

Test report No.: KES-RF-16T0113-R2 Page (1) of (54)

TEST REPORT Part 15 Subpart C 15.247

Equipment under test SMARTCAM

Model name SNH-P6412BN

Derivative model SNH-C6410/SD

FCC ID NLMSNHP6412BN

Applicant Hanwha Techwin Co., Ltd.

Manufacturer Tianjin Samsung Techwin Opto-Electronic Co., Ltd.

Date of test(s) 2016.06.01 ~ 2016.12.12

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Issued to Hanwha Techwin Co., Ltd.

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Test report No .: KES-RF-16T0113-R2 Page (2) of (54)

Revision history

Revision	Date of issue	Test report No.	Description	
- 2016.12.07 KES-RF-16T0113		KES-RF-16T0113	Initial	
1	2016.12.13	KES-RF-16T0113-R1	Retest radiated emissions & AC conducted emissions	
2	2016.12.14	KES-RF-16T0113-R2	Added derivative model	



Test report No .: KES-RF-16T0113-R2 Page (3) of (54)

TABLE OF CONTENTS

1.	General i	nformation	4
	1.1.	EUT description	4
	1.2.	Test configuration	5
	1.3.	Device modifications	5
	1.4.	Derivation model information	5
	1.5.	Frequency/channel operations	6
	1.6.	Worst case data rate	6
	1.7.	Using antenna information	6
2.	Summary	y of tests	7
3.	Test resu	lts	8
	3.1.	Radiated restricted band and emissions	8
	3.2.	AC conducted emissions	51
App	endix A.	Measurement equipment	53
App	endix B.	Test setup photos	54



1. General information

Applicant:	Hanwha Techwin Co., Ltd.				
Applicant address:	1204, Changwon-daero, Seongsa	n-gu, Changwon-si, Gyeong	gsangnam-do, Korea		
Test site:	KES Co., Ltd.				
Test site address:	C-3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, Korea				
	473-21, Gayeo-ro, Yeoju-si, Gyeonggi-do, Korea				
FCC rule part(s):	15.247				
FCC ID:	NLMSNHP6412BN				
Test device serial No.:	Production	Pre-production	Engineering		

1.1. EUT description

Equipment under test	SMARTCAM
Frequency range	2412 MHz ~ 2462 MHz(802.11b/g/n_HT20)
	5 745 MHz ~ 5 825 MHz(802.11a/n_HT20),
	5 755 MHz ~ 5 795 MHz(802.11n_HT40)
	5 180 MHz ~ 5 240 MHz(802.11a/n_HT20),
	5 190 MHz ~ 5 230 MHz(802.11n_HT40)
	5 260 MHz ~ 5 320 MHz(802.11a/n_HT20),
	5 270 MHz ~ 5 310 MHz(802.11n_HT40)
	5 500 MHz ~ 5 700 MHz(802.11a/n_HT20),
	5 510 MHz ~ 5 670 MHz(802.11n_HT40)
Model:	SNH-P6412BN
Derivative model	SNH-C6410/SD
Modulation technique	DSSS, OFDM
Number of channels	2 412 MHz ~ 2 462 MHz(802.11 b/g/n_HT20) : 11ch
	5 745 MHz ~ 5 825 MHz(802.11a/n_HT20) : 5ch
	5 755 MHz ~ 5 795 MHz(802.11n_HT40) : 2ch
	5 180 MHz ~ 5 240 MHz(802.11a/n_HT20) : 4ch
	5 190 MHz ~ 5 230 MHz(802.11n_HT40) : 2ch
	$5\ 260\ \text{Mz} \sim 5\ 320\ \text{Mz}(802.11a/n_HT20): 4ch$
	$5\ 270\ \text{Mz} \sim 5\ 310\ \text{Mz}(802.11n_HT40): 2ch$
	5 500 MHz ~ 5 700 MHz(802.11a/n_HT20) : 11ch
	5 510 MHz ~ 5 670 MHz(802.11n_HT40) : 5ch
Antenna specification	Antenna type: PIFA Antenna
Power source	AC 120V Adapter (Output : DC 5V / 2 A)

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Note:

- 1. Certificated module is mounted in the EUT as following
 - · Applicant: Hanwha Techwin Co., Ltd.
 - Contains FCC ID : NLMSWLQ93T
 - Model: SWL-Q93T

2. The installed module is completed identical as original.

1.2. Test configuration

The <u>Hanwha Techwin Co., Ltd.</u> <u>FCC ID: NLMSNHP6412BN</u> 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. Device modifications

N/A

1.4. Derivation model information

The circuit diagram and software of the basic model and derivative are fundamentally the same. It is for model management purpose.



1.5. 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

1.6. 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: MCS0 (SISO), MCS8 (MIMO)

1.7. Using antenna information

Mode	Bandwidth (Mb)	Antenna 0	Antenna 1	Antenna 0+1
802.11b	20	√	1	×
802.11g	20	1	1	×
802.11n	20	\	\$	✓

Antenna 0 gain(dBi)	Antenna 1 gain(dBi)	Total gain(dBi) ^{Note1}
-2.69	-2.22	0.56

Note.

1. Ant Gain = $10\log[(10^{G1/20}+10^{G2/20}+...+10^{GN/20})^2/N_{ANT}]$



Test report No.: KES-RF-16T0113-R2 Page (7) of (54)

Test results

2. Summary of	tests
Reference	Parameter
15 205	

15.205 15.209	Radiated spurious emission	Pass
15.207	AC conducted emissions	Pass

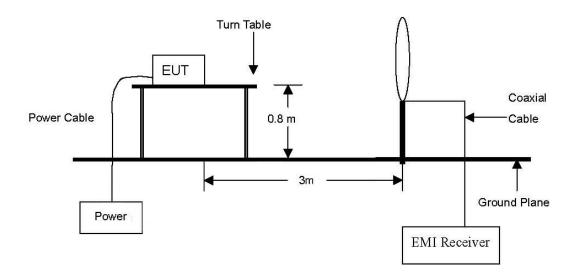


3. Test results

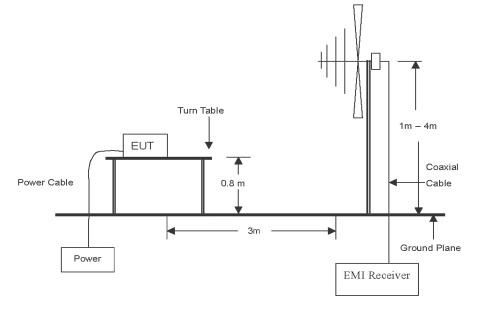
3.1. Radiated restricted band and emissions

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.



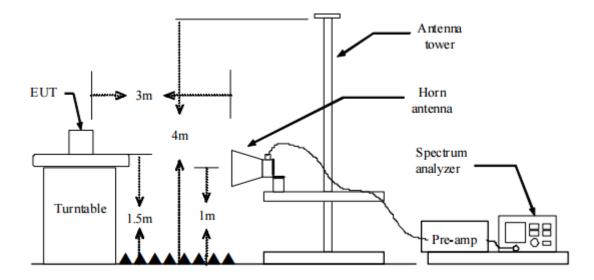
The diagram below shows the test setup that is utilized to make the measurements for emission from 30 Mz to 1 Gz emissions.



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The diagram below shows the test setup that is utilized to make the measurements for emission from 1 $\mathbb{G}\mathbb{Z}$ to the tenth harmonic of the highest fundamental frequency or to 40 $\mathbb{G}\mathbb{Z}$ 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 MHz

- 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 MHz

 - (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. $F_d = 40\log(D_m/Ds)$

 $f \ge 30$ Mz, extrapolation factor of 20 dB/decade of distance. $F_d = 20log(D_m/Ds)$ Where:

- F_d = Distance factor in dB
- D_m = Measurement distance in meters
- D_s = Specification distance in meters
- 3. $CF(Correction factors(dB)) = Antenna factor(dB/m) + Cable loss(dB) + or Amp. gain(dB) + or F_d(dB)$
- 4. Field strength($dB\mu V/m$) = Level($dB\mu V$) + CF (dB) + or DCF(dB)
- 5. Margin(dB) = Limit(dB μ V/m) Field strength(dB μ V/m)
- 6. Emissions below 18 GHz were measured at a 3 meter test distance while emissions above 18 GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 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 (µN/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

`.

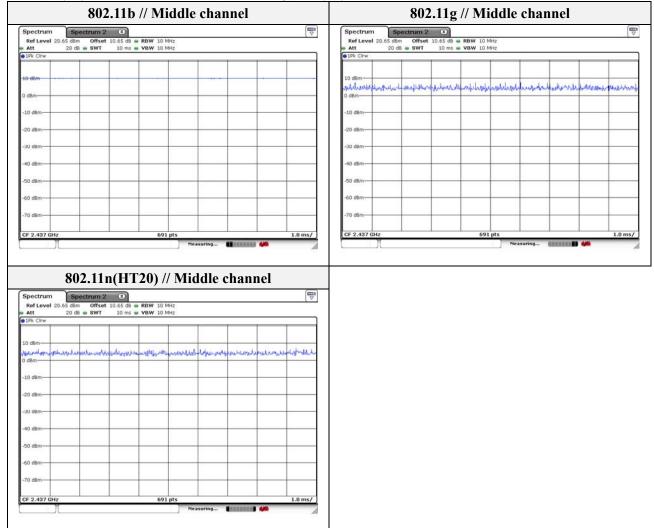
Regarding to KDB 558074 D01_v03r05, 6.0, the maximum duty cycles of all modes were investigated and set the spectrum analyzer as below.

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	T _{on} 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

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

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



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

Frequency	Level	Ant. Pol.	CF	F _d	Field strength	Limit	Margin	
(Mz)	(dBµV)	(H/V)	(dB)	(dB)	(dBµN/m)	(dBµN/m)	(dB)	
	No spurious emissions were detected within 20 dB of the limit							

Horizontal Vertical E □ Spectrum 2 🙁 8 Spectrum Spectrum S trum 2 Ref Level 57.0 Ref Level 57.0 3 kHz SWT 13.4 ms . VBW 3 kHz Mode Auto FFT SWT 13.4 ms . VBW Mode Auto FFT 0 dB 0 dB 1Pk Ma • 1Pk Max M1[1] MIETI 1.86 d8 1.97 dBp 4.600 kH tueb 08 50 dBuV O dBu 40 dBuV 30 dBu to dBu 10 dBu 0 dBu 10 dBul 10 dBuV ANA 20 dBuA 20 dBuA io di 40 d Stop 150.0 kHz Stop 150.0 kHz 691 pts 691 pts Start 9.0 kHz Start 9.0 kHz Type Ref Trc M1 Type Ref Trc M1 Stimulus Stimulus Response Function Function Result Function Function Result Response ---Spectrum Spectrum 2 * Spectrum 2 * SWT 2.1 ms - VBW Att 0 dB Ref Level 57.00 Att SWT 2.1 ms SWT 2.1 ms (6dB) 9 kHz 100 kHz (6dB) 9 kHz 100 kHz Mode Auto FFT Mode Auto FFT • 1Pk Mai 1Pk Ma M1[1] M1[1] 5.67 dBp 172.0 kH 6.83 dBpV 172.0 kH 0 dBs 0 dBu AU dBul 40 dBuV O dBuV 30 dBuV O dBuV 20 dBuV 0 dBus 0 dBuly dRUNdawn! 10 dBµ 10 d8 20 dBµA 20 dBµV 30 dBµ 30 dBµV Start 150.0 kHz
 Start 150.0 kHz

 Marker

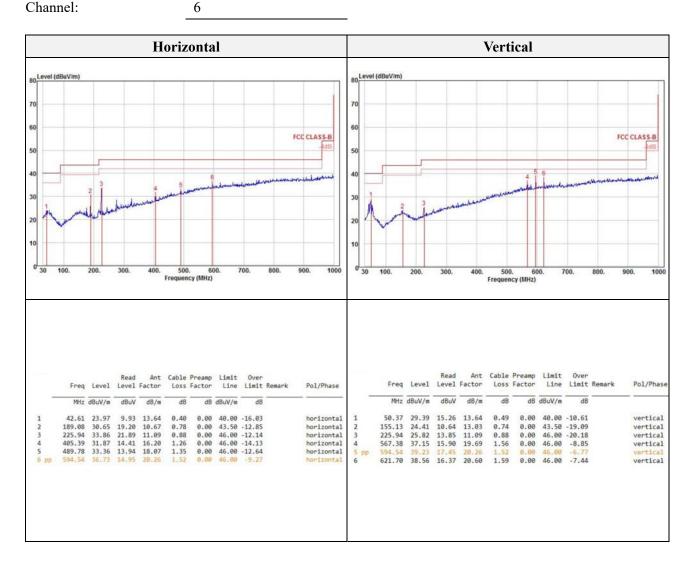
 Type
 Ref
 Trc

 M1
 1
 691 pts Stop 30.0 MHz 691 pts Stop 30.0 MHz Marker Type Ref Trc M1 1 Response Response Function Function Result Stimulus Function Function Result Stimulus COLUMN # COLUMN # Measuring... Measuring...



Test report No.: KES-RF-16T0113-R2 Page (14) of (54)

Test results (Below 1 000	MŁ) – Worst case	
Mode:	802.11n_HT20(MIMO)	
Distance of measurement:	3 meter	





Test results (Above 1 000 Mz)

Ant 1

Mode:

Distance of measurement: 3 meter

802.11b

01

Channel:

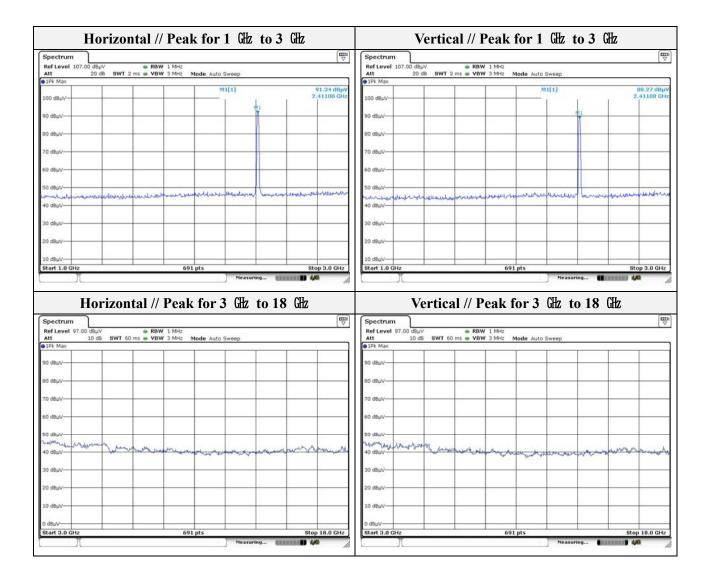
Frequency (Mb)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµN/m)	Margin (dB)
2341.42	46.34	Peak	Н	-9.92	-	36.42	74.00	37.58
2362.08	48.39	Peak	V	-9.85	-	38.54	74.00	35.46

Restricted band // Horizontal // Peak	Restricted band // Vertical // Peak
Spectrum 2 (8) Spectrum 3 (8)	Spectrum 2 (8) Spectrum 3 (8)
Ref Level 97.00 dBµV RBW 1 MHz	Ref Level 97.00 dBµV RBW 1 MHz
Att 10 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep	Att 10 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep
90 dBµV	90 d8µV
80 deµv	80 dBµV 2/310000 Ghz
60 dBuV-	60 dBuV-
50 deux	50 deuron and a second and a second a s
30 deuv	40 dBµV
20 dBµV	20 dBuV
10 dBµV	10 dBµV
0 dBµV F1 Stort 2.3 GHz 691 pts Stop 2.42 GHz	0 dB ₂ /V ²² Stort 2.3 GHz 691 pts Stop 2.42 GHz
Marker Yupe Ref Trc X-value Y-value Function Function Result M2 1 2.39 GHz 44.63 dBµV Heasuring Heas	Marker Type [Ref Trc X-value Y-value Function Function Result] Function Result] M1 1 2.33 GHz 43.97 dBy/ [Millow] [Millow
Restricted band // Horizontal // Average	Restricted band // Vertical // Average
N/A	N/A

Note.

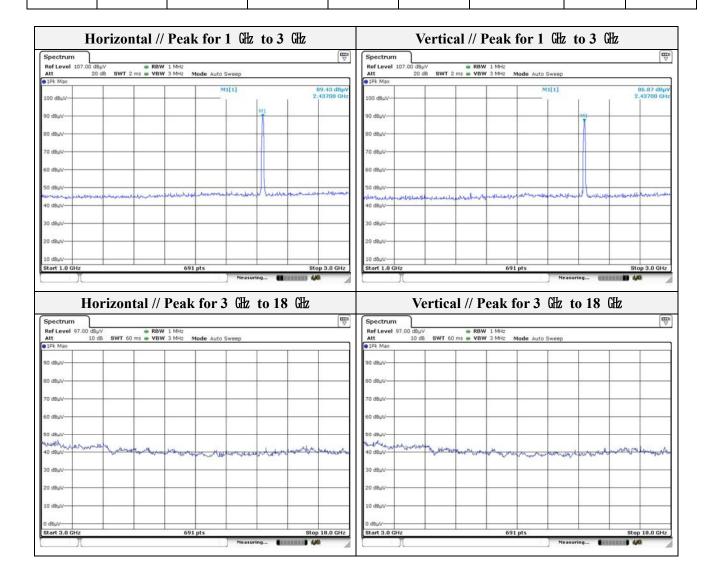
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Mode:		802.11t)					
Distance o	f measurem	ent: 3 meter						
Channel:		06						
		r	1	n				
Frequency (畑)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
		No s	purious emiss	ion were det	ected above	3 GHz.		





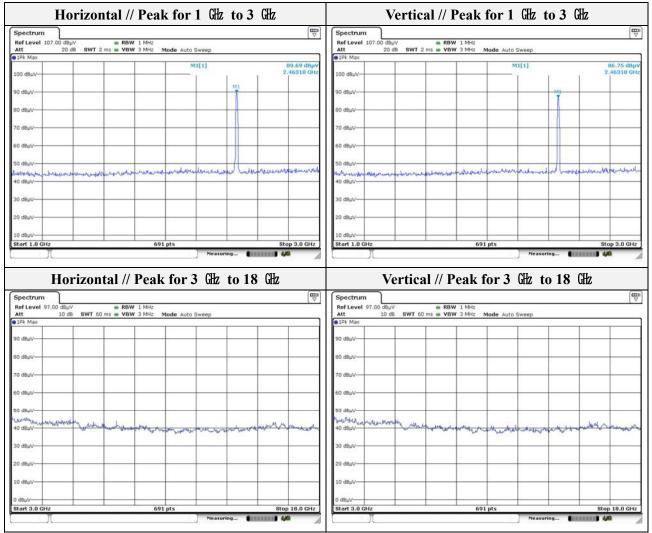
Mode:	802.11b
Distance of measurement:	3 meter
Channel:	11

Frequency (Mz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµN/m)	Margin (dB)
2489.41	42.18	Peak	Н	-9.38	-	32.80	74.00	41.20
2491.00	43.43	Peak	V	-9.38	-	34.05	74.00	39.95

ectrum Spectrum 2 🛞	Spectrum 3 🙁 Spectrum	4 🛛 🕎	Spectrum Spe	ectrum 2 🛞 S	Spectrum 3	×		[Ţ
	BW 1 MHz	4 🔘	Ref Level 97.00 dBµV	ectrum 2 (k) a				1
t 10 dB SWT 1 ms 🖷 V	/BW 3 MHz Mode Auto Sweep		Att 10 dB	SWT 1 ms 👄 VBW	3 MHz Mo	de Auto Sweep		
² k Max	M3[1]	42.18 d8µV	• 1Pk Max		1 1	M3[1]		43.43 dBp
dBuV		2.4894070 GHz	90 dBµV					2.4909990 GH
atuv	M1[1]	40.39 dBpV 2.4835000 GHz	80 dBuV			M1[1]		40.44 dBp 2.4835000 GF
dBµV-			70 dBµV-					
dBµV			60 dBµV		-	_		
dBuV			50 dBµV				110	
	memory with the month	M2	10.40.41	here	Laboration of	MI	M3	M2
dBµV			40 d8µV					
dBµV			30 d8µV				-	
dBuV			20 dBµV					
			10.00.00					
dBµV-	FI	F2	10 dBµV			F1		F2
BuV			0 dBµV			1		
2.48 GHz ker	691 pts	Span 50.0 MHz	CF 2.48 GHz Marker		691	pts	2	Span 50.0 MH
pe Ref Trc X-value	Y-value Function	Function Result	Type Ref Trc	X-value	Y-value	Function	Fund	ction Result
M1 1 2.4835 GHz M2 1 2.5 GHz	41.40 dBµV		M1 1 M2 1	2.4835 GHz 2.5 GHz	40.44 dBµ\ 41.24 dBµ\	V		
M3 1 2.489407 GHz			M3 1	2.490999 GHz	43.43 dBµ1	v		
Л	Measur	ring 🗰 🖬 🚧 🥻				Me	easuring 🚺	HERE 440
			50 CS24					
Restricted ba	nd // Horizontal	// Average	Res	tricted ba	and // `	Vertical	l // Aver	age

Note.





Note.



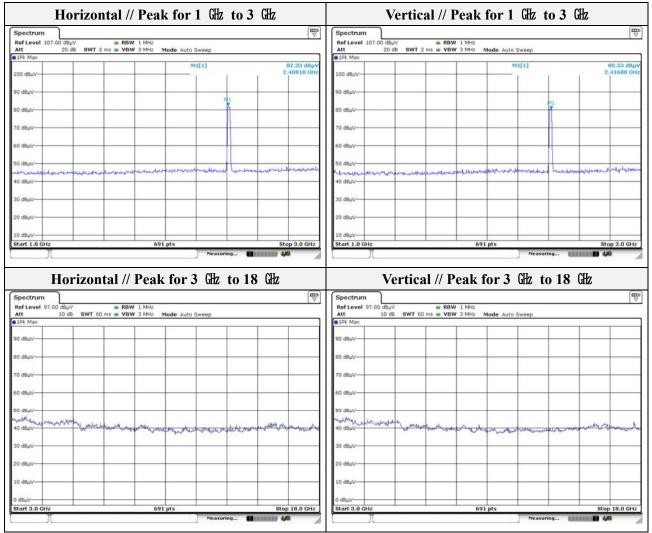
Mode:	802.11g
Distance of measurement:	3 meter
Channel:	01

Frequency (Mz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
2342.63	44.24	Peak	Н	-9.91	-	34.33	74.00	39.67
2324.57	48.53	Peak	V	-9.97	-	38.56	74.00	35.44

Restricted band // Horizontal // Peak	Restricted band // Vertical // Peak
	Spectrum Spectrum 2 (3) Spectrum 3 (3) Spectrum 4 (8)
ef Level 97.00 dBµV	Ref Level 97.00 dBµV
IPk Max M3[1] 44.24 dB	V N3(1) 48.53 dBy
2.342630 G M1[1] 41.79 dB	42 90 dBµV 2.324570 G
0 deuv	Hz 80 d8uV
D dBUV	70 dBuV-
D dBuV	60 dBuV-
Ma man production of the second secon	30 developer all the second and the second s
OBLY CONTRACTOR OF	40 d8µV
danv	
IBUV	20 dBµV
BuV-	10 dBµV-
F1 F2	0 dBuV F1 F2
t 2.3 GHz 691 pts Stop 2.42 GH	z Stort 2.3 GHz 691 pts Stop 2.42 GH Marker
pe Ref Trc X-value Y-value Function Function Result	Type Ref Trc X-value Y-value Function Function Result
M1 1 2.31 GHz 41.79 dBµV M2 1 2.39 GHz 40.41 dBµV	M1 1 2.31 GHz 45.33 dBµV M2 1 2.39 GHz 44.53 dBµV
M3 1 2.34263 GHz 44.24 dBµV Neasuring 1000000 400	M3 1 2.32457 GHz 48.53 dBµV Measuring 11 10000 4/0
Teasuring	measuring
Restricted band // Horizontal // Average	Restricted band // Vertical // Average
N/A	N/A

Note.





Note.



Mode:		802.11g	5					
Distance o	f measurem	ent: 3 meter						
Channel:		06						
Frequency (畑)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµN/m)	Margin (dB)
		No s	purious emiss	ion were det	ected above	3 GHz.		
			L					

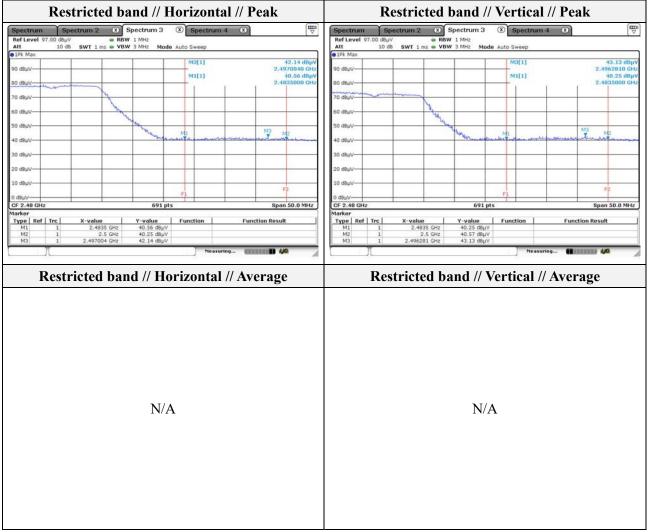
1101120	ontal // Peak fo			Ve	filear // I can		to 3 GH	
pectrum				Spectrum				(
ef Level 107.00 dBpV	RBW 1 MHz	20100 <u>2000</u> 000		Ref Level 107.00 dBµV	RBW 1 MHz			
tt 20 dB SWT	f 2 ms VBW 3 MHz Mode	Auto Sweep		Att 20 dB	SWT 2 ms . VBW 3 MHz	Mode Auto Sweep		
		M1[1]	82.59 d8pV			M1[1]		82.74 d8
00 dBµV			2.44280 GHz	100 dBµV			$\overline{r} = -\overline{r}$	2.43130 0
0 dBµV				90 dBµV				
		M1 A					7	
) dBµV				80 d8µV				
I dBuV	· · · · · ·			70 d8µV-				
				, o depr			11	
dBpV				60 dBµV				
dBµV	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5			50 d8µV				
aucheneueroneur	meaning outsited	manonimumation based	eccurric new discounts		any line and have a server and the	hander blandstation of	and thready	numeround
dBµV				40 dBµV				
dBhA				30 d8µV				
dBuV				20 dBuV				
oup /				-0 WUW				
dBuV-				10 dBuV				
art 1.0 GHz	691 pts		Stop 3.0 GHz	Start 1.0 GHz	93	1 pts		Stop 3.0 G
Horizo	ntal // Peak fo				tical // Peak f			
Horizo	BBW 1 MHz	r 3 GHz to 1	20	Spectrum Ref Level 97.00 dBuV	RBW 1 MHz	for 3 GHz 1		łz
		r 3 GHz to 1	8 GHz	Spectrum Ref Level 97.00 dBµV Att 10 dB		for 3 GHz 1		łz
Horizo	BBW 1 MHz	r 3 GHz to 1	8 GHz	Spectrum Ref Level 97.00 dBuV	RBW 1 MHz	for 3 GHz 1		łz
Horizo	BBW 1 MHz	r 3 GHz to 1	8 GHz	Spectrum Ref Level 97.00 dBµV Att 10 dB	RBW 1 MHz	for 3 GHz 1		łz
Horizo	BBW 1 MHz	r 3 GHz to 1	8 GHz	Spectrum Ref Level 97.00 dBµV Att 10 dB @1Pk Max 90 dBµV	RBW 1 MHz	for 3 GHz 1		łz
Horizo	BBW 1 MHz	r 3 GHz to 1	8 GHz	Spectrum Ref Level 97.00 dBµV Att 10 dB	RBW 1 MHz	for 3 GHz 1		łz
Horizo	BBW 1 MHz	r 3 GHz to 1	8 GHz	Spectrum Ref Level 97.00 dBµV Att 10 dB 90 dBµV 80 dBµV	RBW 1 MHz	for 3 GHz 1		łz
Horizo	BBW 1 MHz	r 3 GHz to 1	8 GHz	Spectrum Ref Level 97.00 dBµV Att 10 dB @1Pk Max 90 dBµV	RBW 1 MHz	for 3 GHz 1		łz
Ногіzо естим ft Level 97.00 dBµV t 10 dB swr k Max dBµV dBµV	BBW 1 MHz	r 3 GHz to 1	8 GHz	Spectrum Ref Level 97.00 dBµV Att 10 dB @ IPk Max 90 dBµV 80 dBµV 70 dBµV	RBW 1 MHz	for 3 GHz 1		łz
Horizo	BBW 1 MHz	r 3 GHz to 1	8 GHz	Spectrum Ref Level 97.00 dBµV Att 10 dB 90 dBµV 80 dBµV	RBW 1 MHz	for 3 GHz 1		łz
Horizo	BBW 1 MHz	r 3 GHz to 1	8 GHz	Spectrum Ref Level 97.00 dBµV Att 10 dB @ IPk Max 90 dBµV 80 dBµV 70 dBµV	RBW 1 MHz	for 3 GHz 1		
Horizo	RBW 1 MHz 60 ms VBW 3 MHz Mode	r 3 GHz to 1		Spectrum Ref Level 97.00 dBµV Att 10 dB Ø10k Max 90 dBµV 80 dBµV 70 dBµV 60 dBµV 50 dBµV 50 dBµV	RBW 1 MHz SWT 60 ms VBW 3 MHz	for 3 GHz 1		łz
Horizo	RBW 1 MHz 60 ms VBW 3 MHz Mode	r 3 GHz to 1	8 GHz	Spectrum Ref Level 97.00 dBµV Att 10 dB Ø1 dBµV 10 dB 90 dBµV 80 dBµV 70 dBµV 60 dBµV 60 dBµV 50 dBµV	RBW 1 MHz	for 3 GHz 1		łz
Horizo	BBW 1 MHz	r 3 GHz to 1		Spectrum Ref Level 97.00 dBµV Att 10 dB 90 dBµV 80 dBµV 80 dBµV 90 dBµV 70 dBµV 60 dBµV 60 dBµV 90 dBµV	RBW 1 MHz SWT 60 ms VBW 3 MHz	for 3 GHz 1		łz
Horizo	RBW 1 MHz 60 ms VBW 3 MHz Mode	r 3 GHz to 1		Spectrum Ref Lavel 97.00 dBµV Att 10 dB 90 dBµV 90 dBµV 80 dBµV 90 dBµV 70 dBµV 90 dBµV 80 dBµV 90 dBµV 90 dBµV 90 dBµV	RBW 1 MHz SWT 60 ms VBW 3 MHz	for 3 GHz 1		łz
Horizo	RBW 1 MHz 60 ms VBW 3 MHz Mode	r 3 GHz to 1		Spectrum Ref Level 97.00 dBµV Att 10 dB 91 JR Max 90 dBµV 90 dBµV 90 dBµV 80 dBµV 90 dBµV 70 dBµV 90 dBµV 80 dBµV 90 dBµV 90 dBµV 90 dBµV	RBW 1 MHz SWT 60 ms VBW 3 MHz	for 3 GHz 1		łz
Horizo bectrum of Level 97.00 dBµV bectrum of Level 97.00 dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV	RBW 1 MHz 60 ms VBW 3 MHz Mode	r 3 GHz to 1		Spectrum Ref Level 97.00 dBµV Att 10 dB 90 dBµV 80 dBµV 80 dBµV 90 dBµV 70 dBµV 60 dBµV 60 dBµV 90 dBµV	RBW 1 MHz SWT 60 ms VBW 3 MHz	for 3 GHz 1		łz
Horizo	RBW 1 MHz 60 ms VBW 3 MHz Mode	r 3 GHz to 1		Spectrum Ref Lavel 97.00 dBµV Att 10 dB 90 dBµV 90 dBµV 80 dBµV 70 dBµV 60 dBµV 50 dBµV 90 dBµV	RBW 1 MHz SWT 60 ms VBW 3 MHz	for 3 GHz 1		łz
Horizo	RBW 1 MHz 60 ms VBW 3 MHz Mode	r 3 GHz to 1		Spectrum Ref Level 97.00 dBµV Att 10 dB 91 JR Max 90 dBµV 90 dBµV 90 dBµV 80 dBµV 90 dBµV 70 dBµV 90 dBµV 80 dBµV 90 dBµV 90 dBµV 90 dBµV	RBW 1 MHz SWT 60 ms VBW 3 MHz	for 3 GHz 1		łz
Horizo	RBW 1 MHz 60 ms VBW 3 MHz Mode	r 3 GHz to 1		Spectrum Ref Lavel 97.00 dBµV Att 10 dB 90 dBµV 90 dBµV 80 dBµV 70 dBµV 60 dBµV 50 dBµV 90 dBµV	RBW 1 MHz SWT 60 ms VBW 3 MHz	for 3 GHz 1		łz
Horizo	RBW 1 MHz 60 ms VBW 3 MHz Mode	r 3 GHz to 1		Spectrum Ref Level 97.00 dBµV Att 10 dB Ø10 dBµV 90 dBµV 80 dBµV 90 dBµV 70 dBµV 90 dBµV 60 dBµV 90 dBµV 80 dBµV 90 dBµV 90 dBµV 90 dBµV 10 dBµV 10 dBµV	RBW 1 MHz SWT 60 ms VBW 3 MHz	for 3 GHz 1		łz

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

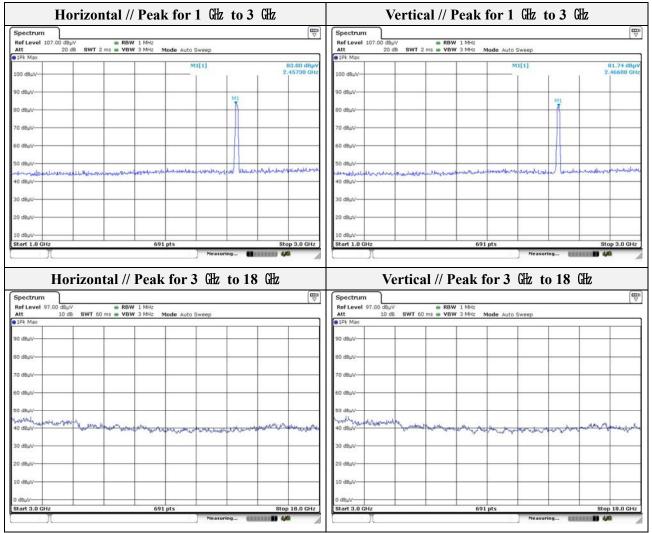
Frequency (Mz)	Level (dBµN)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµN/m)	Margin (dB)
2497.00	42.14	Peak	Н	-9.35	-	32.79	74.00	41.21
2496.28	43.13	Peak	V	-9.35	-	33.78	74.00	40.22



Note.

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Note.



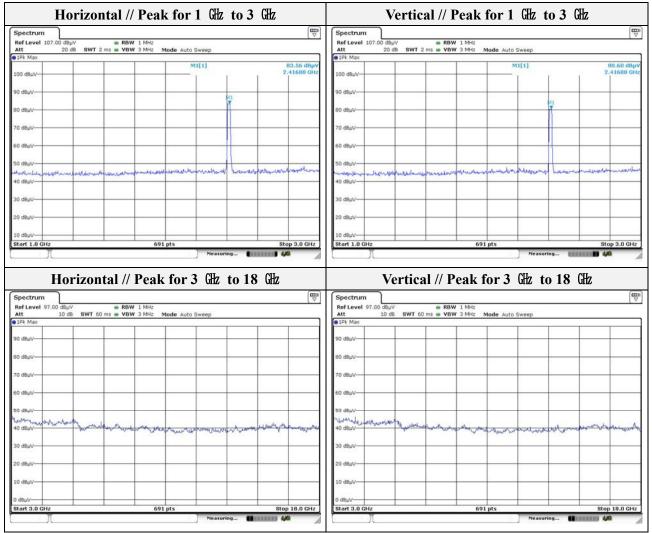
Mode:	802.11n(HT20)
Distance of measurement:	3 meter
Channel:	01

Frequency (Mb)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµN/m)	Margin (dB)
2341.24	46.25	Peak	Н	-9.92	-	36.33	74.00	37.67
2374.59	47.95	Peak	V	-9.81	-	38.14	74.00	35.86

pectrum Spectrum 2 (*) Spectrum 3 (*) Spec	trum 4 🛞 🕎	Spectrum Spectrum	2 8 Spectrum 3 8 Spectrum	4 8
ef Level 97.00 dBµV @ RBW 1 MHz	oum 4 (♥)	Ref Level 97.00 dBµV	RBW 1 MHz	4 (1)
tt 10 dB SWT 1 ms WBW 3 MHz Mode Auto Sweep		Att 10 dB SWT	1 ms 🖷 VBW 3 MHz Mode Auto Sweep	
M3[1]	46.25 dBµV 2.341240 GHz	90 dBµV-	M3[1]	47.95 dBpV 2.374590 GHz
M1[1]	43.11 dBpV	1000 0 0000 U	M1[1]	46.00 dBp
) dBµV	/2:310880-0992	80 d8µV		2:319000.Gi
) dBµV		70 dBµV-		
) dBµV-		60 dBµV-		1
) dBµV	/	50 dBuV41	MD	
white and the and the manus and the	man and merel	40 deur	hundren and the second and the second and the second	mention
		2000.000		
l dBµV-		30 d8µV		
dBµV		20 dBµV		
dBµV	F2	10 dBµV		F2
BuV F1		0 dBuV		
rt 2.3 GHz 691 pts	Stop 2.42 GHz	Start 2.3 GHz Marker	691 pts	Stop 2.42 GH
rker ype Ref Trc X-value Y-value Function	Function Result	Type Ref Trc X-va		Function Result
M1 1 2.31 GHz 43.11 dBµV M2 1 2.39 GHz 41.27 dBµV		M1 1 M2 1	2.31 GHz 46.00 dBµV 2.39 GHz 43.96 dBµV	
M3 1 2.34124 GHz 46.25 dBµV		M3 1 2.3	87459 GHz 47.95 dBµV	
	teasuring 🗰 🖬 🥠		Measu	ring MARKEN 4/0
	4 1 // 4	D ('		/ •
Restricted band // Horizon	tal // Average	Kestric	ted band // Vertical /	/ Average
N/A			N/A	

Note.





Note.



Mode:		802.11n	ı(HT20)					
Distance o	f measurem	ent: 3 meter						
Channel:		06						
				-				
Frequency (畑)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
		No sj	purious emissi	ion were det	ected above	3 GHz.		

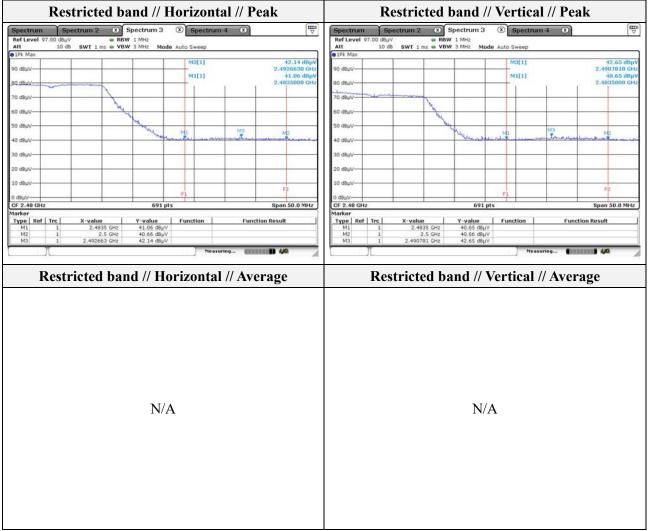
		r1GHz to3						
Spectrum				Spectrum				(
RefLevel 107.00 dBµV Att 20 dB SWT 2	RBW 1 MHz			Ref Level 107.00 dBµV Att 20 dB	RBW 1 MHz			
1Pk Max	ems WBW 3 MHz Mode Au	to Sweep		1Pk Max	SWT 2 ms VBW 3 MHz	Mode Auto Sweep		
		M1[1]	82.52 d8µV			M1[1]		81.10 d£
00 dBµV		- 1	2.44280 GHz	100 dBµV			T I	2.44280 0
N 50/250				- 100 State - 1				
0 dBµV		ML		90 dBµV-				
) dBµV		ð		80 dBµV-			MI	
) dBµV	-			70 d8µV				<u> </u>
dBµV				60 dBµV-				
deuv				50 dBuV-				
went on de welt and allow a server of	a reputeroustern demails	momental here	in man worder and the	+ by standard when he was	المام معلمة فأخليط رست مردراندر	manhanally	ency bundless	manufalled
dBhA				40 dBµV				
dBuV				30 d8µV				
10 V				22.42.47				
dBµV				20 dBµV				
dBuV				10 d8µV-				· · · · · · · · · · · · · · · · · · ·
Horizon	691 pts tal // Peak for				tical // Peak			GHz
Horizon	tal // Peak for	· 3 @ to 18	440	Ver	tical // Peak	for 3 GHz		GHz
pectrum ef Level 97.00 dBµV tt 10 dB SWT 60	tal // Peak for	· 3 @ to 18	8 GHz	Spectrum Ref Level 97.00 dBµV Att 10 dB s	tical // Peak	Nea		
Horizon	tal // Peak for	· 3 @ to 18	8 GHz	Ver	tical // Peak	for 3 GHz		GHz
Horizon pectrum ef Lavel 97.00 dBµV tt 10 dB swr 60	tal // Peak for	· 3 @ to 18	8 GHz	Spectrum Ref Level 97.00 dBµV Att 10 dB s	tical // Peak	for 3 GHz		GHz
	tal // Peak for	· 3 @ to 18	8 GHz	Spectrum Ref Level 97.00 dBµV Att 10 dB s ● 10k Max 90 dBµV	tical // Peak	for 3 GHz		GHz
	tal // Peak for	· 3 @ to 18	8 GHz	Spectrum Ref Level 97.00 dBµV Att 10 dB S @IPk Max	tical // Peak	for 3 GHz		GHz
Horizon	tal // Peak for	· 3 @ to 18	8 GHz	Spectrum Ref Level 97.00 dBµV Att 10 dB s ● 10k Max 90 dBµV	tical // Peak	for 3 GHz		GHz
Horizon	tal // Peak for	· 3 @ to 18	8 GHz	Spectrum Ref Level 97.00 dbj/v Att 10 db s 00 dbj/v 80 dbj/v	tical // Peak	for 3 GHz		GHz
Horizon Pectrum It 10 dB 197.00 dB 197.00 Pic Max dB 107.00 dB 107	tal // Peak for	· 3 @ to 18	8 GHz	Spectrum Ref Level 97.00 dbj/v Att 10 db s 00 dbj/v 80 dbj/v	tical // Peak	for 3 GHz		GHz
Horizon Pectrum of Level 97.00 dBµV tt 10 dB wV dBµV dBµV dBµV dBµV dBµV	tal // Peak for	· 3 @ to 18	8 GHz	Spectrum Ref Level 97.00 dBµV Att 10 dB s IN Max 90 dBµV 80 dBµV 90 dBµV 80 dBµV 60 dBµV	tical // Peak	for 3 GHz		GHz
Horizon Pectrum of Level 97.00 dBµV tt 10 dB swr 60 Pk Max dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV	tal // Peak for	· 3 @ to 18	8 GHz	Spectrum Ref Level 97.00 dBµV Att 10 dB s 90 dBµV 90 dBµV	tical // Peak	for 3 GHz		GHz
Horizon Pectrum of Level 97.00 dBµV t 20 dB SWT 60 Pk Max dBµV dBµV dBµV dBµV dBµV dBµV	tal // Peak for	· 3 @ to 18		Spectrum Ref Level 97.00 dBµV Att 10 dB s IN Max 90 dBµV 80 dBµV 90 dBµV 80 dBµV 60 dBµV	tical // Peak	for 3 GHz		
Horizon	tal // Peak for	· 3 @ to 18		Spectrum Ref Level 97.00 dBj// att 10 dB s @1Pk Max 90 dBj// 90 dBj// 50	ERBW 1 MH2 WT 60 ms = VBW 3 MH2	for 3 GHz		
Horizon Pectrum of Level 97.00 dBuV tt tt 10 dB swr 60 Pk Max dBuV dBuV dBuV dBuV dBuV dBuV	tal // Peak for	· 3 @ to 18		Spectrum Ref Level 97.00 dBj// att 10 dB s @1Pk Max 90 dBj// 90 dBj// 50	ERBW 1 MH2 WT 60 ms = VBW 3 MH2	for 3 GHz		GHz
Horizon Pectrum of Level 97.00 dBµV tt 10.05 SWT 60 Pk Max dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV	tal // Peak for	· 3 @ to 18		Spectrum Ref Level 97:00 dBµV Ref Level 97:00 dBµV 10 dB s 0 DR HAW 90 dBµV 90 dBµV 90 dBµV 80 dBµV 90 dBµV 90 dBµV 90 dBµV 80 dBµV 90 dBµV 90 dBµV 90 dBµV	ERBW 1 MH2 WT 60 ms = VBW 3 MH2	for 3 GHz		
Horizon Pectrum of Level 97.00 dBµV tt 10.05 SWT 60 Pk Max dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV	tal // Peak for	· 3 @ to 18		Spectrum Ref Level 97.00 dBµV Att 0 dBµV 90 dBµV 80 dBµV 70 dBµV 60 dBµV 50 dBµV 60 dBµV	ERBW 1 MH2 WT 60 ms = VBW 3 MH2	for 3 GHz		
Horizon Pectrum of Level 97.00 dBuV tt 20 dB SWT 60 PK Max dBuV dBuV dBuV dBuV dBuV dBuV dBuV dBuV	tal // Peak for	· 3 @ to 18		Vertility Spectrum Ref level 97.00 dBy/ 00 dBy/ 00 dBy/ 90 dBy/	ERBW 1 MH2 WT 60 ms = VBW 3 MH2	for 3 GHz		
Horizon	tal // Peak for	· 3 @ to 18		Spectrum Ref Level 97:00 dBµV Ref Level 97:00 dBµV 10 dB s 0 DR HAW 90 dBµV 90 dBµV 90 dBµV 80 dBµV 90 dBµV 90 dBµV 90 dBµV 80 dBµV 90 dBµV 90 dBµV 90 dBµV	ERBW 1 MH2 WT 60 ms = VBW 3 MH2	for 3 GHz		
Horizon Pectrum of Level 97.00 dBµV tt 10.05 SWT 60 Pk Max dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV	tal // Peak for	· 3 @ to 18		Vertility Spectrum Ref level 97.00 dBy/ 00 dBy/ 00 dBy/ 90 dBy/	ERBW 1 MH2 WT 60 ms = VBW 3 MH2	for 3 GHz		

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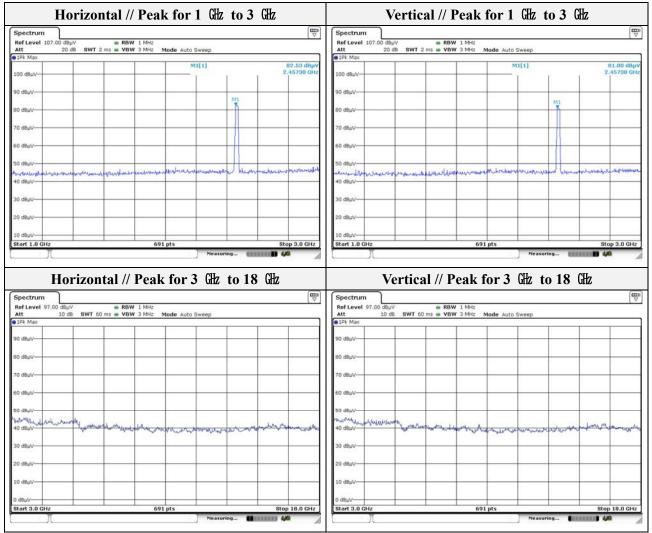
802.11n(HT20)
3 meter
11

Frequency (Mz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµN/m)	Margin (dB)
2492.66	42.14	Peak	Н	-9.37	-	32.77	74.00	41.23
2490.78	42.65	Peak	V	-9.38	-	33.27	74.00	40.73



Note.





Note.



Ant 2

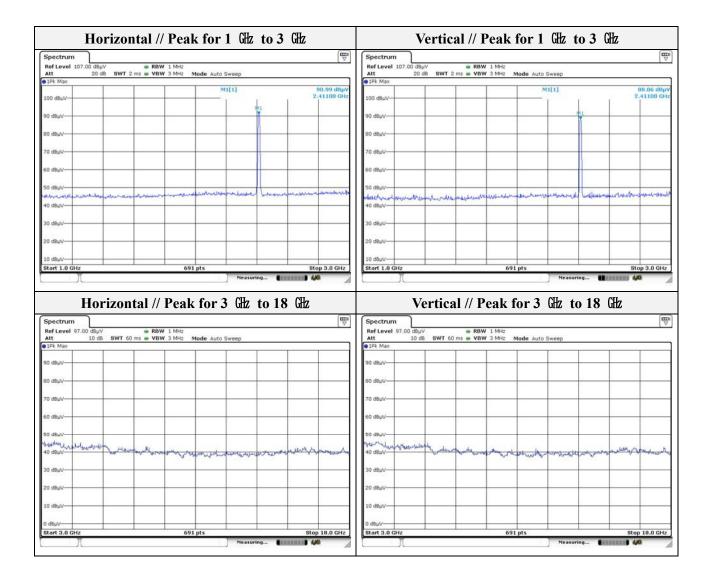
Mode:	802.11b
Distance of measurement:	3 meter
Channel:	01

Frequency (Mz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
2341.94	44.28	Peak	Н	-9.91	-	34.37	74.00	39.63
2332.91	48.13	Peak	V	-9.94	-	38.19	74.00	35.81

Restricted band // Horizontal // Peak	Restricted band // Vertical // Peak
Spectrum 2 3 Spectrum 3 3 Spectrum 4 3	Spectrum Spectrum 2 (3) Spectrum 3 (3) Spectrum 4 (3)
Ref Level 97.00 dBμV ■ RBW 1 MHz Att 10 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep	Ref Level 97.00 dBµV @ RBW IMHz Att 10 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep
1Pk Max	IPk Max
90 dBµV	M1[1] / 44.27 dBpy
80 dBUV 2/310000 GP	80 dBµV
60 d8µV	60 dBuV-
50 SBUV	50 deurs margo muchen automation and and and the the
100000 the second and the second and the second sec	40 dBµV
20 d8µV	20 dBuV
10 dBµV F2	10 dBuV
0 dBu/ -2- Start 2.3 GHz 691 pts Stop 2.42 GHz Marker Stop 2.42 GHz	0 dbu/ 1 Start 2.3 GHz 691 pts Stop 2.42 GHz Marker
Type Ref Trc X-value Y-value Function Function Result M1 1 2.31 GHz 40.60 dBµV Function	Type Ref Trc X-value Y-value Function Function Result M1 1 2.31 GHz 44.27 dBµV H
Restricted band // Horizontal // Average	Restricted band // Vertical // Average
N/A	N/A

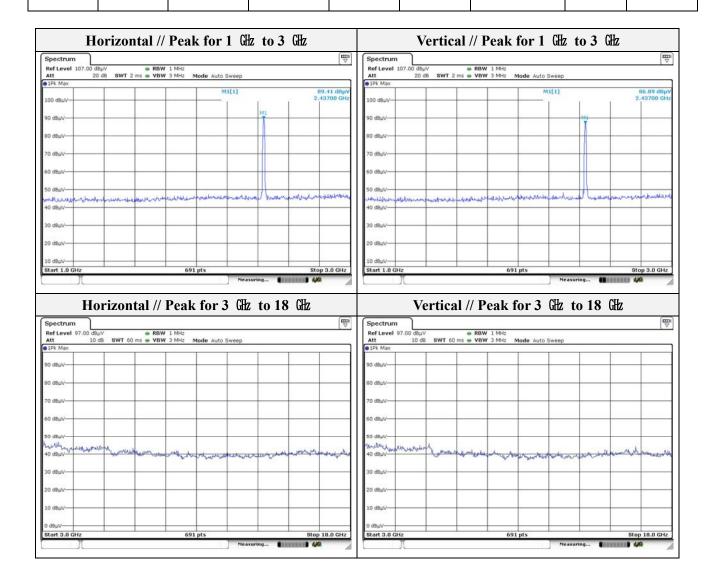
Note.







Mode:		802.11b	1					
Distance of measurement:		ent: 3 meter						
Channel:		06						
Frequency (Mb)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
							· · · ·	
		No st	purious emissi	ion were det				





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

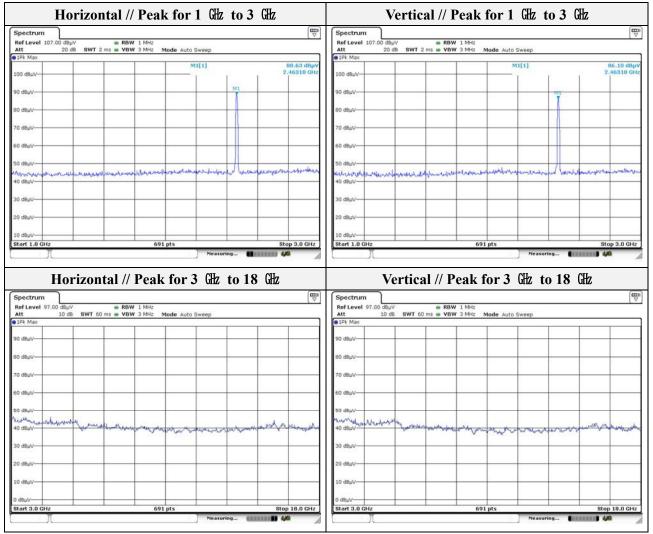
Frequency (Mz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµN/m)	Margin (dB)
2493.24	43.00	Peak	Н	-9.37	-	33.63	74.00	40.37
2498.23	43.33	Peak	V	-9.35	-	33.98	74.00	40.02

		al // Peak		Restricted		_	
	Spectrum 3 (Spectrum RBW 1 MHz	i4 8)	Ref Level 97.00 dB		Spectrum 3 (/ 1 MHz	Spectrum -	4 (8)
10 dB SWT 1 ms 👄	VBW 3 MHz Mode Auto Sweep		Att 10	dB SWT 1 ms - VBW		Auto Sweep	
k Max	M3[1]	43.00 dBµV	• 1Pk Max		1 1	M3[1]	43.33 dB
l8μV		2,4932420 GHz	90 dBut			-	2.4982340 G
RUV	M1[1]	41.20 dBpV 2.4835000 GHz	80 dBµV			M1[1]	40.82 dB 2.4835000 G
IBUV			70 dBuV				
			and a second				
IBµV-			60 dBµV				
BµV-	and the second s	M3 M2	50 d8µV				M3 M3
BµV	the way was a war		40 d8µV	~	- dias	MI	dame on another theme
BuV			30 dBuV				
			0.000.000				
BuV-			20 dBµV				
luv			10 dBµV		+		
u//	F1		0 dBµV			F1	
.48 GHz	691 pts	Span 50.0 MHz	CF 2.48 GHz		691 pts		Span 50.0 MH
ter De Ref Trc X-value	Y-value Function	Function Result	Marker Type Ref Trc	X-value	Y-value	Function	Function Result
41 1 2.4835 GH 42 1 2.5 GH	z 41.20 dBµV		M1 1 M2 1	2.4835 GHz 2.5 GHz	40.82 dBµV 41.26 dBµV		
1 2.493242 GH			M3 1	2.498234 GHz	43.33 dBµV		
1	Measu	ring (******* 4/4				Measuri	ng (
Destricted h							
Restricted D	and // Horizontal	// Average	Re	estricted ba	and // Ve	ertical //	Average

Note.

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Note.



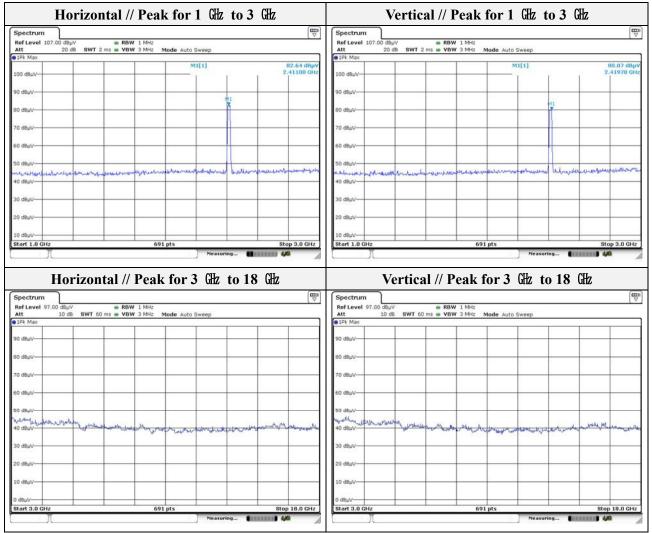
Mode:	802.11g
Distance of measurement:	3 meter
Channel:	01

Frequency (Mz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
2341.42	45.16	Peak	Н	-9.92	-	35.24	74.00	38.76
2323.70	47.59	Peak	V	-9.97	-	37.62	74.00	36.38

Restricted band // Horizontal // Peak	Restricted band // Vertical // Peak					
Spectrum Spectrum 2 X Spectrum 3 X Spectrum 4 Image: The spectrum 3 Im	Spectrum Spectrum 2 X Spectrum 3 X Spectrum 4 Image: Compare the spectrum 4					
Att 10 dB SWT 1 ms - VBW 3 MHz Mode Auto Sweep	Att 10 dB SWT 1 ms WWW 3 MHz Mode Auto Sweep					
1Pk Max M3[1] 45.16 dBµV	M3[1] 47.59 dBµV					
2.341420 GHz M1[1] 44.25 dBµV	90 dBµV 2,323700 GU M1[1] 46.13 dBµV					
B0 d8µV	80 dBµV					
70 dBµV	70 dBµV					
60 dBµV-	60 d8uV					
io dauv _{olt}	50 BULL Marine					
otell the second operation of ward and many street	40 CBUV					
0 dauv-	30 d8µv-					
0 dBuV	20 dBµV-					
0 dBµV	10 dBµV					
dBU/V F1 Spon 120.0 MHz FF 2.36 GHz 691 pts Spon 120.0 MHz	0 dBUV - 1 CF 2.36 GHz 691 pts Span 120.0 MHz					
arker	Marker					
Fype Ref Trc X-value Y-value Function Function Result M1 1 2.31 GHz 44.25 dBµV Function Function Result	Type Ref Trc X-value Y-value Function Function Result M1 1 2.31 GHz 46.13 dBµV Function Function Function					
M2 1 2.39 GHz 40.33 dBµV M3 1 2.34142 GHz 45.16 dBµV	M2 1 2.39 GHz 46.10 dBµV M3 1 2.3237 GHz 47.59 dBµV					
Neasuring	Neasuring					
Restricted band // Horizontal // Average	Restricted band // Vertical // Average					
N/A	N/A					

Note.

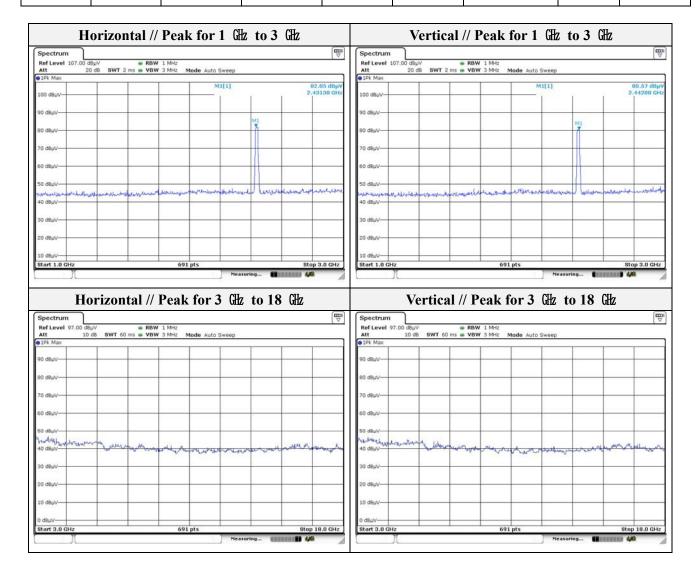




Note.



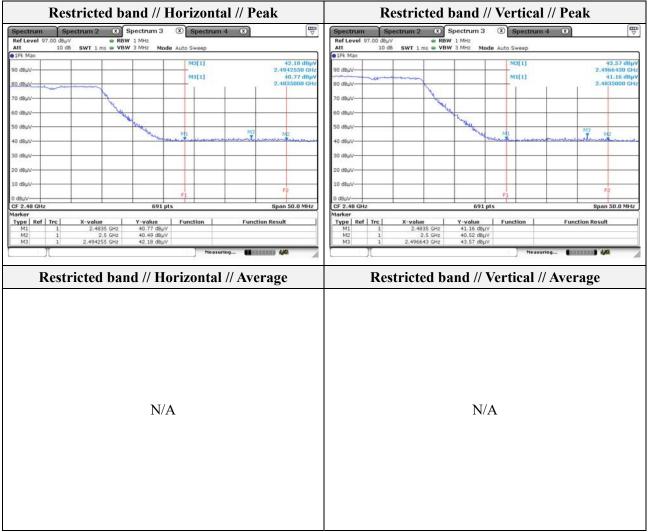
Mode:		8	02.11g						
Distance o	f measurem	ent: 3	meter						
Channel:		0	6						
					n				.
Frequency (Mb)	Level (dBµV)	Detect	mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµV/m)	Margin (dB)
			No sp	ourious emiss	ion were det	ected above	3 GHz.		





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

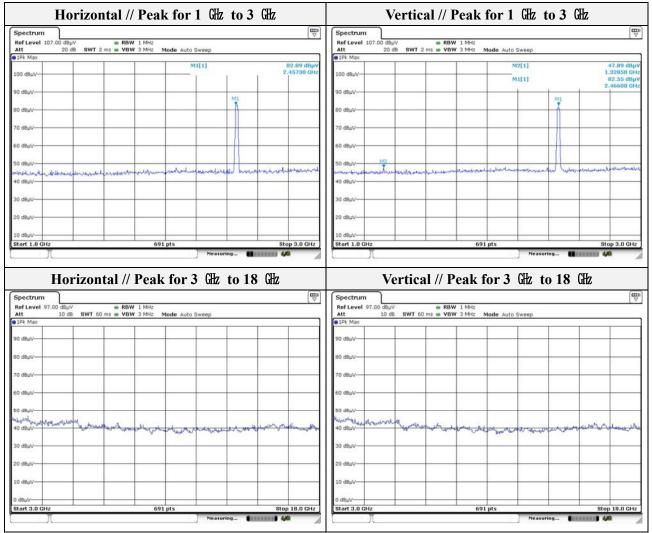
Frequency (Mz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
2494.26	42.18	Peak	Н	-9.36	-	32.82	74.00	41.18
2496.64	43.57	Peak	V	-9.35	-	34.22	74.00	39.78



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Note.



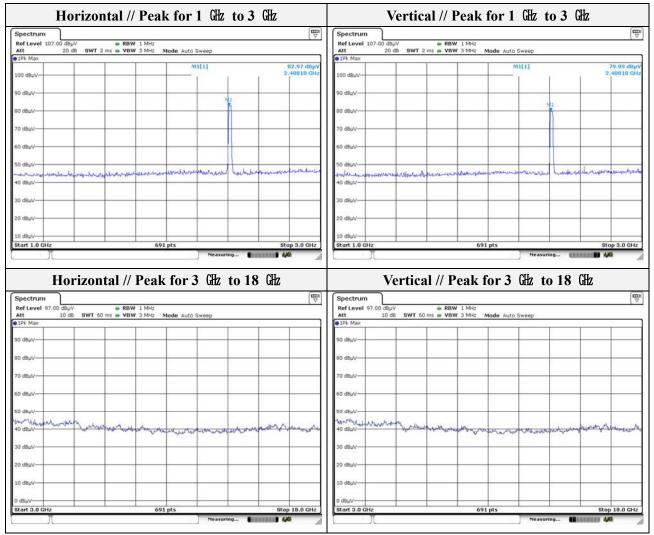
Mode:	802.11n(HT20)
Distance of measurement:	3 meter
Channel:	01

Frequency (Mbz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
2342.11	44.78	Peak	Н	-9.91	-	34.87	74.00	39.13
2312.94	48.17	Peak	V	-10.00	-	38.17	74.00	35.83

ectrum Spectrum 2 🛞 Spectrum 3 🛞 Spect	ntal // Peak	Spectrum Spect	rum 2 🛞 Spectrum 3	Spectrum 4	8	(E
Level 97.00 dBµV . RBW 1 MHz		Ref Level 97.00 dBµV	RBW 1 MHz			()
10 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep k Max]	Att 10 dB	SWT 1 ms . VBW 3 MHz Mo	ie Auto Sweep		
18µV	44.78 dBµV 2.342110 GHz	90 dBµV-		M3[1]		48.17 dBp 12940 GM
M1[1]	40.69 dBpV	(1000), (2002)		M1[1]	-	46.86 dBp
BLW-	6-030000-0He	80 dBµV		1 1	2.3	10000 CH
BuV	J	70 dBuV				
BuV-		60 dBµV-			1	
uV	1	50 dBuV/11/13			HP. W	
The man me we the the the the second of the	March K	an and the standar was	worthen we work and a start	-chormeter and the second	4 cut	
			100 (Mar)	· · · · · · · · · · · · · · · · · · ·		
auv-		30 d8µV-				
uv-		20 dBµV-				
lµV-		10 dBµV-		-		
N F1	F2	0 dBuV F1			F2	
36 GHz 691 pts	Span 120.0 MHz	CF 2.36 GHz	691 p	ts	Span :	20.0 MH
ter be Ref Trc X-value Y-value Function	Function Result	Marker Type Ref Trc	X-value Y-value	Function	Function Result	8
11 1 2.31 GHz 40.69 dBµV 12 1 2.39 GHz 40.03 dBµV		M1 1 M2 1	2.31 GHz 46.86 dBµ\ 2.39 GHz 46.14 dBµ\	7		
43 1 2.34211 GHz 44.78 dBμV		M3 1	2.31294 GHz 48.17 dBµ\	1		
•	leasuring			Measurin	9 (ANNANA) 🎸	3
		-				
Restricted band // Horizon	al // Average	Rest	ricted band // `	Vertical //	Average	
N/A			N/.	A		

Note.





Note.



Mode:		802.11r	n(HT20)					
Distance o	f measurem	ent: 3 meter	,					
Channel:		06						
				r	r			·
Frequency (Mb)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
		No s	purious emiss	ion were det	ected above	3 GHz.		

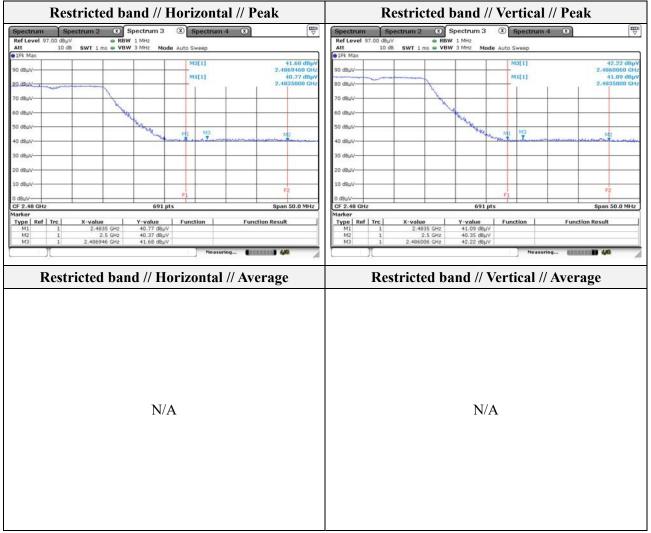
Horizo									
pectrum				Spectrum					
ef Level 107.00 dBµV tt 20 dB SW1	RBW 1 MHz Z ms VBW 3 MHz Mode At			Ref Level 107.00 dBµV Att 20 dB	RBW 1 MHz SWT 2 ms VBW 3 MHz				
Pk Max	Z mis . YOW 3 Minz Mode At	ito sweep		e 1Pk Max	awi z ms 🖶 YOW 3 mmz	Mode Auto Sweep			
		M1[1]	83.57 d8µV			M1[1]		81.38 di	
10. dBµV			2.43130 GHz	100 dBµV			Ť.	2.43130 0	
							_		
d8µV-		M1		90 dBµV-			141		
dBµV		- I		80 d8µV			ň		
dBµV	-			70 d8µV					
							10		
dBuV				60 dBµV-					
dBuV				50 dBuV					
nonumber	out and the second standard and the	commonwhile how	var wellow office to the	manunudulation	yeunicher man	were when he was	when how	intrustion for a survey in the survey of the	
dBµV				40 dBµV					
				2.5022007-1					
dBuV				30 dBhA					
18uV-				20 dBuV-					
dBµV				10 dBµV					
Horizo	691 pts			Stort 1.0 GHz	tical // Peak				
ectrum af Level 97.00 dBµV	ntal // Peak for	·3 GHz to 1	440	Spectrum Ref Level 97.00 dBµV	tical // Peak	for 3 GHz		44	
Horizo	ntal // Peak for	·3 GHz to 1	8 GHz	Spectrum Ref Level 97.00 dBµV	tical // Peak	for 3 GHz		GHz	
Horizo	ntal // Peak for	·3 GHz to 1	8 GHz	Spectrum Ref Level 97.00 dBµV Att 10 dB	tical // Peak	for 3 GHz		GHz	
Horizo	ntal // Peak for	·3 GHz to 1	8 GHz	Spectrum Ref Level 97.00 dBµV Att 10 dB s	tical // Peak	for 3 GHz		GHz	
Horizo	ntal // Peak for	·3 GHz to 1	8 GHz	Spectrum Ref Level 97.00 dbj// 10 db 8 90 dbj// 90 dbj//	tical // Peak	for 3 GHz		GHz	
Horizo	ntal // Peak for	·3 GHz to 1	8 GHz	Spectrum Ref Level 97.00 dBµV Att 10 dB 8	tical // Peak	for 3 GHz		GHz	
Horizo	ntal // Peak for	·3 GHz to 1	8 GHz	Spectrum Ref Level 97.00 dbj// 10 db 8 90 dbj// 90 dbj//	tical // Peak	for 3 GHz		GHz	
Horizo	ntal // Peak for	·3 GHz to 1	8 GHz	Start 1.0 GHz Ver' Spectrum Ref Level 97.00 dBµV Att 10 dB µV Att 10 dB µV 00 dBµV 00 dBµV <t< td=""><td>tical // Peak</td><td>for 3 GHz</td><td></td><td>GHz</td></t<>	tical // Peak	for 3 GHz		GHz	
Horizo	ntal // Peak for	·3 GHz to 1	8 GHz	Spectrum Ver' Ref Level 97.00 dBµV 10 dB 10 dB µV 90 dBµV 80 dBµV 80 dBµV	tical // Peak	for 3 GHz		GHz	
Horizo	ntal // Peak for	·3 GHz to 1	8 GHz	Stort 1.0 GHz Ver' Spectrum Ref Level 97.00 dBµV Att 10 dB S 90 dBµV 80 dBµV 80 dBµV 60 dBµV	tical // Peak	for 3 GHz		GHz	
Horizo	ntal // Peak for	·3 GHz to 1	8 GHz	Start 1.0 GHz Ver' Spectrum Ref Lovel 97.00 dBµV Att 20 dB V O dBµV Spectrum Spectrum Ref Lovel 97.00 dBµV Att 20 dB V O dBµV Spectrum Spectrum O dBµV Spectrum Spectrum <th col<="" td=""><td>tical // Peak</td><td>for 3 GHz</td><td></td><td>GHz</td></th>	<td>tical // Peak</td> <td>for 3 GHz</td> <td></td> <td>GHz</td>	tical // Peak	for 3 GHz		GHz
Horizo	ntal // Peak for	·3 GHz to 1	8 GHz	Start 1.0 GHz Ver' Spectrum Ref Level 97.00 dBµV Att 1.0 dB s @ IPK Maic 90 dBµV \$0 dBµV 90 dBµV \$0 dBµV 60 dBµV \$0 dBµV 50 dBµV \$0 dBµV 50 dBµV	tical // Peak	for 3 GHz		GHz	
Ногіzо естим f tevel 97.00 dbµ/ f tevel 97.00 dbµ/ f tevel 97.00 dbµ/ db	ntal // Peak for	·3 GHz to 1	8 GHz	Start 1.0 GHz Ver' Spectrum Ref Level 97.00 dBµV Att 10 dB © 10k Max 90 dBµV 80 dBµV 70 dBµV 60 dBµV 50 dBµV 60 dBµV 70 dBµV 60 dBµV	tical // Peak	for 3 GHz		GHz	
Ногіzо естим f tevel 97.00 dbµ/ f tevel 97.00 dbµ/ f tevel 97.00 dbµ/ db	ntal // Peak for	·3 GHz to 1	8 GHz	Stort 1.0 GHz Ver" Spectrum B0 dBµV 80 dBµV B0 dBµV 70 dBµV B0 dBµV 80 dBµV B0 dBµV 80 dBµV B0 dBµV 90 dBµV B0 dBµV	tical // Peak	for 3 GHz		GHz	
Horizo	ntal // Peak for	·3 GHz to 1	8 GHz	Start 1.0 GHz Ver' Spectrum Ref Level 97.00 dBµV All to dB 8 ● IPK Maic 90 dBµV \$0 dBµV 90 dBµV	tical // Peak	for 3 GHz		GHz	
Horizo	ntal // Peak for	·3 GHz to 1	8 GHz	Start 1.0 GHz Ver' Spectrum Ref Level 97.00 dBµV Att 10 dB © 10k Max 90 dBµV 80 dBµV 70 dBµV 60 dBµV 50 dBµV 60 dBµV 70 dBµV 60 dBµV	tical // Peak	for 3 GHz		GHz	
Horizo	ntal // Peak for	·3 GHz to 1	8 GHz	Start 1.0 GHz Ver' Spectrum Ref Level 97.00 dBµV All to dB 8 ● IPK Maic 90 dBµV \$0 dBµV 90 dBµV	tical // Peak	for 3 GHz		GHz	
Ногіzо ectrum f Level 97.00 dBµV t10 dB fk Max dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV dBµV	ntal // Peak for	·3 GHz to 1	8 GHz	Start 1.0 GHz Ver' Spectrum Ref Level 97.00 dBµV Att 0 dBµV 90 dBµV 80 dBµV 60 dBµV 50 dBµV 90 dBµV 90 dBµV 90 dBµV 90 dBµV 10 dBµV 90 dBµV 90 dBµV 10 dBµV 10 dBµV 10 dBµV	tical // Peak	for 3 GHz		GHz	
Horizo	ntal // Peak for	·3 GHz to 1	8 GHz	Spectrum Ref Level 97.00 dBµV Att 90 dBµV 80 dBµV 70 dBµV 80 dBµV 90 dBµV	tical // Peak	for 3 GHz		GHz	

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802.11n(HT20)
3 meter
11

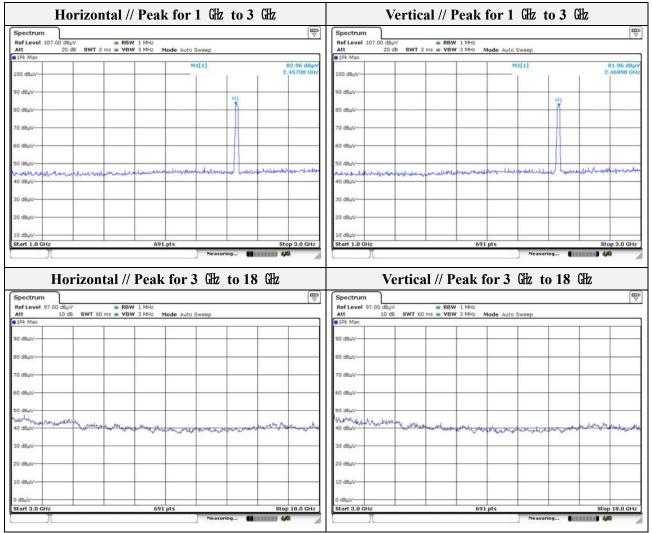
Frequency (Mb)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµN/m)	Margin (dB)
2486.95	41.68	Peak	Н	-9.39	-	32.29	74.00	41.71
2486.01	42.22	Peak	V	-9.40	-	32.82	74.00	41.18



Note.

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Note.



MIMO

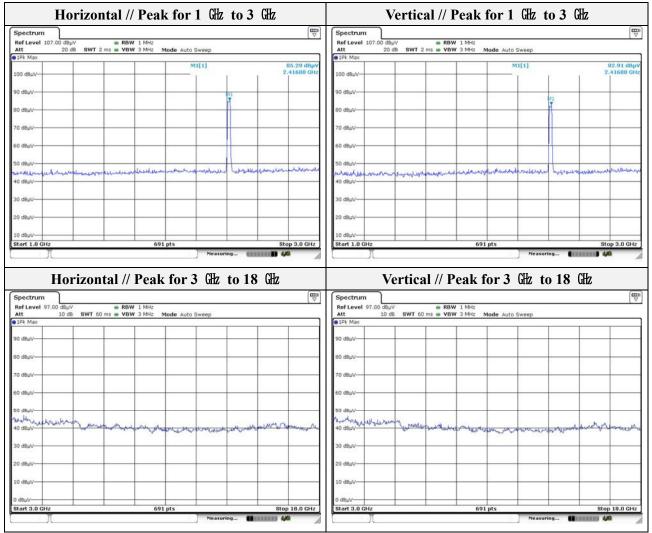
Mode:	802.11n(HT20)
Distance of measurement:	3 meter
Channel:	01

Frequency (Mb)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµN/m)	Margin (dB)
2341.77	44.32	Peak	Н	-9.91	-	34.41	74.00	39.59
2361.91	48.61	Peak	V	-9.85	-	38.76	74.00	35.24

Restricted band // Horizontal // Peak	Restricted band // Vertical // Peak
Spectrum 2 8 Spectrum 3 8 Spectrum 4 8	Spectrum 2 8 Spectrum 3 8 Spectrum 4 8
Ref Level 97.00 dBµV	Ref Level 97.00 dBµV
Att 10 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep	Att 10 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep
M3[1] 44.32 dBµV	M3[1] 48.61 d8µV
	90 dBµV- 90 dBµV- M1[1] 2.361910 QU4 46.42 dBµV
80 dBuV	80 dBµV 2.310000 GHz
70 dBuV	70 d8µV-
60 dBµV-	60 dBµV-
50 dBµVM2M2M2	50 Berry presenter and man all and
400 10 the summer of a deman survey and a survey of the survey	40 dBUV
30 d8µV-	30 d8µV
20 dBµV	20 dBµV
10 dBµV	10 dBuV
F2	11 P
0 dBuV CF 2.36 GHz 691 pts Span 120.0 MHz	0 dBµV
Marker	Marker
Type Ref Trc X-value Y-value Function Function Result	Type Ref Trc X-value Y-value Function Function Result M1 1 2.31 GHz 46.42 dBuV Function Function Function
M1 1 2.31 GHz 42.75 dBμV M2 1 2.39 GHz 41.10 dBμV	M2 1 2.39 GHz 44.59 dBµV
M3 1 2.34177 GHz 44.32 dBµV	M3 1 2.36191 GHz 49.61 dBµV
Measuring Masuring	Measuring
Restricted band // Horizontal // Average	Restricted band // Vertical // Average
N/A	N/A

Note.



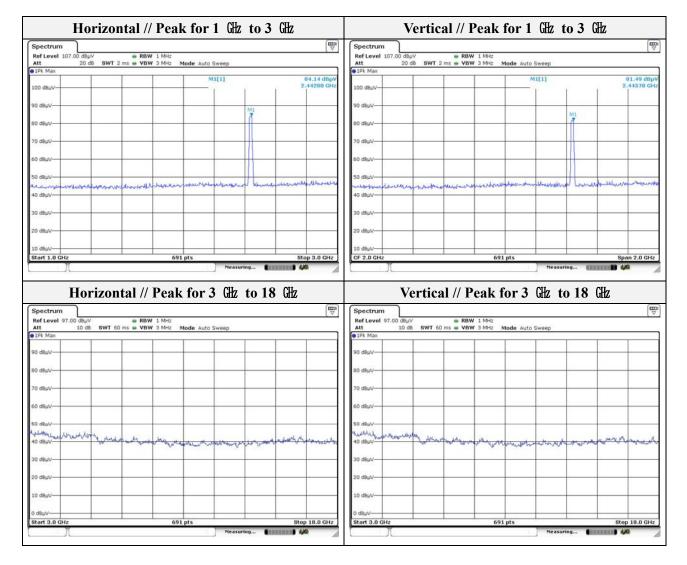


Note.



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

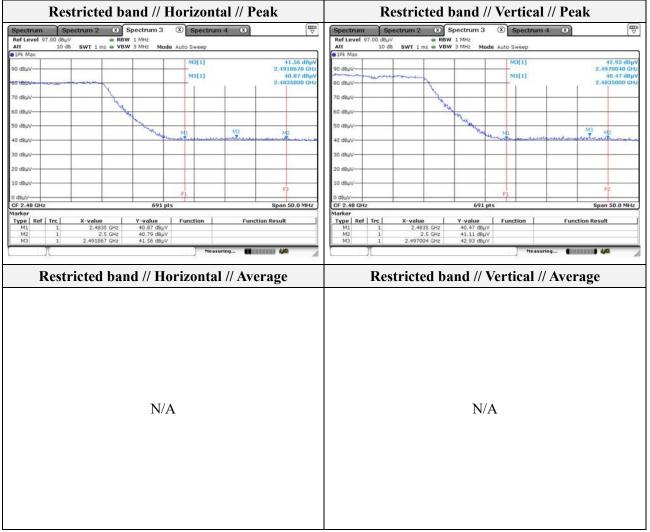
Frequency (Mb)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµN/m)	Limit (dBµV/m)	Margin (dB)
	No spurious emission were detected above 3 GHz.							





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

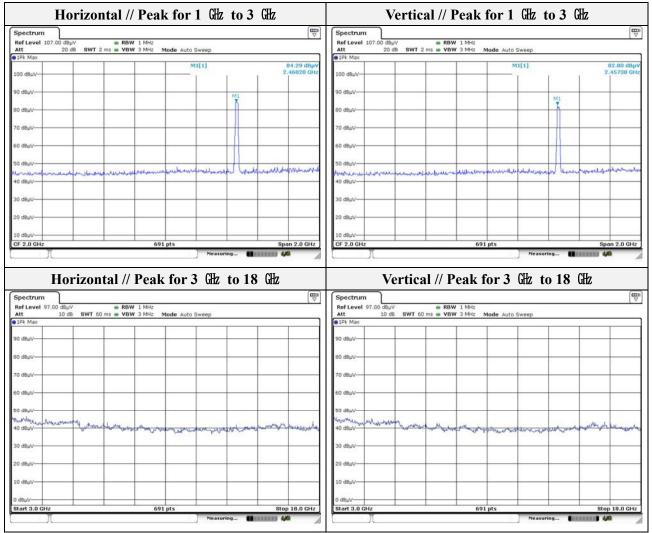
Frequency (Mz)	Level (dBµV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2491.87	41.56	Peak	Н	-9.37	-	32.19	74.00	41.81
2497.00	42.93	Peak	V	-9.35	-	33.58	74.00	40.42



Note.

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Note.



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

Horizontal			Vertical			
	RBW 1 MHz	Ţ	Spectrum Ref Level 87.00 dBµV	RBW 1 MHz	[Ţ	
Att 0 dB SWT 48 ms	VBW 3 MHz Mode Auto Sweep		Att 0 dB SWT 4	3 ms 🖶 VBW 3 MHz Mode Auto Sweep		
80 d8µV			80 d8µV			
70 dBµV			70 d8µV-			
60 dBµV			60 d8µV			
50 d8µV-			50 d8µV			
40 d8µV-			40 d8µV-			
30 BRUG March March Land March	waller an when a strange with a walk	and a strange when and a strange of	30.920 monter for the manual	And the manager and the second second second	man man allow	
20 d8µV			20 dBµV			
10 d8µV			10 dBµV			
0 dBµV-			0 dBuV			
-10 dBµV Start 18.0 GHz	691 pts	Stop 30.0 GHz	-10 dBµV- Start 18.0 GHz	691 pts	Stop 30.0 GHz	
J	Measurin	(Measur	ing	

Note.



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.

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

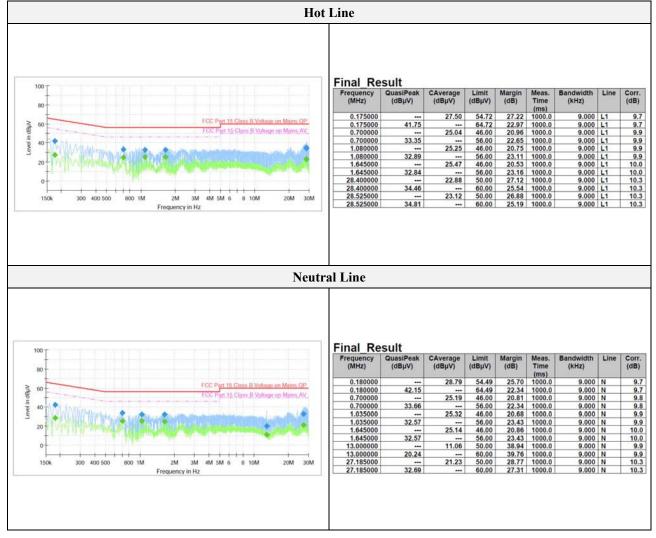
Note.

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





Test report No.: KES-RF-16T0113-R2 Page (53) of (54)

Appendix A. Measurement equipment

Equipment	Manufacturer	Model	Serial No.	Calibration interval	Calibration due.
Spectrum Analyzer	R&S	FSV40	101002	1 year	2016.07.25 2017.07.06
Spectrum Analyzer	R&S	FSV30	100736	1 year	2016.07.25 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
Power Meter	Anritsu	ML2495A	1438001	1 year	2017.01.25
Pulse Power Sensor	Anritsu	MA2411B	1339205	1 year	2017.01.25
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	2016.07.24 2017.07.04
High Pass Filter	WAINWRIGHT INSTRUMENT	WHKX6.0/26.5G- 6SS	1	1 year	2016.07.24 2017.07.05
Low Pass Filter	WEINSCHEL	WLK1.0/18G-10TT	1	1 year	2016.07.24 2017.07.04
Attenuator	KEYSIGHT	8493C	82509	1 year	2017.01.25
Preamplifier	SCHWARZBECK	BBV-9718	9718-246	1 year	2016.10.23 2017.10.14
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.	NT-R530	ZWC493BZC00014H
Test Board	N/A	N/A	N/A
AC Adapter	SOLU M	SLU10	H37H3XPGK01SE3
Speaker	Britz	BR-1000A	N/A