FCC RADIO TEST REPORT
FCC ID:LNQRTL8812AUCG

Product： ScreenBeam Smart Miracast module

Trade Name： Actiontec

Model Name： RTL8812AU-CG

Serial Model： N/A

Report No.： NTEK-2016NT05246020F5

Prepared for

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Prepared by

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TEST RESULT CERTIFICATION

Applicant's name ..... Actiontec Electronics Inc

Address ..... 760 North Mary Ave., Sunnyvale, California94086, United States

Manufacture's Name... Actiontec Electronics Inc

Address ..... 760 North Mary Ave., Sunnyvale, California94086, United States

Product description

Product name ..... ScreenBeam Smart Miracast module

Model and/or type reference RTL8812AU-CG

Serial Model ..... N/A

Standards ..... FCC Part15.407: 01 Oct. 2015

Test procedure ..... ANSI C63.10-2013 and KDB 789033 D02 General UNII Test Procedures New Rules v01r01
FCC KDB 662911 D01 Multiple Transmitter Output v01
FCC KDB 662911 D02 MIMO With Cross Polarized Antenna V01

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/ the Industry Canada 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 ..... 24 May. 2016 ~06 Jun. 2016

Date of Issue..... 06 Jun. 2016

Test Result..... **Pass**

Testing Engineer : Eileen Liu.

(Eileen Liu)

Technical Manager : Jason chen

(Jason Chen)

Authorized Signatory : Sam. chen

(Sam Chen)

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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
15.207	AC Power Line Conducted Emissions	PASS	
15.209(a), 15.407 (b)(1) 15.407 (b)(4) 15.407 (b)(6)	Spurious Radiated Emissions	PASS	
15.407 (a)(1) 15.407 (a)(3) 15.1049	26 dB and 99% Emission Bandwidth	PASS	
15.407(e)	Minimum 6 dB bandwidth	PASS	
15.407 (a)(1) 15.407 (a)(3)	Maximum Conducted Output Power	PASS	
2.1051, 15.407(b)(1) 15.407(b)(4)	Band Edges	PASS	
15.407 (a)(1) 15.407 (a)(3)	Power Spectral Density	PASS	
2.1051, 15.407(b)	Spurious Emissions at Antenna Terminals	PASS	
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 ± U**，where expended 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	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	ScreenBeam Smart Miracast module	
Trade Name	Actiontec	
Model Name	RTL8812AU-CG	
Product Description	IEEE 802.11 WLAN Mode Supported	☒802.11a/AC(20MHz channel bandwidth) ☒802.11n/AC(20MHz channel bandwidth) ☒802.11n/AC(40MHz channel bandwidth) ☒802.11AC(80MHz channel bandwidth)
	Data Rate	802.11 a: 6,9,12,18,24,36,48,54Mbps; 802.11n(HT20):MCS0-MCS15; 802.11n(HT40):MCS0-MCS15; 802.11AC: NSS1,MCS0-MCS9,NSS2,MCS0-MCS9;
	Modulation	OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11a/n/ac;
	Operating Frequency Range	☒5180-5240MHz for 802.11a/n(HT20)/AC20; 5190-5230MHz for 802.11n(HT40)/AC40; 5210MHz for 802.11 AC80; ☒5745-5825 MHz for 802.11a/n(HT20)/AC20; 5755-5795 MHz for 802.11a/n(HT40)/AC40; 5775MHz for 802.11 AC80;
	Number of Channels	☒4 channels for 802.11a/N20/AC20 in the 5180-5240MHz band ; 2 channels for 802.11 N40/AC40 in the 5190-5230MHz band ; 1 channels for 802.11 AC80 in the 5210MHz band ; ☒5 channels for 802.11a/N20/AC20 in the 5745-5825MHz band ; 2 channels for 802.11 N40/AC40 in the 5755-5795MHz band ; 1 channels for 802.11 AC80 in the 5775MHz band ;
	Antenna Type	PIFA Antenna
	Smart system	☒SISO for 802.11a/n ☒MIMO for 802.11n/ac
	Antenna Gain	See Table for Filed Antenna
	Based on the application, features, or specification exhibited in User's Manual, More details of EUT technical specification, please refer to the User's Manual.	
Ratings	DC 5V	
Adapter	Mode: WA-10P05R Input: 100-240V~, 50/60Hz, 0.3A MAX Output: 5.0V⎓, 2.0A	
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. Frequency and Channel list for 802.11a/n(20MHz) band I (5180-5240MHz):

802.11a/n/ac(20MHz) Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220	-	-	-	-
40	5200	48	5240	-	-	-	-

Frequency and Channel list for 802.11n(40MHz) band I (5190-5230MHz):

802.11n /ac(40MHz) Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	-	-	-	-	-	-
46	5230	-	-	-	-	-	-

802.11ac (80MHz) Carrier Frequency Channel	
Channel	Frequency (MHz)
42	5210

Frequency and Channel list for 802.11a/n(20 MHz) band III (5745-5825MHz):

802.11a/n/ac(20 MHz) Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	153	5765	157	5785	161	5805
165	5825	-	-	-	-	-	-

Frequency and Channel list for 802.11n(40MHz) band III (5755-5795MHz):

802.11n/ac 40MHz Carrier Frequency Channel					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795	-	-

802.11ac 80MHz Carrier Frequency Channel	
Channel	Frequency (MHz)
155	5775

The EUT has two types of antenna.

Tx Antenna 1

Antenna	Brand	Model Name (P/N)	Antenna Type	Connector	Antenna Gain(dBi)	
					2.4G	5.0G
A(main)	INPAQ	N/A	PIFA	I-PEX	3.53	5.55
B(aux)	INPAQ	N/A	PIFA	I-PEX	3.53	5.55

Tx Antenna 2

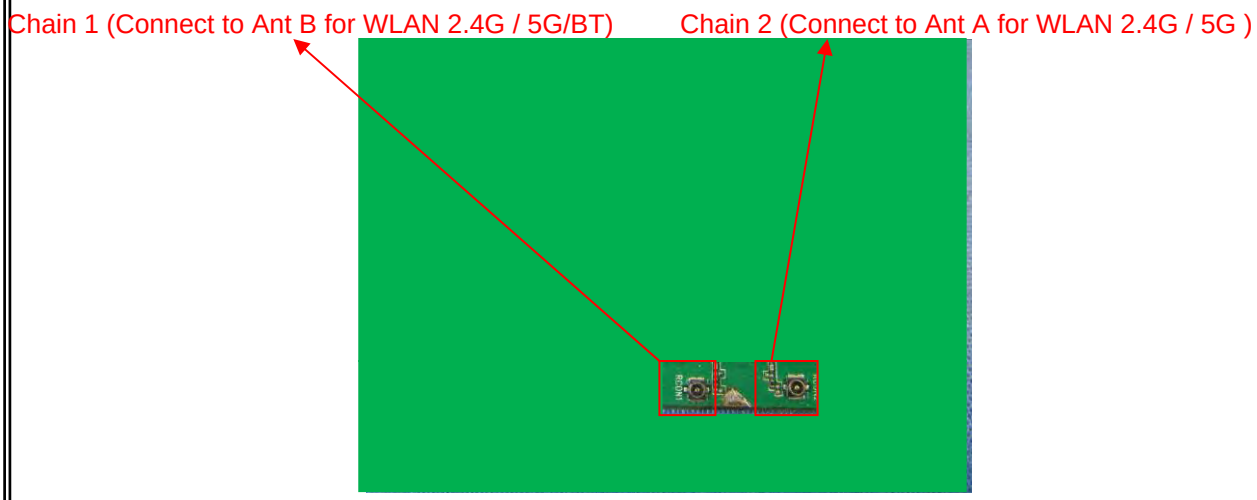
Antenna	Brand	Model Name (P/N)	Antenna Type	Connector	Antenna Gain(dBi)	
					2.4G	5.0G
A(main)	INPAQ	WA-P-LB-02-379	PIFA	I-PEX	-1.87	1.38
B(aux)	INPAQ	WA-P-LB-01-171	PIFA	I-PEX	1.07	2.49

Note: The EUT has two types of antenna.
Only the highest antenna gain for each type has been recorded in this test report, please refer to antenna list for more antenna information.

5G Band:
For IEEE 802.11a mode (1TX, 2RX):
The EUT can support both 1TX and 2RX functions.
For 1TX
Only Chain 1 can be used as transmitting antenna.
Chain 1 and Chain 2 could receive simultaneously.

For IEEE 802.11n mode (1TX/2TX, 2RX):
The EUT can support both 1TX and 2TX functions.
For 1TX
Only Chain 1 can be used as transmitting antenna. When MCS 0~7 enable without TX-Beamforming/STBC.
Chain 1 and Chain 2 could receive simultaneously.
For 2TX
Both Chain 1 and Chain 2 can be used as transmitting/receiving antenna. When TX-Beamforming/STBC enalbe/MCS 8~15 enable.
Chain 1 and Chain 2 could both transmit/receive simultaneously.
Only 2TX function was selected to test and record in the report, the 1TX test results were covered by 2TX Test results.

For IEEE 802.11ac mode (1TX/2TX, 2RX):
The EUT can support both 1TX and 2TX functions.
For 1TX
Only Chain 1 can be used as transmitting antenna. When 1SS MCS 0~9 enable without TX-Beamforming/STBC.
Chain 1 and Chain 2 could receive simultaneously.
For 2TX
Both Chain 1 and Chain 2 can be used as transmitting/receiving antenna. When TX-Beamforming/STBC enalbe/2SS MCS 0~9 enable.
Chain 1 and Chain 2 could both transmit/receive simultaneously.
Only 2TX function was selected to test and record in the report, the 1TX test results were covered by 2TX Test results.



The Control software(tool_WIFI.exe) can control Model 8812 antenna A B,

For 5GHz mode,antenna A B are transmitting, May antennas simultaneously transmit.

And the data is recorded for radiated emission, and band edge.

Model 8812 For MIMO mode , Directional gain=GANT +10log(N)dbi =8.56dbi in 5GHz

802.11n/ac 5GHz has MIMO mode.

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	Link Mode
Mode 2	802.11a / n/ ac 20 CH36/ CH40/ CH 48 802.11a /n/ ac 20 CH149/ CH157/ CH 165
Mode 3	802.11n/ ac40 CH38/ CH 46 802.11n/ ac40 CH 151 / CH 159
Mode 4	802.11 ac80 CH 155

For Radiated Emission	
Final Test Mode	Description
Mode 1	Link Mode
Mode 2	802.11a / n/ ac 20 CH36/ CH40/ CH 48 802.11a /n/ ac 20 CH149/ CH157/ CH 165
Mode 3	802.11n/ ac40 CH38/ CH 46 802.11n/ ac40 CH 151 / CH 159
Mode 4	802.11 ac80 CH 155

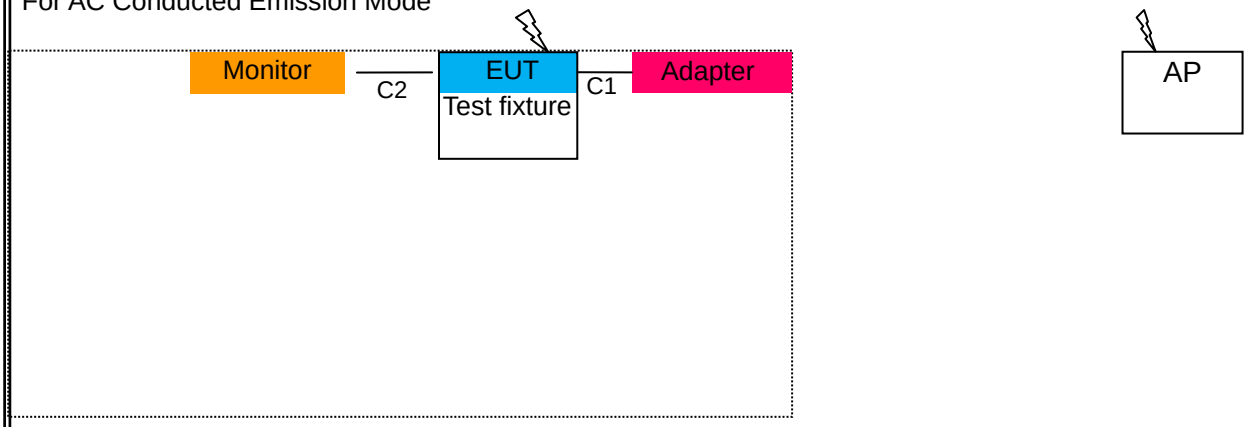
Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

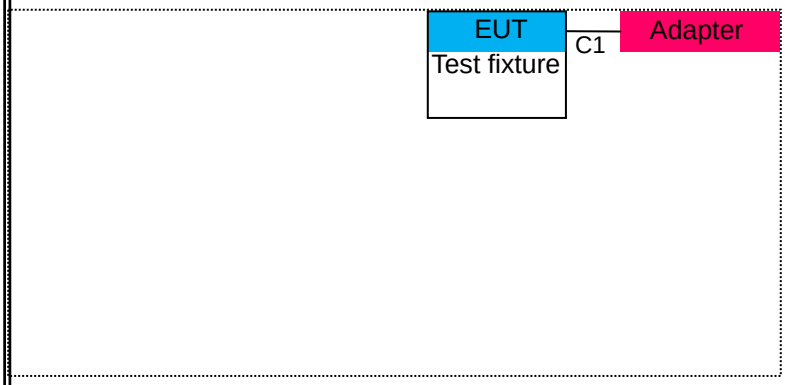
(2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

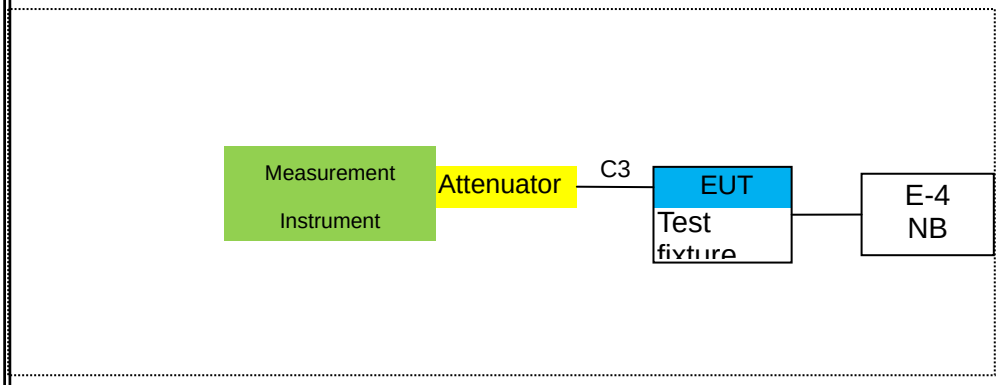
For AC Conducted Emission Mode



Radiated Spurious Emission Test



For Conducted Test Cases



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	ScreenBeam Smart Miracast module	Actiontec	RTL8812AU-CG	LNQRTL8812AUCG	EUT
E-2	Adapter	N/A	WA-10P05R	N/A	Peripherals
E-3	Monitor	SONY	KDL-24EX520	N/A	Peripherals
E-4	Notebook PC	LENOVO	E450	N/A	
	Test fixture	Actionect	SBWD70-C-2T	N/A	Test fixture

Item	Cable Type	Shielded Type	Ferrite Core	Length	Note
C-1	USB Cable	NO	NO	1.0m	
C-2	USB Cable	YES	YES	1.0m	
C-3	RF Cable	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	2015.07.06	2016.07.05	1 year
2	Spectrum Analyzer	Agilent	N9020A	MY49100060	2015.07.06	2016.07.05	1 year
3	EMI Test Receiver	Agilent	N9038A	MY53227146	2016.06.06	2017.06.05	1 year
4	Test Receiver	R&S	ESPI	101318	2016.06.06	2017.06.05	1 year
5	Bilog Antenna	TESEQ	CBL6111D	31216	2015.07.06	2016.07.05	1 year
6	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2016.06.06	2017.06.05	1 year
7	Spectrum Analyzer	ADVANTEST	R3132	150900201	2016.06.06	2017.06.05	1 year
8	Horn Antenna	EM	EM-AH-10180	2011071402	2015.07.06	2016.07.05	1 year
9	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2015.07.06	2016.07.05	1 year
10	Amplifier	EM	EM-30180	060538	2015.12.22	2016.12.21	1 year
11	Amplifier	MITEQ	TTA1840-35-HG	177156	2016.06.06	2017.06.05	1 year
12	Loop Antenna	ARA	PLA-1030/B	1029	2016.06.06	2017.06.05	1 year
13	Power Meter	R&S	NRVS	100696	2015.07.06	2016.07.05	1 year
14	Power Sensor	R&S	URV5-Z4	0395.1619.05	2015.07.06	2016.07.05	1 year
15	Test Cable	N/A	R-01	N/A	2015.07.06	2016.07.05	1 year
16	Test Cable	N/A	R-02	N/A	2015.07.06	2016.07.05	1 year
17	High Test Cable(1G-40 GHz)	N/A	R-03	N/A	2016.06.06	2017.06.05	1 year
18	High Test Cable(1G-40 GHz)	N/A	R-04	N/A	2016.06.06	2017.06.05	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	2016.06.06	2017.06.05	1 year
2	LISN	R&S	ENV216	101313	2015.08.24	2016.08.23	1 year
3	LISN	EMCO	3816/2	00042990	2016.06.06	2017.06.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2016.06.06	2017.06.05	1 year
5	Passive Voltage Probe	R&S	ESH2-Z3	100196	2016.06.06	2017.06.05	1 year
6	Absorbing clamp	R&S	MOS-21	100423	2016.06.06	2017.06.05	1 year
7	Test Cable	N/A	C01	N/A	2015.06.08	2016.06.07	1 year
8	Test Cable	N/A	C02	N/A	2015.06.08	2016.06.07	1 year
9	Test Cable	N/A	C03	N/A	2015.06.08	2016.06.07	1 year

1	Attenuation	MCE	24-10-34	BN9258	2016.06.06	2017.06.05	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/ RSS-247
0.50 -5.0	73.00	60.00	56.00	46.00	FCC/ RSS-247
5.0 -30.0	73.00	60.00	60.00	50.00	FCC/ RSS-247

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

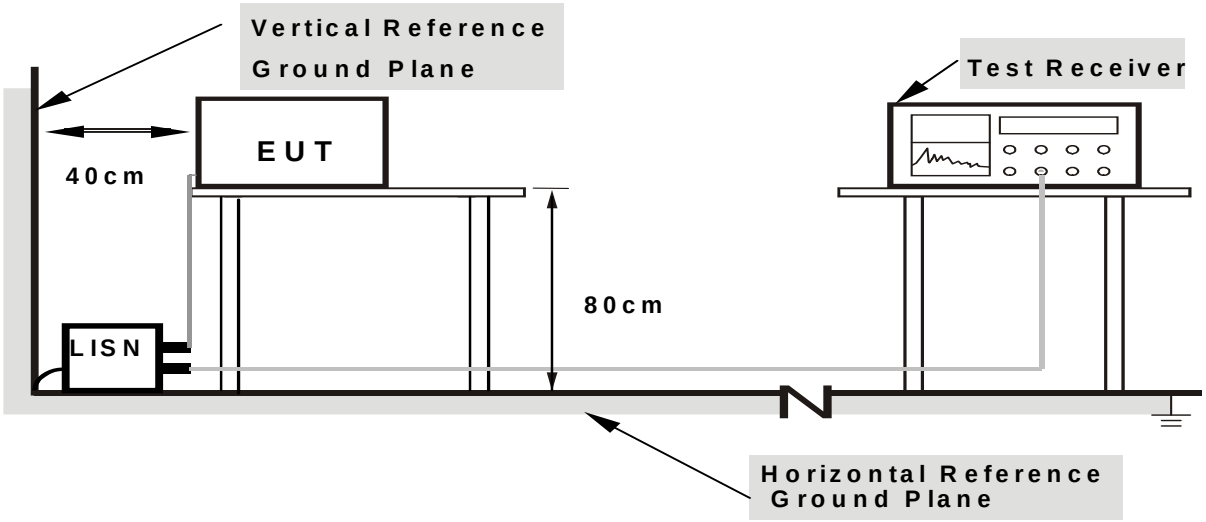
3.1.2 TEST PROCEDURE

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

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

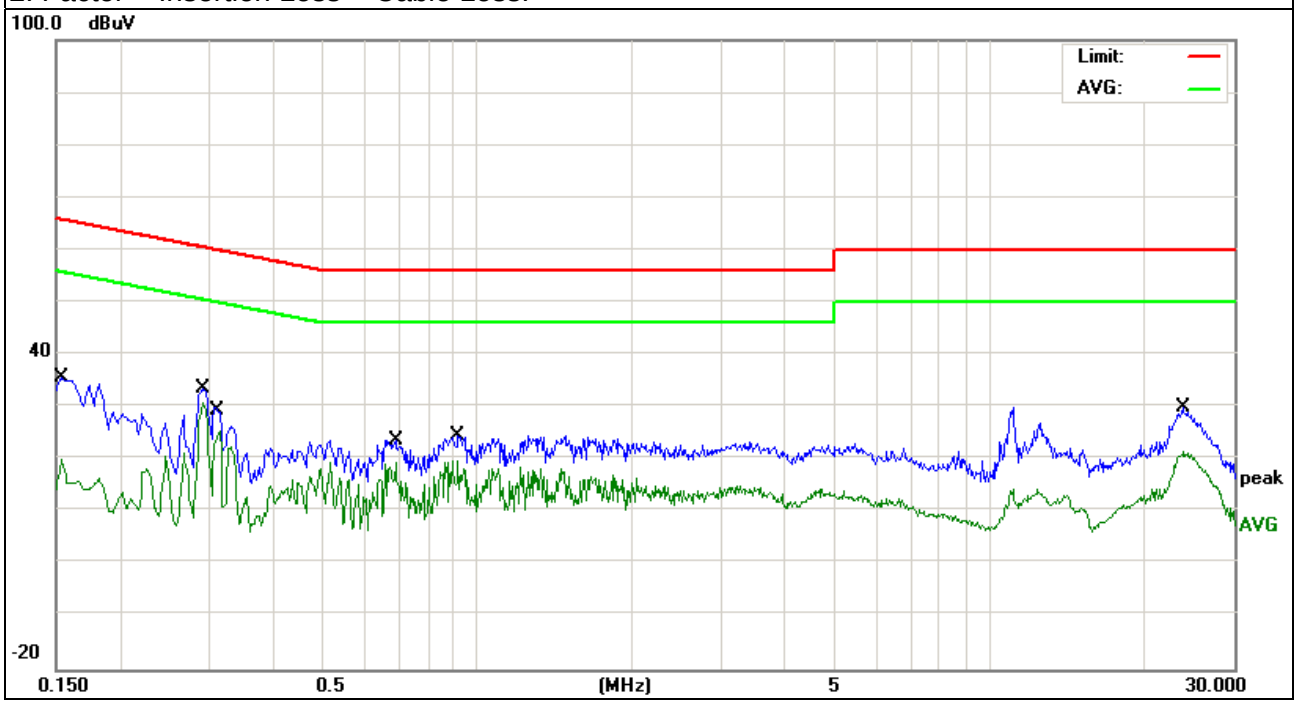
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.6 TEST RESULTS

EUT：	ScreenBeam Smart Miracast module	Model Name. ：	RTL8812AU-CG
Temperature：	26 ℃	Relative Humidity：	56%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5V From adapter AC120V/60Hz	Test Mode：	Mode 1

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.1539	25.41	10.12	35.53	65.78	-30.25	QP
0.1539	9.79	10.12	19.91	55.78	-35.87	AVG
0.2898	23.40	10.14	33.54	60.53	-26.99	QP
0.2898	20.80	10.14	30.94	50.53	-19.59	AVG
0.314	19.95	10.13	30.08	59.86	-29.78	QP
0.314	15.25	10.13	25.38	49.86	-24.48	AVG
0.6898	13.99	9.78	23.77	56.00	-32.23	QP
0.6898	9.61	9.78	19.39	46.00	-26.61	AVG
0.918	14.70	9.83	24.53	56.00	-31.47	QP
0.918	9.99	9.83	19.82	46.00	-26.18	AVG
23.966	19.84	9.97	29.81	60.00	-30.19	QP
23.966	11.70	9.97	21.67	50.00	-28.33	AVG

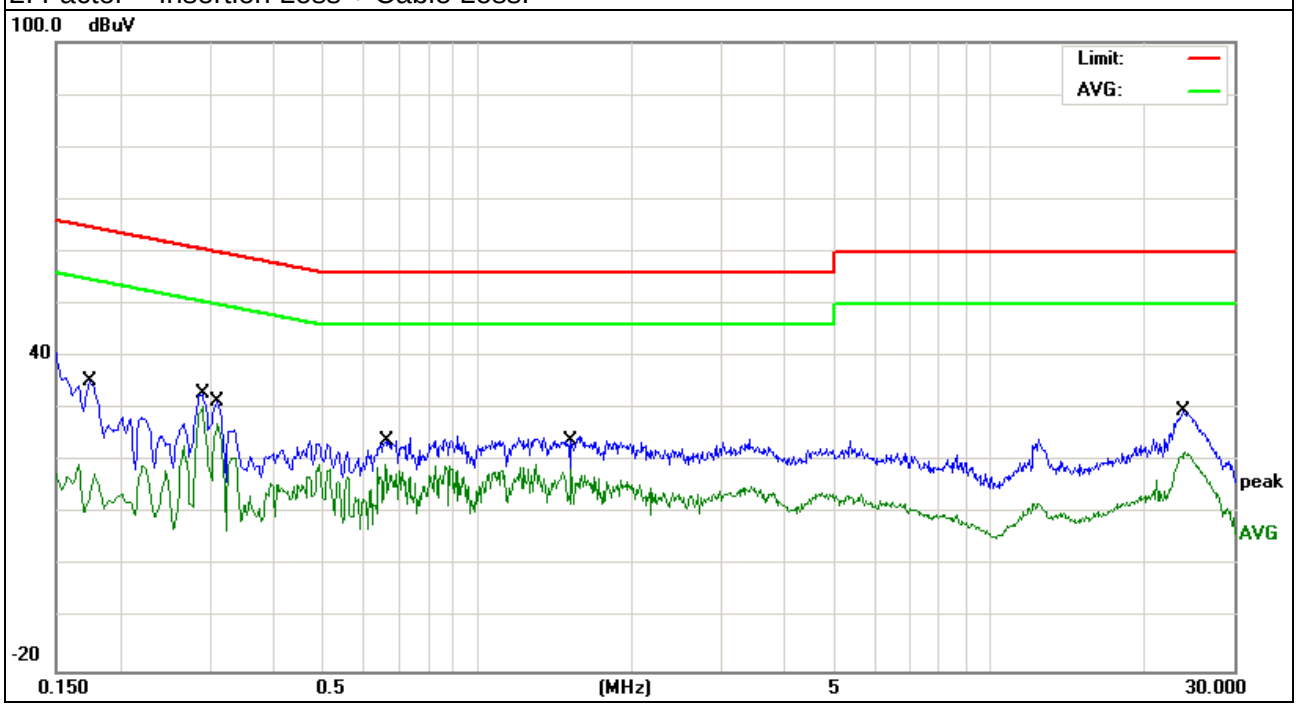
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



EUT：	ScreenBeam Smart Miracast module	Model Name. ：	RTL8812AU-CG
Temperature：	26 ℃	Relative Humidity：	56%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5V From adapter AC120V/60Hz	Test Mode：	Mode 1

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.1737	25.39	10.05	35.44	64.78	-29.34	QP
0.1737	9.29	10.05	19.34	54.78	-35.44	AVG
0.2898	22.68	10.12	32.80	60.53	-27.73	QP
0.2898	20.33	10.12	30.45	50.53	-20.08	AVG
0.3099	21.31	10.12	31.43	59.97	-28.54	QP
0.3099	17.20	10.12	27.32	49.97	-22.65	AVG
0.658	14.05	9.81	23.86	56.00	-32.14	QP
0.658	9.62	9.81	19.43	46.00	-26.57	AVG
1.522	15.04	9.81	24.85	56.00	-31.15	QP
1.522	8.79	9.81	18.60	46.00	-27.40	AVG
24.082	19.73	9.96	29.69	60.00	-30.31	QP
24.082	11.86	9.96	21.82	50.00	-28.18	AVG

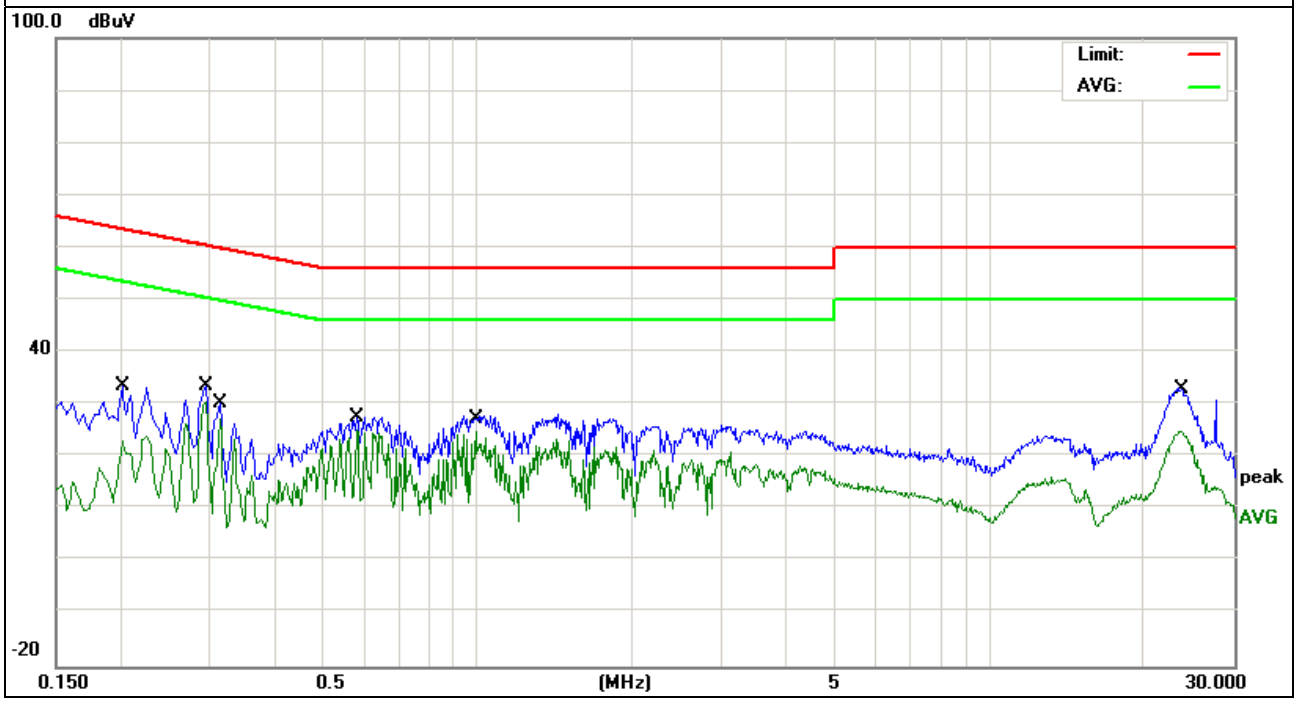
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



EUT：	ScreenBeam Smart Miracast module	Model Name. ：	RTL8812AU-CG
Temperature：	26 ℃	Relative Humidity：	56%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5V From adapter AC230V/50Hz	Test Mode：	Mode 1

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.202	23.40	10.13	33.53	63.52	-29.99	QP
0.202	12.83	10.13	22.96	53.52	-30.56	AVG
0.2938	23.33	10.14	33.47	60.41	-26.94	QP
0.2938	20.44	10.14	30.58	50.41	-19.83	AVG
0.314	20.03	10.13	30.16	59.86	-29.70	QP
0.314	17.11	10.13	27.24	49.86	-22.62	AVG
0.5817	17.91	9.79	27.70	56.00	-28.30	QP
0.5817	15.49	9.79	25.28	46.00	-20.72	AVG
0.9899	18.06	9.85	27.91	56.00	-28.09	QP
0.9899	14.94	9.85	24.79	46.00	-21.21	AVG
23.5657	23.19	9.97	33.16	60.00	-26.84	QP
23.5657	15.03	9.97	25.00	50.00	-25.00	AVG

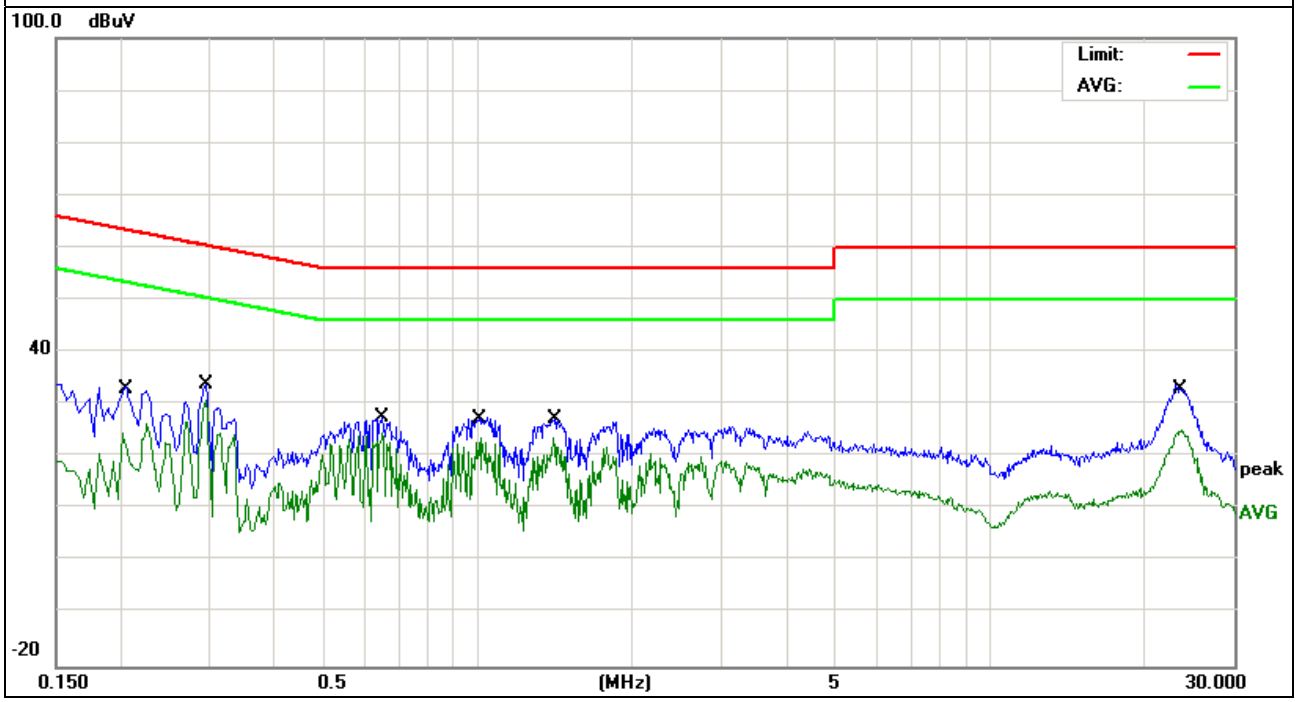
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



EUT：	ScreenBeam Smart Miracast module	Model Name. ：	RTL8812AU-CG
Temperature：	26 ℃	Relative Humidity：	56%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5V From adapter AC230V/50Hz	Test Mode：	Mode 1

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.202	23.38	10.02	33.40	63.52	-30.12	QP
0.202	14.62	10.02	24.64	53.52	-28.88	AVG
0.2938	23.75	10.12	33.87	60.41	-26.54	QP
0.2938	20.70	10.12	30.82	50.41	-19.59	AVG
0.654	17.65	9.81	27.46	56.00	-28.54	QP
0.654	14.72	9.81	24.53	46.00	-21.47	AVG
1.018	17.53	9.87	27.40	56.00	-28.60	QP
1.018	13.76	9.87	23.63	46.00	-22.37	AVG
1.4098	17.41	9.82	27.23	56.00	-28.77	QP
1.4098	13.69	9.82	23.51	46.00	-22.49	AVG
23.7138	23.85	9.95	33.80	60.00	-26.20	QP
23.7138	15.11	9.95	25.06	50.00	-24.94	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 APPLICABLE STANDARD

According to FCC Part 15.407(d) and 15.209

3.2.2 CONFORMANCE LIMIT

According to FCC Part 15.407(b)(7): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
According to FCC Part15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

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.

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009~0.490	2400/F(KHz)	20 log (uV/m)	300
0.490~1.705	2400/F(KHz)	20 log (uV/m)	30
1.705~30.0	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Limits of Radiated Emission Measurement(Above 1000MHz)

Frequency(MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

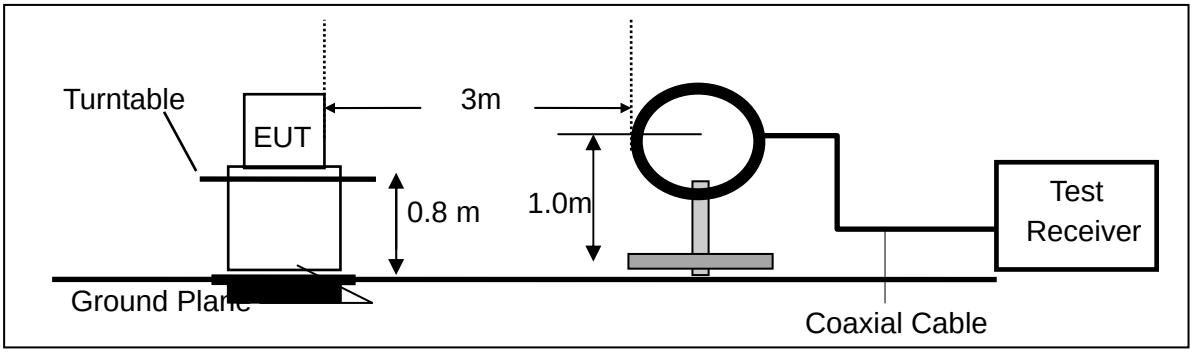
Remark :1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

3.2.3 MEASURING INSTRUMENTS

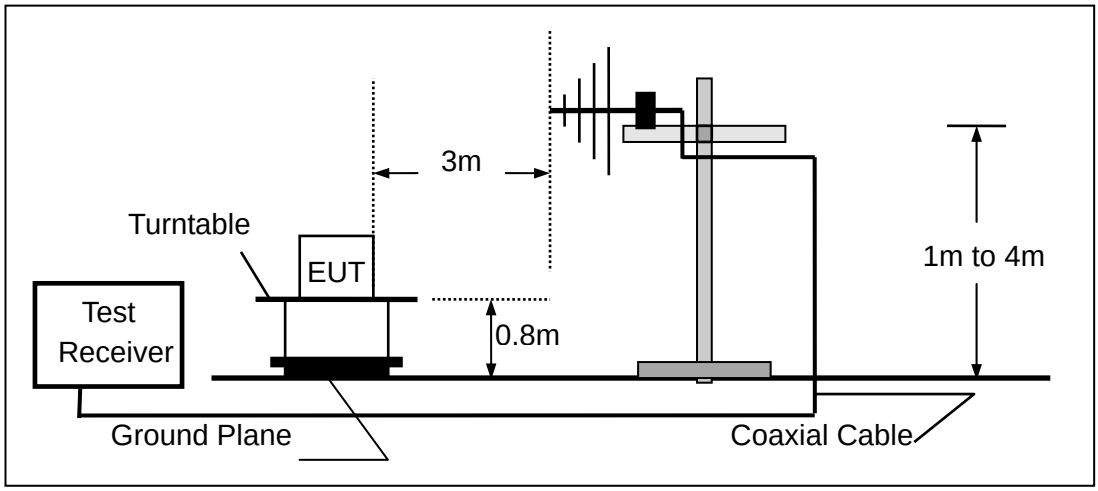
The Measuring equipment is listed in the section 6.3 of this test report.

3.2.4 TEST CONFIGURATION

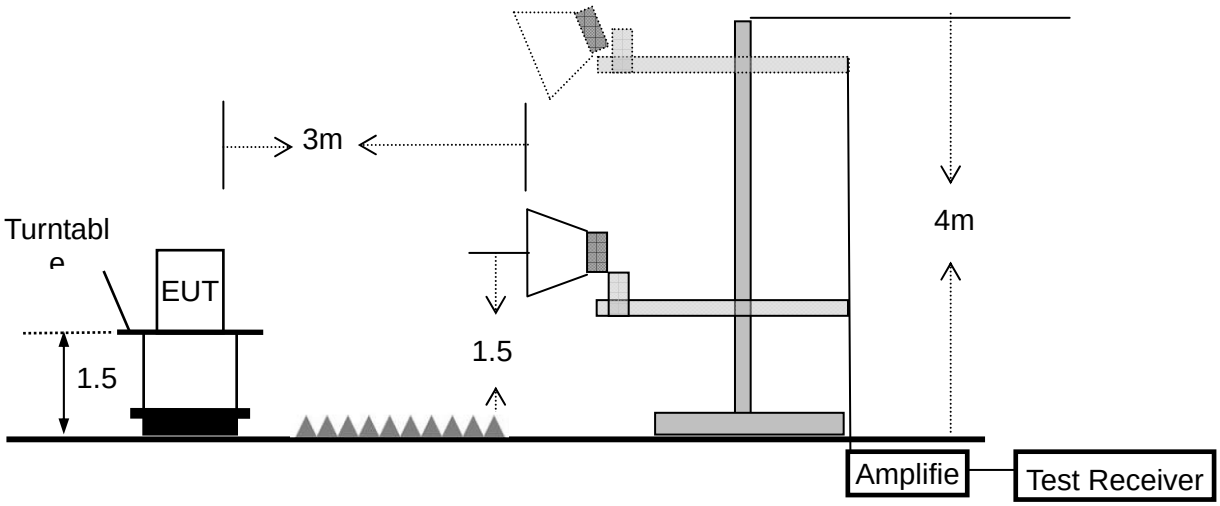
(a) For radiated emissions below 30MHz



(b) For radiated emissions from 30MHz to 1000MHz



(c) For radiated emissions above 1000MHz



3.2.5 TEST PROCEDURE

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10-2013. The test distance is 3m.The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.
This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT.
Use the following spectrum analyzer settings:

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

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 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. 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 for below 1GHz and 1.5m for above 1GHz; 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
	Average	1 MHz	10 Hz

Note: for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where RBWCF [dB] =10*lg(100 [kHz]/narrower RBW [kHz]). , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)

EUT：	ScreenBeam Smart Miracast module	Model Name. ：	RTL8812AU-CG
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 5V
Test Mode ：	TX	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 (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

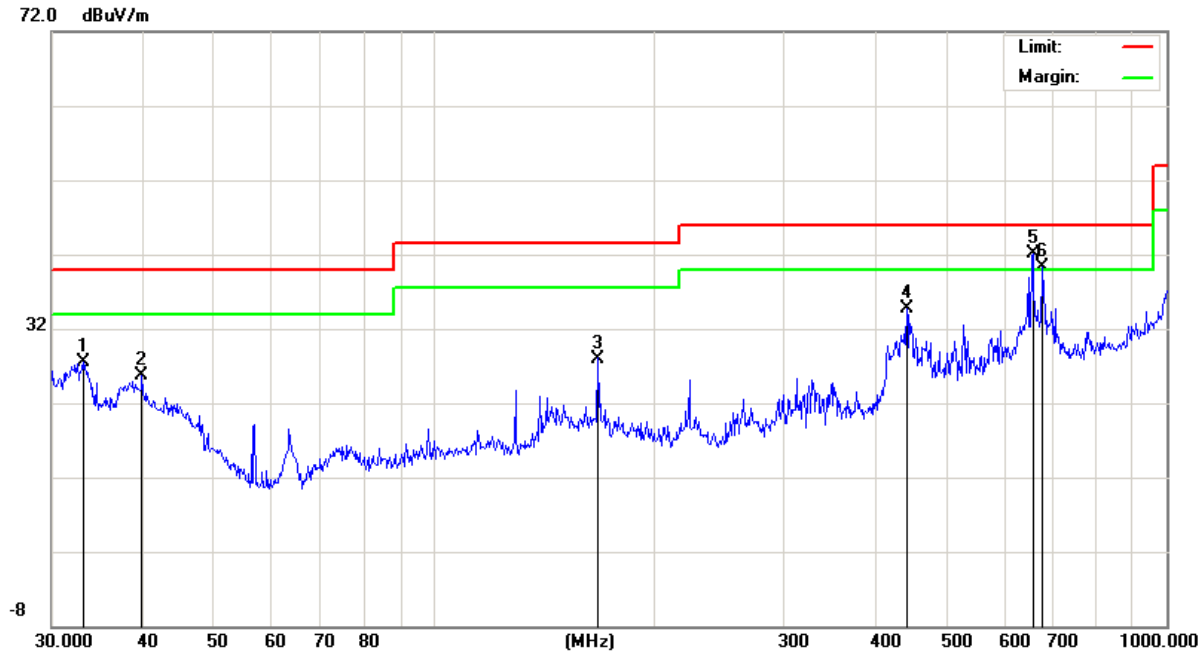
3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

EUT：	ScreenBeam Smart Miracast module	Model Name ：	RTL8812AU-CG
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 5V
Test Mode ：	TX(5.2G)- 802.11a (High CH)		

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
V	33.0949	9.38	18.13	27.51	40.00	-12.49	QP
V	39.8541	11.11	14.64	25.75	40.00	-14.25	QP
V	167.2366	15.89	12.11	28.00	43.50	-15.50	QP
V	441.7426	18.87	15.78	34.65	46.00	-11.35	QP
V	656.5298	21.65	20.52	42.17	46.00	-3.83	QP
V	677.5797	19.48	20.80	40.28	46.00	-5.72	QP

Remark:

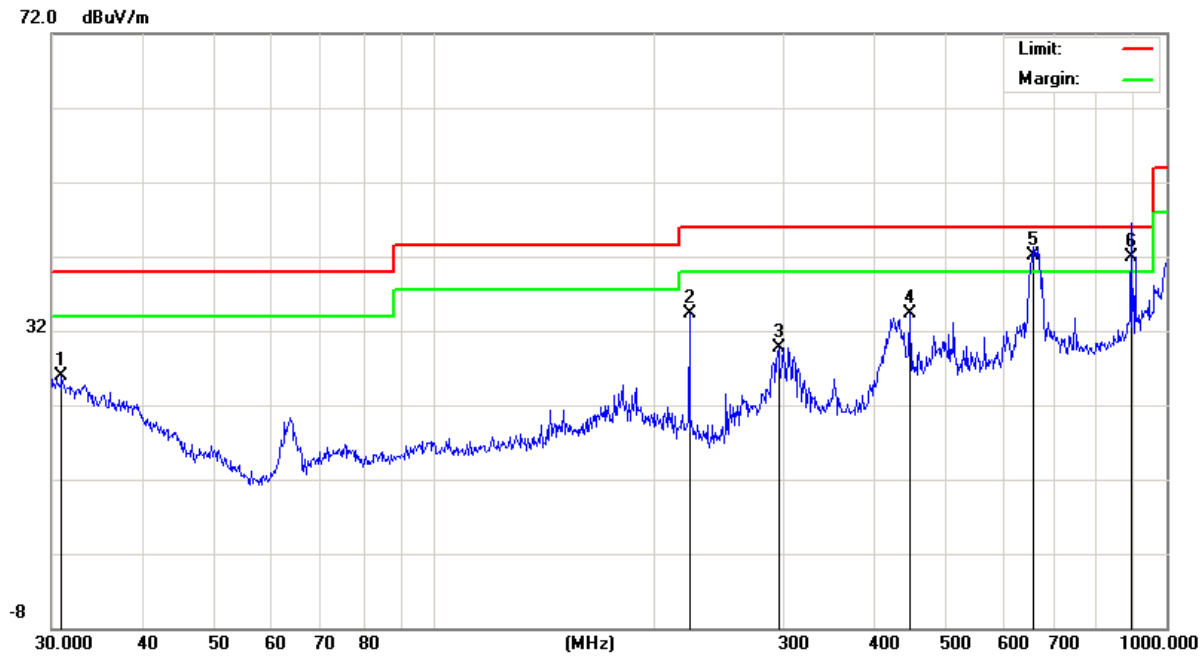
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
H	30.9618	6.64	19.22	25.86	40.00	-14.14	QP
H	222.9502	23.40	10.89	34.29	46.00	-11.71	QP
H	295.1469	17.23	12.45	29.68	46.00	-16.32	QP
H	446.4141	18.45	15.91	34.36	46.00	-11.64	QP
H	658.836	21.51	20.59	42.10	46.00	-3.90	QP
H	893.8567	17.85	24.05	41.90	46.00	-4.10	QP

Remark:

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

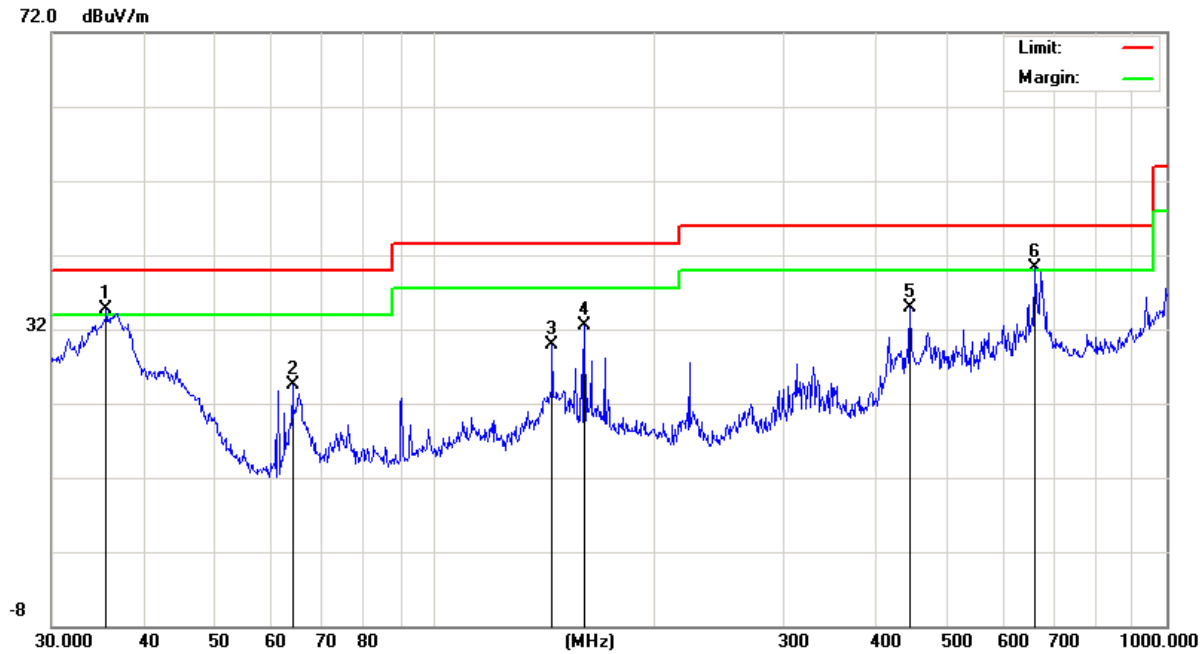


EUT：	ScreenBeam Smart Miracast module	Model Name ：	RTL8812AU-CG
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 5V
Test Mode ：	TX(5.8G) - 802.11a (High CH)		

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
V	35.6240	17.55	17.06	34.61	40.00	-5.39	QP
V	63.9827	18.94	5.64	24.58	40.00	-15.42	QP
V	144.8418	18.69	11.27	29.96	43.50	-13.54	QP
V	160.3454	21.05	11.45	32.50	43.50	-11.00	QP
V	446.4141	19.02	15.91	34.93	46.00	-11.07	QP
V	661.1503	19.58	20.65	40.23	46.00	-5.77	QP

Remark:

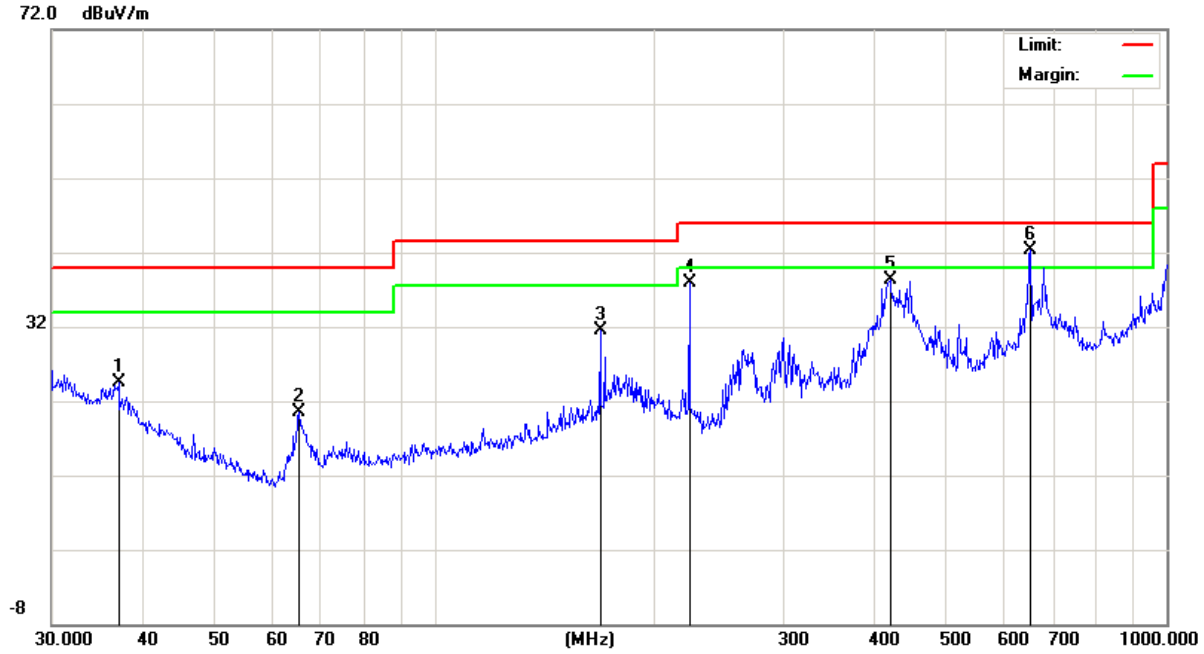
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
H	37.0248	8.11	16.33	24.44	40.00	-15.56	QP
H	65.3431	14.30	6.12	20.42	40.00	-19.58	QP
H	168.4138	19.24	12.30	31.54	43.50	-11.96	QP
H	222.9500	26.99	10.89	37.88	46.00	-8.12	QP
H	419.1080	23.70	14.67	38.37	46.00	-7.63	QP
H	651.9415	21.88	20.39	42.27	46.00	-3.73	QP

Remark:

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



3.2.8 TEST RESULTS (1GHz-18GHz)

EUT：	ScreenBeam Smart Miracast module	Model Name ：	RTL8812AU-CG
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 5V
Test Mode ：	TX (5.2G)-802.11N(20) 5180MHz~5240MHz		

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	6539.362	52.13	-3.64	48.49	74.00	-25.51	Pk
Vertical	6539.362	45.59	-3.64	41.95	54.00	-12.05	AV
Vertical	10360.296	59.86	-0.95	58.91	74.00	-15.09	Pk
Vertical	10360.296	39.97	-0.95	39.02	54.00	-14.98	AV
Horizontal	6539.632	60.41	-3.64	56.77	74.00	-17.23	Pk
Horizontal	6539.632	45.58	-3.64	41.94	54.00	-12.06	AV
Horizontal	10360.605	59.86	-0.95	58.91	74.00	-15.09	Pk
Horizontal	10360.605	44.31	-0.95	43.36	54.00	-10.64	AV
middle Channel (5200 MHz)-Above 1G							
Vertical	6891.329	60	-3.68	56.32	74.00	-17.68	Pk
Vertical	6891.329	46.63	-3.68	42.95	54.00	-11.05	AV
Vertical	10400.214	56.51	-0.82	55.69	74.00	-18.31	Pk
Vertical	10400.214	42.28	-0.82	41.46	54.00	-12.54	AV
Horizontal	6891.359	66.63	-3.68	62.95	74.00	-11.05	Pk
Horizontal	6891.359	45.41	-3.68	41.73	54.00	-12.27	AV
Horizontal	10400.374	58.98	-0.82	58.16	74.00	-15.84	Pk
Horizontal	10400.374	45.55	-0.82	44.73	54.00	-9.27	AV
High Channel (5240 MHz)-Above 1G							
Vertical	7034.276	58.96	-3.59	55.37	74.00	-18.63	Pk
Vertical	7034.276	46.62	-3.59	43.03	54.00	-10.97	AV
Vertical	10480.485	55.53	-0.68	54.85	74.00	-19.15	Pk
Vertical	10480.485	42.27	-0.68	41.59	54.00	-12.41	AV
Horizontal	7034.246	66.69	-3.59	63.10	74.00	-10.90	Pk
Horizontal	7034.246	42.2	-3.59	38.61	54.00	-15.39	AV
Horizontal	10480.175	56.63	-0.68	55.95	74.00	-18.05	Pk
Horizontal	10480.175	43.77	-0.68	43.09	54.00	-10.91	AV

Note:"802.11N(20)(5G)" mode is the worst mode. PK value is lower than the Average value limit, So average didn't record.

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value

has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

EUT：	ScreenBeam Smart Miracast module	Model Name ：	RTL8812AU-CG
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 5V
Test Mode ：	TX (5.8G) -802.11N(20) 5745MHz~5825MHz		

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5745 MHz)-Above 1G							
Vertical	4679.234	54.41	-3.64	50.77	74.00	-23.23	Pk
Vertical	4679.234	43.36	-3.64	39.72	54.00	-14.28	AV
Vertical	11490.227	52.28	-0.95	51.33	74.00	-22.67	Pk
Vertical	11490.227	37.94	-0.95	36.99	54.00	-17.01	AV
Horizontal	4679.639	60.33	-3.64	56.69	74.00	-17.31	Pk
Horizontal	4679.639	42.25	-3.64	38.61	54.00	-15.39	AV
Horizontal	11490.128	49.85	-0.95	48.90	74.00	-25.10	Pk
Horizontal	11490.128	39.96	-0.95	39.01	54.00	-14.99	AV
middle Channel (5785 MHz)-Above 1G							
Vertical	4592.256	58.42	-3.68	54.74	74.00	-19.26	Pk
Vertical	4592.256	41.19	-3.68	37.51	54.00	-16.49	AV
Vertical	11570.199	56.92	-0.82	56.10	74.00	-17.90	Pk
Vertical	11570.199	40.03	-0.82	39.21	54.00	-14.79	AV
Horizontal	4592.535	59.52	-3.68	55.84	74.00	-18.16	Pk
Horizontal	4592.535	42.27	-3.68	38.59	54.00	-15.41	AV
Horizontal	11570.271	56.63	-0.82	55.81	74.00	-18.19	Pk
Horizontal	11570.271	42.24	-0.82	41.42	54.00	-12.58	AV
High Channel (5825 MHz)-Above 1G							
Vertical	6039.235	58.75	-3.59	55.16	74.00	-18.84	Pk
Vertical	6039.235	42.25	-3.59	38.66	54.00	-15.34	AV
Vertical	11652.838	53.31	-0.68	52.63	74.00	-21.37	Pk
Vertical	11652.838	39.96	-0.68	39.28	54.00	-14.72	AV
Horizontal	6039.101	59.86	-3.59	56.27	74.00	-17.73	Pk
Horizontal	6039.101	41.21	-3.59	37.62	54.00	-16.38	AV
Horizontal	11652.283	55.56	-0.68	54.88	74.00	-19.12	Pk
Horizontal	11652.283	39.62	-0.68	38.94	54.00	-15.06	AV

Note:"802.11N(20)(5G)" mode is the worst mode. PK value is lower than the Average value limit, So average didn't record.

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value

has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

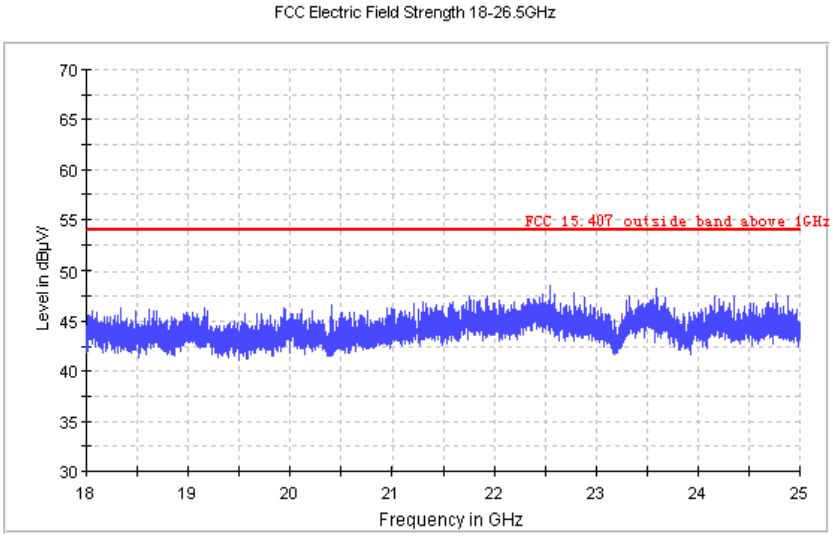
TEST RESULTS (18GHz-40GHz)

EUT：	ScreenBeam Smart Miracast module	Model Name ：	RTL8812AU-CG
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 5V
Test Mode ：	TX (5.2G)-802.11N(20) 5180MHz~5240MHz , TX (5.8G) -802.11N(20) 5745MHz~5825MHz		

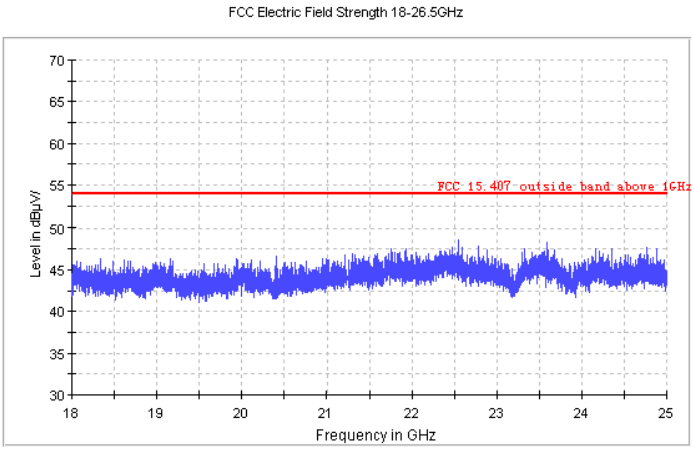
All the modulation modes have been tested, and the worst result was report as below:

Low Channel (5180 MHz)-Above 1G

Horizontal

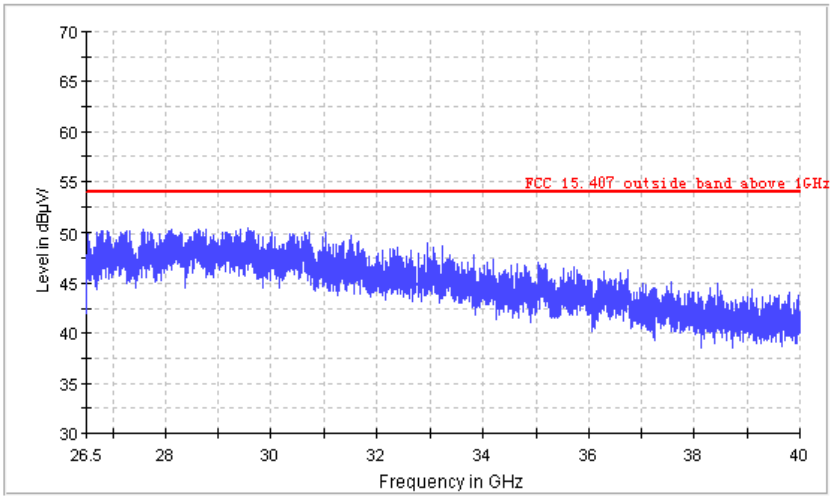


Vertical



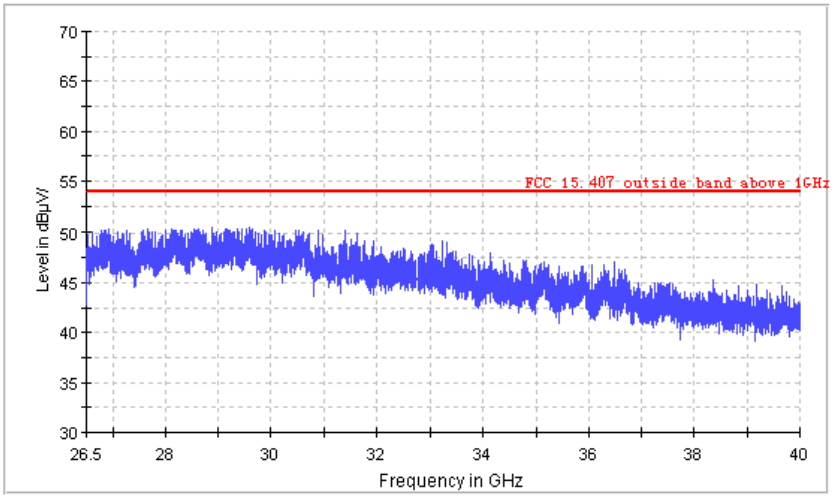
Horizontal

FCC Electric Field Strength 26.5-40GHz



Vertical

FCC Electric Field Strength 26.5-40GHz



4. POWER SPECTRAL DENSITY TEST

4.1 APPLIED PROCEDURES / LIMIT

According to FCC §15.407(a)(3)

For the band 5.15-5.25 GHz,

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 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 maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 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 maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum 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 maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz

(3)For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

,

4.2 TEST PROCEDURE

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, "provided that the measured power is integrated over the full reference bandwidth" to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/T, where T is defined in section II.B.l.a).

b) Set VBW ≥ 3 RBW.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10log(1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections 5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

4.3 DEVIATION FROM STANDARD

No deviation.

4.4 TEST SETUP

4.5 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.

4.6 TEST RESULTS

EUT：	ScreenBeam Smart Miracast module	Model Name ：	RTL8812AU-CG
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1015 hPa	Test Voltage ：	DC 5V
Test Mode ：	TX Frequency Band I (5150-5250MHz)		

Note: Model A(B) represent two different modules，
A(B) Represent the value of antenna A and B, The worst data is A Antenna a ,only shown Antenna A Plot.

EUT has two antennas, and different modes support different transmit mode what describe as Following form:

Mode	Tx/Rx
802.11a	1Tx, 1Rx
802.11n/ac	2Tx, 2Rx

Mode	Frequency	Measured Power Density (dBm)		Total power density (dBm)	Calculate power density (dBm)(Note 1)		Limit (dBm)	Result
		ANT A	ANT B		ANT A	ANT B		
802.11 a	5185 MHz	6.190	6.583	-	6.190	6.583	11	PASS
	5200 MHz	6.599	7.310	-	6.599	7.310	11	PASS
	5240 MHz	7.547	7.890	-	7.547	7.890	11	PASS
802.11 n20	5185 MHz	4.610	4.880	7.757	7.757		8.44	PASS
	5200 MHz	4.342	5.580	8.015	8.015		8.44	PASS
	5240 MHz	3.576	6.234	8.116	8.116		8.44	PASS
802.11 n40	5190 MHz	2.614	2.862	5.750	5.750		8.44	PASS
	5230 MHz	2.296	3.985	6.232	6.232		8.44	PASS
802.11 AC20	5185 MHz	5.176	4.817	8.011	8.011		8.44	PASS
	5200 MHz	3.781	5.912	7.986	7.986		8.44	PASS
	5240 MHz	3.969	6.157	8.210	8.210		8.44	PASS
802.11 AC40	5190 MHz	2.571	3.662	6.161	6.161		8.44	PASS
	5230 MHz	3.127	3.791	6.482	6.482		8.44	PASS
802.11 AC80	5210 MHz	1.785	0.530	4.213	4.213		8.44	PASS

Note: 1.Calculate power density= Measured Power Density+10log(1MHz/RBW)
RBW=1MHz
2. For 802.11n/ac 5GHz has MIMO mode.Directional gain=GANT +10log(N)dbi =8.56dbi

8.56 dbi>6.0 dbi so power density limit= 11-(8.56-6.0)=8.44

Antenna A

802.11 a Mode

TX CH 36

TX CH 40

TX CH 48

802.11 n20 Mode

TX CH 36

TX CH 40

TX CH 48

802.11 n40 Mode

TX CH 38

TX CH 46

802.11 AC20 Mode

TX CH 36

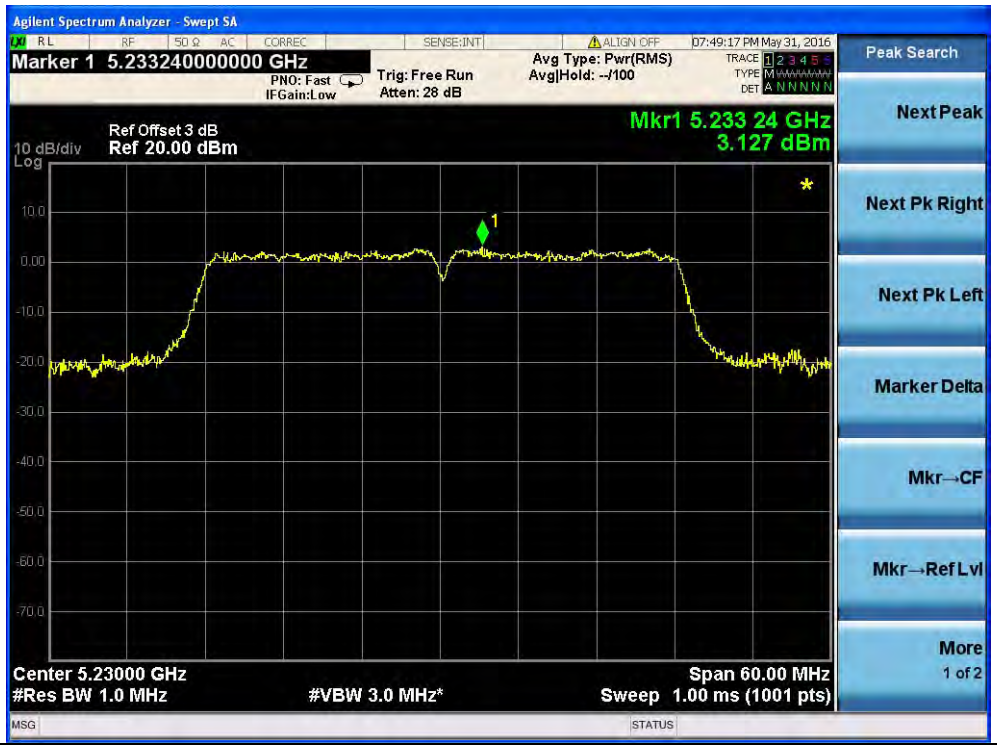
TX CH 40

TX CH 48

802.11 AC40 Mode

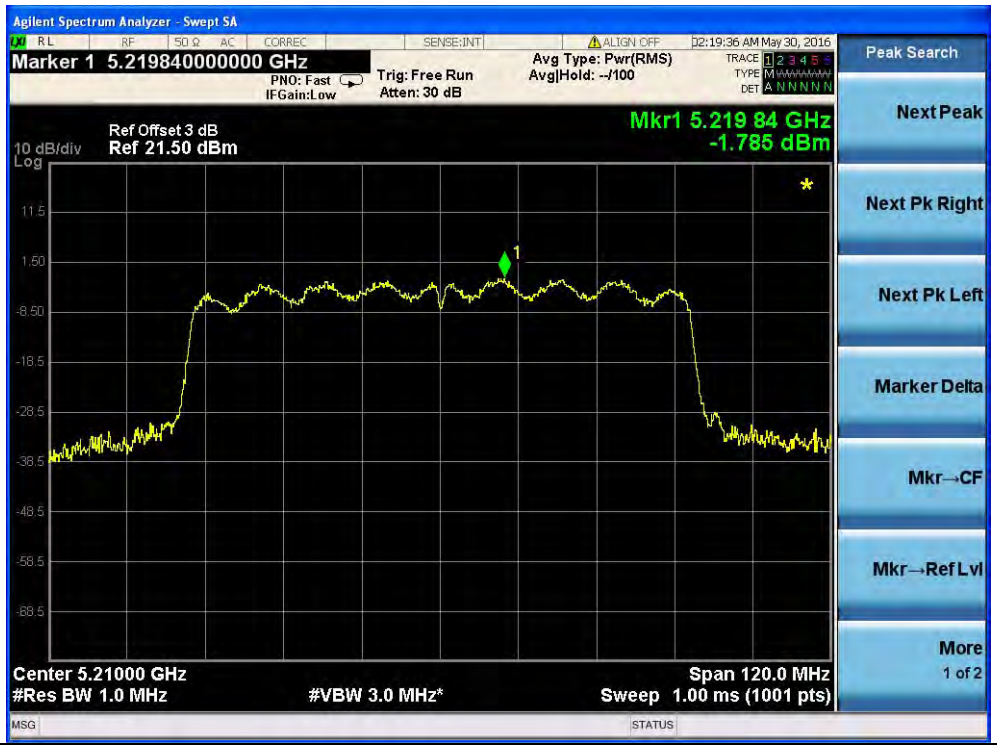
TX CH 38

TX CH 46



802.11 AC80 Mode

TX CH 42



EUT：	ScreenBeam Smart Miracast module	Model Name ：	RTL8812AU-CG
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1015 hPa	Test Voltage ：	DC 5V
Test Mode ：	TX Frequency Band III (5725-5825MHz)		

Note: Model A(B) represent two different modules，
A(B) Represent the value of antenna A and B, The worst data is A Antenna a ,only shown Antenna A Plot.

EUT has two antennas, and different modes support different transmit mode what describe as Following form:

Mode	Tx/Rx
802.11a	1Tx, 1Rx
802.11n/ac	2Tx, 2Rx

Mode	Frequency	Measured Power Density (dBm)		Total power density (dBm)	Calculate power density (dBm)(Note 1)		Limit (dBm)	Result
		ANT A	ANT B		ANT A	ANT B		
802.11 a	5745 MHz	3.196	6.843	-	3.196	6.843	30	PASS
	5785 MHz	2.474	4.908	-	2.474	4.908	30	PASS
	5825 MHz	2.720	4.859	-	2.720	4.859	30	PASS
802.11 n20	5745 MHz	1.947	3.931	6.062	6.062		27.44	PASS
	5785 MHz	1.786	2.880	5.378	5.378		27.44	PASS
	5825 MHz	0.737	4.953	6.348	6.348		27.44	PASS
802.11 n40	5755 MHz	0.939	2.706	4.922	4.922		27.44	PASS
	5795 MHz	1.399	2.779	5.154	5.154		27.44	PASS
802.11 AC20	5745 MHz	2.372	3.370	5.910	5.910		27.44	PASS
	5785 MHz	1.306	4.193	5.995	5.995		27.44	PASS
	5825 MHz	0.689	2.732	4.840	4.840		27.44	PASS
802.11 AC40	5755 MHz	0.359	1.699	4.091	4.091		27.44	PASS
	5795 MHz	1.417	3.634	5.676	5.676		27.44	PASS
802.11 AC80	5775 MHz	3.703	3.507	6.616	6.616		27.44	PASS

Note:

(1) Calculate power density= Measured Power Density+10log(1MHz/RBW)
RBW=0.51MHz

(2) For 802.11n/ac 5GHz has MIMO mode.Directional gain=GANT +10log(N)dbi =8.56dbi

8.56 dbi>6.0 dbi so power density limit= 30-(8.56-6.0)=27.44

Antenna A

802.11 a Mode

TX CH 149

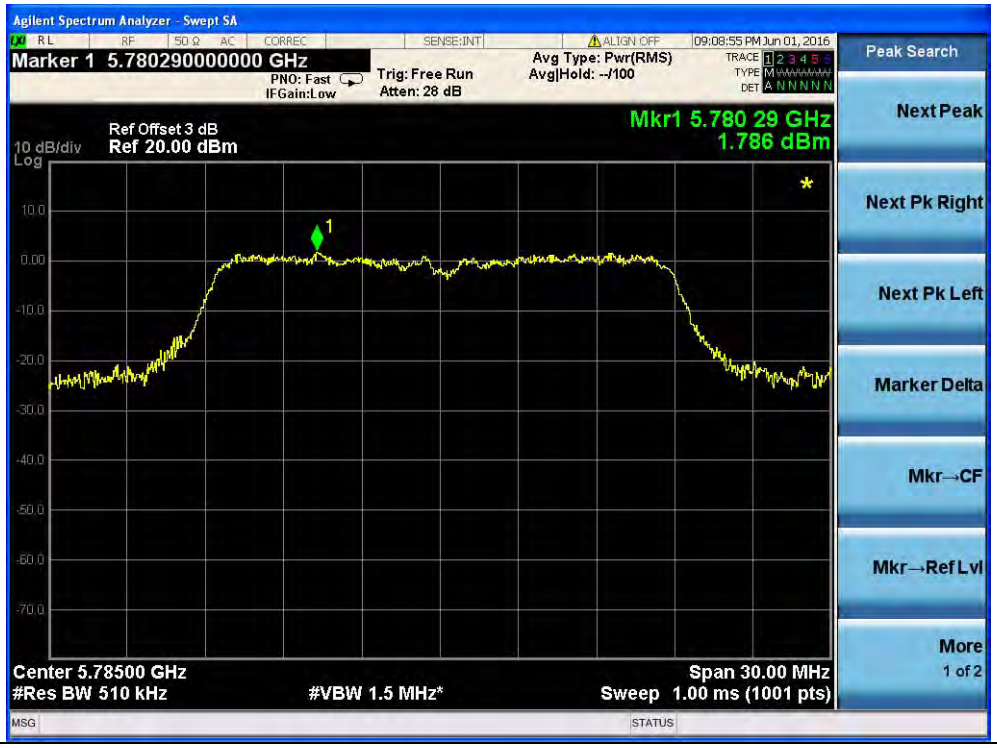
TX CH 157

TX CH 165

802.11 n20 Mode

TX CH 149

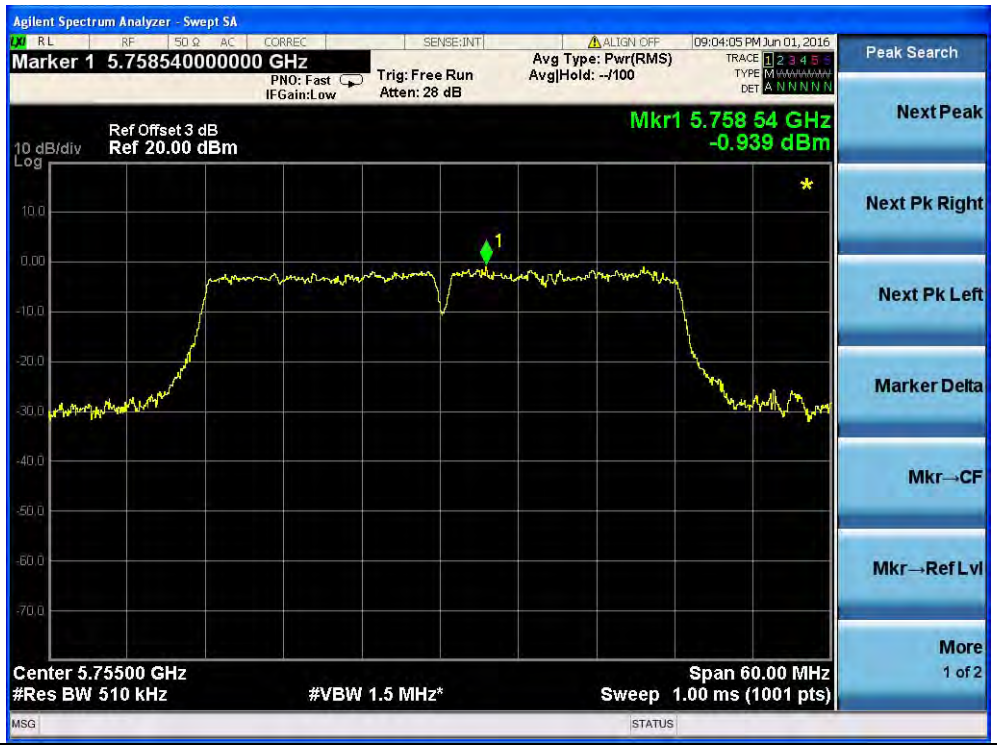
TX CH 157



TX CH 165

802.11 n40 Mode

TX CH 151



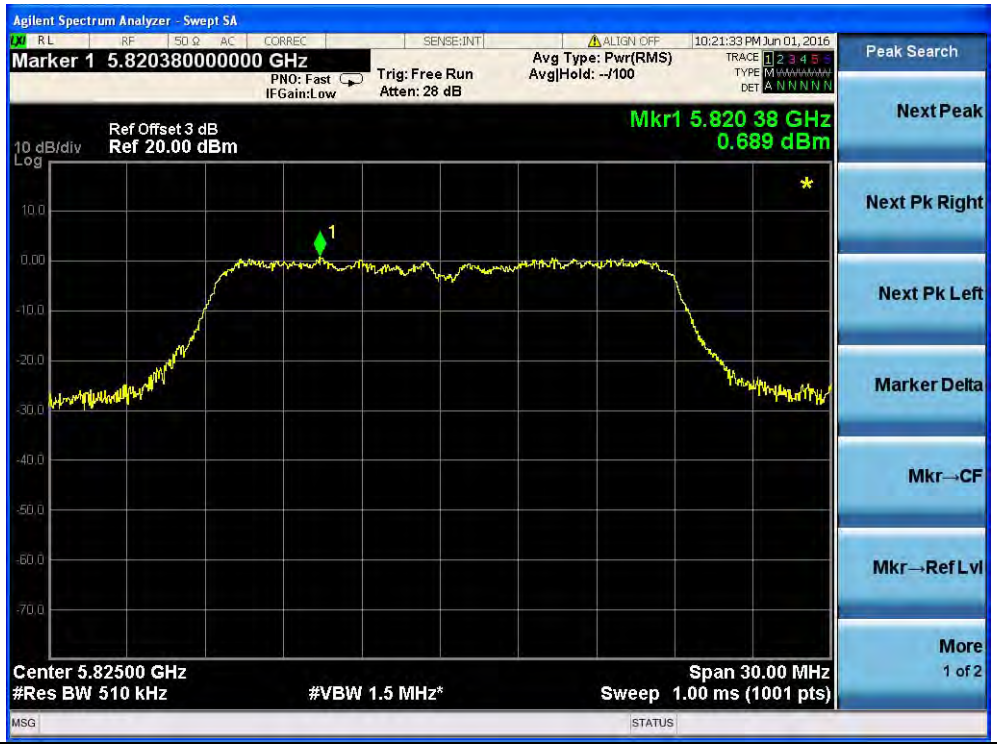
TX CH 159

802.11 AC20 Mode

TX CH 149

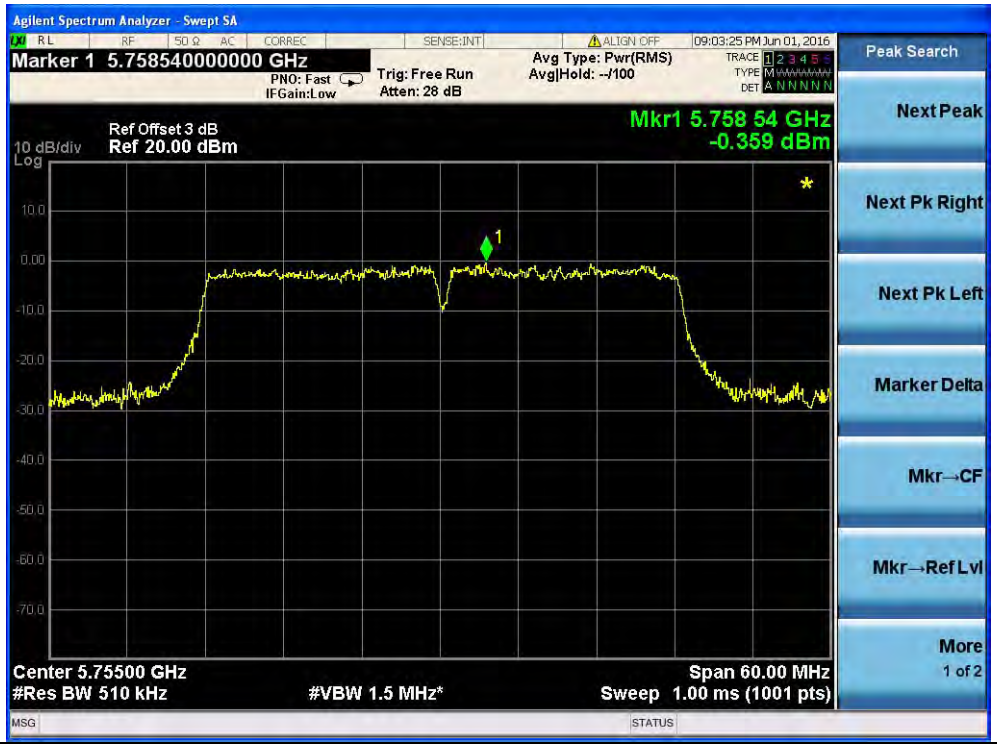
TX CH 157

TX CH 165



802.11 AC40 Mode

TX CH 151



TX CH 159

802.11 AC80 Mode

TX CH 155

5. 26 DB & 99% EMISSION BANDWIDTH

5.1 APPLIED PROCEDURES / LIMIT

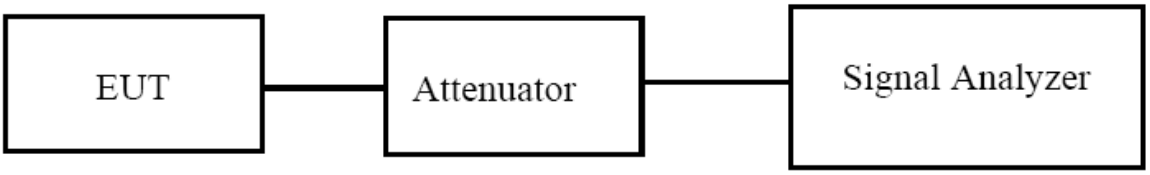
The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

5.2 TEST PROCEDURE

a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) 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%.

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ≥ 3 · RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.



5.3 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.

5.4 TEST RESULTS

EUT：	ScreenBeam Smart Miracast module	Model Name ：	RTL8812AU-CG
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1012 hPa	Test Voltage ：	DC 5V
Test Mode ：	TX Frequency Band I (5150-5250MHz)		

Note: Model A(B) represent two different modules，

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

EUT has two antennas, and different modes support different transmit mode what describe as Following form:

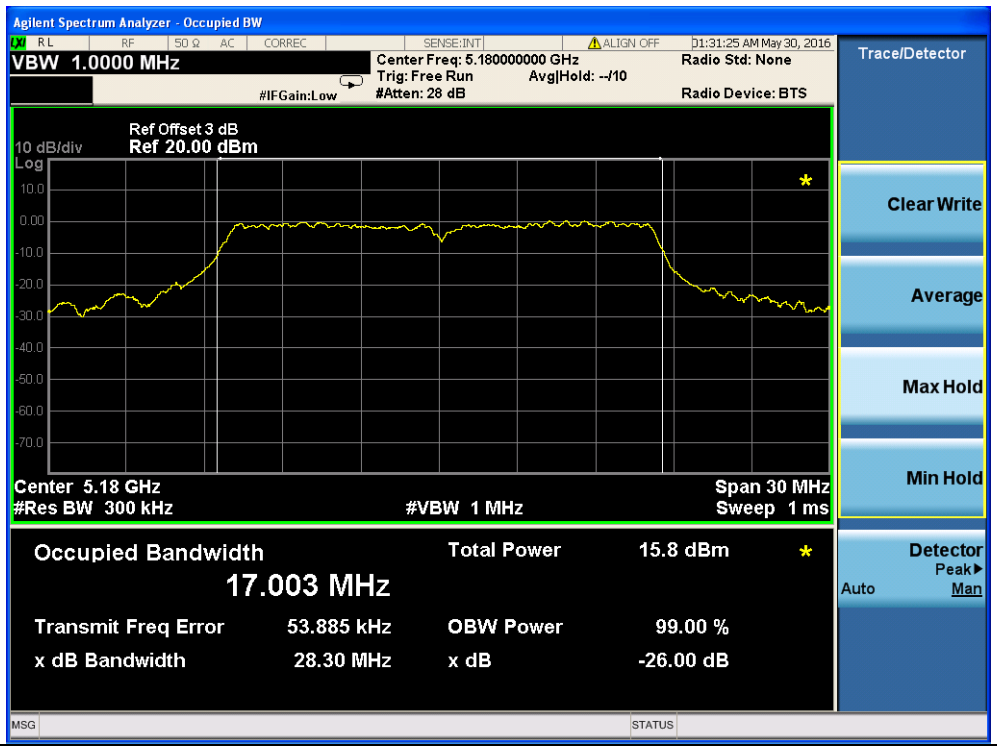
Mode	Tx/Rx
802.11a	1Tx, 1Rx
802.11n/ac	2Tx, 2Rx

Mode	Channel	Frequency (MHz)	99% bandwidth(MHz)		26dB bandwidth (MHz)		Result
			ANT A	ANT B	ANT A	ANT B	
802.11a	CH36	5180	17.003	17.000	28.30	26.34	Pass
	CH40	5200	17.019	17.024	28.36	25.38	Pass
	CH48	5240	17.118	17.078	29.50	26.63	Pass
802.11 n20	CH36	5180	17.946	17.867	24.08	21.98	Pass
	CH40	5200	17.900	17.869	22.24	21.82	Pass
	CH48	5240	18.090	17.886	29.87	22.03	Pass
802.11 n40	CH 38	5190	36.297	36.255	42.80	41.94	Pass
	CH 46	5230	36.272	36.277	42.69	41.82	Pass
802.11 AC20	CH36	5180	17.928	17.851	22.74	21.95	Pass
	CH40	5200	17.904	17.855	21.94	22.12	Pass
	CH48	5240	17.983	17.868	27.28	21.92	Pass
802.11 AC40	CH 38	5190	36.300	36.264	42.81	41.82	Pass
	CH 46	5230	36.280	36.260	42.96	41.96	Pass
802.11 AC80	CH 42	5210	75.190	75.182	80.60	80.73	Pass

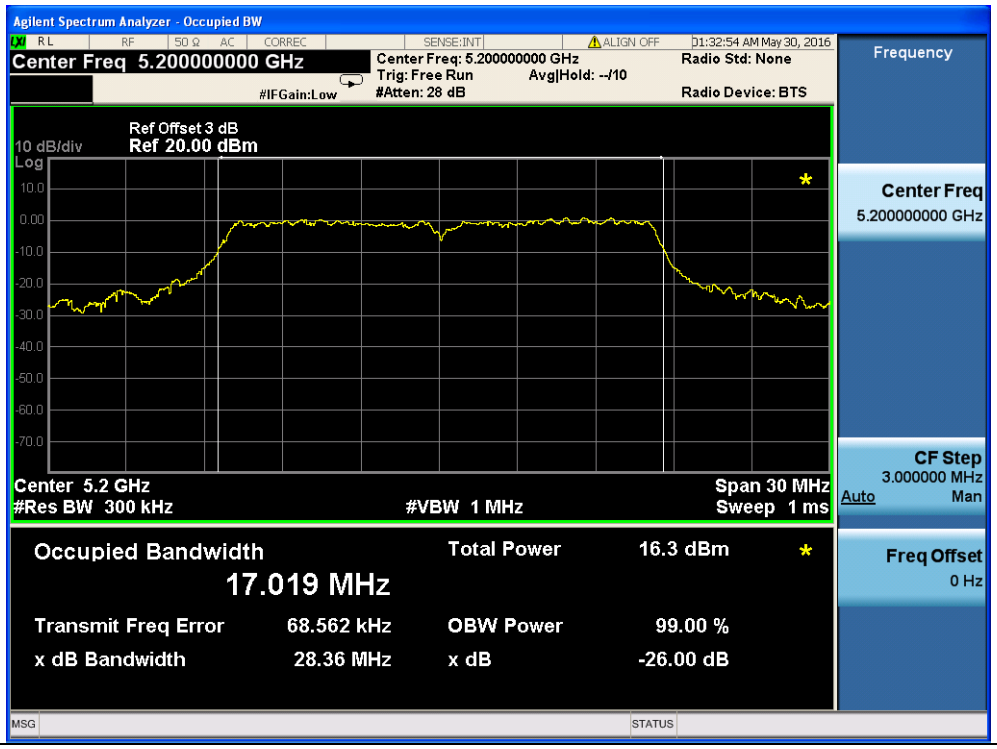
ANT A

802.11 a Mode

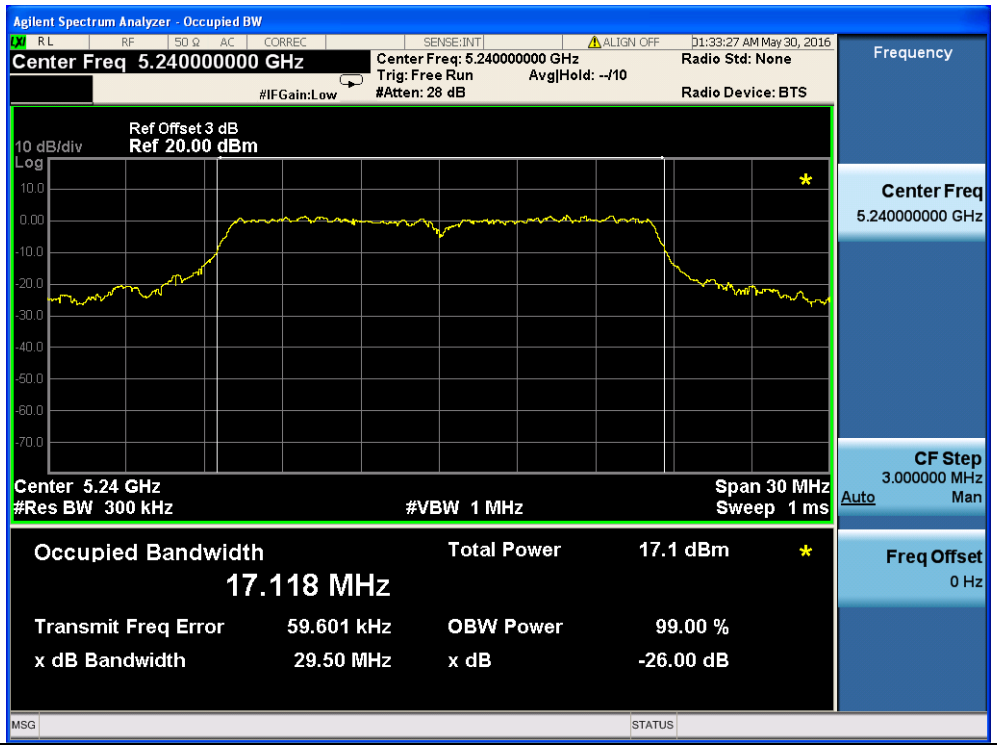
TX CH 36



TX CH 40

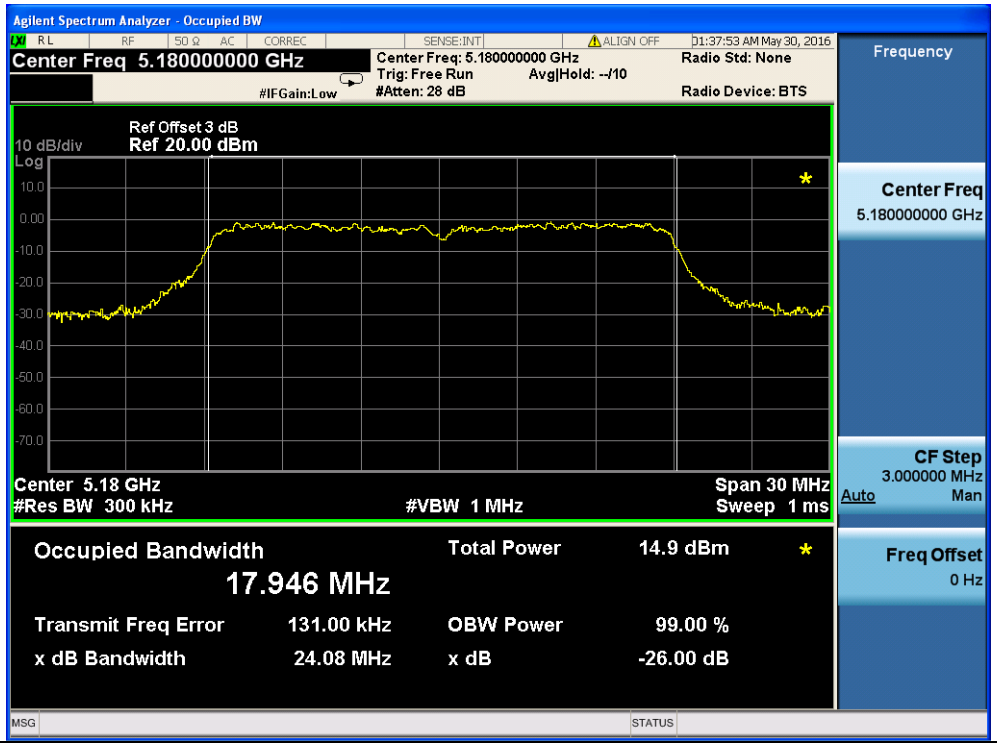


TX CH 48

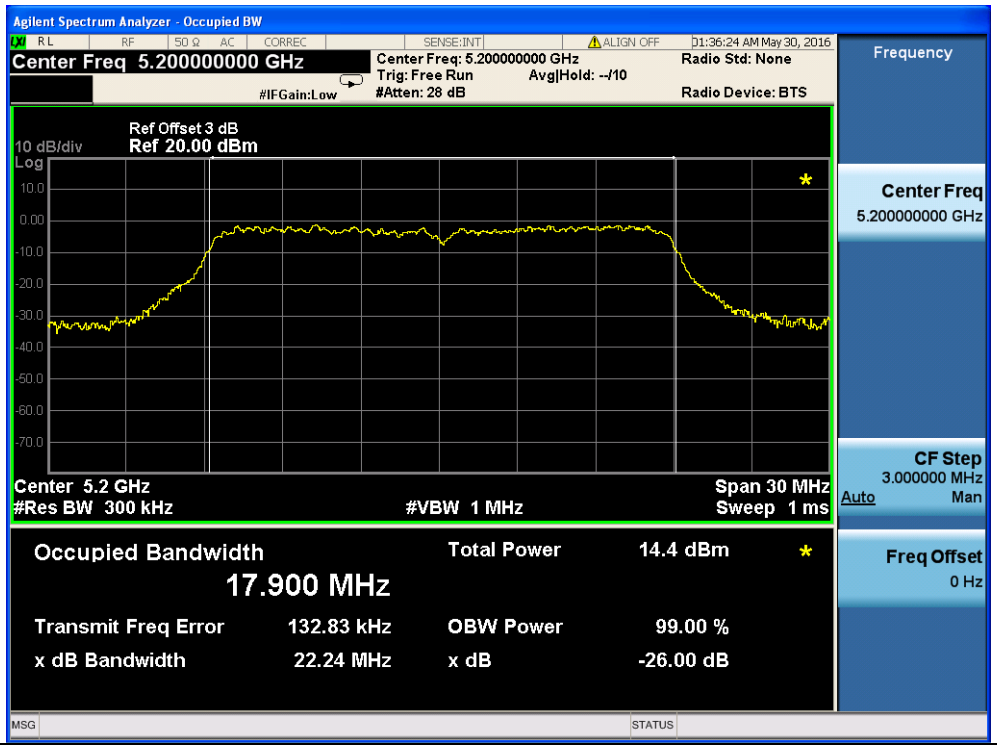


802.11 n20 Mode

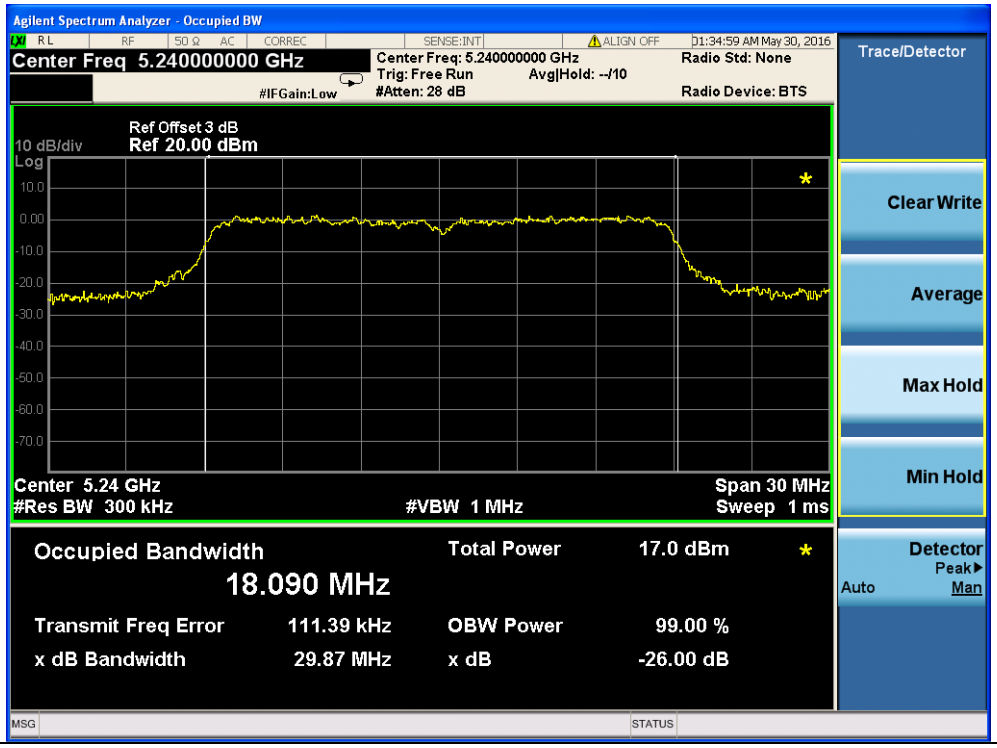
TX CH 36



TX CH 40

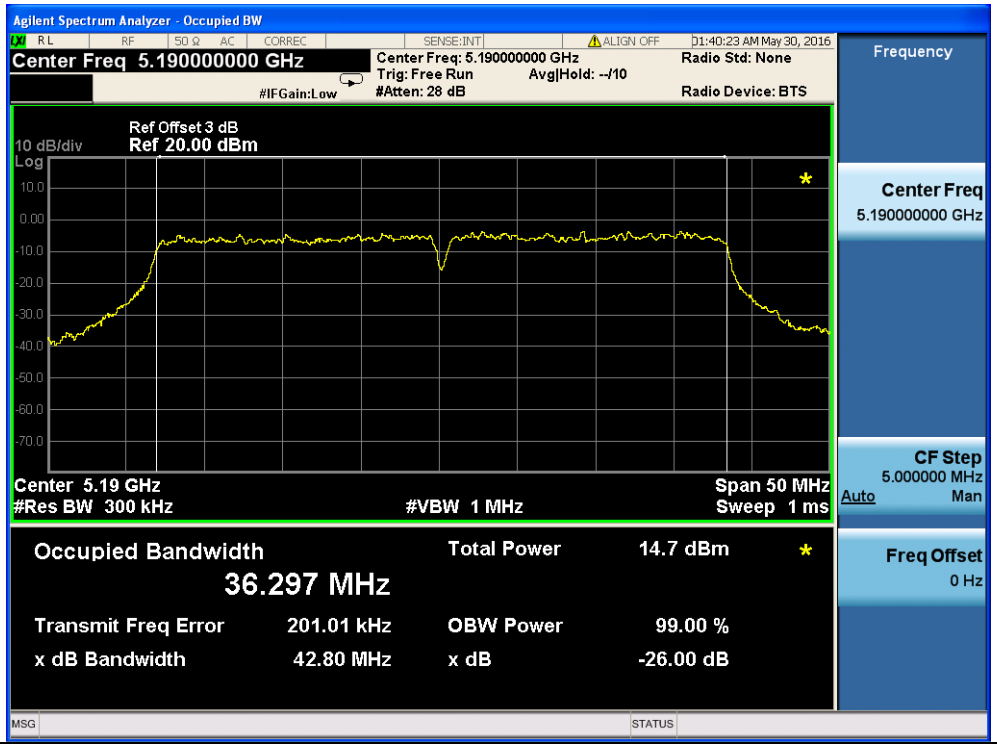


TX CH 48

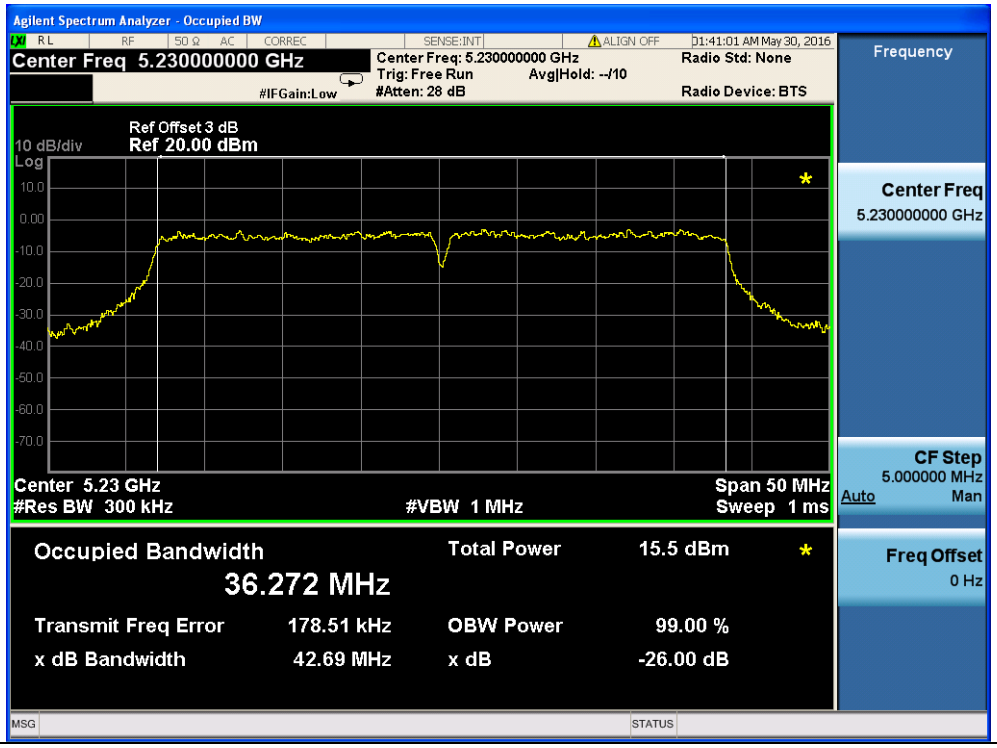


802.11 n40 Mode

TX CH 38

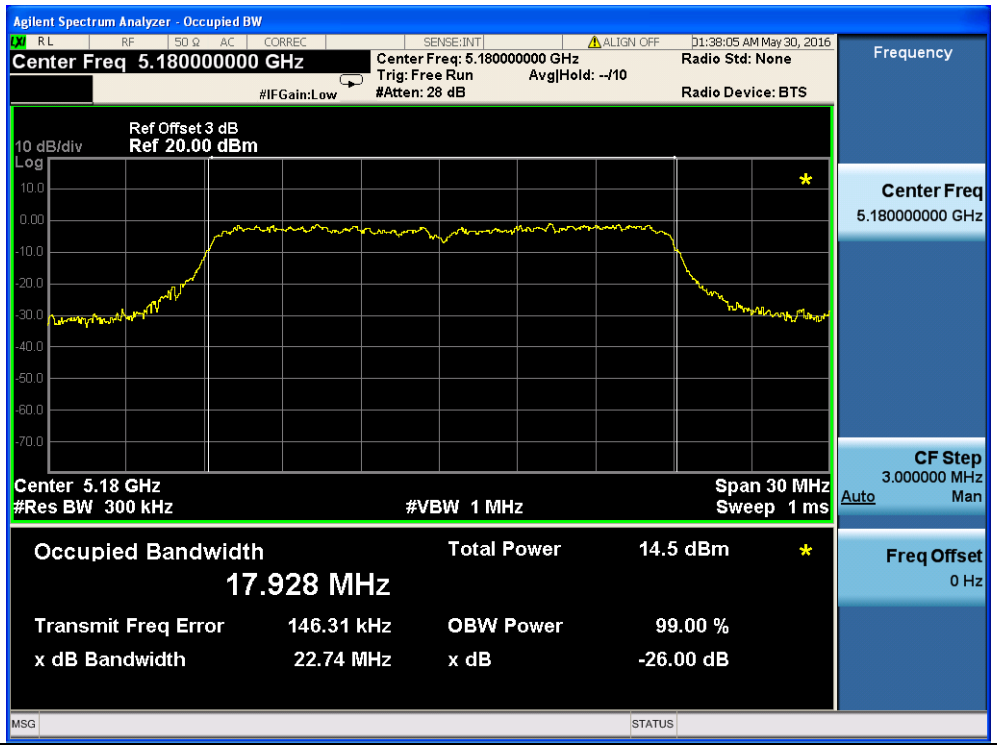


TX CH 46

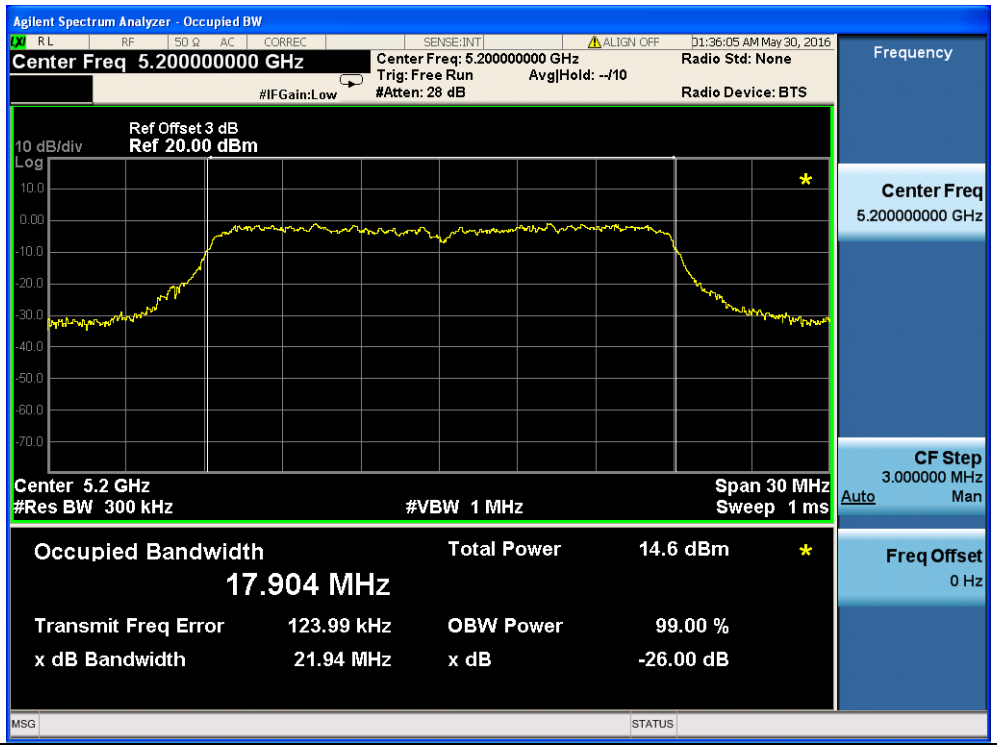


802.11 AC20 Mode

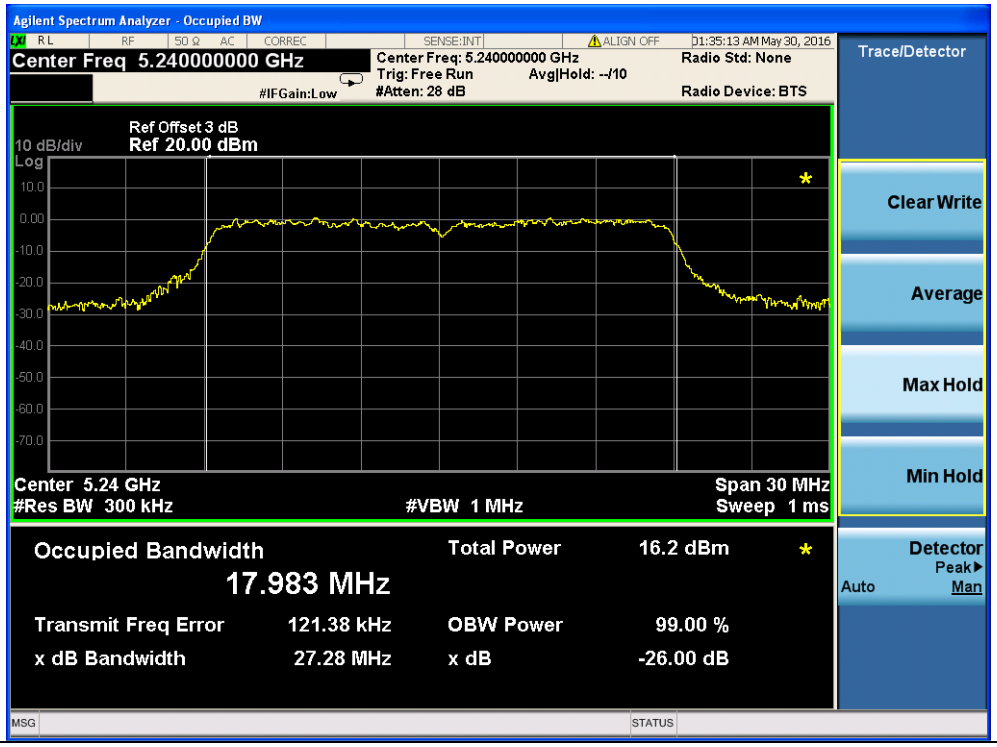
TX CH 36



TX CH 40

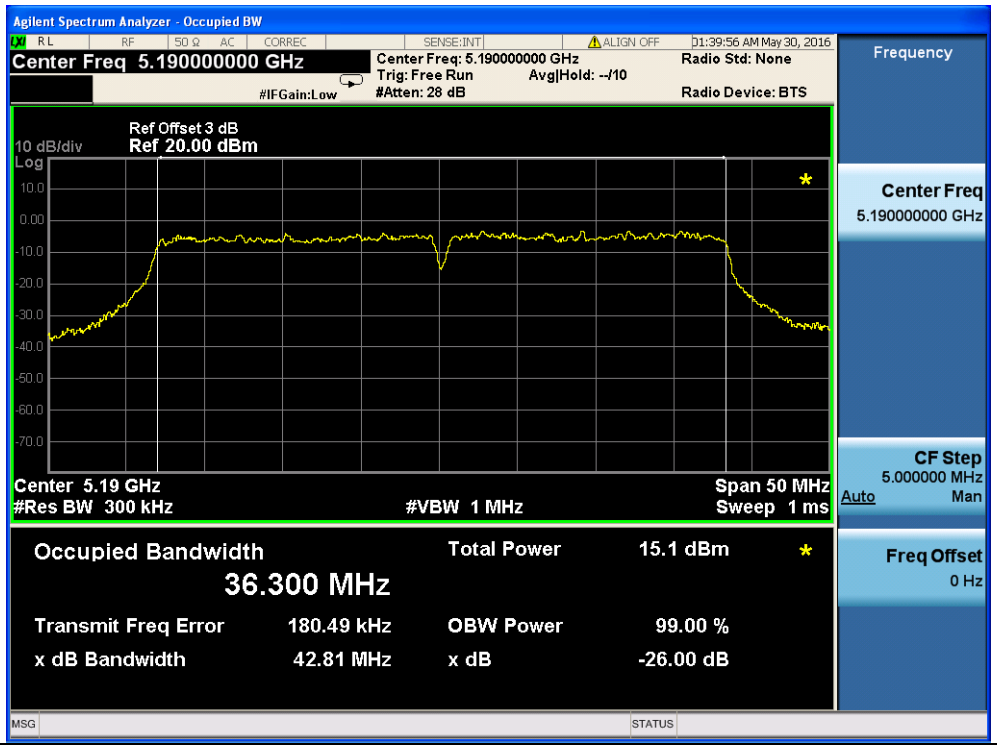


TX CH 48

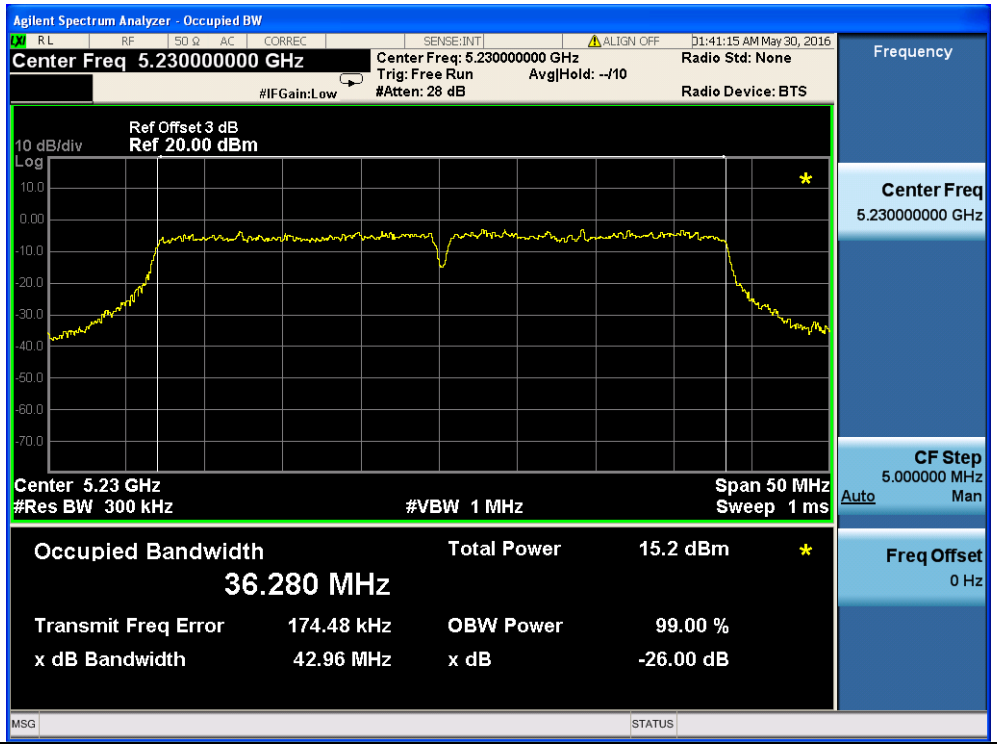


802.11 AC40 Mode

TX CH 38

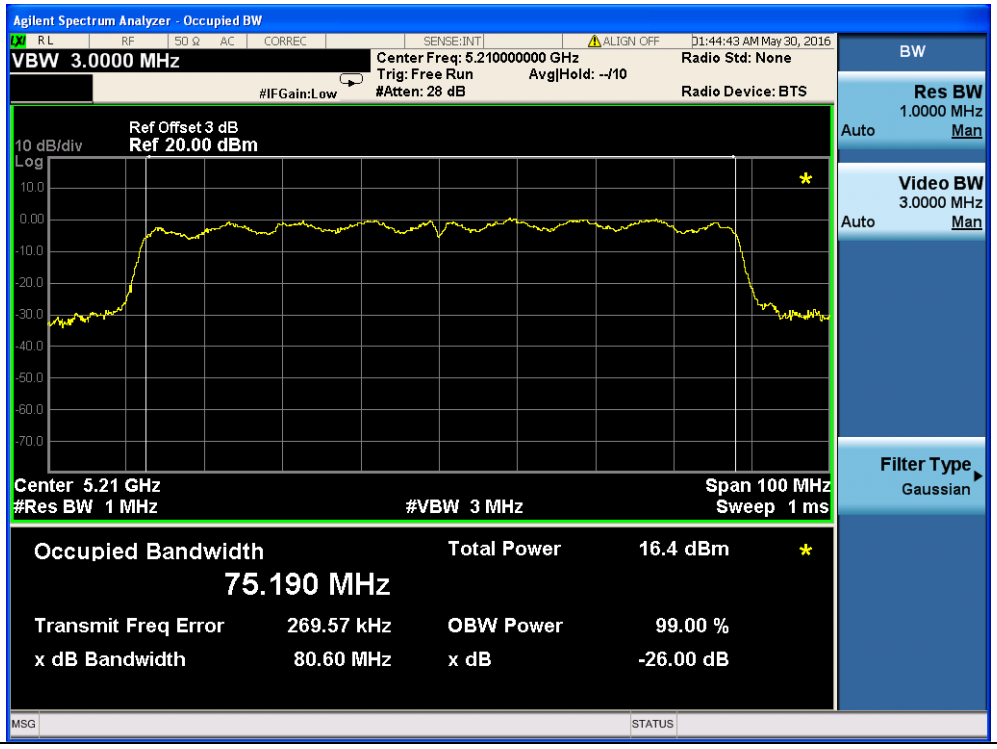


TX CH 46



802.11 AC80 Mode

TX CH 42



EUT：	ScreenBeam Smart Miracast module	Model Name ：	RTL8812AU-CG
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1012 hPa	Test Voltage ：	DC 5V
Test Mode ：	TX Frequency Band III (5745-5850MHz)		

Note: Model A(B) represent two different modules，

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

EUT has two antennas, and different modes support different transmit mode what describe as Following form:

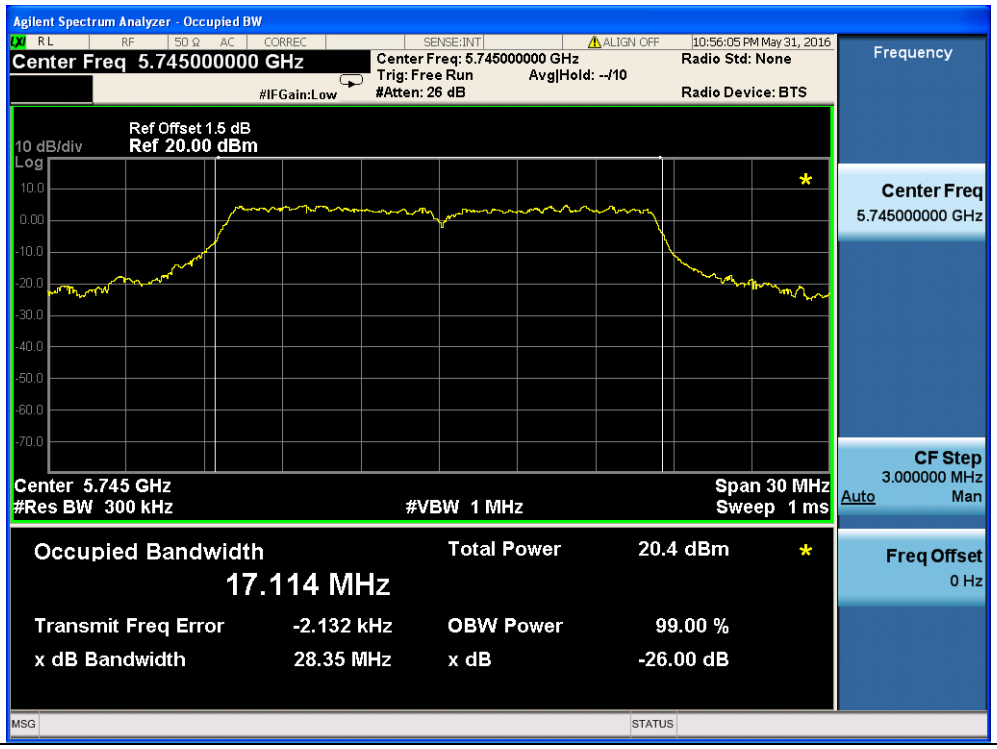
Mode	Tx/Rx
802.11a	1Tx, 1Rx
802.11n/ac	2Tx, 2Rx

Mode	Channel	Frequency (MHz)	99% bandwidth(MHz)		26dB bandwidth (MHz)		Result
			ANT A	ANT B	ANT A	ANT B	
802.11a	CH149	5745	16.994	17.114	26.64	28.35	Pass
	CH157	5785	17.057	17.068	28.54	27.22	Pass
	CH165	5825	17.026	17.050	28.49	25.50	Pass
802.11 n20	CH149	5745	18.068	17.888	29.83	22.03	Pass
	CH157	5785	18.234	17.864	30.00	21.87	Pass
	CH165	5825	18.154	17.857	29.97	21.89	Pass
802.11 n40	CH151	5755	37.009	37.070	44.82	44.46	Pass
	CH159	5795	37.051	37.004	44.71	44.29	Pass
802.11 AC20	CH149	5745	18.098	17.889	29.44	22.10	Pass
	CH157	5785	18.190	17.866	30.00	21.87	Pass
	CH165	5825	18.192	17.864	30.00	21.93	Pass
802.11 AC40	CH151	5755	37.018	37.016	44.62	44.49	Pass
	CH159	5795	36.981	37.144	44.73	44.61	Pass
802.11 AC80	CH155	5775	75.216	75.203	80.61	81.05	Pass

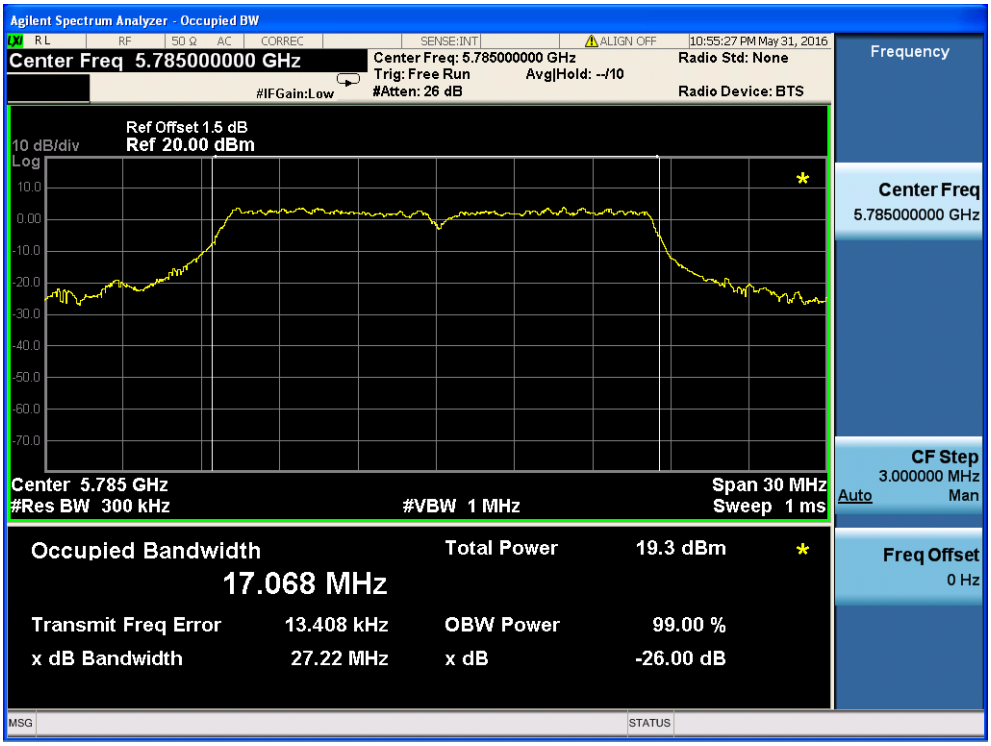
Antenna A

802.11 a Mode

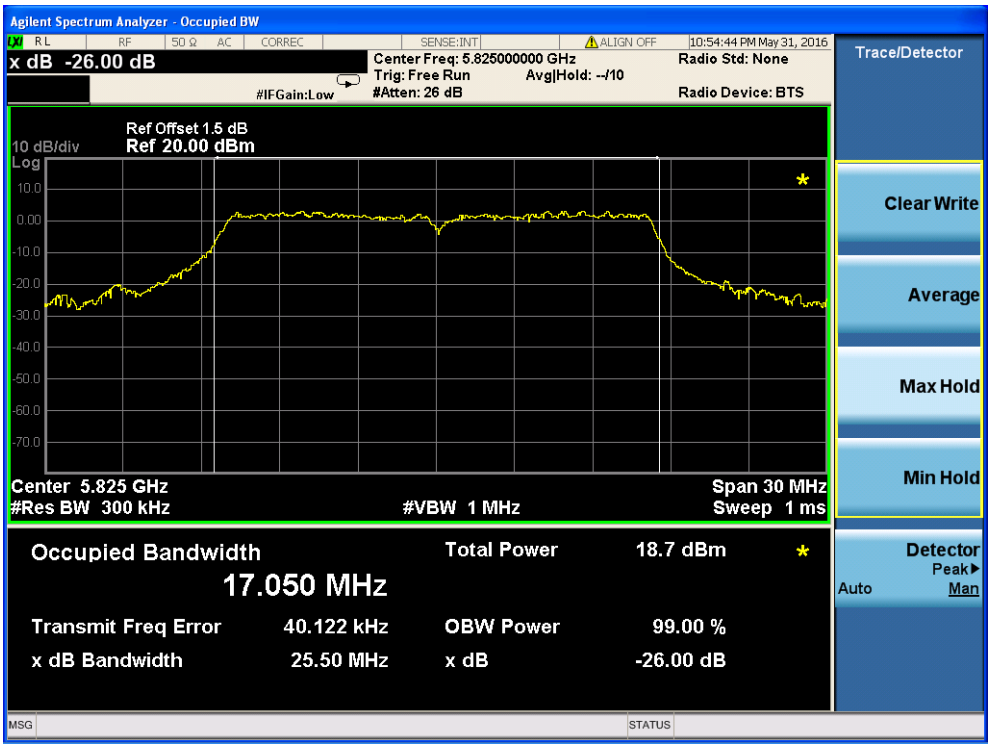
TX CH 149



TX CH 157

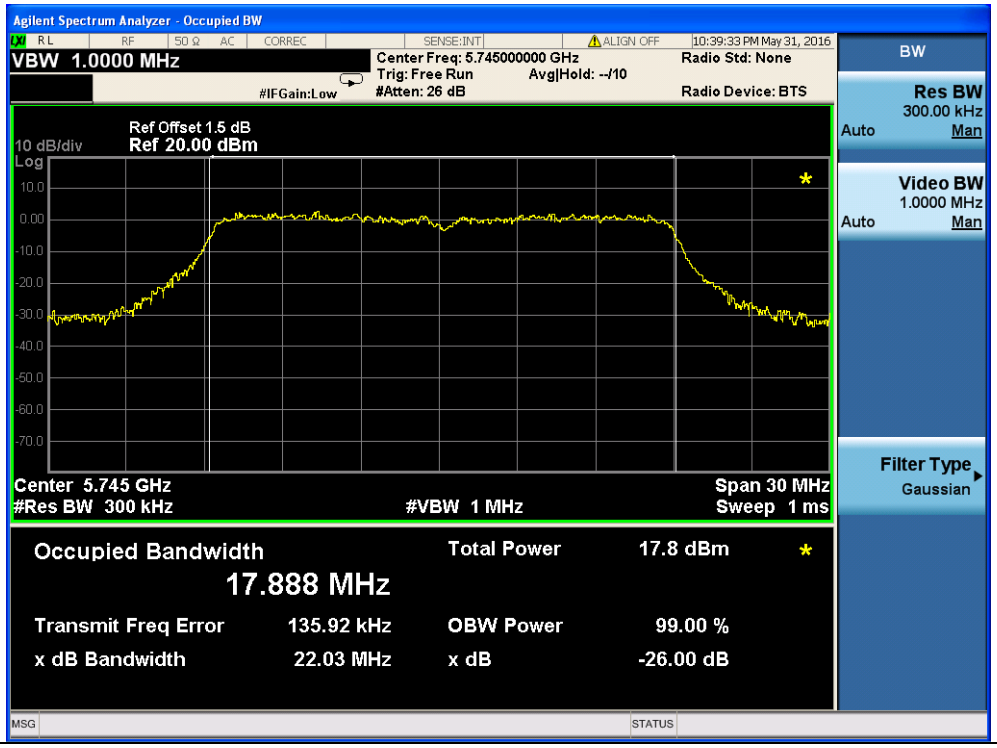


TX CH 165

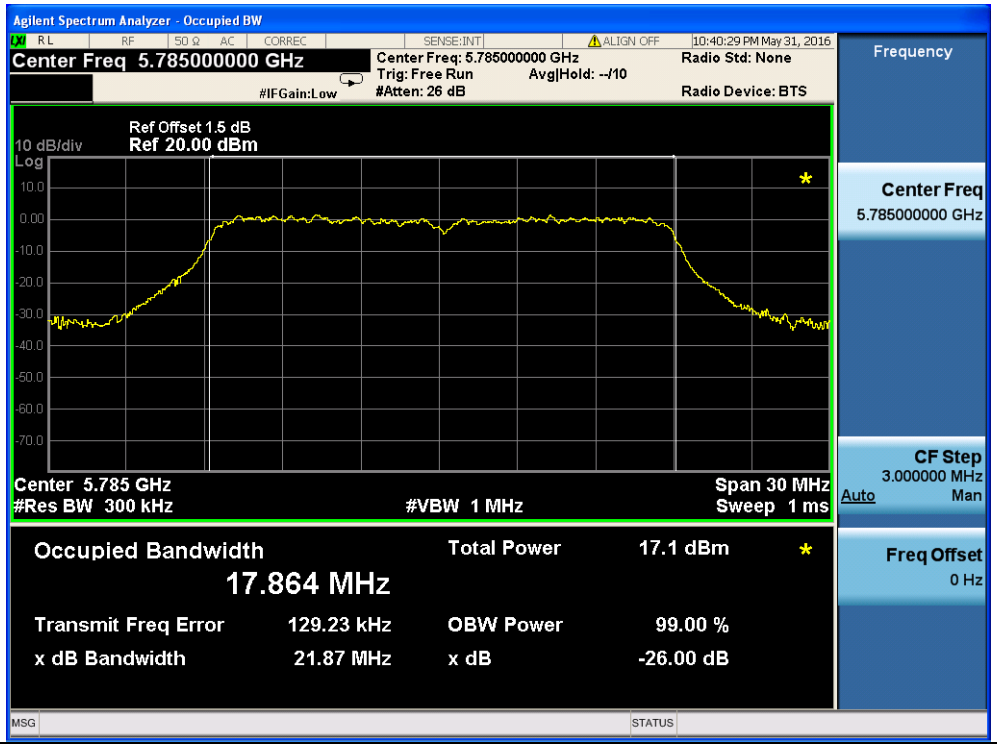


802.11 n20 Mode

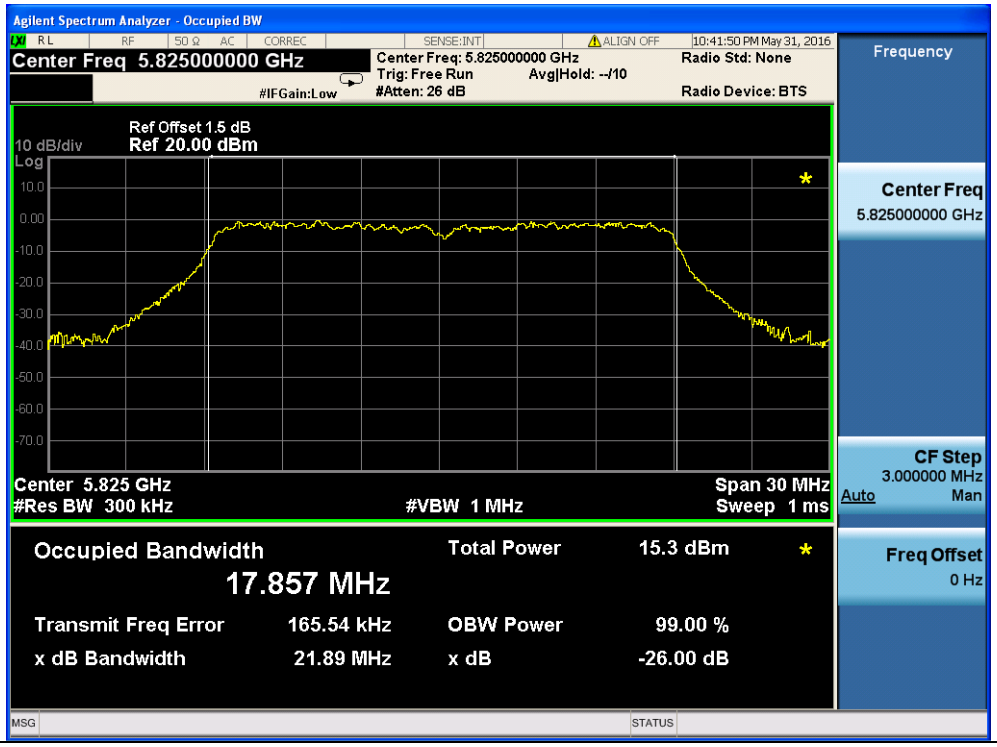
TX CH 149



TX CH 157

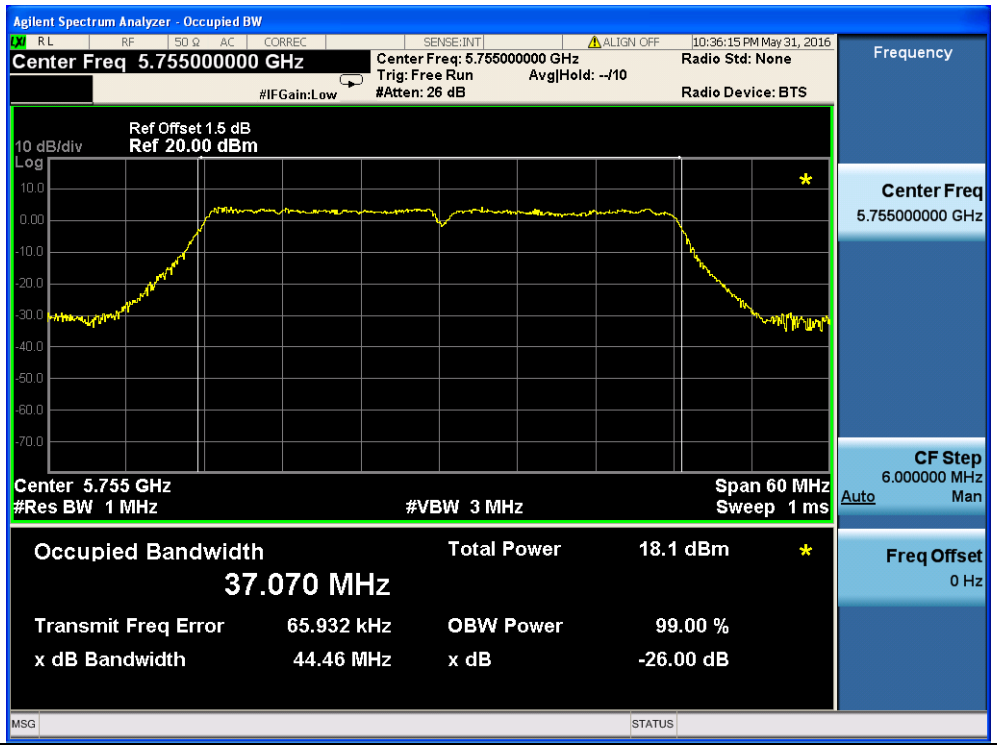


TX CH 165

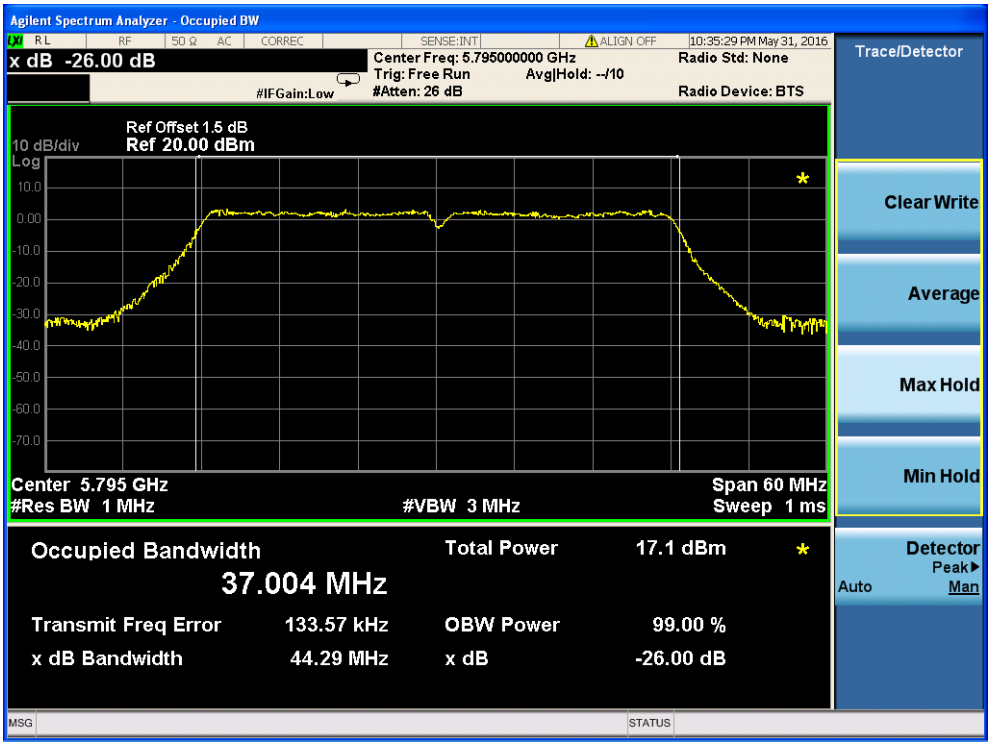


802.11 n40 Mode

TX CH 151

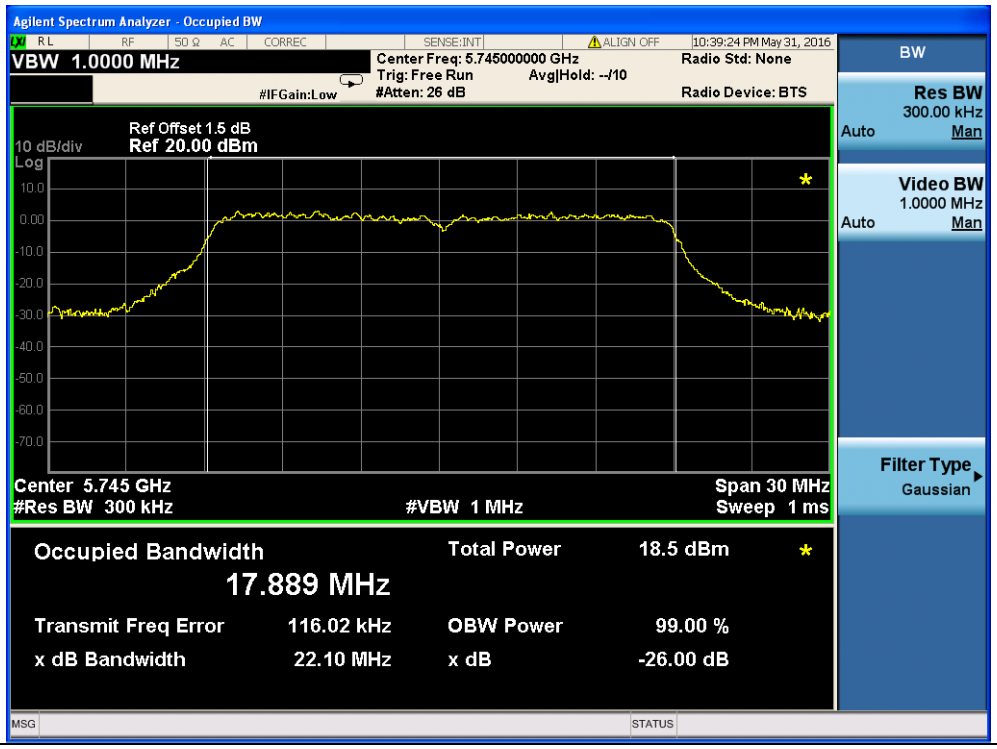


TX CH 159

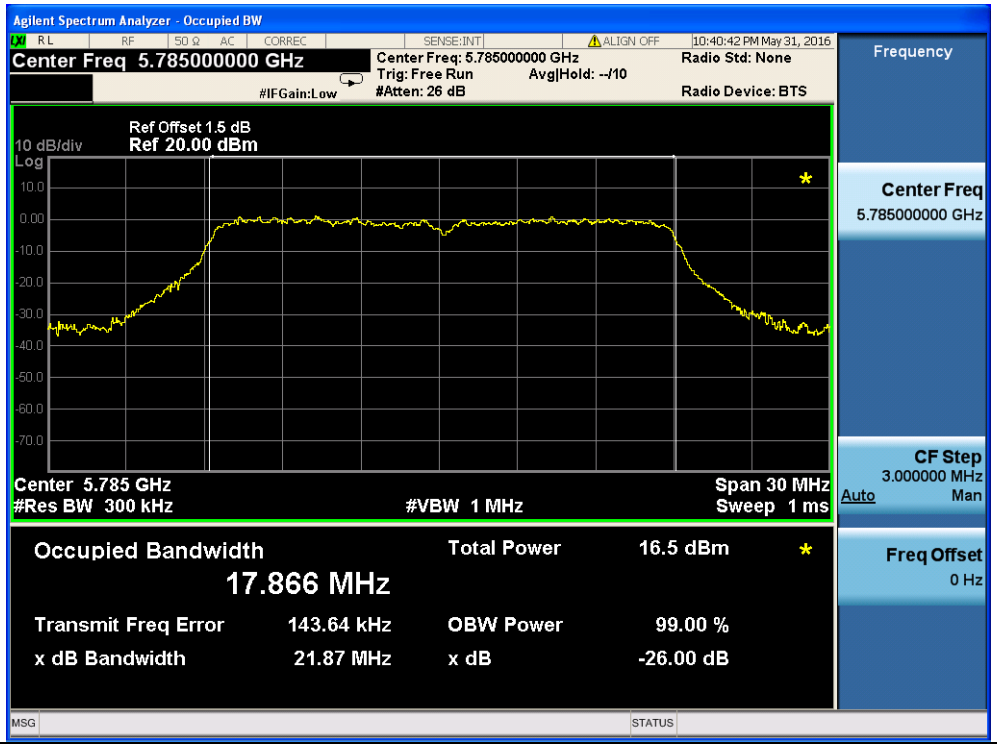


802.11 AC20 Mode

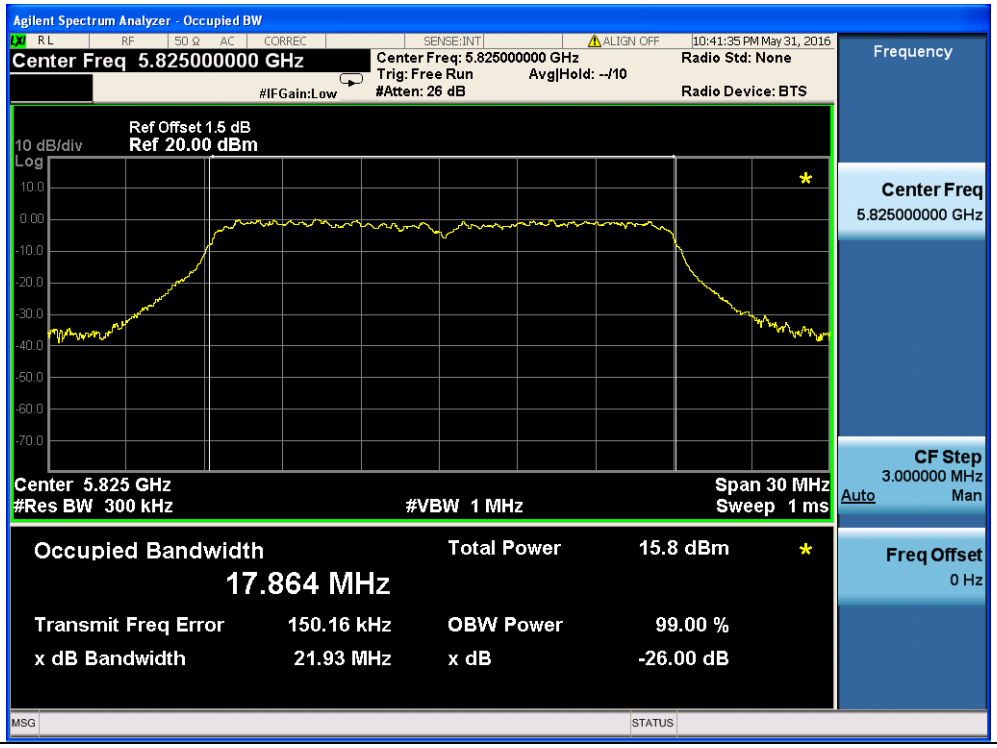
TX CH 149



TX CH 157

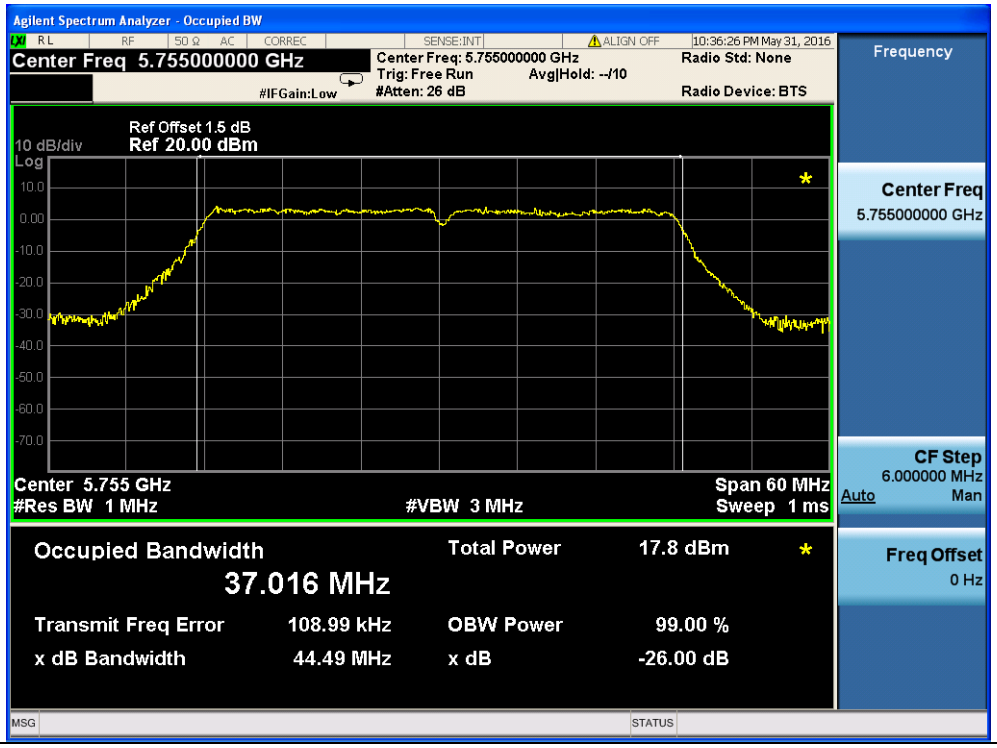


TX CH 165

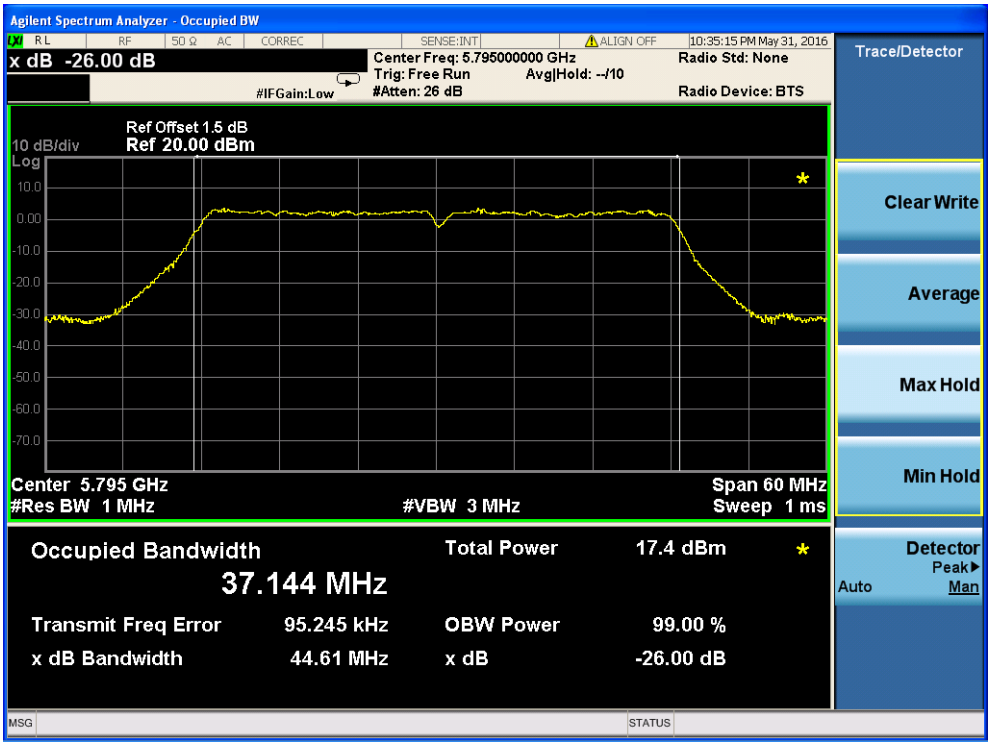


802.11 AC40 Mode

TX CH 151

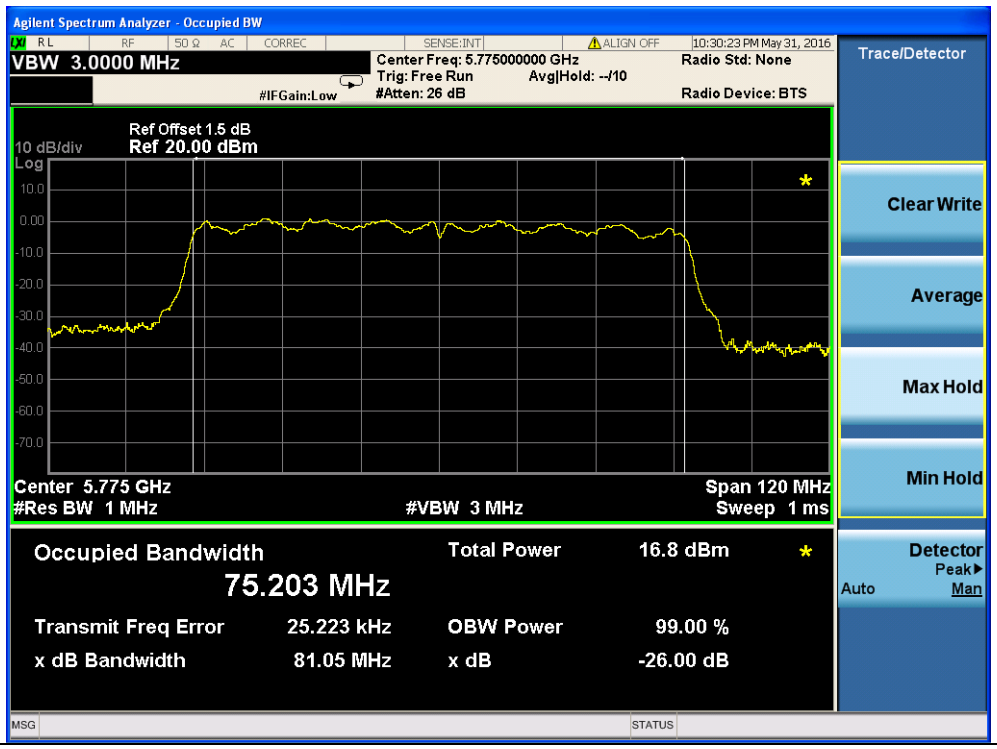


TX CH 159



802.11 AC80 Mode

TX CH 155



6. MINIMUM 6 DB BANDWIDTH

6.1 APPLIED PROCEDURES / LIMIT

According to FCC §15.407(e)
(e) Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

6.2 TEST PROCEDURE

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

a) Set RBW = 100 kHz.

b) Set the video bandwidth (VBW) ≥ 3 × RBW.

c) Detector = Peak.

d) Trace mode = max hold.

e) Sweep = auto couple.

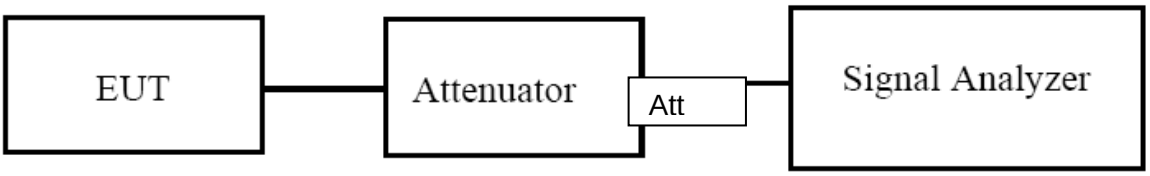
f) Allow the trace to stabilize.

g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 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.

6.6 TEST RESULTS

EUT：	ScreenBeam Smart Miracast module	Model Name ：	RTL8812AU-CG
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 5V
Test Mode ：	TX (5G) Mode Frequency Band III (5725-5825MHz)		

Note: Model A(B) represent two different modules，
A(B) Represent the value of antenna A and B, The worst data is A Antenna a ,only shown Antenna A Plot.

EUT has two antennas, and different modes support different transmit mode what describe as Following form:

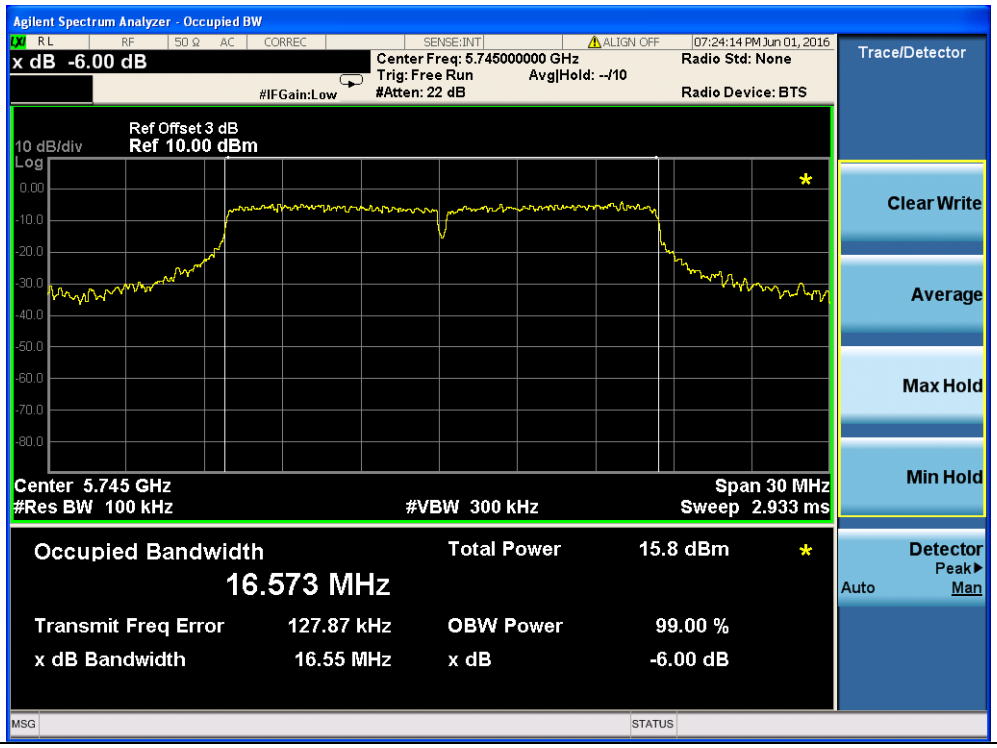
Mode	Tx/Rx
802.11a	1Tx, 1Rx
802.11n/ac	2Tx, 2Rx

Mode	Channel	Frequency (MHz)	-6dB bandwidth (MHz)		Limit (KHz)	Result
			ANT A	ANT B		
802.11a	149	5745	16.55	16.57	500	Pass
	157	5785	16.55	16.57	500	Pass
	165	5825	16.57	16.58	500	Pass
802.11 n20	149	5745	17.78	17.75	500	Pass
	157	5785	17.77	17.71	500	Pass
	165	5825	17.81	17.71	500	Pass
802.11 n40	151	5755	36.50	36.52	500	Pass
	159	5795	36.51	36.52	500	Pass
802.11 AC20	149	5745	17.79	17.71	500	Pass
	157	5785	17.80	17.72	500	Pass
	165	5825	17.78	17.73	500	Pass
802.11 AC40	149	5745	36.51	36.53	500	Pass
	157	5785	36.52	36.53	500	Pass
802.11 AC80	155	5775	74.96	75.43	500	Pass

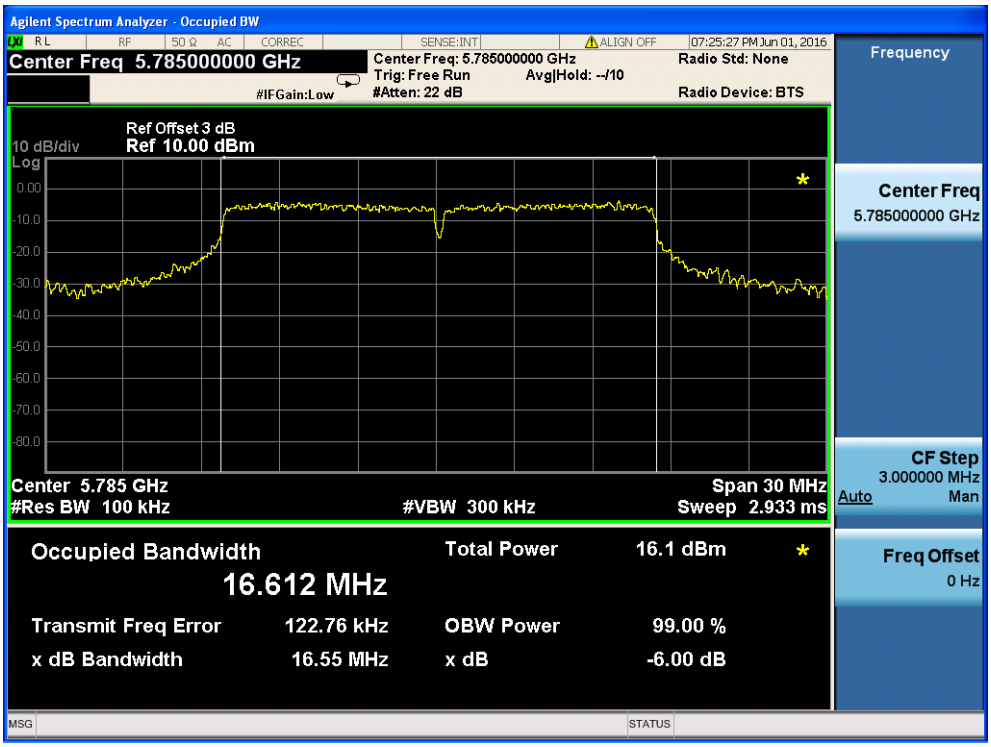
Antenna A

802.11 a Mode

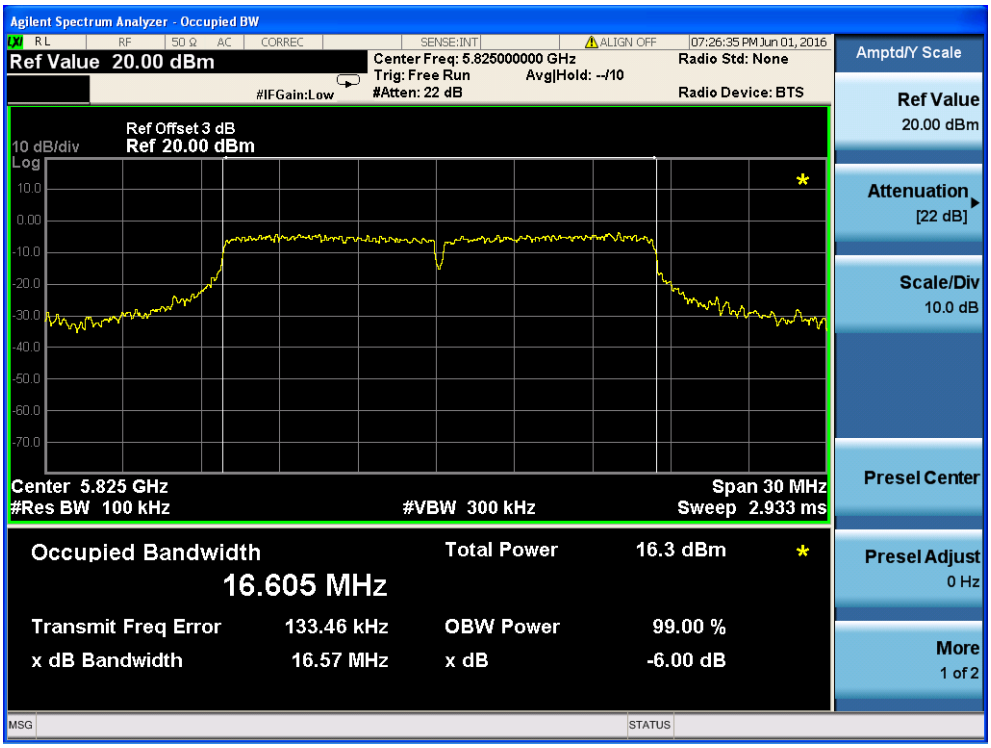
TX CH 149



TX CH 157

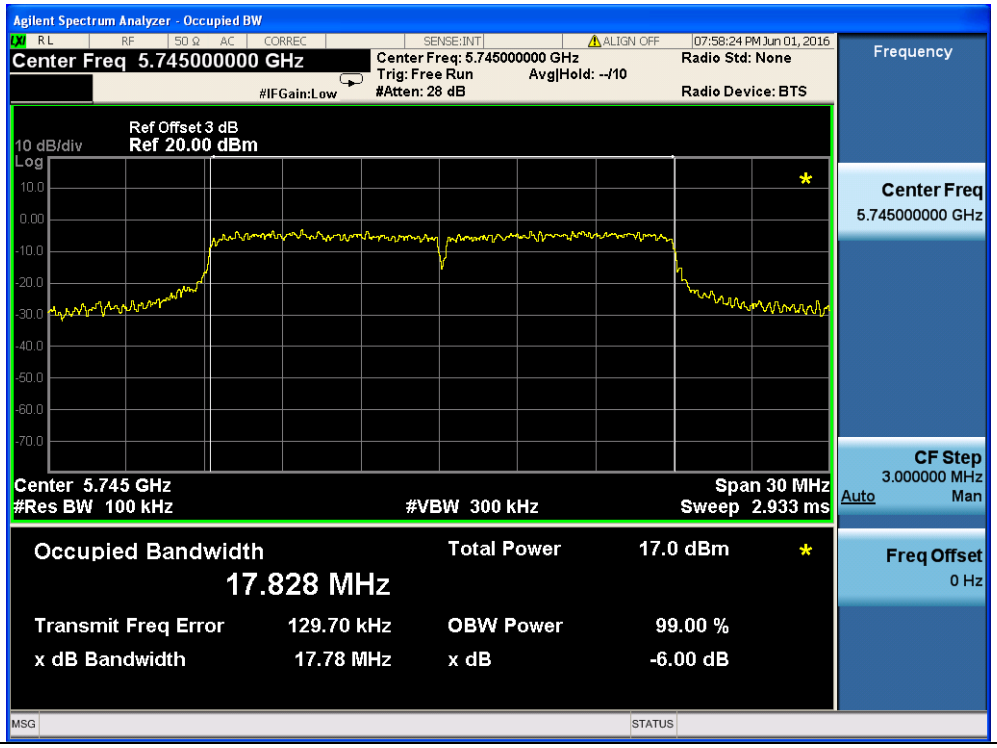


TX CH 165

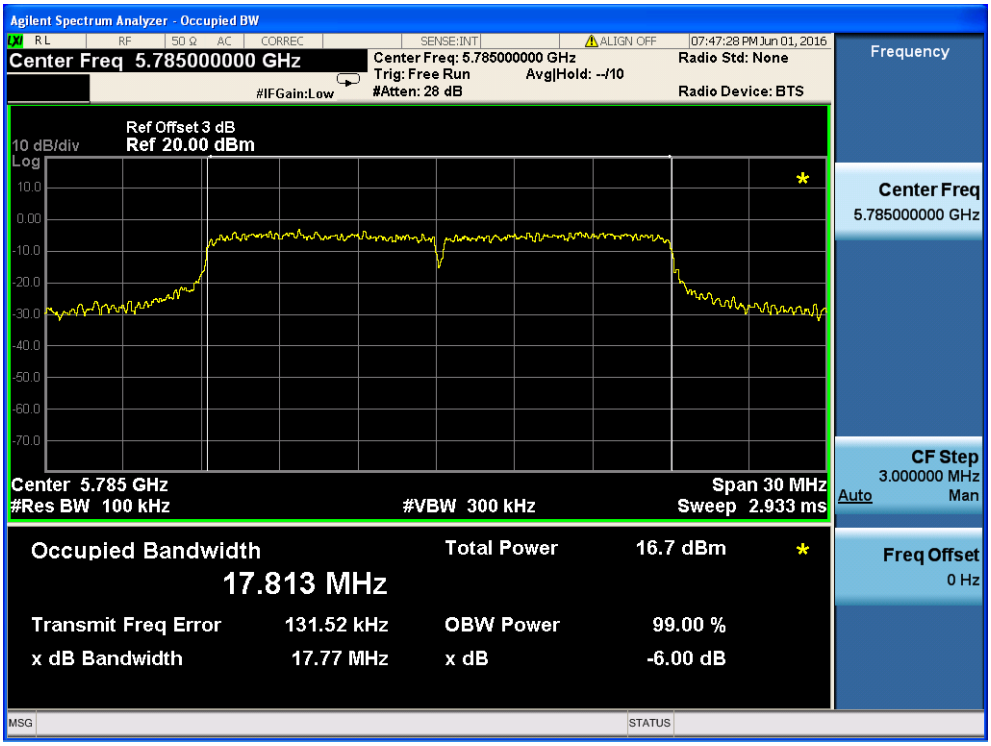


802.11 n20 Mode

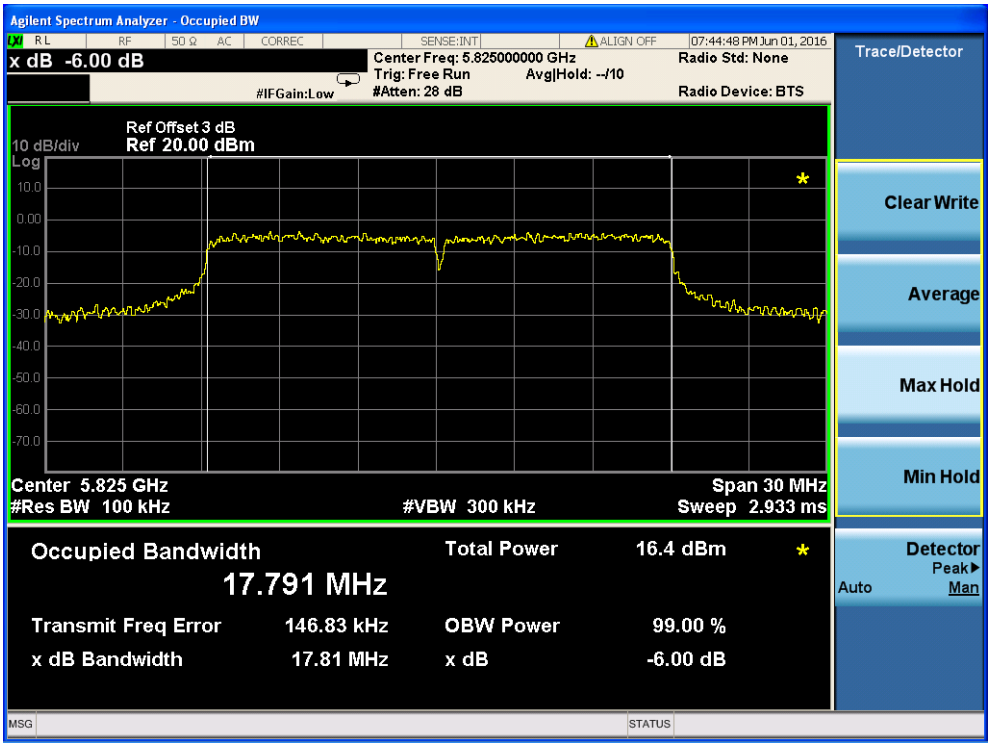
TX CH 149



TX CH 157

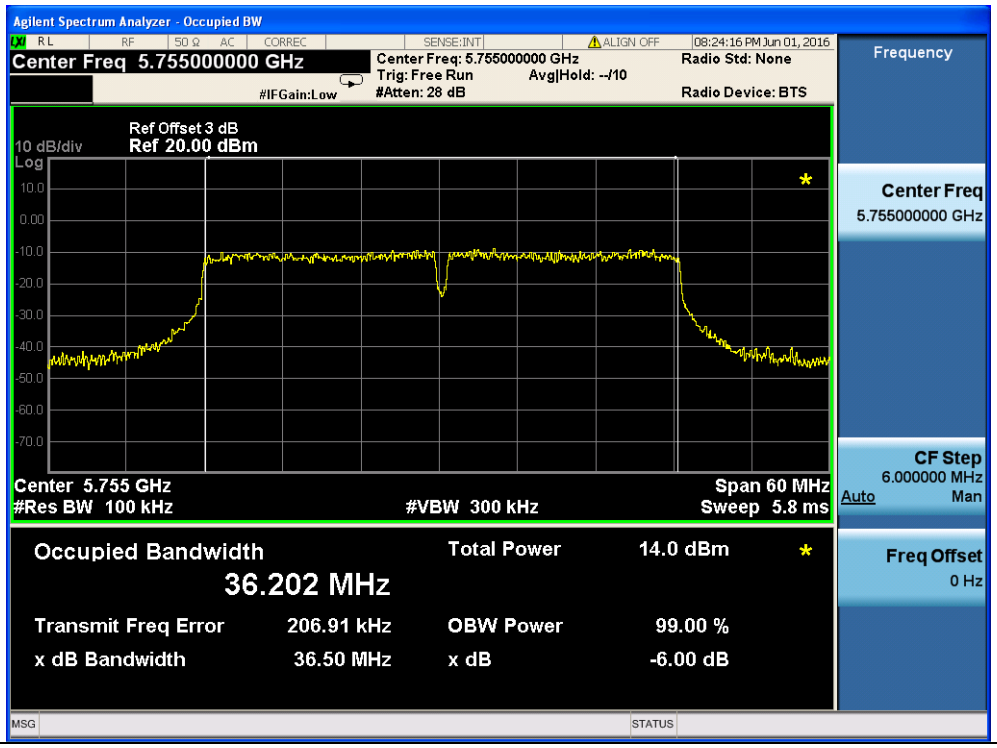


TX CH 165

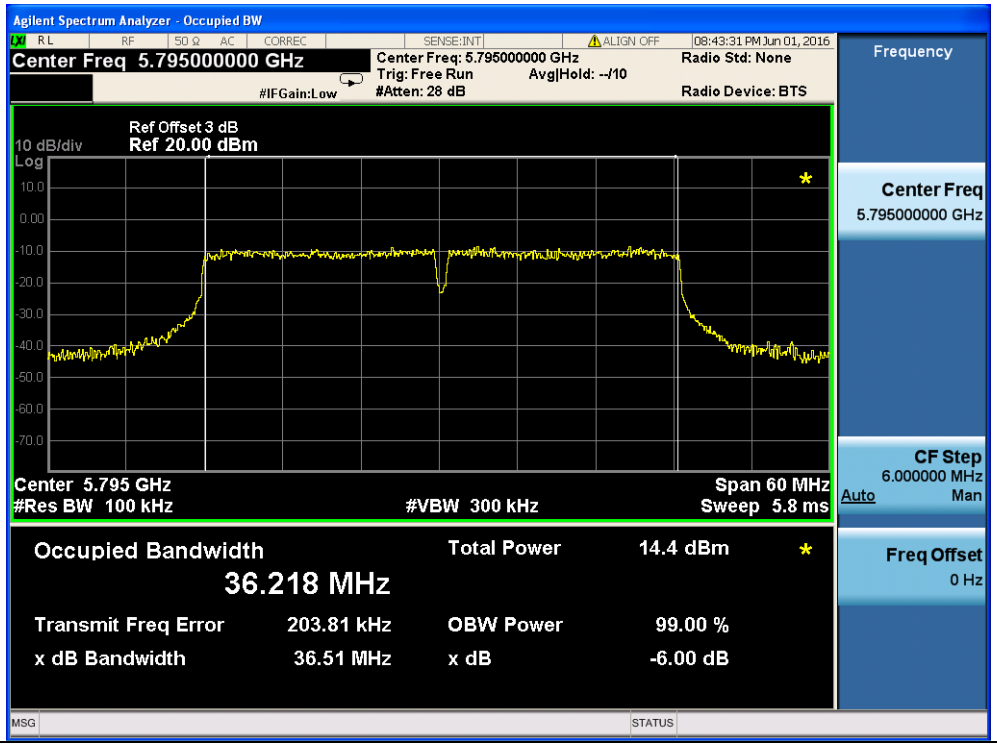


802.11 n40 Mode

TX CH 151

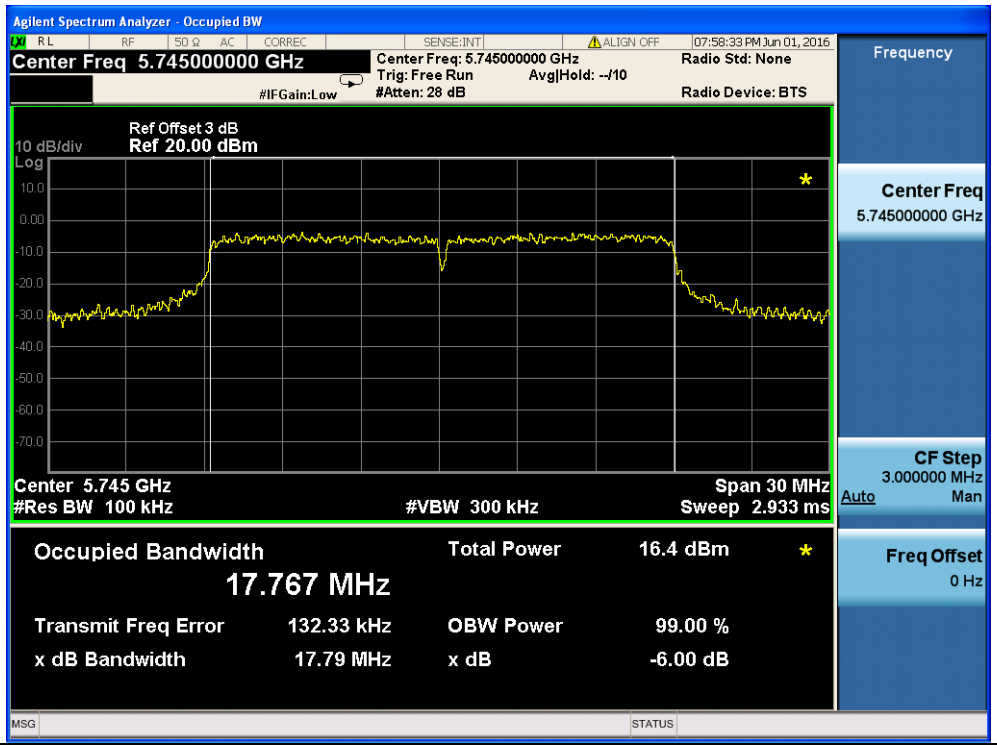


TX CH 159

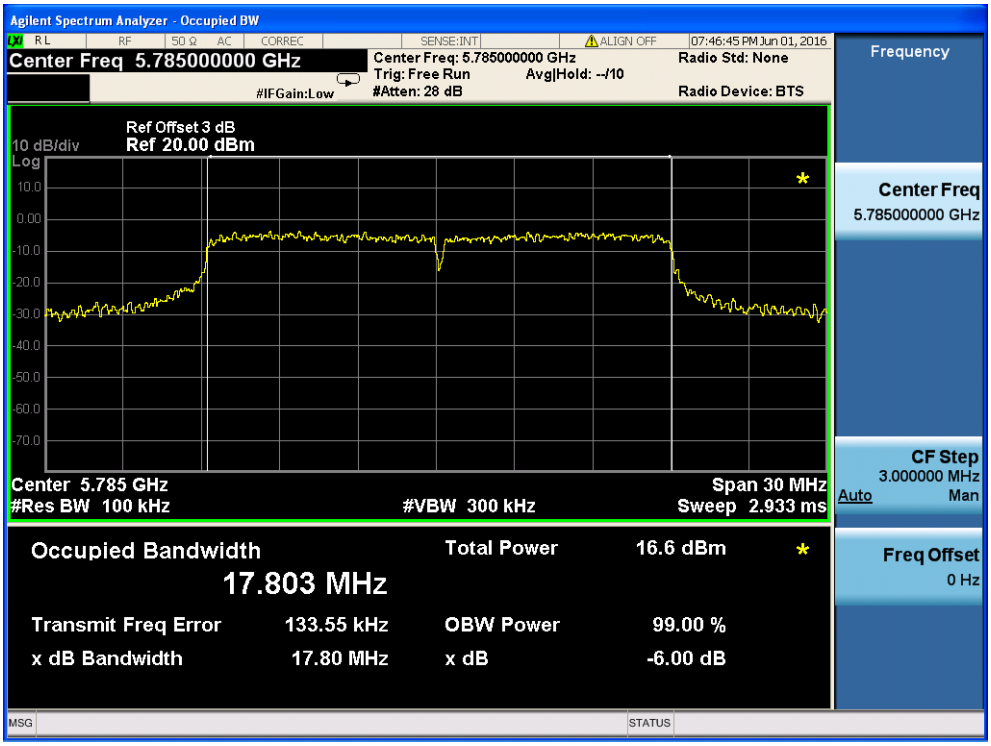


802.11 AC20 Mode

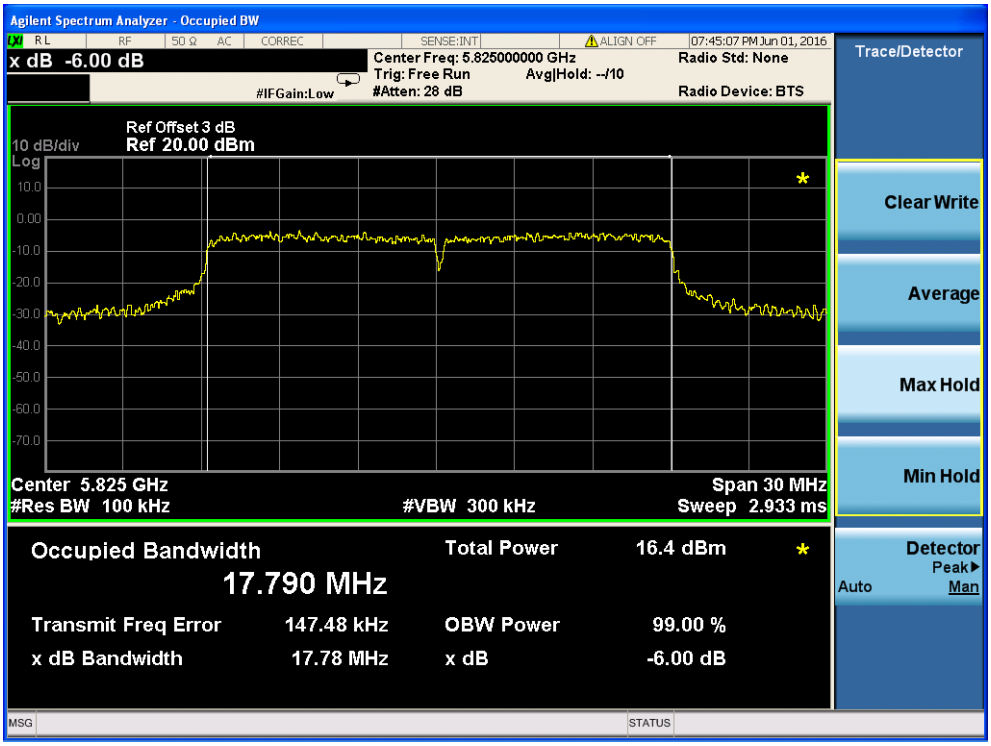
TX CH 149



TX CH 157

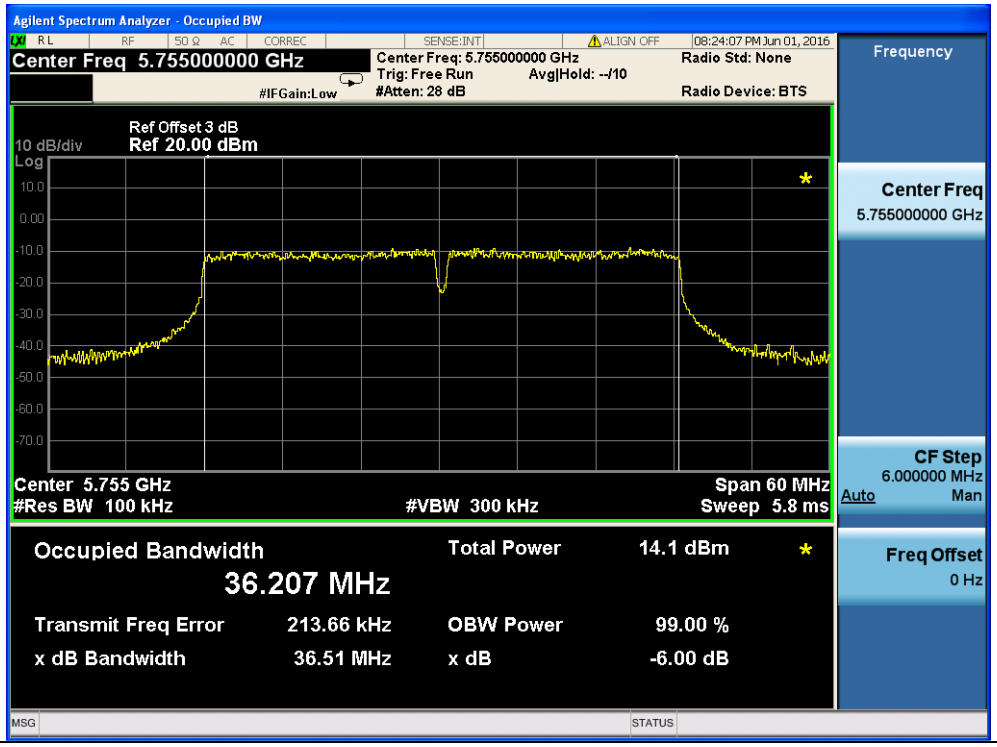


TX CH 165

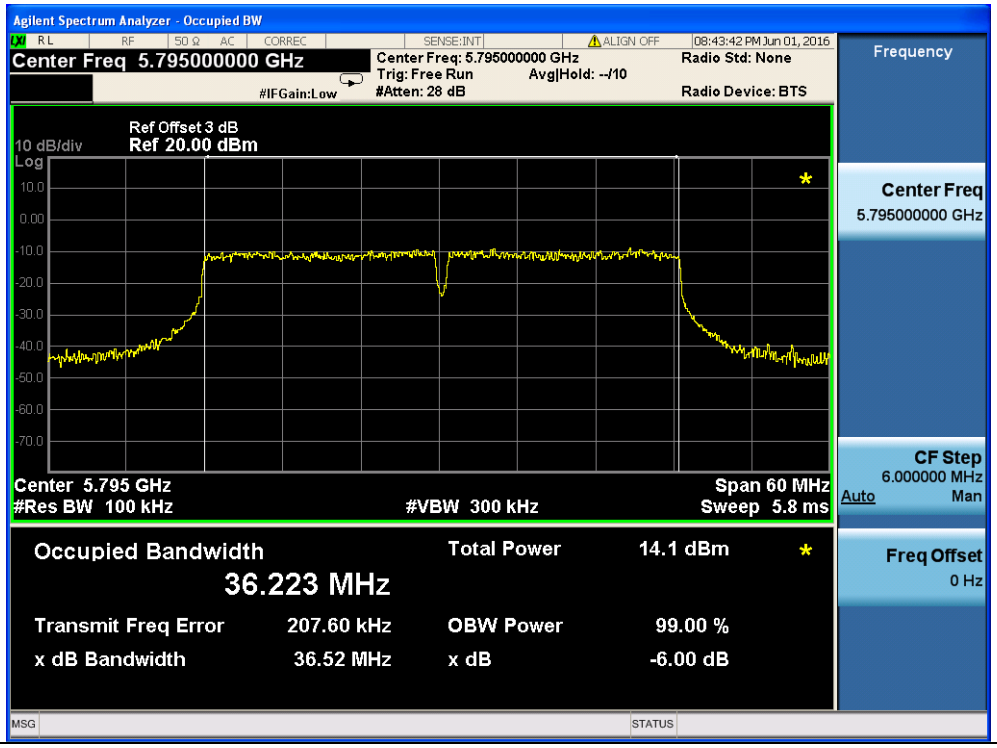


802.11 AC40 Mode

TX CH 151

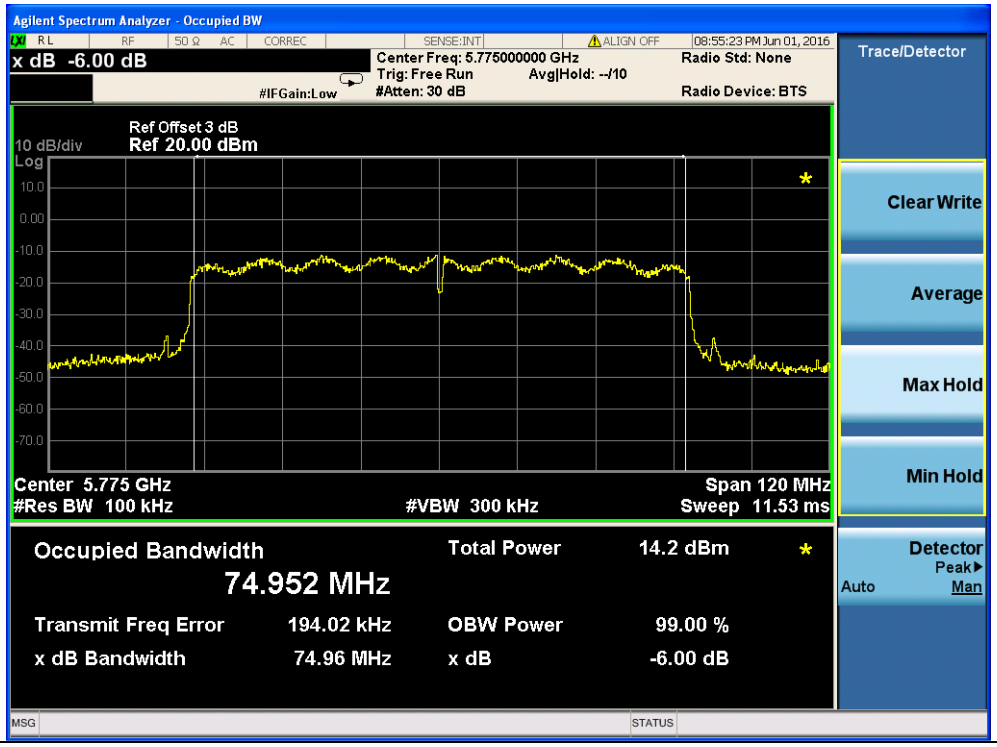


TX CH 159



802.11 AC80 Mode

TX CH 155



7. MAXIMUM CONDUCTED OUTPUT POWER

7.1 PPLIED PROCEDURES / LIMIT

According to FCC §15.407

According to FCC §15.407

The maximum conduced output power should not exceed:

Frequency Band(MHz)	Limit
5150~5250	250mW
5725~5850	1W

The maximum e.i.r.p should not exceed:

Frequency Band(MHz)	Limit
5150~5250	200mW or 10dBm +10logB whichever is less
5725~5850	N/A

Note: Where “B” is the 99% emission bandwidth in MHz

7.2 TEST PROCEDURE

· Maximum conducted output power may be measured using a spectrum analyzer/EMI receiver or an RF power meter.

1. Device Configuration

If possible, configure or modify the operation of the EUT so that it transmits continuously at its maximum power control level (see section II.B.).

a) The intent is to test at 100 percent duty cycle; however a small reduction in duty cycle (to no lower than 98 percent) is permitted if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test lab to permit such continuous operation.

b) If continuous transmission (or at least 98 percent duty cycle) cannot be achieved due to hardware limitations (e.g., overheating), the EUT shall be operated at its maximum power control level with the transmit duration as long as possible and the duty cycle as high as possible.

2. Measurement using a Spectrum Analyzer or EMI Receiver (SA)

Measurement of maximum conducted output power using a spectrum analyzer requires integrating the spectrum across a frequency span that encompasses, at a minimum, either the EBW or the 99-percent occupied bandwidth of the signal.1 However, the EBW must be used to determine bandwidth dependent limits on maximum conducted output power in accordance with § 15.407(a).

a) The test method shall be selected as follows: (i) Method SA-1 or SA-1 Alternative (averaging with the EUT transmitting at full power throughout each sweep) shall be applied if either of the following conditions can be satisfied:

• The EUT transmits continuously (or with a duty cycle ≥ 98 percent).

• Sweep triggering or gating can be implemented in a way that the device transmits at the maximum power control level throughout the duration of each of the instrument sweeps to be averaged. This condition can generally be achieved by triggering the instrument's sweep if the duration of the sweep (with the analyzer configured as in Method SA-1, below) is equal to or shorter than the duration T of each transmission from the EUT and if those transmissions exhibit full power throughout their durations.

(ii) Method SA-2 or SA-2 Alternative (averaging across on and off times of the EUT transmissions, followed by duty cycle correction) shall be applied if the conditions of (i) cannot be achieved and the transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than ± 2 percent.

(iii) Method SA-3 (RMS detection with max hold) or SA-3 Alternative (reduced VBW with max hold) shall be applied if the conditions of (i) and (ii) cannot be achieved.

b) Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep): (i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1 MHz.

(iii) Set VBW ≥ 3 MHz.

(iv) Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ 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".

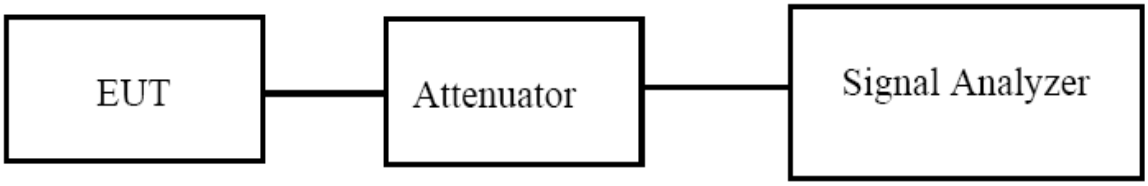
(viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 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.

7.6 TEST RESULTS

EUT：	ScreenBeam Smart Miracast module	Model Name ：	RTL8812AU-CG
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 5V
Test Mode ：	TX (5G) Mode Frequency Band I (5150-5250MHz)		

Note: Model A(B) represent two different modules，
A(B) Represent the value of antenna A and B, The worst data is A Antenna a ,only shown Antenna A Plot.

EUT has two antennas, and different modes support different transmit mode what describe as Following form:

Mode	Tx/Rx
802.11a	1Tx, 1Rx
802.11n/ac	2Tx, 2Rx

Test Channel	Frequency	Maximum output power. Antenna port		Total Power	LIMIT	Result
		(AV) (dBm)		(AV)		
	(MHz)	ANT A	ANT B	dBm	dBm	
TX 802.11a Mode						
CH36	5180	15.74	15.59	–	23.98	Pass
CH40	5200	16.08	15.76	–	23.98	Pass
CH48	5240	16.51	16.67	–	23.98	Pass
TX 802.11 n20M Mode						
CH36	5180	15.23	15.45	18.35	21.42	Pass
CH40	5200	15.52	15.21	18.38	21.42	Pass
CH48	5240	15.16	15.26	18.22	21.42	Pass
TX 802.11 n40M Mode						
CH38	5190	15.11	15.63	18.39	21.42	Pass
CH46	5230	14.84	15.44	18.16	21.42	Pass
TX 802.11 AC20M Mode						
CH36	5180	14.98	15.76	18.40	21.42	Pass
CH40	5200	15.66	15.70	18.69	21.42	Pass
CH48	5240	15.55	15.53	18.55	21.42	Pass
TX 802.11 AC40M Mode						
CH38	5190	15.03	15.17	18.11	21.42	Pass
CH46	5230	15.09	15.61	18.37	21.42	Pass
TX 802.11 AC80M Mode						
CH42	5210	14.92	14.85	17.90	21.42	Pass

Note: For 802.11n/ac 5GHz has MIMO mode.Directional gain=GANT +10log(N)dbi =8.56dbi

8.56 dbi>6.0 dbi so power density limit= 23.98-(8.56-6.0)=21.42

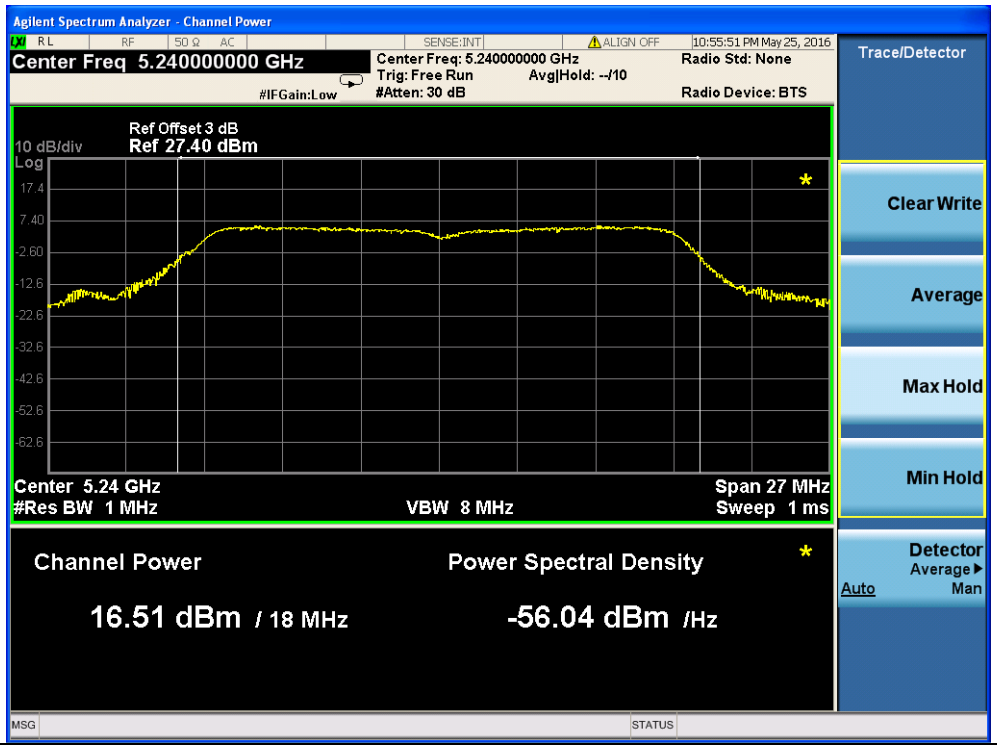
Antenna A

802.11 a Mode

TX CH 36

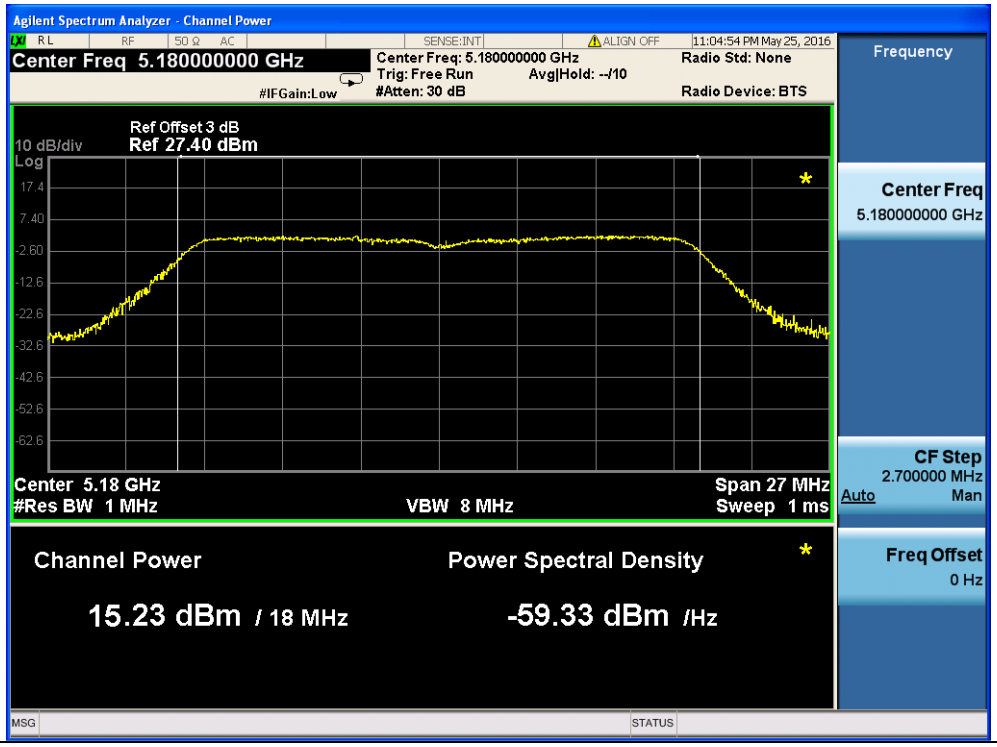
TX CH 40

TX CH 48

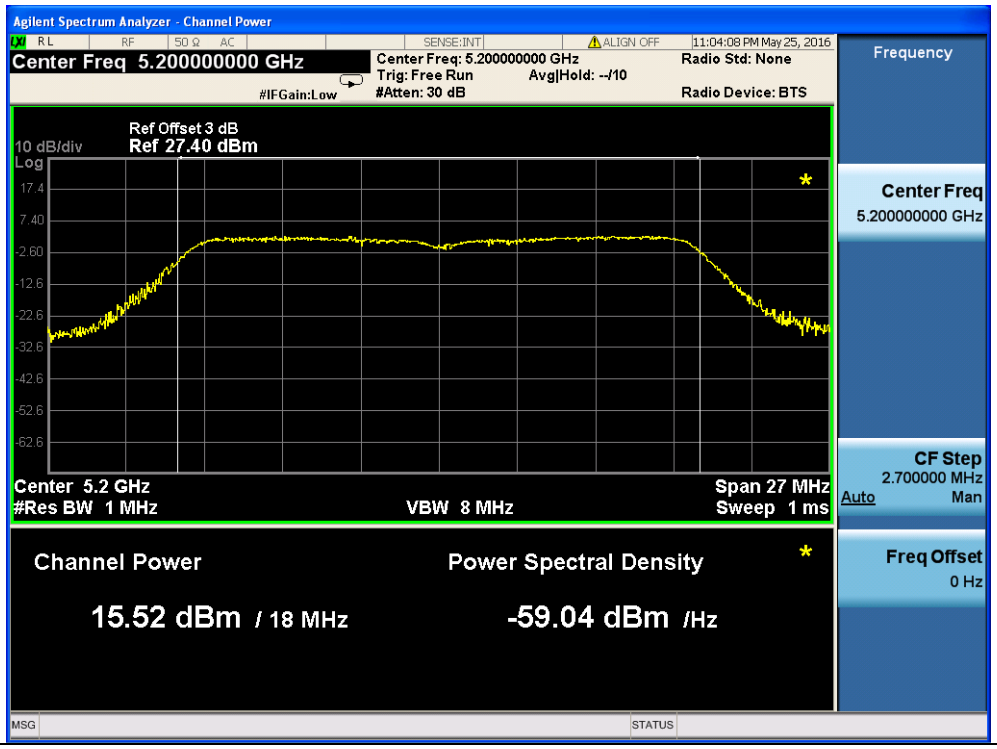


802.11 n20 Mode

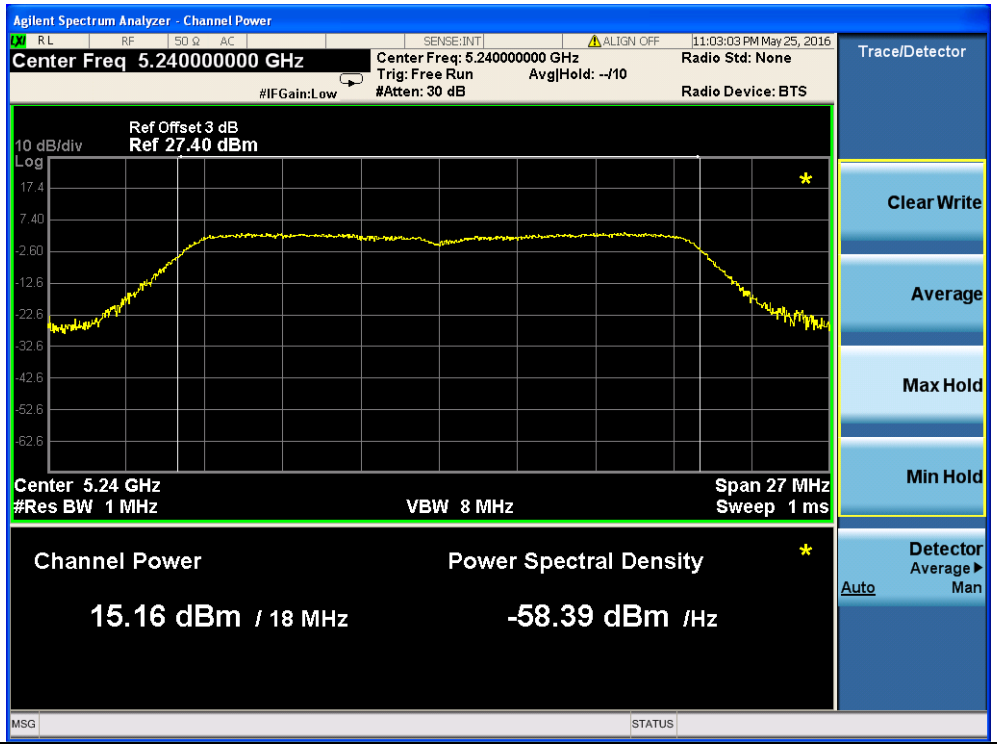
TX CH 36



TX CH 40

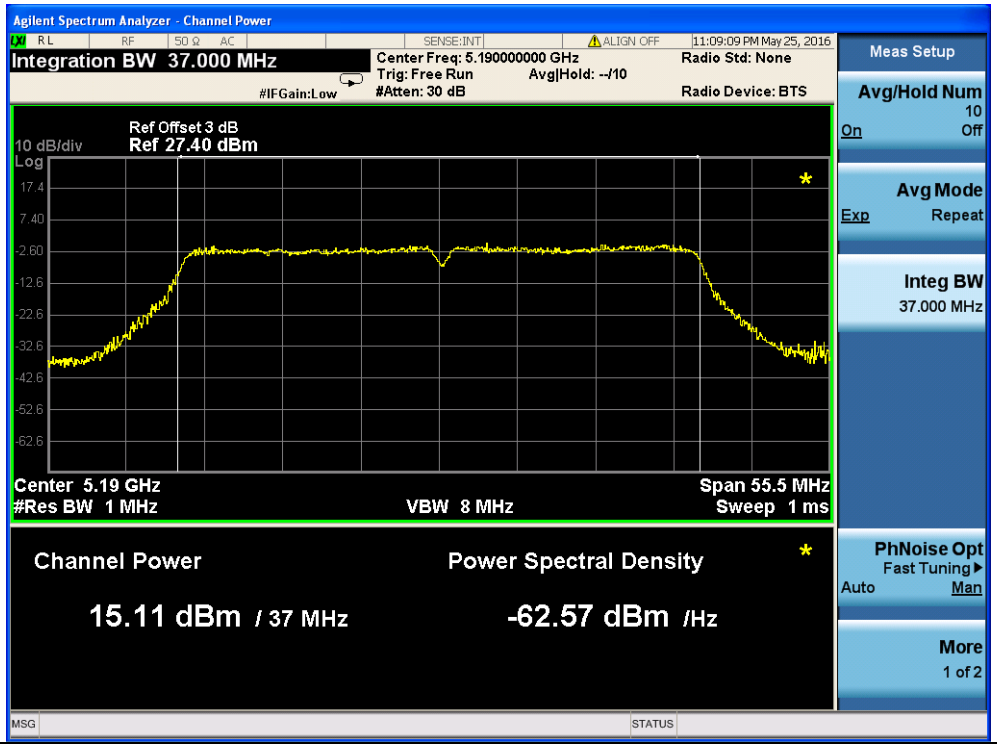


TX CH 48

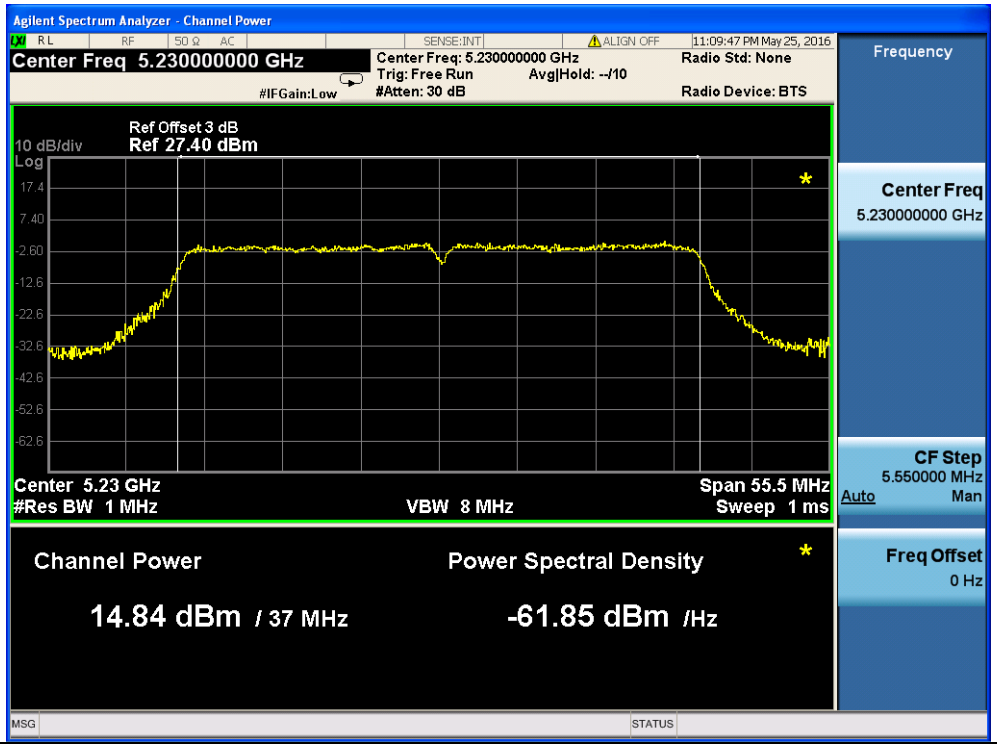


802.11 n40 Mode

TX CH 38

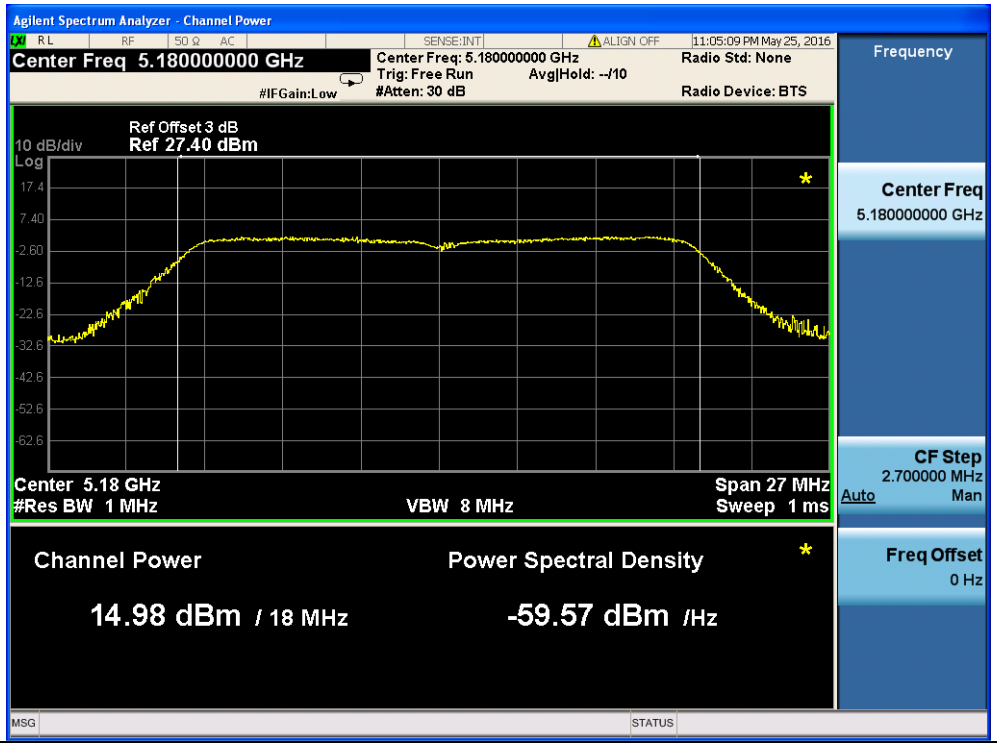


TX CH 46

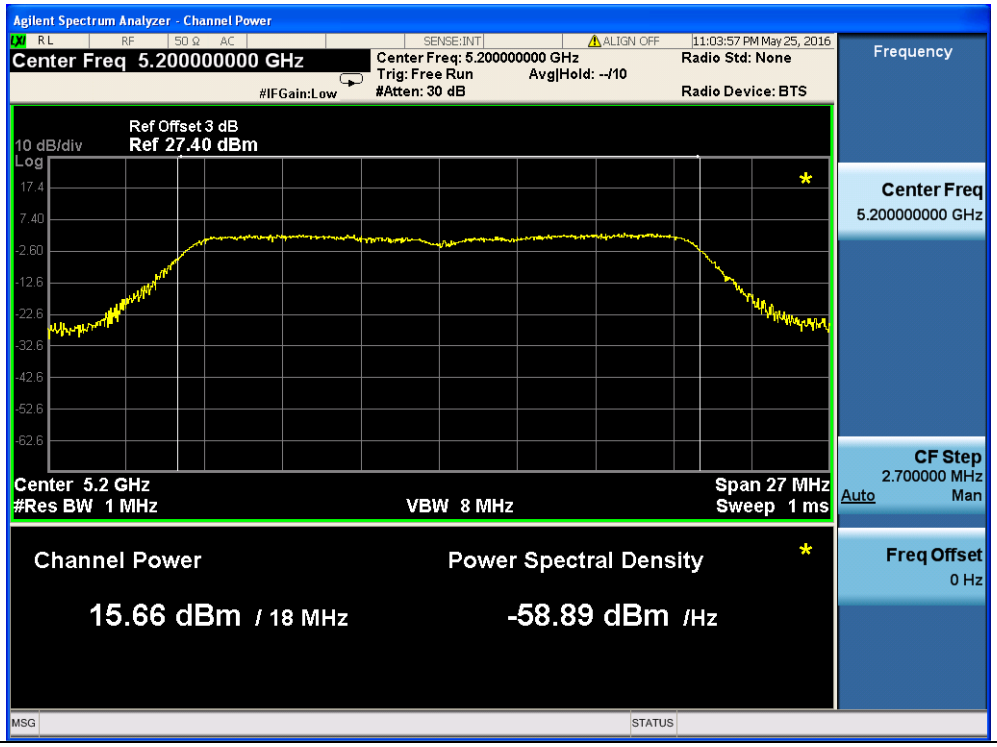


802.11 AC20 Mode

TX CH 36



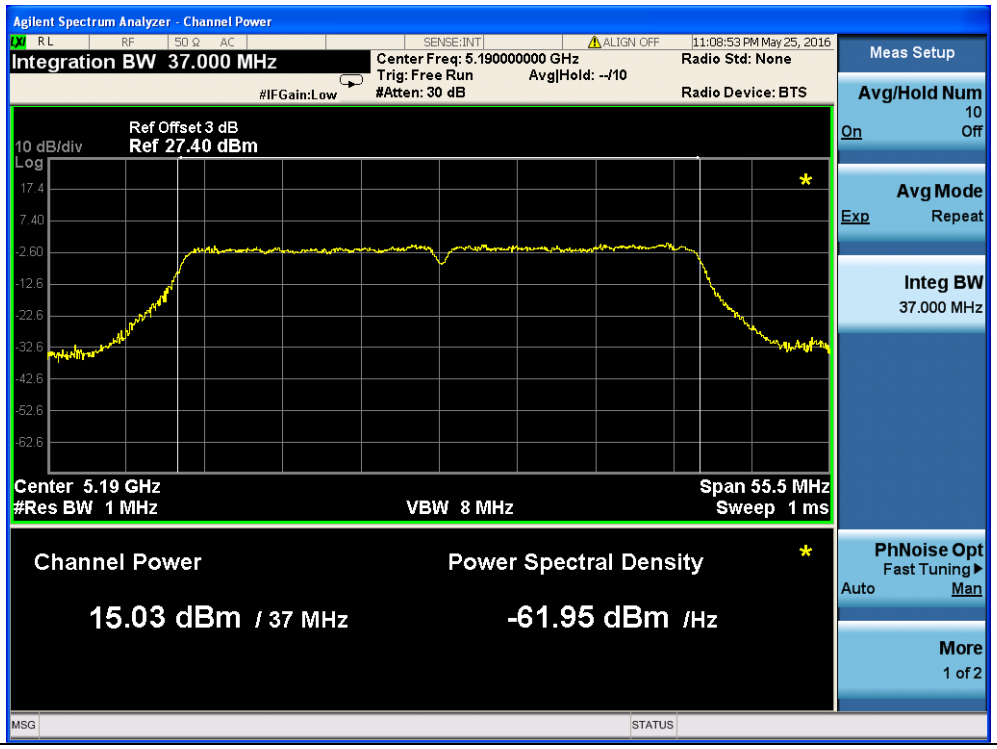
TX CH 40



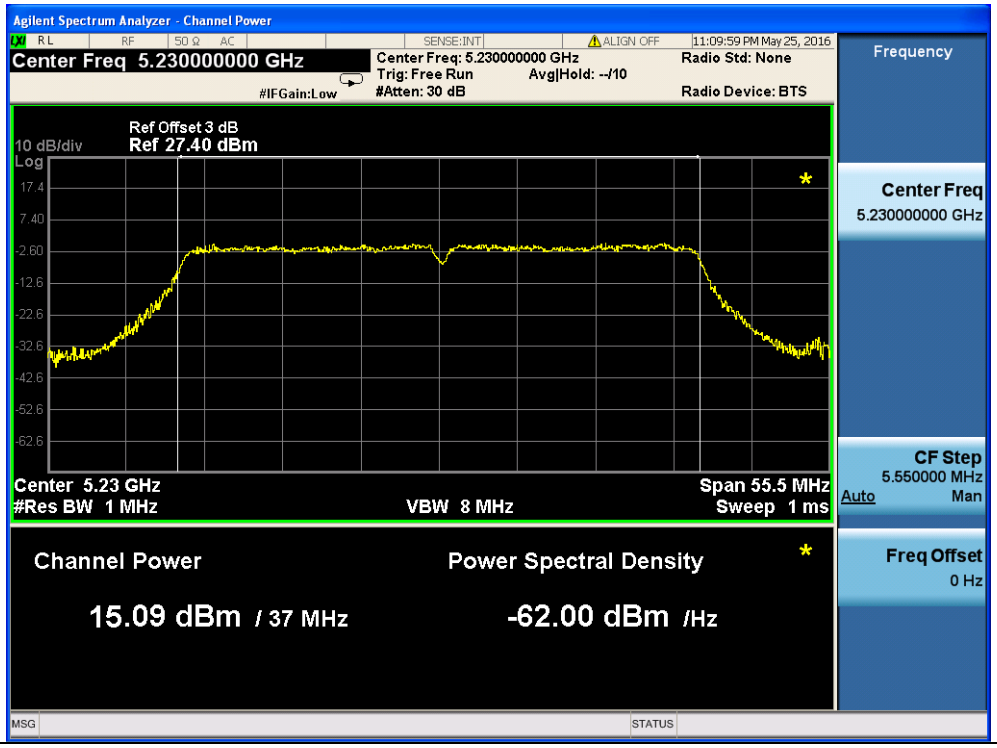
TX CH 48

802.11 AC40 Mode

TX CH 38

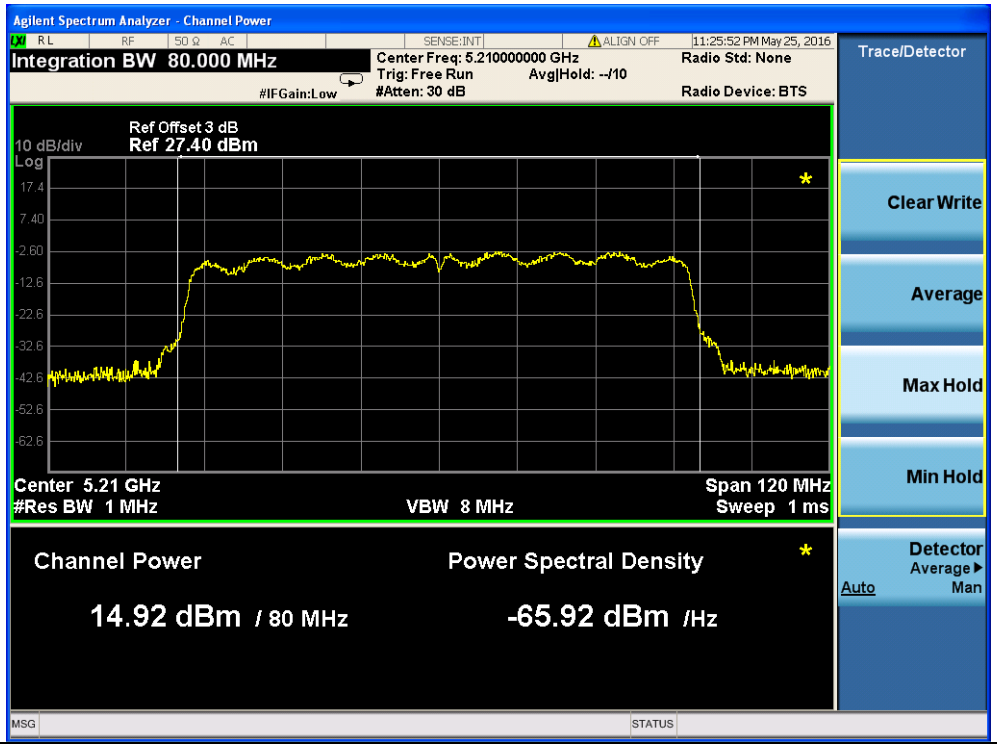


TX CH 46



802.11 AC80 Mode

TX CH 42



EUT：	ScreenBeam Smart Miracast module	Model Name ：	RTL8812AU-CG
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 5V
Test Mode ：	TX (5G) Mode Frequency Band III (5725-5825MHz)		

Note: Model A(B) represent two different modules，
A(B) Represent the value of antenna A and B, The worst data is A Antenna a ,only shown Antenna A Plot.

EUT has two antennas, and different modes support different transmit mode what describe as Following form:

Mode	Tx/Rx
802.11a	1Tx, 1Rx
802.11n/ac	2Tx, 2Rx

Test Channel	Frequency	Maximum output power. Antenna port		Total Power	LIMIT
		(AV) (dBm)		(AV)	
	(MHz)	ANT A	ANT B	dBm	dBm
TX 802.11a Mode					
CH 149	5745	15.64	16.09	–	30
CH 157	5785	15.57	15.64	–	30
CH 165	5825	15.42	15.75	–	30
TX 802.11 n20M Mode					
CH 149	5745	15.78	15.61	18.71	27.44
CH 157	5785	15.44	15.63	18.55	27.44
CH 165	5825	16.14	15.76	18.96	27.44
TX 802.11 n40M Mode					
CH 151	5755	15.50	15.43	18.48	27.44
CH 159	5795	15.66	15.57	18.63	27.44
TX 802.11 AC20M Mode					
CH 149	5745	15.43	15.80	18.63	27.44
CH 157	5785	15.40	15.31	18.37	27.44
CH 165	5825	15.51	15.48	18.51	27.44
TX 802.11 AC40M Mode					
CH 151	5755	15.24	15.75	18.51	27.44
CH 159	5795	15.77	15.74	18.77	27.44
TX 802.11 AC80M Mode					
CH 155	5775	15.17	15.85	18.48	27.44

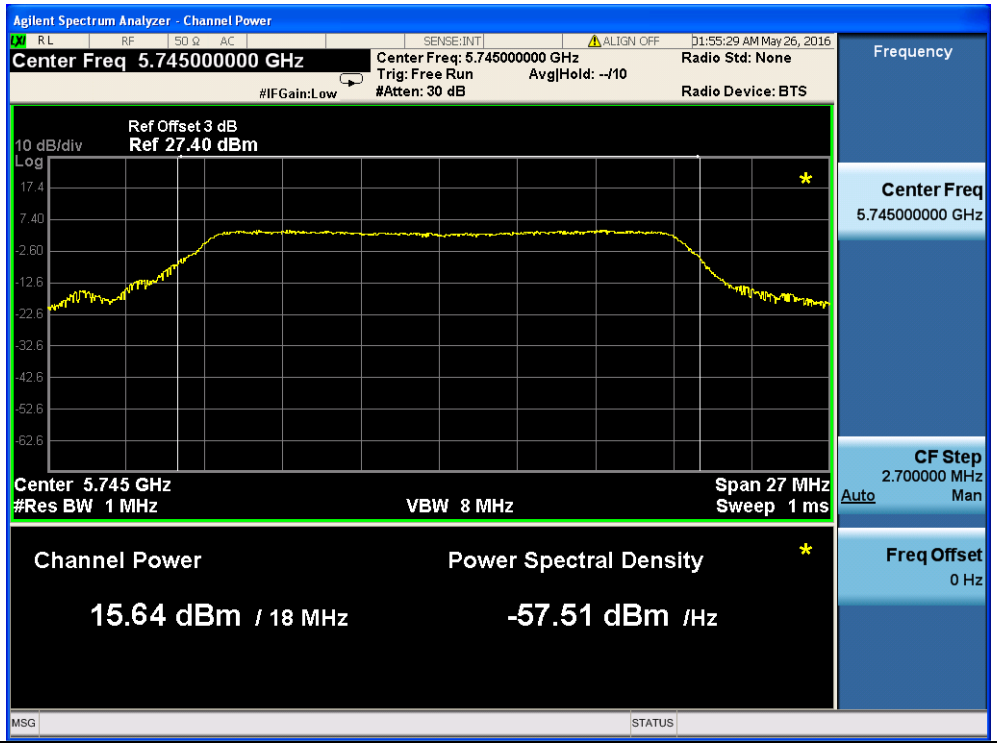
Note: For 802.11n/ac 5GHz has MIMO mode.Directional gain=GANT +10log(N)dbi =8.56dbi

8.56 dbi>6.0 dbi so power density limit= 30-(8.56-6.0)=27.44

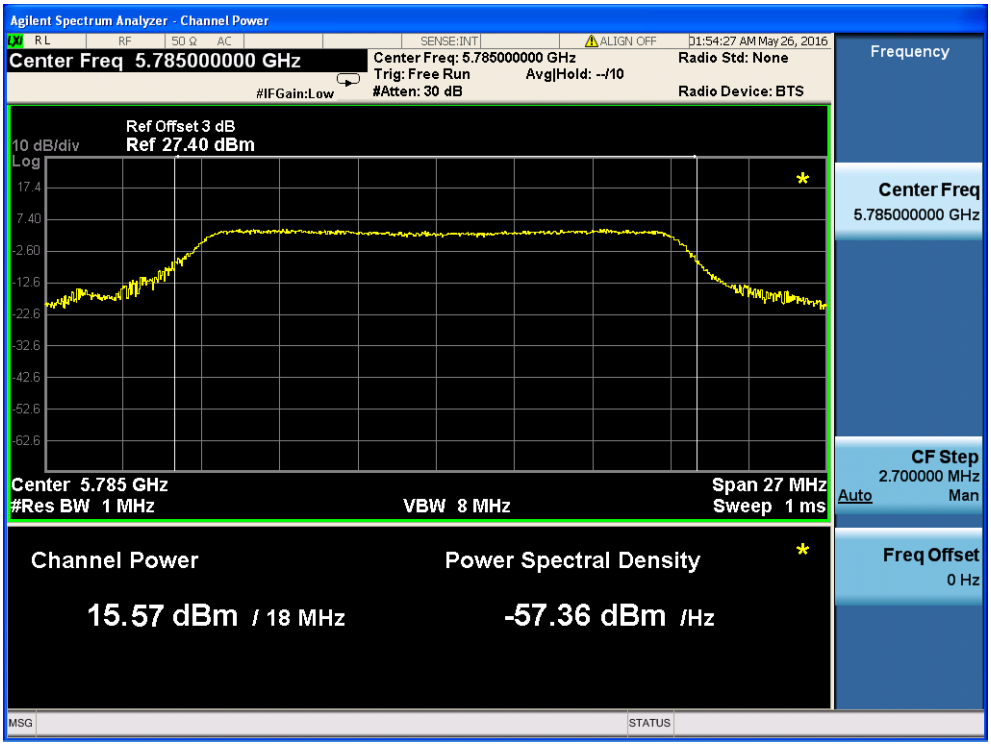
Antenna A

802.11 a Mode

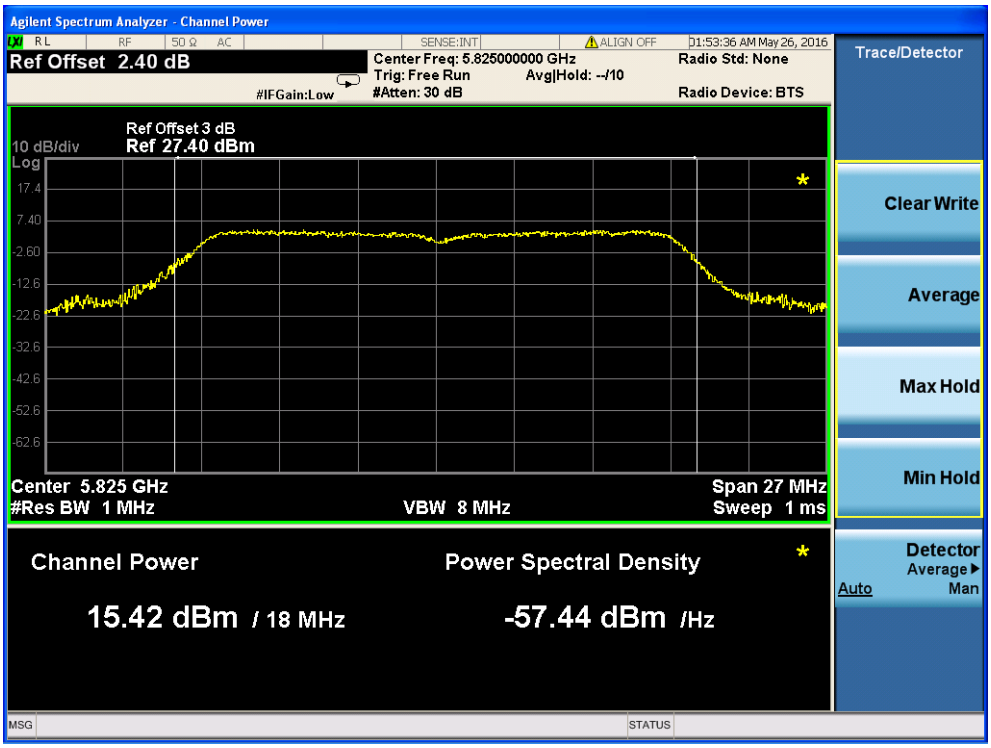
TX CH 149



TX CH 157

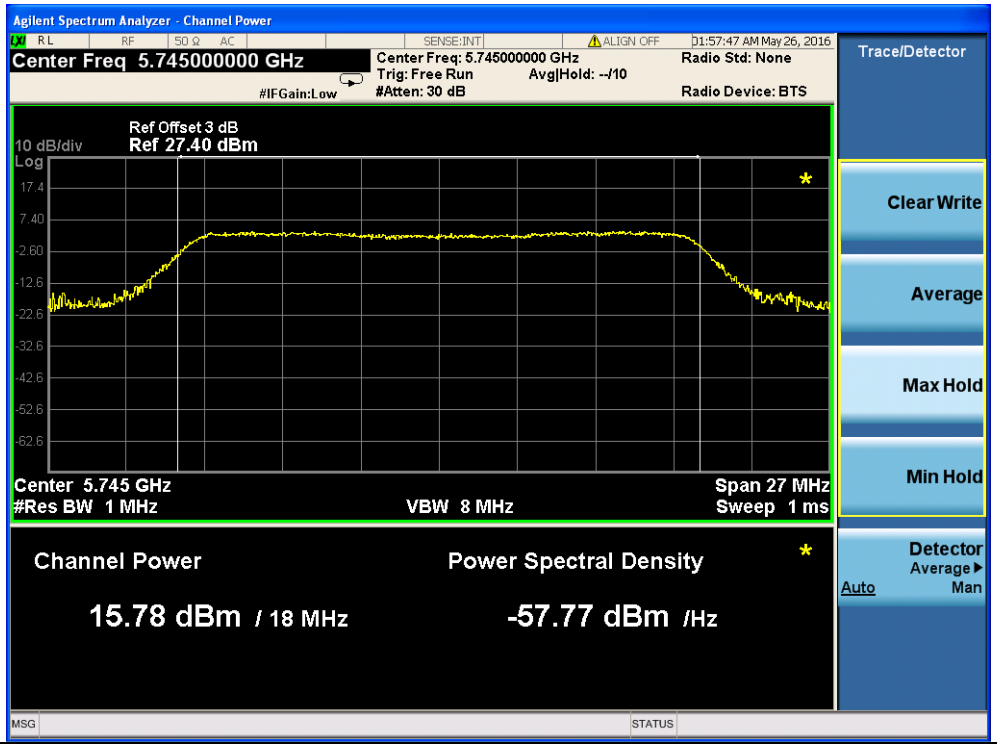


TX CH 165



802.11 n20 Mode

TX CH 149

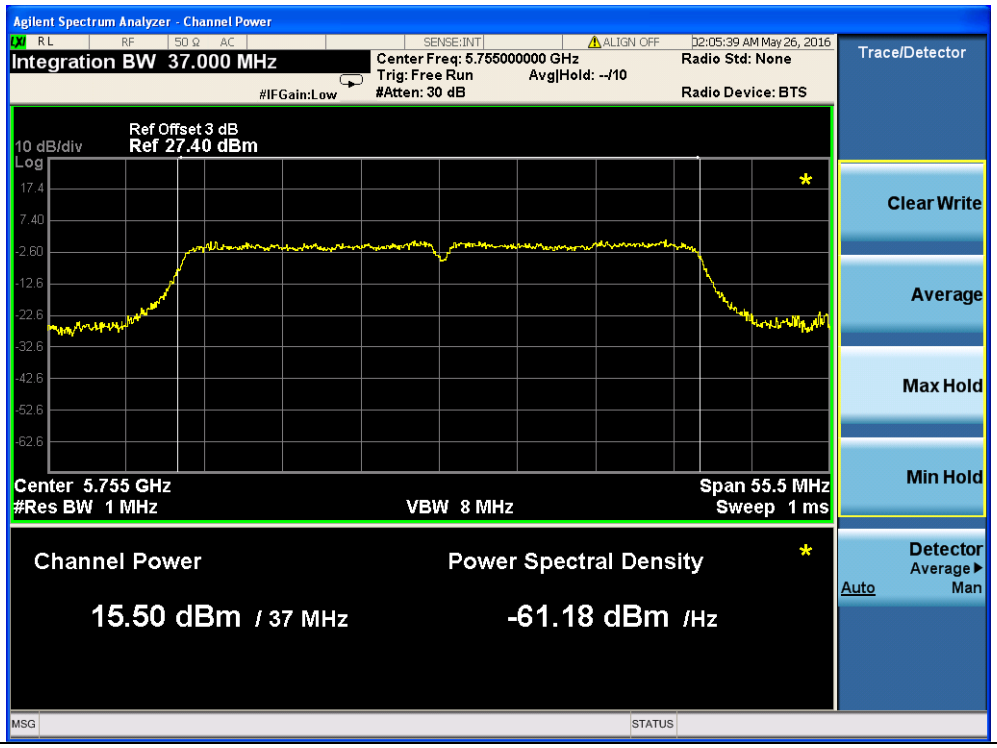


TX CH 157

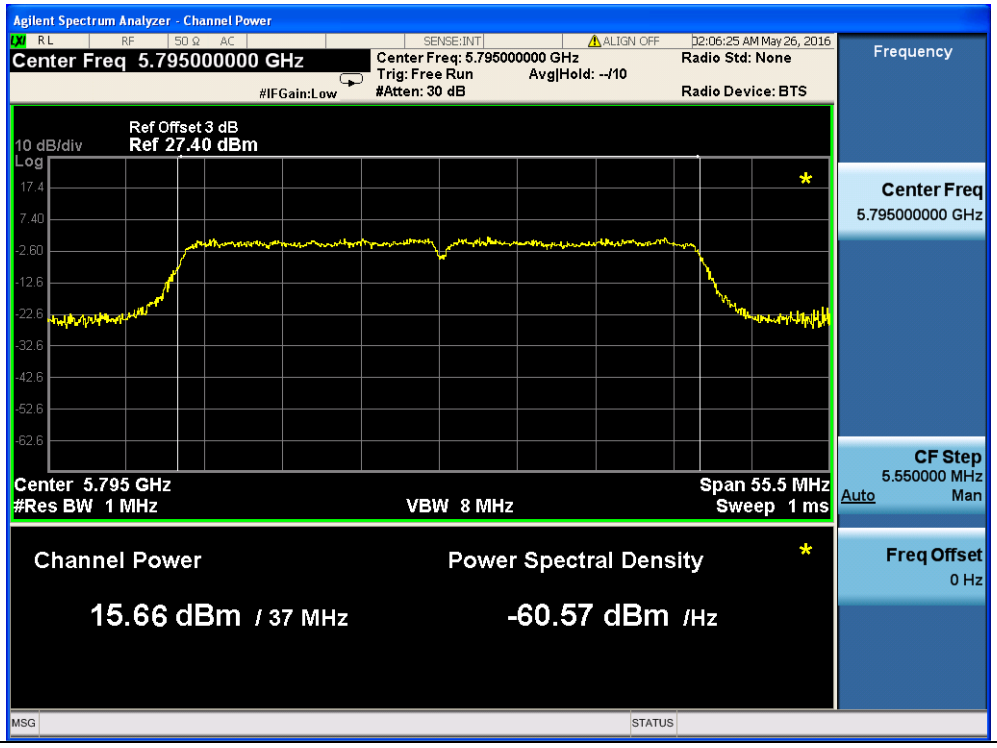
TX CH 165

802.11 n40 Mode

TX CH 151



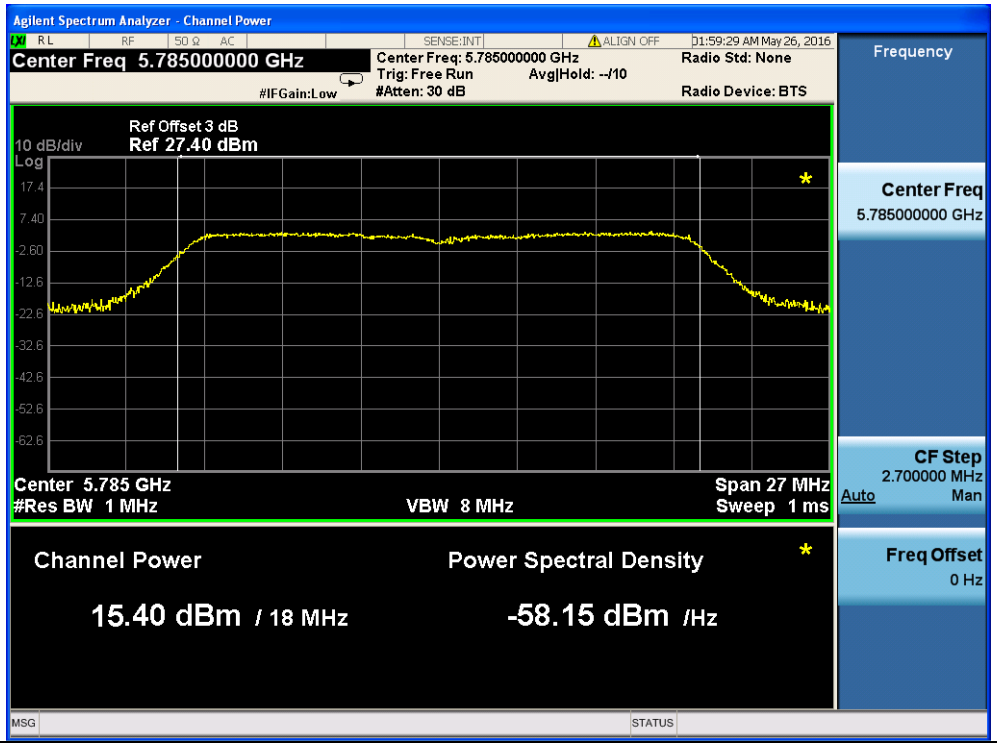
TX CH 159



802.11 AC20 Mode

TX CH 149

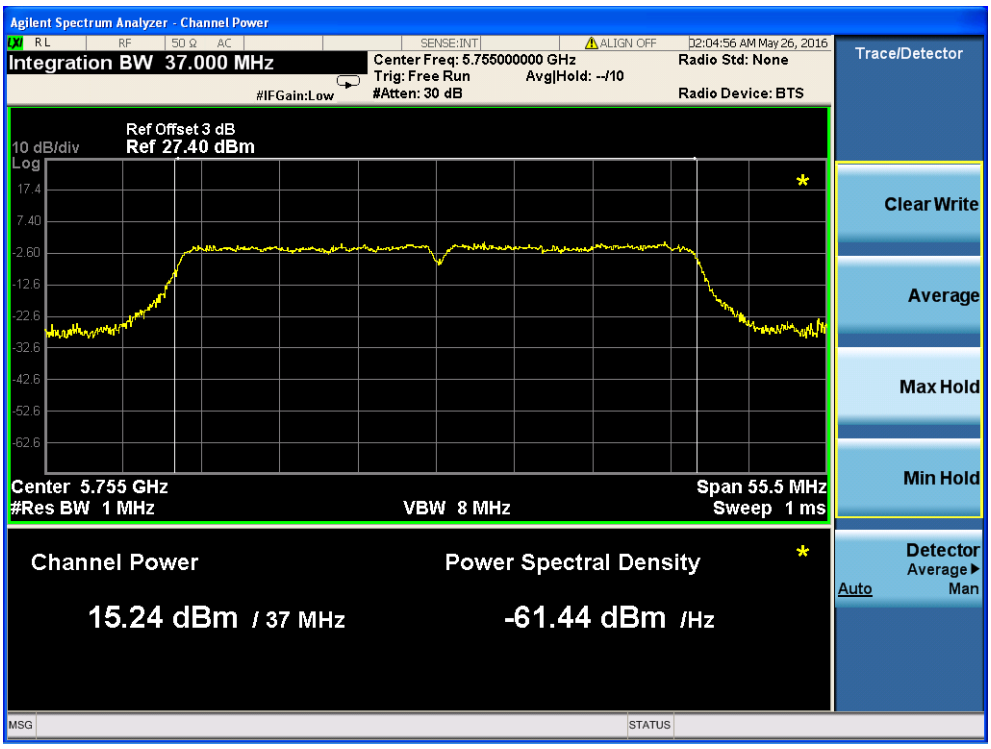
TX CH 157



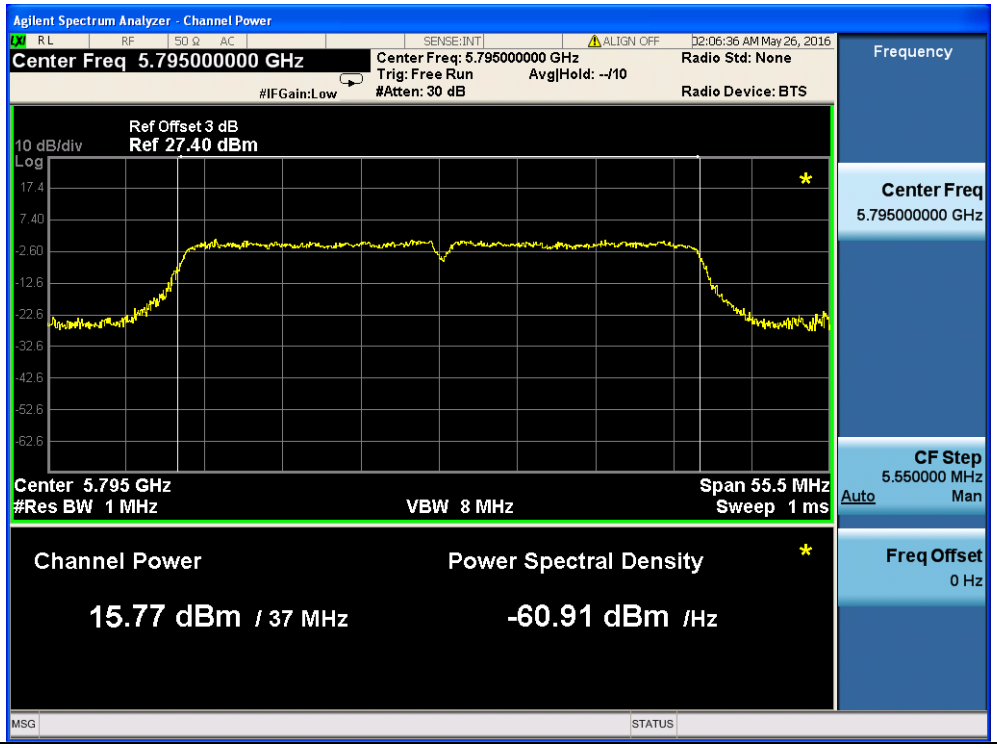
TX CH 165

802.11 AC40 Mode

TX CH 151

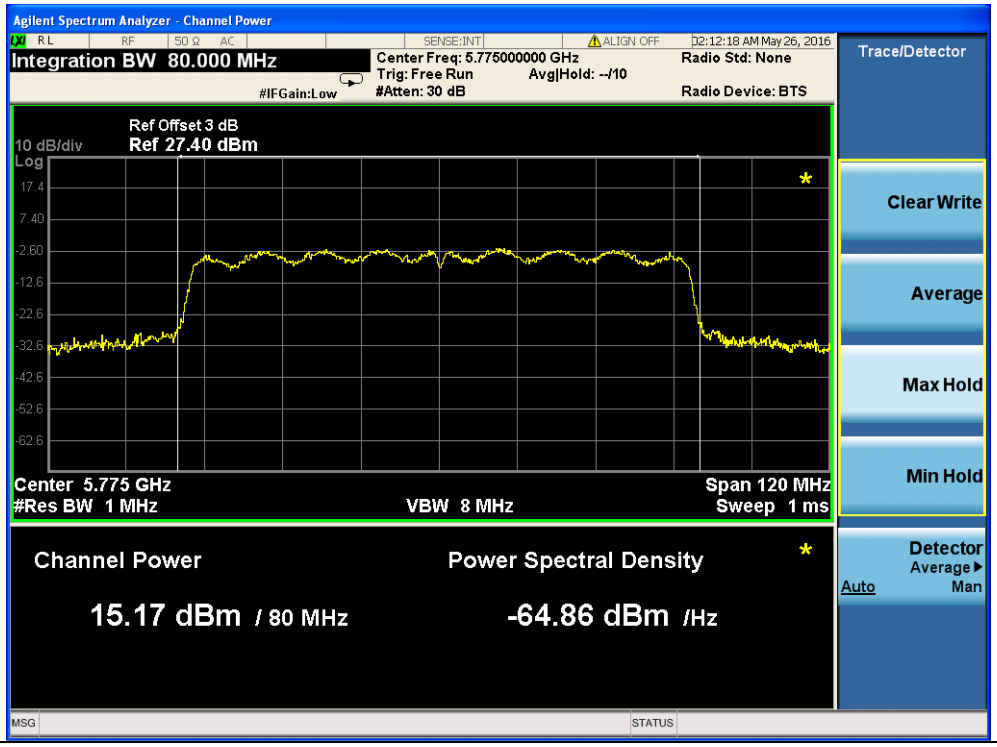


TX CH 159



802.11 AC80 Mode

TX CH 155



8. OUT OF BAND EMISSIONS

8.1 APPLICABLE STANDARD

According to FCC §15.407(b)

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) 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 e.i.r.p. of −27 dBm/MHz.

(2) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

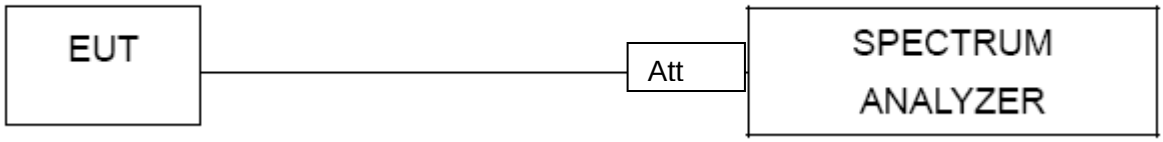
8.2 TEST PROCEDURE

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.

8.3 DEVIATION FROM STANDARD

No deviation.

8.4 TEST SETUP



8.5 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.

8.6 TEST RESULTS

EUT：	ScreenBeam Smart Miracast module	Model Name ：	RTL8812AU-CG
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1012 hPa	Test Voltage ：	DC 5V

Note: Model A(B) represent two different modules，
A(B) Represent the value of antenna A and B, The worst data is A Antenna a ,only shown Antenna A Plot.

EUT has two antennas, and different modes support different transmit mode what describe as Following form:

Mode	Tx/Rx
802.11a	1Tx, 1Rx
802.11n/ac	2Tx, 2Rx

Antenna A

5.2G

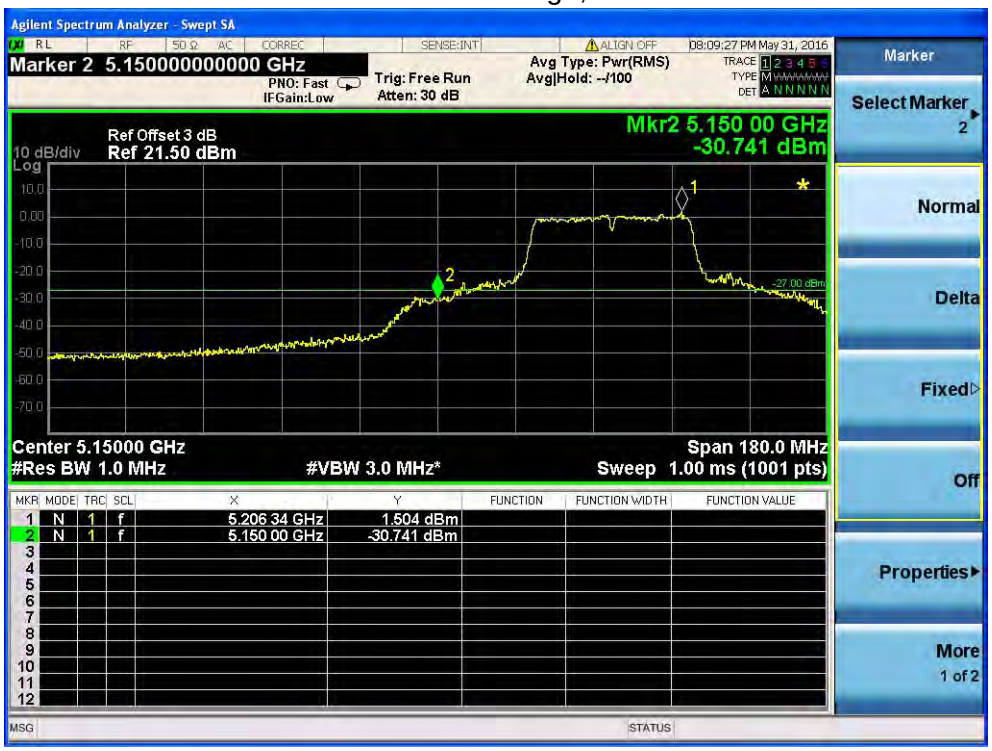
802.11a: Band Edge, Left Side

802.11a: Band Edge, Right Side

802.11n20: Band Edge, Left Side

802.11n20: Band Edge, Right Side

802.11n40: Band Edge, Left Side

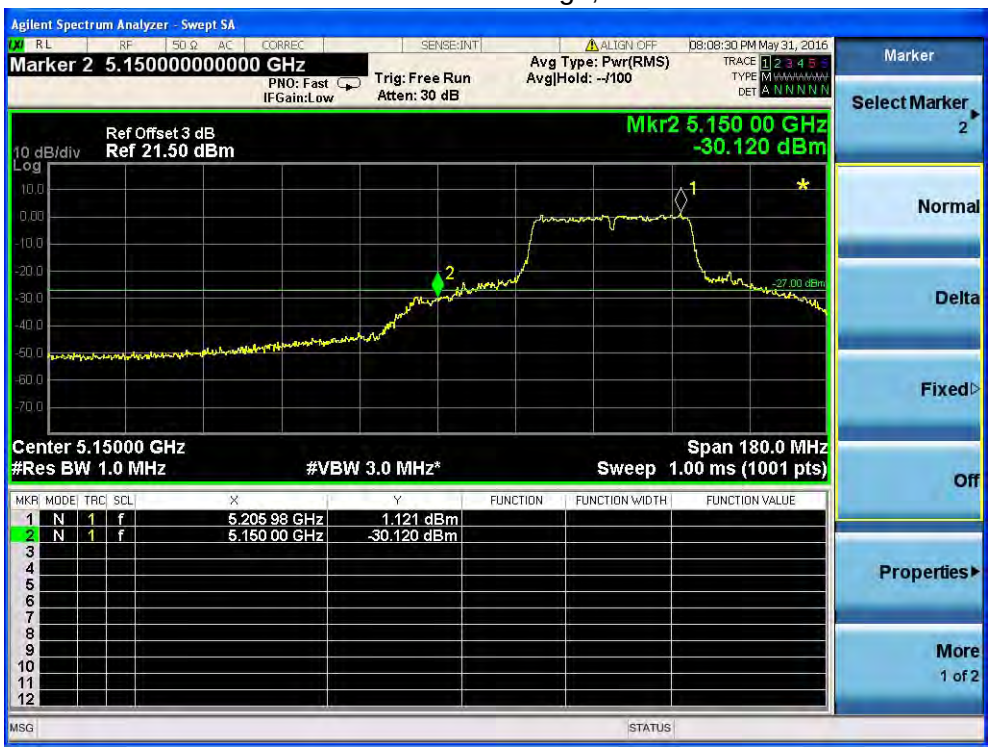


802.11n40: Band Edge, Right Side

802.11AC20: Band Edge, Left Side

802.11AC20: Band Edge, Right Side

802.11AC40: Band Edge, Left Side



802.11AC40: Band Edge, Right Side

802.11AC80: Band Edge, Left Side

802.11AC80: Band Edge, Right Side

Antenna A

5.8G

802.11a: Band Edge, Left Side

802.11a: Band Edge, Right Side

802.11n20: Band Edge, Left Side

802.11n20: Band Edge, Right Side

802.11n40: Band Edge, Left Side

802.11n40: Band Edge, Right Side

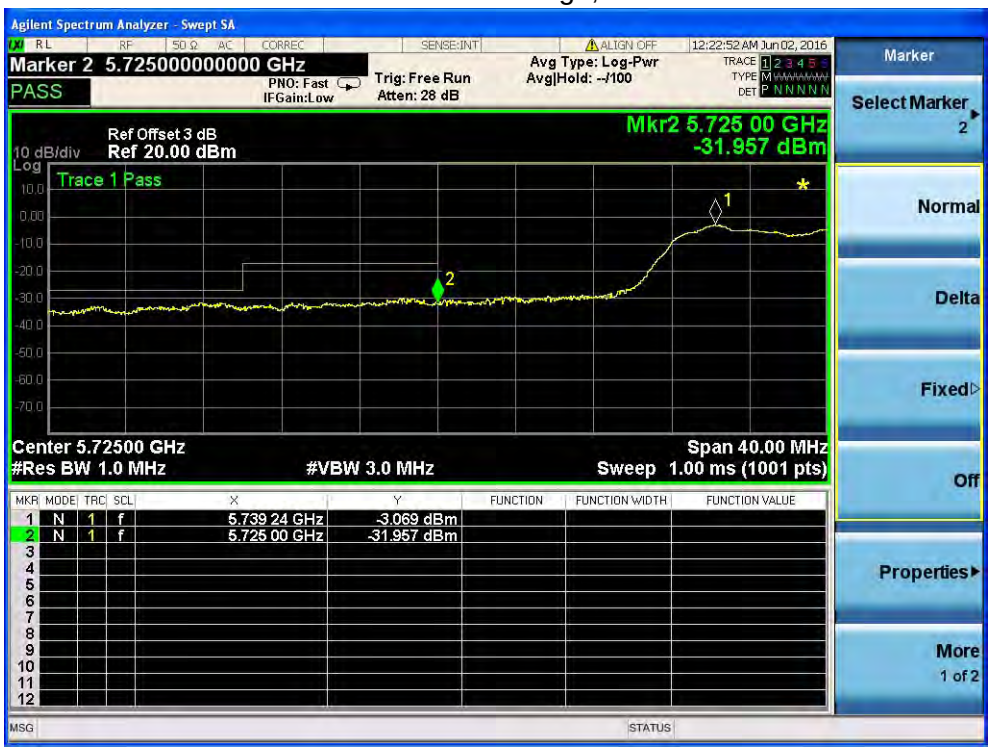
802.11AC20: Band Edge, Left Side

802.11AC20: Band Edge, Right Side

802.11AC40: Band Edge, Left Side

802.11AC40: Band Edge, Right Side

802.11AC80: Band Edge, Left Side



802.11AC80: Band Edge, Right Side

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

Tx Antenna 1

Antenna	Brand	Model Name (P/N)	Antenna Type	Connector	Antenna Gain(dBi)	
					2.4G	5.0G
A(main)	INPAQ	N/A	PIFA	I-PEX	3.53	5.55
B(aux)	INPAQ	N/A	PIFA	I-PEX	3.53	5.55

Tx Antenna 2

Antenna	Brand	Model Name (P/N)	Antenna Type	Connector	Antenna Gain(dBi)	
					2.4G	5.0G
A(main)	INPAQ	WA-P-LB-02-379	PIFA	I-PEX	-1.87	1.38
B(aux)	INPAQ	WA-P-LB-01-171	PIFA	I-PEX	1.07	2.49

The EUT antenna is permanent attached antenna. It comply with the standard requirement.

END OF REPORT