TEST REPORT

FCC ID: 2ADYY-T1

Product: Megabook

Model No.: T1

Additional Model No: N/A

Trade Mark: TECNO

Report No.: WSCT-A2LA-R&E220300004A-Wi-Fi2

Issued Date: 01 August 2022

Issued for:

TECNO MOBILE LIMITED

FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG

Issued By:

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1. GENERAL INFORMATION

Product:	Megabook
Model No.:	T1
Additional Model No.:	N/A
Trade Mark:	TECNO
Applicant:	TECNO MOBILE LIMITED
Address:	FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG
Manufacturer:	TECNO MOBILE LIMITED
Address:	FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG
Date of Test:	February 10, 2018 to February 25, 2018
Applicable Standards:	FCC CFR Title 47 FCC Part 15 Subpart E

The above equipment has been tested by World Standardization Certification & Testing Group(Shenzhen)Co., Ltd. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By: Wang Xiang **(Wang Xiang)**

Checked By: Li Huaibi **(Li Huaibi)**

Approved By: Wang Fengbing **(Wang Fengbing)**

Date: 01 August 2018

1.1 EUT DESCRIPTION

Product:	Megabook
Model No.:	T1
Additional Model No.:	N/A
Trade Mark:	TECNO
Operation Frequency:	Band1:5180-5240MHz Band2:5260-5320MHz Band3:5500-5700MHz Band4:5745-5825MHz
Modulation type:	IEEE 802.11a/n/ac/ax: OFDM/OFDMA (BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM)
Antenna Type:	Integral Antenna
Antenna Gain	4.69dBi
Power supply:	Rechargeable Li-ion Polymer Battery: 156 Rated Voltage: 11.55V Rated Capacity: 6060mAh/69.99Wh Typical Capacity:6160mAh/71.14Wh Limited Charge Voltage: 13.2V
Adapter:	Adapter: TCW-A61S-65W Input: 100-240V~50/60Hz 1.5A Max Output:5.0V⎓3.0A/9.0V⎓3.0A/12.0V⎓3.0A/15.0V⎓3.0A/20.0V3.25A
Remark:	N/A.

2. TEST DESCRIPTION

2.1 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y ± U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

No.	Item	Uncertainty
1	Conducted Emission Test	±3.2dB
2	RF power, conducted	±0.16dB
3	Spurious emissions, conducted	±0.21dB
4	All emissions, radiated(<1GHz)	±4.7dB
5	All emissions, radiated(>1GHz)	±4.7dB
6	Temperature	±0.5°C
7	Humidity	±2%

2.2 TEST ENVIRONMENT AND MODE

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations(The value of duty cycle is 98.46%)

The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. For the full battery state and The output power to the maximum state.

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Test Mode	Description
Mode 1	802.11a
Mode 2	802.11n20
Mode 3	802.11n40
Mode 4	802.11ac20
Mode 5	802.11ac40
Mode 6	802.11ac80
Mode 7	802.11ax20
Mode 8	802.11ax40
Mode 9	802.11ax80

Note:

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

(2) The EUT use new battery.

(3) Record the worst case of each test item in this report.

2.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

Test program	*#9646633#*											
Mode	Test Frequency (MHz)											
	NCB: 20MHz											
802.11a	5180 MHz	5240 MHz	5260 MHz	5320 MHz	5500 MHz	5700 MHz	5745 MHz	5825 MHz				
802.11n	5180 MHz	5240 MHz	5260 MHz	5320 MHz	5500 MHz	5700 MHz	5745 MHz	5825 MHz				
802.11ac	5180 MHz	5240 MHz	5260 MHz	5320 MHz	5500 MHz	5700 MHz	5745 MHz	5825 MHz				
802.11ax	5180 MHz	5240 MHz	5260 MHz	5320 MHz	5500 MHz	5700 MHz	5745 MHz	5825 MHz				
	NCB: 40MHz											
802.11n	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5670 MHz	5755 MHz	5795 MHz				
802.11ac	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5670 MHz	5755 MHz	5795 MHz				
802.11ax	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5670 MHz	5755 MHz	5795 MHz				
	NCB: 80MHz											
802.11ac	5210 MHz	5290 MHz	5530 MHz	5610 MHz	5775 MHz							
802.11ax	5210 MHz	5290 MHz	5530 MHz	5610 MHz	5775 MHz							
During testing, Channel and 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.												

2.4 CONFIGURATION OF SYSTEM UNDER TEST

(EUT: Megabook)

2.5 DESCRIPTION OF SUPPORT UNITS (CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
1	Adapter	/	CQ-18KX	/	/
2	Earphone	/	N/A	/	/

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.
(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.
(4) The adapter supply by the applicant.

3. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 Subpart C&E			
Standard Section	Test Item	Judgment	Remark
2.1049 15.403(i)	26dB & 99% Bandwidth	PASS	Complies
15.407(e)	6dB Spectrum Bandwidth	PASS	Complies
15.407(a)	Maximum Conducted Output Power	PASS	Complies
15.407(a)	Power Spectral Density	PASS	Complies
15.407(b)	Unwanted Emissions	PASS	Complies
15.207	AC Conducted Emission	PASS	Complies
15.407(g)	Frequency Stability	PASS	Complies
15.407(c)	Automatically Discontinue Transmission	PASS	Complies
15.203 & 15.407(a)	Antenna Requirement	PASS	Complies
15.407(h)	Transmit Power Control (TPC) and Dynamic Frequency Selection (DFS)	PASS	Complies

NOTE:

(1)" N/A" denotes test is not applicable in this test report.

4. MEASUREMENT INSTRUMENTS

NAME OF EQUIPMENT	MANUFACTURER	MODEL	SERIAL NUMBER	Calibration Date	Calibration Due.
Test software	--	EZ-EMC	CON-03A	-	-
Test software	--	MTS8310	-	-	-
EMI Test Receiver	R&S	ESCI	100005	11/05/2021	11/04/2022
LISN	AFJ	LS16	16010222119	11/05/2021	11/04/2022
LISN(EUT)	Mestec	AN3016	04/10040	11/05/2021	11/04/2022
Universal Radio Communication Tester	R&S	CMU 200	1100.0008.02	11/05/2021	11/04/2022
Coaxial cable	Megalon	LMR400	N/A	11/05/2021	11/04/2022
GPIB cable	Megalon	GPIB	N/A	11/05/2021	11/04/2022
Spectrum Analyzer	R&S	FSU	100114	11/05/2021	11/04/2022
Pre Amplifier	H.P.	HP8447E	2945A02715	11/05/2021	11/04/2022
Pre-Amplifier	CDSI	PAP-1G18-38	--	11/05/2021	11/04/2022
Bi-log Antenna	SUNOL Sciences	JB3	A021907	11/05/2021	11/04/2022
9*6*6 Anechoic	--	--	--	11/05/2021	11/04/2022
Horn Antenna	COMPLIANCE ENGINEERING	CE18000	--	11/05/2021	11/04/2022
Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-631	11/05/2021	11/04/2022
Cable	TIME MICROWAVE	LMR-400	N-TYPE04	11/05/2021	11/04/2022
System-Controller	CCS	N/A	N/A	N.C.R	N.C.R
Turn Table	CCS	N/A	N/A	N.C.R	N.C.R
Antenna Tower	CCS	N/A	N/A	N.C.R	N.C.R
RF cable	Murata	MXHQ87WA3000	-	11/05/2021	11/04/2022
Loop Antenna	EMCO	6502	00042960	11/05/2021	11/04/2022
Horn Antenna	SCHWARZBECK	BBHA 9170	1123	11/05/2021	11/04/2022
Power meter	Anritsu	ML2487A	6K00003613	11/05/2021	11/04/2022
Power sensor	Anritsu	MX248XD	--	11/05/2021	11/04/2022
Spectrum Analyzer	Keysight	N9010B	MY60241089	11/05/2021	11/04/2022

4.1 FACILITIES AND ACCREDITATIONS

4.1.1 FACILITIES

All measurement facilities used to collect the measurement data are located at **Building A-B, Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China of the World Standardization Certification & Testing Group(Shenzhen) CO., LTD**

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

4.1.2 ACCREDITATIONS

China National Accreditation Service for Conformity Assessment (CNAS)
Registration number NO: L3732

American Association for Laboratory Accreditation(A2LA)

Registration NO：5768.01

Copies of granted accreditation certificates are available for downloading from our web site, **http://www.wsct-cert.com**

5. EMC EMISSION TEST

5.1 CONDUCTED EMISSION MEASUREMENT

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

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

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

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

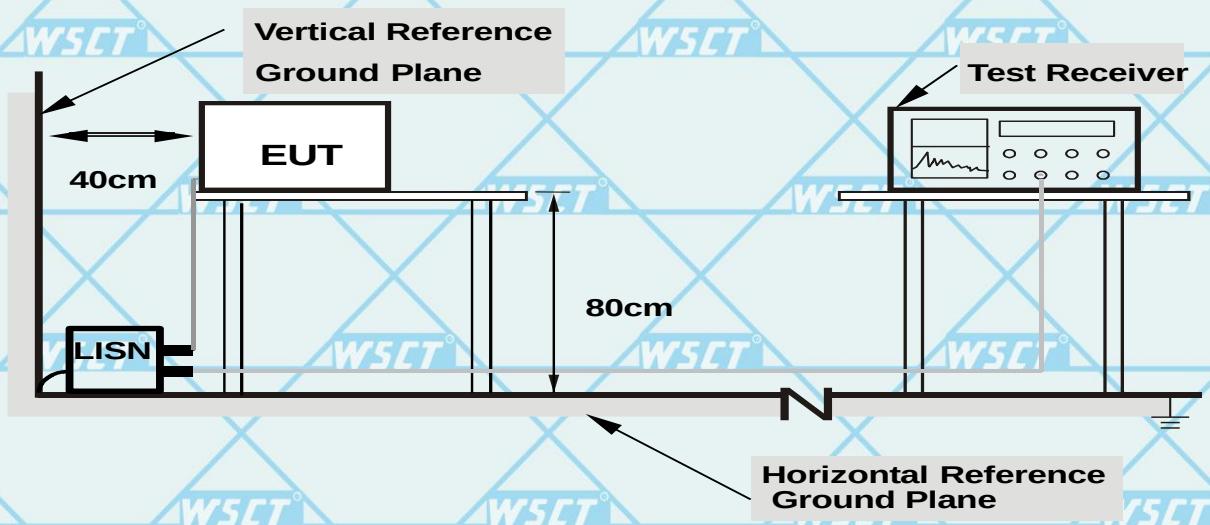
5.1.2 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

5.1.3 DEVIATION FROM TEST STANDARD

No deviation

5.1.4 TEST SETUP



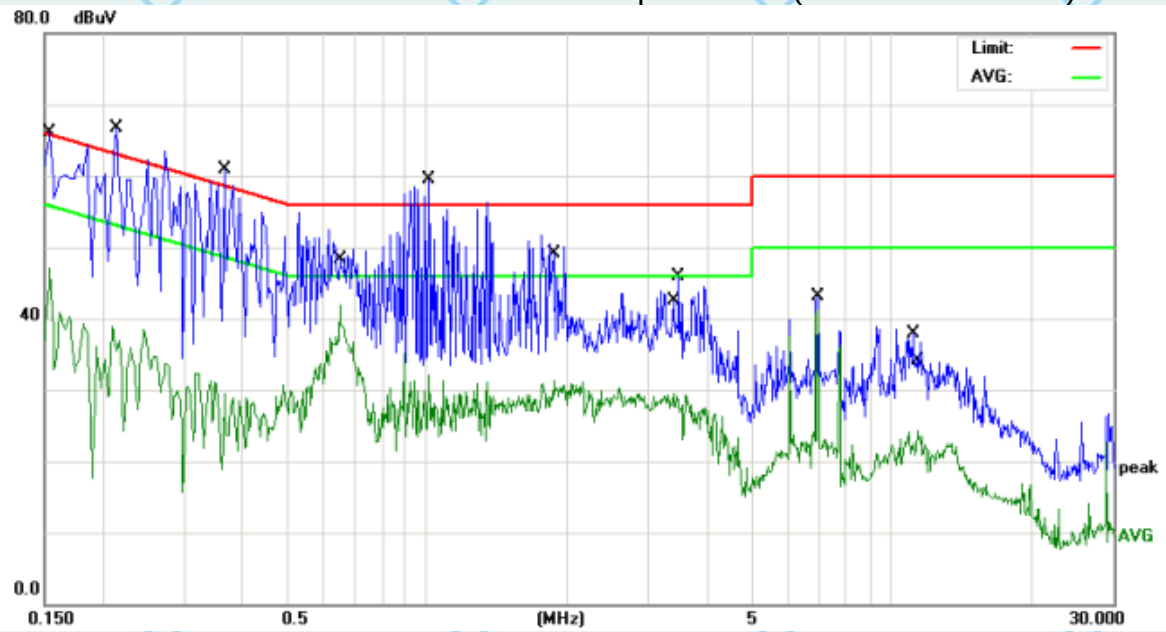
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

5.1.5 EUT OPERATING CONDITIONS

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

5.1.6 TEST RESULTS

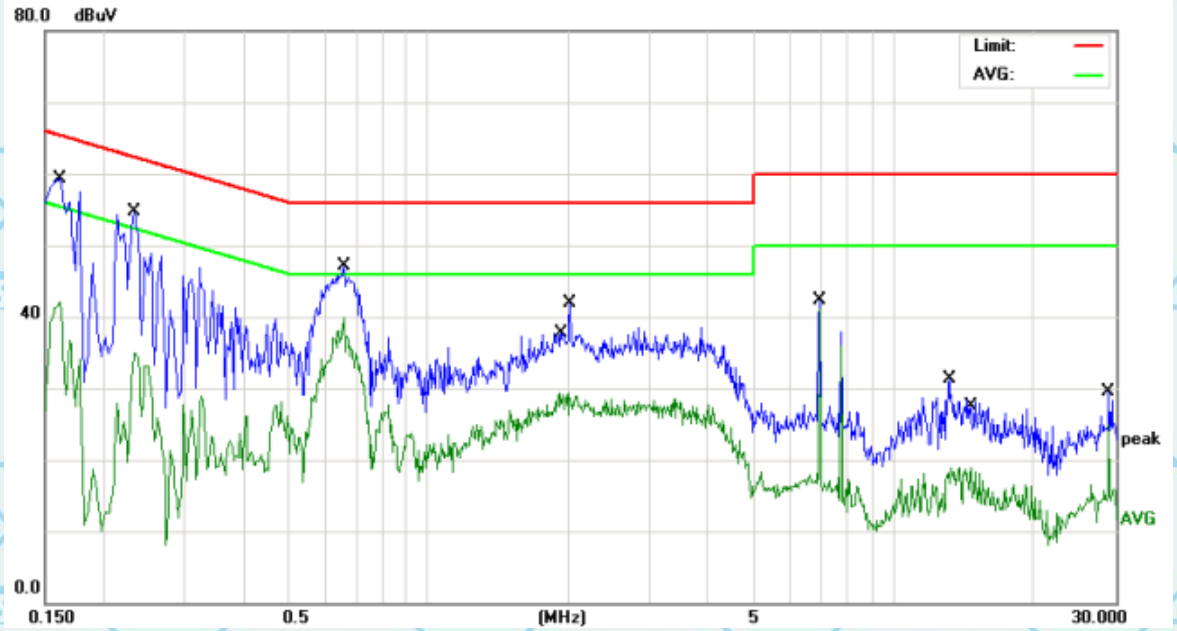
Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)-worst



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1539	36.62	10.41	47.03	55.78	-8.75	AVG
2		0.2140	36.97	10.41	47.38	63.04	-15.66	QP
3		0.3660	26.93	10.44	37.37	58.59	-21.22	QP
4	*	0.6500	31.33	10.48	41.81	46.00	-4.19	AVG
5		1.0060	23.96	10.51	34.47	56.00	-21.53	QP
6		1.8740	20.75	10.64	31.39	46.00	-14.61	AVG
7		3.3860	18.83	10.67	29.50	46.00	-16.50	AVG
8		3.4780	35.15	10.67	45.82	56.00	-10.18	QP
9		6.9260	32.32	10.73	43.05	60.00	-16.95	QP
10		6.9260	30.55	10.73	41.28	50.00	-8.72	AVG
11		11.1140	26.99	10.85	37.84	60.00	-22.16	QP
12		11.3460	13.35	10.86	24.21	50.00	-25.79	AVG

Remark: All the modes have been investigated, and only worst mode is presented in this report.

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	0.1620	48.94	10.41	59.35	65.36	-6.01	QP
2		0.1620	31.70	10.41	42.11	55.36	-13.25	AVG
3		0.2340	24.50	10.42	34.92	52.30	-17.38	AVG
4		0.6580	36.64	10.48	47.12	56.00	-8.88	QP
5		0.6580	29.38	10.48	39.86	46.00	-6.14	AVG
6		1.9100	18.71	10.65	29.36	46.00	-16.64	AVG
7		2.0140	31.17	10.66	41.83	56.00	-14.17	QP
8		6.9260	31.65	10.73	42.38	60.00	-17.62	QP
9		6.9260	30.43	10.73	41.16	50.00	-8.84	AVG
10		13.1700	20.32	10.96	31.28	60.00	-28.72	QP
11		14.6700	7.96	11.04	19.00	50.00	-31.00	AVG
12		28.9580	18.56	10.96	29.52	60.00	-30.48	QP

Notes:

1.An initial pre-scan was performed on the line and neutral lines with peak detector.

2.Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.

3.Final Level =Receiver Read level + LISN Factor + Cable Loss

4.If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

5.2 RADIATED EMISSION MEASUREMENT

5.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

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

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

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

5.2.2 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

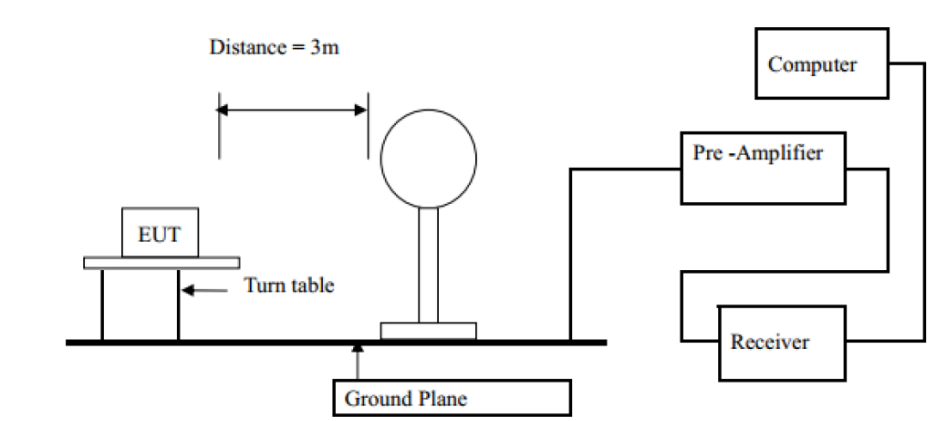
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

5.2.3 DEVIATION FROM TEST STANDARD

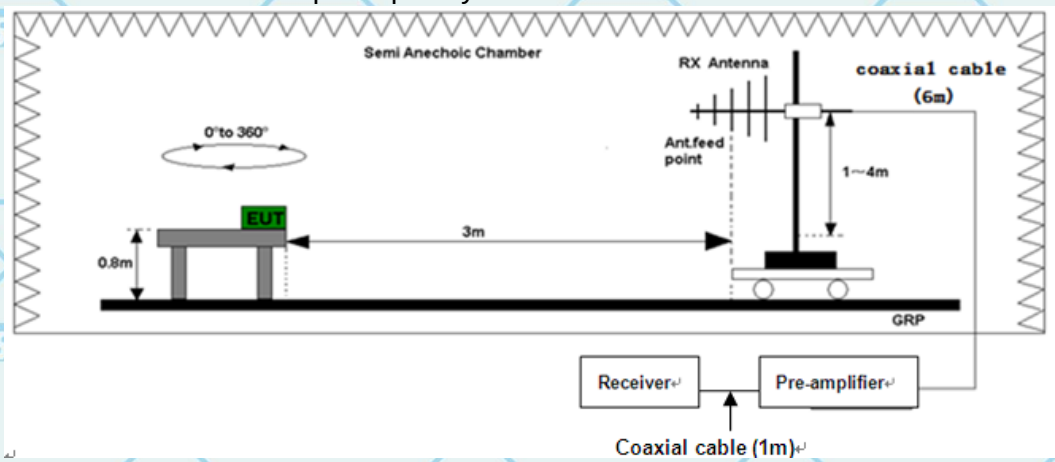
No deviation

5.2.4 TEST SETUP

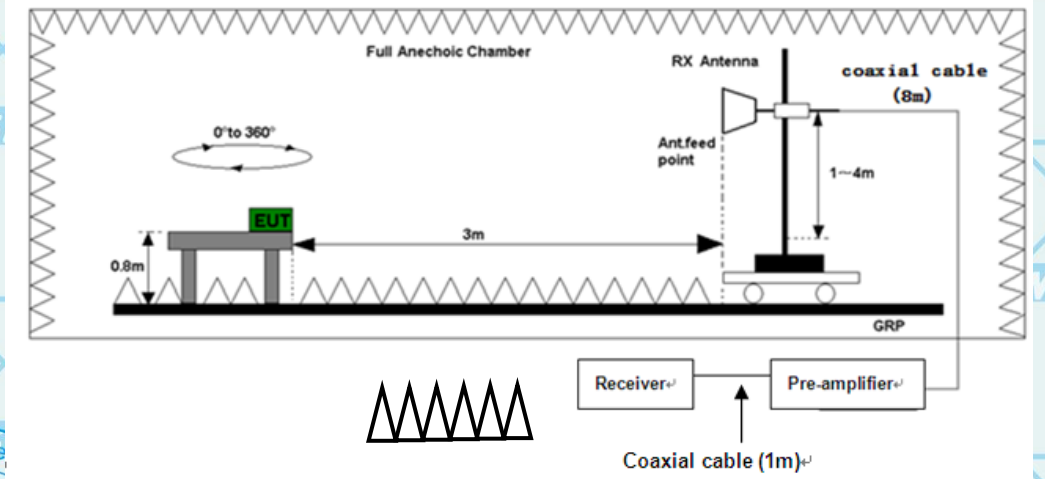
（A）Radiated Emission Test-Up Frequency Below 30MHz



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



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



5.2.5 EUT OPERATING CONDITIONS

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

5.2.5.1 RESULTS (BELOW 30 MHZ)

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

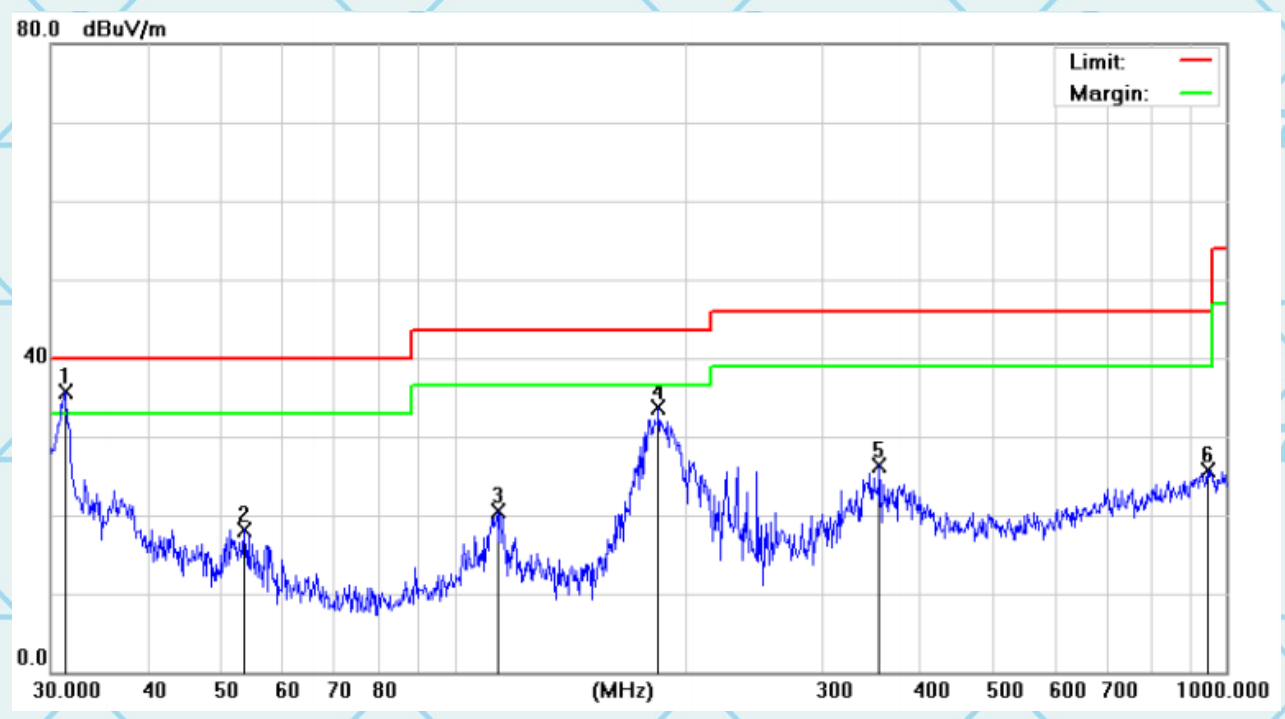
NOTE:
No result in this part for margin above 20dB.
Distance extrapolation factor =20 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuV) + distance extrapolation factor.
All the x/y/z orientation has been investigated, and only worst case is presented in this report.

5.2.5.2 TEST RESULTS (BETWEEN 30M – 1000 MHZ)

Please refer to following diagram for individual

Below 1GHz

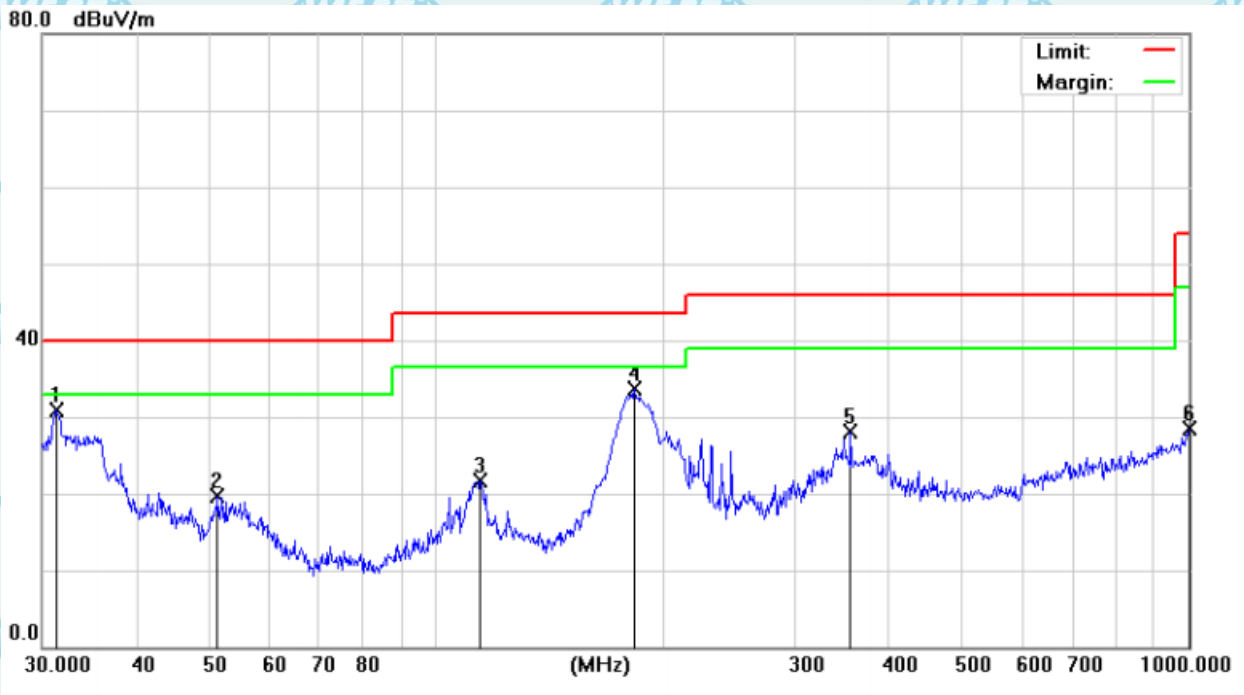
Horizontal:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	31.2893	31.41	4.29	35.70	40.00	-4.30	QP
2		53.3179	23.61	-5.41	18.20	40.00	-21.80	QP
3		113.7143	22.82	-2.23	20.59	43.50	-22.91	QP
4		183.8440	40.78	-7.09	33.69	43.50	-9.81	QP
5		355.4273	27.91	-1.51	26.40	46.00	-19.60	QP
6		945.4399	19.29	6.33	25.62	46.00	-20.38	QP

Remark: All the modes have been investigated, and only worst mode is presented in this report.

Vertical:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	31.2893	26.54	4.29	30.83	40.00	-9.17	QP
2		51.3005	24.82	-5.17	19.65	40.00	-20.35	QP
3		114.5146	23.97	-2.30	21.67	43.50	-21.83	QP
4		183.8440	40.78	-7.09	33.69	43.50	-9.81	QP
5		355.4273	29.54	-1.51	28.03	46.00	-17.97	QP
6		1000.000	21.28	7.32	28.60	54.00	-25.40	QP

Remark: All the modes have been investigated, and only worst mode is presented in this report.

5.2.5.3 TEST RESULTS (ABOVE 1GHZ)

Above 1GHz

Freq. (MHz)	Low channel: 2402MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
10360	V	58.97	40.63	74	54	-15.03	-13.37
15540	V	58.25	40.66	74	54	-15.75	-13.34
10360	H	59.28	40.65	74	54	-14.72	-13.35
15540	H	58.81	39.81	74	54	-15.19	-14.19

Freq. (MHz)	Low channel: 2402MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
10360	V	58.87	39.96	74	54	-15.13	-14.04
15540	V	59.99	39.15	74	54	-14.01	-14.85
10360	H	59.18	39.91	74	54	-14.82	-14.09
15540	H	58.06	39.06	74	54	-15.94	-14.94

Freq. (MHz)	Low channel: 2402MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
10360	V	58.16	39.06	74	54	-15.84	-14.94
15540	V	59.98	39.94	74	54	-14.02	-14.06
10360	H	58.61	40.51	74	54	-15.39	-13.49
15540	H	59.09	40.09	74	54	-14.91	-13.91

Freq. (MHz)	Low channel: 2402MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
10360	V	59.55	39.46	74	54	-14.45	-14.54
15540	V	58.79	40.74	74	54	-15.21	-13.26
10360	H	58.61	40.09	74	54	-15.39	-13.91
15540	H	59.96	40.96	74	54	-14.04	-13.04

Freq. = Emission frequency in MHz
Reading level (dBμV) = Receiver reading
Corr. Factor (dB) = Attenuation factor + Cable loss
Level (dBμV) = Reading level (dBμV) + Corr. Factor (dB)
Limit (dBμV) = Limit stated in standard
Margin (dB) = Level (dBμV) – Limits (dBμV)

6. ANTENNA APPLICATION

6.1 Antenna requirement

The EUT'S antenna is met the requirement of FCC part 15C section 15.203 and FCC part 15C section 15.407.

FCC part 15C section 15.203 and FCC part 15C section 15.407 requirements: Systems operating in the 5150~5850MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

6.2 Result

The EUT's antenna is a Integral Antenna., The antenna's gain is 4.69dBi and meets the requirement.

7 FCC PART 15.407 REQUIREMENTS

7. 1 Test Equipment

Please refer to Section 4 this report.

7. 2 Test Procedure

26dB Bandwidth and 99% Occupied Bandwidth:		
Test Method:	a)The transmitter was radiated to the spectrum analyzer in peak hold mode. b)Measure the maximum width of the emission that is 26 dB down from the peak of the emission Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.	
Test Equipment Setting – 26dB Bandwidth:		Test Equipment Setting – 99%% Bandwidth:
a)Attenuation: Auto b)Span Frequency: > 26dB Bandwidth c)RBW: Approximately 1% of the emission bandwidth d)VBW: VBW > RBW e)Detector: Peak f)Trace: Max Hold g)Sweep Time: Auto		a)Span: 1.5 times to 5.0 times the OBW b)RBW: 1 % to 5 % of the OBW c)VBW: ≥ 3 x RBW d)Detector: Peak e)Trace: Max Hold
6 dB Bandwidth:		
Test Method:	a)The transmitter was radiated to the spectrum analyzer in peak hold mode. b)Test was performed in accordance with KDB789033 D02 v01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (C) Emission Bandwidth. c)Multiple antenna system was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band. d)Measured the spectrum width with power higher than 6dB below carrier.	
Test Equipment Setting:		
a)Attenuation: Auto b)Span Frequency: > 6dB Bandwidth c)RBW: 100kHz d)VBW: ≥ 3 x RBW		e)Detector: Peak f)Trace: Max Hold g)Sweep Time: Auto
Maximum Conducted Output Power Measurement:		
Test Method:	a)The transmitter output (antenna port) was connected to the power meter. b)Test was performed in accordance with KDB789033 D02 v01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (E) Maximum conducted output power =>3. Measurement using a Power Meter (PM) =>b) Method PM-G (Measurement using a gated RF average power meter). c)Multiple antenna systems was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band. d)When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula.	
Test Equipment Setting: Detector - Average		
Power Spectral Density:		
Test Method:	a)The transmitter output (antenna port) was connected RF switch to the spectrum analyzer. b)Test was performed in accordance with KDB789033 D02 v01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (F) Maximum Power Spectral Density (PSD). c)Multiple antenna systems was performed in accordance KDB662911 D01 v02r01 in-Band Power Spectral Density (PSD) Measurements (a) Measure and sum the spectra across the outputs. d)When measuring first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3 and so on up to the Nth output to obtain the value for the first frequency bin of the summed spectrum. The summed spectrum value for each of the other	

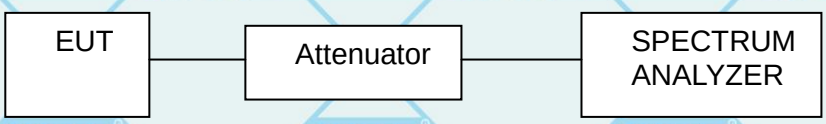
	frequency bins is computed in the same way. e)For 5.725~5.85 GHz, the measured result of PSD level must add 10log(500kHz/RBW) and the final result should ≤ 30 dBm.

Test Equipment Setting:	
a)Attenuation: Auto b)Span Frequency: Encompass the entire emissions bandwidth (EBW) of the signal c)RBW: 1000 kHz d)VBW: 3000 kHz	e)Detector: RMS f)Trace: AVERAGE g)Sweep Time: Auto h)Trace Average: 100 times
Note: If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.	

Frequency Stability Measurement:	
Test Method:	a)The transmitter output (antenna port) was connected to the spectrum analyzer. b)EUT have transmitted absence of modulation signal and fixed channelize. c)Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth. d)Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings. e)fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 106 ppm and the limit is less than ±20ppm (IEEE 802.11nspecification). f)The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value g)Extreme temperature is 0°C~40°C

Test Equipment Setting:	
a)Attenuation: Auto b)Span Frequency: Entire absence of modulation emissions bandwidth c)RBW: 10 kHz d)VBW: 10 kHz	e)Sweep Time: Auto

7. 3 Test Setup



7. 4 Configuration of the EUT

Same as section 2.4 of this report

7. 5 EUT Operating Condition

Same as section 2.2 of this report.

7. 6 Limit

26dB Bandwidth and 99% Occupied Bandwidth:	
Limit:	No restriction limits.
6 dB Bandwidth:	
Limit:	For digital modulation systems, the minimum 6dB bandwidth shall be at least 500 kHz.
Test Equipment Setting:	
a)Attenuation: Auto b)Span Frequency: > 6dB Bandwidth c)RBW: 100kHz d)VBW: ≥ 3 x RBW	e)Detector: Peak f)Trace: Max Hold g)Sweep Time: Auto
Maximum Conducted Output Power Measurement:	
☒5.15~5.25 GHz	
☐Limit of Outdoor access point:	☐Limit of Indoor access point:
The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
☐Limit of Fixed point-to-point access points:	☒Limit of Mobile and portable client devices:
The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.	The maximum conducted output power over the frequency band of operation shall not exceed 250 mW (24dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
☒5.25-5.35 GHz & ☒5.470-5.725 GHz	
The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.	
☒5.725~5.85 GHz	
The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.	
Power Spectral Density	
☒5.15~5.25 GHz	
☐Limit of Outdoor access point: 17 dBm/MHz	☐Limit of Indoor access point: 17 dBm/MHz
☐Limit of Fixed point-to-point access points: 17 dBm/MHz	☒Limit of Mobile and portable client devices: 11 dBm/MHz
☐5.25-5.35 GHz	11 dBm/MHz
☐5.470-5.725 GHz	11 dBm/MHz
☒5.725~5.85 GHz	30 dBm/500kHz
Frequency Stability Measurement:	
Limit:	In-band emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual. The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band

	(IEEE 802.11n specification).

7. 7 Test Result

A. 26dB Bandwidth and 99% Occupied Bandwidth

Product	: EUT-Sample	Test Mode	: See section 2.2
Test Item	: 26dB Bandwidth and 99% Occupied Bandwidth	Temperature	: 25 ℃
Test Voltage	: DC 11.55V	Humidity	: 56%RH
Test Result	: PASS		

26dB Bandwidth

20MHz(IEEE 802.11a/n/ac/ax)

Band1

Channel	Frequency (MHz)	26dBBandwidth (MHz)	FCC Limit (kHz)	Result
Low	5180	25.288	--	PASS
High	5240	25.481		PASS

Band2

Channel	Frequency (MHz)	26dBBandwidth (MHz)	FCC Limit (kHz)	Result
Low	5260	25.481	--	PASS
High	5320	25.192		PASS

Band3

Channel	Frequency (MHz)	26dBBandwidth (MHz)	FCC Limit (kHz)	Result
Low	5500	25.192	--	PASS
High	5700	25.385		PASS

Band4

Channel	Frequency (MHz)	26dBBandwidth (MHz)	FCC Limit (kHz)	Result
Low	5745	24.615	--	PASS
High	5825	24.904		PASS

40MHz(IEEE 802.11n/ac/ax)

IEEE 802.11n 5G 40MHz

Band1

Channel	Frequency (MHz)	26dBBandwidth (MHz)	FCC Limit (kHz)	Result
Low	5190	44.519	--	PASS
High	5230	44.327		PASS

Band2

Channel	Frequency (MHz)	26dBBandwidth (MHz)	FCC Limit (kHz)	Result
Low	5270	44.904	--	PASS
High	5310	44.904		PASS

Band3

Channel	Frequency (MHz)	26dBBandwidth (MHz)	FCC Limit (kHz)	Result
Low	5510	47.115	--	PASS
High	5670	45.865		PASS

Band4

Channel	Frequency (MHz)	26dBBandwidth (MHz)	FCC Limit (kHz)	Result
Low	5755	45.353	--	PASS
High	5795	56.731		PASS

80MHz(IEEE 802.11n/ac/ax)

Band1

Channel	Frequency (MHz)	26dBBandwidth (MHz)	FCC Limit (kHz)	Result
Low	5210	86.410	--	PASS

Band2

Channel	Frequency (MHz)	26dBBandwidth (MHz)	FCC Limit (kHz)	Result
Low	5290	87.179	--	PASS

Band3

Channel	Frequency (MHz)	26dBBandwidth (MHz)	FCC Limit (kHz)	Result
Low	5530	84.103	--	PASS
High	5610	86.154		

Band4

Channel	Frequency (MHz)	26dBBandwidth (MHz)	FCC Limit (kHz)	Result
Low	5775	85.897	--	PASS

99% Occupied Bandwidth

20MHz(IEEE 802.11a/n/ac/ax)-the worst

Band1

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	FCC Limit (kHz)	Result
Low	5180	17.308	--	PASS
High	5240	17.308		PASS

Band2

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	FCC Limit (kHz)	Result
Low	5260	17.308	--	PASS
High	5320	17.308		PASS

Band3

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	FCC Limit (kHz)	Result
Low	5500	17.404	--	PASS
High	5700	17.404		PASS

Band4

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	FCC Limit (kHz)	Result
Low	5745	17.404	--	PASS
High	5825	17.308		PASS

40MHz(IEEE 802.11/n/ac/ax)

Band1

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	FCC Limit (kHz)	Result
Low	5190	36.442	--	PASS
High	5230	36.442		PASS

Band2

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	FCC Limit (kHz)	Result
Low	5270	36.442	--	PASS
High	5310	36.442		PASS

Band3

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	FCC Limit (kHz)	Result
Low	5510	36.538	--	PASS
High	5670	36.442		PASS

Band4

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	FCC Limit (kHz)	Result
Low	5755	36.838	--	PASS
High	5795	36.218		PASS

80MHz(IEEE 802.11/ac/ax)-worst

Band1

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	FCC Limit (kHz)	Result
Low	5210	75.385	--	PASS

Band2

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	FCC Limit (kHz)	Result
Low	5290	75.128	--	PASS

Band3

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	FCC Limit (kHz)	Result
Low	5530	76.667	--	PASS
High	5610	75.128		

Band4

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	FCC Limit (kHz)	Result
Low	5775	75.385	--	PASS

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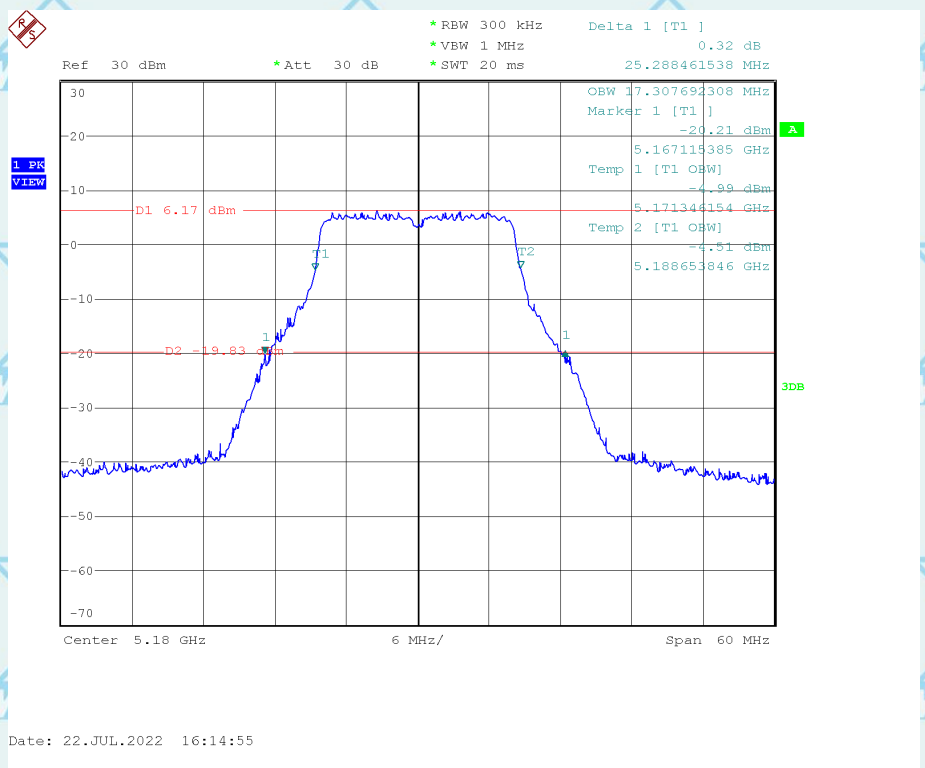
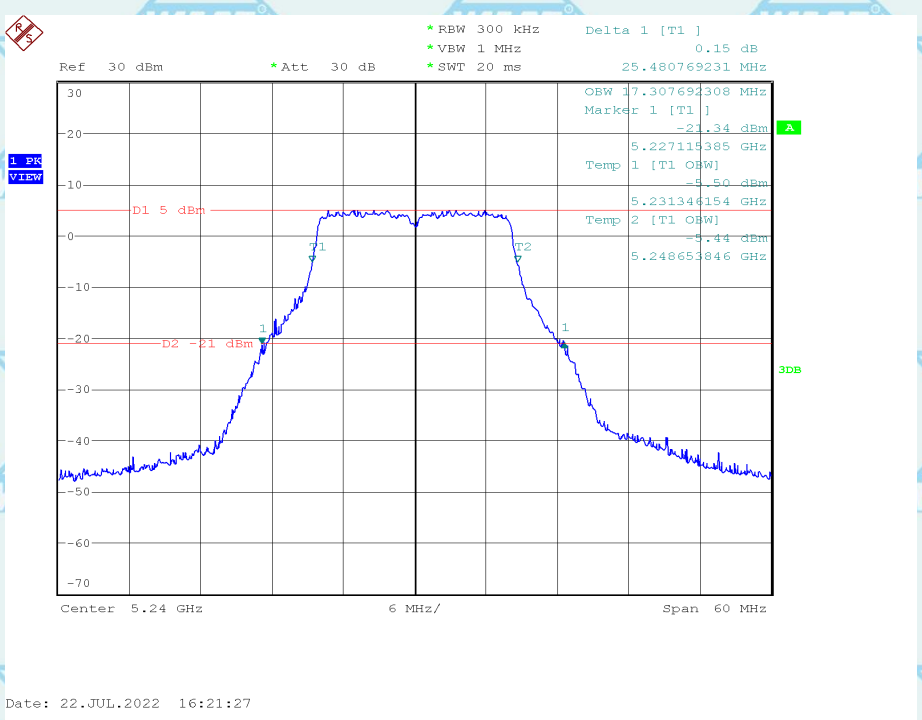
20MHz(IEEE 802.11a/n/ac/ax)
Band1

26dB Bandwidth and 99% Occupied Bandwidth (CH Low)

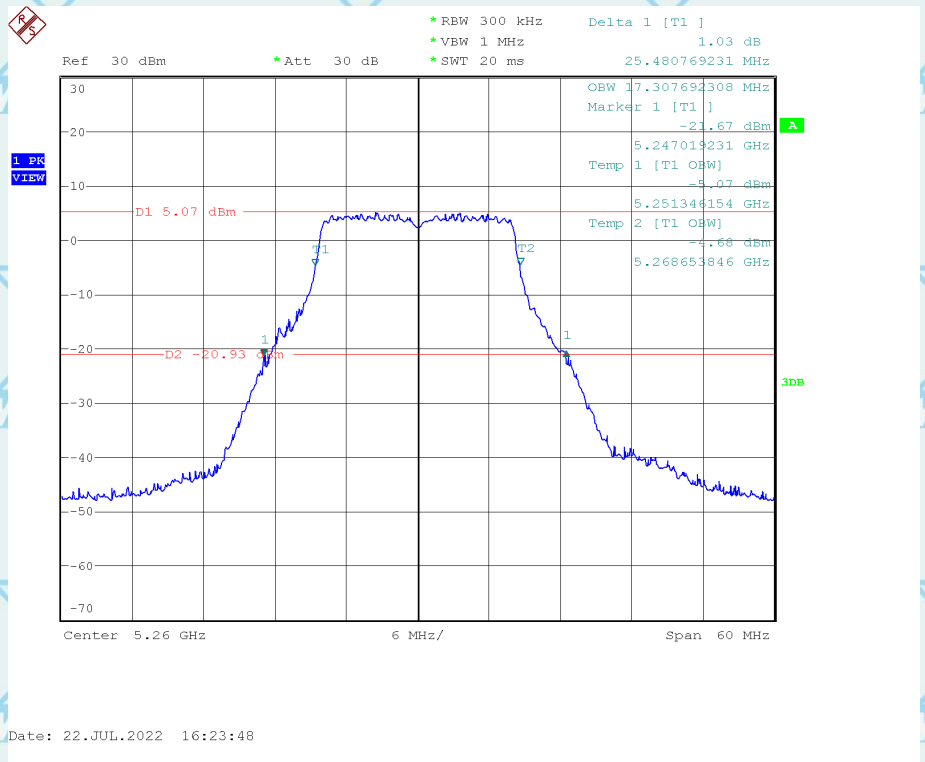


26dB Bandwidth and 99% Occupied Bandwidth (CH High)

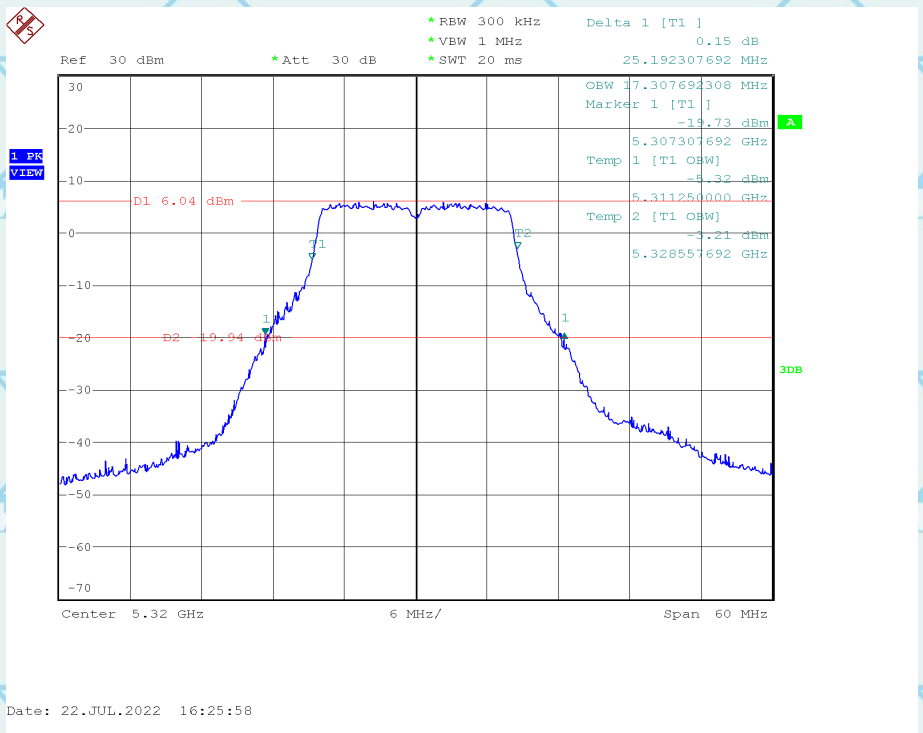


Band2

26dB Bandwidth and 99% Occupied Bandwidth (CH Low)



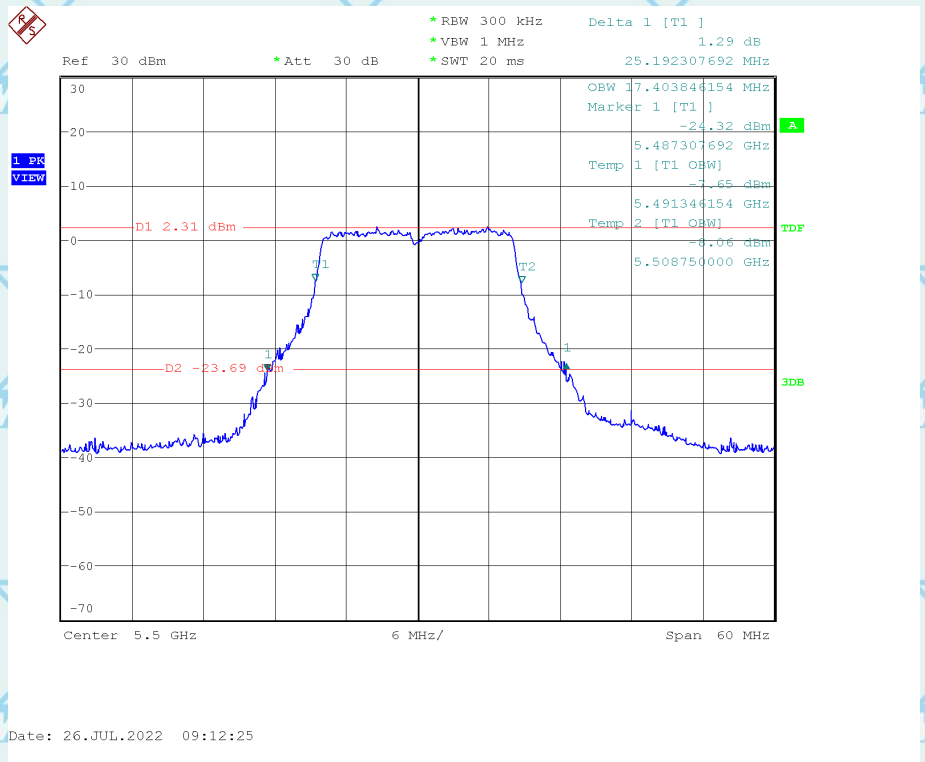
26dB Bandwidth and 99% Occupied Bandwidth (CH High)



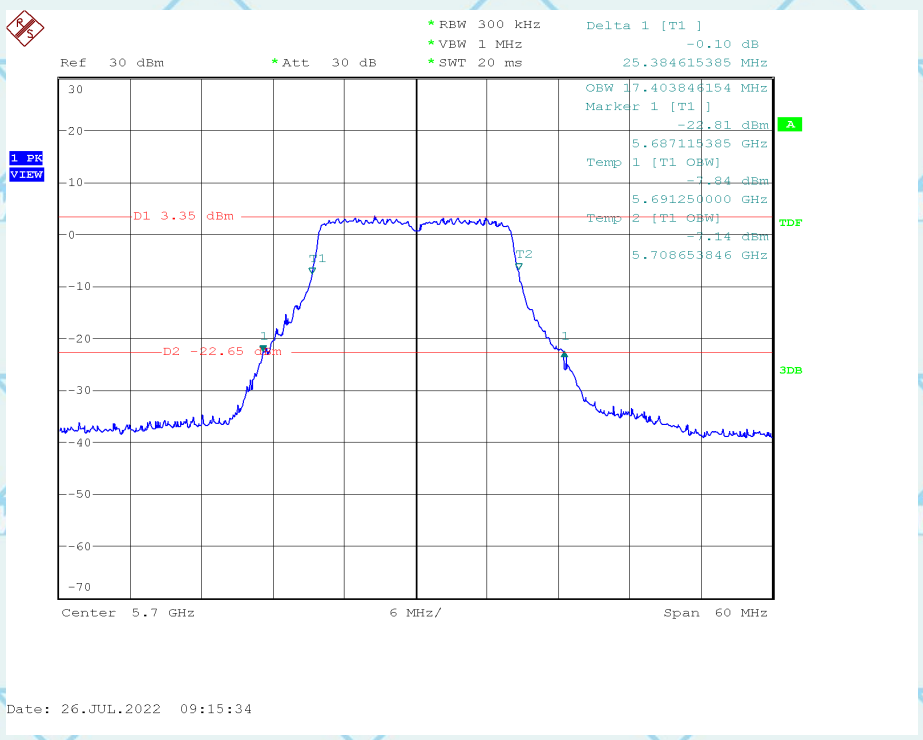
Report No.: WSCT-A2LA-R&E220300004A-Wi-Fi2

Band3

26dB Bandwidth and 99% Occupied Bandwidth (CH Low)

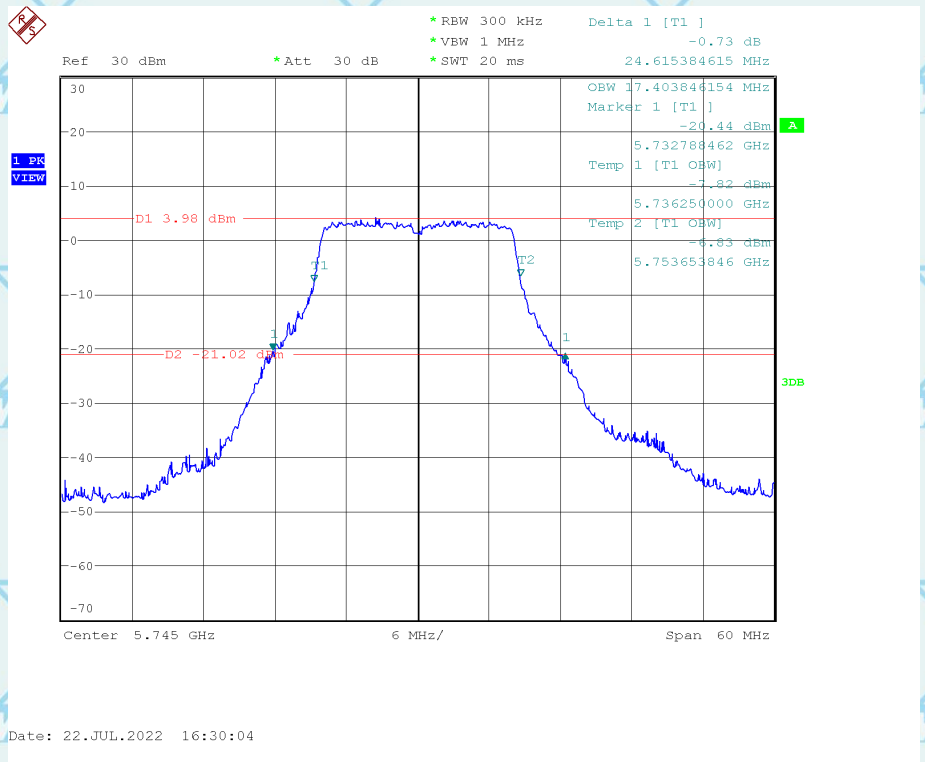


26dB Bandwidth and 99% Occupied Bandwidth (CH High)

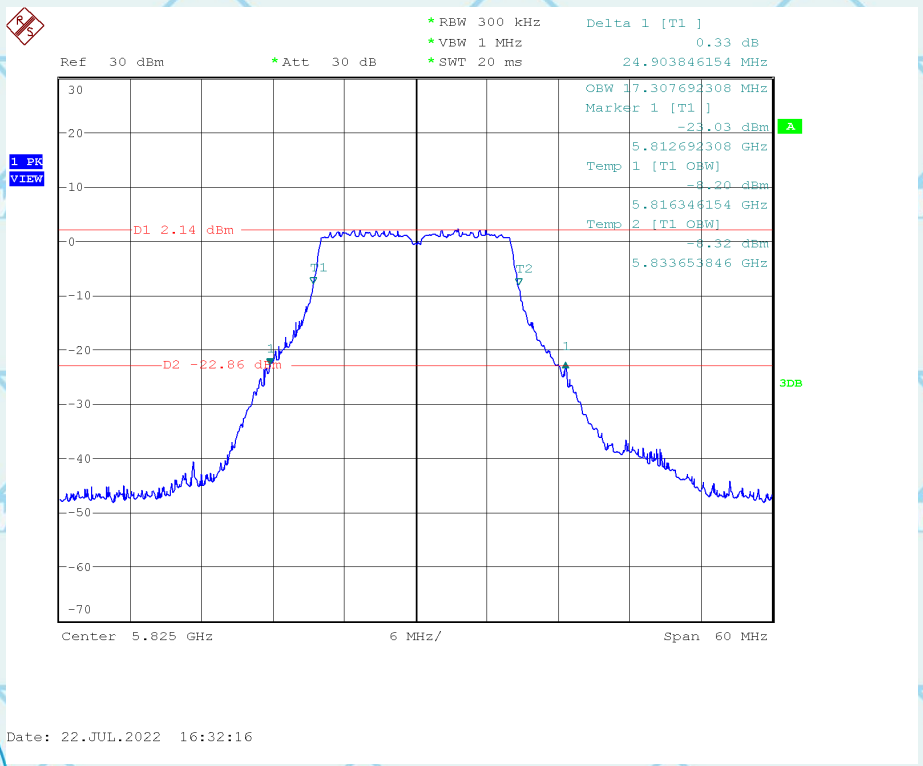


Band4

26dB Bandwidth and 99% Occupied Bandwidth (CH Low)



26dB Bandwidth and 99% Occupied Bandwidth (CH High)



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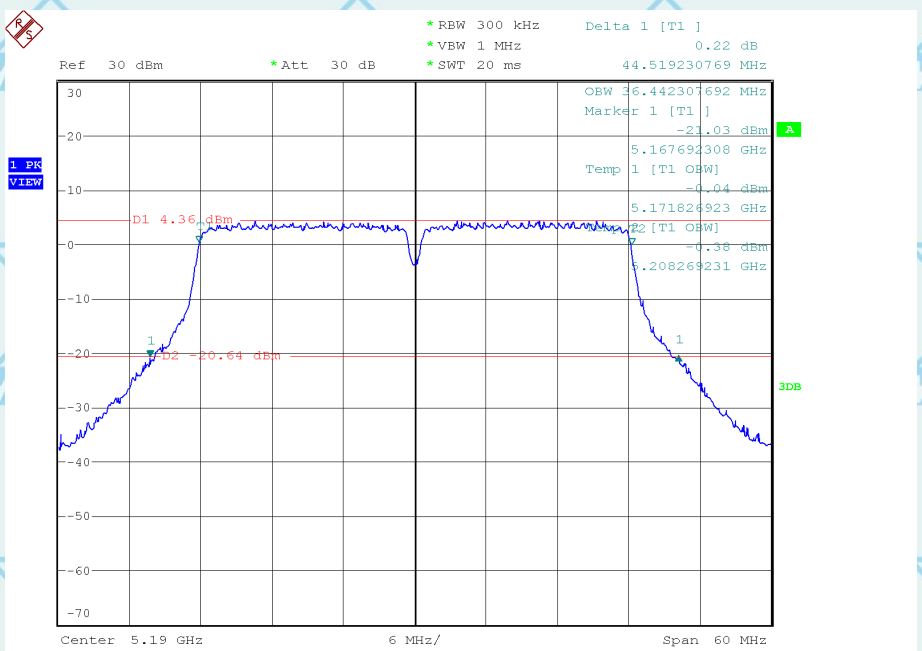
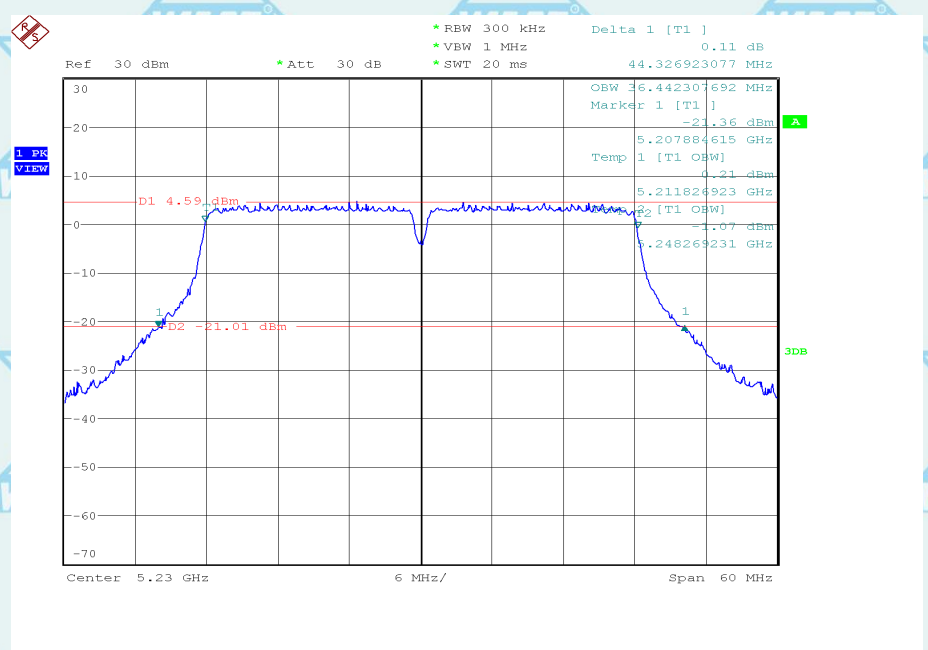
40MHz(IEEE 802.11a/n/ac/ax)
Band1

26dB Bandwidth and 99% Occupied Bandwidth (CH Low)

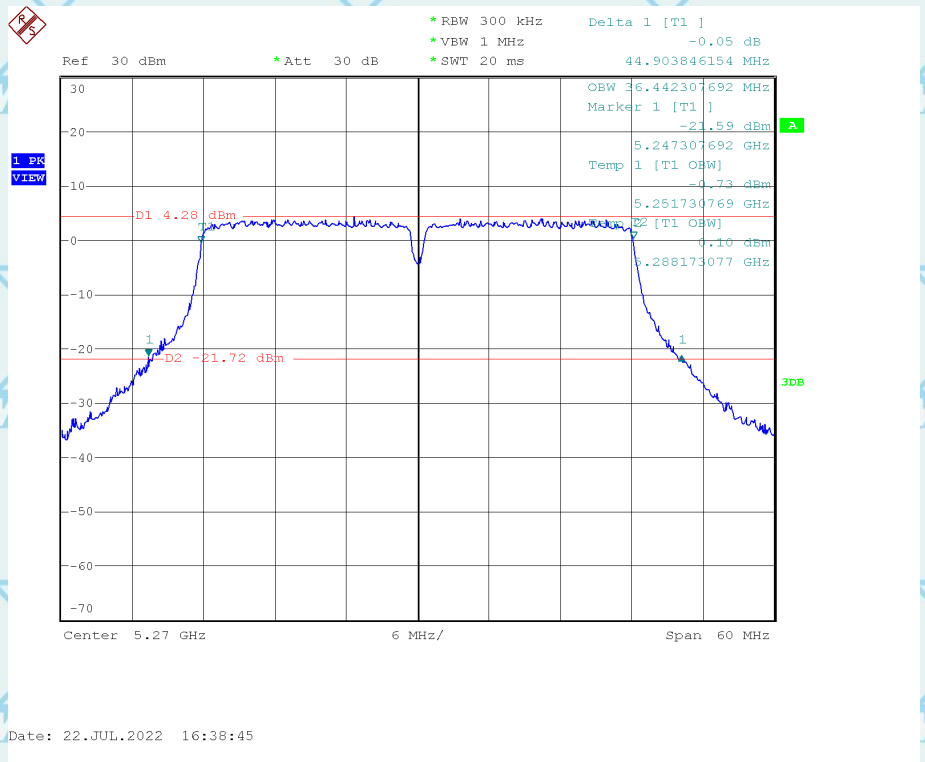


26dB Bandwidth and 99% Occupied Bandwidth (CH High)

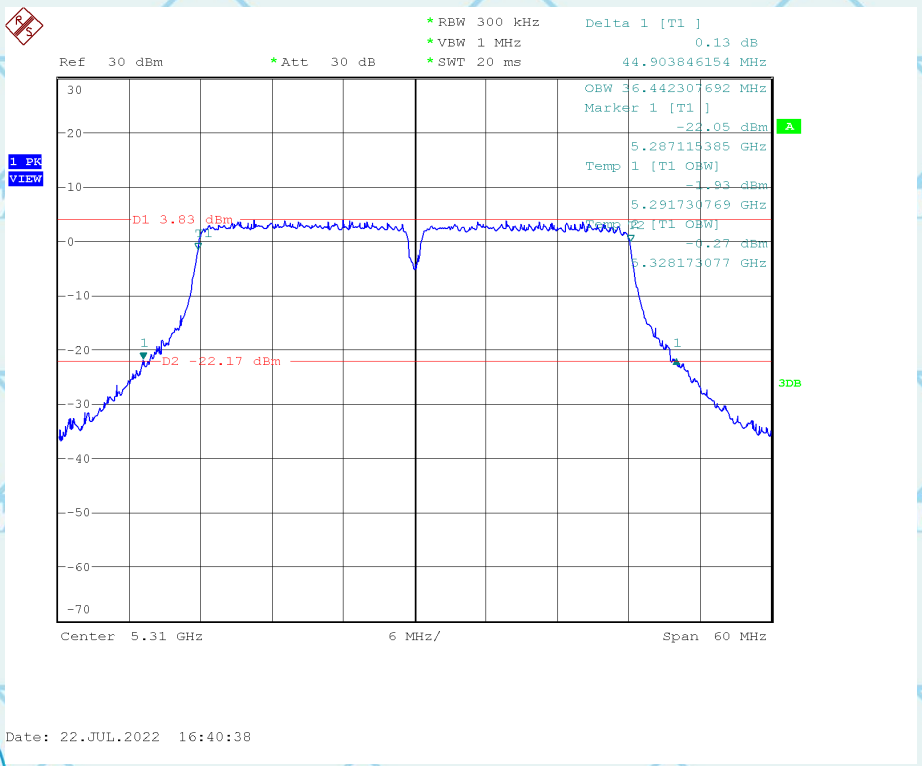


Band2

26dB Bandwidth and 99% Occupied Bandwidth (CH Low)

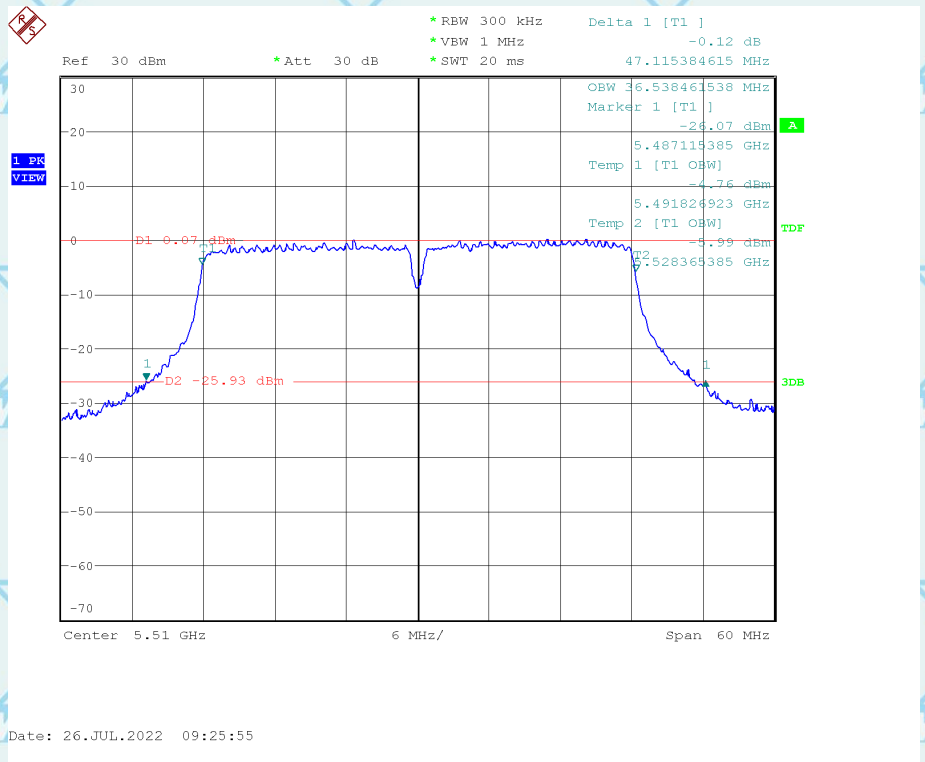


26dB Bandwidth and 99% Occupied Bandwidth (CH High)

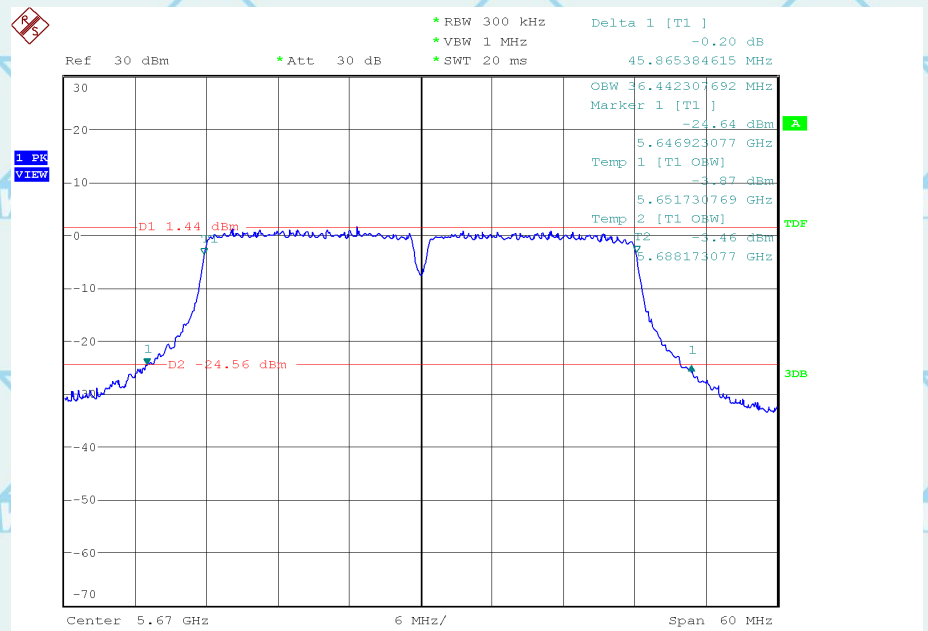


Band3

26dB Bandwidth and 99% Occupied Bandwidth (CH Low)



26dB Bandwidth and 99% Occupied Bandwidth (CH High)



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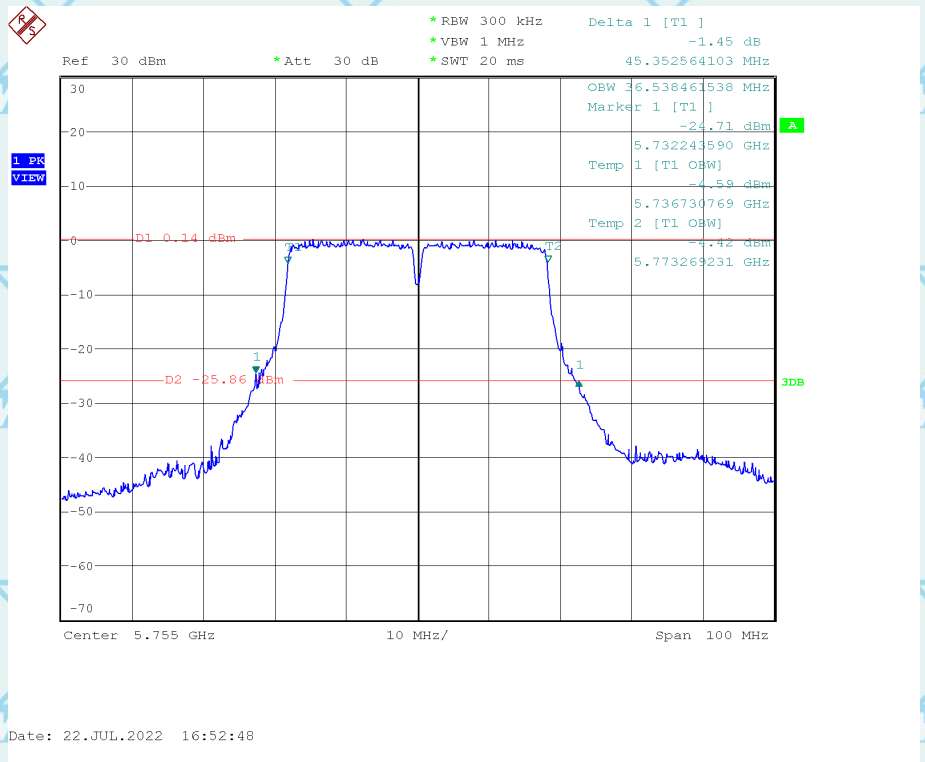
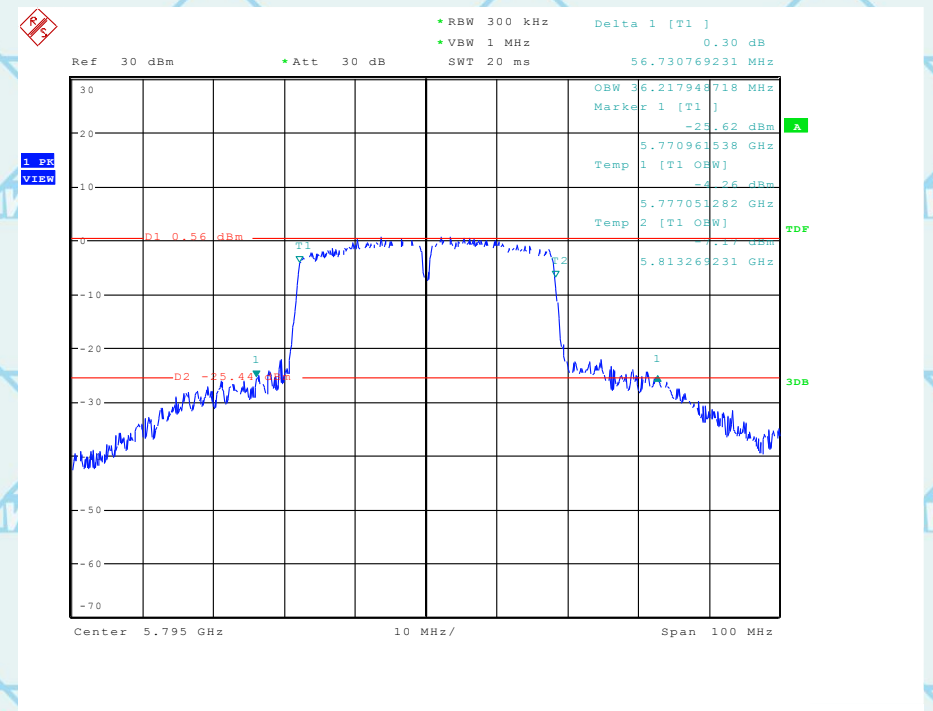
Band4

26dB Bandwidth and 99% Occupied Bandwidth (CH Low)

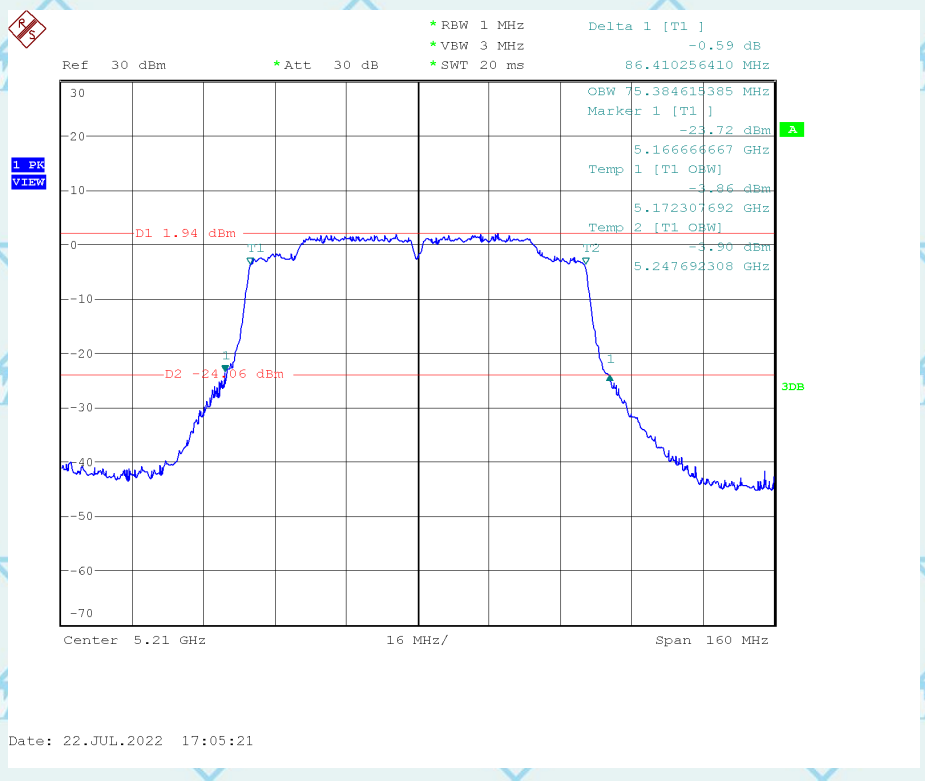


26dB Bandwidth and 99% Occupied Bandwidth (CH High)



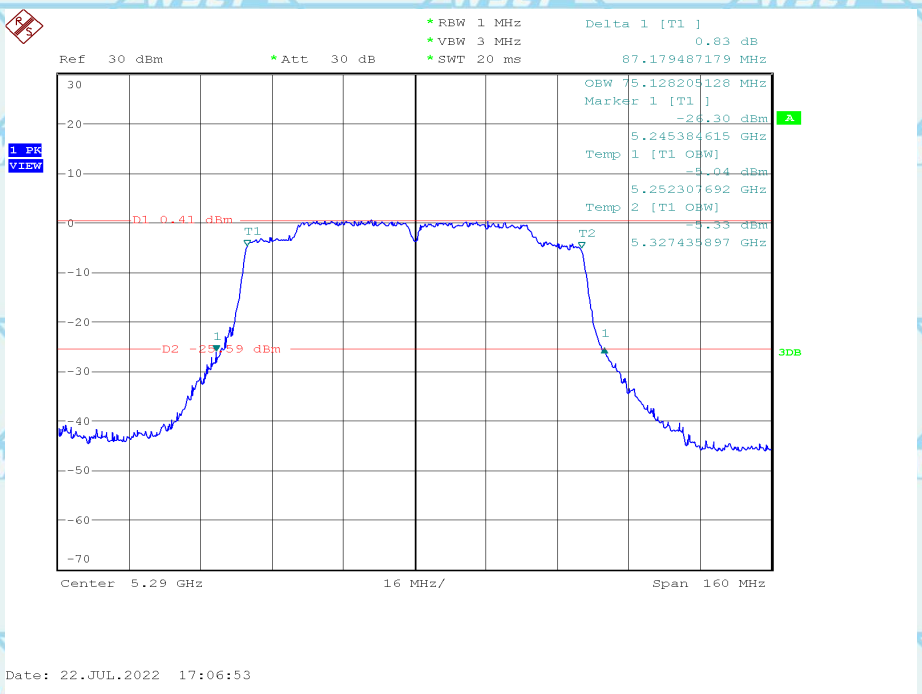
80MHz(IEEE 802.11ac/ax)
Band1

26dB Bandwidth and 99% Occupied Bandwidth (CH Low)



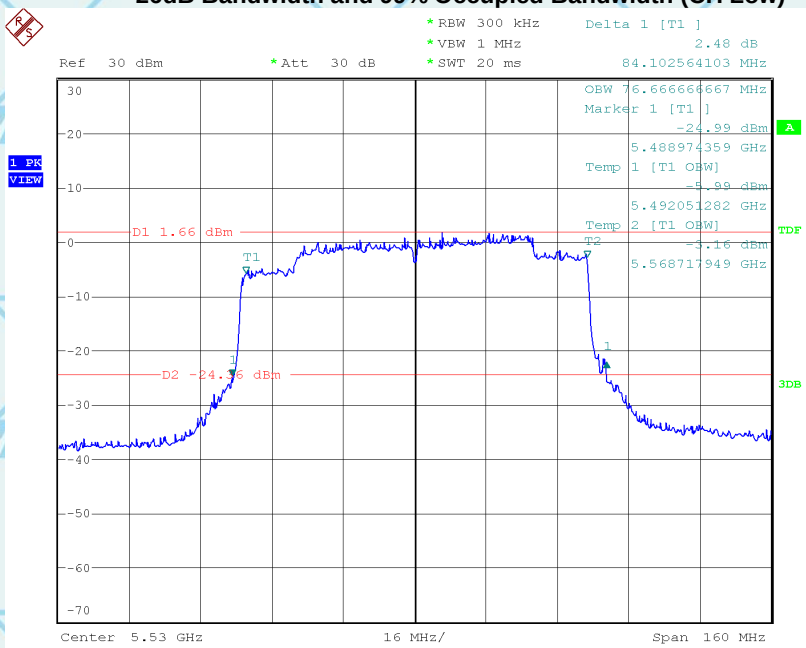
Band2

26dB Bandwidth and 99% Occupied Bandwidth (CH Low)

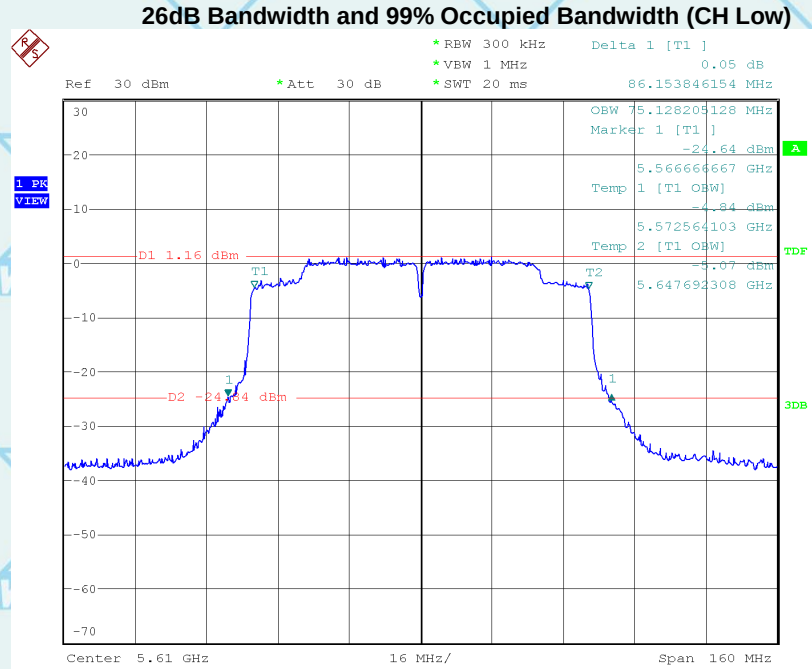


Band3

26dB Bandwidth and 99% Occupied Bandwidth (CH Low)



26dB Bandwidth and 99% Occupied Bandwidth (CH Low)



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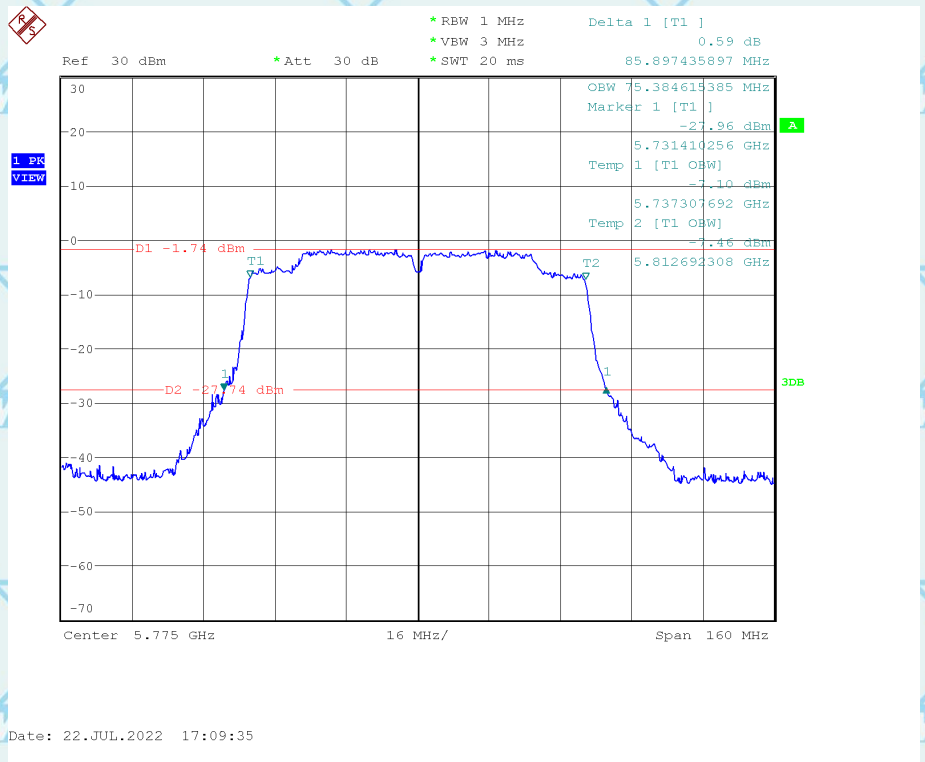
Band4

26dB Bandwidth and 99% Occupied Bandwidth (CH Low)



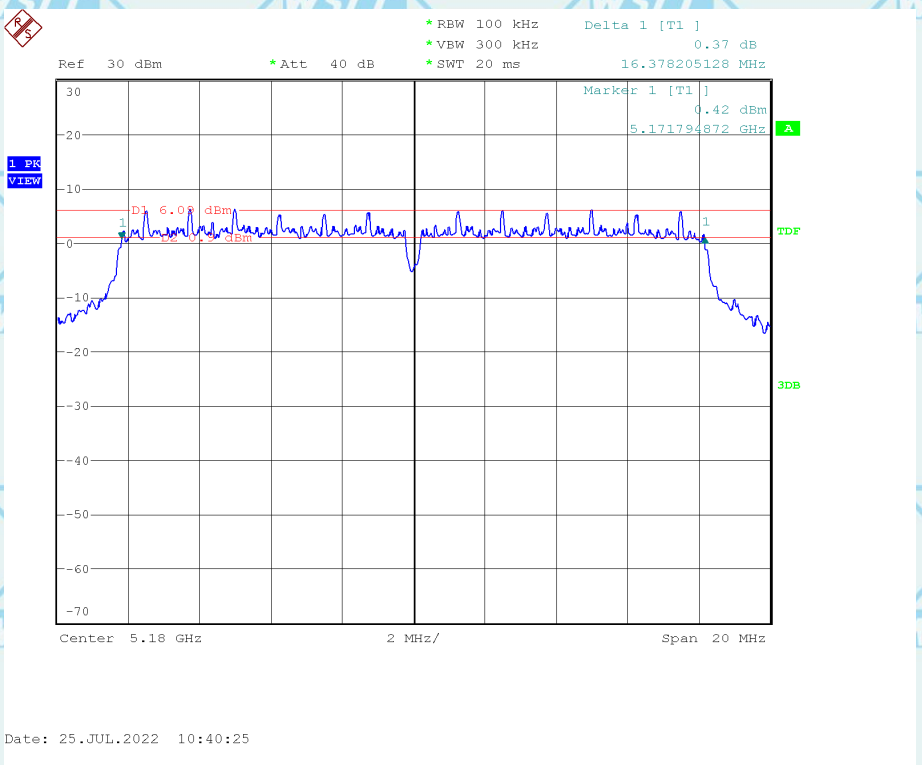
B. 6 dB Bandwidth

Product	: EUT-Sample	Test Mode	: See Section 2.2
Test Item	: 6 dB BW	Temperature	: 25 ℃
Test Voltage	: DC 11.55V	Humidity	: 56%RH
Test Result	: **PASS**		

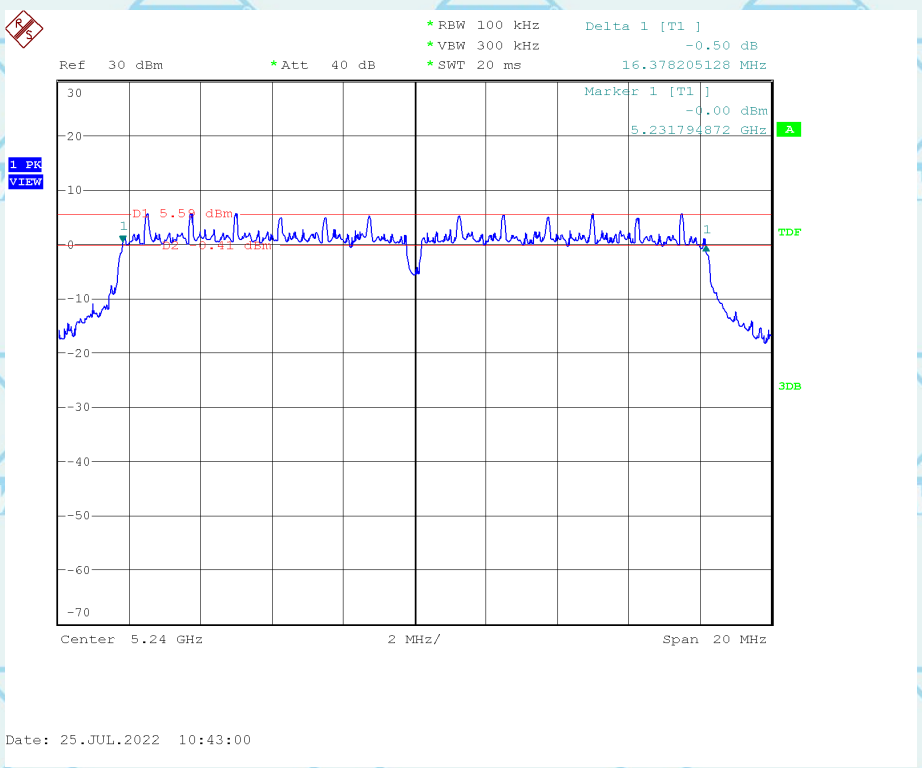
20MMHz(IEEE 802.11a/n/ac/ax)

Channel	Measured Frequency (MHz)	6 dB Bandwidth (MHz)	Limit
Low	**5180**	16.378	> 0.5MHz
High	**5240**	16.378	> 0.5MHz

Channel Low

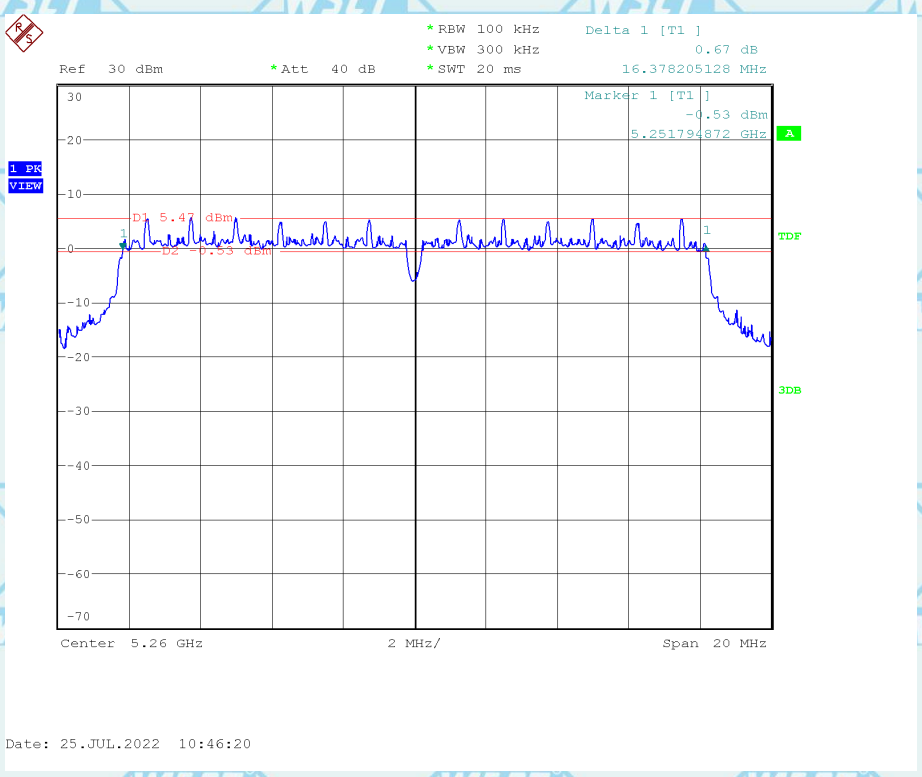


Channel High



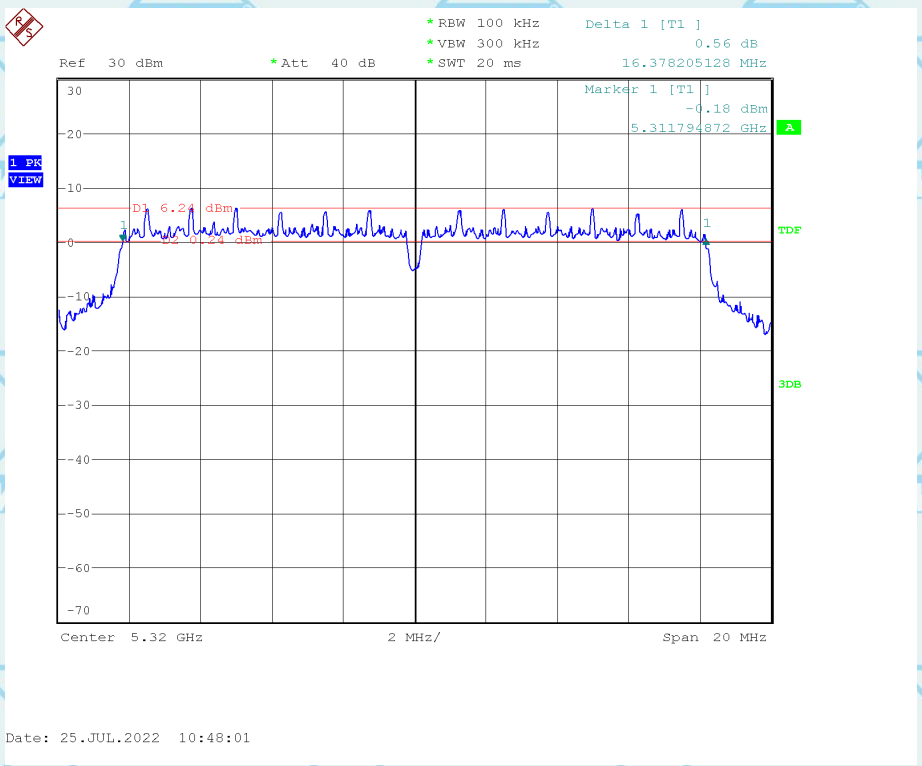
Channel	Measured Frequency (MHz)	6 dB Bandwidth (MHz)	Limit
Low	5260	16.378	> 0.5MHz
High	5320	16.378	> 0.5MHz

Channel Low



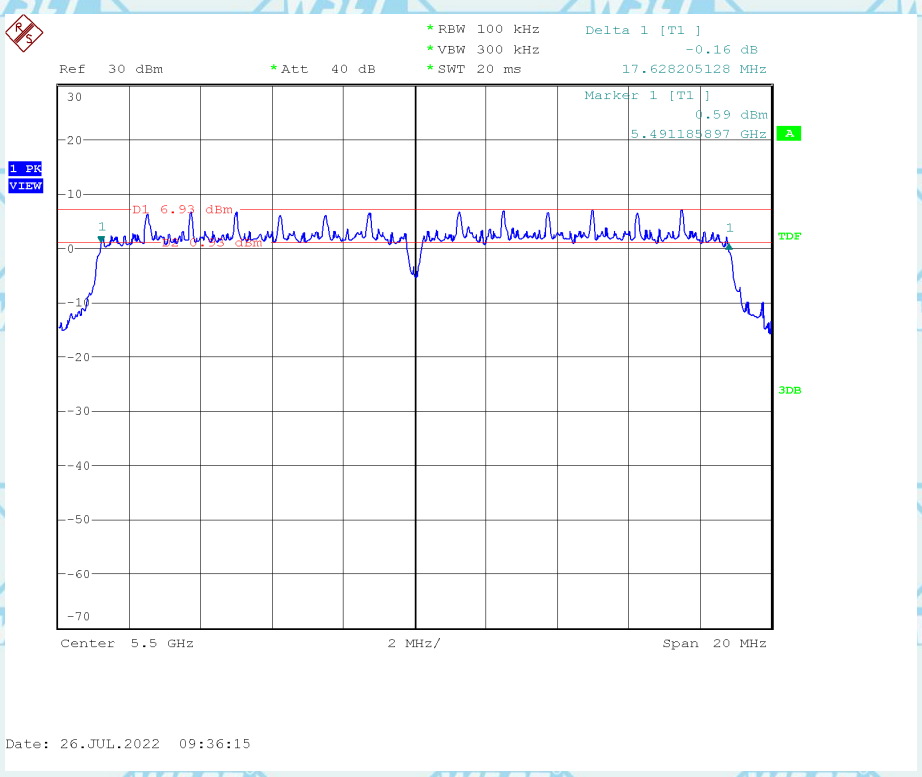
Report No.: WSCT-A2LA-R&E220300004A-Wi-Fi2

Channel High

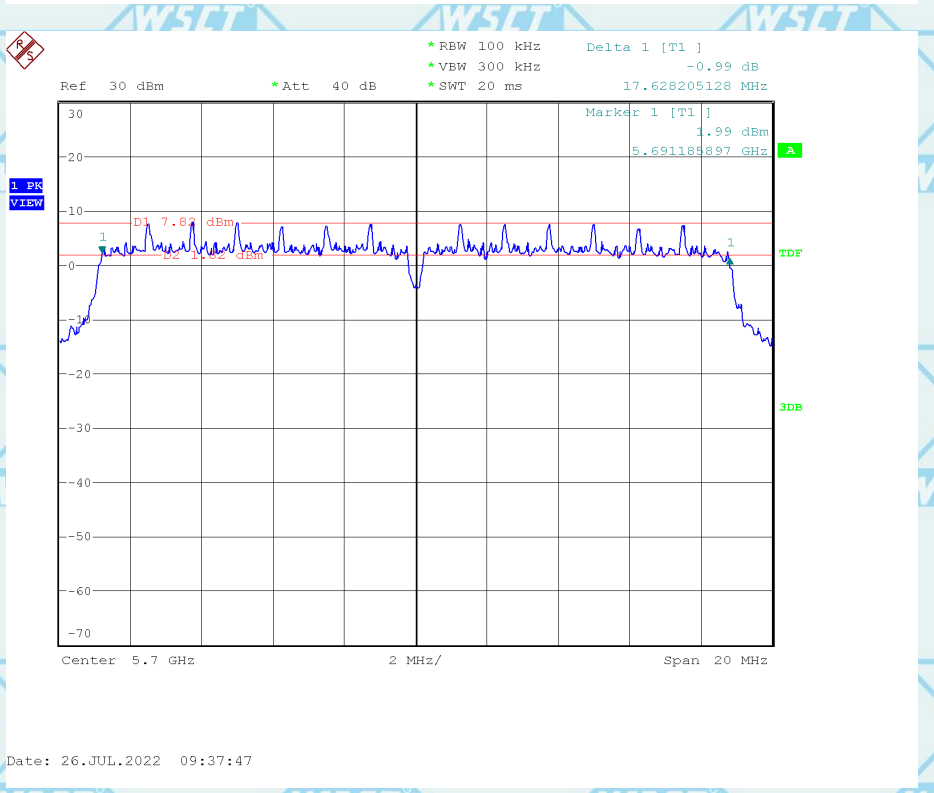


Channel	Measured Frequency (MHz)	6 dB Bandwidth (MHz)	Limit
Low	5500	17.628	> 0.5MHz
High	5700	17.628	> 0.5MHz

Channel Low

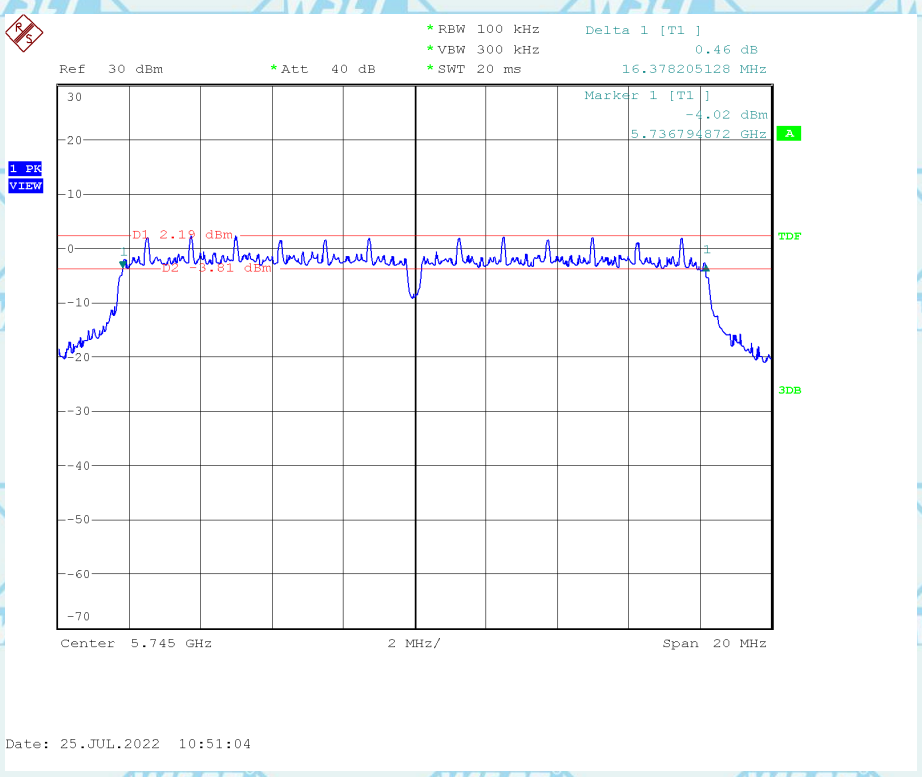


Channel High

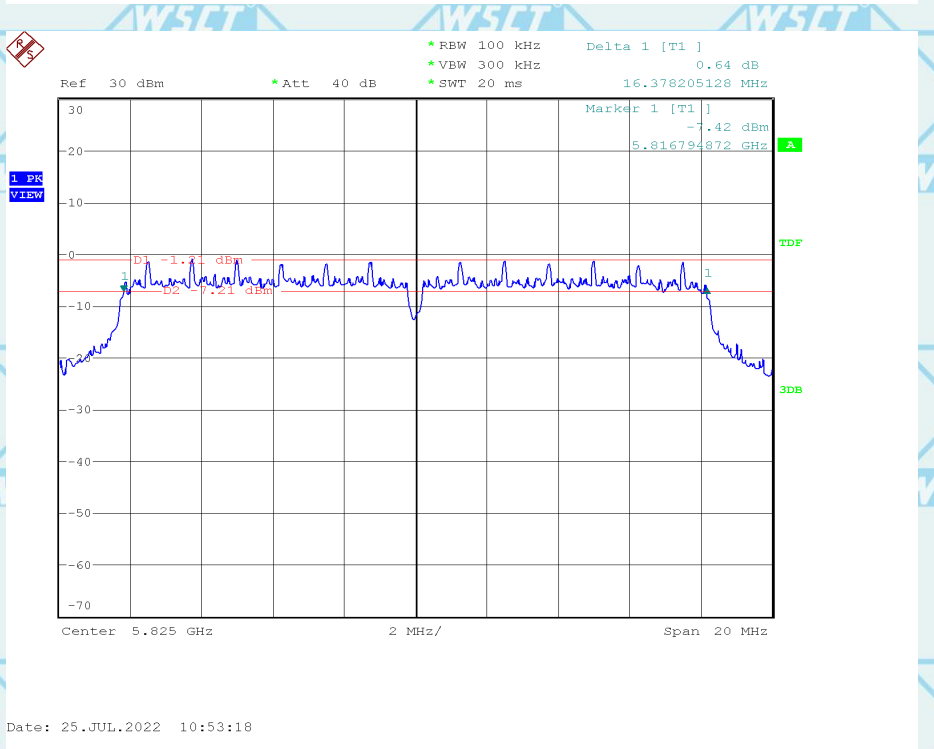


Channel	Measured Frequency (MHz)	6 dB Bandwidth (MHz)	Limit
Low	5745	16.378	> 0.5MHz
High	5825	16.378	> 0.5MHz

Channel Low



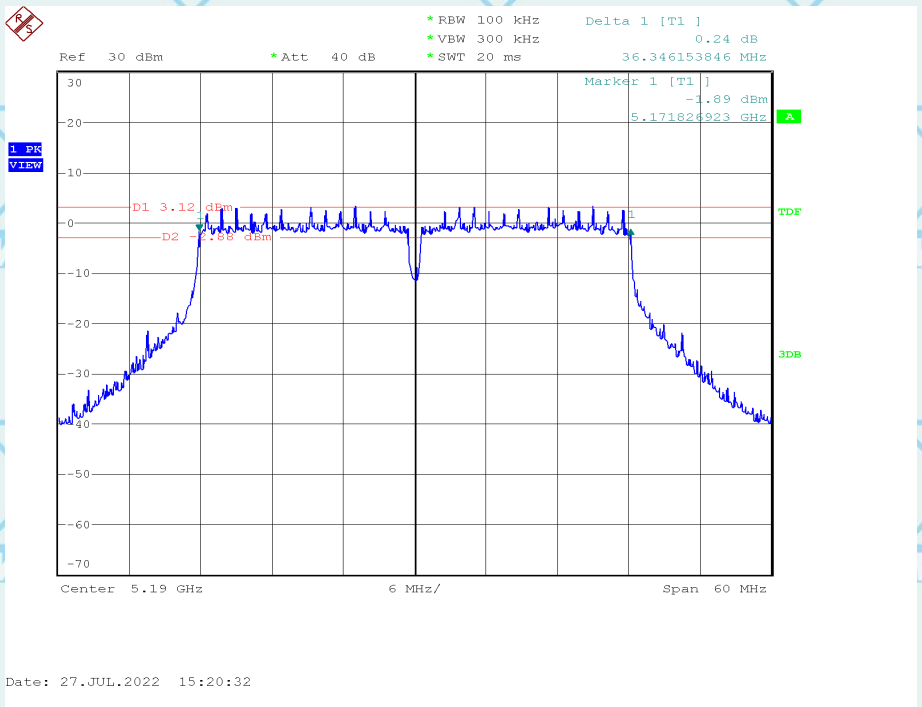
Channel High



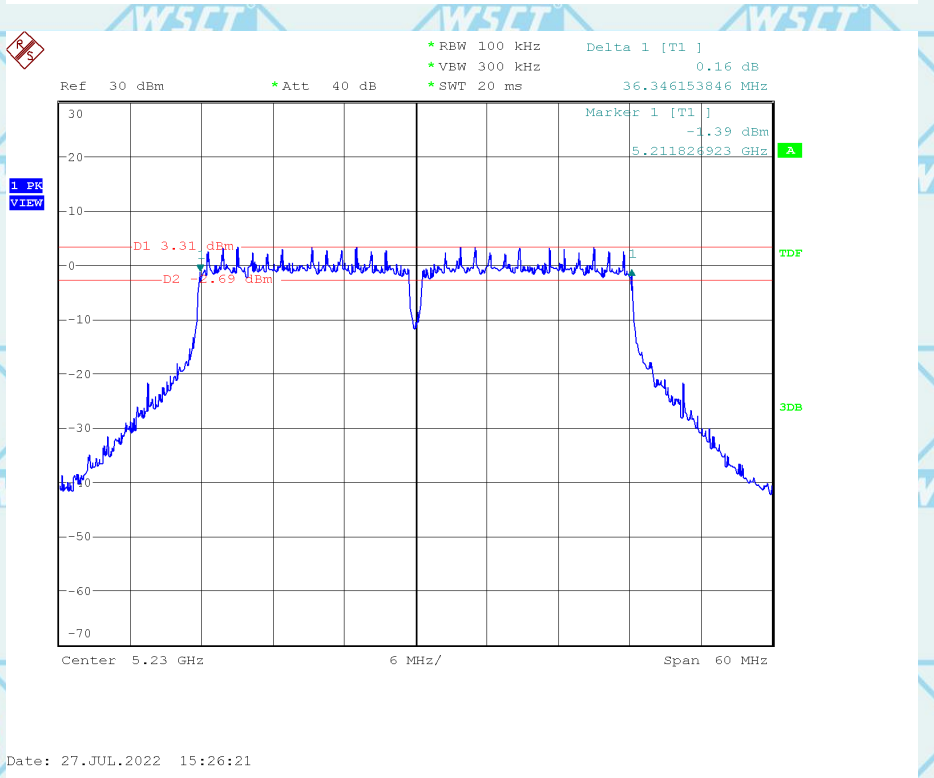
40MMHz(IEEE 802.11n/ac/ax)

Channel	Measured Frequency (MHz)	6 dB Bandwidth (MHz)	Limit
Low	**5190**	36.346	> 0.5MHz
High	**5230**	36.346	> 0.5MHz

Channel Low

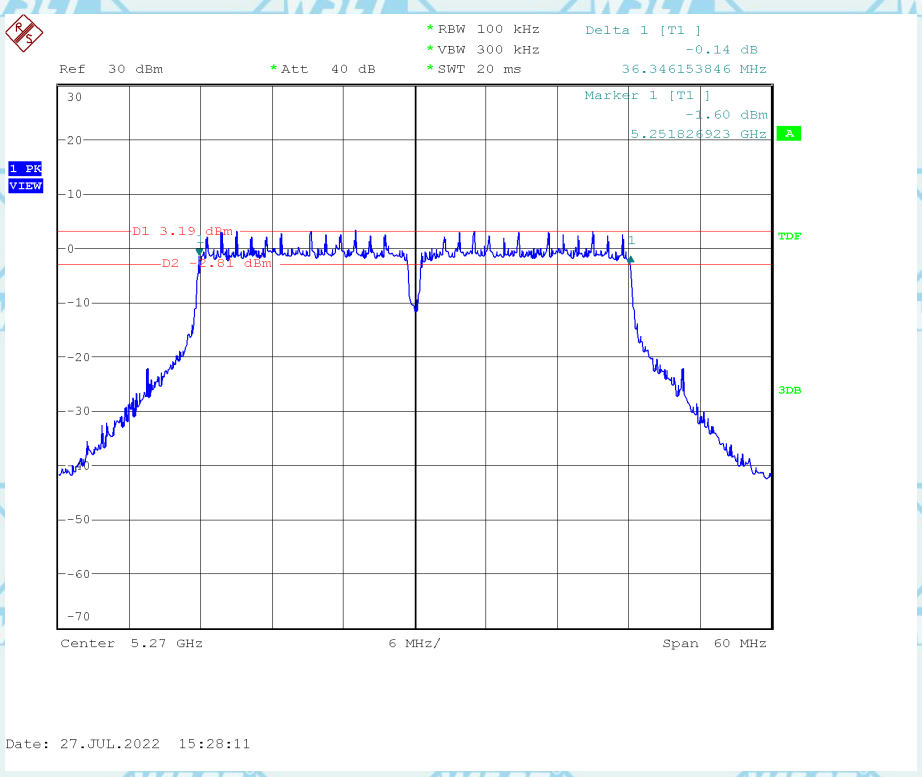


Channel High

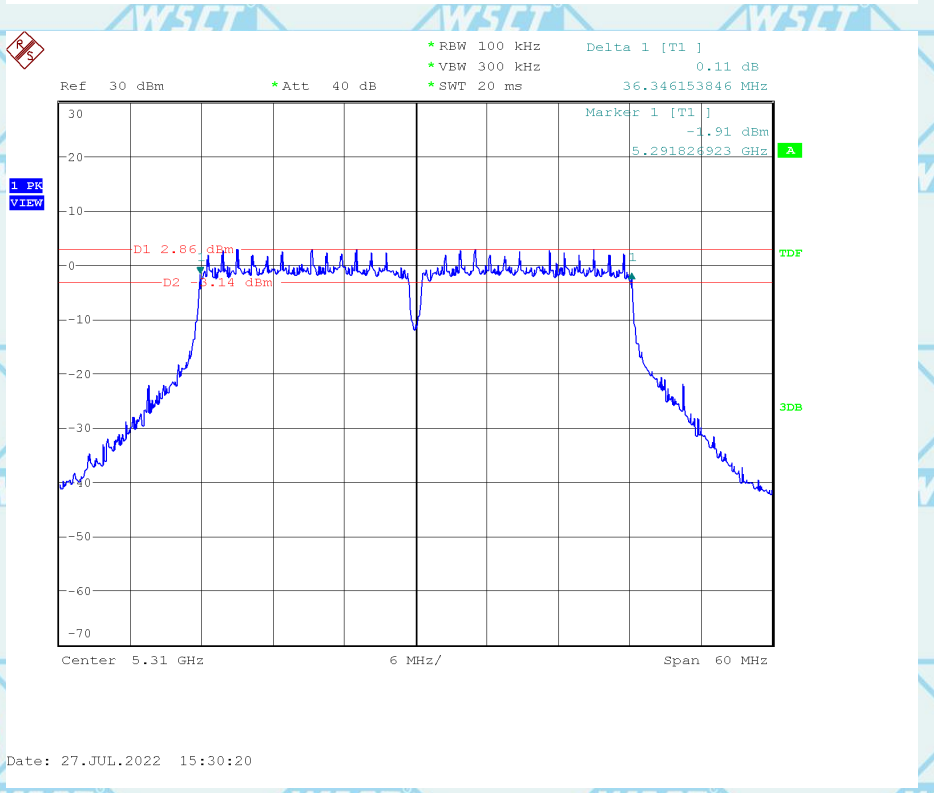


Channel	Measured Frequency (MHz)	6 dB Bandwidth (MHz)	Limit
Low	5270	36.346	> 0.5MHz
High	5310	36.346	> 0.5MHz

Channel Low

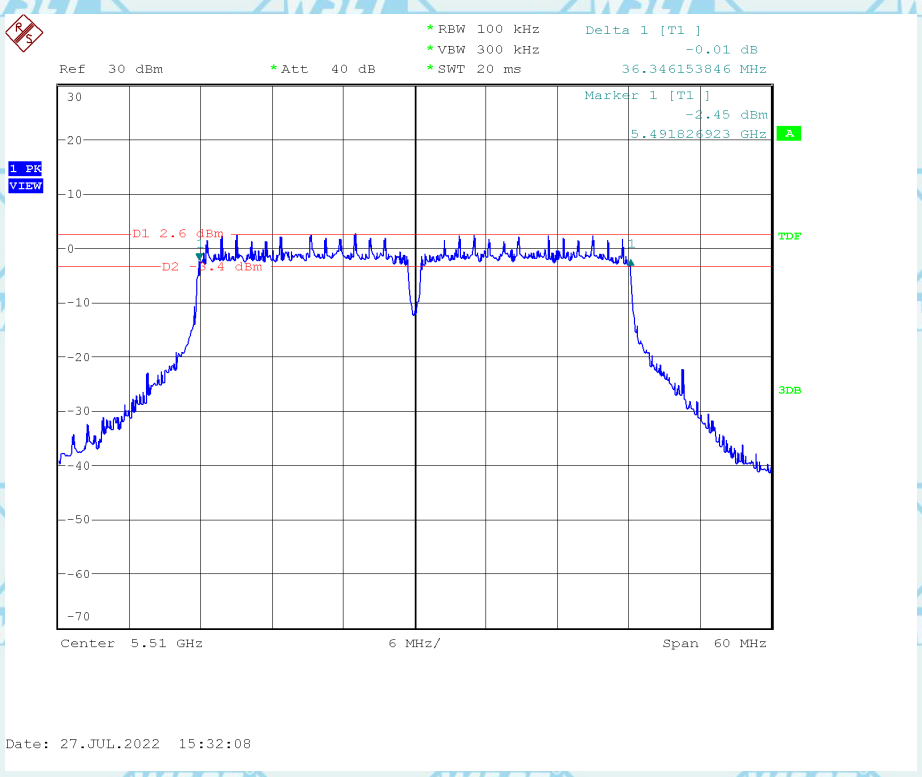


Channel High

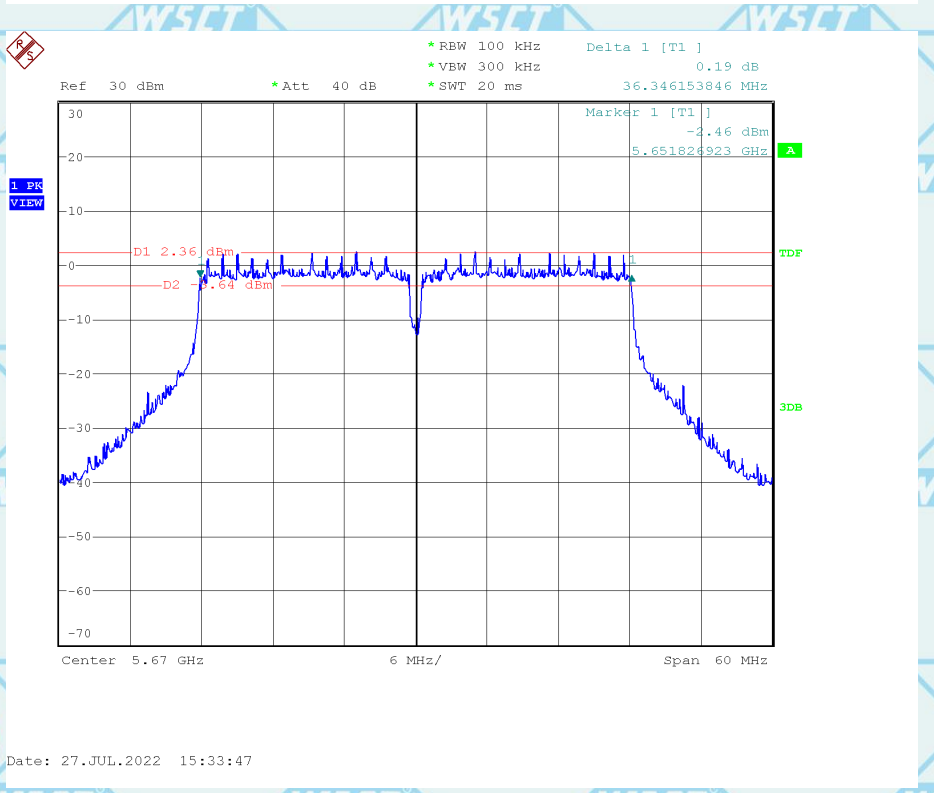


Channel	Measured Frequency (MHz)	6 dB Bandwidth (MHz)	Limit
Low	**5510**	36.346	> 0.5MHz
High	**5670**	36.346	> 0.5MHz

Channel Low

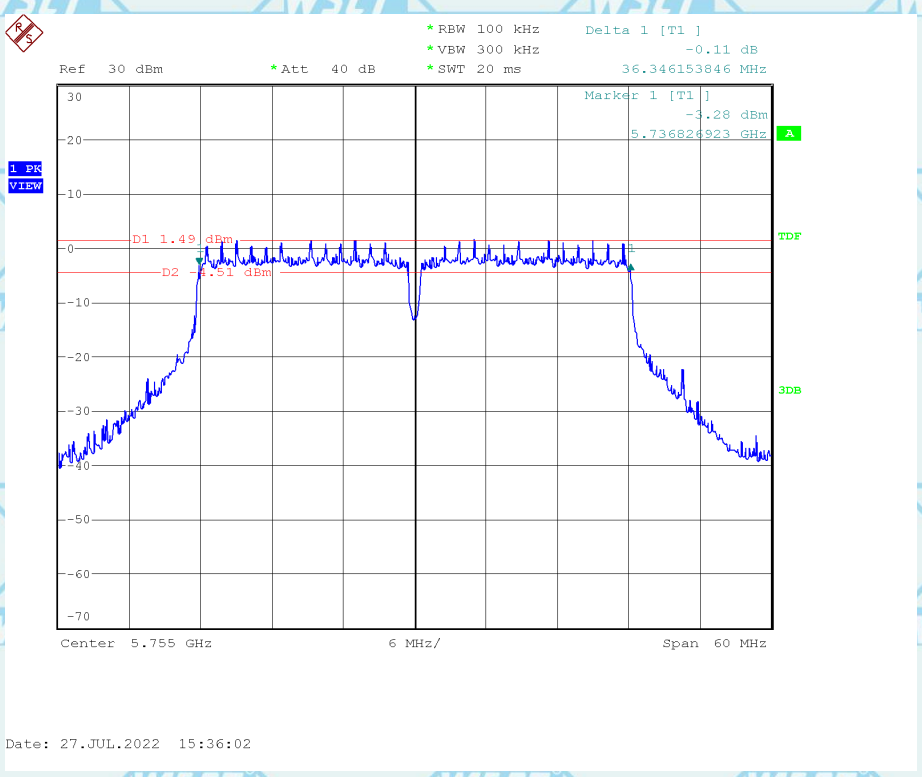


Channel High

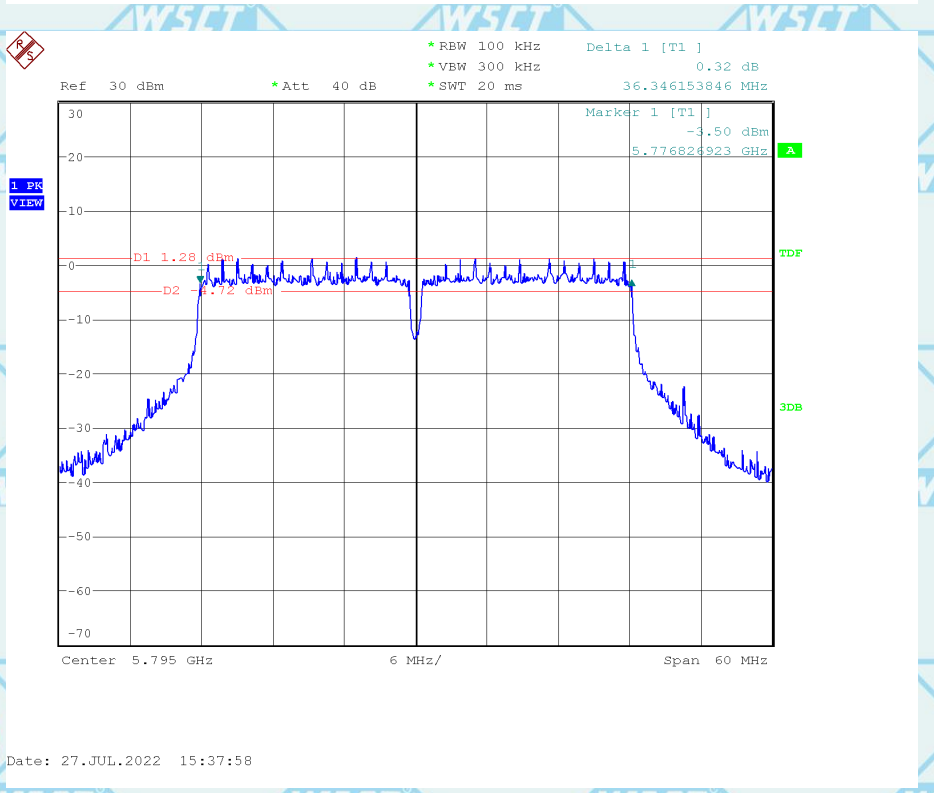


Channel	Measured Frequency (MHz)	6 dB Bandwidth (MHz)	Limit
Low	5755	36.346	> 0.5MHz
High	5795	36.346	> 0.5MHz

Channel Low



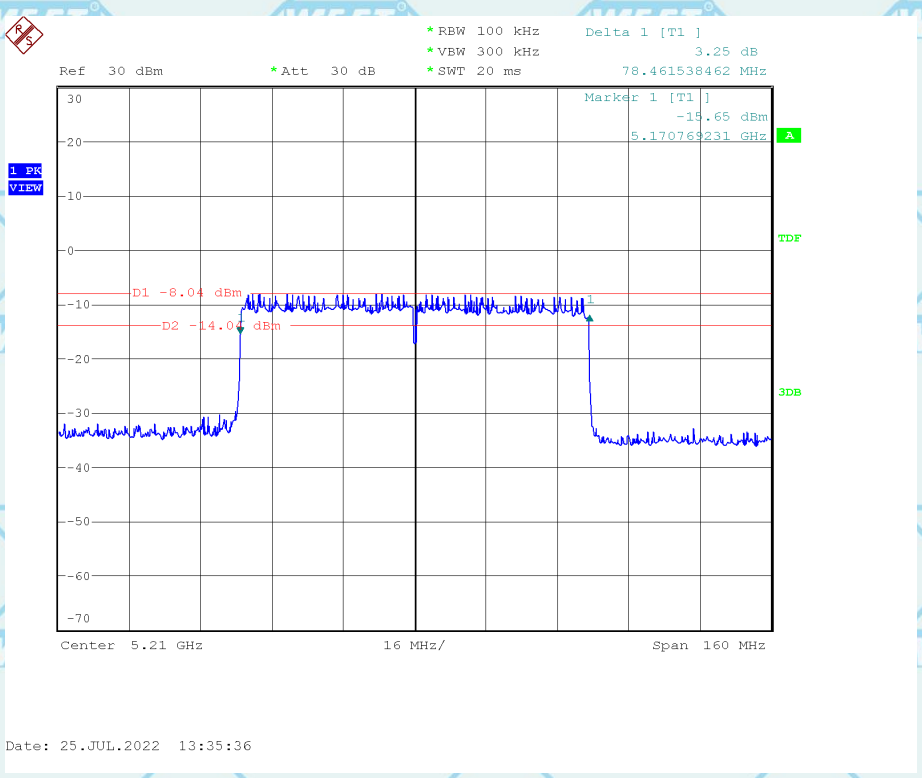
Channel High



80MMHz(IEEE 802.11/ac/ax)

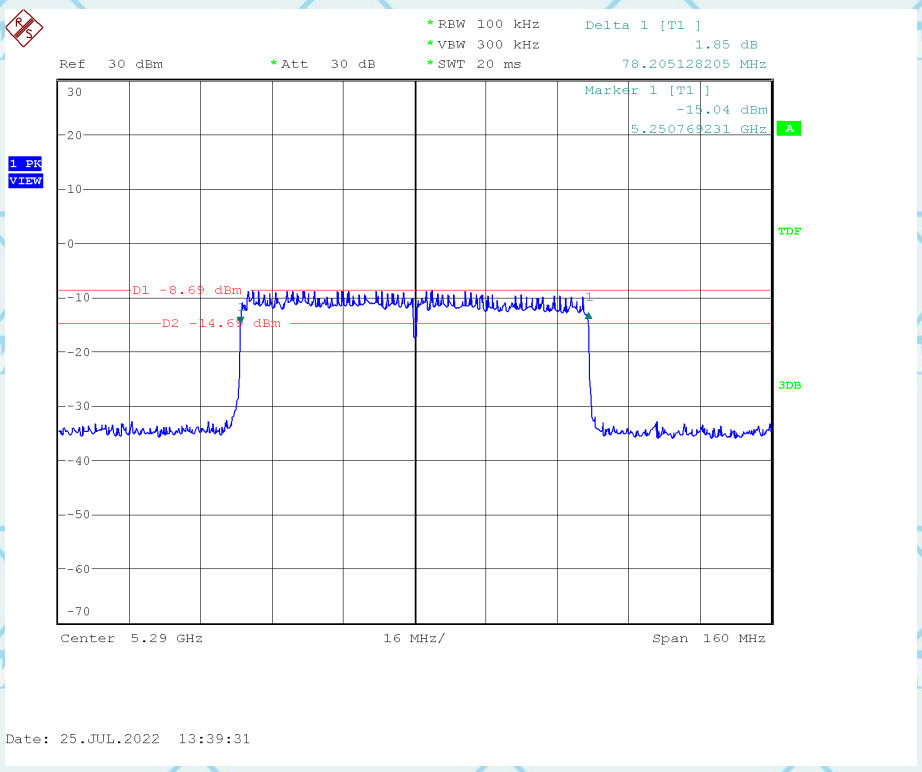
Channel	Measured Frequency (MHz)	6 dB Bandwidth (MHz)	Limit
Low	**5210**	78.462	> 0.5MHz

Channel Low



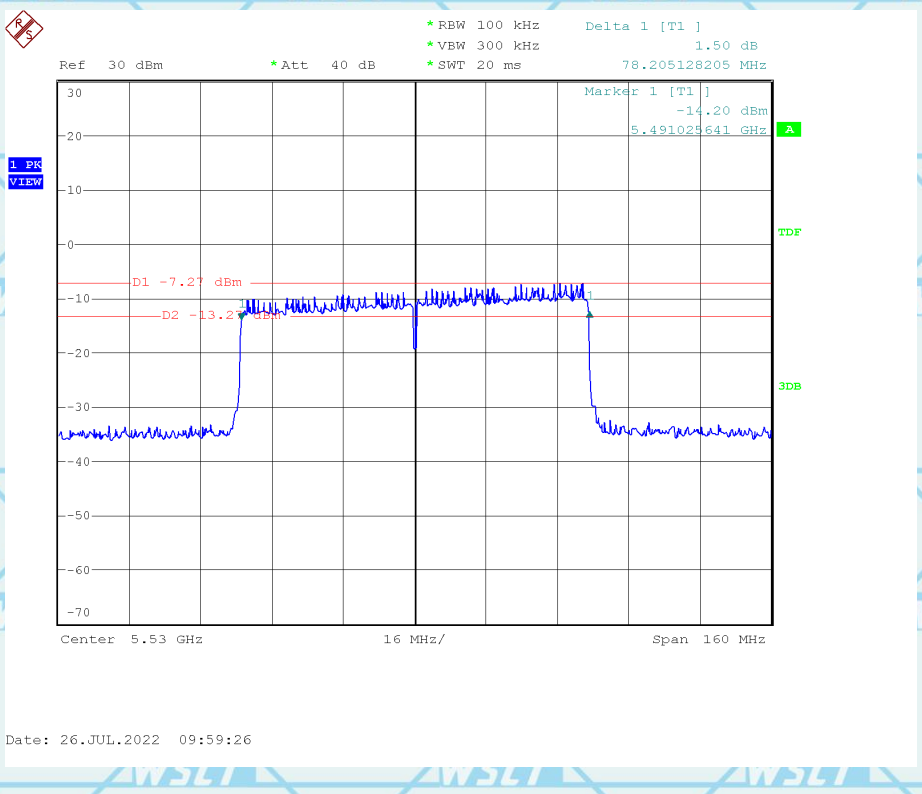
Channel	Measured Frequency (MHz)	6 dB Bandwidth (MHz)	Limit
Low	**5290**	78.205	> 0.5MHz

Channel Low

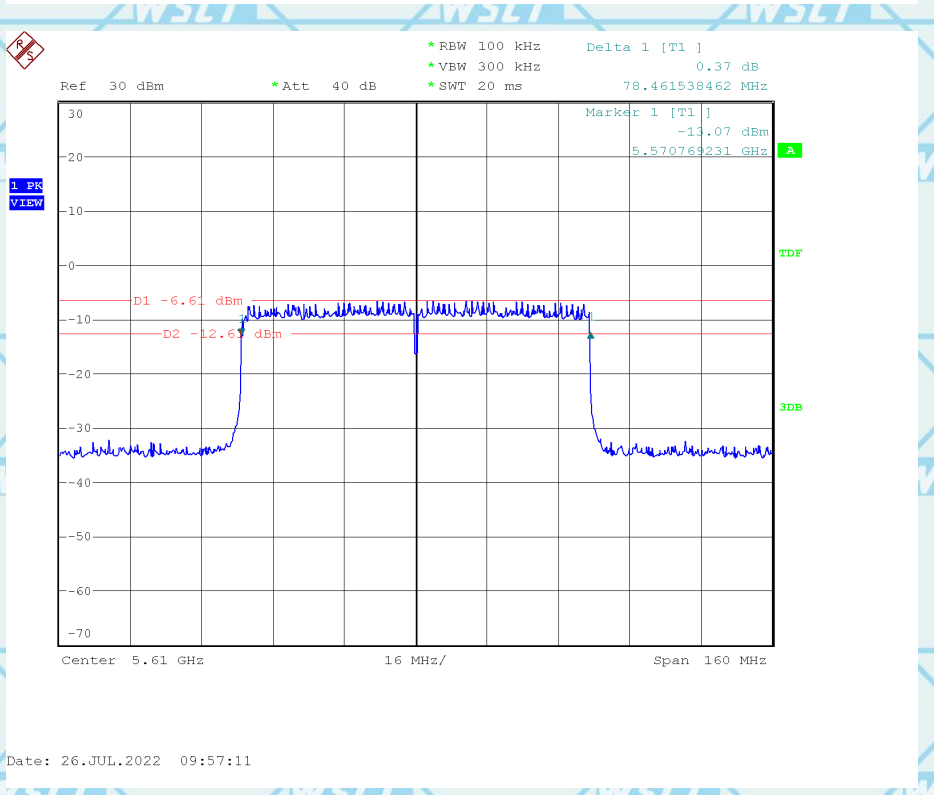


Channel	Measured Frequency (MHz)	6 dB Bandwidth (MHz)	Limit
Low	**5530**	78.205	> 0.5MHz
High	**5610**	78.462	

Channel Low

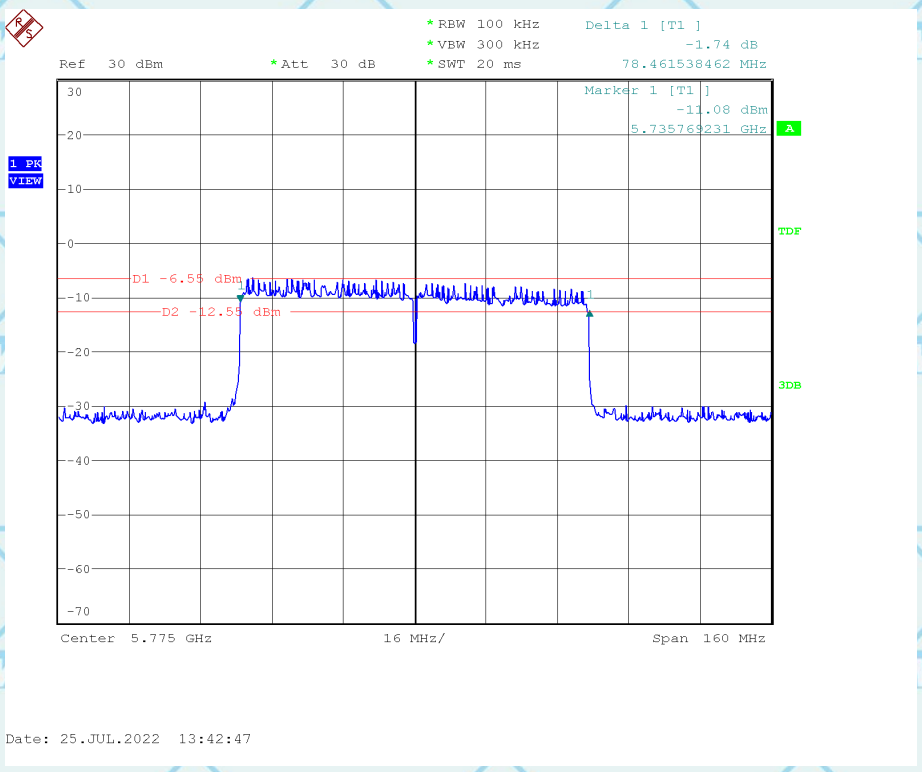


Channel Low



Channel	Measured Frequency (MHz)	6 dB Bandwidth (MHz)	Limit
Low	5775	78.462	> 0.5MHz

Channel Low



C. Peak Power

Product	: EUT-Sample	Test Mode	: See Section 2.2
Test Item	: Peak Power	Temperature	: 25 ℃
Test Voltage	: DC 11.55V	Humidity	: 56%RH
Test Result	: PASS		

20MMHz(IEEE 802.11a/n/ac/ax)-worst

Channel	Frequency (MHz)	Output Power (dBm)	FCC Limit (W/dBm)	Result
Low	5180	15.44	0.25/24.00	PASS
High	5240	15.92		PASS

Band2

Channel	Frequency (MHz)	Output Power (dBm)	FCC Limit (W/dBm)	Result
Low	5260	15.73	0.25/24.00	PASS
High	5320	13.94		PASS

Band3

Channel	Frequency (MHz)	Output Power (dBm)	FCC Limit (W/dBm)	Result
Low	5500	13.20	0.25/24.00	PASS
High	5700	14.22		PASS

Band4

Channel	Frequency (MHz)	Output Power (dBm)	FCC Limit (W/dBm)	Result
Low	5745	12.37	1.00/30.00	PASS
High	5825	9.32		PASS

40MMHz(IEEE 802.11n/ac/ax)-worst

Band1

Channel	Frequency (MHz)	Output Power (dBm)	FCC Limit (W/dBm)	Result
Low	5190	13.16	0.25/24.00	PASS
High	5230	12.08		PASS

Band2

Channel	Frequency (MHz)	Output Power (dBm)	FCC Limit (W/dBm)	Result
Low	5270	11.65	0.25/24.00	PASS
High	5310	11.99		PASS

Band3

Channel	Frequency (MHz)	Output Power (dBm)	FCC Limit (W/dBm)	Result
Low	5510	12.64	0.25/24.00	PASS
High	5670	13.44		PASS

Band4

Channel	Frequency (MHz)	Output Power (dBm)	FCC Limit (W/dBm)	Result
Low	5755	10.90	1.00/30.00	PASS
High	5795	10.49		PASS

80MMHz(IEEE 802.11ac/ax)-worst

Band1

Channel	Frequency (MHz)	Output Power (dBm)	FCC Limit (W/dBm)	Result
Low	5210	13.05	0.25/24.00	PASS

Band2

Channel	Frequency (MHz)	Output Power (dBm)	FCC Limit (W/dBm)	Result
Low	5290	13.81	0.25/24.00	PASS

Band3

Channel	Frequency (MHz)	Output Power (dBm)	FCC Limit (W/dBm)	Result
Low	5530	11.05	0.25/24.00	PASS
High	5610	12.42		

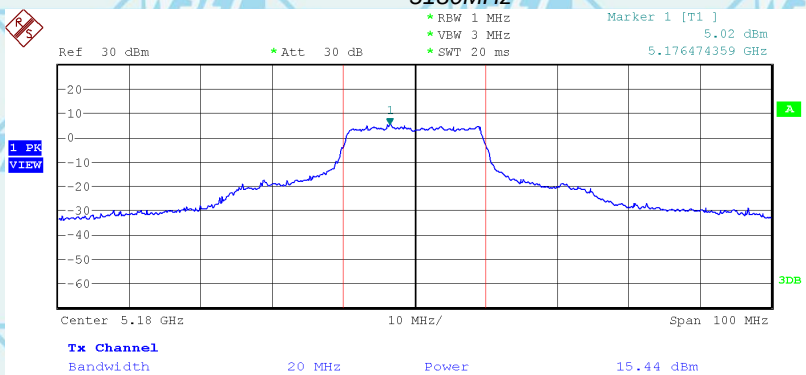
Band4

Channel	Frequency (MHz)	Output Power (dBm)	FCC Limit (W/dBm)	Result
Low	5775	11.37	1.00/30.00	PASS

Report No.: WSCT-A2LA-R&E220300004A-Wi-Fi2

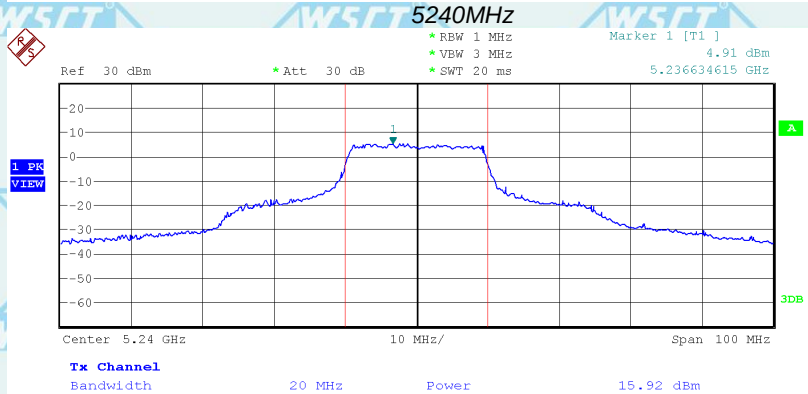
20MMHz(IEEE 802.11a/n/ac/ax)-worst

5180MHz



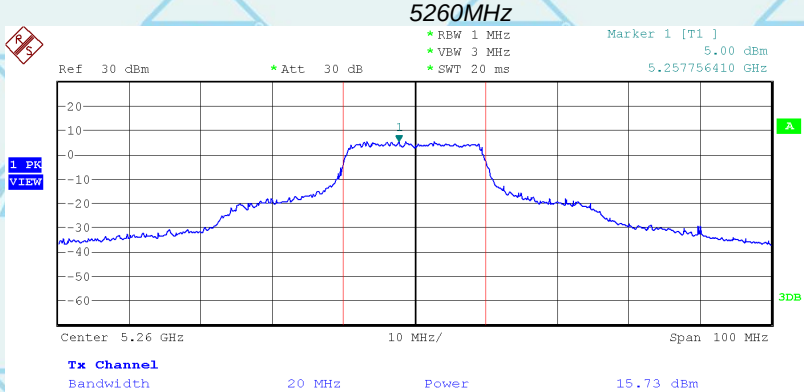
Date: 25.JUL.2022 13:51:15

5240MHz



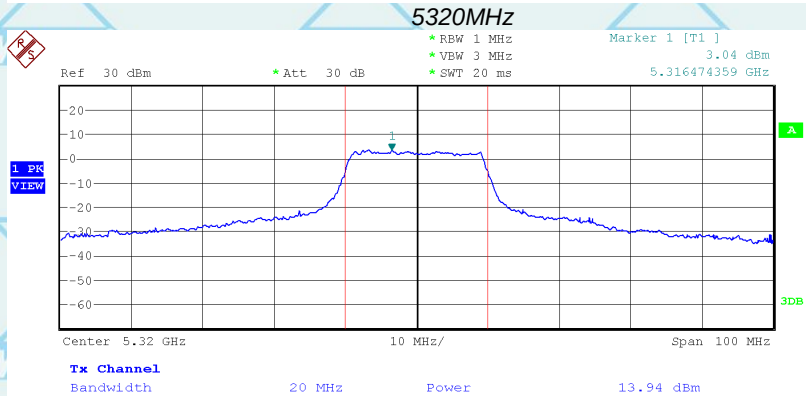
Date: 25.JUL.2022 13:53:00

5260MHz



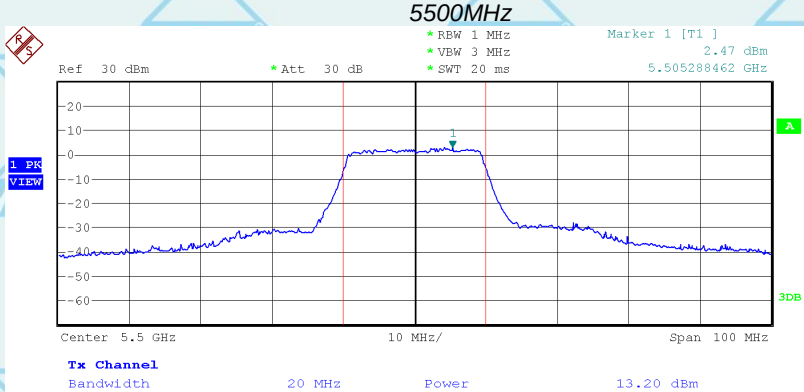
Date: 25.JUL.2022 13:54:13

5320MHz



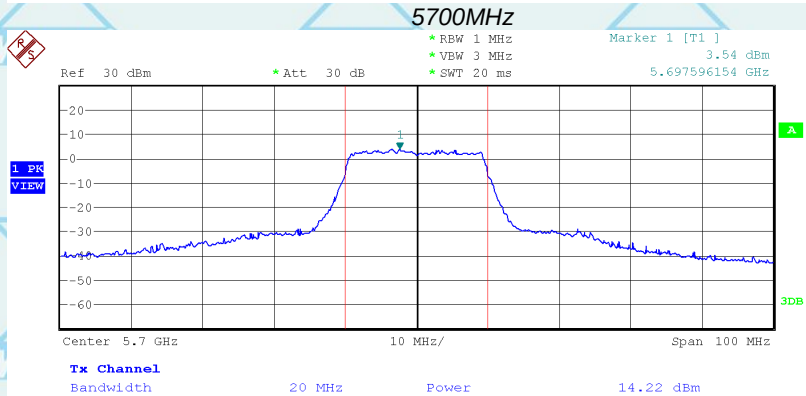
Date: 25.JUL.2022 13:57:08

5500MHz



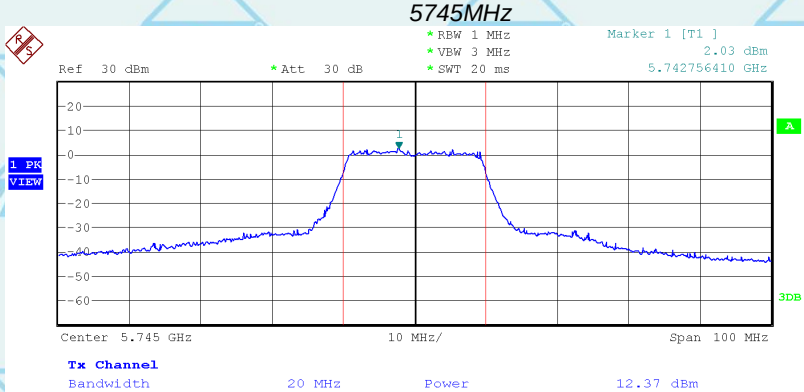
Date: 25.JUL.2022 14:00:40

5700MHz



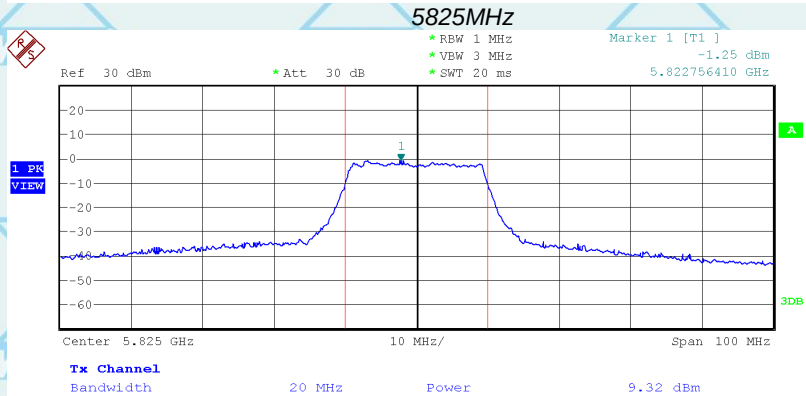
Date: 25.JUL.2022 14:02:00

5745MHz



Date: 25.JUL.2022 14:03:17

5825MHz

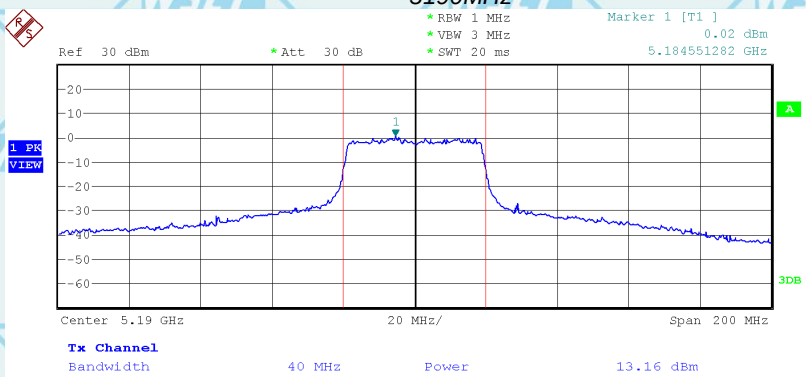


Date: 25.JUL.2022 14:04:40

Report No.: WSCT-A2LA-R&E220300004A-Wi-Fi2

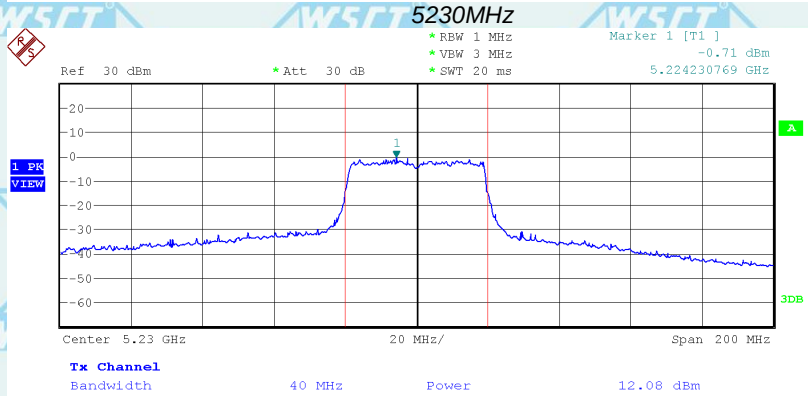
40MMHz(IEEE 802.11n/ac/ax)-worst

5190MHz



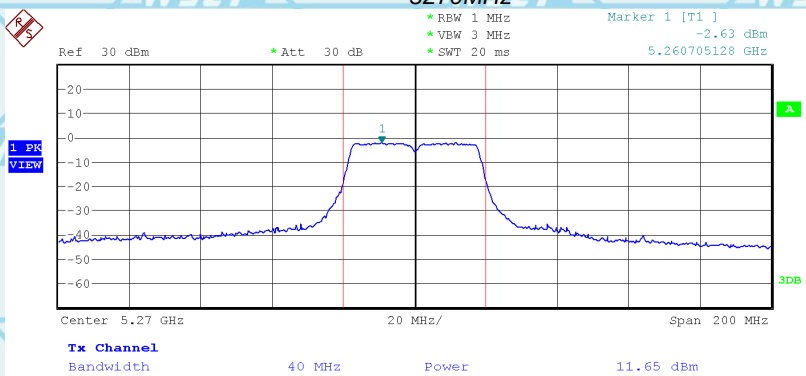
Date: 25.JUL.2022 14:08:45

5230MHz



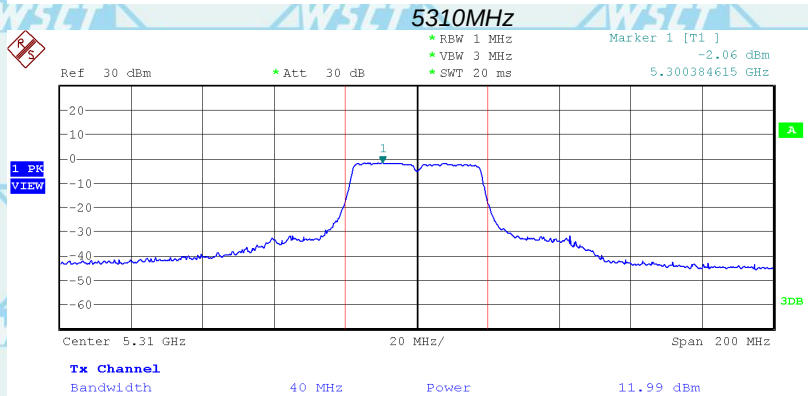
Date: 25.JUL.2022 14:12:30

5270MHz



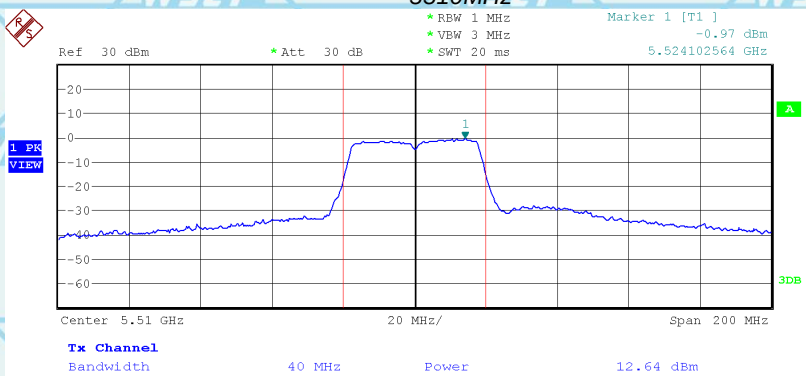
Date: 25.JUL.2022 14:14:23

5310MHz



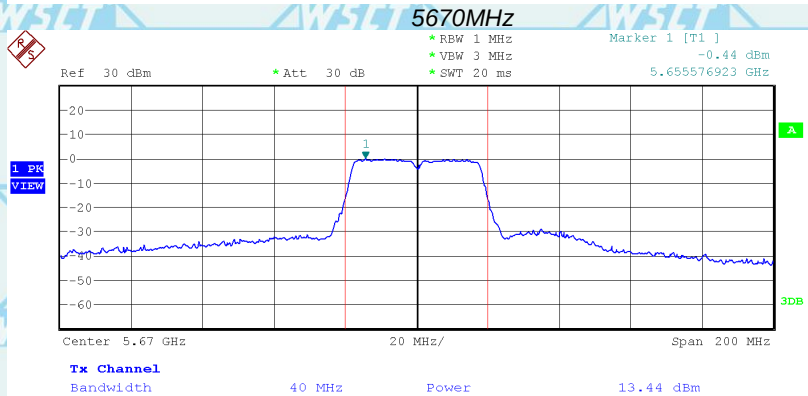
Date: 25.JUL.2022 14:25:55

5510MHz



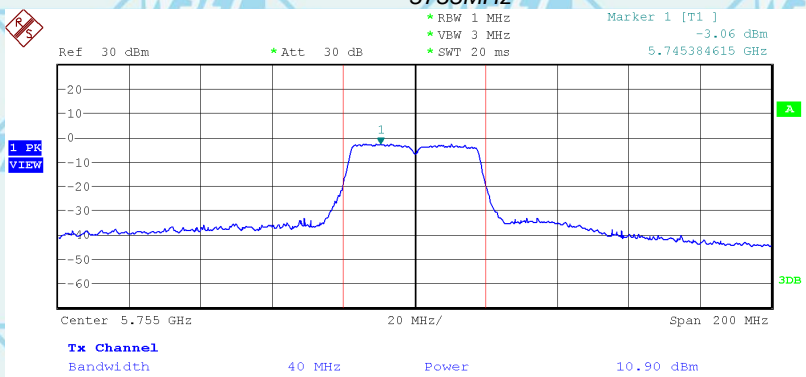
Date: 25.JUL.2022 14:38:59

5670MHz



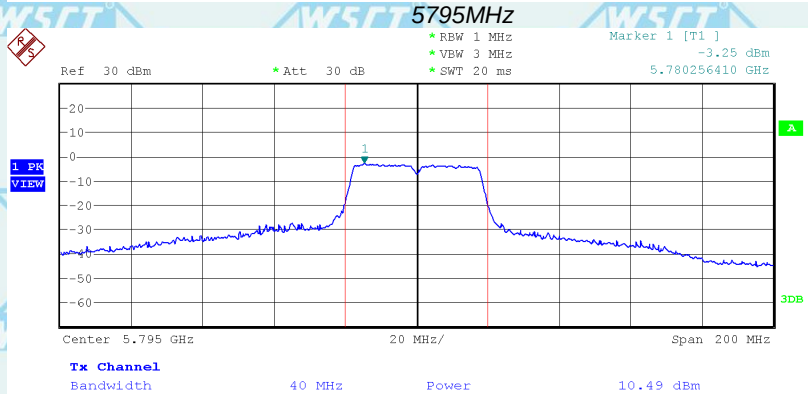
Date: 25.JUL.2022 14:40:15

5755MHz



Date: 25.JUL.2022 14:41:27

5795MHz

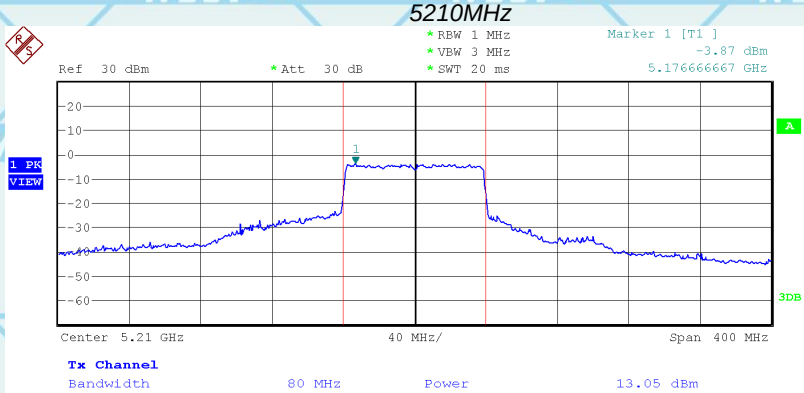


Date: 25.JUL.2022 14:42:27

Report No.: WSCT-A2LA-R&E220300004A-Wi-Fi2

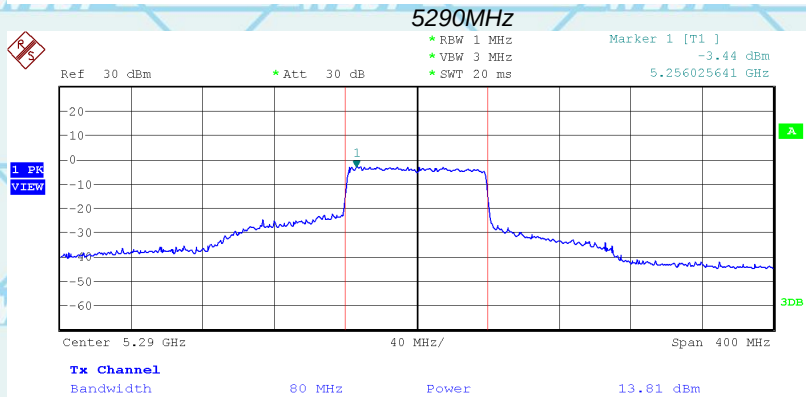
80MMHz(IEEE 802.11ac/ax)-worst

5210MHz



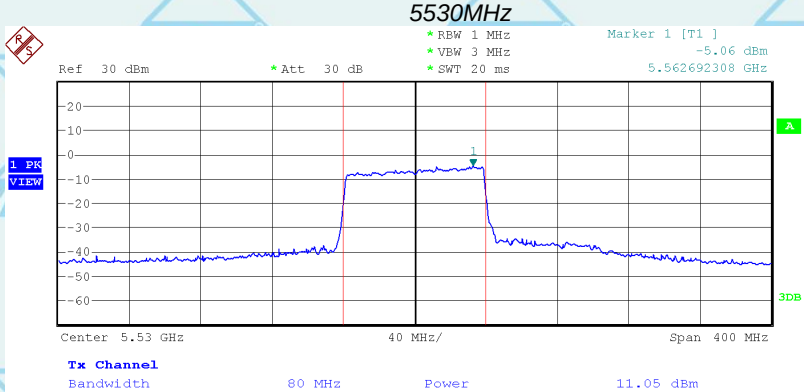
Date: 25.JUL.2022 15:24:30

5290MHz



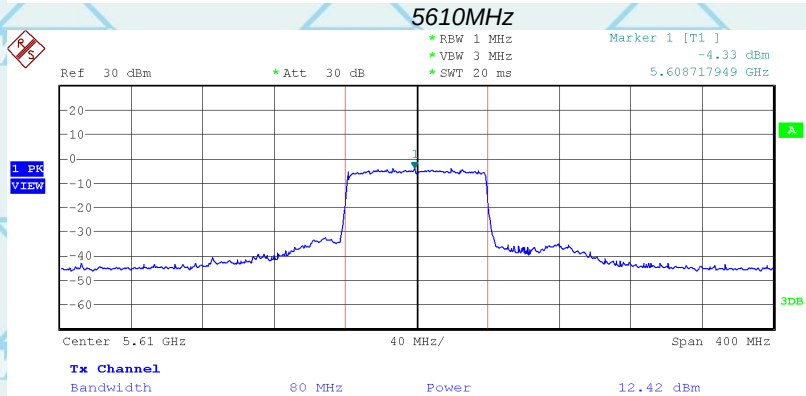
Date: 25.JUL.2022 15:25:59

5530MHz



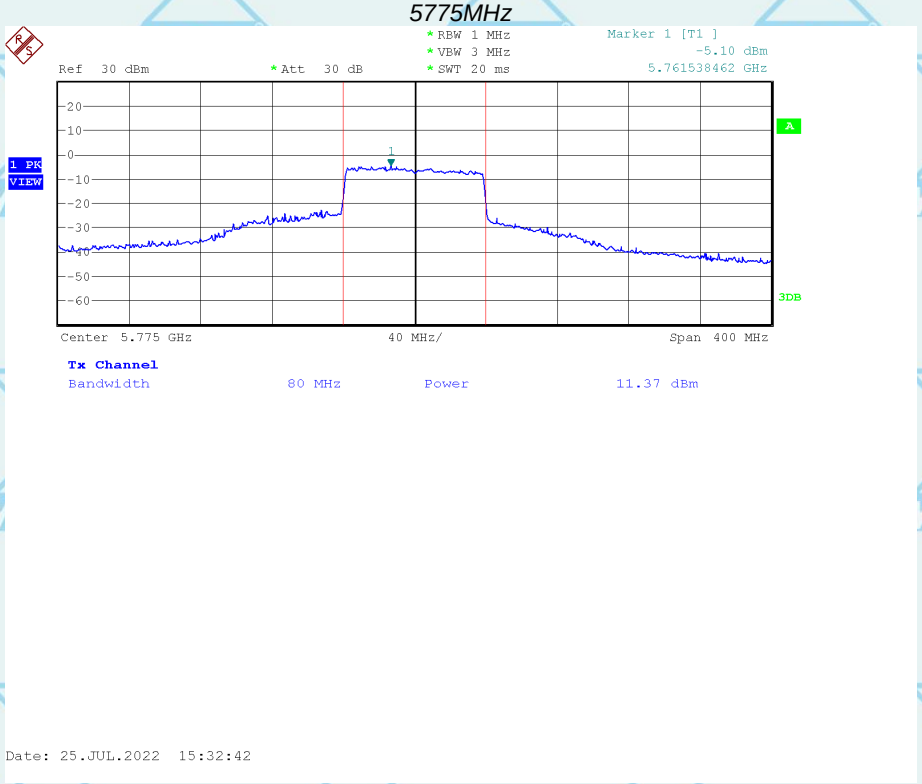
Date: 26.JUL.2022 10:08:35

5610MHz



Date: 25.JUL.2022 15:30:07

5775MHz


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
Marker 1 [T1]
-5.10 dBm
5.761538462 GHz
Ref 30 dBm
Att 30 dB
1 PK
VIEW
A
3DB
Center 5.775 GHz
40 MHz/
Span 400 MHz
Tx Channel
Bandwidth 80 MHz
Power 11.37 dBm
Date: 25.JUL.2022 15:32:42

D. Peak Power Spectral Density

Product	: EUT-Sample	Test Mode	: See Section 2.2
Test Item	: Peak Power Spectral Density	Temperature	: 25 ℃
Test Voltage	: DC 11.55V	Humidity	: 56%RH
Test Result	: **PASS**		

20MHz(IEEE 802.11a/n/ac/ax)

Band1

Channel	Frequency (MHz)	PPSD (dBm)	FCC Limit (kHz)	Result
Low	5180	2.65	11dBm/MHz	PASS
High	5240	2.36		PASS

Band2

Channel	Frequency (MHz)	PPSD (dBm)	FCC Limit (kHz)	Result
Low	5260	2.20	11dBm/MHz	PASS
High	5320	2.45		PASS

Band3

Channel	Frequency (MHz)	PPSD (dBm)	FCC Limit (kHz)	Result
Low	5500	-0.20	11dBm/MHz	PASS
High	5700	0.95		PASS

Band4

Channel	Frequency (MHz)	PPSD (dBm)	FCC Limit (kHz)	Result
Low	5745	-0.65	30dBm/500 kHz (26.99dBm/MHz)	PASS
High	5825	-4.05		PASS

40MHz(IEEE 802.11n/ac/ax)
Band1

Channel	Frequency (MHz)	PPSD (dBm)	FCC Limit (kHz)	Result
Low	5190	-3.54	11dBm/MHz	PASS
High	5230	-3.05		PASS

Band2

Channel	Frequency (MHz)	PPSD (dBm)	FCC Limit (kHz)	Result
Low	5270	-3.65	11dBm/MHz	PASS
High	5310	-3.53		PASS

Band3

Channel	Frequency (MHz)	PPSD (dBm)	FCC Limit (kHz)	Result
Low	5510	-6.29	11dBm/MHz	PASS
High	5670	-5.31		PASS

Band4

Channel	Frequency (MHz)	PPSD (dBm)	FCC Limit (kHz)	Result
Low	5755	-8.03	30dBm/500 kHz (26.99dBm/MHz)	PASS
High	5795	-8.07		PASS

80MHz(IEEE 802.11/ac/ax)
Band1

Channel	Frequency (MHz)	PPSD (dBm)	FCC Limit (kHz)	Result
Low	5210	-5.49	11dBm/MHz	PASS

Band2

Channel	Frequency (MHz)	PPSD (dBm)	FCC Limit (kHz)	Result
Low	5290	-4.51	11dBm/MHz	PASS

Band3

Channel	Frequency (MHz)	PPSD (dBm)	FCC Limit (kHz)	Result
Low	5530	-3.16	11dBm/MHz	PASS
High	5610	-4.30		

Band4

Channel	Frequency (MHz)	PPSD (dBm)	FCC Limit (kHz)	Result
Low	5775	-9.59	30dBm/500 kHz (26.99dBm/MHz)	PASS

Note: For 5.725~5.85GHz (Band4): Power Density (dBm/500kHz)= Power Density (dBm/MHz)- 10log(500kHz/RBW) (dB)

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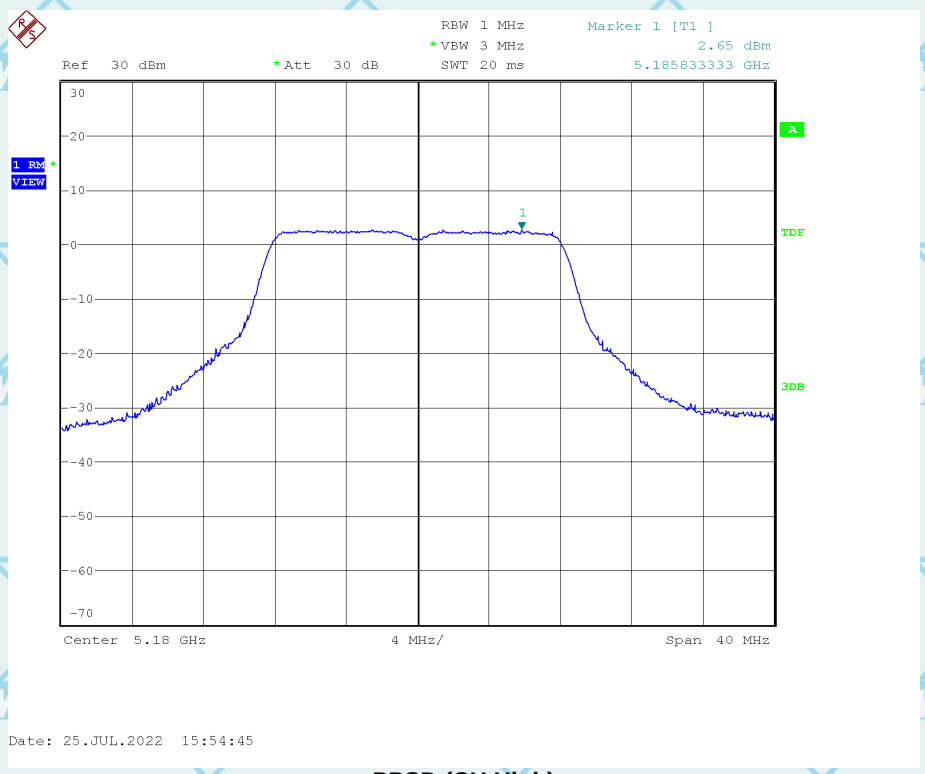
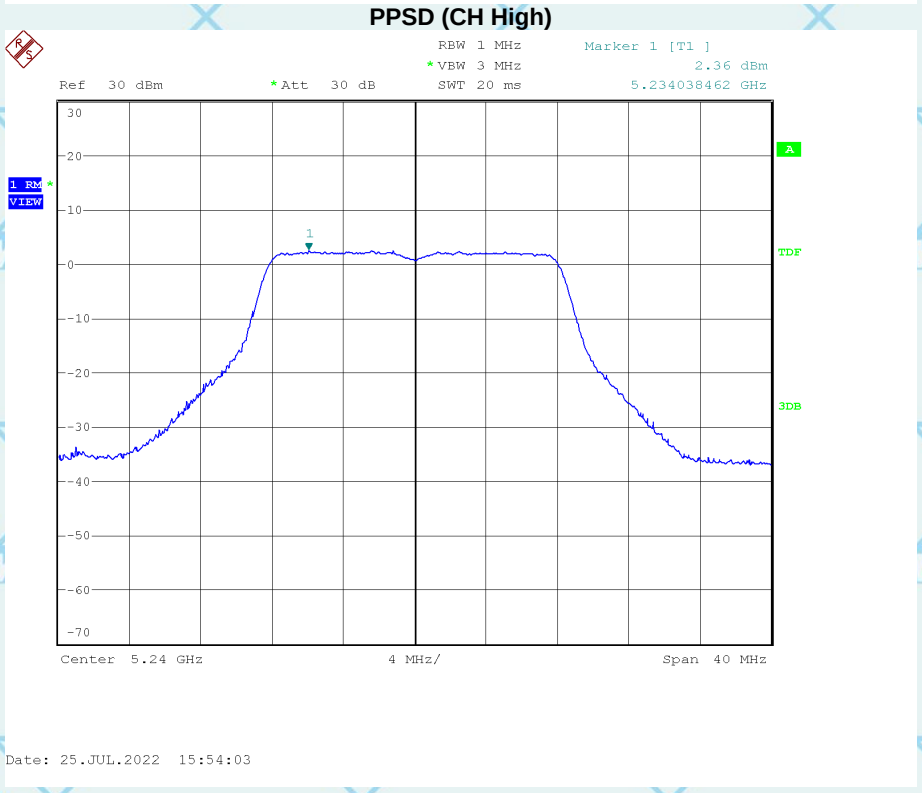
20MHz(IEEE 802.11a/n/ac/ax)
Band1

PPSD (CH Low)

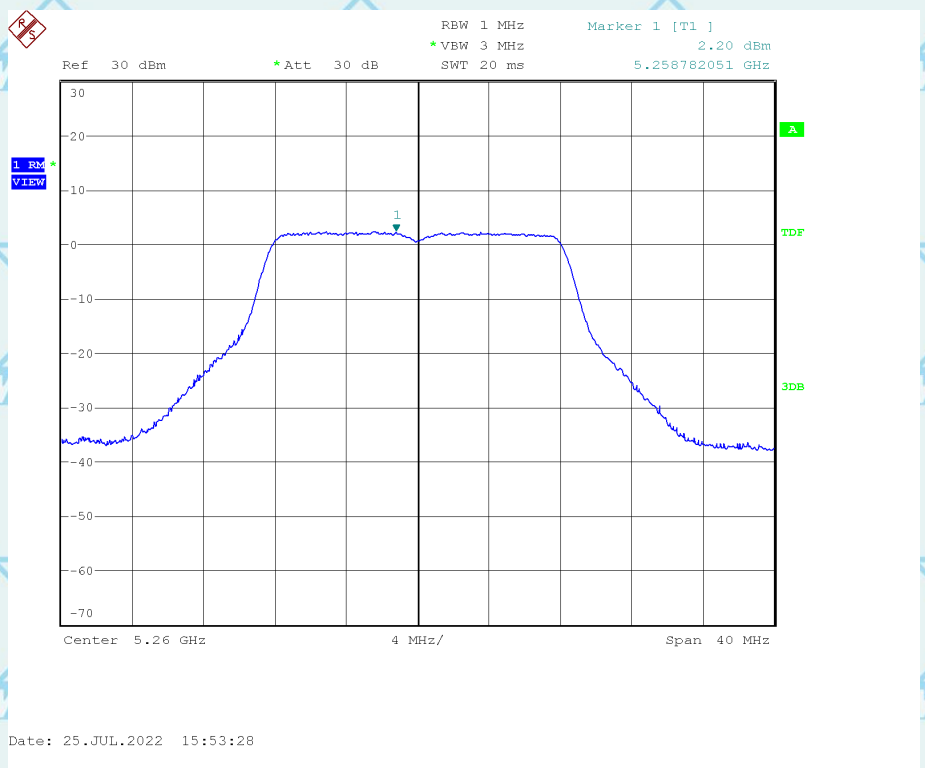


PPSD (CH High)

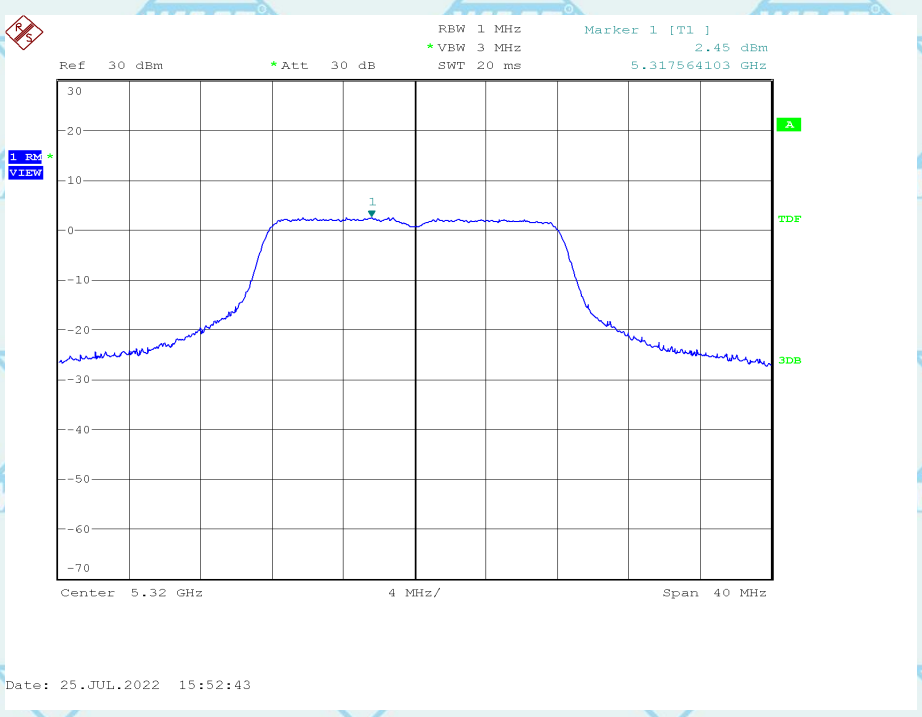


Band2

PPSD (CH Low)

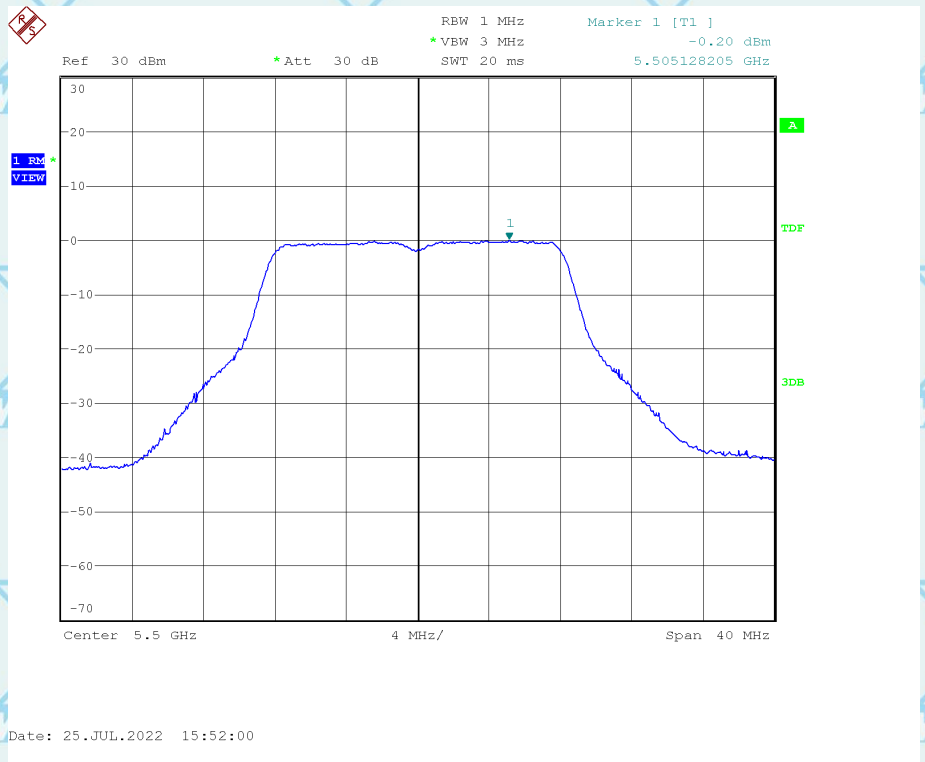


PPSD (CH High)

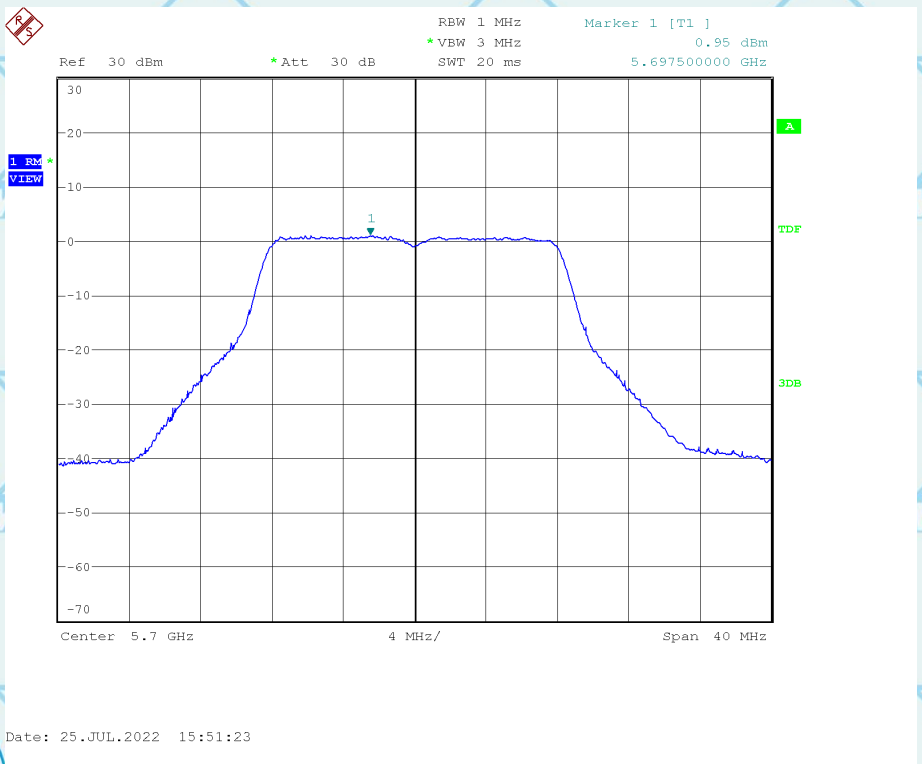


Band3

PPSD (CH Low)



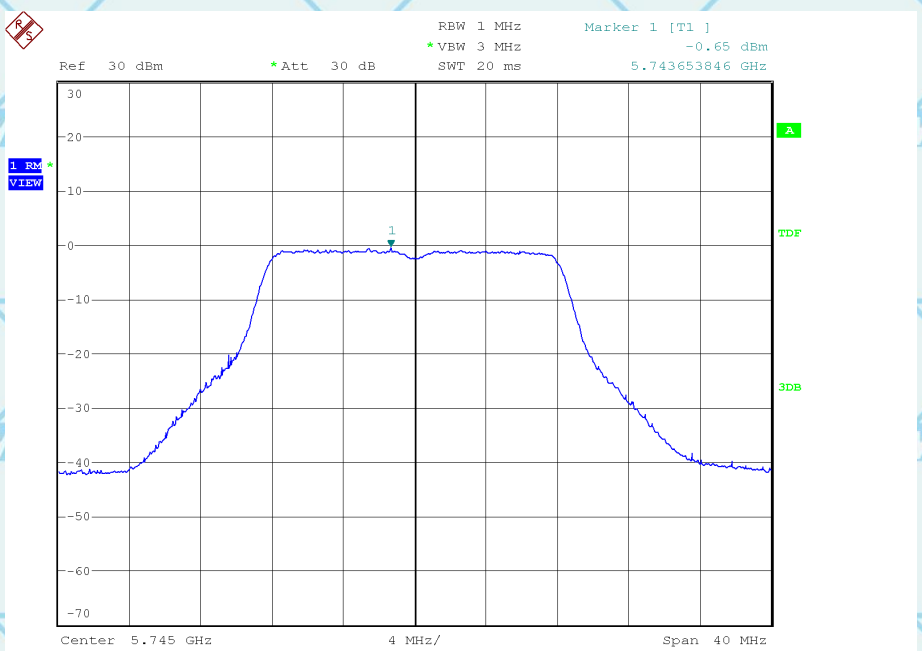
PPSD (CH High)



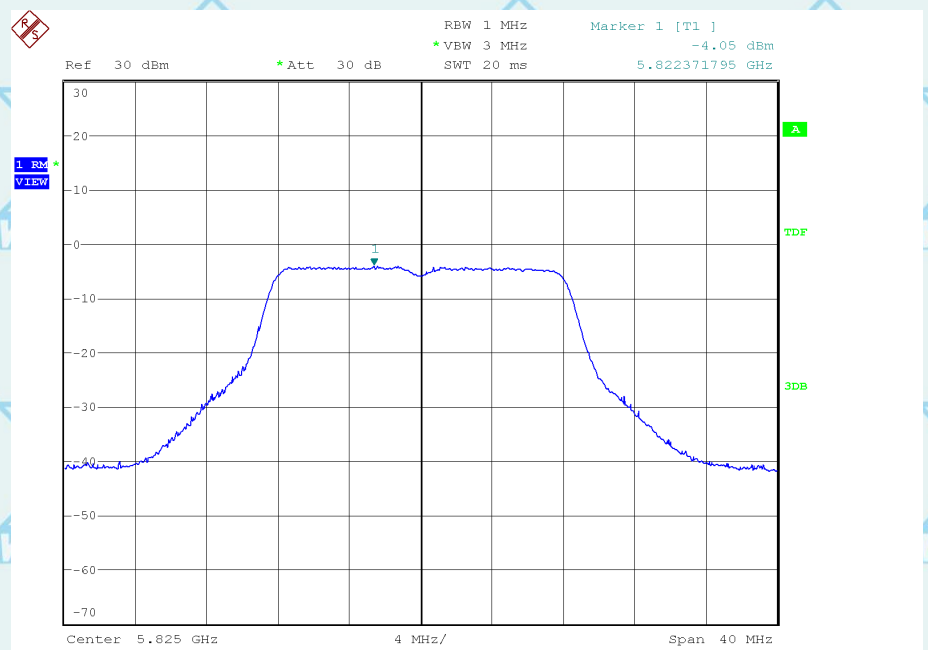
Report No.: WSCT-A2LA-R&E220300004A-Wi-Fi2

Band4

PPSD (CH Low)



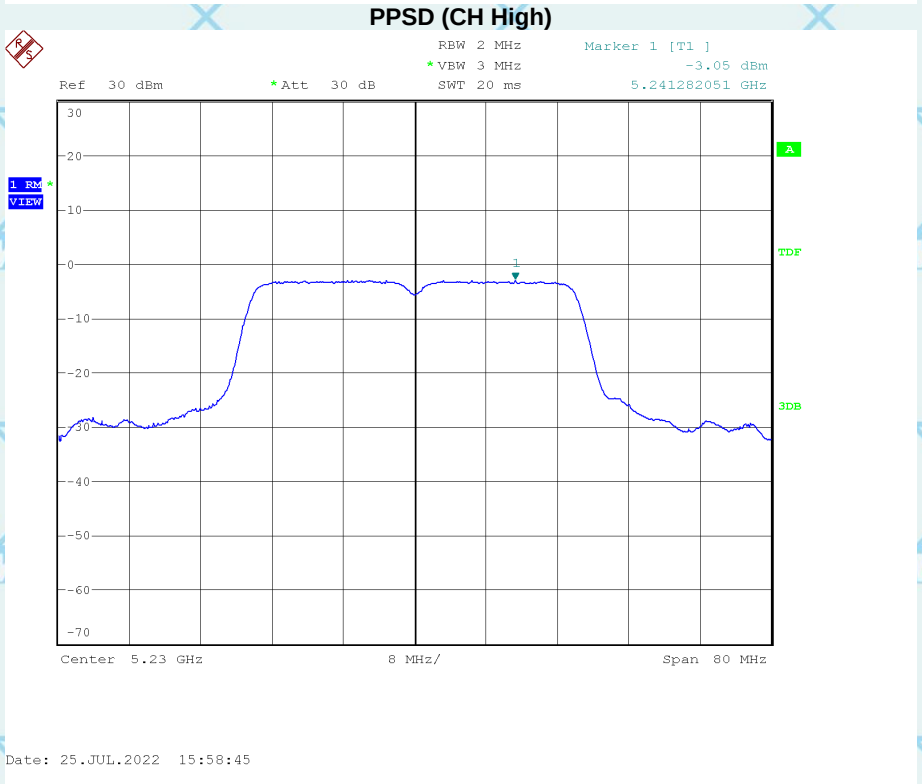
PPSD (CH High)



40MHz(IEEE 802.11n/ac/ax)
Band1

PPSD (CH Low)

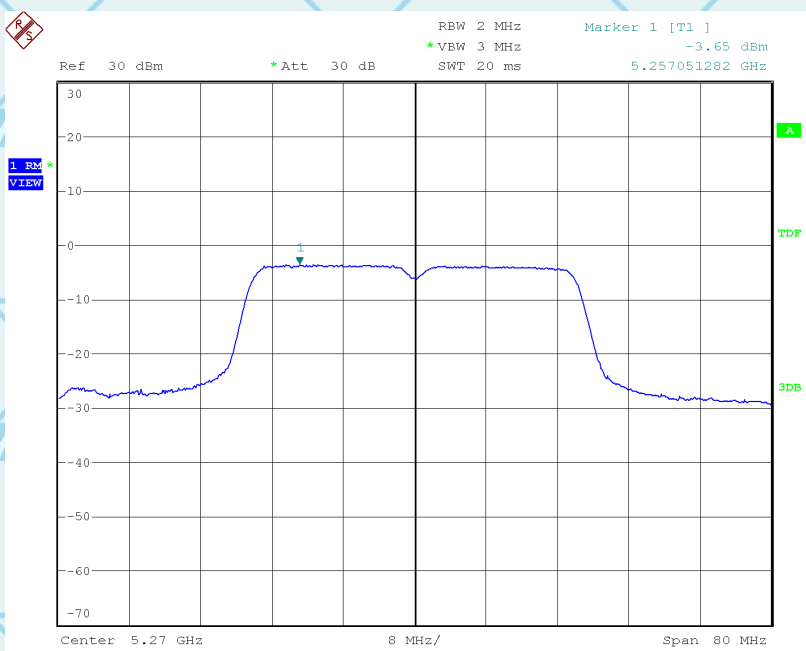
PPSD (CH High)



Report No.: WSCT-A2LA-R&E220300004A-Wi-Fi2

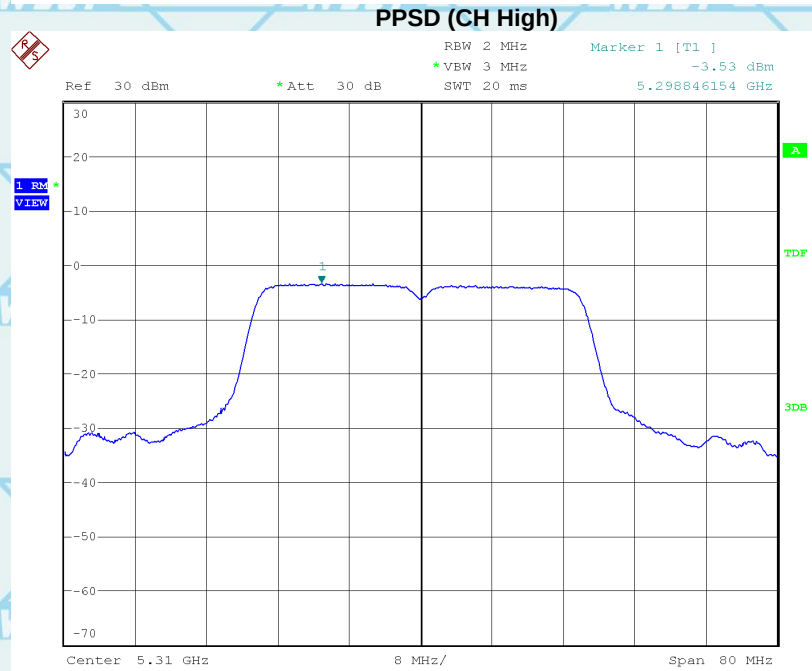
Band2

PPSD (CH Low)



Date: 25.JUL.2022 15:59:19

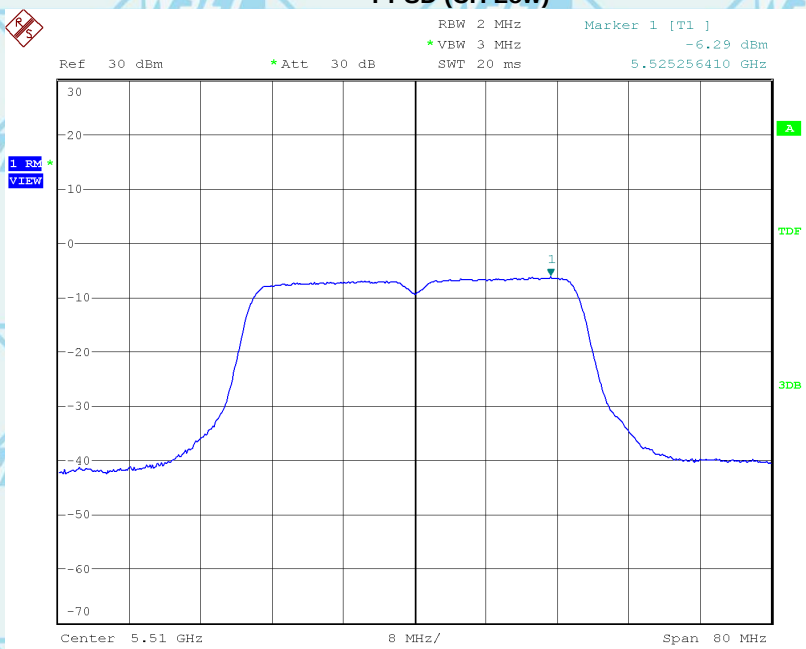
PPSD (CH High)



Date: 25.JUL.2022 16:00:12

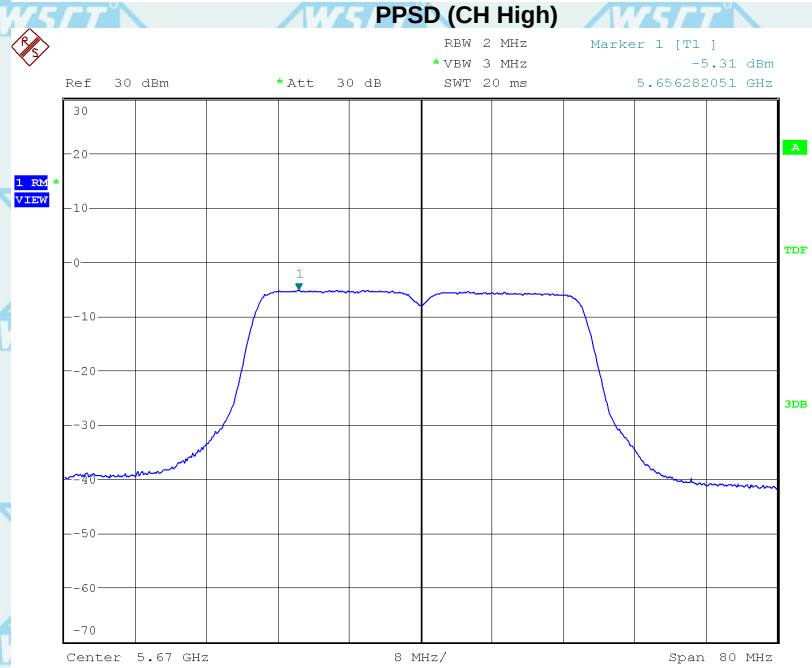
Band3

PPSD (CH Low)



Date: 25.JUL.2022 16:01:20

PPSD (CH High)

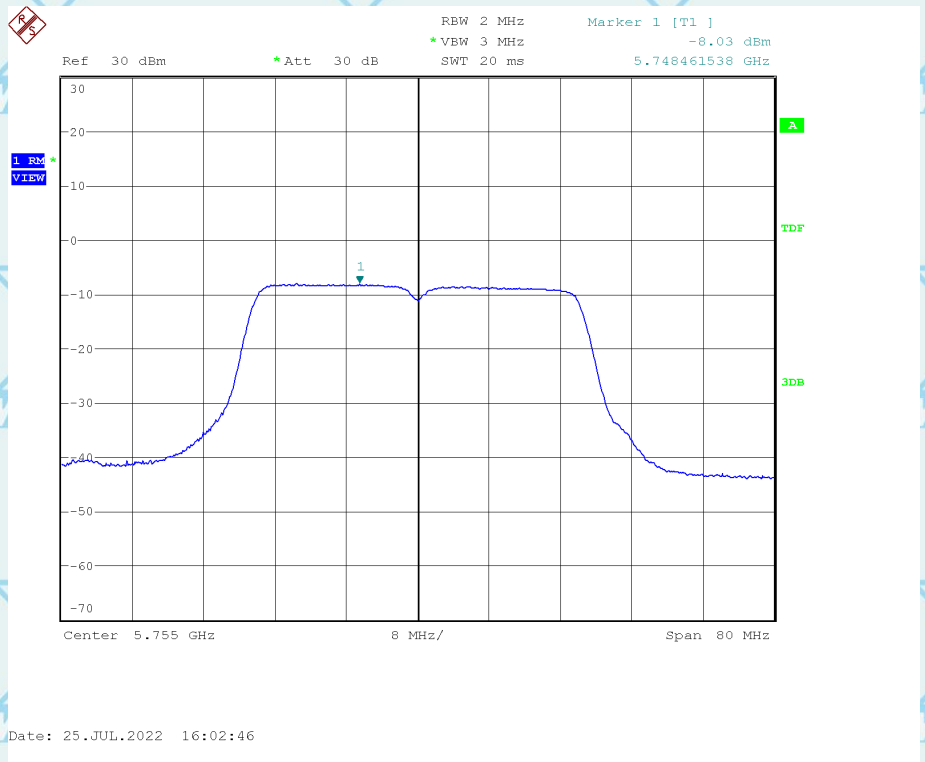


Date: 25.JUL.2022 16:02:08

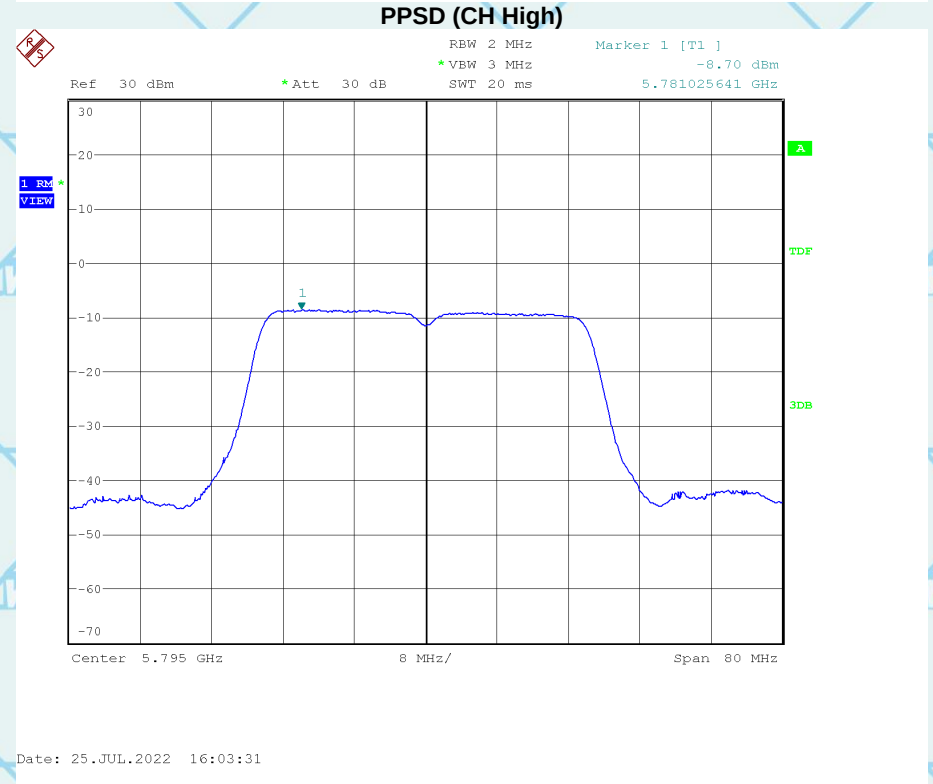
Report No.: WSCT-A2LA-R&E220300004A-Wi-Fi2

Band4

PPSD (CH Low)



PPSD (CH High)



Report No.: WSCT-A2LA-R&E220300004A-Wi-Fi2

80MHz(IEEE 802.11ac/ax)
Band1

PPSD (CH Low)

Band2

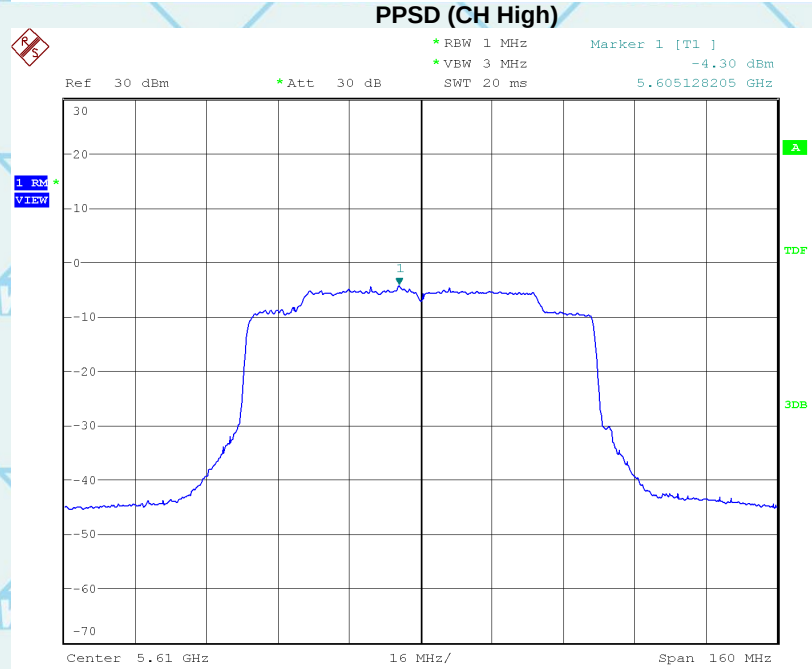
PPSD (CH Low)

Band3

PPSD (CH Low)

Date: 26.JUL.2022 10:11:38

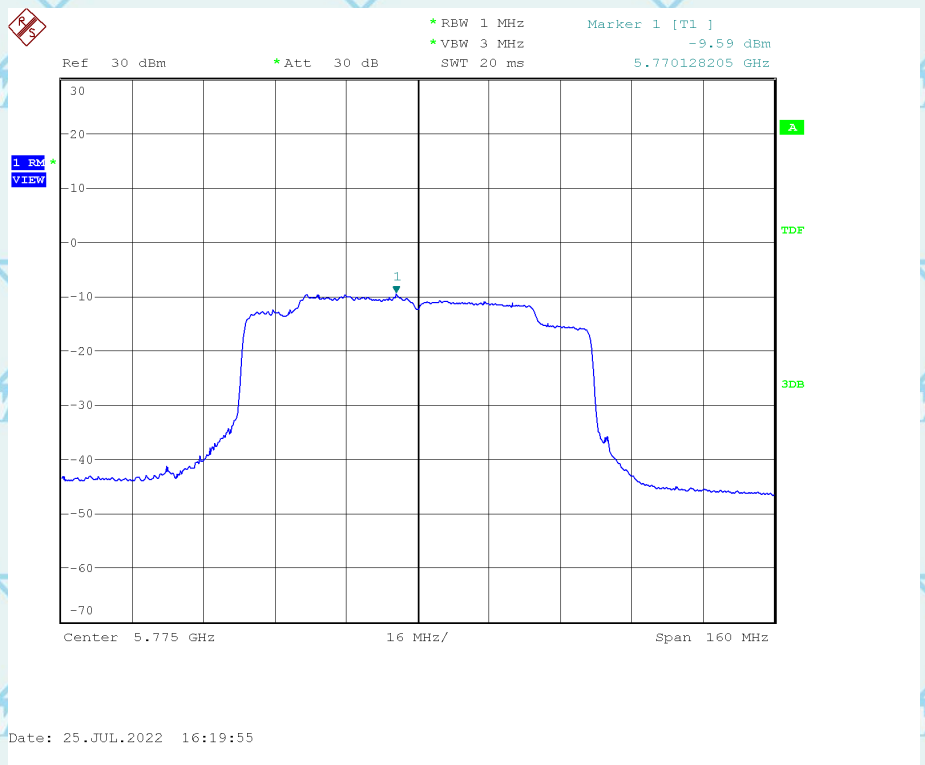
PPSD (CH High)



Date: 25.JUL.2022 16:18:34

Band4

PPSD (CH Low)



E. Frequency Stability

Product:	Megabook	Test Mode:	Mode: 20MHz(IEEE 802.11a/n/ac/ax)
Test Item:	Frequency Stability	Temperature:	25 ℃
Test Voltage:	DC 11.55V	Humidity:	56%RH
Test Result:	**PASS**		

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)							
(V)	5180 MHz	5240 MHz	5260 MHz	5320 MHz	5500 MHz	5700 MHz	5745 MHz	5825 MHz
126.50	5179.9364	5239.9516	5259.9343	5319.9636	5499.9327	5699.933	5744.9102	5824.9614
110.00	5179.9333	5239.9206	5259.9372	5319.9658	5499.9326	5699.935	5744.9132	5824.9628
93.50	5179.9309	5239.9206	5259.9356	5319.9654	5499.9385	5699.9351	5744.9193	5824.9608
Max. Deviation (MHz)	0.0691	0.0794	0.0657	0.0364	0.0674	0.067	0.0898	0.0392
Max. Deviation (ppm)	12.01	13.8	11.42	6.32	11.71	11.64	15.6	6.81

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)							
(℃)	5180 MHz	5240 MHz	5260 MHz	5320 MHz	5500 MHz	5700 MHz	5745 MHz	5825 MHz
0	5179.9333	5239.9598	5259.9345	5319.9681	5499.9371	5699.9398	5744.9125	5824.9649
10	5179.9379	5239.9512	5259.9311	5319.9639	5499.9356	5699.9334	5744.9105	5824.9645
20	5179.9337	5239.9542	5259.9348	5319.9642	5499.9308	5699.9381	5744.9144	5824.9641
30	5179.9394	5239.957	5259.938	5319.9669	5499.9307	5699.9309	5744.9179	5824.9700
40	5179.9361	5239.9539	5259.9336	5319.9699	5499.9326	5699.9339	5744.9196	5824.9628
Max. Deviation (MHz)	0.0667	0.0488	0.0689	0.0361	0.0693	0.0691	0.0895	0.0372
Max. Deviation (ppm)	11.59	8.48	11.97	6.27	12.04	12.01	15.55	6.46

Product:	Megabook	Test Mode:	Mode: 40MHz(IEEE 802.11n/ac/ax)
Test Item:	Frequency Stability	Temperature:	25 ℃
Test Voltage:	DC 11.55V	Humidity:	56%RH
Test Result:	PASS		

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)							
(V)	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5670 MHz	5755 MHz	5795 MHz
126.50	5189.9374	5229.9575	5269.9332	5309.9647	5509.9382	5669.9324	5754.9138	5794.962
110.00	5189.9325	5229.9587	5269.9318	5309.9651	5509.9332	5669.9347	5754.9174	5794.9603
93.50	5189.9372	5229.957	5269.9323	5309.9687	5509.9398	5669.9336	5754.9116	5794.9617
Max. Deviation (MHz)	0.0675	0.043	0.0682	0.0353	0.0668	0.0676	0.0884	0.0397
Max. Deviation (ppm)	13.01	7.47	11.85	6.13	11.61	11.75	15.36	6.9

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)							
(℃)	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5670 MHz	5755 MHz	5795 MHz
0	5189.9354	5229.9526	5269.9373	5309.9617	5509.9332	5669.9359	5754.9184	5794.9684
10	5189.9311	5229.9582	5269.9363	5309.9659	5509.9354	5669.9368	5754.9124	5794.961
20	5189.9324	5229.9596	5269.9397	5309.9689	5509.9315	5669.9332	5754.9106	5794.968
30	5189.9359	5229.9521	5269.9353	5309.9699	5509.9381	5669.9381	5754.9135	5794.9674
40	5189.932	5229.9528	5269.9366	5309.9614	5509.9334	5669.9393	5754.9173	5794.9621
Max. Deviation (MHz)	0.0689	0.0479	0.0647	0.0386	0.0685	0.0668	0.0894	0.039
Max. Deviation (ppm)	11.97	8.32	11.24	6.71	11.9	11.61	15.53	6.78

Product:	Megabook	Test Mode:	80MHz(IEEE 802.11ac/ax)
Test Item:	Frequency Stability	Temperature:	25 ℃
Test Voltage:	DC 11.55V	Humidity:	56%RH
Test Result:	PASS		

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)					
(V)	5210 MHz	5290 MHz	5530 MHz	5610 MHz	5775 MHz	
126.50	5209.9306	5289.951	5529.9345	5609.9678	5774.9382	
110.00	5209.9314	5289.9545	5529.9341	5609.9698	5774.9348	
93.50	5209.9323	5289.9501	5529.9374	5609.969	5774.9376	
Max. Deviation (MHz)	0.0694	0.0499	0.0659	0.0322	0.0652	
Max. Deviation (ppm)	13.32	8.67	11.45	5.6	11.33	

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)					
(℃)	5210 MHz	5290 MHz	5530 MHz	5610 MHz	5775 MHz	
0	5209.9312	5289.9524	5529.9302	5609.9605	5774.938	
10	5209.9304	5289.9554	5529.9394	5609.9664	5774.9378	
20	5209.9362	5289.9563	5529.936	5609.9692	5774.9354	
30	5209.9368	5289.9541	5529.9367	5609.969	5774.9383	
40	5209.939	5289.9588	5529.9394	5609.968	5774.9346	
Max. Deviation (MHz)	0.0696	0.0476	0.0698	0.0395	0.0654	
Max. Deviation (ppm)	12.09	8.27	12.13	6.86	11.36	

8. BAND EDGE EMISSIONS

8. 1 Test Equipment

Please refer to Section 4 this report.

8. 2 Test Procedure

Band Edge Emissions Measurement:	
Test Method:	a.)The EUT was tested according to ANSI C63.10. b)The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 1.5 m. All set up is according to ANSI C63.10. c)The frequency spectrum from 9 kHz to 40 GHz was investigated. All readings from 9 kHz to 150 kHz are quasi-peak values with a resolution bandwidth of 200 Hz. All readings from 150 kHz to 30 MHz are quasi-peak values with a resolution bandwidth of 9 KHz. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 KHz. All readings are above 1 GHz , peak values with a resolution bandwidth of 1 MHz . Measurements were made at 3 meters. d)The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. The Receiving antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency. Emissions below 30MHz were measured with a loop antenna while emission above 30MHz were measured using a broadband E-field antenna. e) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "**QP**" in the data table. f)Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.10.
Band Edge Emissions Measurement:	
Test Equipment Setting:	
a)Attenuation: Auto b)Span Frequency: 100 MHz c)RBW/VBW (Emission in restricted band): 1MHz / 3MHz for Peak, 1MHz / 1/T for Average	d)RBW/VBW(Emission in non-restricted band) 1MHz / 3MHz for peak

8. 3 Test Setup

Same as section 2.2 of this report

8. 4 Configuration of the EUT

Same as section 2.2 of this report

8. 5 EUT Operating Condition

Same as section 2.2 of this report.

8. 6 Limit

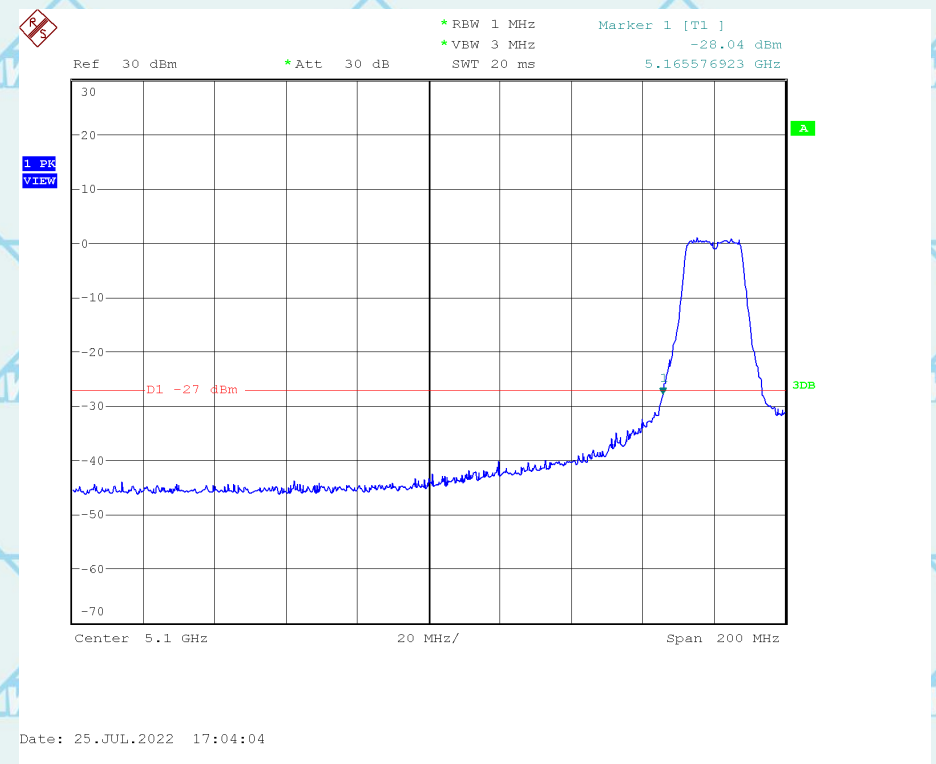
Spurious Radiated Emission & Band Edge Emissions Measurement:	
Limit:	For transmitters operating in the 5.15-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. For transmitters operating in the 5.470-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. For transmitters operating in the 5.725-5.85 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz. In any 100 KHz bandwidth outside the operating frequency band, the radio frequency power that is produced by modulation products of the spreading sequence, the information sequence and the carrier frequency shall be either at least 20 dB below that in any 100 KHz bandwidth within the band that contains the highest level of the desired power or shall not exceed the general levels specified in section 15.209(a), which lesser attenuation. All other emissions inside restricted bands specified in section 15.205(a) shall not exceed the general radiated emission limits specified in section 15.209(a)
Note: Applies to harmonics/spurious emissions that fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209. 47 CFR § 15.237(c): The emission limits as specified above are based on measurement instrument employing an average detector. The provisions in section 15.35 for limiting peak emissions apply.	

8. 7 Test Result

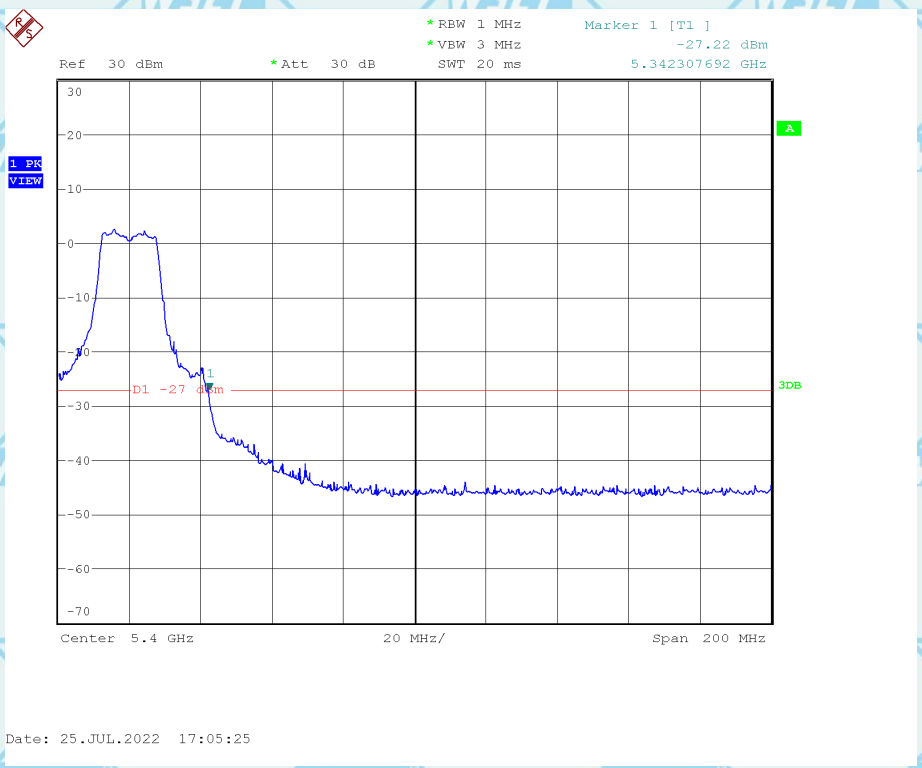
Band Edge and Fundamental Emissions

Product:	Megabook	Test Mode:	20MHzIEEE 802.11a/n/ac/ax
Test Item:	Band Edge and Fundamental Emissions	Temperature:	25 ℃
Test Voltage:	DC 11.55V	Humidity:	56%RH
Test Result:	PASS		

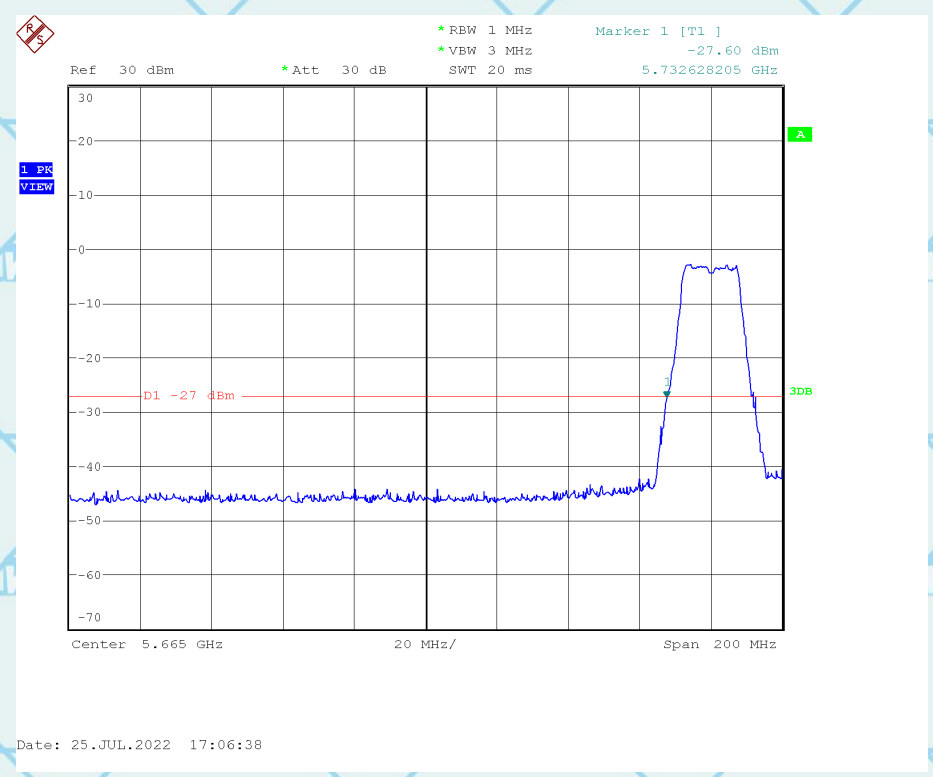
20MHz(IEEE 802.11a/n/ac/ax)
Channel Low (5180MHz)



Channel High (5320MHz)



Channel Low (5745MHz)



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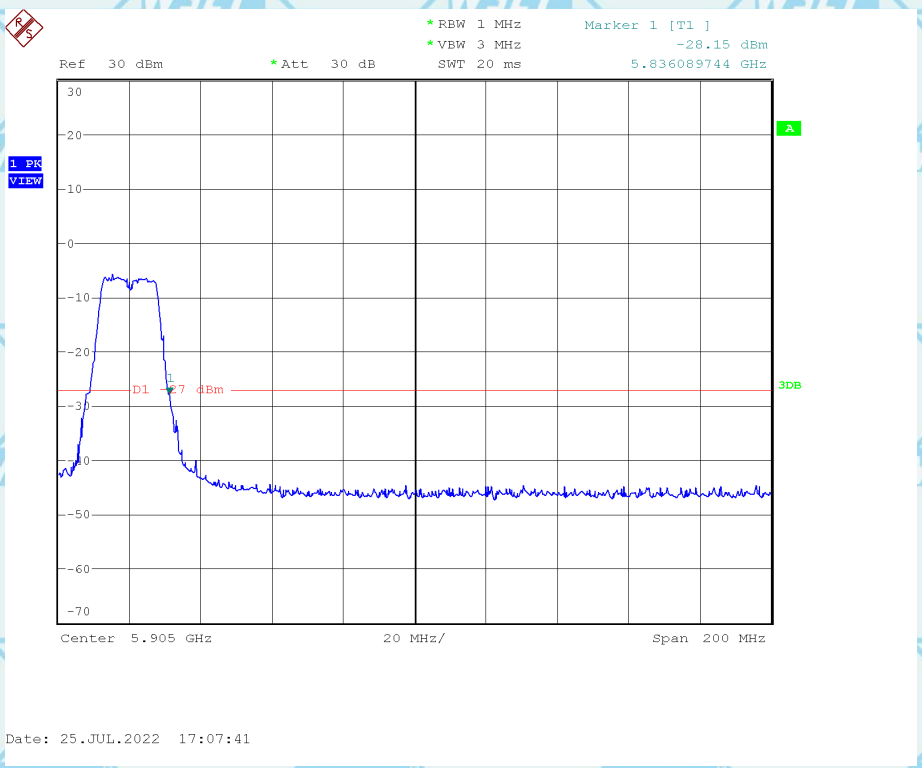
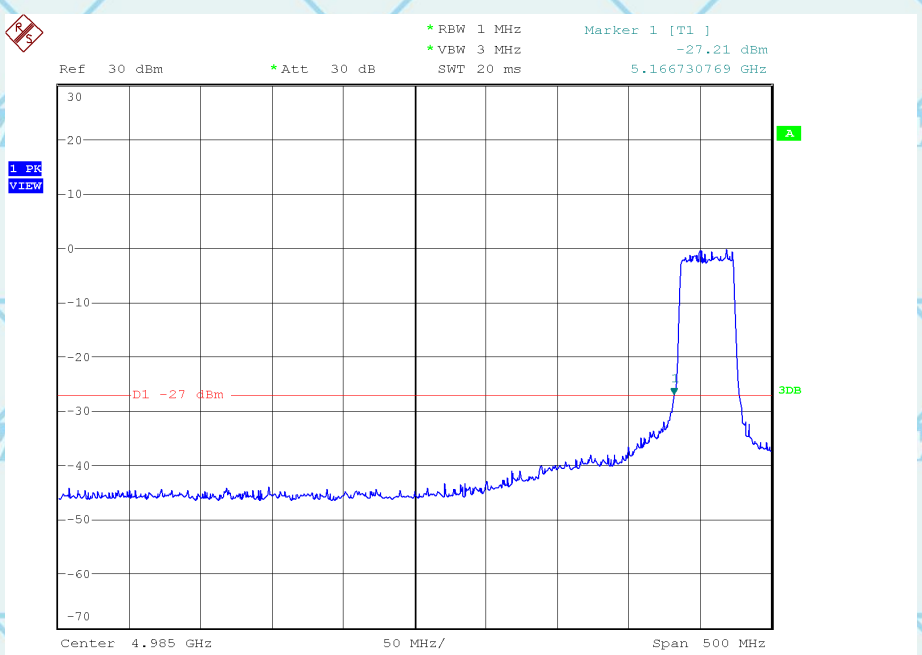
Channel High (5825MHz)

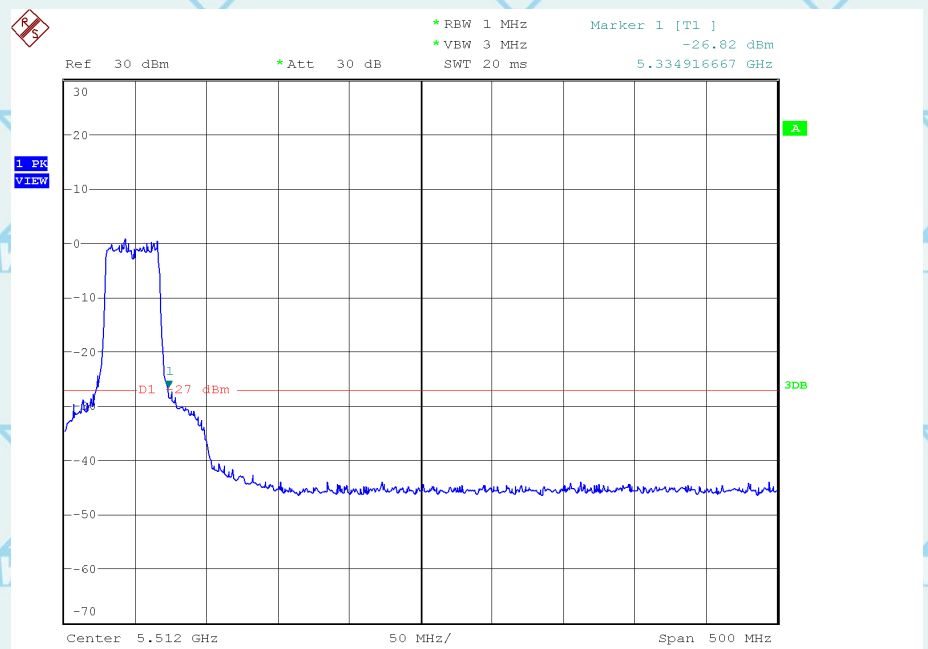


Report No.: WSCT-A2LA-R&E220300004A-Wi-Fi2

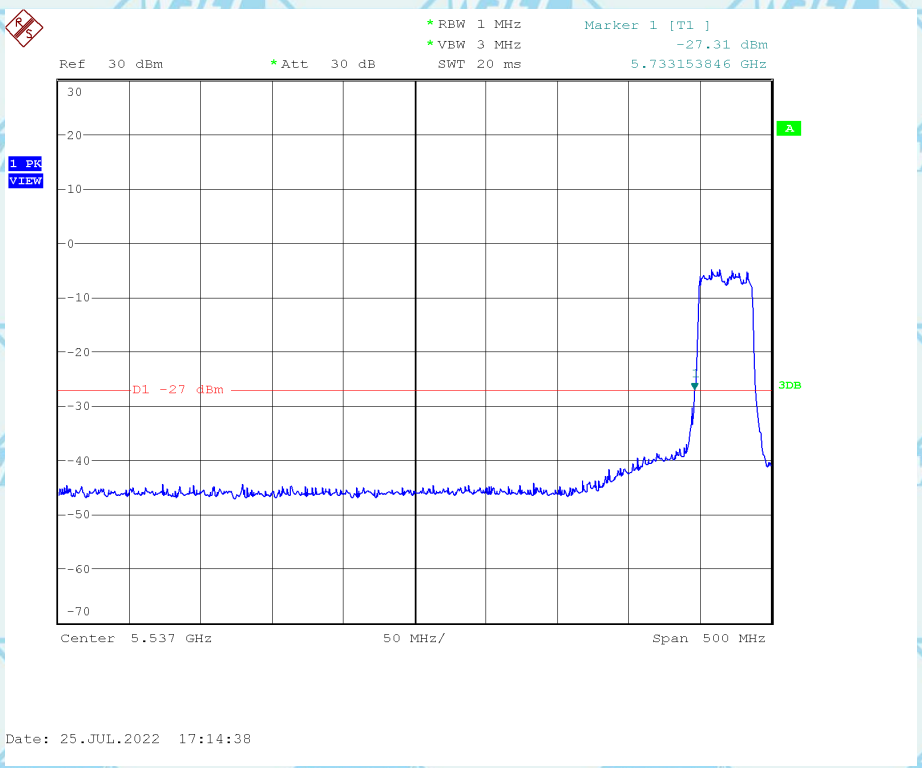
40MHzIEEE 802.11n/ac/ax
Channel Low (5190MHz)



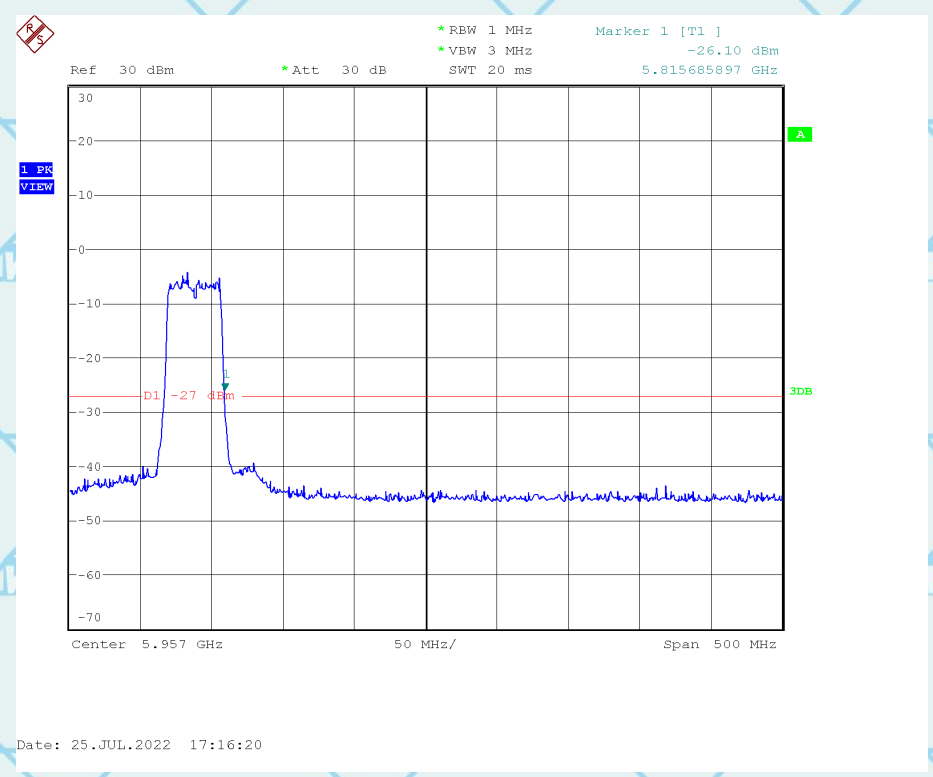
Channel High (5310MHz)



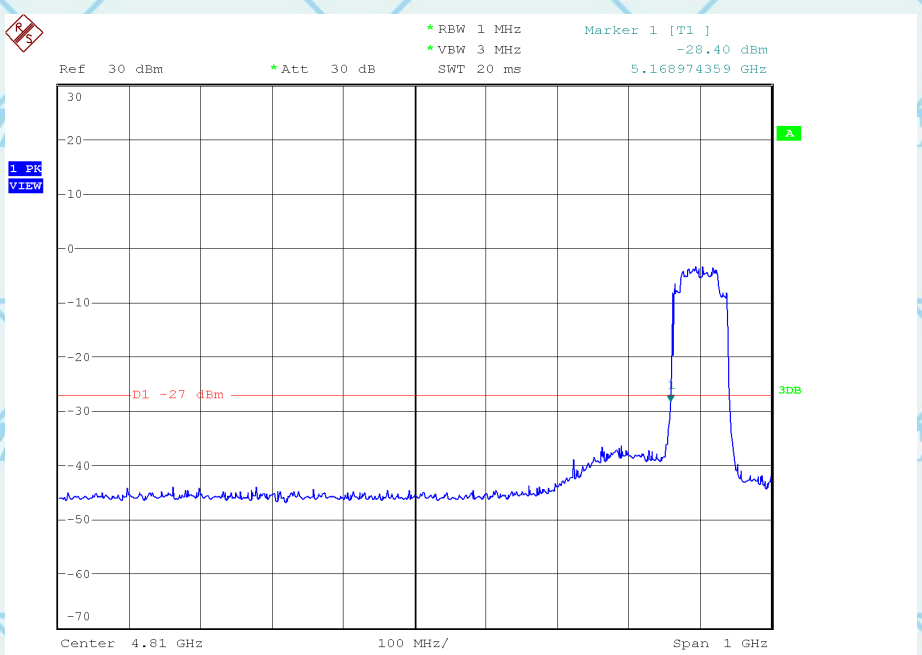
Channel Low (5755MHz)



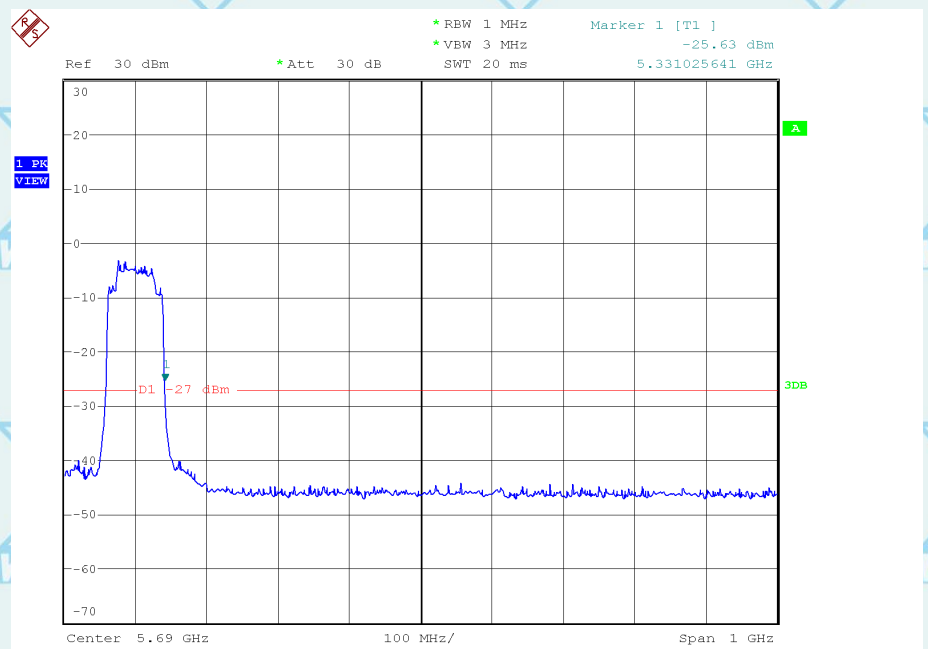
Channel High (5795MHz)



80MHzIEEE 802.11ac/ax
Channel Low (5210MHz)

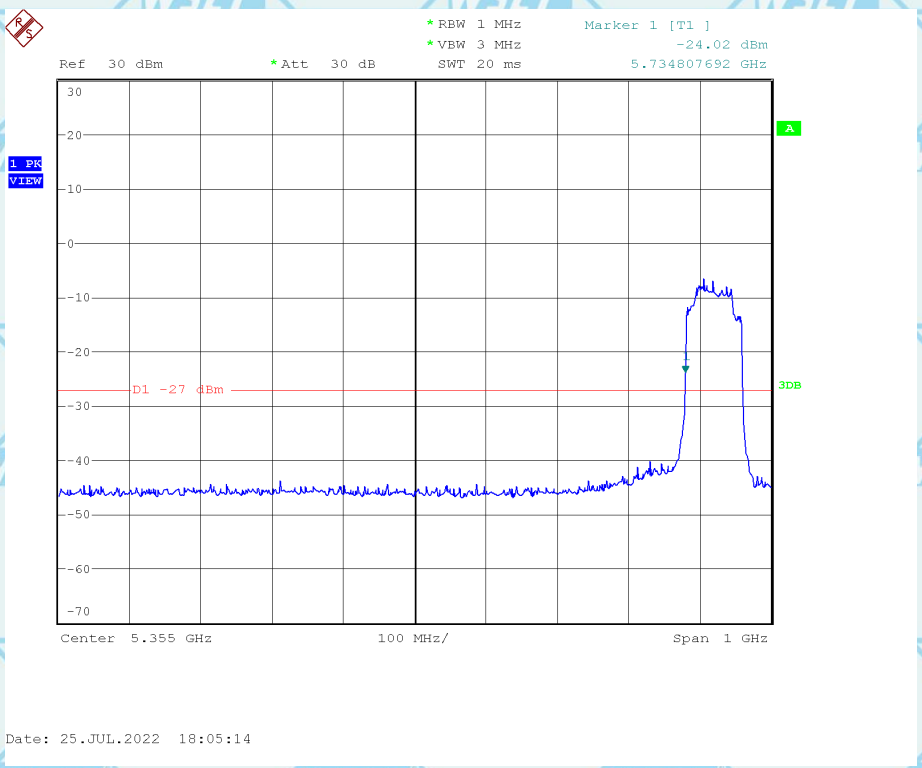


Channel High (5290MHz)



Report No.: WSCT-A2LA-R&E220300004A-Wi-Fi2

Channel Low (5775MHz)



9. DYNAMIC FREQUENCY SELECTION (DFS)

DFS OVERVIEW

A U-NII network will employ a DFS function to detect signals from radar systems and to avoid co-channel operation with these systems. This applies to the 5250-5350 MHz and/or 5470-5725 MHz bands.
Within the context of the operation of the DFS function, a U-NII device will operate in either *Master Mode* or *Client Mode*. U-NII devices operating in *Client Mode* can only operate in a network controlled by a U-NII device operating in *Master Mode*.
Tables 1 and 2 shown below summarize the information contained in sections 5.1.1 and 5.1.2

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode	
	Master Device or Client with Radar Detection	Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar Detection	Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

The operational behavior and individual DFS requirements that are associated with these modes are as follows:

DFS DETECTION THRESHOLDS

Table 3 below provides the *DFS Detection Thresholds* for *Master Devices* as well as *Client Devices* incorporating *In-Service Monitoring*.

Table 3: DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP ≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. **Note 2:** Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. **Note3:** EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

RESPONSE REQUIREMENTS

Table 4 provides the response requirements for *Master* and *Client Devices* incorporating DFS.

Table 4: DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.
Note 1: *Channel Move Time* and the *Channel Closing Transmission Time* should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. **Note 2:** The *Channel Closing Transmission Time* is comprised of 200 milliseconds starting at the beginning of the *Channel Move Time* plus any additional intermittent control signals required to facilitate a *Channel* move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. **Note 3:** During the *U-NII Detection Bandwidth* detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

RADAR TEST WAVEFORMS

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Short Pulse Radar Test Waveforms

Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a	Roundup $\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot10^6}{PRI_{\mu sec}}\right)\right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. If more than 30 waveforms are used for Short Pulse Radar Types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B.

For example if in Short Pulse Radar Type 1 Test B a PRI of 3066 μsec is selected, the number of pulses would be

Roundup $\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot10^6}{3066}\right)\right\}$ = Round up {17.2} = 18.

Table 5a - Pulse Repetition Intervals Values for Test A

Pulse Repetition Frequency Number	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (Microseconds)
1	1930.5	518
2	1858.7	538
3	1792.1	558
4	1730.1	578
5	1672.2	598
6	1618.1	618
7	1567.4	638
8	1519.8	658
9	1474.9	678
10	1432.7	698
11	1392.8	718
12	1355	738
13	1319.3	758
14	1285.3	778
15	1253.1	798
16	1222.5	818
17	1193.3	838
18	1165.6	858
19	1139	878
20	1113.6	898
21	1089.3	918
22	1066.1	938
23	326.2	3066

The aggregate is the average of the percentage of successful detections of Short Pulse Radar Types 1-4. For example, the following table indicates how to compute the aggregate of percentage of successful detections.

Radar Type	Number of Trials	Number of Successful Detections	Minimum Percentage of Successful Detection
1	35	29	82.9%
2	30	18	60%
3	30	27	90%
4	50	44	88%
Aggregate (82.9% + 60% + 90% + 88%)/4 = 80.2%			

Long Pulse Radar Test Waveform

Table 6 – Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per *Burst*	Number of *Bursts*	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

The parameters for this waveform are randomly chosen. Thirty unique waveforms are required for the Long Pulse Radar Type waveforms. If more than 30 waveforms are used for the Long Pulse Radar Type waveforms, then each additional waveform must also be unique and not repeated from the previous waveforms.

Each waveform is defined as follows:

1) The transmission period for the Long Pulse Radar test signal is 12 seconds.

2) There are a total of 8 to 20 *Bursts* in the 12 second period, with the number of *Bursts* being randomly chosen. This number is *Burst Count*.

3) Each *Burst* consists of 1 to 3 pulses, with the number of pulses being randomly chosen. Each *Burst* within the 12 second sequence may have a different number of pulses.

4) The pulse width is between 50 and 100 microseconds, with the pulse width being randomly chosen. Each pulse within a *Burst* will have the same pulse width. Pulses in different *Bursts* may have different pulse widths.

5) Each pulse has a linear frequency modulated chirp between 5 and 20 MHz, with the chirp width being randomly chosen. Each pulse within a *transmission period* will have the same chirp width. The chirp is centered on the pulse. For example, with a radar frequency of 5300 MHz and a 20 MHz chirped signal, the chirp starts at 5290 MHz and ends at 5310 MHz.

6) If more than one pulse is present in a *Burst*, the time between the pulses will be between 1000 and 2000 microseconds, with the time being randomly chosen. If three pulses are present in a *Burst*, the random time interval between the first and second pulses is chosen independently of the random time interval between the second and third pulses.

7) The 12 second transmission period is divided into even intervals. The number of intervals is equal to *Burst Count*. Each interval is of length (12,000,000 / *Burst Count*) microseconds. Each interval contains one *Burst*. The start time for the *Burst*, relative to the beginning of the interval, is between 1 and [(12,000,000 / *Burst Count*) – (Total *Burst* Length) + (One Random PRI Interval)] microseconds, with the start time being randomly chosen. The step interval for the start time is 1 microsecond. The start time for each *Burst* is chosen randomly.

A representative example of a Long Pulse Radar Type waveform:

1) The total test waveform length is 12 seconds.

2) Eight (8) *Bursts* are randomly generated for the *Burst Count*.

3) *Burst* 1 has 2 randomly generated pulses.

4) The pulse width (for both pulses) is randomly selected to be 75 microseconds.

5) The PRI is randomly selected to be at 1213 microseconds.

6) *Bursts* 2 through 8 are generated using steps 3 – 5.

7) Each *Burst* is contained in even intervals of 1,500,000 microseconds. The starting location for Pulse 1, *Burst* 1 is randomly generated (1 to 1,500,000 minus the total *Burst* 1 length + 1 random

PRI interval) at the 325,001 microsecond step. *Bursts* 2 through 8 randomly fall in successive 1,500,000 microsecond intervals (i.e. *Burst* 2 falls in the 1,500,001 – 3,000,000 microsecond range).

Figure 1 provides a graphical representation of the Long Pulse Radar Test Waveform.

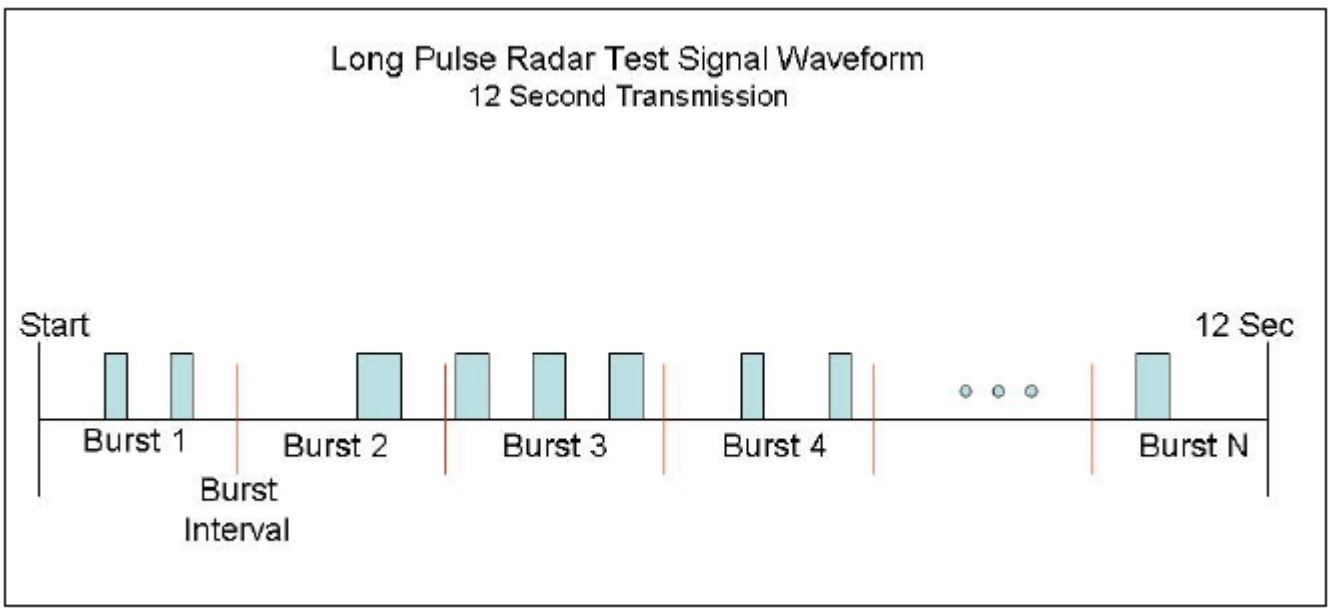


Figure 1: Graphical Representation of a Long Pulse Radar Type Waveform

Frequency Hopping Radar Test Waveform

Table 7 – Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (µsec)	PRI (µsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70%	30

For the Frequency Hopping Radar Type, the same *Burst* parameters are used for each waveform. The hopping sequence is different for each waveform and a 100-length segment is selected from the hopping sequence defined by the following algorithm: 4

The first frequency in a hopping sequence is selected randomly from the group of 475 integer frequencies from 5250 – 5724 MHz. Next, the frequency that was just chosen is removed from the group and a frequency is randomly selected from the remaining 474 frequencies in the group. This process continues until all 475 frequencies are chosen for the set. For selection of a random frequency, the frequencies remaining within the group are always treated as equally likely.

TEST PROCEDURE

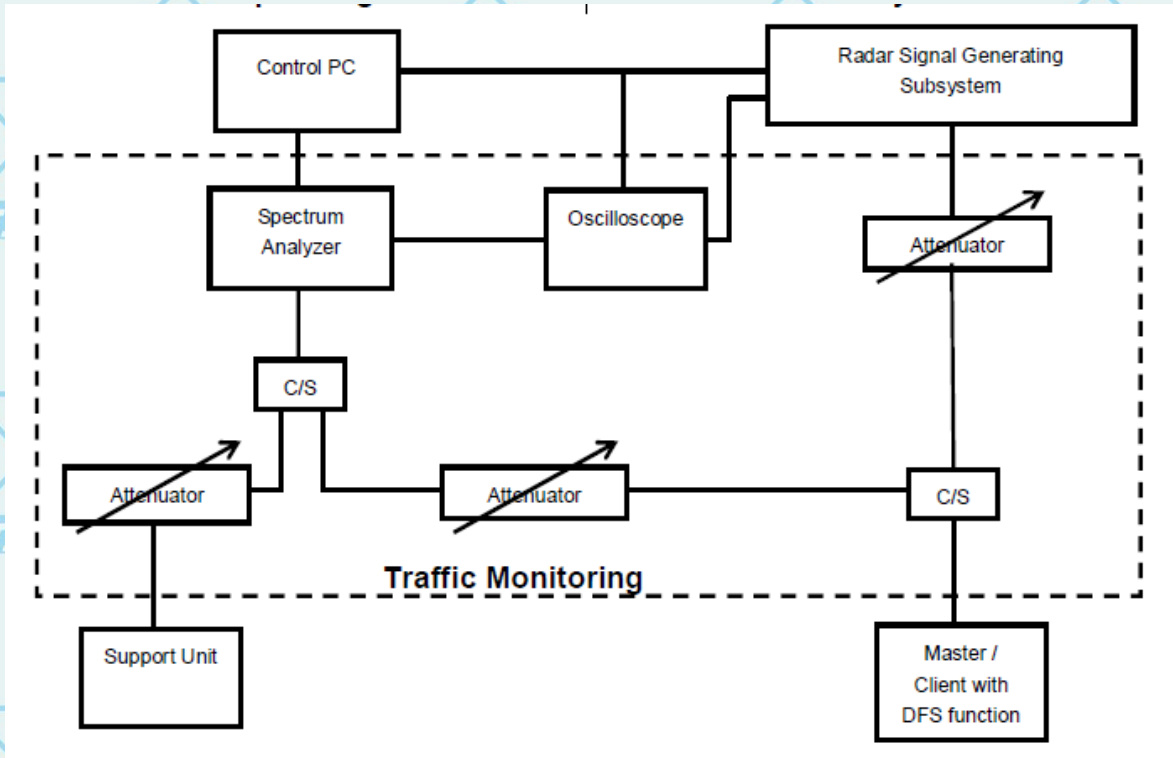
DFS MEASUREMENT SYSTEM

A complete DFS Measurement System consists of two subsystems:

(1) The Radar Signal Generating Subsystem and

(2) The Traffic Monitoring Subsystem.

The control PC is necessary for generating the Radar waveforms in Table 10, 11 and 12. The traffic monitoring subsystem is specified to the type of unit under test (UUT).



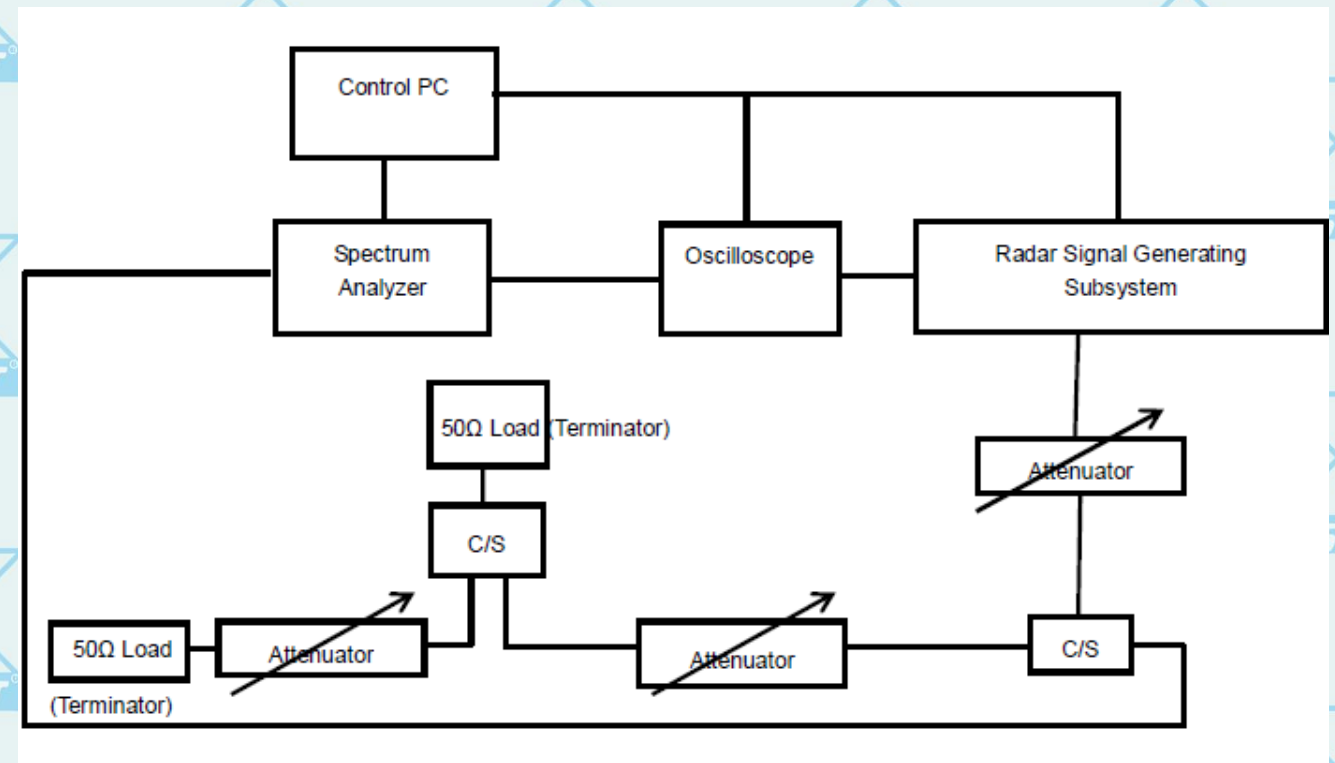
The test transmission will always be from the Master Device to the Client Device. While the Client device is set up to associate with the Master device and play the MPEG file (6 y Magic Hours) from Master device, the designated MPEG test file and instructions are located at: http://ntiacsd.ntia.doc.gov/dfs/.

CALIBRATION OF DFS DETECTION THRESHOLD LEVEL

The measured channel is 5260MHz. The radar signal was the same as transmitted channels, and injected into the antenna port of Client Device with Radar Detection, measured the channel closing transmission time and channel move time.

SLAVE WITHOUT RADAR DETECTION MODE

The antenna gain is -4dBi and required detection threshold is -65dBm (= -62 +1 - 4)dBm. The calibrated conducted detection threshold level is set to -65dBm.



DEVIATION FROM TEST STANDARD

No deviation.

RESULT: PASS

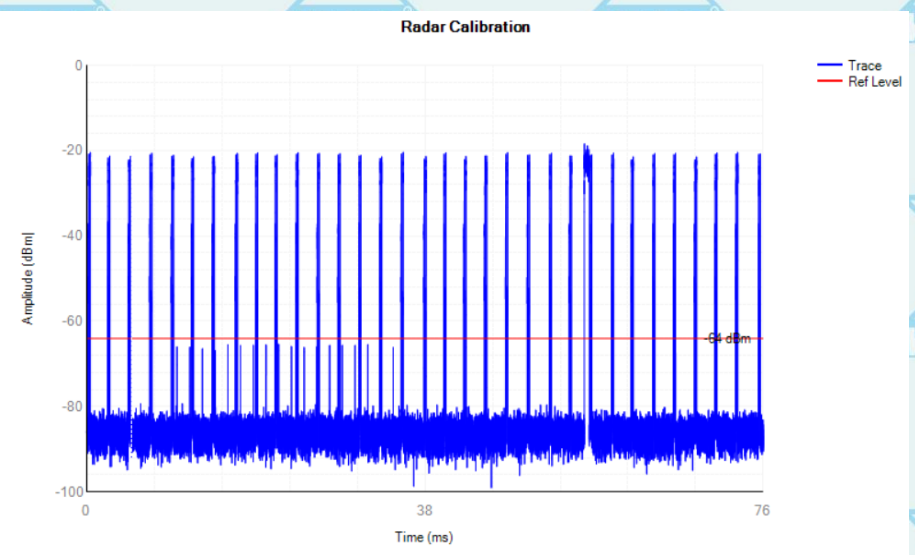
Test Items	Remark	Result
Channel Closing Transmission Time	Applicable	PASS
Channel Move Time	Applicable	PASS

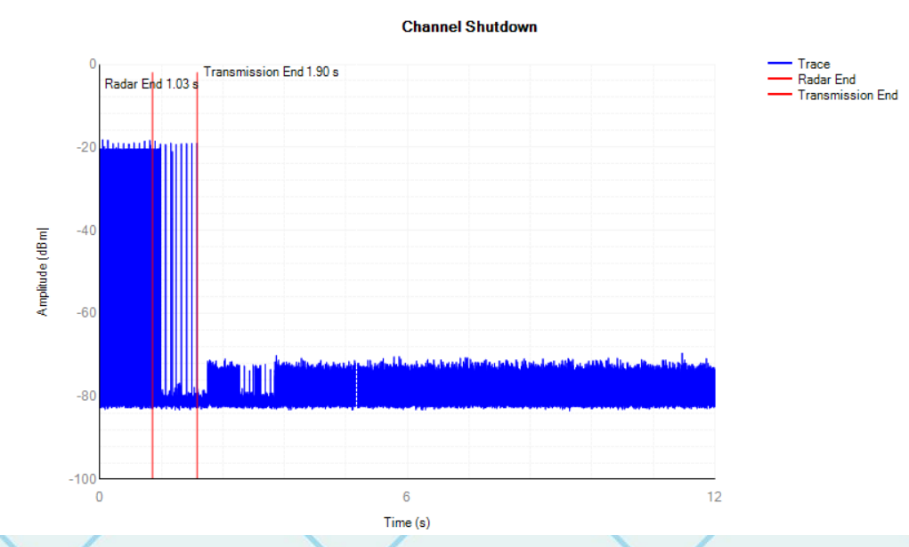
Note: This phone can only be used as a slave without radar detection function.

MEASUREMENT RECORD (THE WOST CASE)

Measurement data below:

5320MHz			
Test Items	**Value（ms）**	**Limit（s）**	**Test Result**
Channel Closing Transmission Time	52.4	1	Pass
Channel Move Time	870.6	10	Pass





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Measurement data below:

5500MHz			
Test Items	**Value（ms）**	**Limit（s）**	**Test Result**
Channel Closing Transmission Time	30.8	1	Pass
Channel Move Time	800.4	10	Pass