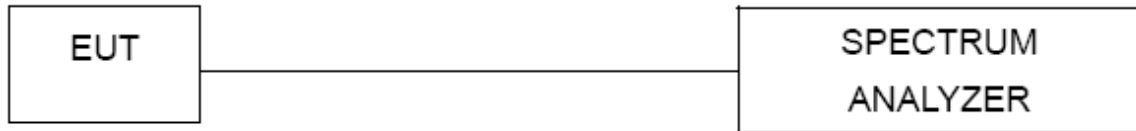


## 12. Spurious RF Conducted Emissions

### 12.1 Block Diagram Of Test Setup



### 12.2 Limit

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of  $-27$  dBm/MHz.

(2) For transmitters operating in the 5.725-5.85 GHz band (i) All emissions shall be limited to a level of  $-27$  dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge..

### 12.3 Test Procedure

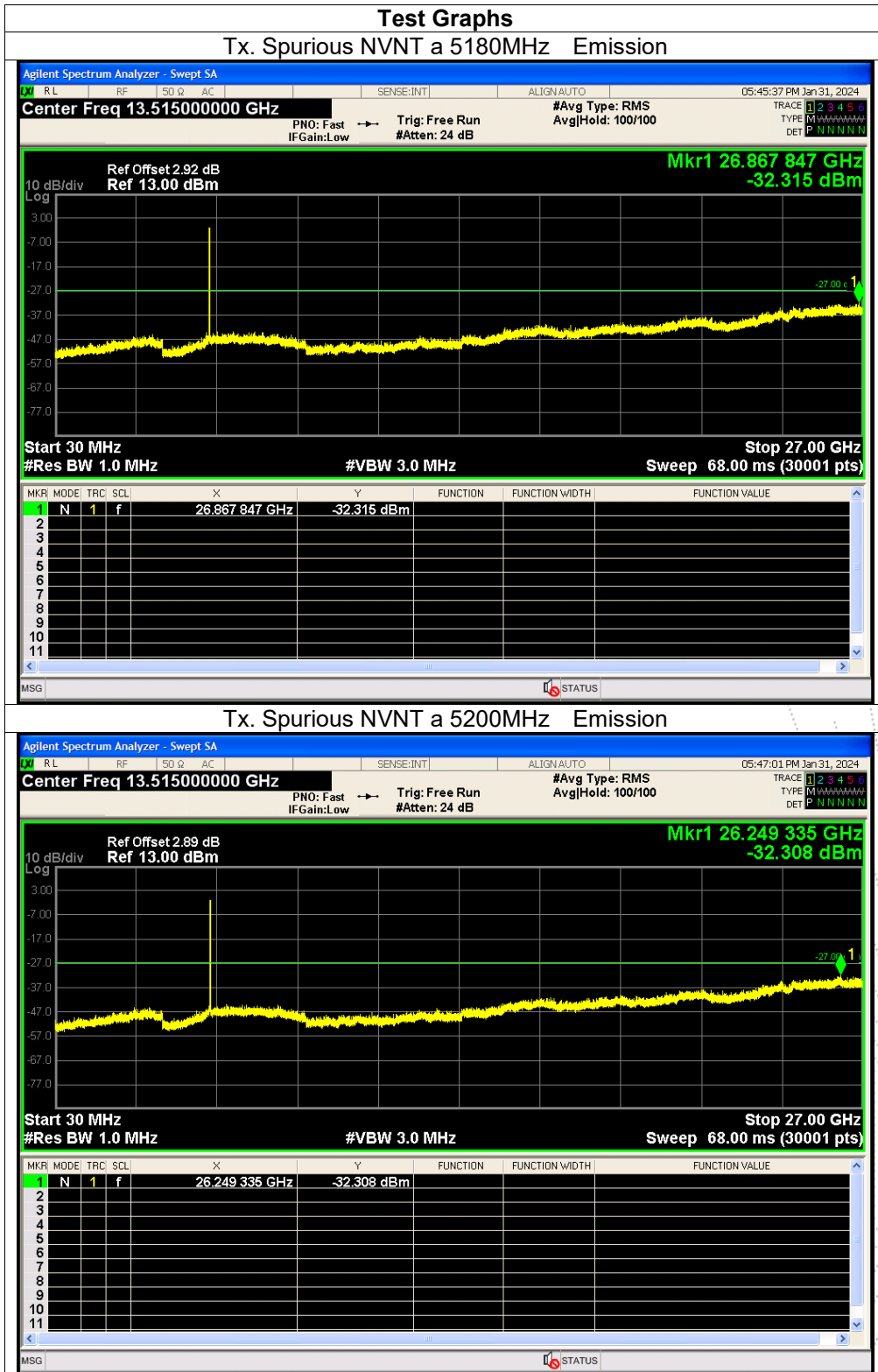
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

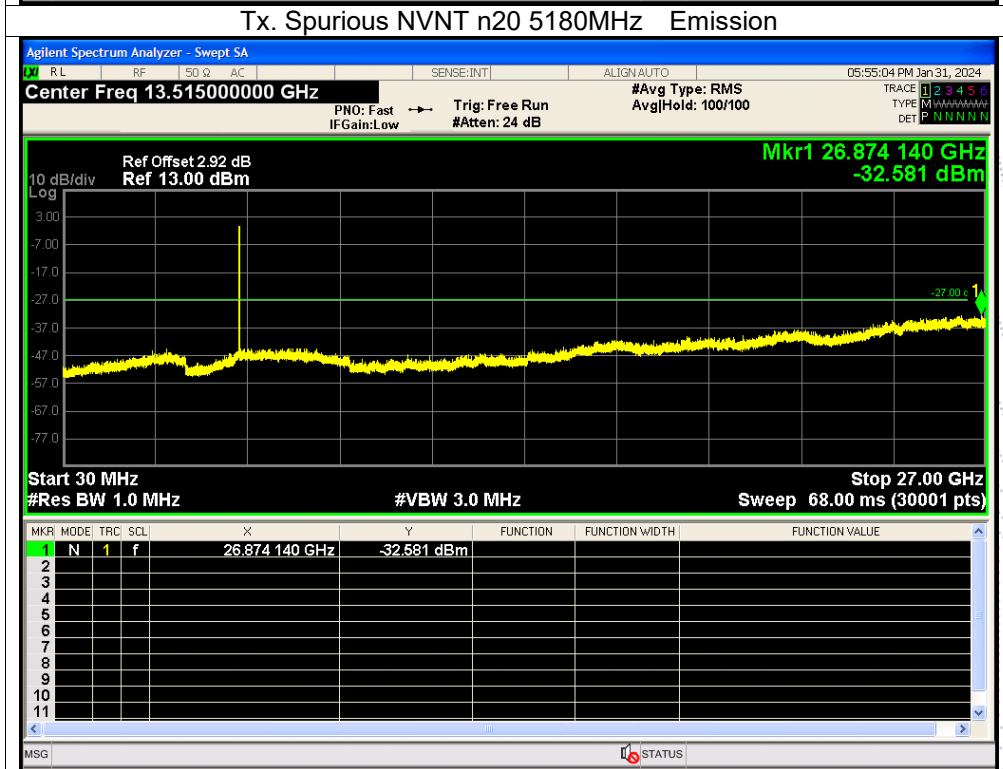
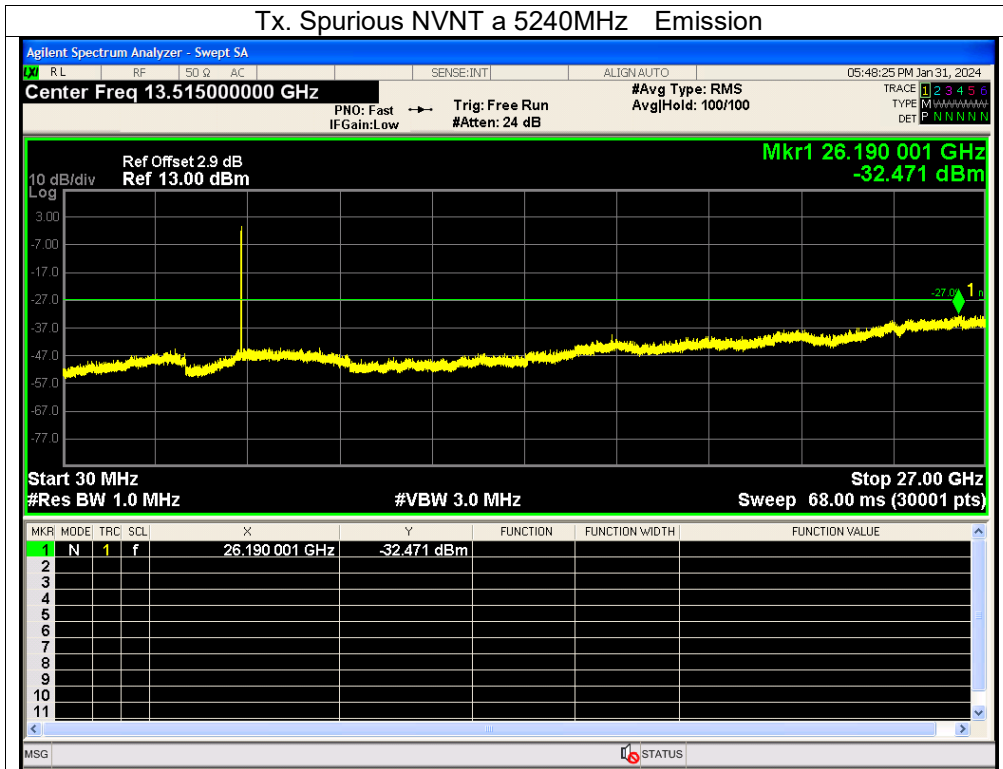
### 12.4 Test Result

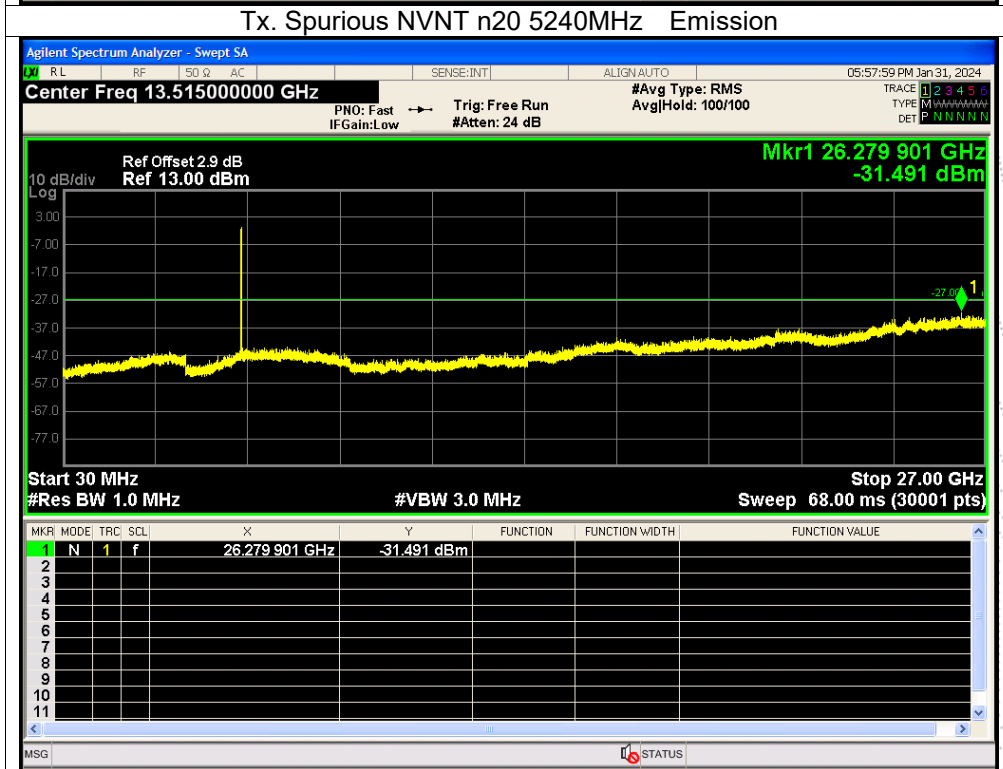
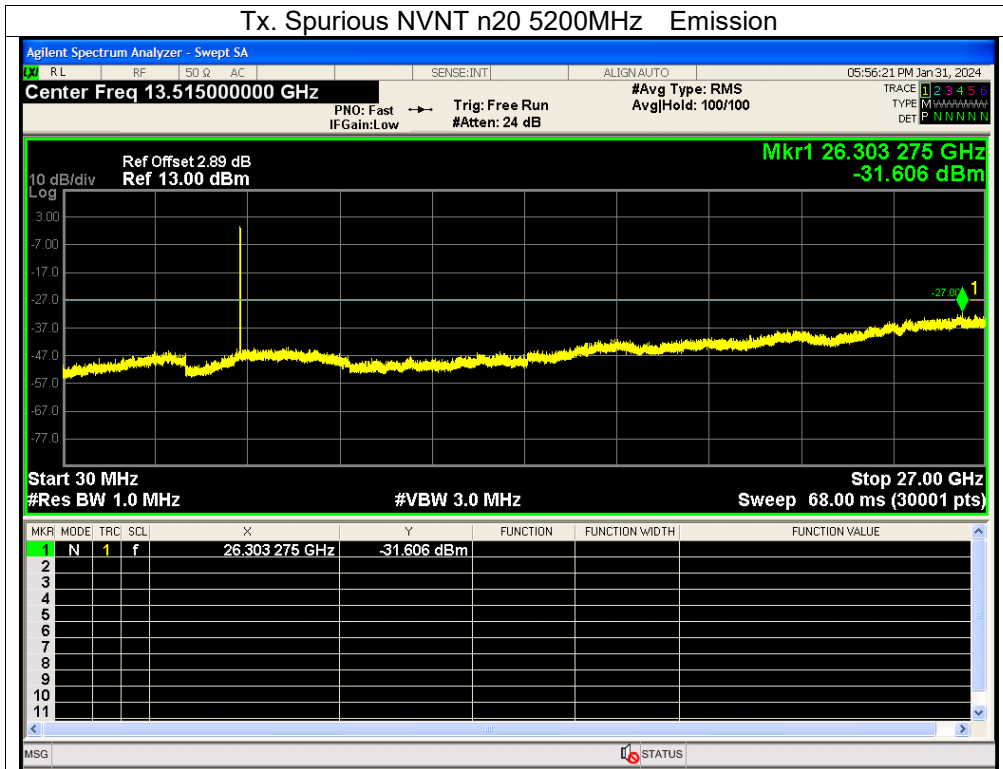
Remark: The measurement frequency range is from 9KHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and band edge measurement data.

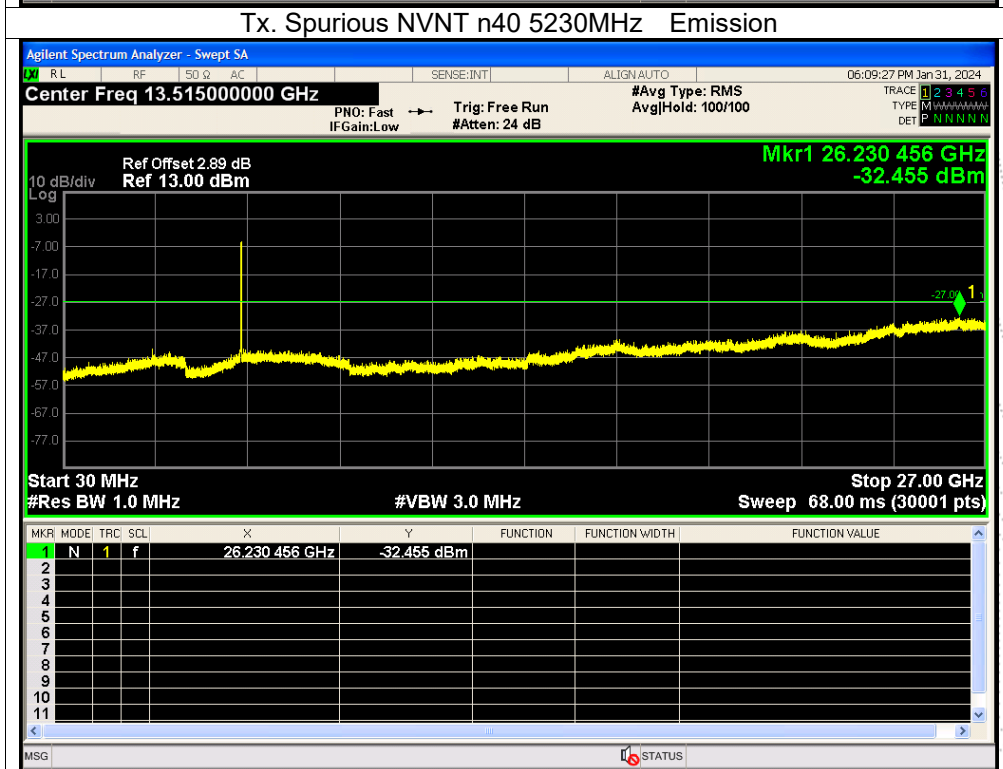
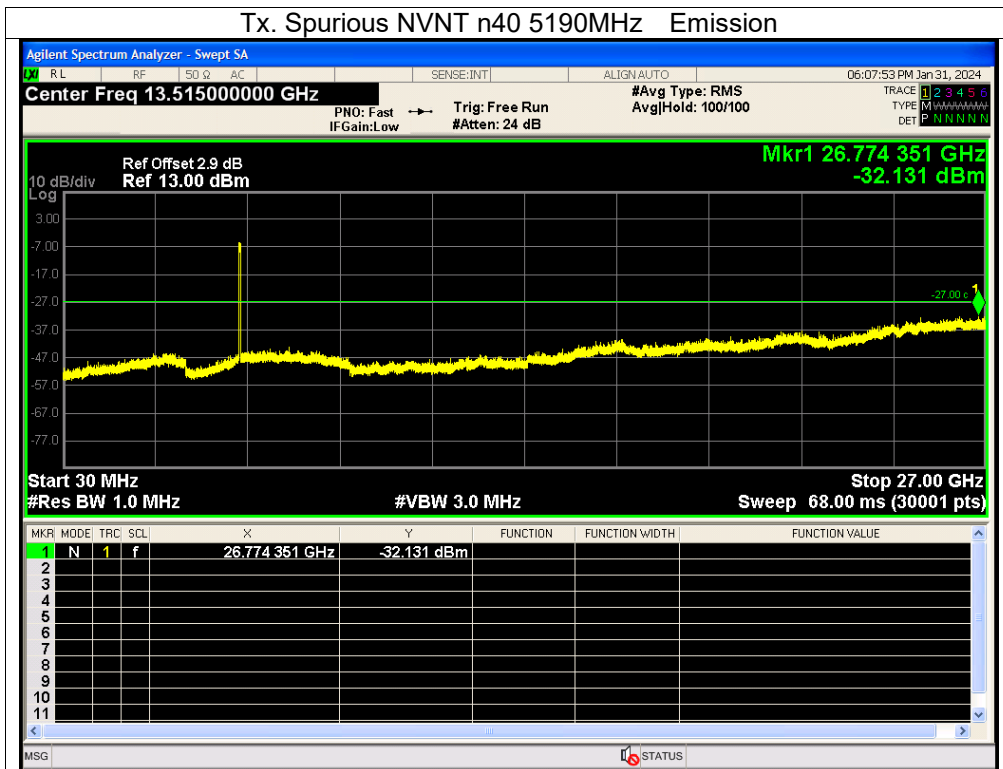
About: 26.5GHz-40GHz, The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Note: A(B) Represent the value of antenna A and B, The worst data is Antenna A, only shown Antenna A Plot. Antenna B: 5180-5240MHz

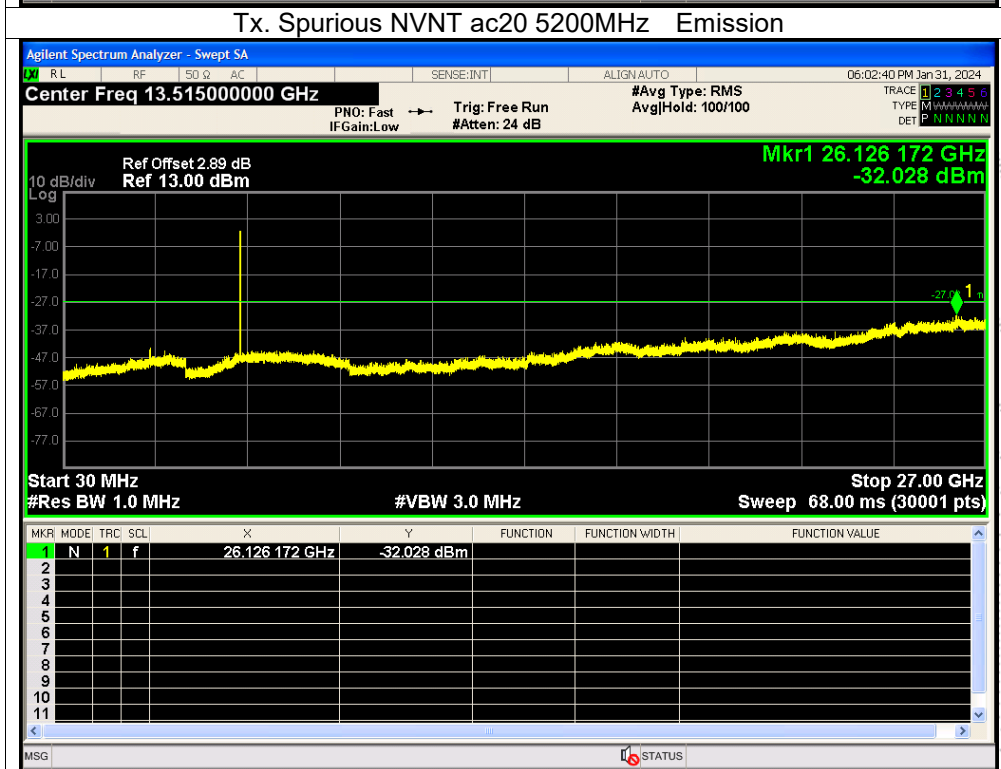
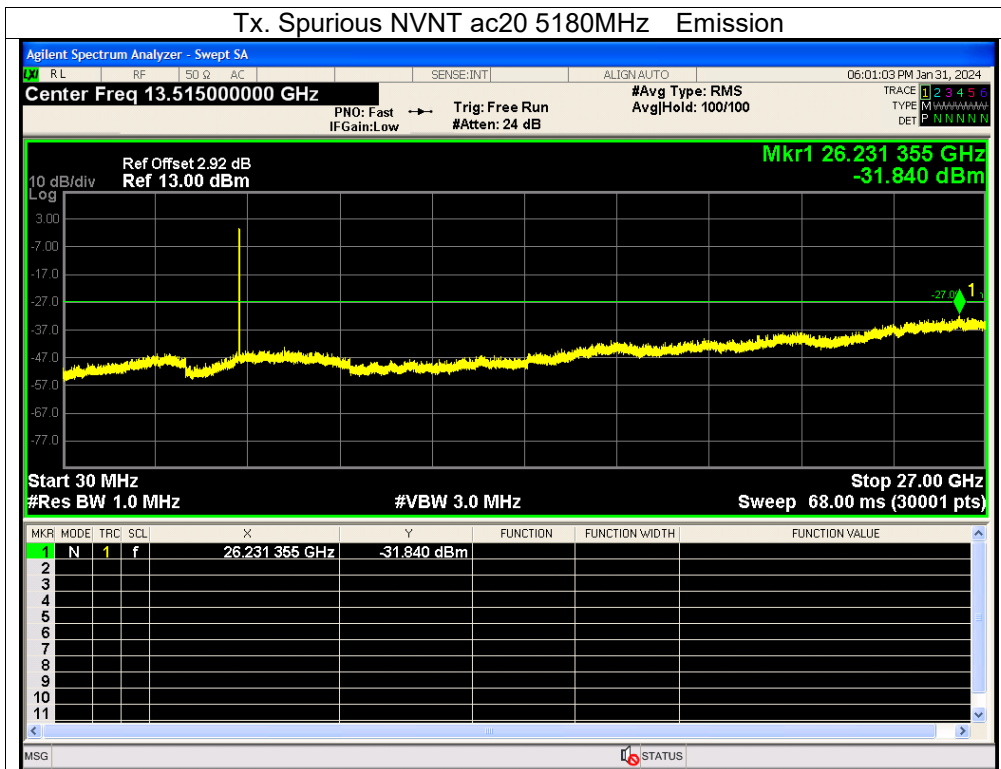




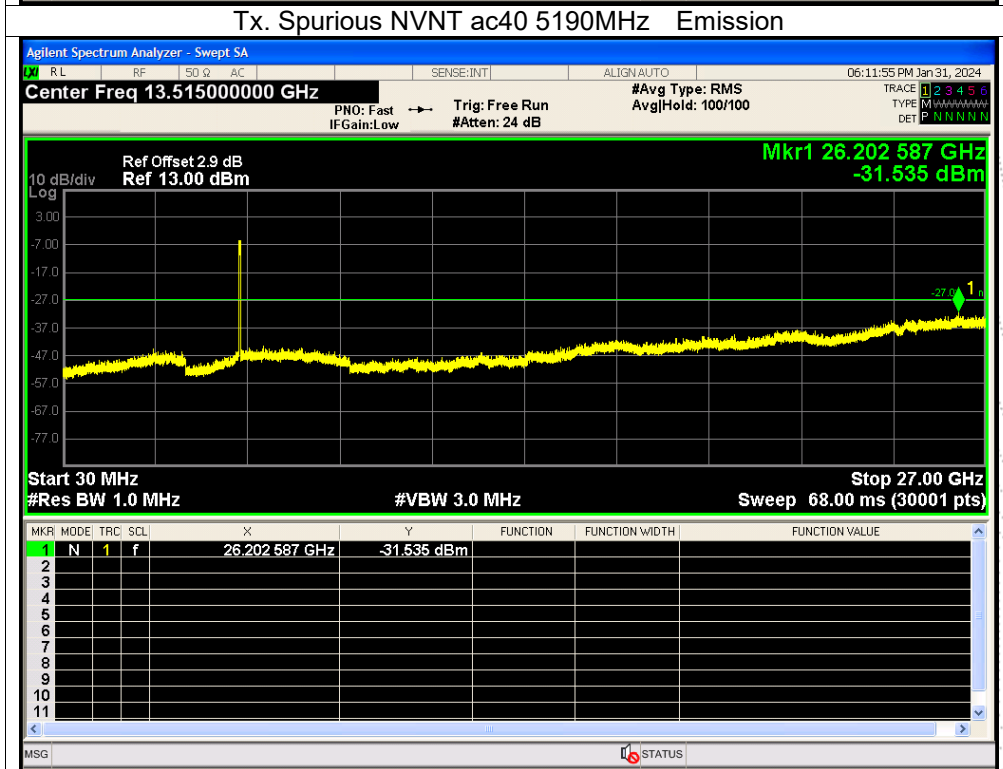
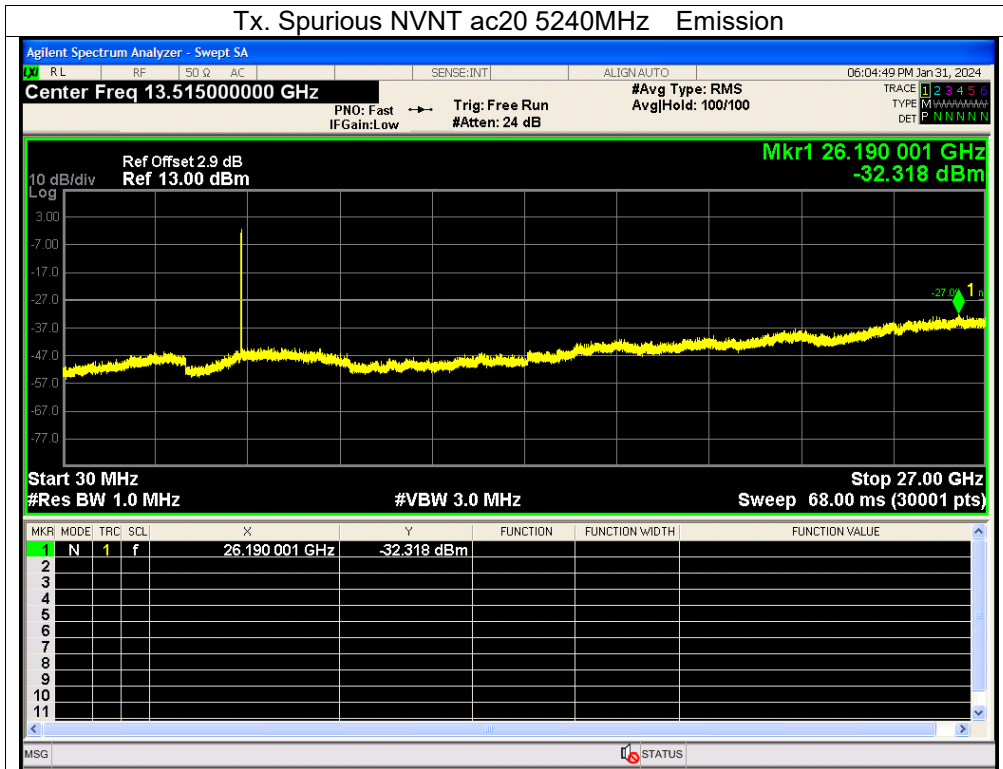


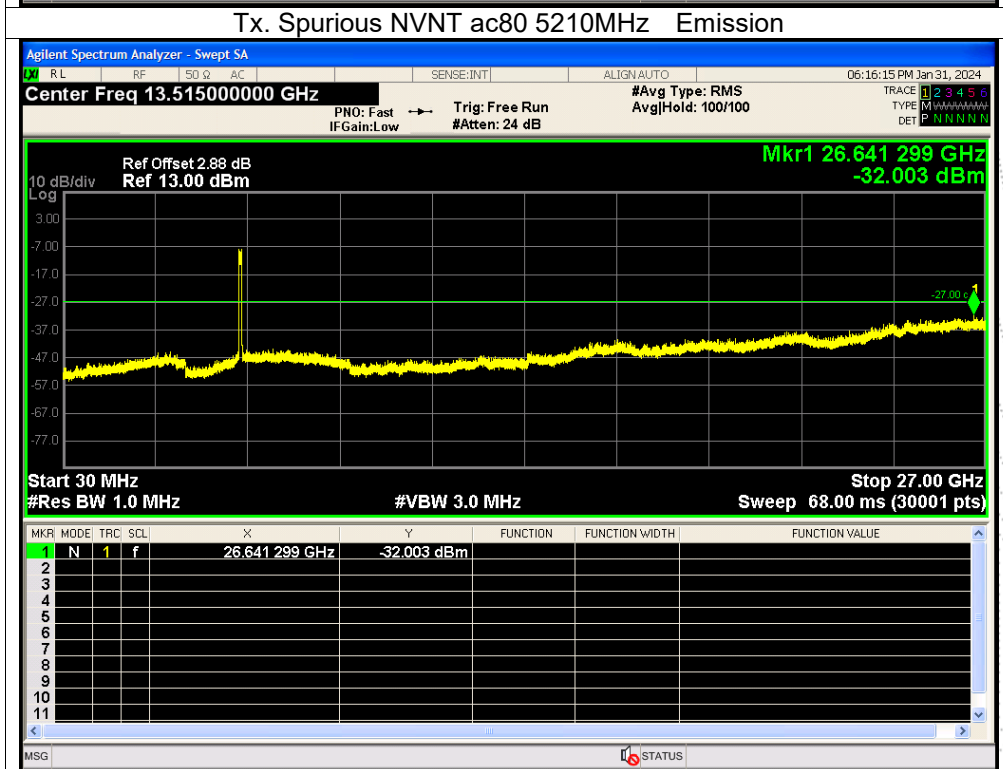
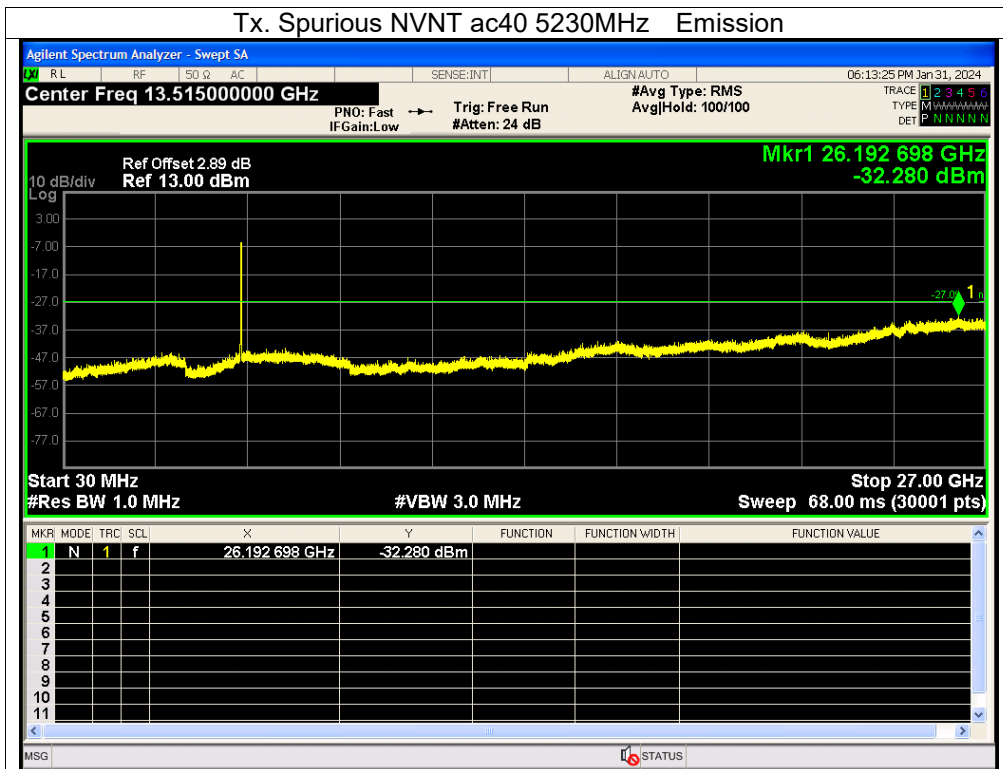




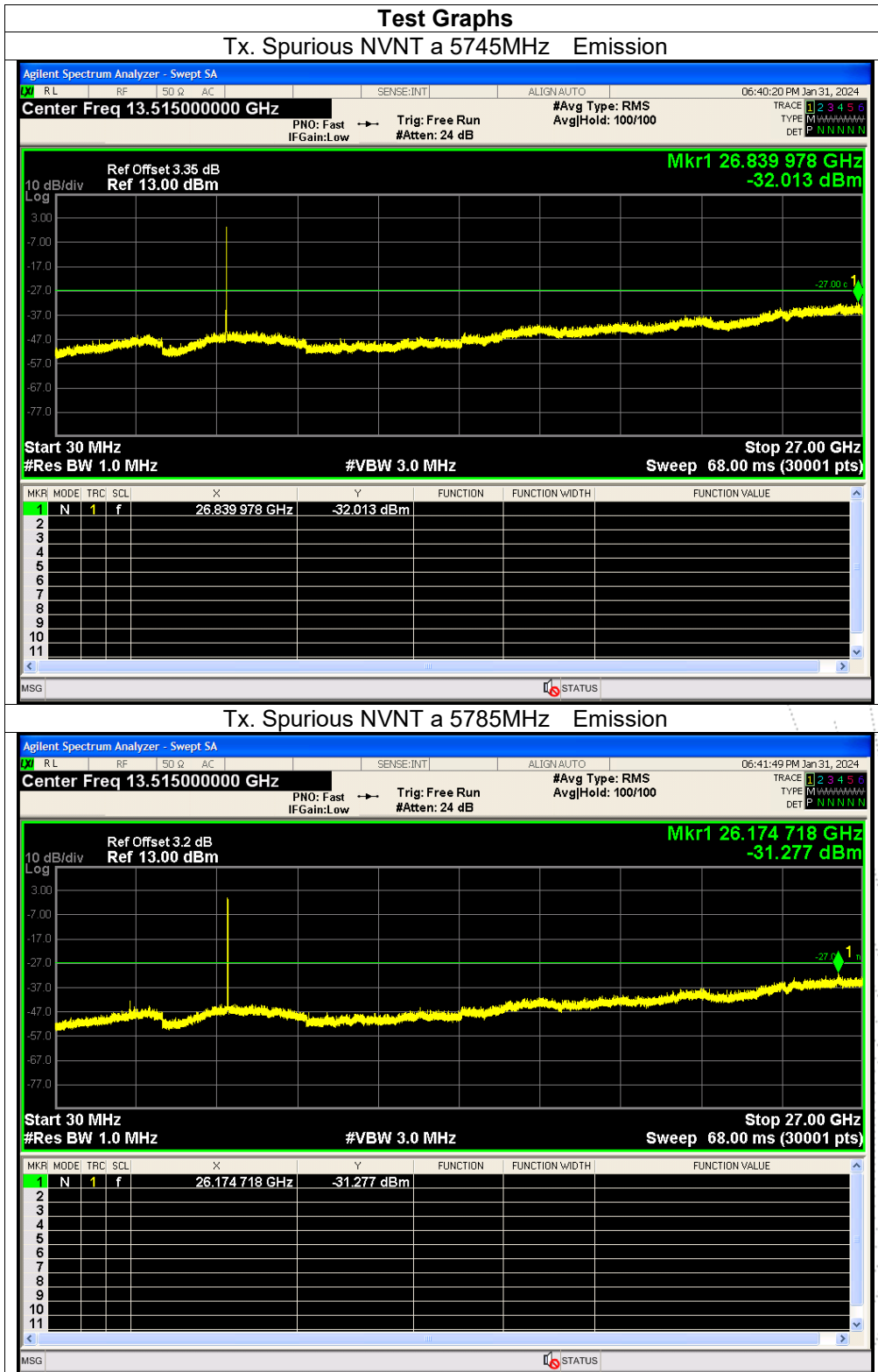


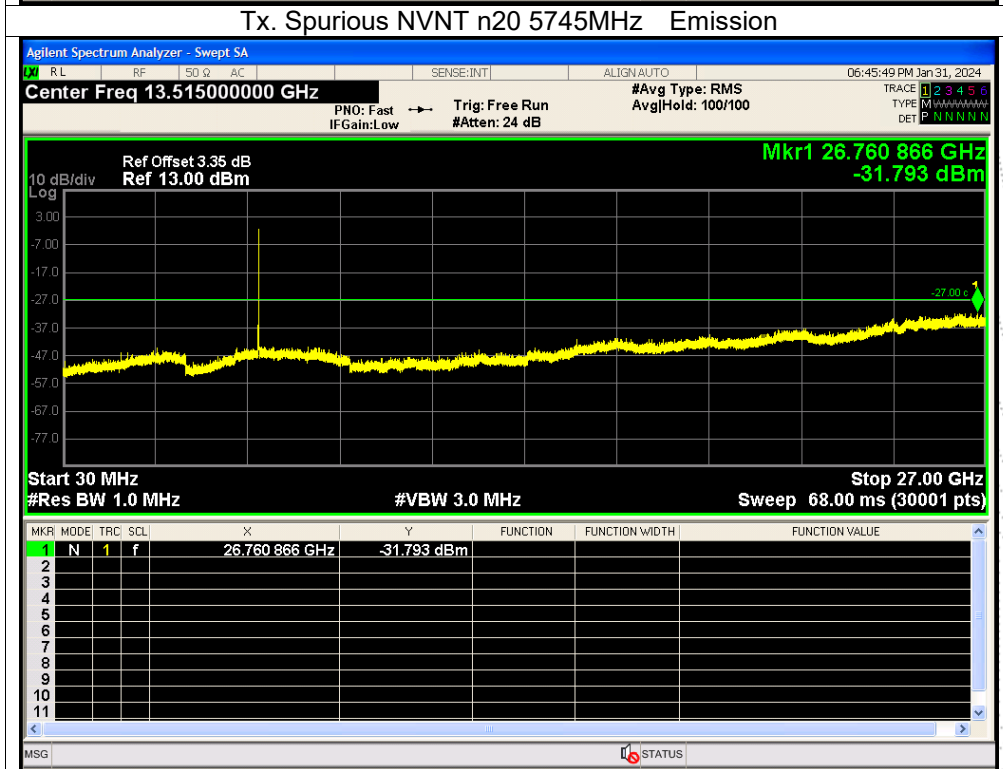
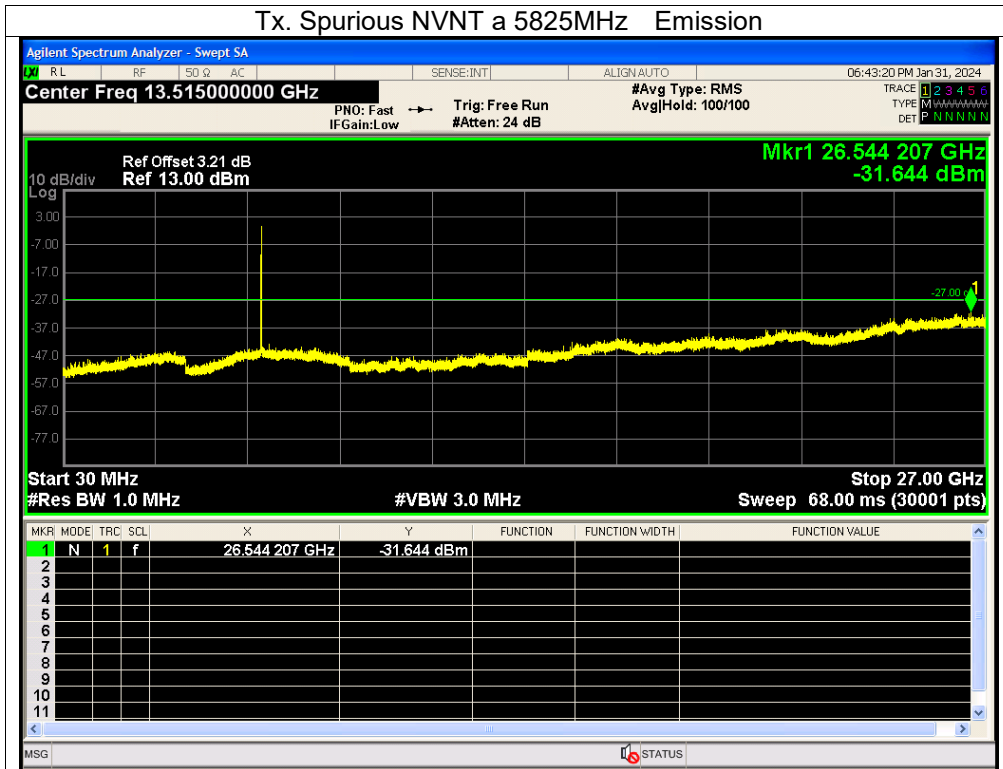


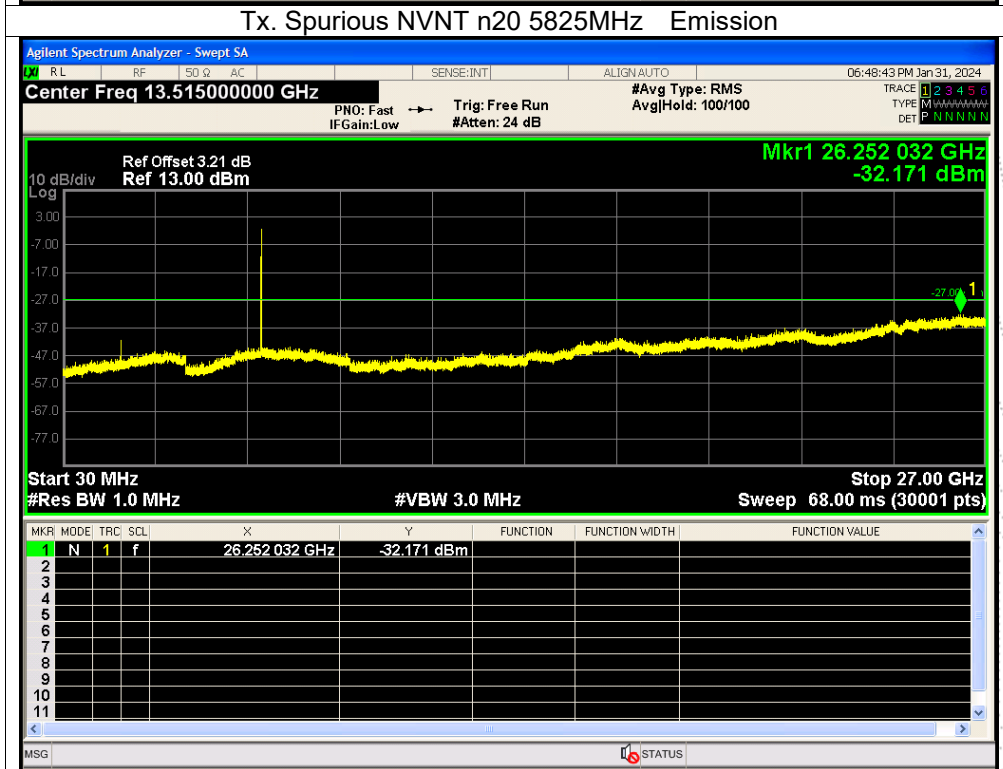
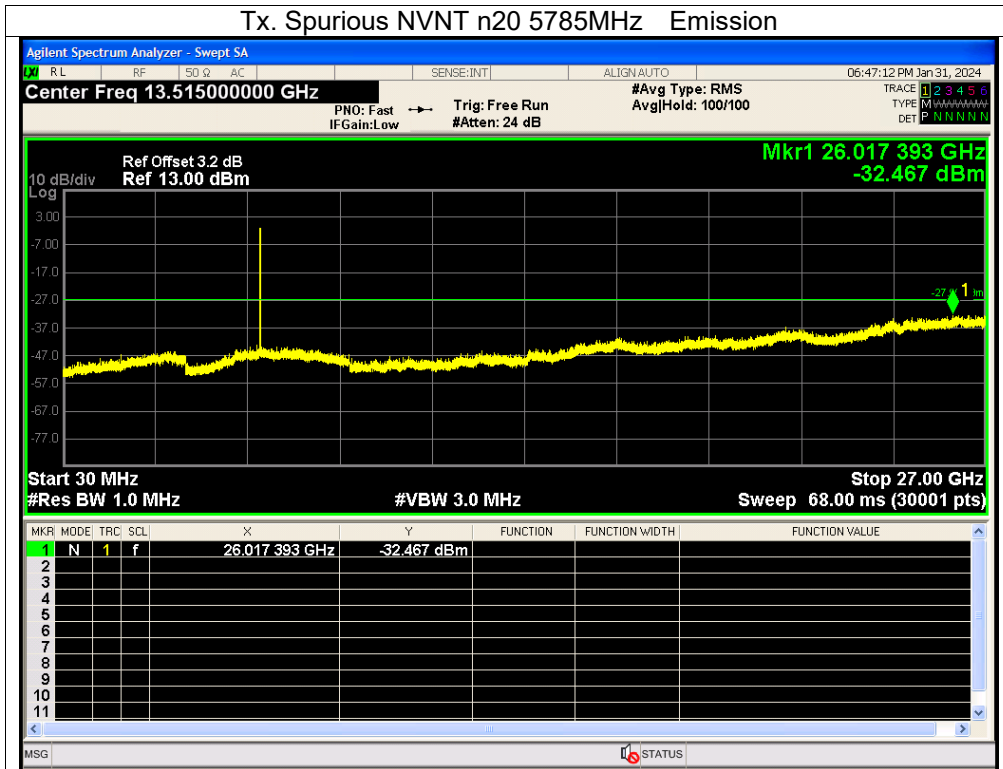


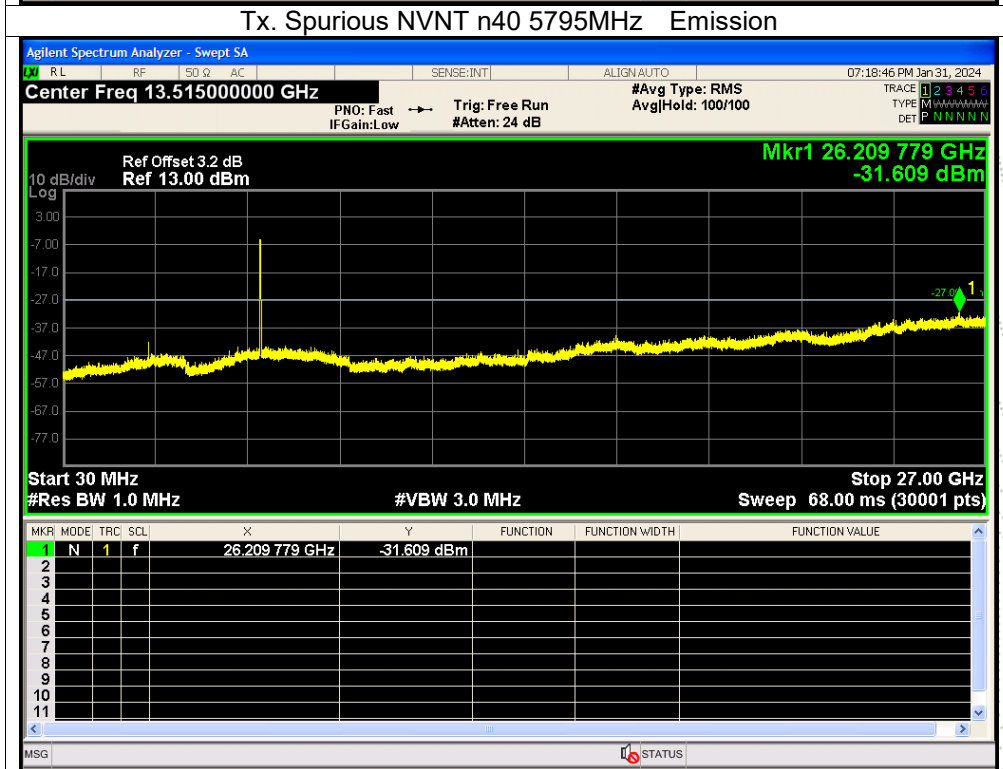
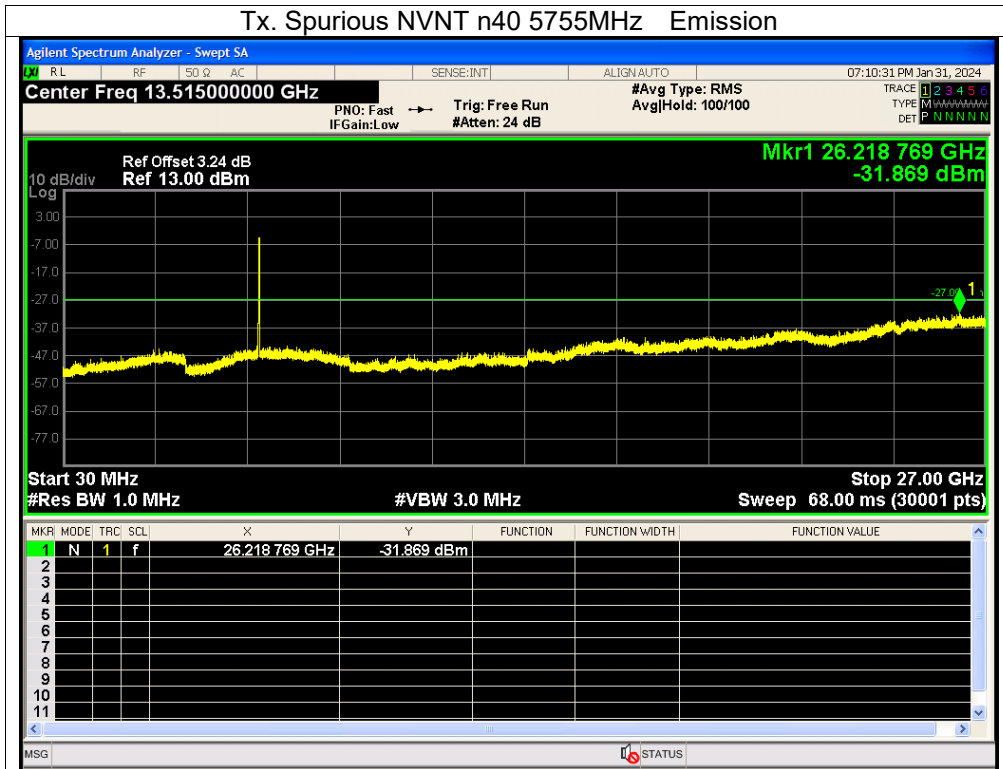


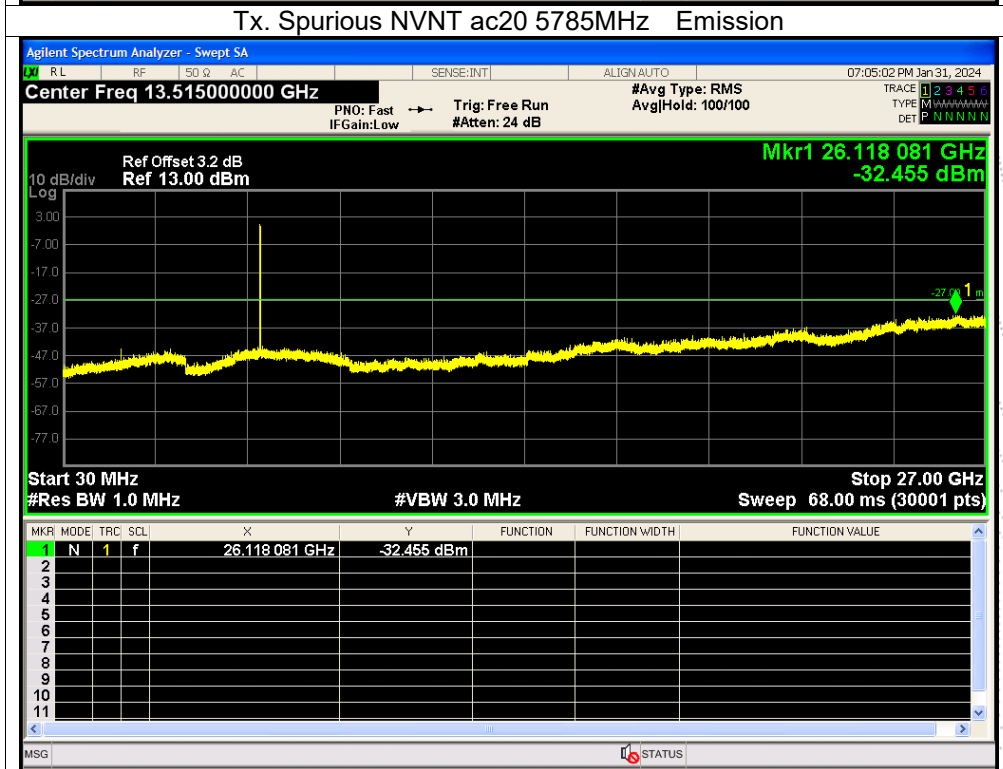
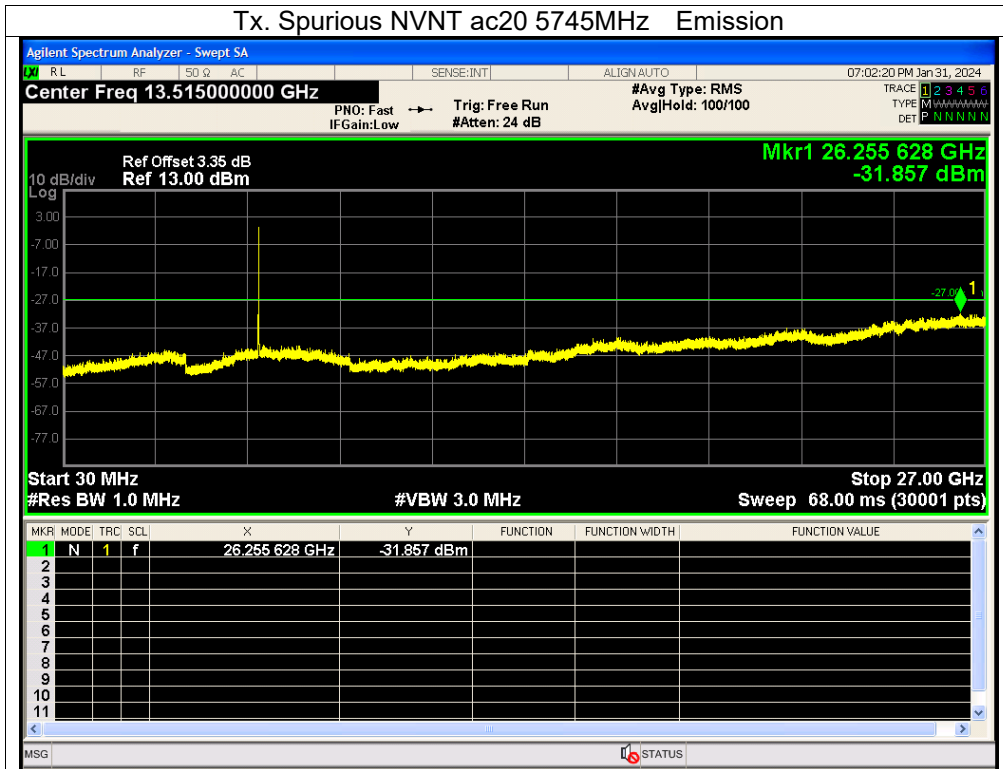
Note: A(B) Represent the value of antenna A and B, The worst data is Antenna A, only shown Antenna A  
 Antenna B: 5745-58250MHz



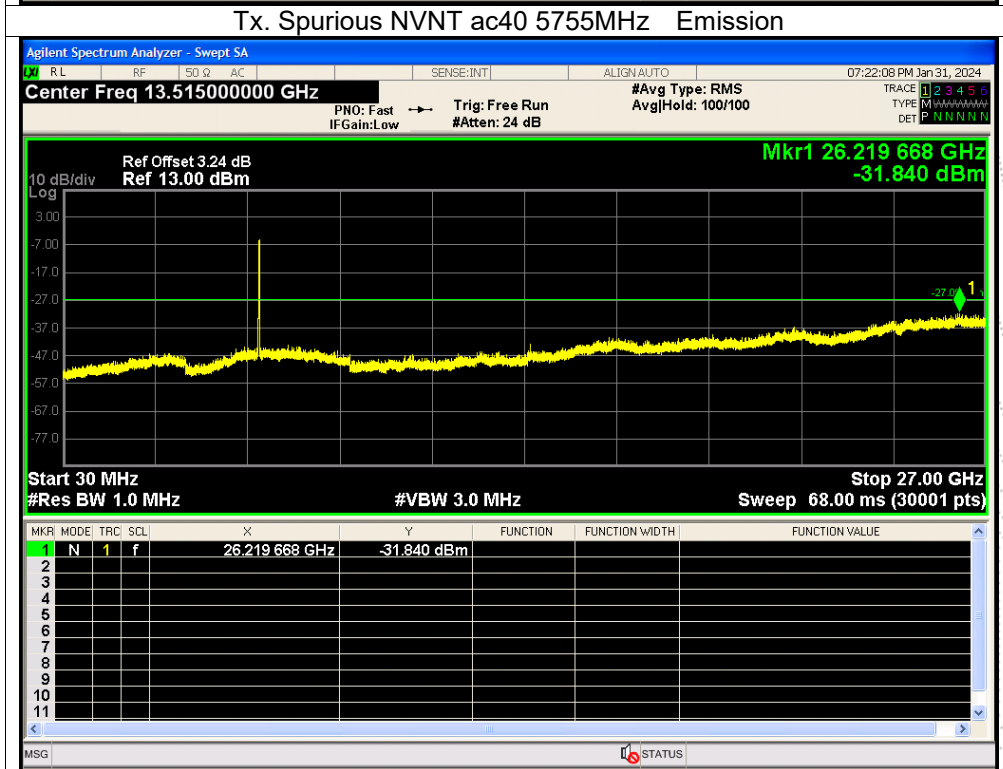
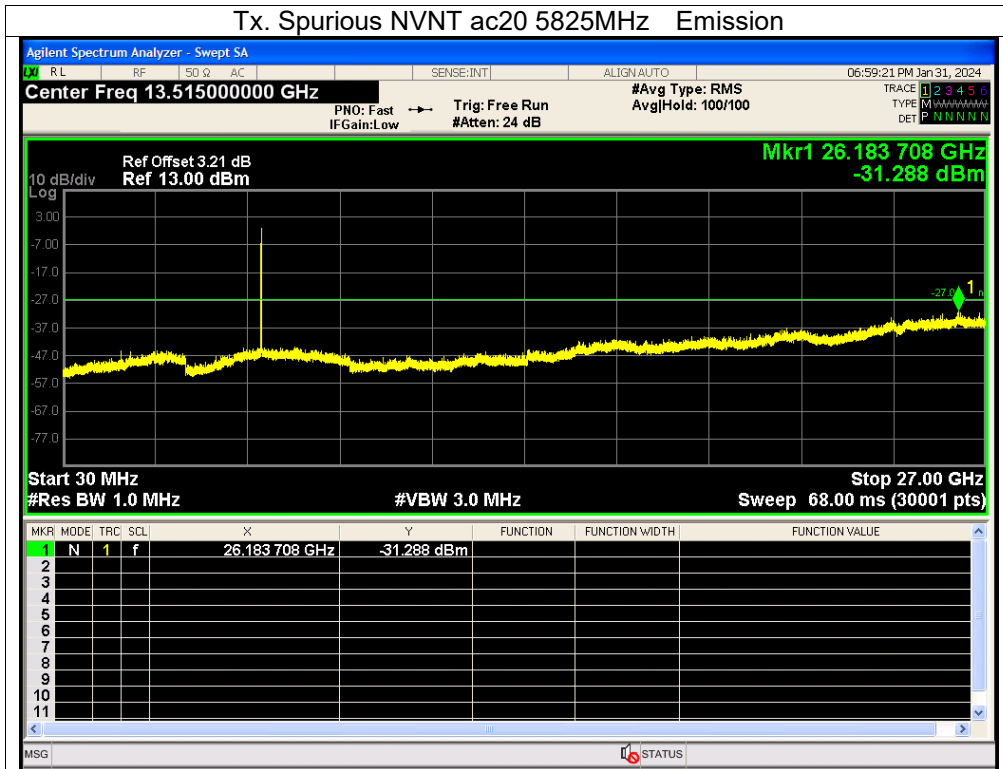


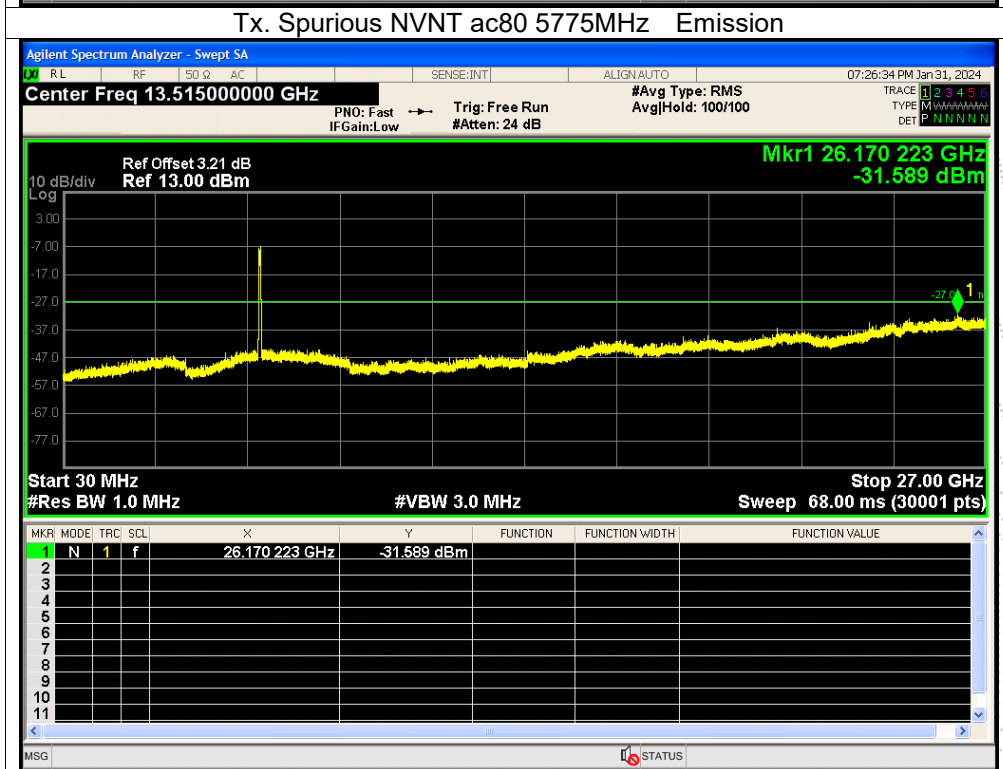
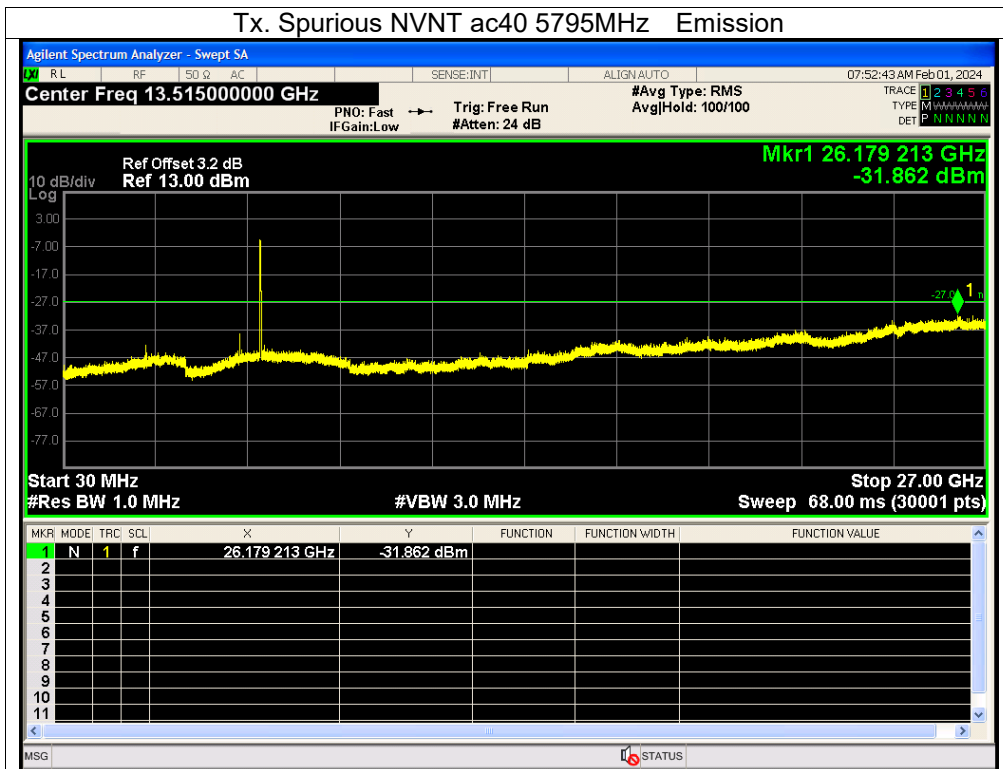






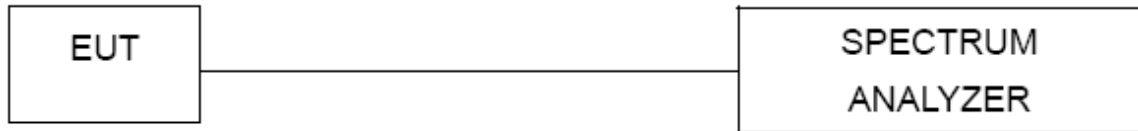






### 13. Frequency Stability Measurement

#### 13.1 Block Diagram Of Test Setup



#### 13.2 Limit

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  $\pm 20$  ppm maximum for the 5 GHz band (IEEE 802.11n specification)..

#### 13.3 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.  $f_c$  is declaring of channel frequency. Then the frequency error formula is  $(f_c - f) / f_c \times 10^6$  ppm and he limit is less than  $\pm 20$  ppm (IEEE 802.11n specification).
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  $-20^\circ\text{C} \sim 70^\circ\text{C}$ .

## 13.4 Test Result

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage :	DC 12V
Test Mode:	TX (5.1G) Mode Frequency U-NII-1 (5180-5240MHz)		

## Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency : 5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12.00	5180.0041	5180	0.0041	0.7915
		V max (V)	13.80	5180.0135	5180	0.0135	2.6062
		V min (V)	10.20	5180.0075	5180	0.0075	1.4479
Limits				5150-5250 MHz			
Result				Complies			

## Temperature vs. Frequency Stability

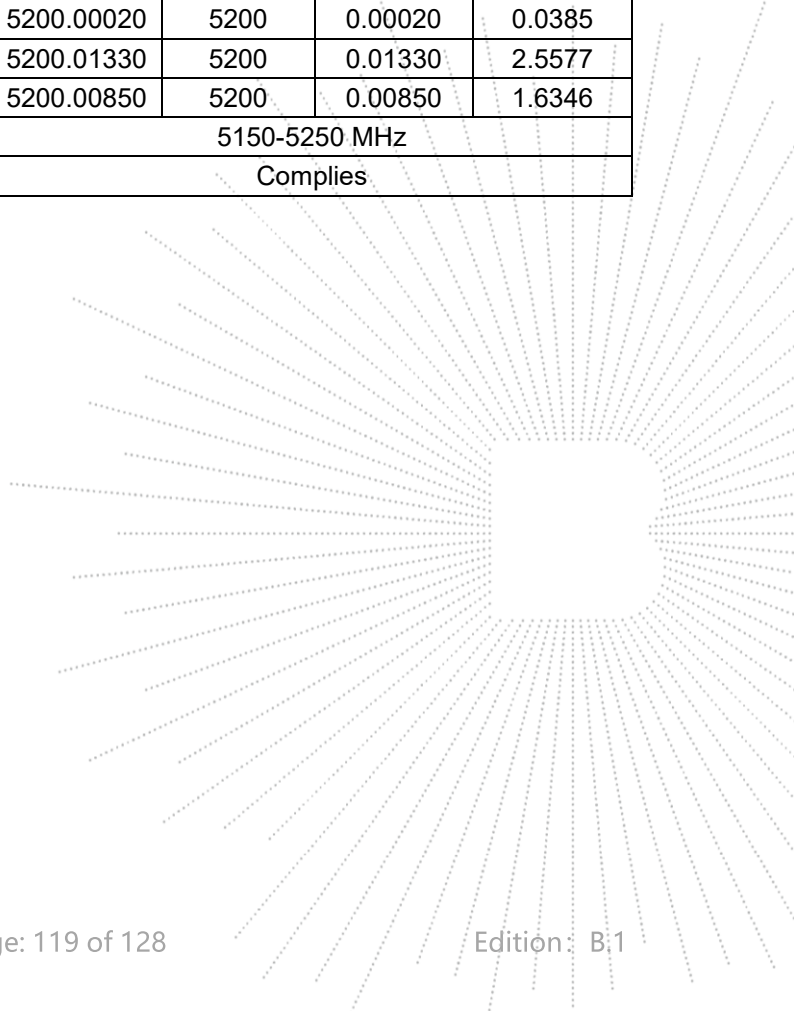
TEST CONDITIONS				Reference Frequency : 5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	12	T (°C)	-20	5180.0022	5180	0.0022	0.4247
		T (°C)	-10	5180.0093	5180	0.0093	1.7954
		T (°C)	0	5180.0041	5180	0.0041	0.7915
		T (°C)	10	5180.0089	5180	0.0089	1.7181
		T (°C)	20	5180.0044	5180	0.0044	0.8494
		T (°C)	30	5180.0032	5180	0.0032	0.6178
		T (°C)	40	5180.0090	5180	0.0090	1.7375
		T (°C)	50	5180.0051	5180	0.0051	0.9846
		T (°C)	60	5180.0093	5180	0.0093	1.7954
		T (°C)	70	5180.0085	5180	0.0085	1.6409
Limits				5150-5250 MHz			
Result				Complies			

## Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12.00	5200.0096	5200	0.0096	1.8462
		V max (V)	13.80	5200.0060	5200	0.0060	1.1538
		V min (V)	10.20	5200.0010	5200	0.0010	0.1923
Limits				5725-5850 MHz			
Result				Complies			

## Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	12	T (°C)	-20	5200.00230	5200	0.00230	0.4423
		T (°C)	-10	5200.00690	5200	0.00690	1.3269
		T (°C)	0	5200.01020	5200	0.01020	1.9615
		T (°C)	10	5200.01350	5200	0.01350	2.5962
		T (°C)	20	5200.00960	5200	0.00960	1.8462
		T (°C)	30	5200.00680	5200	0.00680	1.3077
		T (°C)	40	5200.00230	5200	0.00230	0.4423
		T (°C)	50	5200.00020	5200	0.00020	0.0385
		T (°C)	60	5200.01330	5200	0.01330	2.5577
		T (°C)	70	5200.00850	5200	0.00850	1.6346
Limits				5150-5250 MHz			
Result				Complies			

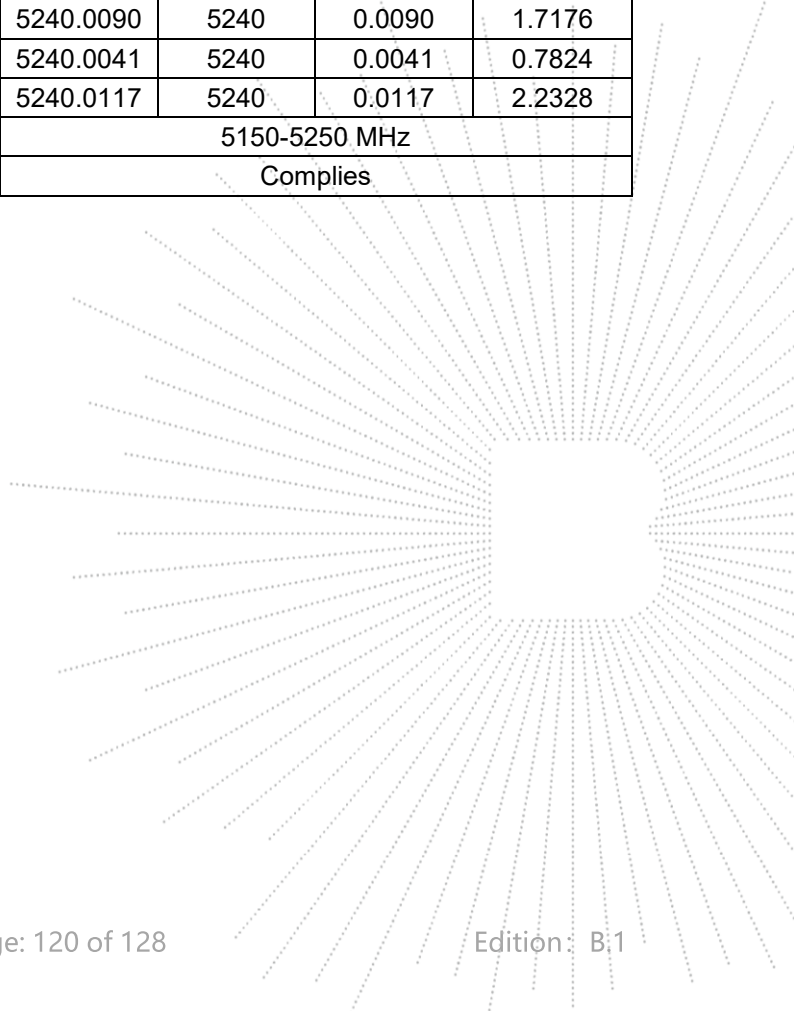


## Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12.00	5240.0054	5240	0.0054	1.0305
		V max (V)	13.80	5240.0122	5240	0.0122	2.3282
		V min (V)	10.20	5240.0020	5240	0.0020	0.3817
Limits				5150-5250 MHz			
Result				Complies			

## Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	12	T (°C)	-20	5240.0048	5240	0.0048	0.9160
		T (°C)	-10	5240.0082	5240	0.0082	1.5649
		T (°C)	0	5240.0004	5240	0.0004	0.0763
		T (°C)	10	5240.0129	5240	0.0129	2.4618
		T (°C)	20	5240.0098	5240	0.0098	1.8702
		T (°C)	30	5240.0122	5240	0.0122	2.3282
		T (°C)	40	5240.0097	5240	0.0097	1.8511
		T (°C)	50	5240.0090	5240	0.0090	1.7176
		T (°C)	60	5240.0041	5240	0.0041	0.7824
		T (°C)	70	5240.0117	5240	0.0117	2.2328
Limits				5150-5250 MHz			
Result				Complies			



Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage :	DC 12V
Test Mode:	TX (5.8G) Mode Frequency U-NII-3 (5745-5825MHz)		

## Voltage vs. Frequency Stabilit

TEST CONDITIONS				Reference Frequency: 5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12.00	5745.00760	5745	0.00760	1.3229
		V max (V)	13.80	5745.00700	5745	0.00700	1.2185
		V min (V)	10.20	5745.01330	5745	0.01330	2.3151
Limits				5725-5850 MHz			
Result				Complies			

## Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	12	T (°C)	-20	5745.00720	5745	0.00720	1.2533
		T (°C)	-10	5745.00670	5745	0.00670	1.1662
		T (°C)	0	5745.00460	5745	0.00460	0.8007
		T (°C)	10	5745.01060	5745	0.01060	1.8451
		T (°C)	20	5745.00430	5745	0.00430	0.7485
		T (°C)	30	5745.01220	5745	0.01220	2.1236
		T (°C)	40	5745.00980	5745	0.00980	1.7058
		T (°C)	50	5745.00720	5745	0.00720	1.2533
		T (°C)	60	5745.00010	5745	0.00010	0.0174
		T (°C)	70	5745.00390	5745	0.00390	0.6789
Limits				5725-5850 MHz			
Result				Complies			

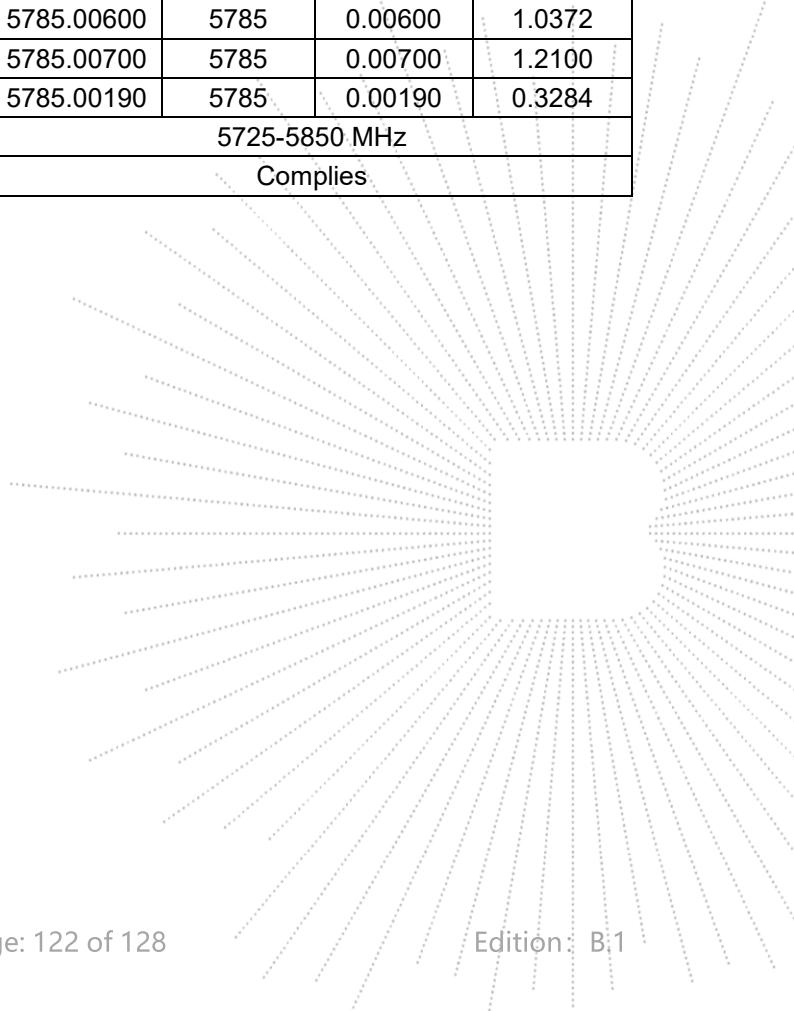


## Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12.00	5785.01170	5785	0.01170	2.0225
		V max (V)	13.80	5785.00490	5785	0.00490	0.8470
		V min (V)	10.20	5785.00760	5785	0.00760	1.3137
Limits				5725-5850 MHz			
Result				Complies			

## Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	12	T (°C)	-20	5785.01290	5785	0.01290	2.2299
		T (°C)	-10	5785.00050	5785	0.00050	0.0864
		T (°C)	0	5785.00770	5785	0.00770	1.3310
		T (°C)	10	5785.00530	5785	0.00530	0.9162
		T (°C)	20	5785.00270	5785	0.00270	0.4667
		T (°C)	30	5785.01310	5785	0.01310	2.2645
		T (°C)	40	5785.01250	5785	0.01250	2.1608
		T (°C)	50	5785.00600	5785	0.00600	1.0372
		T (°C)	60	5785.00700	5785	0.00700	1.2100
		T (°C)	70	5785.00190	5785	0.00190	0.3284
Limits				5725-5850 MHz			
Result				Complies			

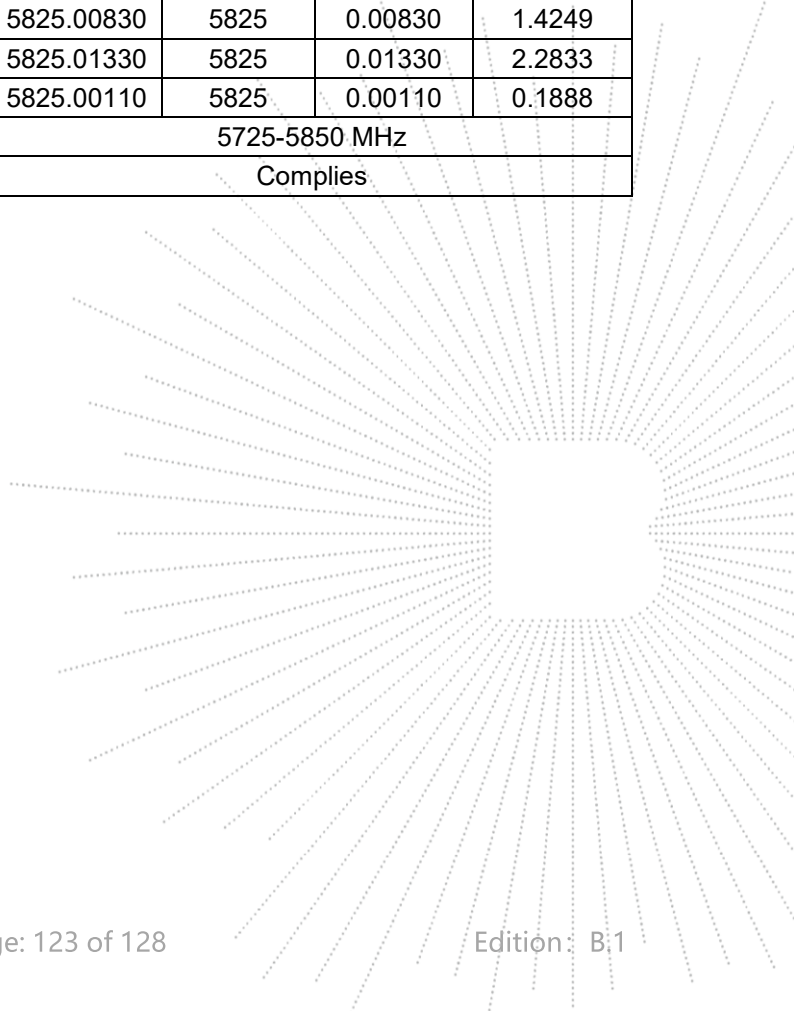


## Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12.00	5825.00470	5825	0.00470	0.8069
		V max (V)	13.80	5825.00870	5825	0.00870	1.4936
		V min (V)	10.20	5825.01310	5825	0.01310	2.2489
Limits				5725-5850 MHz			
Result				Complies			

## Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	12	T (°C)	-20	5825.00860	5825	0.00860	1.4764
		T (°C)	-10	5825.00860	5825	0.00860	1.4764
		T (°C)	0	5825.01050	5825	0.01050	1.8026
		T (°C)	10	5825.00570	5825	0.00570	0.9785
		T (°C)	20	5825.01200	5825	0.01200	2.0601
		T (°C)	30	5825.00460	5825	0.00460	0.7897
		T (°C)	40	5825.00680	5825	0.00680	1.1674
		T (°C)	50	5825.00830	5825	0.00830	1.4249
		T (°C)	60	5825.01330	5825	0.01330	2.2833
		T (°C)	70	5825.00110	5825	0.00110	0.1888
Limits				5725-5850 MHz			
Result				Complies			



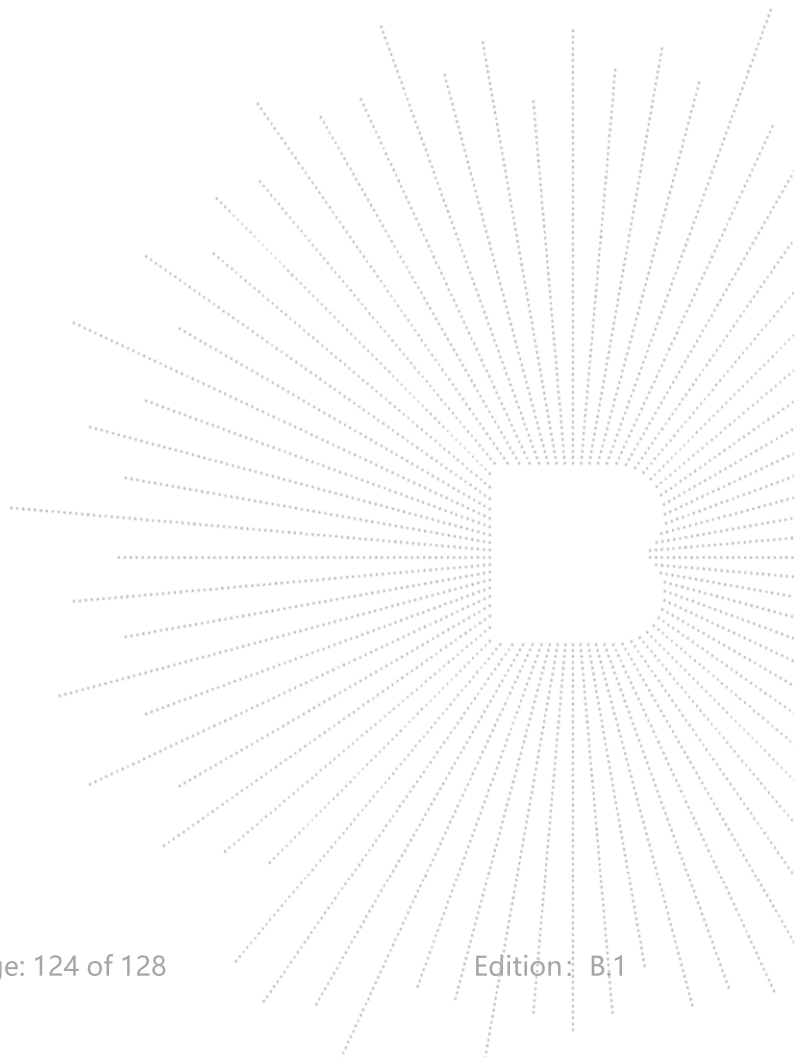
## 14. Antenna Requirement

### 14.1 Limit

15.203 requirement: For intentional device, according to 15.203: 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.

### 14.2 Test Result

The EUT antenna is Internal antenna (antenna gain (A): 2.92 dBi; antenna gain (B) : 2.92 dBi). It comply with the standard requirement.

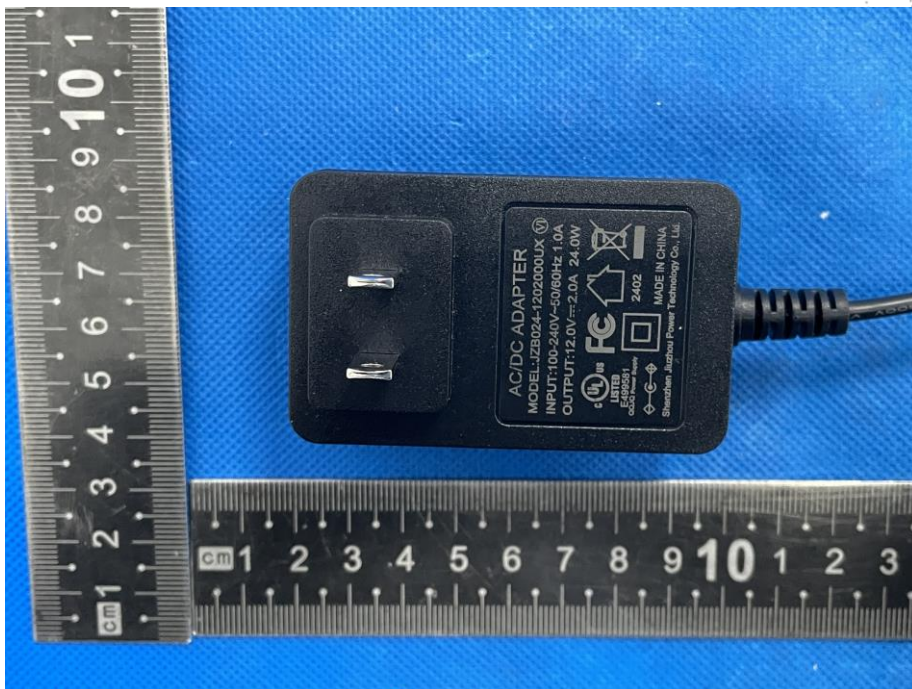


### 15. EUT Photographs

EUT Photo 1



EUT Photo 2



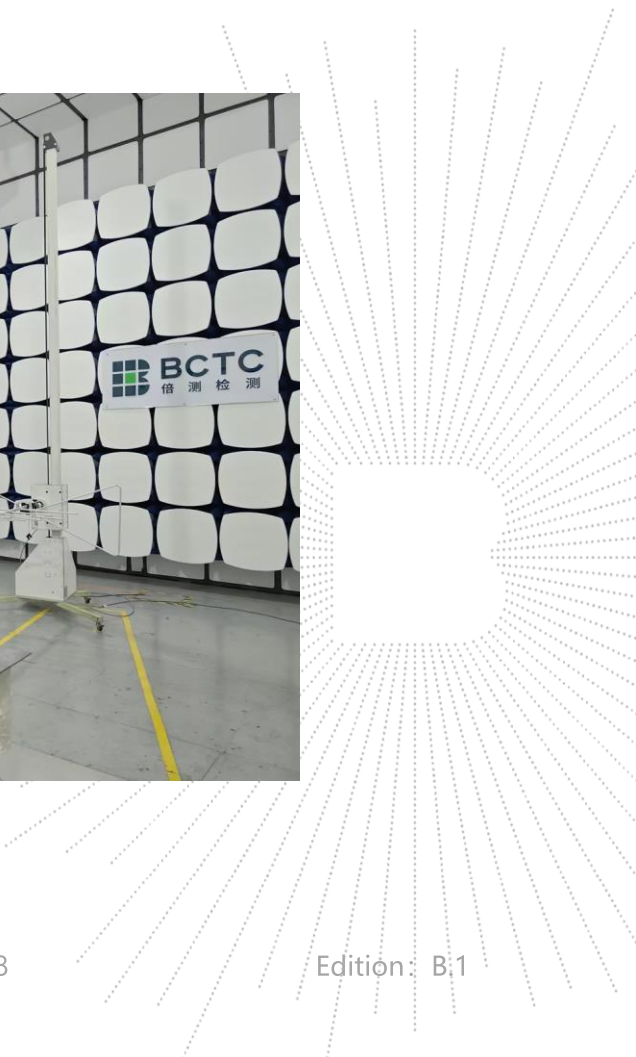
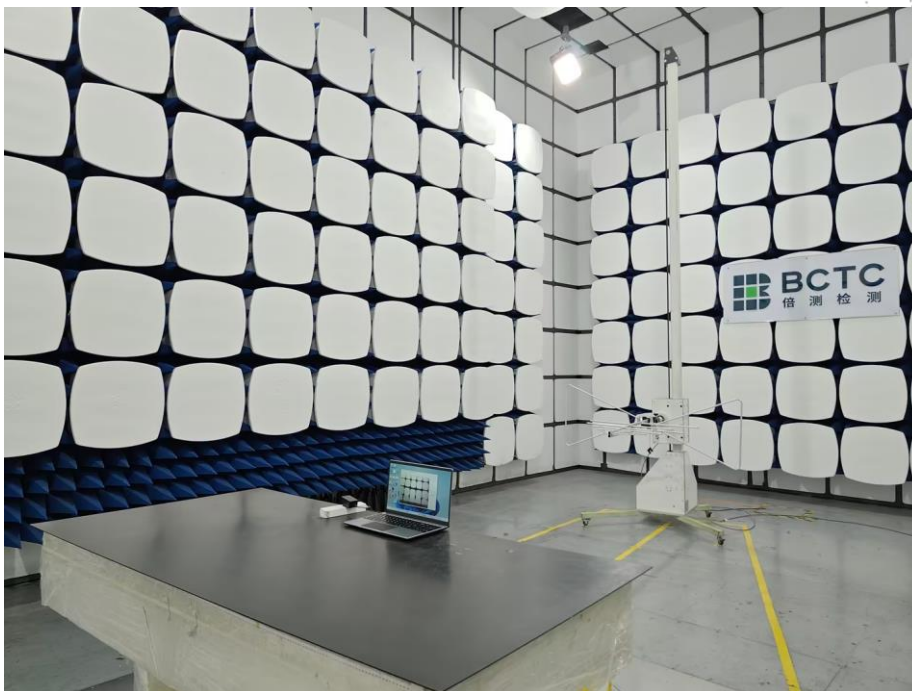


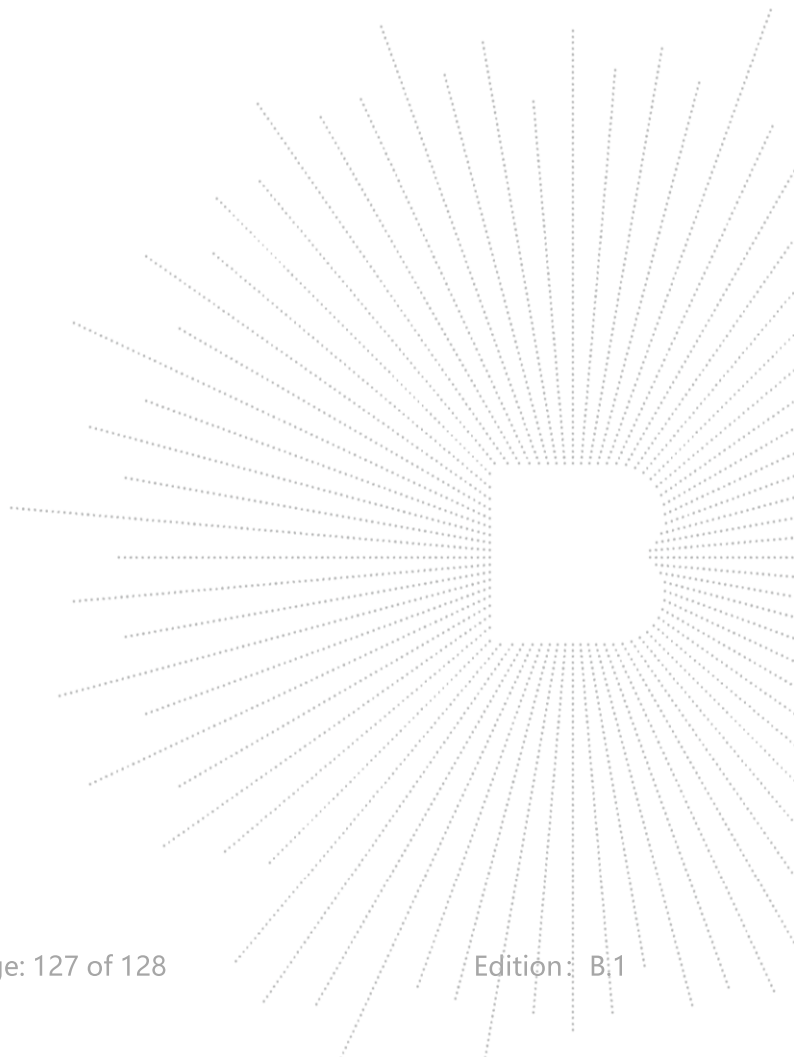
### 16. EUT Test Setup Photographs

#### Conducted Measurement Photo



#### Radiated Measurement Photos





**STATEMENT**

1. The equipment lists are traceable to the national reference standards.
2. The test report can not be partially copied unless prior written approval is issued from our lab.
3. The test report is invalid without the "special seal for inspection and testing".
4. The test report is invalid without the signature of the approver.
5. The test process and test result is only related to the Unit Under Test.
6. Sample information is provided by the client and the laboratory is not responsible for its authenticity.
7. The quality system of our laboratory is in accordance with ISO/IEC17025.
8. If there is any objection to this test report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

**Address:**

1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China

TEL: 400-788-9558

P.C.: 518103

FAX: 0755-33229357

Website: <http://www.chnbctc.com>

E-Mail: [bctc@bctc-lab.com.cn](mailto:bctc@bctc-lab.com.cn)

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