

**CFR 47 FCC PART 15 SUBPART E
ISED RSS-247 ISSUE 3**

CERTIFICATION TEST REPORT

ISEFY

MODEL NUMBER: SC668W

PROJECT NUMBER: 4791532994.10

REPORT NUMBER: 4791532994.10-2

FCC ID: 2BF8I-SC668W

IC: 32415-SC668W

ISSUE DATE: Nov. 22, 2024

Prepared for

ISEFY TECHNOLOGY

Prepared by

UL-CCIC COMPANY LIMITED

No. 2, Chengwan Road, Suzhou Industrial Park, People's Republic of China

Tel: +86 512-6808 6400

Fax: +86 512-6808 4099

Website: www.ul.com

Revision History

Rev.	Issue Date	Revisions	Revised By
V0	11/22/2024	Initial Issue	

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	4
2. TEST METHODOLOGY	6
3. FACILITIES AND ACCREDITATIO	6
4. CALIBRATION AND UNCERTAINTY	7
4.1. MEASURING INSTRUMENT CALIBRATION	7
4.2. MEASUREMENT UNCERTAINTY	7
5. EQUIPMENT UNDER TEST	8
5.1. DESCRIPTION OF EUT	8
5.2. MAXIMUM OUTPUT POWER	9
5.3. CHANNEL LIST	10
5.4. TEST CHANNEL CONFIGURATION	11
5.5. POWER GRADE	12
5.6. DESCRIPTION OF AVAILABLE ANTENNAS	16
5.7. THE WORSE CASE POWER SETTING PARAMETER	17
5.8. DESCRIPTION OF TEST SETUP	20
5.9. MEASURING INSTRUMENT AND SOFTWARE USED	21
6. ANTENNA PORT TEST RESULTS	22
6.1. ON TIME AND DUTY CYCLE	22
6.2. 6/26 dB EMISSION BANDWIDTH AND 99% OCCUPIED BANDWIDTH	26
6.3. MAXIMUM CONDUCTED AVERAGE OUTPUT POWER	100
6.4. POWER SPECTRAL DENSITY	137
7. RADIATED TEST RESULTS	175
7.1. RESTRICTED BANDEDGE	181
7.2. HARMONICS AND SPURIOUS EMISSIONS	243
8. FREQUENCY STABILITY	494
9. DYNAMIC FREQUENCY SELECTION	498
10. AC POWER LINE CONDUCTED EMISSIONS	505
11. ANTENNA REQUIREMENTS	509

1. ATTESTATION OF TEST RESULTS**Applicant Information**

Company Name: ISEFY TECHNOLOGY
Address: 26 Pine Street. Toronto, ON, Canada M9N 2Y8

Manufacturer Information

Company Name: ISEFY TECHNOLOGY
Address: 26 Pine Street. Toronto, ON, Canada M9N 2Y8

EUT Description

Product Name: ISEFY
Model Number: SC668W
Series Model Number: /
Model Difference: /
Sample Number: 7773810-S001
Data of Receipt Sample: Nov. 01, 2024
Test Date: Nov. 01, 2024~ Nov. 20, 2024

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 FCC PART 15 SUBPART E	PASS
ISED RSS-247 Issue 3	
ISED RSS-GEN Issue 5	

Summary of Test Results			
Clause	Test Items	FCC Rules	Test Results
1	6dB/26dB Bandwidth	FCC 15.407 (a)&(e) RSS-247 Clause 6.2	PASS
	99% Occupied Bandwidth	RSS-Gen Clause 6.7	PASS
2	Conducted Output Power	FCC 15.407 (a) RSS-247 Clause 6.2	PASS
3	Power Spectral Density	FCC 15.407 (a) RSS-247 Clause 6.2	PASS
4	Radiated Bandedge and Spurious Emission	FCC 15.407 (b) FCC 15.209 FCC 15.205 RSS-247 Clause 6.2 RSS-GEN Clause 8.9	PASS
5	Conducted Emission Test for AC Power Port	FCC 15.207 RSS-GEN Clause 8.8	PASS
6	Frequency Stability	FCC 15.407 (g) RSS-Gen Clause 6.11	PASS
7	Dynamic Frequency Selection	FCC 15.407 (h) RSS-247 Clause 6.3	PASS
8	Antenna Requirement	FCC 15.203 RSS-GEN Clause 6.8	PASS
Note: 1. The measurement result for the sample received is < Pass > according to < ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15 E, RSS-GEN, RSS-247 > when < Simple Acceptance > decision rule is applied. 2. It is a slave device without radar detection.			

Prepared By:

Tom Tang

Tom Tang

Reviewed By:

Emily Wang

Emily Wang

Authorized By:

Kevin Shen

Kevin Shen

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, CFR 47 FCC Part 2, CFR 47 FCC Part 15, KDB 789033 D02 v02r01, RSS-GEN Issue 5, RSS-247 Issue 3, KDB414788 D01 Radiated Test Site v01r01, KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02, KDB 905462 D03 UNII clients without radar detection New Rules v01r02, KDB 905462 D04 Operational Modes for DFS Testing New Rules v01 and KDB 905462 D06 802.11 Channel Plans New Rules v02.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	A2LA (Certificate No.: 4829.01) UL-CCIC COMPANY LIMITED has been assessed and proved to be in compliance with A2LA. FCC (FCC Designation No.: CN1247) UL-CCIC COMPANY LIMITED has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules. IC (IC Designation No.: 25056; CAB No.: CN0073) UL-CCIC COMPANY LIMITED has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules.
---------------------------	--

Remark 1: All tests measurement facilities use to collect the measurement data are located at No. 2, Chengwan Road, Suzhou Industrial Park, Suzhou 215122, People's Republic of China

Remark 2: For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. These measurements below 30MHz had been correlated to measurements performed on an OFS based on KDB 414788.

Remark 3: The test anechoic chamber in UL-CCIC COMPANY LIMITED had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognize national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty
Conduction emission	3.1dB
Radiation Emission test (include Fundamental emission) (9kHz-30MHz)	3.3dB
Radiation Emission test (include Fundamental emission) (30MHz-1GHz)	3.3dB
Radiation Emission test (1GHz to 26GHz) (include Fundamental emission)	3.9dB (1GHz-18GHz)
	4.2dB (18GHz-26.5GHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

Product Name:	ISEFY
Model No.:	SC668W
Operating Frequency:	IEEE 802.11a/n/ac/ax 20MHz: 5180MHz to 5240MHz, 5260MHz to 5320MHz, 5500MHz to 5720MHz (ISED not include 5600MHz to 5640MHz), 5745MHz to 5825MHz IEEE 802.11n/ac/ax 40MHz: 5190MHz to 5230MHz, 5270MHz to 5310MHz, 5510MHz to 5710MHz (ISED not include 5590MHz to 5630MHz), 5755MHz-5795MHz This report just including 5G WIFI part.
Type of Modulation:	IEEE for 802.11a: BPSK, QPSK, 16QAM, 64QAM IEEE for 802.11n HT20/HT40: BPSK, QPSK, 16QAM, 64QAM IEEE for 802.11ac VHT20/VHT40: BPSK, QPSK, 16QAM, 64QAM, 256QAM IEEE for 802.11ax: BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM
Channels Step:	Channels with 5MHz step
Test Software of EUT:	SecureCRT (manufacturer declare)
Antenna Type:	Patch Antenna
Antenna Gain:	2.66 dBi Note: This data is provided by customer and our lab isn't responsible for this data.

5.2. MAXIMUM OUTPUT POWER

UNII-1 BAND

IEEE Std. 802.11	Frequency (MHz)	Maximum Average Conducted Power
		[dBm]
a	5150 ~ 5250	13.35
n HT20		13.60
n HT40		13.01
ac VHT20		13.60
ac VHT40		13.01
ax HE20		13.17
ax HE40		12.90

UNII-2A BAND

IEEE Std. 802.11	Frequency (MHz)	Maximum Average Conducted Power
		[dBm]
a	5250 ~ 5350	13.54
n HT20		13.72
n HT40		13.11
ac VHT20		13.72
ac VHT40		13.11
ax HE20		13.43
ax HE40		13.98

UNII-2C BAND

IEEE Std. 802.11	Frequency (MHz)	Max Power
		[dBm]
a	5470 ~ 5725	13.66
n HT20		13.69
n HT40		13.59
ac VHT20		13.69
ac VHT40		13.59
ax HE20		13.57
ax HE40		13.59

UNII-3 BAND

IEEE Std. 802.11	Frequency (MHz)	Max Power
		[dBm]
a	5725 ~ 5850	13.91
n HT20		14.02
n HT40		13.96
ac VHT20		14.02
ac VHT40		13.96
ax HE20		13.84
ax HE40		13.92

5.3. CHANNEL LIST

UNII-1 (For Bandwidth = 20 MHz)		UNII-1 (For Bandwidth = 40 MHz)		UNII-1 (For Bandwidth = 80 MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190	/	/
40	5200	46	5230		
44	5220				
48	5240				

UNII-2A (For Bandwidth = 20 MHz)		UNII-2A (For Bandwidth = 40 MHz)		UNII-2A (For Bandwidth = 80 MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	54	5270	/	/
56	5280	62	5310		
60	5300				
64	5320				

UNII-2C (For Bandwidth = 20 MHz)		UNII-2C (For Bandwidth = 40 MHz)		UNII-2C (For Bandwidth = 80 MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	102	5510	/	/
104	5520	110	5550	/	/
108	5540	118	5590	/	/
112	5560	126	5630		
116	5580	134	5670		
120	5600	142	5710		
124	5620				
128	5640				
132	5660				
136	5680				
140	5700				
144	5720				

Note: The frequency band 5600MHz-5650MHz is not allow use in ISFD.

UNII-3 (For Bandwidth = 20 MHz)		UNII-3 (For Bandwidth = 40 MHz)		UNII-3 (For Bandwidth = 80 MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	151	5755	/	/
153	5765	159	5795		
157	5785				
161	5805				
165	5825				

5.4. TEST CHANNEL CONFIGURATION

UNII-1 Test Channel Configuration		
IEEE Std.	Test Channel Number	Frequency
802.11a	CH 36, CH 40, CH 48	5180 MHz, 5200 MHz, 5240 MHz
802.11n HT20	CH 36, CH 40, CH 48	5180 MHz, 5200 MHz, 5240 MHz
802.11n HT40	CH 38, CH 46	5190 MHz, 5230 MHz
802.11ac VHT20	CH 36, CH 40, CH 48	5180 MHz, 5200 MHz, 5240 MHz
802.11ac VHT40	CH 38, CH 46	5190 MHz, 5230 MHz
802.11ax HE20	CH 36, CH 40, CH 48	5180 MHz, 5200 MHz, 5240 MHz
802.11ax HE40	CH 38, CH 46	5190 MHz, 5230 MHz

UNII-2A Test Channel Configuration		
IEEE Std.	Test Channel Number	Frequency
802.11a	CH 52, CH 56, CH 64	5260 MHz, 5280 MHz, 5320 MHz
802.11n HT20	CH 52, CH 56, CH 64	5260 MHz, 5280 MHz, 5320 MHz
802.11n HT40	CH 54, CH 62	5270 MHz, 5310 MHz
802.11ac VHT20	CH 52, CH 56, CH 64	5260 MHz, 5280 MHz, 5320 MHz
802.11ac VHT40	CH 54, CH 62	5270 MHz, 5310 MHz
802.11ax HE20	CH 52, CH 56, CH 64	5260 MHz, 5280 MHz, 5320 MHz
802.11ax HE40	CH 54, CH 62	5270 MHz, 5310 MHz

UNII-2C Test Channel Configuration		
IEEE Std.	Test Channel Number	Frequency
802.11a	CH 100, CH120, CH 140, CH 144	5500 MHz, 5580 MHz, 5700 MHz, 5720 MHz
802.11n HT20	CH 100, CH120, CH 140, CH 144	5500 MHz, 5580 MHz, 5700 MHz, 5720 MHz
802.11n HT40	CH 102, CH 118, CH 134, CH 142	5510 MHz, 5550 MHz, 5670 MHz, 5710 MHz
802.11ac VHT20	CH 100, CH120, CH 140, CH 144	5500 MHz, 5580 MHz, 5700 MHz, 5720 MHz
802.11ac VHT40	CH 102, CH 118, CH 134, CH 142	5510 MHz, 5550 MHz, 5670 MHz, 5710 MHz
802.11ax HE20	CH 100, CH120, CH 140, CH 144	5500 MHz, 5580 MHz, 5700 MHz, 5720 MHz
802.11ax HE40	CH 102, CH 118, CH 134, CH 142	5510 MHz, 5550 MHz, 5670 MHz, 5710 MHz

UNII-3 Test Channel Configuration		
IEEE Std.	Test Channel Number	Frequency
802.11a	CH 149, CH 157, CH165	5745 MHz, 5785 MHz, 5825 MHz
802.11n HT20	CH 149, CH 157, CH165	5745 MHz, 5785 MHz, 5825 MHz
802.11n HT40	CH 151, CH 159	5755 MHz, 5795 MHz
802.11ac VHT20	CH 149, CH 157, CH165	5745 MHz, 5785 MHz, 5825 MHz
802.11ac VHT40	CH 151, CH 159	5755 MHz, 5795 MHz
802.11ac HE20	CH 149, CH 157, CH165	5745 MHz, 5785 MHz, 5825 MHz
802.11ac HE40	CH 151, CH 159	5755 MHz, 5795 MHz

5.5. POWER GRADE

UNII-1

IEEE Std. 802.11	Channel	Power Grade
a	36	default
	40	default
	44	default
	48	default
n HT20	36	default
	40	default
	44	default
	48	default
n HT40	38	default
	46	default
ac VHT20	36	default
	40	default
	44	default
	48	default
ac VHT40	38	default
	46	default
ax HE20	36	default
	40	default
	44	default
	48	default
ax HE40	38	default
	46	default

UNII-2A

IEEE Std. 802.11	Channel	Power Grade
a	52	default
	56	default
	60	default
	64	default
n HT20	52	default
	56	default
	60	default
	64	default
n HT40	54	default
	62	default
ac VHT20	52	default
	56	default
	60	default
	64	default
ac VHT40	54	default
	62	default
ax HE20	52	default
	56	default
	60	default
	64	default
ax HE40	54	default
	62	default

UNII-2C

IEEE Std. 802.11	Channel	Power Grade
a	100	default
	104	default
	108	default
	112	default
	116	default
	120	default
	124	default
	128	default
	132	default
	136	default
	140	default
	144	default
n HT20	100	default
	104	default
	108	default
	112	default
	116	default
	120	default
	124	default
	128	default
	132	default
	136	default
	140	default
	144	default
n HT40	102	default
	110	default
	118	default
	126	default
	134	default
	142	default

ac VHT20	100	default
	104	default
	108	default
	112	default
	116	default
	120	default
	124	default
	128	default
	132	default
	136	default
	140	default
	144	default
ac VHT40	102	default
	110	default
	118	default
	126	default
	134	default
	142	default
ax HE20	100	default
	104	default
	108	default
	112	default
	116	default
	120	default
	124	default
	128	default
	132	default
	136	default
	140	default
	144	default
ax HE40	102	default
	110	default
	118	default
	126	default
	134	default
	142	default

UNII-3

IEEE Std. 802.11	Channel	Power Grade
a	149	default
	153	default
	157	default
	161	default
	165	default
n HT20	149	default
	153	default
	157	default
	161	default
	165	default
n HT40	151	default
	159	default
ac VHT20	149	default
	153	default
	157	default
	161	default
	165	default
ac VHT40	151	default
	159	default
ax HE20	149	default
	153	default
	157	default
	161	default
	165	default
ax HE40	151	default
	159	default

5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna	Frequency Band	Maximum Antenna Gain [dBi]
1	UNII-1	2.66
1	UNII-2A	2.66
1	UNII-2C	2.66
1	UNII-3	2.66

IEEE Std. 802.11	Transmit and Receive Mode	Description
a	☒ 1TX, 1RX	ANT 1 can be used as transmitting/receiving antenna.
n HT20	☒ 1TX, 1RX	ANT 1 can be used as transmitting/receiving antenna.
n HT40	☒ 1TX, 1RX	ANT 1 can be used as transmitting/receiving antenna.
ac VHT20	☒ 1TX, 1RX	ANT 1 can be used as transmitting/receiving antenna.
ac VHT40	☒ 1TX, 1RX	ANT 1 can be used as transmitting/receiving antenna.
ax HE20	☒ 1TX, 1RX	ANT 1 can be used as transmitting/receiving antenna.
Axhe40	☒ 1TX, 1RX	ANT 1 can be used as transmitting/receiving antenna.
Note: BLE & WLAN 2.4G & WLAN 5G can't transmit simultaneously. (Declared by client)		

5.7. THE WORSE CASE POWER SETTING PARAMETER

The Worse Case Power Setting Parameter	
Test Software	SecureCRT

UNII-1

IEEE Std. 802.11	Rate	Channel	Test Software Setting Value
a	6M	36	default
		40	default
		48	default
ac VHT20	MCS0	36	default
		40	default
		48	default
ac VHT40	MCS0	38	default
		46	default
ax HE20	MCS0	36	default
		40	default
		48	default
ax HE40	MCS0	38	default
		46	default

UNII-2A

IEEE Std. 802.11	Rate	Channel	Test Software Setting Value
a	6M	52	default
		56	default
		64	default
ac VHT20	MCS0	52	default
		56	default
		64	default
ac VHT40	MCS0	54	default
		62	default
ax HE20	MCS0	52	default
		56	default
		64	default
ax HE40	MCS0	54	default
		62	default

UNII-2C

IEEE Std. 802.11	Rate	Channel	Test Software Setting Value
a	6M	100	default
		120	default
		136	default
		140	default
		144	default
ac VHT20	MCS0	100	default
		104	default
		120	default
		136	default
		140	default
ac VHT40	MCS0	144	default
		102	default
		110	default
		118	default
		126	default
ax HE20	MCS0	134	default
		142	default
		100	default
		104	default
		120	default
ax HE40	MCS0	136	default
		140	default
		144	default
		102	default
		110	default
		118	default
		126	default
		134	default
		142	default
			default

UNII-3

IEEE Std. 802.11	Rate	Channel	Test Software Setting Value
a	6M	149	default
		157	default
		165	default
ac VHT20	MCS0	149	default
		157	default
		165	default
ac VHT40	MCS0	151	default
		159	default
ax HE20	MCS0	149	default
		157	default
		165	default
ax HE40	MCS0	151	default
		159	default

Note: Since 802.11ac VHT20/VHT40 modes are different from 802.11n HT20/HT40 only in control messages, so all the tests are performed on the worst case (802.11ac VHT20/802.11ac VHT40) mode between these 4 modes and only the worst data was recorded in this report.

5.8. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	Description
1	Laptop	ThinkPad	E590	/
2	Router	I-O DATA	WN-DAX1800GR	/

I/O PORT

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB	USB-TTL	USB	100cm Length	/

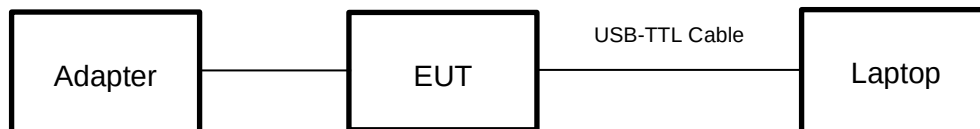
ACCESSORY

Item	Accessory	Brand Name	Model Name	Description
1	AC ADAPTOR	MNC	MAUS-1201001202	Input: 100-240V~ 50/60Hz 0.35A Output: 12V=1.0A

TEST SETUP

The EUT can work in an engineer mode with a software through a laptop.

SETUP DIAGRAM FOR TESTS



5.9. MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions Test (Instrument)							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
☒	EMI Test Receiver	R&S	ESR3	126700	2023-11-25	2024-11-02	2025-11-01
☒	Two-Line V-Network	R&S	ENV216	126701	2023-11-25	2024-11-02	2025-11-01
Conducted Emissions Test (Software)							
Used	Description		Manufacturer		Name	Version	
☒	Software for Conducted Emissions Test		R&S		EMC32	9.25.00	
Radiated Emissions Test (Instrument)							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
☒	EMI test receiver	R&S	ESR7	222993	2023-04-08	2024-03-23	2025-03-22
☒	EMI test receiver	R&S	ESR26	126703	2023-11-25	2024-11-02	2025-11-01
☒	Spectrum Analyzer	R&S	FSV3044	222992	2023-04-08	2024-03-23	2025-03-22
☒	Receiver Antenna (9kHz-30MHz)	Schwarzbeck	FMZB 1513	155456	2021-06-03	2024-05-27	2027-05-26
☒	Receiver Antenna (30MHz-1GHz)	Schwarzbeck	VULB 9168	171952	2021-07-05	2024-07-04	2027-07-03
☒	Receiver Antenna (1GHz-18GHz)	R&S	HF907	126705	2019-01-27	2022-02-28	2025-02-27
☒	Receiver Antenna (18GHz-26.5GHz)	Schwarzbeck	BBHA9170	126706	2019-02-29	2022-02-28	2025-02-27
☒	Pre-amplification (To 18GHz)	Tonscnd	TAP01018050	224539	2023-10-10	2024-10-10	2025-10-09
☒	Pre-amplification (To 18GHz)	R&S	SCU-18D	134667	2023-11-25	2024-11-02	2025-11-01
☒	Pre-amplification (To 26.5GHz)	R&S	SCU-26D	135391	2023-11-25	2024-11-02	2025-11-01
☒	Band Reject Filter	Wainwright	WRCGV12-2375-2400-2485-2510-40SS	1	2023-12-18	2024-11-02	2025-11-01
☒	High Pass Filter	COM-MW	ZBF13-3-18G-01	2	2023-12-18	2024-11-02	2025-11-01
Radiated Emissions Test (Software)							
Used	Description		Manufacturer		Name	Version	
☒	Software for Radiated Emissions Test		Tonscnd		JS32-RE	5.0.0.2	
Antenna Port Test (Instrument)							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
☒	Spectrum Analyzer	Keysight	N9010B	155368	2023-04-08	2024-03-23	2025-03-22
☒	Power Meter	MWT	MW100-RFCB	221694	2023-04-08	2024-03-23	2025-03-22
☒	Power Meter	Anritsu	MA24406A	12896	2023-04-08	2024-03-23	2025-03-22
☒	Attenuator	PASTERNAK	PE7087-6	1624	/	2024-11-04	2025-11-03
	Adjustable Attenuator	SHX	SHX	371	2023-03-24	2024-03-23	2025-03-22
Antenna Port Test (Software)							
Used	Description		Manufacturer		Name	Version	
☒	Software for Antenna Port Test		Tonscnd		JS1120-3 Test System	V3.2.22	

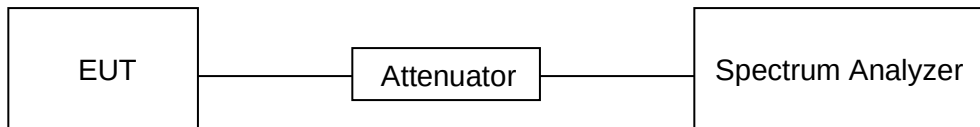
6. ANTENNA PORT TEST RESULTS

6.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

TEST SETUP



TEST ENVIRONMENT

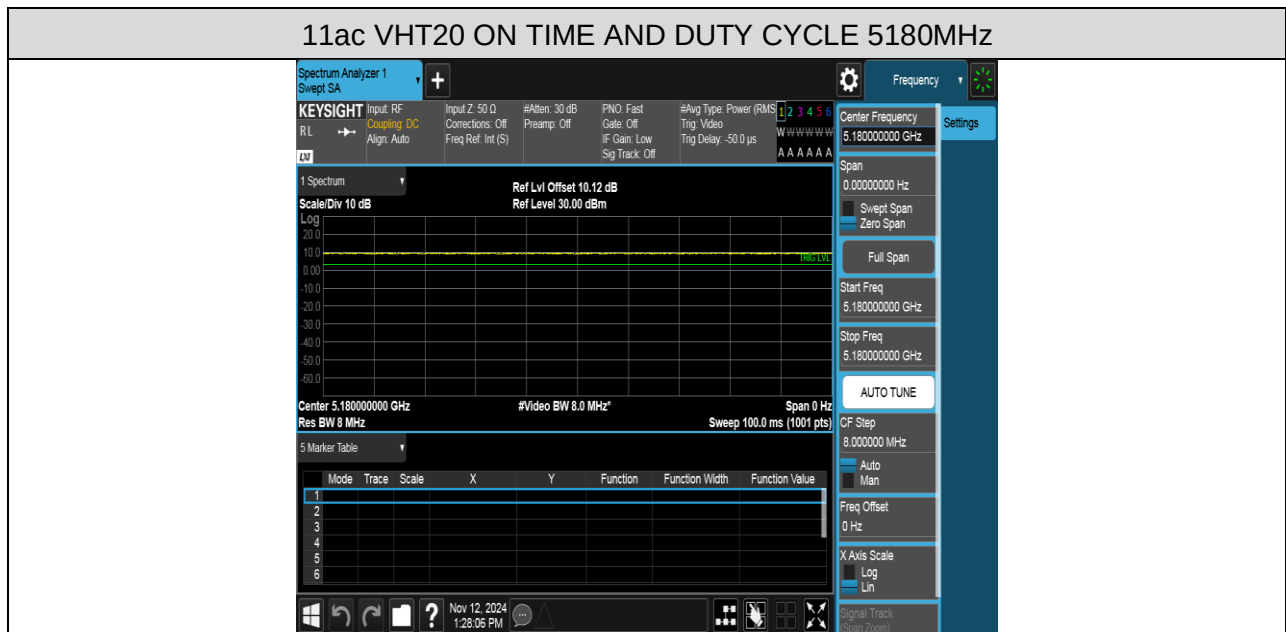
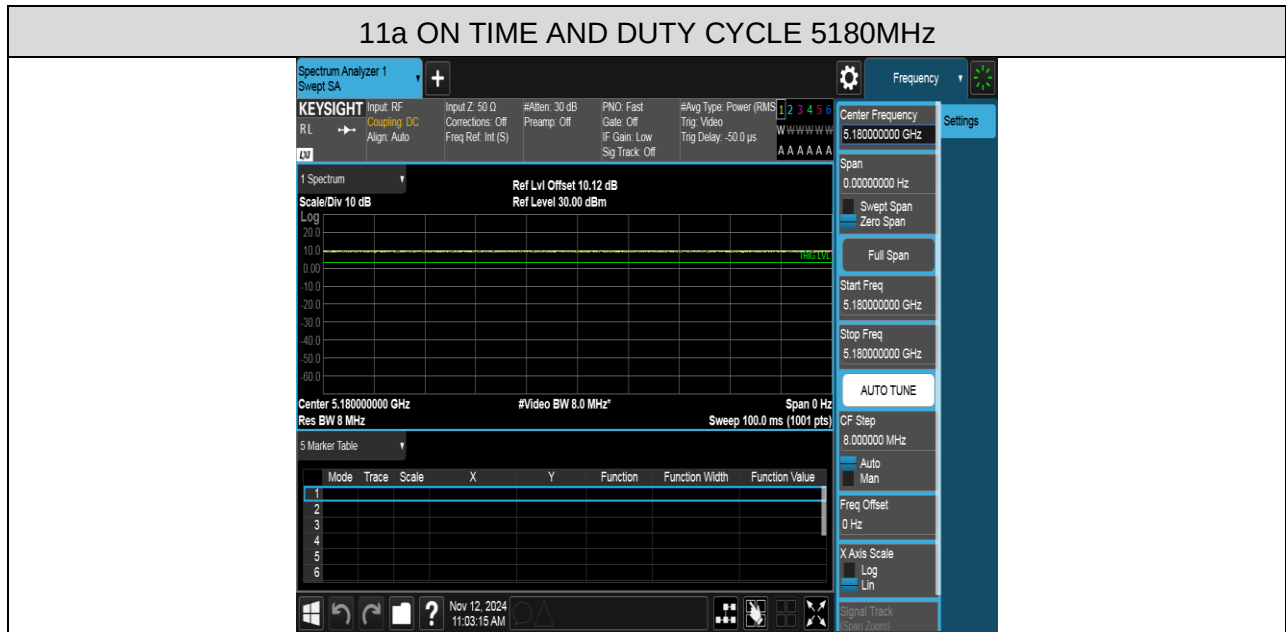
Environment Parameter	Selected Values During Tests
Relative Humidity	60%
Atmospheric Pressure:	101kPa
Temperature	22.2°C
Test Voltage	AC 120V
Test Date	11/12/2024

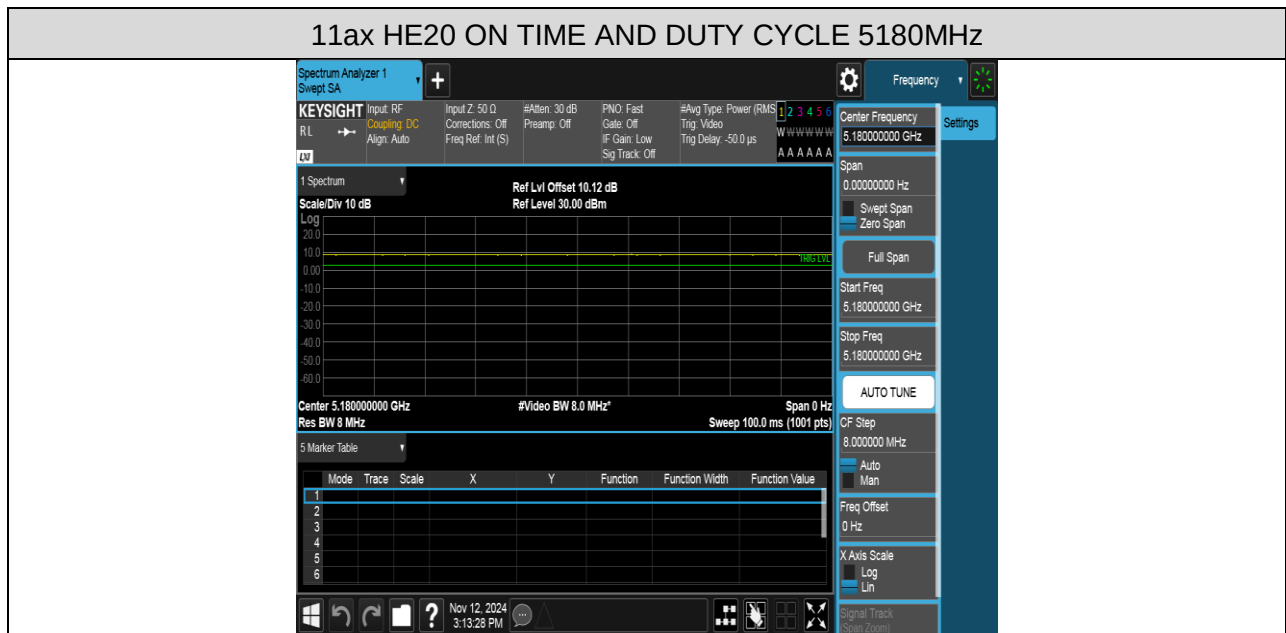
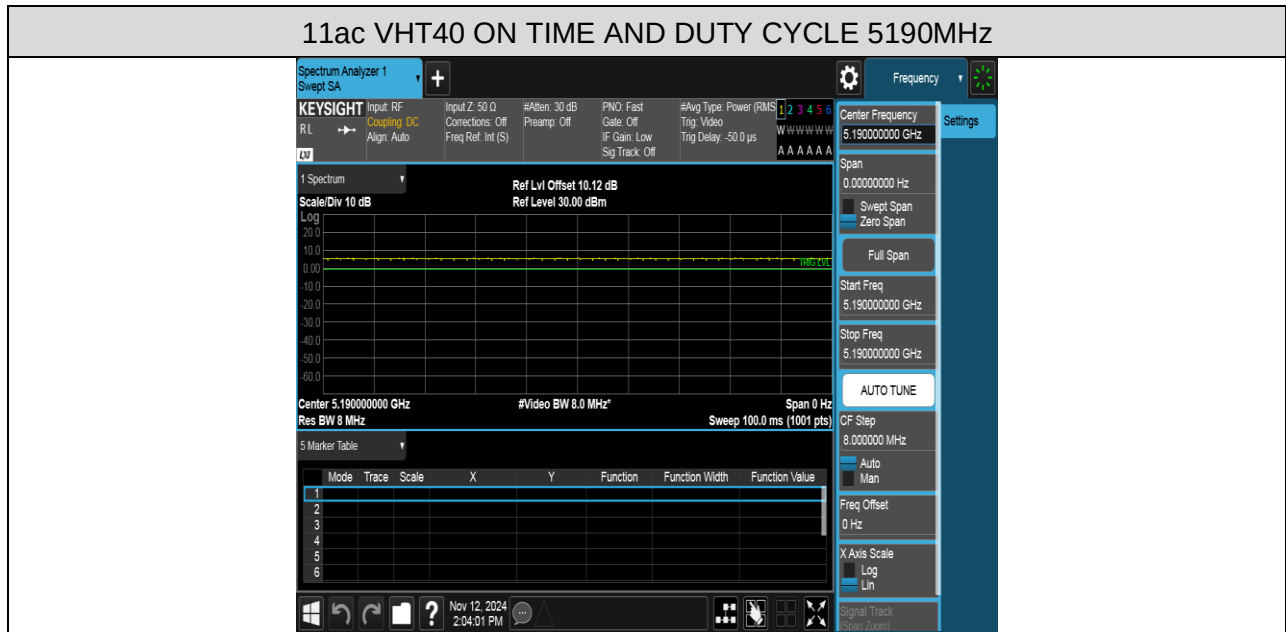
RESULTS

Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)	Final setting For VBW (kHz)
11a	100	1000	1	100	0	0.01	0.01
11ac VHT20	100	1000	1	100	0	0.01	0.01
11ac VHT40	100	1000	1	100	0	0.01	0.01
11ax HE20	100	1000	1	100	0	0.01	0.01
11ax HE40	100	1000	1	100	0	0.01	0.01

Remark:

1. Duty Cycle Correction Factor=10log (1/x).
2. Where: x is Duty Cycle (Linear)
3. Where: T is On Time
4. If that calculated VBW is not available on the analyzer then the next higher value should be used.
5. If the duty cycle is above 98%, the Final VBW is 10Hz.





11ax HE40 ON TIME AND DUTY CYCLE 5190MHz (WORSE CASE)



6.2. 6/26 dB EMISSION BANDWIDTH AND 99% OCCUPIED BANDWIDTH

LIMITS

CFR 47 FCC Part15, Subpart E RSS-247 Clause 6.2 RSS-Gen Clause 6.7		
Test Item	Limit	Frequency Range (MHz)
26 dB Emission Bandwidth	For reporting purposes only.	5150 ~ 5250
26 dB Emission Bandwidth	For reporting purposes only.	5250 ~ 5350
26 dB Emission Bandwidth	For reporting purposes only.	5470 ~ 5725
6 dB Emission Bandwidth	The minimum 6 dB emission bandwidth shall be 500 kHz.	5725 ~ 5850
99 % Occupied Bandwidth	For reporting purposes only.	5150 ~ 5825

TEST PROCEDURE

Refer to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 section II.C1. for 26 dB Emission Bandwidth; section II.C2. for 6 dB Emission Bandwidth; section II.D. for 99 % Occupied Bandwidth.

Connect the EUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	For 6 dB Emission Bandwidth: RBW=100 kHz For 26 dB Emission bandwidth: approximately 1 % of the EBW. For 99 % Occupied Bandwidth: approximately 1 % ~ 5 % of the OBW.
VBW	For 6 dB Bandwidth: $\geq 3 \times \text{RBW}$ For 26 dB Bandwidth: $> \text{RBW}$ For 99 % Bandwidth: $> 3 \times \text{RBW}$
Trace	Max hold
Sweep	Auto couple

a) Use the 99 % power bandwidth function of the instrument, allow the trace to stabilize and report the measured bandwidth.

b) Allow the trace to stabilize and 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 6/26 dB relative to the maximum level measured in the fundamental emission.

Calculation for 26 dB Bandwidth of UNII-2C and UNII-3 Straddle Channel:

For Example: Fundamental Frequency: 5720 MHz

FL: 5710.60 MHz

FH: 5728.33 MHz

Turning Frequency: 5725 MHz

UNII-2C Band Portion = $5725 - 5710.60 = 14.40$ MHzUNII-3 Band Portion = $5728.33 - 5725 = 3.30$ MHz**Calculation for 6dB Bandwidth of UNII-3 Straddle Channel:**

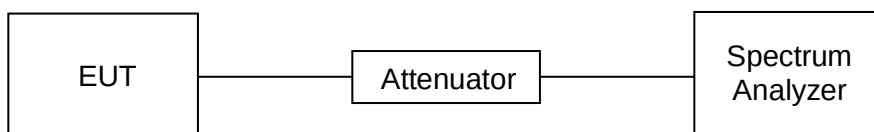
For Example: Fundamental frequency: 5720 MHz

6 dB BW: 16.44 MHz

FL: 5711.76 MHz

FH: 5728.2 MHz

Turning Frequency: 5725 MHz

6 dB Bandwidth of UNII-3 band Portion = $5728.2 - 5725 = 3.2$ MHz**TEST SETUP****TEST ENVIRONMENT**

Environment Parameter	Selected Values During Tests
Relative Humidity	60%
Atmospheric Pressure:	101kPa
Temperature	22.2°C
Test Voltage	AC 120V
Test Date	11/10/2024-11/12/2024

RESULTS TABLE

1) 26 dB Emission Bandwidth Part:

Test Mode	Channel	26dB EBW [MHz]	FL [MHz]	FH [MHz]	Verdict
11a	5180	19.925	5170.055	5189.980	PASS
	5200	20.753	5189.613	5210.367	PASS
	5240	21.887	5229.864	5251.751	PASS
	5260	20.449	5249.911	5270.360	PASS
	5280	19.932	5270.020	5289.952	PASS
	5320	20.145	5309.911	5330.056	PASS
	5500	20.020	5489.883	5509.903	PASS
	5580	20.272	5569.895	5590.167	PASS
	5700	20.293	5689.836	5710.129	PASS
	5720	20.065	5709.785	5729.851	PASS
	5720_UNII-2C	15.215	5709.785	5725	PASS
	5720_UNII-3	4.851	5725	5729.851	PASS
	5745	21.248	5734.169	5755.417	PASS
	5785	23.403	5773.396	5796.799	PASS
	5825	24.823	5812.381	5837.204	PASS

Test Mode	Channel	26dB EBW [MHz]	FL [MHz]	FH [MHz]	Verdict
11ac HT20	5180	20.252	5169.817	5190.069	PASS
	5200	20.804	5189.545	5210.349	PASS
	5240	21.081	5229.036	5250.117	PASS
	5260	20.269	5249.889	5270.159	PASS
	5280	20.501	5269.792	5290.293	PASS
	5320	20.627	5309.769	5330.396	PASS
	5500	20.551	5489.800	5510.351	PASS
	5580	21.271	5568.715	5589.985	PASS
	5700	21.059	5689.025	5710.084	PASS
	5720	20.824	5709.396	5730.220	PASS
	5720_UNII-2C	15.604	5709.396	5725	PASS
	5720_UNII-3	5.22	5725	5730.220	PASS
	5745	25.249	5732.124	5757.373	PASS
	5785	26.632	5772.364	5798.996	PASS
	5825	28.160	5810.943	5839.103	PASS

Test Mode	Channel	26dB EBW [MHz]	FL [MHz]	FH [MHz]	Verdict
11ac HT40	5190	40.032	5169.813	5209.845	PASS
	5230	40.107	5209.709	5249.816	PASS
	5270	40.875	5249.400	5290.275	PASS
	5310	40.763	5289.301	5330.064	PASS
	5510	40.816	5489.133	5529.949	PASS
	5550	42.352	5527.781	5570.133	PASS
	5670	42.123	5647.925	5690.048	PASS
	5710	40.699	5689.261	5729.960	PASS
	5710_UNII-2C	35.739	5689.261	5725	PASS
	5710_UNII-3	4.96	5725	5729.960	PASS
	5755	48.443	5726.515	5774.957	PASS
	5795	57.571	5759.936	5817.507	PASS

Test Mode	Channel	26dB EBW [MHz]	FL [MHz]	FH [MHz]	Verdict
11ax HE20	5180	20.645	5169.692	5190.337	PASS
	5200	24.209	5187.468	5211.677	PASS
	5240	20.405	5229.784	5250.189	PASS
	5260	21.439	5249.639	5271.077	PASS
	5280	20.699	5269.452	5290.151	PASS
	5320	20.572	5309.785	5330.357	PASS
	5500	23.108	5487.304	5510.412	PASS
	5580	20.383	5569.701	5590.084	PASS
	5700	20.876	5689.196	5710.072	PASS
	5720	20.505	5709.705	5730.211	PASS
	5720_UNII-2C	15.295	5709.705	5725	PASS
	5720_UNII-3	5.211	5725	5730.211	PASS
	5745	20.875	5734.412	5755.287	PASS
	5785	23.844	5772.937	5796.781	PASS
	5825	24.611	5811.009	5835.620	PASS

Test Mode	Channel	26dB EBW [MHz]	FL [MHz]	FH [MHz]	Verdict
11ax HE40	5190	40.536	5169.757	5210.293	PASS
	5230	40.387	5209.715	5250.101	PASS
	5270	40.211	5249.891	5290.101	PASS
	5310	39.872	5289.917	5329.789	PASS
	5510	40.504	5489.523	5530.027	PASS
	5550	40.432	5529.885	5570.317	PASS
	5670	40.339	5649.787	5690.125	PASS
	5710	39.856	5689.989	5729.845	PASS
	5710_UNII-2C	35.011	5689.989	5725	PASS
	5710_UNII-3	4.845	5725	5729.845	PASS
	5755	55.837	5721.915	5777.752	PASS
	5795	40.888	5774.304	5815.192	PASS

2) 99% Occupied Channel Bandwidth Part:

Test Mode	Channel	OCW [MHz]	FL [MHz]	FH [MHz]	Verdict
11a	5180	17.028	5171.4487	5188.4767	PASS
	5200	17.035	5191.4714	5208.5064	PASS
	5240	17.016	5231.4327	5248.4487	PASS
	5260	17.050	5251.4328	5268.4828	PASS
	5280	17.003	5271.4633	5288.4663	PASS
	5320	17.053	5311.4397	5328.4927	PASS
	5500	17.038	5491.4296	5508.4676	PASS
	5580	17.039	5571.4374	5588.4764	PASS
	5700	17.021	5691.4227	5708.4437	PASS
	5720	17.010	5711.4378	5728.4478	PASS
	5720_UNII-2C	13.562	5711.4378	5725	PASS
	5720_UNII-3	3.448	5725	5728.4478	PASS
	5745	17.059	5736.3916	5753.4506	PASS
	5785	17.056	5776.4227	5793.4787	PASS
	5825	17.072	5816.4176	5833.4896	PASS

Test Mode	Channel	OCW [MHz]	FL [MHz]	FH [MHz]	Verdict
11ac HT20	5180	17.964	5170.9594	5188.9234	PASS
	5200	17.986	5190.9815	5208.9675	PASS
	5240	17.914	5231.0099	5248.9239	PASS
	5260	17.960	5250.9978	5268.9578	PASS
	5280	17.922	5271.0048	5288.9268	PASS
	5320	17.943	5311.0016	5328.9446	PASS
	5500	17.954	5490.9590	5508.9130	PASS
	5580	17.955	5570.9490	5588.9040	PASS
	5700	17.906	5690.9914	5708.8974	PASS
	5720	17.939	5710.9631	5728.9021	PASS
	5720_UNII-2C	14.037	5710.9631	5725	PASS
	5720_UNII-3	3.902	5725	5728.9021	PASS
	5745	17.968	5735.9601	5753.9281	PASS
	5785	17.990	5775.9870	5793.9770	PASS
	5825	18.008	5815.9496	5833.9576	PASS

Test Mode	Channel	OCW [MHz]	FL [MHz]	FH [MHz]	Verdict
11ac HT40	5190	36.304	5171.7710	5208.0750	PASS
	5230	36.247	5211.8339	5248.0809	PASS
	5270	36.267	5251.8312	5288.0982	PASS
	5310	36.239	5291.8230	5328.0620	PASS
	5510	36.238	5491.8437	5528.0817	PASS
	5550	36.273	5570.8035	5589.0615	PASS
	5670	36.289	5651.7810	5688.0700	PASS
	5710	36.233	5691.7868	5728.0198	PASS
	5710_UNII-2C	33.213	5691.7868	5725	PASS
	5710_UNII-3	3.02	5725	5728.0198	PASS
	5755	36.399	5736.6931	5773.0921	PASS
	5795	36.311	5776.7889	5813.0999	PASS

Test Mode	Channel	OCW [MHz]	FL [MHz]	FH [MHz]	Verdict
11ax HE20	5180	18.848	5170.5470	5189.3950	PASS
	5200	18.900	5190.5077	5209.4077	PASS
	5240	18.855	5230.5618	5249.4168	PASS
	5260	18.890	5250.5291	5269.4191	PASS
	5280	18.881	5270.5327	5289.4137	PASS
	5320	18.909	5310.5052	5329.4142	PASS
	5500	18.912	5490.5126	5509.4246	PASS
	5580	18.884	5570.5128	5589.3968	PASS
	5700	18.898	5690.5173	5709.4153	PASS
	5720	18.900	5710.5156	5729.4156	PASS
	5720_UNII-2C	14.484	5710.5156	5725	PASS
	5720_UNII-3	4.416	5725	5729.4156	PASS
	5745	18.853	5735.5270	5754.3800	PASS
	5785	18.942	5775.4798	5794.4218	PASS
	5825	18.888	5815.5282	5834.4162	PASS

Test Mode	Channel	OCW [MHz]	FL [MHz]	FH [MHz]	Verdict
11ax HE40	5190	37.544	5171.2225	5208.7665	PASS
	5230	37.460	5211.2030	5248.6630	PASS
	5270	37.559	5251.2004	5288.7594	PASS
	5310	37.510	5291.2030	5328.7130	PASS
	5510	37.565	5491.1417	5528.7067	PASS
	5550	37.532	5531.1445	5568.6765	PASS
	5670	37.566	5651.1867	5688.7527	PASS
	5710	37.536	5691.1707	5728.7067	PASS
	5710_UNII-2C	33.829	5691.1707	5725	PASS
	5710_UNII-3	3.707	5725	5728.7067	PASS
	5755	37.629	5736.0586	5773.6876	PASS
	5795	37.696	5776.0998	5813.7958	PASS

3) 6dB Minimum Emission Bandwidth

Test Mode	Channel	6db EBW [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
11a	5745	16.515	5736.697	5753.212	0.5	PASS
	5785	16.501	5776.723	5793.224	0.5	PASS
	5825	16.493	5816.731	5833.224	0.5	PASS
11ac VHT20	5745	17.705	5736.095	5753.800	0.5	PASS
	5785	17.667	5776.128	5793.795	0.5	PASS
	5825	17.681	5816.139	5833.820	0.5	PASS
11ac VHT40	5755	36.315	5736.803	5773.117	0.5	PASS
	5795	36.325	5776.808	5813.133	0.5	PASS
11ax HE20	5745	18.857	5735.517	5754.375	0.5	PASS
	5785	18.845	5775.559	5794.404	0.5	PASS
	5825	18.828	5815.593	5834.421	0.5	PASS
11ax HE40	5755	37.563	5736.357	5773.920	0.5	PASS
	5795	37.579	5776.285	5813.864	0.5	PASS

TEST GRAPHS

For 26 dB Emission Bandwidth Part:

