



RADIO TEST REPORT

Applicant	:	Harman International Industries, Inc.
Address of Applicant	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES
Manufacturer	:	Harman International Industries, Inc.
Address of Manufacturer	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES
Equipment under Test	:	3.1 CHANNEL SOUNDBAR WITH DOLBY ATMOS® AND WIRELESS SUBWOOFER
FCC Model No.	:	CINEMA SB580MK2, CINEMA SB581MK2, CINEMA SB582MK2, CINEMA SB583MK2, CINEMA SB584MK2, CINEMA SB585MK2, CINEMA SB586MK2, CINEMA SB587MK2, CINEMA SB588MK2, CINEMA SB589MK2, CINEMA SB590MK2, CINEMA SB591MK2, CINEMA SB592MK2, CINEMA SB593MK2, CINEMA SB594MK2, CINEMA SB596MK2, CINEMA SB597MK2, CINEMA SB598MK2, CINEMA SB599MK2, CINEMA SB540MK2, CINEMA SB541MK2, CINEMA SB542MK2, CINEMA SB543MK2, CINEMA SB544MK2, CINEMA SB545MK2, CINEMA SB546MK2, CINEMA SB547MK2, CINEMA SB548MK2, CINEMA SB549MK2
IC Model No.	:	CINEMA SB580MK2
FCC ID	:	APISB580MK2
IC	:	6132A-SB580MK2
HVIN	:	SB580MK2
Test Standard(s)	:	FCC Rules and Regulations Part 15 Subpart C, ANSI C63.10-2020, RSS-247 Issue 4 July 24, 2025, RSS-Gen Issue 5, Apr. 2018, Amendment 2 (February 2021), ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024
Report No.	:	DDT-RE26031216-2E02
Issue Date	:	2026/06/04
Issue By	:	Guangdong Dongdian Testing Service Co., Ltd. Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China, 523808

REPORT

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Test Report Declare

Applicant	:	Harman International Industries, Inc.
Address of Applicant	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES
Equipment under Test	:	3.1 CHANNEL SOUNDBAR WITH DOLBY ATMOS® AND WIRELESS SUBWOOFER
FCC Model No.	:	CINEMA SB580MK2, CINEMA SB581MK2, CINEMA SB582MK2, CINEMA SB583MK2, CINEMA SB584MK2, CINEMA SB585MK2, CINEMA SB586MK2, CINEMA SB587MK2, CINEMA SB588MK2, CINEMA SB589MK2, CINEMA SB590MK2, CINEMA SB591MK2, CINEMA SB592MK2, CINEMA SB593MK2, CINEMA SB594MK2, CINEMA SB596MK2, CINEMA SB597MK2, CINEMA SB598MK2, CINEMA SB599MK2, CINEMA SB540MK2, CINEMA SB541MK2, CINEMA SB542MK2, CINEMA SB543MK2, CINEMA SB544MK2, CINEMA SB545MK2, CINEMA SB546MK2, CINEMA SB547MK2, CINEMA SB548MK2, CINEMA SB549MK2
IC Model No.	:	CINEMA SB580MK2
Manufacturer	:	Harman International Industries, Inc.
Address of Manufacturer	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES

Test Standard Used:

FCC Rules and Regulations Part 15 Subpart C, RSS-247 Issue 4 July 24, 2025,
ANSI C63.10-2020, RSS-Gen Issue 5, Apr. 2018, Amendment 2 (February 2021),
ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024

We Declare:

The equipment described above is tested by Guangdong 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 Guangdong Dongdian Testing Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

Report No.:	DDT-RE26031216-2E02		
Date of Receipt:	2026/03/16	Date of Test:	2026/03/16 - 2026/05/18

Created: Jacky Huang	Reviewed: Johnson Huang	Approved: Ella Gong
		
2026/05/19	2026/06/04	2026/06/04

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

Revision History

Version	Revision Content	Issue Date	Approved
V0	Initial issue	2026/06/04	Ella Gong

1. Summary of Test Results

No.	Test Parameter	Clause No.	Condition	Result
1	6 dB Bandwidth and 99% Bandwidth	47 CFR Part 15 15.247(a)(2), RSS-247 clause 6.3.1, RSS-Gen clause 6.7	/	Pass
2	Peak Output Power	47 CFR Part 15 15.247(b)(3), RSS-247 clause 6.3.2	/	Pass
3	Power Spectral Density	47 CFR Part 15 15.247(e), RSS-247 clause 6.3.1	/	Pass
4	RF Conducted Spurious Emissions	47 CFR Part 15 15.247(d), RSS-247 clause 6.6	/	Pass
5	Radiated Emission	47 CFR Part 15 15.205, 47 CFR Part 15 15.209, 47 CFR Part 15 15.247(d), RSS-247 clause 6.6, RSS-Gen clause 8.9, RSS-Gen clause 8.10	/	Pass
6	Band Edge Compliance	47 CFR Part 15 15.205, 47 CFR Part 15 15.209, 47 CFR Part 15 15.247(d), RSS-247 clause 6.6, RSS-Gen clause 8.9, RSS-Gen clause 8.10	/	Pass
7	Antenna Requirement	47 CFR Part 15 15.203, RSS- Gen clause 6.8	/	Pass
8	Power Line Conducted Emissions	47 CFR Part 15 15.207(a), RSS-Gen clause 8.8	/	Pass
Note: N/A is an abbreviation for Not Applicable, and means this item is not applicable for this device or no need to test according to standard.				

2. General Test Information

2.1. Description of EUT

EUT Name	:	3.1 CHANNEL SOUNDBAR WITH DOLBY ATMOS® AND WIRELESS SUBWOOFER
FCC Model Number	:	CINEMA SB580MK2, CINEMA SB581MK2, CINEMA SB582MK2, CINEMA SB583MK2, CINEMA SB584MK2, CINEMA SB585MK2, CINEMA SB586MK2, CINEMA SB587MK2, CINEMA SB588MK2, CINEMA SB589MK2, CINEMA SB590MK2, CINEMA SB591MK2, CINEMA SB592MK2, CINEMA SB593MK2, CINEMA SB594MK2, CINEMA SB596MK2, CINEMA SB597MK2, CINEMA SB598MK2, CINEMA SB599MK2, CINEMA SB540MK2, CINEMA SB541MK2, CINEMA SB542MK2, CINEMA SB543MK2, CINEMA SB544MK2, CINEMA SB545MK2, CINEMA SB546MK2, CINEMA SB547MK2, CINEMA SB548MK2, CINEMA SB549MK2
IC Model Number	:	CINEMA SB580MK2
Difference of model number	:	Above models are identical in schematic and structure, only the model number are different, therefore the test performed on the model: CINEMA SB580MK2
EUT Function Description	:	Please reference user manual of this device
Power Supply	:	AC 100-240V~ 50/60Hz 30W
Antenna Type	:	FPC antenna
Max Antenna Gain (dBi)	:	2.96
Radio Specification	:	Bluetooth LE
Operation Frequency	:	2402 MHz to 2480 MHz
Modulation	:	GFSK

Bluetooth LE 1Mbps 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		

Bluetooth LE 2Mbps 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	/	

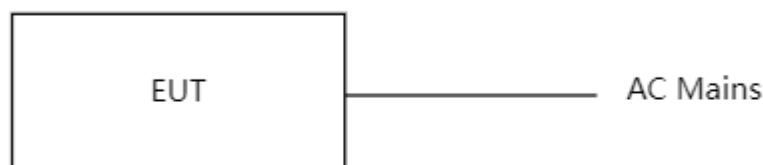
The channels denoted with the grey background are excluded, because they are primary advertising channel only for the Bluetooth LE 1Mbps according to the Bluetooth Core Specification.

Note: The above EUT information is declared by manufacturer and for more detailed features description please refer to the manufacturer's specifications or User's Manual. The above Antenna information is declared by manufacturer and for more detailed features description please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

2.2. Accessories of EUT

Accessories	Manufacturer	Model number	Description
AC cable	Harman	N/A	Length: 1.5m
HDMI cable	Harman	N/A	Length: 1.2m
Remote control	Harman	N/A	N/A

2.3. Block diagram of EUT configuration for test



2.4. Decision of final test mode

According pre-test, the worst test modes were reported as below:

Test software: FCC_Tool_V3.0

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

The pathloss of external cable: 0.5 dB (According to the manufacturer's claims)

Tested mode, Tx Power Setting, Channel, and Frequency			
Mode	Setting Tx Power	Channel	Frequency (MHz)
BLE 1M	11	CH0	2402
	11	CH19	2440
	11	CH39	2480
BLE 2M	11	CH1	2404
	11	CH19	2440
	11	CH38	2478

2.5. Deviations of test standard

No deviation.

2.6. Test environment conditions

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

Temperature range:	+15°C to +35 °C
Humidity range:	20% to 75%
Pressure range:	86 kPa to106 kPa

Note: The specific temperature and humidity information of each test item refers to the temperature and humidity record in the corresponding test data.

2.7. Test laboratory

Guangdong Dongdian Testing Service Co., Ltd.

Add.: Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, 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-20240, G-20118

2.8. Measurement uncertainty

Test Item	Uncertainty
Bandwidth	1.9%
Peak Output Power (Conducted) (Spectrum analyzer)	0.98 dB
Peak Output Power (Conducted) (Power Sensor)	1.18 dB
Power Spectral Density (Base EIRP)	1.51 dB
Power Spectral Density (Spectrum analyzer)	0.98 dB
Frequencies Stability	1.9 kHz
Conducted spurious emissions	1.21 dB ($9 \text{ kHz} \leq f < 7 \text{ GHz}$);
	3.31 dB ($7 \text{ GHz} \leq f < 40 \text{ GHz}$)
Uncertainty for radio frequency (RBW < 20 kHz)	5.5×10^{-8}
Time	0.11%
Temperature	0.3 °C
Humidity	2 %
Uncertainty for Radiation Emission test (9 kHz – 30 MHz)	3.44 dB
Uncertainty for Radiation Emission test (30 MHz - 1 GHz)	4.28 dB (Antenna Polarize: V)
	4.14 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test (1 GHz - 40 GHz)	4.22 dB (1 - 6 GHz)
	4.52 dB (6 GHz - 18 GHz)
	4.58 dB (18 GHz - 40 GHz)
Uncertainty for Power line conduction emission test	3.32dB (150KHz-30MHz)
	3.72dB (9KHz-150KHz)

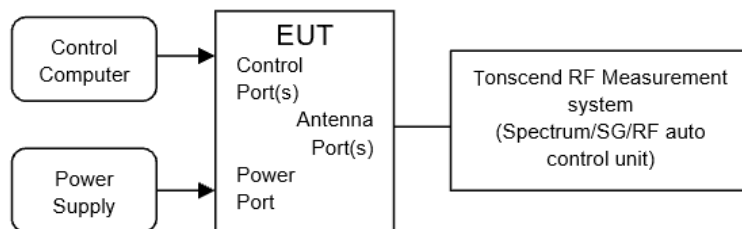
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. Equipment Used During Conductive Test

Equipment	Manufacturer	Model No.	Serial Number	Due Date	Cal. Interval
☒ RF Connected Test (RF Measurement System 1#)					
SIGNAL ANALYZER	R&S	FSQ26	101272	2027/02/28	1 Year
Wideband Radio Communication Tester	R&S	CMW500	117491	2027/02/28	1 Year
MXG Vector Signal Generator	KEYSIGHT	N5182B	MY59100192	2027/02/28	1 Year
MXG Vector Signal Generator	Agilent	N5182A	MY19060405	2027/02/28	1 Year
RF Control Unit	Tonscend	JS0806-2	158060010	2027/02/28	1 Year
TEMP&HUMI Programmable Chamber	ZHIXIANG	ZXGDJS-150L	ZX170110-A	2027/02/28	1 Year
Test Software	Tonscend	JS1120-3	V3.6.21	N/A	N/A

4. 6 dB Bandwidth

4.1. Block diagram of test setup



4.2. Limits

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

4.3. Test procedure

- (1) The test according to ANSI C63.10 clause 11.8.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously
- (4) Use the following spectrum analyzer settings for 6 dB Bandwidth:

RBW: 100 kHz

VBW: $\geq [3 \times \text{RBW}]$

Detector Mode: Peak

Sweep time: Auto

Trace mode: Max hold

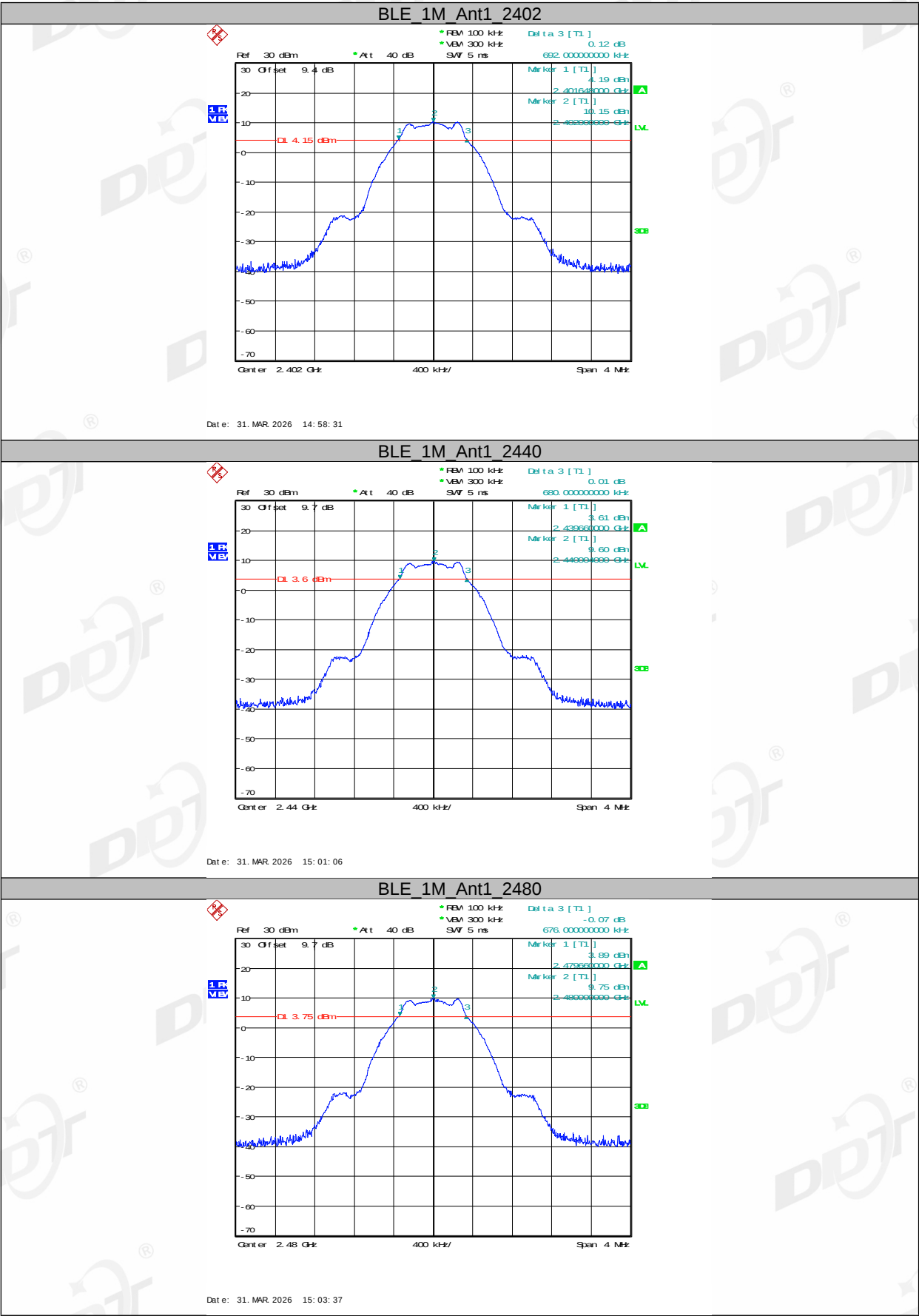
- (5) Allow the trace to stabilize, measure the 6 dB bandwidth of signal, and record the results in the report.

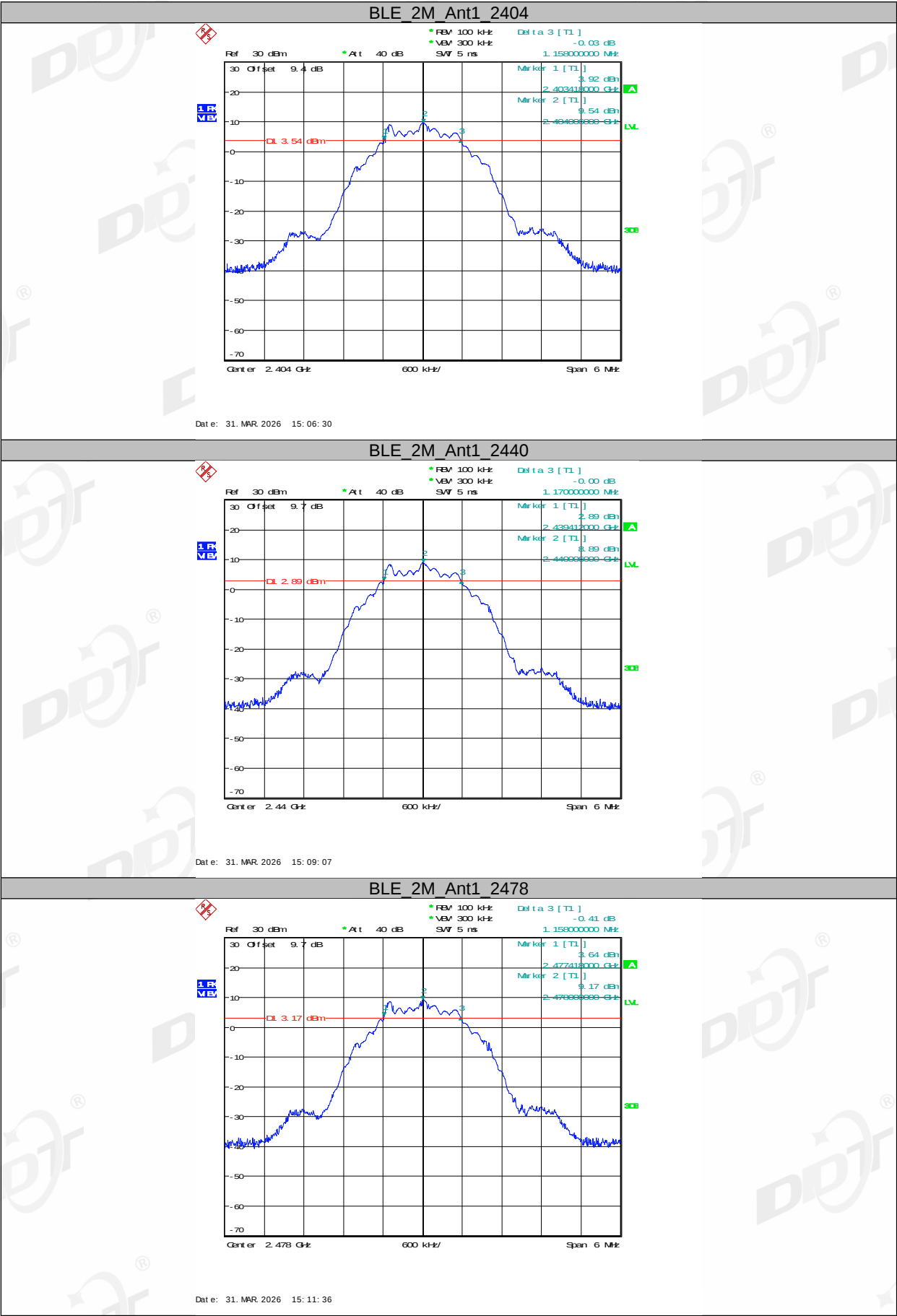
4.4. Test result

Test Engineer:	Zeng Zhongyao	Test Site:	RF Measurement System 1#
Ambient Condition:	25.2℃, 38.7%RH	Test Date:	2026.03.31-2026.04.01
Test Power Supply:	AC 120V	Sample Number:	S26031216-003

Test Mode	Antenna	Frequency [MHz]	DTS BW [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
BLE_1M	Ant1	2402	0.69	2401.65	2402.34	0.5	PASS
		2440	0.68	2439.66	2440.34	0.5	PASS
		2480	0.68	2479.66	2480.34	0.5	PASS
BLE_2M	Ant1	2404	1.16	2403.42	2404.58	0.5	PASS
		2440	1.17	2439.41	2440.58	0.5	PASS
		2478	1.16	2477.42	2478.58	0.5	PASS

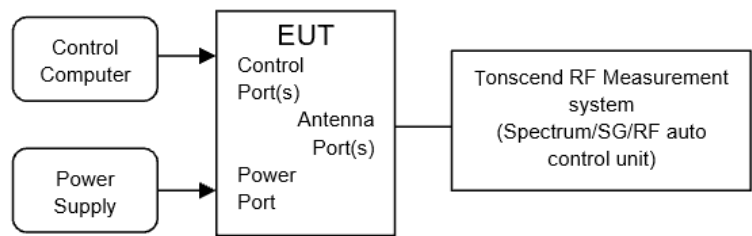
4.5. Test graphs





5. 99% Bandwidth

5.1. Block diagram of test setup



5.2. Limits

Just for Report.

5.3. Test procedure

- (1) The test according to ANSI C63.10 clause 6.9.3.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously
- (4) Use the following spectrum analyzer settings for the 99% Bandwidth:

RBW:	1% to 5% of the OBW
VBW:	approximately three times RBW
Span:	between 1.5 times and 5.0 times the OBW
Detector Mode:	Peak
Sweep time:	Auto
Trace mode:	Max hold

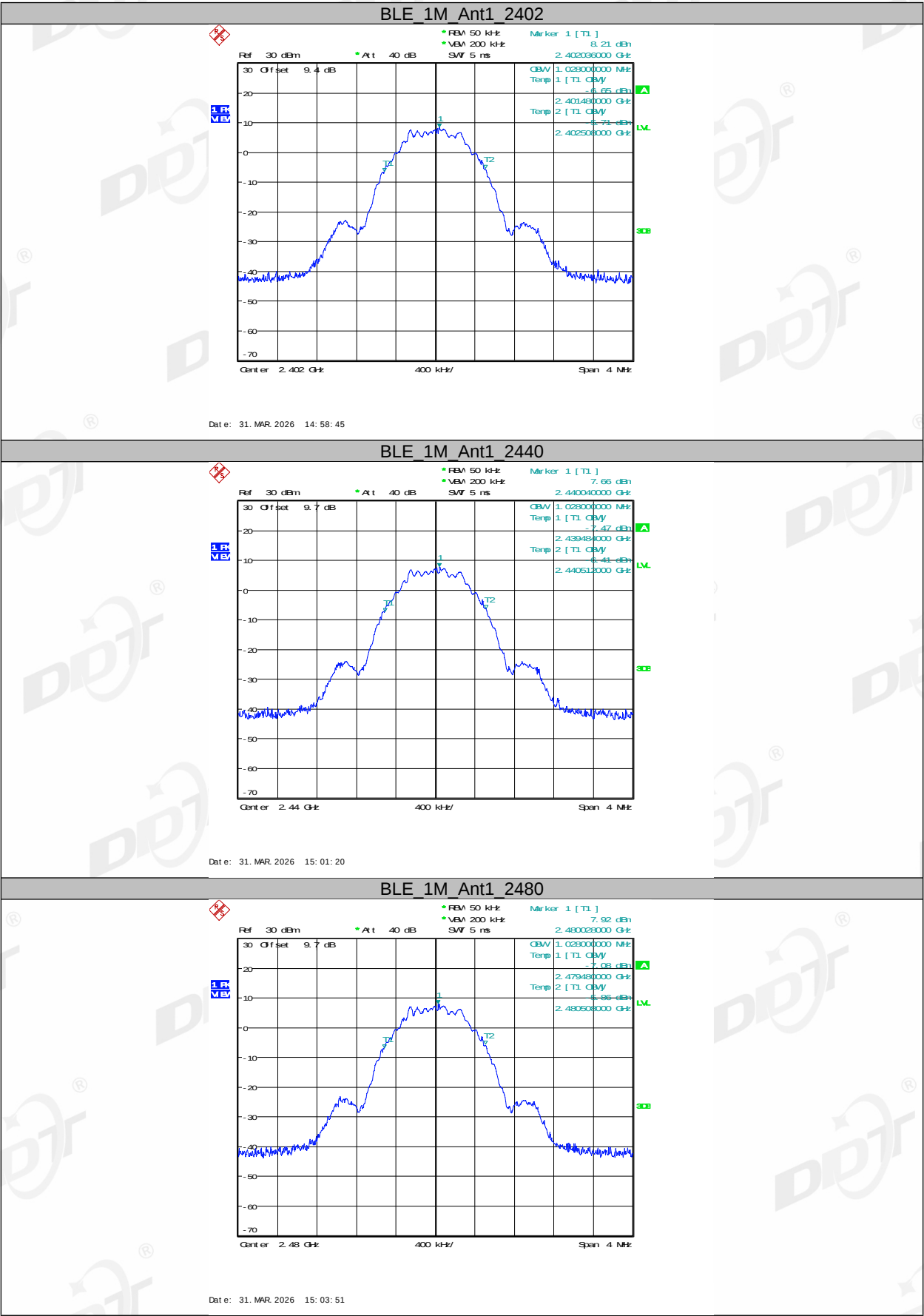
- (5) Allow the trace to stabilize, measure the 99% bandwidth of signal, and record the results in the report.

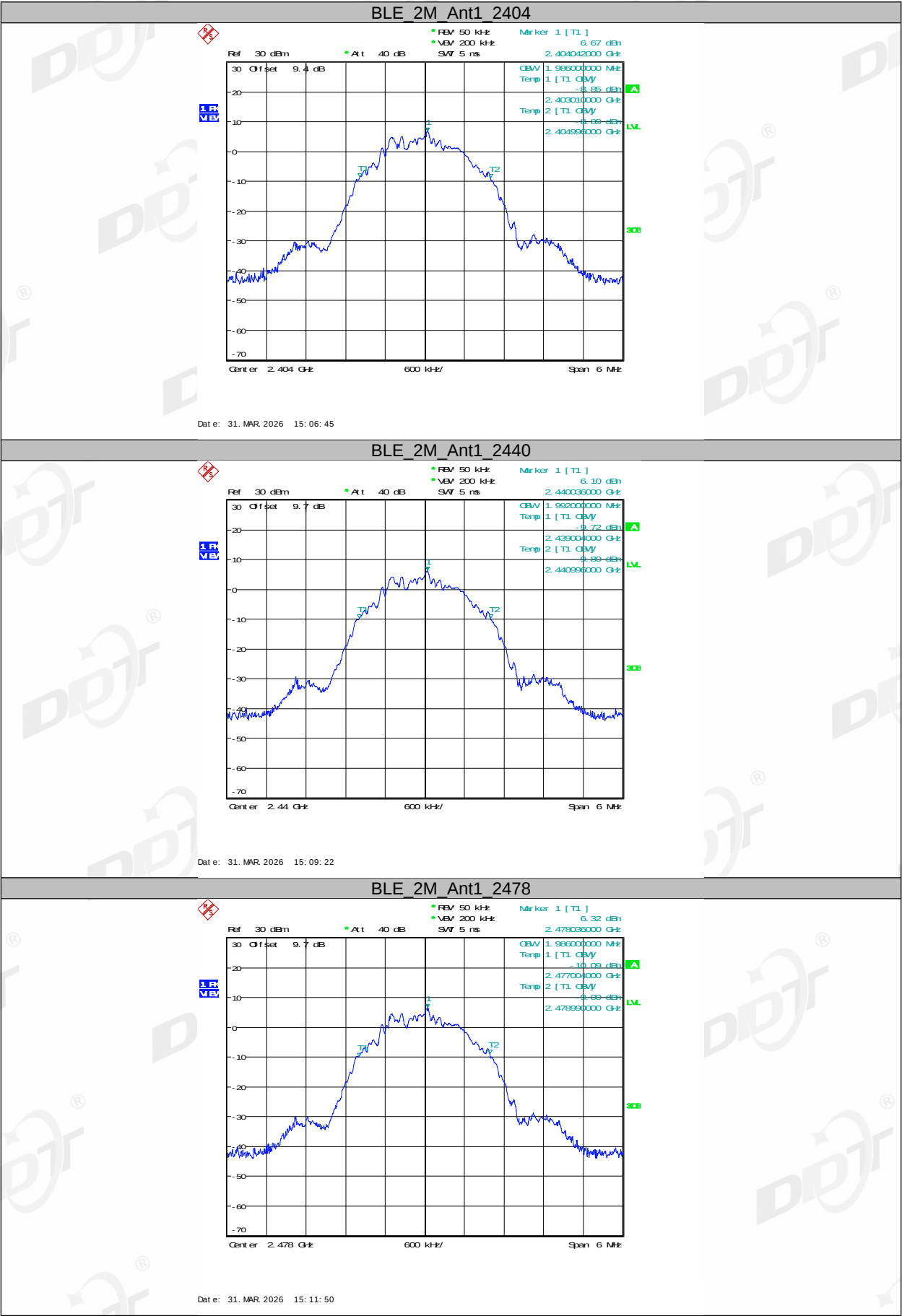
5.4. Test result

Test Engineer:	Zeng Zhongyao	Test Site:	RF Measurement System 1#
Ambient Condition:	25.2℃, 38.7%RH	Test Date:	2026.03.31-2026.04.01
Test Power Supply:	AC 120V	Sample Number:	S26031216-003

Test Mode	Antenna	Frequency [MHz]	OCB [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
BLE_1M	Ant1	2402	1.0280	2401.4800	2402.5080	---	---
		2440	1.0280	2439.4840	2440.5120	---	---
		2480	1.0280	2479.4800	2480.5080	---	---
BLE_2M	Ant1	2404	1.9860	2403.0100	2404.9960	---	---
		2440	1.9920	2439.0040	2440.9960	---	---
		2478	1.9860	2477.0040	2478.9900	---	---

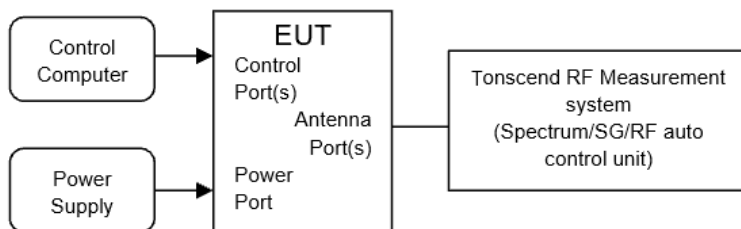
5.5. Test graphs





6. Maximum Peak Output Power

6.1. Block diagram of test setup



6.2. 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 6dBi 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, the e.i.r.p shall not exceed 4W.

6.3. Test procedure

- (1) The test according to ANSI C63.10 clause 11.9.1.1.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results.
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously.
- (4) Use the following spectrum analyzer settings for the maximum peak output power measurement:

RBW: $\geq$ DTS bandwidth

VBW: $\geq 3 \times$ RBW

Span: $\geq 3 \times$ RBW

Detector Mode: Peak

Sweep time: Auto

Trace mode: Max hold

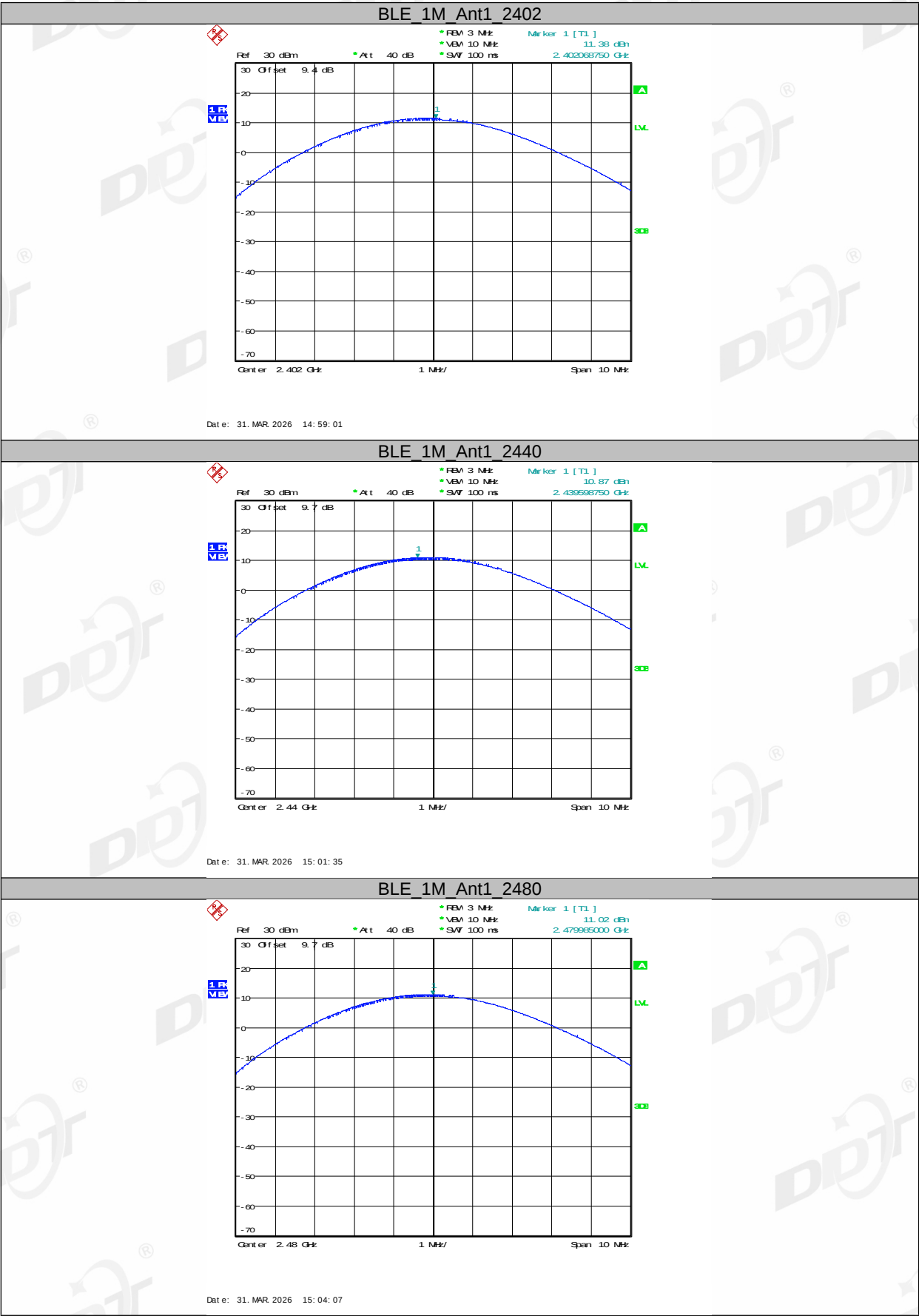
- (5) Allow the trace to stabilize, use peak marker function to determine the peak amplitude level.

6.4. Test result

Test Engineer:	Zeng Zhongyao	Test Site:	RF Measurement System 1#
Ambient Condition:	25.2℃, 38.7%RH	Test Date:	2026.03.31-2026.04.01
Test Power Supply:	AC 120V	Sample Number:	S26031216-003

Test Mode	Antenna	Frequency [MHz]	Conducted Peak Power [dBm]	Conducted Limit [dBm]	EIRP [dBm]	EIRP Limit [dBm]	Verdict
BLE_1M	Ant1	2402	11.38	≤30	14.34	≤36	PASS
		2440	10.87	≤30	13.83	≤36	PASS
		2480	11.02	≤30	13.98	≤36	PASS
BLE_2M	Ant1	2404	11.06	≤30	14.02	≤36	PASS
		2440	10.42	≤30	13.38	≤36	PASS
		2478	10.72	≤30	13.68	≤36	PASS

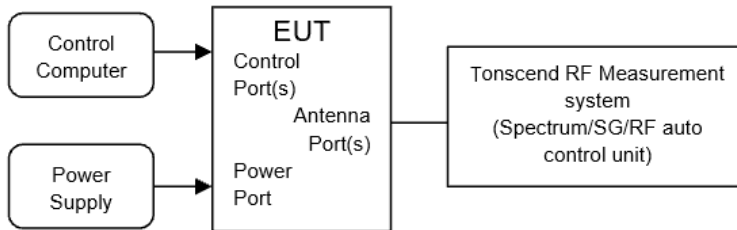
6.5. Test graphs





7. Power Spectral Density

7.1. Block diagram of test setup



7.2. 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.

7.3. Test procedure

- (1) The test according to ANSI C63.10 clause 11.10.2.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results.
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously.
- (4) Use the following spectrum analyzer settings for Power Spectral Density measurement:

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

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

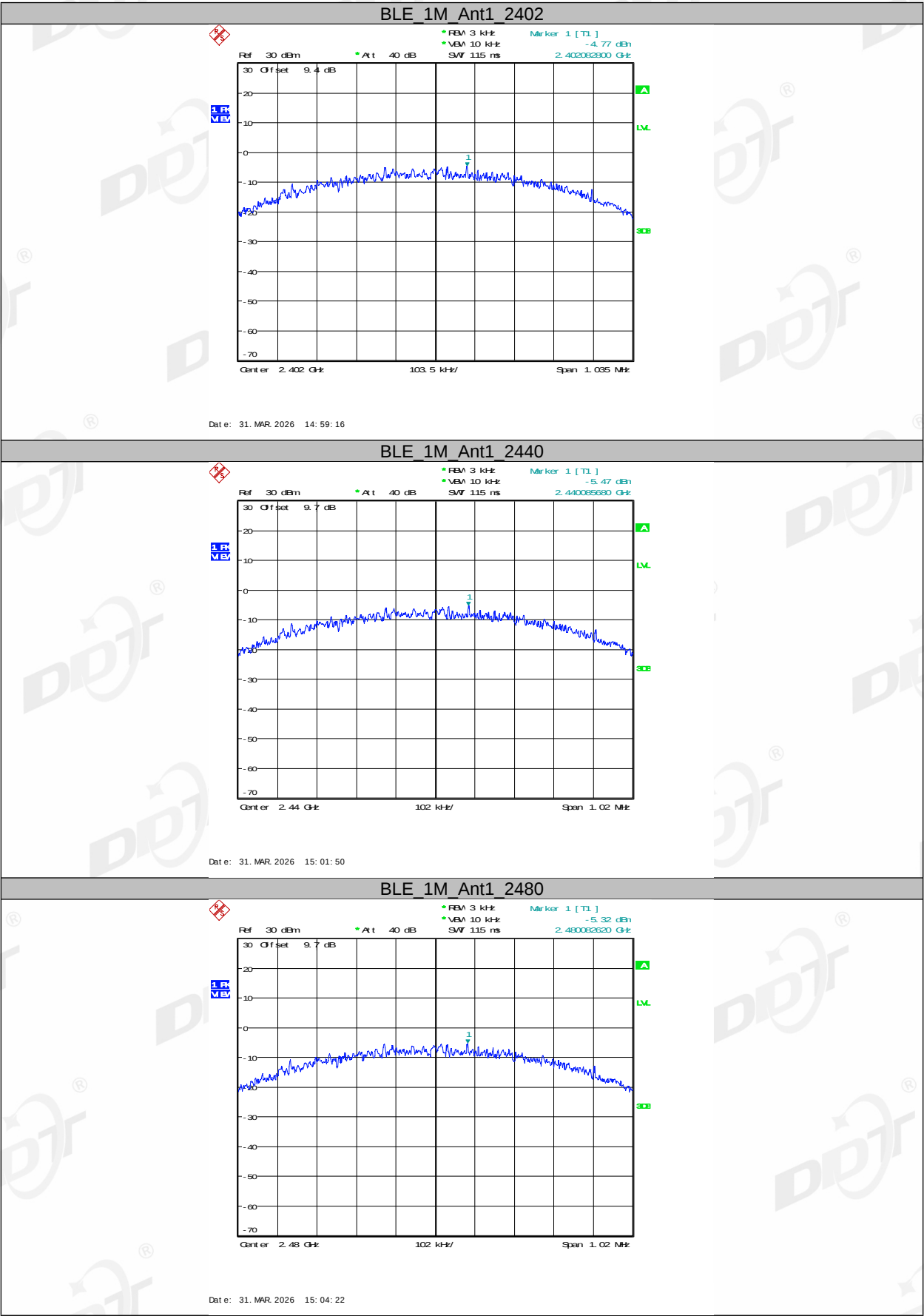
If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

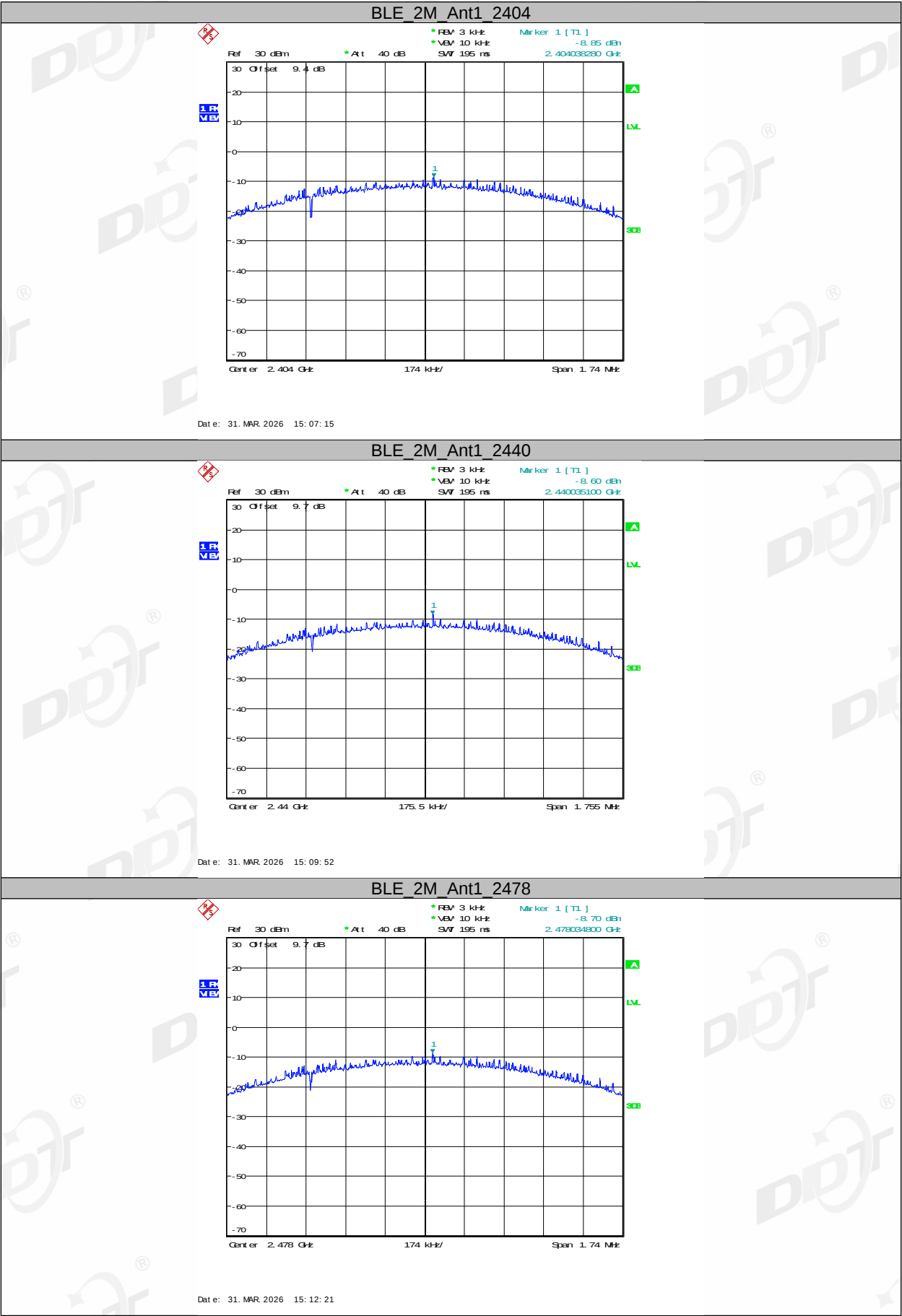
7.4. Test result

Test Engineer:	Zeng Zhongyao	Test Site:	RF Measurement System 1#
Ambient Condition:	25.2℃, 38.7%RH	Test Date:	2026.03.31-2026.04.01
Test Power Supply:	AC 120V	Sample Number:	S26031216-003

Test Mode	Antenna	Frequency [MHz]	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-4.77	≤8.00	PASS
		2440	-5.47	≤8.00	PASS
		2480	-5.32	≤8.00	PASS
BLE_2M	Ant1	2404	-8.85	≤8.00	PASS
		2440	-8.60	≤8.00	PASS
		2478	-8.70	≤8.00	PASS

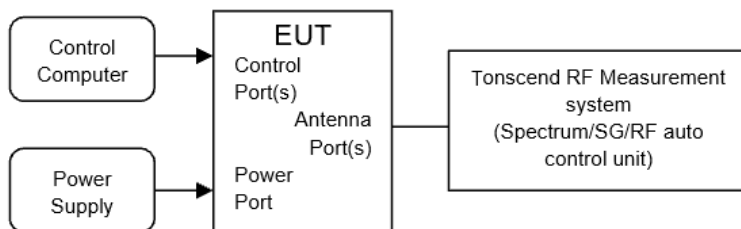
7.5. Test graphs





8. Band Edge Compliance (Conducted Method)

8.1. Block diagram of test setup



8.2. 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.

8.3. 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.

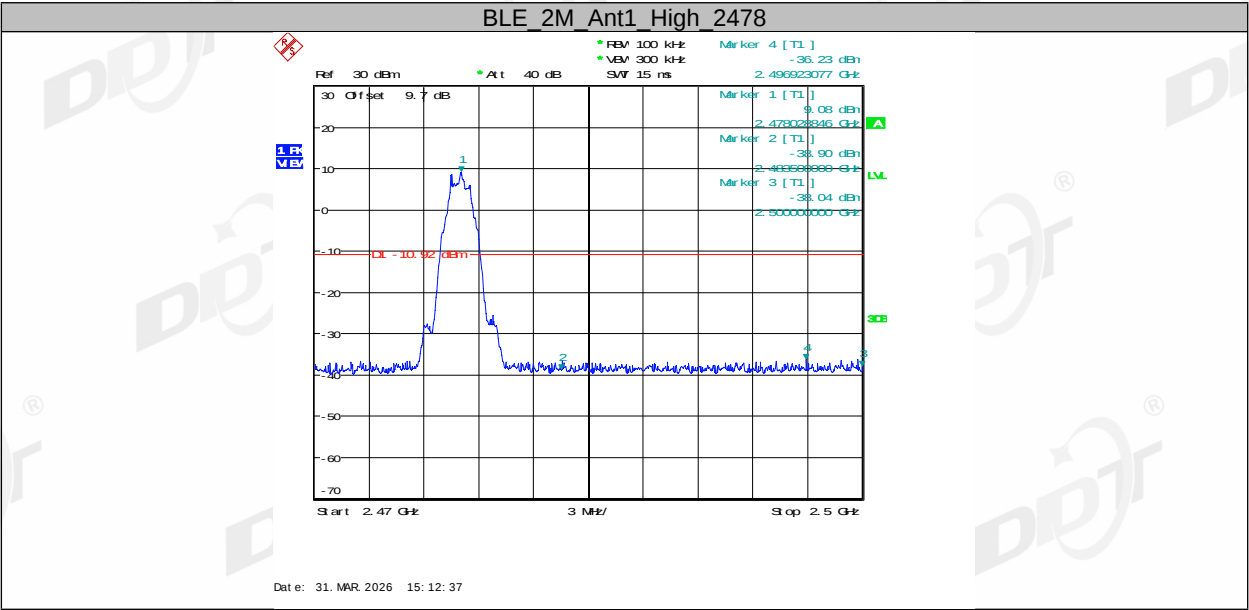
8.4. Test result

Test Engineer:	Zeng Zhongyao	Test Site:	RF Measurement System 1#
Ambient Condition:	25.2℃, 38.7%RH	Test Date:	2026.03.31-2026.04.01
Test Power Supply:	AC 120V	Sample Number:	S26031216-003

Mode	Frequency [MHz]	Measured Range	Verdict
BLE 1M	2402	2.310 GHz - 2.410 GHz	Pass
	2480	2.470 GHz - 2.500 GHz	Pass
BLE 2M	2404	2.310 GHz - 2.410 GHz	Pass
	2478	2.470 GHz - 2.500 GHz	Pass

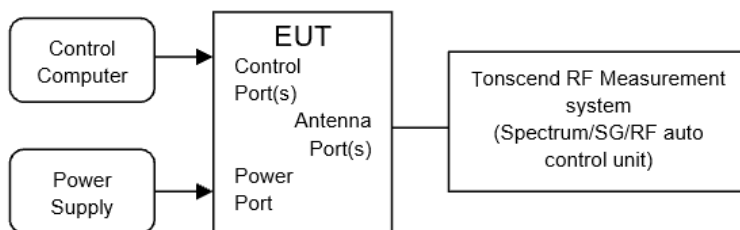
8.5. Test graphs





9. RF Conducted Spurious Emissions

9.1. Block diagram of test setup



9.2. 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.

9.3. 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:	$\geq \text{Span/RBW}$
Detector Mode:	Peak
Sweep time:	Auto
Trace mode	Max hold

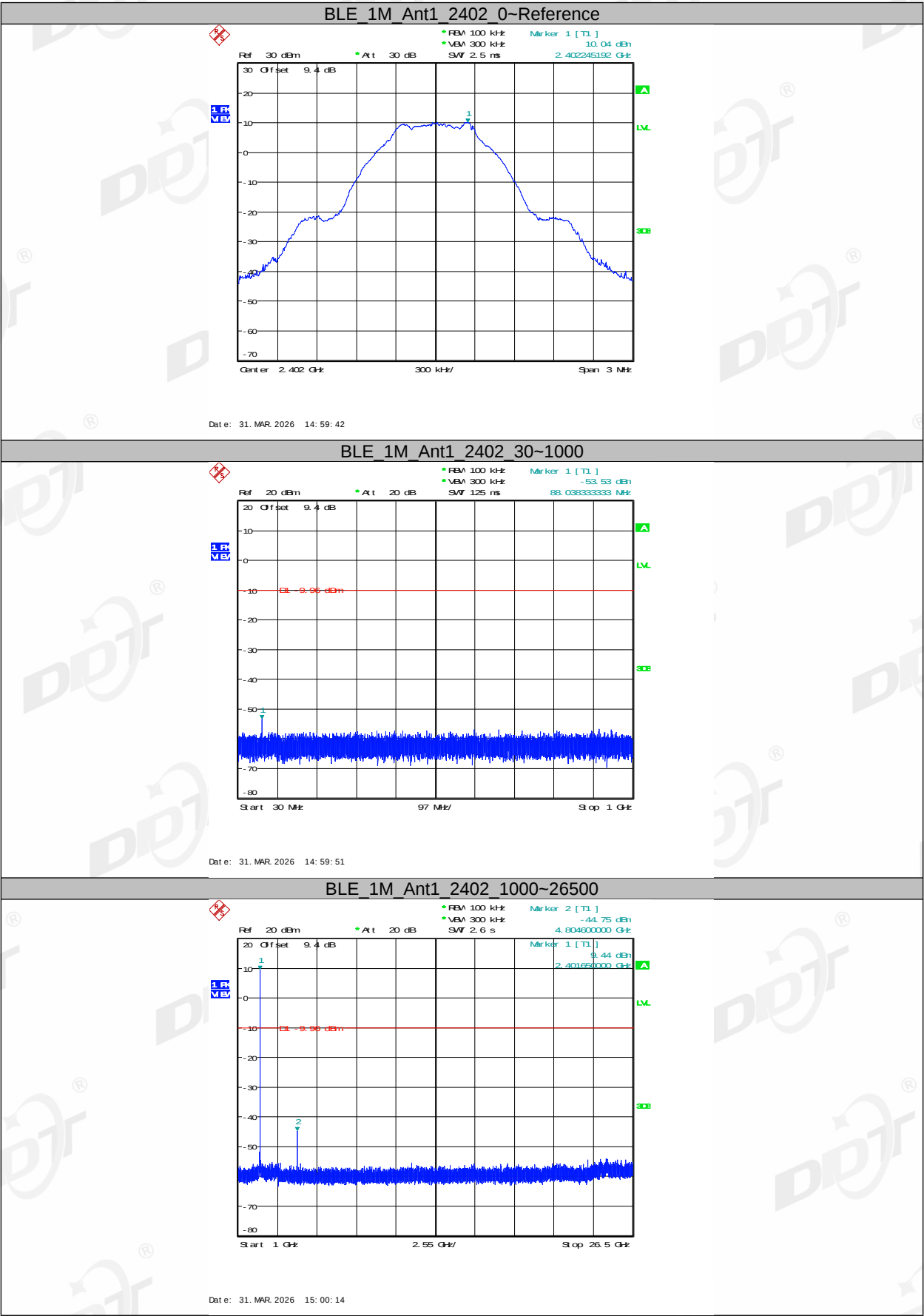
(5) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude of all unwanted emissions outside of the authorized frequency band

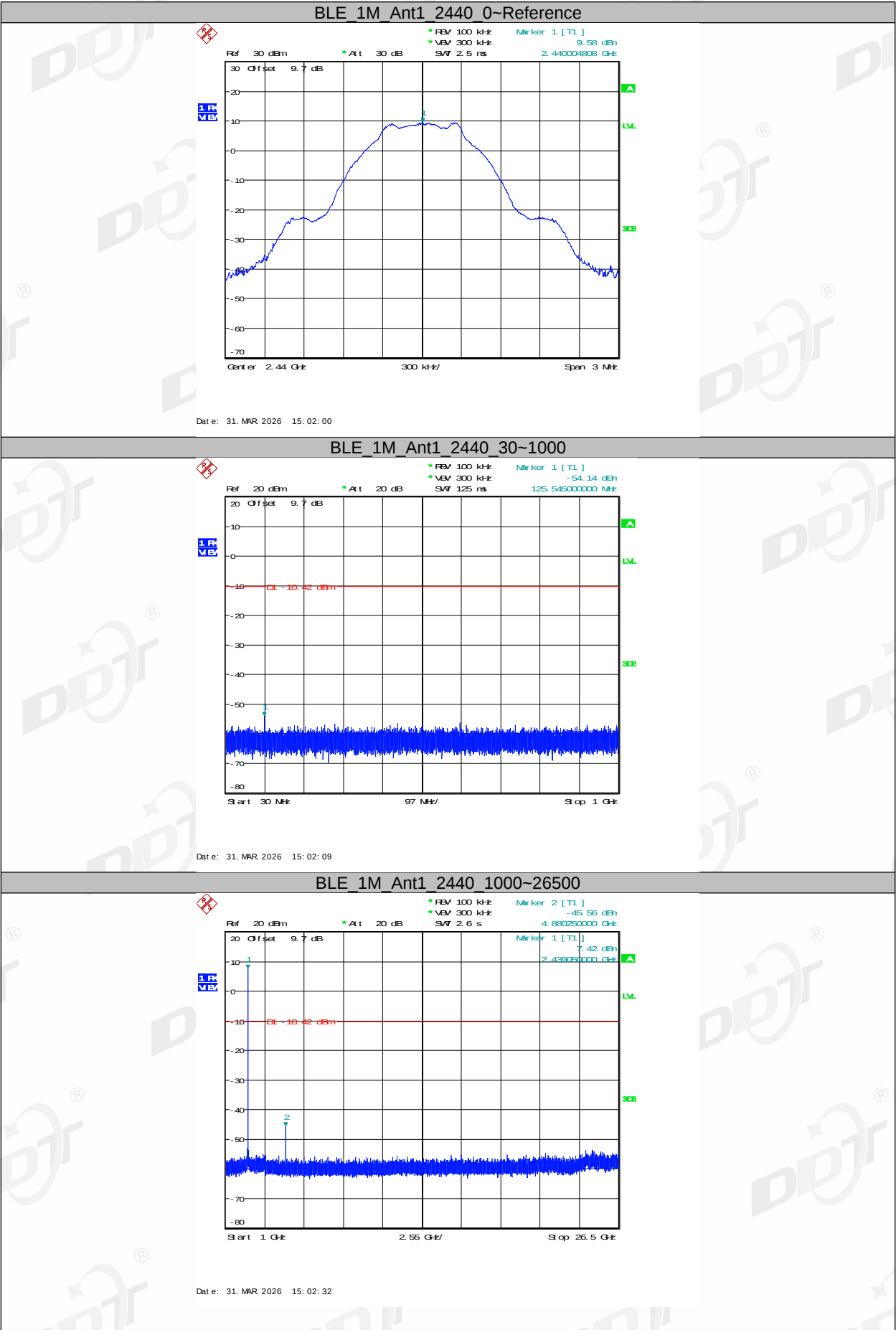
9.4. Test result

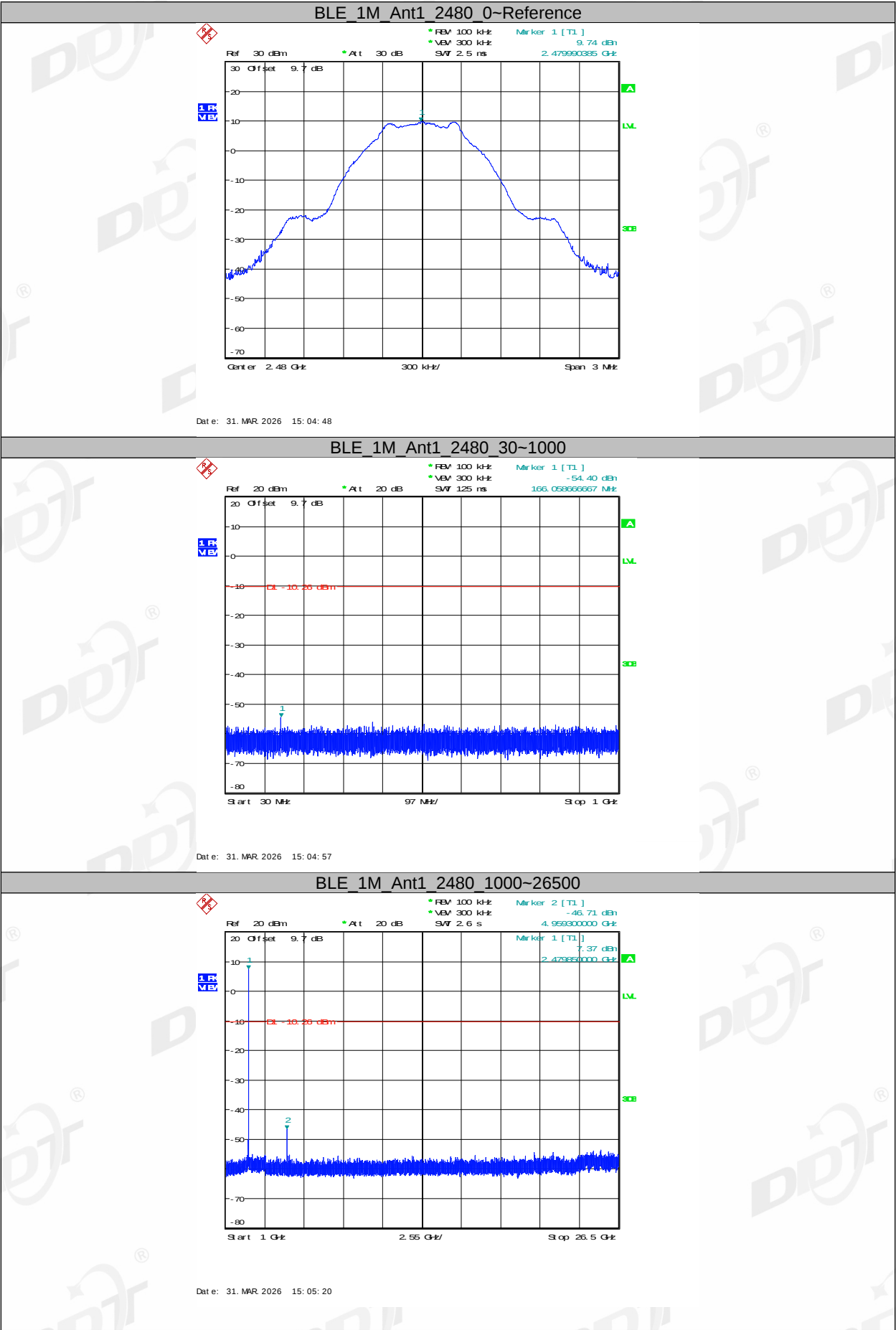
Test Engineer:	Zeng Zhongyao	Test Site:	RF Measurement System 1#
Ambient Condition:	25.2℃, 38.7%RH	Test Date:	2026.03.31-2026.04.01
Test Power Supply:	AC 120V	Sample Number:	S26031216-003

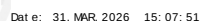
Mode	Frequency [MHz]	Verdict
BLE 1M	2402	Pass
	2440	Pass
	2480	Pass
BLE2M	2404	Pass
	2440	Pass
	2478	Pass

9.5. Test graphs







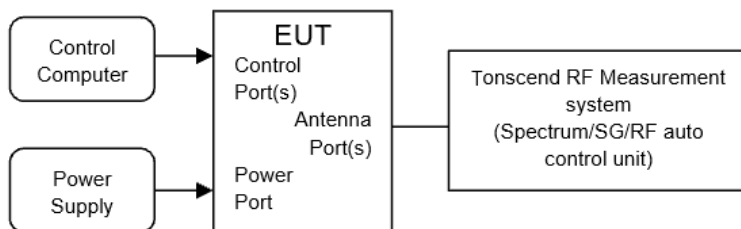






10. Duty Cycle

10.1. Block diagram of test setup



10.2. Limit

Just for Report.

10.3. Test procedure

- (1) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, The cable loss and attenuator loss have been put into spectrum analyzer as amplitude offset. set the Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the middle hopping channel.

Resolution BW: 10 MHz.

Video BW: 10 MHz.

Span: Zero span.

Detector: Peak.

Trace Mode: Clear Write.

Sweep: Video Trigger

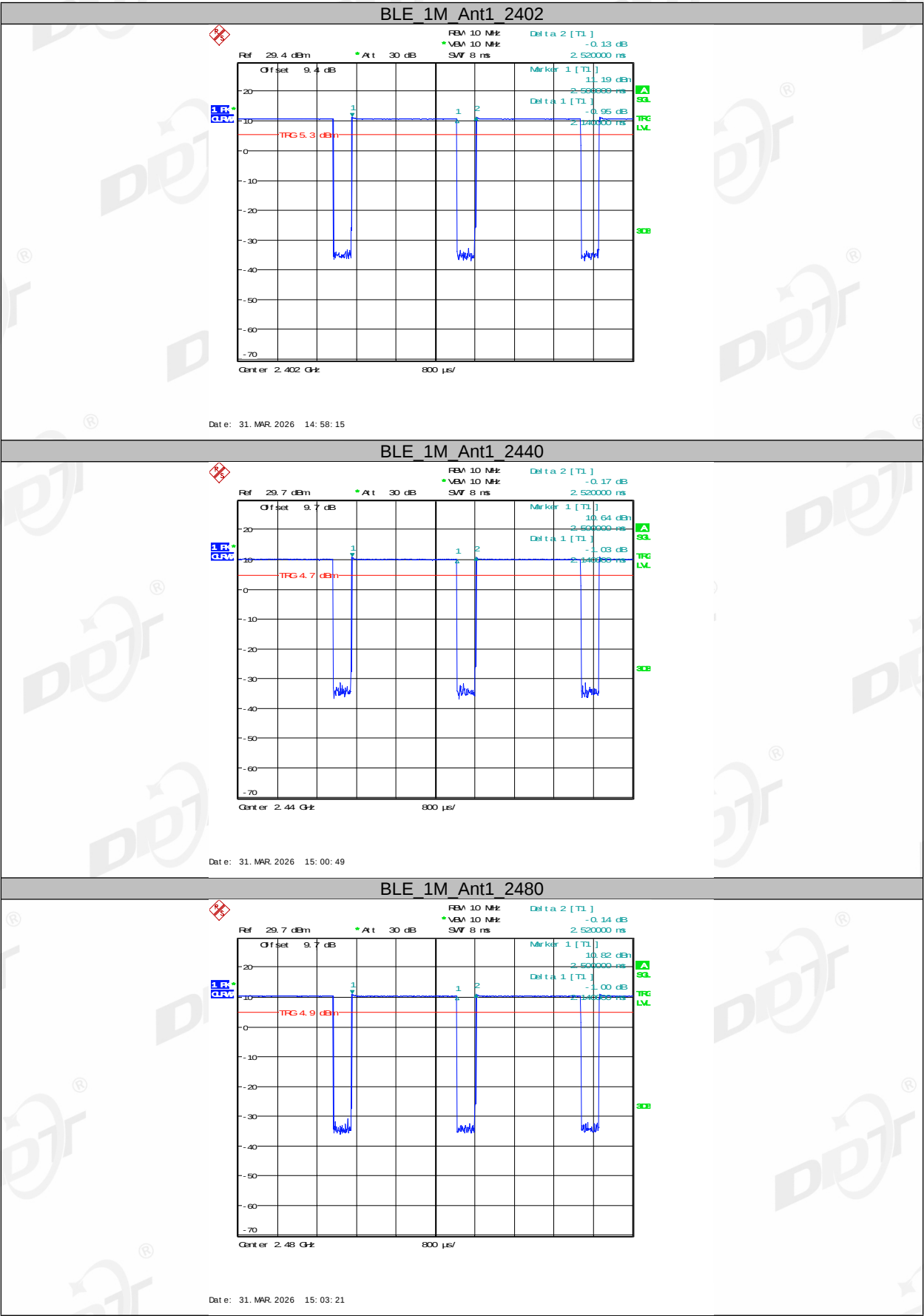
- (2) When the trace is complete, measure the sending time of 1 burst and the duty cycle of 1 burst cycle.
- (3) Calculate dwell time follow below formula:
Duty cycle= Pulse's on time / Burst cycle

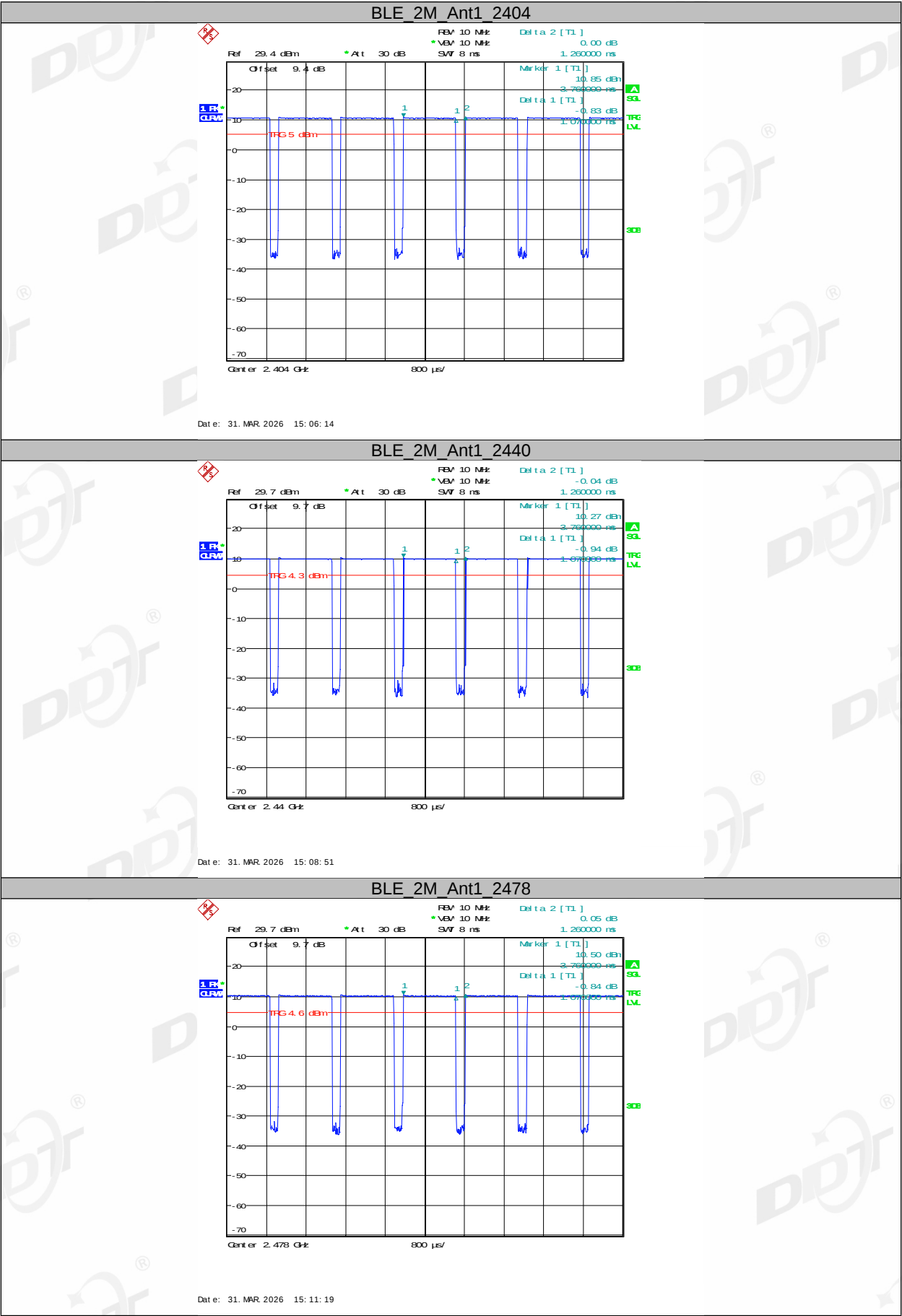
10.4. Test result

Test Engineer:	Zeng Zhongyao	Test Site:	RF Measurement System 1#
Ambient Condition:	25.2℃, 38.7%RH	Test Date:	2026.03.31-2026.04.01
Test Power Supply:	AC 120V	Sample Number:	S26031216-003

Test Mode	Antenna	Frequency [MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor [dB]
BLE_1M	Ant1	2402	2.14	2.52	84.92	0.71
		2440	2.14	2.52	84.92	0.71
		2480	2.14	2.52	84.92	0.71
BLE_2M	Ant1	2404	1.07	1.26	84.92	0.71
		2440	1.07	1.26	84.92	0.71
		2478	1.07	1.26	84.92	0.71

10.5. Test graphs





11. Antenna Requirements

11.1. Limit

For intentional device, according to FCC 47 CFR Section 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For intentional device, according to RSS-Gen issue 5 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.

11.2. Result

The antenna used for this product as Antenna information described in section 2.1 of the report, and there is no other antenna than that furnished by the responsible party shall be used with the device.

12. Radiated Emission

12.1. Test equipment

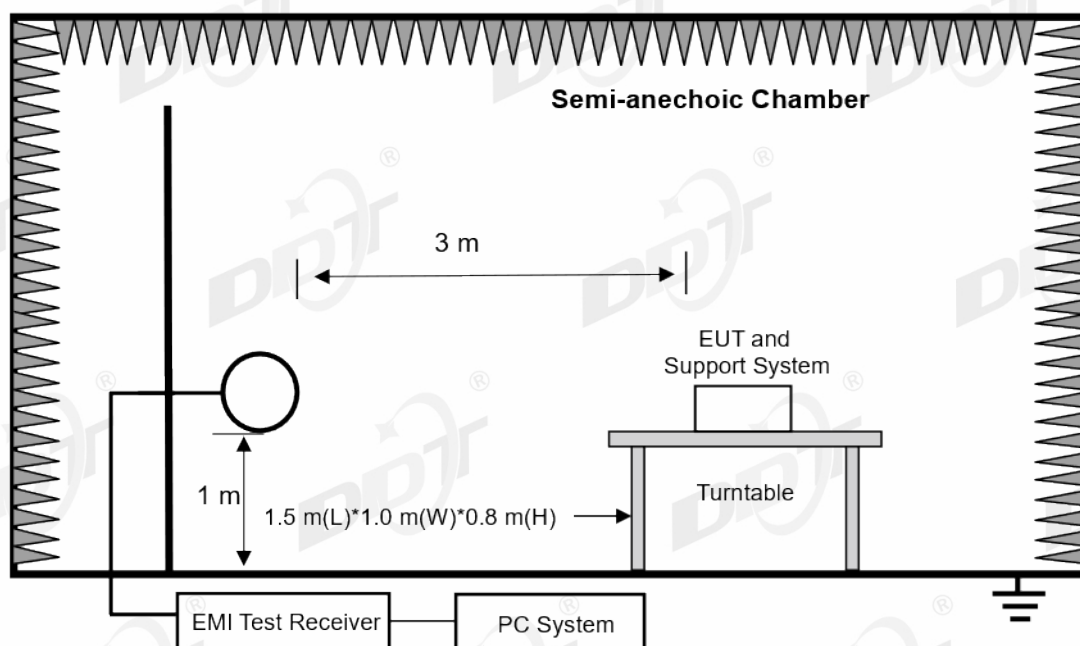
Below 1GHz Radiation Test system

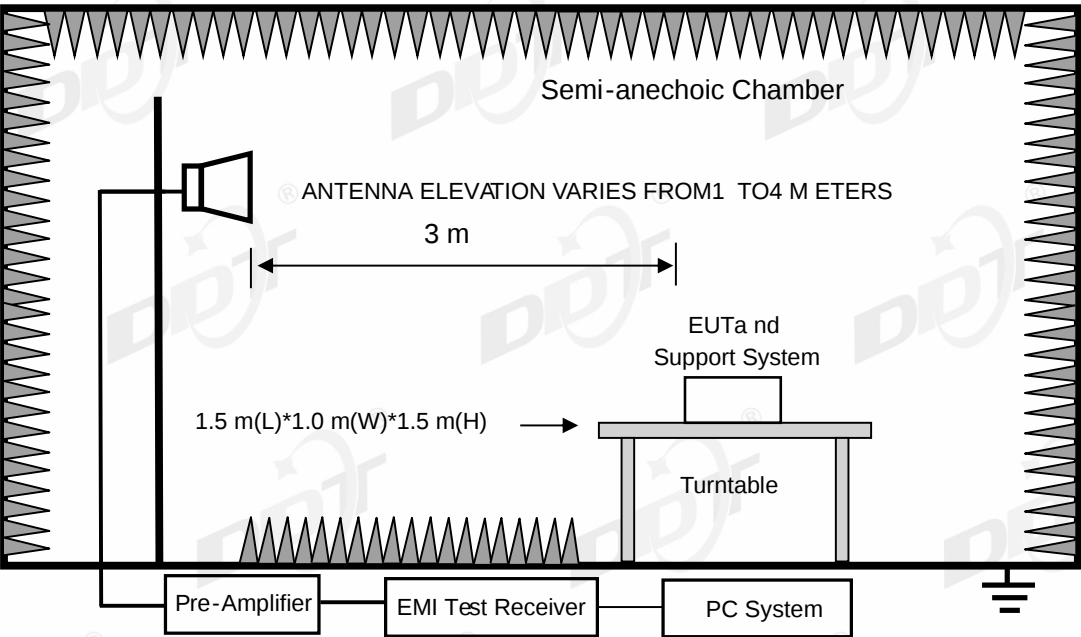
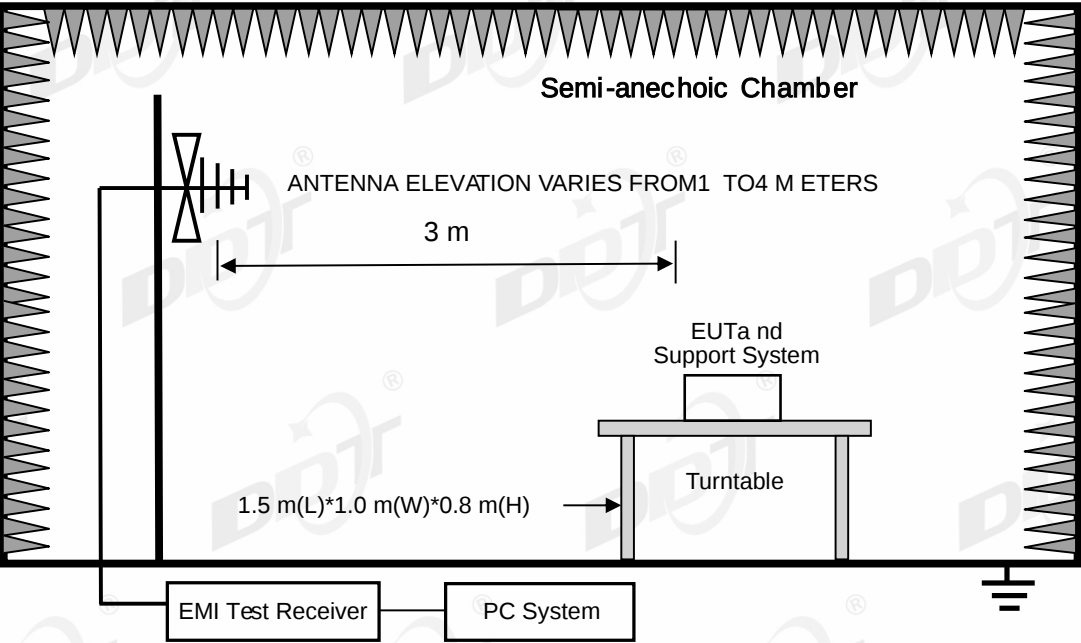
Equipment	Manufacturer	Model No.	Serial No.	Cal Due To	Cal. Interval
High pass filter	Micro-Tronics	HPM50102	DDT-ZC00561	2027/02/27	1 Year
RF cable	Zhongke Junchuang	Z805UF-NJ-NJ-10M	DDT-ZC05591	2026/10/10	1 Year
RF cable	Zhongke Junchuang	Z805UF-NJ-NJ-3M	DDT-ZC05590	2026/10/10	1 Year
RF cable	Zhongke Junchuang	JCTB510-NJW-NJW-0.6M	DDT-ZC04595	2026/10/10	1 Year
RF cable	Zhongke Junchuang	JCT40P-2.92J-2.92J-1M	DDT-ZC03802	2026/10/10	1 Year
RF cable	Yuhu Technology	ZT26S-SMAJ-SMAJ-1M	DDT-ZC02037	2026/10/10	1 Year
RF cable	Zhongke Junchuang	JCT40P-2.92J-2.92J-5M	DDT-ZC03800	2026/10/10	1 Year
Radiation disturbance fully automated test software	Tonscend	JS32-RE (V5.0.0)	DDT-ZC02739	/	/
Pre-amplifier	SONOMA	310N	DDT-ZC01969	2026/07/06	1 Year
Pre-amplifier	COM-POWER	PAM-840A	DDT-ZC01693	2027/03/05	1 Year
Pre-amplifier	COM-POWER	PAM-118A	DDT-ZC01293	2026/08/10	1 Year
EMI TEST RECEIVER	R&S	ESU26	DDT-ZC01909	2027/02/27	1 Year
Micro-Tronics filters	REBES	BRM50702	DDT-ZC03242	/	/
High pass filter	Micro-Tronics	HPM50108	DDT-ZC00560	2027/02/27	1 Year
High Pass filter	Xi'an Xingbo	XBLBQ-GTA67	DDT-ZC02179	2027/02/27	1 Year
Micro-Tronics filters	REBES	BRM50716	DDT-ZC03240	/	/
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	DDT-ZC00506	2027/03/04	1 Year
Trilog Broadband Antenna	Schwarzbeck	VULB 9163	DDT-ZC02050	2026/07/25	1 Year
Hochgewinn-Hornantenne	SCHWARZBECK	BBHA 9120 D	DDT-ZC02129	2026/08/11	1 Year
Active Loop Antenna	Schwarzbeck	FMZB1519	DDT-ZC00524	2026/08/18	1 Year
PSA Series Spectrum Analyzer	Agilent	E4447A	DDT-ZC00517	2027/02/27	1 Year

Above 1GHz Radiation Test system

Equipment	Manufacturer	Model No.	Serial No.	Cal Due To	Cal. Interval
Band Reject Filter Group	Tonscend	JS0806-F	DDT-ZC05733	/	/
Hochgewinn-Hornantenne	SCHWARZBECK	BBHA 9120 D	DDT-ZC05922	2027/01/06	1 Year
Broadband Preamplifier	HPX	BP-01G-18G	DDT-ZC05923	2027/01/06	1 Year
Pre-amplifier	COM-POWER	PAM-840A	DDT-ZC01693	2027/03/05	1 Year
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	DDT-ZC00506	2027/03/04	1 Year
Signal & Spectrum analyzer	R&S	FSV40-N	DDT-ZC04979	2026/07/04	1 Year
SPECTRUM ANALYZER	R&S	FSU26	DDT-ZC00236	2026/07/06	1 Year
RF Cable	Tonscend	7+1+1+0.5+0.5m	DDT-ZC05978	2027/01/29	1 Year
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	DDT-ZC00506	2027/03/04	1 Year
PSA Series Spectrum Analyzer	Agilent	E4447A	DDT-ZC00517	2027/02/27	1 Year
RF cable	Zhongke Junchuang	JCT40P-2.92J-2.92J-1M	DDT-ZC03802	2026/10/10	1 Year
Radiation disturbance fully automated test software	Tonscend	JS-RE&RSE (V5.0.0)	DDT-ZC06466	/	/

12.2. Block diagram of test setup





12.3. Limits

(1) FCC 15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.1772&4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.2072&4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²)
13.36-13.41			

¹Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

²Above 38.6

RSS-Gen section 8.10 Restricted frequency bands*

MHz	MHz	MHz	GHz
0.090-0.110	12.51975-12.52025	240-285	3.5-4.4
0.495-0.505	12.57675-12.57725	322-335.4	4.5-5.15
2.1735-2.1905	13.36-13.41	399.9-410	5.35-5.46
3.020-3.026	16.42-16.423	608-614	7.25-7.75
4.125-4.128	16.69475-16.69525	960-1427	8.025-8.5
4.1772&4.17775	16.80425-16.80475	1435-1626.5	9.0-9.2
4.2072&4.20775	25.5-25.67	1645.5-1646.5	9.3-9.5
5.677-5.683	37.5-38.25	1660-1710	10.6-12.7
6.215-6.218	73-74.6	1718.8-1722.2	13.25-13.4
6.26775-6.26825	74.8-75.2	2200-2300	14.47-14.5
6.31175-6.31225	108-138	2310-2390	15.35-16.2
8.291-8.294	149.9-150.05	2483.5-2500	17.7-21.4
8.362-8.366	156.52475-156.52525	2655-2900	22.01-23.12
8.37625-8.38675	156.7-156.9	3260-3267	23.6-24.0
8.41425-8.41475	162.0125-167.17	3332-3339	31.2-31.8
12.29-12.293	167.72-173.2	3345.8-3358	36.43-36.5
			Above 38.6

* Certain frequency bands listed in table and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

(2) FCC 15.209 Limit & RSS-Gen section 8.9 Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		uV/m	dBuV/m
0.009 ~ 0.490	300	2400/F(kHz)	67.6-20log(F)
0.490 ~ 1.705	30	24000/F(kHz)	87.6-20log(F)
1.705 ~ 30.0	30	30	29.54
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dBuV/m (Peak) 54.0 dBuV/m (Average)	

Note:

(1) The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9 - 90 kHz, 110 - 490 kHz and above 1000 MHz, radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30 MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit}_{3m}(\text{dBuV/m}) = \text{Limit}_{30m}(\text{dBuV/m}) + 40\text{Log}(30m/3m)$$

(3) Limit for this EUT

The emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, and the emissions appearing within RSS-Gen section 8.10 Restricted frequency bands shall not exceed the limits shown in RSS-Gen section 8.9, all the other emissions shall be at least 20 dB below the fundamental emissions or comply with 15.209 limits and RSS-Gen section 8.9 limits.

12.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
Notebook	Lenovo	i5-5300U	Test comptuer	/

12.5. Test procedure

(1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber for below 1G and 150 cm above the ground plane inside a fully-anechoic chamber for above 1G.

(2) Test antenna was located 3 m from the EUT on an adjustable mast, and the antenna used as below table.