

# CFR 47 FCC PART 15 SUBPART C TEST REPORT

For

In-cab advanced telematics tracker

MODEL NUMBER: FT750-L430-GL

FCC ID: 2AP3PFT750

REPORT NUMBER: 4789043452.2-2

ISSUE DATE: July 5, 2019

Prepared for

Flex Industrial, Ltd.
Level 3, Alexander House, 35 Cybercity, Ebene, Mauritius

#### Prepared by

UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch Building 10, Innovation Technology Park, No. 1, Li Bin Road, Song Shan Lake Hi-Tech Development Zone Dongguan, People's Republic of China

> Tel: +86 769 22038881 Fax: +86 769 33244054 Website: www.ul.com



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Revision	1 110101 9

Rev.	Issue Date	Revisions	Revised By
V0	07/05/2019	Initial Issue	



Summary of Test Results				
Clause	Test Items	FCC/IC Rules	Test Results	
1	6dB Bandwidth and 99% Occupied Bandwidth	FCC Part 15.247 (a) (2)	Pass	
2	Peak Conducted Output Power	FCC Part 15.247 (b) (3)	Pass	
3	Power Spectral Density	FCC Part 15.247 (e)	Pass	
4	Conducted Bandedge and Spurious Emission	FCC Part 15.247 (d)	Pass	
5	Radiated Bandedge and Spurious Emission	FCC Part 15.247 (d) FCC Part 15.209 FCC Part 15.205	Pass	
6	Conducted Emission Test For AC Power Port	FCC Part 15.207	N/A	
7	Antenna Requirement	FCC Part 15.203	Pass	



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#### 1. ATTESTATION OF TEST RESULTS

**Applicant Information** 

Company Name: Flex Industrial, Ltd.

Address: Level 3, Alexander House, 35 Cybercity, Ebene, Mauritius

**Manufacturer Information** 

Company Name: Flex Industrial, Ltd.

Address: Level 3, Alexander House, 35 Cybercity, Ebene, Mauritius

**EUT Information** 

EUT Name: In-cab advanced telematics tracker

Model: FT750-L430-GL

Sample Status:

Sample ID:

Sample Received Date:

Date of Tested:

Normal

2361606

June 14, 2019

June 19 ~ 28, 2019

APPLICABLE STANDARDS			
STANDARD TEST RESULTS			
CFR 47 FCC PART 15 SUBPART C	PASS		

Prepared By: Checked By:

Jacky Jang Shemy lier

Jacky Jiang Shawn Wen Engineer Project Associate Laboratory Leader

Approved By:

Stephen Guo

Laboratory Manager



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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.

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
Accreditation	IC(Company No.: 21320)
Certificate	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.
	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 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30MHz 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:

Test Item	Uncertainty
Conduction emission	3.62dB
Radiation Emission test(include Fundamental emission) (9kHz-30MHz)	2.2dB
Radiation Emission test(include Fundamental emission) (30MHz-1GHz)	4.00dB
Radiation Emission test (1GHz to 26GHz)( include Fundamental emission)	5.78dB (1GHz-18Gz)
(1.5.12 to 255112)( marado i directino interiorità o modio i)	5.23dB (18GHz-26Gz)

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

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# 5. EQUIPMENT UNDER TEST

# 5.1. DESCRIPTION OF EUT

EUT Name	In-cab advanced telematics tracker
Model	FT750-L430-GL
Radio Technology	IEEE802.11b/g/n HT20
Operation Description	IEEE 802.11b: 2412MHz—2462MHz IEEE 802.11g: 2412MHz—2462MHz IEEE 802.11n HT20: 2412MHz—2462MHz
Modulation	IEEE 802.11b: DSSS(CCK) IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK)
Rate Input	DC 12V/24V
Battery	3.7V 1300mAh
Hardware Version	P2
Software Version	2.0.14

# **5.2. MAXIMUM OUTPUT POWER**

Number of Transmit Chains (NTX)	IEE Std. 802.11	Frequency (MHz)	Channel Number	Max PK Conducted Power (dBm)
1	IEEE 802.11b	2412-2462	1-11[11]	21.71
1	IEEE 802.11g	2412-2462	1-11[11]	17.92
1	IEEE 802.11nHT20	2412-2462	1-11[11]	17.49

#### 5.3. CHANNEL LIST

	Channel List for 802.11b/g/n (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	/	/

# 5.4. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel	Frequency
WiFi TX(802.11b)	CH 1, CH 6, CH 11	2412MHz, 2437MHz, 2462MHz
WiFi TX(802.11g)	CH 1, CH 6, CH 11	2412MHz, 2437MHz, 2462MHz
WiFi TX(802.11n HT20)	CH 1, CH 6, CH 11	2412MHz, 2437MHz, 2462MHz



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# 5.5. THE WORST CASE CONFIGURATIONS

The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band							
Test Softv	vare			ESP_RF_tes	st_tool_v1.1.0		
	Transmit			Test C	Channel		
Modulation Mode	Antenna		NCB: 20MH		NCB: 40MHz		
Mode	Number	CH 1	CH 6	CH 11	CH 3	CH 6	CH 9
802.11b	1	default	default	default			
802.11g	1	20 20 20			/		
802.11n HT20	1	20	20	20			

# 5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
1	2412-2462	PCB Antenna	1.00

Test Mode Transmit and Receive Mode		Description	
IEEE 802.11b	⊠1TX, 1RX	Antenna 1 can be used as transmitting/receivir antenna.	
IEEE 802.11g	⊠1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.	
IEEE 802.11n HT20	⊠1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.	



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#### 5.7. DESCRIPTION OF TEST SETUP

#### **SUPPORT EQUIPMENT**

Item	Equipment	Brand Name	Model Name	P/N
1	PC	Dell	Vostro 3902	8KNDDB2

#### **I/O CABLES**

Item	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB to Serial cable	/	N/A	1.0	/

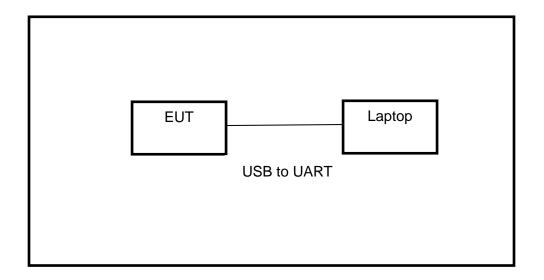
#### **ACCESSORIES**

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

#### **TEST SETUP**

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

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





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# 6. MEASURING INSTRUMENT AND SOFTWARE USED

	Conducted Emissions								
	Instrument								
Used	Equipment	Manufacturer	Mo	del	No.	Seri	al No.	Last Cal.	Next Cal.
<b>V</b>	EMI Test Receiver	R&S	E	ESF	3	10	1961	Dec.10,2018	Dec.10,2019
V	Two-Line V- Network	R&S	El	NV2	216	10 <sup>-</sup>	1983	Dec.10,2018	Dec.10,2019
V	Artificial Mains Networks	Schwarzbeck	NS	LK 8	8126	812	6465	Dec.10,2018	Dec.10,2019
			So	ftwa	re				
Used	Des	cription			Manu	ıfactı	ırer	Name	Version
V	Test Software for C	Conducted distu	rbanc	е	F	arad		EZ-EMC	Ver. UL-3A1
		Rad	iated	l En	nissio	ns			
			Inst	rum	ent				
Used	Equipment	Manufacturer	Mo	del	No.	Seri	al No.	Last Cal.	Next Cal.
V	MXE EMI Receiver	KESIGHT	N	903	8A		56400 36	Dec.10,2018	Dec.10,2019
V	Hybrid Log Periodic Antenna	TDK	HLF	<b>-</b> 3(	003C	130	0960	Sep.17, 2018	Sep.17, 2021
V	Preamplifier	HP	8	3447	7D		4A090 99	Dec.10,2018	Dec.10,2019
V	EMI Measurement Receiver	R&S	Е	SR	26	10 <sup>-</sup>	1377	Dec.10,2018	Dec.10,2019
$\checkmark$	Horn Antenna	TDK	HR	N-C	)118	130	0939	Sep.17, 2018	Sep.17, 2021
V	High Gain Horn Antenna	Schwarzbeck	BBI	HA-	9170		91	Aug.11, 2018	Aug.11, 2021
V	Preamplifier	TDK	PA-	02-	0118	00	S-305- 1066	Dec.10,2018	Dec.10,2019
V	Preamplifier	TDK	P	A-0	2-2	_	S-307- 003	Dec.10,2018	Dec.10,2019
V	Loop antenna	Schwarzbeck		519		00	800	Mar.26,2016	Mar.25, 2019
V	Band Reject Filter	Wainwright	235 24	WRCJV8- 2350-2400- 2483.5- 2533.5-40SS			4	Dec.10,2018	Dec.10,2019
V	High Pass Filter	Wi	WHKX10- 2700-3000- 18000-40SS		2	23	Dec.10,2018	Dec.10,2019	
			So	ftwa	are				
Used	Descr	iption		Ма	nufact	urer		Name	Version
V	Test Software for R	adiated disturba	nce		Farad	l		EZ-EMC	Ver. UL-3A1
		Oth	ner in	str	ument	ts			



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Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
<b>V</b>	Spectrum Analyzer	Keysight	N9030A	MY55410512	Dec.10,2018	Dec.10,2019
	Power Meter	Keysight	N1911A	MY55416024	Dec.10,2018	Dec.10,2019
<b>V</b>	Power Sensor	Keysight	U2021XA	MY5100022	Dec.10,2018	Dec.10,2019

# 7. MEASUREMENT METHODS

No.	Test Item	KDB Name	Section
1	6dB Bandwidth	KDB 558074 D01 15.247 Meas Guidance v05r02	8.2
2	Peak Output Power	KDB 558074 D01 15.247 Meas Guidance v05r02	8.3.1.3/8.3.2.3
3	Power Spectral Density	KDB 558074 D01 15.247 Meas Guidance v05r02	8.4
4	Out-of-band emissions in non- restricted bands	KDB 558074 D01 15.247 Meas Guidance v05r02	8.5
5	Out-of-band emissions in restricted bands	KDB 558074 D01 15.247 Meas Guidance v05r02	8.6
6	Band-edge	KDB 558074 D01 15.247 Meas Guidance v05r02	8.7
7	Conducted Emission Test For AC Power Port	ANSI C63.10-2013	6.2
8	99% Bandwidth	ANSI C63.10-2013	6.9.3



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#### 8. ANTENNA PORT TEST RESULTS

#### 8.1. ON TIME AND DUTY CYCLE

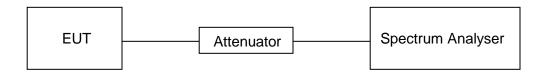
#### **LIMITS**

None; for reporting purposes only

#### **PROCEDURE**

KDB 558074 Zero-Span Spectrum Analyzer Method

#### **TEST SETUP**



#### **TEST ENVIRONMENT**

Temperature	24.4°C	Relative Humidity	53%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.7V

#### **RESULTS**

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	4.185	4.712	0.888	88.82%	0.5158	0.24	1
11g	0.687	0.795	0.864	86.42%	0.6349	1.46	2
11n20	0.651	0.760	0.857	85.66%	0.6702	1.54	2

Note:

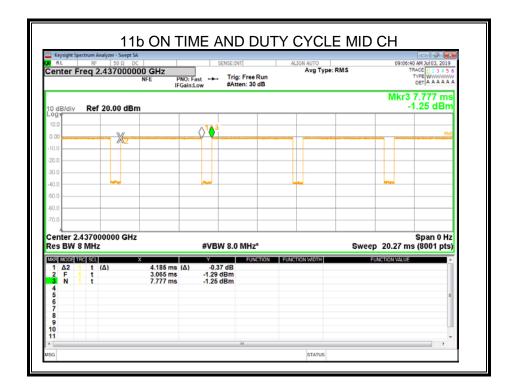
Duty Cycle Correction Factor=10log (1/x).

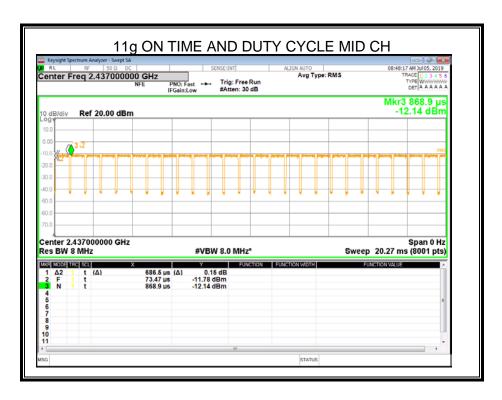
Where: x is Duty Cycle (Linear)

Where: T is On Time

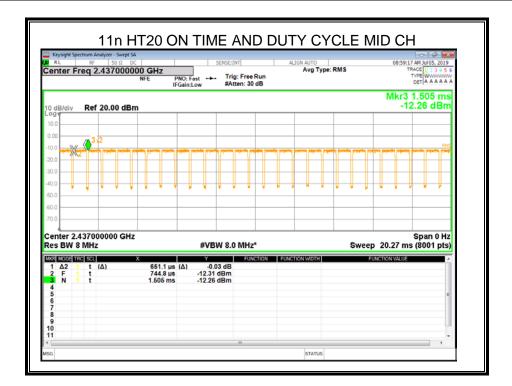
If that calculated VBW is not available on the analyzer then the next higher value should be used.











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#### 8.2. 6 dB DTS BANDWIDTH AND 99% OCCUPIED BANDWIDTH

#### **LIMITS**

CFR 47 FCC Part15 (15.247) Subpart C						
Section	Test Item	Limit	Frequency Range (MHz)			
CFR 47 FCC 15.247(a)(2)	6 dB Bandwidth	≥ 500KHz	2400-2483.5			

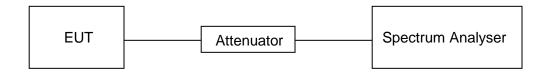
#### **TEST PROCEDURE**

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

Center Frequency	The centre frequency of the channel under test
Detector	Peak
IRRW	For 6dB Bandwidth :100K For 99% Occupied Bandwidth :1% to 5% of the occupied bandwidth
IV/RV//	For 6dB Bandwidth : ≥3 × RBW For 99% Occupied Bandwidth : approximately 3×RBW
Trace	Max hold
Sweep	Auto couple

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 and 99% relative to the maximum level measured in the fundamental emission.

#### **TEST SETUP**





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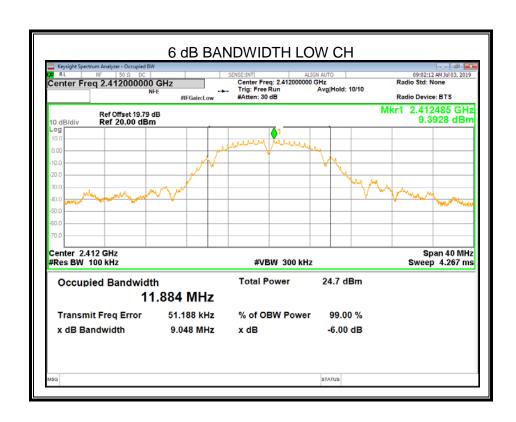
#### **TEST ENVIRONMENT**

Temperature	24.4°C	Relative Humidity	53%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.7V

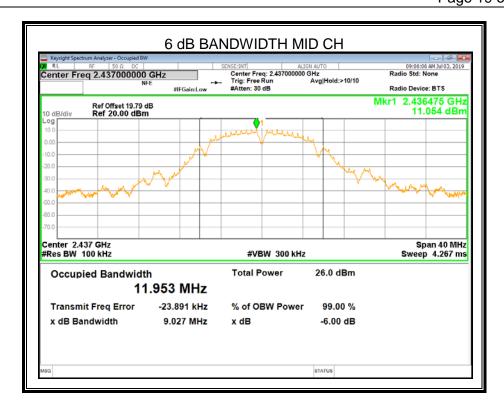
#### **RESULTS**

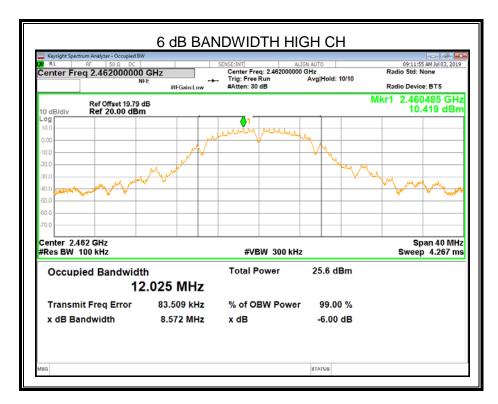
#### 8.2.1. 802.11b MODE

Channel	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
Low	9.048	11.923	≥500	Pass
Middle	9.027	11.967	≥500	Pass
High	8.572	12.054	≥500	Pass

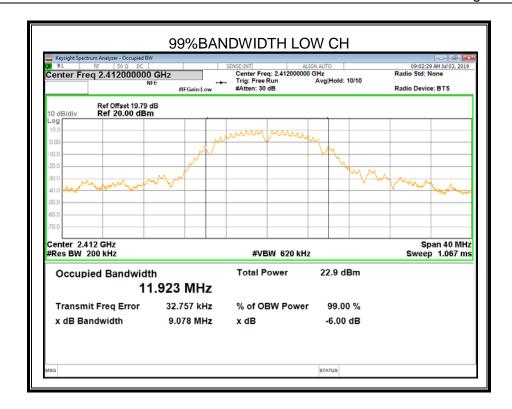


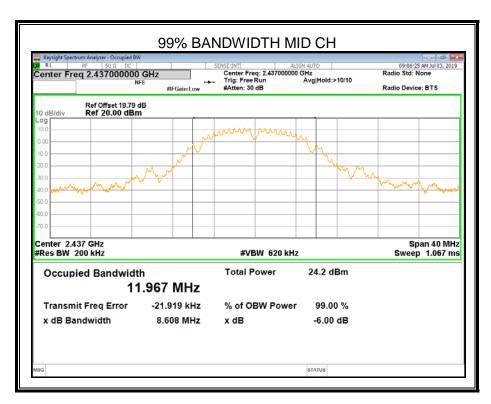




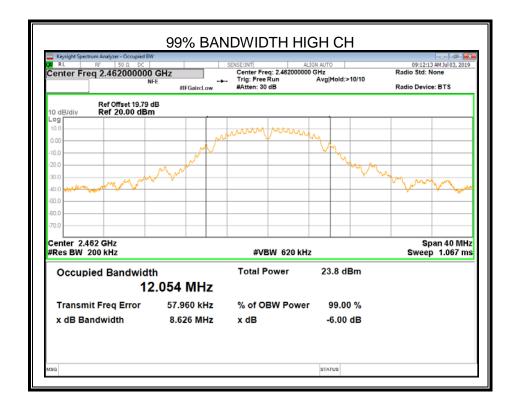








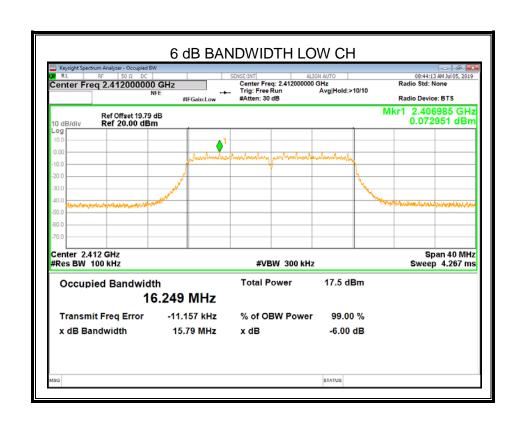




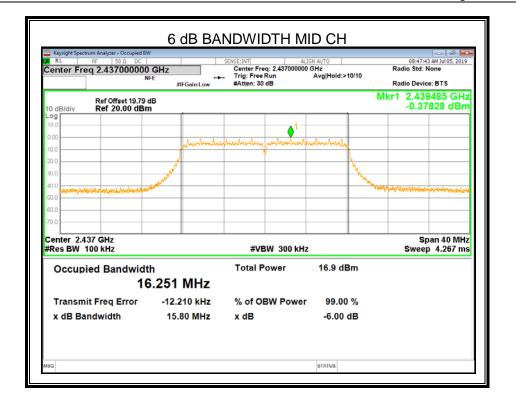


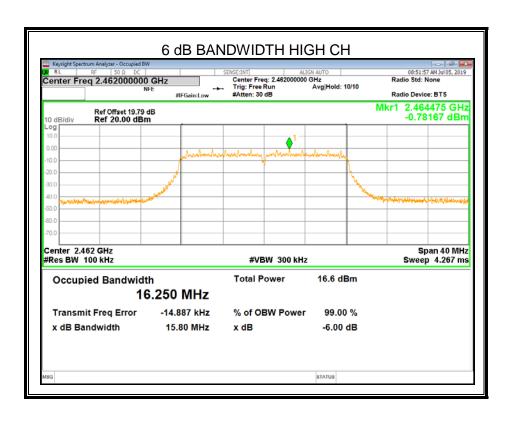
8.2.2. 802.11g MODE

Channel	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
Low	15.79	16.247	≥500	Pass
Middle	15.80	16.255	≥500	Pass
High	15.80	16.255	≥500	Pass

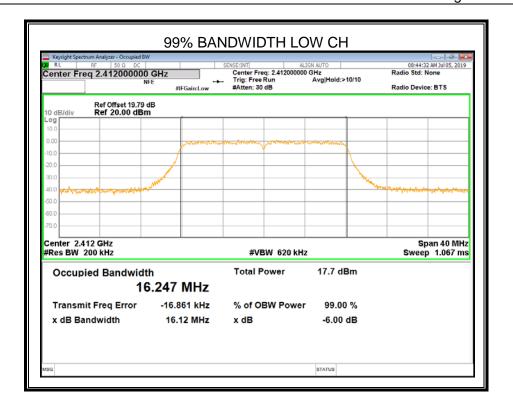


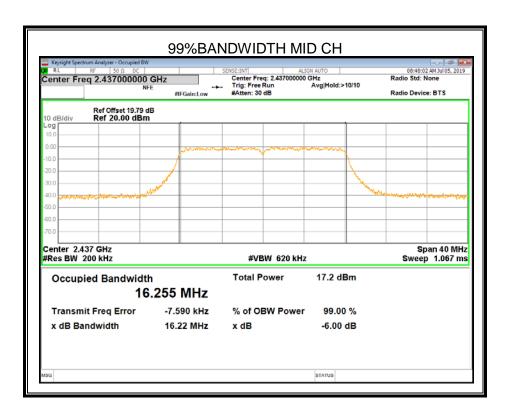




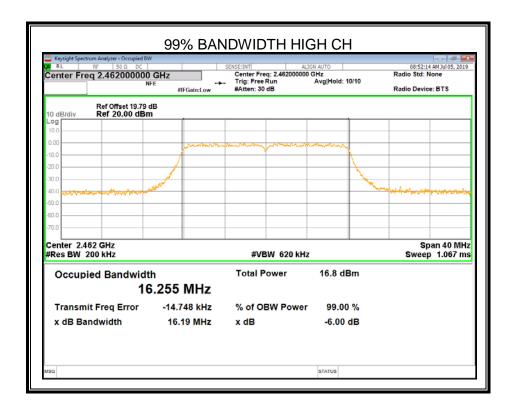










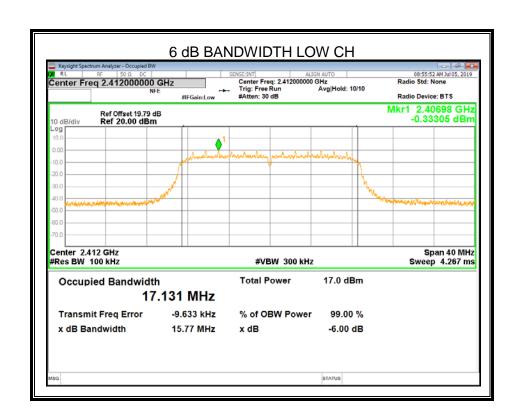




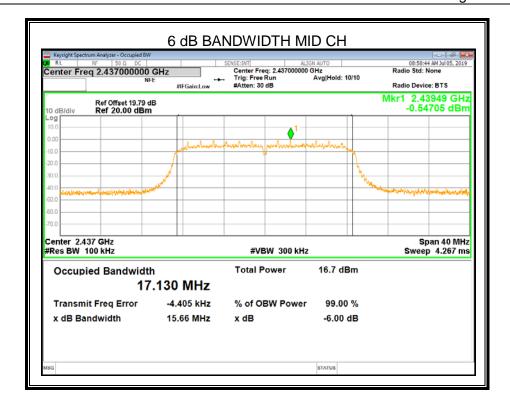
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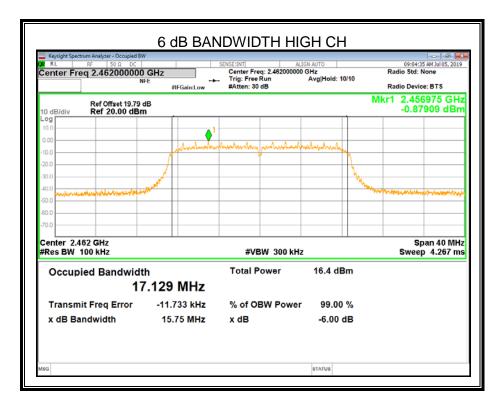
#### 8.2.3. 802.11n HT20 MODE

Channel	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
Low	15.77	17.135	≥500	Pass
Middle	15.66	17.133	≥500	Pass
High	15.75	17.137	≥500	Pass

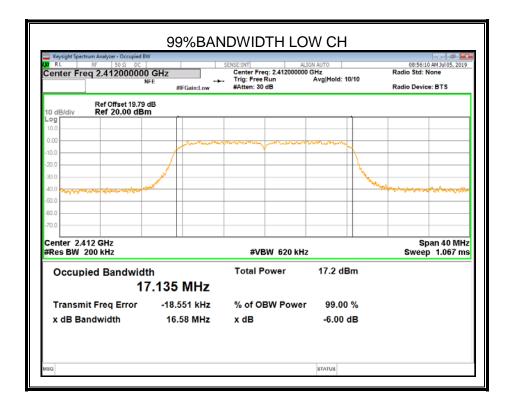


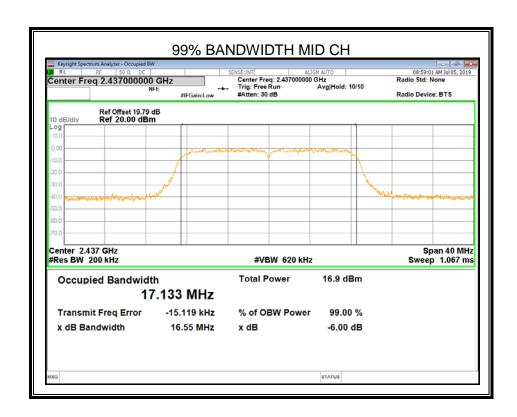




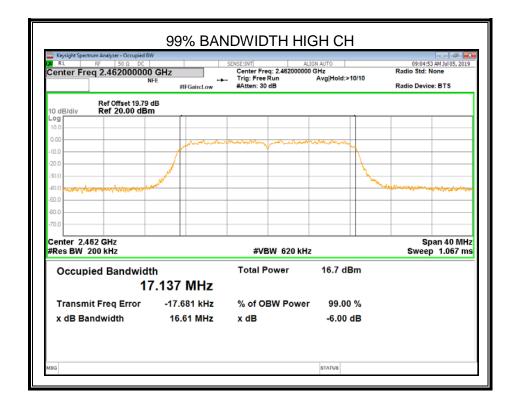












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#### 8.3. PEAK CONDUCTED OUTPUT POWER

#### **LIMITS**

CFR 47 FCC Part15 (15.247) Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC 15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5

#### **TEST PROCEDURE**

Place the EUT on the table and set it in the transmitting mode.

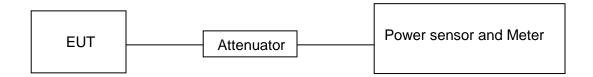
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Power sensor.

Measure the power of each channel.

Peak Detector use for Peak result.

AVG Detector use for AVG result.

#### **TEST SETUP**



#### **TEST ENVIRONMENT**

Temperature	24.4°C	Relative Humidity	53%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.7V



#### **RESULTS**

#### 8.3.1. 802.11b MODE

Test Channel	Maximum Conducted Output Power(PK)	Maximum Conducted Output Power(AV)	LIMIT
	(dBm)	(dBm)	dBm
Low	20.37	18.07	30
Middle	21.71	19.46	30
High	21.16	19.02	30

# 8.3.2. 802.11g MODE

Test Channel	Maximum Conducted Output Power(PK)	Maximum Conducted Output Power(AV)	LIMIT
	(dBm)	(dBm)	dBm
Low	17.92	11.24	30
Middle	17.59	10.93	30
High	17.26	10.60	30

#### 8.3.3. 802.11n HT20 MODE

Test Channel	Maximum Conducted Output Power(PK)	Maximum Conducted Output Power(AV)	LIMIT
	(dBm)	(dBm)	dBm
Low	17.49	10.84	30
Middle	17.20	10.57	30
High	16.94	10.31	30

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#### 8.4. POWER SPECTRAL DENSITY

#### **LIMITS**

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

#### **TEST PROCEDURE**

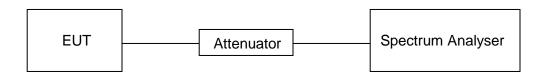
Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre 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**

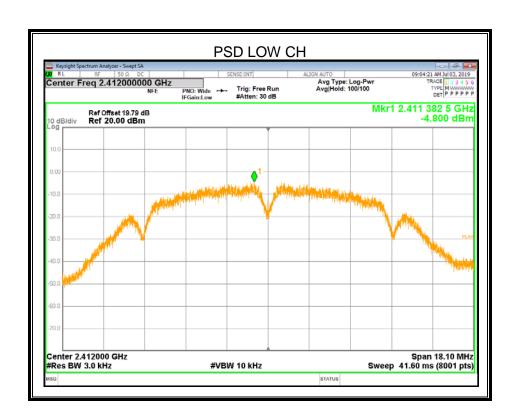
Temperature	24.4°C	Relative Humidity	53%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.7V

#### **RESULTS**

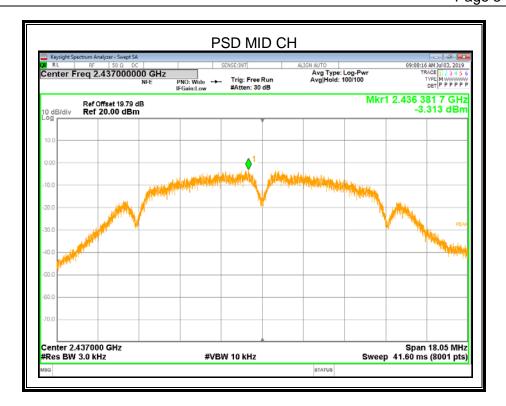


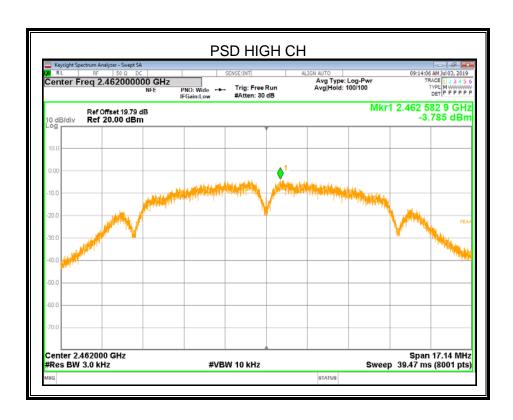
8.4.1. 802.11b MODE

Test Channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Low	-4.800	8	PASS
Middle	-3.313	8	PASS
High	-3.785	8	PASS







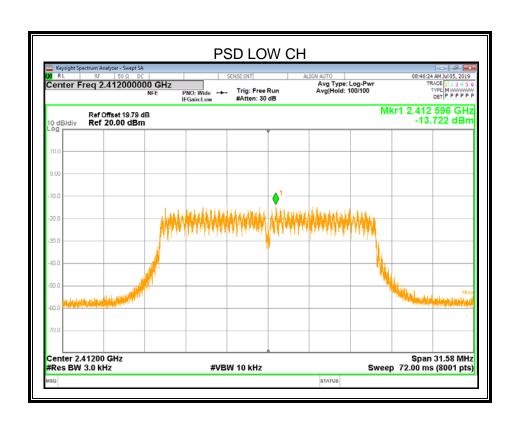




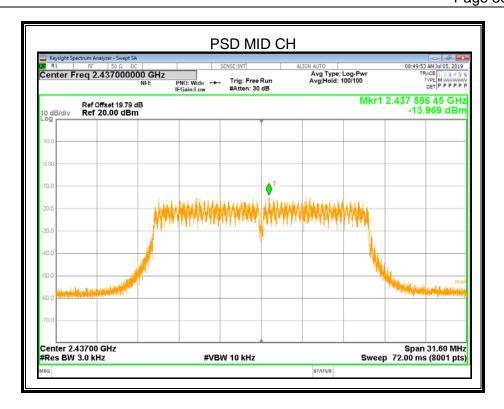
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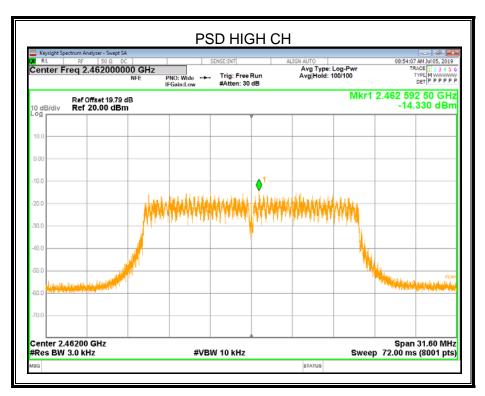
# 8.4.2. 802.11g MODE

Test Channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Low	-13.722	8	PASS
Middle	-13.969	8	PASS
High	-14.330	8	PASS







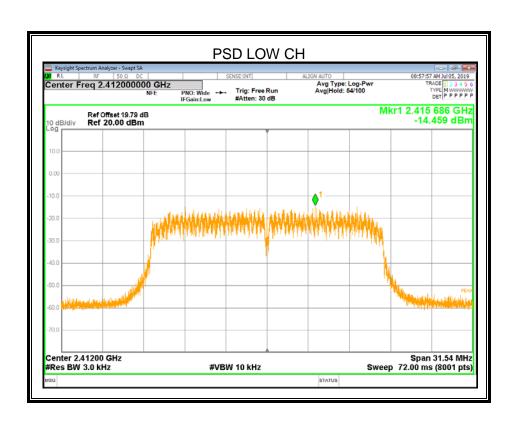




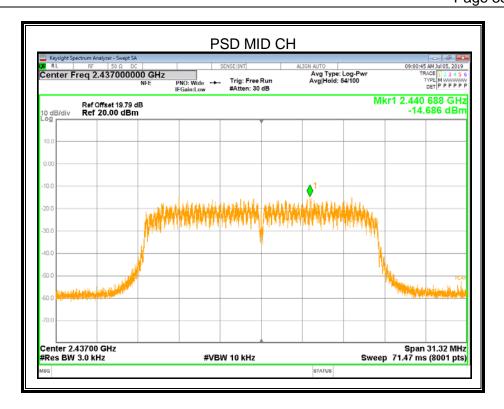
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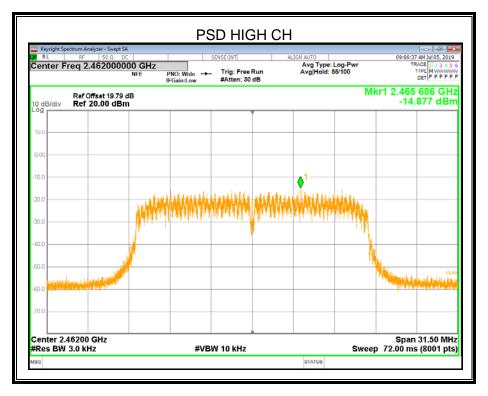
# 8.4.3. 802.11n HT20 MODE

Test Channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Low	-14.459	8	PASS
Middle	-14.686	8	PASS
High	-14.877	8	PASS









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# 8.5. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

# **LIMITS**

CFR 47 FCC Part15 (15.247) Subpart C			
Section Test Item Limit			
CFR 47 FCC §15.247 (d)	Conducted Bandedge and Spurious Emissions	at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power	

### **TEST PROCEDURE**

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

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

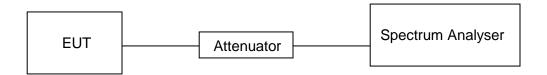
Use the peak marker function to determine the maximum PSD level.

19090	Set the center frequency and span to encompass frequency range to be measured
Detector	Peak
RBW	100K
VBW	≥3 × RBW
measurement points	≥span/RBW
Trace	Max hold
Sweep time	Auto couple.

Use the peak marker function to determine the maximum amplitude level.



### **TEST SETUP**



### **TEST ENVIRONMENT**

Temperature	24.4°C	Relative Humidity	53%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.7V

LOW CH BANDEDGE

### **RESULTS**

### 8.5.1. 802.11b MODE

# 09:04:37 AM Jul 03, 2019 Center Freq 2.400000000 GHz Trig: Free Run #Atten: 30 dB PNO: Fast IFGain:Low Mkr4 2.397 975 0 GHz Ref Offset 19.79 dB Ref 20.00 dBm -34.118 dBm Center 2.40000 GHz Span 100.0 MHz #Res BW 100 kHz **#VBW** 300 kHz Sweep 1.067 ms (8001 pts) MKR MODE TRC SCL 9.340 dBm -36.351 dBm -41.475 dBm -34.118 dBm 2.412 487 5 GHz 2.400 000 0 GHz 2.390 000 0 GHz 2.397 975 0 GHz N N N 5 6 7 8 9 10

STATUS



LOW CH SPURIOUS EMISSIONS REFERENCE

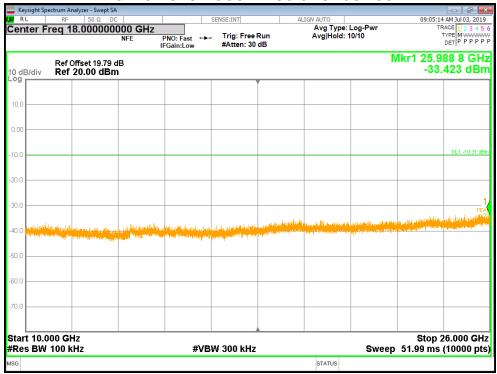


### LOW CH SPURIOUS EMISSIONS 30M-10G





LOW CH SPURIOUS EMISSIONS 10G-26G

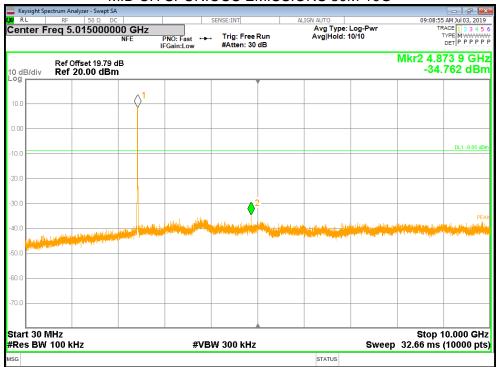


### MID CH SPURIOUS EMISSIONS REFERENCE

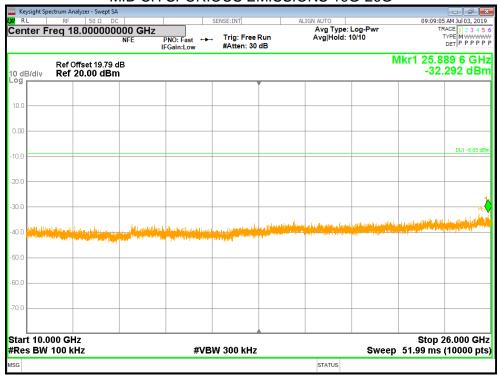




MID CH SPURIOUS EMISSIONS 30M-10G

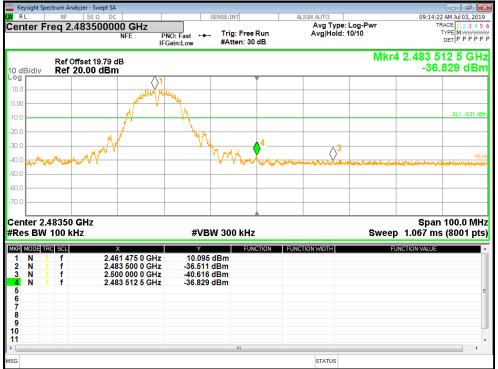


### MID CH SPURIOUS EMISSIONS 10G-26G



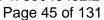






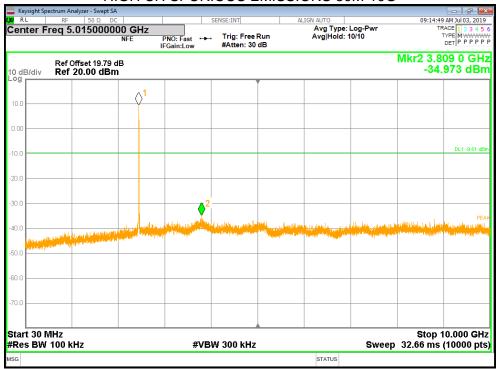
### HIGH CH SPURIOUS EMISSIONS REFERENCE



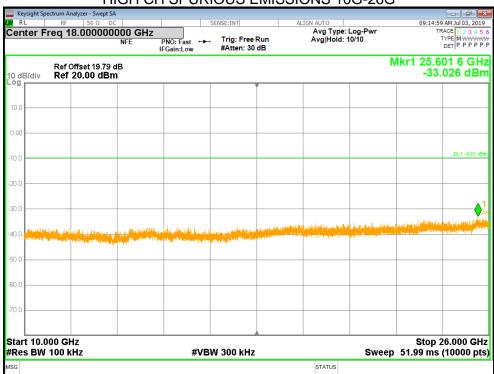




# HIGH CH SPURIOUS EMISSIONS 30M-10G



### HIGH CH SPURIOUS EMISSIONS 10G-26G





8.5.1. 802.11g MODE

### LOW CH BANDEDGE







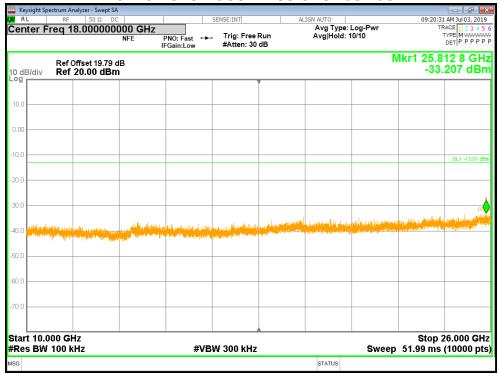


### LOW CH SPURIOUS EMISSIONS 30M-10G





LOW CH SPURIOUS EMISSIONS 10G-26G



### MID CH SPURIOUS EMISSIONS REFERENCE

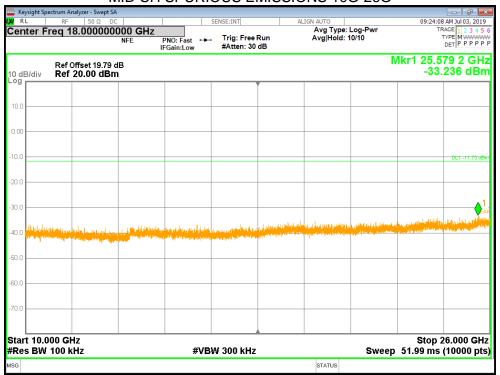




MID CH SPURIOUS EMISSIONS 30M-10G



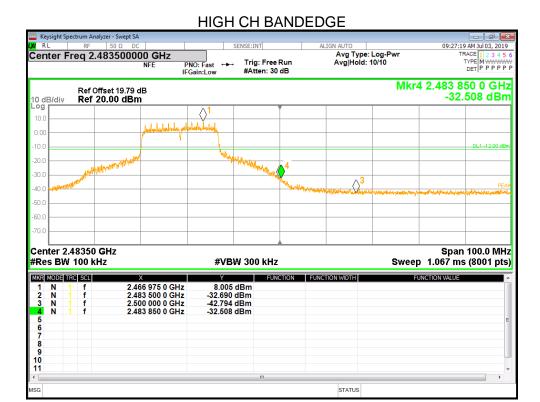
### MID CH SPURIOUS EMISSIONS 10G-26G



Span 40.00 MHz

Sweep 1.067 ms (8001 pts)





# Ref Offset 19.79 dB Ref 20.00 dBm Ref 20.00 dBm Ref 0ffset 19.79 dB Ref 20.00 dBm Ref 20.00 dBm

HIGH CH SPURIOUS EMISSIONS REFERENCE

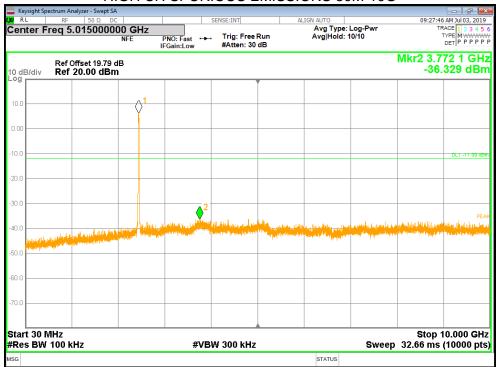
STATUS

**#VBW** 300 kHz

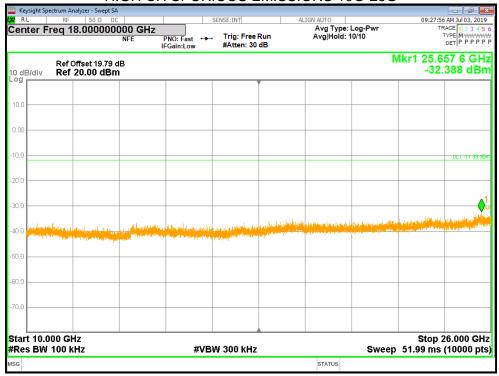
Center 2.46200 GHz #Res BW 100 kHz



HIGH CH SPURIOUS EMISSIONS 30M-10G



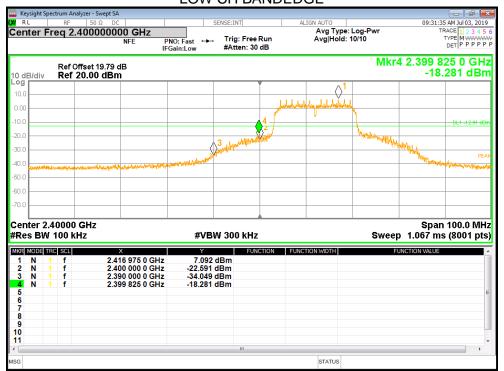
### HIGH CH SPURIOUS EMISSIONS 10G-26G





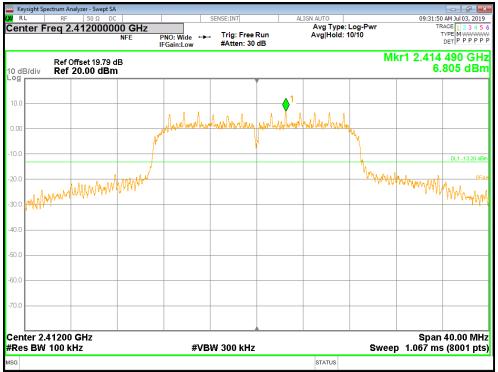
8.5.1. 802.11n HT20 MODE

# LOW CH BANDEDGE







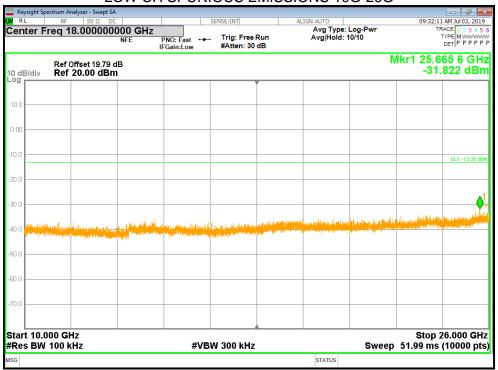


### LOW CH SPURIOUS EMISSIONS 30M-10G

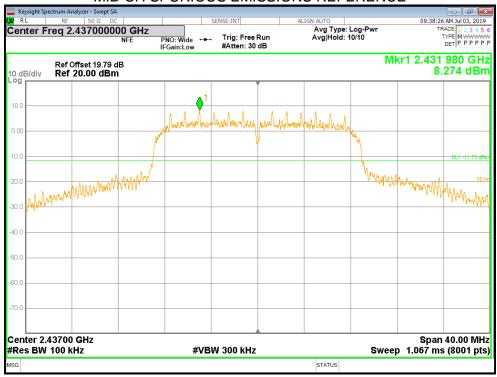




LOW CH SPURIOUS EMISSIONS 10G-26G

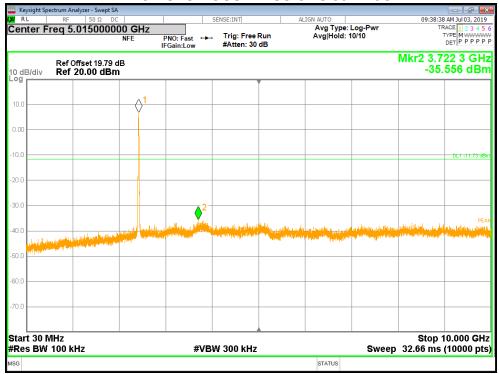


### MID CH SPURIOUS EMISSIONS REFERENCE

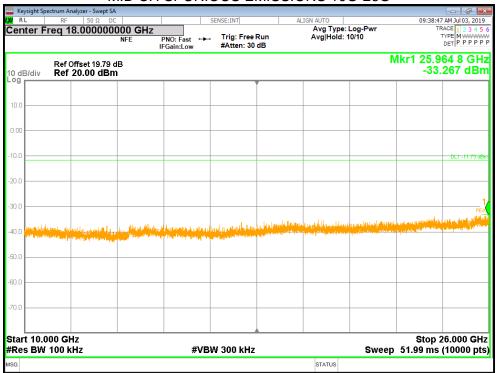




MID CH SPURIOUS EMISSIONS 30M-10G

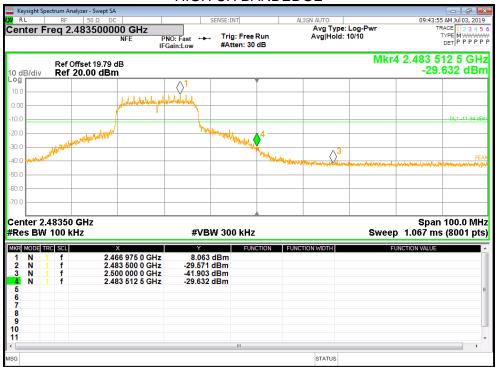


### MID CH SPURIOUS EMISSIONS 10G-26G







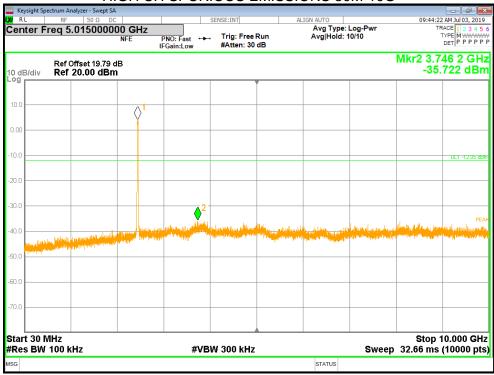


### HIGH CH SPURIOUS EMISSIONS REFERENCE

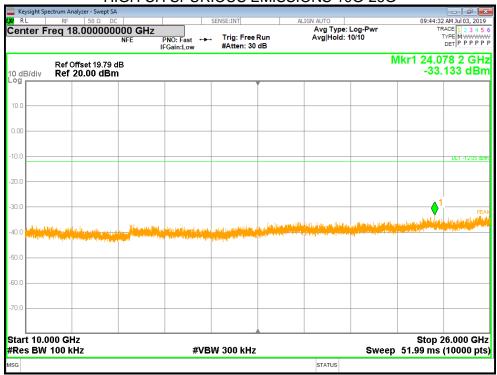




HIGH CH SPURIOUS EMISSIONS 30M-10G









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### 9. RADIATED TEST RESULTS

### **LIMITS**

Please refer to CFR 47 FCC §15.205 and §15.209

Radiation Disturbance Test Limit for FCC (Class B)(9KHz-1GHz)

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
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

Note: 1) At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

(2) At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). This paragraph (f) shall not apply to Access BPL devices operating below 30 MHz.



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# Radiation Disturbance Test Limit for FCC (Above 1G)

Fraguency (MHz)	dB(uV/m) (at 3 meters)	
Frequency (MHz)	Peak	Average
Above 1000	74	54

### FCC Restricted bands of operation:

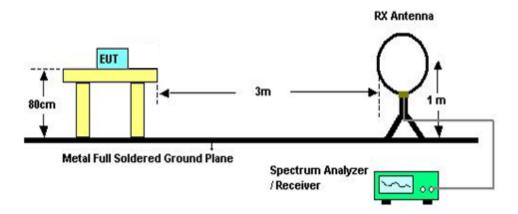
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
<sup>1</sup> 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
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 30MHz



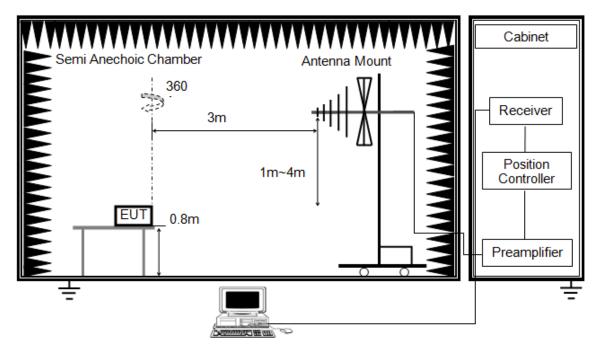
### The setting of the spectrum analyser

RBW	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)
VBW	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)
Sweep	Auto
Detector	Peak/QP/ Average
Trace	Max hold

- 1. The testing follows the guidelines in ANSI C63.10-2013
- 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 and vertical polarizations of the antenna are set to make the measurement.
- 3. The EUT was placed on a turntable with 0.8 meter 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 1GHz, 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.
- 6. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)
- 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.



Below 1G



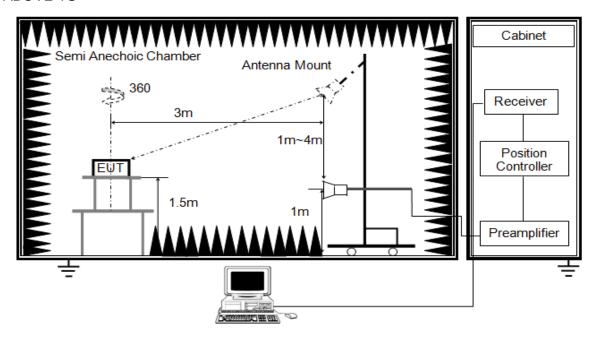
The setting of the spectrum analyser

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

- 1. The testing follows the guidelines in ANSI C63.10-2013.
- 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 0.8 meter 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 1GHz, 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 1G**



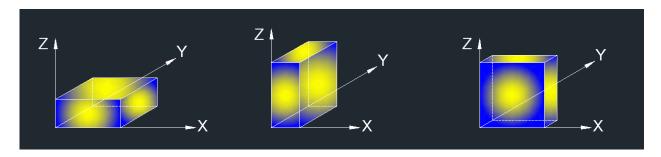
The setting of the spectrum analyser

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

- 1. The testing follows the guidelines in ANSI C63.10-2013.
- 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 1.5m 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 1GHz, 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 8.1.ON TIME AND DUTY CYCLE.



X axis, Y axis, Z axis positions:



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

### **TEST ENVIRONMENT**

Temperature	23.1°C	Relative Humidity	53%
Atmosphere Pressure	101kPa	Test Voltage	DC 12V

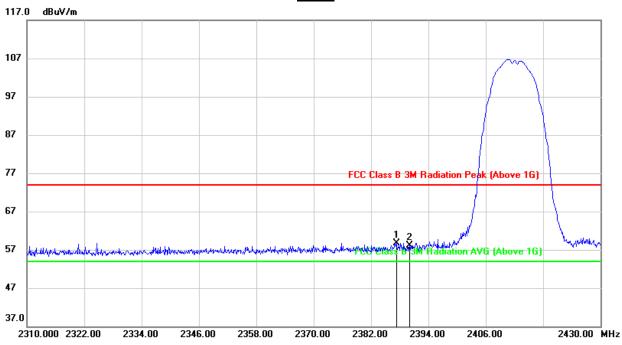
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### 9.1. RESTRICTED BANDEDGE

### 9.1.1. 802.11b MODE

### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

### **PEAK**



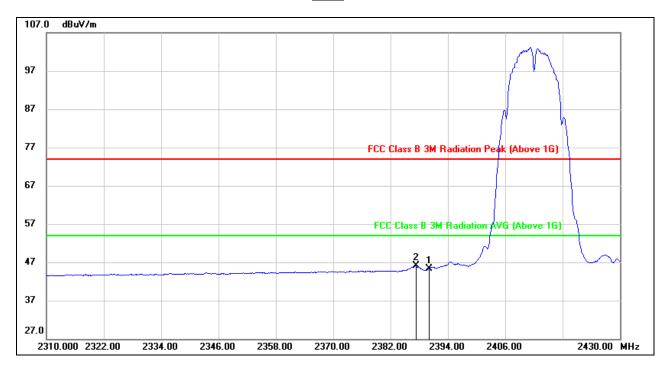
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	2387.280	25.85	32.94	58.79	74.00	-15.21	peak
2	2390.000	25.16	32.94	58.10	74.00	-15.90	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



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# **AVG**



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	2390.000	12.39	32.94	45.33	54.00	-8.67	AVG
2	2387.280	13.08	32.94	46.02	54.00	-7.98	AVG

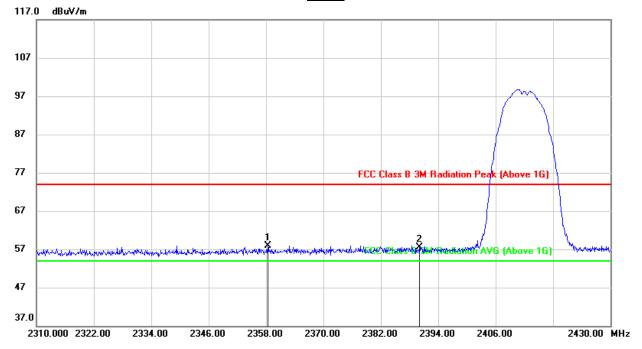
- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. AVG: VBW=1/Ton where: ton is transmit duration.
- 4. For transmit duration, please refer to clause 8.1.
- 5. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



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

### <u>PEAK</u>



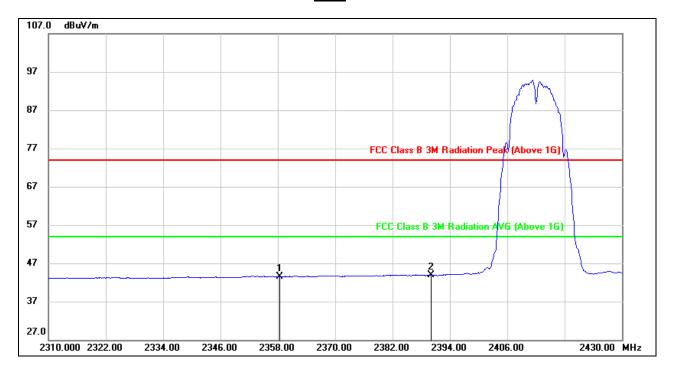
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	2358.360	25.15	32.83	57.98	74.00	-16.02	peak
2	2390.000	24.65	32.94	57.59	74.00	-16.41	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



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# **AVG**



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	2358.360	10.74	32.83	43.57	54.00	-10.43	AVG
2	2390.000	10.92	32.94	43.86	54.00	-10.14	AVG

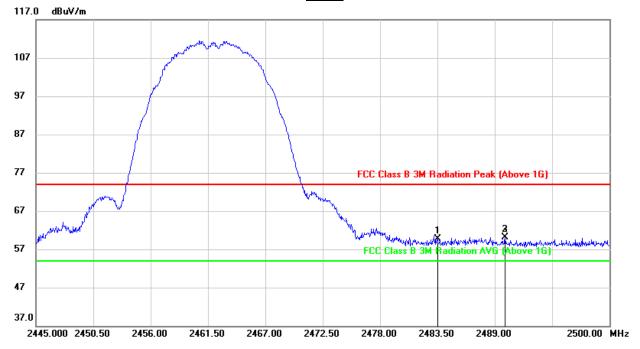
- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. AVG: VBW=1/Ton where: ton is transmit duration.
- 4. For transmit duration, please refer to clause 8.1.
- 5. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



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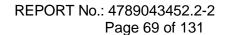
### RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

### <u>PEAK</u>



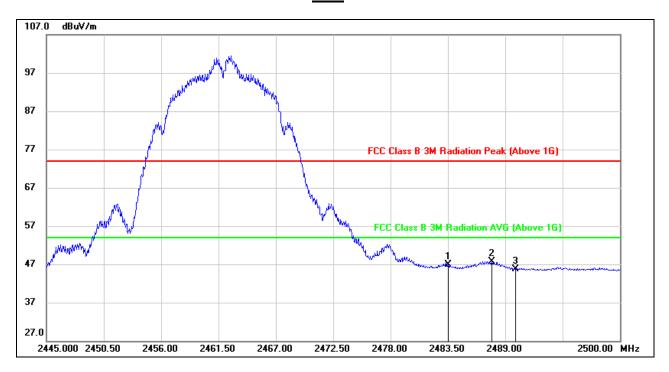
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	2483.500	26.22	33.58	59.80	74.00	-14.20	peak
2	2489.990	26.47	33.63	60.10	74.00	-13.90	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.





**AVG** 



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	2483.500	13.32	33.58	46.90	54.00	-7.10	AVG
2	2487.735	14.18	33.61	47.79	54.00	-6.21	AVG
3	2489.990	12.15	33.63	45.78	54.00	-8.22	AVG

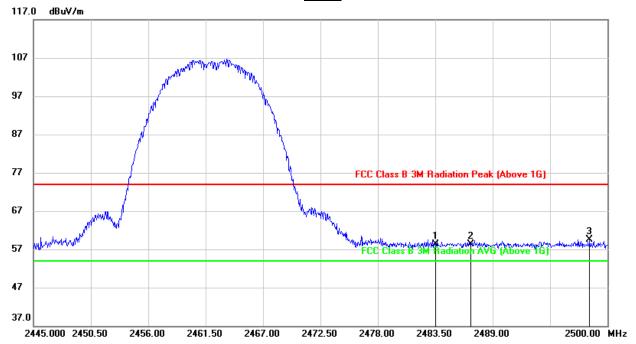
- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. AVG: VBW=1/Ton where: ton is transmit duration.
- 4. For transmit duration, please refer to clause 8.1.
- 5. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



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

### **PEAK**

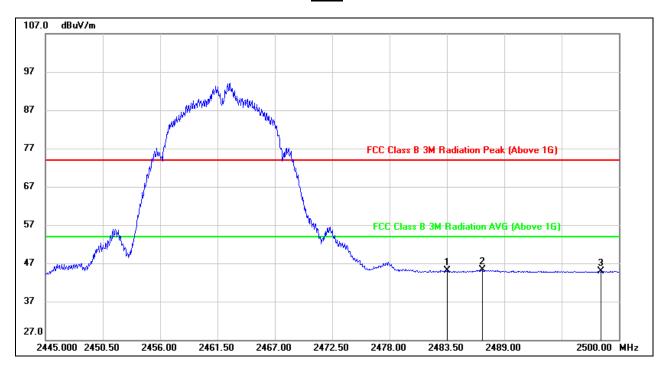


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	2483.500	24.75	33.58	58.33	74.00	-15.67	peak
2	2486.910	24.76	33.61	58.37	74.00	-15.63	peak
3	2498.295	25.80	33.69	59.49	74.00	-14.51	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Only the worst case emission 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)	(dBuV)	(dB)	
1	2483.500	11.44	33.58	45.02	54.00	-8.98	AVG
2	2486.910	11.69	33.61	45.30	54.00	-8.70	AVG
3	2498.295	11.15	33.69	44.84	54.00	-9.16	AVG

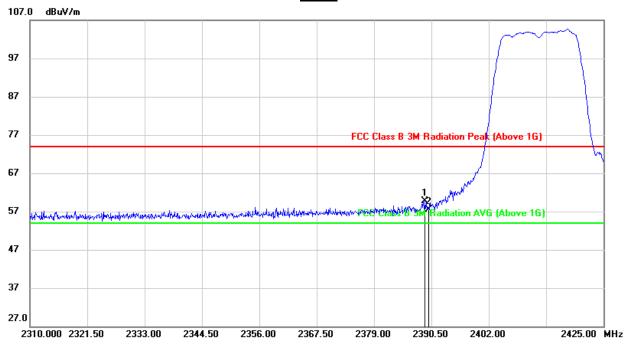
- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. AVG: VBW=1/Ton where: ton is transmit duration.
- 4. For transmit duration, please refer to clause 8.1.
- 5. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

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# 9.1.2. 802.11g MODE

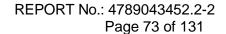
### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

### **PEAK**



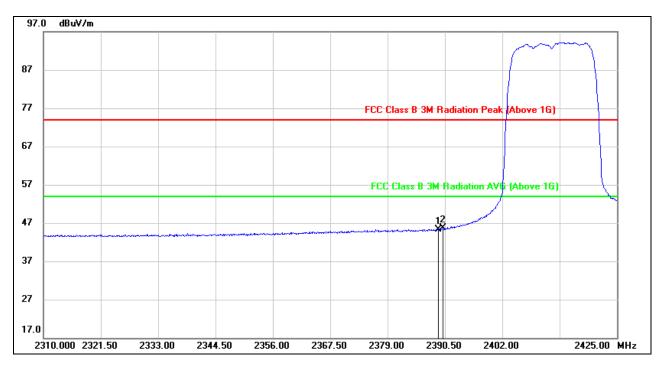
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	2389.235	26.74	32.94	59.68	74.00	-14.32	peak
2	2390.000	24.51	32.94	57.45	74.00	-16.55	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Only the worst case emission 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)	(dBuV)	(dB)	
1	2389.235	12.33	32.94	45.27	54.00	-8.73	AVG
2	2390.000	12.70	32.94	45.64	54.00	-8.36	AVG

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. AVG: VBW=1/Ton where: ton is transmit duration.
- 4. For transmit duration, please refer to clause 8.1.
- 5. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



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



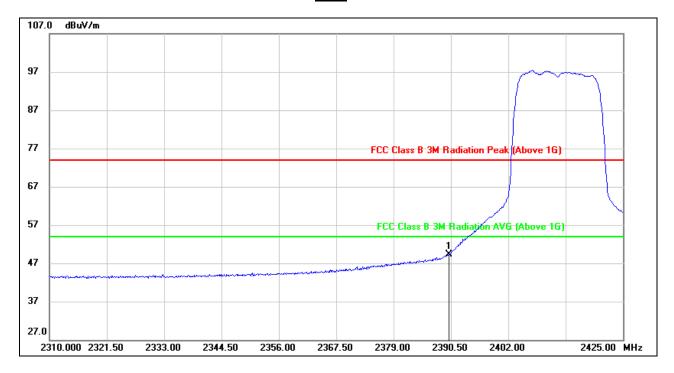


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	2390.000	36.92	32.94	69.86	74.00	-4.14	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Only the worst case emission 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)	(dBuV)	(dB)	
1	2390.000	16.41	32.94	49.35	54.00	-4.65	AVG

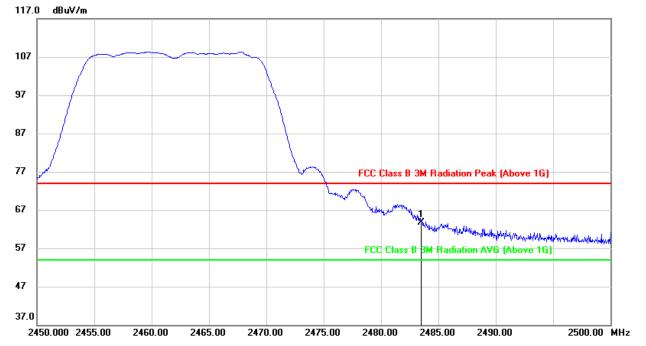
- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. AVG: VBW=1/Ton where: ton is transmit duration.
- 4. For transmit duration, please refer to clause 8.1.
- 5. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



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## RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

## **PEAK**



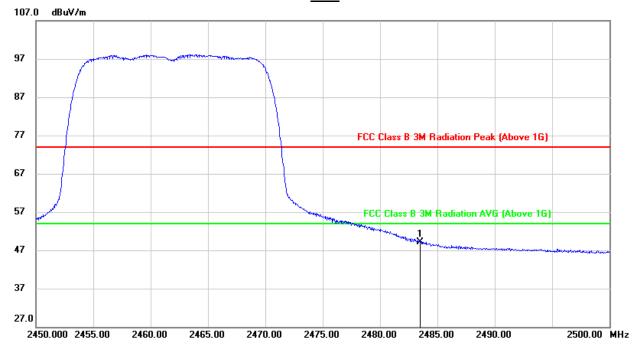
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	2483.500	30.22	33.58	63.80	74.00	-10.20	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Only the worst case emission 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)	(dBuV)	(dB)	
1	2483.500	15.52	33.58	49.10	54.00	-4.90	AVG

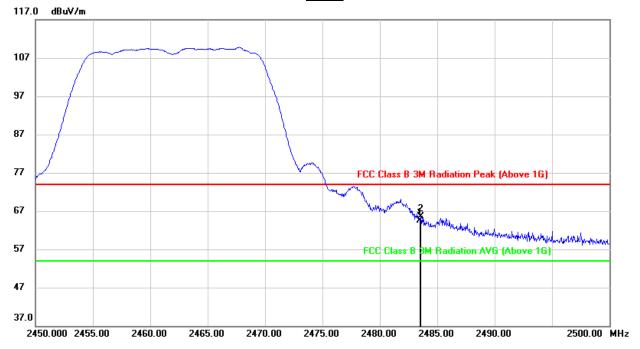
- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. AVG: VBW=1/Ton where: ton is transmit duration.
- 4. For transmit duration, please refer to clause 8.1.
- 5. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



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## RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

### **PEAK**

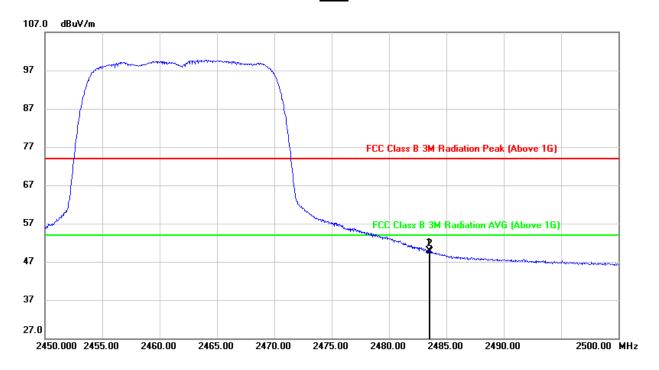


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	2483.500	30.85	33.58	64.43	74.00	-9.57	peak
2	2483.550	31.85	33.58	65.43	74.00	-8.57	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Only the worst case emission 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)	(dBuV)	(dB)	
1	2483.500	16.34	33.58	49.92	54.00	-4.08	AVG
2	2483.550	16.11	33.58	49.69	54.00	-4.31	AVG

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. AVG: VBW=1/Ton where: ton is transmit duration.
- 4. For transmit duration, please refer to clause 8.1.
- 5. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

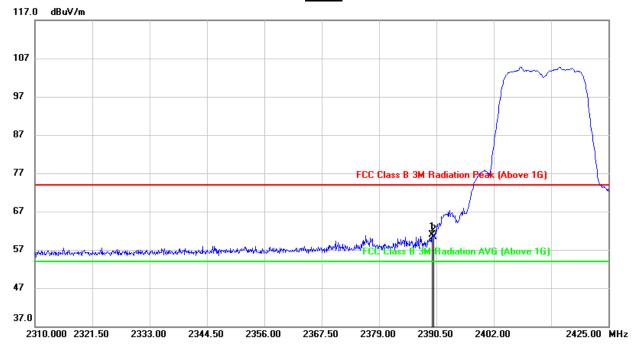


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## 9.1.3. 802.11n HT20 MODE

## RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

#### **PEAK**



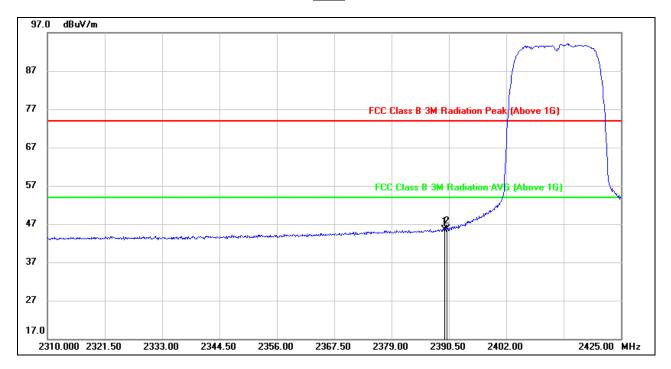
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	2389.580	27.98	32.94	60.92	74.00	-13.08	peak
2	2390.000	27.44	32.94	60.38	74.00	-13.62	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



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## <u>AVG</u>



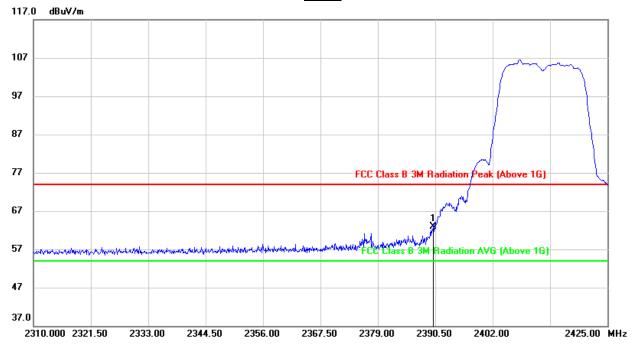
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	2389.580	12.59	32.94	45.53	54.00	-8.47	AVG
2	2390.000	12.83	32.94	45.77	54.00	-8.23	AVG

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. AVG: VBW=1/Ton where: ton is transmit duration.
- 4. For transmit duration, please refer to clause 8.1.
- 5. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

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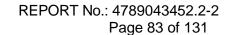
## **RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**

## **PEAK**



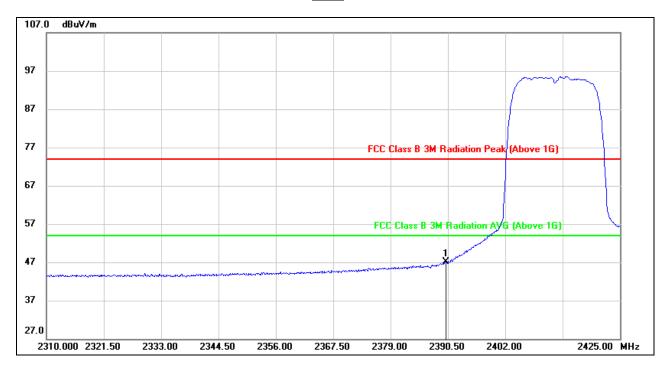
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	2390.000	29.92	32.94	62.86	74.00	-11.14	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.





AVG



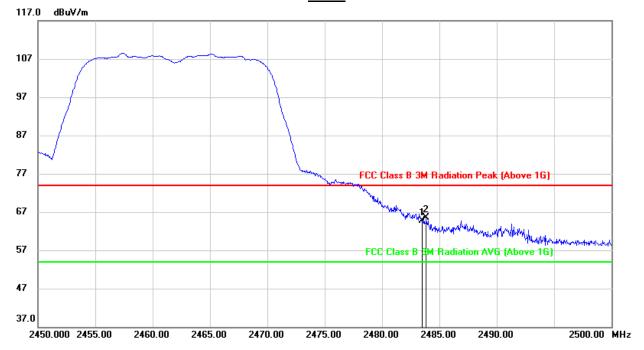
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	2390.000	14.09	32.94	47.03	54.00	-6.97	AVG

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. AVG: VBW=1/Ton where: ton is transmit duration.
- 4. For transmit duration, please refer to clause 8.1.
- 5. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

## **PEAK**

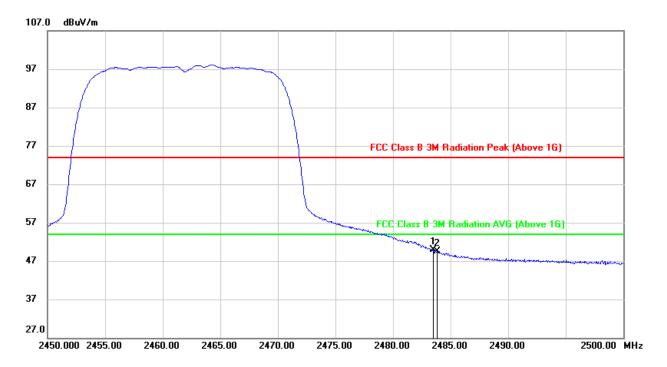


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	2483.500	31.03	33.58	64.61	74.00	-9.39	peak
2	2483.850	31.87	33.58	65.45	74.00	-8.55	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



### AVG



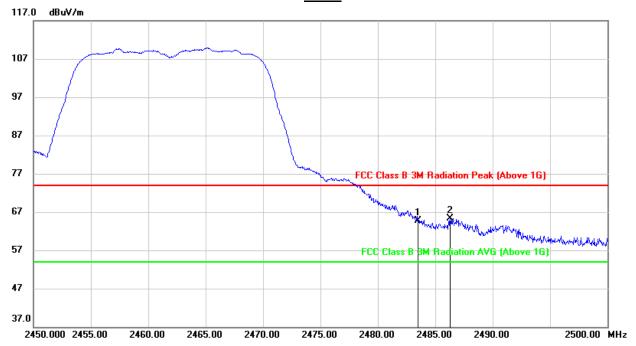
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	2483.500	16.23	33.58	49.81	54.00	-4.19	AVG
2	2483.850	15.93	33.58	49.51	54.00	-4.49	AVG

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. AVG: VBW=1/Ton where: ton is transmit duration.
- 4. For transmit duration, please refer to clause 8.1.
- 5. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



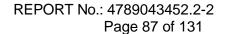
RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

## **PEAK**



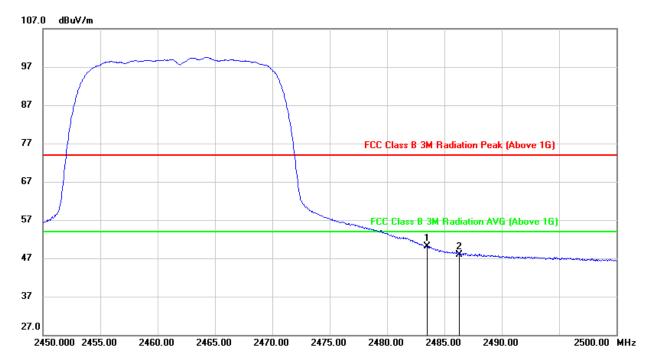
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	2483.500	31.05	33.58	64.63	74.00	-9.37	peak
2	2486.300	31.77	33.61	65.38	74.00	-8.62	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Only the worst case emission 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)	(dBuV)	(dB)	
1	2483.500	16.56	33.58	50.14	54.00	-3.86	AVG
2	2486.300	14.37	33.61	47.98	54.00	-6.02	AVG

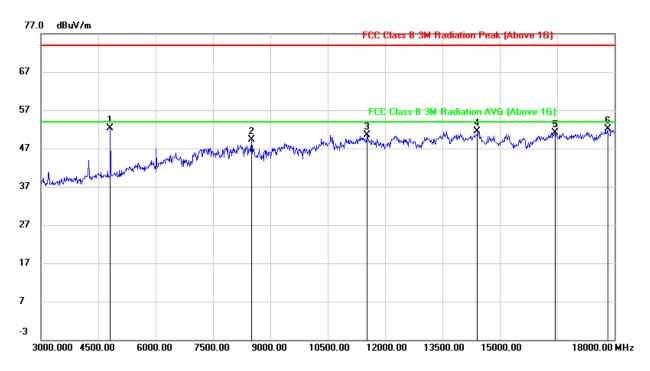
- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. AVG: VBW=1/Ton where: ton is transmit duration.
- 4. For transmit duration, please refer to clause 8.1.
- 5. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

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# 9.2. SPURIOUS EMISSIONS (3~18GHz)

### 9.2.1. 802.11b MODE

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



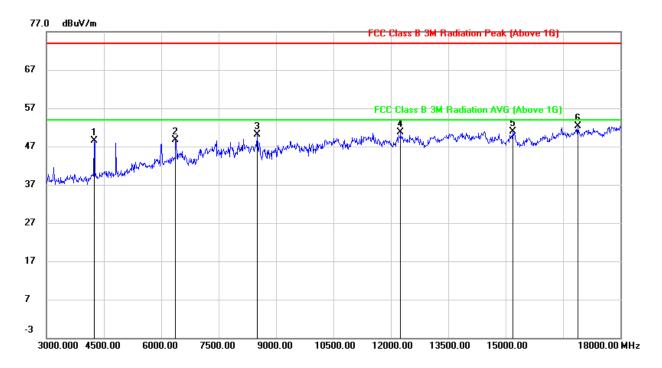
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	4815.000	52.58	-0.23	52.35	74.00	-21.65	peak
2	8505.000	40.74	8.55	49.29	74.00	-24.71	peak
3	11535.000	36.42	14.10	50.52	74.00	-23.48	peak
4	14415.000	35.18	16.41	51.59	74.00	-22.41	peak
5	16440.000	32.50	18.69	51.19	74.00	-22.81	peak
6	17820.000	28.91	23.21	52.12	74.00	-21.88	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. The High Pass filter loss factor already add into the correct factor.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



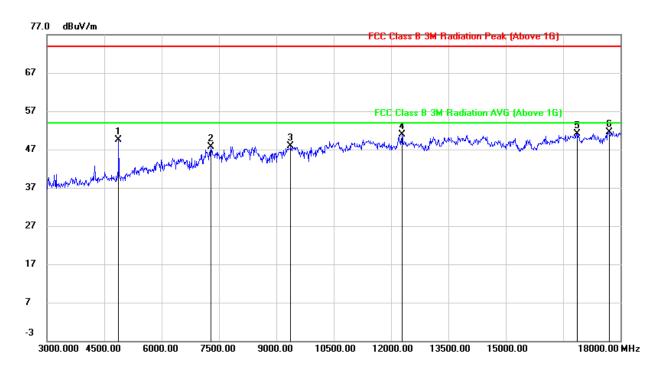
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	4245.000	50.47	-2.02	48.45	74.00	-25.55	peak
2	6375.000	43.78	4.90	48.68	74.00	-25.32	peak
3	8505.000	41.65	8.55	50.20	74.00	-23.80	peak
4	12255.000	36.39	14.32	50.71	74.00	-23.29	peak
5	15180.000	35.45	15.54	50.99	74.00	-23.01	peak
6	16890.000	32.30	19.93	52.23	74.00	-21.77	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. The High Pass filter loss factor already add into the correct factor.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



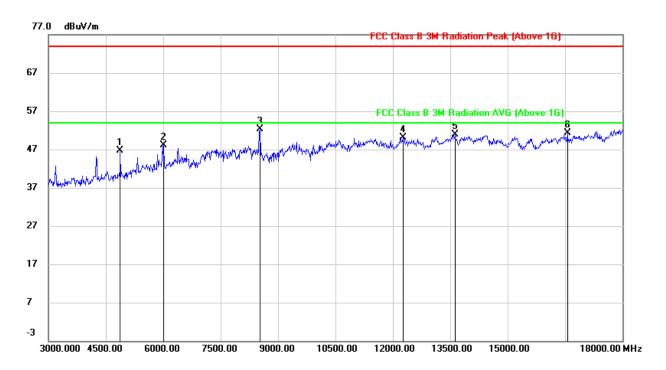
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	4875.000	49.63	-0.12	49.51	74.00	-24.49	peak
2	7290.000	40.67	7.11	47.78	74.00	-26.22	peak
3	9375.000	37.78	10.14	47.92	74.00	-26.08	peak
4	12285.000	36.53	14.37	50.90	74.00	-23.10	peak
5	16860.000	31.28	19.92	51.20	74.00	-22.80	peak
6	17700.000	29.31	22.24	51.55	74.00	-22.45	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. The High Pass filter loss factor already add into the correct factor.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



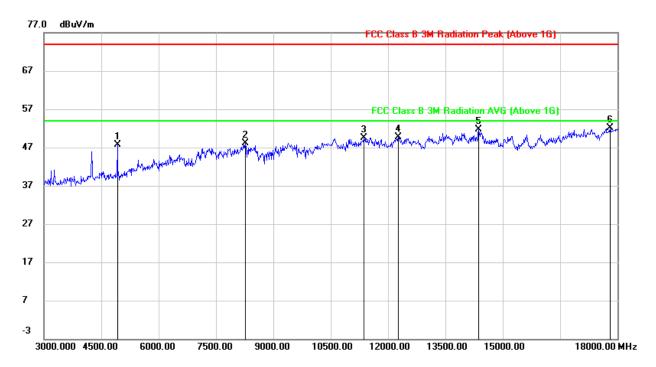
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	4875.000	46.75	-0.12	46.63	74.00	-27.37	peak
2	6015.000	44.26	3.78	48.04	74.00	-25.96	peak
3	8535.000	43.83	8.49	52.32	74.00	-21.68	peak
4	12270.000	35.75	14.34	50.09	74.00	-23.91	peak
5	13620.000	34.82	16.04	50.86	74.00	-23.14	peak
6	16560.000	32.04	19.18	51.22	74.00	-22.78	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. The High Pass filter loss factor already add into the correct factor.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



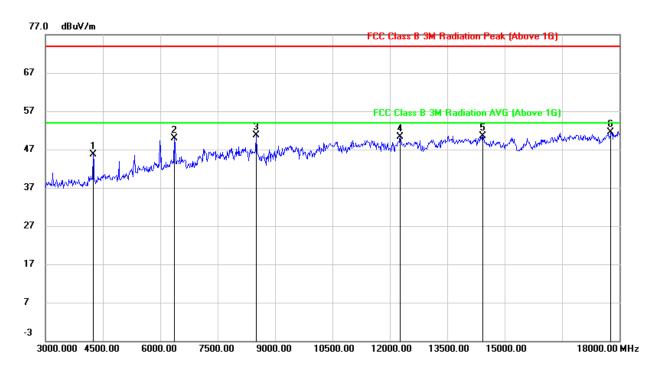
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	4920.000	47.75	0.02	47.77	74.00	-26.23	peak
2	8265.000	39.24	8.91	48.15	74.00	-25.85	peak
3	11370.000	36.30	13.22	49.52	74.00	-24.48	peak
4	12270.000	35.43	14.34	49.77	74.00	-24.23	peak
5	14370.000	35.23	16.39	51.62	74.00	-22.38	peak
6	17805.000	28.85	23.22	52.07	74.00	-21.93	neak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. The High Pass filter loss factor already add into the correct factor.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



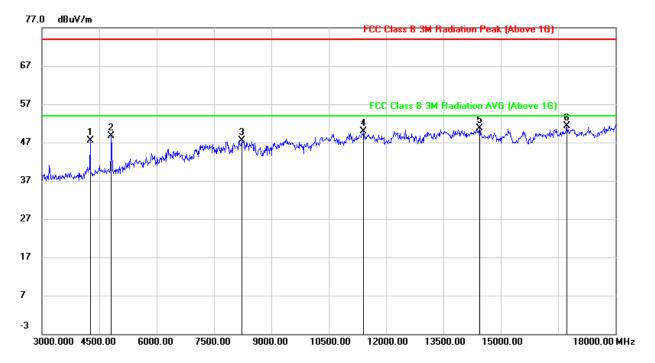
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	4245.000	47.65	-2.02	45.63	74.00	-28.37	peak
2	6360.000	45.12	4.84	49.96	74.00	-24.04	peak
3	8505.000	42.24	8.55	50.79	74.00	-23.21	peak
4	12270.000	35.91	14.34	50.25	74.00	-23.75	peak
5	14430.000	34.21	16.39	50.60	74.00	-23.40	peak
6	17775.000	28.59	22.97	51.56	74.00	-22.44	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. The High Pass filter loss factor already add into the correct factor.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

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## 9.2.2. 802.11g MODE

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



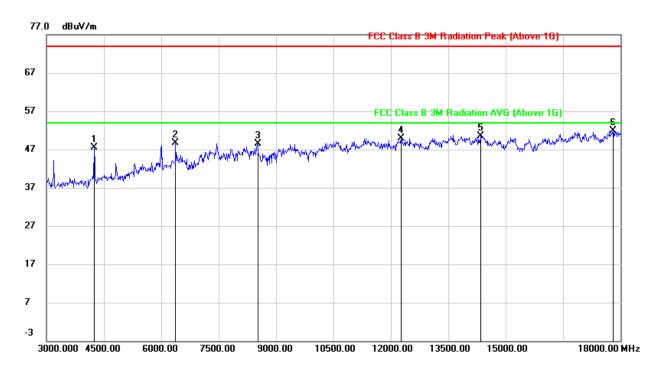
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	4260.000	49.69	-2.09	47.60	74.00	-26.40	peak
2	4815.000	48.84	-0.23	48.61	74.00	-25.39	peak
3	8220.000	38.01	9.40	47.41	74.00	-26.59	peak
4	11415.000	36.41	13.46	49.87	74.00	-24.13	peak
5	14445.000	34.31	16.37	50.68	74.00	-23.32	peak
6	16725.000	31.52	19.85	51.37	74.00	-22.63	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. The High Pass filter loss factor already add into the correct factor.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



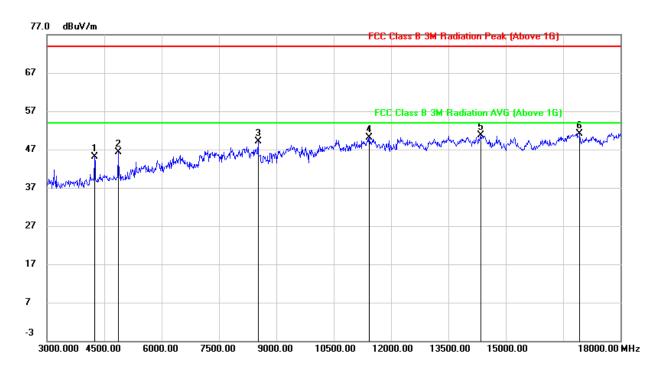
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	4245.000	49.53	-2.02	47.51	74.00	-26.49	peak
2	6375.000	43.85	4.90	48.75	74.00	-25.25	peak
3	8520.000	40.05	8.53	48.58	74.00	-25.42	peak
4	12270.000	35.51	14.34	49.85	74.00	-24.15	peak
5	14340.000	34.21	16.36	50.57	74.00	-23.43	peak
6	17805.000	28.66	23.22	51.88	74.00	-22.12	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. The High Pass filter loss factor already add into the correct factor.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



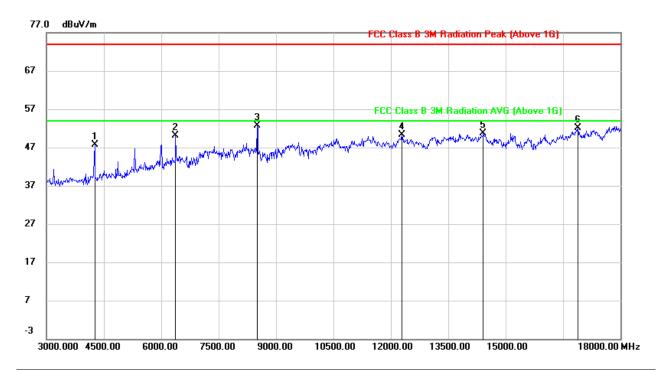
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	4245.000	47.18	-2.02	45.16	74.00	-28.84	peak
2	4860.000	46.38	-0.15	46.23	74.00	-27.77	peak
3	8520.000	40.61	8.53	49.14	74.00	-24.86	peak
4	11430.000	36.48	13.57	50.05	74.00	-23.95	peak
5	14355.000	34.23	16.38	50.61	74.00	-23.39	peak
6	16935.000	30.96	20.07	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. The High Pass filter loss factor already add into the correct factor.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



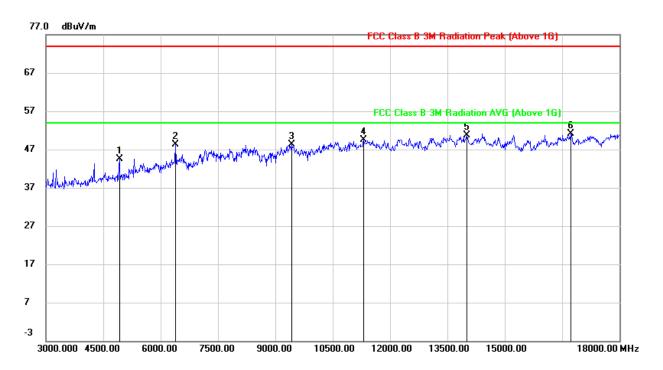
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	4260.000	49.79	-2.09	47.70	74.00	-26.30	peak
2	6375.000	45.22	4.90	50.12	74.00	-23.88	peak
3	8505.000	44.12	8.55	52.67	74.00	-21.33	peak
4	12285.000	35.85	14.37	50.22	74.00	-23.78	peak
5	14415.000	34.25	16.41	50.66	74.00	-23.34	peak
6	16890.000	32.16	19.93	52.09	74.00	-21.91	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. The High Pass filter loss factor already add into the correct factor.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



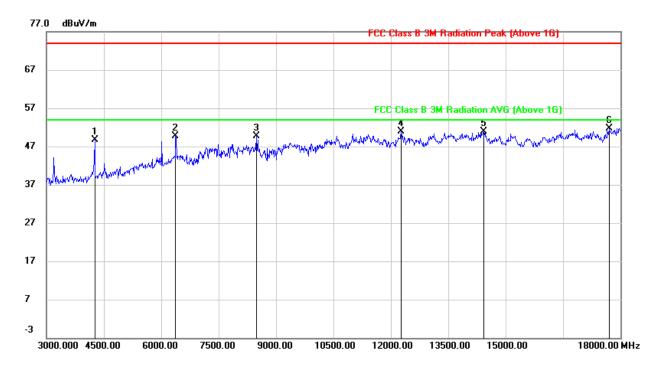
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	4920.000	44.46	0.02	44.48	74.00	-29.52	peak
2	6390.000	43.34	4.97	48.31	74.00	-25.69	peak
3	9420.000	37.91	10.34	48.25	74.00	-25.75	peak
4	11310.000	36.58	12.94	49.52	74.00	-24.48	peak
5	14010.000	34.46	16.34	50.80	74.00	-23.20	peak
6	16725.000	31.19	19.85	51.04	74.00	-22.96	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. The High Pass filter loss factor already add into the correct factor.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	4260.000	50.71	-2.09	48.62	74.00	-25.38	peak
2	6375.000	44.90	4.90	49.80	74.00	-24.20	peak
3	8490.000	41.21	8.59	49.80	74.00	-24.20	peak
4	12270.000	36.56	14.34	50.90	74.00	-23.10	peak
5	14430.000	34.45	16.39	50.84	74.00	-23.16	peak
6	17700.000	29.41	22.24	51.65	74.00	-22.35	peak

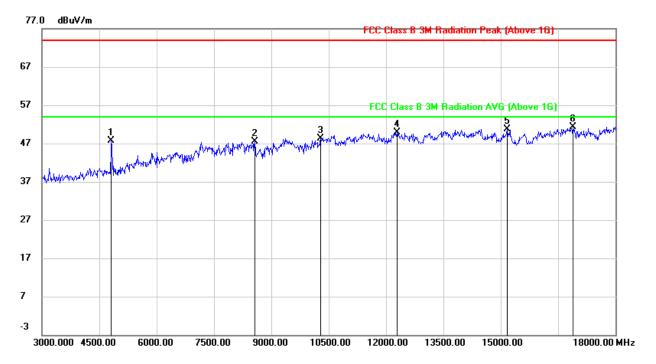
- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. The High Pass filter loss factor already add into the correct factor.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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### 9.2.3. 802.11n HT20 MODE

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



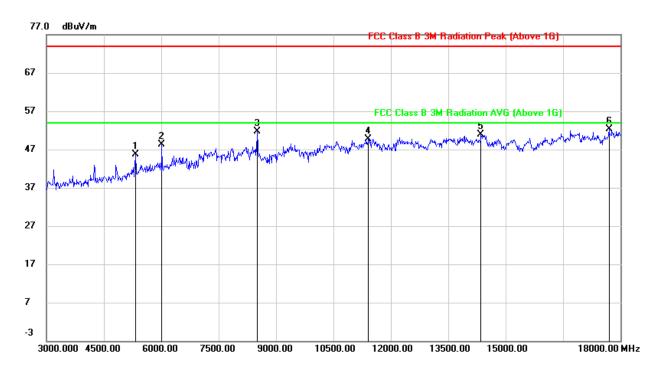
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	4815.000	47.88	-0.23	47.65	74.00	-26.35	peak
2	8565.000	39.03	8.41	47.44	74.00	-26.56	peak
3	10290.000	36.82	11.51	48.33	74.00	-25.67	peak
4	12285.000	35.46	14.37	49.83	74.00	-24.17	peak
5	15165.000	35.21	15.54	50.75	74.00	-23.25	peak
6	16890.000	31.30	19.93	51.23	74.00	-22.77	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. The High Pass filter loss factor already add into the correct factor.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



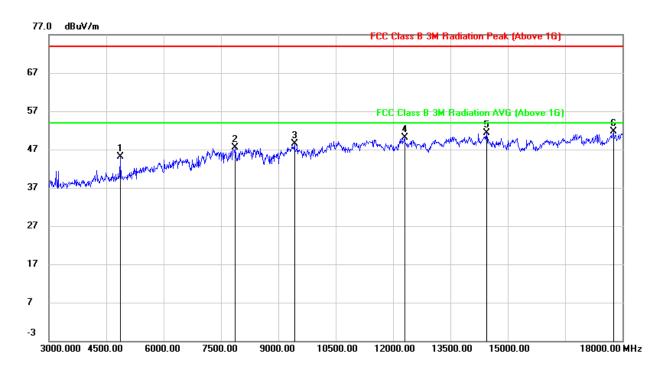
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	5325.000	44.16	1.57	45.73	74.00	-28.27	peak
2	6015.000	44.60	3.78	48.38	74.00	-25.62	peak
3	8505.000	43.06	8.55	51.61	74.00	-22.39	peak
4	11415.000	36.31	13.46	49.77	74.00	-24.23	peak
5	14355.000	34.55	16.38	50.93	74.00	-23.07	peak
6	17700.000	30.06	22.24	52.30	74.00	-21.70	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. The High Pass filter loss factor already add into the correct factor.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



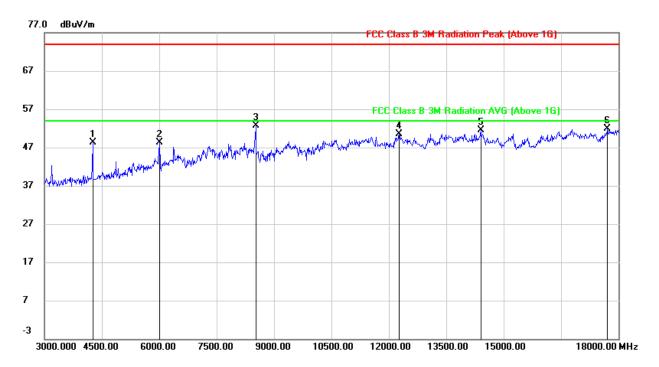
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	4860.000	45.29	-0.15	45.14	74.00	-28.86	peak
2	7875.000	38.98	8.55	47.53	74.00	-26.47	peak
3	9420.000	38.14	10.34	48.48	74.00	-25.52	peak
4	12300.000	35.70	14.39	50.09	74.00	-23.91	peak
5	14445.000	34.99	16.37	51.36	74.00	-22.64	peak
6	17760.000	28.85	22.83	51.68	74.00	-22.32	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. The High Pass filter loss factor already add into the correct factor.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



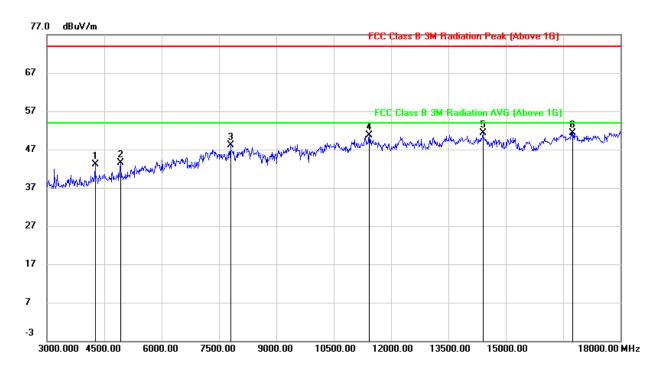
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	4260.000	50.43	-2.09	48.34	74.00	-25.66	peak
2	6015.000	44.47	3.78	48.25	74.00	-25.75	peak
3	8520.000	44.18	8.53	52.71	74.00	-21.29	peak
4	12270.000	36.17	14.34	50.51	74.00	-23.49	peak
5	14400.000	35.02	16.43	51.45	74.00	-22.55	peak
6	17715.000	29.56	22.39	51.95	74.00	-22.05	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. The High Pass filter loss factor already add into the correct factor.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



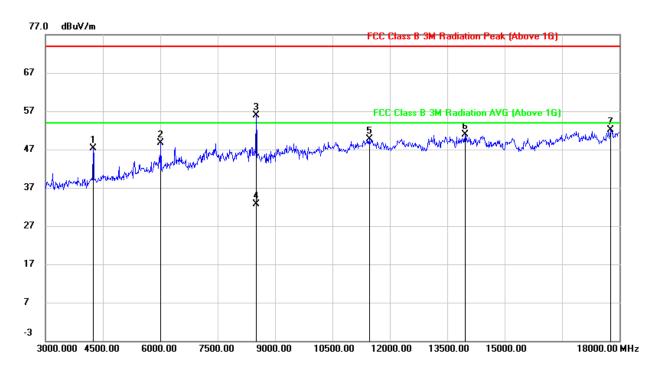
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	4260.000	45.12	-2.09	43.03	74.00	-30.97	peak
2	4920.000	43.46	0.02	43.48	74.00	-30.52	peak
3	7800.000	39.21	8.87	48.08	74.00	-25.92	peak
4	11430.000	37.09	13.57	50.66	74.00	-23.34	peak
5	14400.000	34.87	16.43	51.30	74.00	-22.70	peak
6	16755.000	31.50	19.87	51.37	74.00	-22.63	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. The High Pass filter loss factor already add into the correct factor.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	4245.000	49.42	-2.02	47.40	74.00	-26.60	peak
2	6015.000	44.96	3.78	48.74	74.00	-25.26	peak
3	8505.000	47.43	8.55	55.98	74.00	-18.02	peak
4	8505.000	24.08	8.55	32.63	54.00	-21.37	AVG
5	11460.000	35.82	13.79	49.61	74.00	-24.39	peak
6	13965.000	34.66	16.29	50.95	74.00	-23.05	peak
7	17760.000	29.24	22.83	52.07	74.00	-21.93	peak

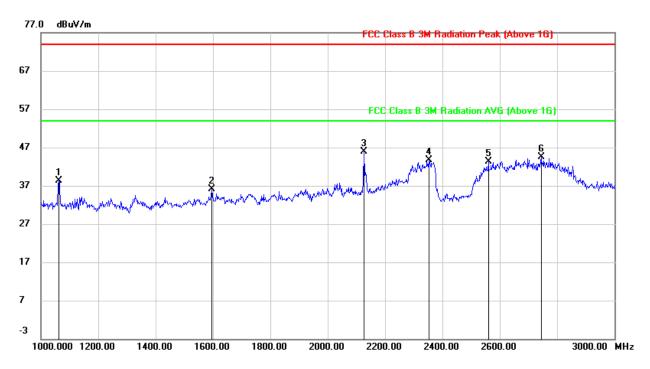
- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. The High Pass filter loss factor already add into the correct factor.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



# 9.3. SPURIOUS EMISSIONS (1~3GHz)

### 9.3.1. 802.11b MODE

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



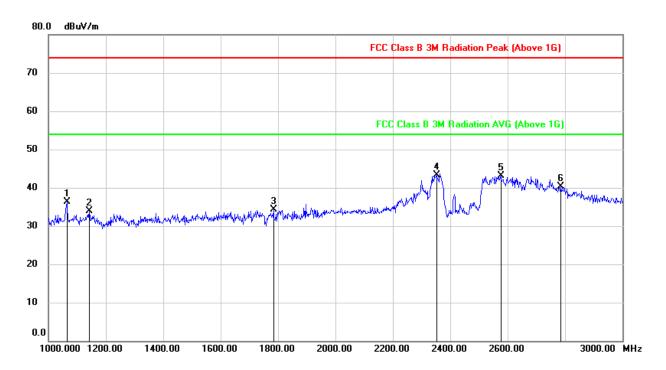
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	1062.000	52.17	-13.79	38.38	74.00	-35.62	peak
2	1596.000	47.87	-11.77	36.10	74.00	-37.90	peak
3	2126.000	55.00	-9.15	45.85	74.00	-28.15	peak
4	2352.000	51.64	-7.99	43.65	74.00	-30.35	peak
5	2560.000	50.53	-7.26	43.27	74.00	-30.73	peak
6	2744.000	50.92	-6.35	44.57	74.00	-29.43	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 then spurious frequency bands and the authorized band was not corrected for BRF losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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

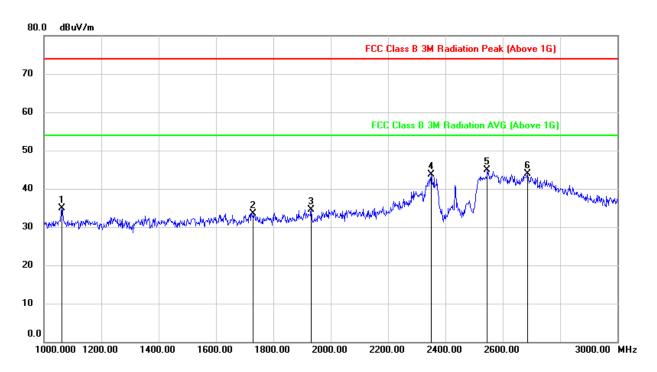


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	1064.000	49.07	-12.78	36.29	74.00	-37.71	peak
2	1142.000	46.33	-12.52	33.81	74.00	-40.19	peak
3	1784.000	43.98	-9.63	34.35	74.00	-39.65	peak
4	2352.000	50.53	-7.29	43.24	74.00	-30.76	peak
5	2576.000	49.74	-6.69	43.05	74.00	-30.95	peak
6	2786.000	45.84	-5.51	40.33	74.00	-33.67	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 then spurious frequency bands and the authorized band was not corrected for BRF losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

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

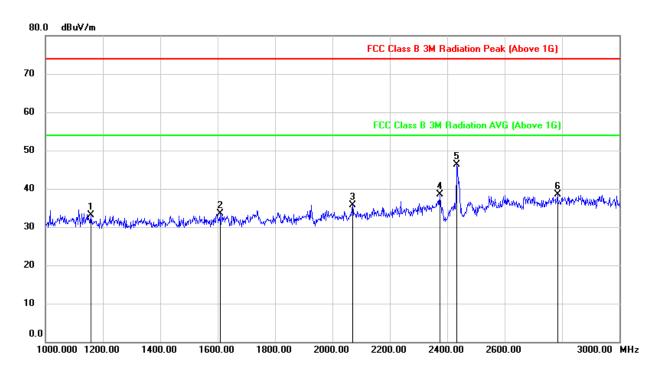


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	1062.000	47.61	-12.80	34.81	74.00	-39.19	peak
2	1730.000	43.84	-10.32	33.52	74.00	-40.48	peak
3	1932.000	44.02	-9.45	34.57	74.00	-39.43	peak
4	2350.000	51.05	-7.30	43.75	74.00	-30.25	peak
5	2546.000	51.41	-6.54	44.87	74.00	-29.13	peak
6	2686.000	51.26	-7.33	43.93	74.00	-30.07	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 then spurious frequency bands and the authorized band was not corrected for BRF losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

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



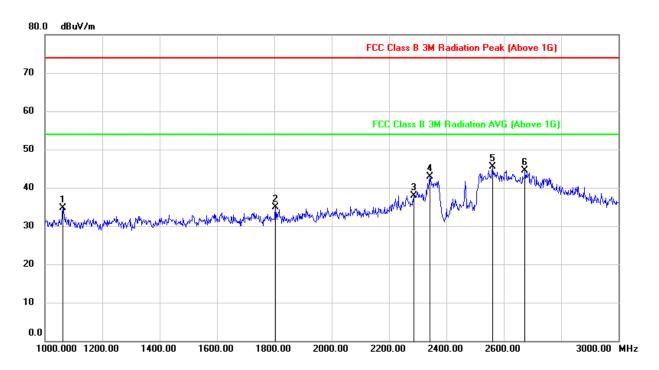
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	1158.000	45.66	-12.52	33.14	74.00	-40.86	peak
2	1608.000	44.14	-10.62	33.52	74.00	-40.48	peak
3	2070.000	44.41	-8.75	35.66	74.00	-38.34	peak
4	2374.000	45.68	-7.21	38.47	74.00	-35.53	peak
5	2434.000	53.19	-6.84	46.35	74.00	-27.65	peak
6	2784.000	44.16	-5.56	38.60	74.00	-35.40	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 then spurious frequency bands and the authorized band was not corrected for BRF losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



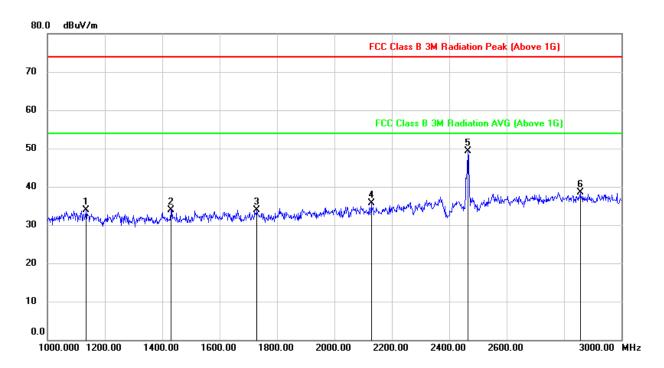
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	1062.000	47.43	-12.80	34.63	74.00	-39.37	peak
2	1804.000	44.28	-9.41	34.87	74.00	-39.13	peak
3	2286.000	45.59	-7.63	37.96	74.00	-36.04	peak
4	2342.000	50.28	-7.33	42.95	74.00	-31.05	peak
5	2562.000	52.22	-6.63	45.59	74.00	-28.41	peak
6	2674.000	51.71	-7.26	44.45	74.00	-29.55	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 then spurious frequency bands and the authorized band was not corrected for BRF losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



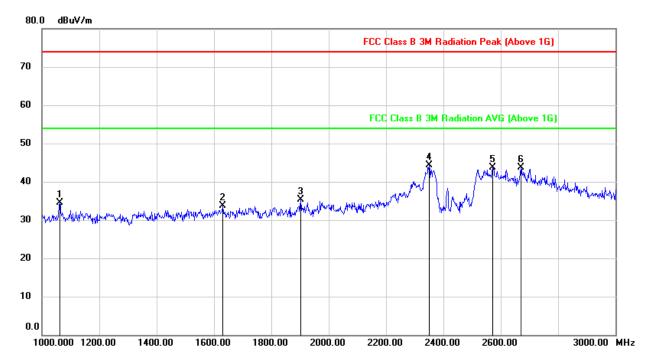
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	1134.000	46.41	-12.54	33.87	74.00	-40.13	peak
2	1430.000	45.66	-11.83	33.83	74.00	-40.17	peak
3	1730.000	44.31	-10.32	33.99	74.00	-40.01	peak
4	2128.000	43.97	-8.36	35.61	74.00	-38.39	peak
5	2466.000	55.81	-6.60	49.21	74.00	-24.79	peak
6	2856.000	43.77	-5.17	38.60	74.00	-35.40	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 then spurious frequency bands and the authorized band was not corrected for BRF losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



# 9.3.2. 802.11g MODE

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



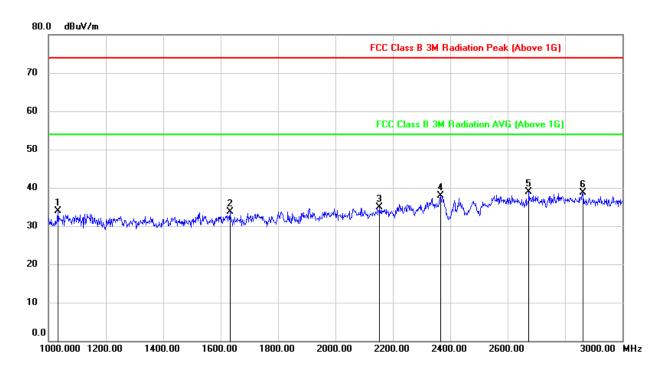
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	1062.000	47.22	-12.80	34.42	74.00	-39.58	peak
2	1630.000	44.28	-10.64	33.64	74.00	-40.36	peak
3	1902.000	44.60	-9.31	35.29	74.00	-38.71	peak
4	2350.000	51.64	-7.30	44.34	74.00	-29.66	peak
5	2572.000	50.39	-6.67	43.72	74.00	-30.28	peak
6	2670.000	50.97	-7.24	43.73	74.00	-30.27	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 then spurious frequency bands and the authorized band was not corrected for BRF losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



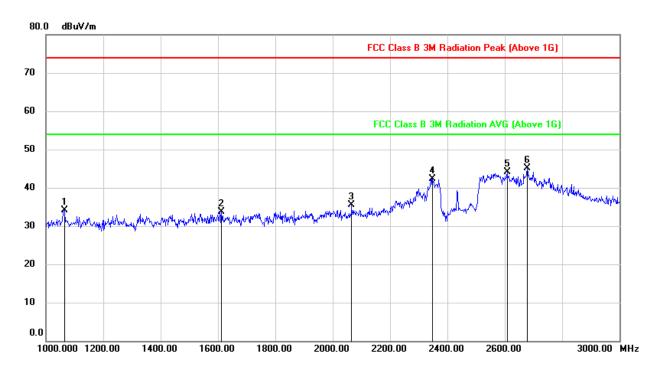
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	1032.000	46.78	-12.94	33.84	74.00	-40.16	peak
2	1632.000	44.34	-10.64	33.70	74.00	-40.30	peak
3	2154.000	43.27	-8.39	34.88	74.00	-39.12	peak
4	2366.000	45.12	-7.23	37.89	74.00	-36.11	peak
5	2674.000	46.18	-7.26	38.92	74.00	-35.08	peak
6	2862.000	43.87	-5.17	38.70	74.00	-35.30	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 then spurious frequency bands and the authorized band was not corrected for BRF losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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# HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



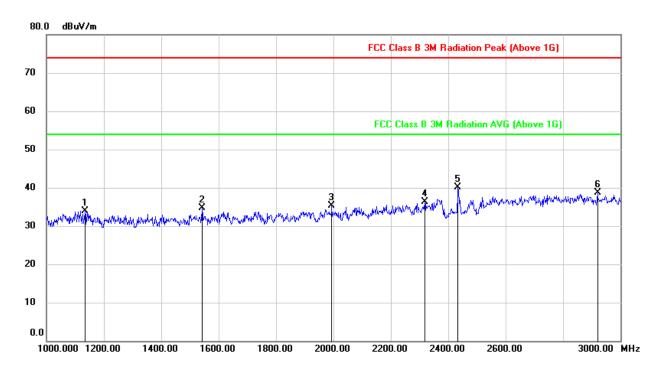
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	1064.000	46.90	-12.78	34.12	74.00	-39.88	peak
2	1612.000	44.32	-10.62	33.70	74.00	-40.30	peak
3	2066.000	44.25	-8.81	35.44	74.00	-38.56	peak
4	2348.000	49.63	-7.31	42.32	74.00	-31.68	peak
5	2608.000	50.98	-6.85	44.13	74.00	-29.87	peak
6	2678.000	52.30	-7.28	45.02	74.00	-28.98	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 then spurious frequency bands and the authorized band was not corrected for BRF losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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# HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)



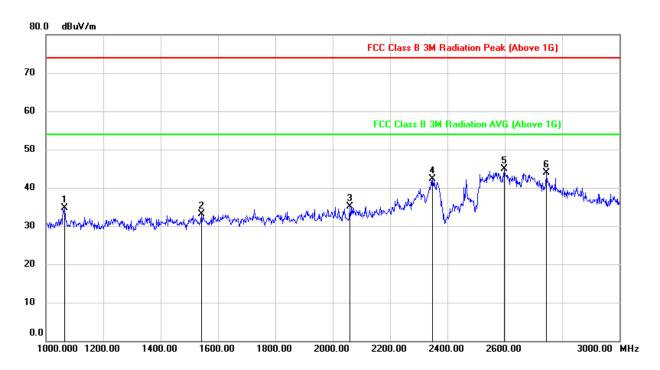
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	1134.000	46.52	-12.54	33.98	74.00	-40.02	peak
2	1542.000	45.96	-11.18	34.78	74.00	-39.22	peak
3	1994.000	45.10	-9.75	35.35	74.00	-38.65	peak
4	2318.000	43.66	-7.43	36.23	74.00	-37.77	peak
5	2434.000	47.00	-6.84	40.16	74.00	-33.84	peak
6	2920.000	43.81	-5.04	38.77	74.00	-35.23	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 then spurious frequency bands and the authorized band was not corrected for BRF losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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# HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



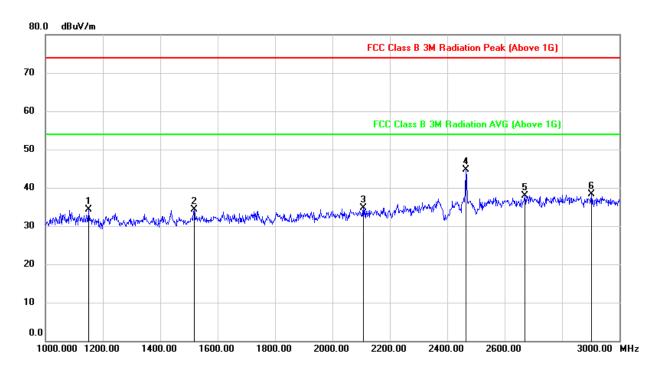
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	1066.000	47.58	-12.78	34.80	74.00	-39.20	peak
2	1542.000	44.22	-11.18	33.04	74.00	-40.96	peak
3	2060.000	43.96	-8.90	35.06	74.00	-38.94	peak
4	2348.000	49.55	-7.31	42.24	74.00	-31.76	peak
5	2598.000	51.75	-6.79	44.96	74.00	-29.04	peak
6	2746.000	50.33	-6.40	43.93	74.00	-30.07	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 then spurious frequency bands and the authorized band was not corrected for BRF losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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# HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



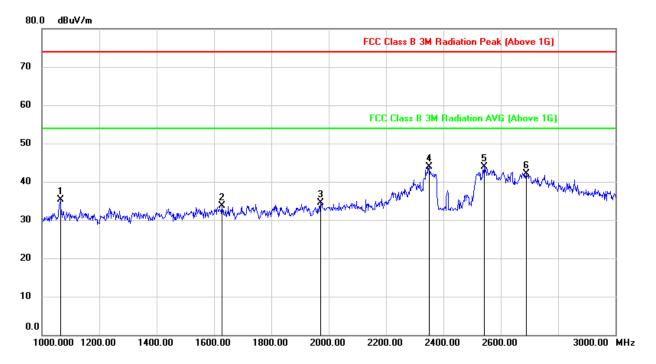
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	1150.000	46.78	-12.52	34.26	74.00	-39.74	peak
2	1518.000	45.79	-11.42	34.37	74.00	-39.63	peak
3	2108.000	42.97	-8.33	34.64	74.00	-39.36	peak
4	2466.000	51.32	-6.60	44.72	74.00	-29.28	peak
5	2670.000	45.15	-7.24	37.91	74.00	-36.09	peak
6	2902.000	43.43	-5.13	38.30	74.00	-35.70	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 then spurious frequency bands and the authorized band was not corrected for BRF losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



## 9.3.3. 802.11n HT20 MODE

# HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



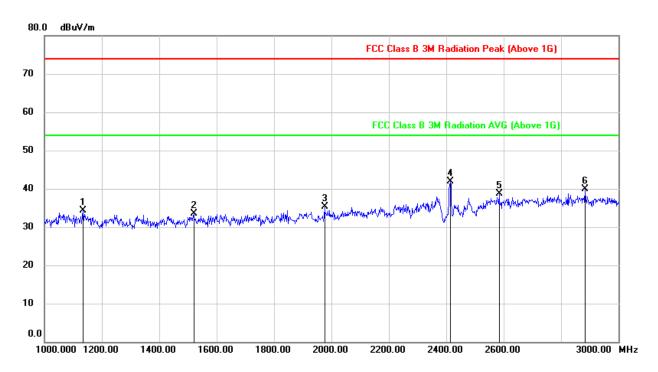
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	1064.000	48.01	-12.78	35.23	74.00	-38.77	peak
2	1628.000	44.39	-10.63	33.76	74.00	-40.24	peak
3	1972.000	44.24	-9.65	34.59	74.00	-39.41	peak
4	2350.000	51.25	-7.30	43.95	74.00	-30.05	peak
5	2542.000	50.39	-6.53	43.86	74.00	-30.14	peak
6	2690.000	49.56	-7.37	42.19	74.00	-31.81	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 then spurious frequency bands and the authorized band was not corrected for BRF losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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# HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



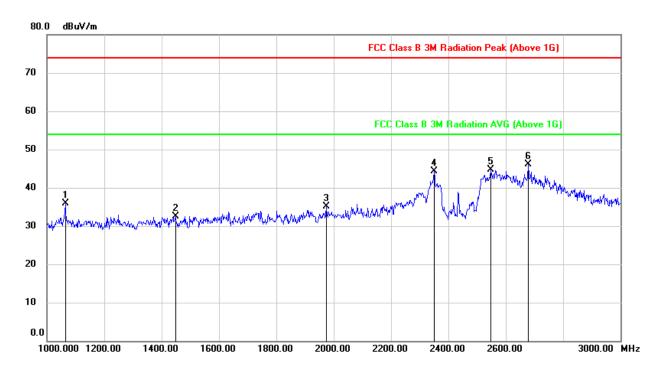
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	1134.000	46.81	-12.54	34.27	74.00	-39.73	peak
2	1520.000	44.94	-11.40	33.54	74.00	-40.46	peak
3	1976.000	44.94	-9.67	35.27	74.00	-38.73	peak
4	2414.000	48.94	-7.00	41.94	74.00	-32.06	peak
5	2584.000	45.48	-6.73	38.75	74.00	-35.25	peak
6	2884.000	45.09	-5.15	39.94	74.00	-34.06	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 then spurious frequency bands and the authorized band was not corrected for BRF losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



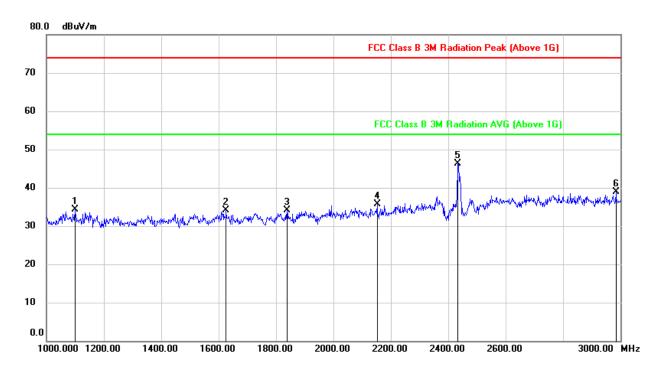
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	1064.000	48.68	-12.78	35.90	74.00	-38.10	peak
2	1448.000	44.32	-11.76	32.56	74.00	-41.44	peak
3	1974.000	44.81	-9.66	35.15	74.00	-38.85	peak
4	2350.000	51.55	-7.30	44.25	74.00	-29.75	peak
5	2548.000	51.17	-6.56	44.61	74.00	-29.39	peak
6	2678.000	53.39	-7.28	46.11	74.00	-27.89	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 then spurious frequency bands and the authorized band was not corrected for BRF losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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# HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)



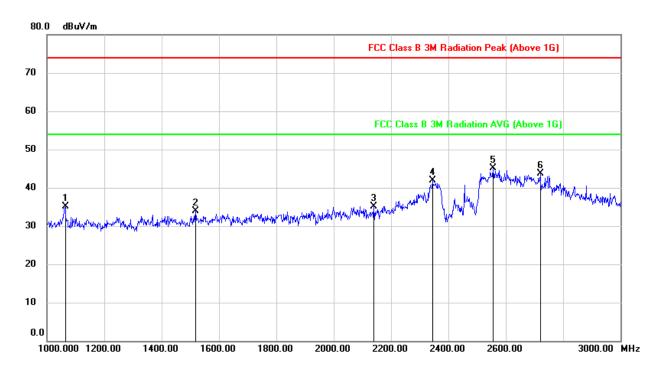
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	1100.000	46.85	-12.60	34.25	74.00	-39.75	peak
2	1626.000	44.68	-10.63	34.05	74.00	-39.95	peak
3	1838.000	43.40	-9.37	34.03	74.00	-39.97	peak
4	2152.000	44.13	-8.39	35.74	74.00	-38.26	peak
5	2434.000	53.23	-6.84	46.39	74.00	-27.61	peak
6	2984.000	43.68	-4.68	39.00	74.00	-35.00	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 then spurious frequency bands and the authorized band was not corrected for BRF losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



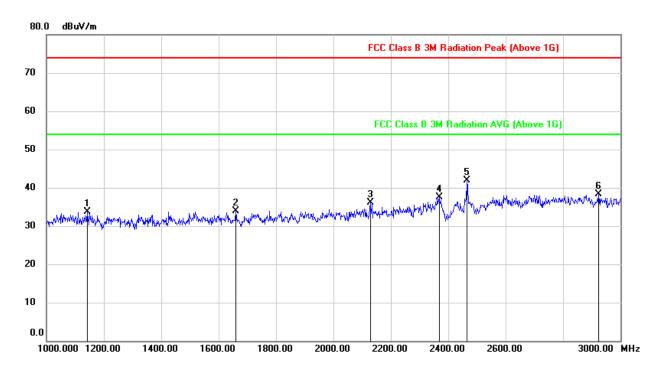
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	1064.000	47.93	-12.78	35.15	74.00	-38.85	peak
2	1518.000	45.25	-11.42	33.83	74.00	-40.17	peak
3	2140.000	43.57	-8.37	35.20	74.00	-38.80	peak
4	2344.000	49.13	-7.32	41.81	74.00	-32.19	peak
5	2556.000	51.69	-6.59	45.10	74.00	-28.90	peak
6	2720.000	50.77	-6.97	43.80	74.00	-30.20	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 then spurious frequency bands and the authorized band was not corrected for BRF losses.
  - 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	1142.000	46.18	-12.52	33.66	74.00	-40.34	peak
2	1660.000	44.49	-10.67	33.82	74.00	-40.18	peak
3	2128.000	44.48	-8.36	36.12	74.00	-37.88	peak
4	2368.000	44.75	-7.23	37.52	74.00	-36.48	peak
5	2466.000	48.48	-6.60	41.88	74.00	-32.12	peak
6	2924.000	43.30	-5.01	38.29	74.00	-35.71	peak

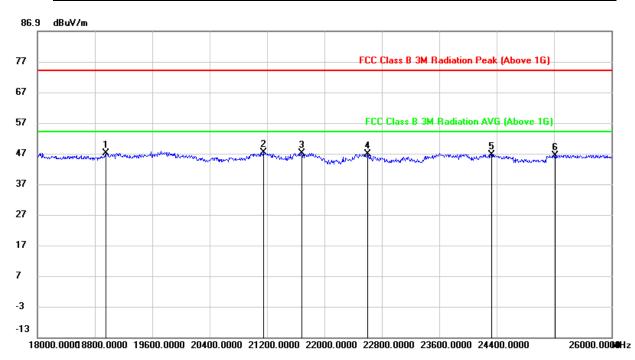
- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for BRF losses.
  - 5. Proper operation of the transmitter prior to adding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



# 9.4. SPURIOUS EMISSIONS (18~26GHz)

## 9.4.1. 802.11b MODE

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

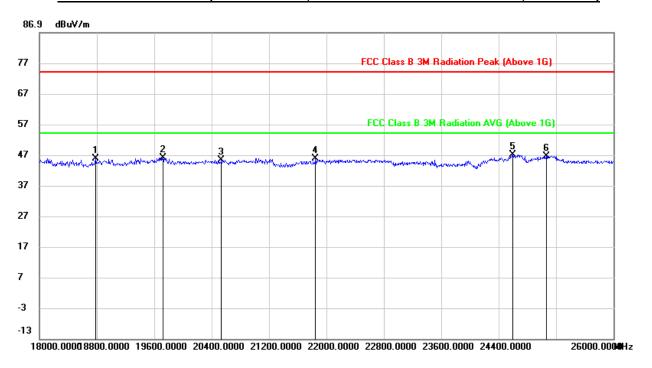


No. Frequency Reading Correct Result Limit Margin Remark (MHz) (dBuV) (dBuV/m) (dB/m) (dBuV/m) (dB) 51.92 -4.89 47.03 74.00 -26.97 18952.000 peak 52.70 47.28 2 21152.000 -5.42 74.00 -26.72 peak 3 21680.000 52.74 -5.76 46.98 74.00 -27.02 peak 4 22600.000 52.54 -5.77 46.77 74.00 -27.23 peak 24328.000 49.91 -3.28 46.63 74.00 5 -27.37 peak 6 25216.000 47.55 -1.16 46.39 74.00 -27.61 peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	18784.000	50.55	-4.84	45.71	74.00	-28.29	peak
2	19720.000	50.50	-4.39	46.11	74.00	-27.89	peak
3	20536.000	50.34	-4.98	45.36	74.00	-28.64	peak
4	21848.000	51.76	-5.95	45.81	74.00	-28.19	peak
5	24592.000	49.32	-2.36	46.96	74.00	-27.04	peak
6	25064.000	47.68	-1.11	46.57	74.00	-27.43	peak

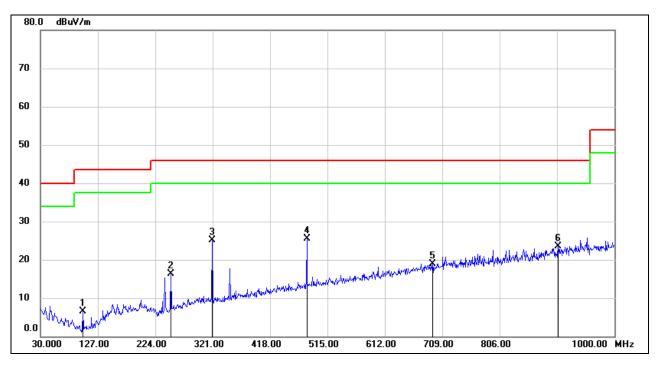
- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Proper operation of the transmitter prior to adding the filter to the measurement chain.

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# 9.5. SPURIOUS EMISSIONS (0.03 ~ 1 GHz)

## 9.5.1. 802.11b MODE

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



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	101.7800	28.32	-21.75	6.57	43.50	-36.93	QP
2	250.1900	32.35	-16.12	16.23	46.00	-29.77	QP
3	320.0300	38.80	-13.63	25.17	46.00	-20.83	QP
4	480.0800	36.39	-10.84	25.55	46.00	-20.45	QP
5	692.5100	25.66	-6.79	18.87	46.00	-27.13	QP
6	904.9400	27.47	-4.05	23.42	46.00	-22.58	OP

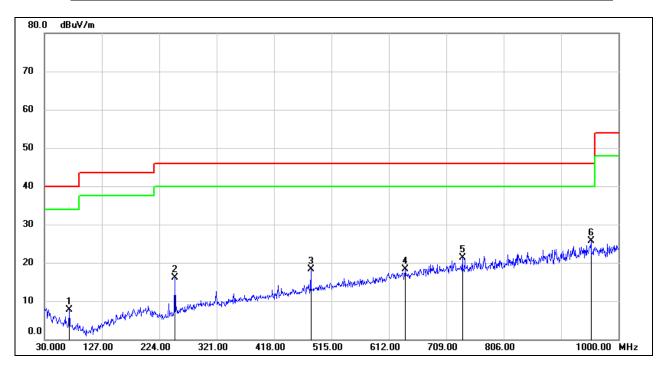
Note: 1. Result Level = Read Level + Correct Factor.

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.

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



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	71.7100	27.95	-20.27	7.68	40.00	-32.32	QP
2	250.1900	32.16	-16.12	16.04	46.00	-29.96	QP
3	480.0800	29.21	-10.84	18.37	46.00	-27.63	QP
4	640.1300	25.90	-7.68	18.22	46.00	-27.78	QP
5	736.1599	27.48	-6.14	21.34	46.00	-24.66	QP
6	953,4400	29.08	-3.37	25.71	46.00	-20.29	OP

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 test modes have been tested, only the worst data record in the report.

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0.150

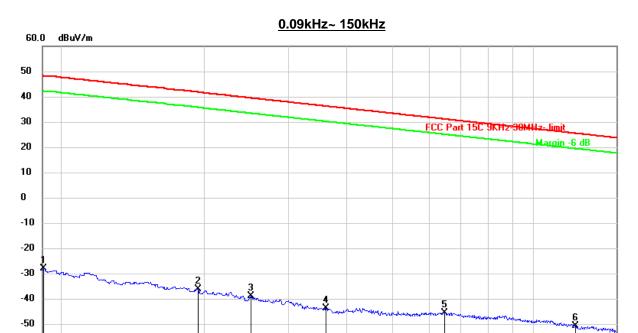
# 9.6. SPURIOUS EMISSIONS BELOW 30M

#### 9.6.1. 802.11b MODE

-60

0.009

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



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.0091	74.29	-101.33	-27.04	48.28	-75.32	peak
2	0.0193	66.15	-101.35	-35.20	41.89	-77.09	peak
3	0.0250	63.29	-101.37	-38.08	39.64	-77.72	peak
4	0.0361	58.72	-101.42	-42.70	36.45	-79.15	peak
5	0.0646	57.03	-101.54	-44.51	31.40	-75.91	peak
6	0.1226	52.10	-101.73	-49.63	25.83	-75.46	peak

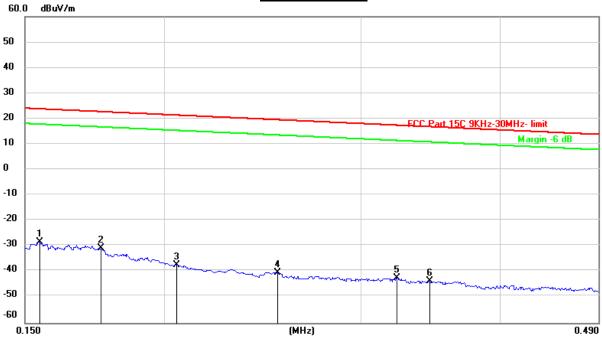
(MHz)

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

2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.







No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.1547	73.31	-101.65	-28.34	23.81	-52.15	peak
2	0.1756	70.84	-101.68	-30.84	22.72	-53.56	peak
3	0.2051	64.31	-101.73	-37.42	21.36	-58.78	peak
4	0.2530	61.59	-101.80	-40.21	19.54	-59.75	peak
5	0.3234	59.48	-101.88	-42.40	17.41	-59.81	peak
6	0.3462	58.24	-101.90	-43.66	16.82	-60.48	peak

<sup>2.</sup> If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.



-60

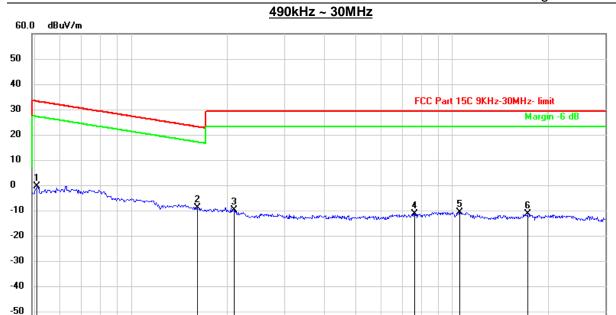
0.490

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20.000

30.000

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No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.5080	62.35	-62.07	0.28	33.49	-33.21	peak
2	1.6026	53.69	-62.00	-8.31	23.51	-31.82	peak
3	2.0853	52.57	-61.80	-9.23	29.54	-38.77	peak
4	7.6314	50.51	-61.12	-10.61	29.54	-40.15	peak
5	10.5823	50.82	-60.82	-10.00	29.54	-39.54	peak
6	17.1631	50.16	-60.93	-10.77	29.54	-40.31	peak

(MHz)

5.000

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

2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.



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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

**END OF REPORT**