FCC TEST REPORT

FCC ID: 2AYMH-P160

On Behalf of

HANSHOW TECHNOLOGY CO.,LTD.

Electronic shelf label

Model No.: Polaris Pro-160Q-N, Polaris-160R-N

Prepared for	:	HANSHOW TECHNOLOGY CO.,LTD.
Address	:	Building 1 (IF podium building and 4F) and Building 5 (7F) in Jiaxing Photovolta High-tech Park, No. 1288 Kanghe Rd., Xiuzhou District, Jiaxing, Zhejiang

Prepared By	:	Shenzhen Alpha Product Testing Co., Ltd.
Address	:	Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

Report Number	:	A2312226-C01-R08
Date of Receipt	:	February 18, 2024
Date of Test	:	February 18-28, 2024
Date of Report	:	February 29, 2024
Version Number	:	V0
Test Result	:	Pass

TABLE OF CONTENTS

Description Page

TEST REPORT DECLARATION

Applicant	:	HANSHOW TECHNOLOGY CO.,LTD.
Address	:	Building 1 (IF podium building and 4F) and Building 5 (7F) in Jiaxing Photovolta High-tech Park, No. 1288 Kanghe Rd., Xiuzhou District, Jiaxing, Zhejiang
Manufacturer	:	HANSHOW TECHNOLOGY CO.,LTD.
Address	:	Building 1 (IF podium building and 4F) and Building 5 (7F) in Jiaxing Photovolta High-tech Park, No. 1288 Kanghe Rd., Xiuzhou District, Jiaxing, Zhejiang
EUT Description	:	Electronic shelf label
(A) Model No.	:	Polaris Pro-160Q-N, Polaris-160R-N
(B) Trademark	:	Hanshow

Measurement Standard Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.249

ANSI C63.10:2013

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed full responsibility for the accuracy and completeness of test. Also, this report shows that the EUT is technically compliant with the FCC Part 15 requirements.

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.

Tested by (name + signature).....:	Yannis Wen Project Engineer	Yannis Wen
Approved by (name + signature).....:	Reak Yang Project Manager	Reak Yang
Date of issue.....:	February 29, 2024	

Revision History

Revision	Issue Date	Revisions	Revised By
V0	February 29, 2024	Initial released Issue	Yannis Wen

1. Summary of Standards and Results

1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

EMISSION			
Description of Test Item	**Test Requirement**	**Standard Paragraph**	**Results**
Power Line Conducted Emission Test	FCC Part 15	Section 15.207	N/A
Spurious Emission Test	FCC Part 15	Section 15.249&15.209	P
Occupied bandwidth	FCC Part 15	Section 15. 249	P
Band edge Requirement	FCC Part 15	Section 15.249	P
Antenna Requirement	FCC Part 15	Section 15.203	P
Field strength of Fundamental	FCC Part 15	Section 15.249(a)	P

Note: 1. P is an abbreviation for Pass.

2. F is an abbreviation for Fail.

3. N/A is an abbreviation for Not Applicable.

2. General Information

2.1. Description of Device (EUT)

EUT Name	:	Electronic shelf label
Model No.	:	Polaris Pro-160Q-N, Polaris-160R-N
DIFF.	:	There is no difference except the name of the model. All tests are made with the Polaris Pro-160Q-N model.
Power supply	:	DC 3V from battery

2.4G Technology		
Operation frequency	:	2402MHz-2480MHz
Channel No.	:	157 Channel
Channel spacing	:	0.5MHz
Modulation type	:	GFSK
Antenna Type	:	PCB IFA Antenna, max gain -1.8dBi (Antenna information is provided by applicant.)
Hardware version	:	HSEL3_01_60M_34
Software version	:	V1.0
Intend use environment	:	Residential, commercial and light industrial environment

Note: new batteries used during all test.

2.2. Accessories of Device (EUT)

Accessories1 : /

Manufacturer : /

Model : /

Power supply : /

2.3. Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number	Certification or SDOC
1.	--	--	--	--	--

2.4. Block Diagram of Connection Between EUT and Simulators

2.5. Test Mode Description

Test mode:

Mode	Channel	Frequency (MHz)
GFSK	Low :CH1	2402
GFSK	Middle: CH79	2441
GFSK	High: CH157	2480

Note:
1. The test was used to control EUT work in Continuous TX mode, and select test channel, wireless mode
2. The EUT has been tested as an independent unit. And Continual Transmitting in maximum power.
3. New battery is used during all tests.
4. For the relevant Conducted Measurement, the temporary antenna connector is used during the measurement. Antenna Connector Impedance: 50Ω, Cable Loss: 1.0 dB

Channel list					
CH1	2402MHz	CH78	2440.5MHz	….	….
CH2	2402.5MHz	CH79	2441MHz	CH155	2479MHz
CH3	2403MHz	CH80	2441.5MHz	CH156	2479.5MHz
……	…….	….	….	CH157	2480MHz

2.6. Test Conditions

Temperature range	21-25℃
Humidity range	40-75%
Pressure range	86-106kPa

2.7. Test Facility

Shenzhen Alpha Product Testing Co., Ltd.

Building i, No.2, Lixin Road, Fuyong Street, Bao'an District,

518103, Shenzhen, Guangdong, China

June 21, 2018 File on Federal Communication Commission

Registration Number: 293961

2.8. Measurement Uncertainty

(95% confidence levels, k=2)

Item	**Uncertainty**
Uncertainty for Power point Conducted Emissions Test	2.74dB
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	2.13 dB(Polarize: V)
	2.57dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.77 dB (Distance: 3m Polarize: V)
	3.80 dB (Distance: 3m Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	4.13 dB (Distance: 3m Polarize: V)
	4.16 dB (Distance: 3m Polarize: H)
Uncertainty for radio frequency	5.8×10-8
Uncertainty for conducted RF Power	0.37dB
Uncertainty for temperature	0.2℃
Uncertainty for humidity	1%
Uncertainty for DC and low frequency voltages	0.06%

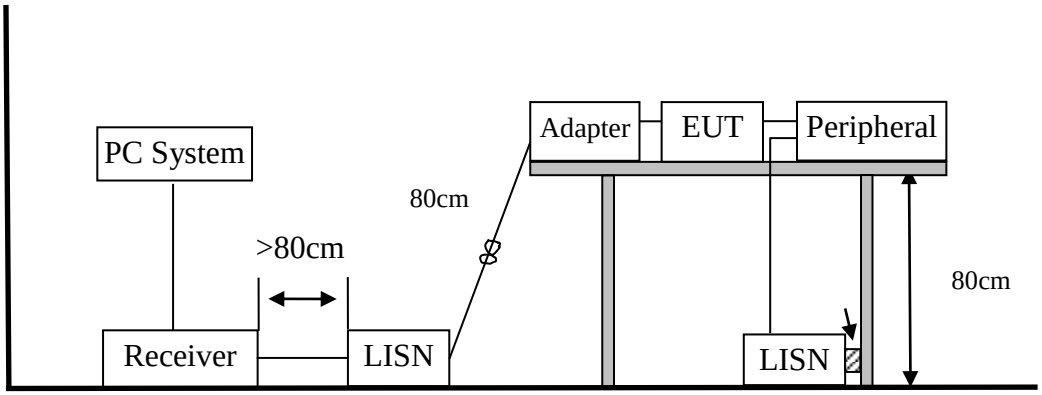
2.9. Test Equipment List

Equipment	Manufacture	Model No.	Firmware version	Serial No.	Last cal.	Cal Interval
9*6*6 anechoic chamber	CHENYU	9*6*6	/	N/A	2022.05.18	3Year
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	2.3	102137	2023.08.16	1Year
Spectrum analyzer	Agilent	N9020A	A.14.16	MY499100060	2023.08.16	1Year
Receiver	ROHDE&SCHWARZ	ESR	2.28 SP1	1316.3003K03-102082-Wa	2023.08.16	1Year
Receiver	R&S	ESCI	4.42 SP1	101165	2023.08.16	1Year
Bilog Antenna	Schwarzbeck	VULB 9168	/	VULB 9168#627	2023.08.28	2Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	/	2106	2023.08.19	2Year
Active Loop Antenna	SCHWARZBECK	FMZB 1519B	/	00059	2023.08.19	2Year
RF Cable	Resenberger	Cable 1	/	RE1	2023.08.16	1Year
RF Cable	Resenberger	Cable 2	/	RE2	2023.08.16	1Year
RF Cable	Resenberger	Cable 3	/	CE1	2023.08.16	1Year
Pre-amplifier	HP	HP8347A	/	2834A00455	2023.08.16	1Year
Pre-amplifier	Agilent	8449B	/	3008A02664	2023.08.16	1Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	/	8126-466	2023.08.16	1Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	/	101043	2023.08.16	1 Year
Horn Antenna	SCHWARZBECK	BBHA9170	/	00946	2023.08.19	2 Year
Preamplifier	SKET	LNPA_1840-50	/	SK2018101801	2023.08.16	1 Year
Power Meter	Agilent	E9300A	/	MY41496628	2023.08.16	1 Year
Power Sensor	DARE	RPR3006W	/	15100041SNO91	2023.08.16	1 Year
Temp. & Humid. Chamber	Weihuang	WHTH-1000-40-880	/	100631	2023.08.16	1 Year
Switching Mode Power Supply	JUNKE	JK12010S	/	20140927-6	2023.08.16	1 Year
Adjustable attenuator	MWRFtest	N/A	/	N/A	N/A	N/A
10dB Attenuator	Mini-Circuits	DC-6G	/	N/A	N/A	N/A

Software Information			
Test Item	Software Name	Manufacturer	Version
RE	EZ-EMC	farad	Alpha-3A1
CE	EZ-EMC	farad	Alpha-3A1
RF-CE	MTS 8310	MWRFtest	2.0.0.0

3. Power Line Conducted Emission Test

3.1. Block Diagram of Test Setup



3.2. Test Limits

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

Notes: 1. Emission level=Read level + LISN factor-Preamp factor + Cable loss

2. * Decreasing linearly with logarithm of frequency.

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

3.3. Configuration of EUT on Test

The following equipment are installed on Power Line Conducted Emission Test to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

3.4. Operating Condition of EUT

（1） Setup the EUT as shown as Section 3.1.

（2） Turn on the power of all equipment.

（3） Let the EUT work in test mode taking the test.

3.5. Test Procedure

（1） The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#). This provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#2). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10:2013 on conducted Emission test.

（2） The frequency range from 150kHz to 30MHz is checked, the bandwidth of test receiver is set at 9kHz.

（3） The frequency range from 30MHz to 1000MHz was pre-scanned with a Peak detector and all final readings of measurement from Test Receiver are Quasi-Peak and Average values.

（4） The test results are reported on Section 3.6.

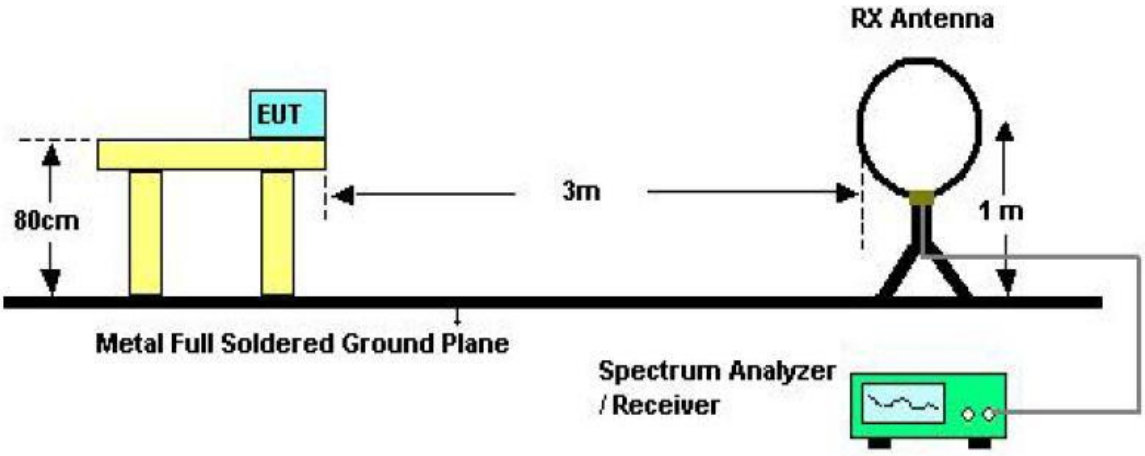
3.6. Test Results

Note: The EUT is supplied by battery, so this item does not applicable.

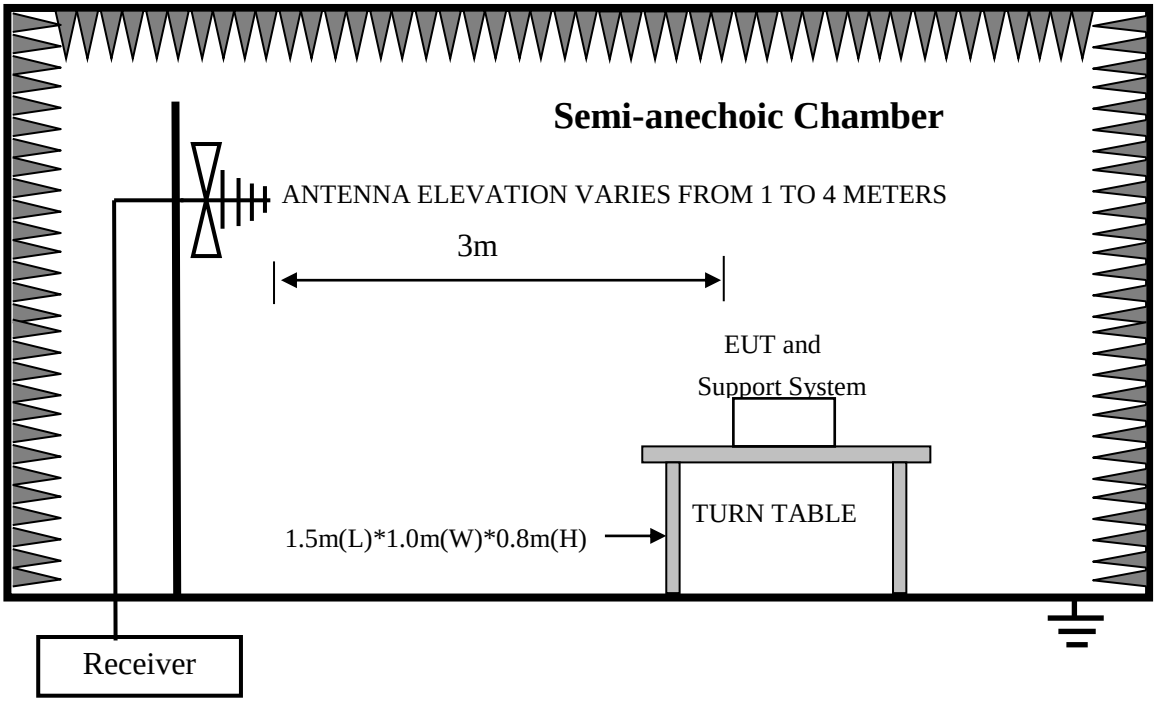
4. Radiated Emission Test

4.1. Block Diagram of Test Setup

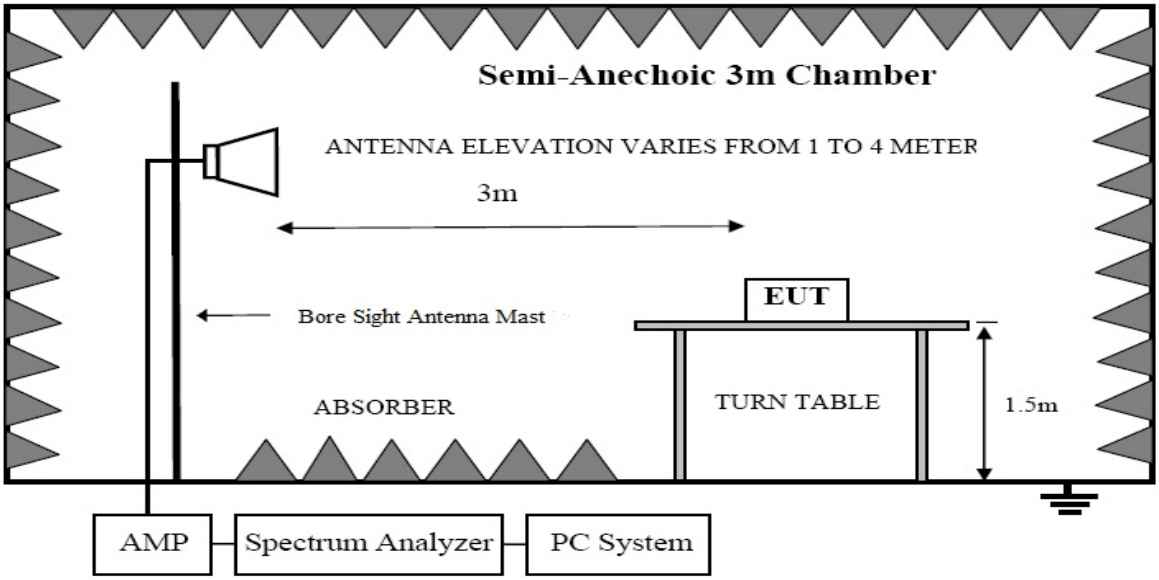
In Semi Anechoic Chamber (3m) Test Setup Diagram for 9KHz~30MHz



In Semi Anechoic Chamber (3m) Test Setup Diagram for 30MHz~1000MHz



In Semi Anechoic Chamber (3m) Test Setup Diagram for Above 1GHz



4.2. Test Limit

Frequency MHz	Distance (Meters)	Field Strengths Limits	
		uV/m	dB uV/m
0.009 ~ 0.490	300	2400/F(kHz)	---
0.490 1.705	30	24000/F(kHz)	----
1.705 30	30	30	29.5
30 88	3	100(3nW)	40
88 216	3	150(6.8nW)	43.5
216 960	3	200(12nW)	46
Above 960	3	500(75nW)	54
Carrier frequency	3	50000(avg)	113.97(peak) 93.97(avg)

Notes:
1. Emission level = Read level + Antenna Factor - Preamp Factor + Cable Loss
2. The smaller limit shall apply at the cross point between two frequency bands.
3. Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.
4. For frequencies above 1000 MHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

4.3. Configuration of EUT on Test

The following equipment are installed on Radiated Emission Test to meet the commission requirements and operating regulations in a manner that tends to maximize its emission characteristics in normal application.

4.4. Operating Condition of EUT

（1） Setup the EUT as shown as Section 4.1.

（2） Turn on the power of all equipment.

（3） Let the EUT work in test mode taking the test.

4.5. Test Procedure

（1） The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber for below 1GHz and 150 cm above the ground plane inside a semi-anechoic chamber for above 1GHz. An antenna was located 3m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10: 2013 on Radiated Emission test.

（2） For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

（3） Test antenna was located 4m from the EUT on an adjustable mast. Below pre-scan procedure was first performed in order to find prominent radiated emissions.

(a) Change work frequency or channel of device if practicable.

(b) Change modulation type of device if practicable.

(c) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions

（4） For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP

（5） The frequency range from 9KHz to 150KHz is checked, the bandwidth of test receiver is set at 200Hz.

The frequency range from 150KHz to 30MHz is checked, the bandwidth of test receiver is set at 9KHz.

The frequency range from 30MHz to 1000MHz is checked, the bandwidth of test receiver is set at 120kHz.

The frequency range from above 1GHz is checked, the bandwidth of Signal Analyzer is set at 1MHz.

（6） The frequency range from 30MHz to 1000MHz was pre-scanned with a peak detector and all final readings of measurement from Test Receiver are Quasi-Peak values, the frequency range from 1GHz to 6GHz was pre-scanned with a peak detector and all final readings of measurement from Spectrum Analyzer are peak and average values checked, all measurement distance is 3m in 3m semi anechoic chamber.

（7） Test for all x, y, z axes is performed and only the worst case of X xes was recorded in the test report.

（8） The test results are reported on Section 4.6.

4.6. Test Results

Frequency Range	:	**9kHz~30MHz**
Test Mode	:	TX 2402MHz
Test Results	:	**PASS**
Note:	1. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported. 2. This mode is worst case mode, and this report only reflected the worst mode.	

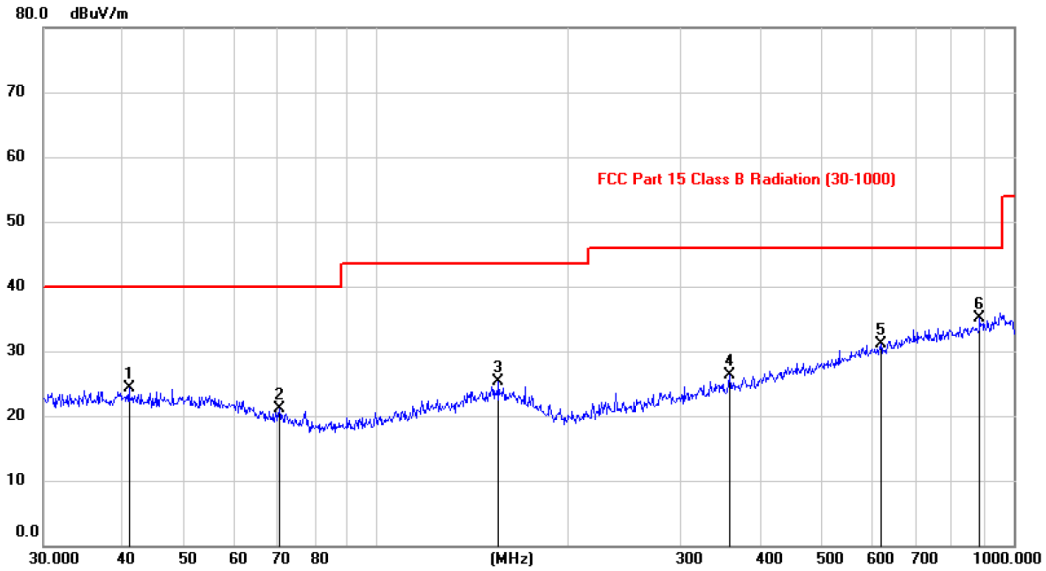
Frequency Range	:	**30MHz~1000MHz**
Test Mode	:	TX 2402MHz
Test Results	:	**PASS**

Note: 1. The test results are listed in next pages.

2. This mode is worst case mode, and this report only reflected the worst mode.

3. If the limits for the measurement with the quasi-peak detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out.

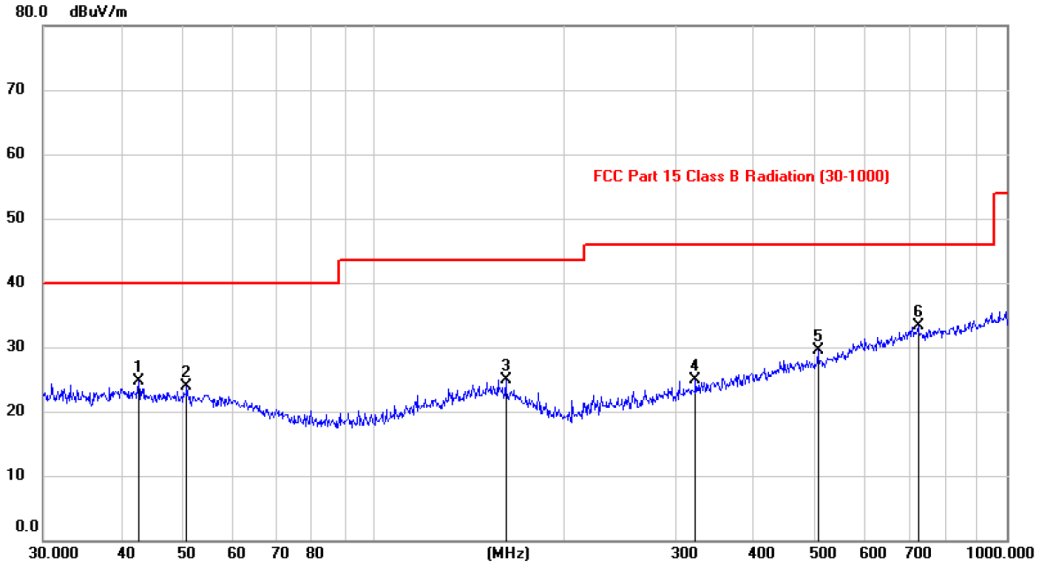
Antenna polarity: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		40.8924	10.11	14.27	24.38	40.00	-15.62	peak			
2		70.4846	9.89	11.13	21.02	40.00	-18.98	peak			
3		155.7826	10.48	14.76	25.24	43.50	-18.26	peak			
4		358.0961	11.27	15.05	26.32	46.00	-19.68	peak			
5		619.9121	10.73	20.31	31.04	46.00	-14.96	peak			
6	*	885.3303	11.66	23.41	35.07	46.00	-10.93	peak			

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

Antenna polarity: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		42.5651	10.56	14.19	24.75	40.00	-15.25	peak			
2		50.7459	10.11	13.80	23.91	40.00	-16.09	peak			
3		161.7764	10.35	14.59	24.94	43.50	-18.56	peak			
4		322.4523	10.65	14.32	24.97	46.00	-21.03	peak			
5		502.9395	11.43	17.98	29.41	46.00	-16.59	peak			
6	*	726.0410	11.56	21.75	33.31	46.00	-12.69	peak			

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

Note: This report only shall the worst case mode for TX 2402MHz.

Frequency Range : **1GHz~25GHz**

Test Mode : TX 2402MHz

No.	Freq MHz	Polarity	Reading (dBuV/m)	Correct Factor	Result (dBuV/m)	Limit (dBuV/m)	Margin	Remark
1	2402	H	95.49	-3.41	92.08	113.97	-21.89	Peak
2	2402	H	--	-3.41	--	93.97	--	Avg
3	4804	H	37.11	3.23	40.34	74	-33.66	Peak
4	4804	H	--	3.23	--	54	--	Avg
1	2402	V	95.69	-3.41	92.28	113.97	-21.69	Peak
2	2402	V	--	-3.41	--	93.97	--	Avg
3	4804	V	38.19	3.23	41.42	74	-32.58	Peak
4	4804	V	--	3.23	--	54	--	Avg

Test Mode : TX 2441MHz

No.	Freq MHz	Polarity	Reading (dBuV/m)	Correct Factor	Result (dBuV/m)	Limit (dBuV/m)	Margin	Remark
1	2441	H	91.93	-3.38	88.55	113.97	-25.42	Peak
2	2441	H	--	-3.38	--	93.97	--	Avg
3	4882	H	38.18	3.23	41.41	74	-32.59	Peak
4	4882	H	--	3.23	--	54	--	Avg
1	2441	V	88.27	-3.38	84.89	113.97	-29.08	Peak
2	2441	V	--	-3.38	--	93.97	--	Avg
3	4882	V	41.71	3.23	44.94	74	-29.06	Peak
4	4882	V	--	3.23	--	54	--	Avg

Test Mode : TX 2480MHz

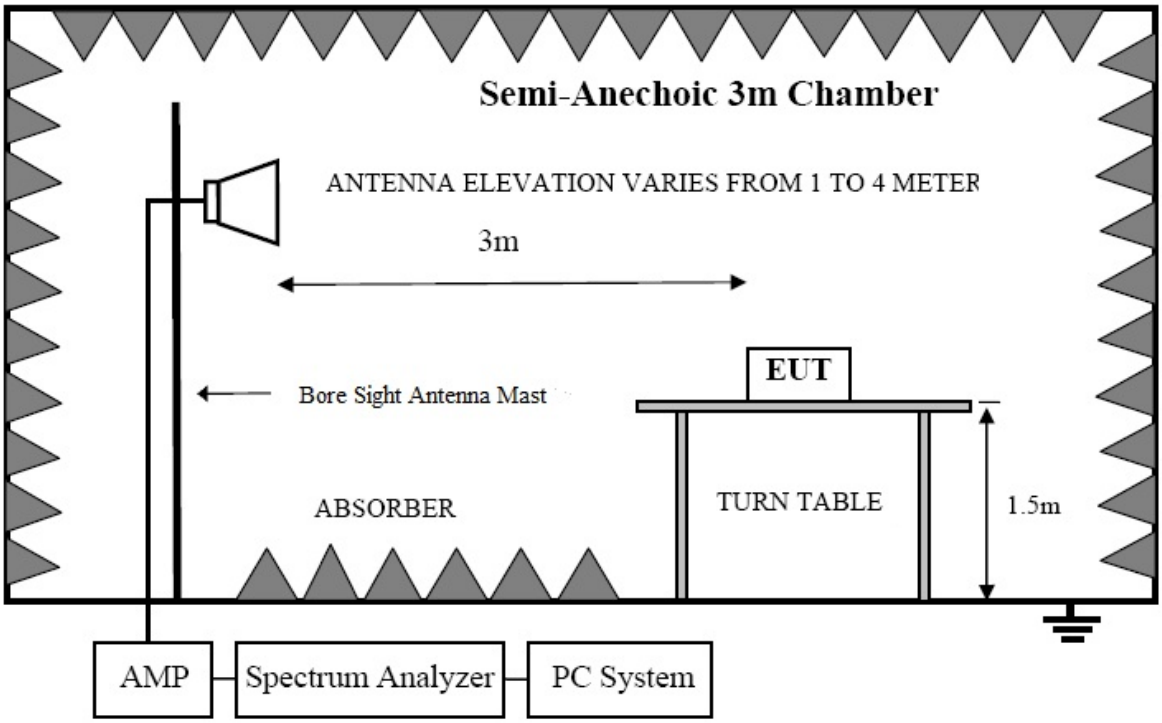
No.	Freq MHz	Polarity	Reading (dBuV/m)	Correct Factor	Result (dBuV/m)	Limit (dBuV/m)	Margin	Remark
1	2480	H	93.45	-3.35	90.10	113.97	-23.87	Peak
2	2480	H	--	-3.35	--	93.97	--	Avg
3	4960	H	37.31	3.23	40.54	74	-33.46	Peak
4	4960	H	--	3.23	--	54	--	Avg
1	2480	V	91.58	-3.35	88.23	113.97	-25.74	Peak
2	2480	V	--	-3.38	--	93.97	--	Avg
3	4960	V	39.31	3.23	42.54	74	-31.46	Peak
4	4960	V	--	3.23	--	54	--	Avg

Note:

1. Means other frequency and mode comply with standard requirements and at least have 20dB margin.
2. Correct Factor=Cable Loss+ Antenna Factor-Amplifier Gain.
Result=Reading + Correct Factor.
Margin= Result-Limit.
3. Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK.
4. Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: Avg.
5. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.

5. Band Edge Test

5.1. Block Diagram of Test Setup



5.2. Test Limit

Please refer section15.249 and section 15.205.

249(d) 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 to the general radiated emission limits in section 15.209, whichever is the lesser attenuation.

249(e) As show in section 15.35(b), for frequencies above 1000MHz,the above field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak filed strength shall not exceed 2500 millivolts/meter at 3meters along the antenna azimuth.

5.3. Configuration of EUT on Test

The following equipment are installed on Radiated Emission Test to meet the commission requirements and operating regulations in a manner that tends to maximize its emission characteristics in normal application.

5.4. Operating Condition of EUT

（1） Setup the EUT as shown as Section 5.1.

（2） Turn on the power of all equipment.

（3） Let the EUT work in test mode taking the test.

5.5. Test Procedure

（1） The EUT was placed on a non-metallic table, 150 cm above the ground plane inside a semi-anechoic chamber. An antenna was located 3m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10: 2013 on Radiated Emission test.

（2） For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

（3） Test antenna was located 4m from the EUT on an adjustable mast. Below pre-scan procedure was first performed in order to find prominent radiated emissions.

(a) Change work frequency or channel of device if practicable.

(b) Change modulation type of device if practicable.

(c) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions

（5） The frequency range from above 1GHz is checked, the bandwidth of Signal Analyzer is set at 1MHz.

（6） The frequency range from 1GHz to 6GHz was pre-scanned with a peak detector and all final readings of measurement from Spectrum Analyzer are peak and average values checked, all measurement distance is 3m in 3m semi anechoic chamber.

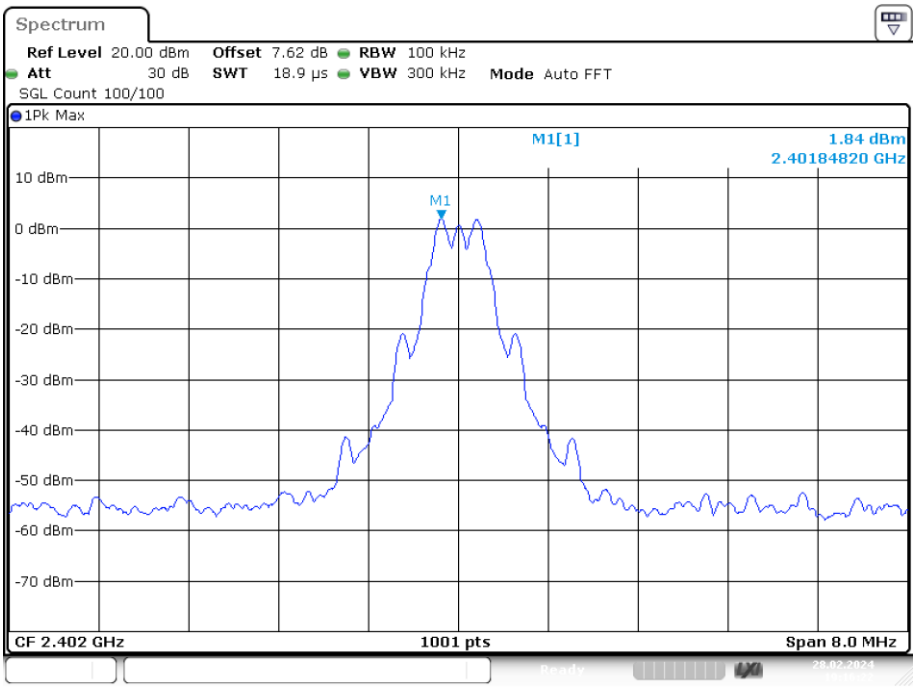
（7） Test for all x, y, z axes is performed and only the worst case of X xes was recorded in the test report.

（8） The test results are reported on Section 5.6.

5.6. Test Results

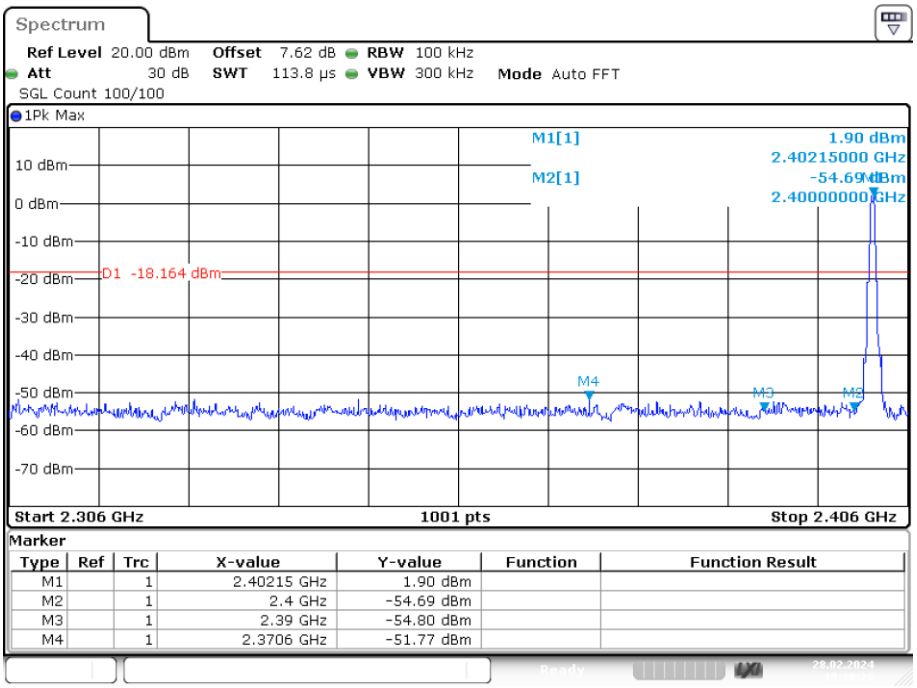
GFSK

Band Edge NVNT user 2402MHz Ant1 Ref



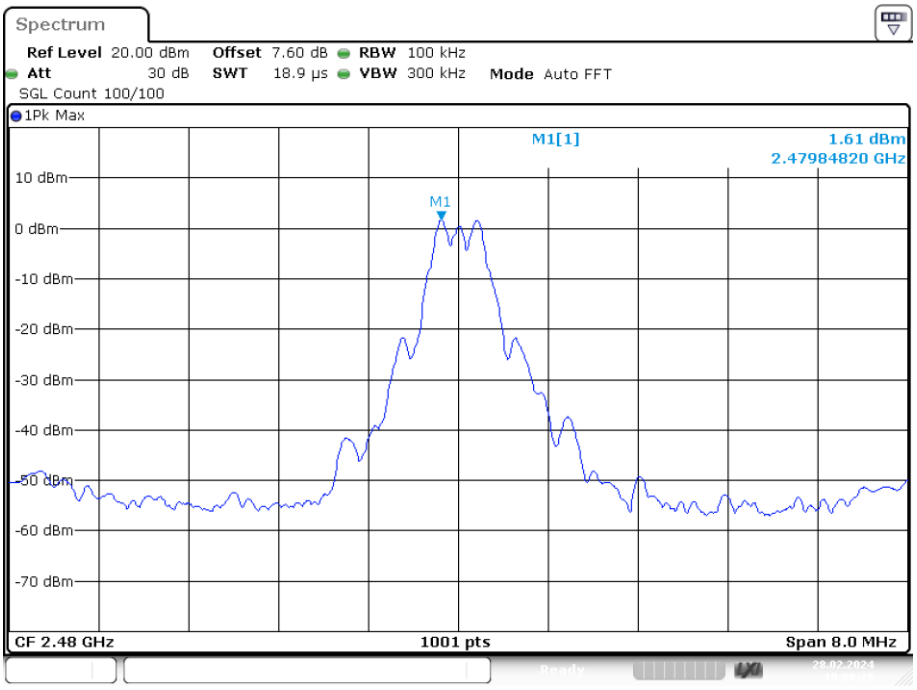
Date: 28.FEB.2024 19:16:21

Band Edge NVNT user 2402MHz Ant1 Emission



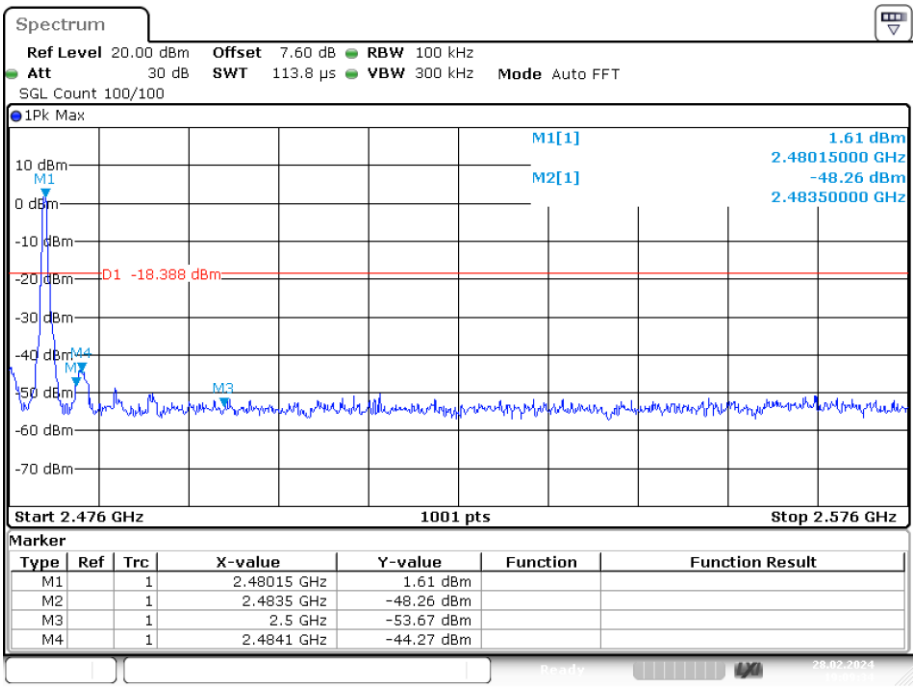
Date: 28.FEB.2024 19:16:27

Band Edge NVNT user 2480MHz Ant1 Ref



Date: 28.FEB.2024 19:09:28

Band Edge NVNT user 2480MHz Ant1 Emission



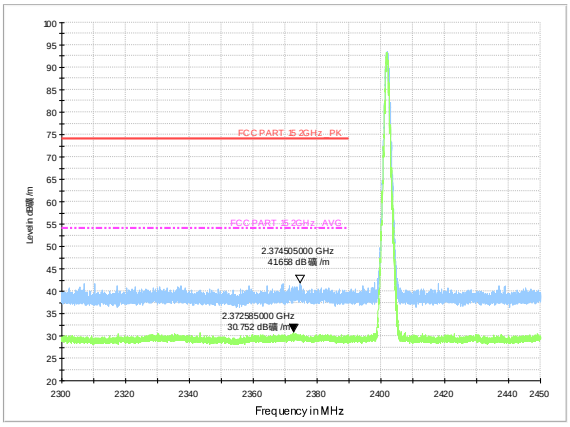
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.48015 GHz	1.61 dBm		
M2		1	2.4835 GHz	-48.26 dBm		
M3		1	2.5 GHz	-53.67 dBm		
M4		1	2.4841 GHz	-44.27 dBm		

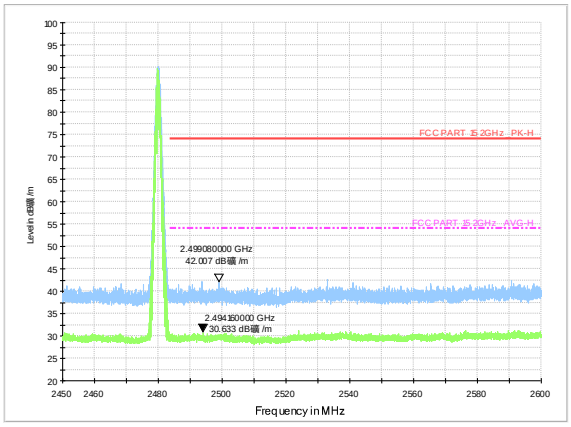
Date: 28.FEB.2024 19:09:34

Radiated Method: GFSK

Test Mode: CH-L

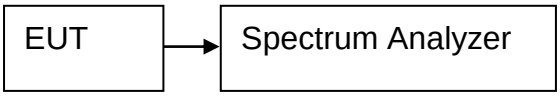


Test Mode: CH-H



6. Occupied Bandwidth Test

6.1. Block Diagram of Test Setup



6.2. Test Limit

Please refer section15.249 and section 15.205.

6.3. Test Procedure

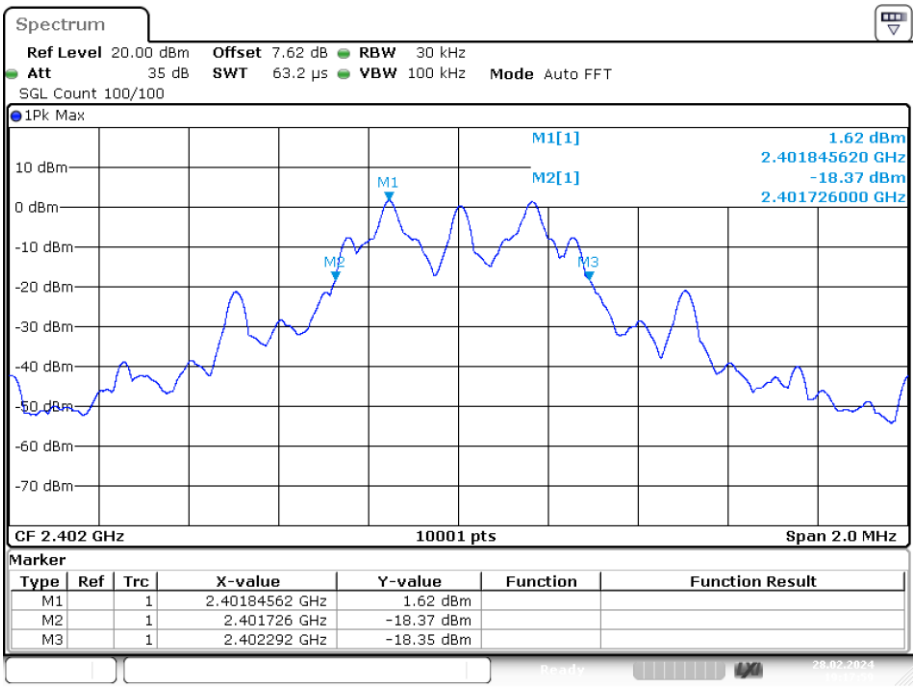
（1） The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating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

（2） The test receiver RBW set 30KHz,VBW set 100KHz,Sweep time set auto.

6.4. Test Results

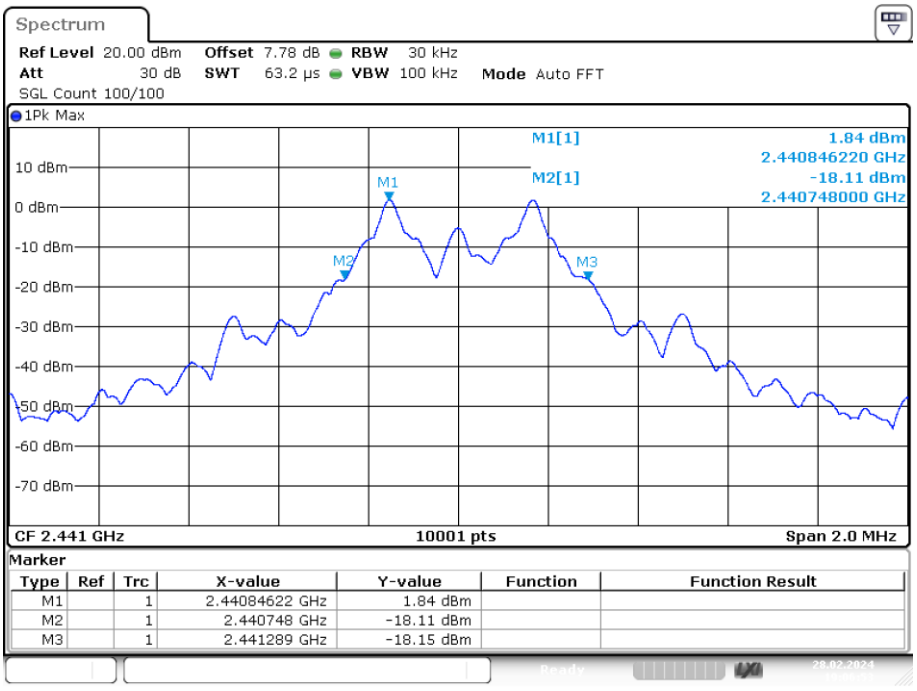
Mode		Frequency MHz	-20dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (kHz)
GFSK	ANT1	2402	0.566	0.549	/
		2441	0.542	0.553	/
		2480	0.54	0.539	/
Note: 1. The test results are listed in next pages.					

-20dB Bandwidth NVNT user 2402MHz Ant1



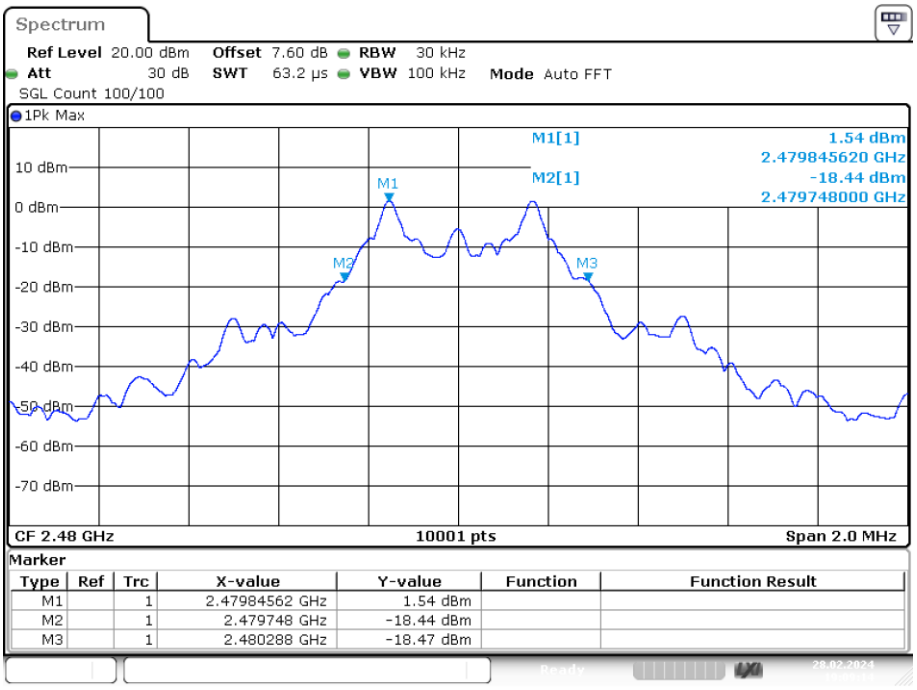
Date: 28.FEB.2024 19:17:59

-20dB Bandwidth NVNT user 2441MHz Ant1



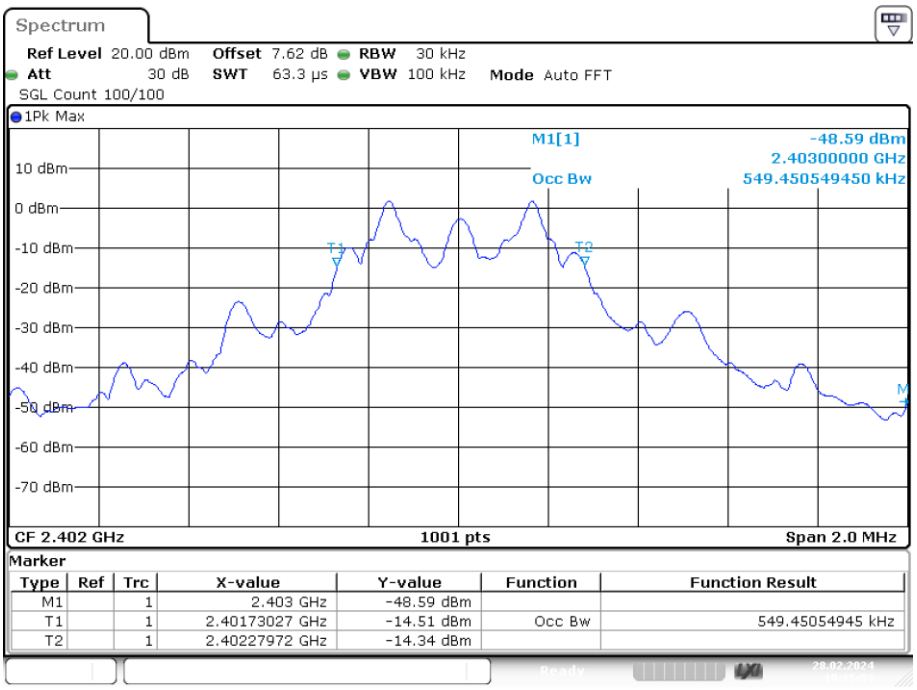
Date: 28.FEB.2024 19:06:52

-20dB Bandwidth NVNT user 2480MHz Ant1



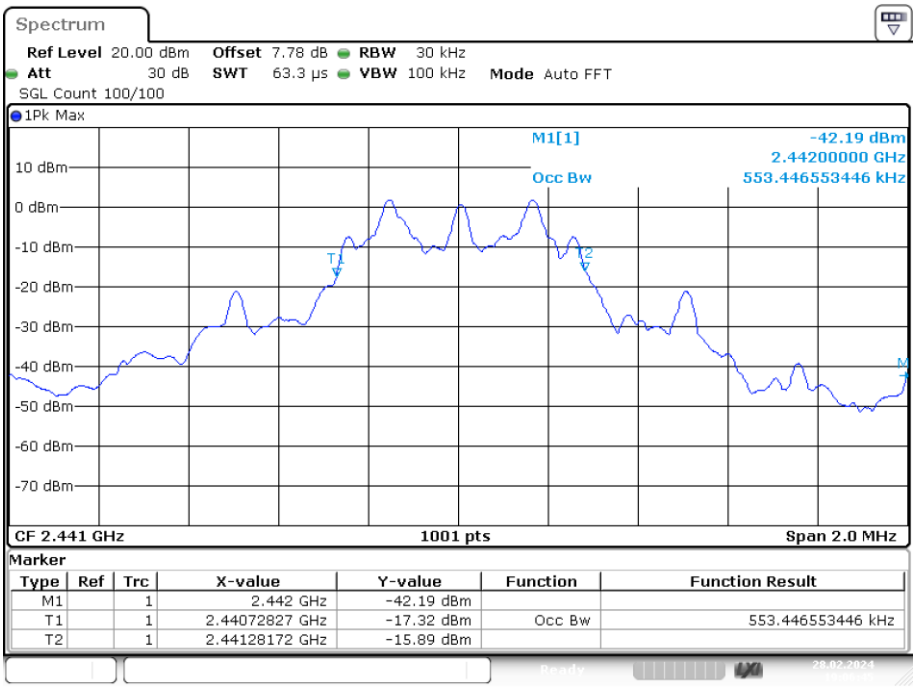
Date: 28.FEB.2024 19:09:14

OBW NVNT user 2402MHz Ant1



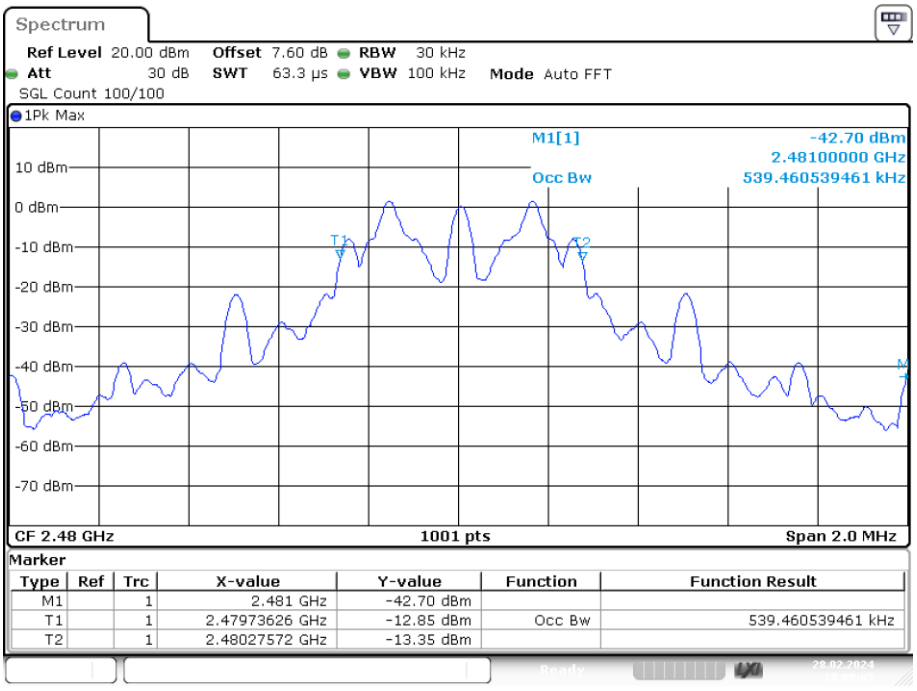
Date: 28.FEB.2024 19:15:53

OBW NVNT user 2441MHz Ant1



Date: 28.FEB.2024 19:06:44

OBW NVNT user 2480MHz Ant1



Date: 28.FEB.2024 19:09:05

7. Antenna Requirement

7.1. Standard Requirement

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.

7.2. Antenna Connected Construction

The directional gains of antenna used for transmitting is 0.7dBi, and the antenna is fixed antenna no consideration of replacement. Please see EUT photo for details.

7.3. Results

The EUT antenna is PCB Antenna. It complies with the standard requirement.

------ END OF REPORT-------