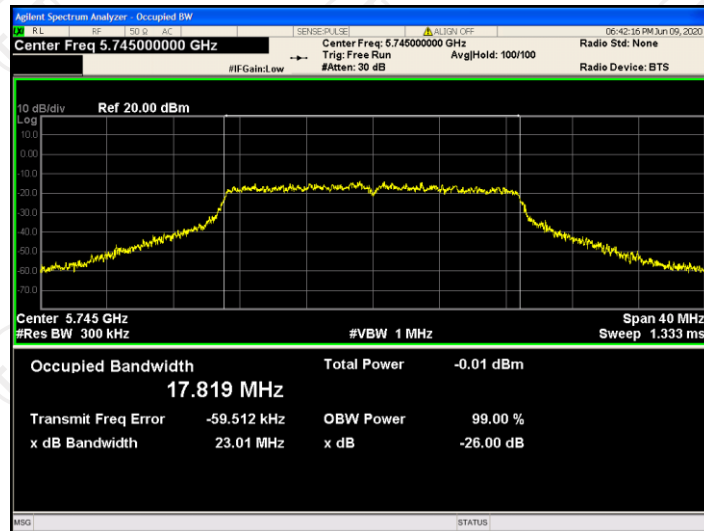
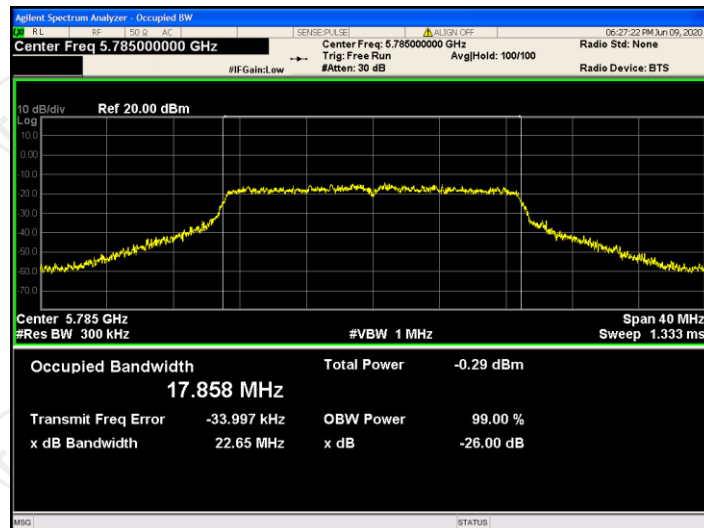


11n(HT20)

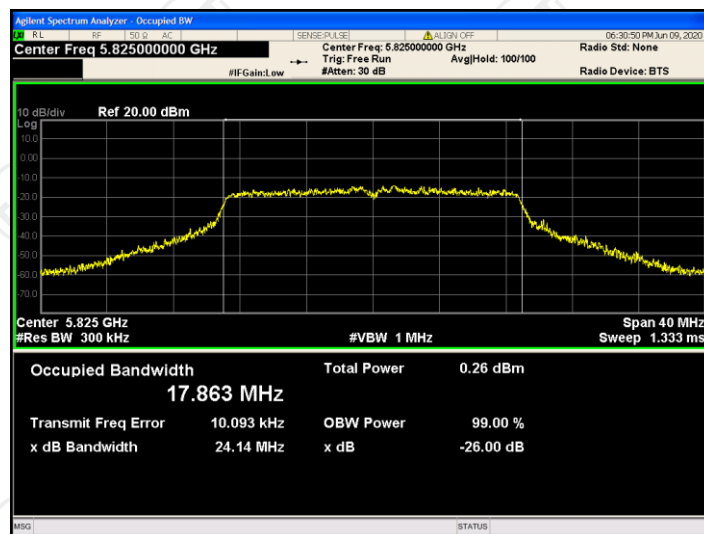
CH149



CH157

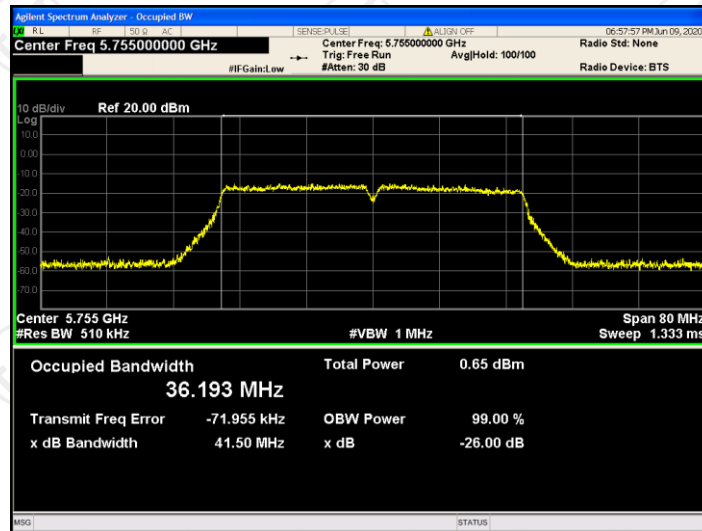


CH165

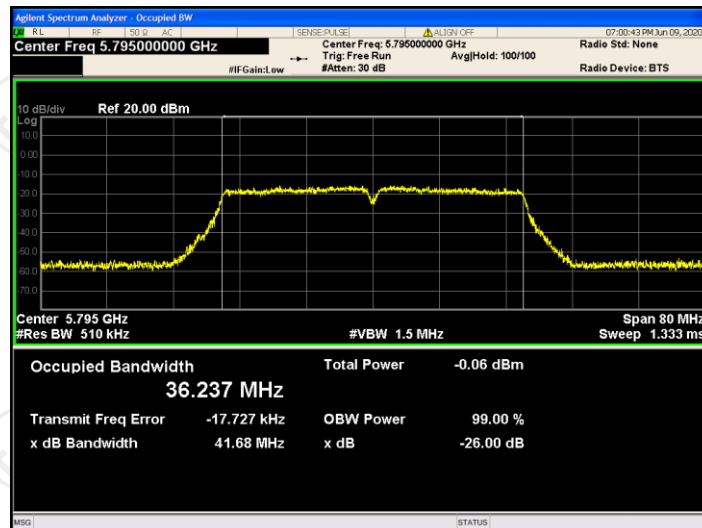


11n(HT40)

CH151

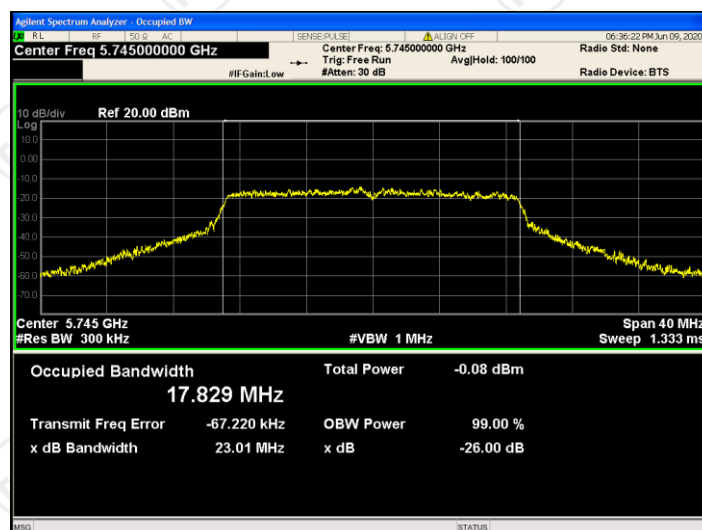


CH159

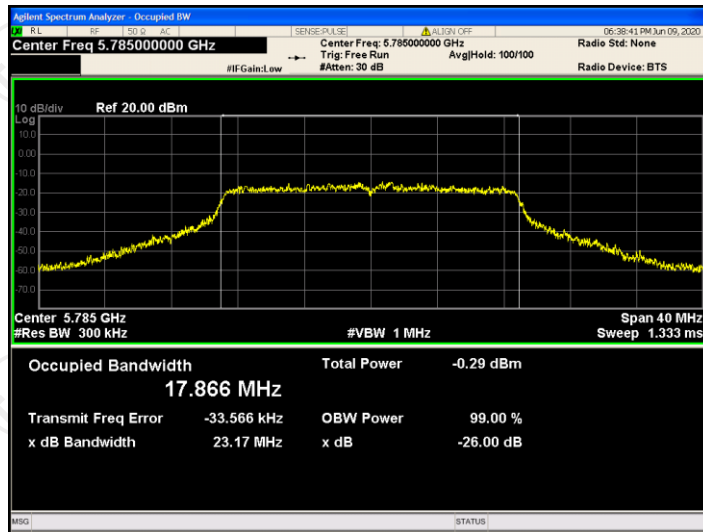


11ac(VHT20)

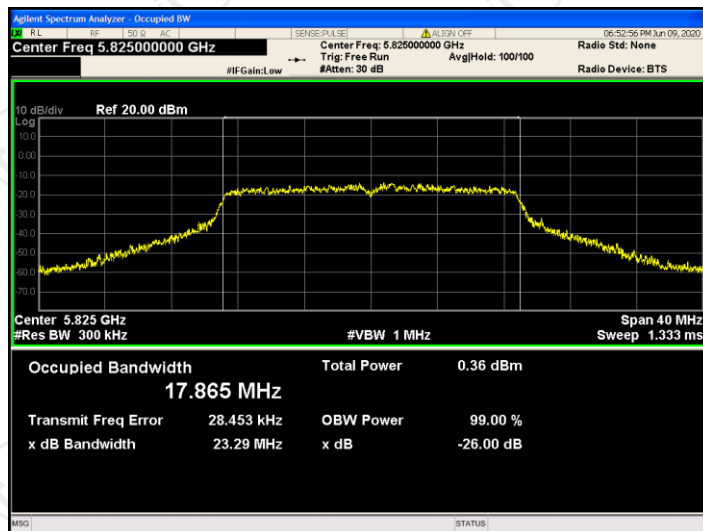
CH149



CH157

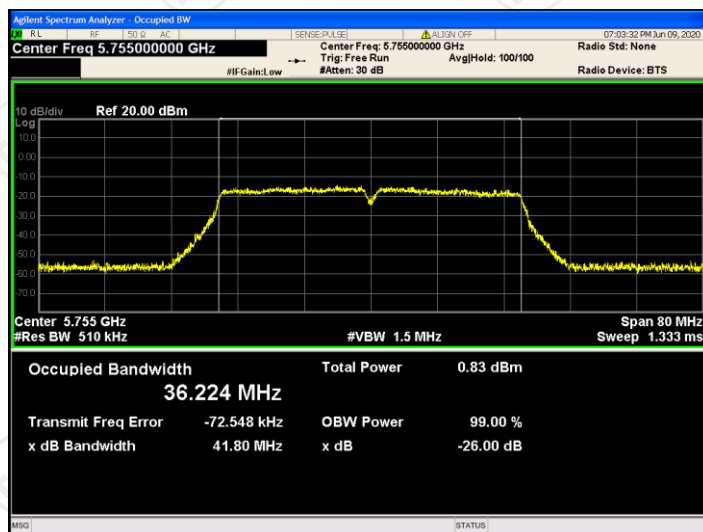


CH165

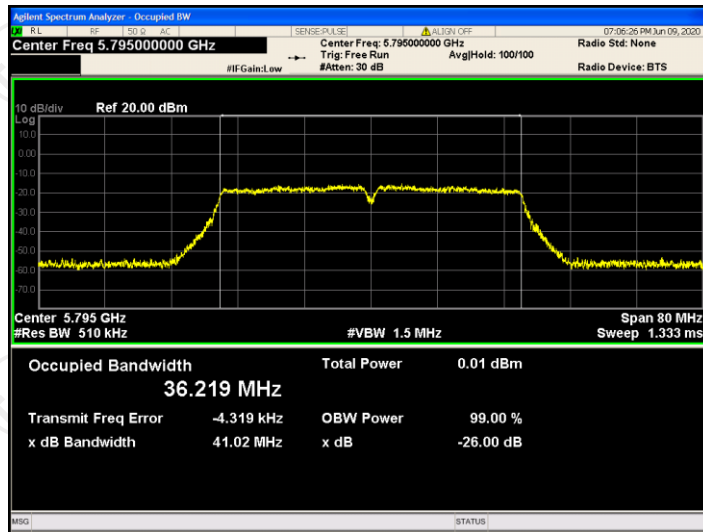


11ac(VHT40)

CH151

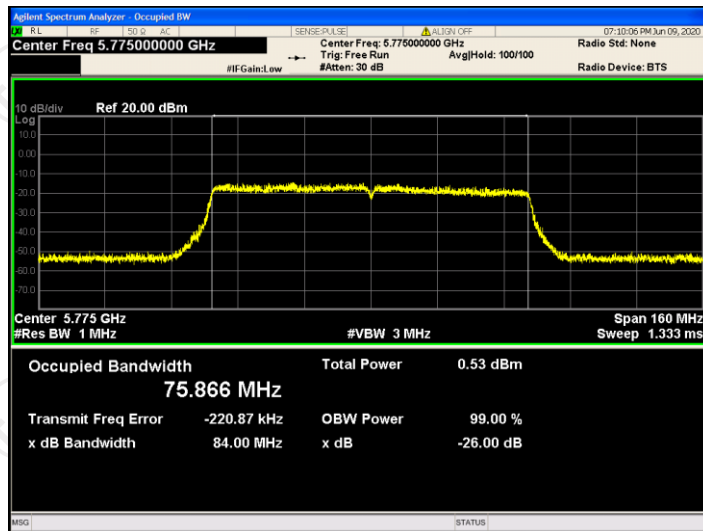


CH159




11ac(VHT80)

CH155



## 6.6. Power Spectral Density

### 6.6.1. Test Specification

<b>Test Requirement:</b>	FCC Part15 E Section 15.407 (a)
<b>Test Method:</b>	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section F
<b>Limit:</b>	≤11.00dBm/MHz for Band 1 5150MHz-5250MHz(client device) ≤30.00dBm/500KHz for Band 3 5725MHz-5850MHz The e.i,r,p spectral density for Band 1 5150MHz – 5250 MHz should not exceed 10dBm/MHz
<b>Test Setup:</b>	 <p style="text-align: center;">Spectrum Analyzer                      EUT</p>
<b>Test Mode:</b>	Transmitting mode with modulation
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>Set the spectrum analyzer or EMI receiver span to view the entire emission bandwidth.</li> <li>Set RBW = 510 kHz/1 MHz, VBW ≥ 3*RBW, Sweep time = Auto, Detector = RMS.</li> <li>Allow the sweeps to continue until the trace stabilizes.</li> <li>Use the peak marker function to determine the maximum amplitude level.</li> <li>The E.I.R.P spectral density used radiated test method. At a test site that has been validated using the procedures of ANSI C63.4 or the latest CISPR 16-1-4 for measurements above 1 GHz, so as to simulate a near free-space environment.</li> </ol>
<b>Remark:</b>	The transmit duty cycle ≥ 98%

### 6.6.2. 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).

**6.6.3. Test data**

Configuration Band 1 (5180-5240 MHz) / Antenna 0+Antenna 1						
Mode	Test channel	Power Spectral Density			Limit (dBm/MHz)	Result
		Ant0	Ant1	Total		
11a	CH36	-6.217	-6.548	/	11	PASS
11a	CH40	-5.762	-5.834	/	11	PASS
11a	CH48	-4.798	-5.643	/	11	PASS
11n(HT20)	CH36	-6.073	-6.696	-3.363	11	PASS
11n(HT20)	CH40	-6.112	-6.901	-3.478	11	PASS
11n(HT20)	CH48	-4.989	-6.863	-2.815	11	PASS
11n(HT40)	CH38	-9.014	-9.620	-6.296	11	PASS
11n(HT40)	CH46	-7.575	-9.780	-5.529	11	PASS
11ac(VHT20)	CH36	-6.175	-6.614	-3.379	11	PASS
11ac(VHT20)	CH40	-6.135	-6.631	-3.366	11	PASS
11ac(VHT20)	CH48	-5.155	-6.545	-2.784	11	PASS
11ac(VHT40)	CH38	-9.092	-9.822	-6.431	11	PASS
11ac(VHT40)	CH46	-7.729	-9.216	-5.399	11	PASS
11ac(VHT80)	CH42	-11.271	-12.342	-8.763	11	PASS

**Note:** The total PSD method used the sum spectra maxima across the outputs.

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

Mode	Test channel	Power Spectral Density			Limit (dBm/500kHz)	Result
		Ant0	Ant1	Total		
11a	CH149	-7.907	-8.542	/	30	PASS
11a	CH157	-7.086	-8.804	/	30	PASS
11a	CH165	-7.518	-9.182	/	30	PASS
11n(HT20)	CH149	-8.178	-9.143	-5.623	30	PASS
11n(HT20)	CH157	-8.882	-9.047	-5.953	30	PASS
11n(HT20)	CH165	-8.915	-9.297	-6.092	30	PASS
11n(HT40)	CH151	-11.835	-12.129	-8.969	30	PASS
11n(HT40)	CH159	-12.036	-12.929	-9.449	30	PASS
11ac(VHT20)	CH149	-7.991	-9.126	-5.511	30	PASS
11ac(VHT20)	CH157	-8.814	-9.051	-5.921	30	PASS
11ac(VHT20)	CH165	-9.176	-8.940	-6.046	30	PASS
11ac(VHT40)	CH151	-11.761	-12.224	-8.976	30	PASS
11ac(VHT40)	CH159	-11.902	-12.769	-9.304	30	PASS
11ac(VHT80)	CH155	-15.219	-15.152	-12.175	30	PASS

**Note:** The total PSD method used the sum spectra maxima across the outputs.

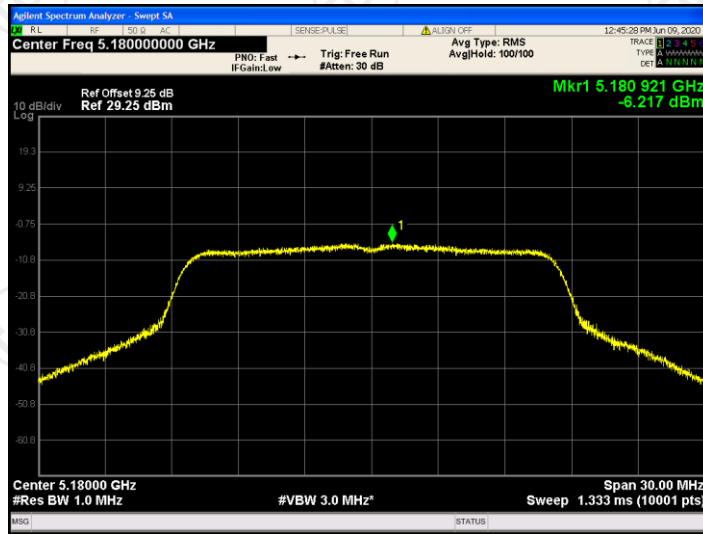
Test plots as follows:

ANT 0

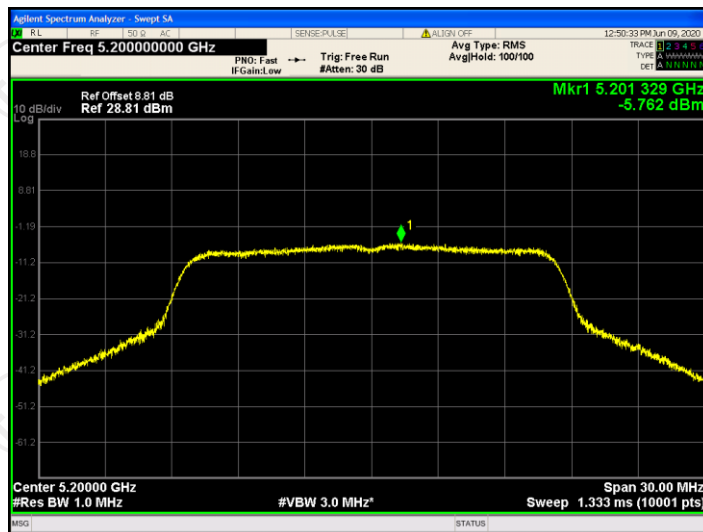
Band1 (5180-5240 MHz)

11a

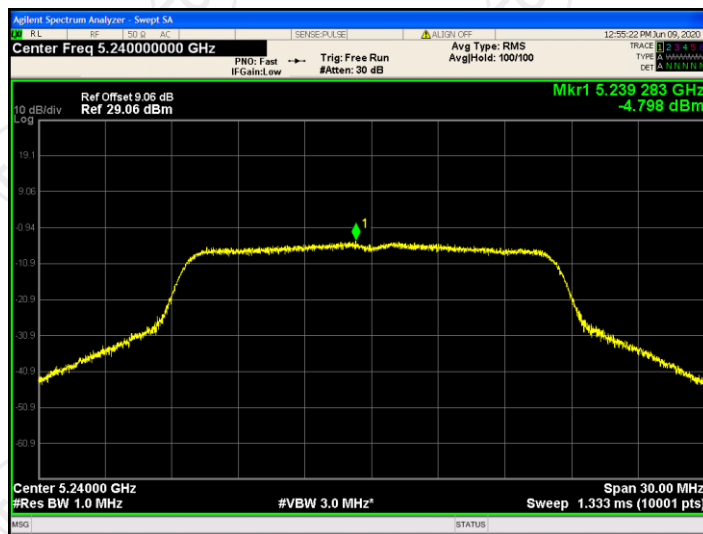
CH36



CH40



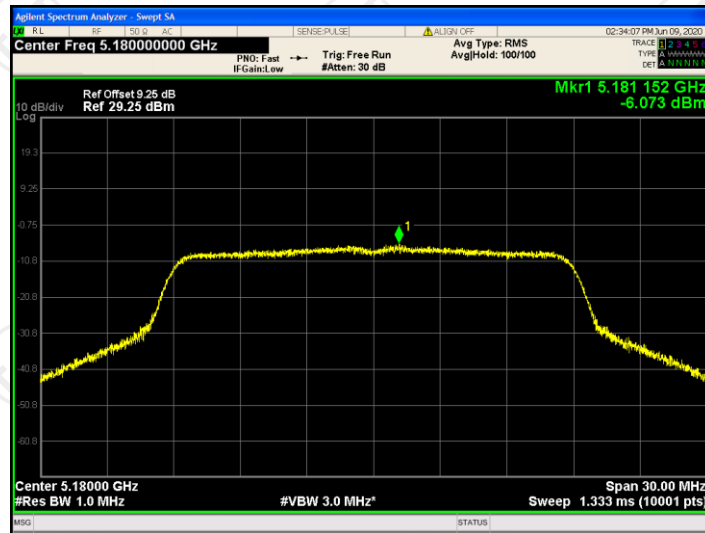
CH48



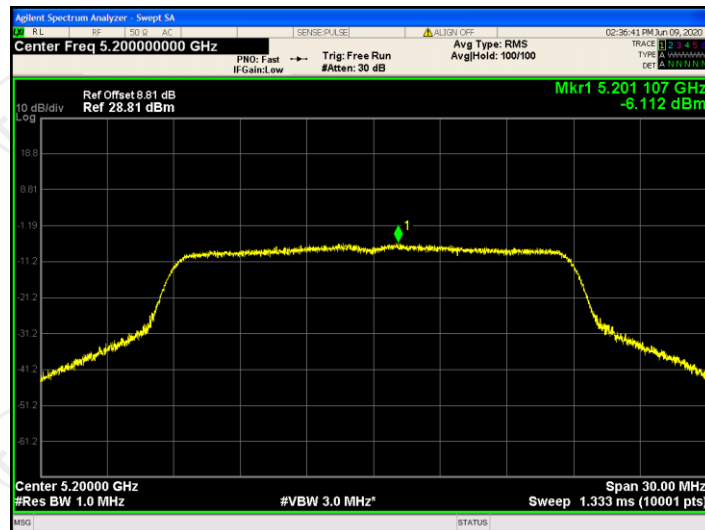


11n(HT20)

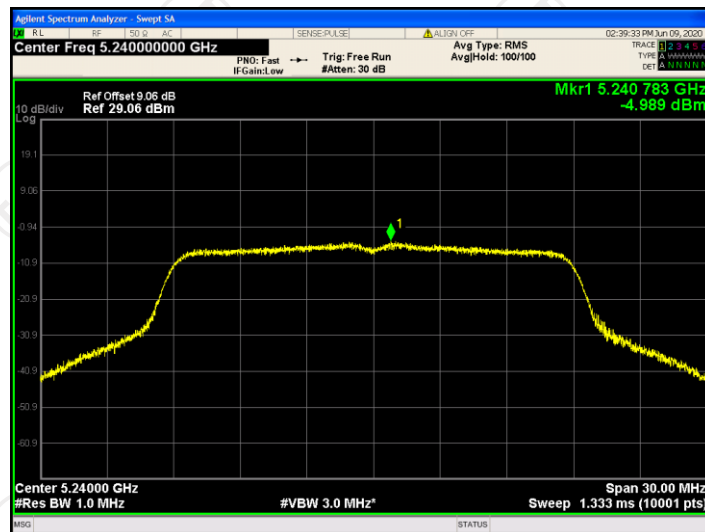
CH36



CH40

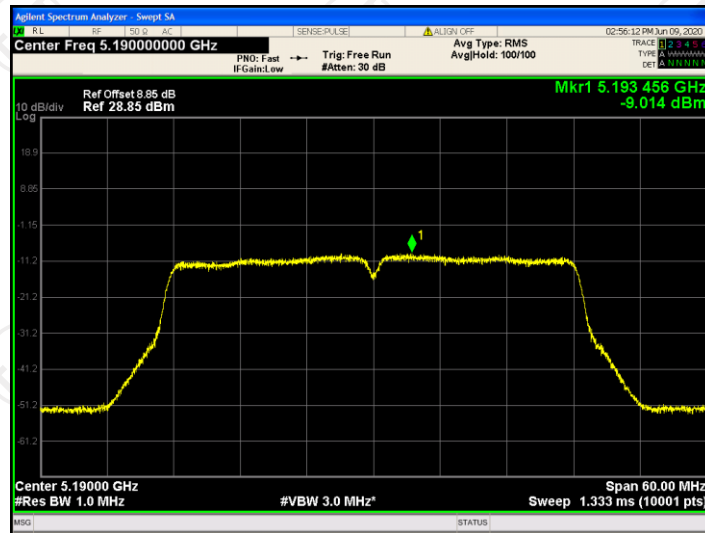


CH48

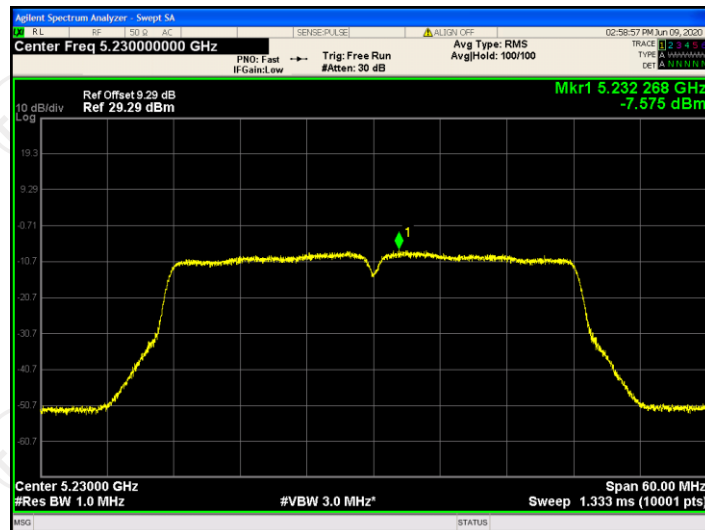


11n(HT40)

CH38

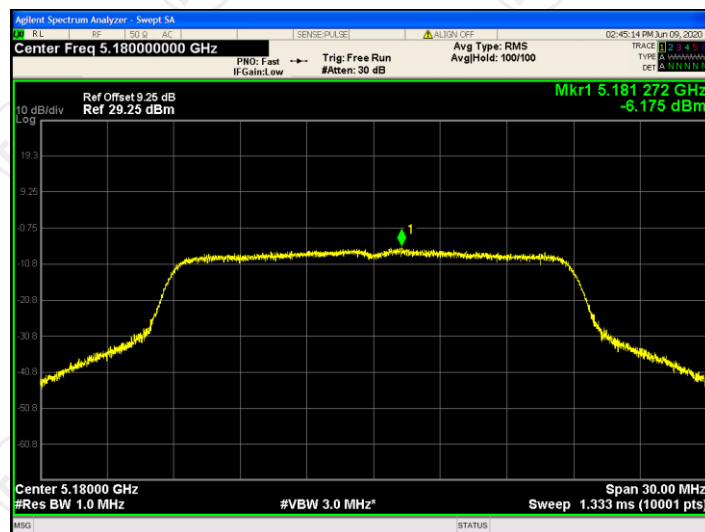


CH46

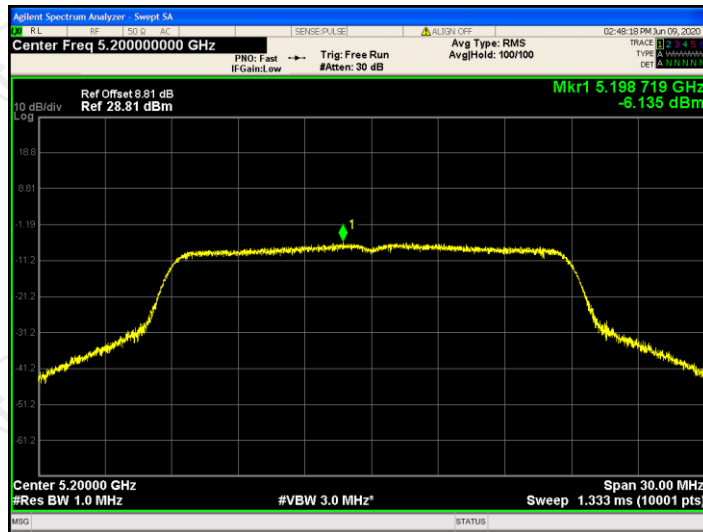


11ac(VHT20)

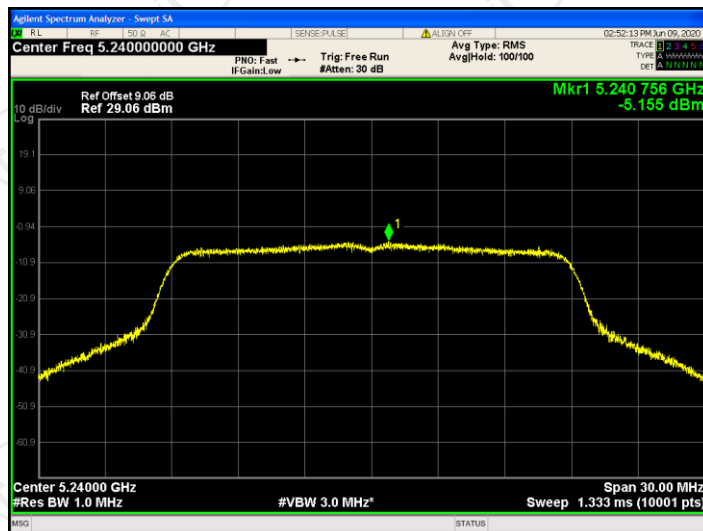
CH36



CH40

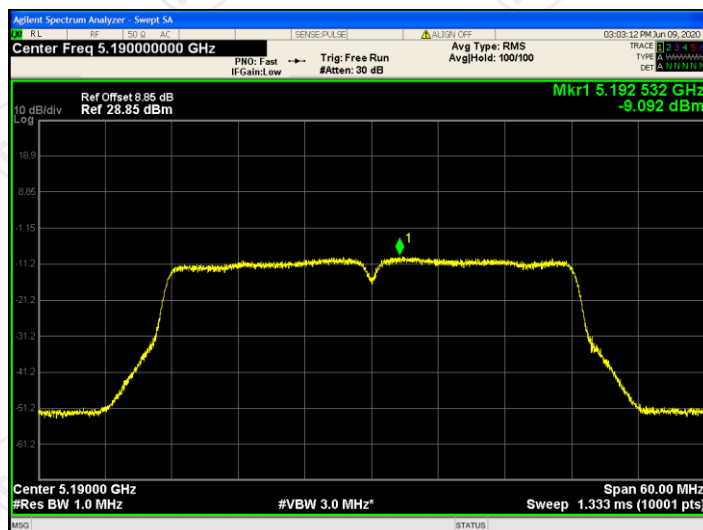


CH48

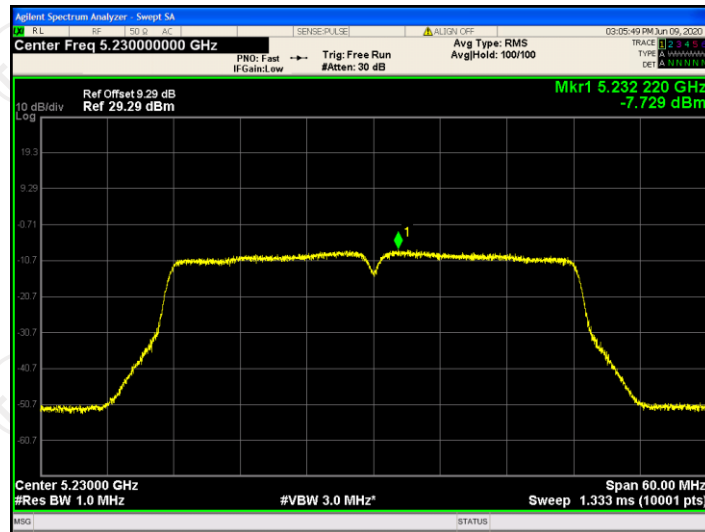


11ac(VHT40)

CH38

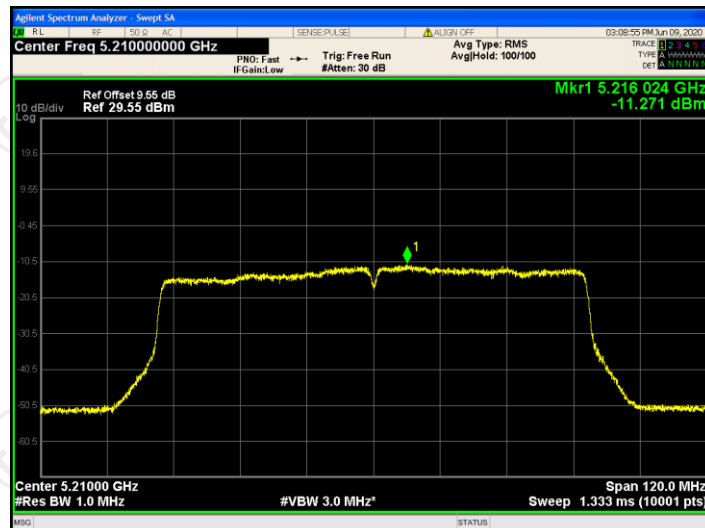


CH46



11ac(VHT80)

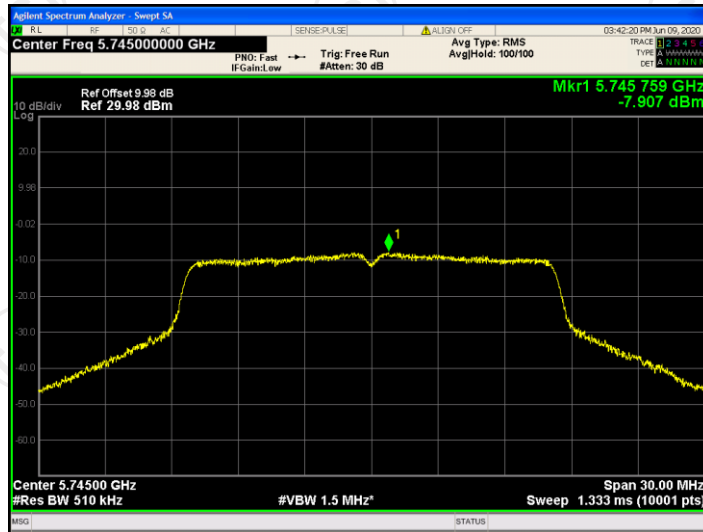
CH42



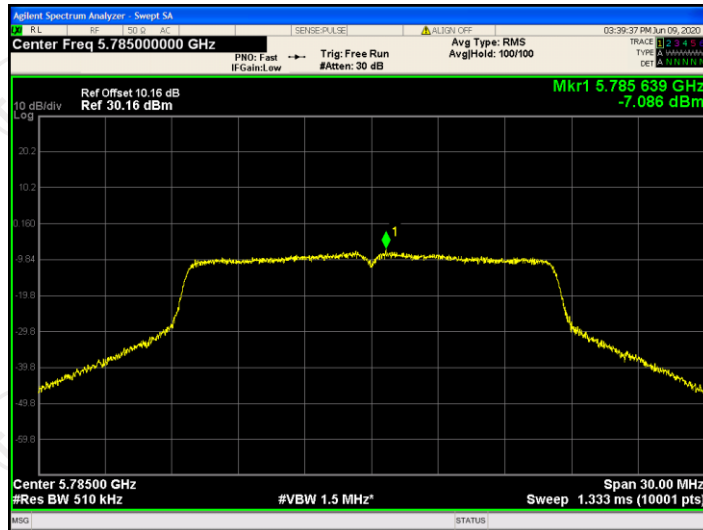
Band 3 (5745-5825MHz)

11a

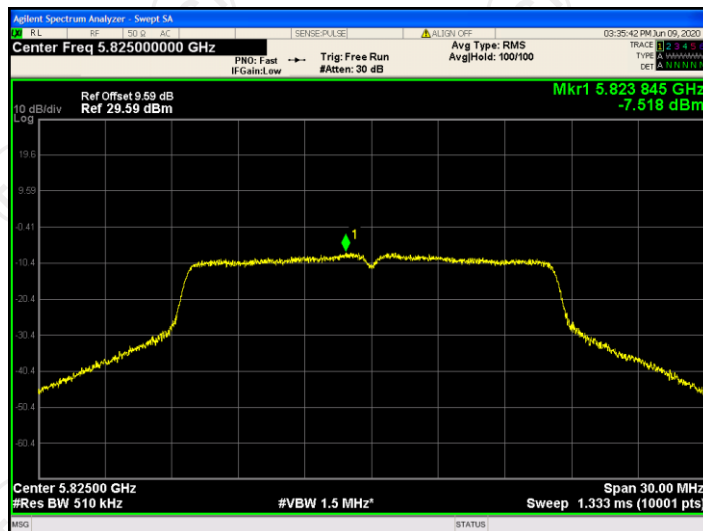
CH149



CH157

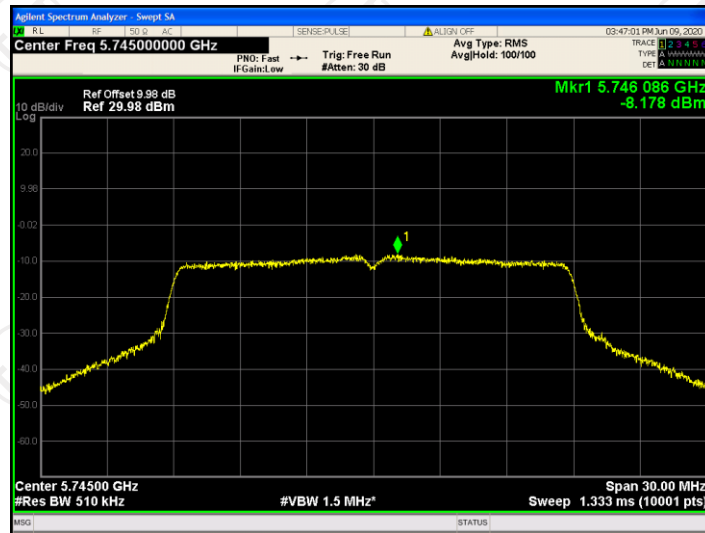


CH165

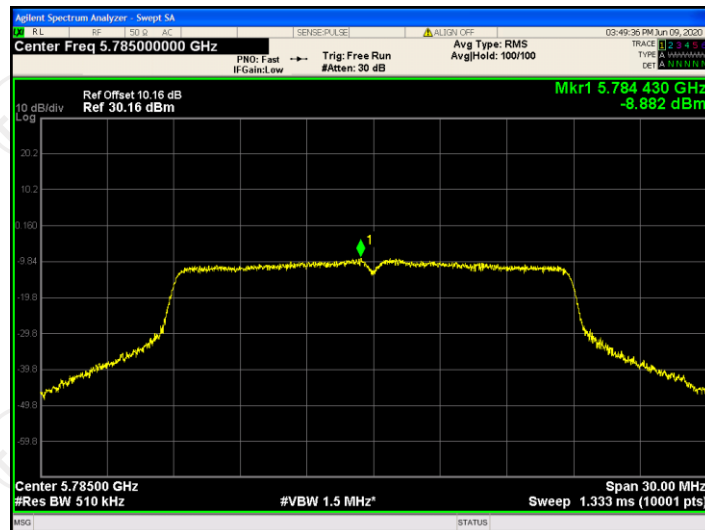


11n(HT20)

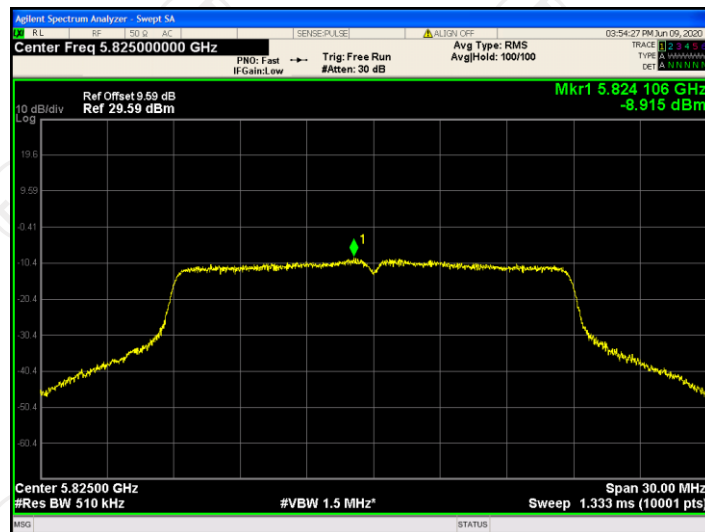
CH149



CH157

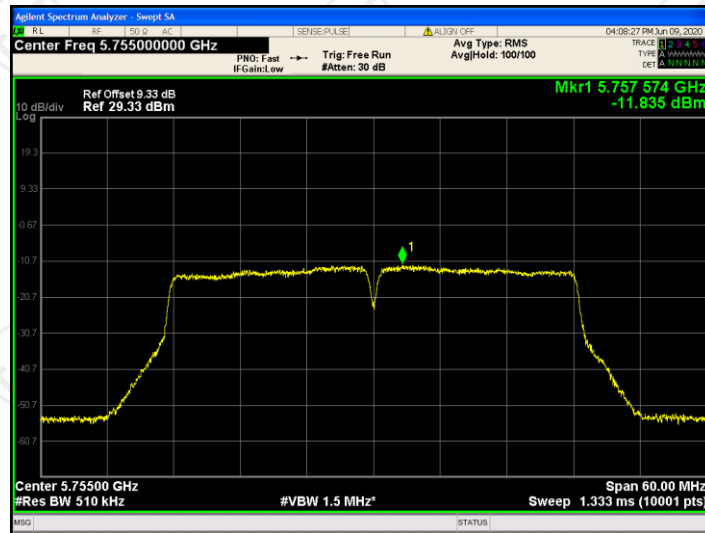


CH165

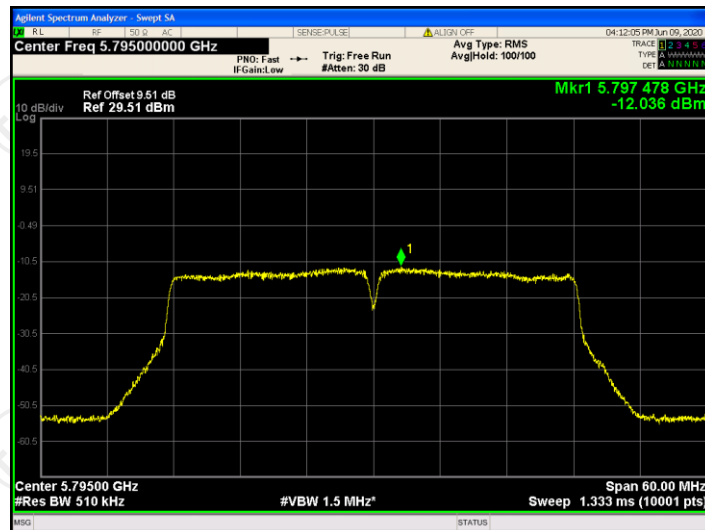


11n(HT40)

CH151

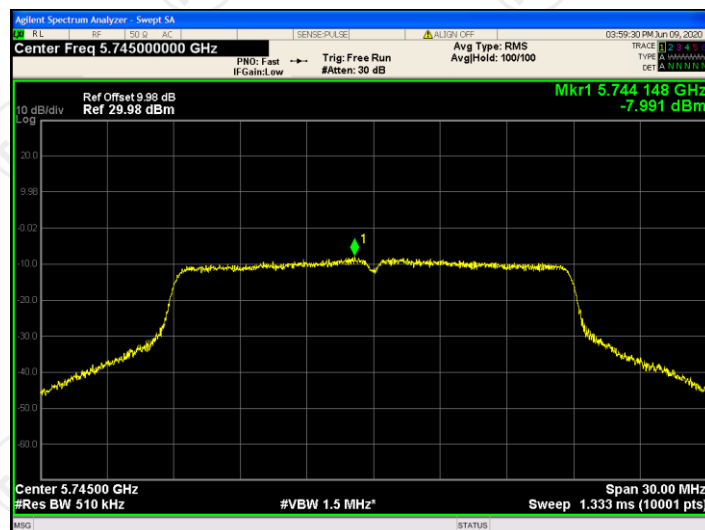


CH159

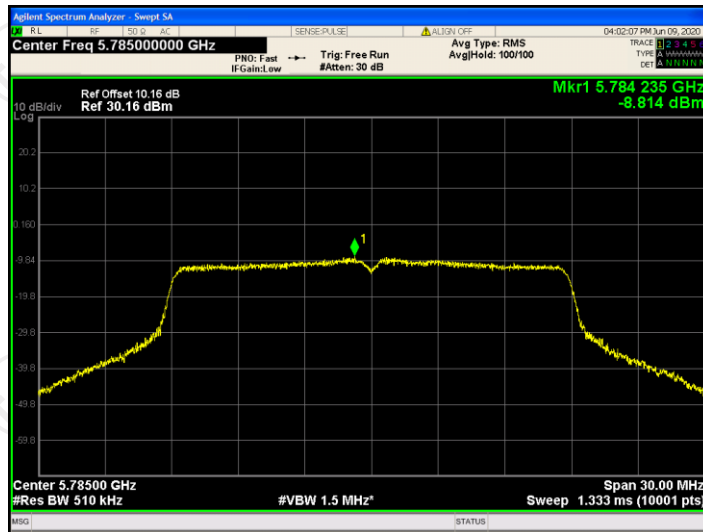


11ac(VHT20)

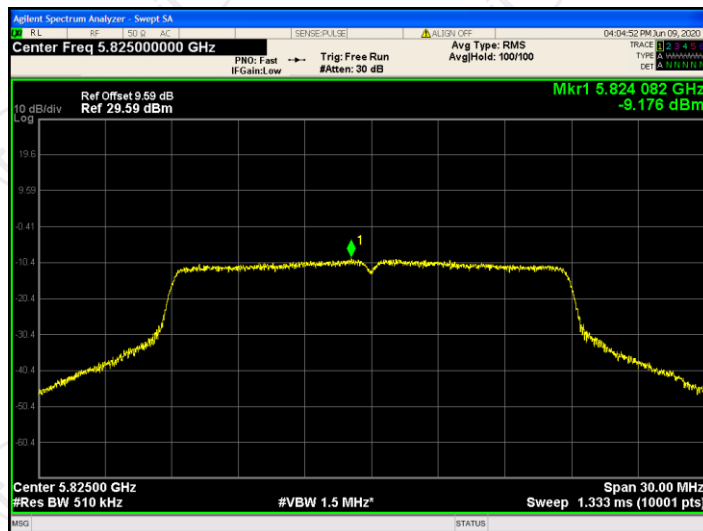
CH149



CH157

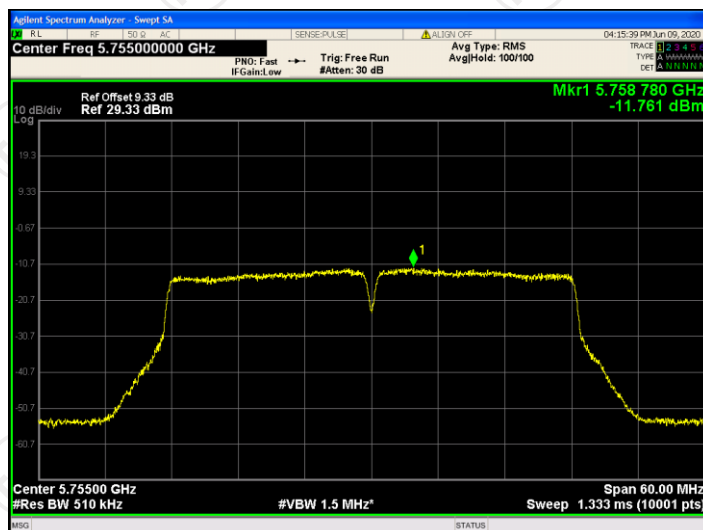


CH165



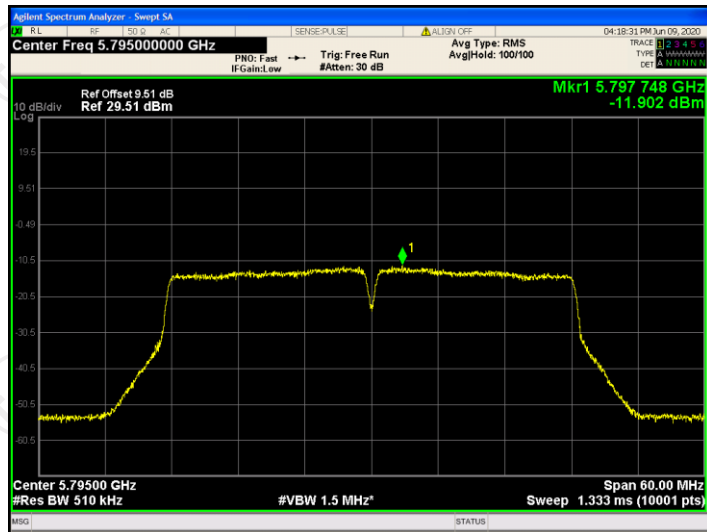
11ac(VHT40)

CH151



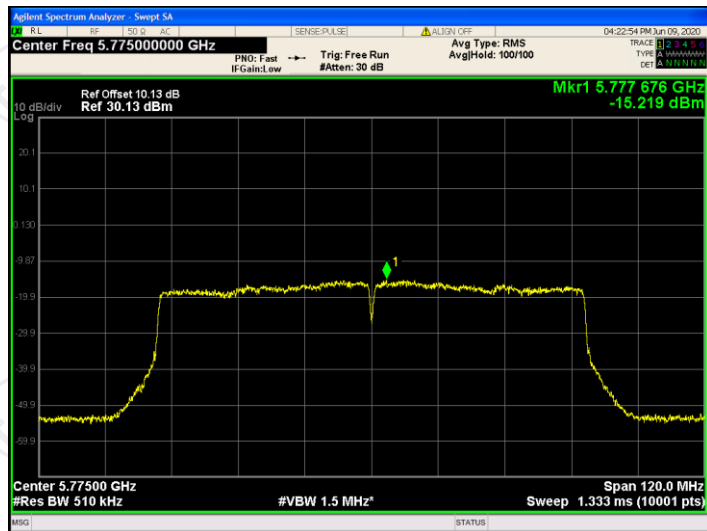


CH159



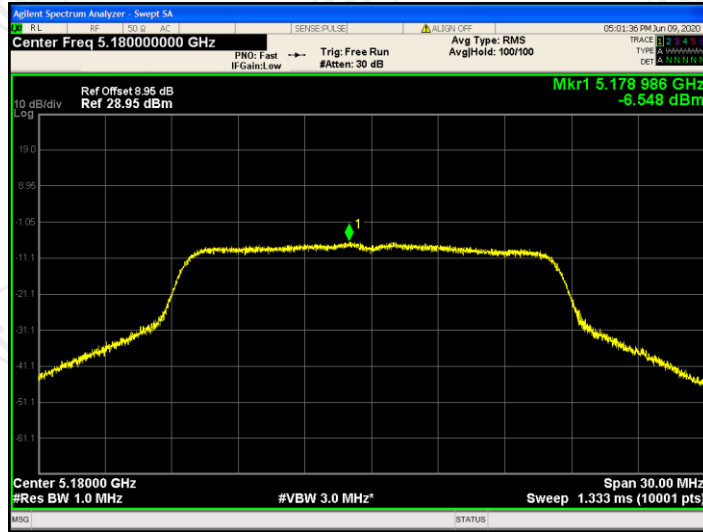
11ac(VHT80)

CH155

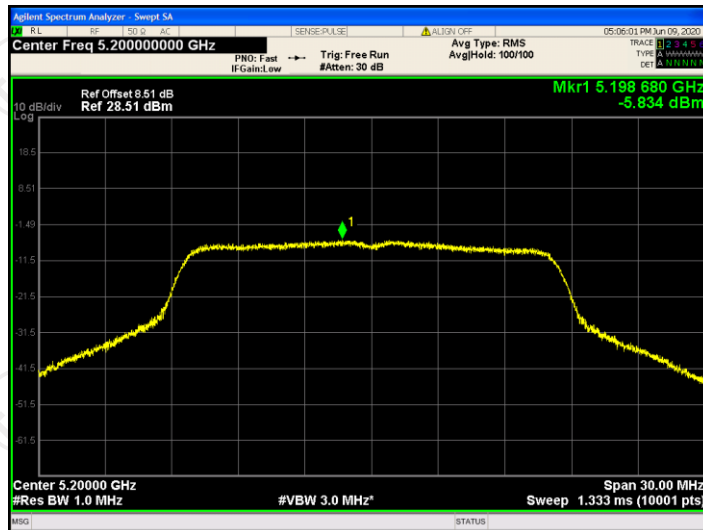


ANT 1  
Band 1 (5180-5240 MHz)  
11a

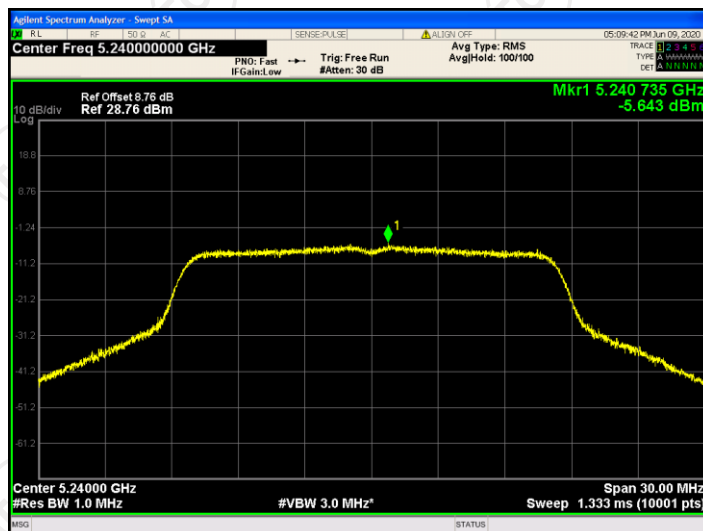
CH36



CH40

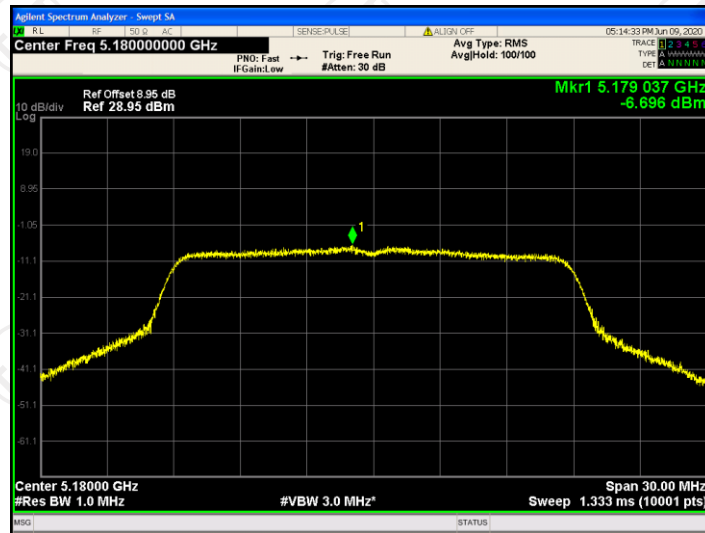


CH48

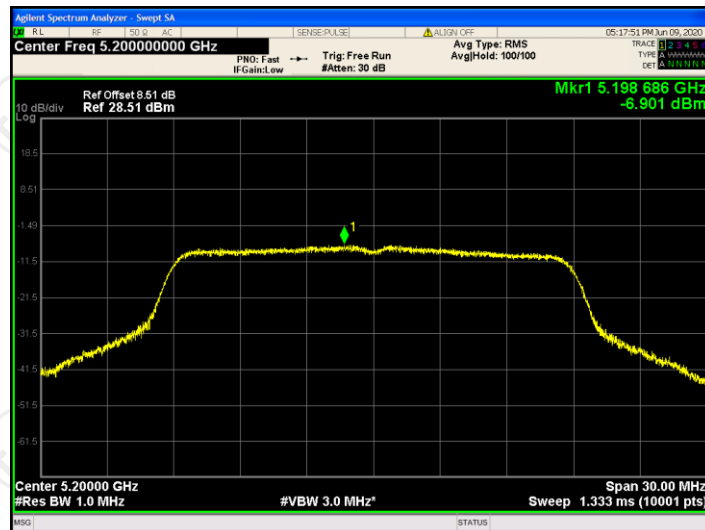


11n(HT20)

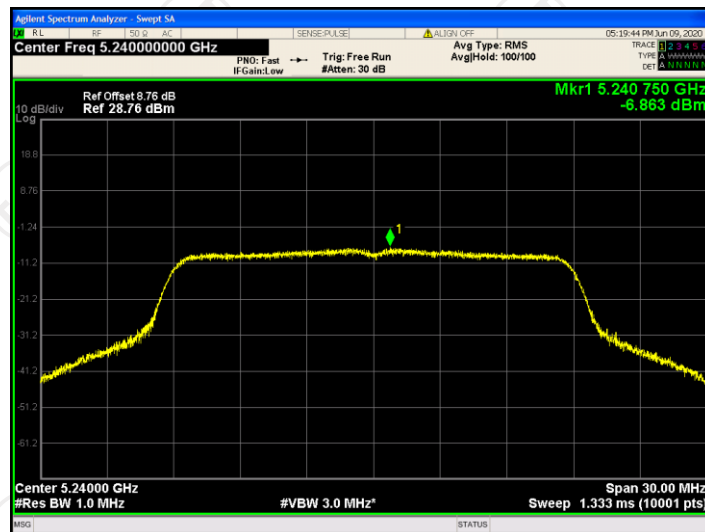
CH36



CH40

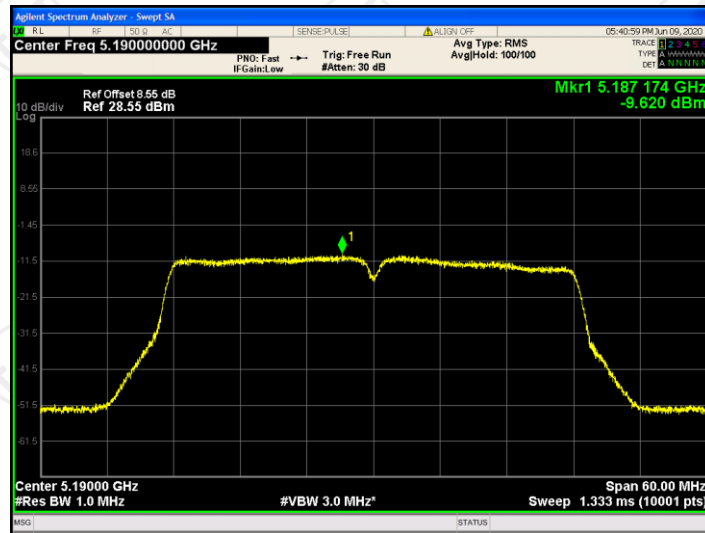


CH48

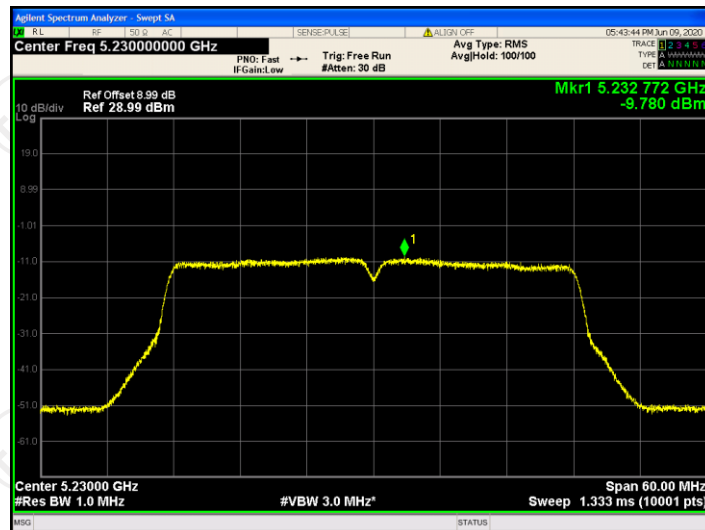


11n(HT40)

CH38

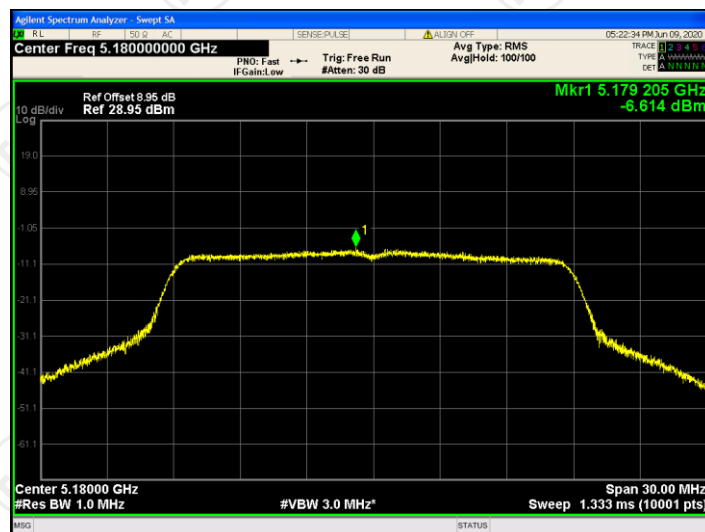


CH46

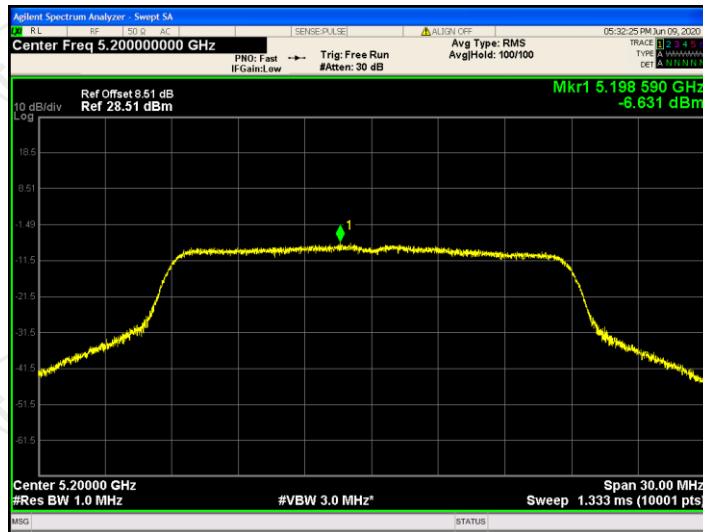


11ac(VHT20)

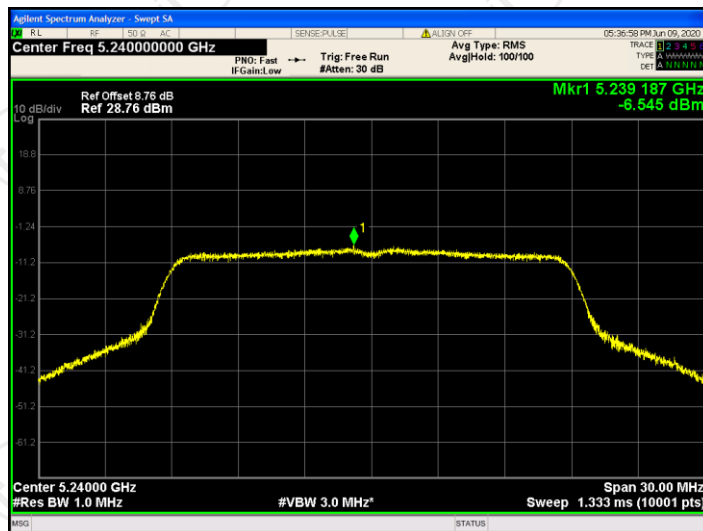
CH36



CH40

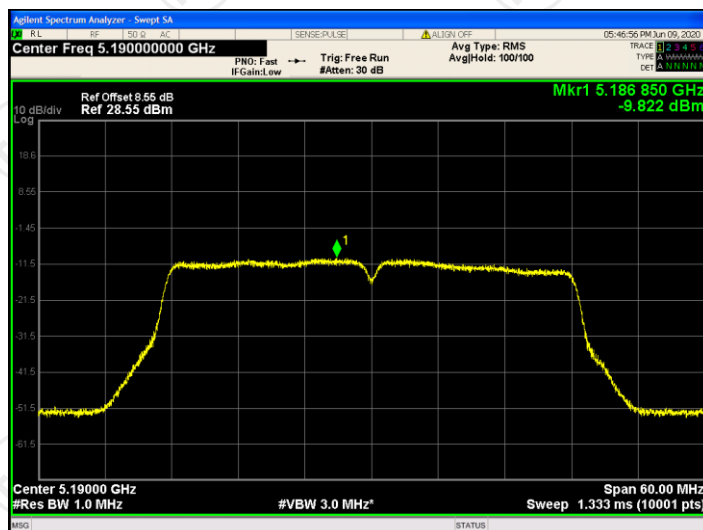


CH48

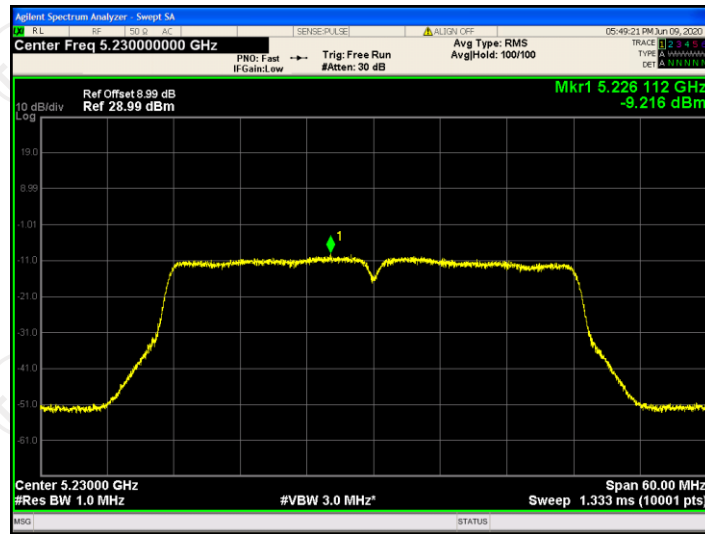


11ac(VHT40)

CH38

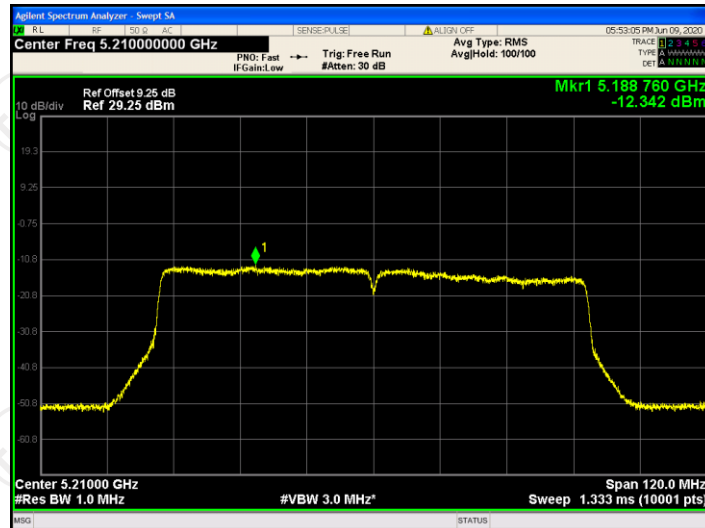


CH46



11ac(VHT80)

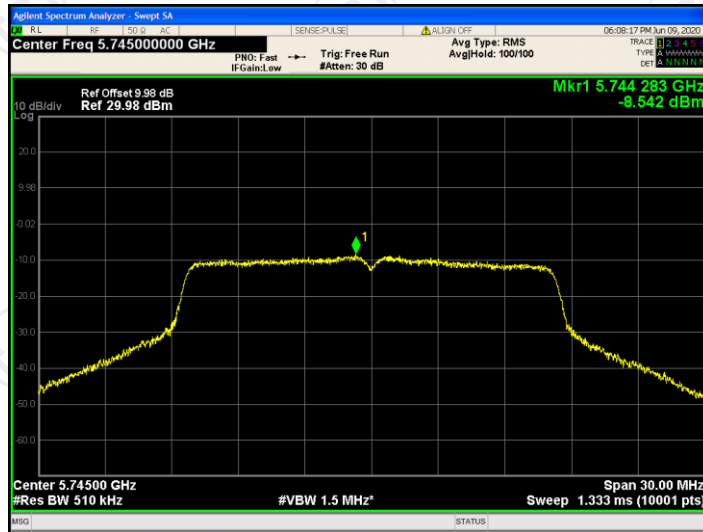
CH42



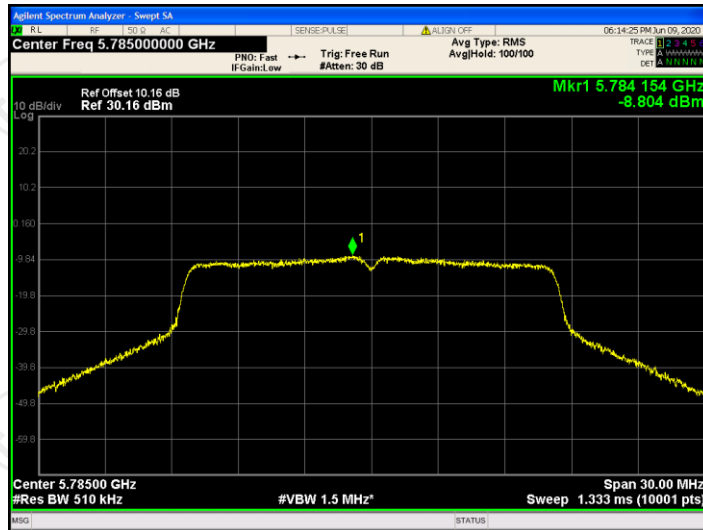
Band 3 (5745-5825MHz)

11a

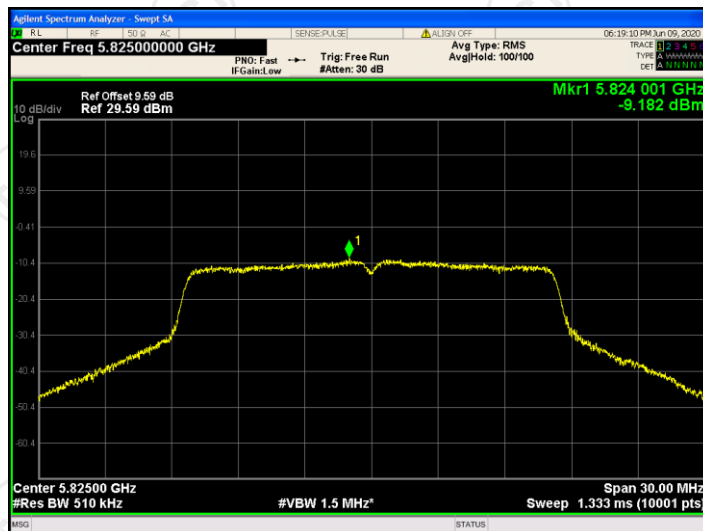
CH149



CH157

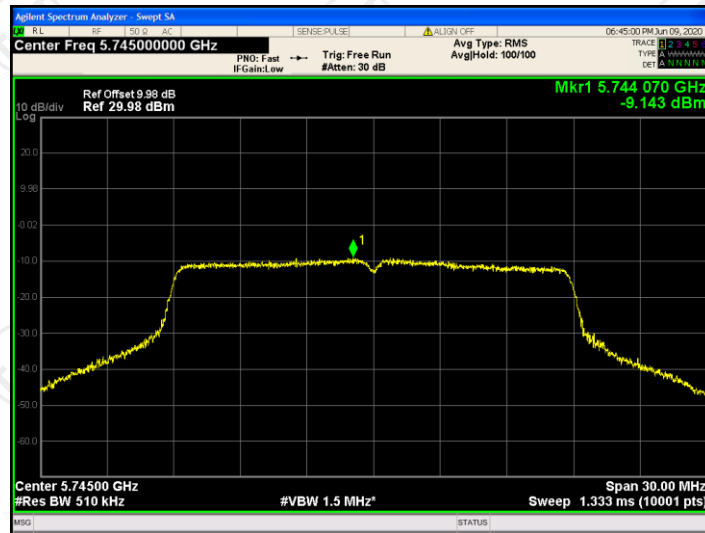


CH165

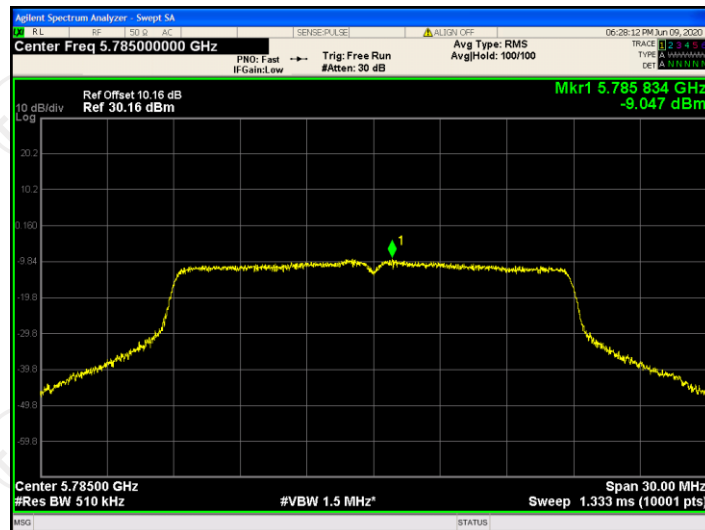


11n(HT20)

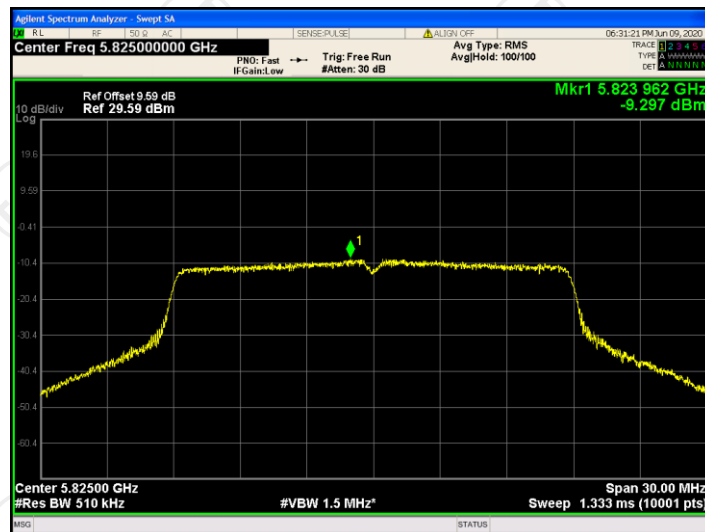
CH149



CH157



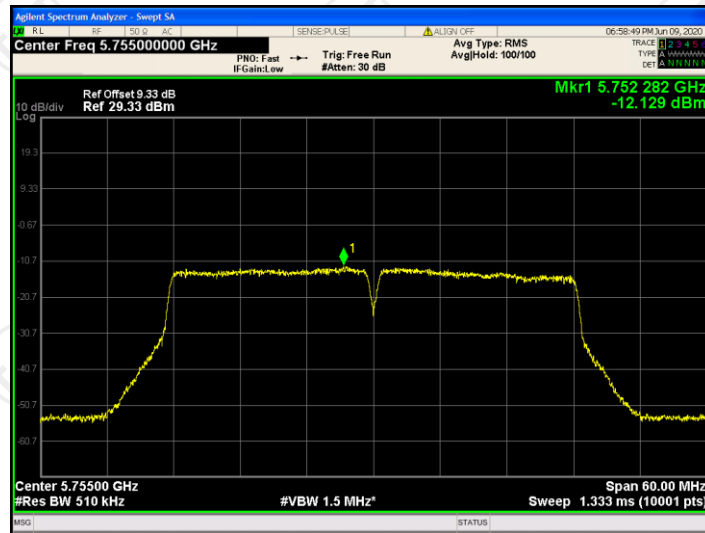
CH165



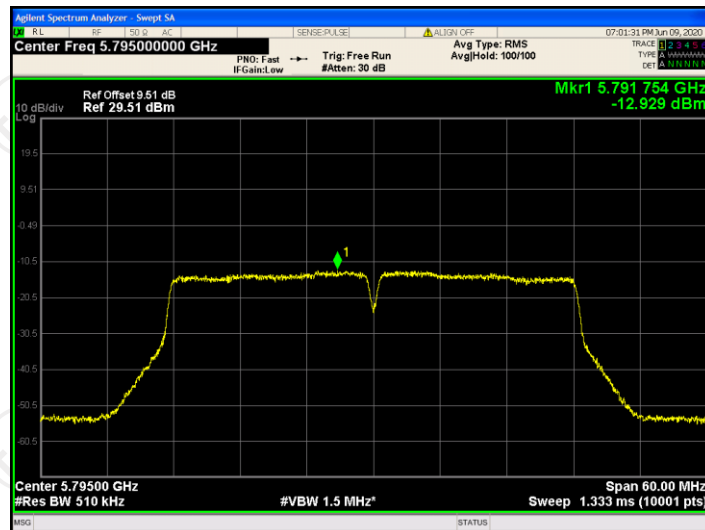


11n(HT40)

CH151

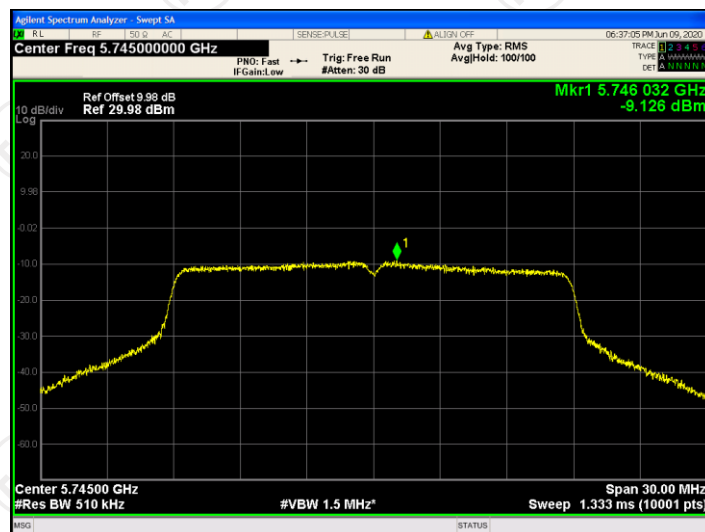


CH159

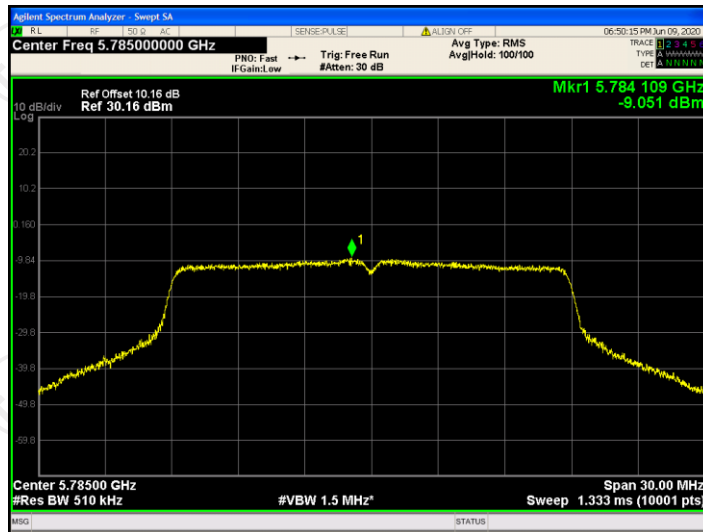


11ac(VHT20)

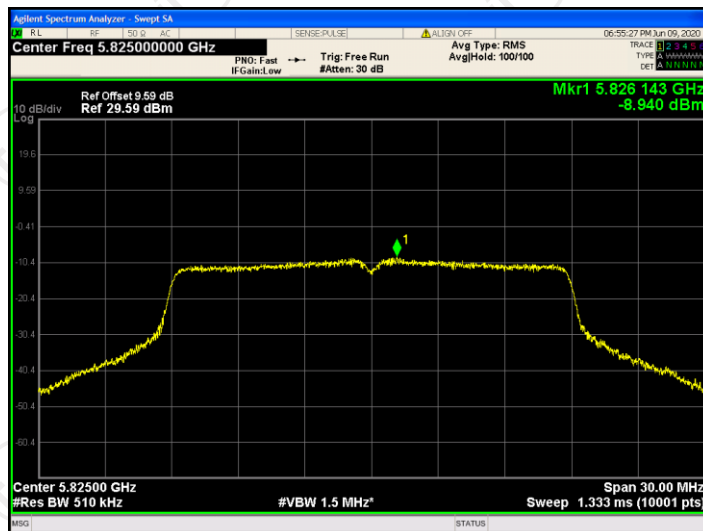
CH149



CH157

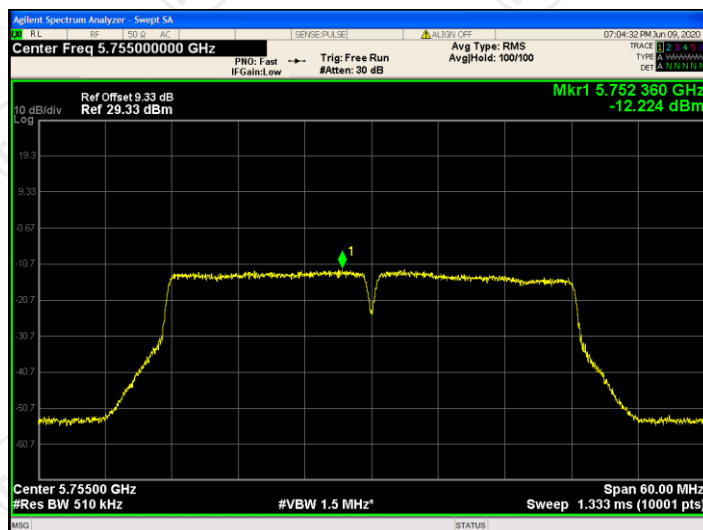


CH165

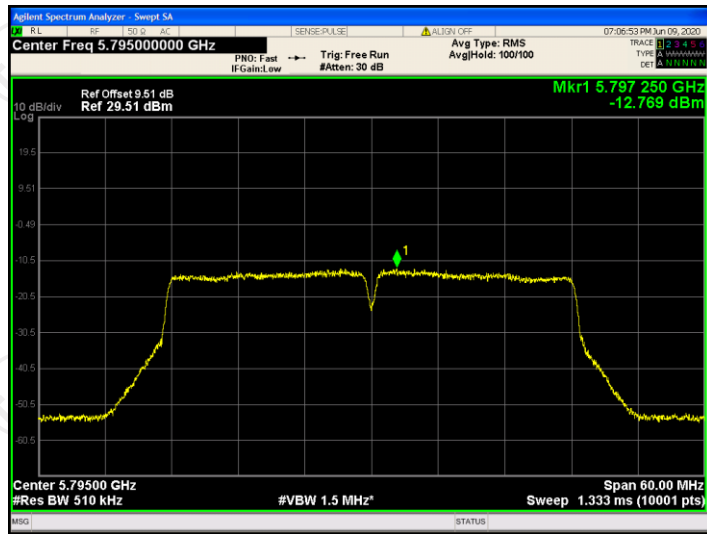


11ac(VHT40)

CH151

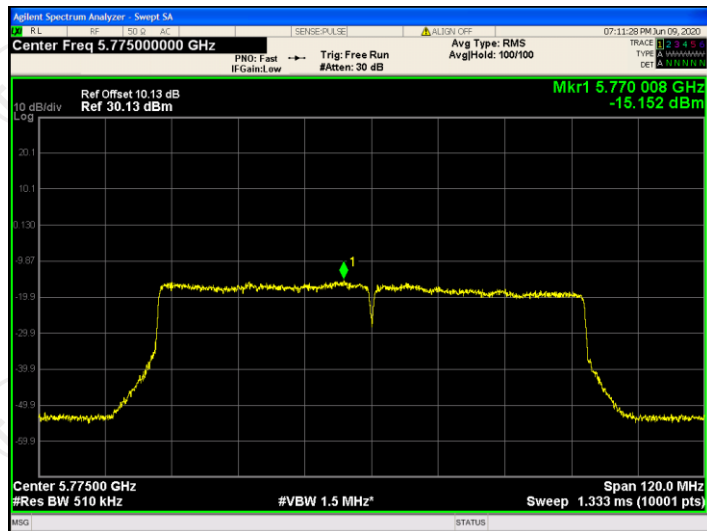


CH159



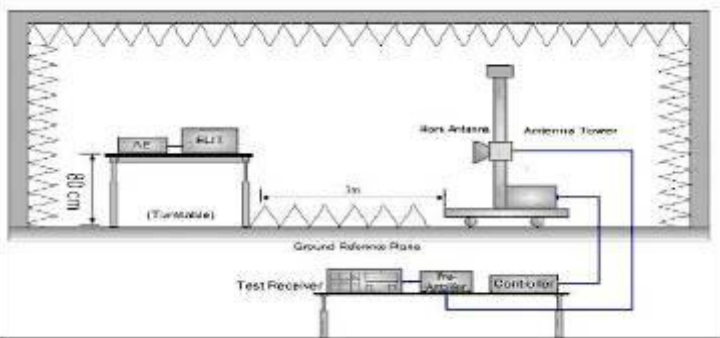
11ac(VHT80)

CH155



## 6.7. Band edge

### 6.7.1. Test Specification

<b>Test Requirement:</b>	FCC CFR47 Part 15E Section 15.407
<b>Test Method:</b>	ANSI C63.10 2013
<b>Limit:</b>	For Band 1: $E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2 = 68.2 \text{ dB}\mu\text{V}/\text{m}$ , for $\text{EIRP}(\text{dBm}) = -27 \text{ dBm}$ For Band 3(5715-5725MHz&5850-5860MHz): $E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2 = 78.2 \text{ dB}\mu\text{V}/\text{m}$ , for $\text{EIRP}(\text{dBm}) = -17 \text{ dBm}$ For Band 3(other un-restricted band): $E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2 = 68.2 \text{ dB}\mu\text{V}/\text{m}$ , for $\text{EIRP}(\text{dBm}) = -27 \text{ dBm}$
<b>Test Setup:</b>	 <p>The diagram illustrates the test setup within an anechoic chamber. On the left, a rotating table (labeled 'Turntable') holds the Equipment Under Test (EUT). To the right, an antenna tower is positioned at a 3-meter camber from the EUT. The tower is mounted on a 'Ground Reference Plane'. The antenna system includes a '30cm Antenna' and an 'Antenna Tower'. A 'Test Receiver' system, consisting of a 'Pre-Amplifier' and a 'Controller', is connected to the antenna tower. The chamber walls are lined with pyramidal absorbers.</p>
<b>Test Mode:</b>	Transmitting mode with modulation
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</li> <li>4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.</li> <li>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak,</li> </ol>

	quasi-peak or average method as specified and then reported in a data sheet.
<b>Test Result:</b>	PASS

**6.7.2. Test Instruments**

Radiated Emission Test Site (966)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Test Receiver	ROHDE&SCHW ARZ	ESIB7	100197	Jul. 29, 2020
Spectrum Analyzer	ROHDE&SCHW ARZ	FSQ40	200061	Sep. 11, 2020
Spectrum Analyzer	Agilent	N9020A	MY49100619	Sep. 11, 2020
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Sep. 08, 2020
Pre-amplifier	HP	8447D	2727A05017	Sep. 08, 2020
Loop antenna	ZHINAN	ZN30900A	12024	Oct. 27, 2020
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 06, 2020
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 06, 2020
Horn Antenna	A-INFO	LB-180400-KF	J211020657	Sep. 06, 2020
Coax cable (9KHz-40GHz)	TCT	RE-high-02	N/A	Sep. 08, 2020
Coax cable (9KHz-40GHz)	TCT	RE-high-04	N/A	Sep. 08, 2020
Antenna Mast	Keleto	CC-A-4M	N/A	N/A
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).

**6.7.3. Test Data**

802.11 a	CH	Freq. (MHz)	Read_level (dBuV/m)	Factor (dB)	Peak (dBuV/m)	Limit (dBuV/m) (Peak)	Limit (dBuV/m) (Avg)	Over	Ant. Pol. H/V
Band 1	Lowest	5150	43.17	5.82	48.99	74	54	-5.01	H
		5150	38.84	5.82	44.66	74	54	-9.34	V
	Highest	5350	43.69	6.17	49.86	74	54	-4.14	H
		5350	39.51	6.17	45.68	74	54	-8.32	V
Band 3	Lowest	5725	43.04	5.82	48.86	68.2	/	-19.34	H
		5725	38.29	5.82	44.11	68.2	/	-24.09	V
	Highest	5850	46.53	6.52	53.05	68.2	/	-15.15	H
		5850	42.90	6.52	49.42	68.2	/	-18.78	V
Remark: Factor(dB)=Ant. Factor+Cable Loss-Amp. Factor									

802.11 n HT20	CH	Freq. (MHz)	Read_level (dBuV/m)	Factor (dB)	Peak (dBuV/m)	Limit (dBuV/m) (Peak)	Limit (dBuV/m) (Avg)	Over	Ant. Pol. H/V
Band 1	Lowest	5150	44.26	6.96	51.22	74	54	-2.78	H
		5150	41.84	6.96	48.80	74	54	-5.20	V
	Highest	5350	45.07	6.17	51.24	74	54	-2.76	H
		5350	42.66	6.17	48.83	74	54	-5.17	V
Band 3	Lowest	5725	41.14	8.21	49.35	68.2	/	-18.85	H
		5725	42.33	8.21	50.54	68.2	/	-17.66	V
	Highest	5850	44.79	8.87	53.66	68.2	/	-14.54	H
		5850	40.65	8.87	49.52	68.2	/	-18.68	V
Remark: Factor(dB)=Ant. Factor+Cable Loss-Amp. Factor									

802.11 n HT40	CH	Freq. (MHz)	Read_level (dBuV/m)	Factor (dB)	Peak (dBuV/m)	Limit (dBuV/m) (Peak)	Limit (dBuV/m) (Avg)	Over	Ant. Pol. H/V
Band 1	Lowest	5150	43.16	5.82	48.98	74	54	-5.02	H
		5150	38.52	5.82	44.34	74	54	-9.66	V
	Highest	5350	45.44	6.17	51.61	74	54	-2.39	H
		5350	42.98	6.17	49.15	74	54	-4.85	V

Band 3	Lowest	5725	43.54	5.82	49.36	68.2	/	-18.84	H
		5725	38.21	5.82	44.03	68.2	/	-24.17	V
	Highest	5850	45.78	6.52	52.30	68.2	/	-15.90	H
		5850	42.66	6.52	49.18	68.2	/	-19.02	V

Remark: Factor(dB)=Ant. Factor+Cable Loss-Amp. Factor

802.11 ac HT20	CH	Freq. (MHz)	Read_level (dBuV/m)	Factor (dB)	Peak (dBuV/m)	Limit (dBuV/m) (Peak)	Limit (dBuV/m) (Avg)	Over	Ant. Pol. H/V
Band 1	Lowest	5150	42.85	6.96	49.81	74	54	-4.19	H
		5150	41.36	6.96	48.32	74	54	-5.68	V
	Highest	5350	45.12	6.17	51.29	74	54	-2.71	H
		5350	42.05	6.17	48.22	74	54	-5.78	V

Band 3	Lowest	5725	41.79	8.21	50.00	68.2	/	-18.20	H
		5725	42.53	8.21	50.74	68.2	/	-17.46	V
	Highest	5850	44.08	8.87	52.95	68.2	/	-15.25	H
		5850	40.47	8.87	49.34	68.2	/	-18.86	V

Remark: Factor(dB)=Ant. Factor+Cable Loss-Amp. Factor

802.11 ac HT40	CH	Freq. (MHz)	Read_level (dBuV/m)	Factor (dB)	Peak (dBuV/m)	Limit (dBuV/m) (Peak)	Limit (dBuV/m) (Avg)	Over	Ant. Pol. H/V
Band 1	Lowest	5150	43.79	5.82	49.61	74	54	-4.39	H
		5150	38.56	5.82	44.38	74	54	-9.62	V
	Highest	5350	43.41	6.17	49.58	74	54	-4.42	H
		5350	39.80	6.17	45.97	74	54	-8.03	V

Band 3	Lowest	5725	44.27	5.82	50.09	68.2	/	-18.11	H
		5725	38.86	5.82	44.68	68.2	/	-23.52	V
	Highest	5850	45.03	6.52	51.55	68.2	/	-16.65	H
		5850	43.69	6.52	50.21	68.2	/	-17.99	V

Remark: Factor(dB)=Ant. Factor+Cable Loss-Amp. Factor

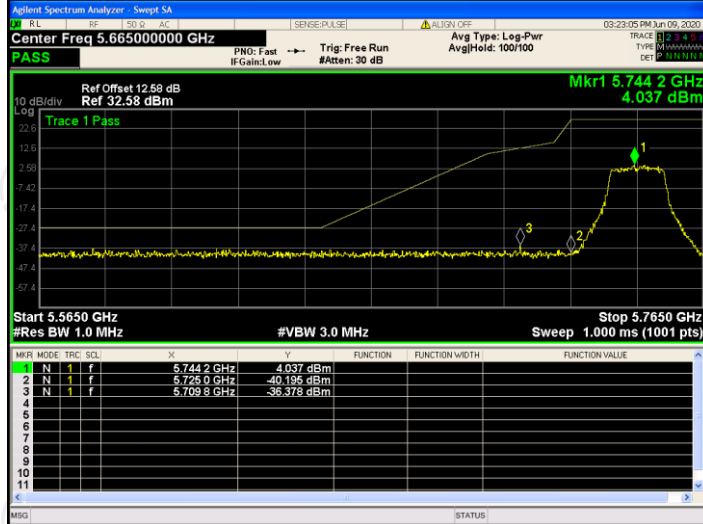


802.11 ac HT80	CH	Freq. (MHz)	Read_level (dBuV/m)	Factor (dB)	Peak (dBuV/m)	Limit (dBuV/m) (Peak)	Limit (dBuV/m) (Avg)	Over	Ant. Pol. H/V
Band 1	Lowest	5150	43.48	6.96	6.96	50.44	74	54	H
		5150	41.62	6.96	6.96	48.58	74	54	V
	Highest	5350	43.75	6.17	6.17	49.92	74	54	H
		5350	39.31	6.17	6.17	45.48	74	54	V
Band 3	Lowest	5725	40.69	8.21	48.90	68.2	/	-19.30	H
		5725	41.48	8.21	49.69	68.2	/	-18.51	V
	Highest	5850	45.31	8.87	54.18	68.2	/	-14.02	H
		5850	40.74	8.87	49.61	68.2	/	-18.59	V

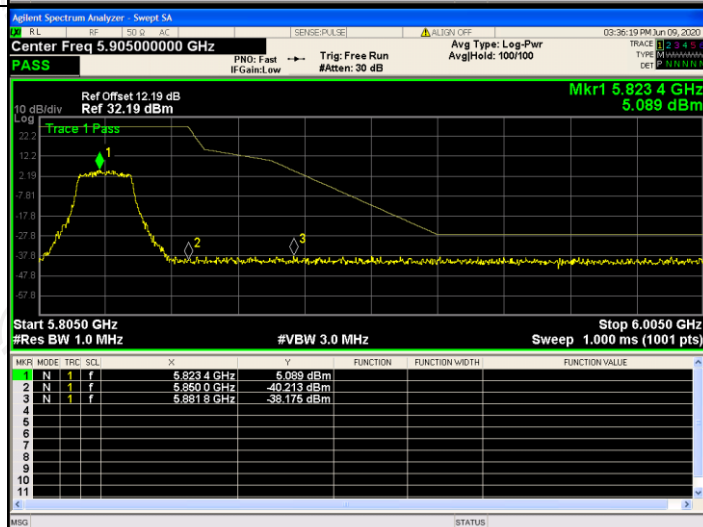
Remark: Factor(dB)=Ant. Factor+Cable Loss-Amp. Factor

### Band 3 Band-edge for RF Conducted Emissions

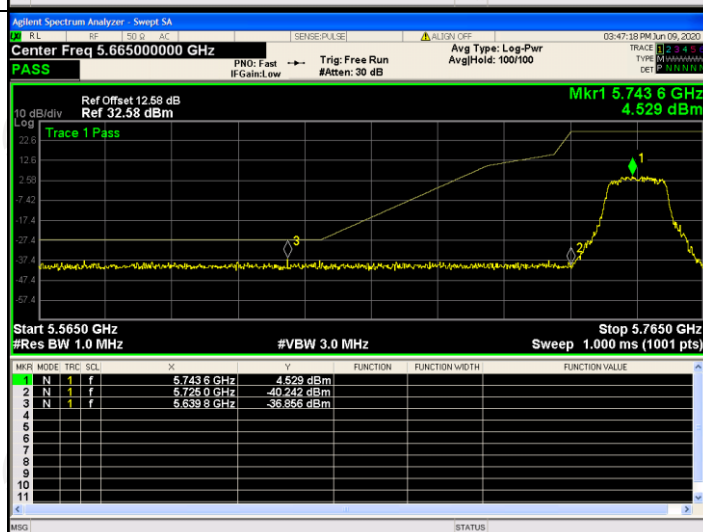
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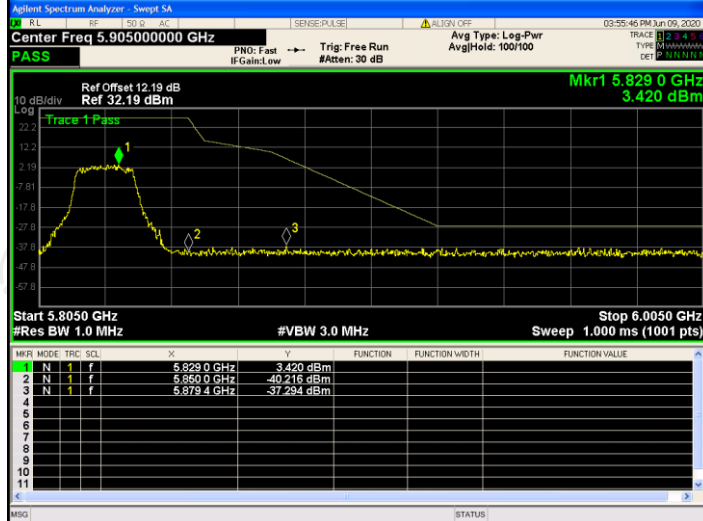
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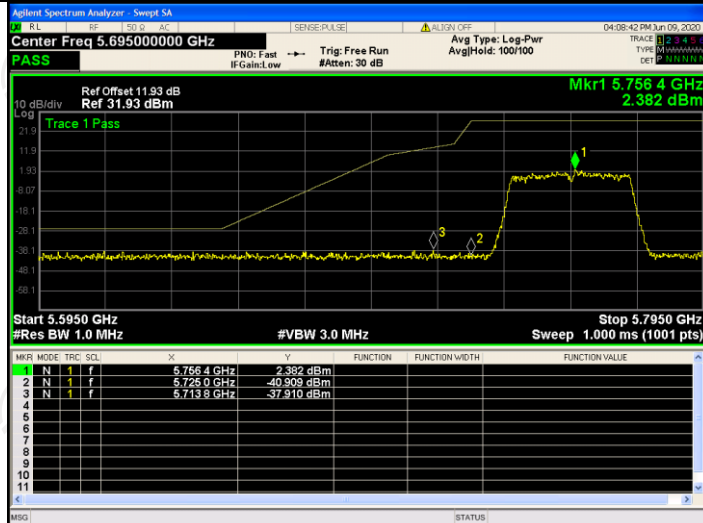
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HT20 / LCH



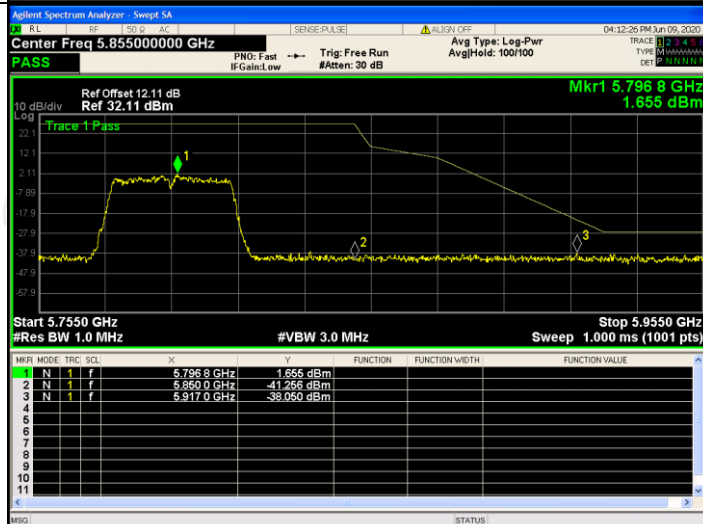
802.11n  
HT20 / HCH



802.11n  
HT40 / LCH

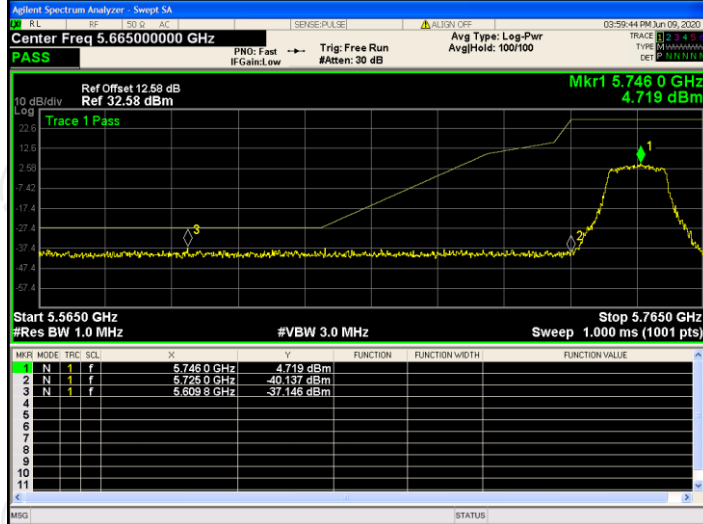


802.11n  
HT40 / HCH

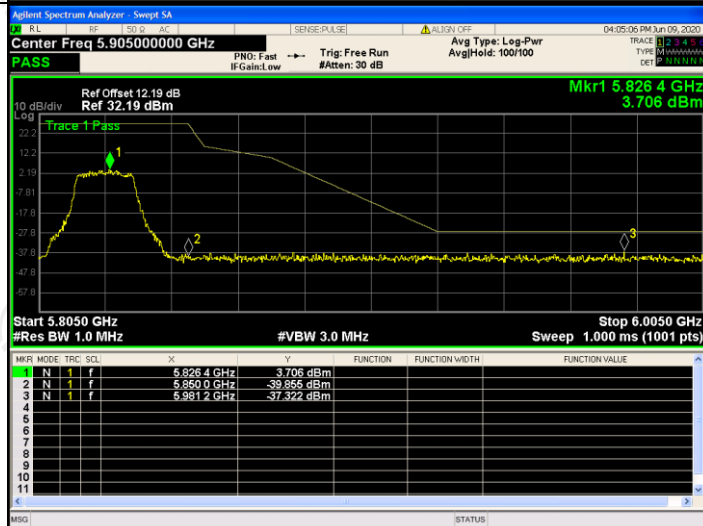


### Band 3 Band-edge for RF Conducted Emissions

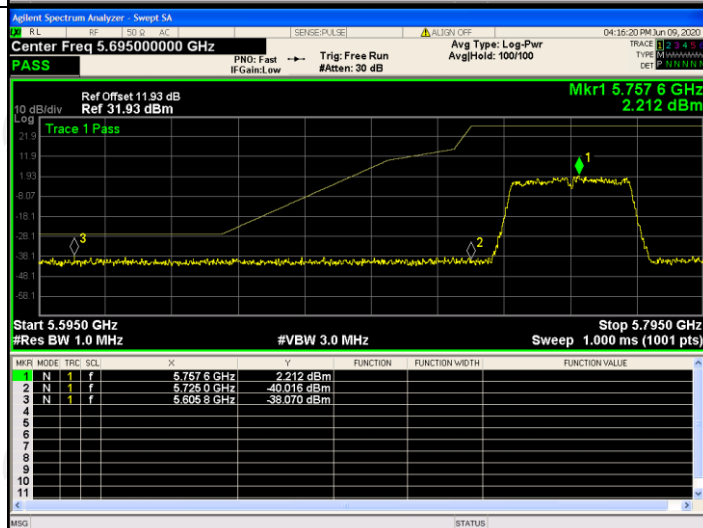
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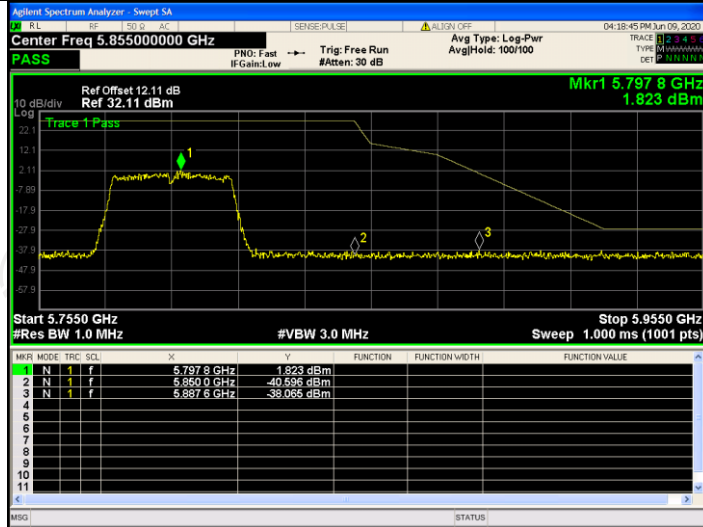
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HT20 / HCH



802.11ac  
HT40 / LCH



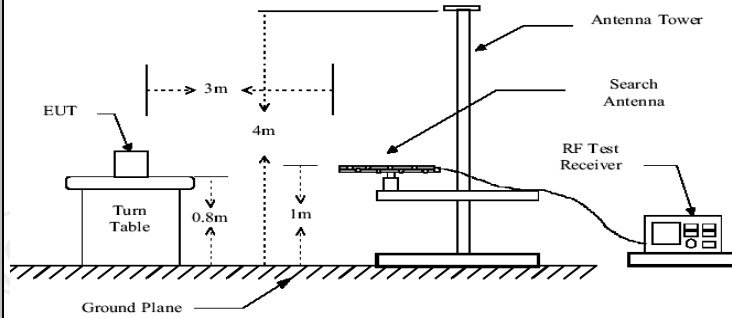
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HT40 / HCH



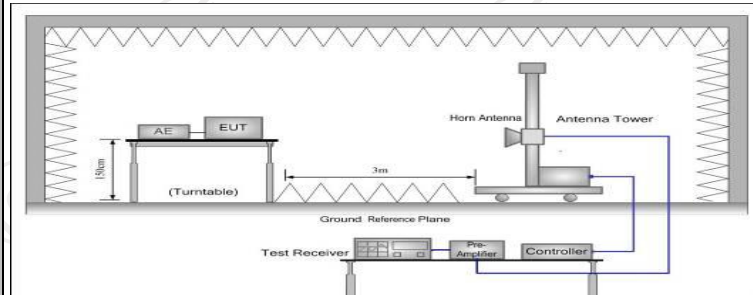
## 6.8. Unwanted Emission

### 6.8.1. Test Specification

<b>Test Requirement:</b>	FCC CFR47 Part 15 Section 15.407 & 15.209 & 15.205				
<b>Test Method:</b>	KDB 789033 D02 v02r01				
<b>Frequency Range:</b>	9kHz to 40GHz				
<b>Measurement Distance:</b>	3 m				
<b>Antenna Polarization:</b>	Horizontal & Vertical				
<b>Operation mode:</b>	Transmitting mode with modulation				
<b>Receiver Setup:</b>	Frequency	Detector	RBW	VBW	Remark
	9kHz- 150kHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value
	150kHz- 30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		Peak	1MHz	10Hz	Average Value
<b>Limit:</b>	Unwanted spurious emissions fallen in restricted bands per FCC Part15.205 shall comply with the general field strength limits set forth in § 15.209 as below table,				
	Frequency	Field Strength (microvolts/meter)	Measurement Distance (meters)		
	0.009-0.490	2400/F(KHz)	300		
	0.490-1.705	24000/F(KHz)	30		
	1.705-30	30	30		
	30-88	100	3		
	88-216	150	3		
	216-960	200	3		
	Above 960	500	3		
		Frequency	Limit (dBuV/m @3m)	Detector	
	Above 1G	74.0	Peak		
		54.0	Average		
<b>Test setup:</b>	For radiated emissions below 30MHz				
	<p>Distance = 3m</p> <p>EUT</p> <p>Turn table</p> <p>Ground Plane</p> <p>Computer</p> <p>Pre -Amplifier</p> <p>Receiver</p>				
	30MHz to 1GHz				



Above 1GHz



**Test Procedure:**

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

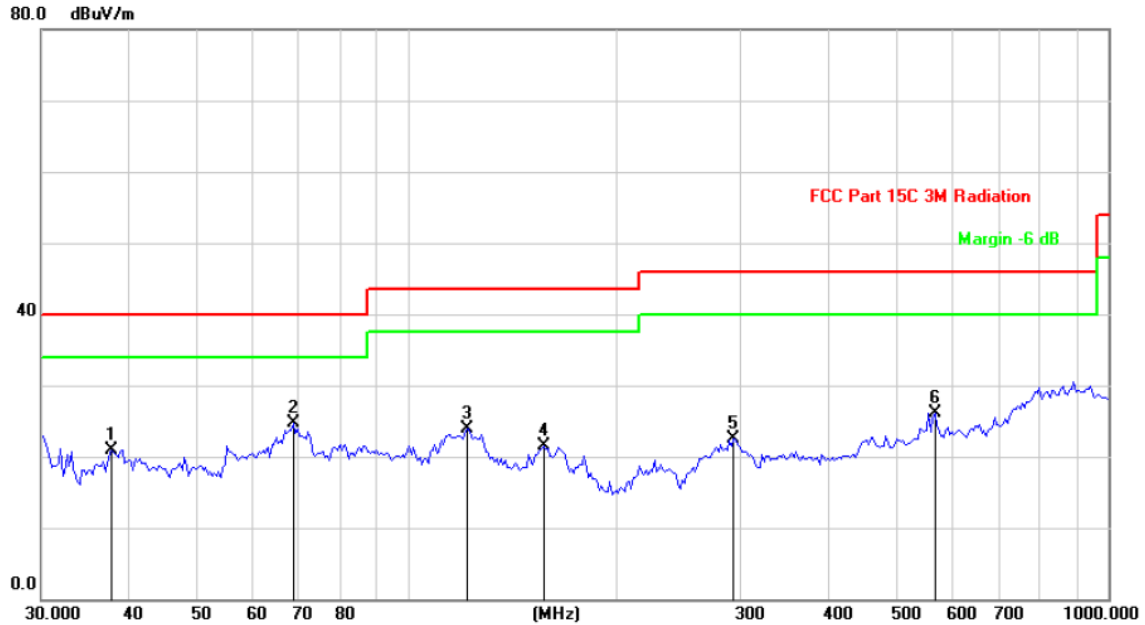
**Test results:**

PASS

**6.8.2. Test Data**

Please refer to following diagram for individual  
Below 1GHz

Horizontal:



Site: Polarization: *Horizontal* Temperature: 25  
Limit: FCC Part 15C 3M Radiation Power: AC 120V/60Hz Humidity: 55 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1		37.8297	32.10	-11.18	20.92	40.00	-19.08	peak
2	*	68.7450	40.22	-15.48	24.74	40.00	-15.26	peak
3		121.4623	36.49	-12.53	23.96	43.50	-19.54	peak
4		156.4259	37.83	-16.31	21.52	43.50	-21.98	peak
5		292.3643	33.80	-11.29	22.51	46.00	-23.49	peak
6		565.9776	32.32	-6.29	26.03	46.00	-19.97	peak