



FCC REPORT

Applicant	:	AEC Lighting Solutions Co., Ltd.
Address of Applicant	:	No. 2548 Baoan Road Jiading District, 201801 Shanghai, P.R. China
Manufacturer	:	AEC Lighting Solutions Co., Ltd.
Address of Manufacturer	:	No. 2548 Baoan Road Jiading District, 201801 Shanghai, P.R. China
Equipment under Test	:	Sol 5 Spectra Bluetooth RGBCW & Bi-Color Light
Model No.	:	Sol 5 RGB/Sol 5
FCC ID	:	2ANLP-HARLOWESOL5
Test Standard(s)	:	FCC Rules and Regulations Part 15 Subpart C Section 15.247, ANSI C63.10:2013
Report No.	:	A2504088-C02-R01
Issue Date	:	2025/04/29
Issued By	:	Shenzhen Alpha Product Testing Co., Ltd. Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen City, Guangdong Province, P.R. China.

Table of Contents

1.	Summary of Test Results	7
2.	General Test Information.....	8
2.1.	Description of EUT	8
2.2.	Accessories of EUT	9
2.3.	Block diagram of EUT configuration for test.....	9
2.4.	Test mode description	9
2.5.	Deviations of test standard	9
2.6.	Test environment conditions	9
2.7.	Test laboratory	9
2.8.	Measurement uncertainty	11
3.	Spurious Emission	12
3.1.	Test equipment.....	12
3.2.	Block diagram of test setup	12
3.3.	Limits	13
3.4.	Assistant equipment used for test	14
3.5.	Test procedure	14
3.6.	Test result.....	15
3.7.	Test data	16
4.	RF Conducted Spurious Emissions	19
4.1.	Test equipment.....	19
4.2.	Block diagram of test setup	19
4.3.	Limits	19
4.4.	Assistant equipment used for test	20
4.5.	Test procedure	20
4.6.	Test result.....	20
5.	Power Line Conducted Emissions	21
5.1.	Test equipment.....	21
5.2.	Block diagram of test setup	21
5.3.	Limits	21
5.4.	Assistant equipment used for test	21
5.5.	Test procedure	21
5.6.	Test result.....	22
5.7.	Test data	23
6.	Maximum Conducted Output Power	25
6.1.	Test equipment.....	25
6.2.	Block diagram of test setup	25

6.3.	Limits	25
6.4.	Assistant equipment used for test	25
6.5.	Test procedure	25
6.6.	Test result.....	26
7.	Maximum Power Spectral Density Level.....	27
7.1.	Test equipment.....	27
7.2.	Block diagram of test setup	27
7.3.	Limits	27
7.4.	Assistant equipment used for test	27
7.5.	Test procedure	27
7.6.	Test result.....	28
8.	-6 dB Bandwidth and 99% Bandwidth	29
8.1.	Test equipment.....	29
8.2.	Block diagram of test setup	29
8.3.	Limits	29
8.4.	Assistant equipment used for test	29
8.5.	Test procedure	29
8.6.	Test result.....	30
9.	Band Edge(Conducted).....	31
9.1.	Test equipment.....	31
9.2.	Block diagram of test setup	31
9.3.	Limits	31
9.4.	Assistant equipment used for test	31
9.5.	Test procedure	31
9.6.	Test result.....	32
10.	Band Edge(Radiated).....	33
10.1.	Test equipment.....	33
10.2.	Block diagram of test setup	33
10.3.	Limits	33
10.4.	Assistant equipment used for test	33
10.5.	Test procedure	34
10.6.	Test result.....	34
10.7.	Test data	34
11.	Antenna Requirement	36
11.1.	Test equipment.....	36
11.2.	Block diagram of test setup	36
11.3.	Limits	36
11.4.	Assistant equipment used for test	36

11.5. Test procedure36

11.6. Test result.....37

12. Test Setup Photograph38

13. Photos of the EUT40

14. Annex44

Test Report Declare

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Manufacturer	:	AEC Lighting Solutions Co., Ltd.
Address of Manufacturer	:	No. 2548 Baoan Road Jiading District, 201801 Shanghai, P.R. China
Equipment under Test	:	Sol 5 Spectra Bluetooth RGBCW & Bi-Color Light
Model No.	:	Sol 5 RGB/Sol 5
Trademark	:	/

Test Standard Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247, ANSI C63.10:2013

We Declare:

The equipment described above is tested by Shenzhen Alpha Product Testing 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 Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

Report No.:	A2504088-C02-R01		
Date of Receipt:	2025/04/14	Date of Test:	2025/04/14 - 2025/04/29

Prepared By:

Yannis Wen/Engineer

Approved By:

Jack Xu/EMC Manager



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

Revision History

Rev.	Revisions	Issue Date	Revised By
V0	Initial issue	2025/04/29	Yannis Wen

1. Summary of Test Results

No.	Test Parameter	Clause No.	Result
1	Spurious Emission	FCC Part 15: 15.209, FCC Part 15: 15.247(d), ANSI C63.10 :2013	Pass
2	RF Conducted Spurious Emissions	FCC Part 15: 15.247(d), ANSI C63.10 :2013	Pass
3	Power Line Conducted Emissions	FCC Part 15: 15.207, ANSI C63.10 :2013	Pass
4	Maximum Conducted Output Power	FCC Part 15: 15.247(b)(3), ANSI C63.10 :2013	Pass
5	Maximum Power Spectral Density Level	FCC PART 15:15.247(e), ANSI C63.10 :2013	Pass
6	-6 dB Bandwidth and 99% Bandwidth	FCC PART 15:15.247(a)(2), ANSI C63.10 :2013	Pass
7	Band Edge(Conducted)	FCC Part 15: 15.247(d), ANSI C63.10 :2013	Pass
8	Band Edge(Radiated)	FCC Part 15: 15.247(d), ANSI C63.10 :2013	Pass
9	Antenna Requirement	FCC Part 15: 15.203	Pass

Note: 1.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. Decision rules for the conclusion of this test report: decision by actual test data without considering measurement uncertainty.

Software Information			
Test Item	Software Name	Manufacturer	Version
RE	EZ-EMC	Farad	Alpha-3A1
RF-CE	MTS 8310	MWRFTtest	V2.0.0.0

2. General Test Information

2.1. Description of EUT

EUT Name	:	Sol 5 Spectra Bluetooth RGBCW & Bi-Color Light
Model Number	:	Sol 5 RGB/Sol 5
Difference of model number	:	/
Power Supply	:	DC 3.7V from battery, DC 5V from adapter
Hardware Version	:	V1.0
Software Version	:	V1.0

Radio Specification	:	Bluetooth LE
Operation Frequency	:	2402 MHz to 2480 MHz
Modulation	:	GFSK
Data Rate	:	1Mbps
Antenna Type	:	PCB Antenna
Max Antenna Gain(dBi)	:	-0.41dBi(Antenna information is provided by applicant.)

Bluetooth LE 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		

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.

“☒” means to be chosen or applicable; “☐” means don't to be chosen or not applicable; This note applies to entire report.

2.2. Accessories of EUT

Accessories	Manufacturer	Model number	Description
/	/	/	/

2.3. Block diagram of EUT configuration for test



2.4. Test mode description

The test software "RTL8762x_RFTTestTool.exe" was used to control EUT work in Continuous TX mode, and select test channel, default power level, wireless mode:

Mode	Channel	Frequency (MHz)
GFSK(1Mbps) TX Mode	Low : CH0	2402
	Middle: CH19	2440
	High: CH39	2480
Charging	/	/

2.5. Deviations of test standard

No deviation.

2.6. Test environment conditions

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

Items	Required
Temperature range:	15-35°C
Humidity range:	25-75%
Pressure range:	86-106kPa

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

Shenzhen Alpha Product Testing Co., Ltd.

Add.: Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen City, Guangdong Province, P.R. China.

Tel.: 4008-3008-95, Website: <http://www.a-lab.cn>, Email: service@a-lab.cn

CNAS Accreditation No. L7472; A2LA Accreditation Number: 4762.01

FCC Designation Number: CN1182, Test Firm Registration Number: 203110

Innovation, Science and Economic Development Canada Site Registration Number: 12135A

2.8. Measurement uncertainty

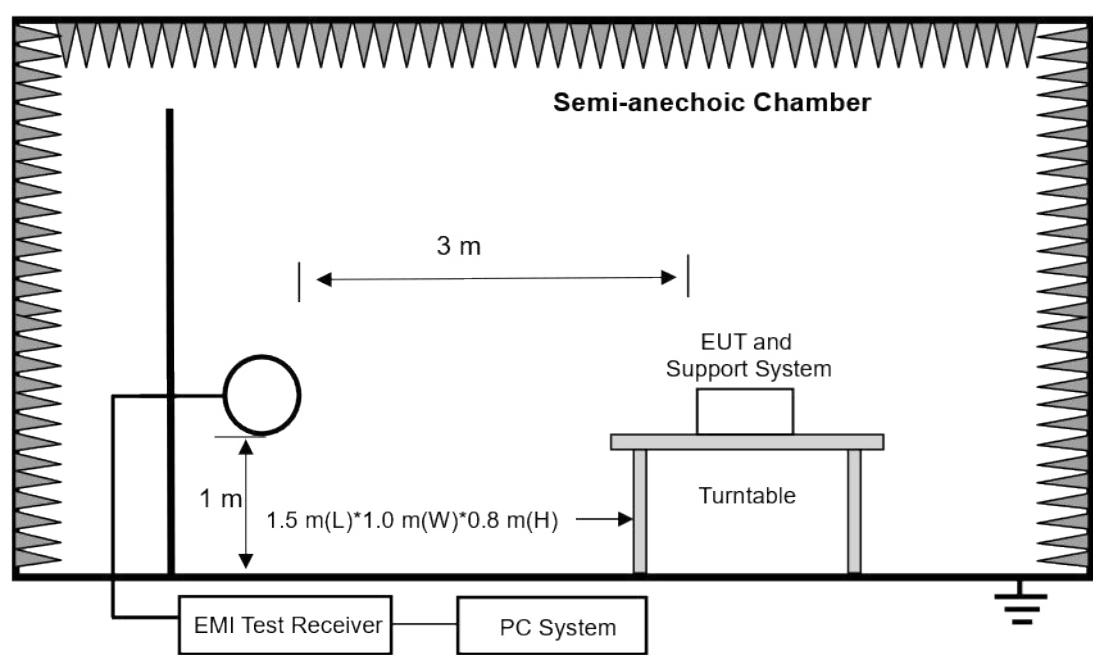
Item	Uncertainty
Uncertainty for Power point Conducted Emissions Test	1.63dB
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	3.5dB
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.74dB(Polarize: V)
	3.76dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	3.77dB(Polarize: V)
	3.80dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (18GHz to 40GHz)	4.31 dB(Polarize: V)
	4.30 dB(Polarize: H)
Uncertainty for radio frequency	5.06×10^{-8} GHz
Uncertainty for conducted RF Power	0.40dB
Uncertainty for temperature	0.2°C
Uncertainty for humidity	1%
Uncertainty for DC and low frequency voltages	0.06%

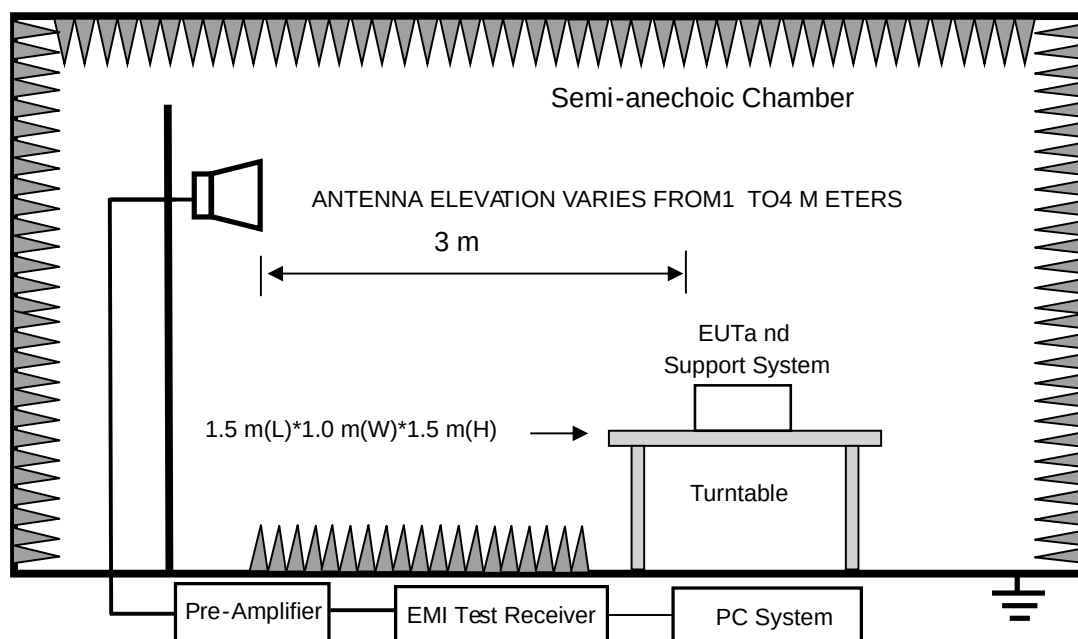
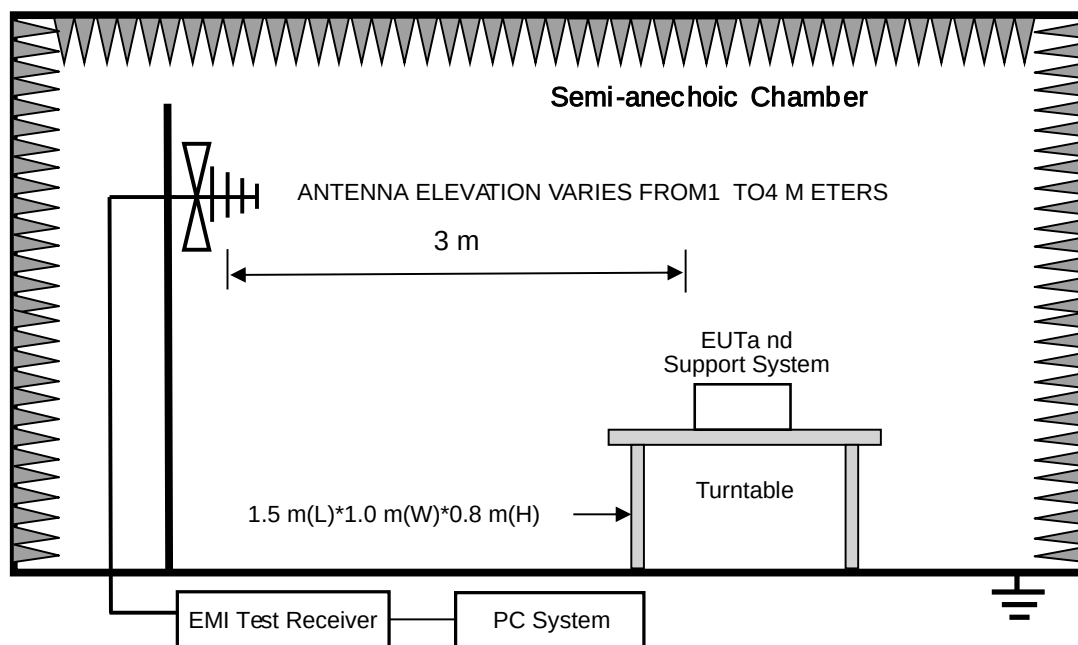
3. Spurious Emission

3.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal Due To
Horn Antenna	SCHWARZBEC K	BBHA 9120 D	Aa-EE076	2023/08/19	2025/08/18
Horn Antenna	SCHWARZBEC K	BBHA 9170	Aa-EE077	2023/08/19	2025/08/18
Amplifier	SKET	LNPA_0118G -45	Aa-EE087	2024/08/08	2025/08/07
Loop Antenna	SCHWARZBEC K	FMZB 1519B	Aa-EE074	2023/08/19	2025/08/18
Bilog Antenna	SCHWARZBEC K	VULB 9168	Aa-EE001	2023/08/28	2025/08/27
Spectrum analyzer	ROHDE&SCH WARZ	FSU	Aa-EE075	2024/08/08	2025/08/07
Test Receiver	ROHDE&SCH WARZ	ESR	Aa-EE048	2024/08/08	2025/08/07

3.2. Block diagram of test setup





3.3. Limits

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 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
¹ 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

(2) FCC 15.209 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: Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

3.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
/	/	/	/	/

3.5. Test procedure

The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1GHz, The EUT was placed on a rotating 0.8 m high above ground for below 1GHz and 1.5m high for above 1GHz testing, The table was rotated 360 degrees to determine the position of the highest radiation

The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set of make measurement.

The initial step in collecting conducted emission data is a spectrum analyzer Peak detector mode pre-scanning the measurement frequency range. Significant Peaks are then marked. and then Qusia Peak Detector mode premeasured

If Peak value comply with QP limit Below 1GHz. The EUT deemed to comply with QP limit. But the Peak value and average value both need to comply with applicable limit above 1GHz.

For the actual test configuration, please see the test setup photo.

3.6. Test result

PASS. (See below detailed test result)

3.7. Test data



深圳阿尔法商品检验有限公司

SHENZHEN ALPHA PRODUCT TESTING CO.,LTD.

深圳阿尔法商品检验有限公司

Shenzhen Alpha Product Testing Co.,Ltd.

地址: ALPHA 广东省深圳市宝安区福永街道立新路 2 号 i 栋

TEL: 4008-3008-95

Site LAB 966 Chamber 1

Polarization: Vertical

Temperature: 22.8

Limit: FCC Part 15 Class B Radiation (30-1000)

Power: DC 3.7V From battery

Humidity: 54 %

EUT/Task No : A2504088-C02

Distance: 3m

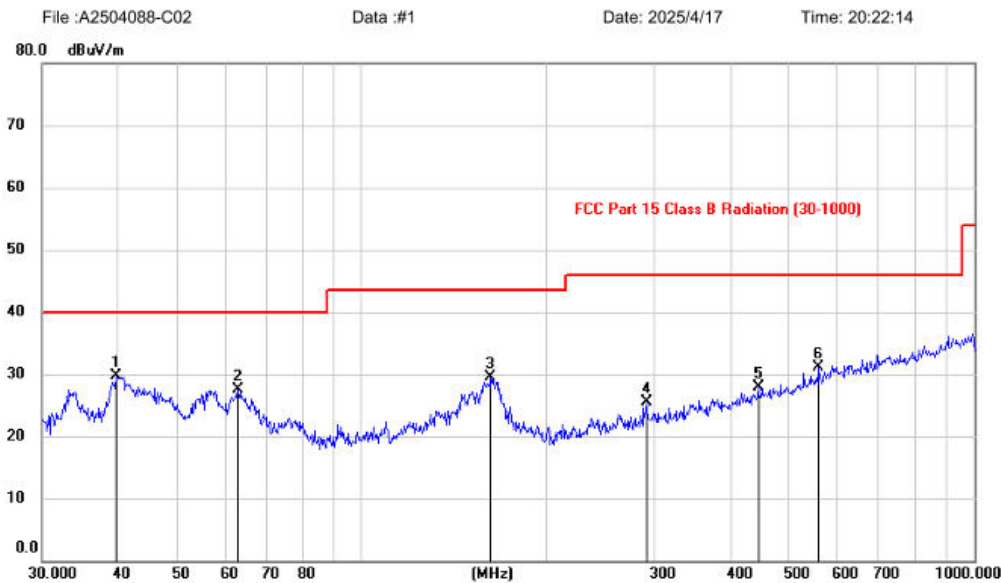
M/N/Sample No: A2504088-S0004

Mode : Mode 1

Note:

Engineer Signature: *yanniz wen*

Radiated Emission Measurement



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	39.6728	15.28	14.47	29.75	40.00	-10.25	peak		
2		62.7678	14.88	12.60	27.48	40.00	-12.52	peak		
3		162.1357	14.58	14.83	29.41	43.50	-14.09	peak		
4		291.9216	11.67	13.92	25.59	46.00	-20.41	peak		
5		444.2798	10.51	17.43	27.94	46.00	-18.06	peak		
6		558.3383	11.77	19.34	31.11	46.00	-14.89	peak		

Note: 1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

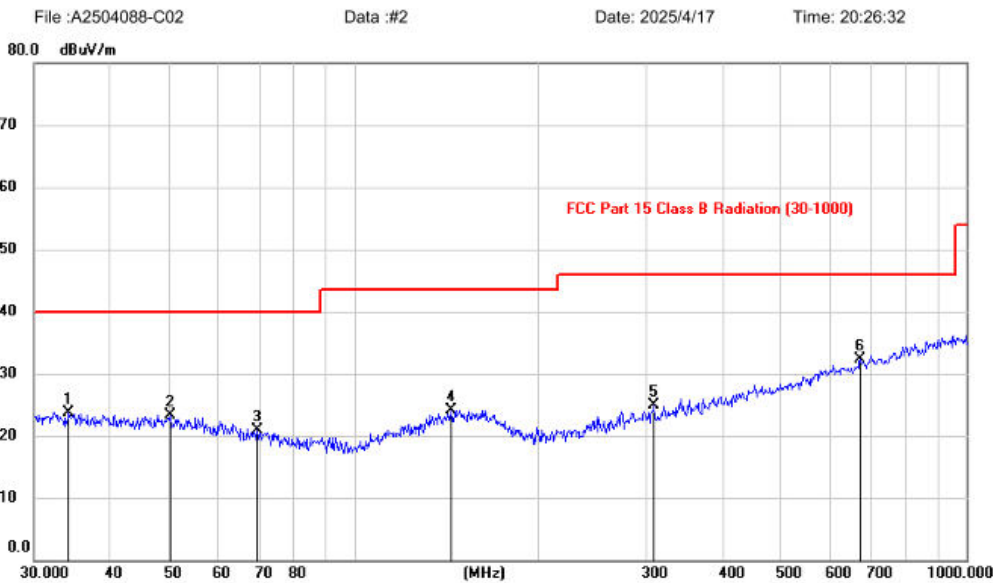


深圳阿尔法商品检验有限公司 深圳阿尔法商品检验有限公司
SHENZHEN ALPHA PRODUCT TESTING CO.,LTD. Shenzhen Alpha Product Testing Co.,Ltd.

地址: ALPHA 广东省深圳市宝安区福永街道立新路 2 号 i 栋
TEL: 4008-3008-95

Site LAB 966 Chamber 1	Polarization: Horizontal	Temperature: 22.8
Limit: FCC Part 15 Class B Radiation (30-1000)	Power: DC 3.7V From battery	Humidity: 54 %
EUT/Task No : A2504088-C02	Distance: 3m	
M/N/Sample No: A2504088-S0004		
Mode : Mode 1		
Note:		
Engineer Signature: <i>Yanni3 wen</i>		

Radiated Emission Measurement



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree
1		34.1760	9.93	13.71	23.64	40.00	-16.36	peak	
2		50.2146	9.38	14.01	23.39	40.00	-16.61	peak	
3		69.5841	9.44	11.42	20.86	40.00	-19.14	peak	
4		143.9302	9.56	14.61	24.17	43.50	-19.33	peak	
5		309.8890	10.53	14.34	24.87	46.00	-21.13	peak	
6	*	671.9012	10.95	21.35	32.30	46.00	-13.70	peak	

Note: 1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

1Mbps

From 1G-25GHz

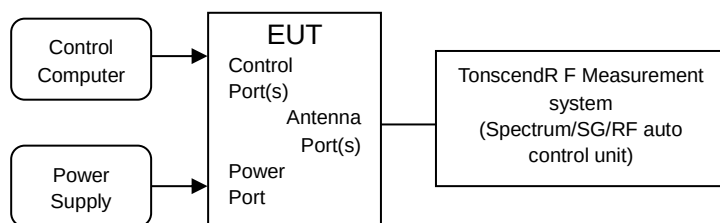
Test Mode: TX Low									
Freq (MHz)	Read Level (dBuV/m)	Polar (H/V)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4804	41.86	V	33.95	10.18	34.26	51.73	74	-22.27	PK
4804	34.98	V	33.95	10.18	34.26	44.85	54	-9.15	AV
7206	/	/	/	/	/	/	/	/	/
9608	/	/	/	/	/	/	/	/	/
4804	45.02	H	33.95	10.18	34.26	54.89	74	-19.11	PK
4804	37.51	H	33.95	10.18	34.26	47.38	54	-6.62	AV
7206	/	/	/	/	/	/	/	/	/
9608	/	/	/	/	/	/	/	/	/
Test Mode: TX Mid									
4880	42.05	V	33.93	10.2	34.29	51.89	74	-22.11	PK
4880	36.09	V	33.93	10.2	34.29	45.93	54	-8.07	AV
7320	/	/	/	/	/	/	/	/	/
9760	/	/	/	/	/	/	/	/	/
4880	45.70	H	33.93	10.2	34.29	55.54	74	-18.46	PK
4880	36.63	H	33.93	10.2	34.29	46.47	54	-7.53	AV
7320	/	/	/	/	/	/	/	/	/
9760	/	/	/	/	/	/	/	/	/
Test Mode: TX High									
4960	45.83	V	33.98	10.22	34.25	55.78	74	-18.22	PK
4960	35.59	V	33.98	10.22	34.25	45.54	54	-8.46	AV
7440	/	/	/	/	/	/	/	/	/
9920	/	/	/	/	/	/	/	/	/
4960	41.92	H	33.98	10.22	34.25	51.87	74	-22.13	PK
4960	36.85	H	33.98	10.22	34.25	46.80	54	-7.20	AV
7440	/	/	/	/	/	/	/	/	/
9920	/	/	/	/	/	/	/	/	/
Note:									
1, Result = Read level + Antenna factor + cable loss-Amp factor									
2, All the other emissions not reported were too low to read and deemed to comply with FCC limit.									

4. RF Conducted Spurious Emissions

4.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal Due To
Power Sensor	Agilent	E9300A	Aa-EE046	2024/08/08	2025/08/07
CMW500	ROHDE&SCHWARZ	CMW500	Aa-EE073	2024/08/08	2025/08/07
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	Aa-EE081	2024/08/08	2025/08/07
Vector Signal Generator	Agilent	N5182A	Aa-EE040	2024/08/08	2025/08/07
Power Sensor	DARE	RPR3006W	Aa-EE070	2024/08/08	2025/08/07
Power Sensor	DARE	RPR3006W	Aa-EE071	2024/08/08	2025/08/07
Signal Analyzer	Agilent	N9020A	Aa-EE039	2024/08/08	2025/08/07

4.2. Block diagram of test setup



4.3. Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20dB.

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 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
¹ 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

4.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
/	/	/	/	/

4.5. Test procedure

The test receiver set RBW = 100kHz, VBW≥3*RBW =300kHz, sweep time set auto, detail see the test plot

4.6. Test result

Test Site: RF Laboratory	Test Date: 2025/04/15--2025/04/15
Condition: 24°C,56%RH,101kPa	Test Engineer: Yannis Wen
Memo: /	

EUT Name: Sol 5 Spectra Bluetooth RGBCW & Bi-Color Light	EUT Model: Sol 5 RGB/Sol 5
Sample No.: A2504088-S0004	Test Mode: GFSK(1Mbps) TX Mode
Power supply: DC 3.7V from battery	Memo: The test data can be referred to the Annex Conducted RF Spurious Emission

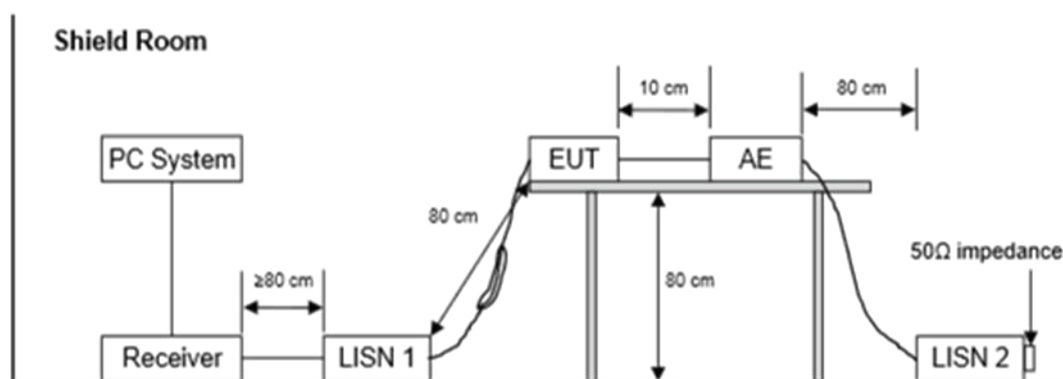
/

5. Power Line Conducted Emissions

5.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal Due To
Test Receiver	ROHDE&SCHWARZ	ESCI	Aa-EE005	2024/08/08	2025/08/07
Pulse Limiter	SCHWARZBECK	9516F	Aa-EE004	2024/08/08	2025/08/07
L.I.S.N.	SCHWARZBECK	NSLK8126	Aa-EE003	2024/08/08	2025/08/07

5.2. Block diagram of test setup



5.3. Limits

Frequency	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150 kHz~500 kHz	66 ~ 56*	56 ~ 46*
500 kHz~5 MHz	56	46
5 MHz~30 MHz	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

3. The limit decreases in line with the logarithm of the frequency in rang of 0.15 to 0.50 MH

5.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
/	/	/	/	/

5.5. Test procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10:2013 on Conducted Emission Measurement.

The bandwidth of test receiver is set at 9 kHz.

5.6. Test result

PASS. (See below detailed test result)

Note1: All emissions not reported below are too low against the prescribed limits.

Note2: “-----” means Peak detection; “-----” means Average detection.

Note3: Pre-test AC conducted emission at both voltage AC 120V/60Hz and AC 240V/50Hz, recorded the worst case.

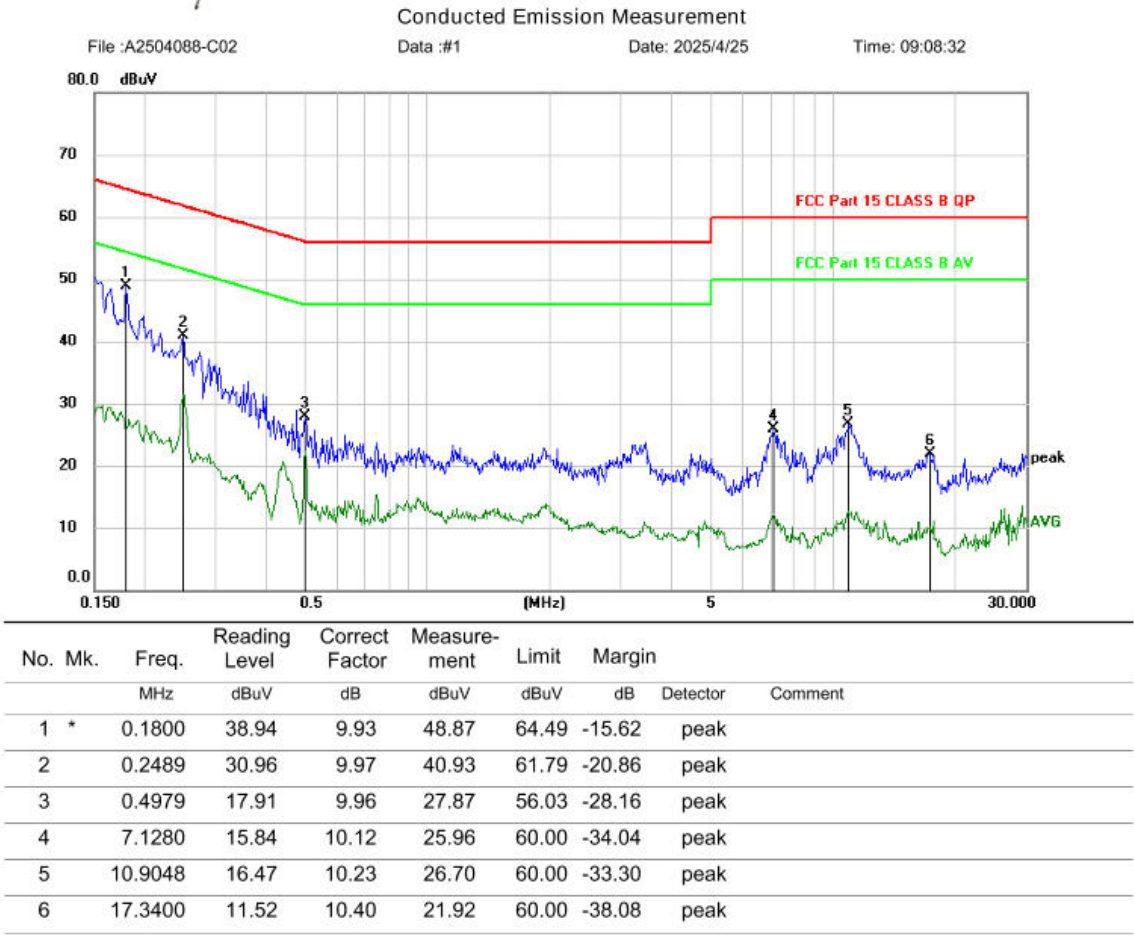
5.7. Test data



深圳阿尔法商品检验有限公司
SHENZHEN ALPHA PRODUCT TESTING CO.,LTD.

深圳阿尔法商品检验有限公司
Shenzhen Alpha Product Testing Co.,Ltd.
地址: ALPHA 广东省深圳市宝安区福永街道立新路 2 号 i 栋
TEL: 4008-3008-95

Site LAB	Phase: N	Temperature: 23.2
Limit: FCC Part 15 CLASS B QP	Power: DC 5V From Adapter	Humidity: 55 %
EUT/Task No : A2504088-C02		
M/N/Sample No: A2504088-S0004		
Mode : Mode 1		
Note:		
Engineer Signature: <i>Yanni3 wen</i>		



*:Maximum data x:Over limit !:over margin <Reference Only
Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable



深圳阿尔法商品检验有限公司
SHENZHEN ALPHA PRODUCT TESTING CO.,LTD.

深圳阿尔法商品检验有限公司
Shenzhen Alpha Product Testing Co.,Ltd.

地址: ALPHA 广东省深圳市宝安区福永街道立新路 2 号 i 栋
TEL: 4008-3008-95

Site LAB

Phase: L1

Temperature: 23.2

Limit: FCC Part 15 CLASS B QP

Power: DC 5V From Adapter

Humidity: 55 %

EUT/Task No : A2504088-C02

M/N/Sample No: A2504088-S0004

Mode : Mode 1

Note:

Engineer Signature: Vannu3 Wen

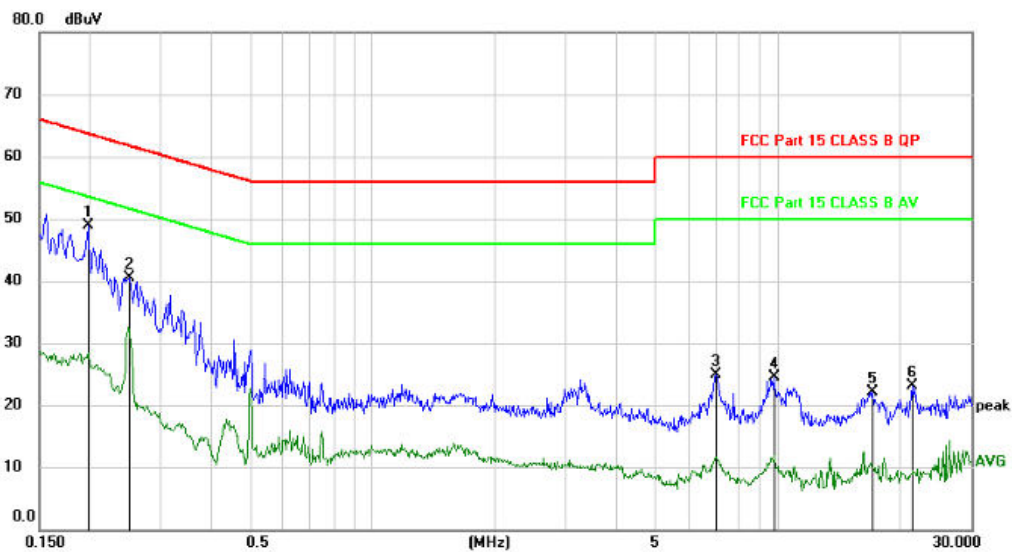
Conducted Emission Measurement

File :A2504088-C02

Data :#2

Date: 2025/4/25

Time: 09:12:16



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector Comment
1	*	0.1980	38.97	9.92	48.89	63.69	-14.80	peak
2		0.2519	30.48	9.97	40.45	61.69	-21.24	peak
3		7.0620	14.74	10.12	24.86	60.00	-35.14	peak
4		9.7980	14.30	10.20	24.50	60.00	-35.50	peak
5		17.1299	11.74	10.39	22.13	60.00	-37.87	peak
6		21.4318	12.68	10.46	23.14	60.00	-36.86	peak

*:Maximum data x:Over limit !:over margin

&ltReference Only

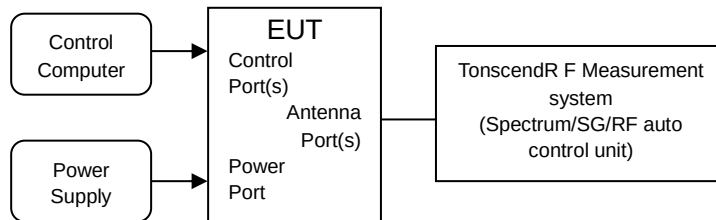
Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

6. Maximum Conducted Output Power

6.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal Due To
Power Sensor	DARE	RPR3006W	Aa-EE071	2024/08/08	2025/08/07
Power Sensor	DARE	RPR3006W	Aa-EE070	2024/08/08	2025/08/07
Power Sensor	Agilent	E9300A	Aa-EE046	2024/08/08	2025/08/07
Spectrum analyzer	ROHDE&SCH WARZ	FSV40-N	Aa-EE081	2024/08/08	2025/08/07
Signal Analyzer	Agilent	N9020A	Aa-EE039	2024/08/08	2025/08/07
Vector Signal Generator	Agilent	N5182A	Aa-EE040	2024/08/08	2025/08/07
CMW500	ROHDE&SCH WARZ	CMW500	Aa-EE073	2024/08/08	2025/08/07

6.2. Block diagram of test setup



6.3. Limits

Please refer section 15.247.

6.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
/	/	/	/	/

6.5. Test procedure

Details see the KDB 558074 D01 15.247 Meas Guidance v05r02

5.2.1 Place the EUT on the table and set it in transmitting mode.

5.2.2 Measure out each mode and each bands peak output power of EUT.

Note: The cable loss and attenuator loss were offset into measure device as amplitude offset.

6.6. Test result

Test Site: RF Laboratory	Test Date: 2025/04/15--2025/04/15
Condition: 24°C,56%RH,101kPa	Test Engineer: Yannis Wen
Memo: /	

EUT Name: Sol 5 Spectra Bluetooth RGBCW & Bi-Color Light	EUT Model: Sol 5 RGB/Sol 5
Sample No.: A2504088-S0004	Test Mode: GFSK(1Mbps) TX Mode
Power supply: DC 3.7V from battery	Memo: The test data can be referred to the Annex Maximum Conducted Output Power

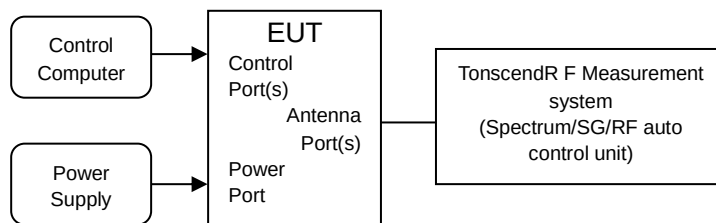
/

7. Maximum Power Spectral Density Level

7.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal Due To
CMW500	ROHDE&SCH WARZ	CMW500	Aa-EE073	2024/08/08	2025/08/07
Vector Signal Generator	Agilent	N5182A	Aa-EE040	2024/08/08	2025/08/07
Power Sensor	Agilent	E9300A	Aa-EE046	2024/08/08	2025/08/07
Power Sensor	DARE	RPR3006W	Aa-EE070	2024/08/08	2025/08/07
Spectrum analyzer	ROHDE&SCH WARZ	FSV40-N	Aa-EE081	2024/08/08	2025/08/07
Signal Analyzer	Agilent	N9020A	Aa-EE039	2024/08/08	2025/08/07
Power Sensor	DARE	RPR3006W	Aa-EE071	2024/08/08	2025/08/07

7.2. Block diagram of test setup



7.3. Limits

Please refer section 15.247.

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

The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

7.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
/	/	/	/	/

7.5. Test procedure

Details see the KDB 558074 D01 15.247 Meas Guidance v05r02

Place the EUT on the table and set it in transmitting mode.

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

Set the spectrum analyzer as RBW = 3kHz(Set the RBW to: $3\text{ kHz} \leq \text{RBW} \leq 100\text{ kHz}$.), VBW = 10kHz(Set the $\text{VBW} \geq 3 \times \text{RBW}$), span=1.5×DTS bandwidth., detail see the test plot.

Record the max reading.

Repeat the above procedure until the measurements for all frequencies are completed.

7.6. Test result

Test Site: RF Laboratory	Test Date: 2025/04/15--2025/04/15
Condition: 24°C,56%RH,101kPa	Test Engineer: Yannis Wen
Memo: /	

EUT Name: Sol 5 Spectra Bluetooth RGBCW & Bi-Color Light	EUT Model: Sol 5 RGB/Sol 5
Sample No.: A2504088-S0004	Test Mode: GFSK(1Mbps) TX Mode
Power supply: DC 3.7V from battery	Memo: The test data can be referred to the Annex Maximum Power Spectral Density Level

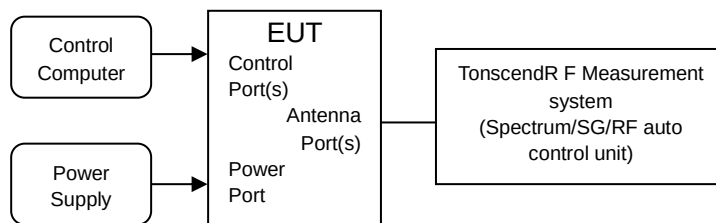
/

8. -6 dB Bandwidth and 99% Bandwidth

8.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal Due To
Power Sensor	DARE	RPR3006W	Aa-EE071	2024/08/08	2025/08/07
Spectrum analyzer	ROHDE&SCH WARZ	FSV40-N	Aa-EE081	2024/08/08	2025/08/07
Vector Signal Generator	Agilent	N5182A	Aa-EE040	2024/08/08	2025/08/07
CMW500	ROHDE&SCH WARZ	CMW500	Aa-EE073	2024/08/08	2025/08/07
Signal Analyzer	Agilent	N9020A	Aa-EE039	2024/08/08	2025/08/07
Power Sensor	DARE	RPR3006W	Aa-EE070	2024/08/08	2025/08/07
Power Sensor	Agilent	E9300A	Aa-EE046	2024/08/08	2025/08/07

8.2. Block diagram of test setup



8.3. Limits

Please refer section 15.247

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

8.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
/	/	/	/	/

8.5. Test procedure

Details see the KDB 558074 D01 15.247 Meas Guidance v05r02

a) The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

b) The test receiver set RBW = 100kHz, VBW $\geq$ 3*RBW =300kHz, sweep time set auto, detail see the test plot.

8.6. Test result

Test Site: RF Laboratory	Test Date: 2025/04/15--2025/04/15
Condition: 24°C,56%RH,101kPa	Test Engineer: Yannis Wen
Memo: /	

EUT Name: Sol 5 Spectra Bluetooth RGBCW & Bi-Color Light	EUT Model: Sol 5 RGB/Sol 5
Sample No.: A2504088-S0004	Test Mode: GFSK(1Mbps) TX Mode
Power supply: DC 3.7V from battery	Memo: The test data can be referred to the Annex -6dB Bandwidth&Occupied Channel Bandwidth

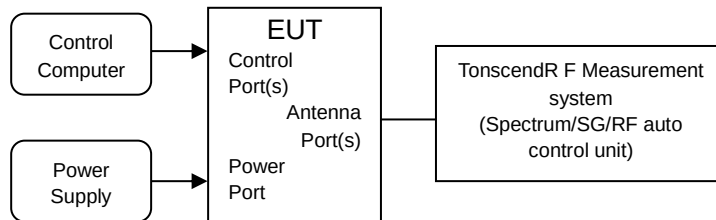
/

9. Band Edge(Conducted)

9.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal Due To
Power Sensor	DARE	RPR3006W	Aa-EE070	2024/08/08	2025/08/07
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	Aa-EE081	2024/08/08	2025/08/07
CMW500	ROHDE&SCHWARZ	CMW500	Aa-EE073	2024/08/08	2025/08/07
Power Sensor	Agilent	E9300A	Aa-EE046	2024/08/08	2025/08/07
Signal Analyzer	Agilent	N9020A	Aa-EE039	2024/08/08	2025/08/07
Vector Signal Generator	Agilent	N5182A	Aa-EE040	2024/08/08	2025/08/07
Power Sensor	DARE	RPR3006W	Aa-EE071	2024/08/08	2025/08/07

9.2. Block diagram of test setup



9.3. Limits

Please refer section 15.247.

9.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
/	/	/	/	/

9.5. Test procedure

Details see the KDB 558074 D01 15.247 Meas Guidance v05r02

- ♣ Put the EUT on a 0.8m high table, power on the EUT. Emissions were scanned and measured rotating the EUT to 360 degrees, Find the maximum Emission
- ♣ Check the spurious emissions out of band.
- ♣ RBW 1MHz, VBW 3MHz, peak detector for peak value, RBW 1MHz, VBW 3MHz, RMS detector for AV value.

9.6. Test result

Test Site: RF Laboratory	Test Date: 2025/04/15--2025/04/15
Condition: 24°C,56%RH,101kPa	Test Engineer: Yannis Wen
Memo: /	

EUT Name: Sol 5 Spectra Bluetooth RGBCW & Bi-Color Light	EUT Model: Sol 5 RGB/Sol 5
Sample No.: A2504088-S0004	Test Mode: GFSK(1Mbps) TX Mode-L/H
Power supply: DC 3.7V from battery	Memo: The test data can be referred to the Annex Band Edge

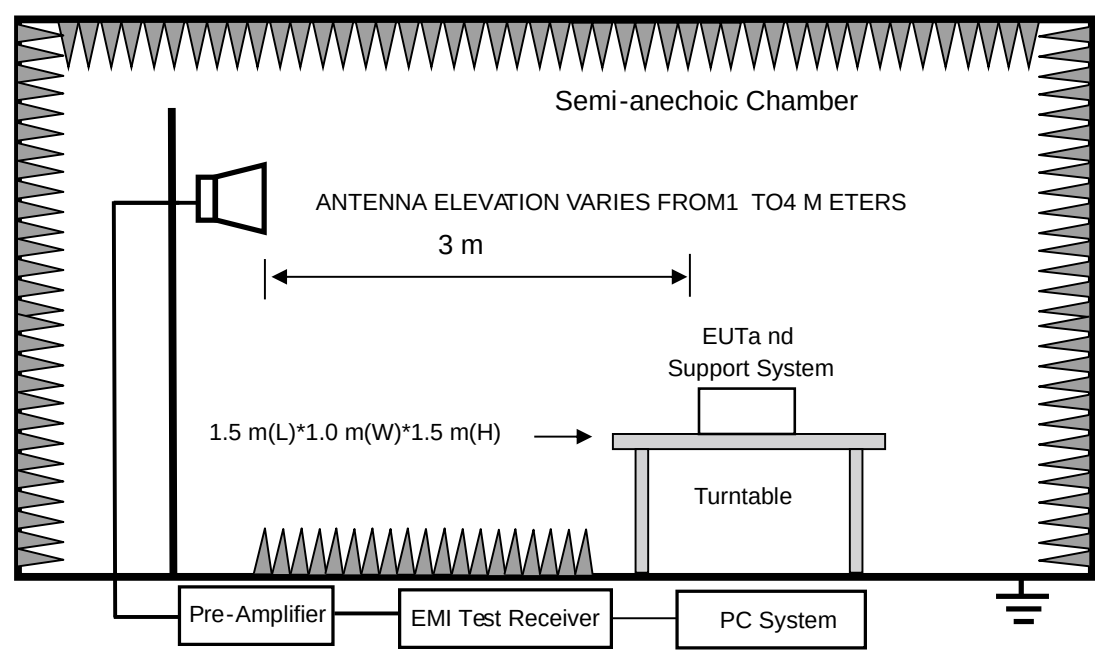
/

10.Band Edge(Radiated)

10.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal Due To
Test Receiver	ROHDE&SCHWARZ	ESR	Aa-EE048	2024/08/08	2025/08/07
Loop Antenna	SCHWARZBECK	FMZB 1519B	Aa-EE074	2023/08/19	2025/08/18
Horn Antenna	SCHWARZBECK	BBHA 9120 D	Aa-EE076	2023/08/19	2025/08/18
Amplifier	SKET	LNPA_0118G-45	Aa-EE087	2024/08/08	2025/08/07
Bilog Antenna	SCHWARZBECK	VULB 9168	Aa-EE001	2023/08/28	2025/08/27
Spectrum analyzer	ROHDE&SCHWARZ	FSU	Aa-EE075	2024/08/08	2025/08/07
Horn Antenna	SCHWARZBECK	BBHA 9170	Aa-EE077	2023/08/19	2025/08/18

10.2. Block diagram of test setup



10.3. Limits

Please refer section 15.247.

10.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
/	/	/	/	/

10.5. Test procedure

Details see the KDB 558074 D01 15.247 Meas Guidance v05r02

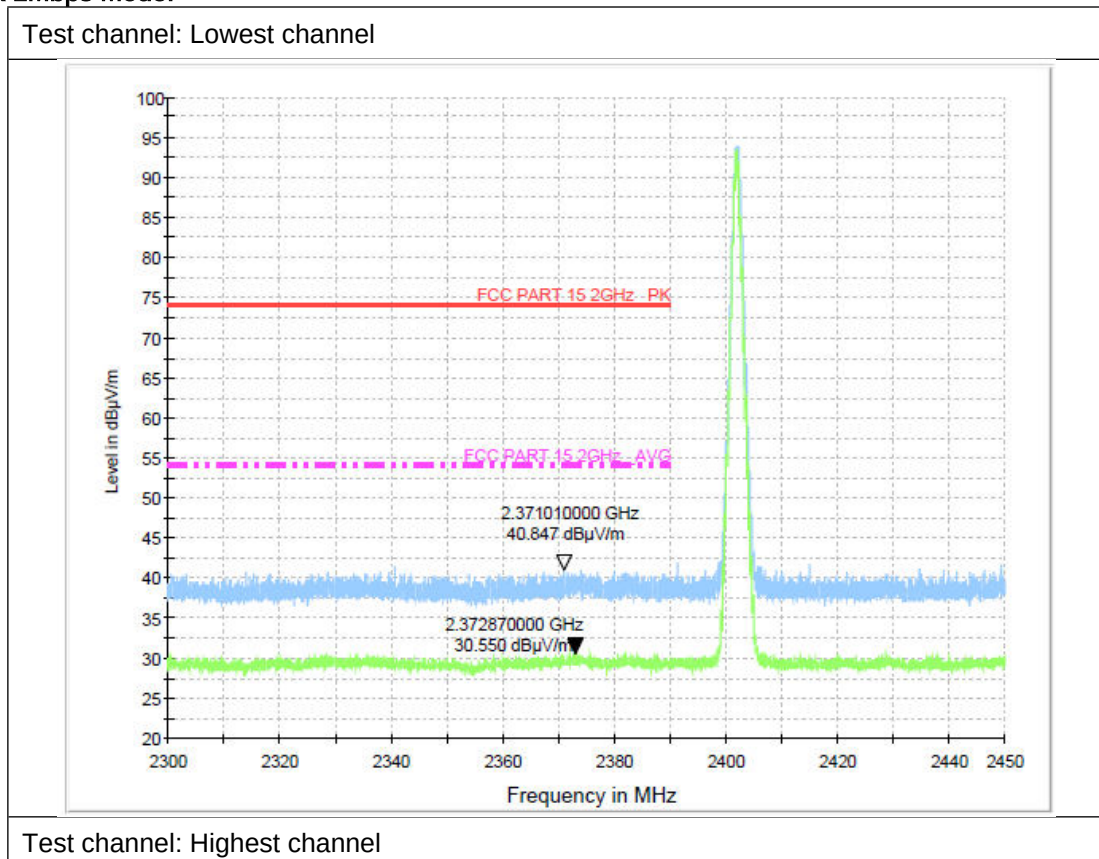
- ♣ Put the EUT on a 0.8m high table, power on the EUT. Emissions were scanned and measured rotating the EUT to 360 degrees, Find the maximum Emission
- ♣ Check the spurious emissions out of band.
- ♣ RBW 1MHz, VBW 3MHz, peak detector for peak value, RBW 1MHz, VBW 3MHz, RMS detector for AV value.

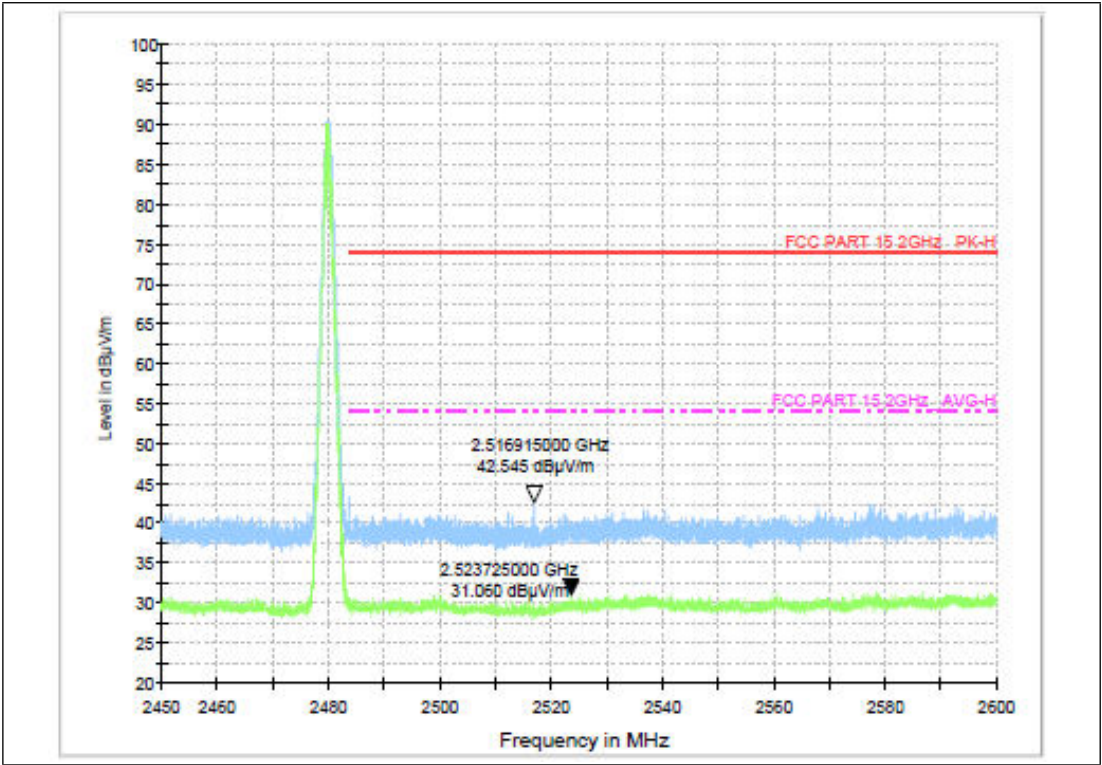
10.6. Test result

PASS. (See below detailed test result)

10.7. Test data

GFSK 1Mbps Mode:





11. Antenna Requirement

11.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal Due To
Signal Analyzer	Agilent	N9020A	Aa-EE039	2024/08/08	2025/08/07
CMW500	ROHDE&SCH WARZ	CMW500	Aa-EE073	2024/08/08	2025/08/07
Vector Signal Generator	Agilent	N5182A	Aa-EE040	2024/08/08	2025/08/07
Power Sensor	DARE	RPR3006W	Aa-EE071	2024/08/08	2025/08/07
Spectrum analyzer	ROHDE&SCH WARZ	FSV40-N	Aa-EE081	2024/08/08	2025/08/07
Power Sensor	DARE	RPR3006W	Aa-EE070	2024/08/08	2025/08/07
Power Sensor	Agilent	E9300A	Aa-EE046	2024/08/08	2025/08/07

11.2. Block diagram of test setup



11.3. Limits

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

11.4. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Description	other
/	/	/	/	/

11.5. Test procedure

The antenna is internal antenna and no consideration of replacement. Please see EUT photo for details.

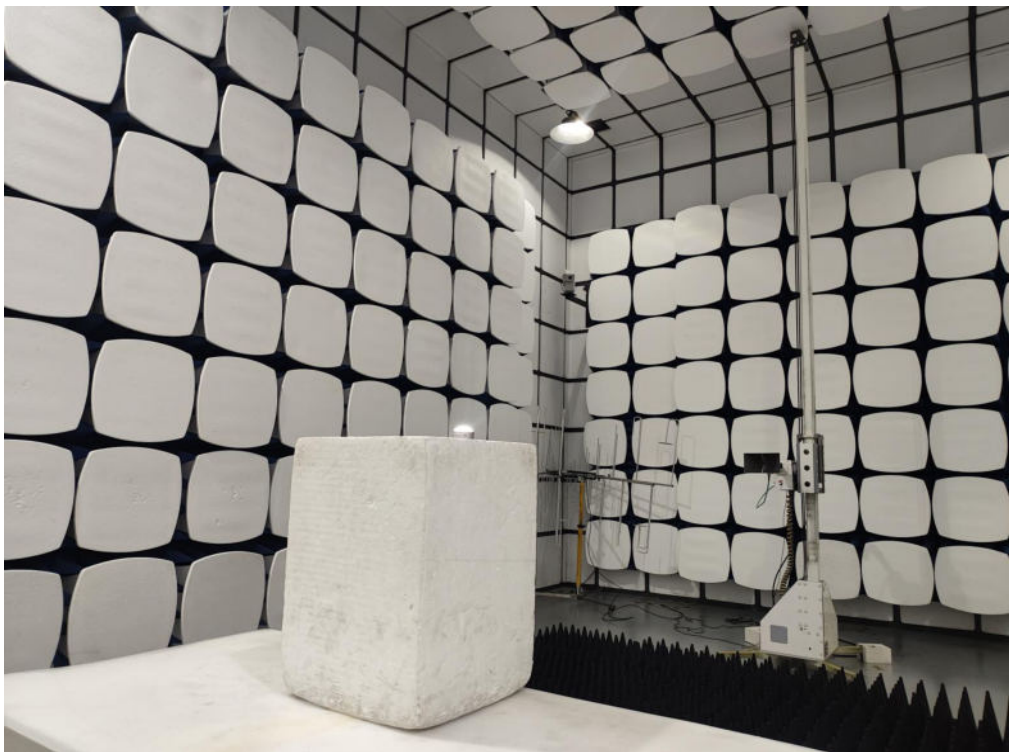
11.6. Test result

Test Site: RF Laboratory	Test Date: 2025/04/23--2025/04/23
Condition: 24.3°C,56%RH,101kPa	Test Engineer: Yannis Wen
Memo: /	

EUT Name: Sol 5 Spectra Bluetooth RGBCW & Bi-Color Light	EUT Model: Sol 5 RGB/Sol 5
Sample No.: A2504088-S0004	Test Mode: /
Power supply: /	Memo: The EUT antenna is Internal Antenna. It complies with the standard requirement.

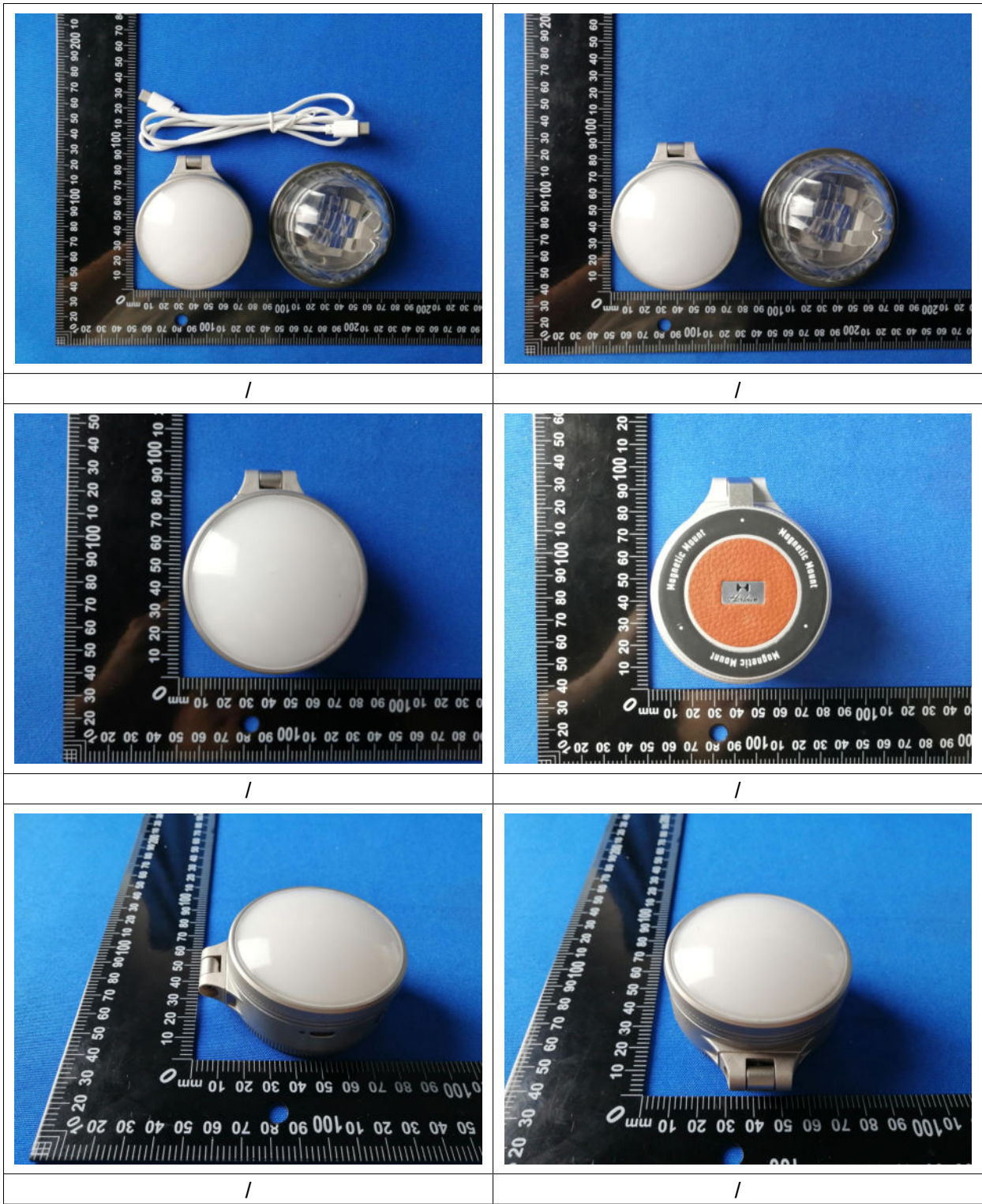
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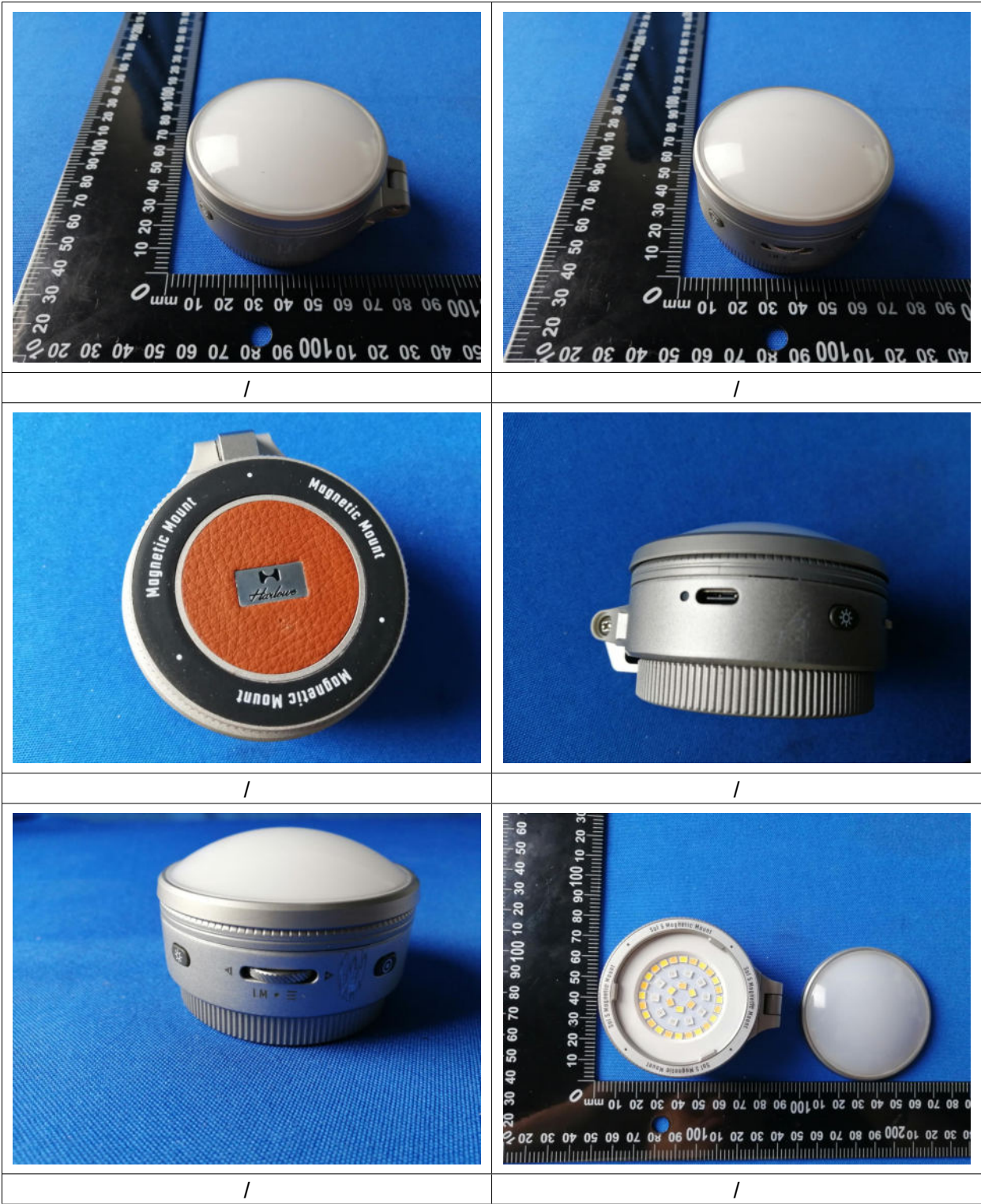
12. Test Setup Photograph



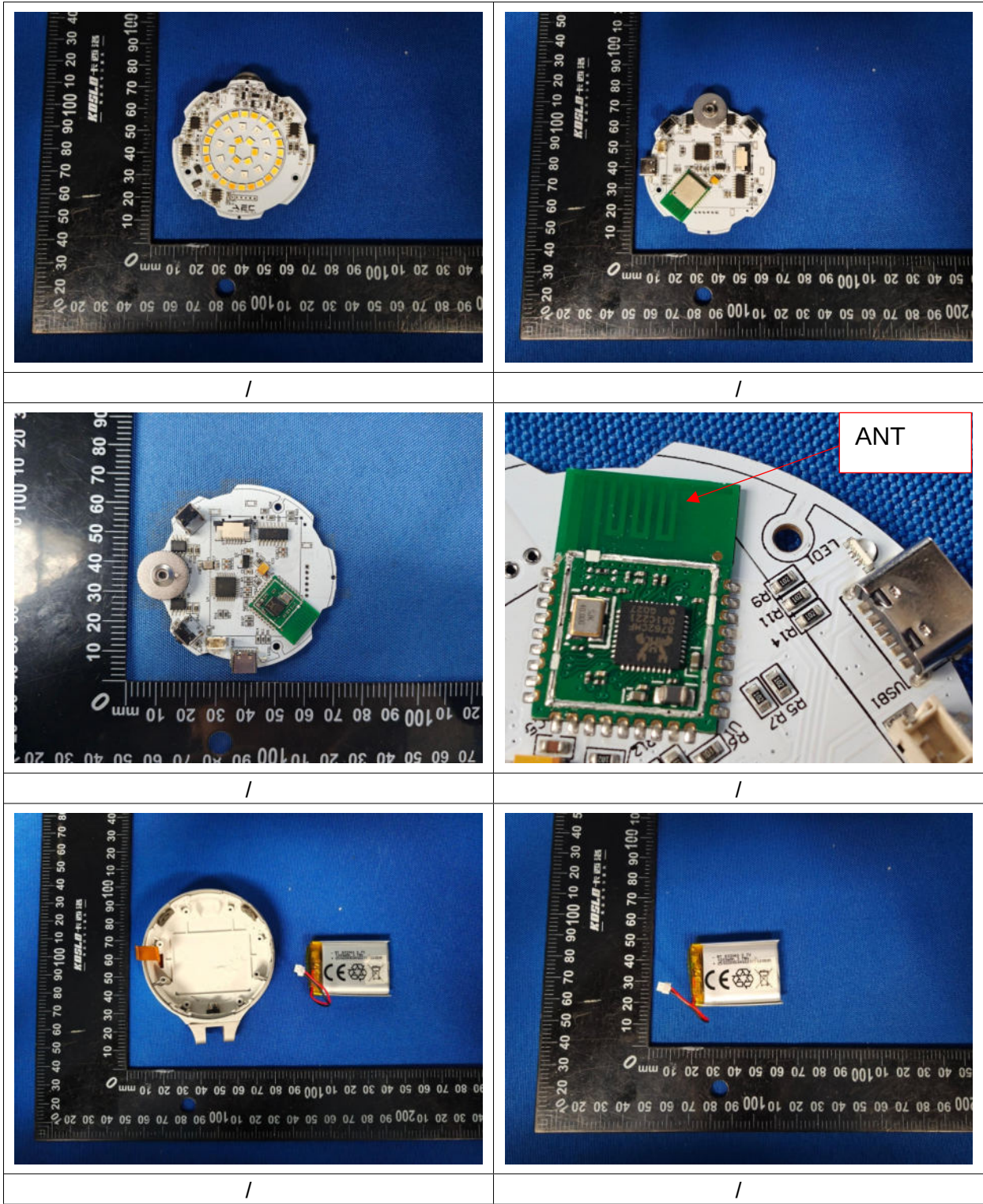


13. Photos of the EUT









14. Annex

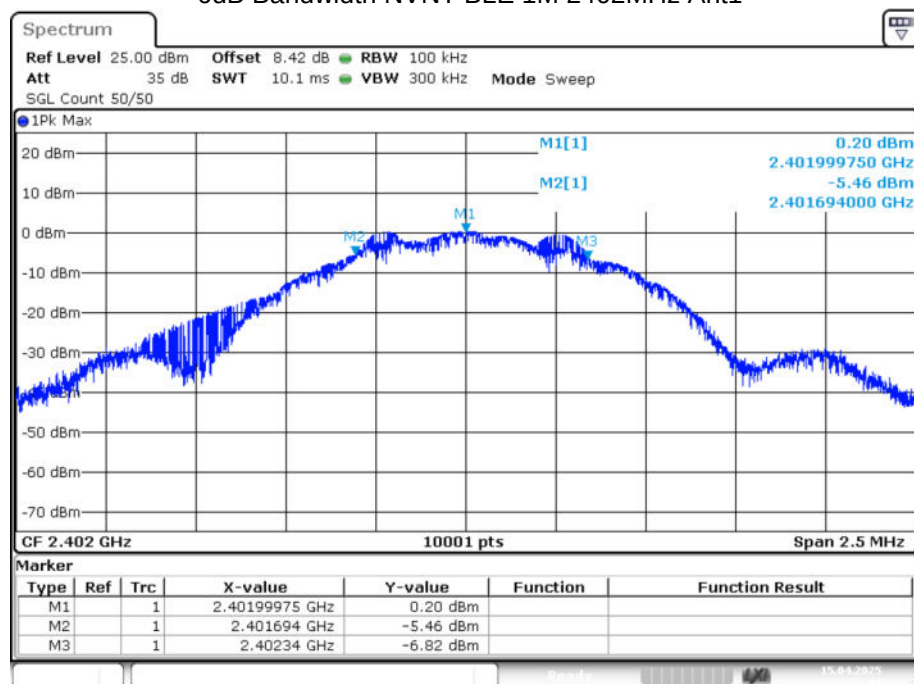
Maximum Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	Ant1	-2.469	30	Pass
NVNT	BLE 1M	2440	Ant1	-0.626	30	Pass
NVNT	BLE 1M	2480	Ant1	-0.033	30	Pass

-6dB Bandwidth

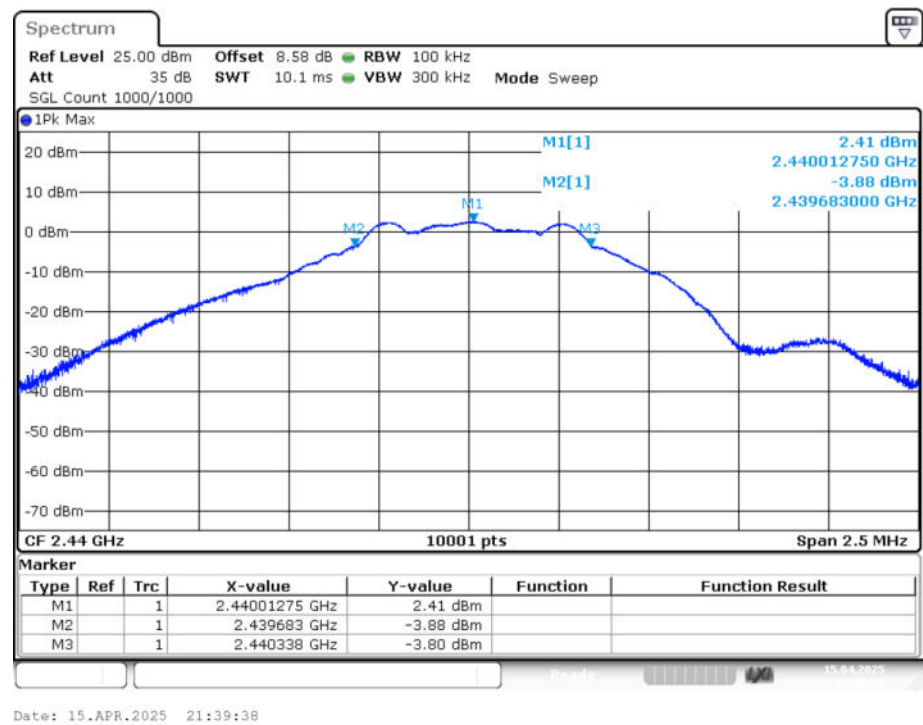
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1M	2402	Ant1	0.646	0.5	Pass
NVNT	BLE 1M	2440	Ant1	0.654	0.5	Pass
NVNT	BLE 1M	2480	Ant1	0.662	0.5	Pass

-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1

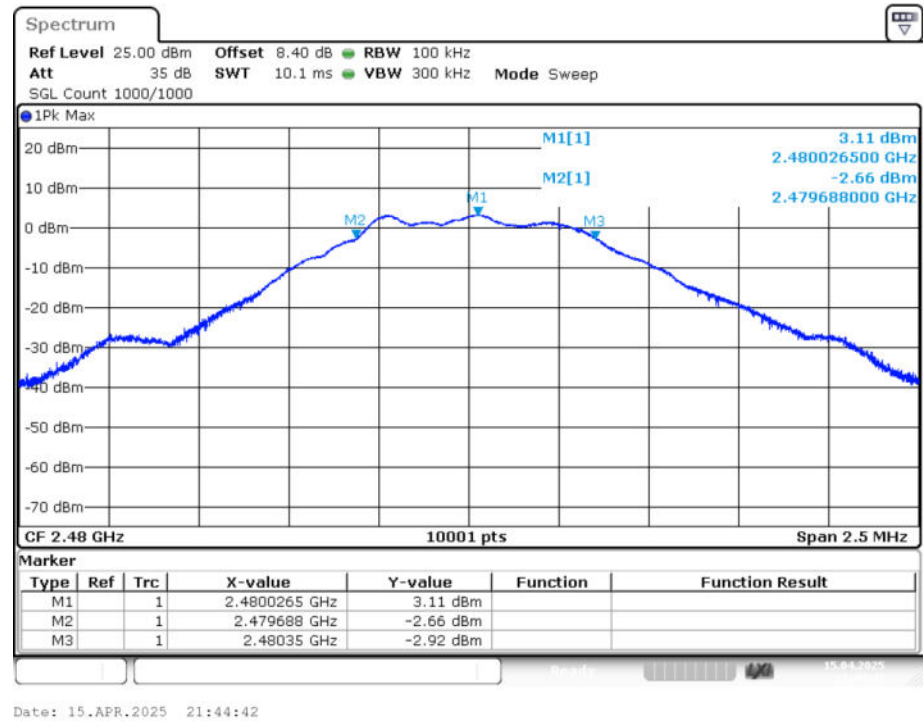


Date: 15.APR.2025 21:36:02

-6dB Bandwidth NVNT BLE 1M 2440MHz Ant1



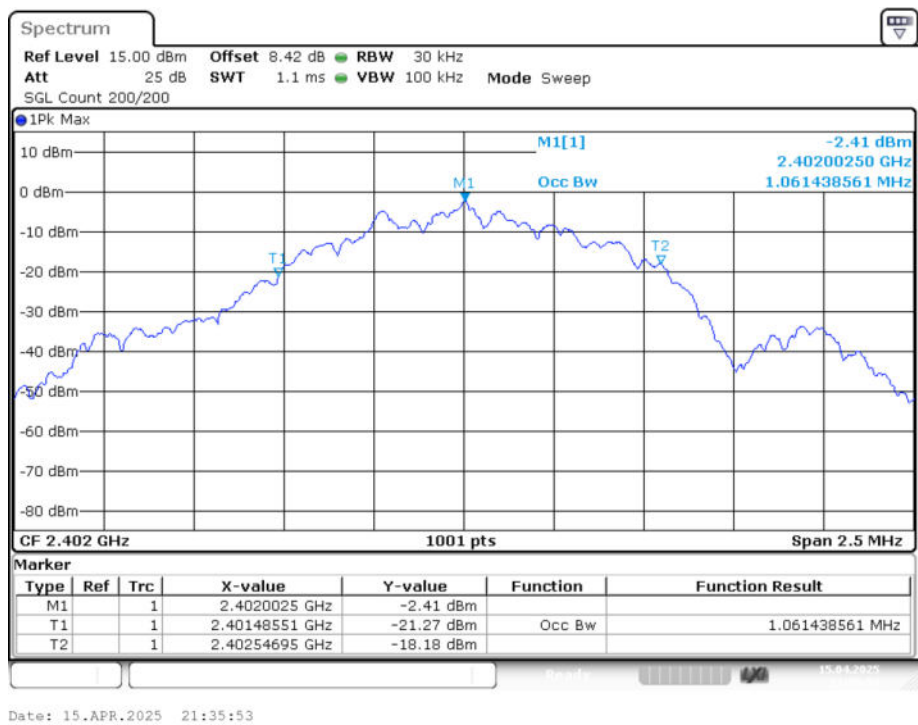
-6dB Bandwidth NVNT BLE 1M 2480MHz Ant1



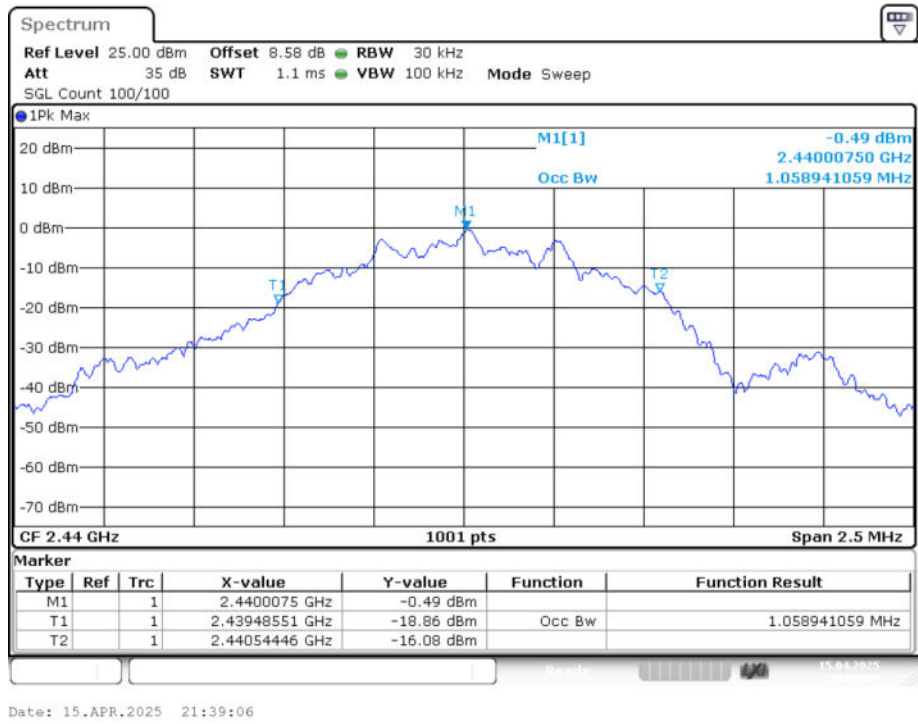
Occupied Channel Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	BLE 1M	2402	Ant1	1.061
NVNT	BLE 1M	2440	Ant1	1.059
NVNT	BLE 1M	2480	Ant1	1.031

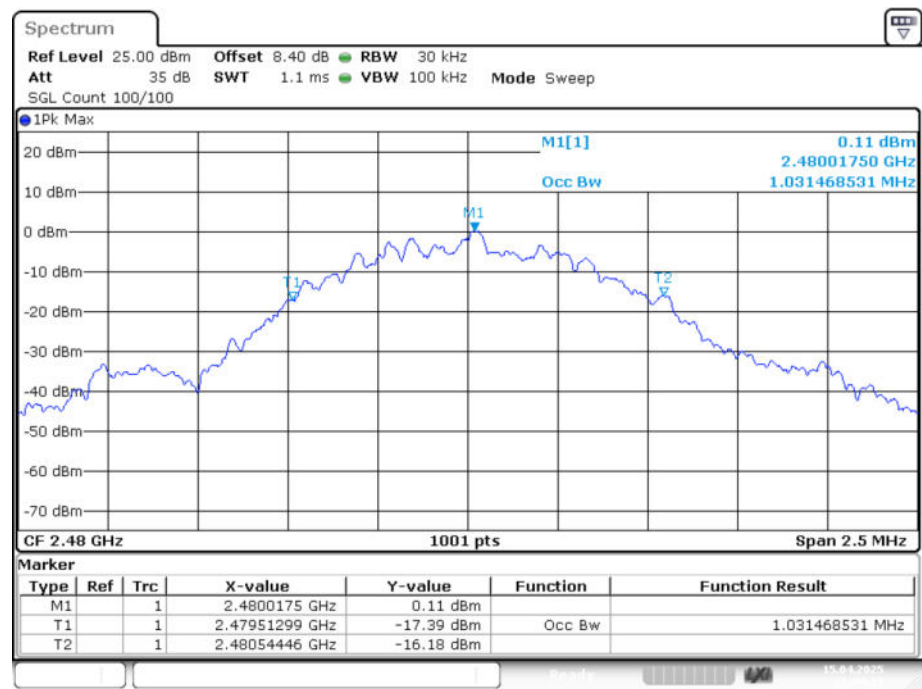
OBW NVNT BLE 1M 2402MHz Ant1



OBW NVNT BLE 1M 2440MHz Ant1



OBW NVNT BLE 1M 2480MHz Ant1

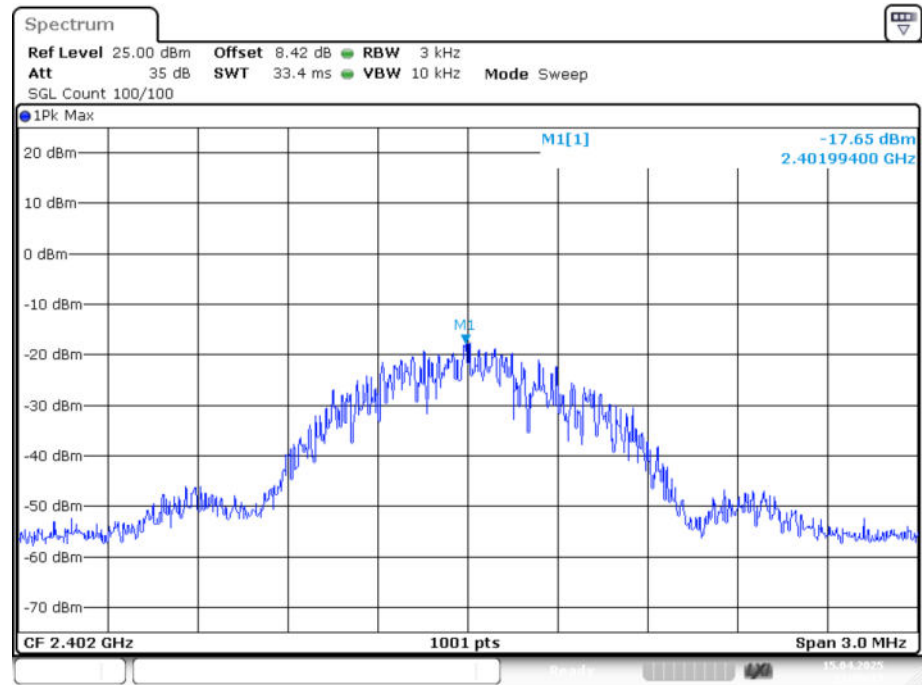


Date: 15.APR.2025 21:44:11

Maximum Power Spectral Density Level

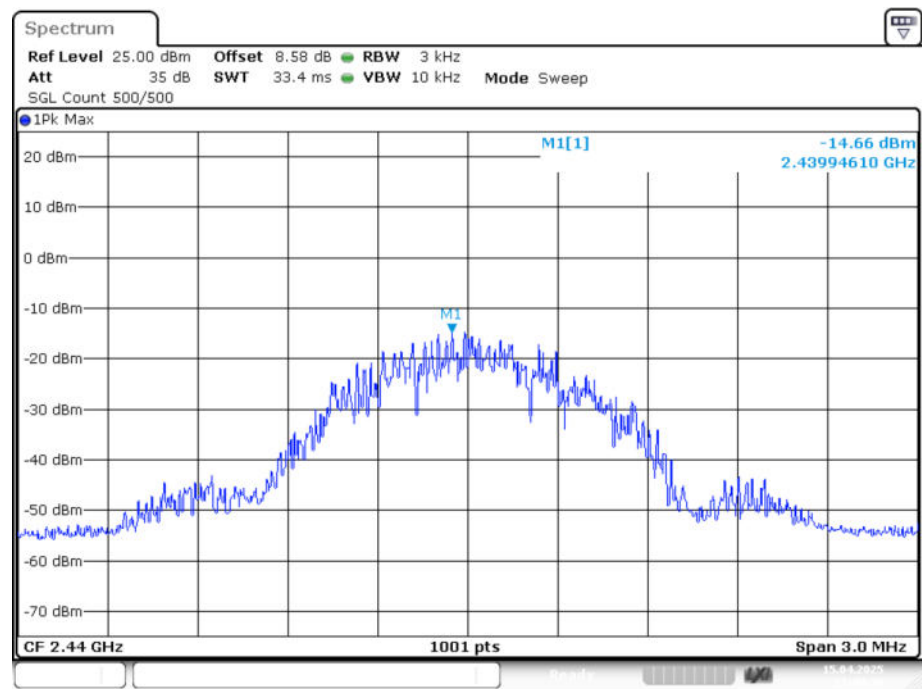
Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	BLE 1M	2402	Ant1	-17.647	8	Pass
NVNT	BLE 1M	2440	Ant1	-14.664	8	Pass
NVNT	BLE 1M	2480	Ant1	-13.311	8	Pass

PSD NVNT BLE 1M 2402MHz Ant1



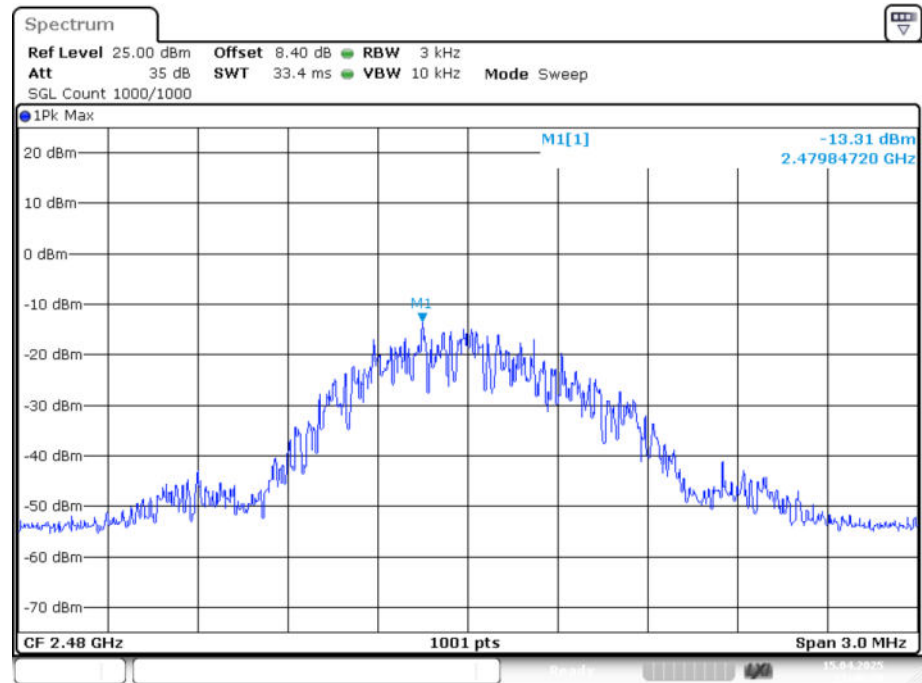
Date: 15.APR.2025 21:36:17

PSD NVNT BLE 1M 2440MHz Ant1



Date: 15.APR.2025 21:40:30

PSD NVNT BLE 1M 2480MHz Ant1

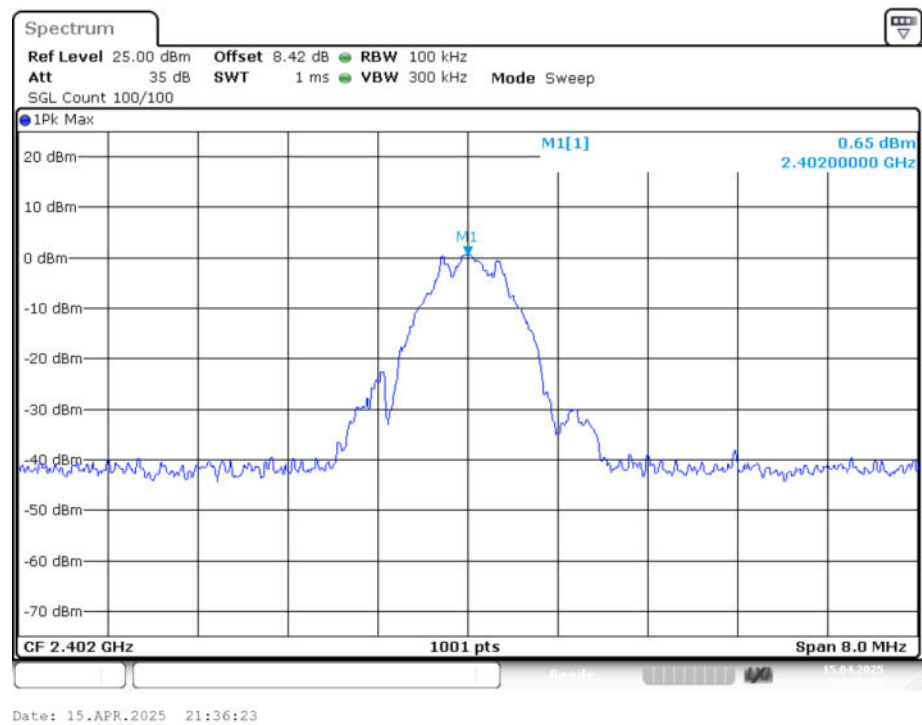


Date: 15.APR.2025 21:46:20

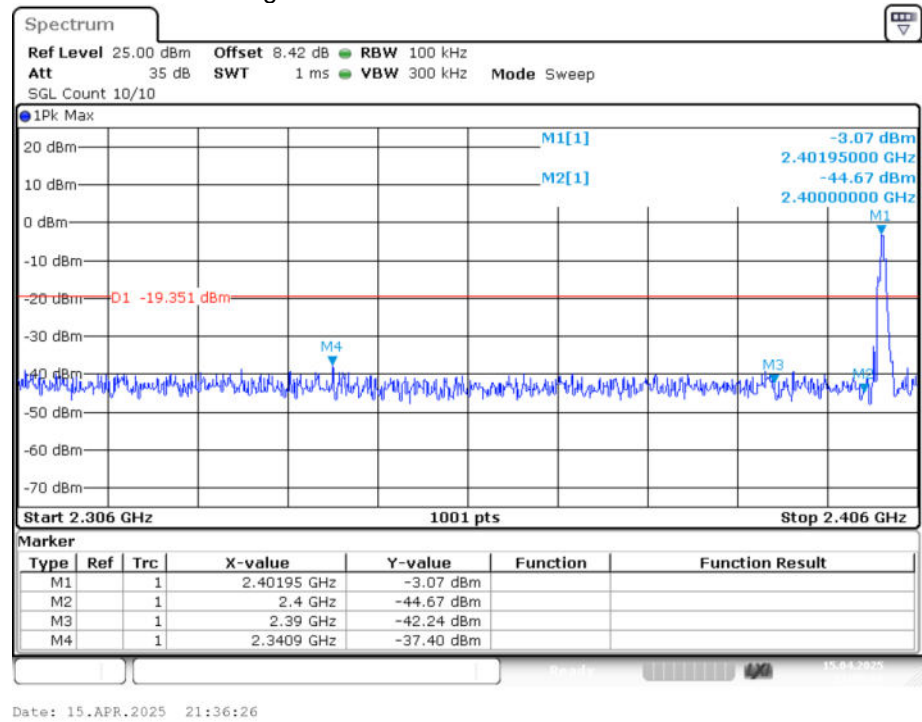
Band Edge

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-38.05	-20	Pass
NVNT	BLE 1M	2480	Ant1	-42.26	-20	Pass

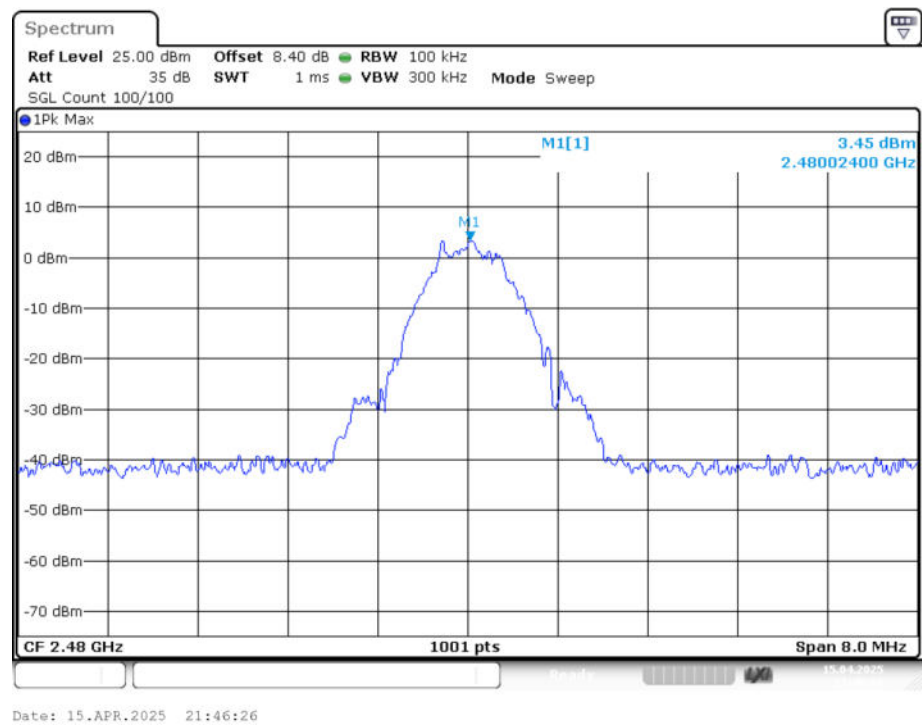
Band Edge NVNT BLE 1M 2402MHz Ant1 Ref



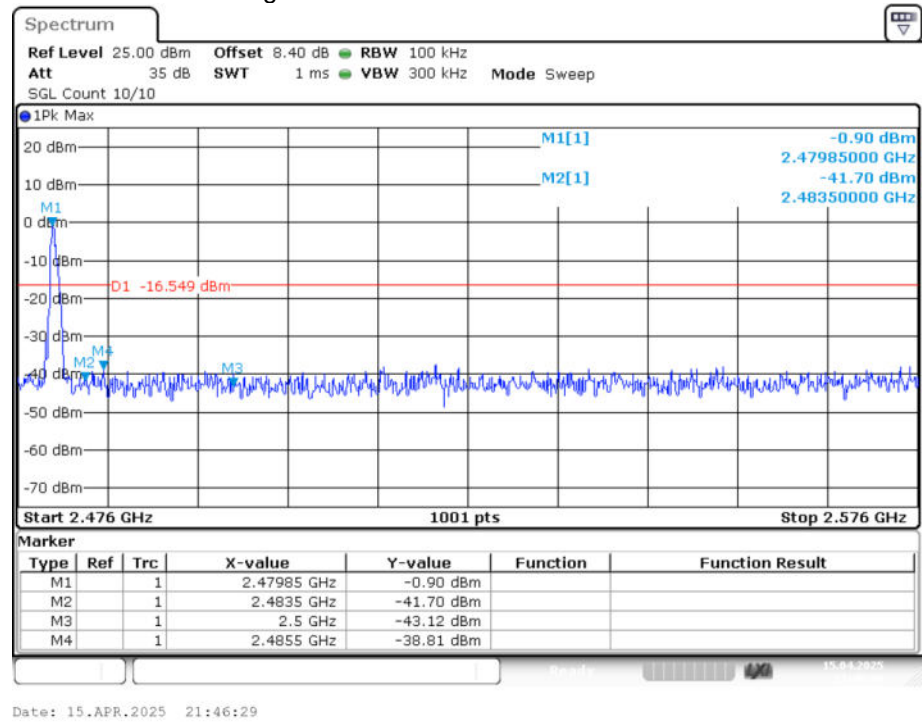
Band Edge NVNT BLE 1M 2402MHz Ant1 Emission



Band Edge NVNT BLE 1M 2480MHz Ant1 Ref

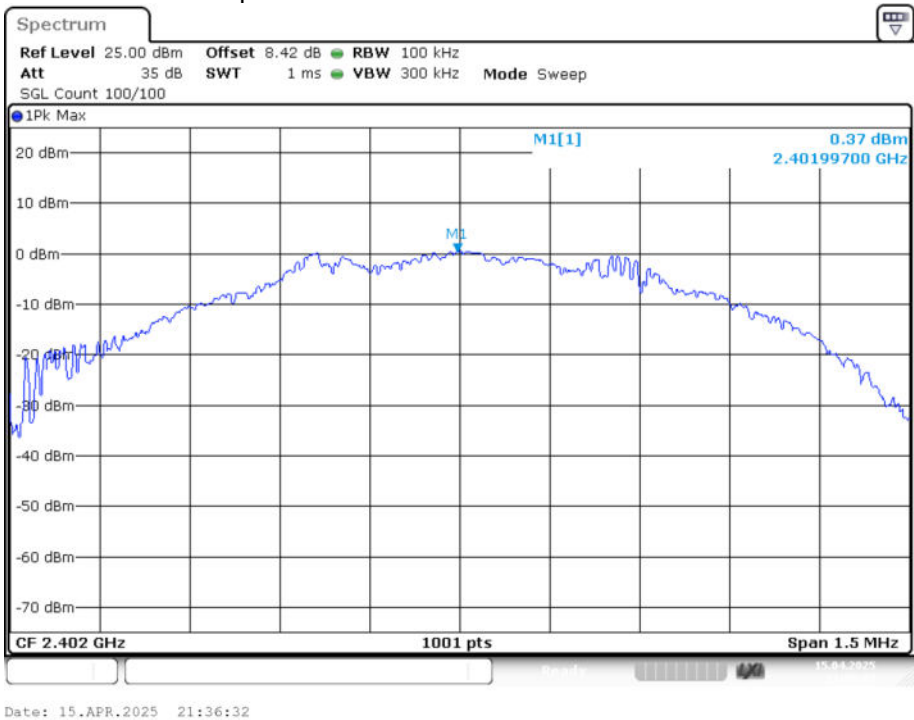


Band Edge NVNT BLE 1M 2480MHz Ant1 Emission

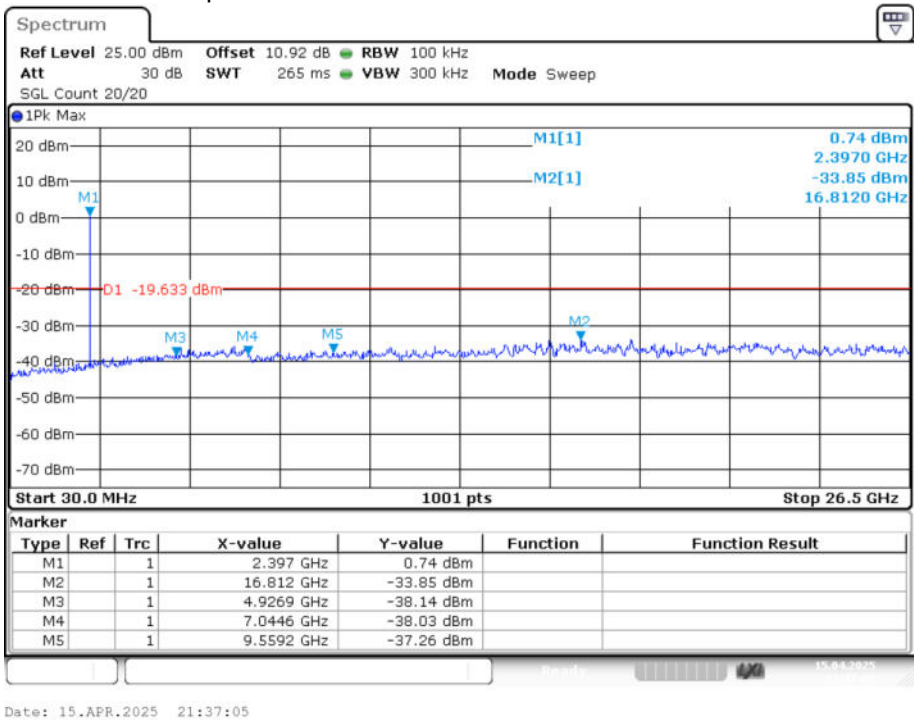


Conducted RF Spurious Emission

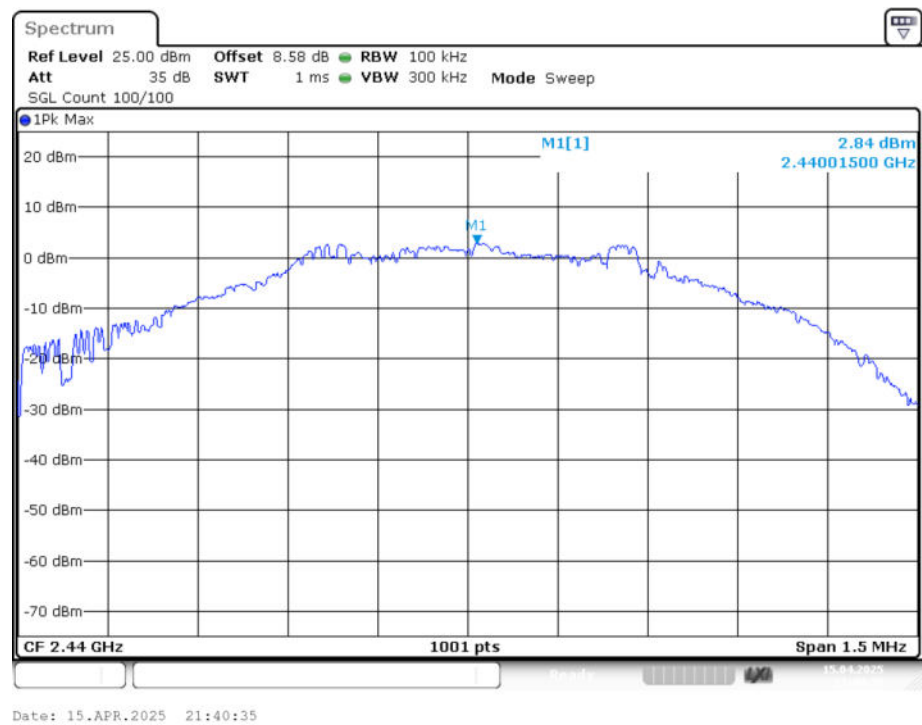
Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Ref



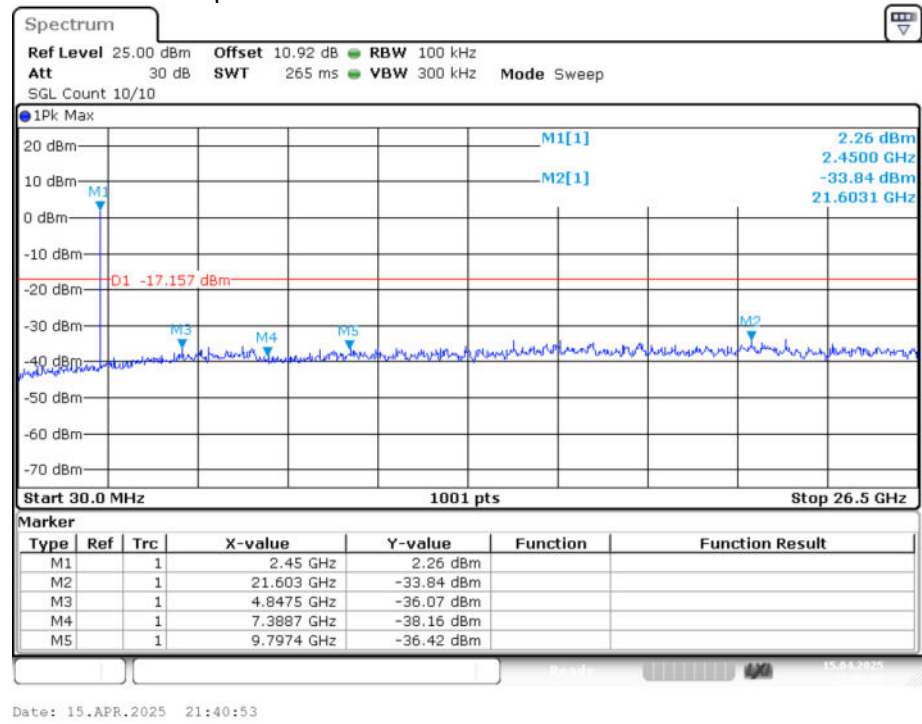
Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Emission



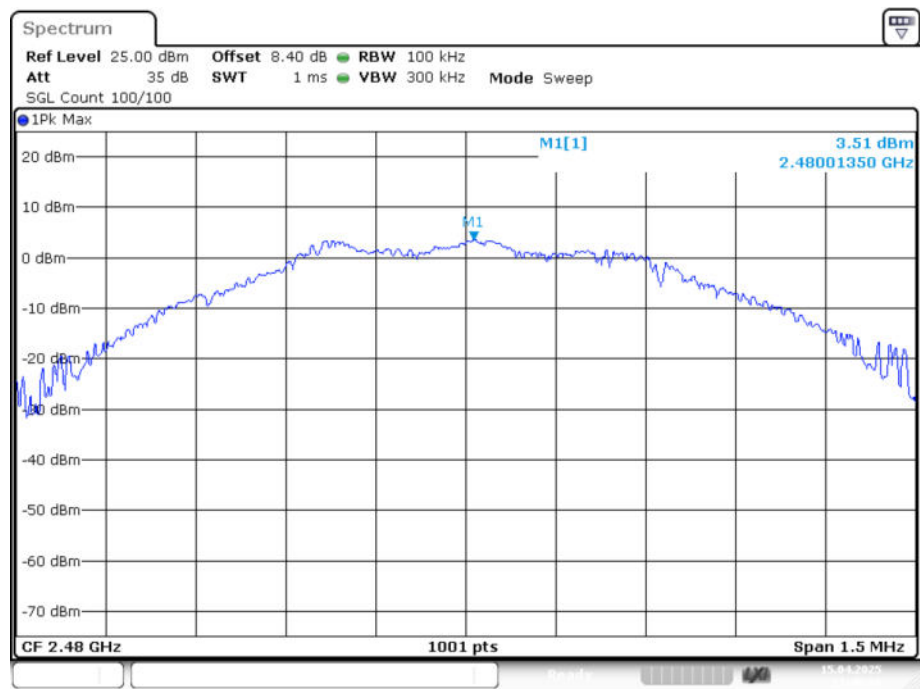
Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Ref



Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Emission

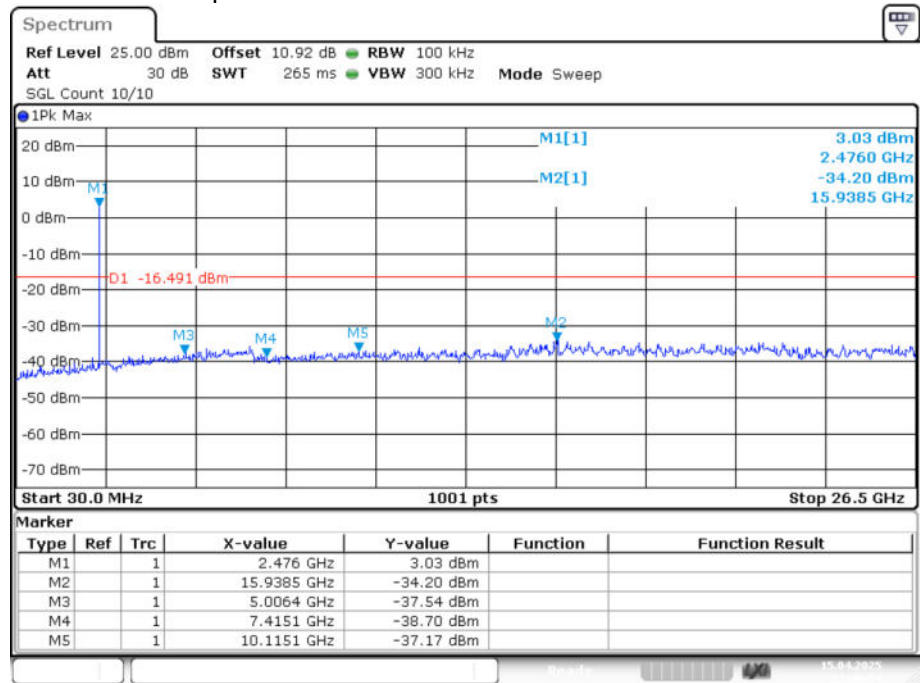


Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref



Date: 15.APR.2025 21:46:35

Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Emission

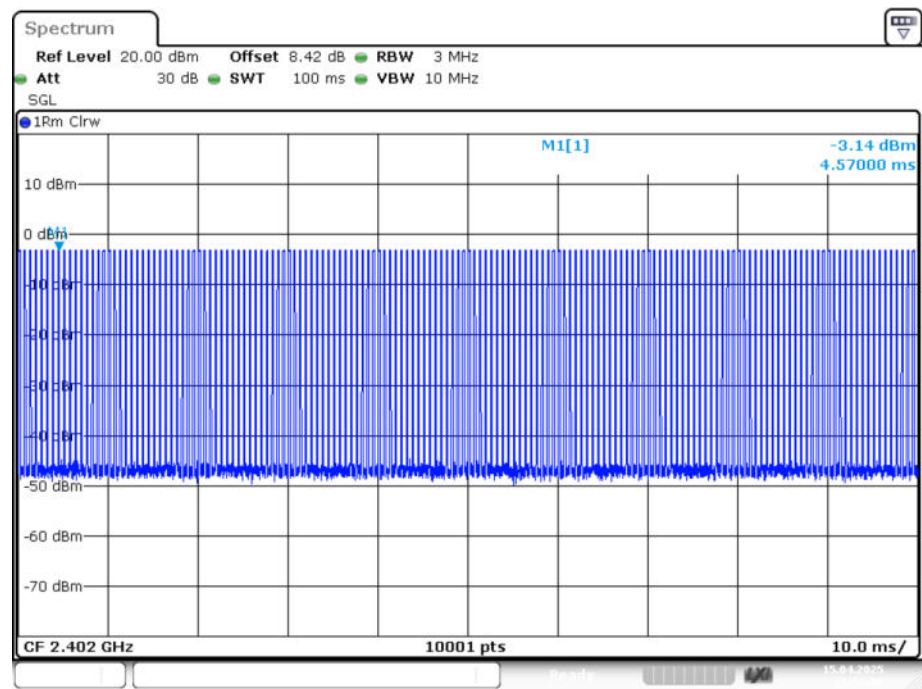


Date: 15.APR.2025 21:46:53

Duty Cycle

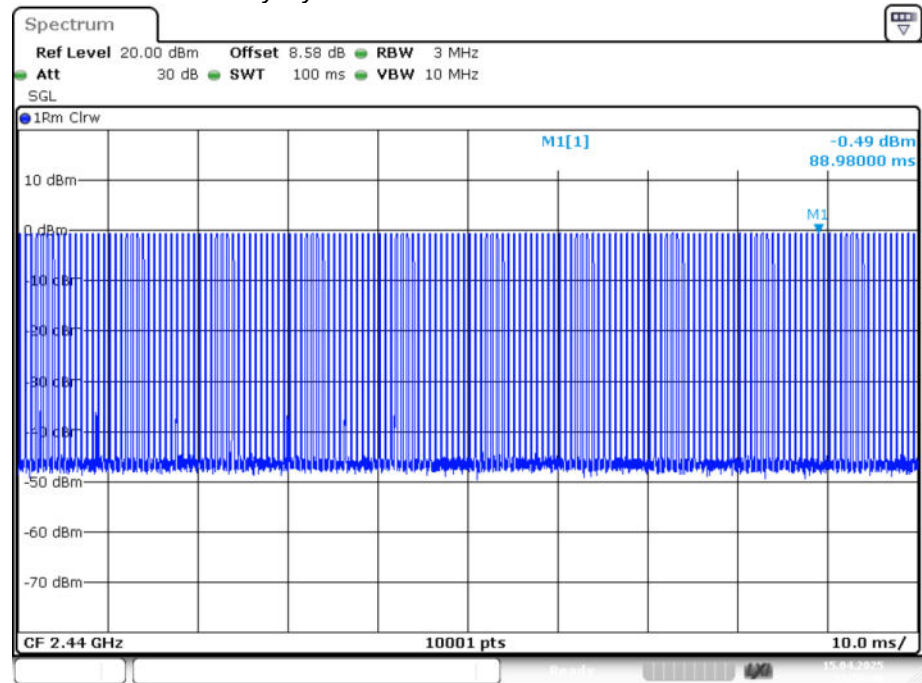
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)
NVNT	BLE 1M	2402	Ant1	28.8	5.41
NVNT	BLE 1M	2440	Ant1	29.64	5.28
NVNT	BLE 1M	2480	Ant1	28.28	5.49

Duty Cycle NVNT BLE 1M 2402MHz Ant1



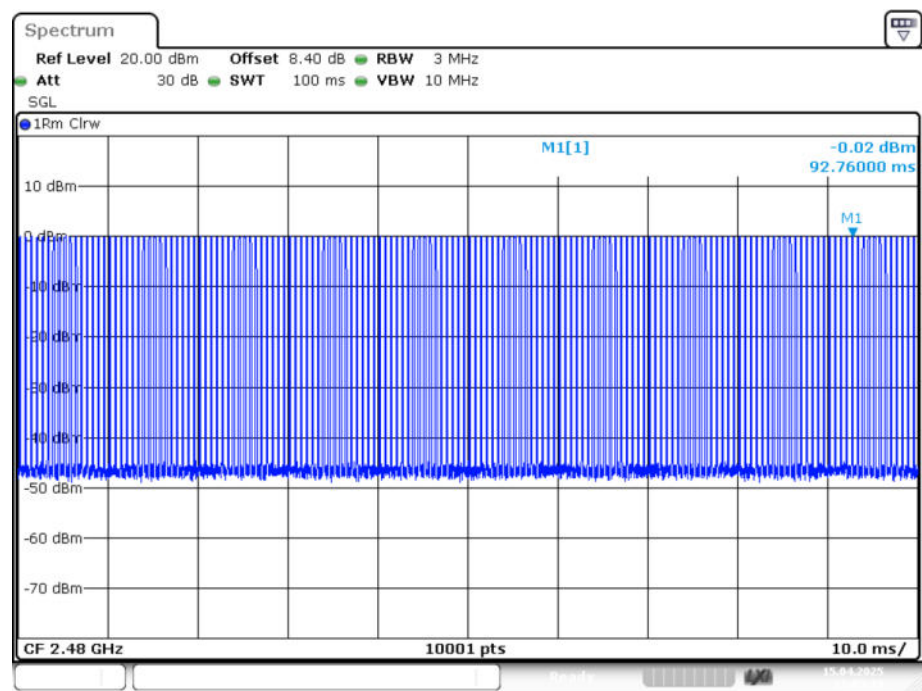
Date: 15.APR.2025 21:51:36

Duty Cycle NVNT BLE 1M 2440MHz Ant1



Date: 15.APR.2025 21:56:48

Duty Cycle NVNT BLE 1M 2480MHz Ant1



Date: 15.APR.2025 22:03:19

-----End Report-----