TEST REPORT

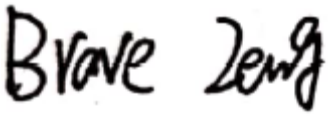
Report No.:	BCTC2203305540E
Applicant:	VISION ELECTRONICS CO., LTD.
Product Name:	Wireless Game Controller
Model/Type Ref.:	1712
Tested Date:	2022-03-24 to 2022-04-01
Issued Date:	2022-04-01

Shenzhen BCTC Testing Co., Ltd.

FCC ID: Q5P-1712

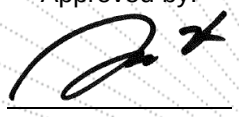
Product Name:	Wireless Game Controller
Trademark:	VISION / VISIONHMD
Model/Type Ref.:	1712 1713, 1712A, 17121, 17122, 17123, 1713A, 17131, 17132, 17133
Prepared For:	VISION ELECTRONICS CO., LTD.
Address:	11F-6, No.400 Huanbei Rd. Jhongli Dist. Taoyuan City, Taiwan
Manufacturer:	VISION ELECTRONICS CO., LTD.
Address:	NO.1 XiNan Rd, ShiGu, TangXia Town, DongGuan City, GuangDong P.R.C
Prepared By:	Shenzhen BCTC Testing Co., Ltd.
Address:	1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Tangwei, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date:	2022-03-24
Sample tested Date:	2022-03-24 to 2022-04-01
Issue Date:	2022-04-01
Report No.:	BCTC2203305540E
Test Standards	FCC Part15 15.407 ANSI C63.10-2013 KDB 662911 D01 v02r01 KDB 789033 D02 v02r01
Test Results	PASS

Tested by:



Brave Zeng/ Project Handler

Approved by:



Zero Zhou/Reviewer

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(Note: N/A Means Not Applicable)

1. Version

Report No.	Issue Date	Description	Approved
BCTC2203305540E	2022-04-01	Original	Valid

2. Test Summary

The Product has been tested according to the following specifications:

No.	Test Parameter	Clause No	Results
1	Spurious Radiated Emissions	15.209(a), 15.407 (b)(1) 15.407 (b)(4) 15.407 (b)(8)	PASS
2	Conducted Emission	15.207	N/A
3	26 dB and 99% Emission Bandwidth	15.407 (a)(12) 15.1049	PASS
4	Minimum 6 dB bandwidth	15.407(e)	PASS
5	Maximum Conducted Output Power	15.407 (a)(1) 15.407 (a)(3)	PASS
6	Band Edge	2.1051, 15.407(b)(1) 15.407(b)(4)	PASS
7	Power Spectral Density	15.407 (a)(1) 15.407 (a)(3)	PASS
8	Spurious Emissions at Antenna Terminals	2.1051, 15.407(b)	PASS
9	Antenna Requirement	15.203	PASS

3. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Uncertainty
1	3m chamber Radiated spurious emission(9kHz-30MHz)	U=3.7dB
2	3m chamber Radiated spurious emission(30MHz-1GHz)	U=4.3dB
3	3m chamber Radiated spurious emission(1GHz-18GHz)	U=4.5dB
4	3m chamber Radiated spurious emission(18GHz-40GHz)	U=3.34dB
5	Conducted Emission(150kHz-30MHz)	U=3.20dB
6	Conducted Adjacent channel power	U=1.38dB
7	Conducted output power uncertainty Above 1G	U=1.576dB
8	Conducted output power uncertainty below 1G	U=1.28dB
9	humidity uncertainty	U=5.3%
10	Temperature uncertainty	U=0.59℃

4. Product Information And Test Setup

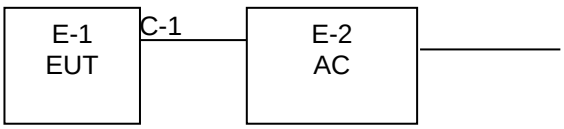
4.1 Product Information

Model/Type Ref.:	1712 1713, 1712A, 17121, 17122, 17123, 1713A, 17131, 17132, 17133
Model differences:	All the model are the same circuit and RF module, except model names.
Hardware Version:	N/A
Software Version:	N/A
IEEE 802.11 WLAN Mode Supported	802.11a/n (20MHz channel bandwidth) 802.11n (40MHz channel bandwidth)
Operation Frequency:	5180-5240MHz for 802.11a/n (HT20); 5190-5230MHz for 802.11n(HT40); 5745-5825 MHz for 802.11a/n(HT20) 5755-5795 MHz for 802.11n(HT40)
Data Rate	802.11a: 6,9,12,18,24,36,48,54Mbps; 802.11n(HT20/HT40):MCS0-MCS15;
Type of Modulation:	OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11a/n
Number Of Channel	4 channels for 802.11a/n20 in the 5180-5240MHz band ; 2 channels for 802.11 n40 in the 5190-5230MHz band ; 5 channels for 802.11a/n20 in the 5745-5825MHz band ; 2 channels for 802.11 n40 in the 5755-5795MHz band ;
Antenna installation:	Internal antenna
Antenna Gain:	0dBi
Ratings:	AC 120V/60Hz/DC 3.7V

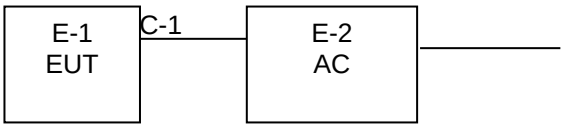
4.2 Test Setup Configuration

See test photographs attached in *EUT TEST SETUP PHOTOGRAPHS* for the actual connections between Product and support equipment.

Conducted Emission:



Radiated Spurious Emission



4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note
E-1	Wireless Game Controller	VISION / VISIONHMD	1712	N/A	EUT
E-2	Adapter	N/A	BCTC002	N/A	Auxiliary

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	0.5M	DC cable unshielded

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.4 Channel List

5.1G

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

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

5.8G

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

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

4.5 Test Mode

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

5.1G

Pretest Mode	Description
Mode 1	802.11a / n 20 CH36/ CH40
Mode 2	802.11n 40 CH38
Mode 3	Link Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11a / n 20 CH36/ CH40
Mode 2	802.11n 40 CH38
Mode 3	802.11a / n 20 CH36/ CH40
Note:	
(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.	

5.8G

Pretest Mode	Description
Mode 1	802.11a /n 20 CH149/ CH157
Mode 2	802.11n 40 CH 151
Mode 3	Link Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11a /n 20 CH149/ CH157
Mode 2	802.11n 40 CH 151
Note:	
(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.	

4.6 Table Of Parameters Of Text Software Setting

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

Test software Version	FCC_TOOL		
Parameters	DEF	DEF	DEF

5. Test Facility And Test Instrument Used

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at Shenzhen BCTC Testing Co., Ltd. Address:1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Tangwei, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.
FCC Test Firm Registration Number: 712850
IC Registered No.: 23583

5.2 Test Instrument Used

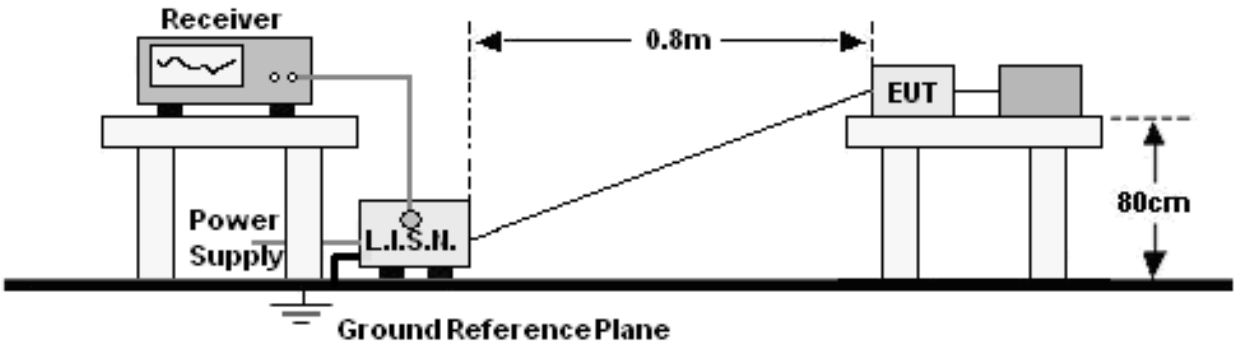
Conducted Emissions Test					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
Receiver	R&S	ESR3	102075	May 28, 2021	May 27, 2022
LISN	R&S	ENV216	101375	May 28, 2021	May 27, 2022
Software	Frad	EZ-EMC	EMC-CON 3A1	\	\
Attenuator	\	10dB DC-6GHz	1650	May 28, 2021	May 27, 2022

RF Conducted Test					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
Power Metter	Keysight	E4419	\	May 28, 2021	May 27, 2022
Power Sensor (AV)	Keysight	E9300A	\	May 28, 2021	May 27, 2022
Signal Analyzer20kHz-26.5GHz	Keysight	N9020A	MY49100060	May 28, 2021	May 27, 2022
Spectrum Analyzer9kHz-40GHz	R&S	FSP40	\	May 28, 2021	May 27, 2022

Radiated Emissions Test (966 Chamber)					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
966 chamber	ChengYu	966 Room	966	Jun. 06. 2020	Jun. 05, 2023
Receiver	R&S	ESR3	102075	May 28, 2021	May 27, 2022
Receiver	R&S	ESRP	101154	May 28, 2021	May 27, 2022
Amplifier	SKET	LAPA_01G18G-45dB	\	May 28, 2021	May 27, 2022
Amplifier	Schwarzbeck	BBV9744	9744-0037	May 28, 2021	May 27, 2022
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	942	Jun. 01, 2021	May 31, 2022
Horn Antenna	Schwarzbeck	BBHA9120D	1541	Jun. 02, 2021	Jun. 01, 2022
Horn Antenn(18GHz-40GHz)	Schwarzbeck	BBHA9170	00822	Jun. 15, 2021	Jun. 14, 2022
Amplifier(18GHz-40GHz)	MITEQ	TTA1840-35-HG	2034381	May 28, 2021	May 27, 2022
Loop Antenna(9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	Jun. 02, 2021	Jun. 01, 2022
RF cables1(9kHz-30MHz)	Huber+Suhnar	9kHz-30MHz	B1702988-0008	May 28, 2021	May 27, 2022
RF cables2(30MHz-1GHz)	Huber+Suhnar	30MHz-1GHz	1486150	May 28, 2021	May 27, 2022
RF cables3(1GHz-40GHz)	Huber+Suhnar	1GHz-40GHz	1607106	May 28, 2021	May 27, 2022
Power Metter	Keysight	E4419	\	May 28, 2021	May 27, 2022
Power Sensor (AV)	Keysight	E9300A	\	May 28, 2021	May 27, 2022
Signal Analyzer20kHz-26.5GHz	Keysight	N9020A	MY49100060	May 28, 2021	May 27, 2022
Spectrum Analyzer9kHz-40GHz	R&S	FSP40	\	May 28, 2021	May 27, 2022
Software	Frad	EZ-EMC	FA-03A2 RE	\	\

6. Conducted Emissions

6.1 Block Diagram Of Test Setup



6.2 Limit

FREQUENCY (MHz)	Limit (dBuV)	
	Quas-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Notes:
1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

6.3 Test Procedure

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

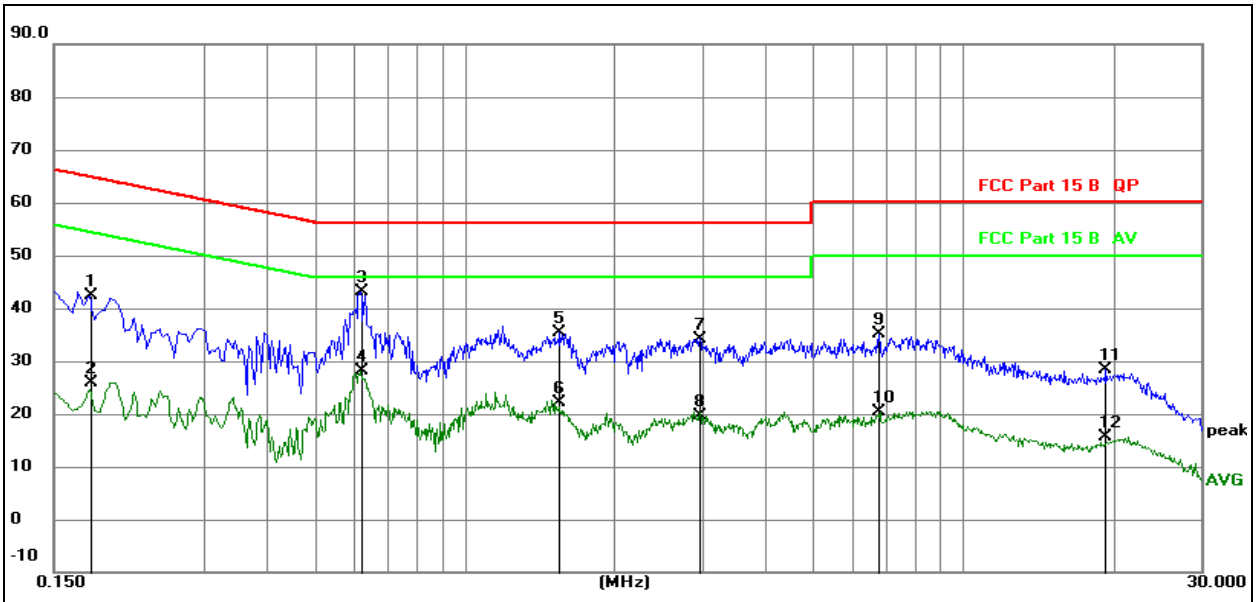
a. The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
b. The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
c. For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

6.4 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.
We pretest AC 120V and AC 240V, the worst voltage was AC 120V and the data recording in the report.

6.5 Test Result

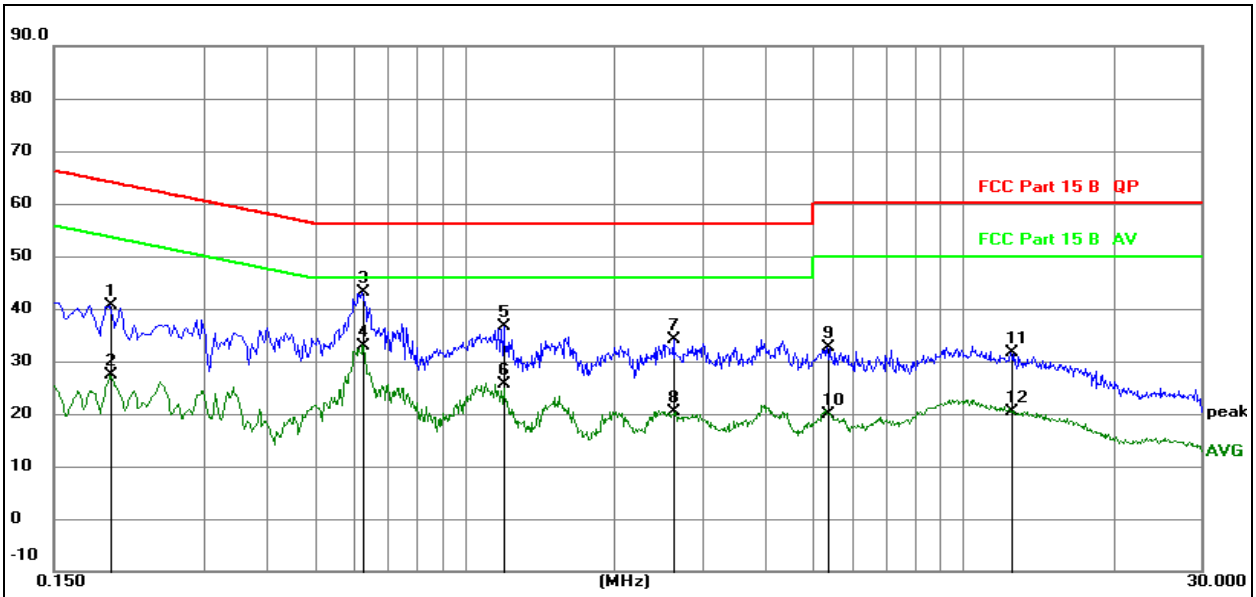
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Line
Test Voltage :	AC 120V/60Hz	Test Mode:	Mode 3



Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement=Reading Level+ Correct Factor
4. Over=Measurement-Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.1768	22.85	19.60	42.45	64.63	-22.18	QP
2		0.1768	6.31	19.60	25.91	54.63	-28.72	AVG
3	*	0.6173	23.55	19.61	43.16	56.00	-12.84	QP
4		0.6173	8.48	19.61	28.09	46.00	-17.91	AVG
5		1.5518	15.72	19.62	35.34	56.00	-20.66	QP
6		1.5518	2.62	19.62	22.24	46.00	-23.76	AVG
7		2.9619	14.60	19.65	34.25	56.00	-21.75	QP
8		2.9619	-0.14	19.65	19.51	46.00	-26.49	AVG
9		6.7691	15.32	19.73	35.05	60.00	-24.95	QP
10		6.7691	0.77	19.73	20.50	50.00	-29.50	AVG
11		19.3257	8.58	19.74	28.32	60.00	-31.68	QP
12		19.3257	-4.19	19.74	15.55	50.00	-34.45	AVG

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Neutral
Test Voltage :	AC 120V/60Hz	Test Mode:	Mode 3



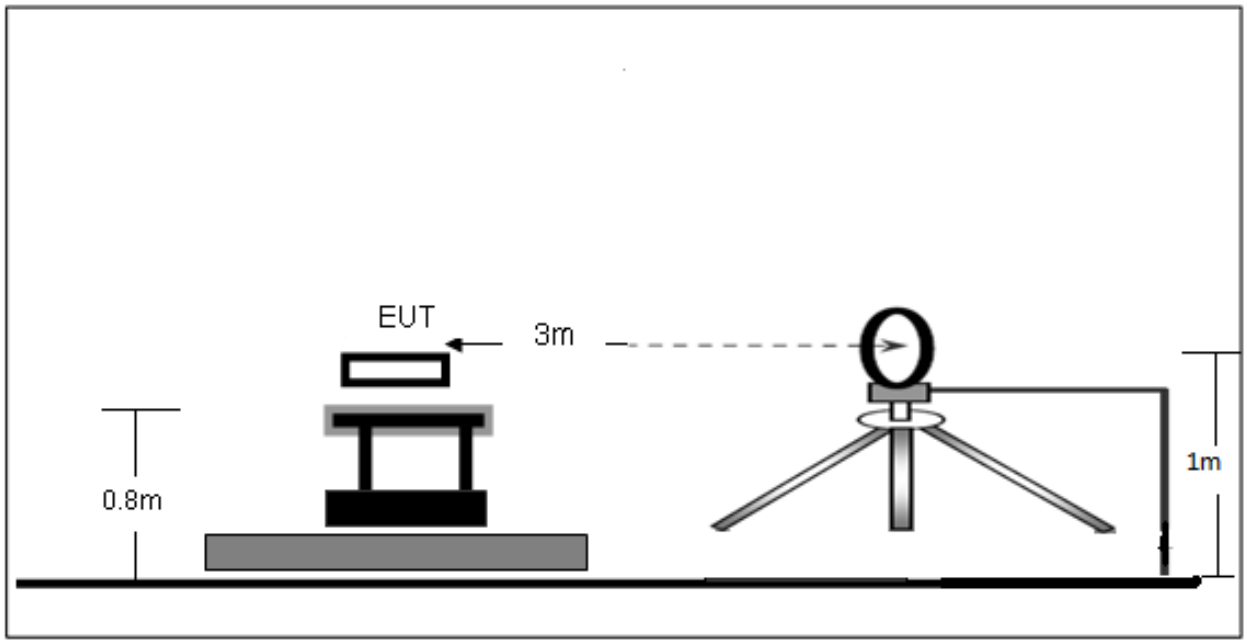
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement=Reading Level+ Correct Factor
4. Over=Measurement-Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.1949	21.04	19.60	40.64	63.83	-23.19	QP
2		0.1949	7.80	19.60	27.40	53.83	-26.43	AVG
3	*	0.6269	23.50	19.61	43.11	56.00	-12.89	QP
4		0.6269	13.32	19.61	32.93	46.00	-13.07	AVG
5		1.2028	16.93	19.62	36.55	56.00	-19.45	QP
6		1.2028	6.04	19.62	25.66	46.00	-20.34	AVG
7		2.6295	14.40	19.64	34.04	56.00	-21.96	QP
8		2.6295	0.68	19.64	20.32	46.00	-25.68	AVG
9		5.3475	12.84	19.71	32.55	60.00	-27.45	QP
10		5.3475	0.26	19.71	19.97	50.00	-30.03	AVG
11		12.4620	11.74	19.78	31.52	60.00	-28.48	QP
12		12.4620	0.60	19.78	20.38	50.00	-29.62	AVG

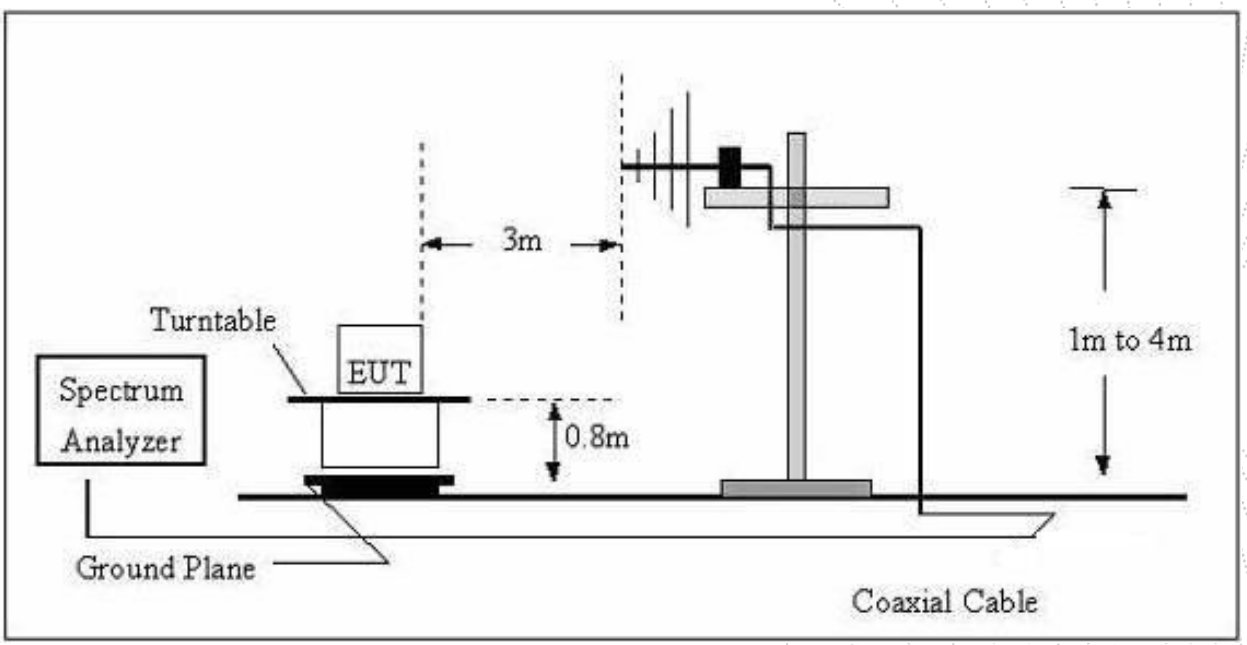
7. Radiated Emissions

7.1 Block Diagram Of Test Setup

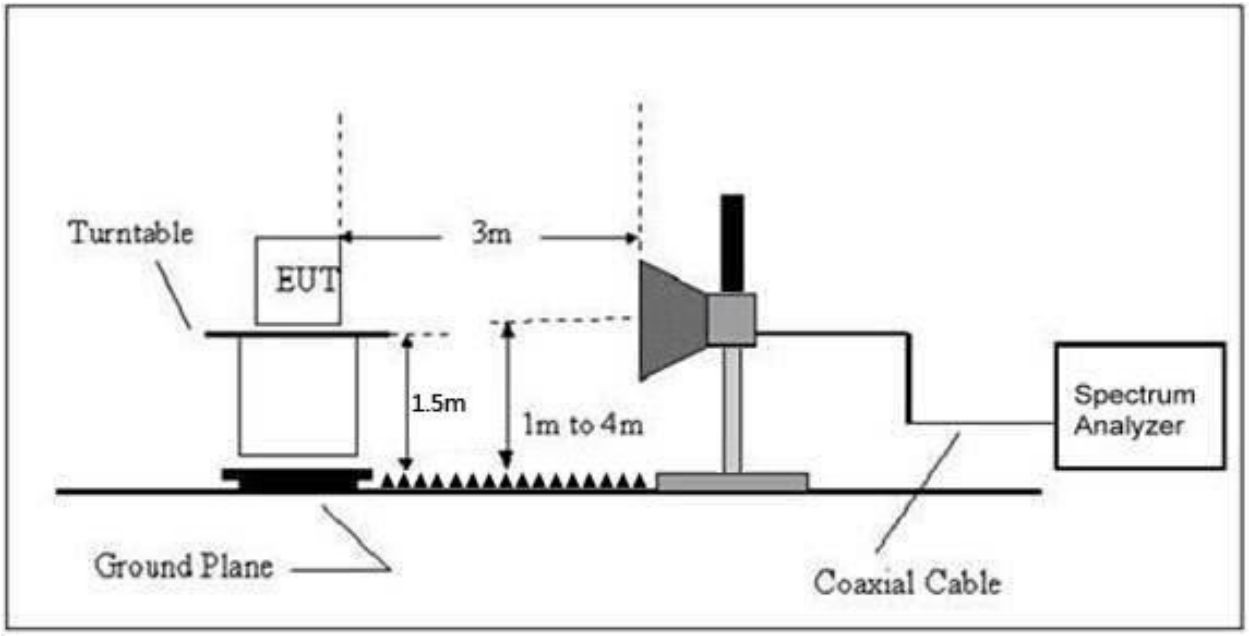
（A）Radiated Emission Test-Up Frequency Below 30MHz



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



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



7.2 Limit

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.

Frequency	Field Strength	Distance	Field Strength Limit at 3m Distance	
(MHz)	uV/m	(m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))}$ + 80
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))}$ + 40
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)}$ + 40
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

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).

7.3 Test Procedure

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

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

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

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

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

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

Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

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

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7.4 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.

7.5 Test Result

Below 30MHz

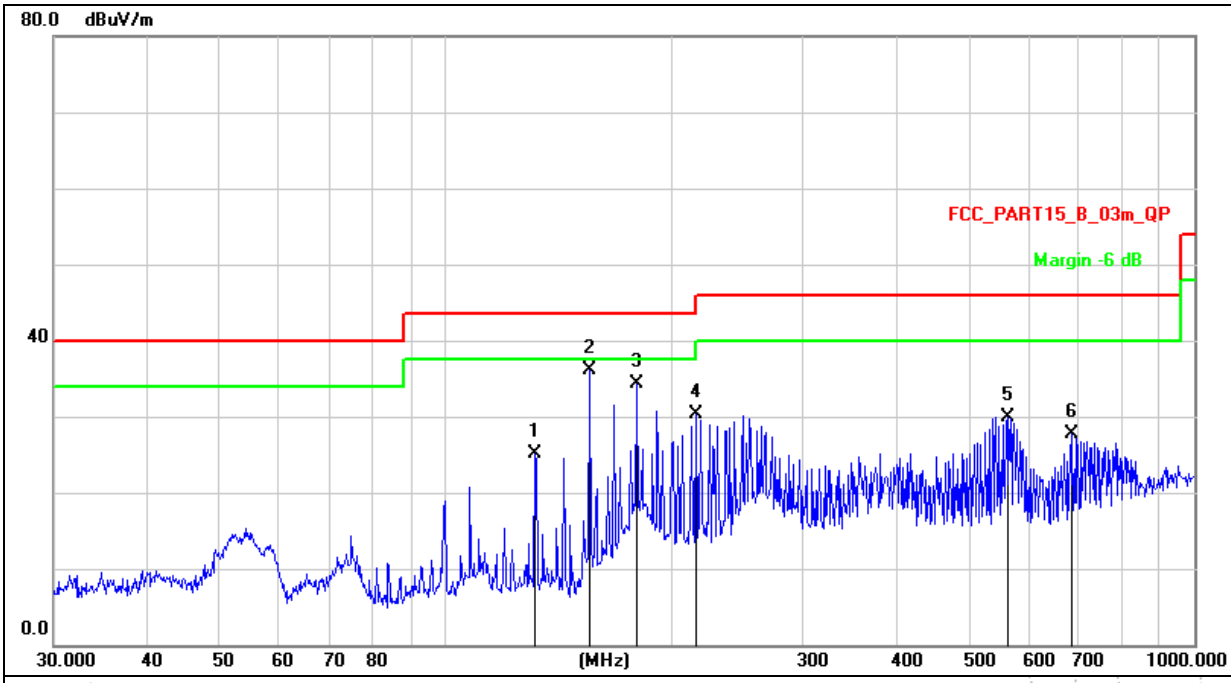
Temperature：	26℃	Relative Humidtity：	24%
Pressure：	101 kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	Mode 3	Polarization :	--

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

Note:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

Between 30MHz – 1GHz

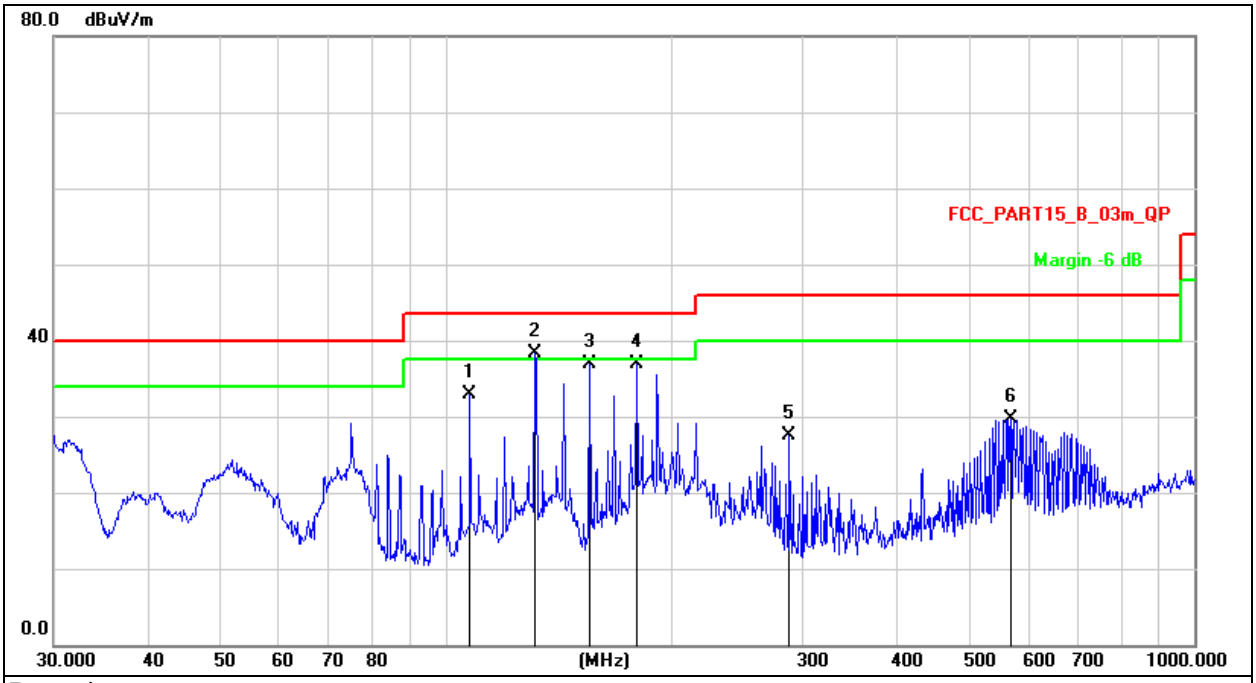
Temperature：	26℃	Relative Humidity：	54%
Pressure：	101 kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	Mode 3	Polarization :	Horizontal



Remark:
1.Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Measurement=Reading Level+ Correct Factor
3. Over=Measurement-Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		131.7577	43.41	-18.33	25.08	43.50	-18.42	QP
2	*	155.9101	55.24	-19.12	36.12	43.50	-7.38	QP
3		180.0165	51.97	-17.58	34.39	43.50	-9.11	QP
4		216.0240	46.26	-15.93	30.33	46.00	-15.67	QP
5		562.6624	37.26	-7.39	29.87	46.00	-16.13	QP
6		687.1507	33.36	-5.57	27.79	46.00	-18.21	QP

Temperature：	26℃	Relative Humidity：	54%
Pressure：	101 kpa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	Mode 3	Polarization :	Vertical



Remark:
1.Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Measurement=Reading Level+ Correct Factor
3. Over=Measurement-Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		107.8877	49.74	-16.79	32.95	43.50	-10.55	QP
2	*	131.7577	56.65	-18.33	38.32	43.50	-5.18	QP
3		155.9101	56.09	-19.12	36.97	43.50	-6.53	QP
4		180.0165	54.48	-17.58	36.90	43.50	-6.60	QP
5		287.9904	41.52	-13.97	27.55	46.00	-18.45	QP
6		568.6127	37.02	-7.25	29.77	46.00	-16.23	QP

Between 1GHz – 40GHz

Test Mode :	TX(5.1G) - 802.11a

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5180 MHz)-Above 1G									
V	4434.150	63.82	5.94	35.40	44.00	61.16	68.2	-7.04	PK
V	4434.150	43.30	5.94	35.40	44.00	40.64	54	-13.36	AV
V	10360.176	61.78	8.46	39.75	44.50	65.49	68.2	-2.71	PK
V	10360.176	43.09	8.46	39.75	44.50	46.80	54	-7.20	AV
V	15540.099	62.00	10.12	38.80	44.10	66.82	74	-7.18	PK
V	15540.099	43.69	10.12	38.80	42.70	49.91	54	-4.09	AV
H	4434.042	63.68	5.94	35.18	44.00	60.80	68.2	-7.40	PK
H	4434.042	43.78	5.94	35.18	44.00	40.90	54	-13.10	AV
H	10360.004	50.16	8.46	38.71	44.50	52.83	68.2	-15.37	PK
H	10360.004	44.45	8.46	38.71	44.50	47.12	54	-6.88	AV
H	15540.073	54.81	10.12	38.38	44.10	59.21	74	-14.79	PK
H	15540.073	43.48	10.12	38.38	44.10	47.88	54	-6.12	AV
middle Channel (5200 MHz)-Above 1G									
V	4592.021	62.07	6.48	36.35	44.05	60.85	74	-13.15	PK
V	4592.021	43.99	6.48	36.35	44.05	42.77	54	-11.23	AV
V	10400.076	60.35	8.47	37.88	44.51	62.19	68.2	-6.01	PK
V	10400.076	43.69	8.47	37.88	44.51	45.53	54	-8.47	AV
V	15600.046	61.13	10.12	38.80	44.10	65.95	74	-8.05	PK
V	15600.046	43.53	10.12	38.80	42.70	49.75	54	-4.25	AV
H	4592.185	60.18	6.48	36.37	44.05	58.98	74	-15.02	PK
H	4592.185	43.03	6.48	36.37	44.05	41.83	54	-12.17	AV
H	10400.119	52.56	8.47	38.64	44.50	55.17	68.2	-13.03	PK
H	10400.119	43.44	8.47	38.64	44.50	46.05	54	-7.95	AV
H	15600.061	53.49	10.12	38.38	44.10	57.89	74	-16.11	PK
H	15600.061	44.43	10.12	38.38	44.10	48.83	54	-5.17	AV
High Channel (5240 MHz)-Above 1G									
V	4739.159	63.49	7.10	37.24	43.50	64.33	74	-9.67	PK
V	4739.159	43.74	7.10	37.24	43.50	44.58	54	-9.42	AV
V	10480.198	63.88	8.46	37.68	44.50	65.52	68.2	-2.68	PK
V	10480.198	43.35	8.46	37.68	44.50	44.99	54	-9.01	AV
V	15720.148	61.93	10.12	38.80	44.10	66.75	74	-7.25	PK
V	15720.148	43.10	10.12	38.80	42.70	49.32	54	-4.68	AV
H	4739.081	63.38	7.10	37.24	43.50	64.22	74	-9.78	PK
H	4739.081	43.28	7.10	37.24	43.50	44.12	54	-9.88	AV
H	10480.107	54.41	8.46	38.57	44.50	56.94	68.2	-11.26	PK
H	10480.107	42.37	8.46	38.57	44.50	44.90	54	-9.10	AV
H	15720.185	51.09	10.12	38.38	44.10	55.49	74	-18.51	PK
H	15720.185	40.51	10.12	38.38	44.10	44.91	54	-9.09	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

Test Mode :	TX(5.1G) - 802.11n-HT20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5180 MHz)-Above 1G									
V	4434.148	60.75	5.94	35.40	44.00	58.09	68.2	-10.11	PK
V	4434.148	43.78	5.94	35.40	44.00	41.12	54	-12.88	AV
V	10360.010	60.94	8.46	39.75	44.50	64.65	68.2	-3.55	PK
V	10360.010	43.94	8.46	39.75	44.50	47.65	54	-6.35	AV
V	15540.093	60.34	10.12	38.80	44.10	65.16	74	-8.84	PK
V	15540.093	43.62	10.12	38.80	42.70	49.84	54	-4.16	AV
H	4434.156	62.87	5.94	35.18	44.00	59.99	68.2	-8.21	PK
H	4434.156	43.01	5.94	35.18	44.00	40.13	54	-13.87	AV
H	10360.097	52.76	8.46	38.71	44.50	55.43	68.2	-12.77	PK
H	10360.097	41.41	8.46	38.71	44.50	44.08	54	-9.92	AV
H	15540.056	51.14	10.12	38.38	44.10	55.54	74	-18.46	PK
H	15540.056	42.48	10.12	38.38	44.10	46.88	54	-7.12	AV
middle Channel (5200 MHz)-Above 1G									
V	4592.002	63.38	6.48	36.35	44.05	62.16	74	-11.84	PK
V	4592.002	43.46	6.48	36.35	44.05	42.24	54	-11.76	AV
V	10400.113	60.07	8.47	37.88	44.51	61.91	68.2	-6.29	PK
V	10400.113	43.67	8.47	37.88	44.51	45.51	54	-8.49	AV
V	15600.110	63.73	10.12	38.80	44.10	68.55	74	-5.45	PK
V	15600.110	43.56	10.12	38.80	42.70	49.78	54	-4.22	AV
H	4592.022	61.79	6.48	36.37	44.05	60.59	74	-13.41	PK
H	4592.022	43.59	6.48	36.37	44.05	42.39	54	-11.61	AV
H	10400.168	54.96	8.47	38.64	44.50	57.57	68.2	-10.63	PK
H	10400.168	42.02	8.47	38.64	44.50	44.63	54	-9.37	AV
H	15600.113	54.32	10.12	38.38	44.10	58.72	74	-15.28	PK
H	15600.113	40.57	10.12	38.38	44.10	44.97	54	-9.03	AV
High Channel (5240 MHz)-Above 1G									
V	4739.147	60.94	7.10	37.24	43.50	61.78	74	-12.22	PK
V	4739.147	43.84	7.10	37.24	43.50	44.68	54	-9.32	AV
V	10480.017	60.87	8.46	37.68	44.50	62.51	68.2	-5.69	PK
V	10480.017	43.89	8.46	37.68	44.50	45.53	54	-8.47	AV
V	15720.191	62.15	10.12	38.80	44.10	66.97	74	-7.03	PK
V	15720.191	43.90	10.12	38.80	42.70	50.12	54	-3.88	AV
H	4739.160	60.64	7.10	37.24	43.50	61.48	74	-12.52	PK
H	4739.160	43.93	7.10	37.24	43.50	44.77	54	-9.23	AV
H	10480.020	50.64	8.46	38.57	44.50	53.17	68.2	-15.03	PK
H	10480.020	41.96	8.46	38.57	44.50	44.49	54	-9.51	AV
H	15720.080	51.21	10.12	38.38	44.10	55.61	74	-18.39	PK
H	15720.080	43.20	10.12	38.38	44.10	47.60	54	-6.40	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

Test Mode :	TX(5.1G) - 802.11n-HT40

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5190 MHz)-Above 1G									
V	4434.008	62.33	5.94	35.40	44.00	59.67	68.2	-8.53	PK
V	4434.008	43.50	5.94	35.40	44.00	40.84	54	-13.16	AV
V	10380.108	60.69	8.46	39.75	44.50	64.40	68.2	-3.80	PK
V	10380.108	43.07	8.46	39.75	44.50	46.78	54	-7.22	AV
V	15570.049	60.40	10.12	38.80	44.10	65.22	74	-8.78	PK
V	15570.049	43.08	10.12	38.80	42.70	49.30	54	-4.70	AV
H	4434.029	60.13	5.94	35.18	44.00	57.25	74	-16.75	PK
H	4434.029	43.99	5.94	35.18	44.00	41.11	54	-12.89	AV
H	10380.126	53.92	8.46	38.71	44.50	56.59	68.2	-11.61	PK
H	10380.126	40.36	8.46	38.71	44.50	43.03	54	-10.97	AV
H	15570.148	54.07	10.12	38.38	44.10	58.47	74	-15.53	PK
H	15570.148	44.93	10.12	38.38	44.10	49.33	54	-4.67	AV
middle Channel (5230 MHz)-Above 1G									
V	4739.157	63.28	6.48	36.35	44.05	62.06	68.2	-6.14	PK
V	4739.157	43.79	6.48	36.35	44.05	42.57	54	-11.43	AV
V	10460.052	60.21	8.47	37.88	44.51	62.05	68.2	-6.15	PK
V	10460.052	43.10	8.47	37.88	44.51	44.94	54	-9.06	AV
V	15690.058	61.97	10.12	38.80	44.10	66.79	74	-7.21	PK
V	15690.058	43.14	10.12	38.80	42.70	49.36	54	-4.64	AV
H	4739.112	61.83	6.48	36.37	44.05	60.63	68.2	-7.57	PK
H	4739.112	43.39	6.48	36.37	44.05	42.19	54	-11.81	AV
H	10460.035	52.72	8.47	38.64	44.50	55.33	68.2	-12.87	PK
H	10460.035	44.13	8.47	38.64	44.50	46.74	54	-7.26	AV
H	15690.152	54.90	10.12	38.38	44.10	59.30	74	-14.70	PK
H	15690.152	41.44	10.12	38.38	44.10	45.84	54	-8.16	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

Test Mode :	TX (5.8G) -- 802.11a

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5745 MHz)-Above 1G									
V	4679.019	56.86	5.94	35.40	44.00	54.20	74	-19.80	PK
V	4679.019	43.79	5.94	35.40	44.00	41.13	54	-12.87	AV
V	11490.064	55.88	8.46	39.75	44.50	59.59	68.2	-8.61	PK
V	11490.064	43.88	8.46	39.75	44.50	47.59	54	-6.41	AV
V	17235.180	56.32	10.12	38.80	44.10	61.14	68.2	-7.06	PK
V	17235.180	43.23	10.12	38.80	42.70	49.45	54	-4.55	AV
H	4679.008	56.63	5.94	35.18	44.00	53.75	74	-20.25	PK
H	4679.008	43.61	5.94	35.18	44.00	40.73	54	-13.27	AV
H	11490.138	53.49	8.46	38.71	44.50	56.16	68.2	-12.04	PK
H	11490.138	40.01	8.46	38.71	44.50	42.68	54	-11.32	AV
H	17235.157	54.42	10.12	38.38	44.10	58.82	68.2	-9.38	PK
H	17235.157	41.00	10.12	38.38	44.10	45.40	54	-8.60	AV
middle Channel (5785 MHz)-Above 1G									
V	4592.099	56.19	6.48	36.35	44.05	54.97	74	-19.03	PK
V	4592.099	43.29	6.48	36.35	44.05	42.07	54	-11.93	AV
V	11570.054	56.11	8.47	37.88	44.51	57.95	68.2	-10.25	PK
V	11570.054	43.77	8.47	37.88	44.51	45.61	54	-8.39	AV
V	17355.026	57.79	10.12	38.80	44.10	62.61	68.2	-5.59	PK
V	17355.026	39.63	10.12	38.80	42.70	45.85	54	-8.15	AV
H	4592.116	58.60	6.48	36.37	44.05	57.40	74	-16.60	PK
H	4592.116	43.15	6.48	36.37	44.05	41.95	54	-12.05	AV
H	11570.170	52.23	8.47	38.64	44.50	54.84	68.2	-13.36	PK
H	11570.170	41.30	8.47	38.64	44.50	43.91	54	-10.09	AV
H	17355.066	52.00	10.12	38.38	44.10	56.40	68.2	-11.80	PK
H	17355.066	41.24	10.12	38.38	44.10	45.64	54	-8.36	AV
High Channel (5825 MHz)-Above 1G									
V	6039.150	57.13	7.10	37.24	43.50	57.97	68.2	-10.23	PK
V	6039.150	43.05	7.10	37.24	43.50	43.89	54	-10.11	AV
V	11650.181	60.45	8.46	37.68	44.50	62.09	74	-11.91	PK
V	11650.181	43.21	8.46	37.68	44.50	44.85	54	-9.15	AV
V	17475.153	53.23	10.12	38.80	44.10	58.05	68.2	-10.15	PK
V	17475.153	43.96	10.12	38.80	42.70	50.18	54	-3.82	AV
H	6039.029	54.37	7.10	37.24	43.50	55.21	68.2	-12.99	PK
H	6039.029	43.27	7.10	37.24	43.50	44.11	54	-9.89	AV
H	11650.096	51.07	8.46	38.57	44.50	53.60	74	-20.40	PK
H	11650.096	40.91	8.46	38.57	44.50	43.44	54	-10.56	AV
H	17475.044	52.01	10.12	38.38	44.10	56.41	68.2	-11.79	PK
H	17475.044	43.29	10.12	38.38	44.10	47.69	54	-6.31	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

Test Mode :	TX (5.8G) --802.11n-HT20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5745 MHz)-Above 1G									
V	4679.133	56.13	5.94	35.40	44.00	53.47	74	-20.53	PK
V	4679.133	43.59	5.94	35.40	44.00	40.93	54	-13.07	AV
V	11490.142	54.76	8.46	39.75	44.50	58.47	68.2	-9.73	PK
V	11490.142	43.83	8.46	39.75	44.50	47.54	54	-6.46	AV
V	17235.167	61.79	10.12	38.80	44.10	66.61	68.2	-1.59	PK
V	17235.167	43.55	10.12	38.80	42.70	49.77	54	-4.23	AV
H	4679.091	56.22	5.94	35.18	44.00	53.34	74	-20.66	PK
H	4679.091	43.61	5.94	35.18	44.00	40.73	54	-13.27	AV
H	11490.051	51.02	8.46	38.71	44.50	53.69	68.2	-14.51	PK
H	11490.051	41.14	8.46	38.71	44.50	43.81	54	-10.19	AV
H	17235.170	52.97	10.12	38.38	44.10	57.37	68.2	-10.83	PK
H	17235.170	43.84	10.12	38.38	44.10	48.24	54	-5.76	AV
middle Channel (5785 MHz)-Above 1G									
V	4592.198	58.98	6.48	36.35	44.05	57.76	74	-16.24	PK
V	4592.198	43.27	6.48	36.35	44.05	42.05	54	-11.95	AV
V	11570.132	56.53	8.47	37.88	44.51	58.37	68.2	-9.83	PK
V	11570.132	43.70	8.47	37.88	44.51	45.54	54	-8.46	AV
V	17355.082	59.21	10.12	38.80	44.10	64.03	68.2	-4.17	PK
V	17355.082	43.32	10.12	38.80	42.70	49.54	54	-4.46	AV
H	4592.050	59.07	6.48	36.37	44.05	57.87	74	-16.13	PK
H	4592.050	43.11	6.48	36.37	44.05	41.91	54	-12.09	AV
H	11570.115	53.83	8.47	38.64	44.50	56.44	68.2	-11.76	PK
H	11570.115	43.94	8.47	38.64	44.50	46.55	54	-7.45	AV
H	17355.005	53.96	10.12	38.38	44.10	58.36	68.2	-9.84	PK
H	17355.005	40.15	10.12	38.38	44.10	44.55	54	-9.45	AV
High Channel (5825 MHz)-Above 1G									
V	6039.172	59.94	7.10	37.24	43.50	60.78	68.2	-7.42	PK
V	6039.172	43.57	7.10	37.24	43.50	44.41	54	-9.59	AV
V	11650.194	58.26	8.46	37.68	44.50	59.90	74	-14.10	PK
V	11650.194	43.04	8.46	37.68	44.50	44.68	54	-9.32	AV
V	17475.141	58.59	10.12	38.80	44.10	63.41	68.2	-4.79	PK
V	17475.141	43.46	10.12	38.80	42.70	49.68	54	-4.32	AV
H	6039.173	59.50	7.10	37.24	43.50	60.34	68.2	-7.86	PK
H	6039.173	43.92	7.10	37.24	43.50	44.76	54	-9.24	AV
H	11650.053	51.80	8.46	38.57	44.50	54.33	74	-19.67	PK
H	11650.053	42.25	8.46	38.57	44.50	44.78	54	-9.22	AV
H	17475.086	53.45	10.12	38.38	44.10	57.85	68.2	-10.35	PK
H	17475.086	42.16	10.12	38.38	44.10	46.56	54	-7.44	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

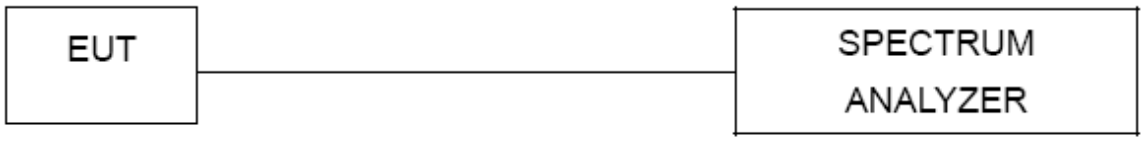
Test Mode :	TX (5.8G) -- 802.11n-HT40

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5755 MHz)-Above 1G									
V	4679.077	60.30	5.94	35.40	44.00	57.64	74	-16.36	PK
V	4679.077	43.51	5.94	35.40	44.00	40.85	54	-13.15	AV
V	11510.056	56.24	8.46	39.75	44.50	59.95	74	-14.05	PK
V	11510.056	43.42	8.46	39.75	44.50	47.13	54	-6.87	AV
V	17265.154	56.08	10.12	38.80	44.10	60.90	68.2	-7.30	PK
V	17265.154	2.00	10.12	38.80	42.70	8.22	54	-45.78	AV
H	4679.173	57.41	5.94	35.18	44.00	54.53	74	-19.47	PK
H	4679.173	43.24	5.94	35.18	44.00	40.36	54	-13.64	AV
H	11510.188	54.42	8.46	38.71	44.50	57.09	74	-16.91	PK
H	11510.188	40.81	8.46	38.71	44.50	43.48	54	-10.52	AV
H	17265.185	54.39	10.12	38.38	44.10	58.79	68.2	-9.41	PK
H	17265.185	44.03	10.12	38.38	44.10	48.43	54	-5.57	AV
middle Channel (5795 MHz)-Above 1G									
V	6039.073	58.68	6.48	36.35	44.05	57.46	68.2	-10.74	PK
V	6039.073	43.44	6.48	36.35	44.05	42.22	54	-11.78	AV
V	11590.139	57.24	8.47	37.88	44.51	59.08	74	-14.92	PK
V	11590.139	43.47	8.47	37.88	44.51	45.31	54	-8.69	AV
V	17385.181	55.83	10.12	38.80	44.10	60.65	68.2	-7.55	PK
V	17385.181	41.82	10.12	38.80	42.70	48.04	54	-5.96	AV
H	6039.078	60.26	6.48	36.37	44.05	59.06	68.2	-9.14	PK
H	6039.078	43.75	6.48	36.37	44.05	42.55	54	-11.45	AV
H	11590.178	52.63	8.47	38.64	44.50	55.24	74	-18.76	PK
H	11590.178	42.35	8.47	38.64	44.50	44.96	54	-9.04	AV
H	17385.007	53.90	10.12	38.38	44.10	58.30	68.2	-9.90	PK
H	17385.007	44.88	10.12	38.38	44.10	49.28	54	-4.72	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

8. Power Spectral Density Test

8.1 Block Diagram Of Test Setup



8.2 Limit

For the band 5.15-5.25 GHz,

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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

(iv) For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz

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

8.3 Test Procedure

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

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

b) Set VBW ≥ 3 RBW.

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

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

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

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

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8.4 EUT Operating Conditions

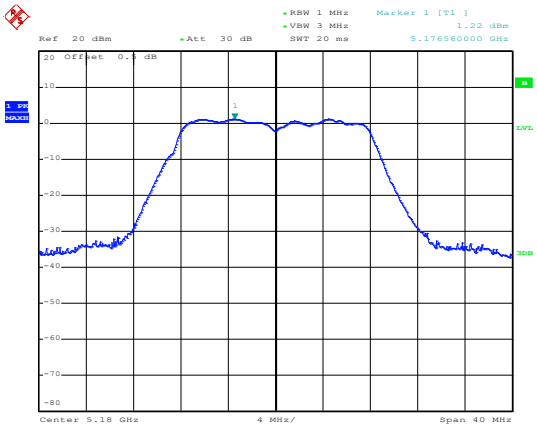
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

8.5 Test Result

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX Frequency U-NII-1 (5180-5240MHz)		

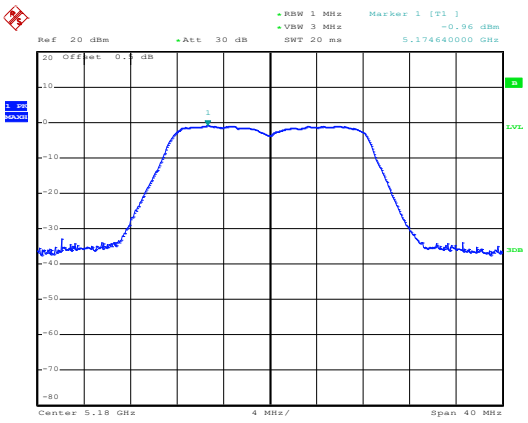
Test Mode	Frequency	Measured Power Density (dBm/MHz)	Limit (dBm/MHz)	Result
802.11 a	5180 MHz	1.22	11	PASS
	5200 MHz	0.78	11	PASS
	5240 MHz	0.77	11	PASS
802.11 n20	5180 MHz	-0.96	11	PASS
	5200 MHz	-0.77	11	PASS
	5240 MHz	-0.58	11	PASS
802.11 n40	5190 MHz	-3.48	11	PASS
	5230 MHz	-3.66	11	PASS

(802.11a) PSD plot on channel 36



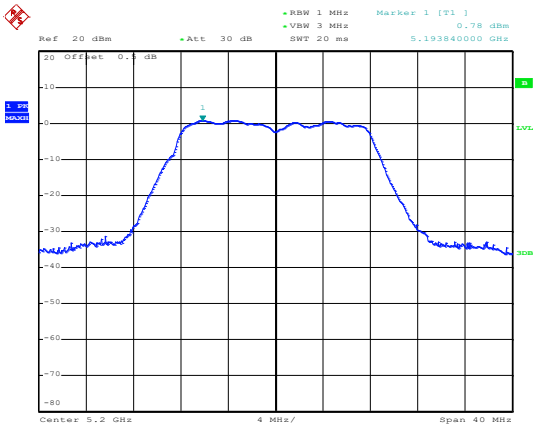
Date: 31.MAR.2022 16:05:40

(802.11n20) PSD plot on channel 36



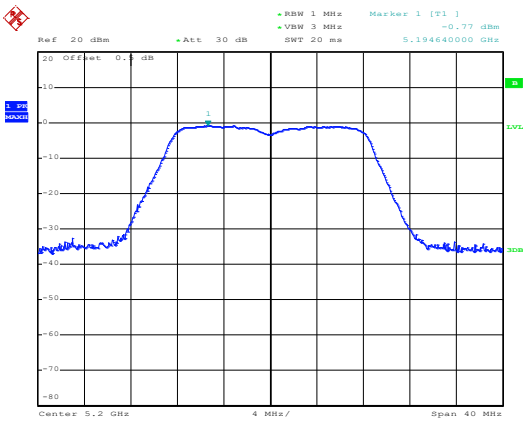
Date: 31.MAR.2022 16:04:13

(802.11a) PSD plot on channel 40



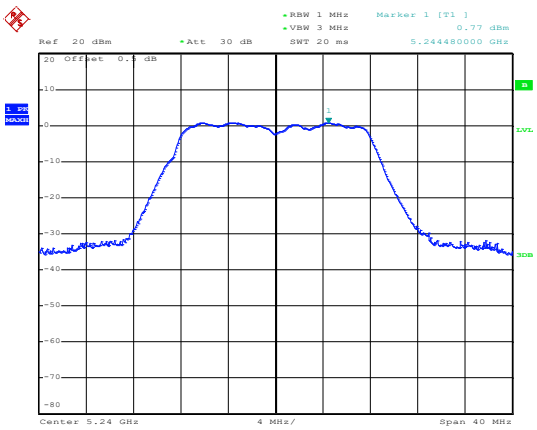
Date: 31.MAR.2022 16:07:20

(802.11n20) PSD plot on channel 40



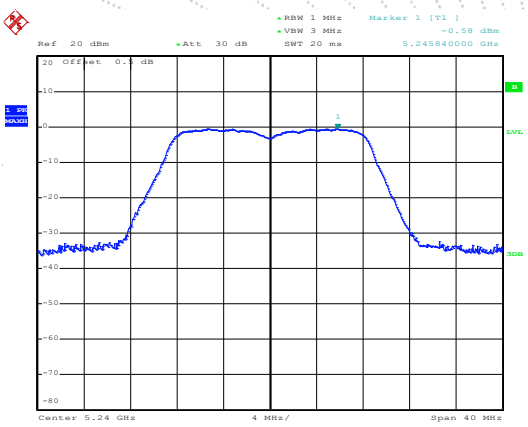
Date: 31.MAR.2022 16:08:07

(802.11a) PSD plot on channel 48



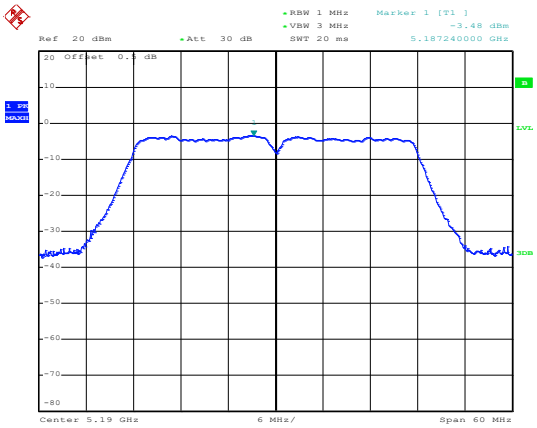
Date: 31.MAR.2022 16:10:39

(802.11n20) PSD plot on channel 48



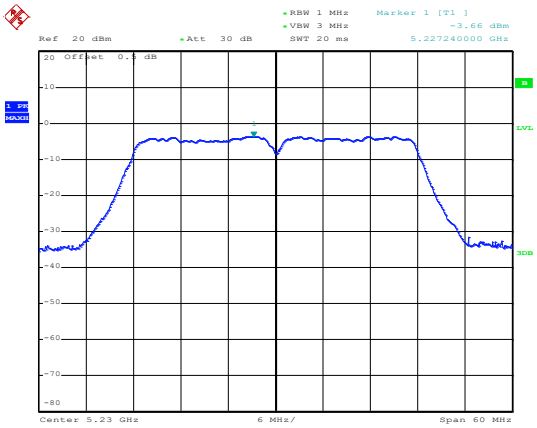
Date: 31.MAR.2022 16:09:28

(802.11n40) PSD plot on channel 38



Date: 31.MAR.2022 16:02:53

(802.11n40) PSD plot on channel 46

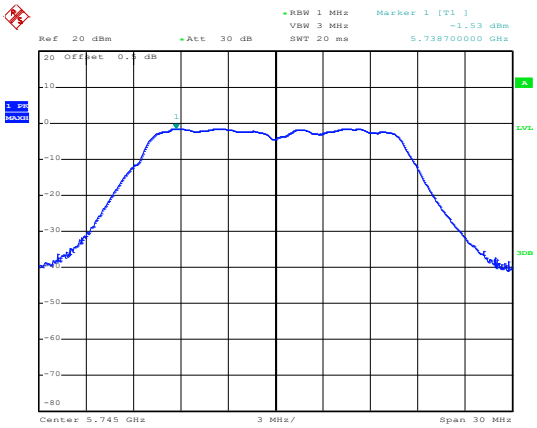


Date: 31.MAR.2022 16:01:44

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX Frequency U-NII-3 (5745-5825MHz)		

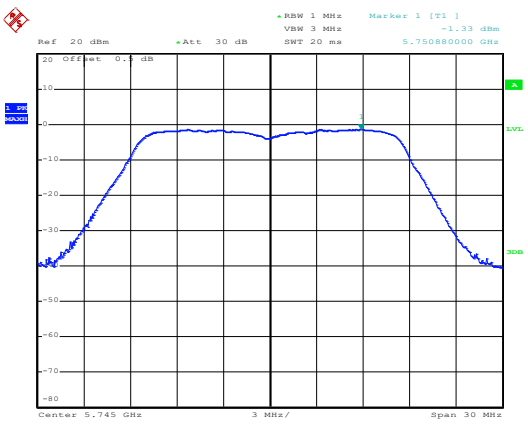
Mode	Frequency	Measured Power Density (dBm/500kHz)	Limit (dBm/500kHz)	Result
802.11 a	5745 MHz	-1.53	30	PASS
	5785 MHz	-0.28	30	PASS
	5825 MHz	-2.32	30	PASS
802.11 n20	5745 MHz	-1.33	30	PASS
	5785 MHz	-1.60	30	PASS
	5825 MHz	-1.24	30	PASS
802.11 n40	5755 MHz	-5.31	30	PASS
	5795 MHz	-5.80	30	PASS

(802.11a) PSD plot on channel 149



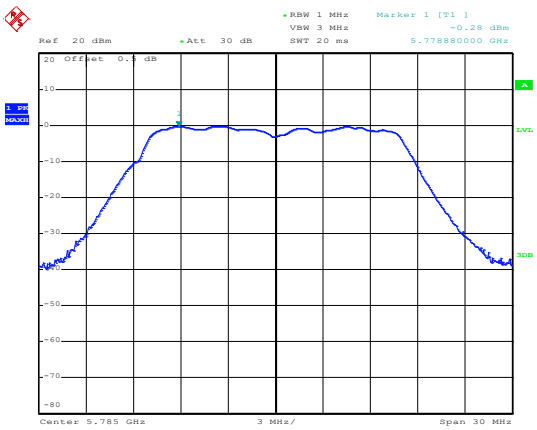
Date: 31.MAR.2022 18:28:11

(802.11n20) PSD plot on channel 149



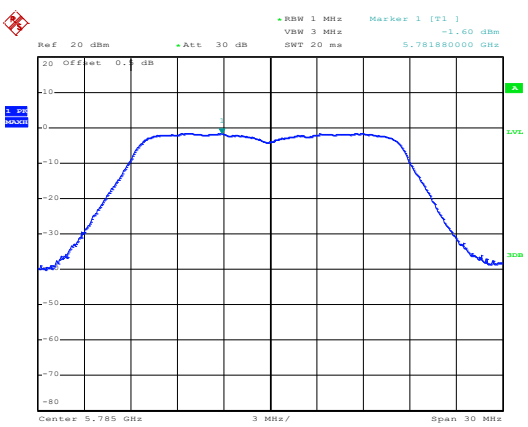
Date: 31.MAR.2022 18:27:08

(802.11a) PSD plot on channel 157



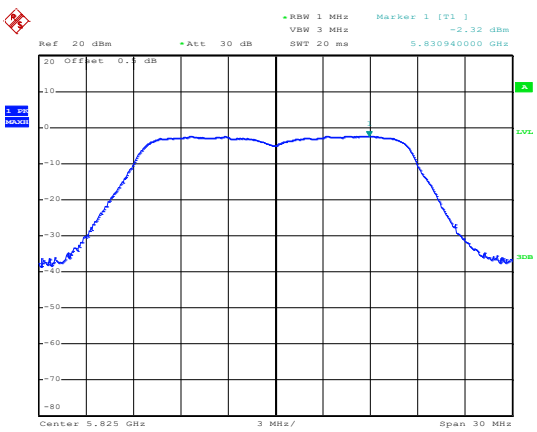
Date: 31.MAR.2022 18:25:19

(802.11n20) PSD plot on channel 157



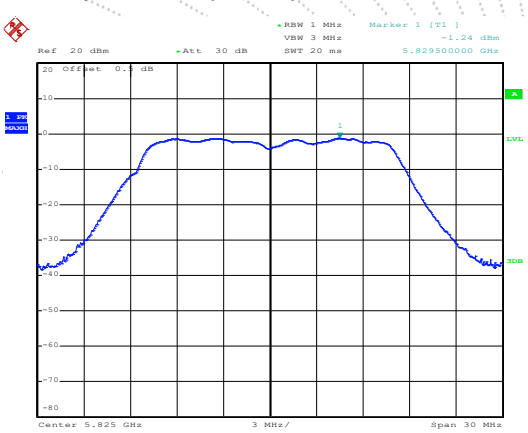
Date: 31.MAR.2022 18:26:00

(802.11a) PSD plot on channel 165



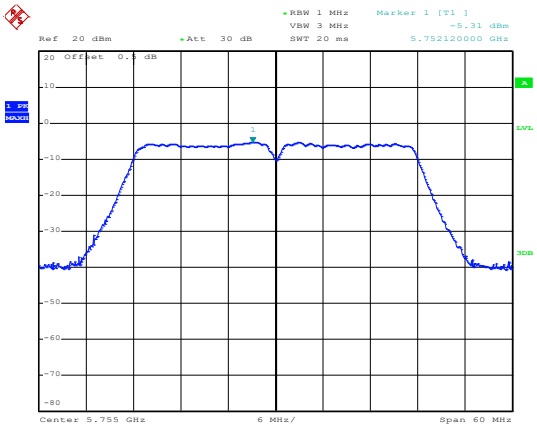
Date: 31.MAR.2022 18:31:09

(802.11n20) PSD plot on channel 165



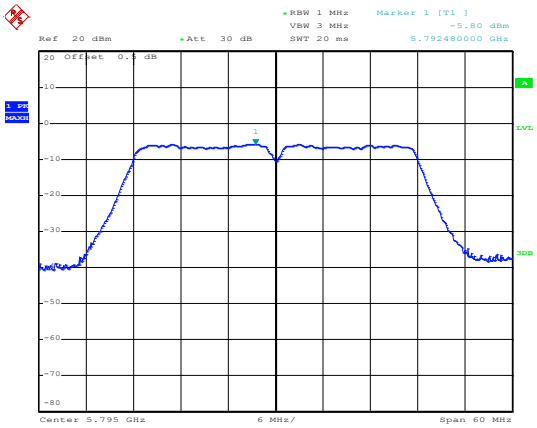
Date: 31.MAR.2022 18:29:59

(802.11n40) PSD plot on channel 151



Date: 31.MAR.2022 18:20:28

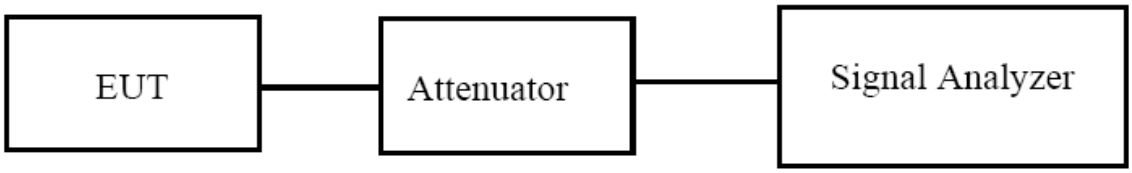
(802.11n40) PSD plot on channel 159



Date: 31.MAR.2022 18:16:47

9. 26dB & 6dB & 99% Emission Bandwidth

9.1 Block Diagram Of Test Setup



9.2 Limit

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

9.3 Test Procedure

a) Set RBW = approximately 1% of the emission bandwidth.

b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
The following procedure shall be used for measuring (99 %) power bandwidth:

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

9.4 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.

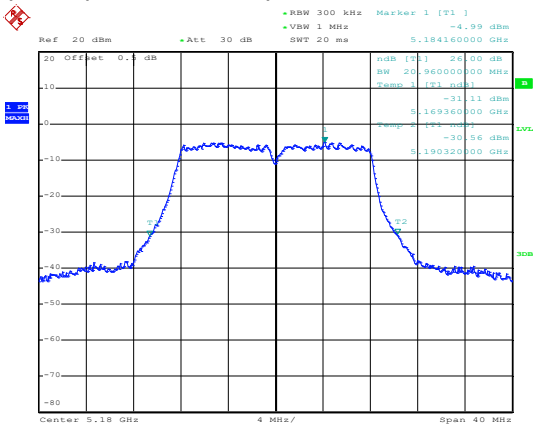
9.5 Test Result

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX Frequency U-NII-1 (5180-5240MHz)		

Mode	Channel	Frequency (MHz)	99% bandwidth(MHz)	26dB bandwidth(MHz)	Result
802.11a	CH36	5180	16.88	20.96	Pass
	CH40	5200	16.80	21.12	Pass
	CH48	5240	16.80	21.04	Pass
802.11 n20	CH36	5180	17.76	21.52	Pass
	CH40	5200	17.84	21.60	Pass
	CH48	5240	17.84	21.76	Pass
802.11 n40	CH 38	5190	36.36	45.24	Pass
	CH 46	5230	36.24	45.84	Pass

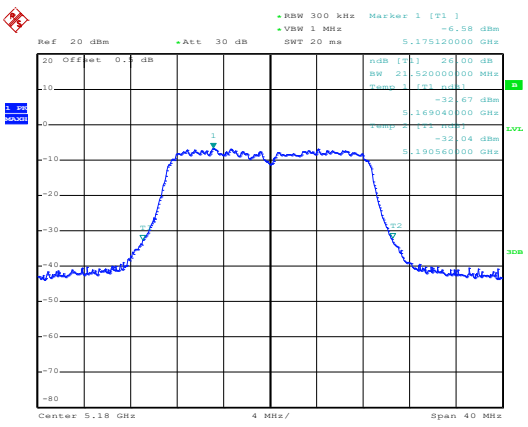
Test plot

(802.11a) -26dB Bandwidth plot on channel 36



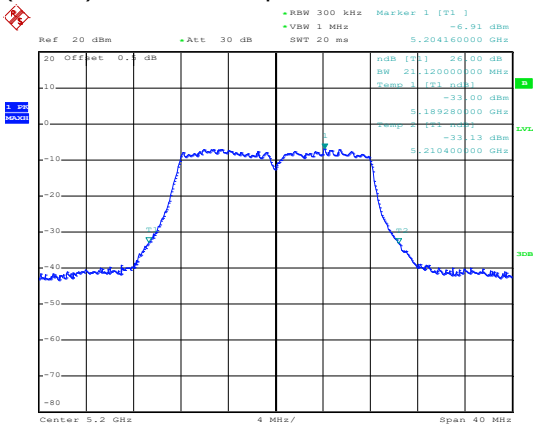
Date: 31.MAR.2022 15:51:29

(802.11 n20) -26dB Bandwidth plot on channel 36



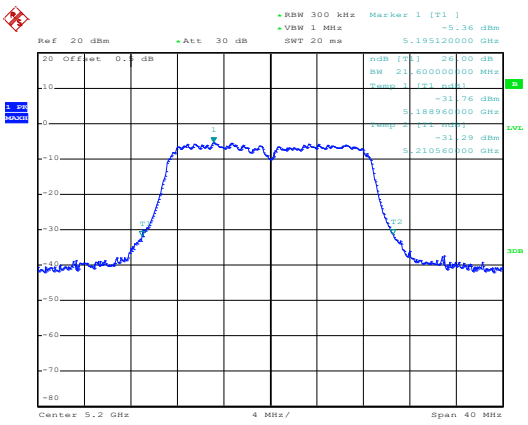
Date: 31.MAR.2022 15:50:48

(802.11a) -26dB Bandwidth plot on channel 40



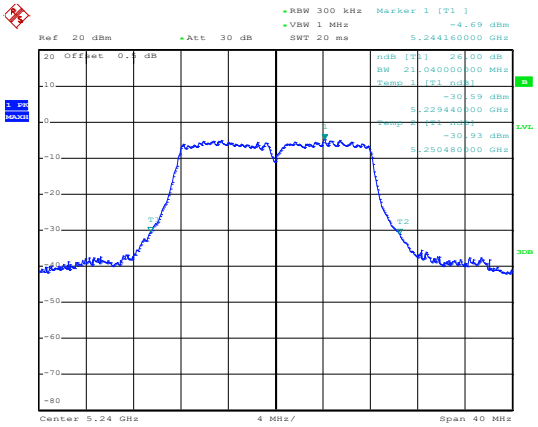
Date: 31.MAR.2022 15:52:41

(802.11 n20) -26dB Bandwidth plot on channel 40



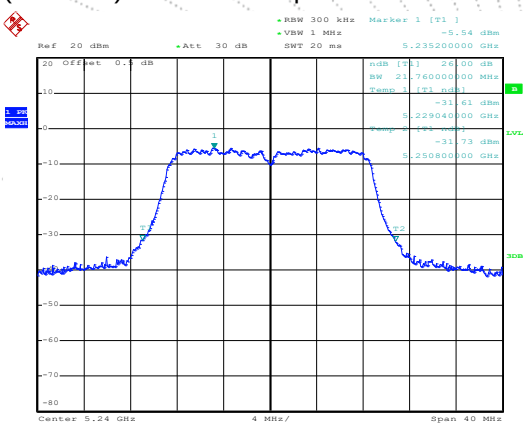
Date: 31.MAR.2022 15:53:42

(802.11a) -26dB Bandwidth plot on channel 48



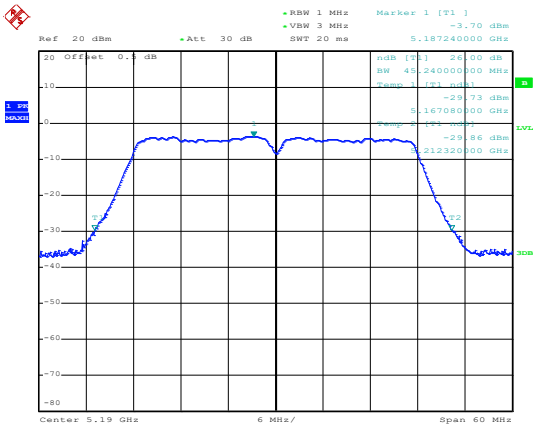
Date: 31.MAR.2022 15:55:57

(802.11 n20) -26dB Bandwidth plot on channel 48



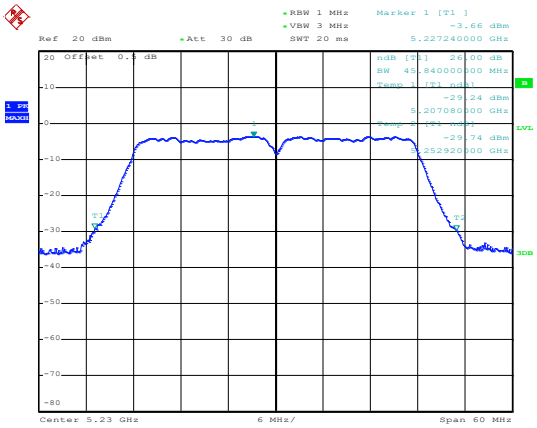
Date: 31.MAR.2022 15:54:54

(802.11 n40) -26dB Bandwidth plot on channel 38



Date: 31.MAR.2022 15:58:01

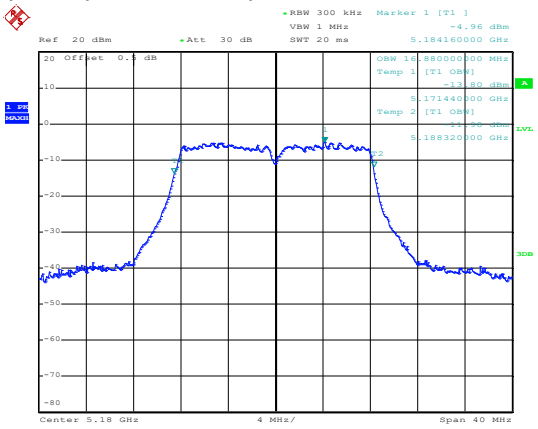
(802.11 n40) -26dB Bandwidth plot on channel 46



Date: 31.MAR.2022 15:59:44

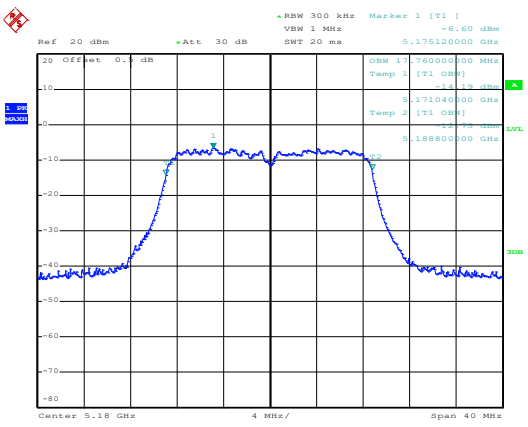
Test plot

(802.11a) 99%Bandwidth plot on channel 36



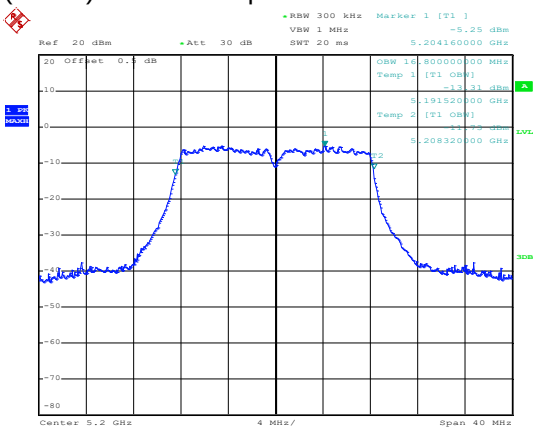
Date: 31.MAR.2022 19:02:08

(802.11 n20) 99%Bandwidth plot on channel 36



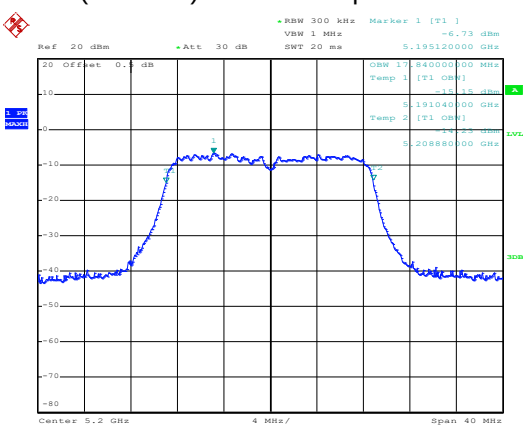
Date: 31.MAR.2022 19:07:11

(802.11a) 99%Bandwidth plot on channel 40



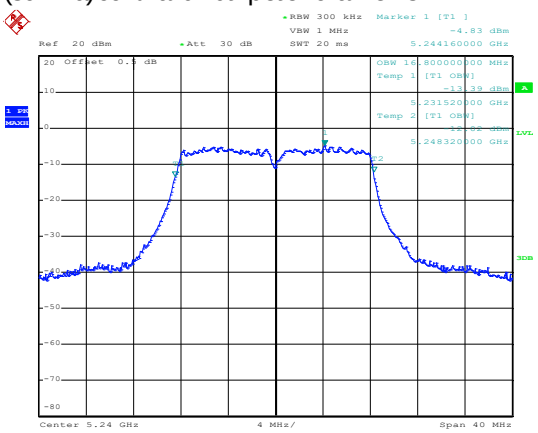
Date: 31.MAR.2022 19:03:18

(802.11 n20) 99%Bandwidth plot on channel 40



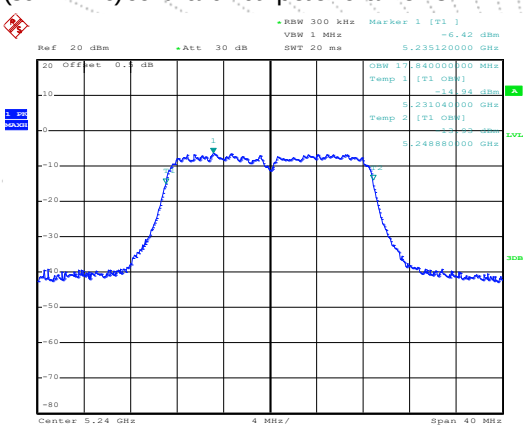
Date: 31.MAR.2022 19:06:23

(802.11a) 99%Bandwidth plot on channel 48



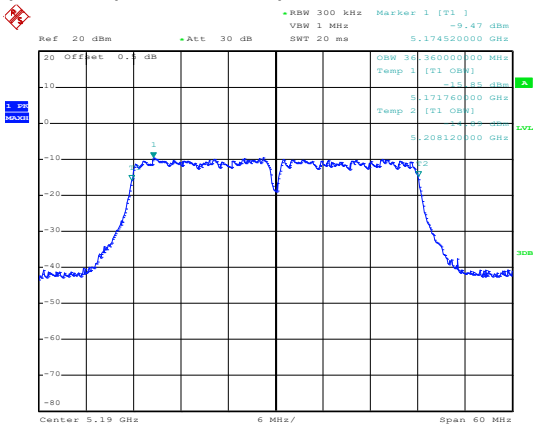
Date: 31.MAR.2022 19:04:26

(802.11 n20) 99%Bandwidth plot on channel 48



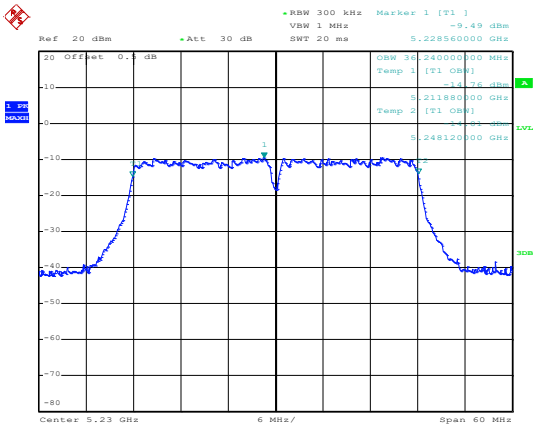
Date: 31.MAR.2022 19:05:06

(802.11 n40) 99%Bandwidth plot on channel 38



Date: 31.MAR.2022 19:09:16

(802.11 n40) 99%Bandwidth plot on channel 46



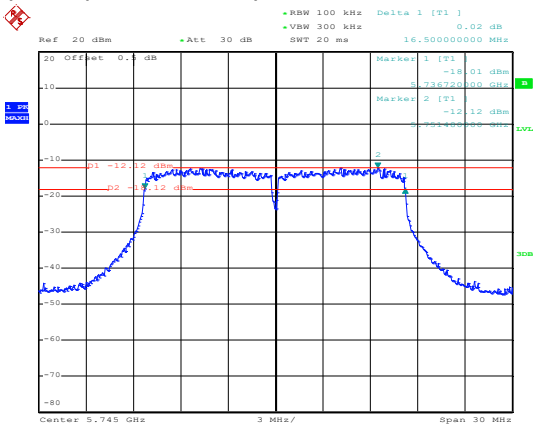
Date: 31.MAR.2022 19:10:44

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX Frequency U-NII-3(5745-5825MHz)		

Mode	Channel	Frequency (MHz)	99% bandwidth (MHz)	6dB bandwidth (MHz)	Limit kHz	Result
802.11a	CH149	5745	16.74	16.50	≥500	Pass
	CH157	5785	16.74	16.62	≥500	Pass
	CH165	5825	16.74	16.56	≥500	Pass
802.11 n20	CH149	5745	17.76	17.76	≥500	Pass
	CH157	5785	17.76	17.70	≥500	Pass
	CH165	5825	17.76	17.64	≥500	Pass
802.11 n40	CH151	5755	36.24	36.74	≥500	Pass
	CH159	5795	36.24	36.70	≥500	Pass

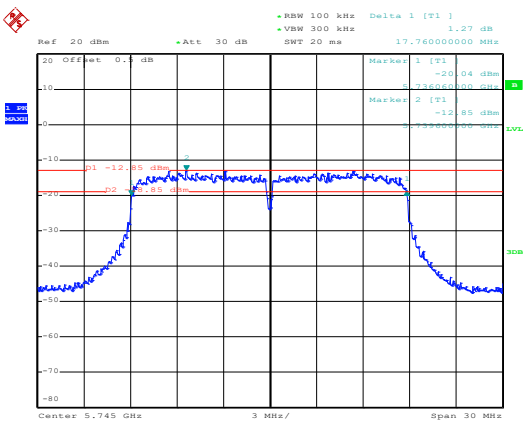
Test plot

(802.11a) -6dB Bandwidth plot on channel 149



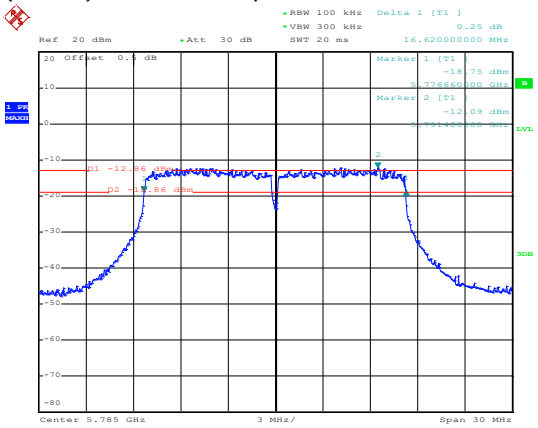
Date: 31.MAR.2022 17:57:44

(802.11 n20) -6dB Bandwidth plot on channel 149



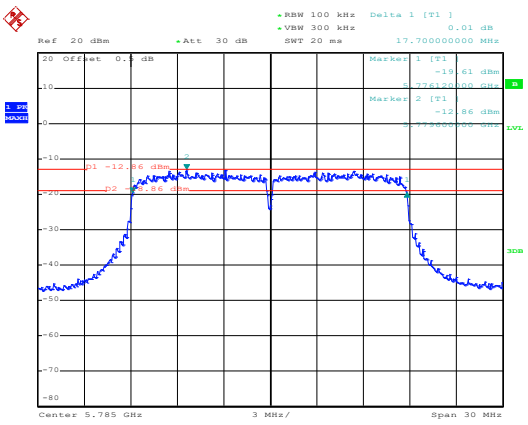
Date: 31.MAR.2022 17:59:35

(802.11a) -6dB Bandwidth plot on channel 157



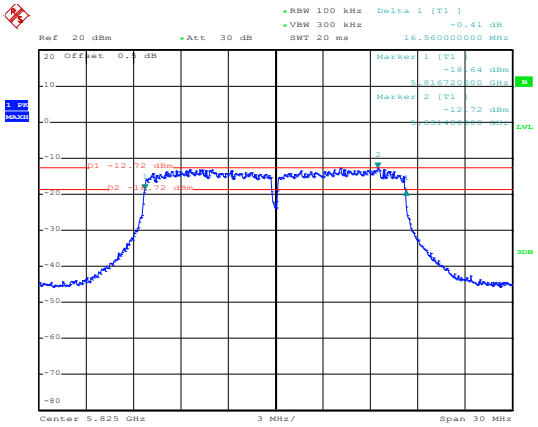
Date: 31.MAR.2022 17:54:39

(802.11 n20) -6dB Bandwidth plot on channel 157



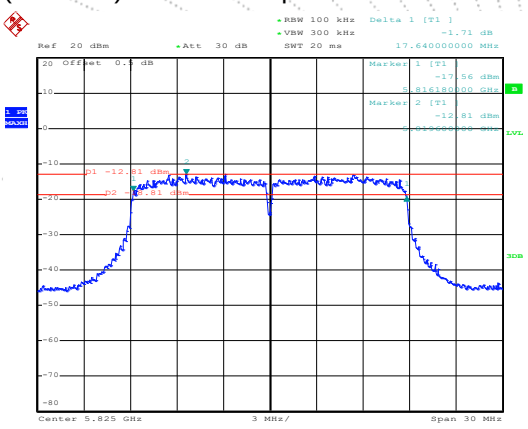
Date: 31.MAR.2022 17:52:46

(802.11a) -6dB Bandwidth plot on channel 165



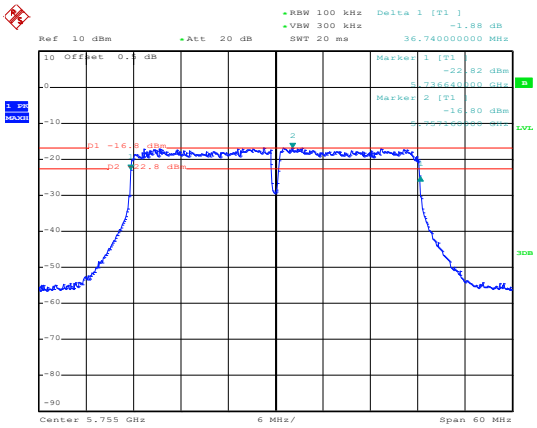
Date: 31.MAR.2022 17:45:59

(802.11 n20) -6dB Bandwidth plot on channel 165



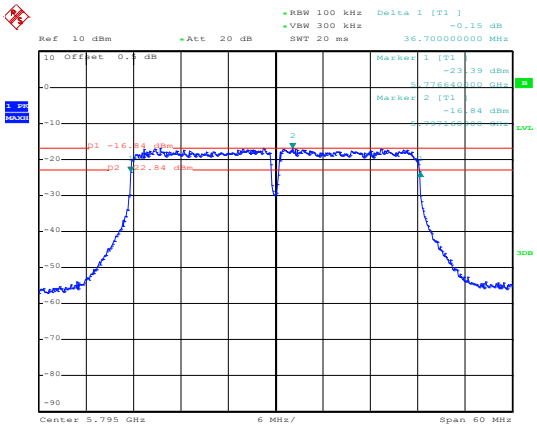
Date: 31.MAR.2022 17:48:45

(802.11 n40) -6dB Bandwidth plot on channel 151



Date: 31.MAR.2022 18:08:48

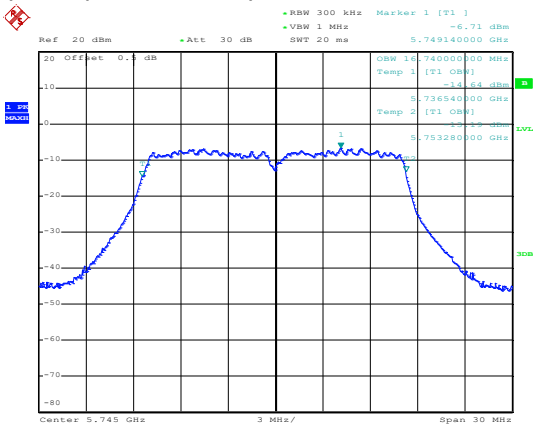
(802.11 n40) -6dB Bandwidth plot on channel 159



Date: 31.MAR.2022 18:11:39

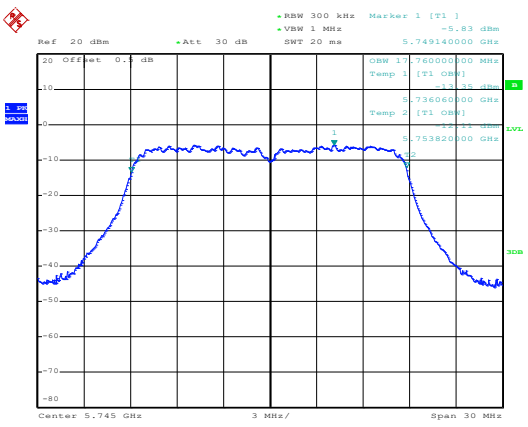
Test plot

(802.11a) 99%Bandwidth plot on channel 149



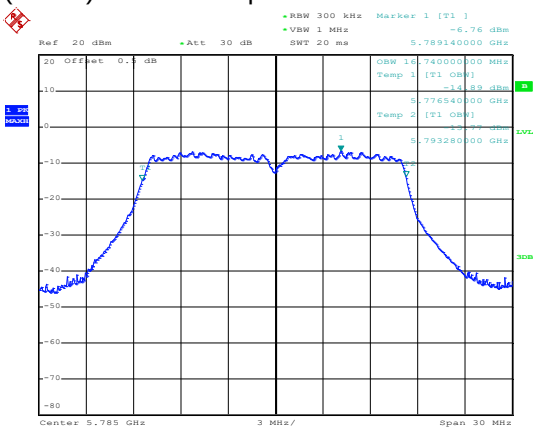
Date: 31.MAR.2022 17:37:20

(802.11 n20) 99%Bandwidth plot on channel 149



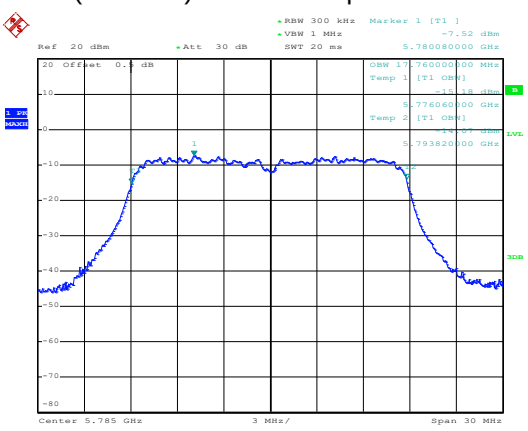
Date: 31.MAR.2022 17:36:31

(802.11a) 99%Bandwidth plot on channel 157



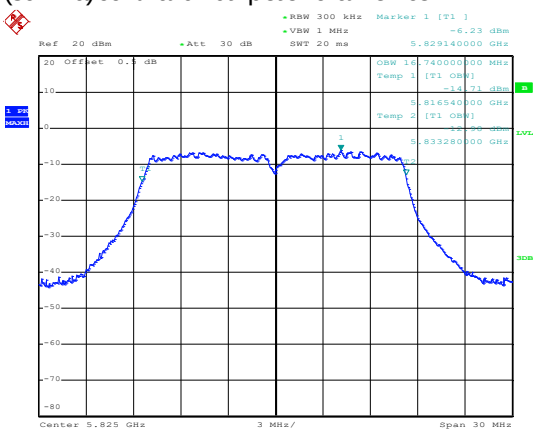
Date: 31.MAR.2022 17:38:45

(802.11 n20) 99%Bandwidth plot on channel 157



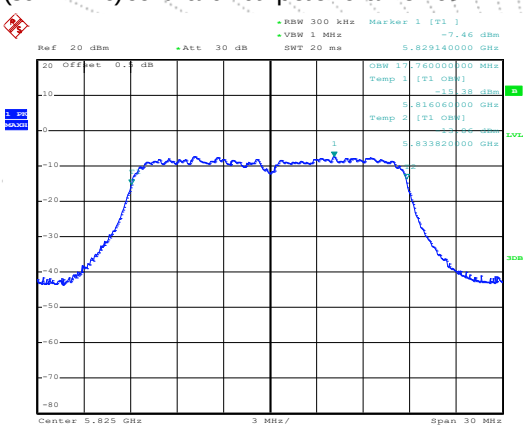
Date: 31.MAR.2022 17:39:31

(802.11a) 99%Bandwidth plot on channel 165



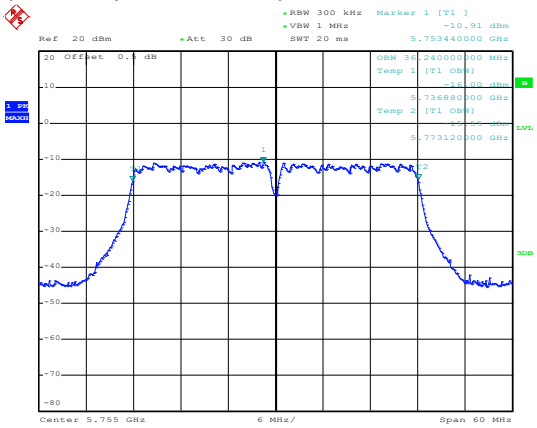
Date: 31.MAR.2022 17:41:51

(802.11 n20) 99%Bandwidth plot on channel 165



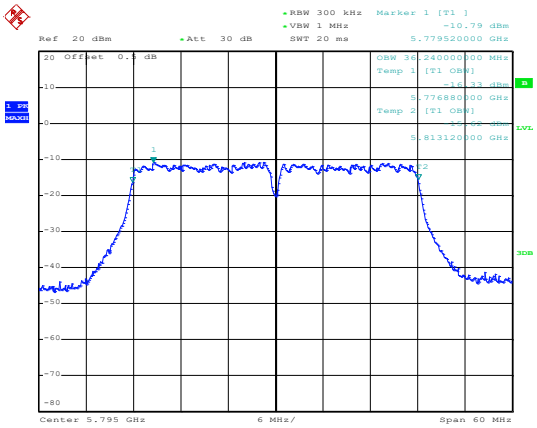
Date: 31.MAR.2022 17:40:42

(802.11 n40) 99%Bandwidth plot on channel 151



Date: 31.MAR.2022 17:32:57

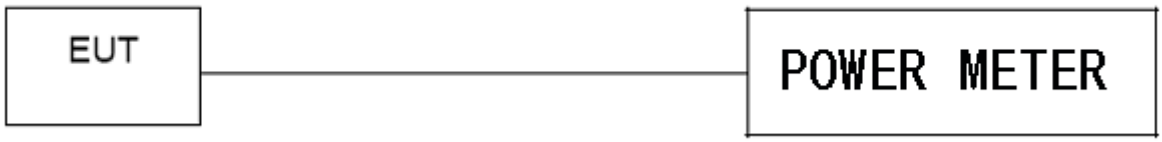
(802.11 n40) 99%Bandwidth plot on channel 159



Date: 31.MAR.2022 17:34:11

10. Maximum Conducted Output Power

10.1 Block Diagram Of Test Setup



10.2 Limit

According to FCC §15.407

The maximum conduced output power should not exceed:

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

10.3 Test Procedure

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

1. Device Configuration

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

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

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

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

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

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

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

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

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

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

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

(ii) Set RBW = 1 MHz.

(iii) Set VBW ≥ 3 MHz.

(iv) Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)

(v) Sweep time = auto.

(vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

(vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run”.

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

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

10.4 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.

10.5 Test Result

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX (5.1G) Mode Frequency U-NII-1 (5180-5240MHz)		

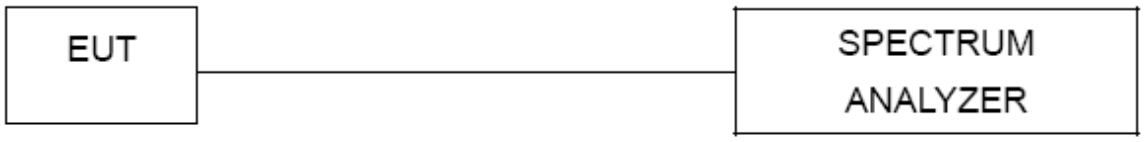
Mode	Test Channel	Frequency	Maximum output power. Antenna port (AV)	LIMIT	Result
		(MHz)	(dBm)	dBm	
TX 802.11a Mode	CH36	5180	5.70	23.98	Pass
	CH40	5200	5.96	23.98	Pass
	CH48	5240	5.64	23.98	Pass
TX 802.11 n20M Mode	CH36	5180	4.56	23.98	Pass
	CH40	5200	4.47	23.98	Pass
	CH48	5240	4.93	23.98	Pass
TX 802.11 n40M Mode	CH38	5190	2.54	23.98	Pass
	CH46	5230	2.47	23.98	Pass

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX (5.8G) Mode Frequency U-NII-3 (5745-5825MHz)		

Mode	Test Channel	Frequency	Maximum output power. Antenna port (AV)	LIMIT	Result
		(MHz)	(dBm)	dBm	
TX 802.11a Mode	CH 149	5745	5.53	30	Pass
	CH 157	5785	5.48	30	Pass
	CH 165	5825	5.64	30	Pass
TX 802.11 n20M Mode	CH 149	5745	4.45	30	Pass
	CH 157	5785	3.76	30	Pass
	CH 165	5825	4.67	30	Pass
TX 802.11 n40M Mode	CH 151	5755	1.62	30	Pass
	CH 159	5795	0.96	30	Pass

11. Out Of Band Emissions

11.1 Block Diagram Of Test Setup



11.2 Limit

According to FCC §15.407(b)
Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:
(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(2) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

11.3 Test Procedure

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

11.4 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

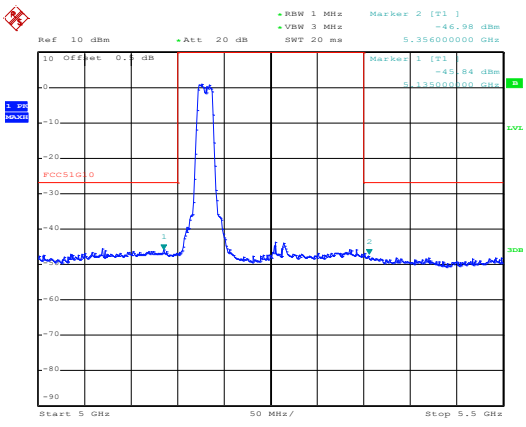
11.5 Test Result

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz

5.1G

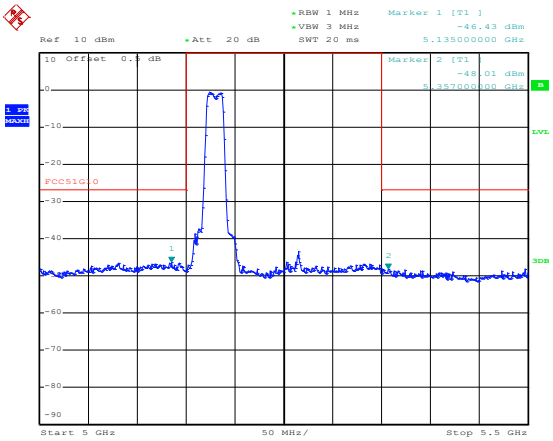
5.180~5.240 GHz

(802.11a) Band Edge, Left Side



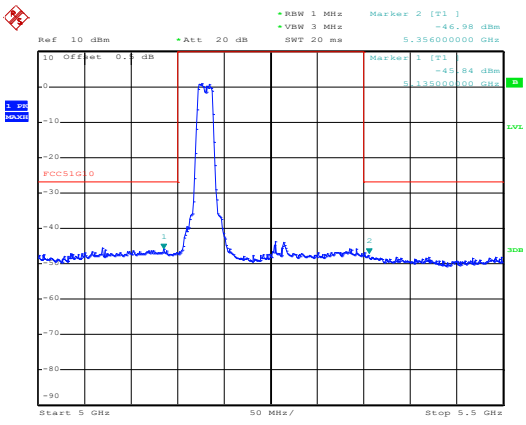
Date: 31.MAR.2022 15:36:55

(802.11n20) Band Edge, Left Side



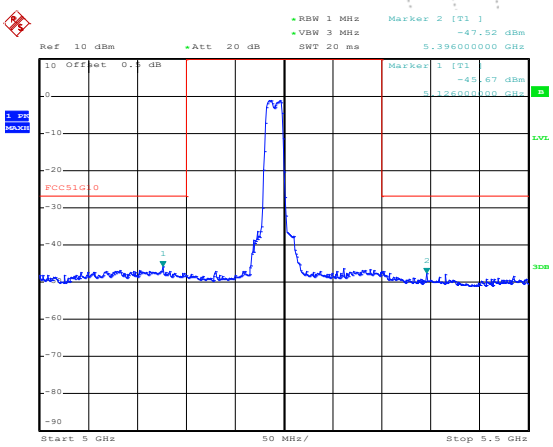
Date: 31.MAR.2022 15:42:03

(802.11a) Band Edge, Right Side



Date: 31.MAR.2022 15:36:55

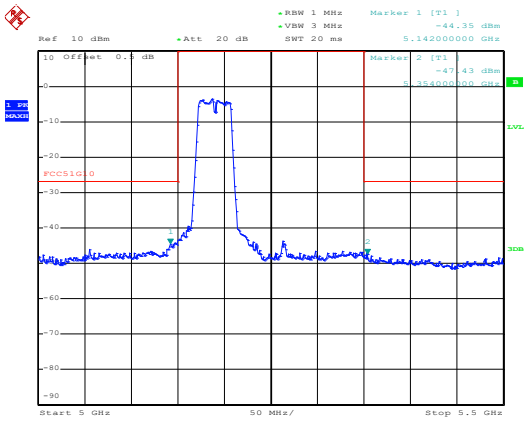
(802.11n20) Band Edge, Right Side



Date: 31.MAR.2022 15:41:04

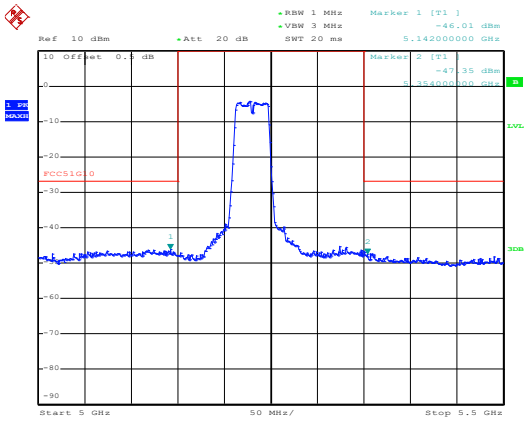
5.180~5.240 GHz

(802.11n40) Band Edge, Left Side



Date: 31.MAR.2022 15:34:27

(802.11n40) Band Edge, Right Side

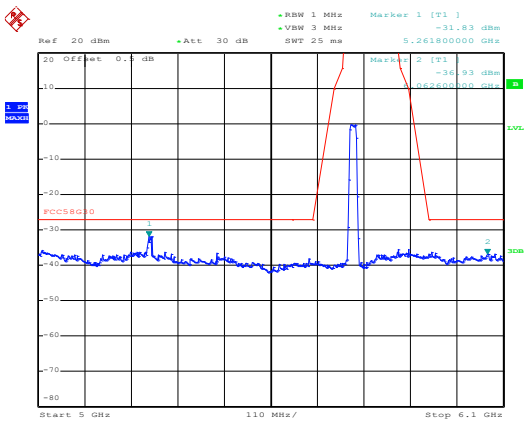


Date: 31.MAR.2022 15:33:13

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz

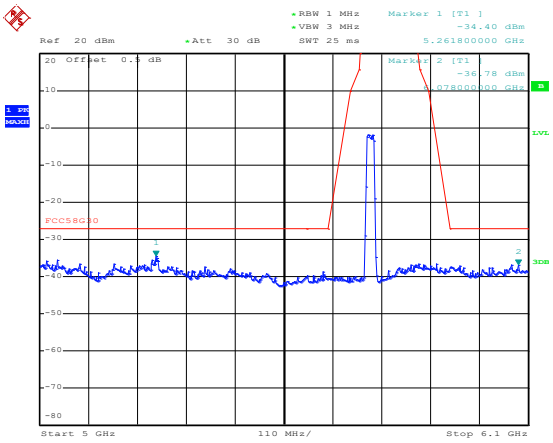
5.745~5.825 GHz

(802.11a) Band Edge, Left Side



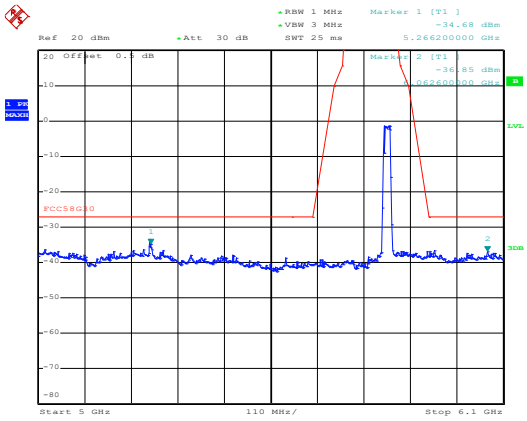
Date: 31.MAR.2022 17:24:36

(802.11n20) Band Edge, Left Side



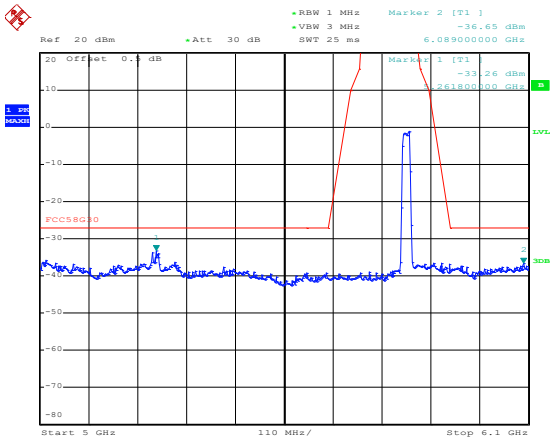
Date: 31.MAR.2022 17:27:16

(802.11a) Band Edge, Right Side



Date: 31.MAR.2022 17:25:30

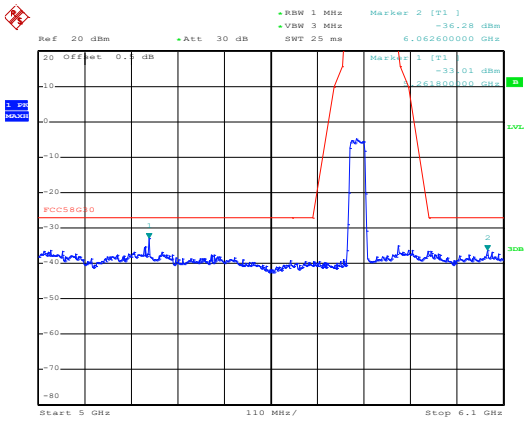
(802.11n20) Band Edge, Right Side



Date: 31.MAR.2022 17:26:26

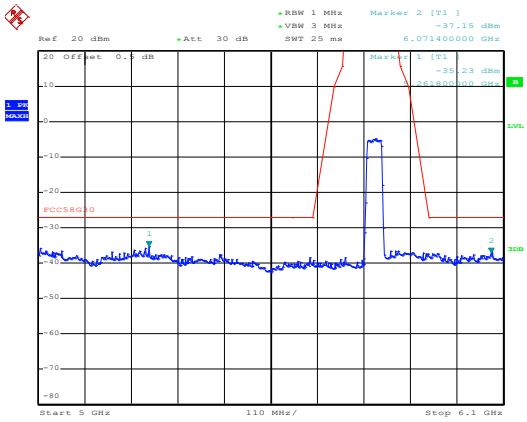
5.745~5.825 GHz

(802.11n40) Band Edge, Left Side



Date: 31.MAR.2022 17:29:25

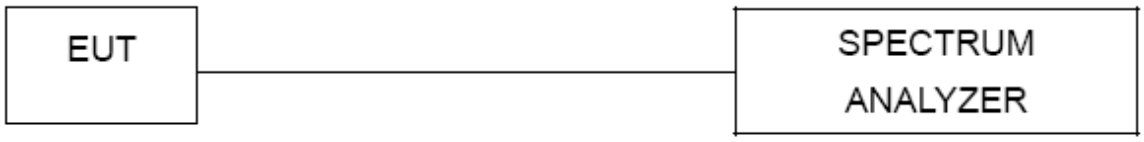
(802.11n40) Band Edge, Right Side



Date: 31.MAR.2022 17:28:36

12. Spurious RF Conducted Emissions

12.1 Block Diagram Of Test Setup



12.2 Limit

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:
(1)For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(2)For transmitters operating in the 5.725-5.85 GHz band(i) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge..

12.3 Test Procedure

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

5. Repeat above procedures until all measured frequencies were complete.

12.4 Test Result

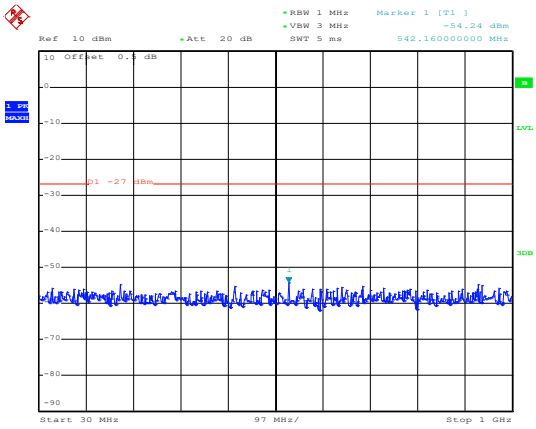
Remark: The measurement frequency range is from 9KHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and bandege measurement data.

About:26.5GHz-40GHz, The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

5.1G

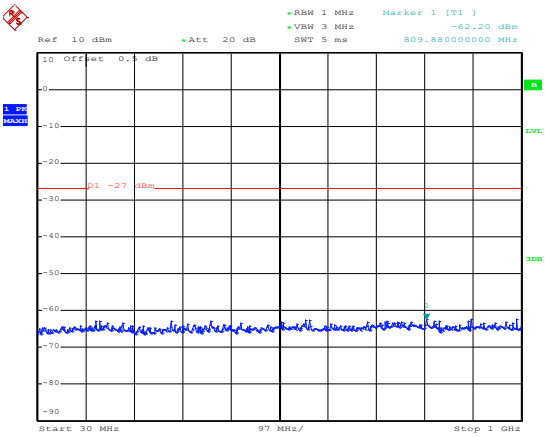
Test Plot

802.11a on channel 36



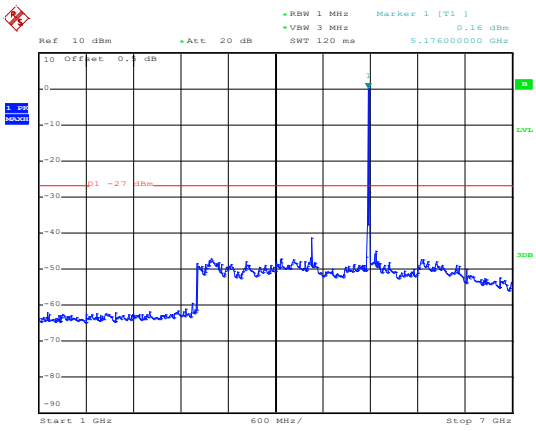
Date: 31.MAR.2022 16:14:03

802.11a on channel 40



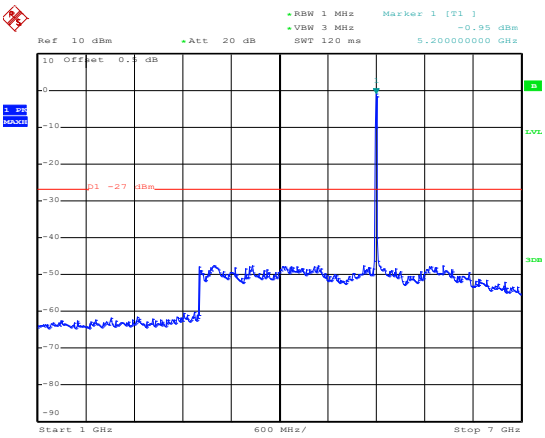
Date: 31.MAR.2022 16:14:15

802.11a on channel 36



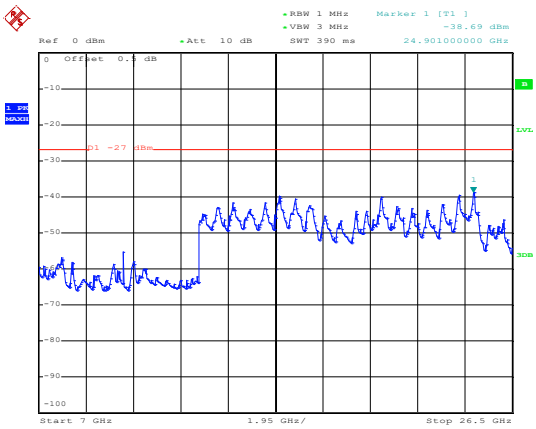
Date: 31.MAR.2022 16:36:26

802.11a on channel 40



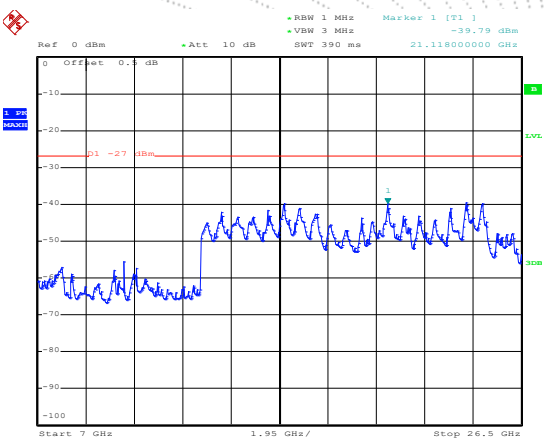
Date: 31.MAR.2022 16:35:33

802.11a on channel 36



Date: 31.MAR.2022 16:24:50

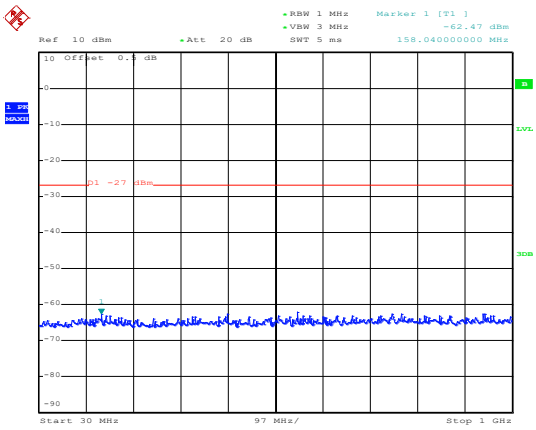
802.11a on channel 40



Date: 31.MAR.2022 16:25:47

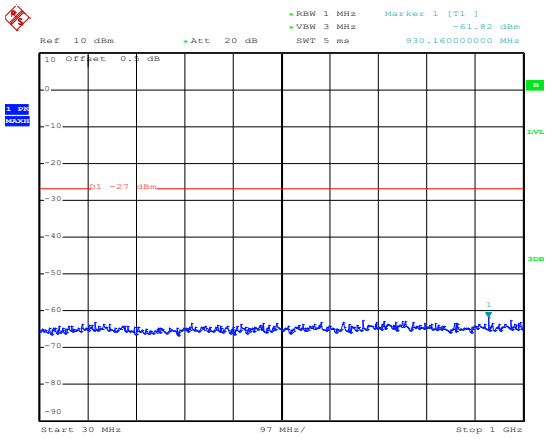
Test Plot

802.11a on channel 48



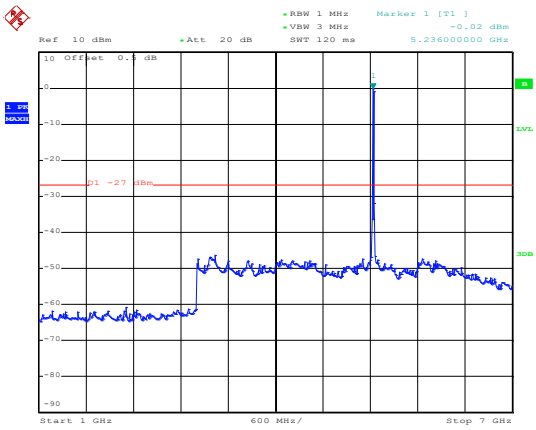
Date: 31.MAR.2022 16:14:24

802.11n20 on channel 36



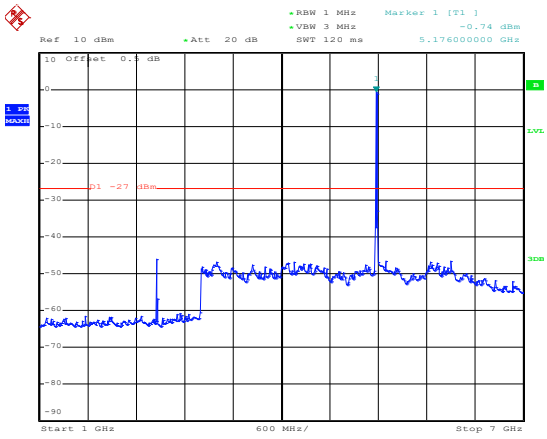
Date: 31.MAR.2022 16:14:34

802.11a on channel 48



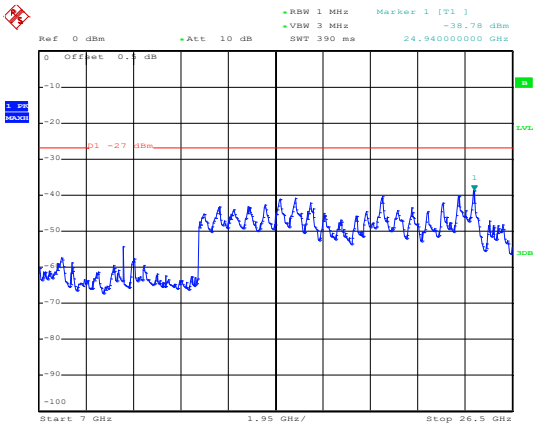
Date: 31.MAR.2022 16:31:20

802.11n20 on channel 36



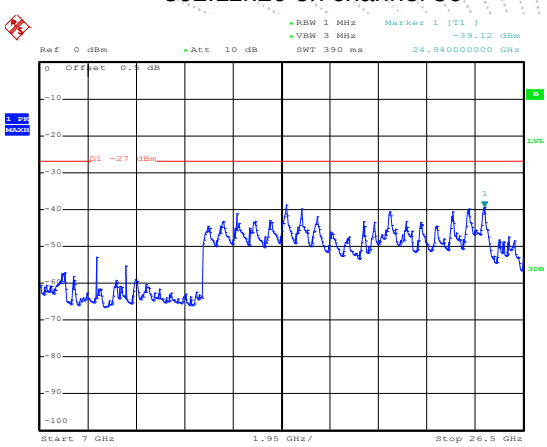
Date: 31.MAR.2022 16:37:35

802.11a on channel 48



Date: 31.MAR.2022 16:24:59

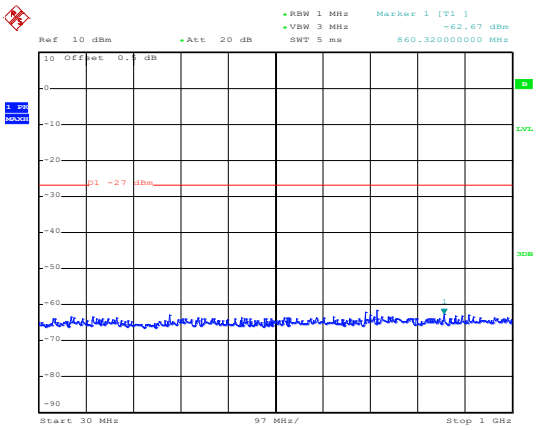
802.11n20 on channel 36



Date: 31.MAR.2022 16:25:54

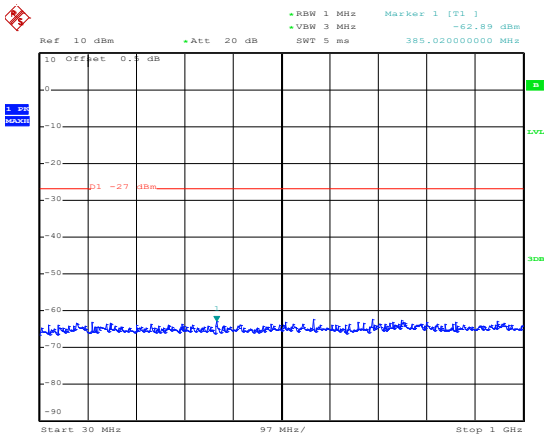
Test Plot

802.11n20 on channel 40



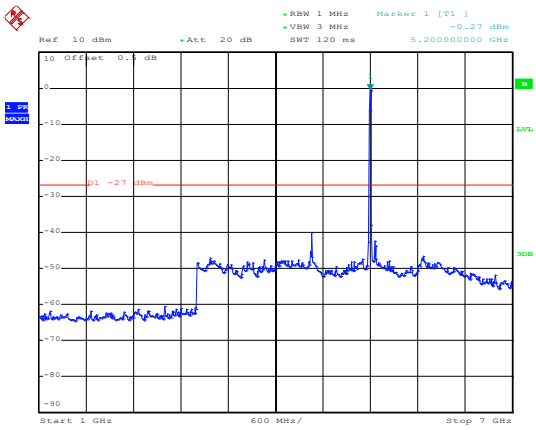
Date: 31.MAR.2022 16:14:40

802.11n20 on channel 48



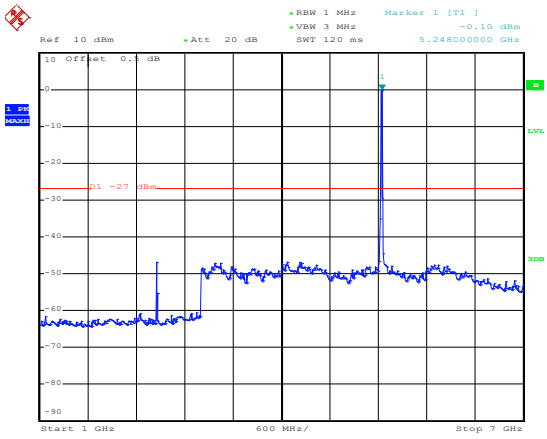
Date: 31.MAR.2022 16:15:09

802.11n20 on channel 40



Date: 31.MAR.2022 16:34:50

802.11n20 on channel 48



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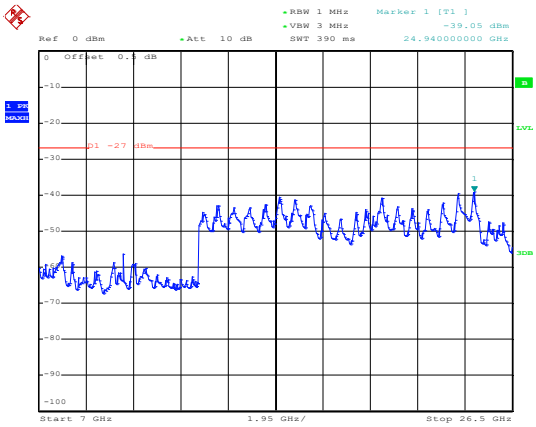
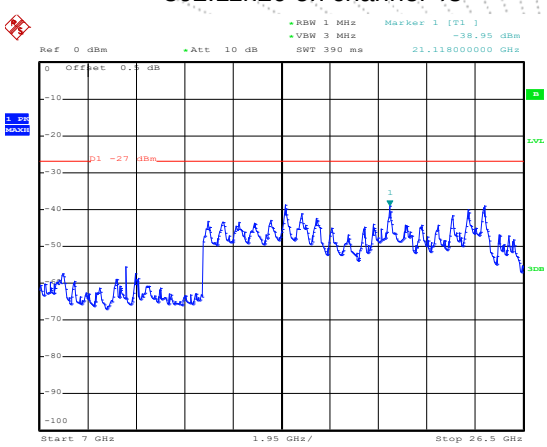
802.11n20 on channel 40



Date: 31.MAR.2022 16:25:05

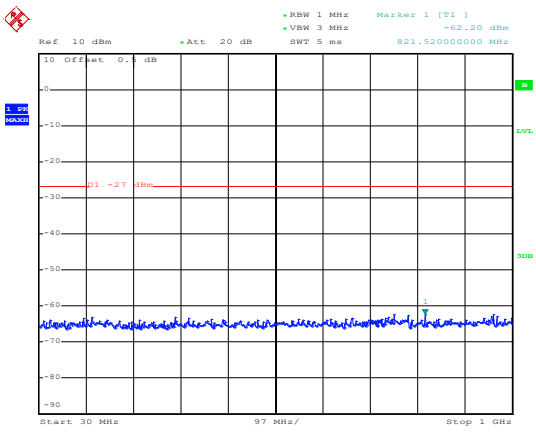
802.11n20 on channel 48



Date: 31.MAR.2022 16:26:01

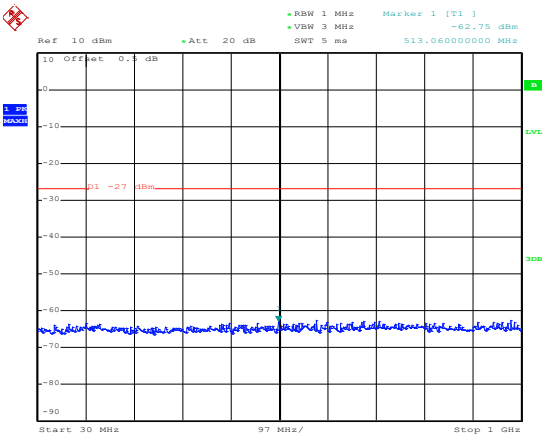
Test Plot

802.11n40 on channel 38



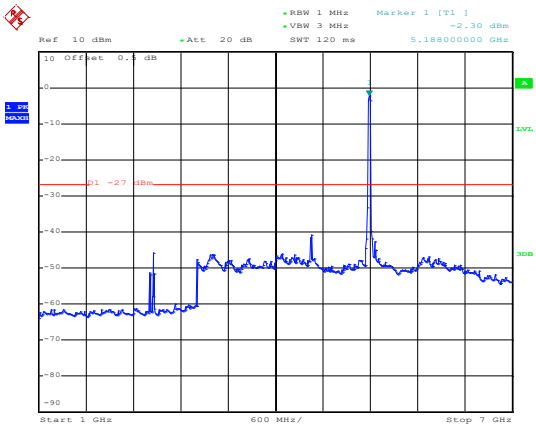
Date: 31.MAR.2022 16:15:26

802.11n40 on channel 46



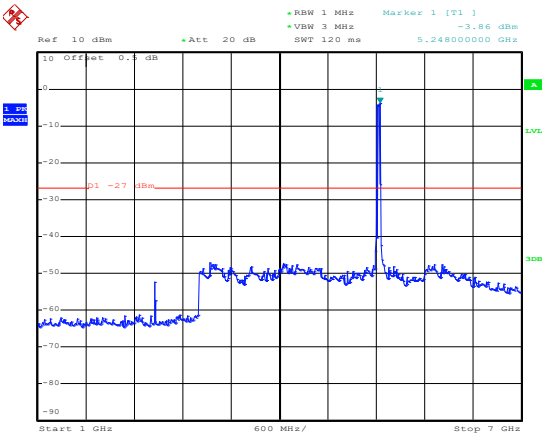
Date: 31.MAR.2022 16:15:20

802.11n40 on channel 38



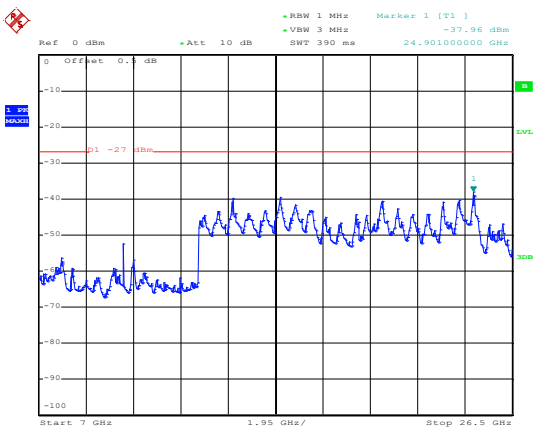
Date: 1.APR.2022 16:34:52

802.11n40 on channel 46



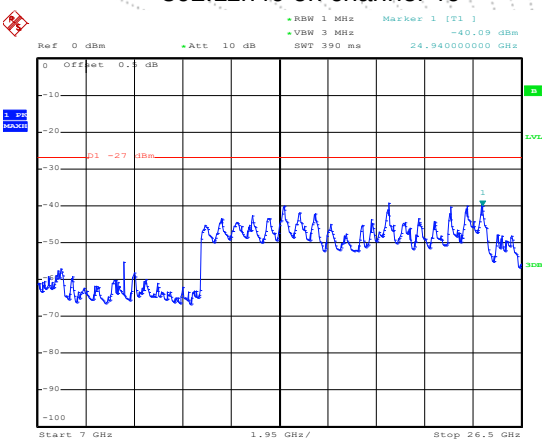
Date: 1.APR.2022 16:37:22

802.11n40 on channel 38



Date: 31.MAR.2022 16:25:10

802.11n40 on channel 46

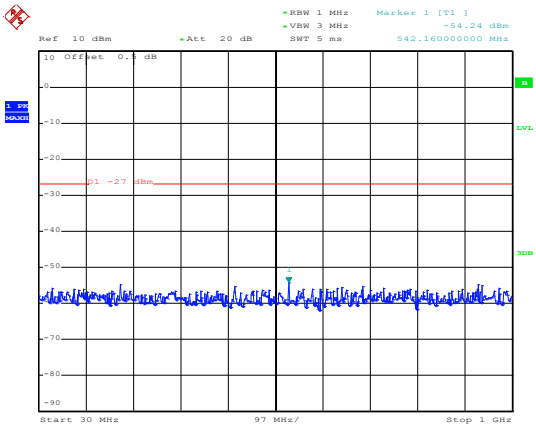


Date: 31.MAR.2022 16:26:10

5.8G

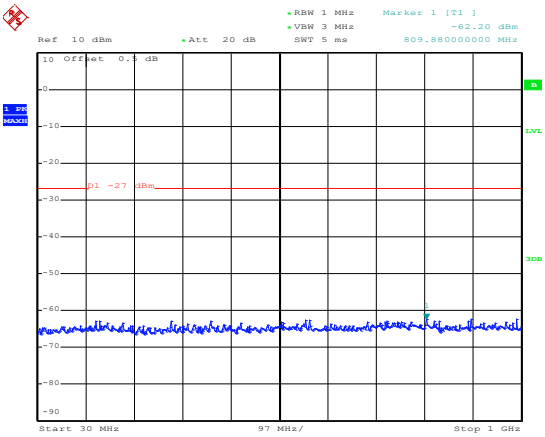
Test Plot

802.11a on channel 149



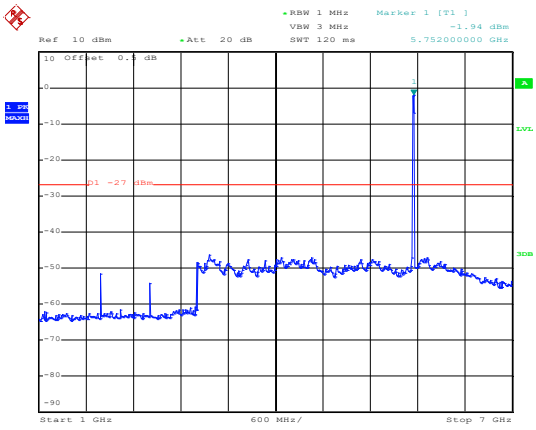
Date: 31.MAR.2022 16:14:03

802.11a on channel 157



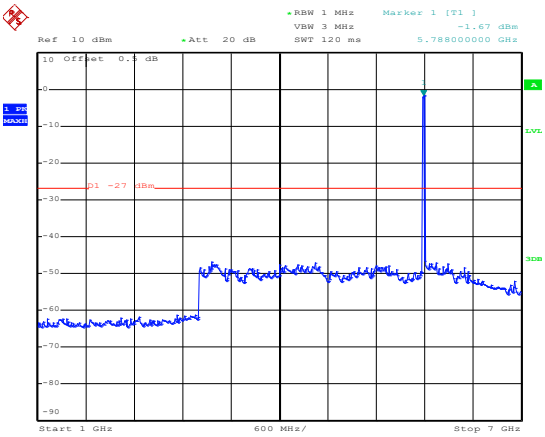
Date: 31.MAR.2022 16:14:15

802.11a on channel 149



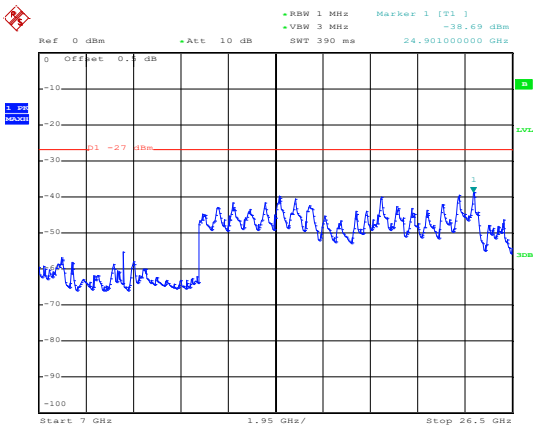
Date: 31.MAR.2022 18:36:55

802.11a on channel 157



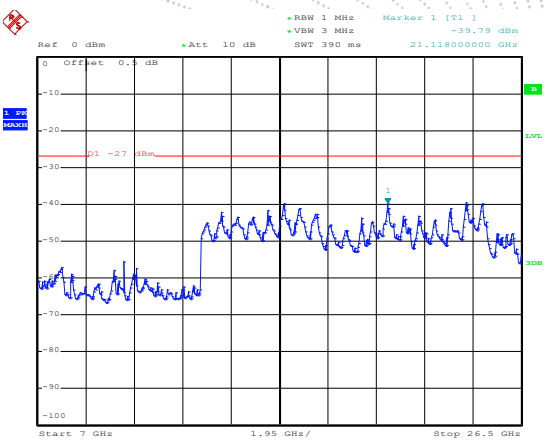
Date: 31.MAR.2022 18:36:06

802.11a on channel 149



Date: 31.MAR.2022 16:24:50

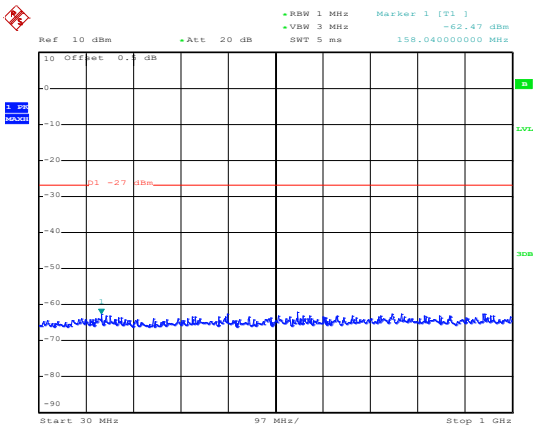
802.11a on channel 157



Date: 31.MAR.2022 16:25:47

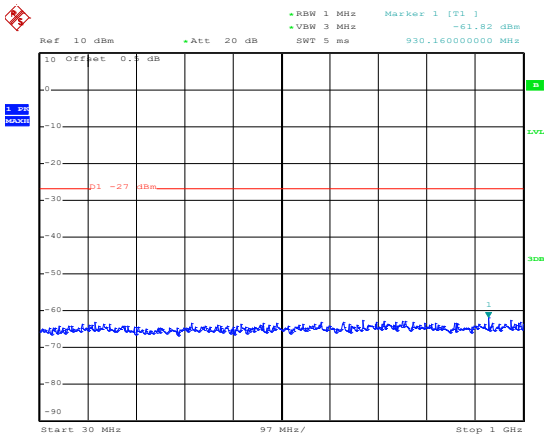
Test Plot

802.11a on channel 165



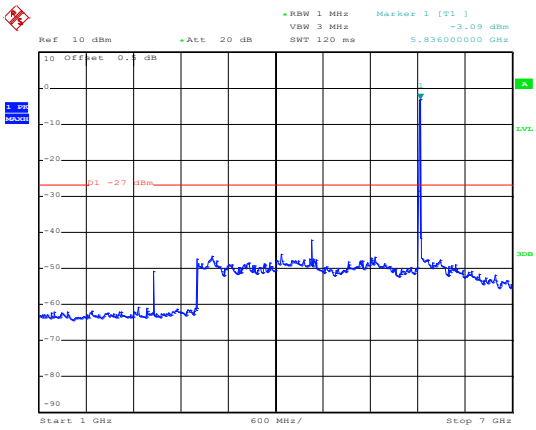
Date: 31.MAR.2022 16:14:24

802.11n20 on channel 149



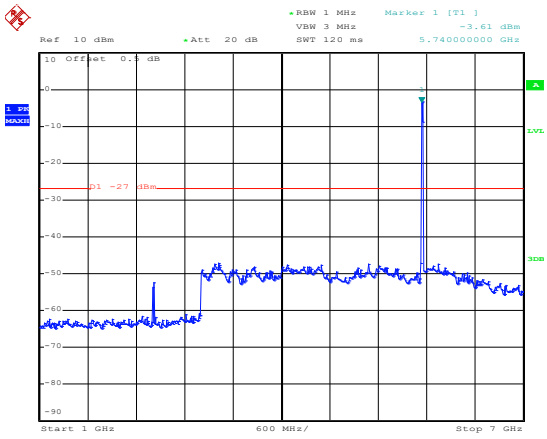
Date: 31.MAR.2022 16:14:34

802.11a on channel 165



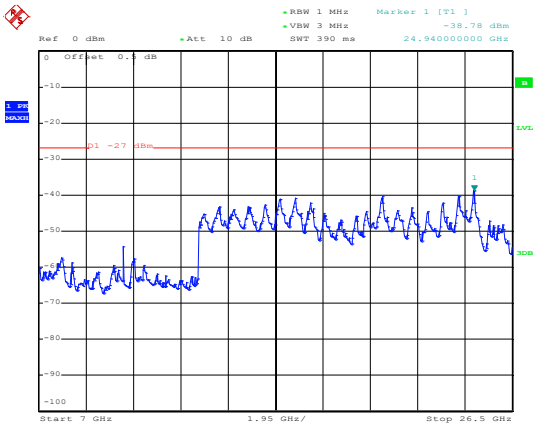
Date: 31.MAR.2022 18:33:19

802.11n20 on channel 149



Date: 31.MAR.2022 18:37:25

802.11a on channel 165



Date: 31.MAR.2022 16:24:59

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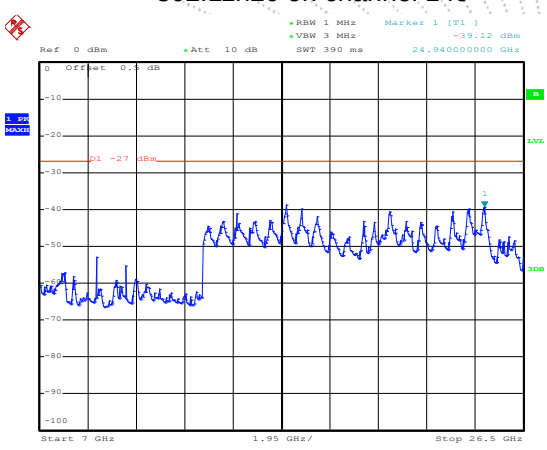
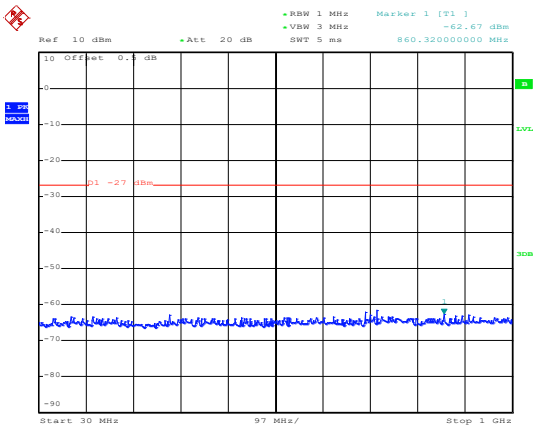


Date: 31.MAR.2022 16:25:54

Test Plot

802.11n20 on channel 157



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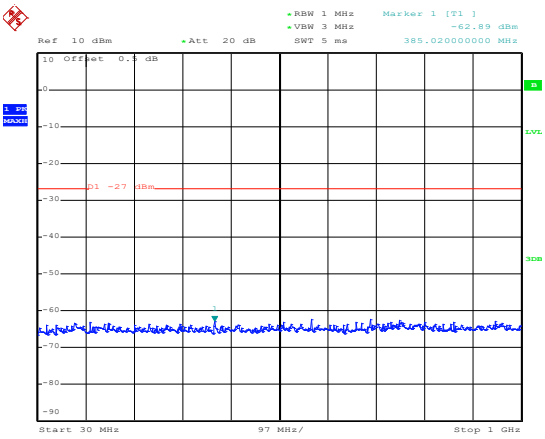
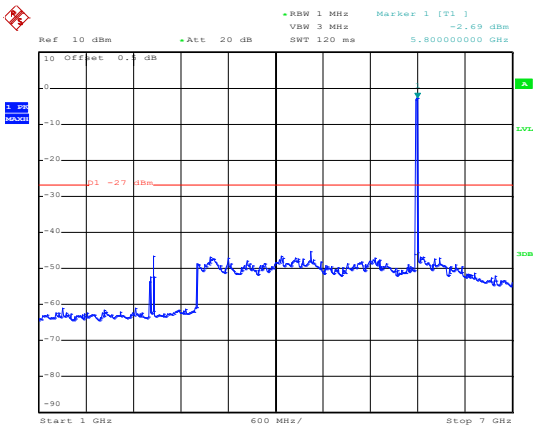
802.11n20 on channel 165



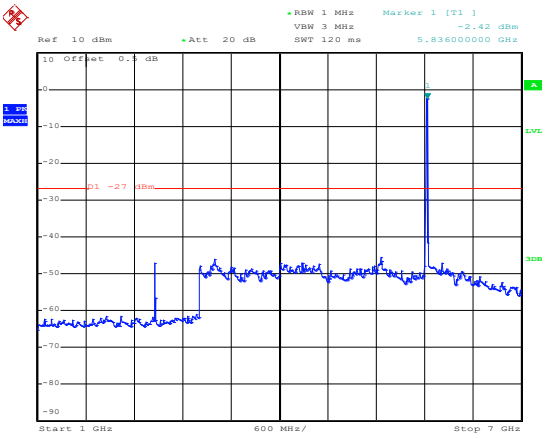
Date: 31.MAR.2022 16:15:09

802.11n20 on channel 157



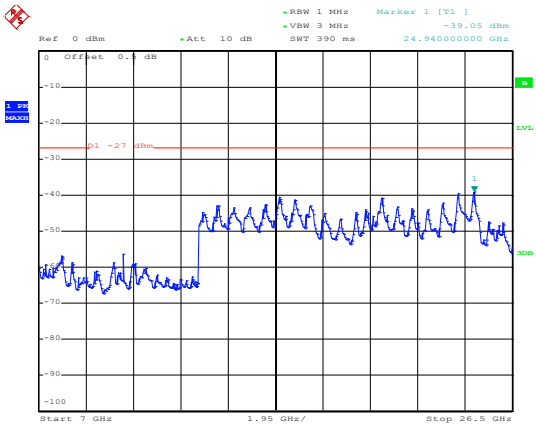
Date: 31.MAR.2022 18:35:24

802.11n20 on channel 165



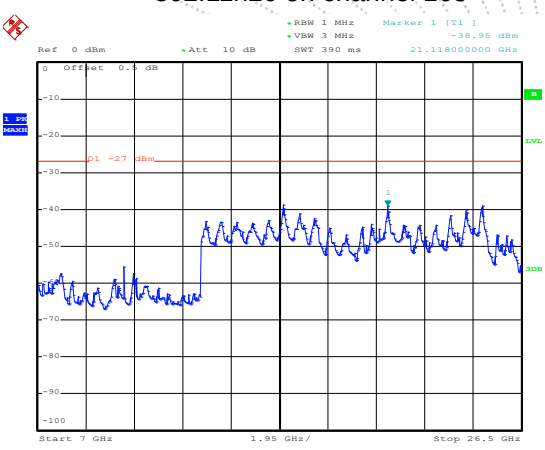
Date: 31.MAR.2022 18:34:27

802.11n20 on channel 157



Date: 31.MAR.2022 16:25:05

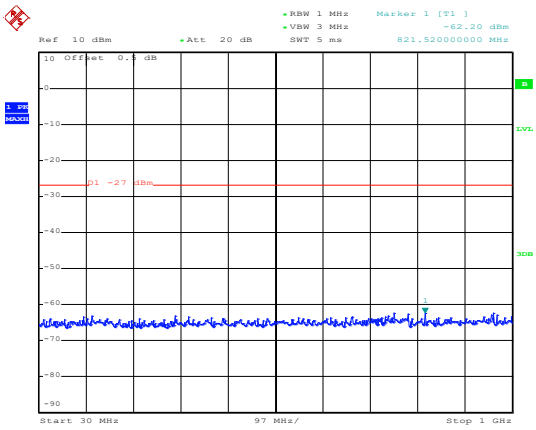
802.11n20 on channel 165



Date: 31.MAR.2022 16:26:01

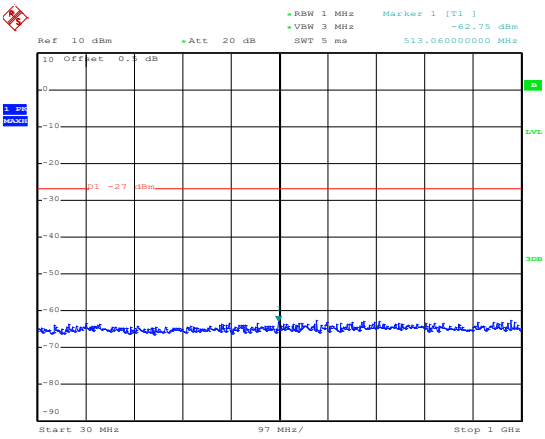
Test Plot

802.11n40 on channel 151



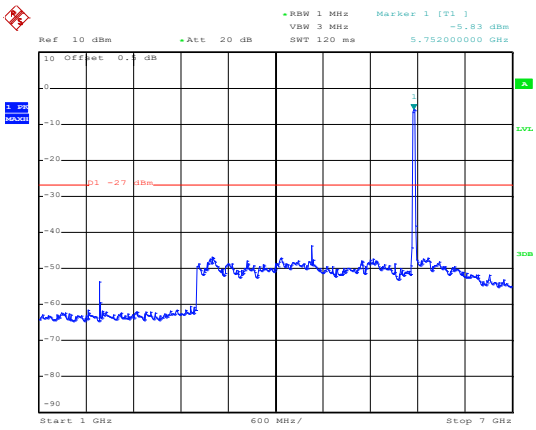
Date: 31.MAR.2022 16:15:26

802.11n40 on channel 159



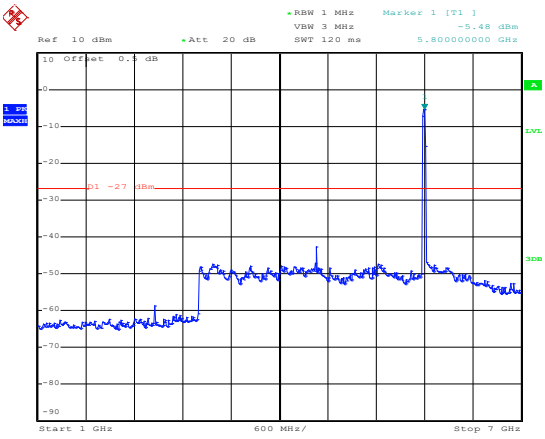
Date: 31.MAR.2022 16:15:20

802.11n40 on channel 151



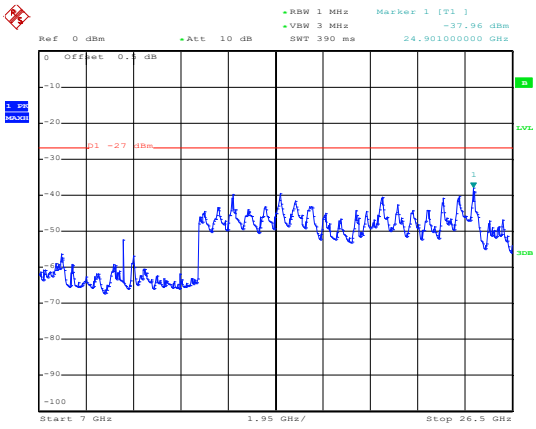
Date: 31.MAR.2022 18:38:29

802.11n40 on channel 159



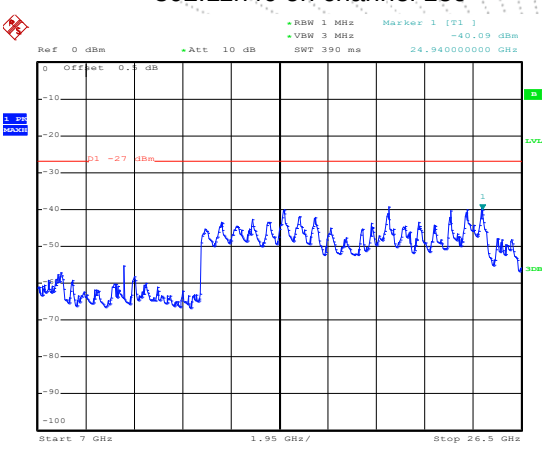
Date: 31.MAR.2022 18:39:10

802.11n40 on channel 151



Date: 31.MAR.2022 16:25:10

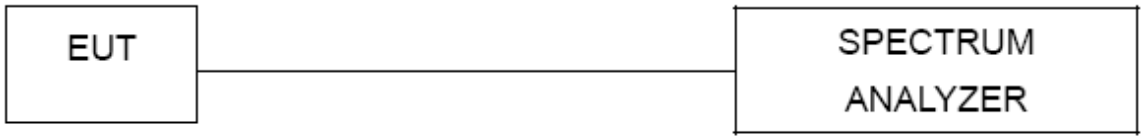
802.11n40 on channel 159



Date: 31.MAR.2022 16:26:10

13. Frequency Stability Measurement

13.1 Block Diagram Of Test Setup



13.2 Limit

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an 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)..

13.3 Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 106 ppm and he limit is less than ±20ppm (IEEE 802.11nspecification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature is -20°C~70°C.

13.4 Test Result

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX Frequency U-NII-1 (5180-5240MHz)		

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5180.0062	5180	0.0062	1.2027
		V max (V)	138.00	5180.0103	5180	0.0103	1.9862
		V min (V)	102.00	5180.0034	5180	0.0034	0.6474
Limits				5150-5250 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	AC 120V	T (°C)	-20	5180.0047	5180	0.0047	0.9149
		T (°C)	-10	5180.0098	5180	0.0098	1.8834
		T (°C)	0	5180.0105	5180	0.0105	2.0326
		T (°C)	10	5180.0021	5180	0.0021	0.4029
		T (°C)	20	5180.0046	5180	0.0046	0.8909
		T (°C)	30	5180.0105	5180	0.0105	2.0292
		T (°C)	40	5180.0108	5180	0.0108	2.0880
		T (°C)	50	5180.0021	5180	0.0021	0.4122
		T (°C)	60	5180.0059	5180	0.0059	1.1441
		T (°C)	70	5180.0104	5180	0.0104	2.0137
Limits				5150-5250 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5200.0015	5200	0.0015	0.2900
		V max (V)	138.00	5200.0101	5200	0.0101	1.9482
		V min (V)	102.00	5200.0095	5200	0.0095	1.8257
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	AC 120V	T (°C)	-20	5200.01318	5200	0.01318	2.5349
		T (°C)	-10	5200.00576	5200	0.00576	1.1086
		T (°C)	0	5200.00485	5200	0.00485	0.9323
		T (°C)	10	5200.00348	5200	0.00348	0.6701
		T (°C)	20	5200.00513	5200	0.00513	0.9864
		T (°C)	30	5200.01293	5200	0.01293	2.4866
		T (°C)	40	5200.01264	5200	0.01264	2.4315
		T (°C)	50	5200.00352	5200	0.00352	0.6779
		T (°C)	60	5200.00214	5200	0.00214	0.4107
		T (°C)	70	5200.01143	5200	0.01143	2.1980
Limits				5150-5250 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5240.0041	5240	0.0041	0.7880
		V max (V)	138.00	5240.0036	5240	0.0036	0.6872
		V min (V)	102.00	5240.0093	5240	0.0093	1.7756
Limits				5150-5250 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	AC 120V	T (°C)	-20	5240.0011	5240	0.0011	0.2033
		T (°C)	-10	5240.0058	5240	0.0058	1.1039
		T (°C)	0	5240.0043	5240	0.0043	0.8208
		T (°C)	10	5240.0039	5240	0.0039	0.7471
		T (°C)	20	5240.0021	5240	0.0021	0.4017
		T (°C)	30	5240.0077	5240	0.0077	1.4696
		T (°C)	40	5240.0026	5240	0.0026	0.4886
		T (°C)	50	5240.0020	5240	0.0020	0.3848
		T (°C)	60	5240.0039	5240	0.0039	0.7465
		T (°C)	70	5240.0009	5240	0.0009	0.1659
Limits				5150-5250 MHz			
Result				Complies			

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Hzst Mode ：	TX Frequency(5745-5825MHz)		

Voltage vs. Frequency Stabilit

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5745.00900	5745	0.00900	1.5664
		V max (V)	138.00	5745.00445	5745	0.00445	0.7739
		V min (V)	102.00	5745.00638	5745	0.00638	1.1103
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	AC 120V	T (°C)	-20	5745.00260	5745	0.00260	0.4526
		T (°C)	-10	5745.01348	5745	0.01348	2.3470
		T (°C)	0	5745.00834	5745	0.00834	1.4523
		T (°C)	10	5745.00129	5745	0.00129	0.2241
		T (°C)	20	5745.01120	5745	0.01120	1.9492
		T (°C)	30	5745.00583	5745	0.00583	1.0141
		T (°C)	40	5745.00641	5745	0.00641	1.1161
		T (°C)	50	5745.00050	5745	0.00050	0.0866
		T (°C)	60	5745.00335	5745	0.00335	0.5828
		T (°C)	70	5745.00751	5745	0.00751	1.3077
Limits				5725-5850 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5785.00032	5785	0.00032	0.0545
		V max (V)	138.00	5785.00069	5785	0.00069	0.1195
		V min (V)	102.00	5785.00460	5785	0.00460	0.7959
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	AC 120V	T (°C)	-20	5785.00065	5785	0.00065	0.1116
		T (°C)	-10	5785.00134	5785	0.00134	0.2317
		T (°C)	0	5785.01139	5785	0.01139	1.9685
		T (°C)	10	5785.00698	5785	0.00698	1.2060
		T (°C)	20	5785.00065	5785	0.00065	0.1115
		T (°C)	30	5785.01352	5785	0.01352	2.3378
		T (°C)	40	5785.01017	5785	0.01017	1.7582
		T (°C)	50	5785.01304	5785	0.01304	2.2547
		T (°C)	60	5785.00671	5785	0.00671	1.1595
		T (°C)	70	5785.00376	5785	0.00376	0.6506
Limits				5725-5850 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5825.01069	5825	0.01069	1.8356
		V max (V)	138.00	5825.00358	5825	0.00358	0.6141
		V min (V)	102.00	5825.00393	5825	0.00393	0.6749
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	AC 120V	T (°C)	-20	5825.00309	5825	0.00309	0.5301
		T (°C)	-10	5825.00741	5825	0.00741	1.2720
		T (°C)	0	5825.00739	5825	0.00739	1.2689
		T (°C)	10	5825.00456	5825	0.00456	0.7825
		T (°C)	20	5825.00693	5825	0.00693	1.1899
		T (°C)	30	5825.00314	5825	0.00314	0.5396
		T (°C)	40	5825.00903	5825	0.00903	1.5503
		T (°C)	50	5825.00998	5825	0.00998	1.7134
		T (°C)	60	5825.00655	5825	0.00655	1.1242
		T (°C)	70	5825.00863	5825	0.00863	1.4822
Limits				5725-5850 MHz			
Result				Complies			

14. Antenna Requirement

14.1 Limit

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

14.2 Test Result

The EUT antenna is Internal Antenna (antenna gain:0dBi). It comply with the standard requirement.

15. EUT Photographs

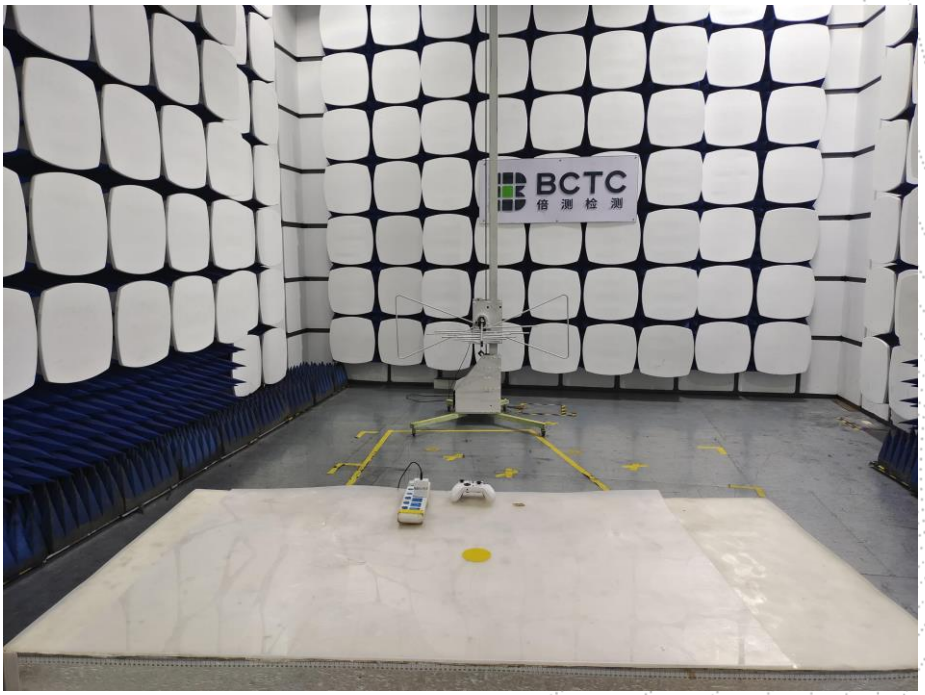
EUT Photo 1

EUT Photo 2

16. EUT Test Setup Photographs

Conducted Measurement Photo

Radiated Measurement Photos

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STATEMENT

1.The equipment lists are traceable to the national reference standards.

2.The test report can not be partially copied unless prior written approval is issued from our lab.

3.The test report is invalid without stamp of laboratory.

4.The test report is invalid without signature of person(s) testing and authorizing.

5.The test process and test result is only related to the Unit Under Test.

6.The quality system of our laboratory is in accordance with ISO/IEC17025.

7.If there is any objection to report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

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E-Mail：bctc@bctc-lab.com.cn

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