



# CFR 47 FCC PART 15 SUBPART C ISED RSS-247 ISSUE 2

# **CERTIFICATION TEST REPORT**

For

Wifi Module

**MODEL NUMBER: SI07B** 

FCC ID: 2AFG6-SI07B

IC: 22166-SI07B

REPORT NUMBER: 4790081439-4

ISSUE DATE: October 31, 2021

Prepared for

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# **Revision History**

Rev.	Issue Date	Revisions	Revised By
V0	10/31/2021	Initial Issue	



**Summary of Test Results** CI **Test Results Test Items** FCC/ISED Rules ause FCC Part 15.247 (a) (2) 6dB Bandwidth and 99% 1 RSS-247 Clause 5.2 (a) Pass Occupied Bandwidth ISED RSS-Gen Clause 6.7 FCC Part 15.247 (b) (3) 2 Conducted Output Power Pass RSS-247 Clause 5.4 (d) FCC Part 15.247 (e) 3 Power Spectral Density Pass RSS-247 Clause 5.2 (b) Conducted Bandedge and FCC Part 15.247 (d) 4 Pass Spurious Emission RSS-247 Clause 5.5 FCC Part 15.247 (d) FCC Part 15.209 Radiated Bandedge and 5 FCC Part 15.205 Pass Spurious Emission RSS-247 Clause 5.5 **RSS-GEN Clause 8.9** Conducted Emission Test for AC FCC Part 15.207 6 Pass Power Port **RSS-GEN Clause 8.8** FCC Part 15.203 7 Antenna Requirement Pass **RSS-GEN Clause 6.8** 

#### Note:

- 1. This test report is only published to and used by the applicant, and it is not for evidence purpose in China.
- 2. The measurement result for the sample received is <Pass> according to < CFR 47 FCC PART 15 SUBPART C >< ISED RSS-247 > when <Accuracy Method> decision rule is applied.



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# 1. ATTESTATION OF TEST RESULTS

**Applicant Information** 

Company Name: Guangzhou Shirui Electronics Co., Ltd.

Address: 192 Kezhu Road, Scientech Park, Guangzhou Economic &

Technology Development District, Guangzhou, Guangdong, China

**Manufacturer Information** 

Company Name: Guangzhou Shirui Electronics Co., Ltd.

Address: 192 Kezhu Road, Scientech Park, Guangzhou Economic &

Technology Development District, Guangzhou, Guangdong, China

**EUT Information** 

Stephen Guo

Laboratory Manager

EUT Name: Wifi Module

Model: SI07B

Sample Received Date: August 31, 2021

Sample Status: Normal Sample ID: 4175726

Date of Tested: September 1, 2021 ~ October 30, 2021

APPLICABLE STANDARDS				
STANDARD	TEST RESULTS			
CFR 47 FCC PART 15 SUBPART C	PASS			
ISED RSS-247 Issue 2	PASS			
ISED RSS-GEN Issue 5	PASS			

Prepared By:	Checked By:
Danny Grany	Shementier
Denny Huang Project Engineer	Shawn Wen Laboratory Leader
Approved By:	
LephenGuo	



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# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 414788 D01 Radiated Test Site v01r01, CFR 47 FCC Part 2, CFR 47 FCC Part 15, ANSI C63.10-2013, ISED RSS-247 Issue 2 and ISED RSS-GEN Issue 5.

# 3. FACILITIES AND ACCREDITATION

	A2LA (Certificate No.: 4102.01)
	UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch.
	has been assessed and proved to be in compliance with A2LA.
	FCC (FCC Designation No.: CN1187)
	UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch.
	Has been recognized to perform compliance testing on equipment subject
	to the Commission's Delcaration of Conformity (DoC) and Certification
	rules
	ISED (Company No.: 21320)
Accreditation	UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch.
Certificate	has been registered and fully described in a report filed with ISED.
	The Company Number is 21320 and the test lab Conformity Assessment
	Body Identifier (CABID) is CN0046.
	VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011)
	UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch.
	has been assessed and proved to be in compliance with VCCI, the
	Membership No. is 3793.
	Facility Name:
	Chamber D, the VCCI registration No. is G-20019 and R-20004
	Shielding Room B , the VCCI registration No. is C-20012 and T-20011

Note 1: All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

Note 2: The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

Note 3: For below 30 MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30 MHz had been correlated to measurements performed on an OFS.



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# 4. CALIBRATION AND UNCERTAINTY

#### 4.1. **MEASURING INSTRUMENT CALIBRATION**

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognize national standards.

#### 4.2. **MEASUREMENT UNCERTAINTY**

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Uncertainty
3.62 dB
2.2 dB
4.00 dB
5.78 dB (1 GHz ~ 18 GHz)
5.23 dB (18 GHz ~ 26 GHz)
±0.028%
±0.0196%
±0.686 dB
±0.743 dB
±1.328 dB
±0.746 dB (9 kHz ~ 1 GHz)
±1.328dB (1 GHz ~ 26 GHz)

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



5. EQUIPMENT UNDER TEST

# 5.1. DESCRIPTION OF EUT

EUT Name	Wifi Module
Model Name	SI07B
Radio Technology	WLAN (IEEE 802.11b/g/n HT20/n HT40 ax HE20/ax HE40)
Operation frequency	IEEE 802.11b: 2412MHz ~ 2462MHz IEEE 802.11g: 2412MHz ~ 2462MHz IEEE 802.11n HT20: 2412MHz ~ 2462MHz IEEE 802.11n HT40: 2422MHz ~ 2452MHz IEEE 802.11ax HE20: 2412MHz ~ 2462MHz IEEE 802.11ax HE40: 2422MHz ~ 2452MHz
Modulation	IEEE 802.11b: DSSS(CCK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax HE20: OFDMA (BPSK, QPSK,16QAM,64QAM, 256QAM, 1024QAM) IEEE 802.11ax HE40: OFDMA (BPSK, QPSK,16QAM,64QAM, 256QAM, 1024QAM)
Rated Input	DC 5 V

# 5.2. CHANNEL LIST

Channel List for 802.11b/g/n/ax (20 MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	4	2427	7	2442	10	2457
2	2417	5	2432	8	2447	11	2462
3	2422	6	2437	9	2452	1	1

Channel List for 802.11n/ax (40 MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	2422	5	2432	7	2442	9	2452
4	2427	6	2437	8	2447	1	/

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# 5.3. MAXIMUM OUTPUT POWER

IEEE Std. 802.11	Frequency (MHz)	Channel Number	Maximum Conducted AVG Output Power (dBm)
b	2412 ~ 2462	1-11[11]	8.63
g	2412 ~ 2462	1-11[11]	5.97
n HT20	2412 ~ 2462	1-11[11]	12.73
n HT40	2422 ~ 2452	3-9[7]	12.66
ax HE20	2412 ~ 2462	1-11[11]	12.73
ax HE40	2422 ~ 2452	3-9[7]	12.15

# 5.4. TEST CHANNEL CONFIGURATION

IEEE Std. 802.11	Test Channel Number	Frequency
b	CH 1(Low Channel), CH 6(MID Channel), CH 11(High Channel)	2412 MHz, 2437 MHz, 2462 MHz
g	CH 1(Low Channel), CH 6(MID Channel), CH 11(High Channel)	2412 MHz, 2437 MHz, 2462 MHz
n HT20	CH 1(Low Channel), CH 6(MID Channel), CH 11(High Channel)	2412 MHz, 2437 MHz, 2462 MHz
n HT40	CH 3(Low Channel), CH 6(MID Channel), CH 9(High Channel)	2422 MHz, 2437 MHz, 2452 MHz
ax HE20	CH 1(Low Channel), CH 6(MID Channel), CH 11(High Channel)	2412 MHz, 2437 MHz, 2462 MHz
ax HE40	CH 3(Low Channel), CH 6(MID Channel), CH 9(High Channel)	2422 MHz, 2437 MHz, 2452 MHz

# 5.5. THE WORSE CASE POWER SETTING PARAMETER

The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band							
Test Softv	vare			Secu	reCRT		
1555 011	Transmit			Test C	Channel		
IEEE Std. 802.11	Antenna	١	NCB: 20MH	lz	NCB: 40MHz		
002.11	Number	CH 1	CH 6	CH 11	CH 3	CH 6	CH 9
b	1	2	2	3	/		
g	1	5	5	5			
n HT20	1	11	11	11			
n HT40	1		/		11	11	11
ax HE20	1	11 11 11 /					
ax HE40	1		1	·	11	11	11

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#### 5.6. THE WORSE CASE CONFIGURATIONS

The EUT was tested in the following configuration(s):

Controlled in test mode using a software application on the EUT supplied by customer. The application was used to enable a continuous transmission and to select the mode, test channels, bandwidth, data rates as required.

Test channels referring to section 5.4.

Maximum power setting referring to section 5.5.

Worst-case data rates as provided by the client were:

802.11b mode: 1 Mbps 802.11g mode: 6 Mbps 802.11n HT20 mode: MCS0 802.11n HT40 mode: MCS0 802.11ax HE20 mode: MCS0 802.11ax HE40 mode: MCS0

The measured additional path loss was included in any path loss calculations for all RF cable used during tested.



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# 5.7. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna	Antenna Frequency (MHz)		MAX Antenna Gain (dBi)	
0	2412-2462	PCB	3.75	

Test Mode	Transmit and Receive Mode	Description
IEEE 802.11b	⊠1TX, 1RX	ANT 0 can be used as transmitting/receiving antenna.
IEEE 802.11g	⊠1TX, 1RX	ANT 0 can be used as transmitting/receiving antenna.
IEEE 802.11n HT20	⊠1TX, 1RX	ANT 0 can be used as transmitting/receiving antenna.
IEEE 802.11n HT40	⊠1TX, 1RX	ANT 0 can be used as transmitting/receiving antenna.
IEEE 802.11ax HE20	⊠1TX, 1RX	ANT 0 can be used as transmitting/receiving antenna.
IEEE 802.11ax HE40	⊠1TX, 1RX	ANT 0 can be used as transmitting/receiving antenna.

Note: The value of the antenna gain was declared by customer.



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#### 5.8. **DESCRIPTION OF TEST SETUP**

#### **SUPPORT EQUIPMENT**

Item	Equipment	Brand Name	Model Name	Remarks
1	Laptop	Lenovo	XIAOXIN 5000	1
2	Main Board	/	1	1
3	Serial to USB Board	/	1	1
3	AC Power Adapter	/	1	

#### I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB	/	Unshielded	1.0	1

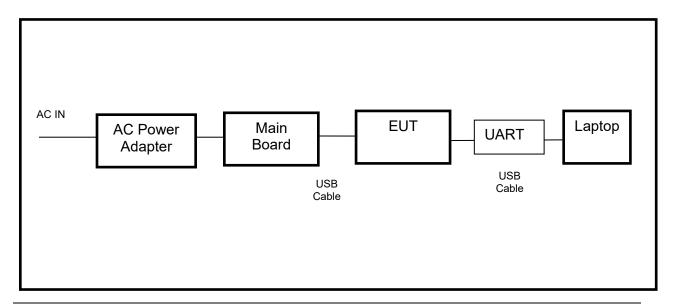
#### **ACCESSORIES**

Item	Accessory	Brand Name	Model Name	Description
1	1	/	1	/

# **TEST SETUP**

The EUT can work in engineering mode with a software through a Laptop.

#### **SETUP DIAGRAM FOR TESTS**





6. MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions							
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date		
EMI Test Receiver	R&S	ESR3	101961	Nov. 12, 2020	Nov. 11, 2021		
Two-Line V- Network	R&S	ENV216	101983	Nov. 12, 2020	Nov. 11, 2021		
Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Nov. 12, 2020	Nov. 11, 2021		
Software							
Description			Manufacturer	Name	Version		
Test Software	for Conducted	Emissions	Farad	EZ-EMC	Ver. UL-3A1		

Radiated Emissions							
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date		
MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Nov. 12, 2020	Nov. 11, 2021		
Hybrid Log Periodic Antenna	TDK	HLP-3003C	130959	Apr. 24, 2020	Apr. 23, 2023		
Preamplifier	HP	8447D	2944A09099	Nov. 12, 2020	Nov. 11, 2021		
EMI Measurement Receiver	R&S	ESR26	101377	Nov. 12, 2020	Nov. 11, 2021		
Horn Antenna	TDK	HRN-0118	130940	Jul. 20, 2021	Jul. 19, 2024		
Preamplifier	TDK	PA-02-0118	TRS-305- 00067	Nov. 20, 2020	Nov. 19, 2021		
Horn Antenna	Schwarzbeck	BBHA9170	#697	July 20, 2021	July 19, 2024		
Preamplifier	TDK	PA-02-2	TRS-307- 00003	Nov. 12, 2020	Nov. 11, 2021		
Preamplifier	TDK	PA-02-3	TRS-308- 00002	Nov. 12, 2020	Nov. 11, 2021		
Loop antenna	Schwarzbeck	1519B	80000	Jan.17, 2019	Jan.17,2022		
Preamplifier	TDK	PA-02-001- 3000	TRS-302- 00050	Nov. 12, 2020	Nov. 11, 2021		
Preamplifier	Mini-Circuits	ZX60-83LN- S+	SUP01201941	Nov. 20, 2020	Nov. 19, 2021		
High Pass Filter	Wi	WHKX10- 2700-3000- 18000-40SS	23	Nov. 12, 2020	Nov. 11, 2021		
Band Reject Filter	Wainwright	WRCJV8- 2350-2400- 2483.5- 2533.5-40SS	4	Nov. 12, 2020	Nov. 11, 2021		



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Software					
Description Manufacturer Name					
Test Software for Radiated Emissions	Farad	EZ-EMC	Ver. UL-3A1		

Tonsend RF Test System								
Equipment	Manufacturer	anufacturer Model No.		Serial No.	Last	Cal.	Due. Date	
Wideband Radio Communication Tester	R&S	CMW500		155523	Nov.20	0,2020	Nov.19,2021	
PXA Signal Analyzer	Keysight	Ν	9030A	MY55410512	Nov.20	0,2020	Nov.19,2021	
MXG Vector Signal Generator	Keysight	N5182B		MY56200284	Nov.20	0,2020	Nov.19,2021	
MXG Vector Signal Generator	Keysight	N5172B		MY56200301	Nov.20	0,2020	Nov.19,2021	
DC power supply	Keysight	E3642A		MY55159130	Nov.2	4,2020	Nov.23,2021	
Software								
Description Manufactur		rer Name			,	Version		
Tonsend SRD Test Syste	m Tonsend	1	JS1120-3 RF Test Syst		stem	2.6	6.77.0518	

Other Instruments							
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.		
Dual Channel Power Meter	Keysight	N1912A	MY55416024	Nov. 20, 2020	Nov. 19, 2021		
Power Sensor	Keysight	USB Wideband Power Sensor	MY5100022	Nov. 20, 2020	Nov. 19, 2021		

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# 7. ANTENNA PORT TEST RESULTS

# 7.1. ON TIME AND DUTY CYCLE

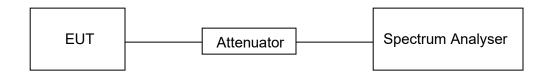
### **LIMITS**

None; for reporting purposes only

#### **PROCEDURE**

Refer to ANSI C63.10-2013 clause 11.6 Zero – Span Spectrum Analyzer method.

# **TEST SETUP**



#### **TEST ENVIRONMENT**

Temperature	26.1 °C	Relative Humidity	55.7 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 5 V

# **RESULTS**

Please refer to appendix G.

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#### 6 dB DTS BANDWIDTH AND 99 % OCCUPIED BANDWIDTH 7.2.

#### **LIMITS**

CFR 47 FCC Part15 (15.247) Subpart C				
Section Test Item Limit Frequency Range (MHz)				
CFR 47 FCC 15.247(a)(2) ISED RSS-247 5.2 (a)	2400-2483.5			
ISED RSS-Gen Clause 6.7 99 % Occupied Bandwidth For reporting purposes only. 2400-2483.5				

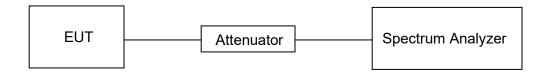
#### TEST PROCEDURE

Connect the EUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Frequency Span	Between 1.5 times and 5.0 times the OBW
Detector	Peak
RBW	For 6 dB Bandwidth: 100 kHz For 99 % Occupied Bandwidth: 1 % to 5 % of the occupied bandwidth
VBW	For 6 dB Bandwidth: ≥3 × RBW For 99 % Occupied Bandwidth: ≥3 × RBW
Trace	Max hold
Sweep	Auto couple

- a) Use the 99 % power bandwidth function of the instrument, allow the trace to stabilize and report the measured bandwidth.
- b) Allow the trace to stabilize and 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.

#### **TEST SETUP**





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# **TEST ENVIRONMENT**

Temperature	26.1 °C	Relative Humidity	55.7 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 5 V

# **RESULTS**

Please refer to appendix A & B.

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# 7.3. CONDUCTED OUTPUT POWER

## **LIMITS**

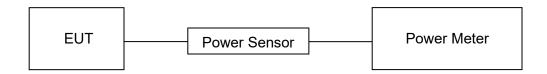
CFR 47 FCC Part15 (15.247) Subpart C ISED RSS-247 ISSUE 2				
Section Test Item Limit Frequency Range (MHz)				
CFR 47 FCC 15.247(b)(3) ISED RSS-247 5.4 (d)	AVG Output Power	1 watt or 30 dBm	2400-2483.5	

#### **TEST PROCEDURE**

Connect the EUT to a low loss RF cable from the antenna port to the power sensor (video bandwidth is greater than the occupied bandwidth).

Measure peak emission level, the indicated level is the average output power, after any corrections for external attenuators and cables.

#### **TEST SETUP**



# **TEST ENVIRONMENT**

Temperature	26.1 °C	Relative Humidity	55.7 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 5 V

# **RESULTS**

Please refer to appendix C1 & C2.

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### 7.4. POWER SPECTRAL DENSITY

#### **LIMITS**

CFR 47 FCC Part15 (15.247) Subpart C ISED RSS-247 ISSUE 2			
Section Test Item Limit Frequency Range (MHz)			
CFR 47 FCC §15.247 (e) ISED RSS-247 5.2 (b)	Power Spectral Density	8 dBm/3 kHz	2400-2483.5

# **TEST PROCEDURE**

Refer to ANSI C63.10-2013 clause 11.10.

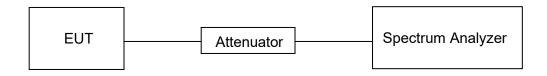
Connect the EUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	PEAK
RBW	3 kHz ≤ RBW ≤ 100 kHz
VBW	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple

Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

# **TEST SETUP**



#### **TEST ENVIRONMENT**

Temperature	26.1 °C	Relative Humidity	55.7 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 5 V



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# **RESULTS**

Please refer to appendix D.

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### 7.5. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

#### **LIMITS**

CFR 47 FCC Part15 (15.247) Subpart C ISED RSS-247 ISSUE 2			
Section Test Item Limit			
CFR 47 FCC §15.247 (d) ISED RSS-247 5.5	Conducted Bandedge and Spurious Emissions	at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power	

### **TEST PROCEDURE**

Refer to ANSI C63.10-2013 clause 11.11 and 11.13.

Connect the EUT to the spectrum analyser and use the following settings for reference level measurement:

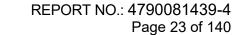
Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	100 kHz
VBW	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

Allow trace to fully stabilize and use the peak marker function to determine the maximum PSD level.

Change the settings for emission level measurement:

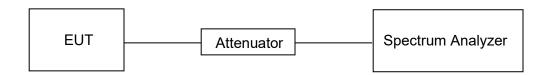
Span	Set the center frequency and span to encompass frequency range to be measured
Detector	Peak
RBW	100 kHz
VBW	≥3 × RBW
measurement points	≥span/RBW
Trace	Max hold
Sweep time	Auto couple.

Allow trace to fully stabilize and use the peak marker function to determine the maximum PSD level. Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11.





# **TEST SETUP**



# **TEST ENVIRONMENT**

Temperature	26.1 °C	Relative Humidity	55.7 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 5 V

# **RESULTS**

Please refer to appendix E & F.



8. RADIATED TEST RESULTS

Please refer to CFR 47 FCC §15.205 and §15.209.

Please refer to ISED RSS-GEN Clause 8.9 and Clause 8.10.

Radiation Disturbance Test Limit for FCC (Class B) (9 kHz ~ 1 GHz)

Emissions radiated outside of the specified frequency bands above 30 MHz						
Frequency Range	Field Strength Limit	Field Strength Limit				
(MHz)	(uV/m) at 3 m	(dBuV/m) at 3 m  Quasi-Peak				
30 - 88	100	40				
88 - 216	150	43.5				
216 - 960	200	46				
Above 960	500	54				
Above 1000	500		Average			
Above 1000	500	74	54			

FCC Emissions radiated outside of the specified frequency bands below 30 MHz							
Frequency (MHz) Field strength (microvolts/meter) Measurement distance (meters)							
0.009-0.490	2400/F(kHz)	300					
0.490-1.705	24000/F(kHz)	30					
1.705-30.0 30 30							

# ISED General field strength limits at frequencies below 30 MHz

Table 6 – General field strength limits at frequencies below 30 MHz							
Frequency Magnetic field strength (H-Field) (µA/m) Measurement distance (m)							
9 - 490 kHz <sup>Note 1</sup>	6.37/F (F in kHz)	300					
490 - 1705 kHz	63.7/F (F in kHz)	30					
1.705 - 30 MHz	0.08	30					

**Note 1:** The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.



ISED Restricted bands please refer to ISED RSS-GEN Clause 8.10

ЛНz	MHz	GHz
0.090 - 0.110	149.9 - 150.05	9.0 - 9.2
0.495 - 0.505	156.52475 - 156.52525	9.3 - 9.5
2.1735 - 2.1905	156.7 - 156.9	10.6 - 12.7
3.020 - 3.026	182.0125 - 187.17	13.25 - 13.4
1.125 - 4.128	167.72 - 173.2	14.47 - 14.5
1.17725 - 4.17775	240 – 285	15.35 - 16.2
1.20725 - 4.20775	322 - 335.4	17.7 - 21.4
5.677 - 5.683	399.9 - 410	22.01 - 23.12
3.215 - 6.218	608 - 614	23.6 - 24.0
3.26775 - 6.26825	980 - 1427	31.2 - 31.8
3.31175 - 6.31225	1435 - 1626.5	36.43 - 36.5
3.291 - 8.294	1645.5 - 1646.5	Above 38.6
3.362 - 8.366	1660 - 1710	
3.37625 - 8.38675	1718.8 - 1722.2	
3.41425 - 8.41475	2200 - 2300	
12.29 - 12.293	2310 - 2390	
12.51975 - 12.52025	2483.5 - 2500	
12.57675 - 12.57725	2655 - 2900	
13.36 - 13.41	3280 - 3287	
16.42 - 16.423	3332 - 3339	
16.69475 - 16.69525	3345.8 - 3358	
16.80425 - 16.80475	3500 - 4400	
25.5 - 25.67	4500 - 5150	
37.5 - 38.25	5350 - 5460	
73 - 74.6	7250 - 7750	
74.8 - 75.2	8025 - 8500	
108 – 138		

# FCC Restricted bands of operation refer to FCC §15.205 (a):

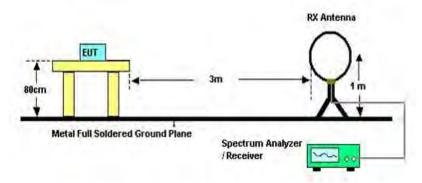
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
<sup>1</sup> 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	( <sup>2</sup> )
13.36-13.41			

Note: <sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz. <sup>2</sup>Above 38.6c



**TEST SETUP AND PROCEDURE** 

#### Below 30 MHz



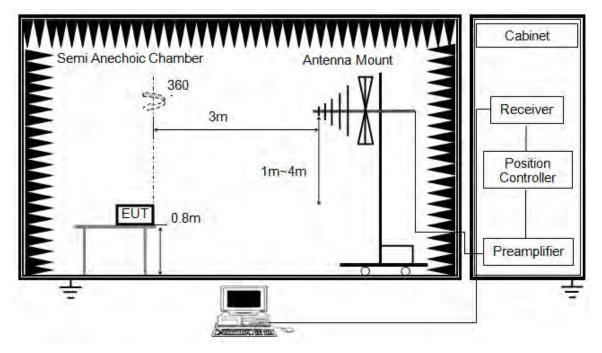
# The setting of the spectrum analyser

RBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
VBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
Sweep	Auto
Trace	Max hold

- 1. The testing follows the guidelines in ANSI C63.10-2013 clause 11.11 and 11.12.
- 2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.
- 3. The EUT was placed on a turntable with 80 cm above ground.
- 4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1 m height antenna tower.
- 5. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
- 6. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak and average detector mode remeasured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak and average detector and reported.
- 7. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30m open field site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field site based on KDB 414788.
- 8. The limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377Ω For example, the measurement frequency X kHz resulted in a level of Y dBuV/m, which is equivalent to Y-51.5 = Z dBuA/m, which has the same margin, W dB, to the corresponding RSS-GEN Table 6 limit as it has to be 15.209(a) limit.



Below 1 GHz and above 30 MHz



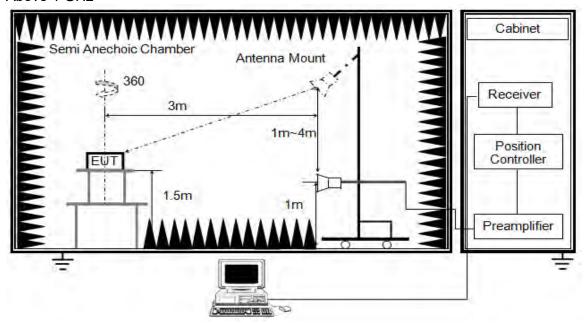
The setting of the spectrum analyser

	·
RBW	120 kHz
VBW	300 kHz
Sweep	Auto
Detector	Peak/QP
Trace	Max hold

- 1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.5.
- 2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- 3. The EUT was placed on a turntable with 80 cm above ground.
- 4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
- 5. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.



Above 1 GHz



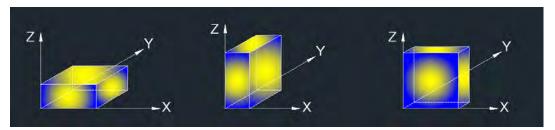
The setting of the spectrum analyser

RBW	1 MHz
IV/RW	PEAK: 3 MHz AVG: see note 6
Sweep	Auto
Detector	Peak
Trace	Max hold

- 1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.6.
- 2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- 3. The EUT was placed on a turntable with 1.5 m above ground.
- 4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
- 5. For measurement above 1 GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.
- 6. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 7.1.ON TIME AND DUTY CYCLE.



X axis, Y axis, Z axis positions:



Note 1: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (Y axis) data recorded in the report.

Note 2: The EUT was fully exercised with external accessories during the test. In the case of multiple accessory external ports, an external accessory shall be connected to one of each type of port.

## **TEST ENVIRONMENT**

Temperature	24.3 °C	Relative Humidity	61 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 5 V

# **RESULTS**

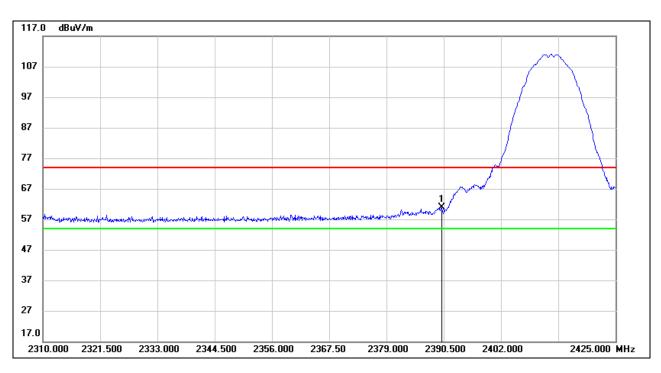


8.1. RESTRICTED BANDEDGE

# 8.1.1. 802.11b MODE

# RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

#### **PEAK**



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2390.000	27.63	33.35	60.98	74.00	-13.02	peak

- 2. Peak: Peak detector.
- 3. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



# <u>AVG</u>



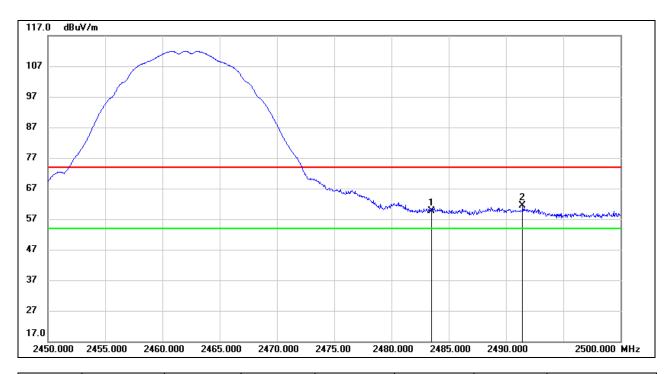
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2390.000	14.25	33.35	47.60	54.00	-6.40	AVG

- 2. Peak: Peak detector.
- 3. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

### **PEAK**

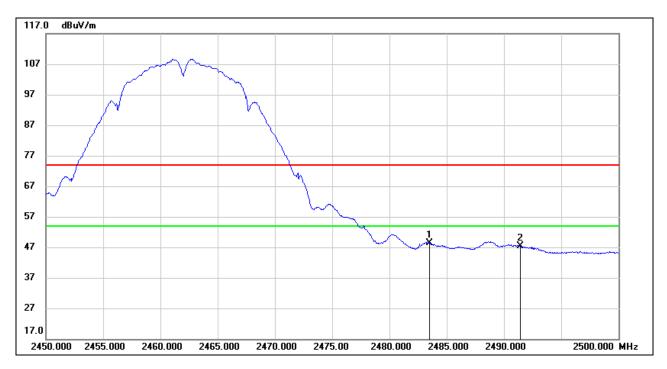


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	25.94	33.71	59.65	74.00	-14.35	peak
2	2491.450	27.56	33.73	61.29	74.00	-12.71	peak

- 2. Peak: Peak detector.
- 3. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



# <u>AVG</u>



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	14.62	33.71	48.33	54.00	-5.67	AVG
2	2491.450	13.53	33.73	47.26	54.00	-6.74	AVG

Note: 1. Measurement = Reading Level + Correct Factor.

- 2. Peak: Peak detector.
- 3. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

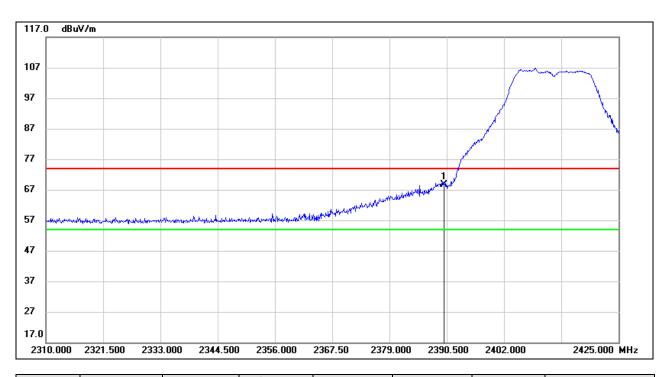
Note: Horizontal and Vertical have been tested, only the worst data was recorded in the report.



# 8.1.2. 802.11g MODE

# **RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**

#### **PEAK**

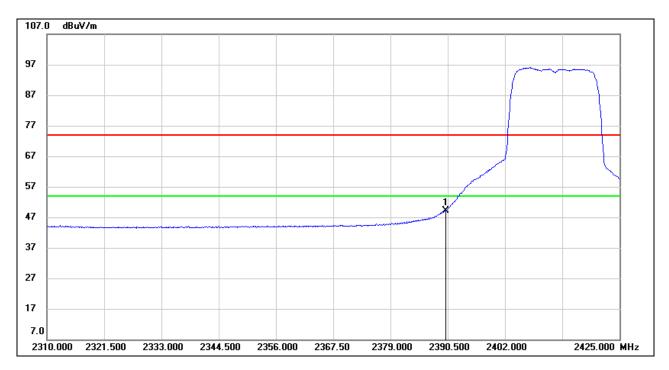


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2390.000	35.17	33.35	68.52	74.00	-5.48	peak

- 2. Peak: Peak detector.
- 3. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



# <u>AVG</u>



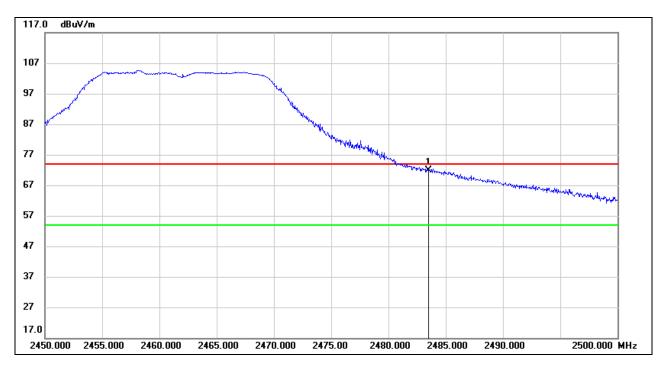
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2390.000	15.76	33.35	49.11	54.00	-4.89	AVG

- 2. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
- 3. For the transmitting duration, please refer to clause 7.1.
- 4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

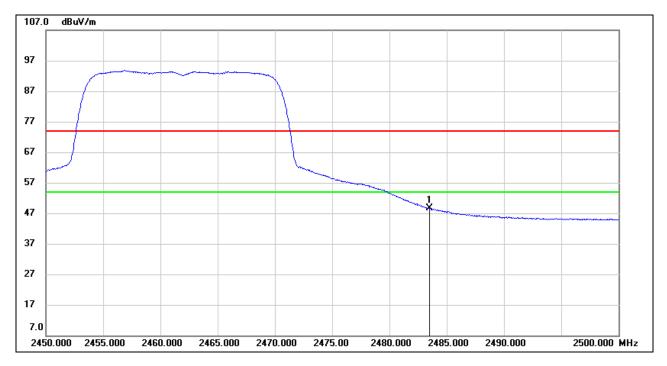
# **PEAK**



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	38.06	33.71	71.77	74.00	-2.23	peak

- 2. Peak: Peak detector.
- 3. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.





No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	14.88	33.71	48.59	54.00	-5.41	AVG

Note: 1. Measurement = Reading Level + Correct Factor.

- 2. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
- 3. For the transmitting duration, please refer to clause 7.1.
- 4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

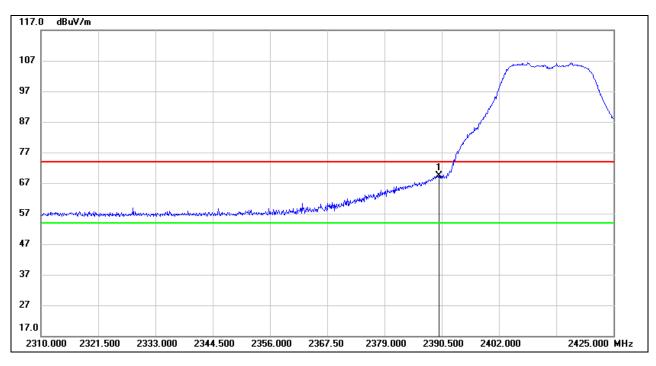
Note: Horizontal and Vertical have been tested, only the worst data was recorded in the report.

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## 8.1.3. 802.11n HT20 MODE

## RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

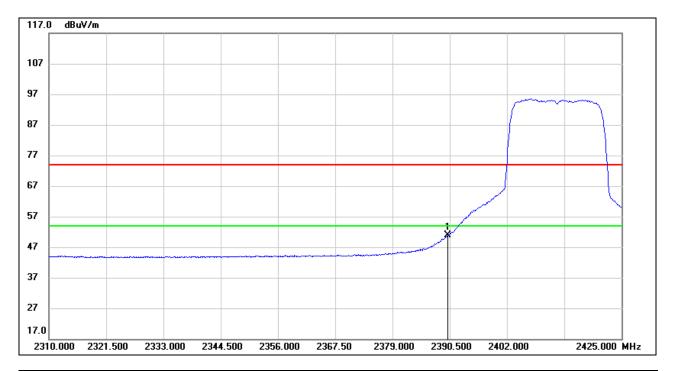
#### **PEAK**



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2390.000	35.96	33.35	69.31	74.00	-4.69	peak

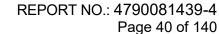
- 2. Peak: Peak detector.
- 3. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.





No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2390.000	17.42	33.35	50.77	54.00	-3.23	AVG

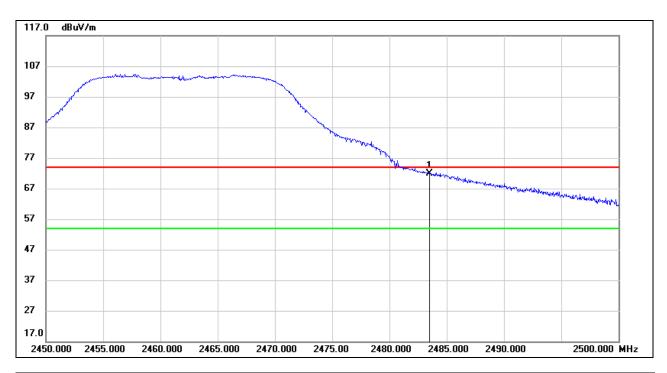
- 2. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
- 3. For the transmitting duration, please refer to clause 7.1.
- 4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

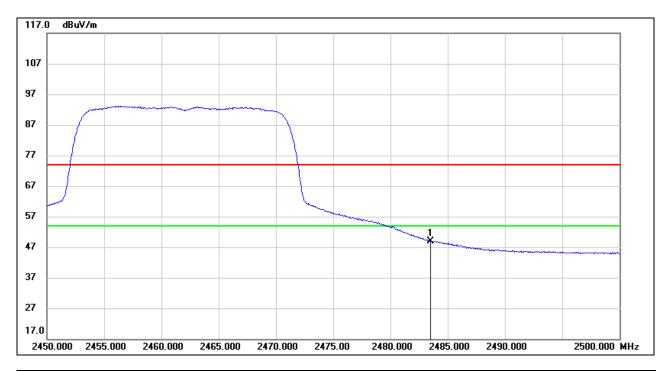
#### **PEAK**



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	38.06	33.71	71.77	74.00	-2.23	peak

- 2. Peak: Peak detector.
- 3. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.





No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	15.26	33.71	48.97	54.00	-5.03	AVG

Note: 1. Measurement = Reading Level + Correct Factor.

- 2. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
- 3. For the transmitting duration, please refer to clause 7.1.
- 4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

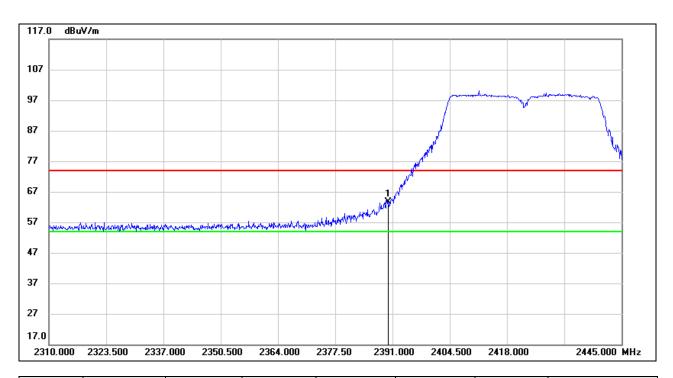
Note: Horizontal and Vertical have been tested, only the worst data was recorded in the report.



## 8.1.4. 802.11n HT40 MODE

#### RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

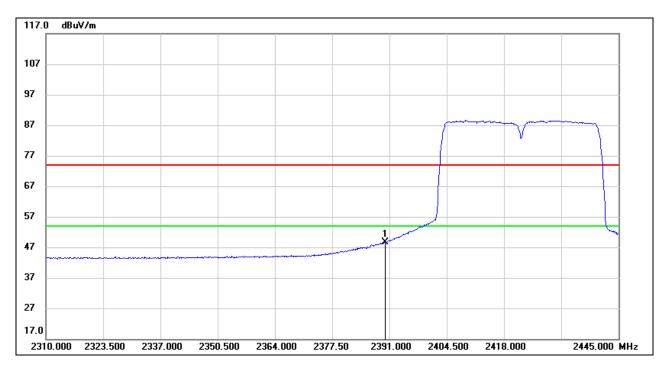
## **PEAK**



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2390.000	30.36	33.35	63.71	74.00	-10.29	peak

- 2. Peak: Peak detector.
- 3. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.





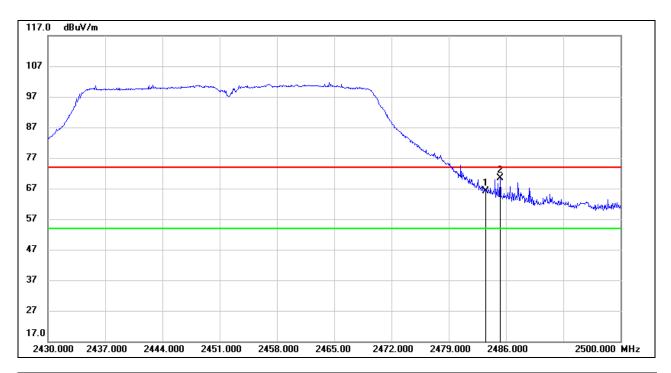
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2390.000	15.16	33.35	48.51	54.00	-5.49	AVG

- 2. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
- 3. For the transmitting duration, please refer to clause 7.1.
- 4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

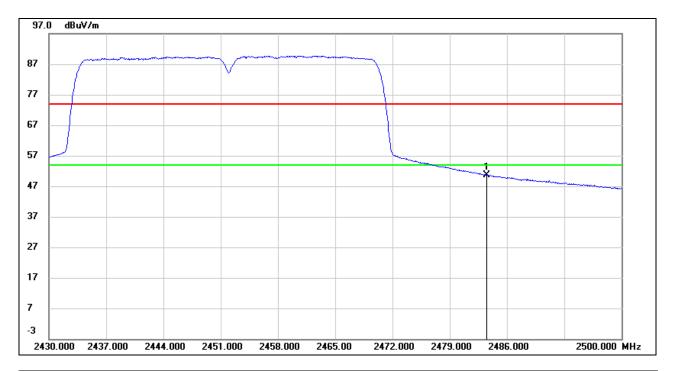
#### **PEAK**



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	32.38	33.71	66.09	74.00	-7.91	peak
2	2485.300	36.76	33.71	70.47	74.00	-3.53	peak

- 2. Peak: Peak detector.
- 3. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.





No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	16.94	33.71	50.65	54.00	-3.35	AVG

Note: 1. Measurement = Reading Level + Correct Factor.

- 2. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
- 3. For the transmitting duration, please refer to clause 7.1.
- 4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

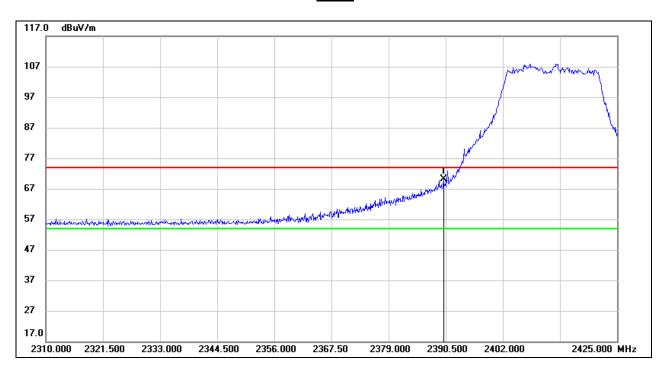
Note: Horizontal and Vertical have been tested, only the worst data was recorded in the report.



8.1.5. 802.11ax HE20 MODE

# RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

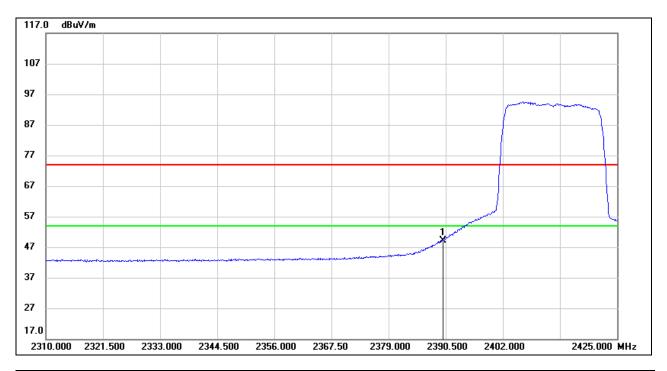
#### **PEAK**



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2390.000	37.51	32.66	70.17	74.00	-3.83	peak

- 2. Peak: Peak detector.
- 3. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.





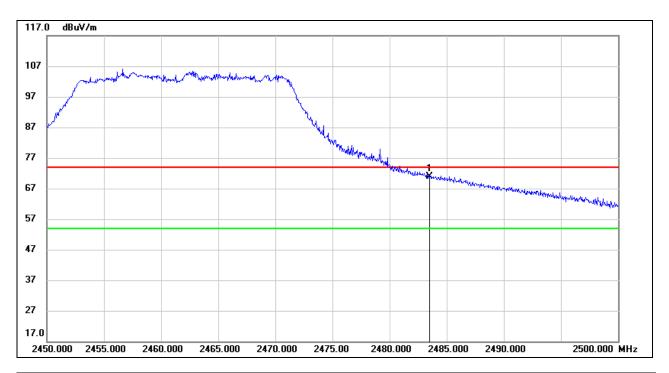
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2390.000	16.57	32.66	49.23	54.00	-4.77	AVG

- 2. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
- 3. For the transmitting duration, please refer to clause 7.1.
- 4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

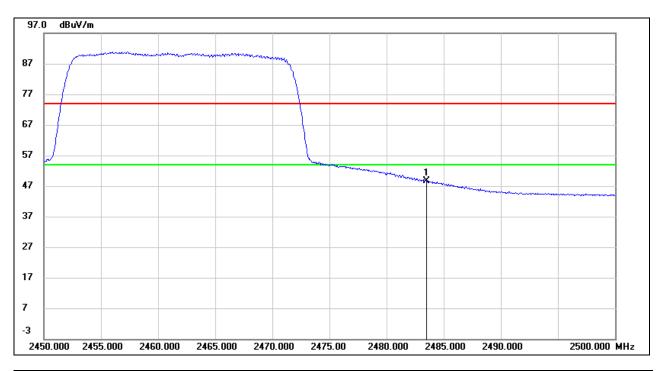
#### **PEAK**



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	37.84	33.10	70.94	74.00	-3.06	peak

- 2. Peak: Peak detector.
- 3. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.





No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	15.54	33.10	48.64	54.00	-5.36	AVG

Note: 1. Measurement = Reading Level + Correct Factor.

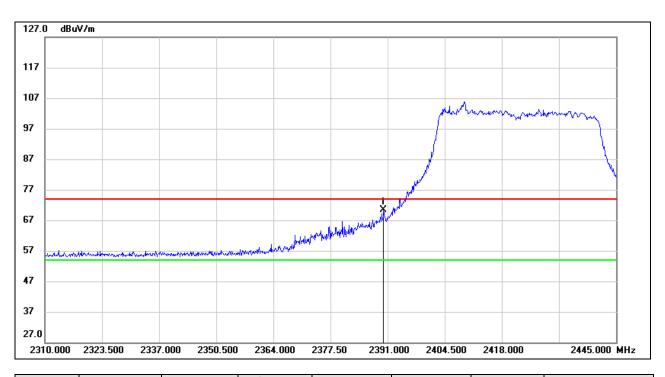
- 2. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
- 3. For the transmitting duration, please refer to clause 7.1.
- 4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

Note: Horizontal and Vertical have been tested, only the worst data was recorded in the report.

8.1.6. 802.11ax HE40 MODE

## **RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**

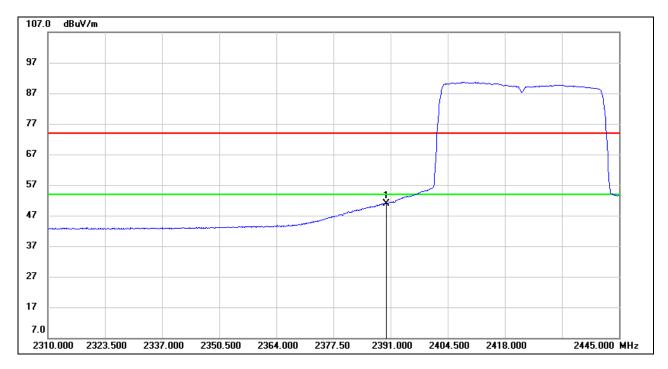
## **PEAK**



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2390.000	37.65	32.66	70.31	74.00	-3.69	peak

- 2. Peak: Peak detector.
- 3. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.





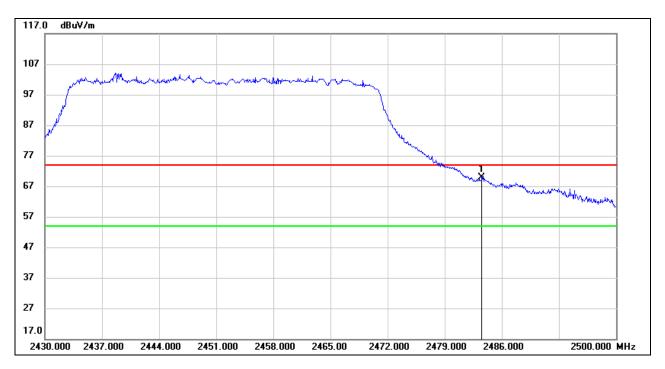
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2390.000	18.25	32.66	50.91	54.00	-3.09	AVG

- 2. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
- 3. For the transmitting duration, please refer to clause 7.1.
- 4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

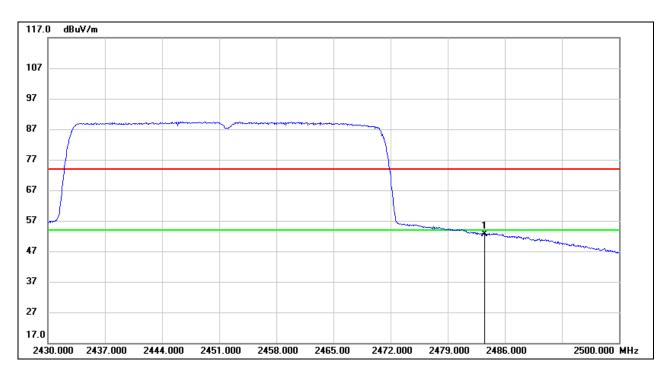
# **PEAK**



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	36.72	33.10	69.82	74.00	-4.18	peak

- 2. Peak: Peak detector.
- 3. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.





No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	19.45	33.10	52.55	54.00	-1.45	AVG

Note: 1. Measurement = Reading Level + Correct Factor.

- 2. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
- 3. For the transmitting duration, please refer to clause 7.1.
- 4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

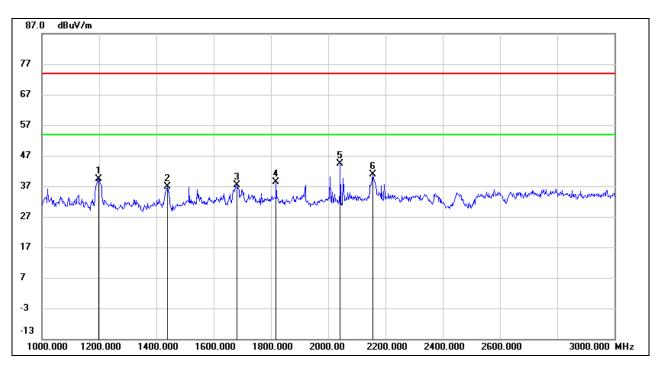
Note: Horizontal and Vertical have been tested, only the worst data was recorded in the report.



8.2. SPURIOUS EMISSIONS (1 GHz ~ 3 GHz)

#### 8.2.1. 802.11n HT20 MODE

## HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)

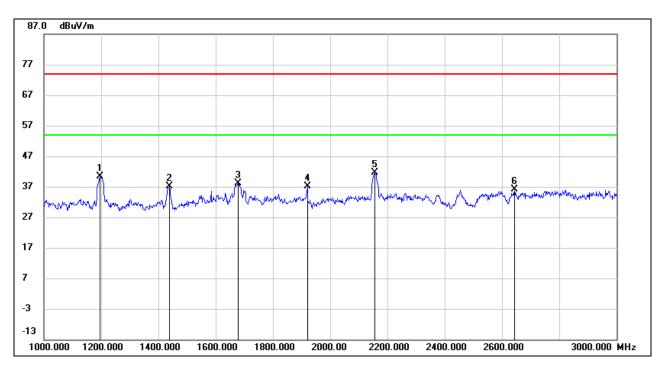


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	1199.000	53.18	-13.77	39.41	74.00	-34.59	peak
2	1439.500	49.87	-12.92	36.95	74.00	-37.05	peak
3	1681.000	48.82	-11.50	37.32	74.00	-36.68	peak
4	1818.500	49.29	-10.81	38.48	74.00	-35.52	peak
5	2043.250	55.37	-10.91	44.46	74.00	-29.54	peak
6	2156.000	51.04	-10.17	40.87	74.00	-33.13	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)

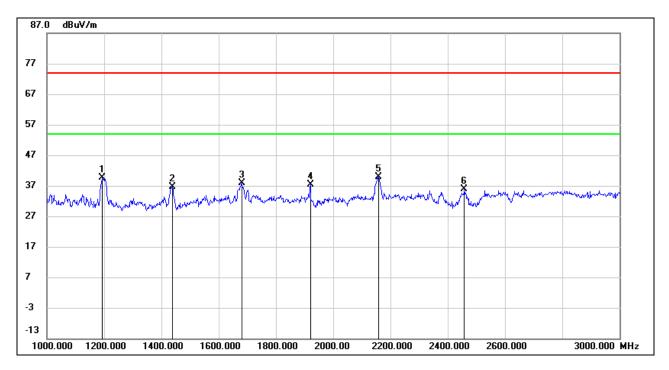


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	1196.000	54.14	-13.79	40.35	74.00	-33.65	peak
2	1438.000	49.99	-12.92	37.07	74.00	-36.93	peak
3	1679.250	49.59	-11.51	38.08	74.00	-35.92	peak
4	1920.500	48.16	-11.02	37.14	74.00	-36.86	peak
5	2157.750	51.86	-10.16	41.70	74.00	-32.30	peak
6	2645.250	44.68	-8.43	36.25	74.00	-37.75	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)

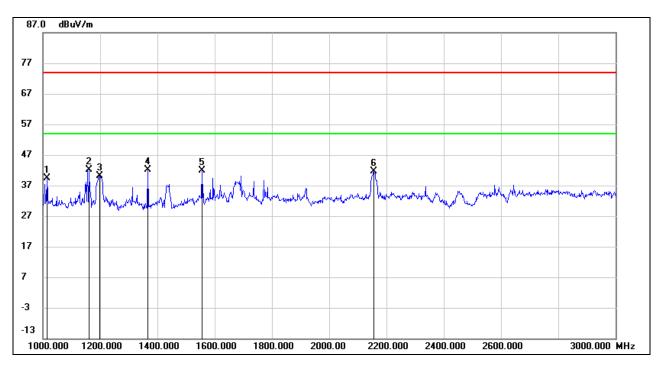


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	1195.250	53.34	-13.81	39.53	74.00	-34.47	peak
2	1438.000	49.51	-12.92	36.59	74.00	-37.41	peak
3	1680.250	49.45	-11.50	37.95	74.00	-36.05	peak
4	1920.250	48.44	-11.02	37.42	74.00	-36.58	peak
5	2158.250	50.15	-10.16	39.99	74.00	-34.01	peak
6	2458.500	44.79	-8.93	35.86	74.00	-38.14	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



## HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)

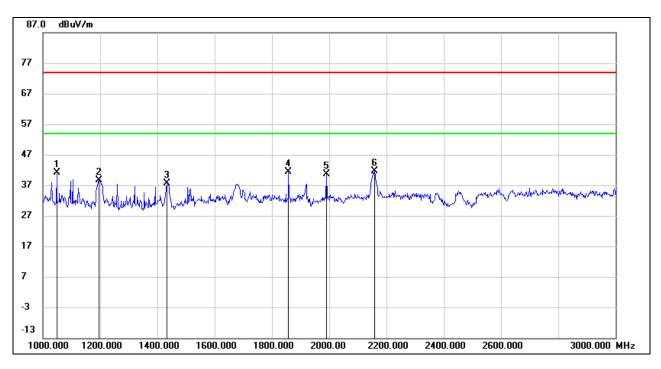


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	1014.750	54.28	-14.98	39.30	74.00	-34.70	peak
2	1160.250	56.08	-14.03	42.05	74.00	-31.95	peak
3	1199.750	53.88	-13.77	40.11	74.00	-33.89	peak
4	1367.000	55.46	-13.27	42.19	74.00	-31.81	peak
5	1556.750	54.20	-12.23	41.97	74.00	-32.03	peak
6	2156.500	51.81	-10.17	41.64	74.00	-32.36	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)

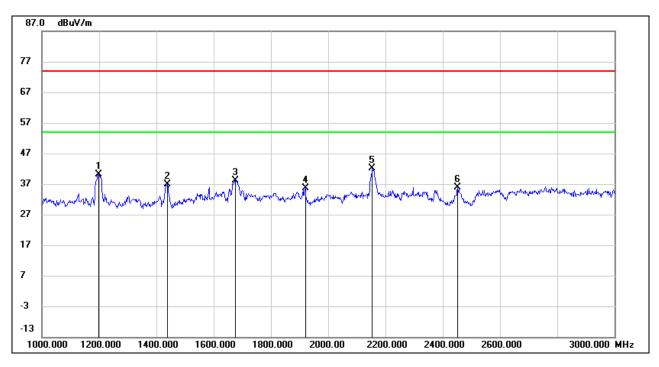


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	1049.000	55.80	-14.76	41.04	74.00	-32.96	peak
2	1197.500	52.35	-13.79	38.56	74.00	-35.44	peak
3	1433.250	50.50	-12.96	37.54	74.00	-36.46	peak
4	1859.750	52.20	-10.90	41.30	74.00	-32.70	peak
5	1991.500	51.74	-11.17	40.57	74.00	-33.43	peak
6	2158.250	51.84	-10.16	41.68	74.00	-32.32	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	1198.250	54.03	-13.79	40.24	74.00	-33.76	peak
2	1439.750	49.86	-12.90	36.96	74.00	-37.04	peak
3	1677.500	49.71	-11.51	38.20	74.00	-35.80	peak
4	1920.000	46.77	-11.02	35.75	74.00	-38.25	peak
5	2154.500	52.33	-10.18	42.15	74.00	-31.85	peak
6	2452.500	44.78	-8.94	35.84	74.00	-38.16	peak

Note: 1. Measurement = Reading Level + Correct Factor.

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

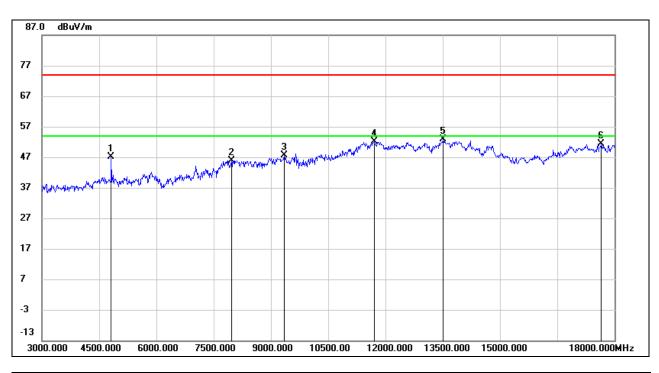
Note: All modes and channels have been tested, only the worst data was recorded in the report.



8.3. SPURIOUS EMISSIONS (3 GHz ~ 18 GHz)

## 8.3.1. 802.11b MODE

#### HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)

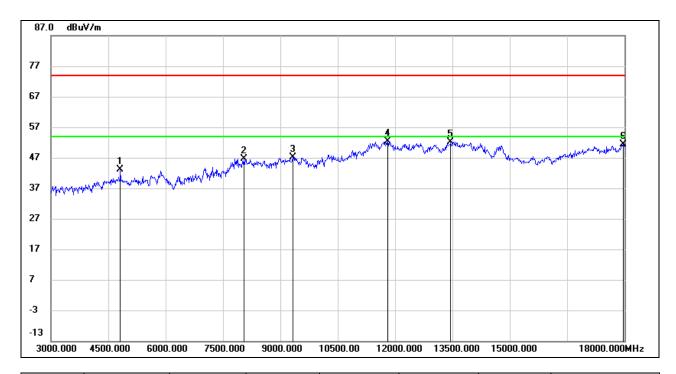


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4822.500	46.97	0.11	47.08	74.00	-26.92	peak
2	7968.750	37.86	8.10	45.96	74.00	-28.04	peak
3	9352.500	37.11	10.48	47.59	74.00	-26.41	peak
4	11709.375	35.07	17.09	52.16	74.00	-21.84	peak
5	13528.125	33.76	19.17	52.93	74.00	-21.07	peak
6	17668.125	28.38	23.01	51.39	74.00	-22.61	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
- 5. For the transmitting duration, please refer to clause 7.1.
- 6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 7. Proper operation of the transmitter prior to adding the filter to the measurement chain.



## HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)

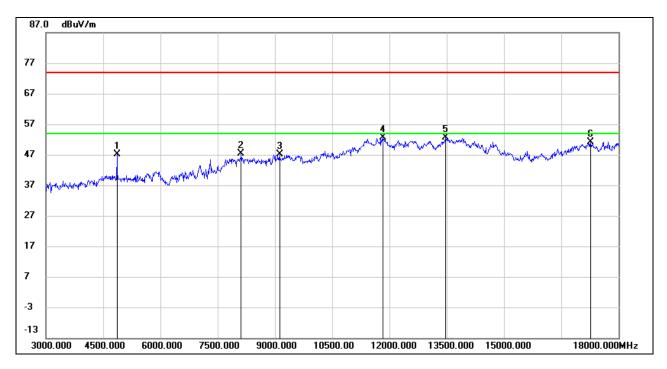


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4822.500	43.14	0.11	43.25	74.00	-30.75	peak
2	8047.500	37.86	8.76	46.62	74.00	-27.38	peak
3	9343.125	36.71	10.43	47.14	74.00	-26.86	peak
4	11818.125	35.35	17.02	52.37	74.00	-21.63	peak
5	13455.000	33.01	19.09	52.10	74.00	-21.90	peak
6	17977.500	26.50	24.83	51.33	74.00	-22.67	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



#### HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)

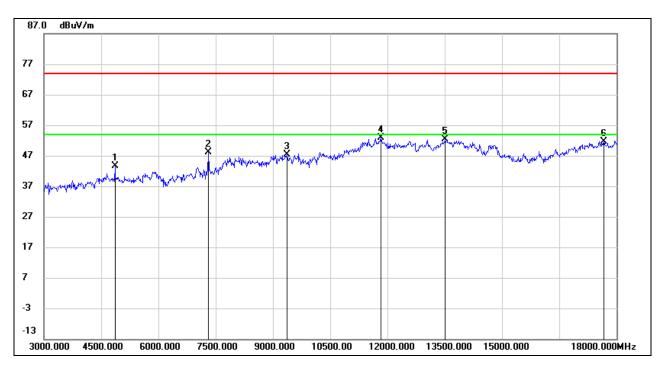


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4873.125	47.02	0.02	47.04	74.00	-26.96	peak
2	8115.000	37.94	9.50	47.44	74.00	-26.56	peak
3	9125.625	37.44	9.68	47.12	74.00	-26.88	peak
4	11833.125	35.44	17.07	52.51	74.00	-21.49	peak
5	13473.750	33.42	19.14	52.56	74.00	-21.44	peak
6	17278.125	29.85	21.33	51.18	74.00	-22.82	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



## HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)

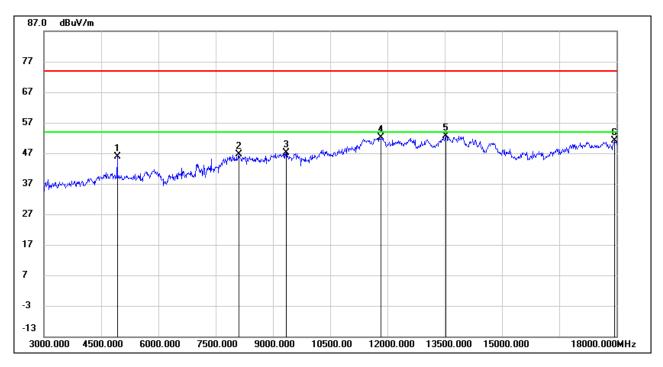


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4873.125	43.71	0.02	43.73	74.00	-30.27	peak
2	7308.750	41.80	6.36	48.16	74.00	-25.84	peak
3	9384.375	36.70	10.68	47.38	74.00	-26.62	peak
4	11829.375	35.78	17.05	52.83	74.00	-21.17	peak
5	13528.125	33.16	19.17	52.33	74.00	-21.67	peak
6	17670.000	28.64	23.02	51.66	74.00	-22.34	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



## HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)

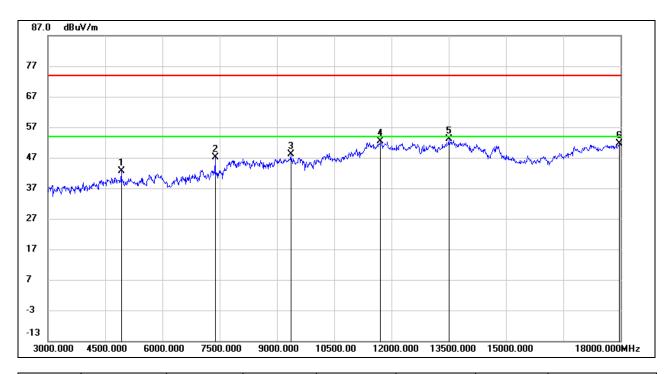


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4923.750	45.69	0.15	45.84	74.00	-28.16	peak
2	8109.375	36.98	9.53	46.51	74.00	-27.49	peak
3	9354.375	36.75	10.49	47.24	74.00	-26.76	peak
4	11836.875	35.05	17.08	52.13	74.00	-21.87	peak
5	13531.875	33.53	19.17	52.70	74.00	-21.30	peak
6	17966.250	26.43	24.75	51.18	74.00	-22.82	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



## HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4923.750	42.59	0.15	42.74	74.00	-31.26	peak
2	7383.750	40.09	7.06	47.15	74.00	-26.85	peak
3	9369.375	37.58	10.59	48.17	74.00	-25.83	peak
4	11718.750	35.31	17.08	52.39	74.00	-21.61	peak
5	13501.875	33.79	19.22	53.01	74.00	-20.99	peak
6	17981.250	26.78	24.85	51.63	74.00	-22.37	peak

Note: 1. Peak Result = Reading Level + Correct Factor.

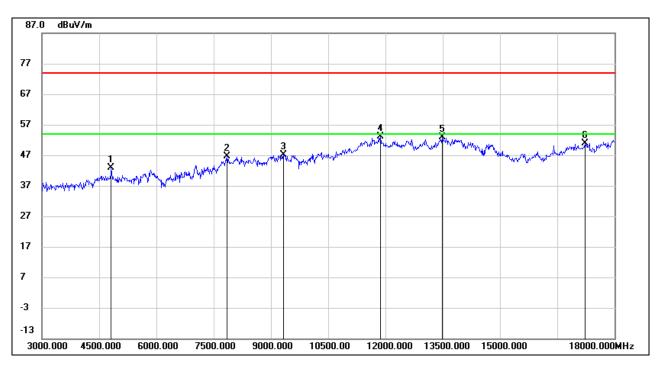
- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

Note: Both the two antennas had been tested, but only the worst data was recorded in the report.



8.3.2. 802.11g MODE

#### HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)

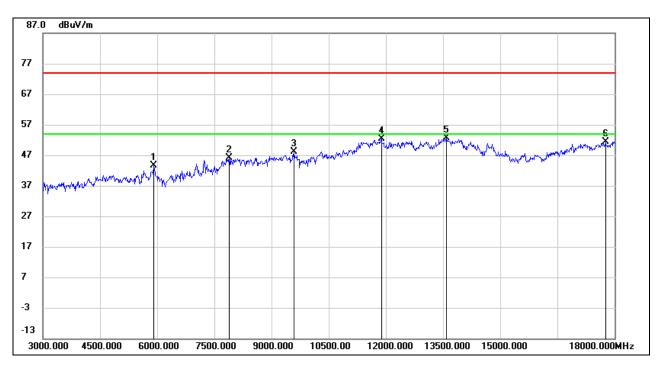


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4822.500	42.82	0.11	42.93	74.00	-31.07	peak
2	7848.750	38.08	8.48	46.56	74.00	-27.44	peak
3	9330.000	36.84	10.34	47.18	74.00	-26.82	peak
4	11865.000	35.97	17.14	53.11	74.00	-20.89	peak
5	13498.125	33.67	19.22	52.89	74.00	-21.11	peak
6	17236.875	29.81	20.99	50.80	74.00	-23.20	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
- 5. For the transmitting duration, please refer to clause 7.1.
- 6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 7. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)

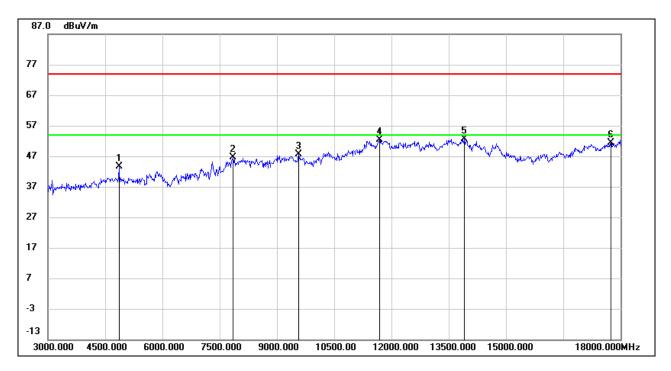


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5923.125	40.41	3.31	43.72	74.00	-30.28	peak
2	7899.375	37.86	8.24	46.10	74.00	-27.90	peak
3	9598.125	36.96	11.06	48.02	74.00	-25.98	peak
4	11883.750	35.23	17.20	52.43	74.00	-21.57	peak
5	13595.625	33.60	19.04	52.64	74.00	-21.36	peak
6	17765.625	27.46	23.89	51.35	74.00	-22.65	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



## HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)

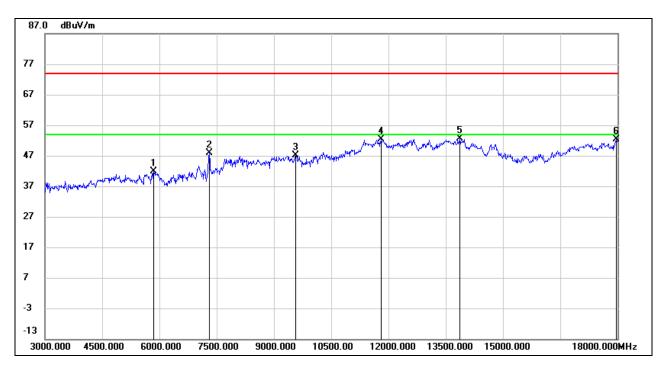


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4873.125	43.65	0.02	43.67	74.00	-30.33	peak
2	7846.875	38.22	8.49	46.71	74.00	-27.29	peak
3	9570.000	36.83	10.88	47.71	74.00	-26.29	peak
4	11688.750	35.31	17.04	52.35	74.00	-21.65	peak
5	13916.250	33.30	19.30	52.60	74.00	-21.40	peak
6	17746.875	27.52	23.74	51.26	74.00	-22.74	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



## HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)

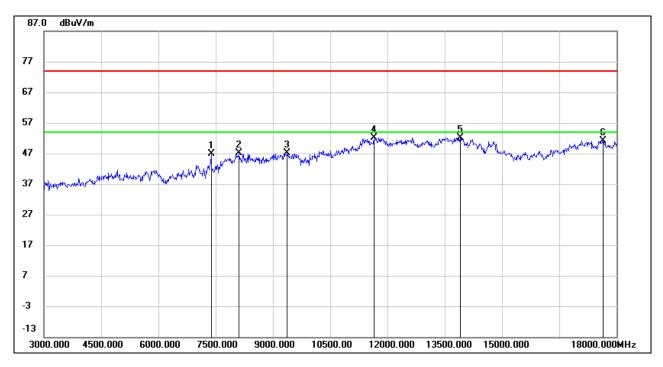


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5857.500	38.77	3.02	41.79	74.00	-32.21	peak
2	7308.750	41.49	6.36	47.85	74.00	-26.15	peak
3	9571.875	36.21	10.88	47.09	74.00	-26.91	peak
4	11812.500	35.39	17.01	52.40	74.00	-21.60	peak
5	13880.625	33.22	19.32	52.54	74.00	-21.46	peak
6	17977.500	27.50	24.83	52.33	74.00	-21.67	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)

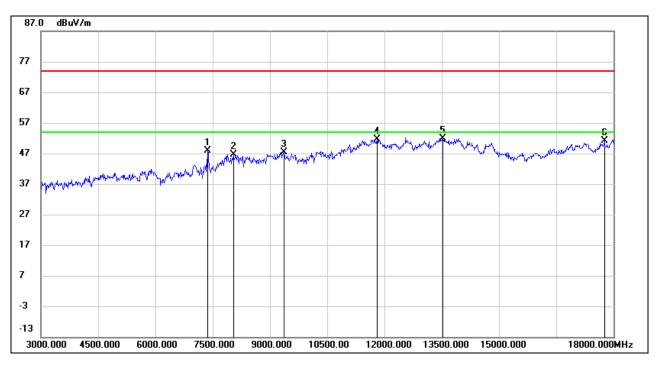


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	7381.875	39.80	7.05	46.85	74.00	-27.15	peak
2	8115.000	37.63	9.50	47.13	74.00	-26.87	peak
3	9378.750	36.46	10.66	47.12	74.00	-26.88	peak
4	11645.625	35.42	16.78	52.20	74.00	-21.80	peak
5	13918.125	32.92	19.30	52.22	74.00	-21.78	peak
6	17653.125	28.35	22.85	51.20	74.00	-22.80	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	7378.125	40.81	7.00	47.81	74.00	-26.19	peak
2	8043.750	37.89	8.70	46.59	74.00	-27.41	peak
3	9367.500	36.75	10.58	47.33	74.00	-26.67	peak
4	11812.500	34.50	17.01	51.51	74.00	-22.49	peak
5	13533.750	32.80	19.16	51.96	74.00	-22.04	peak
6	17771.250	27.07	23.95	51.02	74.00	-22.98	peak

Note: 1. Peak Result = Reading Level + Correct Factor.

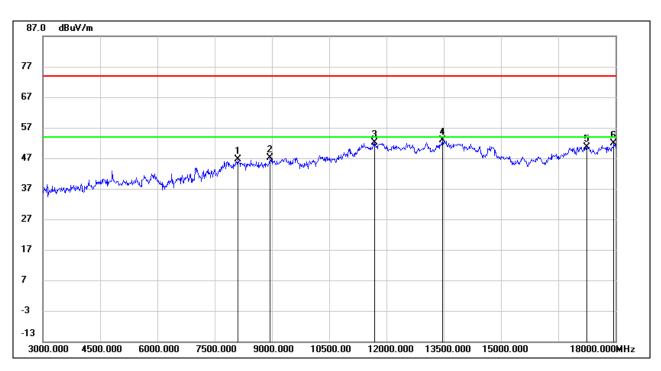
- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
- 5. For the transmitting duration, please refer to clause 7.1.
- 6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

Note: Both the two antennas had been tested, but only the worst data was recorded in the report.



8.3.3. 802.11n HT20 MODE

#### HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)

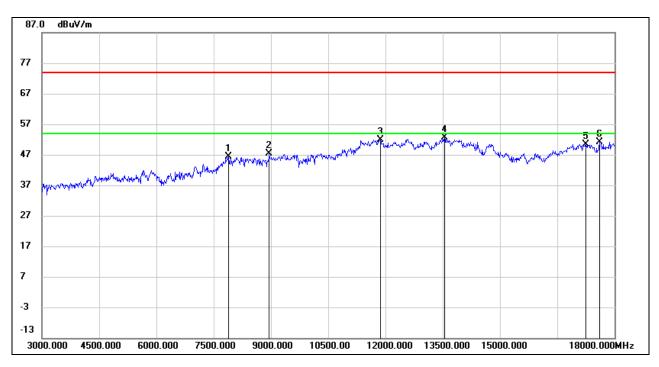


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	8120.625	37.25	9.48	46.73	74.00	-27.27	peak
2	8968.125	37.00	10.15	47.15	74.00	-26.85	peak
3	11698.125	35.15	17.10	52.25	74.00	-21.75	peak
4	13483.125	33.62	19.17	52.79	74.00	-21.21	peak
5	17261.250	29.45	21.19	50.64	74.00	-23.36	peak
6	17960.625	27.12	24.71	51.83	74.00	-22.17	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
- 5. For the transmitting duration, please refer to clause 7.1.
- 6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 7. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)

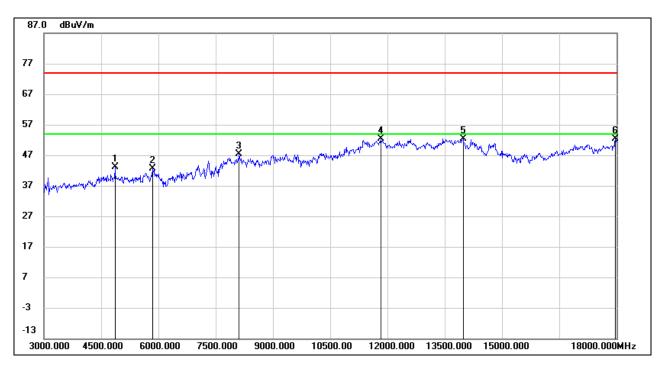


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	7890.000	38.03	8.28	46.31	74.00	-27.69	peak
2	8968.125	37.32	10.15	47.47	74.00	-26.53	peak
3	11874.375	34.78	17.17	51.95	74.00	-22.05	peak
4	13545.000	33.50	19.13	52.63	74.00	-21.37	peak
5	17261.250	29.27	21.19	50.46	74.00	-23.54	peak
6	17619.375	28.62	22.51	51.13	74.00	-22.87	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
- 5. For the transmitting duration, please refer to clause 7.1.
- 6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 7. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)

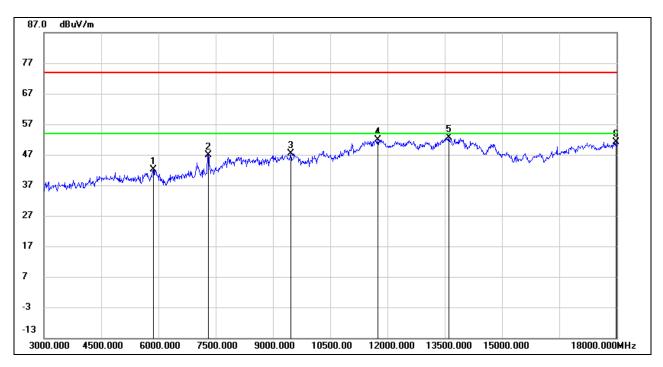


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4860.000	42.99	0.04	43.03	74.00	-30.97	peak
2	5850.000	39.77	2.93	42.70	74.00	-31.30	peak
3	8115.000	37.86	9.50	47.36	74.00	-26.64	peak
4	11820.000	35.43	17.03	52.46	74.00	-21.54	peak
5	13980.000	33.06	19.35	52.41	74.00	-21.59	peak
6	17970.000	27.57	24.77	52.34	74.00	-21.66	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



#### HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)

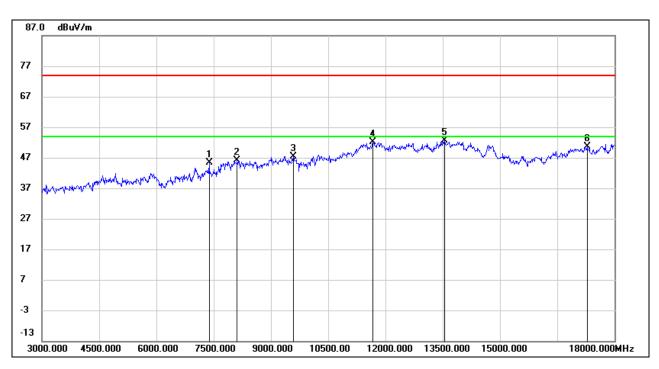


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5865.000	38.97	3.09	42.06	74.00	-31.94	peak
2	7306.875	40.56	6.35	46.91	74.00	-27.09	peak
3	9465.000	36.74	10.55	47.29	74.00	-26.71	peak
4	11756.250	34.86	17.03	51.89	74.00	-22.11	peak
5	13608.750	33.50	19.08	52.58	74.00	-21.42	peak
6	17992.500	26.11	24.92	51.03	74.00	-22.97	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)

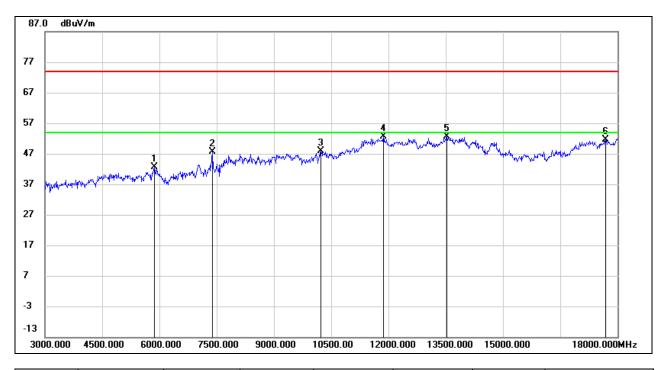


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	7380.000	38.25	7.02	45.27	74.00	-28.73	peak
2	8115.000	36.70	9.50	46.20	74.00	-27.80	peak
3	9585.000	36.40	10.98	47.38	74.00	-26.62	peak
4	11670.000	35.31	16.93	52.24	74.00	-21.76	peak
5	13545.000	33.57	19.13	52.70	74.00	-21.30	peak
6	17280.000	29.30	21.34	50.64	74.00	-23.36	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



#### HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)

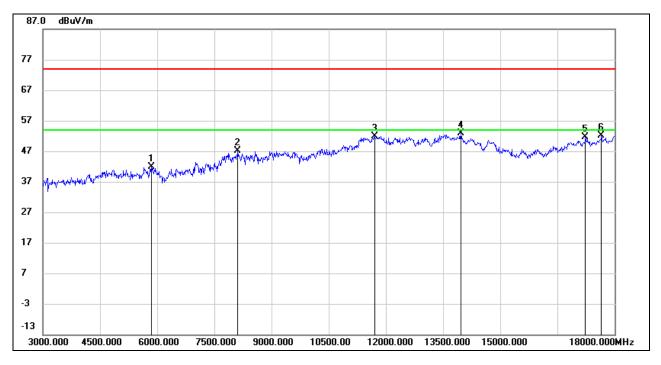


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5865.000	39.48	3.09	42.57	74.00	-31.43	peak
2	7380.000	40.50	7.02	47.52	74.00	-26.48	peak
3	10230.000	35.78	12.13	47.91	74.00	-26.09	peak
4	11865.000	35.55	17.14	52.69	74.00	-21.31	peak
5	13530.000	33.35	19.17	52.52	74.00	-21.48	peak
6	17685.000	28.54	23.18	51.72	74.00	-22.28	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
- 5. For the transmitting duration, please refer to clause 7.1.
- 6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

8.3.4. 802.11n HT40 MODE

#### HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)

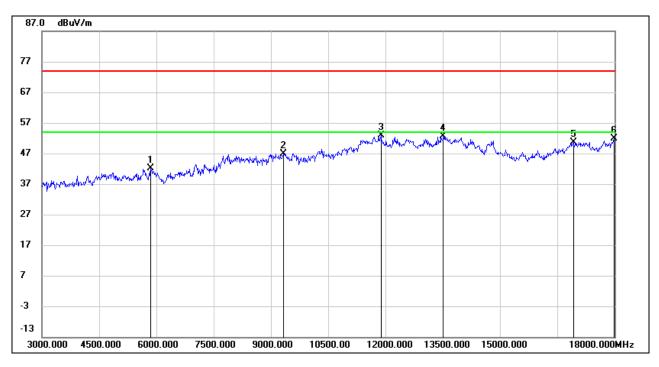


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5850.000	38.88	2.93	41.81	74.00	-32.19	peak
2	8115.000	37.71	9.50	47.21	74.00	-26.79	peak
3	11700.000	34.87	17.11	51.98	74.00	-22.02	peak
4	13965.000	33.56	19.34	52.90	74.00	-21.10	peak
5	17235.000	30.68	20.98	51.66	74.00	-22.34	peak
6	17655.000	29.26	22.87	52.13	74.00	-21.87	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)

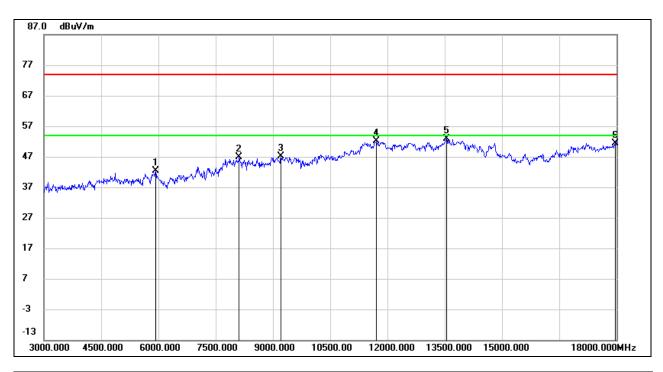


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5850.000	39.17	2.93	42.10	74.00	-31.90	peak
2	9330.000	36.62	10.34	46.96	74.00	-27.04	peak
3	11880.000	35.81	17.18	52.99	74.00	-21.01	peak
4	13515.000	33.42	19.18	52.60	74.00	-21.40	peak
5	16920.000	30.87	19.70	50.57	74.00	-23.43	peak
6	17985.000	27.05	24.87	51.92	74.00	-22.08	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)

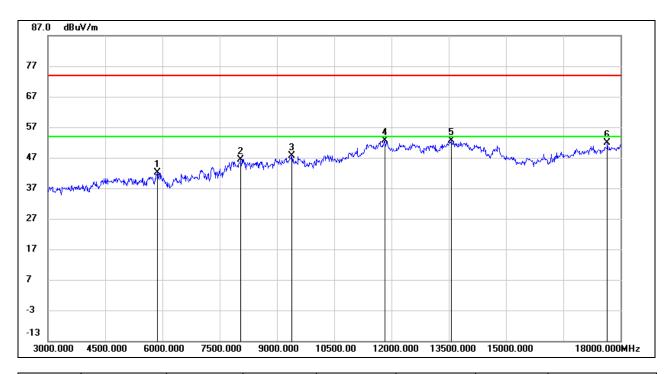


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5925.000	39.05	3.30	42.35	74.00	-31.65	peak
2	8115.000	37.30	9.50	46.80	74.00	-27.20	peak
3	9210.000	37.51	9.62	47.13	74.00	-26.87	peak
4	11715.000	35.16	17.09	52.25	74.00	-21.75	peak
5	13545.000	33.73	19.13	52.86	74.00	-21.14	peak
6	17970.000	26.71	24.77	51.48	74.00	-22.52	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



#### HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)

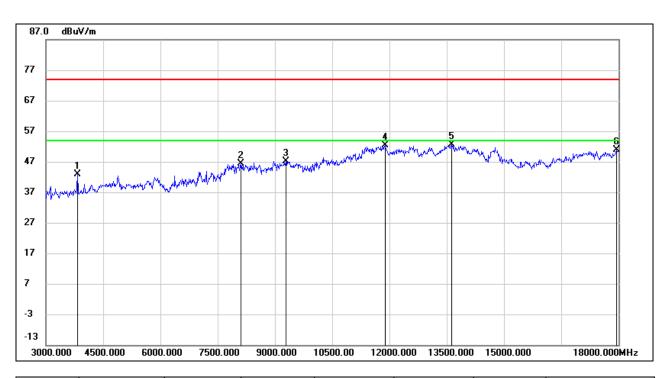


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5865.000	38.92	3.09	42.01	74.00	-31.99	peak
2	8055.000	37.53	8.87	46.40	74.00	-27.60	peak
3	9390.000	36.81	10.73	47.54	74.00	-26.46	peak
4	11820.000	35.63	17.03	52.66	74.00	-21.34	peak
5	13560.000	33.43	19.12	52.55	74.00	-21.45	peak
6	17655.000	28.93	22.87	51.80	74.00	-22.20	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)

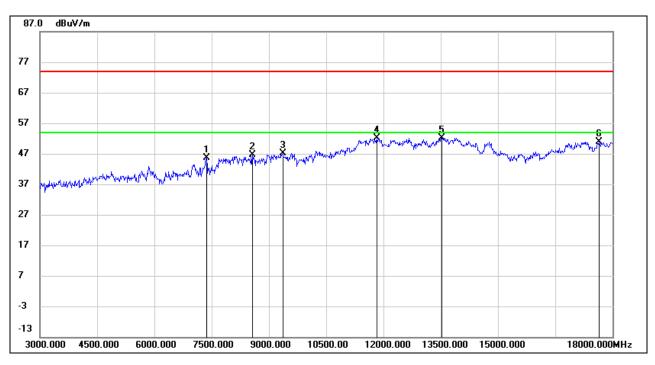


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	3825.000	46.63	-3.70	42.93	74.00	-31.07	peak
2	8115.000	36.88	9.50	46.38	74.00	-27.62	peak
3	9285.000	37.13	10.06	47.19	74.00	-26.81	peak
4	11880.000	35.10	17.18	52.28	74.00	-21.72	peak
5	13620.000	33.58	19.12	52.70	74.00	-21.30	peak
6	17940.000	26.31	24.57	50.88	74.00	-23.12	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



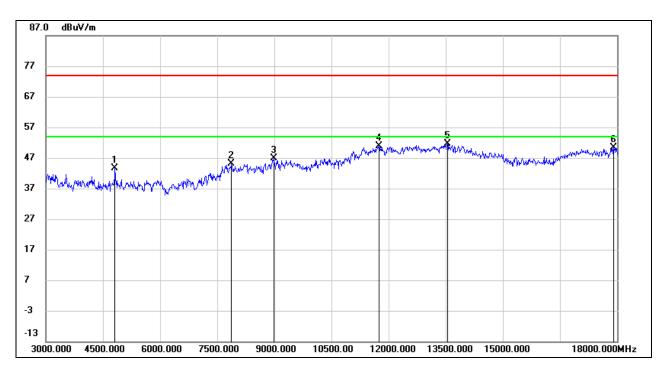
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	7365.000	38.78	6.88	45.66	74.00	-28.34	peak
2	8565.000	38.11	8.48	46.59	74.00	-27.41	peak
3	9360.000	36.62	10.54	47.16	74.00	-26.84	peak
4	11820.000	35.08	17.03	52.11	74.00	-21.89	peak
5	13530.000	33.00	19.17	52.17	74.00	-21.83	peak
6	17640,000	28.19	22.72	50.91	74.00	-23.09	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



#### 8.3.5. 802.11ax HE20 MODE

#### HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)

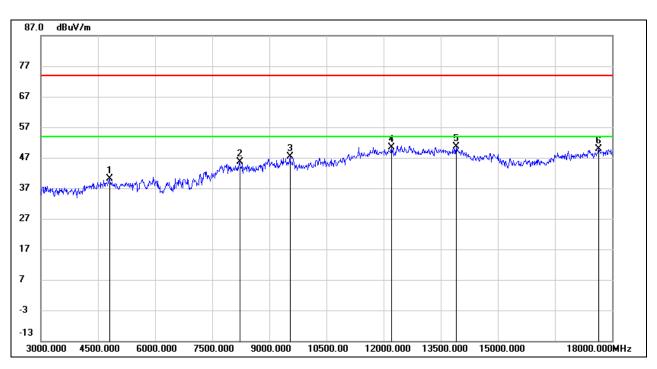


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4826.500	44.23	-0.63	43.60	74.00	-30.40	peak
2	7881.500	37.70	7.39	45.09	74.00	-28.91	peak
3	8991.500	36.76	10.04	46.80	74.00	-27.20	peak
4	11758.500	33.67	17.14	50.81	74.00	-23.19	peak
5	13555.500	33.30	18.39	51.69	74.00	-22.31	peak
6	17911.000	27.19	23.15	50.34	74.00	-23.66	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
- 5. For the transmitting duration, please refer to clause 7.1.
- 6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 7. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)

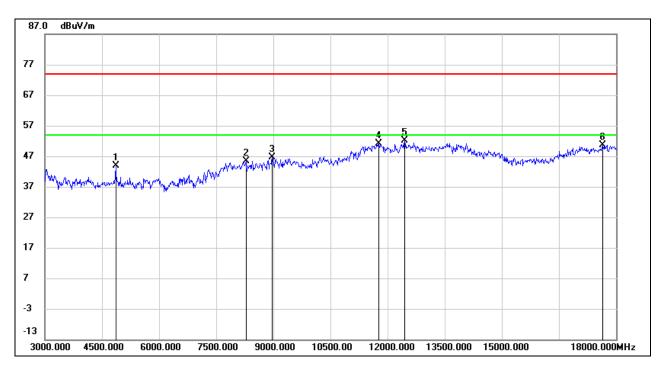


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4814.500	40.85	-0.64	40.21	74.00	-33.79	peak
2	8233.000	37.04	8.59	45.63	74.00	-28.37	peak
3	9546.000	36.89	10.42	47.31	74.00	-26.69	peak
4	12224.000	33.70	16.68	50.38	74.00	-23.62	peak
5	13912.500	31.91	18.65	50.56	74.00	-23.44	peak
6	17649.000	28.70	21.26	49.96	74.00	-24.04	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
- 5. For the transmitting duration, please refer to clause 7.1.
- 6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 7. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)

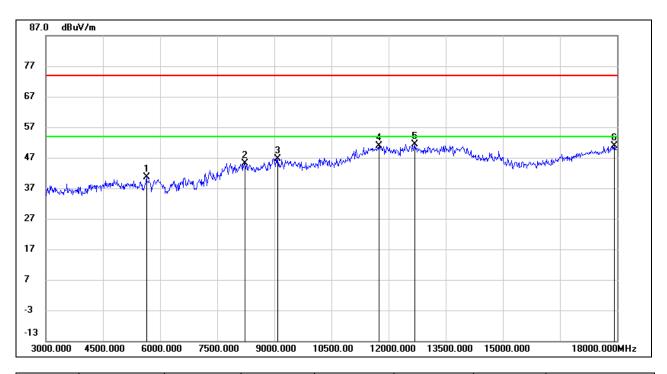


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4868.500	44.36	-0.60	43.76	74.00	-30.24	peak
2	8286.500	37.06	8.37	45.43	74.00	-28.57	peak
3	8984.500	36.70	9.96	46.66	74.00	-27.34	peak
4	11781.000	33.95	17.25	51.20	74.00	-22.80	peak
5	12453.500	35.29	16.78	52.07	74.00	-21.93	peak
6	17653.000	29.40	21.31	50.71	74.00	-23.29	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)

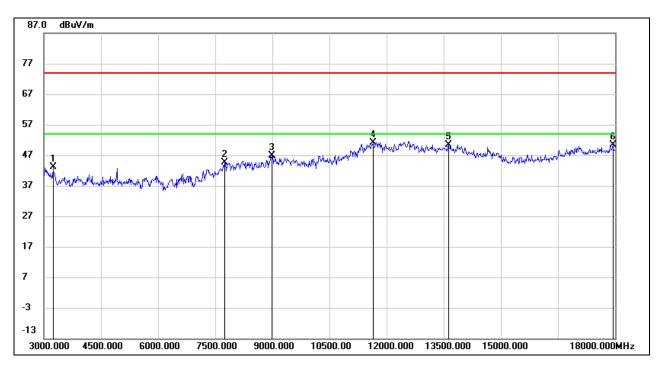


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5648.500	39.08	1.44	40.52	74.00	-33.48	peak
2	8239.500	36.51	8.56	45.07	74.00	-28.93	peak
3	9098.500	37.09	9.55	46.64	74.00	-27.36	peak
4	11745.000	33.75	17.07	50.82	74.00	-23.18	peak
5	12702.500	34.60	16.85	51.45	74.00	-22.55	peak
6	17929.500	27.65	23.19	50.84	74.00	-23.16	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)

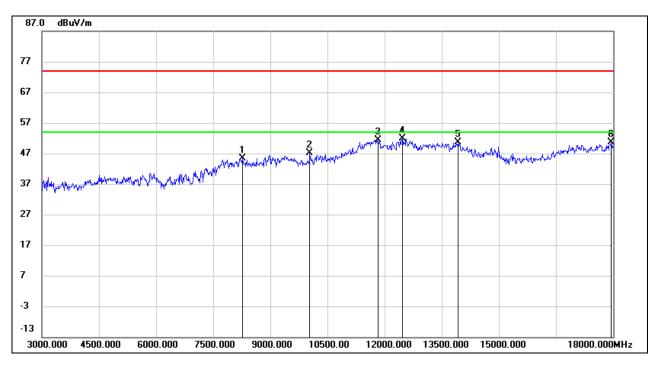


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	3246.500	49.76	-6.53	43.23	74.00	-30.77	peak
2	7756.000	37.24	7.42	44.66	74.00	-29.34	peak
3	8988.500	36.89	10.01	46.90	74.00	-27.10	peak
4	11652.000	34.57	16.57	51.14	74.00	-22.86	peak
5	13622.000	32.07	18.41	50.48	74.00	-23.52	peak
6	17942.000	27.09	23.22	50.31	74.00	-23.69	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



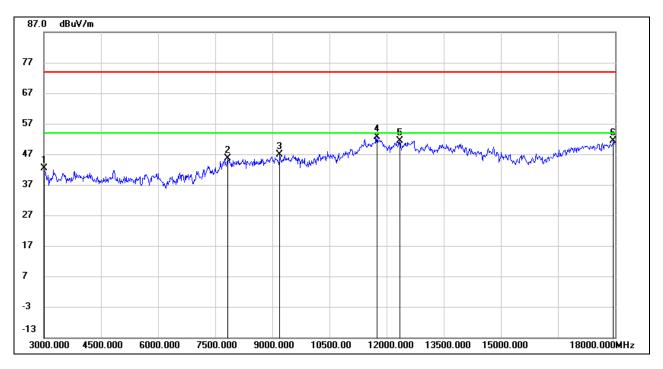
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	8272.000	36.99	8.43	45.42	74.00	-28.58	peak
2	10049.500	36.21	10.95	47.16	74.00	-26.84	peak
3	11824.000	34.09	17.32	51.41	74.00	-22.59	peak
4	12466.500	35.16	16.74	51.90	74.00	-22.10	peak
5	13949.500	31.91	18.61	50.52	74.00	-23.48	peak
6	17955.500	27.35	23.25	50.60	74.00	-23.40	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
- 5. For the transmitting duration, please refer to clause 7.1.
- 6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 7. Proper operation of the transmitter prior to adding the filter to the measurement chain.



8.3.6. 802.11ax HE40 MODE

#### HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)

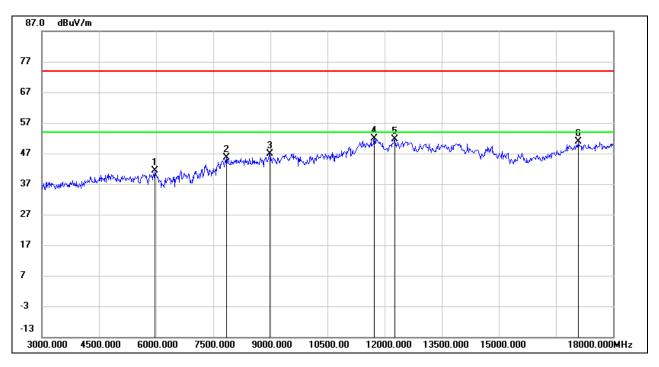


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	3000.000	49.50	-7.09	42.41	74.00	-31.59	peak
2	7830.000	38.20	7.53	45.73	74.00	-28.27	peak
3	9195.000	37.80	8.97	46.77	74.00	-27.23	peak
4	11745.000	35.50	17.07	52.57	74.00	-21.43	peak
5	12345.000	34.62	16.82	51.44	74.00	-22.56	peak
6	17955.000	28.06	23.26	51.32	74.00	-22.68	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)

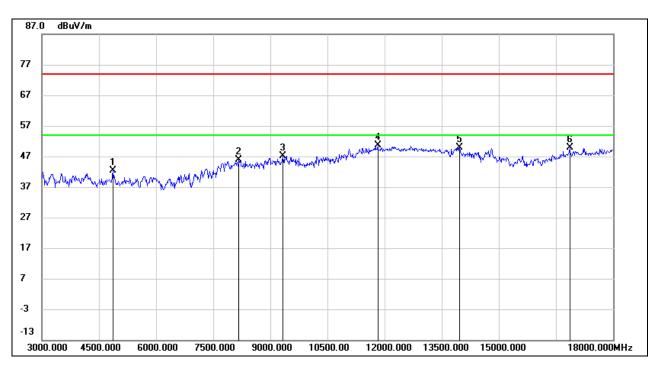


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5970.000	39.26	2.09	41.35	74.00	-32.65	peak
2	7845.000	38.24	7.49	45.73	74.00	-28.27	peak
3	8985.000	37.03	9.96	46.99	74.00	-27.01	peak
4	11730.000	34.87	16.98	51.85	74.00	-22.15	peak
5	12270.000	34.89	16.73	51.62	74.00	-22.38	peak
6	17085.000	31.93	19.05	50.98	74.00	-23.02	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)

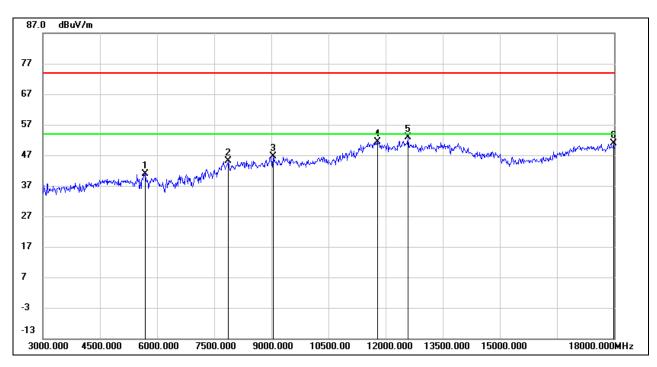


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4860.000	43.01	-0.61	42.40	74.00	-31.60	peak
2	8175.000	37.37	8.51	45.88	74.00	-28.12	peak
3	9330.000	37.40	9.72	47.12	74.00	-26.88	peak
4	11820.000	33.35	17.32	50.67	74.00	-23.33	peak
5	13965.000	31.19	18.58	49.77	74.00	-24.23	peak
6	16860.000	31.90	17.99	49.89	74.00	-24.11	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)

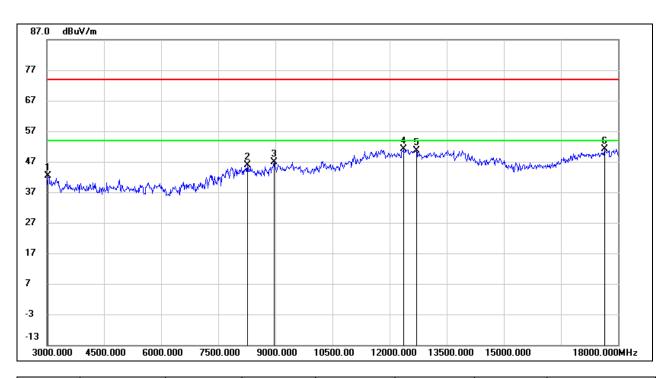


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	5689.500	39.40	1.44	40.84	74.00	-33.16	peak
2	7877.500	37.72	7.40	45.12	74.00	-28.88	peak
3	9055.500	36.81	9.81	46.62	74.00	-27.38	peak
4	11801.000	34.10	17.35	51.45	74.00	-22.55	peak
5	12585.500	36.15	16.63	52.78	74.00	-21.22	peak
6	17996.500	27.54	23.36	50.90	74.00	-23.10	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)

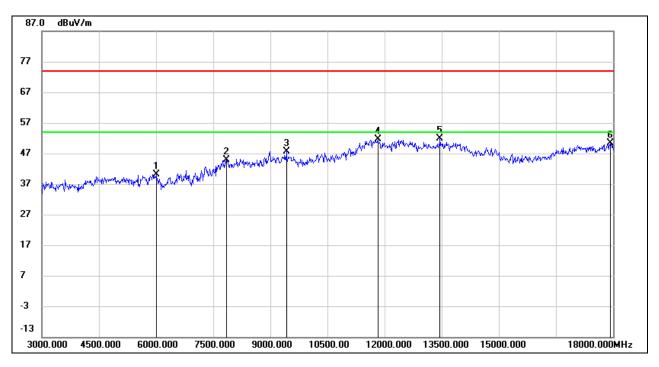


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	3041.500	49.40	-6.98	42.42	74.00	-31.58	peak
2	8279.500	37.40	8.40	45.80	74.00	-28.20	peak
3	8981.000	37.00	9.92	46.92	74.00	-27.08	peak
4	12374.000	34.17	16.86	51.03	74.00	-22.97	peak
5	12716.000	33.85	16.88	50.73	74.00	-23.27	peak
6	17648.000	29.99	21.26	51.25	74.00	-22.75	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	6001.000	38.03	2.20	40.23	74.00	-33.77	peak
2	7846.000	37.36	7.49	44.85	74.00	-29.15	peak
3	9431.000	37.47	10.20	47.67	74.00	-26.33	peak
4	11833.000	34.23	17.30	51.53	74.00	-22.47	peak
5	13460.000	33.43	18.33	51.76	74.00	-22.24	peak
6	17938.000	27.12	23.21	50.33	74.00	-23.67	peak

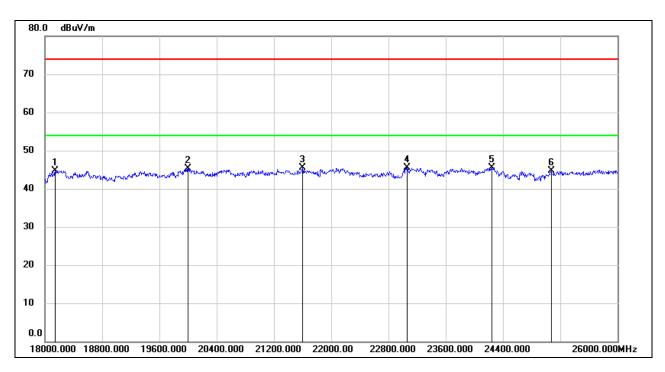
- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



### 8.5. SPURIOUS EMISSIONS (18 GHz ~ 26 GHz)

#### 8.5.1. 802.11n HT20 MODE

#### SPURIOUS EMISSIONS (LOW CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	18144.000	50.27	-5.48	44.79	74.00	-29.21	peak
2	20000.000	50.81	-5.45	45.36	74.00	-28.64	peak
3	21600.000	50.02	-4.54	45.48	74.00	-28.52	peak
4	23064.000	48.99	-3.42	45.57	74.00	-28.43	peak
5	24248.000	48.32	-2.83	45.49	74.00	-28.51	peak
6	25072.000	46.67	-1.97	44.70	74.00	-29.30	peak

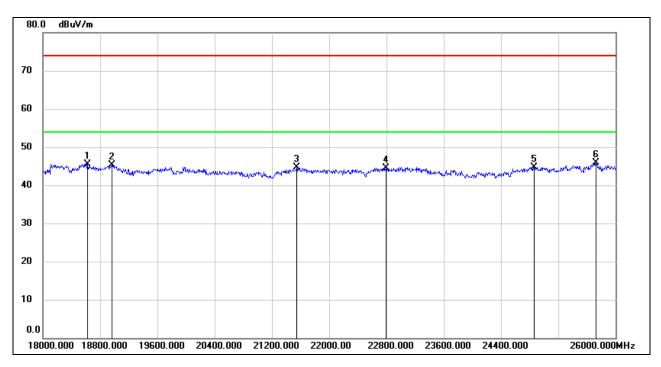
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.



#### SPURIOUS EMISSIONS (LOW CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	18624.000	50.83	-5.34	45.49	74.00	-28.51	peak
2	18960.000	50.51	-5.25	45.26	74.00	-28.74	peak
3	21544.000	49.26	-4.63	44.63	74.00	-29.37	peak
4	22792.000	48.11	-3.65	44.46	74.00	-29.54	peak
5	24864.000	47.03	-2.23	44.80	74.00	-29.20	peak
6	25728.000	46.61	-0.72	45.89	74.00	-28.11	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

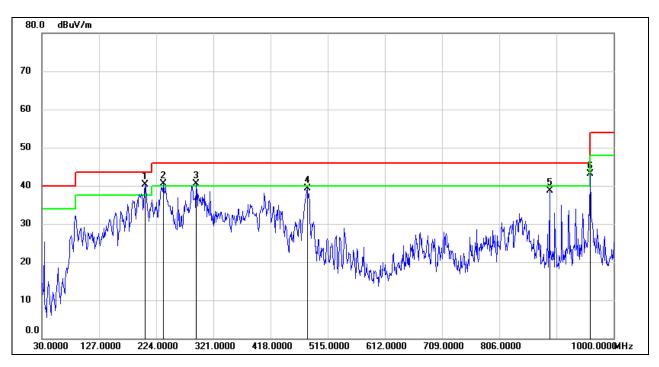
Note: All the modes, channels and antennas had been tested, but only the worst data was recorded in the report.



## 8.6. SPURIOUS EMISSIONS (30 MHz ~ 1 GHz)

#### 8.6.1. 802.11n HT20 MODE

#### SPURIOUS EMISSIONS (LOW CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



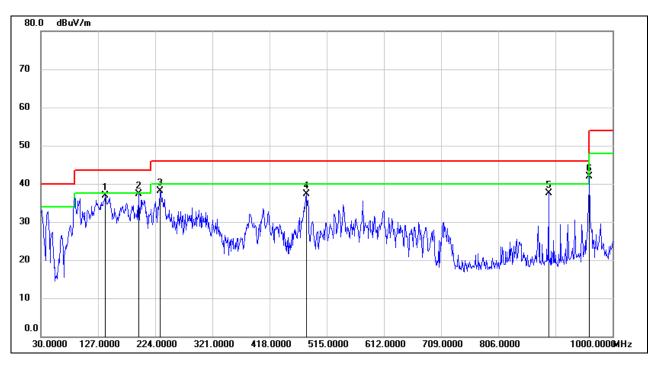
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	205.5700	57.15	-16.88	40.27	43.50	-3.23	QP
2	236.6100	59.42	-19.01	40.41	46.00	-5.59	QP
3	291.9000	56.31	-15.80	40.51	46.00	-5.49	QP
4	481.0500	51.00	-11.78	39.22	46.00	-6.78	QP
5	891.3600	44.04	-5.24	38.80	46.00	-7.20	QP
6	960.2300	47.57	-4.54	43.03	54.00	-10.97	QP

Note: 1. Result Level = Read Level + Correct Factor.

- 2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
- 3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.



SPURIOUS EMISSIONS (LOW CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	139.6100	55.75	-18.87	36.88	43.50	-6.62	QP
2	195.8700	53.74	-16.47	37.27	43.50	-6.23	QP
3	232.7300	56.91	-18.79	38.12	46.00	-7.88	QP
4	480.0800	49.08	-11.79	37.29	46.00	-8.71	QP
5	891.3600	42.68	-5.24	37.44	46.00	-8.56	QP
6	960.2300	46.48	-4.54	41.94	54.00	-12.06	QP

Note: 1. Result Level = Read Level + Correct Factor.

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto

Note: All the modes, channels and antennas had been tested, but only the worst data was recorded in the report.

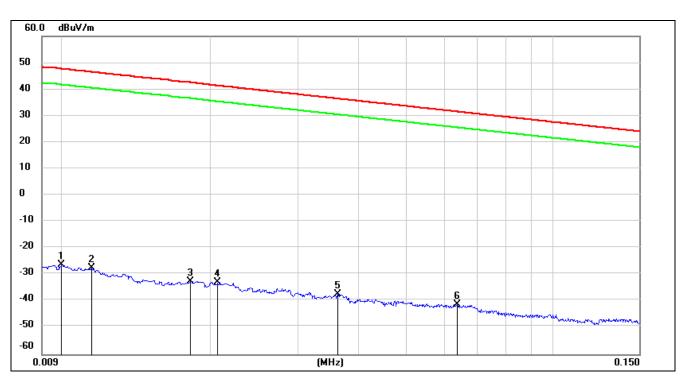


#### 8.7. SPURIOUS EMISSIONS BELOW 30 MHz

#### 8.7.1. 802.11n HT20 MODE

# SPURIOUS EMISSIONS (LOW CHANNEL, LOOP ANTENNA FACE ON TO THE EUT, WORST-CASE CONFIGURATION)

#### 9 kHz ~ 150 kHz



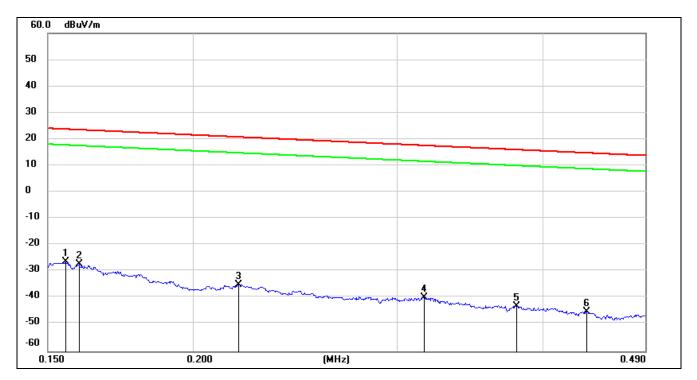
No.	Frequency	Reading	Correct	FCC	FCC	ISED	ISED	Margin	Remark
				Result	Limit	Result	Limit		
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuA/m)	(dBuA/m)	(dB)	
1	0.0100	75.22	-101.40	-26.18	47.6	-77.68	-3.90	-73.78	peak
2	0.0114	73.88	-101.40	-27.52	46.46	-79.02	-5.04	-73.98	peak
3	0.0181	68.85	-101.36	-32.51	42.45	-84.01	-9.05	-74.96	peak
4	0.0206	68.42	-101.35	-32.93	41.32	-84.43	-10.18	-74.25	peak
5	0.0362	64.01	-101.42	-37.41	36.43	-88.91	-15.07	-73.84	peak
6	0.0636	60.31	-101.54	-41.23	31.53	-92.73	-19.97	-72.76	peak

Note: 1. Measurement = Reading Level + Correct Factor (dBuA/m= dBuV/m- 20Log10[120 $\pi$ ] = dBuV/m- 51.5).

- 2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
- 3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.



#### 150 kHz ~ 490 kHz



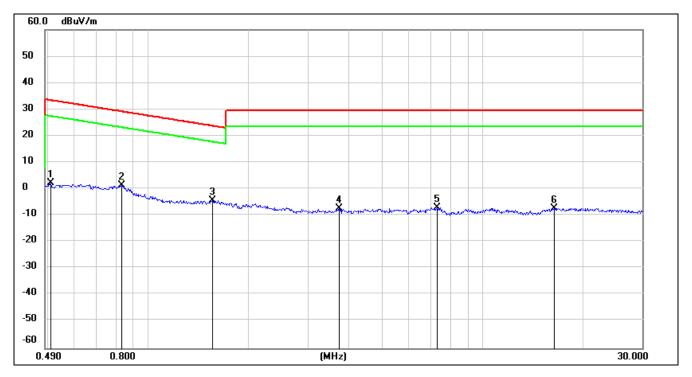
No.	Frequency	Reading	Correct	FCC	FCC	ISED	ISED	Margin	Remark
				Result	Limit	Result	Limit		
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuA/m)	(dBuA/m)	(dB)	
1	0.1554	75.27	-101.65	-26.38	23.77	-77.88	-27.73	-50.15	peak
2	0.1595	74.36	-101.65	-27.29	23.55	-78.79	-27.95	-50.84	peak
3	0.2190	66.77	-101.75	-34.98	20.79	-86.48	-30.71	-55.77	peak
4	0.3163	62.20	-101.87	-39.67	17.6	-91.17	-33.90	-57.27	peak
5	0.3800	59.02	-101.94	-42.92	16.01	-94.42	-35.49	-58.93	peak
6	0.4364	56.86	-101.99	-45.13	14.8	-96.63	-36.70	-59.93	peak

Note: 1. Measurement = Reading Level + Correct Factor (dBuA/m= dBuV/m- 20Log10[120 $\pi$ ] = dBuV/m- 51.5).

- 2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
- 3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.



#### 490 kHz ~ 30 MHz



No.	Frequency	Reading	Correct	FCC	FCC	ISED	ISED	Margin	Remark
				Result	Limit	Result	Limit		
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuA/m)	(dBuA/m)	(dB)	
1	0.5106	64.30	-62.07	2.23	33.44	-49.27	-18.06	-31.21	peak
2	0.8296	63.44	-62.17	1.27	29.23	-50.23	-22.27	-27.96	peak
3	1.5564	57.68	-62.02	-4.34	23.76	-55.84	-27.74	-28.10	peak
4	3.7100	54.20	-61.41	-7.21	29.54	-58.71	-21.96	-36.75	peak
5	7.3361	54.08	-61.17	-7.09	29.54	-58.59	-21.96	-36.63	peak
6	16.3959	53.67	-60.96	-7.29	29.54	-58.79	-21.96	-36.83	peak

Note: 1. Measurement = Reading Level + Correct Factor (dBuA/m= dBuV/m- 20Log10[120 $\pi$ ] = dBuV/m- 51.5).

- 2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
- 3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.

Note: All the modes, channels and antennas had been tested, but only the worst data was recorded in the report.



#### 9. AC POWER LINE CONDUCTED EMISSIONS

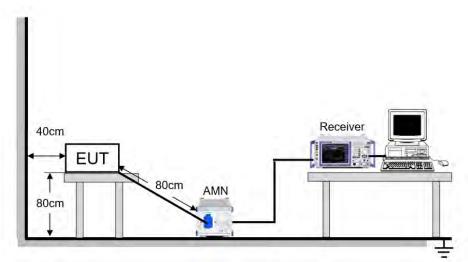
#### **LIMITS**

Please refer to CFR 47 FCC §15.207 (a).

FREQUENCY (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

#### **TEST SETUP AND PROCEDURE**

Refer to ANSI C63.10-2013 clause 6.2.



The EUT is put on a table of non-conducting material that is 80 cm high. The vertical conducting wall of shielding is located 40 cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10-2013. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9 kHz.

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

#### **TEST ENVIRONMENT**

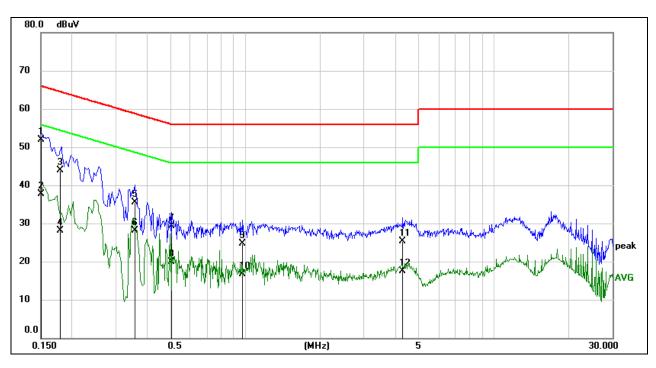
Temperature	25.2 °C	Relative Humidity	67.2 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 5 V



#### **RESULTS**

#### 9.1. 802.11n HT20 MODE

#### LINE L RESULTS (LOW CHANNEL, WORST-CASE CONFIGURATION)



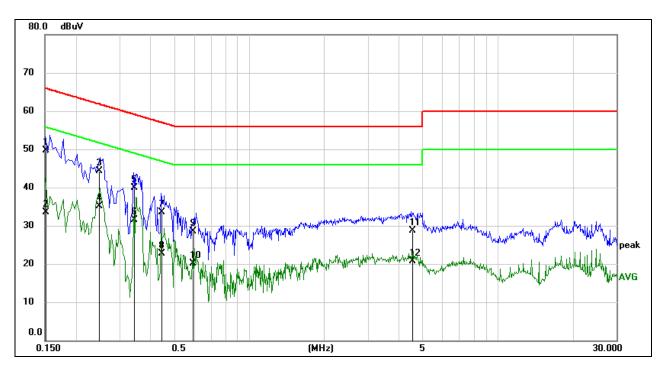
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.1505	42.27	9.59	51.86	65.97	-14.11	QP
2	0.1505	28.18	9.59	37.77	55.97	-18.20	AVG
3	0.1792	34.29	9.59	43.88	64.52	-20.64	QP
4	0.1792	18.61	9.59	28.20	54.52	-26.32	AVG
5	0.3601	26.00	9.59	35.59	58.73	-23.14	QP
6	0.3601	18.55	9.59	28.14	48.73	-20.59	AVG
7	0.5057	19.62	9.60	29.22	56.00	-26.78	QP
8	0.5057	10.32	9.60	19.92	46.00	-26.08	AVG
9	0.9709	15.05	9.61	24.66	56.00	-31.34	QP
10	0.9709	7.09	9.61	16.70	46.00	-29.30	AVG
11	4.3229	15.61	9.60	25.21	56.00	-30.79	QP
12	4.3229	7.95	9.60	17.55	46.00	-28.45	AVG

Note: 1. Result = Reading +Correct Factor.

- 2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Test setup: RBW: 200 Hz (9 kHz ~ 150 kHz), 9 kHz (150 kHz ~ 30 MHz).
- 4. Step size: 80 Hz (0.009 MHz  $\sim$  0.15 MHz), 4 kHz (0.15 MHz  $\sim$  30 MHz), Scan time: auto.



#### **LINE N RESULTS (MID CHANNEL, WORST-CASE CONFIGURATION)**



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.1519	40.17	9.59	49.76	65.90	-16.14	QP
2	0.1519	23.93	9.59	33.52	55.90	-22.38	AVG
3	0.2477	34.77	9.59	44.36	61.83	-17.47	QP
4	0.2477	25.47	9.59	35.06	51.83	-16.77	AVG
5	0.3460	30.38	9.59	39.97	59.06	-19.09	QP
6	0.3460	21.95	9.59	31.54	49.06	-17.52	AVG
7	0.4456	23.87	9.60	33.47	56.96	-23.49	QP
8	0.4456	13.13	9.60	22.73	46.96	-24.23	AVG
9	0.5940	18.92	9.60	28.52	56.00	-27.48	QP
10	0.5940	10.52	9.60	20.12	46.00	-25.88	AVG
11	4.5398	19.19	9.61	28.80	56.00	-27.20	QP
12	4.5398	11.02	9.61	20.63	46.00	-25.37	AVG

Note: 1. Result = Reading +Correct Factor.

- 2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Test setup: RBW: 200 Hz (9 kHz ~ 150 kHz), 9 kHz (150 kHz ~ 30 MHz).
- 4. Step size: 80 Hz (0.009 MHz ~ 0.15 MHz), 4 kHz (0.15 MHz ~ 30 MHz), Scan time:

auto.

Note: All the modes and channels had been tested, but only the worst data was recorded in the report.

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#### 10. ANTENNA REQUIREMENTS

#### **APPLICABLE REQUIREMENTS**

Please refer to FCC §15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

#### Please refer to FCC §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 transmitting 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.

#### **RESULTS**

Complies



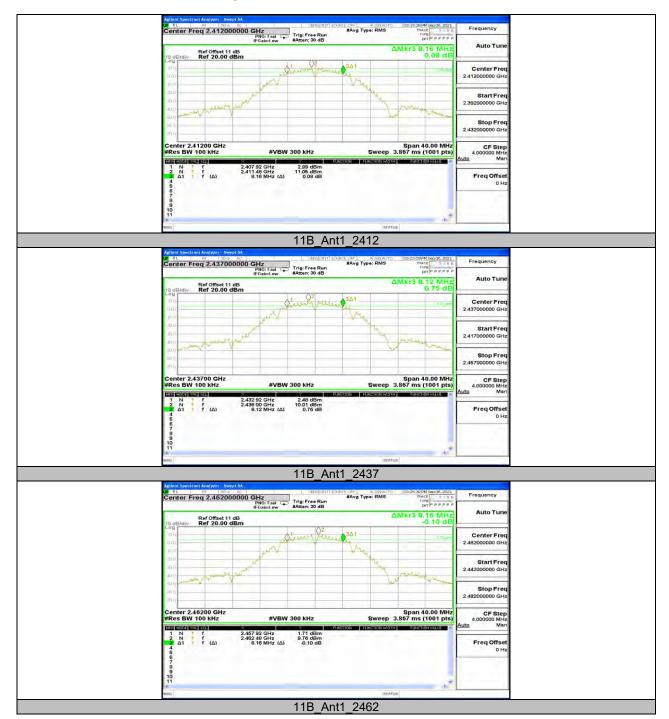
# 11. Appendix

# 11.1. Appendix A: DTS Bandwidth 11.1.1. Test Result

Test Mode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
		2412	8.160	2407.920	2416.080	0.5	PASS
11B	Ant1	2437	8.120	2432.920	2441.040	0.5	PASS
		2462	8.160	2457.920	2466.080	0.5	PASS
		2412	16.400	2403.800	2420.200	0.5	PASS
11G	Ant1	2437	16.400	2428.800	2445.200	0.5	PASS
		2462	16.400	2453.800	2470.200	0.5	PASS
		2412	17.640	2403.160	2420.800	0.5	PASS
11N20SISO	Ant1	2437	17.640	2428.160	2445.800	0.5	PASS
		2462	17.680	2453.160	2470.840	0.5	PASS
		2422	36.480	2403.760	2440.240	0.5	PASS
11N40SISO	Ant1	2437	36.480	2418.760	2455.240	0.5	PASS
		2452	36.480	2433.760	2470.240	0.5	PASS
		2412	19.080	2402.480	2421.560	0.5	PASS
11AX20SISO	Ant1	2437	19.040	2427.480	2446.520	0.5	PASS
		2462	18.960	2452.520	2471.480	0.5	PASS
		2422	38.080	2402.960	2441.040	0.5	PASS
11AX40SISO	Ant1	2437	38.080	2417.880	2455.960	0.5	PASS
		2452	38.160	2432.880	2471.040	0.5	PASS



#### 11.1.2. Test Graphs

























# 11.2. Appendix B: Occupied Channel Bandwidth 11.2.1. Test Result

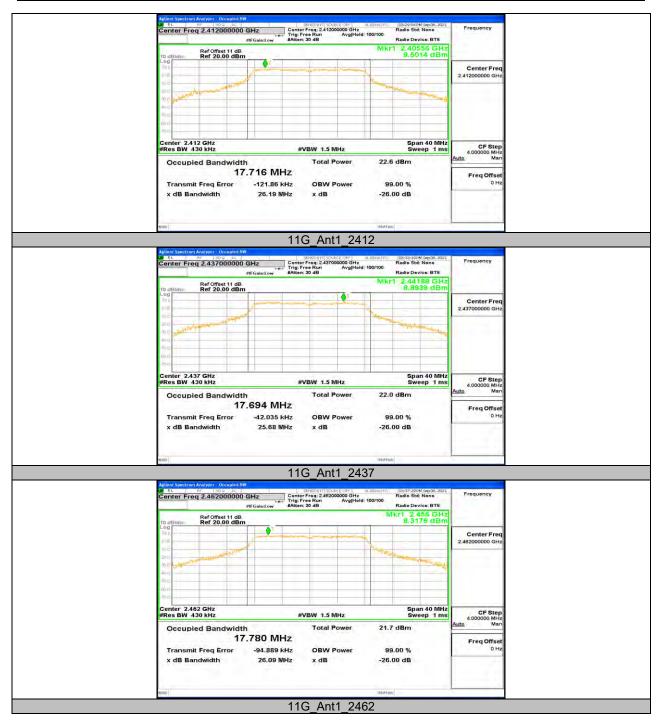
Test Mode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Verdict
		2412	12.558	2405.699	2418.257	PASS
11B	Ant1	2437	12.534	2430.733	2443.267	PASS
		2462	12.517	2455.752	2468.269	PASS
		2412	17.716	2403.020	2420.736	PASS
11G	Ant1	2437	17.694	2428.111	2445.805	PASS
		2462	17.780	2453.015	2418.257 2443.267 2468.269 2420.736	PASS
		2412	18.868	2402.508	2421.376	PASS
11N20SISO	Ant1	2437	18.997	2427.435	2446.432	PASS
		2462	18.943	2452.529	2471.472	PASS
		2422	37.375	2403.188	2440.563	PASS
11N40SISO	Ant1	2437	37.189	2418.322	2455.511	PASS
		2452	37.154	2433.359	2470.513	PASS
		2412	19.536	2402.216	2421.752	PASS
11AX20SISO	Ant1	2437	19.360	2427.322	2446.682	PASS
		2462	19.462	2452.302	2471.764	PASS
		2422	38.352	2402.724	2441.076	PASS
11AX40SISO	Ant1	2437	38.466	2417.649	2456.115	PASS
		2452	38.241	2432.810	2471.051	PASS



#### 11.2.2. Test Graphs

























### 11.3. Appendix C: Maximum Average Conducted Output Power 11.3.1. Test Result

Test Mode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
		2412	8.63	≤30	PASS
11B	Ant1	2437	8.23	≤30	PASS
		2462	7.98	≤30	PASS
		2412	5.90	≤30	PASS
11G	Ant1	2437	5.97	≤30	PASS
		2462	5.49	≤30	PASS
		2412	12.73	≤30	PASS
11N20SISO	Ant1	2437	12.44	≤30	PASS
		2462	12.67	≤30	PASS
		2422	12.16	≤30	PASS
11N40SISO	Ant1	2437	11.79	≤30	PASS
		2452	12.66	≤30	PASS
		2412	12.73	≤30	PASS
11AX20SISO	Ant1	2437	10.81	≤30	PASS
		2462	11.65	≤30	PASS
		2422	12.15	≤30	PASS
11AX40SISO	Ant1	2437	10.69	≤30	PASS
		2452	11.59	≤30	PASS

Note: 1. Conducted Power=Meas. Level+ Correction Factor

<sup>2.</sup> The Duty Cycle Factor (refer to section 7.1) had already compensated to the test data.

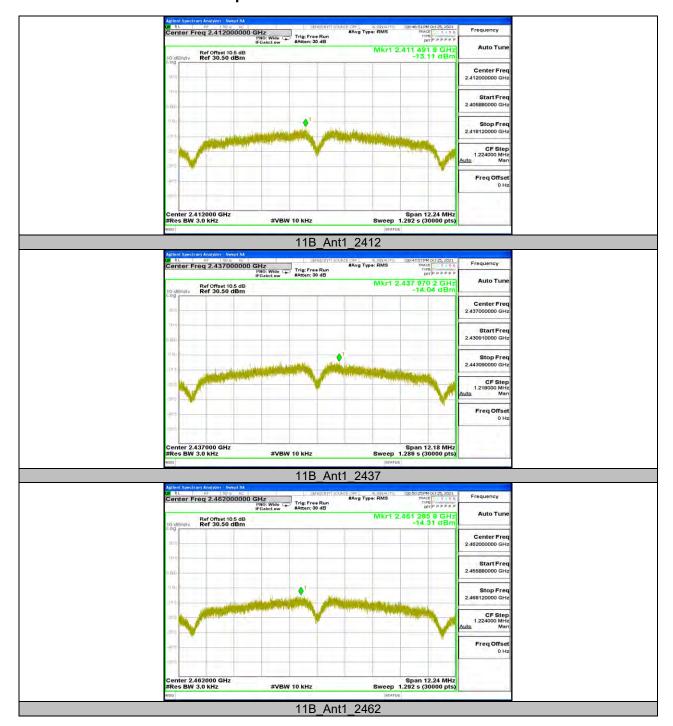


# 11.4. Appendix D: Maximum Power Spectral Density 11.4.1. Test Result

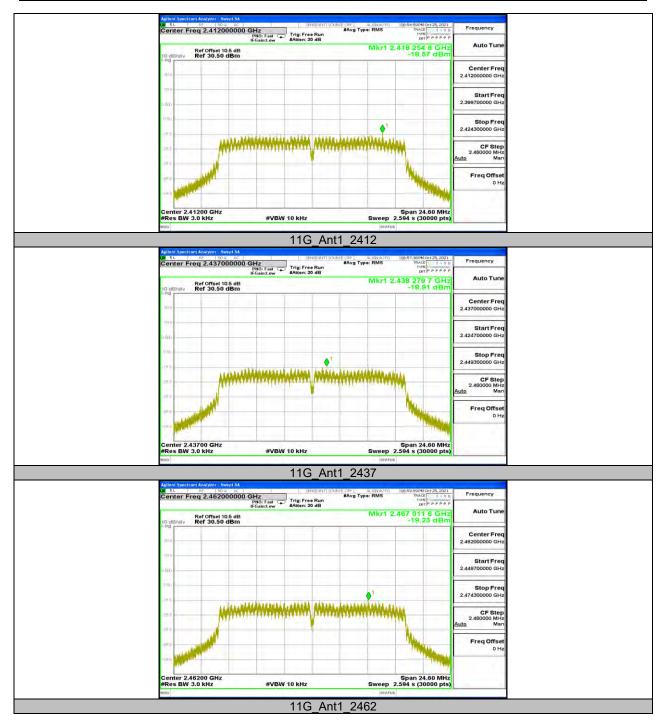
Test Mode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
		2412	-13.11	≤8	PASS
11B	Ant1	2437	-14.04	≤8	PASS
		2462	-14.31	≤8	PASS
		2412	-18.57	≤8	PASS
11G	Ant1	2437	-18.91	≤8	PASS
		2462	-19.23	≤8	PASS
	Ant1	2412	-12.53	≤8	PASS
11N20SISO		2437	-12.03	≤8	PASS
		2462	-11.88	≤8	PASS
		2422	-14.93	≤8	PASS
11N40SISO	Ant1	2437	-14.69	≤8	PASS
		2452	-14.54	≤8	PASS
		2412	-12.11	≤8	PASS
11AX20SISO	Ant1	2437	-13.2	≤8	PASS
		2462	-13.11	≤8	PASS
		2422	-15.25	≤8	PASS
11AX40SISO	Ant1	2437	-15.63	≤8	PASS
		2452	-16.09	≤8	PASS



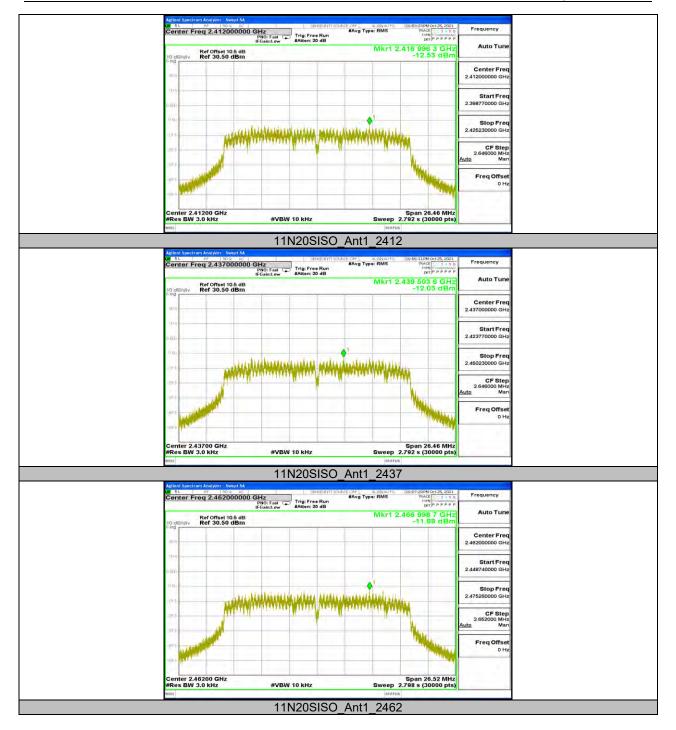
#### 11.4.2. Test Graphs



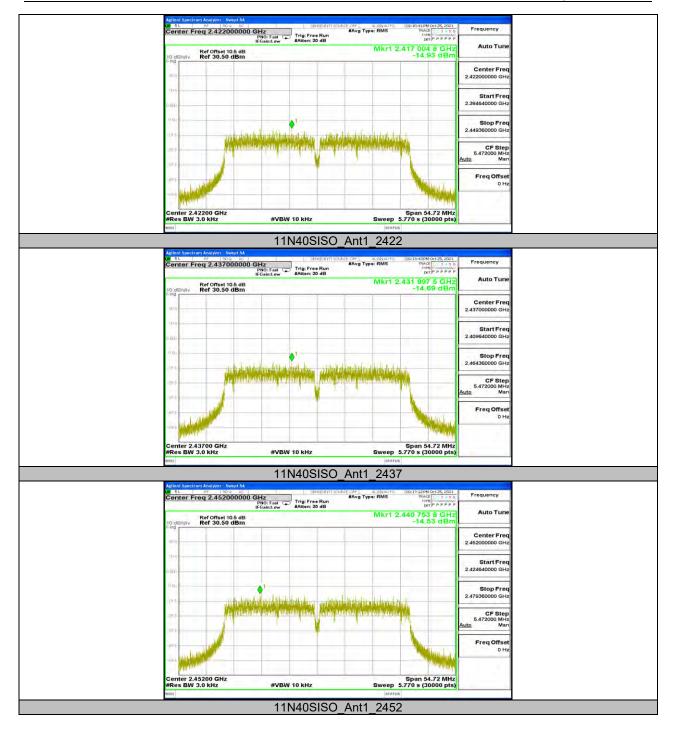




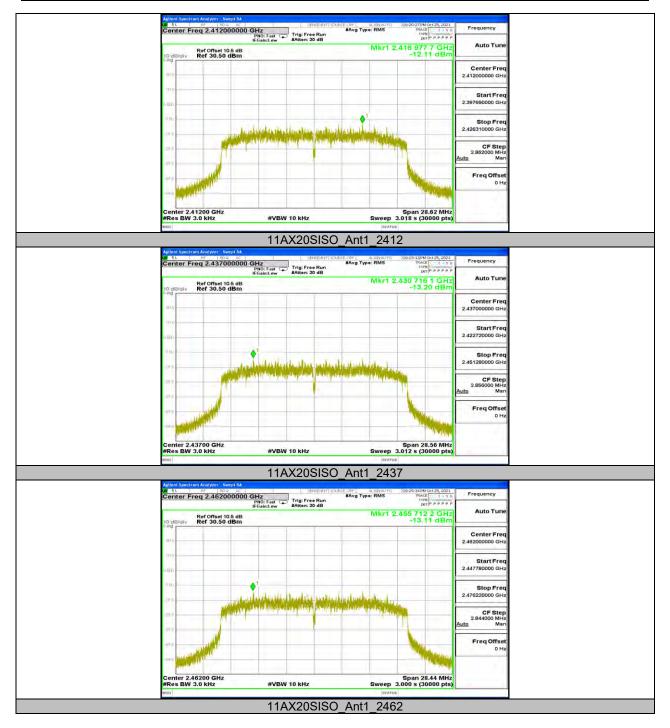




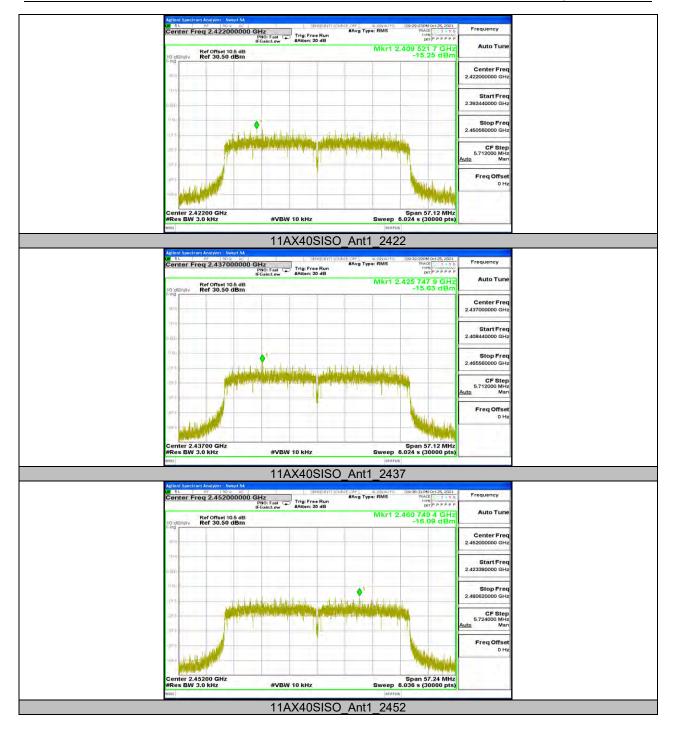














11.5. Appendix E: Band Edge Measurements 11.5.1. Test Result

Test Mode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	1.04	-41.46	≤-28.96	PASS
IID	Anti	High	2462	0.10	-48.06	≤-29.9	PASS
11G	Ant1	Low	2412	-4.70	-38.6	≤-34.7	PASS
116	Anti	High	2462	-5.49	-48.19	≤-35.49	PASS
441000100	Ant1	Low	2412	2.10	-33.28	≤-27.9	PASS
11N20SISO		High	2462	1.94	-46.41	≤-28.06	PASS
11N40SISO	Ant1	Low	2422	-1.79	-35.02	≤-31.79	PASS
		High	2452	-1.38	-39.3	≤-31.38	PASS
44AV000100	Ant1	Low	2412	2.06	-33.04	≤-27.94	PASS
11AX20SISO		High	2462	0.91	-48.16	≤-29.09	PASS
11AX40SISO	A m+1	Low	2422	-1.88	-32.75	≤-31.88	PASS
	Ant1	High	2452	-2.55	-41.9	≤-32.55	PASS



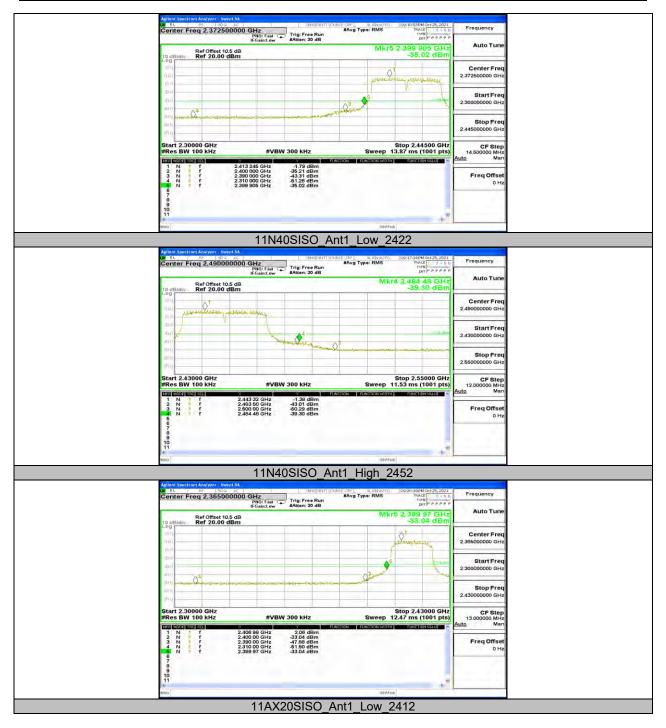
#### 11.5.2. Test Graphs

















### 11.6. Appendix F: Conducted Spurious Emission 11.6.1. Test Result

Test Mode	Antenna	Channel	FreqRange [Mhz]	Result [dBm]	Limit [dBm]	Verdict
			Reference	0.87		PASS
		2412	30~1000	-57.94	≤-29.14	PASS
			1000~26500	-43.65	≤-29.14	PASS
			Reference	-0.22	-	PASS
11B	Ant1	2437	30~1000	-58.38	≤-30.22	PASS
			1000~26500	-43.78	≤-30.22	PASS
			Reference	-0.34	-	PASS
		2462	30~1000	-57.67	≤-30.34	PASS
			1000~26500	-45.98	≤-30.34	PASS
			Reference	-4.78		PASS
		2412	30~1000	-58.37	≤-34.78	PASS
			1000~26500	-47.19	≤-34.78	PASS
			Reference	-4.93		PASS
11G	Ant1	2437	30~1000	Reference       -4.93         30~1000       -1000         1000~26500       -47.61         Reference       -5.24         30~1000       -1000         1000~26500       -47.85         Reference       2.12         30~1000       -1000         1000~26500       -42.93         Reference       2.19         30~1000       -58.34         1000~26500       -44.54         Reference       1.97         30~1000       -58.41         1000~26500       -45.11         Reference       -1.82         30~1000       -58.17	≤-34.93	PASS
					≤-34.93	PASS
			Reference	-5.24		PASS
		2462	30~1000	-1000	≤-35.24	PASS
			1000~26500	-47.85	≤-35.24	PASS
			Reference	2.12	-	PASS
		2412	30~1000	-1000	≤-27.88	PASS
			1000~26500		≤-27.88	PASS
			Reference		-	PASS
11N20SISO	Ant1	2437	30~1000	-58.34	≤-27.81	PASS
			1000~26500	-44.54	≤-27.81	PASS
			Reference	1.97		PASS
		2462	30~1000	-58.41	≤-28.03	PASS
			1000~26500	-45.11	≤-28.03	PASS
			Reference	-1.82	-	PASS
	Ant1	2422	30~1000	-58.17	≤-31.82	PASS
			1000~26500		≤-31.82	PASS
			Reference	-1.39		PASS
11N40SISO		2437	30~1000	-1000	≤-31.39	PASS
			1000~26500	-41.84	≤-31.39	PASS
			Reference	-1.36		PASS
		2452	30~1000	-1000	≤-31.36	PASS
			1000~26500	-43.1	≤-31.36	PASS
			Reference	2.03		PASS
		2412	30~1000	-58.6	≤-27.97	PASS
			1000~26500	-43.62	≤-27.97	PASS
			Reference	1.12		PASS
11AX20SISO	Ant1	2437	30~1000	-58.11	≤-28.88	PASS
			1000~26500	-42.77	≤-28.88	PASS
			Reference	0.90		PASS
		2462	30~1000	-1000	≤-29.1	PASS
	1		1000~26500	-44.96	≤-29.1	PASS
	1		Reference	-1.85		PASS
		2422	30~1000	-57.96	≤-31.85	PASS
			1000~26500	-42.05	≤-31.85	PASS
11AX40SISO	Ant1		Reference	-2.47		PASS
117/14/00100		2437	30~1000	-1000	≤-32.47	PASS
		2452	1000~26500	-38.12	≤-32.47	PASS
			Reference	-2.52		PASS
		2702	30~1000	-1000	≤-32.52	PASS



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	1000~26500	-39.24	≤-32.52	PASS

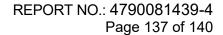


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#### 11.6.2. Test Graphs

Conducted Spurious Emission





11.7. Appendix G: Duty Cycle 11.7.1. Test Result

Test Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)	Final setting For VBW (kHz)
11B	12.23	12.28	0.9959	99.59	0.02	0.08	0.01
11G	2.03	2.15	0.9442	94.42	0.25	0.49	0.5
11N20SISO	1.89	2.12	0.8915	89.15	0.50	0.53	1
11N40SISO	0.93	1.10	0.8455	84.55	0.73	1.08	2
11AX20SISO	1.45	1.62	0.8951	89.51	0.48	0.69	1
11AX40SISO	0.75	0.93	0.8065	80.65	0.93	1.33	2

Note:

Duty Cycle Correction Factor=10log (1/x).

Where: x is Duty Cycle (Linear)

Where: T is On Time

If that calculated VBW is not available on the analyzer then the next higher value should be

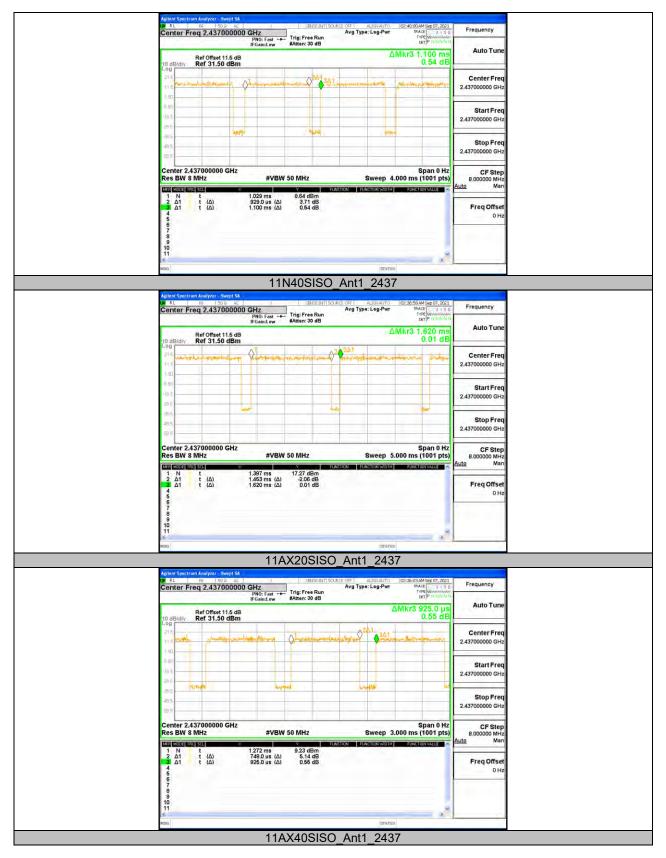
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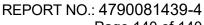


#### 11.7.2. Test Graphs











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**END OF REPORT**