



FCC RADIO TEST REPORT

FCC ID:2AD37JUE302

Product : Wireless N300 Dual Band USB Adapter

Trade Name : j5 create

Model Name : JUE302

Serial Model : N/A

Report No. : NTEK-2015NT0113211F1

Prepared for

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Prepared by

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TEST RESULT CERTIFICATION

Applicant's name KaiJet Technology International Limited
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Manufacture's Name... SHENZHEN MTN ELECTRONICS CO.,LTD.
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Product description

Product name Wireless N300 Dual Band USB Adapter

Model and/or type JUE302
reference

Serial Model N/A

Standards FCC Part15.407

Test procedure ANSI C63.4-2009 and KDB 789033 D01 General UNII Test Procedures
 Old Rules v01r04

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.

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Date of Test

Date (s) of performance of tests 13 Jan. 2015 ~23 Jan. 2015

Date of Issue 23 Jan. 2015

Test Result **Pass**

Testing Engineer : Kyle Xu
 (Kyle Xu)

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.407) , Subpart E			
Standard Section	Test Item	Judgment	Remark
FCC §15.207	AC Power Line Conducted Emissions	PASS	
FCC §15.209(a), 15.407(b)	Spurious Radiated Emissions	PASS	
FCC §15.407(a)	26 dB and 99% Emission Bandwidth	PASS	
FCC §407(a)(1)	Peak Output Power Measurement	PASS	
FCC §2.1051, §15.407(b)	Band Edges	PASS	
FCC §15.407(a)(1)	Power Spectral Density	PASS	
FCC §15.407(a)(6)	Peak Excursion Ratio	PASS	
IC RSS-210 §2.3	Receiver Spurious Radiated Emissions	PASS	
FCC §2.1051, §15.407(b)	Spurious Emissions at Antenna Terminals	PASS	
FCC §15.203	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	Wireless N300 Dual Band USB Adapter	
Trade Name	j5 create	
Model Name	JUE302	
Product Description	The EUT is a Wireless N300 Dual Band USB Adapter	
	Operation Frequency:	802.11a/n(20):5180 MHz ~ 5240 MHz 802.11n(40): 5190 MHz ~ 5230 MHz
	Modulation Type:	OFDM (BPSK / QPSK / 16QAM / 64QAM)
	Bit Rate of Transmitter	802.11a:54/48/36/24/18/12/9/6Mbps 802.11n(20MHz):150/144.44/130/117/115.56/104/86.67/78/52/6.5Mbps 802.11n(40MHz):300/270/240/180/150/120/108/90/54 Mbps
	Number Of Channel	802.11a/n20MHz:7CH 802.11n40MHz:2CH
	Antenna Designation:	Please see Note 3.
	Antenna Gain (dBi)	Please see Note 3.
	Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.	
Channel List	Please refer to the Note 2.	
Ratings	DC 5.0V	
Adapter	N/A	
Battery	N/A	
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.

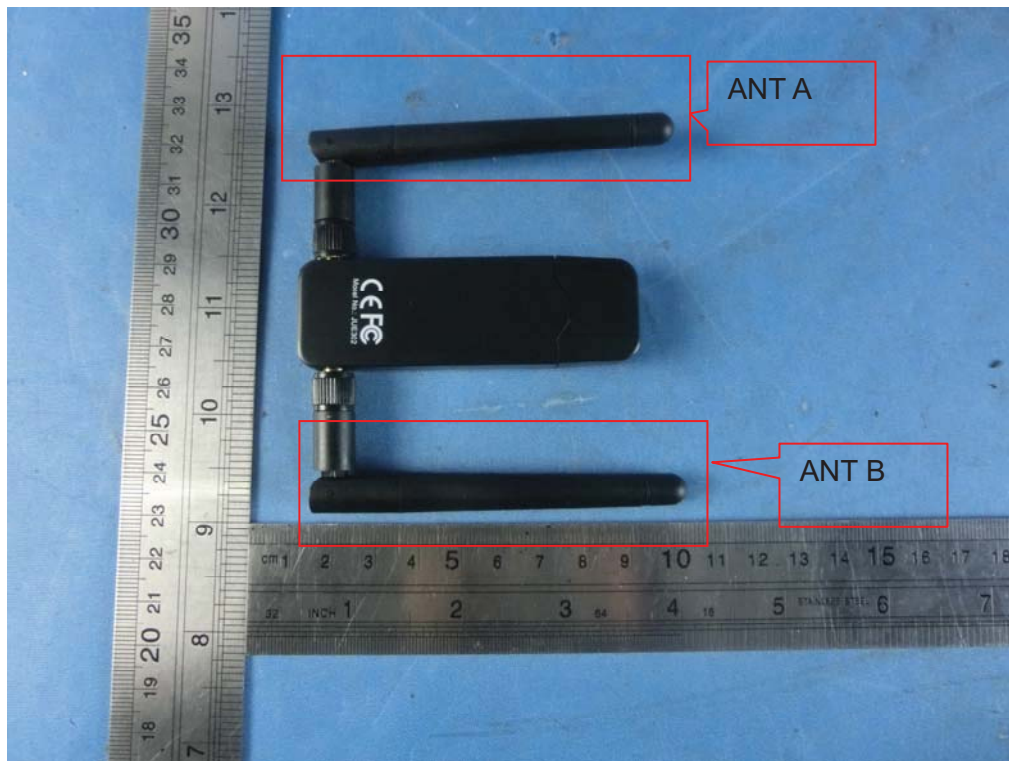
5GHz

802.11a/n(20)Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190	40	5200	42	5210
44	5220	46	5230	48	5240	-	-

802.11n (BW40MHz) Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	46	5230				
		-	-	-	-	-	-

3.

Antenna	Brand	Model Name	Antenna Type	Gain (dBi)	NOTE
A	N/A	N/A	External antenna	2.0	Wifi Antenna
B	N/A	N/A	External antenna	2.0	Wifi Antenna



The Control software(tool_WIFI.exe) can control antenna A B ,
For 2.4GHz mode, antenna A B are transmitting,two antennas simultaneously transmit.
And the data is recorded for radiated emission and band edge.
For 5GHz mode,antenna A B are transmitting Two antennas simultaneously transmit.
And the data is recorded for radiated emission, and band edge.
For MIMO mode , Directional gain= $G_{ANT} + 10\log(N)\text{dbi} = 5.01\text{dbi}$

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 /n CH36/ CH40/ CH 48
Mode 2	802.11n38/ CH 46
Mode 3	keeping TX MIMO mode

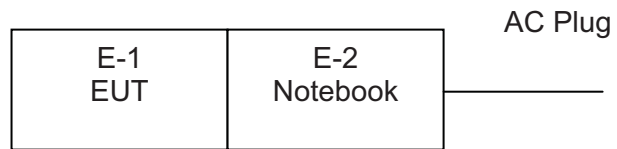
For Conducted Emission	
Final Test Mode	Description
Mode 3	keeping TX MIMO mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11a /n CH36/ CH40/ CH 48
Mode 2	802.11n38/ CH 46
Mode 3	keeping TX MIMO mode

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	Brand	Model/Type No.	Series No.	Note
E-1	Wireless N300 Dual Band USB Adapter	j5 create	JUE302	N/A	EUT
E-2	Notebook	DELL	PP10L	N/A	FCC DOC

Item	Shielded Type	Ferrite Core	Length	Note

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	2014.07.06	2015.07.05	1 year
2	Test Receiver	R&S	ESPI	101318	2014.06.07	2015.06.06	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2014.07.06	2015.07.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2014.06.07	2015.06.06	1 year
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2014.06.07	2015.06.06	1 year
6	Horn Antenna	EM	EM-AH-10180	2011071402	2014.07.06	2015.07.05	1 year
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2014.07.06	2015.07.05	1 year
8	Amplifier	EM	EM-30180	060538	2014.12.22	2015.12.21	1 year
9	Loop Antenna	ARA	PLA-1030/B	1029	2014.06.07	2015.06.06	1 year
10	Power Meter	R&S	NRVS	100696	2014.07.06	2015.07.05	1 year
11	Power Sensor	R&S	URV5-Z4	0395.1619.05	2014.07.06	2015.07.05	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	2014.06.07	2015.06.06	1 year
2	LISN	R&S	ENV216	101313	2014.08.24	2015.08.23	1 year
3	LISN	EMCO	3816/2	00042990	2014.08.24	2015.08.23	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2014.06.07	2015.06.06	1 year
5	Passive Voltage Probe	R&S	ESH2-Z3	100196	2014.06.07	2015.06.06	1 year
6	Absorbing clamp	R&S	MOS-21	100423	2014.06.07	2015.06.06	1 year

1	Attenuation	MCE	24-10-34	BN9258	2014.06.07	2015.06.06	1 year
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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

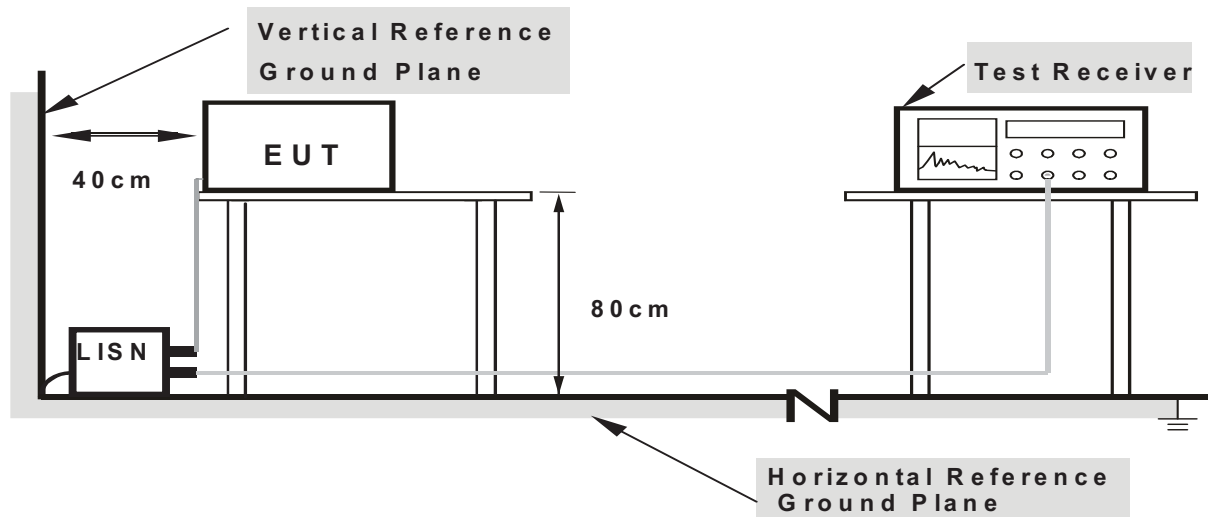
3.1.2 TEST PROCEDURE

- The EUT was placed 0.8 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.
- 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.

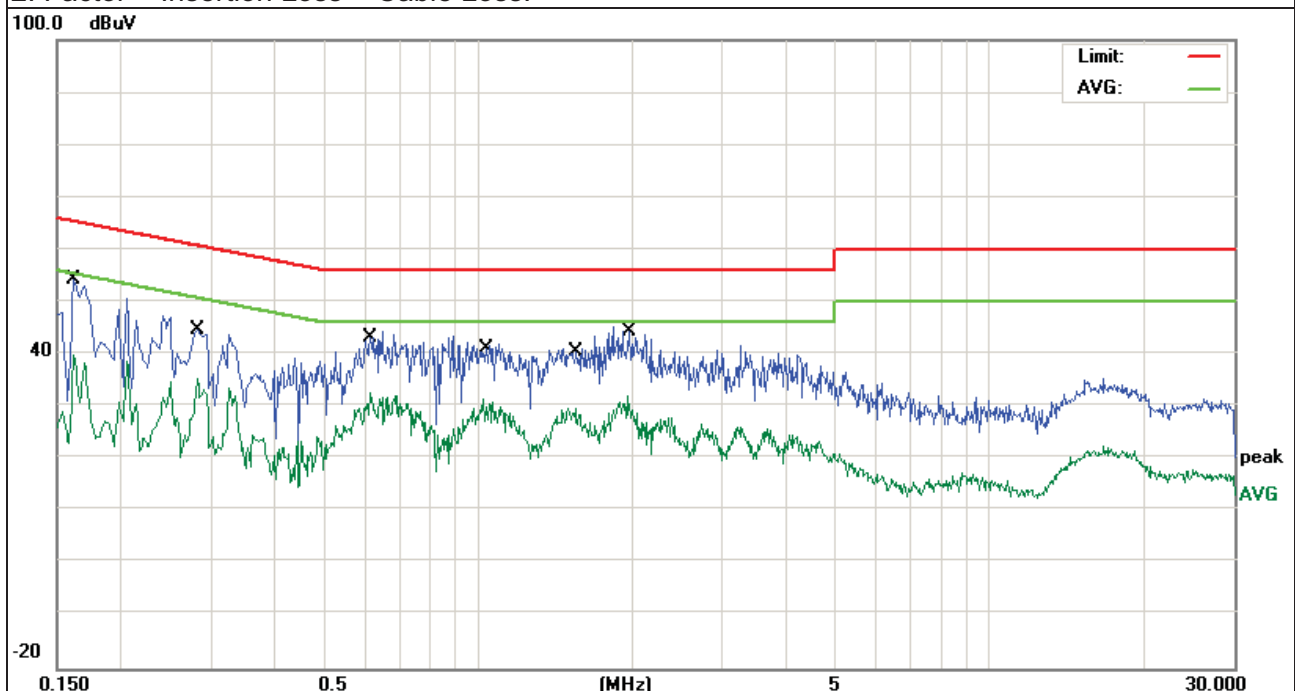
3.1.6 TEST RESULTS

EUT :	Wireless N300 Dual Band USB Adapter	Model Name. :	JUE302
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5V From PC AC120V/60Hz	Test Mode :	Mode 3

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1620	44.78	9.60	54.38	65.36	-10.98	QP
0.1620	30.38	9.60	39.98	55.36	-15.38	AVG
0.2816	35.10	9.50	44.60	60.77	-16.17	QP
0.2816	25.94	9.50	35.44	50.77	-15.33	AVG
0.6139	33.74	9.52	43.26	56.00	-12.74	QP
0.6139	23.07	9.52	32.59	46.00	-13.41	AVG
1.0260	30.67	9.53	40.20	56.00	-15.80	QP
1.0260	21.98	9.53	31.51	46.00	-14.49	AVG
1.5460	30.05	9.54	39.59	56.00	-16.41	QP
1.5460	20.24	9.54	29.78	46.00	-16.22	AVG
1.9536	32.25	9.55	41.80	56.00	-14.20	QP
1.9536	22.60	9.55	32.15	46.00	-13.85	AVG

Remark:

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

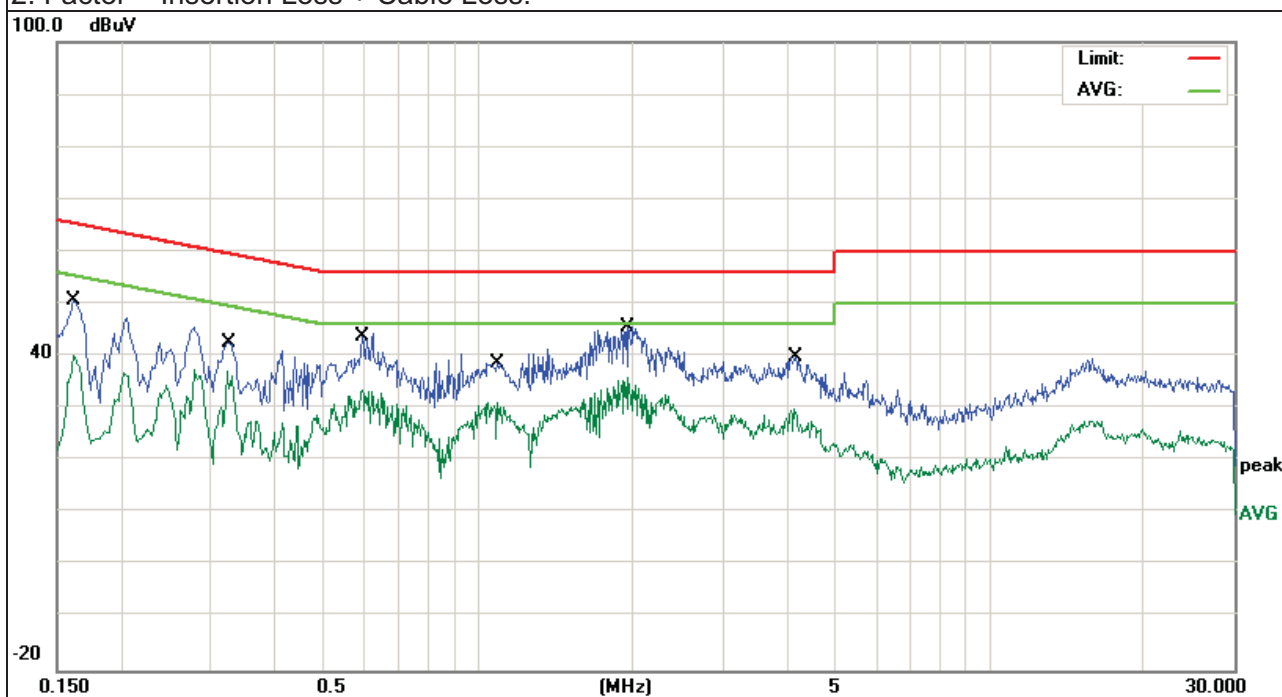


EUT :	Wireless N300 Dual Band USB Adapter	Model Name. :	JUE302
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5V From PC AC120V/60Hz	Test Mode :	Mode 3

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1620	41.19	9.60	50.79	65.36	-14.57	QP
0.1620	30.47	9.60	40.07	55.36	-15.29	AVG
0.3220	33.01	9.50	42.51	59.65	-17.14	QP
0.3220	27.73	9.50	37.23	49.65	-12.42	AVG
0.5936	34.26	9.51	43.77	56.00	-12.23	QP
0.5936	24.04	9.51	33.55	46.00	-12.45	AVG
1.0900	29.15	9.53	38.68	56.00	-17.32	QP
1.0900	21.52	9.53	31.05	46.00	-14.95	AVG
1.9616	36.00	9.55	45.55	56.00	-10.45	QP
1.9616	26.51	9.55	36.06	46.00	-9.94	AVG
4.1379	30.03	9.59	39.62	56.00	-16.38	QP
4.1379	20.27	9.59	29.86	46.00	-16.14	AVG

Remark:

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



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)	RBW 1MHz VBW 1MHz PEAK detector for PK value ,RMS detector for AV value

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

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

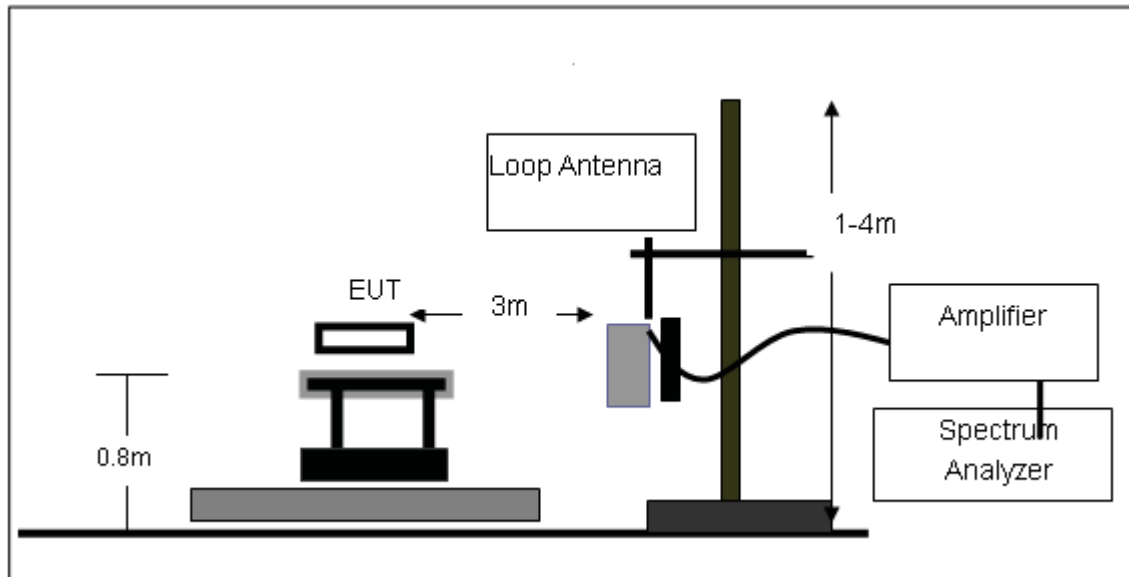
Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	1 MHz
	RMS	1 MHz	1 MHz

3.2.3 DEVIATION FROM TEST STANDARD

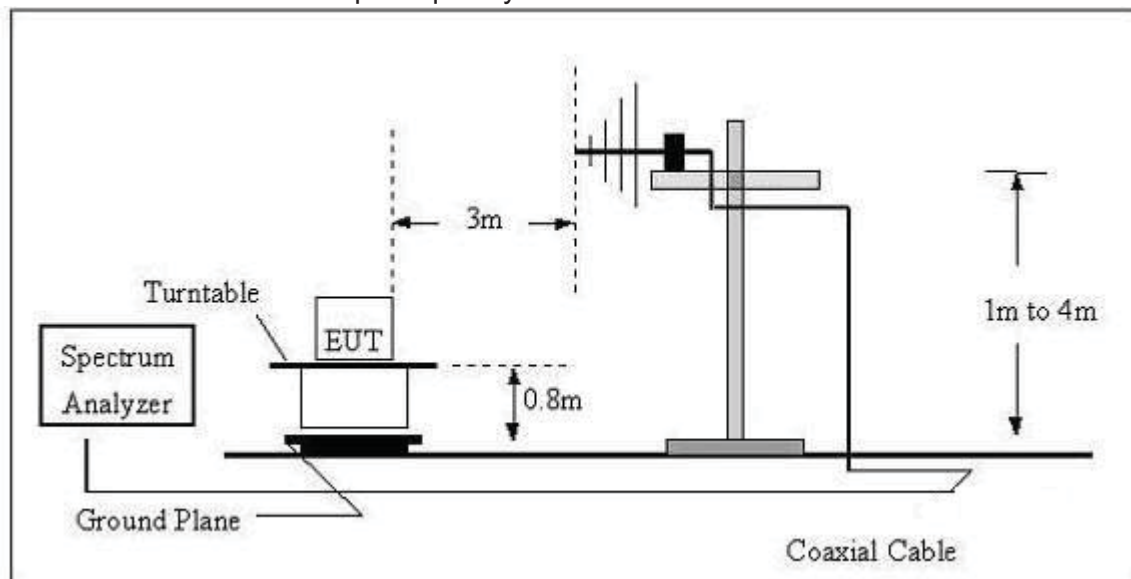
No deviation

3.2.4 TEST SETUP

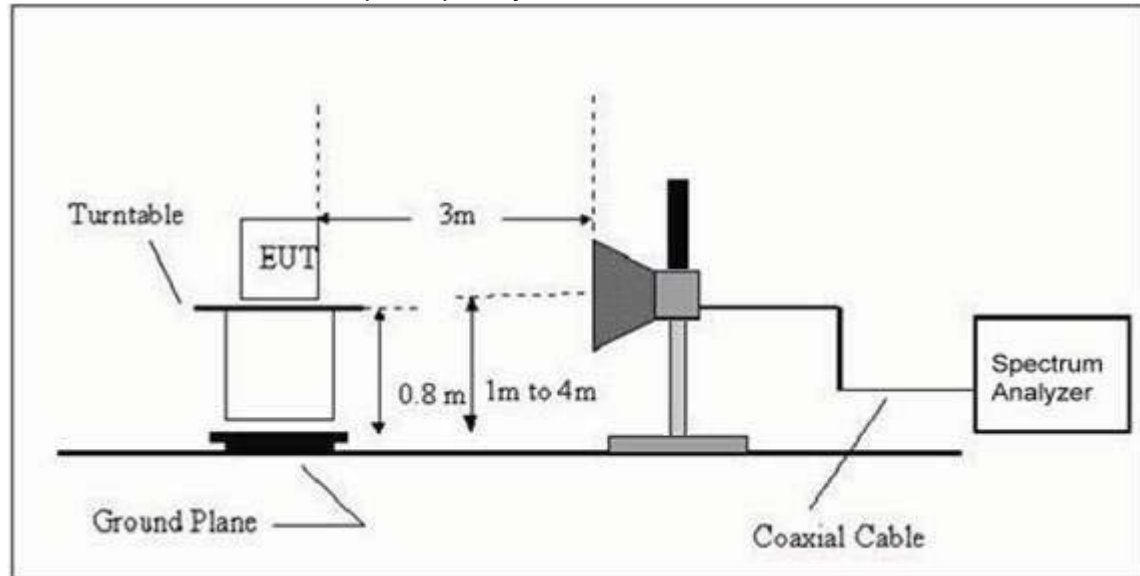
(A) Radiated Emission Test-Up Frequency Below 30MHz



(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:	Wireless N300 Dual Band USB Adapter	Model Name. :	JUE302
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 5V From PC AC120V/60Hz
Test Mode :	keeping TX MIMO mode	Polarization :	--

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

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.

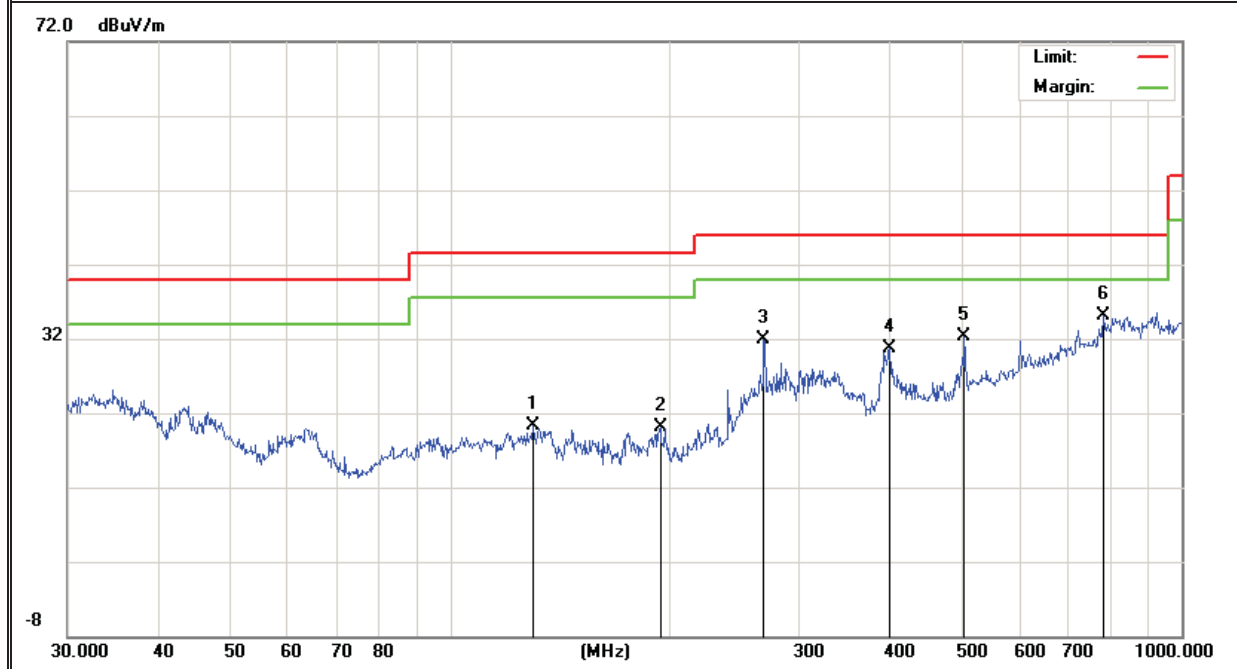
3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

EUT :	Wireless N300 Dual Band USB Adapter	Model Name :	JUE302
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V From PC AC120V/60Hz
Test Mode :	keeping TX MIMO mode		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	129.9225	8.43	11.89	20.32	43.50	-23.18	QP
V	193.7726	9.36	10.74	20.10	43.50	-23.40	QP
V	268.4852	18.02	13.80	31.82	46.00	-14.18	QP
V	399.0300	12.43	18.27	30.70	46.00	-15.30	QP
V	504.7062	11.99	20.39	32.38	46.00	-13.62	QP
V	782.3451	8.09	26.95	35.04	46.00	-10.96	QP

Remark:

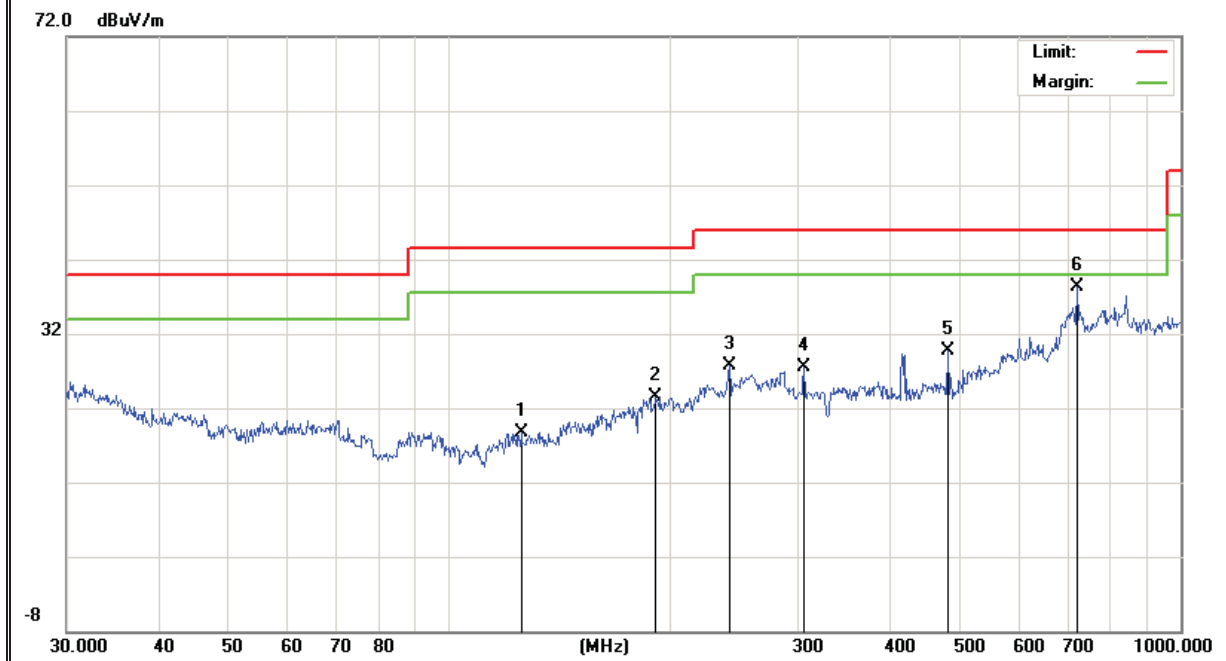
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
H	125.4457	6.70	11.98	18.68	43.50	-24.82	QP
H	191.7450	12.78	10.71	23.49	43.50	-20.01	QP
H	241.6761	14.19	13.50	27.69	46.00	-18.31	QP
H	305.6800	13.11	14.39	27.50	46.00	-18.50	QP
H	480.5276	9.85	19.91	29.76	46.00	-16.24	QP
H	721.7259	13.04	25.36	38.40	46.00	-7.60	QP

Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



3.2.8 TEST RESULTS (ABOVE 1000 MHZ)

EUT :	Wireless N300 Dual Band USB Adapter	Model Name :	JUE302
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V From PC AC120V/60Hz
Test Mode :	keeping TX MIMO mode (5.0G)		

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5180 MHz)-Above 1G							
Vertical	10360.000	38.78	13.09	51.87	74	-22.13	Pk
Vertical	15540.000	33.63	15.16	48.79	74	-25.21	Pk
Horizontal	10360.000	35.76	13.09	48.85	74	-25.15	Pk
Horizontal	15540.000	31.36	15.16	46.52	74	-27.48	Pk
middle Channel (5200 MHz)-Above 1G							
Vertical	10400.000	35.78	13.11	48.89	74	-25.11	Pk
Vertical	15600.000	36.83	15.19	52.02	74	-21.98	Pk
Horizontal	10400.000	35.93	13.11	49.04	74	-24.96	Pk
Horizontal	15600.000	34.36	15.19	49.55	74	-24.45	Pk
High Channel (5240 MHz)-Above 1G							
Vertical	10480.000	36.84	13.19	50.03	74	-23.97	Pk
Vertical	15720.00	35.39	15.25	50.64	74	-23.36	Pk
Horizontal	10480.000	37.36	13.19	50.55	74	-23.45	Pk
Horizontal	15720.00	36.62	15.34	51.96	74	-22.04	Pk

Note: 802.11a,802.11 nH20 and 802.11n H40 Keeping TX MIMO mode all have been tested , 802.11a mode is the worst mode.. When PK value is lower than the Average value limit, average didn't record.

4. POWER SPECTRAL DENSITY TEST

4.1 APPLIED PROCEDURES / LIMIT

According to FCC §15.407(a)(1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band. 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.

According to IC RSS-210 §A9.2:

5150-5250MHz the maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

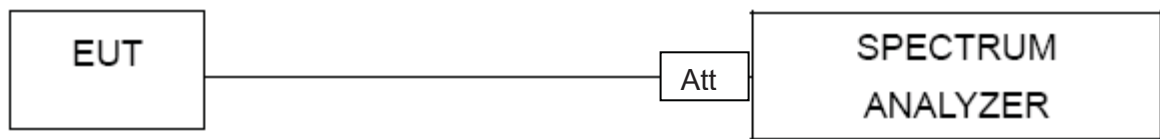
4.1.1 TEST PROCEDURE

- (i) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- (ii) Set RBW = 1 MHz.
- (iii) Set VBW ≥ 3 MHz.
- (iv) Number of points in sweep $\geq 2 \text{ Span} / \text{RBW}$. (This ensures that bin-to-bin spacing is $\leq \text{RBW}/2$, so that narrowband signals are not lost between frequency bins.)
- (v) Sweep time = auto.
- (vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
- (vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run”.
- (viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.
- (ix) 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 (in power units) at 1 MHz intervals extending across the 26 dB EBW of the spectrum.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



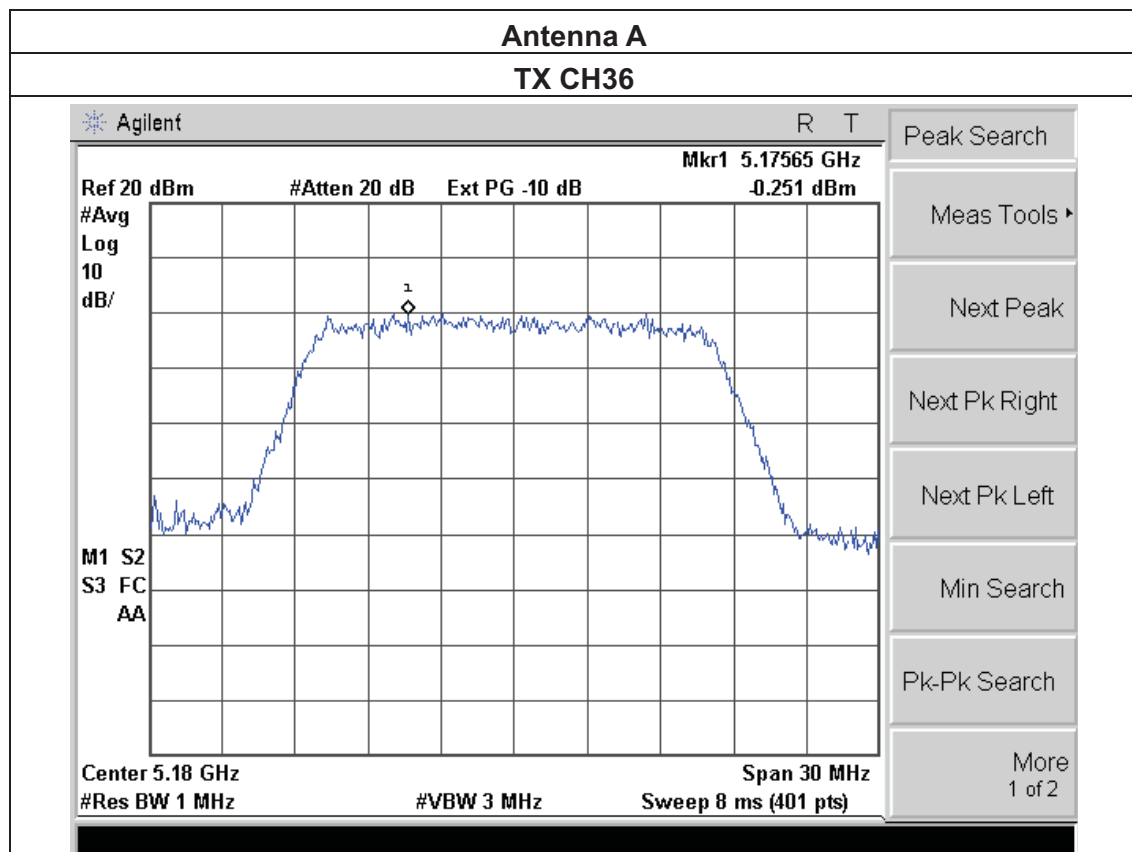
4.1.4 EUT OPERATION CONDITIONS

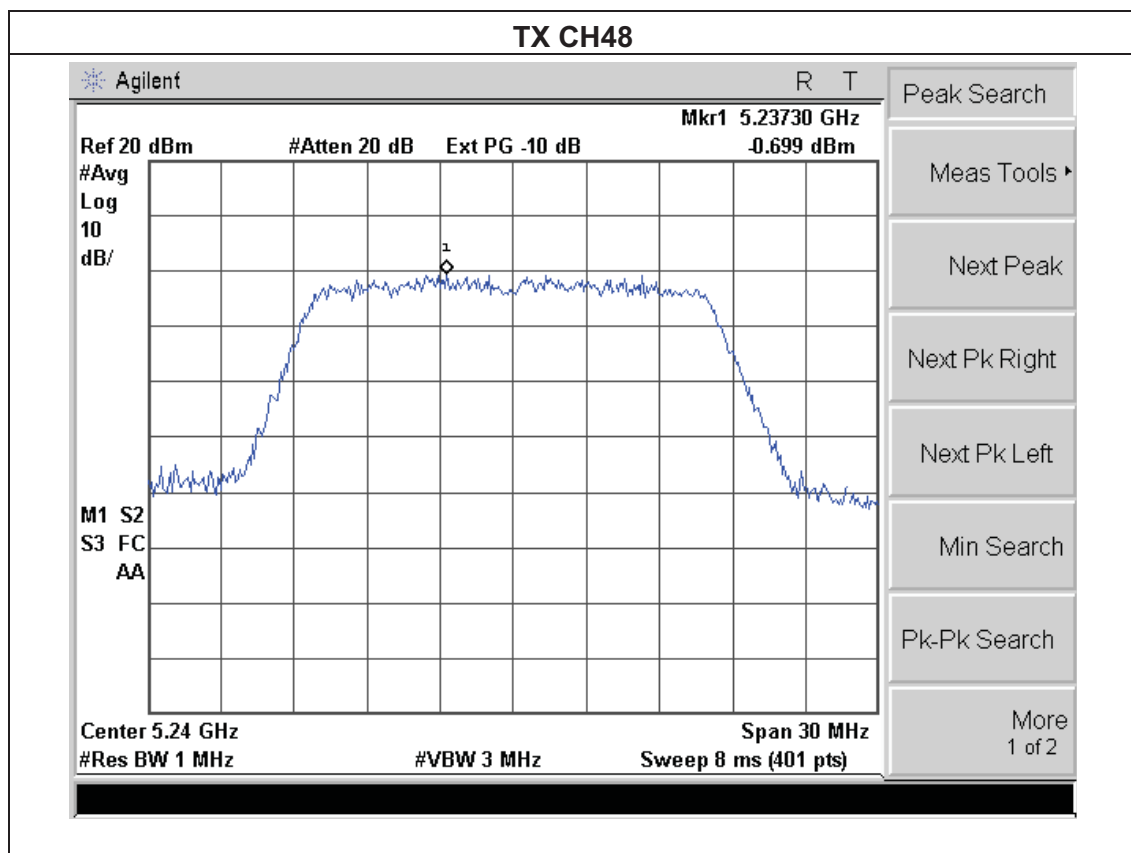
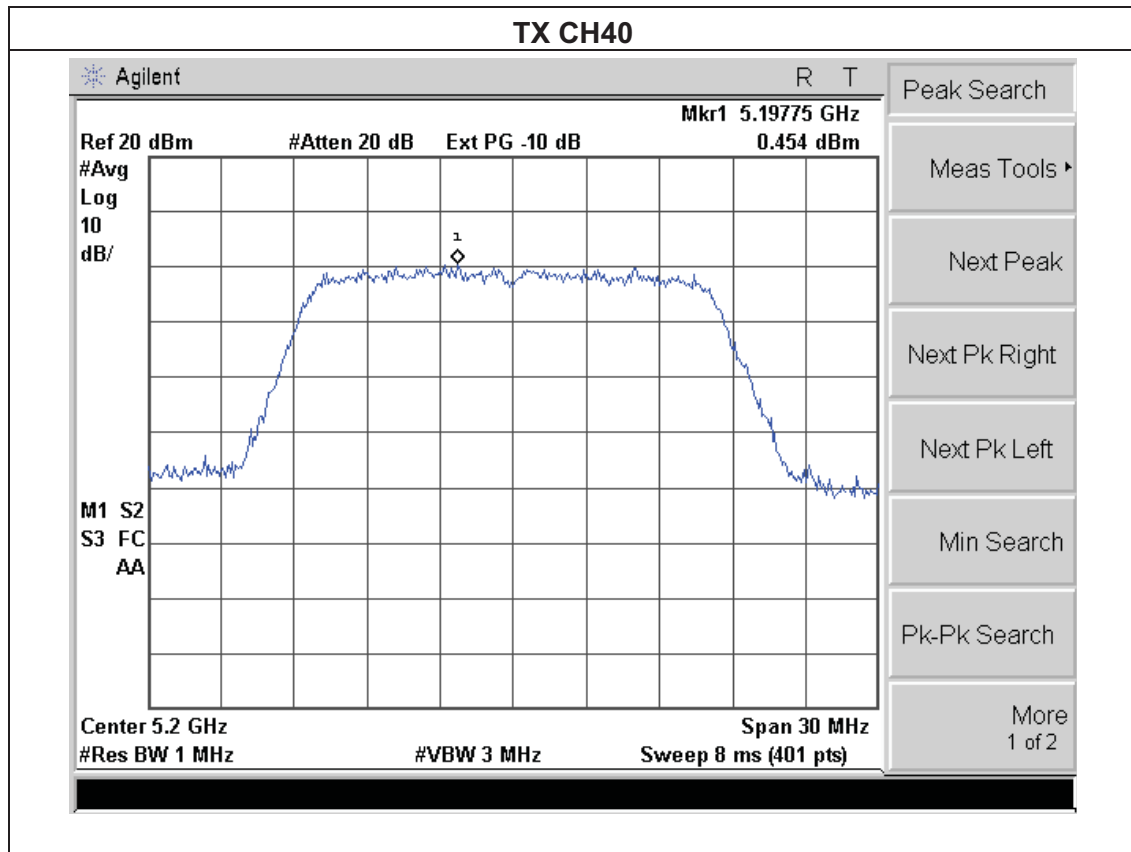
The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

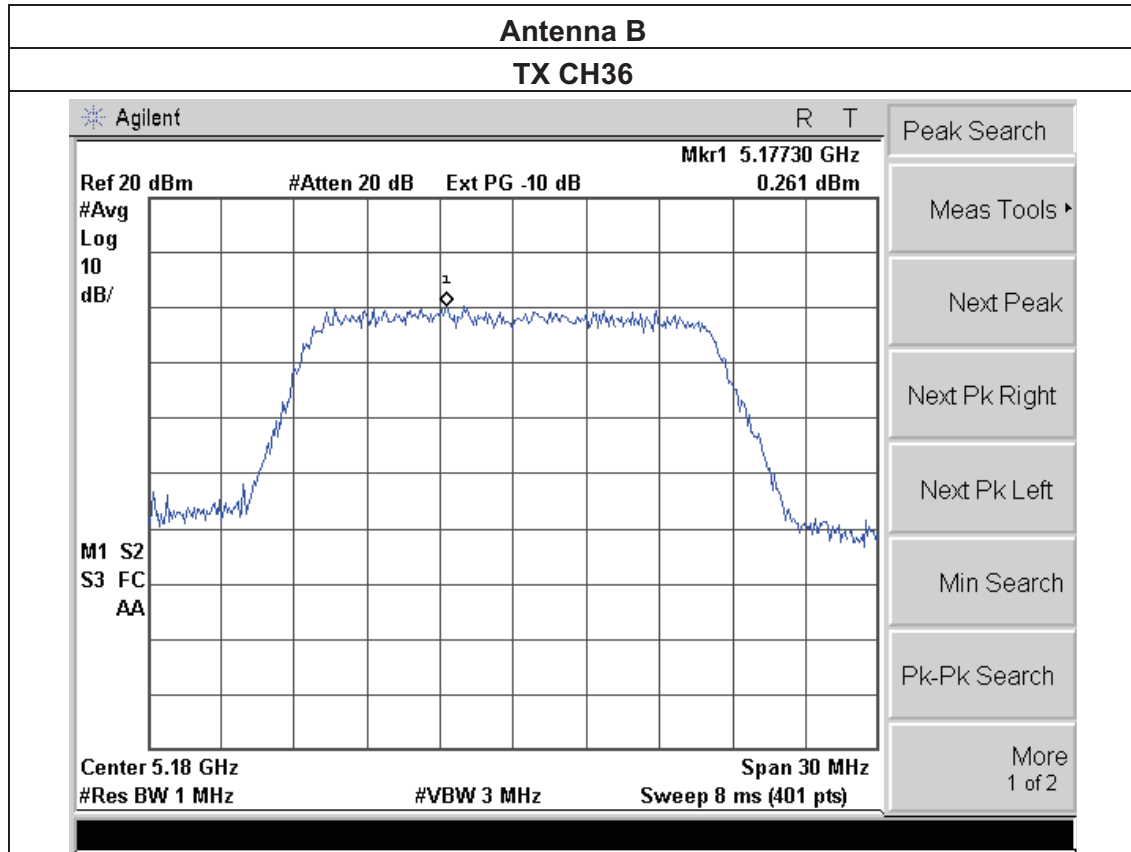
4.1.5 TEST RESULTS

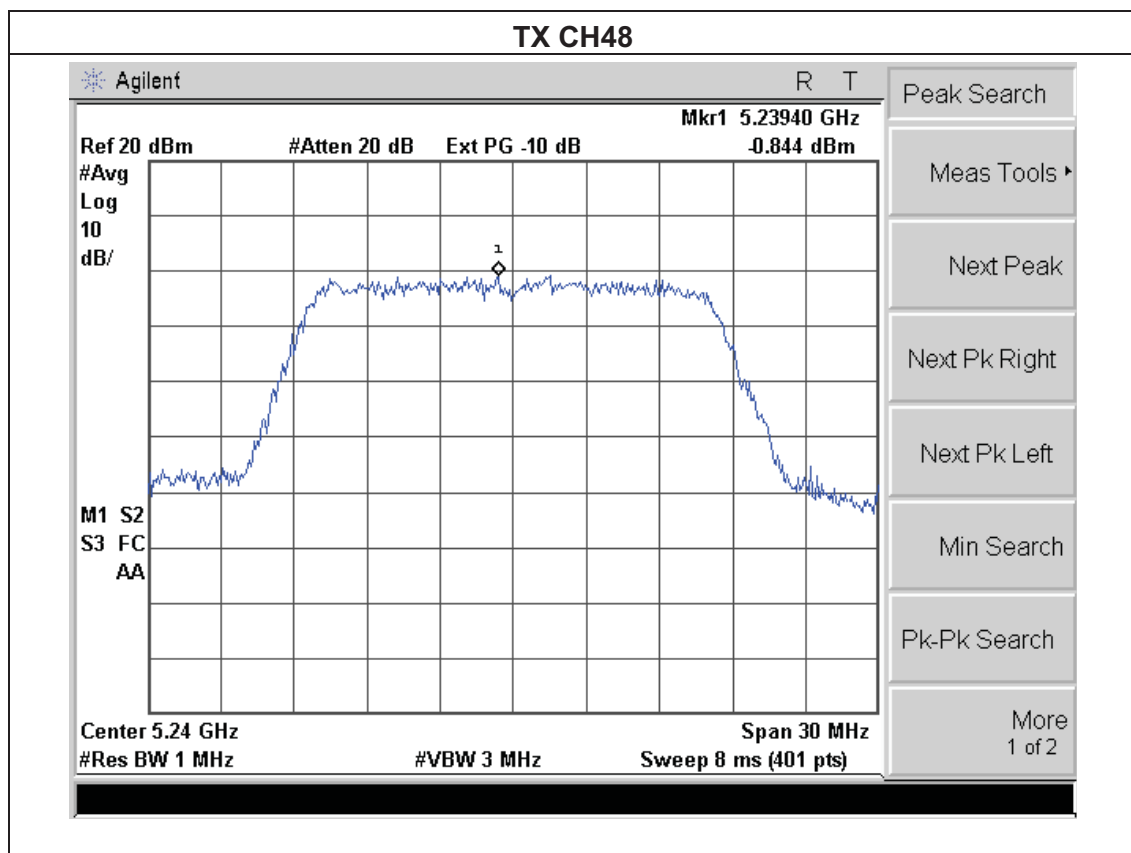
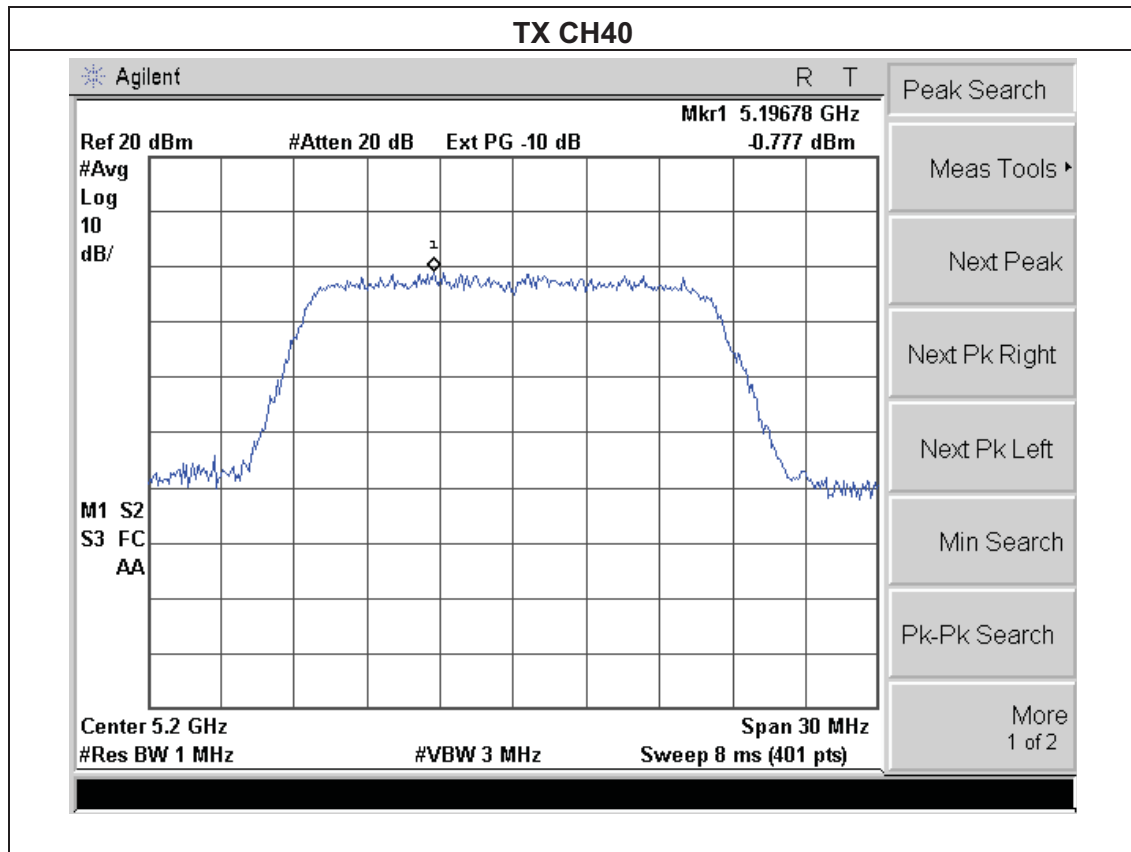
EUT :	Wireless N300 Dual Band USB Adapter	Model Name :	JUE302
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1015 hPa	Test Voltage :	DC 5V From PC AC120V/60Hz
Test Mode :	TX a Mode /CH36, CH40, CH48		

Frequency	Power Density A (dBm)	Power Density B (dBm)	total power density (dBm)	Limit (dBm)	Result
5180 MHz	-0.251	0.261	3.02	4	PASS
5200 MHz	0.454	-0.777	2.50	4	PASS
5240 MHz	-0.699	-0.844	2.24	4	PASS



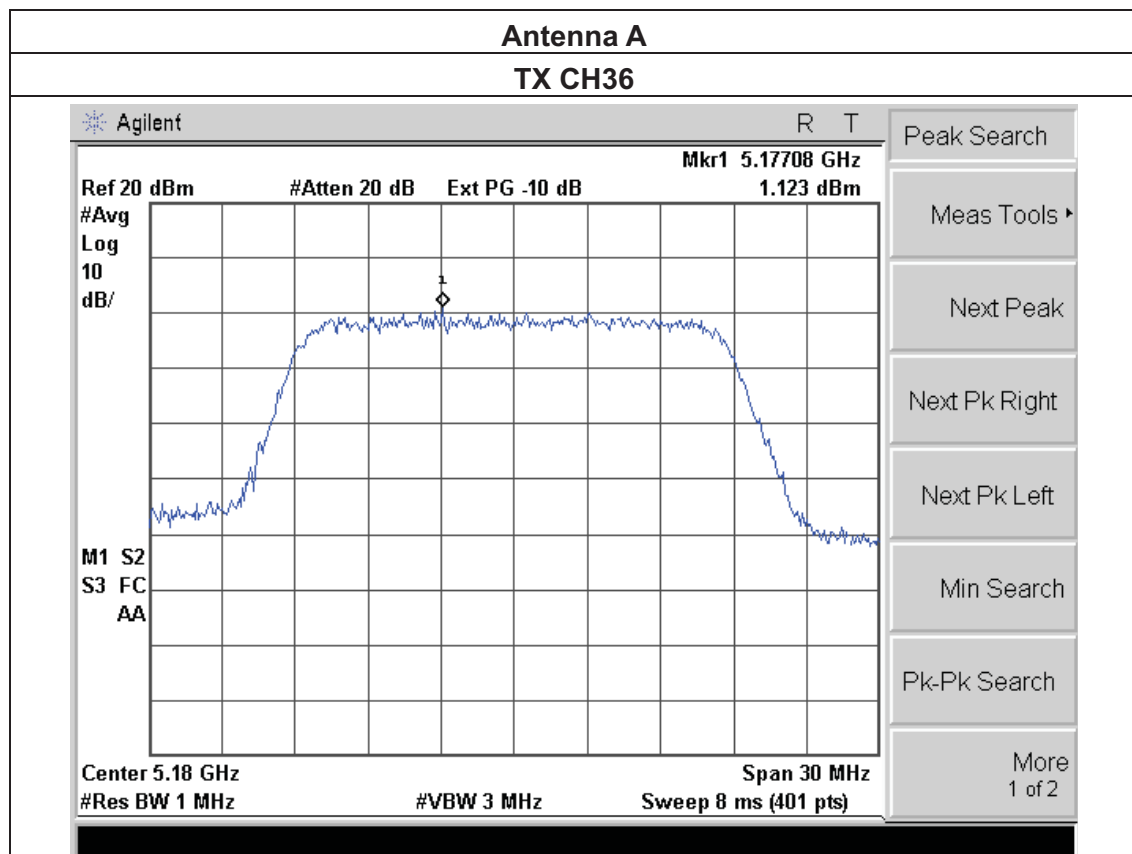


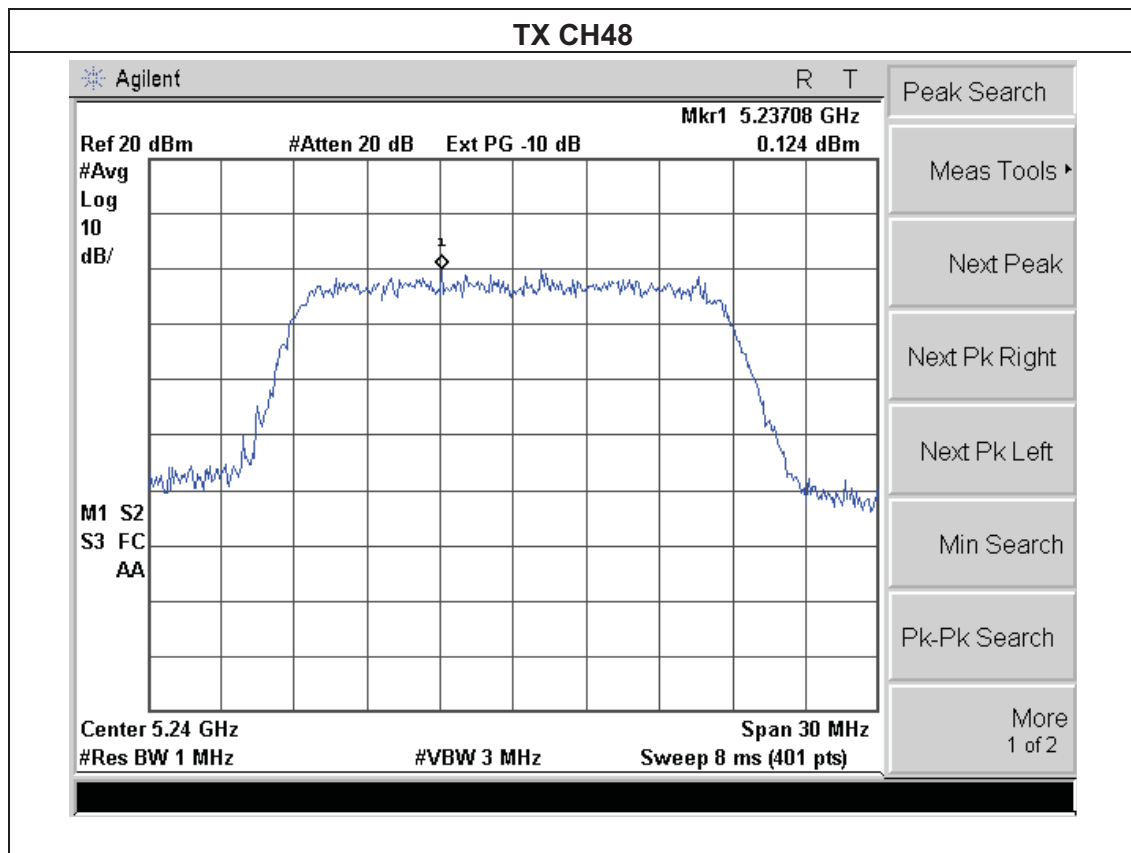
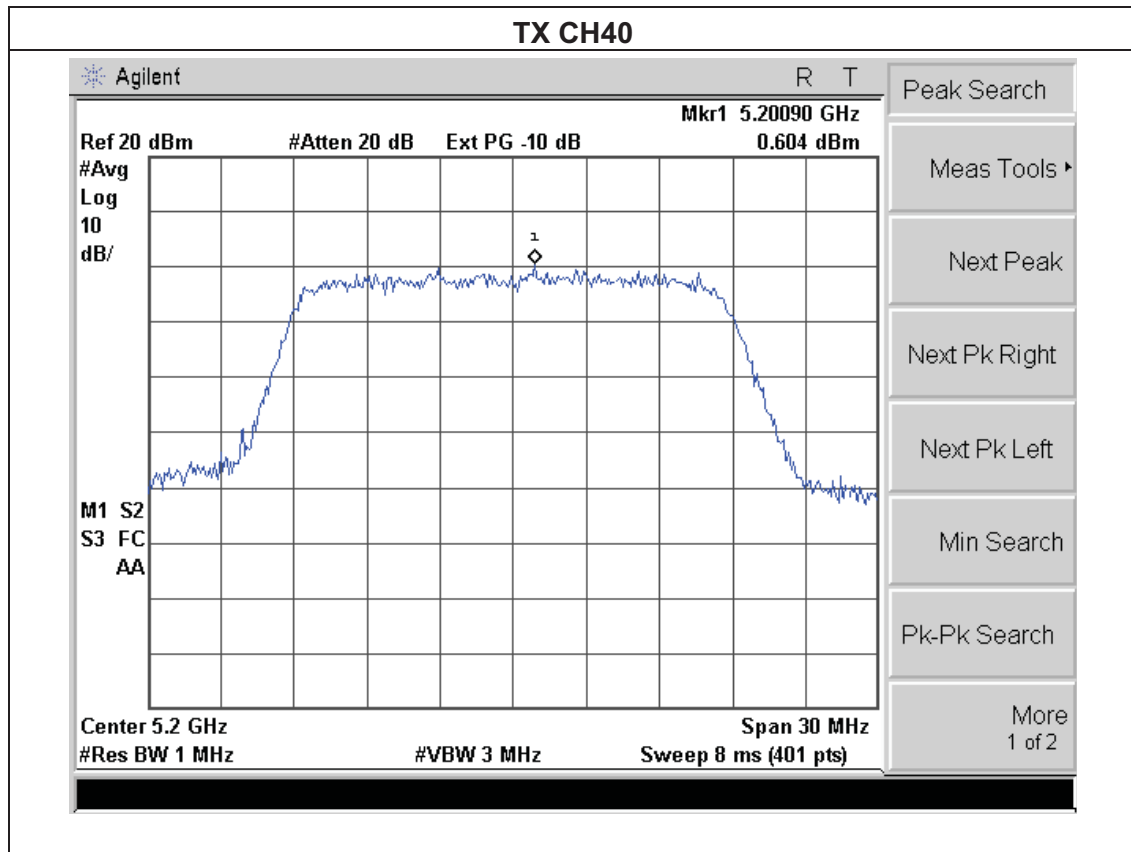


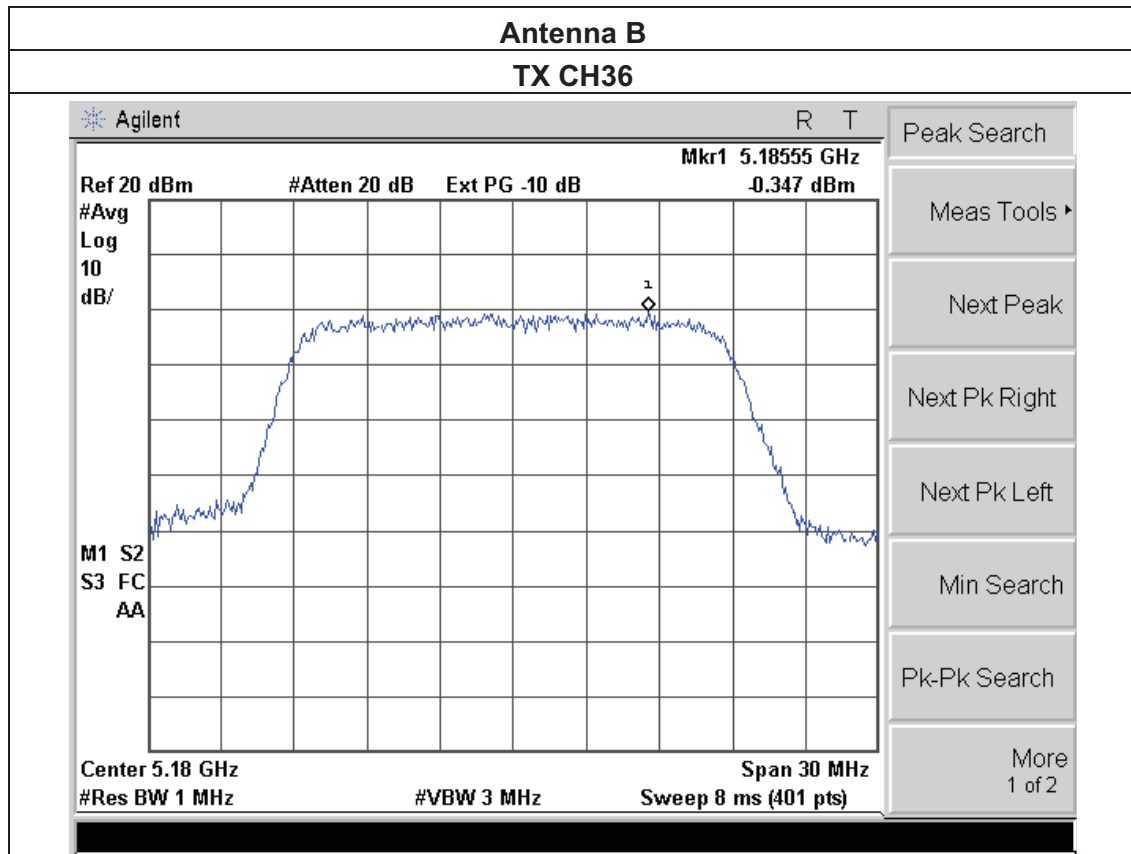


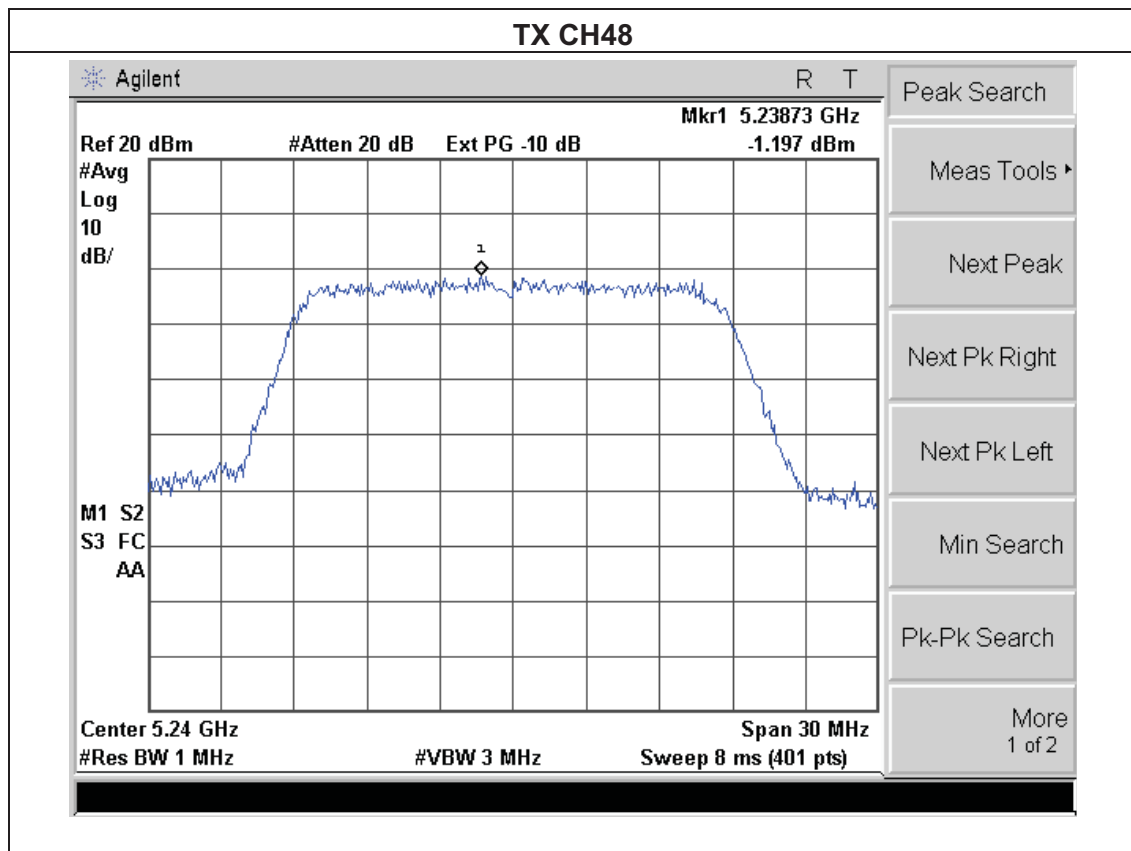
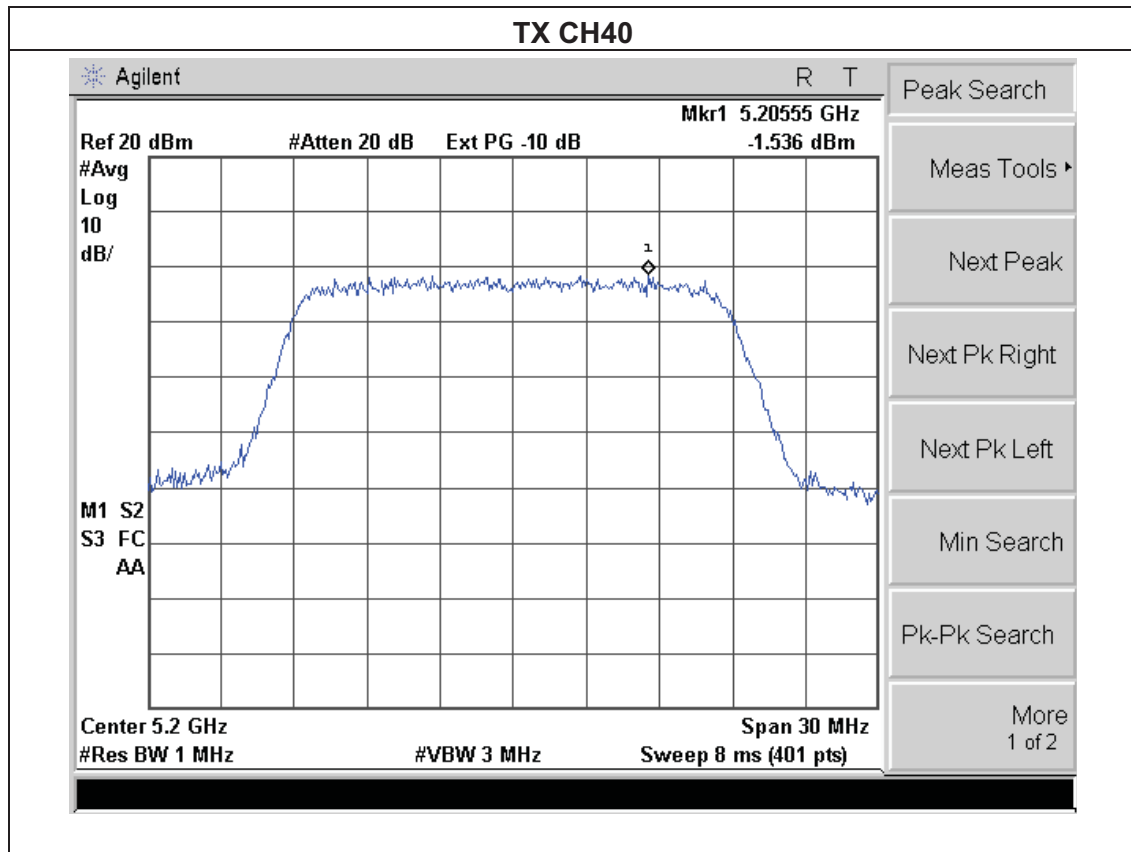
EUT :	Wireless N300 Dual Band USB Adapter	Model Name :	JUE302
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1015 hPa	Test Voltage :	DC 5V From PC AC120V/60Hz
Test Mode :	TX n(20) Mode(5G) /CH36, CH40, CH48		

Frequency	Power Density A (dBm)	Power Density B (dBm)	total power density (dBm)	Limit (dBm)	Result
5180 MHz	1.123	-0.347	3.46	4	PASS
5200 MHz	0.604	-1.536	3.00	4	PASS
5240 MHz	0.124	-1.197	2.52	4	PASS



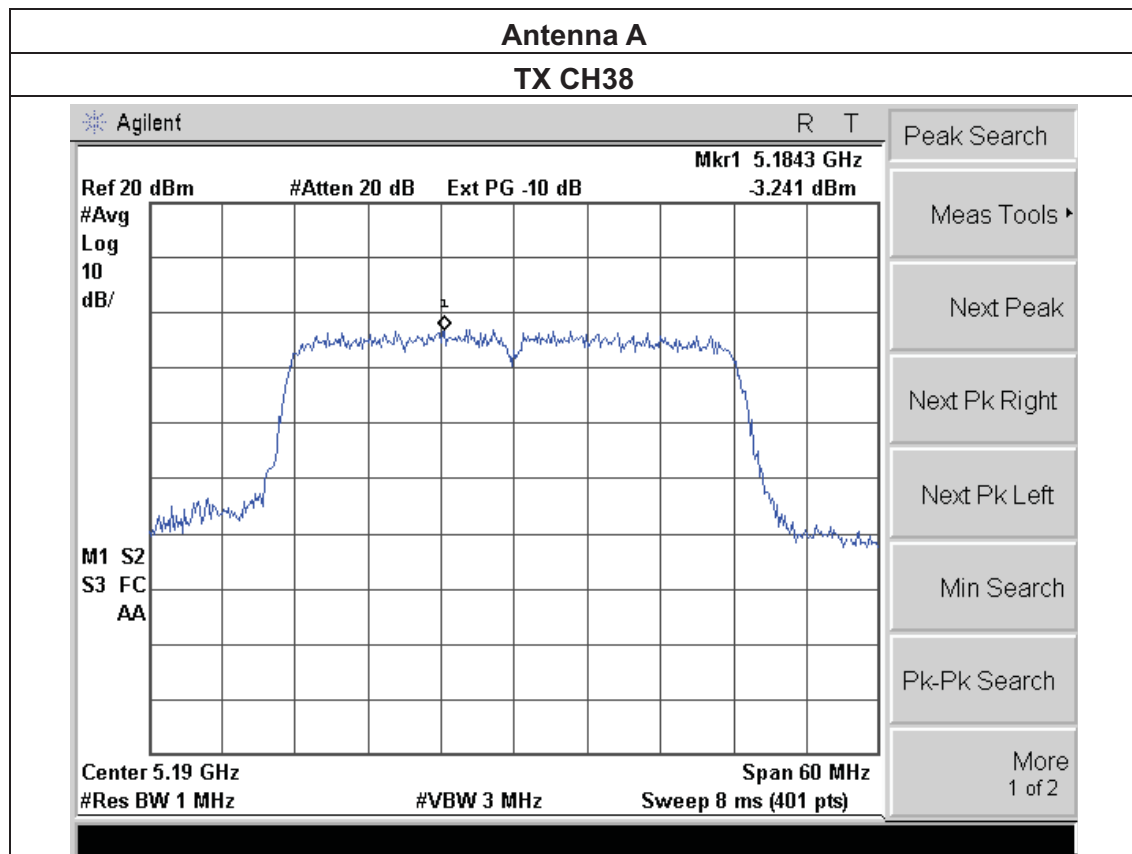


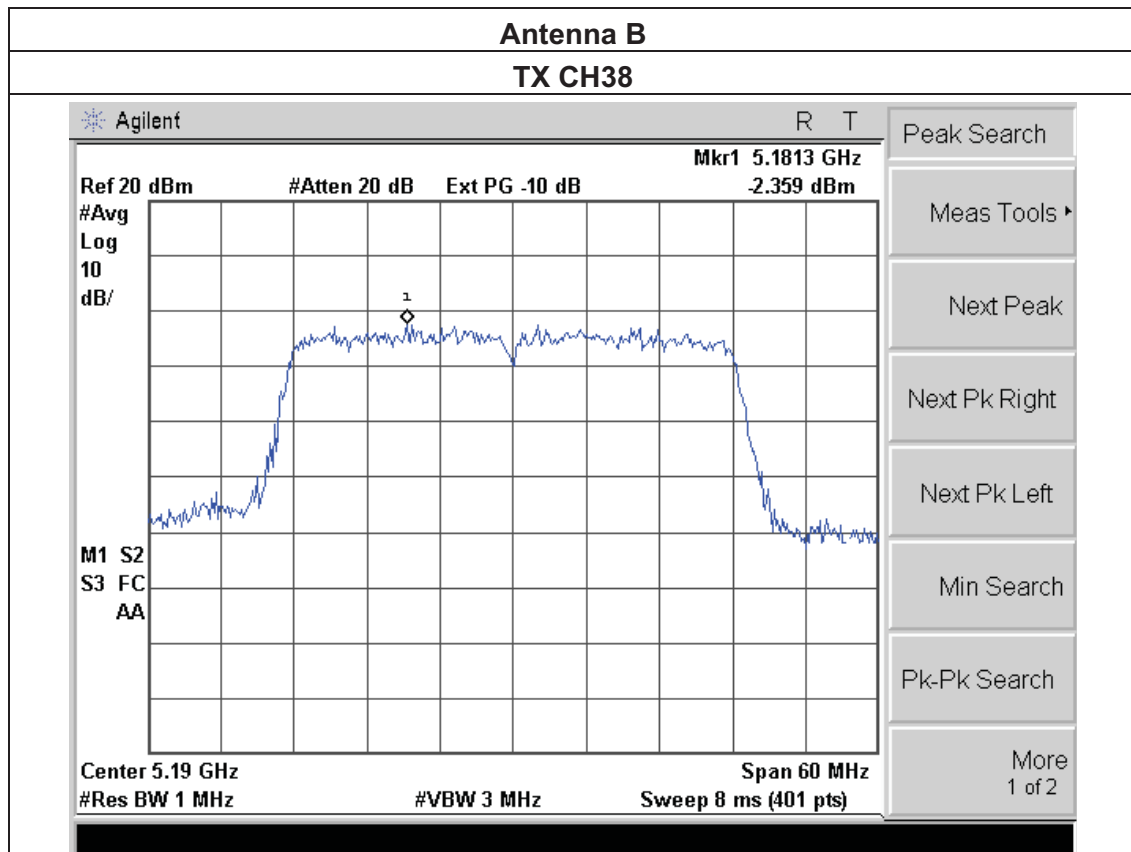
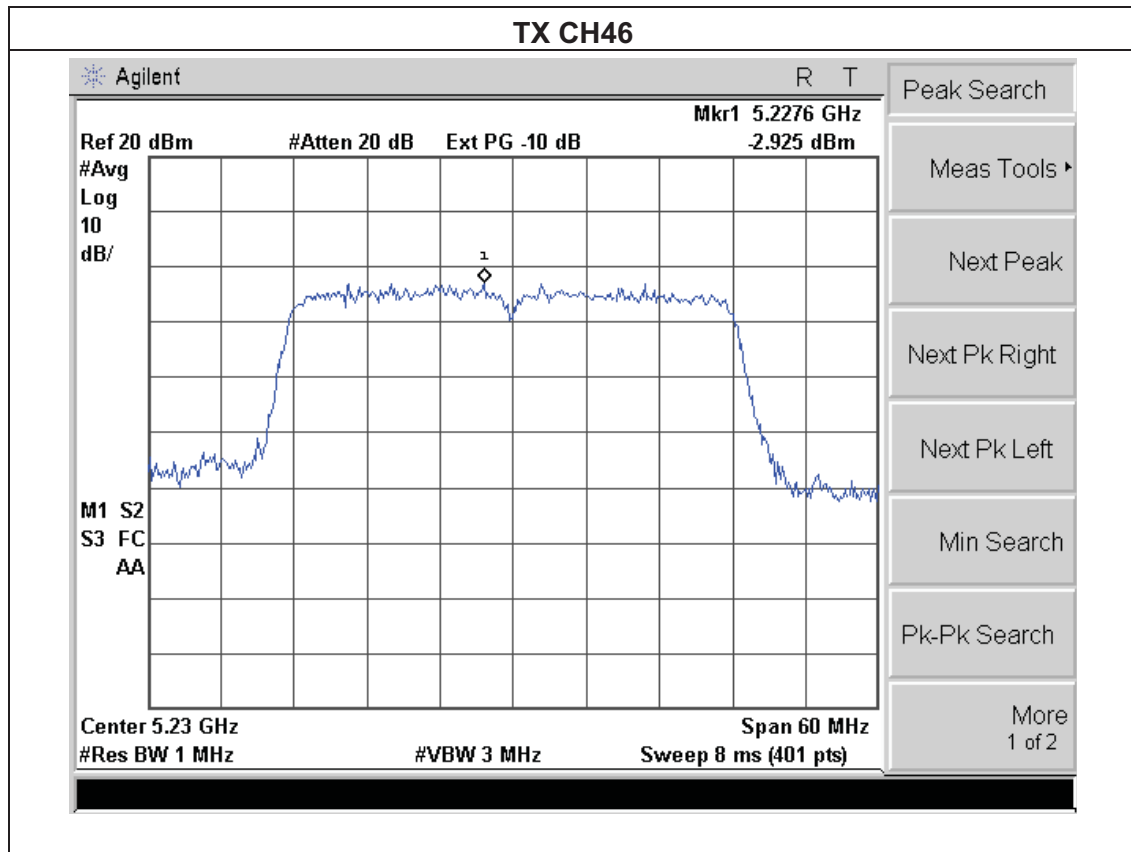


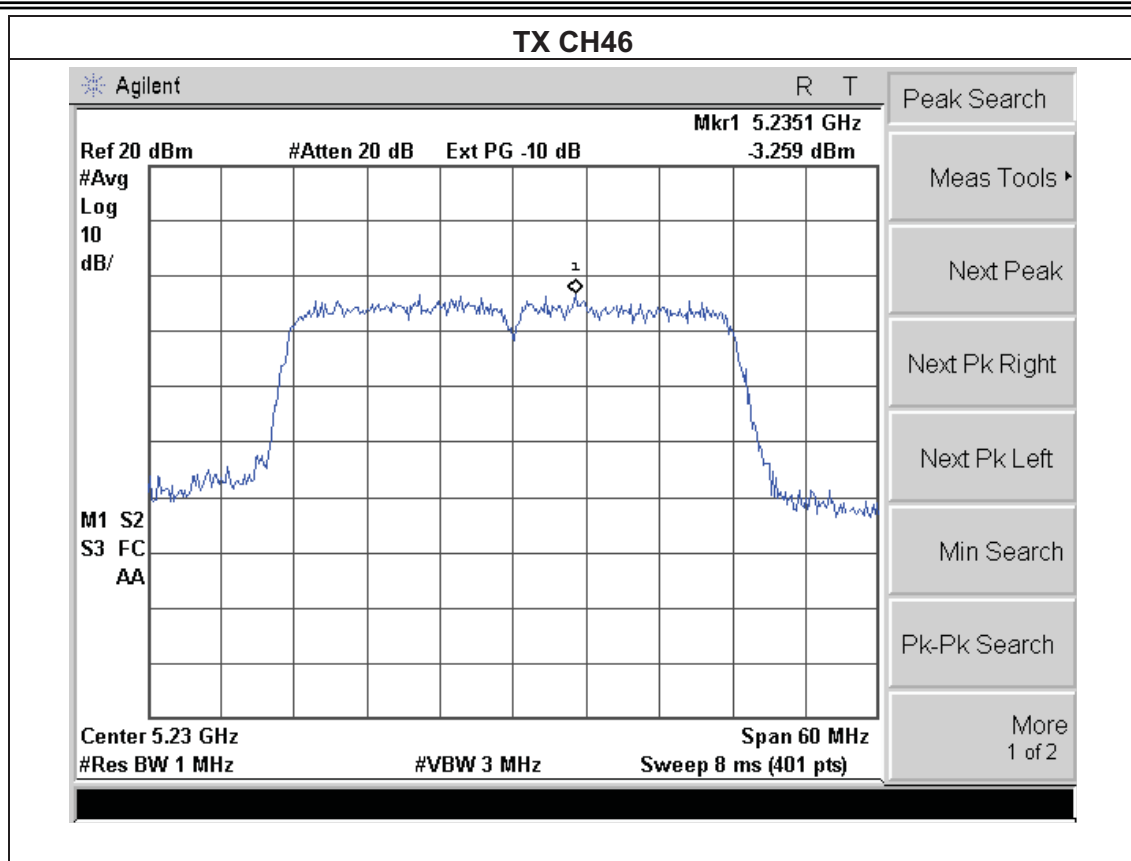


EUT :	Wireless N300 Dual Band USB Adapter	Model Name :	JUE302
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1015 hPa	Test Voltage :	DC 5V From PC AC120V/60Hz
Test Mode :	TX n40 Mode(5G) /CH38, CH46		

Frequency	Power Density A (dBm)	Power Density B (dBm)	total power density (dBm)	Limit (dBm)	Result
5190 MHz	-3.241	-2.359	0.23	4	PASS
5230 MHz	-2.925	-3.259	-0.24	4	PASS







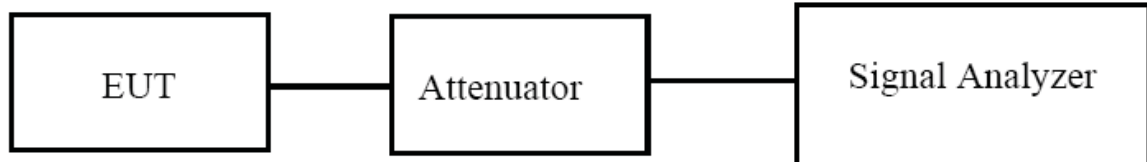
5. 26 DB & 99% EMISSION BANDWIDTH

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.407) , Subpart E			
Section	Test Item	Limit	Result
15.407(a)	Bandwidth	$\geq 500\text{KHz}$ (26dB bandwidth)	PASS

5.1.1 TEST PROCEDURE

- Set RBW = approximately 1% of the emission bandwidth.
- Set the VBW > RBW.
- Detector = Peak.
- Trace mode = max hold.
- Measure the maximum width of the emission that is 26 dB down from the maximum 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%.



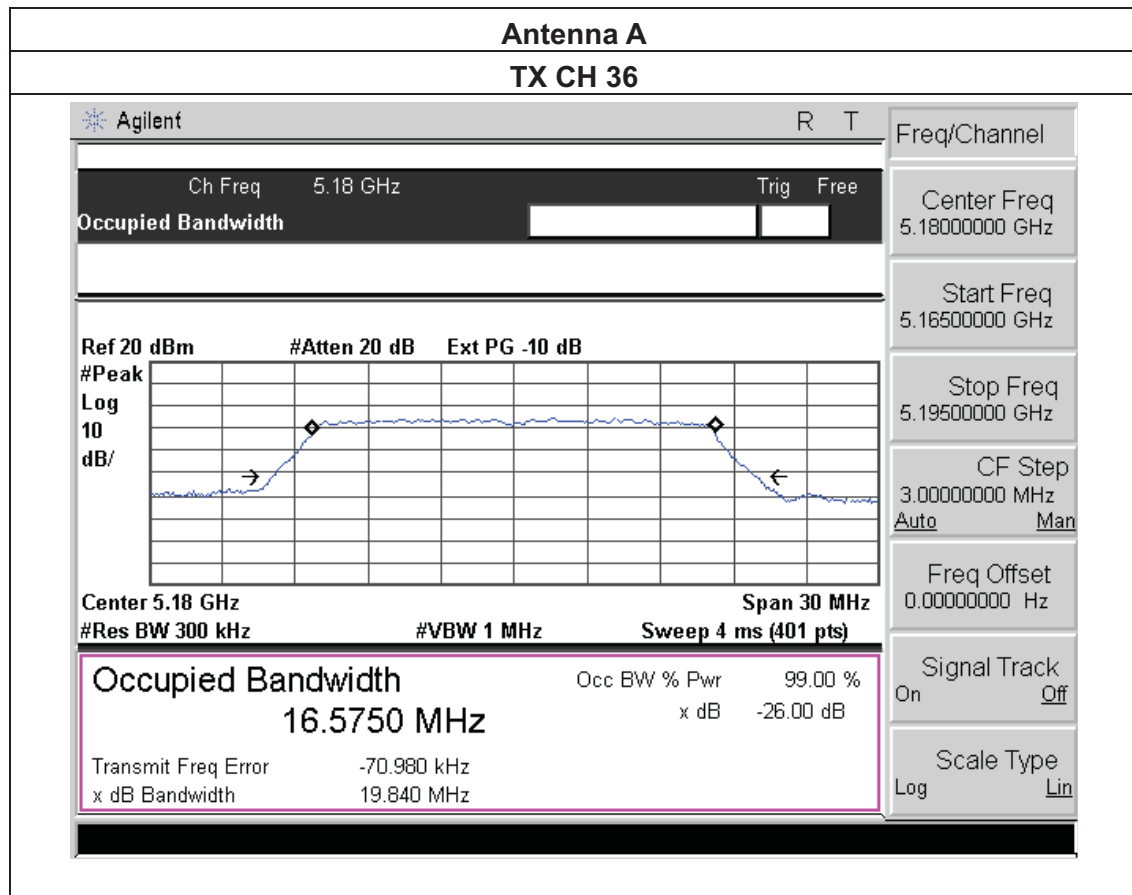
5.1.2 EUT OPERATION CONDITIONS

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.

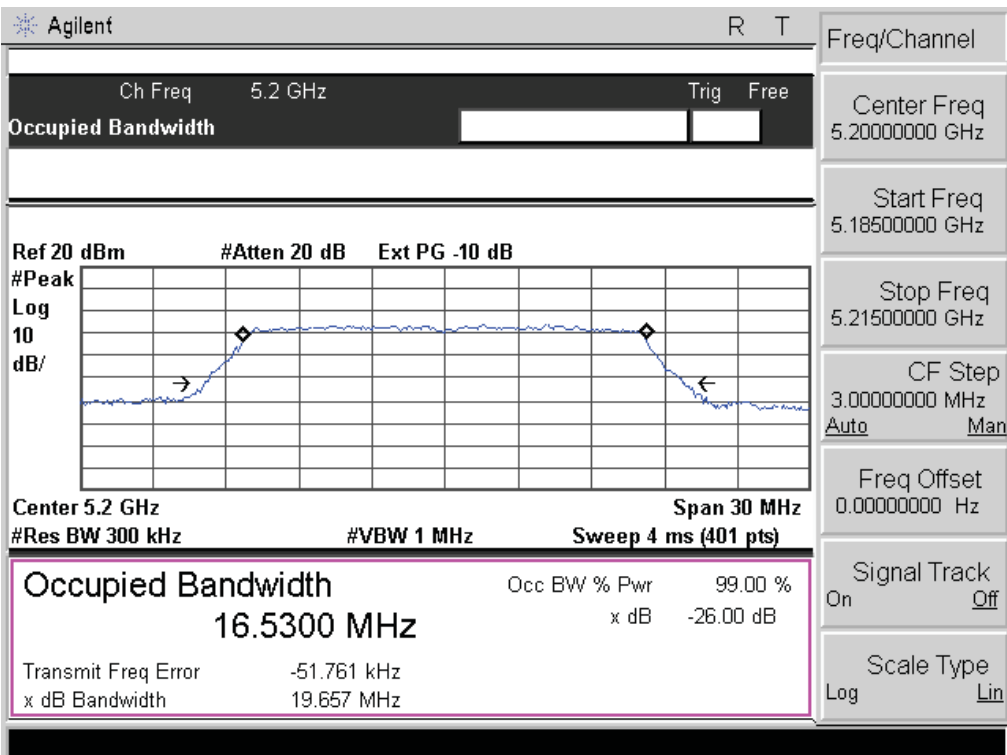
5.1.3 TEST RESULTS

EUT :	Wireless N300 Dual Band USB Adapter	Model Name :	JUE302
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 5V From PC AC120V/60Hz
Test Mode :	TX a Mode /CH36, CH40, CH48		

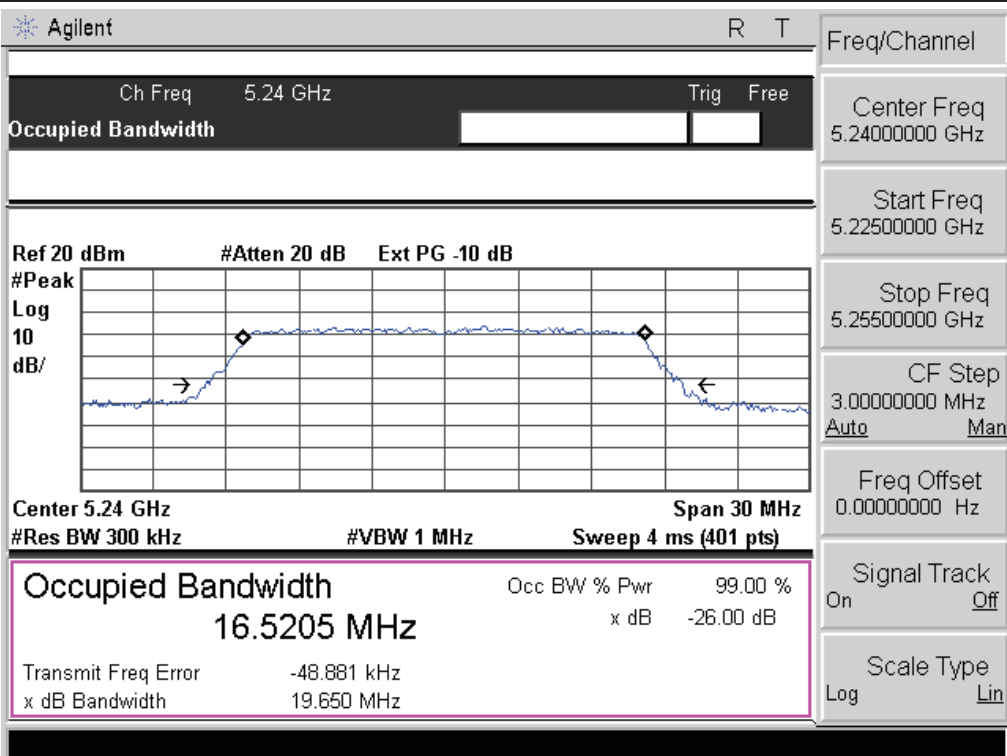
Channel	Frequency (MHz)	99% bandwidth (MHz)ANT A	99% bandwidth (MHz)ANT B	26dB bandwidth (MHz)ANT A	26dB bandwidth (MHz)ANT B	Limit (kHz)	Result
802.11a mode							
Low	5180	16.575	16.544	19.840	19.620	500	Pass
Middle	5200	16.530	16.554	19.657	19.738	500	Pass
High	5240	16.521	16.531	19.650	19.748	500	Pass

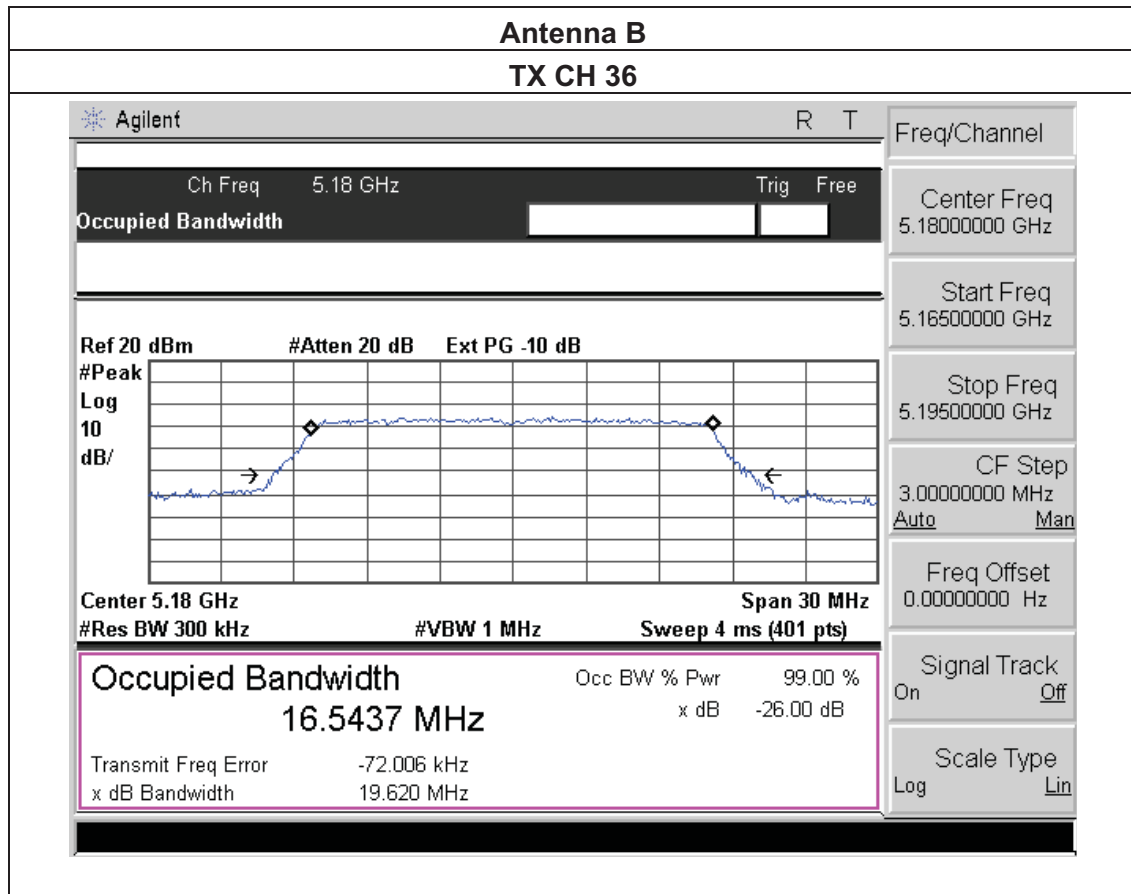


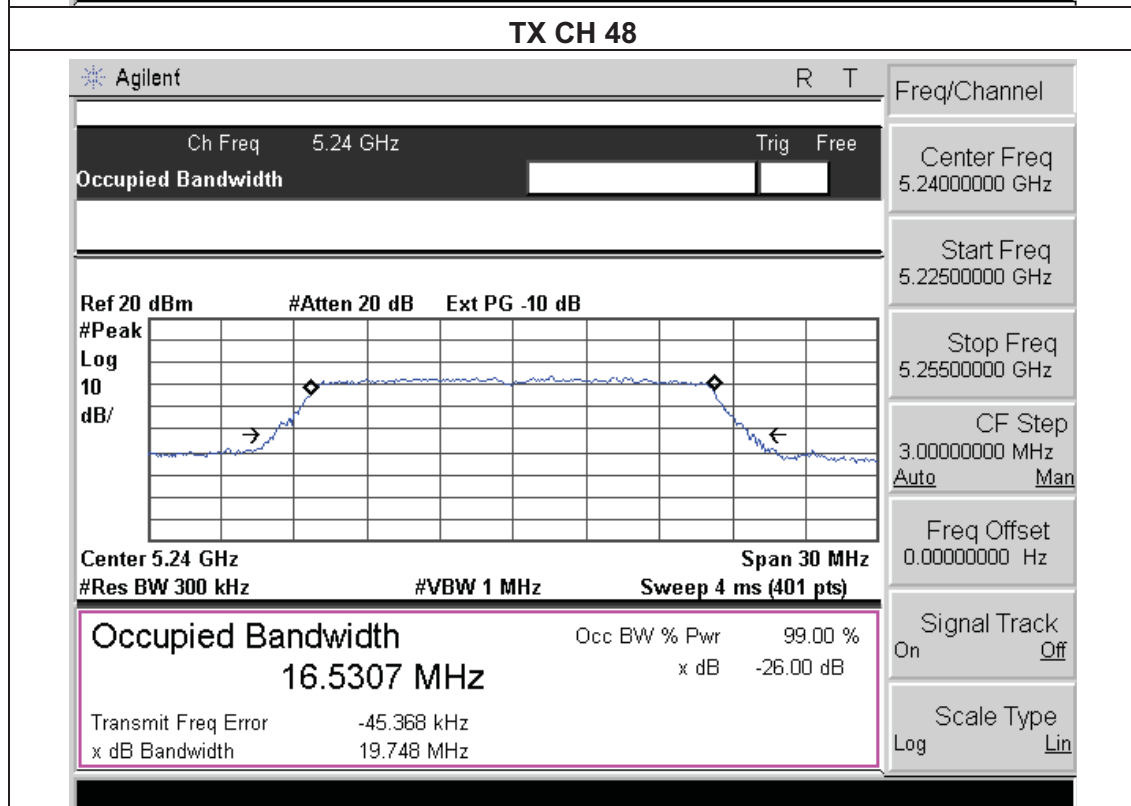
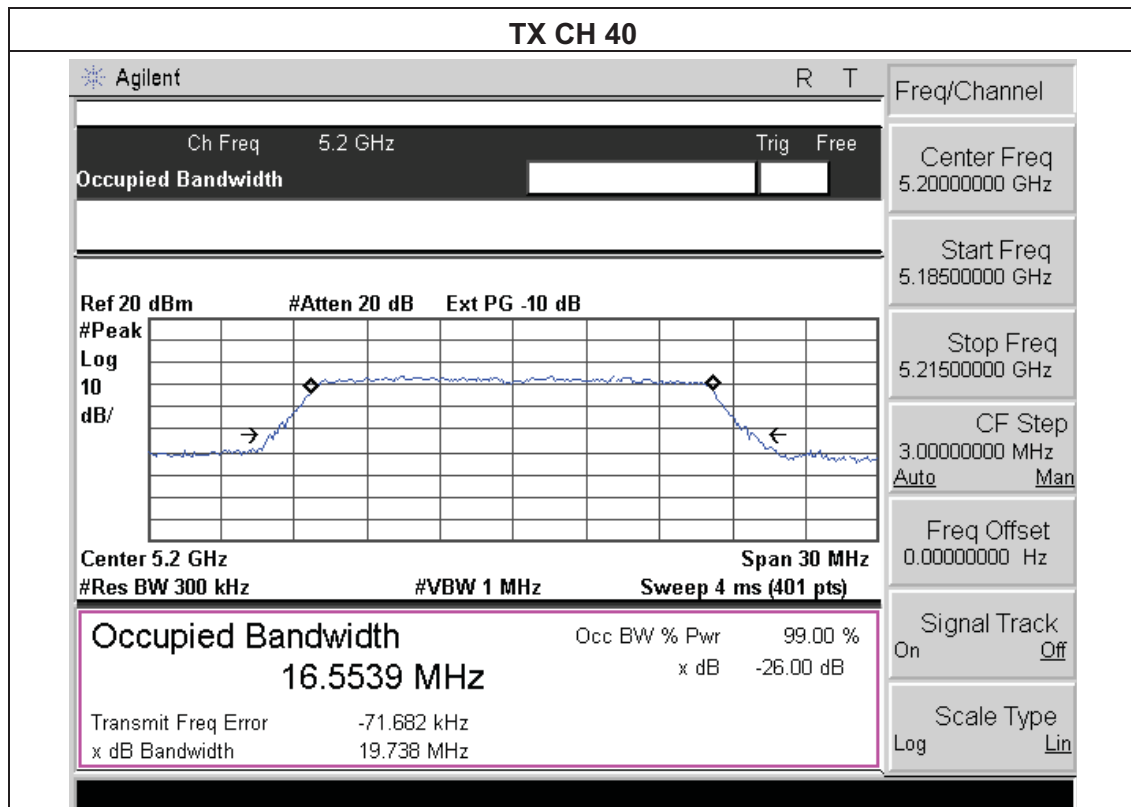
TX CH 40



TX CH 48

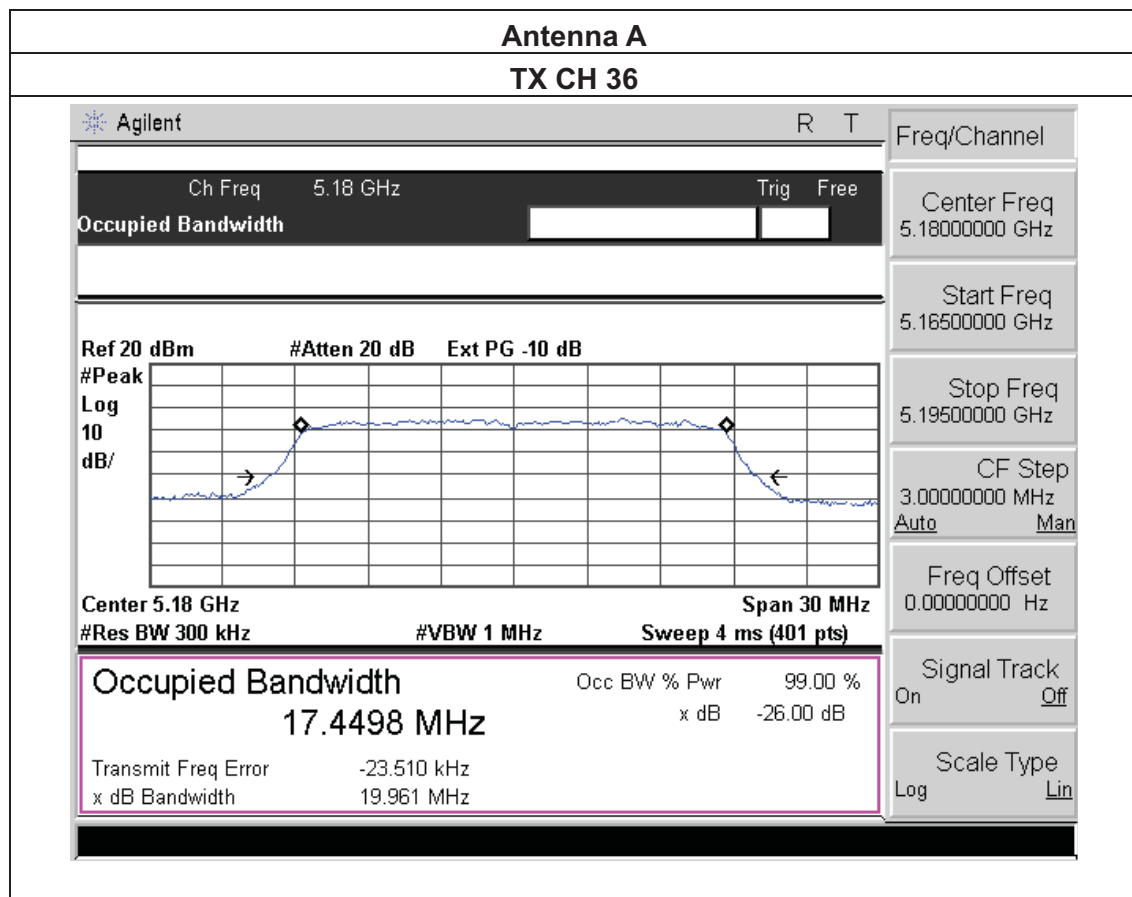




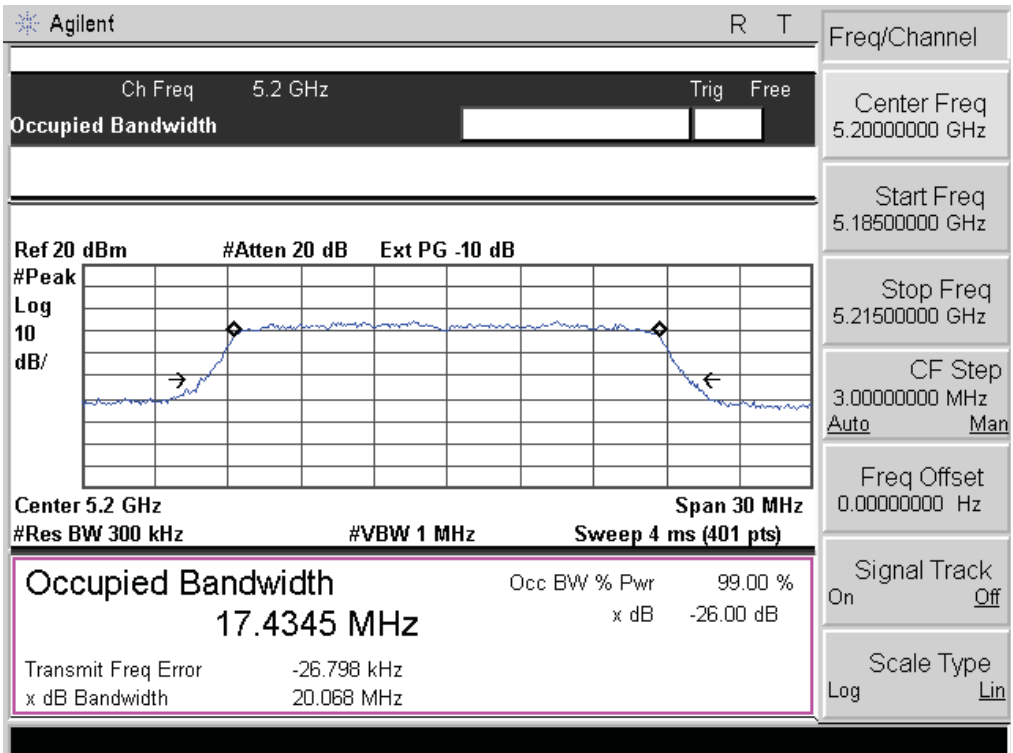


EUT :	Wireless N300 Dual Band USB Adapter	Model Name :	JUE302
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 5V From PC AC120V/60Hz
Test Mode :	TX n(20) Mode(5G) /CH36, CH40, CH48		

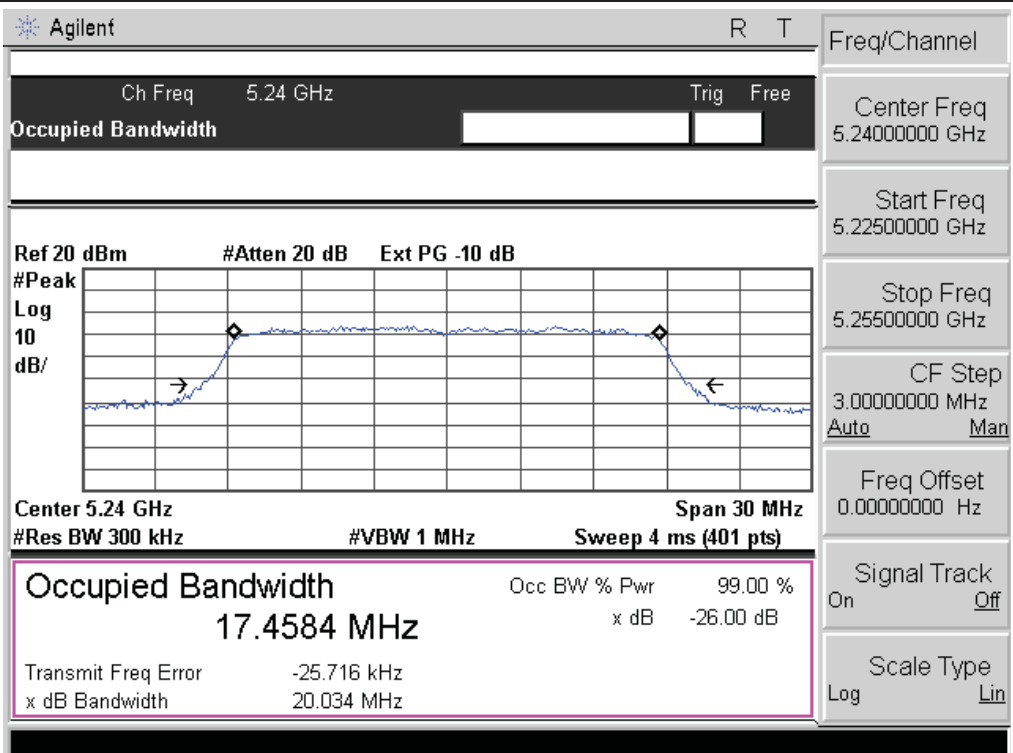
Channel	Frequency (MHz)	99% bandwidth (MHz)ANT A	99% bandwidth (MHz)ANT B	26dB bandwidth (MHz)ANT A	26dB bandwidth (MHz) ANT B	Limit (kHz)	Result
802.11N20 mode							
Low	5180	17.450	17.447	19.961	19.937	500	Pass
Middle	5200	17.435	17.439	20.068	19.931	500	Pass
High	5240	17.458	17.437	20.034	19.869	500	Pass

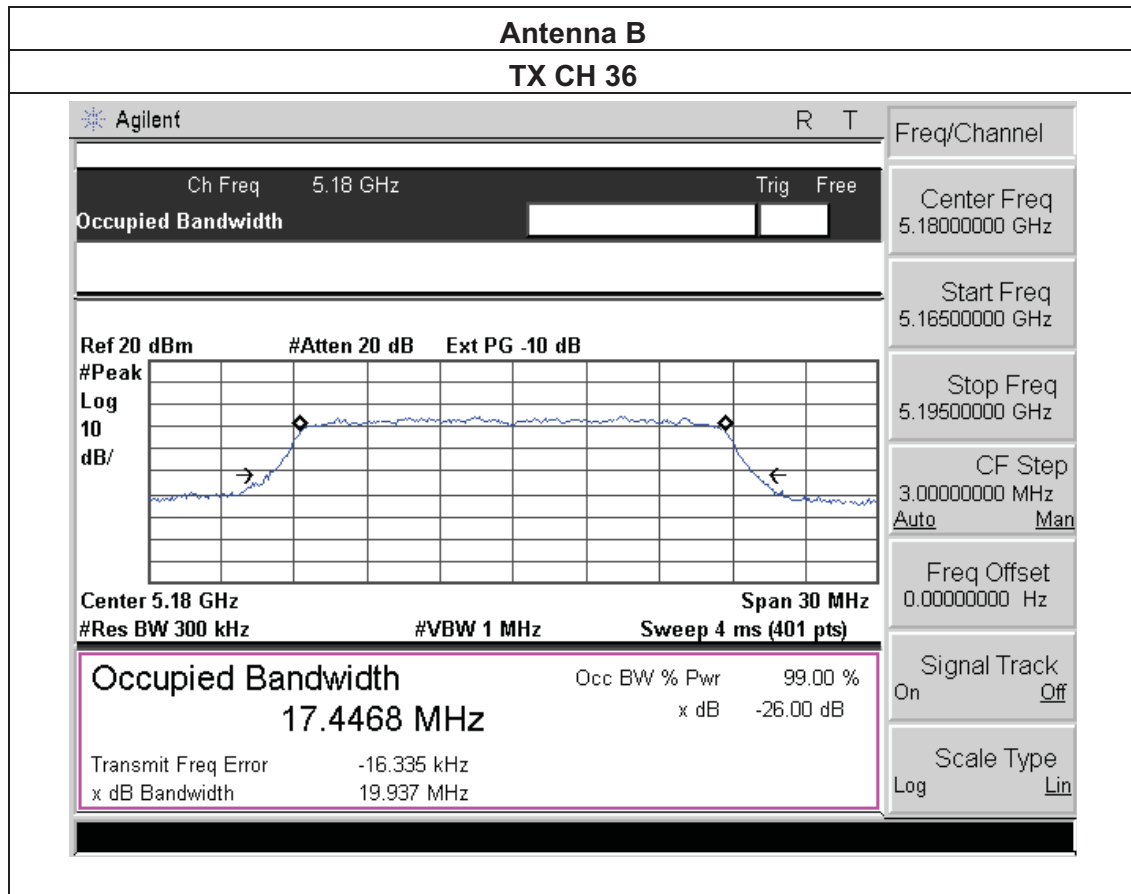


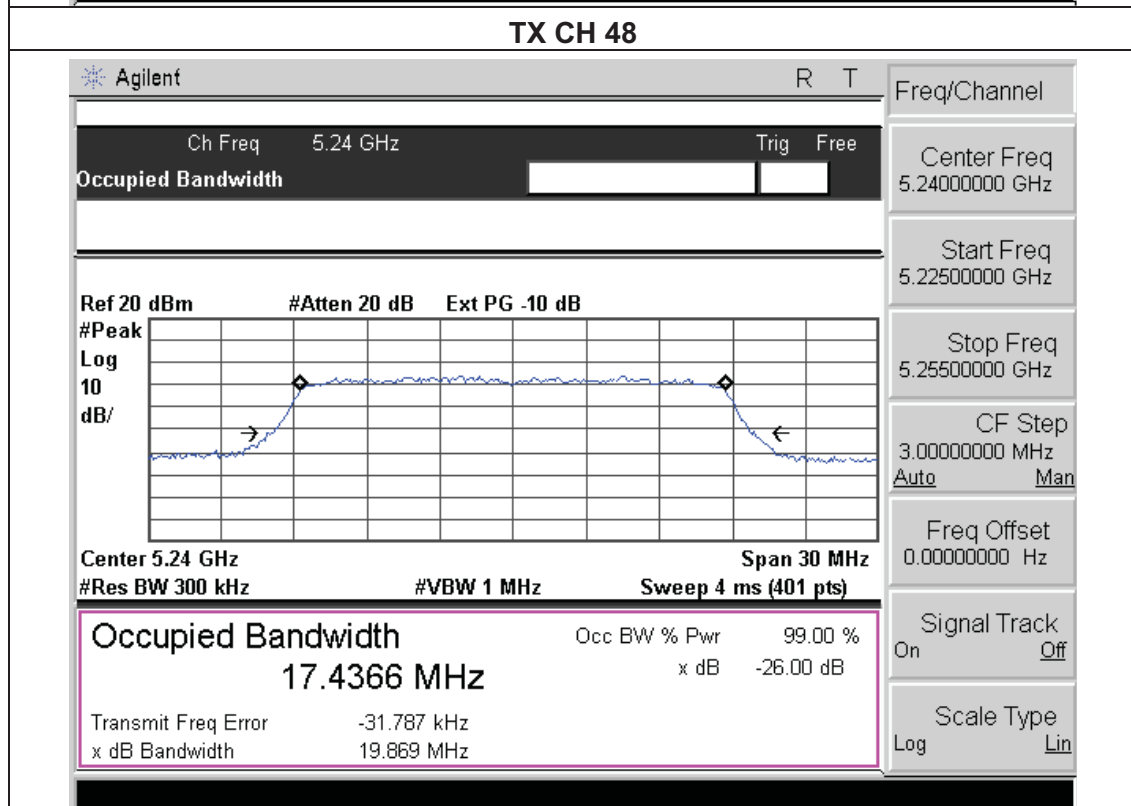
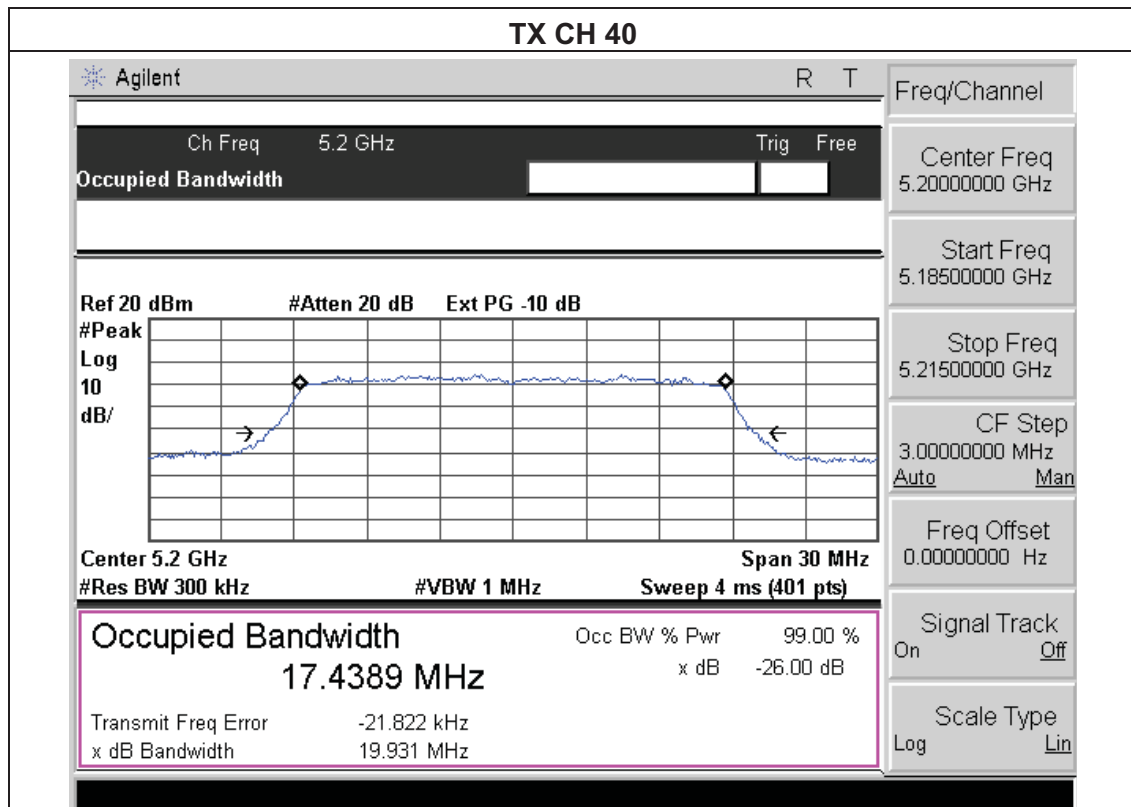
TX CH 40



TX CH 48

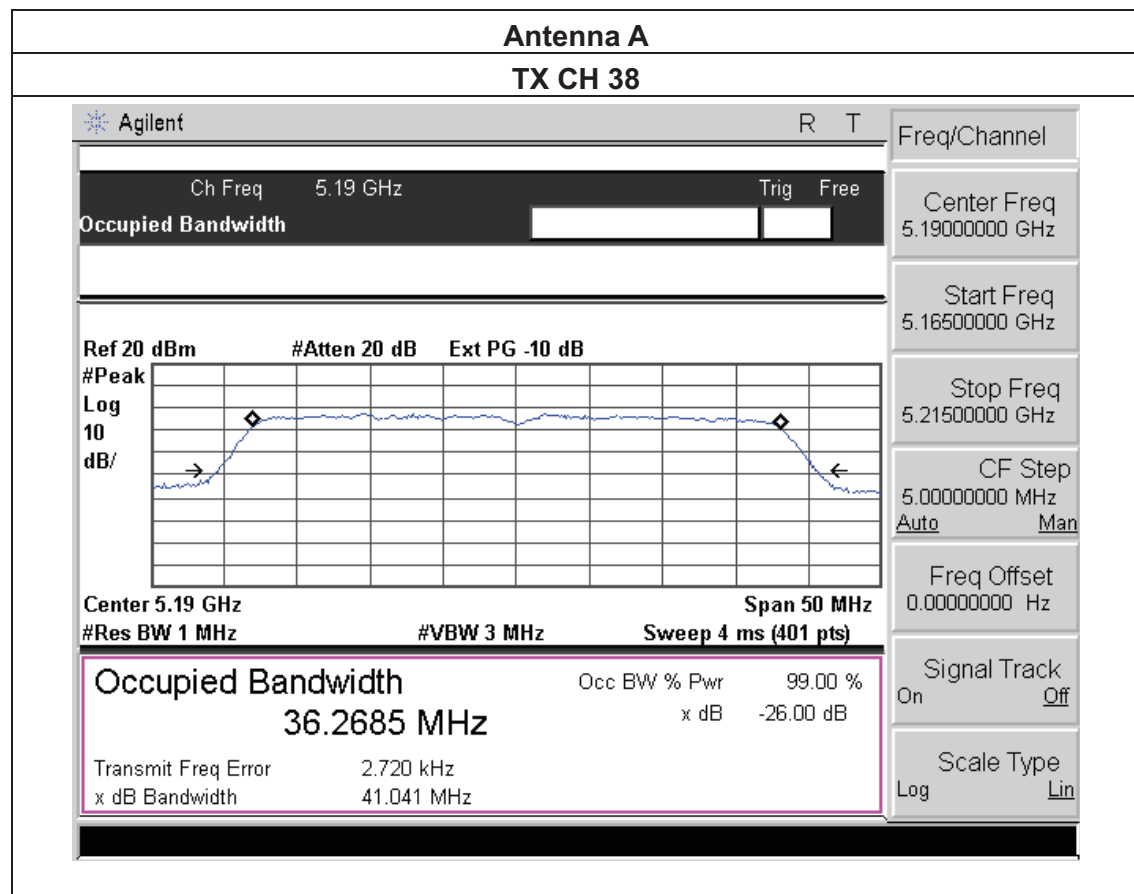


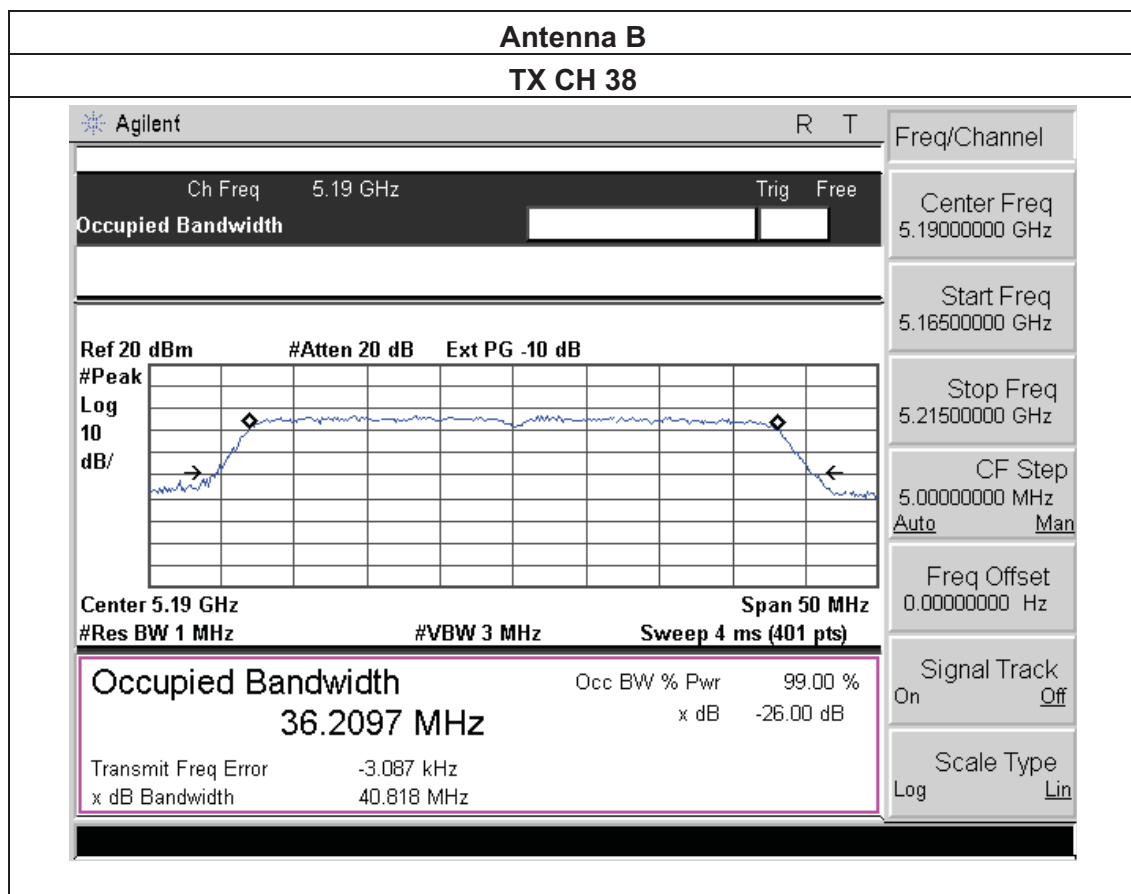
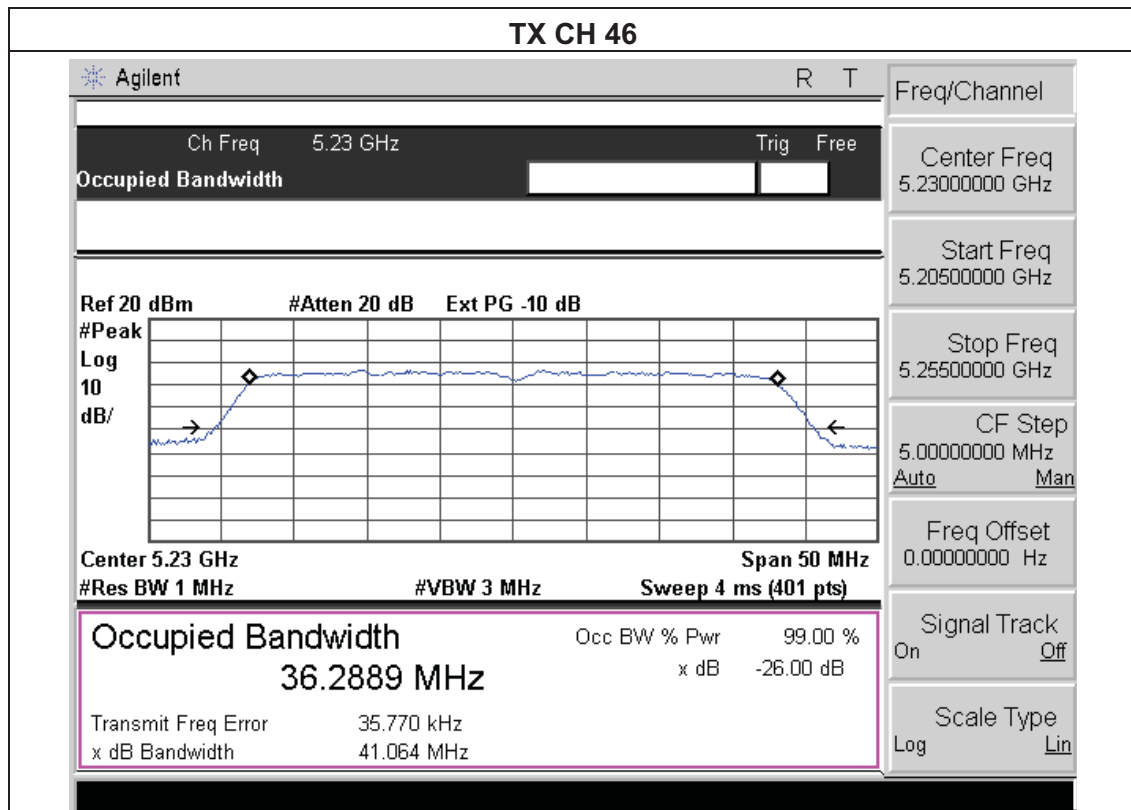


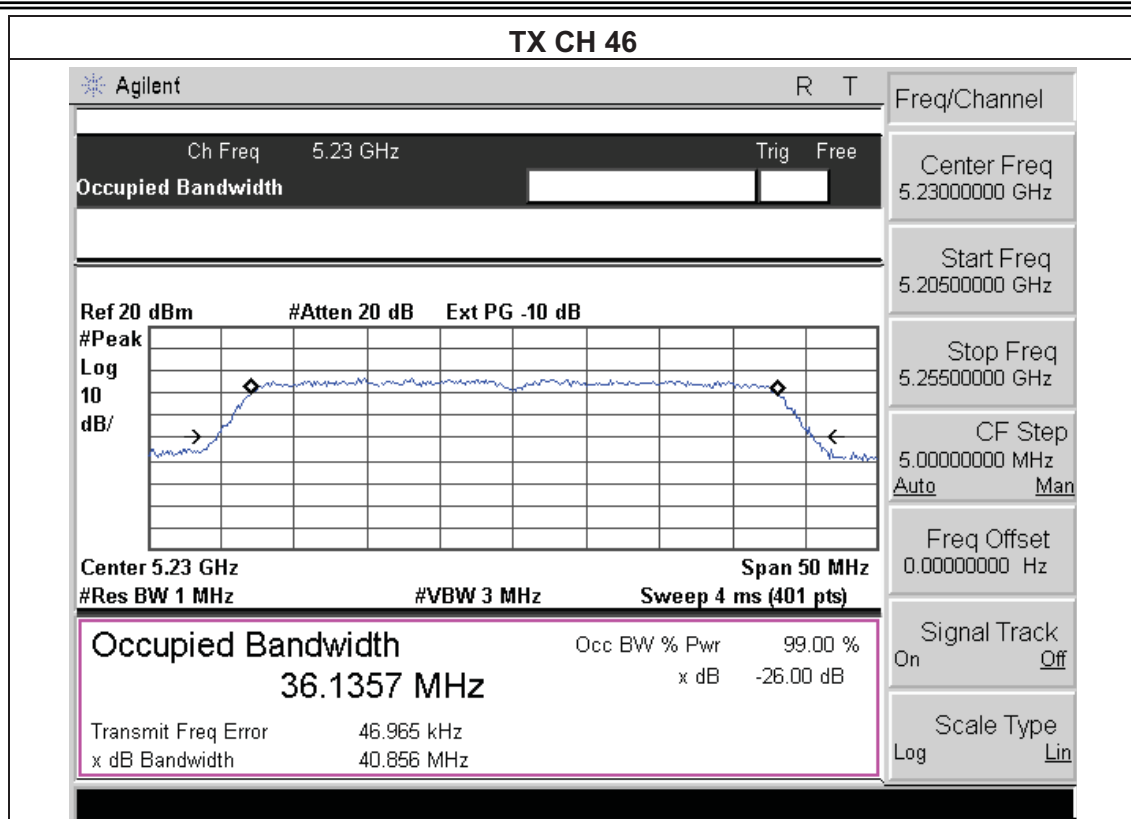


EUT :	Wireless N300 Dual Band USB Adapter	Model Name :	JUE302
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 5V From PC AC120V/60Hz
Test Mode :	TX n40 Mode(5G) /CH38, CH46		

Channel	Frequency (MHz)	99% bandwidth (MHz)ANT A	99% bandwidth (MHz)ANT B	26dB bandwidth (MHz)ANT A	26dB bandwidth (MHz) ANT B	Limit (kHz)	Result
802.11N40 mode							
Low	5190	36.269	36.210	41.041	40.818	500	Pass
High	5230	36.289	36.136	41.064	40.856	500	Pass







6. OUTPUT POWER TEST

6.1 APPLIED PROCEDURES / LIMIT

According to FCC §15.407(a)(1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band. 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.

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. 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.

According to IC RSS-210 §A9.2:

For the 5.15–5.250 GHz bands, the maximum e.i.r.p shall not exceed 200 mW or $10 + 10 \log B$, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p spectral density shall not exceed 10 dBm in any 1.0 MHz band.

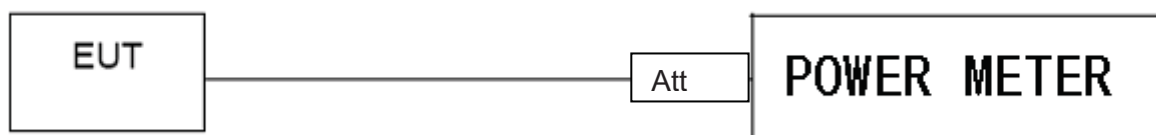
6.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the Power meter

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 :	Wireless N300 Dual Band USB Adapter	Model Name :	JUE302
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V From PC AC120V/60Hz
Test Mode :	TX a/n(5G) Mode		

Test Channe	Frequency	Maximum output power. Antenna port		Total Power	LIMIT
	(MHz)	ANT A	ANT B	dBm	dBm
TX 802.11a Mode					
CH36	5180	4.11	3.37	6.77	17
CH40	5200	4.26	3.36	6.76	17
CH48	5240	4.31	3.28	6.84	17
TX 802.11 n20 Mode					
CH36	5180	3.59	2.49	6.09	17
CH40	5200	3.44	2.37	6.03	17
CH48	5240	3.37	2.49	5.96	17
TX 802.11 n40 Mode					
CH38	5190	2.48	1.61	5.08	17
CH46	5230	2.57	1.52	5.04	17

7. OUT OF BAND EMISSIONS

APPLICABLE STANDARD

According to FCC §15.407(b)

For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz

According to RSS-210 §A8.5,

in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required.

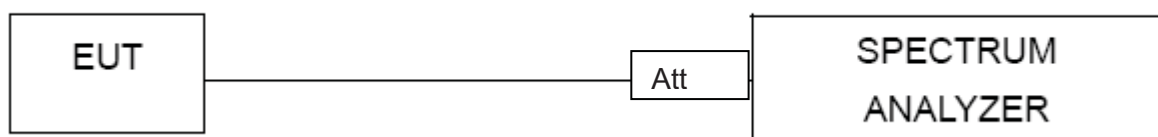
TEST PROCEDURE

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

7.1 DEVIATION FROM STANDARD

No deviation.

7.2 TEST SETUP



7.3 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.

7.4 TEST RESULTS

EUT :	Wireless N300 Dual Band USB Adapter	Model Name :	JUE302
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 5V From PC AC120V/60Hz
Test Mode	keeping TX MIMO mode		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
802.11a							
5150	35.38	11.23	46.61	68.2	-21.59	PEAK	Vertical
5150	34.84	11.23	46.07	68.2	-22.13	PEAK	Horizontal
5350	34.69	11.56	46.25	68.2	-21.95	PEAK	Vertical
5350	35.21	11.56	46.77	68.2	-21.43	PEAK	Horizontal
802.11n20							
5150	34.74	11.23	45.97	68.2	-22.23	PEAK	Vertical
5150	33.84	11.23	45.07	68.2	-23.13	PEAK	Horizontal
5350	34.67	11.56	46.23	68.2	-21.97	PEAK	Vertical
5350	34.38	11.56	45.94	68.2	-22.26	PEAK	Horizontal
802.11n40							
5150	34.35	11.23	45.58	68.2	-22.62	PEAK	Vertical
5150	33.26	11.23	44.49	68.2	-23.71	PEAK	Horizontal
5350	32.73	11.56	44.29	68.2	-23.91	PEAK	Vertical
5350	32.58	11.56	44.14	68.2	-24.06	PEAK	Horizontal

8. PEAK EXCURSION RATIO

8.1 APPLIED PROCEDURES / LIMIT

According to FCC §15.407(a) (6), 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.

8.1.1 TEST PROCEDURE

The largest difference between the following two traces must be ≤ 13 dB for all frequencies across the emission

bandwidth. Submit a plot.

1st Trace:

- Set RBW = 1 MHz, VBW ≥ 3 MHz with peak detector and maxhold settings.

2nd Trace:

- create the 2nd trace using the settings described in the setion “FCC §15.407(a)(1)(2) –

CONDUCTED

TRANSMITTER OUTPUT POWER”.

8.1.2 DEVIATION FROM STANDARD

No deviation.

8.1.3 TEST SETUP



8.1.4 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.

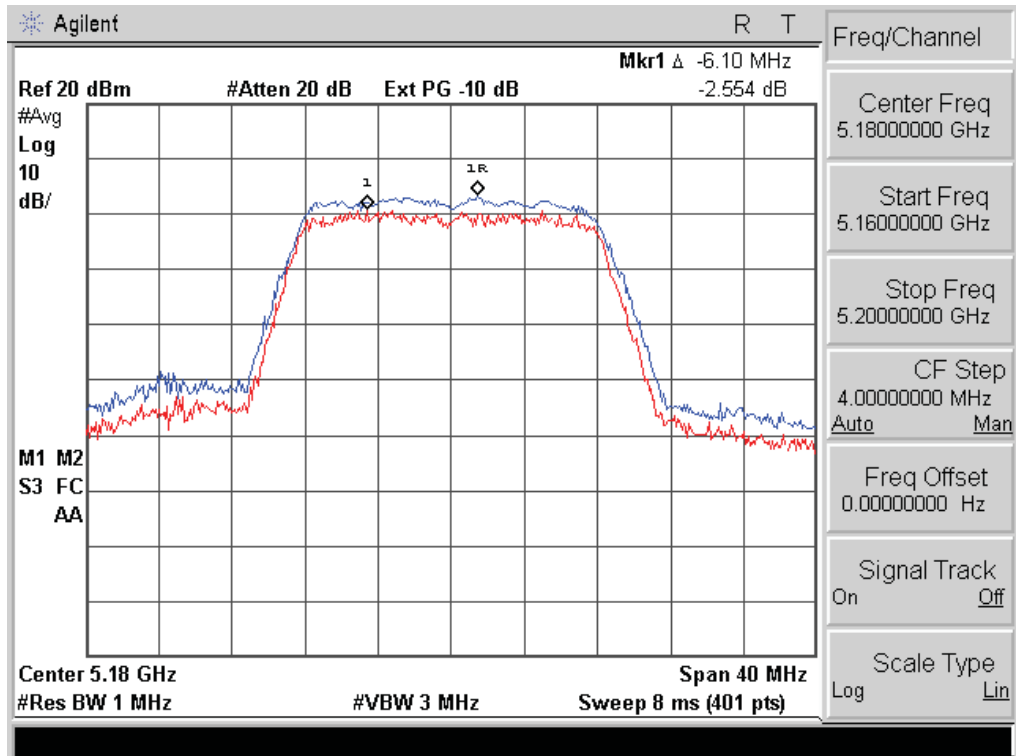
8.1.5 TEST RESULTS

EUT :	Wireless N300 Dual Band USB Adapter	Model Name :	JUE302
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 5V From PC AC120V/60Hz

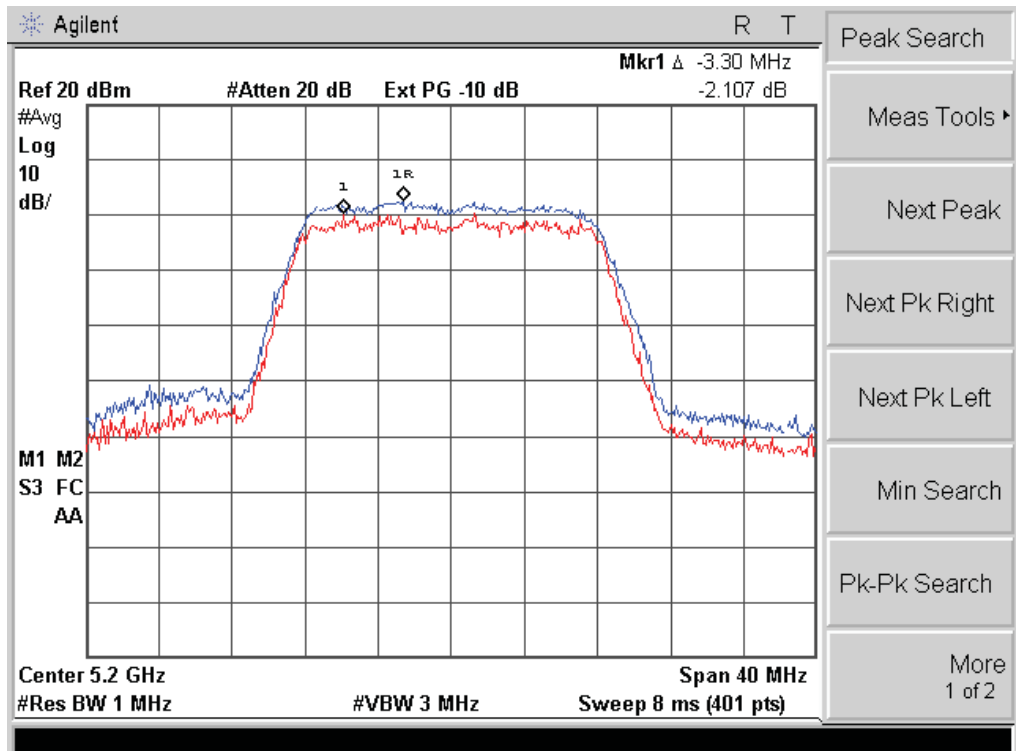
Channel	Frequency (MHz)	TX ANT A PER(dB)	TX ANT B PER(dB)	Limit (dB)
802.11a mode				
Low	5180	-2.554	-2.622	13
Middle	5200	-2.107	-2.674	
High	5240	-2.485	-3.446	
802.11n HT20 mode				
Low	5180	-2.120	-2.688	13
Middle	5200	-2.590	-2.473	
High	5240	-3.467	-1.525	
802.11n HT40 mode				
Low	5190	-1.295	-2.021	13
High	5230	-1.948	-2.675	

Antenna A

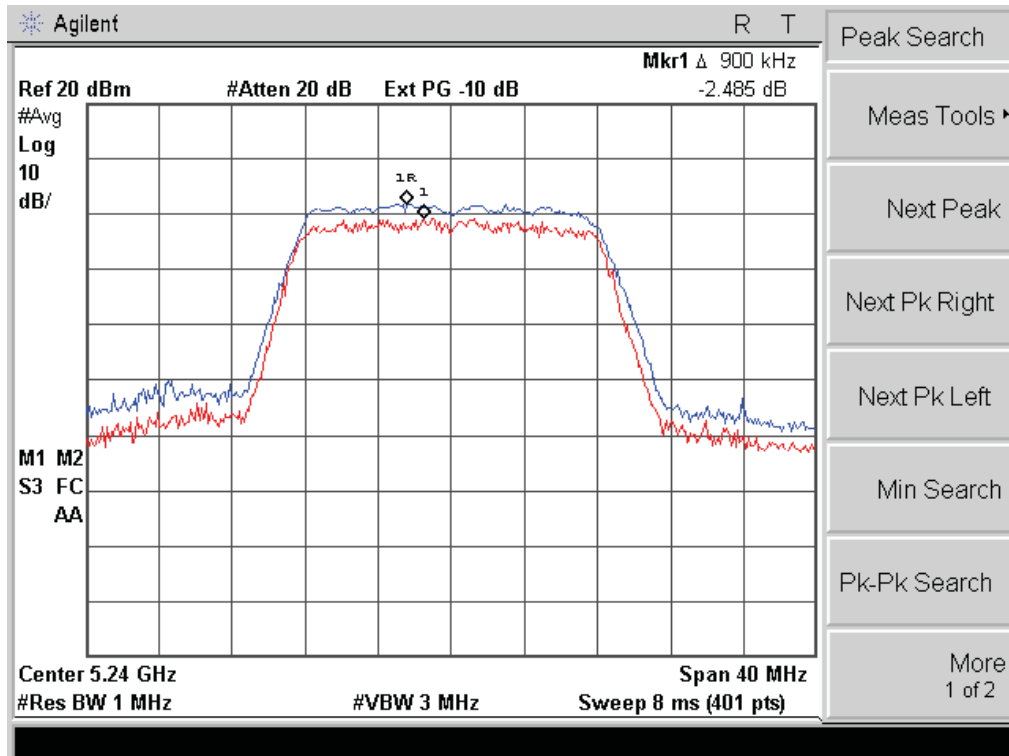
802.11a:CH 36



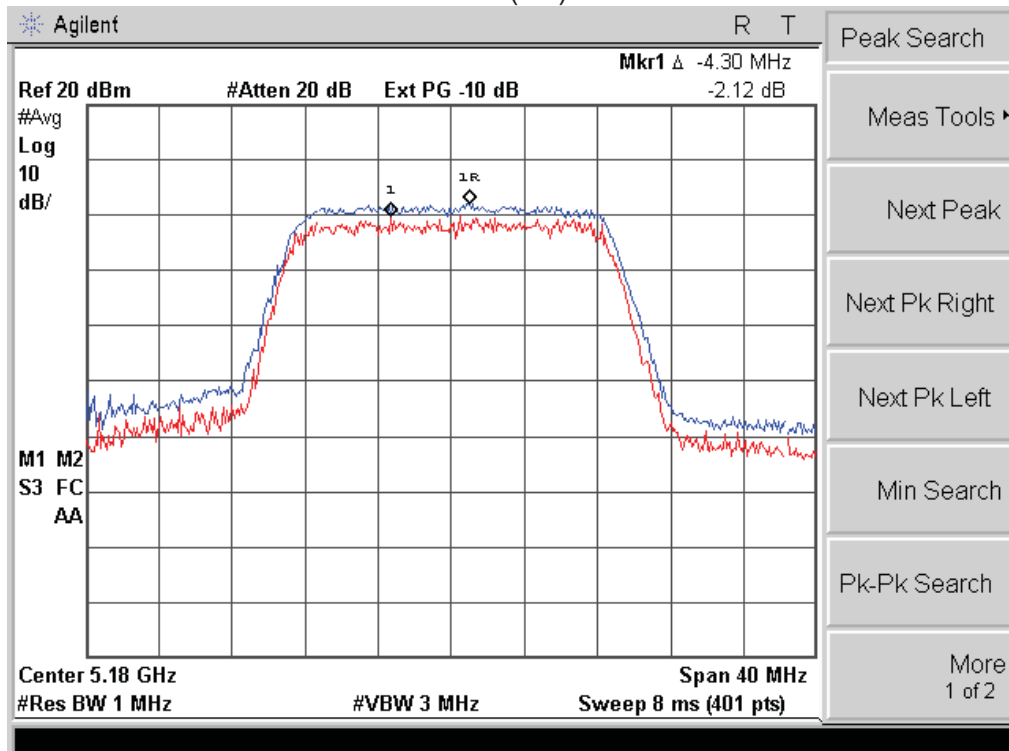
CH 40



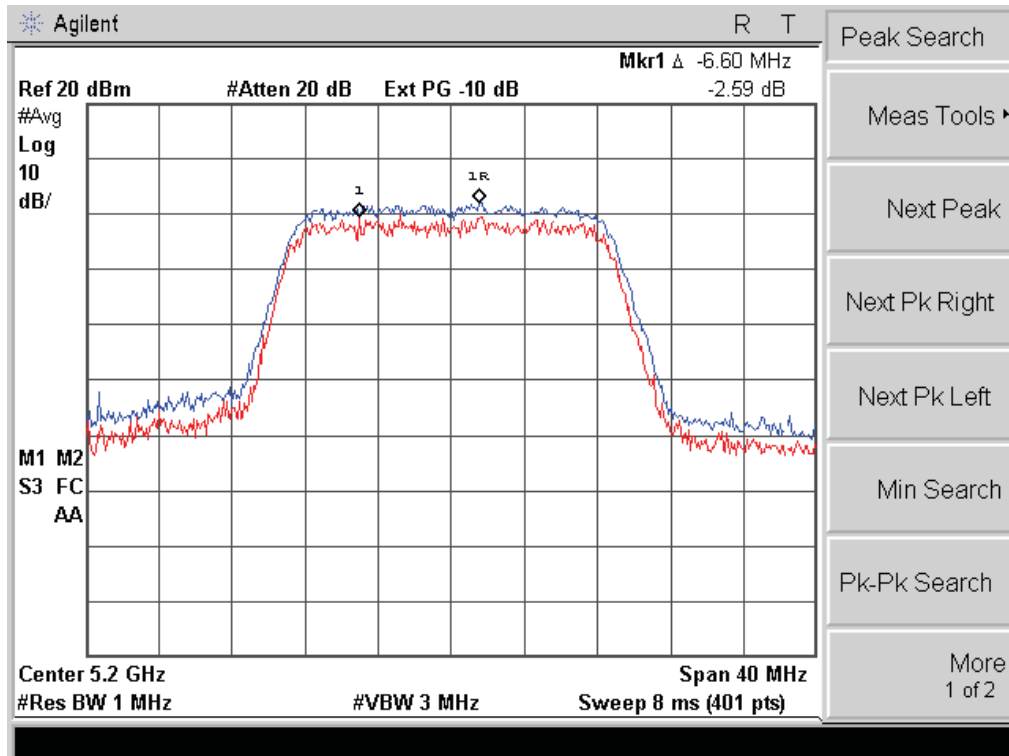
CH 48



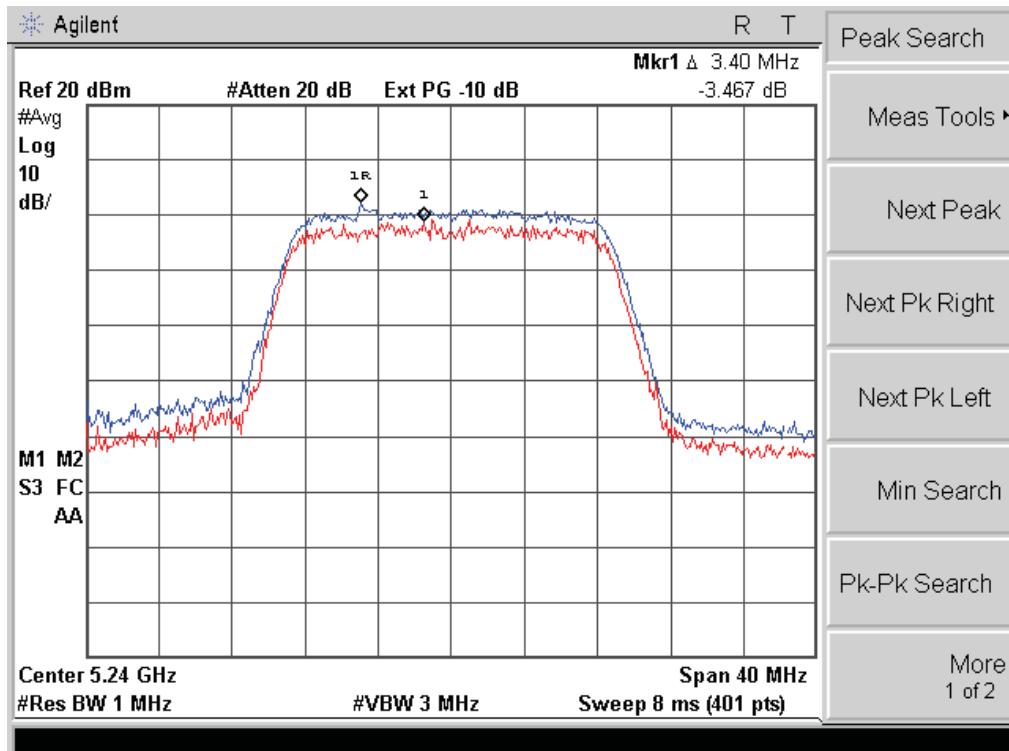
802.11 n20(5G):CH 36



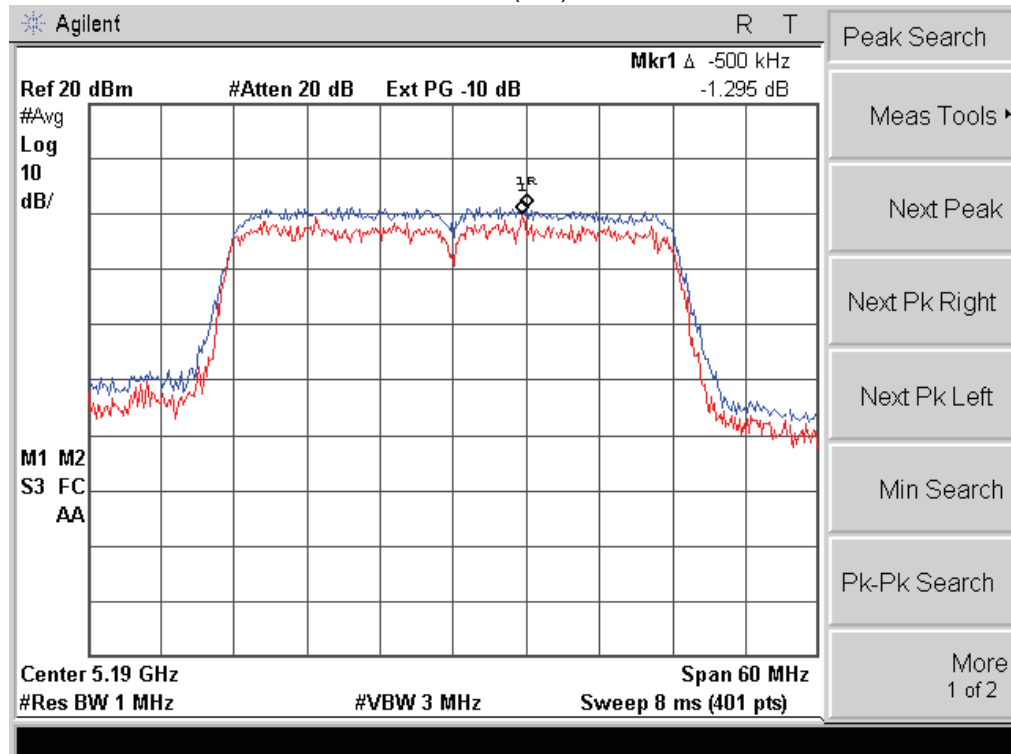
CH 40



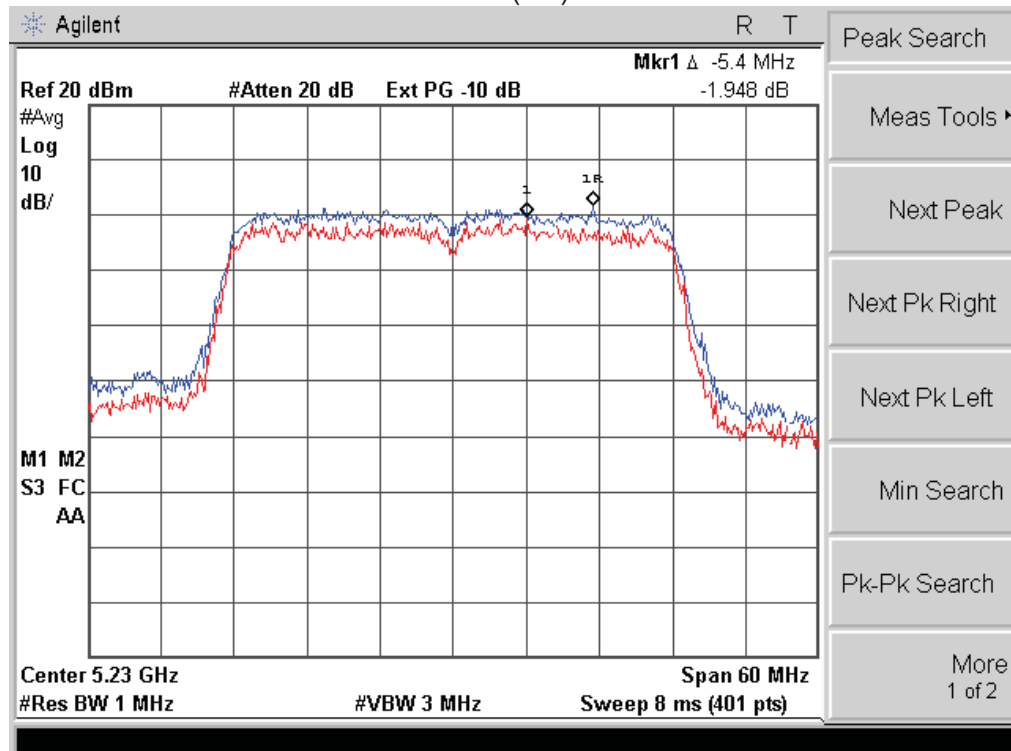
CH 48



802.11 n40(5G):CH 38

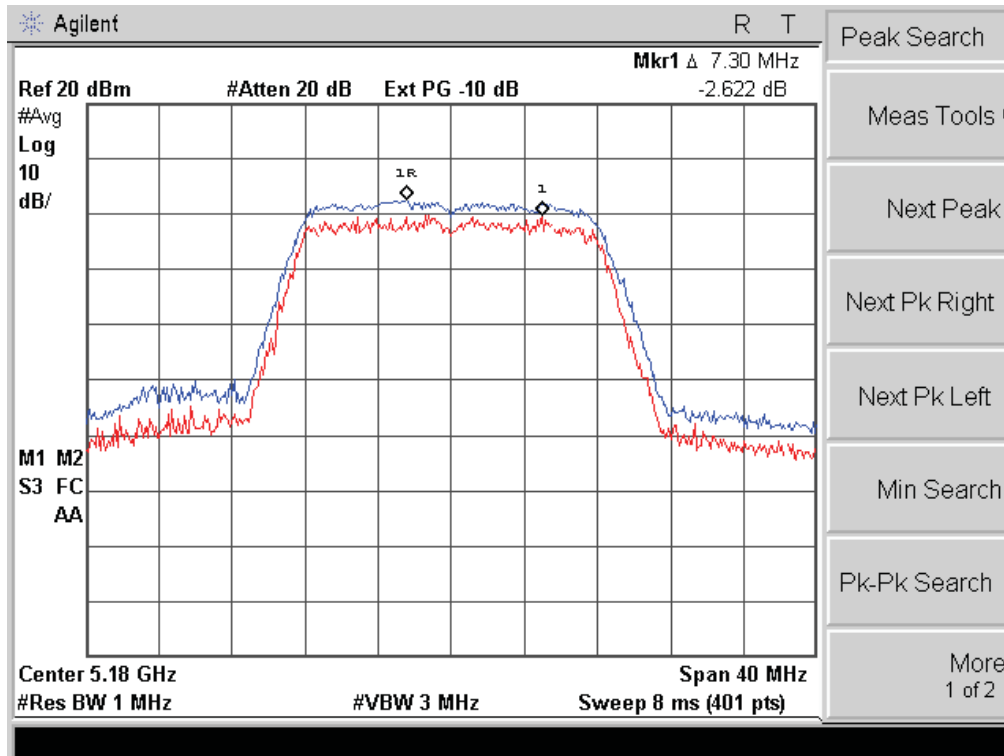


802.11 n20(5G):CH 46

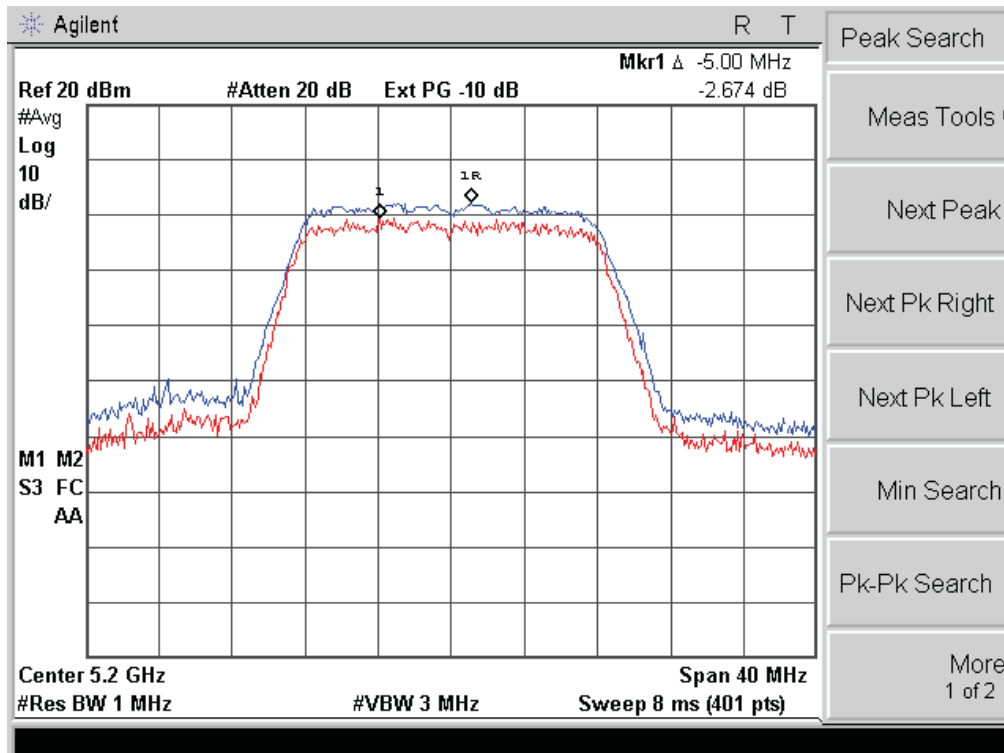


Antenna B

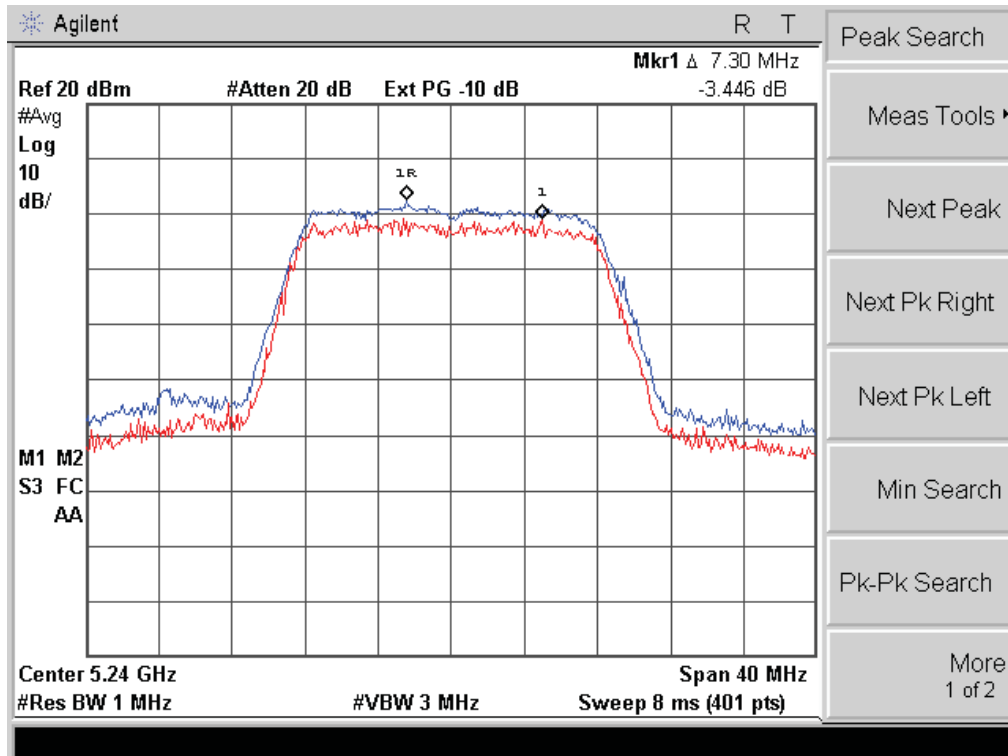
802.11a: CH 36



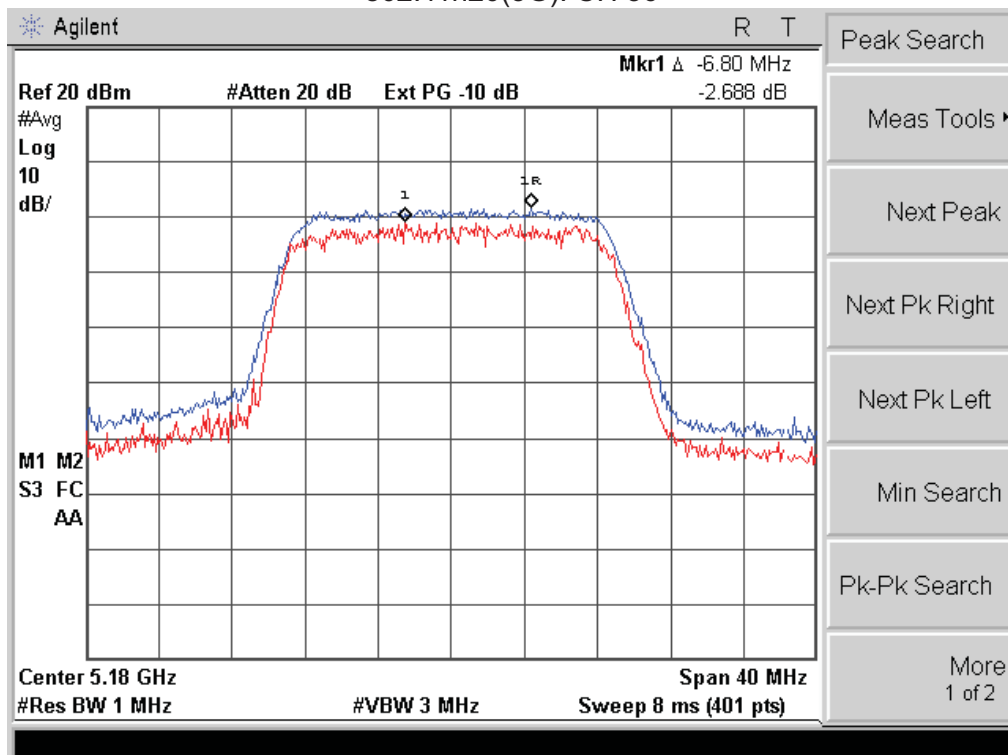
CH 40



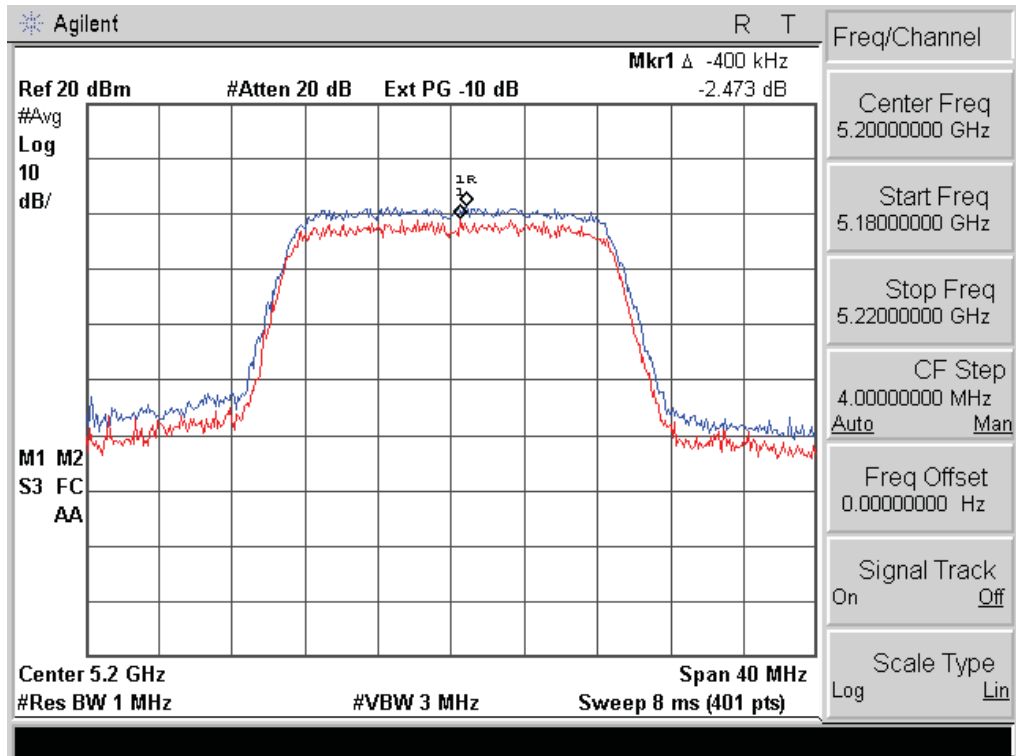
CH 48



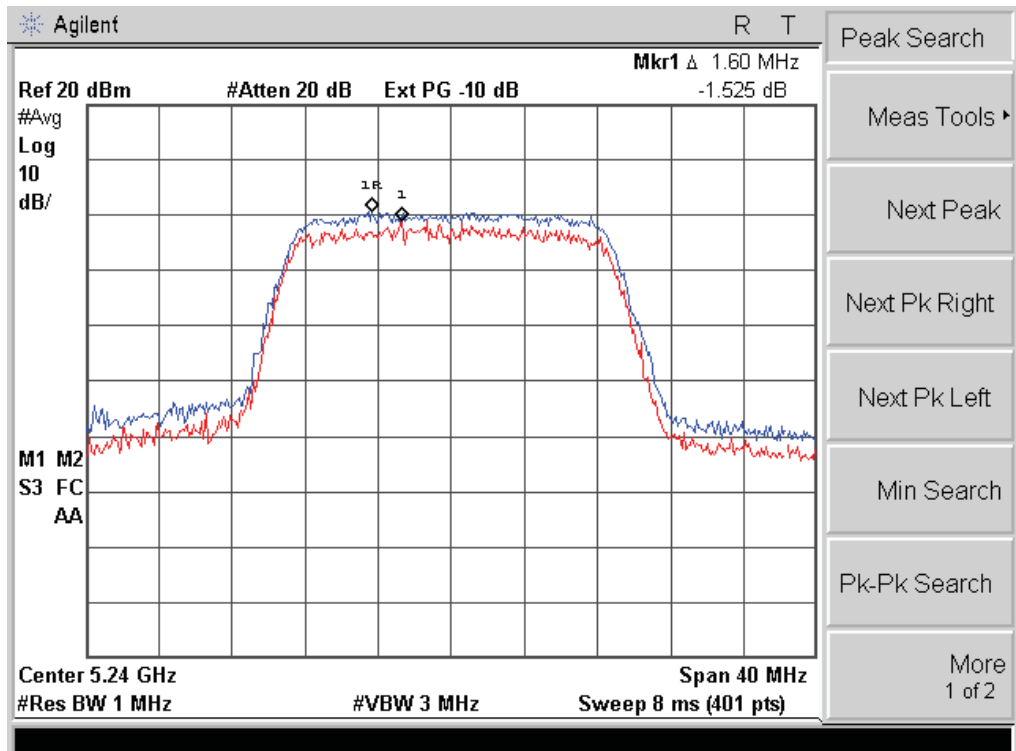
802.11n20(5G): CH 36



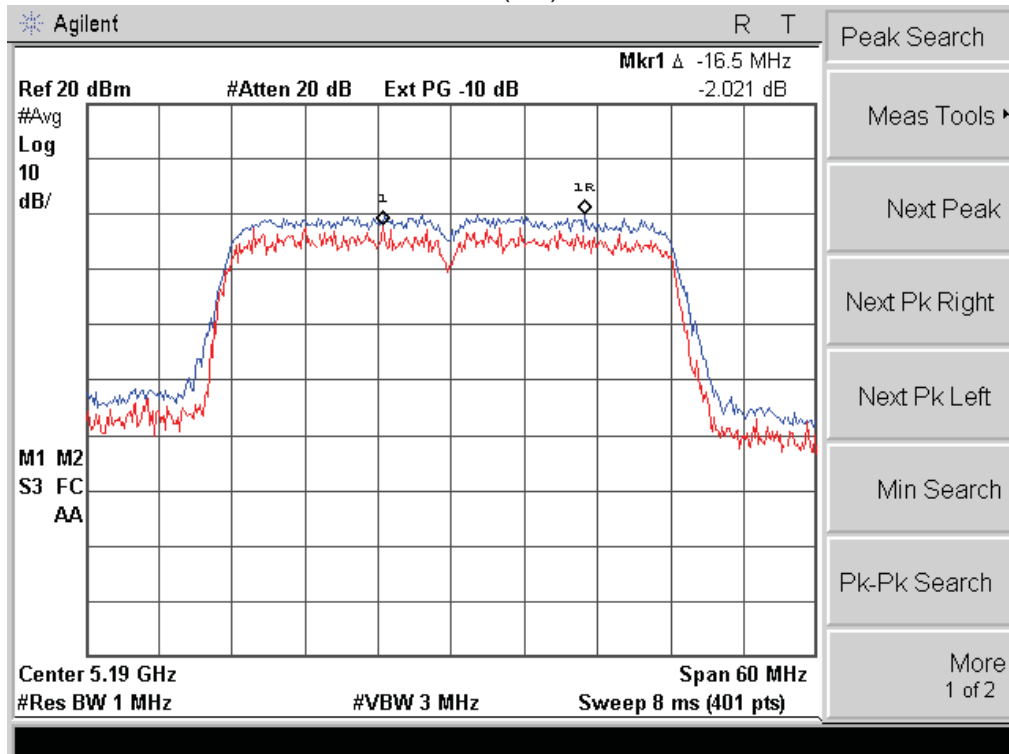
CH 40



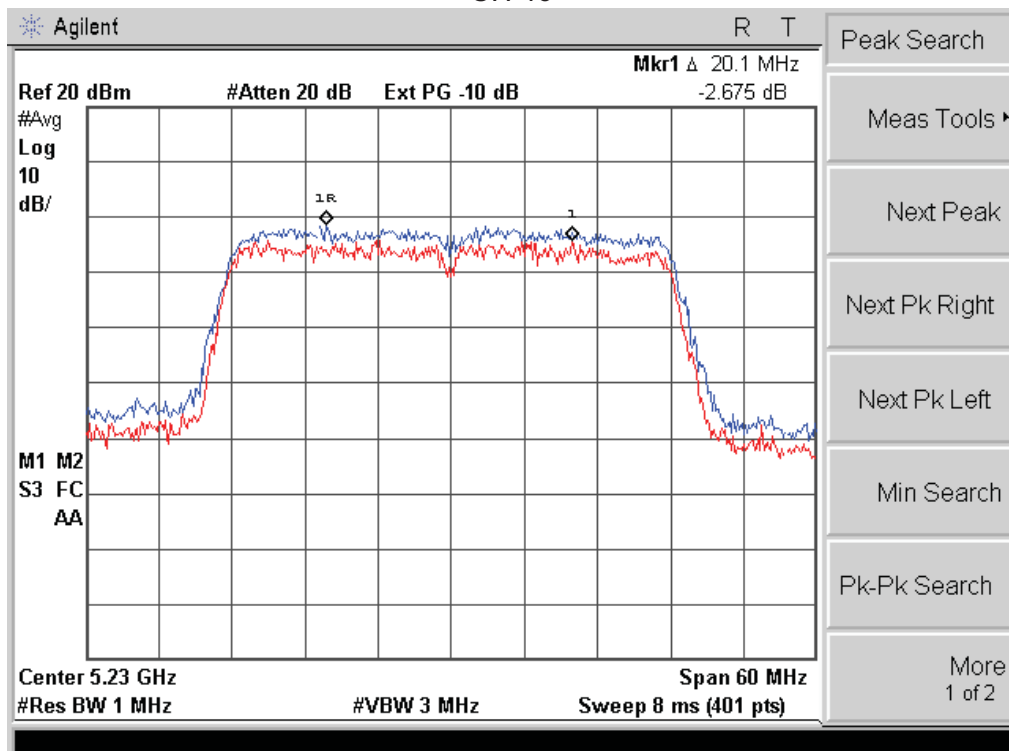
CH 48



802.11n40(5G): CH 38



CH 46



9. ANTENNA REQUIREMENT

9.1 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.

9.2 EUT ANTENNA

The EUT antenna is unique connector antenna(R-SMA), detailed in the External photos, It comply with the standard requirement.

10. FREQUENCY STABILITY

10.1 Applicable Standard

FCC § 2.1055, The frequency tolerance of the carrier signal shall be maintained within +/- 0.02% of the operating frequency over a temperature variation of -30 degrees to 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees

10.2 Test Procedure

1. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

10.3 Test Result

Channel 36 (5180MHz)

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
DC4.3V	5179.9746
DC5.0V	5179.9767
DC5.7V	5179.9773
Max. Deviation (MHz)	0.0254
Max. Deviation (ppm)	4.9

Rated working voltage: DC5.0V

Temperature vs. Frequency Stability

Temperature (°C)	Measurement Frequency (MHz)
-30	5179.9747
-20	5179.9686
-10	5179.9863
0	5179.9737
10	5179.9773
20	5179.9643
30	5179.9647
40	5179.9845
50	5179.9748
Max. Deviation (MHz)	0.0357
Max. Deviation (ppm)	6.9

Channel 40 (5200MHz)
Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
DC4.3V	5199.9657
DC5.0V	5199.9674
DC5.7V	5199.9667
Max. Deviation (MHz)	0.0343
Max. Deviation (ppm)	6.6

Rated working voltage: DC5.0V

Temperature vs. Frequency Stability

Temperature (°C)	Measurement Frequency (MHz)
-30	5199.9778
-20	5199.9767
-10	5199.9798
0	5199.9784
10	5199.9754
20	5199.9787
30	5199.9764
40	5199.9776
50	5199.9774
Max. Deviation (MHz)	0.0246
Max. Deviation (ppm)	4.7

Channel 48 (5240MHz)
Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
DC4.3V	5239.9768
DC5.0V	5239.9747
DC5.7V	5239.9689
Max. Deviation (MHz)	0.0311
Max. Deviation (ppm)	5.9

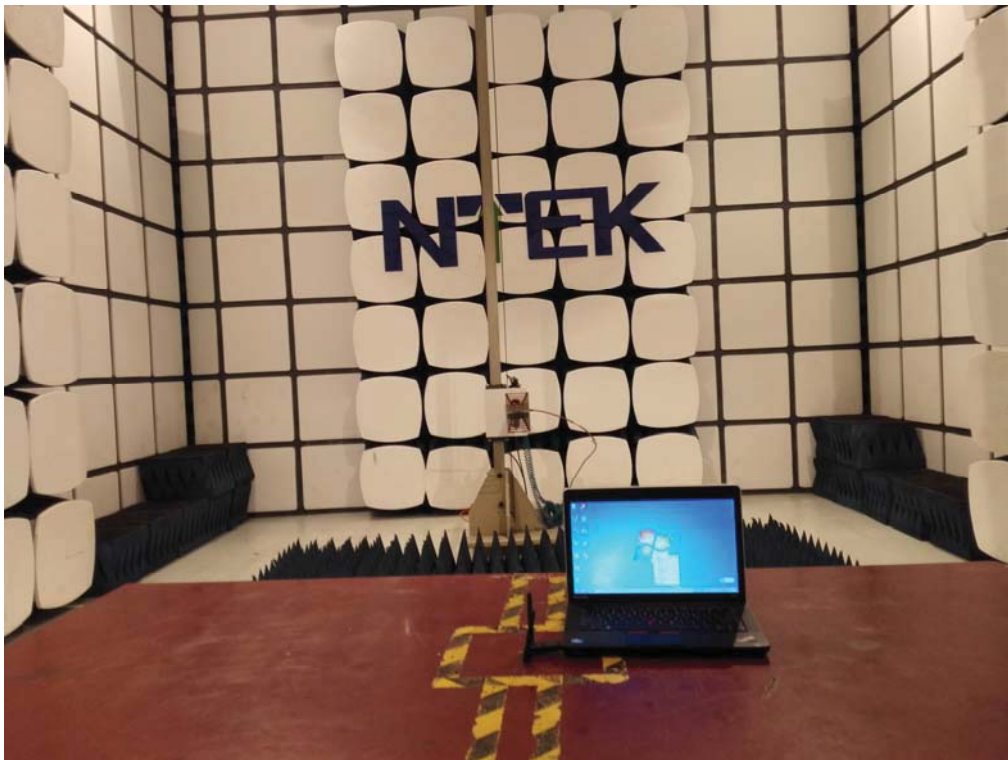
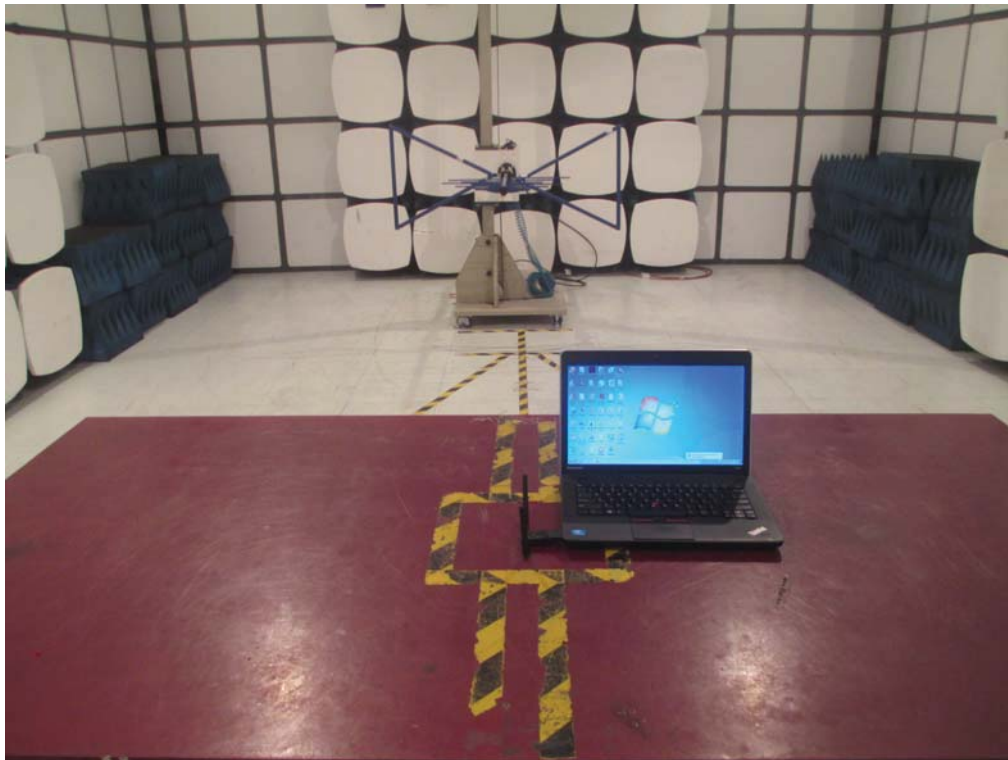
Rated working voltage: DC5.0V

Temperature vs. Frequency Stability

Temperature (°C)	Measurement Frequency (MHz)
-30	5239.9757
-20	5239.9786
-10	5239.9778
0	5239.9763
10	5239.9747
20	5239.9738
30	5239.9736
40	5239.9774
50	5239.9773
Max. Deviation (MHz)	0.0264
Max. Deviation (ppm)	5.0

11. EUT TEST PHOTO

Radiated Measurement Photos



Conducted Measurement Photos