



# FCC Radio Test Report

## FCC ID: T58WF2151RT

This report concerns (check one):  Original Grant  Class I Change

**Issued Date** : Nov. 08, 2013  
**Project No.** : 1211C045A  
**Equipment** : Wireless Dual Band USB Adapter  
**Model Name** : WF2151  
**Applicant** : NETIS SYSTEMS CO., LTD  
**Address** : 4F&5F R&D Building, Oriental Cyberport,  
High-Tech Industrial Park, Nanshan,  
Shenzhen, China.

**Tested by:** Neutron Engineering Inc. EMC Laboratory

**Date of Receipt:** Sep. 26, 2013

**Date of Test:** Sep. 26, 2013~ Nov. 07, 2013

**Testing Engineer** : David Mao  
(David Mao)  
**Technical Manager** : Leo Hung  
(Leo Hung)  
**Authorized Signatory** : Steven Lu  
(Steven Lu)

### Neutron Engineering Inc.

No.3, Jinshagang 1st Road, ShiXia,  
Dalang Town, Dong Guan, China.

TEL: 0769-8318-3000

FAX: 0769-8319-6000



**Declaration**

**Neutron** represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (NML) of R.O.C., or National Institute of Standards and Technology (NIST) of U.S.A.

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**Limitation**

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.



<b>Table of Contents</b>	<b>Page</b>
<b>1 . CERTIFICATION</b>	<b>6</b>
<b>2 . SUMMARY OF TEST RESULTS</b>	<b>7</b>
2.1 TEST FACILITY	8
2.2 MEASUREMENT UNCERTAINTY	8
<b>3 . GENERAL INFORMATION</b>	<b>9</b>
3.1 GENERAL DESCRIPTION OF EUT	9
3.2 DESCRIPTION OF TEST MODES	11
3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING	12
3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	13
3.5 DESCRIPTION OF SUPPORT UNITS	14
<b>4 . EMC EMISSION TEST</b>	<b>15</b>
4.1 CONDUCTED EMISSION MEASUREMENT	15
4.1.1 POWER LINE CONDUCTED EMISSION	15
4.1.2 MEASUREMENT INSTRUMENTS LIST	15
4.1.3 TEST PROCEDURE	16
4.1.4 DEVIATION FROM TEST STANDARD	16
4.1.5 TEST SETUP	16
4.1.6 EUT OPERATING CONDITIONS	16
4.1.7 TEST RESULTS	17
4.2 RADIATED EMISSION MEASUREMENT	20
4.2.1 RADIATED EMISSION LIMITS	20
4.2.2 MEASUREMENT INSTRUMENTS LIST	21
4.2.3 TEST PROCEDURE	21
4.2.4 DEVIATION FROM TEST STANDARD	22
4.2.5 TEST SETUP	22
4.2.6 EUT OPERATING CONDITIONS	23
4.2.7 TEST RESULTS (BELOW 30MHZ)	24
4.2.8 TEST RESULTS-BETWEEN 30MHZ - 1000MHZ	25
4.2.9 TEST RESULTS - ABOVE 1000MHZ	32
<b>5 . 26dB SPECTRUM BANDWIDTH</b>	<b>64</b>
5.1 APPLIED PROCEDURES / LIMIT	64
5.1.1 MEASUREMENT INSTRUMENTS LIST	64
5.1.2 TEST PROCEDURE	64
5.1.3 DEVIATION FROM STANDARD	64
5.1.4 TEST SETUP	64
5.1.5 EUT OPERATION CONDITIONS	64
5.1.6 TEST RESULTS	65
<b>6 . MAXIMUM CONDUCTED OUTPUT POWER</b>	<b>71</b>



Table of Contents	Page
<b>6.1 APPLIED PROCEDURES / LIMIT</b>	<b>71</b>
6.1.1 MEASUREMENT INSTRUMENTS LIST	71
6.1.2 TEST PROCEDURE	71
6.1.3 DEVIATION FROM STANDARD	72
6.1.4 TEST SETUP	72
6.1.5 EUT OPERATION CONDITIONS	72
6.1.6 TEST RESULTS	73
<b>7 . ANTENNA CONDUCTED SPURIOUS EMISSION</b>	<b>85</b>
7.1 APPLIED PROCEDURES / LIMIT	85
7.1.1 MEASUREMENT INSTRUMENTS LIST	85
7.1.2 TEST PROCEDURE	85
7.1.3 DEVIATION FROM STANDARD	85
7.1.4 TEST SETUP	85
7.1.5 EUT OPERATION CONDITIONS	85
7.1.6 TEST RESULTS	86
<b>8 . POWER SPECTRAL DENSITY TEST</b>	<b>96</b>
8.1 APPLIED PROCEDURES / LIMIT	96
8.1.1 MEASUREMENT INSTRUMENTS LIST	96
8.1.2 TEST PROCEDURE	96
8.1.3 DEVIATION FROM STANDARD	96
8.1.4 TEST SETUP	96
8.1.5 EUT OPERATION CONDITIONS	96
<b>9 . PEAK EXCURSION MEASUREMENT</b>	<b>109</b>
9.1 APPLIED PROCEDURES / LIMIT	109
9.1.1 MEASUREMENT INSTRUMENTS LIST	109
9.1.2 TEST PROCEDURE	109
9.1.3 DEVIATION FROM STANDARD	109
9.1.4 TEST SETUP	110
9.1.5 EUT OPERATION CONDITIONS	110
9.1.6 TEST RESULTS	111
<b>10 . FREQUENCY STABILITY MEASUREMENT</b>	<b>117</b>
10.1 APPLIED PROCEDURES / LIMIT	117
10.1.1 MEASUREMENT INSTRUMENTS LIST	117
10.1.2 TEST PROCEDURE	117
10.1.3 DEVIATION FROM STANDARD	117
10.1.4 TEST SETUP	118
10.1.5 EUT OPERATION CONDITIONS	118
10.1.6 TEST RESULTS	119
<b>11. EUT TEST PHOTO</b>	<b>121</b>



REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
NEI-FCCP-2-1211C045A	Original Issue.	Nov. 08, 2013



## 1. CERTIFICATION

Equipment : Wireless Dual Band USB Adapter  
Brand Name : netis  
Model Name : WF2151  
Applicant : NETIS SYSTEMS CO., LTD  
Manufacture : Shenzhen Netcore Industrial Ltd.  
Address : 4F&5F R&D Building , Oriental Cyberport, High-Tech Industrial Park, Nanshan, Shenzhen, China.  
Factory : Dongguan City Netcore Network Technology Co.,Ltd.  
Address : No.10-1,Sankeng Road,Qinghutou,Tangxia Town,Dongguan City  
Date of Test : Sep. 26, 2013~ Nov. 07, 2013  
Test Item : ENGINEERING SAMPLE  
Standard(s) : FCC Part15, Subpart E(15.407) / ANSI C63.4 : 2009;  
FCC KDB 789033 D01 General UNII Test Procedures v01r03 .

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FCCP-2-1211C045A) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

**Test result included in this report is only for the 5150MHz~5250MHz mode part of the product.**



**2. SUMMARY OF TEST RESULTS**

Test procedures according to the technical standard(s):

<b>FCC Part15, Subpart E</b>			
<b>Standard(s) Section</b>	<b>Test Item</b>	<b>Judgment</b>	<b>Remark</b>
15.207	AC Power Line Conducted Emissions	PASS	
15.407(a)	26dB Spectrum Bandwidth	PASS	
15.407(a)	Maximum Conducted Output Power	PASS	
15.407(a)	Power Spectral Density	PASS	
15.407(a)	Peak Excursion	PASS	
15.407(a)	Radiated Emissions	PASS	
15.407(b)	Band Edge Emissions	PASS	
15.407(g)	Frequency Stability	PASS	
15.203	Antenna Requirements	PASS	

**NOTE:**

(1) "N/A" denotes test is not applicable in this test report



**2.1 TEST FACILITY**

The test facilities used to collect the test data in this report is **DG-C02/DG-CB03** at the location of No.3,Jinshagang 1st Road, ShiXia, Dalang Town, Dong Guan, China.523792  
 Neutron's test firm number for FCC: 319330

**2.2 MEASUREMENT UNCERTAINTY**

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**, providing a level of confidence of approximately **95%**.

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)	NOTE
DG-C02	CISPR	150 KHz ~ 30MHz	1.94	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U , (dB)	NOTE
DG-CB03	CISPR	9KHz~30MHz	V	3.79	
		9KHz~30MHz	H	3.57	
		30MHz ~ 200MHz	V	3.82	
		30MHz ~ 200MHz	H	3.60	
		200MHz ~ 1,000MHz	V	3.86	
		200MHz ~ 1,000MHz	H	3.94	
		1GHz~18GHz	V	3.12	
		1GHz~18GHz	H	3.68	
		18GHz~40GHz	V	4.15	
		18GHz~40GHz	H	4.14	





**3. GENERAL INFORMATION**

**3.1 GENERAL DESCRIPTION OF EUT**

Equipment	Wireless Dual Band USB Adapter	
Brand Name	netis	
Model Name	WF2151	
Mode Different	N/A	
Product Description	Operation Frequency	Band 1:5150MHz~5250MHz
	Modulation Type	OFDM
	Bit Rate of Transmitter	300Mbps
	Antenna Designation	Please see note 3.(Page 10)
	Antenna Gain(Peak)	
	Output Power (Max.)	802.11a: 13.25 dBm 802.11n (20M): 11.91 dBm 802.11n (40M): 11.97 dBm
	More details of EUT technical specification, please refer to the User's Manual.	
Power Source	Supplied from PC USB port.	
Power Rating	AC 120V/60Hz	
Connecting I/O Port(s)	Please refer to the User's Manual.	

**Note:**



1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



2. Channel List:

802.11a / 802.11n 20MHz		802.11n 40M	
Band 1		Band 1	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190
40	5200	46	5230
44	5220		
48	5240		

3. Antenna Specification:

Ant.	Brand	M/N	Antenna Type	Connector	Gain (dBi)	Note
0		N/A	Internal Antenna	N/A	5.2	TX/RX
1		N/A	Internal Antenna	N/A	5.2	TX/RX

Note:

The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers (2T2R). all transmit signals are completely uncorrelated, then, **Direction gain = G<sub>ANT</sub>**, that is Directional gain=5.2dBi

4.

Operating Mode	1TX	2TX
802.11a	V (ANT 0 or ANT 1)	-
802.11n(20MHz)	-	V (ANT 0 + ANT 1)
802.11n(40MHz)	-	V (ANT 0 + ANT 1)



**3.2 DESCRIPTION OF TEST MODES**

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Test Mode	Description
Mode 1	TX A Mode / CH36, CH40, CH48(Band 1)
Mode 2	TX N20 Mode / CH36, CH40, CH48(Band 1)
Mode 3	TX N40 Mode / CH38, CH46 (Band 1)
Mode 4	TX Mode

The EUT system operated these modes were found to be the worst case during the pre-scanning test as following:

<b>For Conducted Test</b>	
Final Test Mode	Description
Mode 4	TX Mode

<b>For Radiated Test</b>	
Final Test Mode	Description
Mode 1	TX A Mode / CH36, CH40, CH48(Band 1)
Mode 2	TX N20 Mode / CH36, CH40, CH48(Band 1)
Mode 3	TX N40 Mode / CH38, CH46 (Band 1)

Note: For radiated below 1G test, the 802.11a mode is found to be the worst case and recorded.



**3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING**

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product

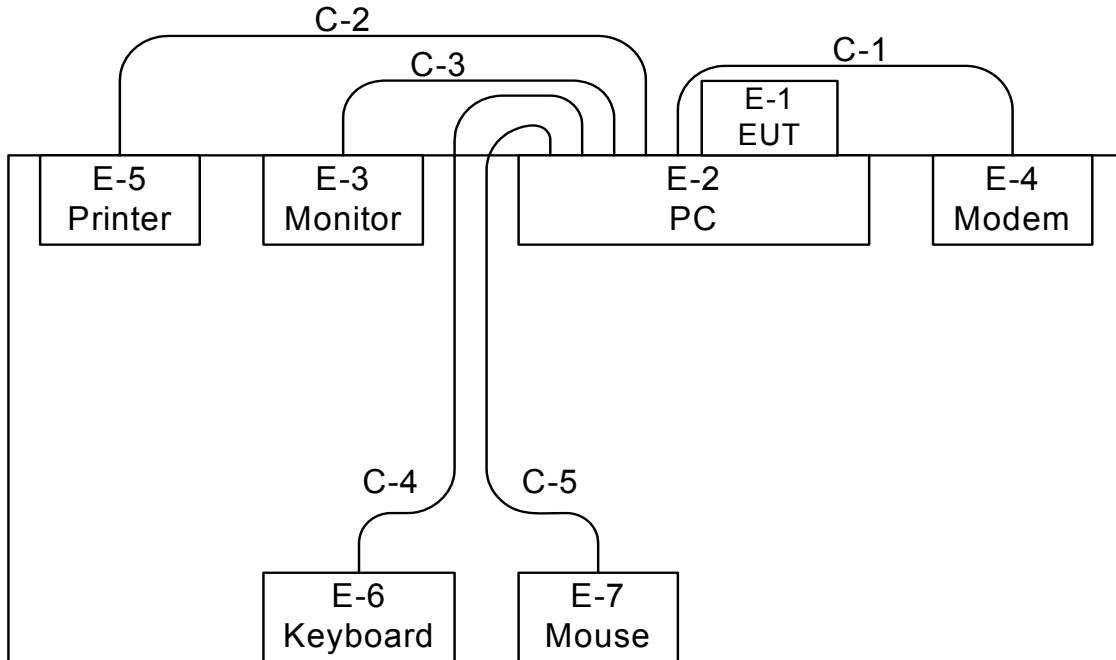
Test software version	Qatest		
Frequency	5180 MHz	5200MHz	5240 MHz
A Mode	15	16	18
N20 Mode	14	16	17

Test software version	Qatest		
Frequency	5190 MHz	5230MHz	
N40 Mode	16	16	



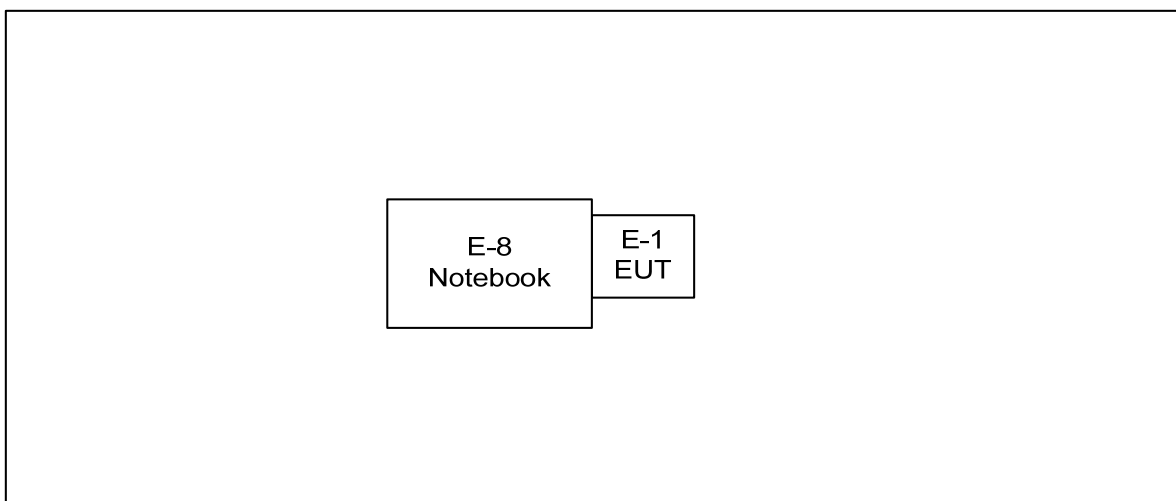
**3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED**

**Conducted TX Mode:**



- C-1: RS232 Cable
- C-2: Parallel Cable
- C-3: D-Sub Cable
- C-4: USB Cable
- C-5: USB Cable

**Radiated TX Mode:**





**3.5 DESCRIPTION OF SUPPORT UNITS**

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
E-1	Wireless Dual Band USB Adapter	netis	WF2151	T58WF2151RT	N/A	EUT
E-2	PC	Dell 745	DCSM	DOC	G7K832X	
E-3	LCD monitor	Dell	E177FPc	DOC	CNOFJ179-64180-6AG-1WNS	
E-4	Modem	ACEEX	DM-1414V	IFAXDM1414	0603002131	
E-5	Printer	SII	DPU-414	DOC	3018507 B	
E-6	USB Keyboard	Lenovo	SK-8815(L)	DOC	00975811	
E-7	USB Mouse	Lenovo	MO28UOL	DOC	23-122591	
E-8	Notebook	HP	HSTNN-169C-3	DOC	CNU02203XG	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	YES	NO	1.5m	
C-2	YES	YES	1.5m	
C-3	YES	NO	0.9m	
C-4	NO	NO	1.5m	
C-5	NO	NO	1.5m	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.



**4. EMC EMISSION TEST**

**4.1 CONDUCTED EMISSION MEASUREMENT**

**4.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)**

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

**4.1.2 MEASUREMENT INSTRUMENTS LIST**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	3816/2	00052765	Apr. 25, 2014
2	LISN	R&S	ENV216	100087	Nov.16, 2013
3	Test Cable	N/A	C_17	N/A	Mar.15, 2014
4	EMI TEST RECEIVER	R&S	ESCS30	826547/022	Apr. 25, 2014
5	50Ω Terminator	SHX	TF2-3G-A	08122902	Apr. 25, 2014

Remark: "N/A" denotes no model name, serial no. or calibration specified.  
 All calibration period of equipment list is one year.

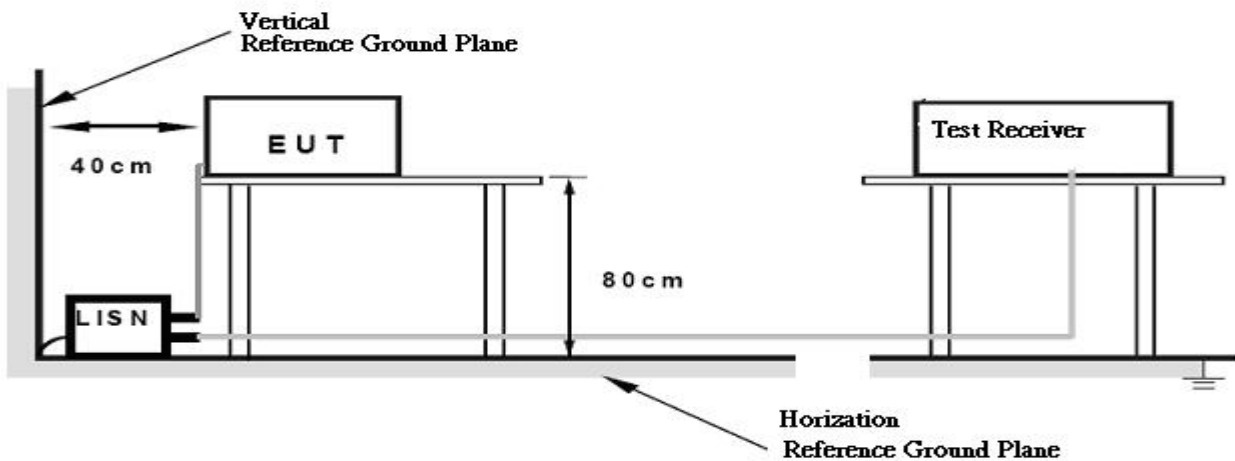
#### 4.1.3 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.5 TEST SETUP



#### 4.1.6 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT was programmed to be in continuously transmitting/TX Mode mode.





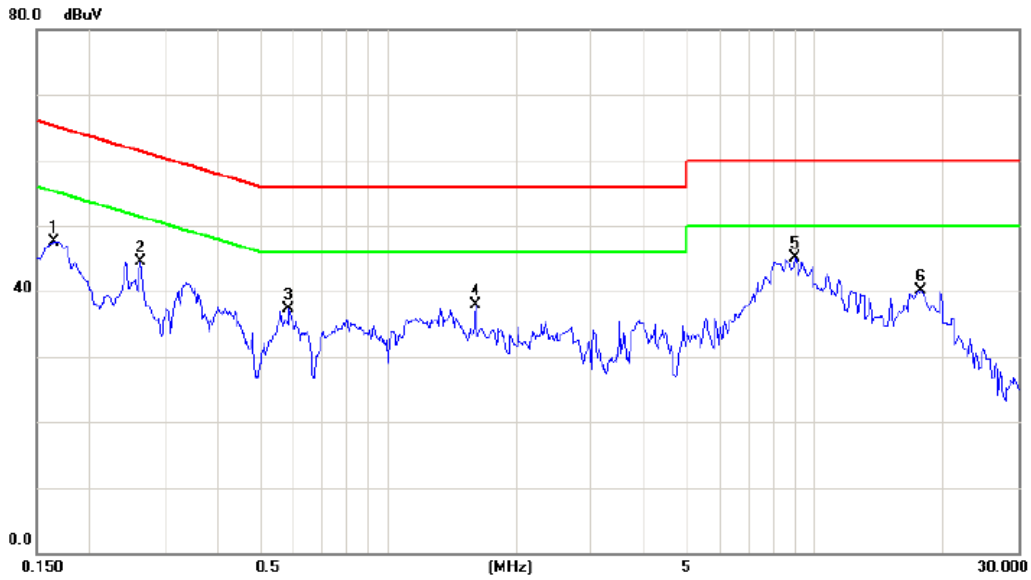
#### **4.1.7 TEST RESULTS**

**Remark:**

- (1) All readings are QP Mode value unless otherwise stated AVG in column of 'Note'. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a " \* " marked in AVG Mode column of Interference Voltage Measured.
- (2) Measuring frequency range from 150KHz to 30MHz.



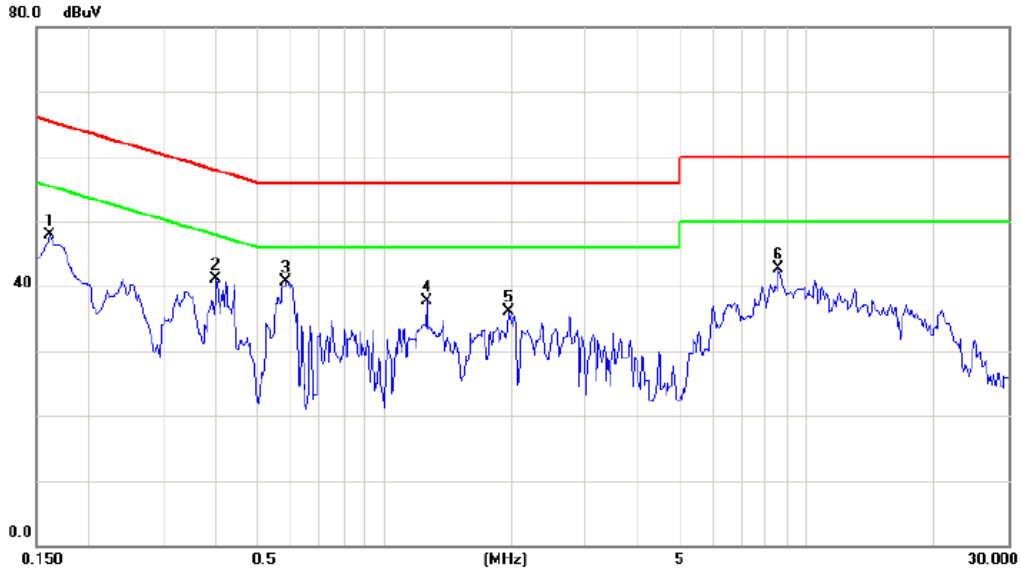
EUT:	Wireless Dual Band USB Adapter	Model Name:	WF2151
Temperature:	24 °C	Relative Humidity:	55 %
Test Power:	AC 120V/60Hz	Phase:	Line
Test Mode :	TX Mode		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1650	37.84	9.72	47.56	65.21	-17.65	peak	
2		0.2631	34.86	9.71	44.57	61.33	-16.76	peak	
3		0.5862	27.62	9.71	37.33	56.00	-18.67	peak	
4		1.6053	28.08	9.77	37.85	56.00	-18.15	peak	
5	*	9.0004	35.06	9.98	45.04	60.00	-14.96	peak	
6		17.7454	29.90	10.14	40.04	60.00	-19.96	peak	



EUT:	Wireless Dual Band USB Adapter	Model Name:	WF2151
Temperature:	24 °C	Relative Humidity:	55 %
Test Power:	AC 120V/60Hz	Phase:	Neutral
Test Mode :	TX Mode		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1615	38.12	9.72	47.84	65.39	-17.55	peak	
2		0.4001	31.32	9.72	41.04	57.85	-16.81	peak	
3	*	0.5862	30.96	9.72	40.68	56.00	-15.32	peak	
4		1.2580	27.84	9.77	37.61	56.00	-18.39	peak	
5		1.9640	26.38	9.79	36.17	56.00	-19.83	peak	
6		8.5810	32.62	9.99	42.61	60.00	-17.39	peak	



**4.2 RADIATED EMISSION MEASUREMENT**

**4.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)**

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
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
Above 960	500	3

**Notes**

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.

**LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS**

Frequencies (MHz)	EIRP Limit (dBm)	Equivalent Field Strength at 3m (dBµV/m)
5150~5250	-27	68.3
5250~5350	-27	68.3
5470~5725	-27	68.3
5725~5825	-27	68.3
	-17	78.3

NOTE: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000 \sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts)}$$



**4.2.2 MEASUREMENT INSTRUMENTS LIST**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Apr. 25, 2014
2	Amplifier	HP	8447D	2944A09673	Apr. 25, 2014
3	Test Receiver	R&S	ESCI	100382	Apr. 25, 2014
4	Test Cable	N/A	C-01_CB03	N/A	Jul. 02, 2014
5	Antenna	ETS	3115	00075789	Apr. 25, 2014
6	Amplifier	Agilent	8449B	3008A02274	Apr. 25, 2014
7	Spectrum	Agilent	E4408B	US39240143	Nov. 16, 2013
8	Test Cable	HUBER+SUHNER	C-45	N/A	Apr. 30, 2014
9	Controller	CT	SC100	N/A	N/A
10	Horn Antenna	EMCO	3115	9605-4803	Apr. 25, 2014
11	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Apr. 25, 2014
12	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Oct. 22, 2014

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.

**4.2.3 TEST PROCEDURE**

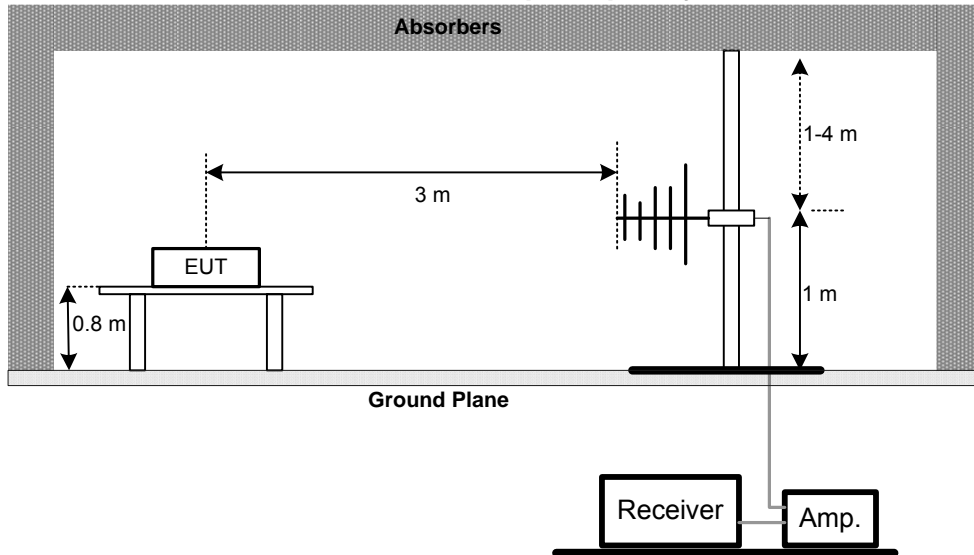
- a. The measuring distance of at 1.5m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. 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.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

**4.2.4 DEVIATION FROM TEST STANDARD**

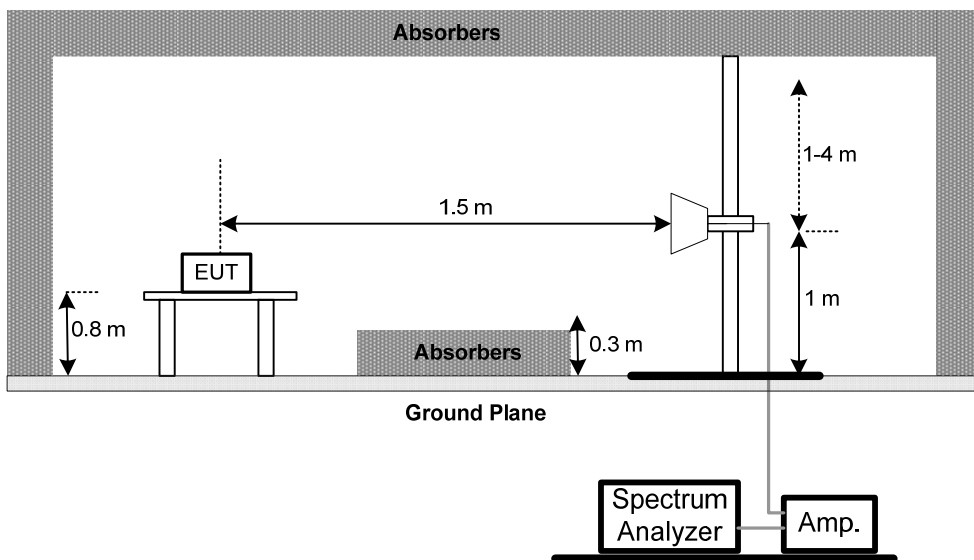
No deviation

**4.2.5 TEST SETUP**

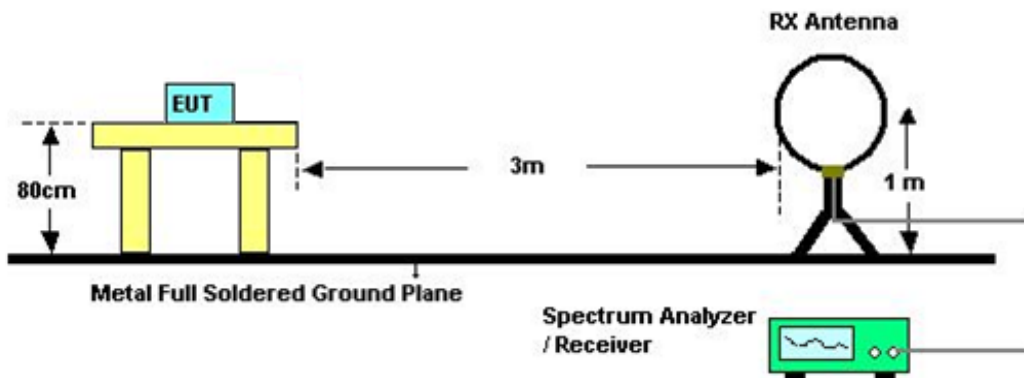
**Radiated Emission Test Set-Up Frequency 30 - 1000MHz**



**Radiated Emission Test Set-Up Frequency Above 1 GHz**



**Radiated emissions below 30MHz**



**4.2.6 EUT OPERATING CONDITIONS**

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



**4.2.7 TEST RESULTS (BELOW 30MHZ)**

EUT:	Wireless Dual Band USB Adapter	Model Name:	WF2151
Temperature:	24 °C	Relative Humidity:	55 %
Test Voltage:	AC 120V/60Hz		
Test Mode:	TX MODE		

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0089	0°	26.32	24.30	50.62	128.62	-78.00	AVG
0.0089	0°	30.19	24.30	54.49	148.62	-94.13	PK
0.0256	0°	22.85	23.94	46.79	119.43	-72.64	AVG
0.0256	0°	25.37	23.94	49.31	139.43	-90.12	PK
0.0382	0°	20.92	23.15	44.07	115.96	-71.89	AVG
0.0382	0°	23.65	23.15	46.80	135.96	-89.16	PK
0.0652	0°	19.82	22.10	41.92	111.32	-69.40	AVG
0.0652	0°	24.27	22.10	46.37	131.32	-84.95	PK
0.2639	0°	20.38	20.37	40.75	99.18	-58.43	AVG
0.2639	0°	23.72	20.37	44.09	119.18	-75.09	PK
1.4864	0°	27.68	19.55	47.23	64.16	-16.93	QP

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0099	90°	18.56	24.30	42.86	127.67	-84.81	AVG
0.0099	90°	21.34	24.30	45.64	147.67	-102.03	PK
0.0224	90°	14.37	24.15	38.52	120.59	-82.07	AVG
0.0224	90°	16.68	24.15	40.83	140.59	-99.76	PK
0.0463	90°	19.72	22.64	42.36	114.30	-71.94	AVG
0.0463	90°	22.39	22.64	45.03	134.30	-89.27	PK
0.0774	90°	20.61	21.85	42.46	109.83	-67.37	AVG
0.0774	90°	23.53	21.85	45.38	129.83	-84.45	PK
0.3756	90°	20.29	20.10	40.39	96.11	-55.72	AVG
0.3756	90°	23.75	20.10	43.85	116.11	-72.26	PK
1.6719	90°	24.92	19.53	44.45	63.14	-18.69	QP

Remark :

- (1) The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.
- (2) Distance extrapolation factor = 40 log (specific distance / test distance) (dB);
- (3) Limit line = specific limits (dBuV) + distance extrapolation factor.





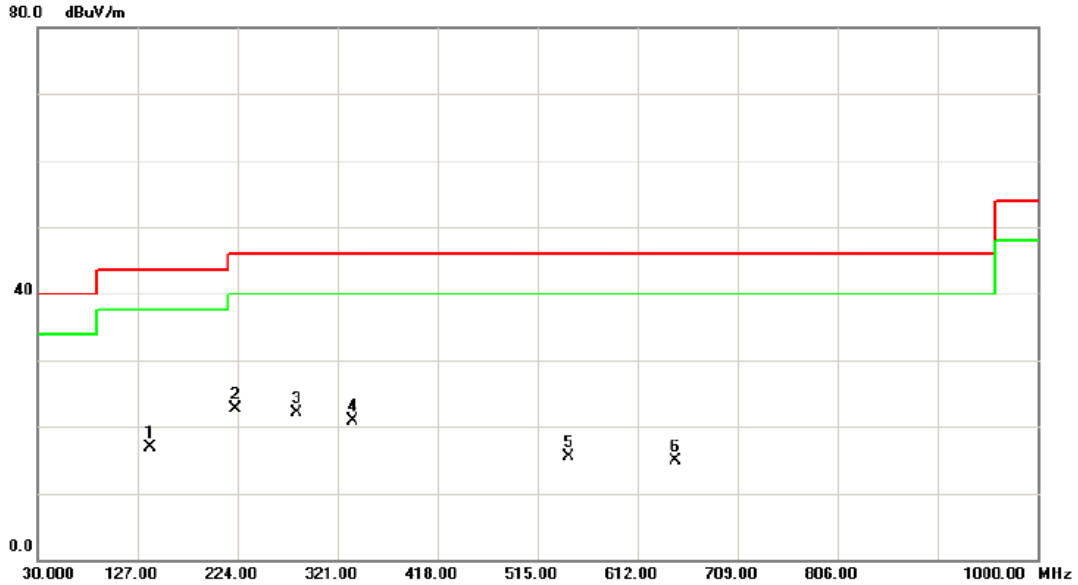
**4.2.8 TEST RESULTS-BETWEEN 30MHZ - 1000MHZ**

Remark:

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz.
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz.
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.



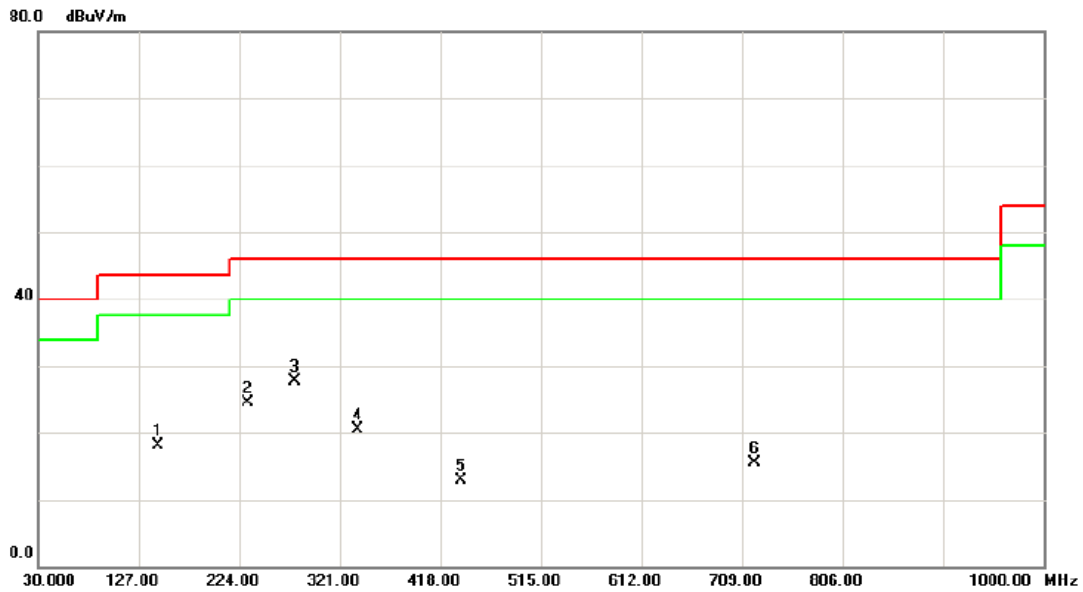
EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25°C	Relative Humidity:	58 %
Pressure:	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	Band 1/TX A Mode 5180MHz		
Phase:	Vertical		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		138.6400	30.58	-13.72	16.86	43.50	-26.64	peak	
2	*	222.0600	37.53	-14.91	22.62	46.00	-23.38	peak	
3		281.2300	34.64	-12.45	22.19	46.00	-23.81	peak	
4		335.5500	32.21	-11.40	20.81	46.00	-25.19	peak	
5		545.0700	23.41	-7.92	15.49	46.00	-30.51	peak	
6		648.8600	20.52	-5.62	14.90	46.00	-31.10	peak	



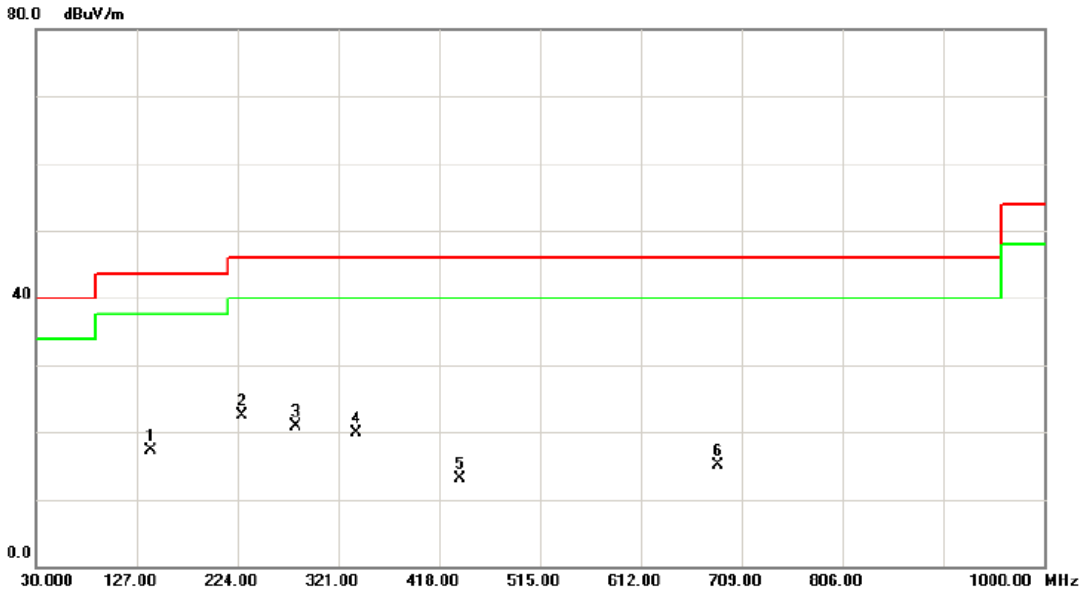
EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25°C	Relative Humidity:	58 %
Pressure:	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	Band 1/TX A Mode 5180MHz		
Phase:	Horizontal		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		145.4300	31.84	-13.75	18.09	43.50	-25.41	peak	
2		231.7600	39.06	-14.53	24.53	46.00	-21.47	peak	
3	*	277.3500	40.50	-12.89	27.61	46.00	-18.39	peak	
4		338.4600	31.82	-11.41	20.41	46.00	-25.59	peak	
5		438.3700	22.07	-9.14	12.93	46.00	-33.07	peak	
6		720.6400	20.42	-4.85	15.57	46.00	-30.43	peak	



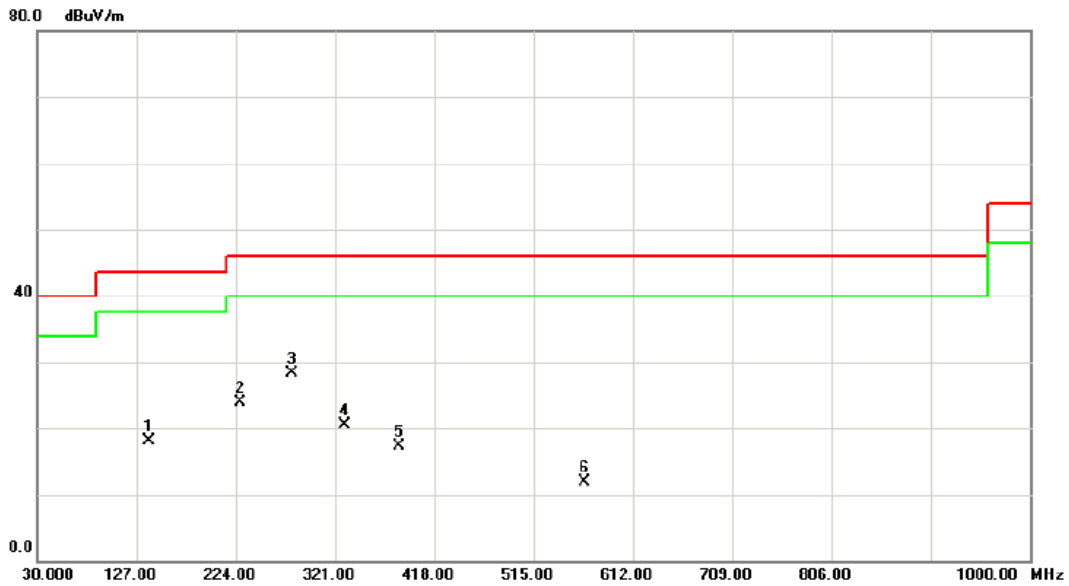
EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25°C	Relative Humidity:	58 %
Pressure:	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	Band 1/TX A Mode 5200MHz		
Phase:	Vertical		



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	140.5800	31.10	-13.78	17.32	43.50	-26.18	peak	
2 *	228.8500	37.01	-14.54	22.47	46.00	-23.53	peak	
3	280.2600	33.51	-12.52	20.99	46.00	-25.01	peak	
4	338.4600	31.35	-11.41	19.94	46.00	-26.06	peak	
5	437.4000	22.17	-9.16	13.01	46.00	-32.99	peak	
6	685.7200	20.13	-5.03	15.10	46.00	-30.90	peak	



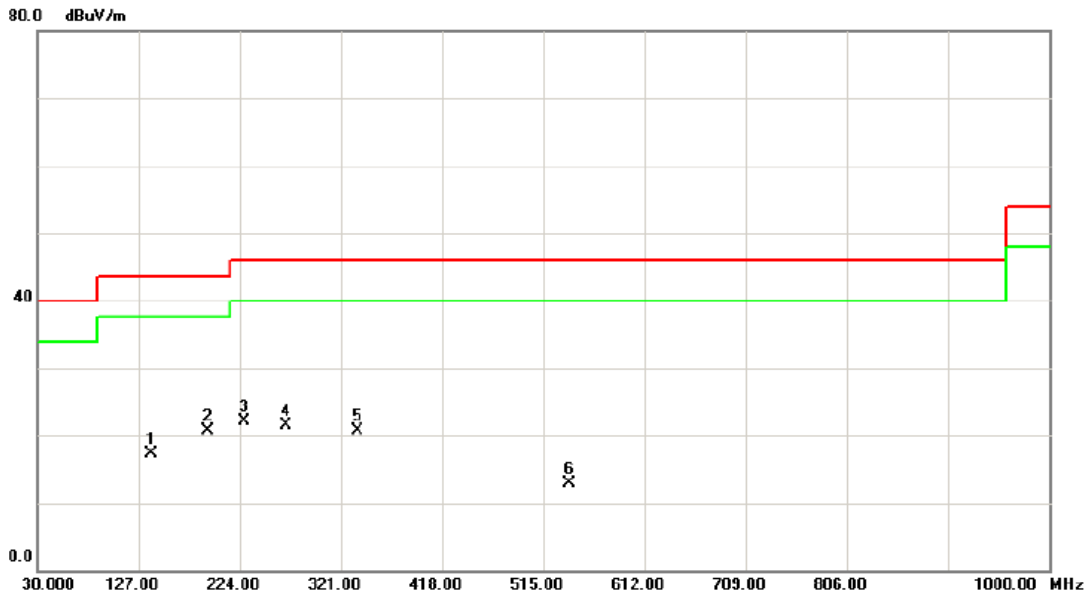
EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25°C	Relative Humidity:	58 %
Pressure:	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	Band 1/TX A Mode 5200MHz		
Phase:	Horizontal		



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	139.6100	31.87	-13.76	18.11	43.50	-25.39	peak	
2	227.8800	38.42	-14.60	23.82	46.00	-22.18	peak	
3 *	278.3200	41.08	-12.77	28.31	46.00	-17.69	peak	
4	330.7000	31.84	-11.37	20.47	46.00	-25.53	peak	
5	384.0500	27.68	-10.38	17.30	46.00	-28.70	peak	
6	564.4700	19.71	-7.78	11.93	46.00	-34.07	peak	



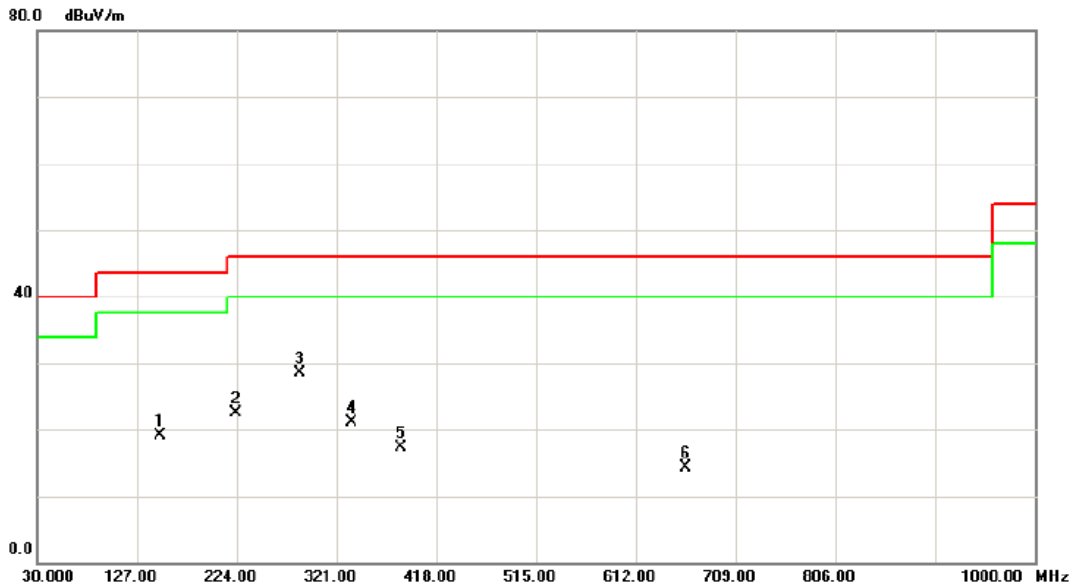
EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25°C	Relative Humidity:	58 %
Pressure:	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	Band 1/TX A Mode 5240MHz		
Phase:	Vertical		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		139.6100	31.16	-13.76	17.40	43.50	-26.10	peak	
2	*	193.9300	35.38	-14.66	20.72	43.50	-22.78	peak	
3		227.8800	36.67	-14.60	22.07	46.00	-23.93	peak	
4		268.6200	35.51	-14.01	21.50	46.00	-24.50	peak	
5		337.4900	32.17	-11.41	20.76	46.00	-25.24	peak	
6		540.2200	21.08	-8.18	12.90	46.00	-33.10	peak	



EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25°C	Relative Humidity:	58 %
Pressure:	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	Band 1/TX A Mode 5240MHz		
Phase:	Horizontal		



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	149.3100	32.84	-13.74	19.10	43.50	-24.40	peak	
2	223.0300	37.45	-14.86	22.59	46.00	-23.41	peak	
3 *	285.1100	40.61	-12.16	28.45	46.00	-17.55	peak	
4	335.5500	32.53	-11.40	21.13	46.00	-24.87	peak	
5	383.0800	27.77	-10.42	17.35	46.00	-28.65	peak	
6	660.5000	19.80	-5.40	14.40	46.00	-31.60	peak	



**4.2.9 TEST RESULTS - ABOVE 1000MHZ**

EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 ° C	Relative Humidity :	58 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	Band 1/ TX A Mode 5180MHz		

Freq. (MHz)	Ant. Pol. H/V	Reading		Ant./CF CF(dB)	Act. (dBuV/m)		Act. (dBm)		Limit (dBuV/m)		Limit (dBm)		Note
		Peak (dBuV)	AV (dBuV)		Peak	AV	Peak	AV	Peak	AV	Peak	AV	
5150.00	V	13.76	3.20	42.72	56.48	45.92	-48.29	-58.85	68.30	54.00	-27.00	-41.30	X/E
5187.50	V	63.36	54.27	42.81	106.17	97.08	1.40	-7.69					X/F
10368.60	V	39.40	29.43	16.03	55.43	45.46	-49.34	-59.31	68.30	54.00	-27.00	-41.30	X/H

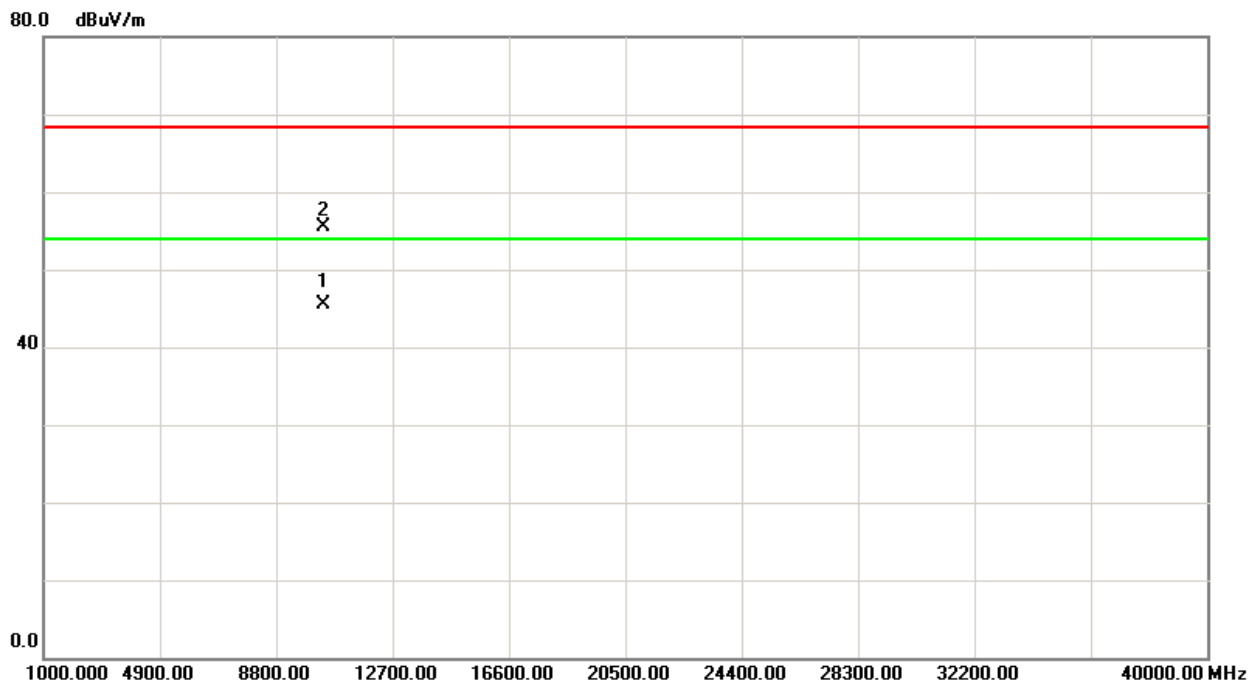
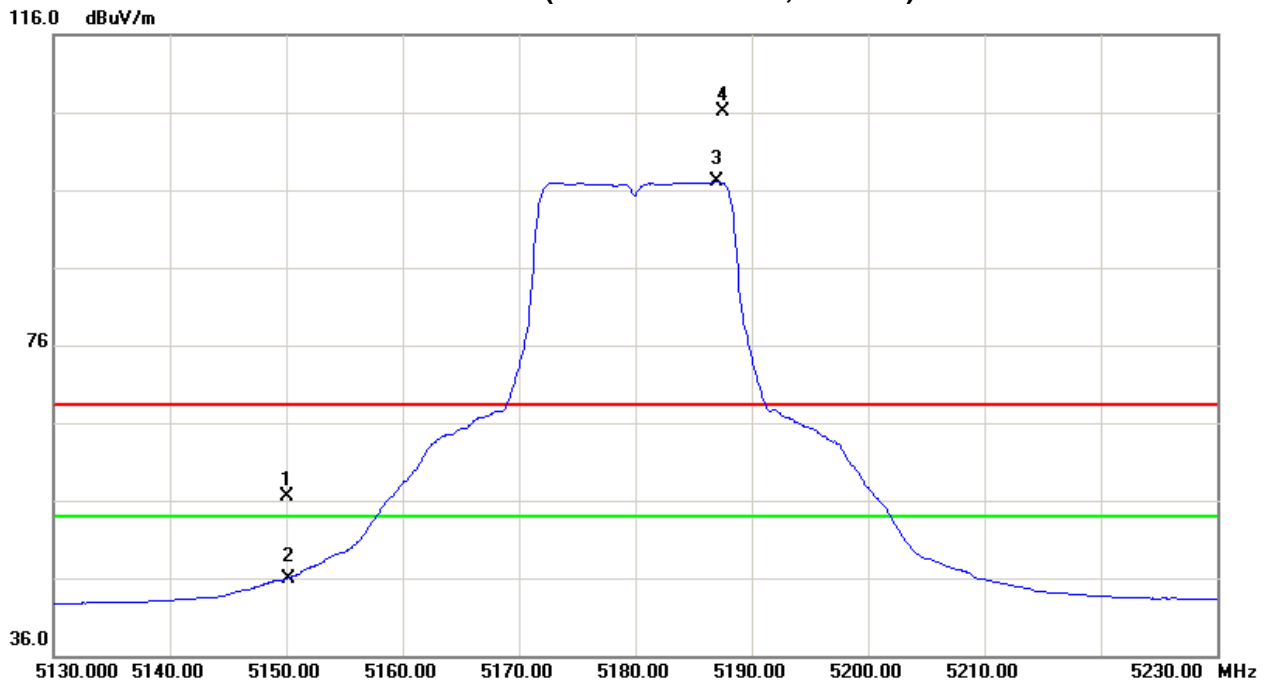
Remark:

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (2) All readings are Peak unless otherwise stated AV in column of 『Note』 . Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (5) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes:  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.





Orthogonal Axis:X  
Band 1/CH36(Above 1000 MHz, Vertical)





EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity :	58 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	Band 1/ TX A Mode 5180MHz		

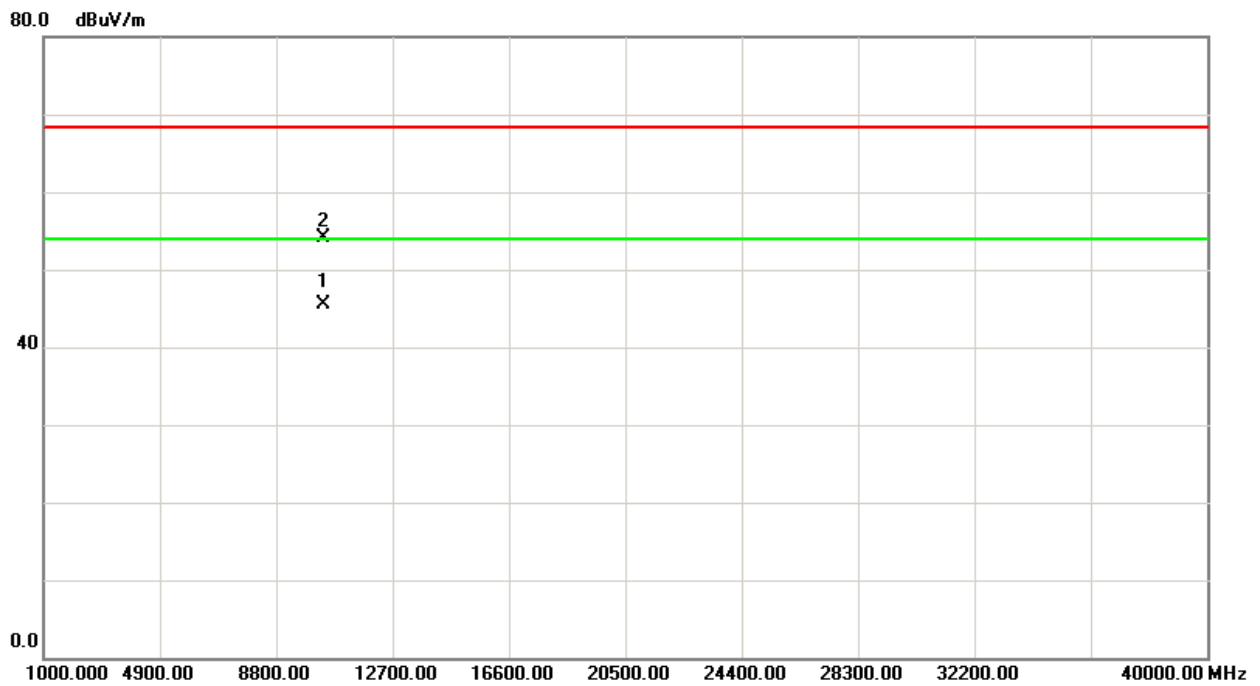
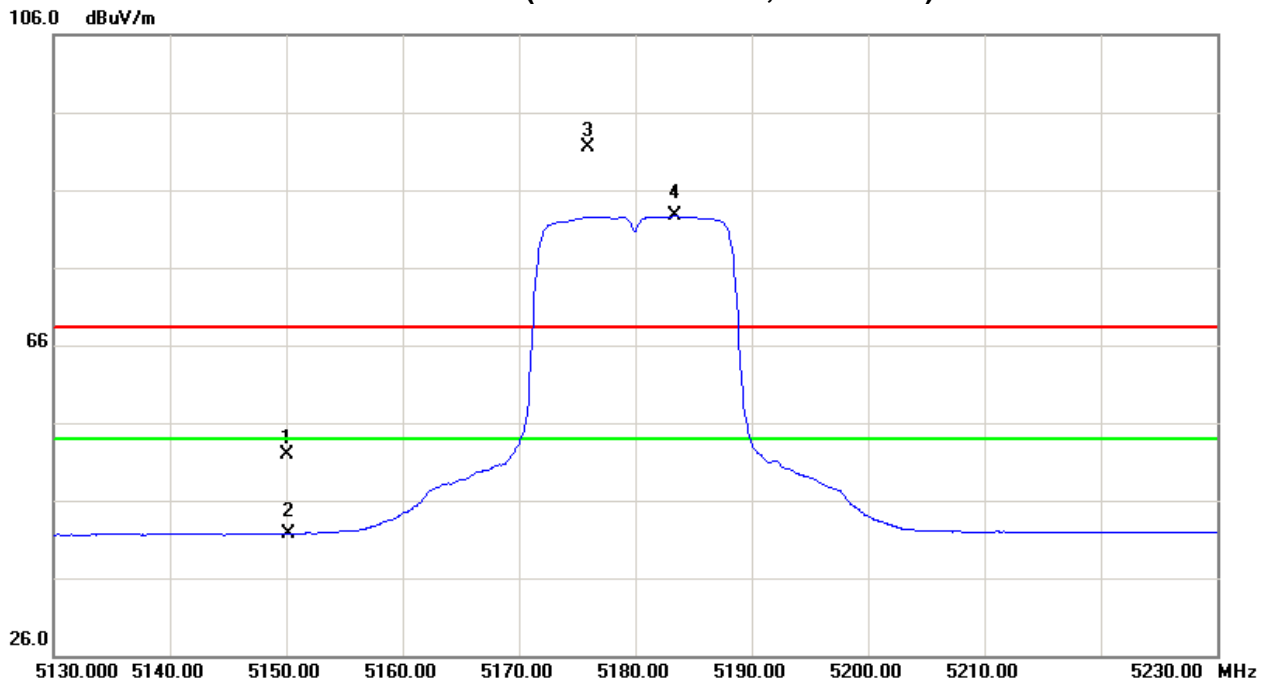
Freq. (MHz)	Ant.Pd. H/V	Reading		Ant./CF CF(dB)	Act.(dBuV/m)		Act.(dBm)		Limit(dBuV/m)		Limit(dBm)		Note
		Peak (dBuV)	AV (dBuV)		Peak	AV	Peak	AV	Peak	AV	Peak	AV	
5150.00	H	9.22	-0.97	42.72	51.94	41.75	-52.83	-63.02	68.30	54.00	-27.00	-41.30	X/E
5175.90	H	48.66	39.84	42.78	91.44	82.62	-13.33	-22.15					X/F
10362.45	H	38.14	29.47	16.02	54.16	45.49	-50.61	-59.28	68.30	54.00	-27.00	-41.30	X/H

**Remark:**

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (2) All readings are Peak unless otherwise stated AV in column of 『Note』 . Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency."F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (5) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes:  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.



Orthogonal Axis:X  
Band 1/CH36(Above 1000 MHz, Horizontal)





EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 ° C	Relative Humidity :	58 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	Band 1/ TX A Mode 5200MHz		

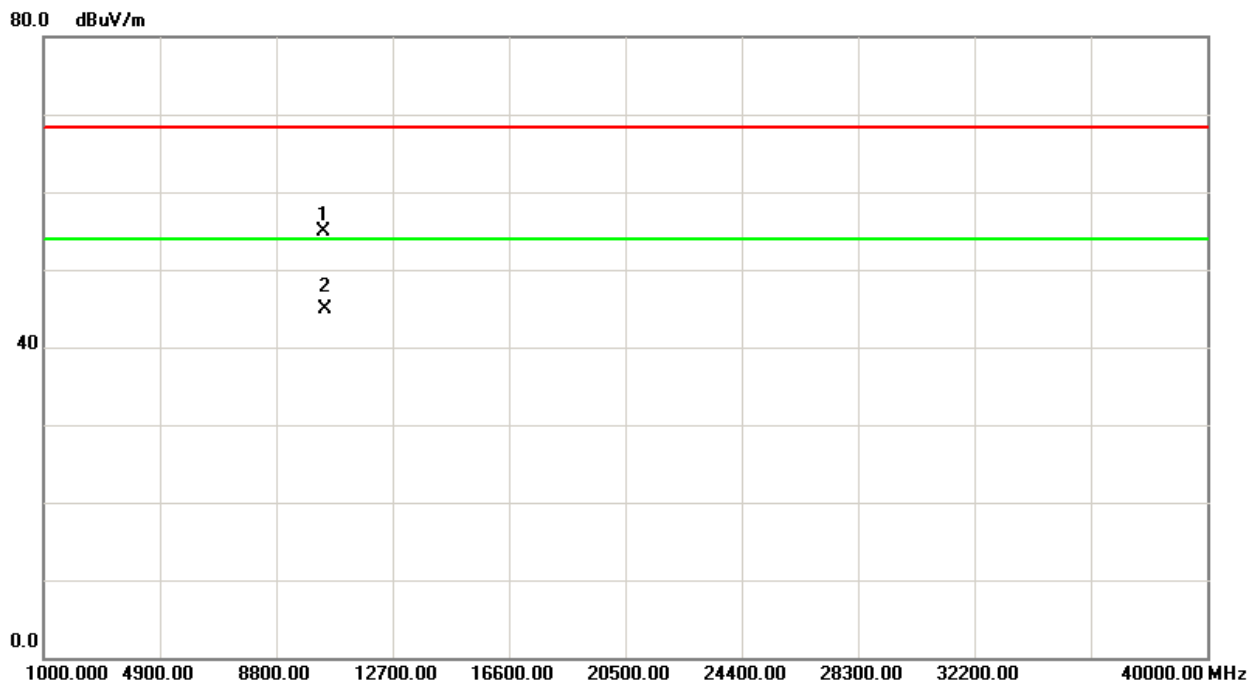
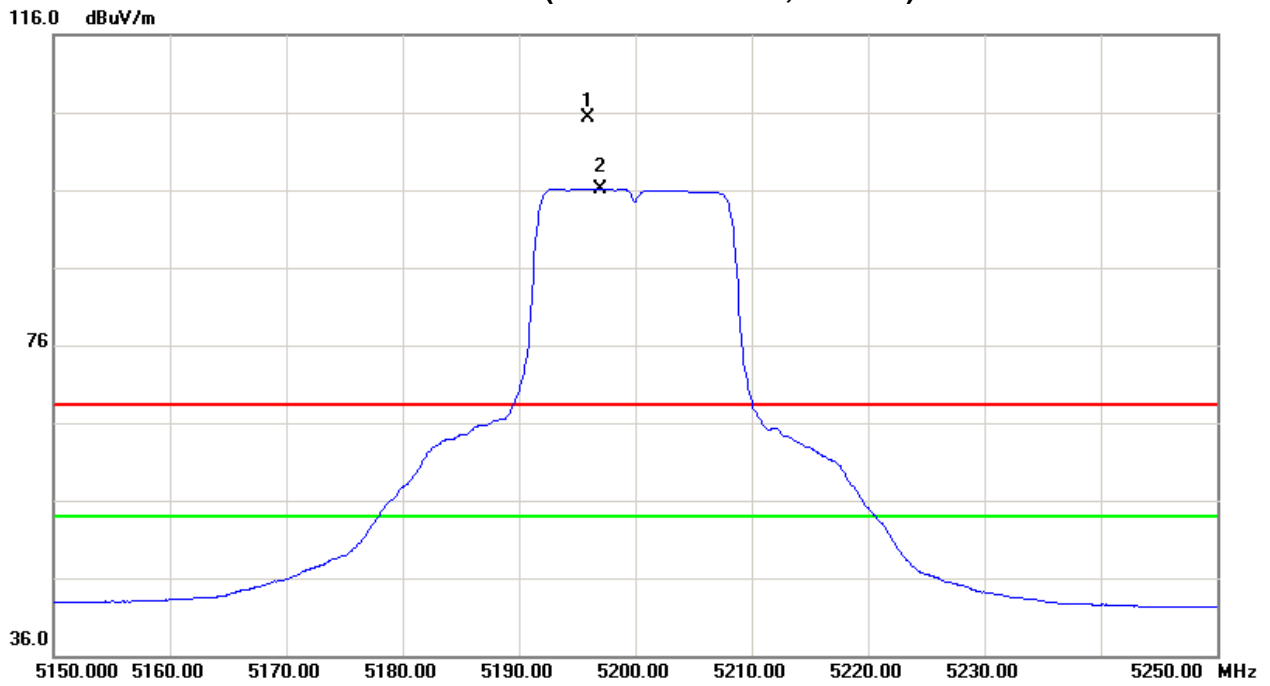
Freq. (MHz)	Ant.Pd. H/V	Reading		Ant./CF CF(dB)	Act.(dBuV/m)		Act.(dBm)		Limit(dBuV/m)		Limit(dBm)		Note
		Peak (dBuV)	AV (dBuV)		Peak	AV	Peak	AV	Peak	AV	Peak	AV	
5195.90	V	62.48	53.35	42.83	105.31	96.18	0.54	-8.59					X/F
10402.34	V	38.92	29.03	15.96	54.88	44.99	-49.89	-59.78	68.30	54.00	-27.00	-41.30	X/H

**Remark:**

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (2) All readings are Peak unless otherwise stated AV in column of 『Note』 . Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency.“F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (5) Data of measurement within this frequency range shown “ \* ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes:  
“X” - denotes Laid on Table ; ”Y” - denotes Vertical Stand ; ”Z” - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.



Orthogonal Axis:X  
Band 1/CH40(Above 1000 MHz, Vertical)





EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 ° C	Relative Humidity :	58 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	Band 1/ TX A Mode 5200MHz		

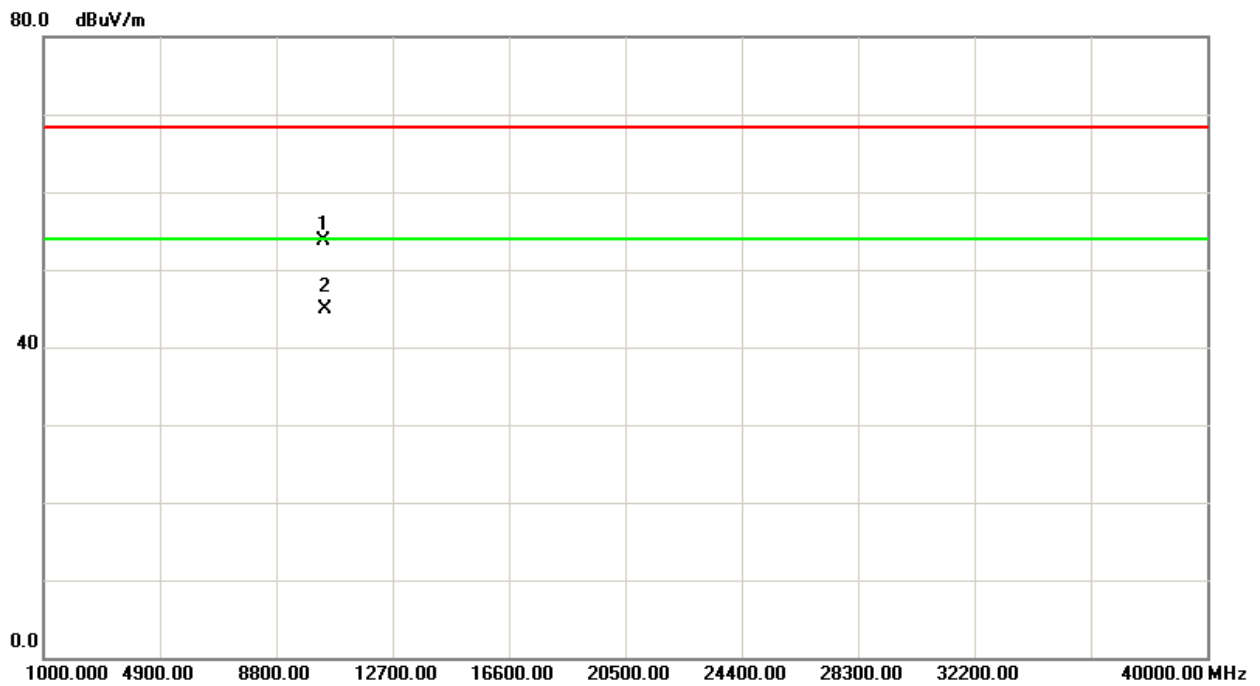
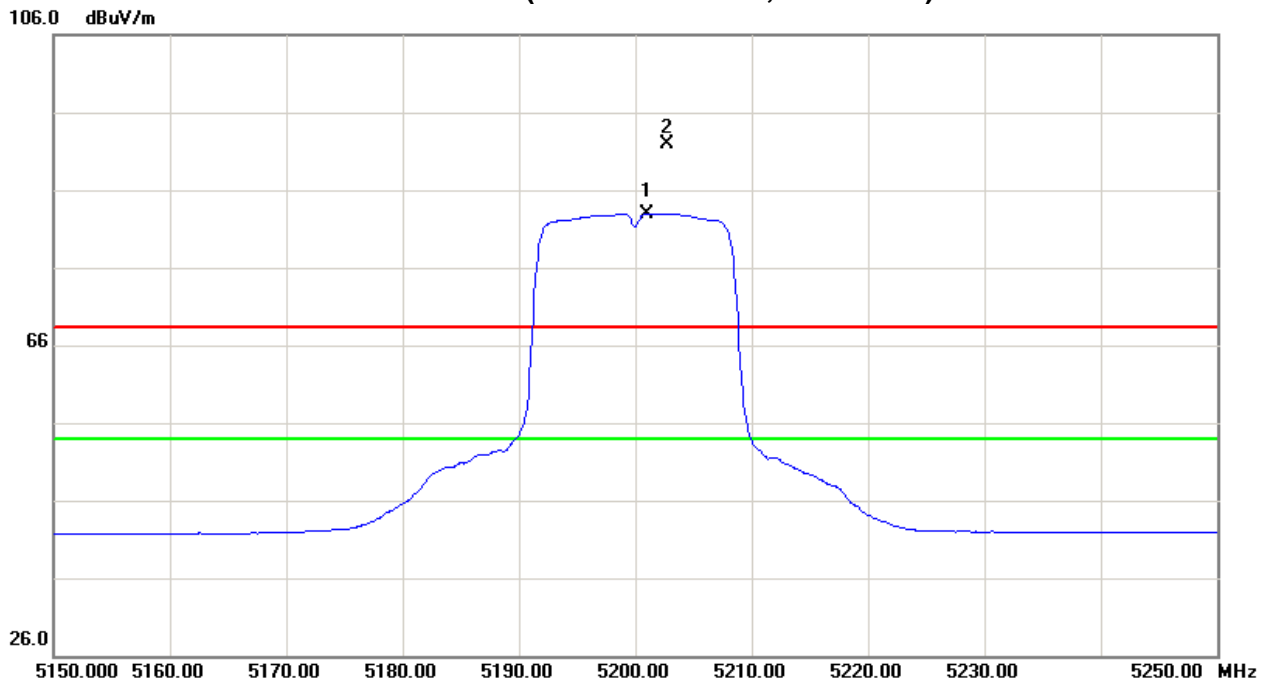
Freq. (MHz)	Ant.Pd. H/V	Reading		Ant./CF CF(dB)	Act.(dBuV/m)		Act.(dBm)		Limit(dBuV/m)		Limit(dBm)		Note
		Peak (dBuV)	AV (dBuV)		Peak	AV	Peak	AV	Peak	AV	Peak	AV	
5201.00	H	49.14	40.11	42.84	91.98	82.95	-12.79	-21.82					X/F
10405.52	H	37.84	28.95	15.96	53.80	44.91	-50.97	-59.86	68.30	54.00	-27.00	-41.30	X/H

**Remark:**

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (2) All readings are Peak unless otherwise stated AV in column of 『Note』 . Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency."F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (5) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes:  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.



Orthogonal Axis:X  
Band 1/CH40(Above 1000 MHz, Horizontal)





EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 ° C	Relative Humidity :	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	Band 1/ TX A Mode 5240MHz		

Freq. (MHz)	Ant. Pol. H/V	Reading		Ant./CF CF(dB)	Act.(dBUV/m)		Act.(dBm)		Limit(dBUV/m)		Limit(dBm)		Note
		Peak (dBUV)	AV (dBUV)		Peak	AV	Peak	AV	Peak	AV	Peak	AV	
5235.30	V	63.04	53.84	42.92	105.96	96.76	1.19	-8.01					X/F
10482.22	V	38.57	28.77	15.84	54.41	44.61	-50.36	-60.16	68.30	54.00	-27.00	-41.30	X/H

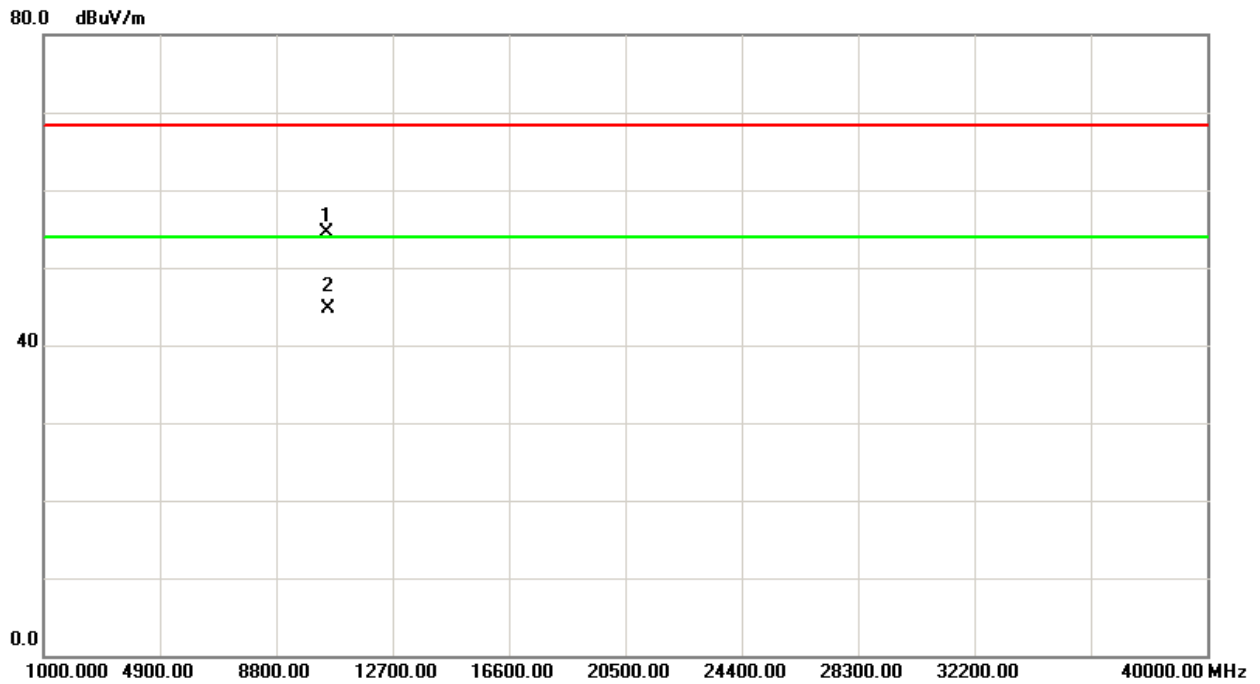
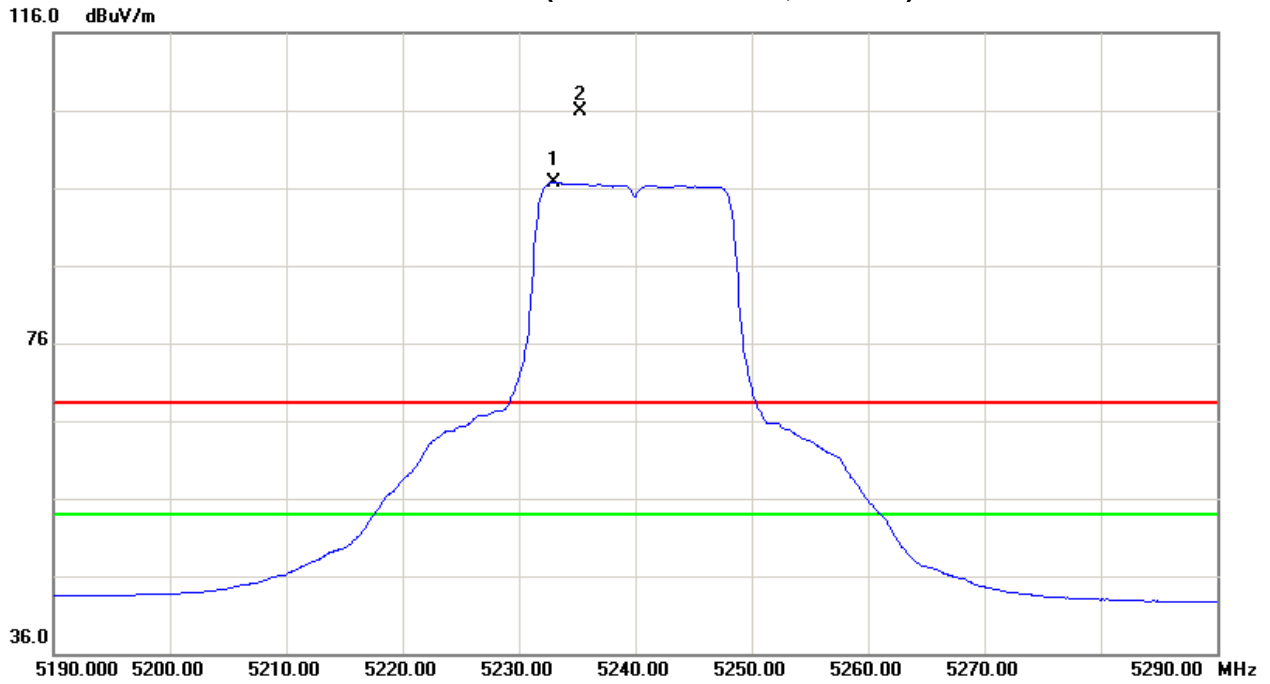
**Remark:**

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (2) All readings are Peak unless otherwise stated AV in column of 『Note 』 . Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (5) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes:  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.





Orthogonal Axis:X  
Band 1/CH48(Above 1000 MHz, Vertical)





EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 ° C	Relative Humidity :	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	Band 1/ TX A Mode 5240MHz		

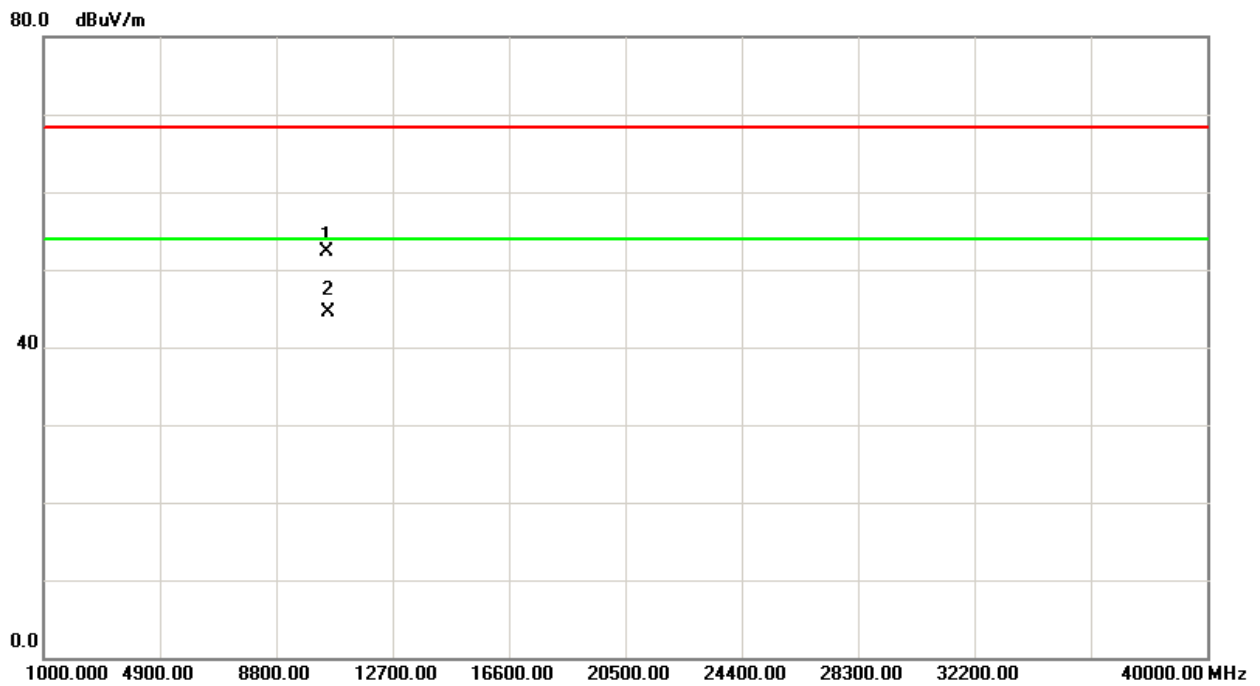
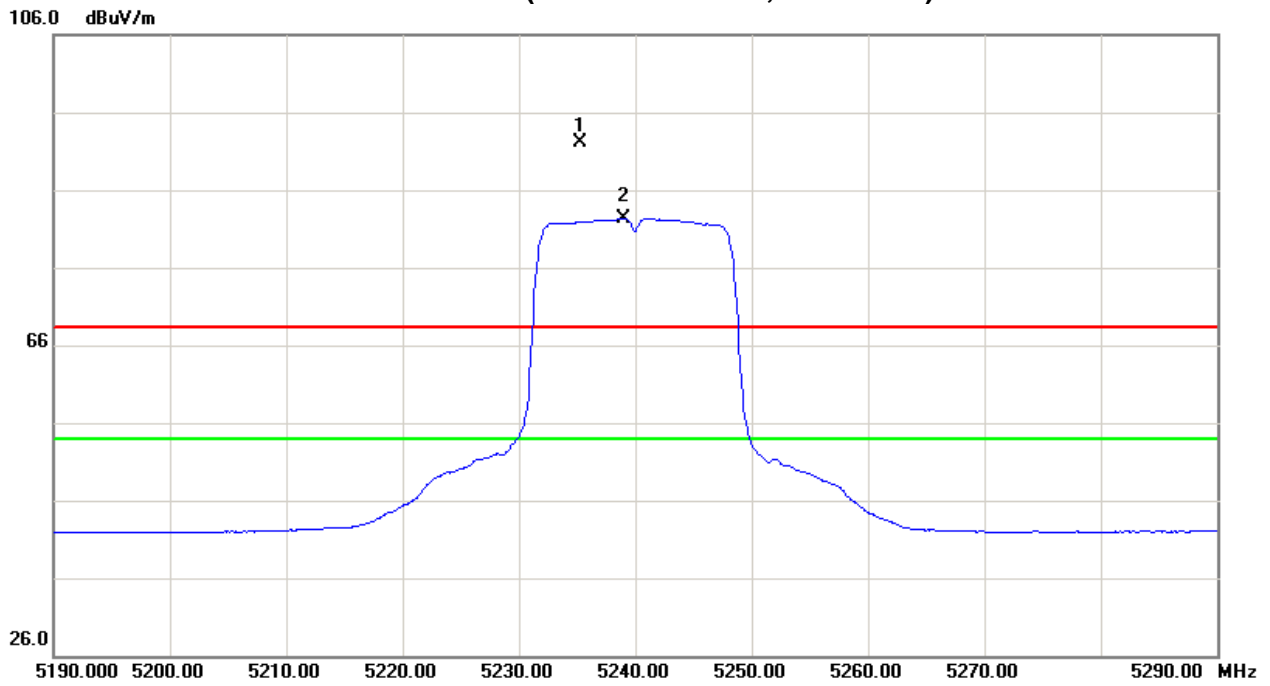
Freq. (MHz)	Ant. Pol. H/V	Reading		Ant./CF CF(dB)	Act.(dBuV/m)		Act.(dBm)		Limit(dBuV/m)		Limit(dBm)		Note
		Peak (dBuV)	AV (dBuV)		Peak	AV	Peak	AV	Peak	AV	Peak	AV	
5235.20	H	49.13	39.40	42.93	92.06	82.33	-12.71	-22.44					X/F
10482.54	H	36.42	28.68	15.84	52.26	44.52	-52.51	-60.25	68.30	54.00	-27.00	-41.30	X/H

**Remark:**

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (2) All readings are Peak unless otherwise stated AV in column of 『Note 』 . Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (5) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes:  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.



Orthogonal Axis:X  
Band 1/CH48(Above 1000 MHz, Horizontal)





EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity :	58 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	Band 1/ TX N20 Mode 5180MHz		

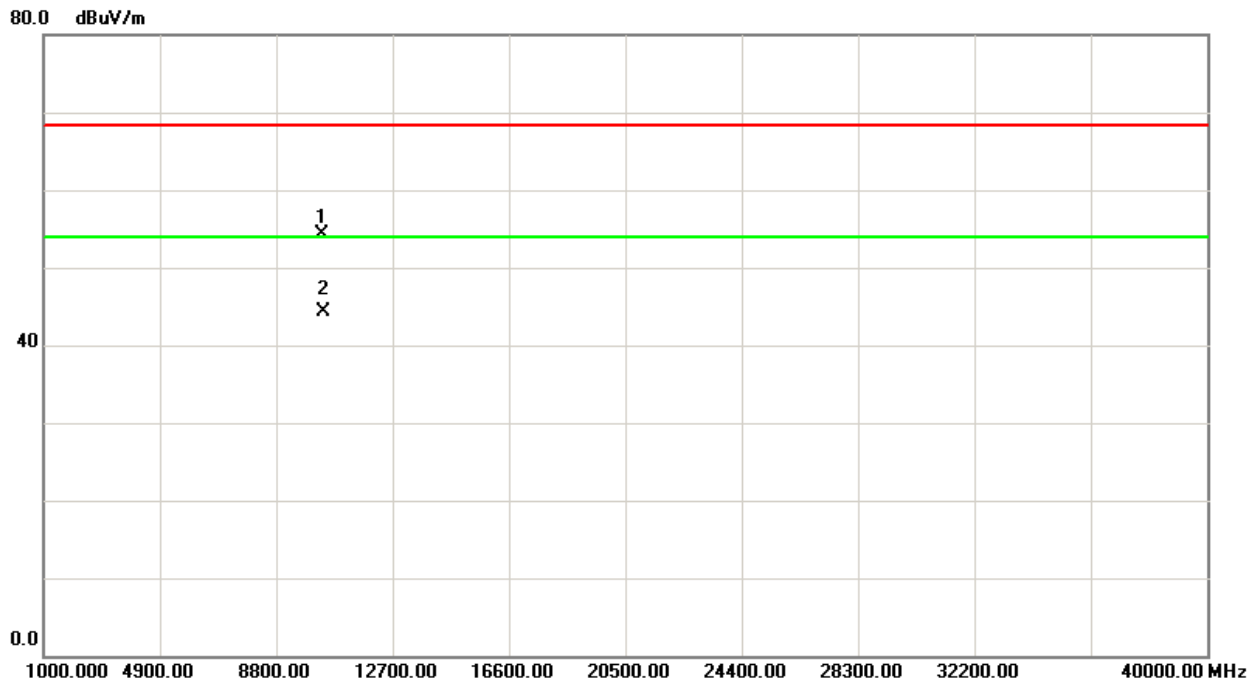
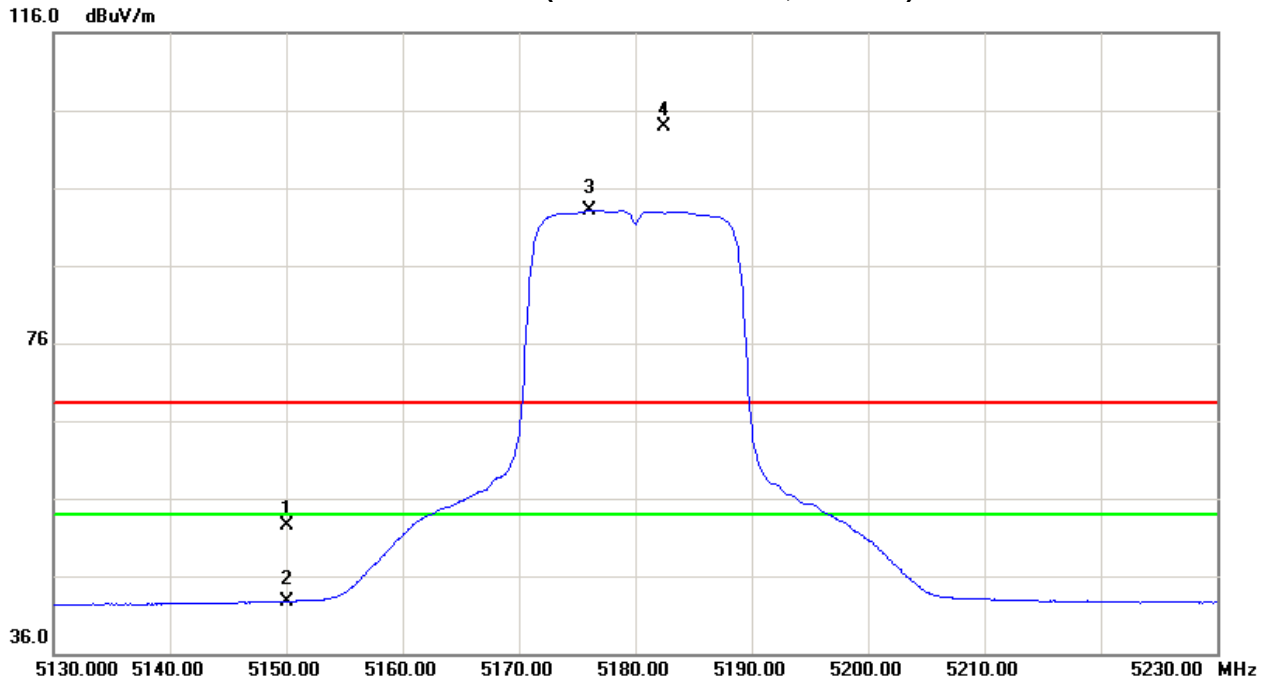
Freq. (MHz)	Ant.Pd. H/V	Reading		Ant./CF CF(dB)	Act.(dBuV/m)		Act.(dBm)		Limit(dBuV/m)		Limit(dBm)		Note
		Peak (dBuV)	AV (dBuV)		Peak	AV	Peak	AV	Peak	AV	Peak	AV	
5150.00	V	8.86	-1.10	42.72	51.58	41.62	-53.19	-63.15	68.30	54.00	-27.00	-41.30	X/E
5176.10	V	61.11	50.30	42.80	103.91	93.10	-0.86	-11.67					X/F
10357.90	V	38.27	28.36	16.02	54.29	44.38	-50.48	-60.39	68.30	54.00	-27.00	-41.30	X/H

**Remark:**

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (2) All readings are Peak unless otherwise stated AV in column of 『Note 』 . Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (5) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes:  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.



Orthogonal Axis:X  
Band 1/CH36(Above 1000 MHz, Vertical)





EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 ° C	Relative Humidity :	58 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	Band 1/ TX N20 Mode 5180MHz		

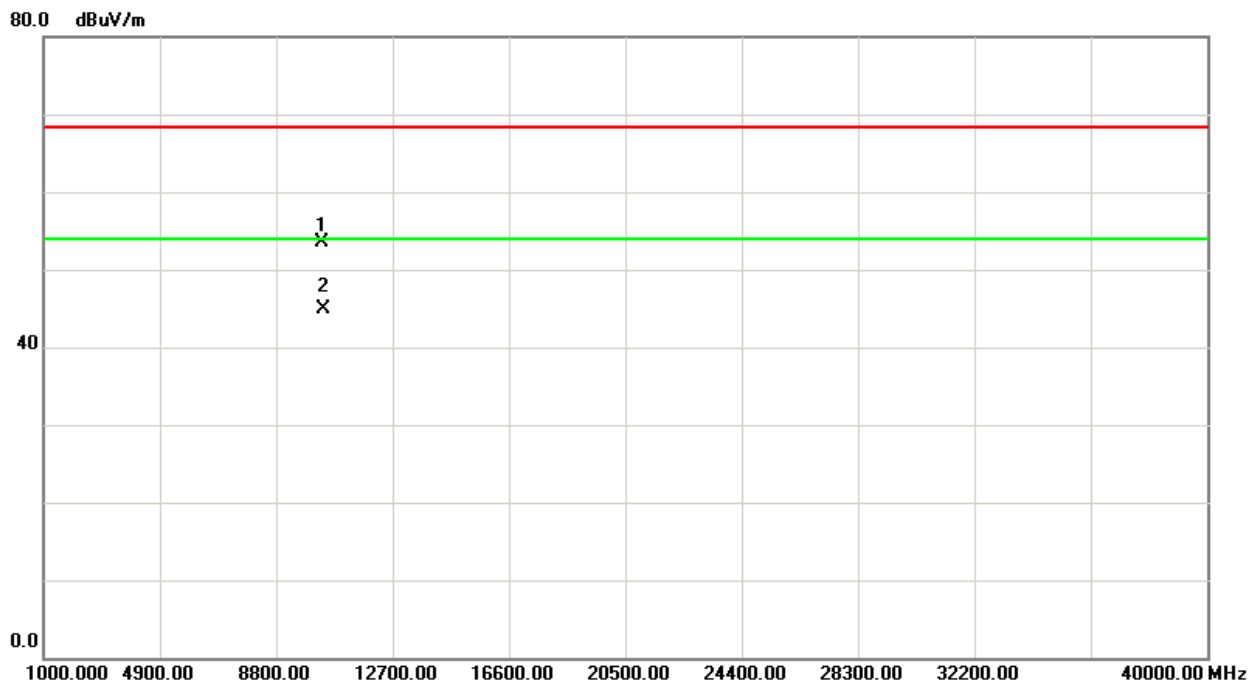
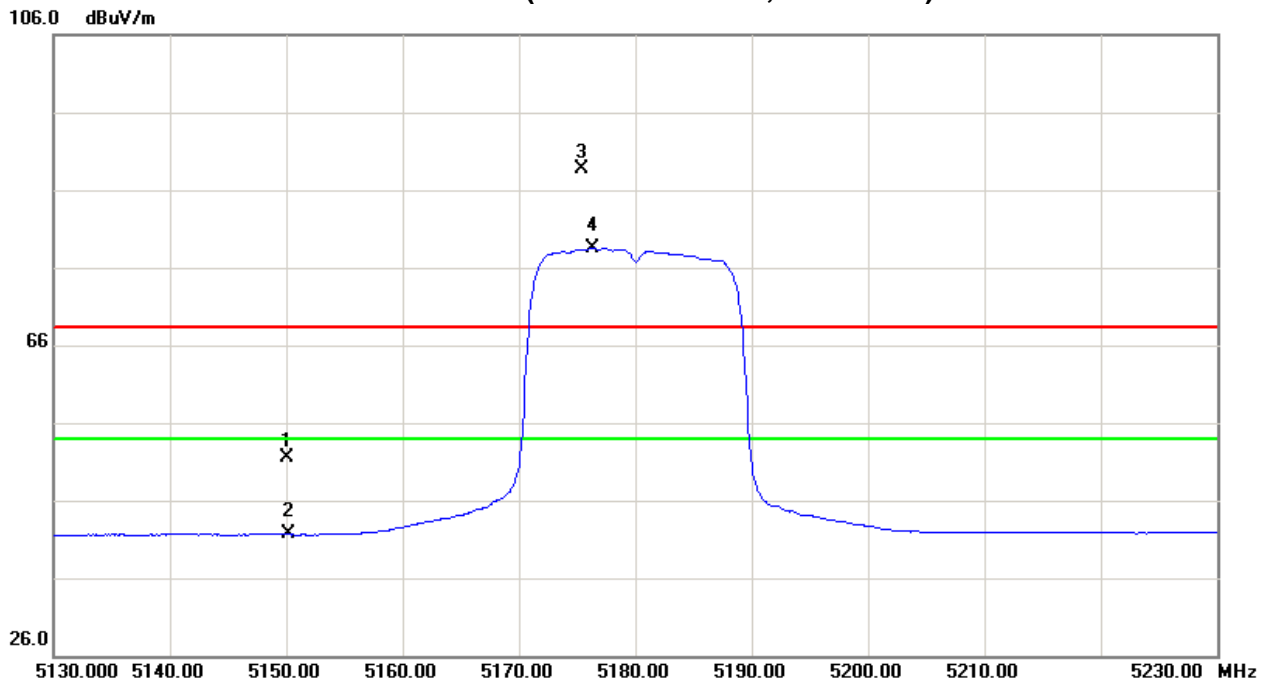
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.(dBuV/m)		Act.(dBm)		Limit(dBuV/m)		Limit(dBm)		Note
		Peak (dBuV)	AV (dBuV)		Peak	AV	Peak	AV	Peak	AV	Peak	AV	
5150.00	H	8.86	-1.10	42.72	51.58	41.62	-53.19	-63.15	68.30	54.00	-27.00	-41.30	X/E
5175.40	H	46.02	35.68	42.78	88.80	78.46	-15.97	-26.31					X/F
10352.60	H	37.54	28.97	16.03	53.57	45.00	-51.20	-59.77	68.30	54.00	-27.00	-41.30	X/H

**Remark:**

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (2) All readings are Peak unless otherwise stated AV in column of 『Note』 . Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency."F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (5) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes:  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.



Orthogonal Axis:X  
Band 1/CH36(Above 1000 MHz, Horizontal)





EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity :	58 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	Band 1/ TX N20 Mode 5200MHz		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.(dBuV/m)		Act.(dBm)		Limit(dBuV/m)		Limit(dBm)		Note
		Peak (dBuV)	AV (dBuV)		Peak	AV	Peak	AV	Peak	AV	Peak	AV	
5201.90	V	62.27	57.19	42.84	105.11	100.03	0.34	-4.74					X/F
10405.22	V	38.49	28.51	15.97	54.46	44.48	-50.31	-60.29	68.30	54.00	-27.00	-41.30	X/H

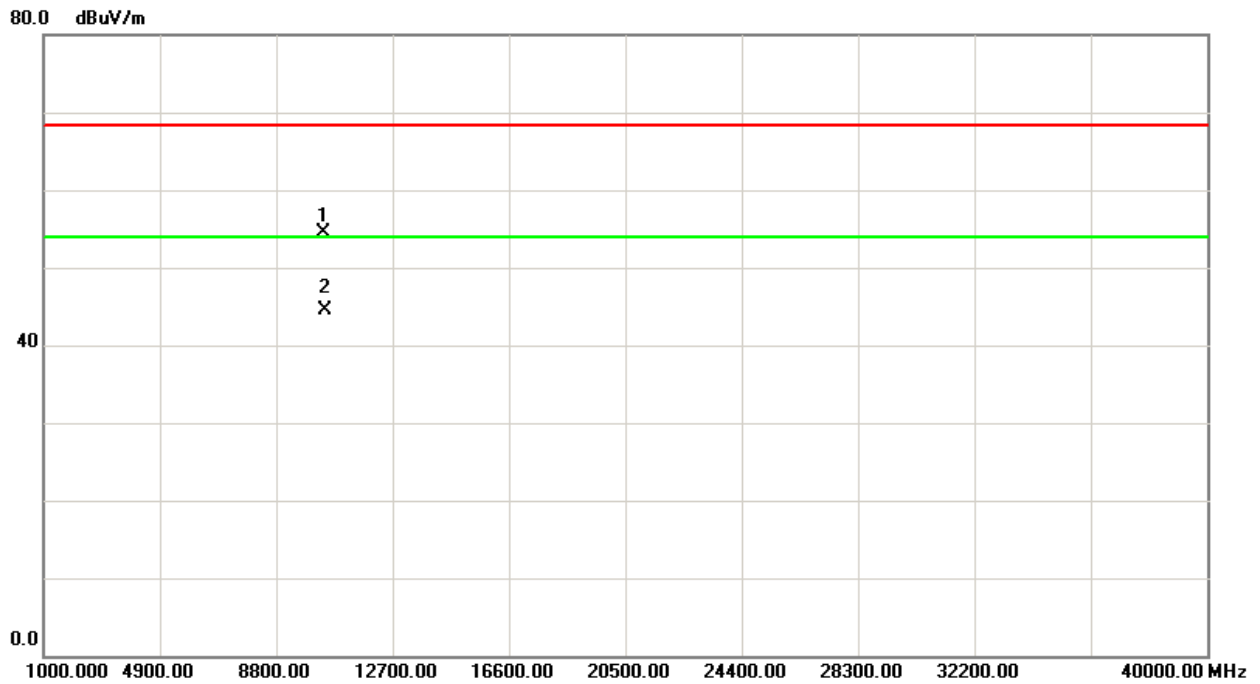
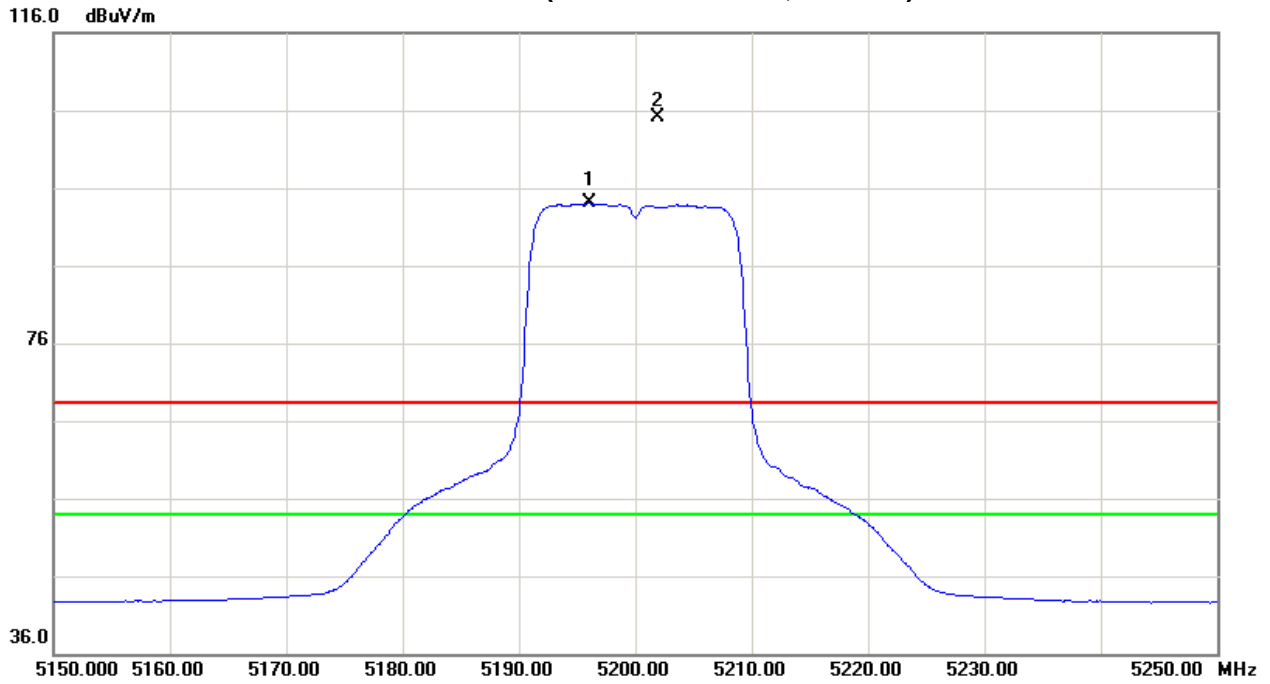
**Remark:**

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (2) All readings are Peak unless otherwise stated AV in column of 『Note』 . Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (5) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes:  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.





Orthogonal Axis:X  
Band 1/CH40(Above 1000 MHz, Vertical)





EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity :	58 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	Band 1/ TX N20 Mode 5200MHz		

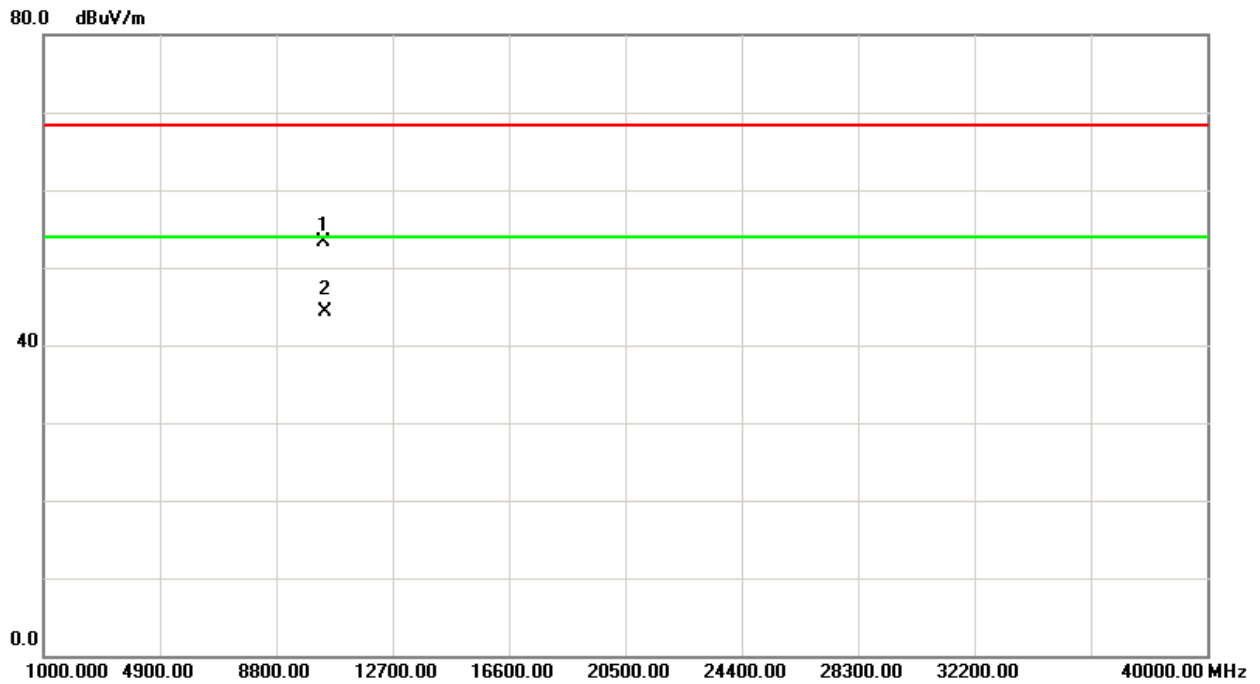
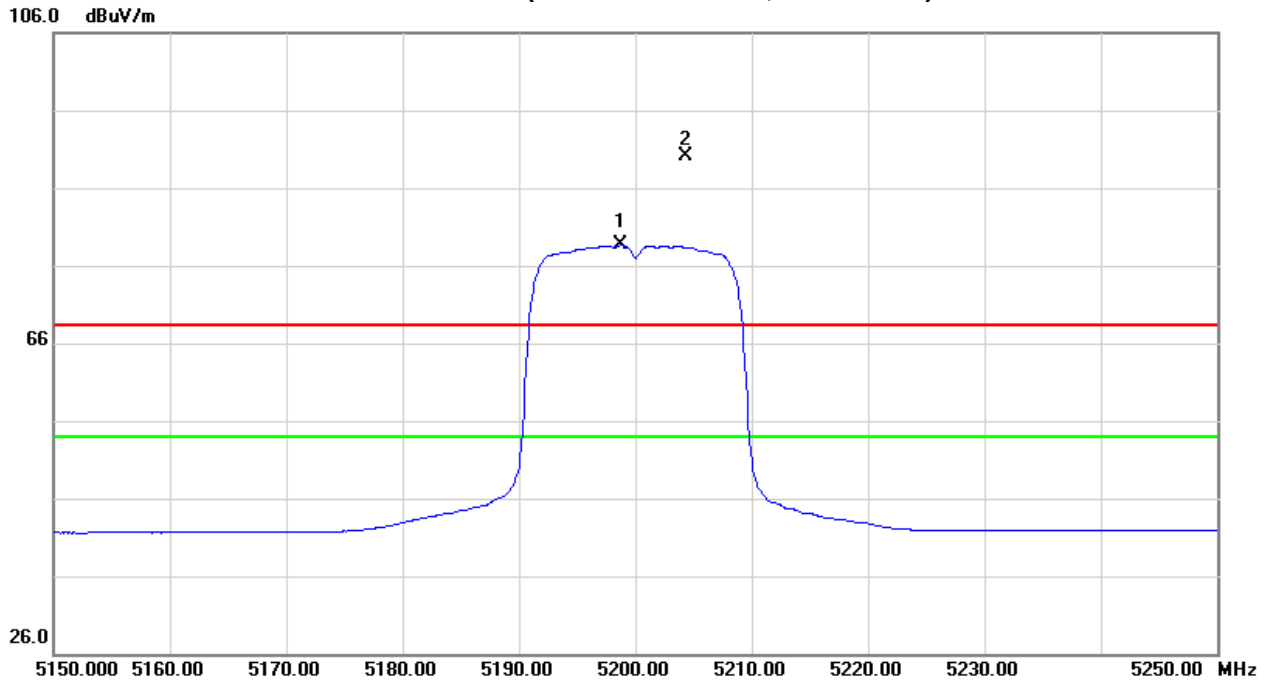
Freq. (MHz)	Ant. Pol. H/V	Reading		Ant./CF CF(dB)	Act.(dBuV/m)		Act.(dBm)		Limit(dBuV/m)		Limit(dBm)		Note
		Peak (dBuV)	AV (dBuV)		Peak	AV	Peak	AV	Peak	AV	Peak	AV	
5204.30	H	47.17	35.79	42.84	90.01	78.63	-14.76	-26.14					X/F
10402.52	H	37.36	28.34	15.96	53.32	44.30	-51.45	-60.47	68.30	54.00	-27.00	-41.30	X/H

**Remark:**

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (2) All readings are Peak unless otherwise stated AV in column of 『Note』 . Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (5) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes:  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.



Orthogonal Axis:X  
Band 1/CH40(Above 1000 MHz, Horizontal)





EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity :	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	Band 1/ TX N20 Mode 5240MHz		

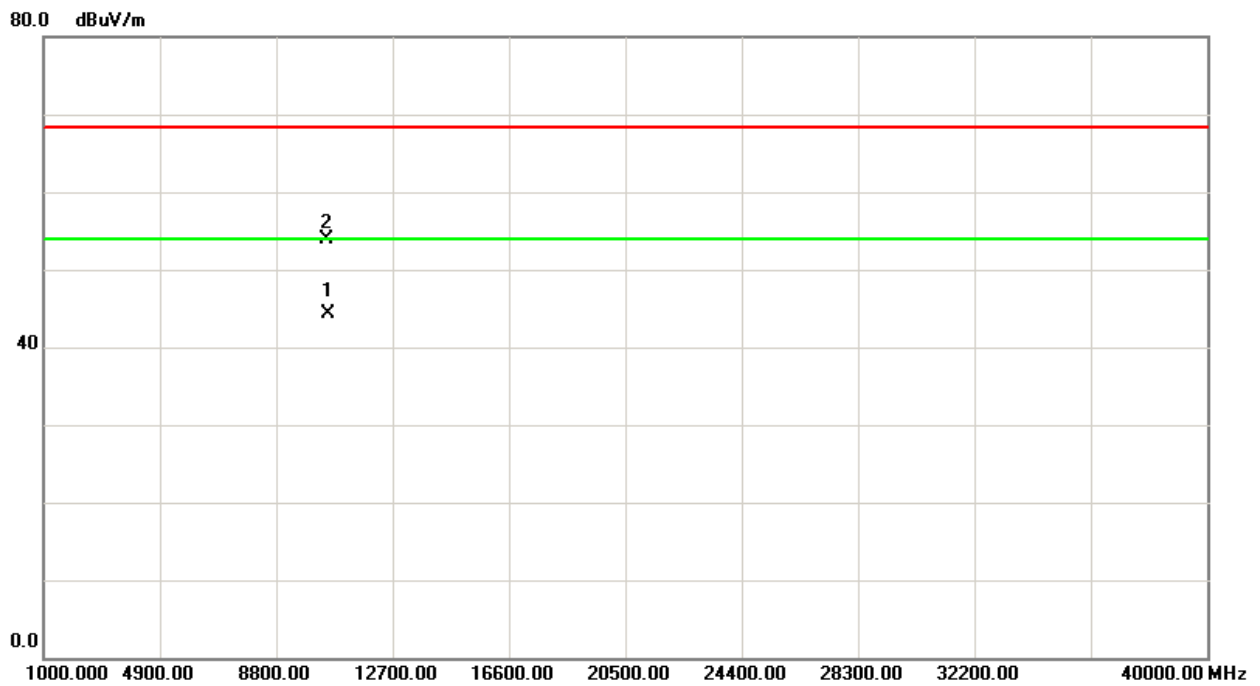
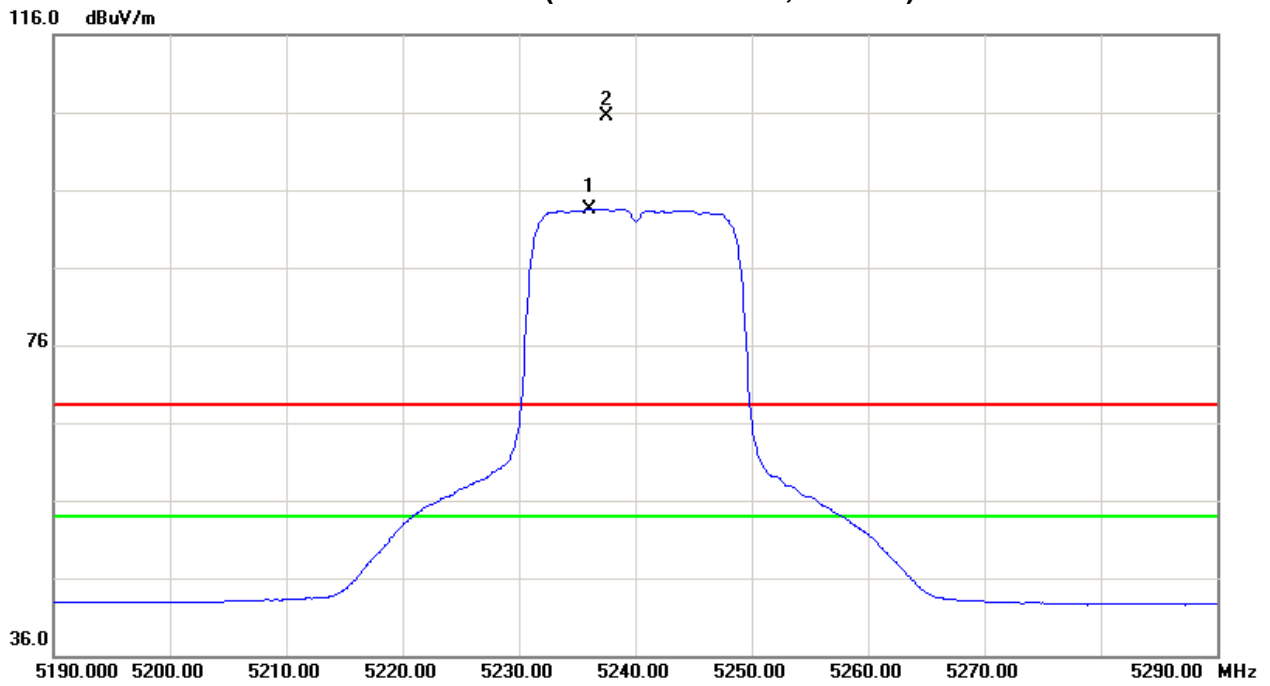
Freq. (MHz)	Ant.Pd. H/V	Reading		Ant./CF CF(dB)	Act.(dBuV/m)		Act.(dBm)		Limit(dBuV/m)		Limit(dBm)		Note
		Peak (dBuV)	AV (dBuV)		Peak	AV	Peak	AV	Peak	AV	Peak	AV	
5237.50	V	62.58	50.61	42.93	105.51	93.54	0.74	-11.23					X/F
10486.28	V	38.11	28.39	15.84	53.95	44.23	-50.82	-60.54	68.30	54.00	-27.00	-41.30	X/H

**Remark:**

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (2) All readings are Peak unless otherwise stated AV in column of 『Note』 . Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency.“F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (5) Data of measurement within this frequency range shown “ \* ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes:  
“X” - denotes Laid on Table ; ”Y” - denotes Vertical Stand ; ”Z” - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.



Orthogonal Axis:X  
Band 1/CH48(Above 1000 MHz, Vertical)





EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 ° C	Relative Humidity :	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	Band 1/ TX N20 Mode 5240MHz		

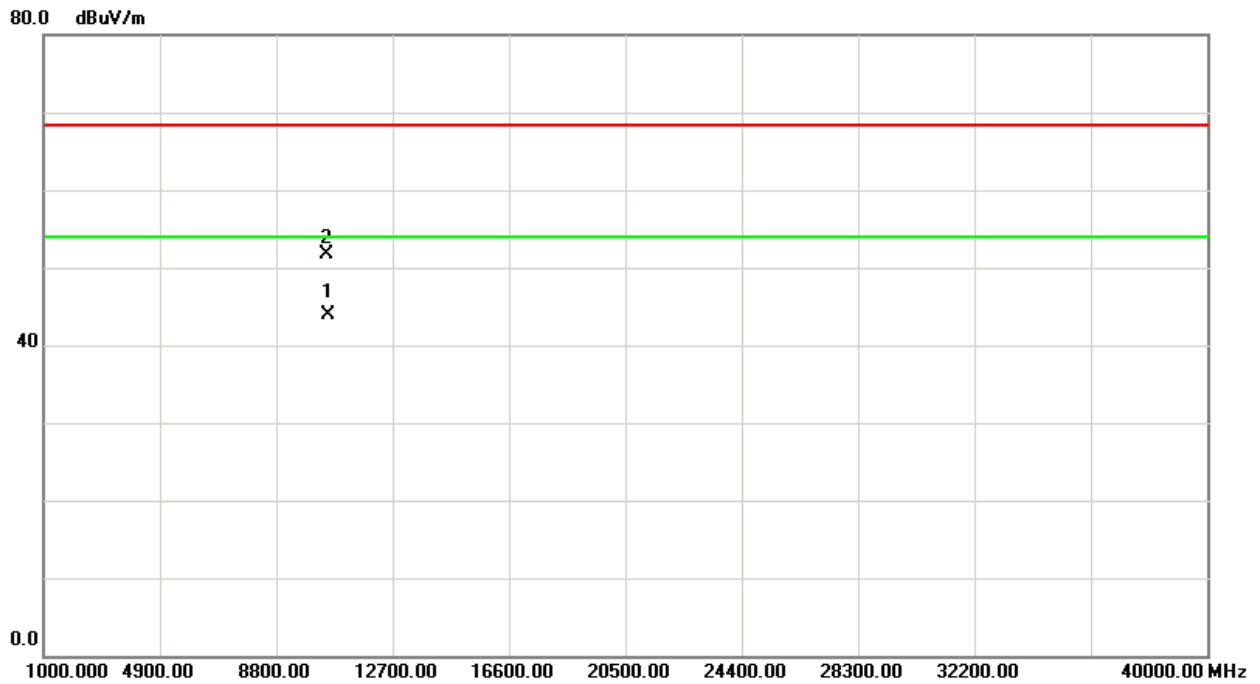
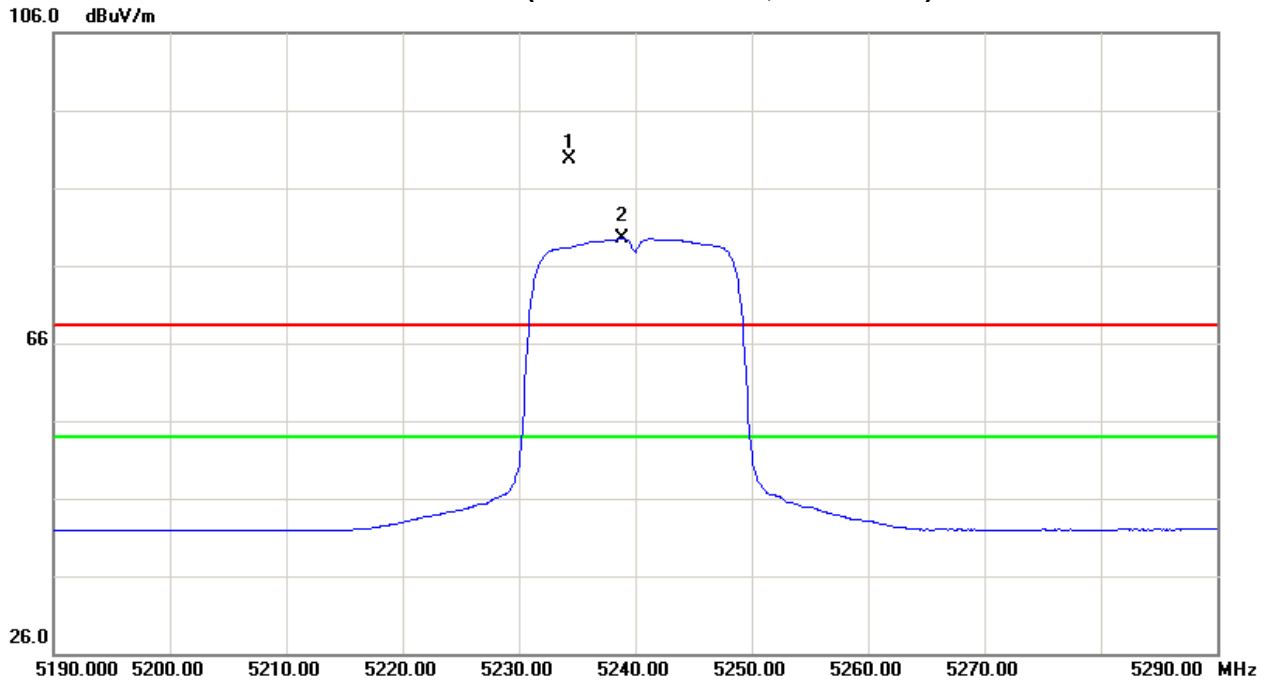
Freq. (MHz)	Ant.Pd. H/V	Reading		Ant./CF CF(dB)	Act.(dBuV/m)		Act.(dBm)		Limit(dBuV/m)		Limit(dBm)		Note
		Peak (dBuV)	AV (dBuV)		Peak	AV	Peak	AV	Peak	AV	Peak	AV	
5234.30	H	46.77	36.52	42.92	89.69	79.44	-15.08	-25.33					X/F
10485.42	H	35.84	28.01	15.84	51.68	43.85	-53.09	-60.92	68.30	54.00	-27.00	-41.30	X/H

**Remark:**

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (2) All readings are Peak unless otherwise stated AV in column of 『Note 』 . Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency."F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (5) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes:  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.



Orthogonal Axis:X  
Band 1/CH48(Above 1000 MHz, Horizontal)





EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity :	58 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	Band 1/ TX N40 Mode 5190MHz		

Freq. (MHz)	Ant.Pd. H/V	Reading		Ant./CF CF(dB)	Act.(dBuV/m)		Act.(dBm)		Limit(dBuV/m)		Limit(dBm)		Note
		Peak (dBuV)	AV (dBuV)		Peak	AV	Peak	AV	Peak	AV	Peak	AV	
5150.00	V	20.69	8.24	42.72	63.41	50.96	-41.36	-53.81	68.30	54.00	-27.00	-41.30	X/E
5177.80	V	60.79	47.55	42.78	103.57	90.33	-1.20	-14.44					X/F
10382.30	V	36.42	26.88	15.99	52.41	42.87	-52.36	-61.90	68.30	54.00	-27.00	-41.30	X/H

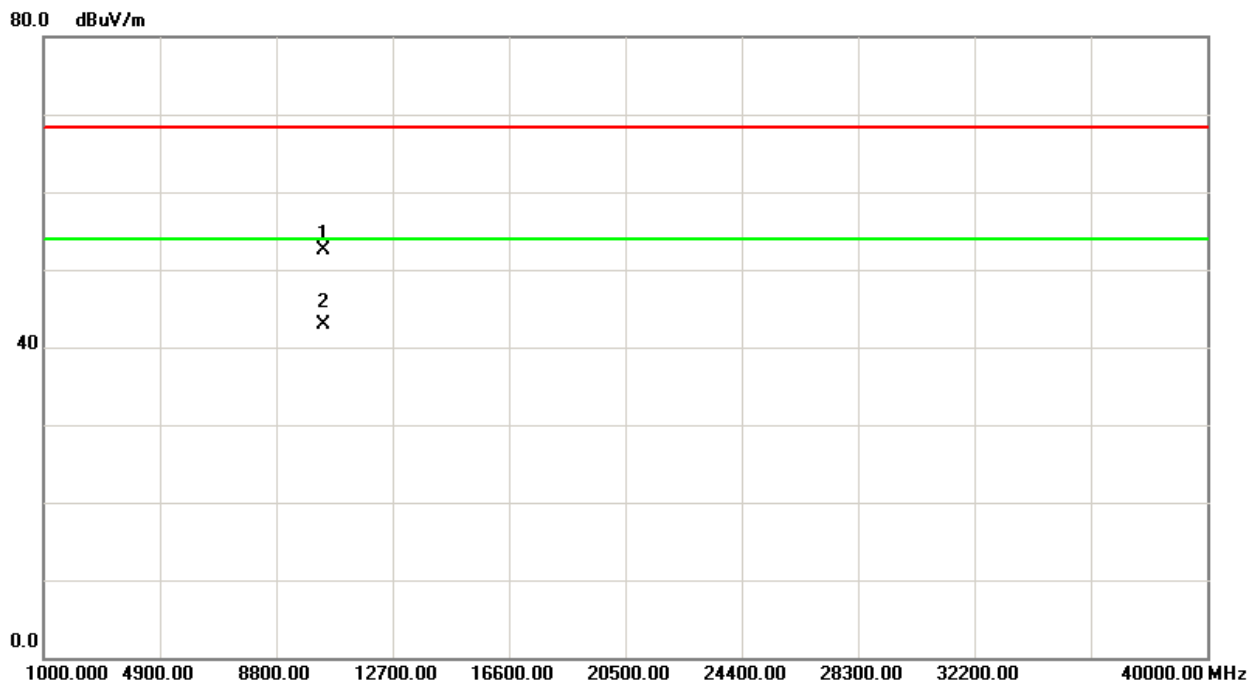
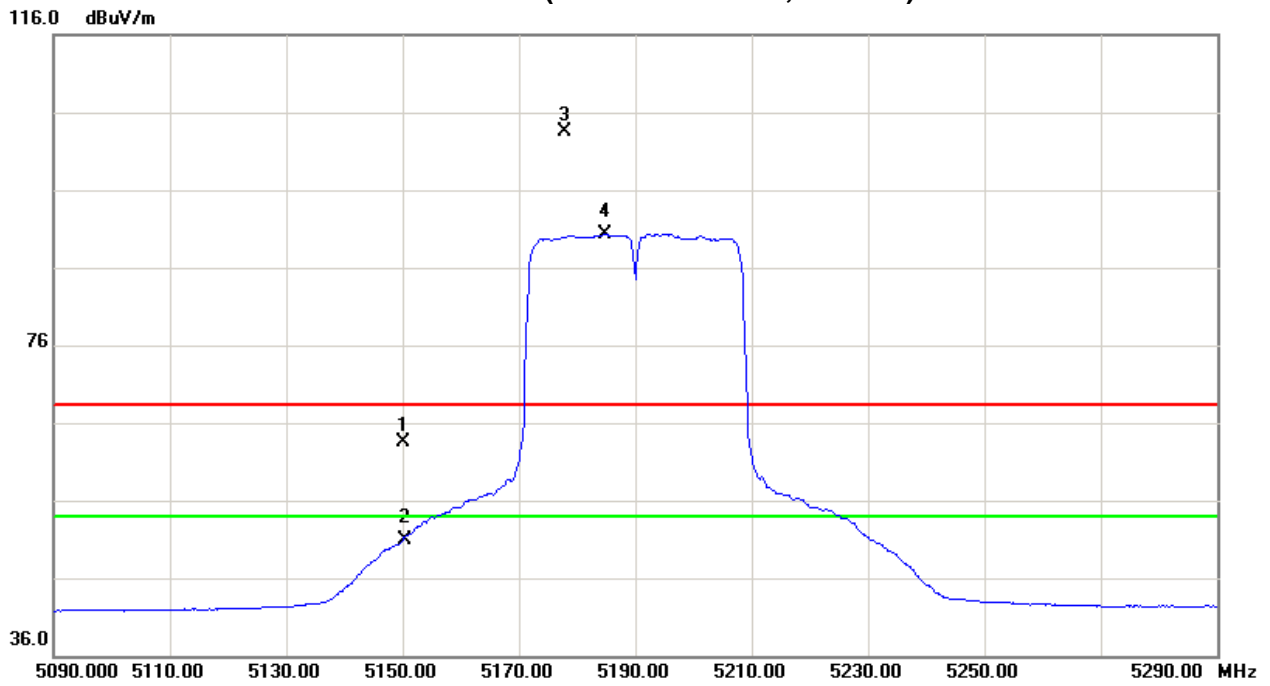
**Remark:**

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (2) All readings are Peak unless otherwise stated AV in column of 『Note 』 . Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (5) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes:  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.





Orthogonal Axis:X  
Band 1/CH38(Above 1000 MHz, Vertical)





EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 ° C	Relative Humidity :	58 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	Band 1/ TX N40 Mode 5190MHz		

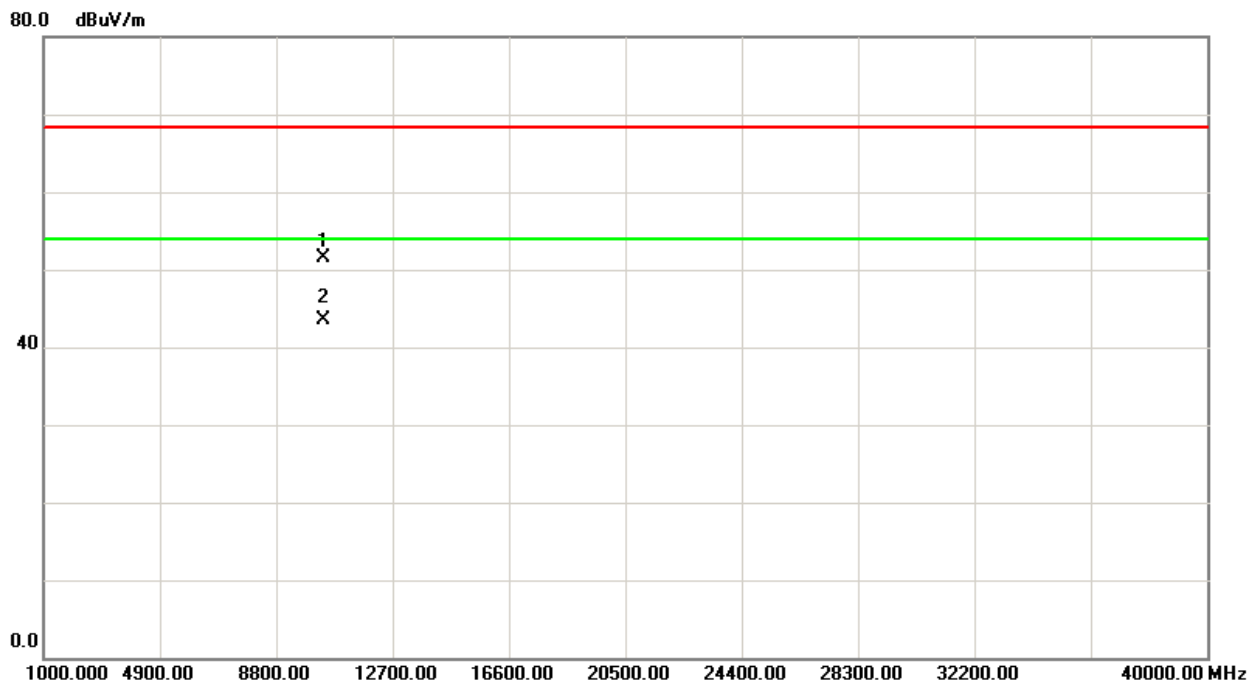
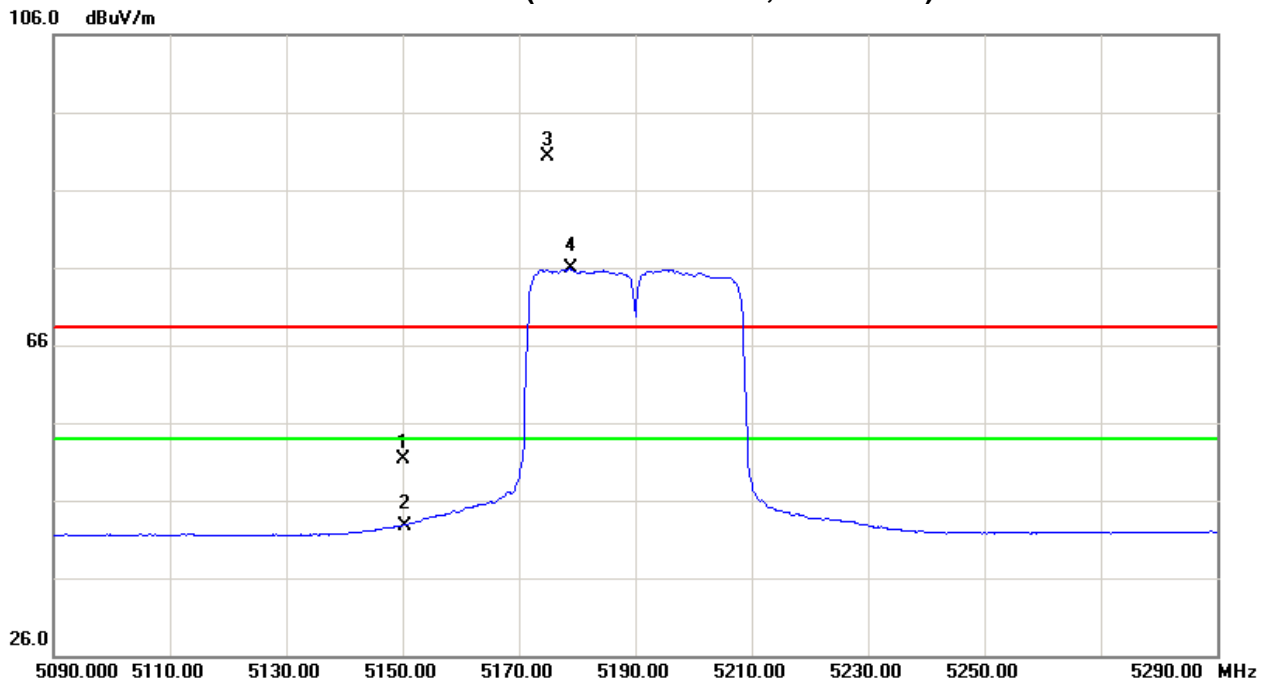
Freq. (MHz)	Ant.Pd. H/V	Reading		Ant./CF CF(dB)	Act.(dBuV/m)		Act.(dBm)		Limit(dBuV/m)		Limit(dBm)		Note
		Peak (dBuV)	AV (dBuV)		Peak	AV	Peak	AV	Peak	AV	Peak	AV	
5150.00	H	8.66	0.08	42.72	51.38	42.80	-53.39	-61.97	68.30	54.00	-27.00	-41.30	X/E
5175.00	H	47.50	33.02	42.78	90.28	75.80	-14.49	-28.97					X/F
10384.20	H	35.52	27.43	15.98	51.50	43.41	-53.27	-61.36	68.30	54.00	-27.00	-41.30	X/H

**Remark:**

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (2) All readings are Peak unless otherwise stated AV in column of 『Note』 . Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency."F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (5) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes:  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.



Orthogonal Axis: X  
Band 1/CH38(Above 1000 MHz, Horizontal)





EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity :	58 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	Band 1/ TX N40 Mode 5230MHz		

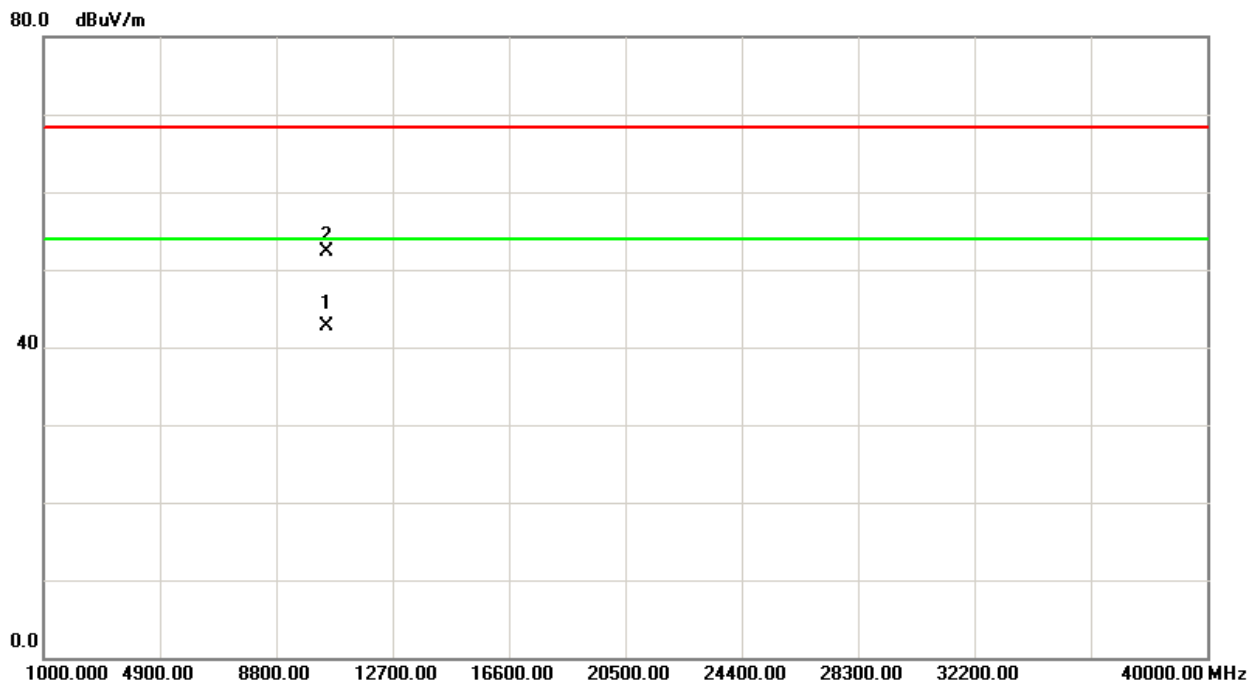
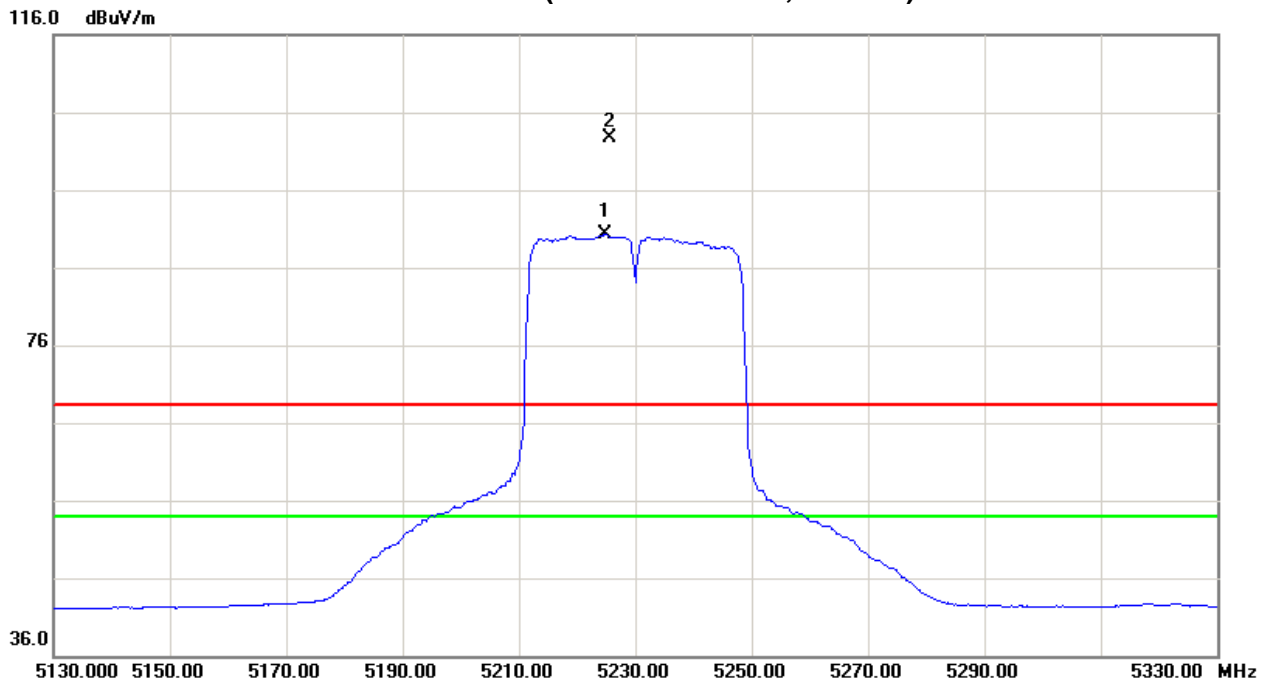
Freq. (MHz)	Ant.Pd. H/V	Reading		Ant./CF CF(dB)	Act.(dBuV/m)		Act.(dBm)		Limit(dBuV/m)		Limit(dBm)		Note
		Peak (dBuV)	AV (dBuV)		Peak	AV	Peak	AV	Peak	AV	Peak	AV	
5225.60	V	59.80	47.32	42.90	102.70	90.22	-2.07	-14.55					X/F
10467.20	V	36.46	26.87	15.88	52.34	42.75	-52.43	-62.02	68.30	54.00	-27.00	-41.30	X/H

**Remark:**

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (2) All readings are Peak unless otherwise stated AV in column of 『Note』 . Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency.“F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (5) Data of measurement within this frequency range shown “ \* ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes:  
“X” - denotes Laid on Table ; ”Y” - denotes Vertical Stand ; ”Z” - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.



Orthogonal Axis:X  
Band 1/CH46(Above 1000 MHz, Vertical)





EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity :	58 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	Band 1/ TX N40 Mode 5230MHz		

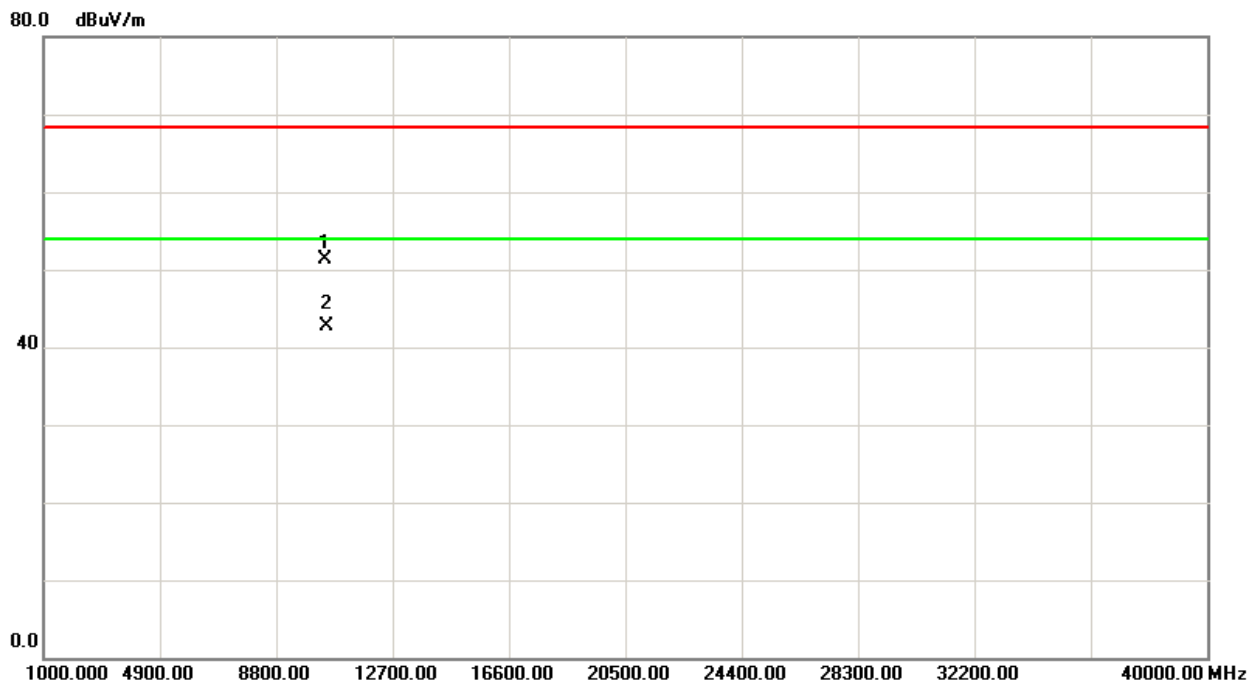
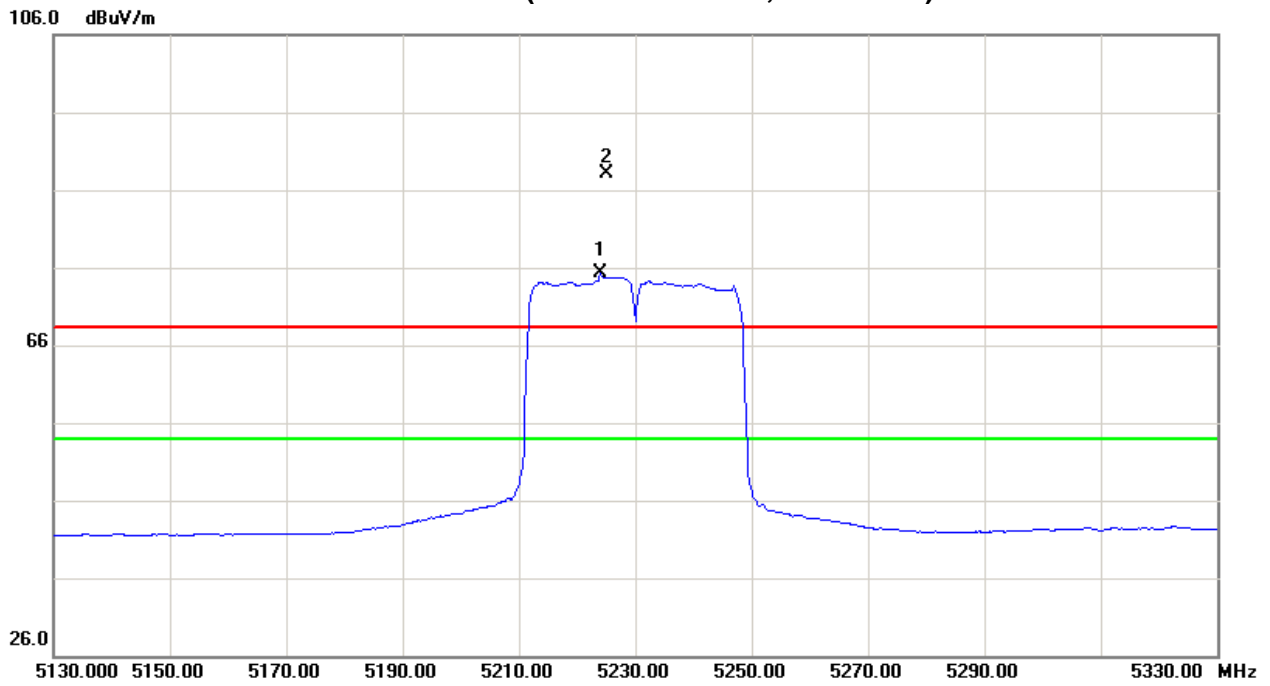
Freq. (MHz)	Ant.Pd. H/V	Reading		Ant./CF CF(dB)	Act.(dBuV/m)		Act.(dBm)		Limit(dBuV/m)		Limit(dBm)		Note
		Peak (dBuV)	AV (dBuV)		Peak	AV	Peak	AV	Peak	AV	Peak	AV	
5225.00	H	45.21	32.34	42.90	88.11	75.24	-16.66	-29.53					X/F
10462.50	H	35.37	26.84	15.88	51.25	42.72	-53.52	-62.05	68.30	54.00	-27.00	-41.30	X/H

**Remark:**

- (1) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (2) All readings are Peak unless otherwise stated AV in column of 『Note』 . Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency.“F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (4) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (5) Data of measurement within this frequency range shown “ \* ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (6) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (7) EUT Orthogonal Axes:  
“X” - denotes Laid on Table ; ”Y” - denotes Vertical Stand ; ”Z” - denotes Side Stand
- (8) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.



Orthogonal Axis:X  
Band 1/CH46(Above 1000 MHz, Horizontal)





**5. 26dB SPECTRUM BANDWIDTH**

**5.1 APPLIED PROCEDURES / LIMIT**

FCC Part15, Subpart E			
Test Item	Limit	Frequency Range (MHz)	Result
26 dB Bandwidth	-----	5150MHz~5250	PASS

**5.1.1 MEASUREMENT INSTRUMENTS LIST**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP_40	100129	Nov.26.2013

Remark: "N/A" denotes no model name, serial no. or calibration specified.  
All calibration period of equipment list is one year.

**5.1.2 TEST PROCEDURE**

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

b.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 26dB Bandwidth
RB	300 kHz
VB	1000 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

c. Measured the spectrum width with power higher than 26dB below carrier

**5.1.3 DEVIATION FROM STANDARD**

No deviation.

**5.1.4 TEST SETUP**



**5.1.5 EUT OPERATION CONDITIONS**

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

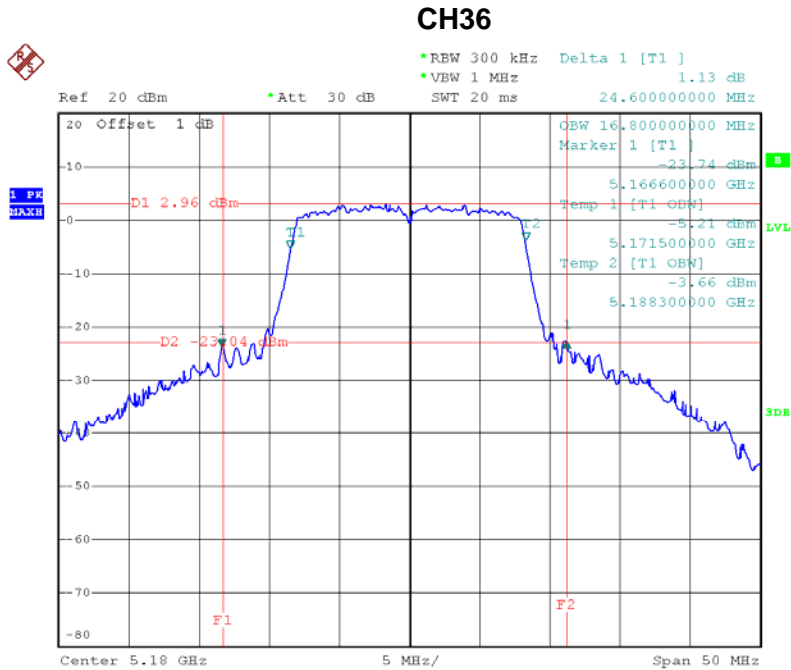




**5.1.6 TEST RESULTS**

EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX A Mode /CH36, CH40, CH48		

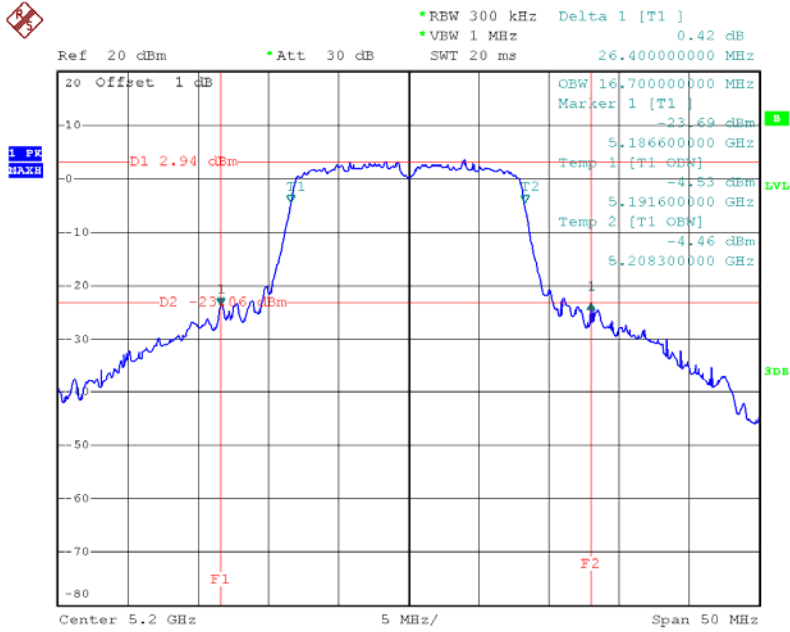
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
CH36	5180	24.60	16.80
CH40	5200	26.40	16.70
CH48	5240	24.60	16.80



Date: 7.NOV.2013 23:51:28

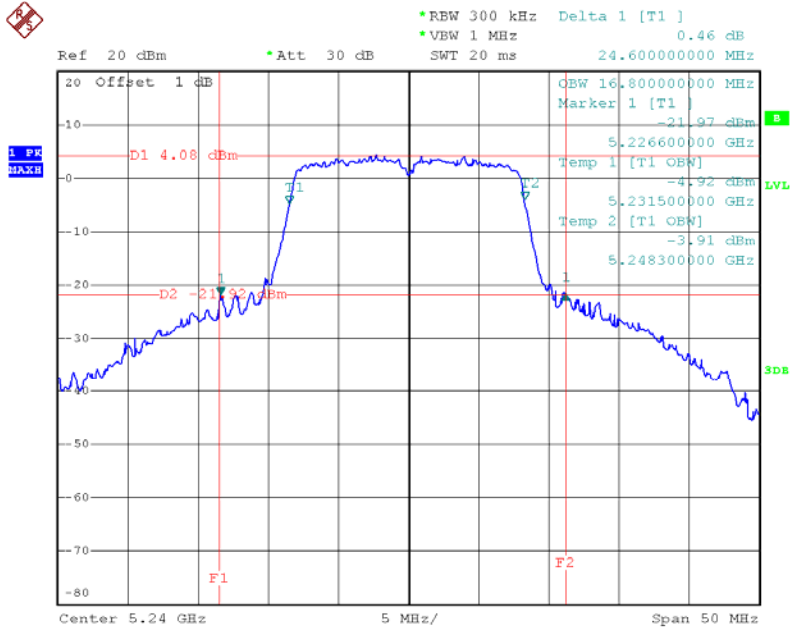


CH40



Date: 7.NOV.2013 23:53:14

CH48



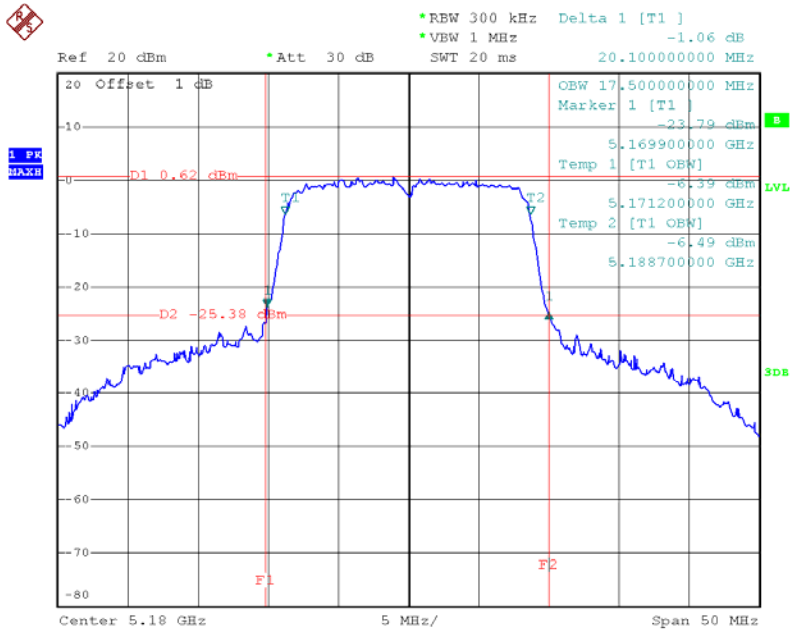
Date: 7.NOV.2013 23:54:17



EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX N20 Mode /CH36, CH40, CH48		

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
CH36	5180	20.10	17.50
CH40	5200	19.90	17.50
CH48	5240	20.10	17.50

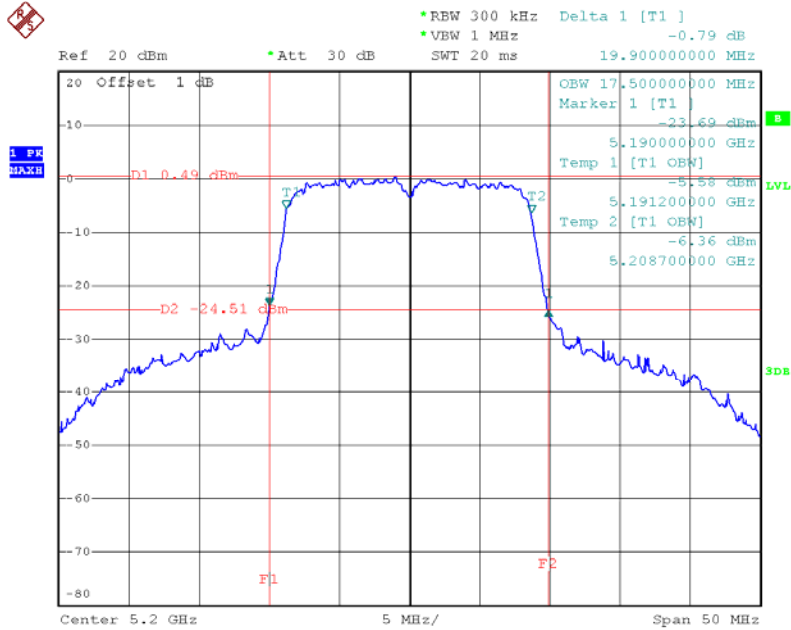
**CH36**



Date: 8.NOV.2013 00:15:14

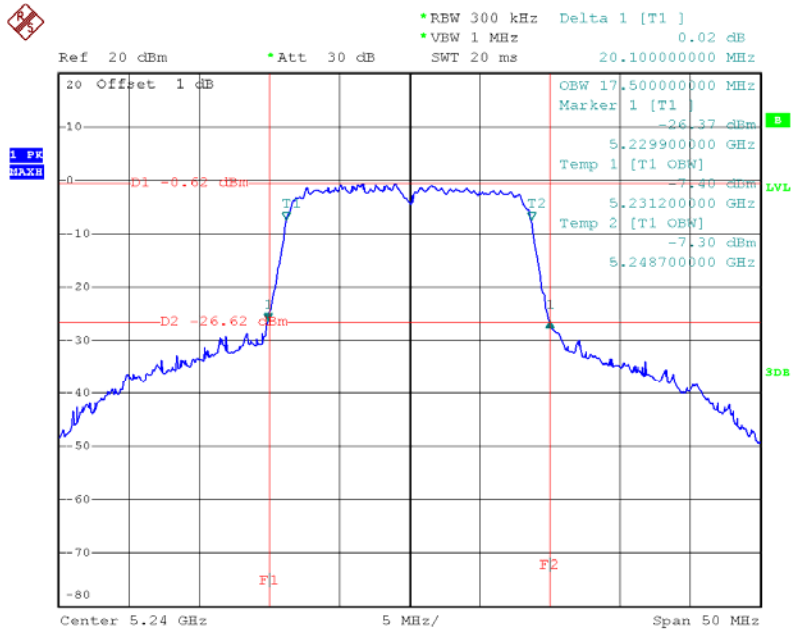


CH40



Date: 8.NOV.2013 00:13:47

CH48

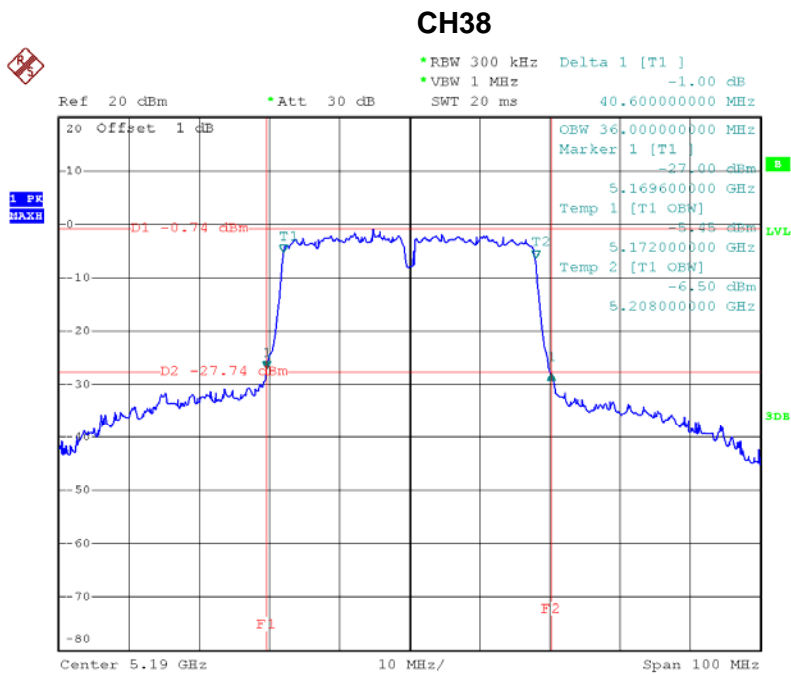


Date: 8.NOV.2013 00:16:28



EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX N40 Mode /CH38, CH46		

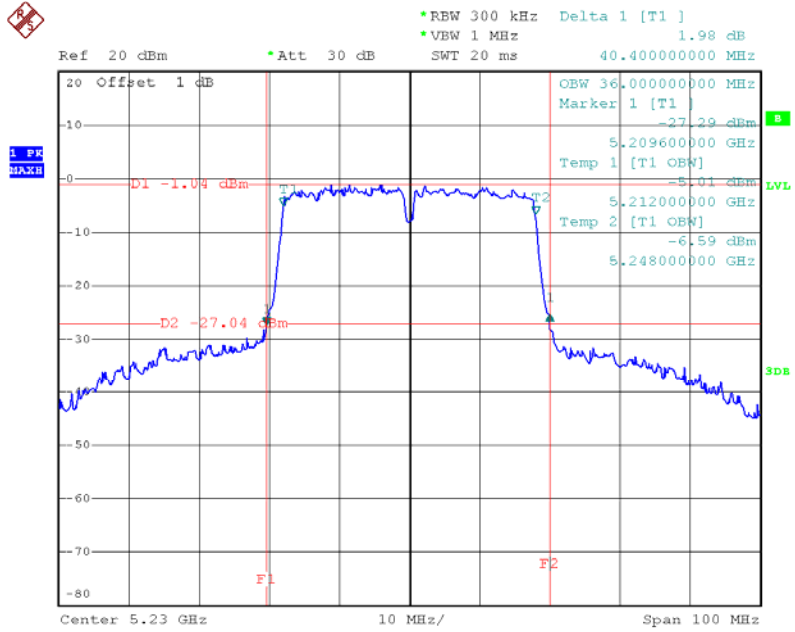
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
CH38	5190	40.60	36.00
CH46	5230	40.40	36.00



Date: 8.NOV.2013 00:29:51



### CH46



Date: 8.NOV.2013 00:28:19



**6. MAXIMUM CONDUCTED OUTPUT POWER**

**6.1 APPLIED PROCEDURES / LIMIT**

FCC Part15, Subpart E			
Test Item	Frequency Range (MHz)	Limit	Result
Conducted Output Power	5150 - 5250	not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log B,	PASS

**Note:** where “B” is the 26 dB emissions bandwidth in MHz.

**6.1.1 MEASUREMENT INSTRUMENTS LIST**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP_40	100129	Nov.26.2013

Remark: “N/A” denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.

**6.1.2 TEST PROCEDURE**

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RBW	= 1 MHz.
VBW	≥ 3 MHz.
Detector	RMS
Trace	Max Hold
Sweep Time	auto

- b. Test was performed in accordance with method of KDB 789033 D01.



**6.1.3 DEVIATION FROM STANDARD**

No deviation.

**6.1.4 TEST SETUP**



**6.1.5 EUT OPERATION CONDITIONS**

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

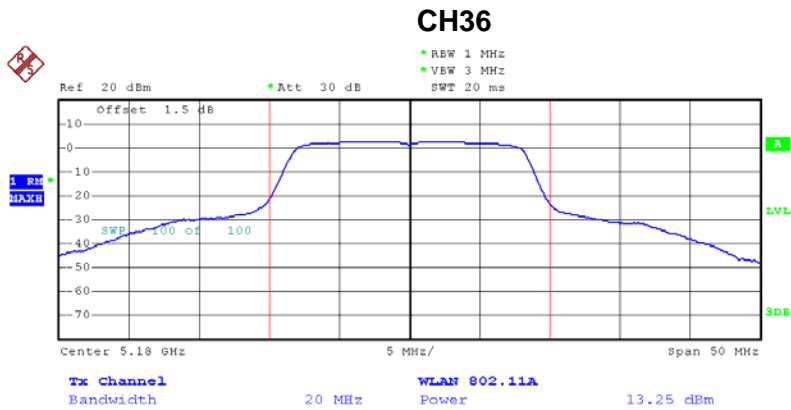




**6.1.6 TEST RESULTS**

EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX A Mode/CH36, CH40, CH48		

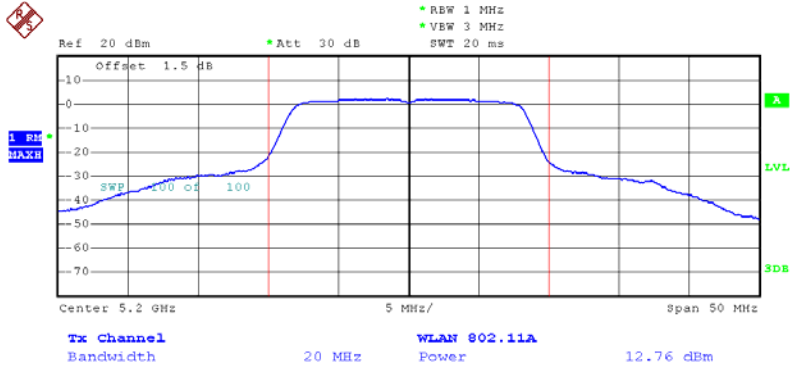
Test Channel	Frequency (MHz)	Conducted Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH36	5180	13.25	17.00	0.0501
CH40	5200	12.76	17.00	0.0501
CH48	5240	13.09	17.00	0.0501



Date: 12.OCT.2013 10:14:01

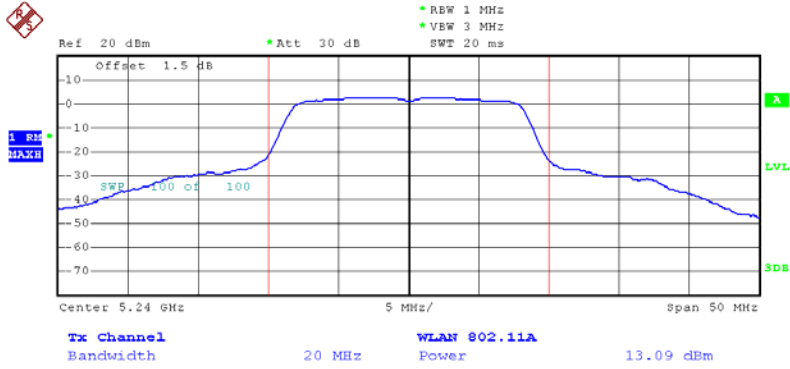


### CH40



Date: 12.OCT.2013 10:16:03

### CH48

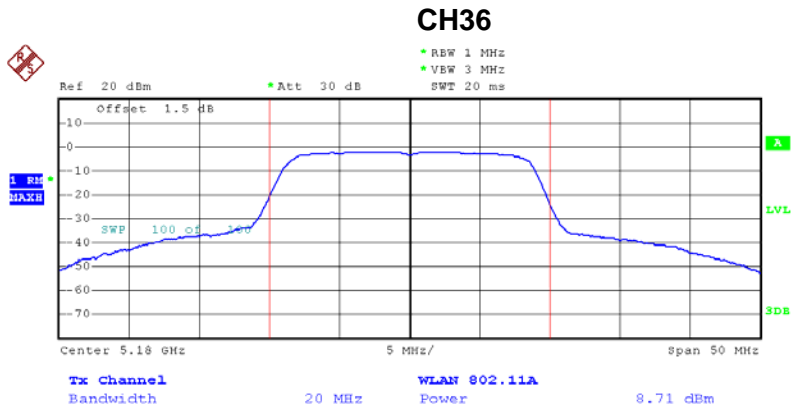


Date: 12.OCT.2013 10:15:21



EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX N20 Mode/CH36, CH40, CH48 / ANT 0		

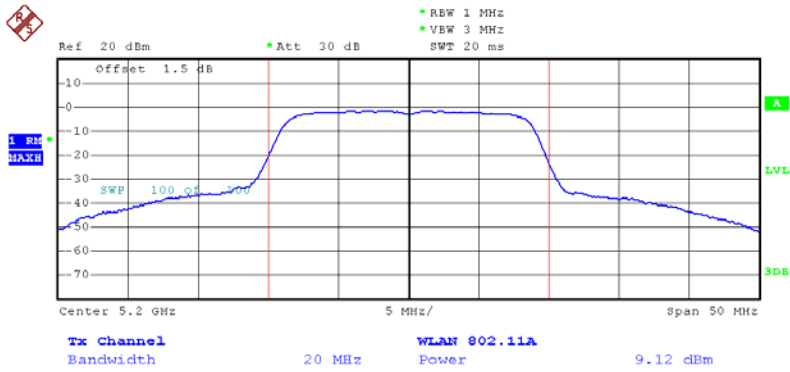
Test Channel	Frequency (MHz)	Conducted Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH36	5180	8.71	17.00	0.0501
CH40	5200	9.12	17.00	0.0501
CH48	5240	9.06	17.00	0.0501



Date: 12.OCT.2013 10:25:33

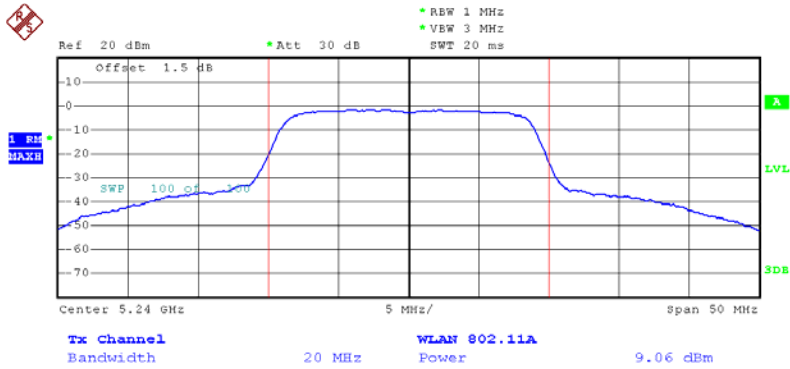


### CH40



Date: 12.OCT.2013 10:24:08

### CH48

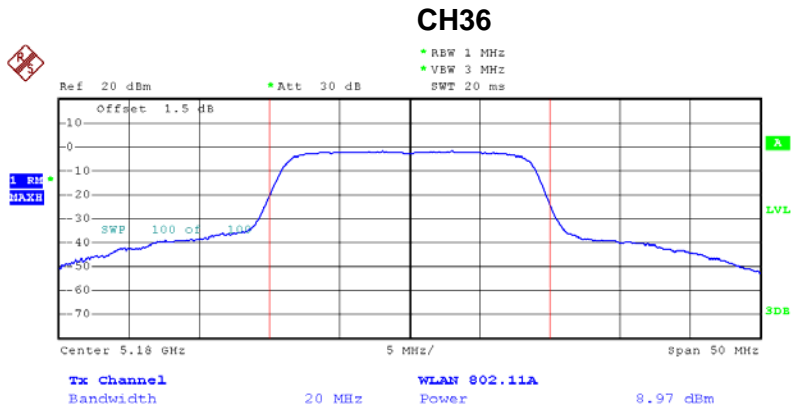


Date: 12.OCT.2013 10:23:02



EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX N20 Mode/CH36, CH40, CH48 / ANT 1		

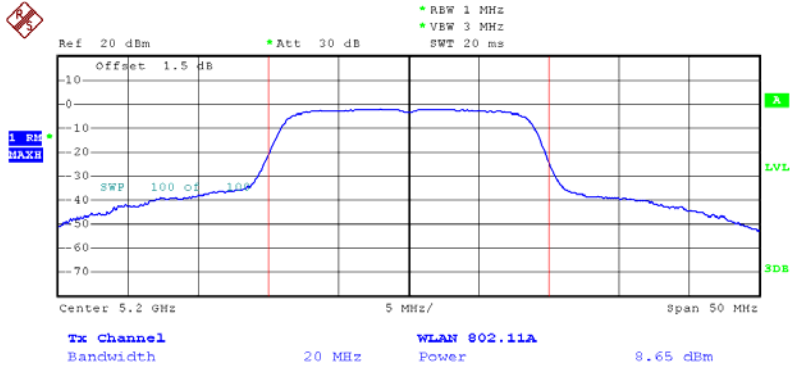
Test Channel	Frequency (MHz)	Conducted Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH36	5180	8.97	17.00	0.0501
CH40	5200	8.65	17.00	0.0501
CH48	5240	8.74	17.00	0.0501



Date: 12.OCT.2013 10:17:48

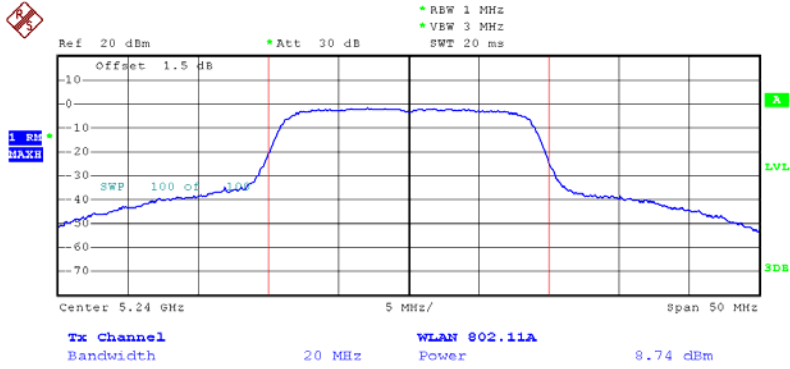


### CH40



Date: 12.OCT.2013 10:19:07

### CH48



Date: 12.OCT.2013 10:20:15



**Neutron Engineering Inc.**

EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 ° C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX N20 Mode/CH36, CH40, CH48 / ANT 0+ANT 1		

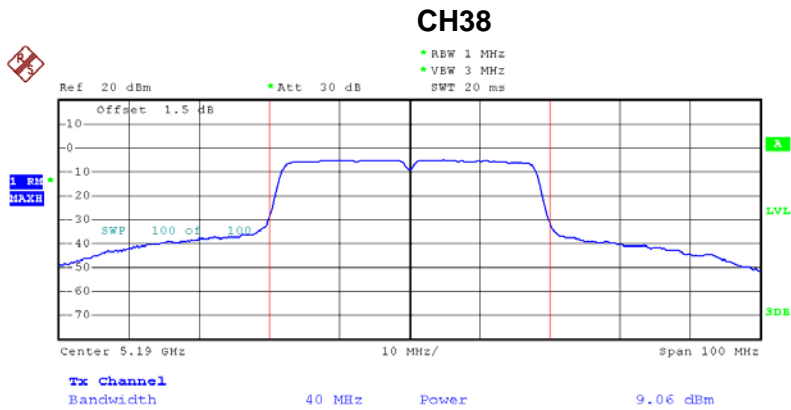
Test Channel	Frequency (MHz)	Conducted Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH36	5180	11.85	17.00	0.0501
CH40	5200	11.90	17.00	0.0501
CH48	5240	11.91	17.00	0.0501

Note: The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers (2T2R). all transmit signals are completely uncorrelated, then, **Direction gain =  $G_{ANT}$** , that is Directional gain=5.2dBi.



EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX N40 Mode/CH38, CH46 / ANT 0		

Test Channel	Frequency (MHz)	Conducted Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH38	5190	9.06	17.00	0.0501
CH46	5230	8.72	17.00	0.0501

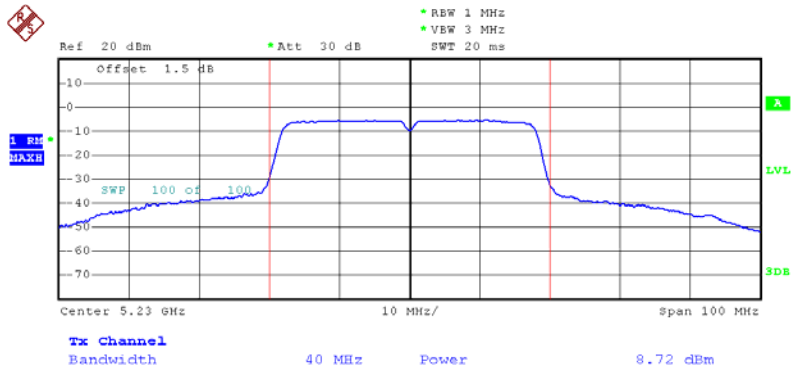


Date: 12.OCT.2013 10:27:26





### CH46

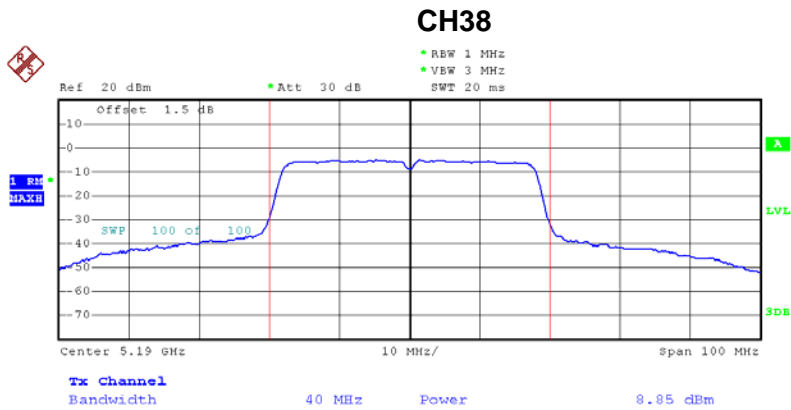


Date: 12.OCT.2013 10:28:59



EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX N40 Mode/CH38, CH46 / ANT 1		

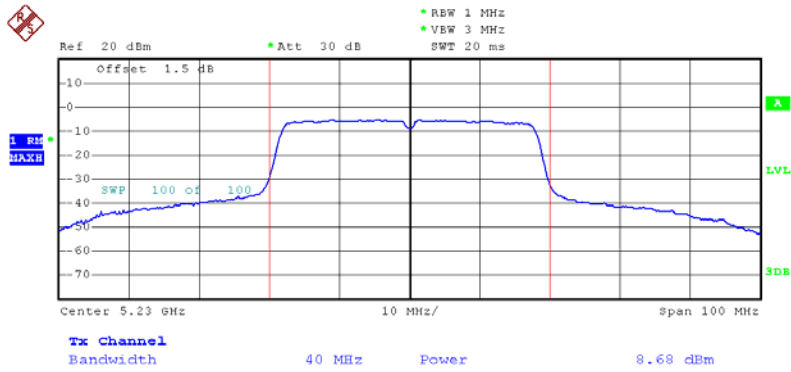
Test Channel	Frequency (MHz)	Conducted Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH38	5190	8.85	17.00	0.0501
CH46	5230	8.68	17.00	0.0501



Date: 12.OCT.2013 10:35:03



### CH46



Date: 12.OCT.2013 10:33:29



EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 ° C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX N40 Mode/CH38, CH46 / ANT 0+ANT 1		

Test Channel	Frequency (MHz)	Conducted Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH38	5190	11.97	17.00	0.0501
CH46	5230	11.71	17.00	0.0501

Note: The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers (2T2R). all transmit signals are completely uncorrelated, then, **Direction gain =  $G_{ANT}$** , that is Directional gain=5.2dBi.



**7. ANTENNA CONDUCTED SPURIOUS EMISSION**

**7.1 APPLIED PROCEDURES / LIMIT**

FCC Part15, Subpart E			
Test Item	Limit	Frequency Range (MHz)	Result
Antenna conducted Spurious Emission	-27 dBm/1MHz	5150 – 5250	PASS

**7.1.1 MEASUREMENT INSTRUMENTS LIST**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP_40	100129	Nov.26.2013

Remark: "N/A" denotes no model name, serial no. or calibration specified.  
All calibration period of equipment list is one year.

**7.1.2 TEST PROCEDURE**

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

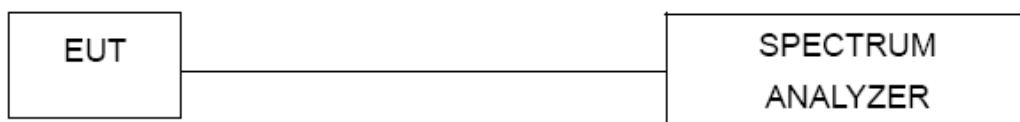
b.

Spectrum Parameter	Setting
Attenuation	Auto
RB	1000 kHz
VB	1000 kHz
Trace	Max Hold
Sweep Time	Auto

**7.1.3 DEVIATION FROM STANDARD**

No deviation.

**7.1.4 TEST SETUP**



**7.1.5 EUT OPERATION CONDITIONS**

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



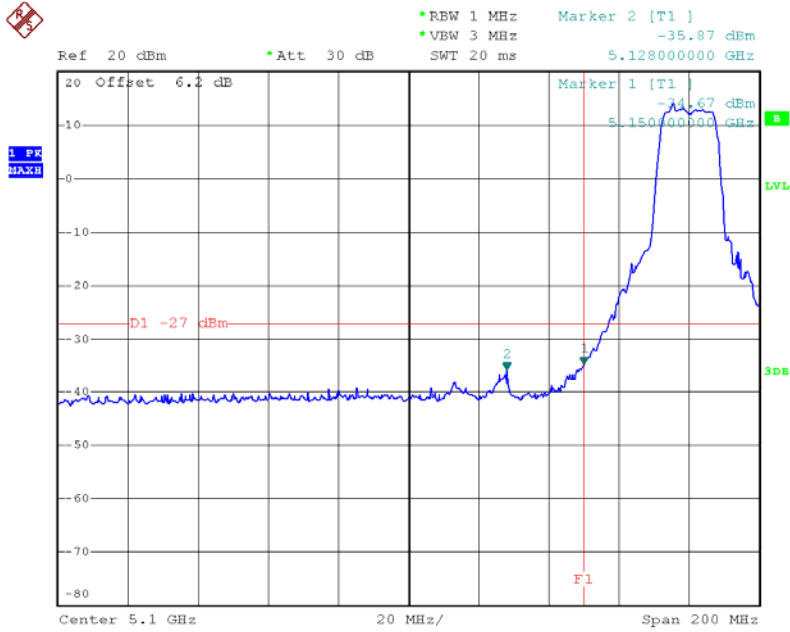
**7.1.6 TEST RESULTS**

EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX A Mode/ CH36, CH40, CH48		

Channel of Worst Data: CH36			
The max. radio frequency power in any 1000kHz bandwidth outside the frequency band		The max. radio frequency power in any 1000kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
5150.00	-34.67	5372.40	-40.54
Limit: -27 dBm/1MHz		Result:PASS	
Measurement method: S.A Read value+Ant gain+cable loss			

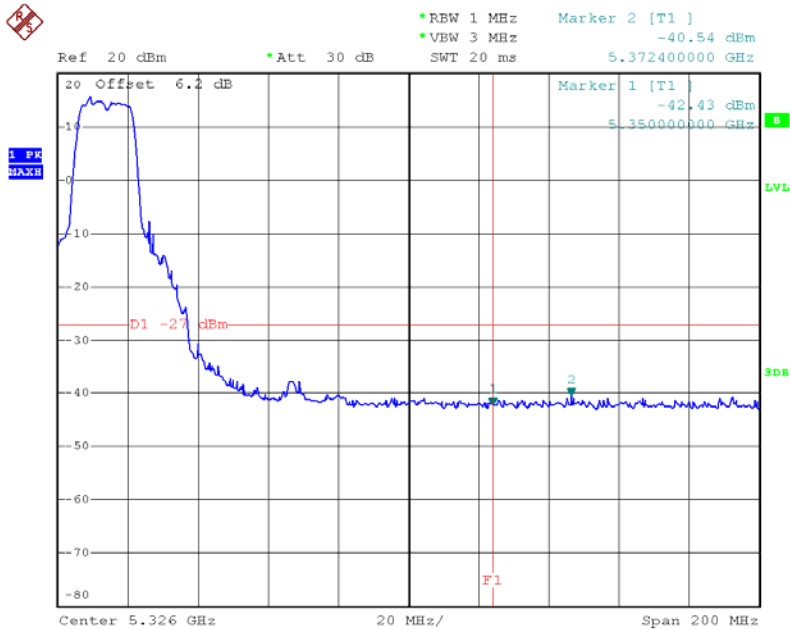


### TX mode CH36



Date: 8.NOV.2013 00:02:11

### TX mode CH48



Date: 7.NOV.2013 23:59:58



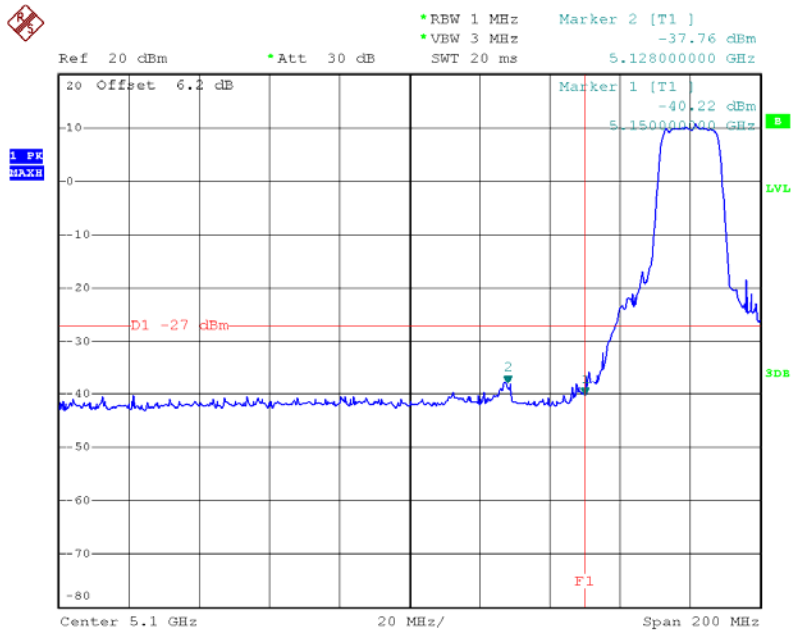
EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 ° C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX N20 Mode/ CH36, CH40 , CH48/ANT 0		

Channel of Worst Data: CH36			
The max. radio frequency power in any 1000kHz bandwidth outside the frequency band		The max. radio frequency power in any 1000kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
5128.00	-37.76	5370.40	-41.28
Limit: -27 dBm/1MHz		Result:PASS	
Measurement method: S.A Read value+Ant gain+cable loss			



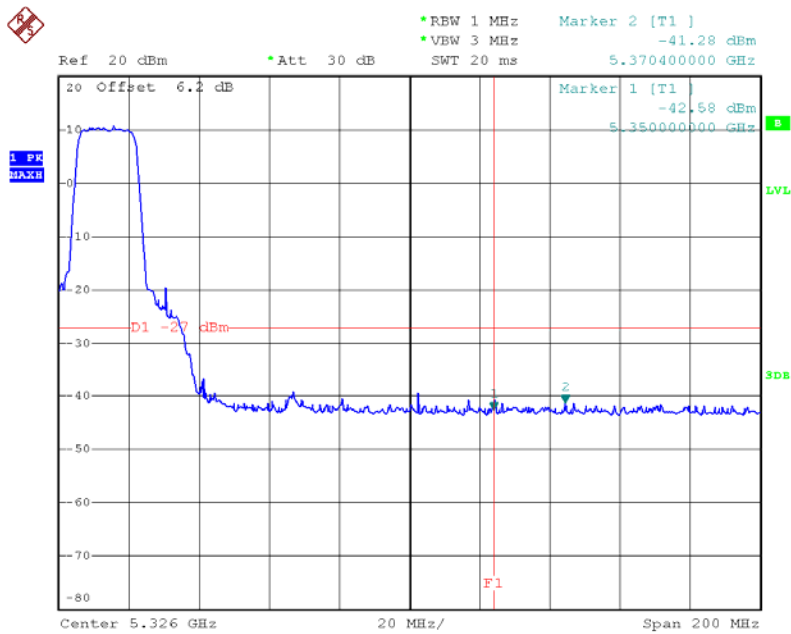


### TX mode CH36



Date: 8.NOV.2013 00:09:31

### TX mode CH48



Date: 8.NOV.2013 00:07:35

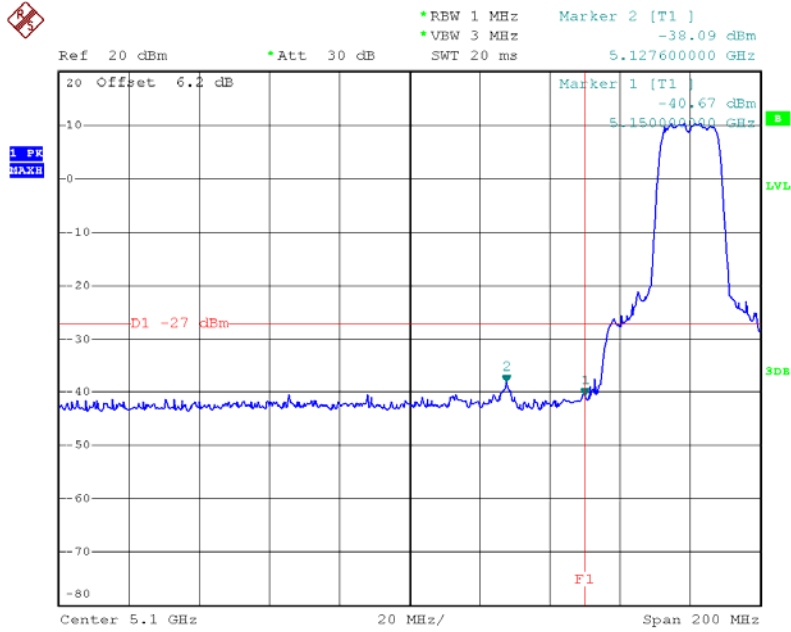


EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 ° C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX N20 Mode/ CH36, CH40 , CH48/ANT 1		

Channel of Worst Data: CH36			
The max. radio frequency power in any 1000kHz bandwidth outside the frequency band		The max. radio frequency power in any 1000kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
5127.60	-38.09	5364.40	-41.40
Limit: -27 dBm/1MHz		Result:PASS	
Measurement method: S.A Read value+Ant gain+cable loss			

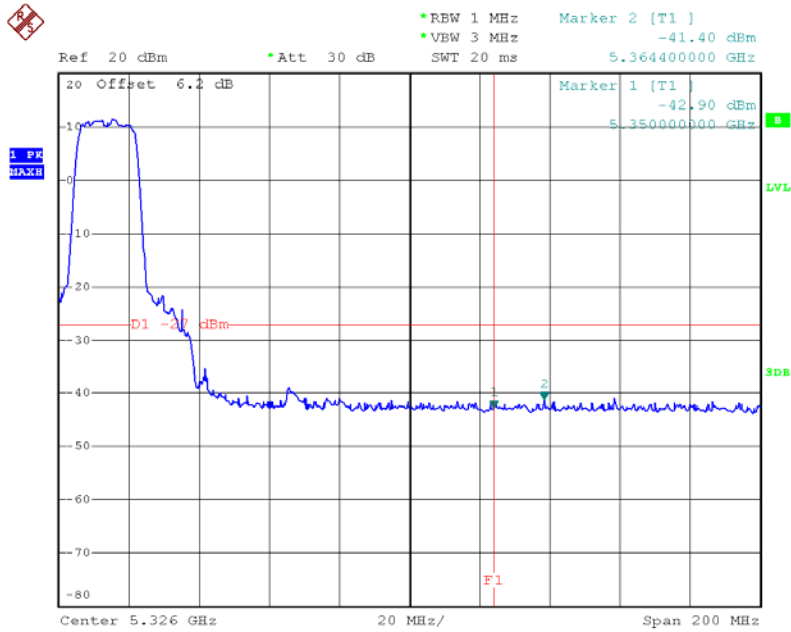


### TX mode CH36



Date: 8.NOV.2013 00:04:32

### TX mode CH48



Date: 8.NOV.2013 00:06:18

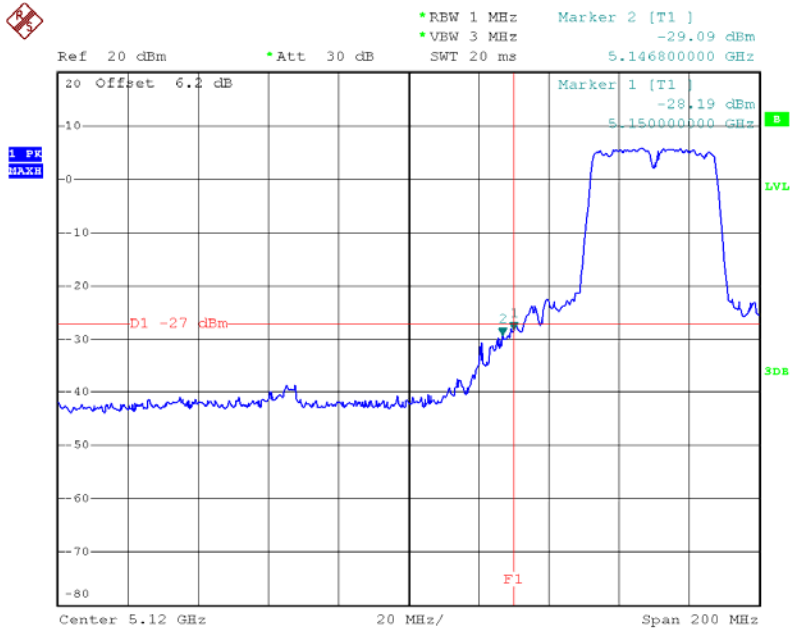


EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 ° C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX N40 Mode/ CH38, CH46/ANT 0		

Channel of Worst Data: CH38			
The max. radio frequency power in any 1000kHz bandwidth outside the frequency band		The max. radio frequency power in any 1000kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
5150.00	-28.19	5368.40	-41.37
Limit: -27 dBm/1MHz		Result:PASS	
Measurement method: S.A Read value+Ant gain+cable loss			

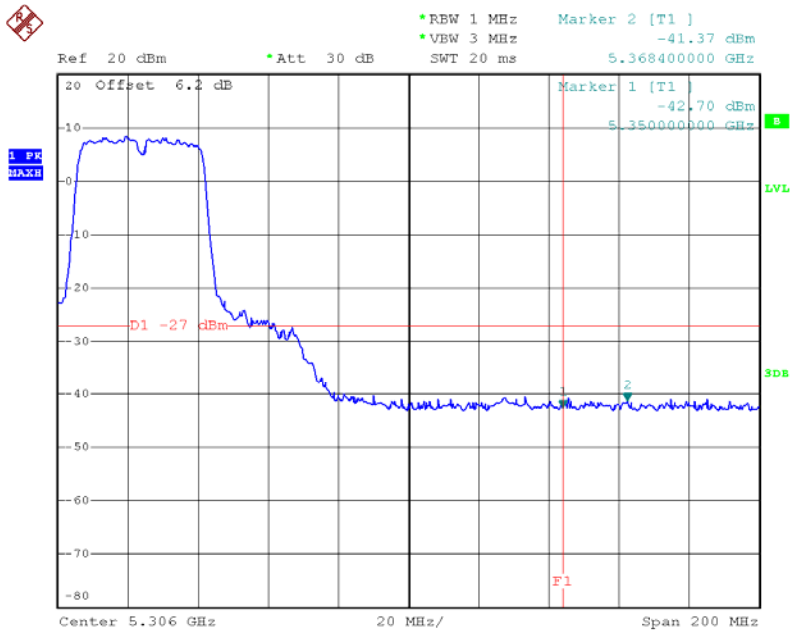


### TX mode CH38



Date: 8.NOV.2013 00:33:34

### TX mode CH46



Date: 8.NOV.2013 00:38:06

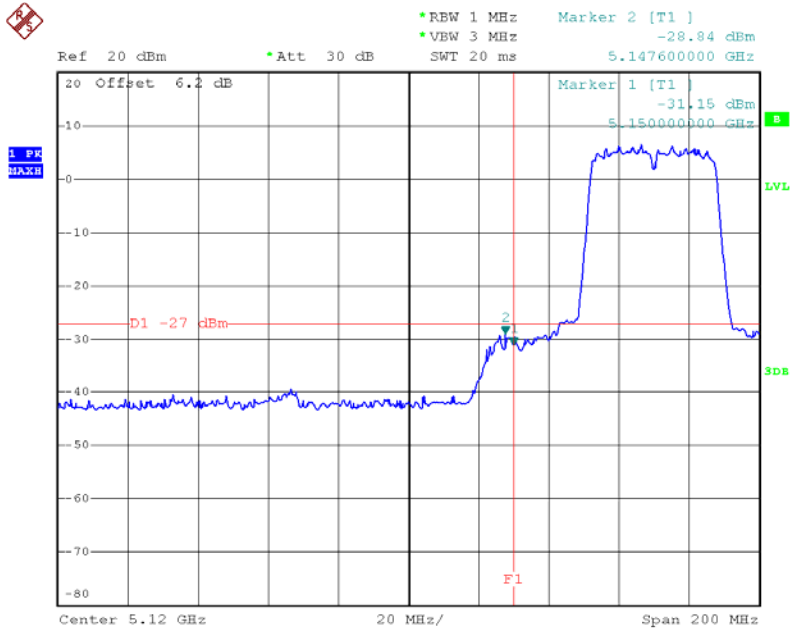


EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 ° C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX N40 Mode/ CH38, CH46/ANT 1		

Channel of Worst Data: CH38			
The max. radio frequency power in any 1000kHz bandwidth outside the frequency band		The max. radio frequency power in any 1000kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
5147.60	-28.84	5374.00	-41.54
Limit: -27 dBm/1MHz		Result:PASS	
Measurement method: S.A Read value+Ant gain+cable loss			

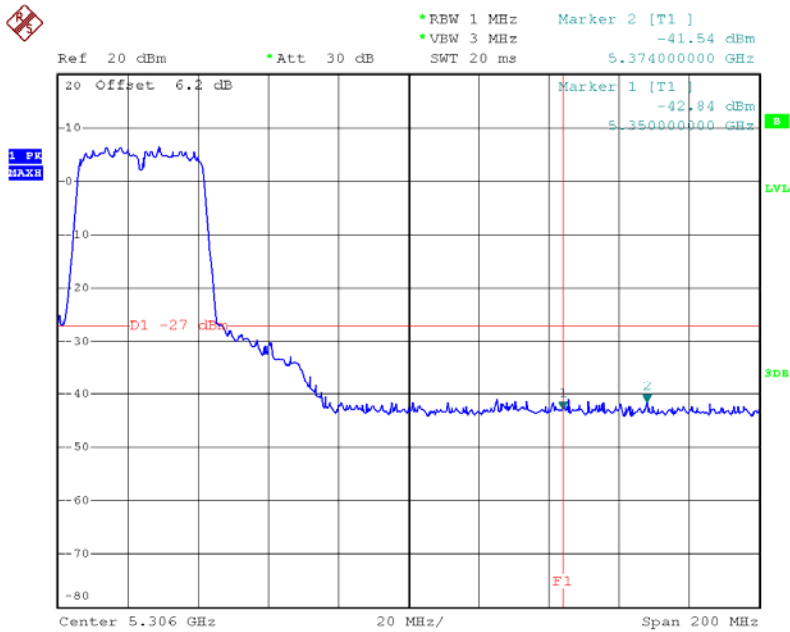


### TX mode CH38



Date: 8.NOV.2013 00:44:07

### TX mode CH46



Date: 8.NOV.2013 00:41:06



**8. POWER SPECTRAL DENSITY TEST**

**8.1 APPLIED PROCEDURES / LIMIT**

FCC Part15, Subpart E			
Test Item	Limit	Frequency Range (MHz)	Result
Power Spectral Density	4 dBm	5150 - 5250	PASS

**8.1.1 MEASUREMENT INSTRUMENTS LIST**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP_40	100129	Nov.26.2013

Remark: "N/A" denotes no model name, serial no. or calibration specified.

**8.1.2 TEST PROCEDURE**

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

b.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	= 1 MHz.
VB	≥ 3 MHz.
Detector	RMS
Trace	Max Hold
Sweep Time	Auto

**8.1.3 DEVIATION FROM STANDARD**

No deviation.

**8.1.4 TEST SETUP**



**8.1.5 EUT OPERATION CONDITIONS**

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

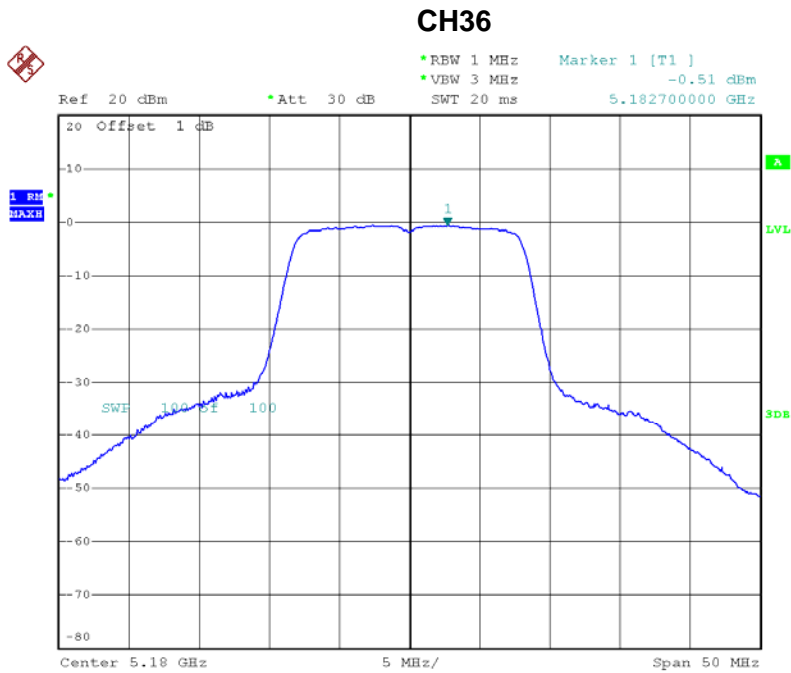




**8.1.6 TEST RESULTS**

EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX A Mode/CH36, CH40, CH48		

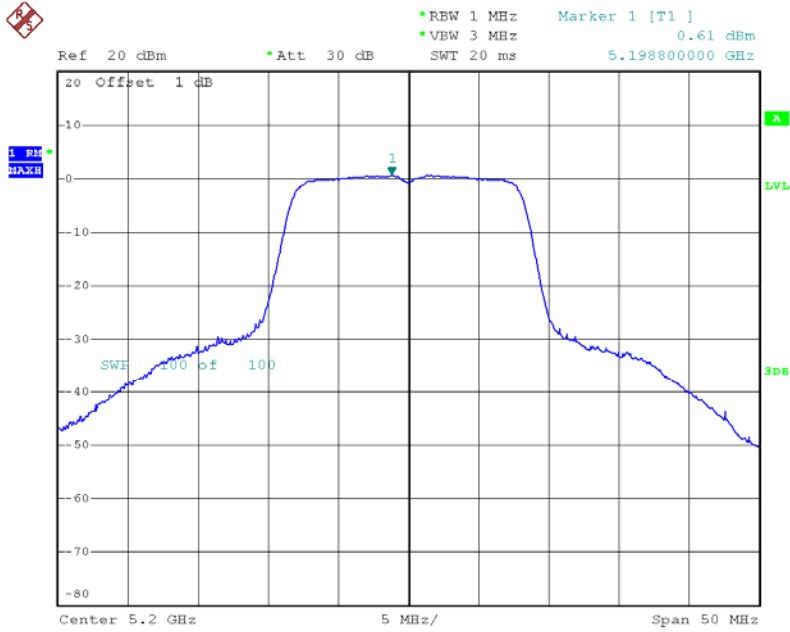
Test Channel	Frequency (MHz)	Power Density (dBm)	LIMIT (dBm)
CH36	5180	-0.51	4.00
CH40	5200	0.61	4.00
CH48	5240	1.39	4.00



Date: 7.NOV.2013 23:52:21

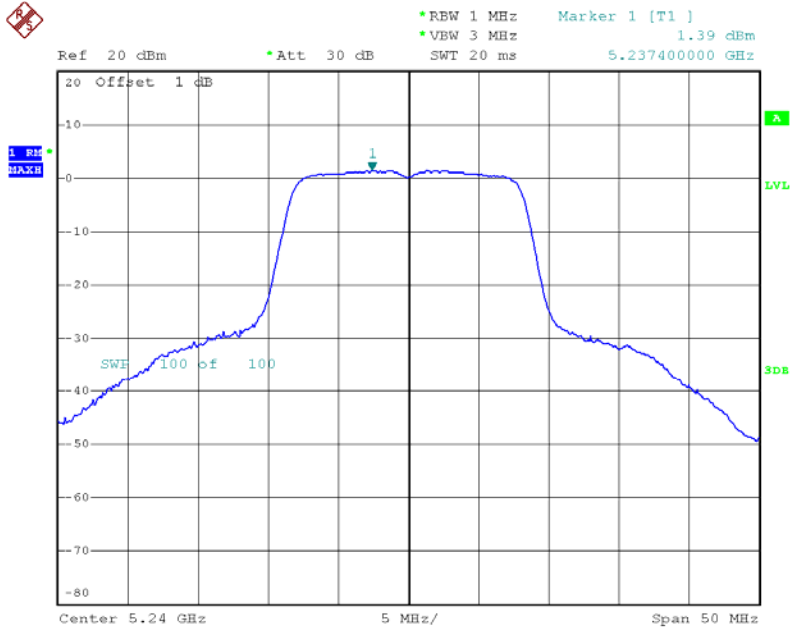


### CH40



Date: 7.NOV.2013 23:53:26

### CH48

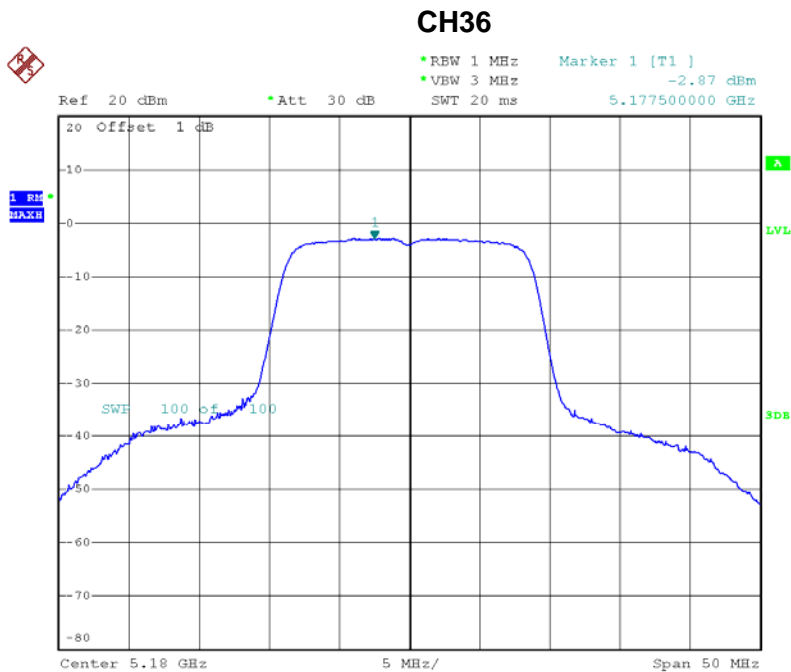


Date: 7.NOV.2013 23:54:28



EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX N20 Mode/CH36, CH40, CH48/ ANT 0		

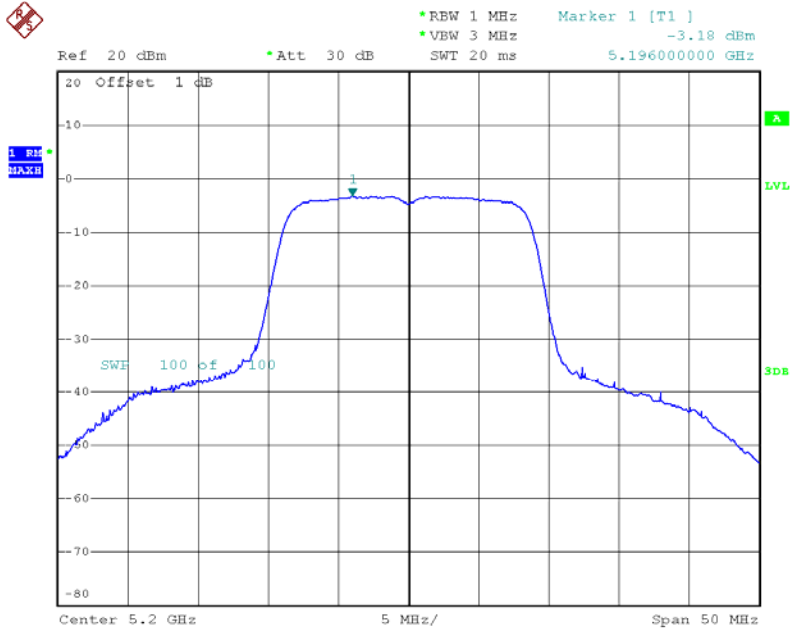
Test Channel	Frequency (MHz)	Power Density (dBm)	LIMIT (dBm)
CH36	5180	-2.87	4.00
CH40	5200	-3.18	4.00
CH48	5240	-4.00	4.00



Date: 8.NOV.2013 00:12:31

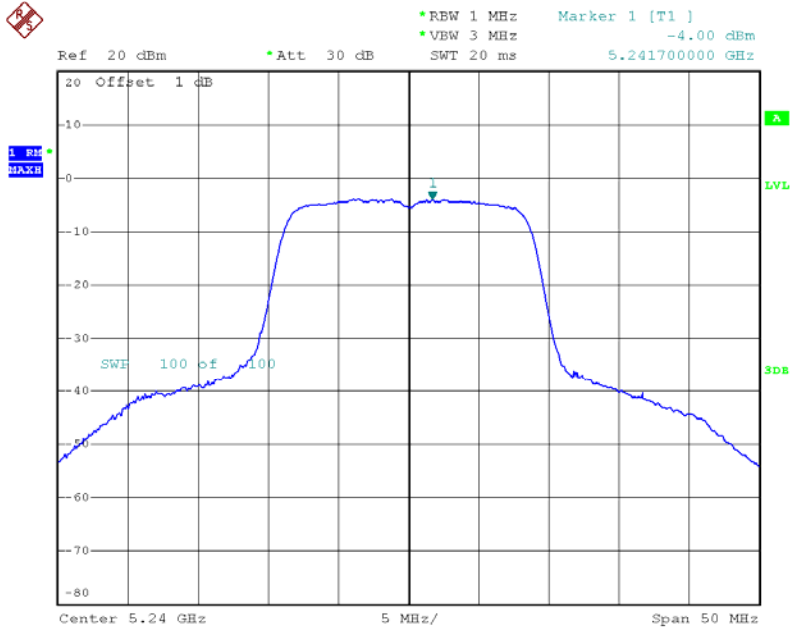


### CH40



Date: 8.NOV.2013 00:13:59

### CH48

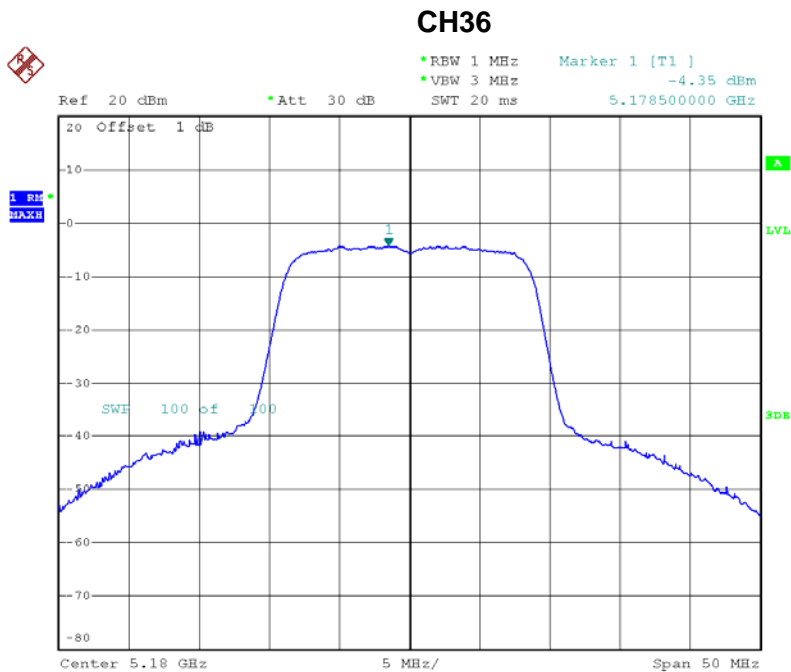


Date: 8.NOV.2013 00:16:41



EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX N20 Mode/CH36, CH40, CH48/ ANT 1		

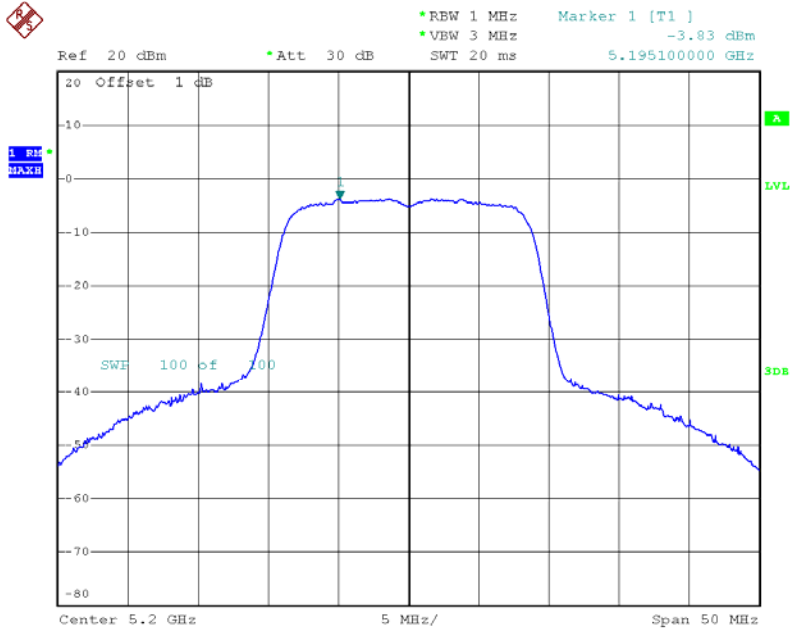
Test Channel	Frequency (MHz)	Power Density (dBm)	LIMIT (dBm)
CH36	5180	-4.35	4.00
CH40	5200	-3.83	4.00
CH48	5240	-3.92	4.00



Date: 8.NOV.2013 00:20:50

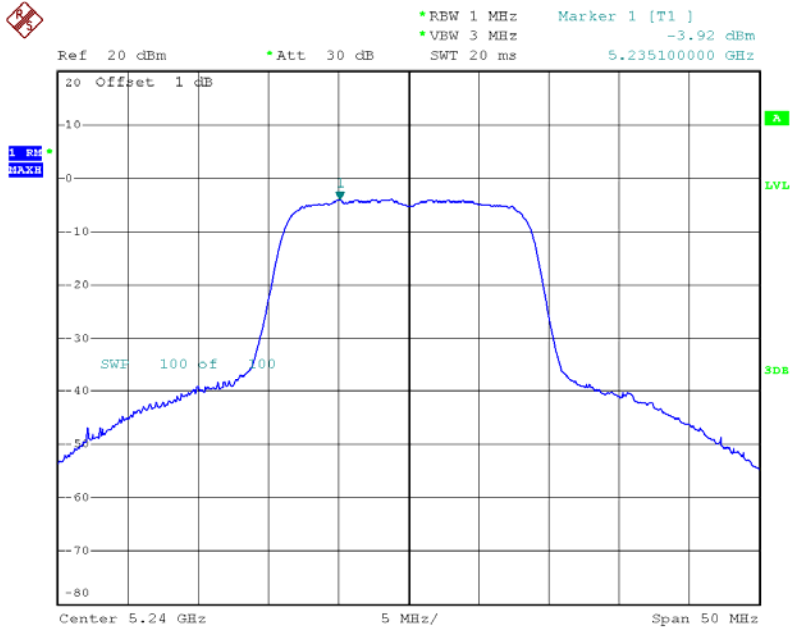


### CH40



Date: 8.NOV.2013 00:19:42

### CH48



Date: 8.NOV.2013 00:18:16



EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 ° C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX N20 Mode/CH36, CH40, CH48/ ANT 0+ANT 1		

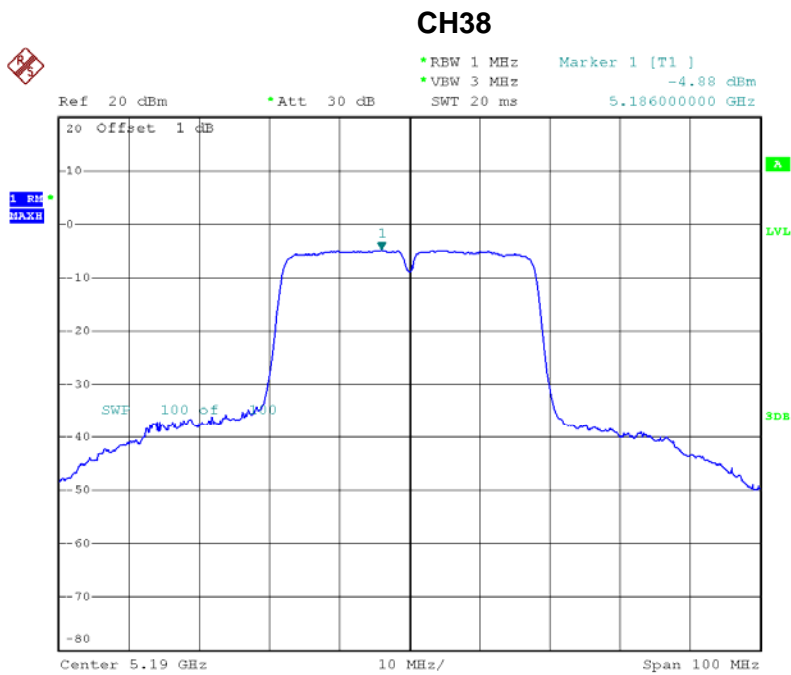
Test Channel	Frequency (MHz)	Power Density (dBm)	LIMIT (dBm)
CH36	5180	-0.54	4.00
CH40	5200	-0.48	4.00
CH48	5240	-0.95	4.00

Note: The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers (2T2R). all transmit signals are completely uncorrelated, then, **Direction gain =  $G_{ANT}$** , that is Directional gain=5.2dBi.



EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX N40 Mode/CH38, CH46/ ANT 0		

Test Channel	Frequency (MHz)	Power Density (dBm)	LIMIT (dBm)
CH38	5190	-4.88	4.00
CH46	5230	-4.87	4.00

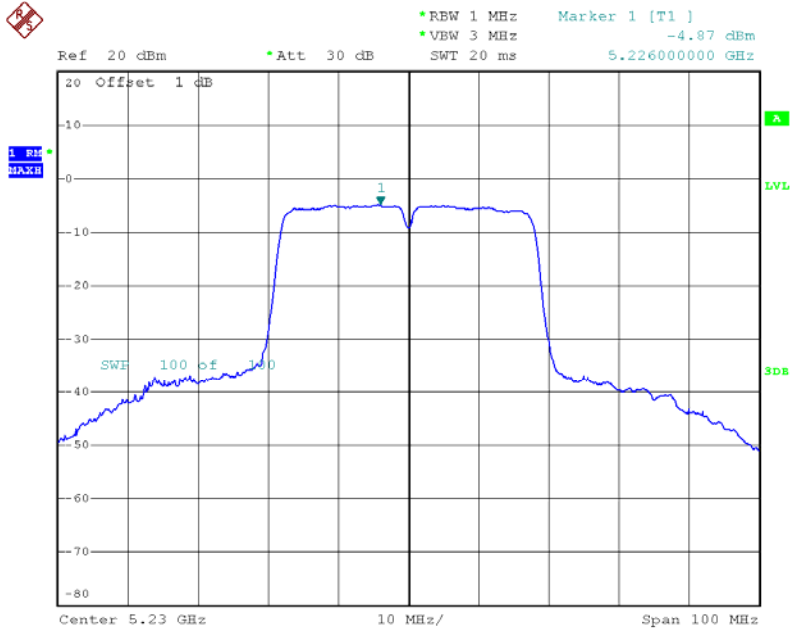


Date: 8.NOV.2013 00:30:03





### CH46

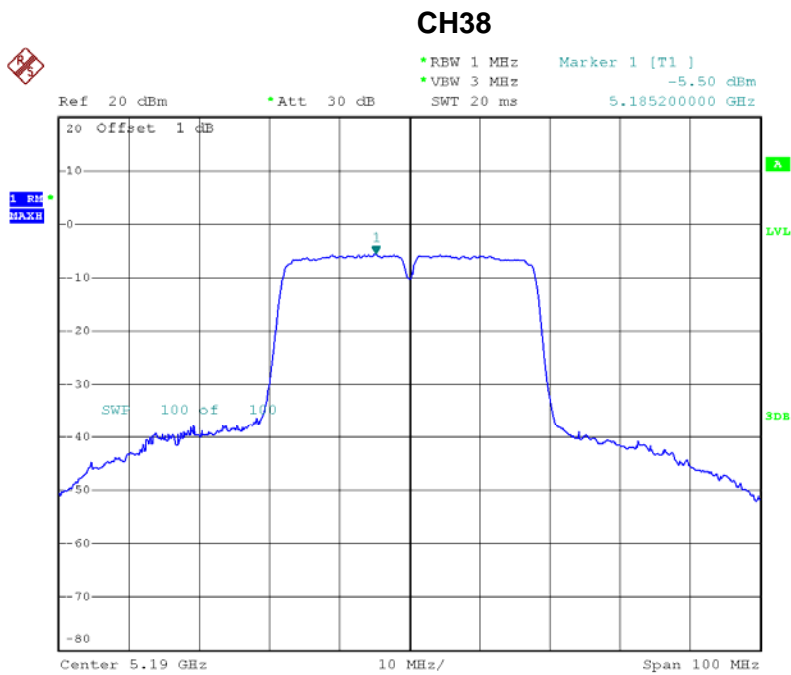


Date: 8.NOV.2013 00:28:31



EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX N40 Mode/CH38, CH46/ ANT 1		

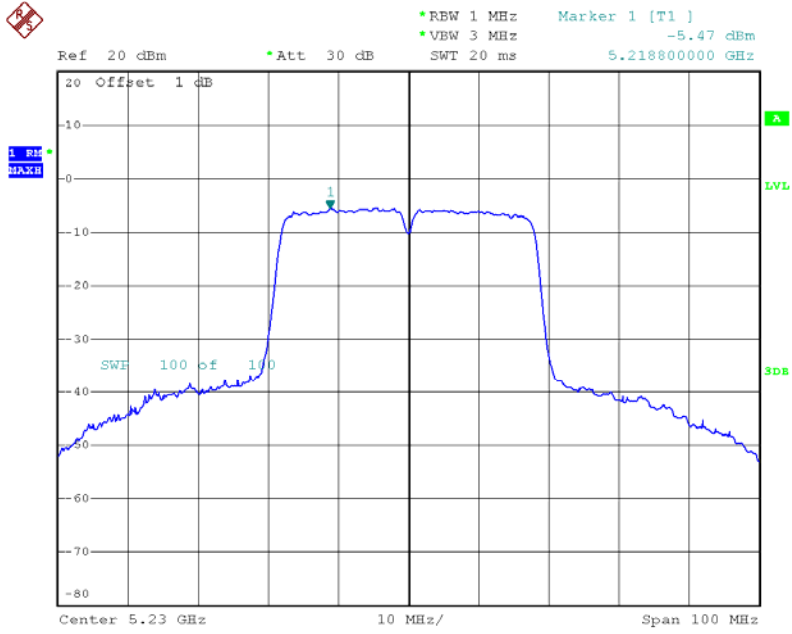
Test Channel	Frequency (MHz)	Power Density (dBm)	LIMIT (dBm)
CH38	5190	-5.50	4.00
CH46	5230	-5.47	4.00



Date: 8.NOV.2013 00:23:43



CH46



Date: 8.NOV.2013 00:27:22



EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 ° C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX N40 Mode/CH38, CH46/ ANT 0+ANT 1		

Test Channel	Frequency (MHz)	Power Density (dBm)	LIMIT (dBm)
CH38	5190	-2.17	4.00
CH46	5230	-2.15	4.00

Note: The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers (2T2R). all transmit signals are completely uncorrelated, then, **Direction gain =  $G_{ANT}$** , that is Directional gain=5.2dBi.



**9. PEAK EXCURSION MEASUREMENT**

**9.1 APPLIED PROCEDURES / LIMIT**

FCC Part15, Subpart E			
Test Item	Limit	Frequency Range (MHz)	Result
Peak Excursion Measurement	13 dB	5150 - 5250	PASS

**9.1.1 MEASUREMENT INSTRUMENTS LIST**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP_40	100129	Nov.26.2013

Remark: "N/A" denotes no model name, serial no. or calibration specified.  
 All calibration period of equipment list is one year.

**9.1.2 TEST PROCEDURE**

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

b.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	1000 kHz (Peak Trace) / 1000 kHz (Average Trace)
VB	3000 kHz (Peak Trace) / 3000 kHz (Average Trace)
Detector	Peak (Peak Trace) / RMS (Average Trace)
Trace	Max Hold
Sweep Time	60s

c. Peak Trace: Set RBW = 1 MHz, VBW ≥ 3 MHz with peak detector and maxhold settings.

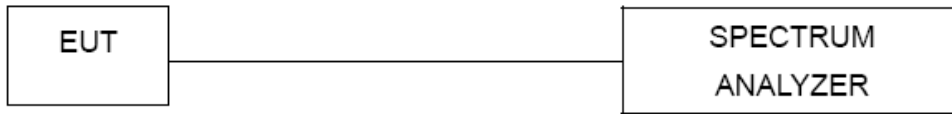
d. Average Trace: set RBW = 1 MHz, VBW = 3 MHz with RMS detector and trace average across 100 traces in power averaging mode.

**9.1.3 DEVIATION FROM STANDARD**

No deviation.



#### **9.1.4 TEST SETUP**



#### **9.1.5 EUT OPERATION CONDITIONS**

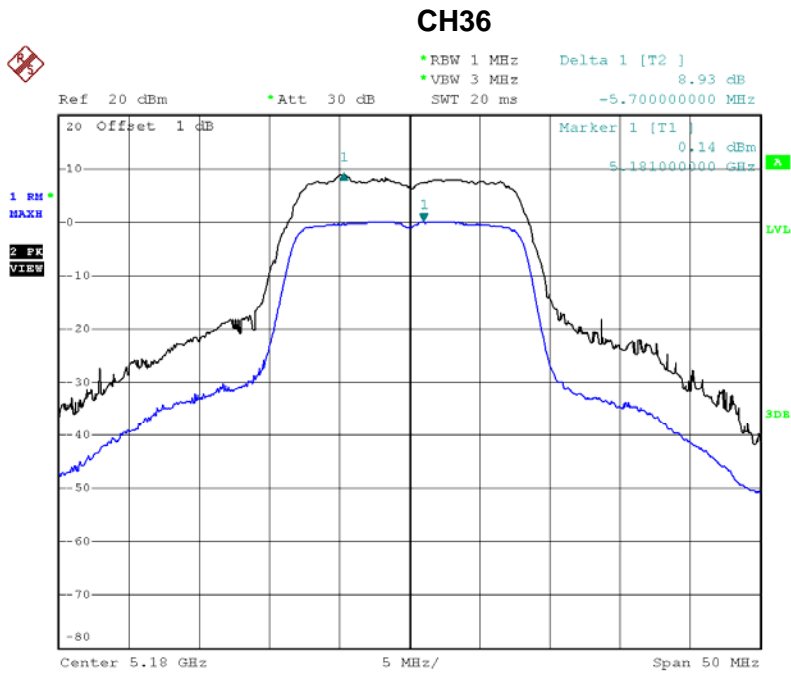
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



**9.1.6 TEST RESULTS**

EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX A Mode/CH36, CH40, CH48		

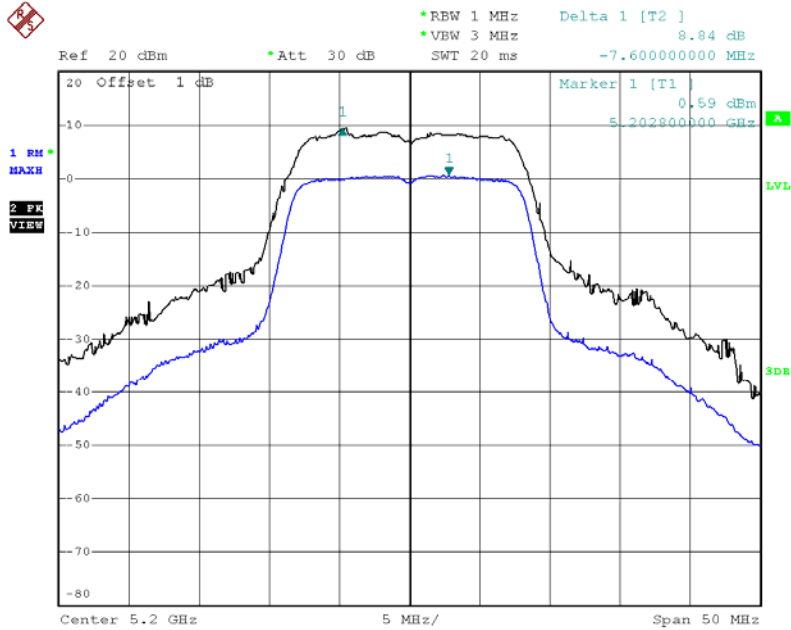
Test Channel	Frequency (MHz)	Peak Excursion (dB)	LIMIT (dB)
CH36	5180	8.93	13
CH40	5200	8.84	13
CH48	5240	8.90	13



Date: 8.NOV.2013 00:00:58

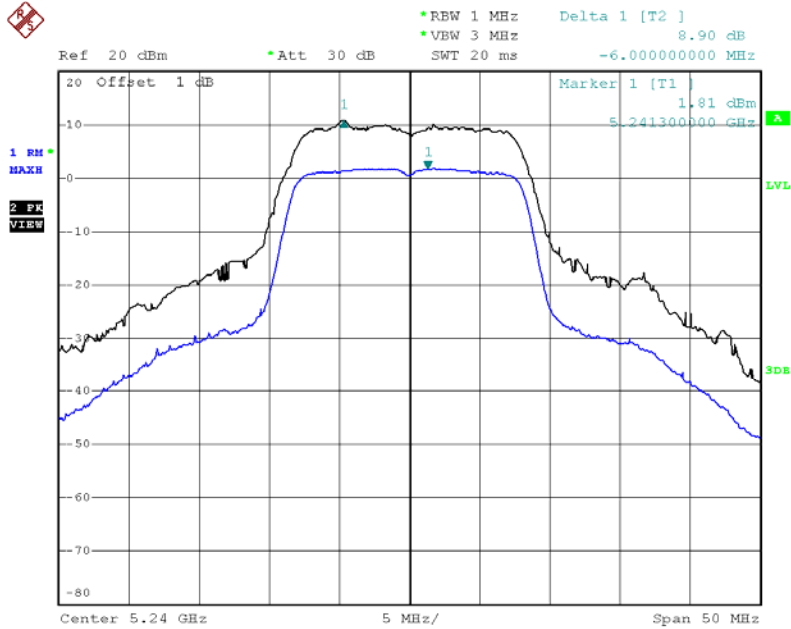


### CH40



Date: 8.NOV.2013 00:00:33

### CH48



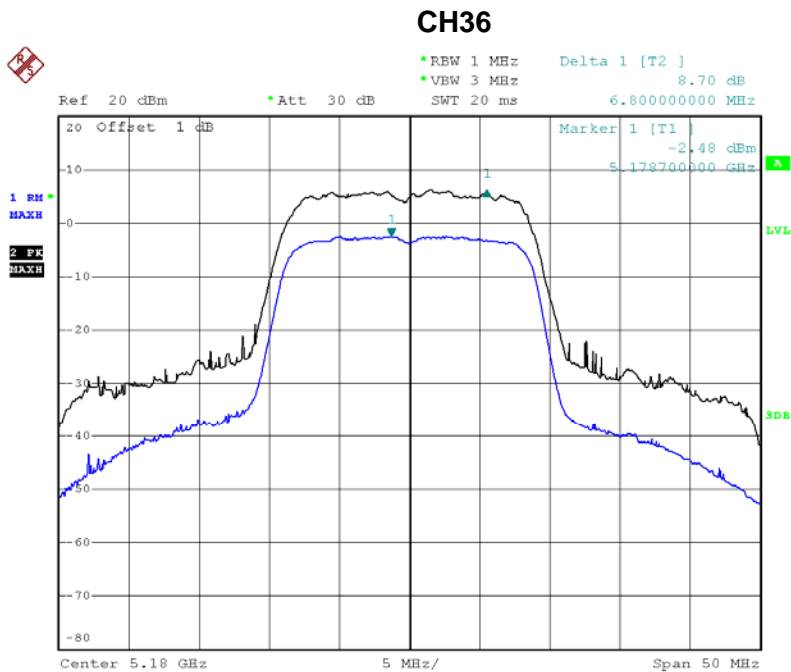
Date: 7.NOV.2013 23:59:19





EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX N20 Mode/CH36, CH40, CH48		

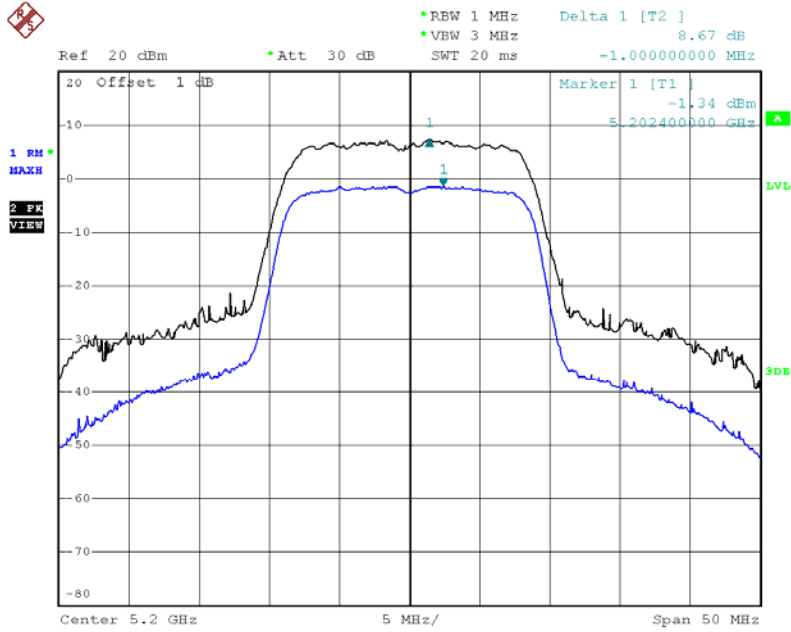
Test Channel	Frequency (MHz)	Peak Excursion (dB)	LIMIT (dB)
CH36	5180	8.70	13
CH40	5200	8.67	13
CH48	5240	8.47	13



Date: 8.NOV.2013 00:04:17

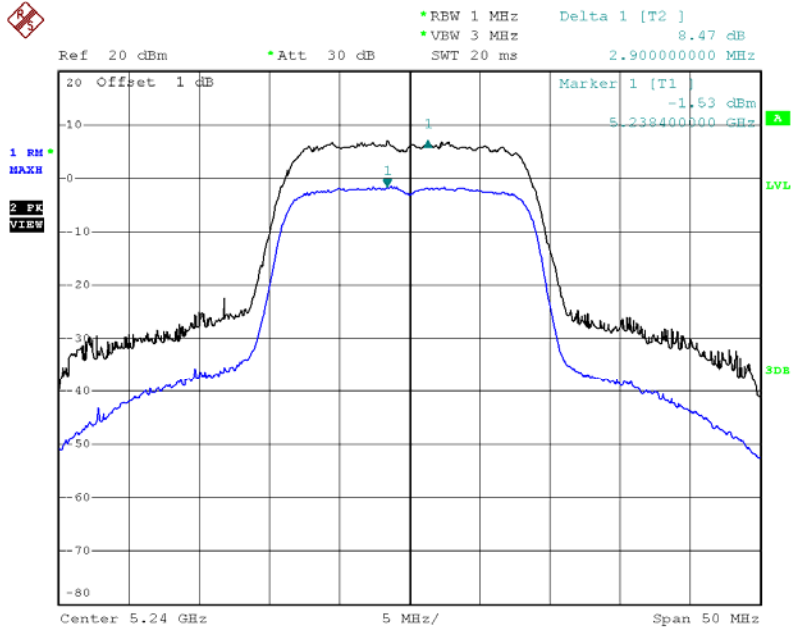


### CH40



Date: 8.NOV.2013 00:05:19

### CH48

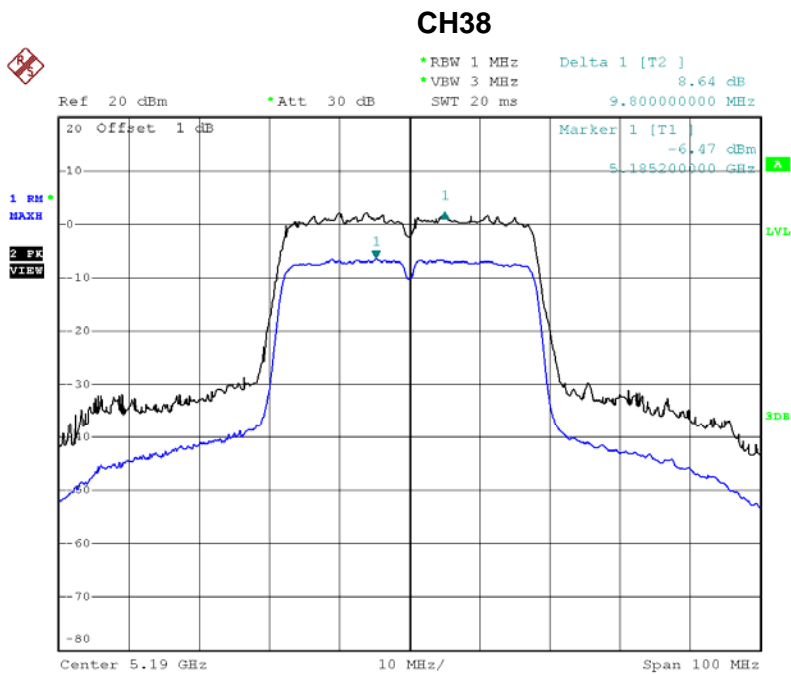


Date: 8.NOV.2013 00:05:55



EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX N40 Mode/CH38, CH46		

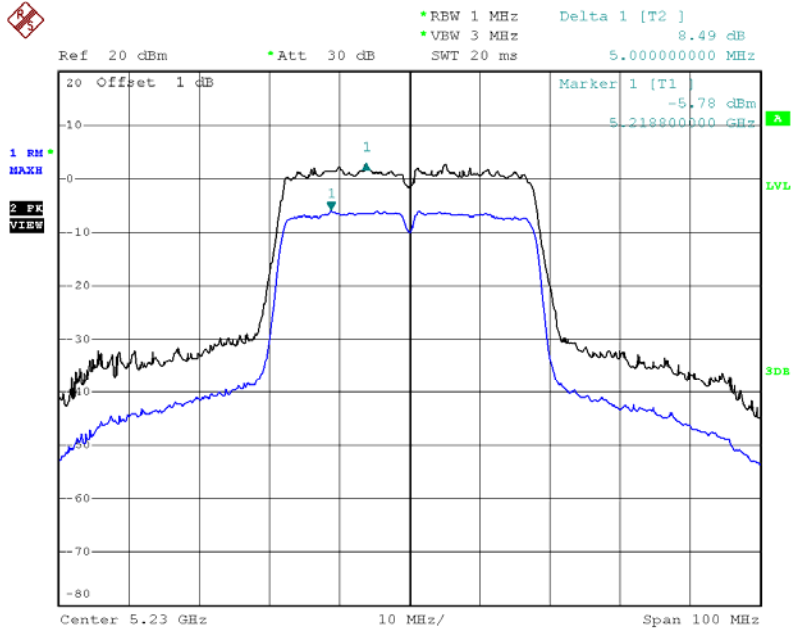
Test Channel	Frequency (MHz)	Peak Excursion (dB)	LIMIT (dB)
CH38	5190	8.64	13
CH46	5230	8.49	13



Date: 8.NOV.2013 00:44:37



### CH46



Date: 8.NOV.2013 00:40:47



**10. FREQUENCY STABILITY MEASUREMENT**

**10.1 APPLIED PROCEDURES / LIMIT**

FCC Part15, Subpart E 15.407(g)			
Test Item	Limit	Frequency Range (MHz)	Result
Frequency Stability	specified in the user's manual	5150 – 5250	PASS

**10.1.1 MEASUREMENT INSTRUMENTS LIST**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP_40	100129	Nov. 26.2013
2	Precision Oven Tester	HOLINK	H-T-1F-D	BA03101701	May.25.2014

Remark: "N/A" denotes no model name, serial no. or calibration specified.  
 All calibration period of equipment list is one year.

**10.1.2 TEST PROCEDURE**

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

b.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Entire absence of modulation emissions bandwidth
RB	10 kHz
VB	10 kHz
Sweep Time	Auto

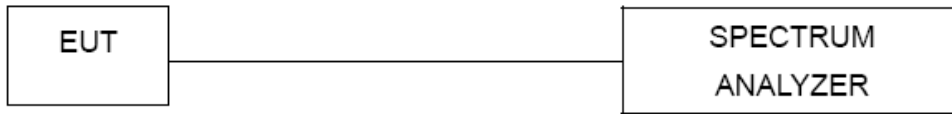
- c. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.
- d. user manual temperature is 0°C~45°C.

**10.1.3 DEVIATION FROM STANDARD**

No deviation.



**10.1.4 TEST SETUP**



**10.1.5 EUT OPERATION CONDITIONS**

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



**10.1.6 TEST RESULTS**

EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX A Mode		

**Voltage vs. Frequency Stability**

Voltage	Measurement Frequency (MHz)
(V)	5180
132	5180.00789
120	5180.006850
118	5180.007650
Max. Deviation (MHz)	0.007890
Max. Deviation (ppm)	1.52

**Temperature vs. Frequency Stability**

Temperature	Measurement Frequency (MHz)
(°C)	5180
0	5180.0076
10	5180.0069
20	5180.0056
30	5180.0045
40	5180.0066
Max. Deviation (MHz)	0.007600
Max. Deviation (ppm)	1.47



EUT:	Wireless Dual Band USB Adapter	Model Name :	WF2151
Temperature:	25 °C	Relative Humidity:	58 %
Test Voltage:	AC 120V/60Hz		
Test Mode :	Band 1/TX N40 Mode		

**Voltage vs. Frequency Stability**

Voltage	Measurement Frequency (MHz)
(V)	5190
132	5190.002600
120	5190.002700
118	5190.003100
Max. Deviation (MHz)	0.003100
Max. Deviation (ppm)	0.60

**Temperature vs. Frequency Stability**

Temperature	Measurement Frequency (MHz)
(°C)	5190
0	5190.002600
10	5190.003100
20	5190.003200
30	5190.003200
40	0.003200
Max. Deviation (MHz)	0.62
Max. Deviation (ppm)	5190.002600





**11. EUT TEST PHOTO**

**Conducted Measurement Photos**





**Radiated Measurement Photos  
9KHz~30MHz**





**Radiated Measurement Photos  
300MHz~1000MHz**





**Radiated Measurement Photos  
Above 1000MHz**

