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Report Template Version: V05

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Test Report

Report No.: CQASZ20240901961E-02
Applicant: Innovative Eyewear, Inc
Address of Applicant: 11900 Biscayne Bl, Suite 630, North Miami, FL 33181, United States
Equipment Under Test (EUT):
Product: Smart Eyewear
Model No.: LCD008-10, LCD010-10, LCD010-11, LCD010-20, LCD010-21, LCD010-30, LCD010-31, LCD010-40, LCD010-41
Test Model No.: LCD008-10
Brand Name: Lucyd Reebok
IC : 30961-LCD008
Standards: RSS-247 Issue 3 August 2023
RSS-GEN Issue 5, Amd 2 February 2021
Date of Receipt: 2024-09-10
Date of Test: 2024-09-10 to 2024-10-09
Date of Issue: 2024-10-09
Test Result : **PASS***

Tested By: Lewis Zhou
(Lewis Zhou)

Reviewed By: Timo Lei
(Timo Lei)

Approved By: Alex
(Alex Wang)



* In the configuration tested, the EUT complied with the standards specified above.

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20240901961E-02	Rev.01	Initial report	2024-10-09

2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	RSS-Gen Issue 5	ANSI C63.10 2013	PASS
AC Power Line Conducted Emission	RSS-Gen Issue 5	ANSI C63.10 2013	PASS
Conducted Peak Output Power	RSS 247 5.4(4)	ANSI C63.10 2013 & RSS-Gen Issue 5	PASS
6dB Occupied Bandwidth	RSS 247 5.2(1)	ANSI C63.10 2013 & RSS-Gen Issue 5	PASS
99% Occupied Bandwidth	RSS-Gen Issue 5	RSS-Gen Issue 5	PASS
Power Spectral Density	RSS 247 5.2(2)	ANSI C63.10 2013	PASS
Band-edge for RF Conducted Emissions	RSS 247 5.5	ANSI C63.10 2013	PASS
RF Conducted Spurious Emissions	RSS 247 5.5	ANSI C63.10 2013	PASS
Radiated Spurious Emissions	RSS-Gen Issue 5	ANSI C63.10 2013 & RSS-Gen Issue 5	PASS
Restricted bands around fundamental frequency (Radiated Emission)	RSS-Gen Issue 5	ANSI C63.10 2013 & RSS-Gen Issue 5	PASS

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4 General Information

4.1 Client Information

Applicant:	Innovative Eyewear, Inc
Address of Applicant:	11900 Biscayne Bl, Suite 630, North Miami, FL 33181, United States
Manufacturer:	Shenzhen Gonbes Technology Co. Ltd
Address of Manufacturer:	RM501, Bldg 3, Mengliyuan Industrial Park, 124 Yousong Rd, Longhua Str, Longhua Dist, Shenzhen, Guangdong Province, 518000, CHINA
Factory:	Shenzhen Gonbes Technology Co. Ltd
Factory of Manufacturer:	RM501, Bldg 3, Mengliyuan Industrial Park, 124 Yousong Rd, Longhua Str, Longhua Dist, Shenzhen, Guangdong Province, 518000, CHINA

4.2 General Description of EUT

Product Name:	Smart Eyewear
All Model No.:	LCD008-10, LCD010-10, LCD010-11, LCD010-20, LCD010-21, LCD010-30, LCD010-31, LCD010-40, LCD010-41
Test Model No.:	LCD008-10
Trade Mark:	Lucyd Reebok
Operation Frequency:	2402MHz~2480MHz
Software Version:	GBS_ATS3025_GK28_V2.2_20240806.fw
Hardware Version:	GK28(ATS3025)-V1.1
Test sample SN:	41526668963
Bluetooth Version:	V5.3
Modulation Type:	GFSK
Transfer Rate:	1Mbps,2Mbps
Number of Channel:	40
Product Type:	☐ Mobile ☒ Portable ☐ Fix Location
Test Software of EUT:	FCC
Antenna Type:	Chip antenna
Antenna Gain:	1.24dBi
EUT Power Supply:	Li-ion battery: DC 3.7V 180mAh, Charge by DC 5V for adapter
Simultaneous Transmission:	☐ Simultaneous TX is supported and evaluated in this report. ☒ Simultaneous TX is not supported.

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

Note:

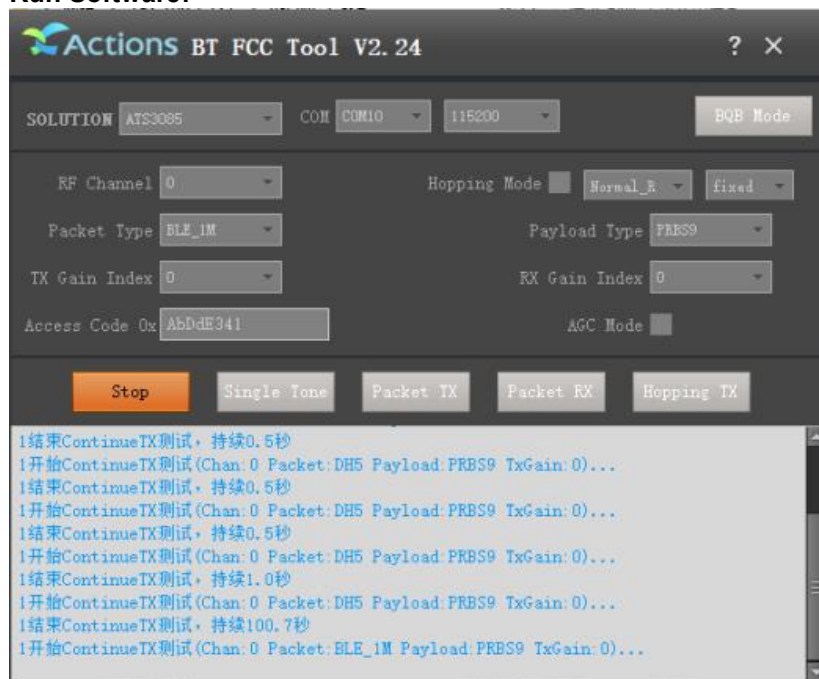
In section RSS-Gen, regards to the operating frequency range over 10 MHz, the lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel (CH0)	2402MHz
The middle channel (CH19)	2440MHz
The highest channel (CH39)	2480MHz

4.3 Additional Instructions

EUT Test Software Settings:		
Mode:	☒ Special software is used. ☐ Through engineering command into the engineering mode. engineering command: *##3646633##*	
EUT Power level:	Class2 (Power level is built-in set parameters and cannot be changed and selected)	
Use test software to set the lowest frequency, the middle frequency and the highest frequency keep transmitting of the EUT.		
Mode	Channel	Frequency(MHz)
GFSK	CH0	2402
	CH19	2440
	CH39	2480

Run Software:



4.4 Test Environment

Operating Environment:	
Temperature:	25.0 °C
Humidity:	53 % RH
Atmospheric Pressure:	1010mbar
Test Mode:	Use test software to set the lowest frequency, the middle frequency and the highest frequency keep transmitting of the EUT. Note: In the process of transmitting of EUT, the duty cycle >98%.

4.5 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Remark	Supplied by
/	/	/	/	/

4.6 Test Location

All tests were performed at:

Shenzhen Huaxia Testing Technology Co., Ltd.

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua New District, Shenzhen, Guangdong, China

4.7 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate.

The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities.

The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Huaxia Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025.

Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CQA laboratory is reported:

No.	Item	Uncertainty	Notes
1	Radiated Emission (Below 1GHz)	±5.12dB	(1)
2	Radiated Emission (Above 1GHz)	±4.60dB	(1)
3	Conducted Disturbance (0.15~30MHz)	±3.34dB	(1)
4	Radio Frequency	3×10^{-8}	(1)
5	Duty cycle	0.6 %.	(1)
6	Occupied Bandwidth	1.1%	(1)
7	RF conducted power	0.86dB	(1)
8	RF power density	0.74	(1)
9	Conducted Spurious emissions	0.86dB	(1)
10	Temperature test	0.8℃	(1)
11	Humidity test	2.0%	(1)
12	Supply voltages	0.5 %.	(1)
13	time	0.6 %.	(1)
14	Frequency Error	5.5 Hz	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

4.8 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

IC Registration No.: 22984-1

The 3m Semi-anechoic chamber of Shenzhen Huaxia Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

The test facility is recognized, certified, or accredited by the following organizations:

• **CNAS (No. CNAS L5785)**

CNAS has accredited Shenzhen Huaxia Testing Technology Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• **A2LA (Certificate No. 4742.01)**

Shenzhen Huaxia Testing Technology Co., Ltd. Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

• **FCC Registration No.: 522263**

Shenzhen Huaxia Testing Technology Co., Ltd. Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.:522263

4.9 Deviation from Standards

None.

4.10 Abnormalities from Standard Conditions

None.

4.11 Other Information Requested by the Customer

None.

4.12 Equipment List

Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR7	CQA-005	2024/9/2	2025/9/1
Spectrum analyzer	R&S	FSU26	CQA-038	2024/9/2	2025/9/1
Spectrum analyzer	R&S	FSU40	CQA-075	2024/9/2	2025/9/1
Preamplifier	MITEQ	AFS4-00010300-18-10P-4	CQA-035	2024/9/2	2025/9/1
Preamplifier	MITEQ	AMF-6D-02001800-29-20P	CQA-036	2024/9/2	2025/9/1
Preamplifier	EMCI	EMC184055SE	CQA-089	2024/9/2	2025/9/1
Loop antenna	Schwarzbeck	FMZB1516	CQA-060	2023/9/8	2026/9/7
Bilog Antenna	R&S	HL562	CQA-011	2023/11/01	2026/10/31
Horn Antenna	R&S	HF906	CQA-012	2023/11/01	2026/10/31
Horn Antenna	Schwarzbeck	BBHA 9170	CQA-088	2023/9/7	2026/9/6
Coaxial Cable (Above 1GHz)	CQA	N/A	C007	2024/9/2	2025/9/1
Coaxial Cable (Below 1GHz)	CQA	N/A	C013	2024/9/2	2025/9/1
RF cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2024/9/2	2025/9/1
Antenna Connector	CQA	RFC-01	CQA-080	2024/9/2	2025/9/1
Power Sensor	KEYSIGHT	U2021XA	CQA-30	2024/9/2	2025/9/1
N1918A Power Analysis Manager Power Panel	Agilent	N1918A	CQA-074	2024/9/2	2025/9/1
Power meter	R&S	NRVD	CQA-029	2024/9/2	2025/9/1
Power divider	MIDWEST	PWD-2533-02-SMA-79	CQA-067	2024/9/2	2025/9/1
EMI Test Receiver	R&S	ESR7	CQA-005	2024/9/2	2025/9/1
LISN	R&S	ENV216	CQA-003	2024/9/2	2025/9/1
Coaxial cable	CQA	N/A	CQA-C009	2024/9/2	2025/9/1
DC power	KEYSIGHT	E3631A	CQA-028	2024/9/2	2025/9/1

Note:

The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

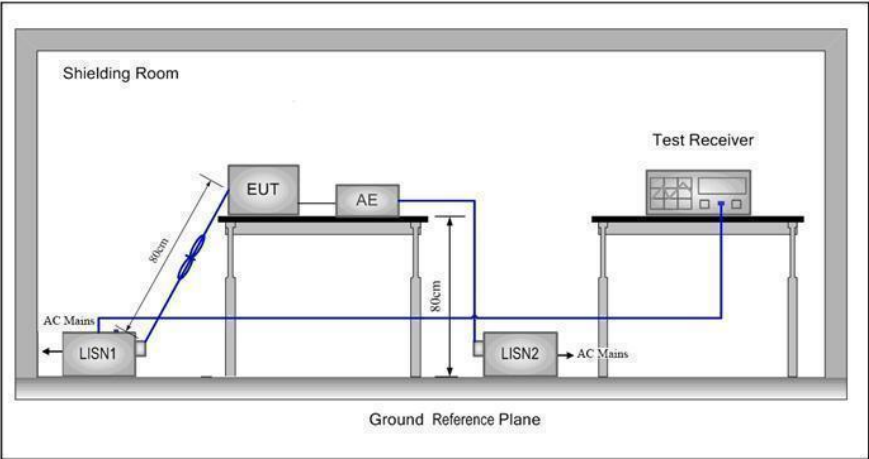
5 Test results and Measurement Data

5.1 Antenna Requirement

Standard requirement:	RSS-Gen Issue 5
EUT Antenna:	
The antenna is Chip antenna. The connection/connection type between the antenna to the EUT's antenna port is: permanently attachment. This is either permanently attachment or a unique coupling that satisfies the requirement.	

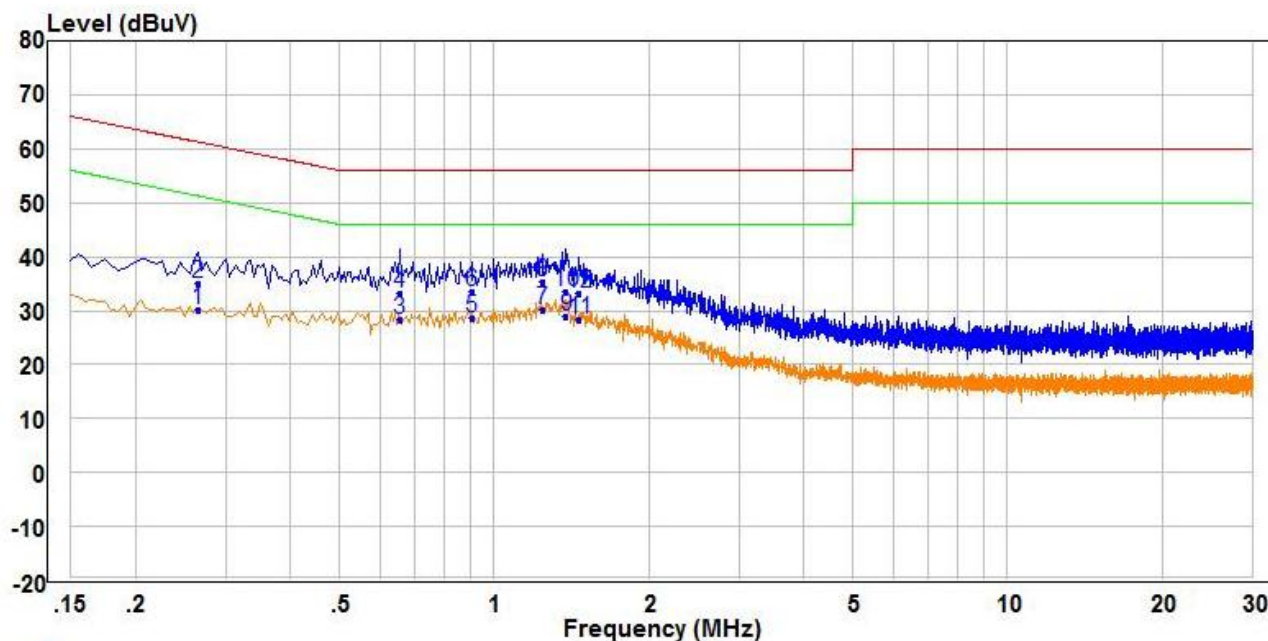
5.2 Conducted Emissions

Test Requirement:	RSS-Gen Issue 5		
Test Method:	ANSI C63.10 2013 & RSS-Gen Issue 5		
Test Frequency Range:	150kHz to 30MHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test Procedure:	1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.		

Test Setup:	
Test Mode:	Through Pre-scan, find the transmitting mode at the lowest channel is the worst case.
Test Voltage:	AC 120V/60Hz
Test Results:	Pass

Measurement Data

Live line:

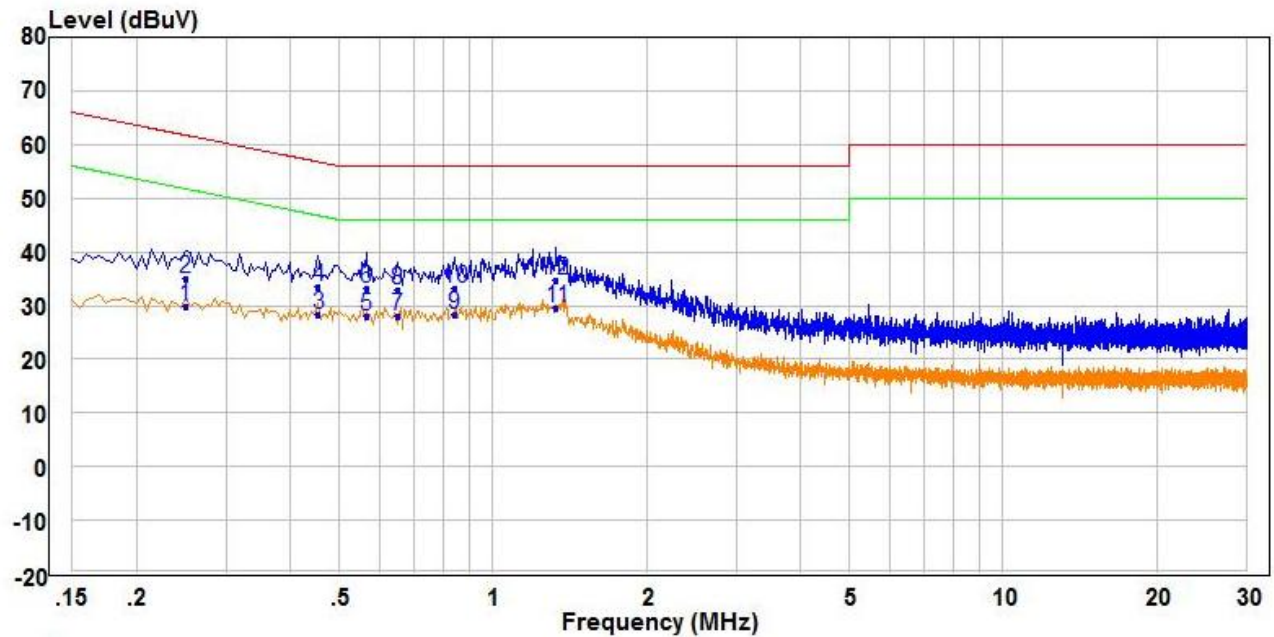


		Read		Limit	Over		
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	Pol/Phase
1	0.265	20.62	9.53	30.15	51.27	-21.12	Average
2	0.265	25.39	9.53	34.92	61.27	-26.35	QP
3	0.655	18.34	9.86	28.20	46.00	-17.80	Average
4	0.655	23.39	9.86	33.25	56.00	-22.75	QP
5	0.905	18.81	9.76	28.57	46.00	-17.43	Average
6	0.905	23.60	9.76	33.36	56.00	-22.64	QP
7 PP	1.240	19.82	10.30	30.12	46.00	-15.88	Average
8 QP	1.240	24.90	10.30	35.20	56.00	-20.80	QP
9	1.380	18.26	10.60	28.86	46.00	-17.14	Average
10	1.380	23.04	10.60	33.64	56.00	-22.36	QP
11	1.465	17.59	10.77	28.36	46.00	-17.64	Average
12	1.465	22.45	10.77	33.22	56.00	-22.78	QP

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral line:

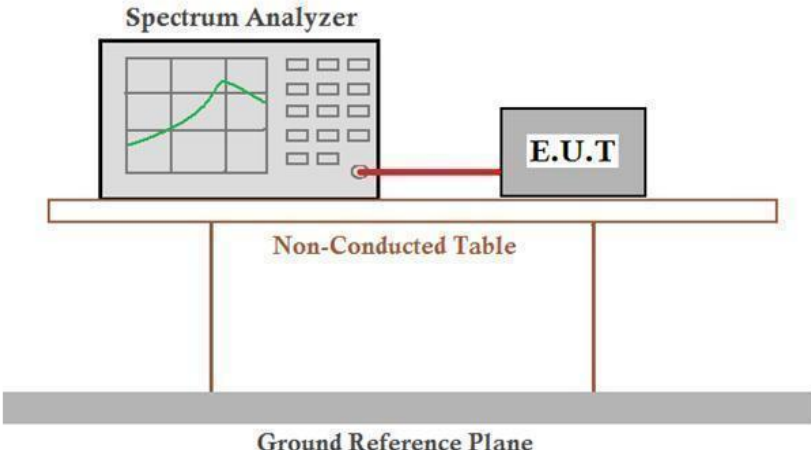


	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.250	20.45	9.54	29.99	51.76	-21.77	Average	Neutral
2	0.250	25.64	9.54	35.18	61.76	-26.58	QP	Neutral
3	0.455	18.79	9.66	28.45	46.78	-18.33	Average	Neutral
4	0.455	23.89	9.66	33.55	56.78	-23.23	QP	Neutral
5	0.565	18.38	9.77	28.15	46.00	-17.85	Average	Neutral
6	0.565	23.42	9.77	33.19	56.00	-22.81	QP	Neutral
7	0.650	18.21	9.85	28.06	46.00	-17.94	Average	Neutral
8	0.650	23.19	9.85	33.04	56.00	-22.96	QP	Neutral
9	0.840	18.58	9.81	28.39	46.00	-17.61	Average	Neutral
10	0.840	23.42	9.81	33.23	56.00	-22.77	QP	Neutral
11 PP	1.330	19.86	9.72	29.58	46.00	-16.42	Average	Neutral
12 QP	1.330	25.13	9.72	34.85	56.00	-21.15	QP	Neutral

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

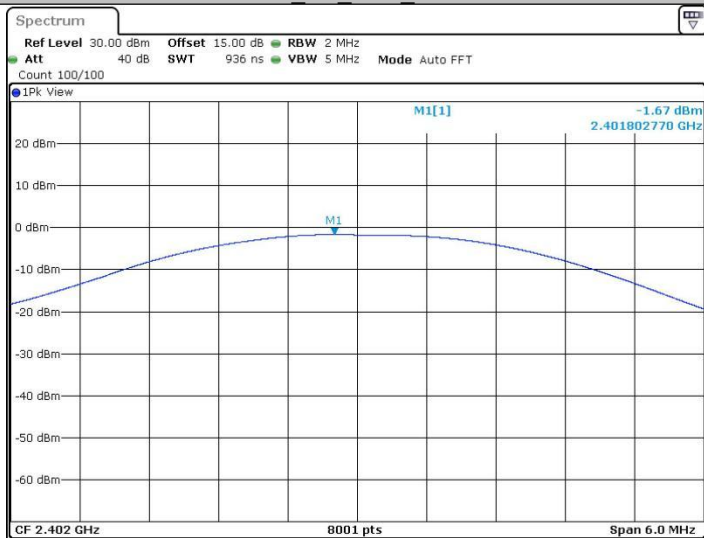
5.3 Conducted Peak Output Power

Test Requirement:	RSS 247 5.4(4)
Test Method:	ANSI C63.10 2013 & RSS-Gen Issue 5
Test Setup:	 Remark: Offset=Cable loss+ attenuation factor.
Limit:	30dBm
EIRP Limit:	36dBm
Test Mode:	Transmitting with GFSK modulation.
Test Results:	Pass

Measurement Data

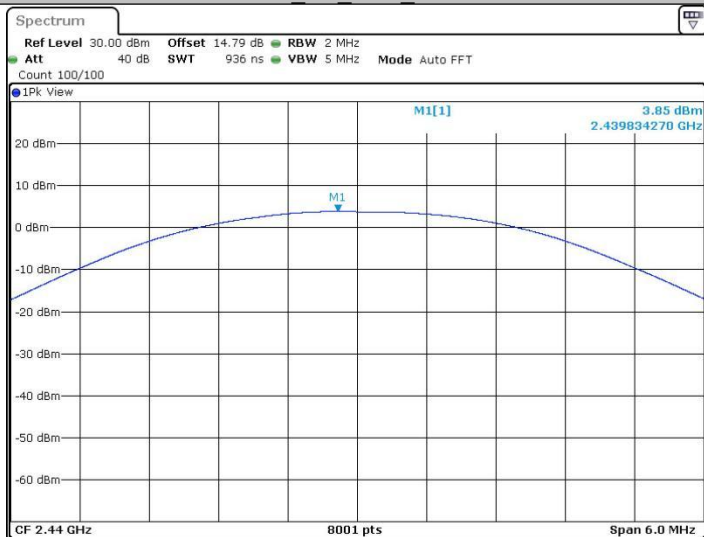
TestMode	Freq(MHz)	Conducted Peak Power[dBm]	Conducted Limit[dBm]	EIRP[dBm]	EIRP Limit[dBm]	Verdict
BLE_1M	2402	-1.67	≤30	-0.43	≤36	PASS
	2440	3.85	≤30	5.09	≤36	PASS
	2480	3.56	≤30	4.8	≤36	PASS
BLE_2M	2402	3.9	≤30	5.14	≤36	PASS
	2440	3.62	≤30	4.86	≤36	PASS
	2480	3.5	≤30	4.74	≤36	PASS

BLE_1M_Ant1_2402



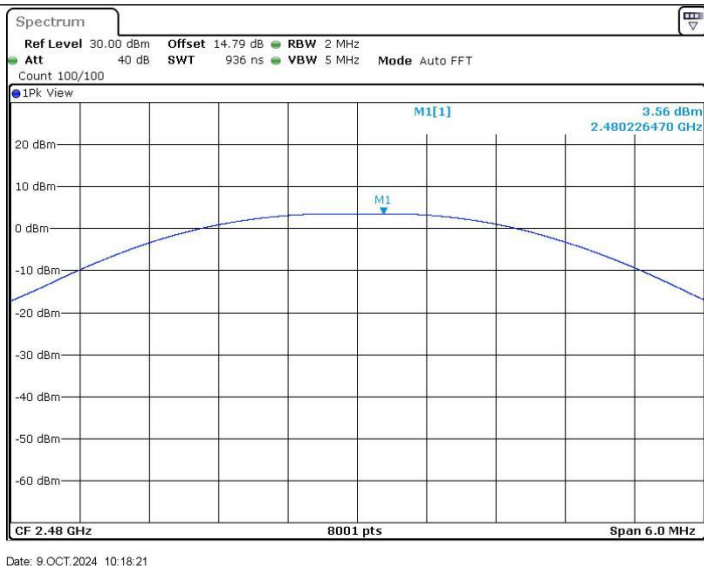
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BLE_1M_Ant1_2440

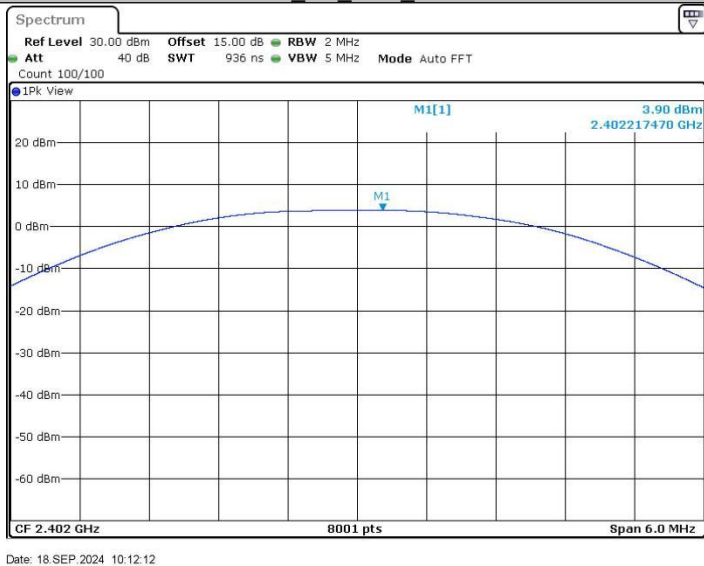


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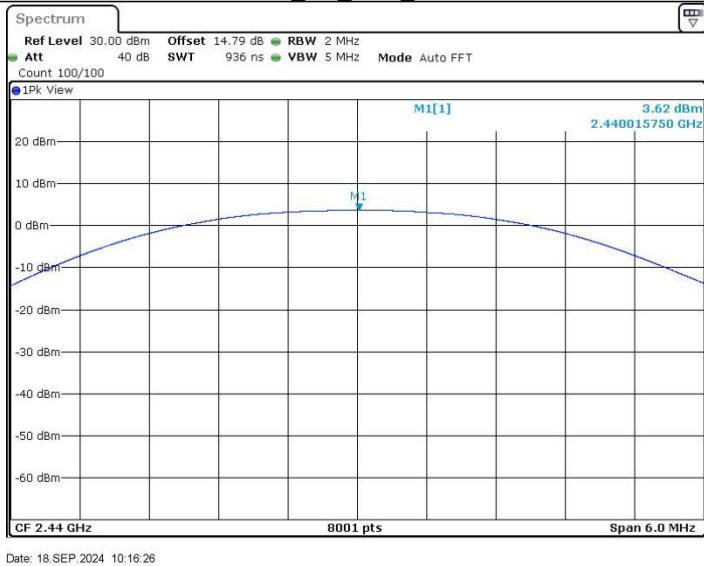
BLE_1M_Ant1_2480



BLE_2M_Ant1_2402

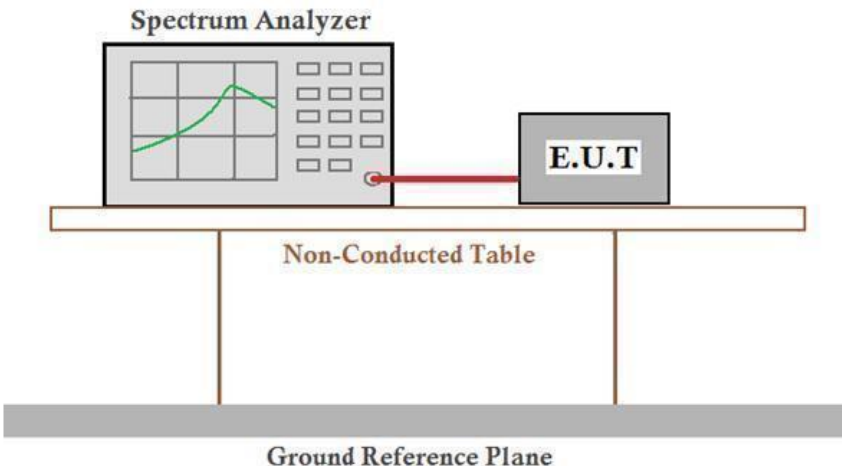


BLE_2M_Ant1_2440





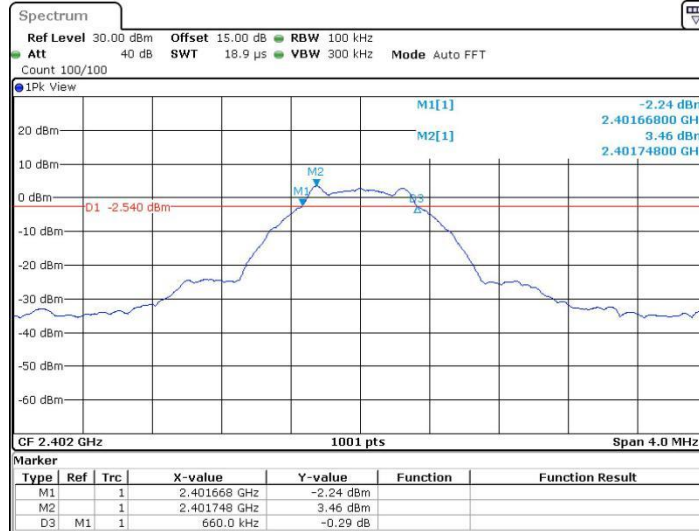
5.4 6dB Occupy Bandwidth

Test Requirement:	RSS 247 5.2(1)
Test Method:	ANSI C63.10 2013 & RSS-Gen Issue 5
Test Setup:	 Remark: Offset=Cable loss+ attenuation factor.
Limit:	≥ 500 kHz
Test Mode:	Transmitting with GFSK modulation.
Test Results:	Pass

Measurement Data

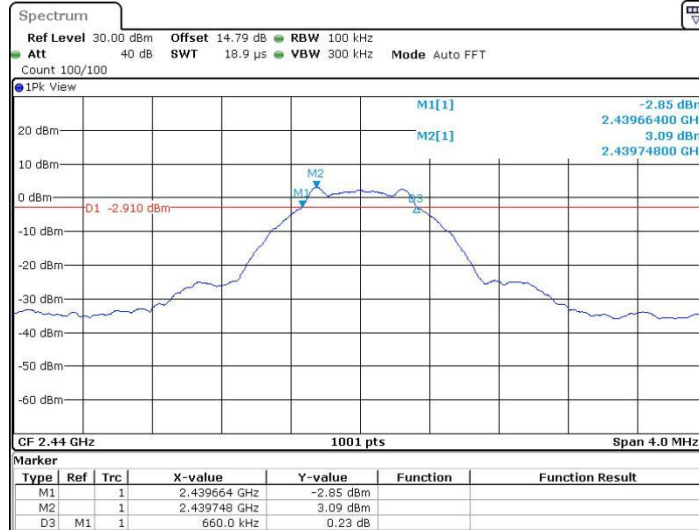
GFSK mode (1Mbps)			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	0.66	≥ 500	Pass
Middle	0.66	≥ 500	Pass
Highest	0.66	≥ 500	Pass
GFSK mode (2Mbps)			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	1.13	≥ 500	Pass
Middle	1.13	≥ 500	Pass
Highest	1.13	≥ 500	Pass

BLE_1M_Ant1_2402



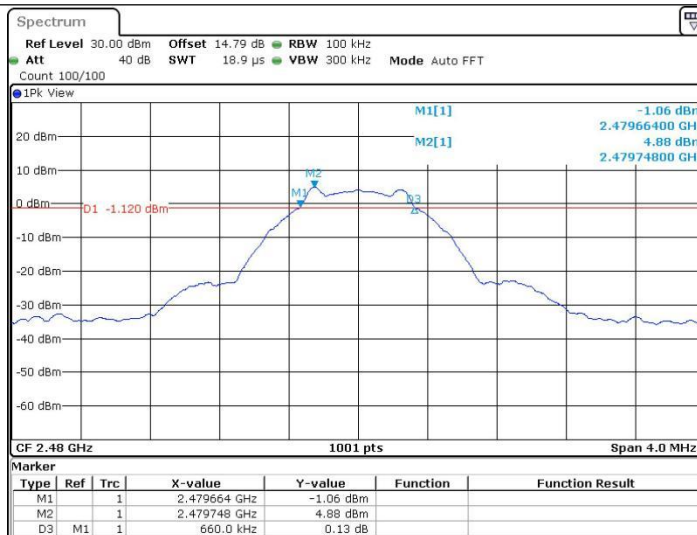
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BLE_1M_Ant1_2440



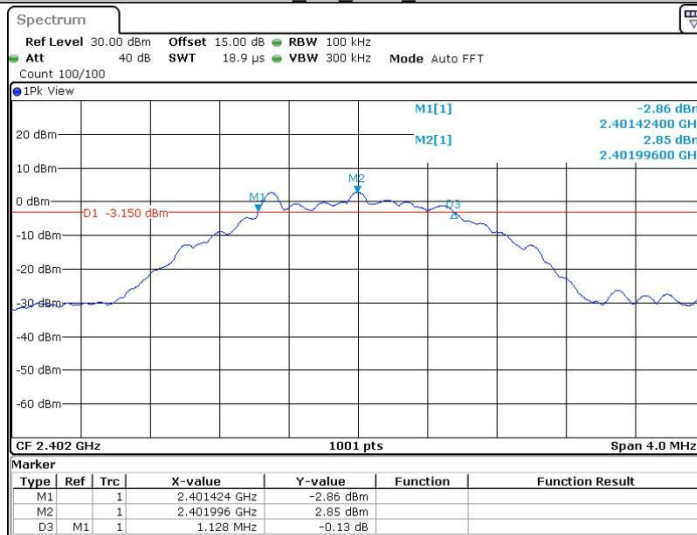
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BLE_1M_Ant1_2480



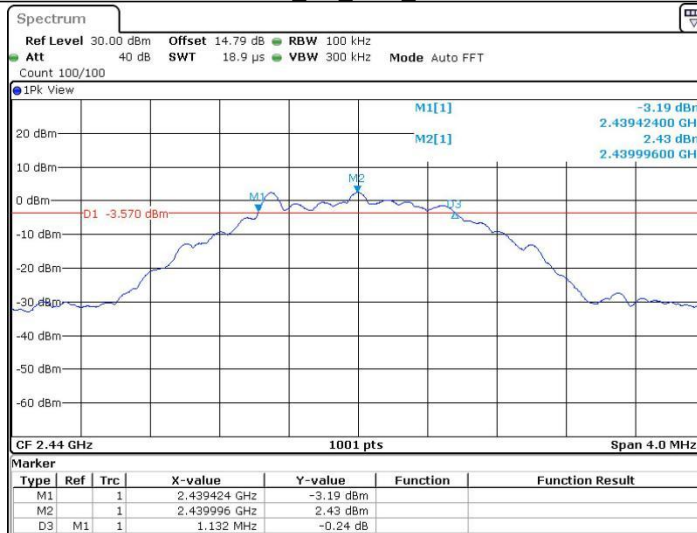
Date: 18.SEP.2024 10:06:04

BLE_2M_Ant1_2402



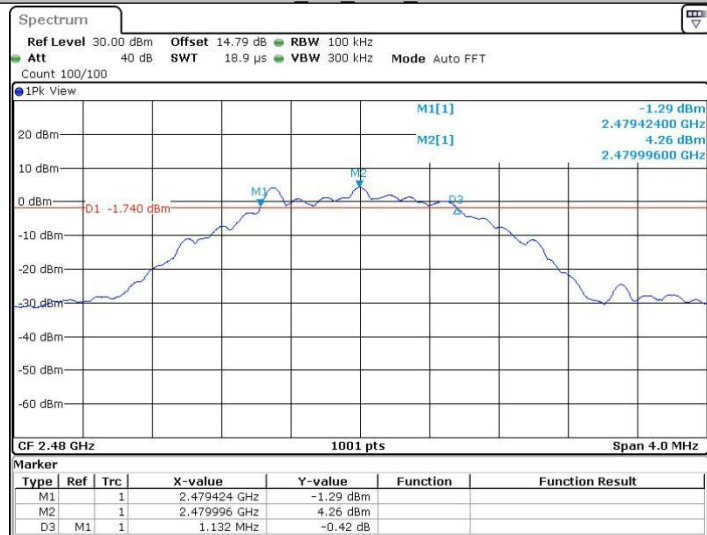
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BLE_2M_Ant1_2440



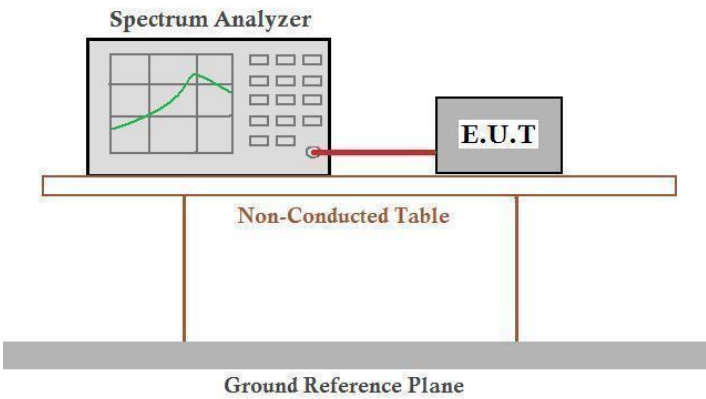
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BLE_2M_Ant1_2480



Date: 18.SEP.2024 10:17:48

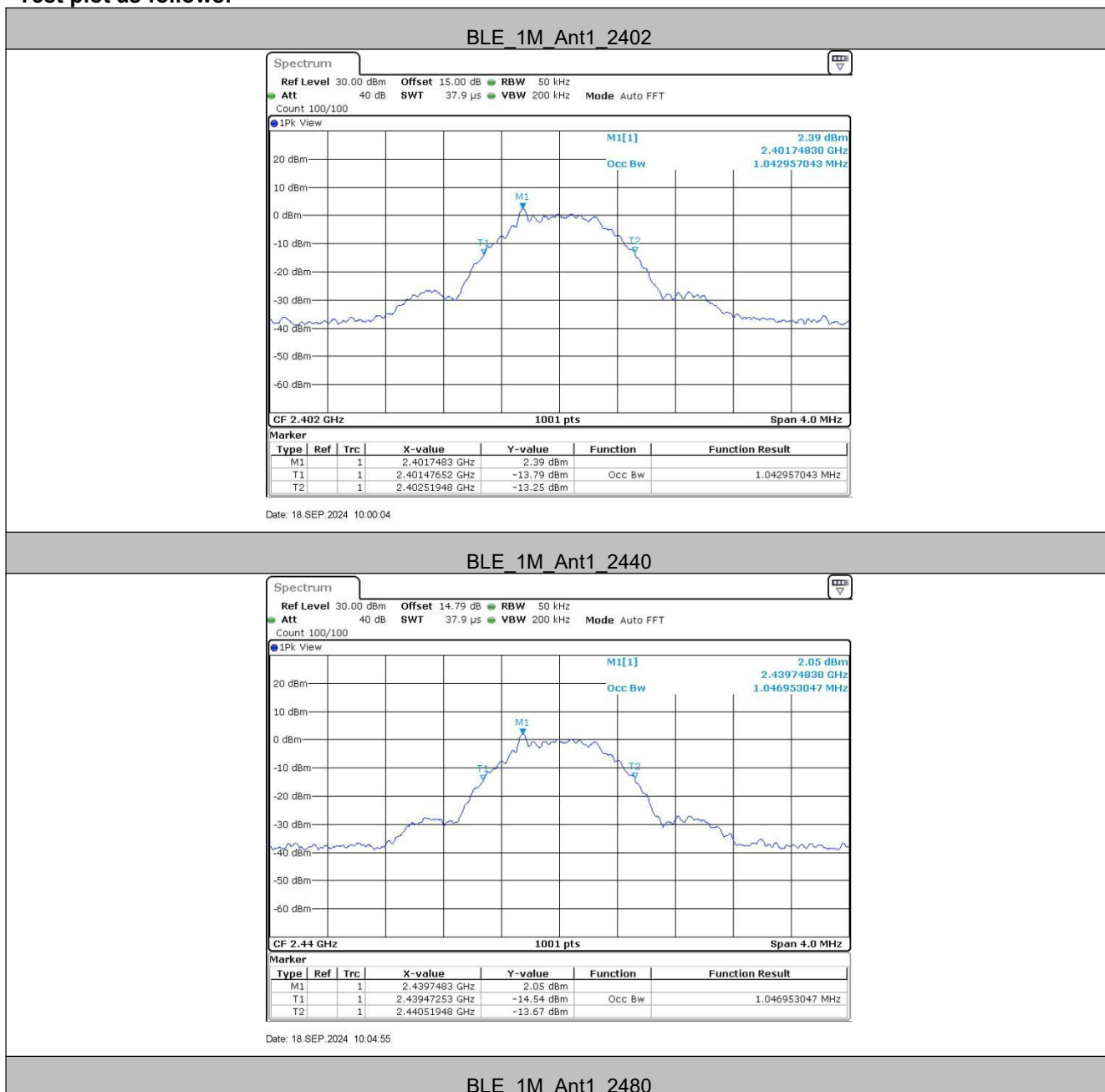
5.5 99% Occupy Bandwidth

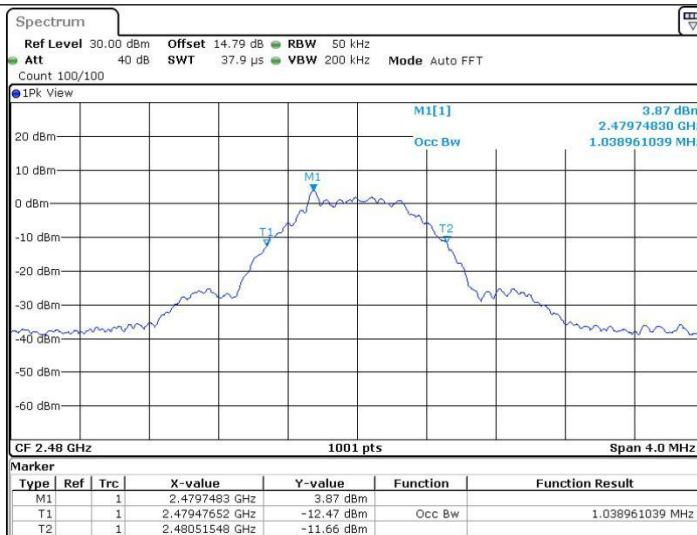
Test Requirement:	RSS-Gen Issue 5
Test Method:	RSS-Gen Issue 5
Test Setup:	 Remark: Offset=Cable loss+ attenuation factor.
Limit:	NA
Test Mode:	Transmitting with GFSK modulation
Test Results:	Pass

Measurement Data

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]
BLE_1M	Ant1	2402	1.043	2401.4765	2402.5195
		2440	1.047	2439.4725	2440.5195
		2480	1.039	2479.4765	2480.5155
BLE_2M	Ant1	2402	1.966	2401.0170	2402.9830
		2440	1.966	2439.0170	2440.9830
		2480	1.954	2479.0210	2480.9750

Test plot as follows:





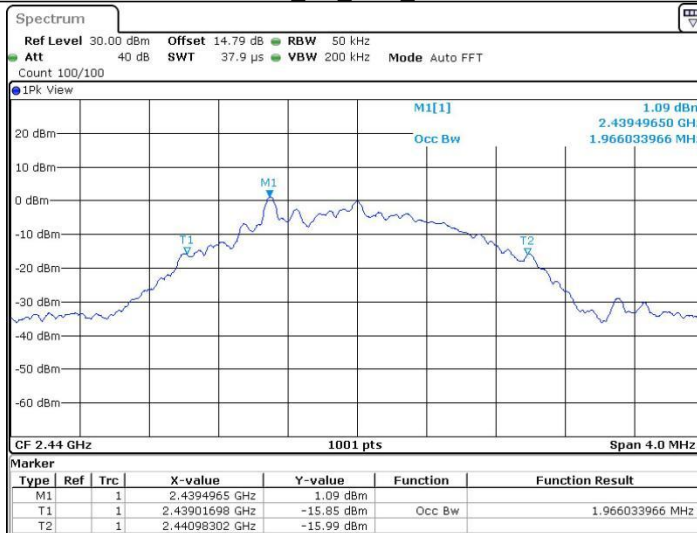
Date: 18.SEP.2024 10:06:10

BLE 2M Ant1 2402



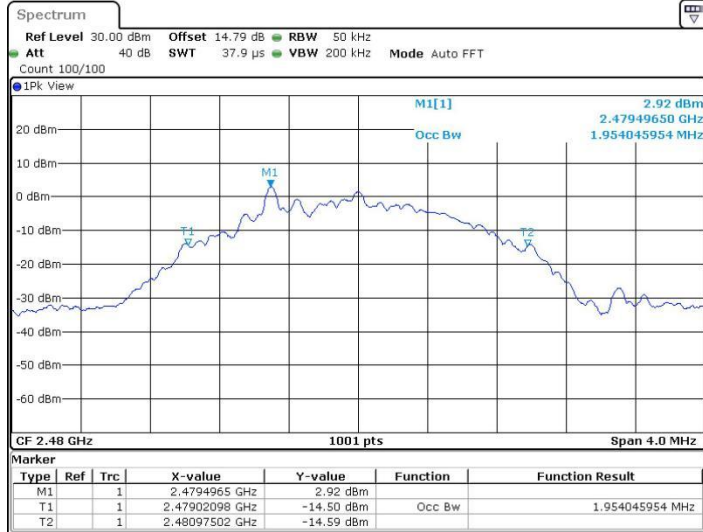
Date: 18.SEP.2024 10:12:05

BLE 2M Ant1 2440



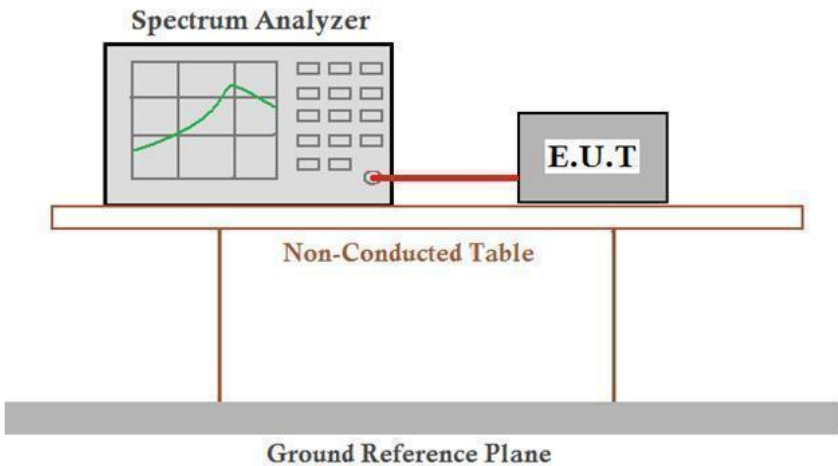
Date: 18.SEP.2024 10:16:19

BLE_2M_Ant1_2480



Date: 18.SEP.2024 10:17:55

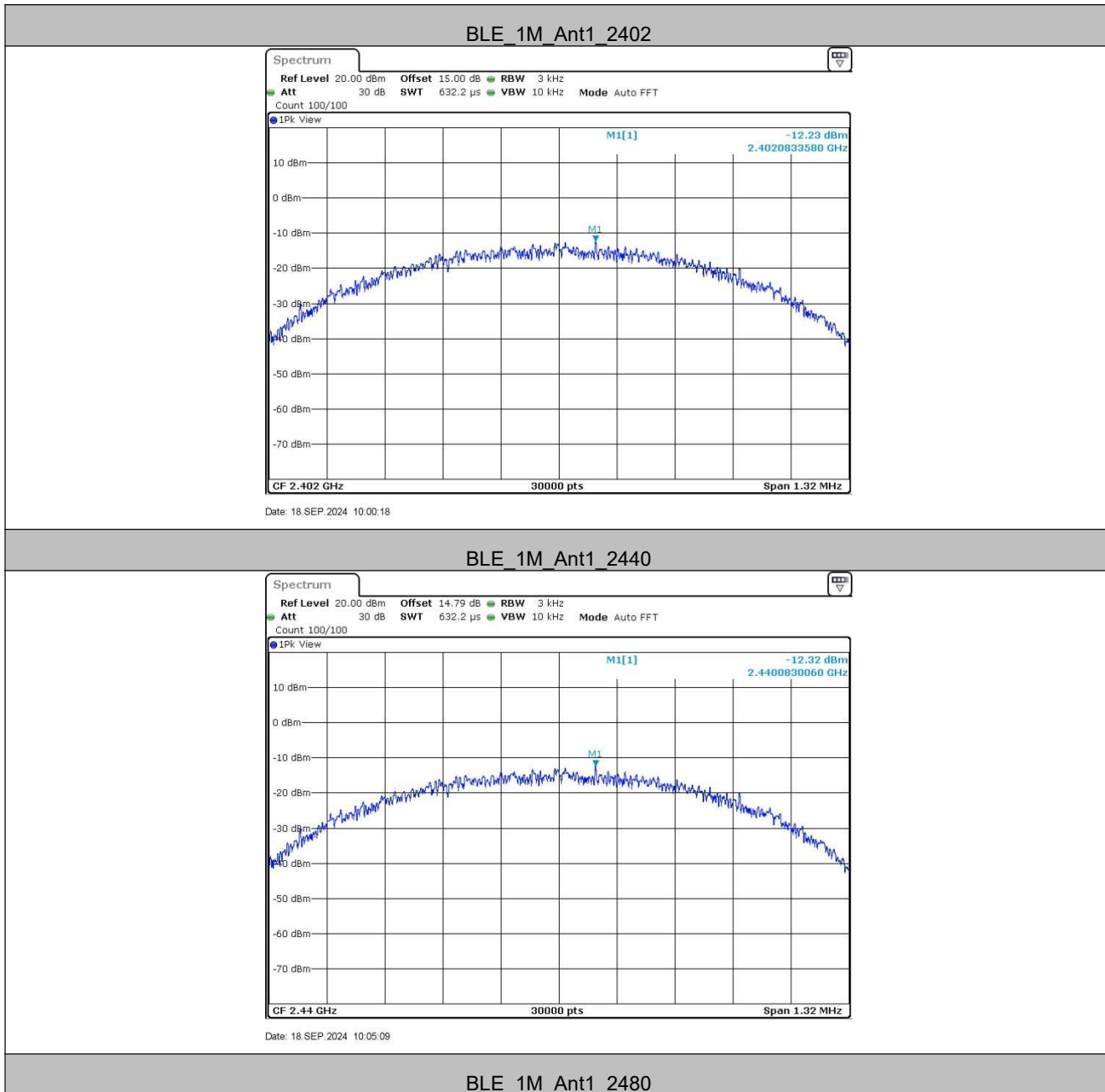
5.6 Power Spectral Density

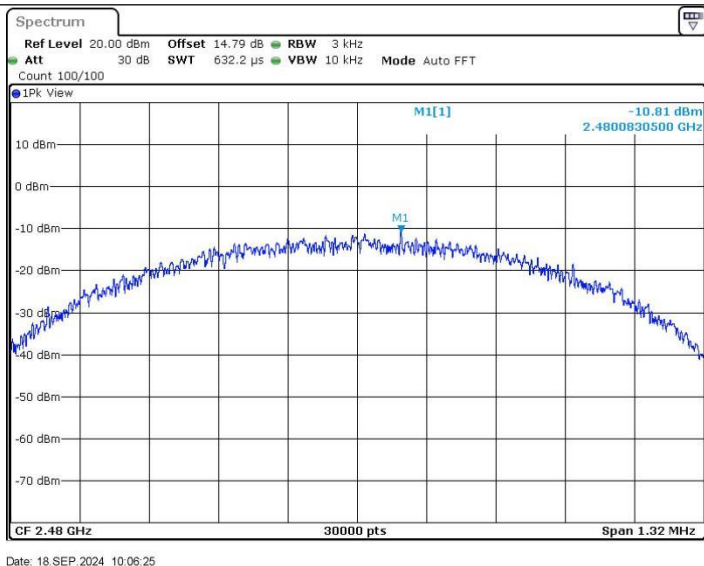
Test Requirement:	RSS 247 5.2(2)
Test Method:	ANSI C63.10 2013
Test Setup:	 Remark: Offset=Cable loss+ attenuation factor.
Limit:	≤8.00dBm/3kHz
Test Mode:	Transmitting with GFSK modulation.
Test Results:	Pass

Measurement Data

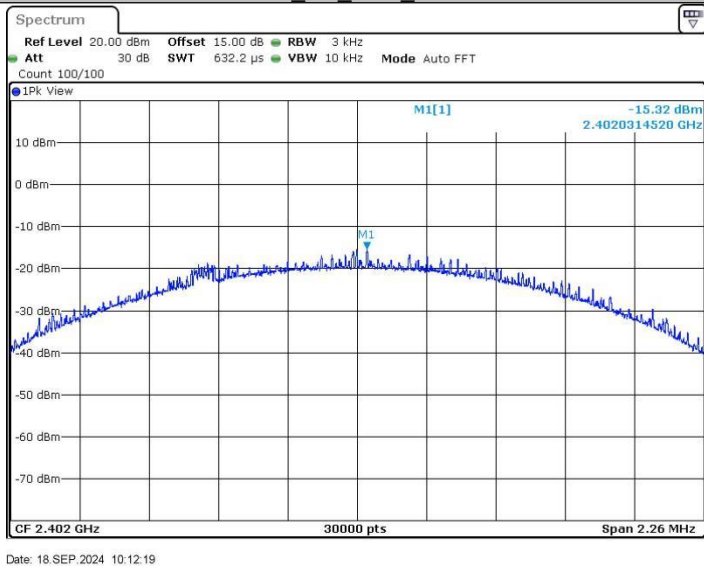
GFSK mode (1Mbps)			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-12.23	≤8.00	Pass
Middle	-12.32	≤8.00	Pass
Highest	-10.81	≤8.00	Pass
GFSK mode (2Mbps)			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-15.32	≤8.00	Pass
Middle	-15.5	≤8.00	Pass
Highest	-14	≤8.00	Pass

Test plot as follows:

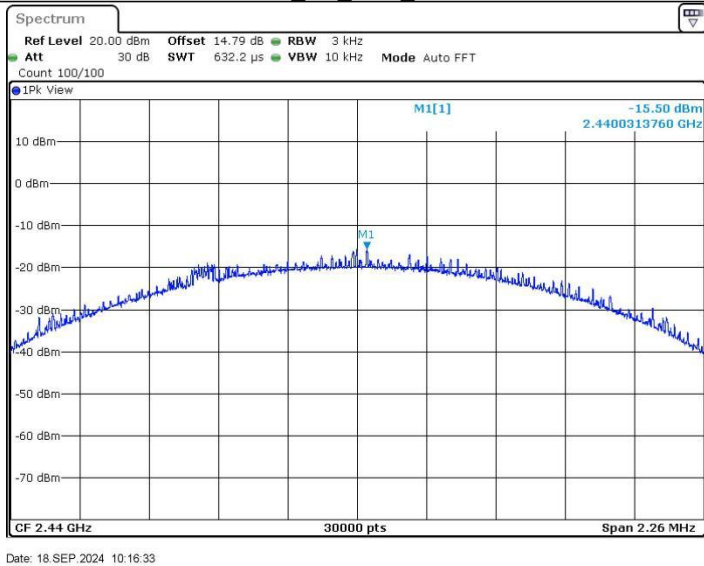


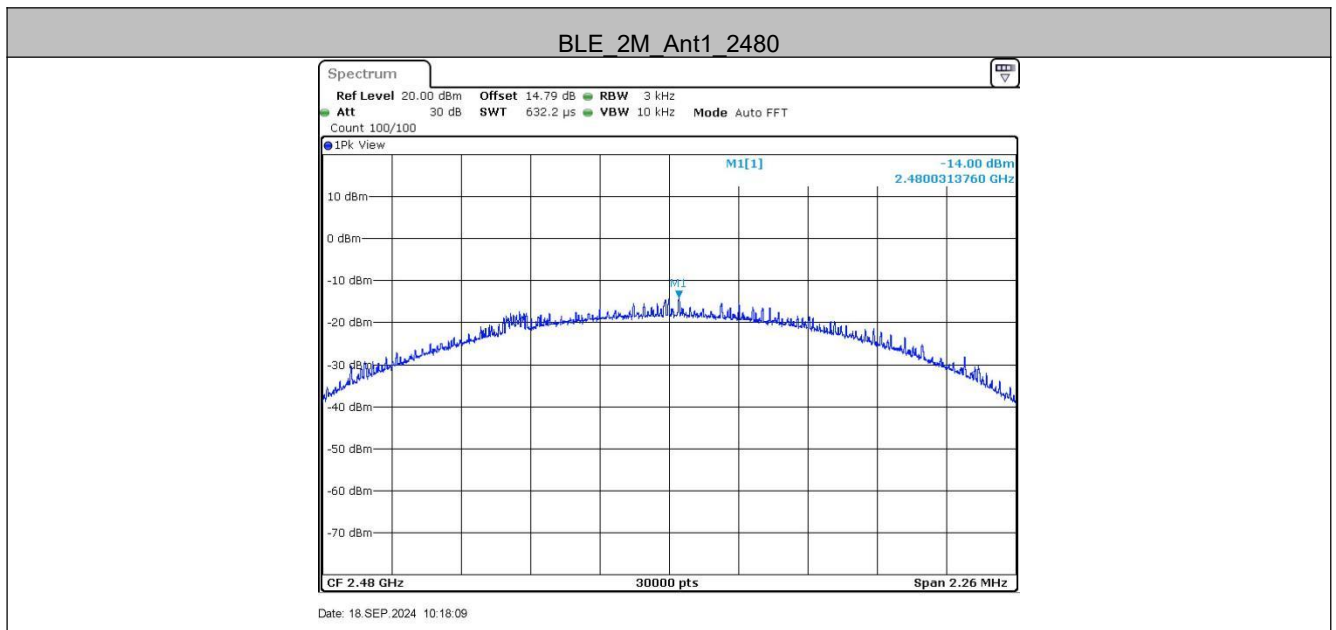


BLE_2M_Ant1_2402

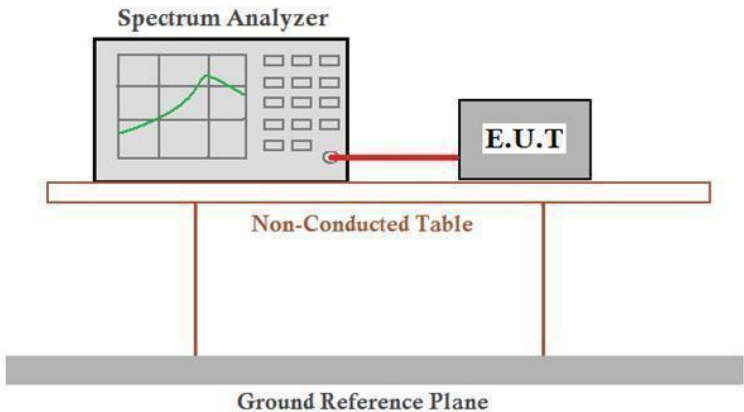


BLE_2M_Ant1_2440



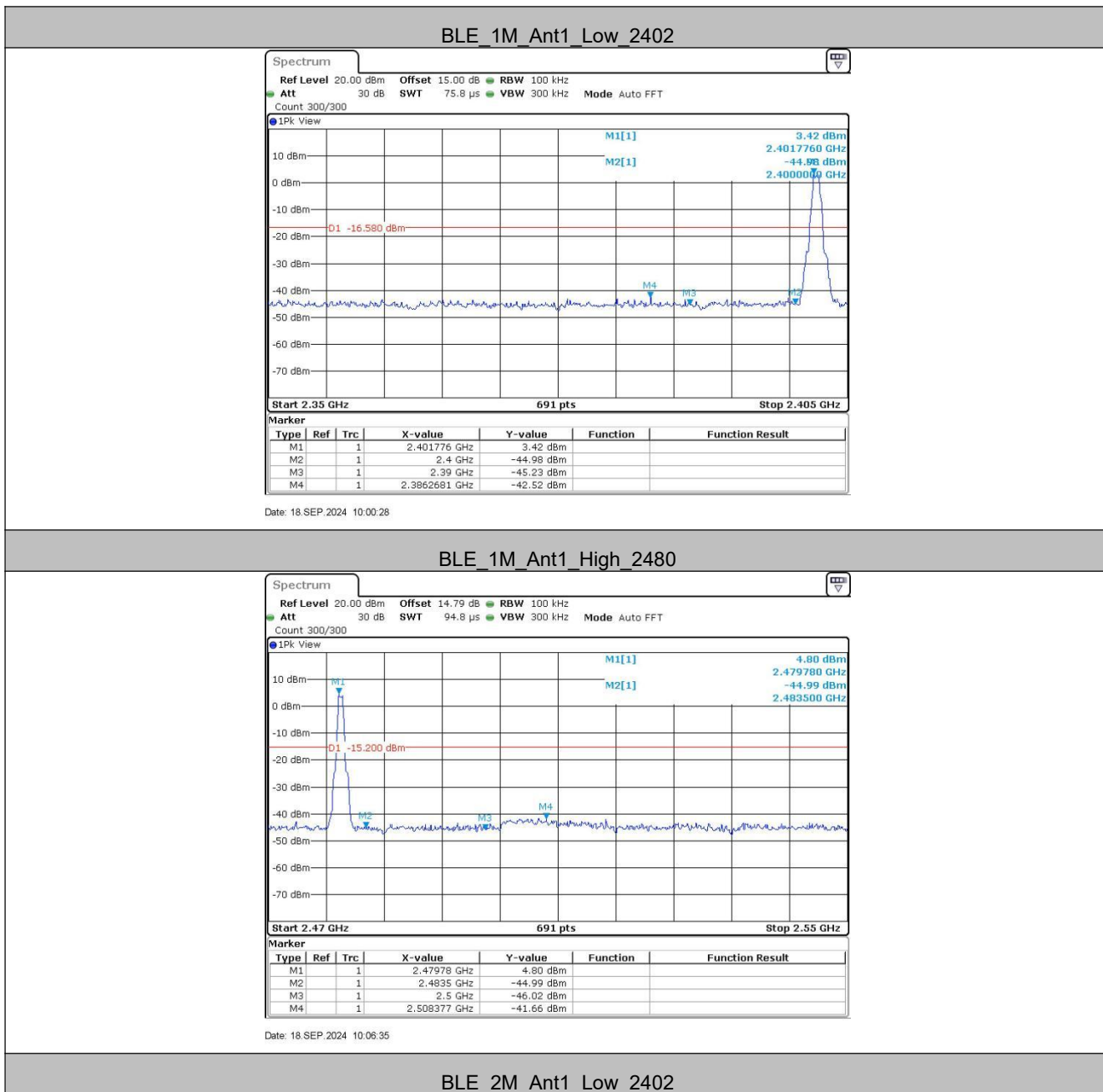


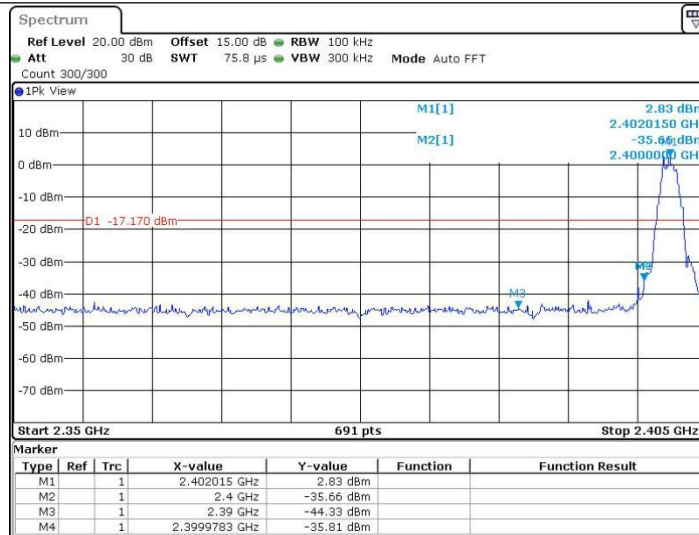
5.7 Band-edge for RF Conducted Emissions

Test Requirement:	RSS 247 5.5
Test Method:	ANSI C63.10 2013
Test Setup:	 Remark: Offset=Cable loss+ attenuation factor.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test Mode:	Transmitting with GFSK modulation.
Test Results:	Pass

TestMode	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Low	2402	3.42	-42.52	≤-16.58	PASS
	High	2480	4.80	-41.66	≤-15.2	PASS
BLE_2M	Low	2402	2.83	-35.81	≤-17.17	PASS
	High	2480	4.19	-40.84	≤-15.81	PASS

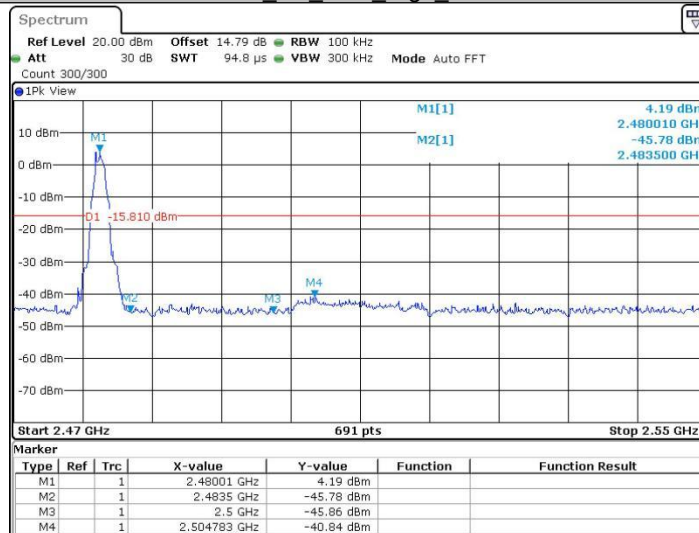
Test plot as follows:





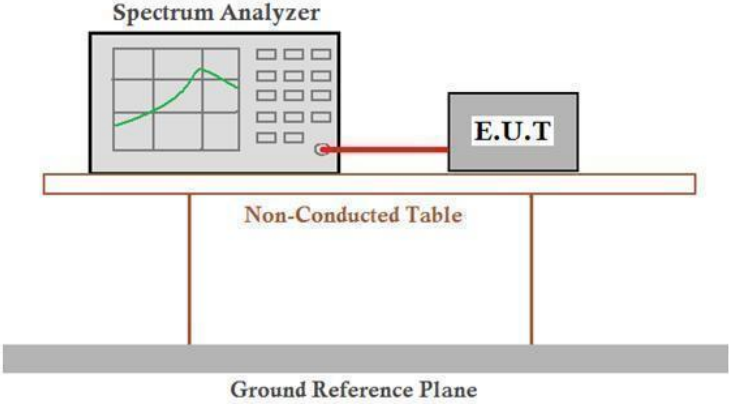
Date: 18.SEP.2024 10:12:29

BLE 2M Ant1_High_2480

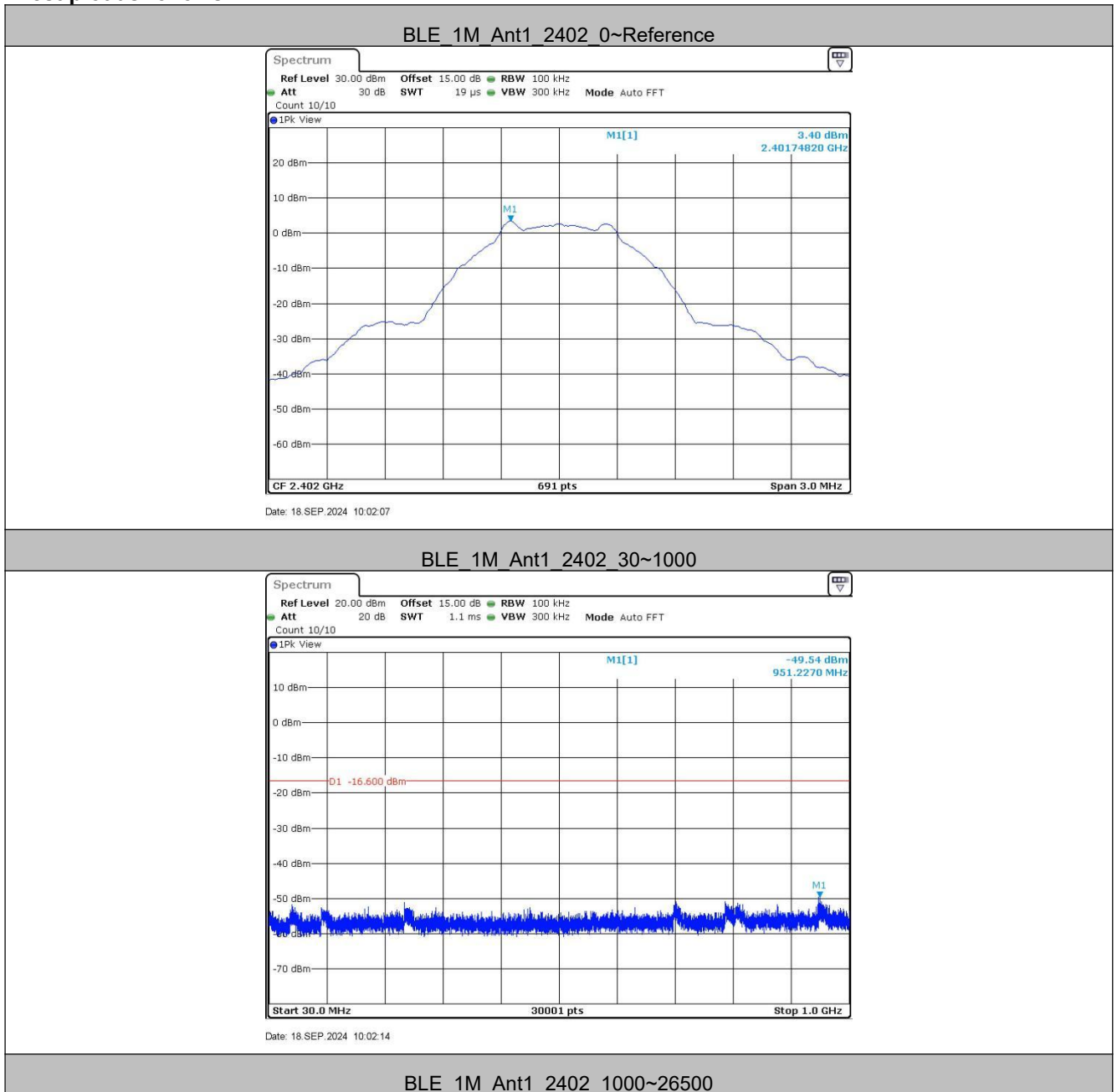


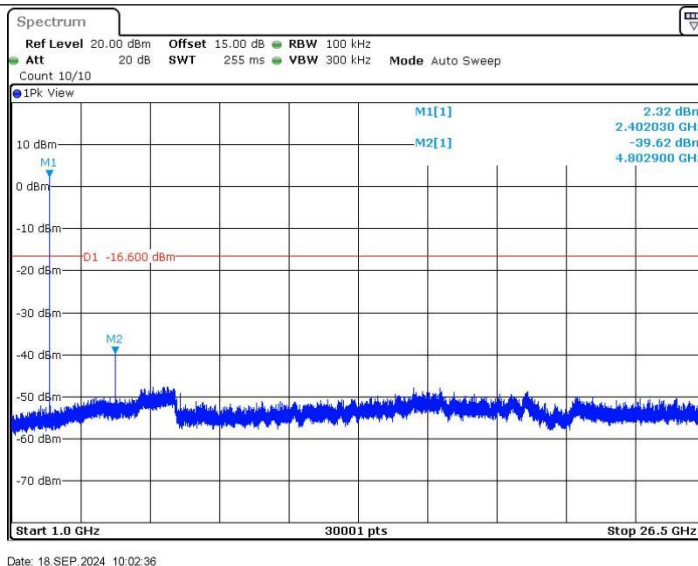
Date: 18.SEP.2024 10:18:19

5.8 Spurious RF Conducted Emissions

Test Requirement:	RSS 247 5.5
Test Method:	ANSI C63.10 2013
Test Setup:	 <i>Remark: Offset=Cable loss+ attenuation factor.</i>
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test Mode:	Transmitting with GFSK modulation.
Test Results:	Pass

Test plot as follows:

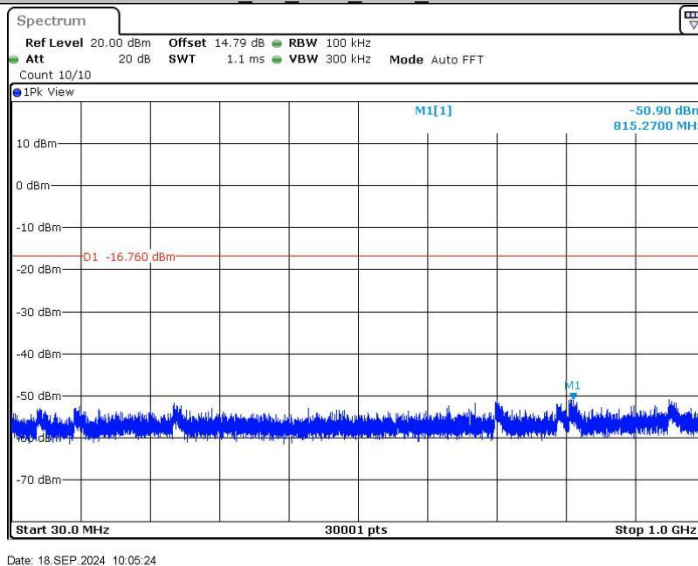




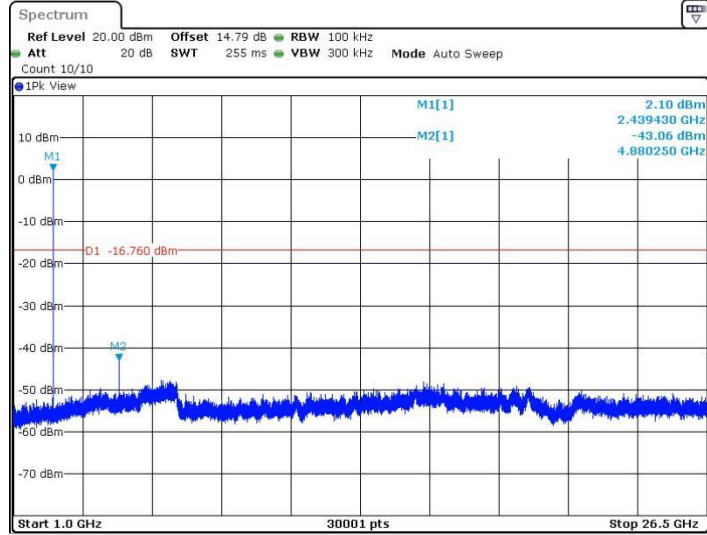
BLE_1M_Ant1_2440_0~Reference



BLE_1M_Ant1_2440_30~1000



BLE_1M_Ant1_2440_1000~26500



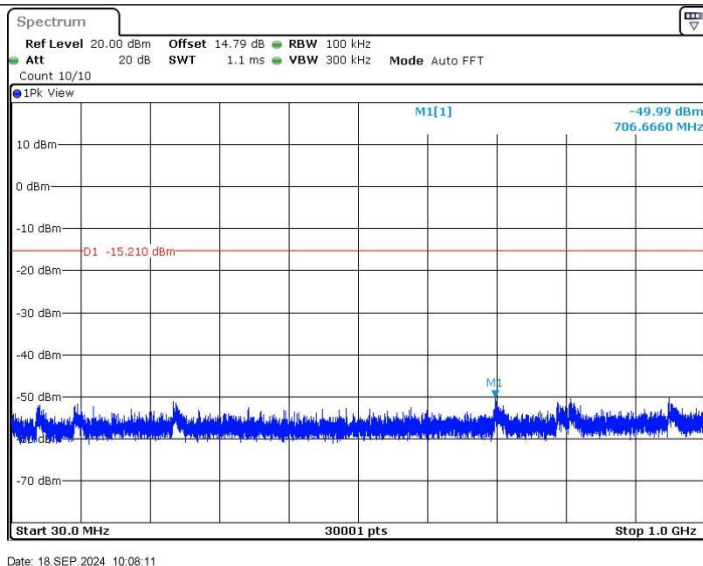
Date: 18.SEP.2024 10:05:46

BLE_1M_Ant1_2480_0~Reference

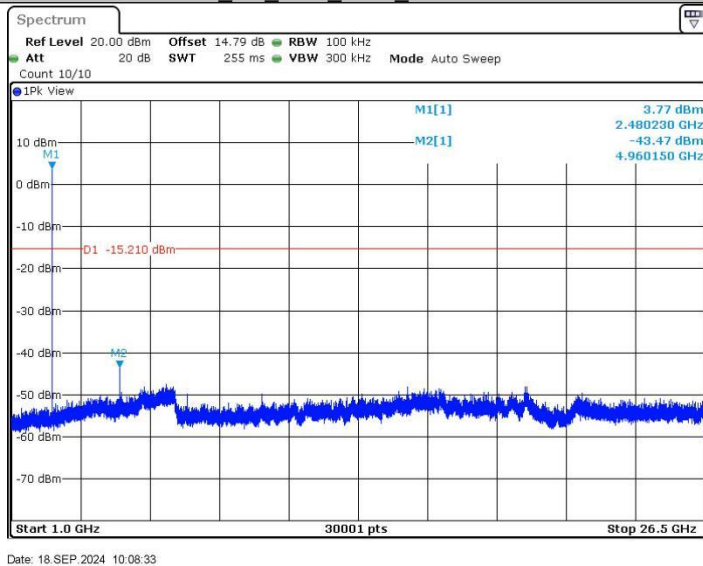


Date: 18.SEP.2024 10:08:04

BLE_1M_Ant1_2480_30~1000



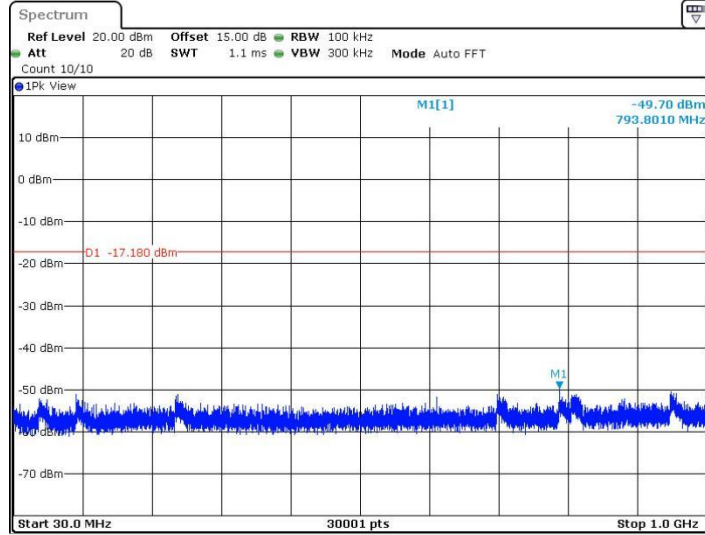
BLE_1M_Ant1_2480_1000~26500



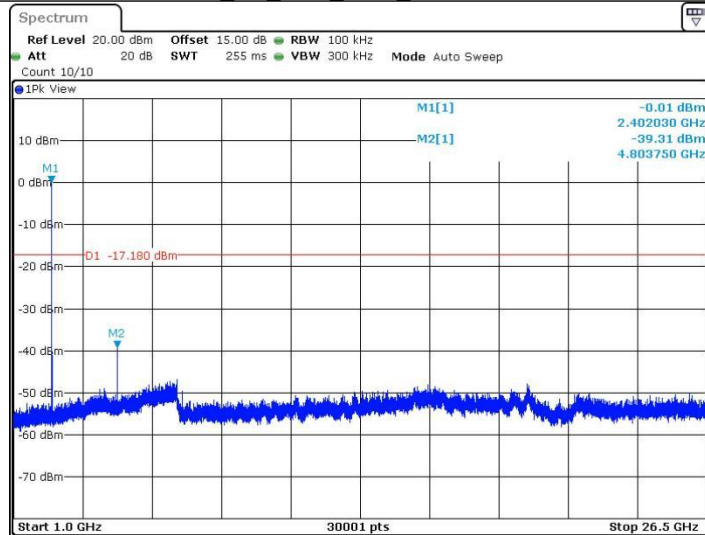
BLE_2M_Ant1_2402_0~Reference



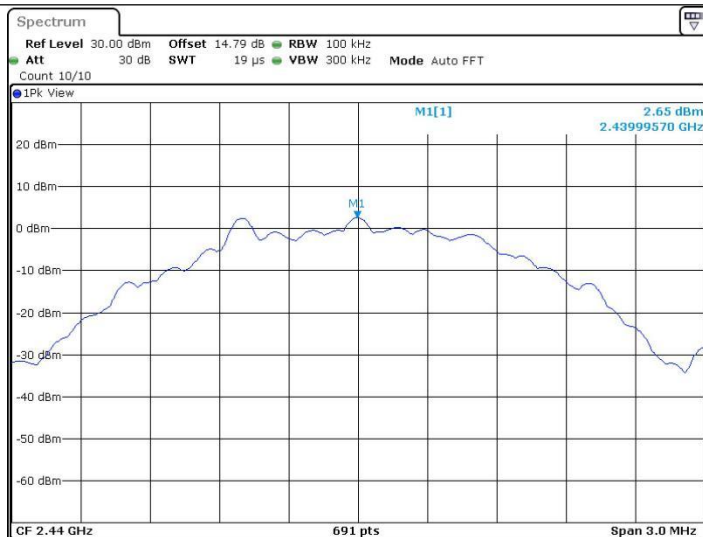
BLE_2M_Ant1_2402_30~1000



BLE_2M_Ant1_2402_1000~26500

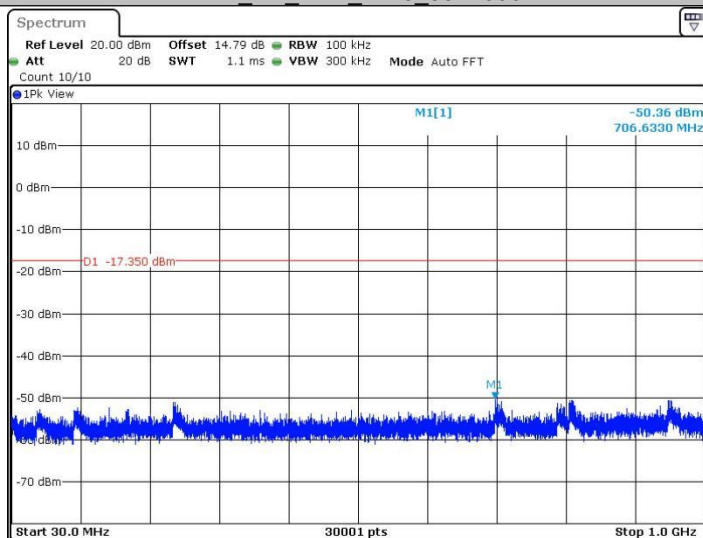


BLE_2M_Ant1_2440_0~Reference



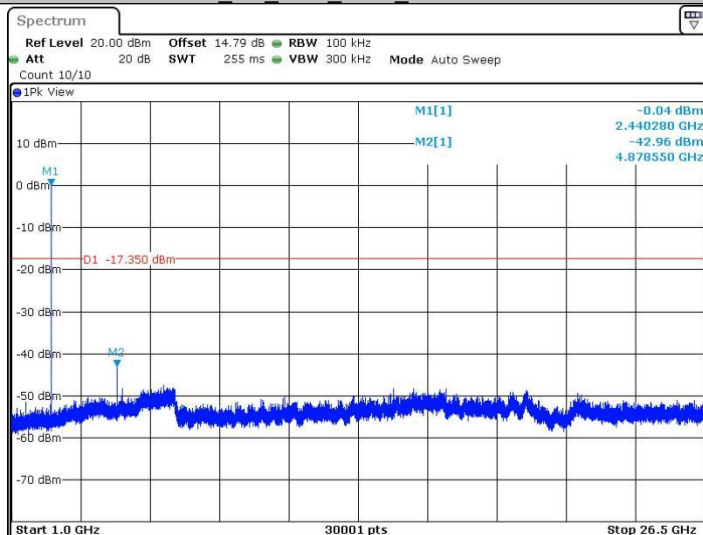
Date: 18.SEP.2024 10:16:42

BLE_2M_Ant1_2440_30~1000



Date: 18.SEP.2024 10:16:48

BLE_2M_Ant1_2440_1000~26500



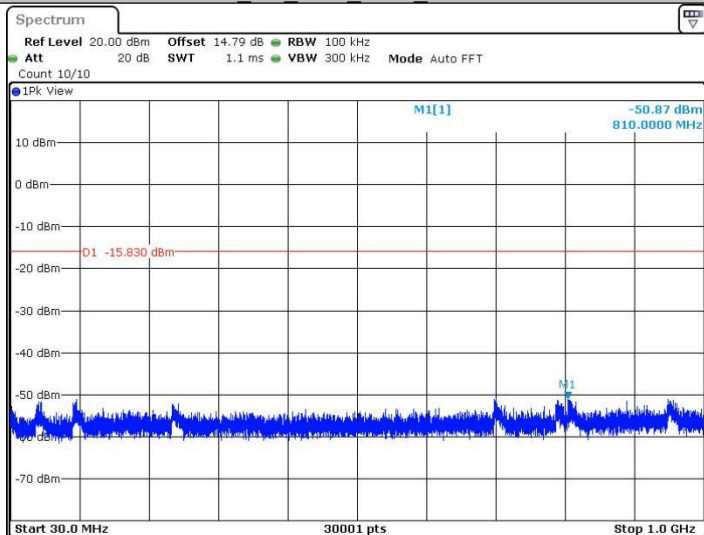
Date: 18.SEP.2024 10:17:10

BLE_2M_Ant1_2480_0~Reference



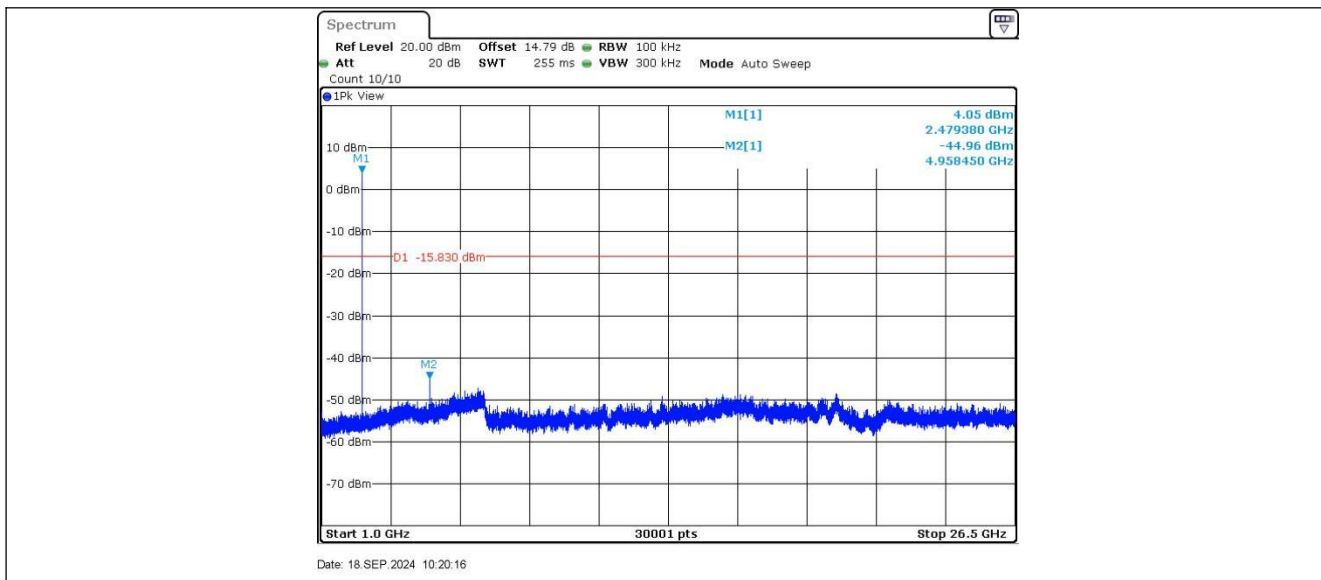
Date: 18 SEP. 2024 10:19:48

BLE_2M_Ant1_2480_30~1000



Date: 18 SEP. 2024 10:19:54

BLE_2M_Ant1_2480_1000~26500



Remark:

Pretest 9kHz to 25GHz, find the highest point when testing, so only the worst data were shown in the test report. Per FCC Part 15.33 (a) and 15.31 (o) ,The amplitude of spurious emissions from intentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this part.

5.9 Radiated Spurious Emission & Restricted bands

Test Requirement:	RSS-Gen Issue 5				
Test Method:	ANSI C63.10 2013 & RSS-Gen Issue 5				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100 kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3

Test Setup:

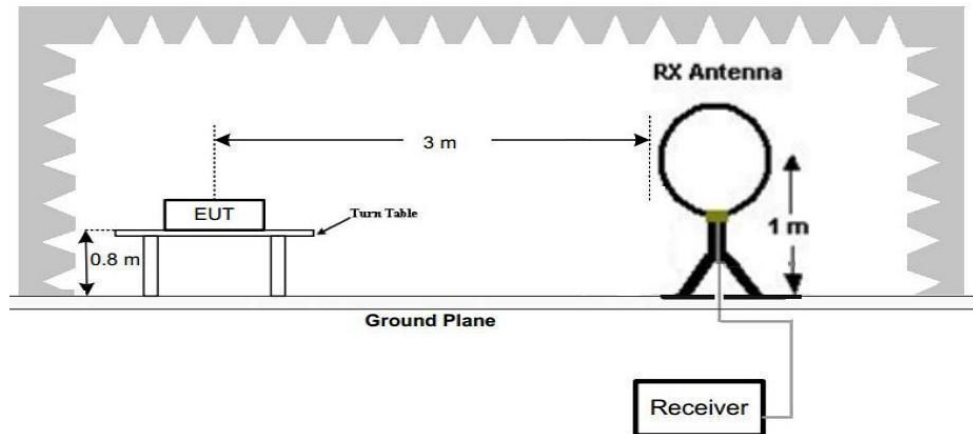


Figure 1. Below 30MHz

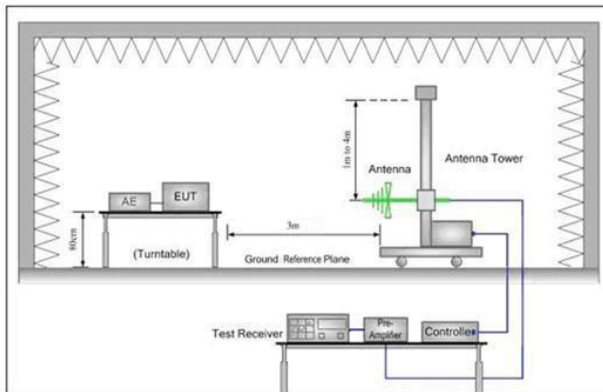


Figure 2. 30MHz to 1GHz

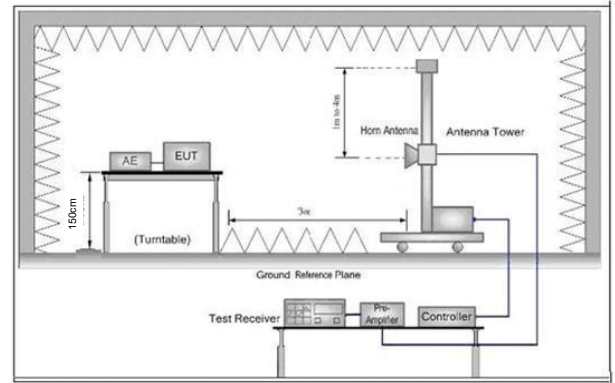


Figure 3. Above 1 GHz

Test Procedure:

- a. 1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
Note: 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.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both

	horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel (2402MHz),the middle channel (2440MHz),the Highest channel (2480MHz) h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. i. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting with GFSK modulation. Transmitting mode.
Final Test Mode:	Transmitting with GFSK modulation. Pretest the EUT at Transmitting mode, found Transmitting mode which it is worse case. For below 1GHz part, through pre-scan, the worst case is the lowest channel. Only the worst case is recorded in the report.
Test Results:	Pass

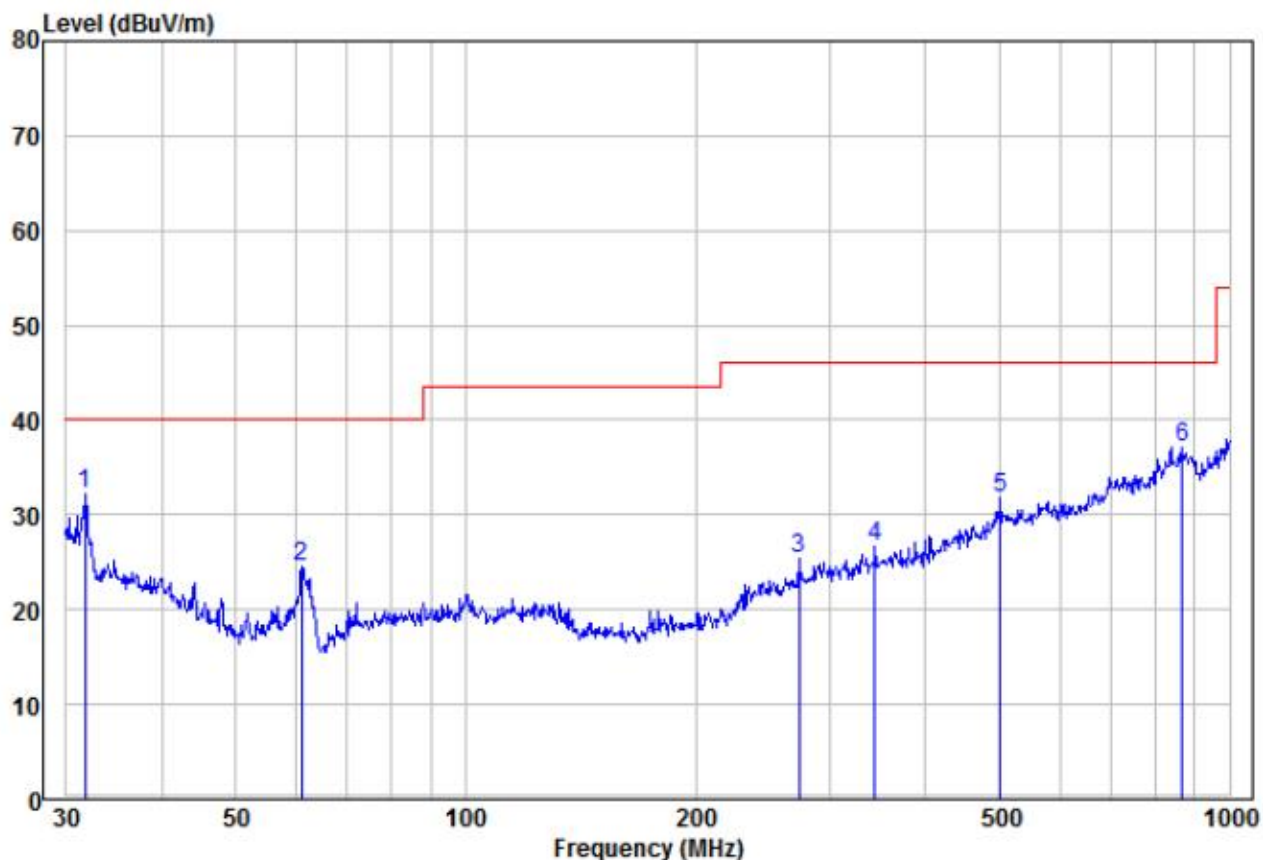
Radiated Emission below 1GHz

30MHz~1GHz

Test mode:

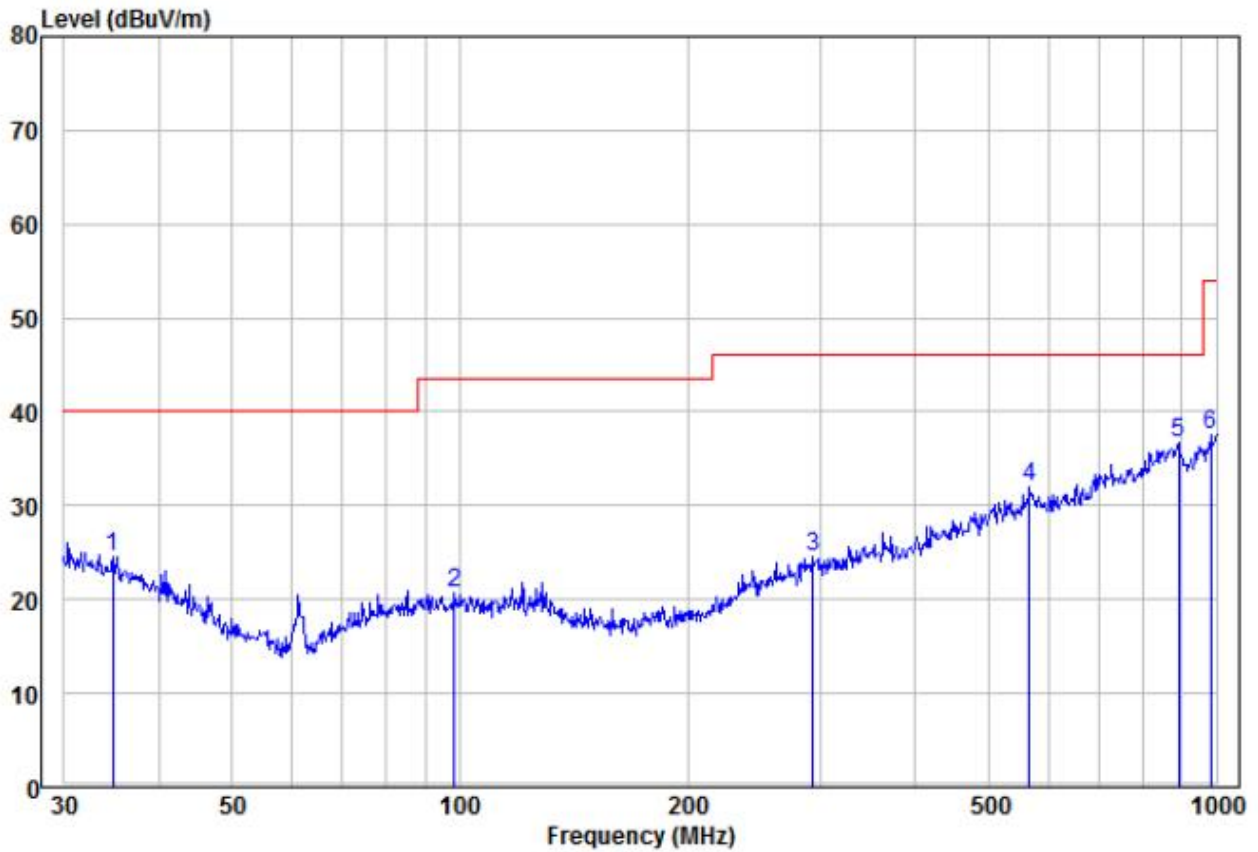
Transmitting mode

Vertical



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	pp 31.73	16.42	15.71	32.13	40.00	-7.87	Peak	VERTICAL
2	60.92	18.34	6.10	24.44	40.00	-15.56	Peak	VERTICAL
3	273.23	10.97	14.41	25.38	46.00	-20.62	Peak	VERTICAL
4	343.18	10.24	16.43	26.67	46.00	-19.33	Peak	VERTICAL
5	501.18	11.58	20.31	31.89	46.00	-14.11	Peak	VERTICAL
6	869.13	10.33	26.78	37.11	46.00	-8.89	Peak	VERTICAL

Test mode:	Transmitting mode	Horizontal
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	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	34.76	9.46	15.08	24.54	40.00	-15.46	Peak	HORIZONTAL
2	98.49	8.97	11.65	20.62	43.50	-22.88	Peak	HORIZONTAL
3	293.08	9.48	15.09	24.57	46.00	-21.43	Peak	HORIZONTAL
4	566.62	10.89	21.15	32.04	46.00	-13.96	Peak	HORIZONTAL
5 pp	890.73	9.98	26.73	36.71	46.00	-9.29	Peak	HORIZONTAL
6	982.62	10.39	27.25	37.64	54.00	-16.36	Peak	HORIZONTAL

Transmitter Emission above 1GHz

Worse case mode:		GFSK		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2390	54.41	-9.2	45.21	74	-28.79	Peak	H
2400	55.47	-9.39	46.08	74	-27.92	Peak	H
4804	52.57	-4.33	48.24	74	-25.76	Peak	H
7206	51.01	1.01	52.02	74	-21.98	Peak	H
2390	53.29	-9.2	44.09	74	-29.91	Peak	V
2400	51.03	-9.39	41.64	74	-32.36	Peak	V
4804	53.41	-4.33	49.08	74	-24.92	Peak	V
7206	49.04	1.01	50.05	74	-23.95	Peak	V

Worse case mode:		GFSK		Test channel:		Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4880	52.90	-4.11	48.79	74	-25.21	peak	H
7320	48.60	1.51	50.11	74	-23.89	peak	H
4880	51.63	-4.11	47.52	74	-26.48	peak	V
7320	51.18	1.51	52.69	74	-21.31	peak	V

Worse case mode:		GFSK		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2483.5	56.60	-9.29	47.31	74	-26.69	Peak	H
4960	50.33	-4.04	46.29	74	-27.71	Peak	H
7440	48.83	1.57	50.40	74	-23.60	Peak	H
2483.5	57.73	-9.29	48.44	74	-25.56	Peak	V
4960	51.15	-4.04	47.11	74	-26.89	Peak	V
7440	50.68	1.57	52.25	74	-21.75	Peak	V

Worse case mode:		GFSK(2Mbps)		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2390	54.60	-9.2	45.40	74	-28.60	Peak	H
2400	56.86	-9.39	47.47	74	-26.53	Peak	H
4804	51.32	-4.33	46.99	74	-27.01	Peak	H
7206	50.52	1.01	51.53	74	-22.47	Peak	H
2390	54.19	-9.2	44.99	74	-29.01	Peak	V
2400	51.77	-9.39	42.38	74	-31.62	Peak	V
4804	54.16	-4.33	49.83	74	-24.17	Peak	V
7206	48.83	1.01	49.84	74	-24.16	Peak	V

Worse case mode:		GFSK(2Mbps)		Test channel:		Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4880	53.09	-4.11	48.98	74	-25.02	peak	H
7320	49.40	1.51	50.91	74	-23.09	peak	H
4880	53.00	-4.11	48.89	74	-25.11	peak	V
7320	51.13	1.51	52.64	74	-21.36	peak	V

Worse case mode:		GFSK(2Mbps)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2483.5	56.14	-9.29	46.85	74	-27.15	Peak	H
4960	52.77	-4.04	48.73	74	-25.27	Peak	H
7440	49.40	1.57	50.97	74	-23.03	Peak	H
2483.5	57.55	-9.29	48.26	74	-25.74	Peak	V
4960	52.10	-4.04	48.06	74	-25.94	Peak	V
7440	50.10	1.57	51.67	74	-22.33	Peak	V

Remark:

- The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
- Scan from 9kHz to 25GHz, the disturbance above 10GHz and below 30MHz was very low. As shown in this section, for frequencies above 1GHz, 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. So, only the peak measurements were shown in the report.

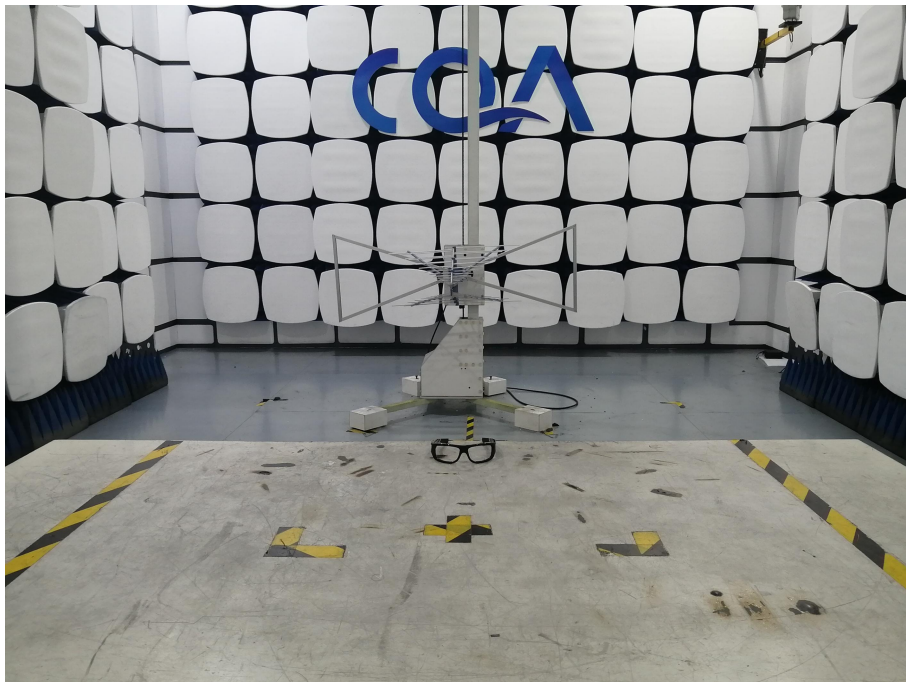
6 Photographs - EUT Test Setup

6.1 Radiated Spurious Emission

9kHz~30MHz:



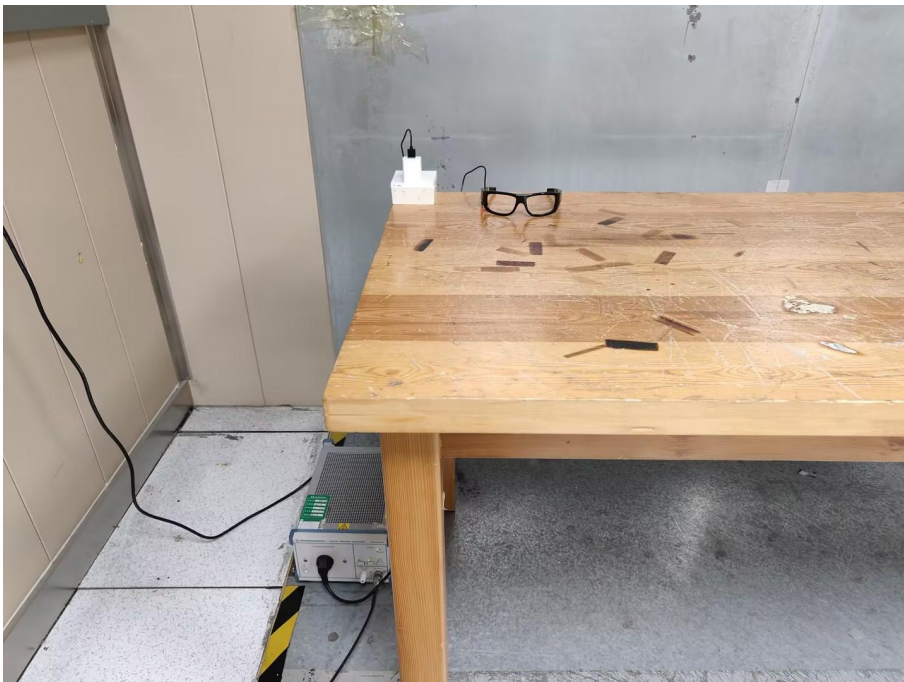
30MHz~1GHz:



Above 1GHz:



6.2 Conducted Emissions Test Setup



7 Photographs - EUT Constructional Details

Refer to PHOTOGRAPHS OF EUT for CQASZ20240901961E-01.

*** END OF REPORT ***