

Test Report

Apple Inc.

REPORT NUMBER: 4792157433-A2LA-S1-R2

PROJECT NUMBER: 4792157433

FCC ID: BCGA3577

IC ID: 579C-A3577

LOCATION:

UL India Private Limited,
30/A, I Stage, Visvesvaraya
Industrial Estate, Doddanekkundi
Industrial Area,
Bengaluru Urban – 560048
Karnataka, India.

General details

Customer / Applicant	Apple Inc, One Apple Park Way Cupertino, California 95014 U.S. A		
Program	A2LA		
Test Lab Location	Refer to the cover page for lab address		
Item Under Test	Wireless headphones		
Model Number	A3577		
Number of Samples	02		
UL Sample Identification	Radiated sample: 9610623 Conducted sample: 9610620		
Manufacturer Serial number (If any)	Radiated sample: DCCPX7F7P6 Conducted sample: JT9VNJQDJ61		
Condition of IUT on receipt	Good (No Physical Damage)		
Date of Receipt	30 Mar 2026		
Applicable Standard	FCC 47 CFR PAR 15 SUBPART C ISED RSS-247 ISSUE 4 ISED RSS-GEN ISSUE 5 + A1 + A2		
Date of Testing (Start date)	6 April 2026	End Date	22 April 2026
UL general ambient condition	Temperature in °C		(23 ± 5) °C
	Relative humidity in %		<70 %
	Atmospheric pressure		860 mbar to 1060 mbar
Date of Issue	27 Apr 2026		
Test In-Charge	Refer clause 1 (Test condition) of this test report.		

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1 SUMMARY OF TEST RESULTS

FCC Clause	ISED Clause	Test Name	Results	Comment
See comment		Duty cycle	Reporting purpose only	ANSI C63.10 Section 11.6
-	RSS-GEN 6.7	99% OBW	Reporting purpose only	ANSI C63.10 Section 6.9.3
15.247 (a)(2)	RSS-247 6.3.1 (a)	6dB Bandwidth	P	None.
15.247 (b)(3)	RSS-247 6.3.2	Output power	P	None.
See Comment		Average Power	Reporting purpose only	ANSI 63.10 Section 11.9.2.3.2
15.247 (e)	RSS-247 6.3.1 (b)	PSD (Power spectral density)	P	None.
15.247 (d)	RSS-247 6.6	Conducted spurious emission	P	None.
15.209, 15.205	RSS-GEN 8.9, 8.10	Radiated Emissions	P	None.
15.207	RSS-Gen 8.8	AC mains conducted emissions	P	None.

P: Meets the requirements F: Does not meet the requirement NA: Not applicable



REPORT NUMBER: 4792157433-A2LA-S1-R2

FCC ID: BCGA3577

IC ID: 579C-A3577

Test condition

Test Item	Test Site details	Environmental	Test date	Tested by
Duty cycle	Wireless Lab 1	23.7°C, 52%	06 Apr 2026	24883 \ 105819
99% OBW	Wireless Lab 1	22.1°C, 56%	08 Apr 2026	24883 \ 105819
6dB Bandwidth	Wireless Lab 1	22.1°C, 56%	08 Apr 2026	24883 \ 105819
Output power	Wireless Lab 1	24.6°C, 52%	07 Apr 2026	24883 \ 105819
Power Spectral density	Wireless Lab 1	22.1°C, 56%	08 Apr 2026	24883 \ 105819
Conducted spurious emission	Wireless Lab 1	23.5°C, 56%	08 Apr 2026 22 Apr 2026	24883 \ 105819
Radiated Emissions	SAC/FAC Chamber	23.5°C, 56% 23.2°C, 55% 22.5°C, 54% 22.2°C, 51% 21.5°C, 52% 22.3°C, 53%	08 Apr 2026 09 Apr 2026 10 Apr 2026 11 Apr 2026 13 Apr 2026 17 Apr 2026	107474 32285 24883
AC mains conducted emissions	Emission Lab 1	23°C, 50%	15 Apr 2026	32285

2 GENERAL REMARKS.**REVISION HISTORY**

Revision	Revised report number	Date	Page revised	Contents
Original	---	27 Apr 2026	--	Initial issue
Revision 1(R1)	4792157433-A2LA-S1-R1	06 May 2026	Page 14 Page 18 Page 13 Page 33 Page 109 Page 113	- ANSI C63.10 Section number corrected for OCB and Output power. - Removed the X, Y & Z orientation setup photos. - Section 4 of the test report, updated with ANSI C63.10 ISED versions. - The test procedure corrected for section 12.1.3, 6dB bandwidth test. 9 kHz to 30 MHz, Final measurement table added. - Conducted emission table calculation updated for average and QP detectors.
Revision 2(R2)	4792157433-A2LA-S1-R2	18 May 2026	N/A	Report split into 2 copies to meet the size.

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3 CUSTOMER PROVIDED INFORMATION

No additional information provided by customers.

4 TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, For FCC lab followed ANSI C63.10-2020, for ISED the lab followed ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024, KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 414788 D01 Radiated Test Site v01r01, RSS-GEN Issue 5 + A1 + A2, and RSS-247 Issue 4.

5 FACILITY AND ACCREDIATION

Test location	UL India Private Limited
Address	30/A, 1 st Stage, Visvesvaraya Industrial Estate, Doddanekkundi Industrial Area, Bengaluru – 560048, India.
Accreditation certificate	UL India, EMC-W lab is accredited by A2LA. Certificate Number: 6728.01 ISED Company Number: 33069

Lab location	SAC/FAC Chamber SI.No 888522 (Radiated emission, Radiated Band edge)
	WIRELESS LAB 1 (Conducted RF \ Antenna port measurements)
	EMISSION LAB 1 (Conducted emission)

6 DECISION RULES AND MEASUREMENT UNCERTAINTY

6.1 METHODOLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturer recommendation, whichever is less, and where applicable is traceable to recognized national standards.

6.2 DECISION RULES

The Decision is based on simple acceptance in accordance with IEC Guide 115: 2023, Clause 4.3.3. Measurement Uncertainty is not taken into account when stating conformity with a specified requirement.

6.2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

Parameters	UL EMC-W lab
RF Output Power	1.35 dB
Occupied Bandwidth	1.71 %
Power Spectral Density	1.25 dB
RF Conducted	1.39 dB
Radiated disturbance below 30 MHz	4.5 dB
Radiated disturbance below 1 GHz	4.5 dB
Radiated disturbance above 1 GHz	4.9 dB
Conducted disturbance at mains terminal ports	2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

7 MEASUREMENT METHOD

On-Time and Duty cycle: ANSI C63.10 Section 11.6

Occupied Bandwidth (99%): ANSI C63.10 Section 6.9.3

6dB Bandwidth: ANSI C63.10 Subclause -11.8.1 RBW $\geq$ DTS BW.

Output Power: ANSI C63.10 Subclause -11.9.1.2 Method PKPM1 Peak-reading power meter.

Output Power: ANSI C63.10 Subclause -11.9.2.3.2 Method AVGPM-G (Measurement using a gated RF average-reading power meter).

PSD: ANSI C63.10 Subclause -11.10.2 Method PKPSD (Peak PSD).

Conducted emissions non-restricted frequency bands: ANSI C63.10 Subclause -11.11 and 6.10.4.

Radiated emissions restricted & unrestricted frequency bands: ANSI C63.10 Subclause -11.12.1 and 6.10.5, 6.3 to 6.6.

8 EQUIPMENT UNDER TEST

8.1. EUT Specification

Equipment	Wireless headphone
RF Protocol	BLE.
Operation Channel frequency	BLE: 2402 MHz ~ 2480 MHz: 1 Mbps. 2404 MHz ~ 2478 MHz: 2 Mbps.
Maximum output power measured	Left Cup: 1Mbps: Mid Channel: Peak Max: 5.83 dBm (0.003828 Watts). 1Mbps: Mid channel : Peak EIRP : 6.39 dBm (0.0044 Watts) Right Cup: 2Mbps: High Channel: Peak Max: 6.46 dBm (0.004426 Watts). 2Mbps: High Channel : Peak EIRP: 8.72 dBm (0.0074 Watts)
Modulation Type	BLE: Wide band modulation other than FHSS
Modulation	BLE: GFSK.
Data rate	BLE: 1Mbps & 2Mbps
Number of Antenna	Left Cup: One antenna. Right Cup: One Antenna.
Antenna Type & Gain	Refer Clause 8.2 of this report.
Power supply	Battery Operated "Charging mode" – 120V 60Hz "AC".

8.2. Antenna Description

RF protocol	Make \ Antenna type	Brand	Frequency range	Antenna Directional peak gain		Comment
			MHz	dBi		
				Left Cup	Right Cup	
BLE \ BDR \ EDR	Apple \ PCB antenna	N/A	2402	0.56	1.78	SISO
			2440	0.56	2.24	
			2480	0.24	2.26	

*Disclaimer:

The information/data is supplied by the customer and the same is considered to arrive at the final value. Any changes made apart from the specified specification can directly impact on the test results.

8.3. EUT Description & Intended Usage

The EUT is Wireless Headphone

Hardware version	EVT
Software version	4A114

8.4. Channel List

BLE

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

8.5. Utility Software/Test Tool Details

Below software is used for the EUT configuration in different test modes

RF protocol	Test tool name	Version	Comments
BLE	Cool Term	Version 2.4.0 (Build 1425)	User for Antenna port measurements
BLE	Terminal	Version 2.14 (451)	.py scrips used for radiated spurious emission and Radiated bandedge.

8.6. Description of Test setup

Support equipment

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
MAC book pro	Apple	A2992	GQW71F6CRF	--

I/O Cables

IO Cable list						
Cable No	Port	# of identical ports	Connector type	Cable type	Cable Length (m)	Remarks
1	USB-C	1	USB-C	Shielded	1.5m	The cable was used to connect the EUT either to the laptop or to the power adapter.

9 WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz, above 18GHz and power line conducted emissions were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Band edge and radiated emissions between 1GHz and 18GHz were performed with the EUT set to transmit at the highest power on low, middle and high channels.

The EUT is assessed in 3 orthogonal orientations, refer “*Test Setup Photograph documents*” shared along with test reports for orientation details.

For Left Cup, the fundamentals of the EUT was investigated in three orthogonal orientations X, Y & Z as shown above. It was determined that the Y orientation was worst-case orientation. Therefore, all final radiated testing was performed with the EUT in Y orientation.

For Right Cup, the fundamental of the EUT was investigated in three orthogonal orientations X, Y & Z as shown above. It was determined that the X orientation was worst-case orientation. Therefore, all final radiated testing was performed with the EUT in X orientation.

Test Item	Modulation Type	Available channel	Test Channel	Data rate
Duty cycle	GFSK	0 to 39	0 \ 19 \ 39	1 Mbps
99% OBW	GFSK	0 to 39	0,19,39	1 Mbps
6dB Bandwidth	GFSK	0 to 39	0,19,39	1 Mbps
Output power	GFSK	0 to 39	0,19,39	1 Mbps
PSD	GFSK	0 to 39	0,19,39	1 Mbps
Conducted spurious emission	GFSK	0 to 39	0,19,39	1 Mbps
Radiated spurious emission <1GHz	GFSK	0 to 39	19 (Left Cup), 39 (Right Cup)	1 Mbps
Radiated spurious emission >18GHz	GFSK	0 to 39	19 (Left Cup), 39 (Right Cup)	1 Mbps
Radiated spurious emission 1GHz to 18 GHz	GFSK	0 to 39	0,19,39	1 Mbps
Radiated band-edge	GFSK	0 to 39	0,19,39	1 Mbps
AC mains conducted emissions	GFSK	0 to 39	19 (Left Cup)	1 Mbps

Test Item	Modulation Type	Available channel	Test Channel	Data rate
Duty cycle	GFSK	1 to 38	1 \ 19 \ 38	2 Mbps
99% OBW	GFSK	1 to 38	1,19,38	2 Mbps
6dB Bandwidth	GFSK	1 to 38	1,19,38	2 Mbps

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REPORT NUMBER: 4792157433-A2LA-S1-R2

FCC ID: BCGA3577

IC ID: 579C-A3577

Output power	GFSK	1 to 38	1,19,38	2 Mbps
PSD	GFSK	1 to 38	1,19,38	2 Mbps
Conducted spurious emission	GFSK	1 to 38	1,19,38	2 Mbps
Radiated spurious emission <1GHz	GFSK	1 to 38	19 (Left Cup), 38 (Right Cup)	2 Mbps
Radiated spurious emission >18GHz	GFSK	1 to 38	19 (Left Cup), 38 (Right Cup)	2 Mbps
Radiated spurious emission 1GHz to 18 GHz	GFSK	1 to 38	1,19,38	2 Mbps
Radiated band-edge	GFSK	1 to 38	1,19,38	2 Mbps
AC mains conducted emissions	GFSK	1 to 38	38 (Right Cup)	2 Mbps

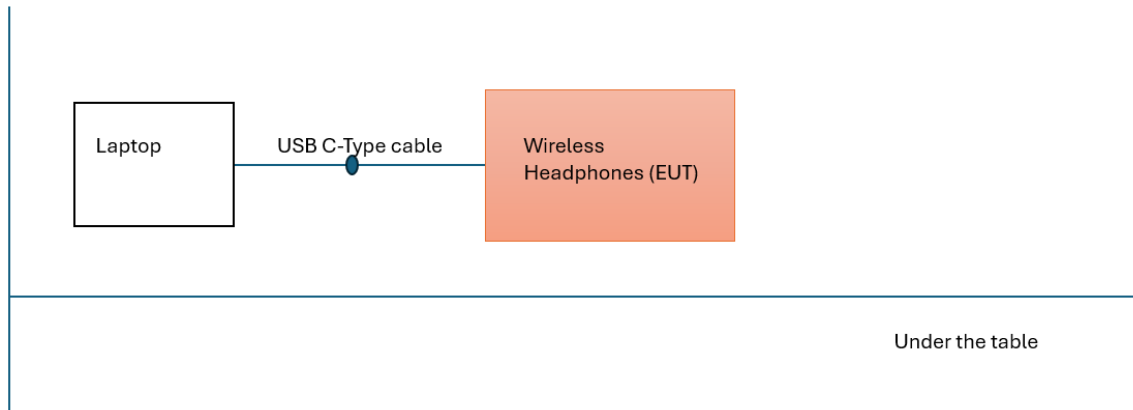
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10 SETUP DIAGRAM FOR TEST

Note: The above block diagram is an example of connection diagram of EUT test configurations. For details, please refer to test photographs for each test item.

11 TEST AND MEASUREMENT EQUIPMENT

Test Equipment	Manufacturer	Model Number	Serial Number	Global ID	Last Calibration	Next Calibration
Conducted RF \ Antenna port measurements						
Real-Time Peak power sensor, 50MHz to 6GHz.	Boonton	RTP5006	11668	208650	02 Jun 2025	02 Jun 2026
Signal Analyzer	Rohde & Schwarz	FSV40	101525	202687	05 Jul 2025	05 Jul 2026
RF Cable (Antenna port 1)	Junflon	--	--	--	CNR	CNR
Boonton power analyzer software	Boonton	Version 4.2.0.0	--	--	CNR	CNR
10dB Attenuator SMA	Bestek	--	--	--	CNR*	CNR*
Digital Altimeter	HTC	AL-7010	--	203314	07 Feb 2026	07 Feb 2027
Radiated Emission						
Active Loop antenna	ETS Lindgren	6502	00235119	208865	01 May 2025	01 May 2026
Trilog broadband antenna	Schwarzbeck	VULB 9162	9162-0244	194608	25 Jun 2024	25 Jun 2026
Signal Amplifier	Sonoma	315	454709	--	28 Feb 2026	28 Feb 2027
EMI Test Receiver	Rohde & Schwarz	ESR7	102146	192268	01 Jun 2025	01 Jun 2026
Double-Ridged waveguide antenna	ETS-Lindgren	3117	00218956	194735	14 Oct 2025	14 Oct 2027
Preamplifier	Rohde & Schwarz	SCU18	100722	192278	23 Jan 2026	23 Jan 2027
Signal and Spectrum Analyzer	Rohde & Schwarz	FSW26	103834	264588	22 Apr 2025	22 Apr 2026
Horn Antenna	Schwarzbeck	BBHA9170 BB	910	194629	15 Sep 2025	15 Sep 2027
Preamplifier	Rohde & Schwarz	SCU40A	101206	203204	04 Jul 2025	04 July 2026
Highpass Filter	Wainwright	WHKX12-2757-2997-	SN34	--	CNR	CNR

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Test Equipment	Manufacturer	Model Number	Serial Number	Global ID	Last Calibration	Next Calibration
		18000-50SS				
3dB Attenuator	Mini-Circuits	BW-N3W5+	1013	--	CNR*	CNR*
10dB Attenuator SMA	Bestek	--	--	--	CNR*	CNR*
RE Test Software (V10.35.02)	Rohde & Schwarz	EMC32	--	--	CNR	CNR
3meter SAC Chamber (NSA and SVSWR)	TDK	--	888522	267120	10 Oct 2025	10 Oct 2027
Digital Altimeter	HTC	AL-7010	--	203314	24 Jan 2026	24 Jan 2027
Digital Thermohygrometer	Mextech	--	--	179781	04 Jun 2025	04 Jun 2026
Conducted Emission						
Line Impedance Stabilization Network	Scientific	SMLIN100-4	205010	267783	11 Jun 2025	11 Jun 2026
EMI Test Receiver	Rohde & Schwarz	ESR7	102146	192268	01 Jun 2025	01 Jun 2026
EMI Test Receiver	Rohde & Schwarz	ESCI-3	101058	169121	26 Jan 2026	27 Jan 2027
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	101153	170343	24 Jan 2026	24 Jan 2027
CE BNC Cable	--	CE Cable	--	230491	2 Jan 2026	2 Jan 2027
CE Test Software (V10.99)	TDK	--	--	--	CNR	CNR
Other Equipment's						
Digital Multimeter	Fluke	87 V	97800068	169405	1 Nov 2025	1 Nov 2026

CNR -> Calibration not required.

CNR* -> Calibration not required, Verified before start of test.

12 TEST DETAILS

12.1.1. ON TIME AND DUTY CYCLE

LIMITS

None, for reporting purpose only.

PROCEDURE

KDB 558074 Zero-span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Left Cup

Mode	ON Time	Period	Duty cycle	Duty cycle	Duty cycle Correction factor	1/T Minimum VBW
	B		x	%	(dB)	(kHz)
	(mSec)	(mSec)	(Linear)			
BLE 1 Mbps	0.375	0.626	0.599	59.904	2.225	2.667
BLE 2 Mbps	0.192	0.624	0.308	30.769	5.119	5.208

Right Cup

Mode	ON Time	Period	Duty cycle	Duty cycle	Duty cycle Correction factor	1/T Minimum VBW
	B		x	%	(dB)	(kHz)
	(mSec)	(mSec)	(Linear)			
BLE 1 Mbps	0.375	0.624	0.601	60.096	2.212	2.667
BLE 2 Mbps	0.192	0.627	0.306	30.636	5.138	5.205

Calculation:

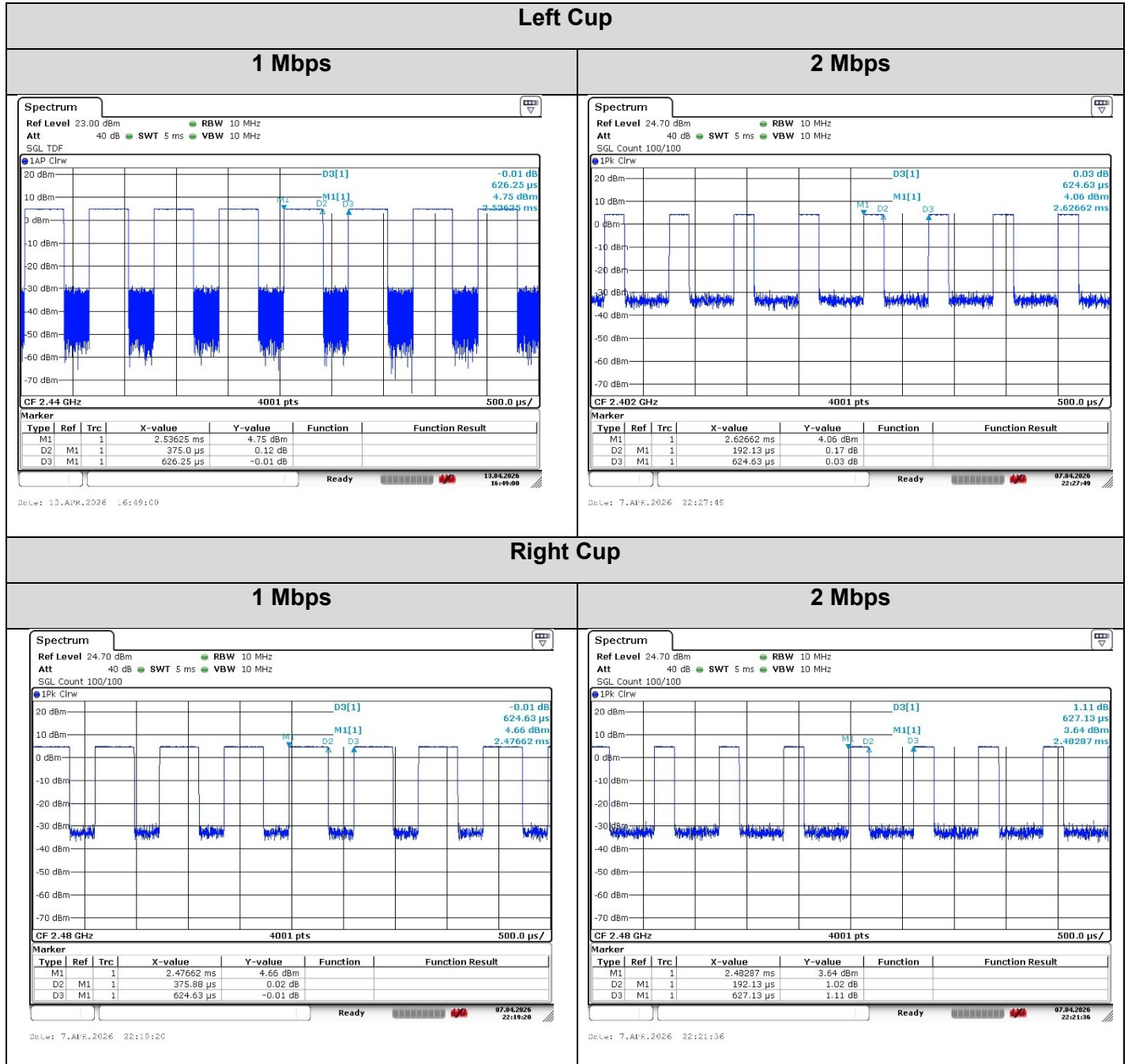
Duty cycle (x) = ON Time / Period.

Duty cycle (%) = Duty cycle (x) * 100.

Duty cycle correction factor = $10 \cdot \log(1/x)$: where x = Duty cycle in Linear.

1/T Minimum VBW = 1 / On Time.

Duty cycle plots

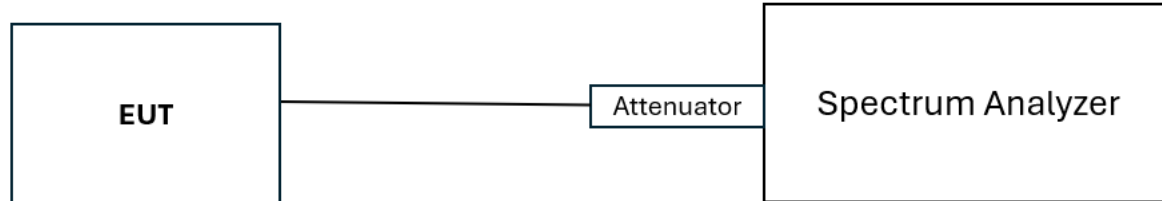


12.1.2. 99% OBW**LIMITS**

None, For reporting purpose only.

PROCEDURE

The transmitter shall be operated at its maximum power measured under normal test conditions. The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, by small enough to avoid having other emissions (Example, on adjacent channels) Within the span. The detector of the spectrum analyzer shall be set to "Sample". However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (Worst-case measurement). Use of a peak hold (or "Max hold") may be necessary to determine the occupied /x dB bandwidth if the device is not transmitting continuously. The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three time the RBW value. Video averaging is not permitted.

TEST SETUP

The loss between RF output port of the EUT and the input port of the spectrum analyzer has been taken into consideration.

TEST RESULTS

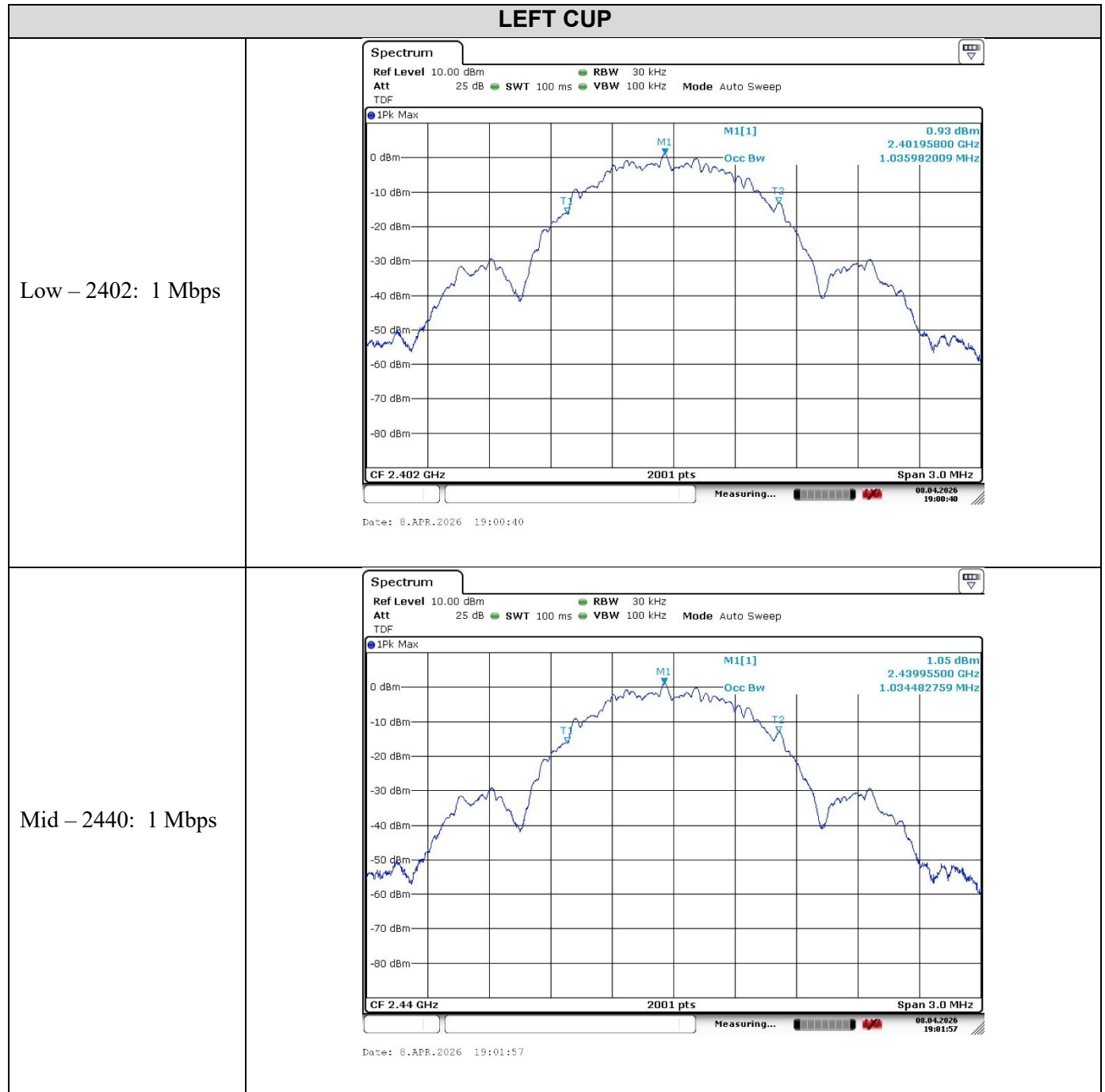
Left Cup

Type	Channel	Frequency (MHz)	99% Bandwidth (MHz)
BLE 1 Mbps	Low	2402	1.035
BLE 1 Mbps	Mid	2440	1.034
BLE 1 Mbps	High	2480	1.032
BLE 2 Mbps	Low	2404	2.077
BLE 2 Mbps	Mid	2440	2.074
BLE 2 Mbps	High	2478	2.074

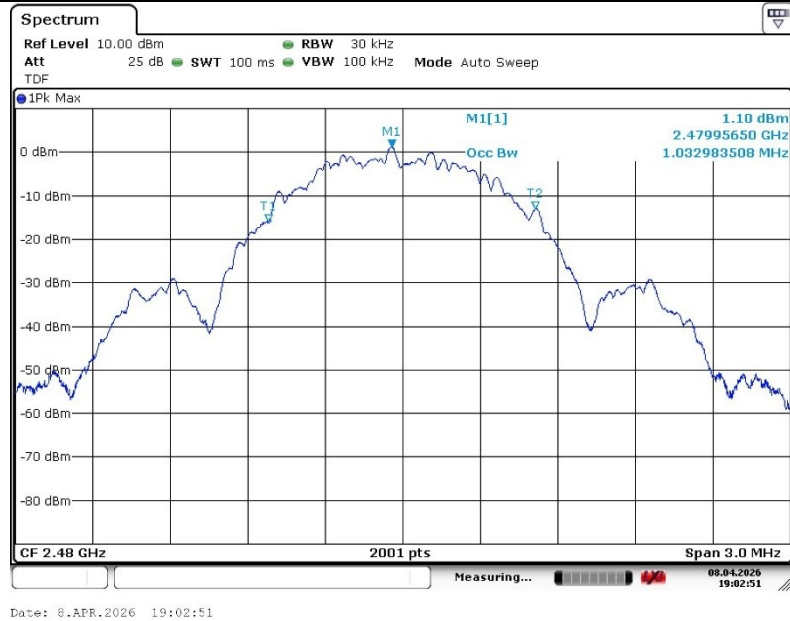
Right Cup

Type	Channel	Frequency (MHz)	99% Bandwidth (MHz)
BLE 1 Mbps	Low	2402	1.034
BLE 1 Mbps	Mid	2440	1.034
BLE 1 Mbps	High	2480	1.034
BLE 2 Mbps	Low	2404	2.077
BLE 2 Mbps	Mid	2440	2.074
BLE 2 Mbps	High	2478	2.071

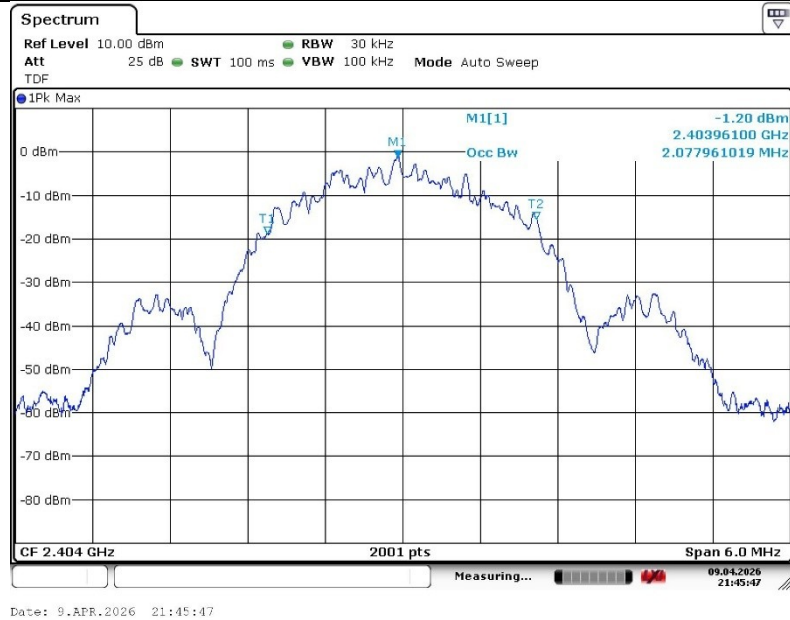
TEST PLOTS



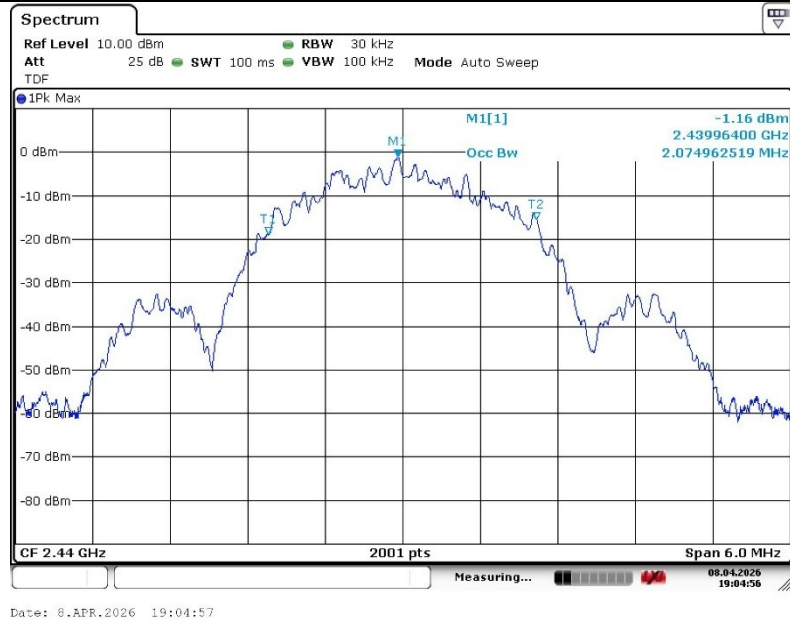
High – 2480 : 1 Mbps



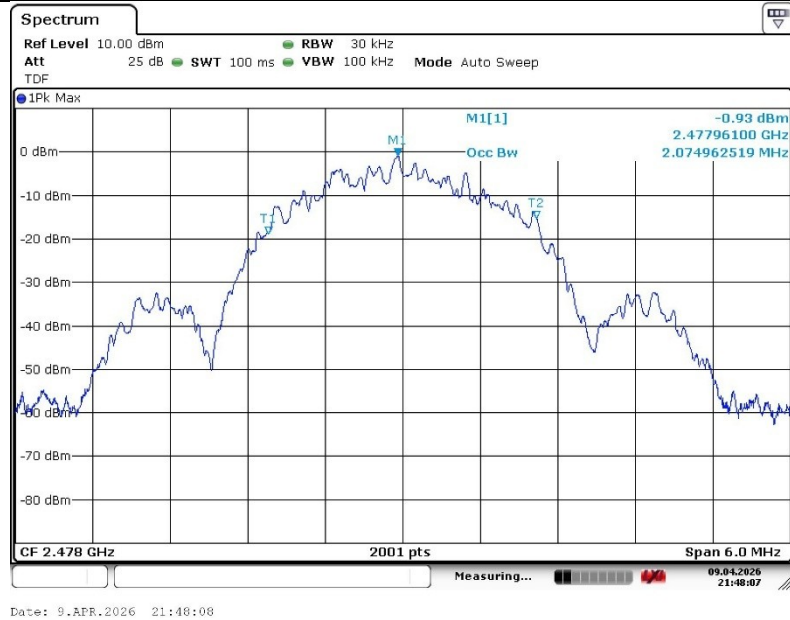
Low – 2404 : 2Mbps



Mid – 2440 : 2Mbps

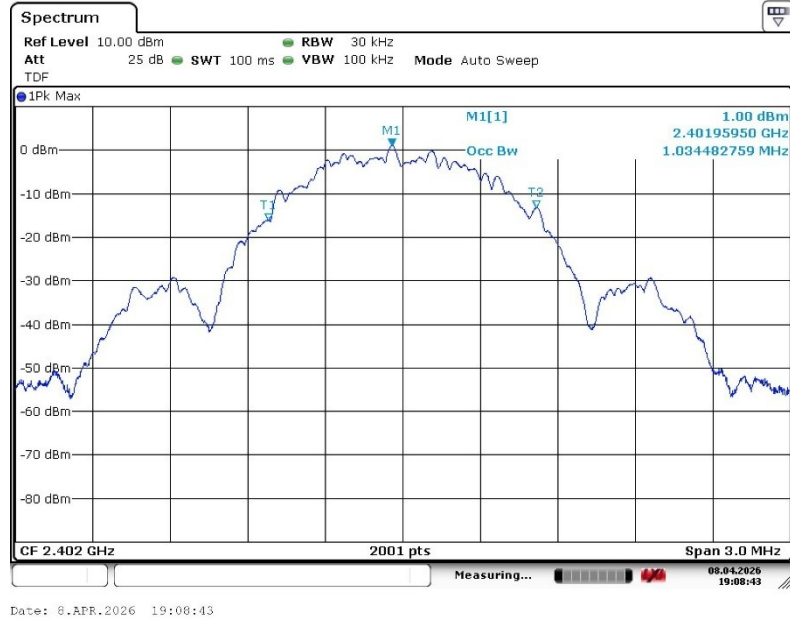


High –2478 : 2Mbps

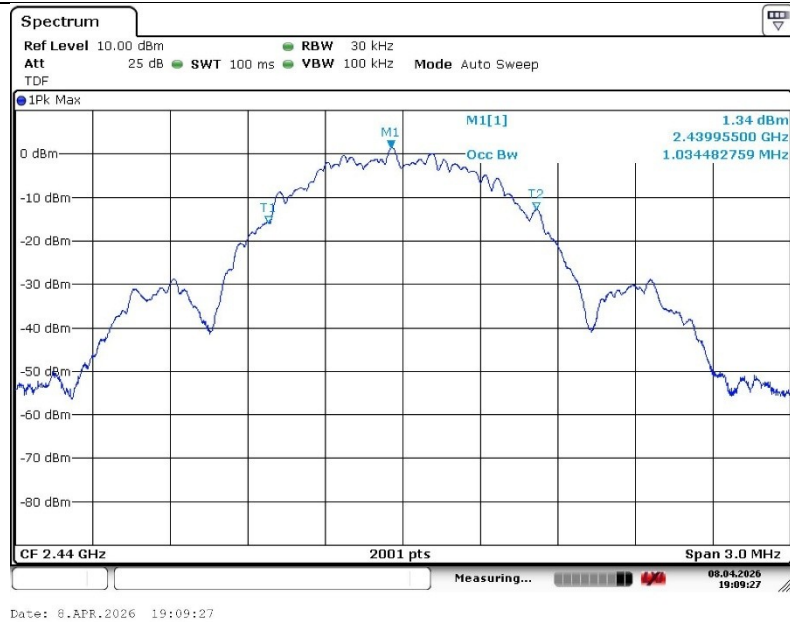


Right CUP

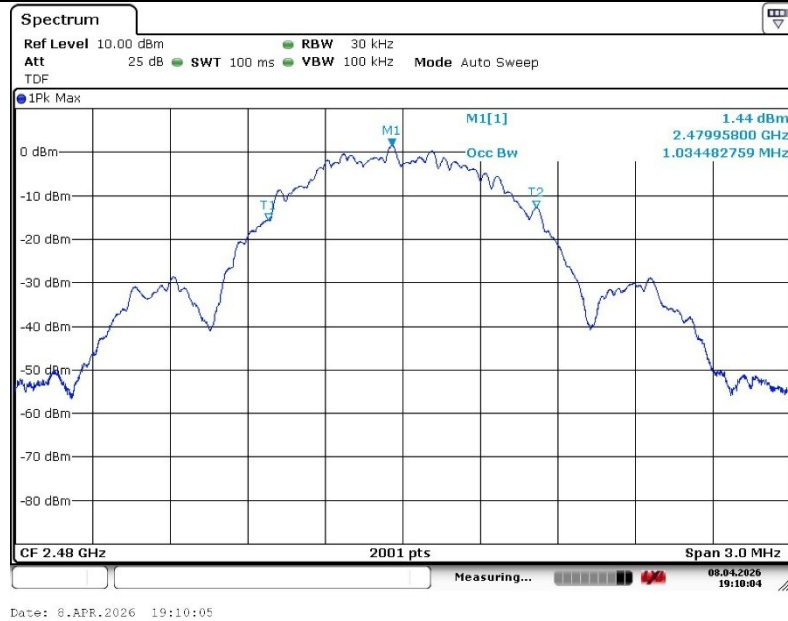
Low – 2402 : 1 Mbps



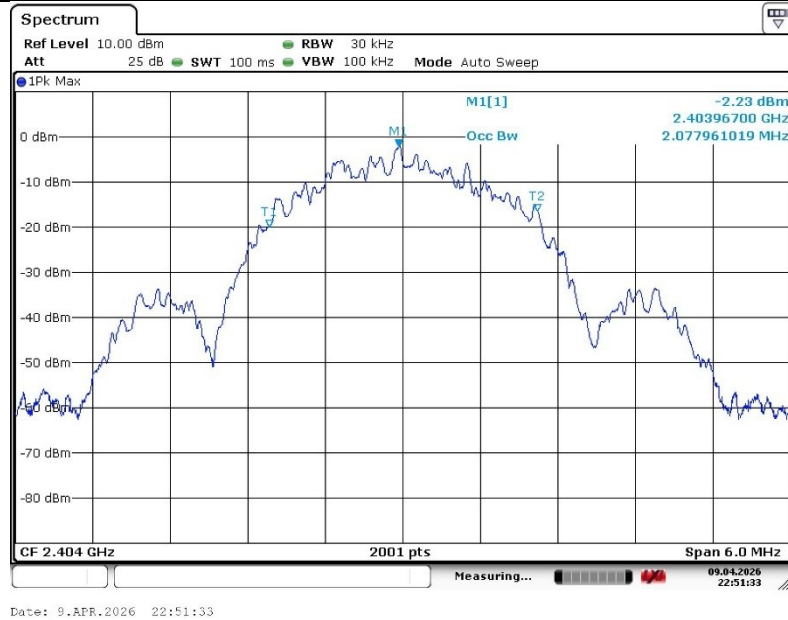
Mid – 2440 : 1 Mbps



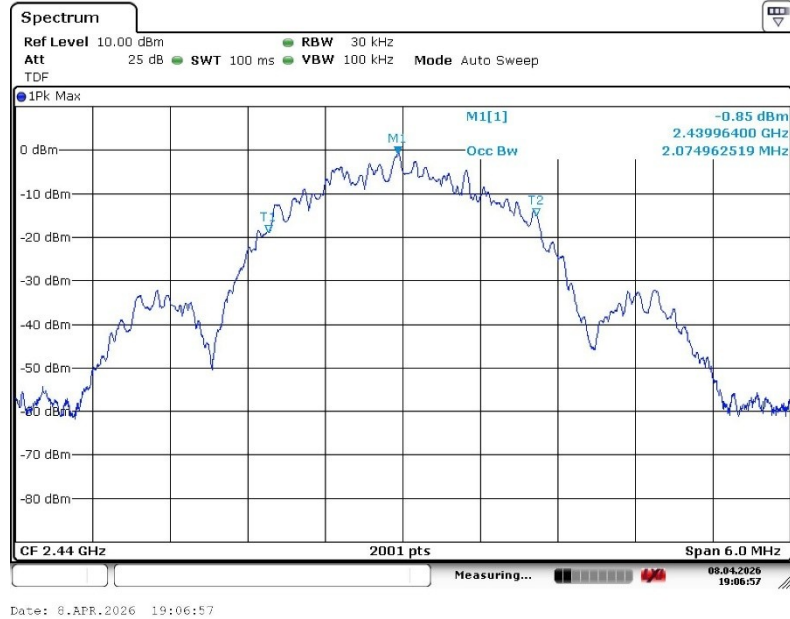
High – 2480 : 1 Mbps



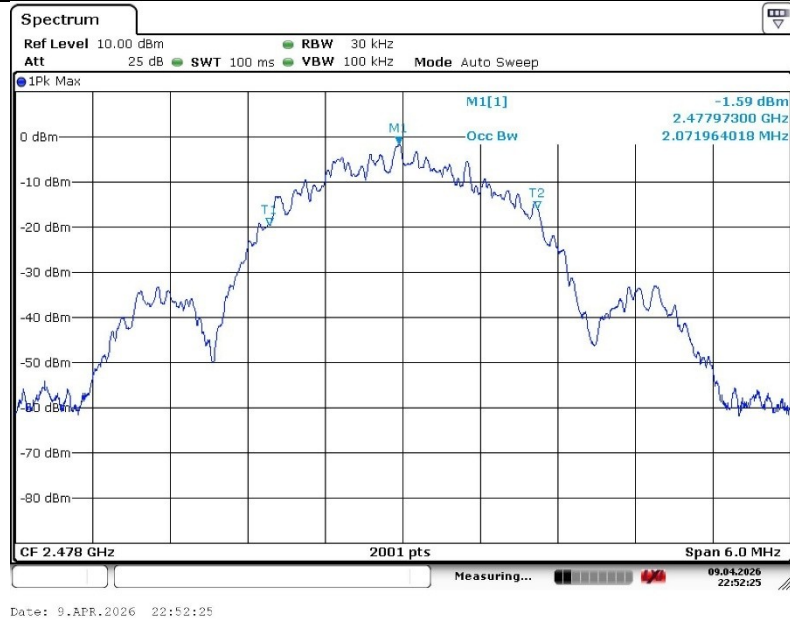
Low – 2404 : 2Mbps



Mid – 2440: 2Mbps



High – 2478 : 2Mbps



12.1.3. 6DB BANDWIDTH**LIMITS**

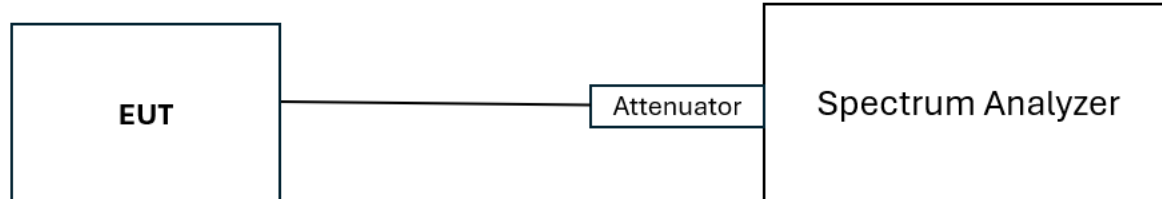
FCC §15.247 (a) (2)

RSS-247 6.3.1 (a)

The minimum 6dB bandwidth shall be at least 500 kHz.

PROCEDURE

- Set RBW = Shall be in the range of 1% to 5% of the OBW but not less than 100kHz.
- Set the video bandwidth (VBW) $\geq 3 \times \text{RBW}$, Detector=Peak.
- Trace mode = Max Hold.
- Sweep = auto couple.
- Measure the maximum width of the emission that is considered by the frequencies associated with the two amplitude points (upper and Lower) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

TEST SETUP

The loss between RF output port of the EUT and the input port of the spectrum analyzer has been taken into consideration.

TEST RESULTS

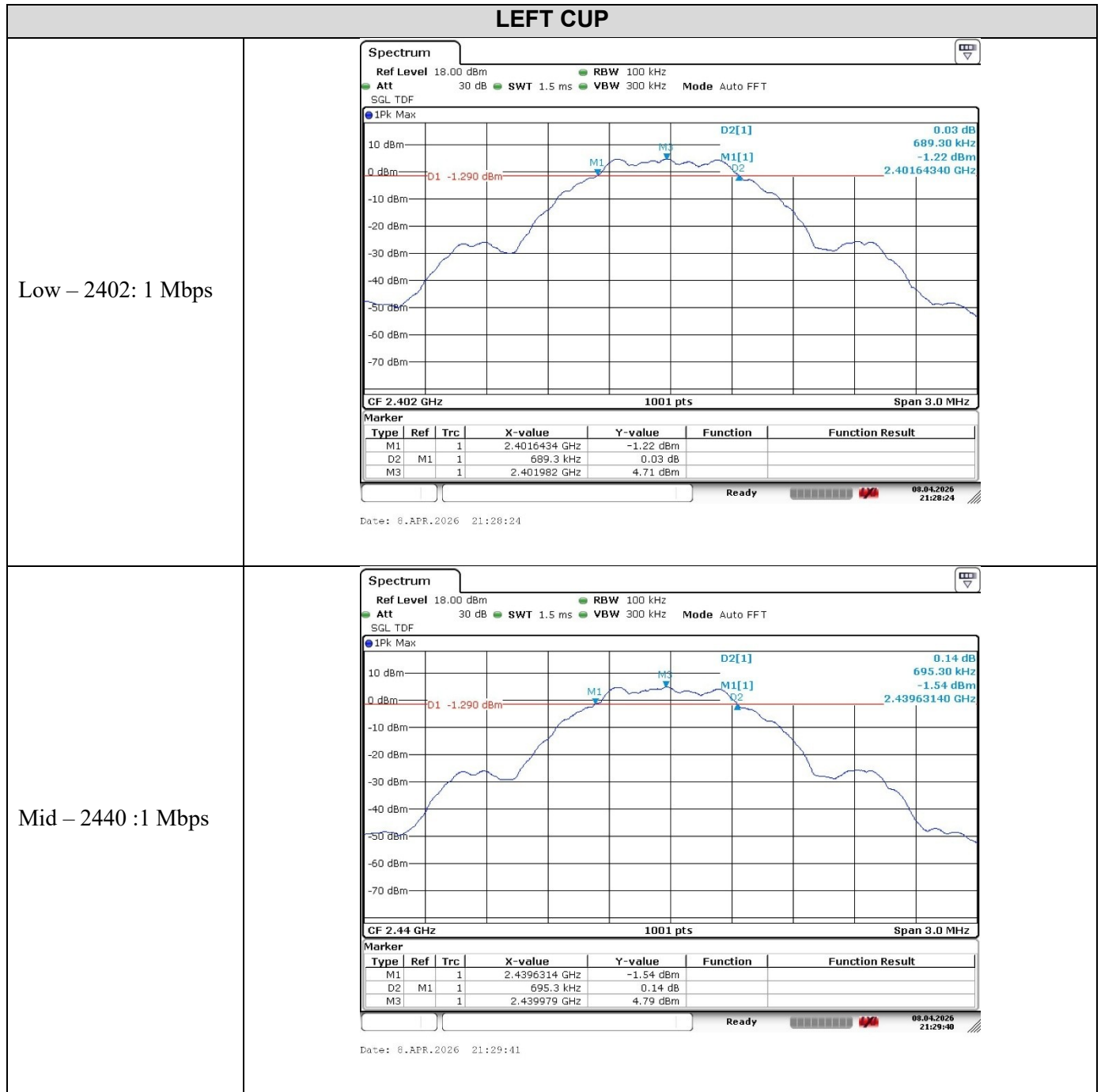
Left Cup

Type	Channel	Frequency	6dB Bandwidth	Minimum Limit
		(MHz)	(MHz)	(MHz)
BLE 1 Mbps	Low	2402	0.689	0.5
BLE 1 Mbps	Mid	2440	0.695	0.5
BLE 1 Mbps	High	2480	0.677	0.5
BLE 2 Mbps	Low	2404	1.162	0.5
BLE 2 Mbps	Mid	2440	1.120	0.5
BLE 2 Mbps	High	2478	1.162	0.5

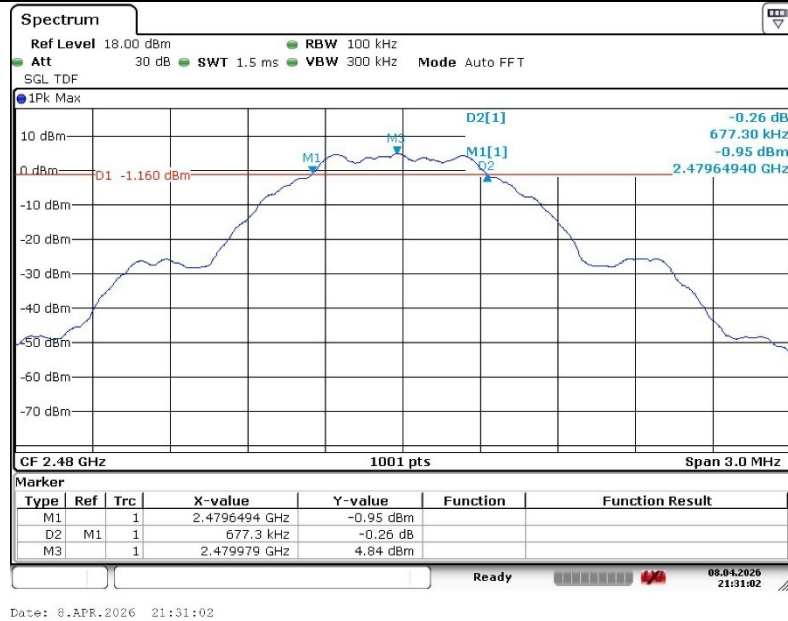
Right Cup

Type	Channel	Frequency	6dB Bandwidth	Minimum Limit
		(MHz)	(MHz)	(MHz)
BLE 1 Mbps	Low	2402	0.710	0.5
BLE 1 Mbps	Mid	2440	0.692	0.5
BLE 1 Mbps	High	2480	0.671	0.5
BLE 2 Mbps	Low	2404	1.126	0.5
BLE 2 Mbps	Mid	2440	1.150	0.5
BLE 2 Mbps	High	2478	1.168	0.5

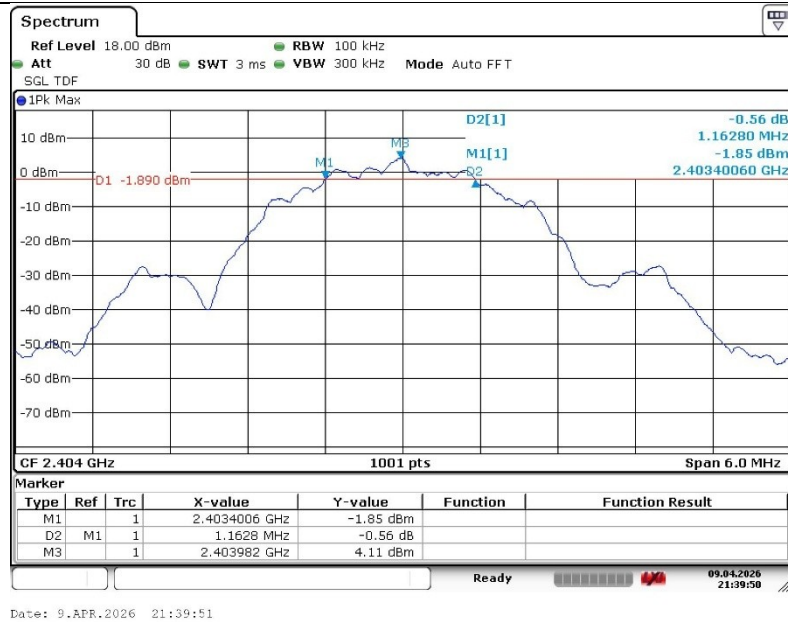
TEST PLOTS



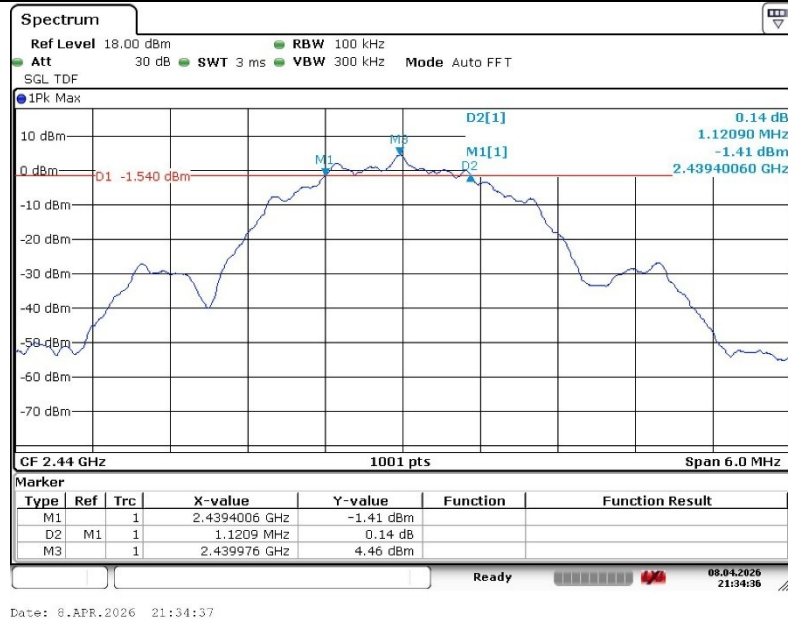
High – 2480 : 1 Mbps



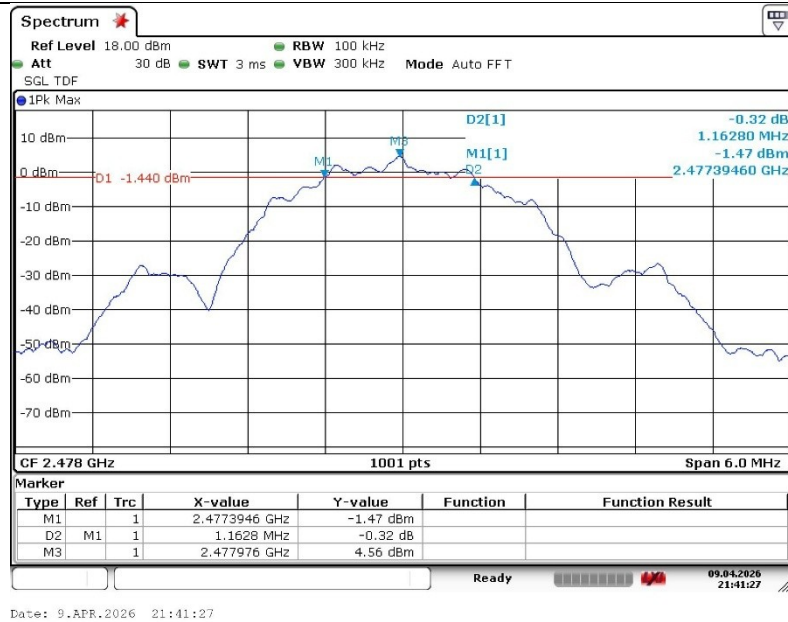
Low – 2404 : 2 Mbps



Mid – 2440 : 2 Mbps

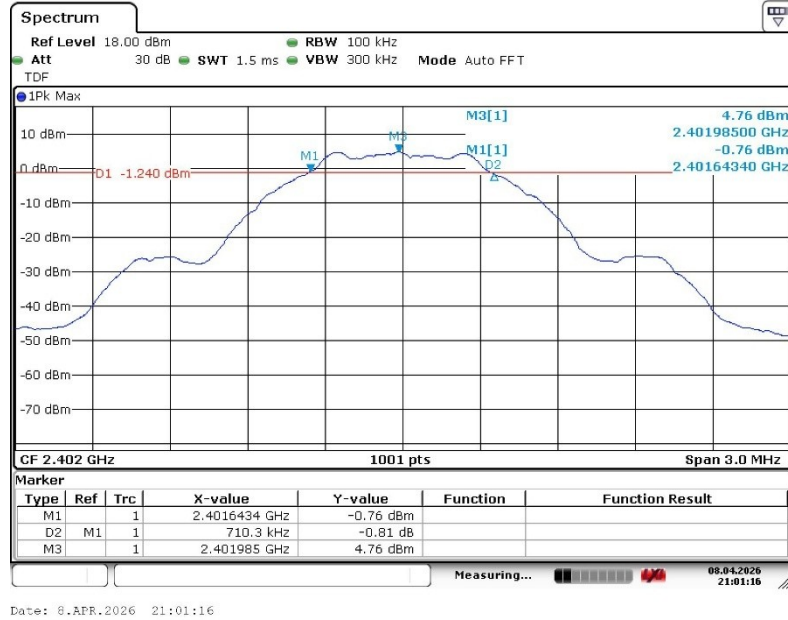


High – 2478 : 2 Mbps

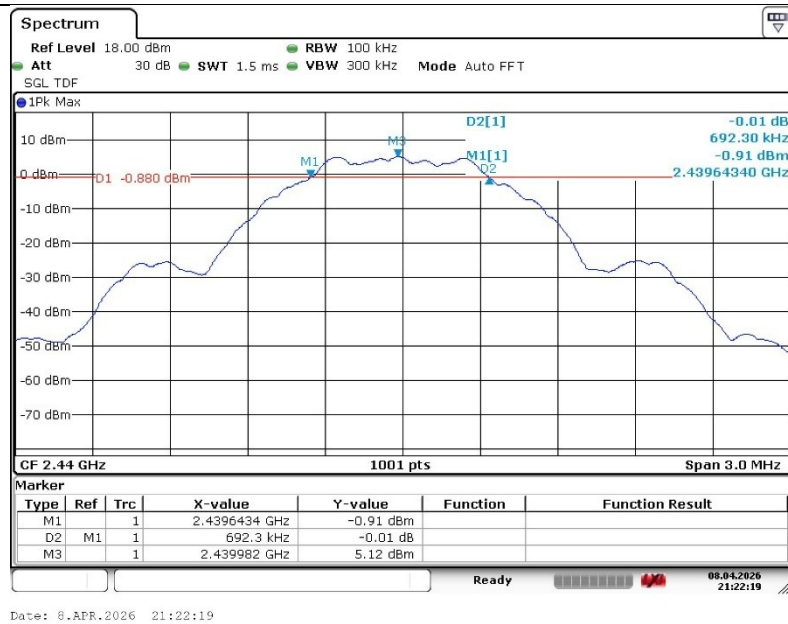


Right CUP

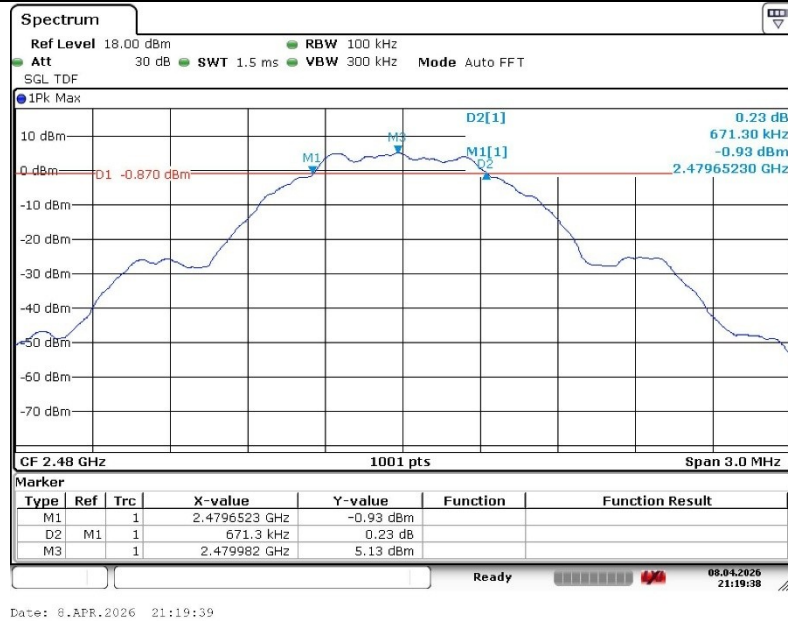
Low – 2402 : 1 Mbps



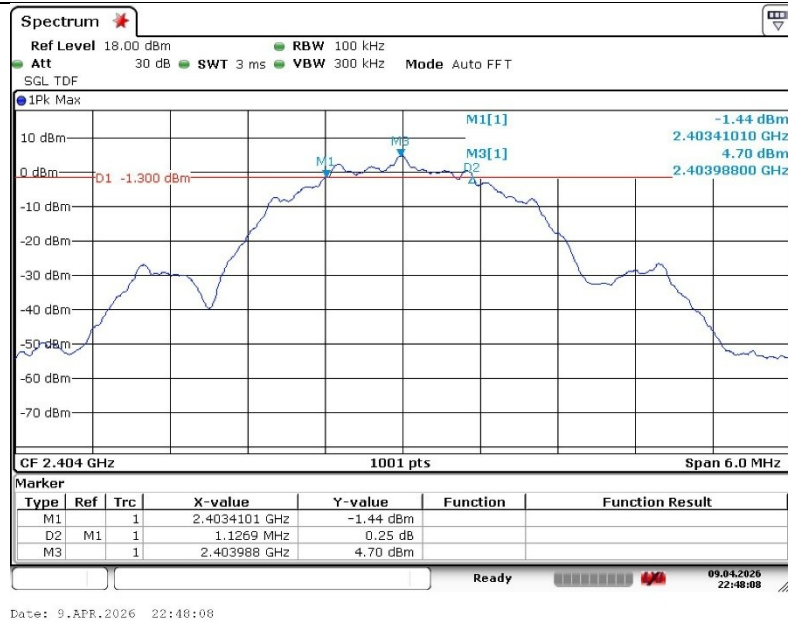
Mid – 2440 : 1 Mbps



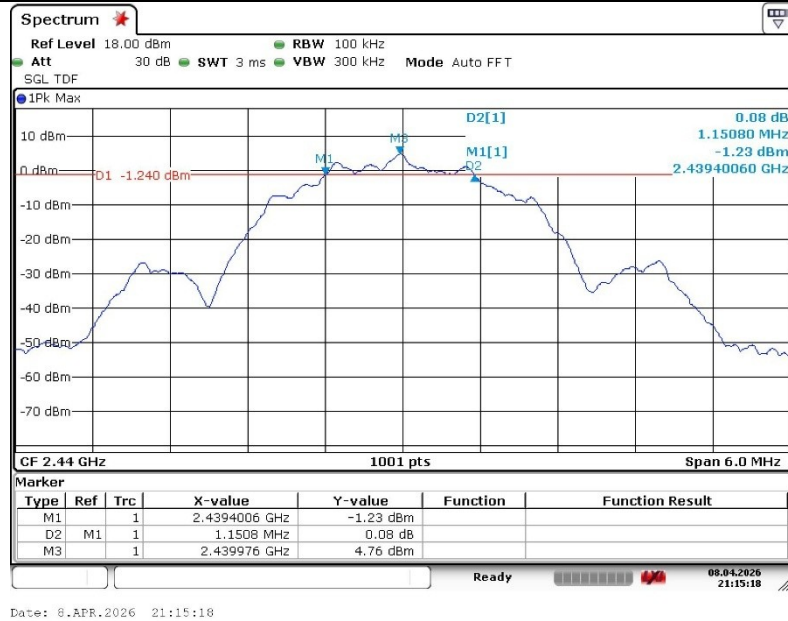
High – 2480 : 1 Mbps



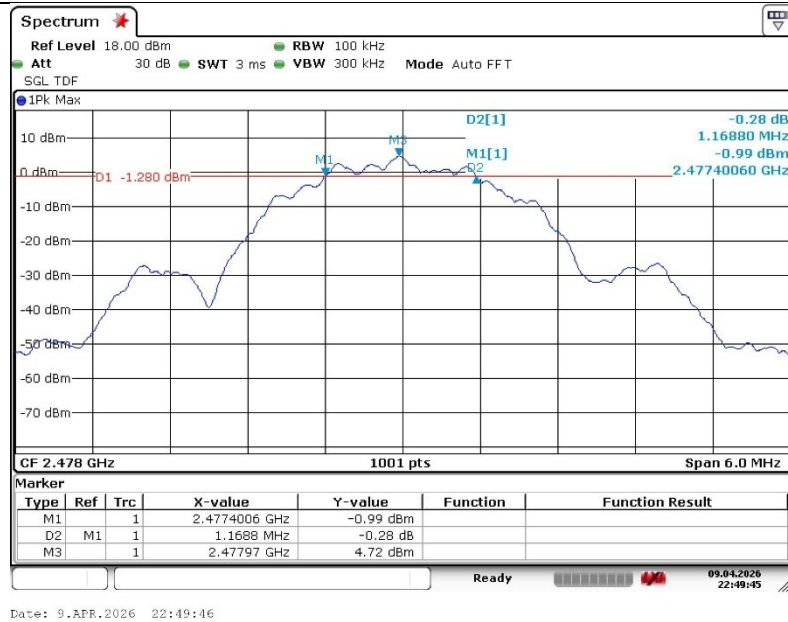
Low – 2404 : 2 Mbps



Mid – 2440 : 2 Mbps



High – 2478 : 2 Mbps



12.1.4. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)

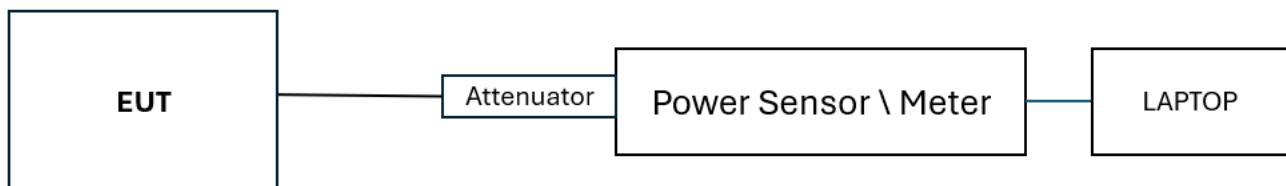
RSS-247 6.3.2

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

PROCEDURE

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

TEST SETUP



The loss between RF output port of the EUT and the input port of the spectrum analyzer has been taken into consideration.

Peak Power table

Left CUP

Type	Data rate	Channel	Frequency (MHz)	Peak Power Reading (dBm)	FCC \ ISED Limit (dBm)	FCC Margin dB	Antenna gain dBi	ISED EIRP power (dBm)	ISED EIRP limit (dBm)	ISED Margin dB
BLE	1 Mbps	Low	2402	5.78	30	-24.22	0.56	6.34	36	-29.66
BLE	1 Mbps	Mid	2440	5.83	30	-24.17	0.56	6.39	36	-29.61
BLE	1 Mbps	High	2480	5.64	30	-24.36	0.24	5.88	36	-30.12
BLE	2 Mbps	Low	2404	5.19	30	-24.81	0.56	5.75	36	-30.25
BLE	2 Mbps	Mid	2440	5.82	30	-24.18	0.56	6.38	36	-29.62
BLE	2 Mbps	High	2478	5.70	30	-24.30	0.24	5.94	36	-30.06

Right CUP

Type	Data rate	Channel	Frequency (MHz)	Peak Power Reading (dBm)	FCC \ ISED Limit (dBm)	FCC Margin dB	Antenna gain dBi	ISED EIRP power (dBm)	ISED EIRP limit (dBm)	ISED Margin dB
BLE	1 Mbps	Low	2402	5.53	30	-24.47	1.78	7.31	36	-28.69
BLE	1 Mbps	Mid	2440	6.11	30	-23.89	2.24	8.35	36	-27.65
BLE	1 Mbps	High	2480	6.20	30	-23.80	2.26	8.46	36	-27.54
BLE	2 Mbps	Low	2404	5.87	30	-24.13	1.78	7.65	36	-28.35
BLE	2 Mbps	Mid	2440	6.12	30	-23.88	2.24	8.36	36	-27.64
BLE	2 Mbps	High	2478	6.46	30	-23.54	2.26	8.72	36	-27.28

Calculation:

ISED EIRP = Measured Peak power reading (dBm) + Antenna gain (dBi).

ISED Margin = ISED EIRP Power (dBm) – ISED EIRP Limit (dBm).

FCC Margin = Peak Power Reading (dBm) – FCC Limit (dBm).

Below average power table is only for reporting purposes.

Left CUP

Type	Data rate	Channel	Frequency	Average measured power reading
			(MHz)	(dBm)
BLE	1 Mbps	Low	2402	5.50
BLE	1 Mbps	Mid	2440	5.58
BLE	1 Mbps	High	2480	5.39
BLE	2 Mbps	Low	2404	4.88
BLE	2 Mbps	Mid	2440	5.58
BLE	2 Mbps	High	2478	5.36

Right CUP

Type	Data rate	Channel	Frequency	Average measured power reading
			(MHz)	(dBm)
BLE	1 Mbps	Low	2402	5.29
BLE	1 Mbps	Mid	2440	5.86
BLE	1 Mbps	High	2480	5.95
BLE	2 Mbps	Low	2404	5.57
BLE	2 Mbps	Mid	2440	5.85
BLE	2 Mbps	High	2478	6.15

12.1.5. POWER SPECTRAL DENSITY (PSD)

LIMITS

FCC §15.247 (e)

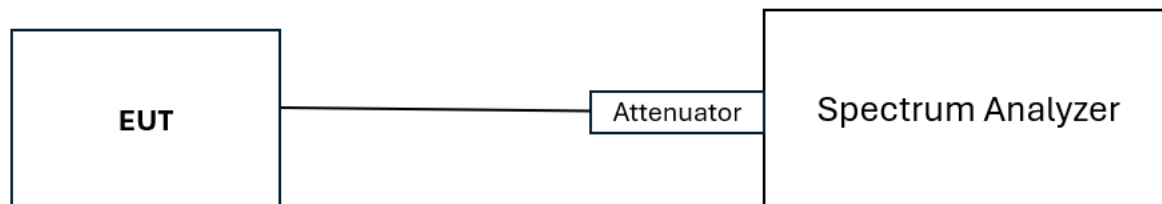
RSS-247 6.3.1 (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

PROCEDURE

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to $3\text{kHz} \leq \text{RBW} \leq 100\text{ kHz}$.
- Set the VBW $\geq 3 \times \text{RBW}$.
- Detector = Peak.
- Sweep time = auto coupled.
- Trade mode = Max Hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.

TEST SETUP



The loss between RF output port of the EUT and the input port of the spectrum analyzer has been taken into consideration.

TEST RESULTS

Left CUP

Type	Data rate	Channel	Frequency (MHz)	Power spectral density (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
BLE	1 Mbps	Low	2402	-10.59	8	-18.59
BLE	1 Mbps	Mid	2440	-10.56	8	-18.56
BLE	1 Mbps	High	2480	-10.50	8	-18.50
BLE	2 Mbps	Low	2404	-13.18	8	-21.18
BLE	2 Mbps	Mid	2440	-13.34	8	-21.34
BLE	2 Mbps	High	2478	-12.79	8	-20.79

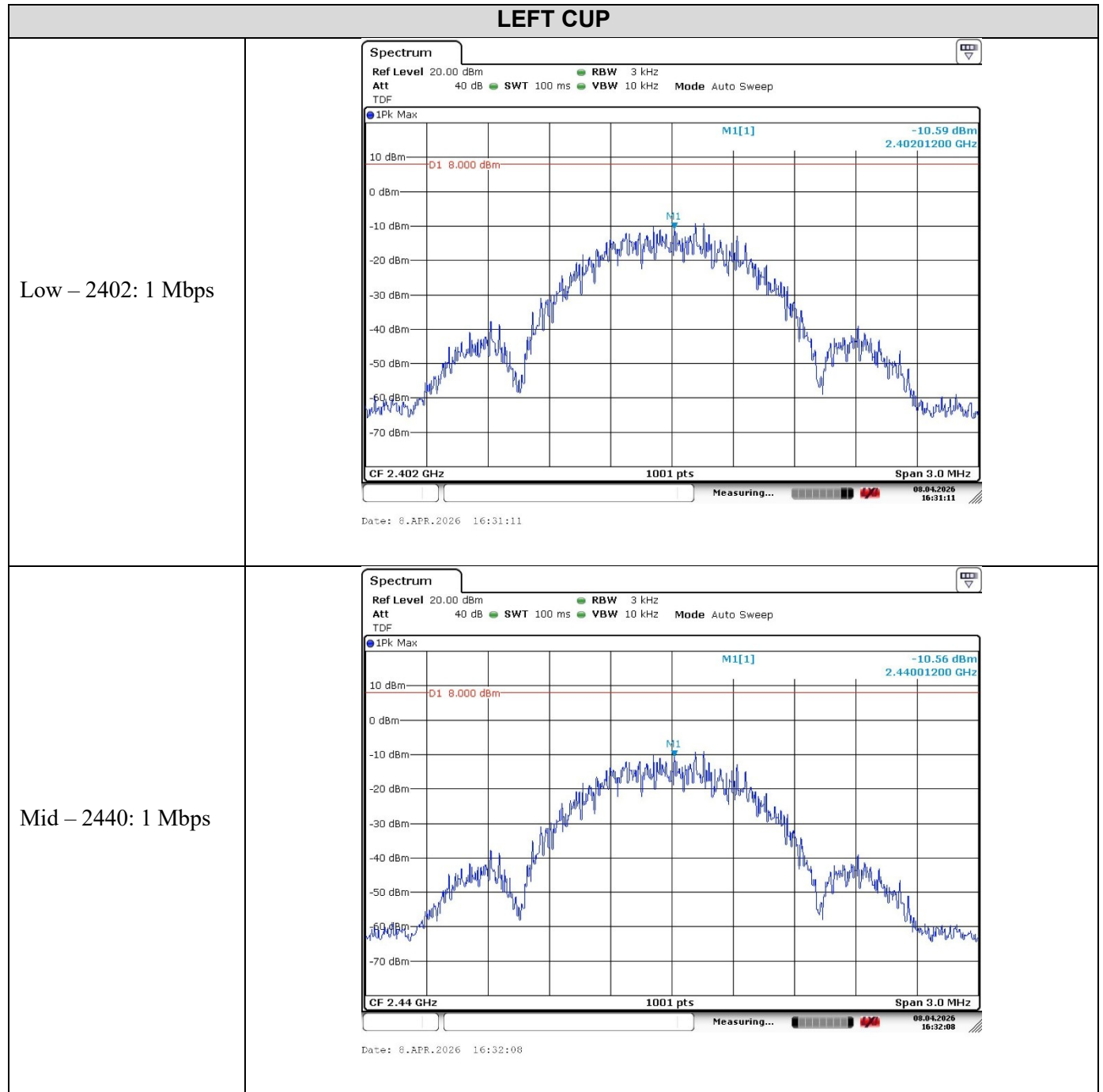
Right CUP

Type	Data rate	Channel	Frequency (MHz)	Power spectral density (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
BLE	1 Mbps	Low	2402	-10.53	8	-18.53
BLE	1 Mbps	Mid	2440	-10.58	8	-18.58
BLE	1 Mbps	High	2480	-10.27	8	-18.27
BLE	2 Mbps	Low	2404	-12.78	8	-20.78
BLE	2 Mbps	Mid	2440	-15.10	8	-23.10
BLE	2 Mbps	High	2478	-12.21	8	-20.21

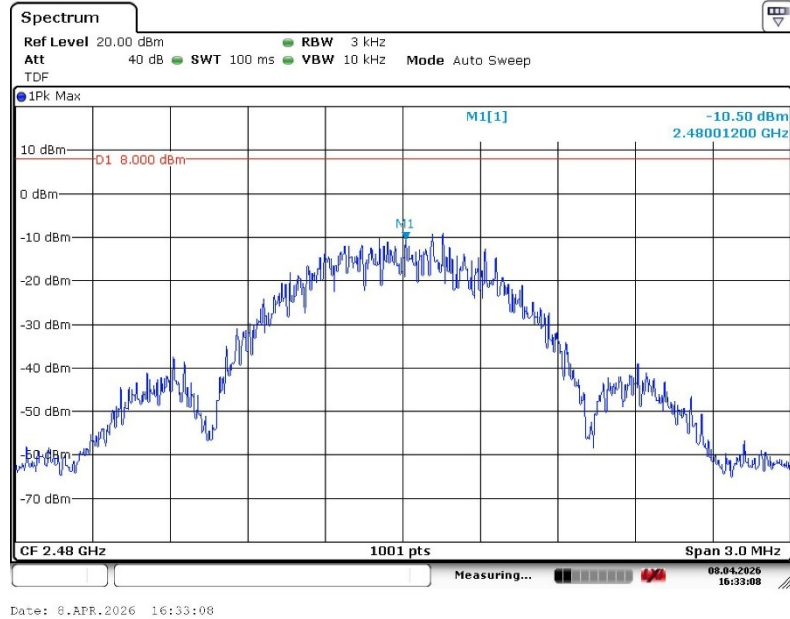
Calculation:

Margin (dB) = Power spectral density (dBm/3kHz) – Limit (dBm/3kHz)

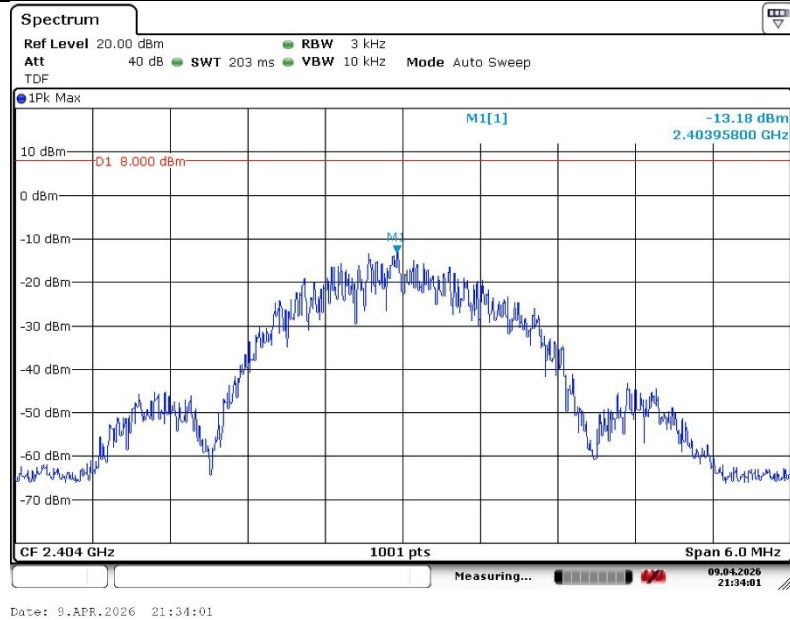
TEST PLOTS



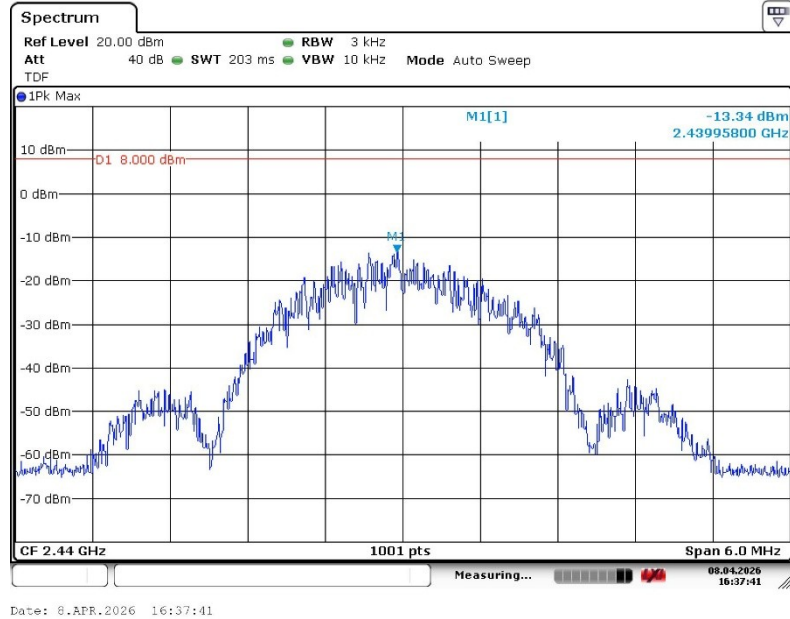
High – 2480: 1 Mbps



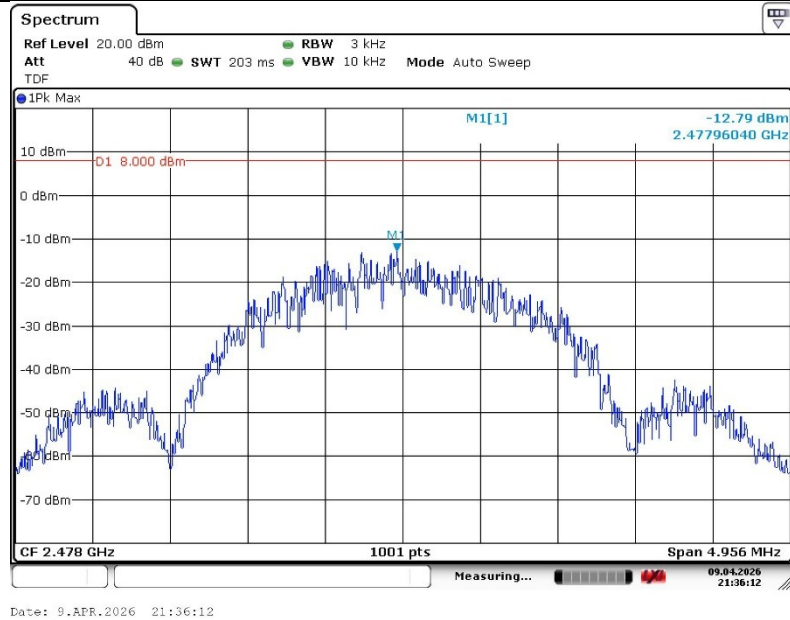
Low – 2404: 2 Mbps



Mid – 2440: 2 Mbps

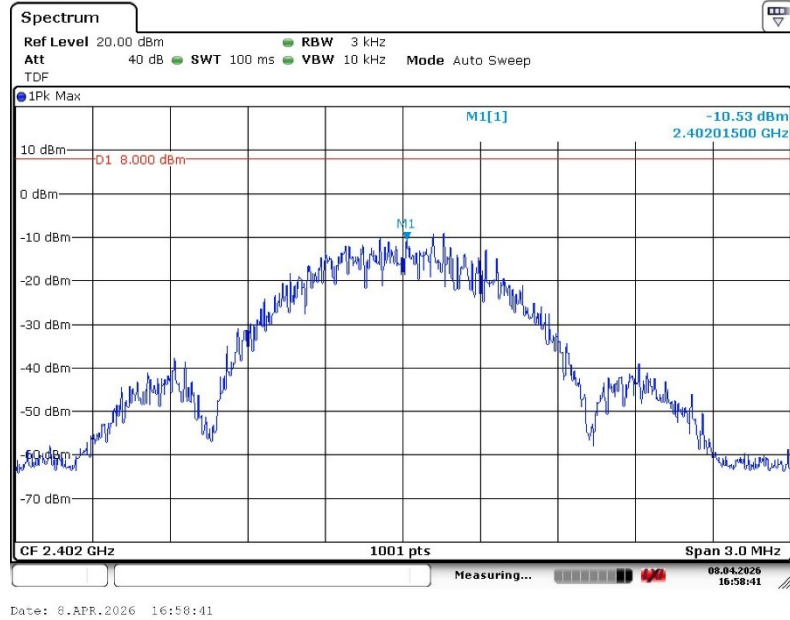


High – 2478: 2 Mbps

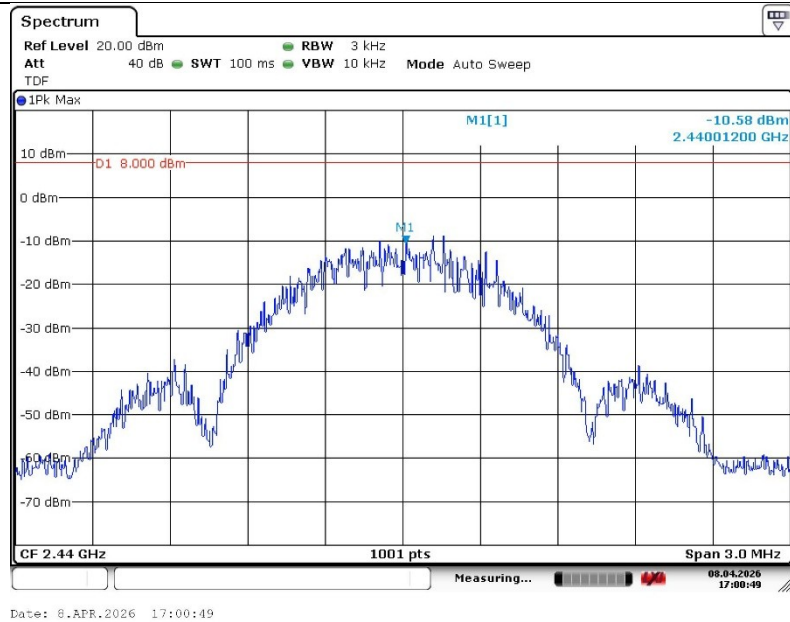


Right CUP

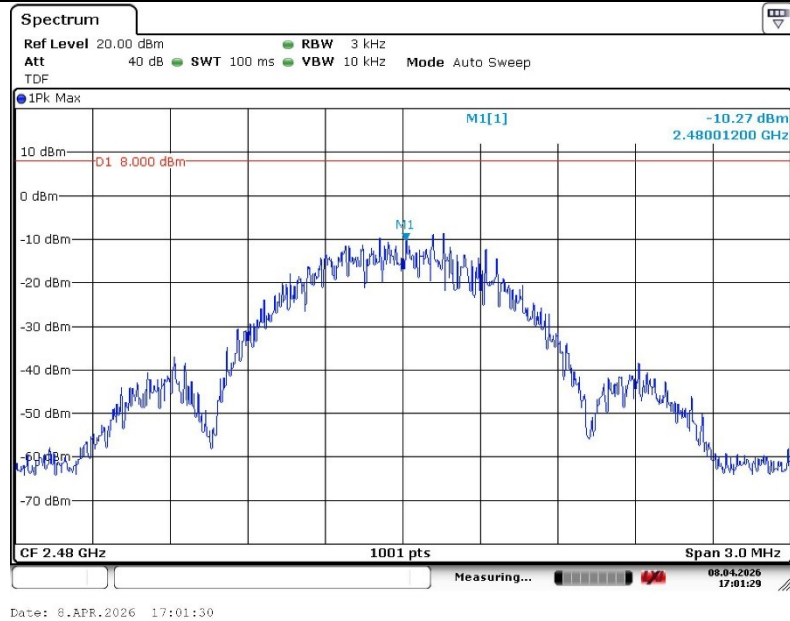
Low – 2402: 1 Mbps



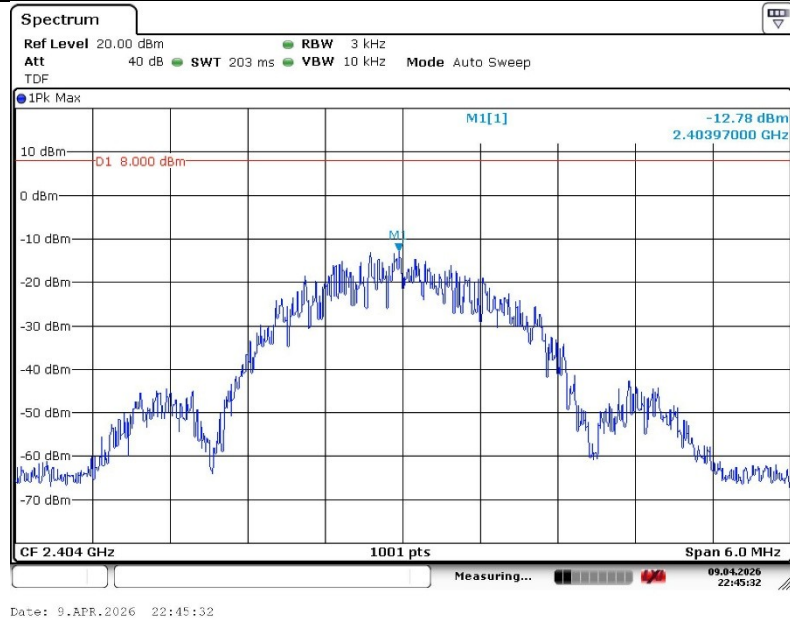
Mid – 2440: 1 Mbps



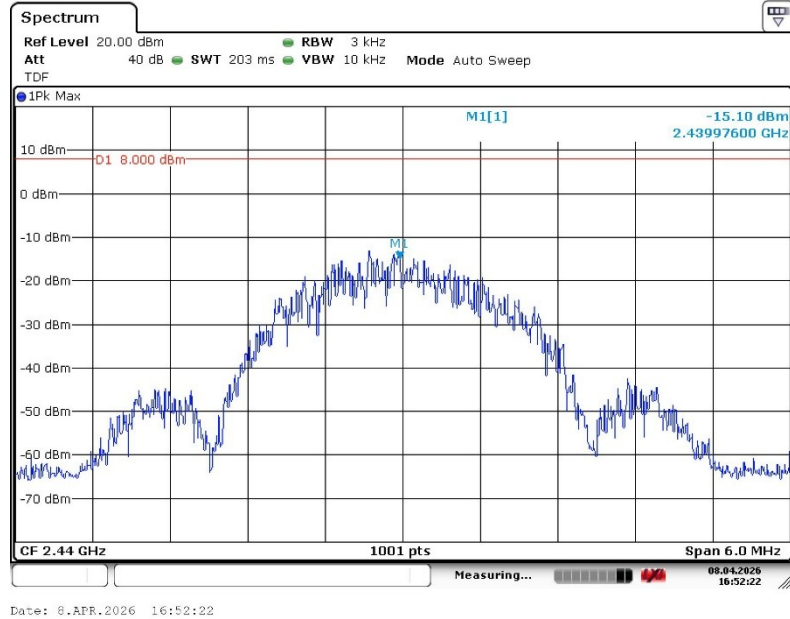
High – 2480: 1 Mbps



Low – 2404: 2 Mbps



Mid – 2440: 2 Mbps



High – 2478: 2 Mbps

