

TEST REPORT

FCC ID: 2AWLP-LPD10-11

Product: LUME PAD

Model No.: LPD-10W

Additional Model No.: LPD-11W

Trade Mark: N/A

Report No.: TCT200527E010

Issued Date: Jun. 15, 2020

Issued for:

Leia, Inc

2440 Sand Hill Road, STE 100, Menlo Park, California 94025, United States

Issued By:

Shenzhen Tongce Testing Lab.

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1. Test Certification

Product:	LUME PAD
Model No.:	LPD-10W
Additional Model No.:	LPD-11W
Trade Mark:	N/A
Applicant:	Leia, Inc
Address:	2440 Sand Hill Road, STE 100, Menlo Park, California 94025, United States
Manufacturer:	Leia, Inc
Address:	2440 Sand Hill Road, STE 100, Menlo Park, California 94025, United States
Date of Test:	May 28, 2020 – Jun. 12, 2020
Applicable Standards:	FCC CFR Title 47 Part 15 Subpart E Section 15.407: 2016 KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General U-NII Test Procedures New Rules v02r01

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

Tested By:



Brews Xu

Date:

Jun. 12, 2020

Reviewed By:



Beryl Zhao

Date:

Jun. 15, 2020

Approved By:



Tomsin

Date:

Jun. 15, 2020

2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	PASS
Maximum Conducted Output Power	§15.407(a)	PASS
6dB Emission Bandwidth	§15.407(a)	PASS
26dB Emission Bandwidth & 99% Occupied Bandwidth	§15.407(a)	PASS
Power Spectral Density	§15.407(a)	PASS
Restricted Bands around fundamental frequency	§15.407(a)	PASS
Radiated Emission	§15.407(a)	PASS
Frequency Stability	§15.407(g)	PASS

Note:

1. PASS: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.

3. EUT Description

Product:	LUME PAD
Model No.:	LPD-10W
Additional Model No.:	LPD-11W
Trade Mark:	N/A
Operation Frequency:	Band 1: 5180 MHz - 5240 MHz Band 3: 5745 MHz - 5825 MHz
Channel Bandwidth:	802.11a: 20MHz 802.11n: 20MHz, 40MHz 802.11ac: 20MHz, 40MHz, 80MHz
Modulation Technology:	Orthogonal Frequency Division Multiplexing(OFDM)
Modulation Type	256QAM, 64QAM, 16QAM, BPSK, QPSK
Antenna Type:	Internal Antenna
Antenna Gain:	Band 1: Antenna 0: 1.75dBi, Antenna 1: 1.47dBi Band 3: Antenna 0: 0.8dBi, Antenna 1: 1.0dBi
Power Supply:	Rechargeable Li-ion Battery DC 3.85V
AC adapter:	Adapter Information: Model: A138A-120150U-US4 Input: AC 100-240V, 50/60Hz, 0.5A Output: DC 5V, 3A/DC 9V, 2A/DC 12V, 1.5A
Remark:	All models above are identical in interior structure, electrical circuits and components, and just LPD-10W with rear camera, LPD-11W without rear camera.

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

Test Frequency each of channel

Band 1

20MHz		40MHz		80MHz	
Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180	38	5190	42	5210
40	5200	46	5230		
48	5240				

Band 3

20MHz		40MHz		80MHz	
Channel	Frequency	Channel	Frequency	Channel	Frequency
149	5745	151	5755	155	5775
157	5785	159	5795		
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:

4. General Information

4.1. Test environment and mode

Operating Environment:		
Condition	Conducted Emission	Radiated Emission
Temperature:	25.0 °C	25.0 °C
Humidity:	55 % RH	55 % RH
Atmospheric Pressure:	1010 mbar	1010 mbar
Test Mode:		
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations(The value of duty cycle is 100%)	
<p>The sample was placed 0.8m & 1.5m for the measurement below & above 1GHz above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case(Z axis) are shown in Test Results of the following pages.</p>		

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Per-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.

Mode	Data rate
802.11a (SISO)	6 Mbps
802.11n(HT20) (MIMO)	6.5 Mbps
802.11n(HT40) (MIMO)	13.5 Mbps
802.11ac(VHT20) (MIMO)	6.5 Mbps
802.11ac(VHT40) (MIMO)	13.5 Mbps
802.11ac(VHT80) (MIMO)	29.3 Mbps
Final Test Mode:	
Operation mode:	Keep the EUT in continuous transmitting with modulation

4.2. Description of 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.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
/	/	/	/	/

Note:

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.
3. For conducted measurements (Output Power, Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

5. Facilities and Accreditations

5.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

- FCC - Registration No.: 645098

Shenzhen Tongce Testing Lab.

The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

The 3m Semi-anechoic chamber of Shenzhen TCT Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

5.2. Location

Shenzhen Tongce Testing Lab.

Address: 1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China

TEL: +86-755-27673339

5.3. 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 %.

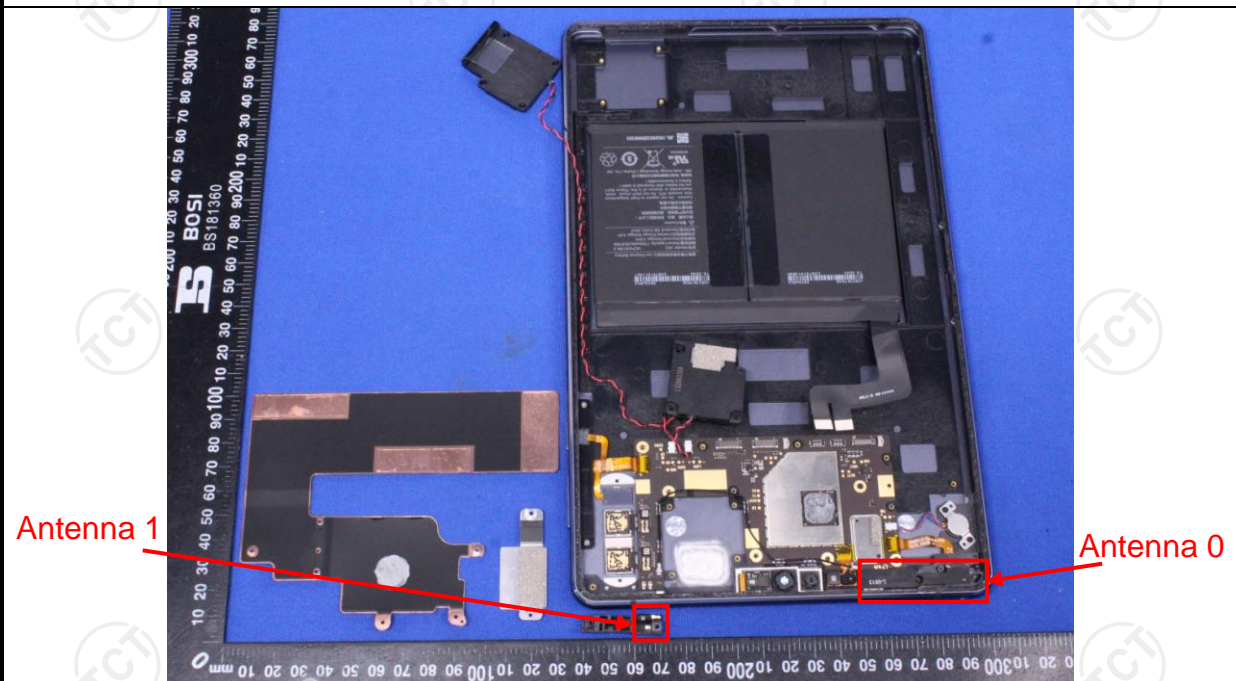
No.	Item	MU
1	Conducted Emission	$\pm 2.56\text{dB}$
2	RF power, conducted	$\pm 0.12\text{dB}$
3	Spurious emissions, conducted	$\pm 0.11\text{dB}$
4	All emissions, radiated(<1G)	$\pm 3.92\text{dB}$
5	All emissions, radiated(>1G)	$\pm 4.28\text{dB}$
6	Temperature	$\pm 0.1^\circ\text{C}$
7	Humidity	$\pm 1.0\%$

6. Test Results and Measurement Data

6.1. Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c)
<p>15.203 requirement: 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.</p>	
E.U.T Antenna:	

The EUT has two internal antennas.



Refer to KDB 662911 D01 Multiple Transmitter Output v02r01:
 Unequal antenna gains, with equal transmit powers, if transmit signals are correlated,
 then Directional gain of B1= $10\log[(10^{1.75/20} + 10^{1.47/20})^2/2] = 4.62 \text{ dB}$;
 Directional gain of B3 = $10\log[(10^{0.8/20} + 10^{1/20})^2/2] = 3.91 \text{ dB}$

6.2. Conducted Emission

6.2.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.207														
Test Method:	ANSI C63.10:2013														
Frequency Range:	150 kHz to 30 MHz														
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto														
Limits:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBuV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15-0.5</td> <td>66 to 56*</td> <td>56 to 46*</td> </tr> <tr> <td>0.5-5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table>	Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
5-30	60	50													
Test Setup:	<p><i>Remark</i> E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>														
Test Mode:	Tx Mode														
Test Procedure:	<ol style="list-style-type: none"> 1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement. 														
Test Result:	PASS														

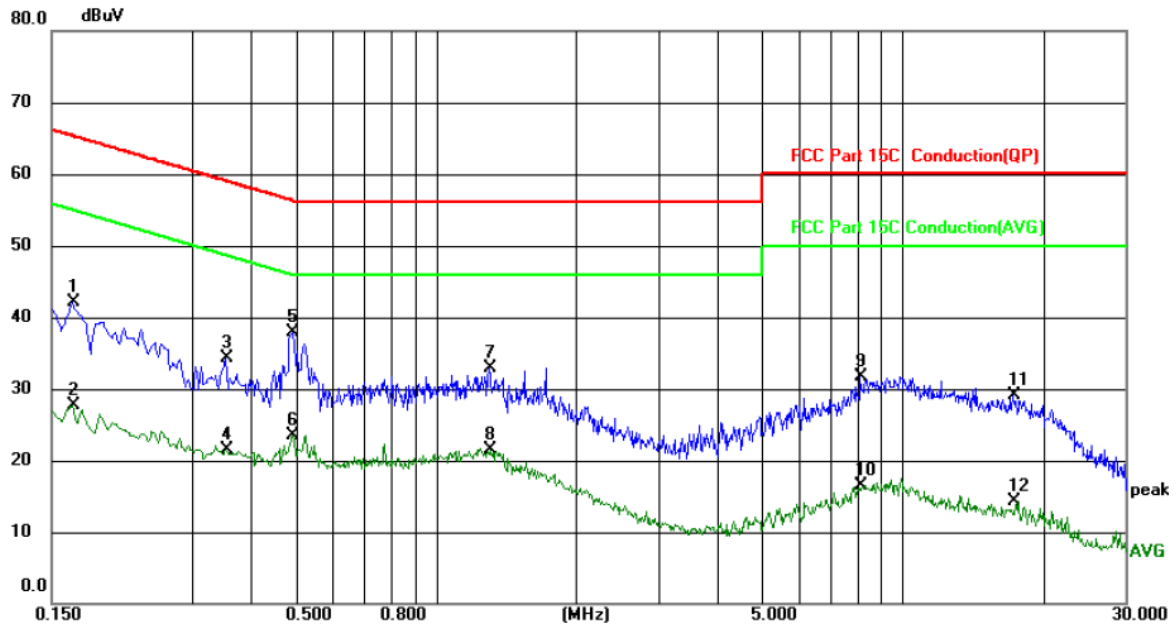
6.2.2. Test Instruments

Conducted Emission Shielding Room Test Site (843)				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Test Receiver	R&S	ESPI	101402	Jul. 29, 2020
LISN	Schwarzbeck	NSLK 8126	8126453	Sep. 11, 2020
Coax cable (9KHz-30MHz)	TCT	CE-05	N/A	Sep. 08, 2020
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.2.3. Test data

Please refer to following diagram for individual
Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



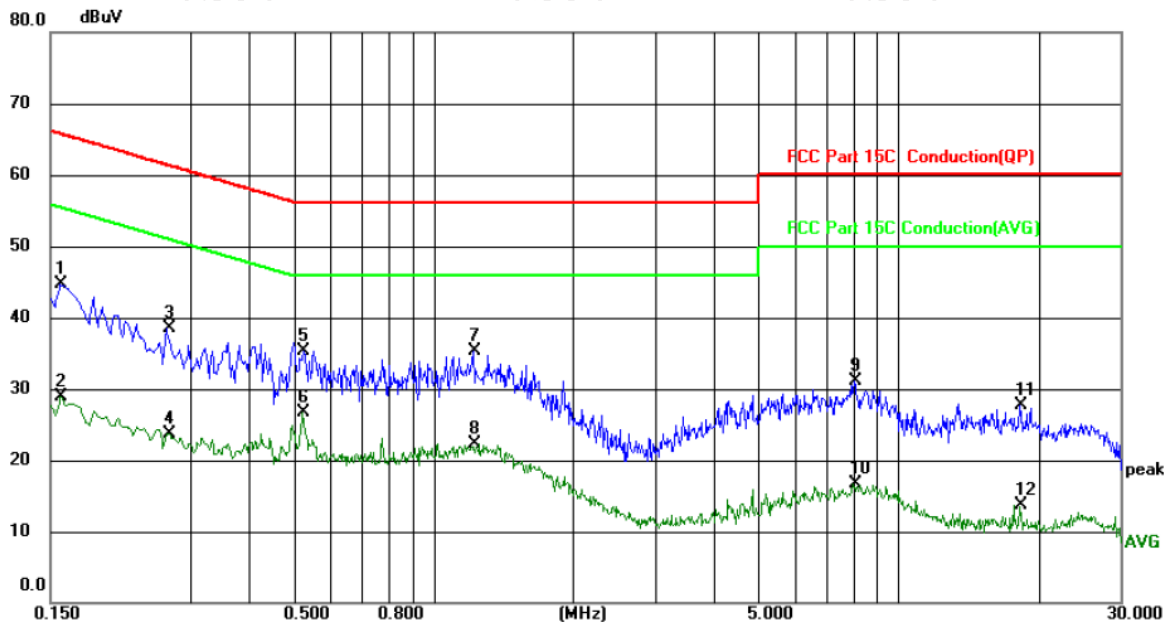
Site: Phase: **L1** Temperature: 25 (C)
Limit: FCC Part 15C Conduction(QP) Power: AC 120V/60Hz Humidity: 55 %RH

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1660	31.91	10.12	42.03	65.16	-23.13	QP	
2		0.1660	17.60	10.12	27.72	55.16	-27.44	AVG	
3		0.3540	24.21	10.13	34.34	58.87	-24.53	QP	
4		0.3540	11.37	10.13	21.50	48.87	-27.37	AVG	
5	*	0.4940	27.68	10.13	37.81	56.10	-18.29	QP	
6		0.4940	13.35	10.13	23.48	46.10	-22.62	AVG	
7		1.2980	22.69	10.12	32.81	56.00	-23.19	QP	
8		1.2980	11.44	10.12	21.56	46.00	-24.44	AVG	
9		8.1220	21.62	10.14	31.76	60.00	-28.24	QP	
10		8.1220	6.31	10.14	16.45	50.00	-33.55	AVG	
11		17.2780	18.92	10.19	29.11	60.00	-30.89	QP	
12		17.2780	4.18	10.19	14.37	50.00	-35.63	AVG	

Note:

- Freq. = Emission frequency in MHz
- Reading level (dBuV) = Receiver reading
- Corr. Factor (dB) = LISN factor + Cable loss
- Measurement (dBuV) = Reading level (dBuV) + Corr. Factor (dB)
- Limit (dBuV) = Limit stated in standard
- Margin (dB) = Measurement (dBuV) – Limits (dBuV)
- Q.P. =Quasi-Peak
- AVG =average
- * is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

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



Site: Phase: **N** Temperature: 25 (C)
 Limit: FCC Part 15C Conduction(QP) Power: AC 120V/60Hz Humidity: 55 %RH

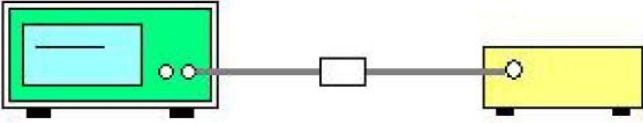
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1580	34.54	10.12	44.66	65.57	-20.91	QP	
2		0.1580	18.79	10.12	28.91	55.57	-26.66	AVG	
3		0.2700	28.39	10.13	38.52	61.12	-22.60	QP	
4		0.2700	13.56	10.13	23.69	51.12	-27.43	AVG	
5		0.5260	25.19	10.13	35.32	56.00	-20.68	QP	
6	*	0.5260	16.61	10.13	26.74	46.00	-19.26	AVG	
7		1.2180	25.16	10.12	35.28	56.00	-20.72	QP	
8		1.2180	12.22	10.12	22.34	46.00	-23.66	AVG	
9		8.0580	20.97	10.14	31.11	60.00	-28.89	QP	
10		8.0580	6.59	10.14	16.73	50.00	-33.27	AVG	
11		18.2460	17.57	10.19	27.76	60.00	-32.24	QP	
12		18.2460	3.43	10.19	13.62	50.00	-36.38	AVG	

Note:

- Freq. = Emission frequency in MHz
- Reading level (dBuV) = Receiver reading
- Corr. Factor (dB) = LISN factor + Cable loss
- Measurement (dBuV) = Reading level (dBuV) + Corr. Factor (dB)
- Limit (dBuV) = Limit stated in standard
- Margin (dB) = Measurement (dBuV) – Limits (dBuV)
- Q.P. =Quasi-Peak
- AVG =average
- * is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

6.3. Maximum Conducted Output Power

6.3.1. Test Specification

Test Requirement:	FCC Part15 E Section 15.407(a)& Part 2 J Section 2.1046						
Test Method:	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section E						
Limit:	<table border="1"> <thead> <tr> <th>Frequency Band (MHz)</th> <th>Limit</th> </tr> </thead> <tbody> <tr> <td>5180 - 5240</td> <td>24dBm(250mW) for client device</td> </tr> <tr> <td>5745 - 5825</td> <td>30dBm(1W)</td> </tr> </tbody> </table>	Frequency Band (MHz)	Limit	5180 - 5240	24dBm(250mW) for client device	5745 - 5825	30dBm(1W)
Frequency Band (MHz)	Limit						
5180 - 5240	24dBm(250mW) for client device						
5745 - 5825	30dBm(1W)						
Test Setup:	 <p>The diagram illustrates the test setup. On the left is a green box labeled 'Power meter'. A grey line representing an RF cable connects the power meter to a small white box labeled 'Attenuator'. Another grey line connects the attenuator to a yellow box labeled 'EUT' (Equipment Under Test).</p>						
Test Mode:	Transmitting mode with modulation						
Test Procedure:	<ol style="list-style-type: none"> 1. The testing follows the Measurement Procedure of KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section E, 3, a 2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement. 3. Set to the maximum power setting and enable the EUT transmit continuously. 5. Measure the conducted output power and record the results in the test report. 						
Test Result:	PASS						
Remark:	The transmit duty cycle $\geq 98\%$						

6.3.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Sep. 11, 2020
Power Meter	Agilent	E4418B	GB43312526	Sep. 08, 2020
Power Sensor	Agilent	E9301A	MY41497725	Sep. 08, 2020
4 Ch. Simultaneous Sampling 14 Bits 2 MS/s	Agilent	U2531A	N/A	Sep. 08, 2020
Combiner Box	Ascentest	AT890-RFB	N/A	Sep. 08, 2020

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.3.3. Test Data

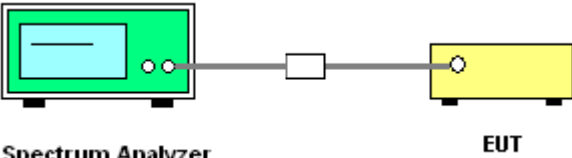
Configuration Band 1 (5180 - 5240 MHz) / Antenna 0+Antenna 1						
Mode	Test channel	Maximum Conducted (Average) Output Power (dBm)			Limit (dBm)	Result
		Ant0	Ant1	Total		
11a	CH36	3.91	3.52	/	24	PASS
11a	CH40	4.30	4.41	/	24	PASS
11a	CH48	5.15	4.12	/	24	PASS
11n(HT20)	CH36	4.02	3.35	6.71	24	PASS
11n(HT20)	CH40	4.22	3.61	6.94	24	PASS
11n(HT20)	CH48	5.08	3.48	7.36	24	PASS
11n(HT40)	CH38	4.47	3.61	7.07	24	PASS
11n(HT40)	CH46	5.61	3.78	7.80	24	PASS
11ac(VHT20)	CH36	3.99	3.41	6.72	24	PASS
11ac(VHT20)	CH40	4.24	3.59	6.94	24	PASS
11ac(VHT20)	CH48	5.09	3.41	7.34	24	PASS
11ac(VHT40)	CH38	4.42	3.56	7.02	24	PASS
11ac(VHT40)	CH46	5.58	3.72	7.76	24	PASS
11ac(VHT80)	CH42	4.99	3.97	7.52	24	PASS

Configuration Band 3 (5745 - 5825 MHz) / Antenna 0+Antenna 1

Mode	Test channel	Maximum Conducted (Average) Output Power (dBm)			Limit (dBm)	Result
		Ant0	Ant1	Total		
11a	CH149	5.10	4.13	/	30	PASS
11a	CH157	5.38	4.07	/	30	PASS
11a	CH165	5.31	3.55	/	30	PASS
11n(HT20)	CH149	4.96	4.14	7.58	30	PASS
11n(HT20)	CH157	4.18	4.02	7.11	30	PASS
11n(HT20)	CH165	3.98	3.96	6.98	30	PASS
11n(HT40)	CH151	4.69	4.23	7.48	30	PASS
11n(HT40)	CH159	4.21	3.60	6.93	30	PASS
11ac(VHT20)	CH149	4.94	4.10	7.55	30	PASS
11ac(VHT20)	CH157	4.19	4.02	7.12	30	PASS
11ac(VHT20)	CH165	4.02	4.01	7.03	30	PASS
11ac(VHT40)	CH151	4.68	4.20	7.46	30	PASS
11ac(VHT40)	CH159	4.23	3.58	6.93	30	PASS
11ac(VHT80)	CH155	4.31	3.97	7.15	30	PASS

6.4. 6dB Emission Bandwidth

6.4.1. Test Specification

Test Requirement:	FCC CFR47 Part 15 Section 15.407(e)& Part 2 J Section 2.1049
Test Method:	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C
Limit:	>500kHz
Test Setup:	 <p style="text-align: center;">Spectrum Analyzer EUT</p>
Test Mode:	Transmitting mode with modulation
Test Procedure:	<ol style="list-style-type: none"> 1. KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz. 4. Measure and record the results in the test report.
Test Result:	PASS

6.4.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Sep. 11, 2020
4 Ch. Simultaneous Sampling 14 Bits 2 MS/s	Agilent	U2531A	N/A	Sep. 08, 2020
Combiner Box	Ascentest	AT890-RFB	N/A	Sep. 08, 2020

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.4.3. Test data

ANT 0

Band 3 (5745 - 5825 MHz)

Mode	Test channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
11a	CH149	5745	16.01	0.5	PASS
11a	CH157	5785	14.45	0.5	PASS
11a	CH165	5825	15.44	0.5	PASS
11n(HT20)	CH149	5745	17.17	0.5	PASS
11n(HT20)	CH157	5785	16.01	0.5	PASS
11n(HT20)	CH165	5825	15.93	0.5	PASS
11n(HT40)	CH151	5755	35.65	0.5	PASS
11n(HT40)	CH159	5795	35.04	0.5	PASS
11ac(VHT20)	CH149	5745	15.90	0.5	PASS
11ac(VHT20)	CH157	5785	16.80	0.5	PASS
11ac(VHT20)	CH165	5825	15.41	0.5	PASS
11ac(VHT40)	CH151	5755	35.72	0.5	PASS
11ac(VHT40)	CH159	5795	35.12	0.5	PASS
11ac(VHT80)	CH155	5775	75.11	0.5	PASS

ANT 1

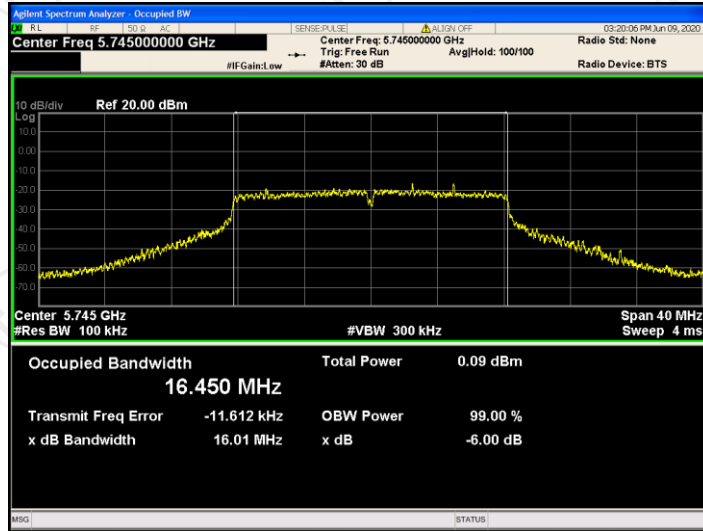
Band 3 (5745 - 5825 MHz)

Mode	Test channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
11a	CH149	5745	15.68	0.5	PASS
11a	CH157	5785	15.36	0.5	PASS
11a	CH165	5825	15.66	0.5	PASS
11n(HT20)	CH149	5745	15.97	0.5	PASS
11n(HT20)	CH157	5785	15.66	0.5	PASS
11n(HT20)	CH165	5825	17.07	0.5	PASS
11n(HT40)	CH151	5755	35.75	0.5	PASS
11n(HT40)	CH159	5795	35.67	0.5	PASS
11ac(VHT20)	CH149	5745	17.24	0.5	PASS
11ac(VHT20)	CH157	5785	16.78	0.5	PASS
11ac(VHT20)	CH165	5825	16.55	0.5	PASS
11ac(VHT40)	CH151	5755	35.63	0.5	PASS
11ac(VHT40)	CH159	5795	35.90	0.5	PASS
11ac(VHT80)	CH155	5775	75.33	0.5	PASS

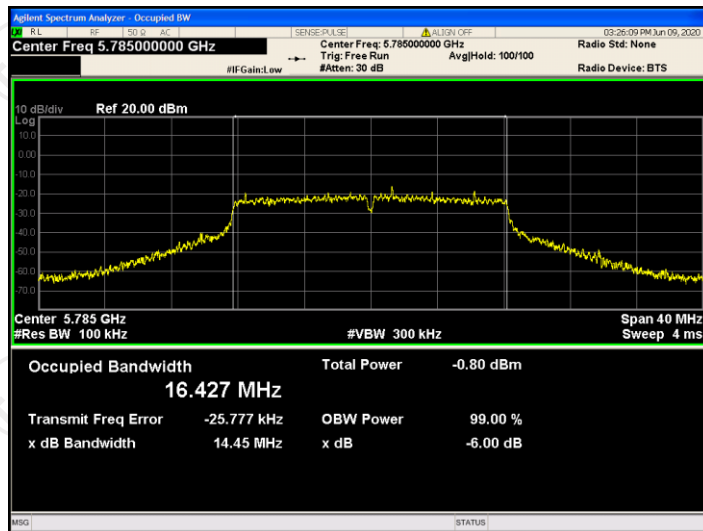
Test plots as follows:

ANT 0
 Band 3 (5745 – 5825 MHz)
 11a

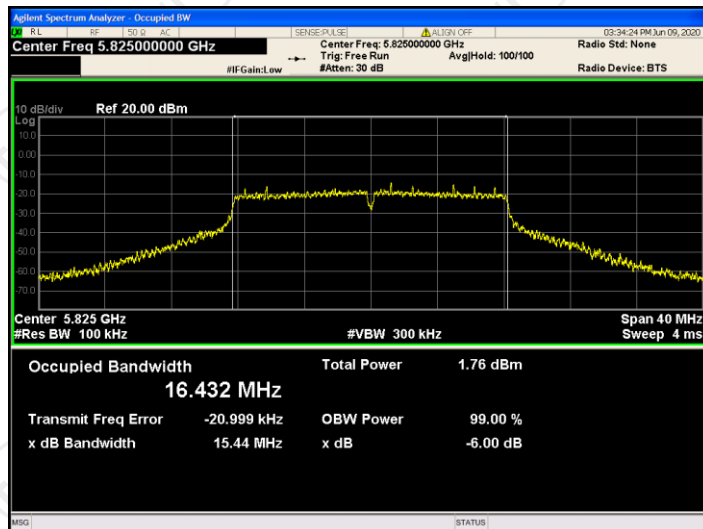
CH149



CH157

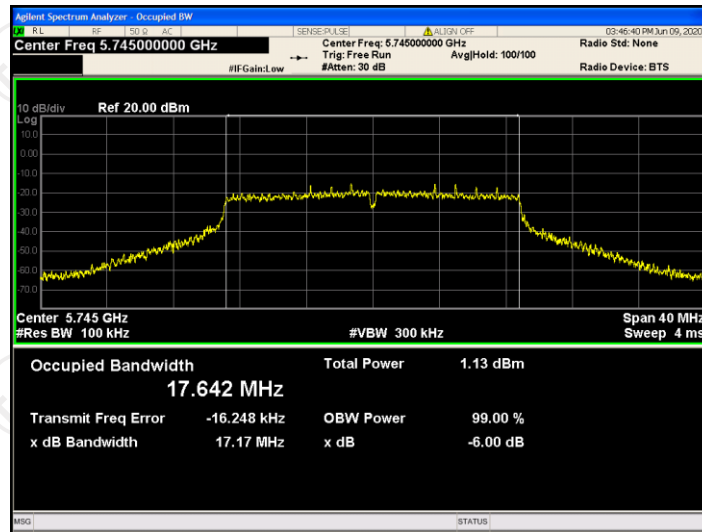


CH165

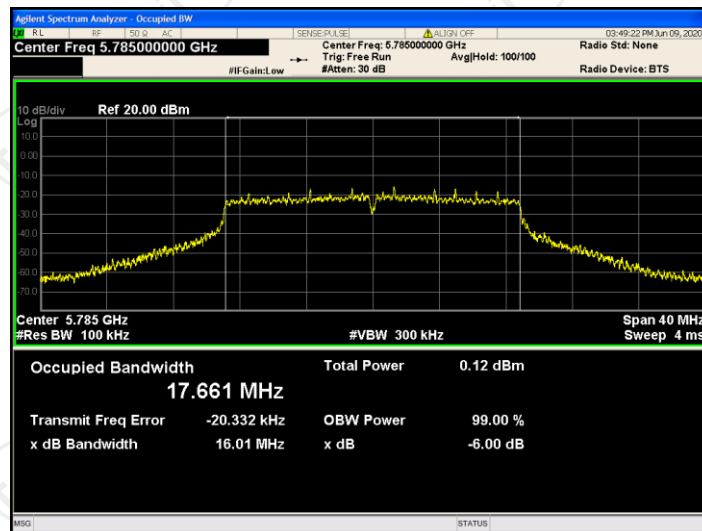


11n(HT20)

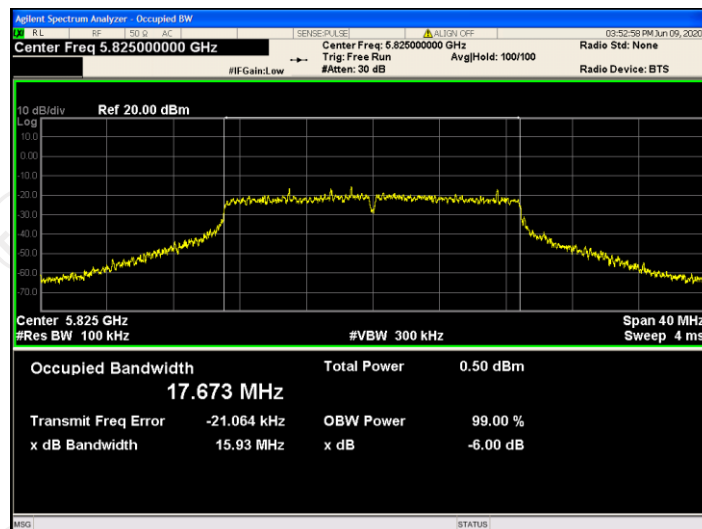
CH149



CH157

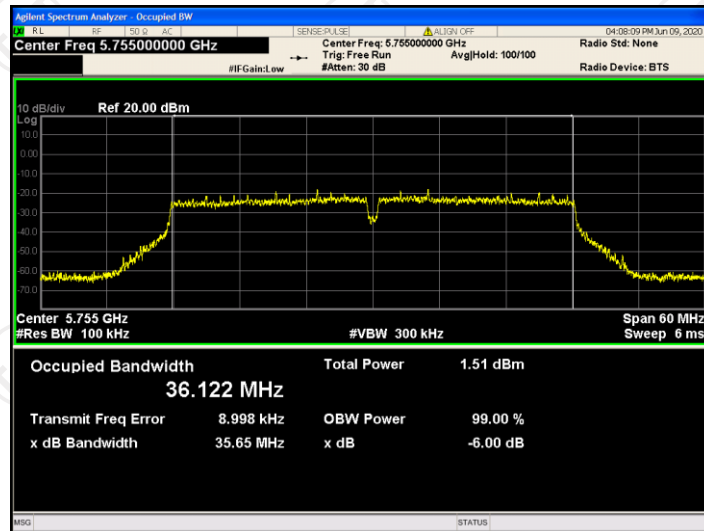


CH165

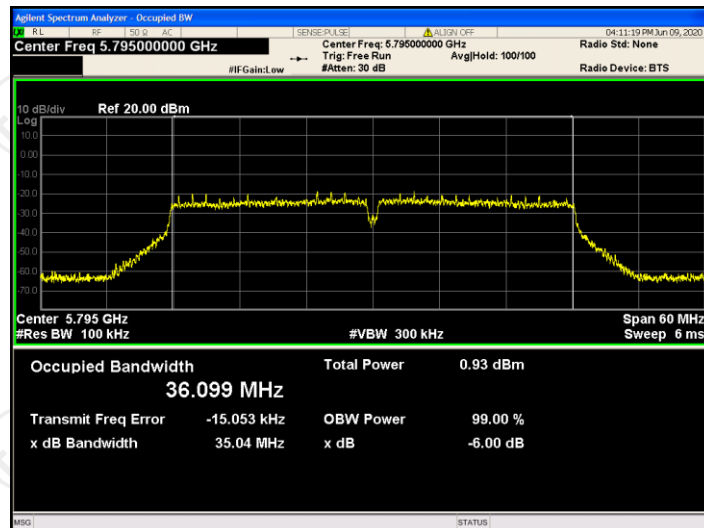


11n(HT40)

CH151

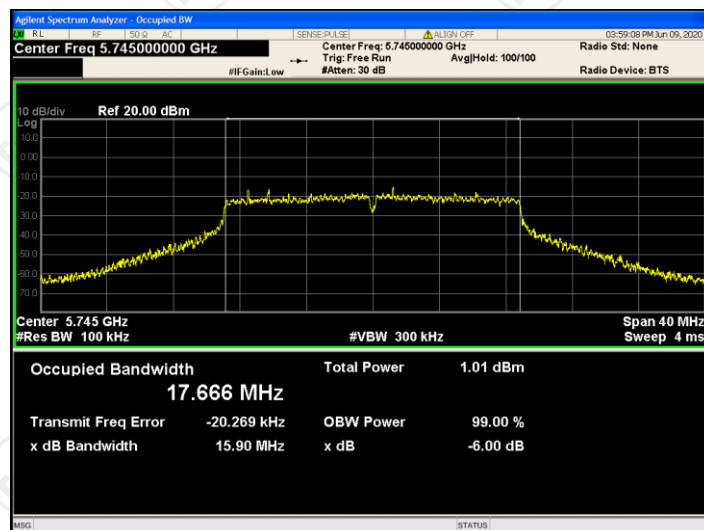


CH159

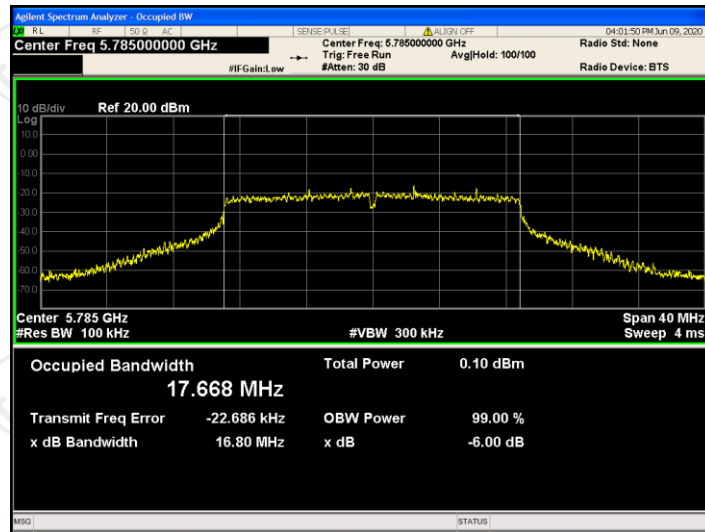


11ac(VHT20)

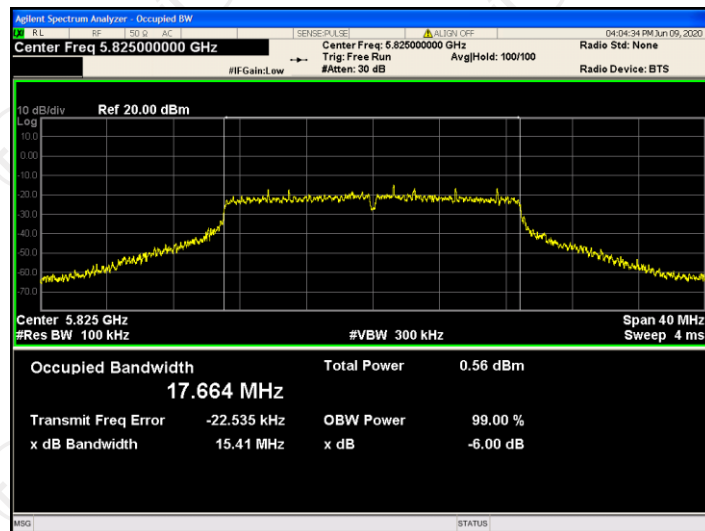
CH149



CH157

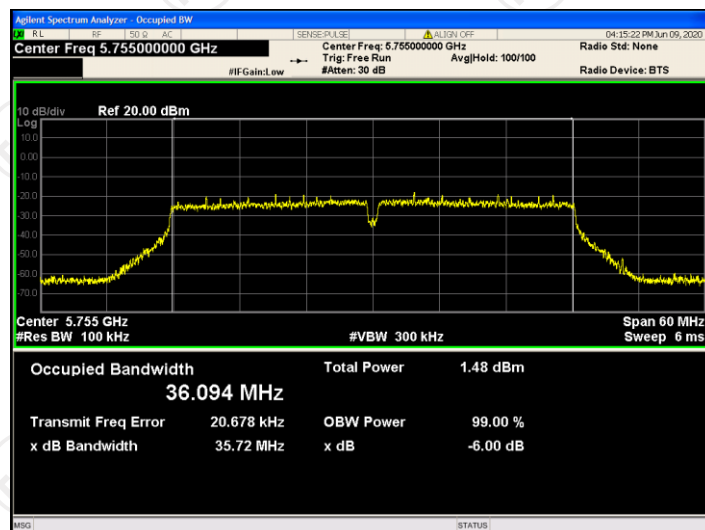


CH165

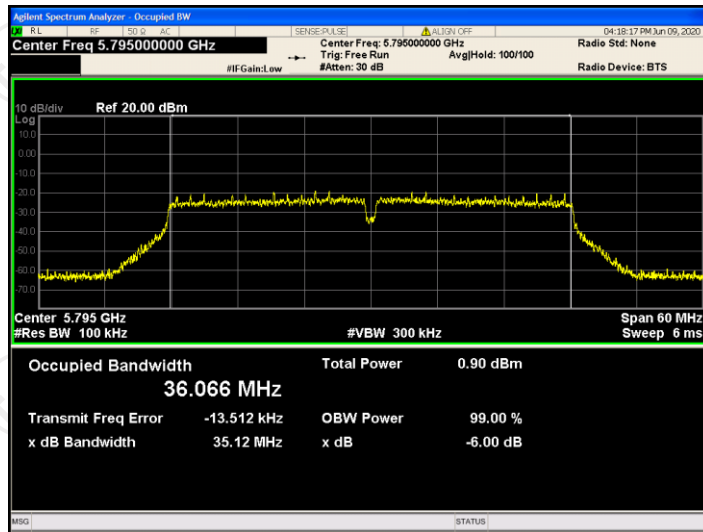


11ac(VHT40)

CH151

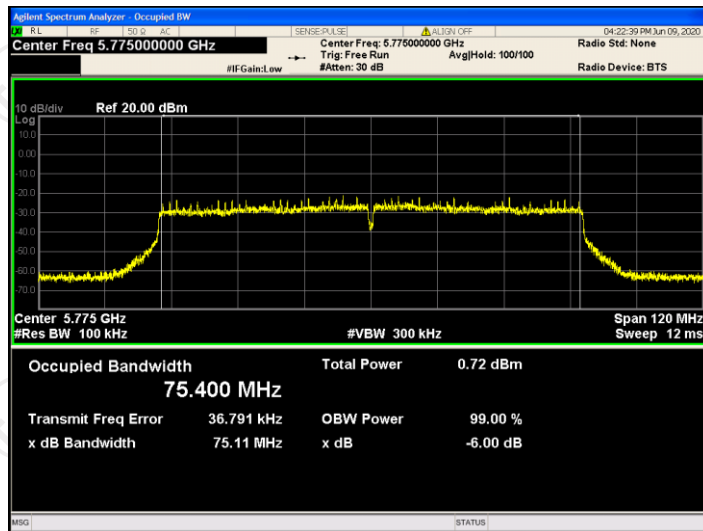


CH159



11ac(VHT80)

CH155

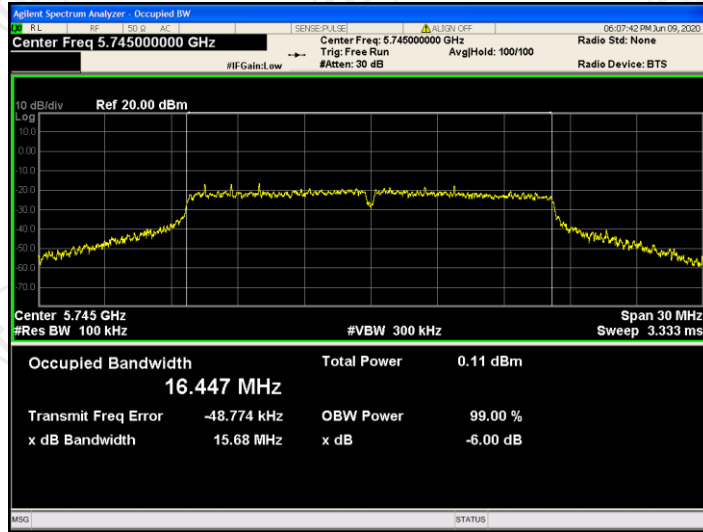


ANT 1

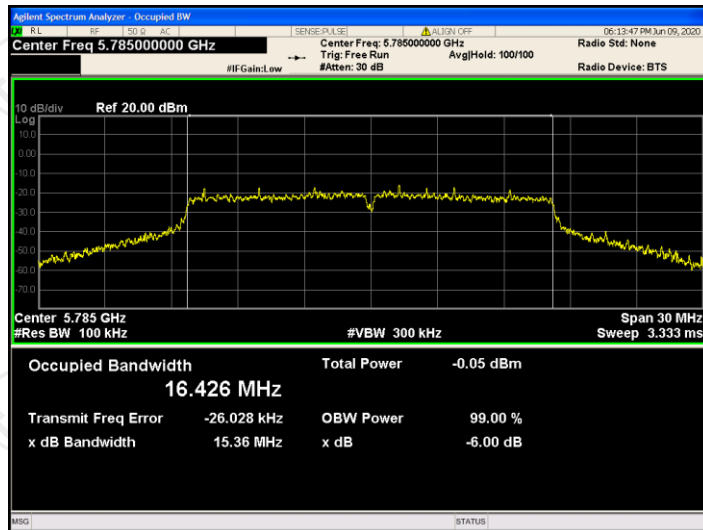
Band 3 (5745 – 5825 MHz)

11a

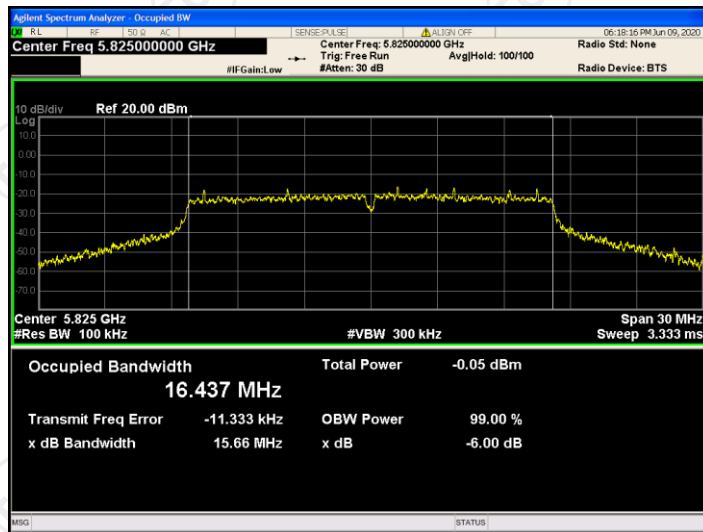
CH149



CH157

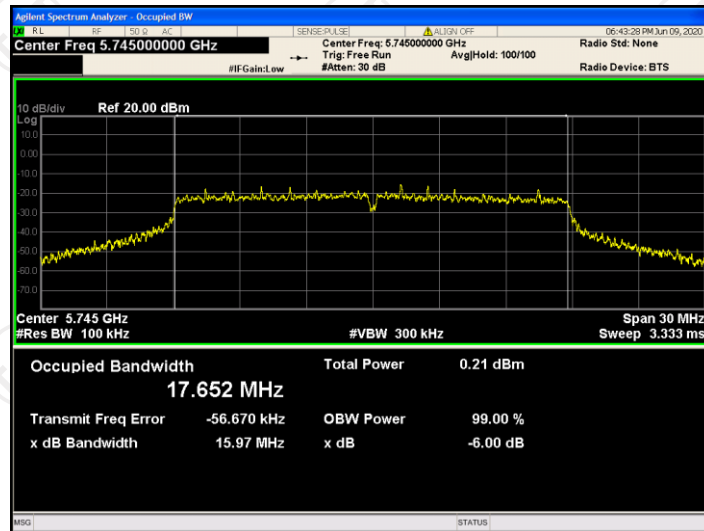


CH165

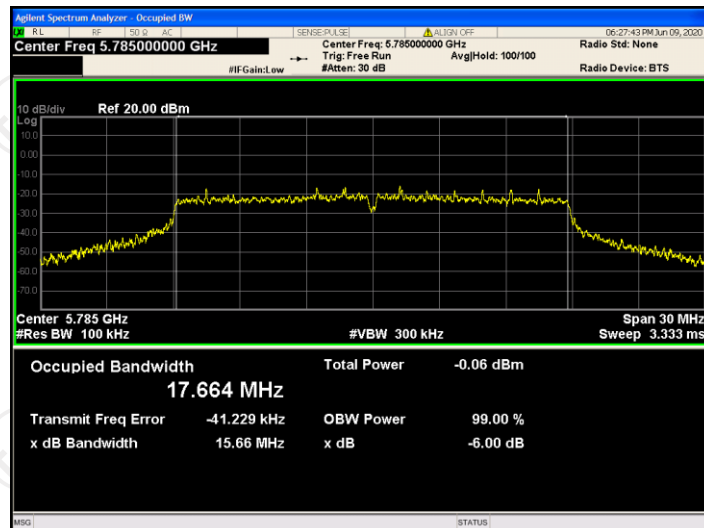


11n(HT20)

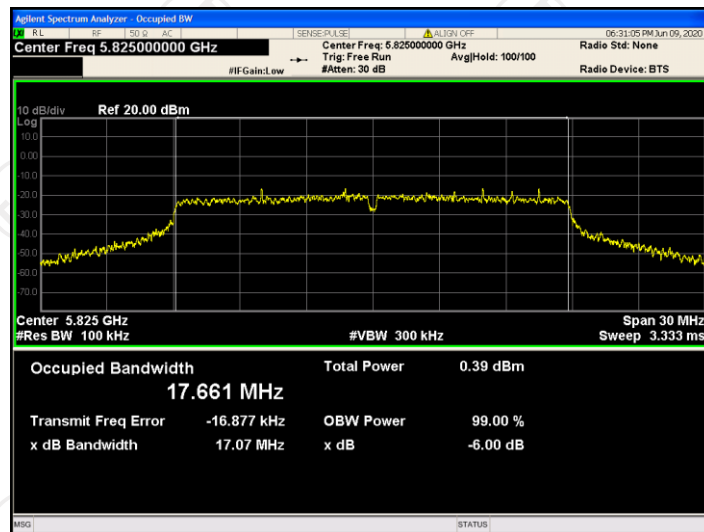
CH149



CH157

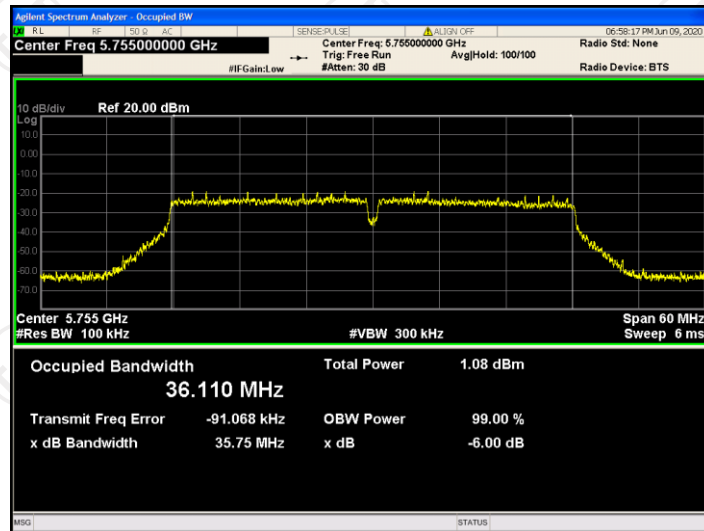


CH165

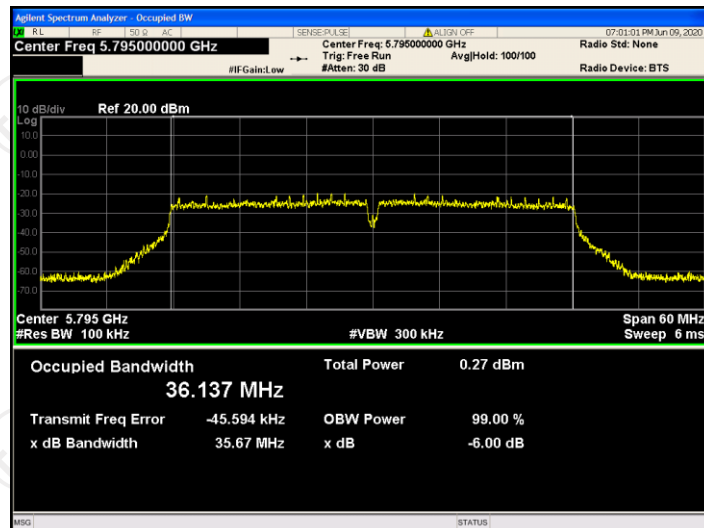


11n(HT40)

CH151

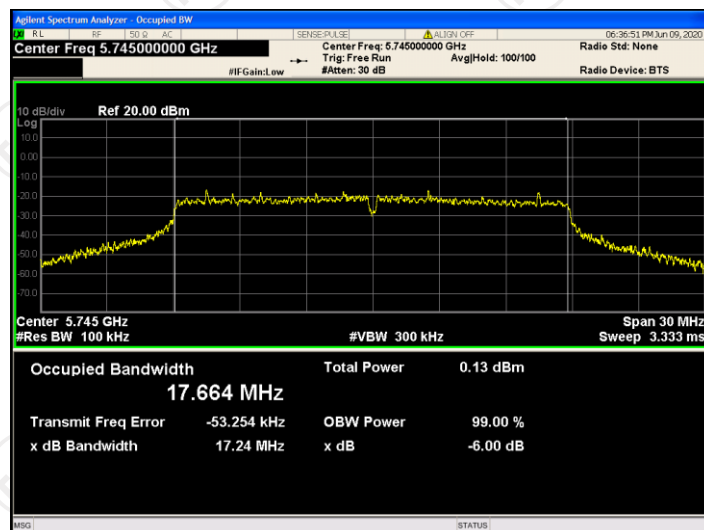


CH159

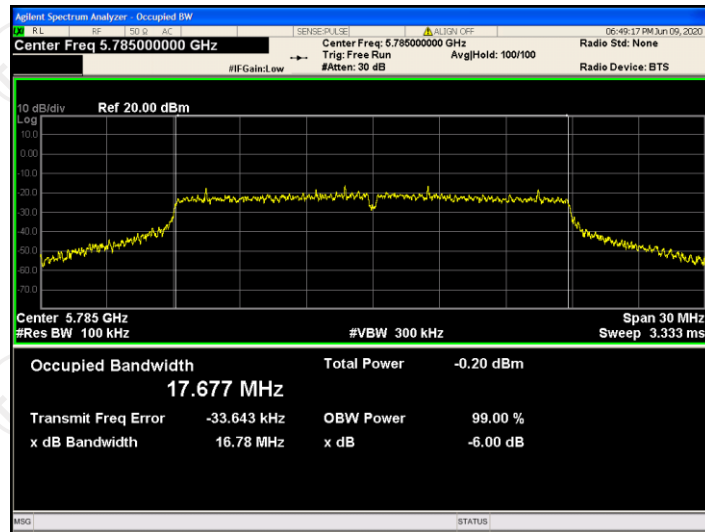


11ac(VHT20)

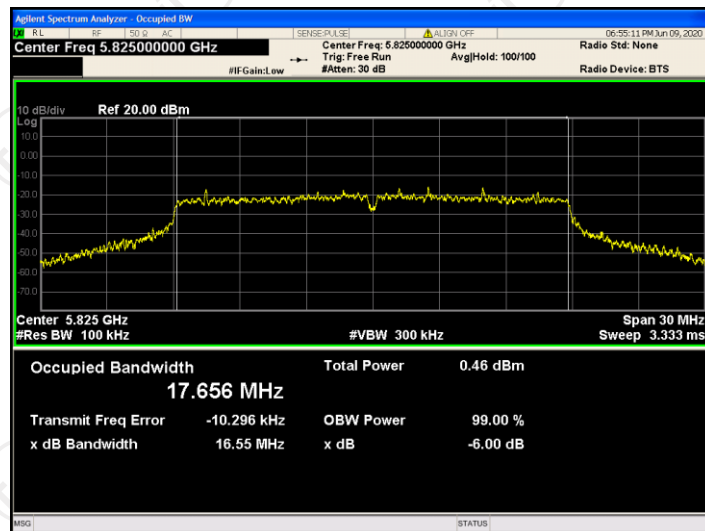
CH149



CH157

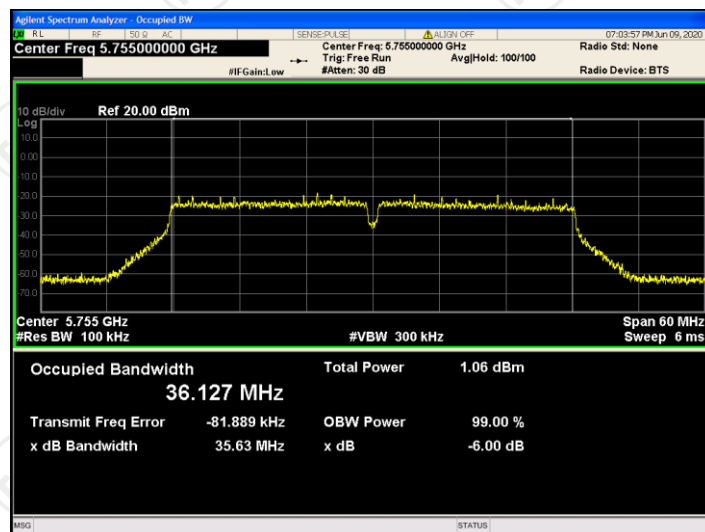


CH165

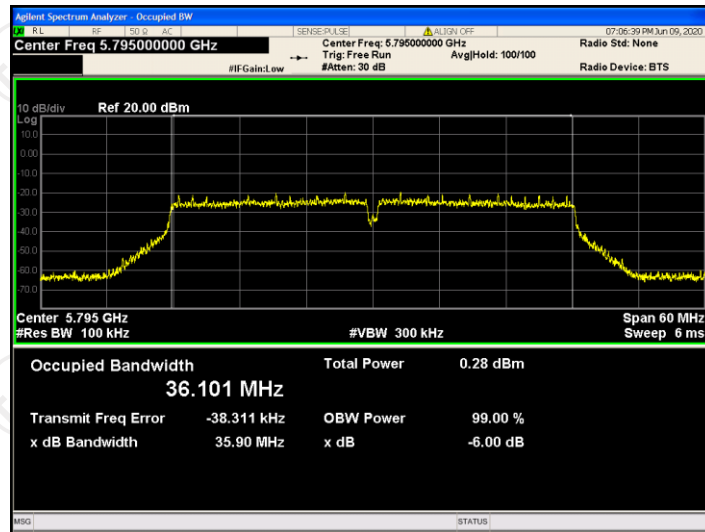


11ac(VHT40)

CH151

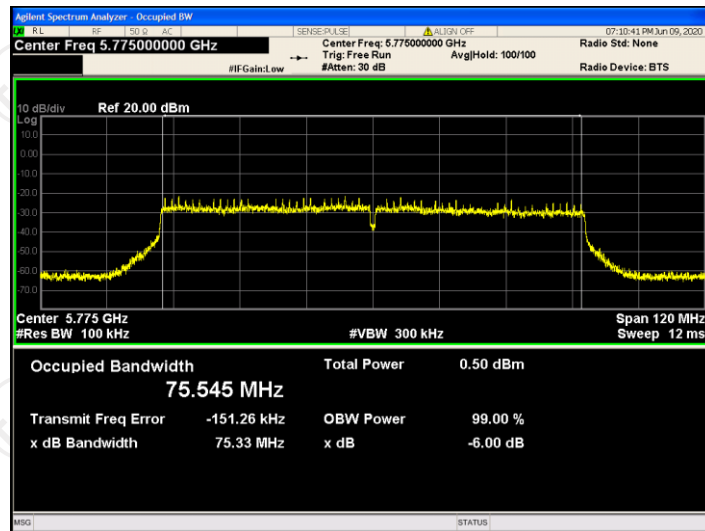


CH159



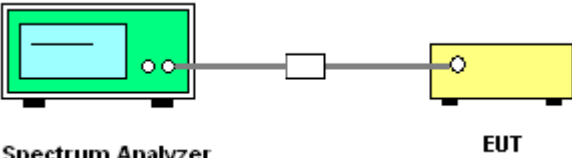
11ac(VHT80)

CH155



6.5. 26dB Bandwidth and 99% Occupied Bandwidth

6.5.1. Test Specification

Test Requirement:	47 CFR Part 15C Section 15.407 (a)& Part 2 J Section 2.1049
Test Method:	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section D
Limit:	No restriction limits
Test Setup:	 <p style="text-align: center;">Spectrum Analyzer EUT</p>
Test Mode:	Transmitting mode with modulation
Test Procedure:	<ol style="list-style-type: none"> 1. KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section D 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. 4. Measure and record the results in the test report.
Test Result:	PASS

6.5.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Sep. 11, 2020
4 Ch. Simultaneous Sampling 14 Bits 2 MS/s	Agilent	U2531A	N/A	Sep. 08, 2020
Combiner Box	Ascentest	AT890-RFB	N/A	Sep. 08, 2020

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

6.5.3. Test data

**ANT 0
Band 1**

Mode	Test channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
11a	CH36	5180	22.79	16.652
11a	CH40	5200	22.89	16.632
11a	CH48	5240	22.02	16.500
11n(HT20)	CH36	5180	23.19	17.833
11n(HT20)	CH40	5200	24.11	17.826
11n(HT20)	CH48	5240	22.83	17.803
11n(HT40)	CH38	5190	41.46	36.240
11n(HT40)	CH46	5230	40.96	36.142
11ac(VHT20)	CH36	5180	23.11	17.826
11ac(VHT20)	CH40	5200	24.39	17.813
11ac(VHT20)	CH48	5240	22.96	17.793
11ac(VHT40)	CH38	5190	41.58	36.238
11ac(VHT40)	CH46	5230	41.12	36.160
11ac(VHT80)	CH42	5210	82.48	75.591

Band 3

Mode	Test channel	Frequency (MHz)	99% Bandwidth (MHz)
11a	CH149	5745	16.604
11a	CH157	5785	16.587
11a	CH165	5825	16.630
11n(HT20)	CH149	5745	17.820
11n(HT20)	CH157	5785	17.848
11n(HT20)	CH165	5825	17.831
11n(HT40)	CH151	5755	36.197
11n(HT40)	CH159	5795	36.212
11ac(VHT20)	CH149	5745	17.819
11ac(VHT20)	CH157	5785	17.843
11ac(VHT20)	CH165	5825	17.826
11ac(VHT40)	CH151	5755	36.178
11ac(VHT40)	CH159	5795	36.174
11ac(VHT80)	CH155	5775	75.627

**ANT 1
Band 1**

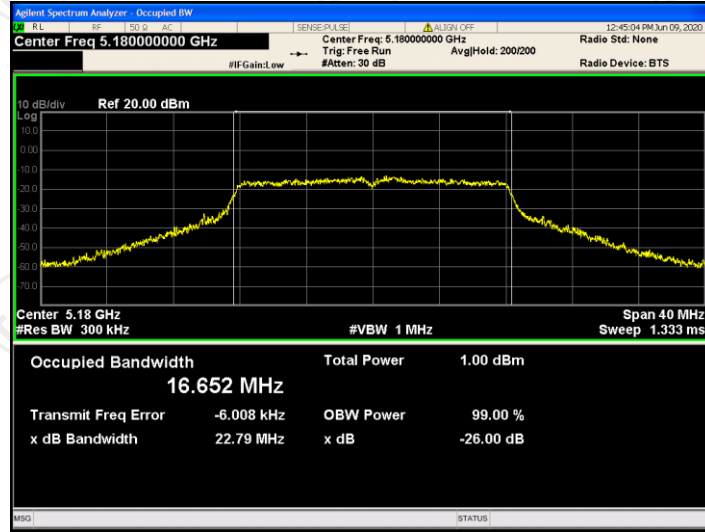
Mode	Test channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
11a	CH36	5180	22.72	16.648
11a	CH40	5200	22.81	16.622
11a	CH48	5240	22.23	16.695
11n(HT20)	CH36	5180	23.90	17.850
11n(HT20)	CH40	5200	23.46	17.849
11n(HT20)	CH48	5240	23.41	17.850
11n(HT40)	CH38	5190	41.26	36.167
11n(HT40)	CH46	5230	41.11	36.251
11ac(VHT20)	CH36	5180	23.35	17.849
11ac(VHT20)	CH40	5200	22.92	17.797
11ac(VHT20)	CH48	5240	23.18	17.875
11ac(VHT40)	CH38	5190	40.88	36.161
11ac(VHT40)	CH46	5230	41.55	36.250
11ac(VHT80)	CH42	5210	83.74	75.769

Band 3

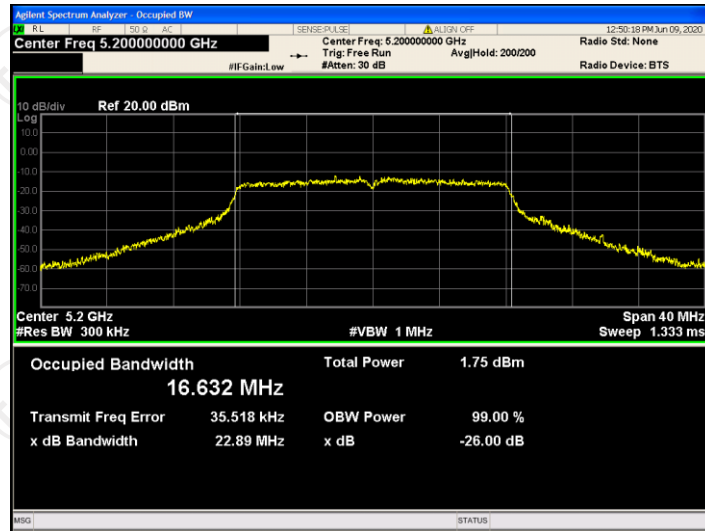
Mode	Test channel	Frequency (MHz)	99% Bandwidth (MHz)
11a	CH149	5745	16.655
11a	CH157	5785	16.670
11a	CH165	5825	16.635
11n(HT20)	CH149	5745	17.819
11n(HT20)	CH157	5785	17.858
11n(HT20)	CH165	5825	17.863
11n(HT40)	CH151	5755	36.193
11n(HT40)	CH159	5795	36.237
11ac(VHT20)	CH149	5745	17.829
11ac(VHT20)	CH157	5785	17.866
11ac(VHT20)	CH165	5825	17.865
11ac(VHT40)	CH151	5755	36.224
11ac(VHT40)	CH159	5795	36.219
11ac(VHT80)	CH155	5775	75.866

Test plots as follows:
ANT 0 Band 1 (5180-5240 MHz)
 11a

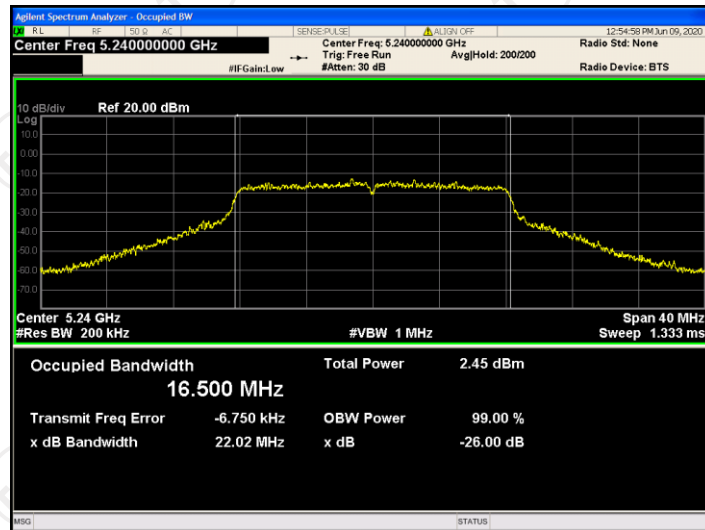
CH36



CH40

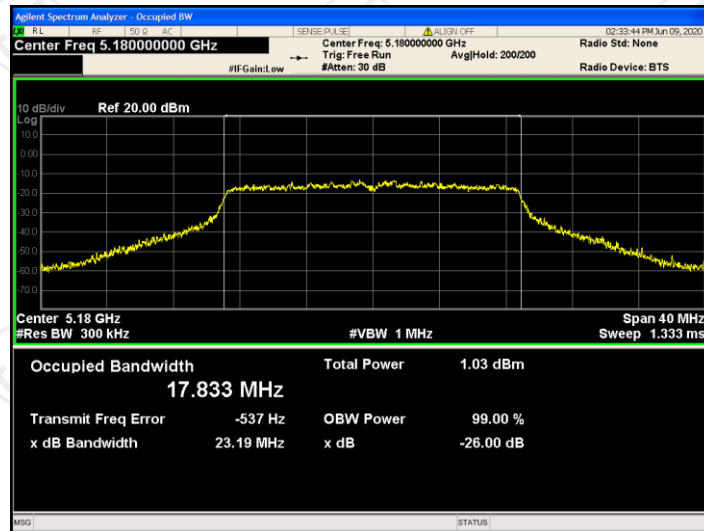


CH48

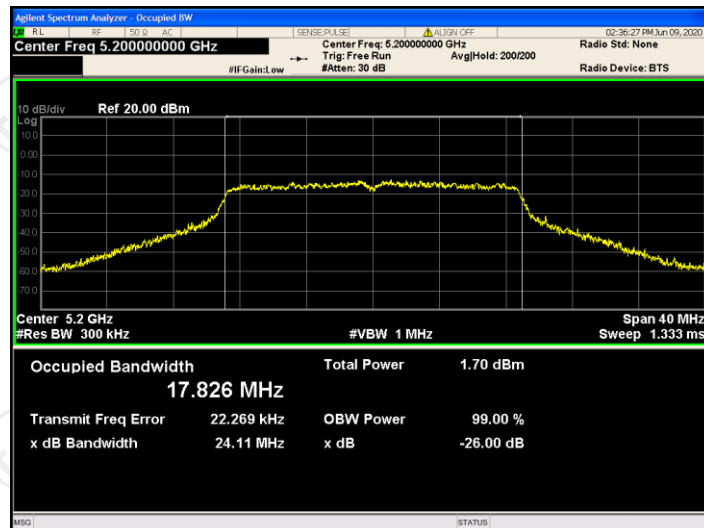


11n(HT20)

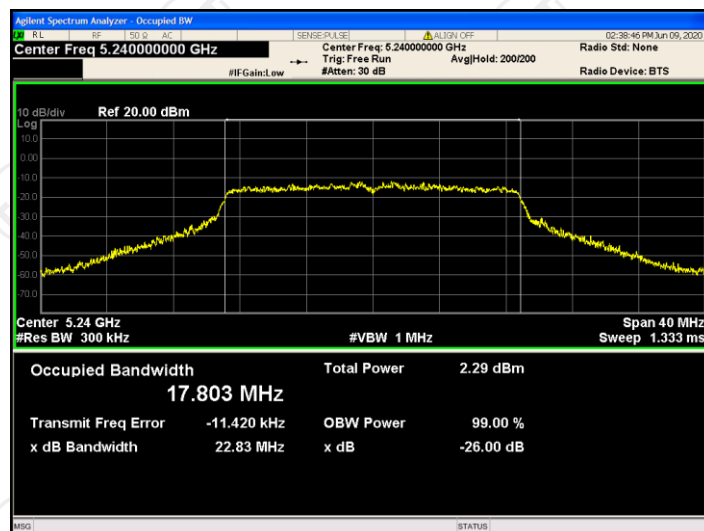
CH36



CH40

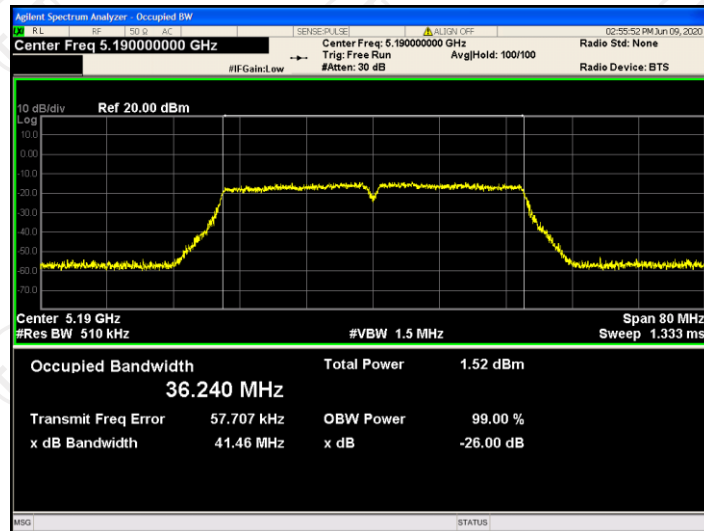


CH48

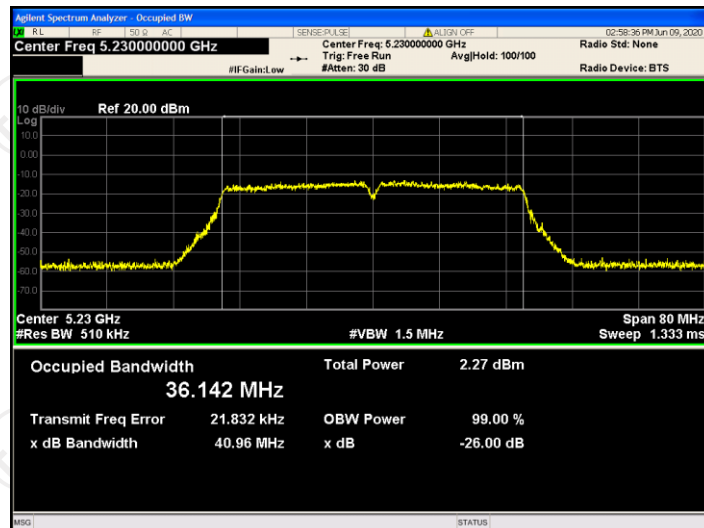


11n(HT40)

CH38

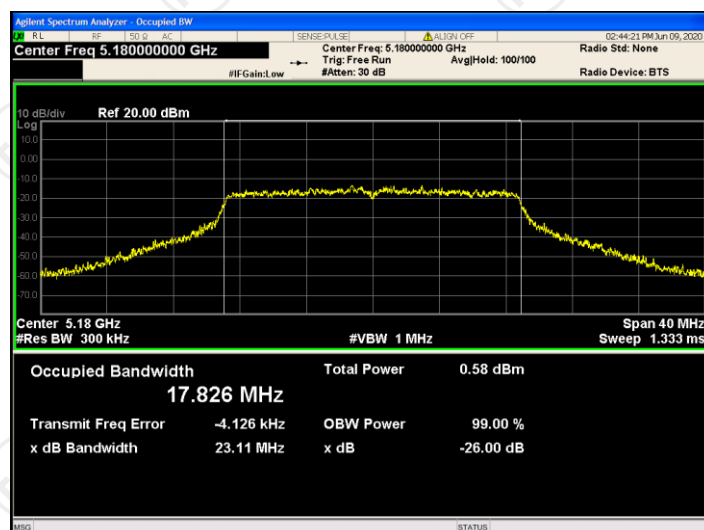


CH46

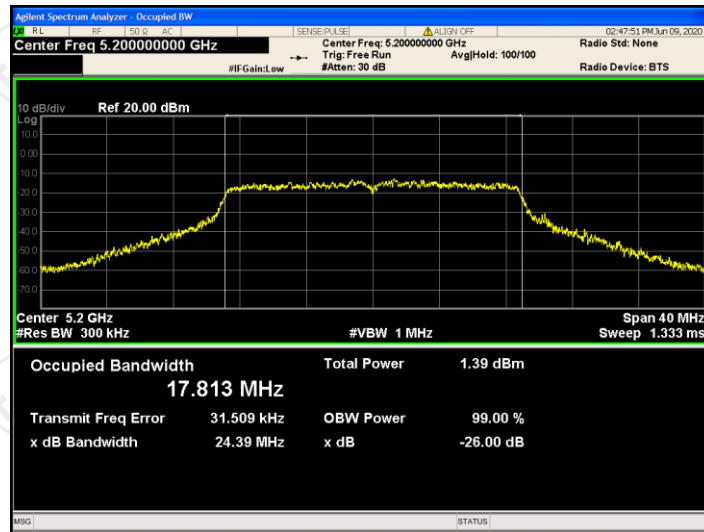


11ac(VHT20)

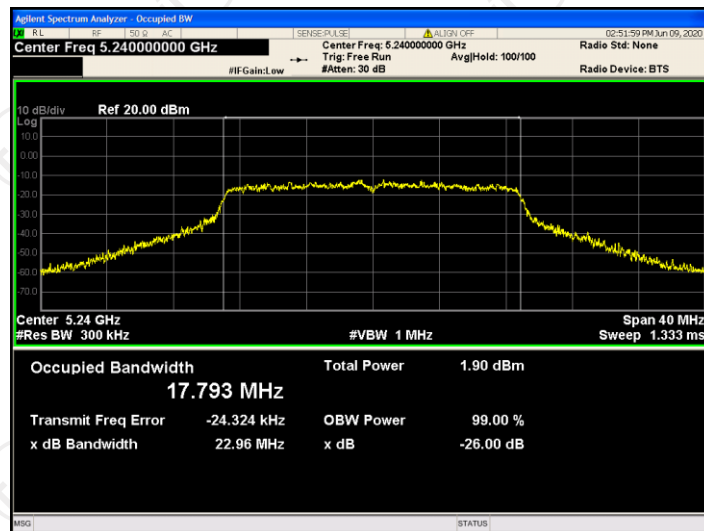
CH36



CH40

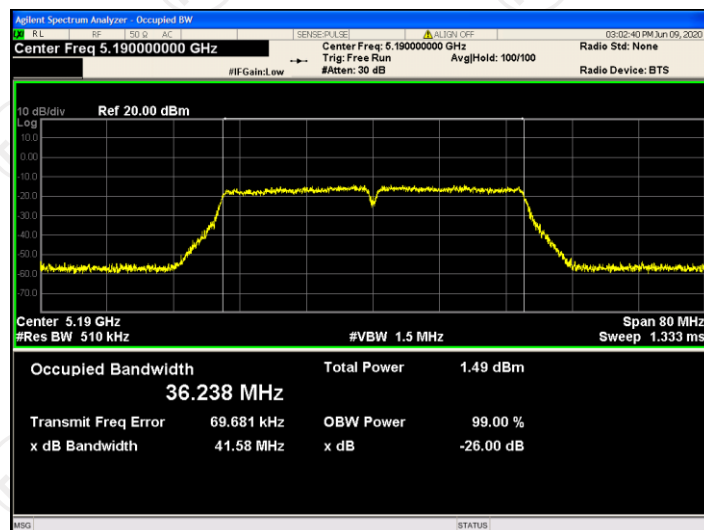


CH48

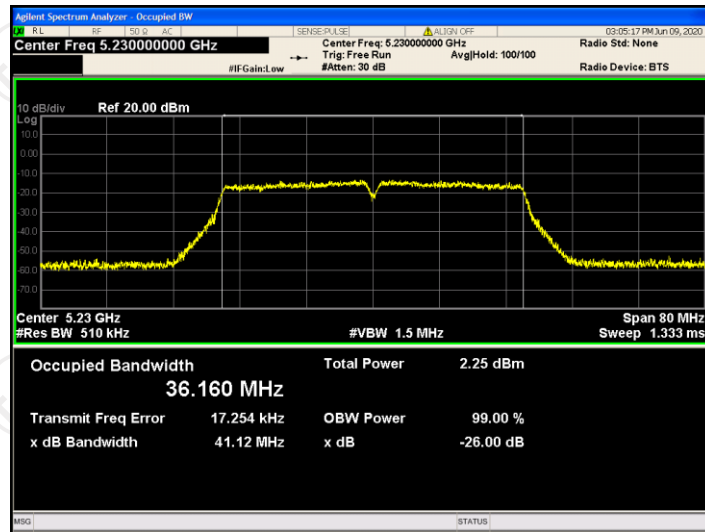


11ac(VHT40)

CH38

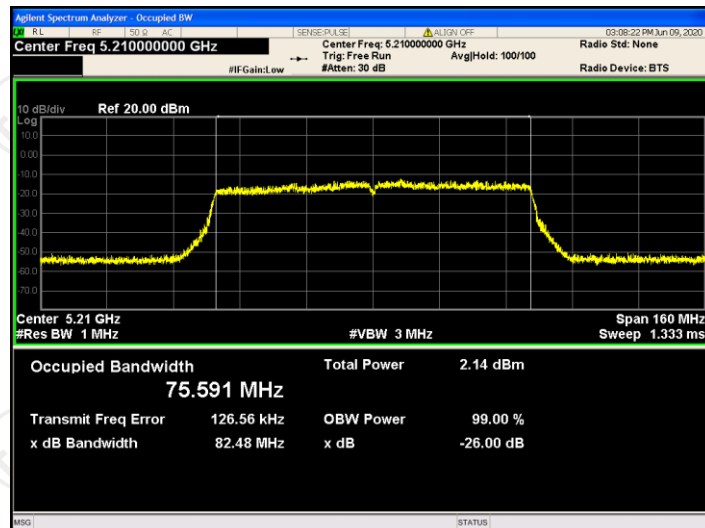


CH46



11ac(VHT80)

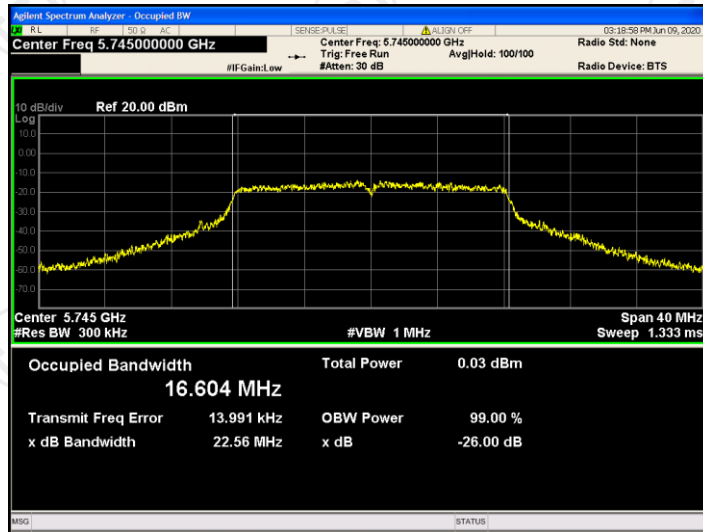
CH42



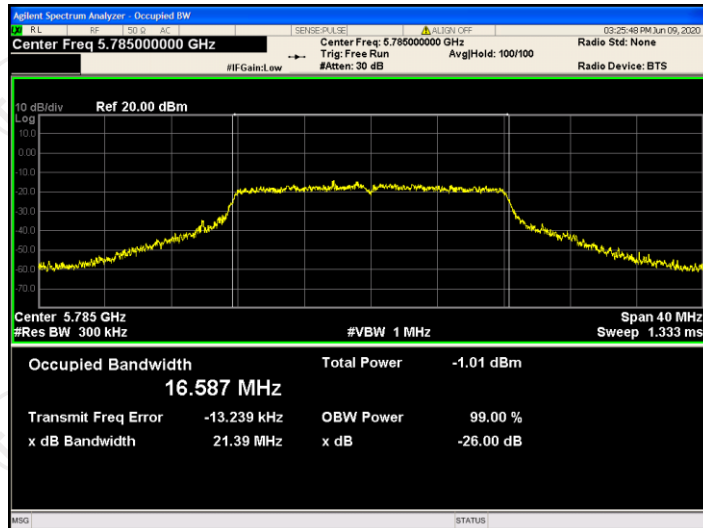
Band 3(5745-5825MHz)

11a

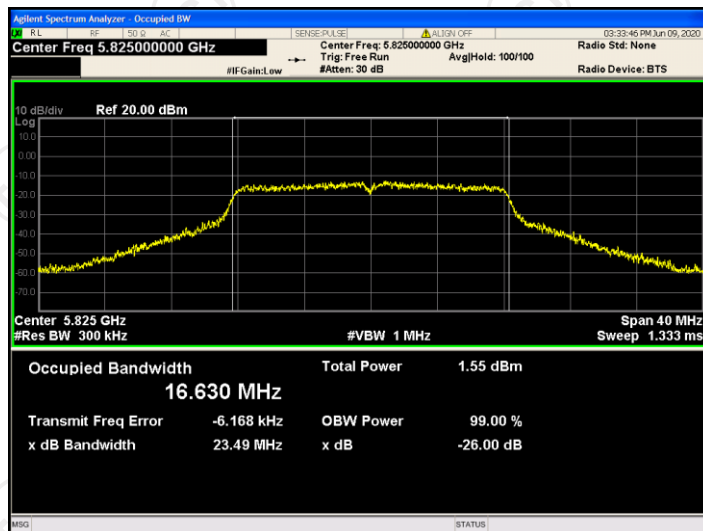
CH149



CH157

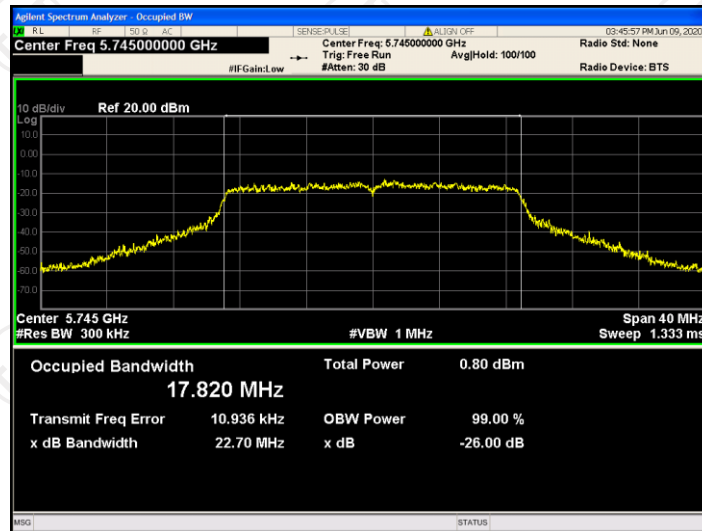


CH165

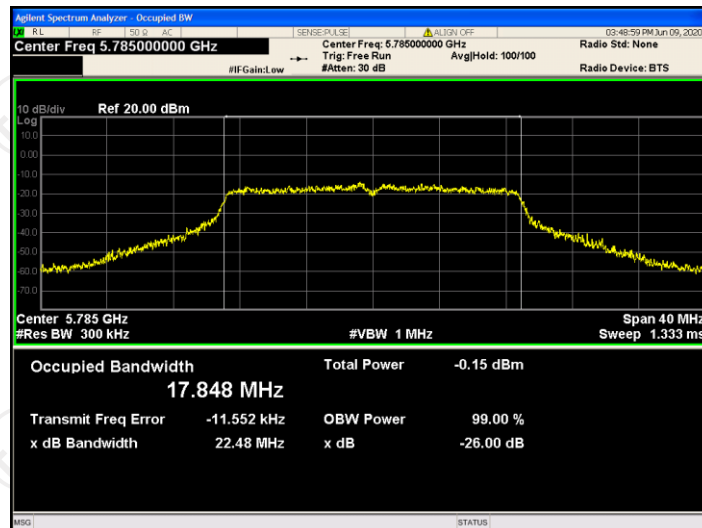


11n(HT20)

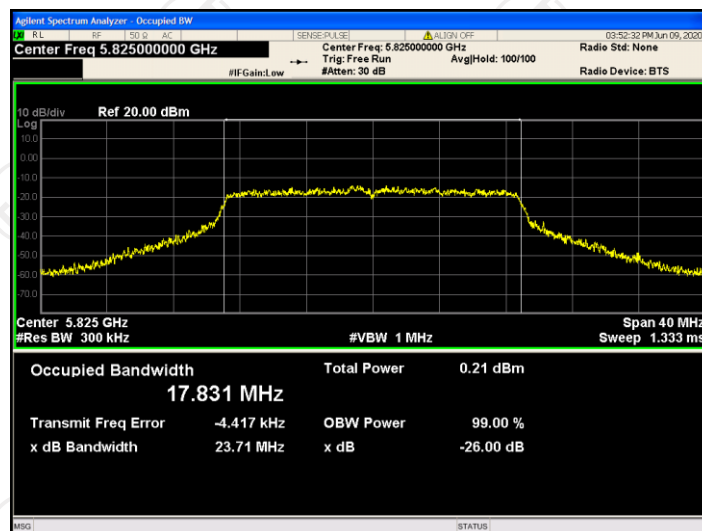
CH149



CH157

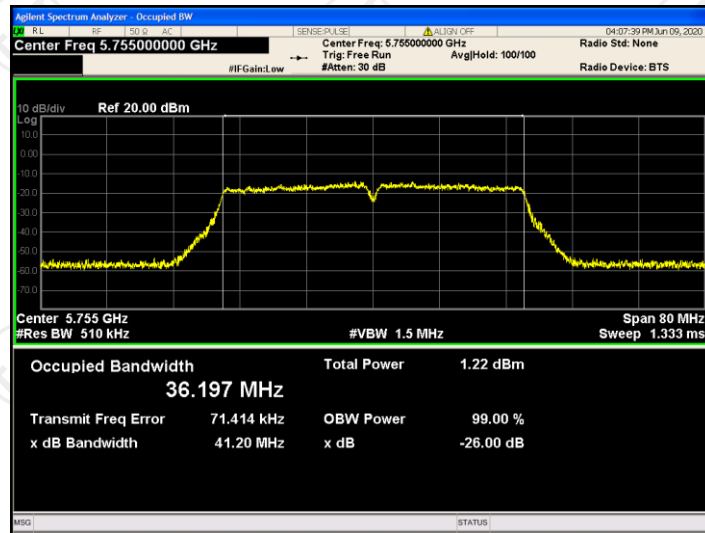


CH165

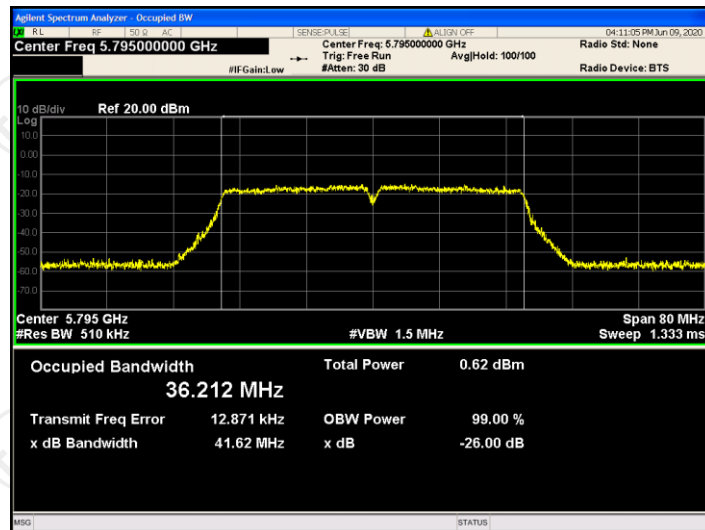


11n(HT40)

CH151

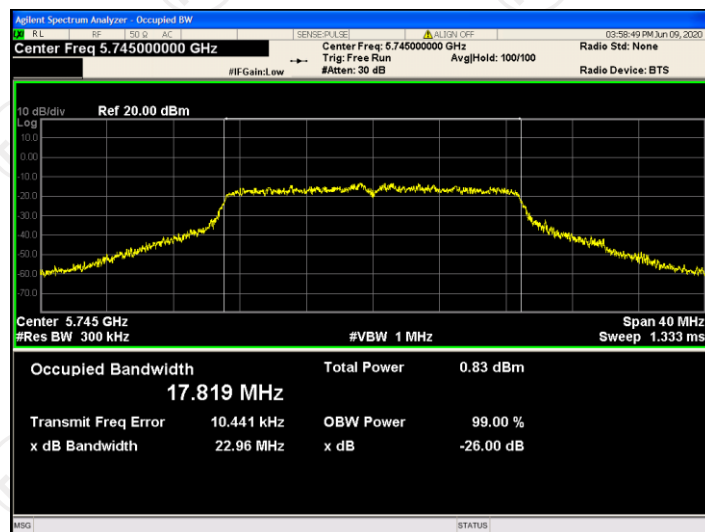


CH159

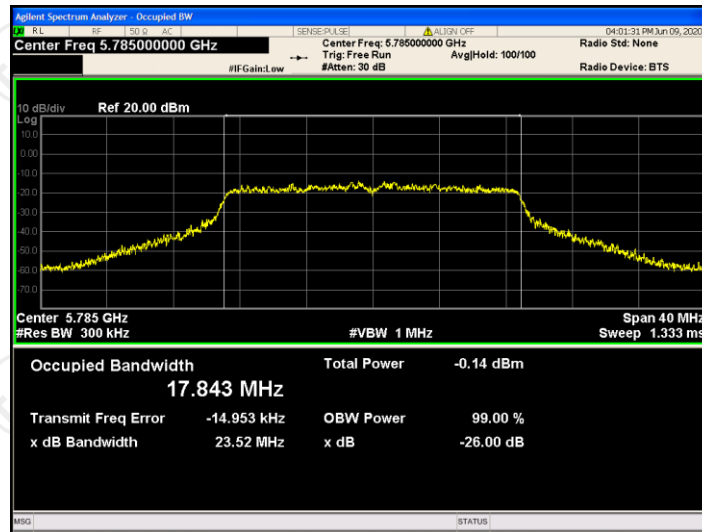


11ac(VHT20)

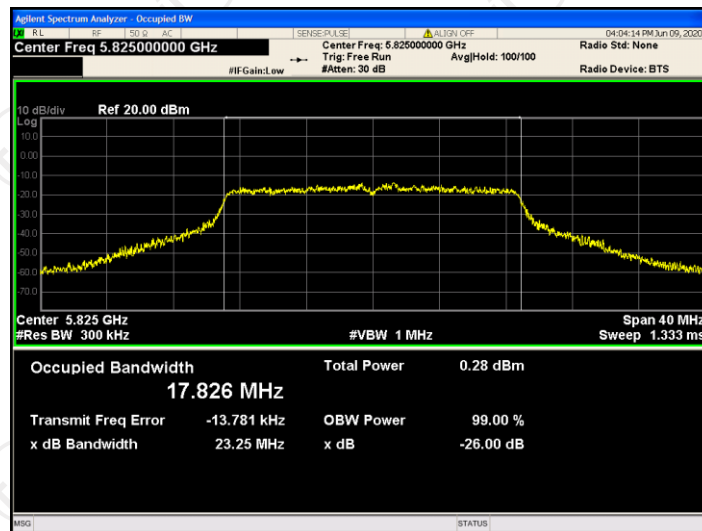
CH149



CH157

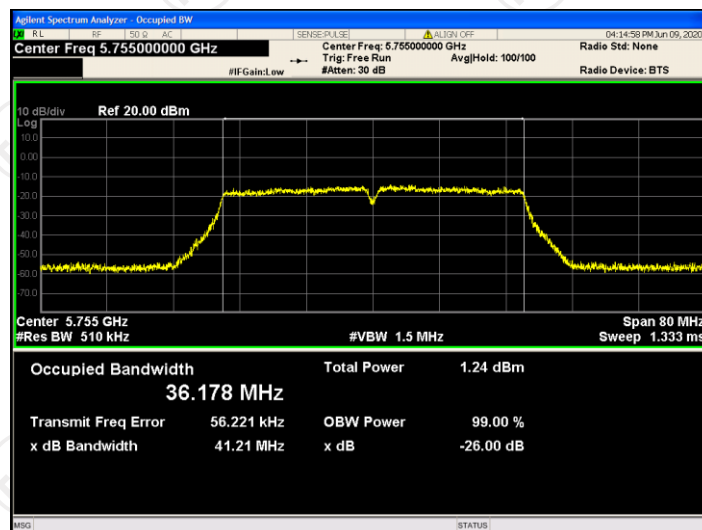


CH165

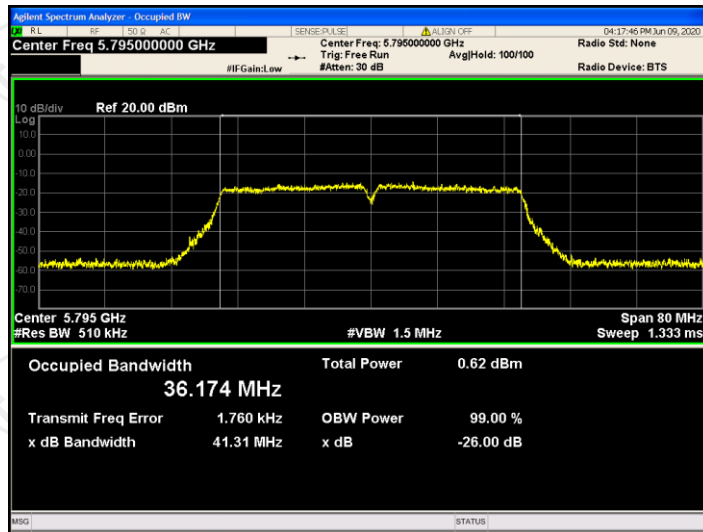


11ac(VHT40)

CH151

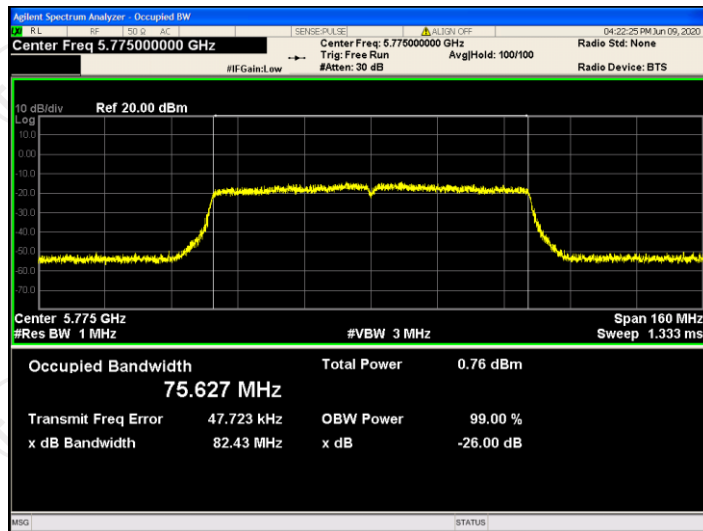


CH159



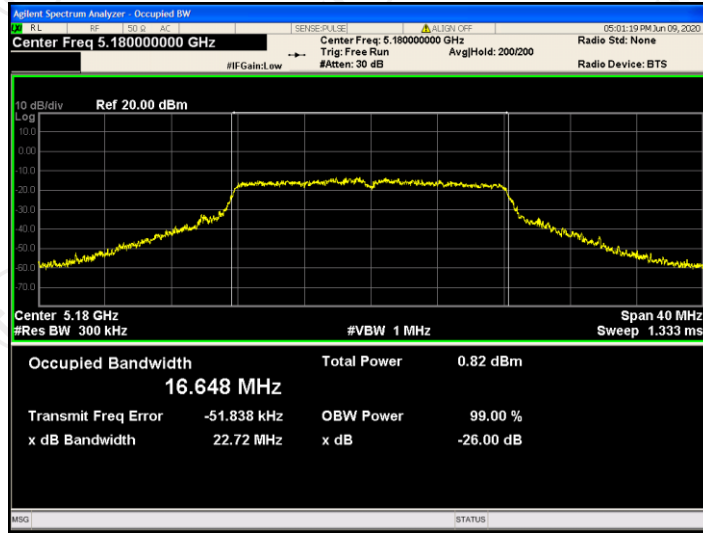
11ac(VHT80)

CH155

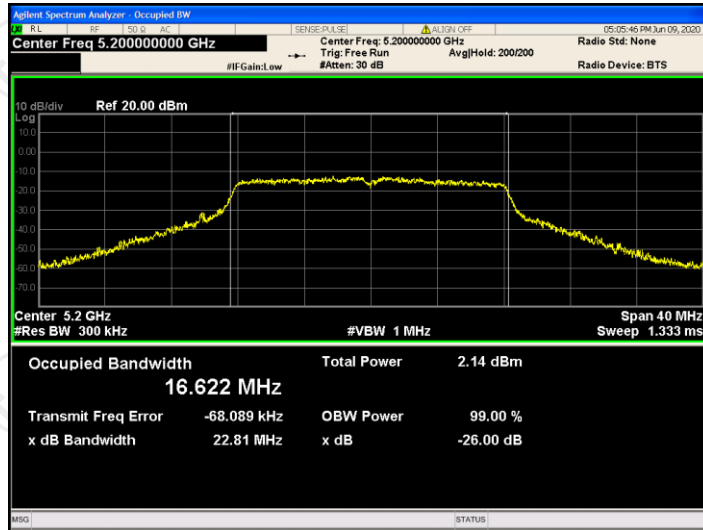


ANT 1
Band1 (5180-5240MHz)
11a

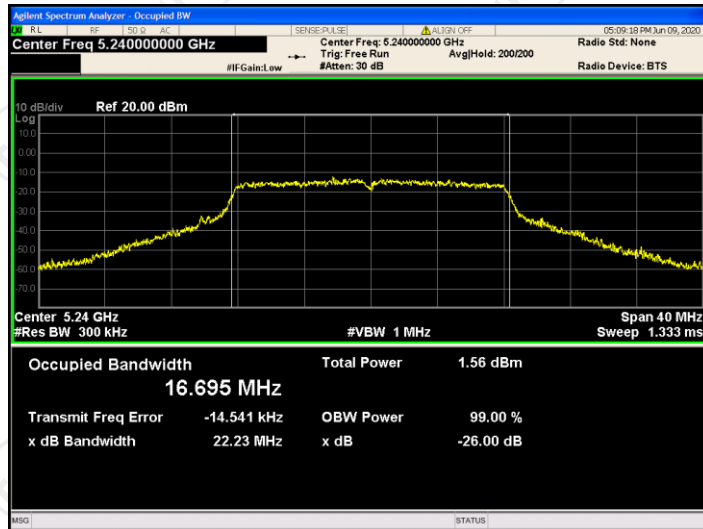
CH36



CH40

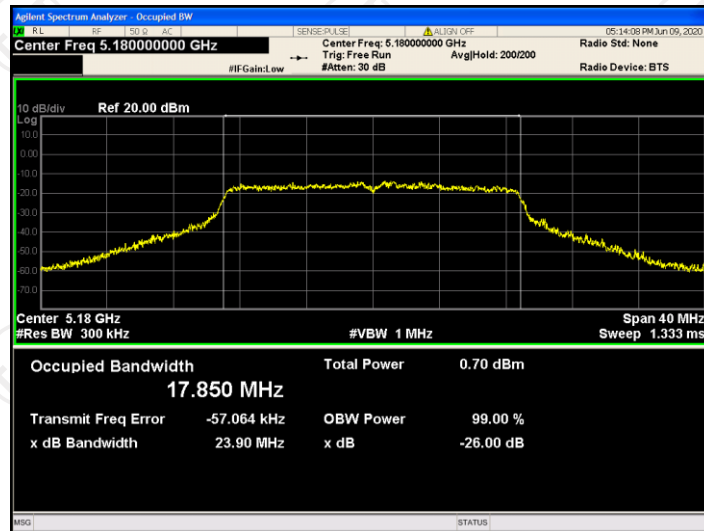


CH48

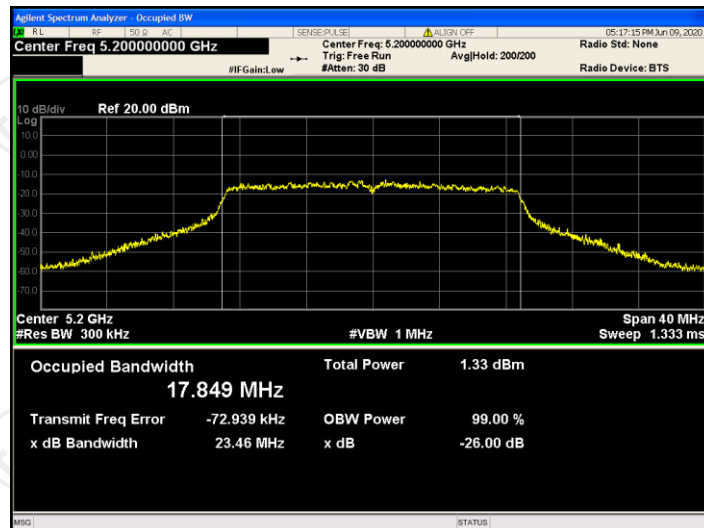


11n(HT20)

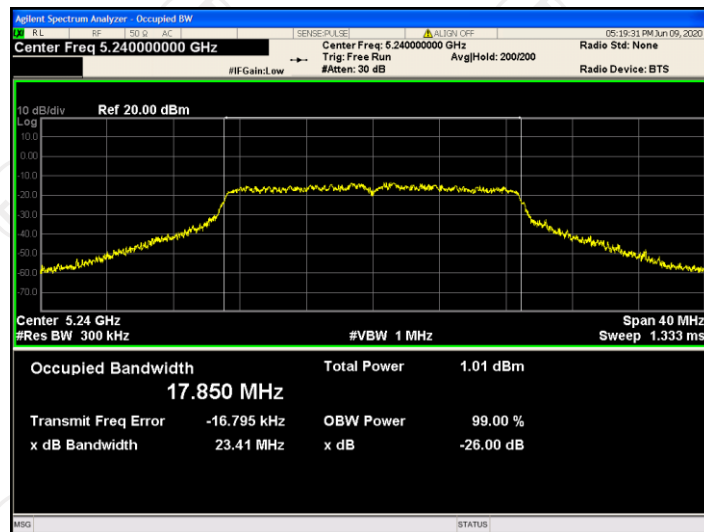
CH36



CH40

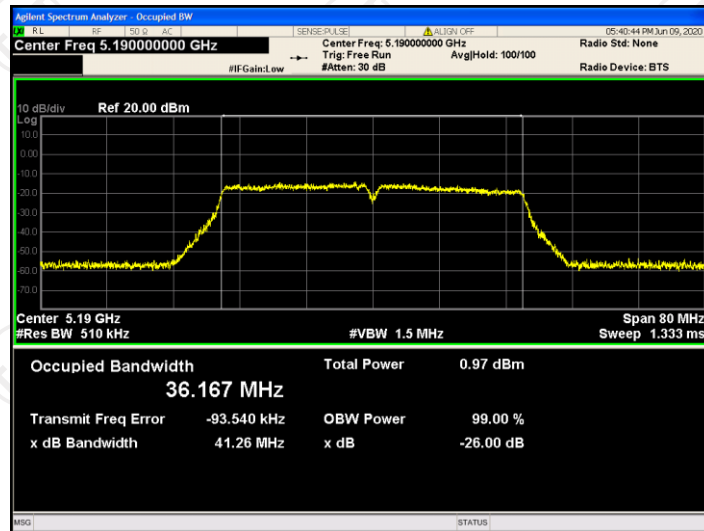


CH48

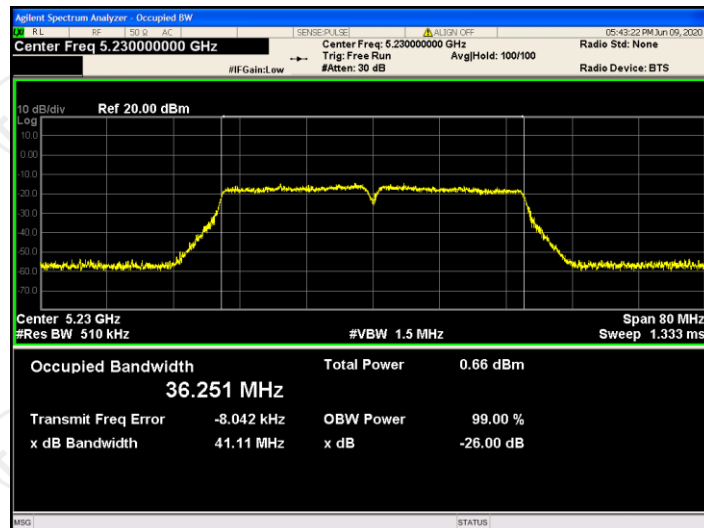


11n(HT40)

CH38

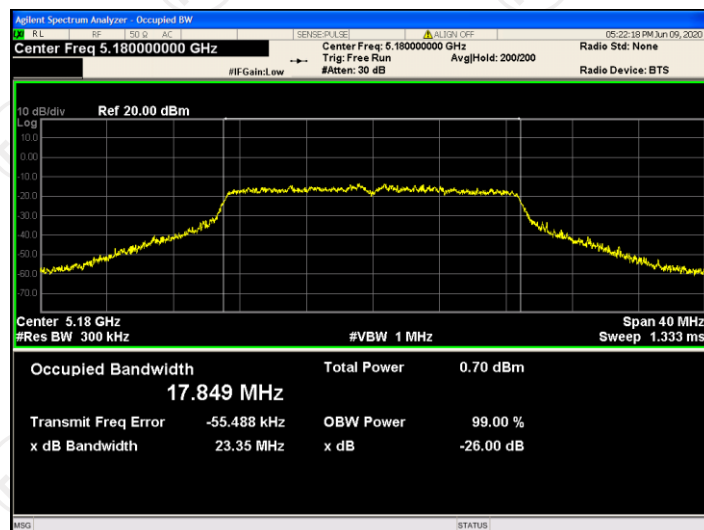


CH46

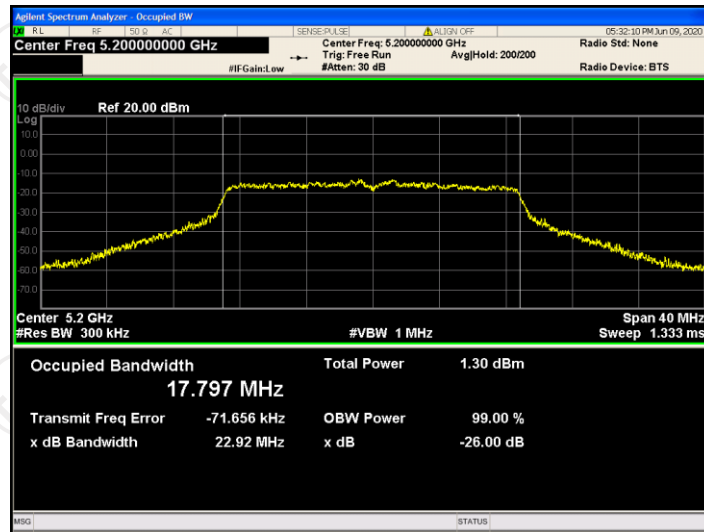


11ac(VHT20)

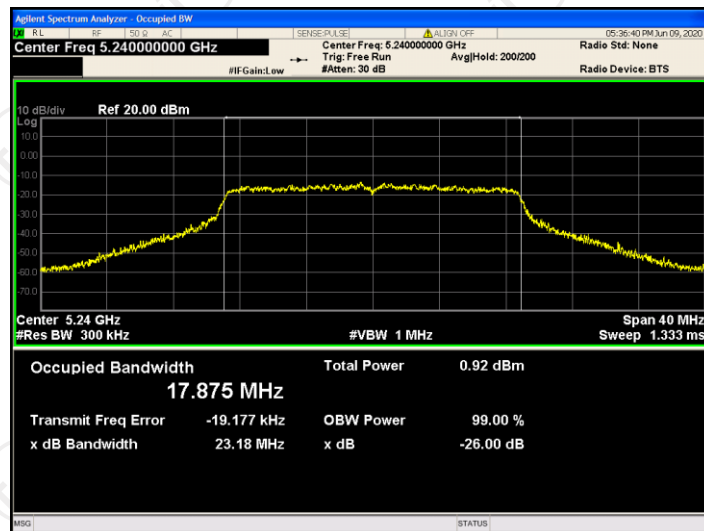
CH36



CH40

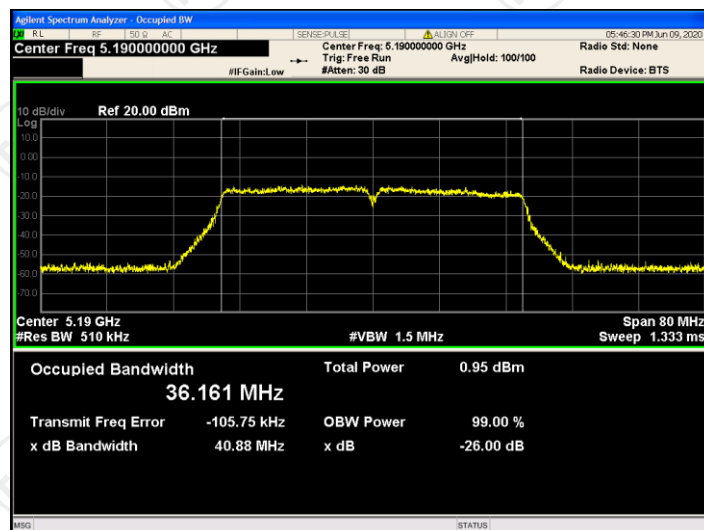


CH48

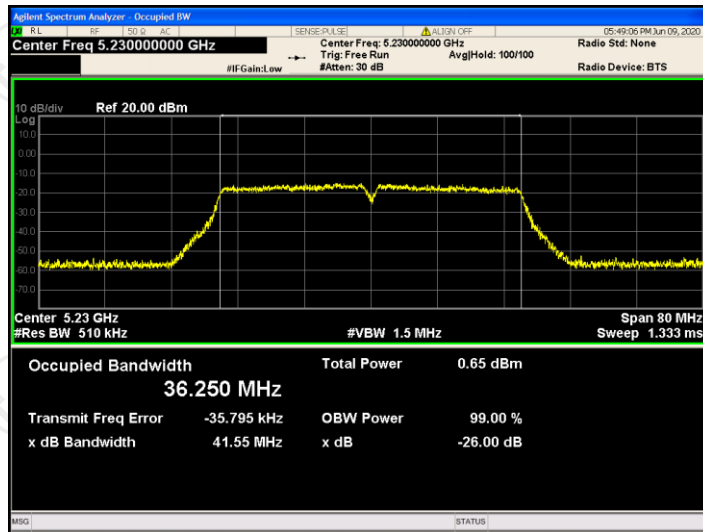


11ac(VHT40)

CH38

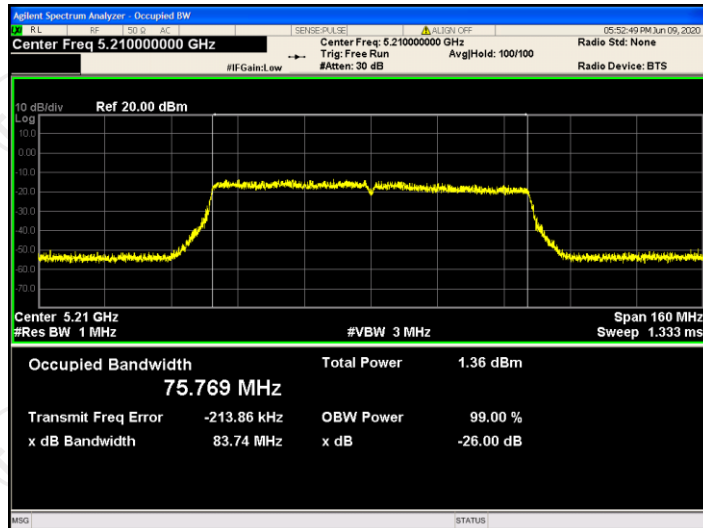


CH46



11ac(VHT80)

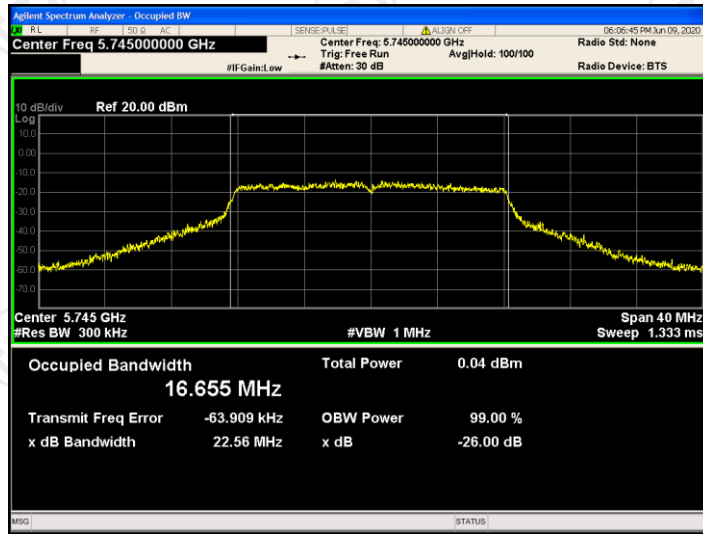
CH42



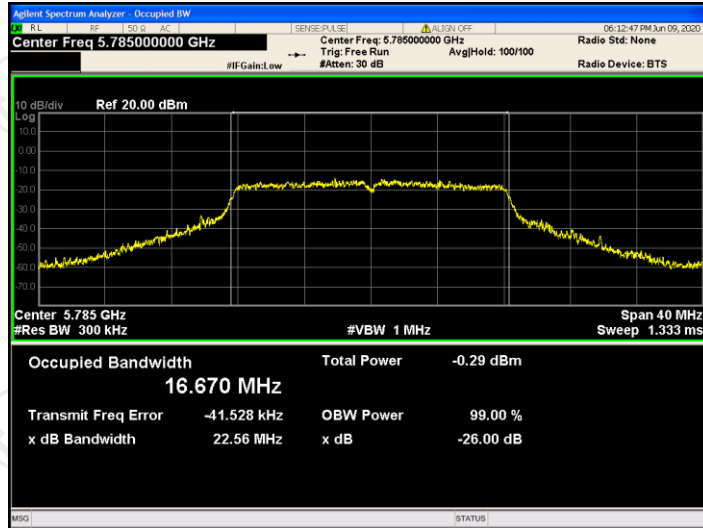
Band 3 (5745-5825MHz)

11a

CH149



CH157



CH165

