

FCC Radio Test Report

FCC ID: LNQSBRT8812AUA

Original Grant

Report No. : TB-FCC143864
Applicant : Actiontec Electronics, Inc.
Equipment Under Test (EUT)
EUT Name : ScreenBeam 802.11 a/b/g/n/ac WiFi Module
Model No. : SBRT8812AUA
Brand Name : Actiontec
Receipt Date : 2015-04-10
Test Date : 2015-04-11 to 2015-04-26
Issue Date : 2015-05-08
Standards : FCC Part 15, Subpart C (15.247:2014)
Test Method : ANSI C63.10:2013
Conclusions : **PASS**

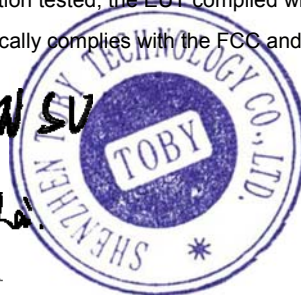
In the configuration tested, the EUT complied with the standards specified above,
The EUT technically complies with the FCC and IC requirements

Test/Witness Engineer :

Ivan Su

**Approved &
Authorized**

Ray



This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

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1. General Information about EUT

1.1 Client Information

Applicant : Actiontec Electronics, Inc.
Address : 760 North Mary Ave., Sunnyvale, California 94086 United States
Manufacturer : Actiontec Electronics, Inc.
Address : 760 North Mary Ave., Sunnyvale, California 94086 United States

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	
Models No.	:	SBRT8812AUA	
Brand Name	:	Actiontec	
Product Description	:	Operation Frequency: 802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz	
		Number of Channel:	802.11b/g/n(HT20):11 channels see note(3) 802.11n(HT40): 7 channels see note(3)
		RF Output Power:	802.11b: 22.71 dBm 802.11g: 26.69 dBm 802.11n (HT20): 26.66 dBm 802.11n (HT40): 26.64 dBm
		Antenna Gain:	see note(4)
		Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g: QPSK , BPSK, 16QAM , 64QAM with OFDM 802.11n: BPSK , QPSK , 16QAM ,64QAM with OFDM
		Bit Rate of Transmitter:	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6 Mbps 802.11n:up to 150Mbps
Power Supply	:	DC Power by USB Cable	
Power Rating	:	DC 5V by USB Cable for Host System.	
Connecting I/O Port(S)	:	Please refer to the User's Manual	
Note: More detailed features description, please refer to the manufacturer's specifications or the User's Manual.			

Note:

(1) This Test Report is FCC Part 15.247 for 802.11b/g/n, the test procedure follows the FCC

KDB 558074 D01 DTS Meas Guidance v03r02.

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

(3) Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	05	2432	09	2452
02	2417	06	2437	10	2457
03	2422	07	2442	11	2462
04	2427	08	2447		

Note: CH 01~CH 11 for 802.11b/g/n(HT20)
CH 03~CH 09 for 802.11n(HT40)

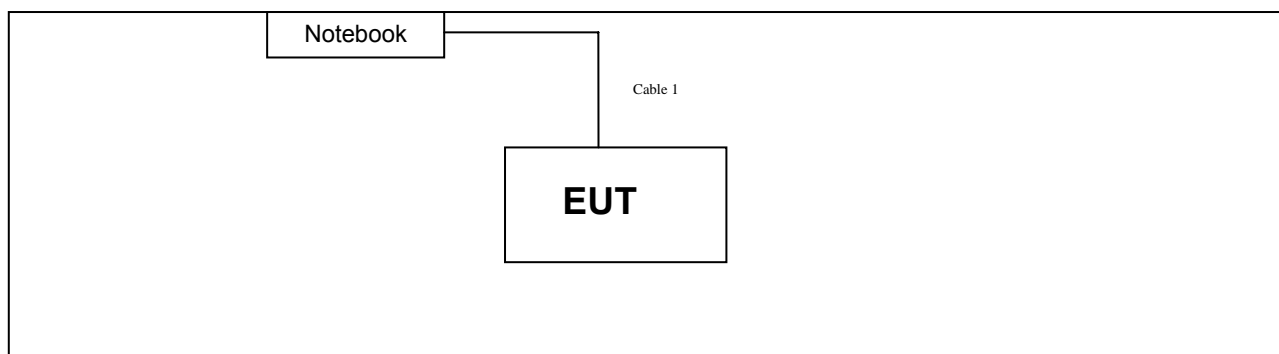
(4) Antenna information.

Ant.	Model Name	Antenna Type	BAND(MHz)	Gain (dBi)
1	N2420DG	Embedded Ant	2412~2462	3.56
			5180~5240	4.60
			5745~5775	2.28
2	N2420DGL	Embedded Ant	2412~2462	3.94
			5180~5240	5.86
			5745~5775	2.39

Mode	TX Antenna (s)	Remark
802.11b	1	The worst case is ANT 2 TX
802.11g	1	The worst case is ANT 2 TX
802.11n (HT20)	2	ANT 1+ANT 2 TX
802.11n (HT40)	2	ANT 1+ANT 2 TX

1.3 Block Diagram Showing the Configuration of System Tested

TX Mode



1.4 Description of Support Units

Equipment Information				
Name	Model	S/N	Manufacturer	Used “√”
Notebook	T60P	42W3244	Lenovo	√
Cable Information				
Number	Shielded Type	Ferrite Core	Length	Note
Cable 1	NO	NO	0.4M	Provided by the applicant

1.5 Description of Test Mode

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 follow was evaluated respectively.

For Conducted Test	
Final Test Mode	Description
Mode 1	USB Charging with TX B Mode

For Radiated Test	
Final Test Mode	Description
Mode 3	TX Mode B Mode Channel 01/06/11
Mode 4	TX Mode G Mode Channel 01/06/11
Mode 5	TX Mode N(HT20) Mode Channel 01/06/11
Mode 6	TX Mode N(HT40) Mode Channel 03/06/09

Note:

- (1) For all test, we have verified the construction and function in typical operation. And all the test modes were carried out with the EUT in transmitting operation in maximum power with all kinds of data rate.

According to ANSI C63.10 standards, the measurements are performed at the low, middle and high available channels, and the worst case data rate as follows:

- 802.11b Mode: CCK (1 Mbps)
- 802.11g Mode: OFDM (6 Mbps)
- 802.11n (HT20) Mode: MCS 8 (6.5 Mbps)
- 802.11n (HT40) Mode: MCS 8 (13 Mbps)

- (2) During the testing procedure, the continuously transmitting with the maximum power

mode was programmed by the customer.

- (3) The EUT is considered a mobile unit; in normal use it was positioned on X-plane. The worst case was found positioned on X-plane. Therefore only the test data of this X-plane was used for radiated emission measurement test.

1.6 Description of Test Software Setting

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

Test Software:				
Realtek 11ac 8812A USB WLAN MP Diagnostic Program 0.0059.20130716				
Test Mode: Continuously transmitting				
Mode	Data Rate	Channel	Parameters	
			ANT 2	ANT 1
802.11b	CCK/ 1Mbps	01	46	46
	CCK/ 1Mbps	06	46	46
	CCK/ 1Mbps	11	46	46
802.11g	OFDM/ 6Mbps	01	62	62
	OFDM/ 6Mbps	06	62	62
	OFDM/ 6Mbps	11	62	62
802.11n(20)	MCS 8	01	58	58
	MCS 8	06	58	58
	MCS 8	11	58	58
802.11n(40)	MCS 8	03	58	58
	MCS 8	06	58	58
	MCS 8	09	58	58

1.7 Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

FCC List No.: (811562)

The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number is 811562.

IC Registration No.: (11950A-1)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.

May 22, 2014 certificated by TUV Rheinland(China) Co., Ltd. with TUV certificate No.: UA 50282953 0001 and report No.: 17026822 002. The certificate is valid until the next scheduled audit or up to 18 months, at the discretion of TUV Rhineland.

2. Test Summary

FCC Part 15 Subpart C(15.247)/RSS-210: 2010				
Standard Section		Test Item	Judgment	Remark
FCC	IC			
15.203	/	Antenna Requirement	PASS	N/A
15.207	RSS-GEN 7.2.4	Conducted Emission	PASS	N/A
15.205	RSS-GEN 7.2.2	Restricted Bands	PASS	N/A
15.247(a)(2)	RSS-210 A.8.2(a)	6dB Bandwidth	PASS	N/A
15.247(b)	RSS-210 A.8.4(4)	Peak Output Power	PASS	N/A
15.247(e)	RSS-210 A.8.2(b)	Power Spectral Density	PASS	N/A
15.247(d)	RSS-210 Annex 8 (A8.5)	Transmitter Radiated Spurious Emission	PASS	N/A
15.247(d)	RSS-210 Annex 8 (A8.5)	Antenna Conducted Spurious Emission	PASS	N/A

Note: "/" for no requirement for this test item.
N/A is an abbreviation for Not Applicable.

3. Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Signal Analyzer	Agilent	N9020A	MY499100060	Nov.18, 2014	Nov.17, 2015
Vector Signal Generator	Agilent	N5182A	MY49060042	Nov.18, 2014	Nov.17, 2015
X-series USB Peak and Average Power Sensor	Agilent	U2021XA	MY54110001	Nov.18, 2014	Nov.17, 2015
	Agilent	U2021XA	MY54110008	Nov.18, 2014	Nov.17, 2015
	Agilent	U2021XA	MY54110019	Nov.18, 2014	Nov.17, 2015
	Agilent	U2021XA	MY54110020	Nov.18, 2014	Nov.17, 2015
4 Ch.Simultaneous Sampling 14 Bits 2 MS/s	Agilent	U2531A	TW54063507	Nov.18, 2014	Nov.17, 2015
	Agilent	U2531A	TW54063507	Nov.18, 2014	Nov.17, 2015
Spectrum Analyzer	Agilent	E4407B	MY45106456	Aug. 08, 2014	Aug. 07, 2015
Spectrum Analyzer	Rohde & Schwarz	FSP30	DE25181	Aug. 08, 2014	Aug. 07, 2015
EMI Test Receiver	Rohde & Schwarz	ESCI	101165	Aug. 08, 2014	Aug. 07, 2015
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 06, 2015	Mar.05, 2016
<i>Bilog Antenna</i>	<i>ETS-LINDGREN</i>	<i>3142E</i>	00117542	Mar. 06, 2015	Mar.05, 2016
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 06, 2015	Mar.05, 2016
Horn Antenna	ETS-LINDGREN	3117	00143209	Mar. 06, 2015	Mar.05, 2016
Pre-amplifier	HP	11909A	185903	Mar. 06, 2015	Mar.05, 2016
Pre-amplifier	HP	8447B	3008A00849	Mar. 06, 2015	Mar.05, 2016
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 06, 2015	Mar.05, 2016
Signal Generator	Rohde & Schwarz	SML03	IKW682-054	Feb. 10, 2015	Feb.09, 2016
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A
Temp. & Humidity Chamber	ZHONG ZHI	CZ-A-225D	HW08053	Aug. 08, 2014	Aug. 07, 2015
DC Power Supply	MATRIX	MPS-3005L-3	D806050W	Aug. 08, 2014	Aug. 07, 2015
AC Power Supply	Heng Jie	HPC-1110	2010007	Aug. 08, 2014	Aug. 07, 2015

4. Conducted Emission Test

4.1 Test Standard and Limit

4.1.1 Test Standard

FCC Part 15.207

4.1.2 Test Limit

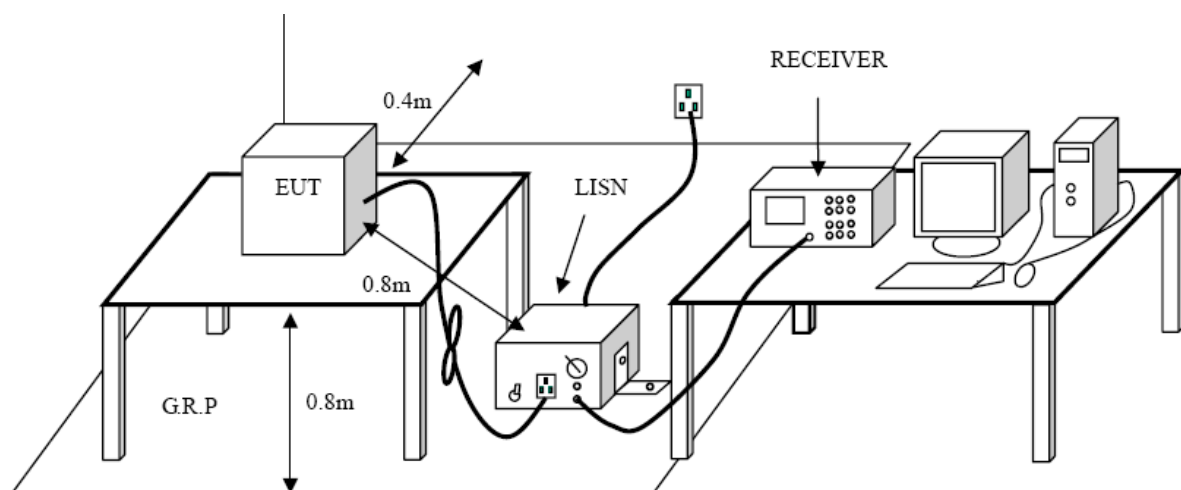
Conducted Emission Test Limit

Frequency	Maximum RF Line Voltage (dB μ V)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Notes:

- (1) *Decreasing linearly with logarithm of the frequency.
- (2) The lower limit shall apply at the transition frequencies.
- (3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2 Test Setup



4.3 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.

The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

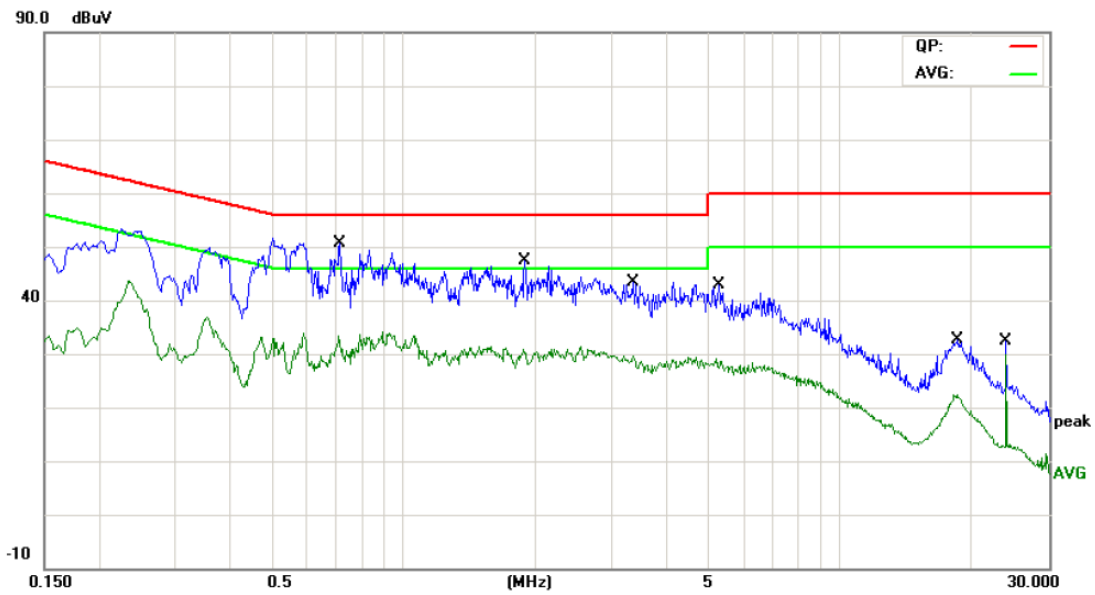
4.4 EUT Operating Mode

Please refer to the description of test mode.

4.5 Test Data

Please see the next page.

EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model Name :	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	AC 120V/60 Hz		
Terminal:	Line		
Test Mode:	AC Charging with TX B Mode		
Remark:	Only worse case is reported		

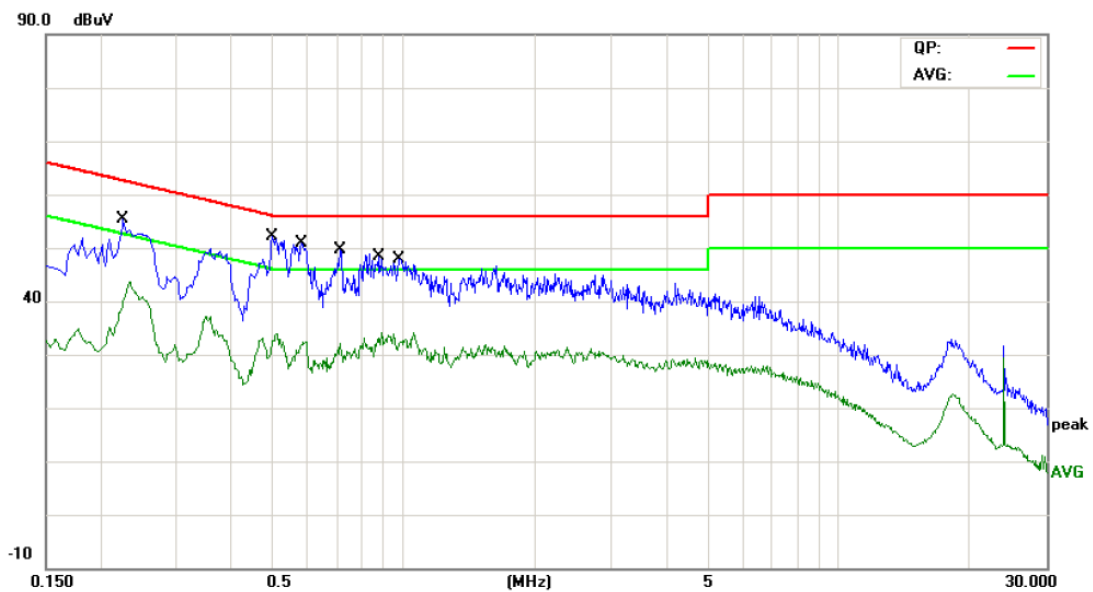


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1	*	0.7140	35.30	10.12	45.42	56.00	-10.58	QP
2		0.7140	21.61	10.12	31.73	46.00	-14.27	AVG
3		1.8900	28.49	10.06	38.55	56.00	-17.45	QP
4		1.8900	19.59	10.06	29.65	46.00	-16.35	AVG
5		3.3500	25.95	10.02	35.97	56.00	-20.03	QP
6		3.3500	19.02	10.02	29.04	46.00	-16.96	AVG
7		5.2500	23.87	9.97	33.84	60.00	-26.16	QP
8		5.2500	17.08	9.97	27.05	50.00	-22.95	AVG
9		18.5419	16.49	10.19	26.68	60.00	-33.32	QP
10		18.5419	11.27	10.19	21.46	50.00	-28.54	AVG
11		24.0020	20.53	10.16	30.69	60.00	-29.31	QP
12		24.0020	19.70	10.16	29.86	50.00	-20.14	AVG

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model Name :	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	AC 120V/60 Hz		
Terminal:	Neutral		
Test Mode:	AC Charging with TX B Mode		
Remark:	Only worse case is reported		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.2260	38.98	10.11	49.09	62.59	-13.50	QP
2		0.2260	29.79	10.11	39.90	52.59	-12.69	AVG
3	*	0.4980	37.73	10.02	47.75	56.03	-8.28	QP
4		0.4980	21.50	10.02	31.52	46.03	-14.51	AVG
5		0.5860	37.37	10.02	47.39	56.00	-8.61	QP
6		0.5860	22.41	10.02	32.43	46.00	-13.57	AVG
7		0.7140	34.85	10.03	44.88	56.00	-11.12	QP
8		0.7140	21.27	10.03	31.30	46.00	-14.70	AVG
9		0.8740	33.88	10.10	43.98	56.00	-12.02	QP
10		0.8740	22.62	10.10	32.72	46.00	-13.28	AVG
11		0.9700	30.65	10.15	40.80	56.00	-15.20	QP
12		0.9700	20.83	10.15	30.98	46.00	-15.02	AVG

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

5. Radiated Emission Test

5.1 Test Standard and Limit

5.1.1 Test Standard

FCC Part 15.209

5.1.2 Test Limit

Radiated Emission Limits (9kHz~1000MHz)

Frequency (MHz)	Field Strength (microvolt/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

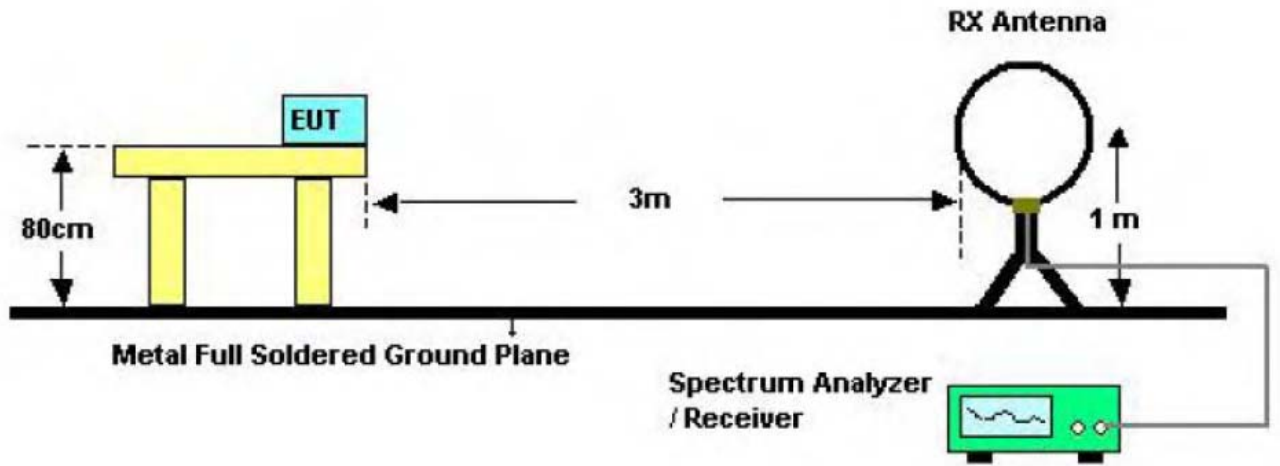
Radiated Emission Limit (Above 1000MHz)

Frequency (MHz)	Class A (dBuV/m)(at 3 M)		Class B (dBuV/m)(at 3 M)	
	Peak	Average	Peak	Average
Above 1000	80	60	74	54

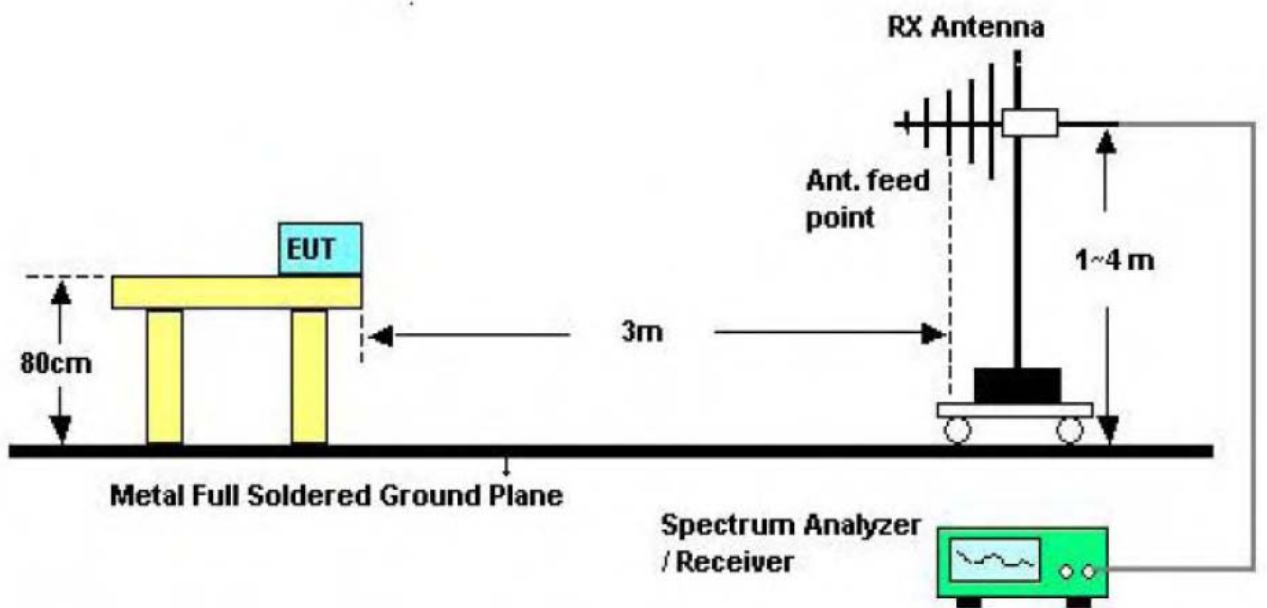
Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission Level(dBuV/m)=20log Emission Level(uV/m)

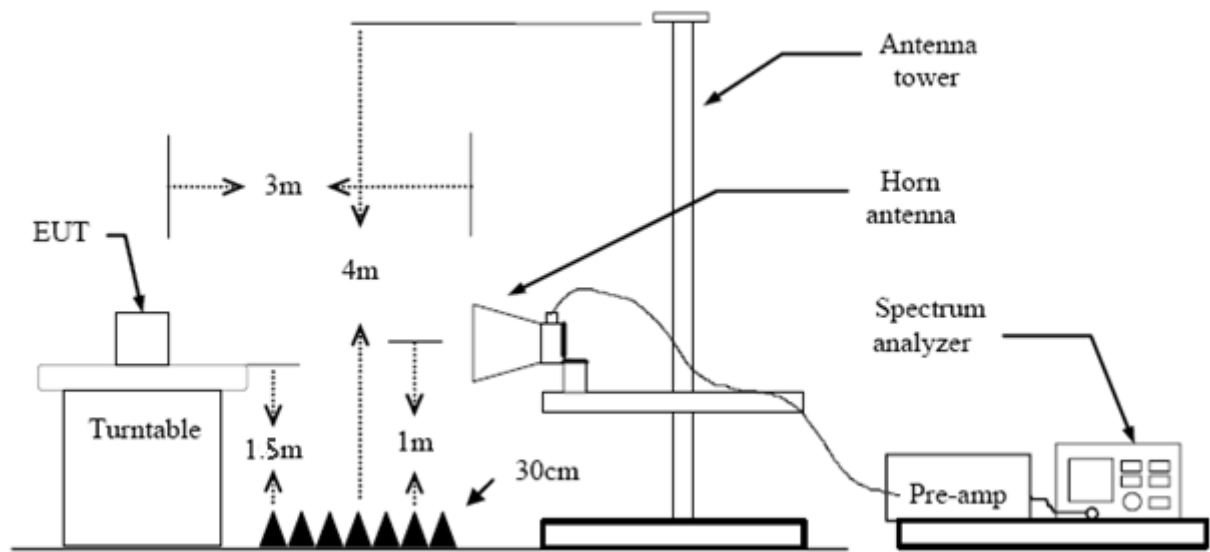
5.2 Test Setup



Below 30MHz Test Setup



Below 1000MHz Test Setup



Above 1GHz Test Setup

5.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) 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.
- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.

5.4 EUT Operating Condition

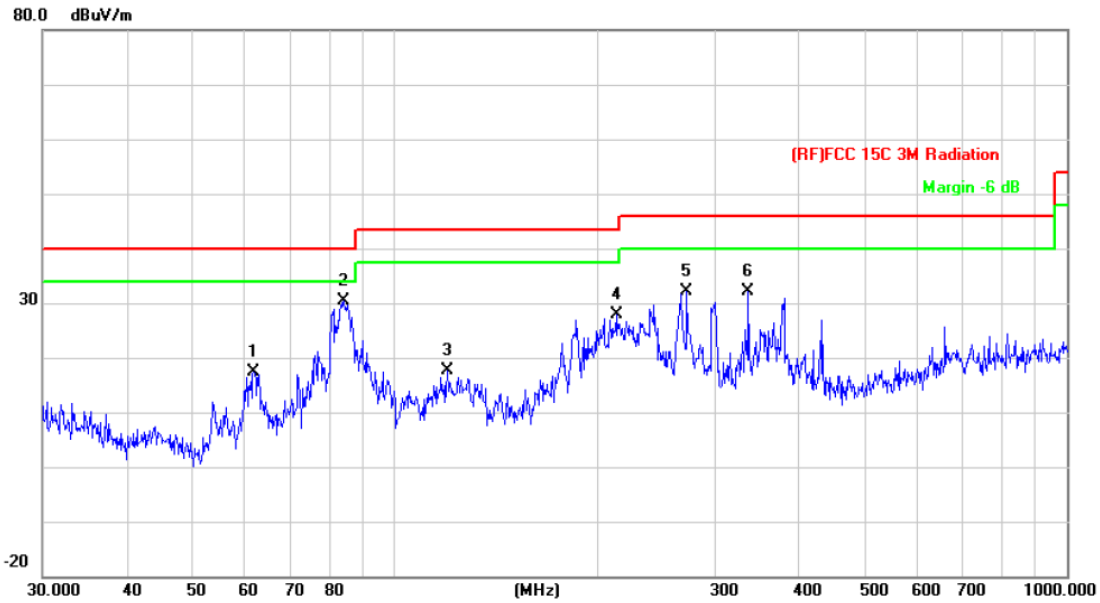
The Equipment Under Test was set to Continual Transmitting in maximum power.

5.5 Test Data

Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.

Test data please refer the following pages.

EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2412MHz		
Remark:	Only worse case is reported		

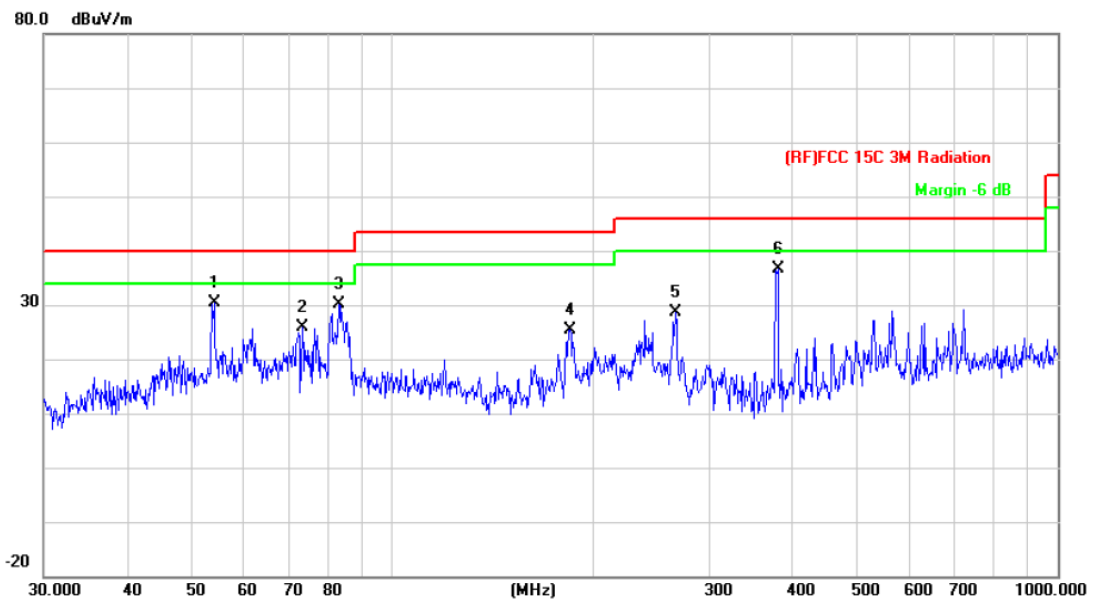


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		61.7781	41.68	-24.36	17.32	40.00	-22.68	peak
2	*	84.1100	53.33	-23.03	30.30	40.00	-9.70	peak
3		119.8556	40.18	-22.50	17.68	43.50	-25.82	peak
4		213.7634	47.67	-19.79	27.88	43.50	-15.62	peak
5		272.2776	49.66	-17.63	32.03	46.00	-13.97	peak
6		336.0352	47.67	-15.46	32.21	46.00	-13.79	peak

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2412MHz		
Remark:	Only worse case is reported		

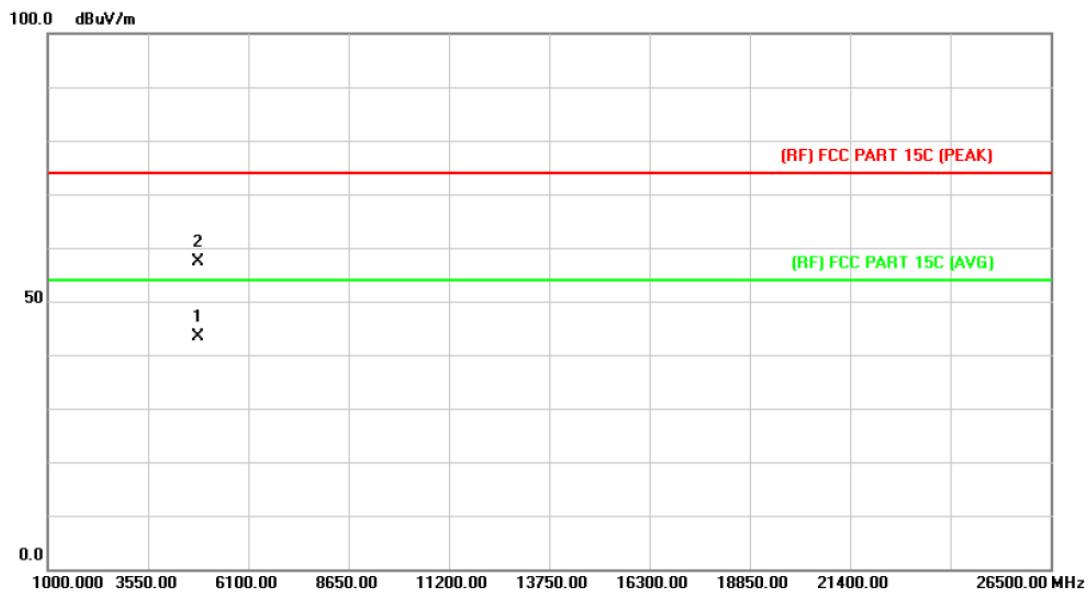


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		54.0711	54.92	-24.45	30.47	40.00	-9.53	peak
2		73.3593	49.27	-23.50	25.77	40.00	-14.23	peak
3		83.2298	53.22	-23.09	30.13	40.00	-9.87	peak
4		185.1379	46.16	-20.74	25.42	43.50	-18.08	peak
5		266.6089	46.39	-17.76	28.63	46.00	-17.37	peak
6	*	379.9141	50.74	-14.14	36.60	46.00	-9.40	peak

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

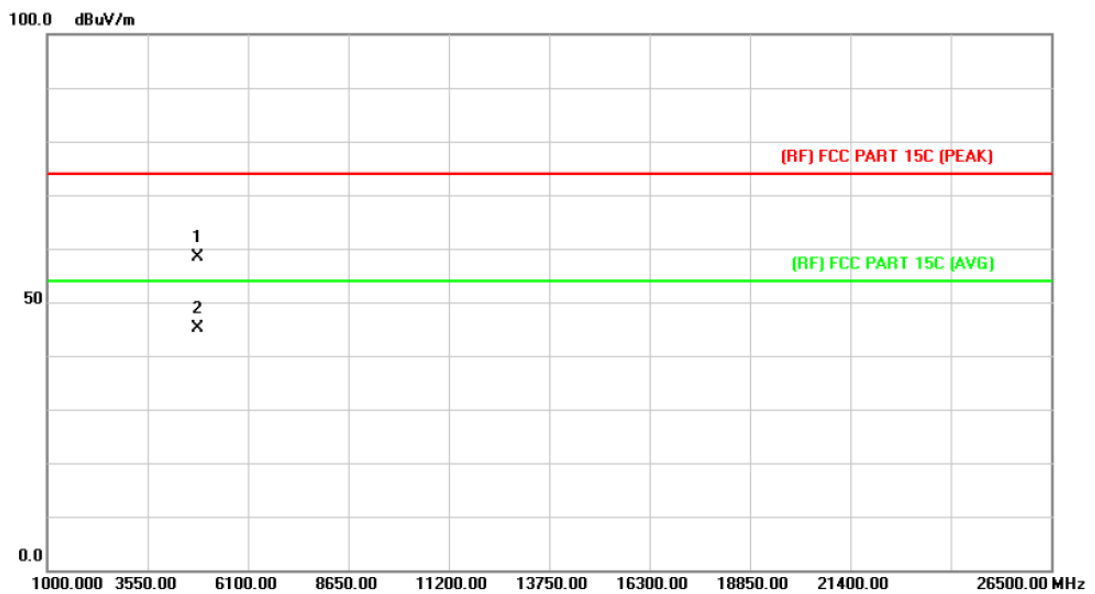
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2412MHz Antenna 2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	*	4824.090	29.72	13.56	43.28	54.00	-10.72	AVG
2		4824.165	43.80	13.56	57.36	74.00	-16.64	peak

Emission Level= Read Level+ Correct Factor

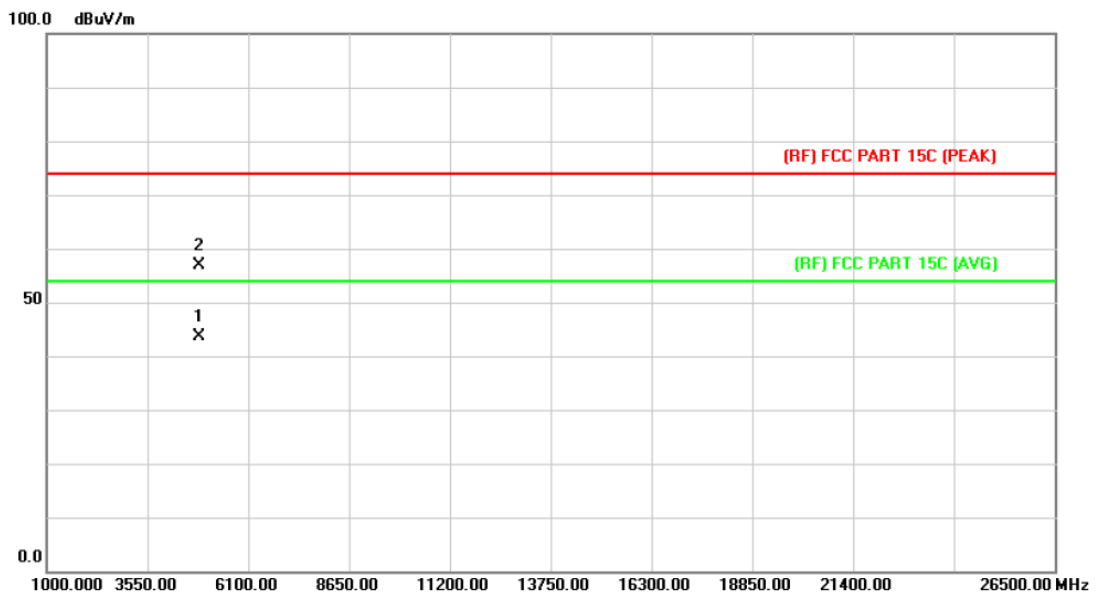
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2412MHz Antenna 2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4823.895	44.78	13.56	58.34	74.00	-15.66	peak
2	*	4823.988	31.61	13.56	45.17	54.00	-8.83	AVG

Emission Level= Read Level+ Correct Factor

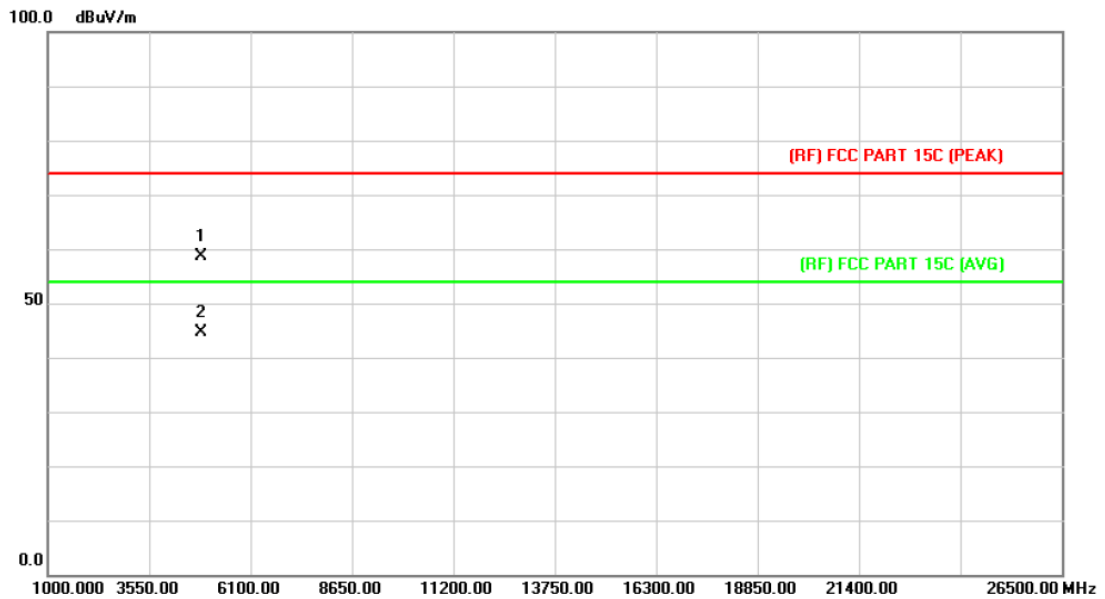
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2437MHz Antenna 2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	*	4873.949	29.73	13.86	43.59	54.00	-10.41	AVG
2		4874.135	43.13	13.86	56.99	74.00	-17.01	peak

Emission Level= Read Level+ Correct Factor

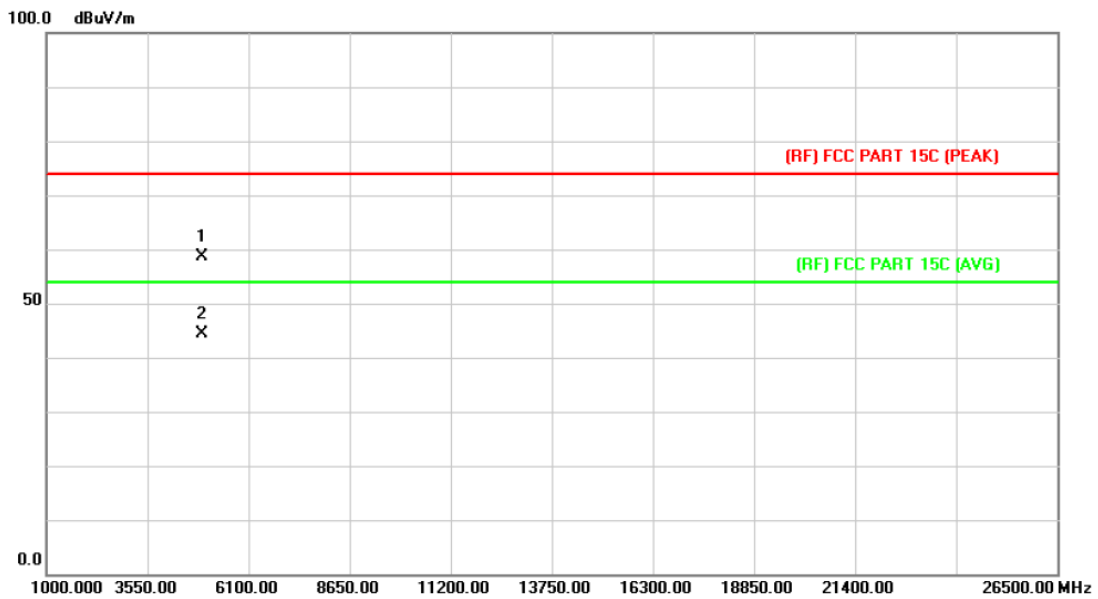
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2437MHz Antenna 2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		4873.451	44.77	13.86	58.63	74.00	-15.37	peak
2	*	4873.988	30.82	13.86	44.68	54.00	-9.32	AVG

Emission Level= Read Level+ Correct Factor

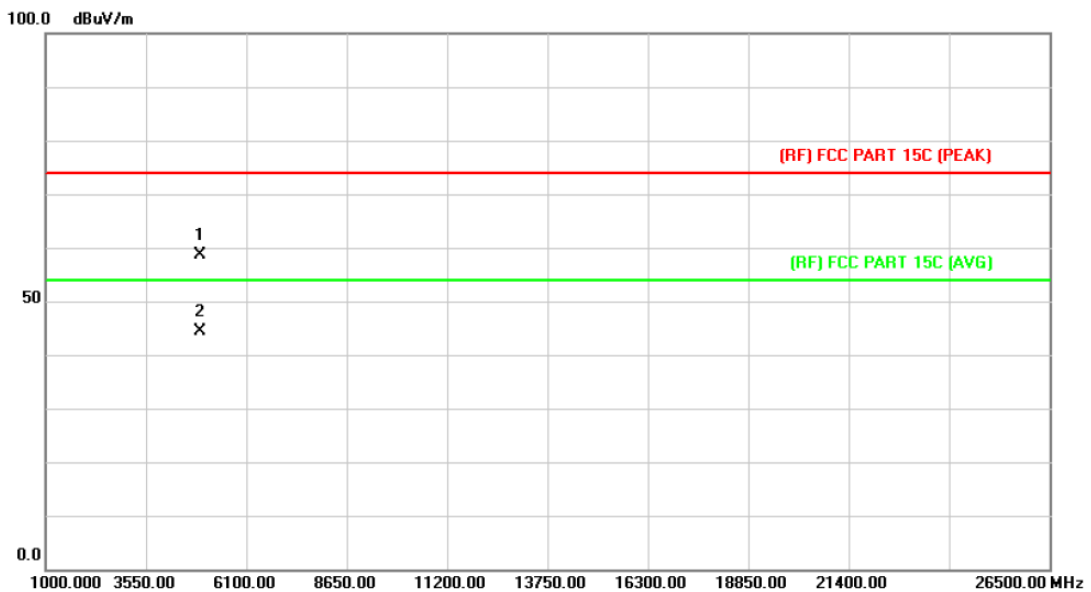
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2462MHz Antenna 2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4923.553	44.53	14.15	58.68	74.00	-15.32	peak
2	*	4924.429	30.13	14.15	44.28	54.00	-9.72	AVG

Emission Level= Read Level+ Correct Factor

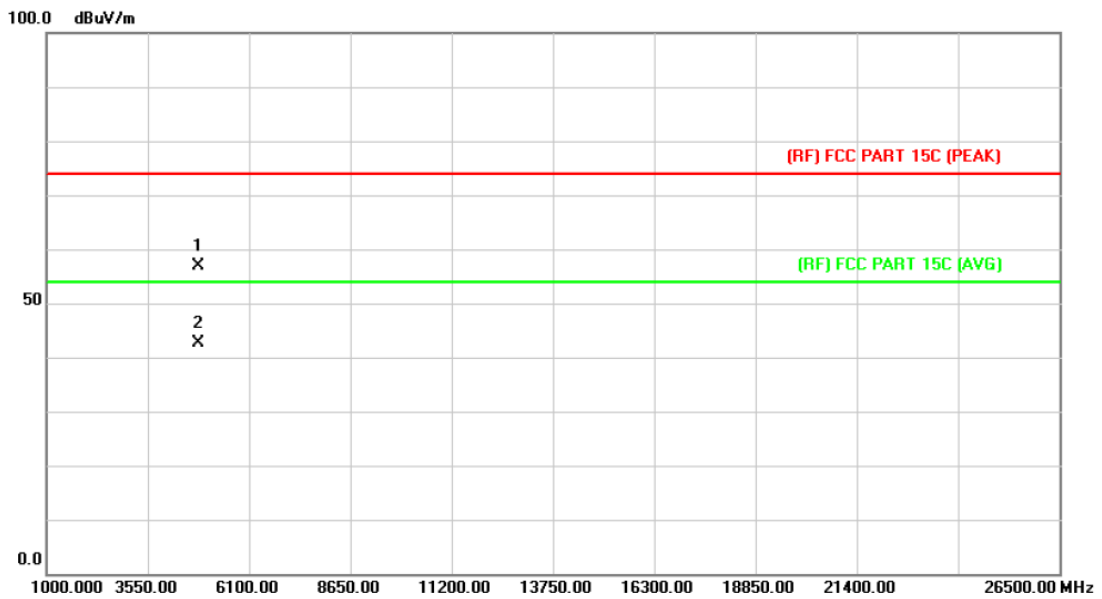
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2462MHz Antenna 2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		4923.193	44.42	14.15	58.57	74.00	-15.43	peak
2	*	4925.083	30.12	14.16	44.28	54.00	-9.72	AVG

Emission Level= Read Level+ Correct Factor

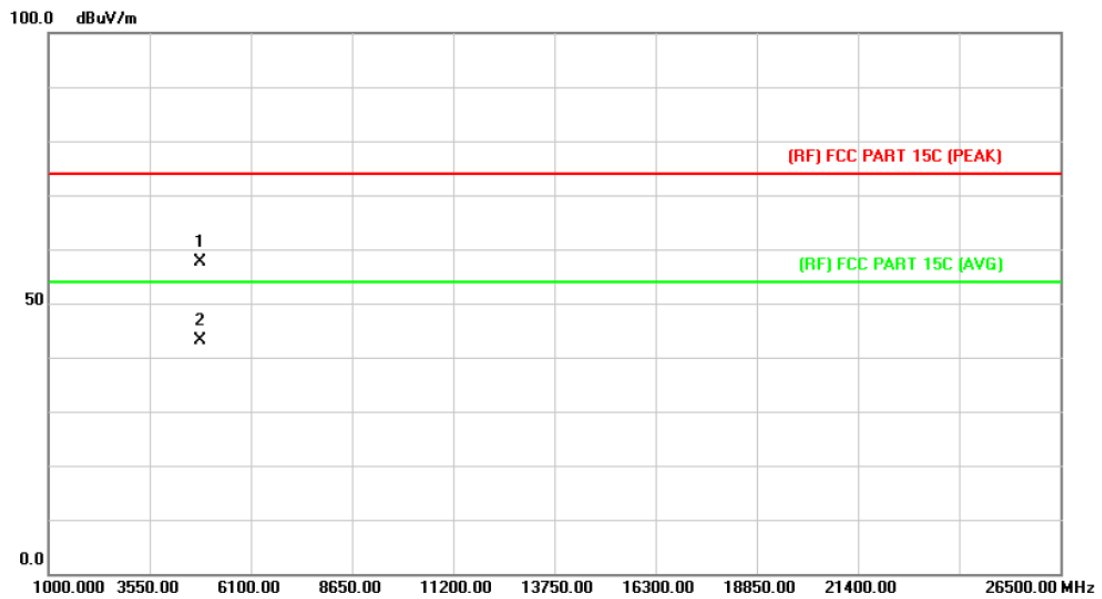
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX G Mode 2412MHz Antenna 2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		4824.111	43.33	13.56	56.89	74.00	-17.11	peak
2	*	4824.645	29.12	13.56	42.68	54.00	-11.32	AVG

Emission Level= Read Level+ Correct Factor

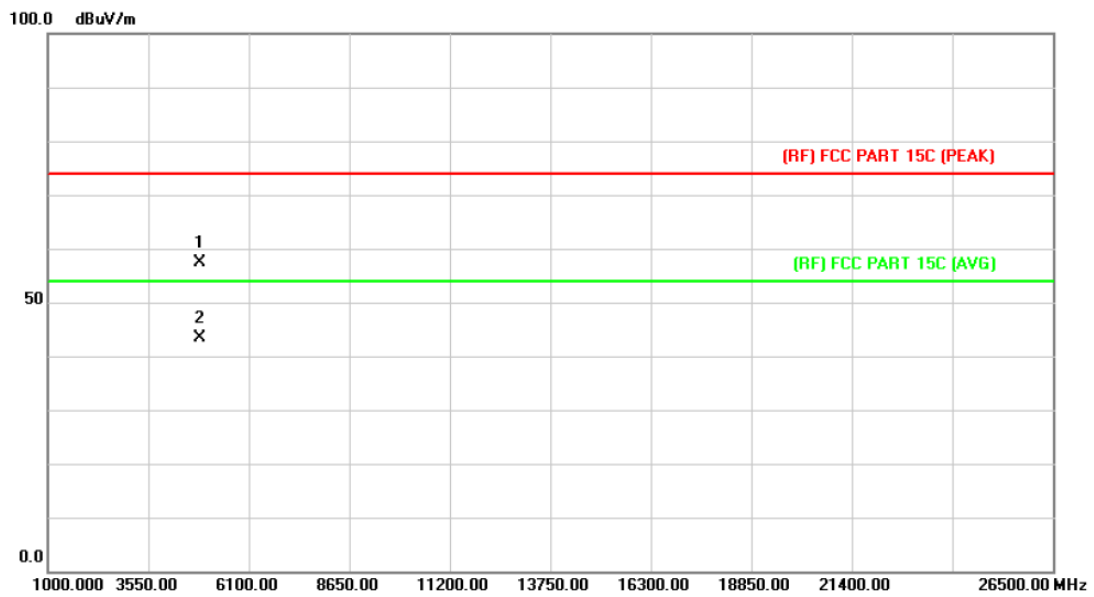
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX G Mode 2412MHz Antenna 2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4823.712	44.19	13.56	57.75	74.00	-16.25	peak
2	*	4824.069	29.54	13.56	43.10	54.00	-10.90	AVG

Emission Level= Read Level+ Correct Factor

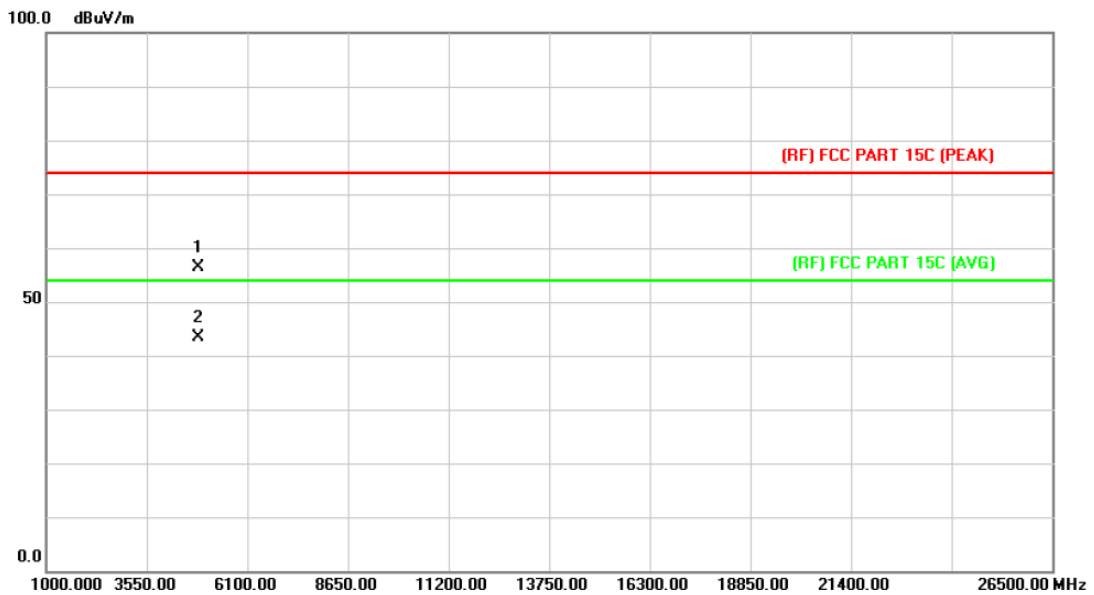
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX G Mode 2437MHz Antenna 2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4874.258	43.62	13.86	57.48	74.00	-16.52	peak
2	*	4874.870	29.44	13.86	43.30	54.00	-10.70	AVG

Emission Level= Read Level+ Correct Factor

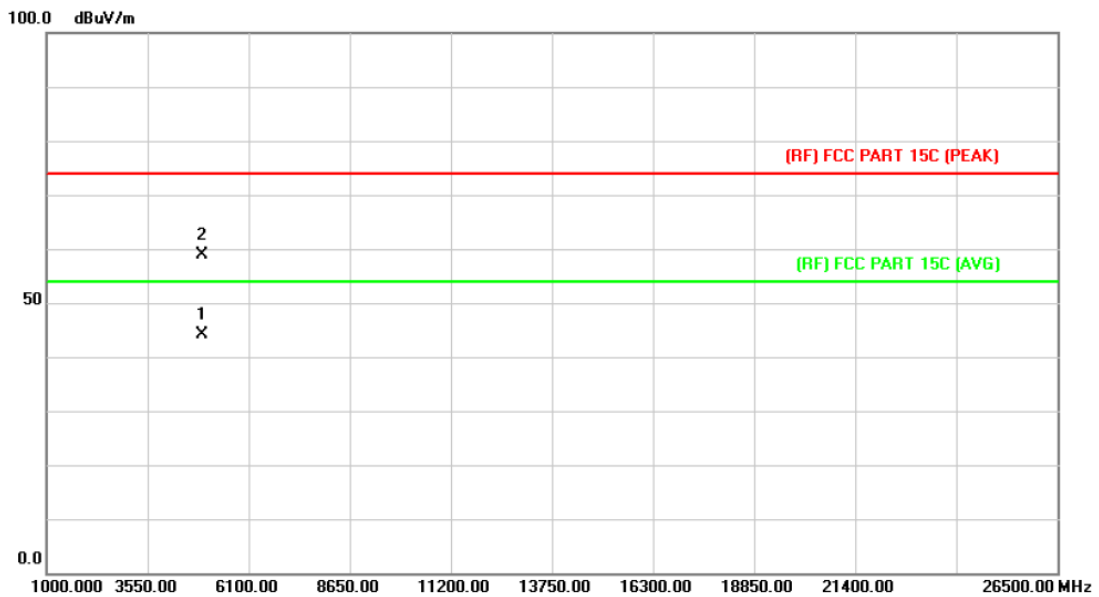
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX G Mode 2437MHz Antenna 2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		4874.075	42.55	13.86	56.41	74.00	-17.59	peak
2	*	4874.687	29.57	13.86	43.43	54.00	-10.57	AVG

Emission Level= Read Level+ Correct Factor

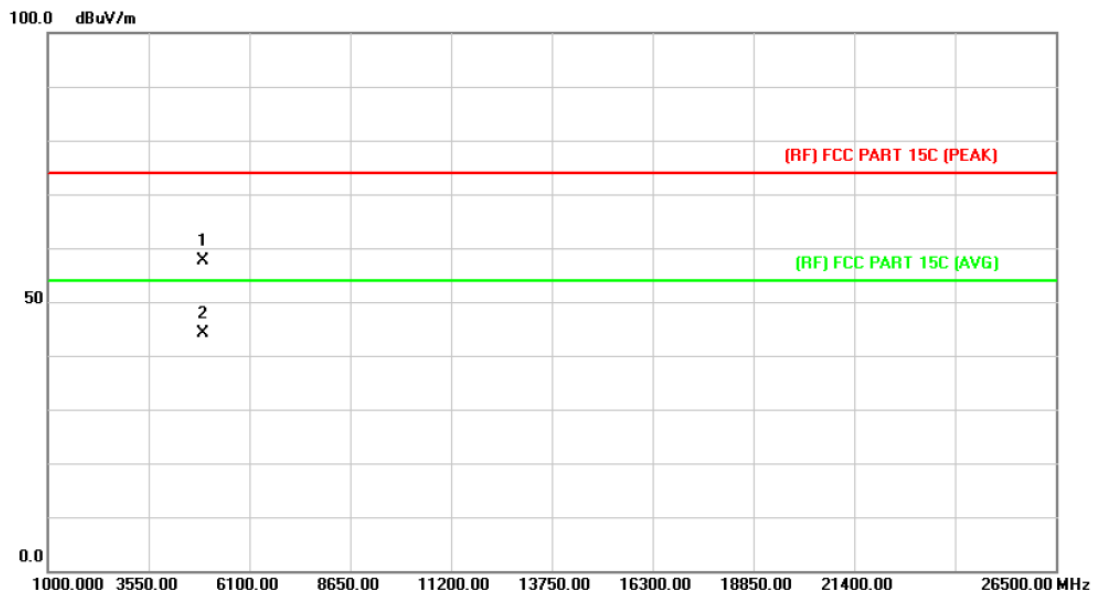
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX G Mode 2462MHz Antenna 2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	*	4924.348	29.92	14.15	44.07	54.00	-9.93	AVG
2		4924.939	44.76	14.15	58.91	74.00	-15.09	peak

Emission Level= Read Level+ Correct Factor

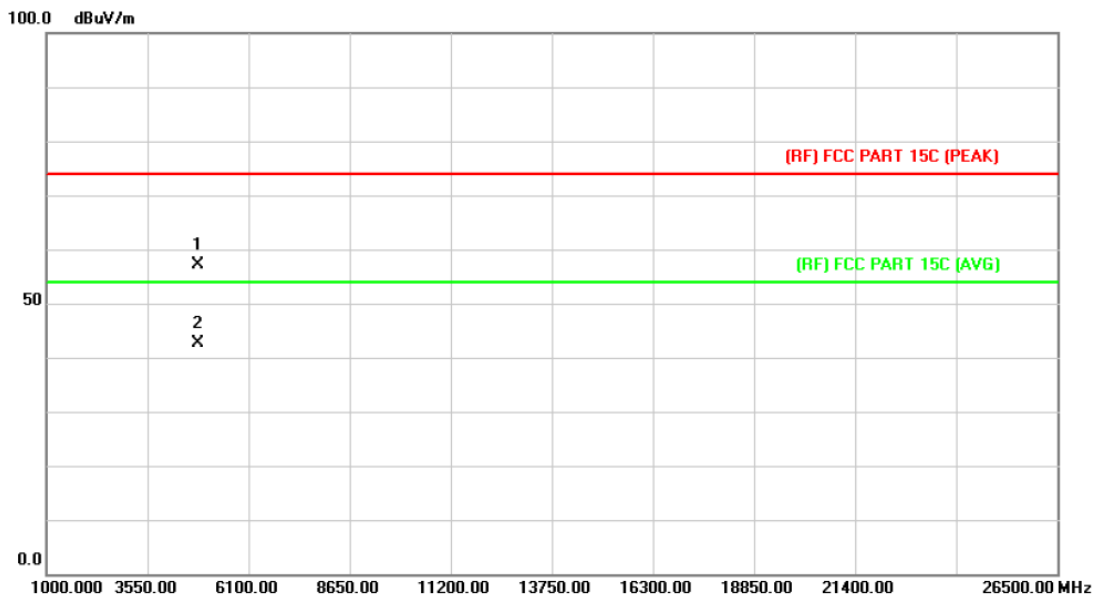
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX G Mode 2462MHz Antenna 2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4923.874	43.43	14.15	57.58	74.00	-16.42	peak
2	*	4924.408	29.93	14.15	44.08	54.00	-9.92	AVG

Emission Level= Read Level+ Correct Factor

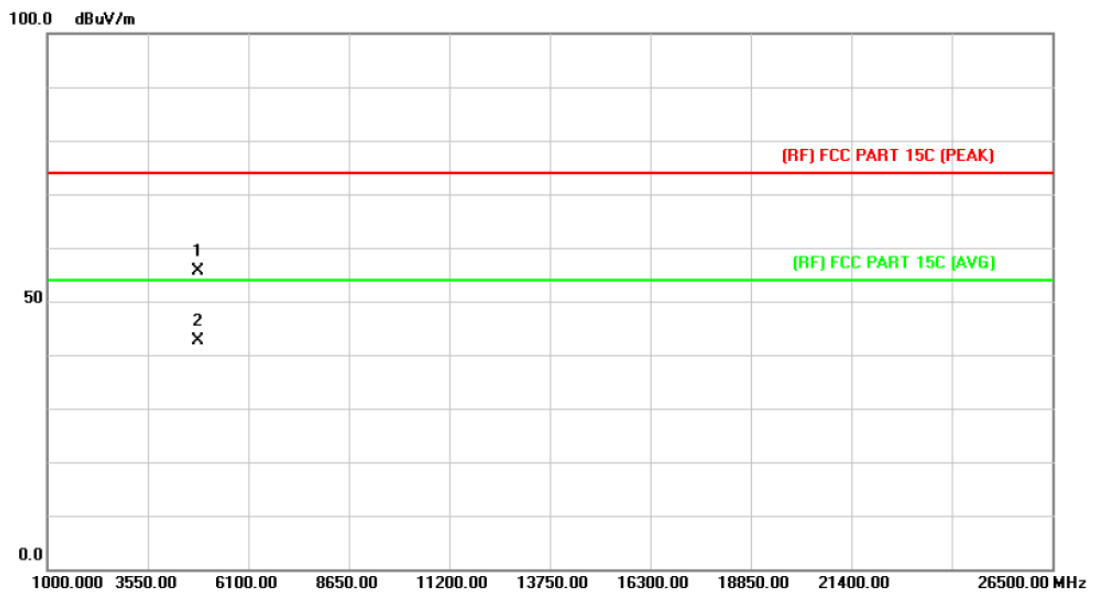
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2412MHz Antenna 1+2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		4824.372	43.57	13.56	57.13	74.00	-16.87	peak
2	*	4824.468	28.98	13.56	42.54	54.00	-11.46	AVG

Emission Level= Read Level+ Correct Factor

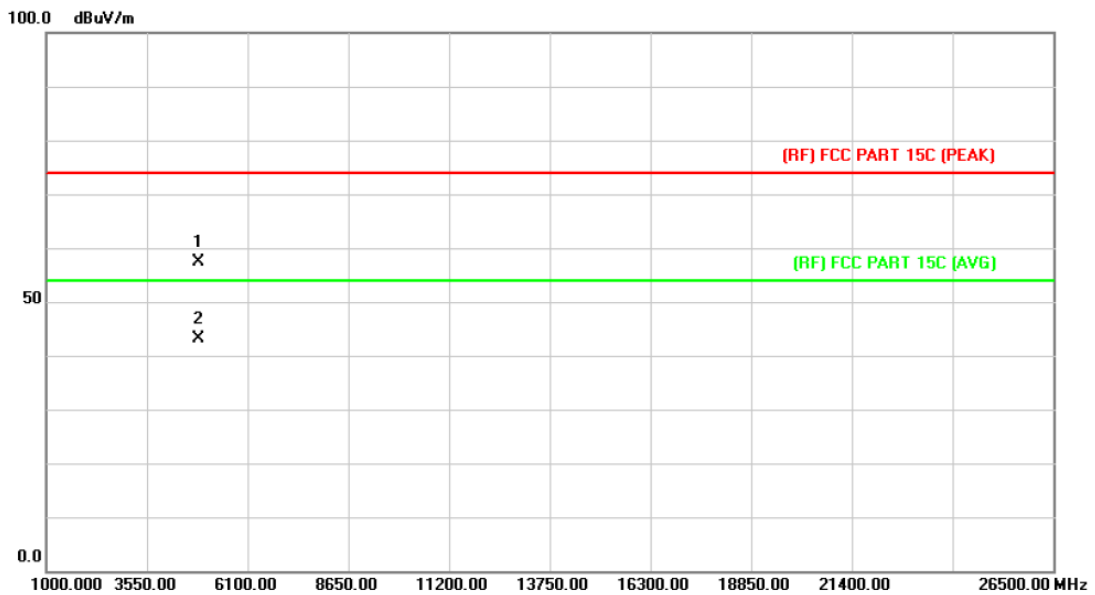
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT20) Mode 2412MHz Antenna 1+2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4823.904	42.12	13.56	55.68	74.00	-18.32	peak
2	*	4824.546	29.11	13.56	42.67	54.00	-11.33	AVG

Emission Level= Read Level+ Correct Factor

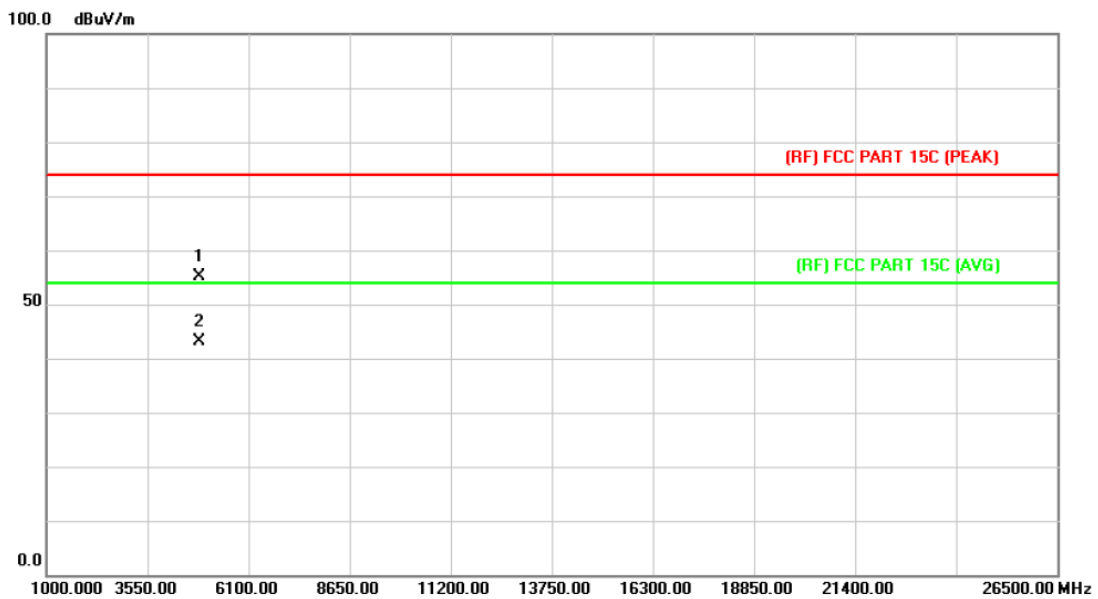
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2437MHz Antenna 1+2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		4873.592	43.52	13.86	57.38	74.00	-16.62	peak
2	*	4874.500	29.27	13.86	43.13	54.00	-10.87	AVG

Emission Level= Read Level+ Correct Factor

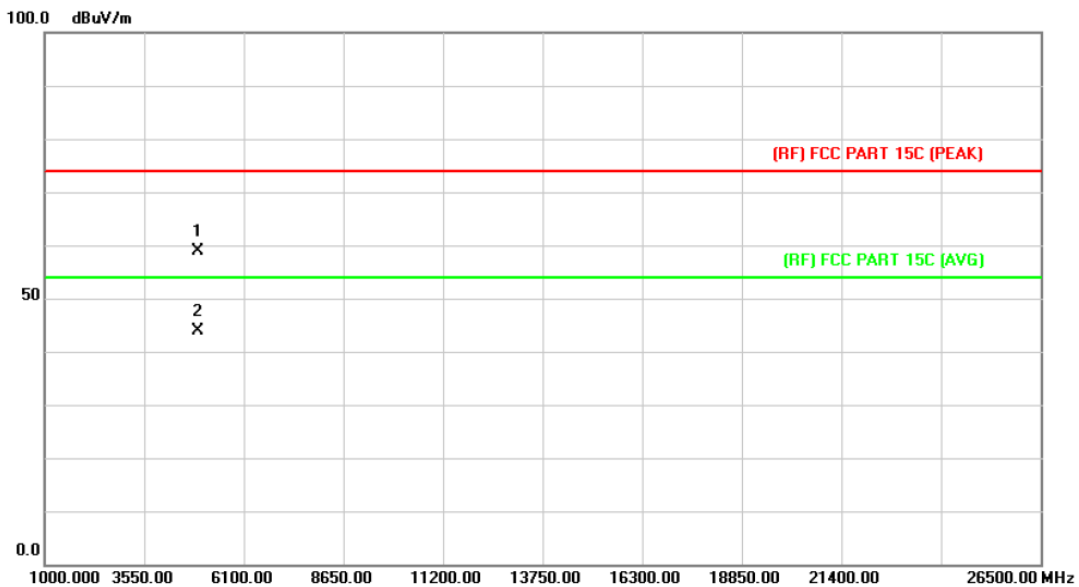
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT20) Mode 2437MHz Antenna 1+2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4873.961	41.27	13.86	55.13	74.00	-18.87	peak
2	*	4874.393	29.32	13.86	43.18	54.00	-10.82	AVG

Emission Level= Read Level+ Correct Factor

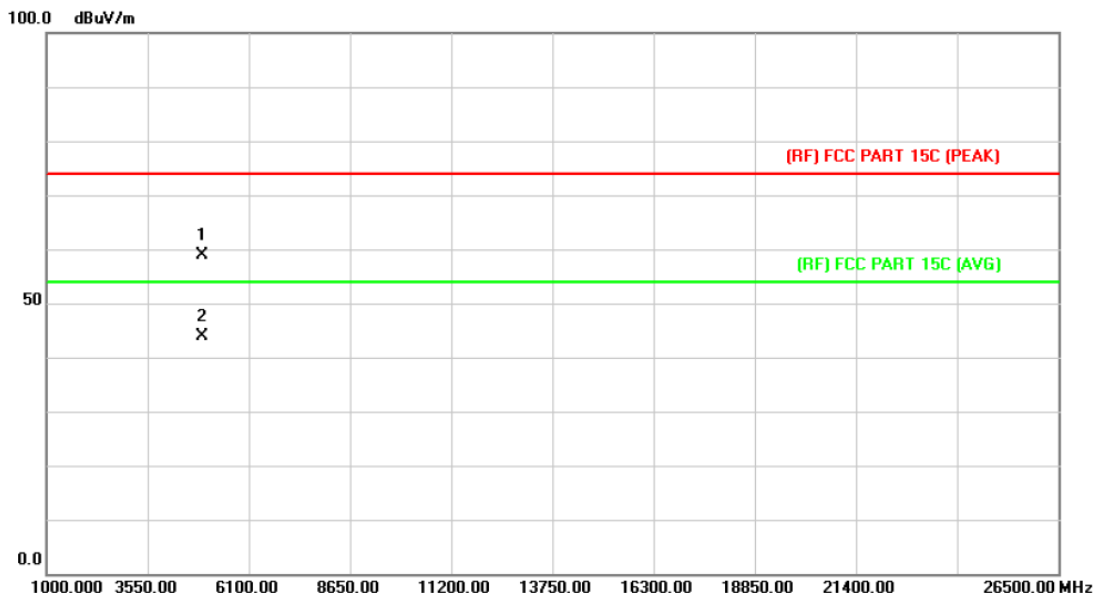
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2462MHz Antenna 1+2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4924.066	44.76	14.15	58.91	74.00	-15.09	peak
2	*	4924.070	29.78	14.15	43.93	54.00	-10.07	AVG

Emission Level= Read Level+ Correct Factor

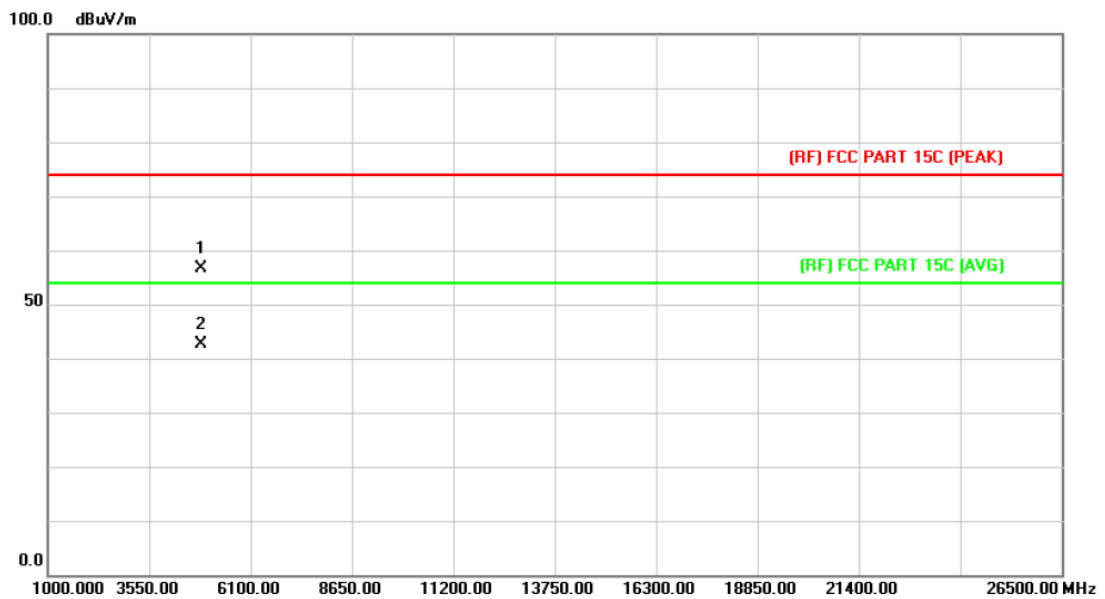
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT20) Mode 2462MHz Antenna 1+2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		4924.176	44.63	14.15	58.78	74.00	-15.22	peak
2	*	4924.357	29.79	14.15	43.94	54.00	-10.06	AVG

Emission Level= Read Level+ Correct Factor

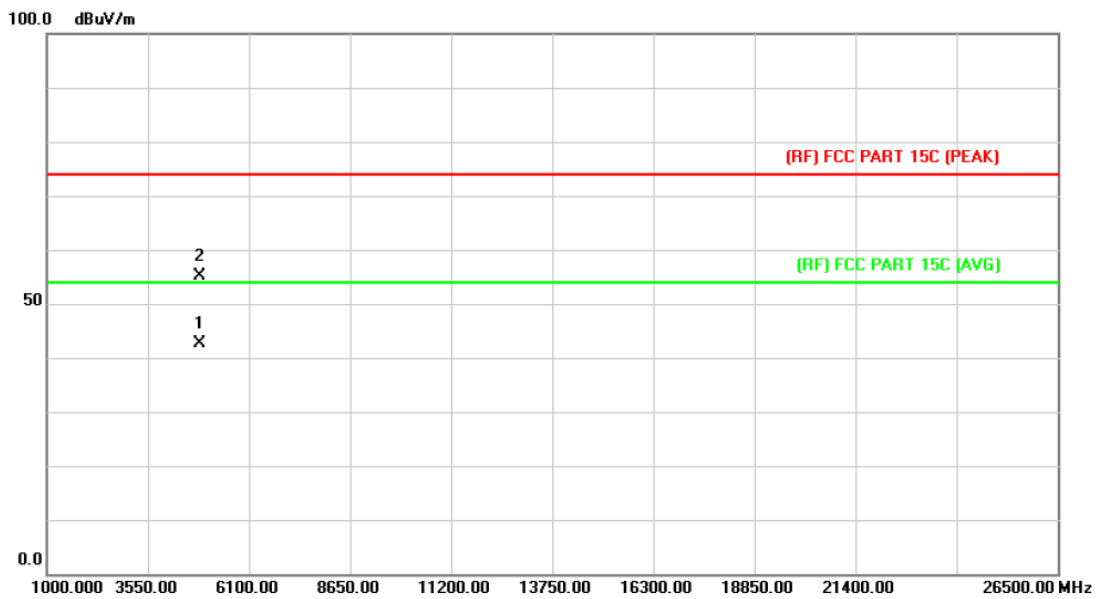
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT40) Mode 2422MHz Antenna 1+2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		4843.885	42.85	13.68	56.53	74.00	-17.47	peak
2	*	4844.255	28.88	13.68	42.56	54.00	-11.44	AVG

Emission Level= Read Level+ Correct Factor

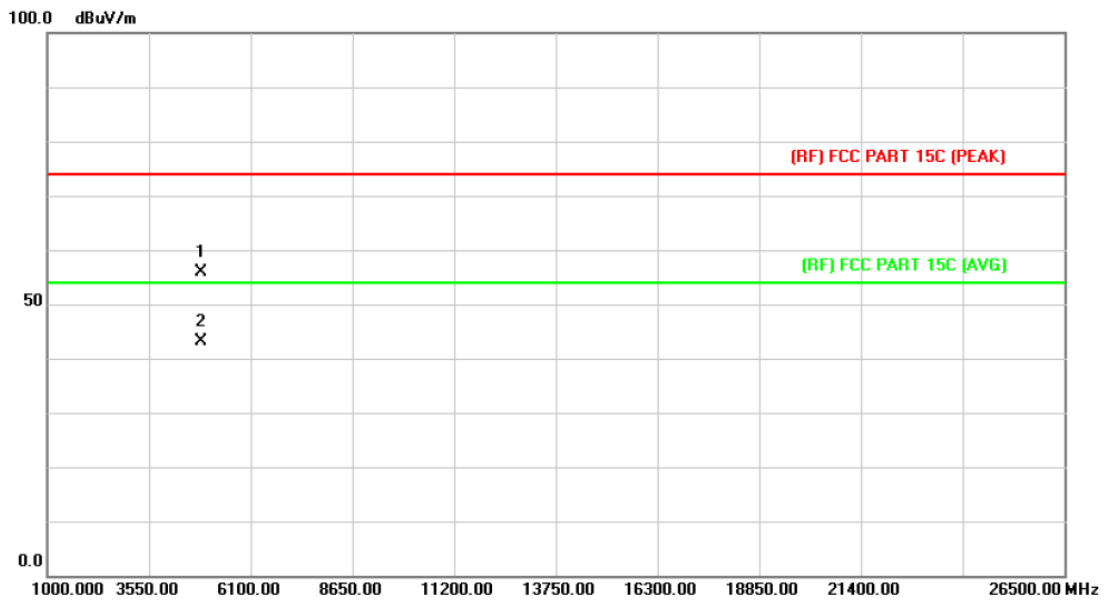
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT40) Mode 2422MHz Antenna 1+2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	*	4843.885	28.89	13.68	42.57	54.00	-11.43	AVG
2		4844.027	41.50	13.68	55.18	74.00	-18.82	peak

Emission Level= Read Level+ Correct Factor

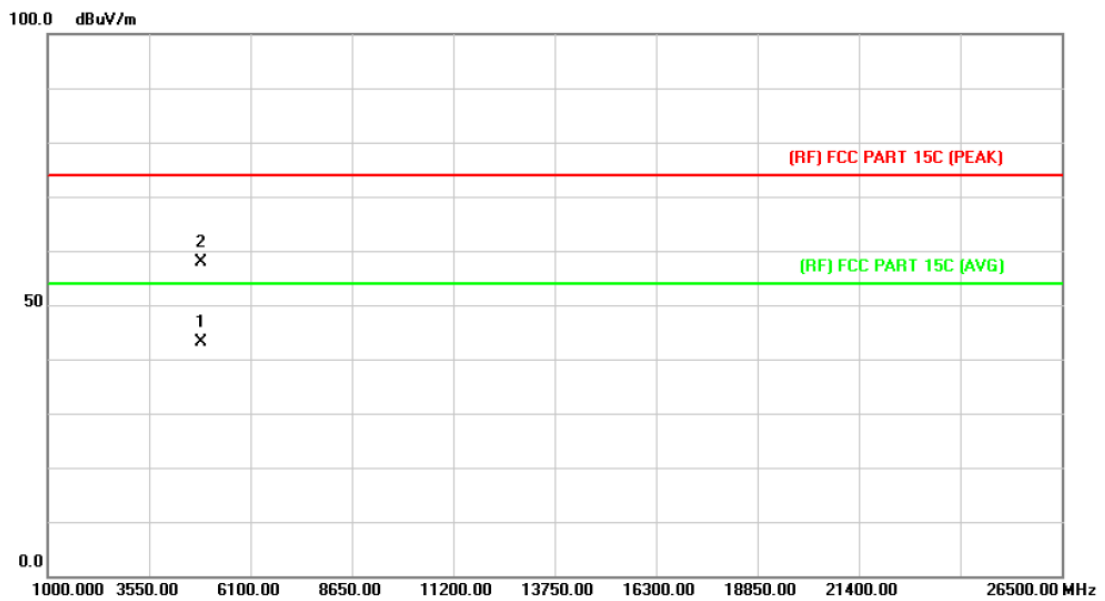
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT40) Mode 2437MHz Antenna 1+2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4873.974	42.13	13.86	55.99	74.00	-18.01	peak
2	*	4874.046	29.16	13.86	43.02	54.00	-10.98	AVG

Emission Level= Read Level+ Correct Factor

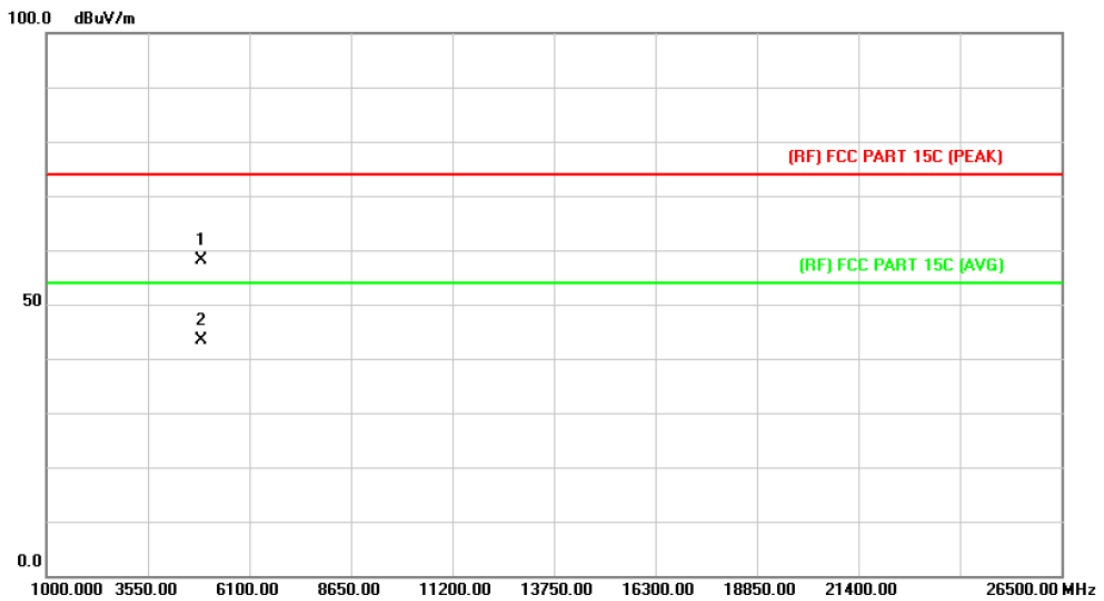
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT40) Mode 2437MHz Antenna 1+2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	*	4874.009	29.21	13.86	43.07	54.00	-10.93	AVG
2		4874.096	43.98	13.86	57.84	74.00	-16.16	peak

Emission Level= Read Level+ Correct Factor

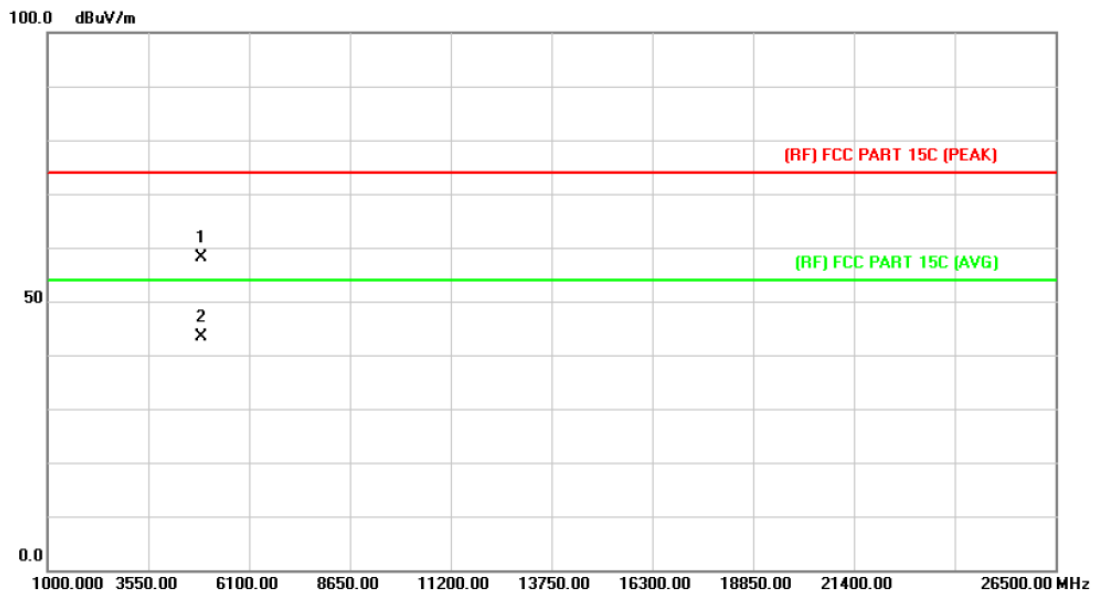
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT40) Mode 2452MHz Antenna 1+2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4903.853	44.07	14.03	58.10	74.00	-15.90	peak
2	*	4903.958	29.28	14.03	43.31	54.00	-10.69	AVG

Emission Level= Read Level+ Correct Factor

EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT40) Mode 2452MHz Antenna 1+2		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4903.766	44.07	14.03	58.10	74.00	-15.90	peak
2	*	4903.928	29.31	14.03	43.34	54.00	-10.66	AVG

Emission Level= Read Level+ Correct Factor

6. Restricted Bands Requirement

6.1 Test Standard and Limit

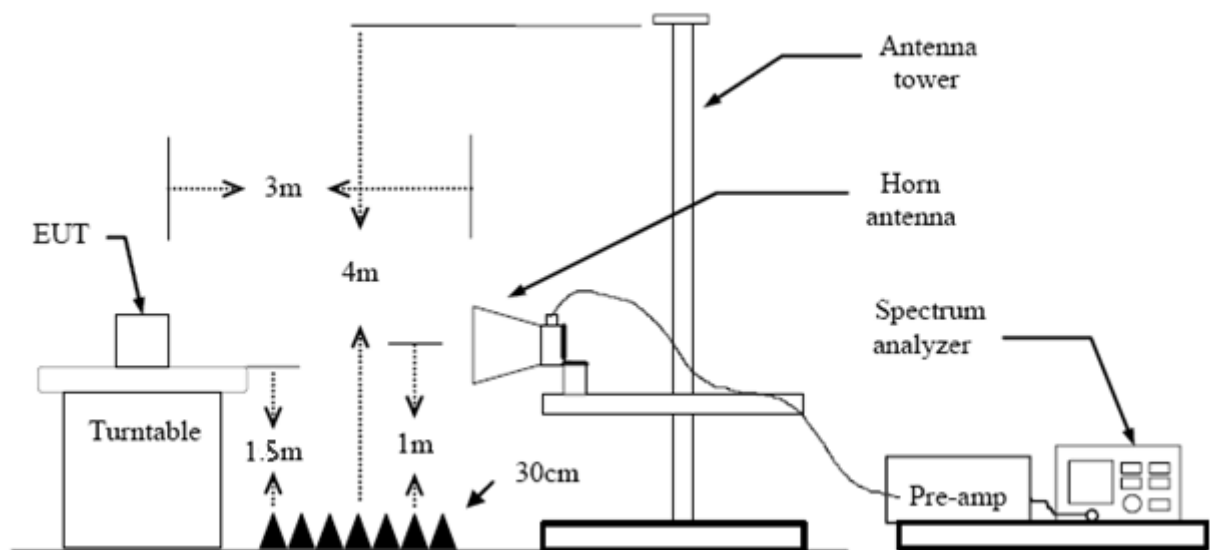
6.1.1 Test Standard

FCC Part 15.209 FCC Part 15.205

6.1.2 Test Limit

Restricted Frequency Band (MHz)	Class B (dBuV/m)(at 3 M)	
	Peak	Average
2310 ~2390	74	54
2483.5 ~2500	74	54

6.2 Test Setup



6.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.

- (4) 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.
- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.

6.4 EUT Operating Condition

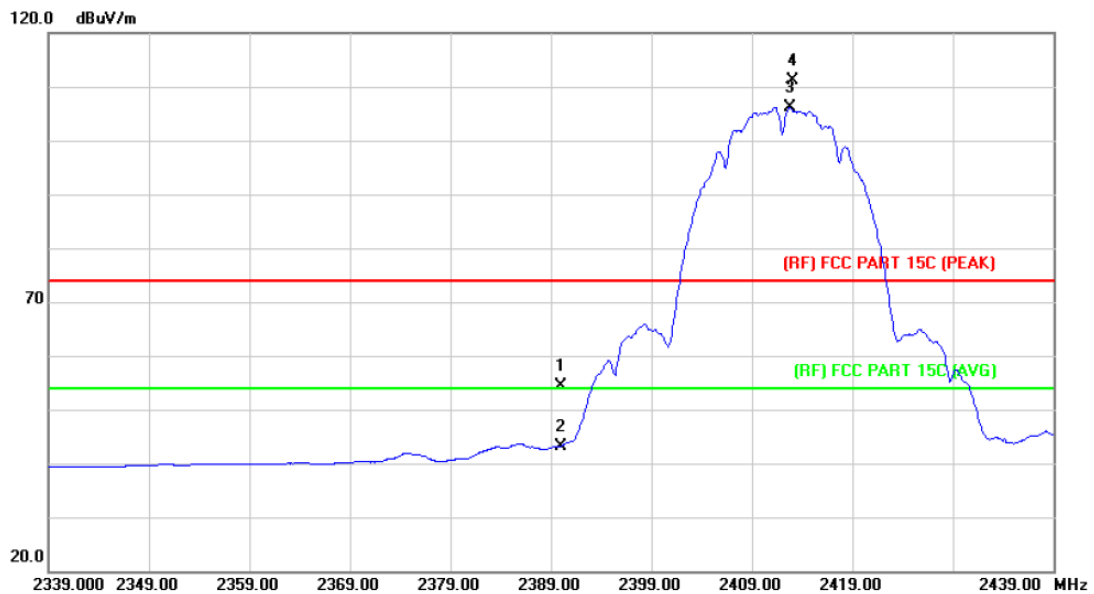
The Equipment Under Test was set to Continual Transmitting in maximum power.

6.5 Test Data

Please see the next page.

(1) Radiation Test

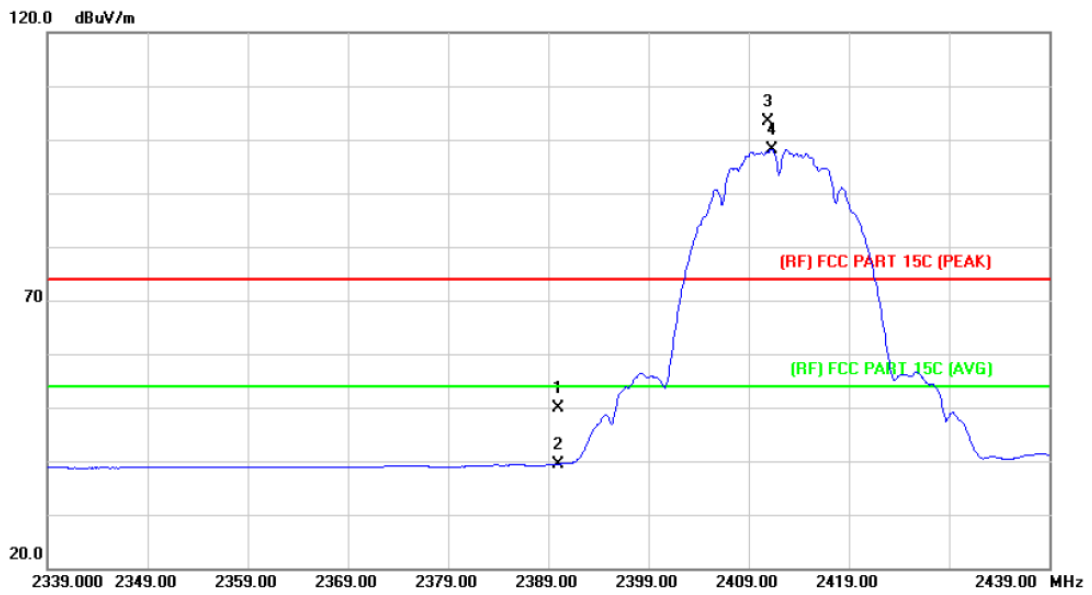
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2412MHz Antenna 1		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		2390.000	53.53	0.77	54.30	74.00	-19.70	peak
2		2390.000	42.48	0.77	43.25	54.00	-10.75	AVG
3	*	2412.800	105.24	0.86	106.10	Fundamental Frequency		AVG
4	X	2413.100	110.17	0.86	111.03	Fundamental Frequency		peak

Emission Level= Read Level+ Correct Factor

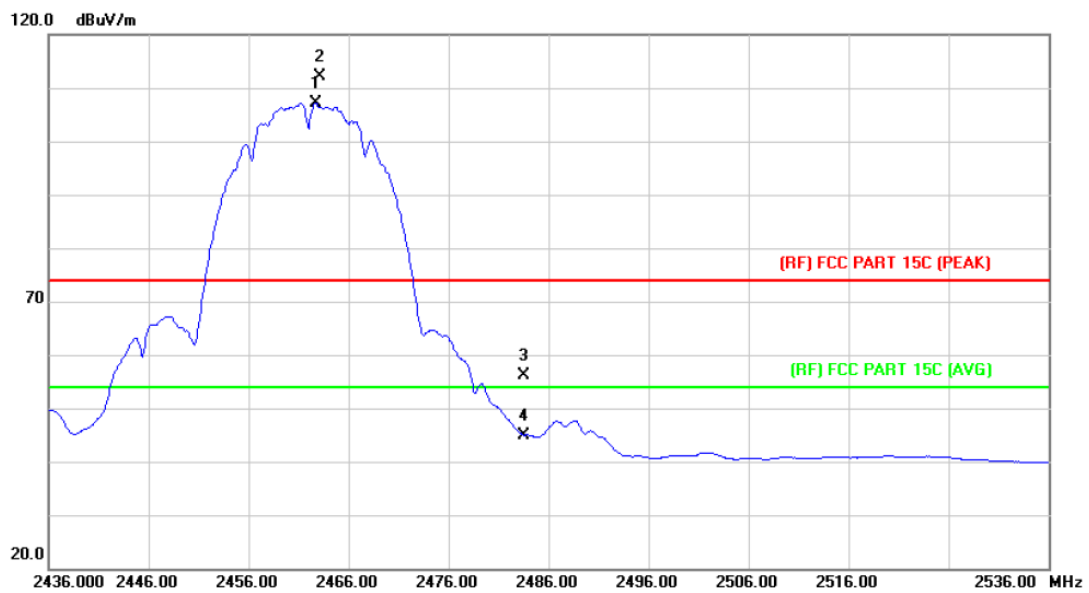
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2412MHz Antenna 1		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2390.000	49.20	0.77	49.97	74.00	-24.03	peak
2		2390.000	38.66	0.77	39.43	54.00	-14.57	AVG
3	X	2410.900	102.60	0.86	103.46	Fundamental Frequency		peak
4	*	2411.300	97.38	0.86	98.24	Fundamental Frequency		AVG

Emission Level= Read Level+ Correct Factor

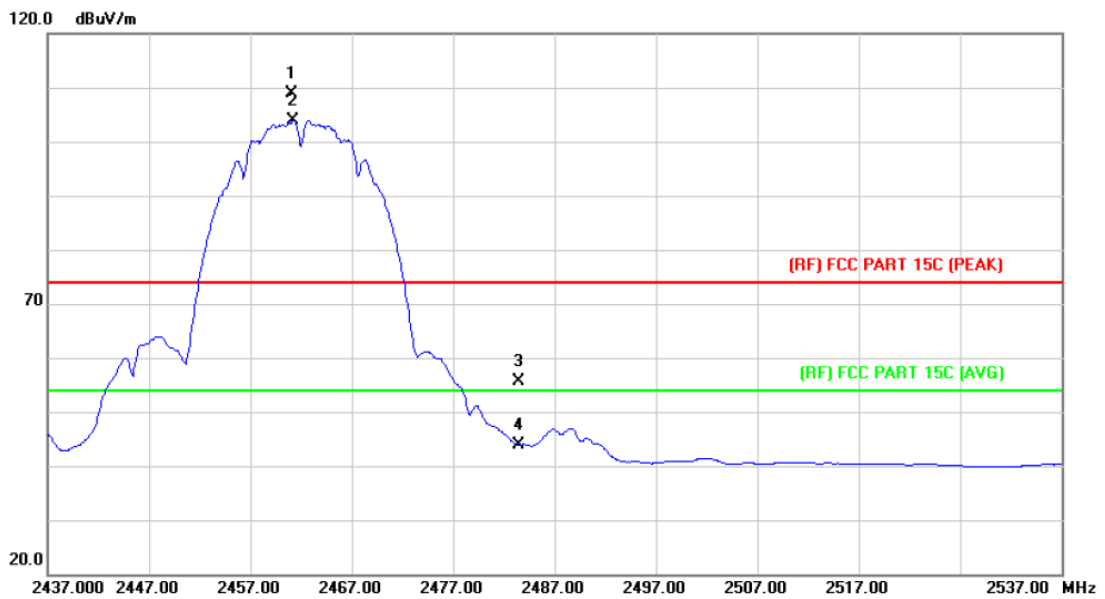
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2462MHz Antenna 1		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	*	2462.700	106.06	1.08	107.14			AVG
2	X	2463.100	111.13	1.08	112.21	Fundamental Frequency		peak
3		2483.500	54.91	1.17	56.08	74.00	-17.92	peak
4		2483.500	43.81	1.17	44.98	54.00	-9.02	AVG

Emission Level= Read Level+ Correct Factor

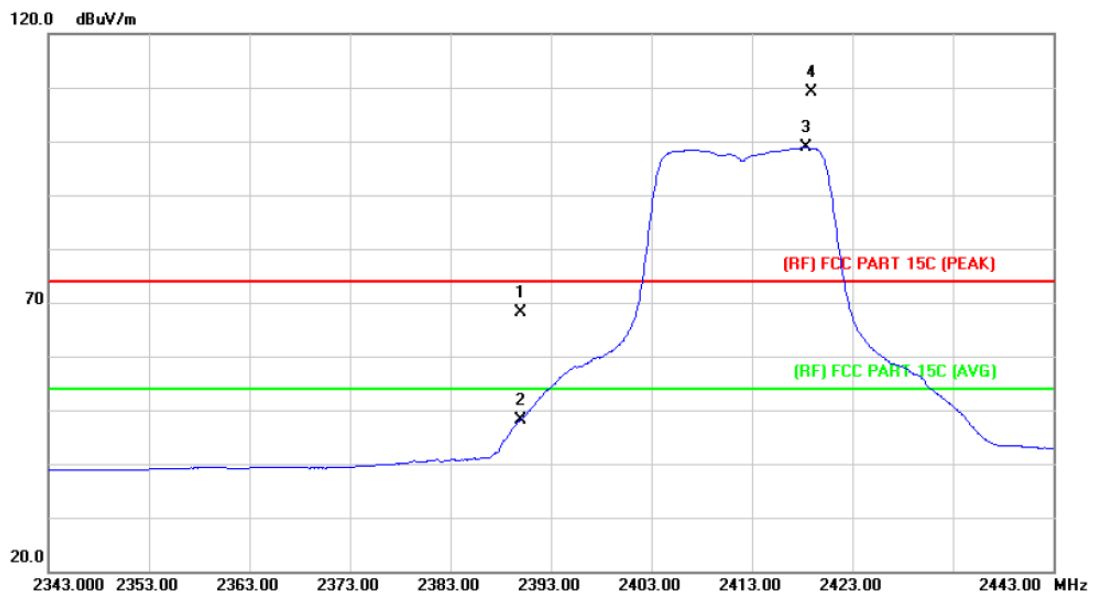
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2462MHz Antenna 1		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	X	2461.000	107.88	1.06	108.94	Fundamental Frequency		peak
2	*	2461.200	102.82	1.07	103.89	Fundamental Frequency		AVG
3		2483.500	54.46	1.17	55.63	74.00	-18.37	peak
4		2483.500	42.69	1.17	43.86	54.00	-10.14	AVG

Emission Level= Read Level+ Correct Factor

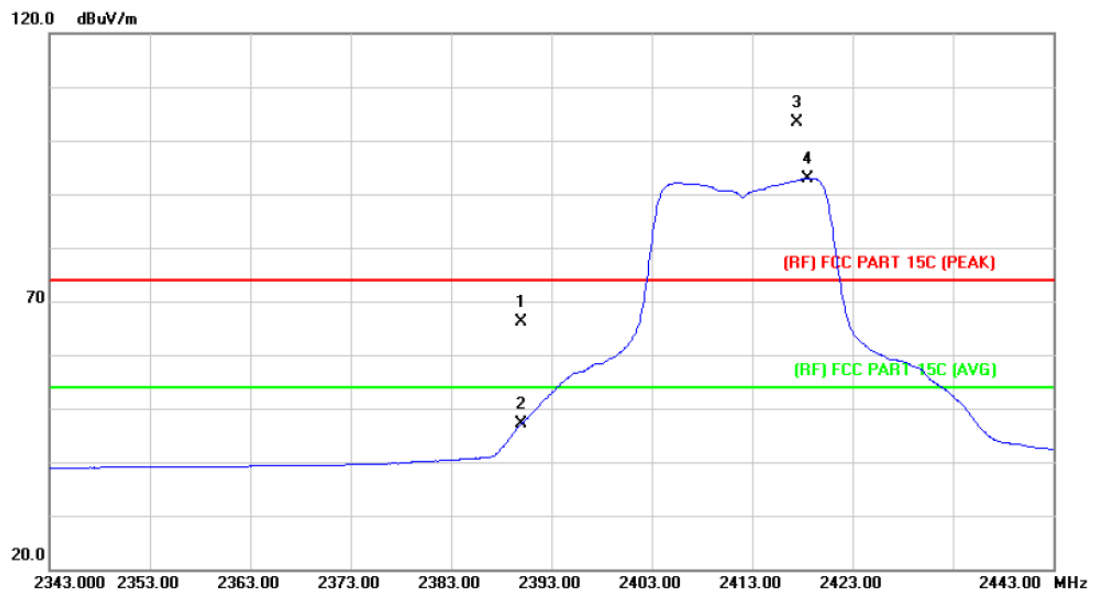
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX G Mode 2412MHz Antenna 1		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2390.000	67.46	0.77	68.23	74.00	-5.77	peak
2		2390.000	47.45	0.77	48.22	54.00	-5.78	AVG
3	*	2418.400	98.03	0.89	98.92	Fundamental Frequency		AVG
4	X	2418.900	108.20	0.89	109.09	Fundamental Frequency		peak

Emission Level= Read Level+ Correct Factor

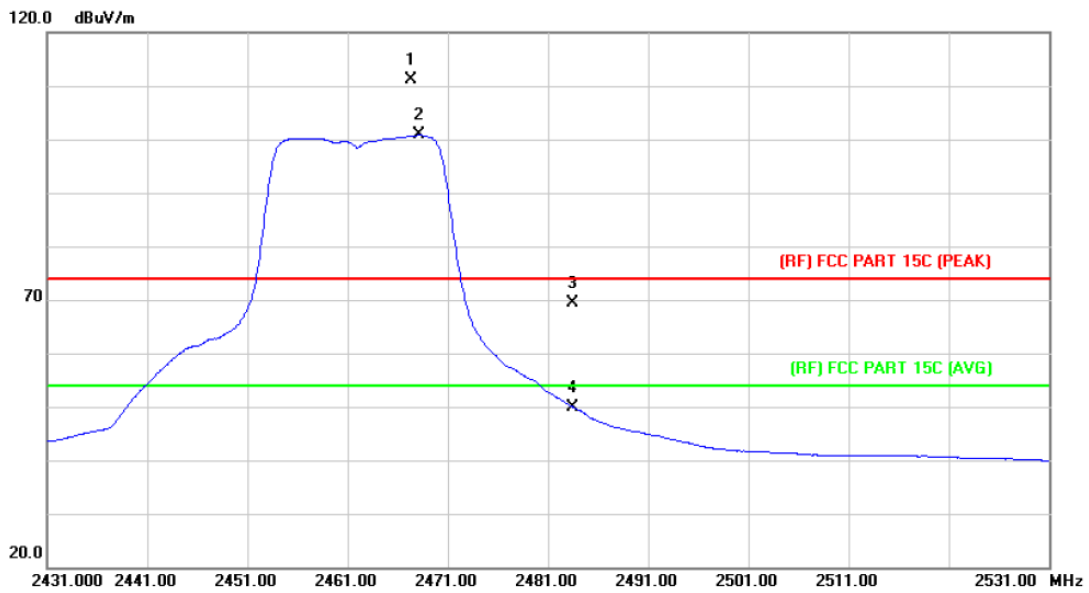
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX G Mode 2412MHz Antenna 1		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2390.000	65.37	0.77	66.14	74.00	-7.86	peak
2		2390.000	46.38	0.77	47.15	54.00	-6.85	AVG
3	X	2417.400	102.38	0.89	103.27	Fundamental Frequency		peak
4	*	2418.500	92.09	0.89	92.98	Fundamental Frequency		AVG

Emission Level= Read Level+ Correct Factor

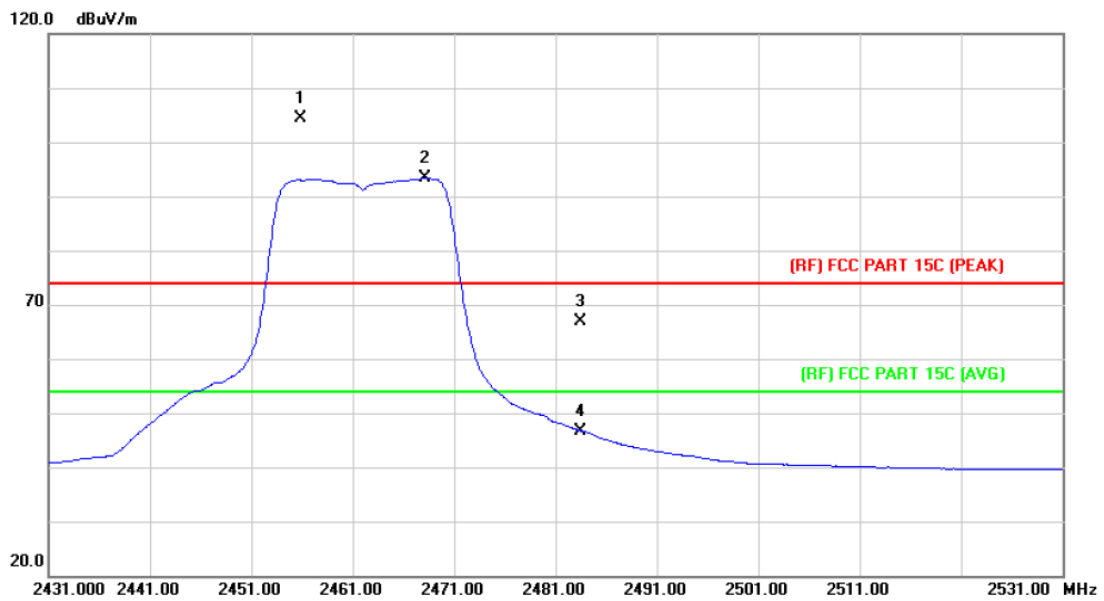
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX G Mode 2462MHz Antenna 1		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	X	2467.300	110.09	1.10	111.19	Fundamental Frequency		peak
2	*	2468.100	99.67	1.11	100.78	Fundamental Frequency		AVG
3		2483.500	68.31	1.17	69.48	74.00	-4.52	peak
4		2483.500	48.75	1.17	49.92	54.00	-4.08	AVG

Emission Level= Read Level+ Correct Factor

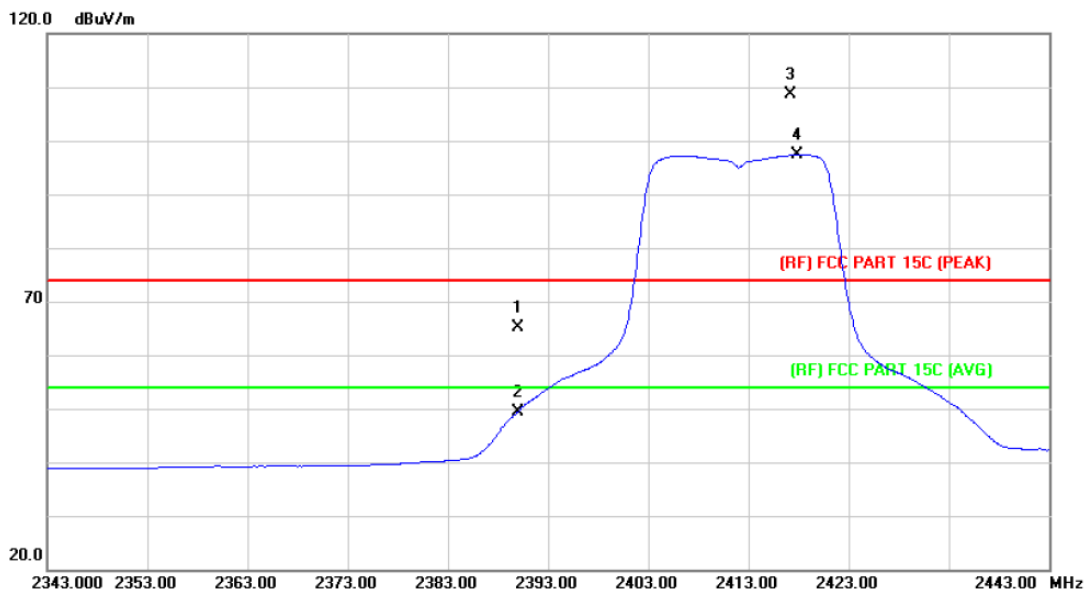
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX G Mode 2462MHz Antenna 1		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	X	2455.900	103.24	1.05	104.29	Fundamental Frequency		peak
2	*	2468.200	92.30	1.11	93.41	Fundamental Frequency		AVG
3		2483.500	65.63	1.17	66.80	74.00	-7.20	peak
4		2483.500	45.56	1.17	46.73	54.00	-7.27	AVG

Emission Level= Read Level+ Correct Factor

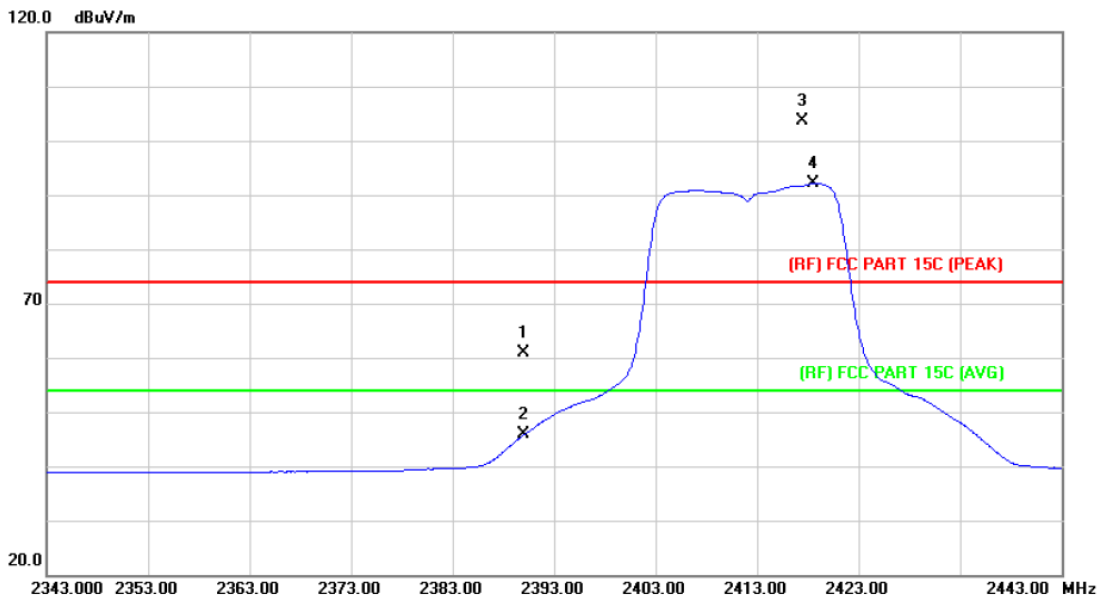
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2412MHz Antenna 1+2		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2390.000	64.31	0.77	65.08	74.00	-8.92	peak
2		2390.000	48.71	0.77	49.48	54.00	-4.52	AVG
3	X	2417.200	107.69	0.88	108.57	Fundamental Frequency		peak
4	*	2417.800	96.56	0.89	97.45	Fundamental Frequency		AVG

Emission Level= Read Level+ Correct Factor

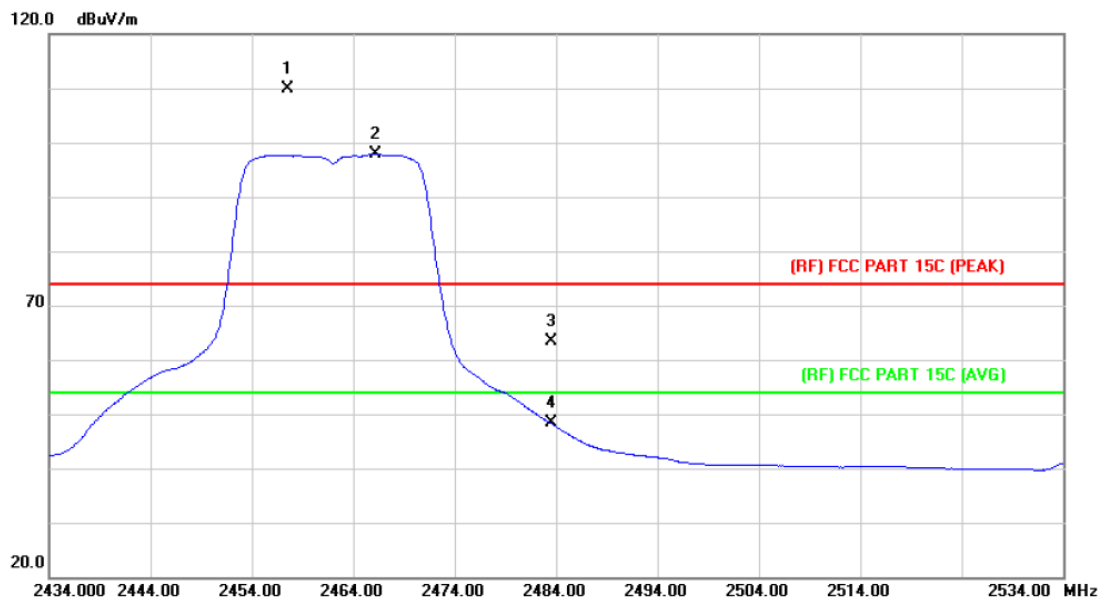
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT20) Mode 2412MHz Antenna 1+2		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2390.000	60.07	0.77	60.84	74.00	-13.16	peak
2		2390.000	45.05	0.77	45.82	54.00	-8.18	AVG
3	X	2417.500	102.65	0.89	103.54	Fundamental Frequency		peak
4	*	2418.500	91.22	0.89	92.11	Fundamental Frequency		AVG

Emission Level= Read Level+ Correct Factor

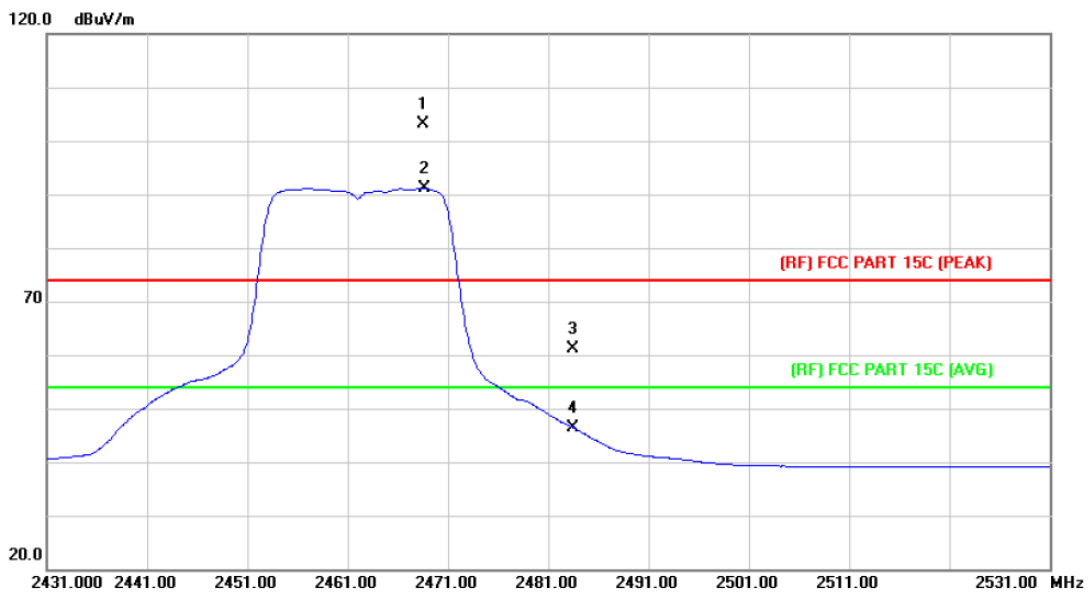
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2462MHz Antenna 1+2		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	X	2457.600	108.93	1.05	109.98			peak
2	*	2466.200	96.80	1.09	97.89			AVG
3		2483.500	62.29	1.17	63.46	74.00	-10.54	peak
4		2483.500	47.12	1.17	48.29	54.00	-5.71	AVG

Emission Level= Read Level+ Correct Factor

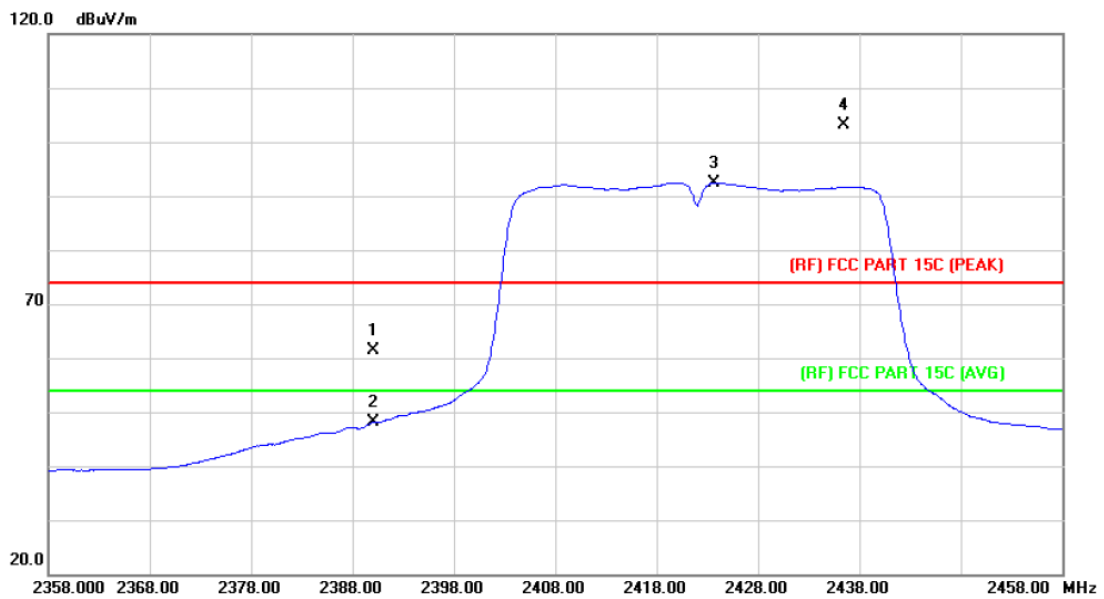
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT20) Mode 2462MHz Antenna 1+2		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	X	2468.500	101.95	1.11	103.06	Fundamental Frequency		peak
2	*	2468.700	90.00	1.11	91.11	Fundamental Frequency		AVG
3		2483.500	60.05	1.17	61.22	74.00	-12.78	peak
4		2483.500	45.26	1.17	46.43	54.00	-7.57	AVG

Emission Level= Read Level+ Correct Factor

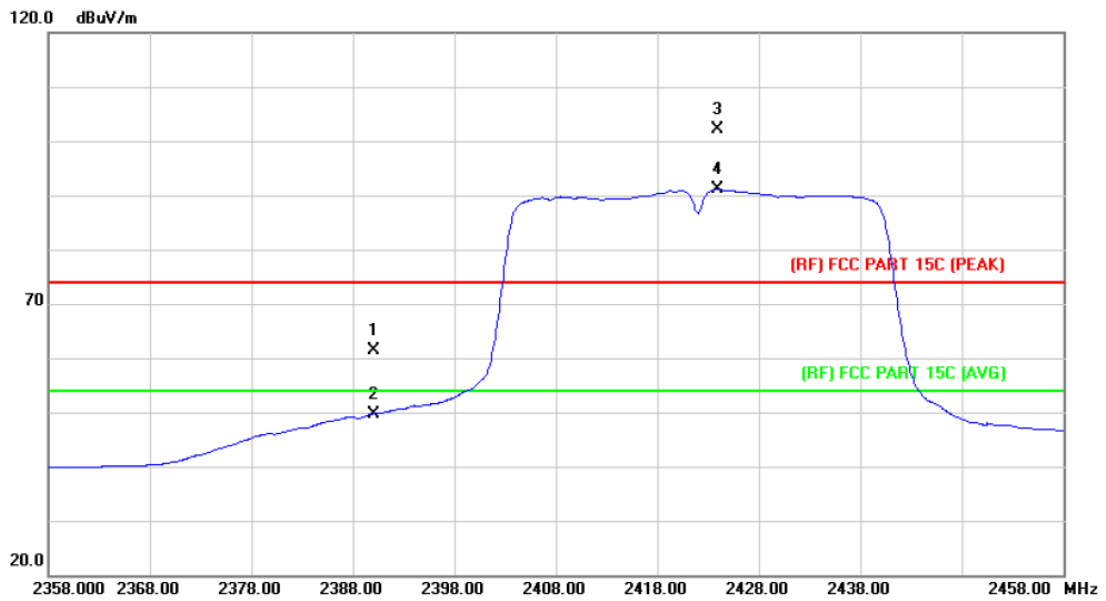
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT40) Mode 2422MHz Antenna 1+2		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2390.000	60.56	0.77	61.33	74.00	-12.67	peak
2		2390.000	47.29	0.77	48.06	54.00	-5.94	AVG
3	*	2423.700	91.51	0.91	92.42	Fundamental Frequency		AVG
4	X	2436.400	102.19	0.97	103.16	Fundamental Frequency		peak

Emission Level= Read Level+ Correct Factor

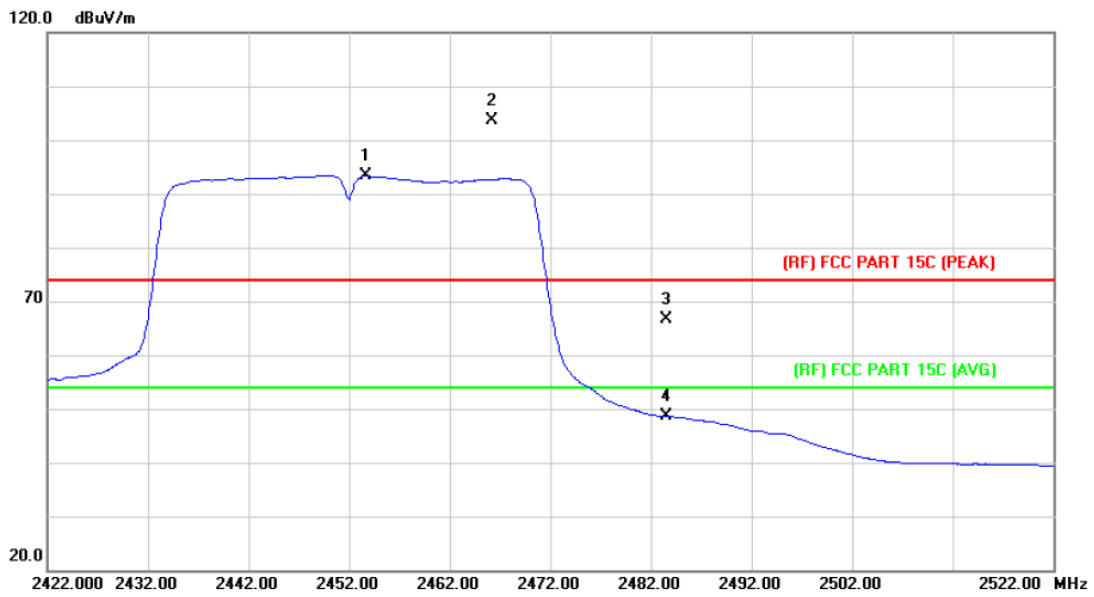
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT40) Mode 2422MHz Antenna 1+2		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2390.000	60.69	0.77	61.46	74.00	-12.54	peak
2		2390.000	48.98	0.77	49.75	54.00	-4.25	AVG
3	X	2423.900	101.10	0.92	102.02	Fundamental Frequency		peak
4	*	2423.900	90.11	0.92	91.03	Fundamental Frequency		AVG

Emission Level= Read Level+ Correct Factor

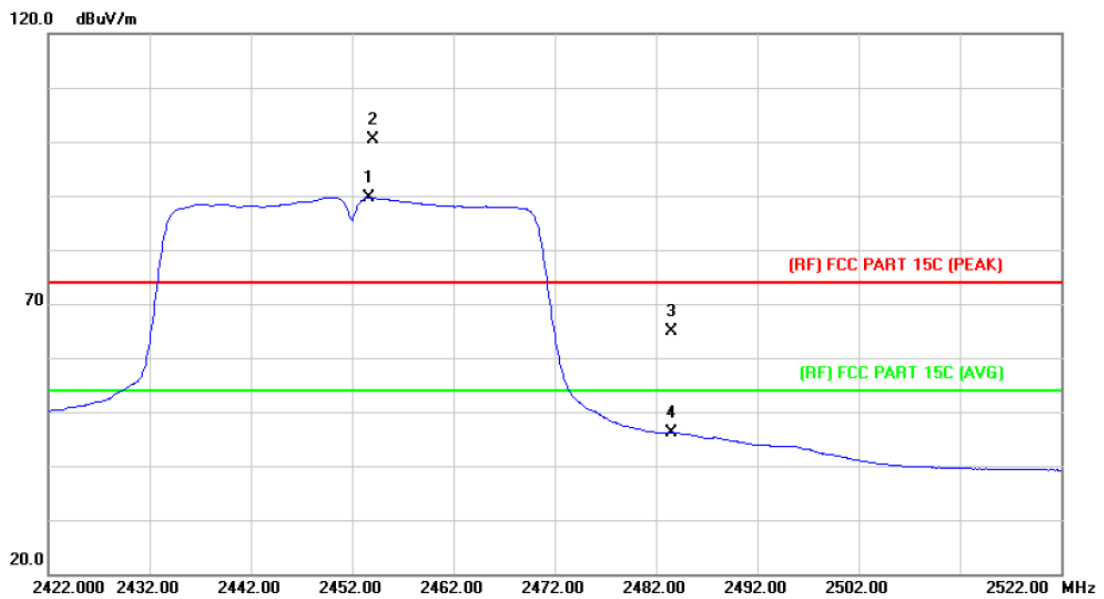
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT40) Mode 2452MHz Antenna 1+2		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	*	2453.700	92.34	1.04	93.38	54.00	39.38	AVG
2	X	2466.200	102.59	1.09	103.68	74.00	29.68	peak
3		2483.500	65.57	1.17	66.74	Fundamental Frequency		peak
4		2483.500	47.50	1.17	48.67	Fundamental Frequency		AVG

Emission Level= Read Level+ Correct Factor

EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT40) Mode 2452MHz Antenna 1+2		
Remark:	N/A		

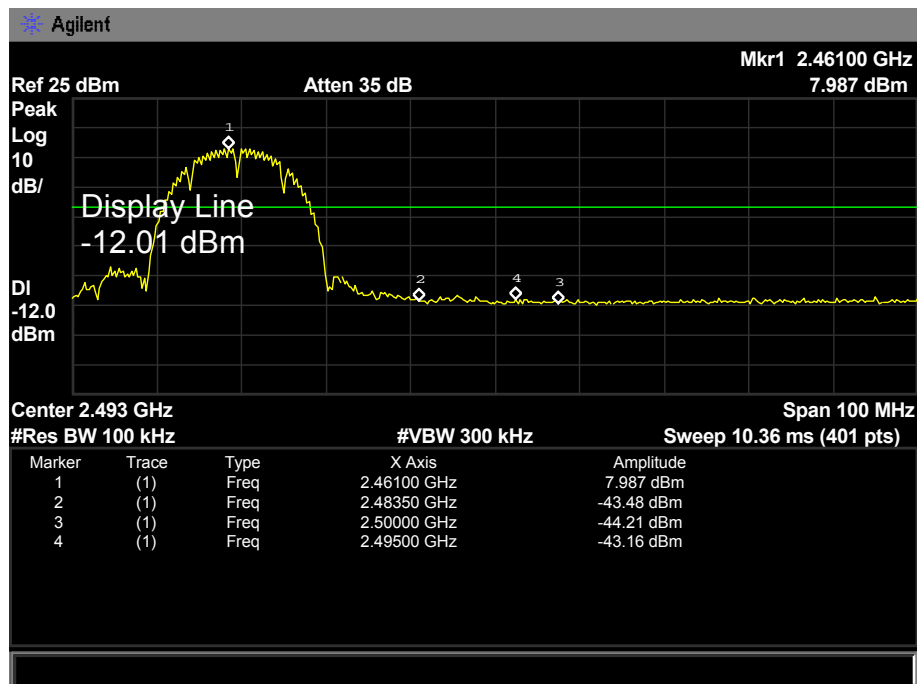
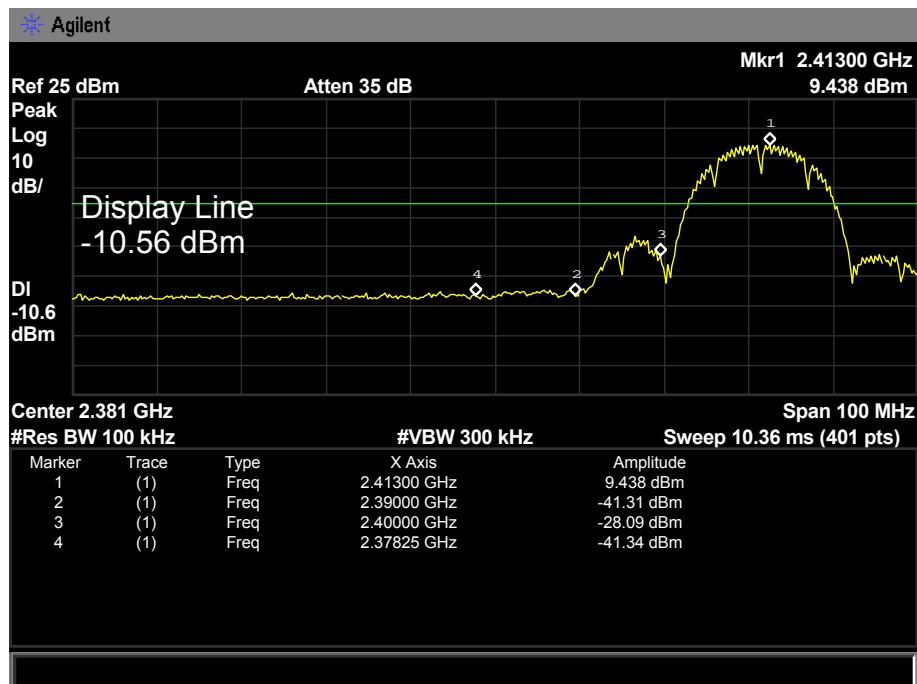


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	*	2453.700	88.67	1.04	89.71	Fundamental Frequency		AVG
2	X	2454.100	99.44	1.04	100.48	Fundamental Frequency		peak
3		2483.500	63.59	1.17	64.76	74.00	-9.24	peak
4		2483.500	44.92	1.17	46.09	54.00	-7.91	AVG

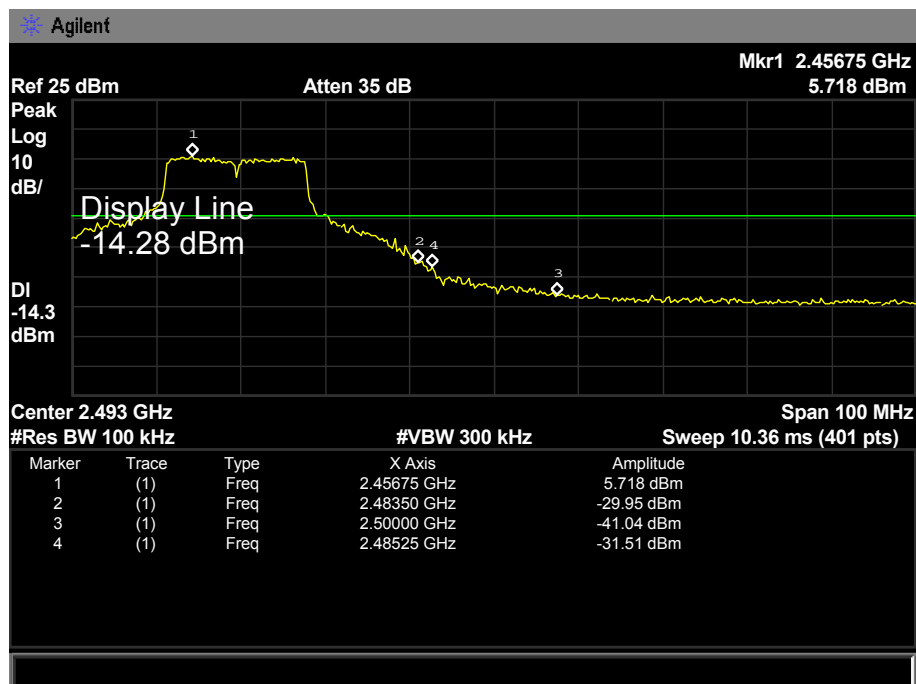
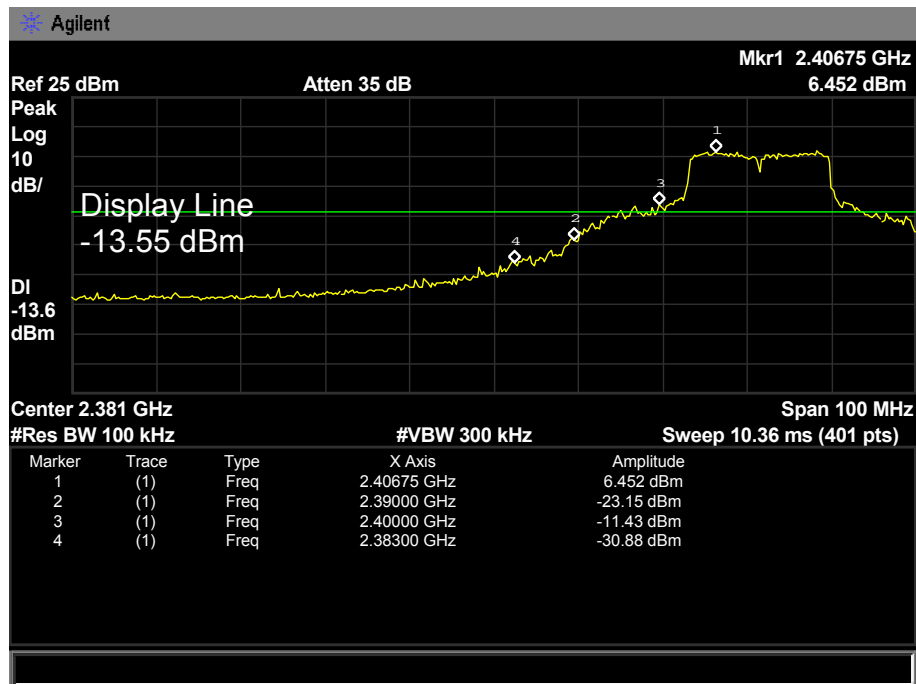
Emission Level= Read Level+ Correct Factor

(2) Conducted Test

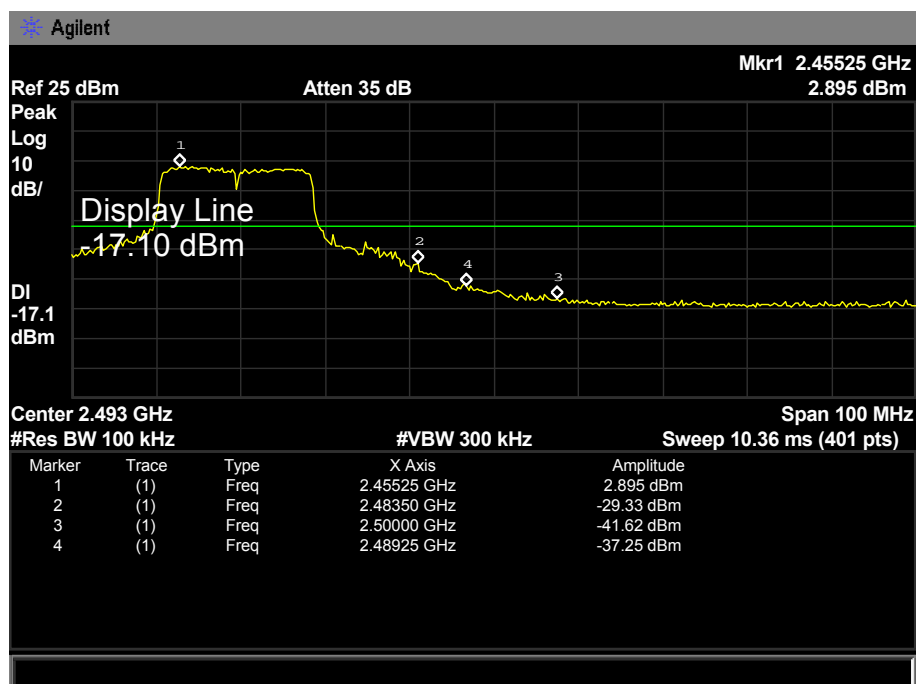
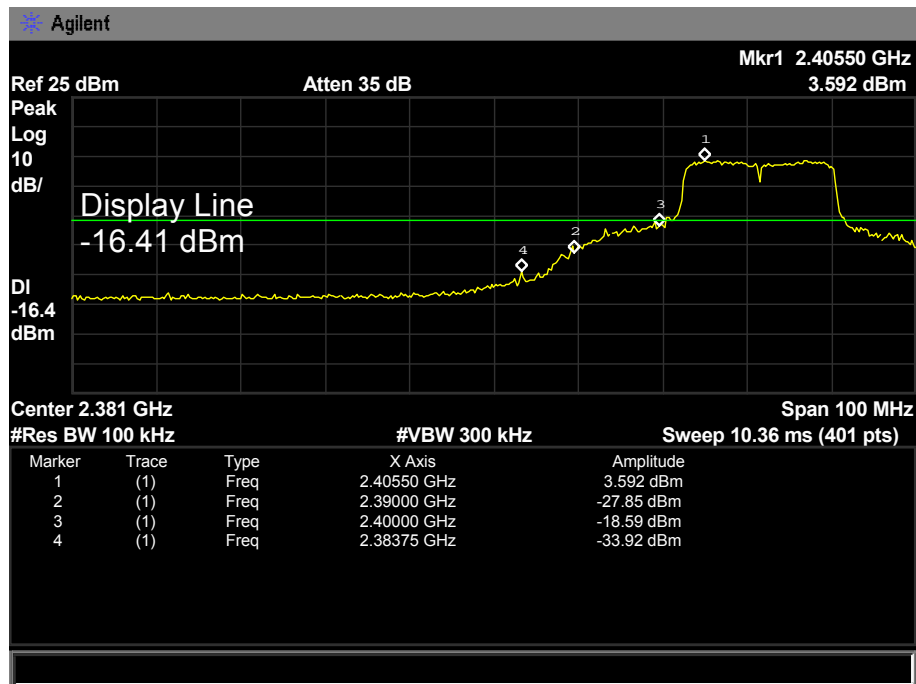
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Test Mode:	TX B Mode 2412MHz / TX B Mode 2462MHz (Antenna 2)		
Remark:	The EUT is programed in continuously transmitting mode		



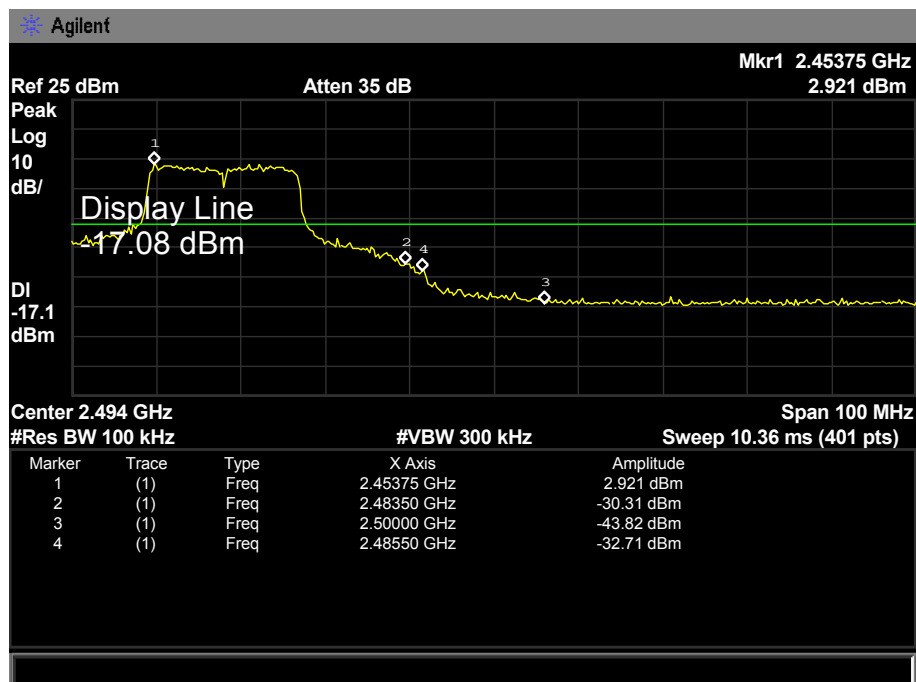
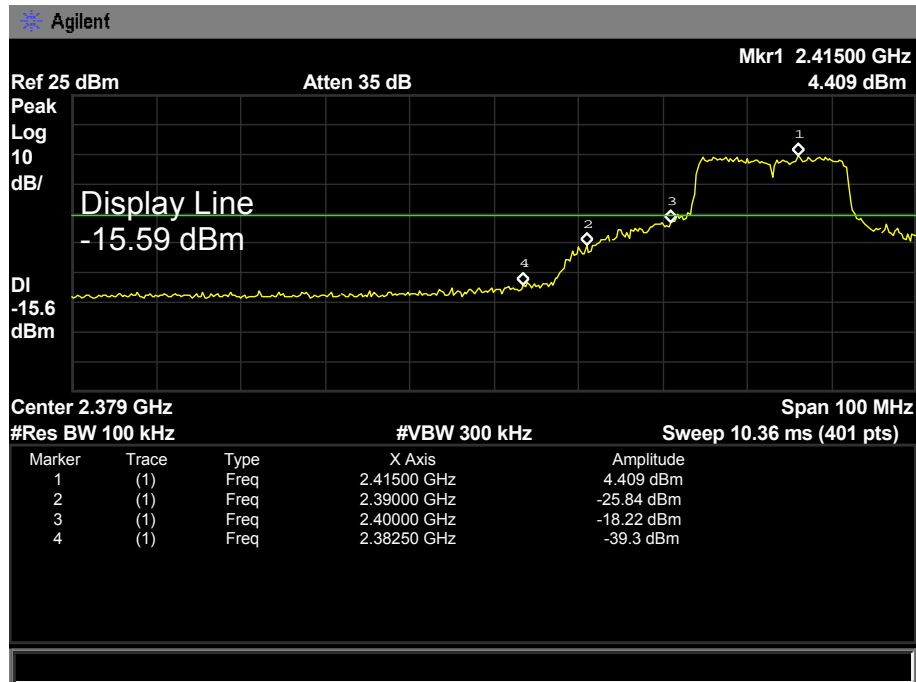
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Test Mode:	TX G Mode 2412MHz / TX G Mode 2462MHz (Antenna 2)		
Remark:	The EUT is programed in continuously transmitting mode		



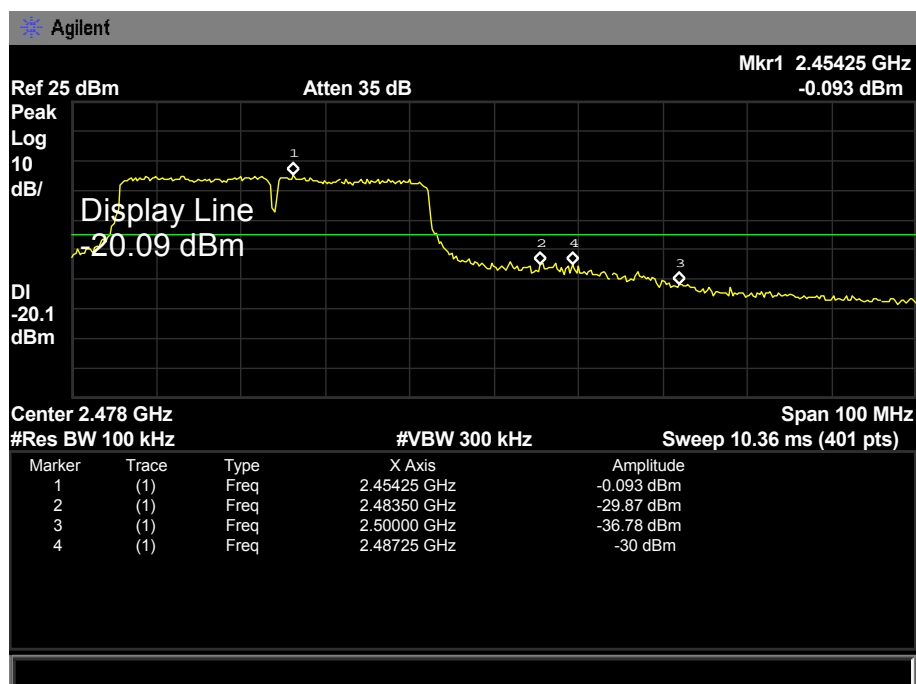
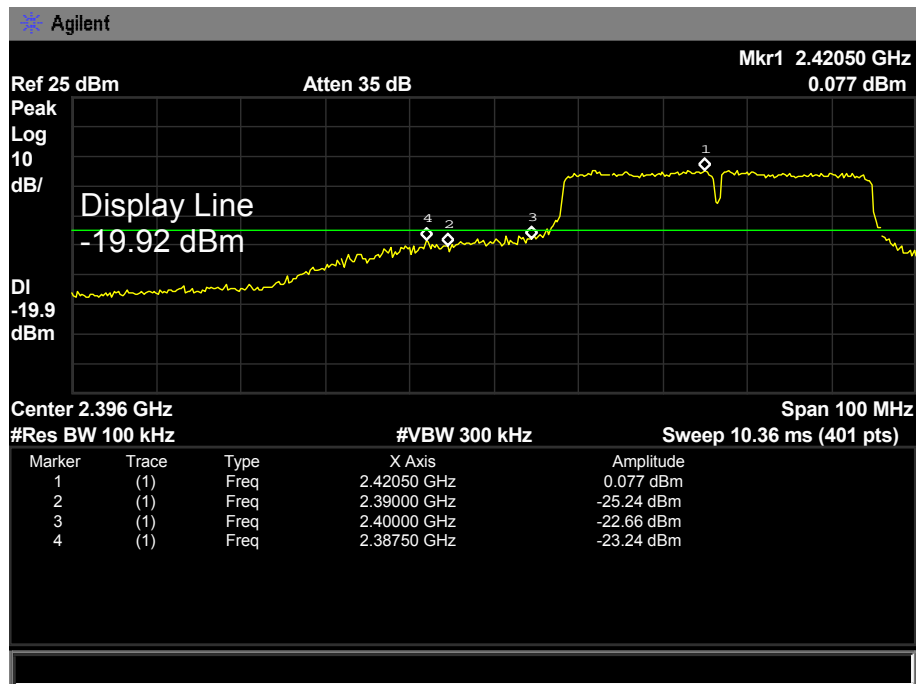
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Test Mode:	TX N(HT20) Mode 2412MHz / TX N(HT20) Mode 2462MHz(Antenna 2)		
Remark:	The EUT is programed in continuously transmitting mode		



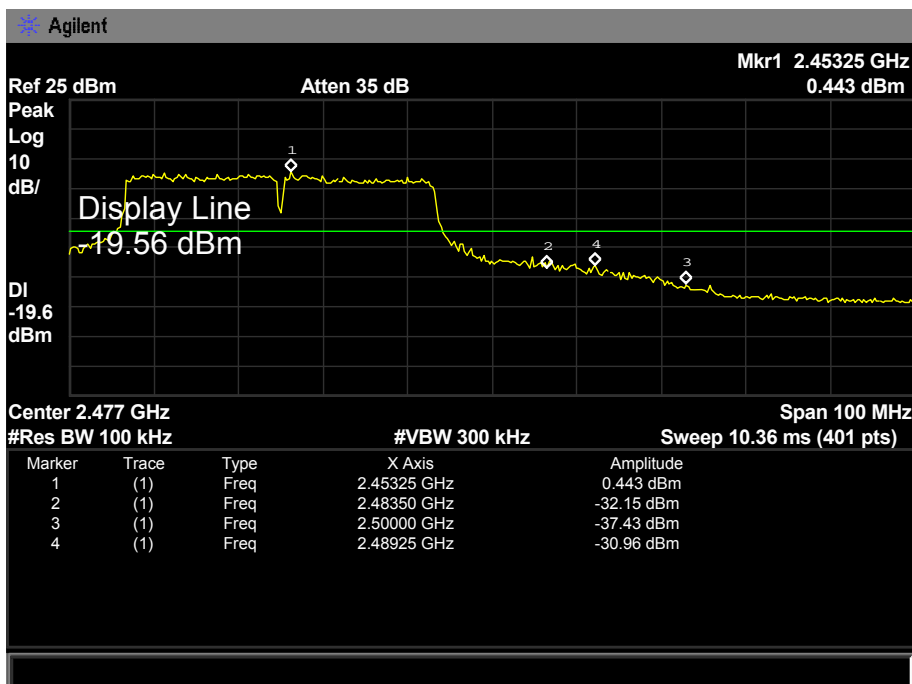
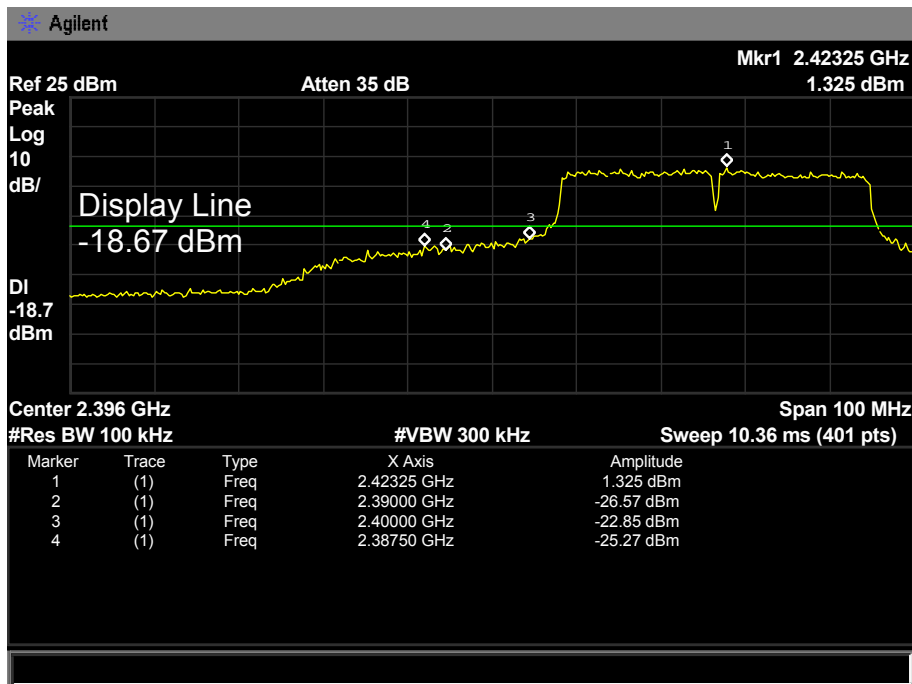
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Test Mode:	TX N(HT20) Mode 2412MHz / TX N(HT20) Mode 2462MHz(Antenna 1)		
Remark:	The EUT is programed in continuously transmitting mode		



EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Test Mode:	TX N(HT40) Mode 2422MHz / TX N(HT40) Mode 2452MHz(Antenna 2)		
Remark:	The EUT is programed in continuously transmitting mode		



EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Test Mode:	TX N(HT40) Mode 2422MHz / TX N(HT40) Mode 2452MHz(Antenna 1)		
Remark:	The EUT is programed in continuously transmitting mode		



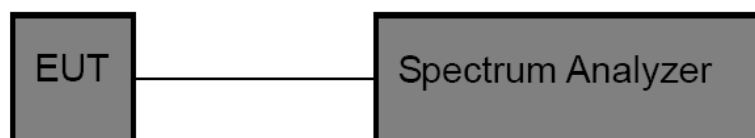
7. Bandwidth Test

7.1 Test Standard and Limit

- 7.1.1 Test Standard
FCC Part 15.247 (a)(2)
- 7.1.2 Test Limit

FCC Part 15 Subpart C(15.247)/RSS-210		
Test Item	Limit	Frequency Range(MHz)
Bandwidth	≥ 500 KHz (6dB bandwidth)	2400~2483.5

7.2 Test Setup



7.3 Test Procedure

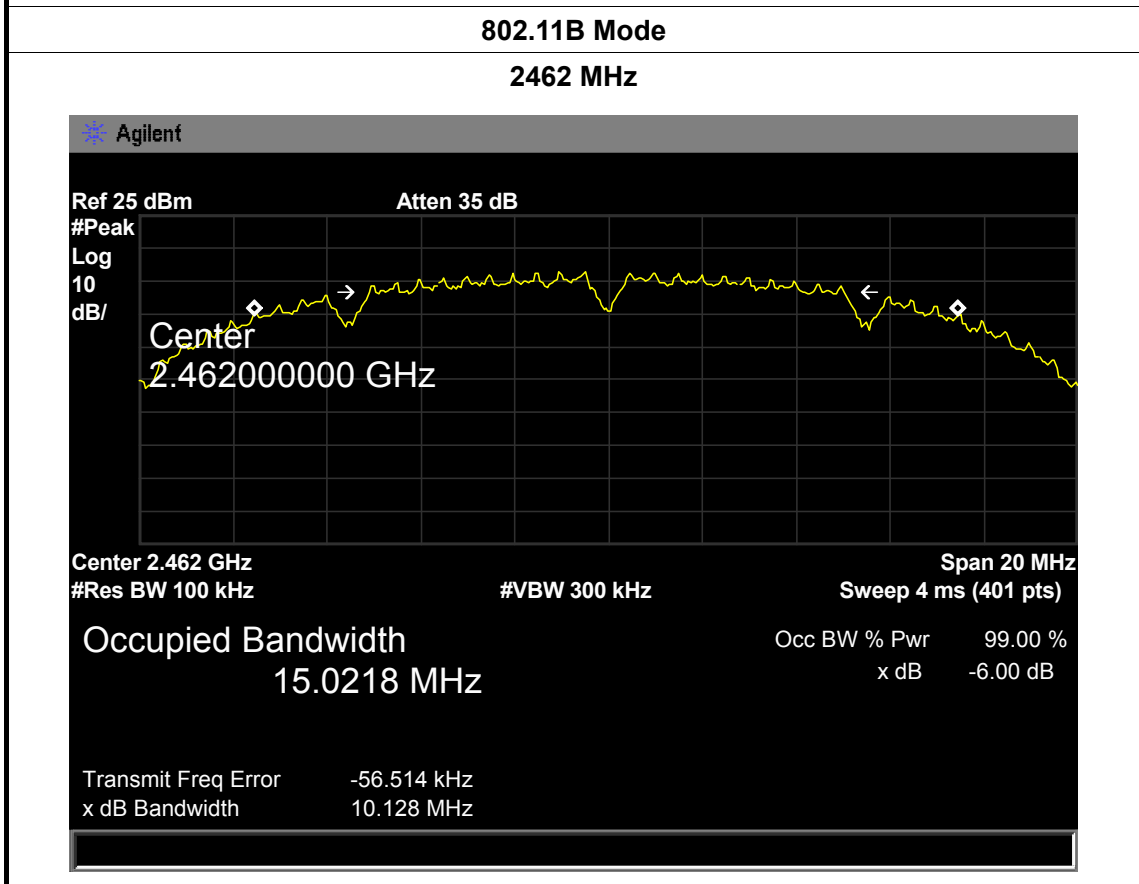
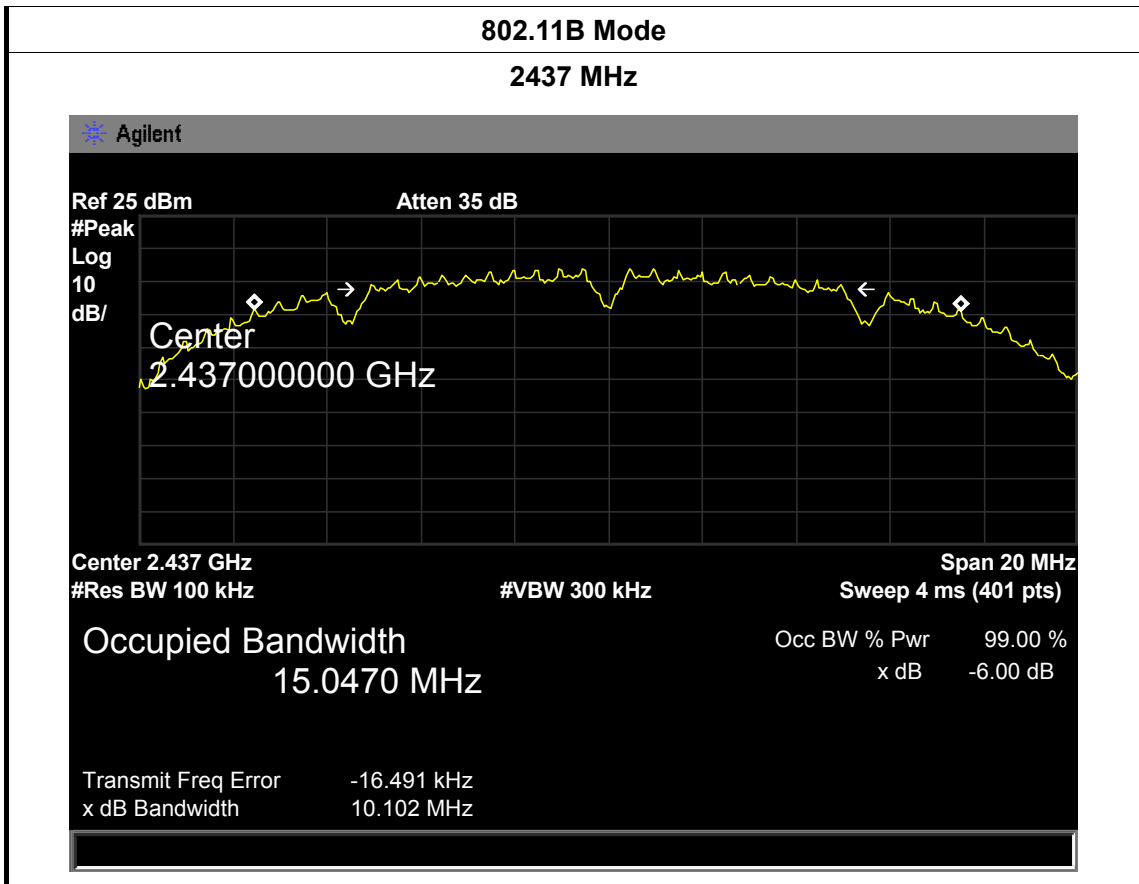
- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) The bandwidth is measured at an amplitude level reduced 6dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst –case (i.e the widest) bandwidth.
- (3) Measure the channel separation the spectrum analyzer was set to Resolution Bandwidth:100 kHz, and Video Bandwidth:300 kHz, Detector: Peak, Sweep Time set auto.

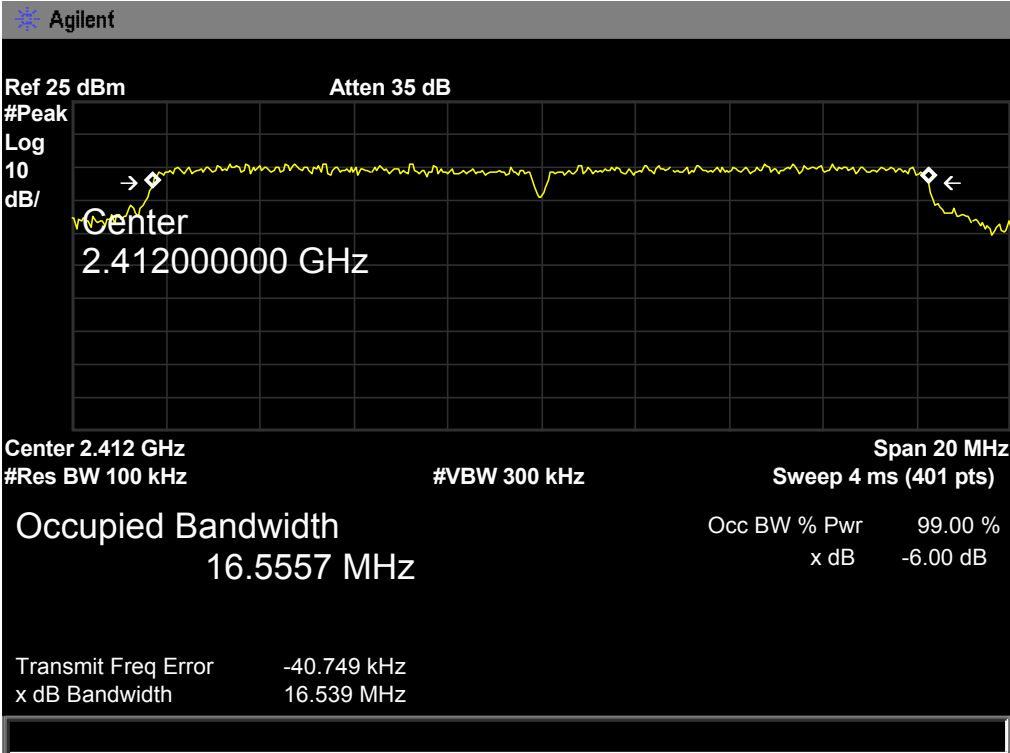
7.4 EUT Operating Condition

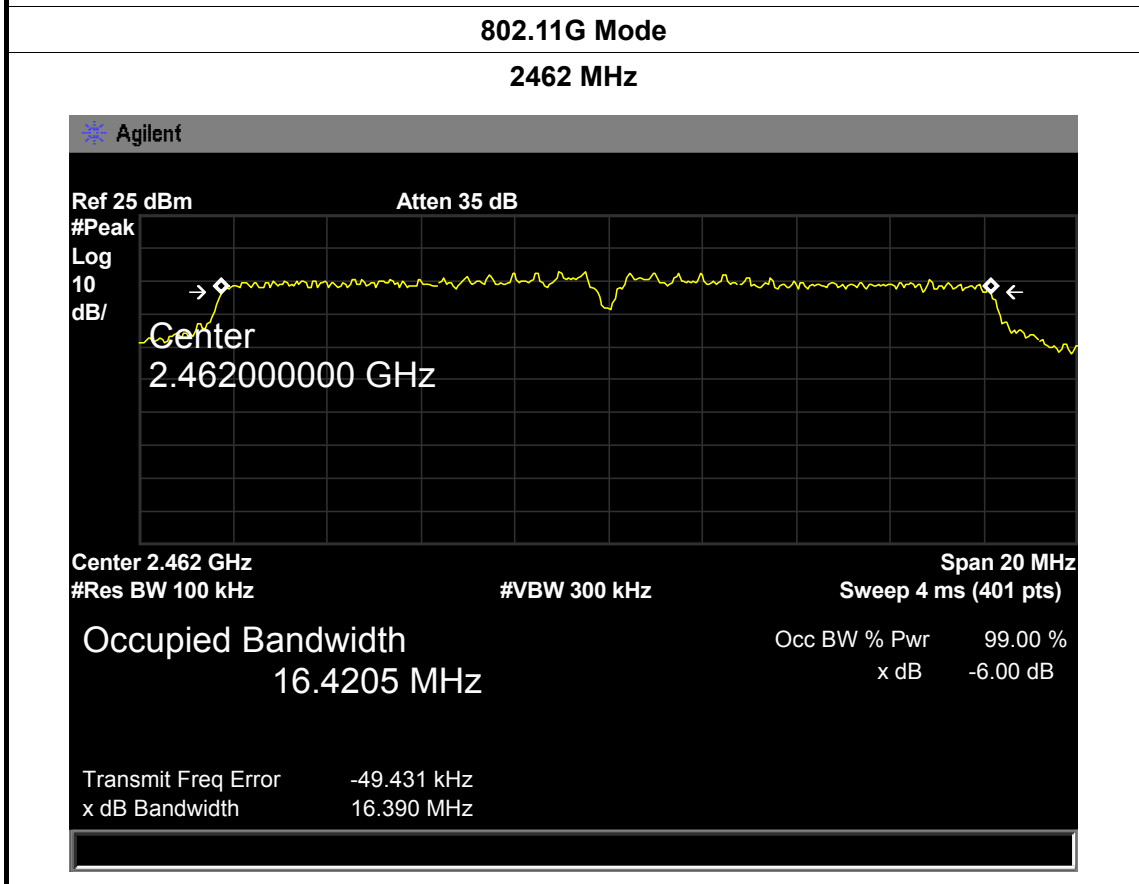
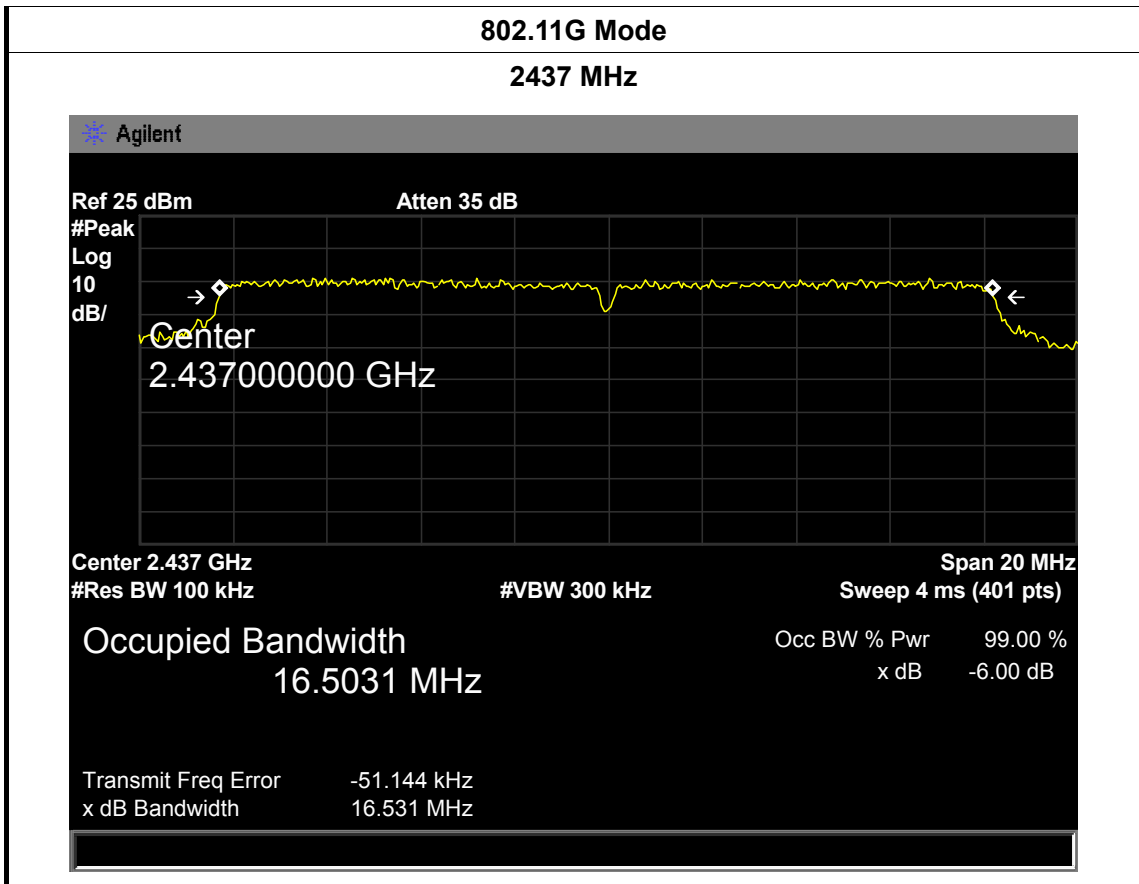
The EUT was set to continuously transmitting in each mode and low, middle and high channel for the test.

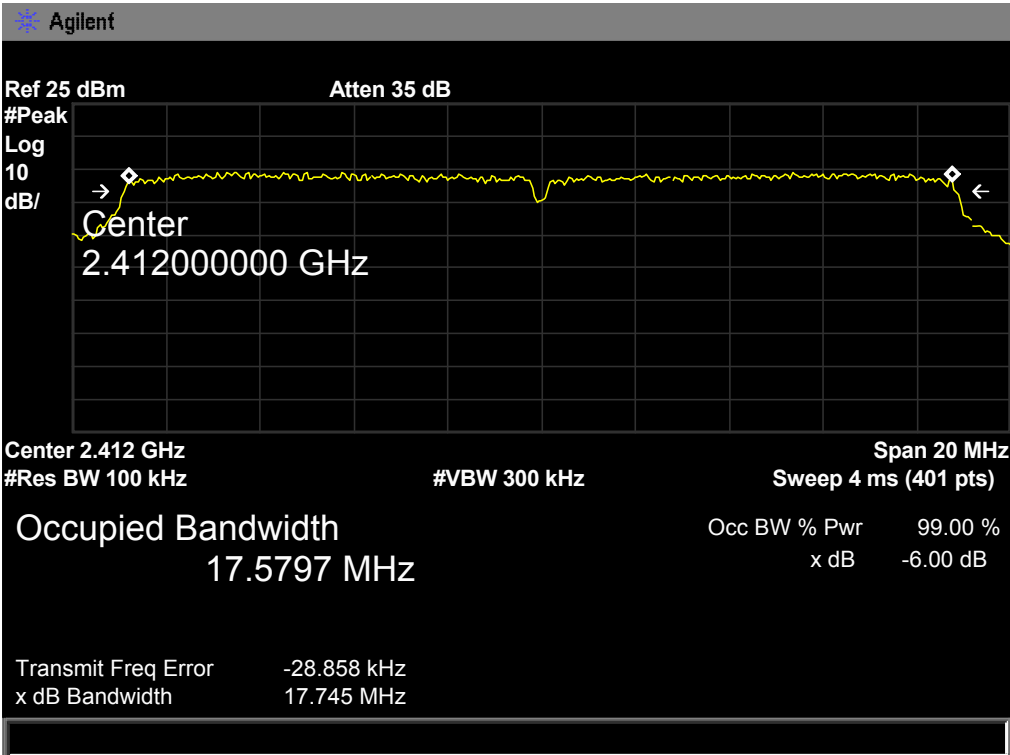
7.5 Test Data

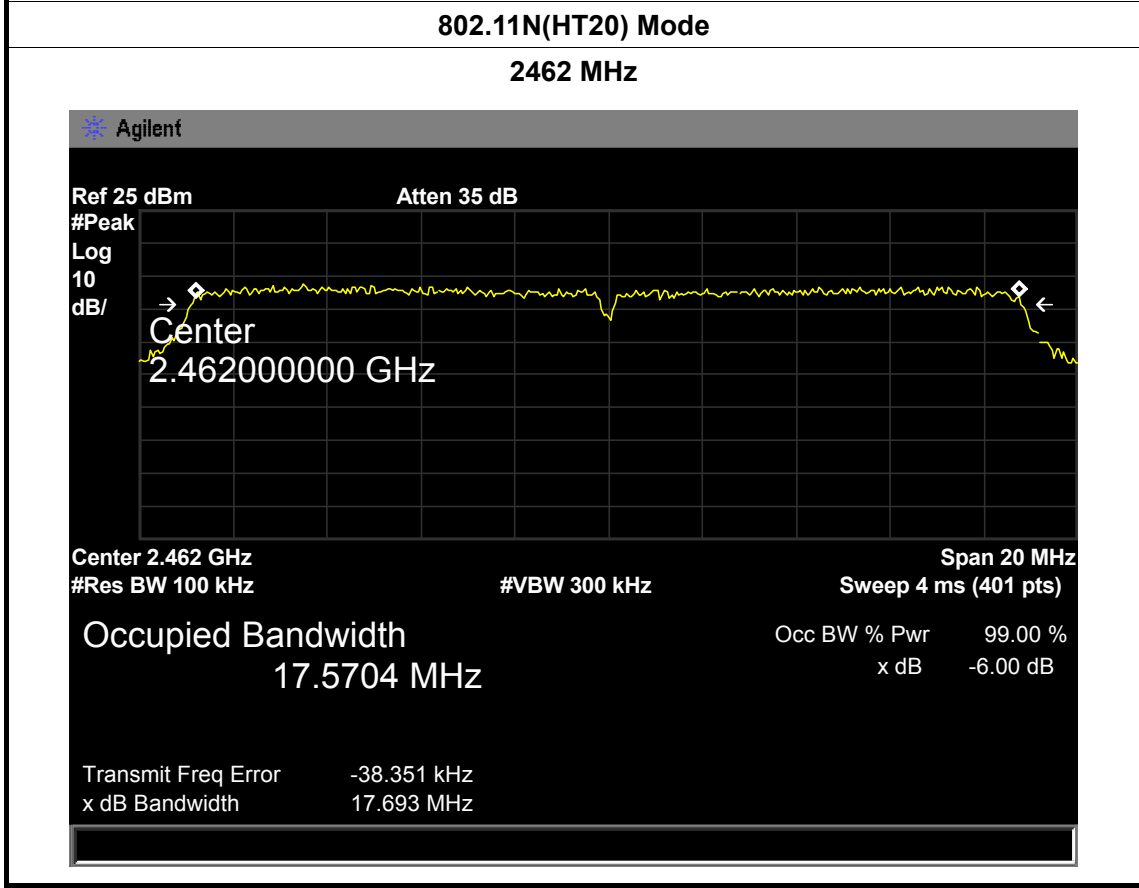
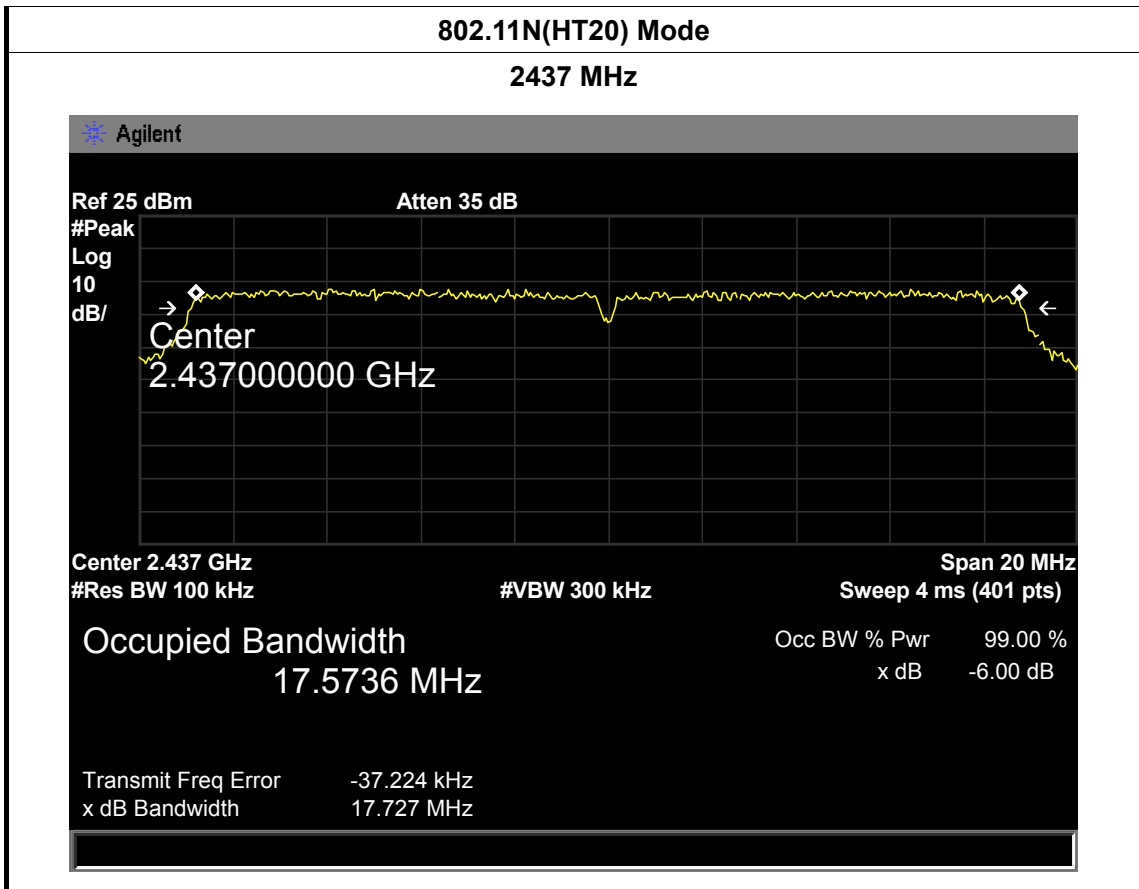
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Test Mode:	TX 802.11B Mode Antenna 2		
Channel frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)
2412	10.138	15.0567	≥0.5
2437	10.102	15.0470	
2462	10.128	15.0218	
802.11B Mode			
2412 MHz			
<p>Agilent Ref 25 dBm Atten 35 dB #Peak Log 10 dB/ Center 2.41200000 GHz Center 2.412 GHz Span 20 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % 15.0567 MHz x dB -6.00 dB Transmit Freq Error 19.588 kHz x dB Bandwidth 10.138 MHz</p>			



EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Test Mode:	TX 802.11G Mode Antenna 2		
Channel frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)
2412	16.539	16.5557	≥0.5
2437	16.531	16.5031	
2462	16.390	16.4205	
802.11G Mode			
2412 MHz			
			



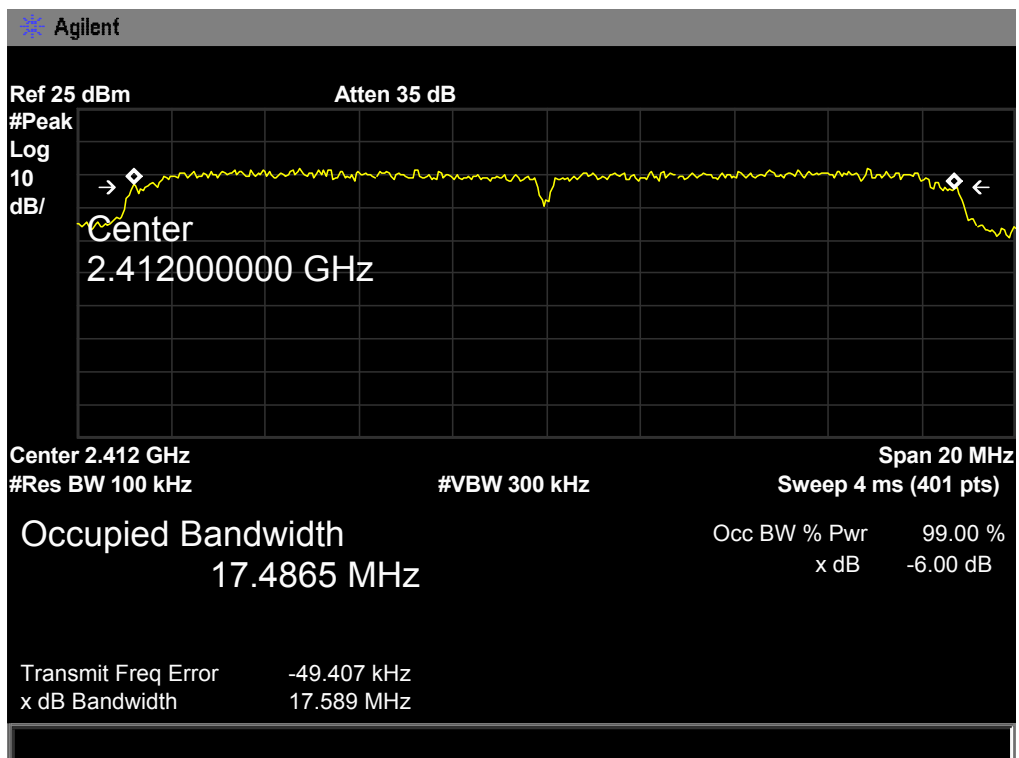
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Test Mode:	TX 802.11N(HT20) Mode Antenna 2		
Channel frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)
2412	17.745	17.5797	≥0.5
2437	17.727	17.5736	
2462	17.693	17.5704	
802.11N(HT20) Mode			
2412 MHz			
 <p>Agilent</p> <p>Ref 25 dBm Atten 35 dB</p> <p>#Peak</p> <p>Log</p> <p>10 dB/</p> <p>Center 2.41200000 GHz</p> <p>Center 2.412 GHz Span 20 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 4 ms (401 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p>17.5797 MHz x dB -6.00 dB</p> <p>Transmit Freq Error -28.858 kHz</p> <p>x dB Bandwidth 17.745 MHz</p>			

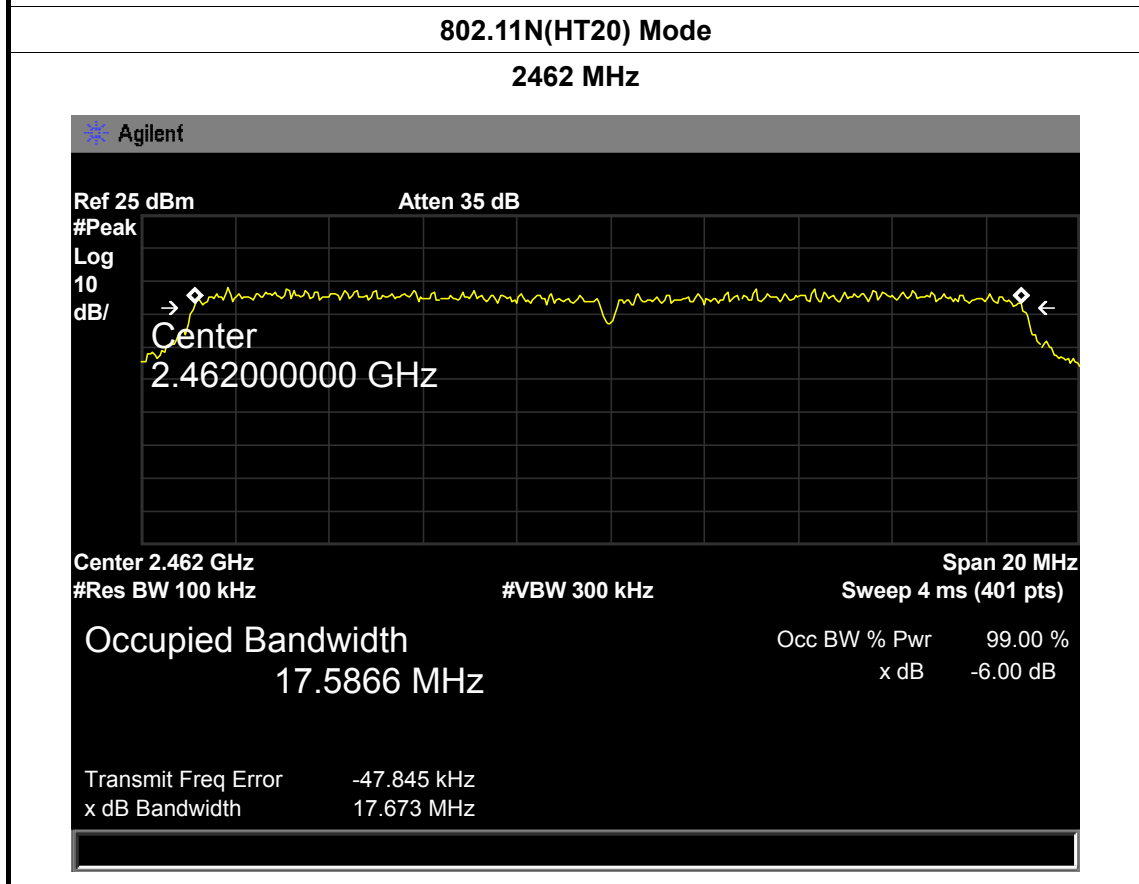
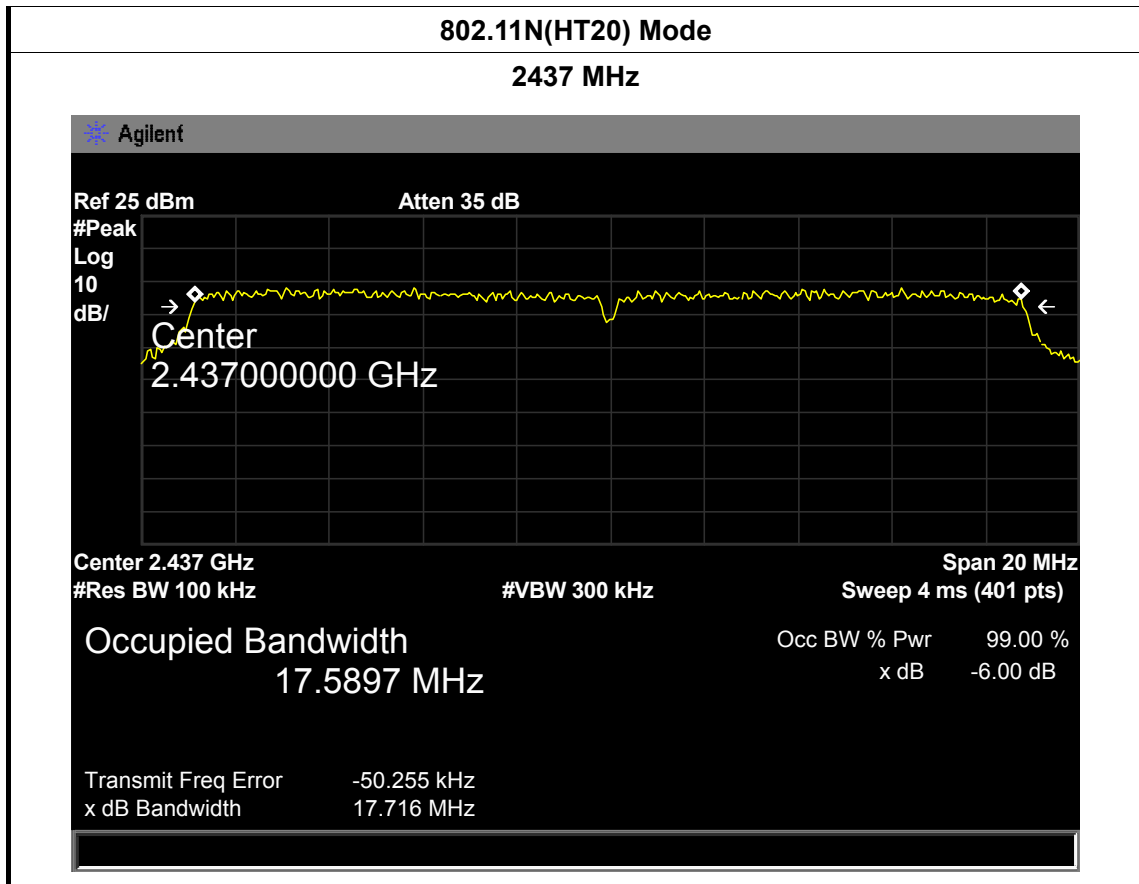


EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Test Mode:	TX 802.11N(HT20) Mode Antenna 1		
Channel frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)
2412	17.589	17.4865	>=0.5
2437	17.716	17.5897	
2462	17.673	17.5866	

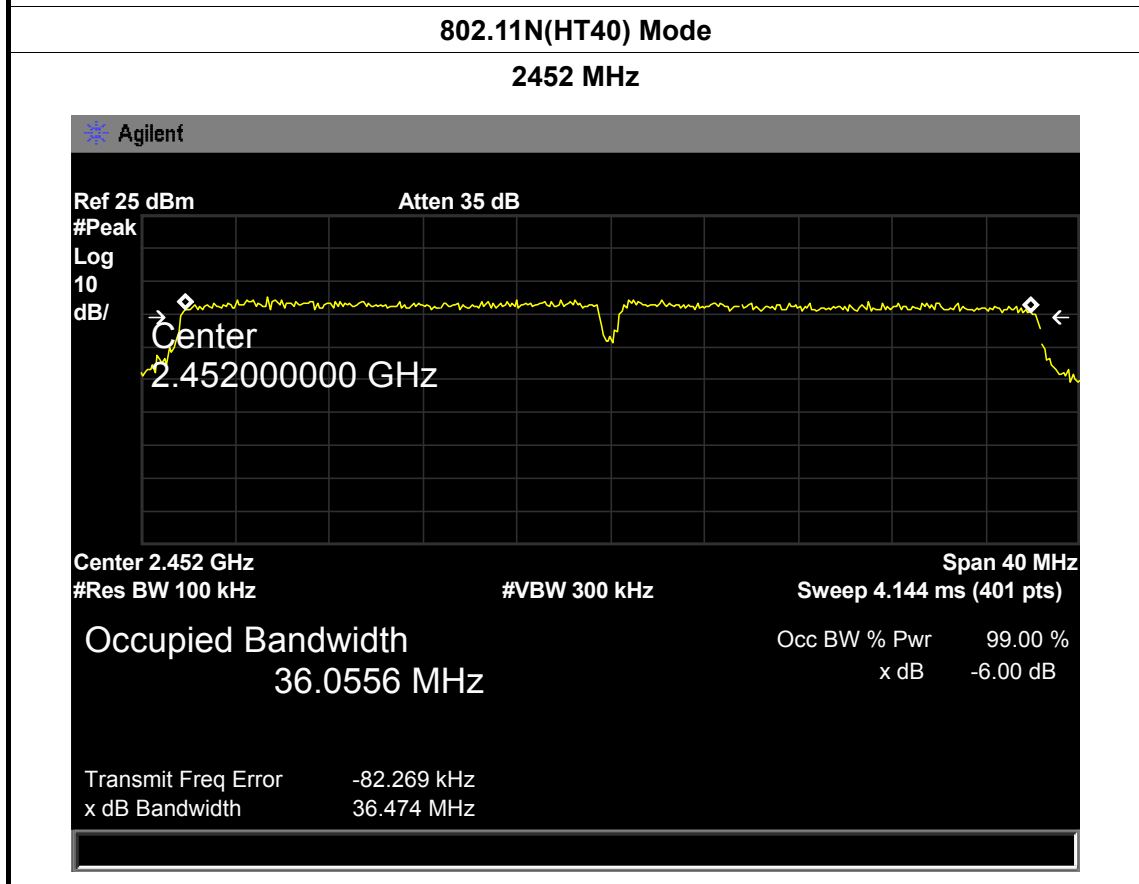
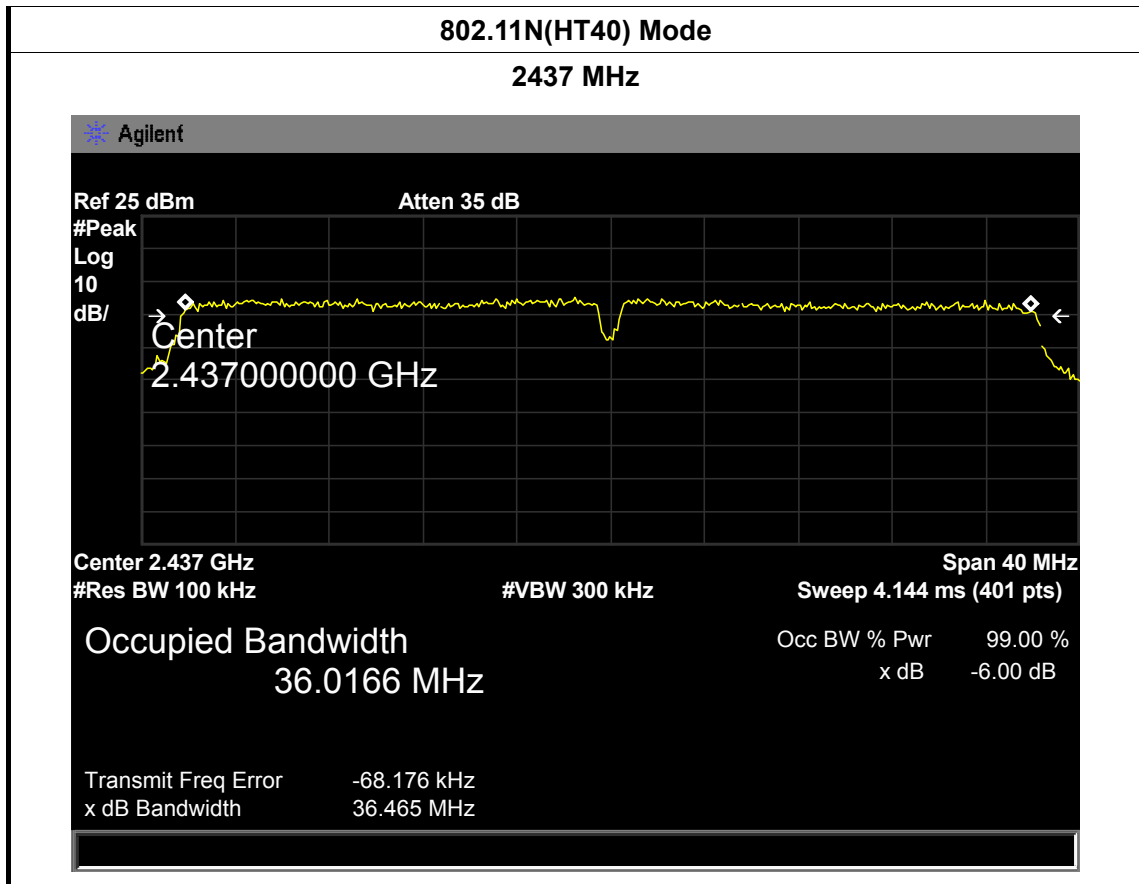
802.11N(HT20) Mode

2412 MHz





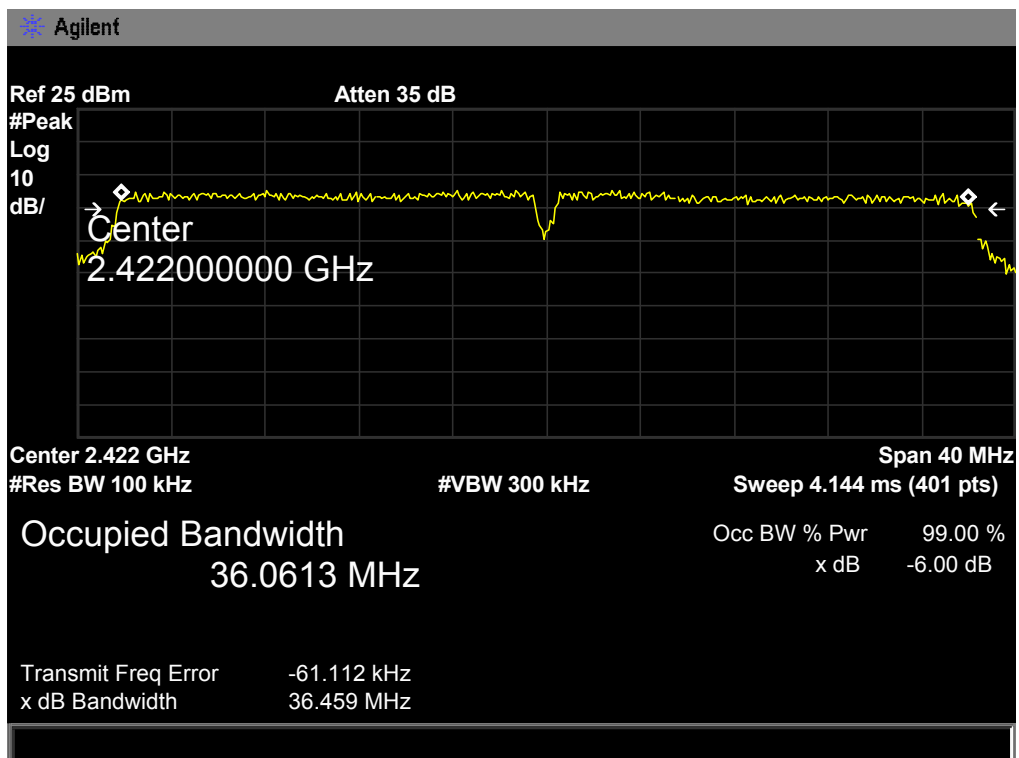
EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Test Mode:	TX 802.11N(HT40) Mode Antenna 2		
Channel frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)
2422	36.438	36.0244	>=0.5
2437	36.465	36.0166	
2452	36.474	36.0556	
802.11N(HT40) Mode			
2422 MHz			
<p>Agilent</p> <p>Ref 25 dBm Atten 35 dB</p> <p>#Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Center 2.42200000 GHz</p> <p>Center 2.422 GHz Span 40 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 4.144 ms (401 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p>36.0244 MHz x dB -6.00 dB</p> <p>Transmit Freq Error -52.504 kHz</p> <p>x dB Bandwidth 36.438 MHz</p>			

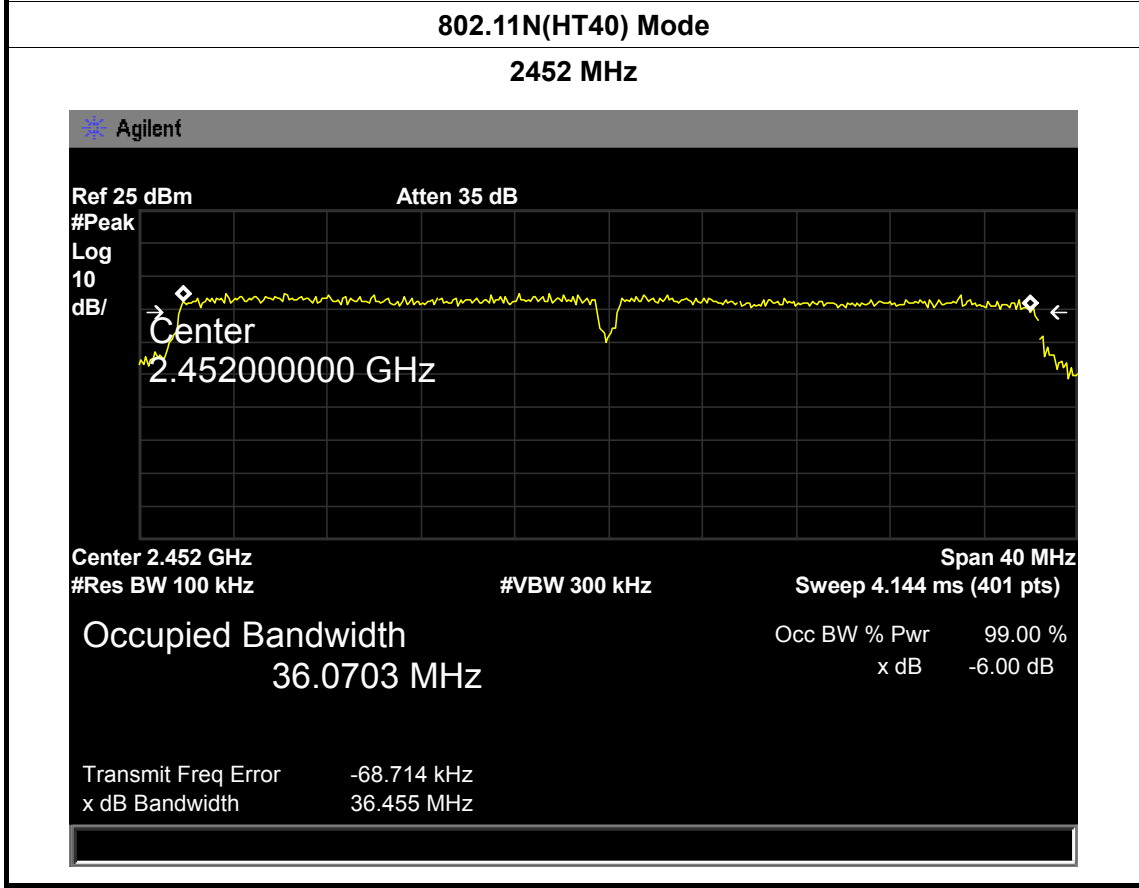
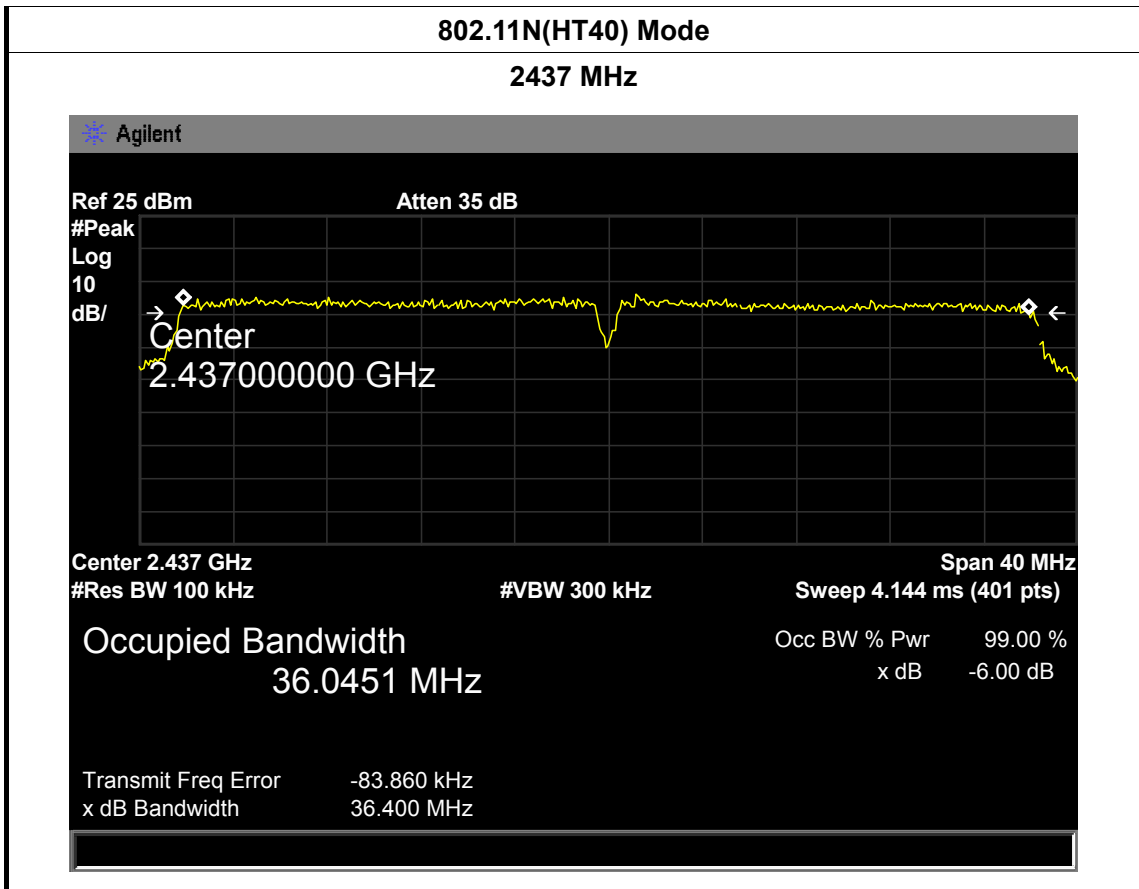


EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model:	SBRT8812AUA
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 5V		
Test Mode:	TX 802.11N(HT40) Mode Antenna 1		
Channel frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)
2422	36.459	36.0613	>=0.5
2437	36.400	36.0451	
2452	36.455	36.0703	

802.11N(HT40) Mode

2422 MHz





8. Peak Output Power Test

8.1 Test Standard and Limit

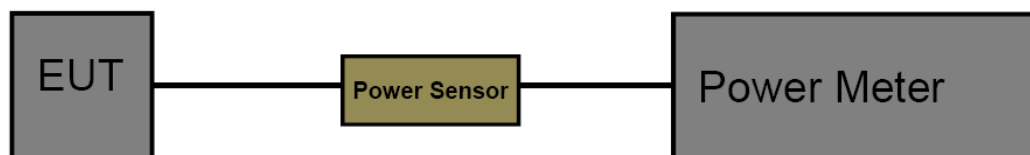
8.1.1 Test Standard

FCC Part 15.247 (b)

8.1.2 Test Limit

FCC Part 15 Subpart C(15.247)/RSS-210		
Test Item	Limit	Frequency Range(MHz)
Peak Output Power	1 Watt or 30 dBm	2400~2483.5

8.2 Test Setup



8.3 Test Procedure

The measurement is according to section 9.1.2 of KDB 558074 D01 DTS Meas Guidance v03r02.

The EUT was connected to RF power meter via a broadband power sensor as show the block above. The power sensor video bandwidth is greater than or equal to the DTS bandwidth of the equipment.

8.4 EUT Operating Condition

The EUT was set to continuously transmitting in the max power during the test.

8.5 Test Data

EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model Name :	SBRT8812AUA			
Temperature:	25 °C	Relative Humidity:	55%			
Test Voltage:	DC 5V					
Test Mode	Frequency (MHz)	Test Data				Limit (dBm)
		ANT 2 (dBm)	ANT 1 (dBm)	Duty Factor (dB)	Total Power (dBm)	
802.11b	2412	22.71		0	22.71	30
	2437	22.19		0	22.19	
	2462	21.51		0	21.51	
802.11g	2412	26.69		0	26.69	
	2437	26.34		0	26.34	
	2462	26.65		0	26.65	
802.11n (HT20)	2412	23.40	23.88	0	26.66	29.24
	2437	23.02	23.00	0	26.02	
	2462	23.40	23.35	0	26.39	
802.11n (HT40)	2422	23.91	23.12	0	26.54	
	2437	23.55	23.70	0	26.64	
	2452	23.30	23.36	0	26.34	
Result: PASS						
<p>Note: When ANT1 and ANT2 transmitting simultaneously, the total Antenna Gain=Gain 1+Gani 2=6.76 dBi> 6 dBi.</p> <p>So $P_{out} = P_{limit} - (G_{TX} - 6) = 30 - 0.76 = 29.24$</p>						

9. Power Spectral Density Test

9.1 Test Standard and Limit

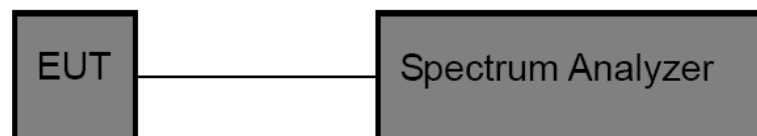
9.1.1 Test Standard

FCC Part 15.247 (e)

9.1.2 Test Limit

FCC Part 15 Subpart C(15.247)		
Test Item	Limit	Frequency Range(MHz)
Power Spectral Density	8dBm(in any 3 kHz)	2400~2483.5

9.2 Test Setup



9.3 Test Procedure

The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v03r02.

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Set analyser center frequency to DTS channel center frequency.
- (3) Set the span to 1.5 times the DTS bandwidth.
- (4) Set the RBW to: 3 kHz
- (5) Set the VBW to: 10 kHz
- (6) Detector: peak
- (7) Sweep time: auto
- (8) Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

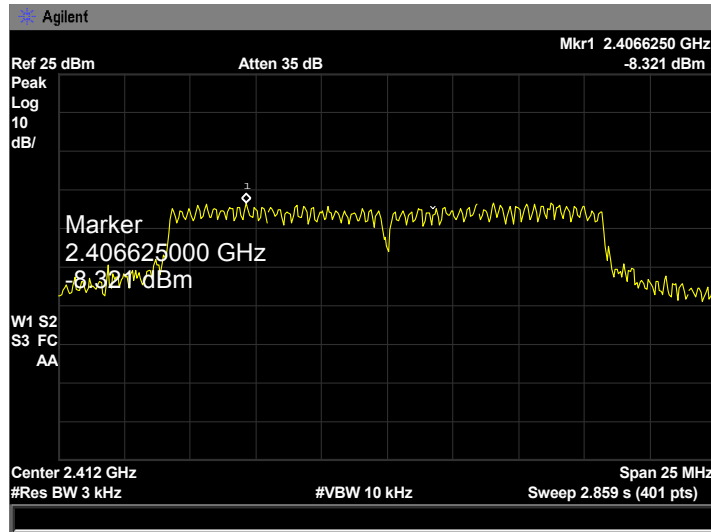
9.4 EUT Operating Condition

The EUT was set to continuously transmitting in each mode and low, middle and high channel for the test.

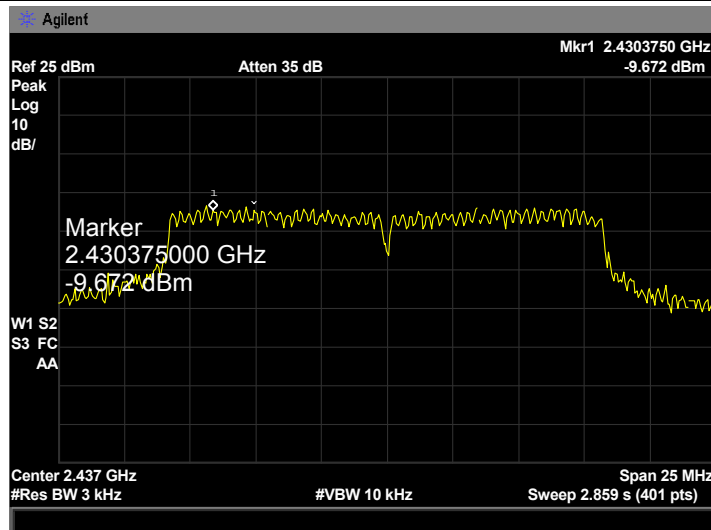
9.5 Test Data

EUT:	ScreenBeam 802.11 a/b/g/n/ac WiFi Module	Model Name :	SBRT8812AUA			
Temperature:	25 °C	Relative Humidity:	55%			
Test Voltage:	DC 5V					
U-NII-1						
Test Mode	Frequency (MHz)	Test Data				Limit (dBm)
		ANT 2 (dBm)	ANT 1 (dBm)	Duty Factor (dB)	Total Power (dBm)	
802.11b	2412	-10.38		0	-10.38	8
	2437	-10.55		0	-10.55	
	2462	-11.46		0	-11.46	
802.11g	2412	-8.321		0	-8.321	
	2437	-9.672		0	-9.672	
	2462	-10.00		0	-10.00	
802.11n (HT20)	2412	-10.73	-12.57	0	-9.34	7.24
	2437	-11.70	-12.35	0	-9.12	
	2462	-13.15	-13.60	0	-9.47	
802.11n (HT40)	2422	-14.30	-13.37	0	-10.86	
	2437	-14.88	-14.62	0	-10.39	
	2462	-15.29	-14.69	0	-12.13	
Result: PASS						
Note: When ANT1 and ANT2 transmitting simultaneously, the total Antenna Gain=Gain 1+Gani 2=6.76 dBi> 6 dBi. So $P_{out} = P_{limit} - (G_{TX} - 6) = 8 - 0.76 = 7.24$						
Test plots please refer to below pages:						

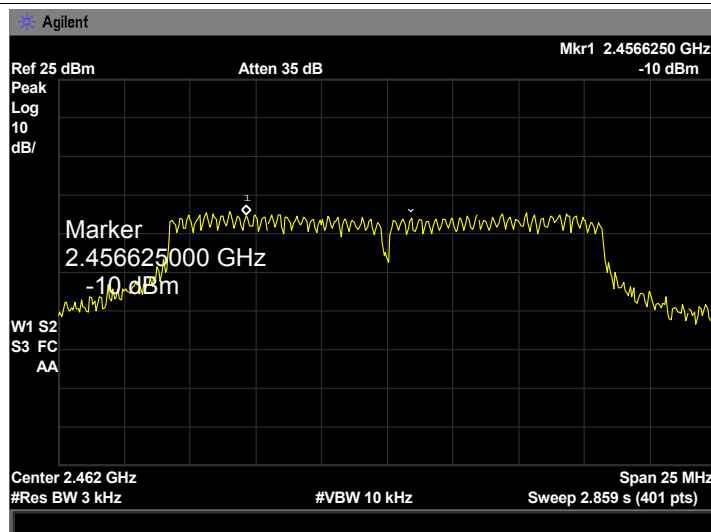
802.11 g 2412 MHz (ANT 2)



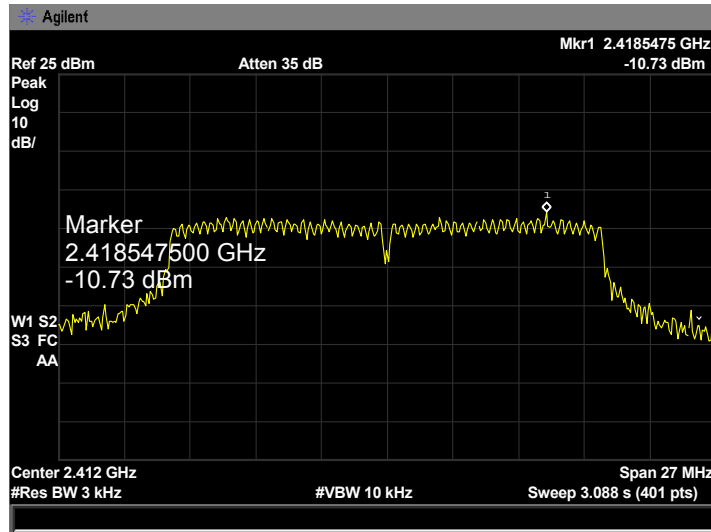
802.11 g 2437 MHz (ANT 2)



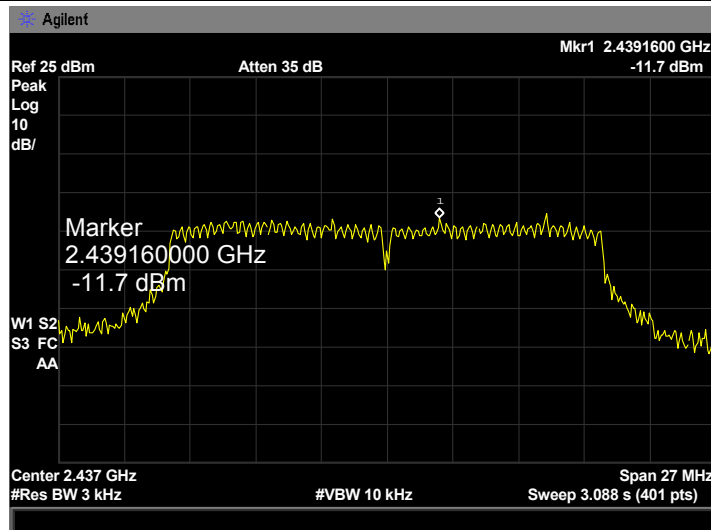
802.11 g 2462MHz (ANT 2)



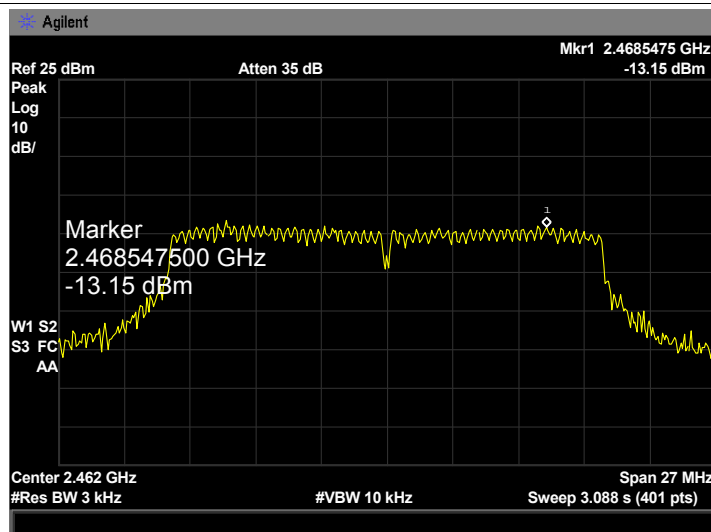
802.11 n(HT20) 2412 MHz (ANT 2)



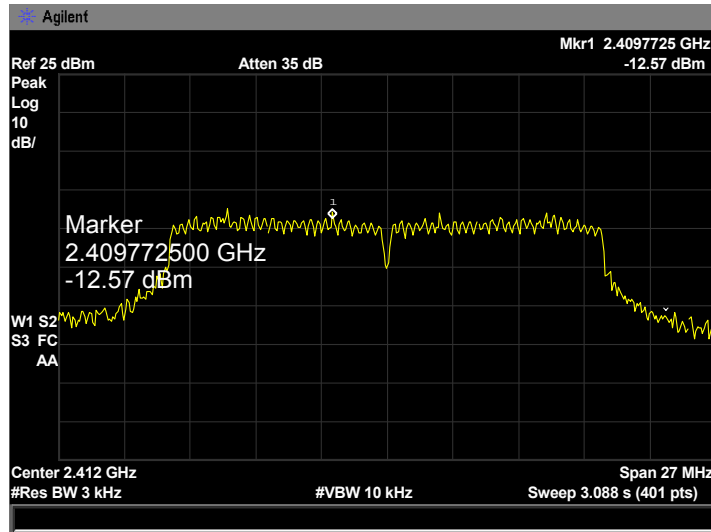
802.11 n(HT20) 2437 MHz (ANT 2)



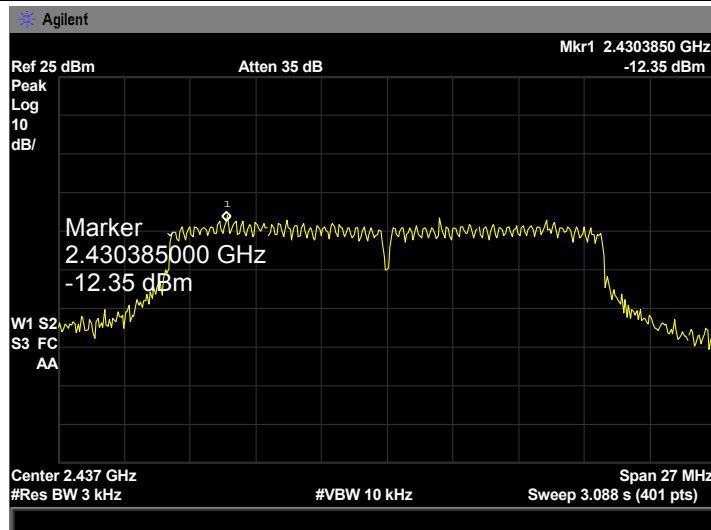
802.11 n(HT20) 2462MHz (ANT 2)



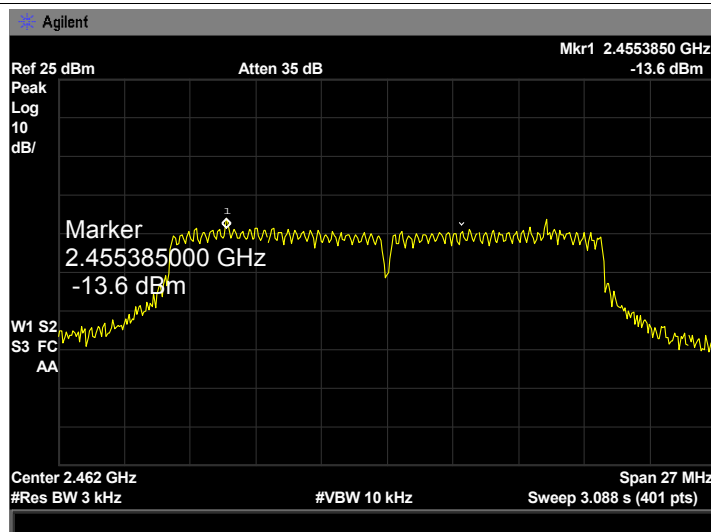
802.11 n(HT20) 2412 MHz (ANT 1)



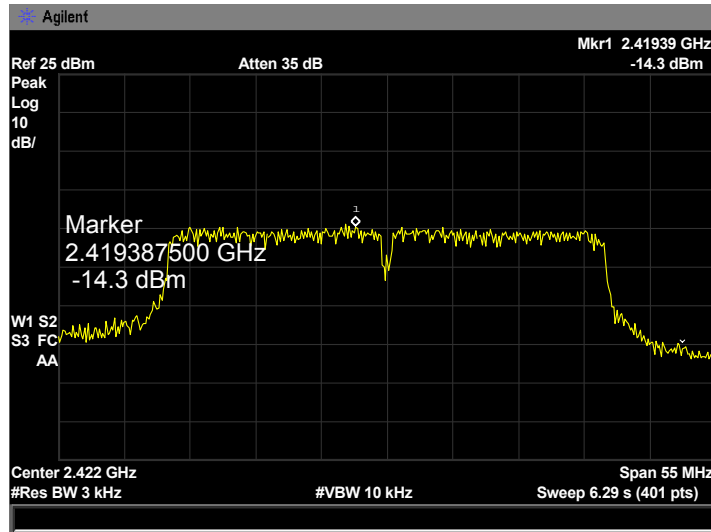
802.11 n(HT20) 2437 MHz (ANT 1)



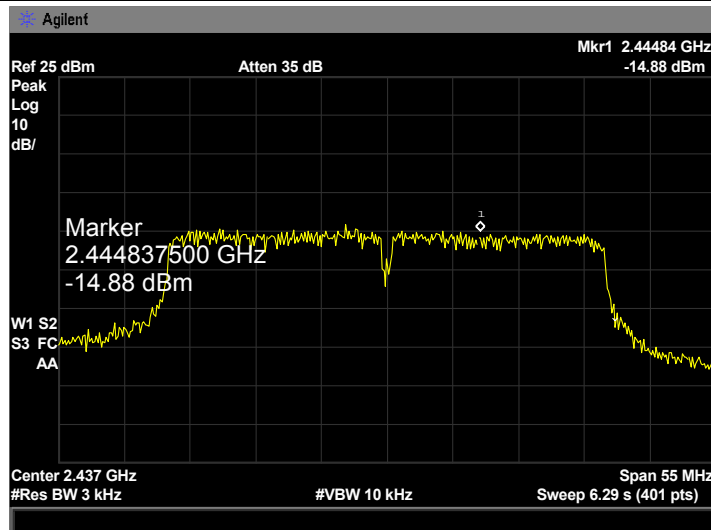
802.11 n(HT20) 2462MHz (ANT 1)



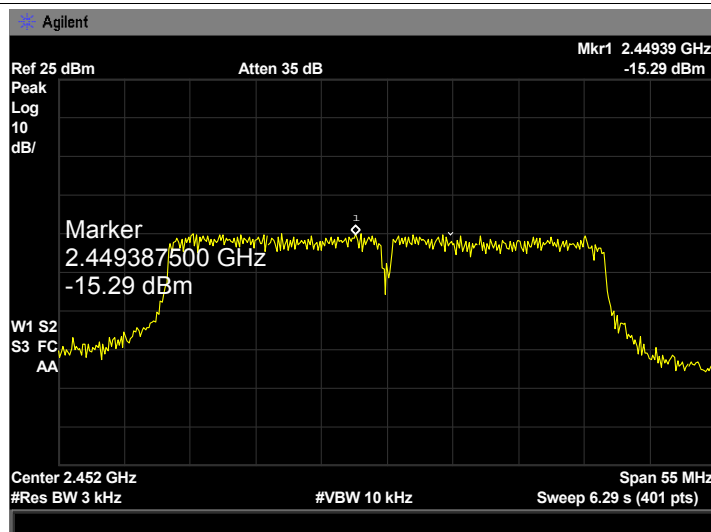
802.11 n(HT40) 2422 MHz (ANT 1)



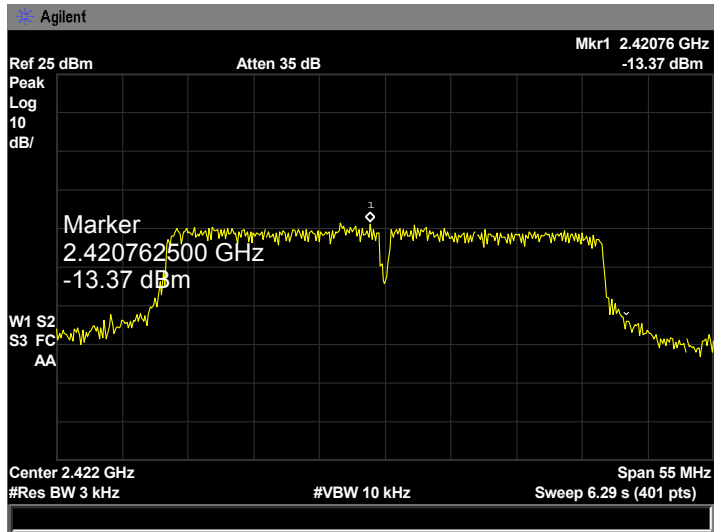
802.11 n(HT40) 2437 MHz (ANT 1)



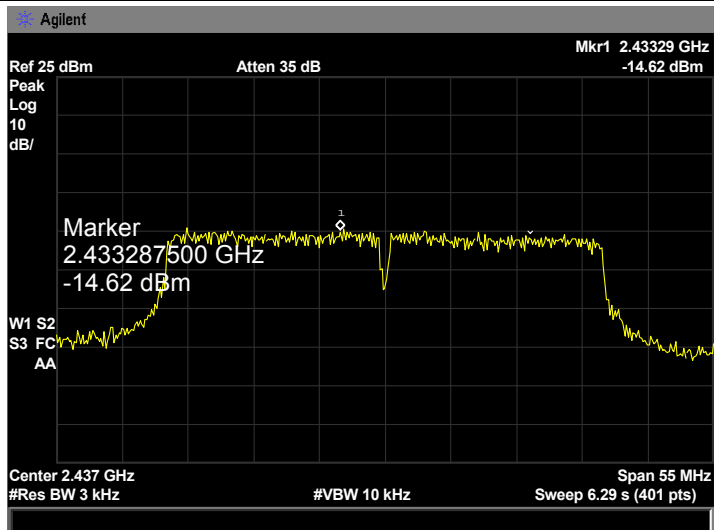
802.11 n(HT40) 2452MHz (ANT 1)



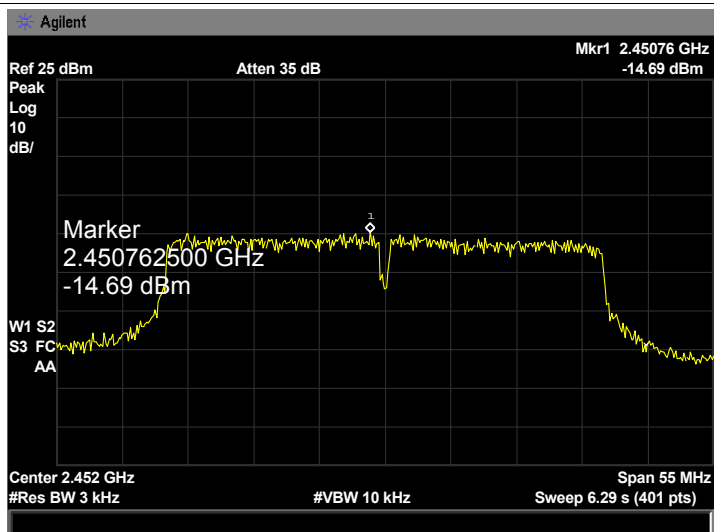
802.11 n(HT40) 2422 MHz (ANT 1)



802.11 n(HT40) 2437 MHz (ANT 1)



802.11 n(HT40) 2452MHz (ANT 1)



10. Antenna Requirement

10.1 Standard Requirement

10.1.1 Standard

FCC Part 15.203

10.1.2 Requirement

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

10.2 Antenna Connected Construction

The directional gains of the antenna used for transmitting is 3.94dBi, and the antenna de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

10.3 Result

The EUT antennas are Embedded Antenna. It complies with the standard requirement.

Antenna Type
<input checked="" type="checkbox"/> Permanent attached antenna
<input type="checkbox"/> Unique connector antenna
<input type="checkbox"/> Professional installation antenna