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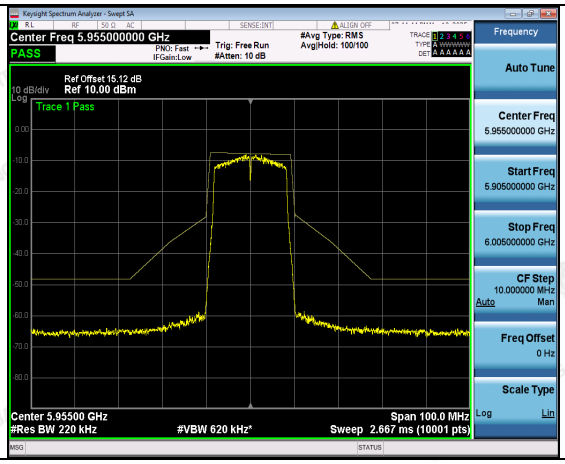

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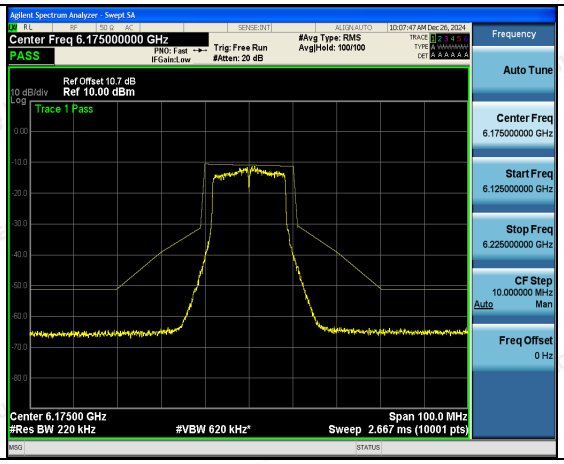

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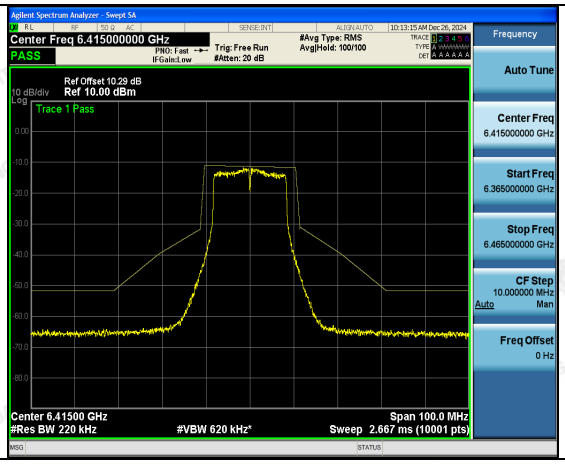

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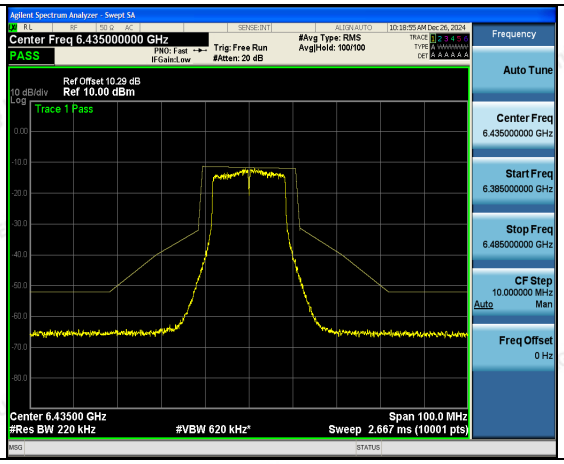

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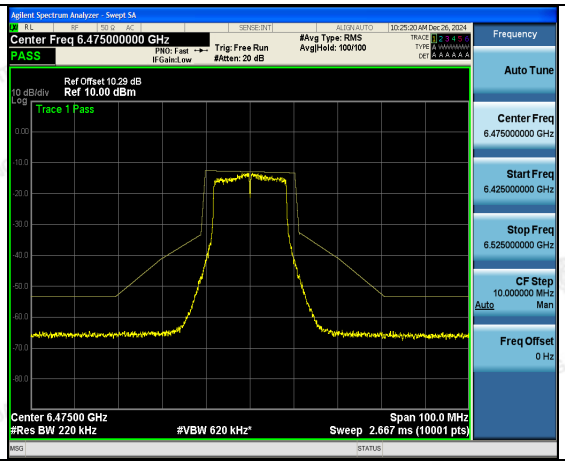

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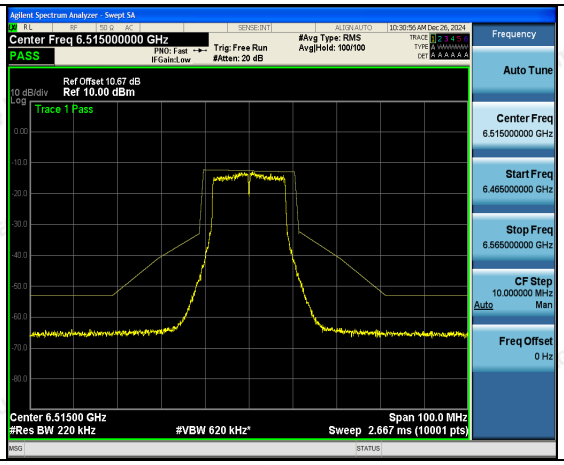

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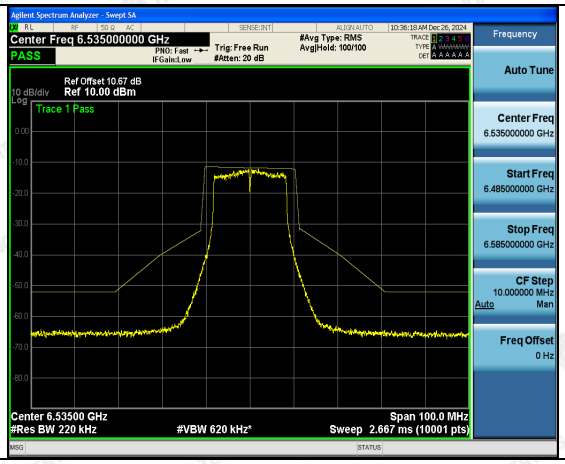

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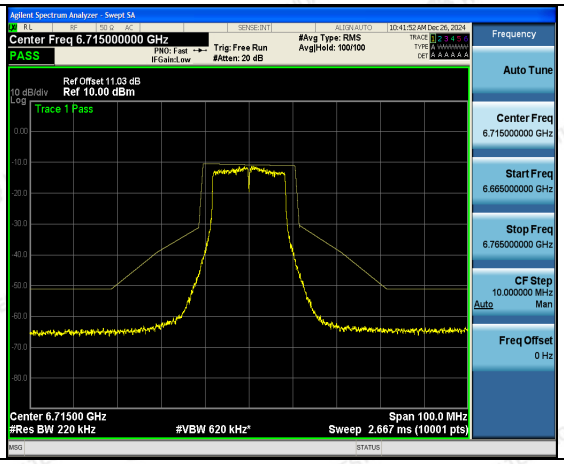

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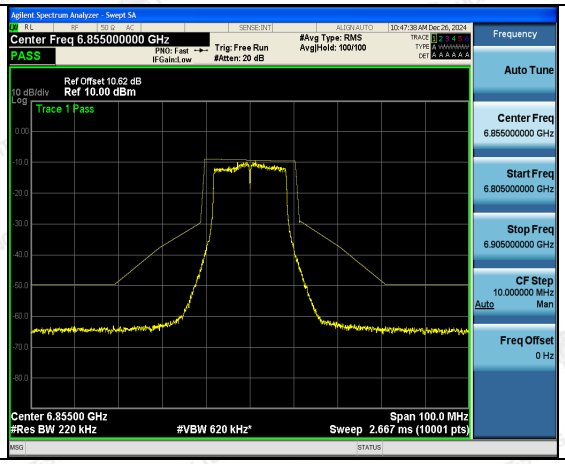

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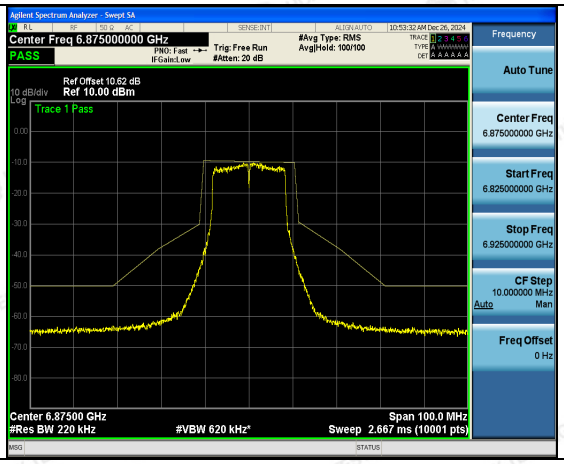

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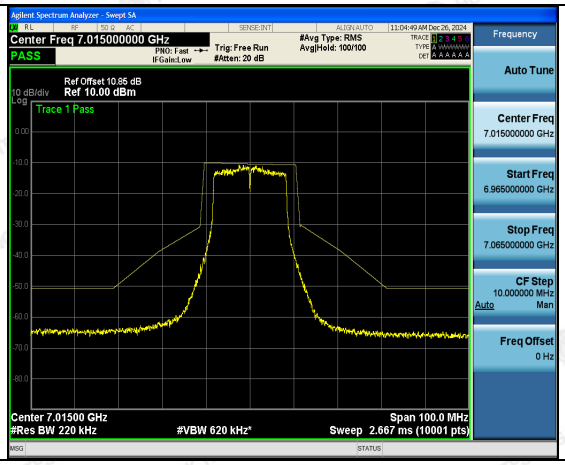

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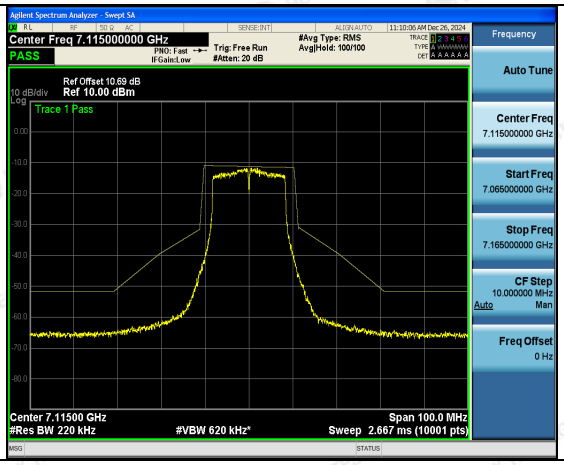

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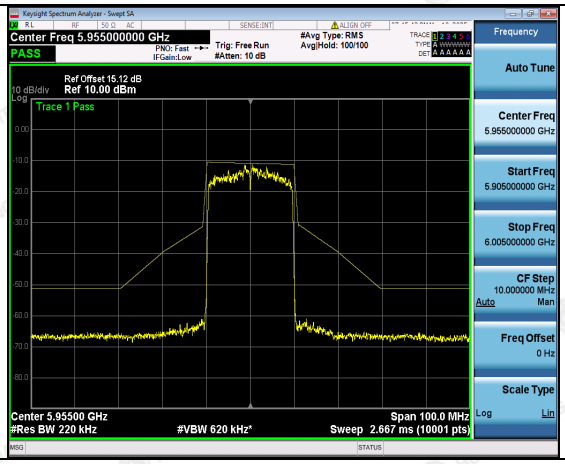

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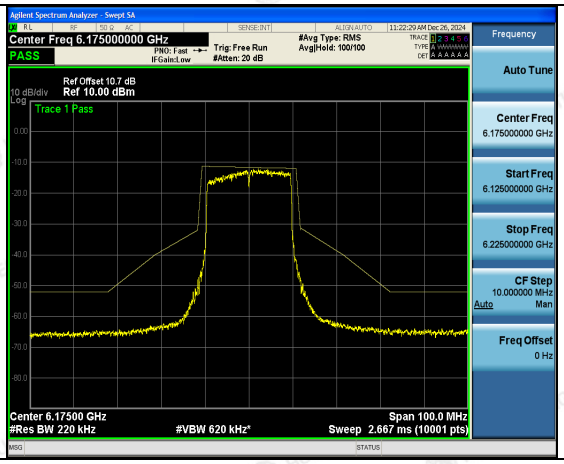

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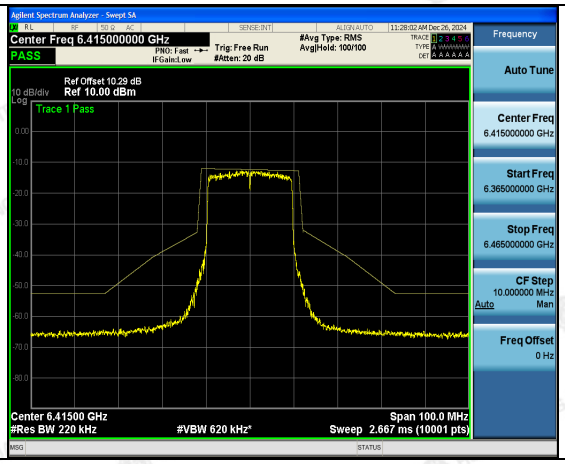

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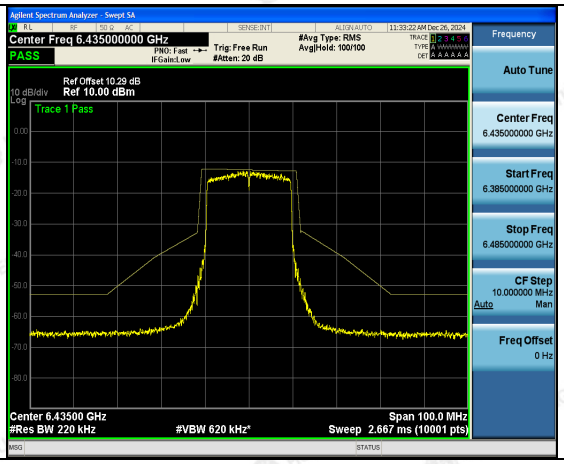

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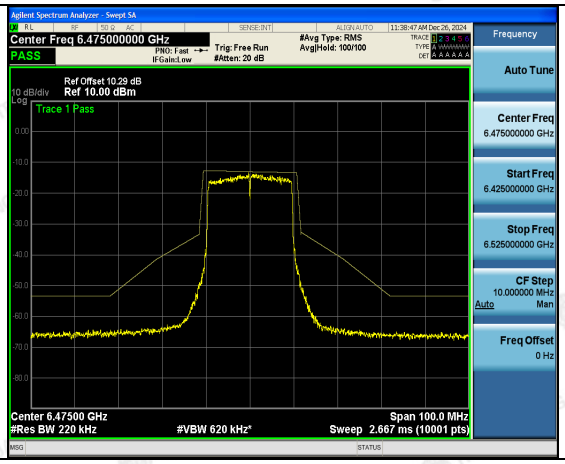

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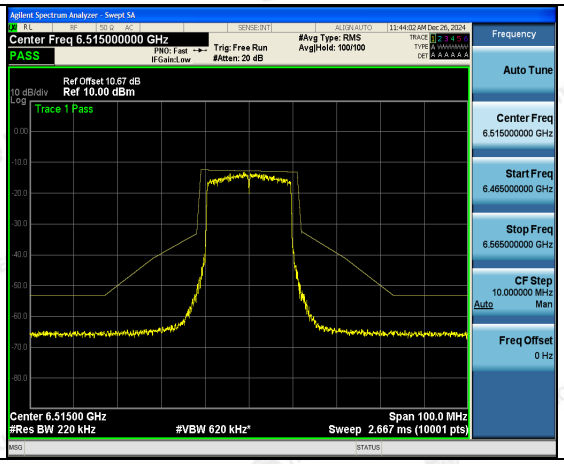

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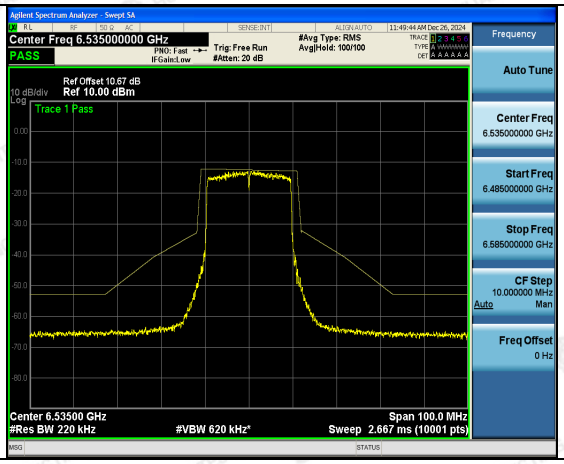	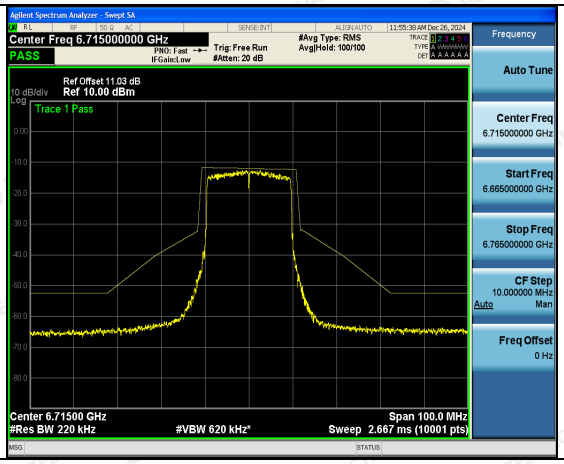
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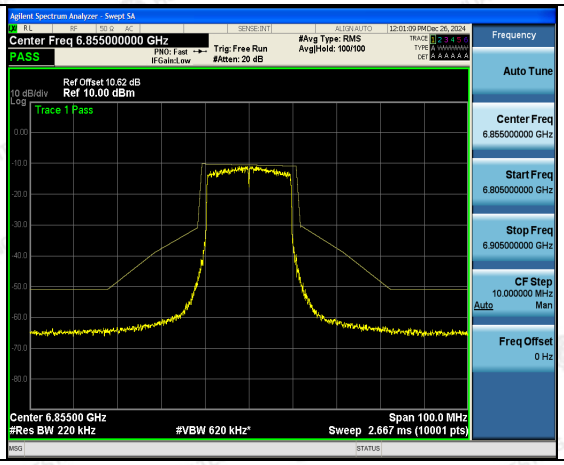	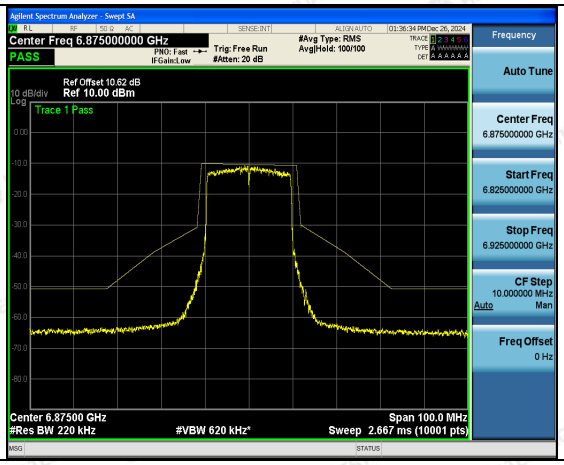
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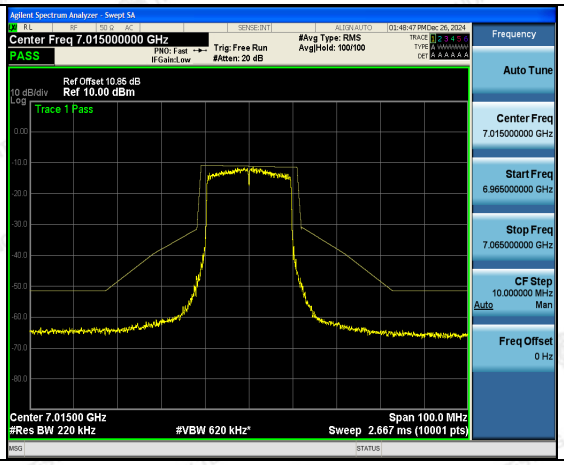	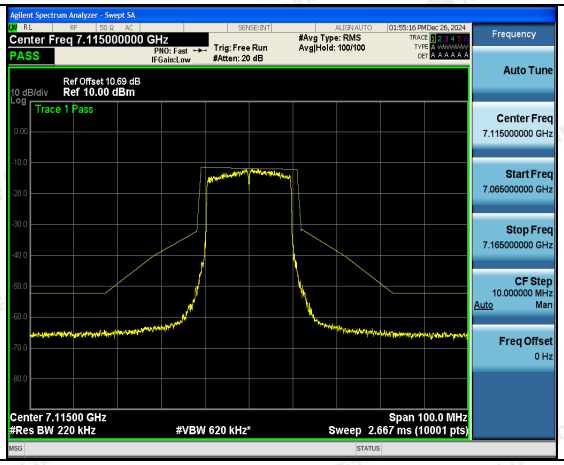

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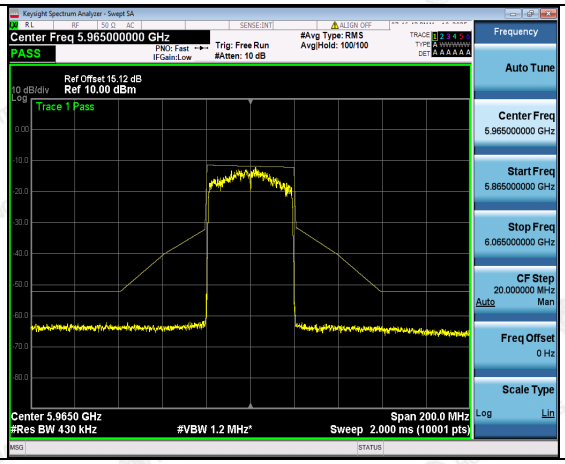

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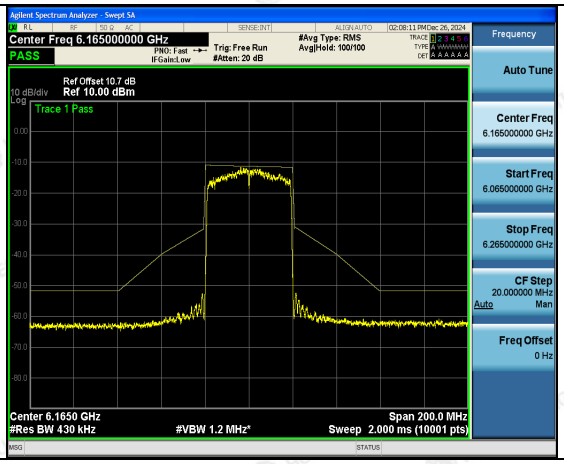

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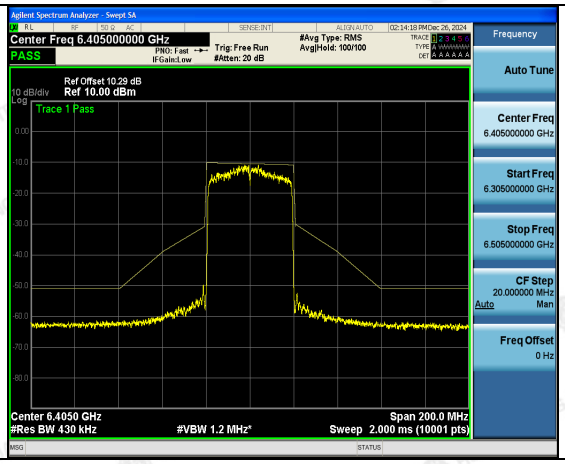

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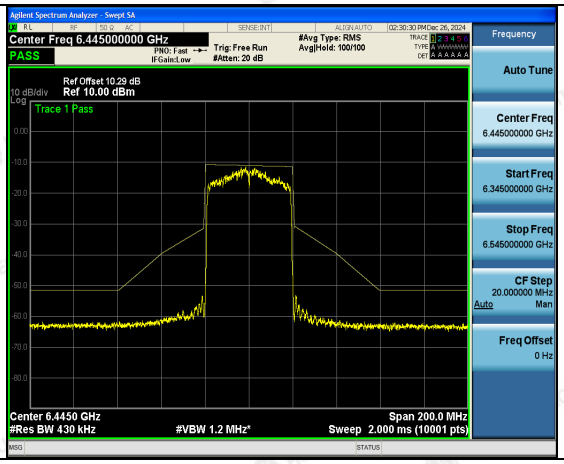

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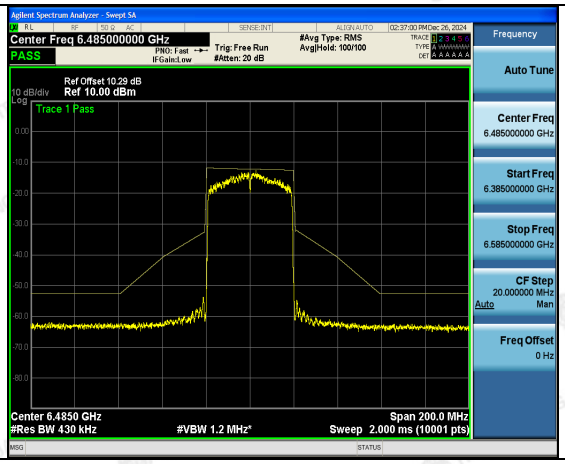

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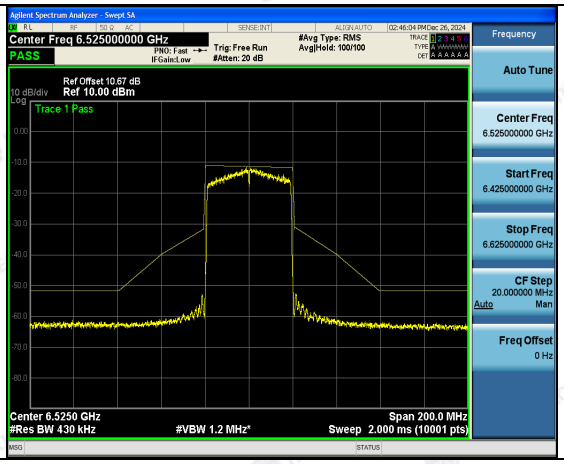

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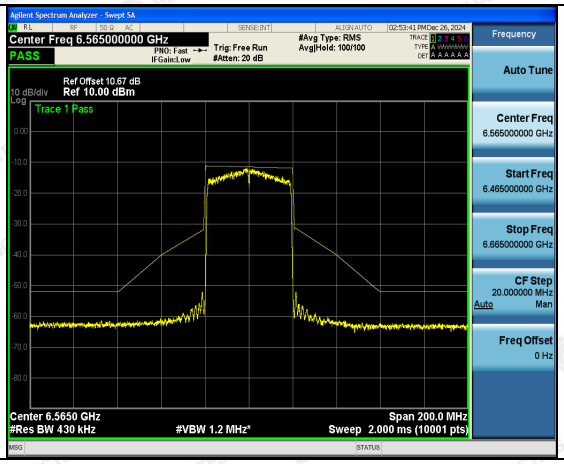	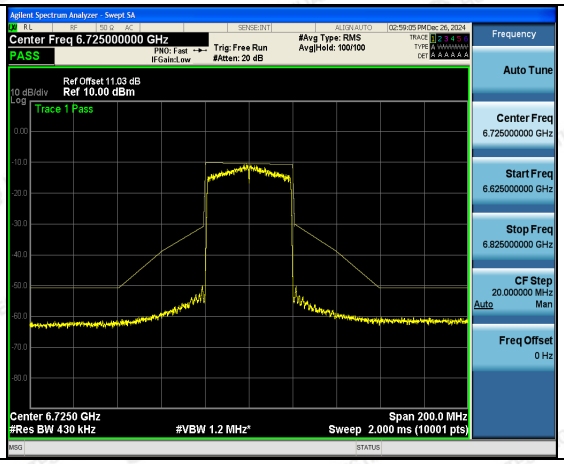
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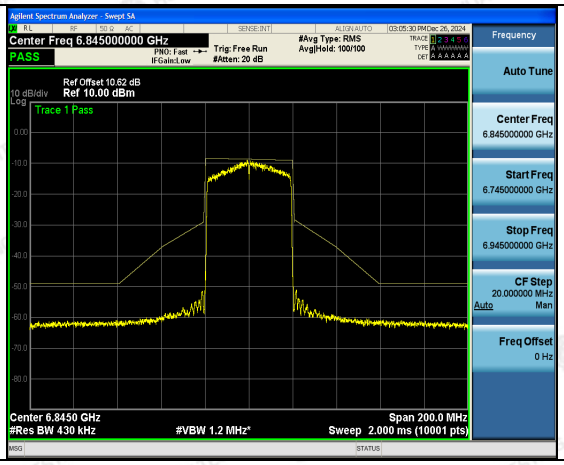	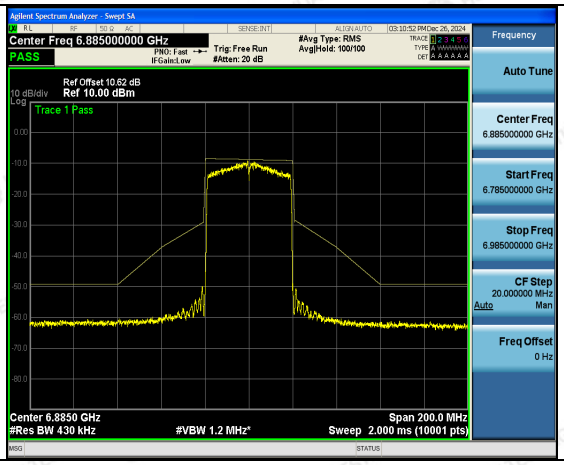
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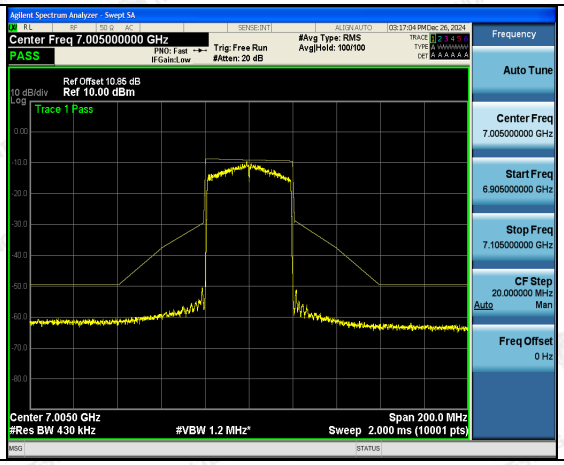	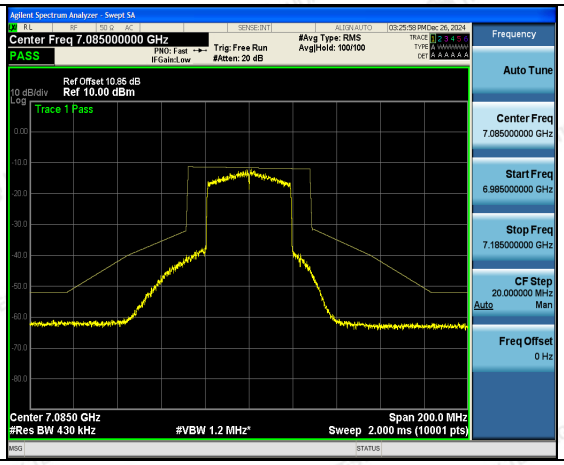

802.11ax (HE80)

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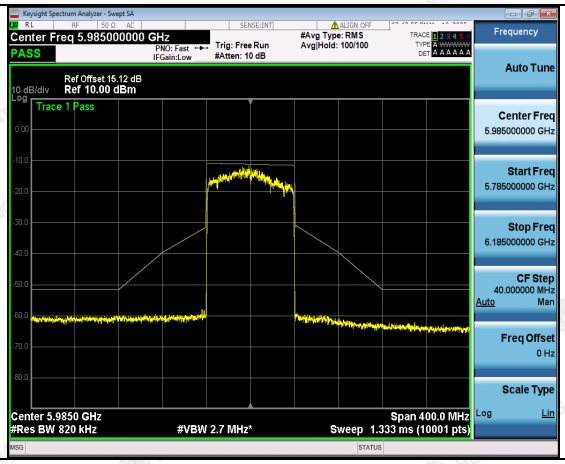

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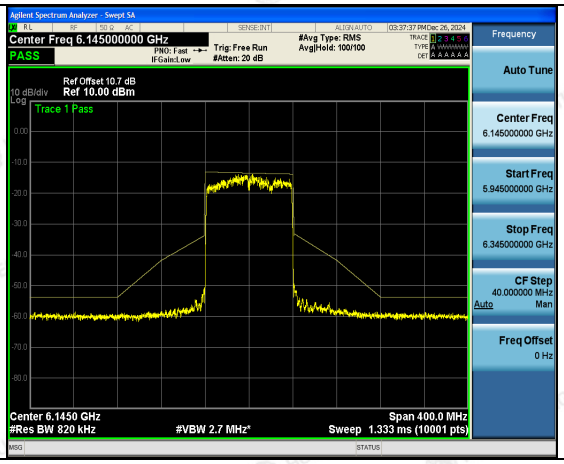

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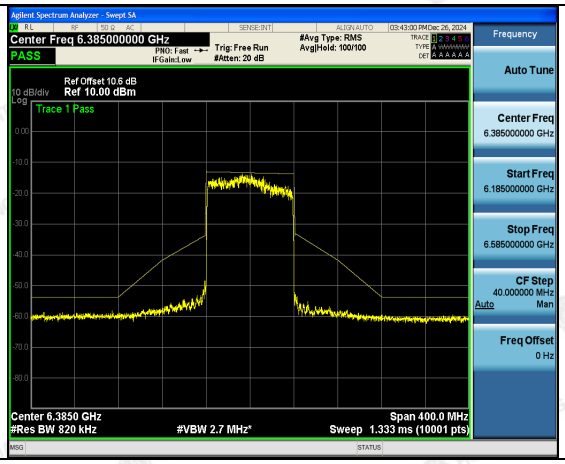

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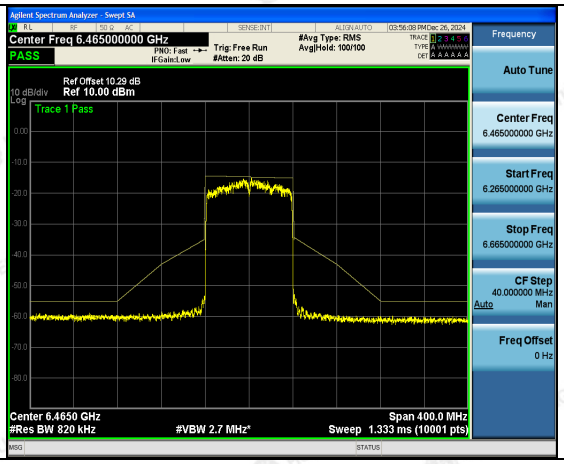

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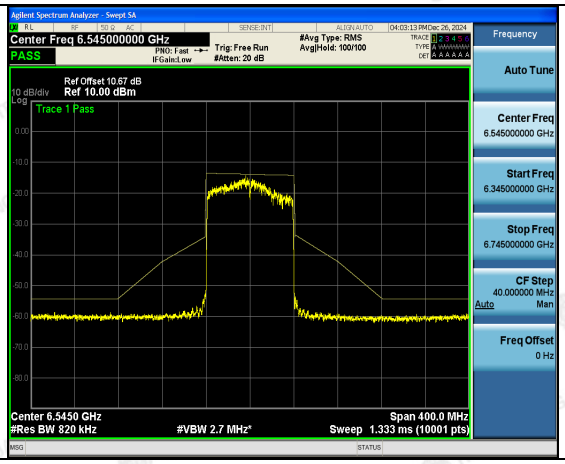

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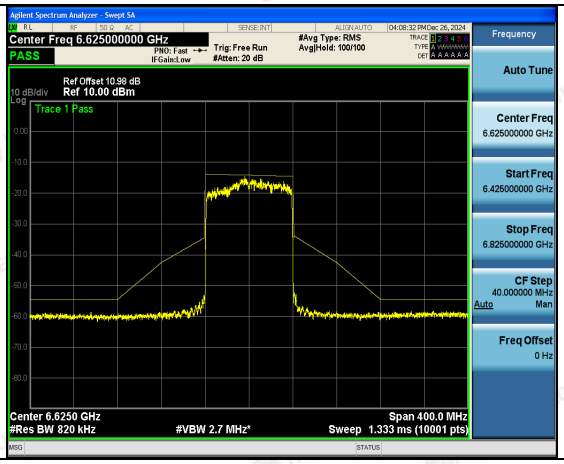

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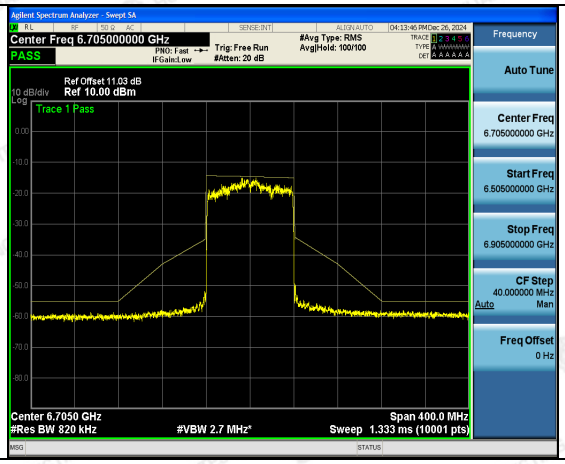	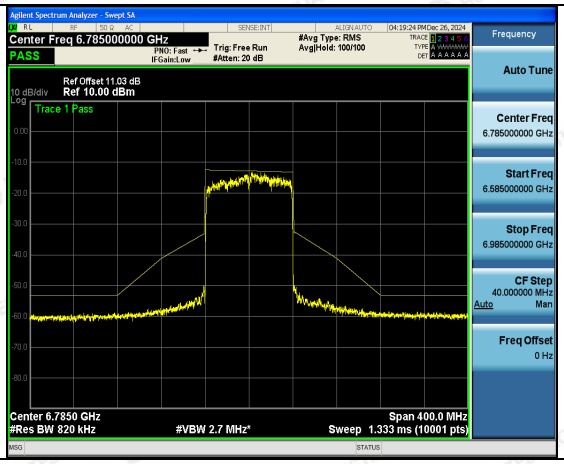
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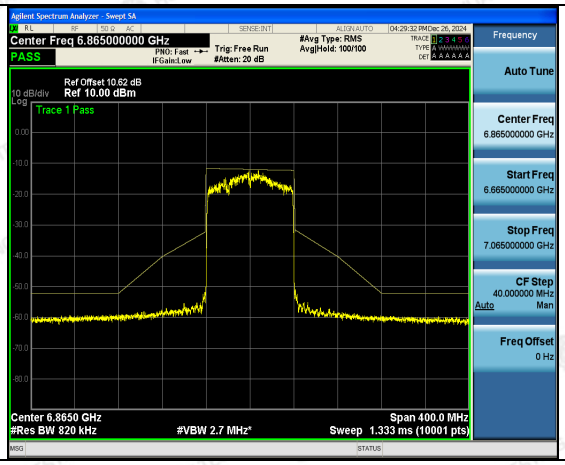	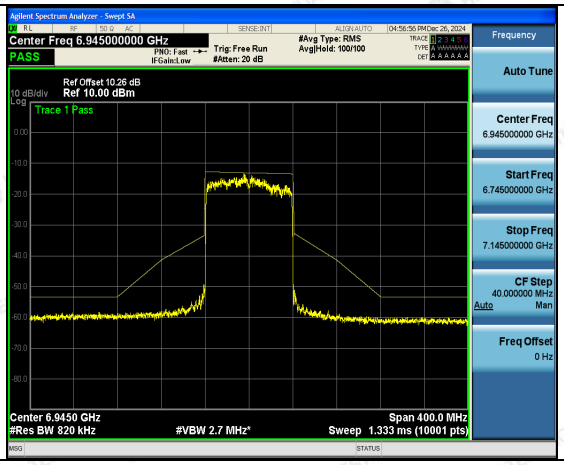
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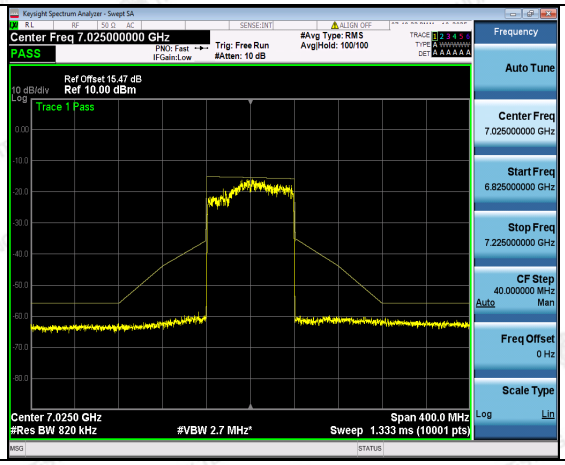	

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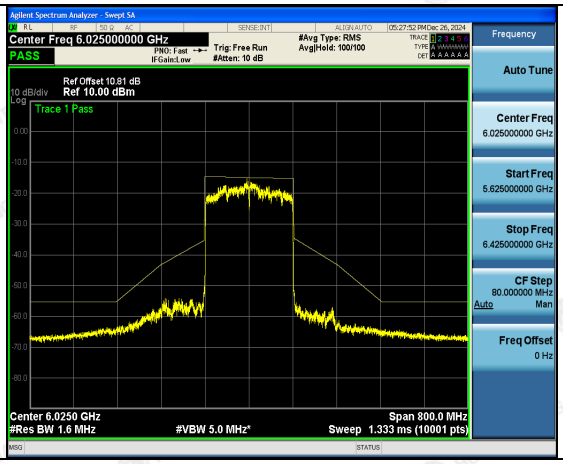

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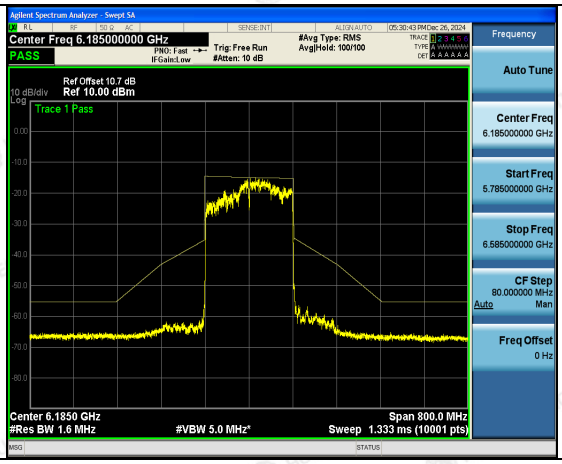

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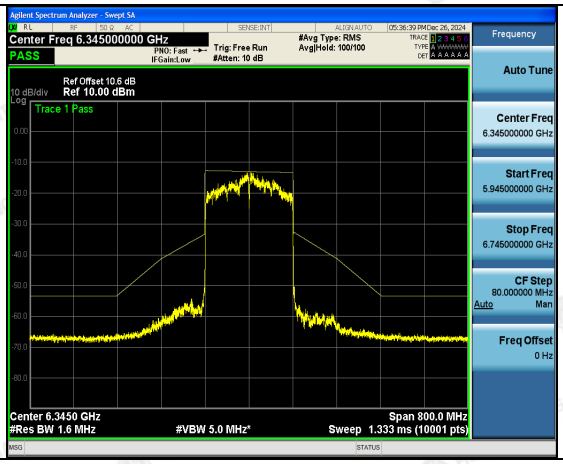

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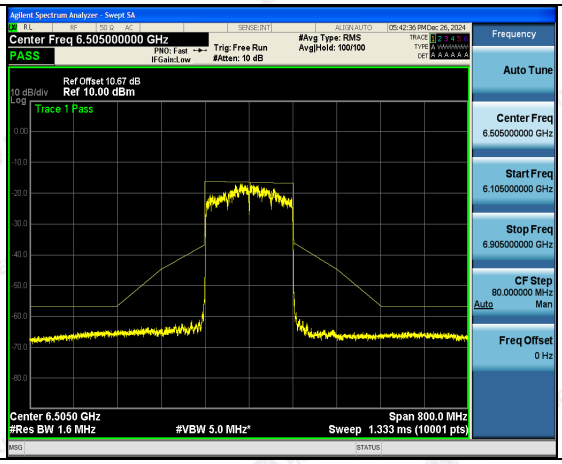

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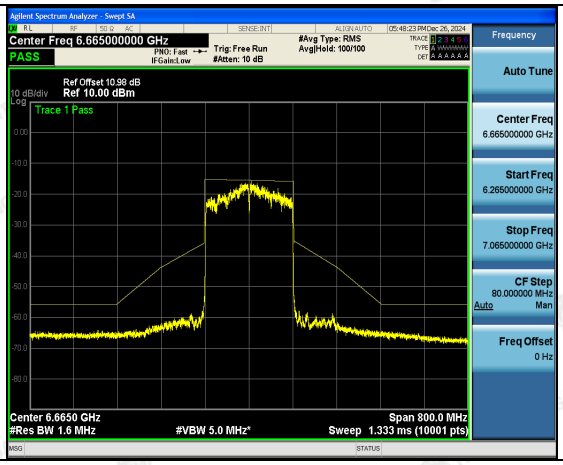

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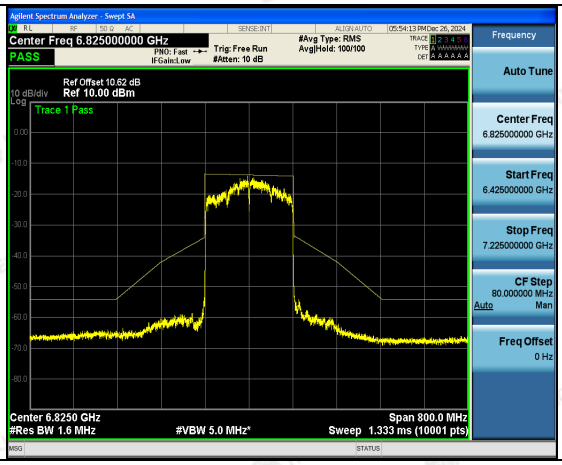

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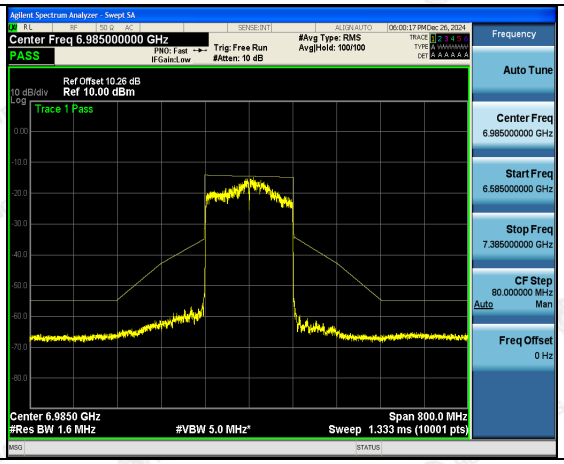
	

4.7 Contention-Based Protocol

4.7.1 Limits of Contention Based Protocol Measurement

Unlicensed indoor low-power devices must detect co-channel radio frequency power that is at least -62 dBm (The threshold is referenced to a 0 dBi antenna gain.) or lower. Additionally, indoor low-power devices must detect co-channel energy with 90% or greater certainty.

4.7.2 Test Procedure

a. Set the signal analyzer center frequency to the nominal EUT channel center frequency. The span range of the signal analyzer shall be between two times and five times the OBW of the EUT. Connect the output port of the EUT to the signal analyzer 2. Ensure that the attenuator 2 provides enough attenuation to not overload the signal analyzer 2 receiver.

b. Monitoring the signal analyzer 2, verify the EUT is operating and transmitting with the parameters (set as following section 4.7.5 EUT operating condition).

c. Determine number of times detection threshold test as following table,

If	Number of Tests	Placement of Incumbent Transmission
$BW_{EUT} \leqq BW_{Inc}$	Once	Same as EUT transmission
$BW_{Inc} < BW_{EUT} \leqq 2xBW_{Inc}$	Once	Contained within BW_{EUT}
$2xBW_{Inc} < BW_{EUT} \leqq 4xBW_{Inc}$	Twice. (Incumbent transmission is contained within BW_{EUT})	Closely to the lower edge and upper edge of the EUT Channel
$BW_{EUT} > 4xBW_{Inc}$	Three times	Closely to the lower edge ,in the middle and upper edge of the EUT Channel

d. Using an AWGN signal source, generate (but do not transmit, i.e. RF OFF) a 10 MHz-wide AWGN signal. Use step C table to determine the center frequency of the 10 MHz AWGN signal relative to the EUT's channel bandwidth and center frequency.

e. Set the AWGN signal power to an extremely low level (more than 20 dB below the -62 dBm threshold). Connect the AWGN signal source, via a 3-dB splitter, to the signal analyzer 1 and the EUT.

f. Transmit the AWGN signal (RF ON) and verify its characteristics on the signal analyzer 1.

g. Monitor the signal analyzer 2 to verify if the AWGN signal has been detected and the EUT has ceased transmission. If the EUT continues to transmit, then incrementally increase the AWGN signal power level until the EUT stops transmitting.

h. (Including all losses in the RF paths) Determine and record the AWGN signal power level (at the EUT's antenna port) at which the EUT ceased transmission. Repeat the procedure at least 10 times to verify the EUT can detect an AWGN signal with 90% (or better) level of certainty.

i. Refer to step C table to determine number of times the detection threshold testing needs to be repeated. If testing is required more than once, then go back to step d, choose a different center frequency for the AWGN signal and repeat the process.

4.7.3 Test Instruments

RF Test Room					
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Spectrum analyzer	Agilent	N9020A	HKE-025	Feb. 20, 2024	Feb. 19, 2025
RF cable	Times	1-40G	HKE-034	Feb. 20, 2024	Feb. 19, 2025
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 20, 2024	Feb. 19, 2025
RF Test Software	Tonscend	JS1120-3 Version 3.5.39	HKE-083	N/A	N/A
Signal source	Rohde&Schwarz	SMCV100B	HKE-190	Feb. 20, 2024	Feb. 19, 2025

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

RF Test Room					
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Spectrum analyzer	Agilent	N9020A	HKE-025	Feb. 19, 2025	Feb. 18, 2026
RF cable	Times	1-40G	HKE-034	Feb. 19, 2025	Feb. 18, 2026
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 19, 2025	Feb. 18, 2026
RF Test Software	Tonscend	JS1120-3 Version 3.5.39	HKE-083	N/A	N/A
Signal source	Rohde&Schwarz	SMCV100B	HKE-190	Feb. 19, 2025	Feb. 18, 2026

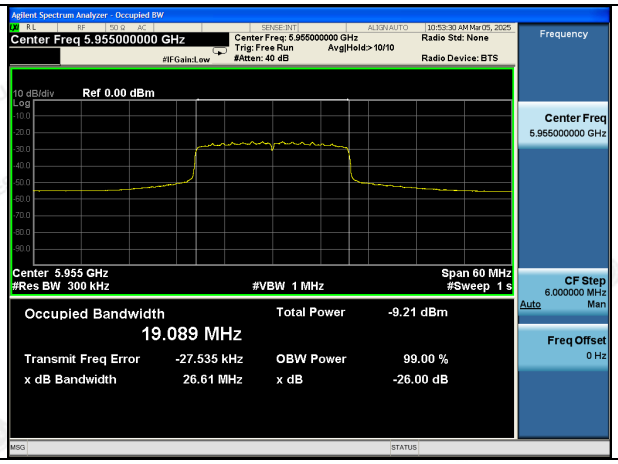
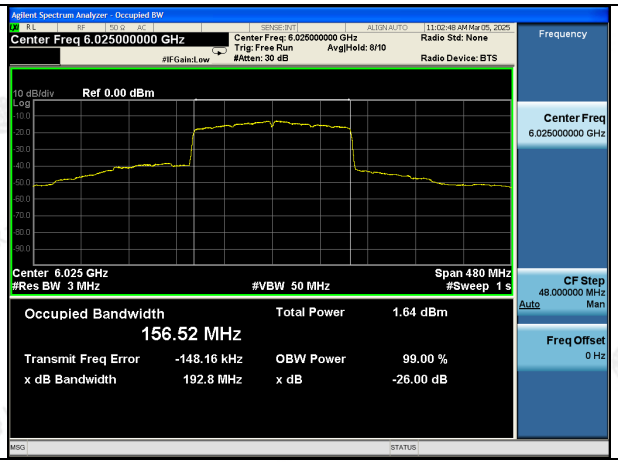
Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

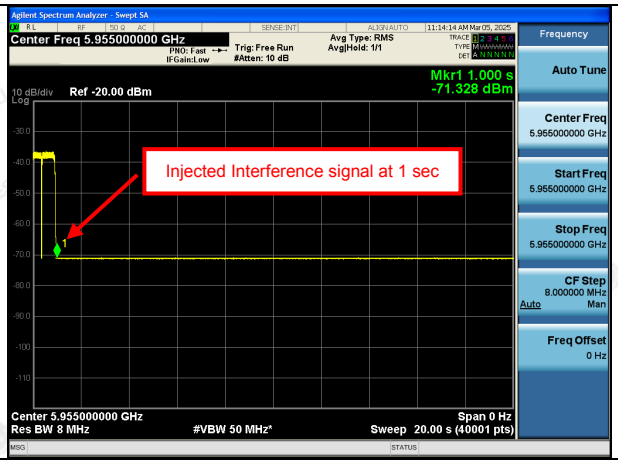
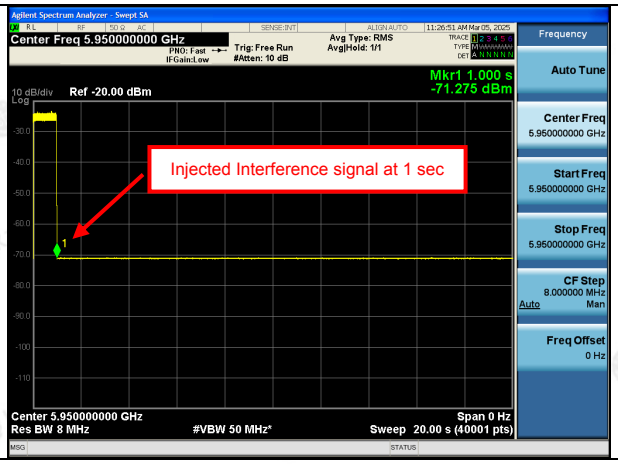
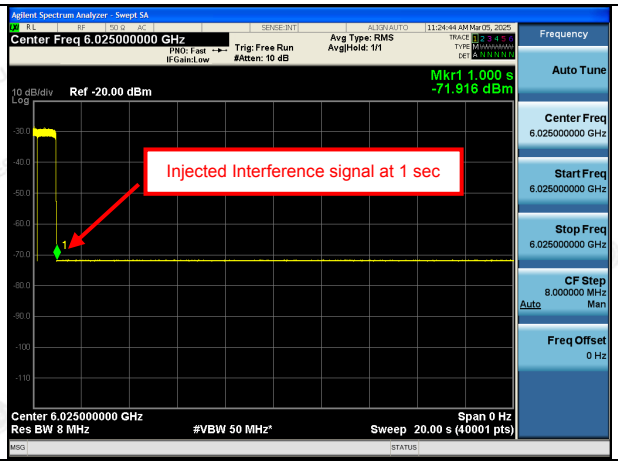
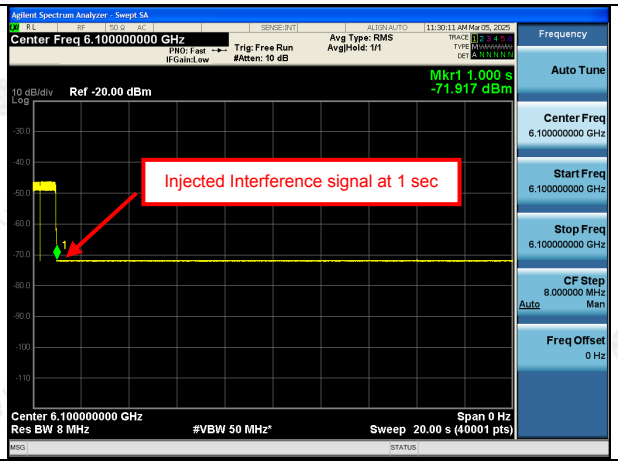
4.7.4 Test Result

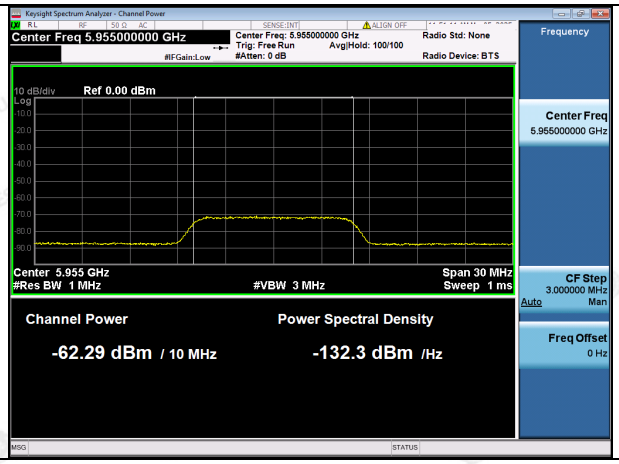
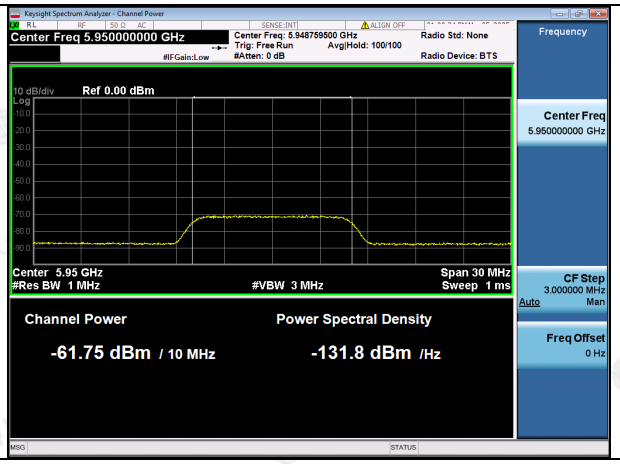
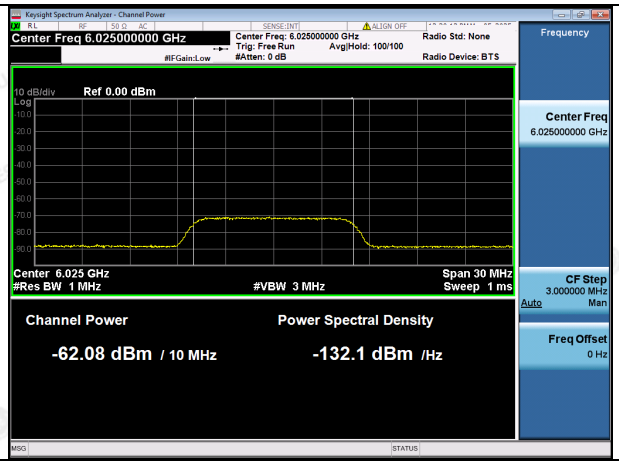
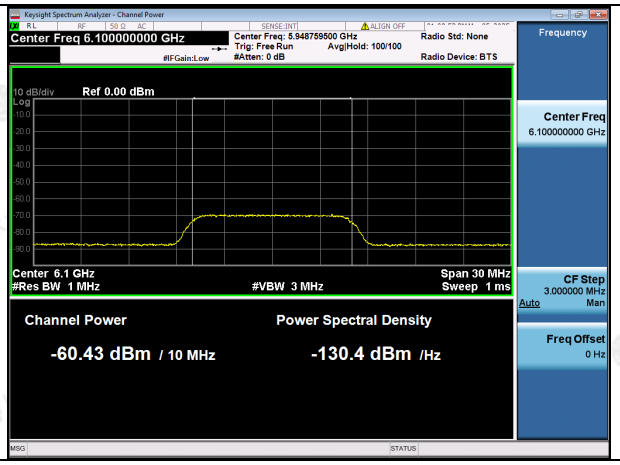
Pass

4.7.5 Test Data

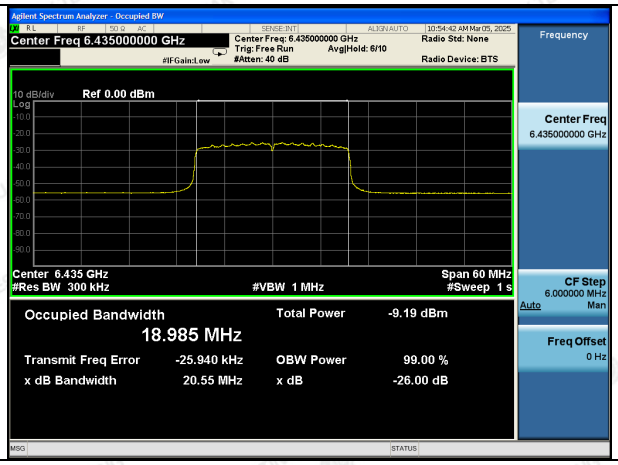
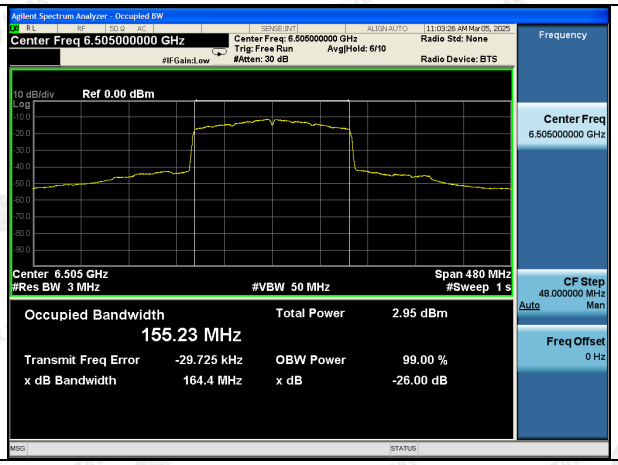
Contention Based Protocol Measurement							
Operation Band	Operation Mode	Channel Bandwidth	Channel number	Channel Frequency (MHz)	AWGN Signal Frequency (MHz)	Detection Limit (dBm)	Test Result
U-NII-5	802.11ax	20	1	5955	5955	-62	Pass
		160	15	6025	5950	-62	Pass
					6025	-62	Pass
					6100	-62	Pass

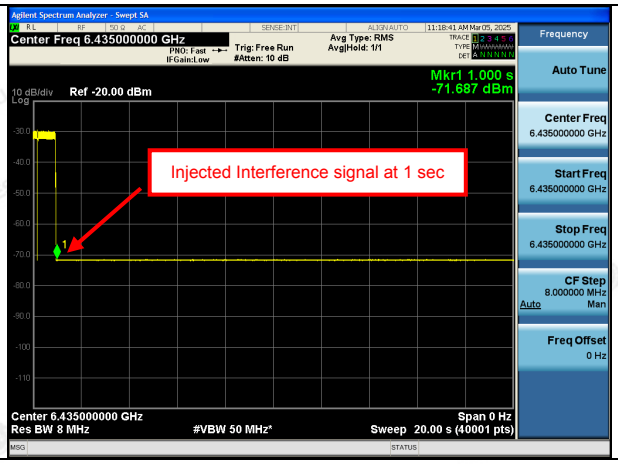
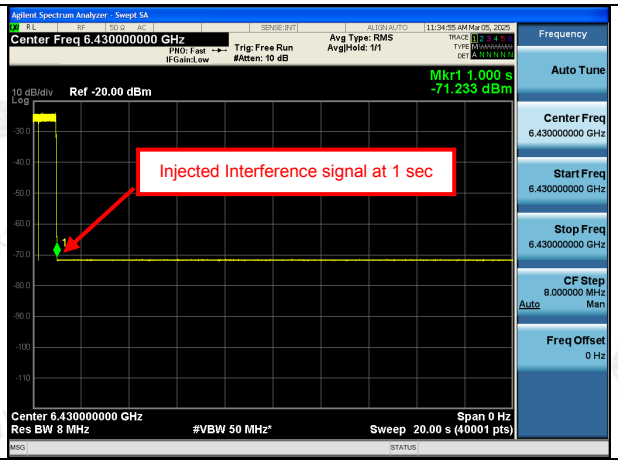
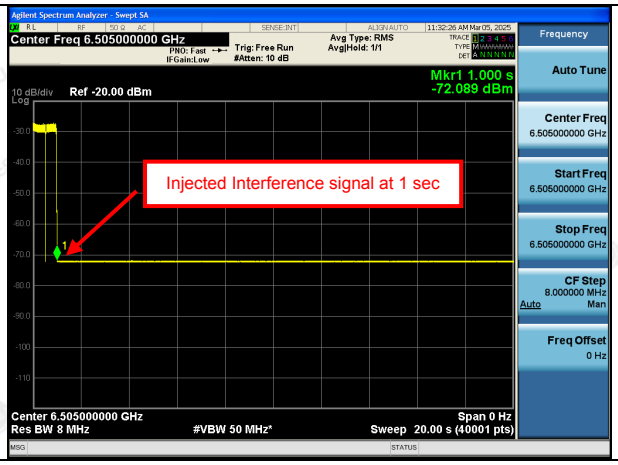
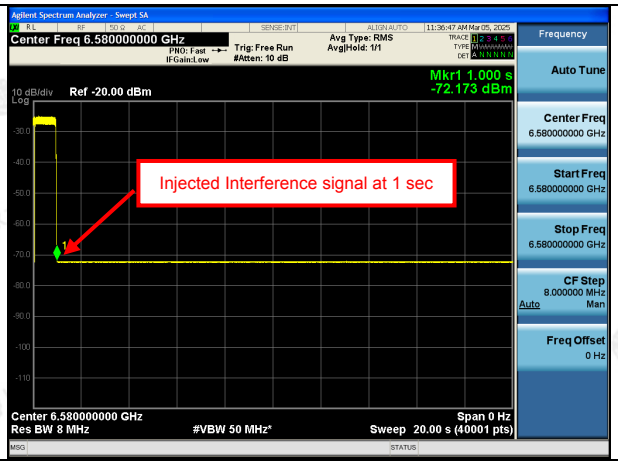
802.11ax (HE20) / CH1	802.11ax (HE160) / CH15
	

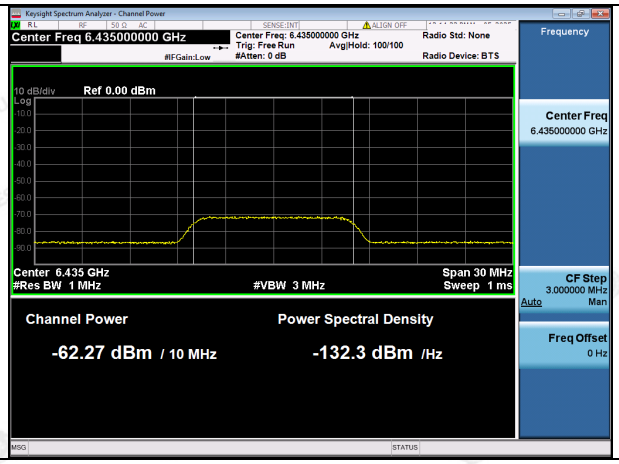
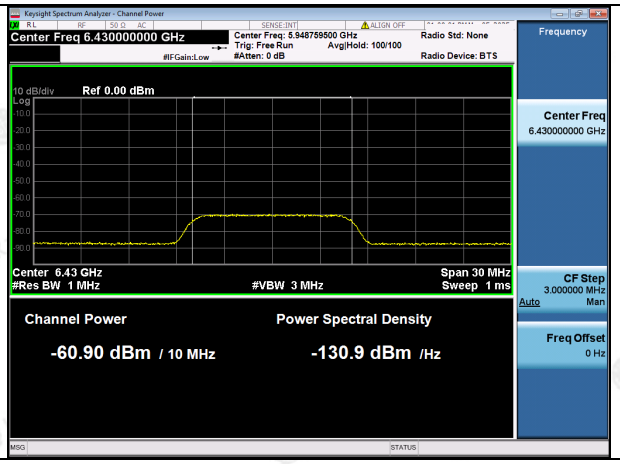
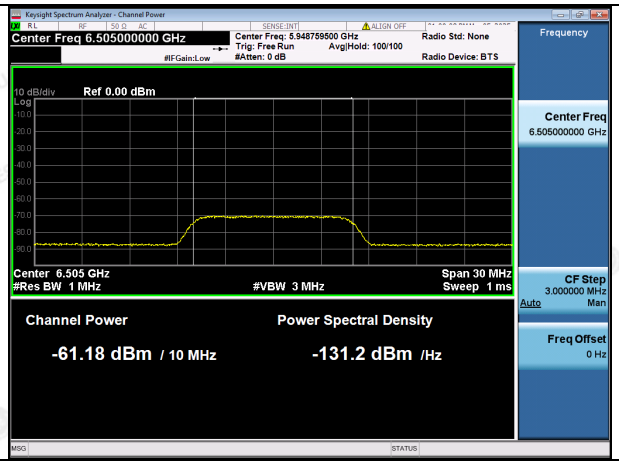
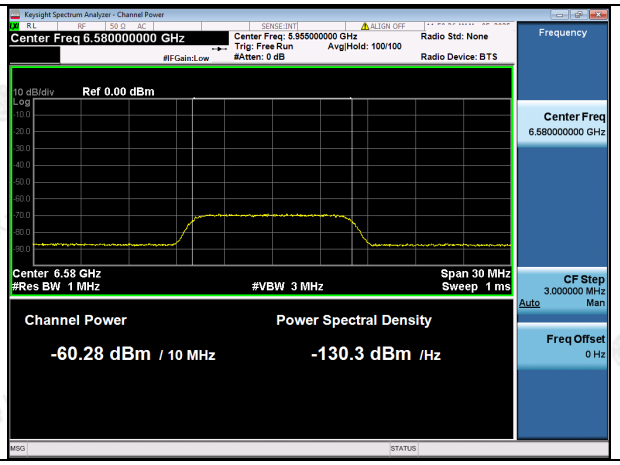
Plots of Incumbent Signal (AWGN) Level	
802.11ax (HE20) / CH1	802.11ax (HE160) / CH15 (Low Edge)
	
802.11ax (HE160) / CH15 (Middle Edge)	802.11ax (HE160) / CH15 (High Edge)
	

Plots of EUT Ceased Transmission In The Time Domain	
802.11ax (HE20) / CH1	802.11ax (HE160) / CH15 (Low Edge)
	
802.11ax (HE160) / CH15 (Middle Edge)	802.11ax (HE160) / CH15 (High Edge)
	

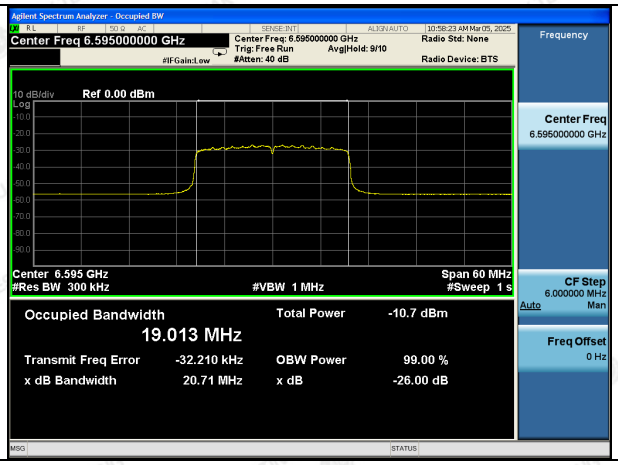
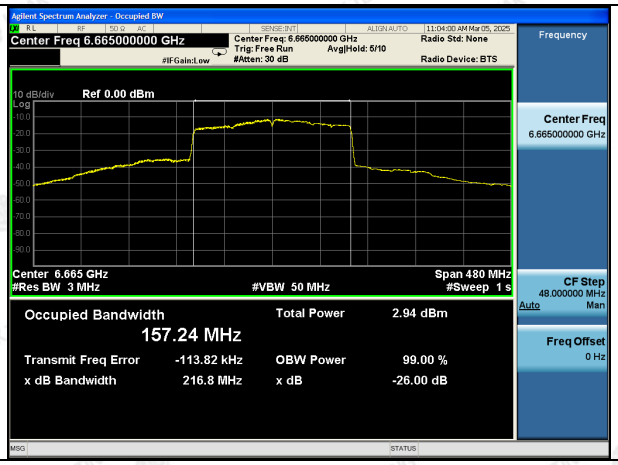
Contention Based Protocol Measurement							
Operation Band	Operation Mode	Channel Bandwidth	Channel number	Channel Frequency (MHz)	AWGN Signal Frequency (MHz)	Detection Limit (dBm)	Test Result
U-NII-6	802.11ax	20	97	6435	6435	-62	Pass
		160	111	6505	6430	-62	Pass
					6505	-62	Pass
					6580	-62	Pass

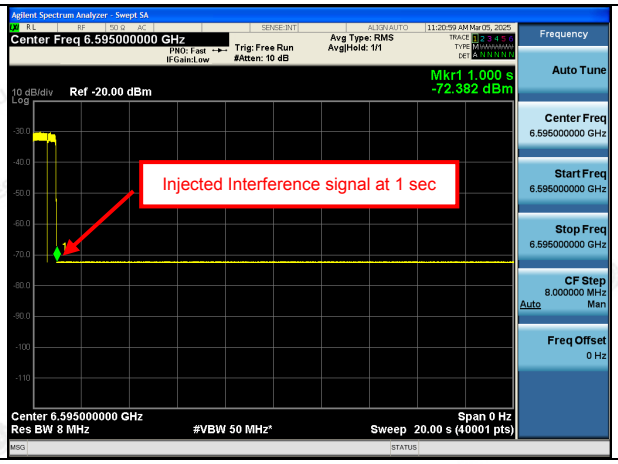
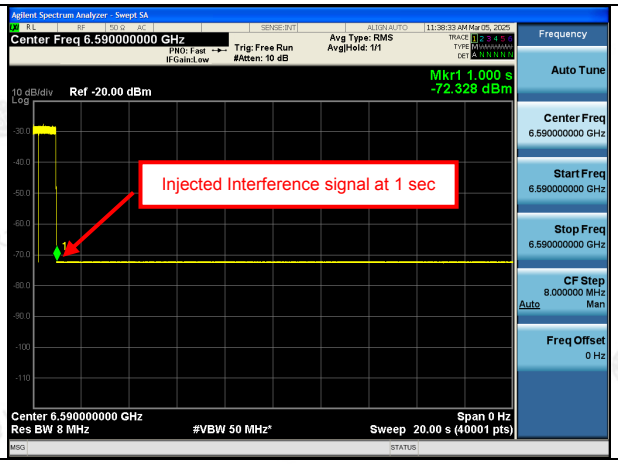
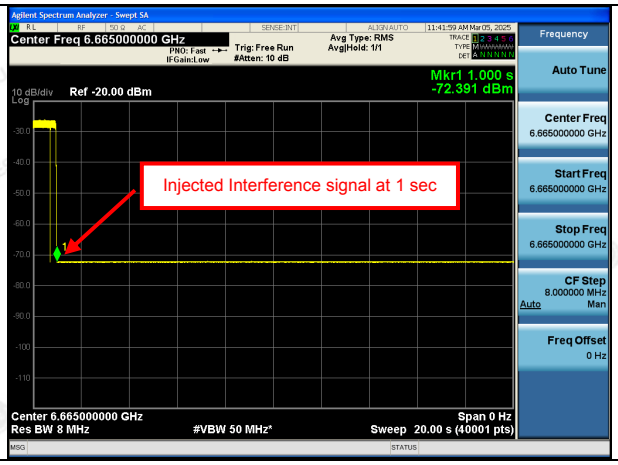
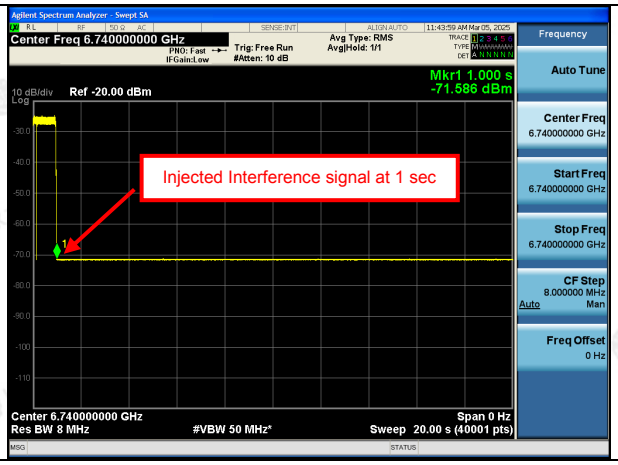
802.11ax (HE20) / CH97	802.11ax (HE160) / CH111
	

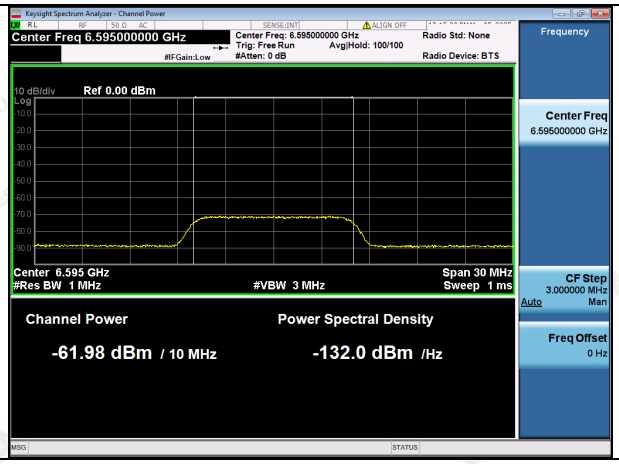
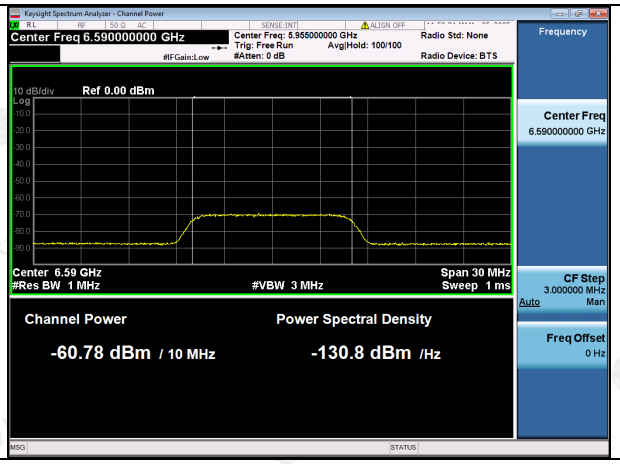
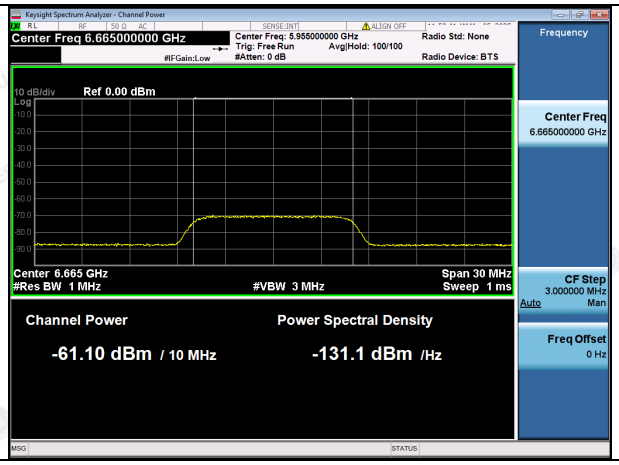
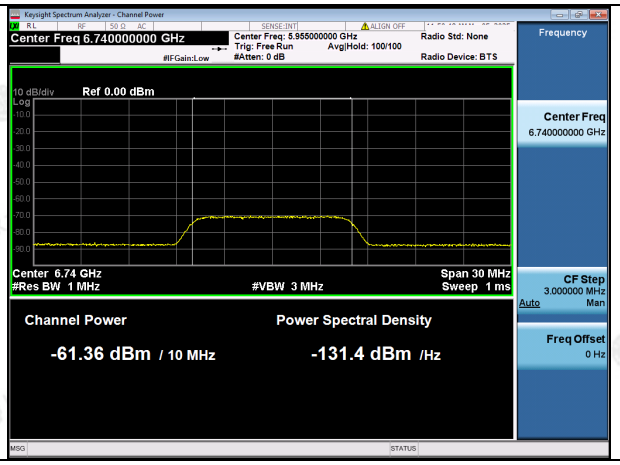
Plots of Incumbent Signal (AWGN) Level	
802.11ax (HE20) / CH97	802.11ax (HE160) / CH111 (Low Edge)
	
802.11ax (HE160) / CH111 (Middle Edge)	802.11ax (HE160) / CH111 (High Edge)
	

Plots of EUT Ceased Transmission In The Time Domain	
802.11ax (HE20) / CH97	802.11ax (HE160) / CH111 (Low Edge)
	
802.11ax (HE160) / CH111 (Middle Edge)	802.11ax (HE160) / CH111 (High Edge)
	

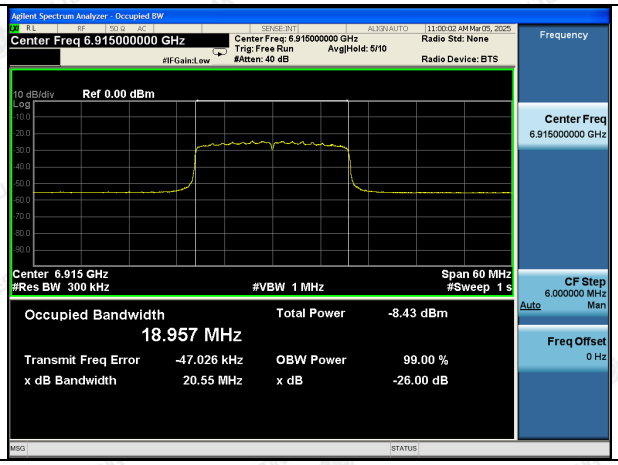
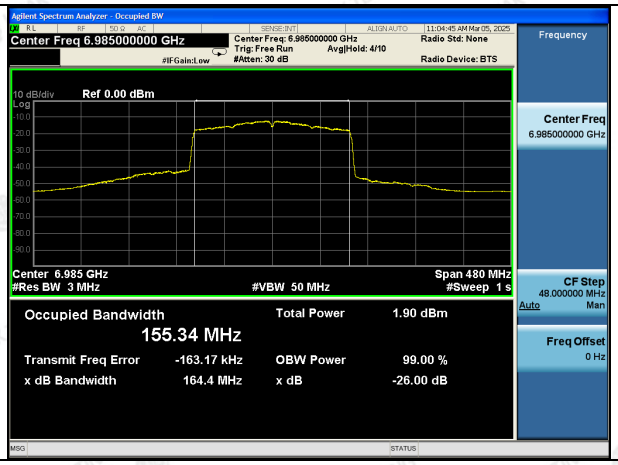
Contention Based Protocol Measurement							
Operation Band	Operation Mode	Channel Bandwidth	Channel number	Channel Frequency (MHz)	AWGN Signal Frequency (MHz)	Detection Limit (dBm)	Test Result
U-NII-7	802.11ax	20	129	6595	6595	-62	Pass
		160	143	6665	6590	-62	Pass
					6665	-62	Pass
					6740	-62	Pass

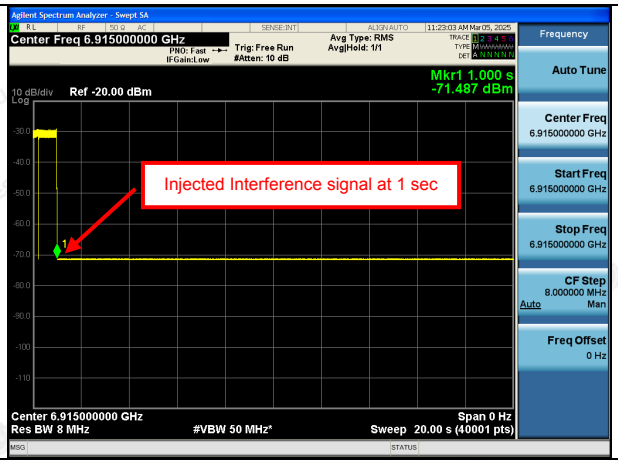
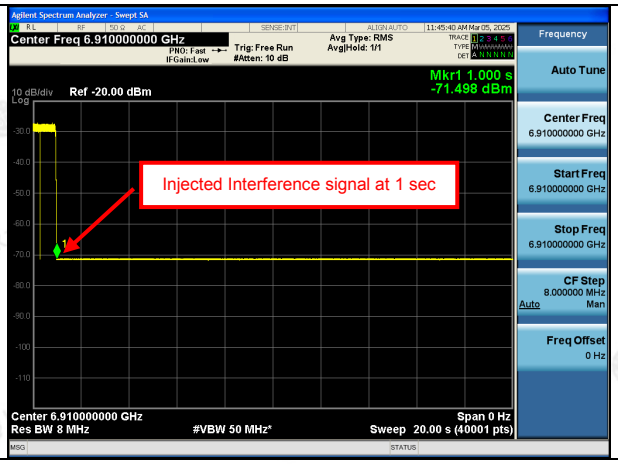
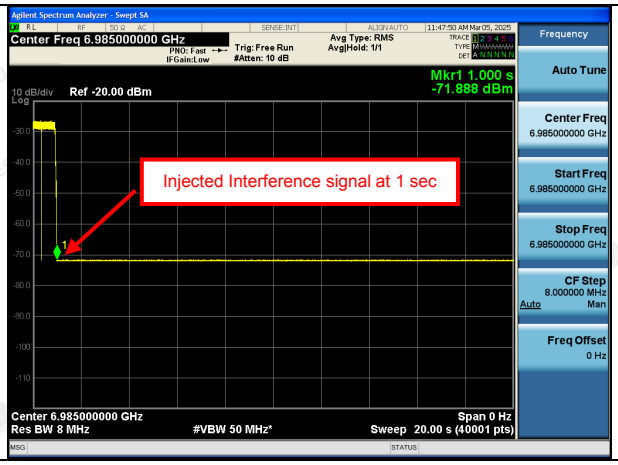
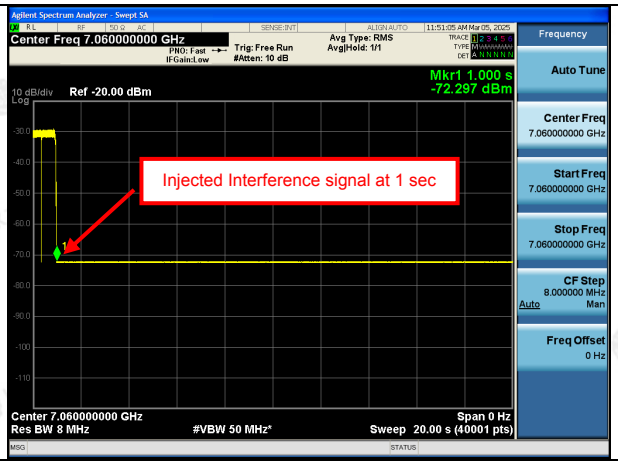
802.11ax (HE20) / CH129	802.11ax (HE160) / CH143
	

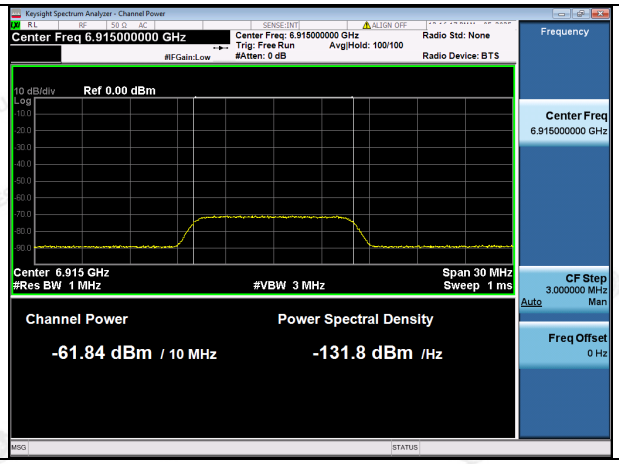
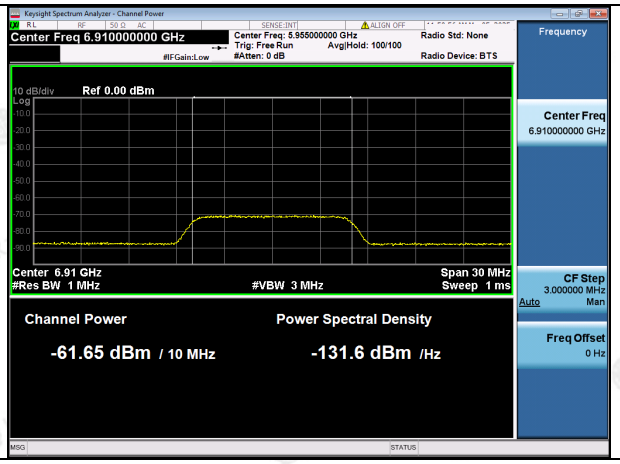
Plots of Incumbent Signal (AWGN) Level	
802.11ax (HE20) / CH129	802.11ax (HE160) / CH143 (Low Edge)
	
802.11ax (HE160) / CH143 (Middle Edge)	802.11ax (HE160) / CH143 (High Edge)
	

Plots of EUT Ceased Transmission In The Time Domain	
802.11ax (HE20) / CH129	802.11ax (HE160) / CH129 (Low Edge)
	
802.11ax (HE160) / CH143 (Middle Edge)	802.11ax (HE160) / CH143 (High Edge)
	

Contention Based Protocol Measurement							
Operation Band	Operation Mode	Channel Bandwidth	Channel number	Channel Frequency (MHz)	AWGN Signal Frequency (MHz)	Detection Limit (dBm)	Test Result
U-NII-8	802.11ax	20	193	6915	6915	-62	Pass
		160	207	6985	6910	-62	Pass
					6985	-62	Pass
					7060	-62	Pass

802.11ax (HE20) / CH193	802.11ax (HE160) / CH207
	

Plots of Incumbent Signal (AWGN) Level	
802.11ax (HE20) / CH193	802.11ax (HE160) / CH207 (Low Edge)
	
802.11ax (HE160) / CH207 (Middle Edge)	802.11ax (HE160) / CH207 (High Edge)
	

Plots of EUT Ceased Transmission In The Time Domain	
802.11ax (HE20) / CH193	802.11ax (HE160) / CH207 (Low Edge)
	
802.11ax (HE160) / CH207 (Middle Edge)	802.11ax (HE160) / CH207 (High Edge)