

TEST REPORT

Report No.: BCTC2202831253-3E

Applicant: Shenzhen Viofo Technology Co.,Ltd

Product Name: Car Dash Camera

Model/Type
reference: A229

Tested Date: 2022-02-17 to 2022-03-07

Issued Date: 2022-03-08



Shenzhen BCTC Testing Co., Ltd.



FCC ID: 2AMBW-A229

Product Name: Car Dash Camera

Trademark: VIOFO

Model/Type reference: A229
A229 Duo, A229 Plus, A229 Plus Duo, A229 Pro, A229 Pro Duo

Prepared For: Shenzhen Viofo Technology Co.,Ltd

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Manufacturer: Shenzhen Viofo Technology Co.,Ltd

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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: 2022-02-17

Sample tested Date: 2022-02-17 to 2022-03-07

Issue Date: 2022-03-08

Report No.: BCTC2202831253-3E

Test Standards: FCC Part15 15.407
ANSI C63.10-2013
KDB 662911 D01 v02r01
KDB 789033 D02 v02r01

Test Results: PASS

Remark: This is WIFI-5GHz band radio test report.

Tested by:



Eric Yang/Project Handler

Approved by:



Zero Zhou/Reviewer

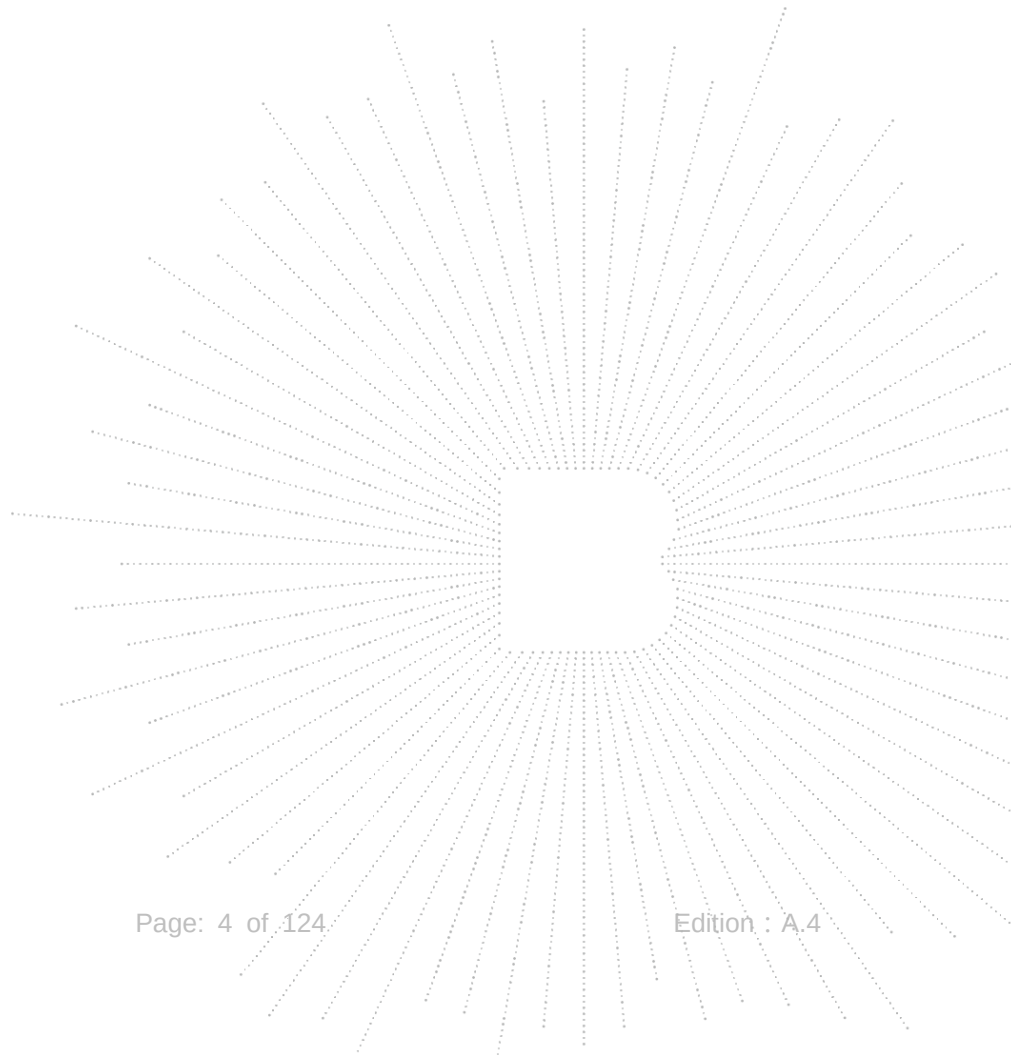
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(Note: N/A Means Not Applicable)



1. Version

Report No.	Issue Date	Description	Approved
BCTC2202831253-3E	2022-03-08	Original	Valid

2. Test Summary

The Product has been tested according to the following specifications:

1	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(30MHz-1GHz)	U=4.3dB
2	3m chamber Radiated spurious emission(9KHz-30MHz)	U=3.7dB
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°C

4. Product Information And Test Setup

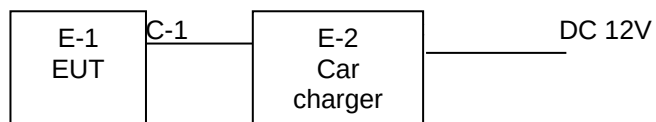
4.1 Product Information

Model/Type reference:	A229 A229 Duo, A229 Plus, A229 Plus Duo, A229 Pro, A229 Pro Duo
Model differences:	All the model are the same circuit and RF module, except model names.
Hardware Version:	VIOFO_W49_MAIN_V03
Software Version:	V1
IEEE 802.11 WLAN Mode Supported:	802.11a/n/ac(20MHz channel bandwidth) 802.11n/ac(40MHz channel bandwidth) 802.11ac(80MHz channel bandwidth)
Operation Frequency:	5180-5240MHz for 802.11a/n(HT20)/ac20; 5190-5230MHz for 802.11n(HT40)/ac40; 5210MHz for 802.11 ac80; 5745-5825 MHz for 802.11a/n(HT20)/ac20; 5755-5795 MHz for 802.11a/n(HT40)/ac40; 5775MHz for 802.11 ac80;
Data Rate:	802.11a: 6,9,12,18,24,36,48,54Mbps; 802.11n(HT20/HT40):MCS0-MCS15; 802.11ac(VHT20): NSS1, MCS0-MCS8 802.11ac(VHT40/VHT80):NSS1, MCS0-MCS
Type of Modulation:	OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11a/n/ac;
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 ; 1 channels for 802.11 ac80 in the 5210MHz band ; 5 channels for 802.11a/n20 in the 5745-5825MHz band ; 2 channels for 802.11 n40 in the 5755-5795MHz band ; 1 channels for 802.11 ac80 in the 5775MHz band ;
Antenna installation:	FPC antenna
Antenna Gain:	1 dBi
Ratings:	DC 5V From Car charger DC12V

4.2 Test Setup Configuration

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

Radiated Spurious Emission



4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note
E-2	Car charger	N/A	CC-030N	N/A	Auxiliary

Item	Shielded Type	Ferrite Core	Length	Note
C-1	N/A	N/A	2M	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

Frequency and Channel list for 802.11a/n /ac (5180-5240MHz):

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

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

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

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

802.11a/n/ac(20MHz) 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/ac(40MHz) Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795	-	-	-	-

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

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.

Pretest Mode	Description
Mode 1	802.11a / n/ ac 20 CH36/ CH40/ CH 48 802.11a /n/ ac 20 CH149/ CH157/ CH 165
Mode 2	802.11n/ ac40 CH38/ CH 46 802.11n/ ac40 CH 151 / CH 159
Mode 3	802.11 ac80 CH 42/CH 155
Mode 4	Link Mode

Note: 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	CMD		
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

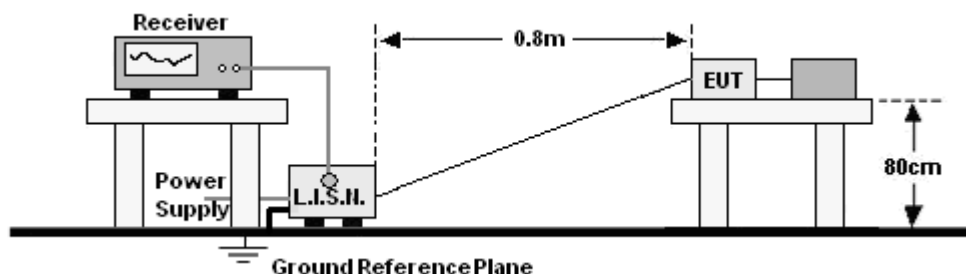
5.2 Test Instrument Used

RF Conducted Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Power Meter	Keysight	E4419	\	May 28, 2021	May 27, 2022
Power Sensor (AV)	Keysight	E9300A	\	May 28, 2021	May 27, 2022
Signal Analyzer 20kHz-26.5G Hz	Keysight	N9020A	MY49100060	May 28, 2021	May 27, 2022
Spectrum Analyzer 9kHz-40GHz	R&S	FSP 40	\	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_01G18 G-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	B1702988-000 8	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 Analyzer 20kHz-26.5G Hz	Keysight	N9020A	MY49100060	May 28, 2021	May 27, 2022
Spectrum Analyzer 9kHz-40GHz	R&S	FSP 40	\	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:

- *Decreasing linearly with logarithm of frequency.
- 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

- 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).
- 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.
- 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.

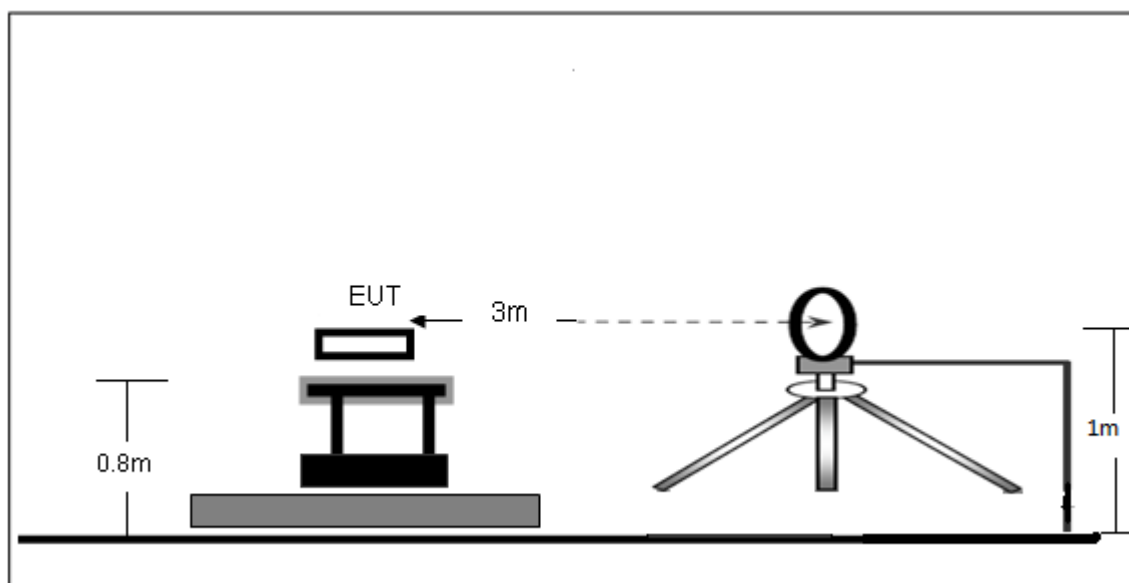
6.5 Test Result

The EUT is powered by the DC only, the test item is not applicable.

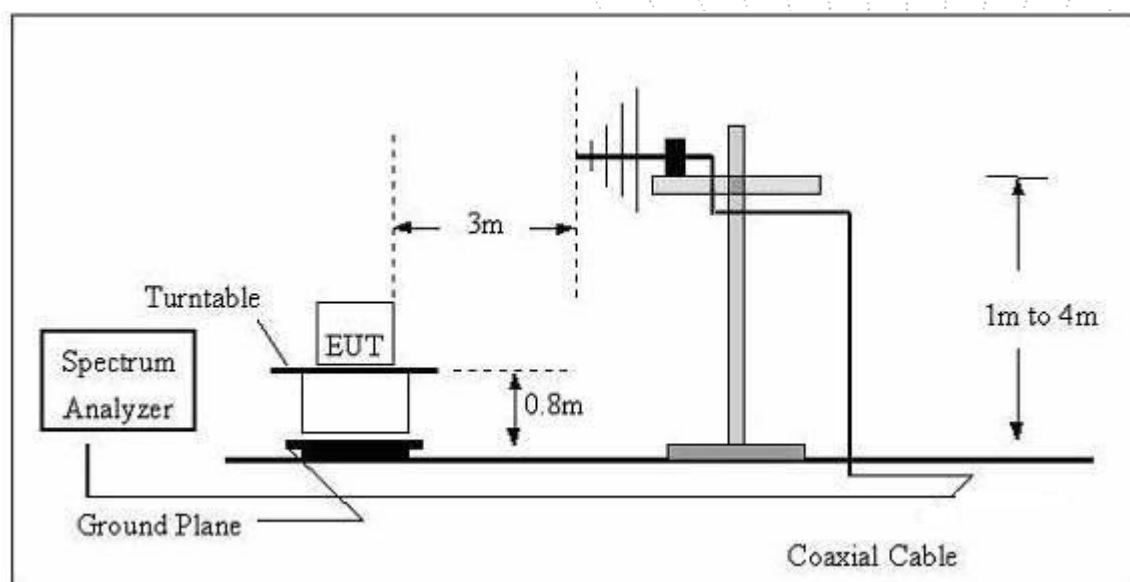
7. Radiated Emissions

7.1 Block Diagram Of Test Setup

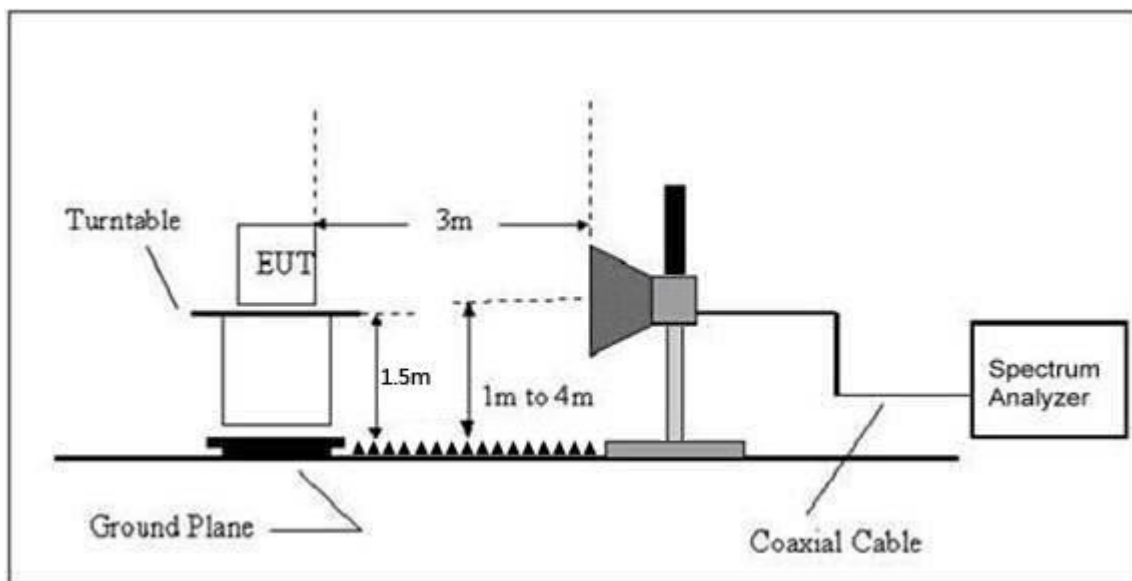
(A) Radiated Emission Test-Up Frequency Below 30MHz



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

- 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.
- 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.
- 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.
- 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.
- 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.
- 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 $RBWCF [dB] = 10 \cdot \lg(100 [kHz] / \text{narrower RBW} [kHz])$. , 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.

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 °C	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage :	DC 12V
Test Mode:	Mode 4	Polarization :	---

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

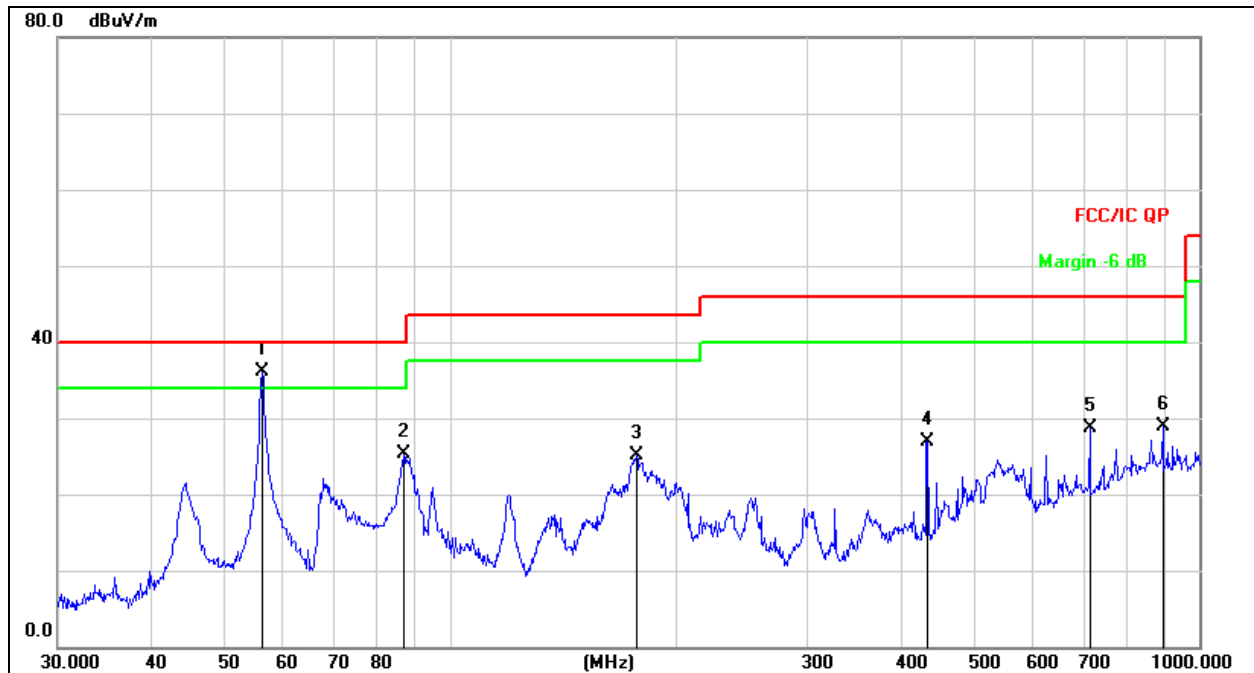
Note:

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 = $40 \log (\text{specific distance/test distance})$ (dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage :	DC 12V
Test Mode:	Mode 4	Polarization :	Horizontal

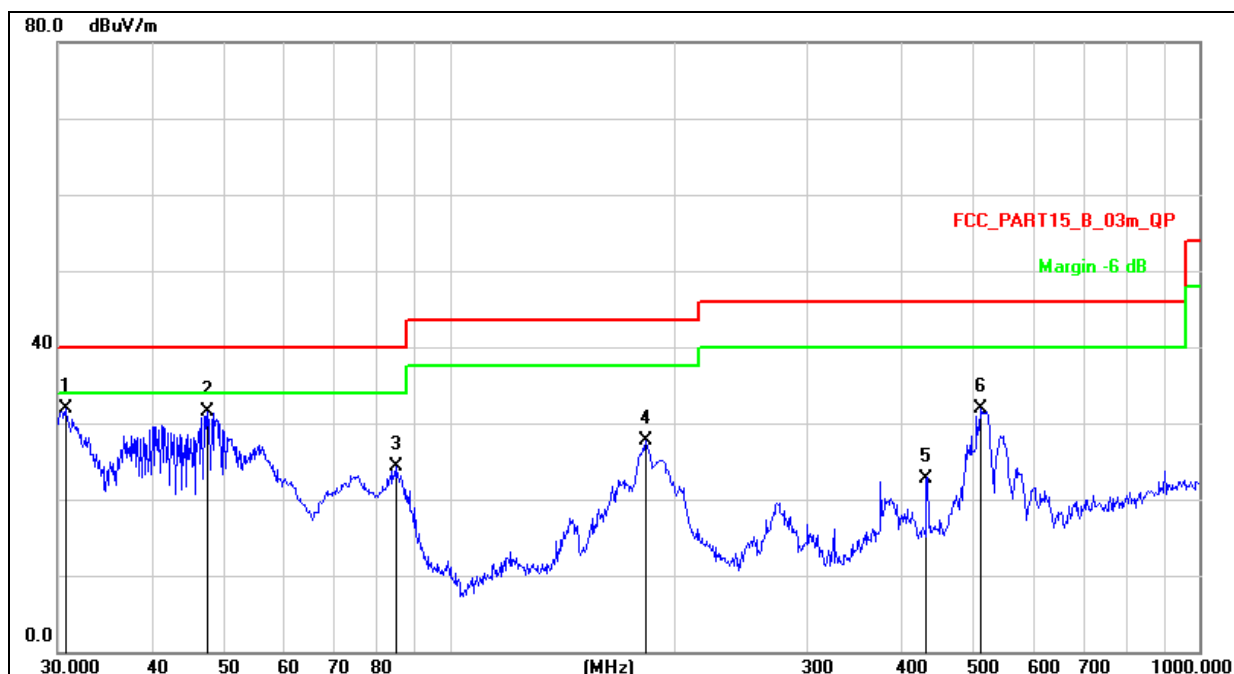


Remark:

- Factor = Antenna Factor + Cable Loss – Pre-amplifier.
- Measurement = Reading Level + Correct Factor
- Over = Measurement - Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	56.1974	51.80	-15.78	36.02	40.00	-3.98	QP
2		86.8068	44.47	-19.25	25.22	40.00	-14.78	QP
3		177.5092	42.34	-17.27	25.07	43.50	-18.43	QP
4		434.0651	36.94	-9.98	26.96	46.00	-19.04	QP
5		714.1734	32.12	-3.44	28.68	46.00	-17.32	QP
6		893.8567	28.68	0.31	28.99	46.00	-17.01	QP

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage :	DC 12V
Test Mode:	Mode 4	Polarization :	Vertical



Remark:

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

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1	*	30.7455	48.95	-17.14	31.81	40.00	-8.19	QP
2		47.4918	46.42	-14.99	31.43	40.00	-8.57	QP
3		84.7019	43.71	-19.32	24.39	40.00	-15.61	QP
4		182.5592	45.19	-17.42	27.77	43.50	-15.73	QP
5		432.5457	33.14	-10.36	22.78	46.00	-23.22	QP
6		511.8352	40.64	-8.64	32.00	46.00	-14.00	QP

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	4434.113	61.22	5.94	35.40	44.00	58.56	68.2	-9.64	PK
V	4434.113	43.19	5.94	35.40	44.00	40.53	54	-13.47	AV
V	10360.056	63.50	8.46	39.75	44.50	67.21	68.2	-0.99	PK
V	10360.056	43.06	8.46	39.75	44.50	46.77	54	-7.23	AV
V	15540.057	60.68	10.12	38.80	44.10	65.50	74	-8.50	PK
V	15540.057	43.00	10.12	38.80	42.70	49.22	54	-4.78	AV
H	4434.182	61.57	5.94	35.18	44.00	58.69	68.2	-9.51	PK
H	4434.182	43.37	5.94	35.18	44.00	40.49	54	-13.51	AV
H	10360.067	54.16	8.46	38.71	44.50	56.83	68.2	-11.37	PK
H	10360.067	42.40	8.46	38.71	44.50	45.07	54	-8.93	AV
H	15540.098	53.44	10.12	38.38	44.10	57.84	74	-16.16	PK
H	15540.098	41.76	10.12	38.38	44.10	46.16	54	-7.84	AV
Middle Channel (5200 MHz)-Above 1G									
V	4592.019	60.89	6.48	36.35	44.05	59.67	74	-14.33	PK
V	4592.019	43.22	6.48	36.35	44.05	42.00	54	-12.00	AV
V	10400.151	60.92	8.47	37.88	44.51	62.76	68.2	-5.44	PK
V	10400.151	43.58	8.47	37.88	44.51	45.42	54	-8.58	AV
V	15600.065	64.05	10.12	38.80	44.10	68.87	74	-5.13	PK
V	15600.065	43.97	10.12	38.80	42.70	50.19	54	-3.81	AV
H	4592.136	63.98	6.48	36.37	44.05	62.78	74	-11.22	PK
H	4592.136	43.15	6.48	36.37	44.05	41.95	54	-12.05	AV
H	10400.054	53.68	8.47	38.64	44.50	56.29	68.2	-11.91	PK
H	10400.054	41.87	8.47	38.64	44.50	44.48	54	-9.52	AV
H	15600.151	50.84	10.12	38.38	44.10	55.24	74	-18.76	PK
H	15600.151	42.86	10.12	38.38	44.10	47.26	54	-6.74	AV
High Channel (5240 MHz)-Above 1G									
V	4739.156	64.52	7.10	37.24	43.50	65.36	74	-8.64	PK
V	4739.156	43.25	7.10	37.24	43.50	44.09	54	-9.91	AV
V	10480.028	64.13	8.46	37.68	44.50	65.77	68.2	-2.43	PK
V	10480.028	43.67	8.46	37.68	44.50	45.31	54	-8.69	AV
V	15720.104	60.79	10.12	38.80	44.10	65.61	74	-8.39	PK
V	15720.104	43.03	10.12	38.80	42.70	49.25	54	-4.75	AV
H	4739.177	62.44	7.10	37.24	43.50	63.28	74	-10.72	PK
H	4739.177	43.51	7.10	37.24	43.50	44.35	54	-9.65	AV
H	10480.107	53.23	8.46	38.57	44.50	55.76	68.2	-12.44	PK
H	10480.107	40.41	8.46	38.57	44.50	42.94	54	-11.06	AV
H	15720.067	52.30	10.12	38.38	44.10	56.70	74	-17.30	PK
H	15720.067	42.66	10.12	38.38	44.10	47.06	54	-6.94	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
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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	4434.177	64.79	5.94	35.40	44.00	62.13	68.2	-6.07	PK
V	4434.177	43.03	5.94	35.40	44.00	40.37	54	-13.63	AV
V	10360.134	63.82	8.46	39.75	44.50	67.53	68.2	-0.67	PK
V	10360.134	43.93	8.46	39.75	44.50	47.64	54	-6.36	AV
V	15540.171	63.83	10.12	38.80	44.10	68.65	74	-5.35	PK
V	15540.171	43.16	10.12	38.80	42.70	49.38	54	-4.62	AV
H	4434.153	61.60	5.94	35.18	44.00	58.72	68.2	-9.48	PK
H	4434.153	43.13	5.94	35.18	44.00	40.25	54	-13.75	AV
H	10360.155	54.24	8.46	38.71	44.50	56.91	68.2	-11.29	PK
H	10360.155	42.92	8.46	38.71	44.50	45.59	54	-8.41	AV
H	15540.032	50.83	10.12	38.38	44.10	55.23	74	-18.77	PK
H	15540.032	44.38	10.12	38.38	44.10	48.78	54	-5.22	AV
Middle Channel (5200 MHz)-Above 1G									
V	4592.196	64.26	6.48	36.35	44.05	63.04	74	-10.96	PK
V	4592.196	43.71	6.48	36.35	44.05	42.49	54	-11.51	AV
V	10400.041	60.84	8.47	37.88	44.51	62.68	68.2	-5.52	PK
V	10400.041	43.61	8.47	37.88	44.51	45.45	54	-8.55	AV
V	15600.088	62.70	10.12	38.80	44.10	67.52	74	-6.48	PK
V	15600.088	43.17	10.12	38.80	42.70	49.39	54	-4.61	AV
H	4592.084	60.68	6.48	36.37	44.05	59.48	74	-14.52	PK
H	4592.084	43.36	6.48	36.37	44.05	42.16	54	-11.84	AV
H	10400.063	53.20	8.47	38.64	44.50	55.81	68.2	-12.39	PK
H	10400.063	44.13	8.47	38.64	44.50	46.74	54	-7.26	AV
H	15600.085	50.09	10.12	38.38	44.10	54.49	74	-19.51	PK
H	15600.085	41.84	10.12	38.38	44.10	46.24	54	-7.76	AV
High Channel (5240 MHz)-Above 1G									
V	4739.165	62.16	7.10	37.24	43.50	63.00	74	-11.00	PK
V	4739.165	43.68	7.10	37.24	43.50	44.52	54	-9.48	AV
V	10480.020	61.20	8.46	37.68	44.50	62.84	68.2	-5.36	PK
V	10480.020	43.63	8.46	37.68	44.50	45.27	54	-8.73	AV
V	15720.132	60.87	10.12	38.80	44.10	65.69	74	-8.31	PK
V	15720.132	43.33	10.12	38.80	42.70	49.55	54	-4.45	AV
H	4739.110	62.40	7.10	37.24	43.50	63.24	74	-10.76	PK
H	4739.110	43.43	7.10	37.24	43.50	44.27	54	-9.73	AV
H	10480.093	51.91	8.46	38.57	44.50	54.44	68.2	-13.76	PK
H	10480.093	42.88	8.46	38.57	44.50	45.41	54	-8.59	AV
H	15720.085	53.70	10.12	38.38	44.10	58.10	74	-15.90	PK
H	15720.085	44.25	10.12	38.38	44.10	48.65	54	-5.35	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
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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	4434.100	61.32	5.94	35.40	44.00	58.66	68.2	-9.54	PK
V	4434.100	43.39	5.94	35.40	44.00	40.73	54	-13.27	AV
V	10380.161	61.65	8.46	39.75	44.50	65.36	68.2	-2.84	PK
V	10380.161	43.26	8.46	39.75	44.50	46.97	54	-7.03	AV
V	15570.071	60.18	10.12	38.80	44.10	65.00	74	-9.00	PK
V	15570.071	43.85	10.12	38.80	42.70	50.07	54	-3.93	AV
H	4434.039	62.68	5.94	35.18	44.00	59.80	74	-14.20	PK
H	4434.039	43.06	5.94	35.18	44.00	40.18	54	-13.82	AV
H	10380.148	53.99	8.46	38.71	44.50	56.66	68.2	-11.54	PK
H	10380.148	41.79	8.46	38.71	44.50	44.46	54	-9.54	AV
H	15570.160	53.94	10.12	38.38	44.10	58.34	74	-15.66	PK
H	15570.160	44.61	10.12	38.38	44.10	49.01	54	-4.99	AV
High Channel (5230 MHz)-Above 1G									
V	4739.022	62.83	6.48	36.35	44.05	61.61	68.2	-6.59	PK
V	4739.022	43.87	6.48	36.35	44.05	42.65	54	-11.35	AV
V	10460.182	60.14	8.47	37.88	44.51	61.98	68.2	-6.22	PK
V	10460.182	43.98	8.47	37.88	44.51	45.82	54	-8.18	AV
V	15690.134	60.75	10.12	38.80	44.10	65.57	74	-8.43	PK
V	15690.134	43.53	10.12	38.80	42.70	49.75	54	-4.25	AV
H	4739.141	61.29	6.48	36.37	44.05	60.09	68.2	-8.11	PK
H	4739.141	43.08	6.48	36.37	44.05	41.88	54	-12.12	AV
H	10460.033	54.38	8.47	38.64	44.50	56.99	68.2	-11.21	PK
H	10460.033	40.08	8.47	38.64	44.50	42.69	54	-11.31	AV
H	15690.149	51.00	10.12	38.38	44.10	55.40	74	-18.60	PK
H	15690.149	42.94	10.12	38.38	44.10	47.34	54	-6.66	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) - 802.11ac-HT20
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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	4434.099	64.87	5.94	35.40	44.00	62.21	68.2	-5.99	PK
V	4434.099	43.08	5.94	35.40	44.00	40.42	54	-13.58	AV
V	10360.086	62.64	8.46	39.75	44.50	66.35	68.2	-1.85	PK
V	10360.086	43.61	8.46	39.75	44.50	47.32	54	-6.68	AV
V	15540.163	64.35	10.12	38.80	44.10	69.17	74	-4.83	PK
V	15540.163	43.56	10.12	38.80	42.70	49.78	54	-4.22	AV
H	4434.010	63.05	5.94	35.18	44.00	60.17	68.2	-8.03	PK
H	4434.010	43.80	5.94	35.18	44.00	40.92	54	-13.08	AV
H	10360.114	52.99	8.46	38.71	44.50	55.66	68.2	-12.54	PK
H	10360.114	40.73	8.46	38.71	44.50	43.40	54	-10.60	AV
H	15540.034	52.08	10.12	38.38	44.10	56.48	74	-17.52	PK
H	15540.034	41.45	10.12	38.38	44.10	45.85	54	-8.15	AV
Middle Channel (5200 MHz)-Above 1G									
V	4592.021	64.20	6.48	36.35	44.05	62.98	74	-11.02	PK
V	4592.021	43.92	6.48	36.35	44.05	42.70	54	-11.30	AV
V	10400.026	64.19	8.47	37.88	44.51	66.03	68.2	-2.17	PK
V	10400.026	43.11	8.47	37.88	44.51	44.95	54	-9.05	AV
V	15600.085	62.15	10.12	38.80	44.10	66.97	74	-7.03	PK
V	15600.085	43.09	10.12	38.80	42.70	49.31	54	-4.69	AV
H	4592.056	60.61	6.48	36.37	44.05	59.41	74	-14.59	PK
H	4592.056	43.82	6.48	36.37	44.05	42.62	54	-11.38	AV
H	10400.089	54.39	8.47	38.64	44.50	57.00	68.2	-11.20	PK
H	10400.089	44.86	8.47	38.64	44.50	47.47	54	-6.53	AV
H	15600.098	53.40	10.12	38.38	44.10	57.80	74	-16.20	PK
H	15600.098	44.74	10.12	38.38	44.10	49.14	54	-4.86	AV
High Channel (5240 MHz)-Above 1G									
V	4739.096	64.59	7.10	37.24	43.50	65.43	74	-8.57	PK
V	4739.096	43.61	7.10	37.24	43.50	44.45	54	-9.55	AV
V	10480.120	64.10	8.46	37.68	44.50	65.74	68.2	-2.46	PK
V	10480.120	43.19	8.46	37.68	44.50	44.83	54	-9.17	AV
V	15720.112	64.43	10.12	38.80	44.10	69.25	74	-4.75	PK
V	15720.112	43.57	10.12	38.80	42.70	49.79	54	-4.21	AV
H	4739.137	64.03	7.10	37.24	43.50	64.87	74	-9.13	PK
H	4739.137	43.40	7.10	37.24	43.50	44.24	54	-9.76	AV
H	10480.053	54.73	8.46	38.57	44.50	57.26	68.2	-10.94	PK
H	10480.053	43.36	8.46	38.57	44.50	45.89	54	-8.11	AV
H	15720.028	52.42	10.12	38.38	44.10	56.82	74	-17.18	PK
H	15720.028	43.41	10.12	38.38	44.10	47.81	54	-6.19	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) - 802.11ac-HT40
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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	4434.175	60.01	5.94	35.40	44.00	57.35	68.2	-10.85	PK
V	4434.175	43.23	5.94	35.40	44.00	40.57	54	-13.43	AV
V	10380.043	62.57	8.46	39.75	44.50	66.28	68.2	-1.92	PK
V	10380.043	43.80	8.46	39.75	44.50	47.51	54	-6.49	AV
V	15570.051	64.84	10.12	38.80	44.10	69.66	74	-4.34	PK
V	15570.051	43.58	10.12	38.80	42.70	49.80	54	-4.20	AV
H	4434.184	62.03	5.94	35.18	44.00	59.15	74	-14.85	PK
H	4434.184	43.28	5.94	35.18	44.00	40.40	54	-13.60	AV
H	10380.007	53.94	8.46	38.71	44.50	56.61	68.2	-11.59	PK
H	10380.007	44.99	8.46	38.71	44.50	47.66	54	-6.34	AV
H	15570.182	50.95	10.12	38.38	44.10	55.35	74	-18.65	PK
H	15570.182	44.62	10.12	38.38	44.10	49.02	54	-4.98	AV
High Channel (5230 MHz)-Above 1G									
V	4739.162	63.95	6.48	36.35	44.05	62.73	68.2	-5.47	PK
V	4739.162	43.85	6.48	36.35	44.05	42.63	54	-11.37	AV
V	10460.065	64.06	8.47	37.88	44.51	65.90	68.2	-2.30	PK
V	10460.065	43.70	8.47	37.88	44.51	45.54	54	-8.46	AV
V	15690.160	60.00	10.12	38.80	44.10	64.82	74	-9.18	PK
V	15690.160	43.64	10.12	38.80	42.70	49.86	54	-4.14	AV
H	4739.073	63.27	6.48	36.37	44.05	62.07	68.2	-6.13	PK
H	4739.073	43.56	6.48	36.37	44.05	42.36	54	-11.64	AV
H	10460.001	54.93	8.47	38.64	44.50	57.54	68.2	-10.66	PK
H	10460.001	43.00	8.47	38.64	44.50	45.61	54	-8.39	AV
H	15690.194	50.39	10.12	38.38	44.10	54.79	74	-19.21	PK
H	15690.194	40.79	10.12	38.38	44.10	45.19	54	-8.81	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) - 802.11ac-HT80
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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
(5210 MHz)-Above 1G									
V	4434.063	60.83	5.94	35.40	44.00	58.17	68.2	-10.03	PK
V	4434.063	43.68	5.94	35.40	44.00	41.02	54	-12.98	AV
V	10420.200	61.14	8.46	39.75	44.50	64.85	68.2	-3.35	PK
V	10420.200	43.79	8.46	39.75	44.50	47.50	54	-6.50	AV
V	15630.030	61.18	10.12	38.80	44.10	66.00	74	-8.00	PK
V	15630.030	43.40	10.12	38.80	42.70	49.62	54	-4.38	AV
H	4434.168	61.23	5.94	35.18	44.00	58.35	68.2	-9.85	PK
H	4434.168	43.28	5.94	35.18	44.00	40.40	54	-13.60	AV
H	10420.053	50.26	8.46	38.71	44.50	52.93	68.2	-15.27	PK
H	10420.053	44.41	8.46	38.71	44.50	47.08	54	-6.92	AV
H	15630.107	53.41	10.12	38.38	44.10	57.81	74	-16.19	PK
H	15630.107	41.64	10.12	38.38	44.10	46.04	54	-7.96	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
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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	4679.168	57.21	5.94	35.40	44.00	54.55	74	-19.45	PK
V	4679.168	43.94	5.94	35.40	44.00	41.28	54	-12.72	AV
V	11490.141	57.83	8.46	39.75	44.50	61.54	68.2	-6.66	PK
V	11490.141	43.23	8.46	39.75	44.50	46.94	54	-7.06	AV
V	17235.180	57.89	10.12	38.80	44.10	62.71	68.2	-5.49	PK
V	17235.180	43.55	10.12	38.80	42.70	49.77	54	-4.23	AV
H	4679.075	57.19	5.94	35.18	44.00	54.31	74	-19.69	PK
H	4679.075	43.88	5.94	35.18	44.00	41.00	54	-13.00	AV
H	11490.003	54.55	8.46	38.71	44.50	57.22	68.2	-10.98	PK
H	11490.003	44.61	8.46	38.71	44.50	47.28	54	-6.72	AV
H	17235.185	50.53	10.12	38.38	44.10	54.93	68.2	-13.27	PK
H	17235.185	43.89	10.12	38.38	44.10	48.29	54	-5.71	AV
Middle Channel (5785 MHz)-Above 1G									
V	4592.082	54.93	6.48	36.35	44.05	53.71	74	-20.29	PK
V	4592.082	43.92	6.48	36.35	44.05	42.70	54	-11.30	AV
V	11570.151	55.11	8.47	37.88	44.51	56.95	68.2	-11.25	PK
V	11570.151	43.54	8.47	37.88	44.51	45.38	54	-8.62	AV
V	17355.151	59.39	10.12	38.80	44.10	64.21	68.2	-3.99	PK
V	17355.151	39.76	10.12	38.80	42.70	45.98	54	-8.02	AV
H	4592.053	59.73	6.48	36.37	44.05	58.53	74	-15.47	PK
H	4592.053	43.60	6.48	36.37	44.05	42.40	54	-11.60	AV
H	11570.135	54.40	8.47	38.64	44.50	57.01	68.2	-11.19	PK
H	11570.135	42.41	8.47	38.64	44.50	45.02	54	-8.98	AV
H	17355.048	54.20	10.12	38.38	44.10	58.60	68.2	-9.60	PK
H	17355.048	42.38	10.12	38.38	44.10	46.78	54	-7.22	AV
High Channel (5825 MHz)-Above 1G									
V	6039.127	60.92	7.10	37.24	43.50	61.76	68.2	-6.44	PK
V	6039.127	43.89	7.10	37.24	43.50	44.73	54	-9.27	AV
V	11650.076	61.89	8.46	37.68	44.50	63.53	74	-10.47	PK
V	11650.076	43.88	8.46	37.68	44.50	45.52	54	-8.48	AV
V	17475.195	57.19	10.12	38.80	44.10	62.01	68.2	-6.19	PK
V	17475.195	43.26	10.12	38.80	42.70	49.48	54	-4.52	AV
H	6039.152	55.37	7.10	37.24	43.50	56.21	68.2	-11.99	PK
H	6039.152	43.54	7.10	37.24	43.50	44.38	54	-9.62	AV
H	11650.056	53.74	8.46	38.57	44.50	56.27	74	-17.73	PK
H	11650.056	44.22	8.46	38.57	44.50	46.75	54	-7.25	AV
H	17475.183	54.19	10.12	38.38	44.10	58.59	68.2	-9.61	PK
H	17475.183	41.40	10.12	38.38	44.10	45.80	54	-8.20	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
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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	4679.036	58.97	5.94	35.40	44.00	56.31	74	-17.69	PK
V	4679.036	43.75	5.94	35.40	44.00	41.09	54	-12.91	AV
V	11490.014	55.03	8.46	39.75	44.50	58.74	68.2	-9.46	PK
V	11490.014	43.09	8.46	39.75	44.50	46.80	54	-7.20	AV
V	17235.037	61.43	10.12	38.80	44.10	66.25	68.2	-1.95	PK
V	17235.037	43.06	10.12	38.80	42.70	49.28	54	-4.72	AV
H	4679.118	58.29	5.94	35.18	44.00	55.41	74	-18.59	PK
H	4679.118	43.33	5.94	35.18	44.00	40.45	54	-13.55	AV
H	11490.094	49.48	8.46	38.71	44.50	52.15	68.2	-16.05	PK
H	11490.094	42.00	8.46	38.71	44.50	44.67	54	-9.33	AV
H	17235.194	54.21	10.12	38.38	44.10	58.61	68.2	-9.59	PK
H	17235.194	43.41	10.12	38.38	44.10	47.81	54	-6.19	AV
Middle Channel (5785 MHz)-Above 1G									
V	4592.084	61.51	6.48	36.35	44.05	60.29	74	-13.71	PK
V	4592.084	43.82	6.48	36.35	44.05	42.60	54	-11.40	AV
V	11570.197	56.84	8.47	37.88	44.51	58.68	68.2	-9.52	PK
V	11570.197	43.88	8.47	37.88	44.51	45.72	54	-8.28	AV
V	17355.082	58.88	10.12	38.80	44.10	63.70	68.2	-4.50	PK
V	17355.082	43.20	10.12	38.80	42.70	49.42	54	-4.58	AV
H	4592.190	57.46	6.48	36.37	44.05	56.26	74	-17.74	PK
H	4592.190	43.95	6.48	36.37	44.05	42.75	54	-11.25	AV
H	11570.126	53.80	8.47	38.64	44.50	56.41	68.2	-11.79	PK
H	11570.126	43.14	8.47	38.64	44.50	45.75	54	-8.25	AV
H	17355.035	53.65	10.12	38.38	44.10	58.05	68.2	-10.15	PK
H	17355.035	42.98	10.12	38.38	44.10	47.38	54	-6.62	AV
High Channel (5825 MHz)-Above 1G									
V	6039.169	56.30	7.10	37.24	43.50	57.14	68.2	-11.06	PK
V	6039.169	43.34	7.10	37.24	43.50	44.18	54	-9.82	AV
V	11650.015	59.09	8.46	37.68	44.50	60.73	74	-13.27	PK
V	11650.015	43.87	8.46	37.68	44.50	45.51	54	-8.49	AV
V	17475.093	56.46	10.12	38.80	44.10	61.28	68.2	-6.92	PK
V	17475.093	43.52	10.12	38.80	42.70	49.74	54	-4.26	AV
H	6039.169	58.52	7.10	37.24	43.50	59.36	68.2	-8.84	PK
H	6039.169	43.21	7.10	37.24	43.50	44.05	54	-9.95	AV
H	11650.062	52.69	8.46	38.57	44.50	55.22	74	-18.78	PK
H	11650.062	41.16	8.46	38.57	44.50	43.69	54	-10.31	AV
H	17475.109	54.54	10.12	38.38	44.10	58.94	68.2	-9.26	PK
H	17475.109	40.40	10.12	38.38	44.10	44.80	54	-9.20	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
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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	4679.129	59.96	5.94	35.40	44.00	57.30	74	-16.70	PK
V	4679.129	43.62	5.94	35.40	44.00	40.96	54	-13.04	AV
V	11510.177	56.43	8.46	39.75	44.50	60.14	74	-13.86	PK
V	11510.177	43.62	8.46	39.75	44.50	47.33	54	-6.67	AV
V	17265.105	56.57	10.12	38.80	44.10	61.39	68.2	-6.81	PK
V	17265.105	2.00	10.12	38.80	42.70	8.22	54	-45.78	AV
H	4679.174	58.61	5.94	35.18	44.00	55.73	74	-18.27	PK
H	4679.174	43.61	5.94	35.18	44.00	40.73	54	-13.27	AV
H	11510.088	54.00	8.46	38.71	44.50	56.67	74	-17.33	PK
H	11510.088	41.83	8.46	38.71	44.50	44.50	54	-9.50	AV
H	17265.149	50.53	10.12	38.38	44.10	54.93	68.2	-13.27	PK
H	17265.149	43.15	10.12	38.38	44.10	47.55	54	-6.45	AV
High Channel (5795 MHz)-Above 1G									
V	6039.179	58.54	6.48	36.35	44.05	57.32	68.2	-10.88	PK
V	6039.179	43.08	6.48	36.35	44.05	41.86	54	-12.14	AV
V	11590.151	55.77	8.47	37.88	44.51	57.61	74	-16.39	PK
V	11590.151	43.20	8.47	37.88	44.51	45.04	54	-8.96	AV
V	17385.080	55.43	10.12	38.80	44.10	60.25	68.2	-7.95	PK
V	17385.080	41.60	10.12	38.80	42.70	47.82	54	-6.18	AV
H	6039.122	57.80	6.48	36.37	44.05	56.60	68.2	-11.60	PK
H	6039.122	43.37	6.48	36.37	44.05	42.17	54	-11.83	AV
H	11590.179	51.47	8.47	38.64	44.50	54.08	74	-19.92	PK
H	11590.179	44.40	8.47	38.64	44.50	47.01	54	-6.99	AV
H	17385.041	53.91	10.12	38.38	44.10	58.31	68.2	-9.89	PK
H	17385.041	42.74	10.12	38.38	44.10	47.14	54	-6.86	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) - 802.11ac-HT20
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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	4679.178	58.80	5.94	35.40	44.00	56.14	74	-17.86	PK
V	4679.178	43.39	5.94	35.40	44.00	40.73	54	-13.27	AV
V	11490.120	56.13	8.46	39.75	44.50	59.84	68.2	-8.36	PK
V	11490.120	43.55	8.46	39.75	44.50	47.26	54	-6.74	AV
V	17235.142	58.38	10.12	38.80	44.10	63.20	68.2	-5.00	PK
V	17235.142	43.93	10.12	38.80	42.70	50.15	54	-3.85	AV
H	4679.037	59.91	5.94	35.18	44.00	57.03	74	-16.97	PK
H	4679.037	43.96	5.94	35.18	44.00	41.08	54	-12.92	AV
H	11490.181	48.12	8.46	38.71	44.50	50.79	68.2	-17.41	PK
H	11490.181	40.12	8.46	38.71	44.50	42.79	54	-11.21	AV
H	17235.146	51.36	10.12	38.38	44.10	55.76	68.2	-12.44	PK
H	17235.146	41.40	10.12	38.38	44.10	45.80	54	-8.20	AV
Middle Channel (5785 MHz)-Above 1G									
V	4592.105	61.68	6.48	36.35	44.05	60.46	74	-13.54	PK
V	4592.105	43.65	6.48	36.35	44.05	42.43	54	-11.57	AV
V	11570.127	56.48	8.47	37.88	44.51	58.32	68.2	-9.88	PK
V	11570.127	43.60	8.47	37.88	44.51	45.44	54	-8.56	AV
V	17355.130	60.66	10.12	38.80	44.10	65.48	68.2	-2.72	PK
V	17355.130	43.24	10.12	38.80	42.70	49.46	54	-4.54	AV
H	4592.165	59.34	6.48	36.37	44.05	58.14	74	-15.86	PK
H	4592.165	43.97	6.48	36.37	44.05	42.77	54	-11.23	AV
H	11570.171	53.84	8.47	38.64	44.50	56.45	68.2	-11.75	PK
H	11570.171	42.28	8.47	38.64	44.50	44.89	54	-9.11	AV
H	17355.191	54.06	10.12	38.38	44.10	58.46	68.2	-9.74	PK
H	17355.191	43.95	10.12	38.38	44.10	48.35	54	-5.65	AV
High Channel (5825 MHz)-Above 1G									
V	6039.079	56.81	7.10	37.24	43.50	57.65	68.2	-10.55	PK
V	6039.079	43.27	7.10	37.24	43.50	44.11	54	-9.89	AV
V	11650.114	57.58	8.46	37.68	44.50	59.22	74	-14.78	PK
V	11650.114	43.67	8.46	37.68	44.50	45.31	54	-8.69	AV
V	17475.052	56.98	10.12	38.80	44.10	61.80	68.2	-6.40	PK
V	17475.052	43.52	10.12	38.80	42.70	49.74	54	-4.26	AV
H	6039.167	57.67	7.10	37.24	43.50	58.51	68.2	-9.69	PK
H	6039.167	43.53	7.10	37.24	43.50	44.37	54	-9.63	AV
H	11650.168	51.98	8.46	38.57	44.50	54.51	74	-19.49	PK
H	11650.168	43.86	8.46	38.57	44.50	46.39	54	-7.61	AV
H	17475.132	52.82	10.12	38.38	44.10	57.22	68.2	-10.98	PK
H	17475.132	43.33	10.12	38.38	44.10	47.73	54	-6.27	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) - 802.11ac-HT40
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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	4679.094	60.57	5.94	35.40	44.00	57.91	74	-16.09	PK
V	4679.094	43.94	5.94	35.40	44.00	41.28	54	-12.72	AV
V	11510.161	55.68	8.46	39.75	44.50	59.39	74	-14.61	PK
V	11510.161	43.38	8.46	39.75	44.50	47.09	54	-6.91	AV
V	17265.066	58.86	10.12	38.80	44.10	63.68	68.2	-4.52	PK
V	17265.066	2.00	10.12	38.80	42.70	8.22	54	-45.78	AV
H	4679.132	60.61	5.94	35.18	44.00	57.73	74	-16.27	PK
H	4679.132	43.29	5.94	35.18	44.00	40.41	54	-13.59	AV
H	11510.015	52.23	8.46	38.71	44.50	54.90	74	-19.10	PK
H	11510.015	41.88	8.46	38.71	44.50	44.55	54	-9.45	AV
H	17265.084	51.87	10.12	38.38	44.10	56.27	68.2	-11.93	PK
H	17265.084	43.62	10.12	38.38	44.10	48.02	54	-5.98	AV
High Channel (5795 MHz)-Above 1G									
V	6039.127	59.95	6.48	36.35	44.05	58.73	68.2	-9.47	PK
V	6039.127	43.48	6.48	36.35	44.05	42.26	54	-11.74	AV
V	11590.132	58.03	8.47	37.88	44.51	59.87	74	-14.13	PK
V	11590.132	43.05	8.47	37.88	44.51	44.89	54	-9.11	AV
V	17385.023	55.91	10.12	38.80	44.10	60.73	68.2	-7.47	PK
V	17385.023	41.69	10.12	38.80	42.70	47.91	54	-6.09	AV
H	6039.159	59.50	6.48	36.37	44.05	58.30	68.2	-9.90	PK
H	6039.159	43.47	6.48	36.37	44.05	42.27	54	-11.73	AV
H	11590.023	53.22	8.47	38.64	44.50	55.83	74	-18.17	PK
H	11590.023	41.94	8.47	38.64	44.50	44.55	54	-9.45	AV
H	17385.019	51.41	10.12	38.38	44.10	55.81	68.2	-12.39	PK
H	17385.019	42.03	10.12	38.38	44.10	46.43	54	-7.57	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) - 802.11ac-HT80
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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
(5775 MHz)-Above 1G									
V	4679.128	58.79	5.94	35.40	44.00	56.13	74	-17.87	PK
V	4679.128	43.41	5.94	35.40	44.00	40.75	54	-13.25	AV
V	11550.030	58.56	8.46	39.75	44.50	62.27	74	-11.73	PK
V	11550.030	43.29	8.46	39.75	44.50	47.00	54	-7.00	AV
V	17325.185	56.57	10.12	38.80	44.10	61.39	68.2	-6.81	PK
V	17325.185	41.30	10.12	38.80	42.70	47.52	54	-6.48	AV
H	4679.143	59.19	5.94	35.18	44.00	56.31	74	-17.69	PK
H	4679.143	43.87	5.94	35.18	44.00	40.99	54	-13.01	AV
H	11550.129	51.81	8.46	38.71	44.50	54.48	74	-19.52	PK
H	11550.129	42.63	8.46	38.71	44.50	45.30	54	-8.70	AV
H	17325.063	52.35	10.12	38.38	44.10	56.75	68.2	-11.45	PK
H	17325.063	43.92	10.12	38.38	44.10	48.32	54	-5.68	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 Wifi Repeater 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 Wifi Repeater 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 Wifi Repeaters 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

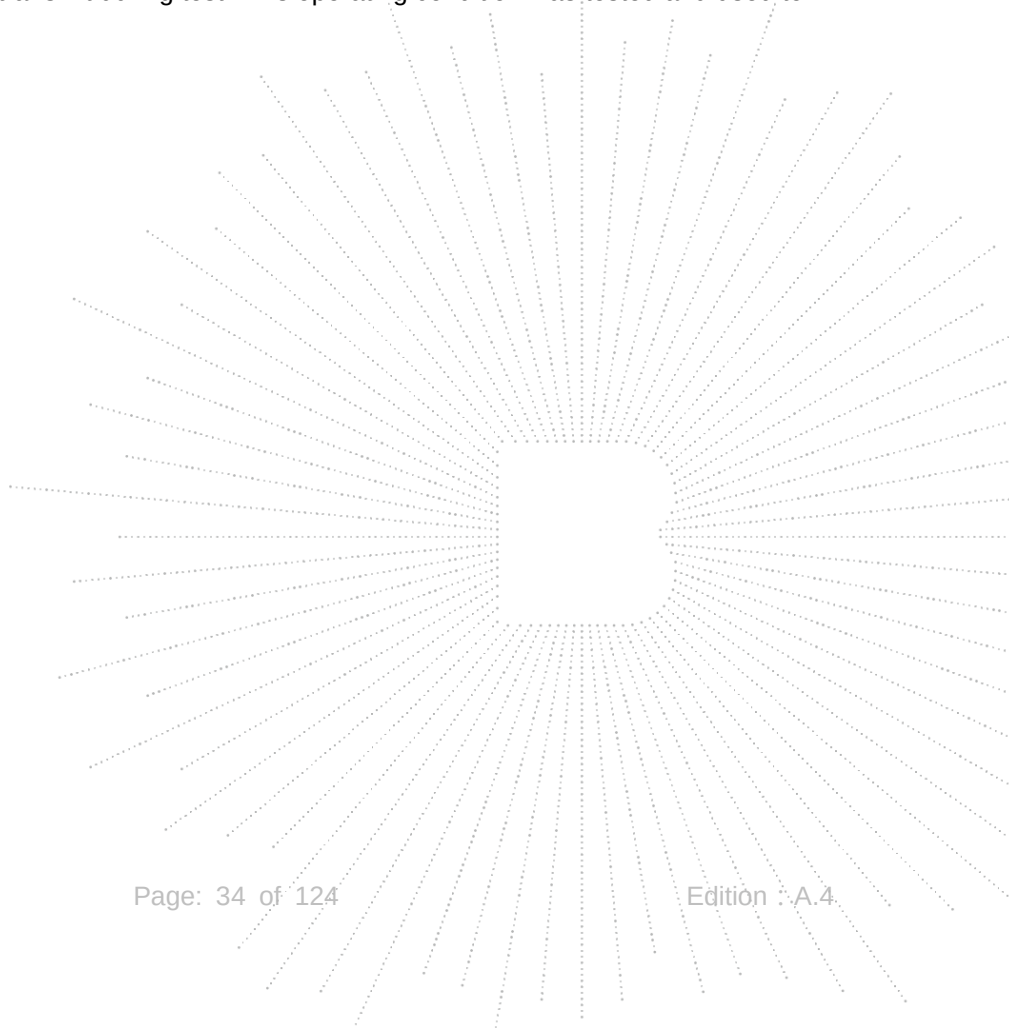
For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 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 $RBW \geq 1/T$, where T is defined in section II.B.I.a).
- b) Set $VBW \geq 3$ RBW.
- c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10\log(500\text{kHz}/RBW)$ 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 $10\log(1\text{MHz}/RBW)$ 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.

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.

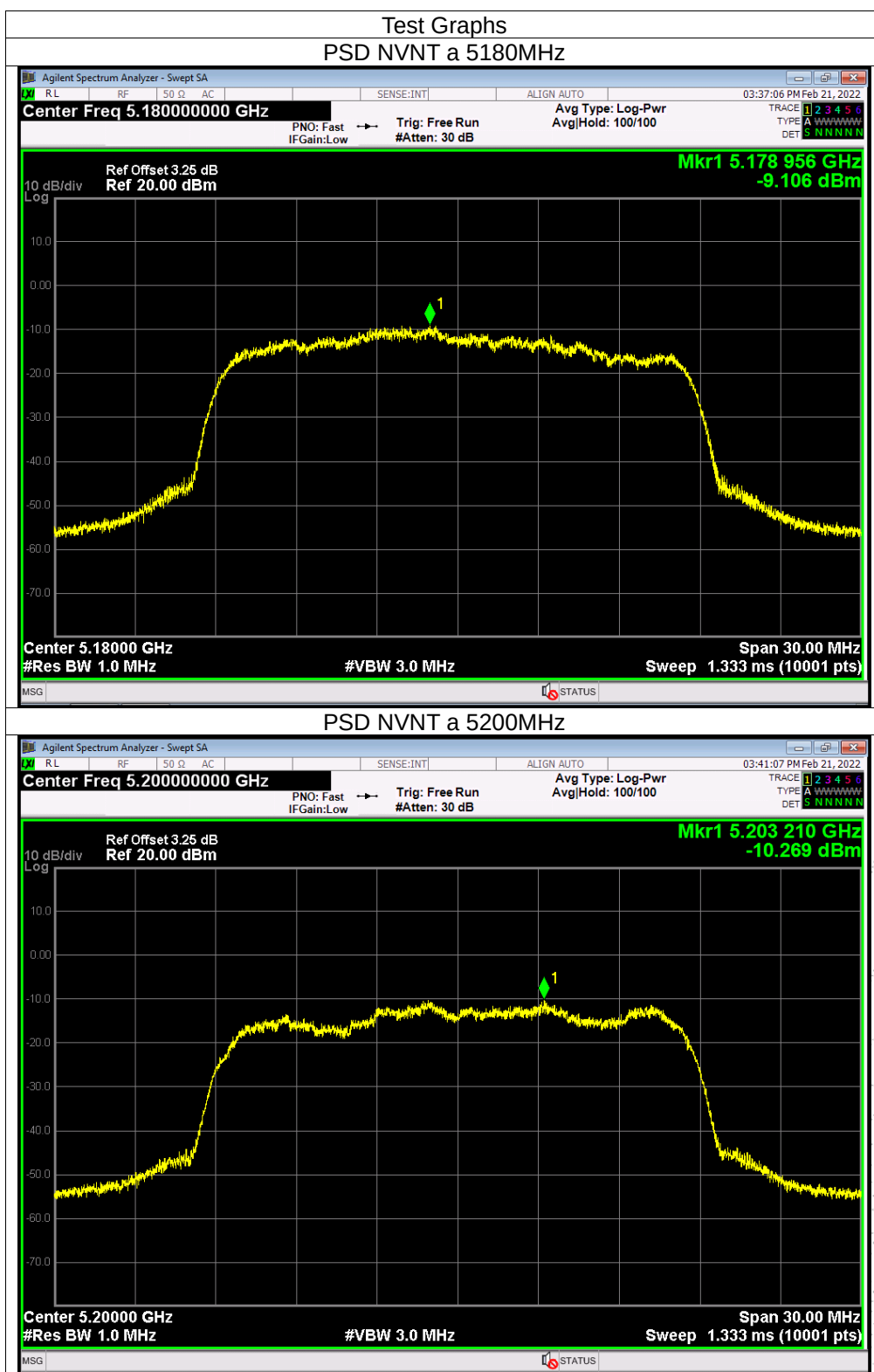


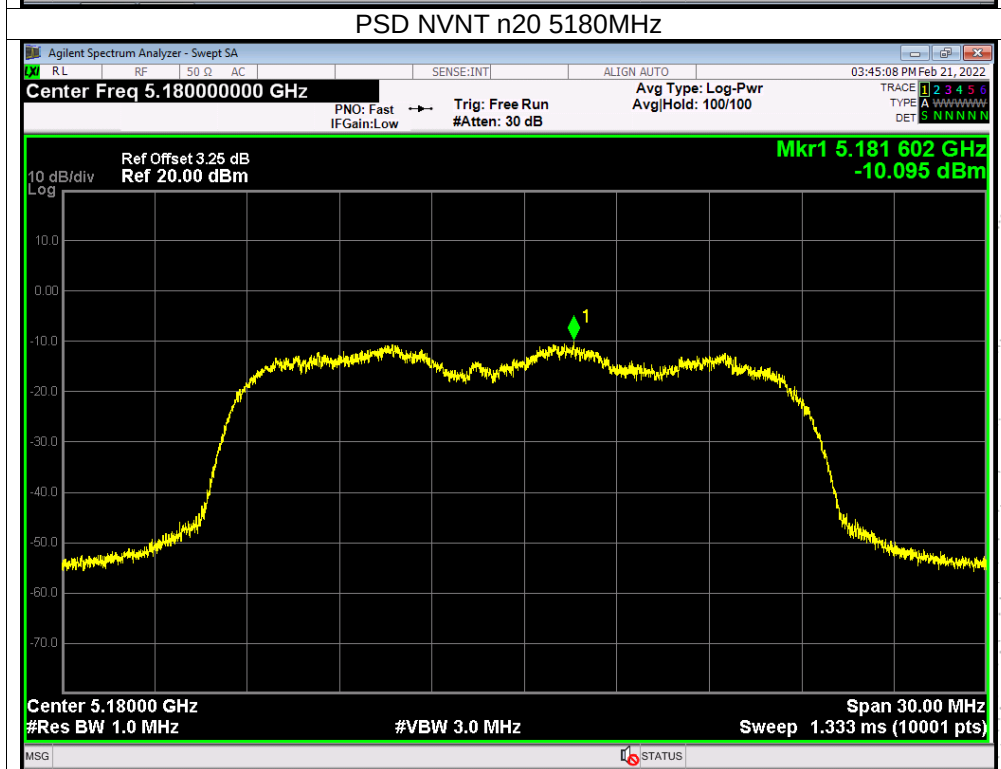
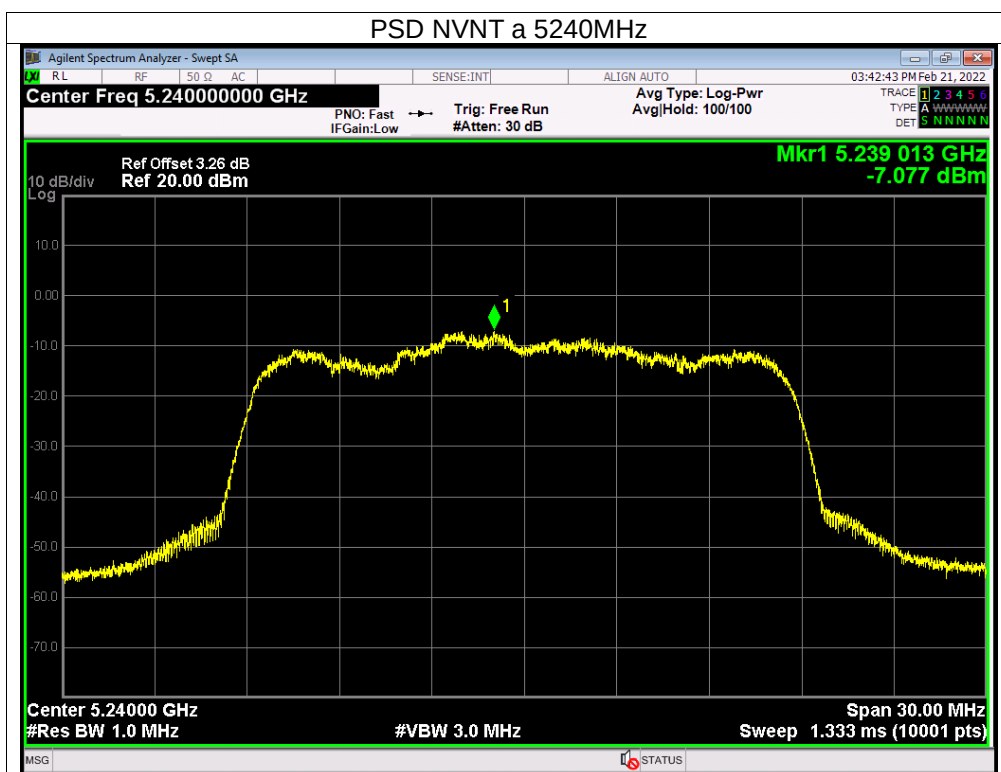
8.5 Test Result

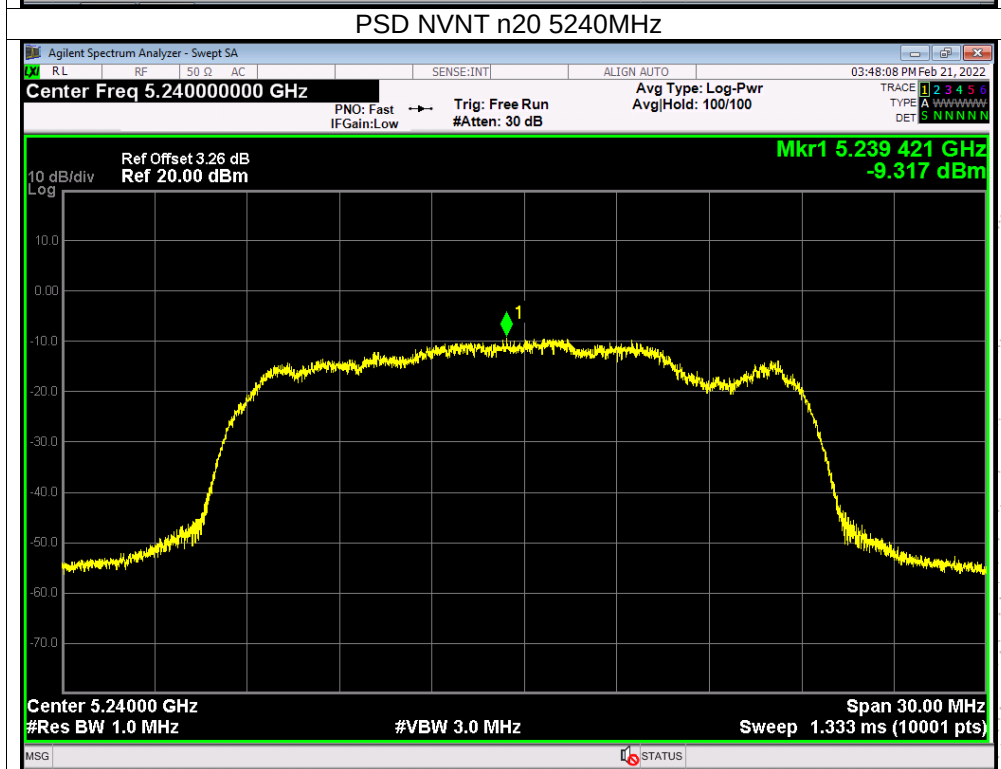
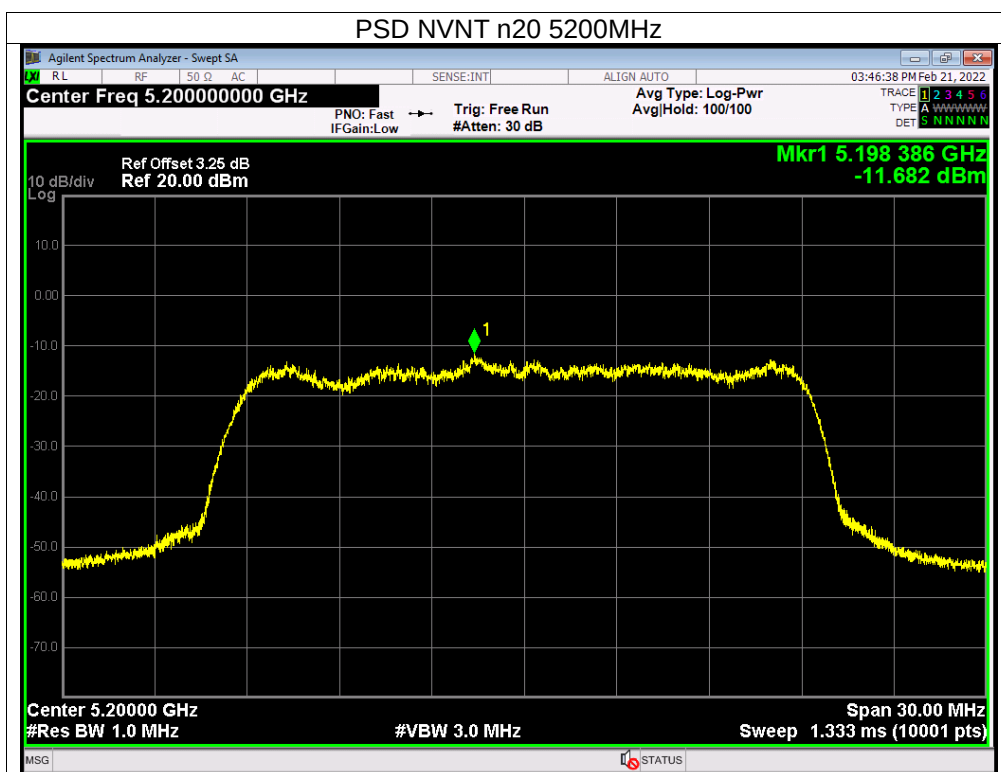
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage:	DC 12V
Test Mode:	(5180-5240MHz); (5745-5825MHz)		

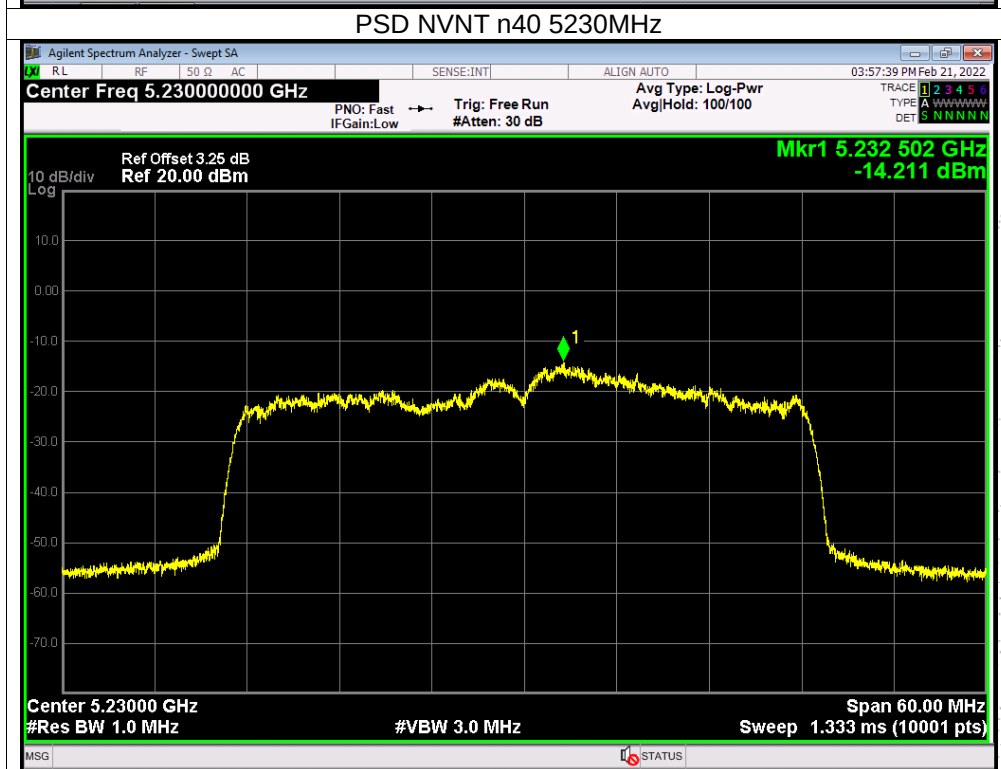
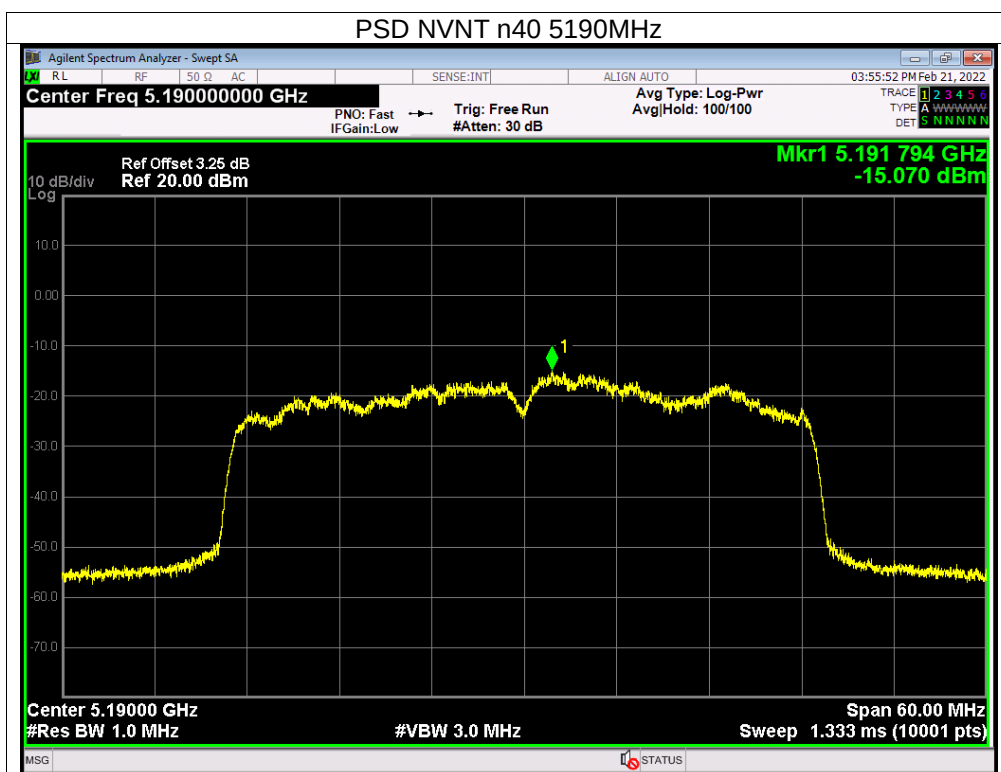
Condition	Mode	Frequency (MHz)	Conducted PSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
NVNT	a	5180	-9.11	11	Pass
NVNT	a	5200	-10.27	11	Pass
NVNT	a	5240	-7.08	11	Pass
NVNT	n20	5180	-10.1	11	Pass
NVNT	n20	5200	-11.68	11	Pass
NVNT	n20	5240	-9.32	11	Pass
NVNT	n40	5190	-15.07	11	Pass
NVNT	n40	5230	-14.21	11	Pass
NVNT	ac20	5180	-9.24	11	Pass
NVNT	ac20	5200	-8.51	11	Pass
NVNT	ac20	5240	-9.37	11	Pass
NVNT	ac40	5190	-13.63	11	Pass
NVNT	ac40	5230	-16.01	11	Pass
NVNT	ac80	5210	-18.17	11	Pass

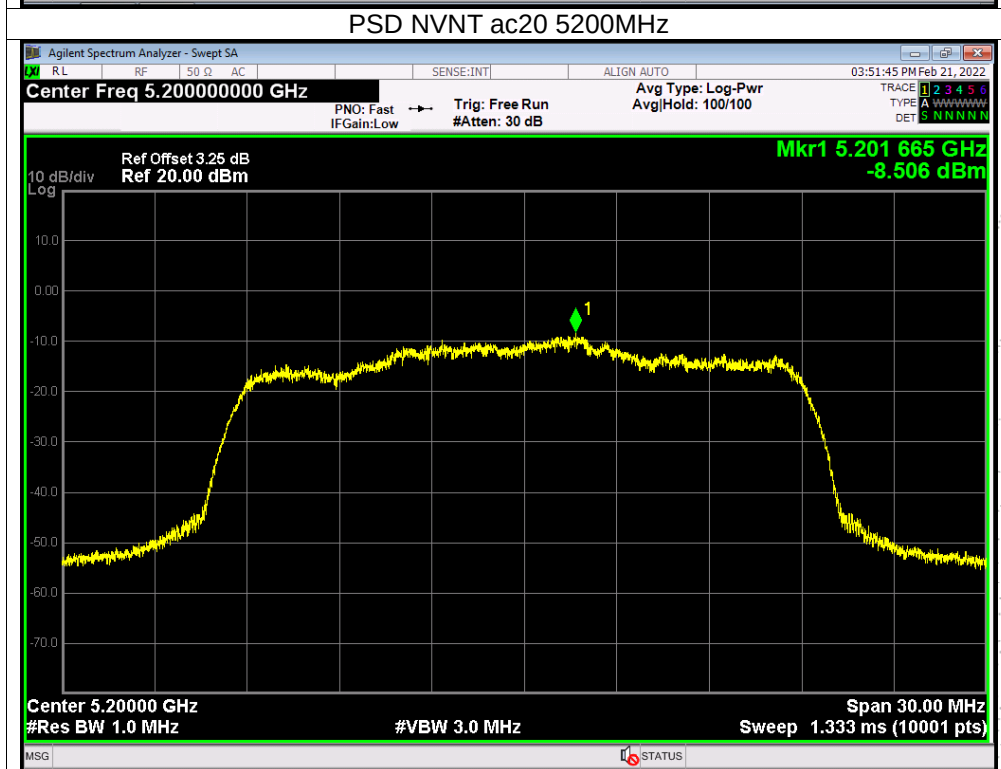
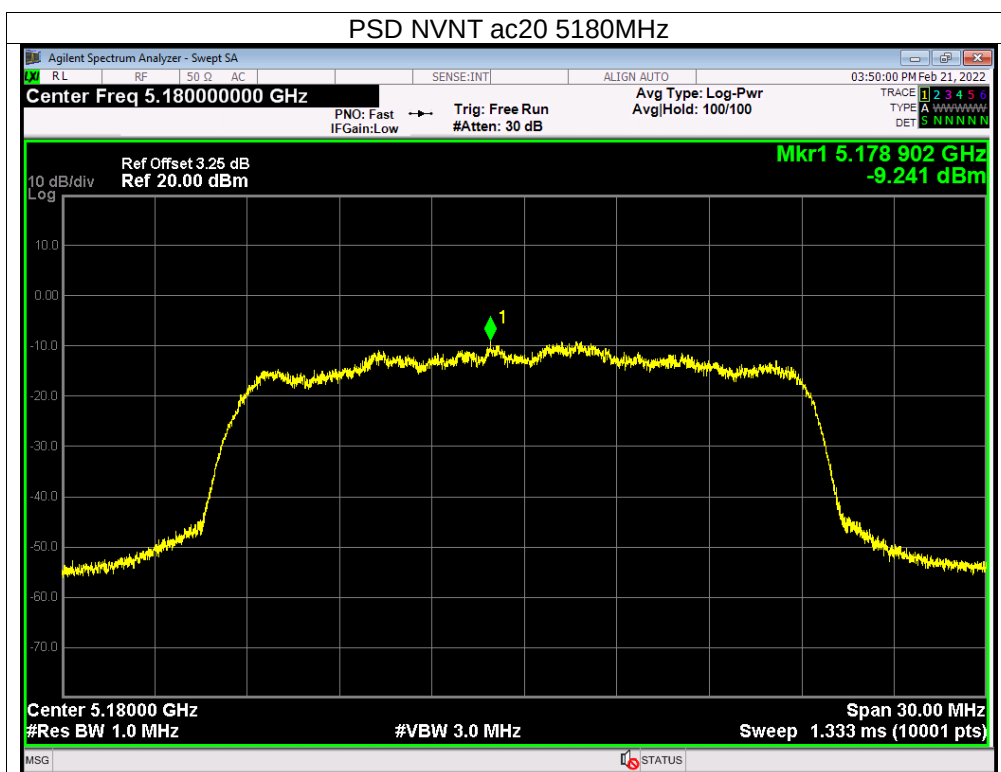
Condition	Mode	Frequency (MHz)	Conducted PSD (dBm/500kHz)	Limit (dBm/500kHz)	Verdict
NVNT	a	5745	-0.32	30	Pass
NVNT	a	5785	-0.85	30	Pass
NVNT	a	5825	-1.03	30	Pass
NVNT	n20	5745	-1.03	30	Pass
NVNT	n20	5785	-0.98	30	Pass
NVNT	n20	5825	-1.59	30	Pass
NVNT	n40	5755	-4.38	30	Pass
NVNT	n40	5795	-4.68	30	Pass
NVNT	ac20	5745	-0.54	30	Pass
NVNT	ac20	5785	-1.3	30	Pass
NVNT	ac20	5825	-1.84	30	Pass
NVNT	ac40	5755	-4.38	30	Pass
NVNT	ac40	5795	-5.39	30	Pass
NVNT	ac80	5775	-8.91	30	Pass

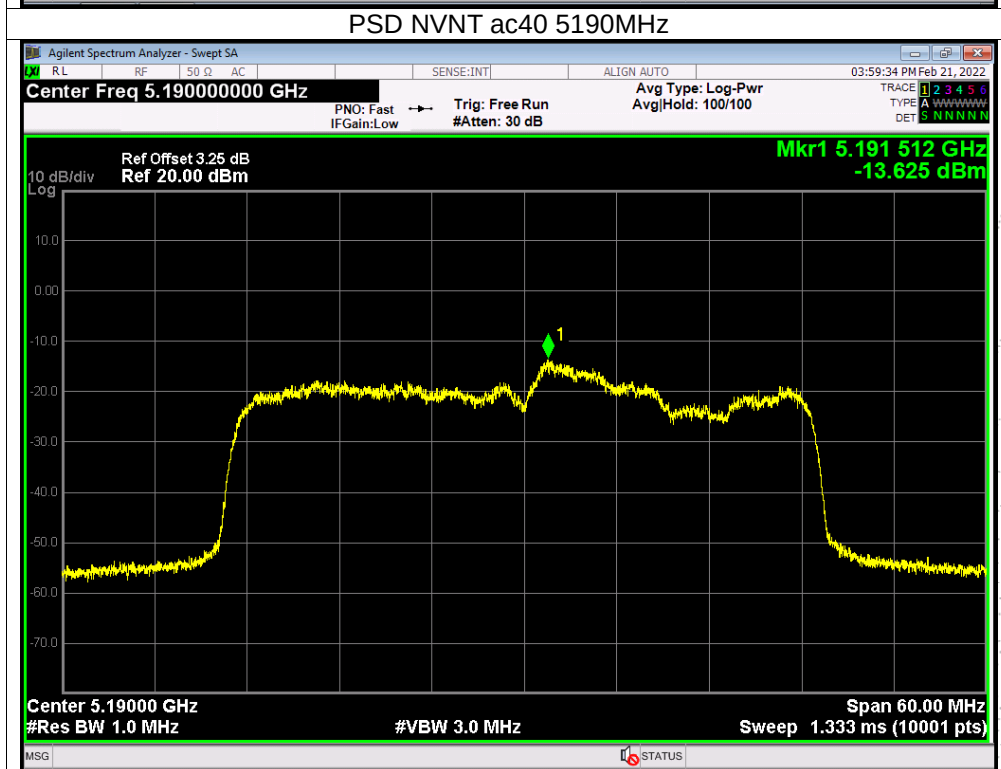
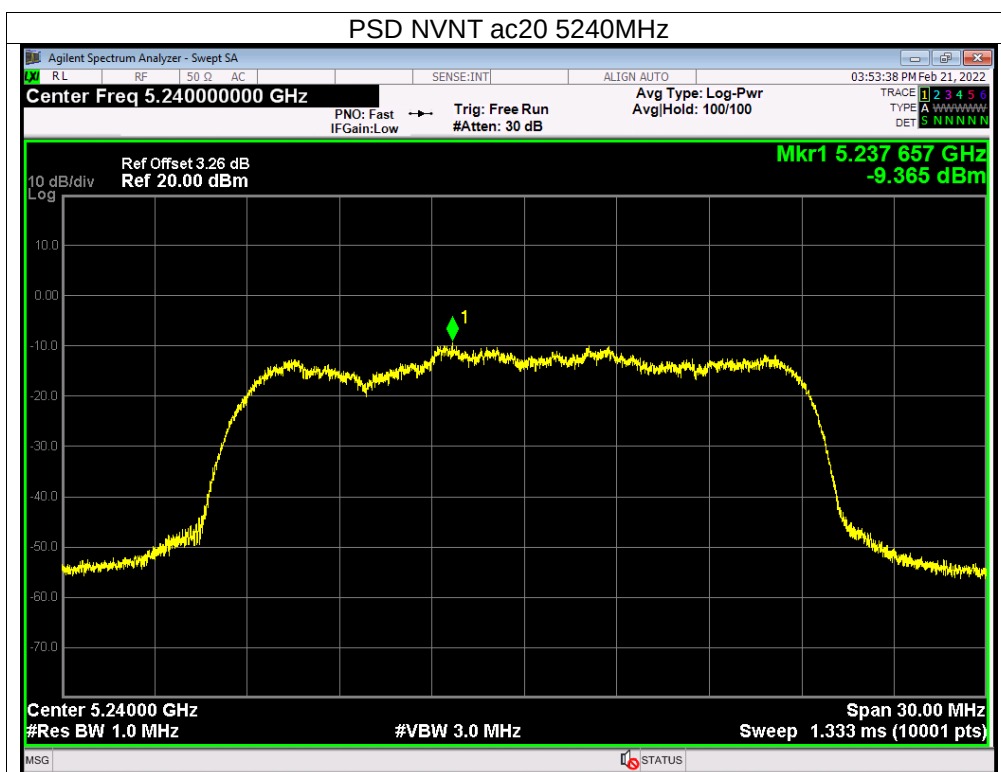


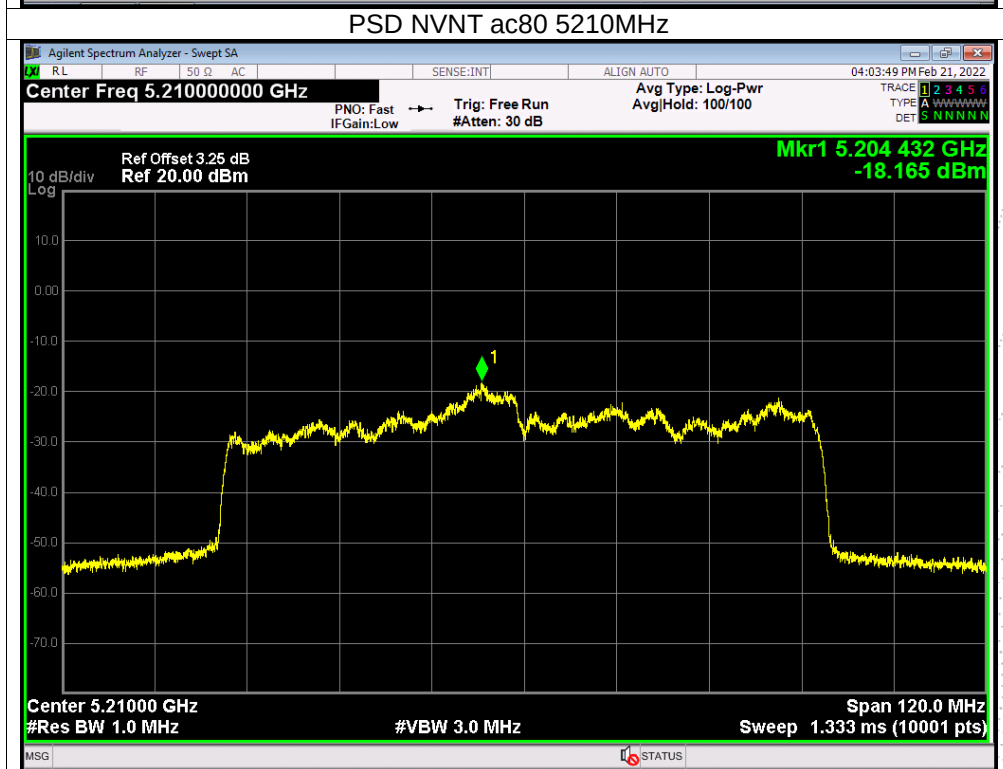
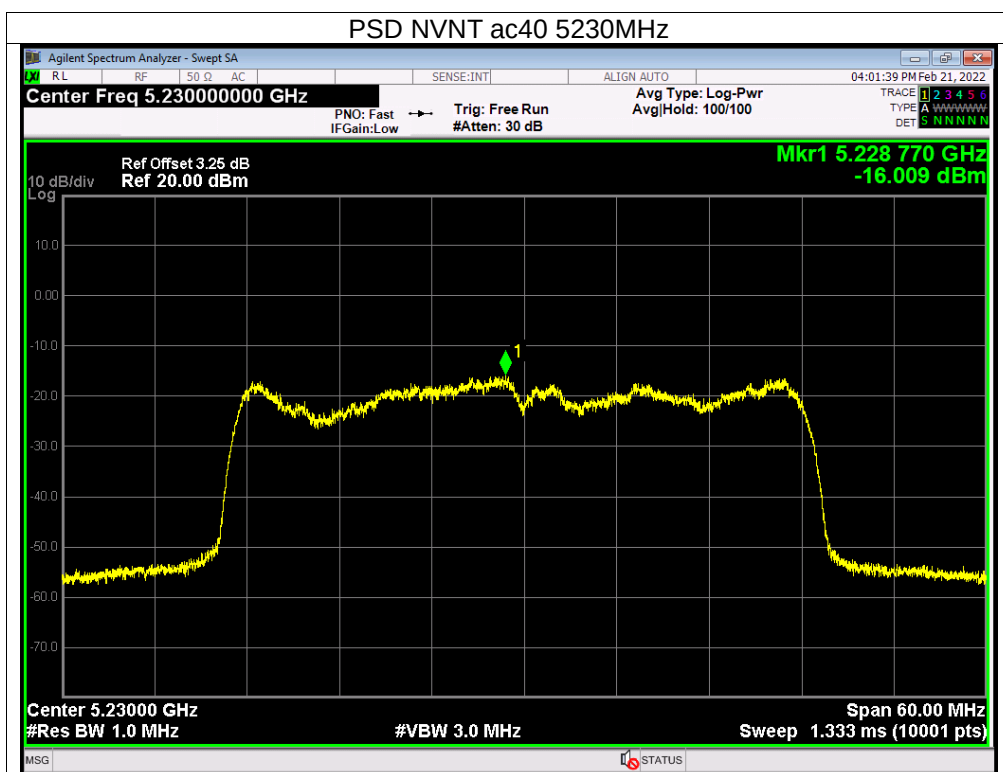


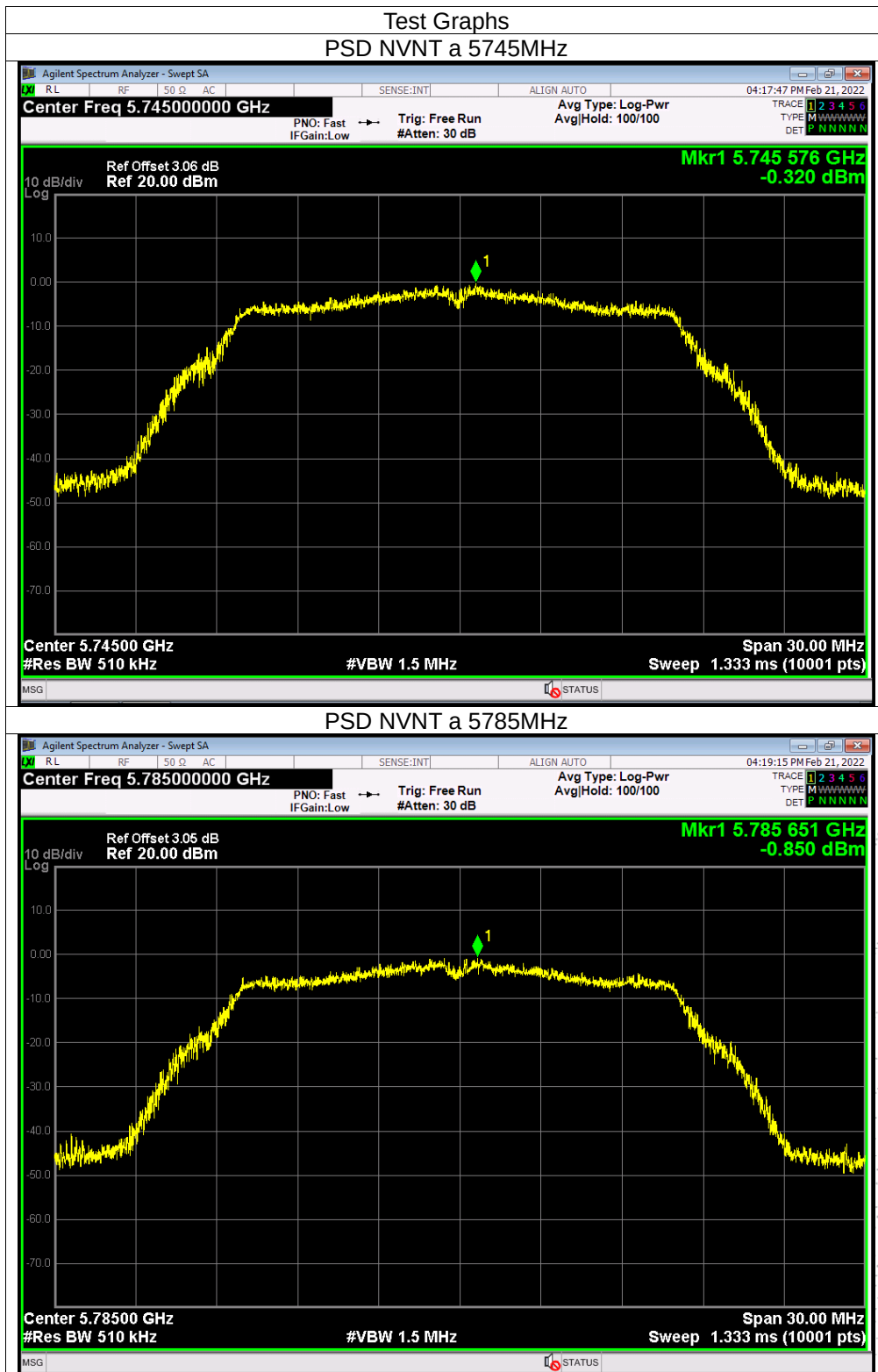


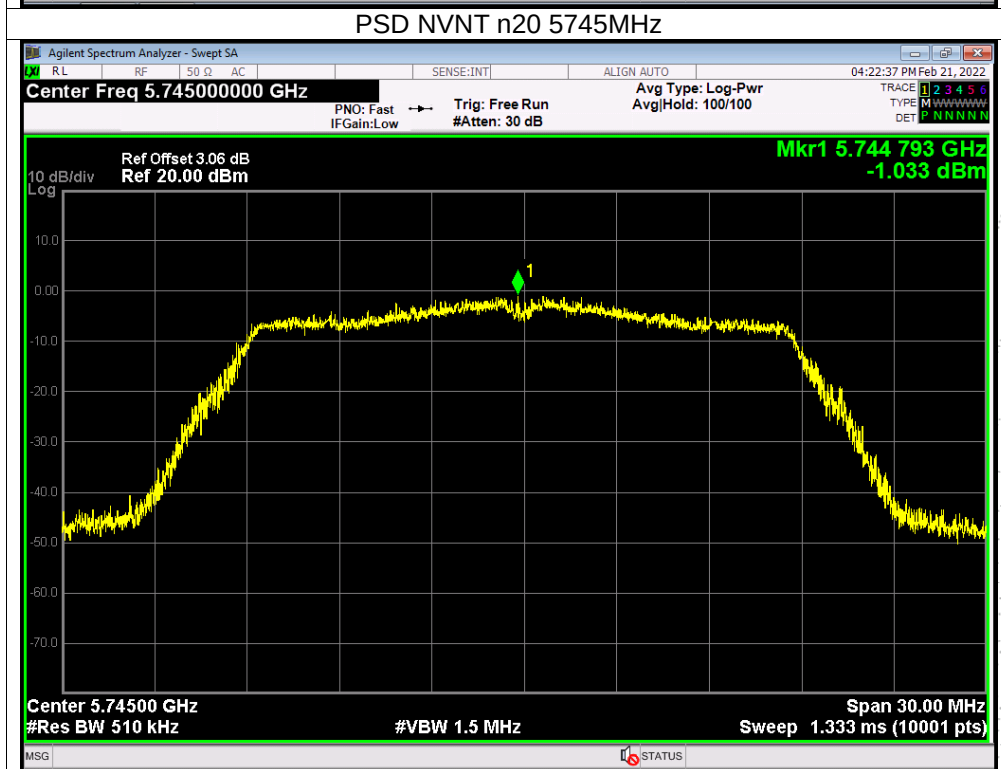
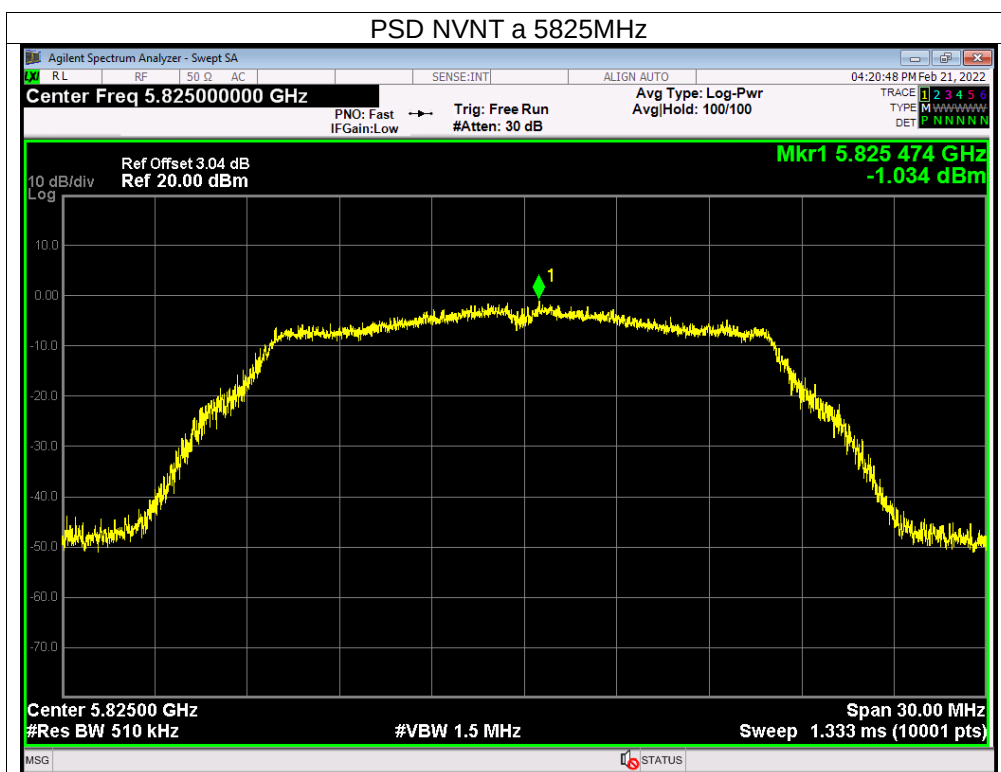


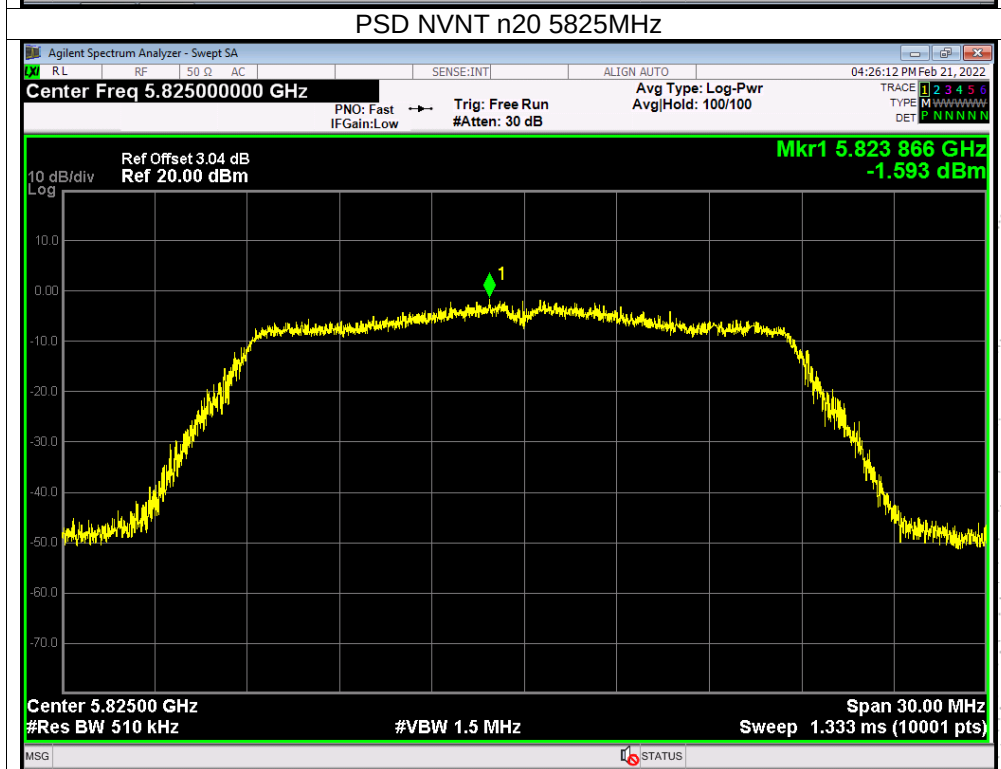
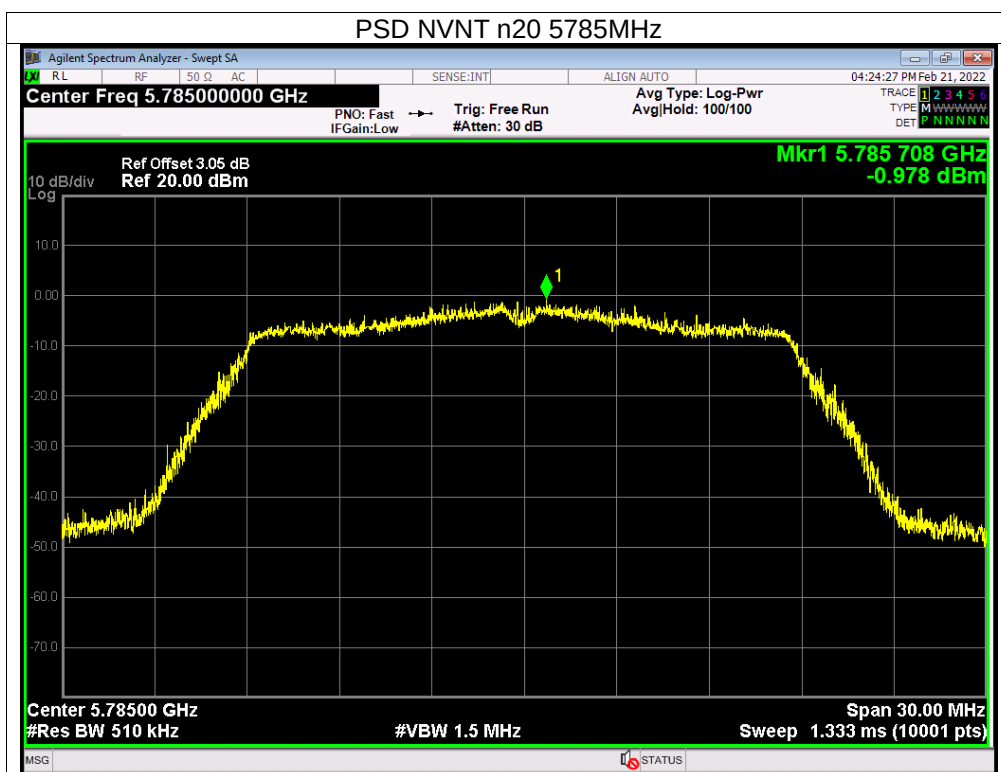


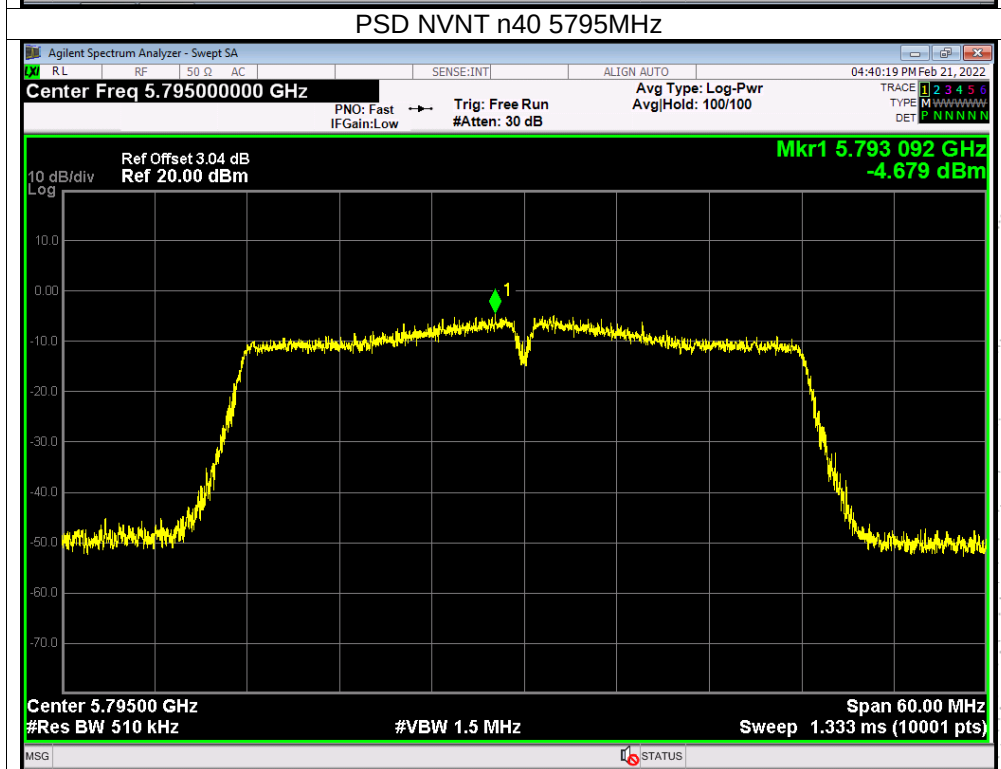
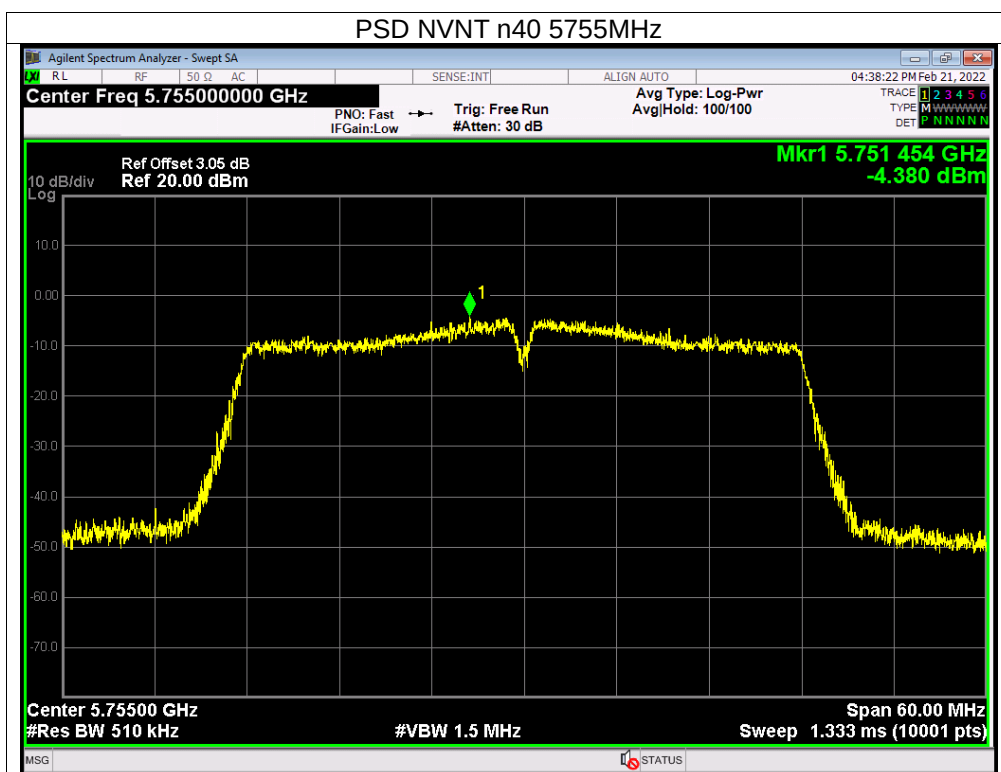


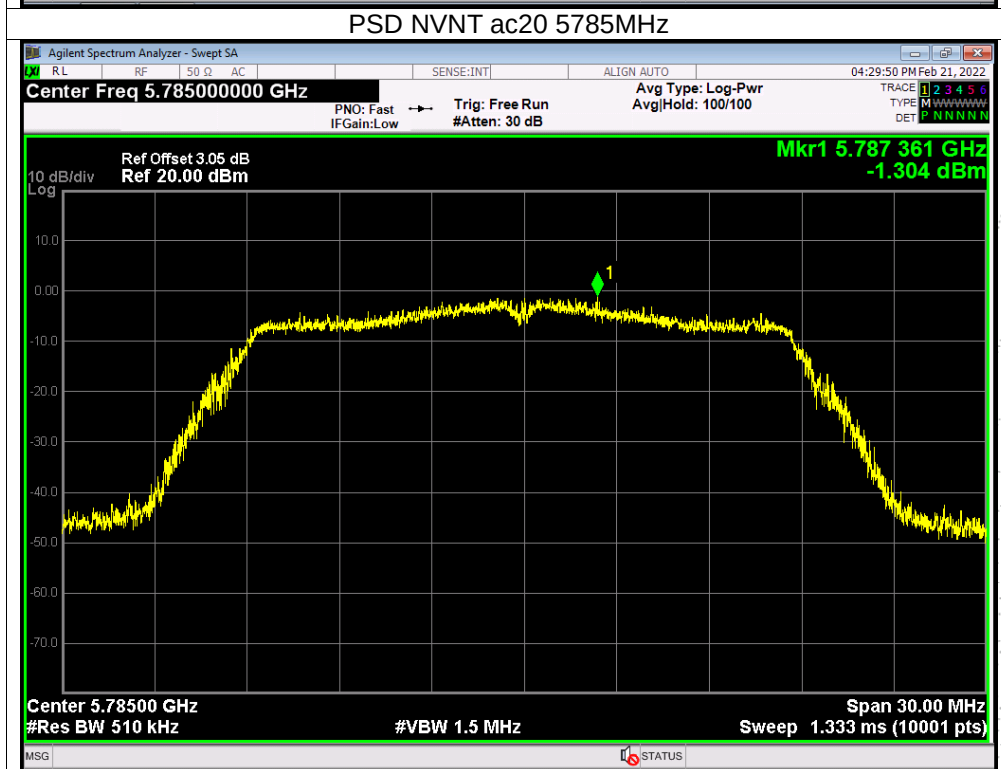
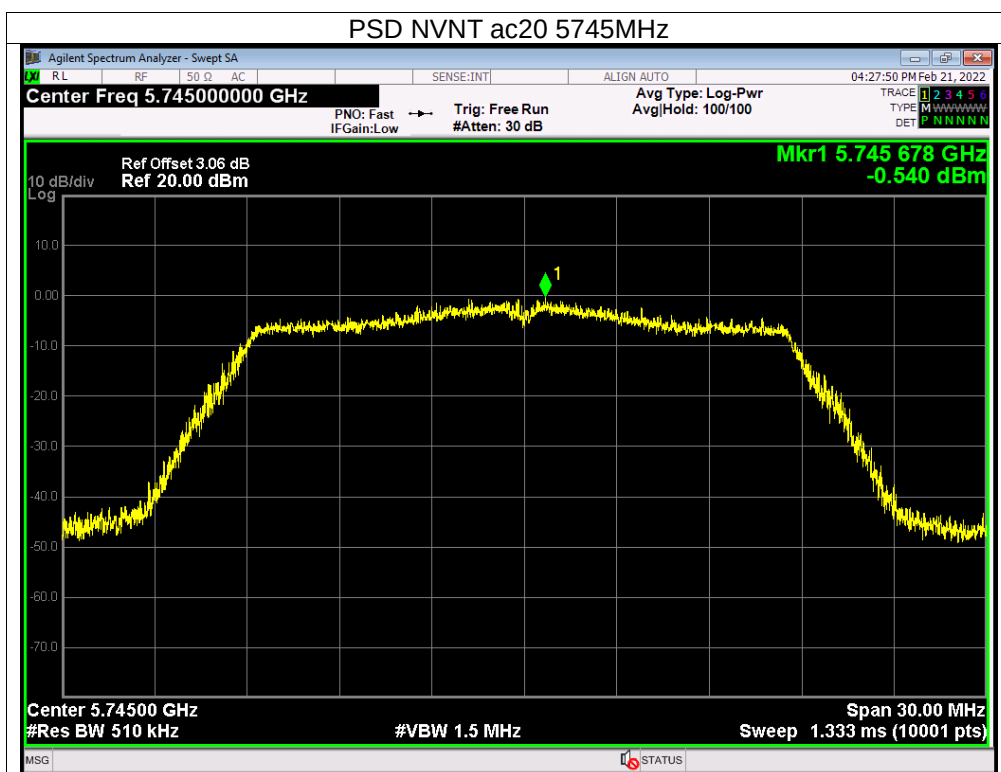


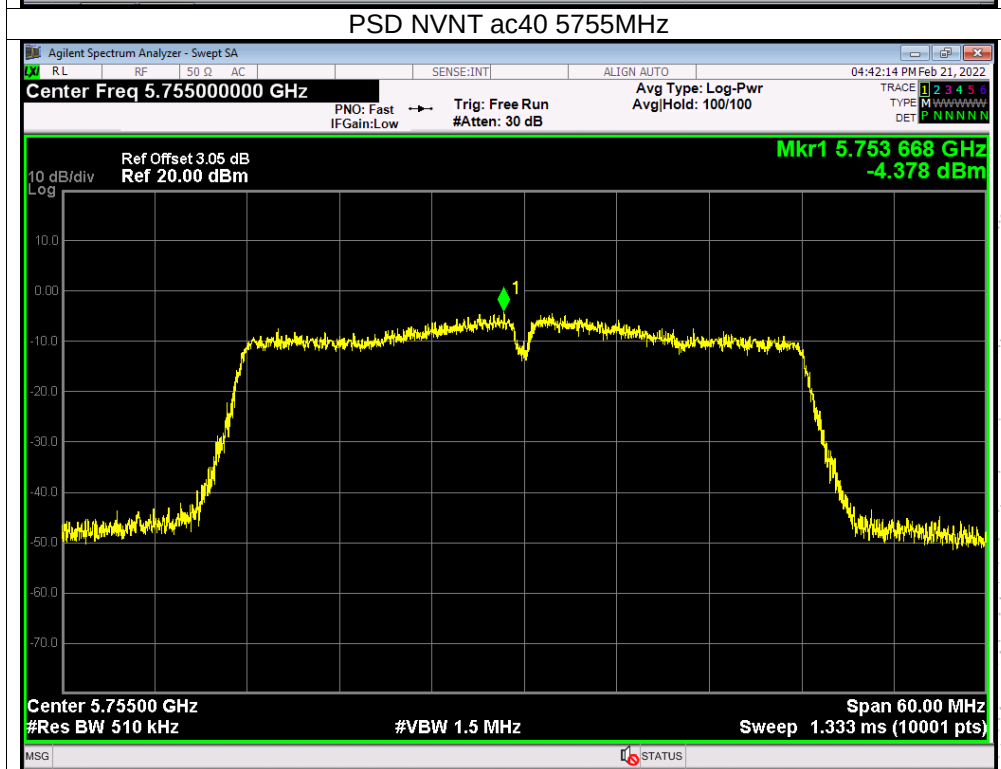
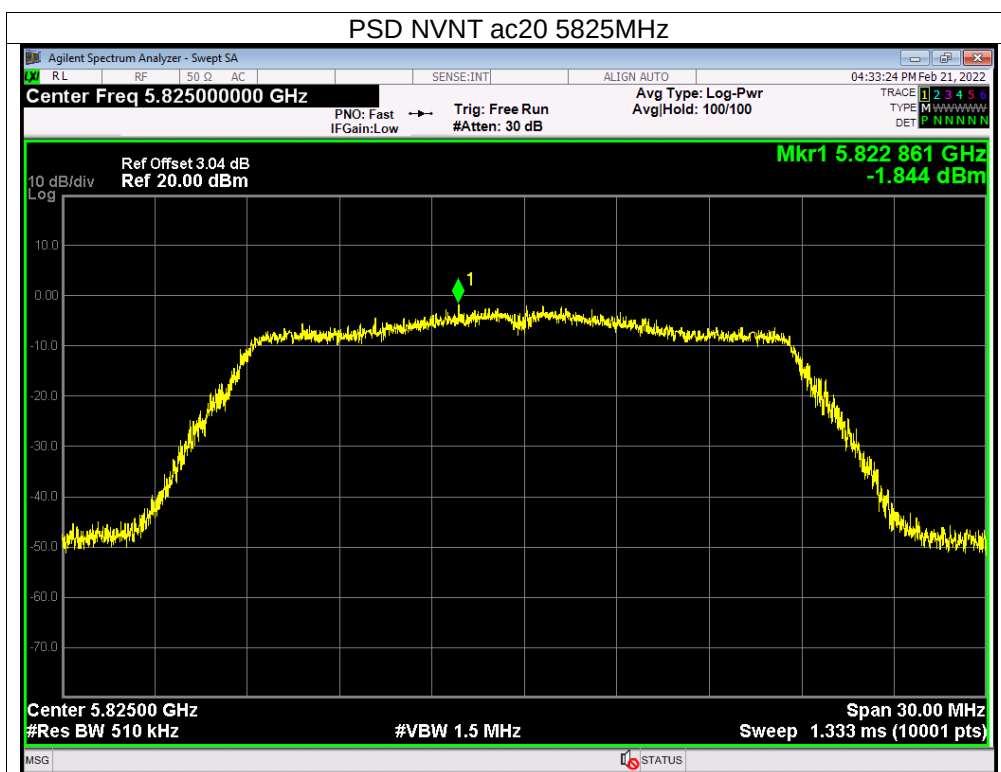


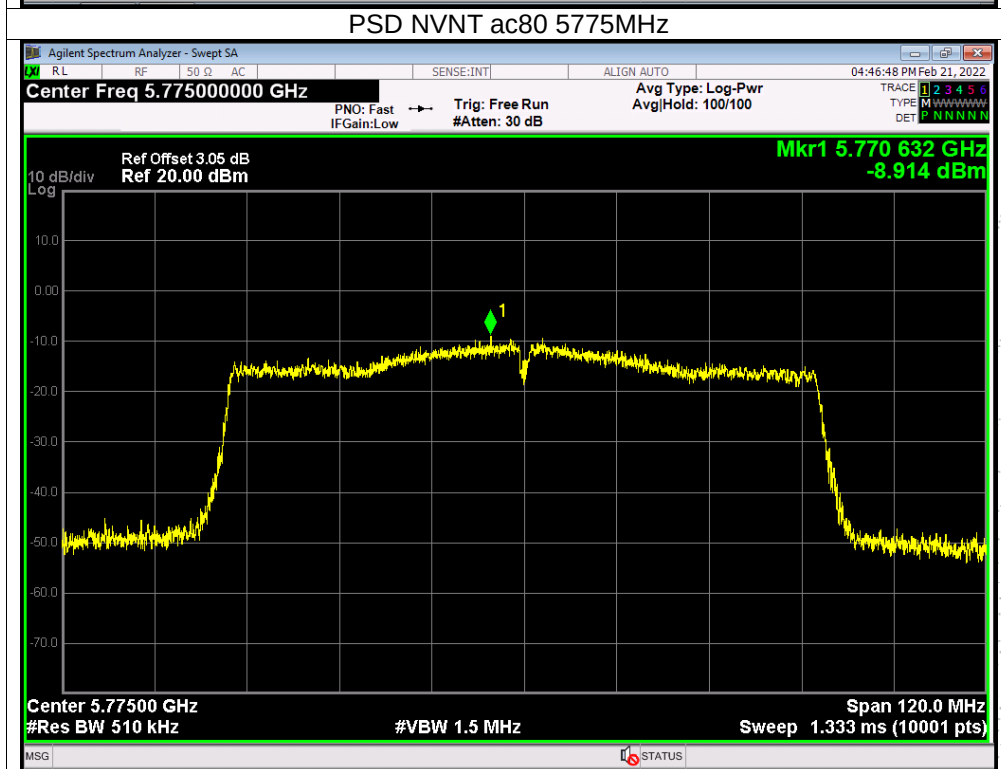
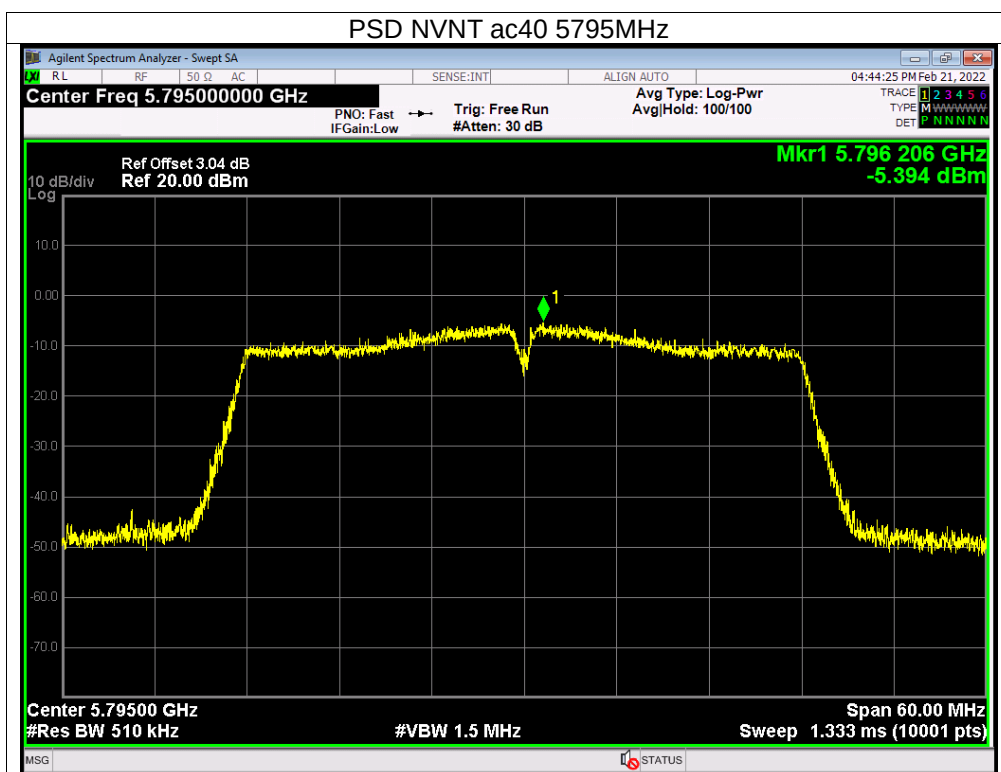






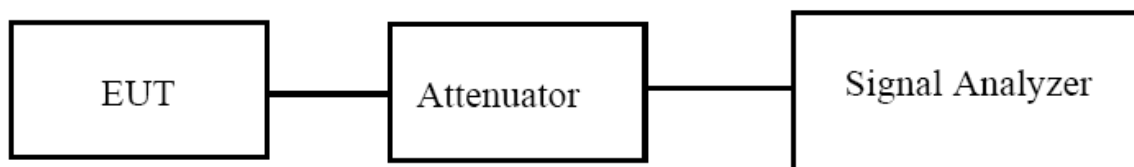






9. 26dB & 6dB & 99% Emission Bandwidth

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 $\geq 3 \cdot$ 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 °C	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage:	DC 12V
Test Mode:	(5180-5240MHz)		

Condition	Mode	Frequency (MHz)	-26 dB Bandwidth (MHz)	Limit -26 dB Bandwidth (MHz)	Verdict
NVNT	a	5180	20.979	\	Pass
NVNT	a	5200	21.093	\	Pass
NVNT	a	5240	21.011	\	Pass
NVNT	n20	5180	21.464	\	Pass
NVNT	n20	5200	21.45	\	Pass
NVNT	n20	5240	21.431	\	Pass
NVNT	n40	5190	38.931	\	Pass
NVNT	n40	5230	38.997	\	Pass
NVNT	ac20	5180	21.164	\	Pass
NVNT	ac20	5200	21.532	\	Pass
NVNT	ac20	5240	21.392	\	Pass
NVNT	ac40	5190	38.831	\	Pass
NVNT	ac40	5230	38.988	\	Pass
NVNT	ac80	5210	79.108	\	Pass

Condition	Mode	Frequency (MHz)	99% OBW (MHz)
NVNT	a	5180	16.414
NVNT	a	5200	16.48
NVNT	a	5240	16.45
NVNT	n20	5180	17.612
NVNT	n20	5200	17.643
NVNT	n20	5240	17.629
NVNT	n40	5190	36.032
NVNT	n40	5230	35.979
NVNT	ac20	5180	17.625
NVNT	ac20	5200	17.64
NVNT	ac20	5240	17.617
NVNT	ac40	5190	36.01
NVNT	ac40	5230	36.004
NVNT	ac80	5210	75.151

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage:	DC 12V
Test Mode:	(5745-5825MHz)		

Condition	Mode	Frequency (MHz)	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	a	5745	15.806	0.5	Pass
NVNT	a	5785	16.046	0.5	Pass
NVNT	a	5825	16.278	0.5	Pass
NVNT	n20	5745	16.019	0.5	Pass
NVNT	n20	5785	16.915	0.5	Pass
NVNT	n20	5825	15.706	0.5	Pass
NVNT	n40	5755	35.352	0.5	Pass
NVNT	n40	5795	35.482	0.5	Pass
NVNT	ac20	5745	17.001	0.5	Pass
NVNT	ac20	5785	16.77	0.5	Pass
NVNT	ac20	5825	15.501	0.5	Pass
NVNT	ac40	5755	35.141	0.5	Pass
NVNT	ac40	5795	35.122	0.5	Pass
NVNT	ac80	5775	75.184	0.5	Pass

Condition	Mode	Frequency (MHz)	99% OBW (MHz)
NVNT	a	5745	16.493
NVNT	a	5785	16.466
NVNT	a	5825	16.451
NVNT	n20	5745	17.656
NVNT	n20	5785	17.642
NVNT	n20	5825	17.604
NVNT	n40	5755	36.033
NVNT	n40	5795	35.994
NVNT	ac20	5745	17.663
NVNT	ac20	5785	17.664
NVNT	ac20	5825	17.646
NVNT	ac40	5755	36.057
NVNT	ac40	5795	36.022
NVNT	ac80	5775	75.24



