

FCC CERTIFICATION TEST REPORT

FOR

Applicant	:	PEAG, LLC dba JLab Audio
Address	:	5927 Landau Ct. Carlsbad, CA 92008, USA
Equipment under Test	:	TWS Earbuds
Model No.	:	JBuds Air Pro ANC
Trade Mark	:	JLab
FCC ID	:	2AHYV-JAPNC
Manufacturer	:	PEAG, LLC dba JLab Audio
Address	:	5927 Landau Ct. Carlsbad, CA 92008, USA

Issued By: Dongguan Dongdian Testing Service Co., Ltd.

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Dongguan City, Guangdong Province, China, 523808

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REPORT

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Test Report Declare

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Trade Mark	:	JLab
Manufacturer	:	PEAG, LLC dba JLab Audio
Address	:	5927 Landau Ct. Carlsbad, CA 92008, USA

Test Standard Used:

FCC Rules and Regulations Part 15 Subpart C.

Test Procedure Used:

ANSI C63.10:2013.

We Declare:

The equipment described above is tested by Dongguan Dongdian Testing Service Co., Ltd. and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Dongguan Dongdian Testing Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC standards.

Report No:	DDT-R22120512-2E02		
Date of Receipt:	Feb. 09, 2023	Date of Test:	Feb. 09, 2023 ~ Mar. 08, 2023

Prepared By:**Johnny Wang /Engineer****Approved By:****Damon Hu/EMC Manager**

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

Revision History

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	Mar. 08, 2023	

1. Summary of Test Results

The EUT have been tested according to the applicable standards as referenced below.		
Description of Test Item	Standard	Verdict
6dB Bandwidth and 99% Bandwidth	FCC Part 15: 15.247(a)(2) ANSI C63.10:2013	Pass
Peak Output Power	FCC Part 15: 15.247(b)(3) ANSI C63.10:2013	Pass
Power Spectral Density	FCC Part 15:15.247(e) ANSI C63.10:2013	Pass
Band Edge Compliance (conducted method)	FCC Part 15: 15.247(d) ANSI C63.10:2013	Pass
RF Conducted Spurious Emissions	FCC Part 15: 15.247(d) ANSI C63.10:2013	Pass
Radiation Emission	FCC Part 15: 15.205(a) FCC Part 15: 15.209(a) FCC Part 15: 15.247(d) ANSI C63.10:2013	Pass
Emission in Restricted Frequency Bands	FCC Part 15: 15.205(a) FCC Part 15: 15.209(a) FCC Part 15: 15.247(d) ANSI C63.10:2013	Pass
Power Line Conducted Emission	FCC Part 15: 15.207(a) ANSI C63.10:2013	Pass
Antenna Requirement	FCC Part 15: 15.203	Pass

1.1. General Test Information

1.2. Description of EUT

Eut* Name	: TWS Earbuds
Model Number	: JBuds Air Pro ANC
EUT Function Description	: Please reference user manual of this device
Power supply	: Charging case: DC 5V by external AC Adapter or 3.7V built-in lithium battery Wireless Headphones: DC 3.7V built-in lithium battery
Radio Specification	: Bluetooth V5.0
Operation Frequency	: 2402 MHz - 2480 MHz
Modulation	: GFSK
Data Rate	: 1 Mbps, 2 Mbps
Antenna Gain	: Left side: -2.05 dBi Right side: -2.05 dBi
Sample Number	: S22120512-02 for conductive, S22120512-03 for radiation

Note: EUT is the abbreviation of equipment under test.

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

1.3. Accessories of EUT

Description of Accessories	Manufacturer	Model number	Description	Remark
N/A	N/A	N/A	N/A	N/A

1.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	EMC Compliance	SN
Adapter	SAMSUNG	EP-TA200	R37R41C1C F2SE3	N/A

1.5. Block diagram of EUT configuration for test

EUT

Test software: FCC_assist_1.0.2.2.exe

The test software was used to control EUT work in Continuous Tx mode, and select test channel, wireless mode as below table:

Tested mode, channel, information			
Mode	Setting Tx Power	Channel	Frequency (MHz)
GFSK_1M	0x8f	CH0	2402
	0x8f	CH19	2440
	0x8f	CH39	2480
GFSK_2M	0x8f	CH0	2402
	0x8f	CH19	2440
	0x8f	CH39	2480

1.6. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	21-25 °C
Humidity range:	40-75%
Pressure range:	86-106 kPa

1.7. Deviations of test standard

No deviation.

1.8. Test laboratory

Dongguan Dongdian Testing Service Co., Ltd.

Add.: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808.

Tel.: +86-0769-38826678, <http://www.dgddt.com>, Email: ddt@dgddt.com.

CNAS Accreditation No. L6451; A2LA Accreditation Number: 3870.01

FCC Designation Number: CN1182, Test Firm Registration Number: 540522

Innovation, Science and Economic Development Canada Site Registration Number: 10288A

Conformity Assessment Body identifier: CN0048

VCCI facility registration number: C-20087, T-20088, R-20123, R-20155, G-20118

1.9. Measurement uncertainty

Test Item	Uncertainty
Bandwidth	1.1%
Peak Output Power (Conducted) (Spectrum analyzer)	0.86 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$); 1.38 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$)
Peak Output Power (Conducted) (Power Sensor)	0.74 dB
Power Spectral Density	0.74 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$); 1.38 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$)
Frequencies Stability	6.7×10^{-8} (Antenna couple method) 5.5×10^{-8} (Conducted method)
Conducted spurious emissions	0.86 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$); 1.40 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$) 1.66 dB ($8 \text{ GHz} \leq f < 26.5 \text{ GHz}$)
Uncertainty for radio frequency (RBW < 20 kHz)	3×10^{-8}
Temperature	0.4 °C
Humidity	2 %
Uncertainty for Radiation Emission test (30 MHz - 1 GHz)	4.70 dB (Antenna Polarize: V) 4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test (1 GHz - 40 GHz)	4.10 dB (1 - 6 GHz) 4.40 dB (6 GHz - 18 GHz) 3.54 dB (18 GHz - 26 GHz) 4.30 dB (26 GHz - 40 GHz)
Uncertainty for Power line conduction emission test	3.32 dB (150 kHz - 30 MHz)

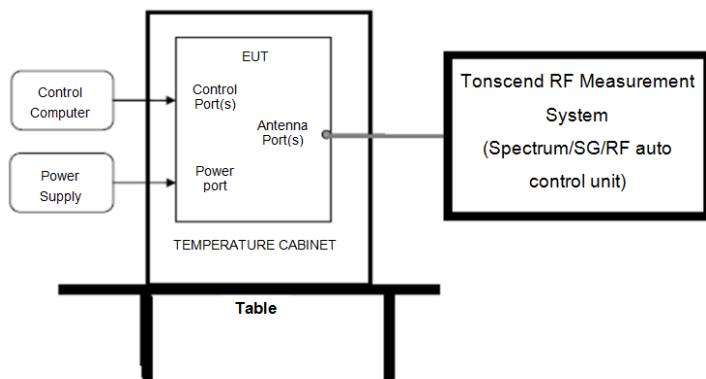
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2. Equipment Used During Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑RF Connected Test (Tonscend RF Measurement System 3#)					
Signal & Spectrum analyzer	R&S	FSV40	101407	Jul. 21, 2022	1 Year
Wideband Radio Communication tester	R&S	CMW500	117491	May 18, 2022	1 Year
Vector Signal Generator	Agilent	N5182A	MY19060405	May 18, 2022	1 Year
Vector Signal Generator	Agilent	N5182A	MY48180912	May 18, 2022	1 Year
RF Control Unit	Tonscend	JS0806-2	20C8060230	May 18, 2022	1 Year
Temp&Humi Programmable	ZHIXIANG	ZXGDJS-150L	ZX170110-A	May 26, 2022	1 Year
Test Software	JS Tonscend	JS1120-3	Ver.3.2.22	N/A	N/A
☑Radiation 3#chamber					
EMI Test Receiver	R&S	ESU26	100472	May 19, 2022	1 Year
Spectrum analyzer	Agilent	E4447A	MY50180031	May 17, 2022	1 Year
Active Loop antenna	Schwarzbeck	FMZB-1519	1519-038	Sep. 29, 2022	1 Year
Trilog Broadband Antenna	Schwarzbeck	VULB 9163	01429	Jul. 22, 2022	1 Year
Double Ridged Horn Antenna	Schwarzbeck	BBHA9120 D	02468	Sep. 29, 2022	1 Year
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	790	May 06, 2022	1 Year
Pre-amplifier	COM-POWER	PAM-118A	18040084	Aug.17, 2022	1 Year
Pre-amplifier	COM-POWER	PAM-840A	461369	Apr. 11, 2022	1 Year
RE Cable	N/A	W23.02 CP1-X2 + W23.09 AP1-X8+ JCT26S-NJ- NJ-1.5M+ JCT26S-NJ- NJ-1.5M	4.5M+8M+1.5M+1.5M	Aug.17, 2022	1 Year
RF Cable	Yuhu Technology	JCTB810-NJ-NJ-9M	21123964	May. 19, 2022	1 Year
RF Cable	Yuhu Technology	ZT26S-SMAJ-SMAJ-1M	21073466	Aug.17, 2022	1 Year
Test software	Tonscend	JS32-RE	V 5.0.0.1	N/A	N/A
☑Power Line Conducted Emissions Test 1#					
Test Receiver	R&S	ESCI	100551	Aug. 26, 2022	1 Year
LISN 1	R&S	ENV216	101109	Aug. 26, 2022	1 Year
LISN 2	R&S	ESH2-Z5	100309	Aug. 26, 2022	1 Year
Pulse Limiter	R&S	ESH3-Z2	101242	Aug. 26, 2022	1 Year
CE Cable 1	HUBSER	N/A	W10.01	Aug. 26, 2022	1 Year
Test software	Audix	E3	V 6.11111b	N/A	N/A
Test Receiver	R&S	ESCI	100551	Aug. 26, 2022	1 Year

3. 6 dB Bandwidth and 99% Bandwidth

3.1. Block diagram of test setup



3.2. Limits

For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz

3.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) 99% Bandwidth set the spectrum analyzer as follows:

RBW:	50 kHz
VBW:	200 kHz
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

(3) 6 dB Bandwidth set the spectrum analyzer as follows:

RBW:	100 kHz
VBW:	300 kHz
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

(4) Allow the trace to stabilize, measure the 6 dB and 99% bandwidth of signal.

3.4. Test result

Left side:

Mode	Channel	99% bandwidth Result (MHz)	6 dB bandwidth Result (MHz)	6 dB width Limit (MHz)	Verdict
GFSK_1M	CH0	1.027	0.67	>0.5	Pass
	CH19	1.023	0.68	>0.5	Pass
	CH39	1.023	0.67	>0.5	Pass
GFSK_2M	CH0	2.030	1.16	>0.5	Pass
	CH19	2.034	1.16	>0.5	Pass
	CH39	2.034	1.17	>0.5	Pass

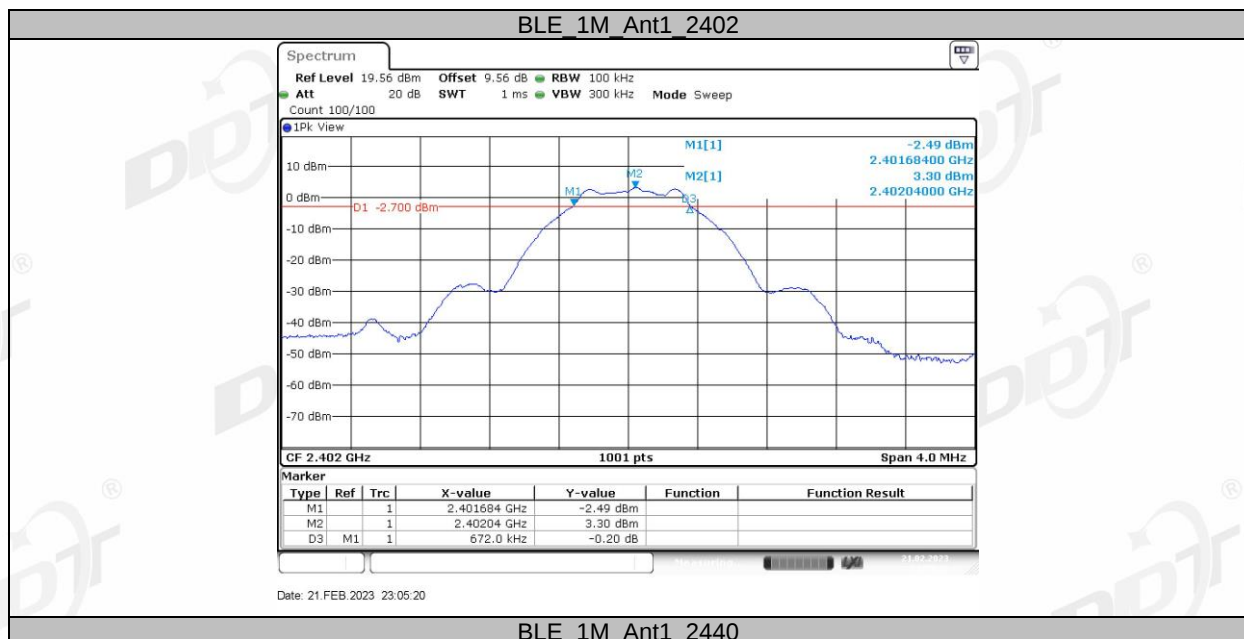
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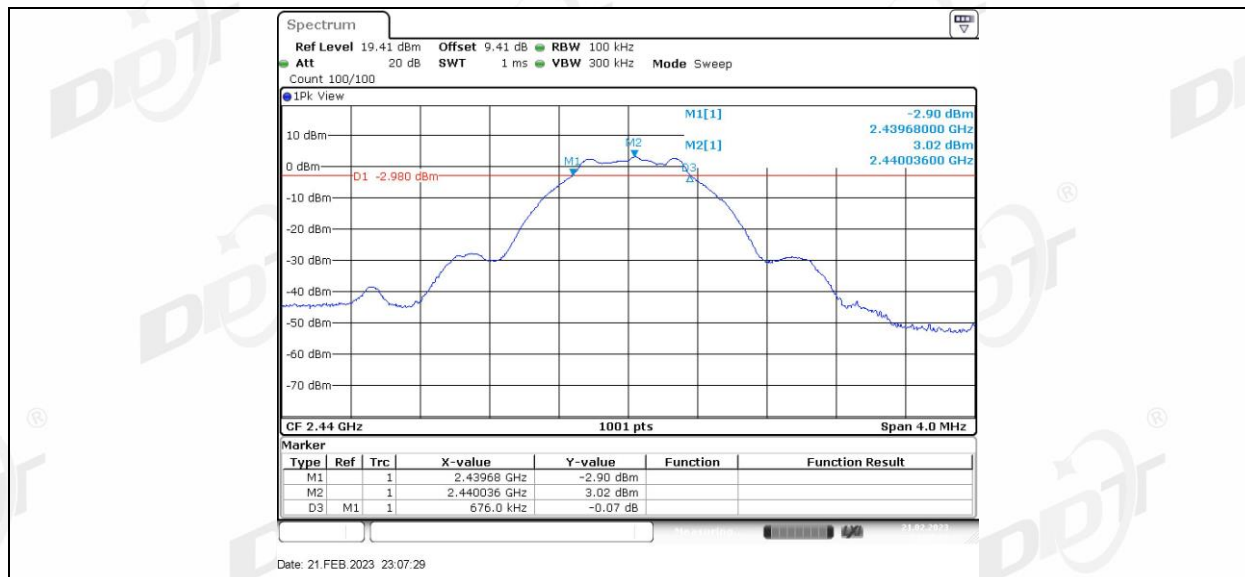
Mode	Channel	99% bandwidth Result (MHz)	6 dB bandwidth Result (MHz)	6 dB width Limit (MHz)	Verdict
GFSK_1M	CH0	1.027	0.67	>0.5	Pass
	CH19	1.027	0.67	>0.5	Pass
	CH39	1.027	0.67	>0.5	Pass
GFSK_2M	CH0	2.034	1.17	>0.5	Pass
	CH19	2.034	1.17	>0.5	Pass
	CH39	2.034	1.16	>0.5	Pass

3.5. Original test data

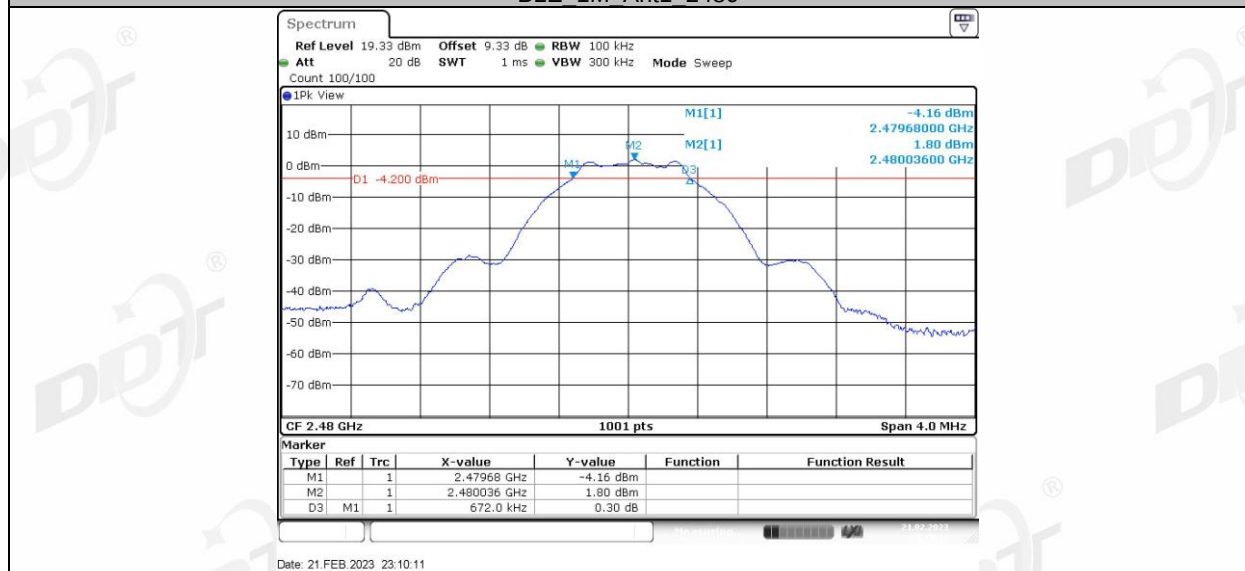
Left side:

6 dB bandwidth:

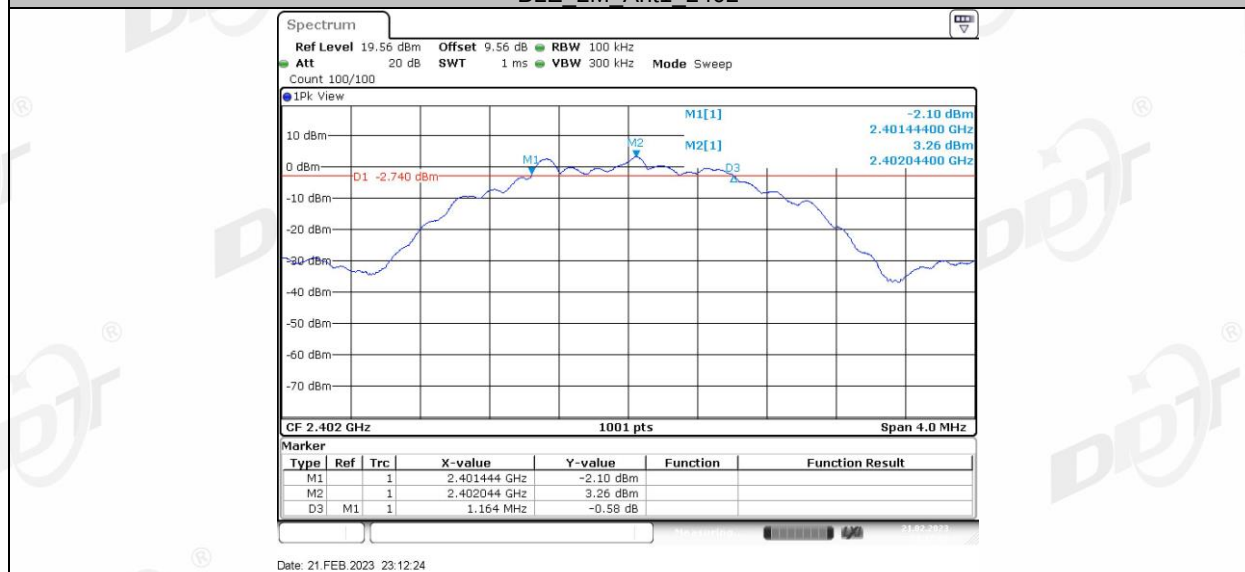




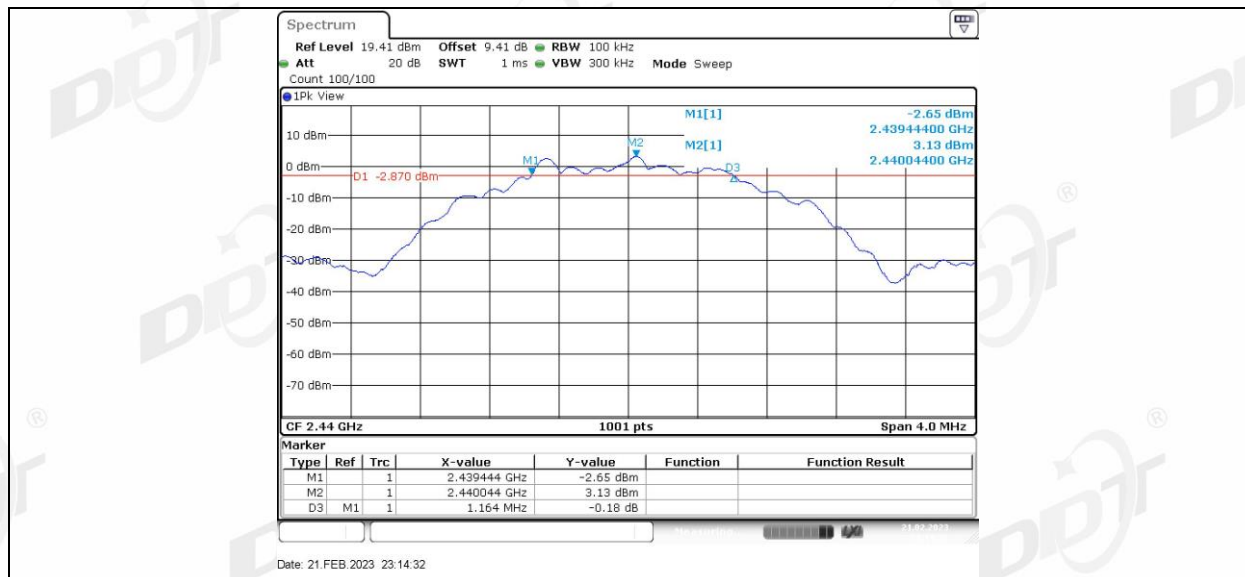
BLE 1M Ant1 2480



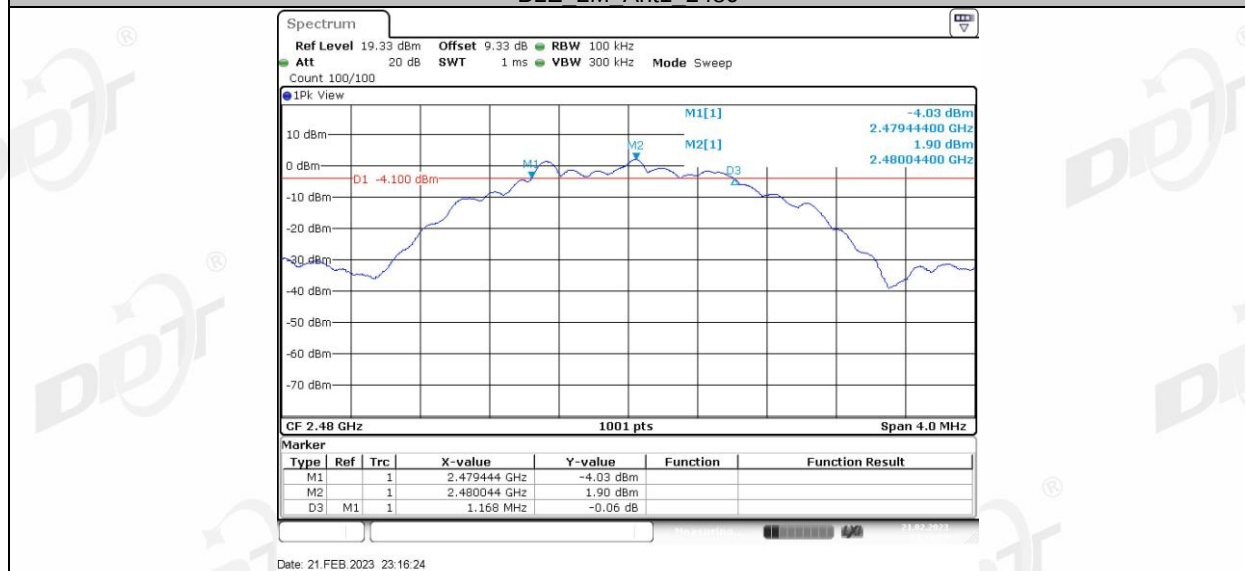
BLE 2M Ant1 2402



BLE 2M Ant1 2440

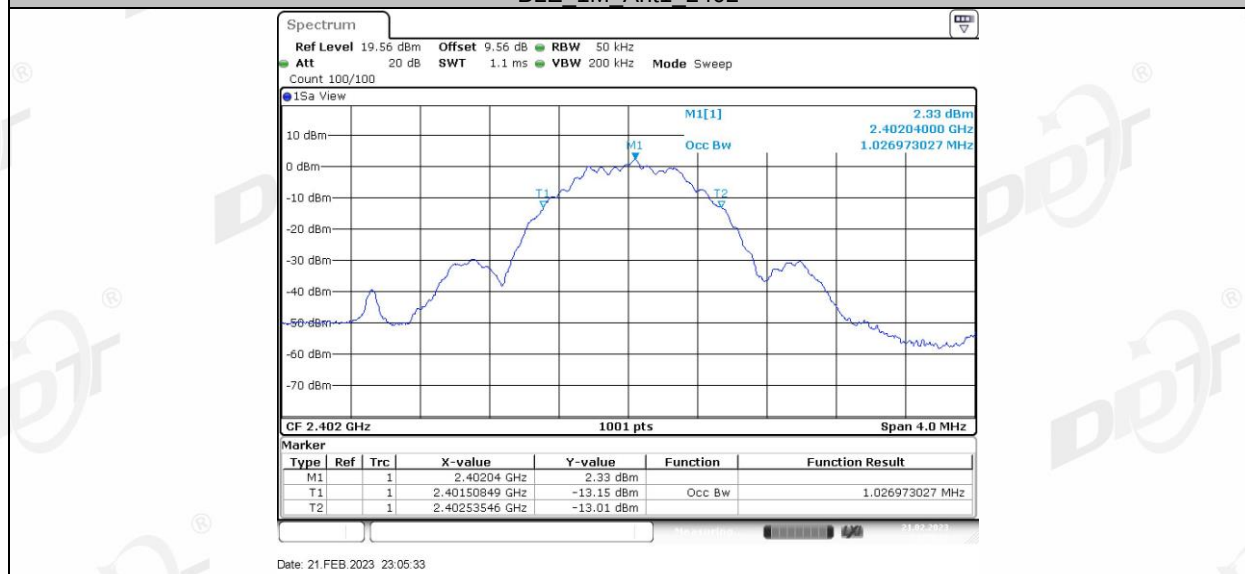


BLE 2M Ant1 2480



99% bandwidth:

BLE 1M Ant1 2402



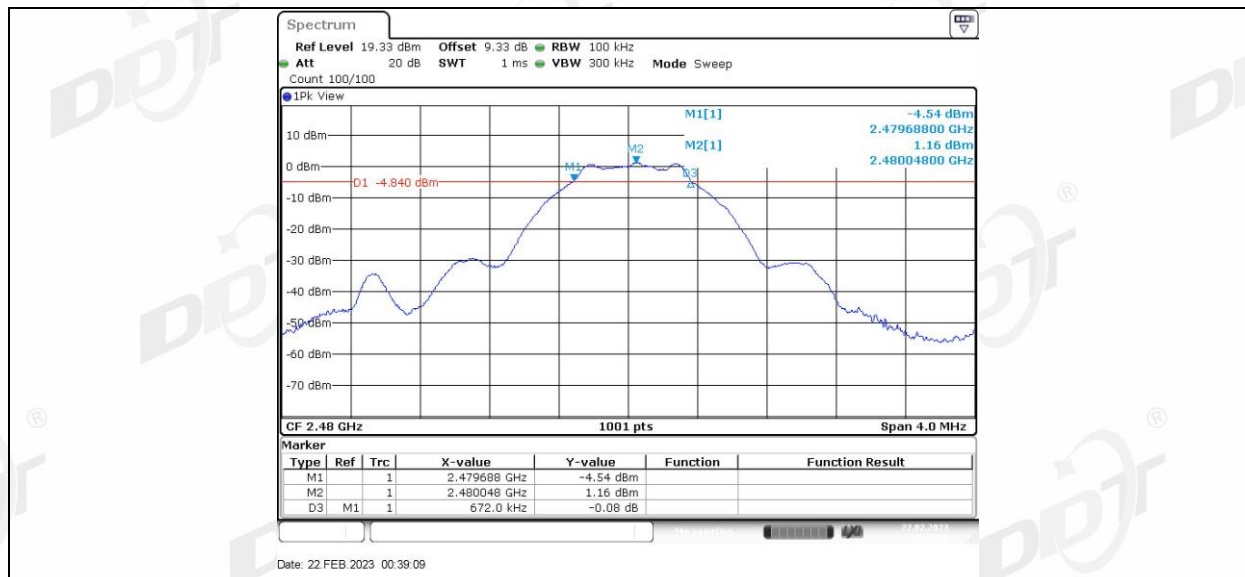




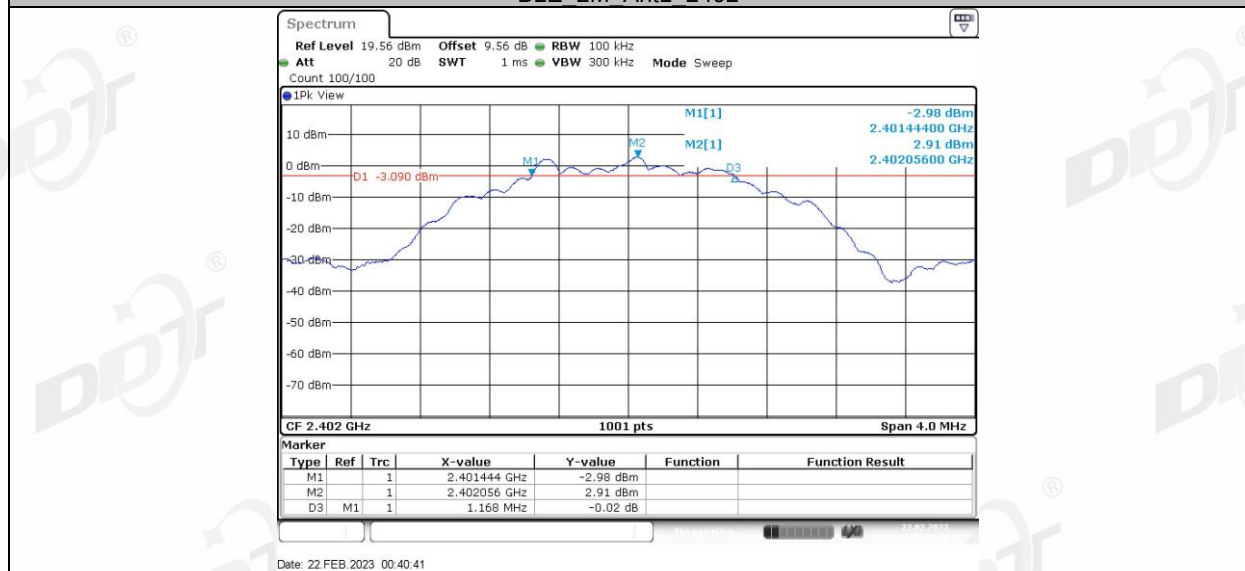
Right side:

6 dB bandwidth:

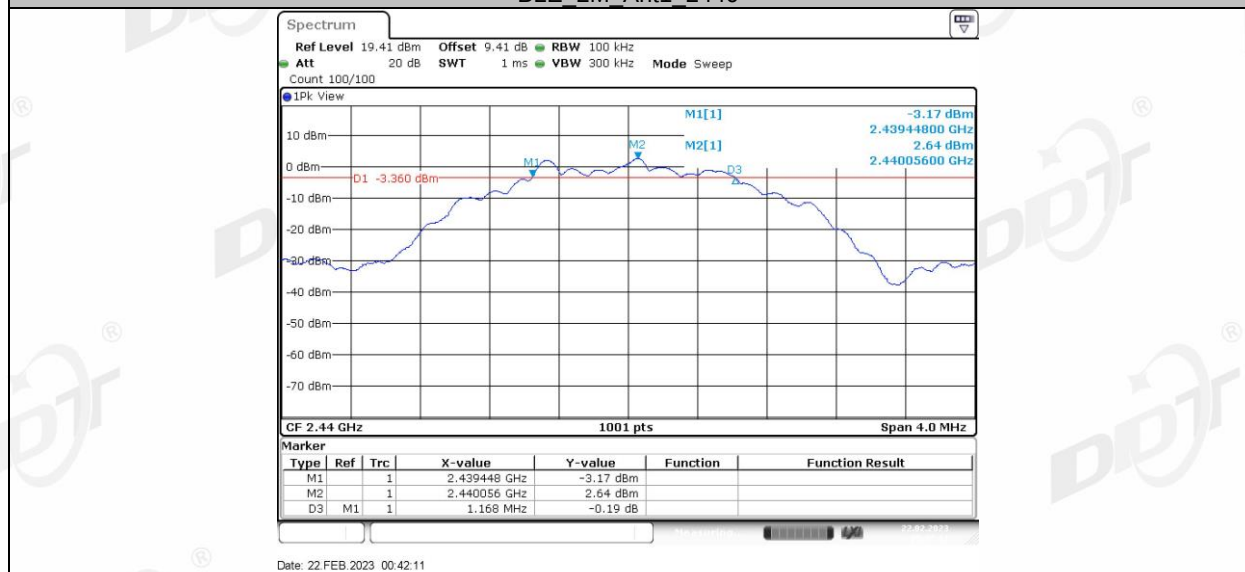




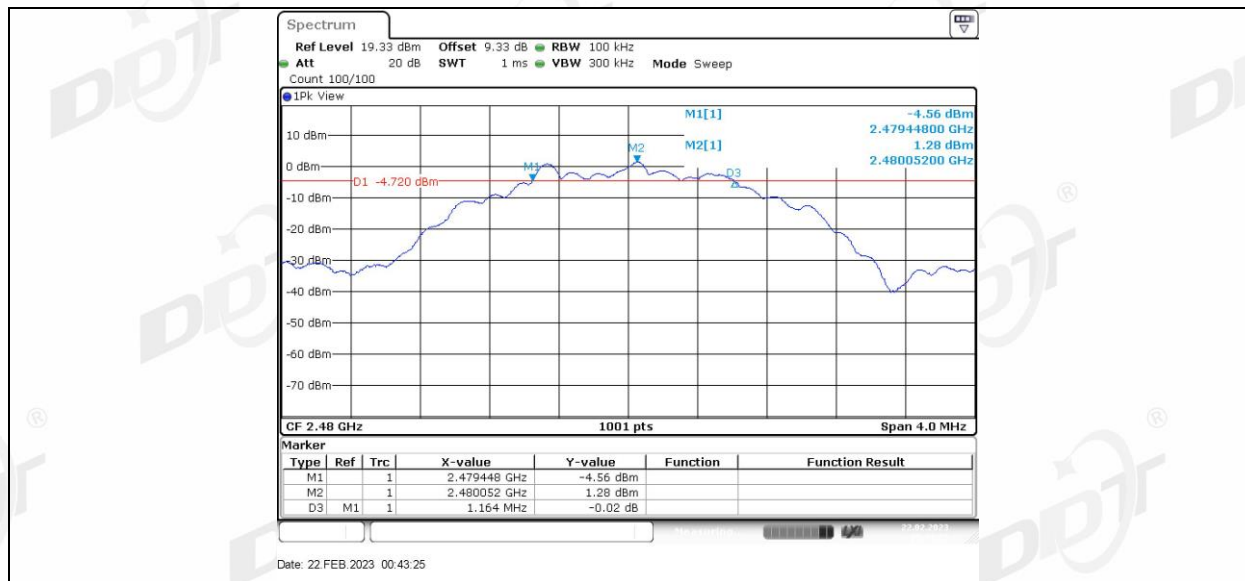
BLE 2M Ant1 2402



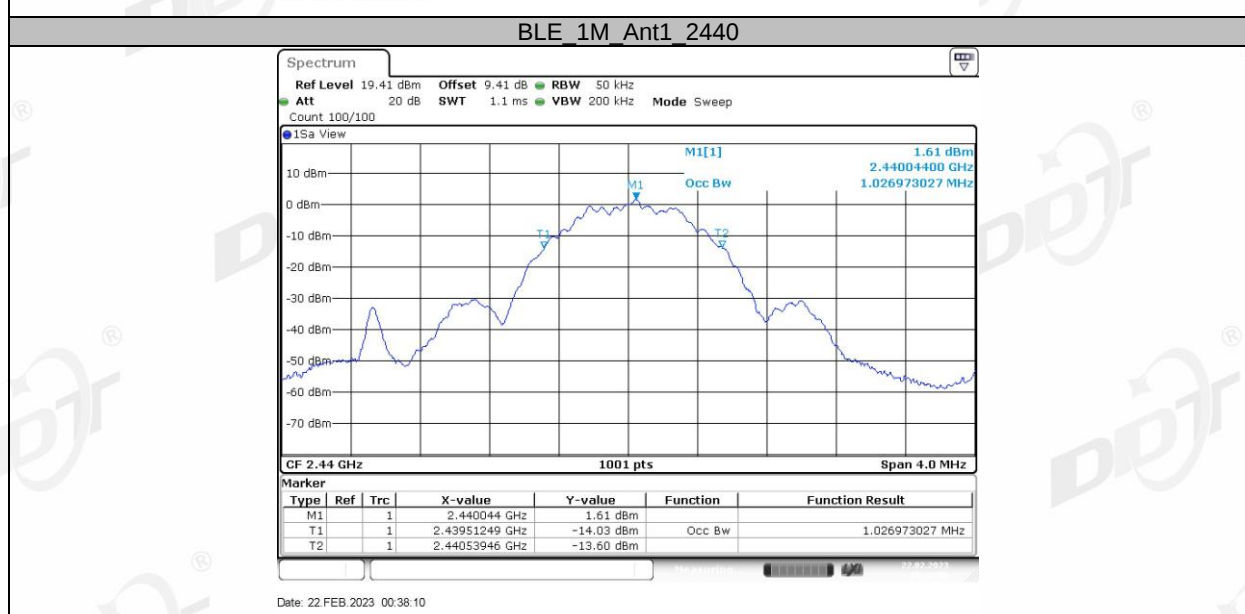
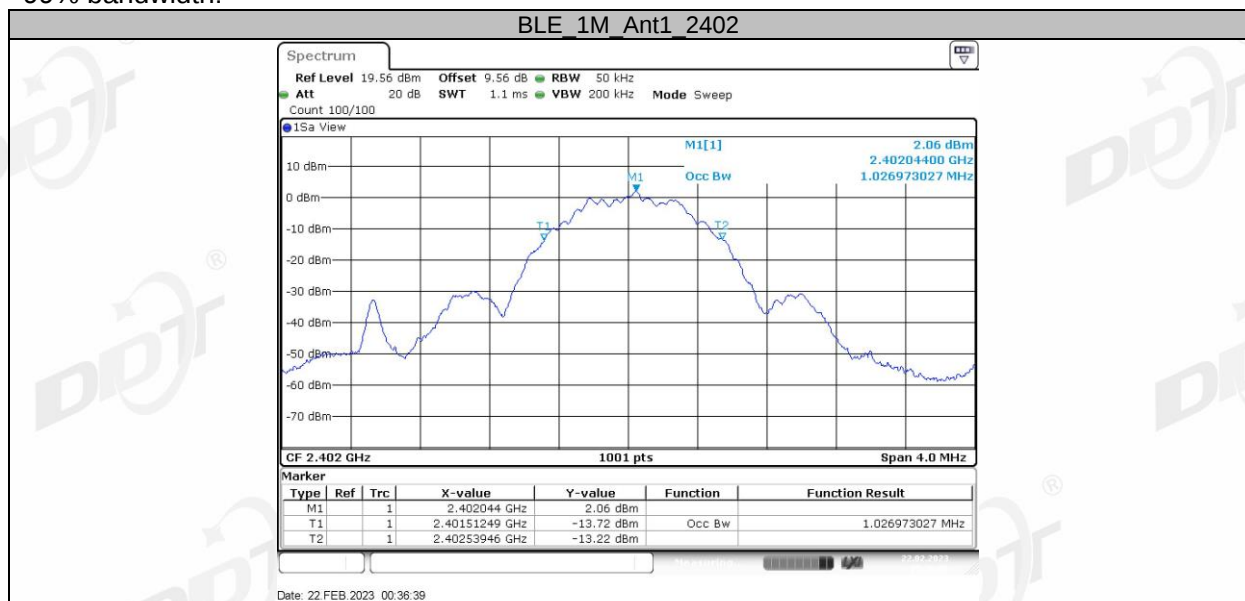
BLE 2M Ant1 2440



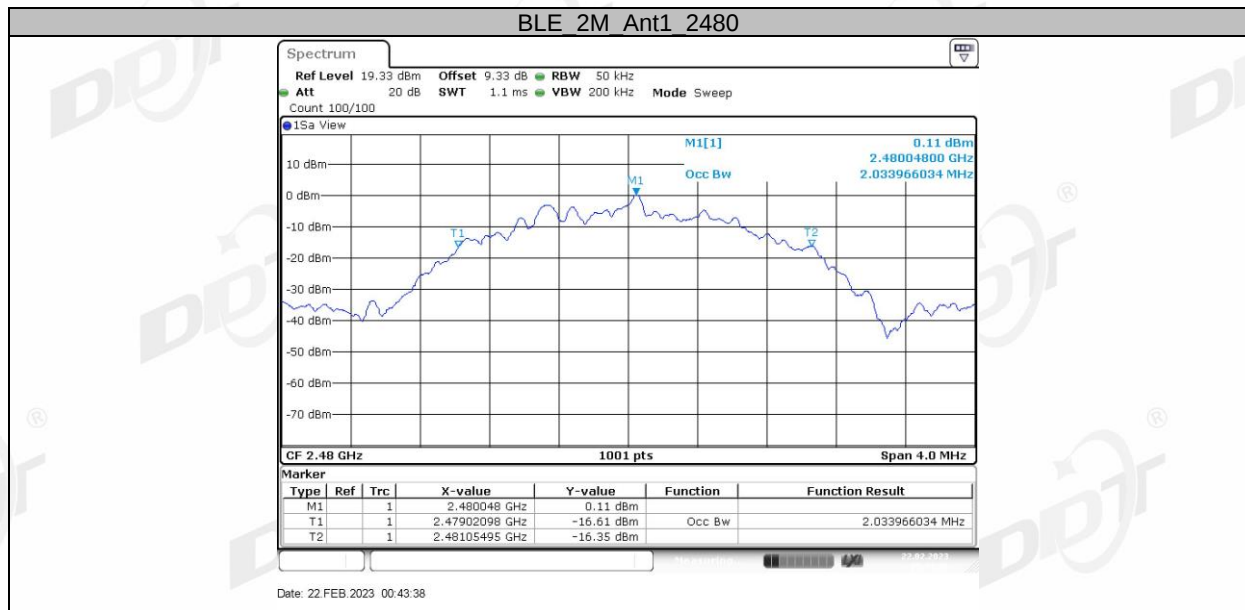
BLE 2M Ant1 2480



99% bandwidth:







4. Maximum Peak Output Power

4.1. Block diagram of test setup

Same with 4.1

4.2. Limits

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Set the spectrum analyzer as follows:

RBW:	≥DTS bandwidth
VBW:	≥3 x RBW
Span	≥3 x RBW
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

(3) Allow the trace to stabilize, Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges measure out the PK output power.

4.4. Test result

Left side:

Mode	Freq. (MHz)	Peak Output Power (dBm)	Limit (dBm)	Verdict
GFSK_1M	2402	3.58	30	Pass
	2440	3.31	30	Pass
	2480	2.07	30	Pass
GFSK_2M	2402	3.71	30	Pass
	2440	3.54	30	Pass
	2480	2.32	30	Pass

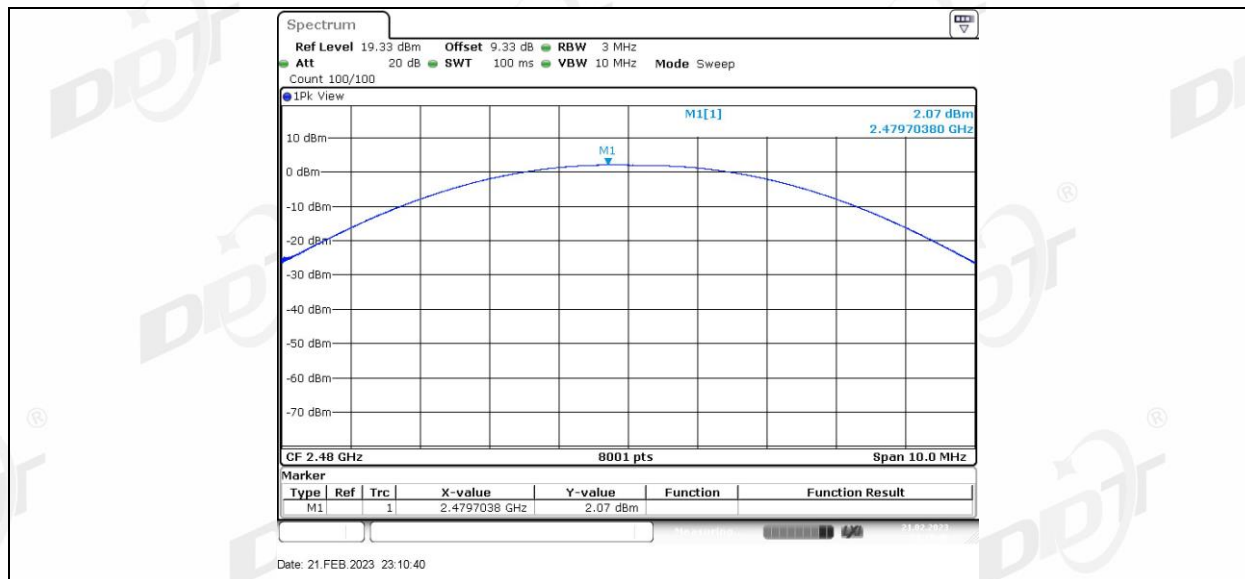
Right side:

Mode	Freq. (MHz)	Peak Output Power (dBm)	Limit (dBm)	Verdict
GFSK_1M	2402	3.24	30	Pass
	2440	2.85	30	Pass
	2480	3.18	30	Pass
GFSK_2M	2402	3.68	30	Pass
	2440	3.82	30	Pass
	2480	3.50	30	Pass

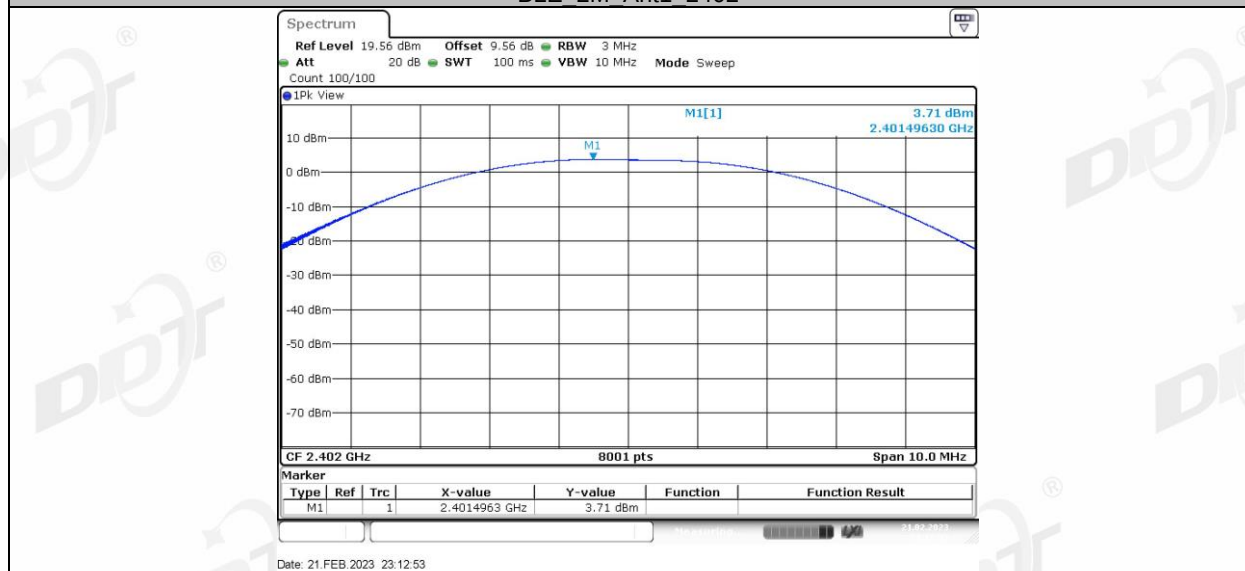
4.5. Original test data

Left side:

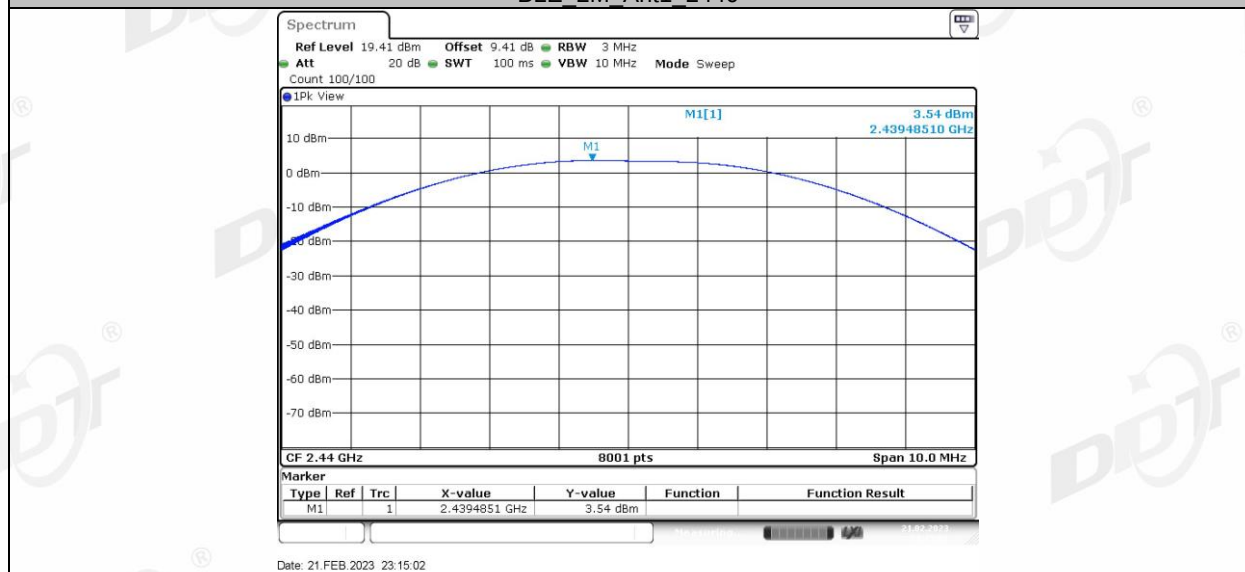




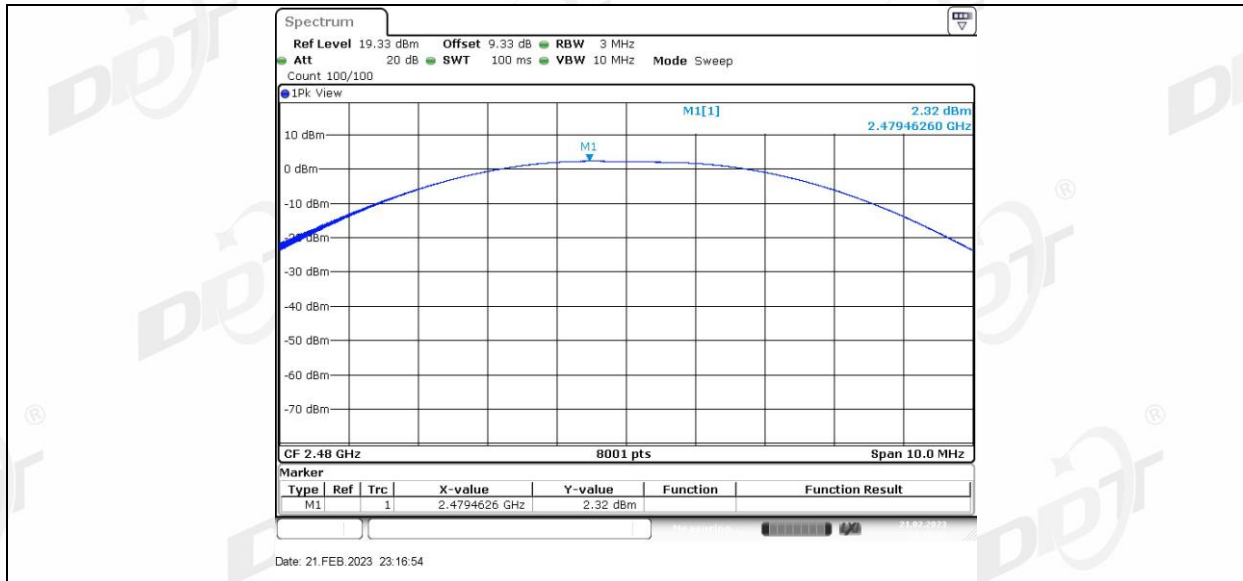
BLE 2M Ant1 2402



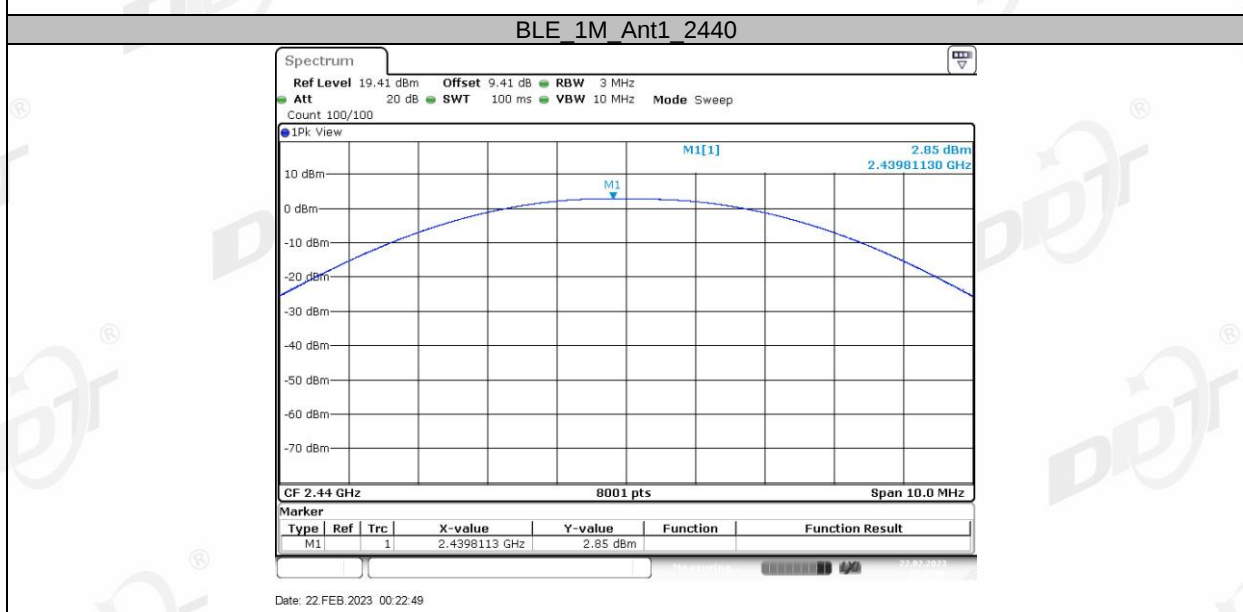
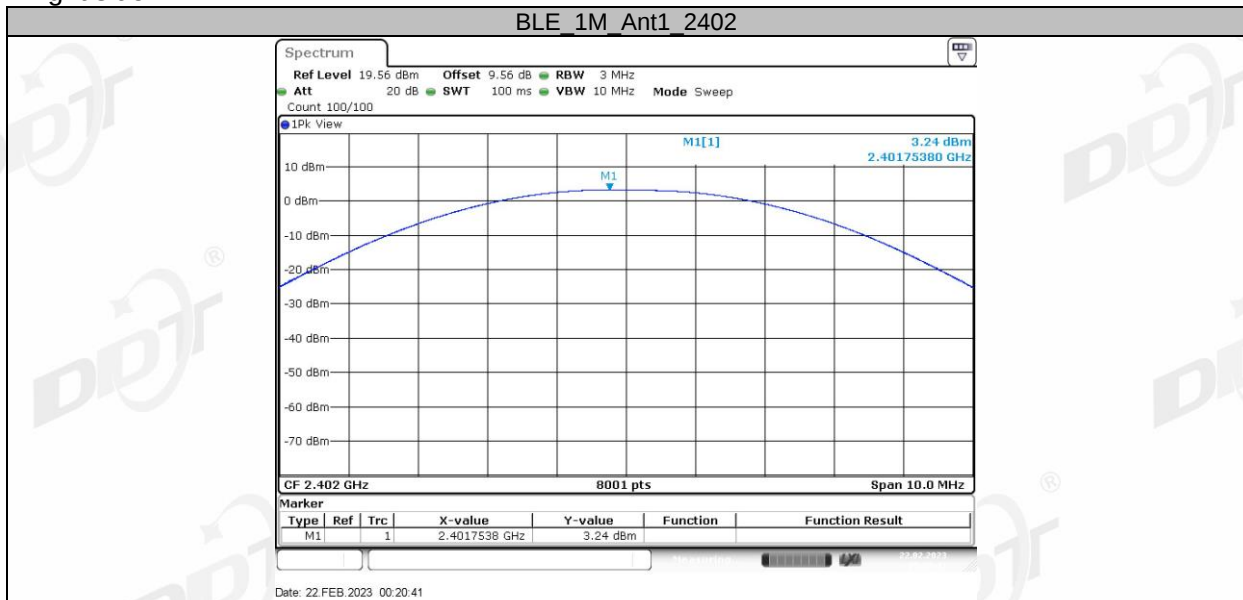
BLE 2M Ant1 2440



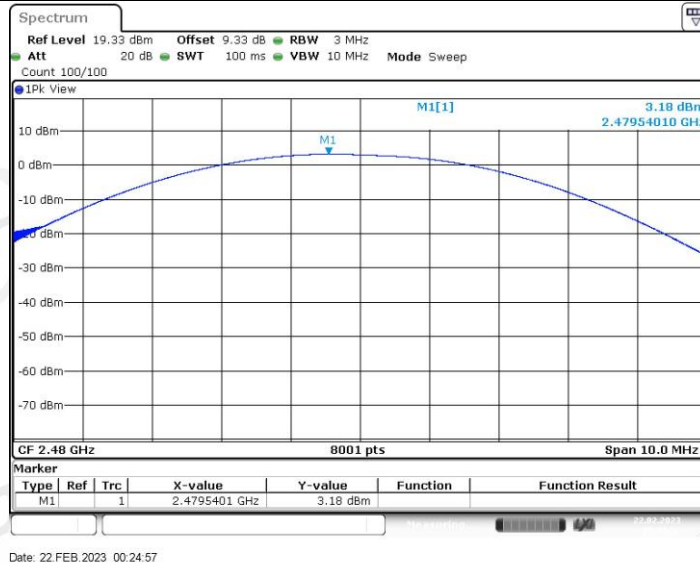
BLE 2M Ant1 2480



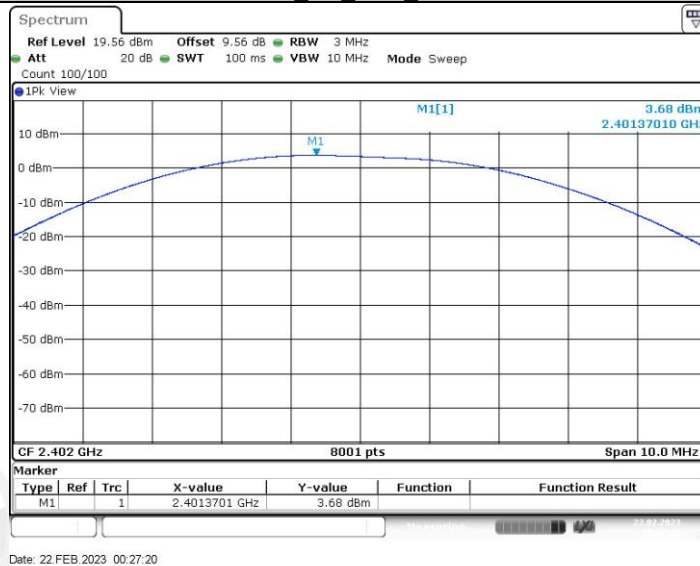
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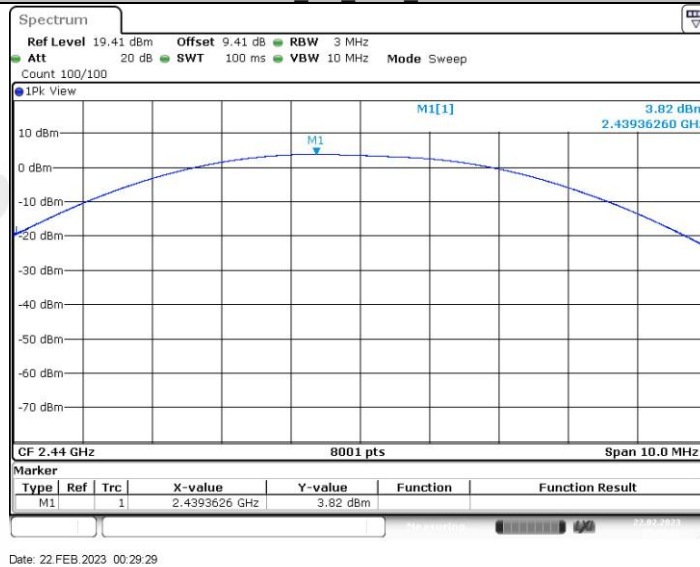
BLE 1M Ant1 2480



BLE 2M Ant1 2402



BLE 2M Ant1 2440





5. Power Spectral Density

5.1. Block diagram of test setup

Same with 4.1

5.2. Limits

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

5.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Set the spectrum analyzer as follows:

Center frequency	DTS Channel center frequency
RBW:	$3\text{ kHz} \leq \text{RBW} \leq 100\text{ kHz}$
VBW:	$\geq 3\text{RBW}$
Span	1.5 times the DTS bandwidth
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

(3) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.

(4) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

5.4. Test result

Left side:

EUT Set Mode	Antenna	Channel	Result (dBm/3 kHz)
GFSK_1M	ANT1	CH0	-12.76
	ANT1	CH19	-13.07
	ANT1	CH39	-14.28
GFSK_2M	ANT1	CH0	-15.01
	ANT1	CH19	-15.23
	ANT1	CH39	-16.57
Limit: <8 dBm/3 kHz			Verdict: Pass

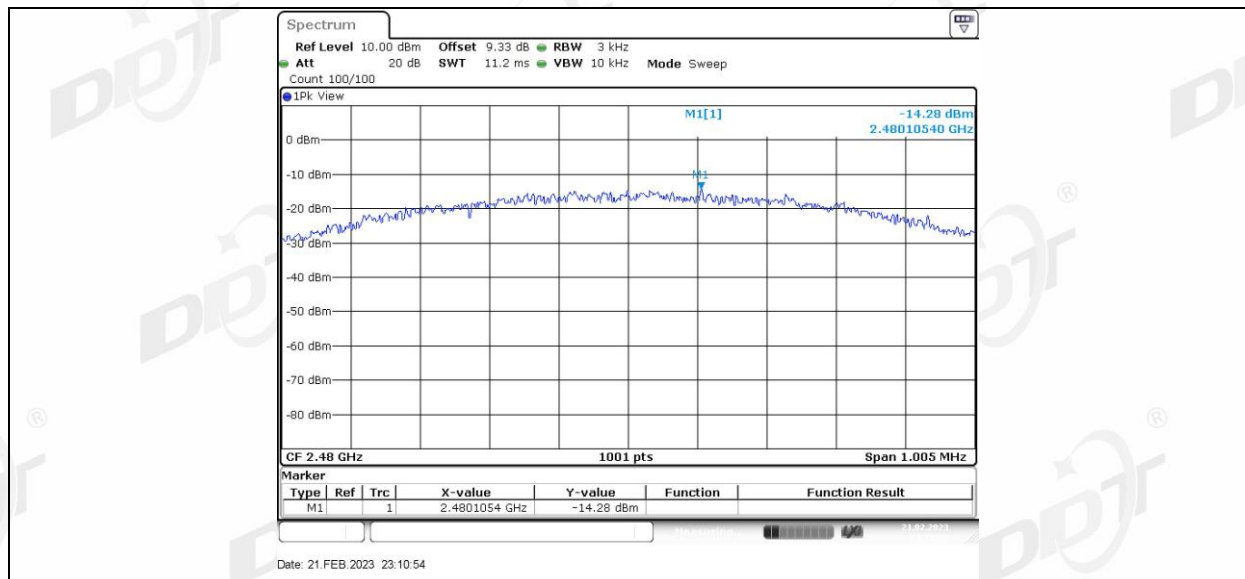
Right side:

EUT Set Mode	Antenna	Channel	Result (dBm/3 kHz)
GFSK_1M	ANT1	CH0	-13.14
	ANT1	CH19	-13.51
	ANT1	CH39	-14.46
GFSK_2M	ANT1	CH0	-16.55
	ANT1	CH19	-16.34
	ANT1	CH39	-16.59
Limit: <8 dBm/3 kHz			Verdict: Pass

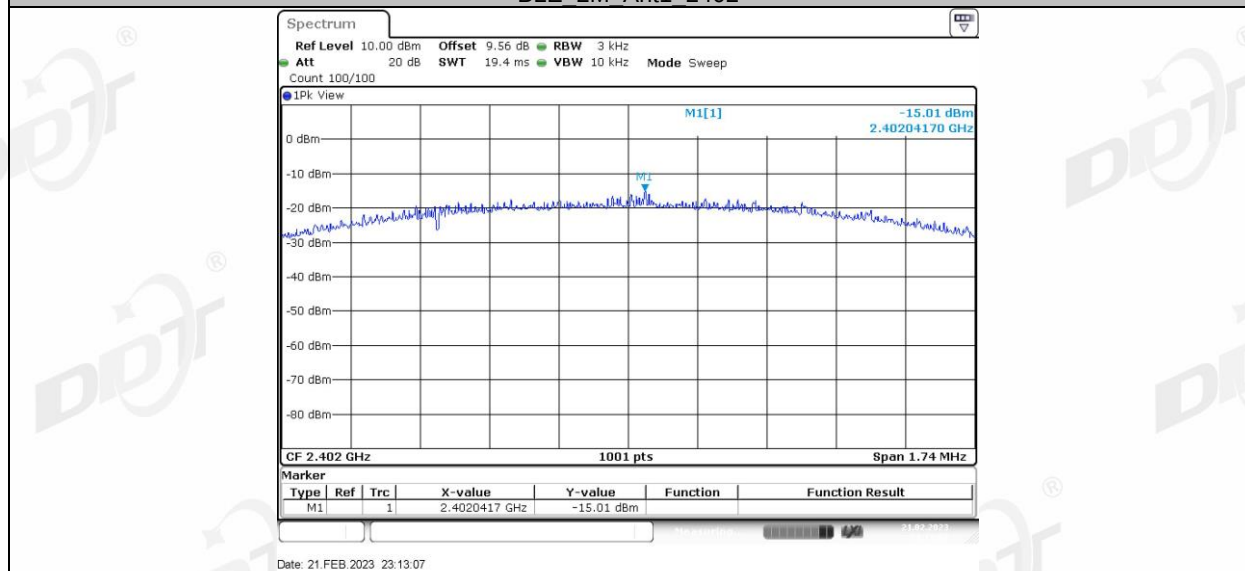
5.5. Original test data

Left side:

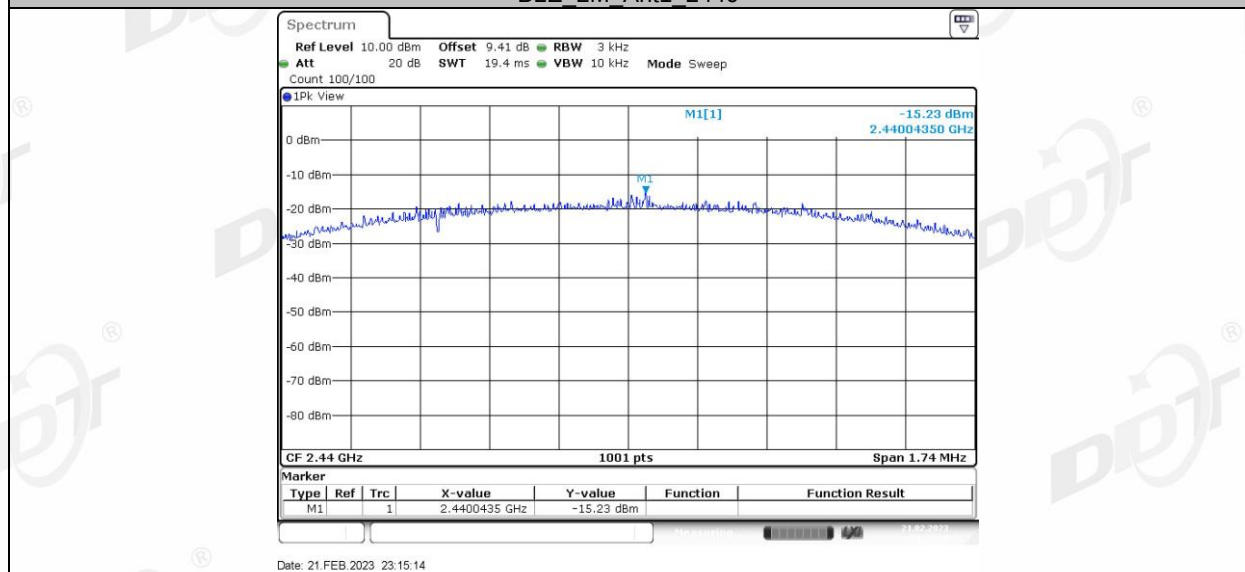




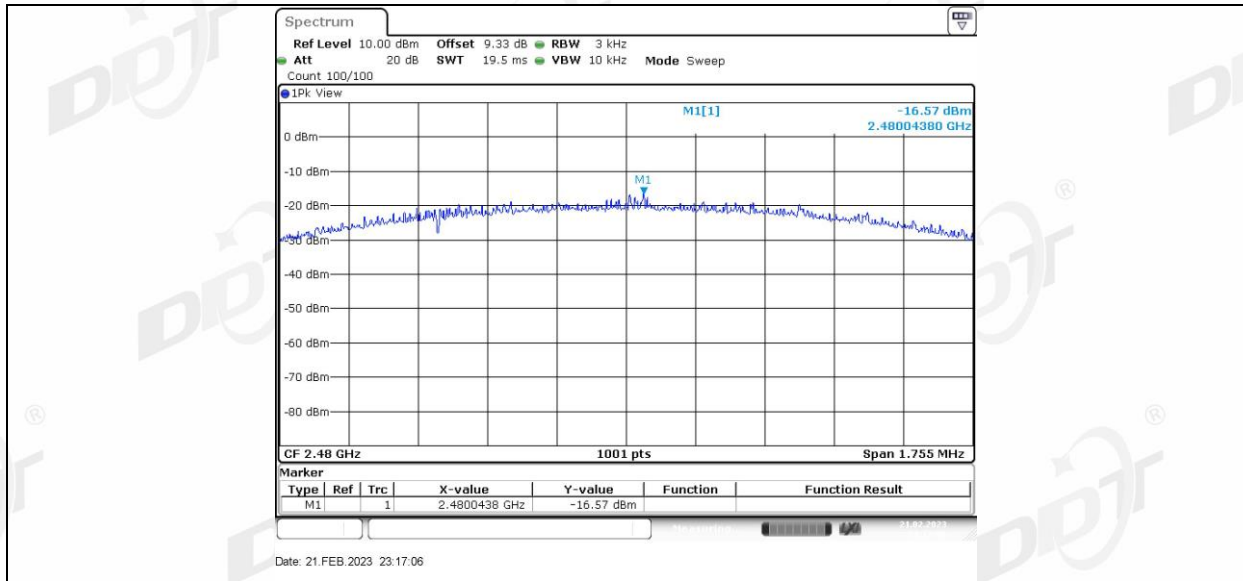
BLE 2M Ant1 2402



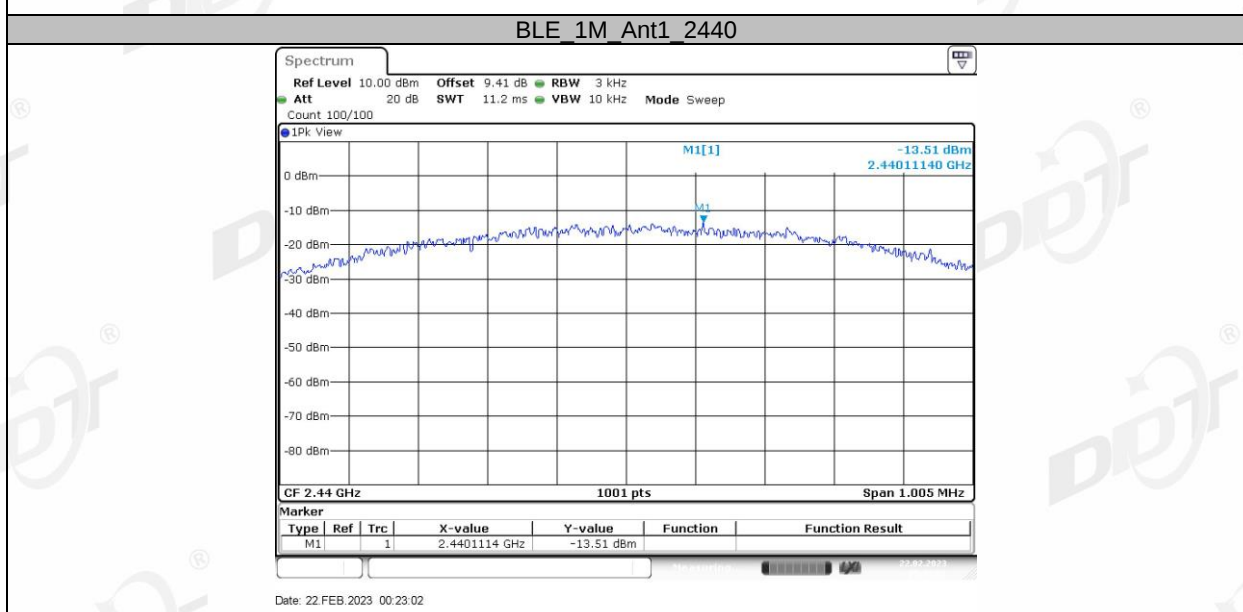
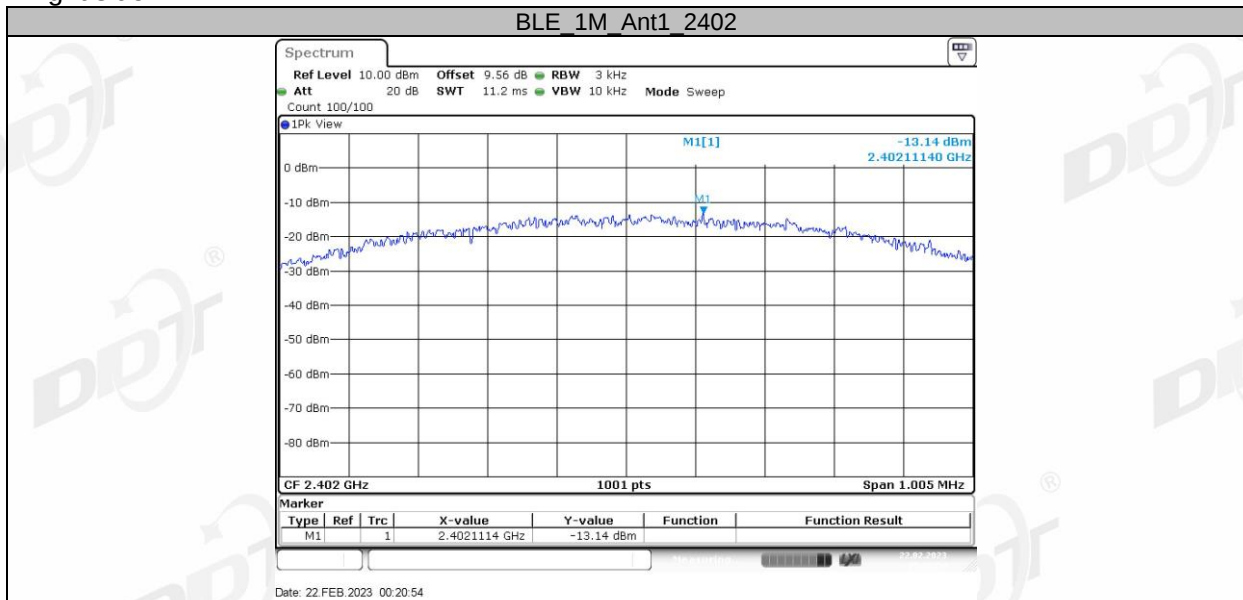
BLE 2M Ant1 2440

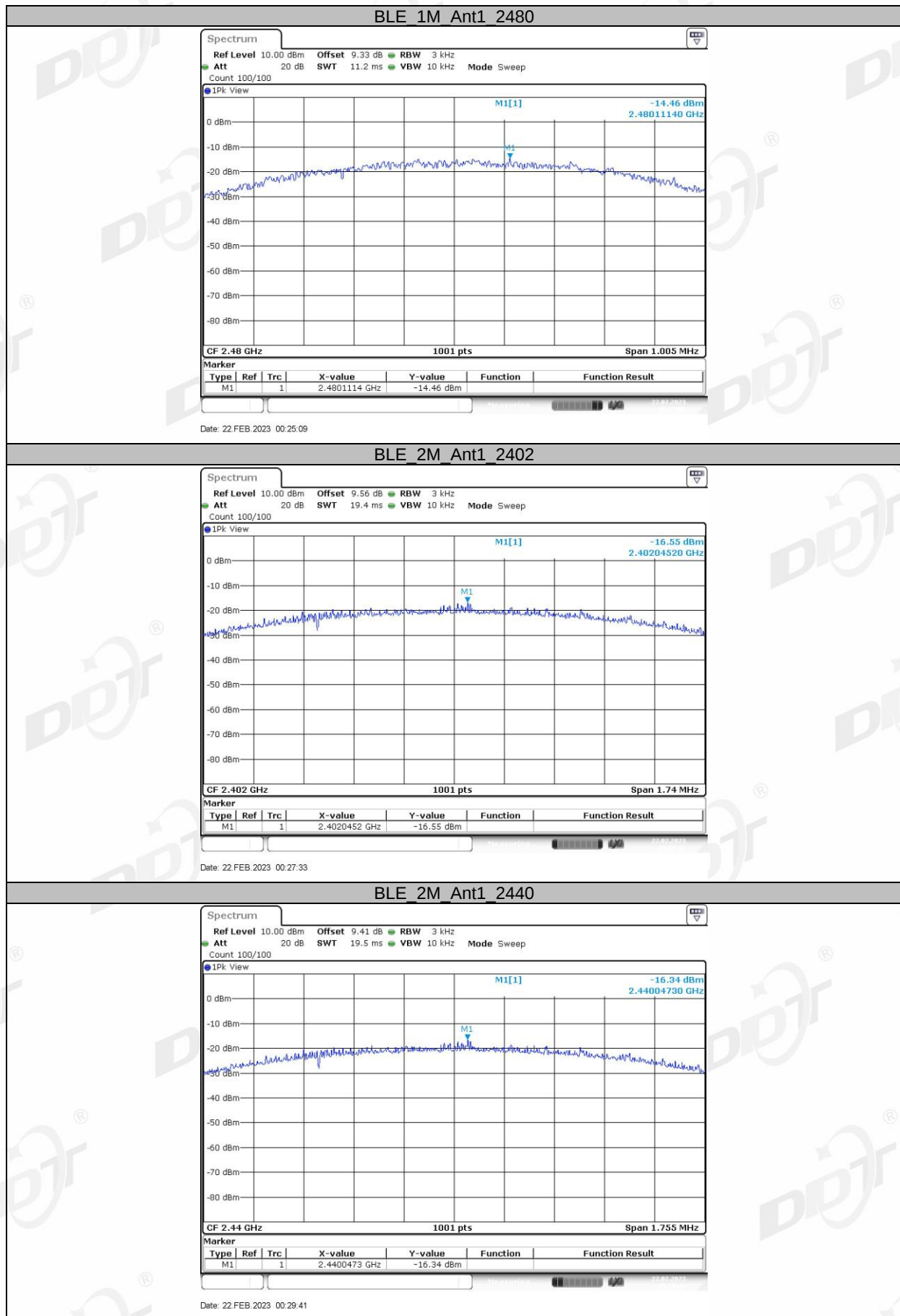


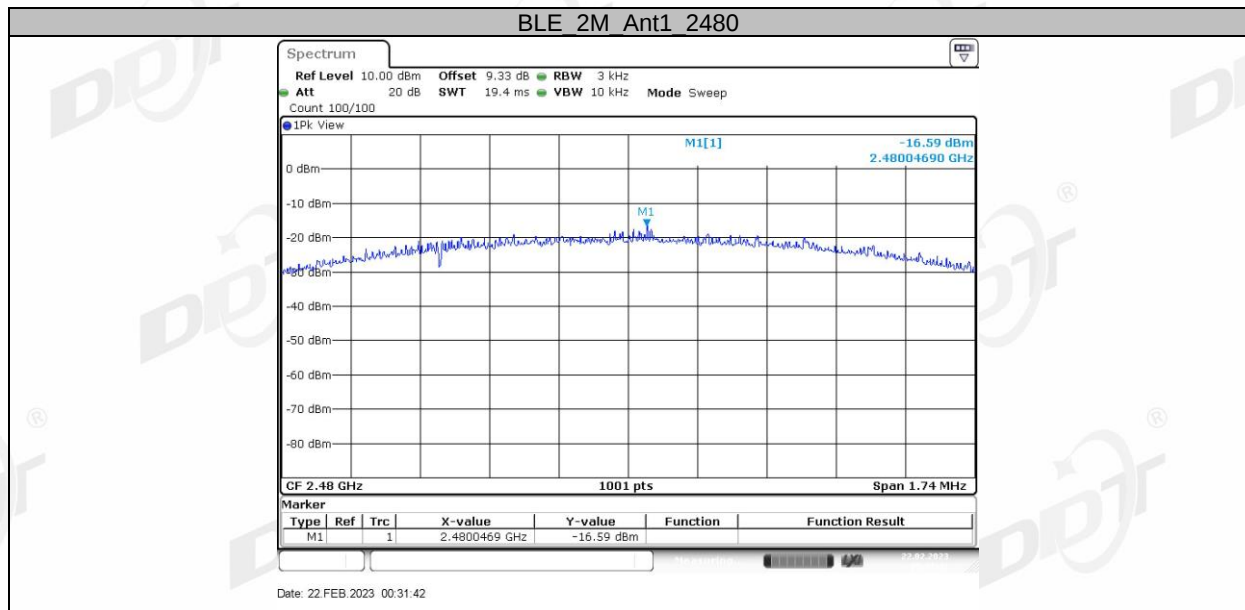
BLE 2M Ant1 2480



Right side:







6. Band Edge Compliance (Conducted Method)

6.1. Block diagram of test setup

Same with 4.1

6.2. Limits

In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

6.3. Test procedure

- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) Establish a reference level by using the following procedure:

RBW:	100 kHz
VBW:	300 kHz
Span	Encompass frequency range to be measured
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold
- (3) Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.
- (4) Then mark the maximum amplitude of all unwanted emissions outside of the authorized frequency band.

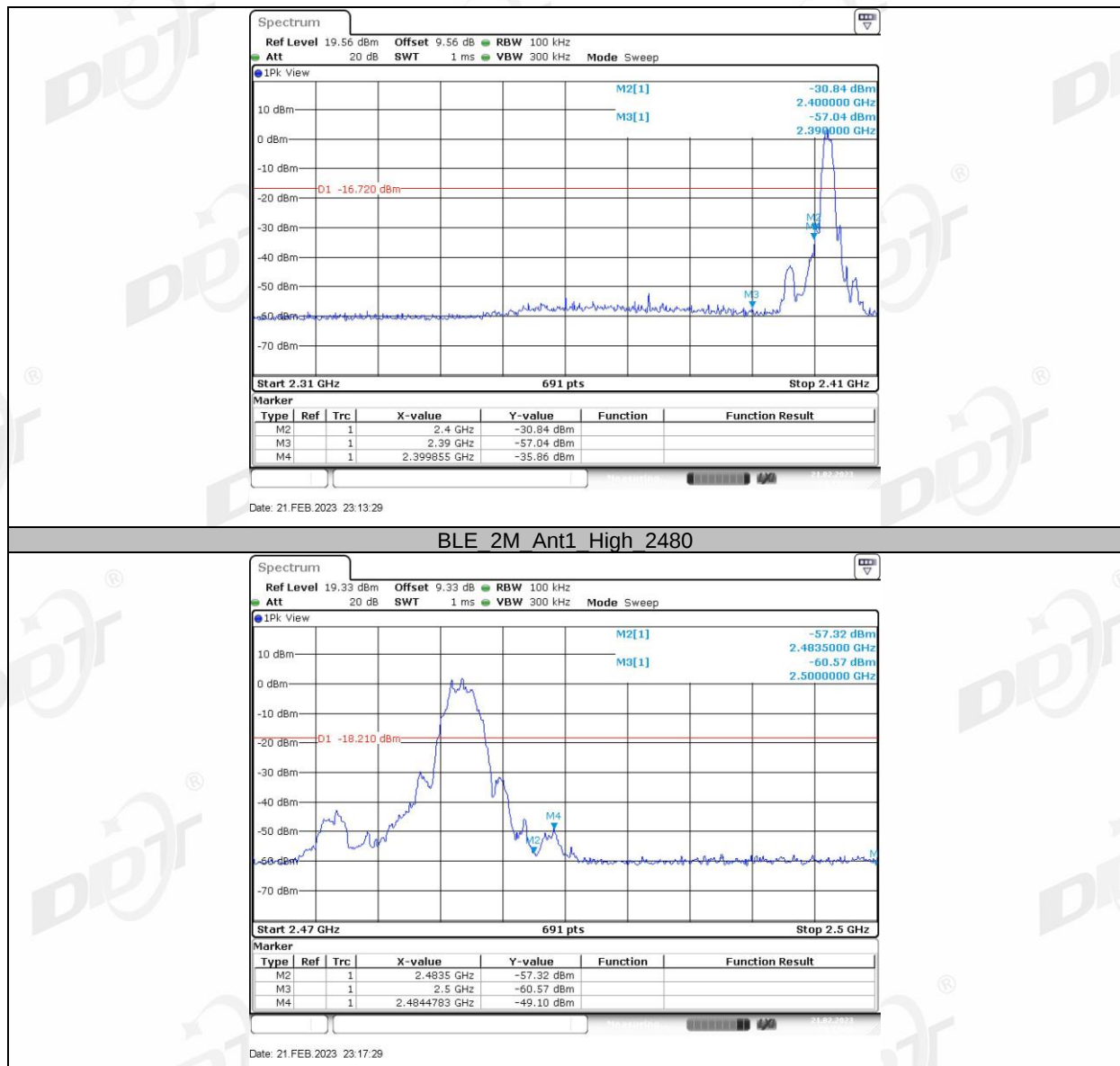
6.4. Test result

EUT Set Mode	CH or Frequency	Measured Range	Verdict
GFSK_1M	CH0	2.310 GHz - 2.410 GHz	Pass
	CH39	2.470 GHz - 2.570 GHz	Pass
GFSK_2M	CH0	2.310 GHz - 2.410 GHz	Pass
	CH39	2.470 GHz - 2.570 GHz	Pass

6.5. Original test data

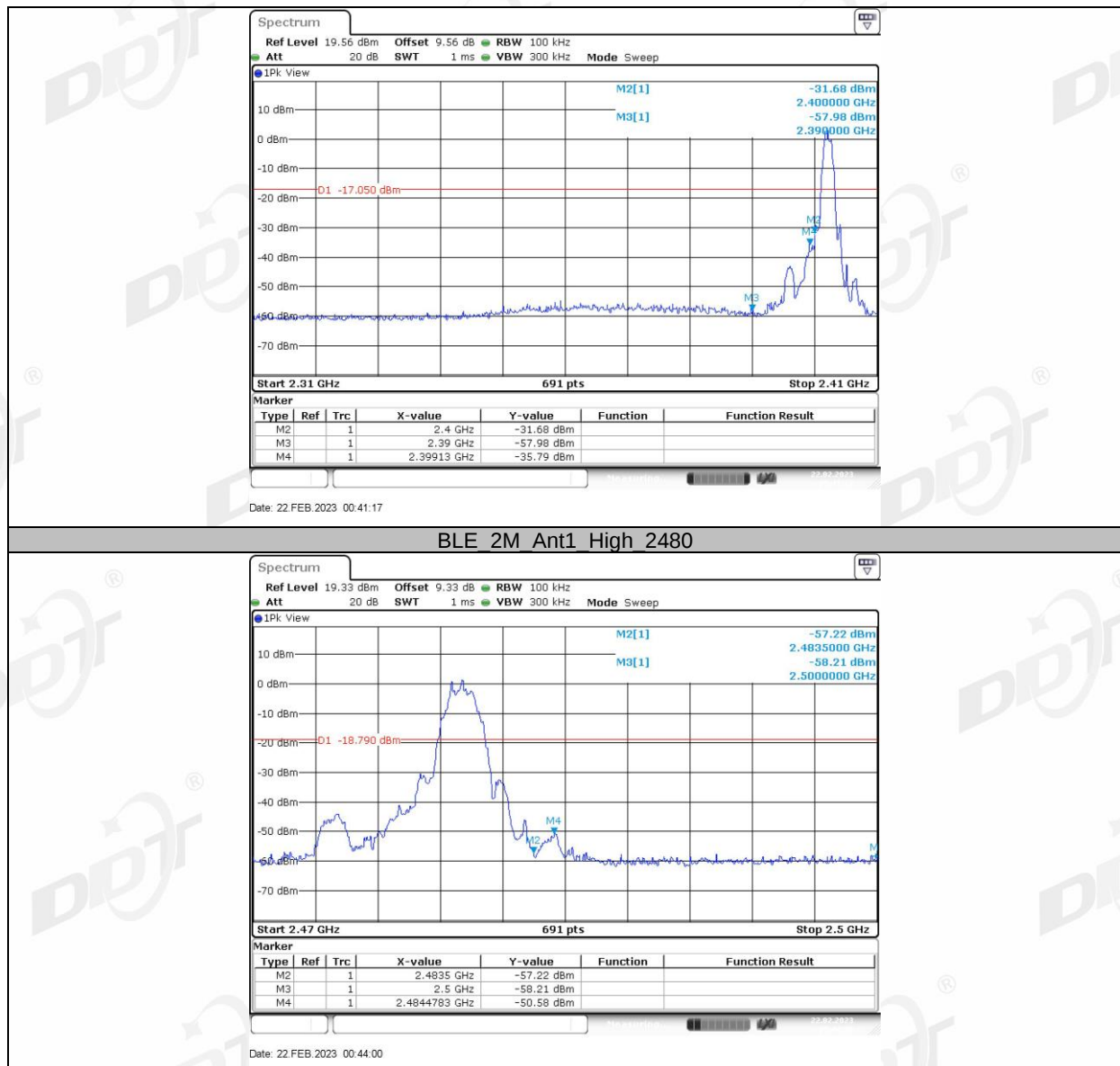
Left side:





Right side:





7. RF Conducted Spurious Emissions

7.1. Block diagram of test setup

Same as section 4.1

7.2. Limits

In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

7.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Establish a reference level by using the following procedure:

Center frequency	Test frequency
RBW:	100 kHz
VBW:	300 kHz
Span	Wide enough to capture the peak level of the in-band emission
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

(3) Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.

(4) Set the spectrum analyzer as follows:

RBW:	100 kHz
VBW:	300 kHz
Span	Encompass frequency range to be measured
Number of measurement points	$\geq \text{span}/\text{RBW}$
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

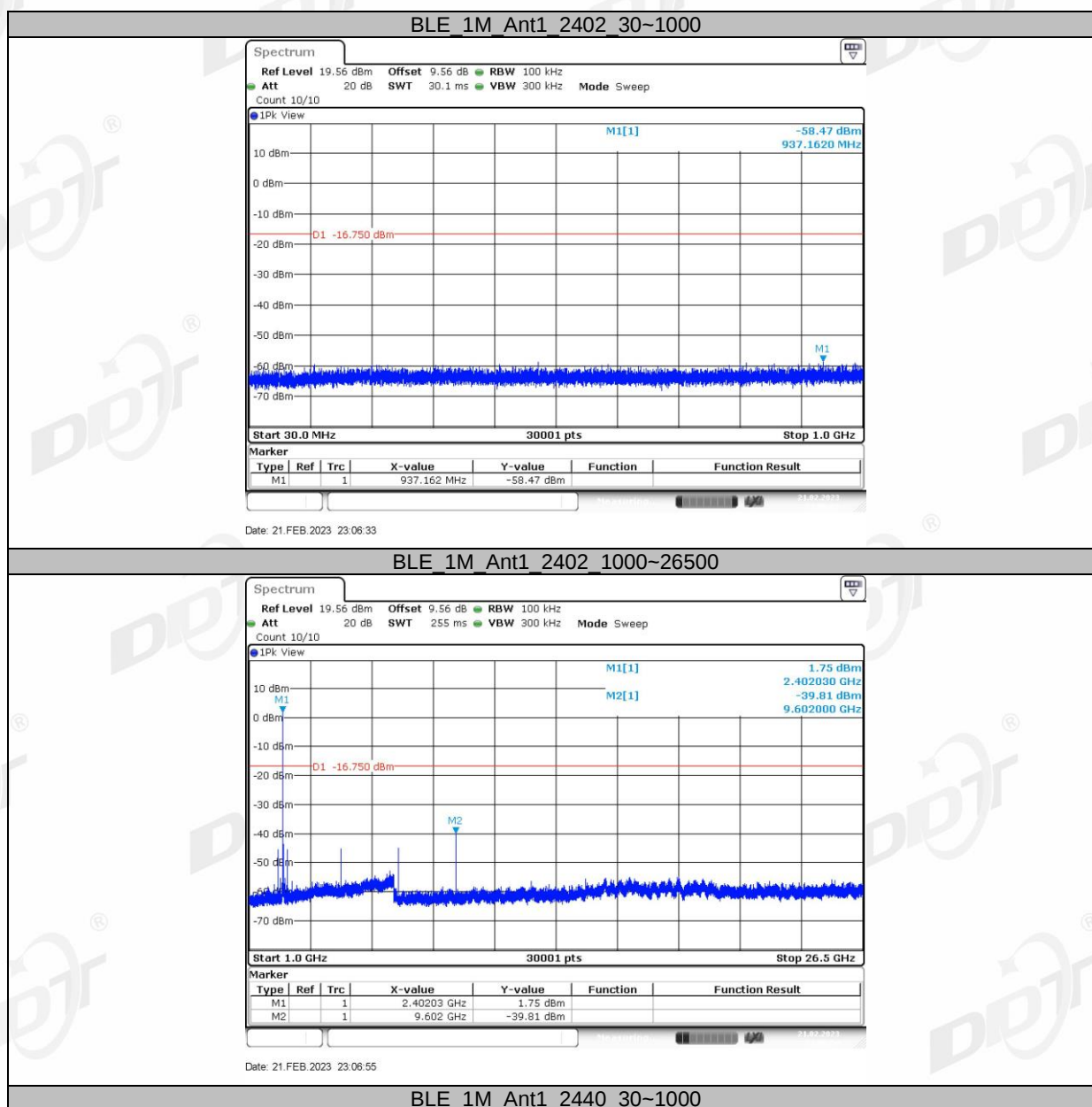
(5) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude of all unwanted emissions outside of the authorized frequency band

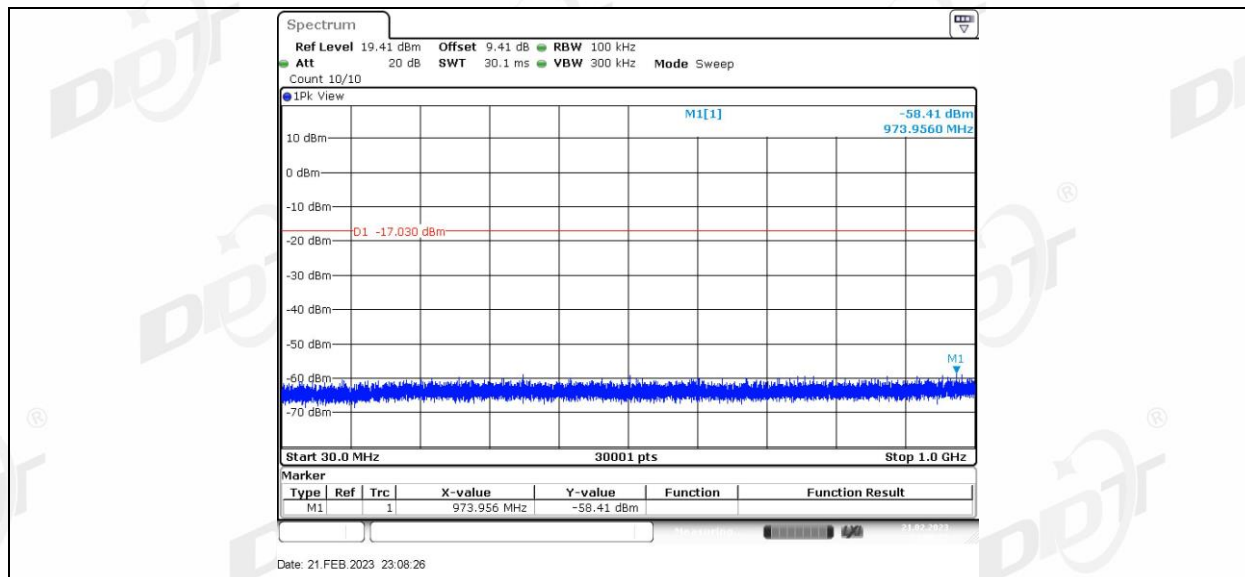
7.4. Test result

Mode	Freq. (MHz)	Verdict
GFSK_1M	2402	Pass
	2440	Pass
	2480	Pass
GFSK_2M	2402	Pass
	2440	Pass
	2480	Pass

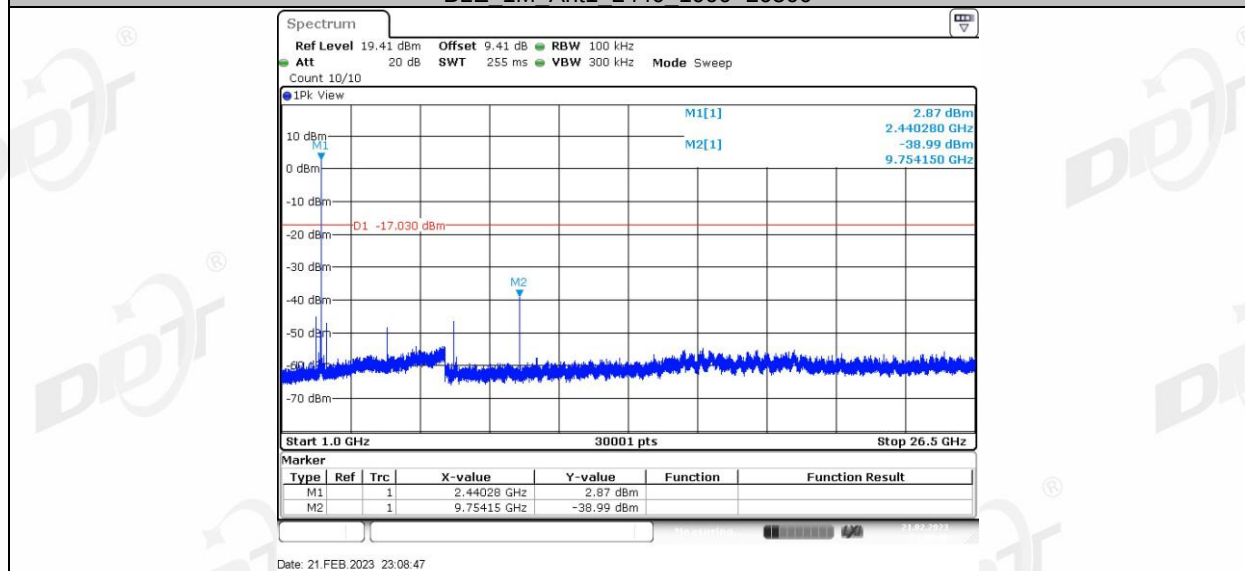
7.5. Original test data

Left side:

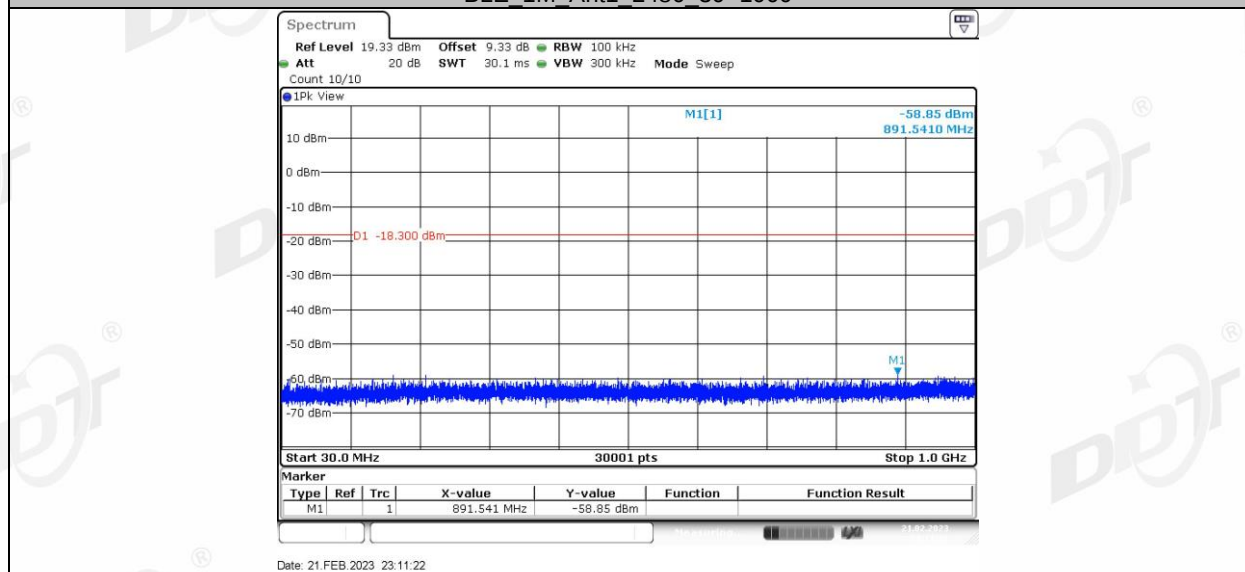




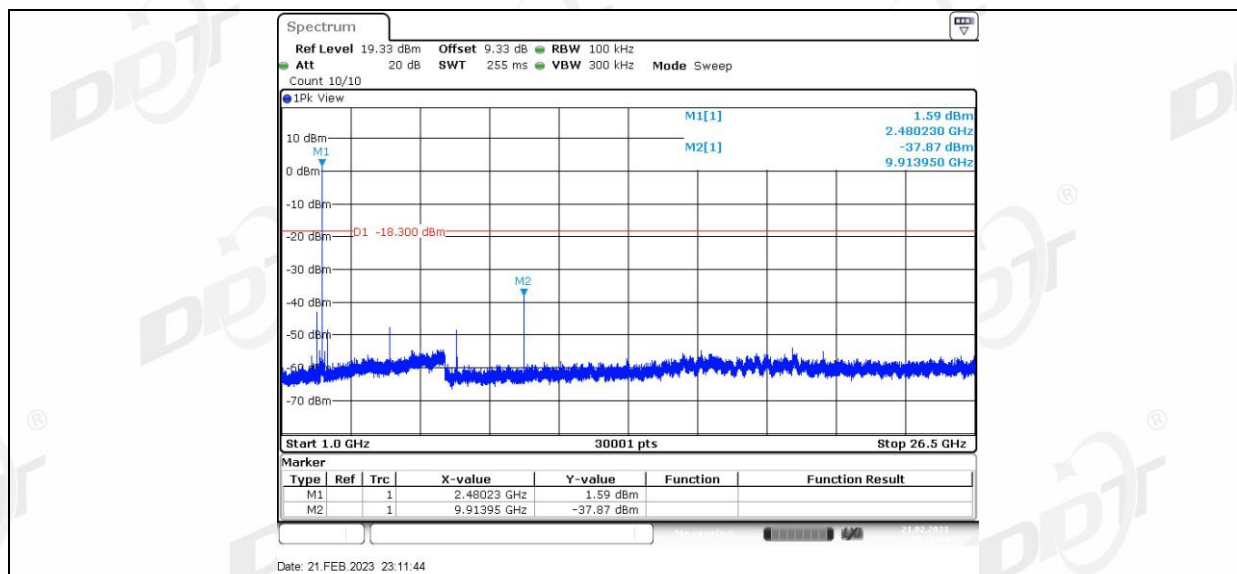
BLE 1M Ant1 2440 1000~26500



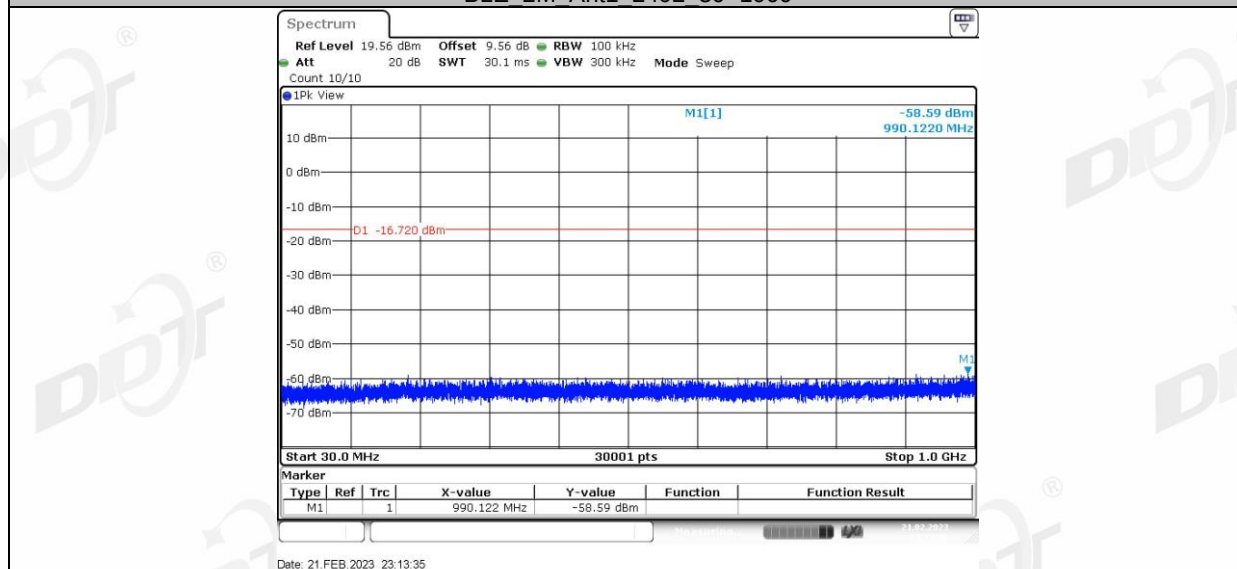
BLE 1M Ant1 2480 30~1000



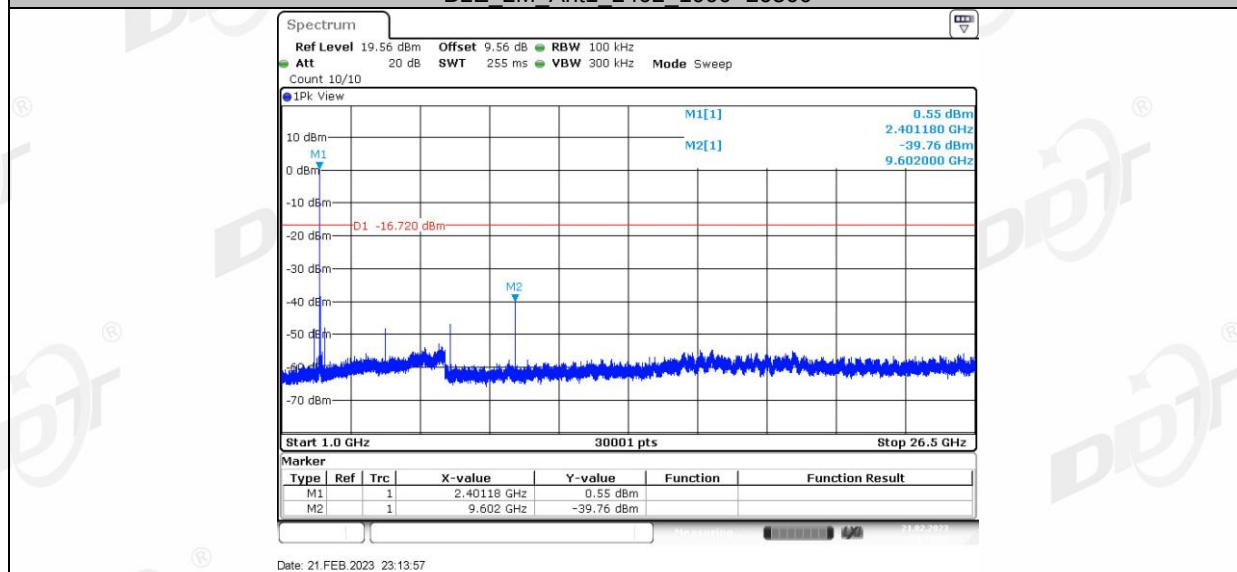
BLE 1M Ant1 2480 1000~26500



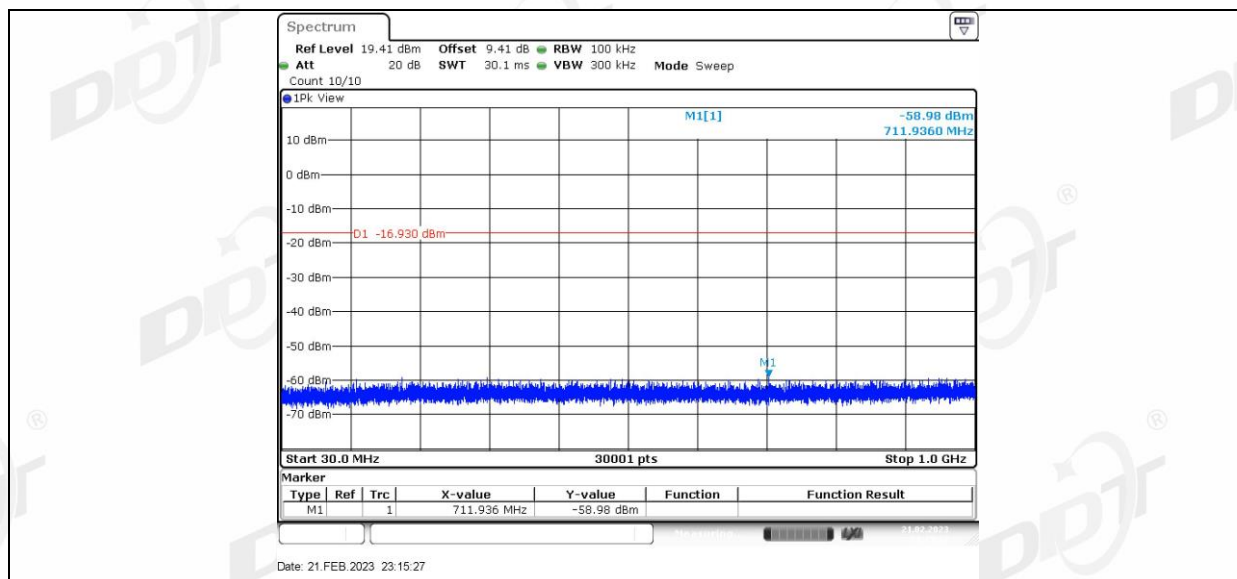
BLE 2M Ant1 2402 30~1000



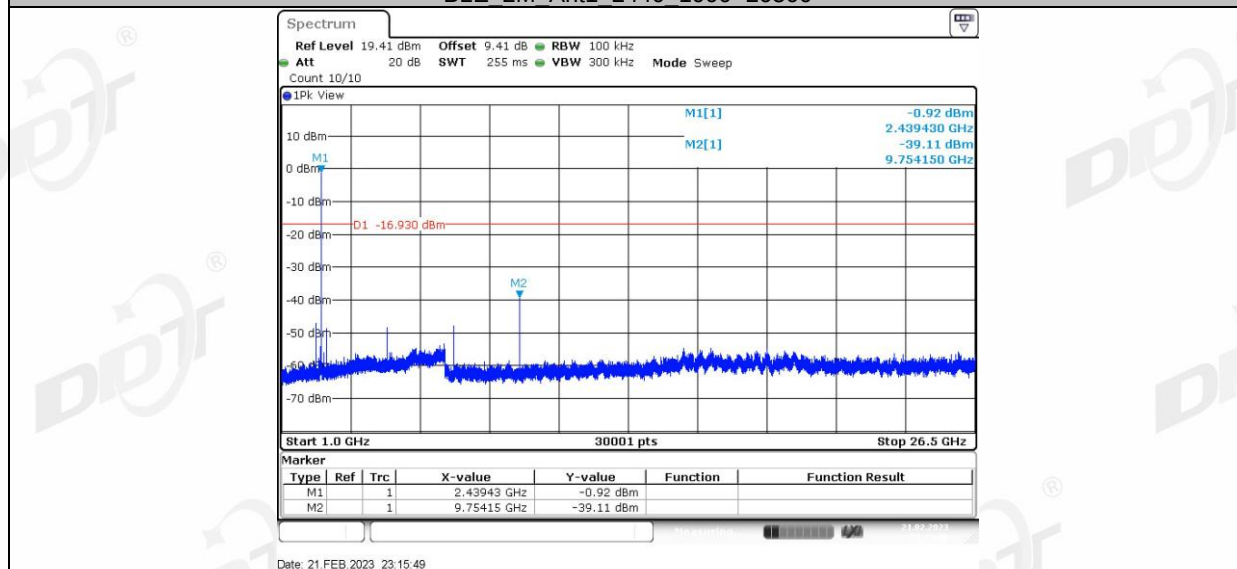
BLE 2M Ant1 2402 1000~26500



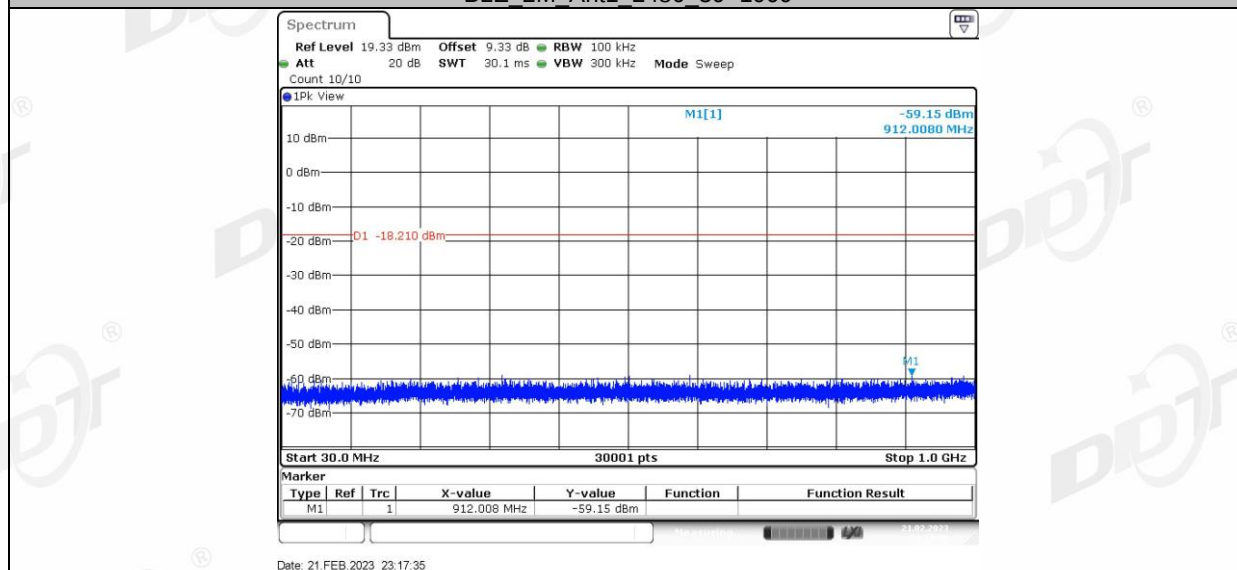
BLE 2M Ant1 2440 30~1000



BLE 2M Ant1 2440 1000~26500



BLE 2M Ant1 2480 30~1000



BLE 2M Ant1 2480 1000~26500