



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

#### **CERTIFICATION TEST REPORT**

For

#### Solar Inverter

MODEL NUMBER: SUN2000-25KTL-NAM3, SUN2000-30KTL-NAM3, SUN2000-33KTL-NAM3, SUN2000-36KTL-NAM3, SUN2000-40KTL-NAM3

FCC ID: QISSUN2000

IC: 6369A-SUN2000

REPORT NUMBER: 4789884617-1

ISSUE DATE: June 5, 2021

Prepared for

Huawei Technologies Co., Ltd.

Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian,
Longgang District, Shenzhen, China

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, 523808, People's Republic of China

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

The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products.



REPORT NO.: 4789884617-1 Page 2 of 98

**Revision History** 

Rev.	Issue Date	Revisions	Revised By
V0	06/05/2021	Initial Issue	



REPORT NO.: 4789884617-1 Page 3 of 98

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

#### Note:

<sup>1.</sup> This test report is only published to and used by the applicant, and it is not for evidence purpose in China.

<sup>2.</sup> The measurement result for the sample received is <Pass> according to < CFR 47 FCC PART 15 SUBPART C >< ISED RSS-247 > when <Accuracy Method> decision rule is applied.



## **TABLE OF CONTENTS**

1. A	TTESTATION OF TEST RESULTS	6
2. TE	EST METHODOLOGY	7
3. F	ACILITIES AND ACCREDITATION	7
4. C	ALIBRATION AND UNCERTAINTY	8
4.1.	MEASURING INSTRUMENT CALIBRATION	8
4.2.	MEASUREMENT UNCERTAINTY	8
5. E0	QUIPMENT UNDER TEST	9
5.1.	DESCRIPTION OF EUT	9
5.2.	CHANNEL LIST	9
5.3.	MAXIMUM OUTPUT POWER	10
5.4.	TEST CHANNEL CONFIGURATION	10
5.5.	THE WORSE CASE POWER SETTING PARAMETER	10
5.6.	THE WORSE CASE CONFIGURATIONS	11
5.7.	DESCRIPTION OF AVAILABLE ANTENNAS	12
5.8.	DESCRIPTION OF TEST SETUP	13
6. M	EASURING INSTRUMENT AND SOFTWARE USED	14
7. AI	NTENNA PORT TEST RESULTS	16
7.1.	ON TIME AND DUTY CYCLE	16
7.2.	6 dB DTS BANDWIDTH AND 99 % OCCUPIED BANDWIDTH	17
7.3.	CONDUCTED OUTPUT POWER	19
7.4.	POWER SPECTRAL DENSITY	20
7.5.	CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS	22
8. R	ADIATED TEST RESULTS	24
8.1.		
	1.1. 802.11b SISO MODE 1.2. 802.11g SISO MODE	
_	1.3. 802.11n HT20 SISO MODE	
8.2.	'	
8.3	2.1. 802.11b SISO MODE	
8.3.	SPURIOUS EMISSIONS (3 GHz ~ 18 GHz)	
_	3.1. 802.11b SISO MODE	
	3.3. 802.11n HT20 SISO MODE	
8.4.		
8.	4.1. 802.11b SISO MODE	62

## REPORT NO.: 4789884617-1

Page 5 of 98

	i age 3 oi 30
8.5. SPURIOUS EMISSIONS (30 MHz ~ 1 GHz)	64
8.5.1. 802.11b SISO MODE	64
8.6. SPURIOUS EMISSIONS BELOW 30 MHz	66
8.6.1. 802.11b SISO MODE	
	•
9. ANTENNA REQUIREMENTS	69
10. Appendix	70
10.1. Appendix A: DTS Bandwidth	
10.1.1. Test Result	
10.1.2. Test Graphs	
10.2. Appendix B: Occupied Channel Bandwidth	
10.2.1. Test Result	
10.2.2. Test Graphs	
10.3. Appendix C: Maximum conducted output power	
10.3.1. Test Result	
10.4. Appendix D: Maximum power spectral density	
10.4.2. Test Graphs	
•	
10.5. Appendix E: Band edge measurements	
10.5.2. Test Graphs	
· · · · · · · · · · · · · · · · · · ·	
10.6. Appendix F: Conducted Spurious Emission	
10.6.1. Test Result	
10.7. Appendix G: Duty Cycle	
10.7.1. Test Result	
10.1.4. 1531 UIAVII3	



REPORT NO.: 4789884617-1

Page 6 of 98

## 1. ATTESTATION OF TEST RESULTS

**Applicant Information** 

Company Name: Huawei Technologies Co., Ltd.

Address: Administration Building, Headquarters of Huawei Technologies

Co., Ltd., Bantian, Longgang District, Shenzhen, China

**Manufacturer Information** 

Company Name: Huawei Technologies Co., Ltd.

Address: Administration Building, Headquarters of Huawei Technologies

Co., Ltd., Bantian, Longgang District, Shenzhen, China

**EUT Information** 

EUT Name: Solar Inverter

Model: SUN2000-25KTL-NAM3, SUN2000-30KTL-NAM3,

SUN2000-33KTL-NAM3, SUN2000-36KTL-NAM3,

SUN2000-40KTL-NAM3

Model differences: Please refer to section 5.1.

Sample Status: Normal
Sample Received Date: June 4, 2021
Date of Tested: June 4, 2021

APPLICABLE STANDARDS					
STANDARD	TEST RESULTS				
CFR 47 FCC PART 15 SUBPART C	PASS				
ISED RSS-247 Issue 2, February 2017	PASS				
ISED RSS-GEN Issue 5, April 2018	PASS				
ISED RSS-GEN Issue 5, Amendment 1 (March 2019)	PASS				
ISED RSS-GEN Issue 5, Amendment 2 (February 2021)	PASS				

⊃re	epared By:	Checked By:

Kebo Zhang

**Project Engineer** 

Shawn Wen

**Laboratory Leader** 

Approved By:

Stephen Guo

Laboratory Manager



REPORT NO.: 4789884617-1 Page 7 of 98

#### 2. TEST METHODOLOGY

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

#### 3. FACILITIES AND ACCREDITATION

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

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

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

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



REPORT NO.: 4789884617-1 Page 8 of 98

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	3.62 dB		
Radiated Emission (Included Fundamental Emission) (9 kHz ~ 30 MHz)	2.2 dB		
Radiated Emission (Included Fundamental Emission) (30 MHz ~ 1 GHz)	4.00 dB		
Radiated Emission	5.78 dB (1 GHz ~ 18 GHz)		
(Included Fundamental Emission) (1 GHz to 26 GHz)	5.23 dB (18 GHz ~ 26 GHz)		
Duty Cycle	±0.028%		
DTS and 99% Occupied Bandwidth	±0.0196%		
Maximum Conducted Output Power	±0.686 dB		
Maximum Power Spectral Density Level	±0.743 dB		
Conducted Band-edge Compliance	±1.328 dB		
Conducted Unwanted Emissions In Non-restricted	±0.746 dB (9 kHz ~ 1 GHz)		
Frequency Bands	±1.328dB (1 GHz ~ 26 GHz)		

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



## 5. EQUIPMENT UNDER TEST

## 5.1. DESCRIPTION OF EUT

EUT Name	Solar Inverter
Model	SUN2000-25KTL-NAM3
Serial No.	ES2130013077
Series Model	SUN2000-30KTL-NAM3, SUN2000-33KTL-NAM3, SUN2000-36KTL-NAM3, SUN2000-40KTL-NAM3
Model Difference	All the models have the same RF technical construction including circuit diagram, PCB Layout, components, component layout and performance.
Radio Technology	WLAN (IEEE 802.11b/g/n HT20)
Operation frequency	IEEE 802.11b: 2412MHz ~ 2462MHz IEEE 802.11g: 2412MHz ~ 2462MHz IEEE 802.11n HT20: 2412MHz ~ 2462MHz
Modulation	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK, BPSK)
Bit Rate of Transmitter	IEEE 802.11b: 11/5.5/2/1 Mbps IEEE 802.11g: 54/48/36/24/18/12/9/6 Mbps IEEE 802.11n HT20: up to 150 Mbps
Firmware Version	V100R001
Software Version	V100R001
Ratings	DC 12V

Note: DC 12V power supply only for WIFI circuit.

## 5.2. 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	/	/		

REPORT NO.: 4789884617-1 Page 10 of 98

## 5.3. MAXIMUM OUTPUT POWER

IEEE Std. 802.11	Frequency (MHz)	Channel Number	Maximum Conducted AVG Output Power (dBm)	Maximum AVG EIRP (dBm)
b	2412 ~ 2462	1-11[11]	16.80	19.65
g	2412 ~ 2462	1-11[11]	16.41	19.26
n HT20	2412 ~ 2462	1-11[11]	16.54	19.39

#### 5.4. TEST CHANNEL CONFIGURATION

IEEE Std. 802.11	Test Channel Number	Frequency	
b	CH 1(Low Channel), CH 6(MID Channel), CH 11(High Channel)	2412 MHz, 2437 MHz, 2462 MHz	
g	CH 1(Low Channel), CH 6(MID Channel), CH 11(High Channel)	2412 MHz, 2437 MHz, 2462 MHz	
n HT20	CH 1(Low Channel), CH 6(MID Channel), CH 11(High Channel)	2412 MHz, 2437 MHz, 2462 MHz	

#### 5.5. THE WORSE CASE POWER SETTING PARAMETER

The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band								
Test Softw	<i>r</i> are		IPOP					
	Transmit		Test Software setting value					
Modulation Mode	Antenna Number	NCB: 20MHz			NCB: 40MHz			
Mode		CH 1	CH 6	CH 11	/	/	/	
802.11b	1	30	30	30				
802.11g 1		20	20	20	/			
802.11n HT20	1	25	25	25				

REPORT NO.: 4789884617-1 Page 11 of 98

## 5.6. THE WORSE CASE CONFIGURATIONS

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

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

Test channels referring to section 5.4.

Maximum power setting referring to section 5.5.

Worst case Data Rates declared by the customer:

802.11b mode: 1 Mbps 802.11b mode: 6 Mbps 802.11n HT20 mode: MCS0



REPORT NO.: 4789884617-1 Page 12 of 98

## 5.7. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna	Frequency (MHz)	Antenna Type	MAX Antenna Gain (dBi)
1	2412-2462	PCB Antenna	2.85

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

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

REPORT NO.: 4789884617-1 Page 13 of 98

#### 5.8. DESCRIPTION OF TEST SETUP

#### **SUPPORT EQUIPMENT**

Item	Equipment	Brand Name	Model Name	Remarks
1	Laptop	ThinkPad	X230i	/
2	USB TO UART	/	/	/
3	Battery	LEOCH	DJW12-20	12V20AH

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

Item	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB	NA	NA	1	/

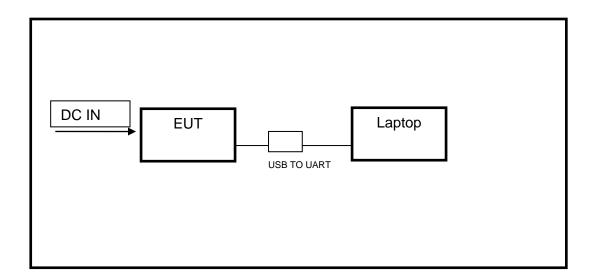
#### **ACCESSORIES**

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

#### **TEST SETUP**

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

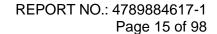
#### **SETUP DIAGRAM FOR TESTS**





6. MEASURING INSTRUMENT AND SOFTWARE USED

Radiated Emissions						
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date	
MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Nov. 12, 2020	Nov. 11, 2021	
Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Aug. 11, 2018	Aug. 10, 2021	
Preamplifier	HP	8447D	2944A09099	Nov. 12, 2020	Nov. 11, 2021	
EMI Measurement Receiver	R&S	ESR26	101377	Nov. 12, 2020	Nov. 11, 2021	
Horn Antenna	TDK	HRN-0118	130939	Sept. 17, 2018	Sept. 17, 2021	
Preamplifier	TDK	PA-02-0118	TRS-305- 00067	Nov. 20, 2020	Nov. 19, 2021	
Horn Antenna	Schwarzbeck	BBHA9170	#691	Aug. 11, 2018	Aug. 11, 2021	
Preamplifier	TDK	PA-02-2	TRS-307- 00003	Nov. 12, 2020	Nov. 11, 2021	
Preamplifier	TDK	PA-02-3	TRS-308- 00002	Nov. 12, 2020	Nov. 11, 2021	
Loop antenna	Schwarzbeck	1519B	00008	Jan.17, 2019	Jan.17,2022	
Preamplifier	TDK	PA-02-001- 3000	TRS-302- 00050	Nov. 12, 2020	Nov. 11, 2021	
Preamplifier	Mini-Circuits	ZX60-83LN- S+	SUP01201941	Nov. 20, 2020	Nov. 19, 2021	
High Pass Filter	Wi	WHKX10- 2700-3000- 18000-40SS	23	Nov. 12, 2020	Nov. 11, 2021	
Software						
Description			Manufacturer	Name	Version	
Test Software for Radiated Emissions			Farad	EZ-EMC	Ver. UL-3A1	





**Tonsend RF Test System** Manufacturer Last Cal. Equipment Model No. Serial No. Due. Date Wideband Radio R&S CMW500 155523 Nov.20,2020 Nov.19,2021 Communication Tester PXA Signal Analyzer Keysight N9030A MY55410512 Nov.20,2020 Nov.19,2021 MXG Vector Signal Keysight N5182B MY56200284 Nov.20,2020 Nov.19,2021 Generator MXG Vector Signal Keysight MY56200301 Nov.20,2020 Nov.19,2021 N5172B Generator DC power supply Keysight E3642A MY55159130 Nov.24,2020 Nov.23,2021 Software Manufacturer Description Name Version Tonsend SRD Test System Tonsend JS1120-3 RF Test System 2.6.77.0518

Other Instruments						
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.	
Dual Channel Power Meter	Keysight	N1912A	MY55416024	Nov. 20, 2020	Nov. 19, 2021	
Power Sensor	Keysight	USB Wideband Power Sensor	MY5100022	Nov. 20, 2020	Nov. 19, 2021	
DC power supply	ARRAY	3662A	A1215015	Nov. 20, 2020	Nov. 19, 2021	



7. ANTENNA PORT TEST RESULTS

### 7.1. ON TIME AND DUTY CYCLE

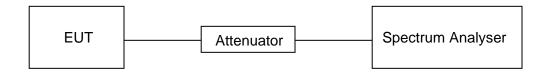
#### **LIMITS**

None; for reporting purposes only

#### **PROCEDURE**

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

#### **TEST SETUP**



#### **TEST ENVIRONMENT**

Temperature	25.5 °C	Relative Humidity	58.6 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 12V

#### **RESULTS**

Please refer to appendix G.

REPORT NO.: 4789884617-1 Page 17 of 98

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

#### **LIMITS**

CFR 47 FCC Part15 (15.247) Subpart C ISED RSS-247 ISSUE 2						
Section Test Item Limit Frequency Range (MHz)						
CFR 47 FCC 15.247(a)(2) ISED RSS-247 5.2 (a)	6 dB Bandwidth	≥ 500 kHz	2400-2483.5			
ISED RSS-Gen Clause 6.7	99 % Occupied Bandwidth	For reporting purposes only.	2400-2483.5			

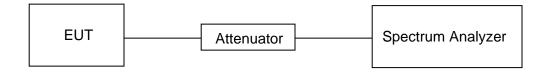
#### **TEST PROCEDURE**

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

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

- a) Use the 99 % power bandwidth function of the instrument, allow the trace to stabilize and report the measured bandwidth.
- b) Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

#### **TEST SETUP**





REPORT NO.: 4789884617-1 Page 18 of 98

## TEST ENVIRONMENT

Temperature	25.5 °C	Relative Humidity	58.6 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 12V

#### **RESULTS**

Please refer to appendix A & B.

REPORT NO.: 4789884617-1 Page 19 of 98

#### 7.3. CONDUCTED OUTPUT POWER

#### **LIMITS**

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

#### **TEST PROCEDURE**

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

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

#### **TEST SETUP**



#### **TEST ENVIRONMENT**

Temperature	25.5 °C	Relative Humidity	58.6 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 12V

#### **RESULTS**

Please refer to appendix C.



#### 7.4. POWER SPECTRAL DENSITY

#### **LIMITS**

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

#### **TEST PROCEDURE**

Refer to ANSI C63.10-2013 clause 11.10.

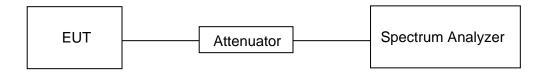
Connect the EUT to the spectrum analyser and use the following settings:

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

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

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

#### **TEST SETUP**



#### **TEST ENVIRONMENT**

Temperature	25.5 °C	Relative Humidity	58.6 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 12V



Please refer to appendix D.



7.5. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

#### **LIMITS**

	CFR 47 FCC Part15 (1 ISED RSS-24	
Section Test Item Limit		
CFR 47 FCC §15.247 (d) ISED RSS-247 5.5	Conducted Bandedge and Spurious Emissions	at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

#### **TEST PROCEDURE**

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

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

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

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

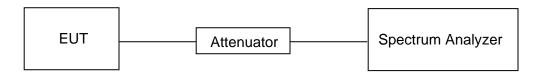
Change the settings for emission level measurement:

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

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

#### **TEST SETUP**





#### **TEST ENVIRONMENT**

Temperature	25.5 °C	Relative Humidity	58.6 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 12V

#### **RESULTS**

Please refer to appendix E & F.



## 8. RADIATED TEST RESULTS

#### **LIMITS**

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

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

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

Emissions radia	ted outside of the specified frequen	cy bands above 30	MHz
Frequency Range	Field Strength Limit	Field Stren	
(MHz)	(uV/m) at 3 m	(dBuV/m)	at 3 m
		Quasi-Peak	
30 - 88	100	40	
88 - 216	150	43.	5
216 - 960	200	46	
Above 960	500	54	
Above 1000	500	Peak	Average
		74	54

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

## ISED General field strength limits at frequencies below 30 MHz

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

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



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

MHz	MHz	GHz
0.090 - 0.110	149.9 - 150.05	9.0 - 9.2
0.495 - 0.505	156.52475 - 156.52525	9.3 - 9.5
2.1735 - 2.1905	156.7 - 156.9	10.6 - 12.7
3.020 - 3.026	162.0125 - 167.17	13.25 - 13.4
1.125 - 4.128	167.72 - 173.2	14.47 - 14.5
1.17725 - 4.17775	240 – 285	15.35 - 16.2
1.20725 - 4.20775	322 - 335.4	17.7 - 21.4
5.677 - 5.683	399.9 - 410	22.01 - 23.12
3.215 - 6.218	608 - 614	23.6 - 24.0
3.26775 - 6.26825	960 - 1427	31.2 - 31.8
3.31175 - 6.31225	1435 - 1626.5	36.43 - 36.5
3.291 - 8.294	1645.5 - 1646.5	Above 38.6
3.362 - 8.366	1660 - 1710	
3.37625 - 8.38675	1718.8 - 1722.2	
3.41425 - 8.41475	2200 - 2300	
12.29 - 12.293	2310 - 2390	
12.51975 - 12.52025	2483.5 - 2500	
12.57675 - 12.57725	2855 - 2900	
13.36 - 13.41	3260 – 3267	
16.42 - 16.423	3332 - 3339	
16.69475 - 16.69525	3345.8 - 3358	
16.80425 - 16.80475	3500 - 4400	
25.5 - 25.67	4500 - 5150	
37.5 - 38.25	5350 - 5460	
73 - 74.6	7250 - 7750	
74.8 - 75.2	8025 - 8500	
108 – 138		

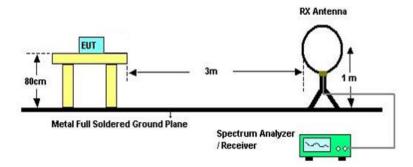
## FCC Restricted bands of operation refer to FCC §15.205 (a):

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

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

#### TEST SETUP AND PROCEDURE

Below 30 MHz



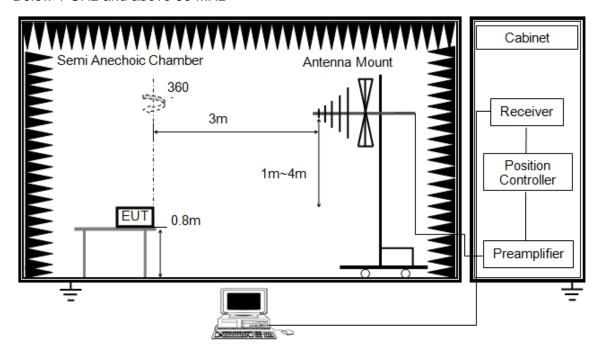
The setting of the spectrum analyser

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

- 1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.4.
- 2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.
- 3. The EUT was placed on a turntable with 80cm above ground.
- 4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1 m height antenna tower.
- 5. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
- 6. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak and average detector mode remeasured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak and average detector and reported.
- 7. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30 m open field site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field site based on KDB 414788.
- 8. The limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of  $377\Omega$ . For example, the measurement frequency X KHz resulted in a level of Y dBuV/m, which is equivalent to Y-51.5 = Z dBuA/m, which has the same margin, W dB, to the corresponding RSS-GEN Table 6 limit as it has to be 15.209(a) limit.



Below 1 GHz and above 30 MHz

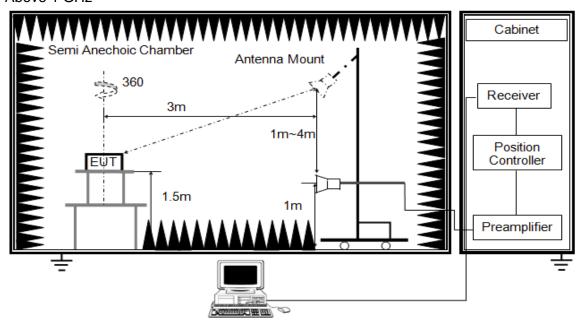


The setting of the spectrum analyser

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

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

Above 1 GHz

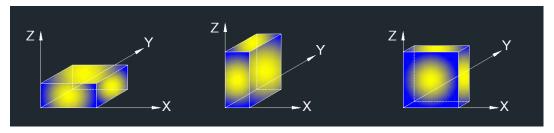


The setting of the spectrum analyser

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

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

X axis, Y axis, Z axis positions:



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

#### **TEST ENVIRONMENT**

Temperature	25.4 °C	Relative Humidity	49 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 12V

## **RESULTS**

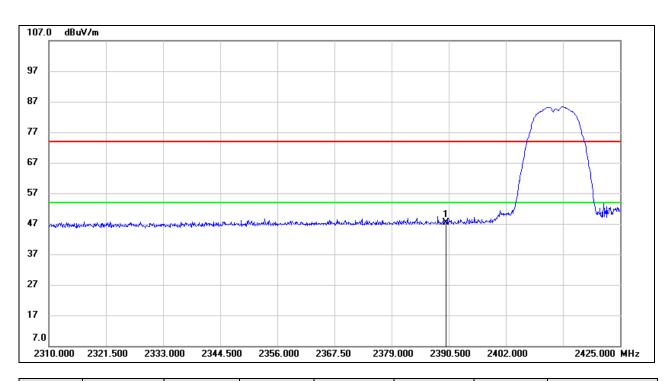


#### 8.1. RESTRICTED BANDEDGE

#### 8.1.1. 802.11b SISO MODE

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

#### **PEAK**



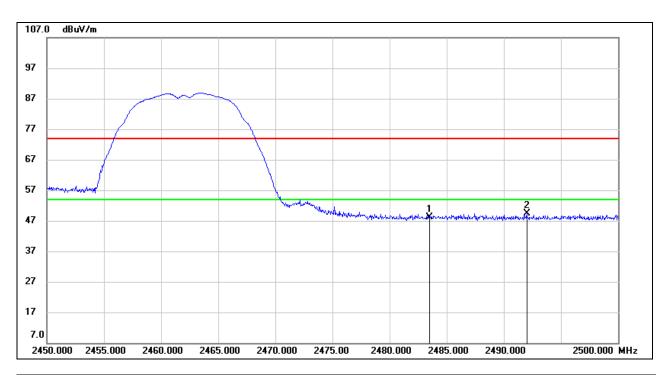
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2390.000	13.95	33.35	47.30	74.00	-26.70	peak

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

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



# RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL) PEAK



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	14.39	33.71	48.10	74.00	-25.90	peak
2	2492.000	15.68	33.74	49.42	74.00	-24.58	peak

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

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

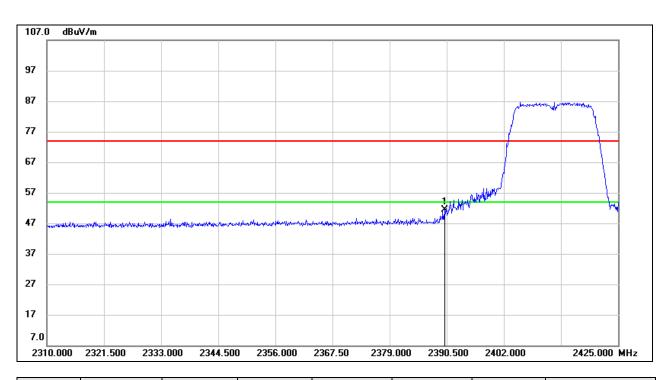
Note: Horizontal and Vertical have been tested, only the worst data was recorded in the report.



## 8.1.2. 802.11g SISO MODE

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

#### **PEAK**



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2390.000	17.92	33.35	51.27	74.00	-22.73	peak

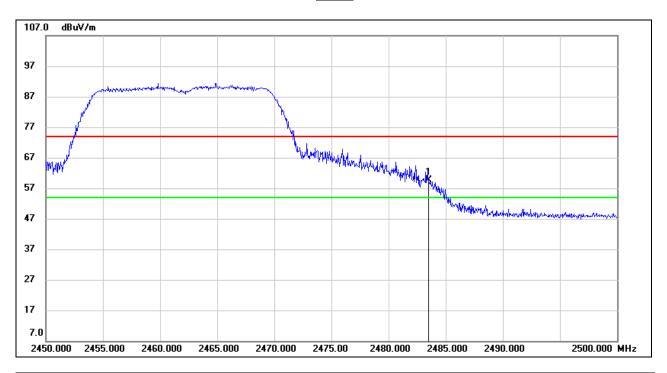
Note: 1. Measurement = Reading Level + Correct Factor.

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



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

#### **PEAK**



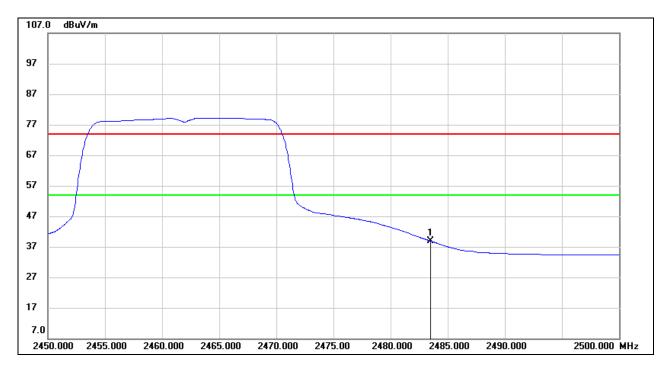
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	25.97	33.71	59.68	74.00	-14.32	peak

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

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



#### **AVG**



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	5.12	33.71	38.83	54.00	-15.17	AVG

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

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

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

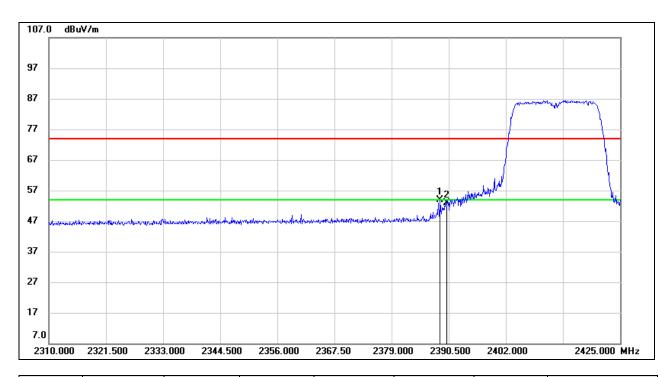


REPORT NO.: 4789884617-1 Page 35 of 98

#### 8.1.3. 802.11n HT20 SISO MODE

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

#### **PEAK**



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2388.775	20.57	33.34	53.91	74.00	-20.09	peak
2	2390.000	19.41	33.35	52.76	74.00	-21.24	peak

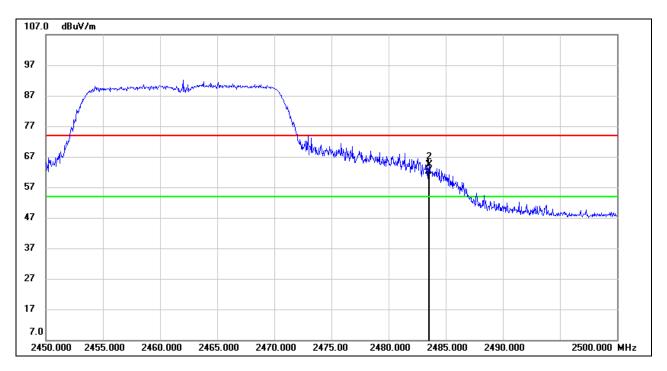
Note: 1. Measurement = Reading Level + Correct Factor.

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



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

#### **PEAK**



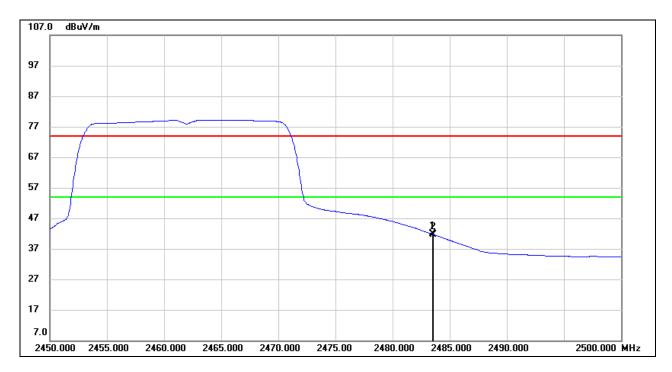
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	28.44	33.71	62.15	74.00	-11.85	peak
2	2483.550	30.60	33.71	64.31	74.00	-9.69	peak

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

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



#### **AVG**



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	8.12	33.71	41.83	54.00	-12.17	AVG
2	2483.550	8.00	33.71	41.71	54.00	-12.29	AVG

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

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

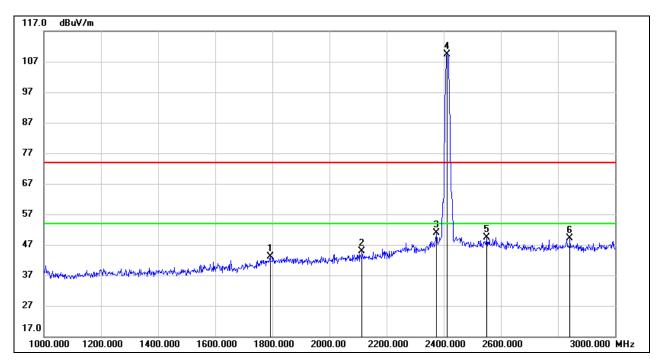
Note: Horizontal and Vertical have been tested, only the worst data was recorded in the report.



# 8.2. SPURIOUS EMISSIONS (1 GHz ~ 3 GHz)

## 8.2.1. 802.11b SISO MODE

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



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	1792.000	33.71	9.52	43.23	74.00	-30.77	peak
2	2114.000	34.02	10.82	44.84	74.00	-29.16	peak
3	2374.000	39.46	11.48	50.94	74.00	-23.06	peak
4	2412.000	97.66	11.71	109.37	/	/	fundamental
5	2550.000	37.45	12.00	49.45	74.00	-24.55	peak
6	2842.000	35.91	13.33	49.24	74.00	-24.76	peak

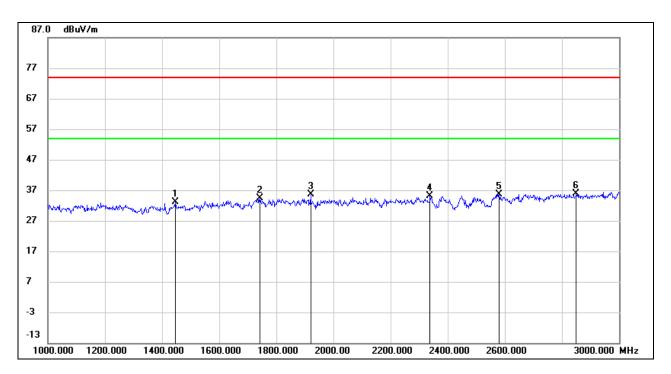
Note: 1. Measurement = Reading Level + Correct Factor.

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

3. Peak: Peak detector.



HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



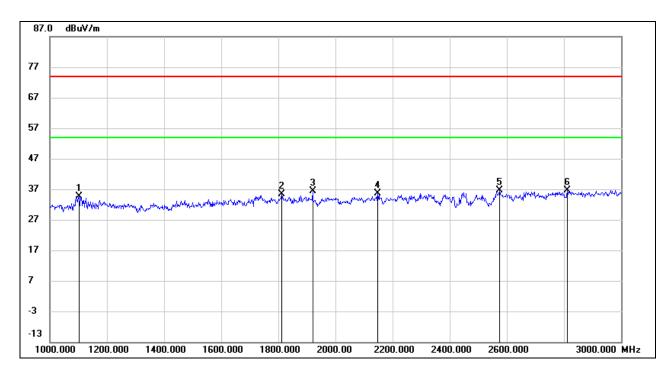
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	1446.000	45.54	-12.49	33.05	74.00	-40.95	peak
2	1742.000	44.85	-10.49	34.36	74.00	-39.64	peak
3	1920.000	45.73	-10.13	35.60	74.00	-38.40	peak
4	2338.000	43.76	-8.60	35.16	74.00	-38.84	peak
5	2580.000	43.51	-7.93	35.58	74.00	-38.42	peak
6	2850.000	42.14	-6.31	35.83	74.00	-38.17	peak

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

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.



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



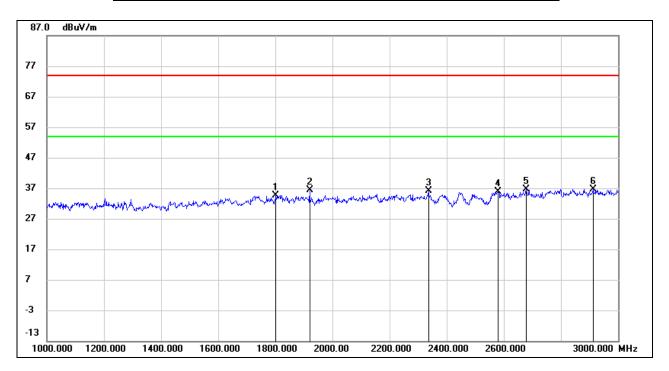
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	1102.000	48.18	-13.48	34.70	74.00	-39.30	peak
2	1812.000	45.34	-10.05	35.29	74.00	-38.71	peak
3	1920.000	46.53	-10.13	36.40	74.00	-37.60	peak
4	2148.000	44.99	-9.34	35.65	74.00	-38.35	peak
5	2574.000	44.48	-7.95	36.53	74.00	-37.47	peak
6	2812.000	43.10	-6.50	36.60	74.00	-37.40	peak

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

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.



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



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	1802.000	44.79	-10.05	34.74	74.00	-39.26	peak
2	1920.000	46.46	-10.13	36.33	74.00	-37.67	peak
3	2336.000	44.71	-8.61	36.10	74.00	-37.90	peak
4	2580.000	43.88	-7.93	35.95	74.00	-38.05	peak
5	2678.000	43.87	-7.35	36.52	74.00	-37.48	peak
6	2912.000	42.69	-6.01	36.68	74.00	-37.32	peak

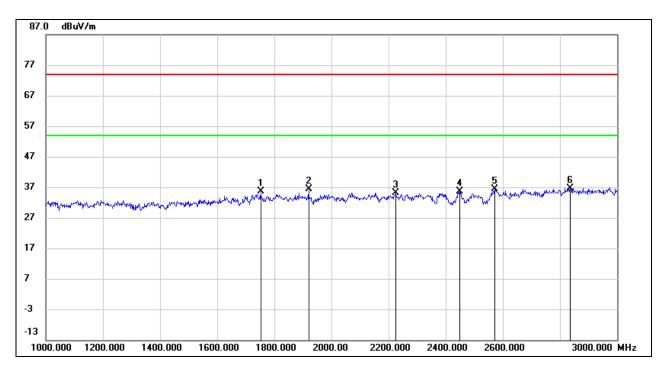
Note: 1. Measurement = Reading Level + Correct Factor.

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

3. Peak: Peak detector.



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



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	1752.000	46.15	-10.41	35.74	74.00	-38.26	peak
2	1920.000	46.41	-10.13	36.28	74.00	-37.72	peak
3	2224.000	44.21	-8.97	35.24	74.00	-38.76	peak
4	2450.000	44.06	-8.31	35.75	74.00	-38.25	peak
5	2572.000	44.37	-7.96	36.41	74.00	-37.59	peak
6	2836.000	43.06	-6.38	36.68	74.00	-37.32	peak

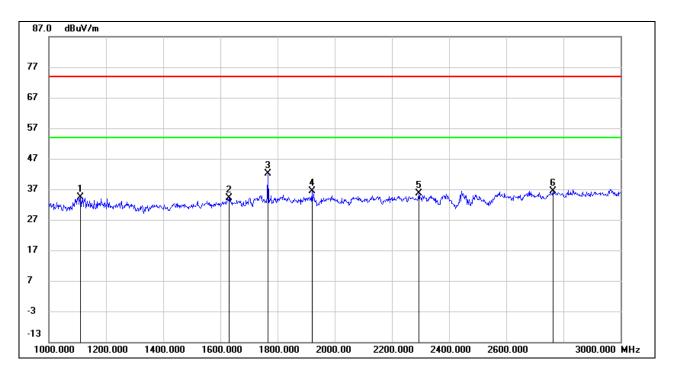
Note: 1. Measurement = Reading Level + Correct Factor.

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

3. Peak: Peak detector.



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



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	1110.000	47.91	-13.43	34.48	74.00	-39.52	peak
2	1630.000	45.56	-11.33	34.23	74.00	-39.77	peak
3	1766.000	52.41	-10.30	42.11	74.00	-31.89	peak
4	1920.000	46.40	-10.13	36.27	74.00	-37.73	peak
5	2294.000	44.43	-8.74	35.69	74.00	-38.31	peak
6	2764.000	43.15	-6.79	36.36	74.00	-37.64	peak

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

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

3. Peak: Peak detector.

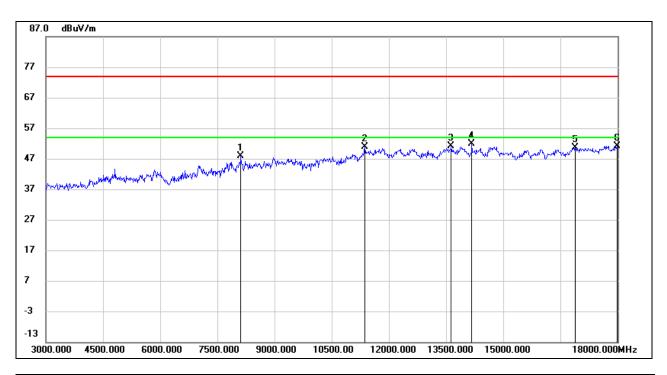
Note: All modes and channels have been tested, only the worst data was recorded in the report.



# 8.3. SPURIOUS EMISSIONS (3 GHz ~ 18 GHz)

## 8.3.1. 802.11b SISO MODE

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

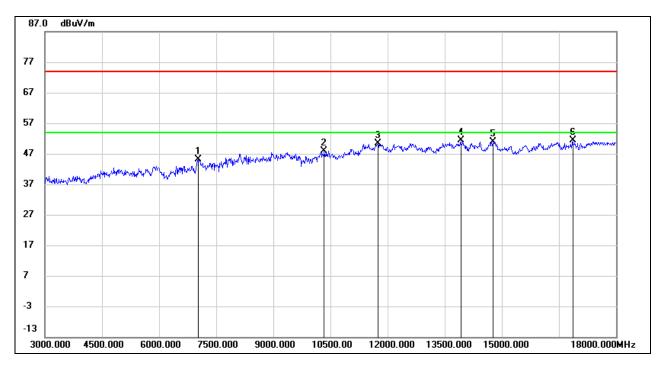


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	8115.000	37.63	10.13	47.76	74.00	-26.24	peak
2	11370.000	36.48	14.49	50.97	74.00	-23.03	peak
3	13635.000	33.82	17.28	51.10	74.00	-22.90	peak
4	14175.000	34.11	17.70	51.81	74.00	-22.19	peak
5	16890.000	29.18	21.49	50.67	74.00	-23.33	peak
6	17985.000	26.91	24.21	51.12	74.00	-22.88	peak

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



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

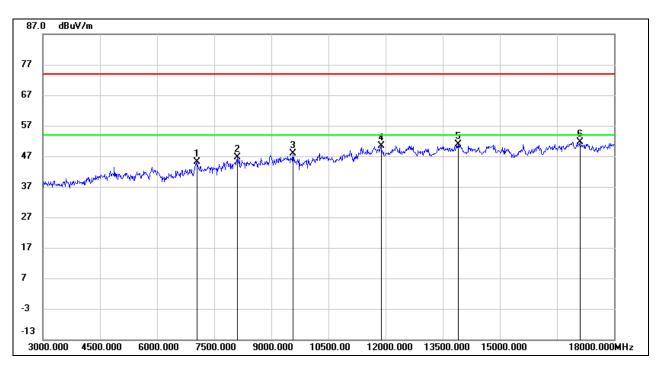


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	7020.000	37.58	7.61	45.19	74.00	-28.81	peak
2	10335.000	35.92	11.96	47.88	74.00	-26.12	peak
3	11745.000	35.01	15.30	50.31	74.00	-23.69	peak
4	13920.000	33.94	17.55	51.49	74.00	-22.51	peak
5	14760.000	33.03	17.90	50.93	74.00	-23.07	peak
6	16860.000	30.04	21.22	51.26	74.00	-22.74	peak

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



HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)

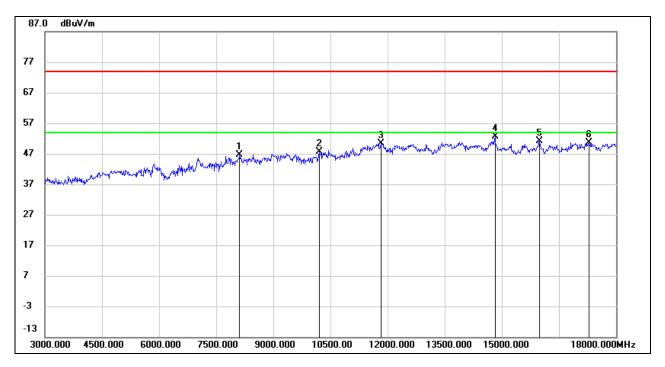


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	7050.000	37.45	7.63	45.08	74.00	-28.92	peak
2	8115.000	36.44	10.13	46.57	74.00	-27.43	peak
3	9570.000	36.95	10.88	47.83	74.00	-26.17	peak
4	11880.000	35.01	15.46	50.47	74.00	-23.53	peak
5	13905.000	33.32	17.54	50.86	74.00	-23.14	peak
6	17100.000	29.63	21.90	51.53	74.00	-22.47	peak

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



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

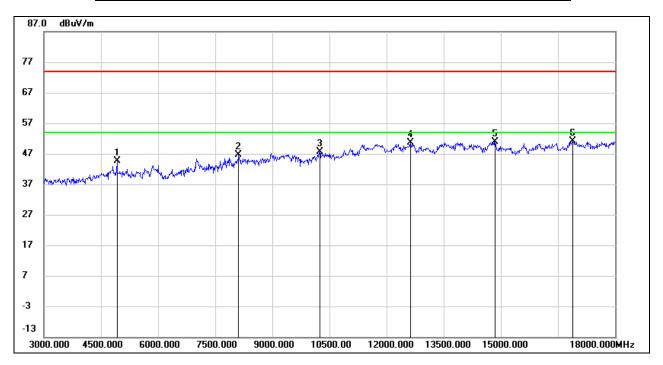


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	8115.000	36.53	10.13	46.66	74.00	-27.34	peak
2	10200.000	36.11	11.49	47.60	74.00	-26.40	peak
3	11820.000	35.07	15.29	50.36	74.00	-23.64	peak
4	14820.000	34.79	17.91	52.70	74.00	-21.30	peak
5	15990.000	32.64	18.39	51.03	74.00	-22.97	peak
6	17280.000	28.21	22.48	50.69	74.00	-23.31	peak

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



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

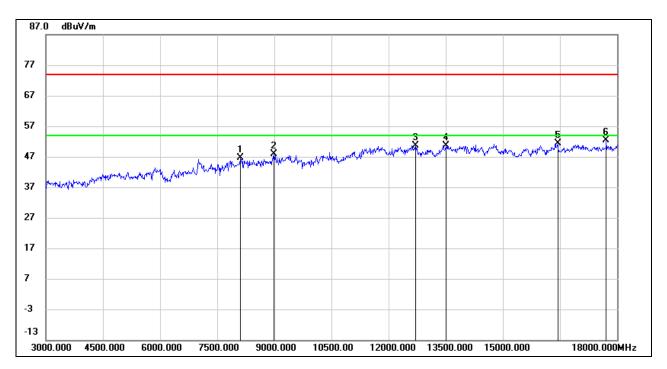


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4920.000	43.28	1.45	44.73	74.00	-29.27	peak
2	8115.000	36.45	10.13	46.58	74.00	-27.42	peak
3	10245.000	36.03	11.63	47.66	74.00	-26.34	peak
4	12630.000	34.85	15.72	50.57	74.00	-23.43	peak
5	14850.000	33.14	17.71	50.85	74.00	-23.15	peak
6	16890.000	29.54	21.49	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. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
- 5. For the transmitting duration, please refer to clause 7.1.
- 6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
  - 7. Proper operation of the transmitter prior to adding the filter to the measurement chain.



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



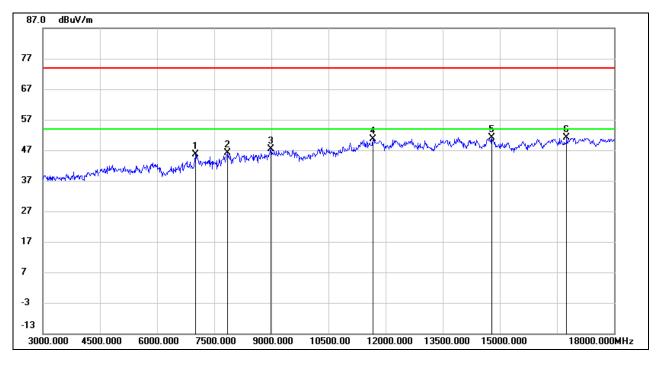
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	8115.000	36.41	10.13	46.54	74.00	-27.46	peak
2	8985.000	36.87	10.99	47.86	74.00	-26.14	peak
3	12705.000	35.08	15.64	50.72	74.00	-23.28	peak
4	13500.000	33.52	17.22	50.74	74.00	-23.26	peak
5	16440.000	31.62	19.68	51.30	74.00	-22.70	peak
6	17715.000	28.75	23.56	52.31	74.00	-21.69	peak

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



## 8.3.2. 802.11g SISO MODE

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



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	7005.000	38.02	7.60	45.62	74.00	-28.38	peak
2	7845.000	37.10	9.14	46.24	74.00	-27.76	peak
3	8985.000	36.45	10.99	47.44	74.00	-26.56	peak
4	11670.000	35.44	15.16	50.60	74.00	-23.40	peak
5	14790.000	33.21	18.01	51.22	74.00	-22.78	peak
6	16755.000	30.78	20.37	51.15	74.00	-22.85	peak

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