

# FCC/IC - TEST REPORT

Report Number	:	4842025306600B	Date of Issue: <u>2025.07.15</u>
Model	:	T3-M	
Product Type	:	Wi-Fi and Bluetooth Module	
Applicant	:	Hangzhou Tuya Information Technology Co., Ltd	
Address	:	Room 301, Building 1, Huace Center, Xihu District, 310000 Hangzhou City, Zhejiang Province, PEOPLE'S REPUBLIC OF CHINA	
Manufacturer	:	Hangzhou Tuya Information Technology Co., Ltd.	
Address	:	Room 301, Building 1, Huace Center, Xihu District, 310000 Hangzhou City, Zhejiang Province, PEOPLE'S REPUBLIC OF CHINA	
Test Result	:	<input checked="" type="radio"/> Positive <input type="radio"/> Negative	
Total pages including Appendices	:	88	

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## 2 Details about the Test Laboratory

### Test Site 1

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd.

Floor 1-4, Building B, No.37, Tuanjie Road(Middle), Xishan Economic and Technological Development Zone, Wuxi, Jiangsu, China

Test Firm FCC 571980

Registration  
Number:

Designation  
number: CN1405

IC Company  
Number: 33393

CAB identifier: CN0184

Telephone: +86 510 8820 3737  
Fax: +86 510 8820 3636

### 3 Description of the Equipment under Test

#### Description of the Equipment Under Test

Product: Wi-Fi and Bluetooth Module

PMN / HVIN / Model no.: T3-M

FCC ID: 2ANDL-T3M

Rating: 2.0-3.6V DC  
Normal: 3.3V DC

RF Transmission Frequency: For 802.11b/g/n(HT20)/ax(HE20): Wi-Fi:2412-2462MHz  
For 802.11n(HT40)/ax(HE40): 2422~2452 MHz  
For Bluetooth LE:2402~2480MHz (V5.4)

No. of Operated Channel: 2.4GHz WIFI: 11 for 802.11b/g/n(HT20)/ax(HE20)  
7 for 802.11n(HT40)/ax(HE40)  
2.4GHz BLE: 40

Modulation: Direct Sequence Spread Spectrum (DSSS) for 802.11b  
Orthogonal Frequency Division Multiplexing (OFDM) for  
802.11g/n; Orthogonal Frequency Division Multiple Access (OFDMA) for  
802.11ax; 2.4GHz BLE: GFSK

Channel list:

802.11b/g/n(HT20)/ax(HE20)				802.11n(HT40)/ax(HE40)			
Ch	Fre(MHz)	Ch	Fre(MHz)	Ch	Fre(MHz)	Ch	Fre(MHz)
1	2412	7	2442	3	2422	8	2447MHz
2	2417	8	2447	4	2427	9	2452MHz
3	2422	9	2452	5	2432		
4	2427	10	2457	6	2437		
5	2432	11	2462	7	2442		
6	2437						

Bluetooth Low Energy							
Ch	Fre(MHz)	Ch	Fre(MHz)	Ch	Fre(MHz)	Ch	Fre(MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480



Antenna Type: Ceramics antenna

Antenna Gain: 2.53dBi

Description of the EUT: The Equipment Under Test (EUT) is a Wi-Fi and Bluetooth module which support 2.4GHz Wi-Fi and BLE 5.4(support 125Kbps,500Kbps and 1Mbps data rate).

Test sample no.: WUX-0932754-004 (RF radiated); WUX-0932754-003 (RF conducted)

The sample's mentioned in this report is/are submitted/ supplied/ manufactured by client. The laboratory therefore assumes no responsibility for accuracy of information on the brand name, model number, origin of manufacture, consignment or any information supplied.

## 4 Summary of Test Standards

<b>Test Standards</b>	
FCC Part 15 Subpart C	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

All the test methods were according to KDB 558074 D01 15.247 Meas Guidance v05r02 and ANSI C63.10 (2020).

## 5 Summary of Test Results

Technical Requirements					
Test Condition	Pages	Test Site	Test Result		
			Pass	Fail	N/A
§15.207	Conducted emission AC power port 13-17	Site 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247 (b) (3)	Conducted peak output power 18-20	Site 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(a)(1)	20dB bandwidth ---	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
§15.247(a)(1)	Carrier frequency separation ---	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
§15.247(a)(1)(iii)	Number of hopping frequencies ---	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
§15.247(a)(1)(iii)	Dwell Time ---	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
§15.247(a)(2)	6dB bandwidth 21-23	Site 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(e)	Power spectral density 24-26	Site 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(d)	Spurious RF conducted emissions 27-33	Site 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(d)	Band edge 34-36	Site 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(d) & §15.209	Spurious radiated emissions for transmitter 37-50	Site 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.203	Antenna requirement	See note 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Remark 1: N/A – Not Applicable.

Note 1: The EUT uses a PCB antenna, which gain is 2.53dBi. In accordance to §15.203, It is considered sufficiently to comply with the provisions of this section.

## 6 General Remarks

### Remarks

This submittal(s) (test report) is intended for FCC ID: 2ANDL-T3-M, complies with Section 15.207,15.209,15.231,15.247 of the FCC Part 15, Subpart C Rules.

This report is only for the 2.4GHz BLE test report, all data rate (125Kbps, 500Kbps, 1Mbps) are performed.

For the 2.4GHz Wi-Fi test report please refer to 4842025306600A.

### SUMMARY:

All tests according to the regulations cited on page 5 were

- Performed

- **Not** Performed

### The Equipment under Test

- **Fulfills** the general approval requirements.

- **Does not** fulfill the general approval requirements.

Sample Received Date: June 10, 2025

Testing Start Date: June 10, 2025

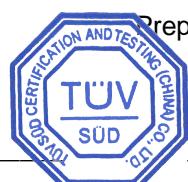
Testing End Date: July 10, 2025

-TÜV SÜD Certification and Testing (China) Co., Ltd.

Reviewed by:



Bo Dai  
Review Engineer



Prepared by:



Yiquan Wang  
Project Engineer

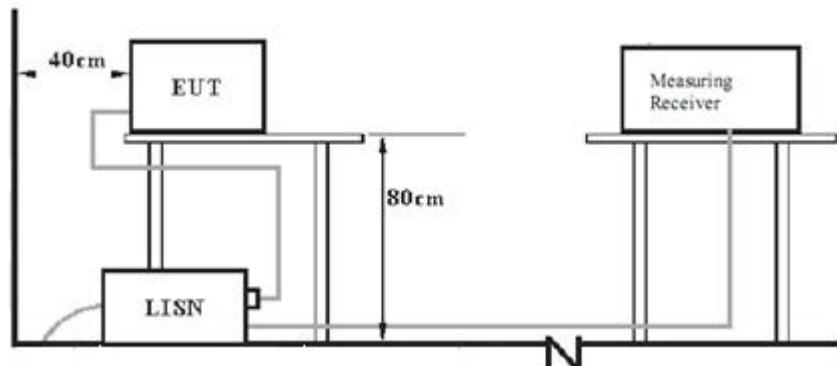
Tested by:



Xia Zihua  
Test Engineer

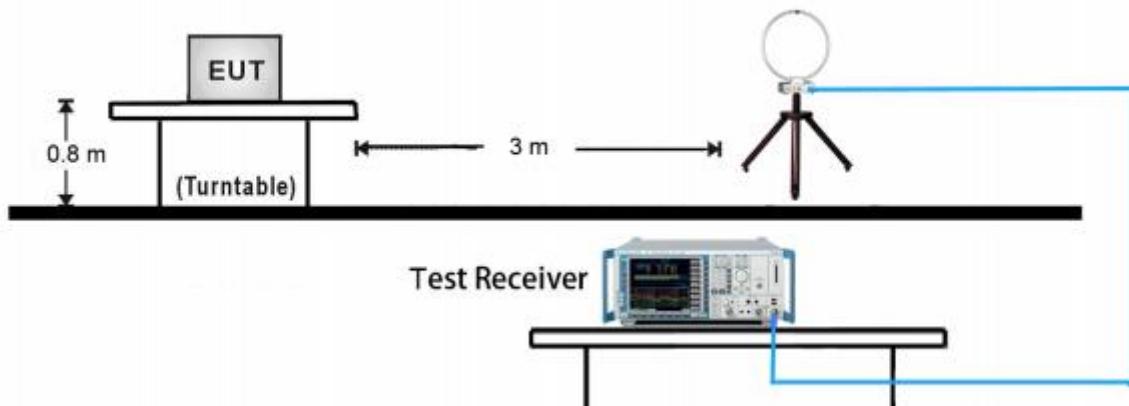
## 7 Test Setups

### 7.1 AC Power Line Conducted Emission test setups

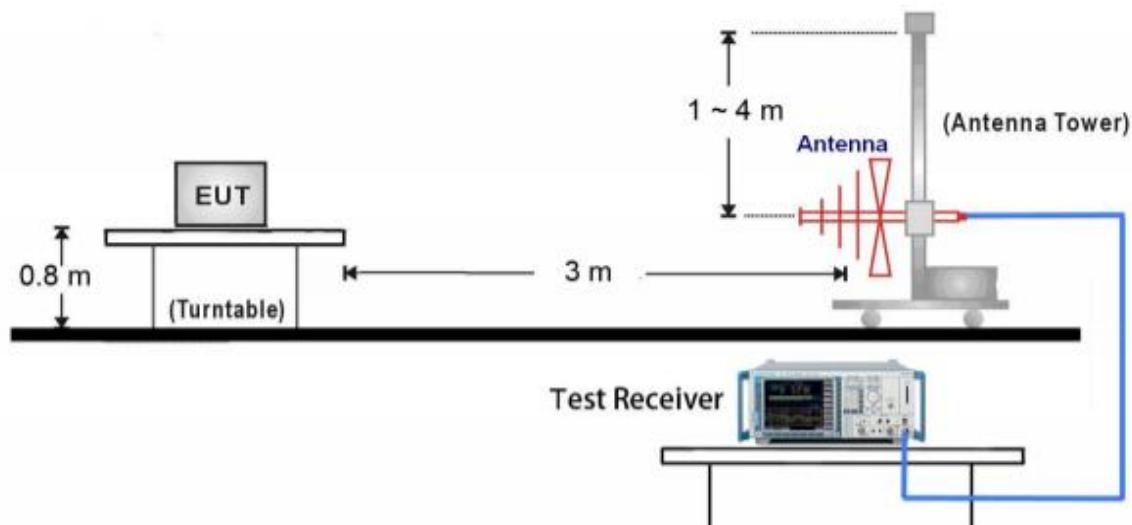


### 7.2 Radiated test setups

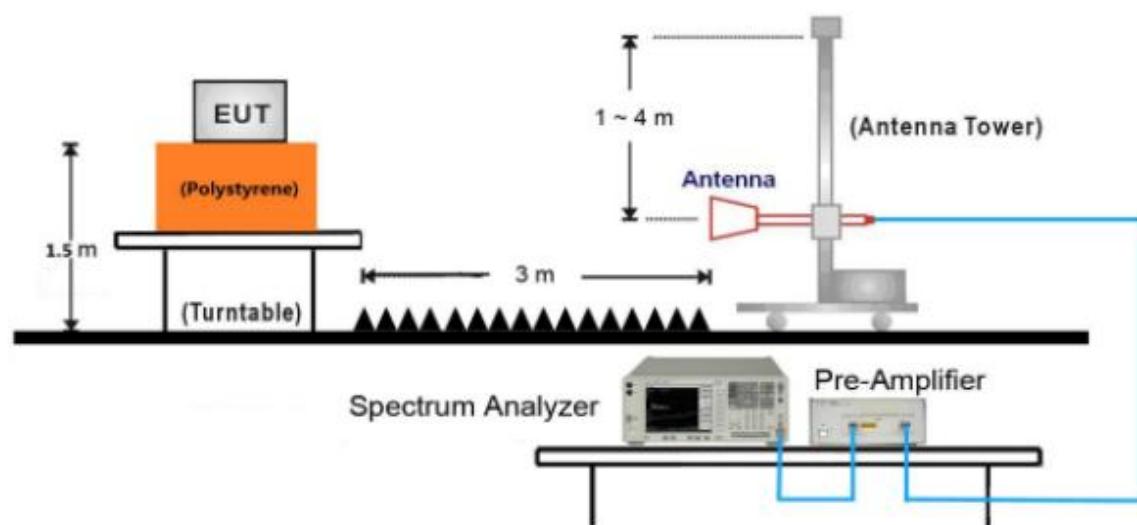
#### 9kHz ~ 30MHz Test Setup:



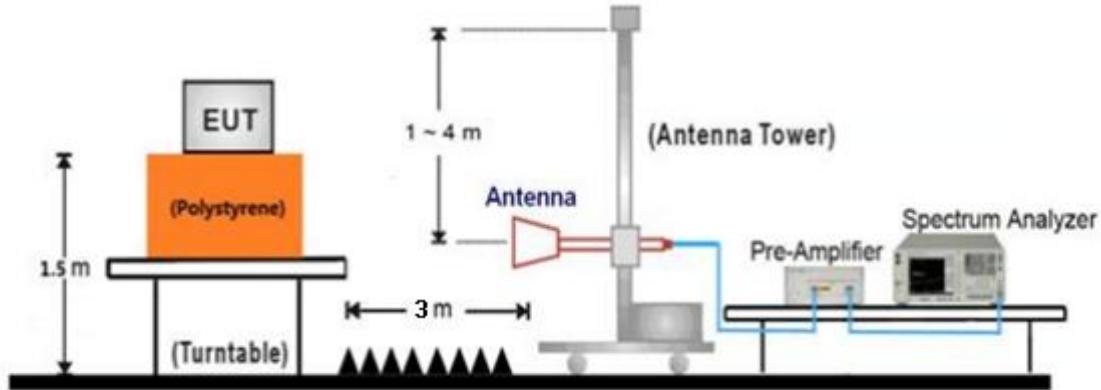
## 30MHz ~ 1GHz Test Setup:



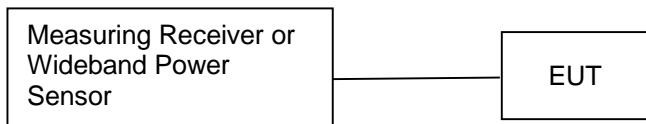
## 1GHz ~ 18GHz Test Setup:



### 18GHz ~ 25GHz Test Setup:



### 7.3 Conducted RF test setups



## 8 Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
Notebook	HONOR	NDR-WFH	ET247
Notebook	HONOR	VLT-W50	ET137

Test software: Wifi Test tool v1.9.0

The system was configured to channel 0, 19, and 39 for the test.

Test Mode Applicability and Tested Channel Detail:

Mode	Tested Channel	Data Rate	Modulation	Index Value (Power level setting)
Bluetooth LE	0	125Kbps	GFSK	47
	19	125Kbps	GFSK	47
	39	125Kbps	GFSK	47
Bluetooth LE	0	500Kbps	GFSK	47
	19	500Kbps	GFSK	47
	39	500Kbps	GFSK	47
Bluetooth LE	0	1Mbps	GFSK	47
	19	1Mbps	GFSK	47
	39	1Mbps	GFSK	47

Non-hopping mode: The system was configured to operate at a signal channel transmitting. The test software allows the configuration and operation at the worst-case duty and the highest transmit power.

## 9 Technical Requirement

### 9.1 Conducted Emission

#### Test Method

1. The EUT was placed on a table, which is 0.8m above ground plane
2. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.).
3. Maximum procedure was performed to ensure EUT compliance
4. A EMI test receiver is used to test the emissions from both sides of AC line

#### Limit

Frequency MHz	QP Limit dB $\mu$ V	AV Limit dB $\mu$ V
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

Decreasing linearly with logarithm of the frequency

## Conducted Emission

# 150k-30MHz Conducted Emission Test

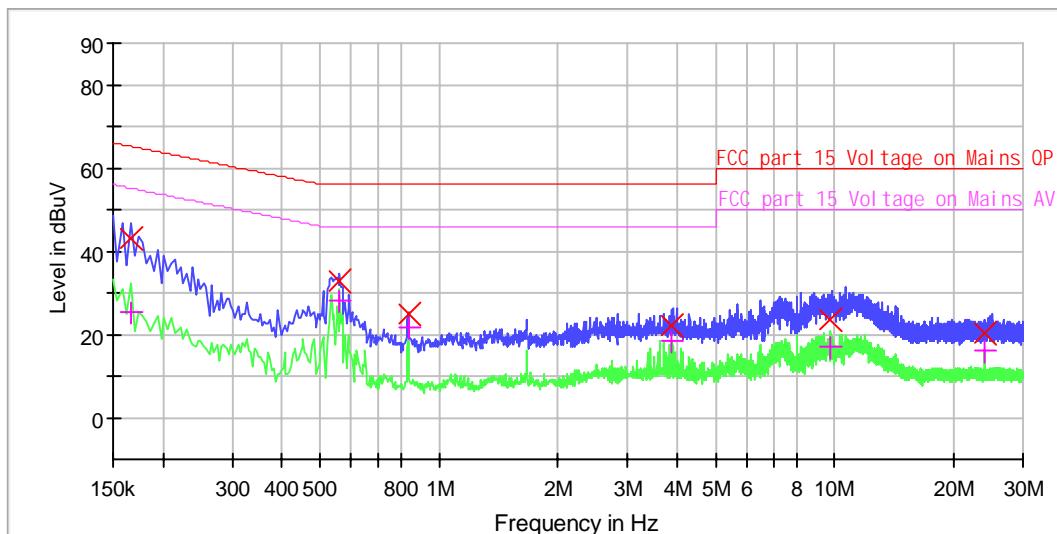
## Common Information

EUT: Wi-Fi and Bluetooth Module  
 Model: T3-M  
 Client: Hangzhou Tuya Information Technology Co., Ltd  
 Operating Conditions: Power on, TX\_2402MHz at 125Kbps  
 Operator Name: Zhihua Xia  
 Input: AC 120V 60Hz  
 Sample No.: WUX-0932754-004  
 Test Standard: FCC Part 15.207(a)  
 Comment: L  
 Comment: Temp.:23.5°C, Humi.:55.7%, Atm.:999.3hPa

## Scan Setup: Mains Voltage LISN 2 Lines 150kHz-30MHz Pre Fcc [EMI conducted]

Hardware Setup: Mains Voltage LISN 2 Lines 150kHz-30MHz\_Fcc  
 Receiver: [ESW 8]  
 Level Unit: dBuV

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
150 kHz - 30 MHz	4 kHz	PK+ ; AVG	9 kHz	0.01 s	0 dB



## Final\_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)
0.166000	43.0	25.4	1000.0	9.000	10.3	22.2	65.2	29.8	55.2
0.562000	32.7	28.1	1000.0	9.000	10.2	23.3	56.0	17.9	46.0
0.834000	25.0	21.6	1000.0	9.000	10.2	31.0	56.0	24.4	46.0
3.894000	22.1	18.3	1000.0	9.000	10.3	33.9	56.0	27.7	46.0
9.694000	23.6	17.0	1000.0	9.000	10.9	36.4	60.0	33.0	50.0
23.870000	20.4	15.9	1000.0	9.000	11.2	39.6	60.0	34.1	50.0

Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB) + 10dB Attenuator

# 150k-30MHz Conducted Emission Test

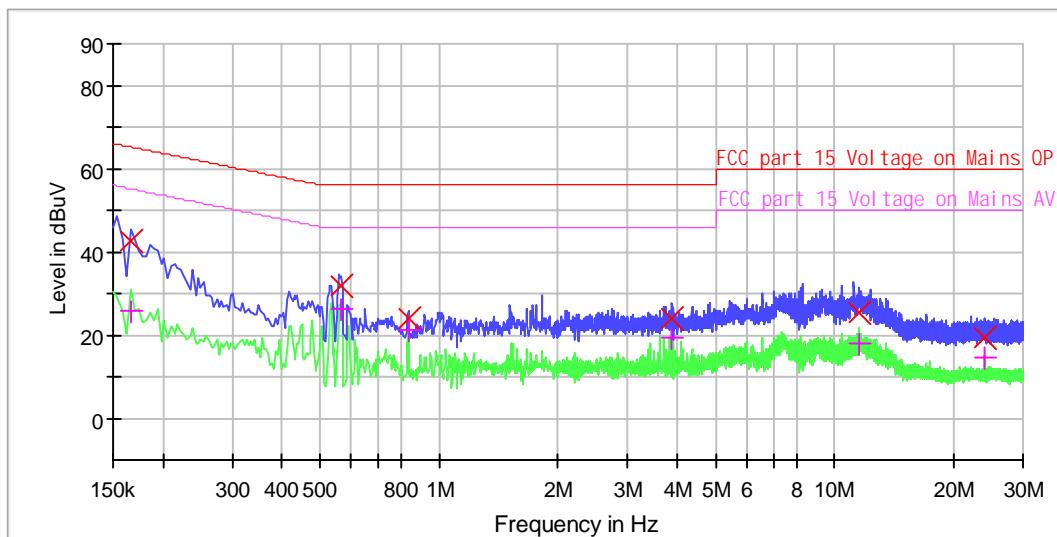
## Common Information

EUT: Wi-Fi and Bluetooth Module  
 Model: T3-M  
 Client: Hangzhou Tuya Information Technology Co., Ltd  
 Operating Conditions: Power on, TX\_2402MHz at 125Kbps  
 Operator Name: Zhihua Xia  
 Input: AC 120V 60Hz  
 Sample No.: WUX-0932754-004  
 Test Standard: FCC Part 15.207(a)  
 Comment: N  
 Comment: Temp.:23.5°C, Humi.:55.7%, Atm.:999.3hPa

## Scan Setup: Mains Voltage LISN 2 Lines 150kHz-30MHz Pre Fcc [EMI conducted]

Hardware Setup: Mains Voltage LISN 2 Lines 150kHz-30MHz\_Fcc  
 Receiver: [ESW 8]  
 Level Unit: dBuV

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
150 kHz - 30 MHz	4 kHz	PK+ ; AVG	9 kHz	0.01 s	0 dB



## Final\_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)
0.166000	42.5	25.9	1000.0	9.000	10.6	22.7	65.2	29.2	55.2
0.566000	32.0	26.1	1000.0	9.000	10.5	24.0	56.0	19.9	46.0
0.834000	23.9	21.0	1000.0	9.000	10.5	32.1	56.0	25.0	46.0
3.894000	23.9	19.4	1000.0	9.000	10.6	32.1	56.0	26.6	46.0
11.518000	25.5	17.8	1000.0	9.000	10.9	34.5	60.0	32.3	50.0
23.870000	19.5	14.5	1000.0	9.000	11.2	40.5	60.0	35.5	50.0

Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB) + 10dB Attenuator

## 9.2 Conducted peak output power

### Test Method

1. Use the following spectrum analyzer settings:  
RBW > the 6 dB bandwidth of the emission being measured, VBW $\geq$ 3RBW, Span $\geq$ 3RBW  
Sweep = auto, Detector function = peak, Trace = max hold.
2. Add a correction factor to the display.
3. Use a power meter to measure the conducted peak output power.

### Limits

According to §15.247 (b) (1), conducted peak output power limit as below:

#### Conducted peak output power

Frequency Range MHz	Limit W	Limit dBm
2400-2483.5	$\leq 1$	$\leq 30$
e.i.r.p		
Frequency Range MHz	Limit W	Limit dBm
2400-2483.5	$\leq 4$	$\leq 36$

Test result as below table

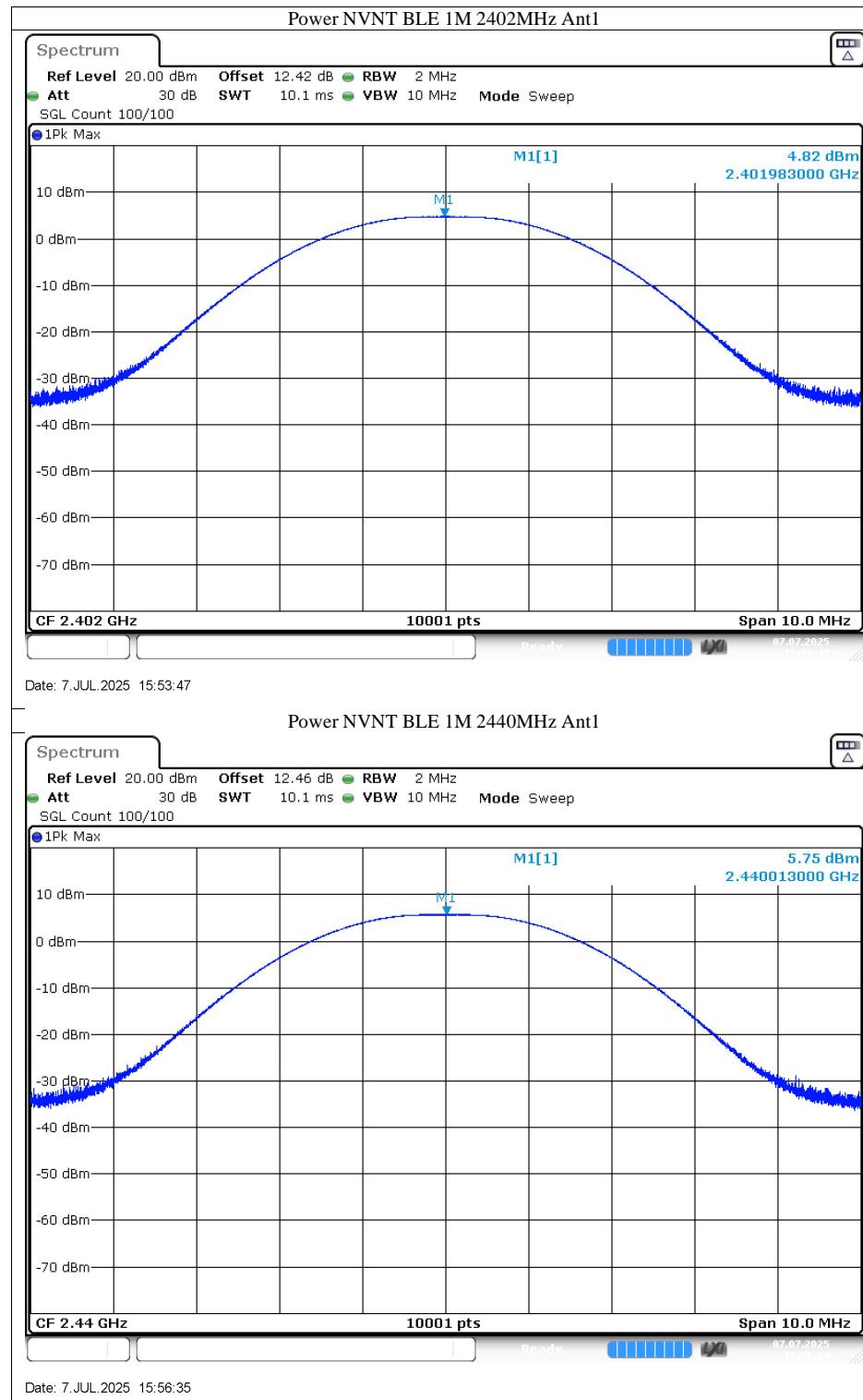
Data transmission rate:125Kbps		
Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2402MHz	4.62	Pass
Middle channel 2440MHz	5.66	Pass
High channel 2480MHz	6.42	Pass

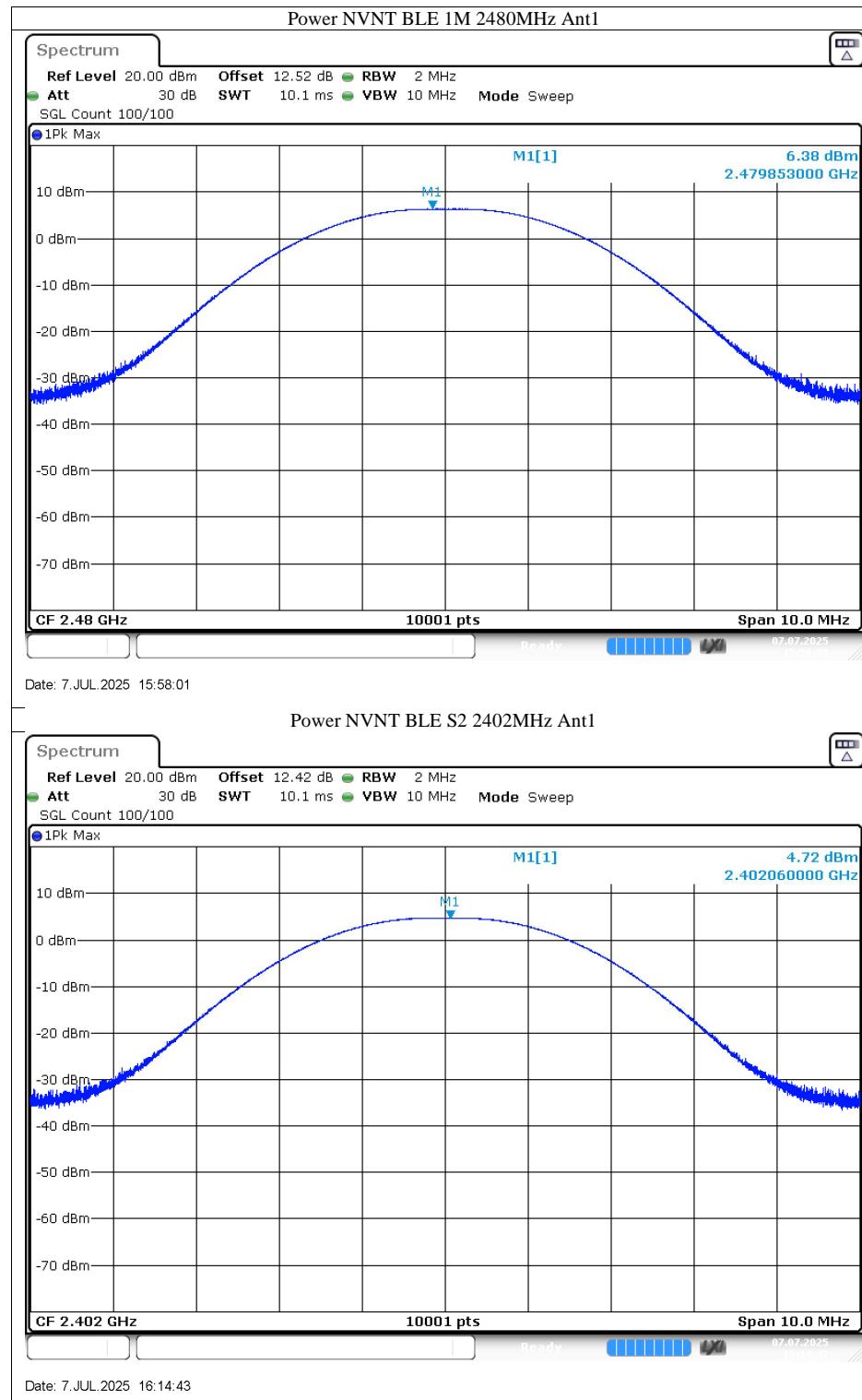
  

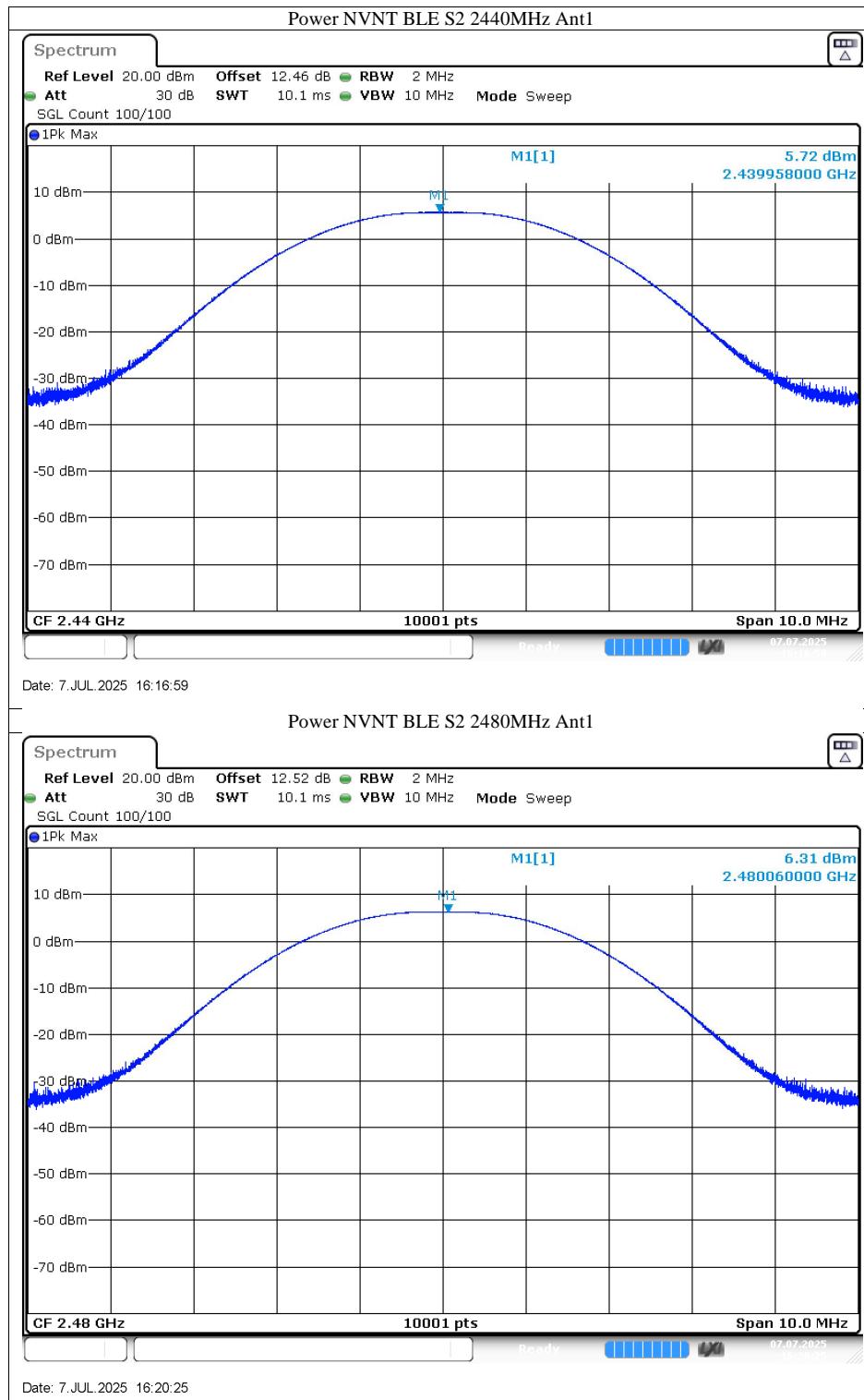
Data transmission rate:500Kbps		
Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2402MHz	4.72	Pass
Middle channel 2440MHz	5.72	Pass
High channel 2480MHz	6.31	Pass

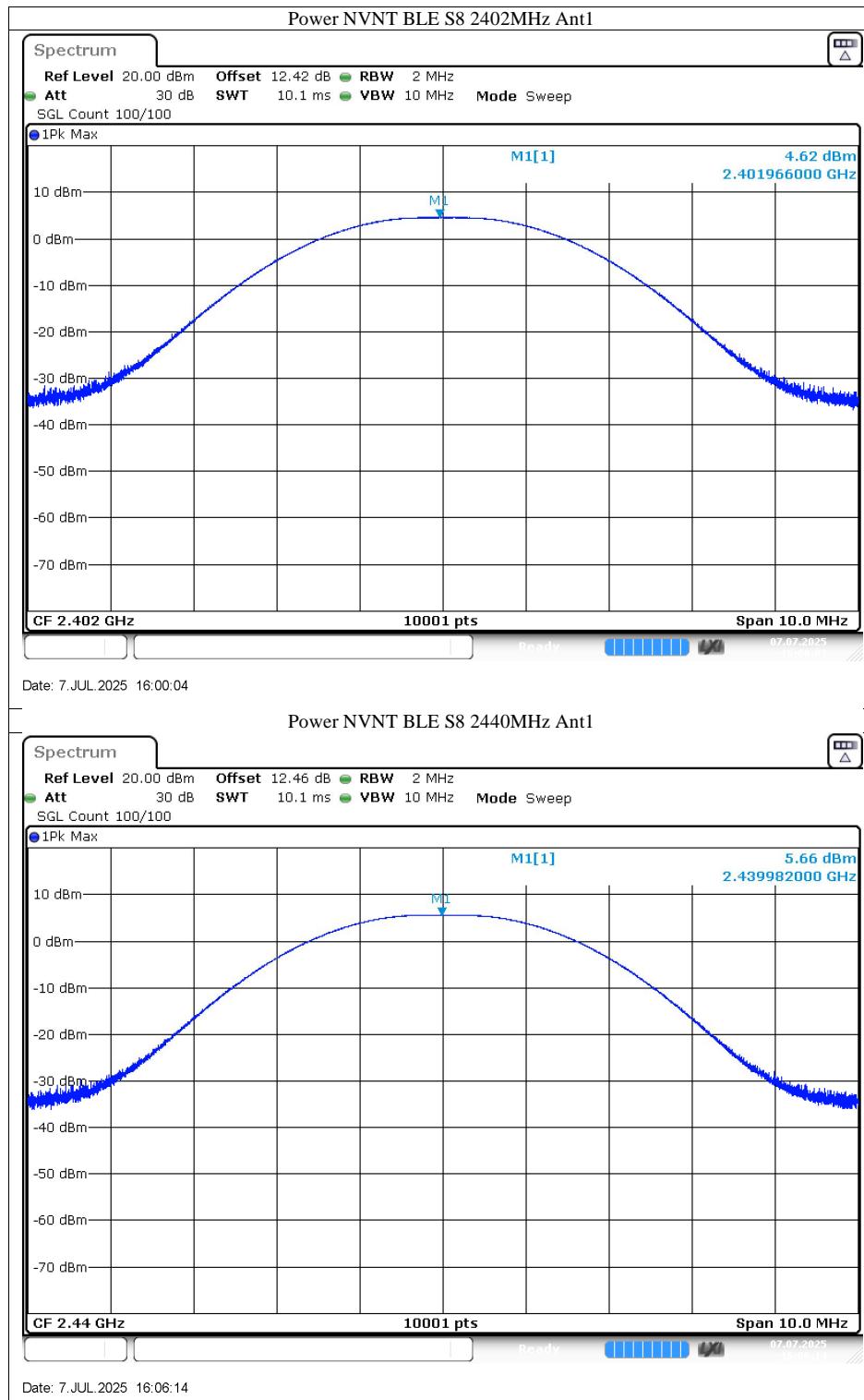
  

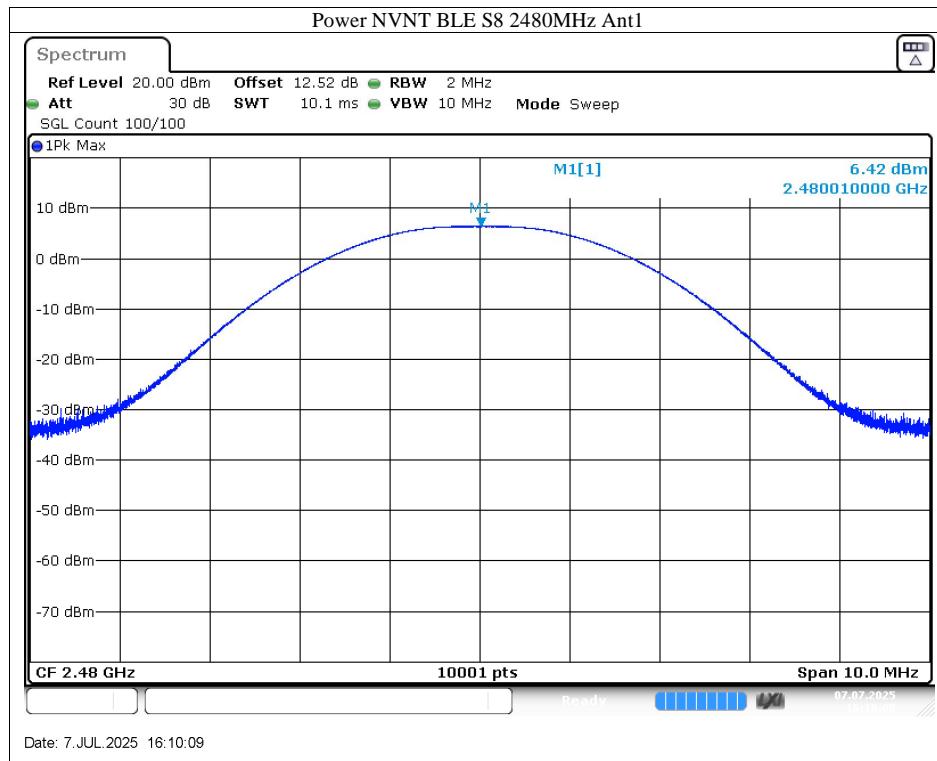
Data transmission rate:1Mbps		
Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2402MHz	4.82	Pass
Middle channel 2440MHz	5.75	Pass
High channel 2480MHz	6.38	Pass











### 9.3 6dB bandwidth

#### Test Method

1. Use the following spectrum analyzer settings:  
RBW=100K, VBW $\geq$ 3RBW, Sweep = auto, Detector function = peak, Trace = max hold
2. Use the automatic bandwidth measurement capability of an instrument, may be employed using the X dB bandwidth mode with X set to 6 dB, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be  $\geq$  6 dB.
3. Allow the trace to stabilize, record the X dB Bandwidth value.

#### Limit

Limit [kHz]

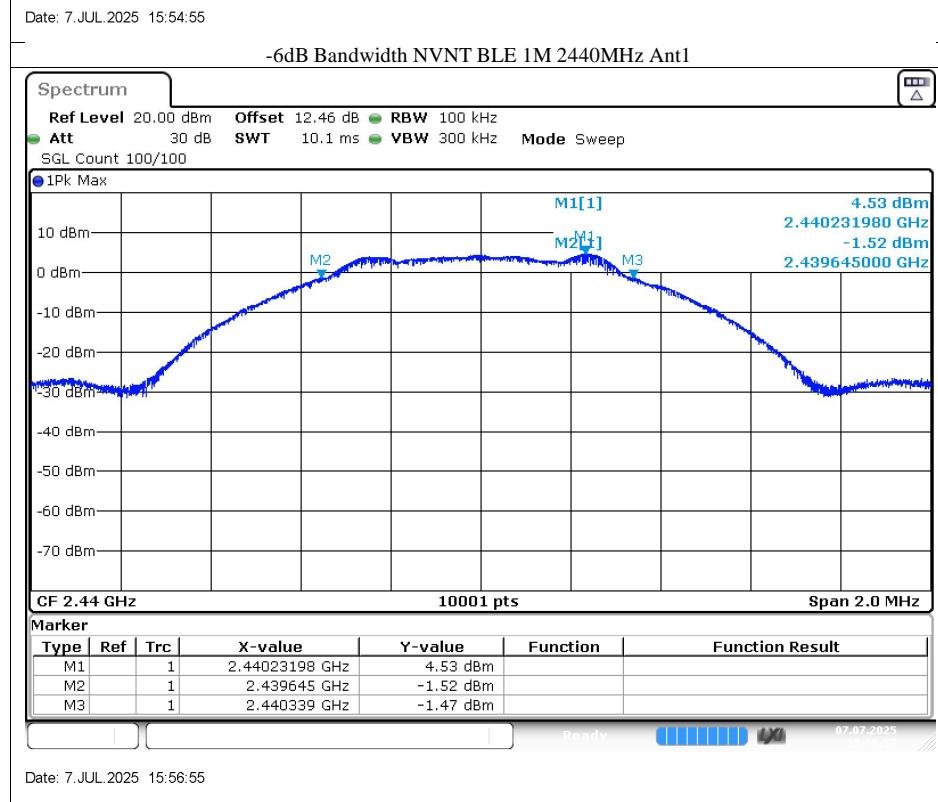
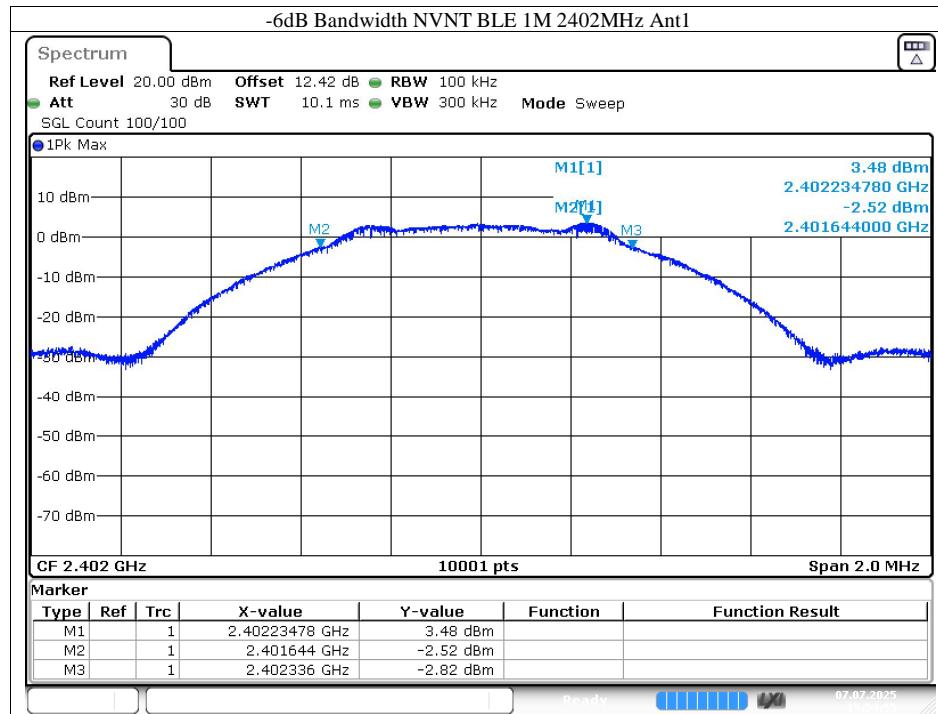
$\geq$ 500

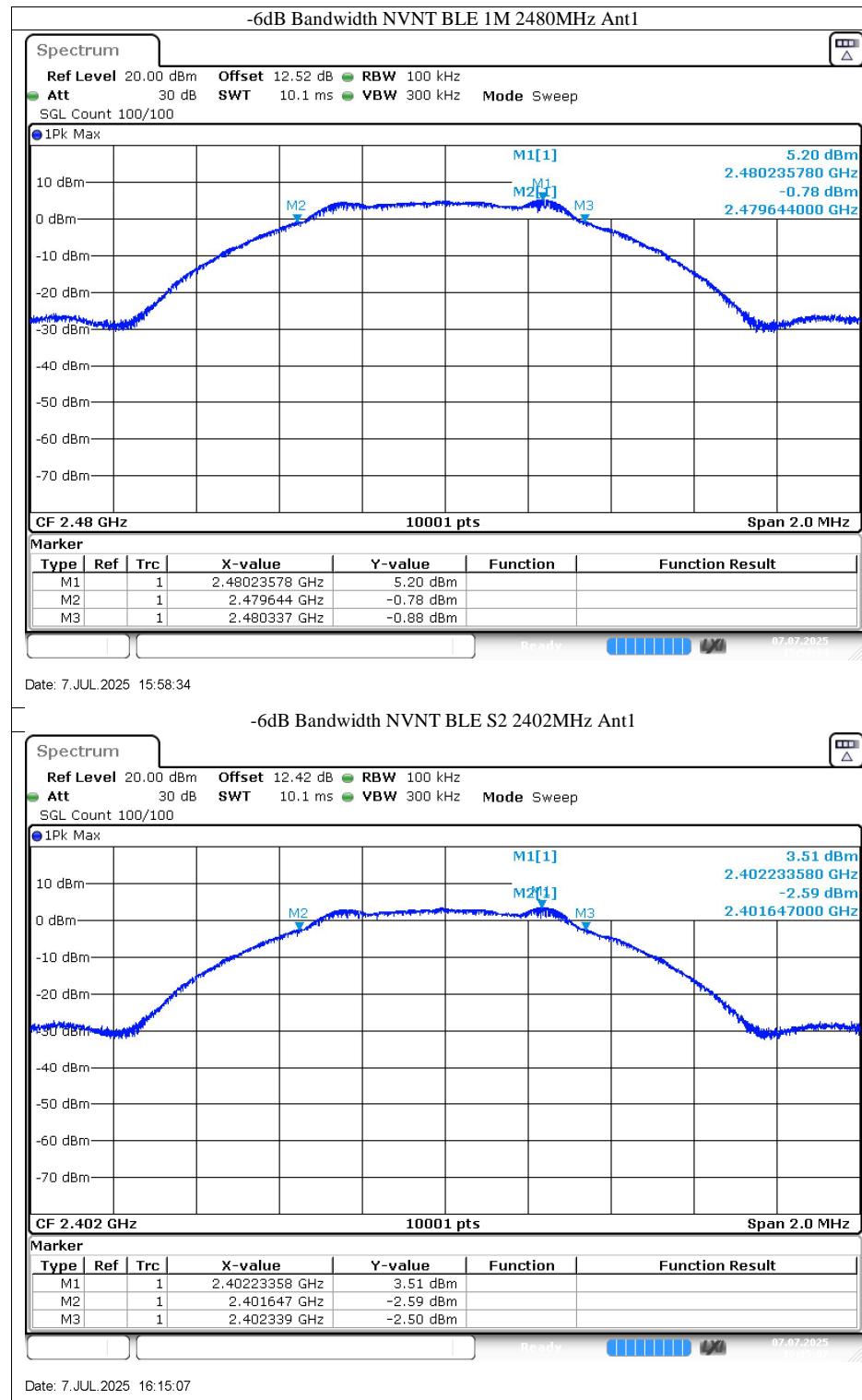
#### Test result

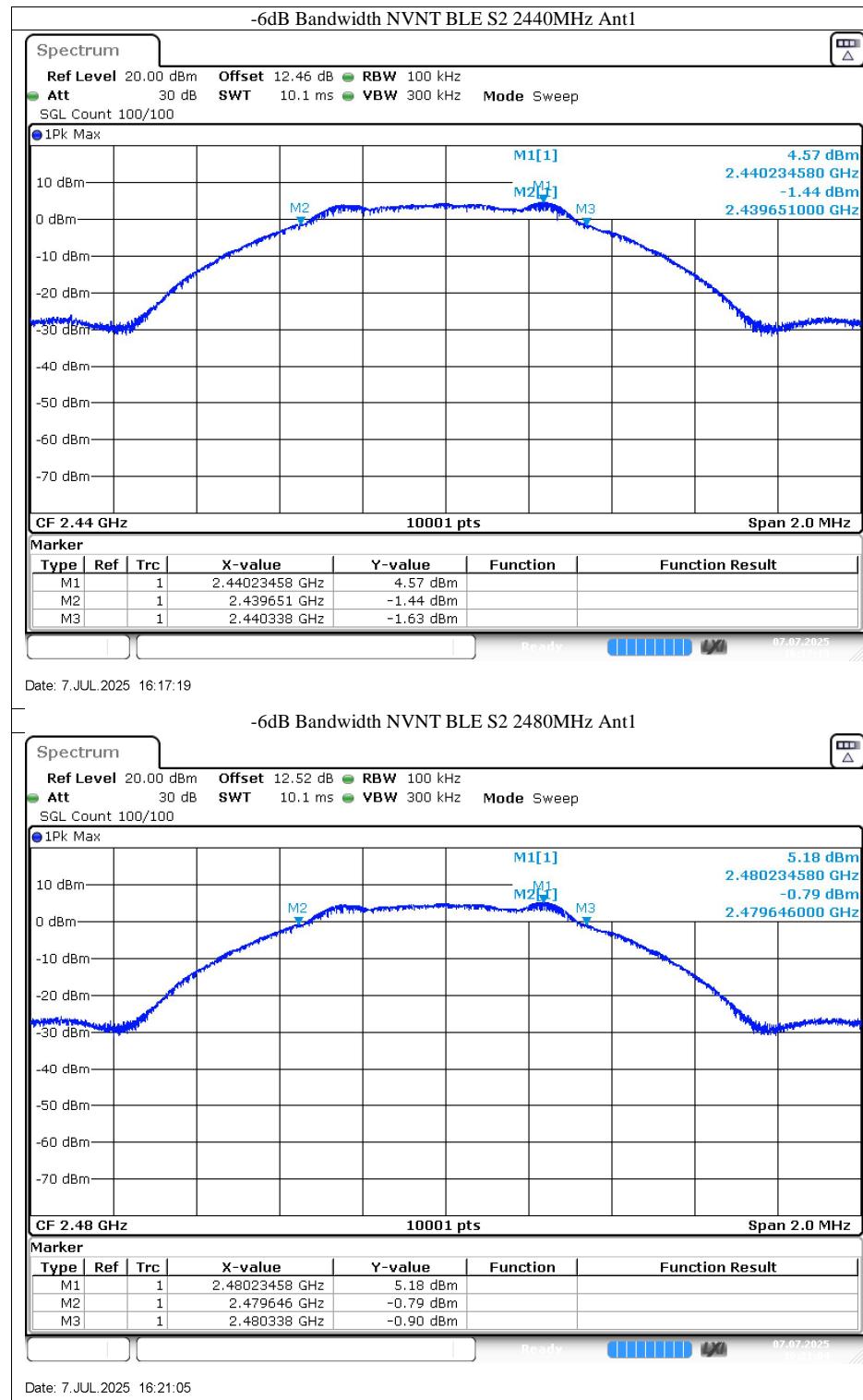
Data transmission rate	Frequency MHz	6dB bandwidth (MHz)		Result
		result	limit	
125Kbps	2402	0.690	$\geq$ 0.5	Pass
	2440	0.696	$\geq$ 0.5	Pass
	2480	0.695	$\geq$ 0.5	Pass
500Kbps	2402	0.692	$\geq$ 0.5	Pass
	2440	0.686	$\geq$ 0.5	Pass
	2480	0.692	$\geq$ 0.5	Pass
1Mbps	2402	0.692	$\geq$ 0.5	Pass
	2440	0.694	$\geq$ 0.5	Pass
	2480	0.694	$\geq$ 0.5	Pass

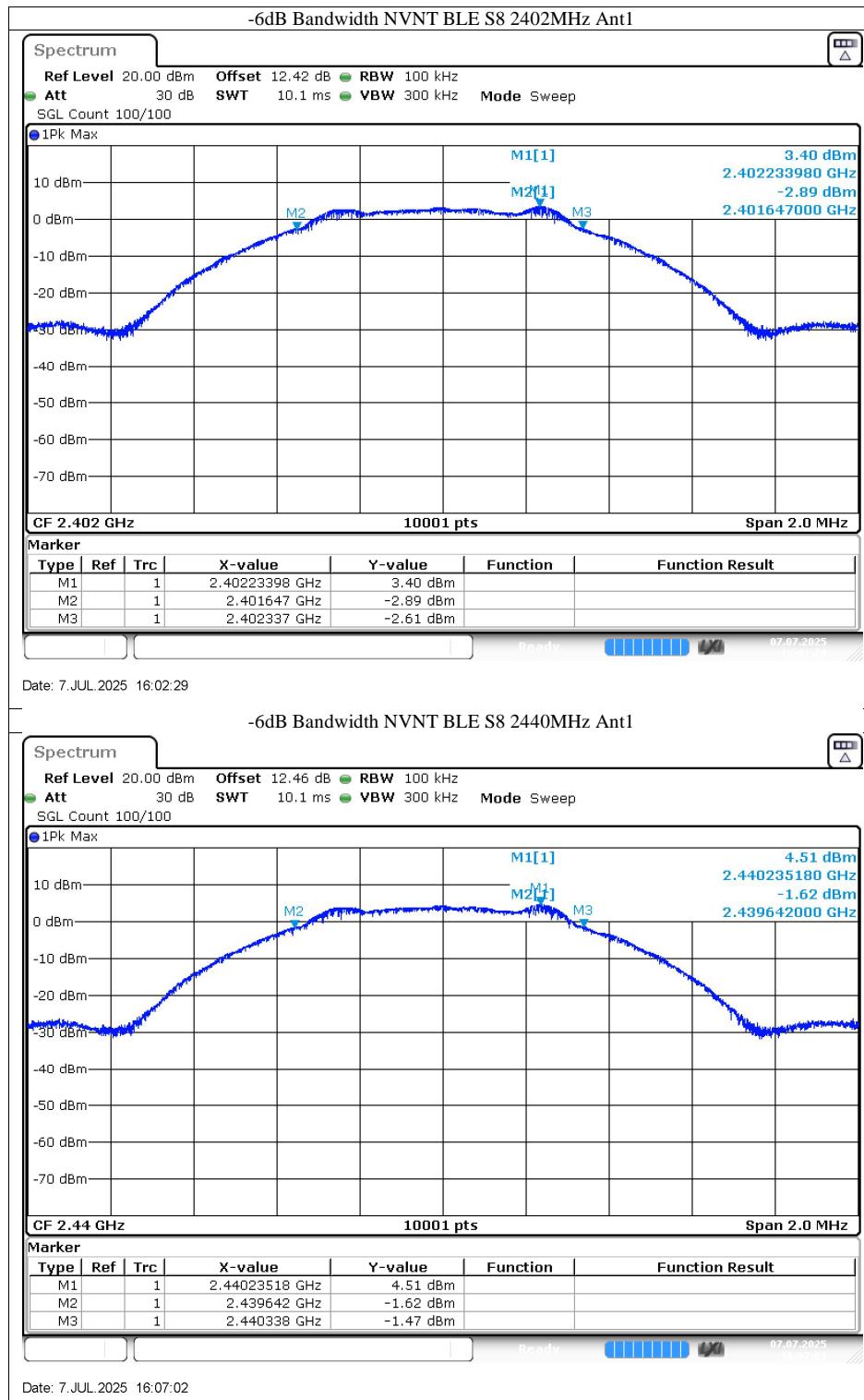


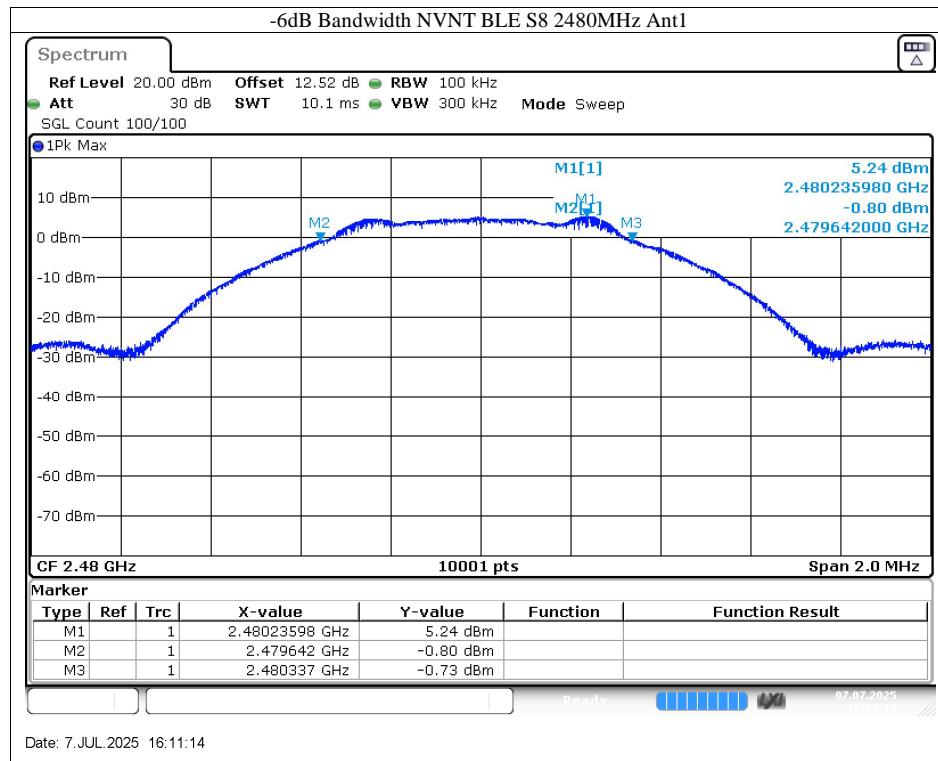
## 6dB Bandwidth











## 9.4 Power spectral density

### Test Method

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance:

1. Set analyzer center frequency to DTS channel center frequency.  
RBW=3kHz, VBW $\geq$ 3RBW, Span=1.5 times DTS bandwidth, Detector=Peak, Sweep=auto, Trace= max hold.
2. Allow trace to fully stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.
3. Repeat above procedures until other frequencies measured were completed.

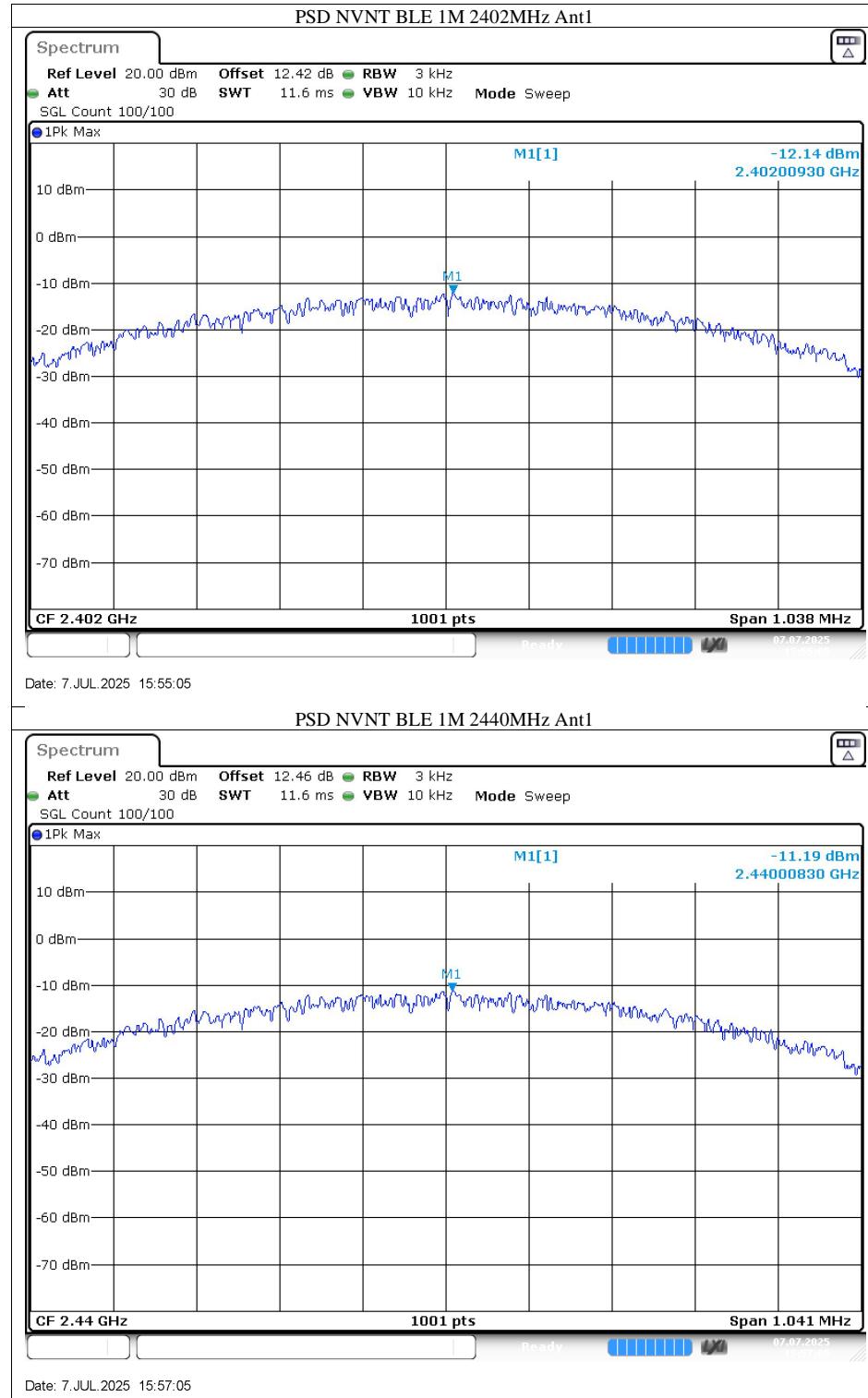
### Limit

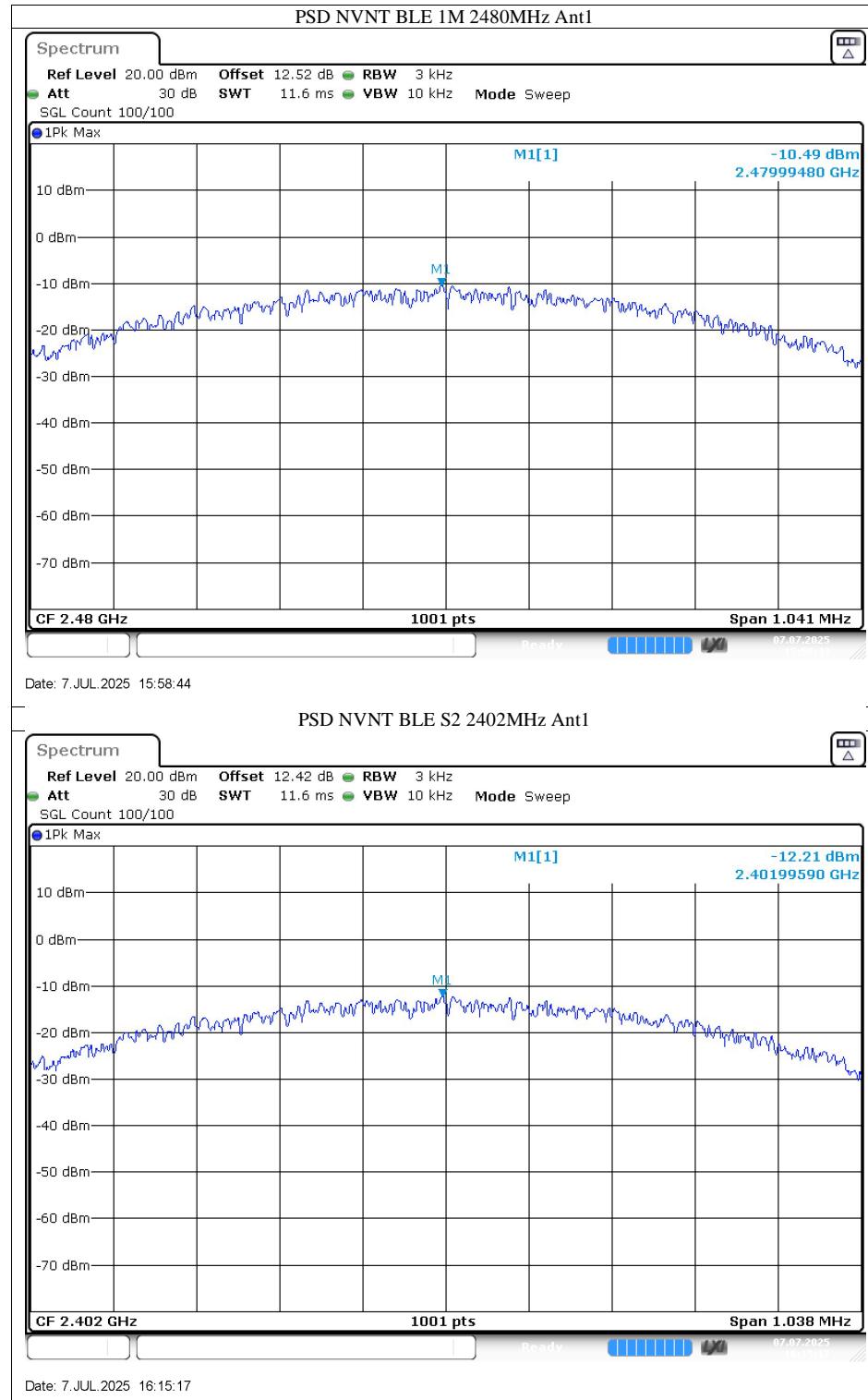
Limit [dBm/3kHz]

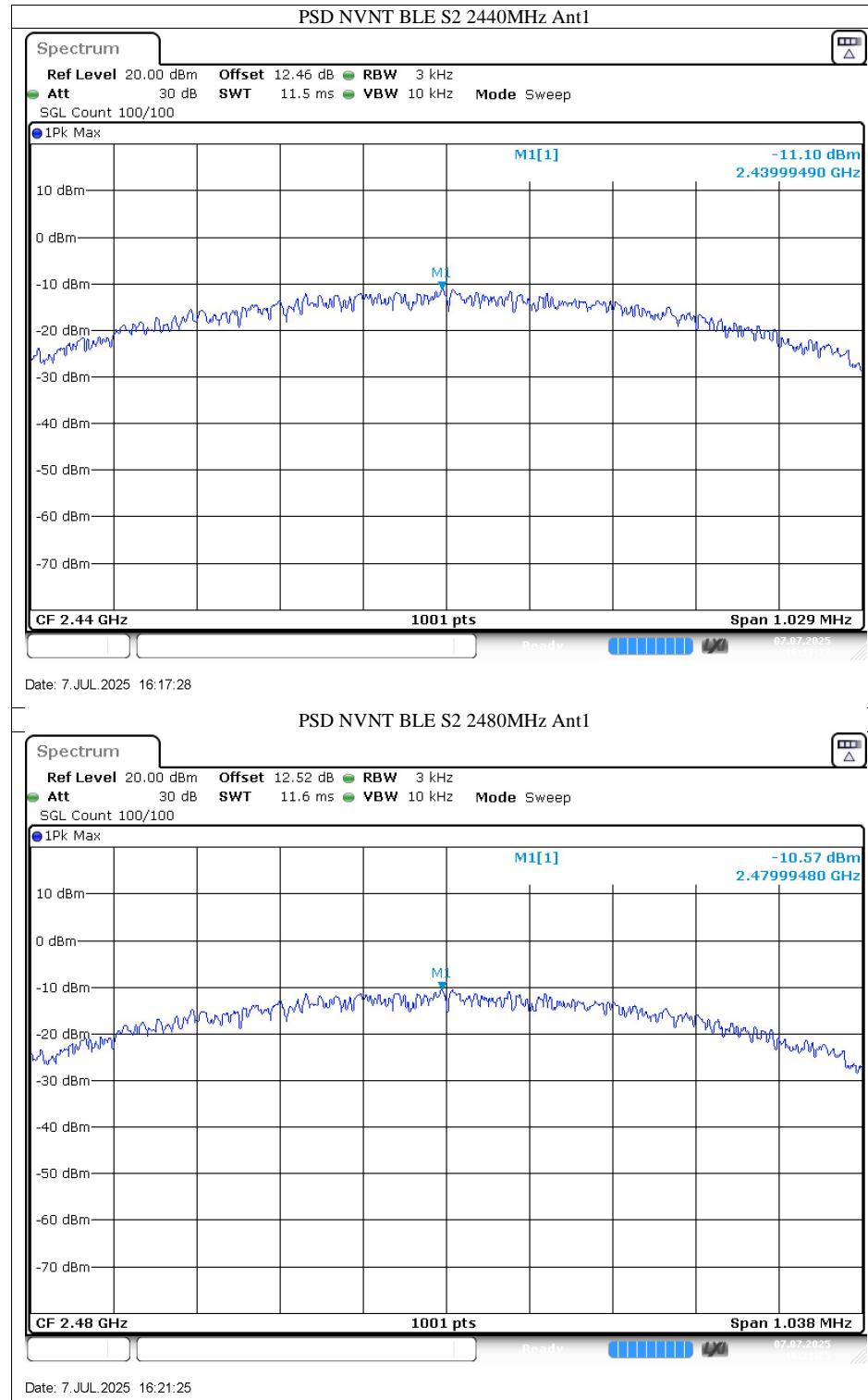
$\leq 8$

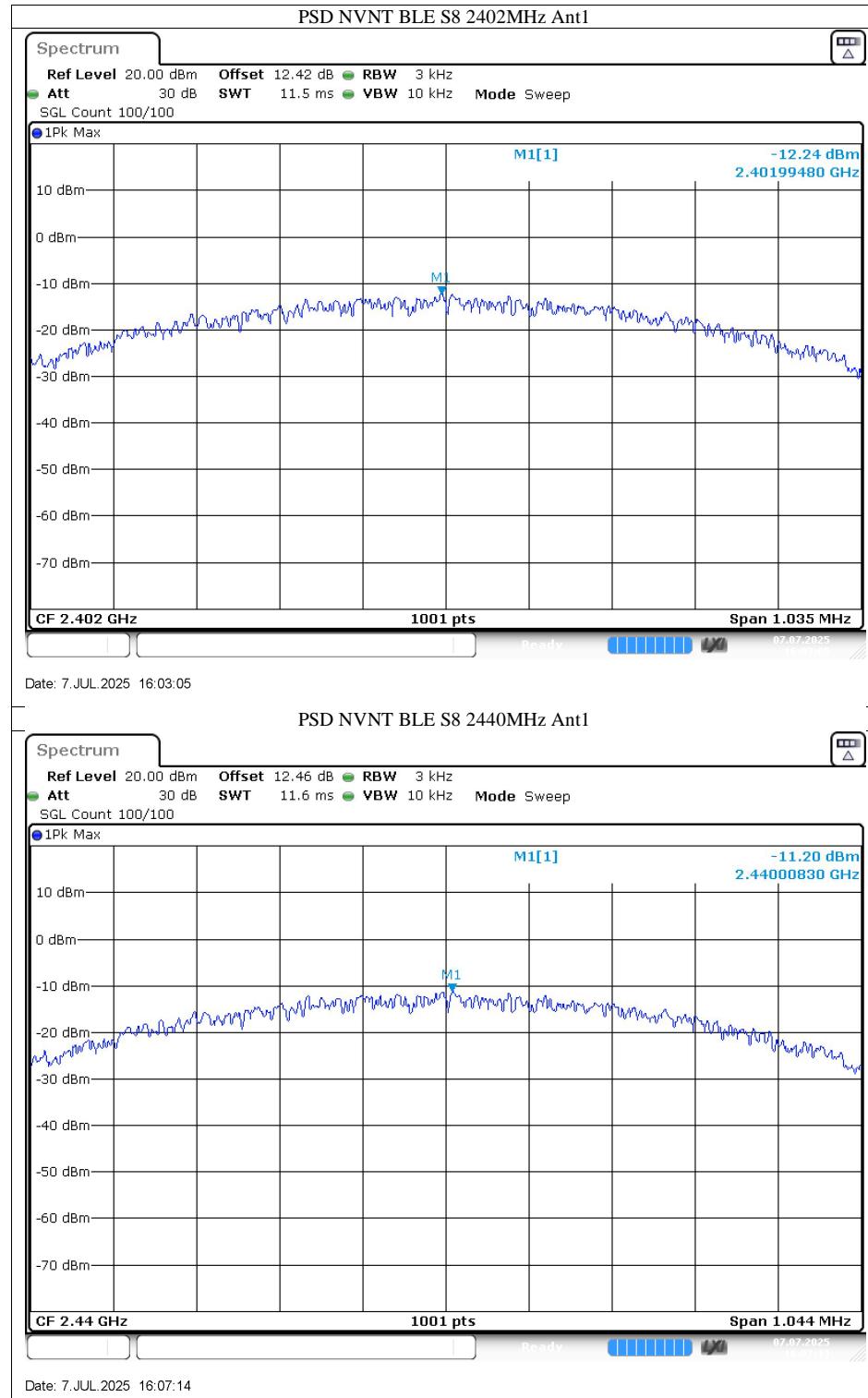
### Test result

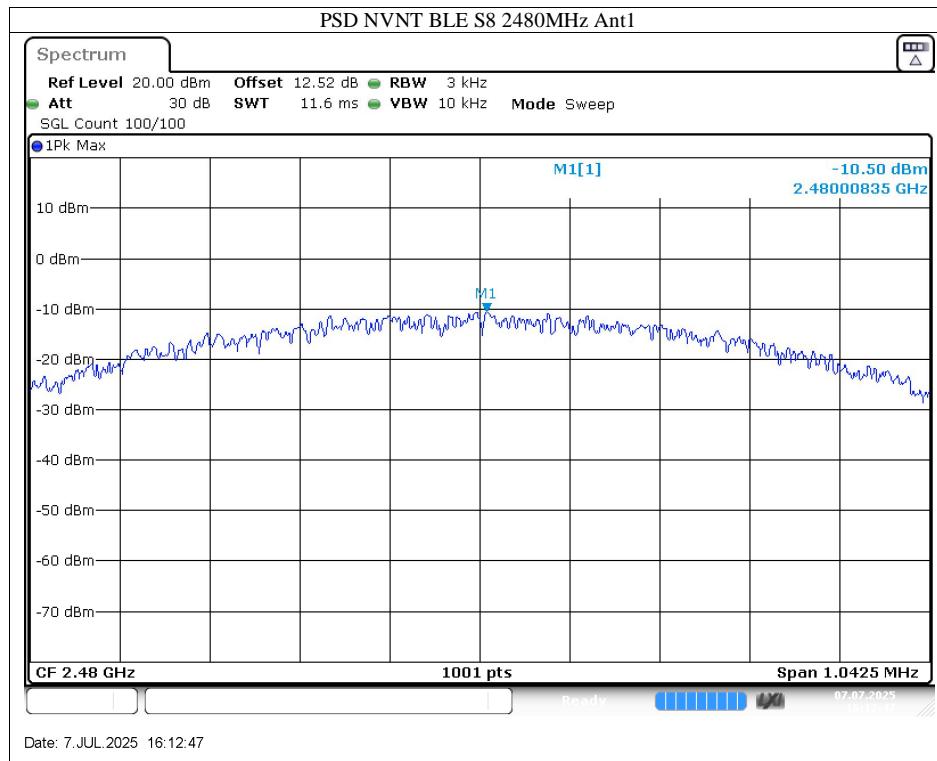
Data transmission rate	Frequency	Power spectral density	Result
125Kbps	MHz	dBm/3kHz	
	Top channel 2402MHz	-12.24	Pass
	Middle channel 2440MHz	-11.2	Pass
500Kbps	Bottom channel 2480MHz	-10.5	Pass
	Top channel 2402MHz	-12.21	Pass
	Middle channel 2440MHz	-11.1	Pass
1Mbps	Bottom channel 2480MHz	-10.57	Pass
	Top channel 2402MHz	-12.14	Pass
	Middle channel 2440MHz	-11.19	Pass
	Bottom channel 2480MHz	-10.49	Pass











## 9.5 Spurious RF conducted emissions

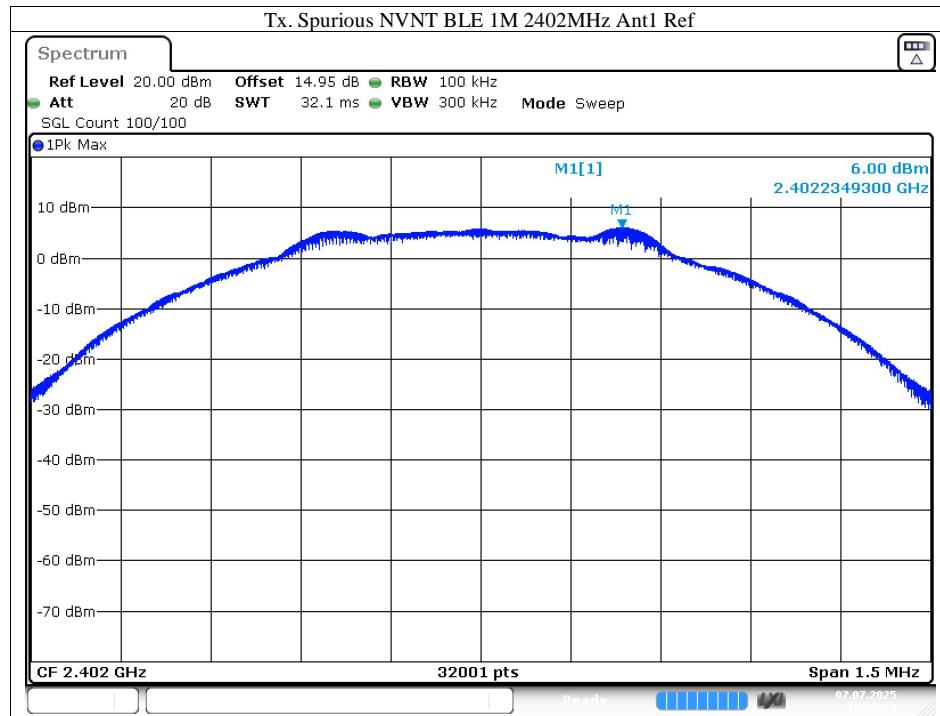
### Test Method

1. Establish a reference level by using the following procedure:
  - a. Set RBW=100 kHz. VBW $\geq$ 3RBW. Detector =peak, Sweep time = auto couple, Trace mode = max hold.
  - b. Allow trace to fully stabilize, use the peak marker function to determine the maximum PSD level.
2. Use the maximum PSD level to establish the reference level.
  - a. Set the center frequency and span to encompass frequency range to be measured.
  - b. Use the peak marker function to determine the maximum amplitude level. Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements, report the three highest emissions relative to the limit.
3. Repeat above procedures until other frequencies measured were completed.

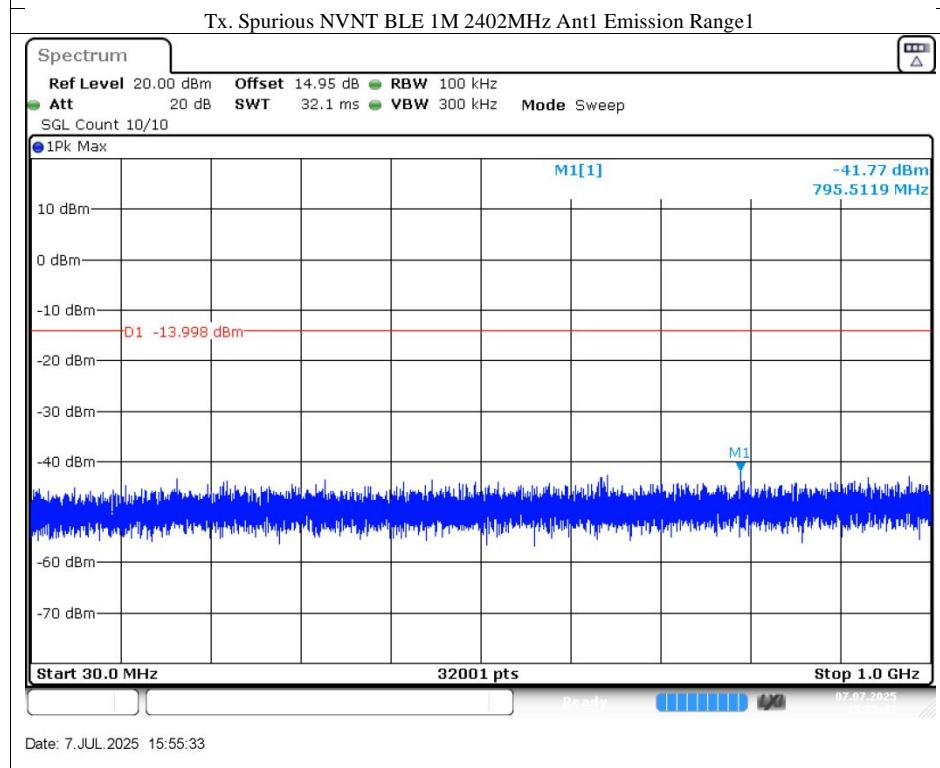
### Limit

Frequency Range MHz	Limit (dBc)
30-25000	-20

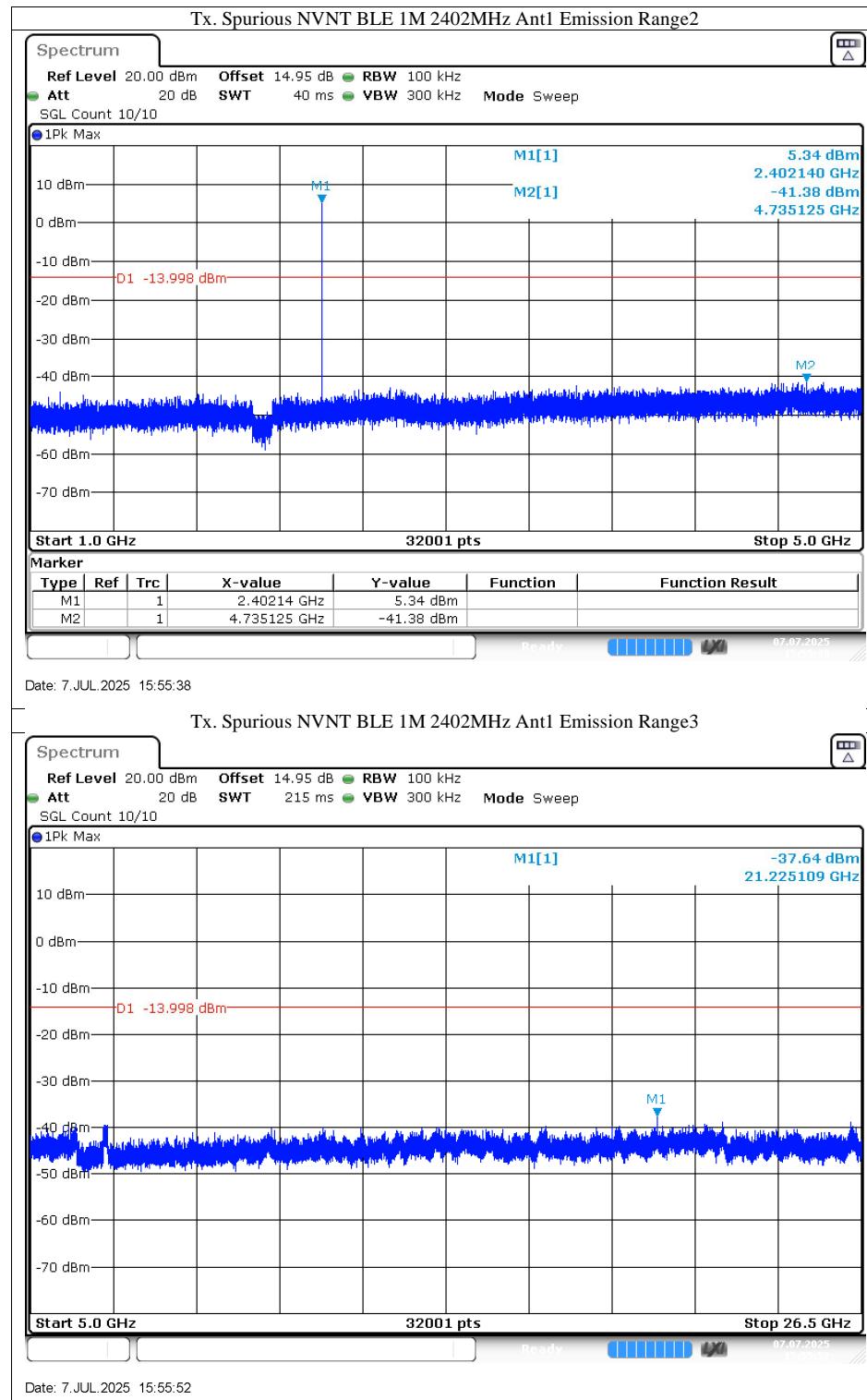
## Spurious RF conducted emissions

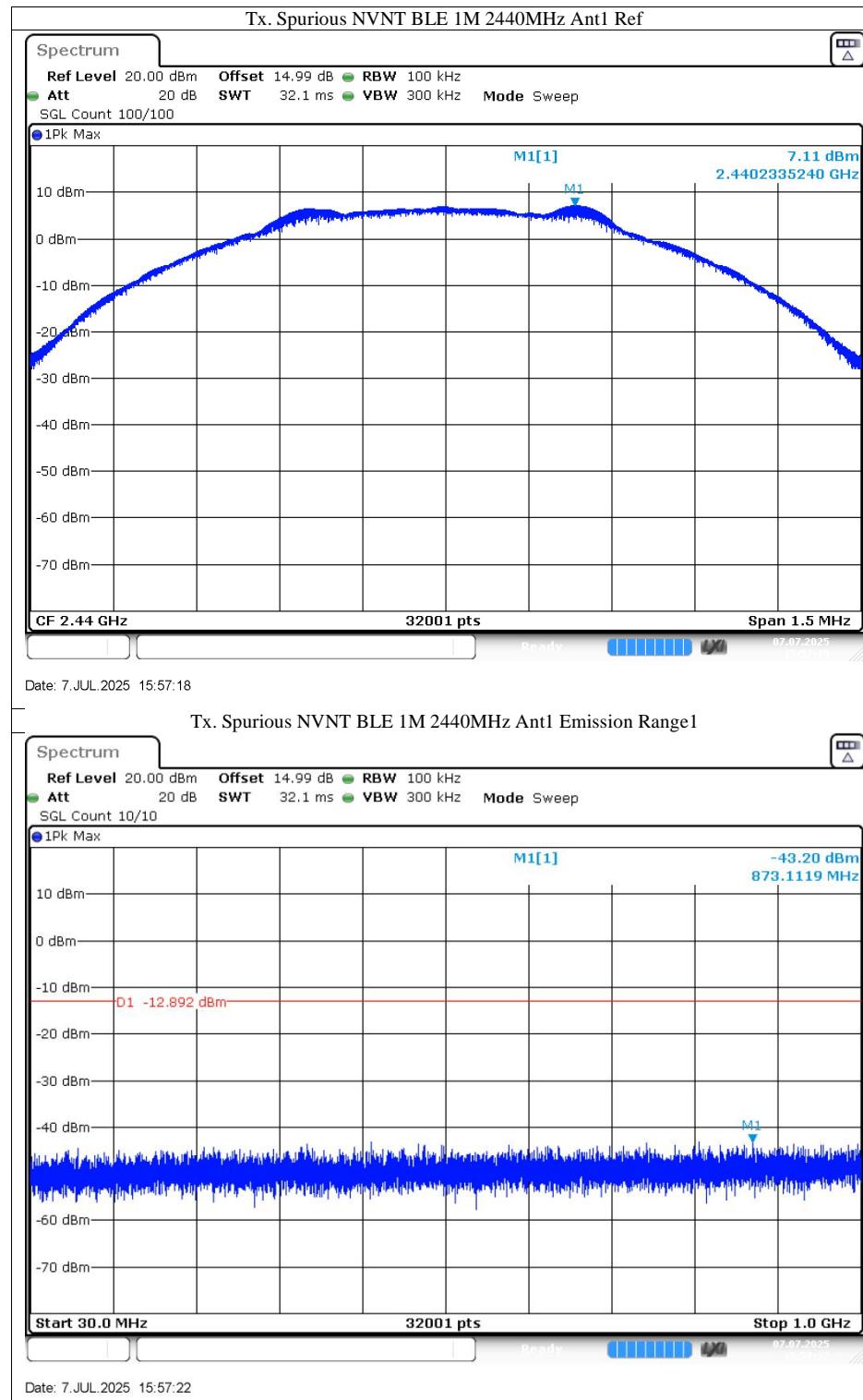


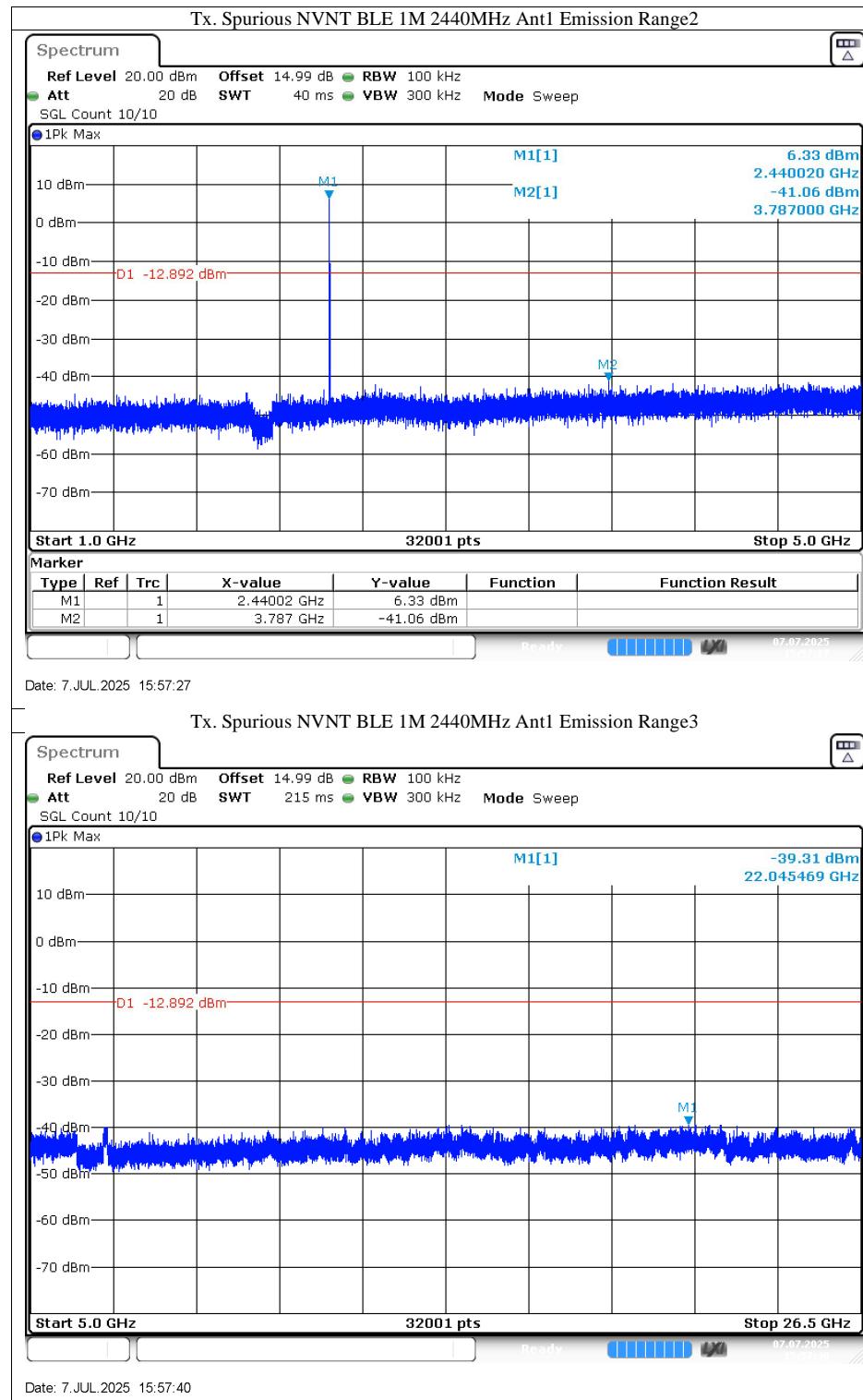
Date: 7.JUL.2025 15:55:30



Date: 7.JUL.2025 15:55:33

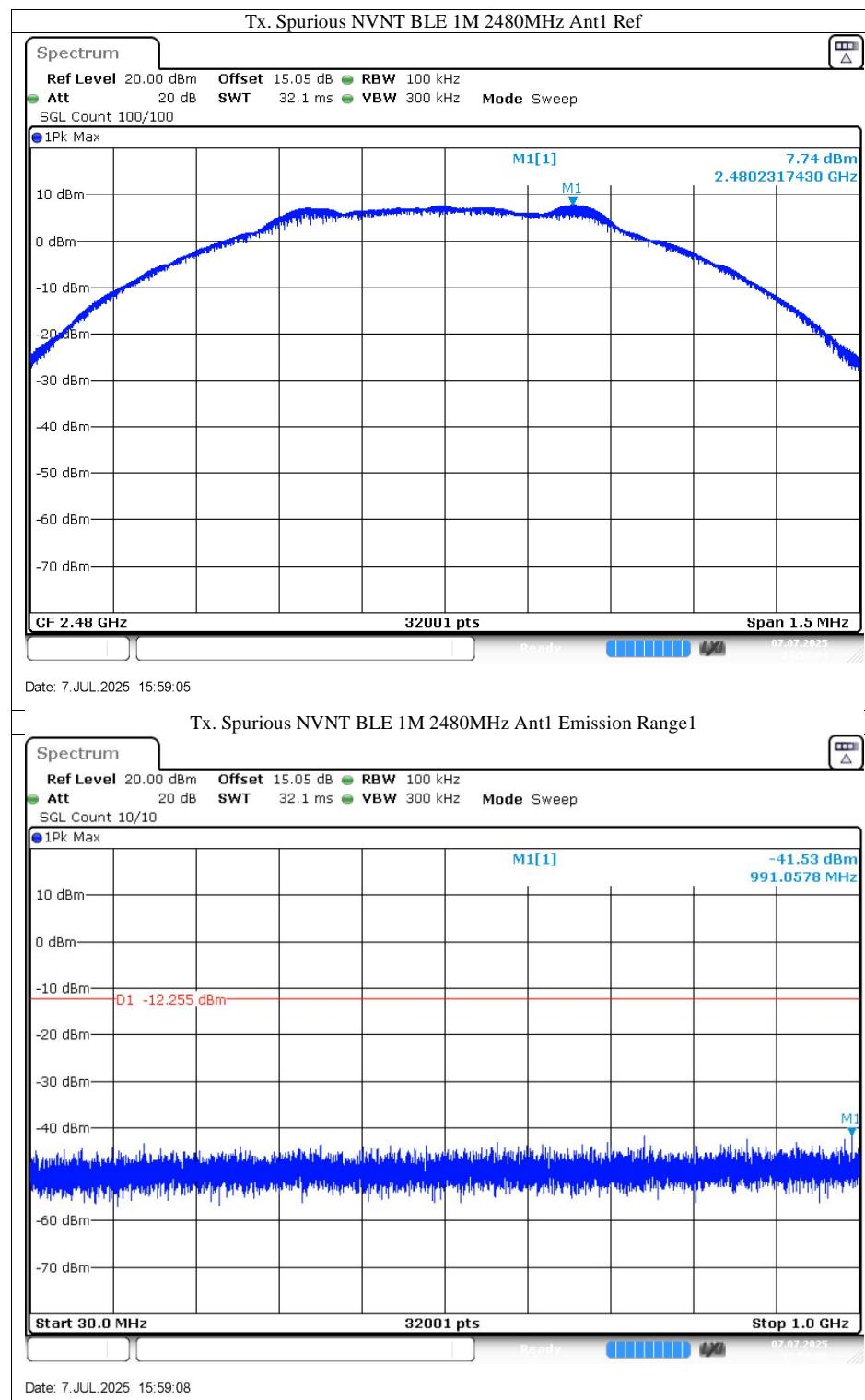








Report Number:4842025306600B



Title: DTS Test Report  
Revision: 02  
Effective date: 2024-08-01

ID-Number: EMC\_WUX\_F\_25.34E  
Author: Ming GU

Phone: +86 510 8820 3737  
Fax: +86 510 8820 3636

TÜV SÜD Certification and Testing (China)  
Co., Ltd.  
Floor 1-4, Building B, No.37, Tuanjie  
Road(Middle), Xishan Economic and  
Technological Development Zone, Wuxi,  
Jiangsu, China

