

TEST REPORT

Report No.: BCTC2305915148-3E

Applicant: Huizhou Dudu Pet Products Co.,Ltd

Product Name: Automatic Pet Feeder

Model/Type
reference: DU3L-WL

Tested Date: 2023-05-16 to 2023-06-05

Issued Date: 2023-06-06

Shenzhen BCTC Testing Co., Ltd.



FCC ID: 2A55Q-DU3L-WL

Product Name: Automatic Pet Feeder
Trademark: N/A
Model/Type reference: DU3L-WL
DU3L-WL-01, DU3L-WL-02, APETDOLA FDG10
Prepared For: Huizhou Dudu Pet Products Co.,ltd
Address: Floor 2/3/4, Building 2 District D Qiaosheng Industrial Park, Lilin Town, Huicheng District, Huizhou, China
Manufacturer: Huizhou Dudu Pet Products Co.,ltd
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Prepared By: Shenzhen BCTC Testing Co., Ltd.
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Sample Received Date: 2023-05-15
Sample tested Date: 2023-05-16 to 2023-06-05
Issue Date: 2023-06-06
Report No.: BCTC2305915148-3E
FCC Part15 15.407
Test Standards: ANSI C63.10-2013
KDB 662911 D01 v02r01
KDB 789033 D02 v02r01
Test Results: PASS

Tested by:



Lei Chen/Project Handler

Approved by:



Zero Zhou/Reviewer

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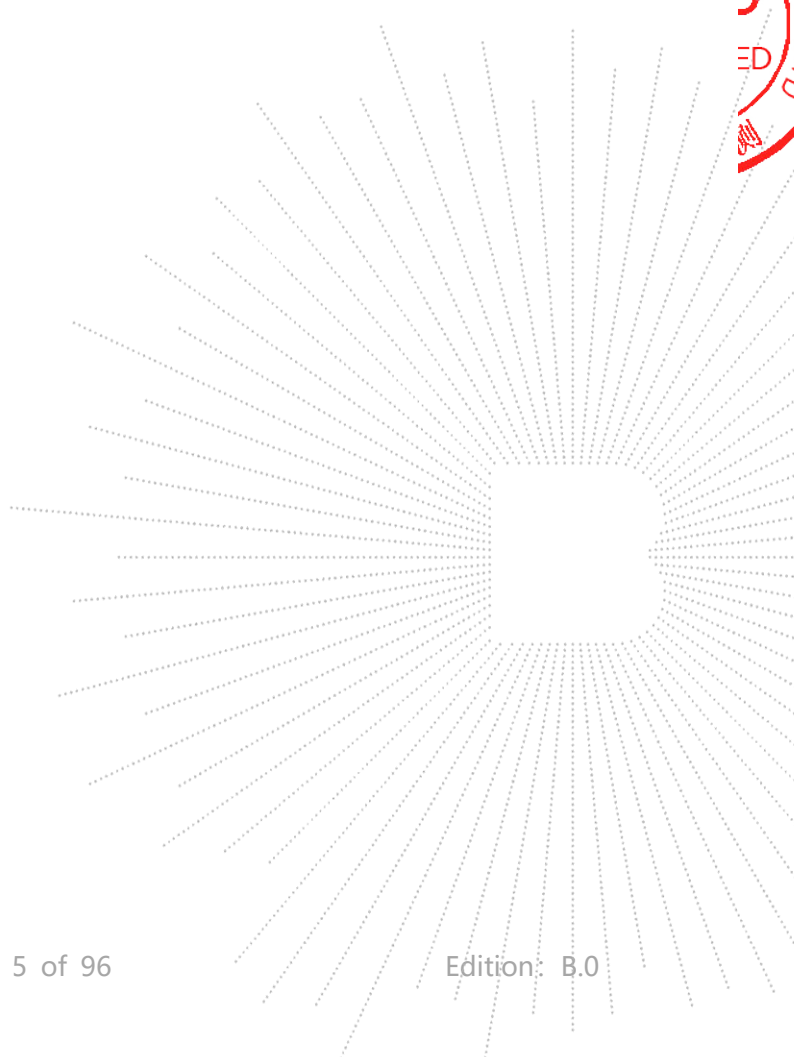
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(Note: N/A Means Not Applicable)

1. Version

Report No.	Issue Date	Description	Approved
BCTC2305915148-3E	2023-06-06	Original	Valid



2. Test Summary

The Product has been tested according to the following specifications:

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

3. Measurement Uncertainty

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

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

4. Product Information And Test Setup

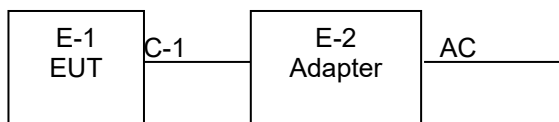
4.1 Product Information

Model/Type Ref.:	DU3L-WL DU3L-WL-01, DU3L-WL-02, APETDOLA FDG10
Model differences:	All the model are the same circuit and RF module, except model names.
Hardware Version:	N/A
Software Version:	N/A
IEEE 802.11 WLAN Mode Supported	802.11a/n (20MHz channel bandwidth) 802.11n (40MHz channel bandwidth) 5180-5240MHz for 802.11a/n(HT20); 5190-5230MHz for 802.11n(HT40); 5745-5825 MHz for 802.11a/n(HT20); 5755-5795 MHz for 802.11n(HT40);
Operation Frequency:	802.11a: 6,9,12,18,24,36,48,54Mbps; 802.11n(HT20/HT40):MCS0-MCS15;
Data Rate	OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11a/n;
Type of Modulation:	4 channels for 802.11a/n20 in the 5180-5240MHz band ; 2 channels for 802.11 n40 in the 5190-5230MHz band ; 5 channels for 802.11a/n20 in the 5745-5825MHz band ; 2 channels for 802.11 n40 in the 5755-5795MHz band
Number Of Channel	PCB antenna
Antenna installation:	5.1G: 1.97 dBi 5.8G: -0.76 dBi
Antenna Gain:	DC 5V from adapter DC 4.5V(3*AAA 1.5V) from battery
Ratings:	Model: TPA-46B050100UU Input: AC 100-240V 50/60Hz 0.2A Output: DC 5V 1A
Adapter:	

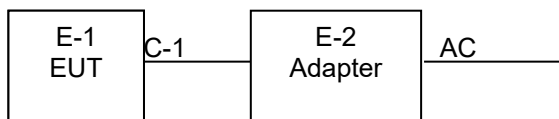
4.2 Test Setup Configuration

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

Conducted Emission:



Radiated Spurious Emission



4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note
E-1	Automatic Pet Feeder	N/A	DU3L-WL	N/A	EUT
E-2	Adapter	N/A	TPA-46B05010 0UU	N/A	Auxiliary

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

Notes:

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

4.4 Channel List

5.1G

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

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

5.8G

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

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

4.5 Test Mode

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

Pretest Mode	Description
Mode 1	802.11a / n 20 CH36/ CH40/ CH 48 802.11a /n 20 CH149/ CH157/ CH 165
Mode 2	802.11n 40 CH38/ CH 46 802.11n 40 CH 151 / CH 159
Mode 3	Link Mode

Conducted Emission	
Final Test Mode	Description
Mode 3	Link Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11a / n 20 CH36/ CH40/ CH 48 802.11 a/n 20 CH149/ CH157/ CH 165
Mode 2	802.11n 40 CH38/ CH 46 802.11n 40 CH 151 / CH 159

Note:

- (1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.
- (2) We're testing antenna A data.

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	UI_mptool		
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, Zhancheng, 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

A2LA certificate registration number is: CN1212

ISED Registered No.: 23583

ISED CAB identifier: CN0017

5.2 Test Instrument Used

Conducted Emissions Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Receiver	R&S	ESR3	102075	May 15, 2023	May 14, 2024
LISN	R&S	ENV216	101375	May 15, 2023	May 14, 2024
Software	Frad	EZ-EMC	EMC-CON 3A1	\	\
Attenuator	\	10dB DC-6GHz	1650	May 15, 2023	May 14, 2024

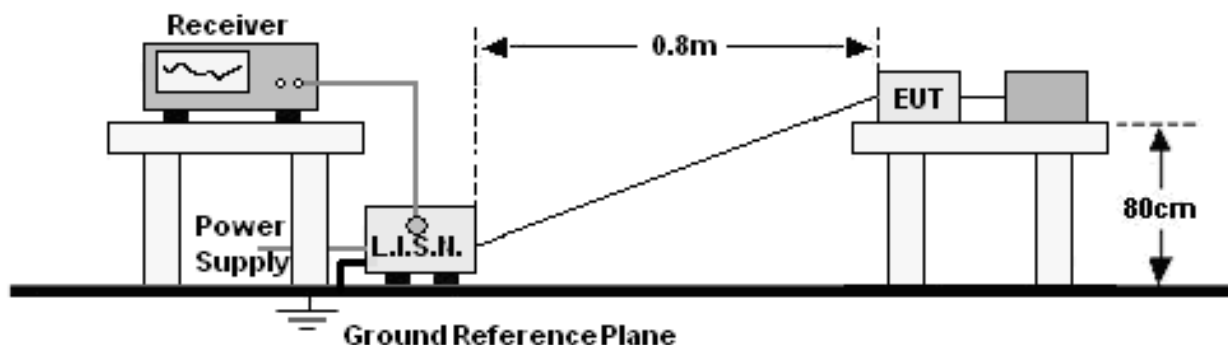
RF Conducted Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Power Metter	Keysight	E4419	\	May 15, 2023	May 14, 2024
Power Sensor (AV)	Keysight	E9300A	\	May 15, 2023	May 14, 2024
Signal Analyzer20kHz-26.5GHz	Keysight	N9020A	MY49100060	May 15, 2023	May 14, 2024
Spectrum Analyzer9kHz-40GHz	R&S	FSP40	100363	May 15, 2023	May 14, 2024
Radio frequency control box	MAIWEI	MW100-RFC B	\	\	\
Software	MAIWEI	MTS 8310	\	\	\

Radiated Emissions Test (966 Chamber01)					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
966 chamber	ChengYu	966 Room	966	May 15, 2023	May 14, 2026
Receiver	R&S	ESR3	102075	May 15, 2023	May 14, 2024
Receiver	R&S	ESRP	101154	May 15, 2023	May 14, 2024
Amplifier	Schwarzbeck	BBV9744	9744-0037	May 15, 2023	May 14, 2024
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	942	May 29, 2023	May 28, 2024
Loop Antenna(9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	May 31, 2023	May 30, 2024
Amplifier	SKET	LAPA_01G18 G-45dB	\	May 15, 2023	May 14, 2024
Horn Antenna	Schwarzbeck	BBHA9120D	1541	May 31, 2023	May 30, 2024
Amplifier(18G Hz-40GHz)	MITEQ	TTA1840-35-HG	2034381	May 15, 2023	May 14, 2024
Horn Antenna(18G Hz-40GHz)	Schwarzbeck	BBHA9170	00822	May 31, 2023	May 30, 2024
Spectrum Analyzer9kHz-40GHz	R&S	FSP40	100363	May 15, 2023	May 14, 2024
Software	Frad	EZ-EMC	FA-03A2 RE	\	\

CO., LTD.

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

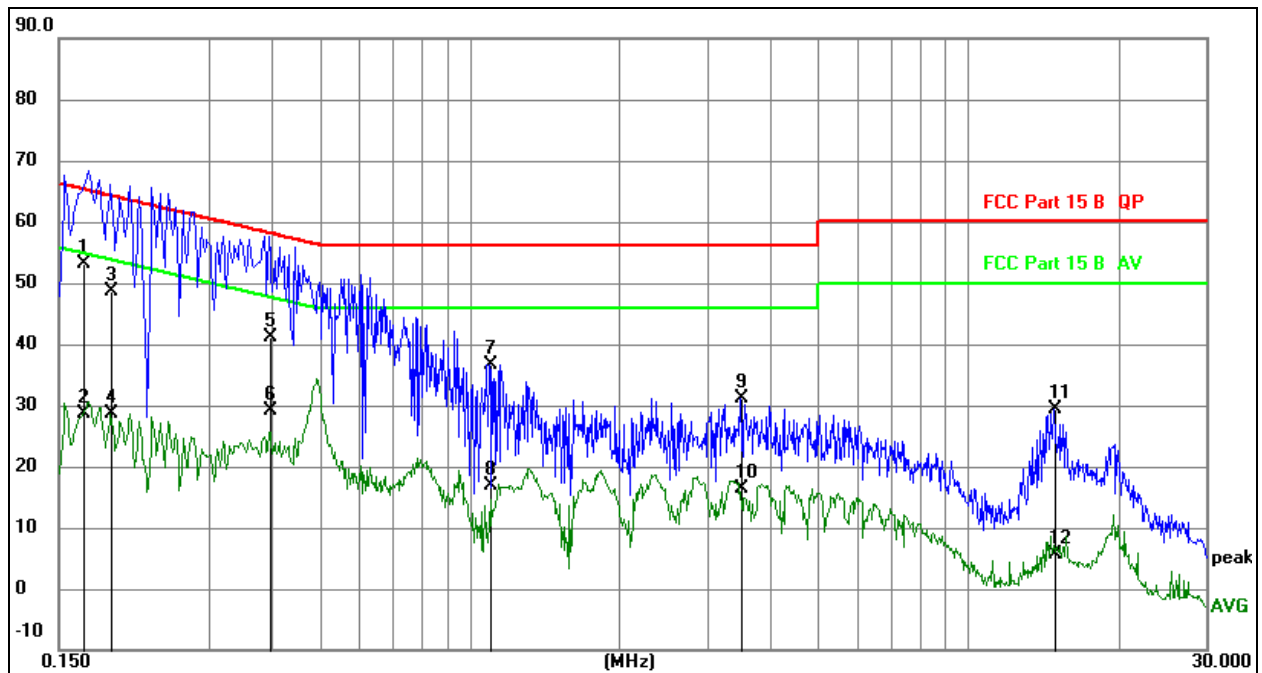
- The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
- The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak 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.

6.5 Test Result

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Phase :	L
Test Mode:	Mode 3	Test Voltage :	AC120V/60Hz

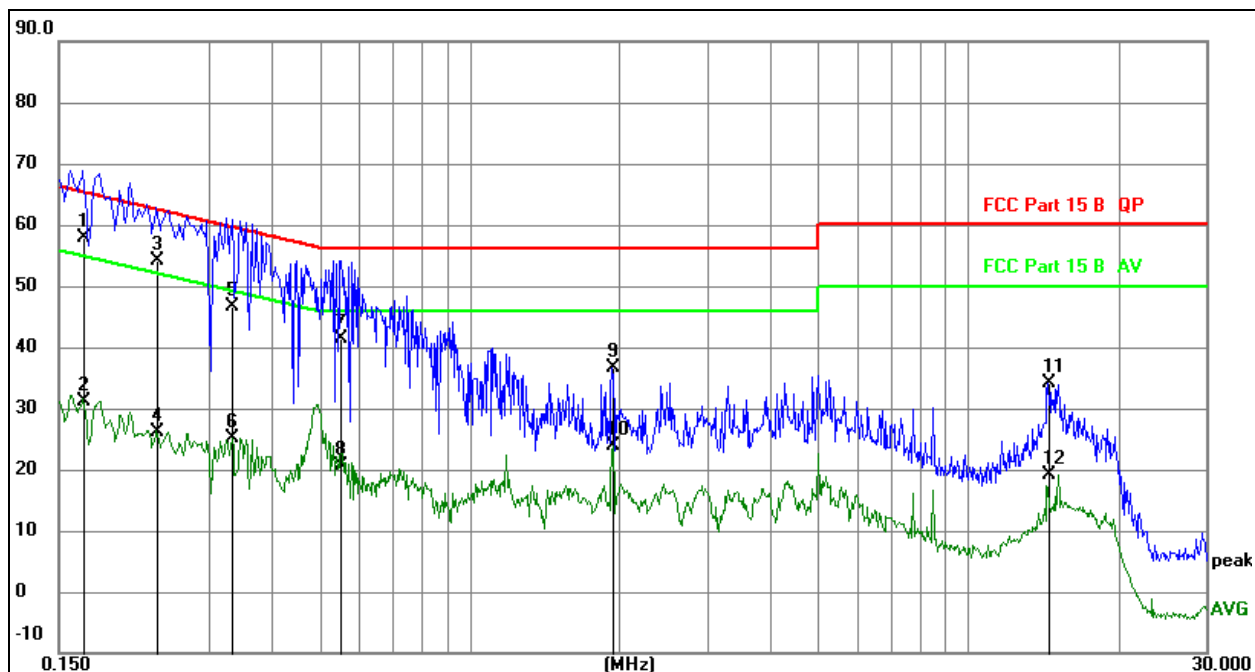


Remark:

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

No. Mk.	Freq. MHz	Reading Level	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1 *	0.1680	43.18	9.89	53.07	65.06	-11.99	QP
2	0.1680	18.85	9.89	28.74	55.06	-26.32	AVG
3	0.1905	38.67	9.91	48.58	64.01	-15.43	QP
4	0.1905	18.75	9.91	28.66	54.01	-25.35	AVG
5	0.3980	31.22	10.03	41.25	57.90	-16.65	QP
6	0.3980	19.15	10.03	29.18	47.90	-18.72	AVG
7	1.0950	26.56	10.04	36.60	56.00	-19.40	QP
8	1.0950	6.91	10.04	16.95	46.00	-29.05	AVG
9	3.5070	21.20	9.87	31.07	56.00	-24.93	QP
10	3.5070	6.43	9.87	16.30	46.00	-29.70	AVG
11	14.8335	19.79	9.67	29.46	60.00	-30.54	QP
12	14.8335	-4.00	9.67	5.67	50.00	-44.33	AVG

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Phase :	N
Test Mode:	Mode 3	Test Voltage :	AC120V/60Hz



Remark:

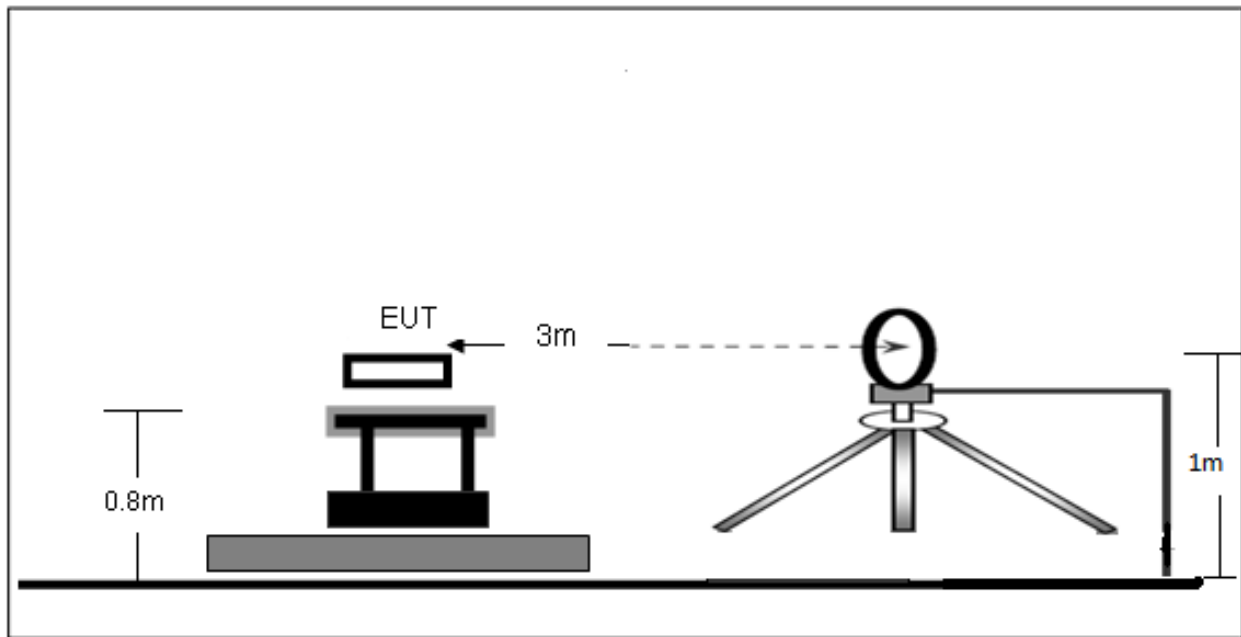
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement=Reading Level+ Correct Factor
4. Over1 Measurement-Limit

No.	Mk.	Freq. MHz	Reading Level	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1	*	0.1680	48.05	9.89	57.94	65.06	-7.12	QP
2		0.1680	21.23	9.89	31.12	55.06	-23.94	AVG
3		0.2360	44.08	9.95	54.03	62.24	-8.21	QP
4		0.2360	16.06	9.95	26.01	52.24	-26.23	AVG
5		0.3338	36.50	10.02	46.52	59.36	-12.84	QP
6		0.3338	15.13	10.02	25.15	49.36	-24.21	AVG
7		0.5509	31.44	10.05	41.49	56.00	-14.51	QP
8		0.5509	10.56	10.05	20.61	46.00	-25.39	AVG
9		1.9284	26.63	9.99	36.62	56.00	-19.38	QP
10		1.9284	13.80	9.99	23.79	46.00	-22.21	AVG
11		14.4404	24.44	9.66	34.10	60.00	-25.90	QP
12		14.4404	9.40	9.66	19.06	50.00	-30.94	AVG

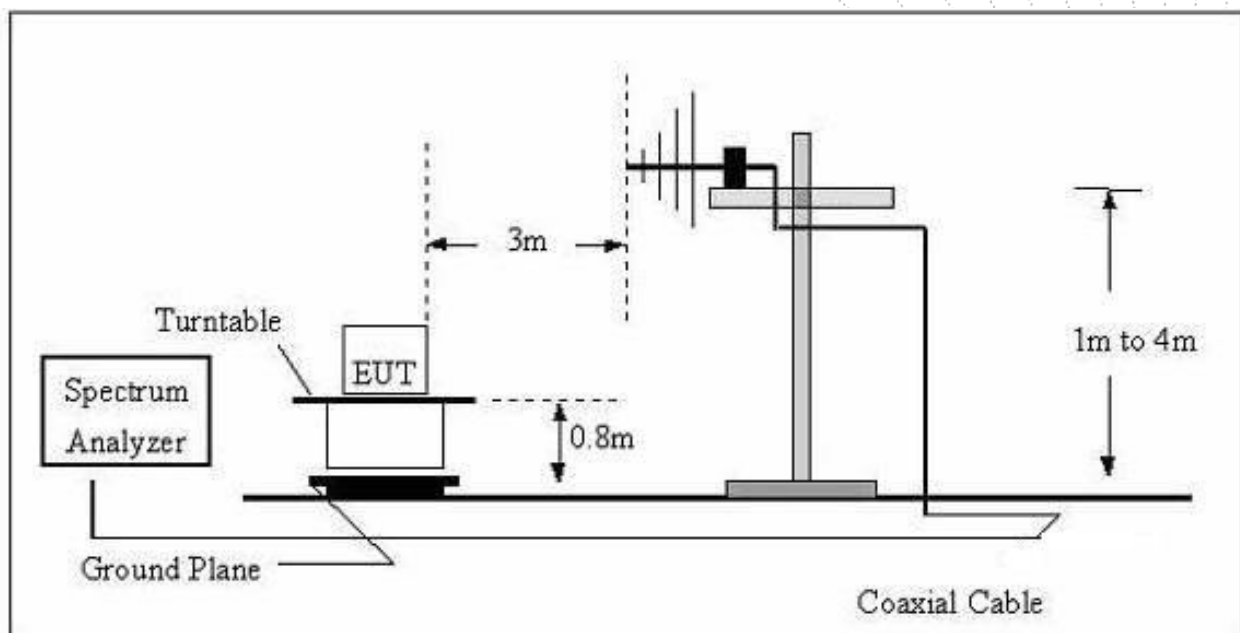
7. Radiated Emissions

7.1 Block Diagram Of Test Setup

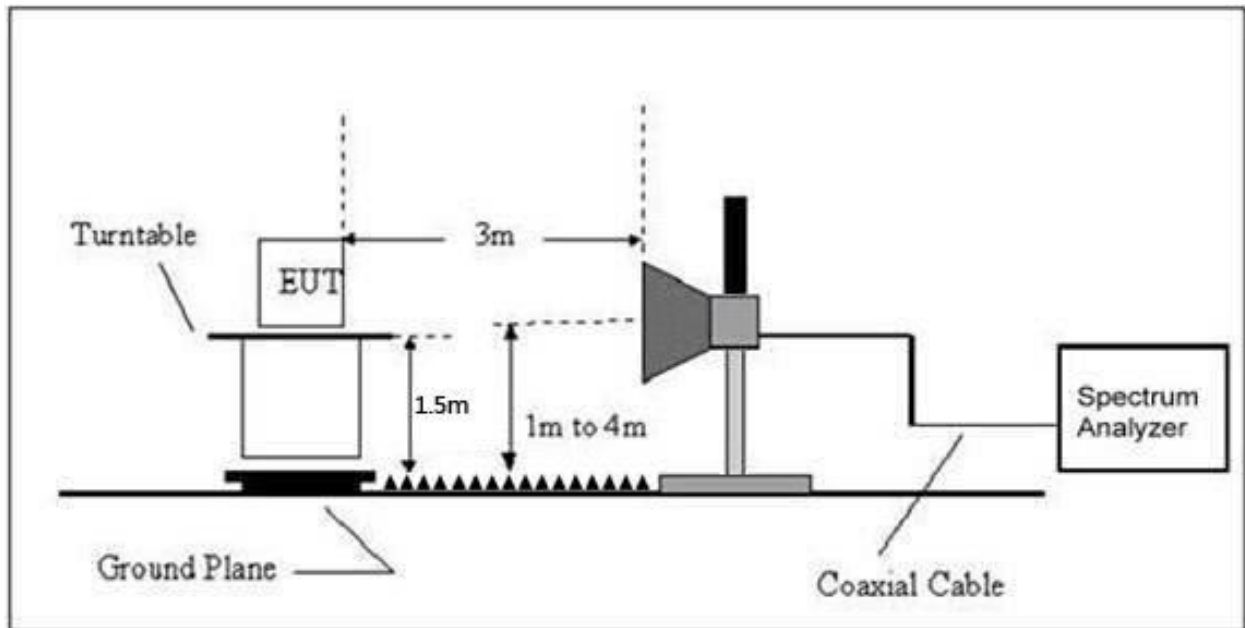
(A) Radiated Emission Test-Up Frequency Below 30MHz



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



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



7.2 Limit

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

Frequency (MHz)	Field Strength uV/m	Distance (m)	Field Strength Limit at 3m Distance	
			uV/m	dBuV/m
0.009 ~ 0.490	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log(2400/F(\text{kHz})) + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	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℃	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage:	AC120V/60Hz
Test Mode:	Mode 3	Polarization :	--

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

Note:

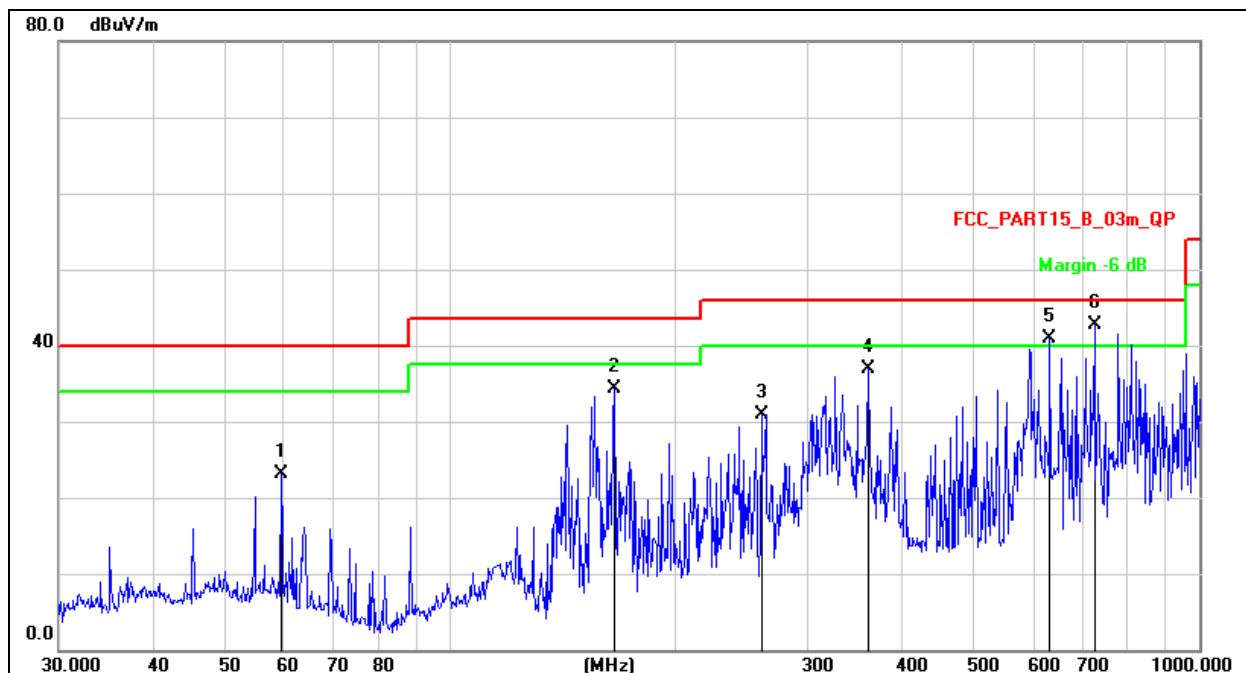
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

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

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

Between 30MHz – 1GHz

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Phase :	Horizontal
Test Mode:	Mode 3	Test Voltage :	AC120V/60Hz

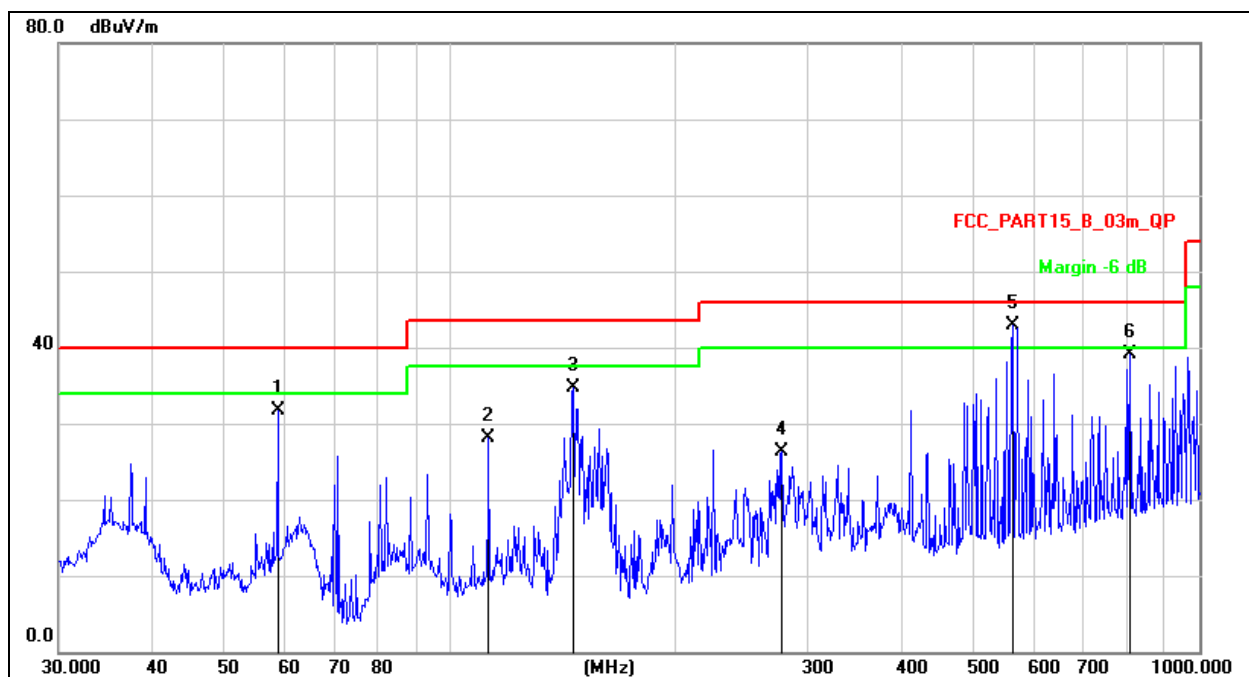


Remark:

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		59.4405	40.11	-17.01	23.10	40.00	-16.90	QP
2		165.4866	54.17	-19.91	34.26	43.50	-9.24	QP
3		260.1444	46.58	-15.58	31.00	46.00	-15.00	QP
4		361.7139	49.65	-12.65	37.00	46.00	-9.00	QP
5	!	631.6884	48.87	-7.96	40.91	46.00	-5.09	QP
6	*	724.2611	49.45	-6.79	42.66	46.00	-3.34	QP

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Phase :	Vertical
Test Mode:	Mode 3	Test Voltage :	AC120V/60Hz



Remark:

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

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		58.8185	48.70	-16.91	31.79	40.00	-8.21	QP
2		112.5244	46.71	-18.58	28.13	43.50	-15.37	QP
3		145.8611	55.44	-20.78	34.66	43.50	-8.84	QP
4		277.0935	41.40	-15.15	26.25	46.00	-19.75	QP
5	*	564.6389	52.07	-9.19	42.88	46.00	-3.12	QP
6		807.4291	44.70	-5.51	39.19	46.00	-6.81	QP

Between 1GHz – 40GHz

Test Mode:	TX(5.1G) - 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 (5180 MHz)-Above 1G									
V	4434.187	64.93	5.94	35.40	44.00	62.27	68.2	-5.93	PK
V	4434.187	43.28	5.94	35.40	44.00	40.62	54	-13.38	AV
V	10360.039	61.89	8.46	39.75	44.50	65.60	68.2	-2.60	PK
V	10360.039	43.61	8.46	39.75	44.50	47.32	54	-6.68	AV
V	15540.116	60.63	10.12	38.80	44.10	65.45	74	-8.55	PK
V	15540.116	43.57	10.12	38.80	42.70	49.79	54	-4.21	AV
H	4434.173	61.73	5.94	35.18	44.00	58.85	68.2	-9.35	PK
H	4434.173	43.64	5.94	35.18	44.00	40.76	54	-13.24	AV
H	10360.061	52.38	8.46	38.71	44.50	55.05	68.2	-13.15	PK
H	10360.061	42.99	8.46	38.71	44.50	45.66	54	-8.34	AV
H	15540.097	54.37	10.12	38.38	44.10	58.77	74	-15.23	PK
H	15540.097	42.32	10.12	38.38	44.10	46.72	54	-7.28	AV
middle Channel (5200 MHz)-Above 1G									
V	4592.006	61.89	6.48	36.35	44.05	60.67	74	-13.33	PK
V	4592.006	43.10	6.48	36.35	44.05	41.88	54	-12.12	AV
V	10400.153	63.71	8.47	37.88	44.51	65.55	68.2	-2.65	PK
V	10400.153	43.82	8.47	37.88	44.51	45.66	54	-8.34	AV
V	15600.078	60.46	10.12	38.80	44.10	65.28	74	-8.72	PK
V	15600.078	43.02	10.12	38.80	42.70	49.24	54	-4.76	AV
H	4592.029	61.16	6.48	36.37	44.05	59.96	74	-14.04	PK
H	4592.029	43.62	6.48	36.37	44.05	42.42	54	-11.58	AV
H	10400.081	51.43	8.47	38.64	44.50	54.04	68.2	-14.16	PK
H	10400.081	44.37	8.47	38.64	44.50	46.98	54	-7.02	AV
H	15600.037	50.03	10.12	38.38	44.10	54.43	74	-19.57	PK
H	15600.037	44.28	10.12	38.38	44.10	48.68	54	-5.32	AV
High Channel (5240 MHz)-Above 1G									
V	4739.069	60.26	7.10	37.24	43.50	61.10	74	-12.90	PK
V	4739.069	43.13	7.10	37.24	43.50	43.97	54	-10.03	AV
V	10480.129	60.04	8.46	37.68	44.50	61.68	68.2	-6.52	PK
V	10480.129	43.29	8.46	37.68	44.50	44.93	54	-9.07	AV
V	15720.070	61.90	10.12	38.80	44.10	66.72	74	-7.28	PK
V	15720.070	43.10	10.12	38.80	42.70	49.32	54	-4.68	AV
H	4739.185	62.31	7.10	37.24	43.50	63.15	74	-10.85	PK
H	4739.185	43.26	7.10	37.24	43.50	44.10	54	-9.90	AV
H	10480.153	52.18	8.46	38.57	44.50	54.71	68.2	-13.49	PK
H	10480.153	42.66	8.46	38.57	44.50	45.19	54	-8.81	AV
H	15720.059	53.05	10.12	38.38	44.10	57.45	74	-16.55	PK
H	15720.059	41.66	10.12	38.38	44.10	46.06	54	-7.94	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	4434.182	60.68	5.94	35.40	44.00	58.02	68.2	-10.18	PK
V	4434.182	43.08	5.94	35.40	44.00	40.42	54	-13.58	AV
V	10360.114	63.46	8.46	39.75	44.50	67.17	68.2	-1.03	PK
V	10360.114	43.91	8.46	39.75	44.50	47.62	54	-6.38	AV
V	15540.152	61.96	10.12	38.80	44.10	66.78	74	-7.22	PK
V	15540.152	43.20	10.12	38.80	42.70	49.42	54	-4.58	AV
H	4434.130	64.05	5.94	35.18	44.00	61.17	68.2	-7.03	PK
H	4434.130	43.83	5.94	35.18	44.00	40.95	54	-13.05	AV
H	10360.186	51.69	8.46	38.71	44.50	54.36	68.2	-13.84	PK
H	10360.186	41.05	8.46	38.71	44.50	43.72	54	-10.28	AV
H	15540.060	50.06	10.12	38.38	44.10	54.46	74	-19.54	PK
H	15540.060	44.29	10.12	38.38	44.10	48.69	54	-5.31	AV
middle Channel (5200 MHz)-Above 1G									
V	4592.185	64.60	6.48	36.35	44.05	63.38	74	-10.62	PK
V	4592.185	43.47	6.48	36.35	44.05	42.25	54	-11.75	AV
V	10400.109	60.17	8.47	37.88	44.51	62.01	68.2	-6.19	PK
V	10400.109	43.68	8.47	37.88	44.51	45.52	54	-8.48	AV
V	15600.065	61.50	10.12	38.80	44.10	66.32	74	-7.68	PK
V	15600.065	43.95	10.12	38.80	42.70	50.17	54	-3.83	AV
H	4592.136	60.71	6.48	36.37	44.05	59.51	74	-14.49	PK
H	4592.136	43.02	6.48	36.37	44.05	41.82	54	-12.18	AV
H	10400.157	51.39	8.47	38.64	44.50	54.00	68.2	-14.20	PK
H	10400.157	42.56	8.47	38.64	44.50	45.17	54	-8.83	AV
H	15600.028	50.14	10.12	38.38	44.10	54.54	74	-19.46	PK
H	15600.028	41.76	10.12	38.38	44.10	46.16	54	-7.84	AV
High Channel (5240 MHz)-Above 1G									
V	4739.113	63.93	7.10	37.24	43.50	64.77	74	-9.23	PK
V	4739.113	43.81	7.10	37.24	43.50	44.65	54	-9.35	AV
V	10480.008	63.08	8.46	37.68	44.50	64.72	68.2	-3.48	PK
V	10480.008	43.24	8.46	37.68	44.50	44.88	54	-9.12	AV
V	15720.011	63.96	10.12	38.80	44.10	68.78	74	-5.22	PK
V	15720.011	43.11	10.12	38.80	42.70	49.33	54	-4.67	AV
H	4739.006	60.36	7.10	37.24	43.50	61.20	74	-12.80	PK
H	4739.006	43.32	7.10	37.24	43.50	44.16	54	-9.84	AV
H	10480.196	54.22	8.46	38.57	44.50	56.75	68.2	-11.45	PK
H	10480.196	41.85	8.46	38.57	44.50	44.38	54	-9.62	AV
H	15720.149	50.47	10.12	38.38	44.10	54.87	74	-19.13	PK
H	15720.149	44.97	10.12	38.38	44.10	49.37	54	-4.63	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	4434.114	61.93	5.94	35.40	44.00	59.27	68.2	-8.93	PK
V	4434.114	43.96	5.94	35.40	44.00	41.30	54	-12.70	AV
V	10380.003	60.45	8.46	39.75	44.50	64.16	68.2	-4.04	PK
V	10380.003	43.58	8.46	39.75	44.50	47.29	54	-6.71	AV
V	15570.002	63.88	10.12	38.80	44.10	68.70	74	-5.30	PK
V	15570.002	43.30	10.12	38.80	42.70	49.52	54	-4.48	AV
H	4434.008	64.48	5.94	35.18	44.00	61.60	74	-12.40	PK
H	4434.008	43.09	5.94	35.18	44.00	40.21	54	-13.79	AV
H	10380.176	51.95	8.46	38.71	44.50	54.62	68.2	-13.58	PK
H	10380.176	40.55	8.46	38.71	44.50	43.22	54	-10.78	AV
H	15570.057	52.31	10.12	38.38	44.10	56.71	74	-17.29	PK
H	15570.057	40.37	10.12	38.38	44.10	44.77	54	-9.23	AV
middle Channel (5230 MHz)-Above 1G									
V	4739.022	60.61	6.48	36.35	44.05	59.39	68.2	-8.81	PK
V	4739.022	43.48	6.48	36.35	44.05	42.26	54	-11.74	AV
V	10460.042	60.57	8.47	37.88	44.51	62.41	68.2	-5.79	PK
V	10460.042	43.16	8.47	37.88	44.51	45.00	54	-9.00	AV
V	15690.057	64.11	10.12	38.80	44.10	68.93	74	-5.07	PK
V	15690.057	43.82	10.12	38.80	42.70	50.04	54	-3.96	AV
H	4739.102	62.12	6.48	36.37	44.05	60.92	68.2	-7.28	PK
H	4739.102	43.96	6.48	36.37	44.05	42.76	54	-11.24	AV
H	10460.038	53.25	8.47	38.64	44.50	55.86	68.2	-12.34	PK
H	10460.038	44.59	8.47	38.64	44.50	47.20	54	-6.80	AV
H	15690.036	50.48	10.12	38.38	44.10	54.88	74	-19.12	PK
H	15690.036	41.05	10.12	38.38	44.10	45.45	54	-8.55	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	4679.149	55.14	5.94	35.40	44.00	52.48	74	-21.52	PK
V	4679.149	43.39	5.94	35.40	44.00	40.73	54	-13.27	AV
V	11490.072	54.20	8.46	39.75	44.50	57.91	68.2	-10.29	PK
V	11490.072	43.74	8.46	39.75	44.50	47.45	54	-6.55	AV
V	17235.179	60.05	10.12	38.80	44.10	64.87	68.2	-3.33	PK
V	17235.179	43.98	10.12	38.80	42.70	50.20	54	-3.80	AV
H	4679.119	55.12	5.94	35.18	44.00	52.24	74	-21.76	PK
H	4679.119	43.55	5.94	35.18	44.00	40.67	54	-13.33	AV
H	11490.113	52.26	8.46	38.71	44.50	54.93	68.2	-13.27	PK
H	11490.113	44.93	8.46	38.71	44.50	47.60	54	-6.40	AV
H	17235.041	52.98	10.12	38.38	44.10	57.38	68.2	-10.82	PK
H	17235.041	43.14	10.12	38.38	44.10	47.54	54	-6.46	AV
middle Channel (5785 MHz)-Above 1G									
V	4592.082	54.48	6.48	36.35	44.05	53.26	74	-20.74	PK
V	4592.082	43.56	6.48	36.35	44.05	42.34	54	-11.66	AV
V	11570.124	55.98	8.47	37.88	44.51	57.82	68.2	-10.38	PK
V	11570.124	43.75	8.47	37.88	44.51	45.59	54	-8.41	AV
V	17355.165	58.33	10.12	38.80	44.10	63.15	68.2	-5.05	PK
V	17355.165	39.16	10.12	38.80	42.70	45.38	54	-8.62	AV
H	4592.088	58.35	6.48	36.37	44.05	57.15	74	-16.85	PK
H	4592.088	43.20	6.48	36.37	44.05	42.00	54	-12.00	AV
H	11570.058	54.69	8.47	38.64	44.50	57.30	68.2	-10.90	PK
H	11570.058	41.32	8.47	38.64	44.50	43.93	54	-10.07	AV
H	17355.073	50.48	10.12	38.38	44.10	54.88	68.2	-13.32	PK
H	17355.073	40.81	10.12	38.38	44.10	45.21	54	-8.79	AV
High Channel (5825 MHz)-Above 1G									
V	6039.133	59.06	7.10	37.24	43.50	59.90	68.2	-8.30	PK
V	6039.133	43.53	7.10	37.24	43.50	44.37	54	-9.63	AV
V	11650.129	60.64	8.46	37.68	44.50	62.28	74	-11.72	PK
V	11650.129	43.61	8.46	37.68	44.50	45.25	54	-8.75	AV
V	17475.094	53.47	10.12	38.80	44.10	58.29	68.2	-9.91	PK
V	17475.094	43.75	10.12	38.80	42.70	49.97	54	-4.03	AV
H	6039.038	57.43	7.10	37.24	43.50	58.27	68.2	-9.93	PK
H	6039.038	43.87	7.10	37.24	43.50	44.71	54	-9.29	AV
H	11650.055	50.67	8.46	38.57	44.50	53.20	74	-20.80	PK
H	11650.055	42.06	8.46	38.57	44.50	44.59	54	-9.41	AV
H	17475.131	51.40	10.12	38.38	44.10	55.80	68.2	-12.40	PK
H	17475.131	43.59	10.12	38.38	44.10	47.99	54	-6.01	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	4679.148	60.10	5.94	35.40	44.00	57.44	74	-16.56	PK
V	4679.148	43.44	5.94	35.40	44.00	40.78	54	-13.22	AV
V	11490.080	56.48	8.46	39.75	44.50	60.19	68.2	-8.01	PK
V	11490.080	43.09	8.46	39.75	44.50	46.80	54	-7.20	AV
V	17235.164	59.24	10.12	38.80	44.10	64.06	68.2	-4.14	PK
V	17235.164	43.80	10.12	38.80	42.70	50.02	54	-3.98	AV
H	4679.127	59.34	5.94	35.18	44.00	56.46	74	-17.54	PK
H	4679.127	43.63	5.94	35.18	44.00	40.75	54	-13.25	AV
H	11490.097	47.40	8.46	38.71	44.50	50.07	68.2	-18.13	PK
H	11490.097	42.13	8.46	38.71	44.50	44.80	54	-9.20	AV
H	17235.132	53.13	10.12	38.38	44.10	57.53	68.2	-10.67	PK
H	17235.132	40.11	10.12	38.38	44.10	44.51	54	-9.49	AV
middle Channel (5785 MHz)-Above 1G									
V	4592.049	61.67	6.48	36.35	44.05	60.45	74	-13.55	PK
V	4592.049	43.65	6.48	36.35	44.05	42.43	54	-11.57	AV
V	11570.158	55.67	8.47	37.88	44.51	57.51	68.2	-10.69	PK
V	11570.158	43.92	8.47	37.88	44.51	45.76	54	-8.24	AV
V	17355.106	60.90	10.12	38.80	44.10	65.72	68.2	-2.48	PK
V	17355.106	43.95	10.12	38.80	42.70	50.17	54	-3.83	AV
H	4592.019	58.48	6.48	36.37	44.05	57.28	74	-16.72	PK
H	4592.019	43.99	6.48	36.37	44.05	42.79	54	-11.21	AV
H	11570.149	53.19	8.47	38.64	44.50	55.80	68.2	-12.40	PK
H	11570.149	43.65	8.47	38.64	44.50	46.26	54	-7.74	AV
H	17355.058	51.63	10.12	38.38	44.10	56.03	68.2	-12.17	PK
H	17355.058	44.09	10.12	38.38	44.10	48.49	54	-5.51	AV
High Channel (5825 MHz)-Above 1G									
V	6039.080	56.51	7.10	37.24	43.50	57.35	68.2	-10.85	PK
V	6039.080	43.07	7.10	37.24	43.50	43.91	54	-10.09	AV
V	11650.130	57.71	8.46	37.68	44.50	59.35	74	-14.65	PK
V	11650.130	43.77	8.46	37.68	44.50	45.41	54	-8.59	AV
V	17475.079	59.66	10.12	38.80	44.10	64.48	68.2	-3.72	PK
V	17475.079	43.30	10.12	38.80	42.70	49.52	54	-4.48	AV
H	6039.173	57.46	7.10	37.24	43.50	58.30	68.2	-9.90	PK
H	6039.173	43.32	7.10	37.24	43.50	44.16	54	-9.84	AV
H	11650.026	50.37	8.46	38.57	44.50	52.90	74	-21.10	PK
H	11650.026	42.69	8.46	38.57	44.50	45.22	54	-8.78	AV
H	17475.172	53.19	10.12	38.38	44.10	57.59	68.2	-10.61	PK
H	17475.172	40.67	10.12	38.38	44.10	45.07	54	-8.93	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	4679.182	60.13	5.94	35.40	44.00	57.47	74	-16.53	PK
V	4679.182	43.57	5.94	35.40	44.00	40.91	54	-13.09	AV
V	11510.184	55.92	8.46	39.75	44.50	59.63	74	-14.37	PK
V	11510.184	43.23	8.46	39.75	44.50	46.94	54	-7.06	AV
V	17265.133	56.35	10.12	38.80	44.10	61.17	68.2	-7.03	PK
V	17265.133	43.31	10.12	38.80	42.70	49.53	54	-4.47	AV
H	4679.095	59.41	5.94	35.18	44.00	56.53	74	-17.47	PK
H	4679.095	43.30	5.94	35.18	44.00	40.42	54	-13.58	AV
H	11510.045	51.72	8.46	38.71	44.50	54.39	74	-19.61	PK
H	11510.045	42.63	8.46	38.71	44.50	45.30	54	-8.70	AV
H	17265.195	54.65	10.12	38.38	44.10	59.05	68.2	-9.15	PK
H	17265.195	44.17	10.12	38.38	44.10	48.57	54	-5.43	AV
middle Channel (5795 MHz)-Above 1G									
V	6039.120	59.31	6.48	36.35	44.05	58.09	68.2	-10.11	PK
V	6039.120	43.25	6.48	36.35	44.05	42.03	54	-11.97	AV
V	11590.031	57.82	8.47	37.88	44.51	59.66	74	-14.34	PK
V	11590.031	43.66	8.47	37.88	44.51	45.50	54	-8.50	AV
V	17385.123	55.91	10.12	38.80	44.10	60.73	68.2	-7.47	PK
V	17385.123	41.56	10.12	38.80	42.70	47.78	54	-6.22	AV
H	6039.054	60.74	6.48	36.37	44.05	59.54	68.2	-8.66	PK
H	6039.054	43.25	6.48	36.37	44.05	42.05	54	-11.95	AV
H	11590.151	52.71	8.47	38.64	44.50	55.32	74	-18.68	PK
H	11590.151	44.77	8.47	38.64	44.50	47.38	54	-6.62	AV
H	17385.092	53.10	10.12	38.38	44.10	57.50	68.2	-10.70	PK
H	17385.092	44.30	10.12	38.38	44.10	48.70	54	-5.30	AV

Note: PK value is lower than the Average value limit, So average didn't record.

The 26.5-40G amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

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

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

8. Power Spectral Density Test

8.1 Block Diagram Of Test Setup



8.2 Limit

For the band 5.15-5.25 GHz,

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

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

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

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

For the band 5.725-5.85 GHz

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

8.3 Test Procedure

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

- a) Set $RBW \geq 1/T$, 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.

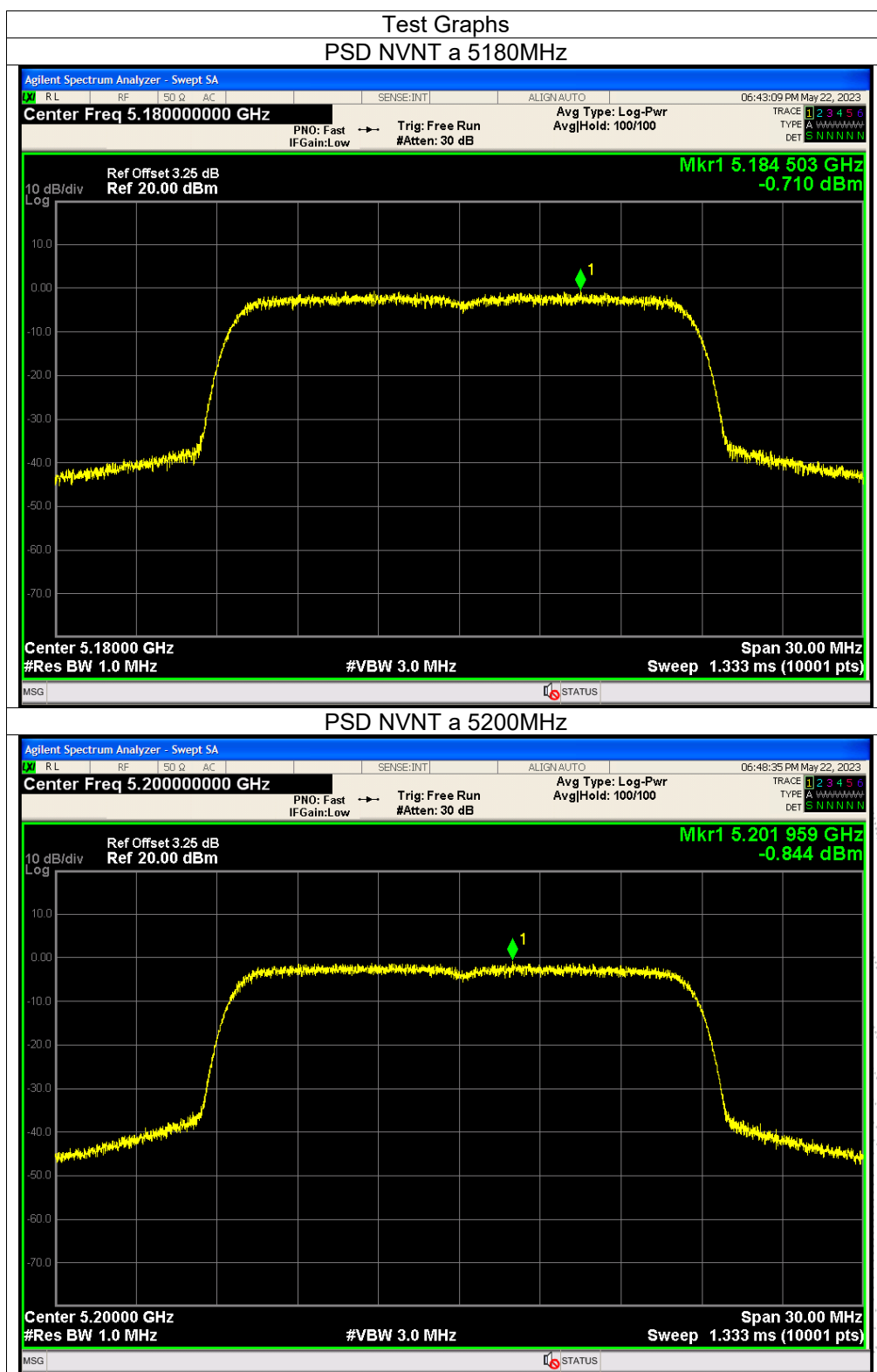
8.5 Test Result

Temperature :	26 °C	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC 4.5V
Test Mode :	(5180-5240MHz); (5745-5825MHz)		

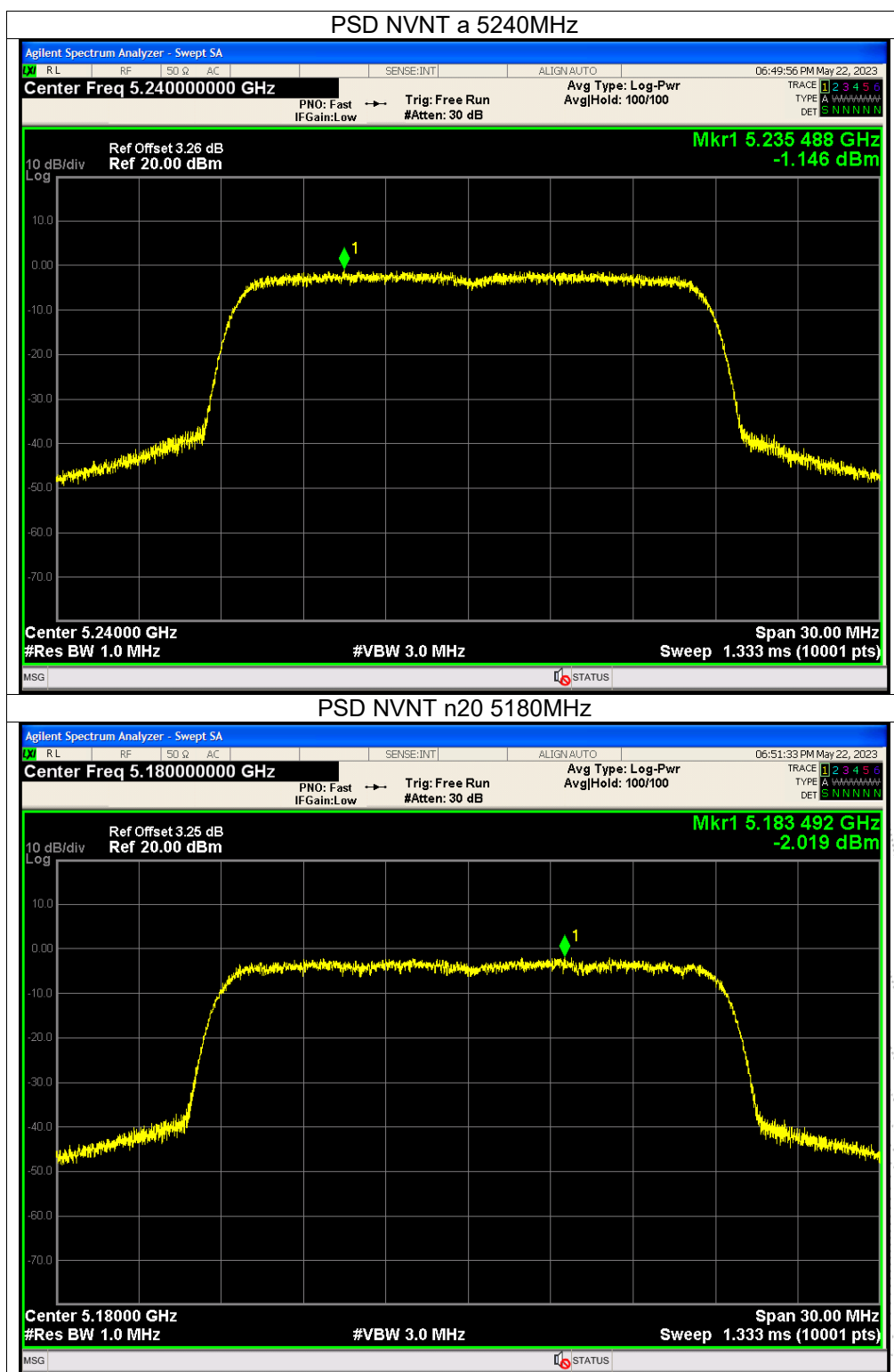
Condition	Mode	Frequency (MHz)	Conducted PSD (dBm/1MHz)	Limit (dBm/1MHz)	Verdict
NVNT	a	5180	-0.71	11	Pass
NVNT	a	5200	-0.84	11	Pass
NVNT	a	5240	-1.15	11	Pass
NVNT	n20	5180	-2.02	11	Pass
NVNT	n20	5200	-2.41	11	Pass
NVNT	n20	5240	-2.92	11	Pass
NVNT	n40	5190	-7.26	11	Pass
NVNT	n40	5230	-7.03	11	Pass

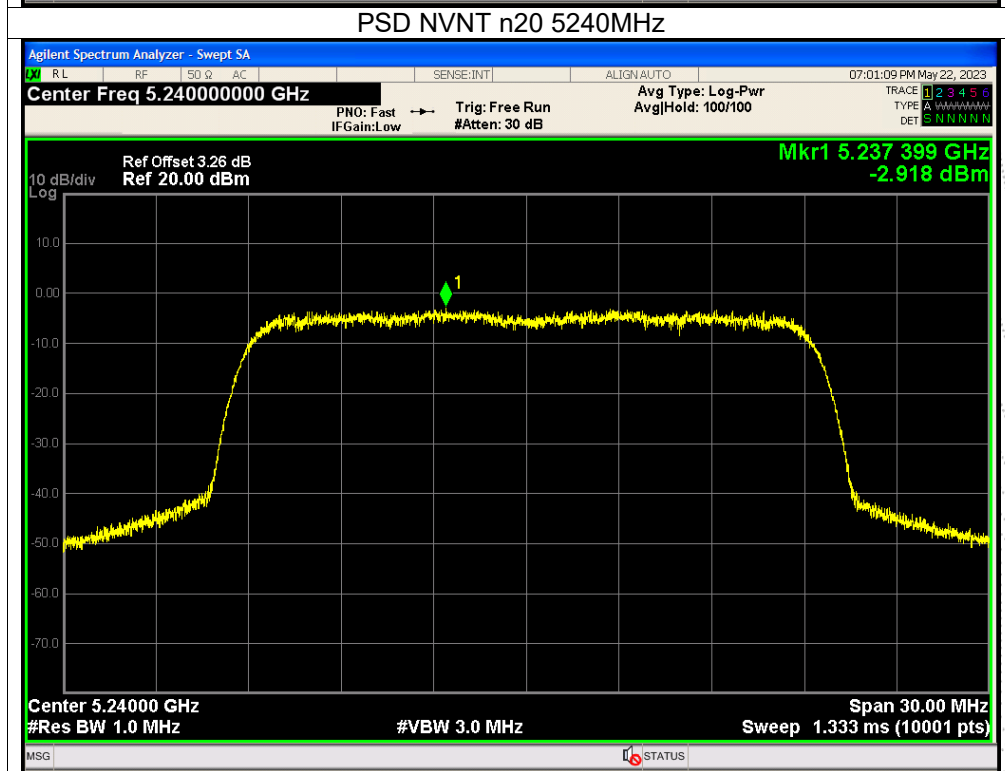
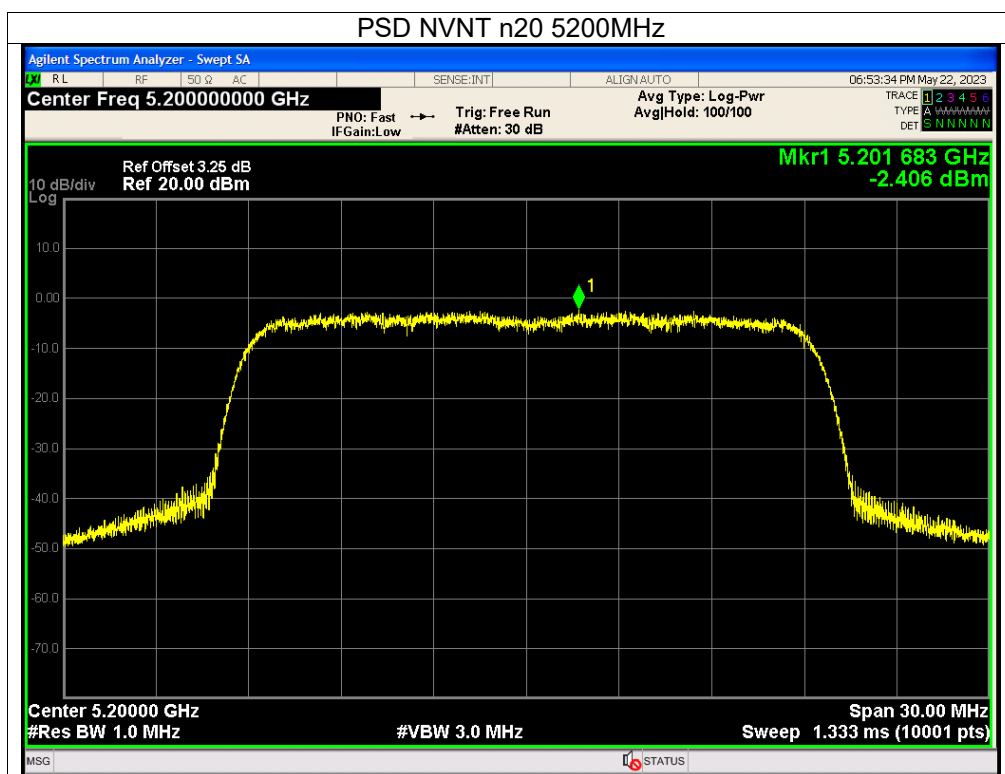
Condition	Mode	Frequency (MHz)	Conducted PSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
NVNT	a	5745	-3.71	30	Pass
NVNT	a	5785	-4.91	30	Pass
NVNT	a	5825	-5.03	30	Pass
NVNT	n20	5745	-6.09	30	Pass
NVNT	n20	5785	-7.46	30	Pass
NVNT	n20	5825	-7.72	30	Pass
NVNT	n40	5755	-10.27	30	Pass
NVNT	n40	5795	-11.74	30	Pass

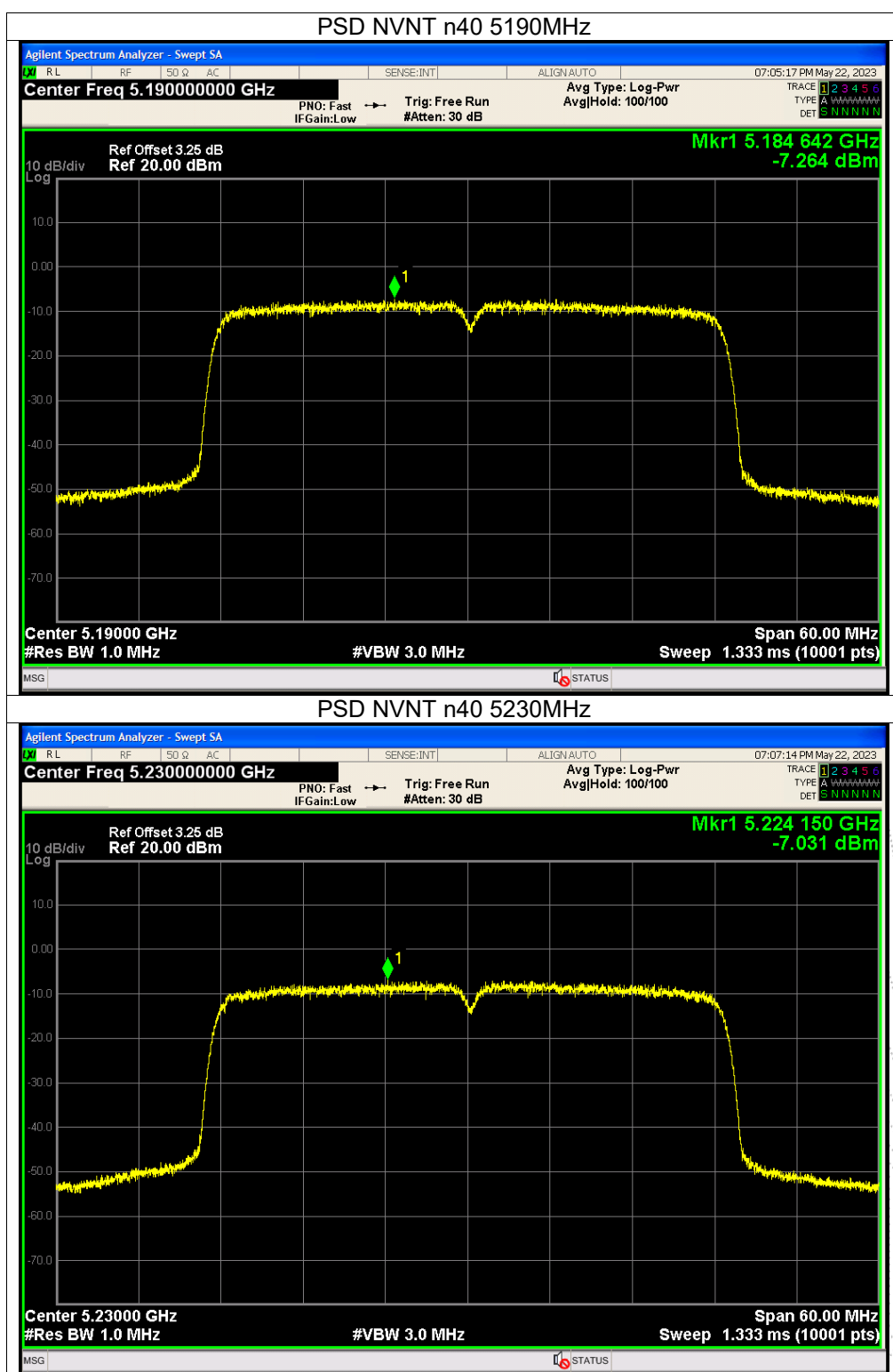
CO., LTD.

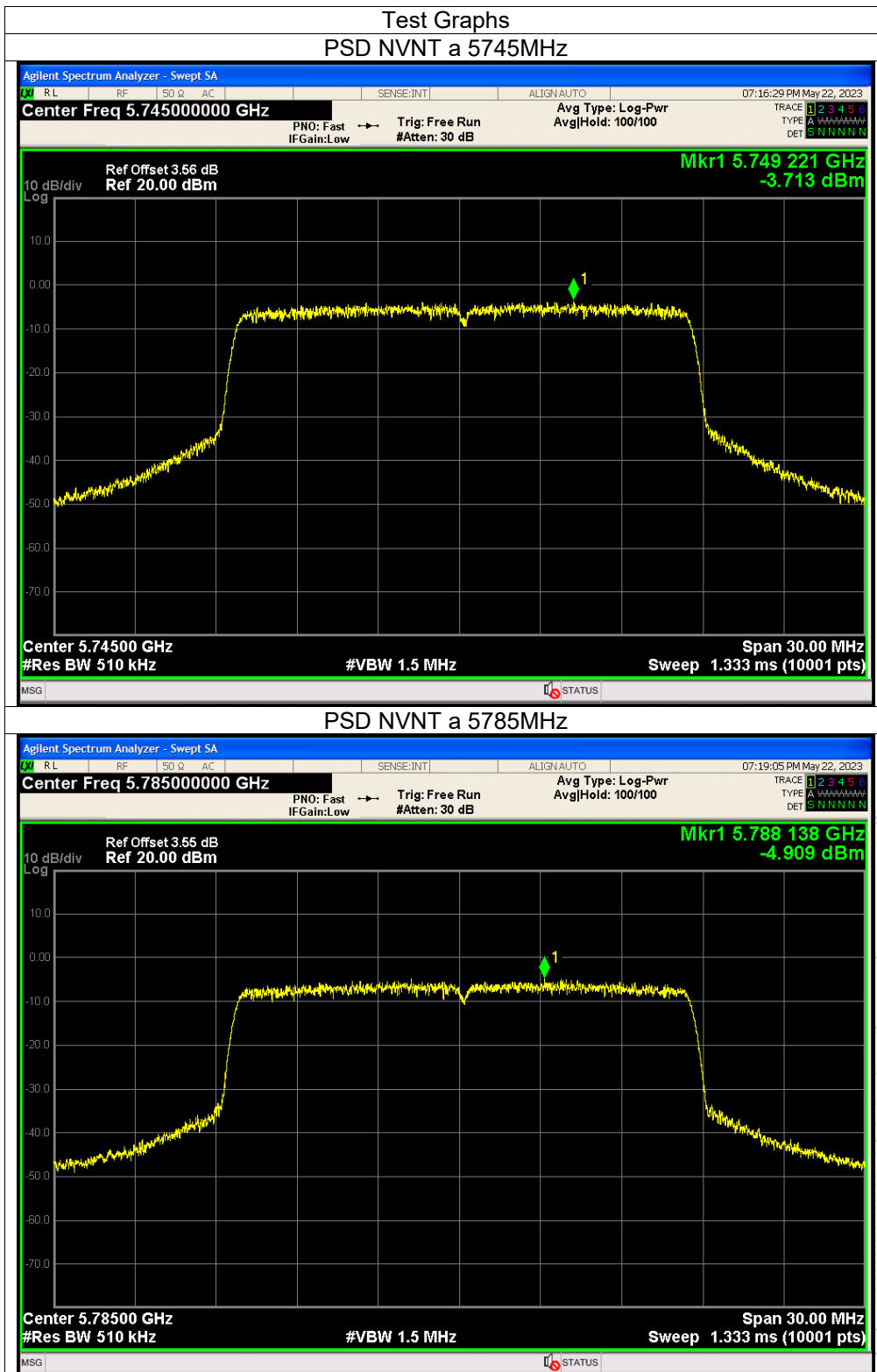


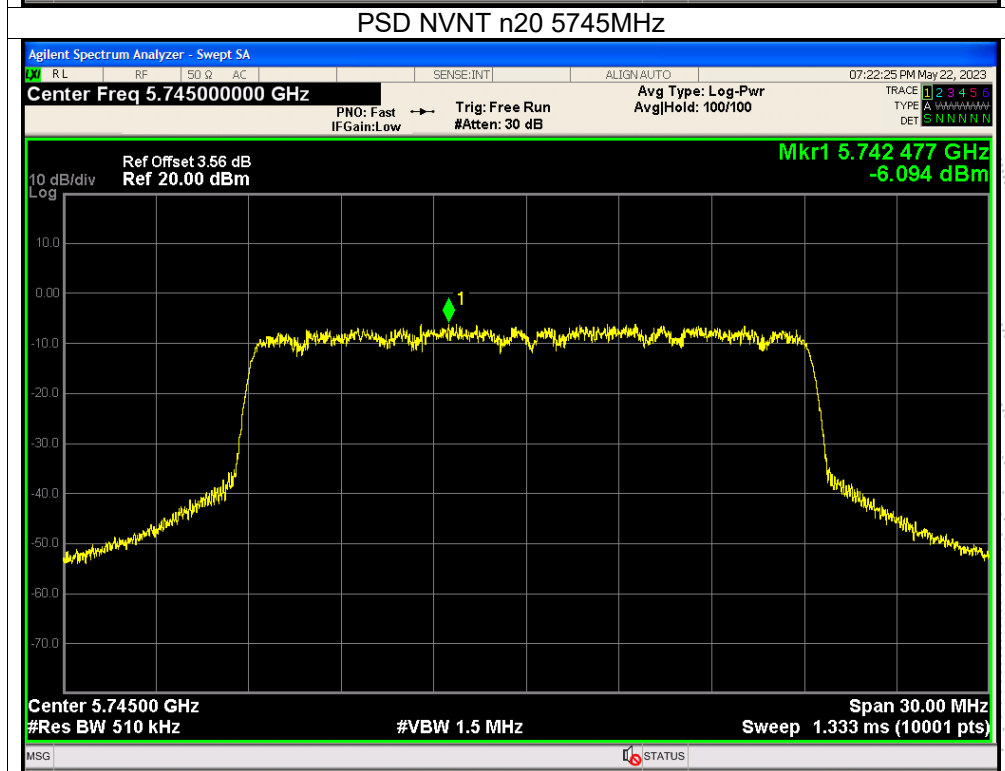
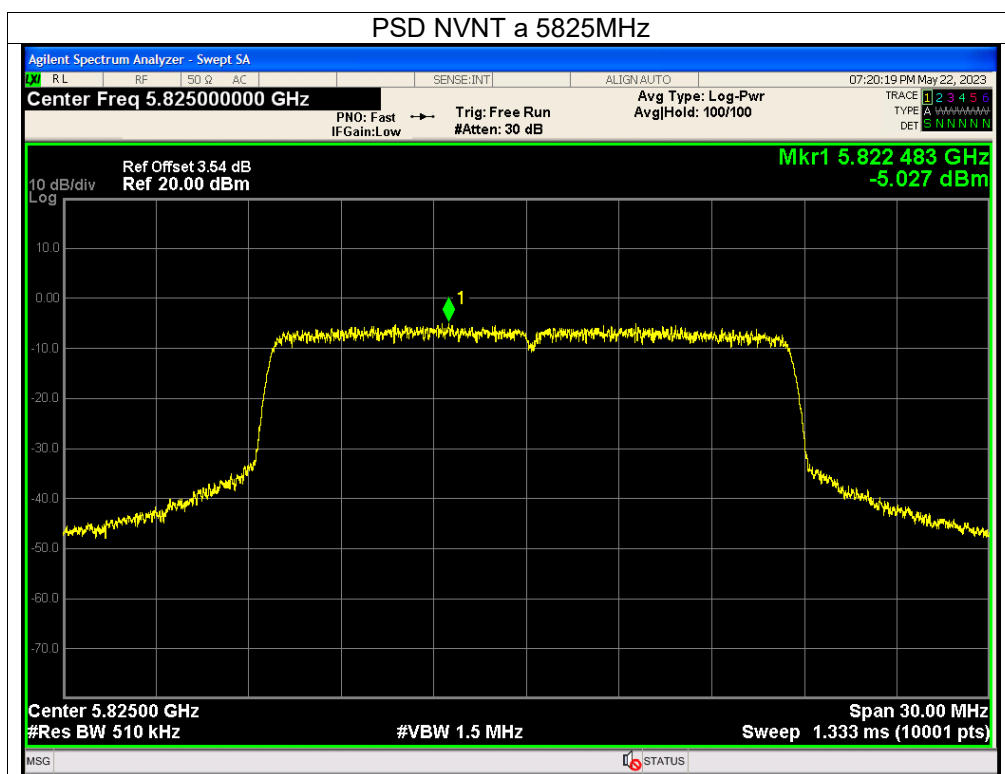
SHENZHEN

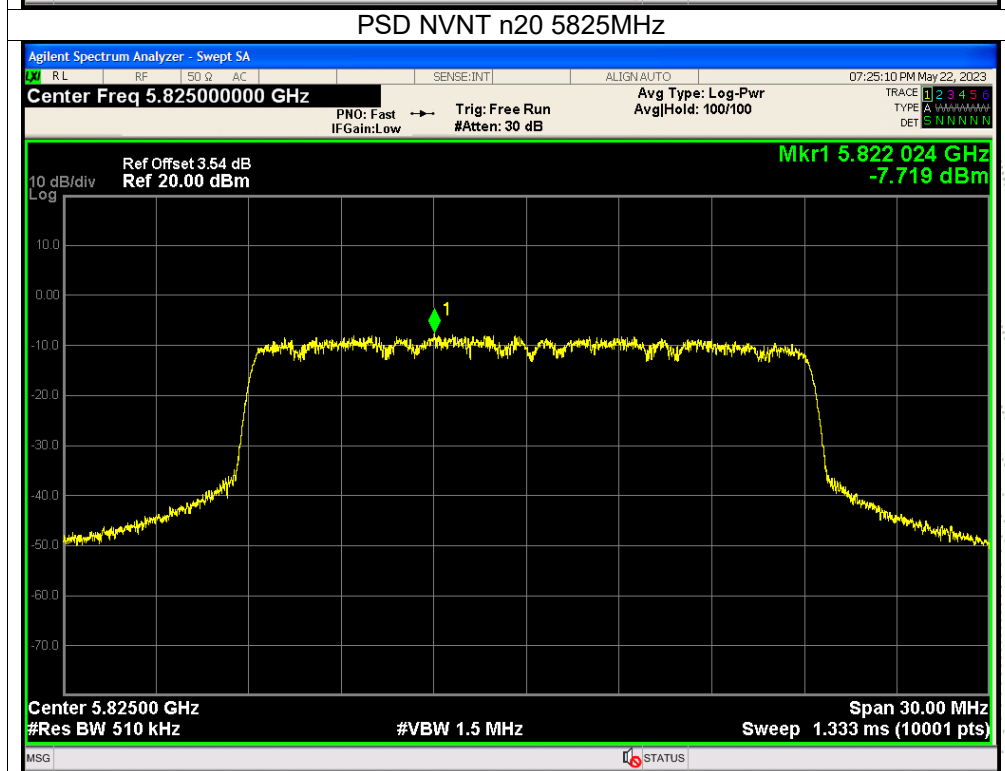
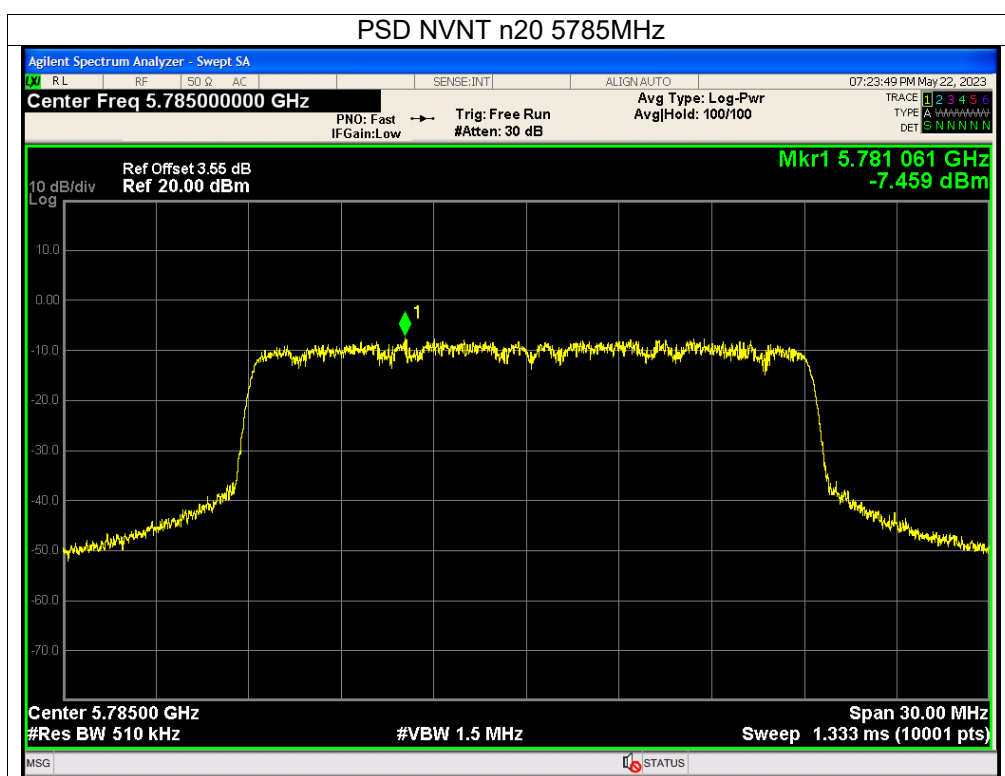


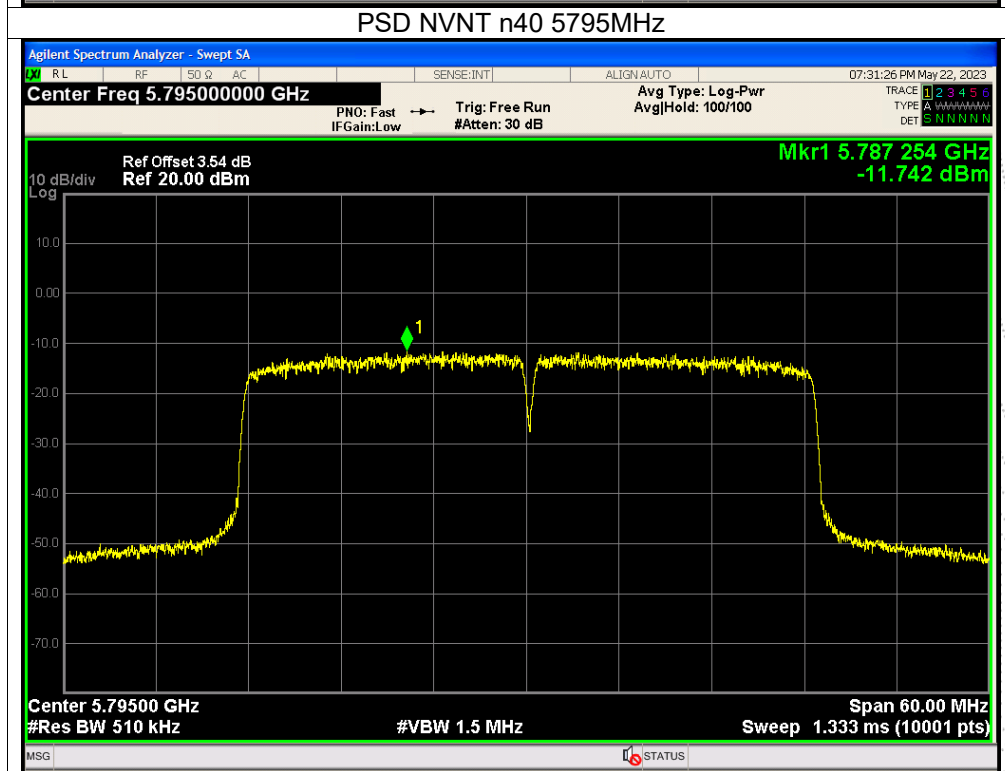
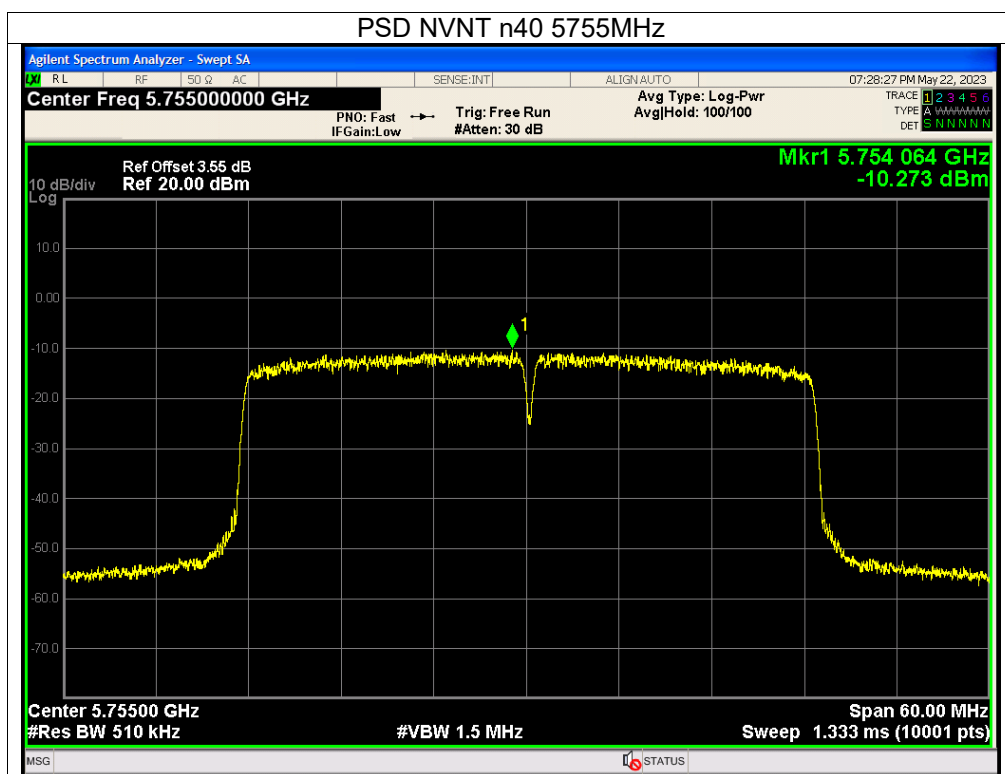






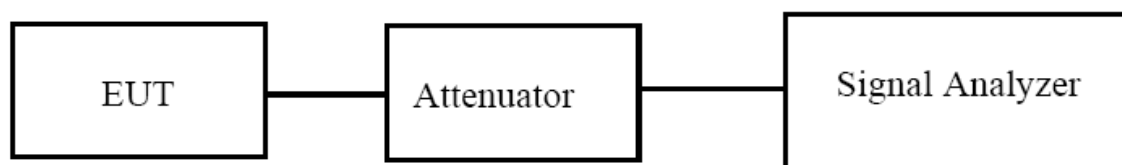






9. 26dB & 6dB & 99% Emission Bandwidth

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.
(6dB bandwidth)>500kHz

9.3 Test Procedure

- Set RBW = approximately 1% of the emission bandwidth.
- Set the VBW > RBW.
- Detector = Peak.
- Trace mode = max hold.
- 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:

- Set center frequency to the nominal EUT channel center frequency.
- Set span = 1.5 times to 5.0 times the OBW.
- Set RBW = 1 % to 5 % of the OBW
- Set VBW $\geq 3 \cdot$ RBW
- 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.
- Use the 99 % power bandwidth function of the instrument (if available).
- 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.

6dB

- Set RBW = 100 kHz.
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.

7. 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.

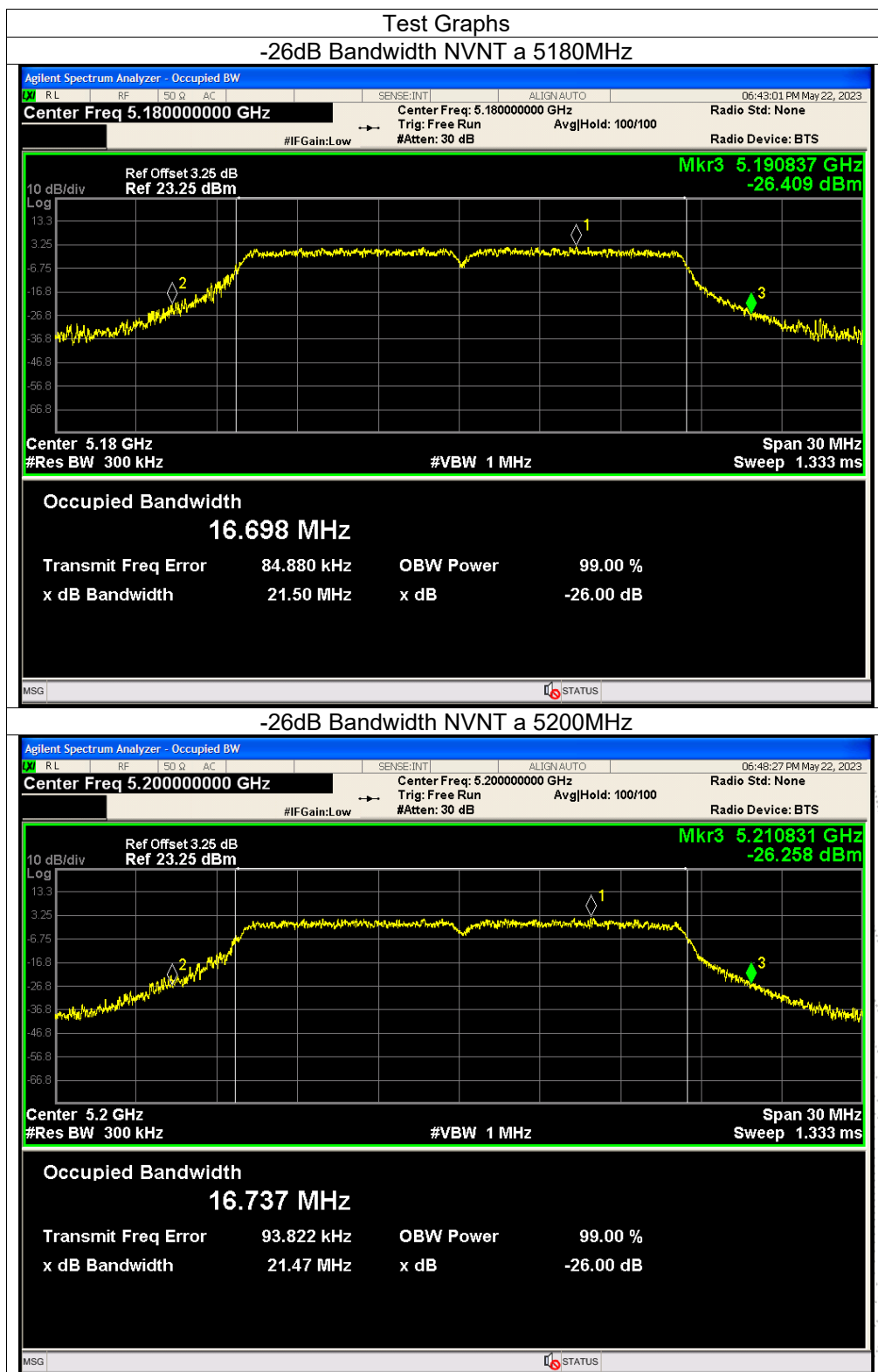
9.4 EUT Operating Conditions

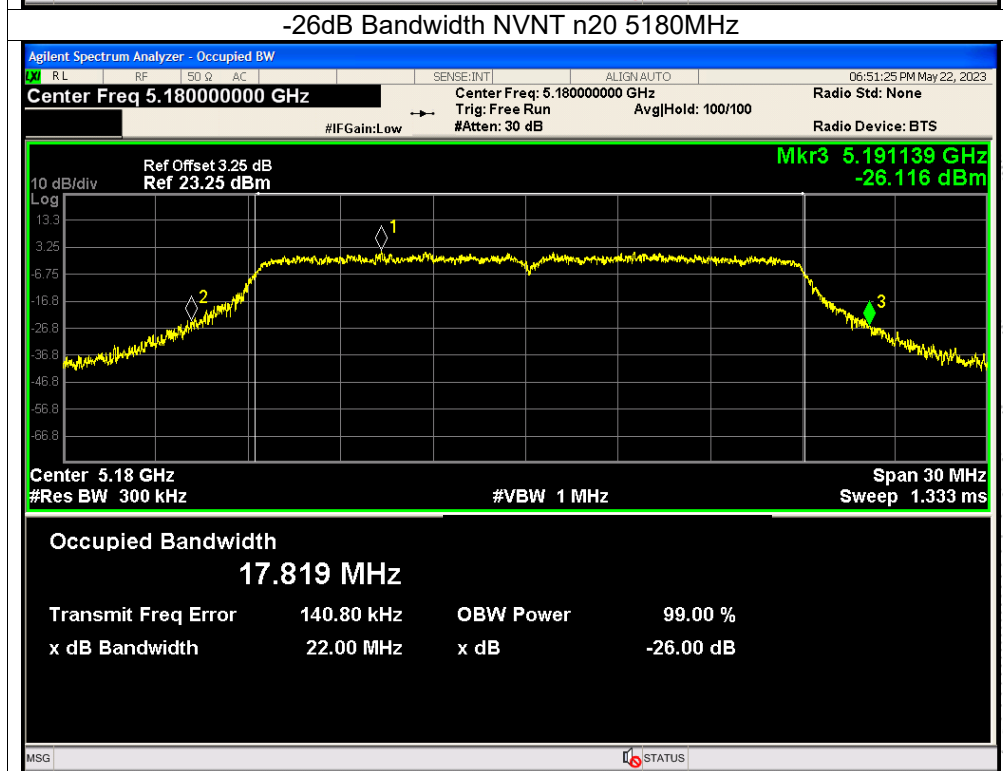
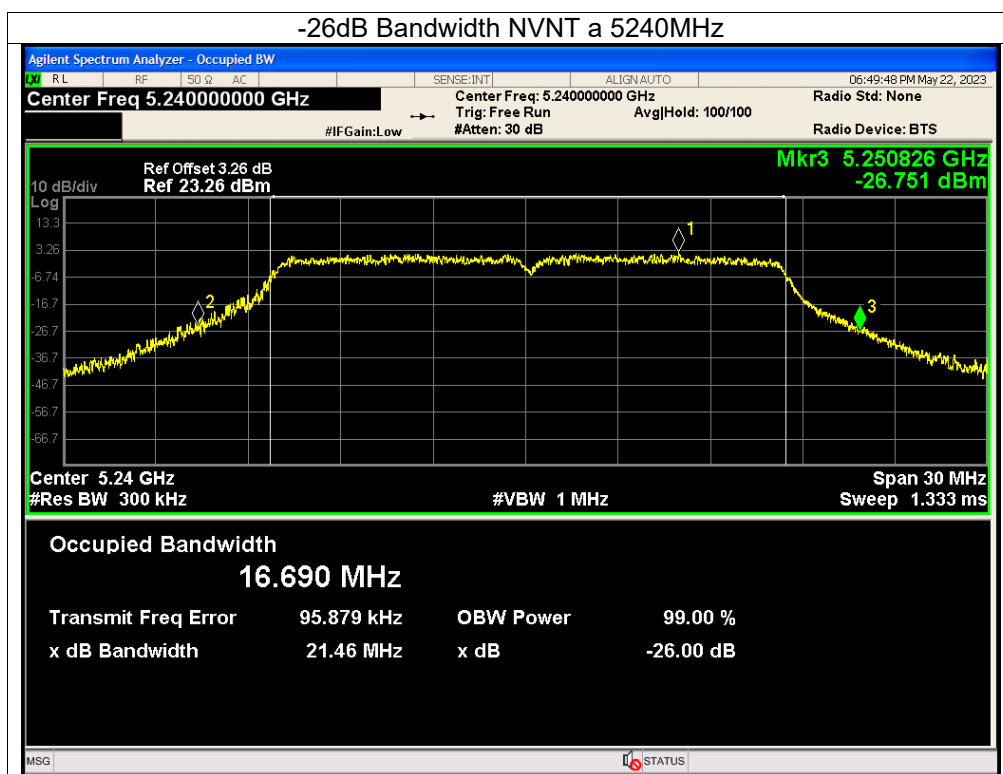
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

9.5 Test Result

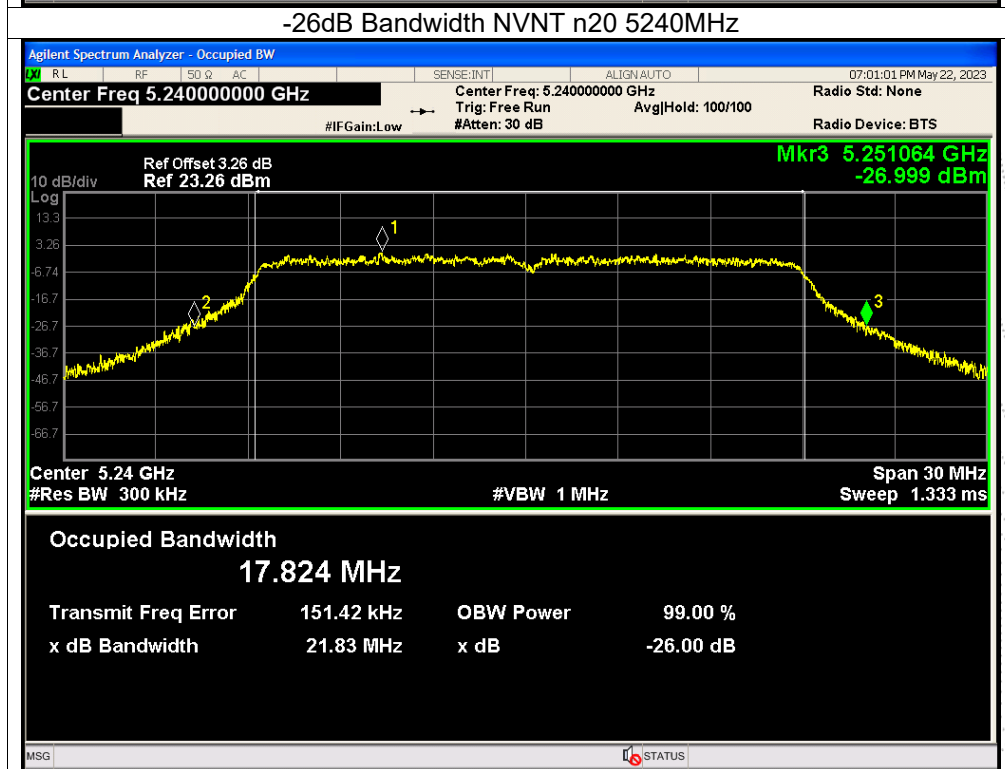
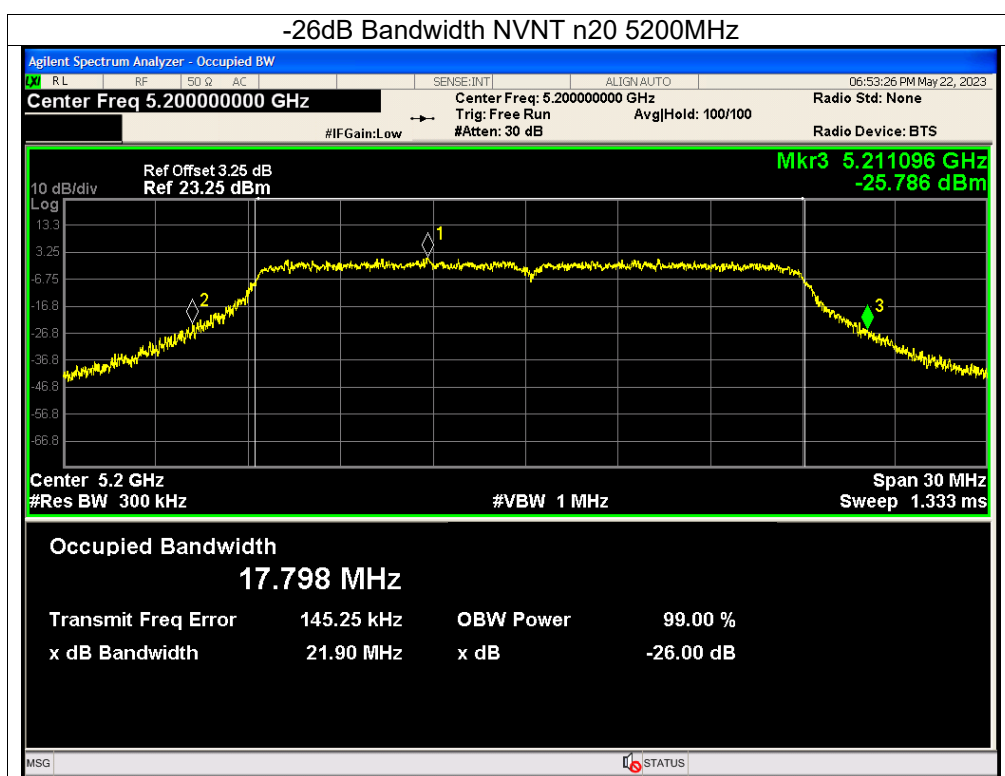
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC 4.5V
Test Mode :	TX Frequency U-NII-1 (5180-5240MHz)		

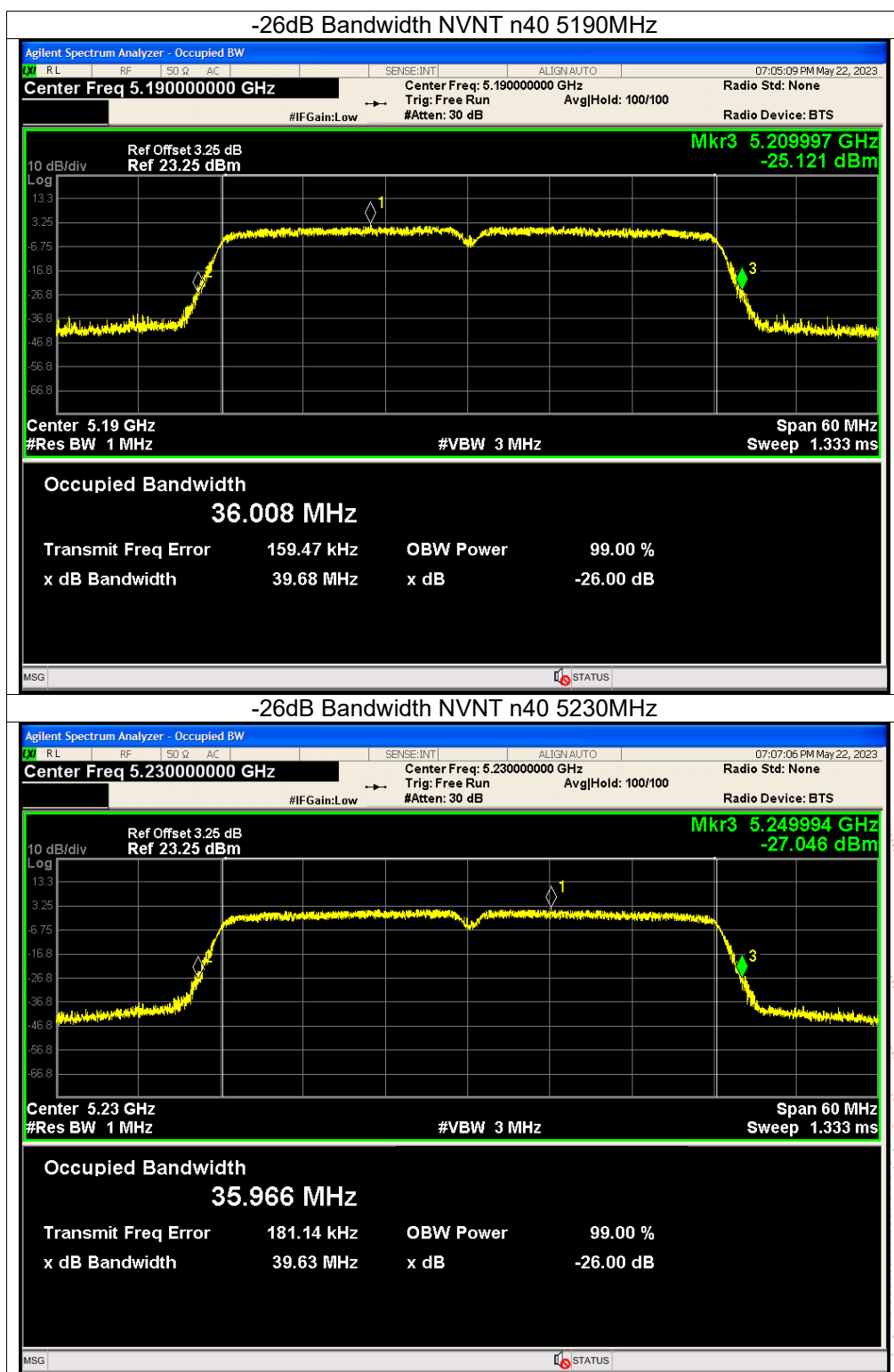
Condition	Mode	Frequency (MHz)	99% bandwidth (MHz)	-26dB bandwidth (MHz)	Result
NVNT	a	5180	16.547	21.504	Pass
NVNT	a	5200	16.524	21.474	Pass
NVNT	a	5240	16.529	21.461	Pass
NVNT	n20	5180	17.709	21.997	Pass
NVNT	n20	5200	17.705	21.901	Pass
NVNT	n20	5240	17.697	21.826	Pass
NVNT	n40	5190	35.819	39.675	Pass
NVNT	n40	5230	35.775	39.626	Pass

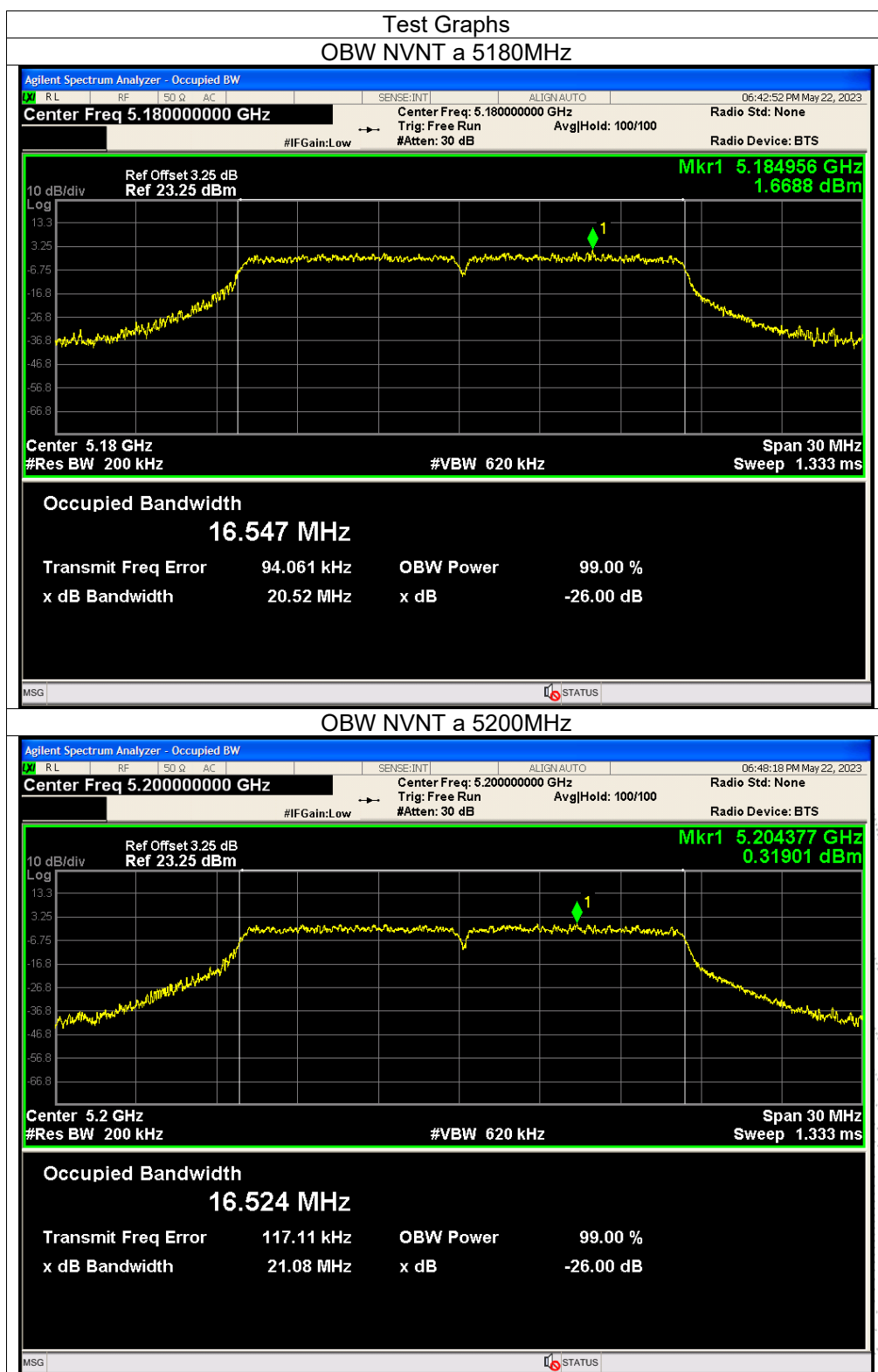


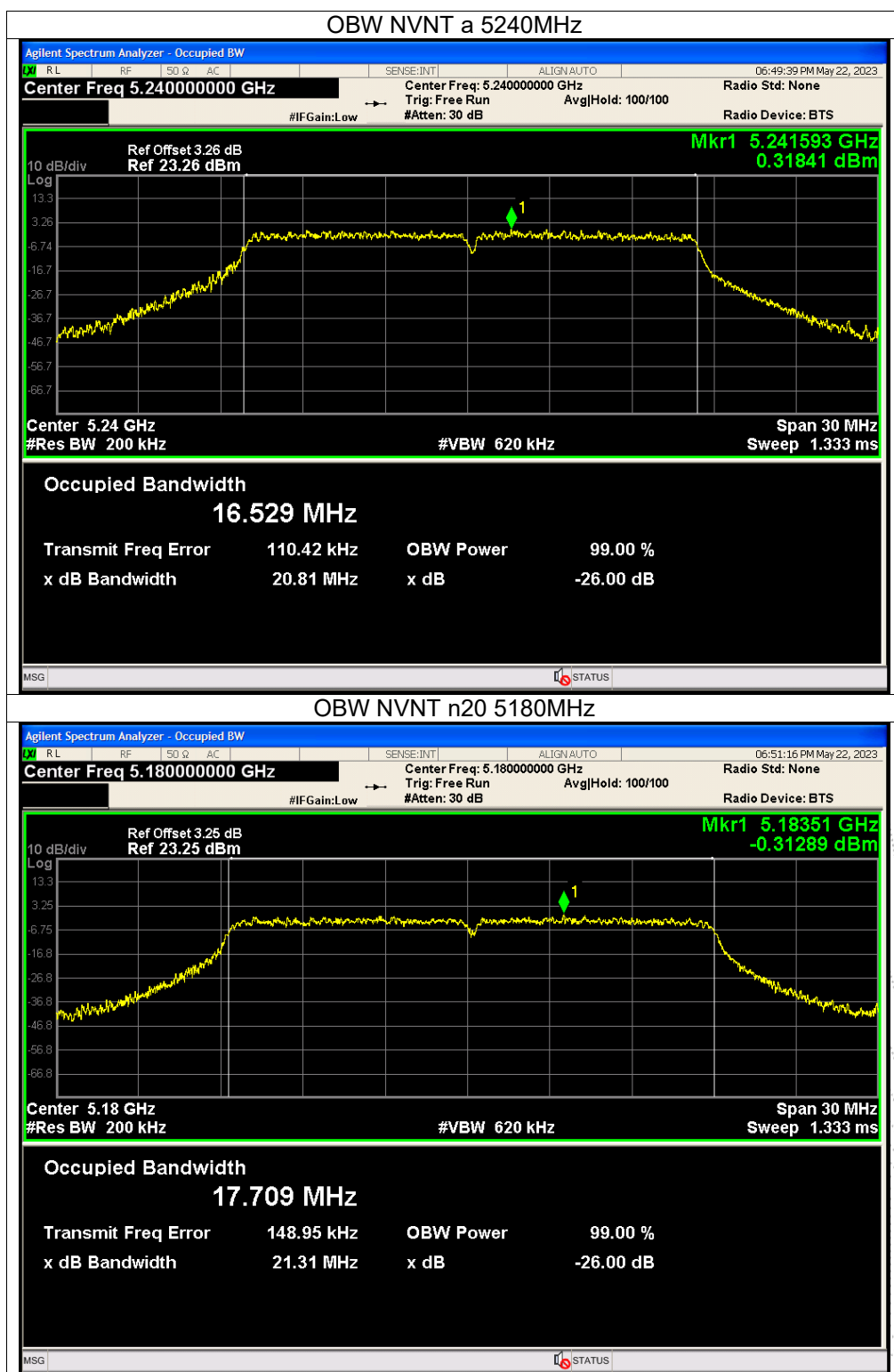


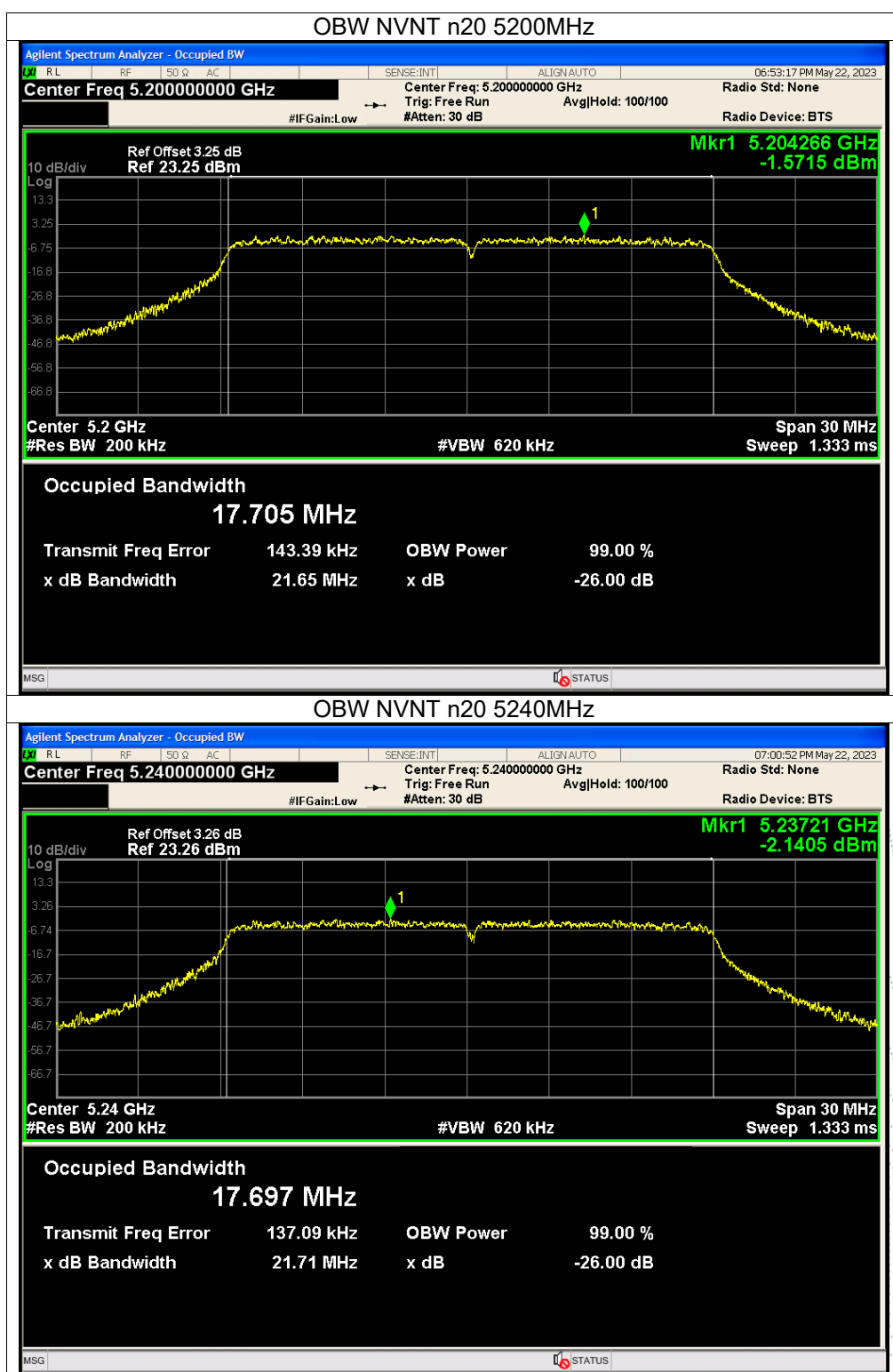
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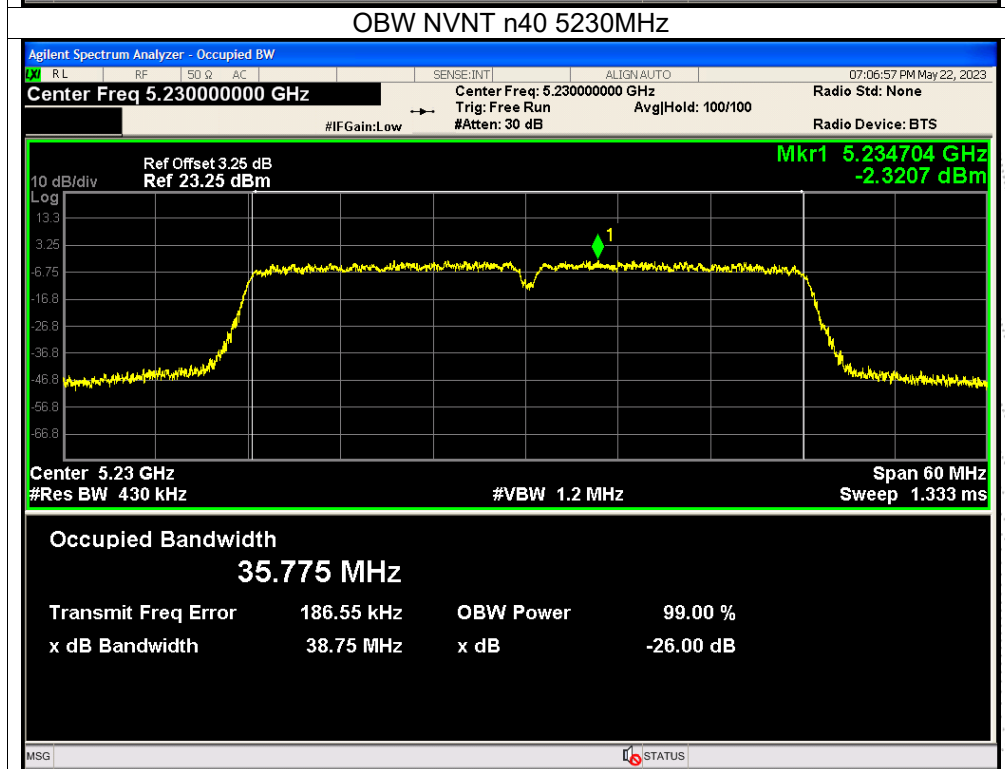
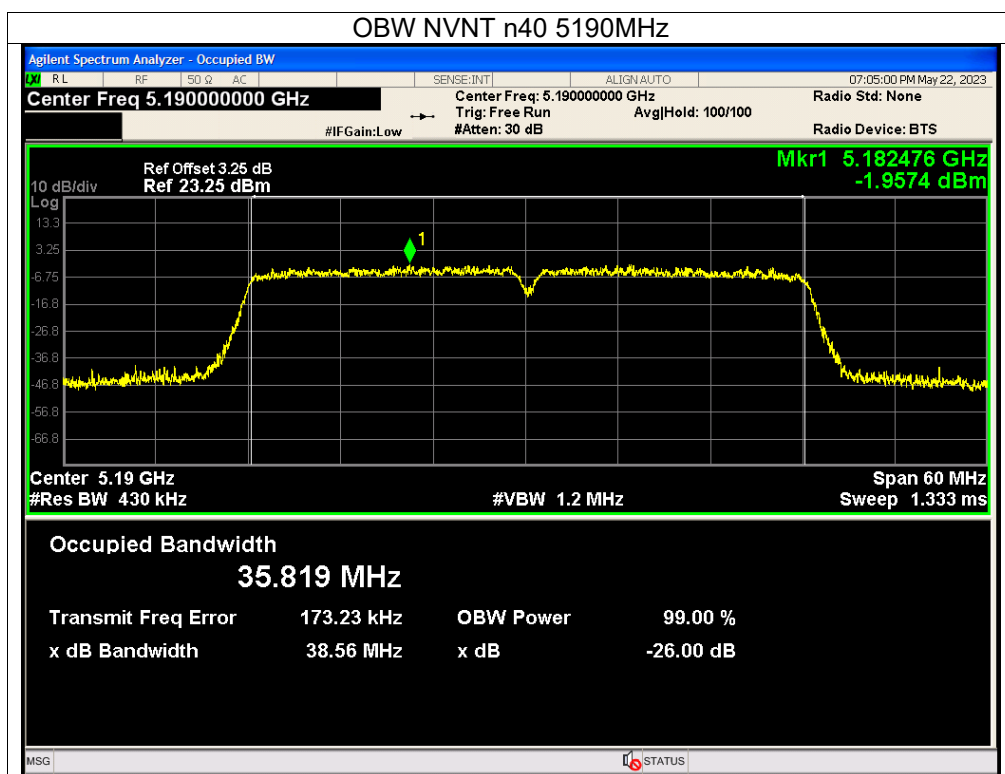






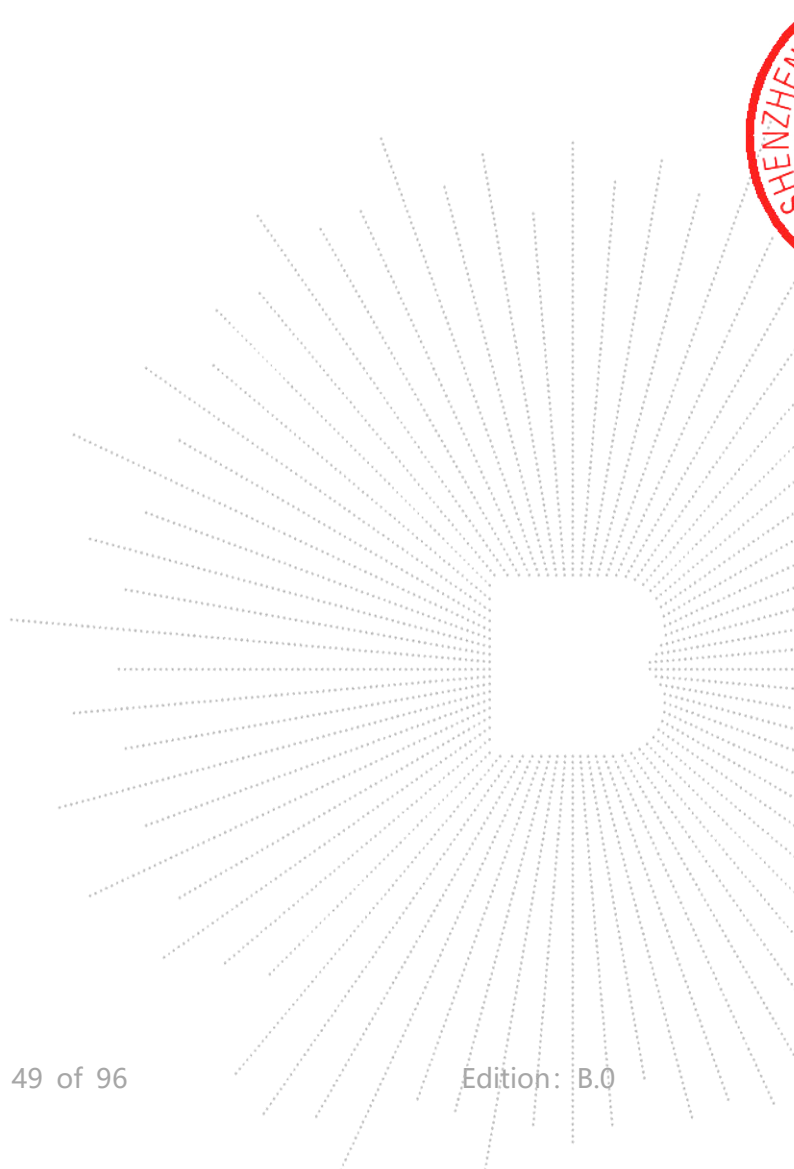


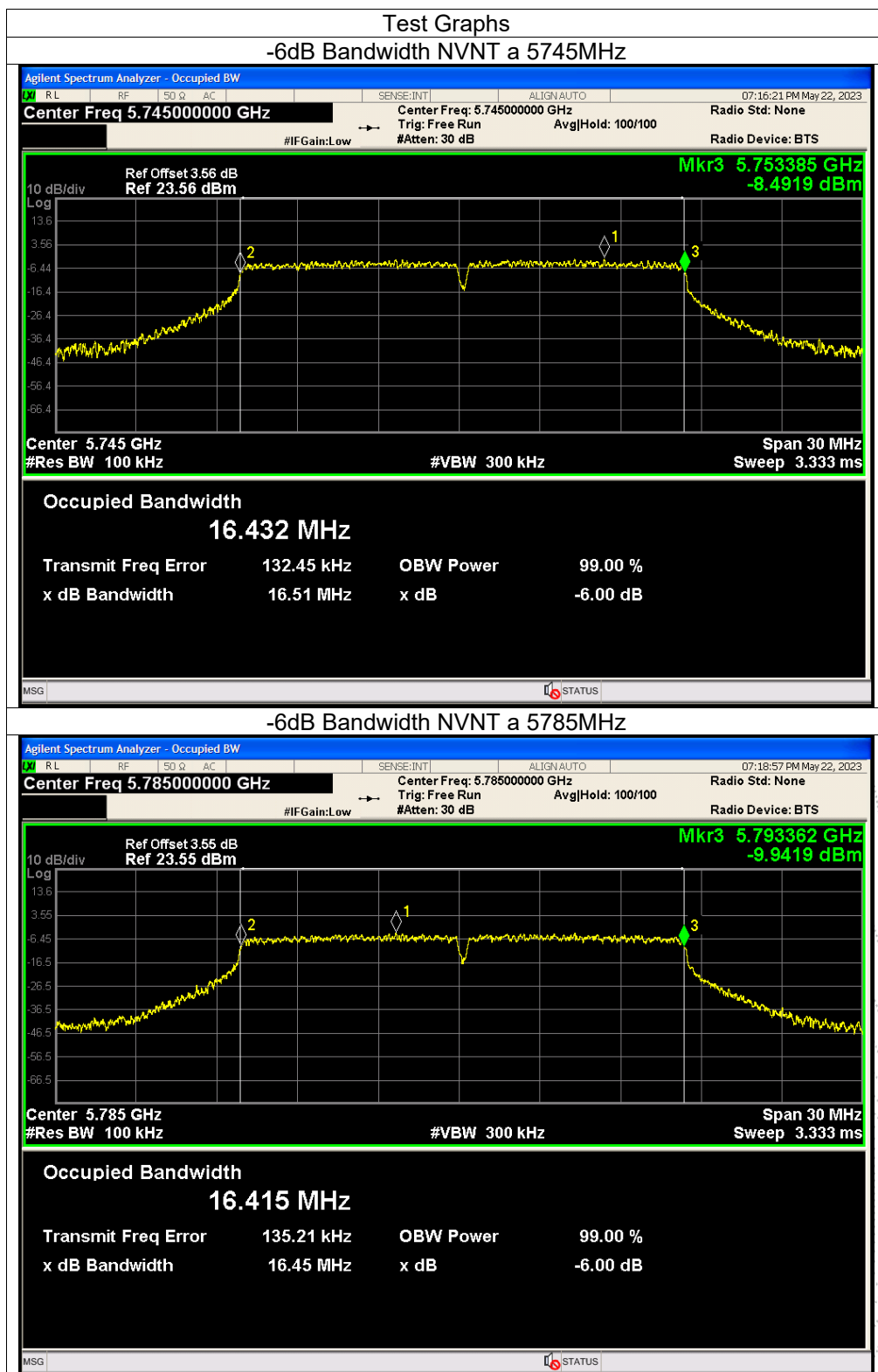


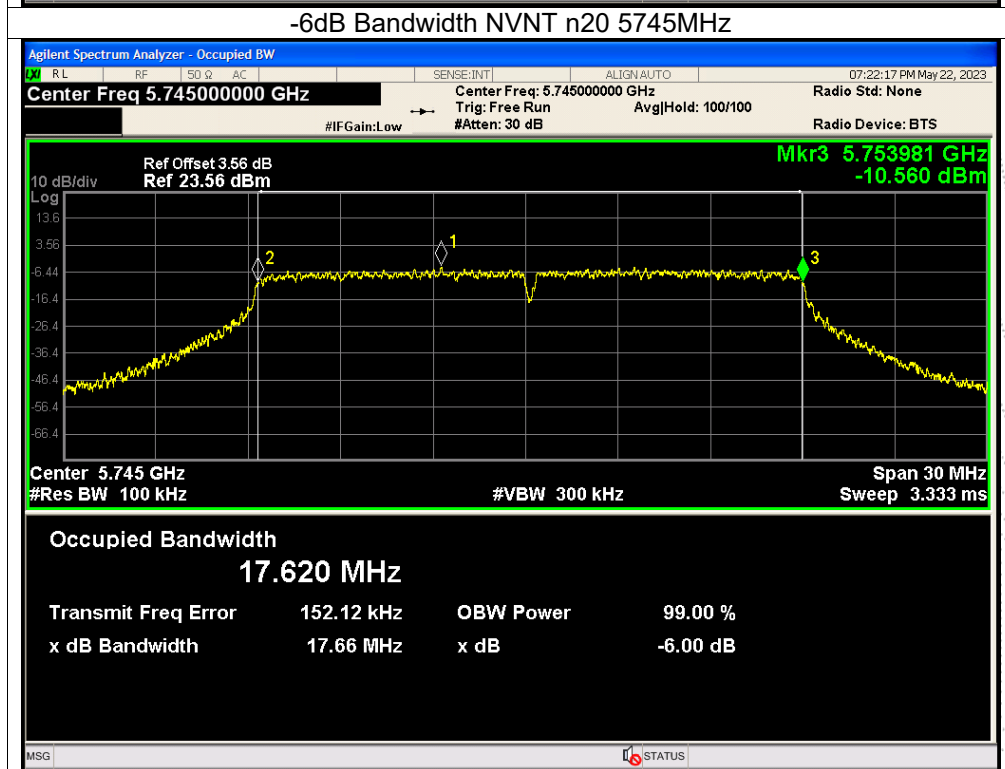
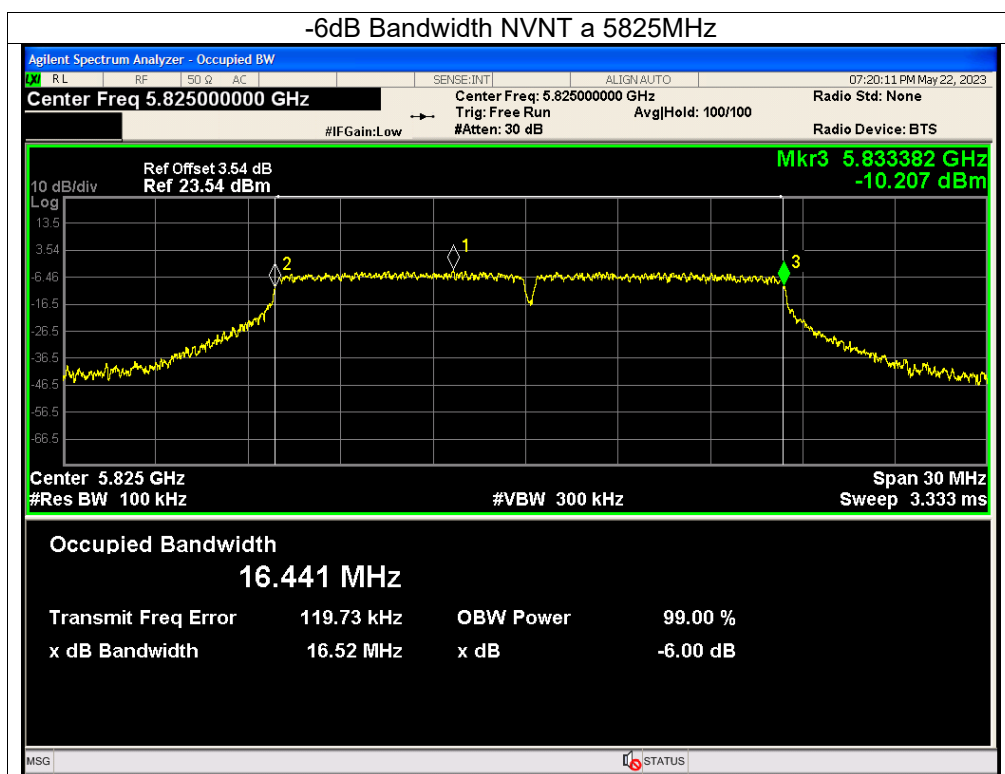


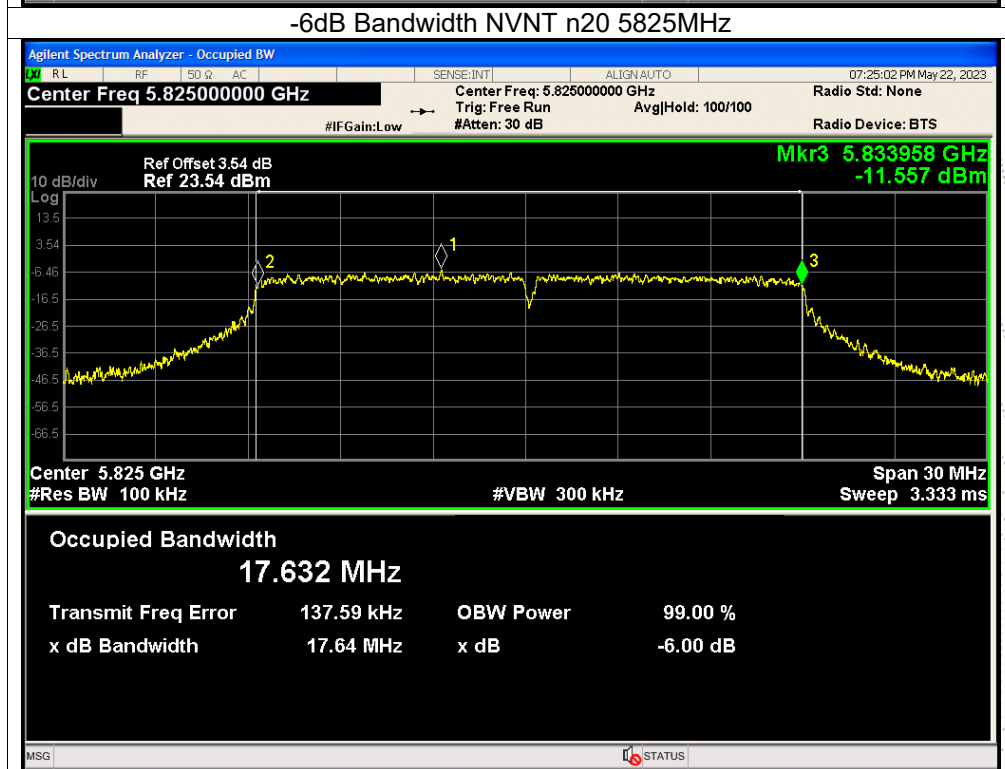
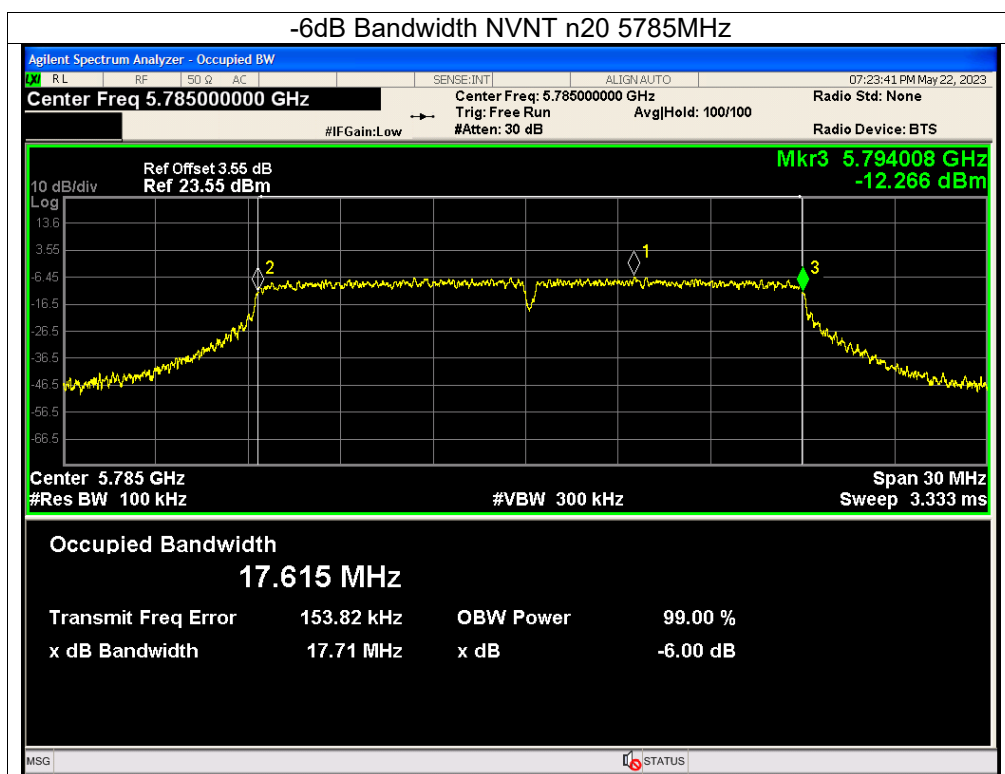
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC 4.5V
Test Mode :	TX Frequency U-NII-3(5745-5825MHz)		

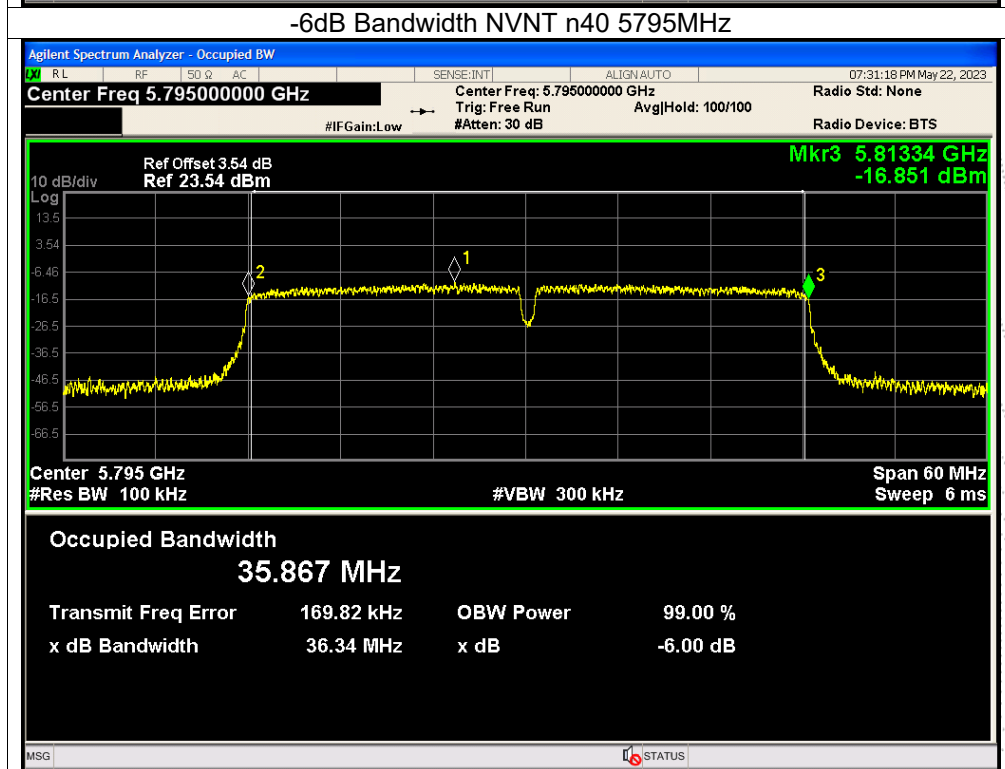
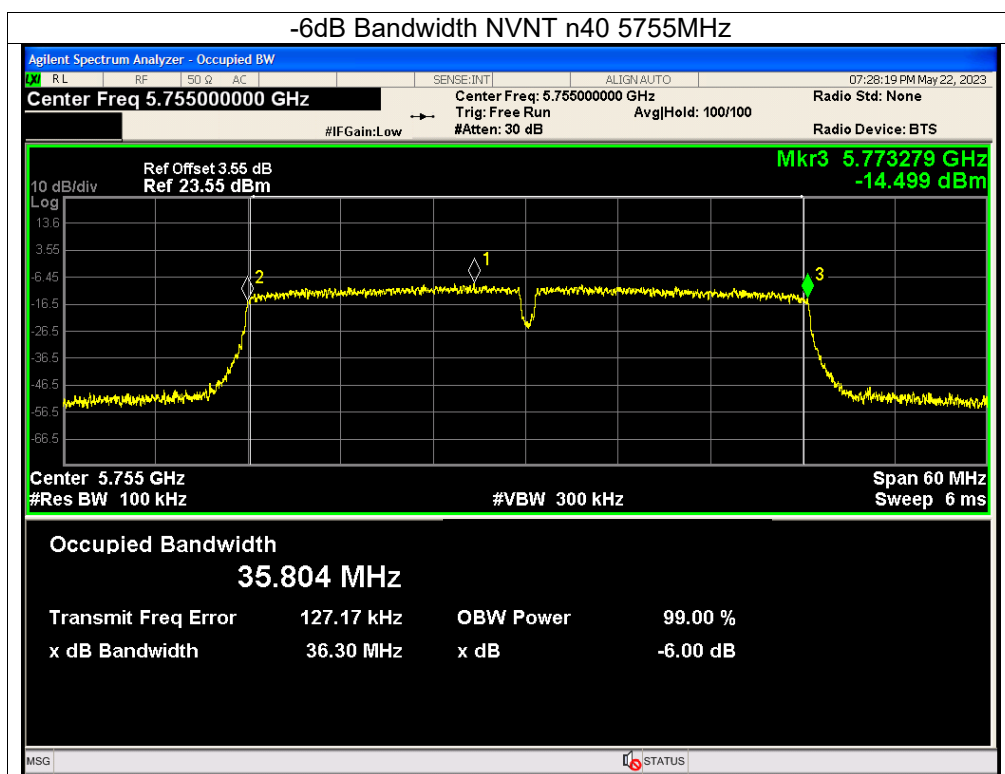
Condition	Mode	Frequency (MHz)	99% bandwidth (MHz)	-6dB bandwidth (MHz)	Limit -6dB bandwidth MHz	Result
NVNT	a	5745	16.532	16.505	≥500	Pass
NVNT	a	5785	16.507	16.453	≥500	Pass
NVNT	a	5825	16.53	16.524	≥500	Pass
NVNT	n20	5745	17.696	17.657	≥500	Pass
NVNT	n20	5785	17.678	17.708	≥500	Pass
NVNT	n20	5825	17.678	17.64	≥500	Pass
NVNT	n40	5755	35.772	36.303	≥500	Pass
NVNT	n40	5795	35.821	36.341	≥500	Pass

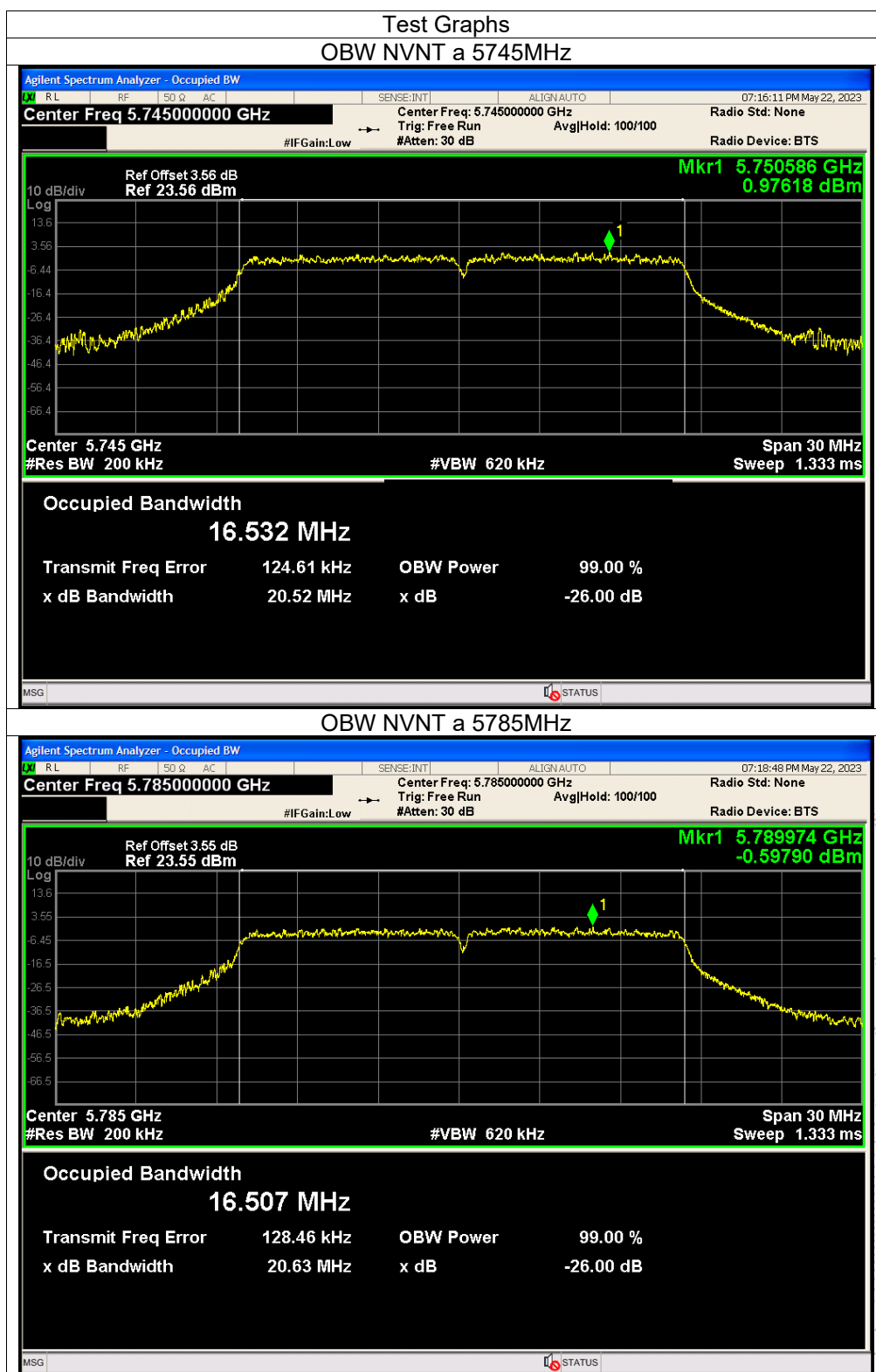


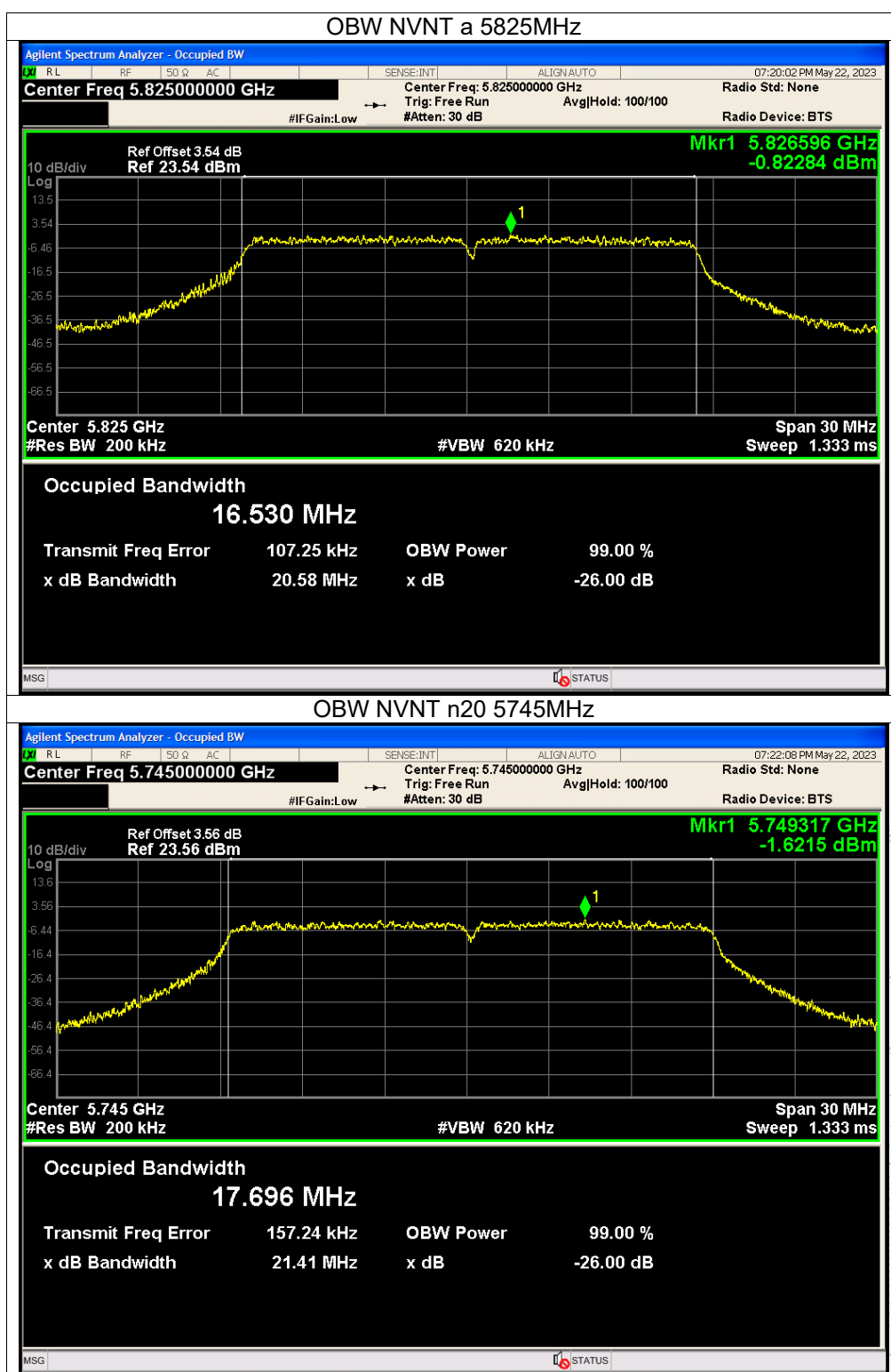


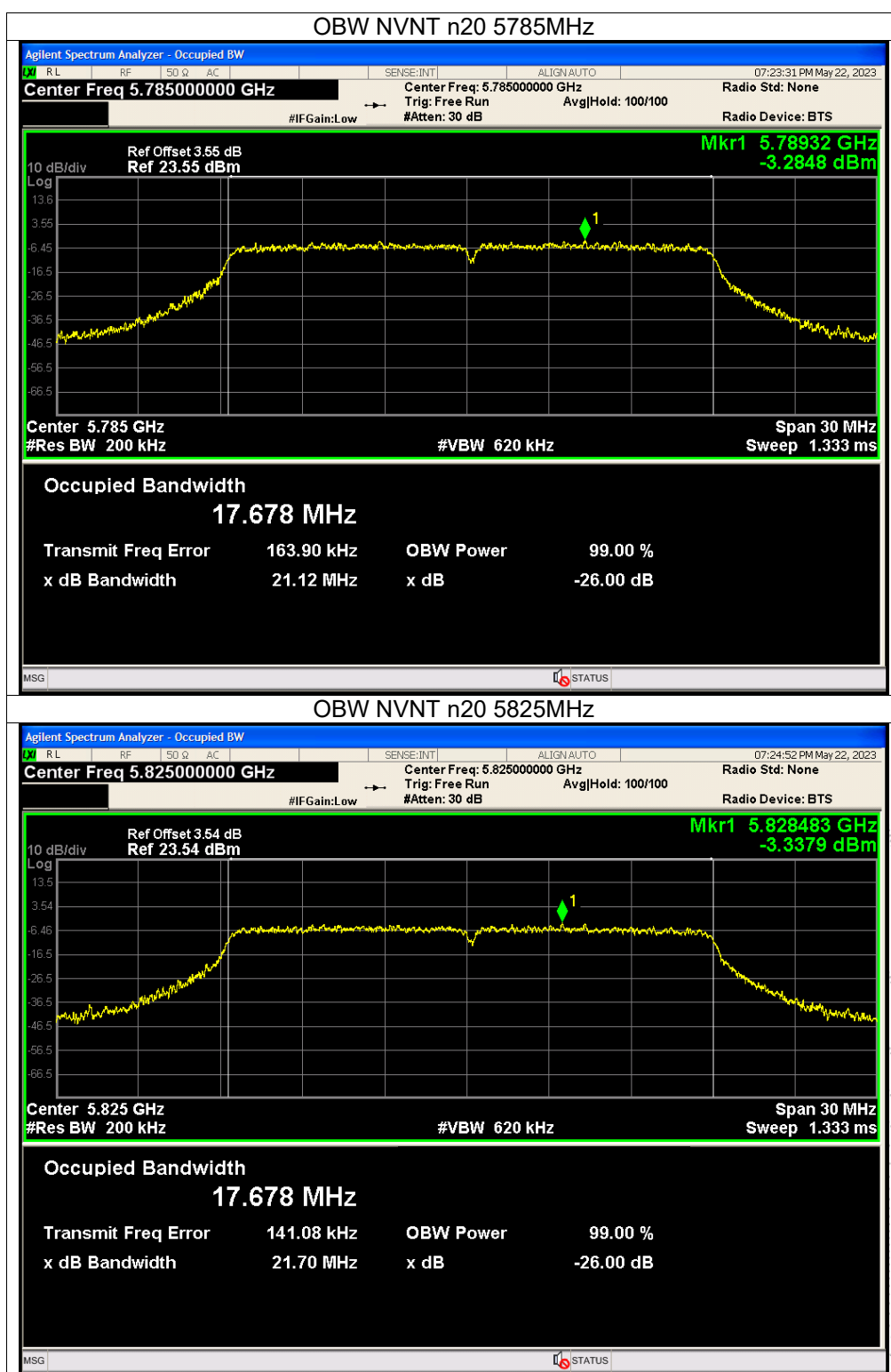


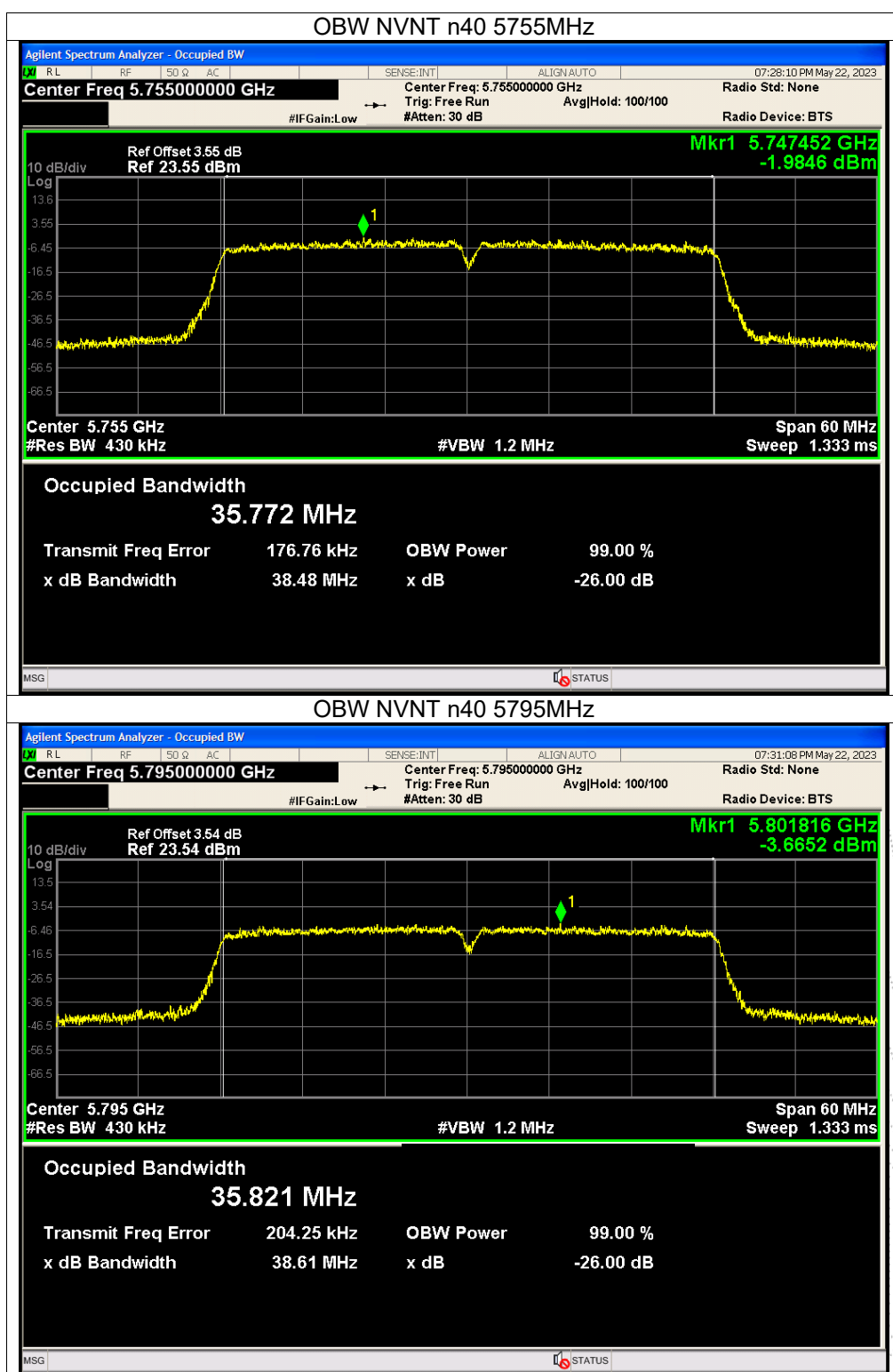












10. Maximum Conducted Output Power

10.1 Block Diagram Of Test Setup



10.2 Limit

According to FCC §15.407

The maximum conducted output power should not exceed:

Frequency Band(MHz)	Limit
5150~5250	250mW
5725~5850	1W

10.3 Test Procedure

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

1. Device Configuration

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

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

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

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

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

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

- The EUT transmits continuously (or with a duty cycle ≥ 98 percent).
- Sweep triggering or gating can be implemented in a way that the device transmits at the maximum power control level throughout the duration of each of the instrument sweeps to be averaged. This condition can generally be achieved by triggering the instrument's sweep if the duration of the sweep (with the analyzer configured as in Method SA-1, below) is equal to or shorter than the duration T of each transmission from the EUT and if those transmissions exhibit full power throughout their durations.

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

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

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

(ii) Set RBW = 1 MHz.

(iii) Set VBW $\geq$ 3 MHz.

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

(v) Sweep time = auto.

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

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

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

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

10.4 EUT Operating Conditions

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

10.5 Test Result

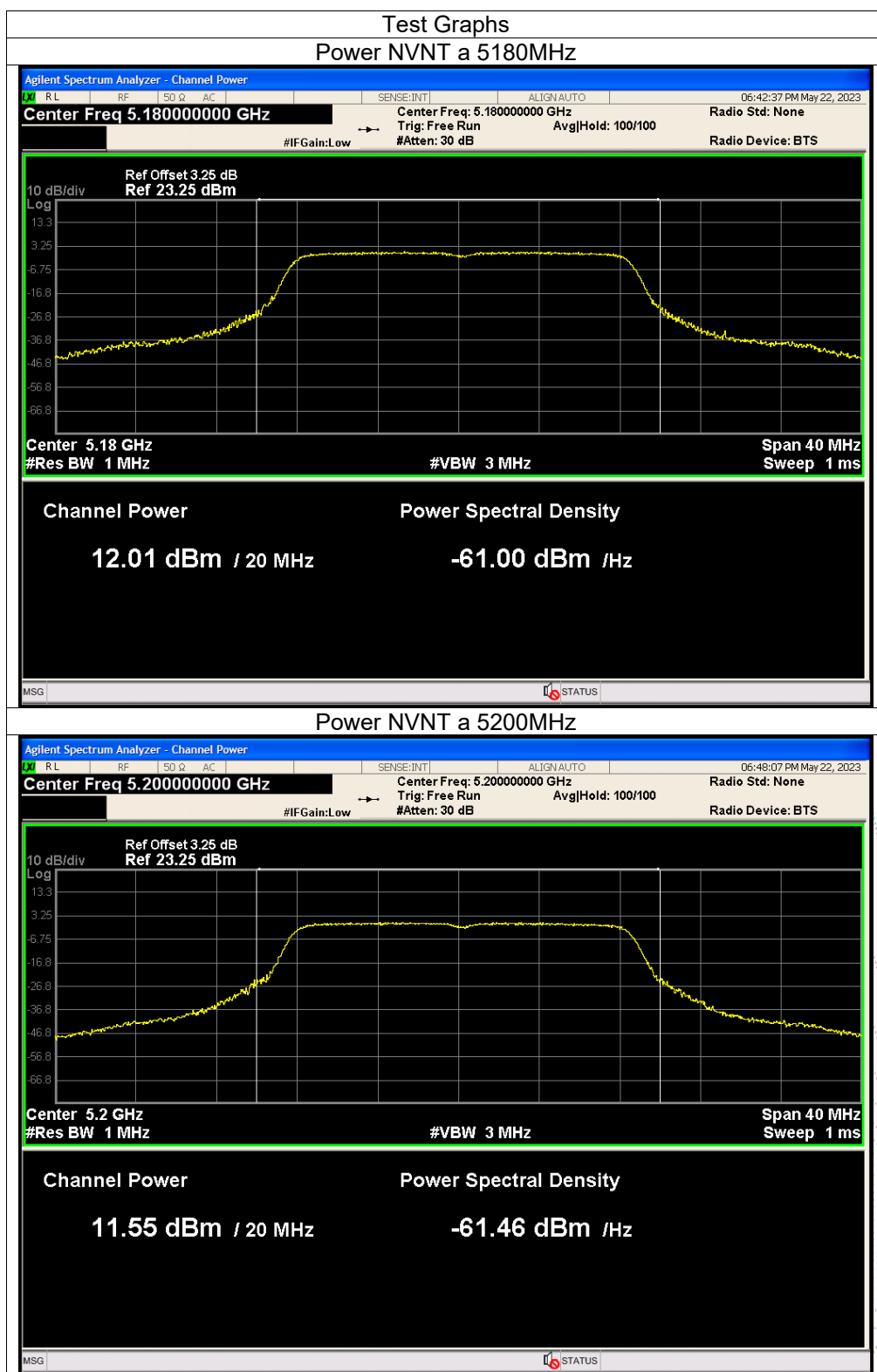
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC 4.5V
Test Mode :	TX (5.1G) Mode Frequency U-NII-1 (5180-5240MHz)		

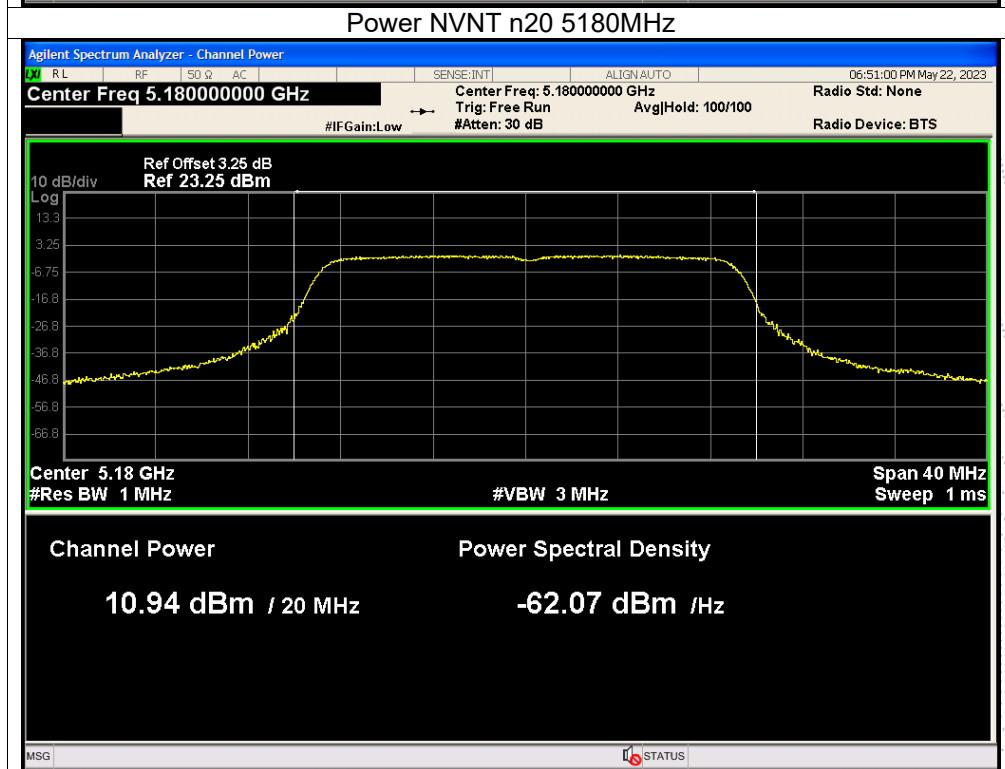
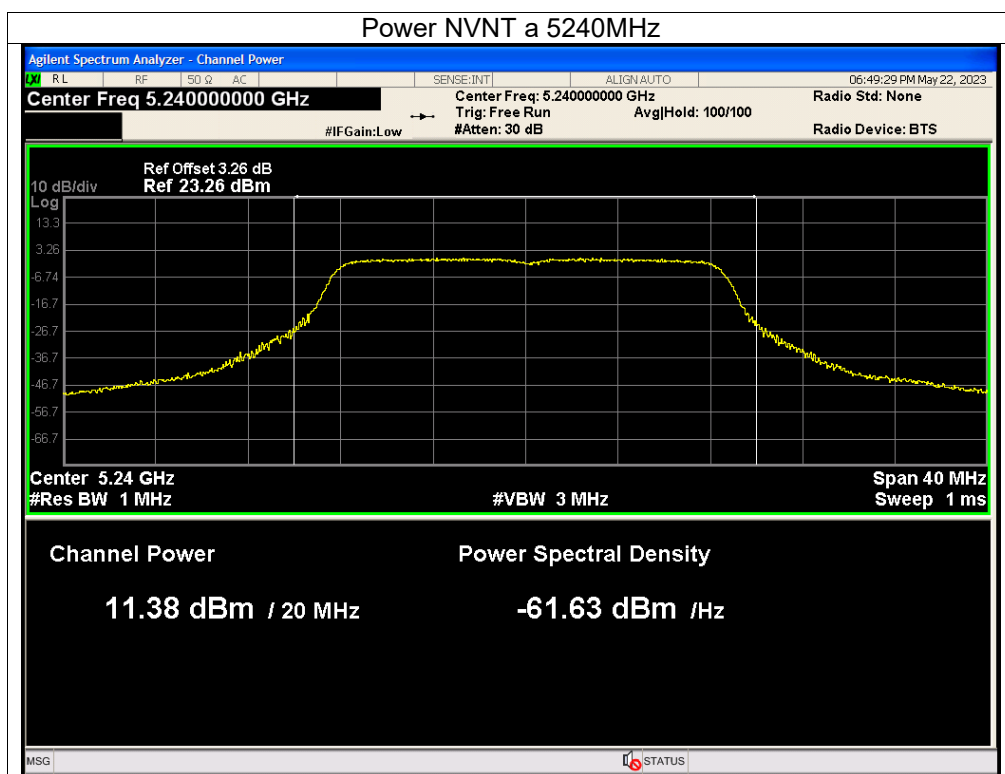
Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	a	5180	12.01	24	Pass
NVNT	a	5200	11.55	24	Pass
NVNT	a	5240	11.38	24	Pass
NVNT	n20	5180	10.94	24	Pass
NVNT	n20	5200	10.5	24	Pass
NVNT	n20	5240	9.77	24	Pass
NVNT	n40	5190	9.09	24	Pass
NVNT	n40	5230	8.77	24	Pass

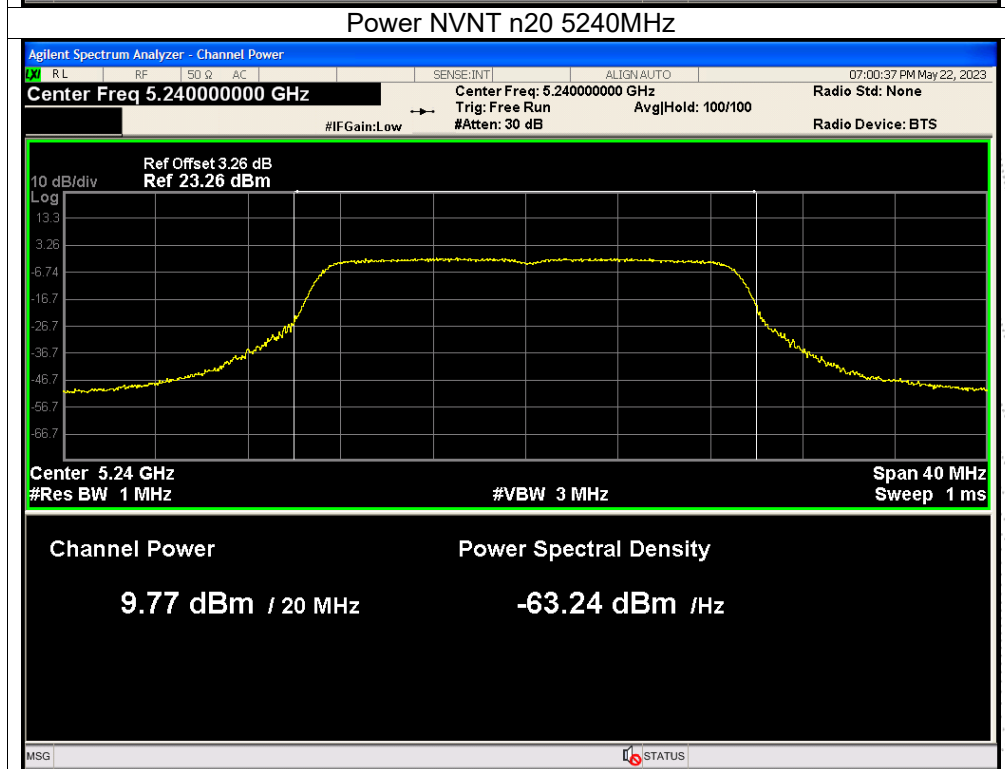
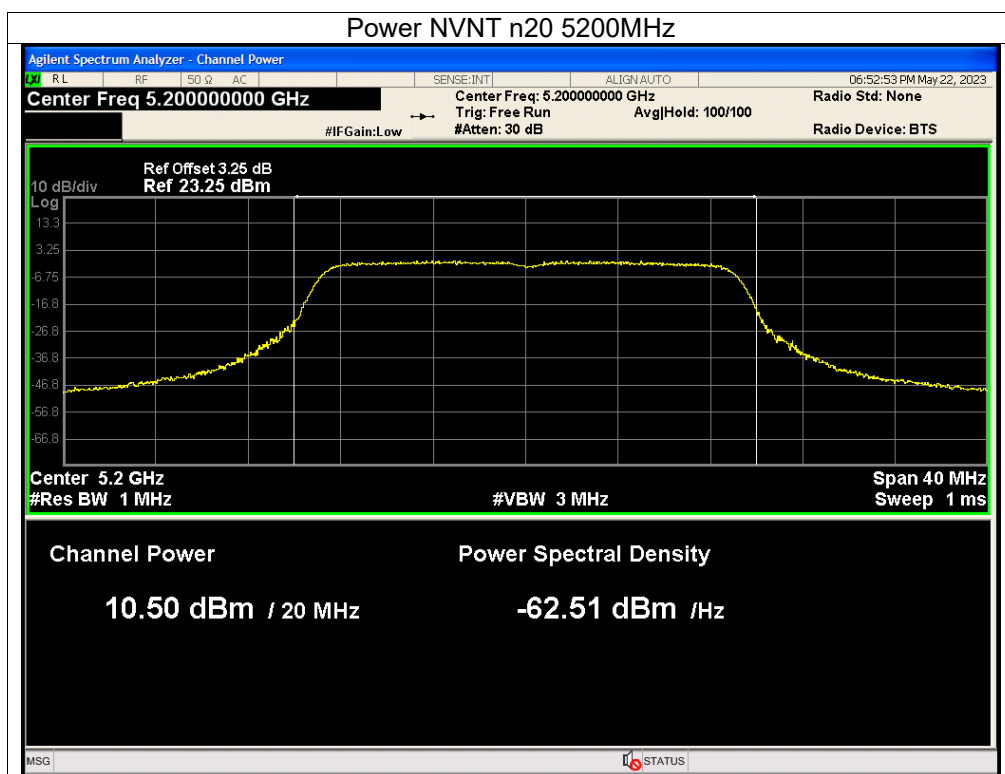
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC 4.5V
Test Mode :	TX (5.8G) Mode Frequency U-NII-3 (5745-5825MHz)		

Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	a	5745	11.83	30	Pass
NVNT	a	5785	10.41	30	Pass
NVNT	a	5825	10.32	30	Pass
NVNT	n20	5745	10.1	30	Pass
NVNT	n20	5785	8.1	30	Pass
NVNT	n20	5825	7.99	30	Pass
NVNT	n40	5755	8.25	30	Pass
NVNT	n40	5795	6.94	30	Pass

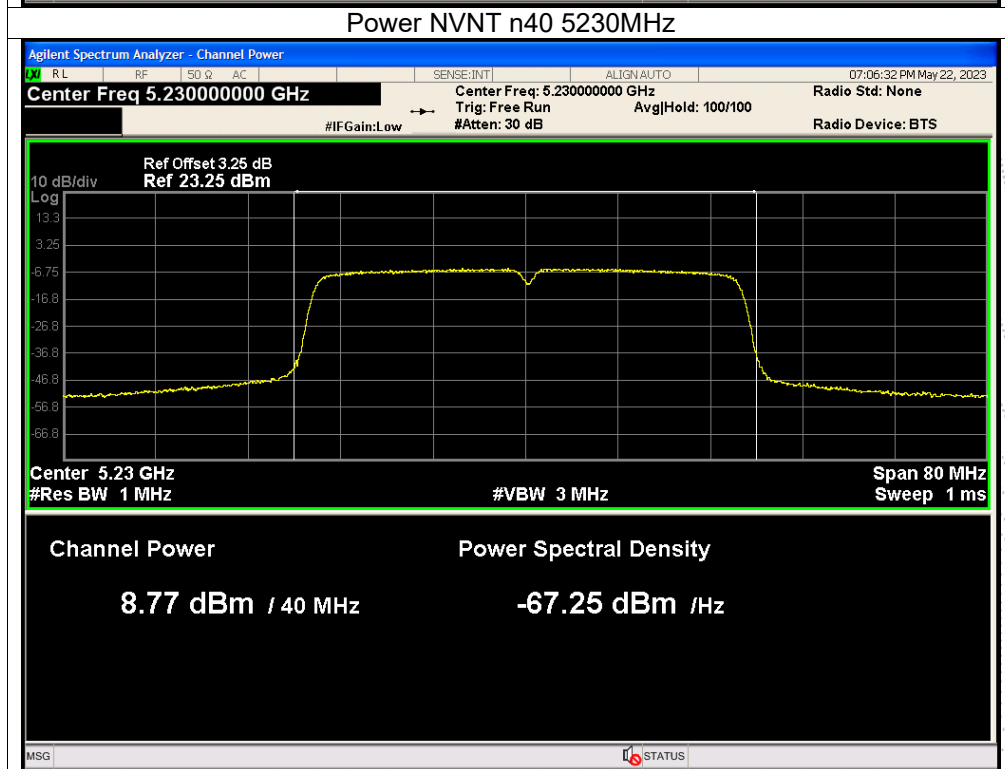
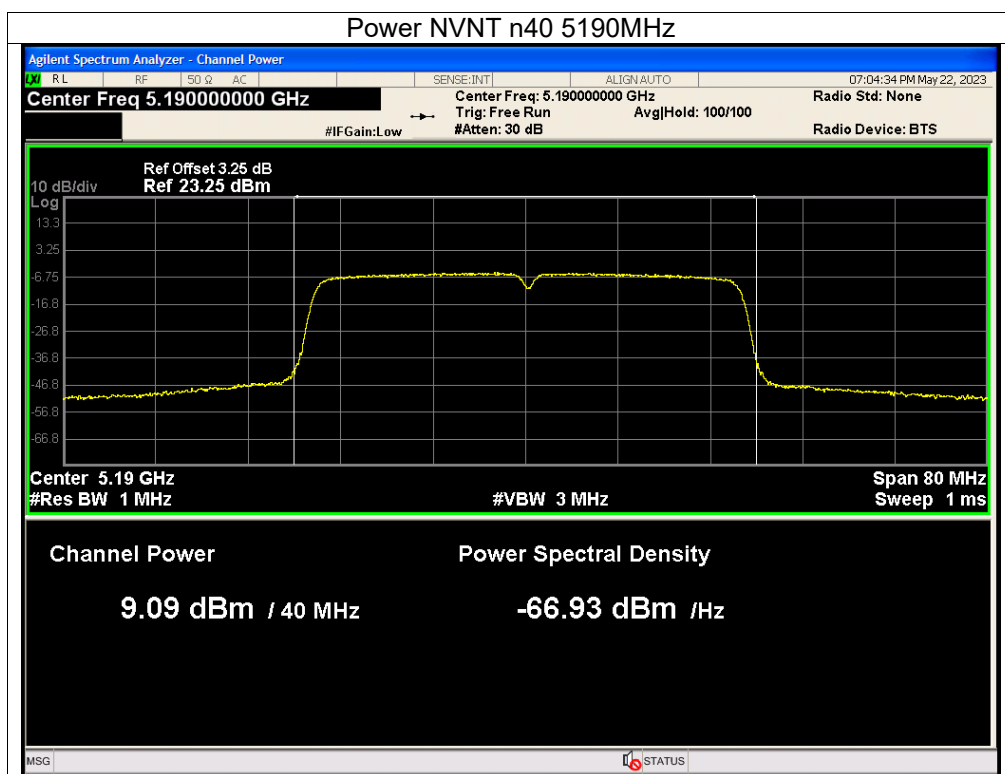
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