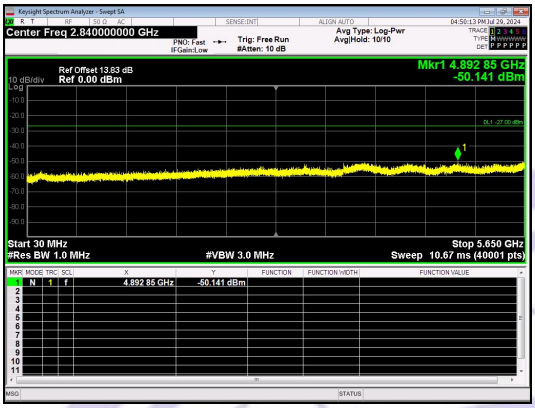
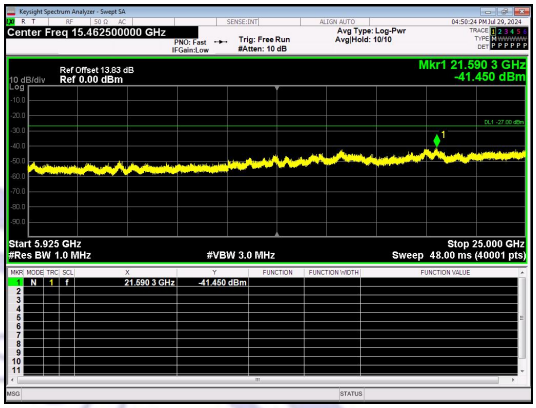


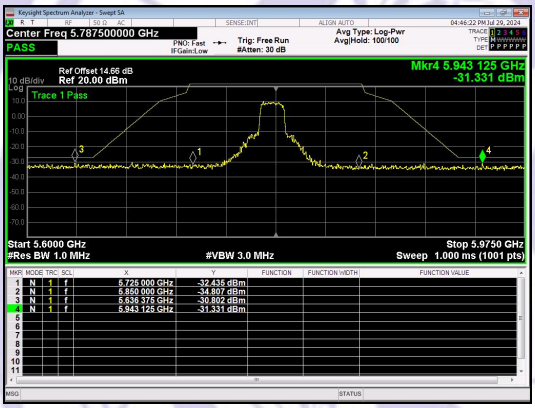
Spurious Emission:30.0~5650 MHz

IEEE 802.11n_Channel 149_20MHz_Antenna 0



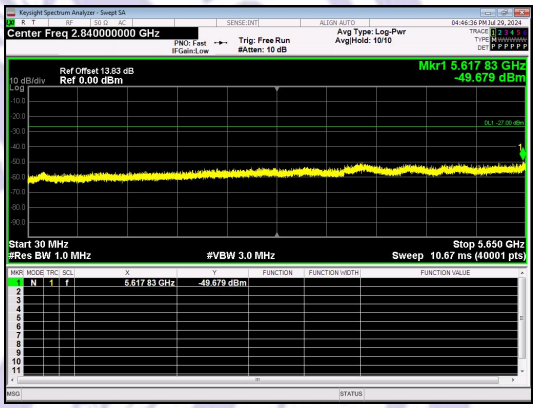
Spurious Emission:5925~25000.0 MHz

IEEE 802.11n_Channel 149_20MHz_Antenna 0



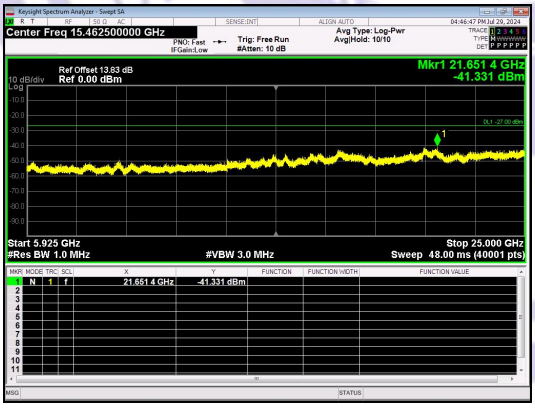
Out Of Band Emission

IEEE 802.11n_Channel 157_20MHz_Antenna 0



Spurious Emission:30.0~5650 MHz

IEEE 802.11n_Channel 157_20MHz_Antenna 0

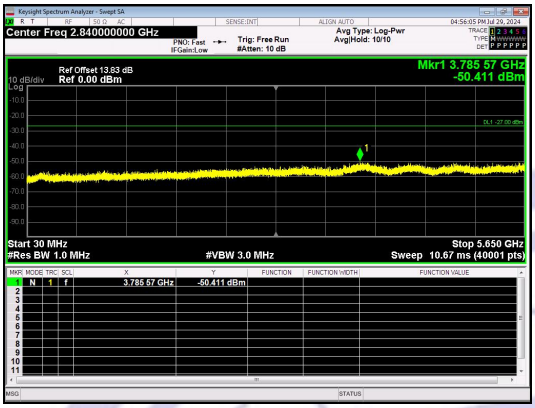


Spurious Emission:5925~25000.0 MHz

IEEE 802.11n_Channel 157_20MHz_Antenna 0

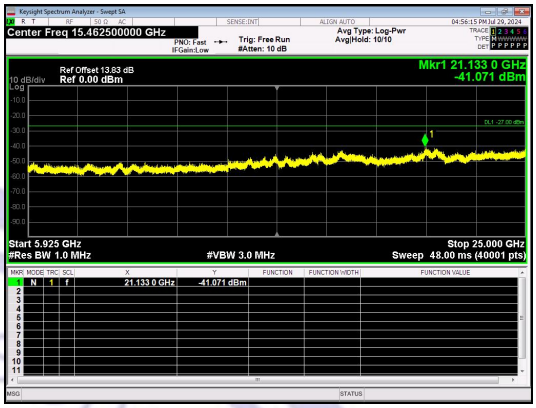
Out Of Band Emission

IEEE 802.11n_Channel 165_20MHz_Antenna 0



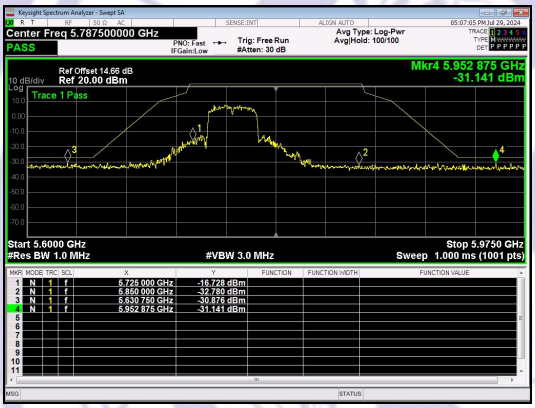
Spurious Emission:30.0~5650 MHz

IEEE 802.11n_Channel 165_20MHz_Antenna 0



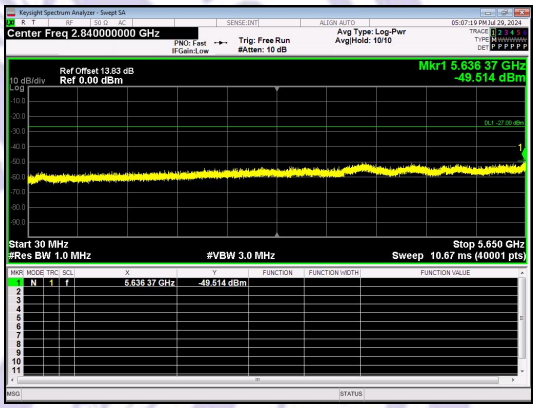
Spurious Emission:5925~25000.0 MHz

IEEE 802.11n_Channel 165_20MHz_Antenna 0



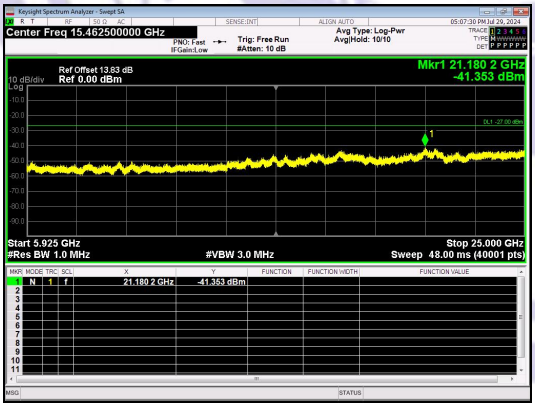
Out Of Band Emission

IEEE 802.11n_Channel 151_40MHz_Antenna 0



Spurious Emission:30.0~5650 MHz

IEEE 802.11n_Channel 151_40MHz_Antenna 0

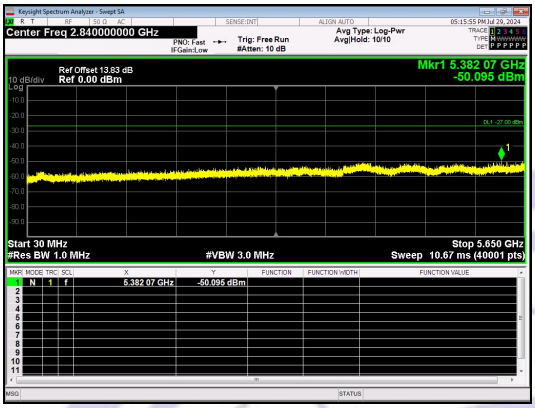
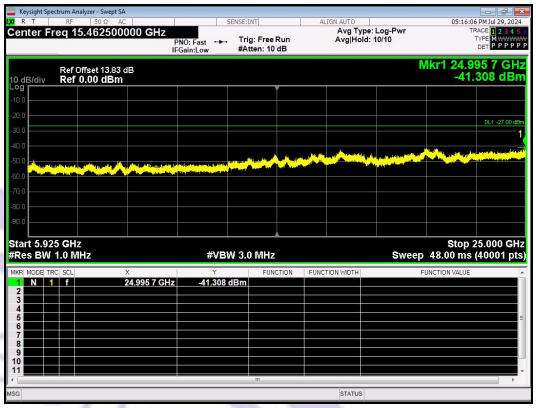


Spurious Emission:5925~25000.0 MHz

IEEE 802.11n_Channel 151_40MHz_Antenna 0

Out Of Band Emission

IEEE 802.11n_Channel 159_40MHz_Antenna 0

	
Spurious Emission:30.0~5650 MHz **IEEE 802.11n_Channel 159_40MHz_Antenna 0**	**Spurious Emission:5925~25000.0 MHz** **IEEE 802.11n_Channel 159_40MHz_Antenna 0**

12 Frequency Stability Measurement

12.1 Test Standard and Limit

FCC

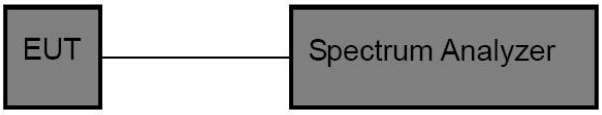
Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification).

IC

If the frequency stability of the licence-exempt radio apparatus is not specified in the applicable RSS, the fundamental emissions of the radio apparatus should be kept within at least the central 80% of its permitted operating frequency band in order to minimize the possibility of out-of-band operation. In addition, its occupied bandwidth shall be entirely outside the restricted bands and the prohibited TV bands of 54 72 MHz, 76-88 MHz, 174-216 MHz, and 470-602 MHz, unless otherwise indicated.

12.2 Test Setup



12.3 Test Procedure

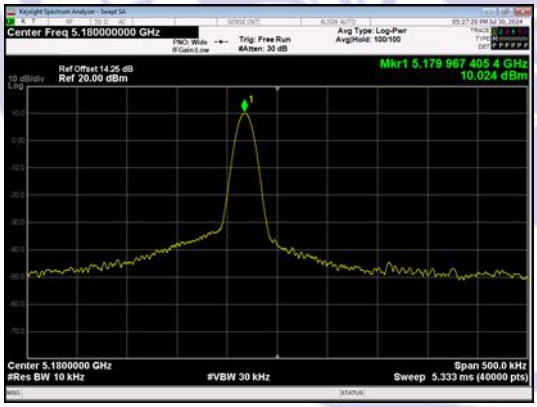
1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 106 ppm and the limit is less than ±20ppm (IEEE 802.11nspecification).

6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value

7. Extreme temperature is -20°C~50°C.

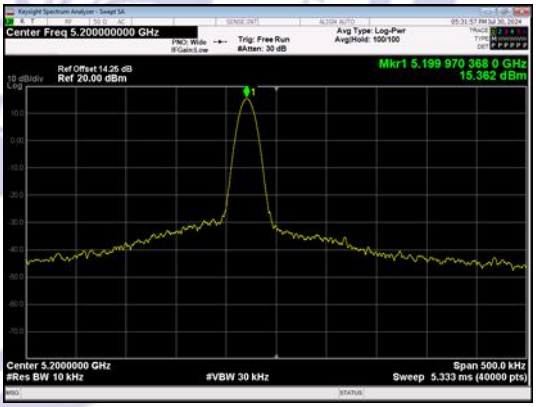
12.4 Test Data

Condition	Ch.	Antenna	Center Frequency (MHz)	Calculated Value of Center Frequency(MHz)	Result (ppm)	Limit (ppm)	State
NT/NV	36	0	5180.0	5179.967405	-6.29	Within authorized band	PASS
	40		5200.0	5199.970368	-5.7		PASS
	38		5190.0	5189.979518	-3.95		PASS
	46		5230.0	5229.980118	-3.8		PASS
	48		5240.0	5239.979206	-3.97		PASS
	149		5745.0	5744.967068	-5.73		PASS
	157		5785.0	5784.966930	-5.72		PASS
	165		5825.0	5824.966580	-5.74		PASS
	151		5755.0	5754.967068	-5.72		PASS
	159		5795.0	5794.966818	-5.73		PASS



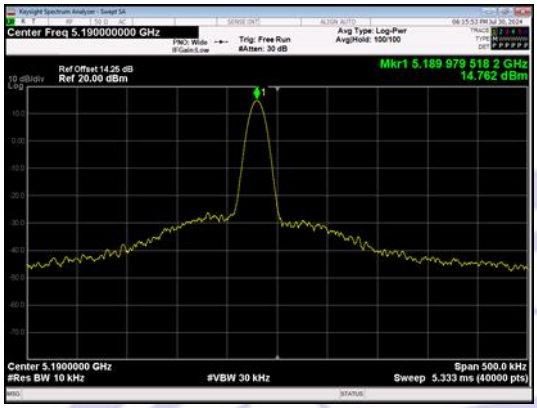
NT/NV_Antenna 0

IEEE 802.11a_Channel 36_20MHz



NT/NV_Antenna 0

IEEE 802.11a_Channel 40_20MHz

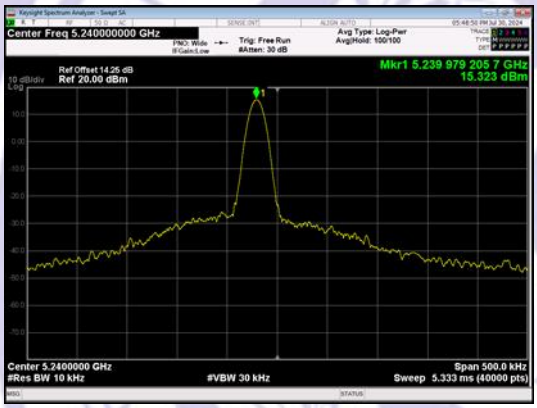


NT/NV_Antenna 0

IEEE 802.11n_Channel 38_40MHz

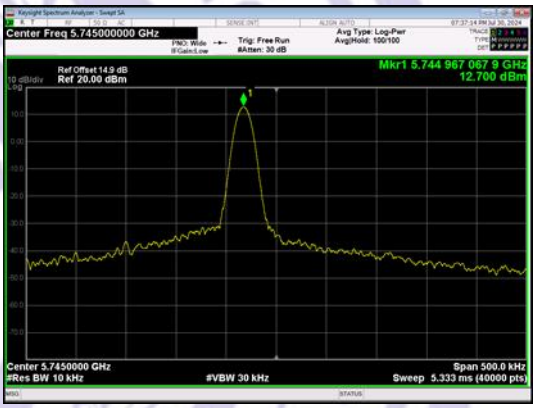
NT/NV_Antenna 0

IEEE 802.11n_Channel 46_40MHz



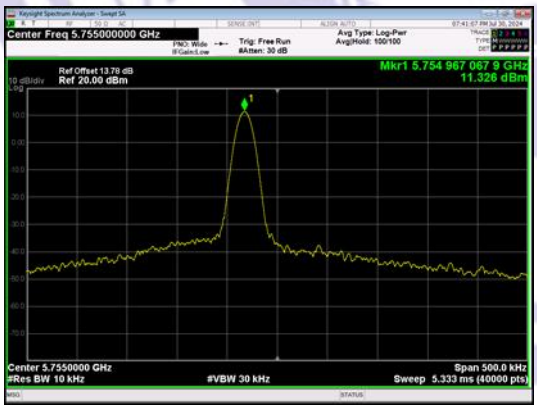
NT/NV_Antenna 0

IEEE 802.11a_Channel 48_20MHz



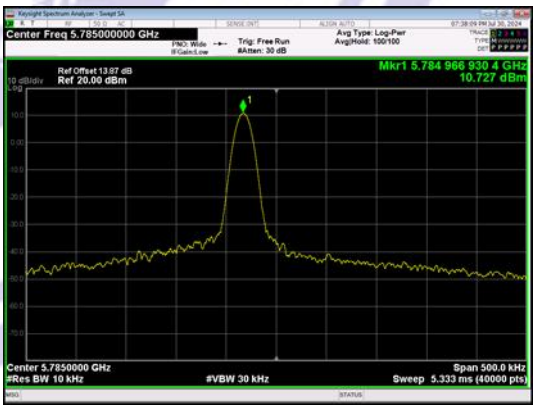
NT/NV_Antenna 0

IEEE 802.11a_Channel 149_20MHz



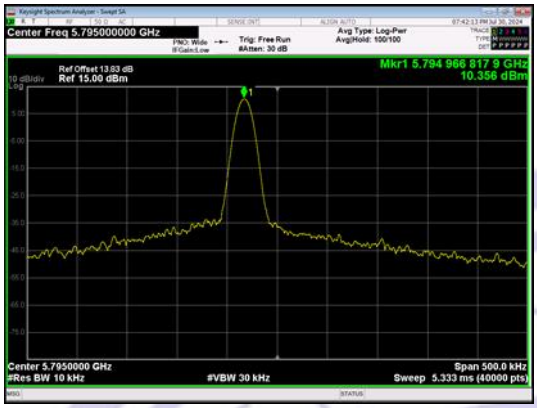
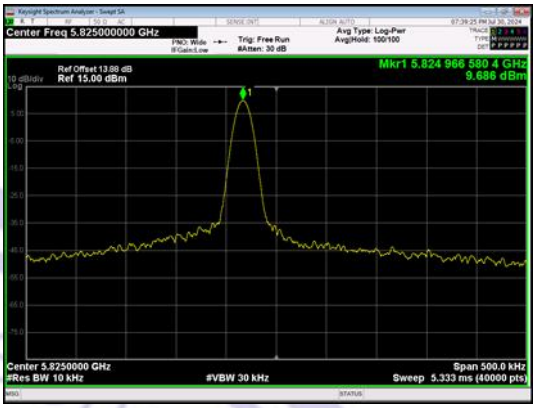
NT/NV_Antenna 0

IEEE 802.11n_Channel 151_40MHz



NT/NV_Antenna 0

IEEE 802.11a_Channel 157_20MHz

	
NT/NV_Antenna 0 **IEEE 802.11n_Channel 159_40MHz**	**NT/NV_Antenna 0** **IEEE 802.11a_Channel 165_20MHz**

13 On Time and Duty Cycle

13.1 Standard Applicable

None; for reporting purpose only

13.2 Measuring Instruments and Setting

Please refer to equipment list in this report. The following table is the setting of the spectrum analyzer.

13.3 Test Procedures

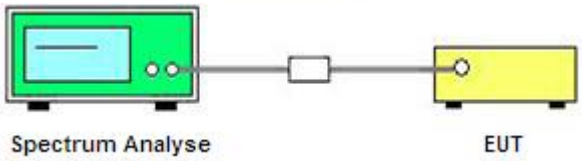
1). Set the Centre frequency of the spectrum analyzer to the transmitting frequency;

2). Set the span=0MHz, RBW=8MHz, VBW=8MHz, Sweep time=10001pts;

3). Detector = peak;

4). Trace mode = Single hold.

13.4 Test Setup Layout



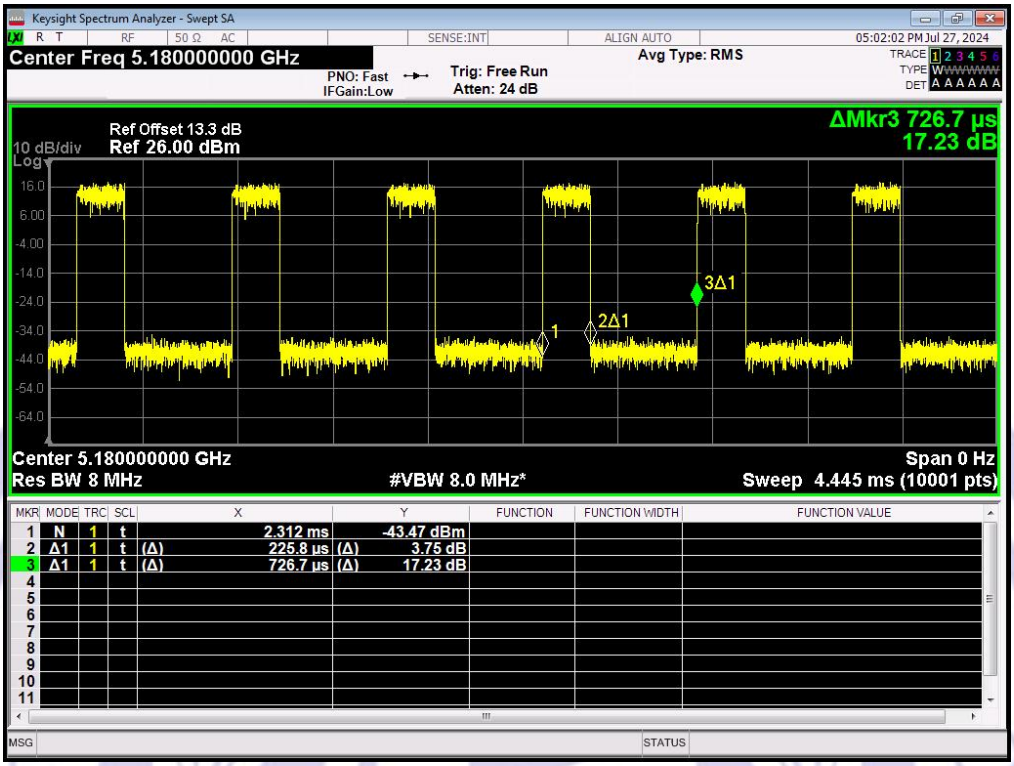
13.5 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

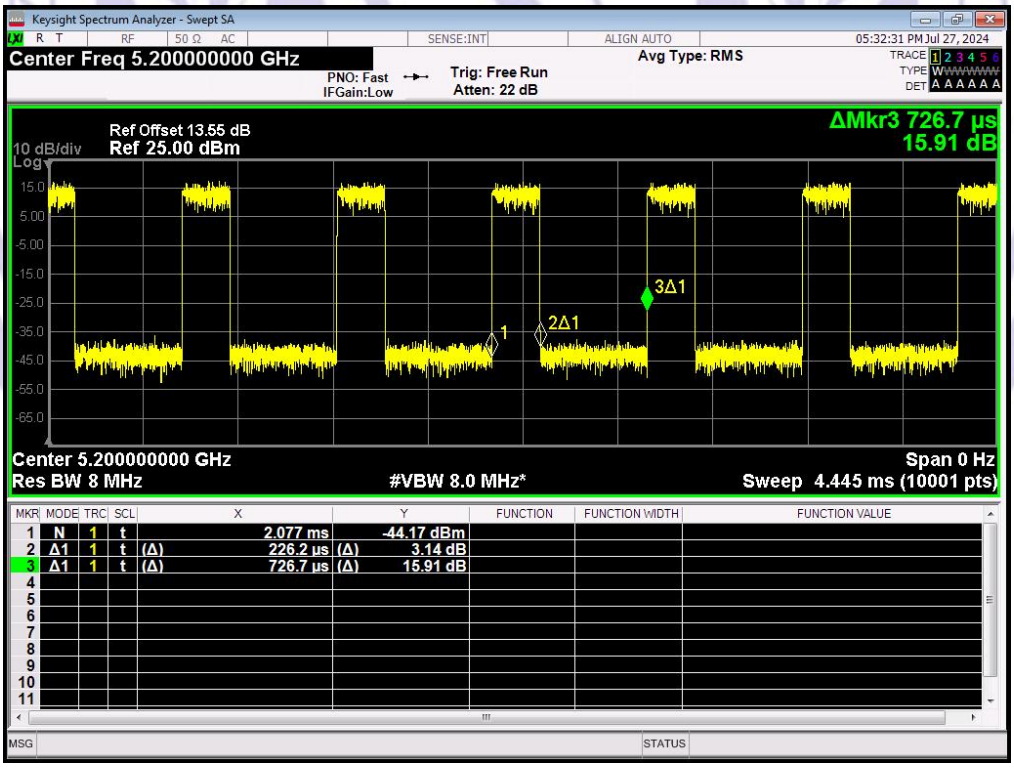
13.6 Test result

Mode	Channel	Antenna	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)
IEEE 802.11a	36	0	0.226	0.727	31.07	0.3107	5.0766
	40		0.226	0.727	31.13	0.3113	5.0682
	48		0.226	0.727	31.13	0.3113	5.0682
	149		0.246	0.747	32.98	0.3298	4.8175
	157		0.246	0.747	32.92	0.3292	4.8254
	165		0.246	0.747	32.98	0.3298	4.8175
IEEE 802.11n_20	36		0.246	0.747	32.98	0.3298	4.8175
	40		0.246	0.747	32.98	0.3298	4.8175
	48		0.246	0.747	32.92	0.3292	4.8254
	149		0.226	0.727	31.11	0.3111	5.071
	157		0.226	0.727	31.11	0.3111	5.071
	165		0.226	0.727	31.13	0.3113	5.0682
IEEE 802.11n_40	38		0.129	0.631	20.54	0.2054	6.874
	46		0.130	0.631	20.65	0.2065	6.8508
	151		0.129	0.631	20.49	0.2049	6.8846
	159		0.129	0.631	20.49	0.2049	6.8846

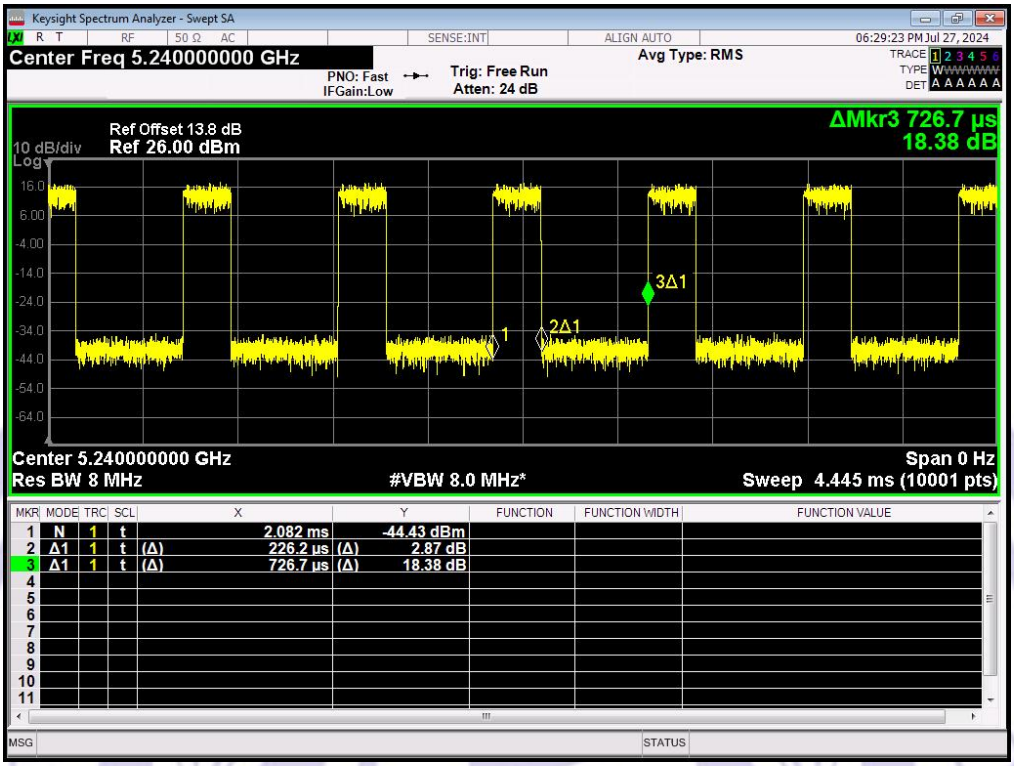
Test Graphs



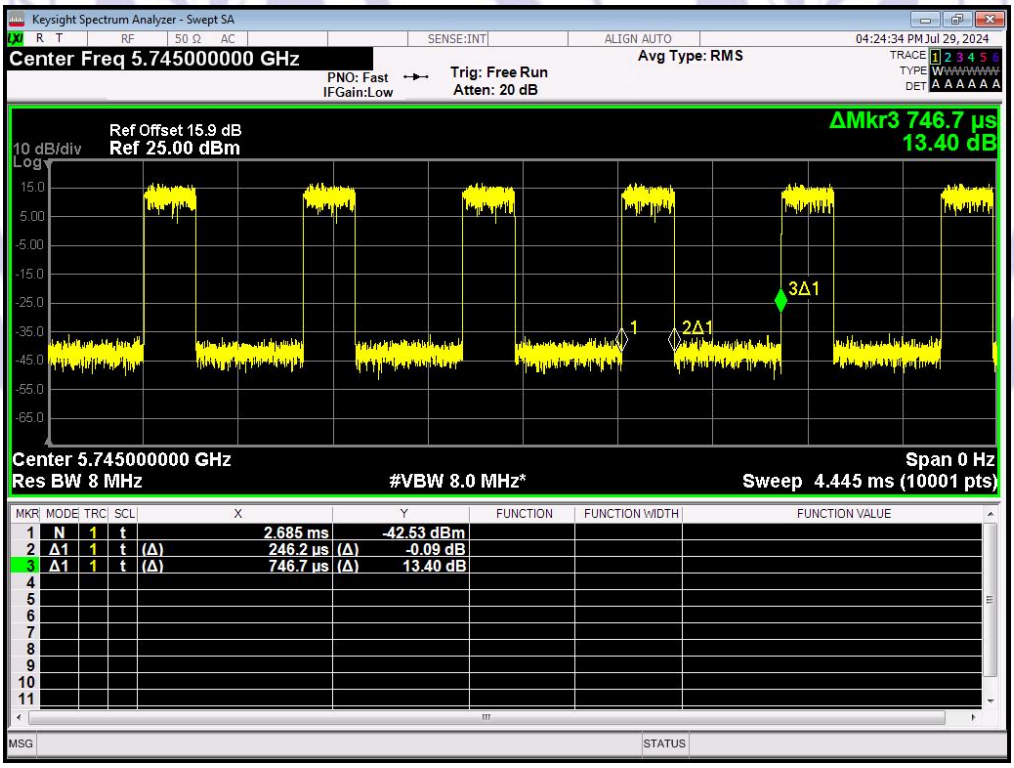
IEEE 802.11a_20MHz_Channel 36



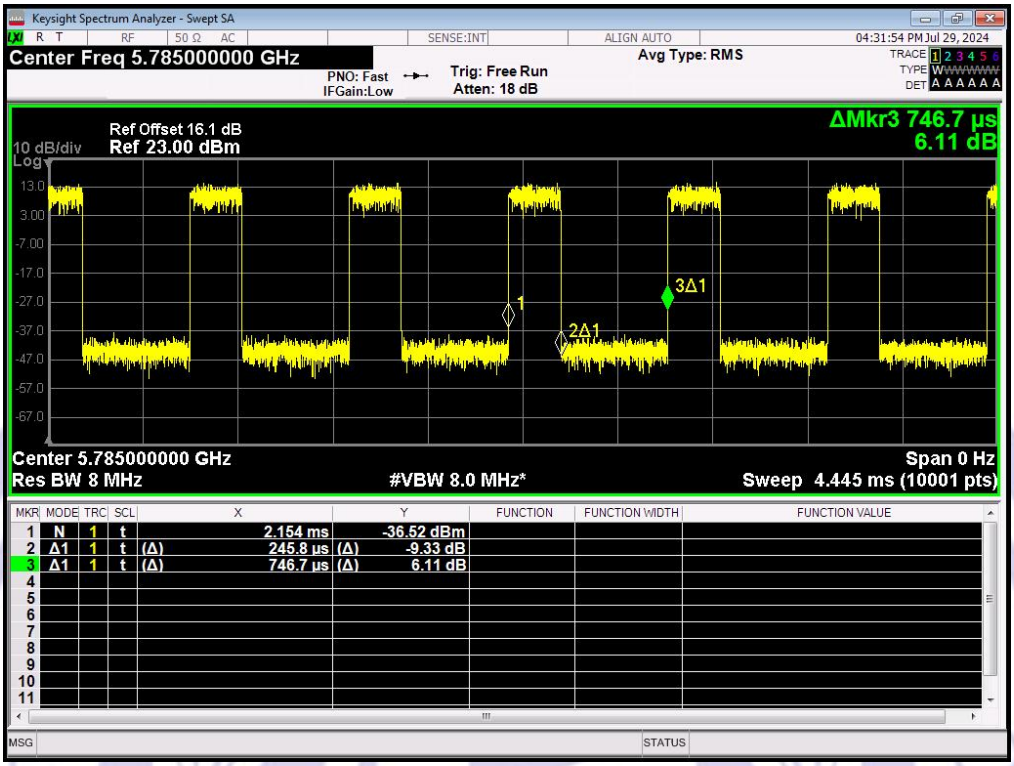
IEEE 802.11a_20MHz_Channel 40



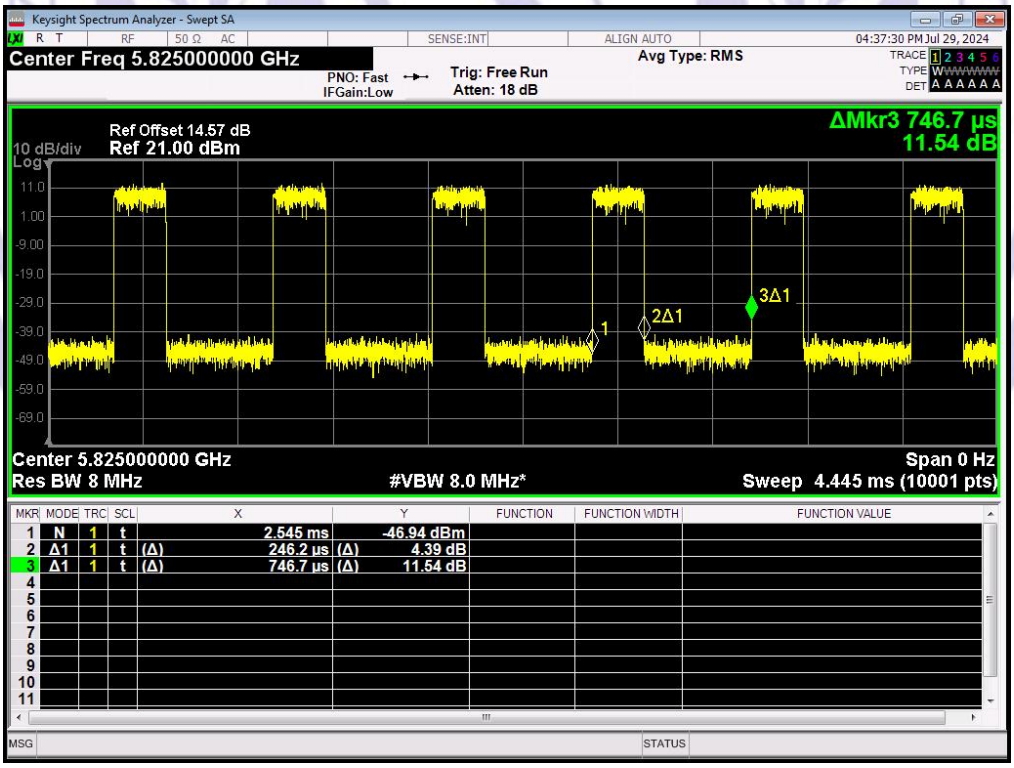
IEEE 802.11a_20MHz_Channel 48



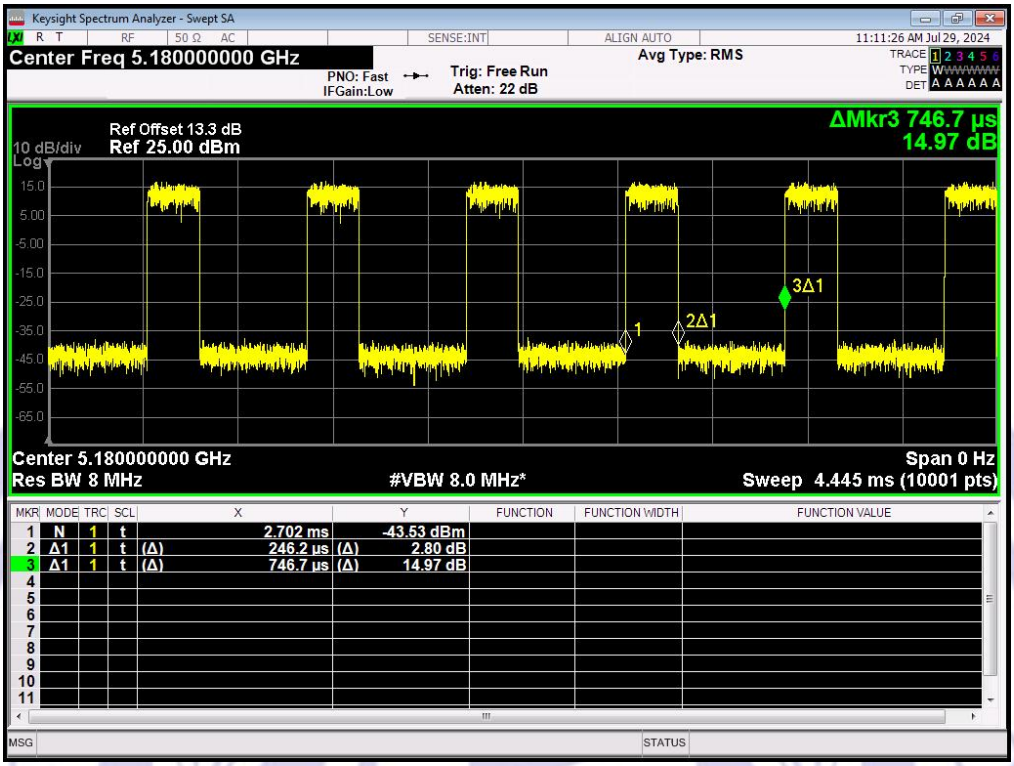
IEEE 802.11a_20MHz_Channel 149



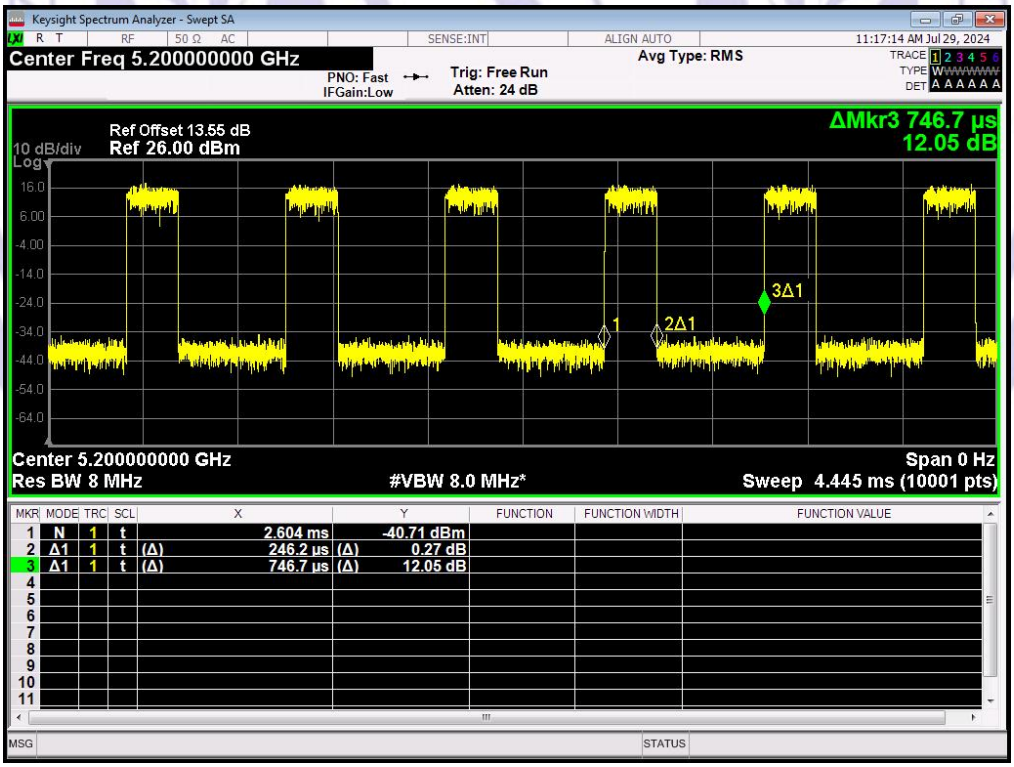
IEEE 802.11a_20MHz_Channel 157



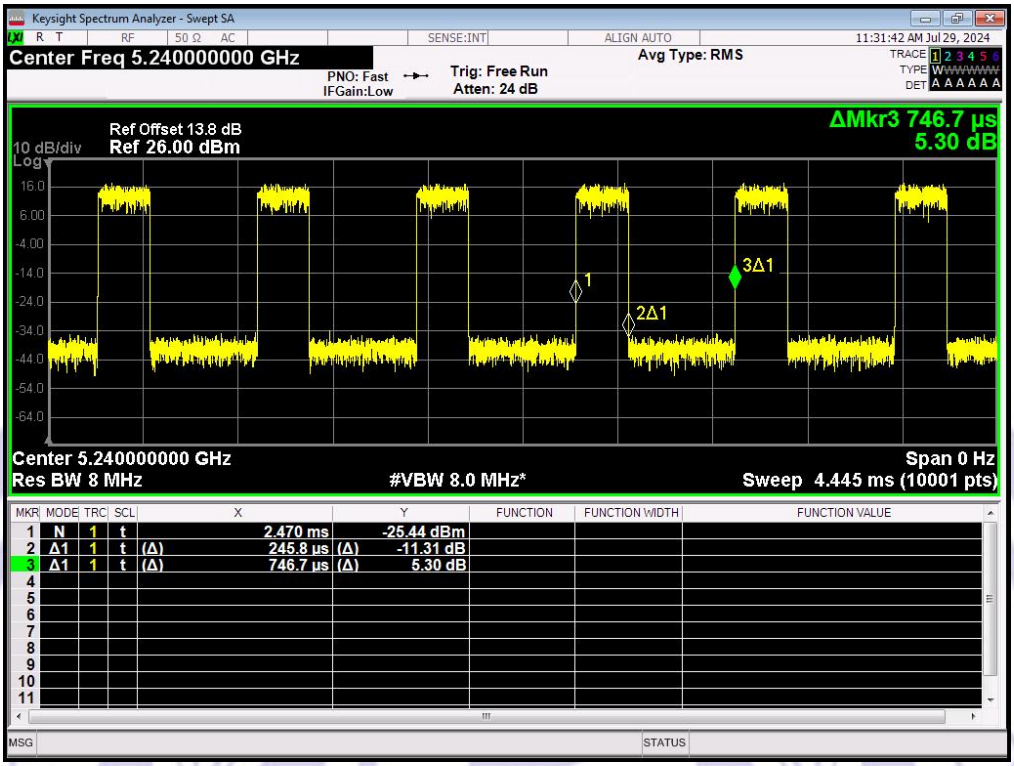
IEEE 802.11a_20MHz_Channel 165



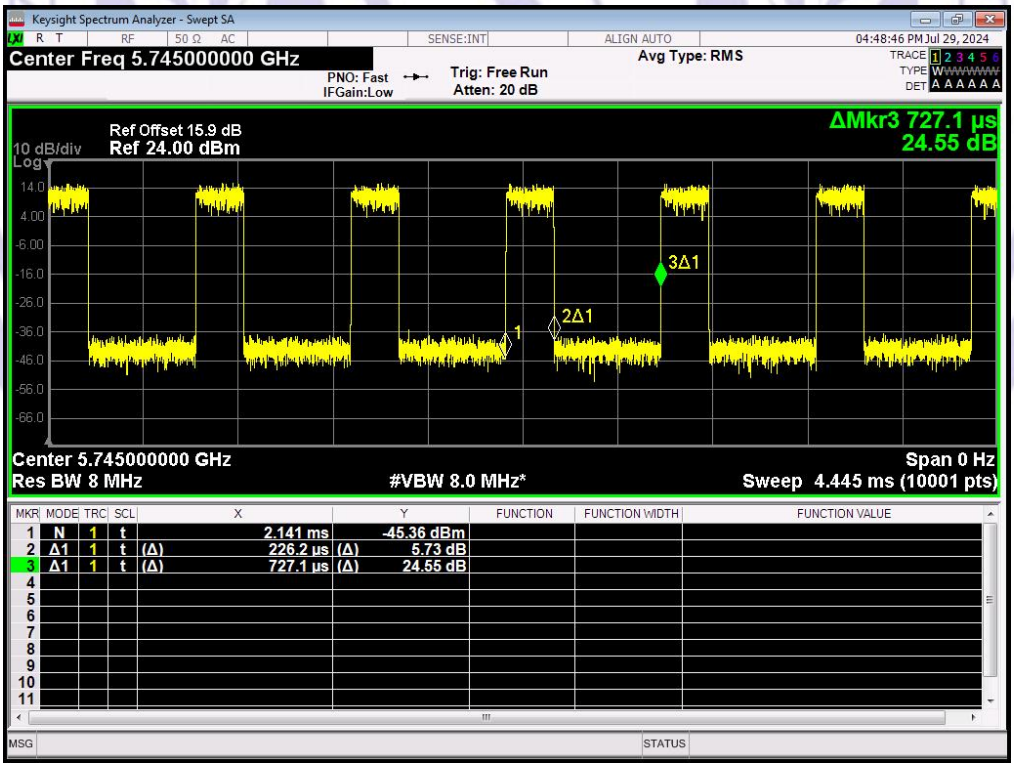
IEEE 802.11n_20MHz_Channel 36



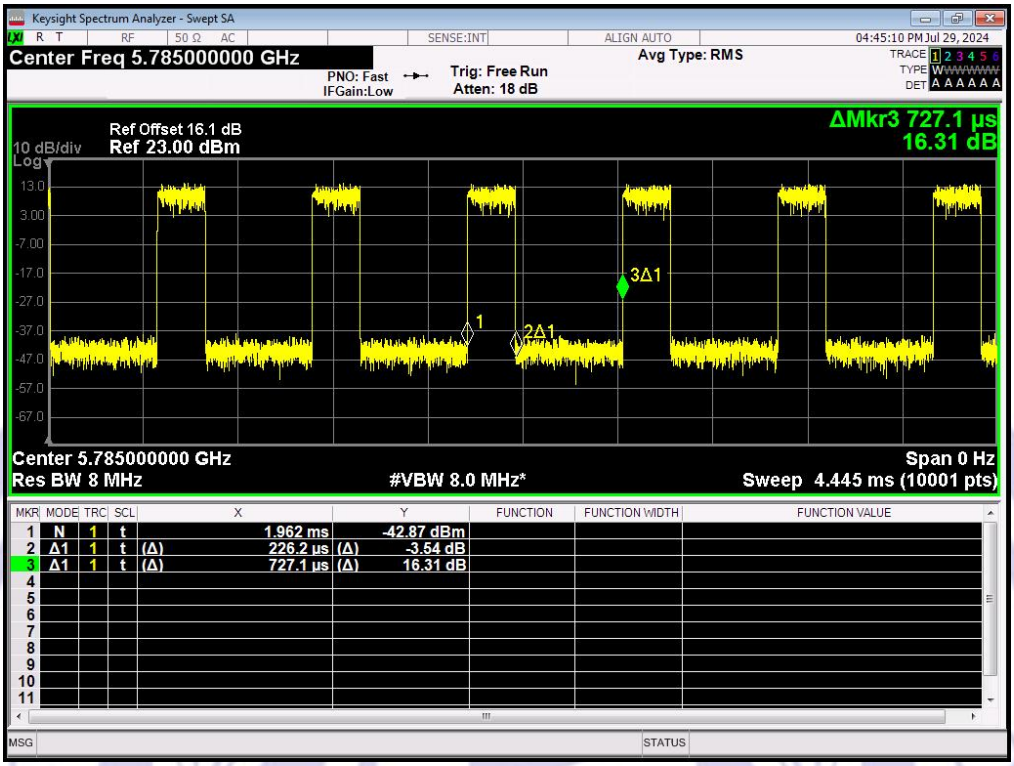
IEEE 802.11n_20MHz_Channel 40



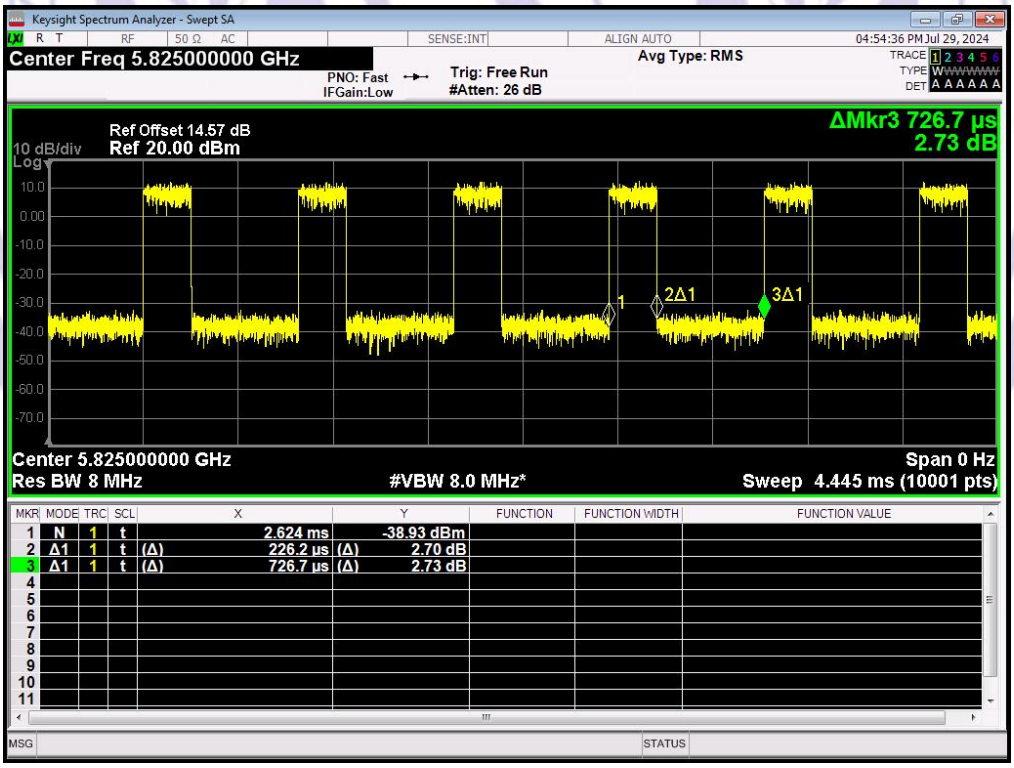
IEEE 802.11n_20MHz_Channel 48



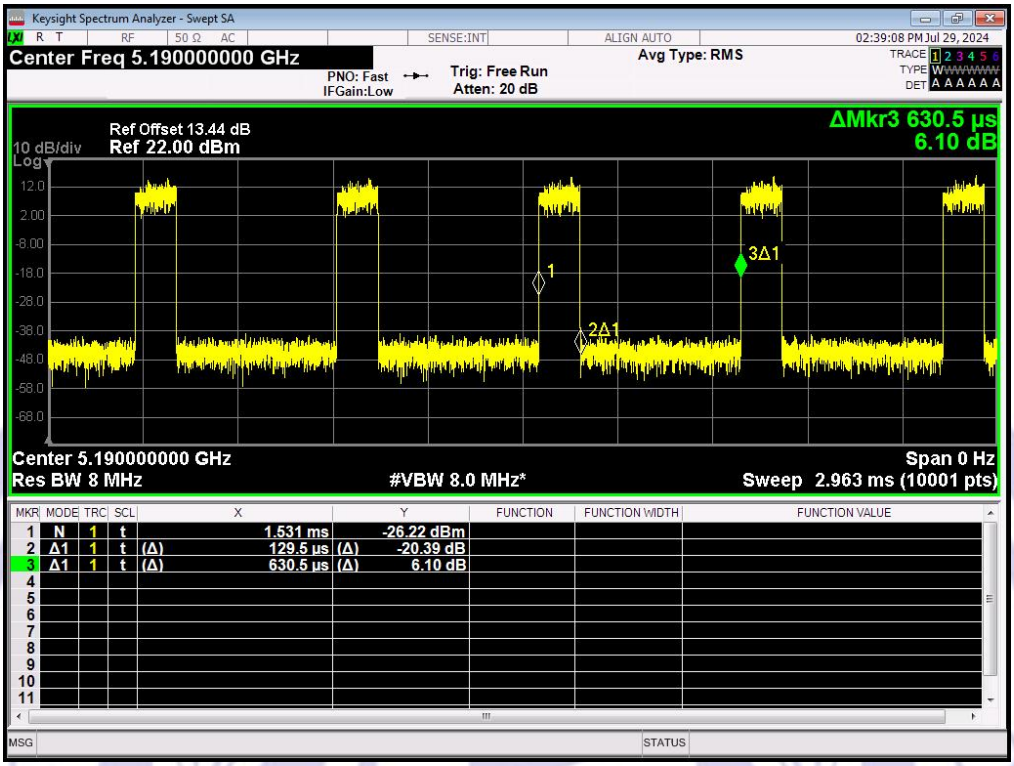
IEEE 802.11n_20MHz_Channel 149



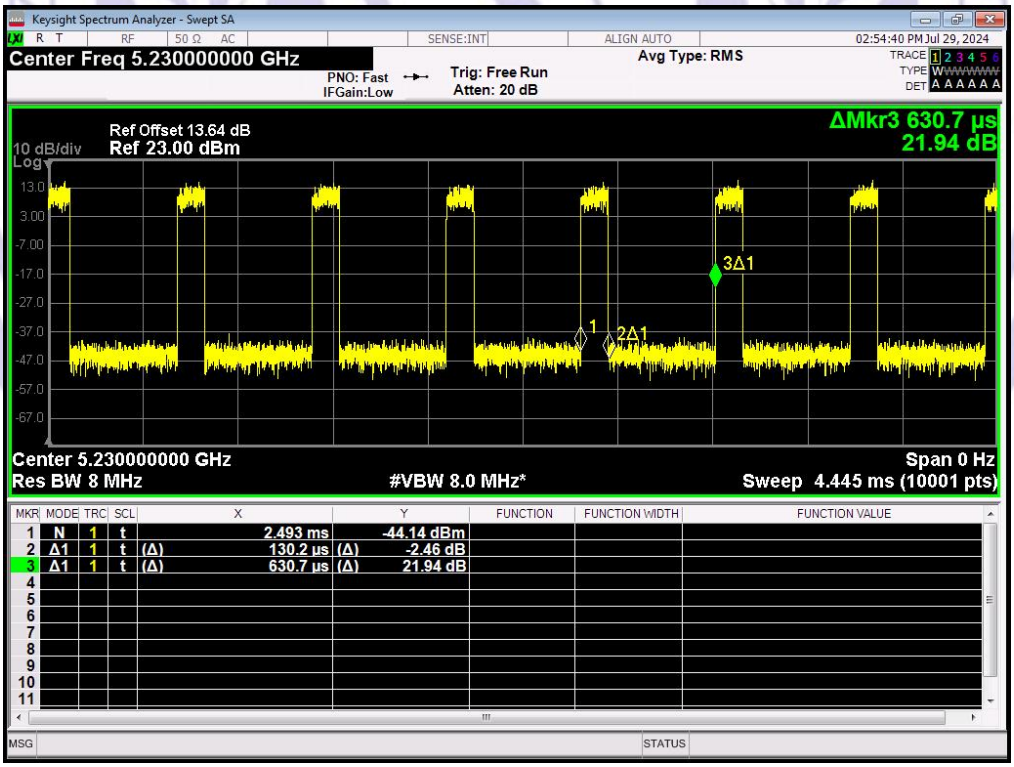
IEEE 802.11n_20MHz_Channel 157



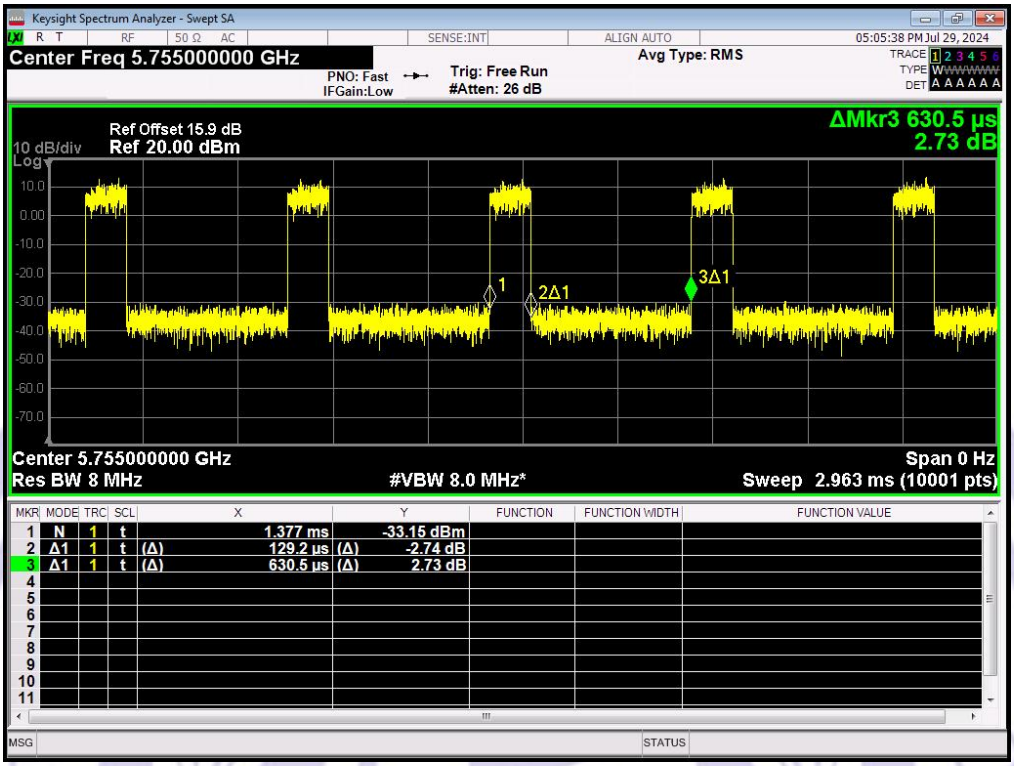
IEEE 802.11n_20MHz_Channel 165



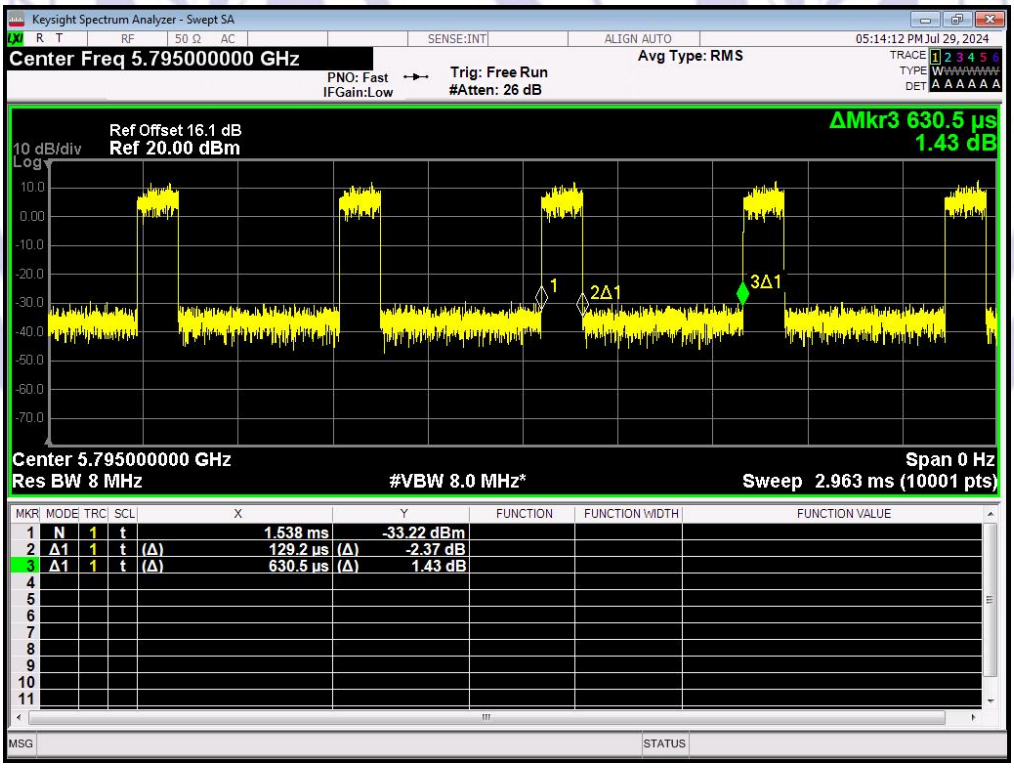
IEEE 802.11n_40MHz_Channel 38



IEEE 802.11n_40MHz_Channel 46



IEEE 802.11n_40MHz_Channel 151



IEEE 802.11n_40MHz_Channel 159

14 Antenna Requirement

14.1 Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203
Requirement	1) 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. According to RSS-GEN section 6.8 The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list. For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below). When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer. The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

14.2 Antenna Connected Construction

The antenna is a PCB Antenna which permanently attached, and the best case gain of the antenna is 3.08 dBi(WIFI 5.2G); 5.12dBi(WIFI5.8G). It complies with the standard requirement.

15 TEST SETUP & EUT PHOTOGRAPH

Please see the attachment for details.

---------- End of Report ----------

Shenzhen NCT Testing Technology Co., Ltd.
2008