



## 10. 20 dB Bandwidth

### 10.1 Block Diagram Of Test Setup



### 10.2 Limit

N/A

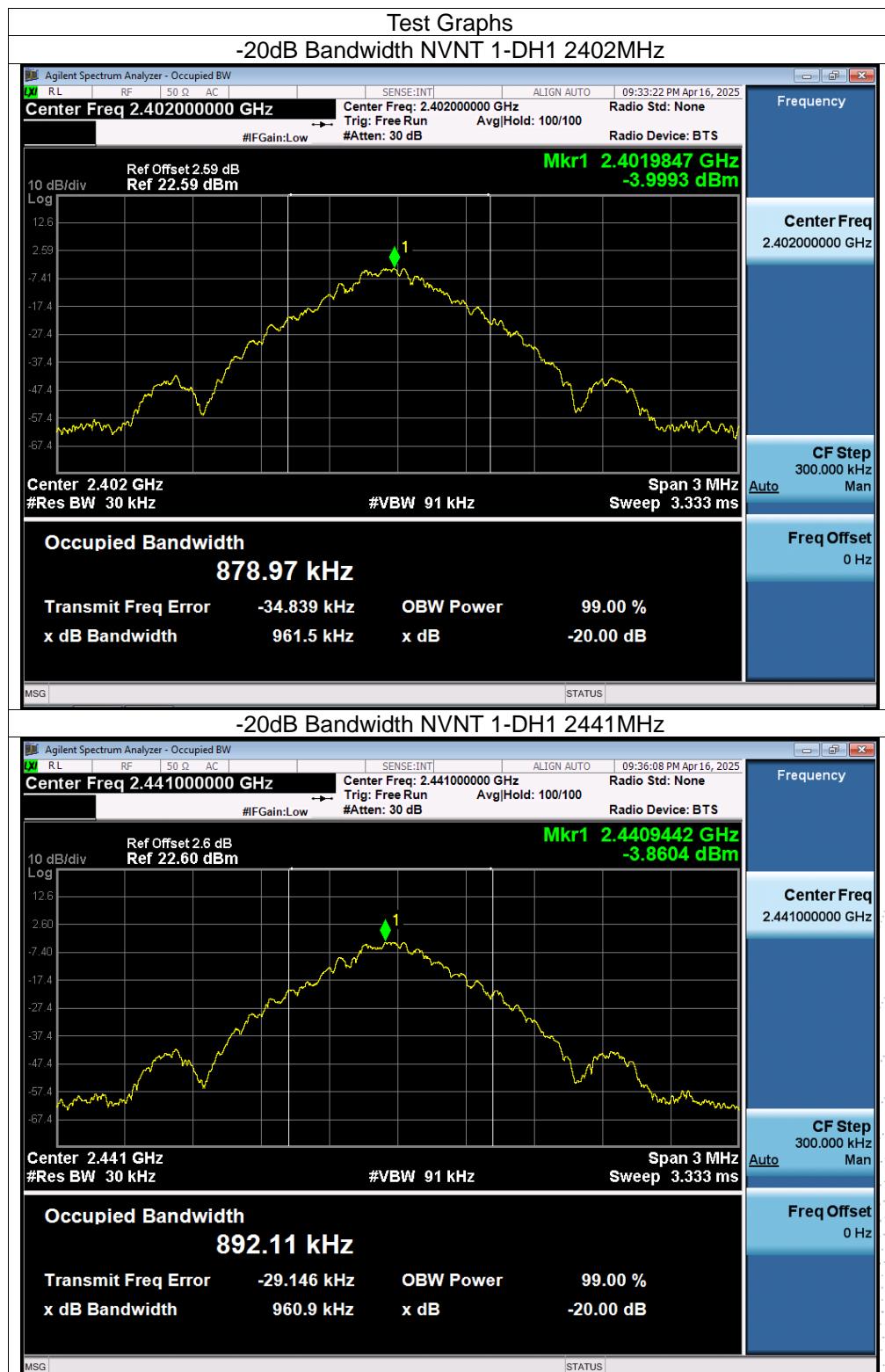
### 10.3 Test procedure

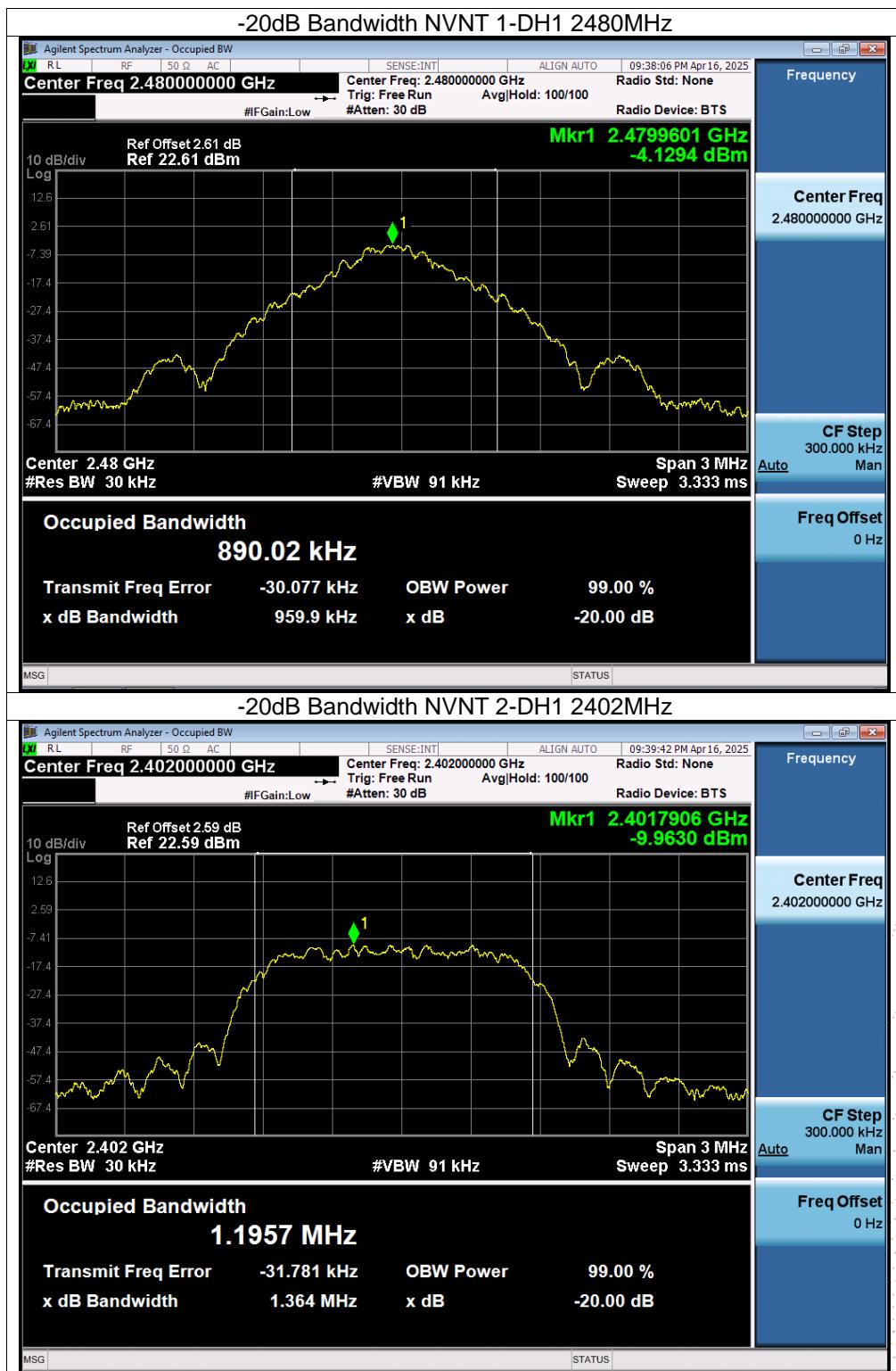
1. Set RBW = 30kHz.
2. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

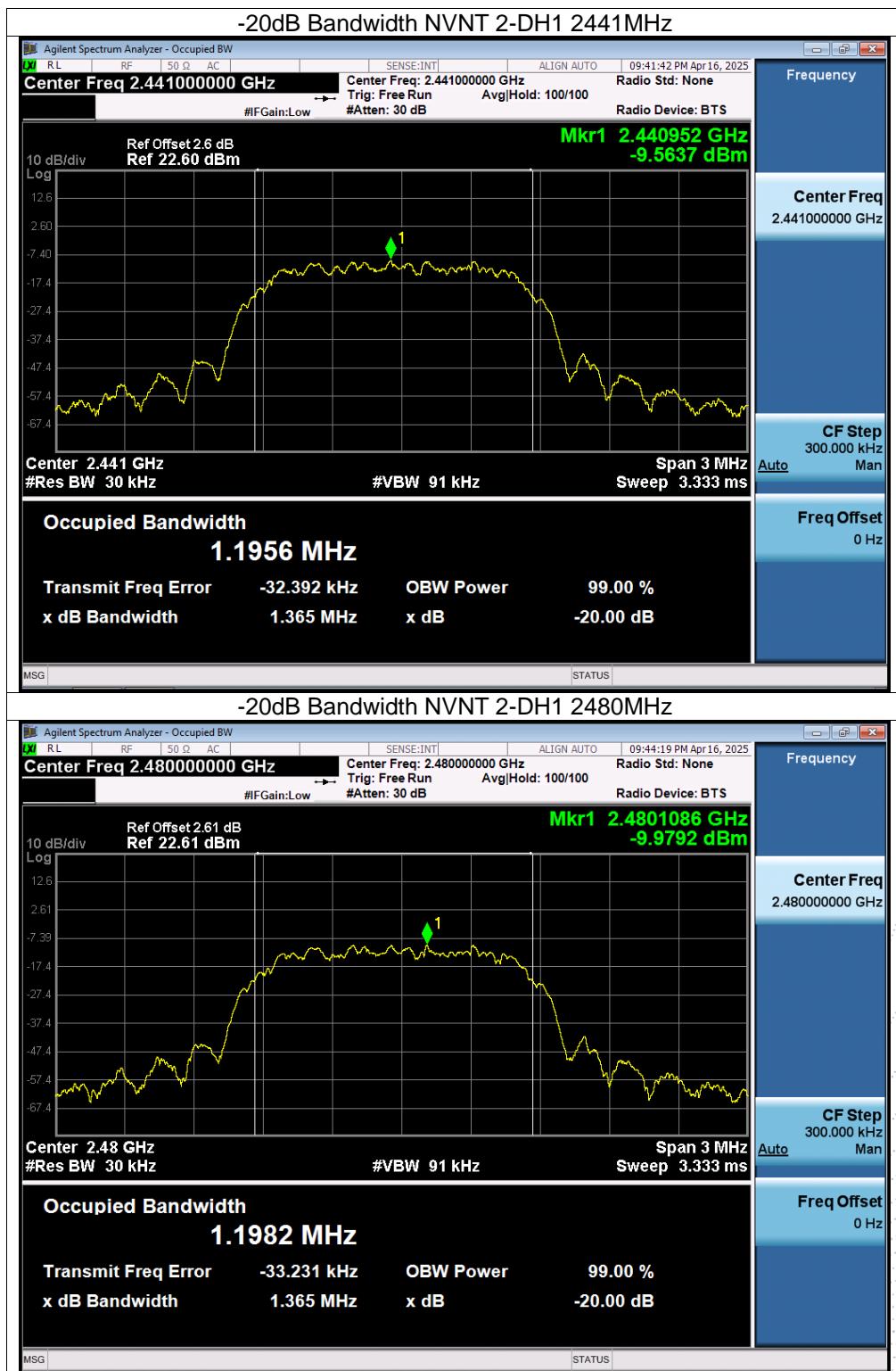
### 10.4 Test Result

Temperature:	26°C	Relative Humidity:	54%
Test Voltage:	DC 3.3V	Remark:	N/A

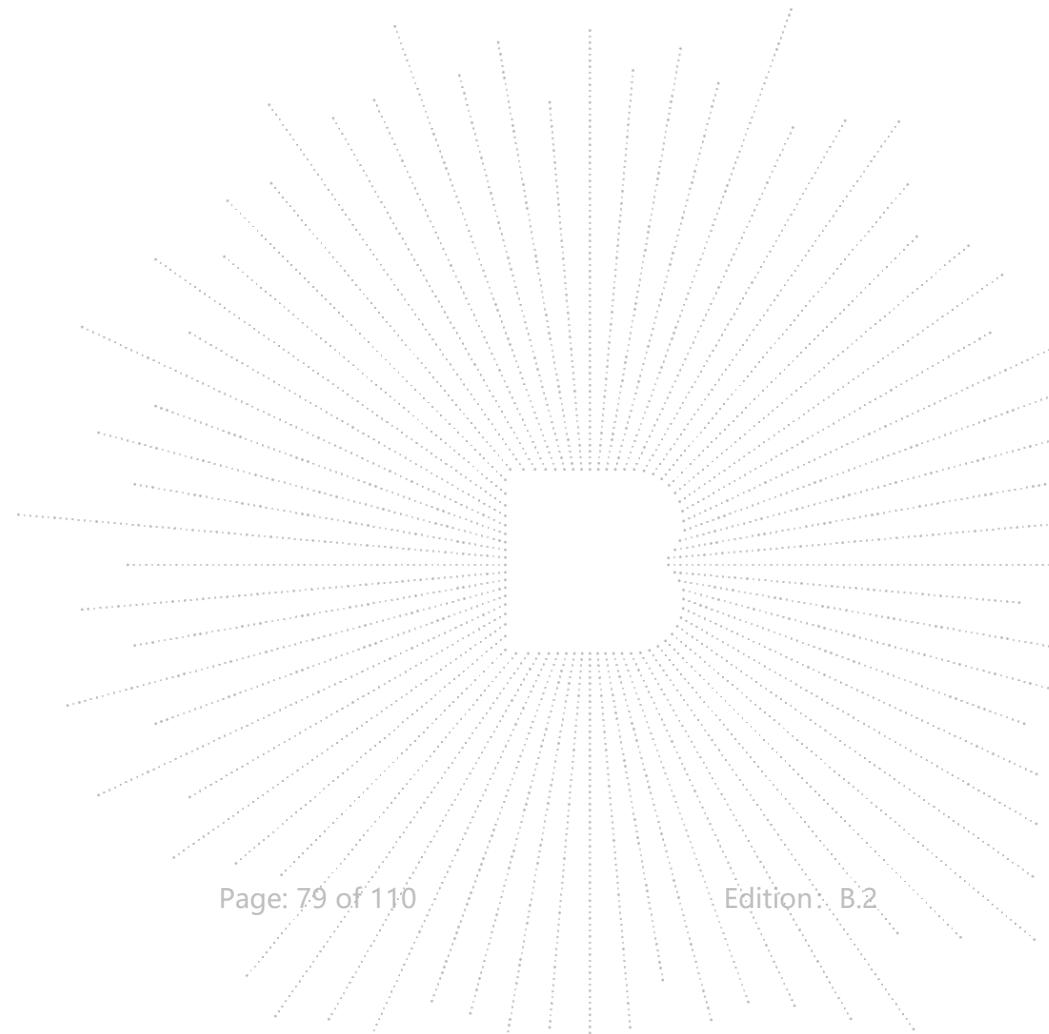
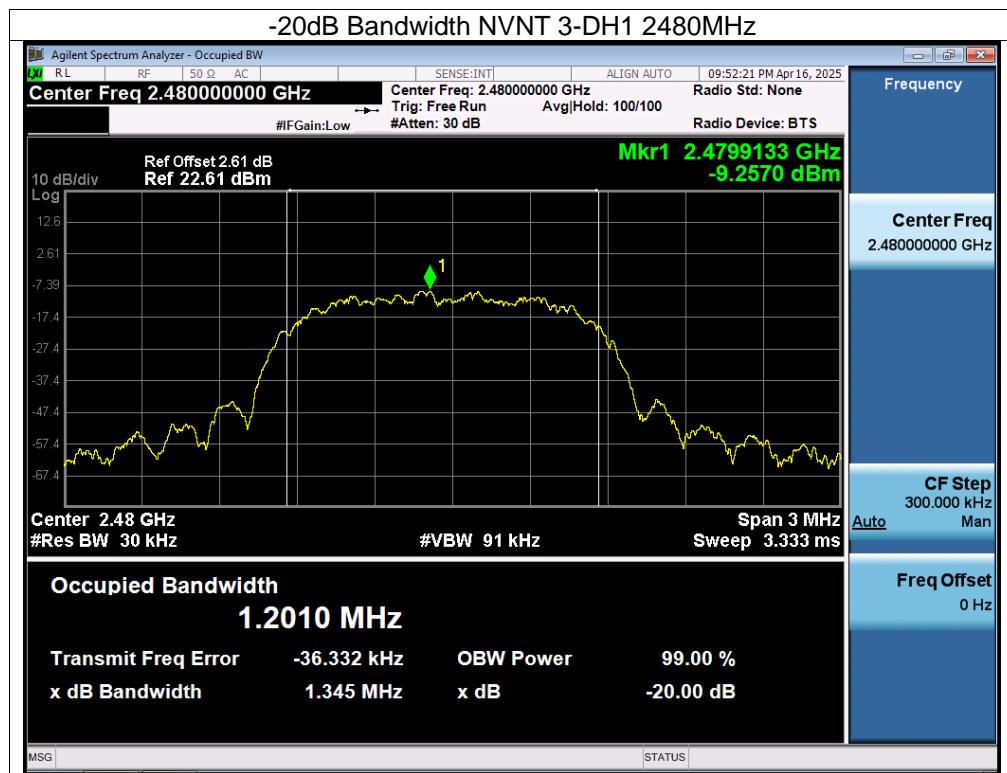
Condition	Mode	Frequency (MHz)	-20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH1	2402	0.962	Pass
NVNT	1-DH1	2441	0.961	Pass
NVNT	1-DH1	2480	0.96	Pass
NVNT	2-DH1	2402	1.364	Pass
NVNT	2-DH1	2441	1.365	Pass
NVNT	2-DH1	2480	1.365	Pass
NVNT	3-DH1	2402	1.347	Pass
NVNT	3-DH1	2441	1.349	Pass
NVNT	3-DH1	2480	1.345	Pass











## 11. Maximum Peak Output Power

### 11.1 Block Diagram Of Test Setup



### 11.2 Limit

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(1)	Peak Output Power	0.125 watt or 21dBm	2400-2483.5	PASS

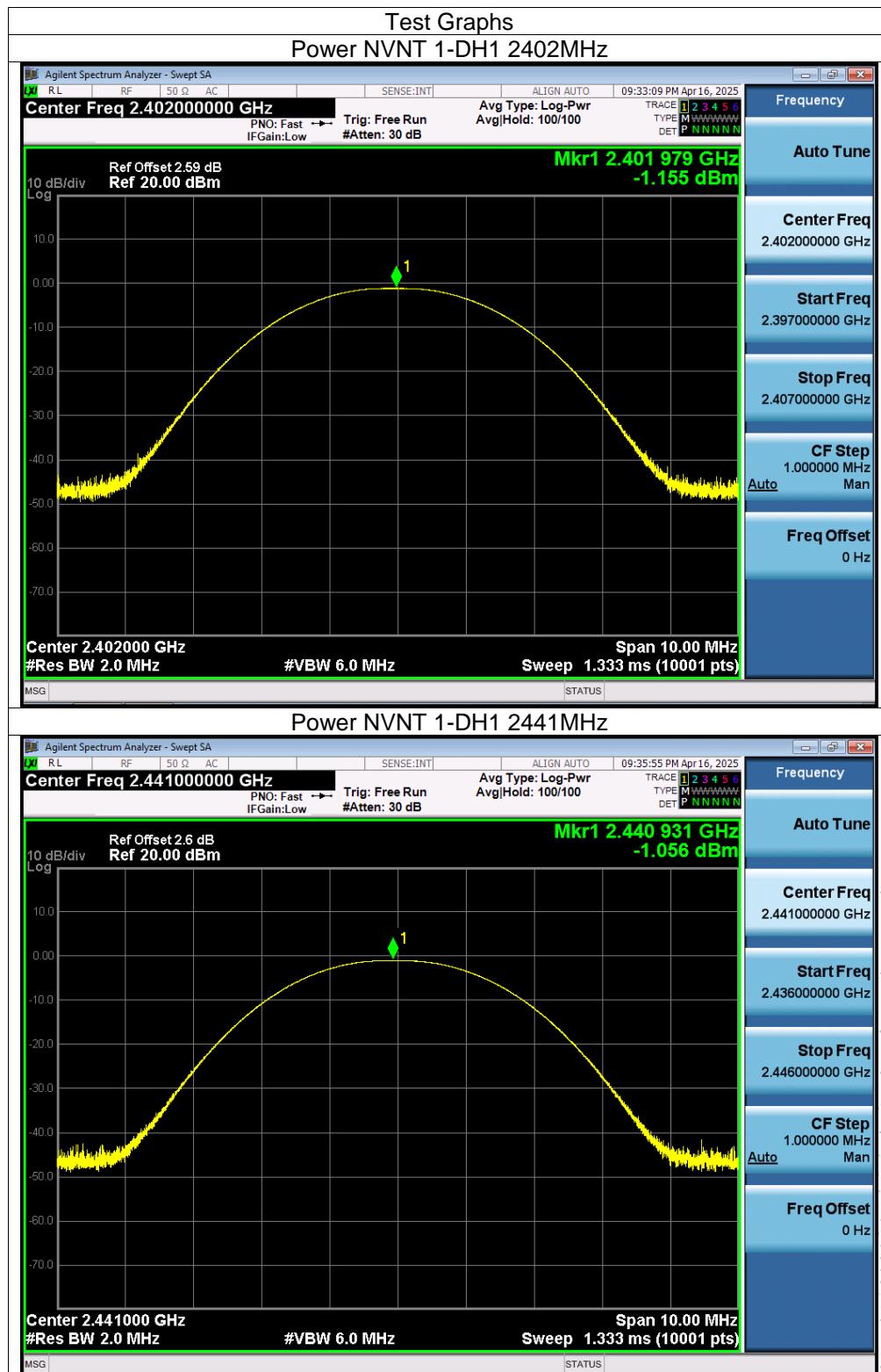
### 11.3 Test procedure

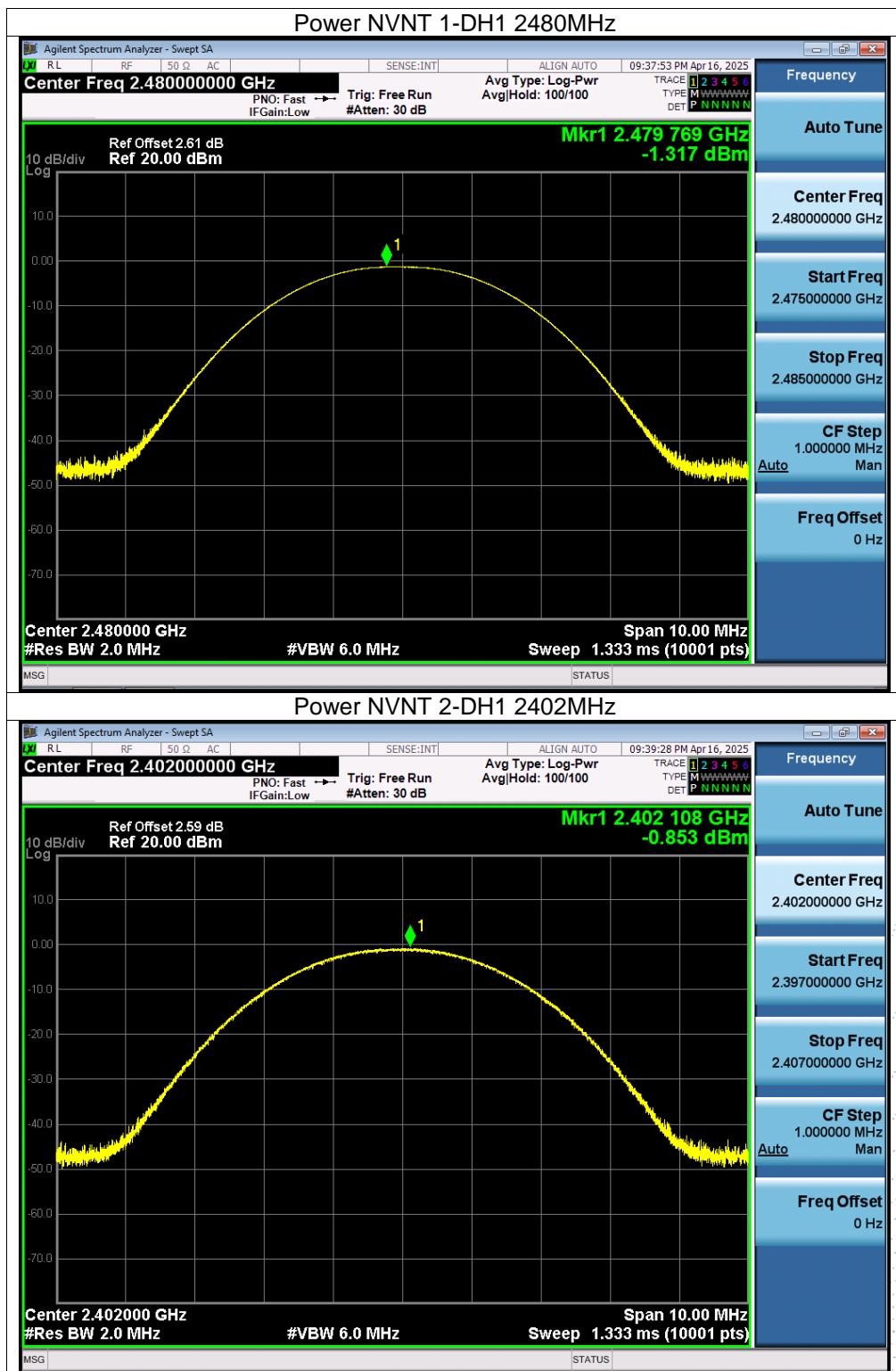
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 2MHz. VBW = 6MHz. Sweep = auto; Detector Function = Peak.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

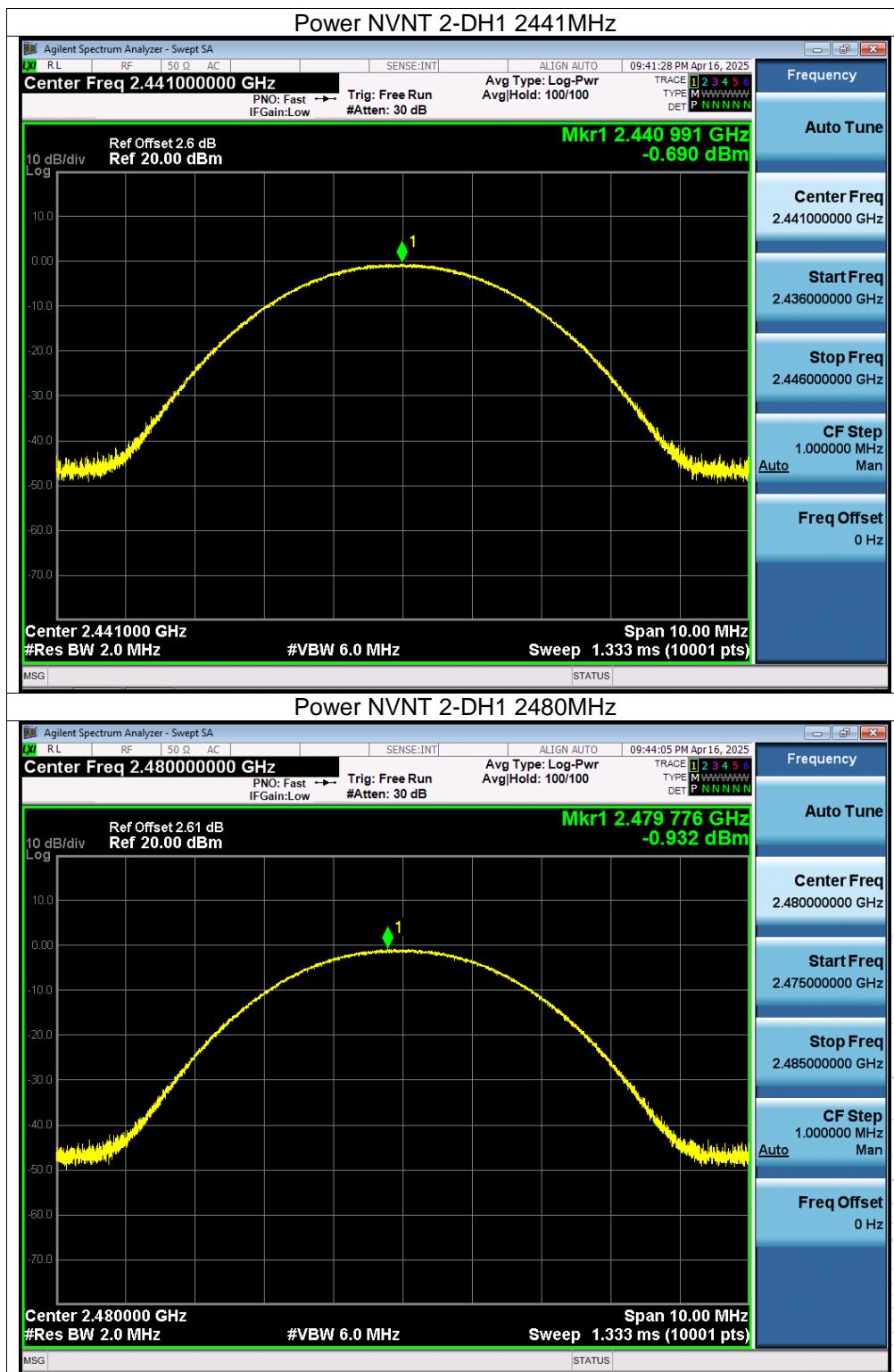
### 11.4 Test Result

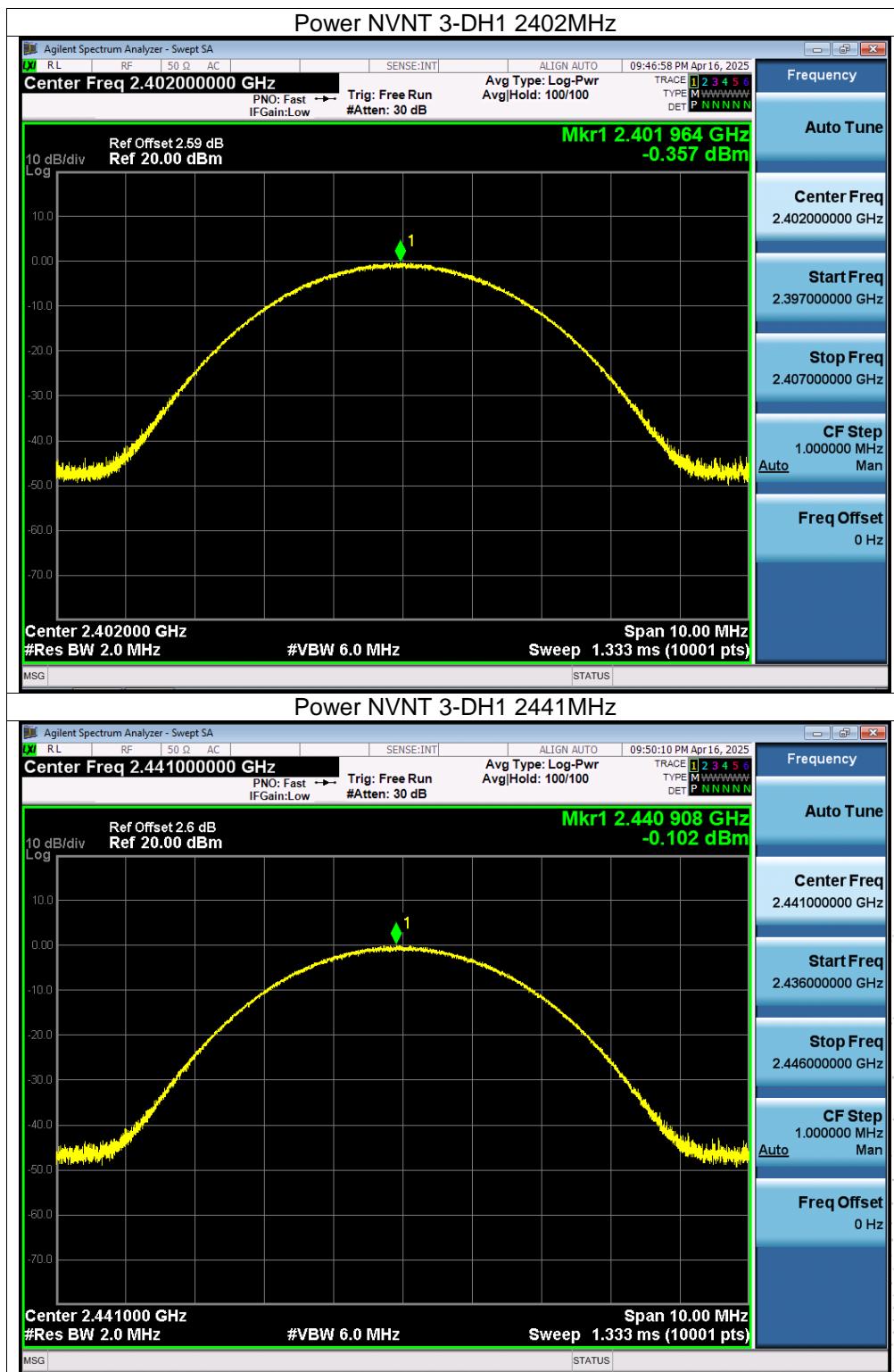
Temperature:	26°C	Relative Humidity:	54%
Test Voltage:	DC 3.3V	Remark:	N/A

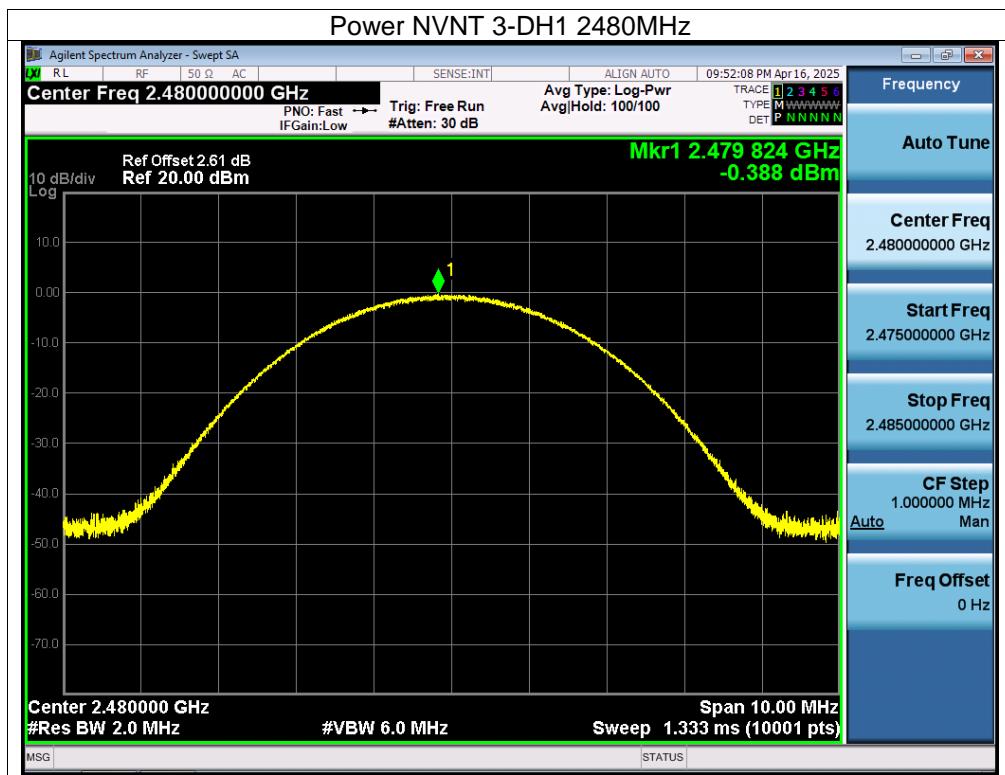
Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH1	2402	-1.16	21	Pass
NVNT	1-DH1	2441	-1.06	21	Pass
NVNT	1-DH1	2480	-1.32	21	Pass
NVNT	2-DH1	2402	-0.85	21	Pass
NVNT	2-DH1	2441	-0.69	21	Pass
NVNT	2-DH1	2480	-0.93	21	Pass
NVNT	3-DH1	2402	-0.36	21	Pass
NVNT	3-DH1	2441	-0.1	21	Pass
NVNT	3-DH1	2480	-0.39	21	Pass











## 12. Hopping Channel Separation

### 12.1 Block Diagram Of Test Setup



### 12.2 Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 0.125W.

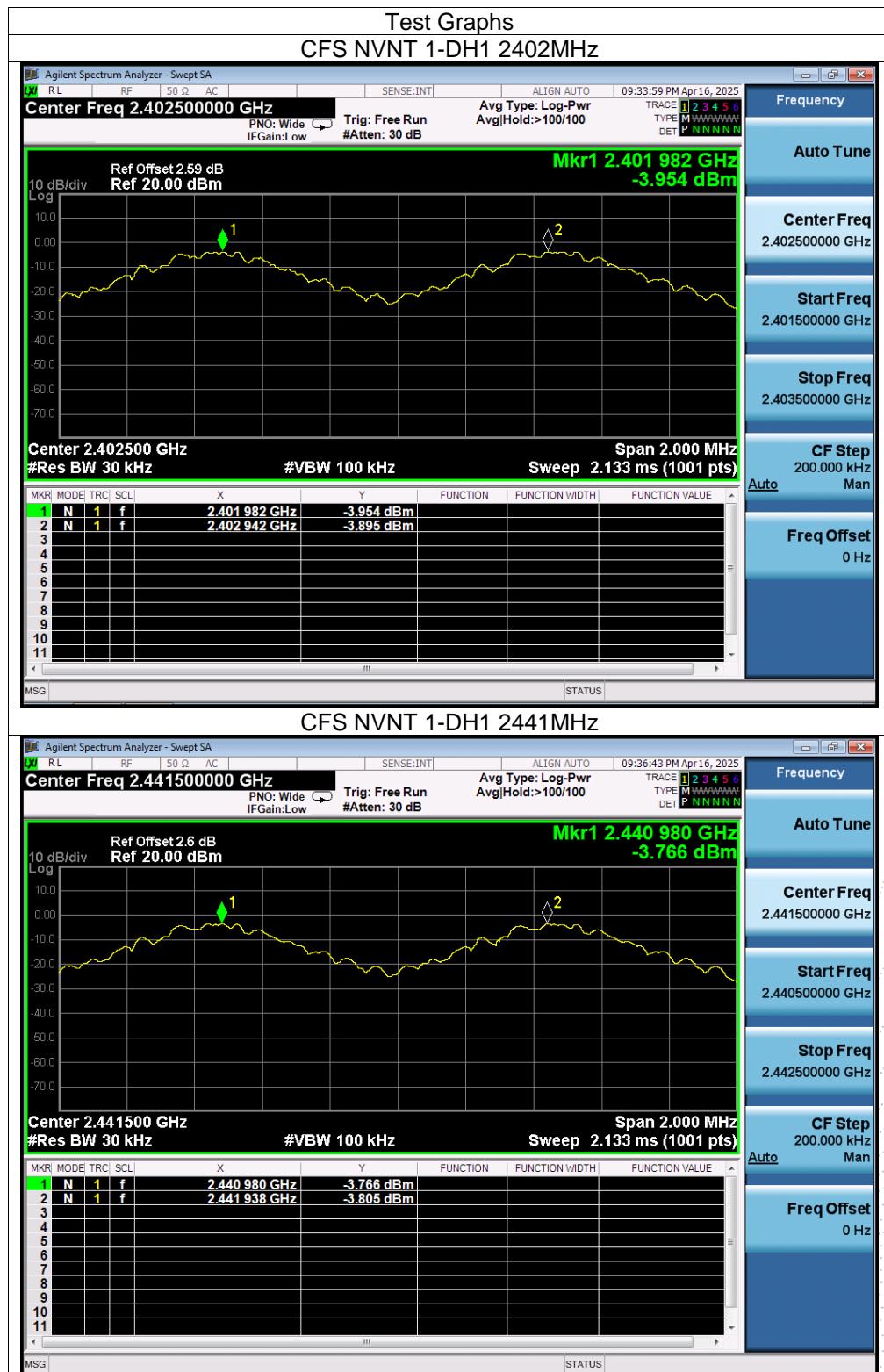
### 12.3 Test procedure

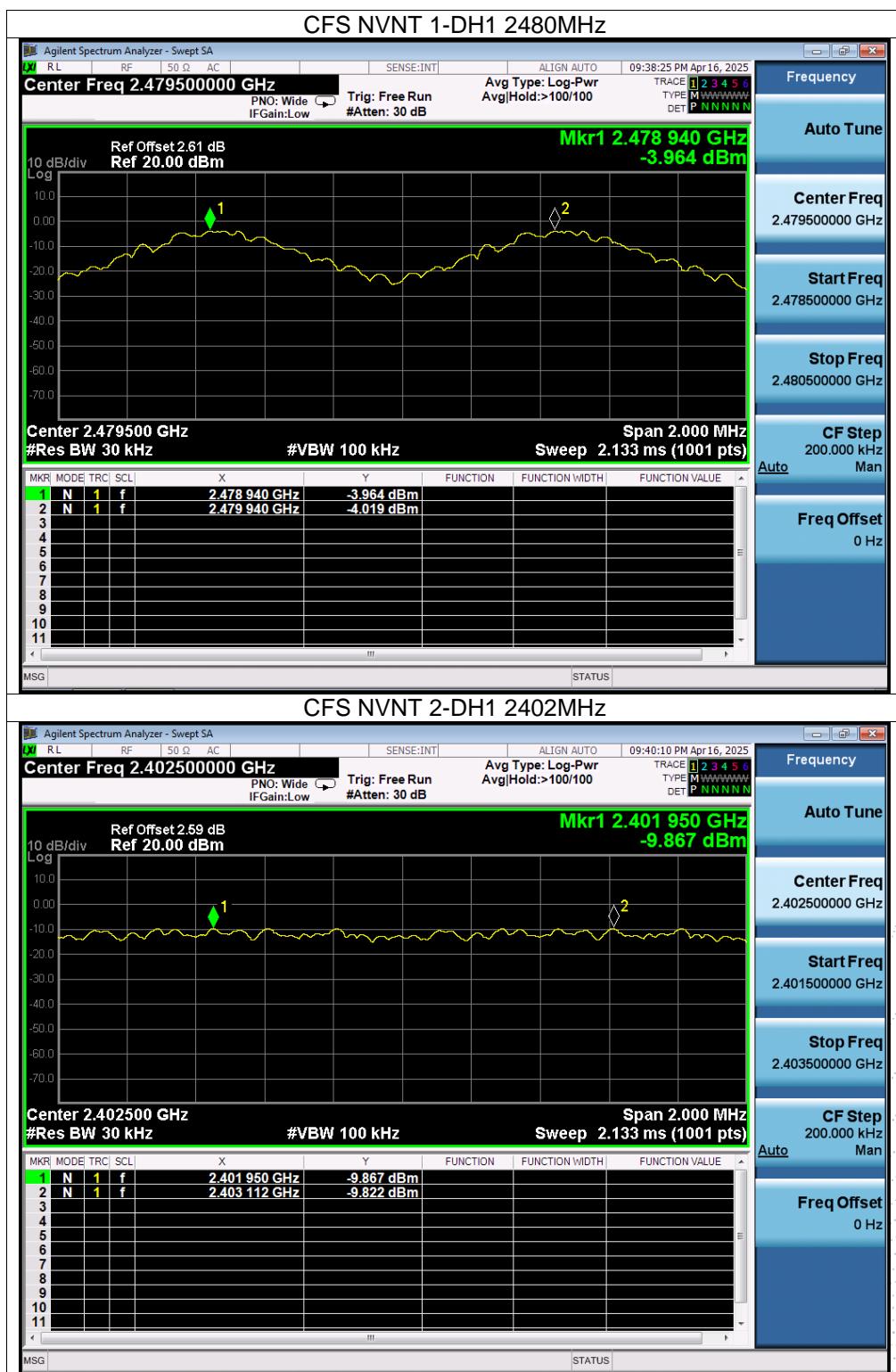
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 30kHz. VBW = 100kHz , Span = 2.0MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

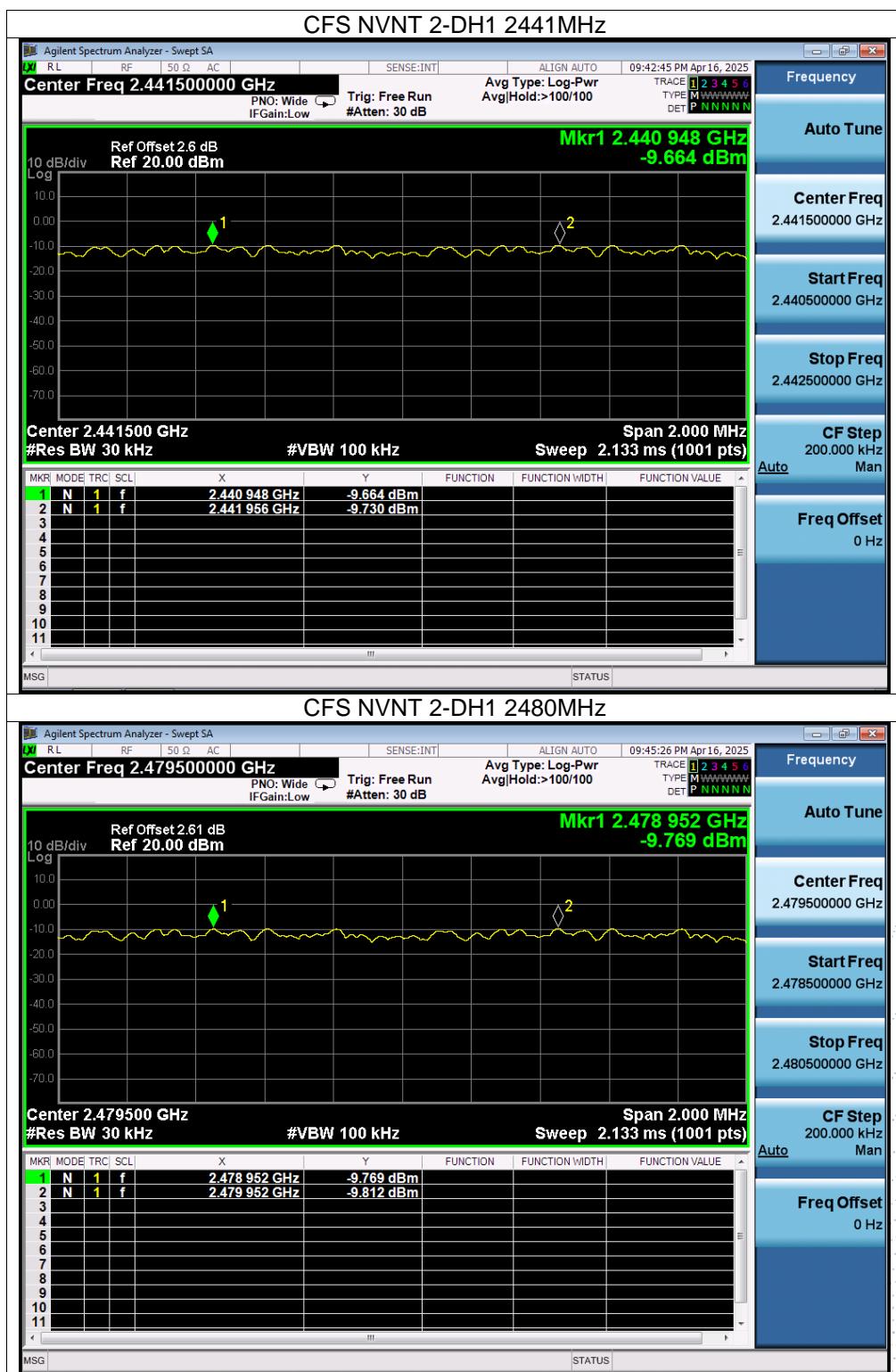
### 12.4 Test Result

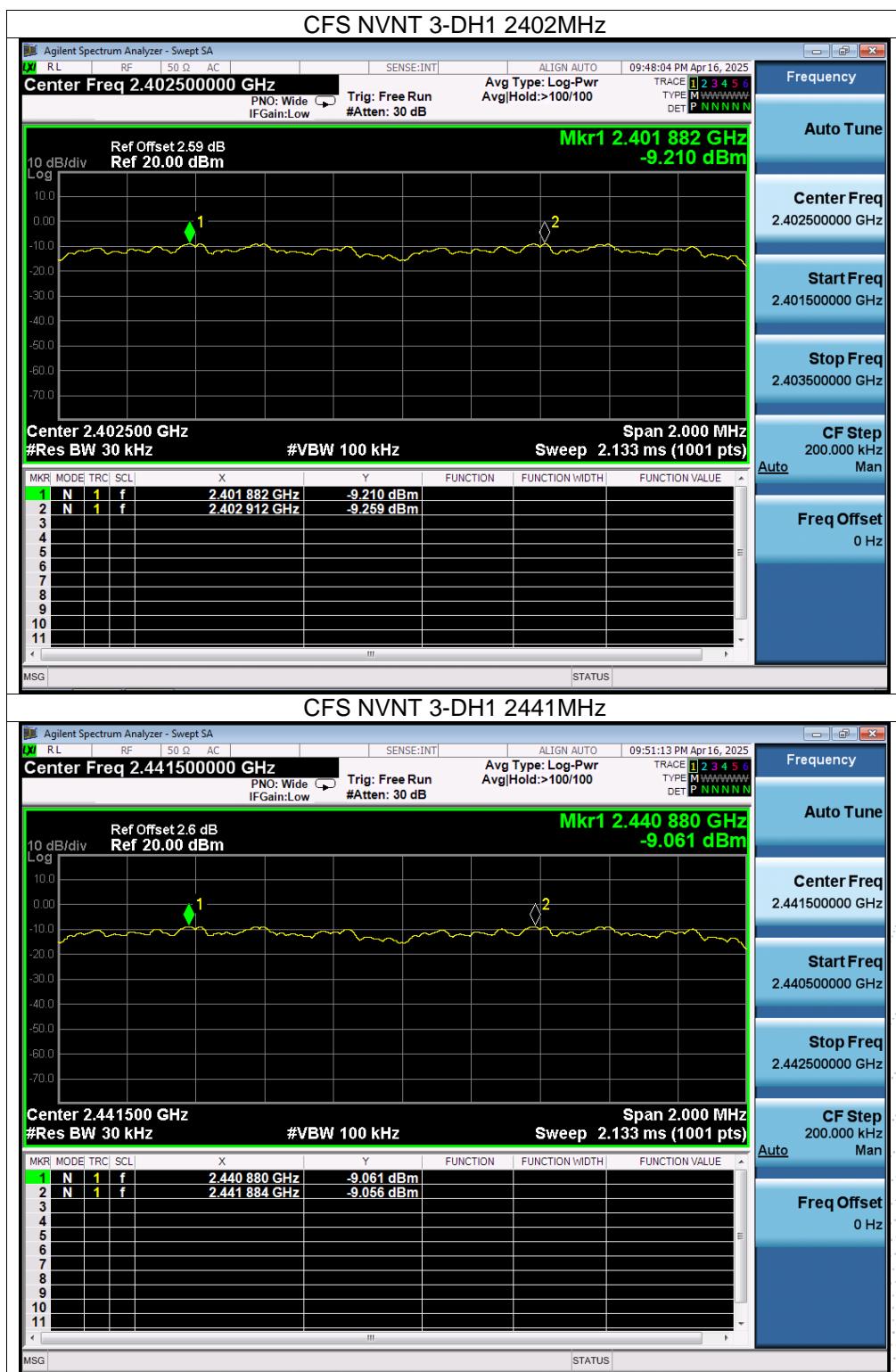
Temperature:	26°C	Relative Humidity:	54%
Test Voltage:	DC 3.3V	Remark:	N/A

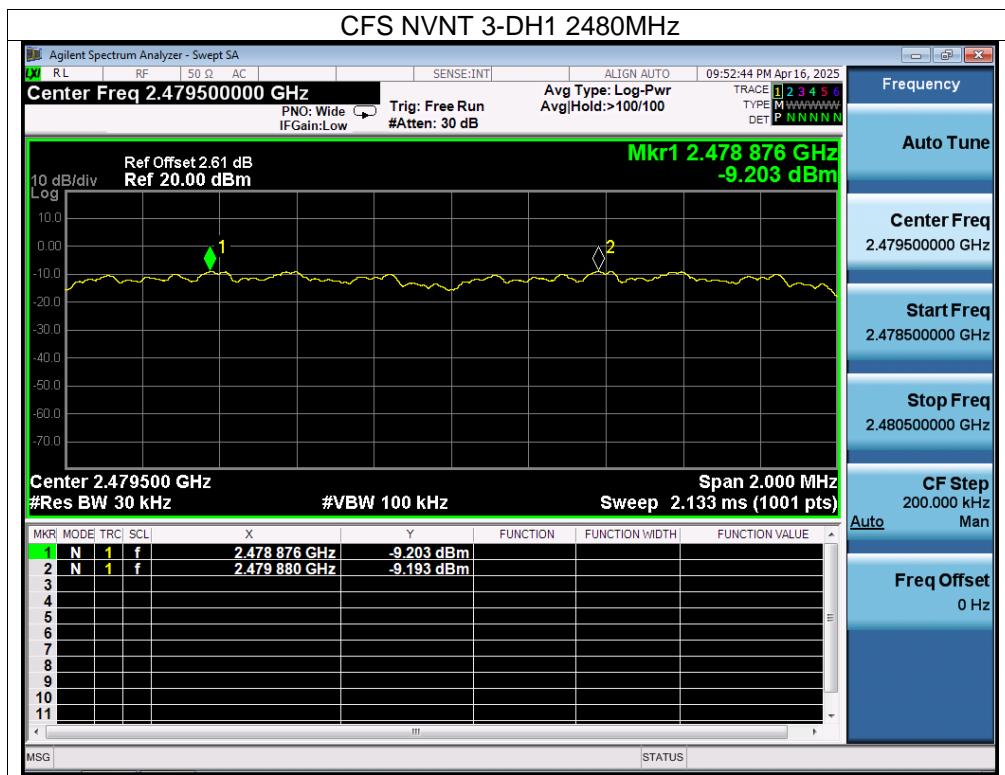
Condition	Mode	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH1	2401.982	2402.942	0.96	0.641	Pass
NVNT	1-DH1	2440.98	2441.938	0.958	0.641	Pass
NVNT	1-DH1	2478.94	2479.94	1	0.64	Pass
NVNT	2-DH1	2401.95	2403.112	1.162	0.909	Pass
NVNT	2-DH1	2440.948	2441.956	1.008	0.91	Pass
NVNT	2-DH1	2478.952	2479.952	1	0.91	Pass
NVNT	3-DH1	2401.882	2402.912	1.03	0.898	Pass
NVNT	3-DH1	2440.88	2441.884	1.004	0.899	Pass
NVNT	3-DH1	2478.876	2479.88	1.004	0.897	Pass











### 13. Number Of Hopping Frequency

#### 13.1 Block Diagram Of Test Setup



#### 13.2 Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

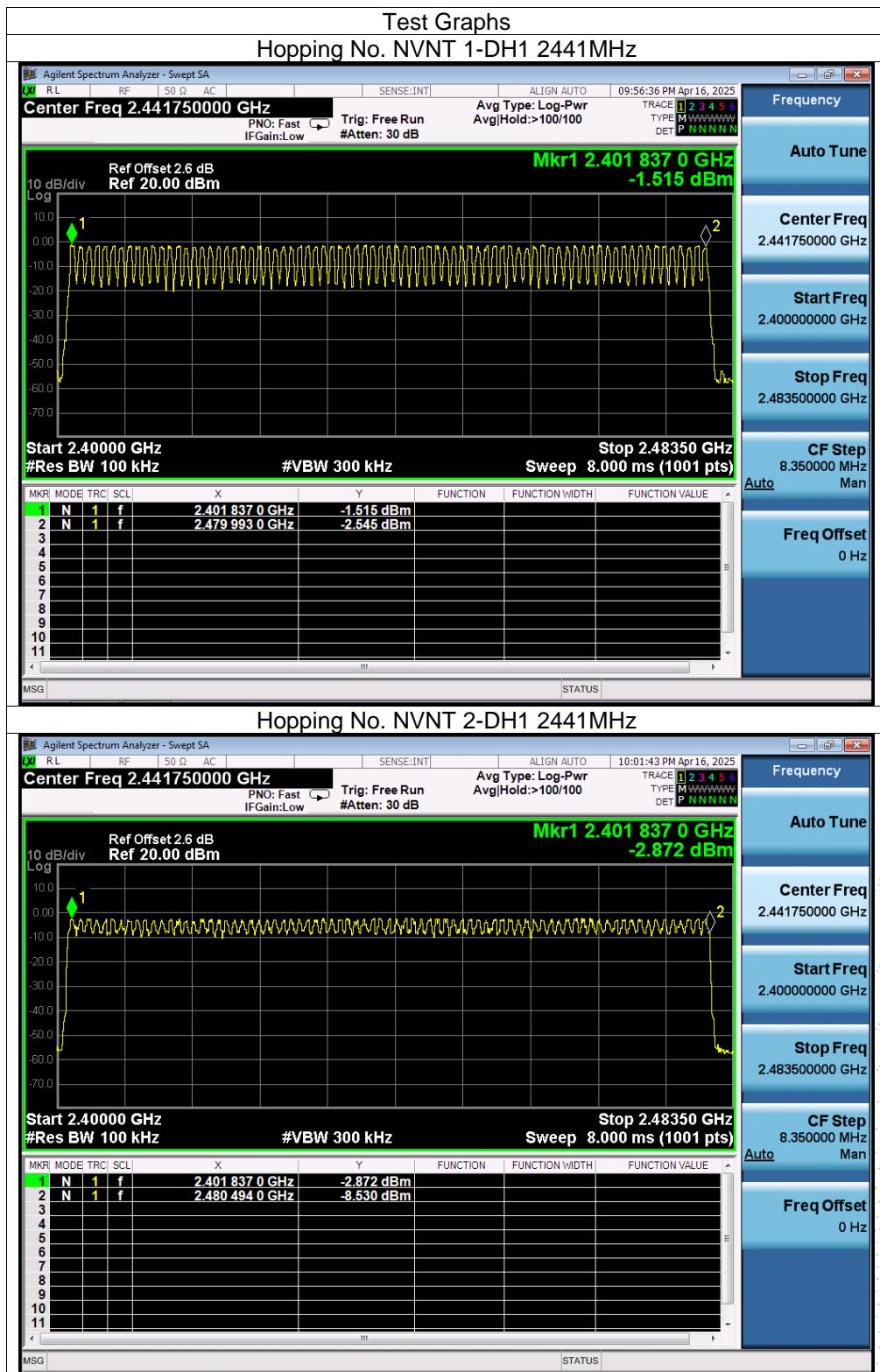
#### 13.3 Test procedure

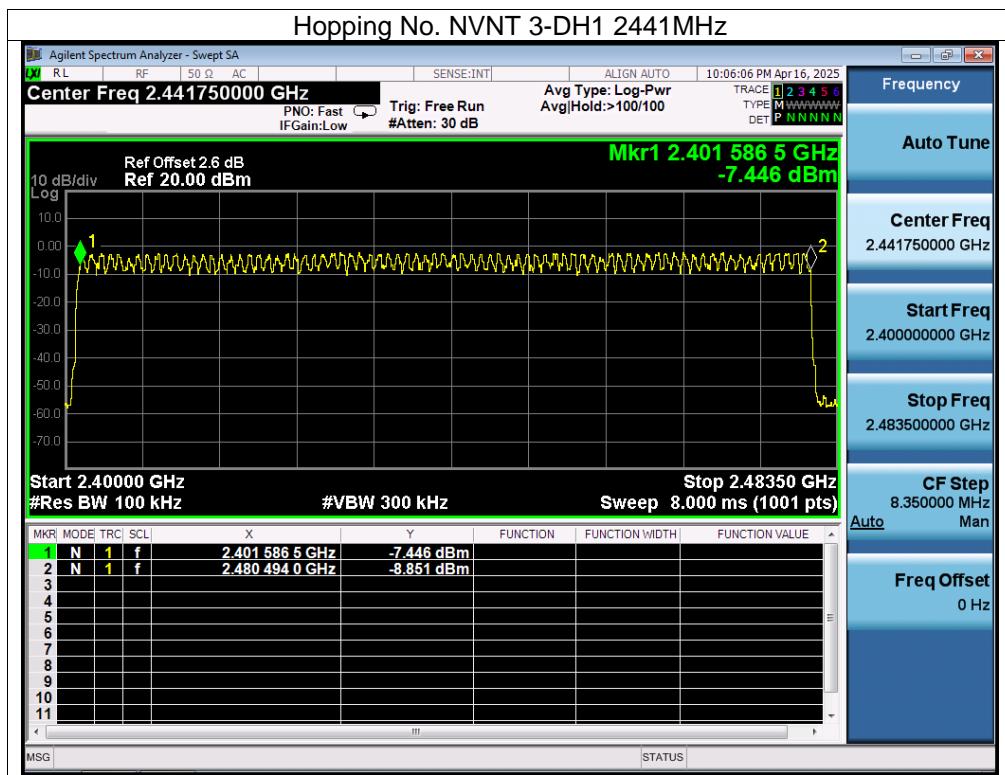
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100kHz. VBW = 300kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.
4. Set the spectrum analyzer: Start Frequency = 2.4GHz, Stop Frequency = 2.4835GHz. Sweep=auto;

#### 13.4 Test Result

Temperature:	26°C	Relative Humidity:	54%
Test Voltage:	DC 3.3V	Remark:	N/A

Condition	Mode	Hopping Number	Limit	Verdict
NVNT	1-DH1	79	15	Pass
NVNT	2-DH1	79	15	Pass
NVNT	3-DH1	79	15	Pass





## 14. Dwell Time

### 14.1 Block Diagram Of Test Setup



### 14.2 Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

### 14.3 Test procedure

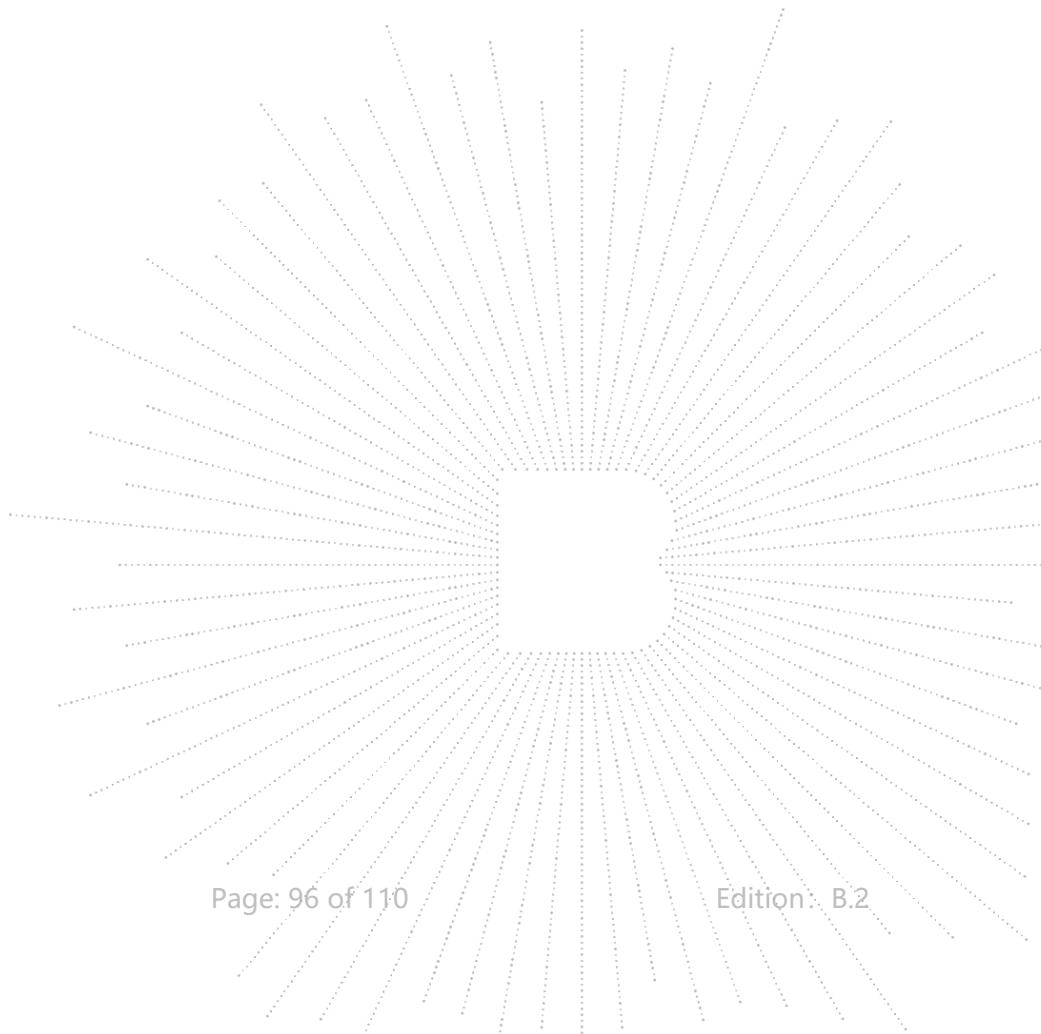
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set spectrum analyzer span = 0. Centred on a hopping channel;
3. Set RBW = 1MHz and VBW = 3MHz. Sweep = as necessary to capture the entire dwell time per hopping channel. Set the EUT for DH5, DH3 and DH1 packet transmitting.
4. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g. data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

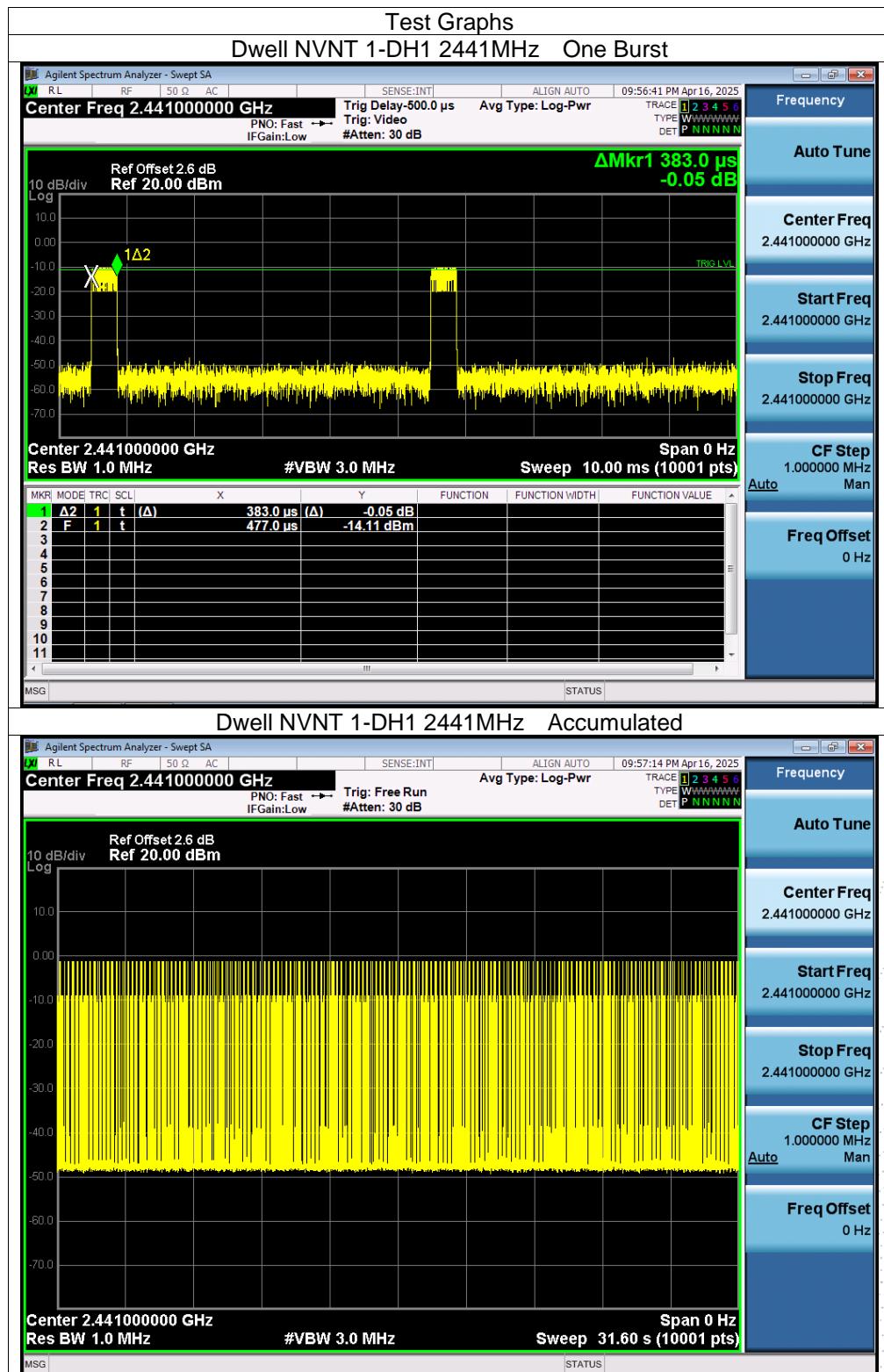
#### 14.4 Test Result

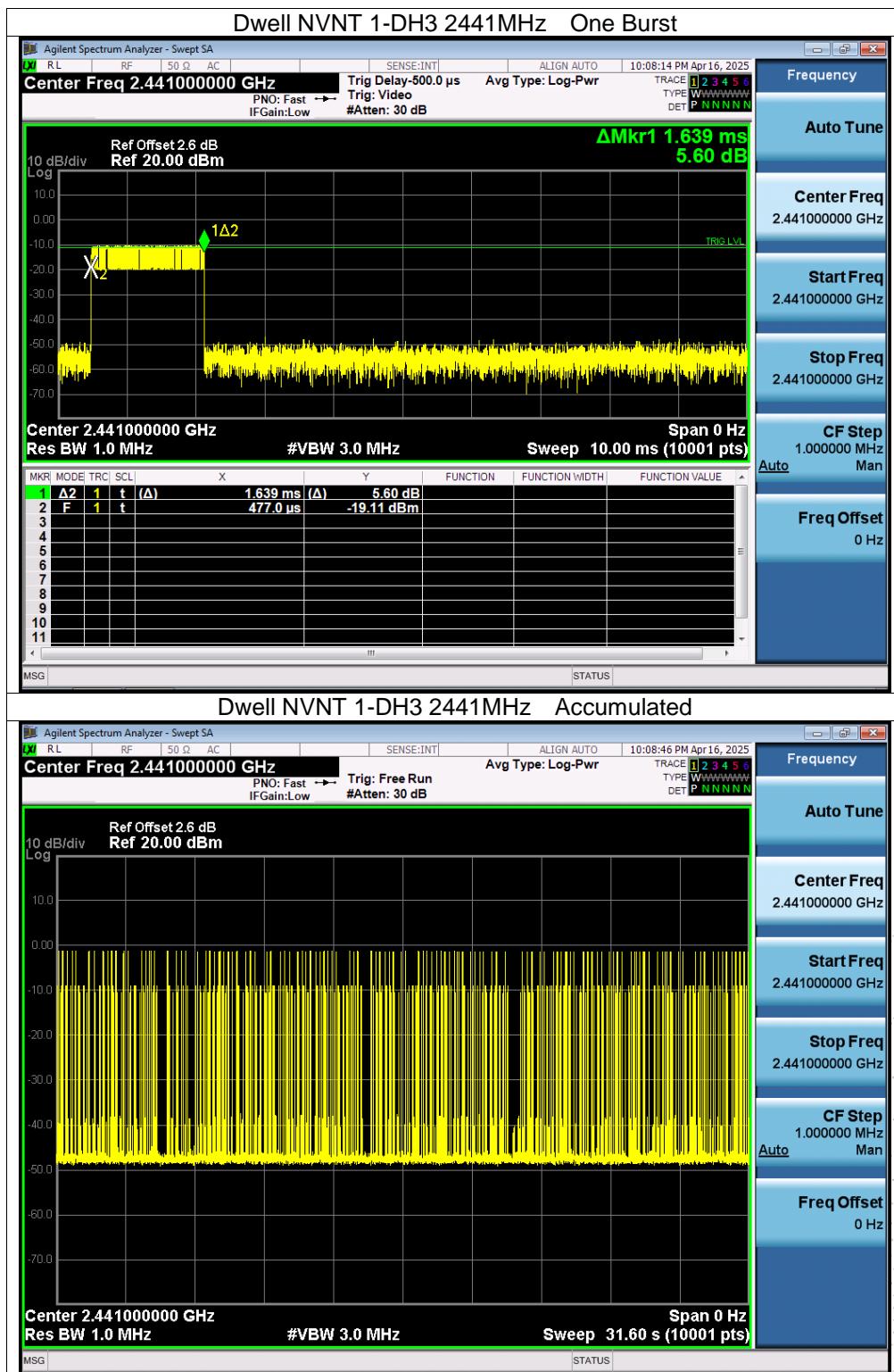
Temperature:	26°C	Relative Humidity:	54%
Test Voltage:	DC 3.3V	Remark:	N/A

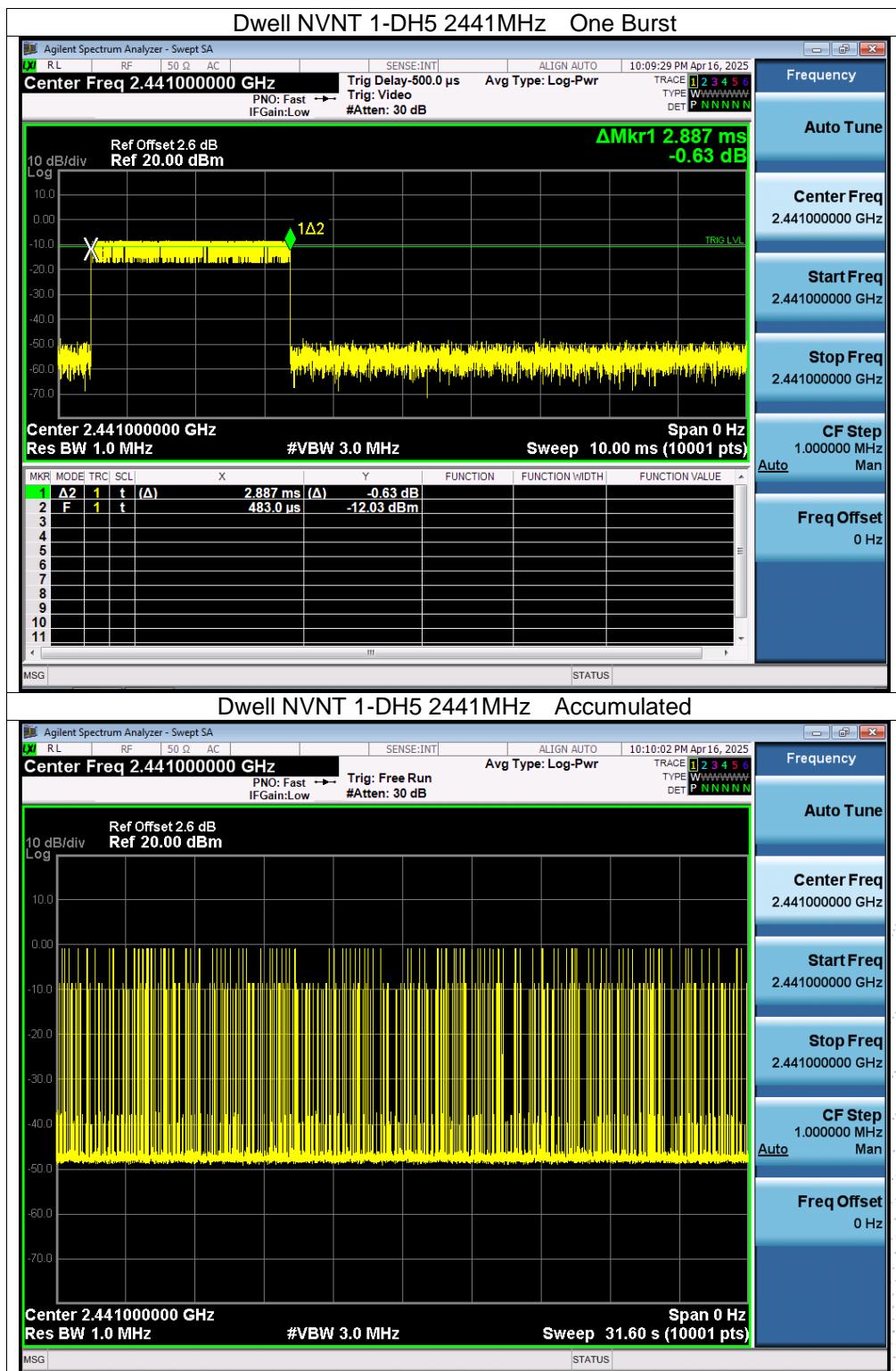
Condition	Mode	Frequency (MHz)	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH1	2441	0.383	121.028	316	31600	400	Pass
NVNT	1-DH3	2441	1.639	250.767	153	31600	400	Pass
NVNT	1-DH5	2441	2.887	303.135	105	31600	400	Pass
NVNT	2-DH1	2441	0.392	123.48	315	31600	400	Pass
NVNT	2-DH3	2441	1.643	257.951	157	31600	400	Pass
NVNT	2-DH5	2441	2.891	346.92	120	31600	400	Pass
NVNT	3-DH1	2441	0.391	124.338	318	31600	400	Pass
NVNT	3-DH3	2441	1.642	247.942	151	31600	400	Pass
NVNT	3-DH5	2441	2.893	335.588	116	31600	400	Pass

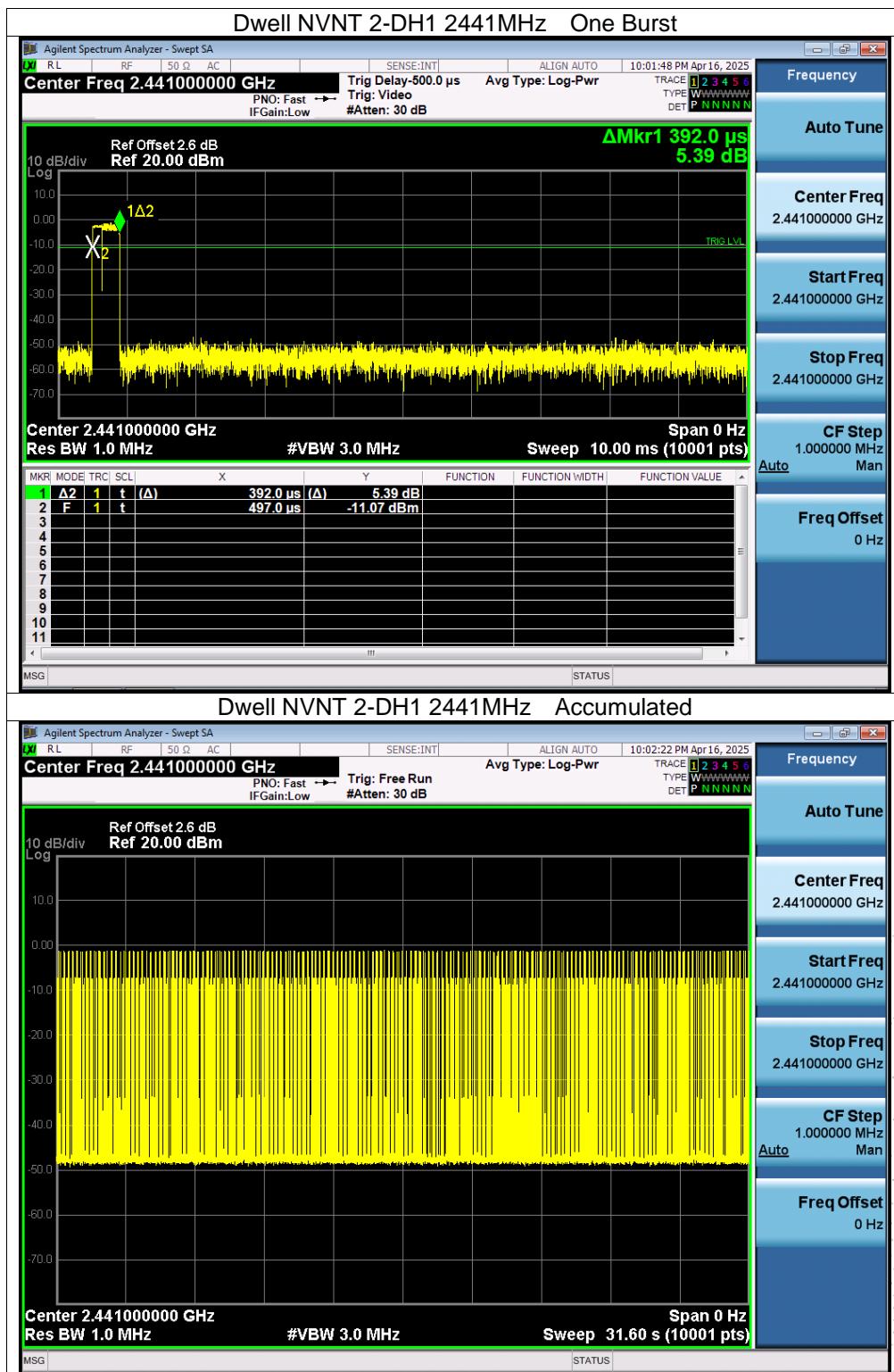
Note: Total Dwell Time (ms) = Pulse Time (ms)\*Burst Count

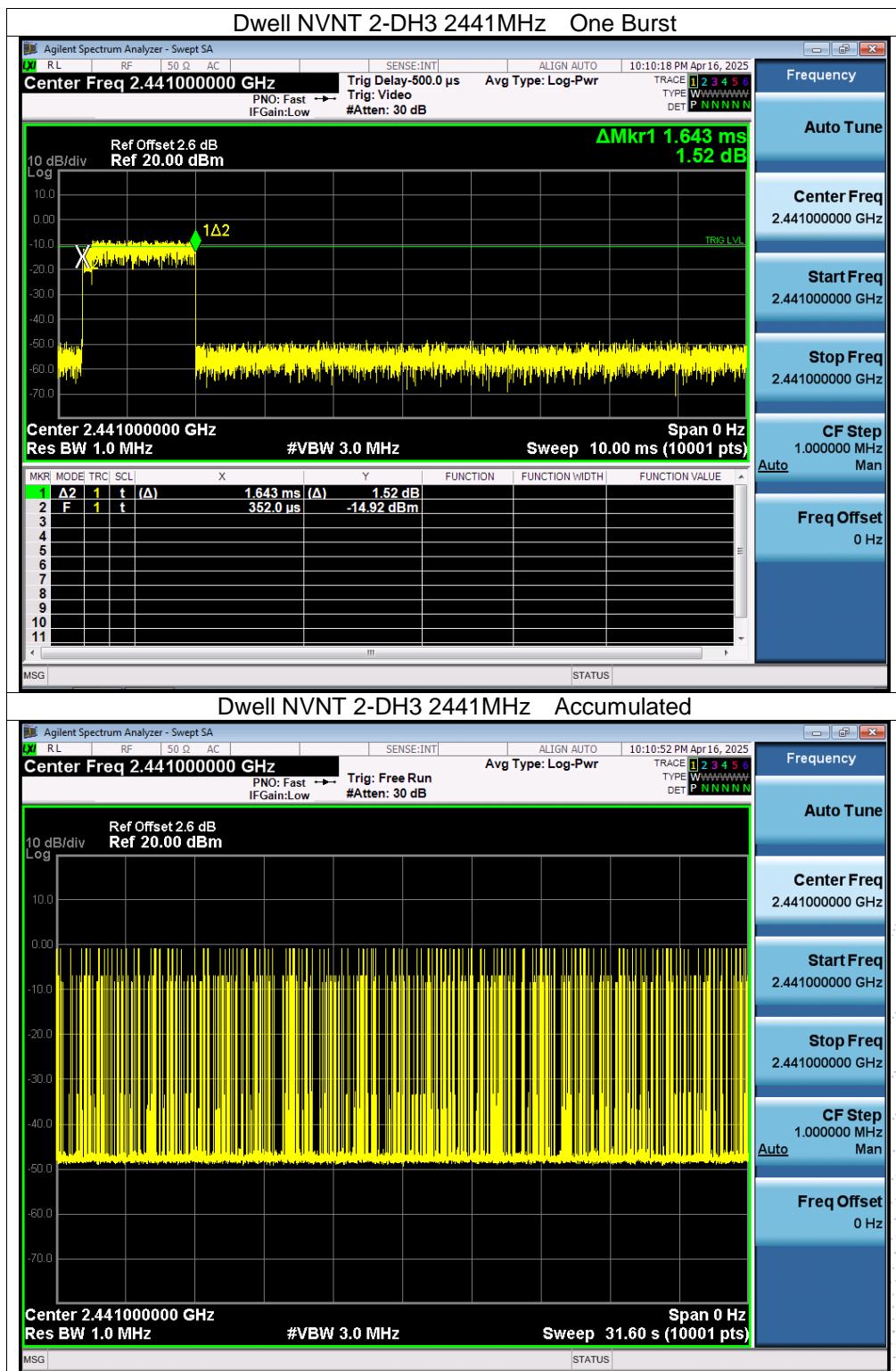


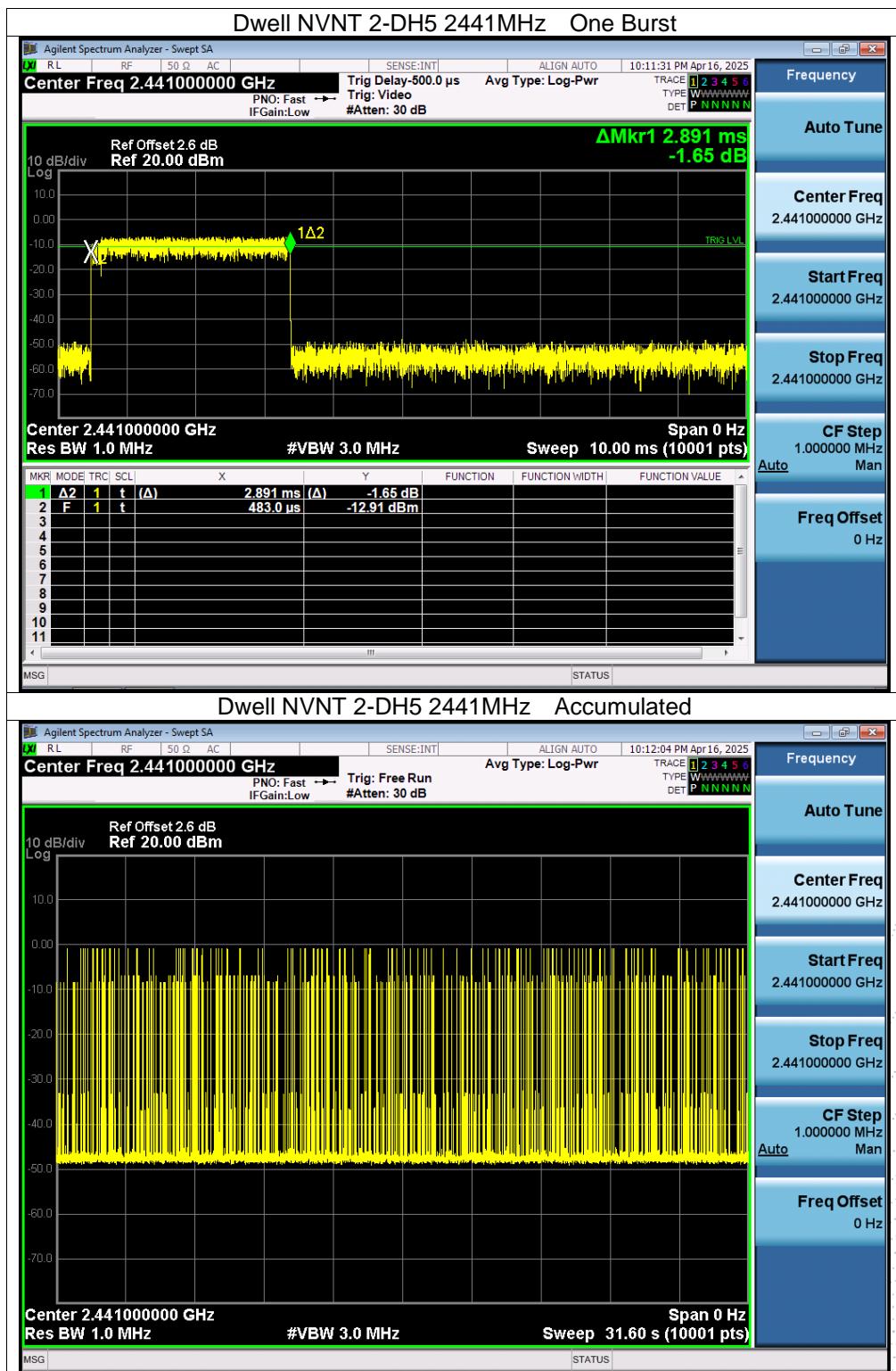


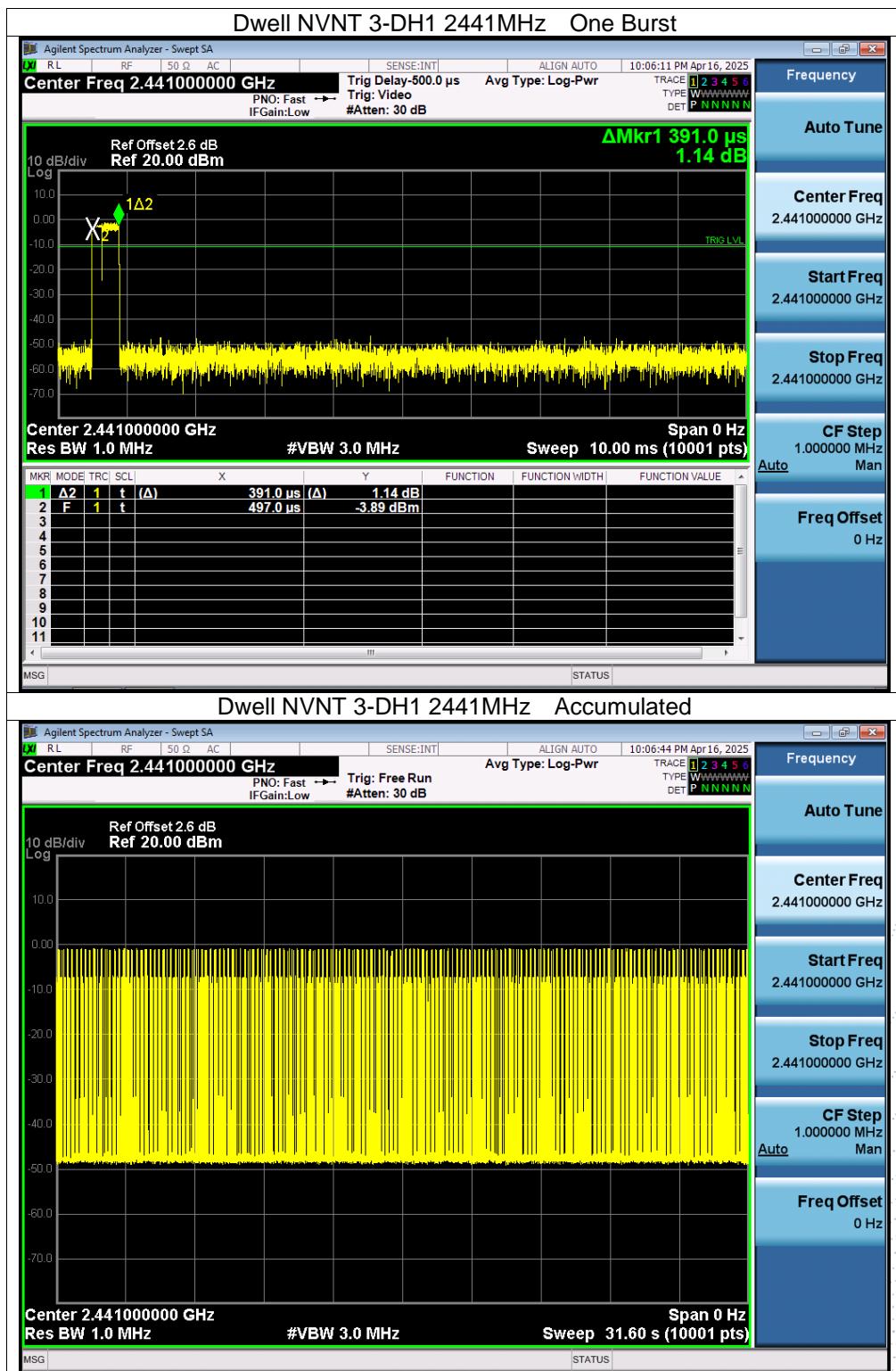


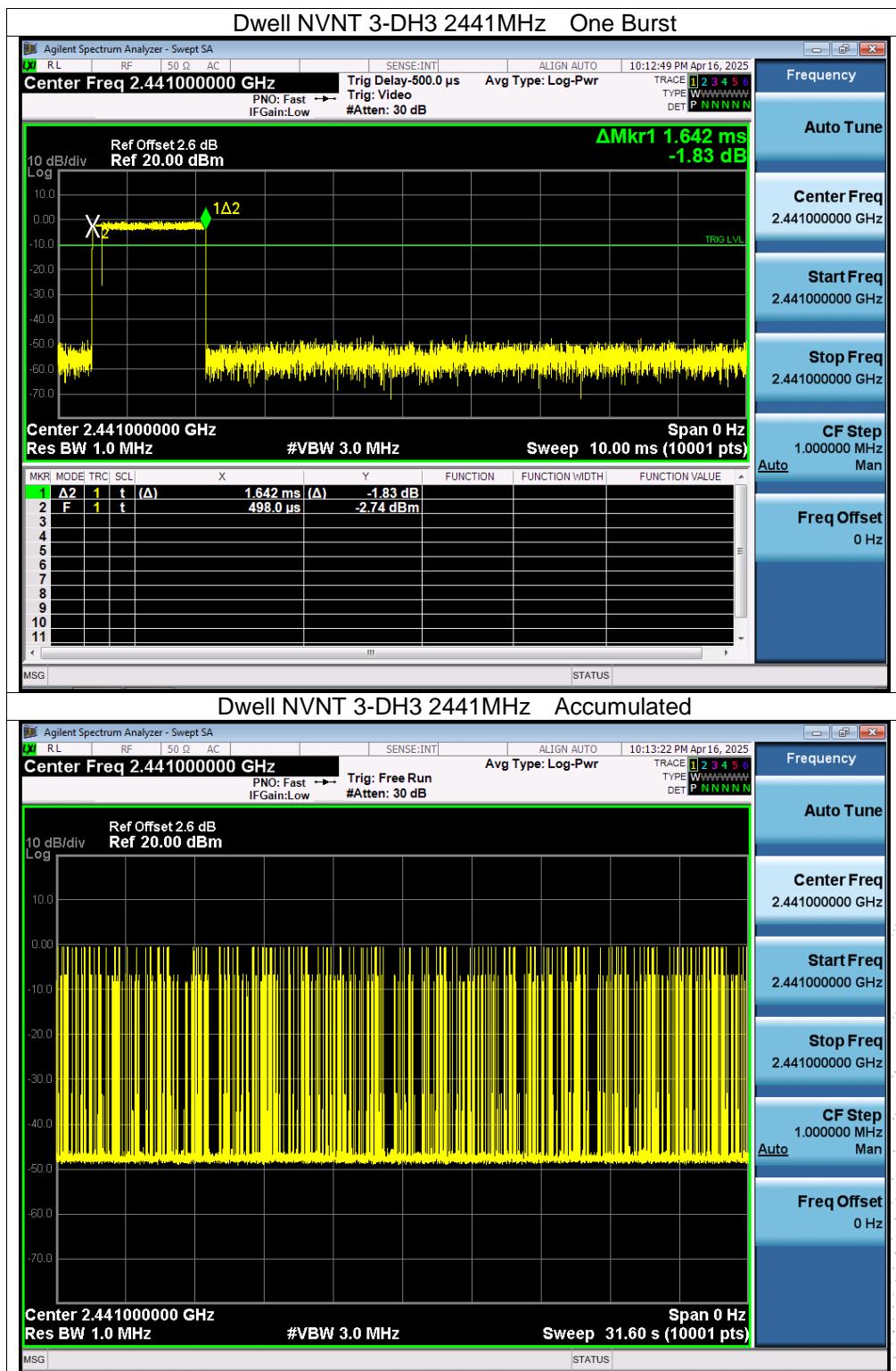


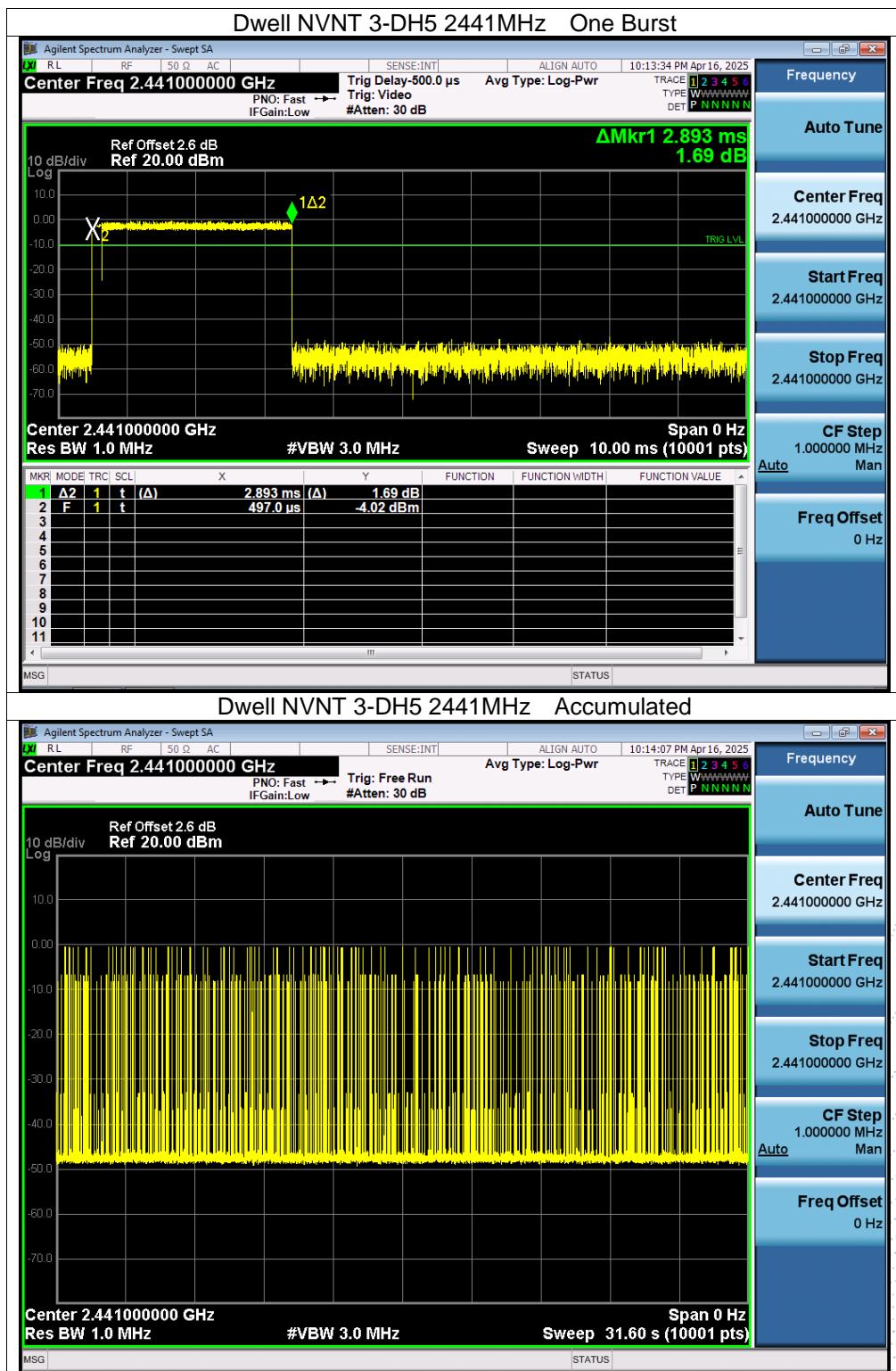












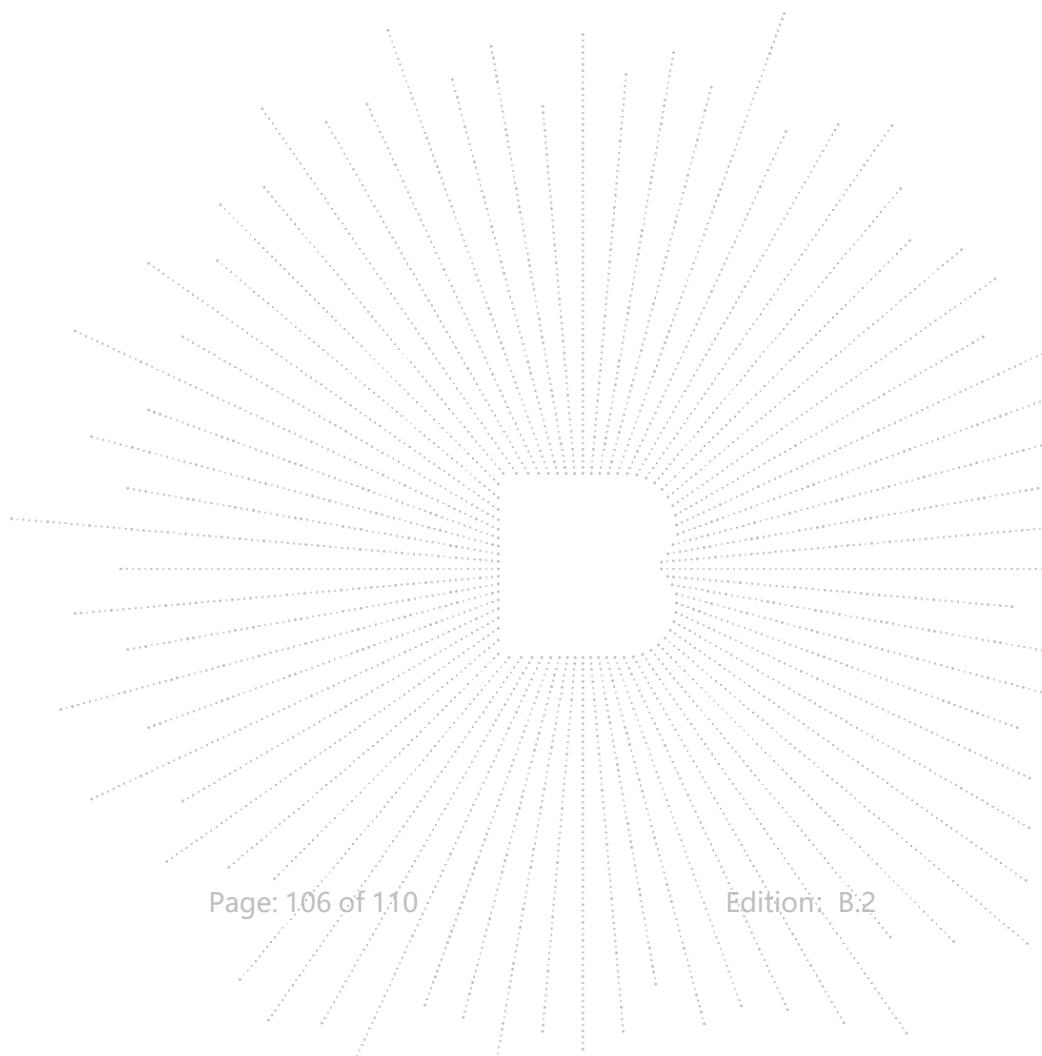
## 15. Antenna Requirement

### 15.1 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.

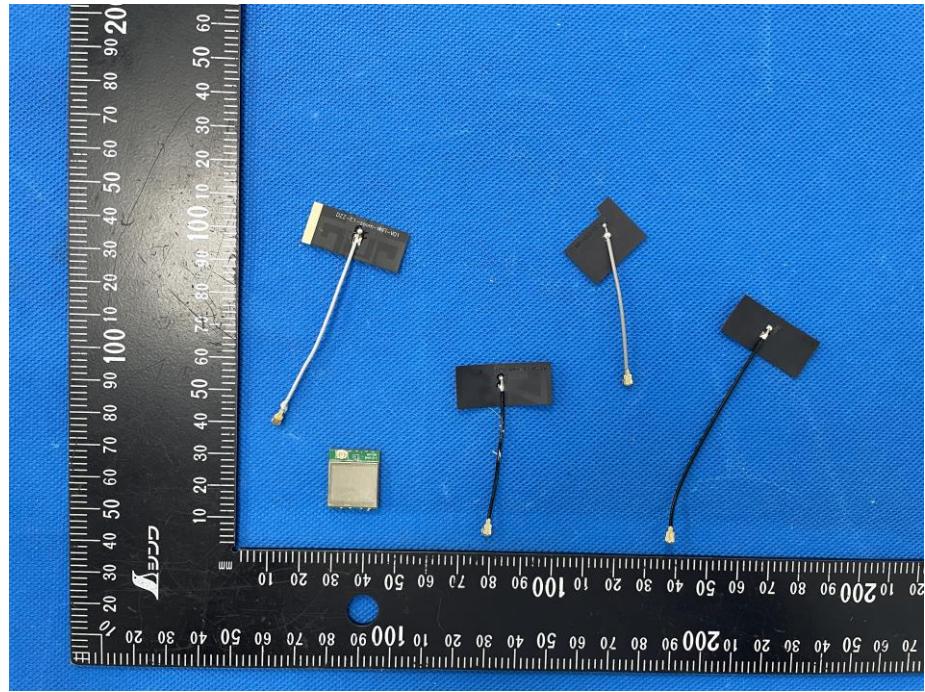
### 15.2 Test Result

The EUT antenna is FPC antenna, fulfill the requirement of this section.



## 16. EUT Photographs

**EUT Photo 1**



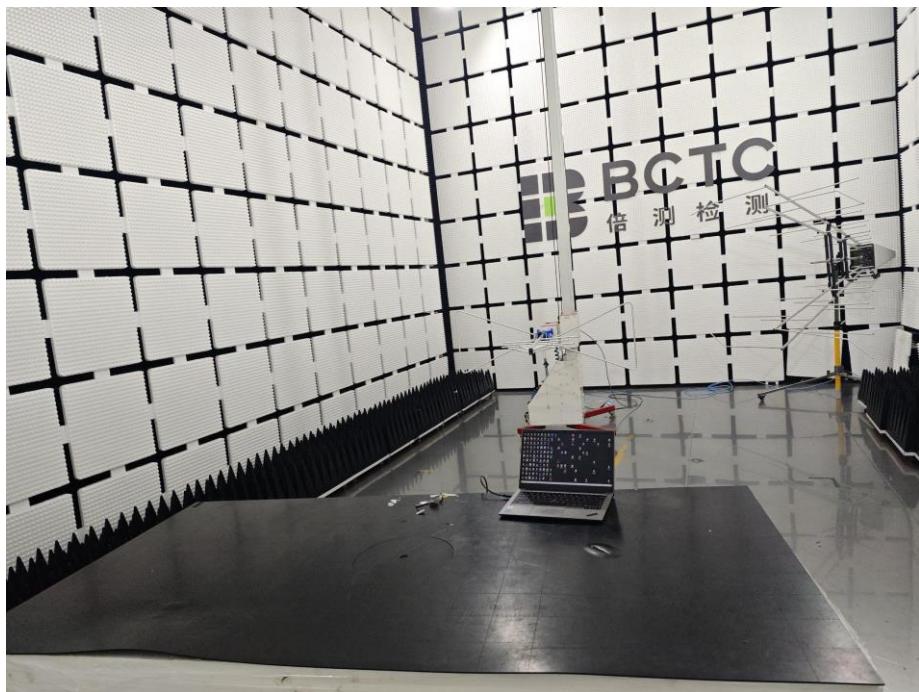
NOTE: Appendix-Photographs Of EUT Constructional Details.

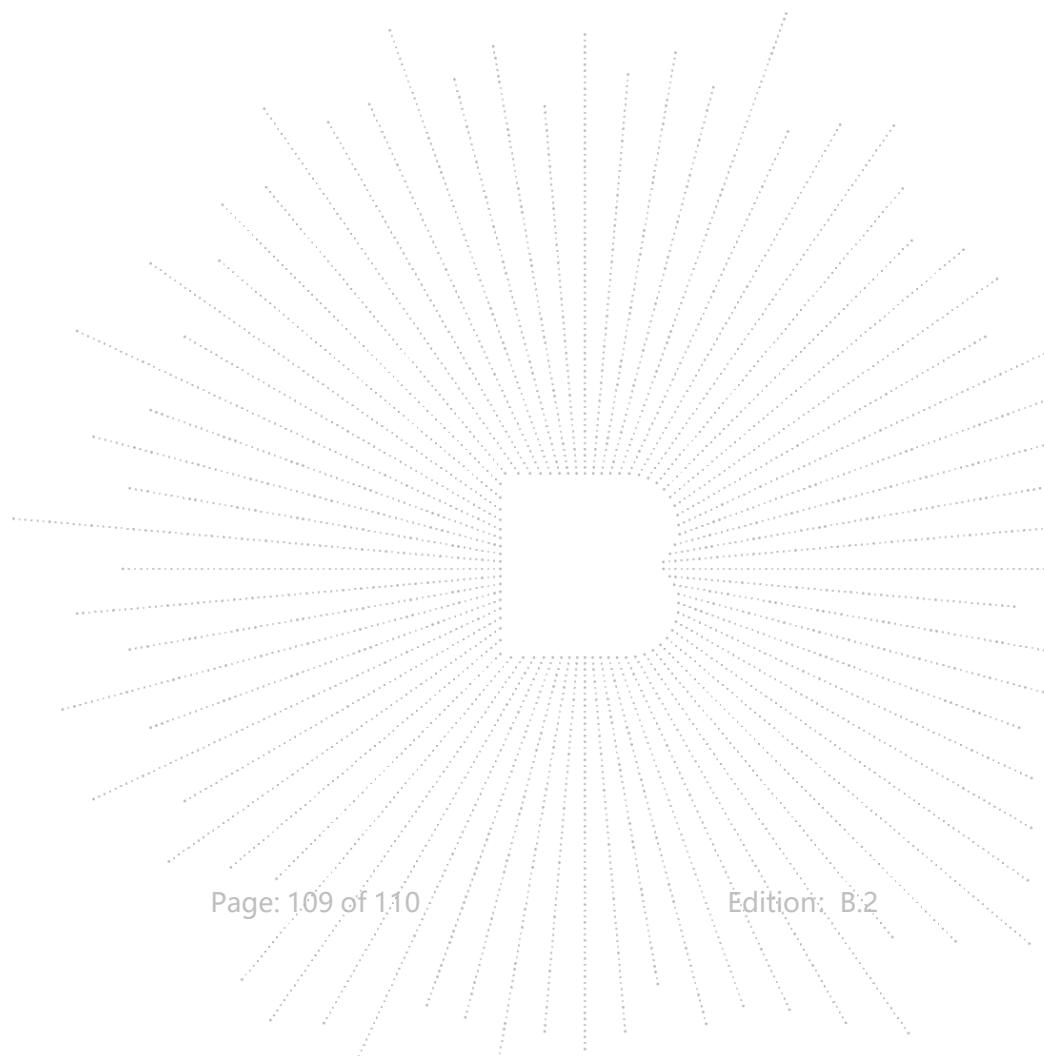
## 17. EUT Test Setup Photographs

### Conducted Emissions 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>

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

Complaint/Advice E-mail: [advice@bctc-lab.com.cn](mailto:advice@bctc-lab.com.cn)

\*\*\*\*\* END \*\*\*\*\*