



FCC RADIO TEST REPORT

FCC ID: ZBXMTO-WN820NM

IC ID: 10926A-MTO-WN820NM

Product : 300Mbps Wireless USB Adapter

Trade Name : N/A

Model Name : MTO-WN820NM

Serial Model : N/A

Report No. : 2012NT1226157F2

Prepared for

Shenzhen MTN Electronics Co., Ltd.
MTN Industrial Park, No.3, Fuhua Road, Pingxi Neighborhood,
Longgang District, Shenzhen, China

Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.
1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street
Bao'an District, Shenzhen P.R. China
Tel.: +86-0755-61156588 Fax.: +86-0755-61156599
Website: www.ntek.org.cn

TEST RESULT CERTIFICATION

Applicant's name : Shenzhen MTN Electronics Co., Ltd.
Address : MTN Industrial Park, No.3, Fuhua Road, Pingxi Neighborhood,
 Longgang District, Shenzhen, China
Manufacture's Name : Shenzhen MTN Electronics Co., Ltd.
Address : MTN Industrial Park, No.3, Fuhua Road, Pingxi Neighborhood,
 Longgang District, Shenzhen, China

Product description

Product name : 300Mbps Wireless USB Adapter
Model and/or type reference : MTO-WN820NM
Serial Model : N/A

Standards : FCC Part15.407

Test procedure ANSI C63.4-2003

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of NTEK, this document may be altered or revised by NTEK, personal only, and shall be noted in the revision of the document.

Date of Test :

Date (s) of performance of tests : 20 Dec. 2012 ~30 Dec. 2012

Date of Issue : 31 Dec. 2012

Test Result : **Pass**

Testing Engineer : Apple Huang
 (Apple Huang)

Technical Manager : Tom Zhang
 (Tom Zhang)

Authorized Signatory : Bovey Yang
 (Bovey Yang)

Table of Contents	Page
1 . SUMMARY OF TEST RESULTS	5
1.1 TEST FACILITY	6
1.2 MEASUREMENT UNCERTAINTY	6
2 . GENERAL INFORMATION	7
2.1 GENERAL DESCRIPTION OF EUT	7
2.2 DESCRIPTION OF TEST MODES	9
2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	10
2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)	11
2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS	12
3 . EMC EMISSION TEST	13
3.1 CONDUCTED EMISSION MEASUREMENT	13
3.1.1 POWER LINE CONDUCTED EMISSION LIMITS	13
3.1.2 TEST PROCEDURE	14
3.1.3 DEVIATION FROM TEST STANDARD	14
3.1.4 TEST SETUP	14
3.1.5 EUT OPERATING CONDITIONS	14
3.1.6 TEST RESULTS	15
3.2 RADIATED EMISSION MEASUREMENT	17
3.2.1 RADIATED EMISSION LIMITS	17
3.2.2 TEST PROCEDURE	18
3.2.3 DEVIATION FROM TEST STANDARD	18
3.2.4 TEST SETUP	19
3.2.5 EUT OPERATING CONDITIONS	20
3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)	21
3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)	22
3.2.8 TEST RESULTS (ABOVE 1000 MHZ)	24
4 . POWER SPECTRAL DENSITY TEST	40
4.1 APPLIED PROCEDURES / LIMIT	40
4.1.1 TEST PROCEDURE	40
4.1.2 DEVIATION FROM STANDARD	40
4.1.3 TEST SETUP	40
4.1.4 EUT OPERATION CONDITIONS	40
4.1.5 TEST RESULTS	41
5 . 26 BANDWIDTH TEST	45
5.1 APPLIED PROCEDURES / LIMIT	45
5.1.1 TEST PROCEDURE	45

Table of Contents	Page
5.1.2 DEVIATION FROM STANDARD	45
5.1.3 TEST SETUP	45
5.1.4 EUT OPERATION CONDITIONS	45
5.1.5 TEST RESULTS	46
6 . MAXIMUM CONDUCTED OUTPUT POWER	50
6.1 APPLIED PROCEDURES / LIMIT	50
6.1.1 TEST PROCEDURE	50
6.1.2 DEVIATION FROM STANDARD	50
6.1.3 TEST SETUP	50
6.1.4 EUT OPERATION CONDITIONS	51
6.1.5 TEST RESULTS	52
7 . PEAK EXCURSION RATIO MEASUREMENT	57
7.1 STANDARD REQUIREMENT	57
7.2 MEASURING INSTRUMENTS	57
7.3 TEST PROCEDURES	57
7.3 TEST SETUP	57
8 . FREQUENCY STABILITY MEASUREMENT	63
8.1 LIMIT OF FREQUENCY STABILITY	63
8.2 MEASURING INSTRUMENTS	63
8.3 TEST PROCEDURES	63
8.4 TEST SETUP	63
9 . AUTOMATICALLY DISCONTINUE TRANSMISSION	65
9.1 LIMIT OF AUTOMATICALLY DISCONTINUE TRANSMISSION	65
9.2 TEST RESULT OF AUTOMATICALLY DISCONTINUE TRANSMISSION	65
10 . ANTENNA REQUIREMENT	66
10.1 STANDARD REQUIREMENT	66
10.2 EUT ANTENNA	66
11 . EUT TEST PHOTO	67
APPENDIX-PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS	

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.407) , Subpart E IC RSS-210 Issued 8			
Standard Section	Test Item	Judgment	Remark
15.207& Gen 7.2.4	Conducted Emission	PASS	
15.403(i)& A9.2	26dB Bandwidth	PASS	
15.407(a) &A9.2	Maximum Conducted Output Power	PASS	
15.407(b)& A9.3	Peak Excursion Ratio	PASS	
15.407(b) &A9.3	Radiated Spurious Emission	PASS	
15.407(a) &A9.2	Power Spectral Density	PASS	
15.407(g)& A9.5	Frequency Stability	PASS	
15.407(c)& A9.5	Automatically Discontinue Transmission	PASS	
15.203& A9.2	Antenna Requirement	PASS	

NOTE:

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

1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd

Add.:1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

FCC Registration No.:238937; IC Registration No.:9270A-1

CNAS Registration No.:L5516

1.2 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 %.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power,conducted	$\pm 0.16\text{dB}$
3	Spurious emissions,conducted	$\pm 0.21\text{dB}$
4	All emissions,radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^{\circ}\text{C}$
7	Humidity	$\pm 2\%$

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	300Mbps Wireless USB Adapter	
Trade Name	N/A	
Model Name	MTO-WN820NM	
Serial Model	N/A	
Model Difference	N/A	
Product Description	The EUT is a 300Mbps Wireless USB Adapter	
	Operation Frequency:	5150 MHz ~ 5250 MHz
	Modulation Type:	OFDM (BPSK / QPSK / 16QAM / 64QAM)
	Antenna Designation:	<5150 MHz ~ 5250 MHz> Antenna with gain 2.00 dBi
	Max.Output Power(Conducted):	12.12dBm
	Operation Frequency:	2412MHz~2462MHz 5725 MHz ~ 5825 MHz
	Modulation Type:	CCK/OFDM/DBPSK/DAPSK
	Bit Rate of Transmitter	802.11b:11/5.5/2/1 Mbps 802.11g/a:54/48/36/24/18/12/9/6Mbps 802.11n(20/40MHz):300/270/150/144.44 /130/117/115.56/104/86.67/78/52/6.5 Mbps
	Max.Output Power(Conducted):	17.78 dBm
	More details of EUT technical specification, please refer to the User's Manual.	
Test Channel	Please refer to the Note 2.	
Adapter	N/A	
Battery	N/A	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

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

2. Carrier Frequency Channel

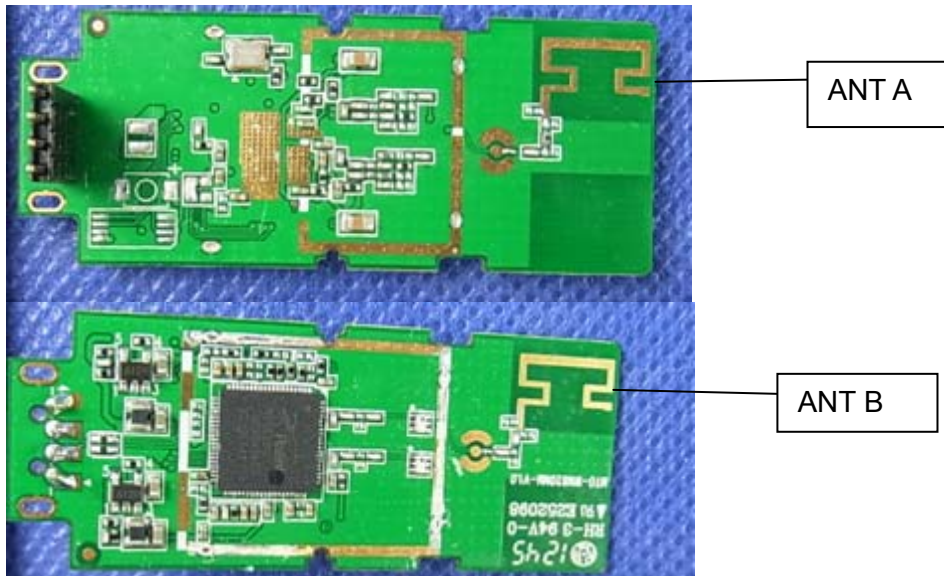
802.11a Carrier Frequency Channel							
Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
36	5180	40	5200	44	5220	48	5240

802.11n (BW 20MHz) Carrier Frequency Channel							
Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
36	5180	40	5200	44	5220	48	5240

3. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
A	N/A	N/A	PCB Antenna	N/A	2.0	N/A
B	N/A	N/A	PCB Antenna	N/A	2.0	N/A

For MIMO mode ,Directional gain= $G_{ANT} + 10\log(N)$ dbi =5.01dbi in 5GHz



For 802.11a/n 20MHz mode ,two antennas simultaneously transmit. And the data is recorded for radiated emission and band edge.

2.2 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 Mode	Description
Mode 1	802.11a
Mode 2	802.11n(20)
Mode 3	Link Mode

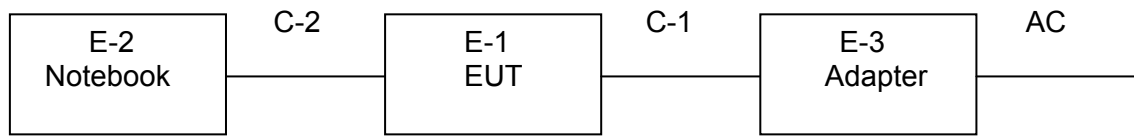
For Conducted Emission	
Final Test Mode	Description
Mode 3	Link Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11a
Mode 2	802.11n(20)

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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.	Series No.	Note
E-1	300Mbps Wireless USB Adapter	N/A	MTO-WN820NM	N/A	
E-2	Notebook	IBM	2366		
E-3	Adapter	IBM	08K8202	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	0.8M	
C-1	NO	NO	0.5M	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4407B	MY45108040	2012.07.06	2013.07.05	1 year
2	Test Receiver	R&S	ESPI	101318	2012.06.07	2013.06.06	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2012.07.06	2013.07.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2012.06.07	2013.06.06	1 year
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2012.06.07	2013.06.06	1 year
6	Horn Antenna	EM	EM-AH-10180	2011071402	2012.07.06	2013.07.05	1 year
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2012.07.06	2013.07.05	1 year
8	Amplifier	EM	EM-30180	060538	2012.12.22	2013.12.21	1 year
9	Loop Antenna	ARA	PLA-1030/B	1029	2012.06.08	2013.06.07	1 year
10	Power Meter	R&S	NRVS	100696	2012.07.06	2013.07.05	1 year
11	Power Sensor	R&S	URV5-Z4	0395.1619.05	2012.07.06	2013.07.05	1 year
12	SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	2012.08.03	2013.08.02	1 year
13	Spectrum Analyzer	R&S	FSP40	100055	2012.08.09	2013.08.08	1 year
14	Power Meter	Agilent	E4416A	GB41292344	2012.07.06	2013.07.05	1 year
15	Power Sensor	Agilent	E9327A	US40441548	2012.07.06	2013.07.05	1 year

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101160	2012.06.06	2013.06.05	1 year
2	LISN	R&S	ENV216	101313	2012.08.24	2013.08.23	1 year
3	LISN	EMCO	3816/2	00042990	2012.08.24	2013.08.23	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2012.06.07	2013.06.06	1 year
5	Passive Voltage Probe	R&S	ESH2-Z3	100196	2012.06.07	2013.06.06	1 year
6	Absorbing clamp	R&S	MOS-21	100423	2012.06.08	2013.06.07	1 year

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

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

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

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.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

- The EUT was placed 0.4 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.
- 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.
- 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.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



Note: 1.Support units were connected to second LISN .

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.6 TEST RESULTS

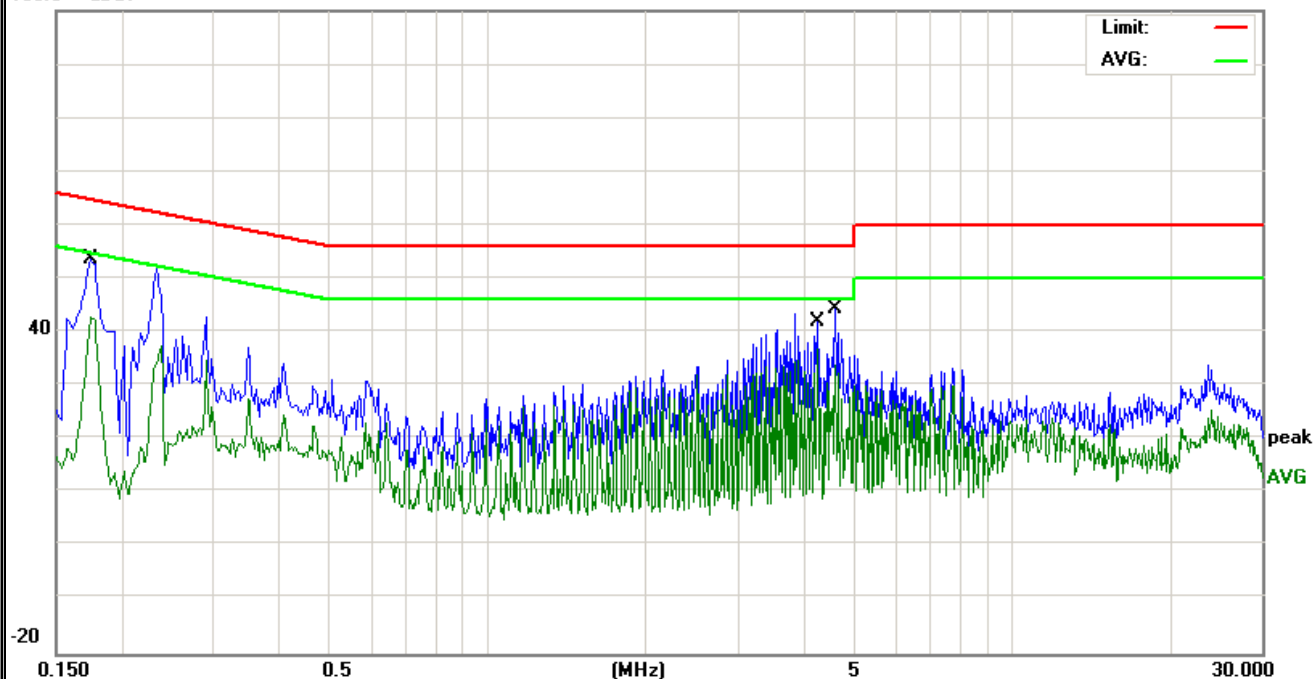
EUT :	300Mbps Wireless USB Adapter	Model Name. :	MTO-WN820NM
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5.0V from PC AC 120V/60Hz	Test Mode :	Mode 4

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.174	43.82	9.8	53.62	64.76	-11.14	QP
0.174	32.96	9.8	42.76	54.76	-12	AVG
4.2619	26.39	10.35	36.74	46	-9.26	AVG
4.6139	34.03	10.37	44.4	56	-11.6	QP

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

100.0 dBμV



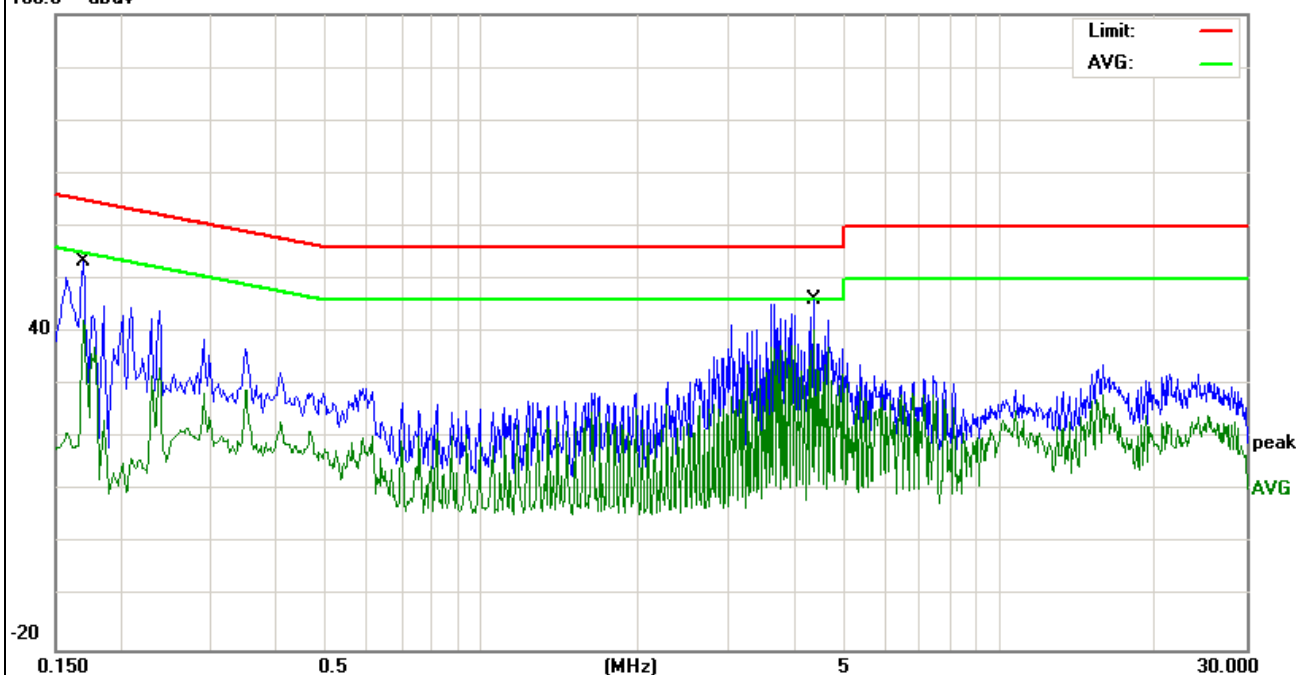
EUT :	300Mbps Wireless USB Adapter	Model Name. :	MTO-WN820NM
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5.0V from PC AC 120V/60Hz	Test Mode :	Mode 4

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.17	43.54	9.8	53.34	64.96	-11.62	QP
0.17	32.46	9.8	42.26	54.96	-12.7	AVG
4.3778	35.77	10.36	46.13	56	-9.87	QP
4.3778	30.02	10.36	40.38	46	-5.62	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

100.0 dBμV



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 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)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class A (dBuV/m) (at 3M)		Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80	60	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

- a. The measuring distance of at 3 m 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 open area test site. 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.

Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

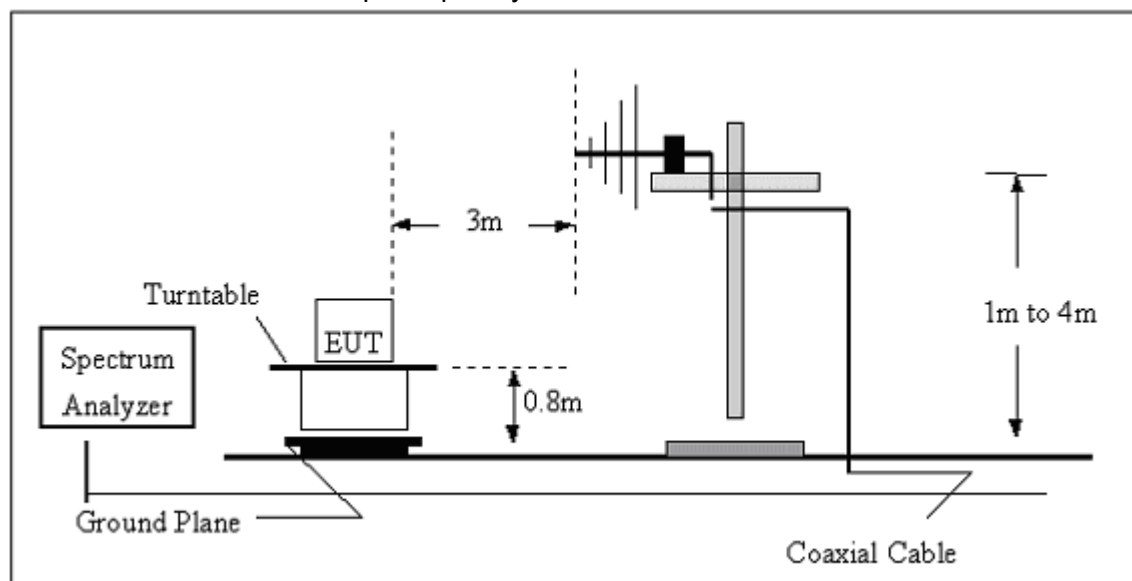
No deviation

3.2.4 TEST SETUP

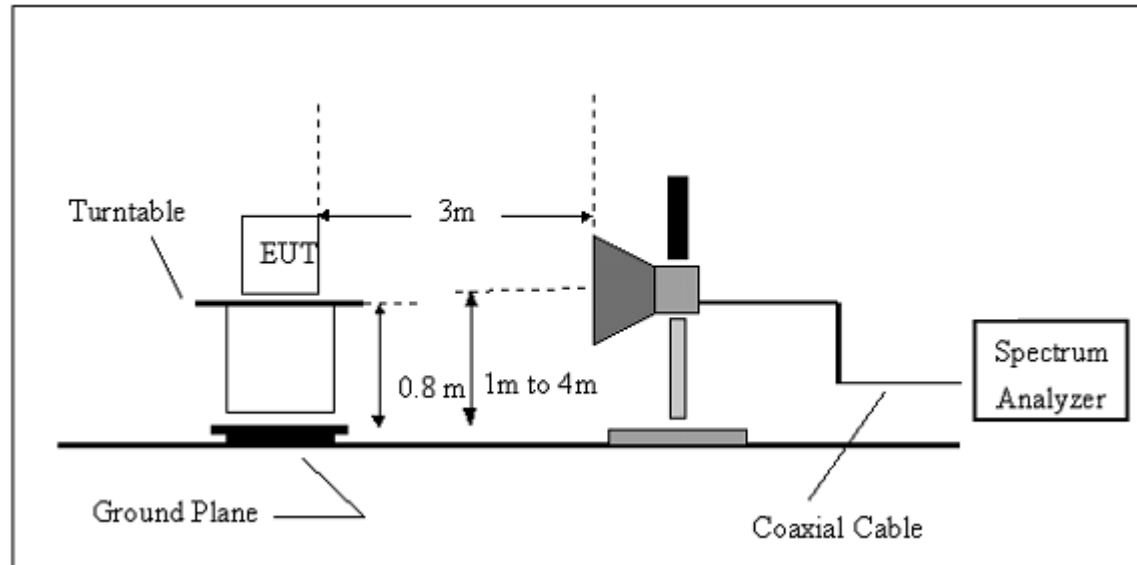
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz

**3.2.5 EUT OPERATING CONDITIONS**

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)

EUT:	300Mbps Wireless USB Adapter	Model Name. :	MTO-WN820NM
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	TX	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	--
--	--	--	--	--

NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance/test distance})(\text{dB})$;

Limit line = specific limits(dBuv) + distance extrapolation factor.

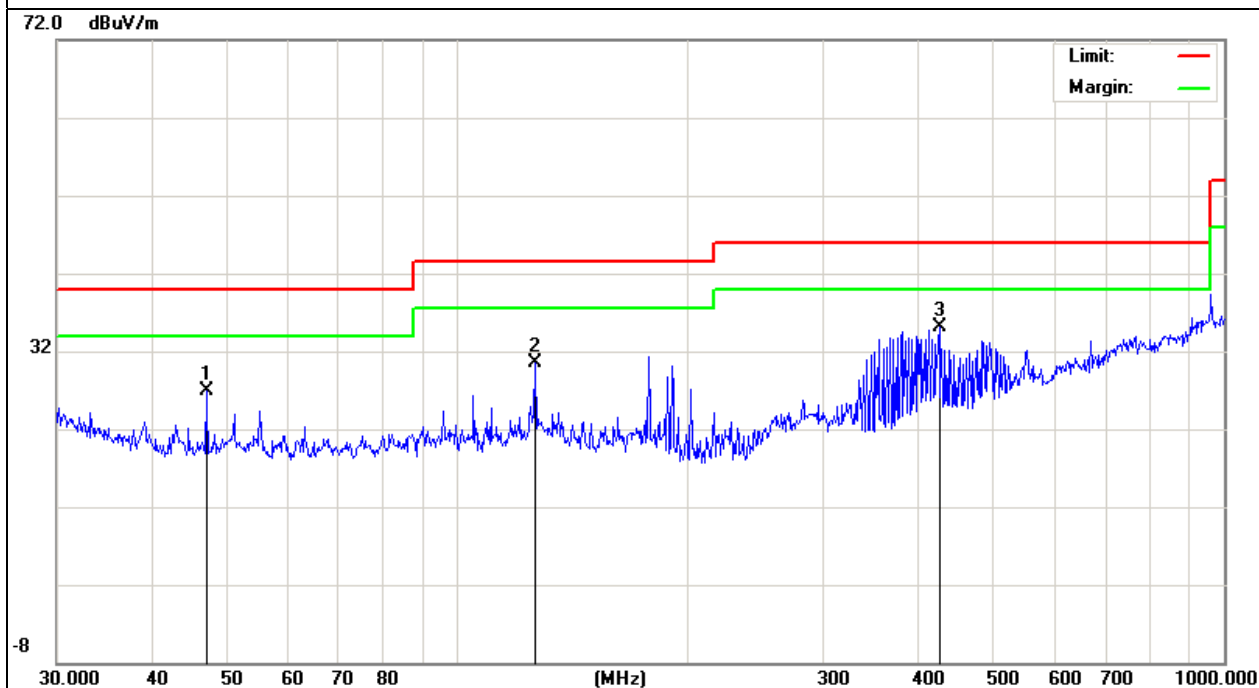
3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	Mode 3	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
46.9947	17.31	9.62	26.93	40	-13.07	QP
126.3285	18.31	12.21	30.52	43.5	-12.98	QP
425.028	16.12	18.91	35.03	46	-10.97	QP

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

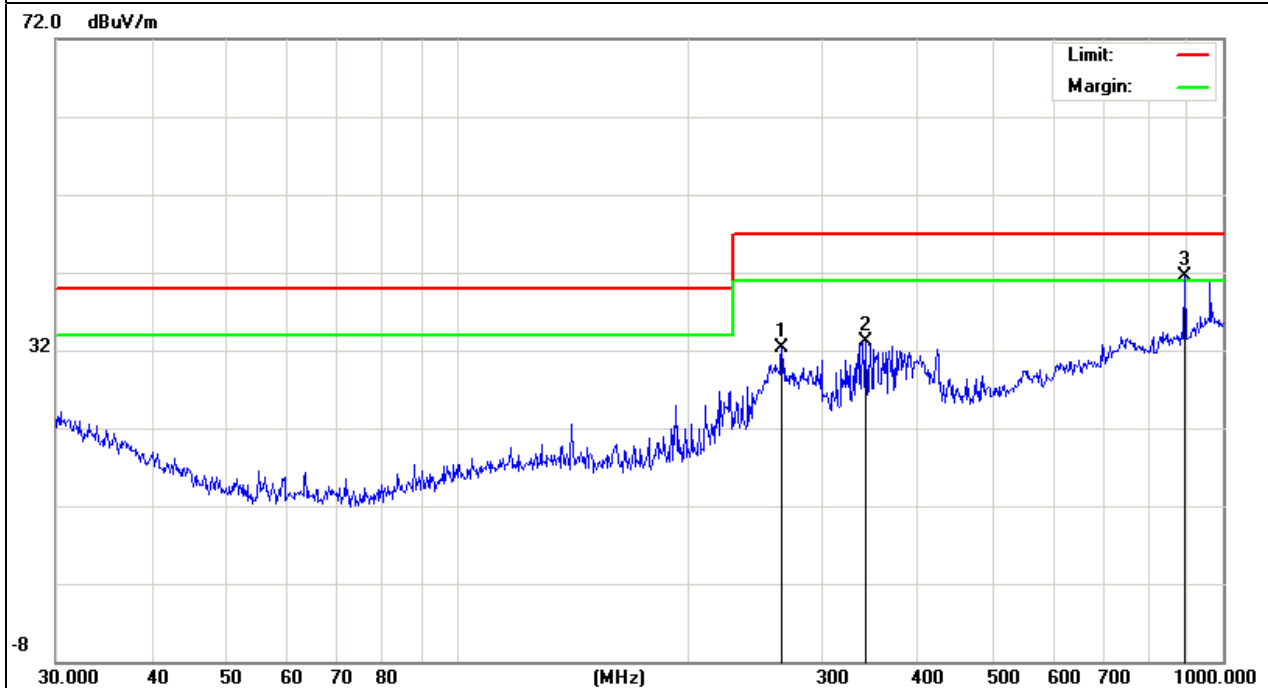


EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	Mode 3	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
265.6757	17.9	14.46	32.36	47	-14.64	QP
341.9786	16.91	16.19	33.1	47	-13.9	QP
890.7278	13.97	27.46	41.43	47	-5.57	QP

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



3.2.8 TEST RESULTS (ABOVE 1000 MHZ)

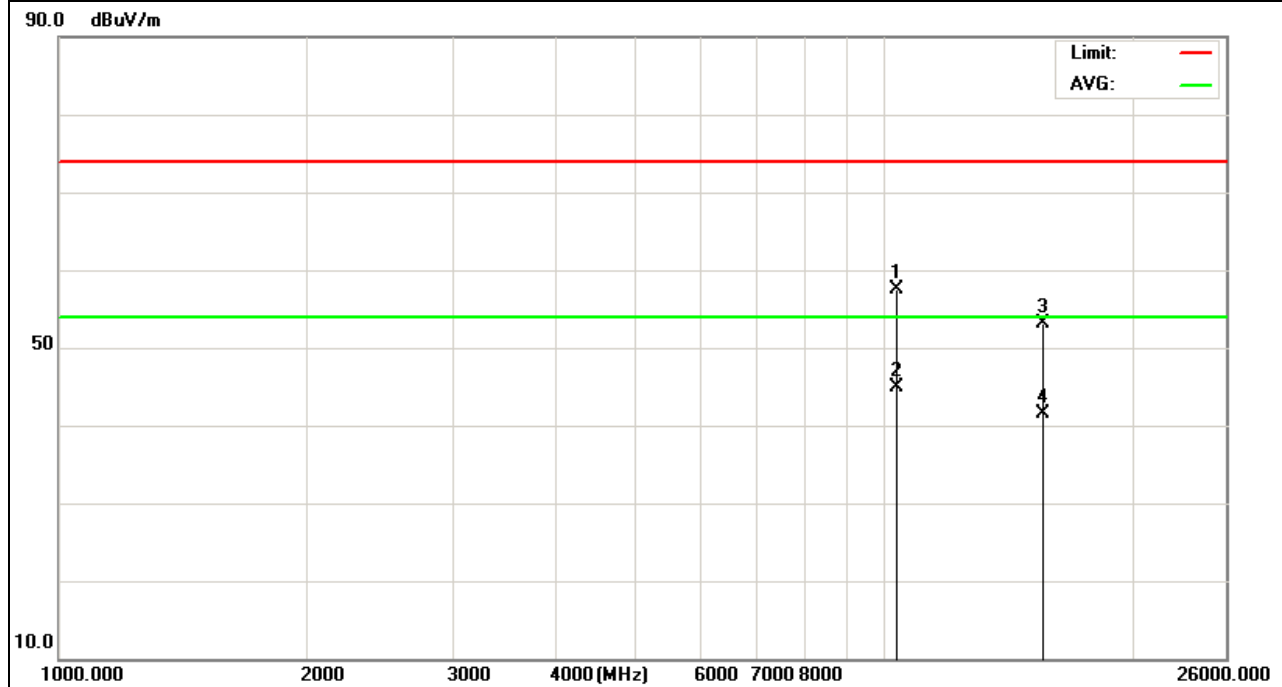
EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	802.11a/5180MHz	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
10360.158	39.8	17.66	57.46	74	-16.54	peak
10360.158	27.26	17.66	44.92	54	-9.08	AVG
15540.267	30.42	22.73	53.15	74	-20.85	peak
15540.267	18.76	22.73	41.49	54	-12.51	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No emission detected above 26GHz.



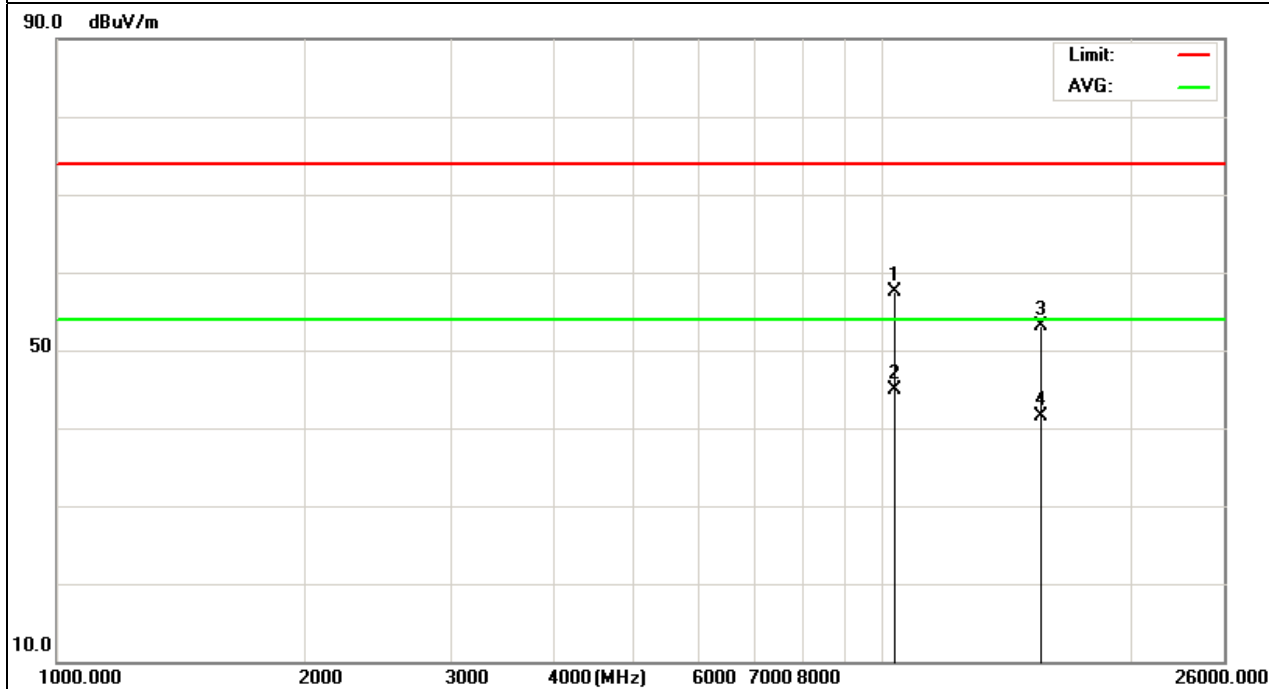
EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	802.11a/5180MHz	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
10360.157	39.8	17.66	57.46	74	-16.54	peak
10360.157	27.26	17.66	44.92	54	-9.08	AVG
15540.249	30.42	22.73	53.15	74	-20.85	peak
15540.249	18.76	22.73	41.49	54	-12.51	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No emission detected above 26GHz.



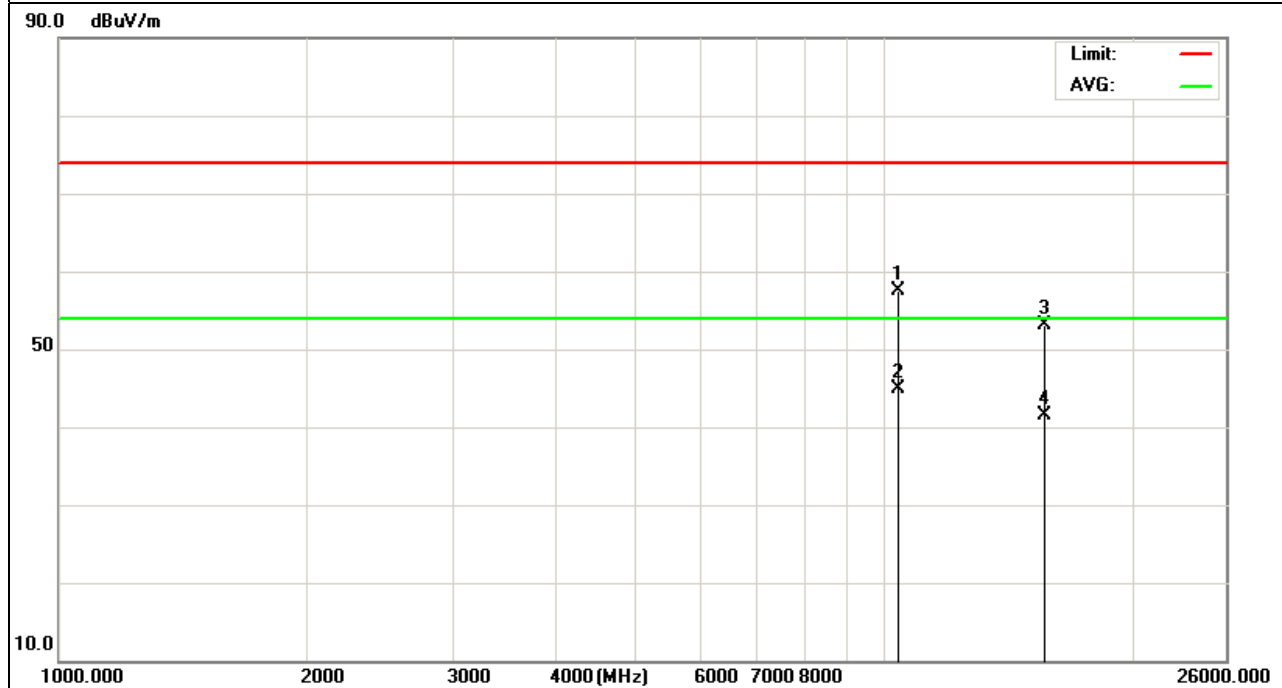
EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	802.11a/5200MHz	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
10400.146	40.4	17.06	57.46	74	-16.54	peak
10400.146	27.86	17.06	44.92	54	-9.08	AVG
15600.238	30.49	22.66	53.15	74	-20.85	peak
15600.238	18.83	22.66	41.49	54	-12.51	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No emission detected above 26GHz.



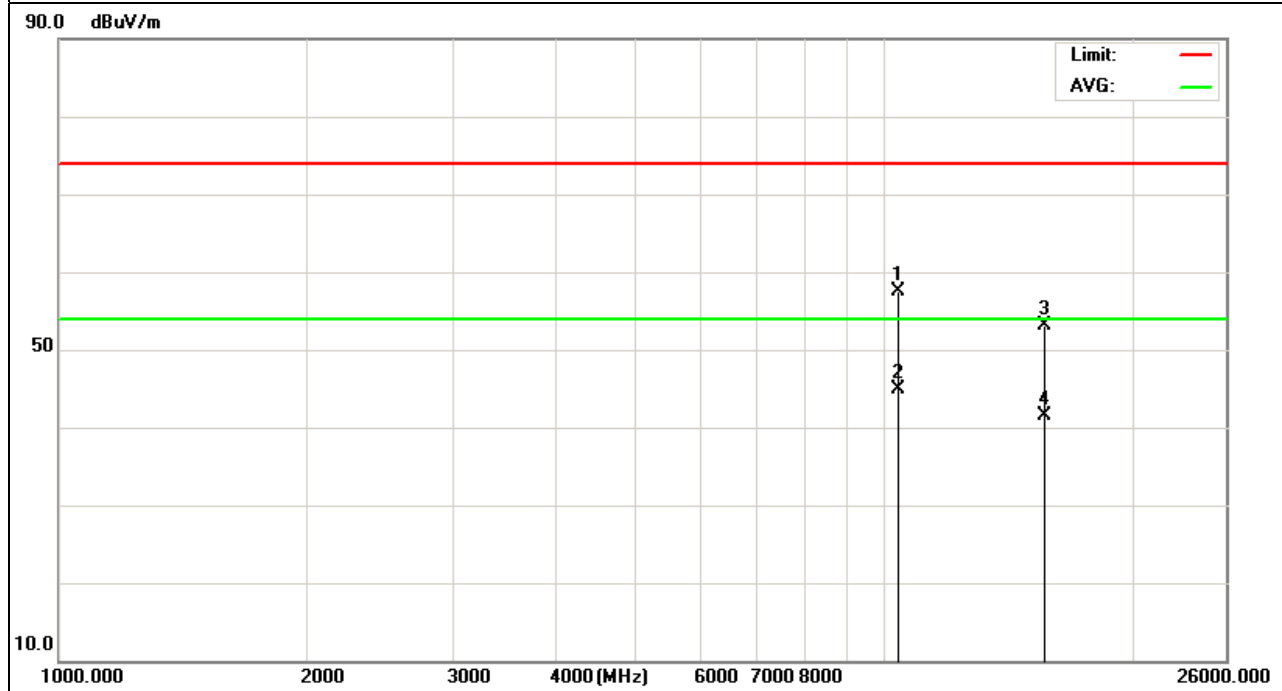
EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	802.11a/5200MHz	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
10400.189	40.4	17.06	57.46	74	-16.54	peak
10400.189	27.86	17.06	44.92	54	-9.08	AVG
15600.247	30.49	22.66	53.15	74	-20.85	peak
15600.247	18.83	22.66	41.49	54	-12.51	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No emission detected above 26GHz



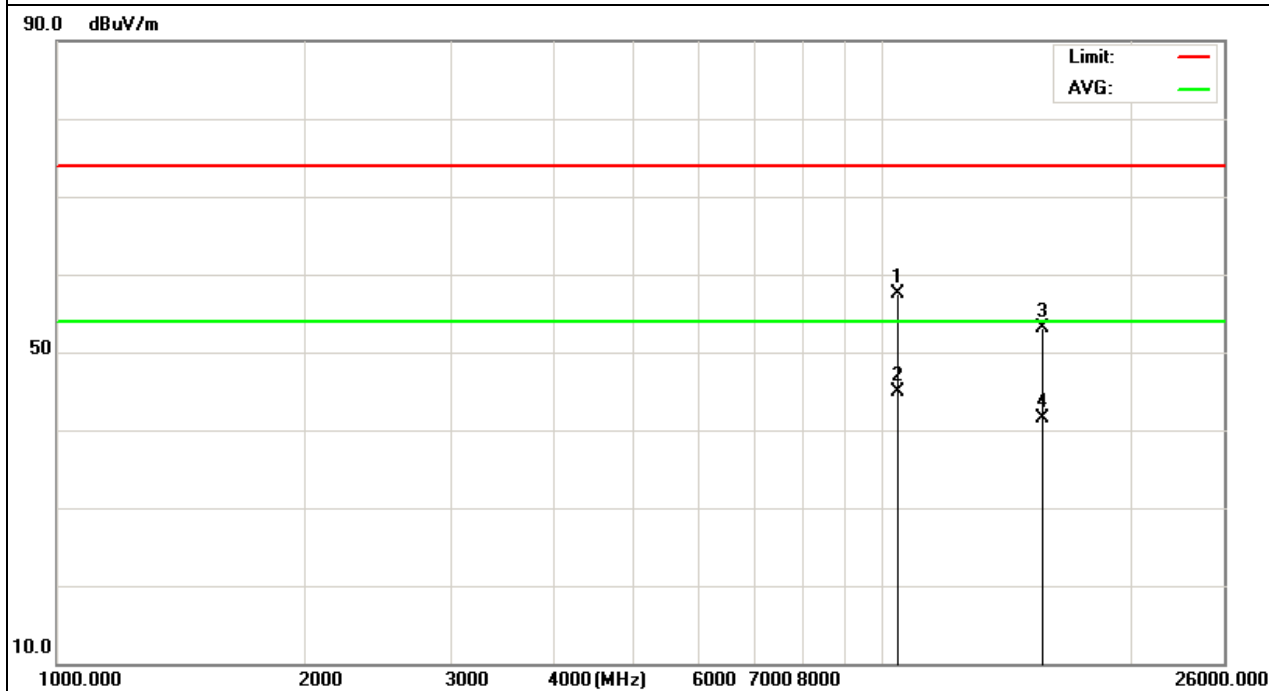
EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	802.11a/5240MHz	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
10480.158	39.8	17.66	57.46	74	-16.54	peak
10480.158	27.26	17.66	44.92	54	-9.08	AVG
15720.252	29.77	23.38	53.15	74	-20.85	peak
15720.252	18.11	23.38	41.49	54	-12.51	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No emission detected above 26GHz.



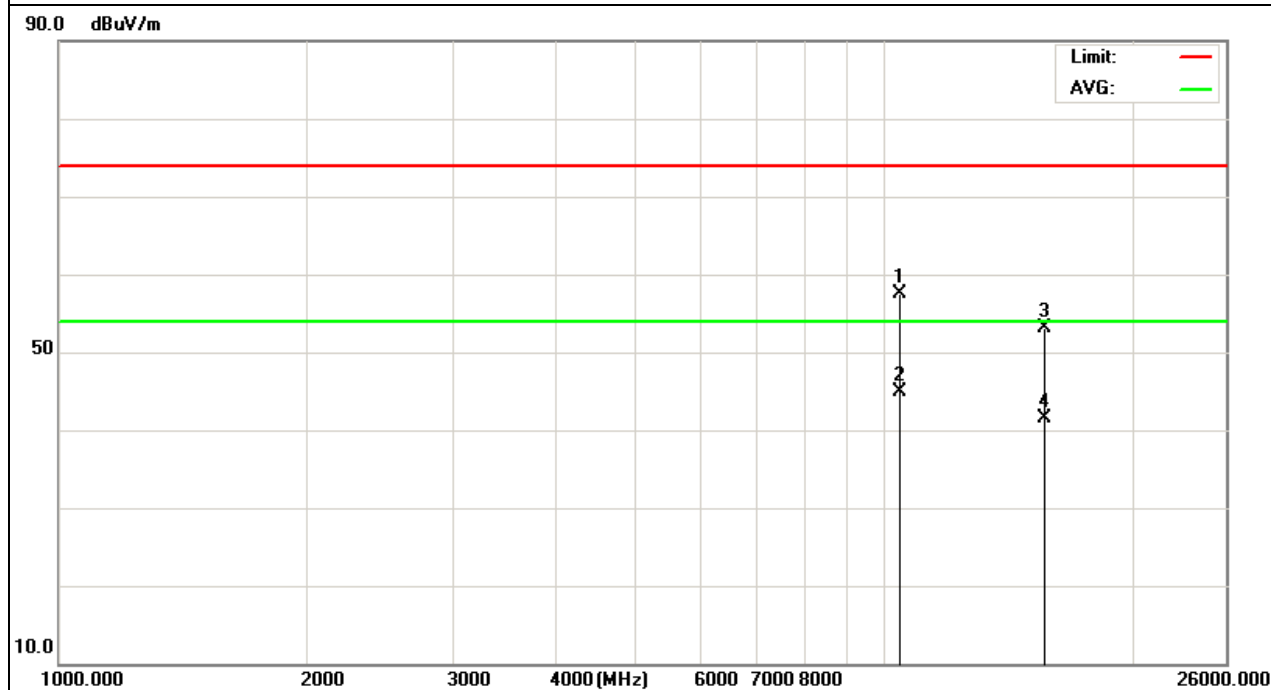
EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	802.11a/5240MHz	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
10480.158	39.8	17.66	57.46	74	-16.54	peak
10480.158	27.26	17.66	44.92	54	-9.08	AVG
15720.252	29.77	23.38	53.15	74	-20.85	peak
15720.252	18.11	23.38	41.49	54	-12.51	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No emission detected above 26GHz.



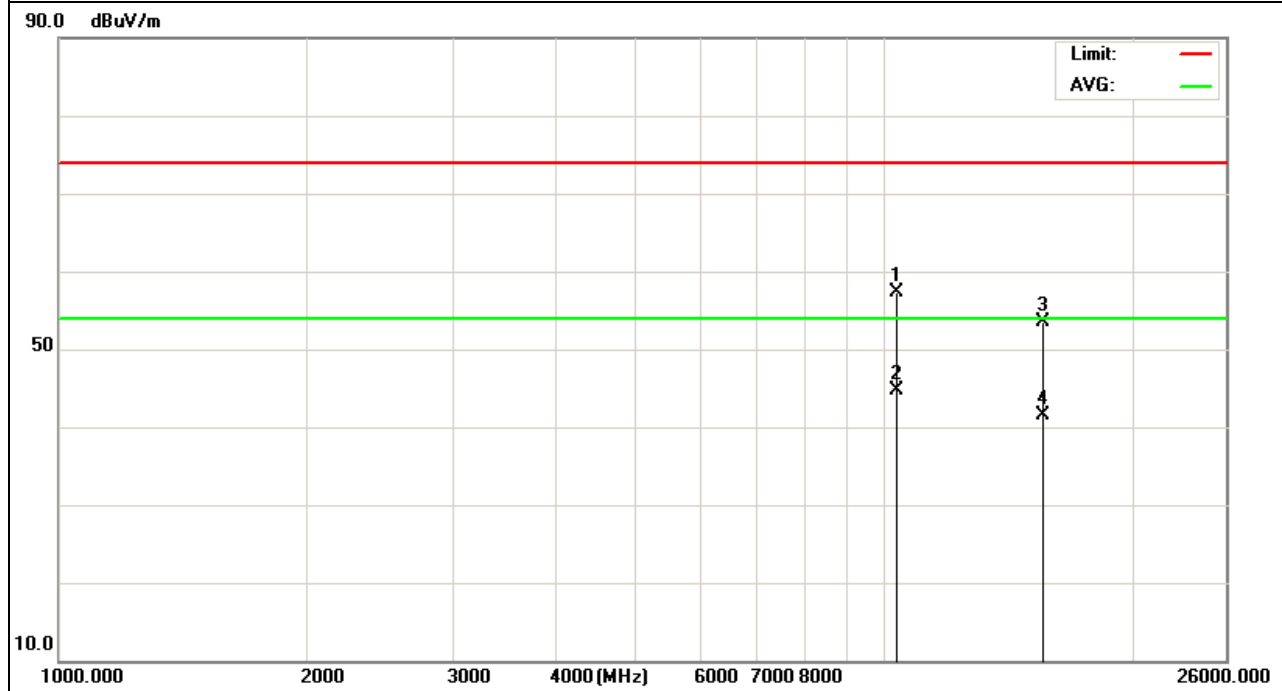
EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	802.11n/5180MHz	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
10360.164	39.71	17.66	57.37	74	-16.63	peak
10360.164	27	17.66	44.66	54	-9.34	AVG
15540.252	30.75	22.73	53.48	74	-20.52	peak
15540.252	18.8	22.73	41.53	54	-12.47	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No emission detected above 26GHz.



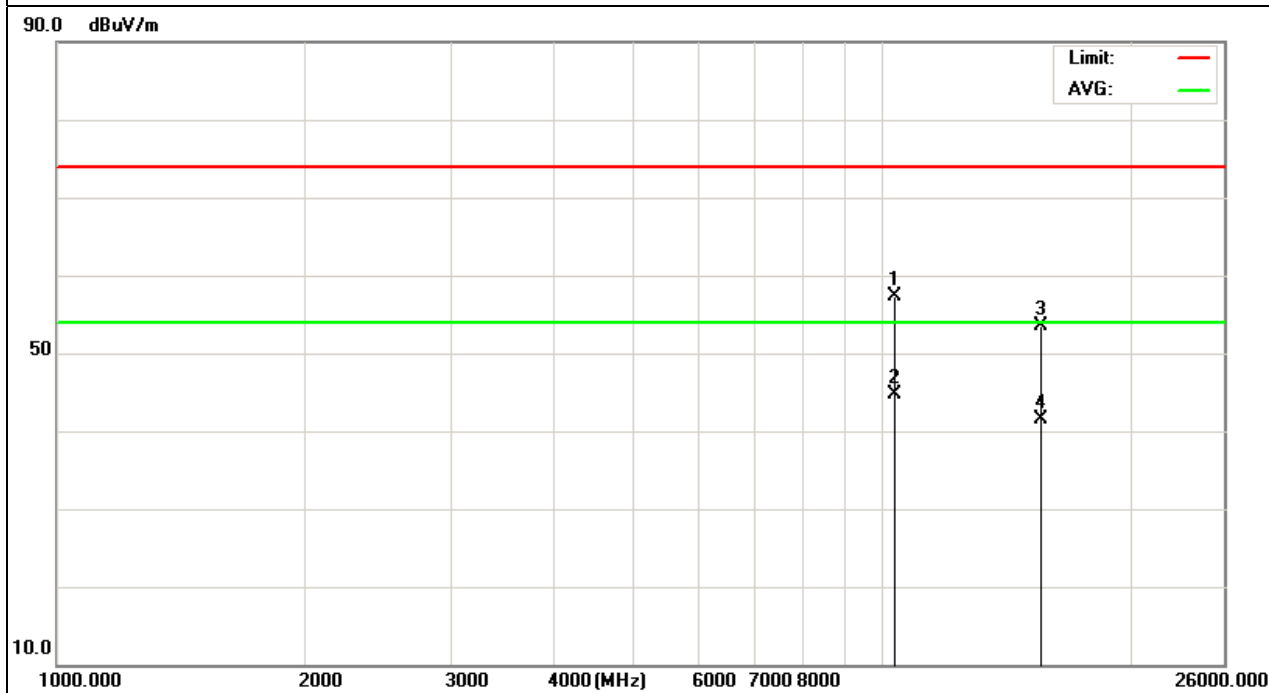
EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	802.11n/5180MHz	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
10360.143	39.72	17.66	57.38	74	-16.62	peak
10360.143	26.99	17.66	44.65	54	-9.35	AVG
15540.235	30.73	22.73	53.46	74	-20.54	peak
15540.235	18.85	22.73	41.58	54	-12.42	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No emission detected above 26GHz.



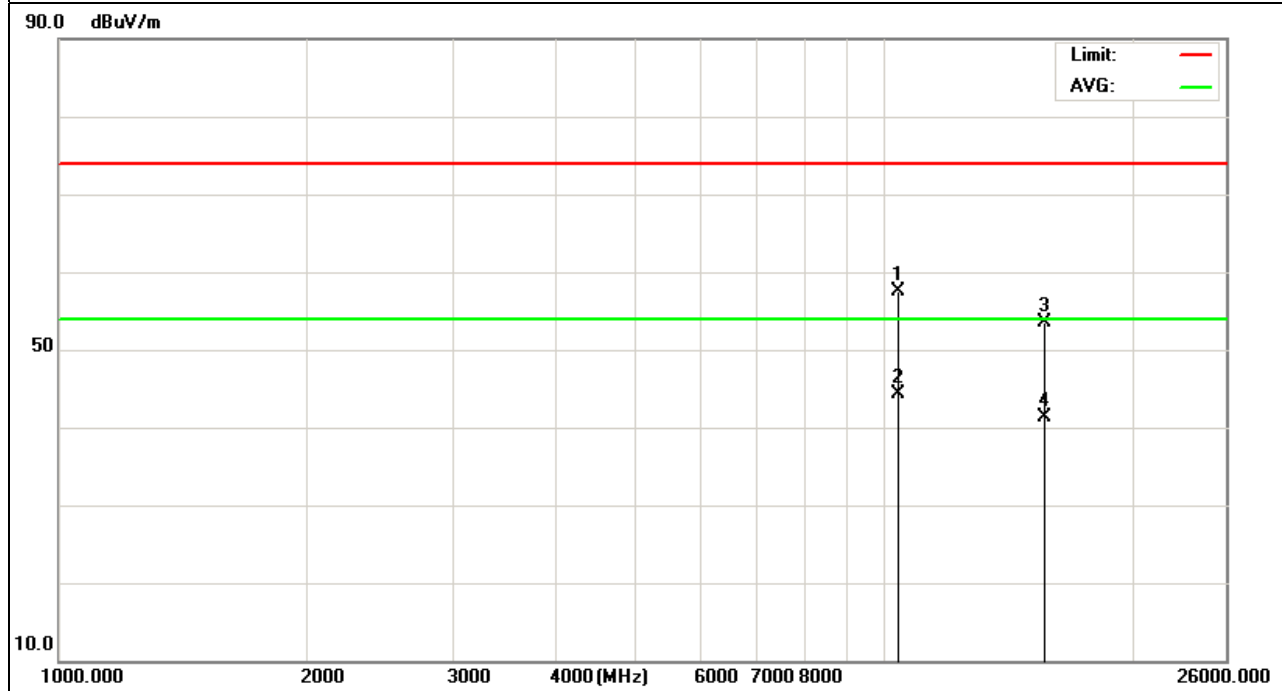
EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	802.11n/5200MHz	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
10400.165	40.46	17.06	57.52	74	-16.48	peak
10400.165	27.3	17.06	44.36	54	-9.64	AVG
15600.229	30.92	22.66	53.58	74	-20.42	peak
15600.229	18.73	22.66	41.39	54	-12.61	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No emission detected above 26GHz.



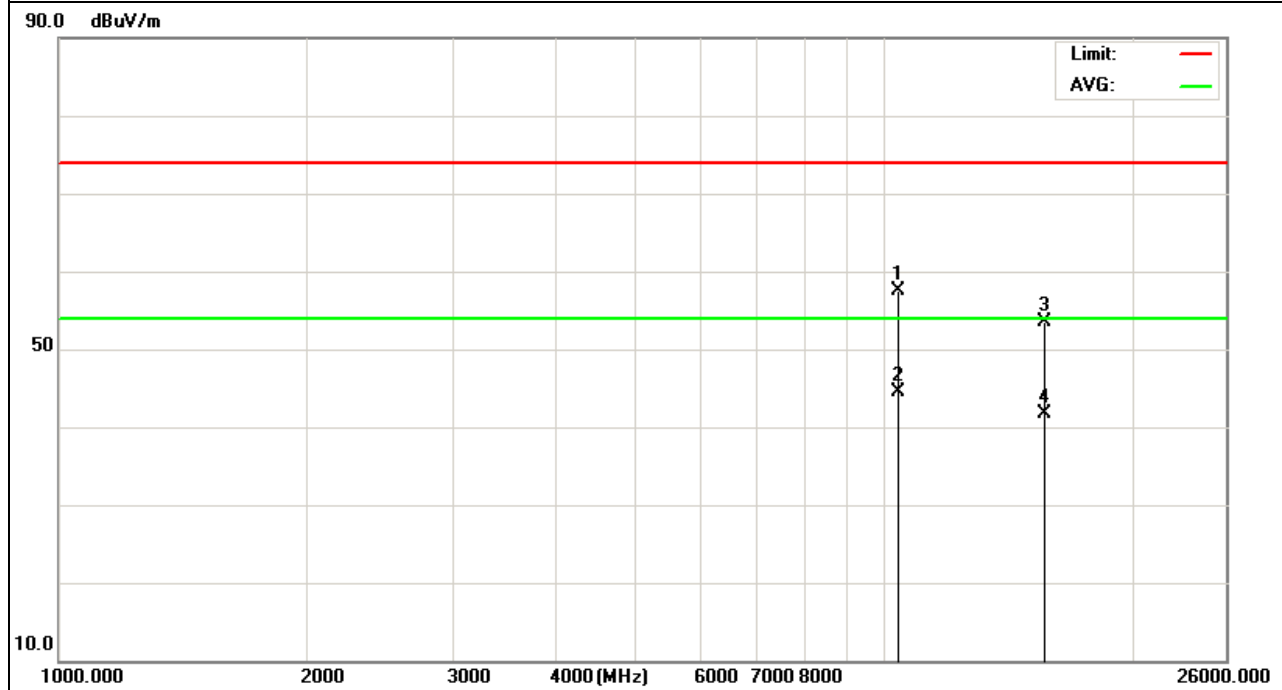
EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	802.11n/5200MHz	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
10400.174	40.41	17.06	57.47	74	-16.53	peak
10400.174	27.52	17.06	44.58	54	-9.42	AVG
15600.255	30.93	22.66	53.59	74	-20.41	peak
15600.255	18.98	22.66	41.64	54	-12.36	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No emission detected above 26GHz



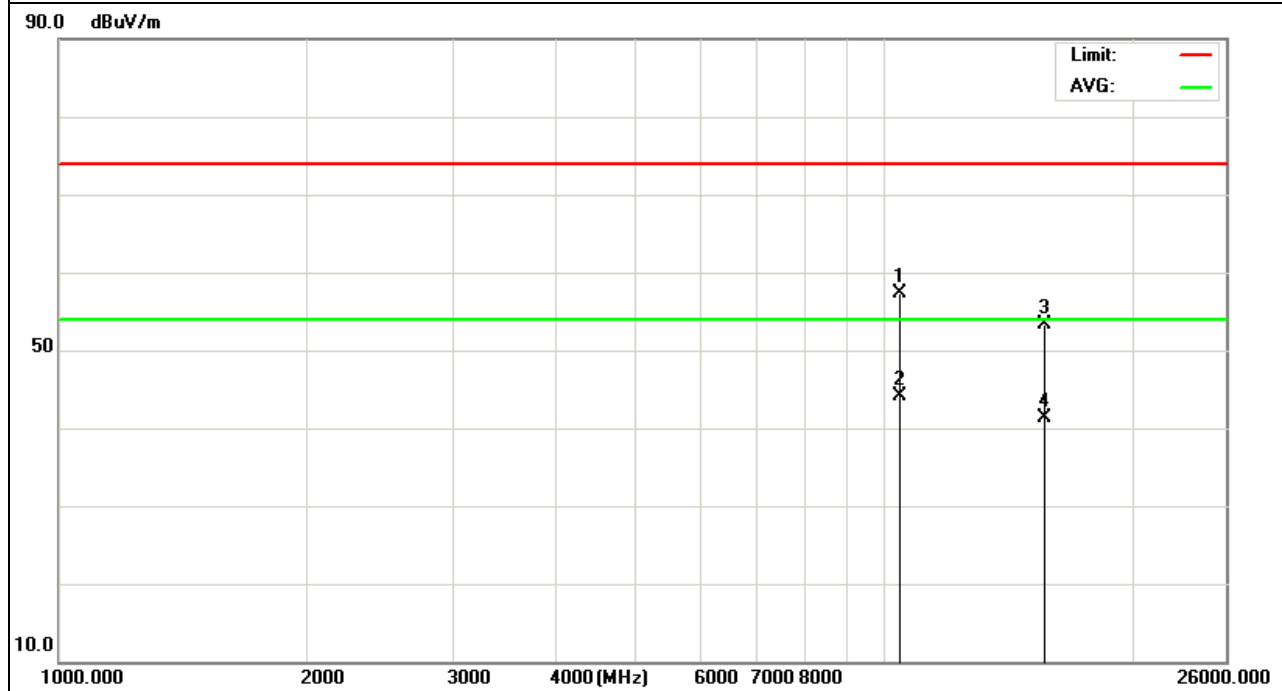
EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	802.11n/5240MHz	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
10480.158	39.57	17.66	57.23	74	-16.77	peak
10480.158	26.53	17.66	44.19	54	-9.81	AVG
15720.252	29.88	23.38	53.26	74	-20.74	peak
15720.252	17.89	23.38	41.27	54	-12.73	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No emission detected above 26GHz.



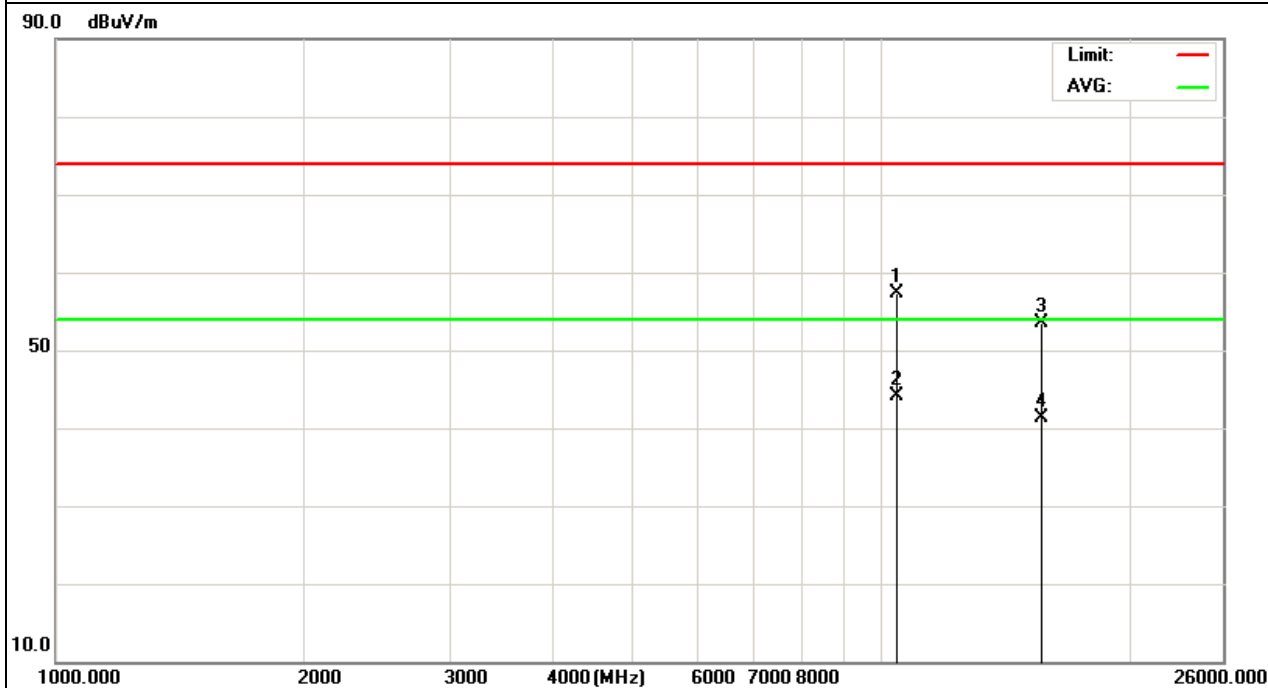
EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	802.11n/5240MHz	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
10480.158	39.7	17.66	57.36	74	-16.64	peak
10480.158	26.44	17.66	44.1	54	-9.9	AVG
15720.252	30.17	23.38	53.55	74	-20.45	peak
15720.252	17.85	23.38	41.23	54	-12.77	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No emission detected above 26GHz.



3.2.1 TEST RESULTS (RADIATED BAND-EGDE MEASUREMENTS)

EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	Channel 36/802.11a	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	49.09	10.39	59.48	74	-14.52	peak
5150	31.2	10.39	41.59	54	-12.41	AVG

EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	Channel 48/802.11a	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5380	42.14	12.68	54.82	74	-19.18	peak
5380	26.75	12.68	39.43	54	-14.57	AVG

EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	Channel 36/802.11a	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	51.96	10.39	62.35	74	-11.65	peak
5150	32.05	10.39	42.44	54	-11.56	AVG

EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	Channel 48/802.11a	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5380	42.85	12.68	55.53	74	-18.47	peak
5380	28.08	12.68	40.76	54	-13.24	AVG

EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	Channel 36/802.11n	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	47.02	10.44	57.46	74	-16.54	peak
5150	31.22	10.44	41.66	54	-12.34	AVG

EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	Channel 48/802.11n	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5380	40.99	12.39	53.38	74	-20.62	peak
5380	26.11	12.39	38.5	54	-15.5	AVG

EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	Channel 36/802.11n	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	48.14	10.44	58.58	74	-15.42	peak
5150	32.31	10.44	42.75	54	-11.25	AVG

EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	Channel 48/802.11n	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5380	42.23	12.39	54.62	74	-19.38	peak
5380	26.28	12.39	38.67	54	-15.33	AVG

4. POWER SPECTRAL DENSITY TEST

4.1 APPLIED PROCEDURES / LIMIT

For the band 5.15 – 5.25 GHz, the peak power spectral density shall not exceed 4 dBm in any 1MHz band. For the band 5.725-5.825 GHz, the peak power spectral density shall not exceed 17 dBm in any 1 1MHz band. If transmitting antenna directional gain is greater than 6 dBi, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

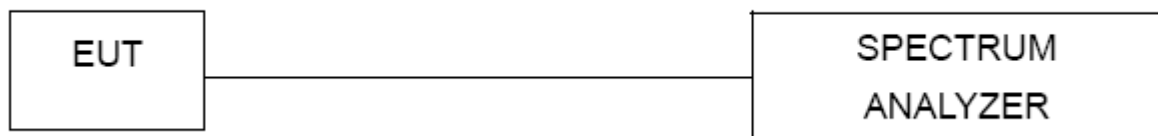
4.1.1 TEST PROCEDURE

1. The setting follows Method SA-1 of FCC KDB 789033 D01 General UNII Test Procedures v01.
 - Set span to encompass the entire emission bandwidth (EBW) of the signal.
 - Set RBW = 1 MHz.
 - Set VBW \geq 3 MHz.
 - Number of points in sweep \geq 2 Span / RBW.
 - Sweep time = auto.
 - Detector = Sample
 - Trace average at least 100 traces in power averaging mode.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Each plot has already offset with cable loss, and attenuator loss.
4. Use the peak search to the highest PPSD and record it.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



4.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

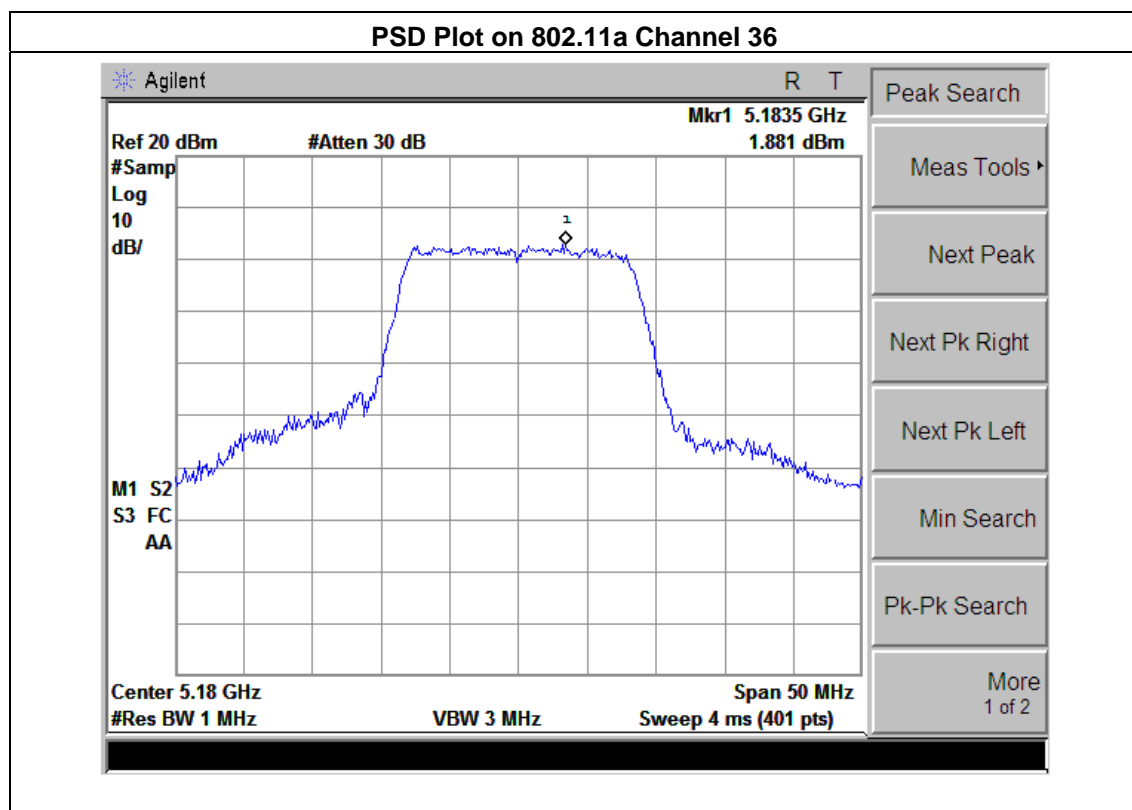
4.1.5 TEST RESULTS

EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	TX a Mode		

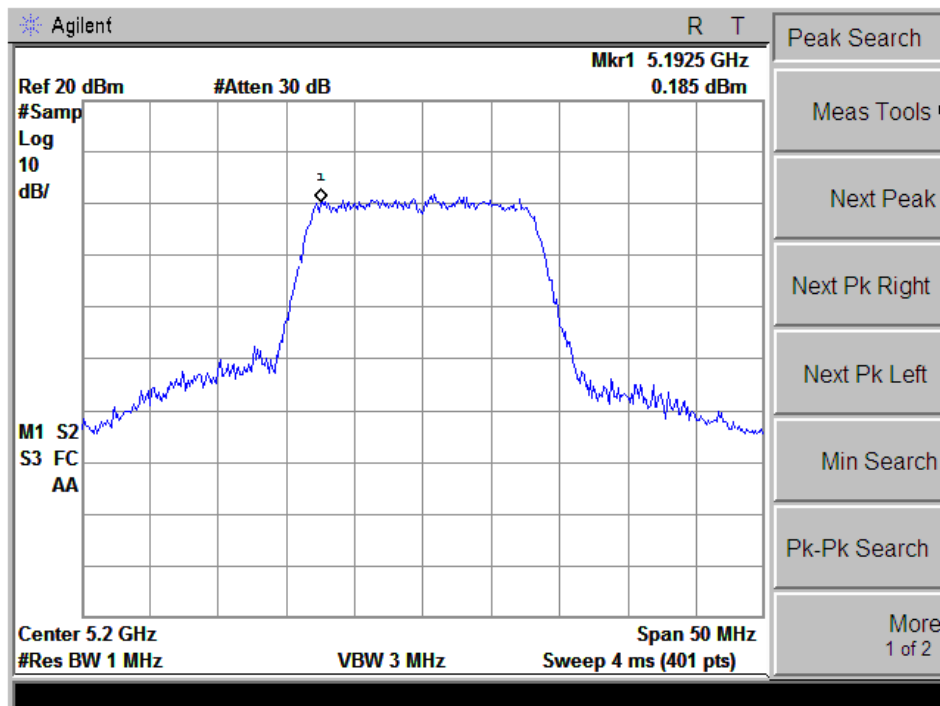
Channel	Frequency	802.11a Measured PSD (dBm)/A	802.11a Measured PSD (dBm)/B	802.11a Measured PSD	Limit (dBm)	Result
36	5180	1.881	-1.212	3.611	4	PASS
40	5200	0.185	-0.124	3.043	4	PASS
46	5240	1.085	-0.135	3.527	4	PASS

Note:

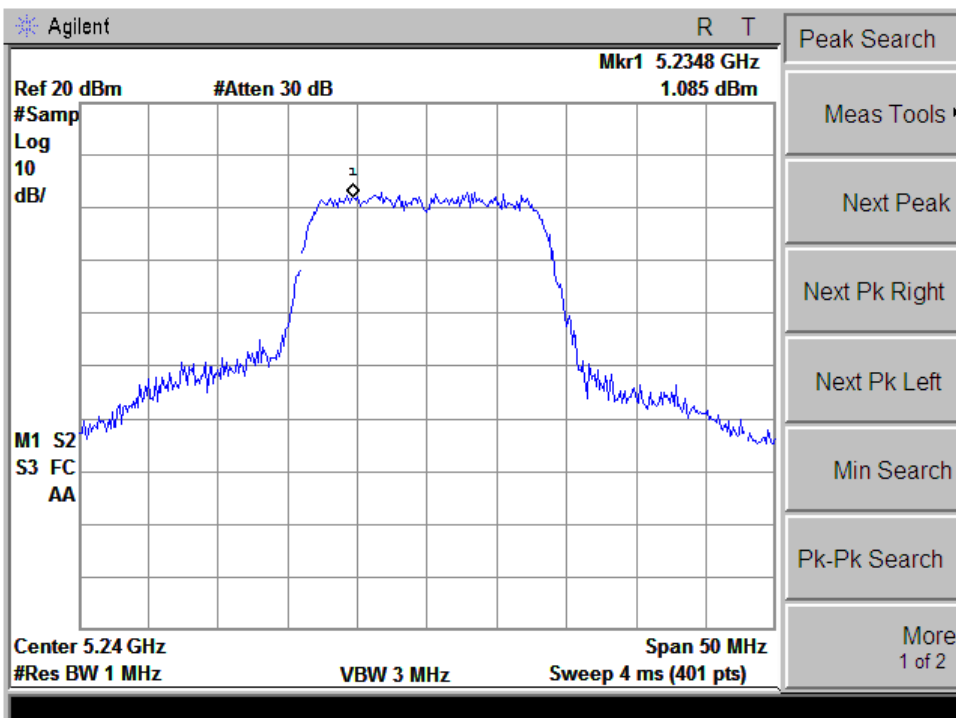
A(B) Represent the value of antennaA and B,The worst data is A Antenna a ,only shown Antenna A Plot.



PSD Plot on 802.11a Channel 40



PSD Plot on 802.11a Channel 46

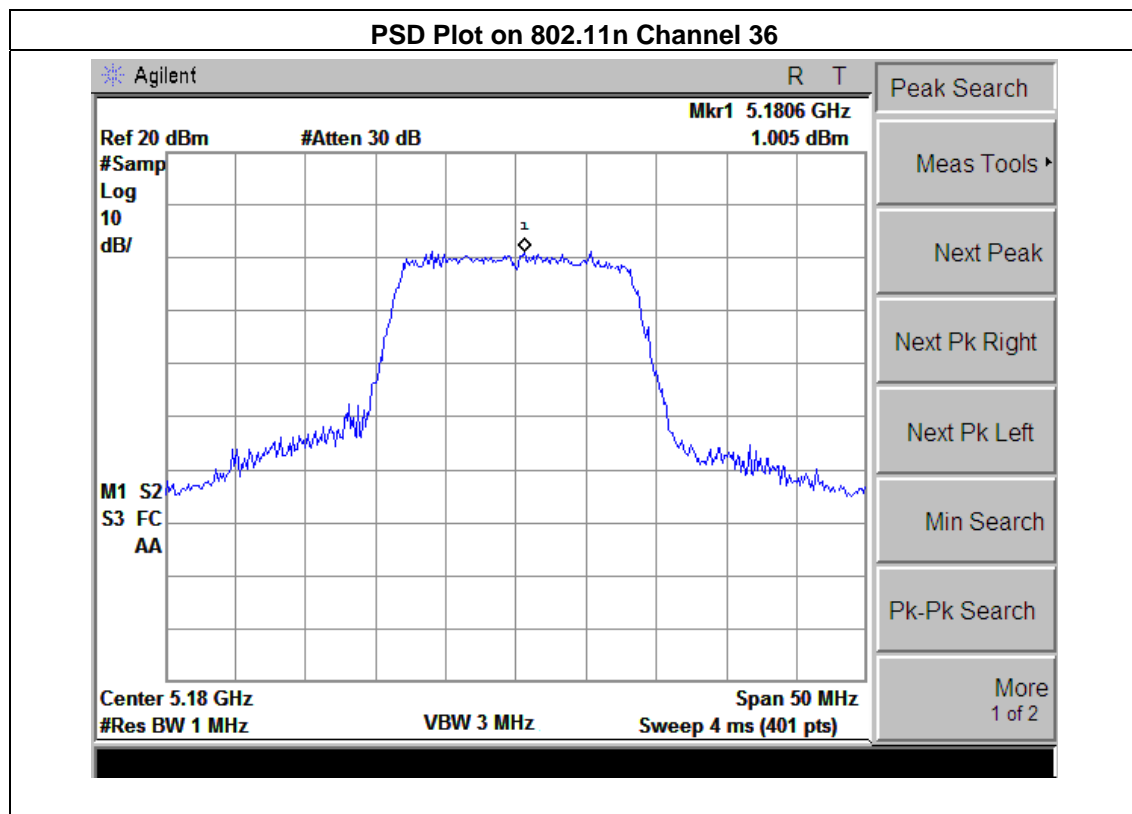


EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	TX n Mode(20)		

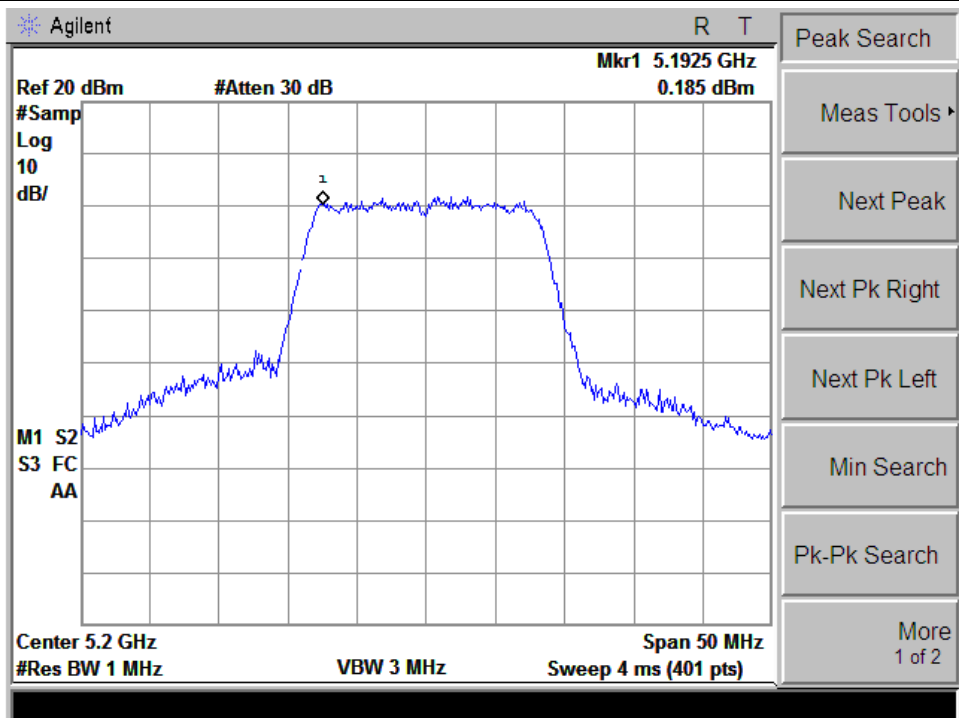
Channel	Frequency	802.11n Measured PSD (dBm)/A	802.11n Measured PSD (dBm)/B	802.11n Measured PSD	Limit (dBm)	Result
36	5180	1.005	-1.232	3.039	4	PASS
40	5200	0.185	-0.165	3.023	4	PASS
46	5240	1.360	-0.143	3.683	4	PASS

Note:

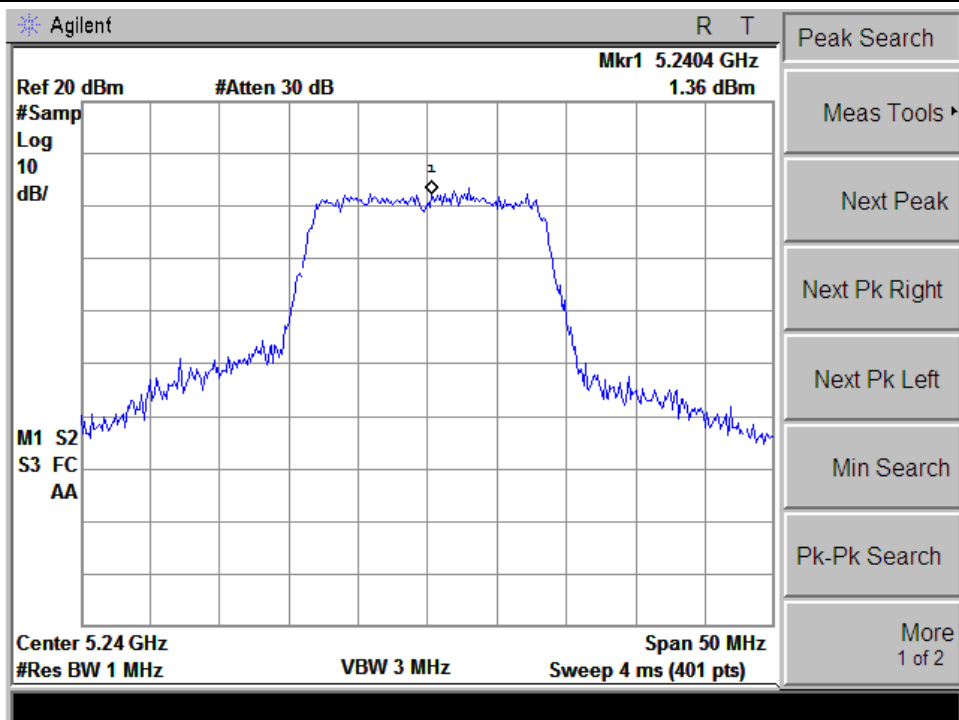
A(B) Represent the value of antennaA and B,The worst data is A Antenna a ,only shown Antenna A Plot.



PSD Plot on 802.11n Channel 40



PSD Plot on 802.11n Channel 46



5. 26 BANDWIDTH TEST

5.1 APPLIED PROCEDURES / LIMIT

See list of measuring instruments of this test report.

5.1.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D01 General UNII Test Procedures v01.
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW \geq RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



5.1.4 EUT OPERATION CONDITIONS

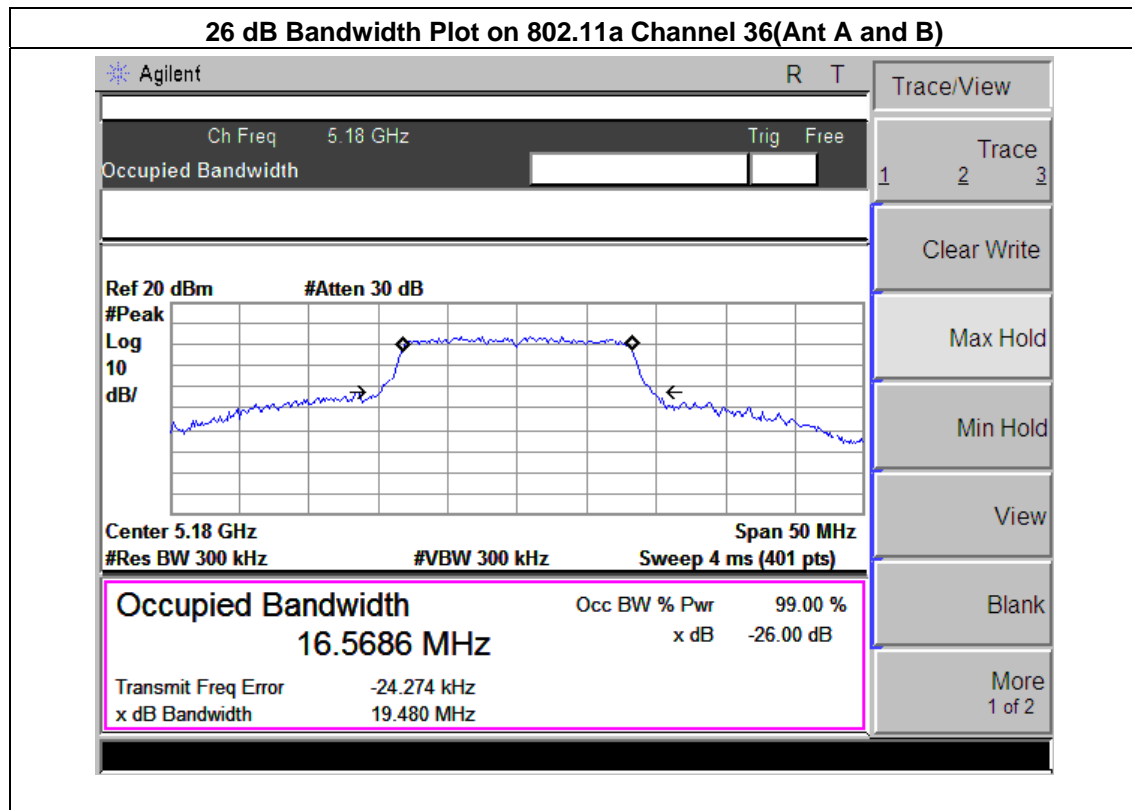
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.5 TEST RESULTS

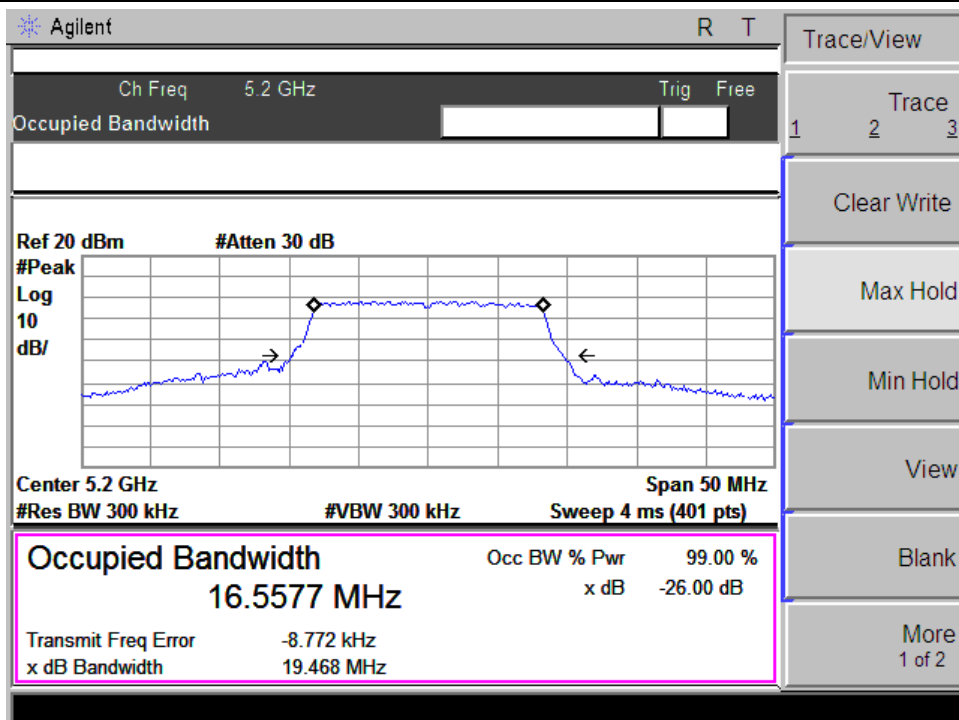
EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	TX a Mode		

Frequency (MHz)	802.11a 26dB Bandwidth (MHz)	Pass/Fail
5180	19.48	N/A
5200	19.46	N/A
5240	19.57	N/A

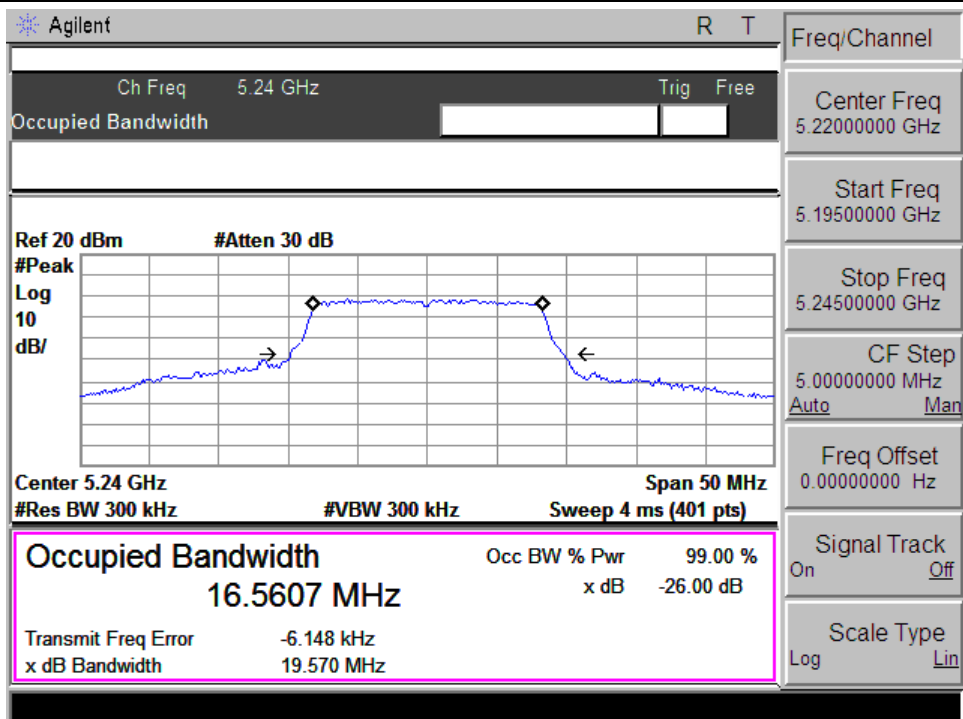
Note: N/A, 26dB bandwidth is reporting only.



26 dB Bandwidth Plot on 802.11a Channel 40(Ant A and B)



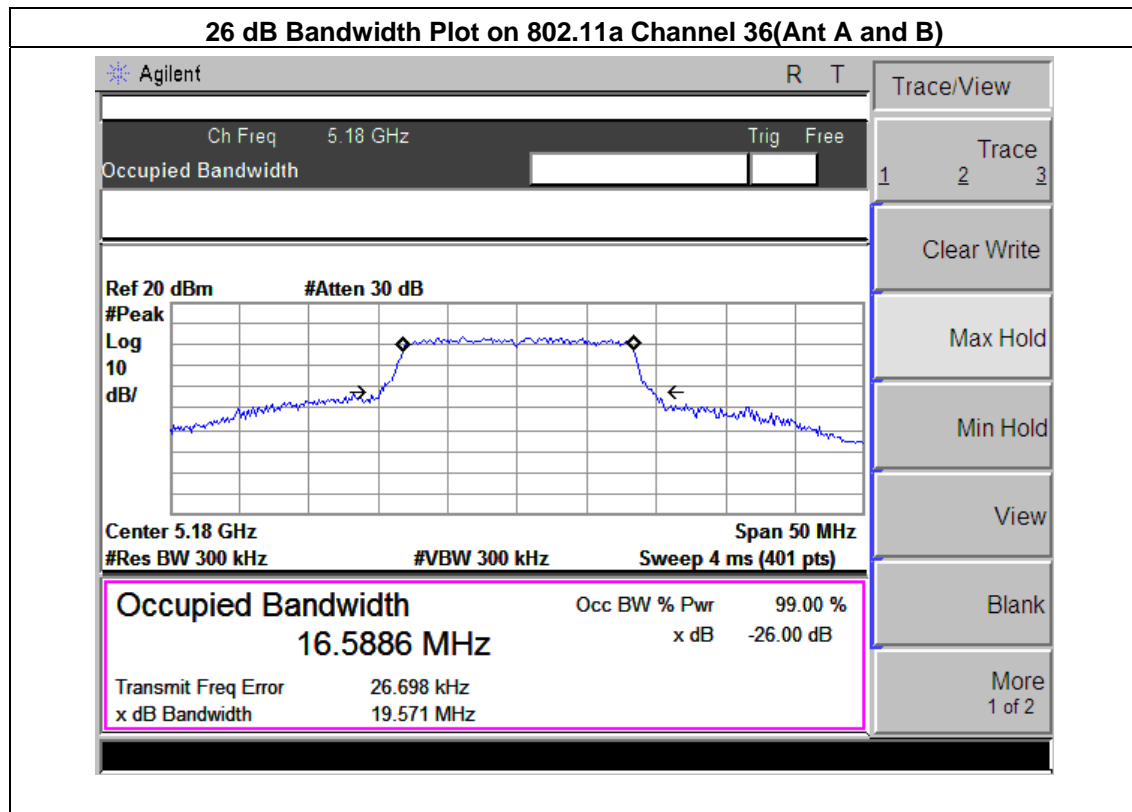
26 dB Bandwidth Plot on 802.11a Channel 46(Ant A and B)



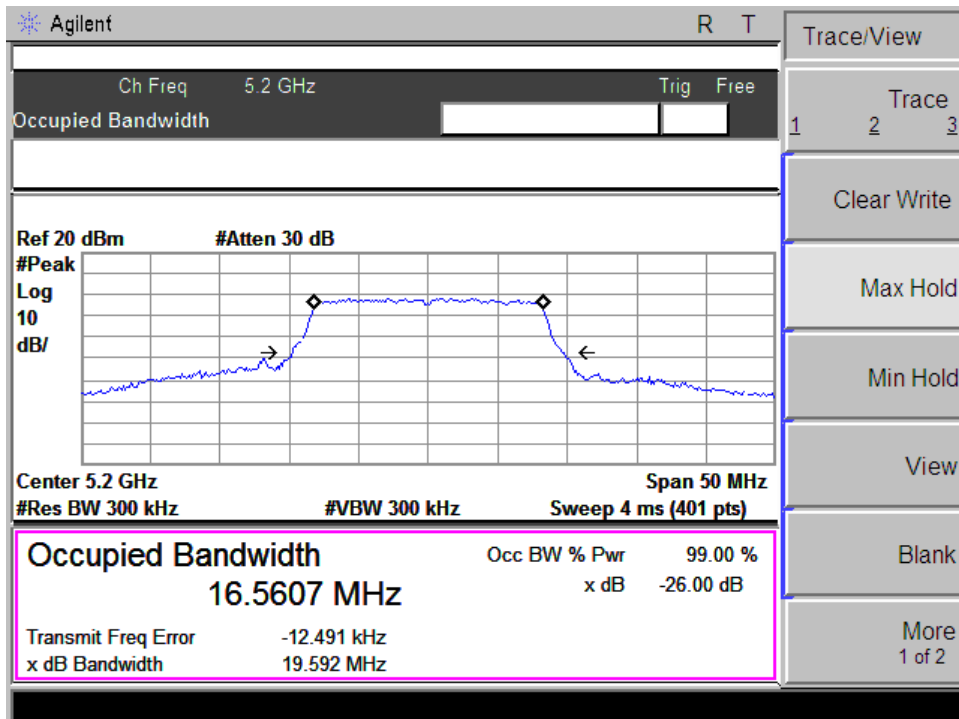
EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	TX n Mode		

Frequency (MHz)	802.11n 26dB Bandwidth (MHz)	Pass/Fail
5180	19.57	N/A
5200	19.59	N/A
5240	19.59	N/A

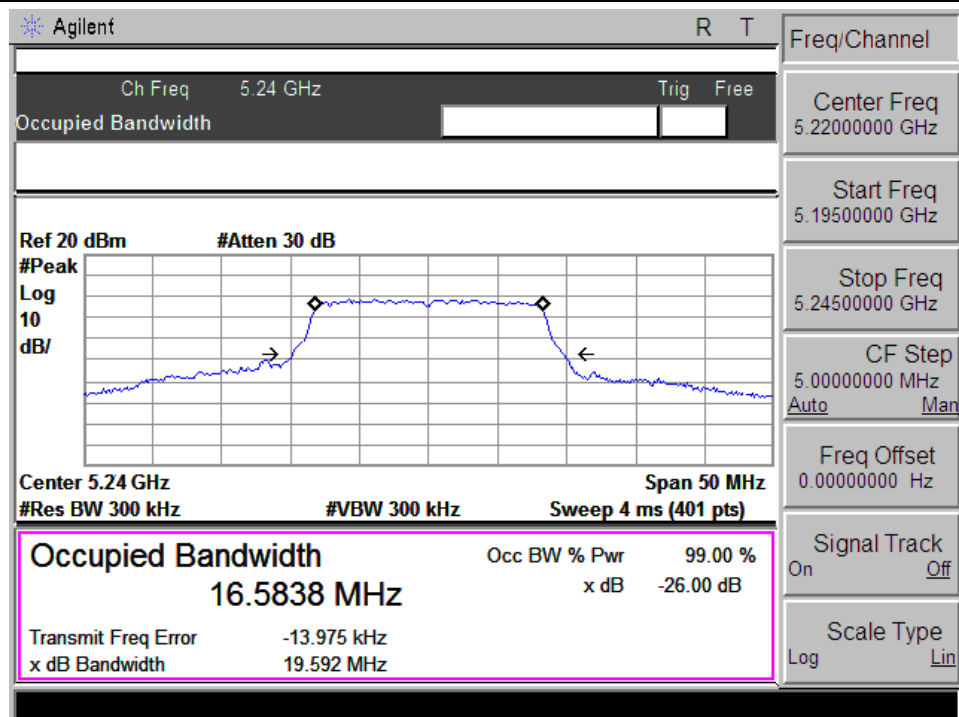
Note: N/A, 26dB bandwidth is reporting only.



26 dB Bandwidth Plot on 802.11a Channel 40(Ant A and B)



26 dB Bandwidth Plot on 802.11a Channel 44(Ant A and B)



6. MAXIMUM CONDUCTED OUTPUT POWER

6.1 APPLIED PROCEDURES / LIMIT

For the band 5.15~5.25 GHz, the maximum conducted output power shall not exceed the lesser of 50 mW (17dBm) or $4 \text{ dBm} + 10\log B$, where B is the 26 dB emissions bandwidth in MHz. If transmitting antenna directional gain is greater than 6 dBi. For the band 5.725-5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or $17 \text{ dBm} + 10\log B$, where B is the 26-dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

6.1.1 TEST PROCEDURE

- The duty cycle of WLAN 802.11a/n were 100 % for 802.11a and 100 % for 802.11n (BW 20MHz).

The testing follows Method SA-1 of FCC KDB 789033 D01 General UNII Test Procedures v01.

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz.
- Set VBW \geq 3 MHz.
- Number of points in sweep \geq 2 Span / RBW.
- Sweep time = auto.
- Detector = Sample
- Trace average at least 100 traces in power averaging mode.
- Compute power by integrating the spectrum across the 26 dB EBW of the signal using the spectrum analyzer's band power measurement function with band limits set equal to the EBW band edges. If the spectrum analyzer does not have a band power function, sum the spectrum levels at 1 MHz intervals extending across the 26 dB EBW of the spectrum.

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



6.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

6.1.5 TEST RESULTS

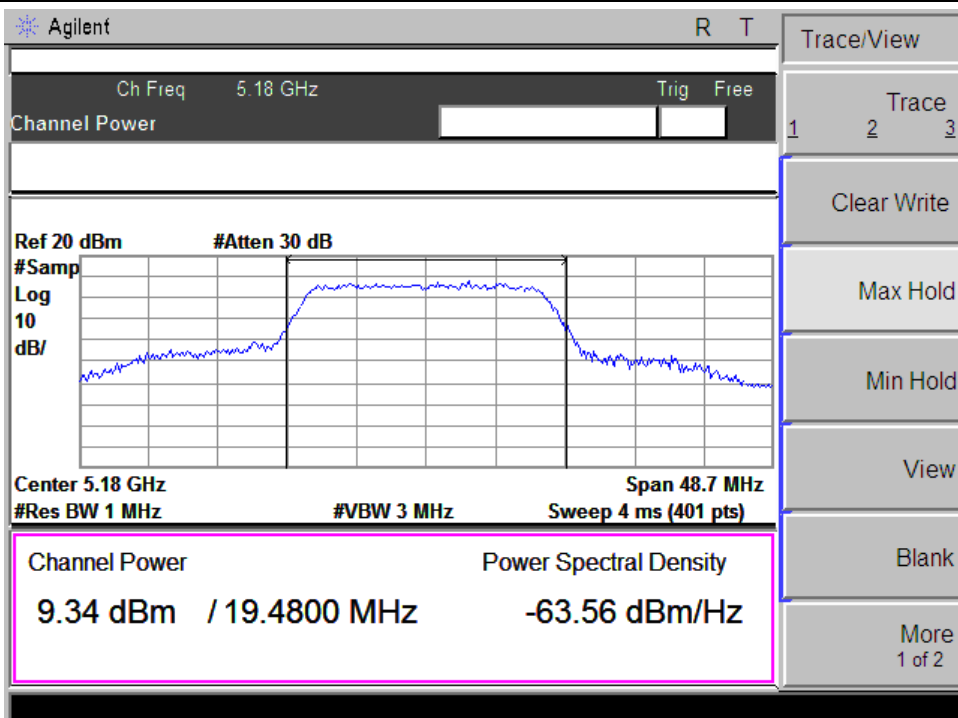
EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	802.11a/n		

802.11a Mode					
Test Channe	Frequency	Output Power/A	Output Power/B	Total Output Power	LIMIT
	(MHz)	dBm	dBm	dBm	dBm
36	5180	9.34	8.43	11.92	17
40	5200	9.59	8.21	11.96	17
46	5240	9.02	8.14	11.61	17
802.11n(20) Mode					
36	5180	9.51	8.54	12.06	17
40	5200	9.70	8.42	12.12	17
46	5240	9.30	8.31	11.84	17

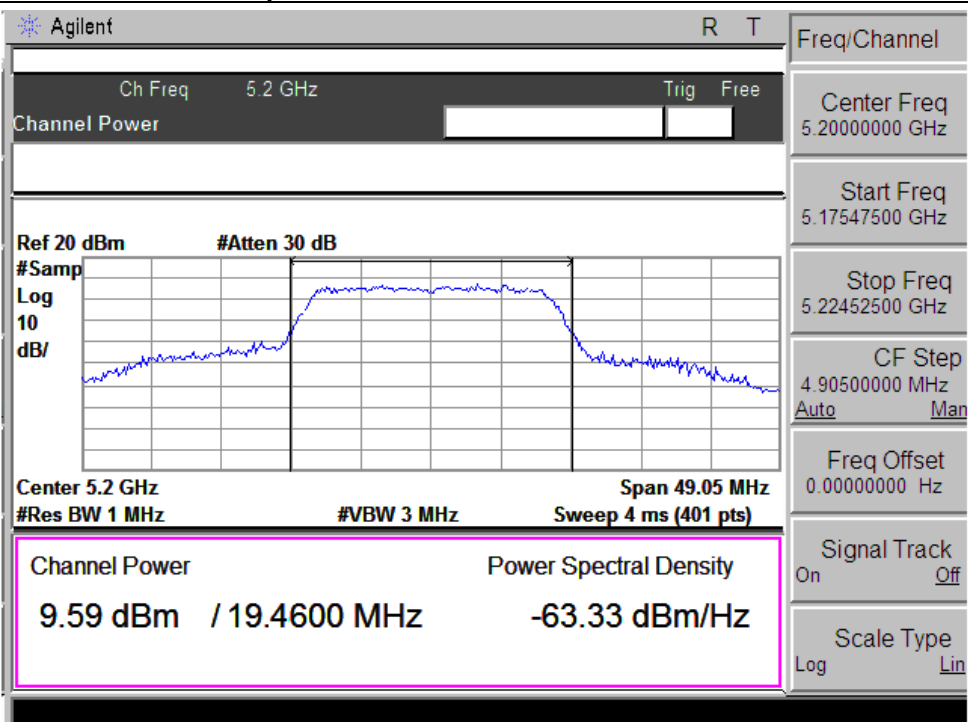
Note:

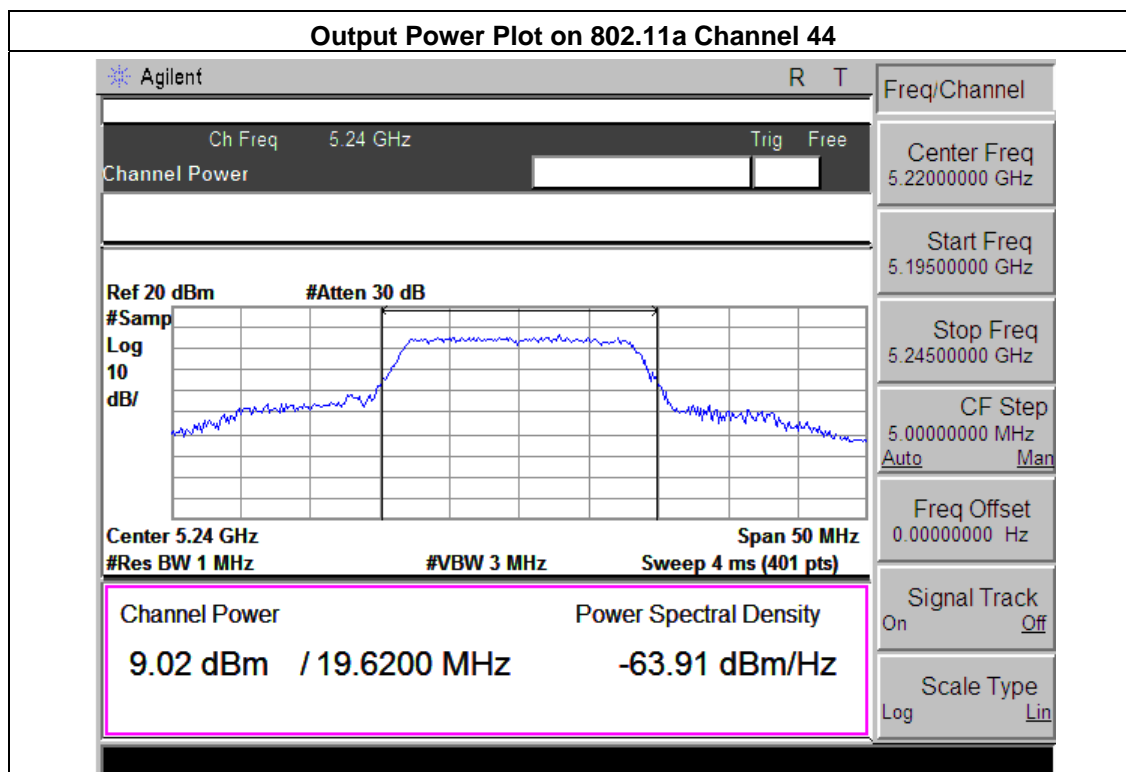
1. For the band 5.15~5.25 GHz, the maximum conducted output power shall not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log (26dB BW)
2. For the band 5.725-5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 17 dBm + 10log (26dB BW)
- 3.A(B) Represent the value of antennaA and B,The worst data is A Antenna a ,only shown Antenna A Plot.

Output Power Plot on 802.11a Channel 36

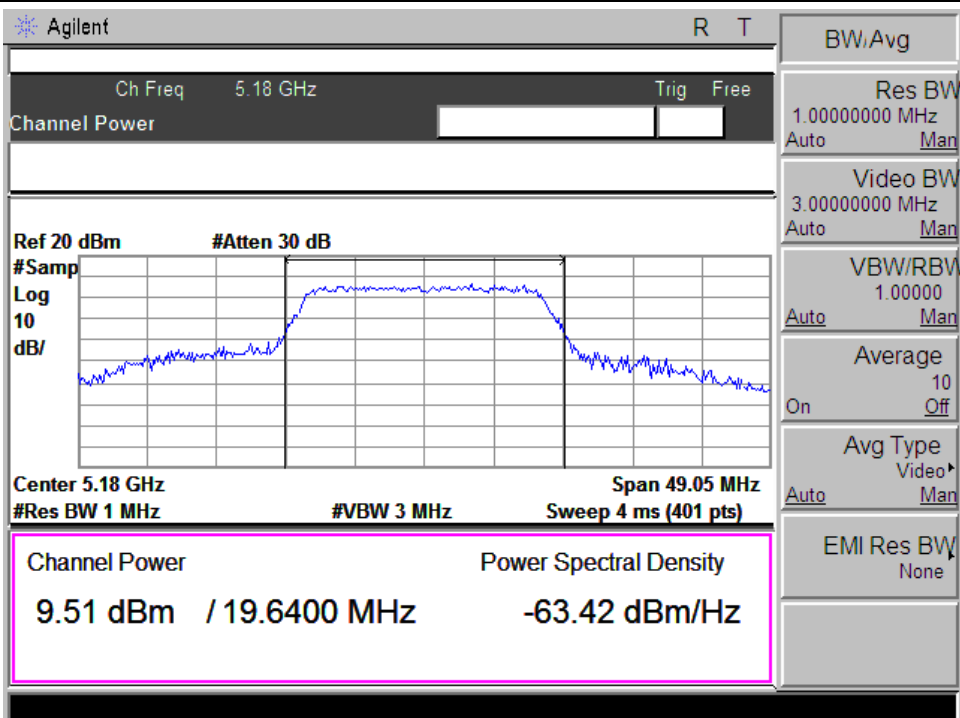


Output Power Plot on 802.11a Channel 40

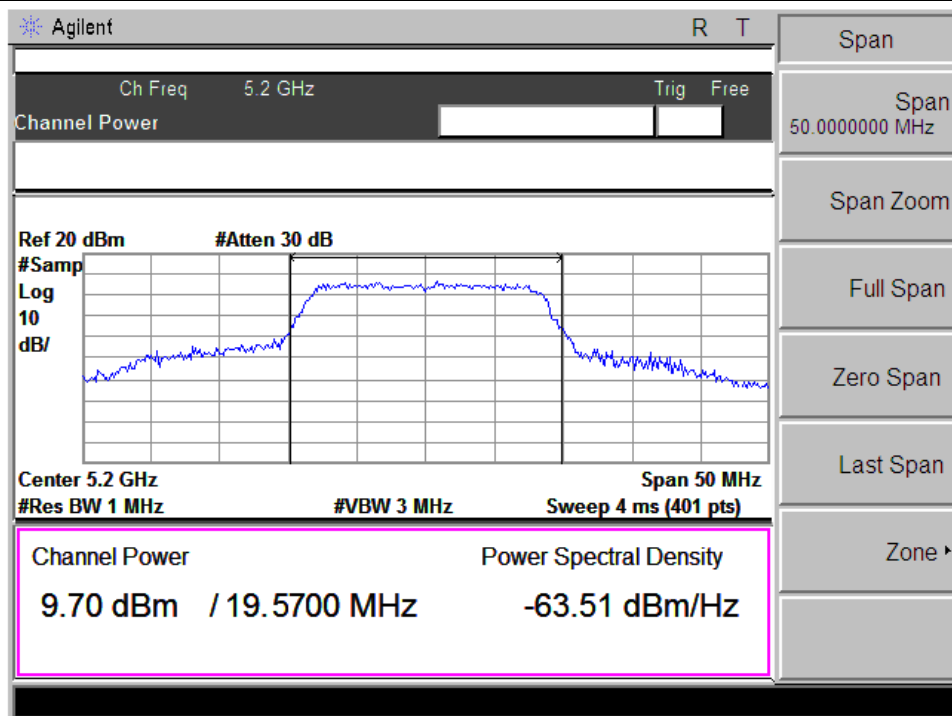


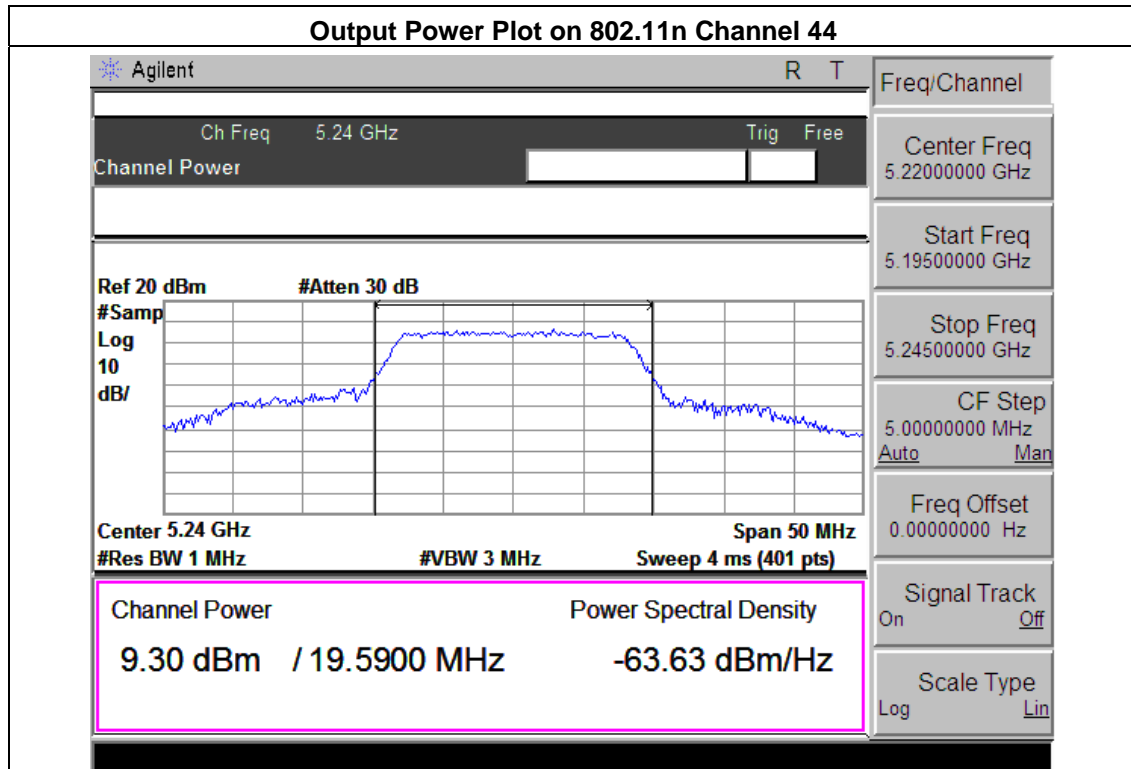


Output Power Plot on 802.11n Channel 36



Output Power Plot on 802.11n Channel 40





7. PEAK EXCURSION RATIO MEASUREMENT

7.1 STANDARD REQUIREMENT

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

7.2 MEASURING INSTRUMENTS

See list of measuring instruments of this test report.

7.3 TEST PROCEDURES

1. The transmitter output is connected to the spectrum analyzer.
2. Set the spectrum analyzer span to view the entire emission bandwidth.
3. Find the maximum of the peak-max-hold spectrum.
 - * Set RBW = 1 MHz.
 - *Set VBW \leq 3 MHz.
 - *Detector = peak.
 - *Trace mode = max-hold.
 - *Allow the sweeps to continue until the trace stabilizes.
 - *Use the peak search function to find the peak of the spectrum.
4. Use the procedure found under section 3.3 to measure the PPSD.
5. Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.

7.3 TEST SETUP



7.4 TEST RESULT OF PEAK EXCURSION RATIO

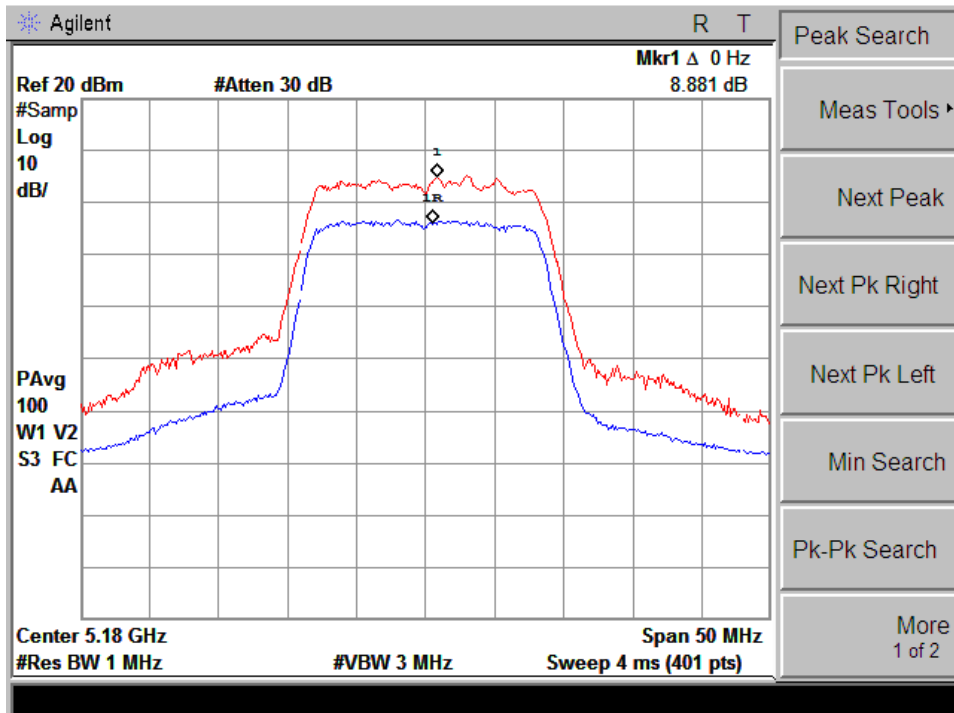
EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	802.11a/n		

802.11a Mode				
Test Channe	Frequency	Peak Excursion Ratio	Peak Excursion Ratio	LIMIT
	(MHz)	dB	dB	dB
36	5180	8.881	7.432	13
40	5200	8.002	7.865	13
46	5240	6.726	5.432	13
802.11n(20) Mode				
36	5180	6.229	6.021	13
40	5200	8.165	7.432	13
46	5240	8.188	7.213	13

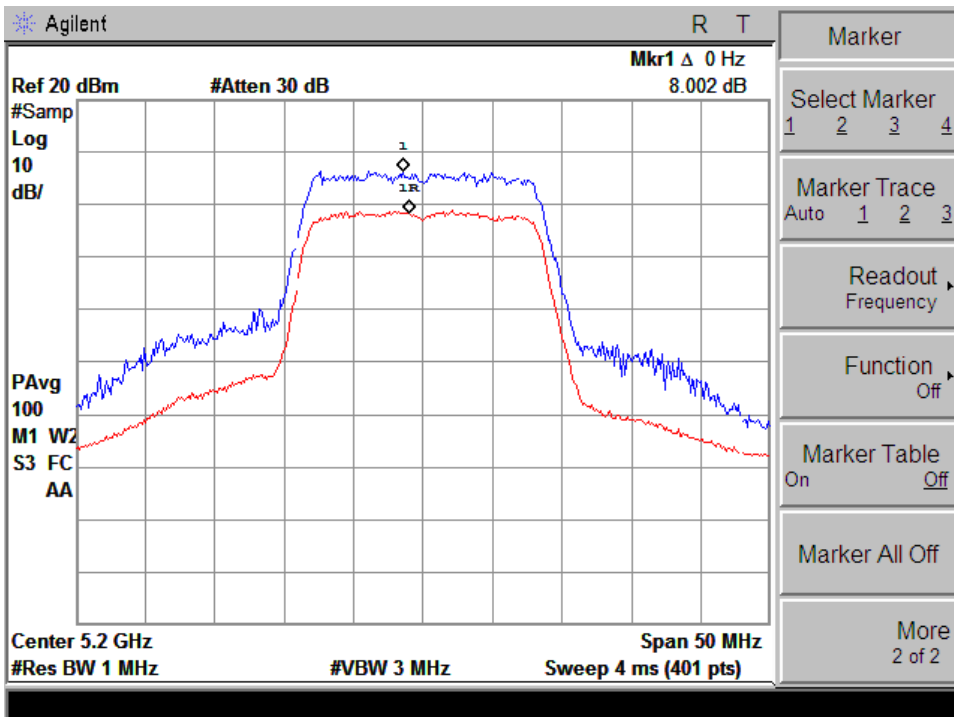
NOTE:

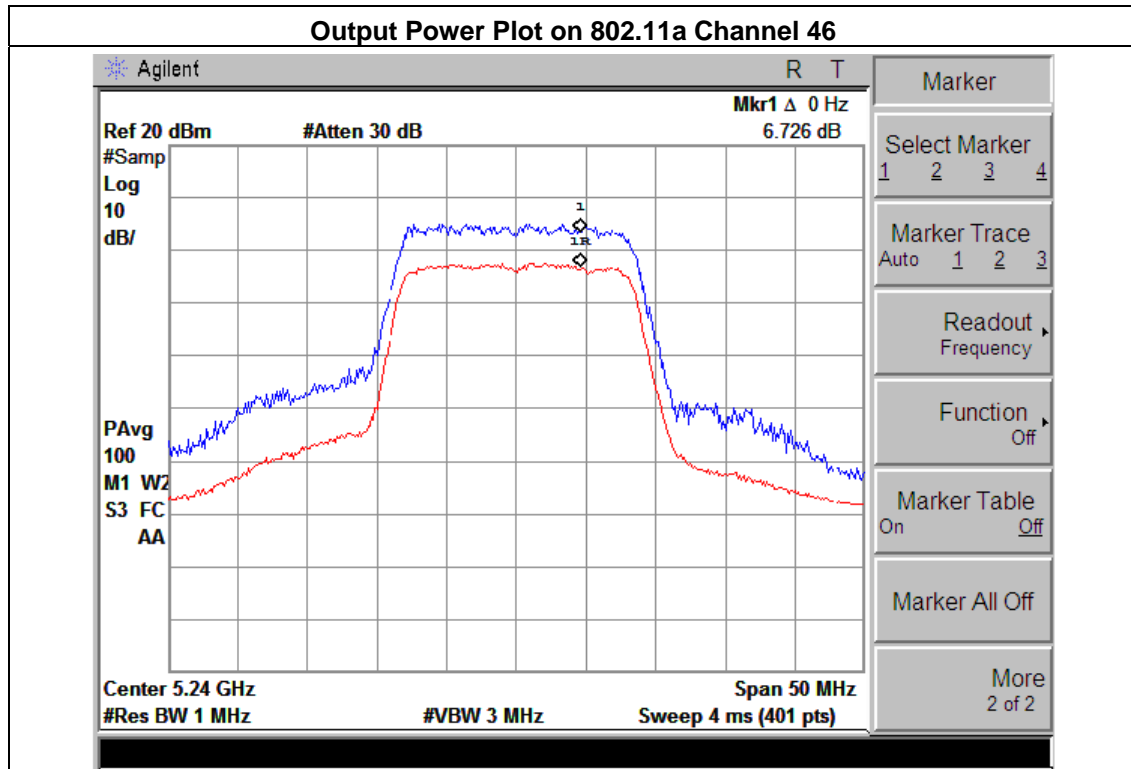
A(B) Represent the value of antennaA and B,The worst data is A Antenna a ,only shown Antenna A Plot.

Output Power Plot on 802.11a Channel 36

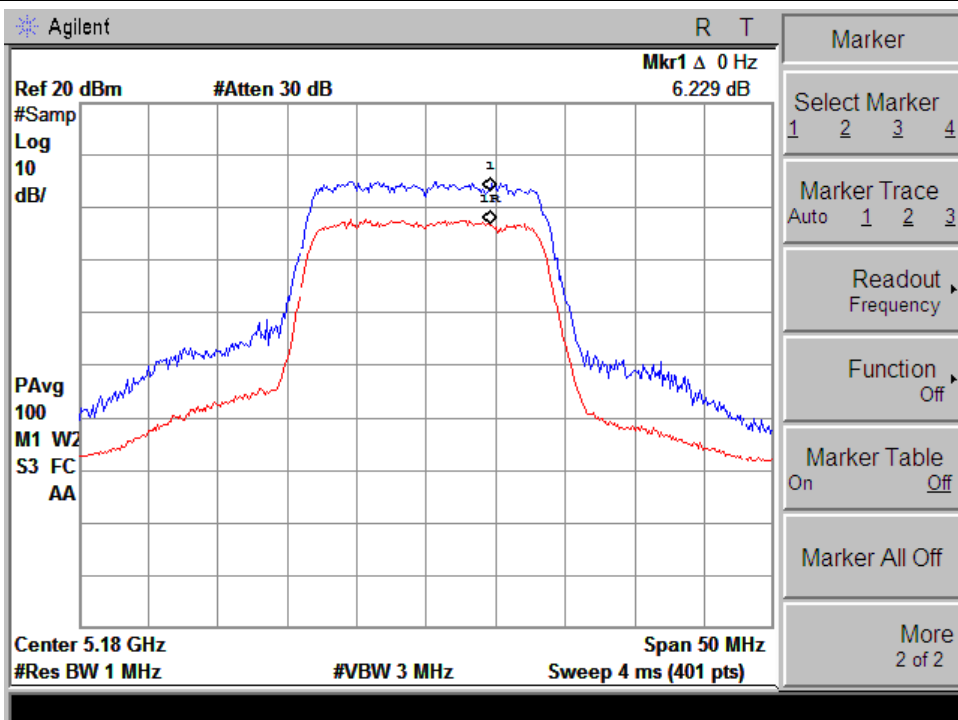


Output Power Plot on 802.11a Channel 40

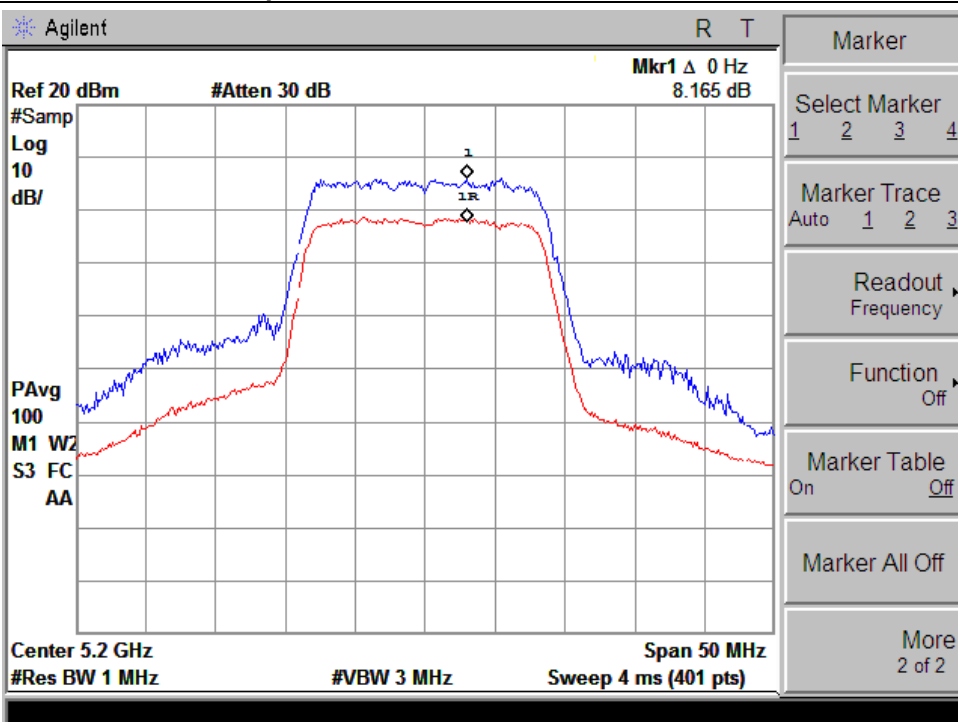


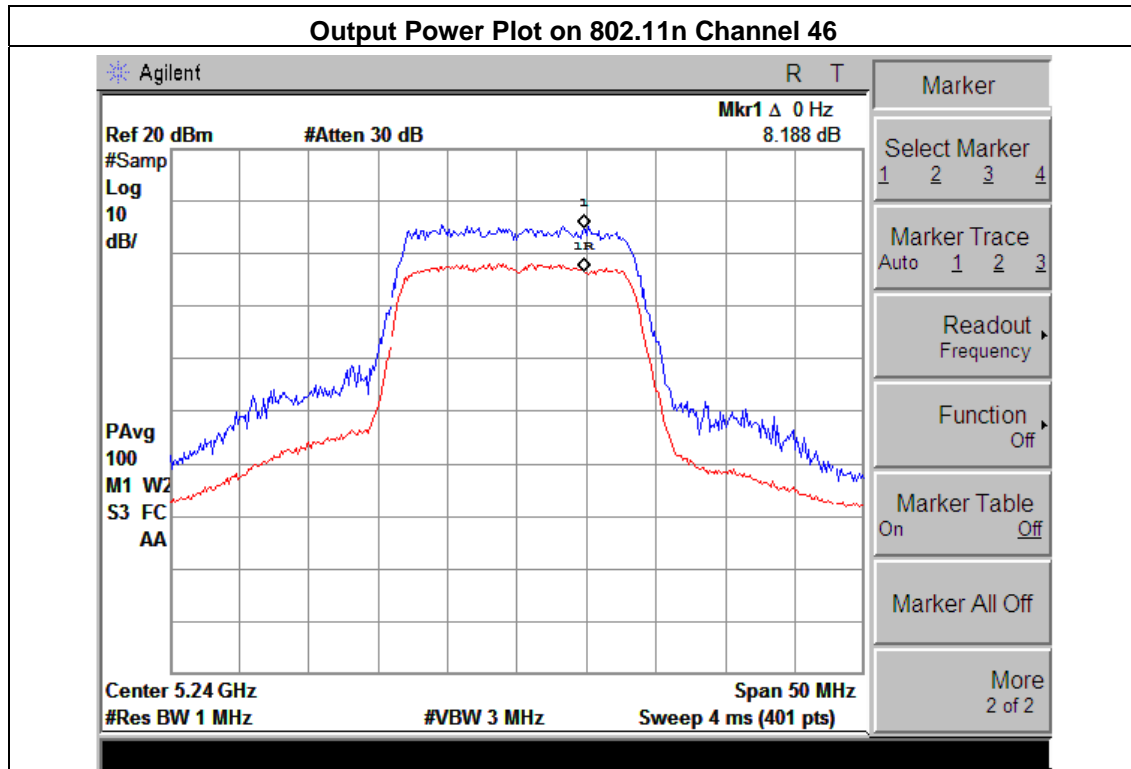


Output Power Plot on 802.11n Channel 36



Output Power Plot on 802.11n Channel 40





8. FREQUENCY STABILITY MEASUREMENT

8.1 LIMIT OF FREQUENCY STABILITY

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an Emission is maintained within the band of operation under all conditions of normal operation as specified in the user' s manual.

8.2 MEASURING INSTRUMENTS

See list of measuring instruments of this test report.

8.3 TEST PROCEDURES

1. To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
2. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10dB lower than the measured peak value.
3. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

8.4 TEST SETUP



EUT :	300Mbps Wireless USB Adapter	Model Name :	MTO-WN820NM
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5.0V from PC AC 120V/60Hz
Test Mode :	802.11a/n		

Voltage Vs. Frequency Stability:

Voltage	Measurement Frequency(MHz)
(V)	5200
126.50	5199.9647
110.00	5199.9646
93.50	5199.9641
Max.Deviation(MHz)	0.035900
Max.Deviation(ppm)	6.90

Temperature Vs. Frequency Stability:

Temperature	Measurement Frequency(MHz)
(°C)	5200
-30	5199.9656
-20	5199.9648
-10	5199.9660
0	5199.9646
10	5199.9675
20	5199.9645
30	5199.9668
40	5199.9664
50	5199.9666
Max.Deviation(MHz)	0.035500
Max.Deviation(ppm)	6.82

9. AUTOMATICALLY DISCONTINUE TRANSMISSION

9.1 LIMIT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

9.2 TEST RESULT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

During no any information transmission, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission

10. ANTENNA REQUIREMENT

10.1 STANDARD REQUIREMENT

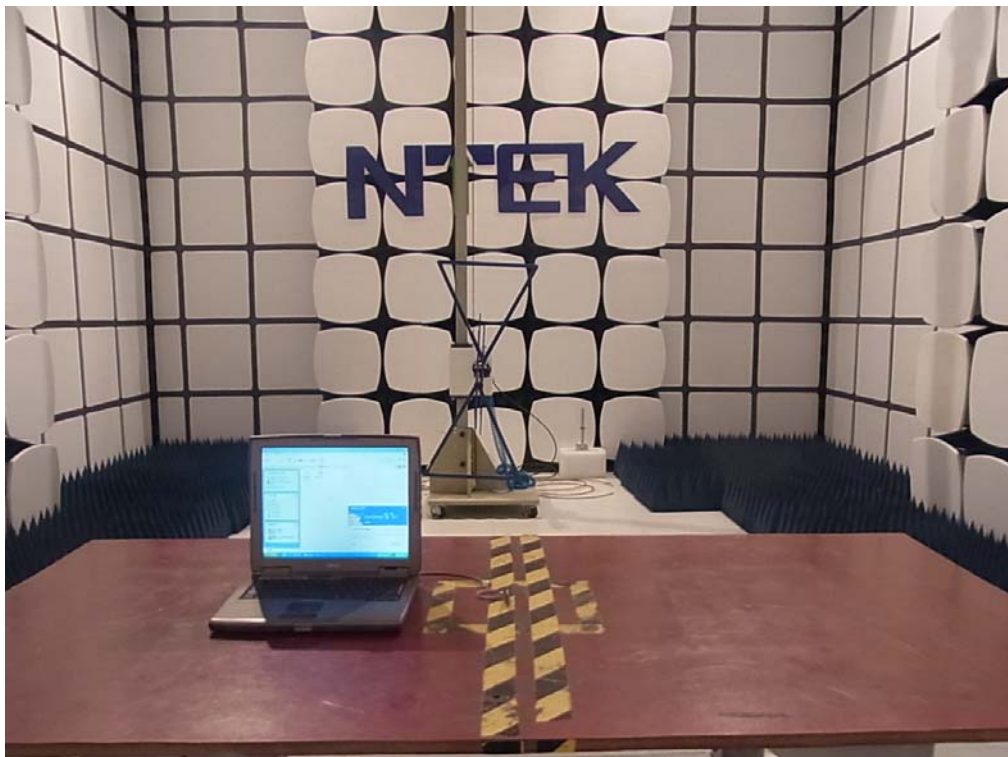
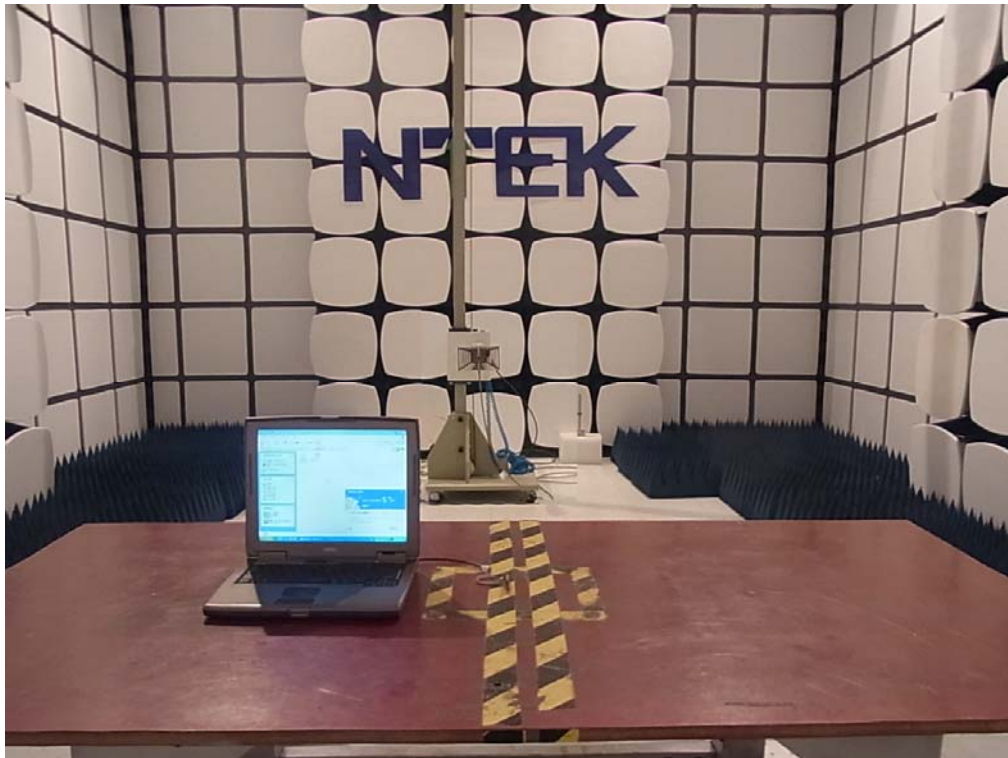
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

10.2 EUT ANTENNA

The EUT antenna is Integrated(PCB) antenna. It comply with the standard requirement.

11. EUT TEST PHOTO

Radiated Measurement Photos





Conducted Measurement Photos

