band // Horizontal // Average					Restricted b	and // Ver	rtical // A	verage
Spectrum 2 B B Matrix B		N/.	A				N/A		
20 dB SWT 2 ms VBw Mode Auto Sweep View Mage Mage </th <th>m Spectrum 2</th> <th>8</th> <th>for 1 GHz to</th> <th>3 GHz</th> <th></th> <th>Spectrum 2 🛞</th> <th></th> <th>1 GHz to</th> <th>3 GHz</th>	m Spectrum 2	8	for 1 GHz to	3 GHz		Spectrum 2 🛞		1 GHz to	3 GHz
M2[1] S.1.82 / 0 GHV 2.347 / 20 GHV M1[1] 54.27 / dBuV M1 55.0 SBUV M1 56.0 SBUV M1	20 dB SWT 2		tode Auto Sweep		- Att			uto Sweep	
dBuv M1[1] S.4.27 dBuv 110 dBuv M1[1] S.4.27 dBuv dBuv 1.54270 GHz 1.54270 GHz 100 dBuv 1.1 buv 1.54270 GHz 100 dBuv 1.1 buv 1.54270 GHz 100 dBuv 1.1 buv 1.10 dBuv 1.1 buv 1.1 1.1	<u></u>		M2[1]		18µV			M3[1]	55.5
Buv 1.54270 GHz 100 dBuv 1 Buv 100 dBuv 1 Buv 1 0 dBuv 1 Buv 1 0 dBuv 1 Buv 1 1 0 dBuv 1 Buv 1 1 1 <			M1[1]	2.34730	GHz 110 d8µV-			M1[1]	2.347
Buv Image: Constraint of the constra	+			1.54270	GH2 100 dBµV-			-	1.551
BUV M1 M2 M2 M2 M3					90 dBuV-				
Bur - Mi - M					80 dBµV-				
sur					and the second second second				
Sa 3845 - Unit of the second and the						M1			
SA 38 20			M2			where a	mark	T I	
8µV			the second second		SD dBy	man the spanned	"	mpmeth b	and a second and a second
30 dBuV-		march March and And	and the second		40 dBµV				
300		emplated which have			30 dBuV		_		
		an March Land							
		an Alako hadarika							
.0 GHz 691 pts Spon 2.0 GHz Marker		and the state of the			20 dBµV		691 pts		Span 2.
e Ref Trc Stimulus Response Function Function Result M1 1 1.5514 GHz 57.26 dBµV	manulanguartilist		ats	Span 2.0 (20 dBµV CF 2.0 GHz Hiz Marker		691 pts		
M1 1 1.5427 GHz 54,27 dBµ/ M2 1 2.0 GHz 56,17 dBµ/ M2 1 2.0 GHz 55,51 dBµ/ M3 1 2.9473 GHz 55,51 dBµ/	Hz Ref Trc Stimulus	691 p	Function		20 dBµV CF 2.0 GHz Marker Type Ref Tro M1	1 1.5514 GHz	Response F 57.26 dBµV	unction	Span 2. Function Result

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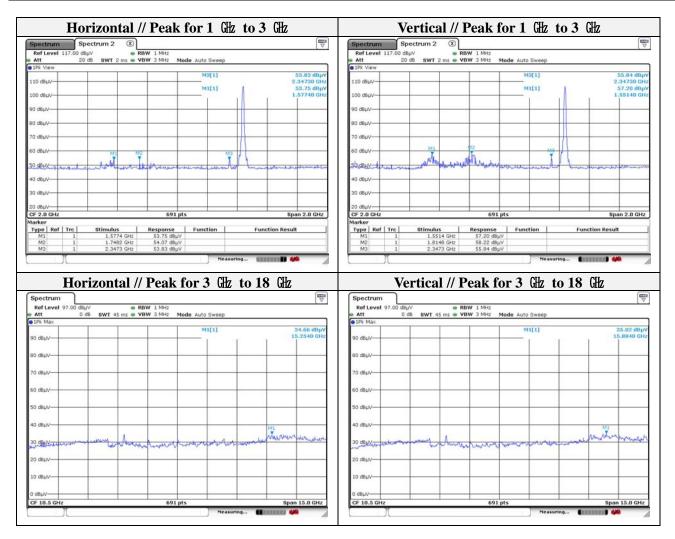




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Mode:	802.11b
Distance of measurement:	3 meter
Channel:	06

Frequency (Mb)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµN/m)	Margin (dB)
1551.40	57.20	Peak	V	-6.97	-	50.23	74.00	23.77
1577.40	53.75	Peak	Н	-6.74	-	47.01	74.00	26.99
1748.20	54.07	Peak	Н	-5.07	-	49.00	74.00	25.00
1814.80	58.22	Peak	V	-4.44	-	53.78	74.00	20.22
2347.30	53.83	Peak	Н	-1.95	-	51.88	74.00	22.12
2347.30	55.84	Peak	V	-1.95	-	53.89	74.00	20.11



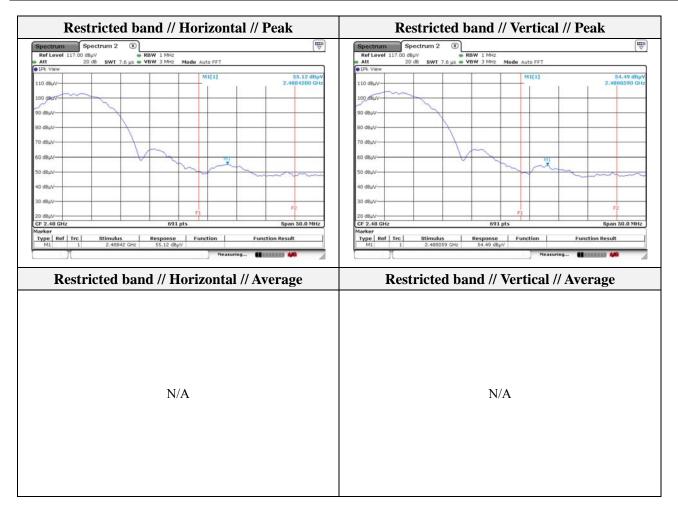
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Mode:	802.11b
Distance of measurement:	3 meter
Channel:	11

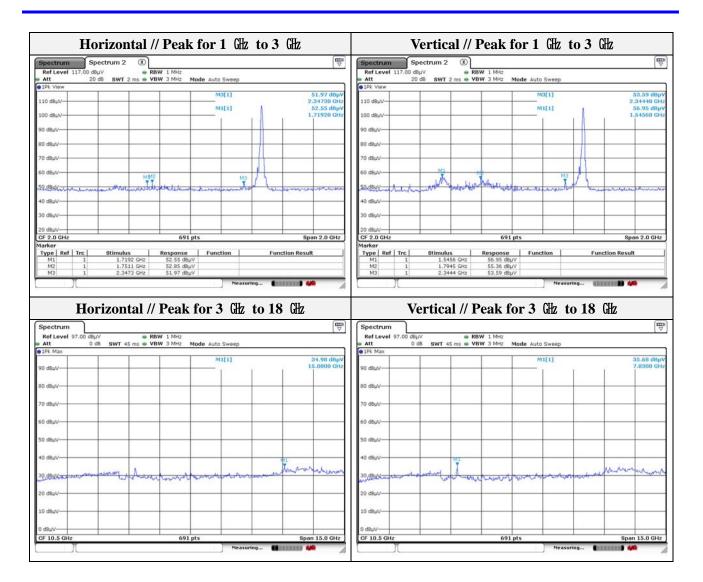
Frequency (Mz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµN/m)	Margin (dB)
1545.60	56.95	Peak	V	-7.02	-	49.93	74.00	24.07
1719.20	52.55	Peak	Н	-5.36	-	47.19	74.00	26.81
1751.10	52.85	Peak	Н	-5.04	-	47.81	74.00	26.19
1794.50	55.36	Peak	V	-4.61	-	50.75	74.00	23.25
2344.40	53.59	Peak	V	-1.95	-	51.64	74.00	22.36
2347.30	51.97	Peak	Н	-1.95	-	50.02	74.00	23.98
2488.06	54.49	Peak	V	-1.58	-	52.91	74.00	21.09
2488.42	55.12	Peak	Н	-1.58	-	53.54	74.00	20.46



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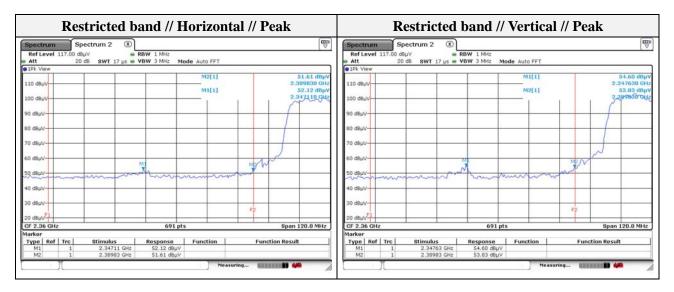




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Mode:	802.11g
Distance of measurement:	3 meter
Channel:	01

Frequency (Mz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµV/m)	Margin (dB)
1551.40	58.52	Peak	V	-6.97	-	51.55	74.00	22.45
1560.10	54.04	Peak	Н	-6.90	-	47.14	74.00	26.86
1730.80	52.19	Peak	Н	-5.25	-	46.94	74.00	27.06
1803.20	55.89	Peak	V	-4.53	-	51.36	74.00	22.64
2347.11	52.12	Peak	Н	-1.95	-	50.17	74.00	23.83
2347.30	53.26	Peak	Н	-1.95	-	51.31	74.00	22.69
2347.30	53.99	Peak	V	-1.95	-	52.04	74.00	21.96
2347.63	54.60	Peak	V	-1.95	-	52.65	74.00	21.35
2389.83	51.61	Peak	Н	-1.86	-	49.75	74.00	24.25
2389.83	53.83	Peak	V	-1.86	-	51.97	74.00	22.03

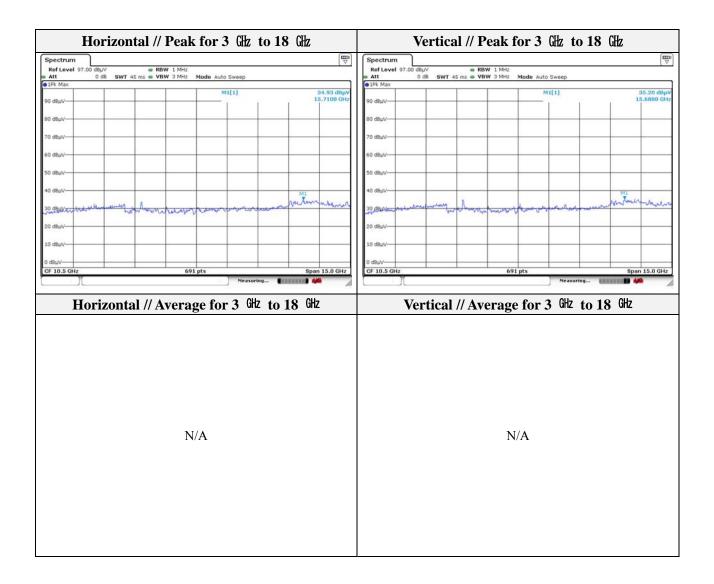




Restricted band // Horizontal // Average	Restricted band // Vertical // Average
N/A	N/A
Horizontal // Peak for 1 (比 to 3 (比	Vertical // Peak for 1 GHz to 3 GHz
Spectrum Spectrum 2 (2)	Comp Spectrum Spectrum © Ref Level 117.00 dbµ/ ● RBW 1 MHz ●
t 20 dB SWT 2 ms WBW 3 MHz Mode Auto Sweep	Att 20 dB SWT 2 ms VBW 3 MHz Mode Auto Sweep
M2[1] 52.19 c	d8µV M2[1] 55.89 d8
48µV 1.73080 M1[1] 54.04 c	d8pV M1[1] 58.52 d8
d8μV	1.55140 C
IBUV-	90 dBµV
BuV-	80 dBuV
IBUV	70 dBuV-
IBUV III III	60 dBµV M1 M2 M2
	the second s
Belle wert war the show the second the second the second and the second se	
IBUV-	40 d8µV-
	30 dBµV
BuV	
18µV	20 dBµV

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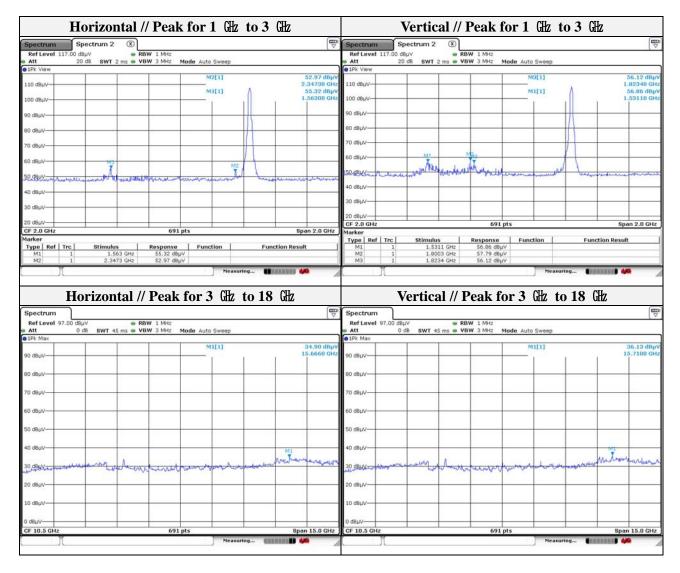




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Mode:	802.11g
Distance of measurement:	3 meter
Channel:	06

Frequency (Mbz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµN/m)	Margin (dB)
1531.10	56.86	Peak	V	-7.15	-	49.71	74.00	24.29
1563.00	55.32	Peak	Н	-6.87	-	48.45	74.00	25.55
1800.30	57.79	Peak	V	-4.56	-	53.23	74.00	20.77
1823.40	56.12	Peak	V	-4.37	-	51.75	74.00	22.25
2347.30	52.97	Peak	Н	-1.95	-	51.02	74.00	22.98



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

Frequency (Mz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµV/m)	Margin (dB)
1554.30	55.34	Peak	V	-6.95	-	48.39	74.00	25.61
1768.50	52.17	Peak	Н	-4.87	-	47.30	74.00	26.70
1814.80	55.29	Peak	V	-4.44	-	50.85	74.00	23.15
2000.00	54.43	Peak	V	-2.91	-	51.52	74.00	22.48
2347.30	53.58	Peak	Н	-1.95	-	51.63	74.00	22.37
2347.30	54.37	Peak	V	-1.95	-	52.42	74.00	21.58
2483.57	52.35	Peak	V	-1.60	-	50.75	74.00	23.25
2483.79	53.67	Peak	Н	-1.60	-	52.07	74.00	21.93

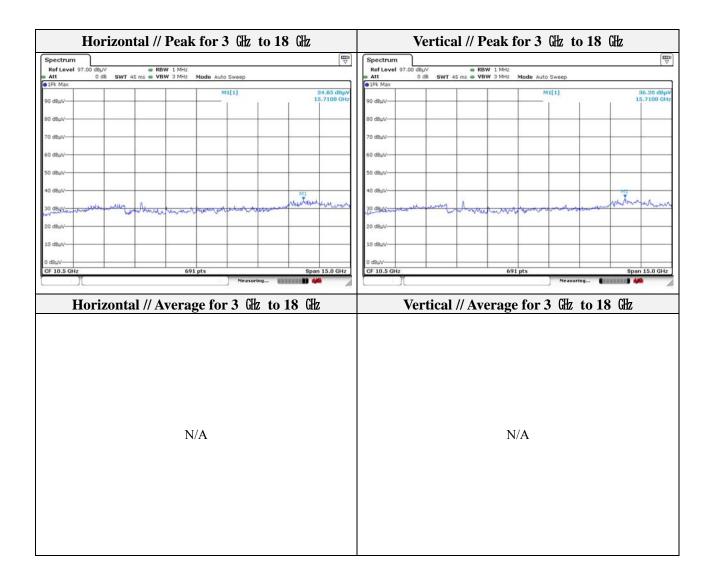
Restricted band // Horizontal // Peak					Restricted band // Vertical // Peak						
Spectrum Sp	ectrum 2 🛞			Ē	Spectrum Sp	pectrum 2 🛞			(m) V		
Ref Level 117.00 dB	uV • F dB SWT 7.6 µs • V	BW 1 MHz BW 3 MHz	Mode Auto FFT		Ref Level 117.00 de	BμV	RBW 1 MHz VBW 3 MHz	Mode Auto FFT			
1Pk View					1Pk View						
110 d8µV			M1[1]	53.67 d8µV 2.4837890 GHz	110 d8µV			M1[1]	52.35 dBpV 2.4835720 GH		
100 09(0	-	-			,100-d8tN	~~~					
90 dBµV					90 dBµV		-				
80 dBµV					80 dBµV						
70 dBuV					70 dBµV	L					
50 dBµV			~~~	· · ··································	50 dBµV			me			
40 d8µV					40 d8µV						
30 dBµV			_	F2	30 dBµV				52		
20 dBµV		-	F1		20 dBµV			FI			
CF 2.48 GHz		691 p	ts	Span 50.0 MHz	CF 2.48 GHz		691 p	ts	Span 50.0 MHz		
Marker Type Ref Trc M1 1	Stimulus 2.483789 GHz	Response 53.67 dBµV	Function	Function Result	Marker Type Ref Trc M1 1	Stimulus 2.483572 GHz	Response 52.35 dBµV	Function	Function Result		
			Meas	uring 🗰 🗰 🥠				Measu	rring 🗰 🗰 🥠		



Kestii	icted band // He	orizontal // A	Restricted band // Vertical // Average						
	N/	A				N/A			
pectrum Spec	rizontal // Peak	for 1 Hz to 3	3 GHz 	Spectrum	Vertical //		1 GHz to 3	3 GHz	(
Spectrum Spe	ctrum 2 (8) RBW 1 MHz	for 1 Hz to 3		Spectrum Ref Level 117.00 Att	Spectrum 2 🛞	BW 1 MHz	1 GHz to .	3 GHz	
Ref Level 117.00 dBµV Mtt 20 dB	ctrum 2 (8) RBW 1 MHz			Spectrum Ref Level 117.00 Att	Spectrum 2 🛞	BW 1 MHz		3 GHz	54.37 d8
Dectrum Spec tef Level 117.00 dBμV tt 20 dB Pk View	ctrum 2 (8) RBW 1 MHz	M2[1]	53.50 dBµV 2.34730 GH₂	Spectrum Ref Level 117.00 Att	Spectrum 2 🛞	BW 1 MHz	Auto Sweep	3 GHz	54.37 d 2.34730
Spectrum Spectrum Spectrum Spectrum Spectrum Spectrum Spectrum 20 dB Pk View Spectrum Spectru	ctrum 2 (8) RBW 1 MHz	lode Auto Sweep	₩ 53.58 dBµV	Spectrum Ref Level 117.00 Att	Spectrum 2 🛞	BW 1 MHz	Auto Sweep	3 GHz	54.37 d 2.34730 55.34 d
Spectrum Spectrum tef Level 117.00 dBµV tt 20 dB dB b View 0 dBµV 0 dBµV 0 dBµV	ctrum 2 (8) RBW 1 MHz	M2[1]	53.58 dBµV 2.34730 GHz 52.17 dBµV	Spectrum S Ref Level 117.00 Att 2 PIR View 1 110 dBµV 2	Spectrum 2 🛞	BW 1 MHz	Auto Sweep	3 GHz	54.37 d 2.34730 55.34 d
Spectrum Spectrum tef Level 117.00 dBµV 20 dB bk View 20 dB 0 dBµV 0 dBµV 0 dBµV 0 dBµV	ctrum 2 (8) RBW 1 MHz	M2[1]	53.58 dBµV 2.34730 GHz 52.17 dBµV	Spectrum S Ref Level 117.00 att att att 01Pk View att 110 dBµV att	Spectrum 2 🛞	BW 1 MHz	Auto Sweep	3 GHz	54.37 d 2.34730 55.34 d
Spectrum Spectrum tef Level 117.00 dBµV 20 dB bk View 20 dB 0 dBµV 0 dBµV 0 dBµV 0 dBµV	ctrum 2 (8) RBW 1 MHz	M2[1]	53.58 dBµV 2.34730 GHz 52.17 dBµV	Spectrum S Rof Level 117.00 Att @ IPk View III dBµV 100 dBµV 90 dBµV 80 dBµV B0 dBµV	Spectrum 2 🛞	BW 1 MHz	Auto Sweep		54.37 d 2.34730 55.34 d
Spectrum Spectrum tof Level 117.00 dBµV 20 dB 20 dB 3k View 0 0 dBµV 0 0 dBµV 0 dBµV 0 dBµV 0	ctrum 2 (8) RBW 1 MHz	M2[1]	53.58 dBµV 2.34730 GHz 52.17 dBµV	Spectrum S Rof Level 117.00 Att @ IPk View 2 100 dBµV- 90 dBµV- 90 dBµV- 90 dBµV- 80 dBµV- 70 dBµV-	Spectrum 2 🛞	BW 1 MHz	Auto Sweep	3 GHz	
Spectrum Spectrum off Level 117.00 dBµV 20 dB by View 0 dBµV by dBµV 0 dBµV dBµV 0 dBµV dBµV 0 dBµV	trum 2 (2) RBW 1 MHz SWT 2 ms • VBW 3 MHz M	M2[1] 	53.58 dBµV 2.34730 GHz 52.17 dBµV	Spectrum S Rof Level 117.00 Att @ IPk View III dBµV 100 dBµV 90 dBµV 80 dBµV B0 dBµV	Spectrum 2 (E) dbµV = Ri dbµV = Ri SWT 2 ms = VI	BW 1 MHz BW 3 MHz Mode /	Auto Sweep		54.37 di 2.34730 (55.34 di
Spectrum Spectrum off Level 117.00 dBµV 20 dB by View 30 dBµV 0 dBµV 40 dBµV 0 dBµV 40 dBµV dBµV 40 dBµV dBµV 40 dBµV	trum 2 ③	M2[1]	53.50 dBpV 2.34730 GHz 52.17 dBpV 1.76050 GHz	Spectrum S Rof Level 117.00 Att @ IPk View 2 100 dBµV- 90 dBµV- 90 dBµV- 90 dBµV- 80 dBµV- 70 dBµV-	Spectrum 2 🛞	BW 1 MHz BW 3 MHz Mode a	Auto Sweep		54.37 d 2.34730 55.34 d 1.55430
Spectrum Spectrum Control Level 117.00 dBµV Dobust 20 dB Dobust 0 dBµV	trum 2 (2) RBW 1 MHz SWT 2 ms • VBW 3 MHz M	M2[1] 	53.58 dBµV 2.34730 GHz 52.17 dBµV	Spectrum S Rof Level 117.00 Att @ IPK View 2 @ ID dBµV- 2 10 dBµV- 9 90 dBµV- 50 dBµV- 50 dBµV- 6 60 dBµV- 60 dBµV-	Spectrum 2 (E) dbµV = Ri dbµV = Ri SWT 2 ms = VI	BW 1 MHz BW 3 MHz Mode /	Auto Sweep		54.37 d 2.34730 55.34 d 1.55430
Spectrum Spectrum Coff Level 117.00 dBµV 20 dB Description 20 dB Description 0 dBµV 0 dBµV 0 dBµV	trum 2 ③	M2[1] 	53.50 dBpV 2.34730 GHz 52.17 dBpV 1.76050 GHz	Spectrum S Rof Level 117.00 Att @IPk View 2 I10 dBµ/- 100 dBµ/- 90 dBµ/- 90 dBµ/- 90 dBµ/- 50 dBµ/- 60 dBµ/- 50 dBµ/- 60 dBµ/- 50 dBµ/-	Spectrum 2 (E) dbµV = Ri dbµV = Ri SWT 2 ms = VI	BW 1 MHz BW 3 MHz Mode /	Auto Sweep		54.37 di 2.34730 (55.34 di 1.55430 (
Spectrum Spectrum Control Level 117.00 dBµV 20 dB 20 dB PK VIEW 0 0 dBµV 0 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0	trum 2 ③	M2[1] 	53.50 dBpV 2.34730 GHz 52.17 dBpV 1.76050 GHz	Spectrum S Rof Level 117.00 Att @ IPK View 10 110 dBuV 2 90 dBuV 90	Spectrum 2 (E) dbµV = Ri dbµV = Ri SWT 2 ms = VI	BW 1 MHz BW 3 MHz Mode /	Auto Sweep		54.37 d 2.34730 55.34 d 1.55430
Spectrum Spectrum tof Level 117.00 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV	trum 2 ③	M2[1] 	53.50 dBpV 2.34730 GHz 52.17 dBpV 1.76050 GHz	Spectrum S Rof Level 117.00 Att @ IPK View 10 10 dBuV 2 90 dBuV 90	Spectrum 2 (E) dbµV = Ri dbµV = Ri SWT 2 ms = VI	BW 1 MHz BW 3 MHz Mode /	Auto Sweep		54.37 d 2.34730 55.34 d 1.55430
Spectrum Spectrum tof Level 117.00 dBµV 20 dB 0 dBµV 0 dBµV	trum 2 (2) RBW 1 MH2 SWT 2 ms = VBW 3 MH2 M	M2[1] M1[1] M1[1] M1[1]	S3.59 dBµV 2.34700 GHz 52.17 dBµV 1.76050 GHz	Spectrum S Rof Level 117.00 Att @ IPk view 10 10 dBµV 90 90 dBµV 9	Spectrum 2 (B) dbµV 20 db SWT 2 ms VI	BW 1 MH2 BW 3 MH2 Mode #	NH[1] MI[1] MI[1]		54.37 dl 2.34730 55.34 dl 1.55430 dl
Spectrum Spectrum Kof Level 117.00 dBµV 20 dB Ntt 20 dB PK View 0 0 dBµV 0	trum 2 ③	M2[1] M2[1] M1[1] M1[1] M2] M2 M2 M2 M2 M2 M2 M2 M2 M2 M2 M2 M2 M2	53.59 dBpV 2.34720 GHz 52.17 dBpV 1.76050 GHz	Spectrum S Rof Level 117.00 Att @ IPk: View 10 10 dBuV 10 10 dBuV 90 90 90 90 90	Spectrum 2 ③ dbµV 20 db SWT 2 ms VI 400-db VT 2 ms VI 400-db VT 2 ms VI 400-db VT 2 ms VI 510-db VT 2 ms VI 400-db VT 2 m	BW 1 MH2 BW 3 MH2 Mode # BW 3 MH2 Mode # BW 3 MH2 BW 5 Mode # BW 5 Mode # BW 5 St 34 GW/	Auto Sweep		54.37 dd 2.34730 (55.34 dd 1.55430 (رواب المحالي محالي محالي محالي محالي مح محالي محالي محالي محالي محالي محالي محالي محالي محا
Spectrum Spectrum Kof Level 117.00 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV	trum 2 (2) RBW 1 MH2 SWT 2 ms = VBW 3 MH2 M	Inde Auto Sweep M2[1] M1[1] M1[1] M2 M3 M4 M3 M4 M4	S3.59 dBµV 2.34700 GHz 52.17 dBµV 1.76050 GHz	Spectrum S Rof Level 117.00 Att @ IPk: View 2 @ IPk: View 100 dBµV 100 dBµV 90 dBµV 90 dBµV	Spectrum 2 (E) dbµV = RI 20 dB SWT 2 ms = VI	BW 1 MH2 BW 3 MH2 Mode / BW 3 MH2 Mode / BW 4 Mode / B	NH[1] MI[1] MI[1]		54.37 dd 2.34730 (55.34 dd 1.55430 (رواب المحالي محالي محالي محالي محالي مح محالي محالي محالي محالي محالي محالي محالي محالي محا

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

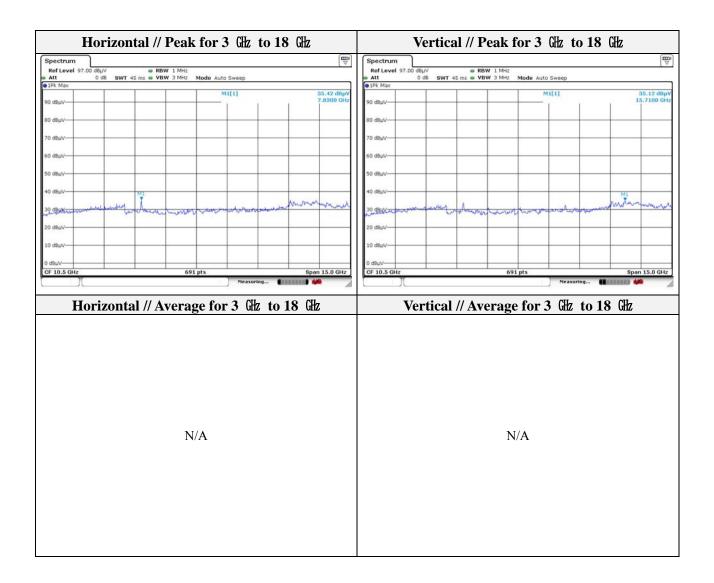
Frequency (Mz)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµN/m)	Margin (dB)
1513.70	51.80	Peak	Н	-7.30	-	44.50	74.00	29.50
1536.90	55.36	Peak	V	-7.10	-	48.26	74.00	25.74
1777.10	55.98	Peak	V	-4.79	-	51.19	74.00	22.81
1997.10	54.40	Peak	V	-2.93	-	51.47	74.00	22.53
2347.30	53.09	Peak	Н	-1.95	-	51.14	74.00	22.86
2347.30	53.81	Peak	V	-1.95	-	51.86	74.00	22.14
2389.13	54.89	Peak	Н	-1.86	-	53.03	74.00	20.97
2389.83	55.07	Peak	V	-1.86	-	53.21	74.00	20.79

Restricted	l band // Horizonta	al // Peak	Rest	tricted band /	/ Vertical //	Peak
Spectrum Spectrum 2	(3)		Spectrum Spectr	um 2 🛞		E S
Ref Level 117.00 dBµV	RBW 1 MHz		Ref Level 117.00 dBµV	· RBW 1 MHz		
	ps VBW 3 MHz Mode Auto FFT			SWT 17 µs . VBW 3 MHz	lode Auto FFT	
1Pk View			1Pk View			
110 d8µV	M1[1]	54.89 dBpV 2.389130 GHz	110 d8µV		M1[1]	55.07 dBp 2.389830 GH
100 d8µV		- mon	100 d8µV			m
0 dBuV		M	90 dBuV			ſ
80 dBµV			80 dBµV			
70 dBµV			70 dBuV			
50 dBµV		MI CAN	60 dBµV			Mer V
io deuv	monument		50 dBµV	minum	manna	
40 d8µV			40 d8µV			
10 dBµV		F2	30 dBµV			F2
20 dBuV			20 dBuy			1
CF 2.36 GHz	691 pts	Span 120.0 MHz	CF 2.36 GHz	691 p	ts	Span 120.0 MHz
Type Ref Trc Stimulus M1 1 2.38913	Response Function	Function Result	Marker Type Ref Trc S	timulus Response	Function	Function Result
	Measur	ing (#######) 🦇		and a set of the set o	Measuring	- (INCOMP)



Restricted band	// Horizontal // Av	Re	stricted ba	nd // Vert	ical // /	Averag	e	
	N/A				N/A			
pectrum 2 🛞	Peak for 1 GHz to 3	3 GHz	Spectrum	Vertical // P		GHz to	3 GHz	
Spectrum Spectrum χ Ref Level 117.00 dBμV RBW 1 Att 20 dB SWT 2 ms VBW 3	1 MHz		Spectrum Ref Level 117.00 (Att 2	Spectrum 2 🛞	W 1 MHz		3 GHz	
Ref Level 117.00 dBµV RBW 1	1 MHz	(₩) 53.09 dBpV	Spectrum S Ref Level 117.00 (Att 2 • 1Pk View	Spectrum 2 🛞	W 1 MHz W 3 MHz Mode Auto		3 GHz	53.81 da
Spectrum Spectrum 2 E lof Level 117.00 dBµV # RBW 1 # 20 dB SWT 2 ms ¥ VBW 3 % View # #	1 MHz 3 MHz Mode Auto Sweep <u>M2[1]</u>	(000) ⊽ 53.09 d8µV 2.34730 GHz	Spectrum Ref Level 117.00 (Att 2	Spectrum 2 🛞	W 1 MHz W 3 MHz Mode Auto	5 Sweep	3 GHz	53.81 d 2.34730
Spectrum Spectrum 2 ® of Level 117.00 dBµV ■ BBW 1 tt 20 dB SWT 2 ms ¥ VBW 2 bk. View 0 dBµV ■ BW 1	1 MHz 3 MHz Mode Auto Sweep	(₩) 53.09 dBpV	Spectrum S Ref Level 117.00 (Att 2 • 1Pk View	Spectrum 2 🛞	W 1 MHz W 3 MHz Mode Auto	o Sweep	3 GHz	53.81 d 2.34730 55.36 d
Spectrum Spectrum 2 ® tef Level 117.00 dBµV ■ RBW 1 tt 20 dB SWT 2 ms ¥ VBW 3 Pk View 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV	1 MHz 3 MHz Mode Auto Sweep <u>M2[1]</u>	53.09 dBµV 2.34730 GHz 51.80 dBµV	Spectrum S Ref Level 117.00 c Att 2 1Pk View 110 dBµV	Spectrum 2 🛞	W 1 MHz W 3 MHz Mode Auto	5 Sweep	3 GHz	53.81 d 2.34730 55.36 d
Spectrum Spectrum 2 ® of Level 117.00 dBµV RBW 1 tt 20.d8 SWT 2 ms VBW bit View 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV dBµV 0 dBµV 0 dBµV 0	1 MHz 3 MHz Mode Auto Sweep <u>M2[1]</u>	53.09 dBµV 2.34730 GHz 51.80 dBµV	Spectrum S Ref Level 117.00 d 2 Att 2 IPk View 1 10 dBµV 100 dBµV	Spectrum 2 🛞	W 1 MHz W 3 MHz Mode Auto	5 Sweep	3 GHz	53.81 d 2.34730 55.36 d
Spectrum Spectrum 2 ® taf Level 117.00 dBµV •	1 MHz 3 MHz Mode Auto Sweep <u>M2[1]</u>	53.09 dBµV 2.34730 GHz 51.80 dBµV	Spectrum S Ref Level 117.00 Att 2 PIPk View 100 MBµ/- 100 00 dBµ/- 90 90 dBµ/- 90 80 dBµ/- 90	Spectrum 2 🛞	W 1 MHz W 3 MHz Mode Auto	5 Sweep		53.81 d 2.34730 55.36 d
Spectrum Spectrum 2 R tof Level 117.00 dBµV •	1 MHz 3 MHz Mode Auto Sweep <u>M2[1]</u>	53.09 dBµV 2.34730 GHz 51.80 dBµV	Spectrum S Ref Level 117.00 Att 2 PIPk. View 100 110 dBµV 90 dBµV	Spectrum 2 🛞	W 1 MHz W 3 MHz Mode Auto	5 Sweep		53.81 d 2.34730 55.36 d
Spectrum Spectrum 2 ® tef Level 117.00 dBµV •	1 MH2 3 MH2 Mode Auto Sweep M2[1] M1[1]	53.09 dBµV 2.34730 GHz 51.80 dBµV	Spectrum S Ref Level 117.00 • • IPk View • • IPk View • • IO0 dBµV • 90 dBµV •	Spectrum 2 (3) Sbj/ (10 05 SWT 2 ms = VBV (10 05 SWT 2 ms = VBV (W 1 MHz W 3 MHz Mode Auto	5 Sweep		53.81 d 2.34730 55.36 d
Spectrum Spectrum 2 ® of Level 117.00 dBµV RBW 1 tt 20 dB SWT 2 ms WBW 3 bl dBµV 0 dBµV 0 dBµV 0 dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV <td>1 MHz 3 MHz Mode Auto Sweep M2[1] M1[1] M1[1] M1[2] M2]</td> <td>53.09 dBµV 2.34730 GHz 51.80 dBµV</td> <td>Spectrum S Ref Level 117.00 Att 2 PIPk. View 100 110 dBµV 90 dBµV</td> <td>Spectrum 2 (3) Sbj/ (10 05 SWT 2 ms = VBV (10 05 SWT 2 ms = VBV (</td> <td>W 1 MHz W 3 MHz Mode Auto</td> <td>5 Sweep</td> <td></td> <td>2.34730 55.36 d</td>	1 MHz 3 MHz Mode Auto Sweep M2[1] M1[1] M1[1] M1[2] M2]	53.09 dBµV 2.34730 GHz 51.80 dBµV	Spectrum S Ref Level 117.00 Att 2 PIPk. View 100 110 dBµV 90 dBµV	Spectrum 2 (3) Sbj/ (10 05 SWT 2 ms = VBV (10 05 SWT 2 ms = VBV (W 1 MHz W 3 MHz Mode Auto	5 Sweep		2.34730 55.36 d
Spectrum Spectrum 2 ® taf Level 117.00 dBµV • RBW 1 tt 20 dB SWT 2 ms • betwin 0 dB µV • • RBW 1 0 dB µV 0 dB µV • • • RBW 1 0 dB µV •	1 MHz 3 MHz Mode Auto Sweep M2[1] M1[1] M1[1] M1[2] M2]	53.09 dBµV 2.34730 GHz 51.80 dBµV	Spectrum S Ref Level 117.00 • • IPk View • • IPk View • • IO0 dBµV • 90 dBµV •	Spectrum 2 (3) Sbj/ (10 05 SWT 2 ms = VBV (10 05 SWT 2 ms = VBV (W 1 MHz W 3 MHz Mode Auto	5 Sweep		53.81 d 2.34730 55.36 d
Spectrum 2 Spectrum 2 RBW 1 tet Level 117.00 dBµV RBW 2 ms RBW 1 20 dB BWT 2 ms VBW 80 dBµV 0 dBµV VBW 0 dBµV 0 dBµV 0 dBµV 0 dBµV 10 dBµV 10 dBµV 0 dBµV 10 dBµV 10 dBµV 0 dBµV 11 dBµV 10 dBµV 10 dBµV 11 dBµV 11 dBµV	1 MHz 3 MHz Mode Auto Sweep M2[1] M1[1] M1[1] M1[2] M2]	S3.00 dbpV 2.34730 GHz 51.00 dbpV 1.51370 GHz	Spectrum S Ref Level 117.00 Att 2 IPk View 100 dBµV 100 dBµV 100 dBµV 90 dBµV 90 dBµV 90 dBµV 60 dBµV 70 dBµV 50 dBµV 50 dBµV 50 dBµV 40 dBµV 40 dBµV 50 dBµV 50 dBµV	Spectrum 2 (3) Sbj/ (10 05 SWT 2 ms = VBV (10 05 SWT 2 ms = VBV (W 1 MHz W 3 MHz Mode Auto	5 Sweep		53.81 d 2.34730 55.36 d
Spectrum Spectrum 2 RBW 1 ter Level 117.00 dBµ/ RBW 2 RBW 1 tt 20 dB SWT 2 RBW 1 b 0 dBµ/ VBW VBW 0 dBµ/ 0 dBµ/ 0 dBµ/ 0 dBµ/ 0 dBµ/ 0	1 MHz 3 MHz Mode Auto Sweep M2[1] M1[1] M1[1] M1[2] M2]	S3.00 dbpV 2.34730 GHz 51.00 dbpV 1.51370 GHz	Spectrum S Ref Level 117.00 Att 2 • IPk View 100 dBµV 100 dBµV 100 dBµV • 00 dBµV 90 dBµV 90 dBµV 90 dBµV • 00 dBµV 90 dBµV 90 dBµV 90 dBµV • 00 dBµV 90 dBµV 90 dBµV 90 dBµV • 00 dBµV 90 dBµV 90 dBµV 90 dBµV • 00 dBµV 90 dBµV 90 dBµV 90 dBµV	Spectrum 2 (3) Sbj/ (10 05 SWT 2 ms = VBV (10 05 SWT 2 ms = VBV (W 1 MHz W 3 MHz Mode Auto	5 Sweep		53.81 d 2.34730 55.36 d
Spectrum Spectrum 2 RBW 1 ter Level 117.00 dBµ/ RBW 2 RBW 1 tt 20 dB SWT 2 RBW 1 b 0 dBµ/ VBW VBW 0 dBµ/ 0 dBµ/ 0 dBµ/ 0 dBµ/ 0 dBµ/ 0	1 MHz 3 MHz Mode Auto Sweep M2[1] M1[1] M1[1] M1[2] M2]	S3.00 dbpV 2.34730 GHz 51.00 dbpV 1.51370 GHz	Spectrum S Rof Level 117.00 // 2 IPK View 10 110 dBµV 90 90 dBµV 90	Spectrum 2 (3) Sbj/ (10 05 SWT 2 ms = VBV (10 05 SWT 2 ms = VBV (W 1 MHz Mode Aut	5 Sweep		53.01 d 2.34720 55.36 d 1.53690
Spectrum Spectrum 2 Image: Constraint 2 Image: Constraint2 Image: Constraint2 Image: Con	1 MHz 3 MHz Mode Auto Sweep	53.09 dbyV 2.34720 dHz 51.00 dbyV 1.51370 GHz	Spectrum S Rof Level 117.00 (att 2 IPK View 100 d8µV 100 d8µV 100 d8µV 90 d8µV 90 d8µV 90 d8µV 90 d8µV	Spectrum 2 (3) Sbj/ (10 05 SWT 2 ms = VBV (10 05 SWT 2 ms = VBV (W 1 MHz W 3 MHz Mode Auto N N N M M M M M M M M M M M M M M M M	5 Sweep 14(1) 13(1) M4 M4 M4		\$3.01 d 2.34730 55.36 d 1.53690
Spectrum Spectrum 2 ® Kef Level 117.00 dBµV •	1 MHz 3 MHz Mode Auto Sweep M2[1] M1[1] M1[1] M1[2] M2]	S3.00 dbpV 2.34730 GHz 51.00 dbpV 1.51370 GHz	Spectrum S Ref Level 117.00 117.00 Att 2 IP/L View 110 dBµV 100 dBµV 90 dBµV 90 dBµV	Stimulus	W 1 MHz Wode Auto	5 Sweep	Function R	\$3.01 d 2.34730 55.36 d 1.53690
Spectrum Spectrum Ref Ker Level 137.00 68µV • RBW 1 Att 20.68 SWT 2 ms • RBW 1 0 0.80V • • 0 0 0 0.80V • • • 0 0 0 0.80V • • • 0	1 MHz 3 MHz Mode Auto Sweep M2[1] M1[1] M1[1] Autobrea Autobrea 691 pts	53.09 dbyV 2.34720 dHz 51.00 dbyV 1.51370 GHz	Spectrum S Rof Level 117.00 (• • IFK View • • IFK View • • IO dBµV • 90 dBµV •	Spectrum 2 (8) Bly/ RBW 0 05 SWT 2 ms • VBV 10 15 SWT 2 ms • VBV 10 15 SWT 2 ms • VBV 10 15 SWT 2 ms • VBV	W 1 MHz W 3 MHz Mode Auto N N N M M M M M M M M M M M M M M M M	5 Sweep 14(1) 13(1) M4 M4 M4		53.01 d 2.34730 55.36 d 1.53690

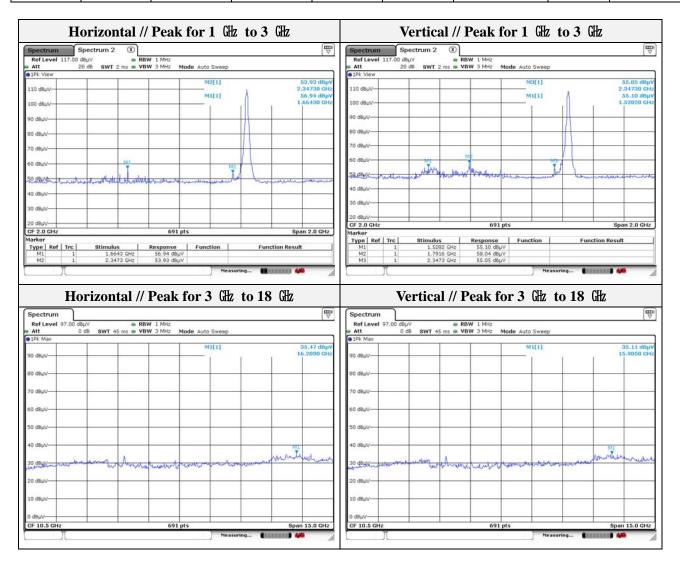






Mode:	802.11n(HT20)
Distance of measurement:	3 meter
Channel:	06

DCF **Field strength** Limit Margin Frequency Level CF Ant. Pol. **Detect mode** (M⊞z) $(dB\mu V)$ (H/V) $(dB\mu N/m)$ $(dB\mu N/m)$ (dB) (dB) (dB) 55.10 V 47.92 74.00 26.08 1528.20 Peak -7.18 -1664.30 56.94 Peak -5.91 51.03 74.00 22.97 Η -1791.60 V 58.04 Peak -4.64 53.40 74.00 20.60 _ 53.93 Peak -1.95 51.98 74.00 22.02 2347.30 Н _ 2347.30 55.05 Peak V -1.95 53.10 74.00 20.90 -





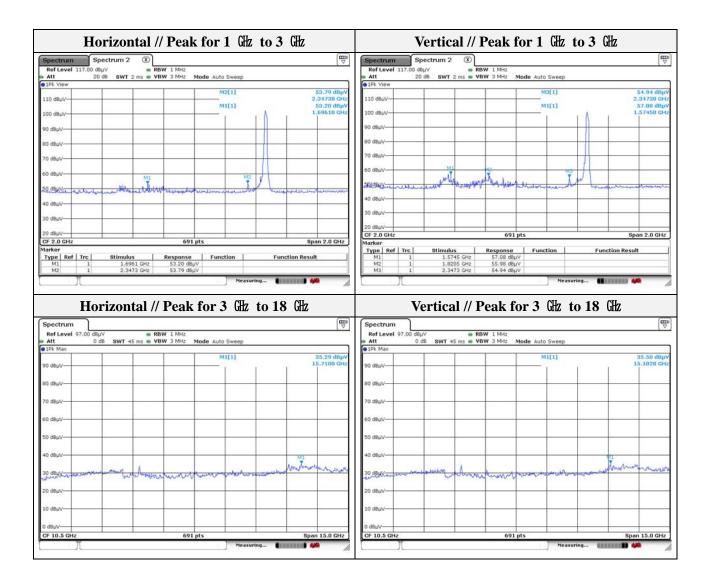
Mode:	802.11n(HT20)
Distance of measurement:	3 meter
Channel:	11

Frequency (Mz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
1574.50	57.08	Peak	V	-6.77	-	50.31	74.00	23.69
1696.10	53.20	Peak	Н	-5.59	-	47.61	74.00	26.39
1820.50	55.98	Peak	V	-4.39	-	51.59	74.00	22.41
2347.30	53.79	Peak	Н	-1.95	-	51.84	74.00	22.16
2347.30	54.94	Peak	V	-1.95	-	52.99	74.00	21.01
2483.57	52.75	Peak	V	-1.60	-	51.15	74.00	22.85
2486.25	51.79	Peak	Н	-1.59	-	50.20	74.00	23.80

Re	estricted ba	and // Horizo	ntal // Peak			Restricte	d band	// Vertica	l // Peak
Spectrum	pectrum 2 🛞			Spe	ctrum	Spectrum 2	×)		E
Ref Level 117.00 d	i8µ∨ — R	BW 1 MHz	1947	Re	Level 117.00	dBµ∨	RBW 1 MHz		
Att 20 1Pk View	0 dB SWT 7.6 µs 🖷 V	BW 3 MHz Mode Auto F	т	e Att	View	20 dB SWT 7.6 µ	s 🖝 VBW 3 MHz	Mode Auto FFT	
110 dBµV		M1[1	2	51.79 dBpV .4862500 GHz 110				M1[1]	52.75 dBµ 2.4835720 GH
100 dBµV-				100	Bigt -				
	m					-			
90 dBµV				90 di	ωv-				
80 dBµV				80 di	uv-		(
70 dBµV				70 d	uv-	-			
60 dBµV-	~	\sim		60 d			Sha		
2027223.2		Market Market		10000					
50 dBµV			more	50 di	μv—			1	mm
40 dBµV				40 di	μv—			<u> </u>	
30 dBµV				30 di	μv	_			
20 dBµV		F1		F2 20 di				F1	F2
CF 2.48 GHz		691 pts	Sp		.48 GHz		69	L pts	Span 50.0 MHz
Marker Type Ref Trc	Stimulus	Response Function	Function Res	Mark	er e Ref Trc	Stimulus	Response	Function	Function Result
M1 1	2.48625 GHz	51.79 dBµV	Function Ros		1 1	2.483572 Gł			Punction Result
Rest	tricted ban	d // Horizon	tal // Averag	je	R	estricted	band //	Vertical /	// Average
		N/A					N	/A	



Test report No.: KES-RF-17T0004 Page (42) of (58)





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

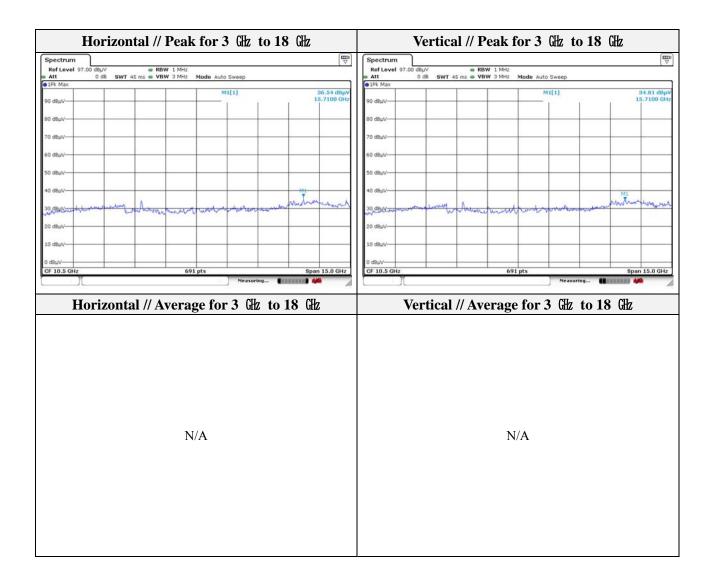
Frequency Level CF DCF Field strength Limit Margin Ant. Pol. **Detect mode** (MHz) $(dB\mu V)$ (H/V) (dB) (dB) $(dB\mu N/m)$ $(dB\mu V/m)$ (dB) 55.73 V -9.93 45.80 74.00 28.20 1039.10 Peak -1493.50 V 49.54 24.46 57.00 Peak -7.46 74.00 -1782.90 57.17 Peak V -4.73 74.00 21.56 -52.44 52.27 Peak Н -4.37 47.90 74.00 26.10 1823.40 -V 2346.24 53.88 Peak -1.95 51.93 74.00 22.07 -2347.30 52.97 -1.95 22.98 Peak Н 51.02 74.00 -2347.30 55.16 Peak V -1.95 53.21 74.00 20.79 -74.00 24.072388.96 51.79 Peak Η -1.86 -49.93 2389.93 55.41 Peak V -1.86 53.55 74.00 20.45 -

Restricte	ed band // Horizonta	al // Peak	R	estricted band /	/ Vertical //	/ Peak
Spectrum Spectrum 2 Ref Level 117.00 dBµV	BW 1 MHz		Ref Level 117.00 dB			Ţ
Att 20 dB SWT 1	17 µs S VBW 3 MHz Mode Auto FFT		Att 20	dB SWT 17 µs . VBW 3 MHz	Mode Auto FFT	
110 d8µV	M1[1]	54.89 d8µV 2.389130 GHz	110 dBµV		M1[1]	55.07 d8µV 2.389830 GHz
100 dBµV		a man	100 d8µV			m
90 dBµV			90 dBµV-			
80 dBµV			80 dBµV-		· · · · ·	
60 dBµV		m	60 dBµV			
50 dBµV	mmmmmmm	Ar	50 dBµV	mmmmmmmm	manna	- A A A A A A A A A A A A A A A A A A A
40 dBµV			40 d8µV-			
30 dBµV		F2	30 dBµV			F2
20 dBµV CF 2.36 GHz	691 pts	Span 120.0 MHz	20 dBµV CF 2.36 GHz	691	pts	Span 120.0 MHz
Marker Type Ref Trc Stimulus M1 1 2.3891	s Response Function	Function Result	Marker Type Ref Trc M1 1	Stimulus Response 2.38983 GHz 55.07 dBµ	Function	Function Result
	Measur	ing 🏭 📶			Neasuring.	() 🦇 🥼



Restricted band // Horizontal // Average					estricted b	and // Vertical	// Average	
	N/A					N/A		
		1 (11- 4- 2	CIL-		X74°1 //	Peak for 1 GHz		
pectrum Spectrum		or 1 GHZ to 3	GHZ	Spectrum	Spectrum 2 🛞		to 3 uffZ	[
Ref Level 117.00 dBµV	m 2 (8)	Auto Sweep		Spectrum Ref Level 117.00	Spectrum 2 🛞	RBW 1 MHz		(
Ref Level 117.00 dBµV	m 2 (8)	Auto Sweep		Spectrum Ref Level 117.00	Spectrum 2 🛞	RBW 1 MHz VBW 3 MHz Mode Auto Sweep		
Spectrum Spectrum tef Level 117.00 dBµV ttt 20 dB s	m 2 (8)	Auto Sweep	52.27 d8µV 1.82340 GHz	Spectrum Ref Level 117.00	Spectrum 2 🛞	RBW 1 MHz VBW 3 MHz Mode Auto Sweep N14[1]	2	55.16 di .34730 (
Spectrum Spectrum setLevel 117.00 dBµV utt 20 dB s Pk View 0 dBµV 0	m 2 (8)	Auto Sweep	₩ ▼ 52.27 d8µV	Ref Level 117.00 Att e 1Pk View	Spectrum 2 🛞	RBW 1 MHz VBW 3 MHz Mode Auto Sweep	2	55.16 di .34730 (55.73 di
Spectrum Spectrum tef Level 117.00 dBµV 20 dB tt 20 dB bk View 0 0 dBµV 0	m 2 (8)	Auto Sweep	52.27 d8μV 1.82340 GHz 52.97 d8μV	Spectrum Reflevel 117.00 • Att • IPk View 110 dBµV-	Spectrum 2 🛞	RBW 1 MHz VBW 3 MHz Mode Auto Sweep N14[1]	2	55.16 d .34730 55.73 d
Spectrum Spectrum tef Level 117.00 dBµV 20 dB tt 20 dB bk View 0 0 dBµV 0	m 2 (8)	Auto Sweep	52.27 d8μV 1.82340 GHz 52.97 d8μV	Spectrum Ref Level 117.00 Att 1Pk View 110 dBµV- 100 dBµV- 90 dBµV-	Spectrum 2 🛞	RBW 1 MHz VBW 3 MHz Mode Auto Sweep N14[1]	2	55.16 di .34730 (55.73 di
Spectrum Spectrum tef Level 117.00 dBµV ttt 20 dB 0 dBµV 0 dBµV 0 dBµV 0 dBµV dBµV 0 dBµV	m 2 (8)	Auto Sweep	52.27 d8μV 1.82340 GHz 52.97 d8μV	Spectrum Ref Level 117.00 Att @19k View 110 dBuV 00 dBuV 90 dBuV	Spectrum 2 🛞	RBW 1 MHz VBW 3 MHz Mode Auto Sweep N14[1]	2	55.16 d .34730 55.73 d
Spectrum Spectrum tef Level 117.00 dbµ/ tt 20 db 0 dbµ/v 0 dbµ/v 0 dbµ/v 0 dbµ/v dbµ/v 0 dbµ/v dbµ/v 0 dbµ/v	m 2 (8)	Auto Sweep	52.27 d8μV 1.82340 GHz 52.97 d8μV	Spectrum Ref Level 117.00 Att 1Pk View 110 dBµV- 100 dBµV- 90 dBµV-	Spectrum 2 🛞	RBW 1 MHz VBW 3 MHz Mode Auto Sweep N14[1]	2	55.16 di
Spectrum Spectrum teft Level 117.00 dbµ/ tt 20 db p 120.00 dbµ/ 0 dbµ/ 0 dbµ/ 0 dbµ/ 0 dbµ/ dbµ/ 0 dbµ/ dbµ/ dbµ/	m 2 (8)	Auto Sweep	52.27 d8μV 1.82340 GHz 52.97 d8μV	Spectrum Ref Level 117.00 Att @19k View 110 dBuV 00 dBuV 90 dBuV	Spectrum 2 (8) dby/ 12 ms + 1 20 db SWT 2 ms + 1 bg	88W 1 MHz 88W 3 MHz 1 Mode Auto Sweep M4[1] M1[2	55.16 di .34730 (55.73 di
Spectrum Spectrum of Level 117.00 dbµ/ tt 20 db y b 80,00 b 80,00 b 80,00 dbµ/ 0 dbµ/ 0 dbµ/ 0 dbµ/ 0	m 2 (8)	Auto Sweep	52.27 d8μV 1.82340 GHz 52.97 d8μV	Spectrum Ref Level 117.00 Att @ 1Pk View 110 dBuV 90 dBuV 90 dBuV 80 dBuV 70 dBuV	Spectrum 2 (8) dby/ 12 ms + 1 20 db SWT 2 ms + 1 bg	RBW 1 MHz VBW 3 MHz Mode Auto Sweep N14[1]	2	55.16 d .34730 55.73 d
Spectrum Spectrum tof Level 117.00 dBµV tt 20 dB s be/ver 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV	m 2 (8)	Auto Sweep	52.27 d8μV 1.82340 GHz 52.97 d8μV	Spectrum Ref Level 117.00 Att In Prk View 110 dBuV 90 dBuV 90 dBuV 80 dBuV 80 dBuV 80 dBuV 80 dBuV	Spectrum 2 (8) dby/ 12 ms + 1 20 db SWT 2 ms + 1 bg	288W 1 MHz 788W 3 MHz Mode Auto Sweep M4[1] M1[1] M1 M1 M1 M1 M1 M1 M1 M1 M1 M1	2	55.16 d .34730 55.73 d
Spectrum Spectrum tof Level 117.00 dbµV 20 db µV ttt 20 db µV 0 dbµV 0 dbµV 0 dbµV 0 dbµV	m 2 (3) RBW 1 MHz SWT 2 ms • VBW 3 MHz Mode	Auto Sweep	52.27 dBpV 1.82340 GHz 52.97 dBpV 2.34730 GHz	Spectrum Ref Level 117.00 Att 10/8 JPK View 110 dBµV 90 dBµV 90 dBµV 80 dBµV 80 dBµV 80 dBµV 80 dBµV 90 dBµV 90 dBµV 90 dBµV 90 dBµV 90 dBµV	Spectrum 2 (8) dby/ 12 ms + 1 20 db SWT 2 ms + 1 bg	288W 1 MHz 788W 3 MHz Mode Auto Sweep M4[1] M1[1] M1 M1 M1 M1 M1 M1 M1 M1 M1 M1	2	55.16 di .34730 (55.73 di
Spectrum Spectrum tot Level 117.00 dBµV 20 dB 20 dB ber View 0 0 dBµV 0 0 dBµV 0 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0	m 2 (3) RBW 1 MHz SWT 2 ms • VBW 3 MHz Mode	Auto Sweep	52.27 dBpV 1.82340 GHz 52.97 dBpV 2.34730 GHz	Spectrum Ref Level 117.00 Att In Prk View 110 dBuV 90 dBuV 90 dBuV 80 dBuV 80 dBuV 80 dBuV 80 dBuV	Spectrum 2 (8) dby/ 12 ms + 1 20 db SWT 2 ms + 1 bg	288W 1 MHz 788W 3 MHz Mode Auto Sweep M4[1] M1[1] M1 M1 M1 M1 M1 M1 M1 M1 M1 M1	2	55.16 d .34730 55.73 d
Spectrum Spectrum tot Level 117.00 dBµV 20 dB 20 dB ber View 0 0 dBµV 0 0 dBµV 0 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0	M 2 (3) RBW 1 MHz WT 2 ms VBW 3 MHz Mode	Auto Sweep	52.27 dBpV 1.82340 GHz 52.97 dBpV 2.34730 GHz	Spectrum Rof Level 117.00 • Att • Ink View 100 dBuV • 0 dBuV	Spectrum 2 (8) dby/ 12 ms + 1 20 db SWT 2 ms + 1 bg	88W 1 MHz 78W 3 MHz Mode Auto Sweep M4[1] M1[1] M1[1] M1 M1[1] M1 M1 M1 M1 M1 M1 M1 M1 M1 M1	2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	55.16 di .34730 i 55.73 di .03910 i
Spectrum Spectrum tof Level 117.00 dBµV 20 dB x Ntt 20 dB x 0 dBµV 0 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0	M 2 (3) RBW 1 MHz WT 2 ms VBW 3 MHz Mode	Auto Sweep	52.27 dBpV 1.82340 GHz 52.97 dBpV 2.34730 GHz	Spectrum Ref Level 117.00 Att I% View 100 dBµ/ 100 dBµ/ 80 dBµ/ 80 dBµ/ 93 dBµ/	Spectrum 2 (8) dby/ 12 ms + 1 20 db SWT 2 ms + 1 bg	288W 1 MHz 788W 3 MHz Mode Auto Sweep M4[1] M1[1] M1 M1 M1 M1 M1 M1 M1 M1 M1 M1	2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	55.16 di .34730 i 55.73 di .03910 i
Spectrum Spectrum tof Level 117.00 dBµV tt 20 dB s b0 dBµV 0 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0 dBµV 0	M 2 (3) RBW 1 MHz WT 2 ms VBW 3 MHz Mode	Auto Sweep	52.27 dBpV 1.82340 GHz 52.97 dBpV 2.34730 GHz	Spectrum Ref Level 117.00 # Att @ 19k View 110 dBµV 90 dBµV 90 dBµV 80 dBµV 90 dBµV	Spectrum 2 (8) dby/ 12 ms + 1 20 db SWT 2 ms + 1 bg	RBW 1 MHz RBW 3 MHz Mode Auto Sweep M4[1] M1[1] M1[1] M2 M2 M2 M3 M4 M4 M4 M4 M4 M4 M4 M4 M4 M4	2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	55.16 di .34720 55.73 di .03910
Spectrum Spectrum Rof Level 117.00 dbµV Ntt 20 db s PK View 0 0 dbµV 0 1 dbµV	m 2 (8) RBW 1 MHz WT 2 ms • VBW 3 MHz Mode WH 4 Multiple Manual Mages Male Count Manual Mages 691 pts	Auto Sweep MI[1] M2[1] M2[1] M2[1]	52.27 dBpV 1.02340 GHz 52.97 dBpV 2.34730 GHz	Spectrum Ref Level 117.00 # Att @ 19k View 110 dBµV 100 dBµV 90 dBµV 80 dBµV 90 dBµV <tr< td=""><td>Spectrum 2 (8) dBy// 12 ms + 1 20 dB SWT 2 ms + 1 M2 M2 M2 M2 M2 M2 M2 M2 M2 M2</td><td>Response 55.73 depty Function 55.73 depty</td><td>2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>55.16 di .34720 (55.73 di .03910 (</td></tr<>	Spectrum 2 (8) dBy// 12 ms + 1 20 dB SWT 2 ms + 1 M2 M2 M2 M2 M2 M2 M2 M2 M2 M2	Response 55.73 depty Function 55.73 depty	2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	55.16 di .34720 (55.73 di .03910 (
Spectrum Spectrum tof Level 117.00 dbµV 20 db yV ttt 20 db yV 00 dbµV 00 dbµV 00 dbµV 00 dbµV dbµV 00 dbµV	m 2 (8) RBW 1 MHz WT 2 ms • VBW 3 MHz Mode WH 4 Multiple and 4 Multiple Multiple and 4 Multiple and 4 Multiple 691 pts	Auto Sweep MI[1] M2[1] M2[1] M2[1]	52.27 dBpV 1.82340 GHz 52.97 dBpV 2.34730 GHz	Spectrum Rof Level 117.00 Att I% for Level 117.00	Spectrum 2 (8) dby/ 12 ms 14 20 db SWT 2 ms 14 Stimulus	XBW 1 MHz Mode Auto Sweep // Weight MHz // MHz <	2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	55.16 di .34720 (55.73 di .03910 (





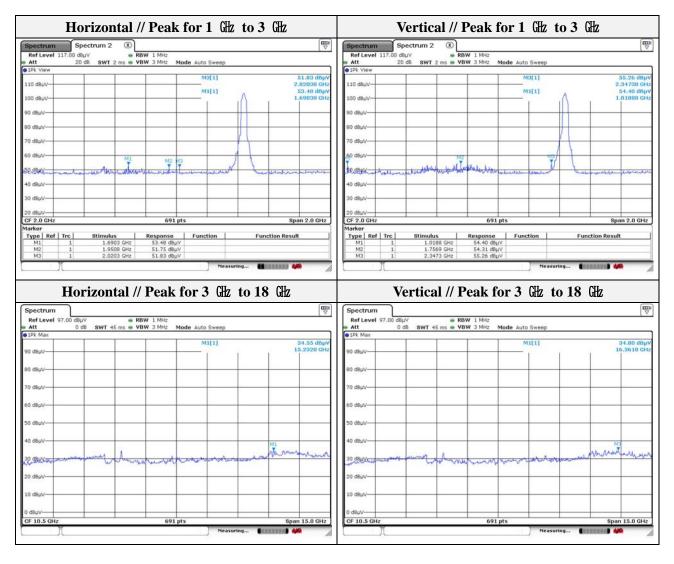


Mode:	802.11n(HT40)
Distance of measurement:	3 meter

Channel:

06

Frequency (Mb)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµN/m)	Margin (dB)
1018.80	54.40	Peak	V	-10.05	-	44.35	74.00	29.65
1690.30	53.48	Peak	Н	-5.65	-	47.83	74.00	26.17
1756.90	54.31	Peak	V	-4.99	-	49.32	74.00	24.68
1950.80	51.75	Peak	Н	-3.32	-	48.43	74.00	25.57
2020.30	51.83	Peak	Н	-2.84	-	48.99	74.00	25.01
2347.30	55.26	Peak	V	-1.95	-	53.31	74.00	20.69



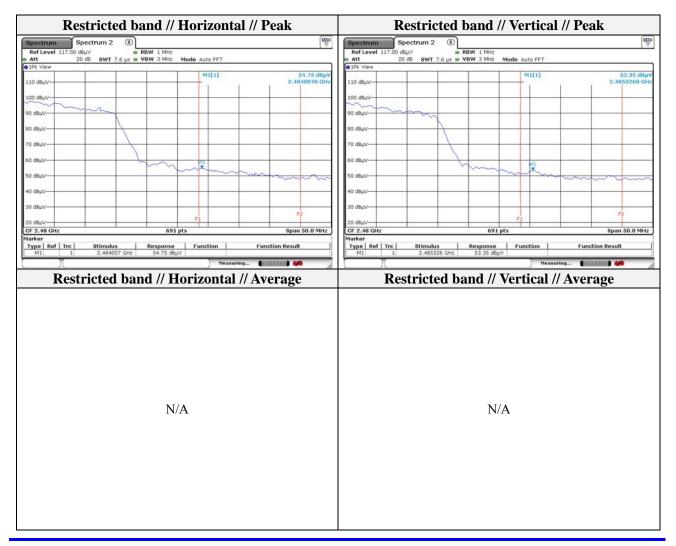


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Mode:		802.11n(HT40)	
			Ĩ

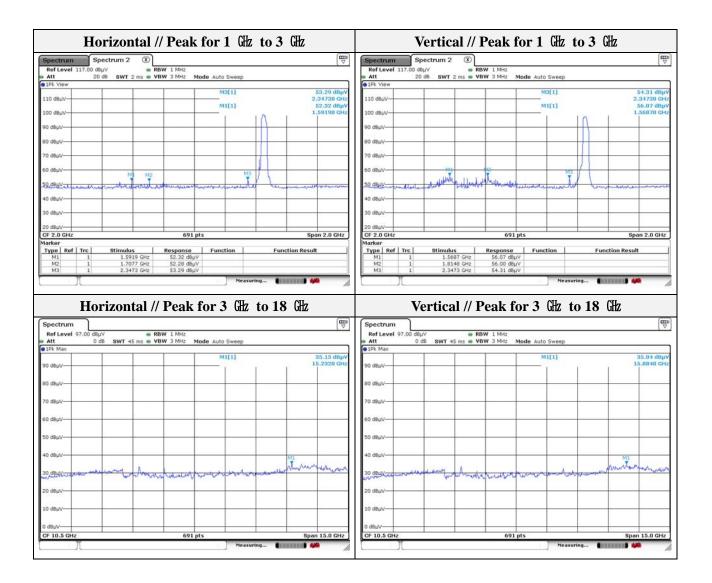
Distance of measurement:	3 meter
Channel:	09

Frequency (Mz)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµN/m)	Margin (dB)
1568.70	56.07	Peak	V	-6.82	-	49.25	74.00	24.75
1591.90	52.32	Peak	Н	-6.62	-	45.70	74.00	28.30
1707.70	52.28	Peak	Н	-5.48	-	46.80	74.00	27.20
1814.80	56.00	Peak	V	-4.44	-	51.56	74.00	22.44
2347.30	53.29	Peak	Н	-1.95	-	51.34	74.00	22.66
2347.30	54.31	Peak	V	-1.95	-	52.36	74.00	21.64
2484.00	54.75	Peak	Н	-1.60	-	53.15	74.00	20.85
2485.52	53.35	Peak	V	-1.59	-	51.76	74.00	22.24





Test report No.: KES-RF-17T0004 Page (48) of (58)





Test results	(18 GHz to 30	GHz)					
Mode:		802.11n(H	(T20)				
Distance of	measurement:	3 meter					
Channel:		06(Worst case)					
Frequency	Level	Ant. Pol.	CF	$\mathbf{F}_{\mathbf{d}}$	Field strength	Limit	Margin

Frequency	Level	Ant. Pol.	Cr	ľd	Fleid strength	Limit	Margin
(MHz)	(dBµV)	(H / V)	(dB)	(dB)	(dBµV/m)	$(dB\mu V/m)$	(dB)
		No spurious e	missions were	detected withir	20 dB of the limit		

	Horizontal		Vertical			
	RBW 1 MHz VBW 3 MHz Mode Auto Sweep	E	Spectrum Ref Level 87.00 dBµV RBW 1 MHz Att 0 db SWT 36 ms VBW 3 MHz Mode Auto Sweep			
IPk View	Note Acto Sweep		IPk View			
80 dBµV			80 d8µV			
70 d8µV			70 d8µV			
60 d8µV			60 d8µV			
50 dBµV			50 dBy/v			
40 dBuV			40 dbµV	1		
30 BUV	un and a have and a start	manufacture and Low	30 30 00 million and the second and	er lar		
20 dBµV			20 dBµV-			
10 d8µV			10 d8µV-			
0 dBu/V			0 d8µV			
-10 d8µV			-10 dBµV			
Start 18.0 GHz	691 pts	Stop 30.0 GHz	Start 18.0 GHz 691 pts Stop 30.4	0 GHz		
Marker	Measuring		Marker			

Note.

- 1. Average test would be performed if the peak result were greater than the average limit.
- 2. Actual = Reading + AFCL(Ant. factor Amp. gain + Cable loss) + DCF(Duty cycle correction factor)
- 3. Duty cycle correction factor = $20\log(\text{dwell time}/100 \text{ ms})$



3.5 Conducted spurious emissions & band edge Test procedure

Pand adga

Band edge

KDB 558074 D01 v03r05 - Section 11.3

- 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. Number of sweep points \geq 2 × Span/RBW
- 7. Trace mode = max hold
- 8. Sweep time = auto
- 9. The trace was allowed to stabilize

Out of band emissions

KDB 558074 D01 v03r05 - Section 11.3

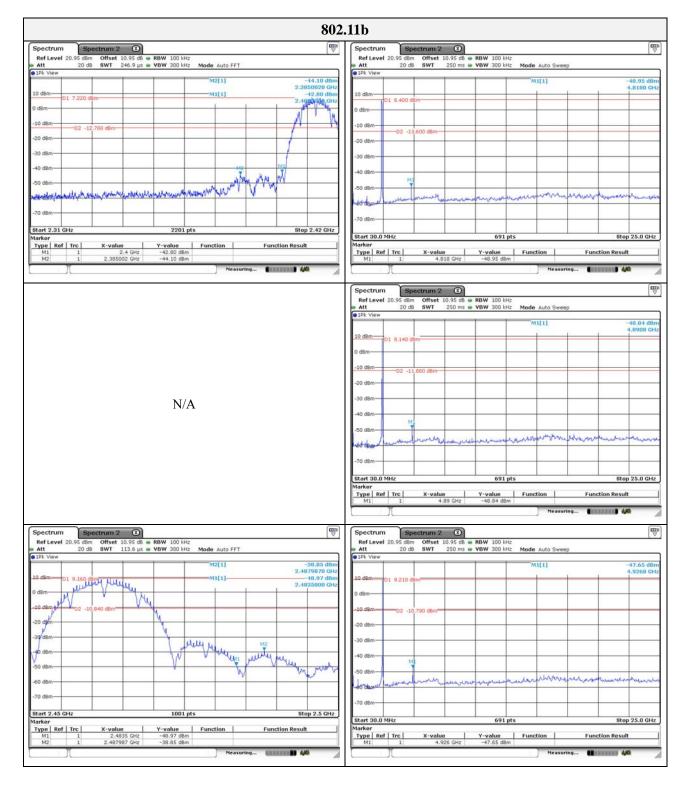
- 1. Start frequency was set to 30 MHz and stop frequency was set to 25 GHz for 2.4 GHz frequencies and 40 GHz for 5 GHz frequencies (separated into two plots per channel)
 - 2. RBW = 100 kHz
 - 3. VBW = 300 kHz
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep time = auto couple
- 7. The trace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



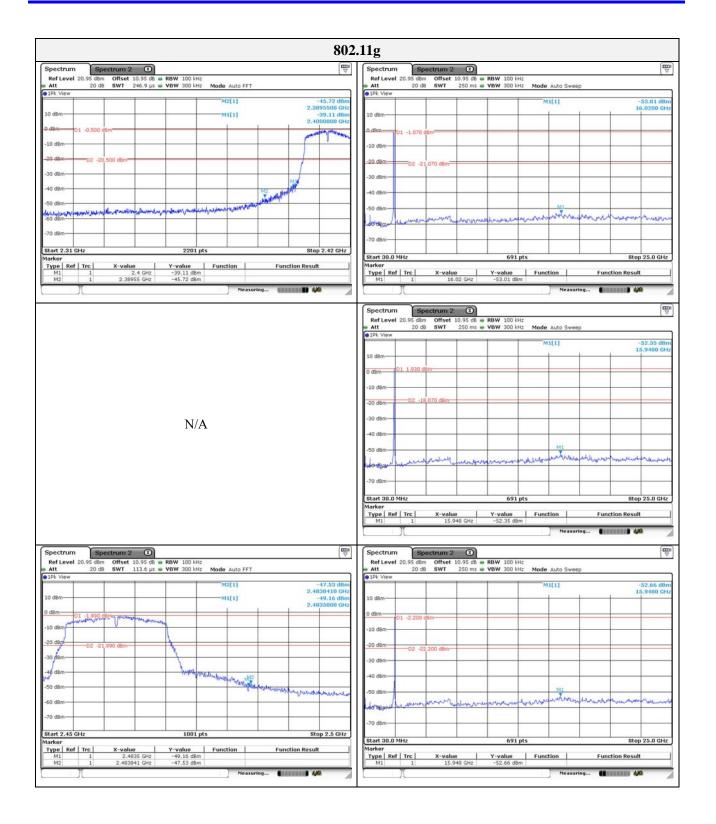
Test results



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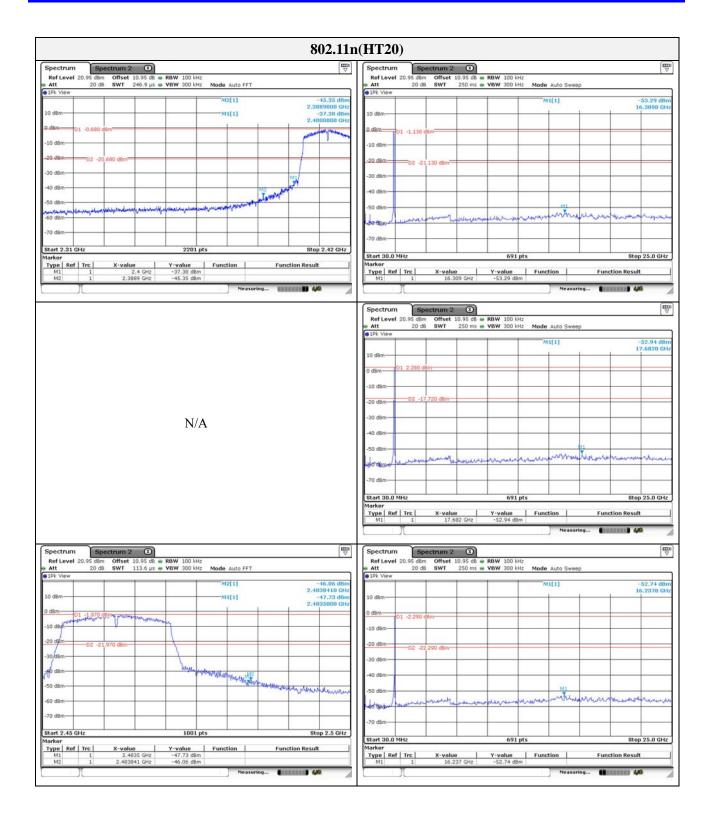


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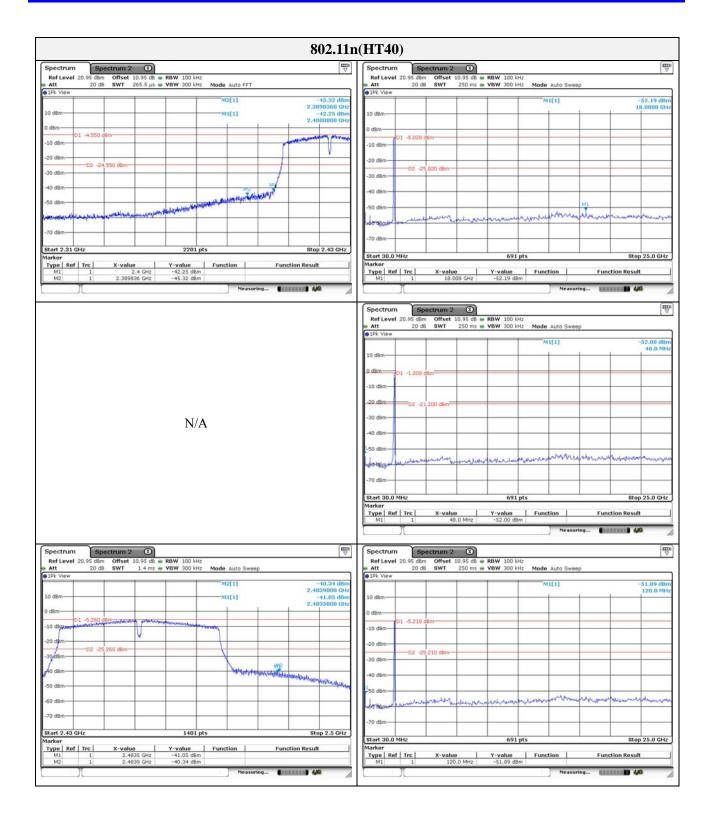


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3.6. AC conducted emissions

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.

Enguaran 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		

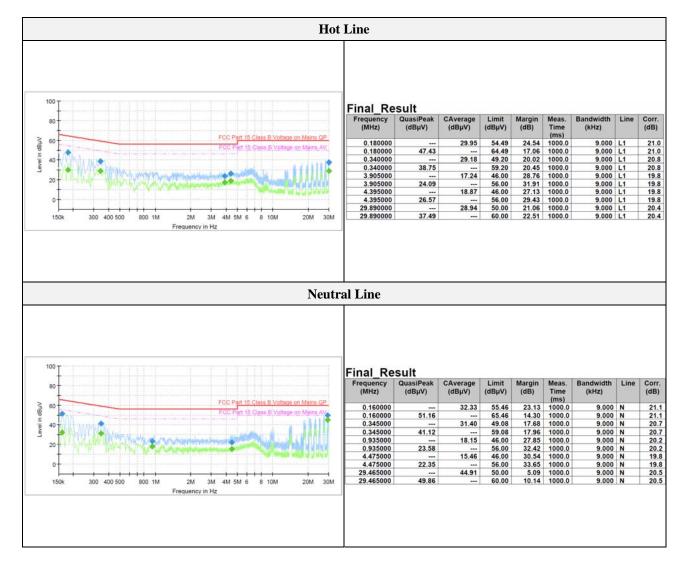
Note.

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.

3. Both Cable loss and LISN factor are included in measurement level(QP Level or AV Level).



Test results





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Appendix A. Measurement equipment

Equipment	Manufacturer	Model	Serial No.	Calibration interval	Calibration due.
Spectrum Analyzer	R&S	FSV30	100736	1 year	2017.07.06
Spectrum Analyzer	R&S	FSV40	101002	1 year	2017.07.06
8360B Series Swept Signal Generator	HP	83630B	3844A00786	1 year	2017.01.25
PSG Analog Signal Generator	Agilent	E8257C	US42340237	1 year	2017.07.05
Attenuator	Keysight	8493C	82509	1 year	2017.01.25
Attenuator	HP	8493C	08961	1 year	2017.07.05
Loop Antenna	R&S	HFH2- Z2.335.4711.52	826532	2 years	2017.03.03
Trilog-broadband antenna	SCHWARZBECK	VULB 9163	9168-713	2 years	2017.05.15
Horn Antenna	A.H.	SAS-571	781	2 years	2017.05.07
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170550	2 years	2017.04.30
High Pass Filter	WAINWRIGHT INSTRUMENT	WHJS3000-10TT	1	1 year	2017.07.04
Low Pass Filter	WEINSCHEL	WLK1.0/18G-10TT	1	1 year	2017.07.04
Preamplifier	HP	8449B	3008A00538	1 year	2017.07.05
Broadband Amplifier	SCHWARZBECK	BBV-9721	PS9721-003	1 year	2017.01.25
EMI Test Receiver	R&S	ESR3	101781	1 year	2017.05.03
EMI Test Receiver	R&S	ESU26	100552	1 year	2017.04.24
EMI Test Receiver	R&S	ESR3	101783	1 year	2017.05.03
LISN	R&S	ENV216	101137	1 year	2017.02.04

Peripheral devices

Device Manufacturer		Model No.	Serial No.	
Notebook Computer	Samsung Electronics Co., Ltd.	NP-QX411L	HJV993BB905283V	