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Report Template Version: V05 Report Template Revision Date: 2021-11-03

# **Test Report**

Report No.:	CQASZ20240801757E-02		
Applicant:	Icarsoft Technology Inc.		
Address of Applicant:	1629 K St. Suite 300 N.W.Washington D.C., 20006 United States.		
Equipment Under Test (E	UT):		
Product:	Car Diagnostic Tool		
Model No.:	CR Eagle		
Test Model No.:	CR Eagle		
Brand Name:	iCarsoft		
FCC ID:	2AWD8-CREAGLE		
Standards:	47 CFR Part 15, Subpart C		
	KDB558074 D01 15.247 Meas Guidance v05r02		
	ANSI C63.10:2013		
Date of Receipt:	2024-08-19		
Date of Test:	2024-08-19 to 2024-10-17		
Date of Issue:	2024-10-17		
Test Result:	PASS*		
*In the configuration tested, the EUT complied with the standards specified above.			

Tested By:	lewis zhou
	( Lewis Zhou )
Reviewed By:	Timo Loj
	( Timo Lei )
Approved By:	Alex
	( Alex Wang )

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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
CQASZ20240801757E-02	Rev.01	Initial report	2024-10-17



## 2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203/15.247 (c)	ANSI C63.10 2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 2013	PASS
Conducted Peak Output Power	47 CFR Part 15, Subpart C Section 15.247 (b)(3)	ANSI C63.10 2013	PASS
6dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.247 (a)(2)	ANSI C63.10 2013	PASS
Power Spectral Density	47 CFR Part 15, Subpart C Section 15.247 (e)	ANSI C63.10 2013	PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 2013	PASS
RF Conducted Spurious Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 2013	PASS
Radiated Spurious Emissions	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2013	PASS



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## 4 General Information

### 4.1 Client Information

Applicant:	Icarsoft Technology Inc.
Address of Applicant:	1629 K St. Suite 300 N.W.Washington D.C., 20006 United States.
Manufacturer:	Icarsoft Technology Inc.
Address of Manufacturer:	1629 K St. Suite 300 N.W.Washington D.C., 20006 United States.
Factory:	Dongguan Yongdong Electronic Technology Co., Ltd
Address of Factory:	No. 10,4th Street, Zhangyang Fuzhu Industrial Zone,Zhangmutou town, Dongguan City

### 4.2 General Description of EUT

Product Name:	Car Diagnostic Tool		
Model No.:	CR Eagle		
Test Model No.:	CR Eagle		
Trade Mark:	iCarsoft		
Software Version:	iMsDiag DiagLib APP:V10.14 iMSDiag System APP:V10.19 System Version:V1.26		
Hardware Version:	F219 U1.1		
Operation Frequency:	2402MHz~2480MHz		
Bluetooth Version:	V5.0		
Modulation Type:	GFSK		
Transfer Rate:	1Mbps, 2Mbps		
Number of Channel:	40		
Product Type:	□ Mobile		
Test Software of EUT:	RF Test		
Antenna Type:	FPC antenna		
Antenna Gain:	5.62dBi		
EUT Power Supply:	Li-ion battery: DC 3.8V 10000mAh, 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 15.31(m), 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:	$\boxtimes$ Special software is used.	Special software is used.			
		☐ Through engineering command into the engineering mode. engineering command: *#*#3646633#*#*			
EUT Power level:	Class2 (Power level is built-in set para selected)	ameters and cannot be changed and			
Use test software to set the	Use test software to set the lowest frequency, the middle frequency and the highest frequency keep				
transmitting of the EUT.	nsmitting of the EUT.				
Mode	Channel	Channel Frequency(MHz)			
	СНО	2402			
GFSK	GFSK CH19 2440				
	CH39	2480			

#### Run Software:

Bluetooth_1	Гх			
Tx Pattern:	0000	•		
Channel:	Single Frequency	-		
Tx channel:				
Pocket Type:	NULL(0x00)	•		
Pocket Length				



### 4.4 Test Environment

Operating Environment	Operating Environment:		
Temperature:	24.5°C		
Humidity:	59% RH		
Atmospheric Pressure:	1009mbar		
Test Mode:	Use test software to set the lowest frequency, the middle frequency and the highest frequency keep transmitting of the EUT.		

### 4.5 Description of Support Units

The EUT has been tested with associated equipment below.

1) Support equipment

Description	Manufacturer	Model No.	Certification	Supplied by
Adapter	MI	1	1	CQA
2) Cable				

Cable No.	Description	Manufacturer	Cable Type/Length	Supplied by
	/	1	1	1



### 4.6 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.

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

Hereafter the best measurement capability for CQA laboratory is reported:



### 4.7 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 District, Shenzhen, China

### 4.8 Test Facility

#### • 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.

### 4.10Other Information Requested by the Customer

None.



### 4.11Equipment List

			Instrument	Calibration	Calibration
Test Equipment	Manufacturer	Model No.	No.	Date	Due Date
				2023/09/08	2024/09/07
EMI Test Receiver	R&S	ESR7	CQA-005	2024/09/02	2025/09/01
				2023/09/08	2024/09/07
Spectrum analyzer	R&S	FSU26	CQA-038	2024/09/02	2025/09/01
				2023/09/08	2024/09/07
Spectrum analyzer	R&S	FSU40	CQA-075	2024/09/02	2025/09/01
		AFS4-00010300-18-		2023/09/08	2024/09/07
Preamplifier	MITEQ	10P-4	CQA-035	2024/09/02	2025/09/01
		AMF-6D-02001800-		2023/09/08	2024/09/07
Preamplifier	MITEQ	29-20P	CQA-036	2024/09/02	2025/09/01
				2023/09/08	2024/09/07
Preamplifier	EMCI	EMC184055SE	CQA-089	2024/09/02	2025/09/01
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				2023/09/08	2024/09/07
(Above 1GHz)	CQA	N/A	C007	2024/09/02	2025/09/01
Coaxial Cable				2023/09/08	2024/09/07
(Below 1GHz)	CQA	N/A	C013	2024/09/02	2025/09/01
RF	04,1		0010	2023/09/08	2024/09/07
cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2024/09/02	2025/09/01
				2023/09/08	2024/09/07
Antenna Connector	CQA	RFC-01	CQA-080	2024/09/02	2025/09/01
				2023/09/08	2024/09/07
Power Sensor	KEYSIGHT	U2021XA	CQA-30	2024/09/02	2025/09/01
N1918A Power					
Analysis Manager	Agilent	N1918A	CQA-074	2023/09/08	2024/09/07
Power Panel				2024/09/02	2025/09/01
				2023/09/08	2024/09/07
Power meter	R&S	NRVD	CQA-029	2024/09/02	2025/09/01
		PWD-2533-02-SMA-		2023/09/08	2024/09/07
Power divider	MIDWEST	79	CQA-067	2024/09/02	2025/09/01
				2023/09/08	2024/09/07
EMI Test Receiver	R&S	ESR7	CQA-005	2024/09/02	2025/09/01
				2023/09/08	2024/09/07
LISN	R&S	ENV216	CQA-003	2024/09/02	2025/09/01
	001		004 0000	2023/09/08	2024/09/07
Coaxial cable	CQA	N/A	CQA-C009	2024/09/02	2025/09/01
	KEVEIGHT	E2624A	COA 020	2023/09/08	2024/09/07
DC power	KEYSIGHT	E3631A	CQA-028	2024/09/02	2025/09/01

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: 47 CFR Part 15C Section 15.203 /247(c)

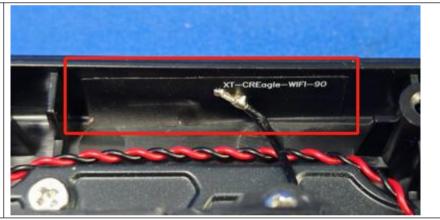
#### 15.203 requirement:

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, 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.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### EUT Antenna:



The antenna is FPC antenna.

The connection/connection type between the antenna to the EUT's antenna port is: unique coupling. This is either permanently attachment or a unique coupling that satisfies the requirement.



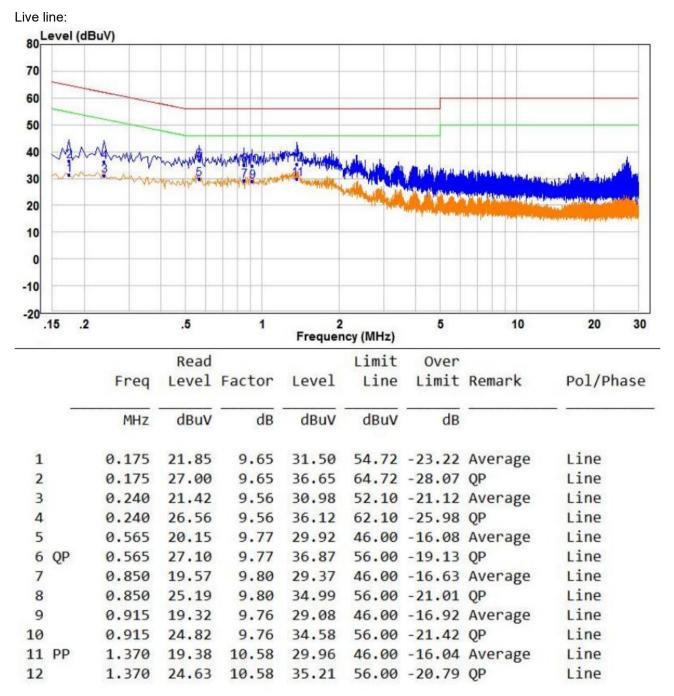
Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
Limit:		Limit (d	lBuV)
	Frequency range (MHz)	Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
	* Decreases with the logarithm o	f the frequency.	
Test Procedure:	1) The mains terminal disturt room.	oance voltage test was	s conducted in a shielded
	2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50µH + 5Ω 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.		
	<ul> <li>3) The tabletop EUT was placed ground reference plane. An placed on the horizontal gr</li> <li>4) The test was performed will of the EUT shall be 0.4 m for vertical ground reference plane. The LISN unit under test and bonded mounted on top of the group between the closest points the EUT and associated equipment and all of the in ANSI C63.10: 2013 on con</li> </ul>	nd for floor-standing an ound reference plane, th a vertical ground refe from the vertical ground blane was bonded to th 1 was placed 0.8 m fro to a ground reference and reference plane. Th of the LISN 1 and the quipment was at least 0 im emission, the relative terface cables must be	rangement, the EUT was erence plane. The rear d reference plane. The e horizontal ground om the boundary of the plane for LISNs his distance was EUT. All other units of 0.8 m from the LISN 2. re positions of



Test Setup:	Shielding Room         Image: Comparison of the second se
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**



Remark:

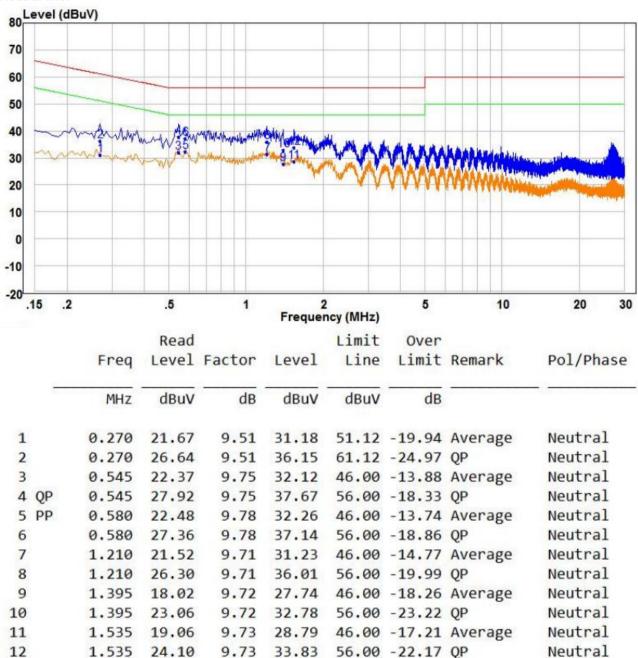
1. The following Quasi-Peak and Average measurements were performed on the EUT:

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.







Remark:

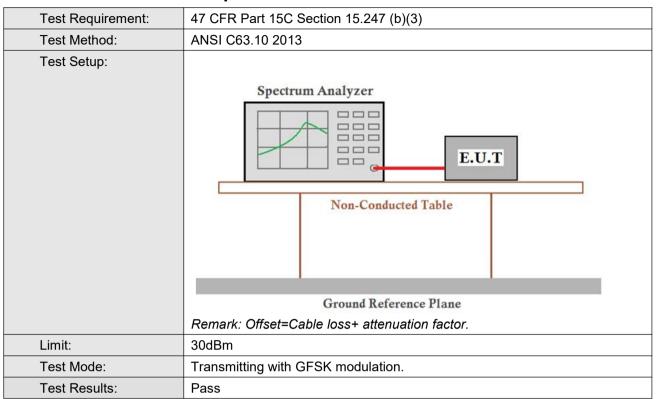
1. The following Quasi-Peak and Average measurements were performed on the EUT:

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.



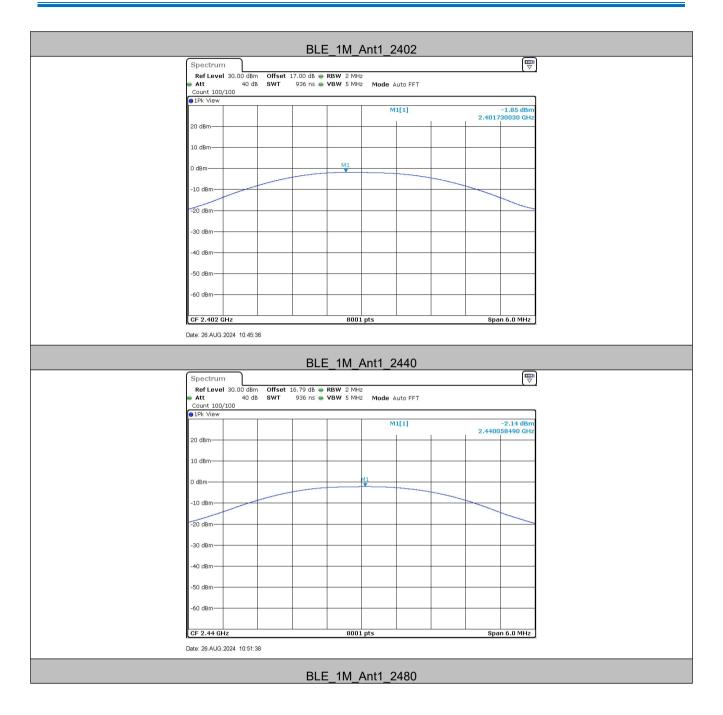
### 5.3 Conducted Peak Output Power



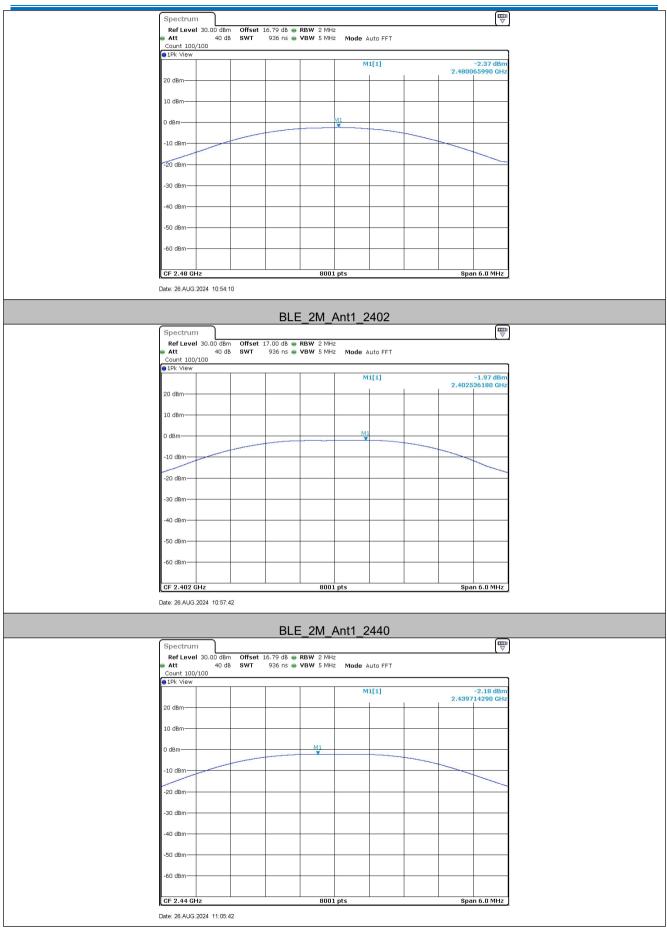
#### Measurement Data

	GFSK mode (1Mbps)					
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result			
Lowest	-1.85	30.00	Pass			
Middle	-2.14	30.00	Pass			
Highest	Highest -2.37		Pass			
	GFSK mode (21	Mbps)				
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result			
Lowest	-1.97	30.00	Pass			
Middle	-2.18	30.00	Pass			
Highest	-2.45	30.00	Pass			







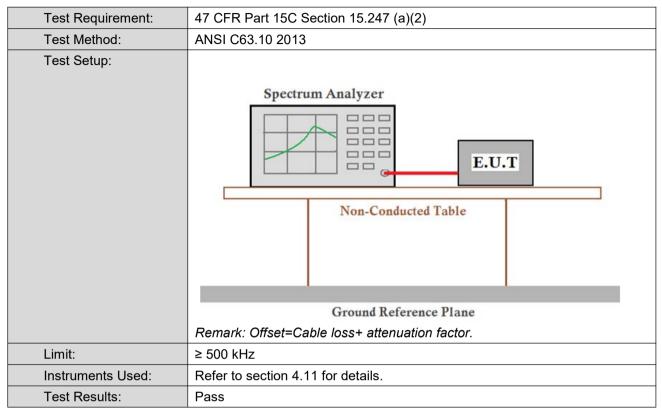








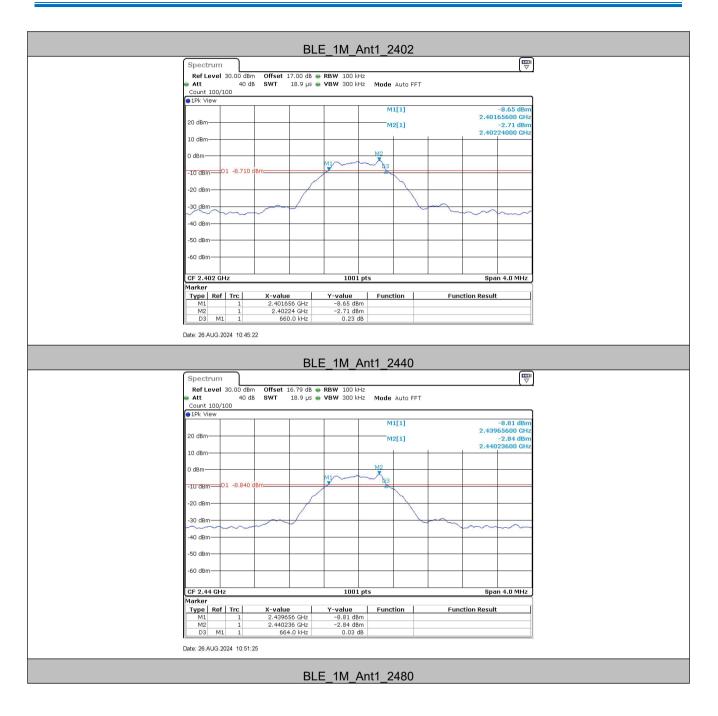
### 5.4 6dB Occupy Bandwidth



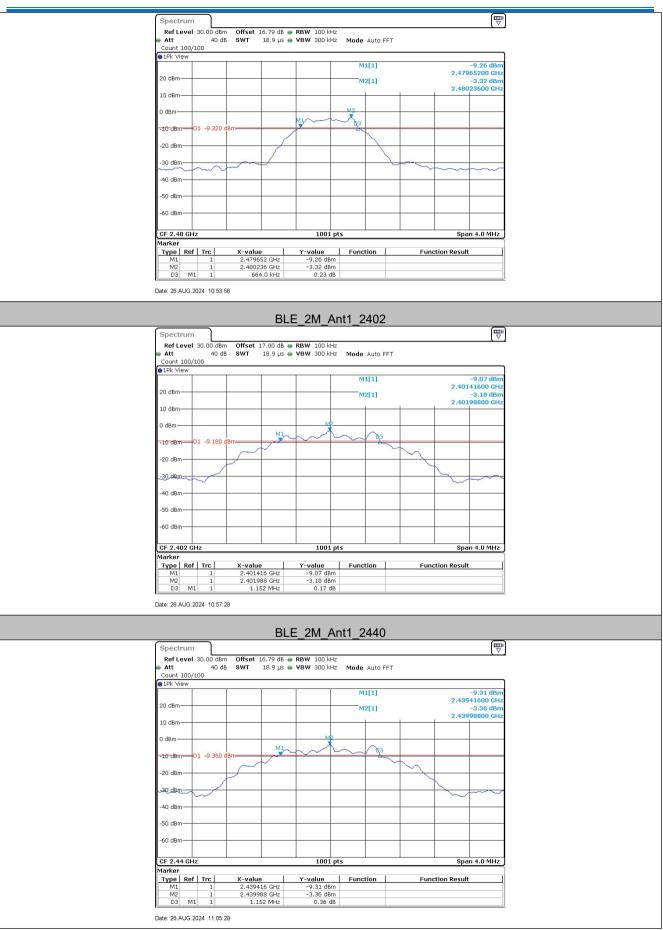
#### **Measurement Data**

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	Lowest 1.15		Pass			
Middle	1.15	≥500	Pass			
Highest 1.16		≥500	Pass			

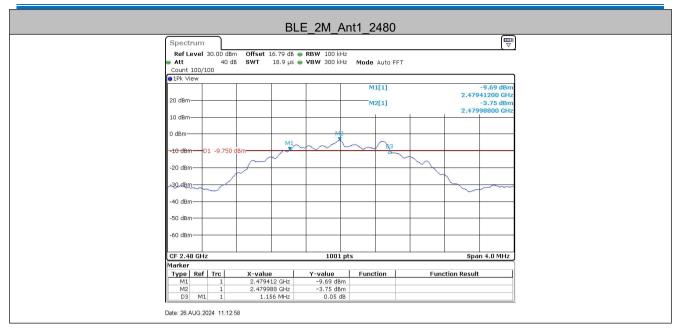






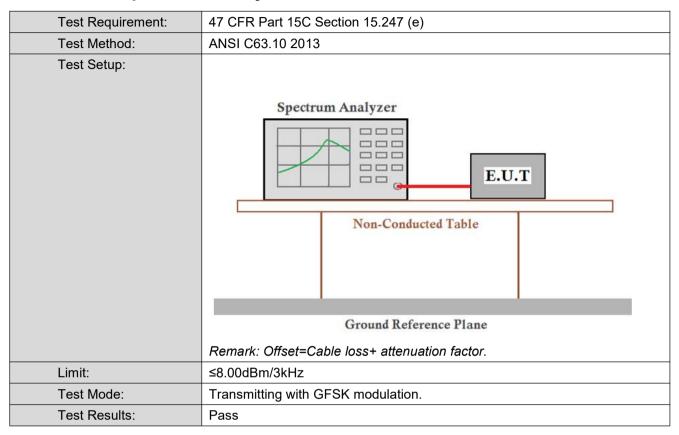








### 5.5 Power Spectral Density

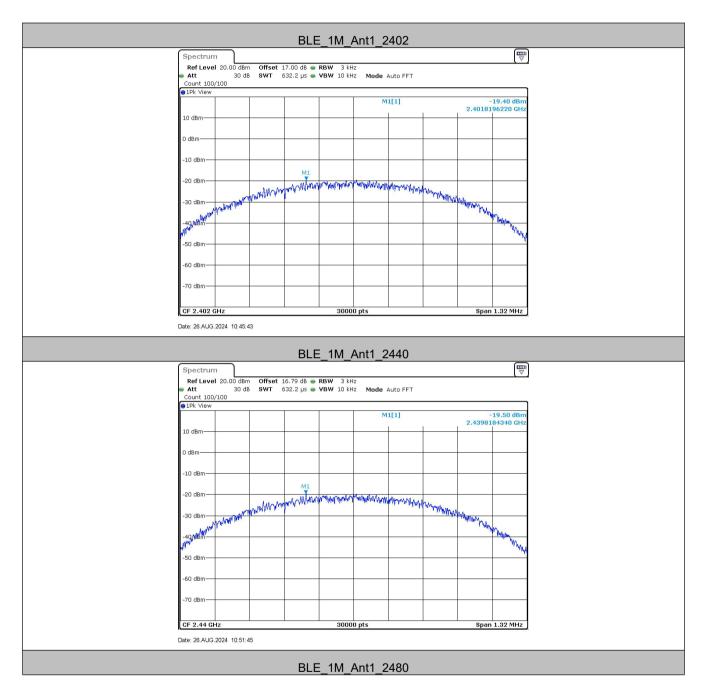


#### Measurement Data

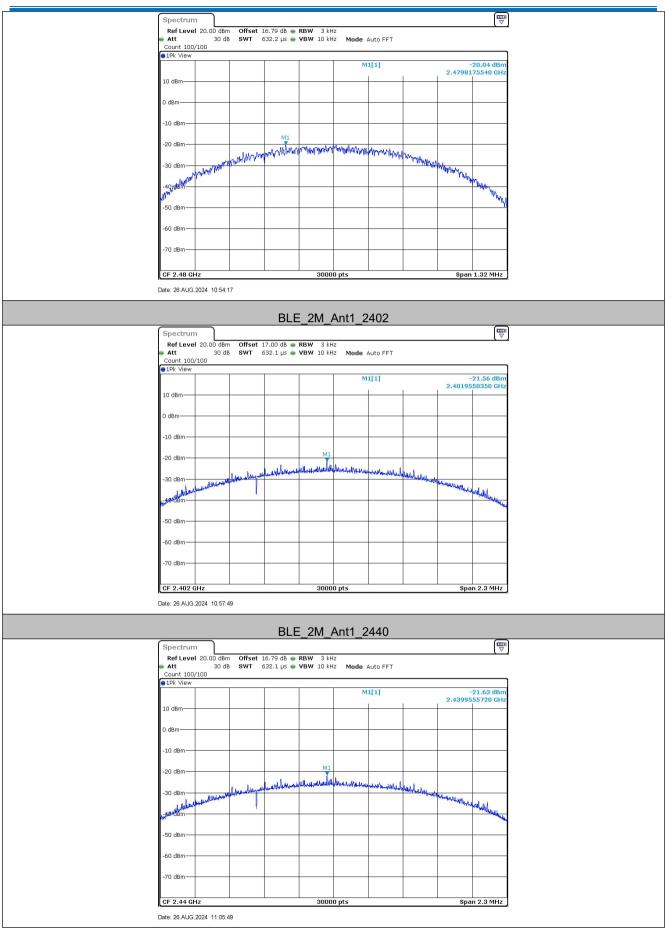
	GFSK mode (1Mbps)					
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result			
Lowest	-19.4	≤8.00	Pass			
Middle	-19.5	≤8.00	Pass			
Highest	-20.04	≤8.00	Pass			
	GFSK mode (2Mbps)					
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result			
Lowest	-21.56	≤8.00	Pass			
Middle	-21.63	≤8.00	Pass			
Highest	Highest -22.17		Pass			



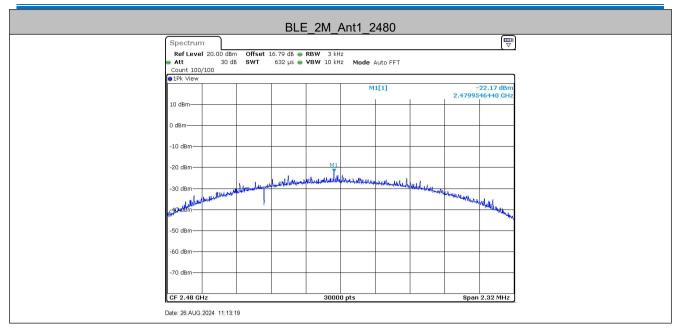
#### Test plot as follows:





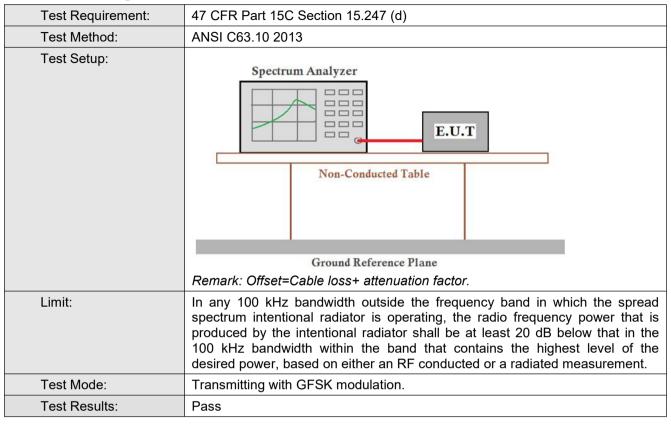








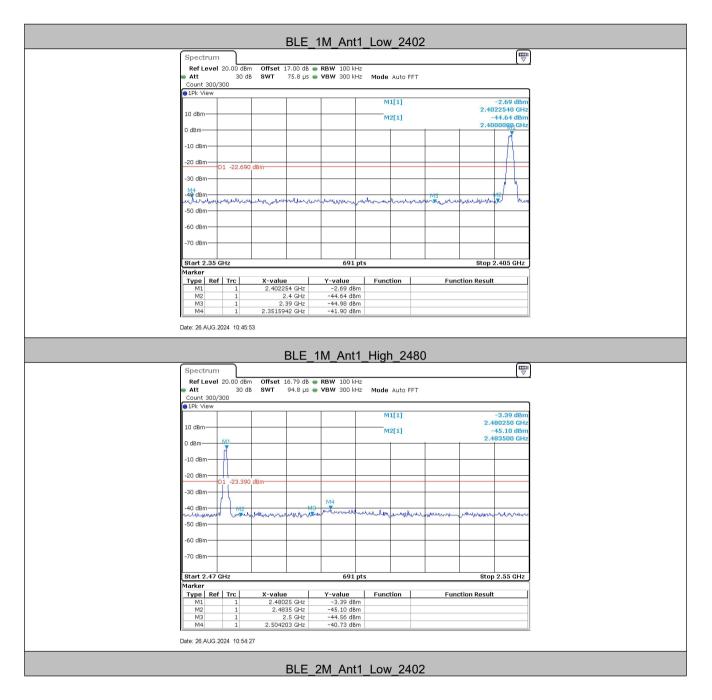
### 5.6 Band-edge for RF Conducted Emissions



TestMode	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
	Low	2402	-2.69	-41.9	≤-22.69	PASS
BLE_1M	High	2480	-3.39	-40.73	≤-23.39	PASS
	Low	2402	-3.36	-35.61	≤-23.36	PASS
BLE_2M	High	2480	-4.06	-40.68	≤-24.06	PASS



#### Test plot as follows:

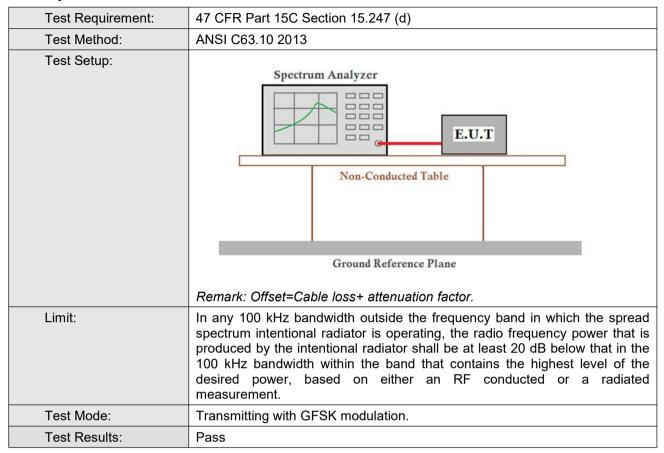








### 5.7 Spurious RF Conducted Emissions





#### Test plot as follows:

