



RF TEST REPORT

Product Name: Wi-Fi Module

Model Number: WS8712, WS8712X, WS8712P, WS8712X-C5, WS8712P-C5, WS8712X-C6, WS8712P-C6, WS8712x

FCC ID: 2BB8U-WS8712

Issued For : Chengdu Silent Smart Technology Co., Ltd.

303-7, Floor 3, Building 12, No.38, South Jinke Road, Jinniu
Hi-tech Industrial Park, Chengdu, Sichuan, China

Issued By : Shenzhen LGT Test Service Co., Ltd.

Room 205, Building 13, Zone B, Zhenxiong Industrial Park,
No.177, Renmin West Road, Jinsha, Kengzi Street, Pingshan
District, Shenzhen, Guangdong, China

Report Number: LGT26D180RF06

Sample Received Date: April 28, 2026

Date of Test: April 28, 2026 ~ May 18, 2026

Date of Issue: May 18, 2026

The test report is effective only with both signature and specialized stamp. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report only apply to the tested sample.

Shenzhen LGT Test Service Co., Ltd. Tel: 0755-89668180 E-mail: lgt@lgt-cert.com Web: www.lgt-cert.com
Room 205, Building 13, Zone B, Zhenxiong Industrial Park, No.177, Renmin West Road, Jinsha, Kengzi Street, Pingshan District,
Shenzhen, Guangdong, China



TEST REPORT CERTIFICATION

Applicant: Chengdu Silent Smart Technology Co., Ltd.
Address: 303-7, Floor 3, Building 12, No.38, South Jinke Road, Jinniu Hi-tech Industrial Park, Chengdu, Sichuan, China
Manufacturer: Chengdu Silent Smart Technology Co., Ltd.
Address: 303-7, Floor 3, Building 12, No.38, South Jinke Road, Jinniu Hi-tech Industrial Park, Chengdu, Sichuan, China
Product Name: Wi-Fi Module
Trademark: Silent Smart
Model Number: WS8712, WS8712X, WS8712P, WS8712X-C5, WS8712P-C5, WS8712X-C6, WS8712P-C6, WS8712x
Sample Status: Normal

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC Part 15.407, Subpart E ANSI C63.10-2020	PASS

Prepared by:

chris chen

Chris Chen
Engineer

Approved by:

Vita Li

Vita Li
Technical Director





Table of Contents

Page

1 . SUMMARY OF TEST RESULTS	6
1.1 TEST LABORATORY	7
1.2 MEASUREMENT UNCERTAINTY	7
2 . GENERAL INFORMATION	8
2.1 GENERAL DESCRIPTION OF THE EUT	8
2.2 DESCRIPTION OF TEST MODES	10
2.3 TEST SOFTWARE AND POWER LEVEL	11
2.4 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS	11
2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS	12
3 . EMC EMISSION TEST	14
3.1 CONDUCTED EMISSION MEASUREMENT	14
3.2 RADIATED EMISSION AND (BANDEDGE) MEASUREMENT	18
4. POWER SPECTRAL DENSITY TEST	29
4.1 LIMIT	29
4.2 TEST PROCEDURE	29
4.3 DEVIATION FROM STANDARD	29
4.4 TEST SETUP	30
4.5 EUT OPERATION CONDITIONS	30
4.6 TEST RESULTS	30
5. BANDWIDTH MEASUREMENT	31
5.1 EMISSION BANDWIDTH (EBW) 26 BANDWID PROCEDURES / LIMIT	31
5.2 OCCUPIED BANDWIDTH (99%) TEST APPLIED PROCEDURES / LIMIT	32
5.3 MINIMUM EMISSION BANDWIDTH(6 DB) PROCEDURES / LIMIT	33
6. MAXIMUM CONDUCTED OUTPUT POWER	34
6.1 LIMIT	34
6.2 TEST PROCEDURE	34
6.3 DEVIATION FROM STANDARD	34
6.4 TEST SETUP	35
6.5 EUT OPERATION CONDITIONS	35
6.6 TEST RESULTS	35
7. CONDUCTED BANDEDGE	36
7.1 LIMIT	36
7.2 TEST PROCEDURE	36
7.3 DEVIATION FROM STANDARD	36



7.4 TEST SETUP	36
7.5 EUT OPERATION CONDITIONS	36
7.6 TEST RESULTS	36
8. AUTOMATICALLY DISCONTINUE TRANSMISSION	37
8.1 LIMIT OF AUTOMATICALLY DISCONTINUE TRANSMISSION	37
8.2 TEST RESULT OF AUTOMATICALLY DISCONTINUE TRANSMISSION	37
9. ANTENNA REQUIREMENT	38
9.1 STANDARD REQUIREMENT	38
9.2 EUT ANTENNA	38
APPENDIX I - TEST RESULTS	39
DUTY CYCLE	39
MAXIMUM CONDUCTED OUTPUT POWER	48
-26DB BANDWIDTH	57
OCCUPIED CHANNEL BANDWIDTH	62
MAXIMUM POWER SPECTRAL DENSITY LEVEL	71
BAND EDGE	80
-6DB BANDWIDTH	87
APPENDIX II - MEASUREMENT PHOTOS	92



Revision History

Rev.	Issue Date	Revisions
00	May 18, 2026	Initial Issue



1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

Part 15.407, KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

FCC Part 15.407		
FCC standard	Test Item	Results
15.207	AC Conducted Emission	PASS
15.407 (a) /15.407 (e)	26dB/6dB &99% Bandwidth	PASS
15.407(a)	Maximum Conducted Output Power	PASS
15.407(b)/15.205/15.209	Radiated Emission And (bandedge Emissions) Measurement	PASS
15.407(a)	Power Spectral Density	PASS
15.407(c)	Automatically Discontinue Transmission	PASS
15.203/15.204	Antenna Requirement	PASS

NOTE:

- (1) 'N/A' denotes test is not applicable in this Test Report.
- (2) All tests are according to ANSI C63.10-2020.
- (3) Manufacturers 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 users manual.



1.1 TEST LABORATORY

Company Name:	Shenzhen LGT Test Service Co., Ltd.
Address:	Room 205, Building 13, Zone B, Zhenxiong Industrial Park, No.177, Renmin West Road, Jinsha, Kengzi Street, Pingshan District, Shenzhen, Guangdong, China
Accreditation Certificate:	FCC Registration No.: 746540
	CAB ID: CN0136

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95** %.

No.	Item	Uncertainty
1	Occupied Channel Bandwidth	$\pm 0.46\%$
2	RF Output Power, Conducted	$\pm 0.71\text{dB}$
3	Power Spectral Density, Conducted	$\pm 1.57\text{dB}$
4	Unwanted Emission, Conducted	$\pm 0.63\text{dB}$
5	Conducted emission	$\pm 2.80\text{dB}$
6	All Emissions, Radiated (0.009-30MHz)	$\pm 2.16\text{dB}$
7	All Emissions, Radiated (30MHz-1GHz)	$\pm 4.61\text{dB}$
8	All Emissions, Radiated (1GHz-18GHz)	$\pm 5.49\text{dB}$
9	All Emissions, Radiated (18GHz-40GHz)	$\pm 4.31\text{dB}$
10	Temperature	$\pm 0.5^{\circ}\text{C}$
11	Humidity	$\pm 2\%$
12	Duty Cycle	$\pm 2.3\%$

Note: The measurement uncertainty is not included in the test result.



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name:	Wi-Fi Module	
Test Model Number:	WS8712	
Series Number:	WS8712X, WS8712P, WS8712X-C5, WS8712P-C5, WS8712X-C6, WS8712P-C6, WS8712x	
Model Difference:	Size difference.	
Product Description:	Operation Frequency:	IEEE 802.11a/n(HT20)/ac(VHT20) /ax(HE20): 5.180GHz-5.240GHz IEEE 802.11a/n(HT20)/ac(VHT20)/ax(HE20): 5.745GHz-5.825GHz
	Modulation Type:	802.11a(OFDM): BPSK, QPSK, 16-QAM, 64-QAM 802.11n(OFDM): BPSK, QPSK, 16-QAM, 64-QAM 802.11ac (OFDM): BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM 802.11ax(OFDM): BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024-QAM
	Antenna Designation:	Dipole Antenna
	Antenna Gain(dBi)	4.61
	More details of EUT technical specification, please refer to the User Manual.	
Test Channel:	Please refer to the Note 3.	
Rating:	Input: DC 3.3V 500mA	
Hardware Version:	V1.0	
Software Version:	V1.1	
Connecting I/O Port(s):	Please refer to the Note 1.	



Note

1. For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.
2. The antenna information refers to the manufacturer provide report, applicable only to the tested sample identified in the report. Due to the incorrect antenna information, a series of problems such as the accuracy of the test results will be borne by the customer.

3.

Operation Frequency of channel			
5.180GHz-5.240GHz		5.745GHz-5.825GHz	
Channel	Frequency	Channel	Frequency
36	5180	149	5745
38	5190	151	5755
40	5200	153	5765
42	5210	157	5785
44	5220	159	5795
46	5230	161	5805
48	5240	165	5825

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Carrier Frequency Channel

Channel List for 802.11a/n/ac/ax(20MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	--	--	--	--	149	5745
40	5200	--	--	--	--	157	5785
48	5240	--	--	--	--	165	5825



2.2 DESCRIPTION OF TEST MODES

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

Worst Mode	Description	Data Rate
Mode 1	TX IEEE 802.11a HT20 CH36&CH40&CH48	6 Mbps
Mode 2	TX IEEE 802.11a HT20 CH149&CH157&CH165	6 Mbps
Mode 3	TX IEEE 802.11n HT20 CH36&CH40&CH48	MCS 0
Mode 4	TX IEEE 802.11ac VHT20&ax HE20 CH36&CH40&CH48	NSS1 MCS0
Mode 5	TX IEEE 802.11n HT20 CH149&CH157&CH165	MCS 0
Mode 6	TX IEEE 802.11ac VHT20&ax HE20 CH149&CH157&CH165	NSS1 MCS0

- Note: (1) The measurements are performed at the highest, middle, lowest available channels.
(2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.
(3) We have been tested for all available U.S. voltage and frequencies (For 120V, 50/60Hz and 240V, 50/60Hz) for which the device is capable of operation.
(4) The battery is fully-charged during the radiated and RF conducted test.
(5) All bandwidth modes have been tested, and the report only shown the worst mode data.
(6) The 802.11ax mode is investigated among different tones (26/52/106/242-tone RU channel), full resource units (RU), partial resource units. The partial RU has no higher power than full RU's, thus the full RU is chosen as main test configuration.

AC Conducted Emission

Test Case	
AC Conducted Emission	Mode 7: TX Mode



2.3 TEST SOFTWARE AND POWER LEVEL

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

Test software Version	Test program: 5G WIFI U-NII-1	
simplelink-wifi-toolbox V4.1.16	Mode Or Modulation type	Power setting
	a	18
	n20	16
	ac20	16
	ax20	16
Test software Version	Test program: 5G WIFI U-NII-3	
simplelink-wifi-toolbox V4.1.16	Mode Or Modulation type	Power setting
	a	18
	n20	16
	ac20	16
	ax20	16

2.4 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

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

Accessories Equipment

Description	Manufacturer	Model	S/N	Rating
USB-A to USB-C Cable	N/A	N/A	N/A	1m

Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
Adapter	ASUS	A20045	N/A	Input: 100-240V 50/60Hz 1.6A Output: 5V3A or 9V3A or 12V3A or 15V5A or 20V4.5A
Laptop	ASUS	UX3407Q	N/A	N/A

Note:

- (1) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (2) “YES” means “with core”; “NO” means “without core”.



2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Conducted Emission					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Until
EMI Test Receiver	R&S	ESCI	100458	2026-04-21	2027-04-20
LISN	COM-POWER	LI-115	02032	2026-03-03	2027-03-02
LISN	SCHWARZBECK	NNLK 8122	00160	2026-03-03	2027-03-02
Transient Limiter	CYBERTEK	EM5010A	E2250100049	2026-03-03	2027-03-02
Coaxial cables (9kHz-30MHz)	Juncoax	JMR600- NMNM-2M	N.A	2026-03-03	2027-03-02
Temperature & Humidity	JINGCHUANG	BT-3	N.A	2026-03-05	2027-03-04
Testing Software	EMC-I_V1.5.0.16_SKET				

Radiated Test equipment					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Until
EMI Test Receiver	R&S	ESU8	100372	2026-03-02	2027-03-01
Active loop Antenna	ETS	6502	00049544	2025-03-11	2028-03-10
Spectrum Analyzer	Keysight	N9010B	MY60242508	2026-03-03	2027-03-02
Trilog Broadband Antenna (30M-1G)	SCHWARZBECK	VULB 9168	2705	2024-05-17	2027-05-16
Horn Antenna(1-18G)	SCHWARZBECK	3115	10SL0060	2025-03-10	2028-03-09
Horn Antenna(18- 40G)	SCHWARZBECK	BBHA 9170	685	2023-10-23	2026-10-22
Pre-amplifier(30M- 1G)	EMtrace	RP01A	02019	2026-03-02	2027-03-01
Pre-amplifier(1- 26.5G)	Agilent	8449B	3008A4722	2026-03-02	2027-03-01
Pre-amplifier(18-40G)	SCHWARZBECK	BBV 9721	9721-019	2025-10-20	2026-10-19
Coaxial cables (9kHz-1GHz)	Juncoax	JMR600- NMNM-8M	N.A	2026-03-03	2027-03-02
Coaxial cables (1GHz-18GHz)	TaiHe	UCD460B- NMSM-1M9	N.A	2026-03-03	2027-03-02
Coaxial cables (18GHz-40GHz)	Junkosha Inc.	MWX241- 05000KMSKMS	N.A	2026-03-03	2027-03-02
Temperature& Humidity test chamber	AISRY	LX-1000L	171200018	2025-07-30	2026-07-29
Antenna Tower	SAEMC	BK-4AT-BS-D	SK2021093008	N.A	N.A
Temperature & Humidity	JINGCHUANG	BT-3	N.A	2026-03-05	2027-03-04
Testing Software	EMC-I_V1.5.0.16_SKET				

RF Conducted Test equipment					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Until
Signal Analyzer	Keysight	N9010B	MY60242508	2026-03-03	2027-03-02
Signal Analyzer	Keysight	N9020A	MY50530994	2026-03-02	2027-03-01
Power Sensor	R&S	NRP8S	104963	2026-03-02	2027-03-01
RF Automatic Test system	MW	MW100-RFCB	MW220324LG -33	2026-03-03	2027-03-02
MXG Vector Signal Generator	Keysight	N5182B	MY59100717	2026-03-03	2027-03-02
Temperature& Humidity test chamber	AISRY	LX-1000L	171200018	2025-07-30	2026-07-29



Attenuator	eastsheep	90db	N.A	2026-03-02	2027-03-01
Temperature & Humidity	JINGCHUANG	BT-3	N.A	2026-03-05	2027-03-04
Digital multimeter	MASTECH	MS8261	MBGBC83053	2025-07-30	2026-07-29
DC source	Keysight	E3634A	MY58036468	2026-03-05	2027-03-04
Testing Software	MTS8310_V2.0.0.0_MW				



3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

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

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

0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of “ * ” marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

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



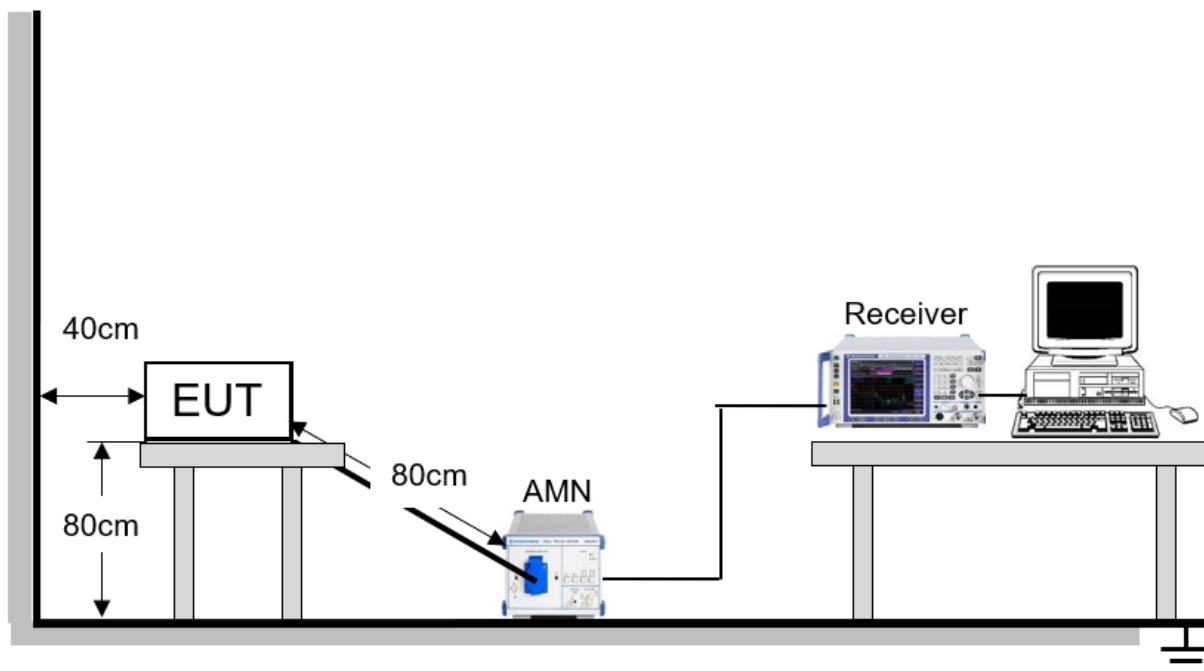
3.1.2 TEST PROCEDURE

- The EUT is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments are powered from additional LISN(s). The LISN provides 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN is at least 80 cm from the nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



3.1.5 EUT OPERATING CONDITIONS

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

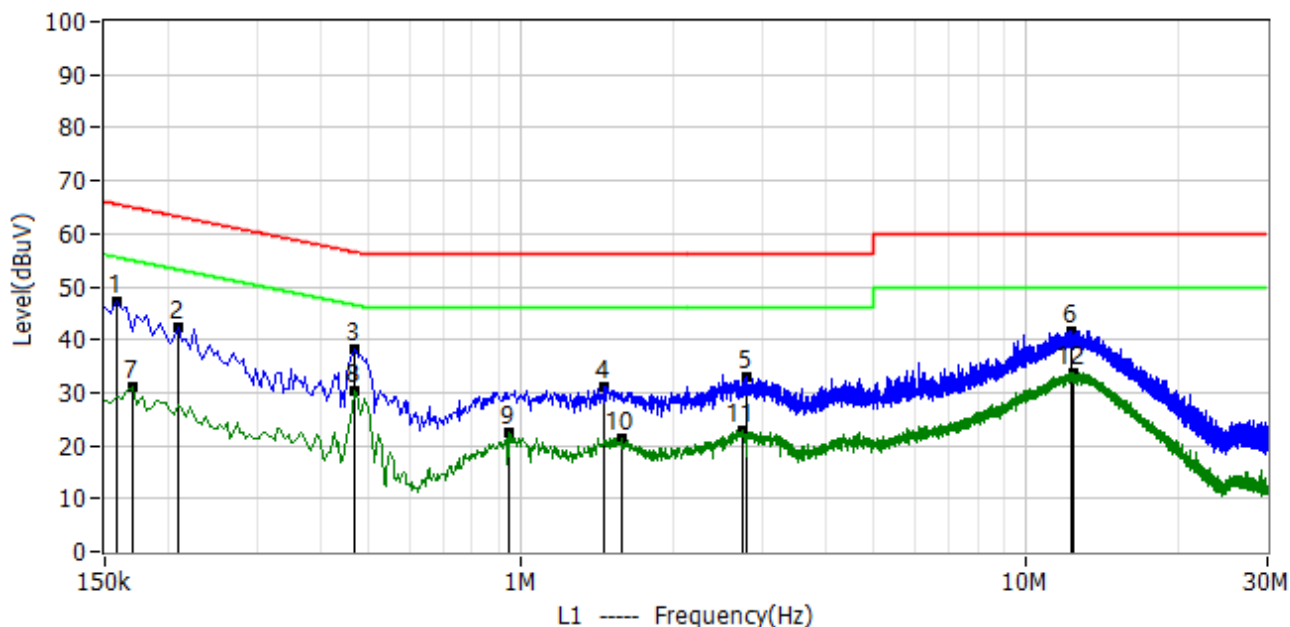


3.1.6 TEST RESULTS

Note: Level = Reading + Factor

Margin = Level – Limit

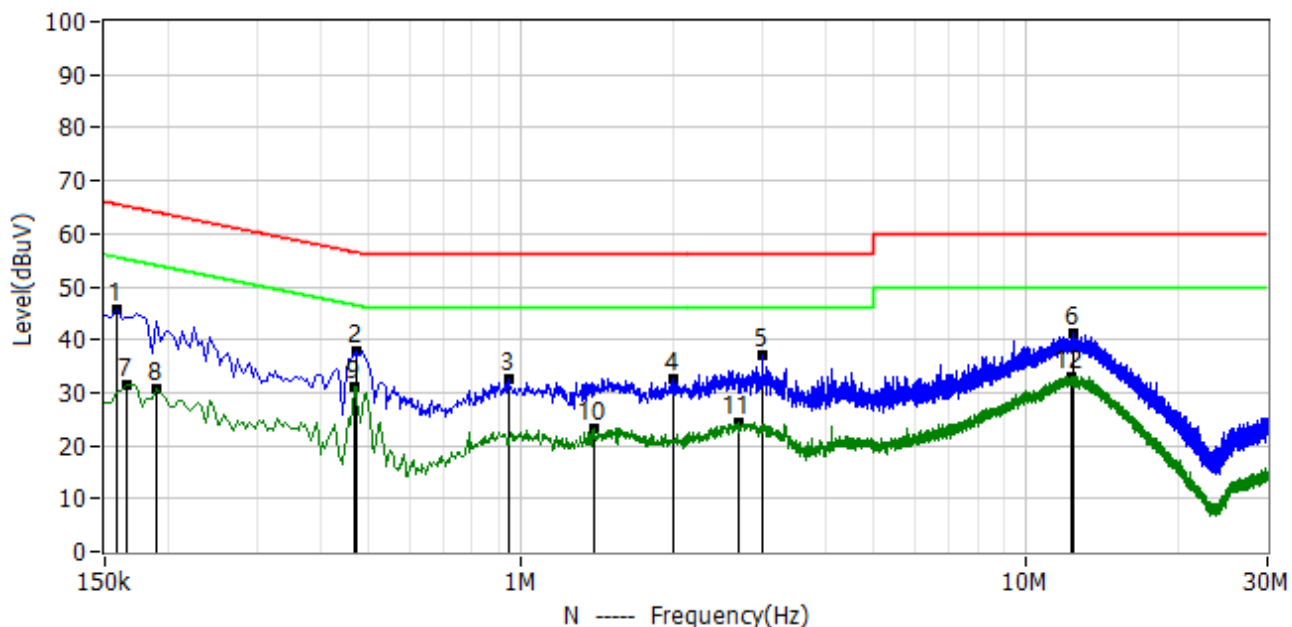
Project: LGT26D180	Test Engineer: LiuH
EUT: Wi-Fi Module	Temperature: 25.1°C
M/N: WS8712	Humidity: 60%RH
Test Voltage: DC 5V	Test Data: 2026-05-08
Test Mode: TX 802.11a 5180	
Note:	



No.	Frequency MHz	Reading dBuV	Factor dB	Result dBuV	Limit dBuV	Margin dB	Detector	Polar
1*	0.158	36.51	10.74	47.25	65.57	-18.32	QP	L1
2*	0.210	31.76	10.74	42.50	63.21	-20.70	QP	L1
3*	0.466	27.20	10.90	38.10	56.58	-18.49	QP	L1
4*	1.458	19.94	11.13	31.07	56.00	-24.93	QP	L1
5*	2.782	21.58	11.26	32.84	56.00	-23.16	QP	L1
6*	12.310	30.13	11.60	41.73	60.00	-18.27	QP	L1
7*	0.170	20.43	10.63	31.06	54.96	-23.90	AV	L1
8*	0.466	19.56	10.90	30.46	46.58	-16.12	AV	L1
9*	0.950	11.57	10.85	22.42	46.00	-23.58	AV	L1
10*	1.586	10.29	11.14	21.43	46.00	-24.57	AV	L1
11*	2.754	11.59	11.25	22.84	46.00	-23.16	AV	L1
12*	12.358	22.26	11.60	33.86	50.00	-16.14	AV	L1



Project: LGT26D180	Test Engineer: LiuH
EUT: Wi-Fi Module	Temperature: 25.1°C
M/N: WS8712	Humidity: 60%RH
Test Voltage: DC 5V	Test Data: 2026-05-08
Test Mode: TX 802.11a 5180	
Note:	



No.	Frequency MHz	Reading dBuV	Factor dB	Result dBuV	Limit dBuV	Margin dB	Detector	Polar
1*	0.158	35.16	10.68	45.84	65.57	-19.73	QP	N
2*	0.470	27.15	10.83	37.98	56.51	-18.53	QP	N
3*	0.946	21.71	10.84	32.55	56.00	-23.45	QP	N
4*	1.994	21.51	11.14	32.65	56.00	-23.35	QP	N
5*	3.002	25.74	11.24	36.98	56.00	-19.02	QP	N
6*	12.410	29.48	11.57	41.05	60.00	-18.95	QP	N
7*	0.166	20.86	10.64	31.50	55.16	-23.66	AV	N
8*	0.190	20.12	10.67	30.79	54.04	-23.25	AV	N
9*	0.466	20.31	10.83	31.14	46.58	-15.44	AV	N
10*	1.390	12.03	11.04	23.07	46.00	-22.93	AV	N
11*	2.686	13.12	11.21	24.33	46.00	-21.67	AV	N
12*	12.294	21.56	11.57	33.13	50.00	-16.87	AV	N



3.2 RADIATED EMISSION AND (BANDEGE) MEASUREMENT

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

In case the emission fall within the restricted band specified on 15.407(b)7&15.205/209(a), then the limit in the table below has to be followed.

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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

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

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15E.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RESTRICTED FREQUENCY BANDS

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

Note: In case the emission radiated emission above 1000MHz fall within the restricted band the restricted frequency bands, the peak limit is 74 dBuV/m.



LIMITS OF EMISSIONS OUTSIDE OF THE FREQUENCY BANDS

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 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) 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.

Note: dBuV/m(at 3M) = EIRP(dBm) + 95.2.

Peak Limit = -27dBm/MHz + 95.2 = 68.2 dBuV/m.

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	10th carrier harmonic (Peak/AV)
RB / VB (emission in restricted band)	1 MHz / 1 MHz, AV=1 MHz /3 MHz

For Band edge

Spectrum Parameter	Setting
Detector	Peak
RB / VB (emission in restricted band)	1 MHz / 1 MHz, AV=1 MHz /3 MHz

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

- The measuring distance at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
- The EUT was placed on the top of a rotating table 0.8 m (above 1GHz is 1.5 m) above the ground at a 3 m anechoic chamber test site. The table was rotated 360 degree to determine the position of the highest radiation.
- The height of the equipment shall be 0.8 m (above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Horizontal and vertical polarization 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 QuasiPeak detector mode will be re-measured.
- If the Peak Mode measured value is compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and no additional QP Mode measurement was performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

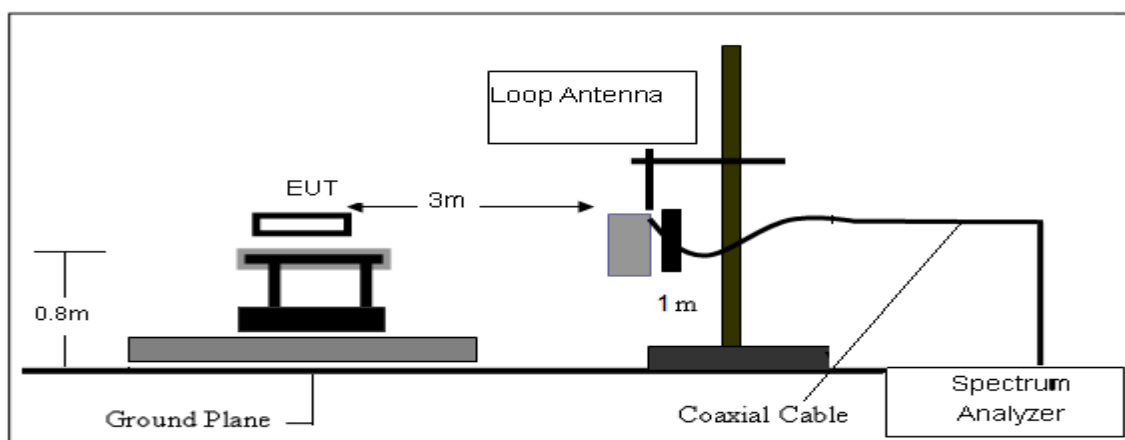
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

3.2.2 DEVIATION FROM TEST STANDARD

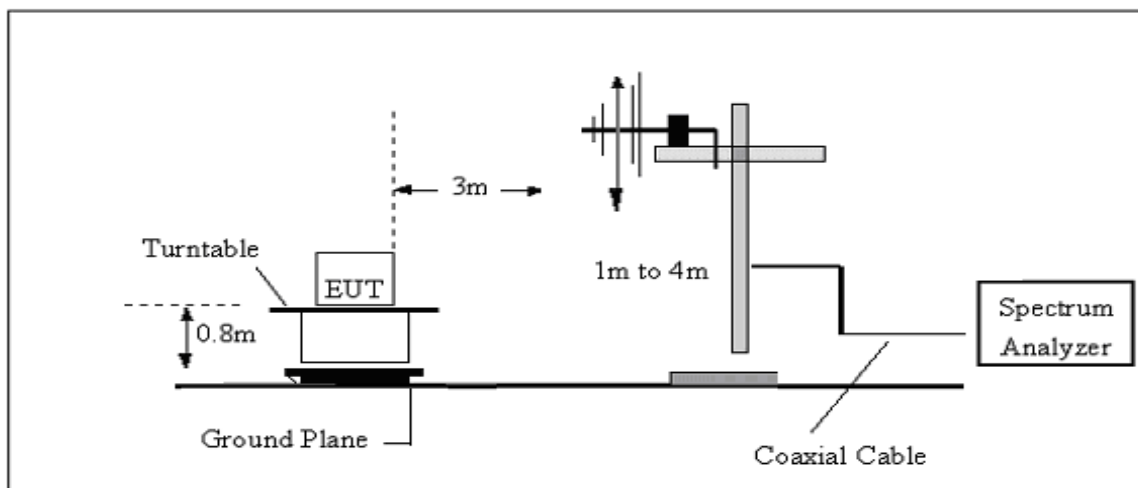
No deviation

3.2.3 TEST SETUP

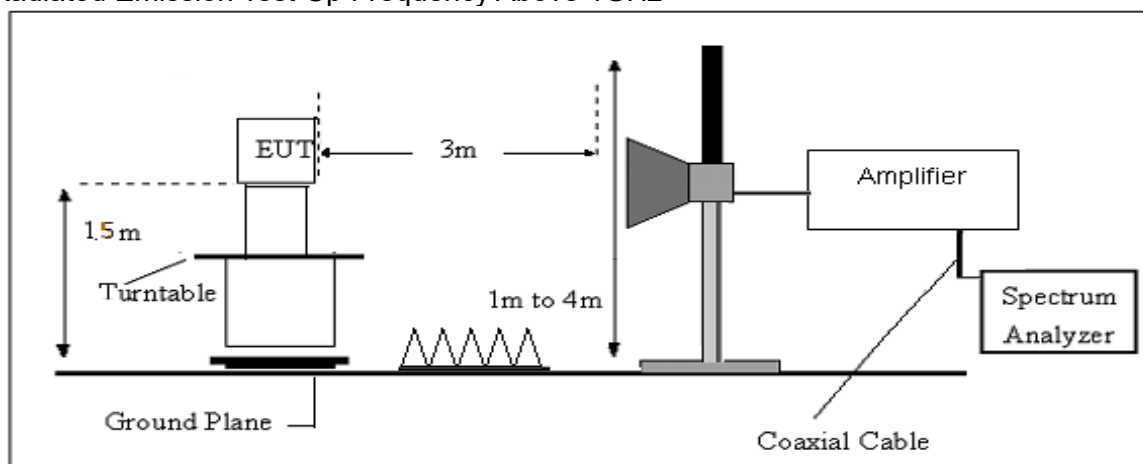
(A) Radiated Emission Test-Up Frequency Below 30MHz



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



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





3.2.4 EUT OPERATING CONDITIONS

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

3.2.5 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where

FS = Field Strength

CL = Cable Attenuation Factor (Cable Loss)

RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

For example

Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1

$$\text{Factor} = \text{AF} + \text{CL} - \text{AG}$$



3.2.6 TEST RESULTS

Results of Radiated Emissions (9 KHz~30MHz)

No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Remark
1*	-	-	-	-	-	-	-	See Note

Note:

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and the permissible value has no need to be reported.

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

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



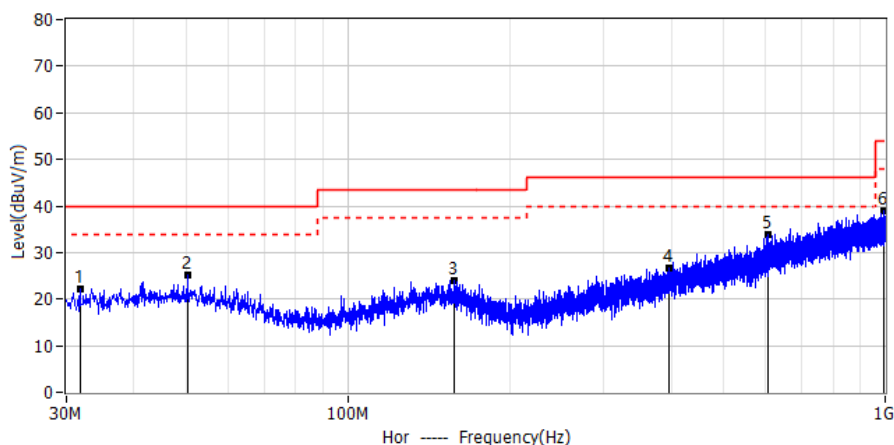
Results of Radiated Emissions (30MHz~1000MHz)

Note: 1. All mode has been tested, only shown the worst case data.

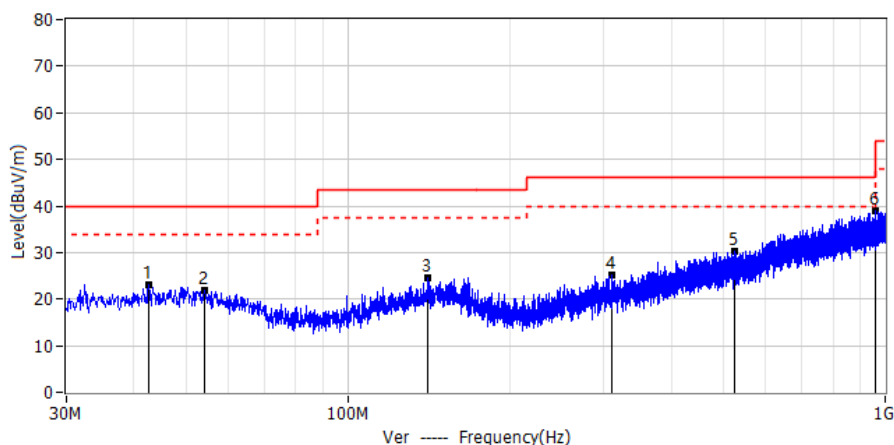
2. Level = Reading + Factor

Margin = Level – Limit

Project: LGT26D180	Test Engineer: LiuH
EUT: Wi-Fi Module	Temperature: 25.1°C
M/N: WS8712	Humidity: 60%RH
Test Voltage: DC 5V	Test Data: 2026-05-08
Test Mode: TX 802.11a 5180	
Note:	



No.	Frequency MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	31.819	2.72	19.47	22.19	40.00	-17.81	QP	Hor
2*	50.370	4.40	20.76	25.16	40.00	-14.84	QP	Hor
3*	158.040	1.98	22.05	24.03	43.50	-19.47	QP	Hor
4*	395.205	1.42	25.19	26.61	46.00	-19.39	QP	Hor
5*	603.876	4.57	29.40	33.97	46.00	-12.03	QP	Hor
6*	993.938	3.81	35.04	38.85	54.00	-15.15	QP	Hor



No.	Frequency MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	42.731	1.97	20.99	22.96	40.00	-17.04	QP	Ver
2*	54.250	1.27	20.53	21.80	40.00	-18.20	QP	Ver
3*	140.823	2.96	21.60	24.56	43.50	-18.94	QP	Ver
4*	309.481	3.14	22.17	25.31	46.00	-20.69	QP	Ver
5*	525.064	2.29	28.04	30.33	46.00	-15.67	QP	Ver
6*	961.685	4.23	34.71	38.94	54.00	-15.06	QP	Ver



Results of Radiated Emissions (Above 1000MHz)

Note:1. All mode has been tested, only shown the worst case data.

5.2 GHz							
Frequency (MHz)	Reading (dBμV)	Corrected Factor (dB)	Result (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector	Polarity
Low Channel (802.11 a/ 5180 MHz)							
3994.00	52.99	-6.89	46.10	74.00	-27.90	PK	Vertical
3994.00	43.38	-6.89	36.49	54.00	-17.51	AV	Vertical
3986.28	52.85	-6.89	45.96	74.00	-28.04	PK	Horizontal
3986.28	42.53	-6.89	35.64	54.00	-18.36	AV	Horizontal
8922.29	53.32	-3.80	49.52	68.20	-18.68	PK	Vertical
8922.29	43.98	-3.80	40.18	54.00	-13.82	AV	Vertical
8923.03	53.80	-3.80	50.00	68.20	-18.20	PK	Horizontal
8923.03	44.47	-3.80	40.67	54.00	-13.33	AV	Horizontal
10360.42	55.17	-2.92	52.25	68.20	-15.95	PK	Vertical
10360.42	45.08	-2.92	42.16	54.00	-11.84	AV	Vertical
10360.44	56.38	-2.92	53.46	68.20	-14.74	PK	Horizontal
10360.44	44.23	-2.92	41.31	54.00	-12.69	AV	Horizontal
13286.80	54.44	-0.67	53.77	74.00	-20.23	PK	Vertical
13286.80	44.89	-0.67	44.22	54.00	-9.78	AV	Vertical
13292.77	54.76	-0.67	54.09	74.00	-19.91	PK	Horizontal
13292.77	44.52	-0.67	43.85	54.00	-10.15	AV	Horizontal
Mid Channel (802.11 a/ 5200 MHz)							
3985.26	52.12	-6.89	45.23	74.00	-28.77	PK	Vertical
3985.26	43.39	-6.89	36.50	54.00	-17.50	AV	Vertical
3990.13	53.43	-6.89	46.54	74.00	-27.46	PK	Horizontal
3990.13	43.25	-6.89	36.36	54.00	-17.64	AV	Horizontal
7219.16	54.25	-3.80	50.45	68.20	-17.75	PK	Vertical
7219.16	43.36	-3.80	39.56	54.00	-14.44	AV	Vertical
7234.19	53.38	-3.80	49.58	68.20	-18.62	PK	Horizontal
7234.19	43.93	-3.80	40.13	54.00	-13.87	AV	Horizontal
10400.01	55.01	-2.92	52.09	68.20	-16.11	PK	Vertical
10400.01	44.17	-2.92	41.25	54.00	-12.75	AV	Vertical
10399.94	55.65	-2.92	52.73	68.20	-15.47	PK	Horizontal
10399.94	44.10	-2.92	41.18	54.00	-12.82	AV	Horizontal
13295.63	53.54	-0.67	52.87	74.00	-21.13	PK	Vertical
13295.63	43.71	-0.67	43.04	54.00	-10.96	AV	Vertical
13290.84	53.70	-0.67	53.03	74.00	-20.97	PK	Horizontal
13290.84	44.98	-0.67	44.31	54.00	-9.69	AV	Horizontal
High Channel (802.11 a/ 5240 MHz)							
3995.65	52.78	-6.89	45.89	74.00	-28.11	PK	Vertical
3995.65	43.39	-6.89	36.50	54.00	-17.50	AV	Vertical
3999.05	52.67	-6.89	45.78	74.00	-28.22	PK	Horizontal
3999.05	42.92	-6.89	36.03	54.00	-17.97	AV	Horizontal
7235.77	54.37	-3.80	50.57	68.20	-17.63	PK	Vertical
7235.77	43.78	-3.80	39.98	54.00	-14.02	AV	Vertical
7232.37	53.92	-3.80	50.12	68.20	-18.08	PK	Horizontal
7232.37	43.99	-3.80	40.19	54.00	-13.81	AV	Horizontal
10480.20	56.30	-2.92	53.38	68.20	-14.82	PK	Vertical
10480.20	44.84	-2.92	41.92	54.00	-12.08	AV	Vertical
10480.27	56.27	-2.92	53.35	68.20	-14.85	PK	Horizontal
10480.27	45.10	-2.92	42.18	54.00	-11.82	AV	Horizontal
13281.26	53.68	-0.67	53.01	74.00	-20.99	PK	Vertical
13281.26	43.61	-0.67	42.94	54.00	-11.06	AV	Vertical
13296.10	54.59	-0.67	53.92	74.00	-20.08	PK	Horizontal
13296.10	44.65	-0.67	43.98	54.00	-10.02	AV	Horizontal



5.8 GHz							
Frequency (MHz)	Reading (dBμV)	Corrected Factor (dB)	Result (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector	Polarity
Low Channel (802.11 a/ 5745 MHz)							
3999.70	52.61	-6.89	45.72	74.00	-28.28	PK	Vertical
3999.70	42.90	-6.89	36.01	54.00	-17.99	AV	Vertical
3991.57	52.92	-6.89	46.03	74.00	-27.97	PK	Horizontal
3991.57	42.64	-6.89	35.75	54.00	-18.25	AV	Horizontal
8910.59	54.24	-3.80	50.44	68.20	-17.76	PK	Vertical
8910.59	43.29	-3.80	39.49	54.00	-14.51	AV	Vertical
8919.20	53.23	-3.80	49.43	68.20	-18.77	PK	Horizontal
8919.20	43.04	-3.80	39.24	54.00	-14.76	AV	Horizontal
11486.38	55.24	-2.92	52.32	74.00	-21.68	PK	Vertical
11486.38	45.45	-2.92	42.53	54.00	-11.47	AV	Vertical
11471.40	56.09	-2.92	53.17	74.00	-20.83	PK	Horizontal
11471.40	44.14	-2.92	41.22	54.00	-12.78	AV	Horizontal
13285.30	54.36	-0.35	54.01	74.00	-19.99	PK	Vertical
13285.30	44.42	-0.35	44.07	54.00	-9.93	AV	Vertical
13289.32	54.40	-0.35	54.05	74.00	-19.95	PK	Horizontal
13289.32	43.81	-0.35	43.46	54.00	-10.54	AV	Horizontal
Mid Channel (802.11 a/ 5785 MHz)							
3990.56	53.23	-6.89	46.34	74.00	-27.66	PK	Vertical
3990.56	43.37	-6.89	36.48	54.00	-17.52	AV	Vertical
3986.81	52.22	-6.89	45.33	74.00	-28.67	PK	Horizontal
3986.81	42.90	-6.89	36.01	54.00	-17.99	AV	Horizontal
8918.62	54.15	-3.80	50.35	68.20	-17.85	PK	Vertical
8918.62	43.17	-3.80	39.37	54.00	-14.63	AV	Vertical
8925.50	54.27	-3.80	50.47	68.20	-17.73	PK	Horizontal
8925.50	43.86	-3.80	40.06	54.00	-13.94	AV	Horizontal
11568.80	55.34	-2.92	52.42	74.00	-21.58	PK	Vertical
11568.80	44.14	-2.92	41.22	54.00	-12.78	AV	Vertical
11560.60	56.08	-2.92	53.16	74.00	-20.84	PK	Horizontal
11560.60	45.27	-2.92	42.35	54.00	-11.65	AV	Horizontal
13285.60	54.38	-0.35	54.03	74.00	-19.97	PK	Vertical
13285.60	44.14	-0.35	43.79	54.00	-10.21	AV	Vertical
13294.92	53.71	-0.35	53.36	74.00	-20.64	PK	Horizontal
13294.92	44.40	-0.35	44.05	54.00	-9.95	AV	Horizontal
High Channel (802.11 a/ 5825 MHz)							
3981.93	52.28	-6.89	45.39	74.00	-28.61	PK	Vertical
3981.93	42.14	-6.89	35.25	54.00	-18.75	AV	Vertical
3996.83	52.73	-6.89	45.84	74.00	-28.16	PK	Horizontal
3996.83	42.90	-6.89	36.01	54.00	-17.99	AV	Horizontal
8915.18	53.42	-3.80	49.62	68.20	-18.58	PK	Vertical
8915.18	43.34	-3.80	39.54	54.00	-14.46	AV	Vertical
8914.47	53.05	-3.80	49.25	68.20	-18.95	PK	Horizontal
8914.47	43.25	-3.80	39.45	54.00	-14.55	AV	Horizontal
11649.58	56.03	-2.92	53.11	74.00	-20.89	PK	Vertical
11649.58	44.86	-2.92	41.94	54.00	-12.06	AV	Vertical
11650.08	55.03	-2.92	52.11	74.00	-21.89	PK	Horizontal
11650.08	44.68	-2.92	41.76	54.00	-12.24	AV	Horizontal
13294.07	53.60	-0.35	53.25	74.00	-20.75	PK	Vertical
13294.07	44.74	-0.35	44.39	54.00	-9.61	AV	Vertical
13283.61	53.91	-0.35	53.56	74.00	-20.44	PK	Horizontal
13283.61	44.13	-0.35	43.78	54.00	-10.22	AV	Horizontal

Remark:

In frequency ranges 18~40GHz no any other harmonic emissions detected which are tested to compliance with the limit. No recording in the test report. No any other emissions level which are attenuated less than 20dB below the limit. No recording in the test report.



3.2.7 TEST RESULTS(Band edge Requirements)

Note:1. All mode has been tested, only shown the worst case data.

5.2 GHz							
Frequency (MHz)	Reading (dBμV)	Corrected Factor (dB)	Result (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector	Polarity
802.11a BW20MHz							
5150	55.32	-7.51	47.81	74	-26.19	PK	Vertical
5150	45.27	-7.51	37.76	54	-16.24	AV	Vertical
5150	55.56	-7.51	48.05	74	-25.95	PK	Horizontal
5150	45.39	-7.51	37.88	54	-16.12	AV	Horizontal
5350	55.16	-8.19	46.97	74	-27.03	PK	Vertical
5350	44.58	-8.19	36.39	54	-17.61	AV	Vertical
5350	54.05	-8.19	45.86	74	-28.14	PK	Horizontal
5350	44.66	-8.19	36.47	54	-17.53	AV	Horizontal
802.11n BW20MHz							
5150	56.24	-7.51	48.73	74	-25.27	Peak	Vertical
5150	44.23	-7.51	36.72	54	-17.28	AVG	Vertical
5150	56.01	-7.51	48.50	74	-25.50	Peak	Horizontal
5150	45.04	-7.51	37.53	54	-16.47	AVG	Horizontal
5350	54.61	-8.19	46.42	74	-27.58	Peak	Vertical
5350	44.52	-8.19	36.33	54	-17.67	AVG	Vertical
5350	55.43	-8.19	47.24	74	-26.76	Peak	Horizontal
5350	44.82	-8.19	36.63	54	-17.37	AVG	Horizontal
802.11ac BW20MHz							
5150	55.94	-7.51	48.43	74	-25.57	Peak	Vertical
5150	44.16	-7.51	36.65	54	-17.35	AVG	Vertical
5150	55.69	-7.51	48.18	74	-25.82	Peak	Horizontal
5150	44.66	-7.51	37.15	54	-16.85	AVG	Horizontal
5350	54.81	-8.19	46.62	74	-27.38	Peak	Vertical
5350	44.74	-8.19	36.55	54	-17.45	AVG	Vertical
5350	55.36	-8.19	47.17	74	-26.83	Peak	Horizontal
5350	44.14	-8.19	35.95	54	-18.05	AVG	Horizontal
802.11ax BW20MHz							
5150	56.16	-7.51	48.65	74	-25.35	Peak	Vertical
5150	44.59	-7.51	37.08	54	-16.92	AVG	Vertical
5150	55.66	-7.51	48.15	74	-25.85	Peak	Horizontal
5150	44.92	-7.51	37.41	54	-16.59	AVG	Horizontal
5350	54.72	-8.19	46.53	74	-27.47	Peak	Vertical
5350	44.94	-8.19	36.75	54	-17.25	AVG	Vertical
5350	54.25	-8.19	46.06	74	-27.94	Peak	Horizontal
5350	44.62	-8.19	36.43	54	-17.57	AVG	Horizontal

5.8 GHz							
Frequency (MHz)	Reading (dBμV)	Corrected Factor (dB)	Result (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector	Polarity
802.11a BW20MHz							
5460	54.03	-8.27	45.76	74	-28.24	PK	Vertical
5460	42.79	-8.27	34.52	54	-19.48	AV	Vertical
5460	54.12	-8.27	45.85	74	-28.15	PK	Horizontal
5460	42.98	-8.27	34.71	54	-19.29	AV	Horizontal
7250	54.85	-6.33	48.52	74	-25.48	PK	Vertical
7250	44.87	-6.33	38.54	54	-15.46	AV	Vertical
7250	55.37	-6.33	49.04	74	-24.96	PK	Horizontal
7250	43.99	-6.33	37.66	54	-16.34	AV	Horizontal
802.11n BW20MHz							
5460	53.10	-8.27	44.83	74	-29.17	PK	Vertical
5460	43.51	-8.27	35.24	54	-18.76	AV	Vertical



5460	53.50	-8.27	45.23	74	-28.77	PK	Horizontal
5460	42.64	-8.27	34.37	54	-19.63	AV	Horizontal
7250	55.05	-6.33	48.72	74	-25.28	PK	Vertical
7250	44.99	-6.33	38.66	54	-15.34	AV	Vertical
7250	54.69	-6.33	48.36	74	-25.64	PK	Horizontal
7250	44.67	-6.33	38.34	54	-15.66	AV	Horizontal
802.11ac BW20MHz							
5460	53.05	-8.27	44.78	74	-29.22	PK	Vertical
5460	42.61	-8.27	34.34	54	-19.66	AV	Vertical
5460	53.09	-8.27	44.82	74	-29.18	PK	Horizontal
5460	43.56	-8.27	35.29	54	-18.71	AV	Horizontal
7250	54.04	-6.33	47.71	74	-26.29	PK	Vertical
7250	43.60	-6.33	37.27	54	-16.73	AV	Vertical
7250	54.18	-6.33	47.85	74	-26.15	PK	Horizontal
7250	44.53	-6.33	38.20	54	-15.80	AV	Horizontal
802.11ax BW20MHz							
5460	53.52	-8.27	45.25	74	-28.75	PK	Vertical
5460	42.63	-8.27	34.36	54	-19.64	AV	Vertical
5460	53.52	-8.27	45.25	74	-28.75	PK	Horizontal
5460	43.23	-8.27	34.96	54	-19.04	AV	Horizontal
7250	54.83	-6.33	48.50	74	-25.50	PK	Vertical
7250	43.62	-6.33	37.29	54	-16.71	AV	Vertical
7250	54.76	-6.33	48.43	74	-25.57	PK	Horizontal
7250	43.68	-6.33	37.35	54	-16.65	AV	Horizontal



4. POWER SPECTRAL DENSITY TEST

4.1 LIMIT

1. For mobile and portable 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.
2. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, 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.
3. For the band 5.725-5.850 GHz, the peak power spectral density shall not exceed 30 dBm in any 500KHz band. If transmitting antenna directional gain is greater than 6 dBi, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.2 TEST PROCEDURE

1. The setting follows Method SA-1 of FCC KDB 789033 D02 General U-NII Test Procedures New Rules v02r01.

For devices operating in the band, 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 $RBW (< 500 \text{ kHz})$ 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 $RBW (< 1 \text{ MHz})$ 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.

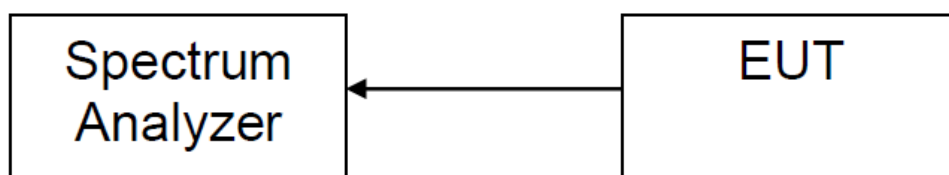
Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the sections 5.c) and 5.d) above, since $RBW=100 \text{ KHz}$ is available on nearly all spectrum analyzers.

4.3 DEVIATION FROM STANDARD

No deviation.



4.4 TEST SETUP



4.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

4.6 TEST RESULTS

For the measurement records, refer to the appendix I.



5. BANDWIDTH MEASUREMENT

5.1 EMISSION BANDWIDTH (EBW) 26 BANDWID PROCEDURES / LIMIT

The following procedure shall be used for measuring 26 bandwidth.

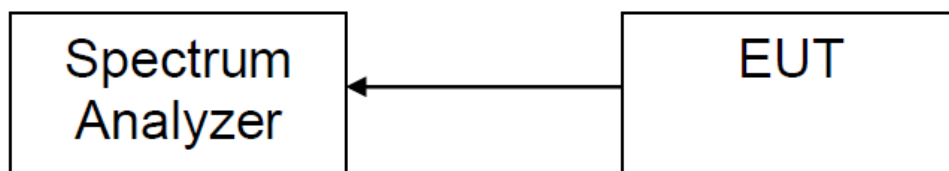
5.1.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW $\geq$ RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



5.1.4 EUT OPERATION CONDITIONS

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

5.1.5 TEST RESULTS

For the measurement records, refer to the appendix I.



5.2 OCCUPIED BANDWIDTH (99%) TEST APPLIED PROCEDURES / LIMIT

The following procedure shall be used for measuring (99 %) power bandwidth.

5.2.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures v02r01.

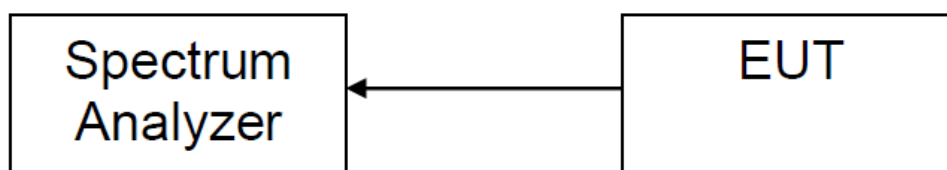
The following procedure shall be used for measuring (99 %) power bandwidth:

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.

5.2.2 DEVIATION FROM STANDARD

No deviation.

5.2.3 TEST SETUP



5.2.4 EUT OPERATION CONDITIONS

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

5.2.5 TEST RESULTS

For the measurement records, refer to the appendix I.



5.3 MINIMUM EMISSION BANDWIDTH(6 DB) PROCEDURES / LIMIT

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.725-5.85 GHz. The following procedure shall be used for measuring this bandwidth.

5.3.1 TEST PROCEDURE

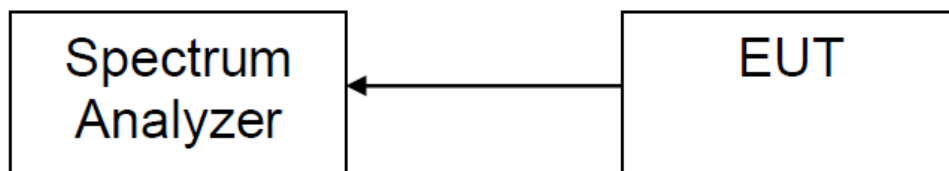
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures v02r01.

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.3.2 DEVIATION FROM STANDARD

No deviation.

5.3.3 TEST SETUP



5.3.4 EUT OPERATION CONDITIONS

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

5.3.5 TEST RESULTS

For the measurement records, refer to the appendix I.



6. MAXIMUM CONDUCTED OUTPUT POWER

6.1 LIMIT

For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz, If transmitting antennas of directional gain greater than 6 dBi are used.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used.

FCC Part15 (15.407) , Subpart E				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.407(a) (1) (iv)	Output Power	0.25 watt	5150-5250	PASS
		The lesser of 250 mW or 11 dBm + 10 log (26 dB emission bandwidth)	5250-5350 5470-5725	
15.407(a) (3)		1 watt	5725-5825	

6.2 TEST PROCEDURE

Refer to C63.10-2020 Section 12.4.2.4.

Method SA-2 uses trace averaging across ON and OFF times of the EUT transmissions, followed by duty cycle correction. The procedure for this method is as follows:

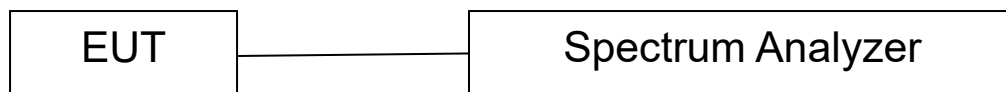
- Measure the duty cycle D of the transmitter output signal as described in 12.2.
- Set span to encompass the entire 99% OBW of the signal.
- Set RBW = 1 MHz.
- Set VBW $\geq$ 3 MHz.
- Number of points in sweep $\geq [2 \times \text{span} / \text{RBW}]$. (This gives bin-to-bin spacing $\leq \text{RBW} / 2$, so that narrowband signals are not lost between frequency bins.)
- Sweep time = auto.
- Detector = Power averaging (rms), if available. Otherwise, use sample detector mode.
- Do not use sweep triggering. Allow the sweep to "free run."
- Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the ON and OFF periods of the transmitter.
- Compute power by integrating the spectrum across the 99% OBW of the signal using the instrument's band-power measurement function with band limits set equal to the EBW or OBW band-edges. If the instrument does not have a band-power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 99% OBW of the spectrum.
- Add $[10 \log (1 / D)]$, where D is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the ON and OFF times of the transmission). For example, add $[10 \log (1 / 0.25)] = 6$ dB if the duty cycle is 25%.

6.3 DEVIATION FROM STANDARD

No deviation.



6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 5 Unless otherwise a special operating condition is specified in the follows during the testing.

6.6 TEST RESULTS

For the measurement records, refer to the appendix I.



7. CONDUCTED BANDEDGE

7.1 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 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band:
 - a) 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;
 - b) 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;
 - c) 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and
 - d) -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

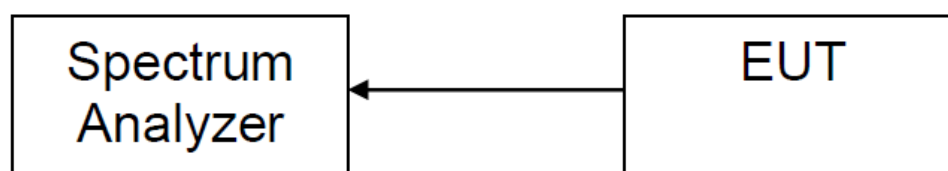
7.2 TEST PROCEDURE

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak
RB / VB (emission in restricted band)	1 MHz / 3 MHz
Offset	Ant Gain+Test system loss

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 EUT OPERATION CONDITIONS

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

7.6 TEST RESULTS

For the measurement records, refer to the appendix I.



8. AUTOMATICALLY DISCONTINUE TRANSMISSION

8.1 LIMIT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

8.2 TEST RESULT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

During no any information transmission, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission



9. ANTENNA REQUIREMENT

9.1 STANDARD REQUIREMENT

Part 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.

9.2 EUT ANTENNA

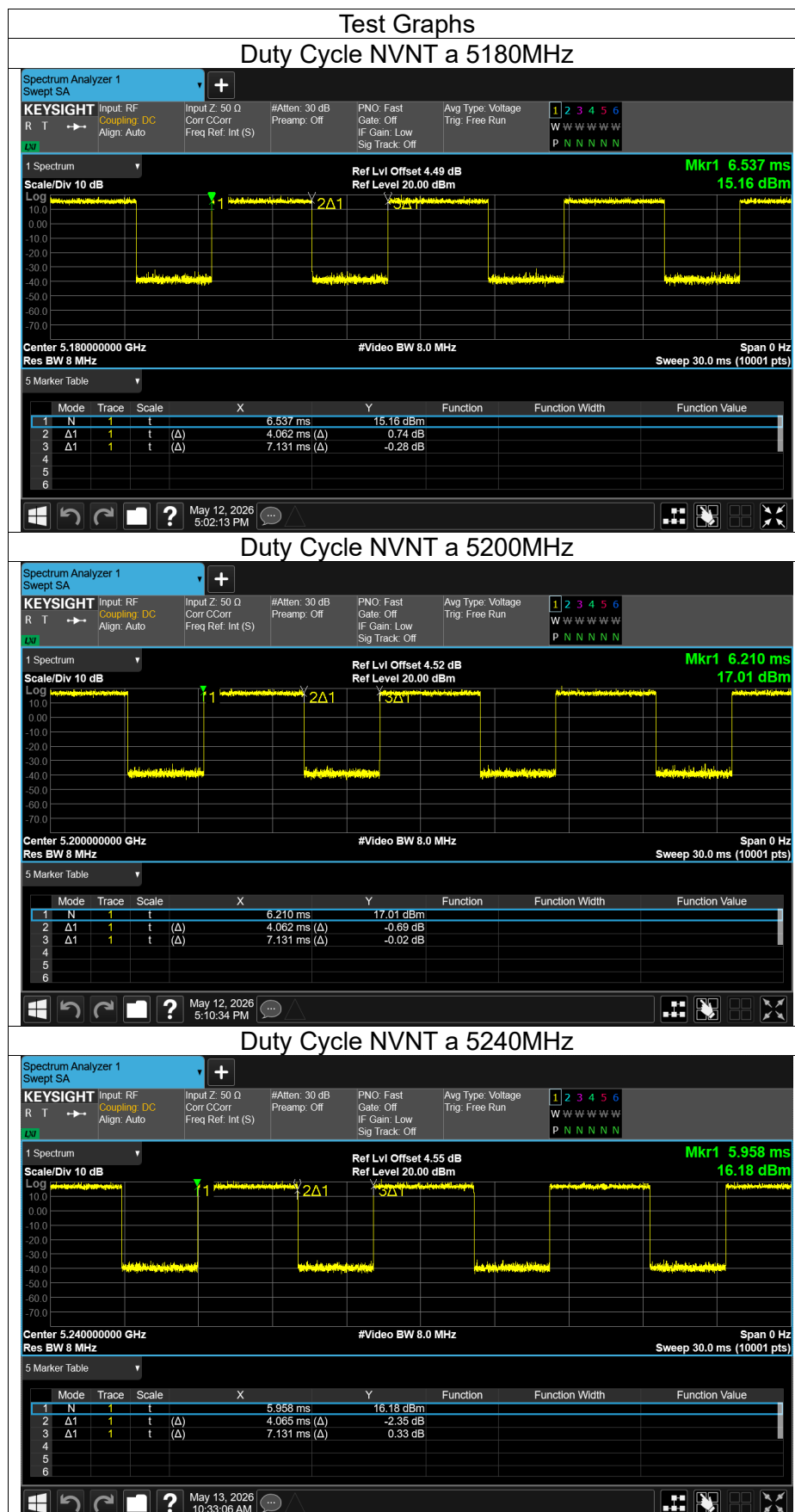
The EUT antenna is Dipole Antenna. It comply with the standard requirement.

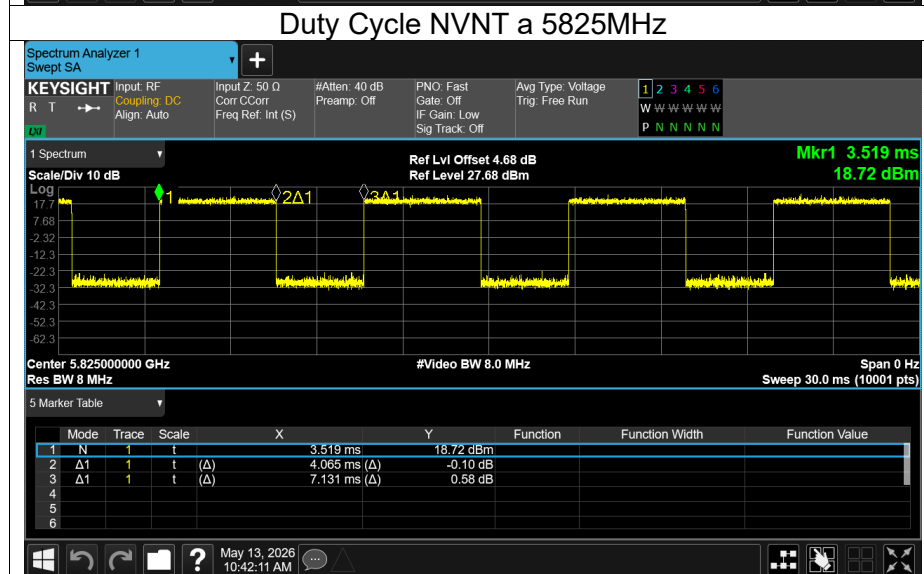
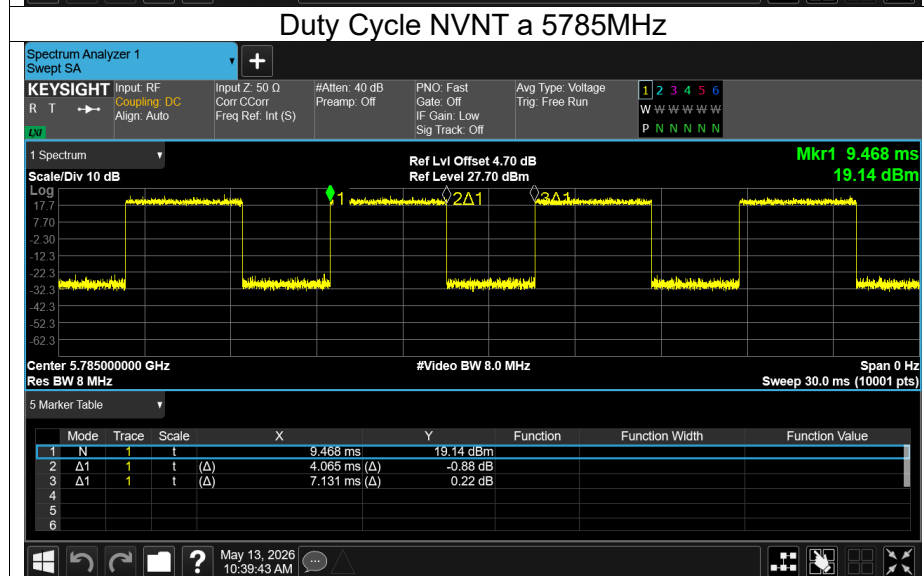
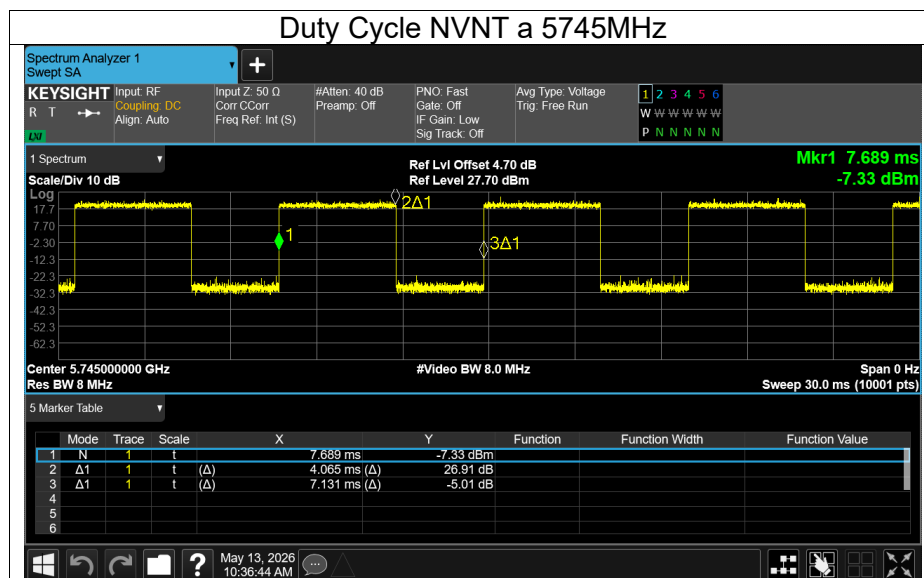


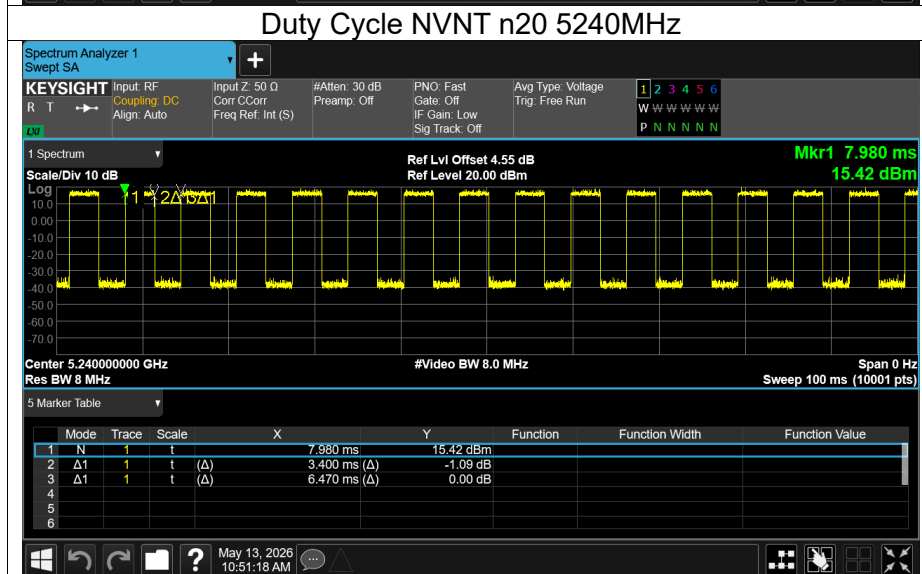
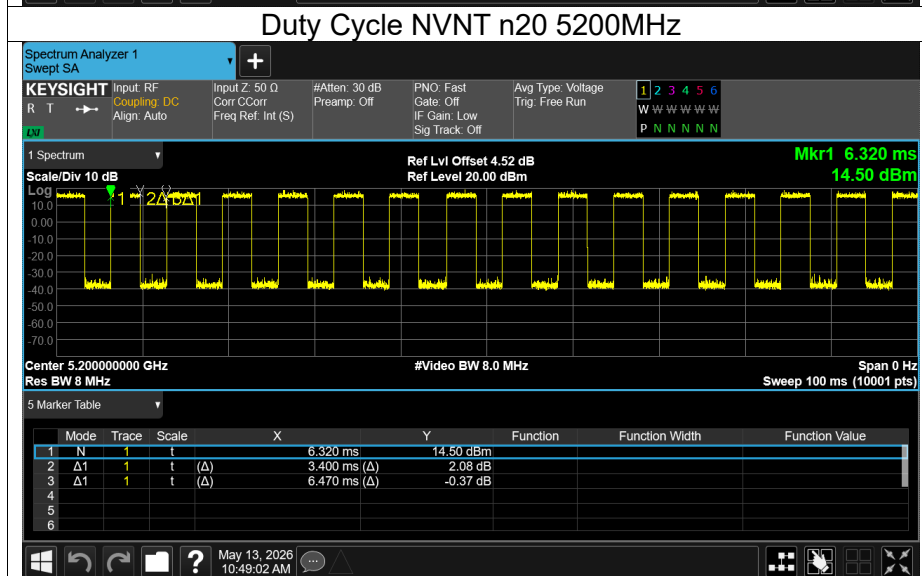
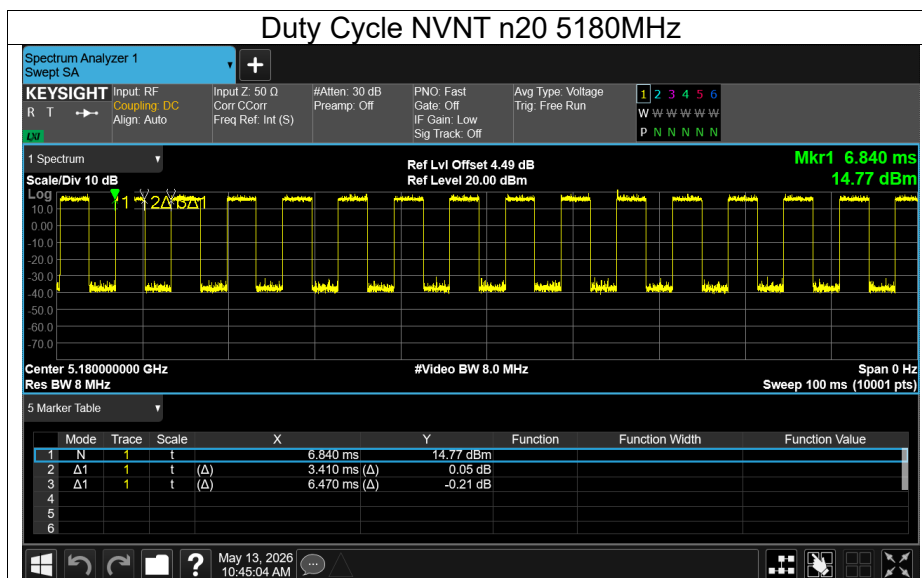
APPENDIX I - TEST RESULTS

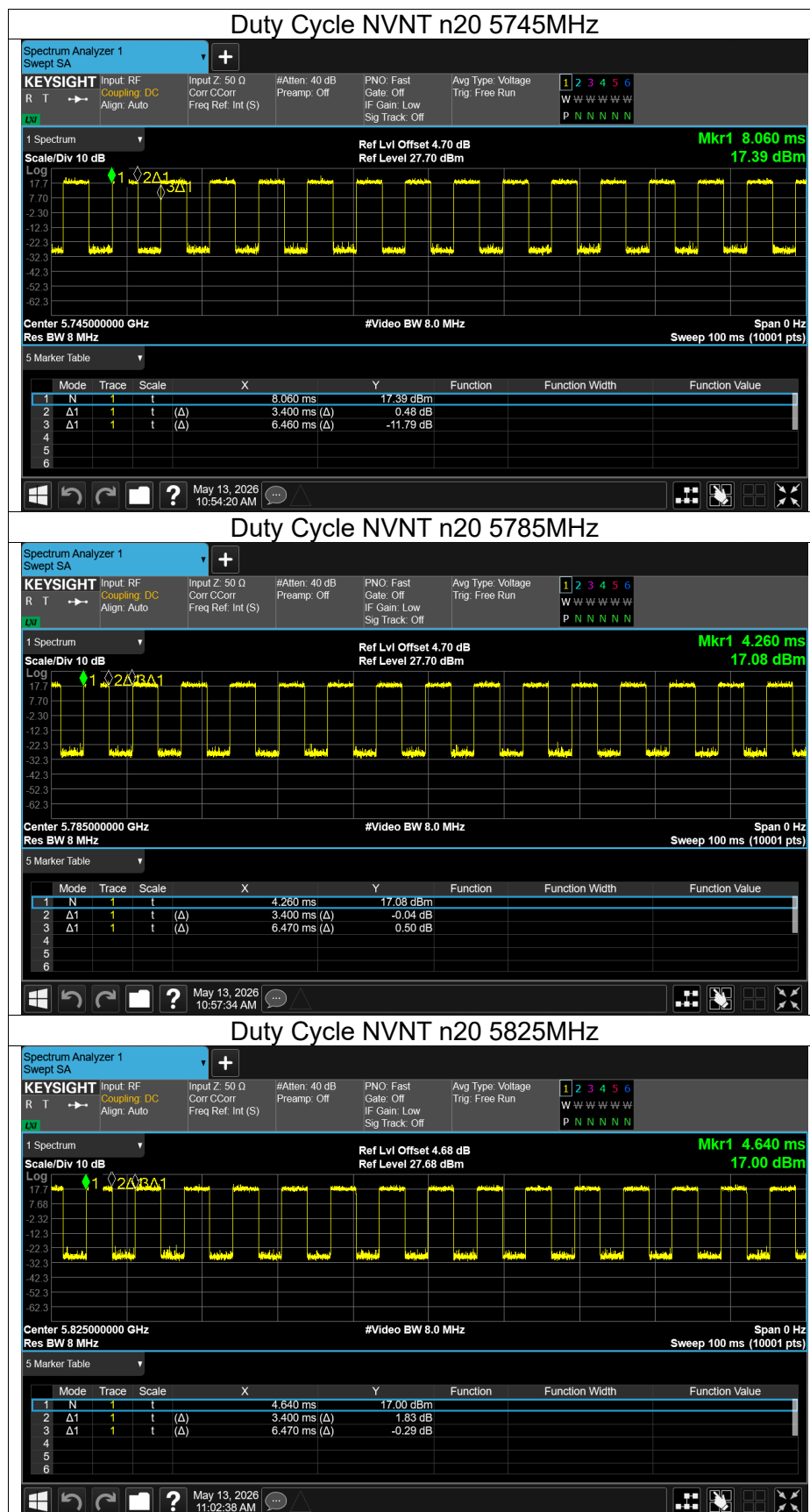
Duty Cycle

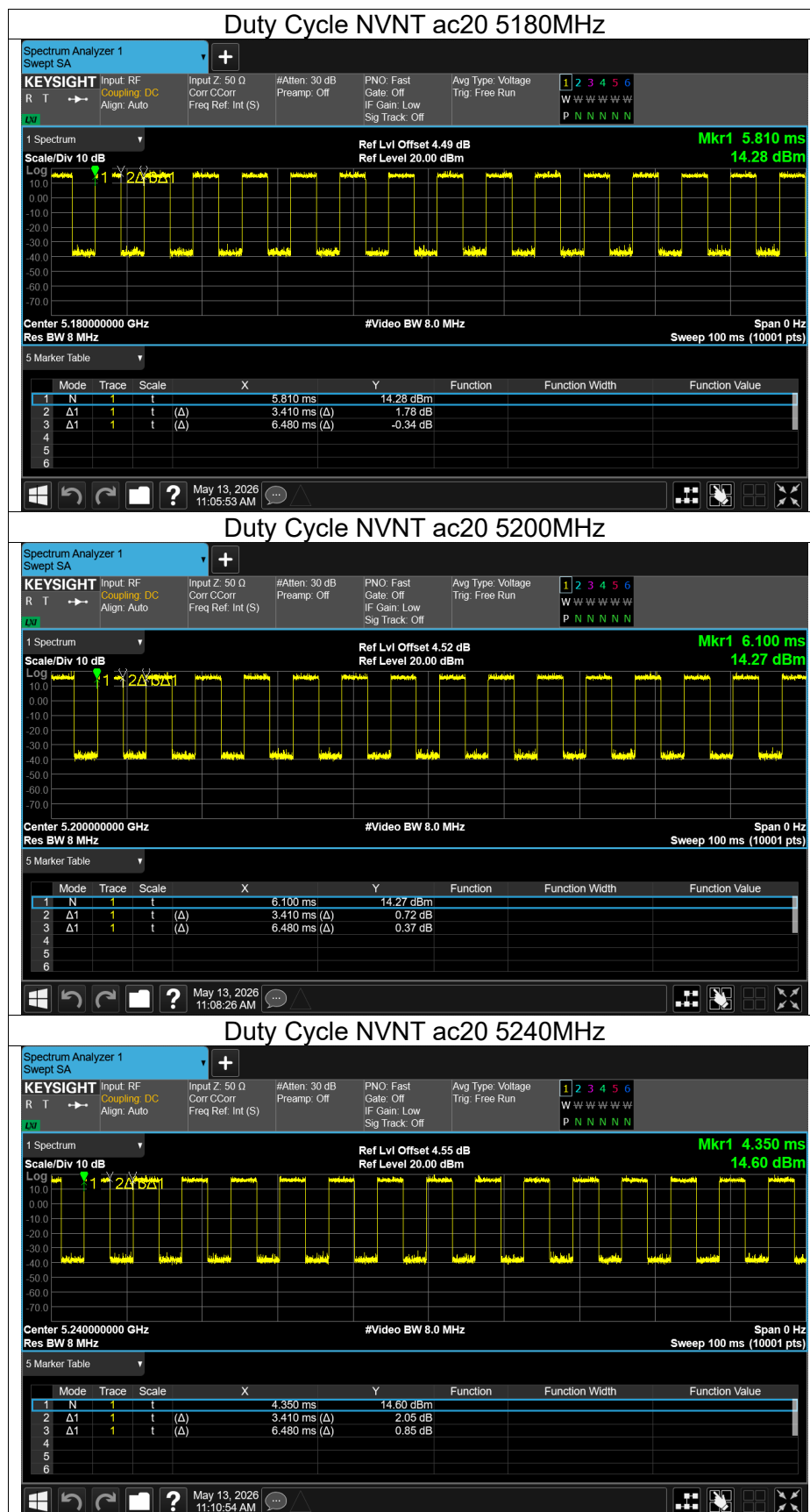
Condition	Mode	Frequency (MHz)	On Time (ms)	Period (ms)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5180	4.062	7.131	56.96	2.44	0.25
NVNT	a	5200	4.062	7.131	56.96	2.44	0.25
NVNT	a	5240	4.065	7.131	57	2.44	0.25
NVNT	a	5745	4.065	7.131	57	2.44	0.25
NVNT	a	5785	4.065	7.131	57	2.44	0.25
NVNT	a	5825	4.065	7.131	57	2.44	0.25
NVNT	n20	5180	3.41	6.47	52.7	2.78	0.29
NVNT	n20	5200	3.4	6.47	52.55	2.79	0.29
NVNT	n20	5240	3.4	6.47	52.55	2.79	0.29
NVNT	n20	5745	3.4	6.46	52.63	2.79	0.29
NVNT	n20	5785	3.4	6.47	52.55	2.79	0.29
NVNT	n20	5825	3.4	6.47	52.55	2.79	0.29
NVNT	ac20	5180	3.41	6.48	52.62	2.79	0.29
NVNT	ac20	5200	3.41	6.48	52.62	2.79	0.29
NVNT	ac20	5240	3.41	6.48	52.62	2.79	0.29
NVNT	ac20	5745	3.41	6.5	52.46	2.8	0.29
NVNT	ac20	5785	3.41	6.47	52.7	2.78	0.29
NVNT	ac20	5825	3.41	6.47	52.7	2.78	0.29
NVNT	ax20	5180	2.88	5.95	48.4	3.15	0.35
NVNT	ax20	5200	2.88	5.94	48.48	3.14	0.35
NVNT	ax20	5240	2.88	5.95	48.4	3.15	0.35
NVNT	ax20	5745	2.88	5.95	48.4	3.15	0.35
NVNT	ax20	5785	2.88	5.95	48.4	3.15	0.35
NVNT	ax20	5825	2.88	5.95	48.4	3.15	0.35

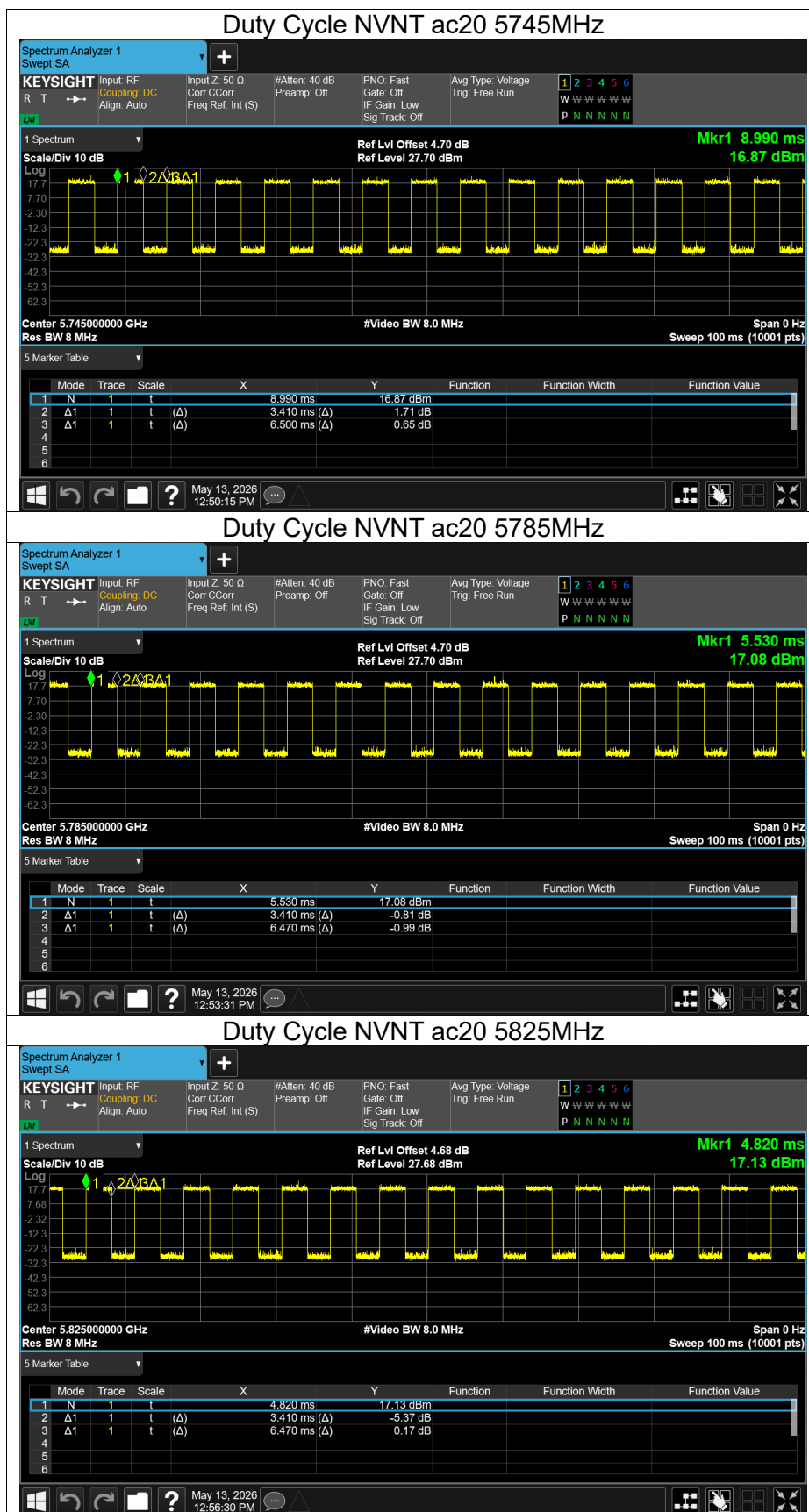


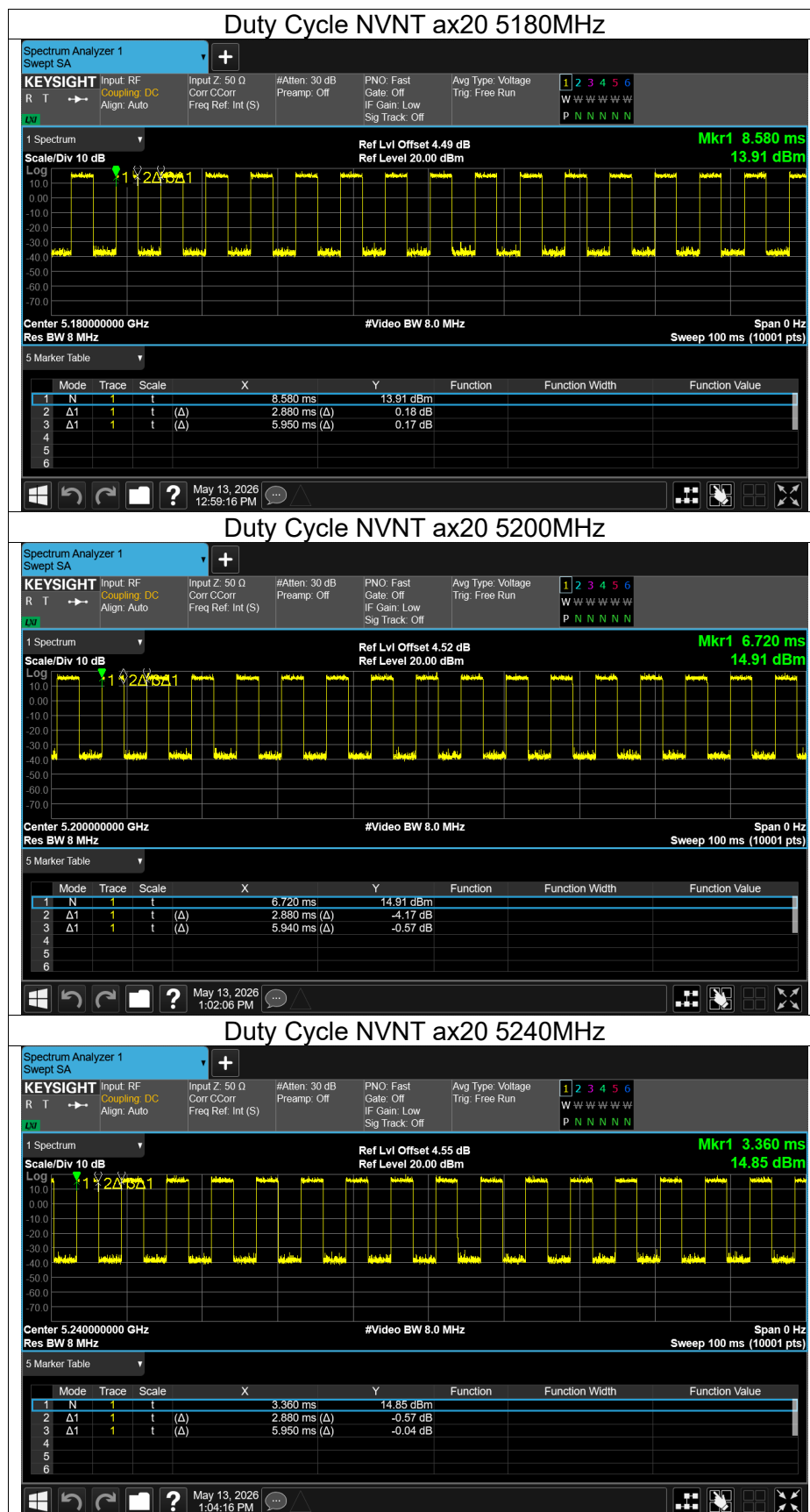


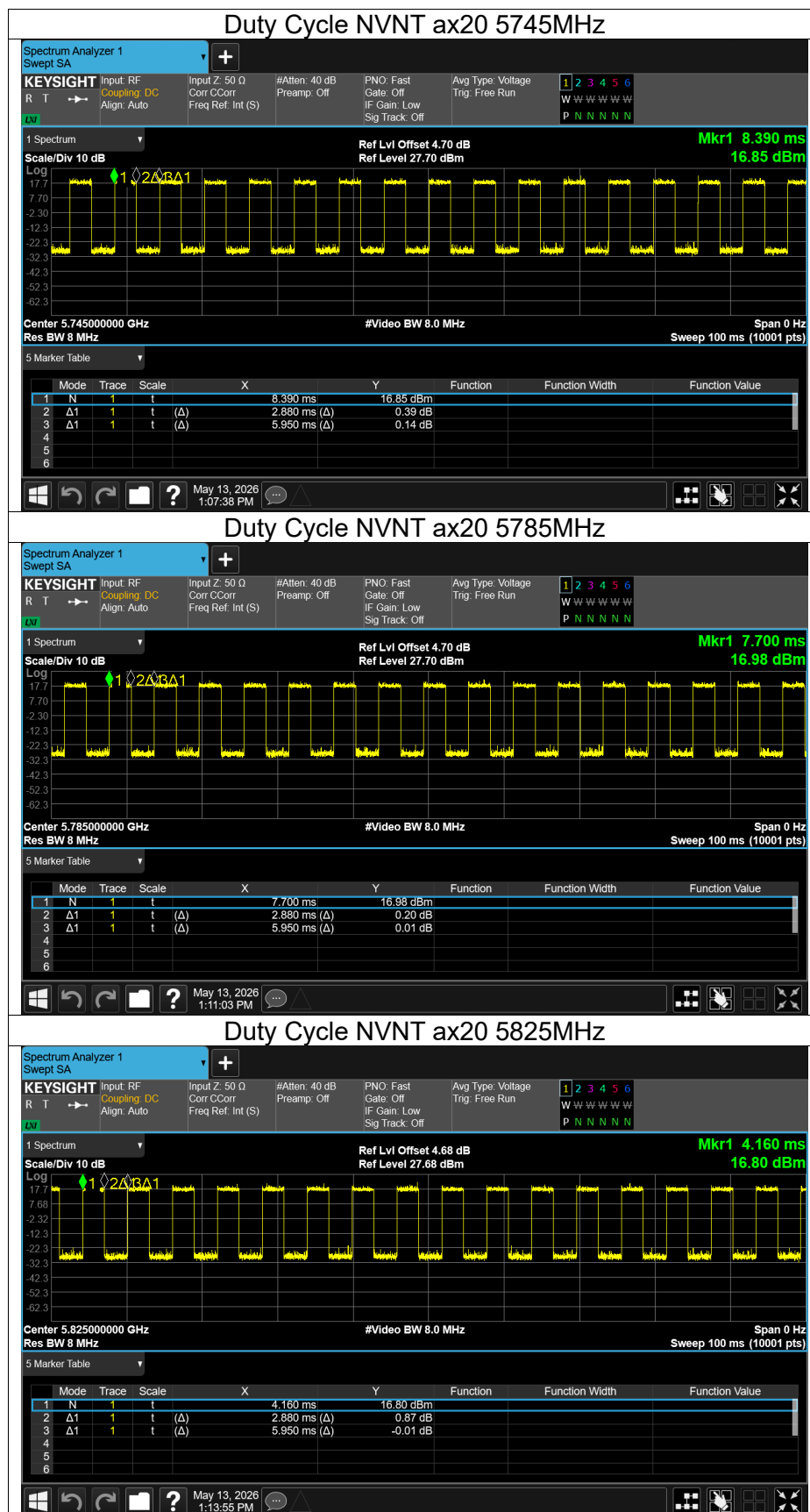








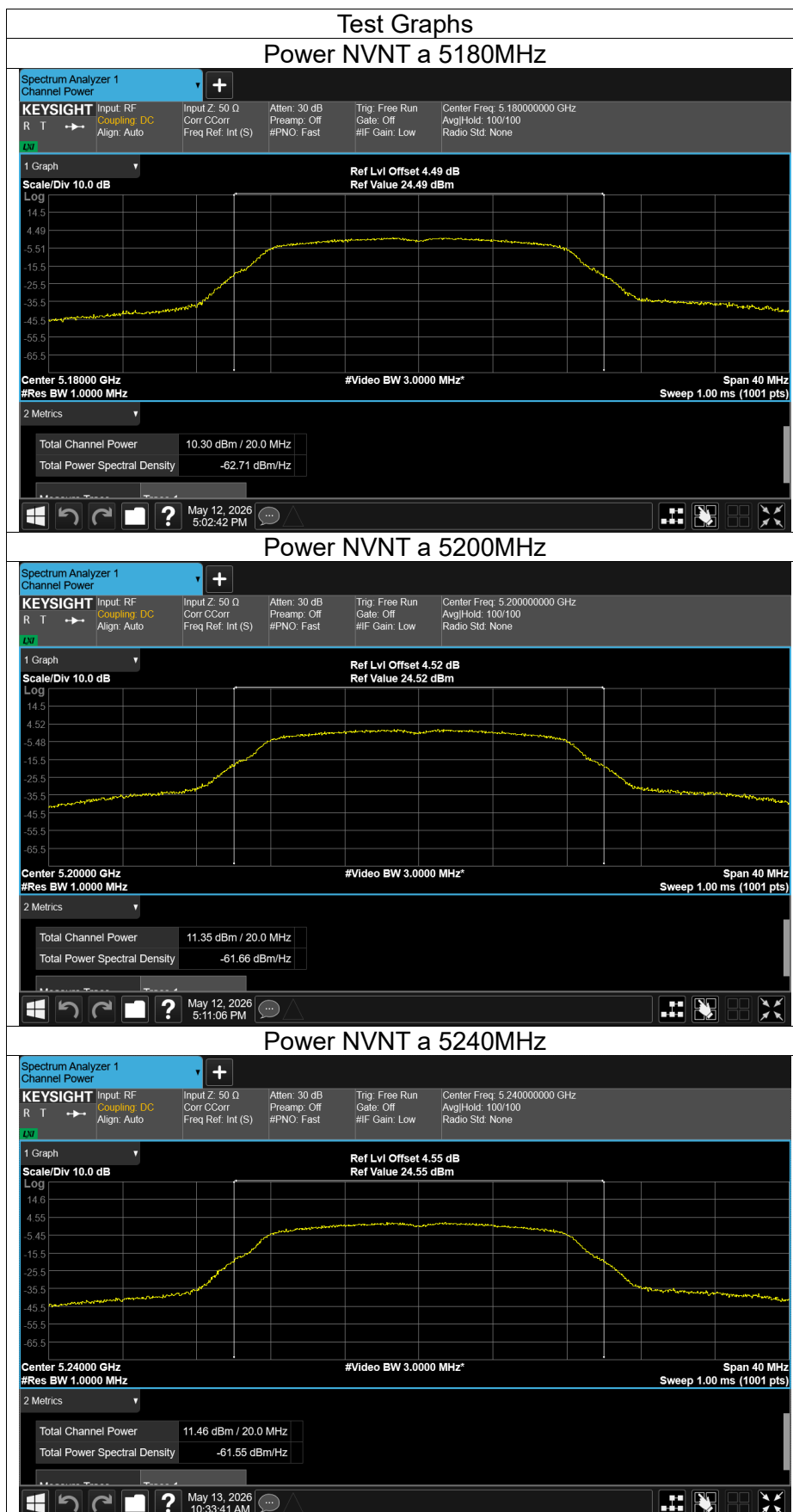


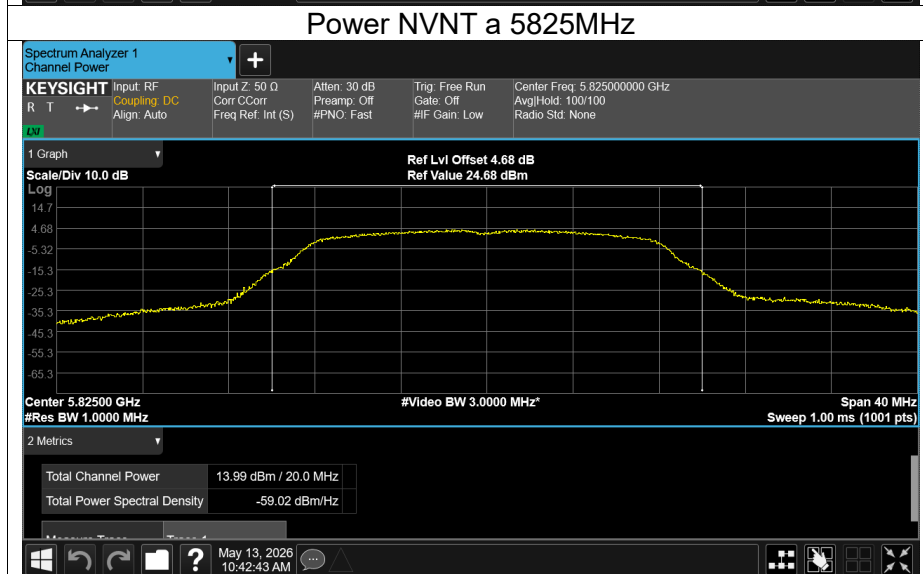
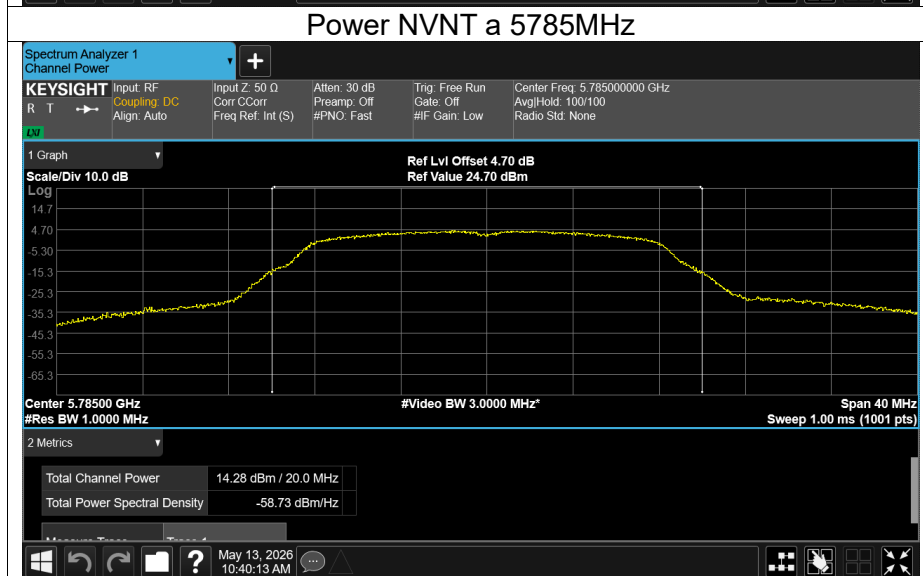
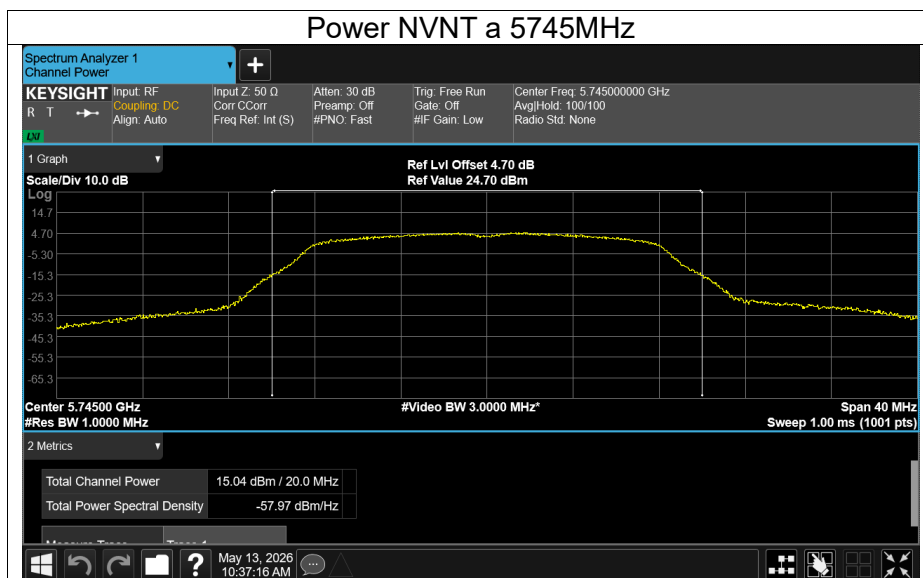


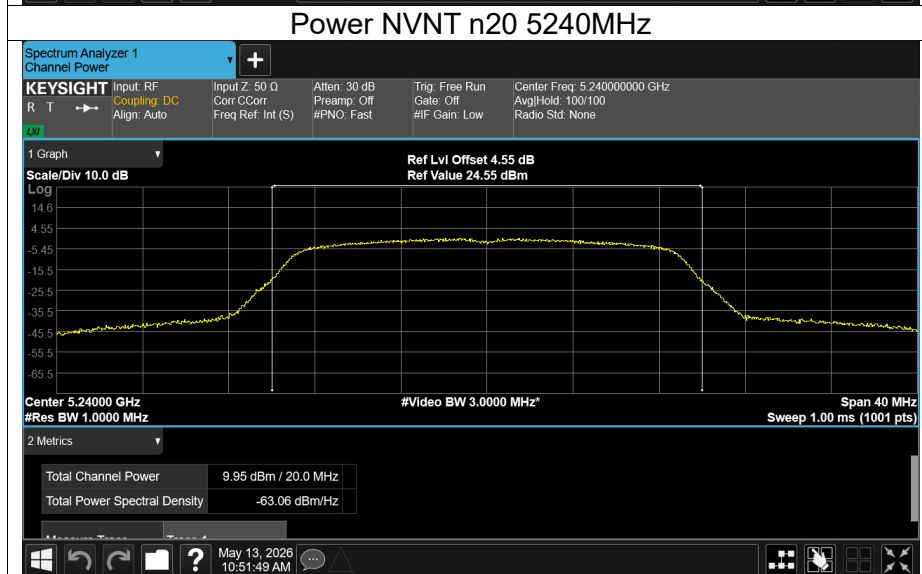
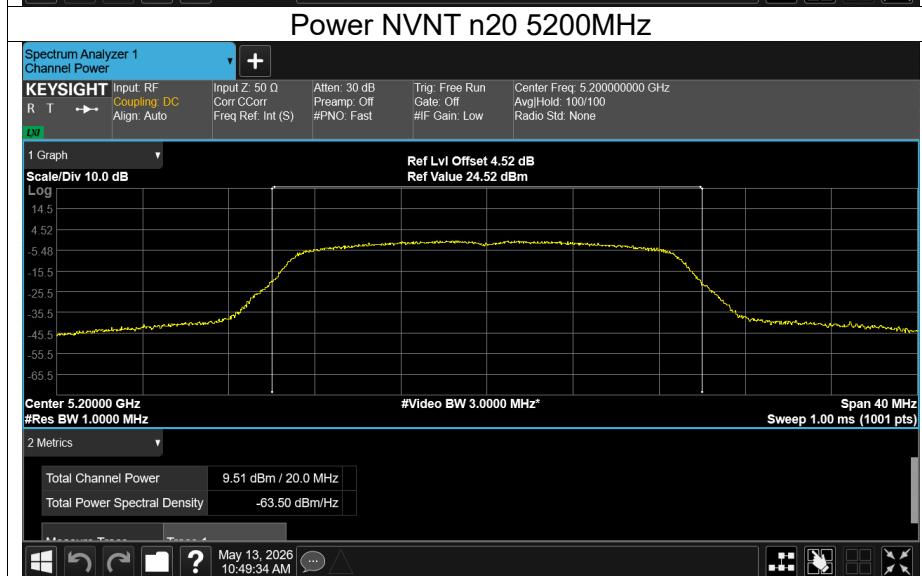
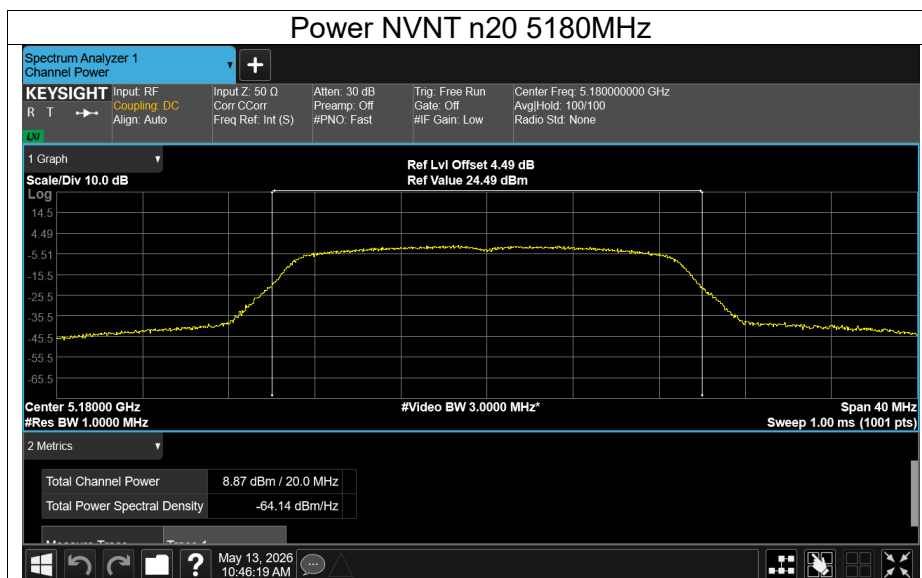


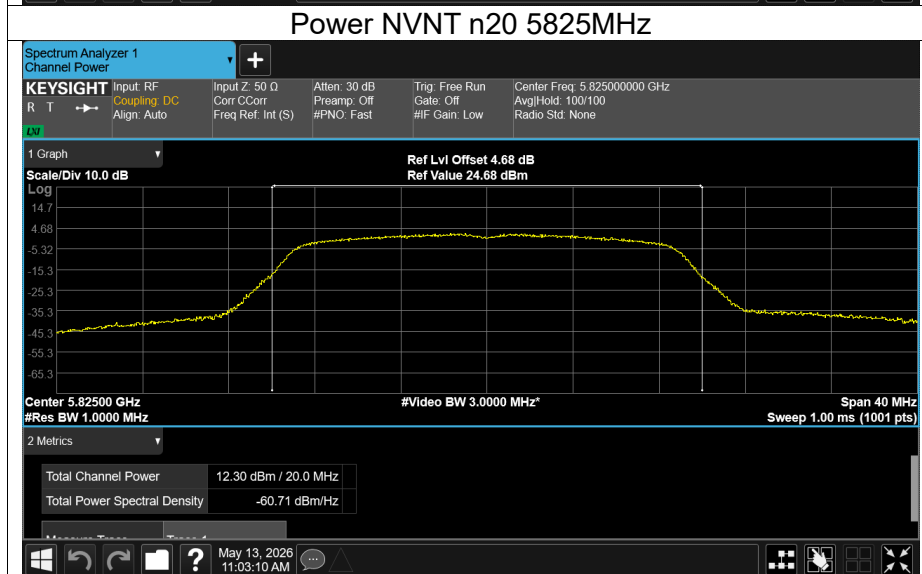
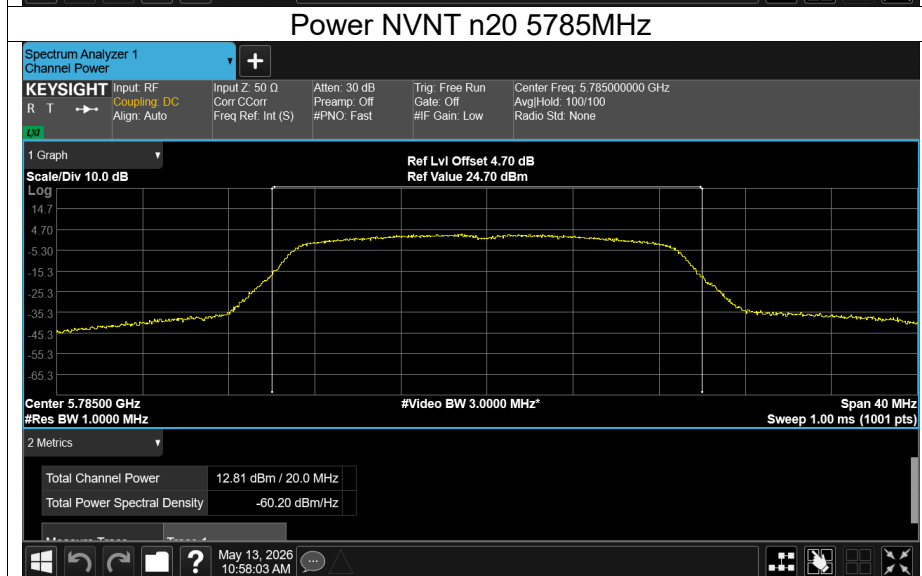
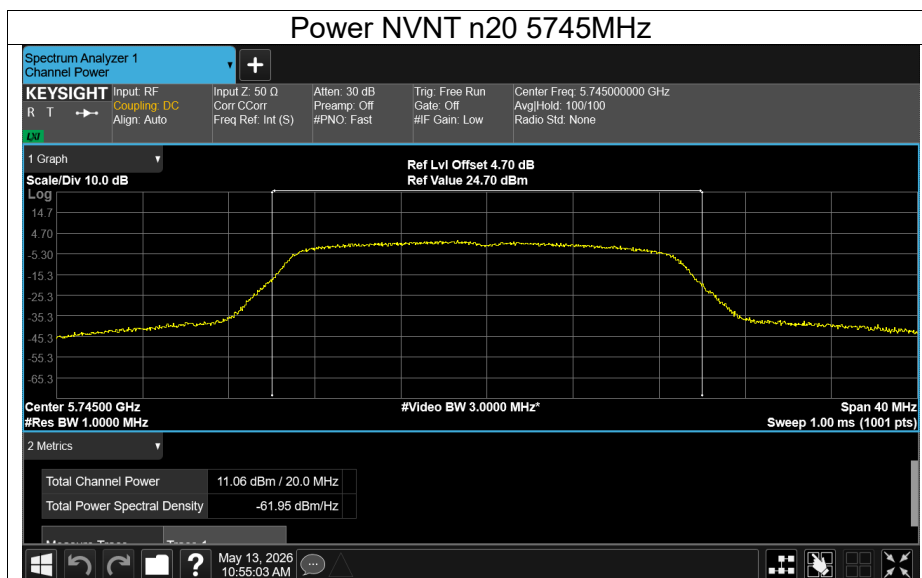
Maximum Conducted Output Power

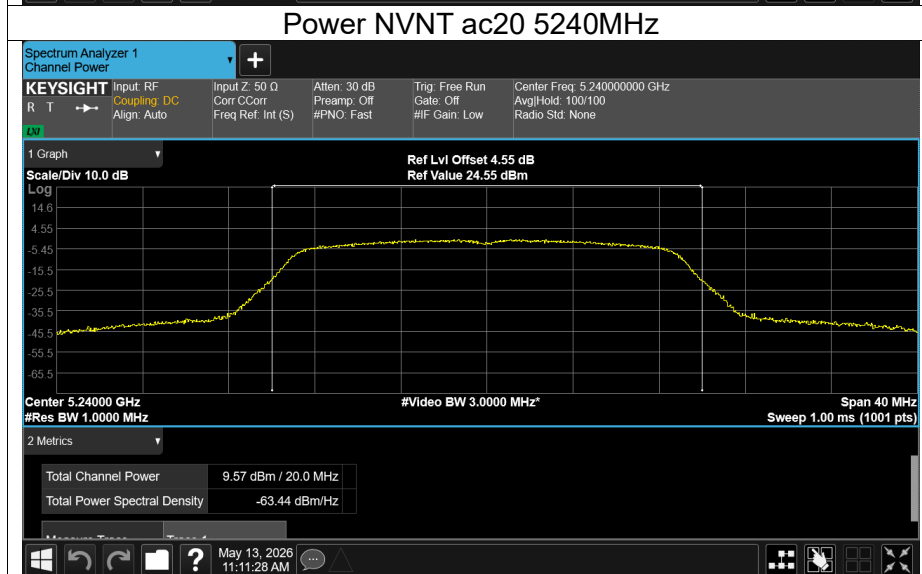
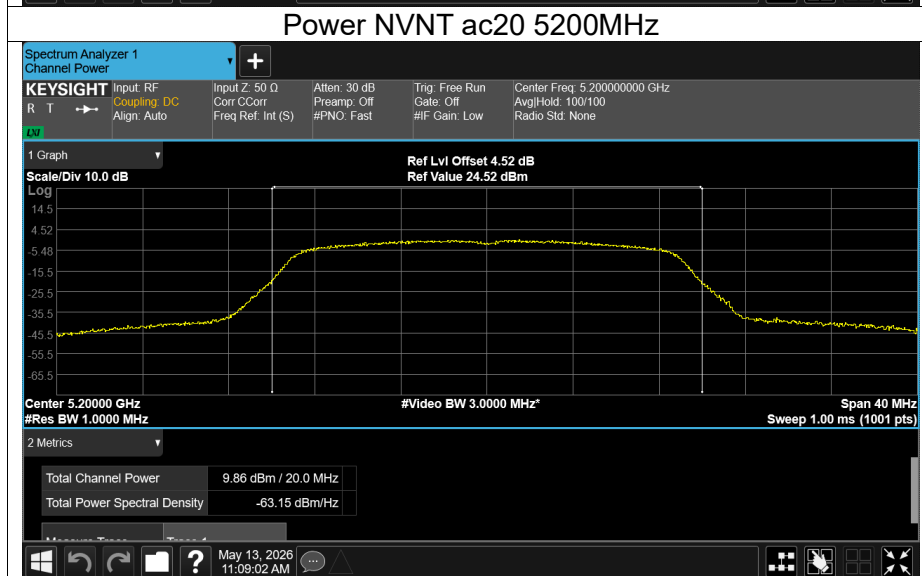
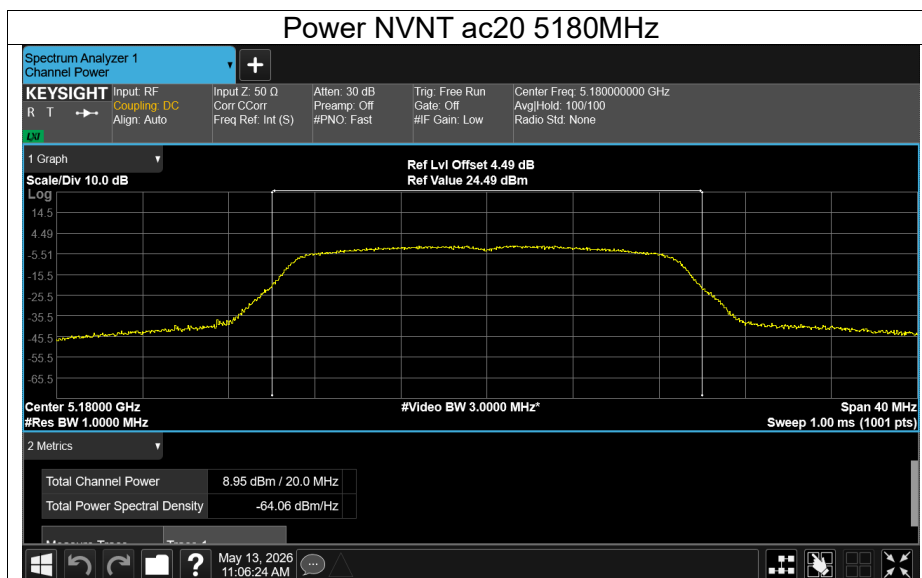
Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	a	5180	10.3	2.44	12.74	24	Pass
NVNT	a	5200	11.35	2.44	13.79	24	Pass
NVNT	a	5240	11.46	2.44	13.9	24	Pass
NVNT	a	5745	15.04	2.44	17.48	30	Pass
NVNT	a	5785	14.28	2.44	16.72	30	Pass
NVNT	a	5825	13.99	2.44	16.43	30	Pass
NVNT	n20	5180	8.87	2.78	11.65	24	Pass
NVNT	n20	5200	9.51	2.79	12.3	24	Pass
NVNT	n20	5240	9.95	2.79	12.74	24	Pass
NVNT	n20	5745	11.06	2.79	13.85	30	Pass
NVNT	n20	5785	12.81	2.79	15.6	30	Pass
NVNT	n20	5825	12.3	2.79	15.09	30	Pass
NVNT	ac20	5180	8.95	2.79	11.74	24	Pass
NVNT	ac20	5200	9.86	2.79	12.65	24	Pass
NVNT	ac20	5240	9.57	2.79	12.36	24	Pass
NVNT	ac20	5745	13.53	2.8	16.33	30	Pass
NVNT	ac20	5785	13.04	2.78	15.82	30	Pass
NVNT	ac20	5825	12	2.78	14.78	30	Pass
NVNT	ax20	5180	8.73	3.15	11.88	24	Pass
NVNT	ax20	5200	9.16	3.14	12.3	24	Pass
NVNT	ax20	5240	9.54	3.15	12.69	24	Pass
NVNT	ax20	5745	11.78	3.15	14.93	30	Pass
NVNT	ax20	5785	11.56	3.15	14.71	30	Pass
NVNT	ax20	5825	11.62	3.15	14.77	30	Pass

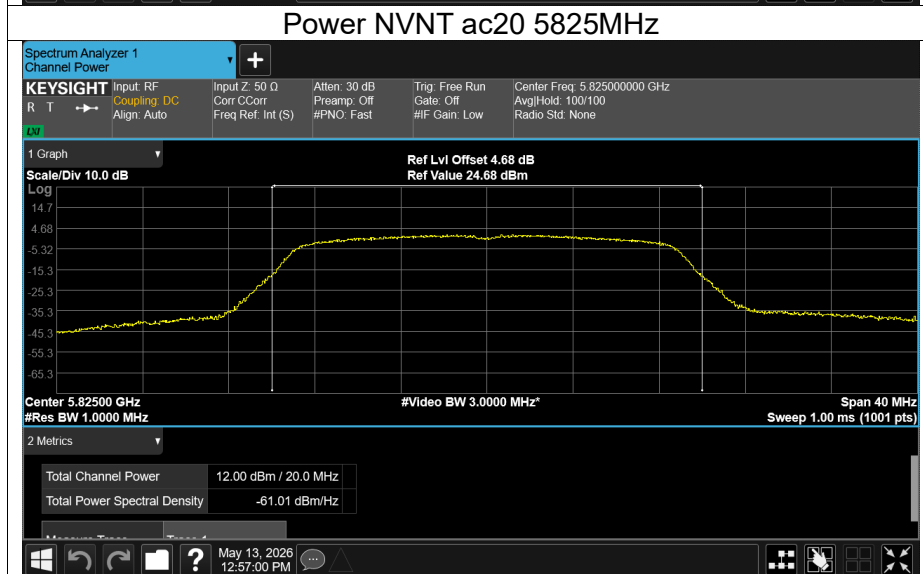
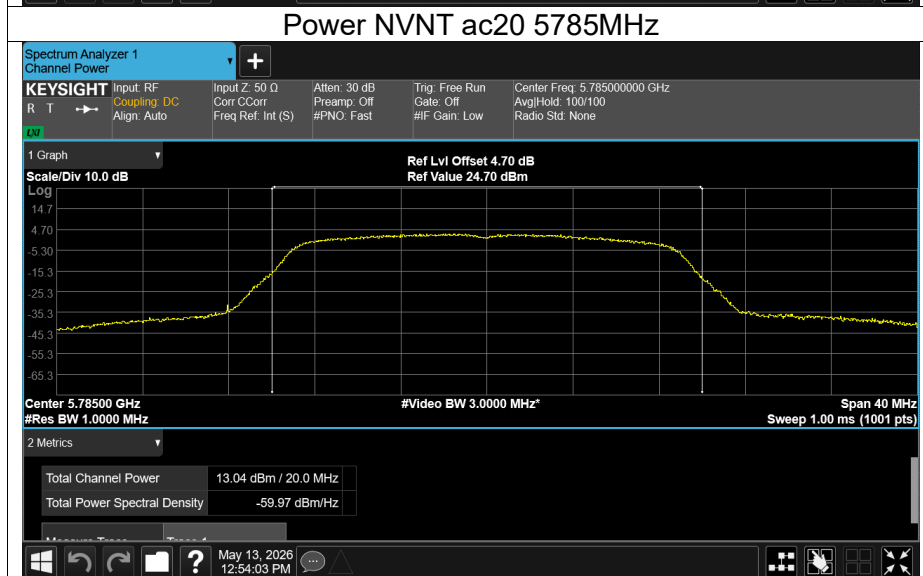
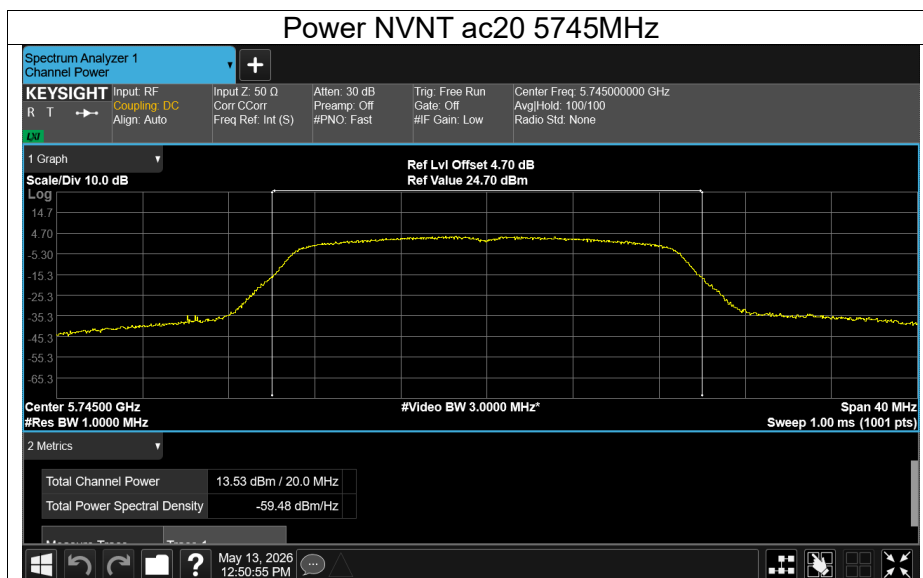


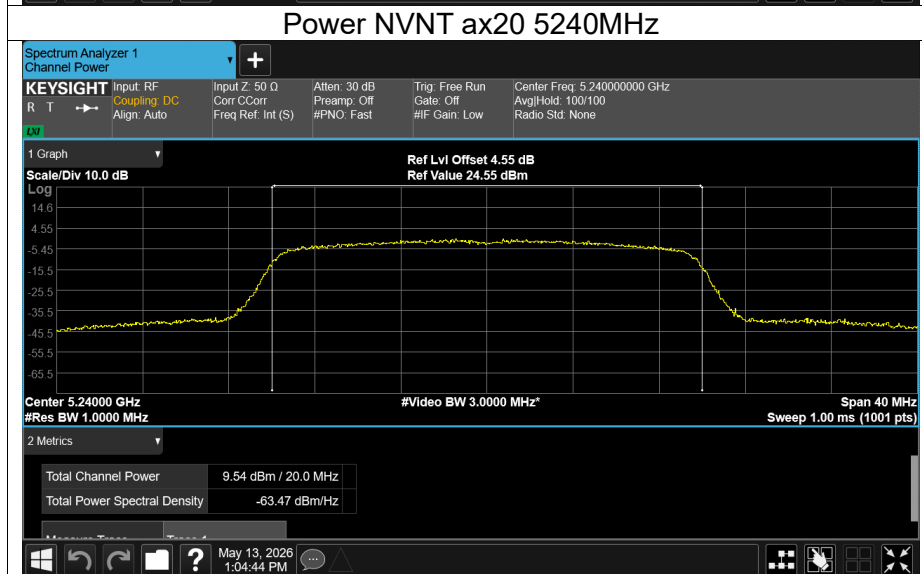
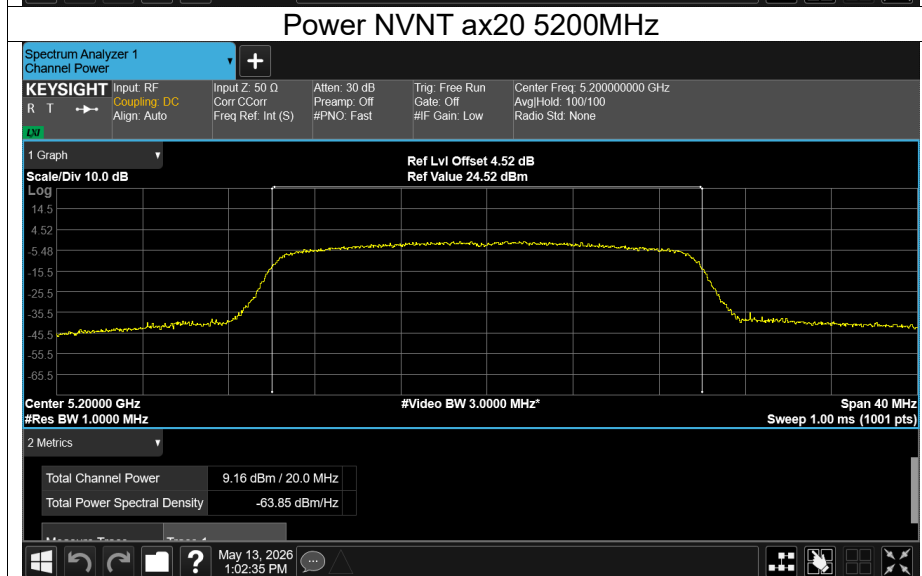
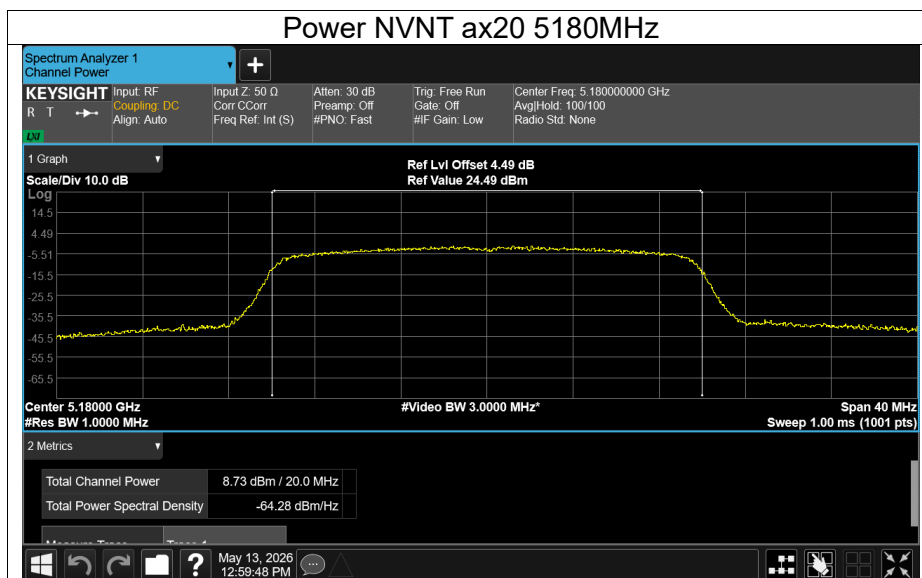


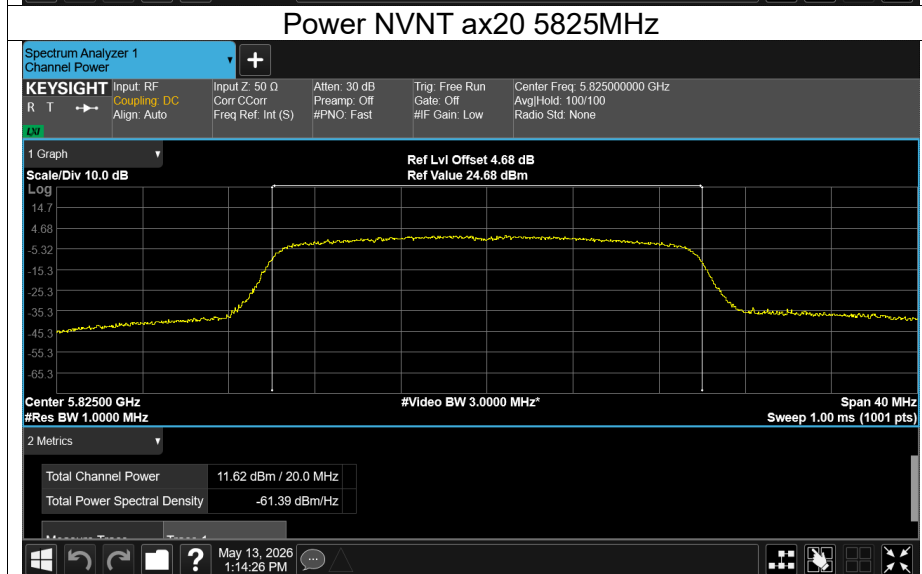
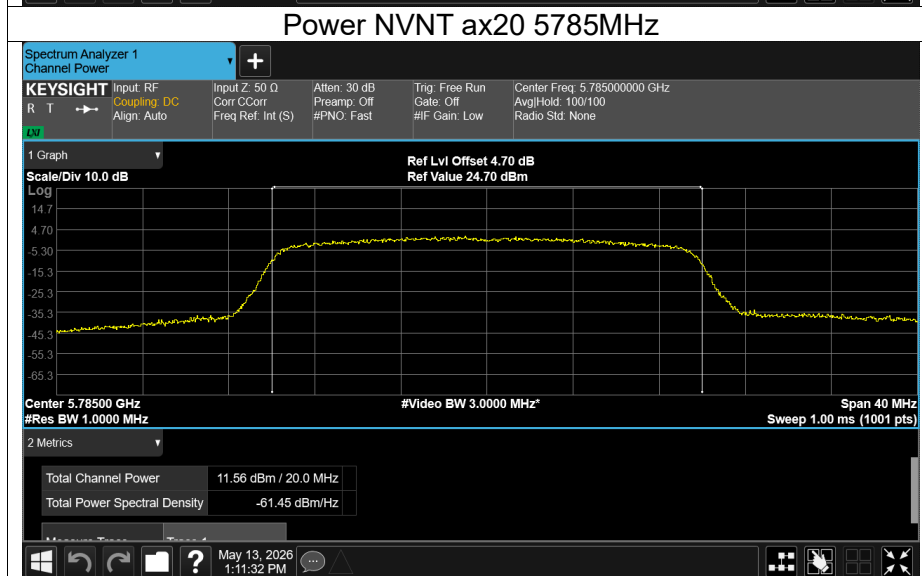
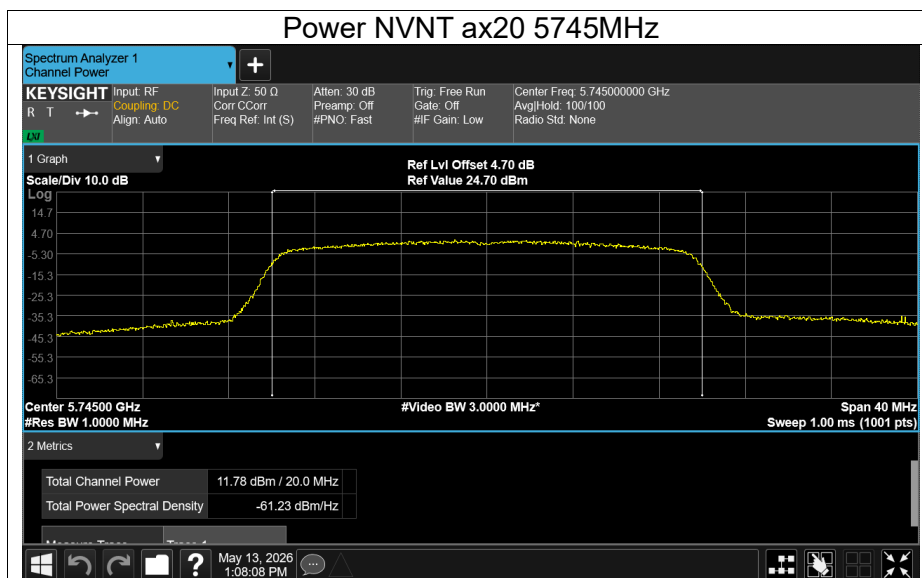














-26dB Bandwidth

Condition	Mode	Frequency (MHz)	-26 dB Bandwidth (MHz)	Verdict
NVNT	a	5180	21.22	Pass
NVNT	a	5200	21.43	Pass
NVNT	a	5240	21.18	Pass
NVNT	n20	5180	21.38	Pass
NVNT	n20	5200	21.04	Pass
NVNT	n20	5240	21.17	Pass
NVNT	ac20	5180	21.21	Pass
NVNT	ac20	5200	21.56	Pass
NVNT	ac20	5240	21.28	Pass
NVNT	ax20	5180	21.08	Pass
NVNT	ax20	5200	21.04	Pass
NVNT	ax20	5240	20.84	Pass

