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Website: www.cqa-cert.com Report Template Revision Date: 2021-11-03

Report Template Version: V05

Test Report

Report No.: CQASZ20230300348E-01

Applicant: Shenzhen Hollyland Technology Co., Ltd

Address of Applicant: 8F, Building 5D, Skyworth Innovation Valley, Tangtou Road. Shiyan Street,

Baoan District, Shenzhen, China.

Equipment Under Test (EUT):

Product: Wireless microphone

Model No.:

LARK MAX

LARK MAX

LARK MAX

Brand Name:

HOLLYLAND

2ADZC-6902R

Standards: 47 CFR Part 15, Subpart C

Date of Receipt: 2023-03-16

Date of Test: 2023-03-16 to 2023-04-13

Date of Issue: 2023-04-23
Test Result: PASS*

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

Tested By:

Reviewed By:

(Timo Lei)

Approved By: Jack Ai)





Report No.: CQASZ20230300348E-01

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20230300348E-01	Rev.01	Initial report	2023-04-23





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)(1)	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:	Shenzhen Hollyland Technology Co., Ltd
Address of Applicant:	8F, Building 5D, Skyworth Innovation Valley, Tangtou Road. Shiyan Street, Baoan District, Shenzhen, China.
Manufacturer:	Shenzhen Hollyland Technology Co., Ltd
Address of Manufacturer:	8F, Building 5D, Skyworth Innovation Valley, Tangtou Road. Shiyan Street, Baoan District, Shenzhen, China.
Factory:	Shenzhen Hollyland Technology Co., Ltd
Address of Factory:	8F, Building 5D, Skyworth Innovation Valley, Tangtou Road. Shiyan Street, Baoan District, Shenzhen, China.

4.2 General Description of EUT

4.2 Ochleral Descrip			
Product Name:	Wireless microphone		
Model No.:	LARK MAX		
Test Model No.:	LARK MAX		
Trade Mark:	HOLLYLAND		
Software Version:	V1.0.2.2		
Hardware Version:	V38		
Operation Frequency:	2404MHz~2480MHz		
Modulation Type:	GFSK		
Transfer Rate:	1Mbps		
Number of Channel:	32		
Product Type:	☐ Mobile ☐ Portable ☐ Fix Location		
Test Software of EUT:	DUT		
Antenna Type:	Chip antenna		
Antenna Gain:	2 dBi		
EUT Power Supply:	Receiver: Li-ion battery: DC 3.87V 490mAh, Charge by DC 3.7V for		
	Charging box		
Simultaneous Transmission	☐ Simultaneous TX is supported and evaluated in this report.		
	⊠ Simultaneous TX is not supported.		



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

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 (CH1)	2404MHz
The middle channel (CH16)	2440MHz
The highest channel (CH32)	2480MHz



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4.3 Additional Instructions

EUT Test Software Settings:						
Mode:	⊠ 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)	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)				
	CH1 2404					
GFSK CH16 2440						
	CH32	2480				

Run Software:





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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	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.** guality 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
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 ⁻⁸
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℃
11	Humidity test	2.0%
12	Supply voltages	0.5 %
13	Frequency Error	5.5 Hz



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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.

4.10 Other Information Requested by the Customer

None.





4.11 Equipment List

			1	0-1:1	0-1:1
Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR7	CQA-005	2022/09/09	2023/09/08
Spectrum analyzer	R&S	FSU26	CQA-038	2022/09/09	2023/09/08
Spectrum analyzer	R&S	FSU40	CQA-075	2022/09/09	2023/09/08
Preamplifier	MITEQ	AFS4-00010300-18- 10P-4	CQA-035	2022/09/09	2023/09/08
Preamplifier	MITEQ	AMF-6D-02001800- 29-20P	CQA-036	2022/09/09	2023/09/08
Preamplifier	EMCI	EMC184055SE	CQA-089	2022/09/09	2023/09/08
Loop antenna	Schwarzbeck	FMZB1516	CQA-060	2021/09/16	2024/09/15
Bilog Antenna	R&S	HL562	CQA-011	2021/09/16	2024/09/15
Horn Antenna	R&S	HF906	CQA-012	2021/09/16	2024/09/15
Horn Antenna	Schwarzbeck	BBHA 9170	CQA-088	2021/09/16	2024/09/15
Coaxial Cable (Above 1GHz)	CQA	N/A	C007	2022/09/09	2023/09/08
Coaxial Cable (Below 1GHz)	CQA	N/A	C013	2022/09/09	2023/09/08
RF cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2022/09/09	2023/09/08
Antenna Connector	CQA	RFC-01	CQA-080	2022/09/09	2023/09/08
Power Sensor	KEYSIGHT	U2021XA	CQA-30	2022/09/09	2023/09/08
N1918A Power Analysis Manager Power Panel	Agilent	N1918A	CQA-074	2022/09/09	2023/09/08
Power meter	R&S	NRVD	CQA-029	2022/09/09	2023/09/08
Power divider	MIDWEST	PWD-2533-02-SMA- 79	CQA-067	2022/09/09	2023/09/08
EMI Test Receiver	R&S	ESR7	CQA-005	2022/09/09	2023/09/08
LISN	R&S	ENV216	CQA-003	2022/09/09	2023/09/08
Coaxial cable	CQA	N/A	CQA-C009	2022/09/09	2023/09/08
DC power	KEYSIGHT	E3631A	CQA-028	2022/09/09	2023/09/08

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)

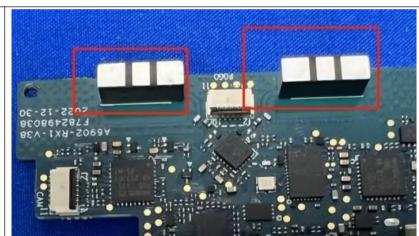
15.203 requirement:

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 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.

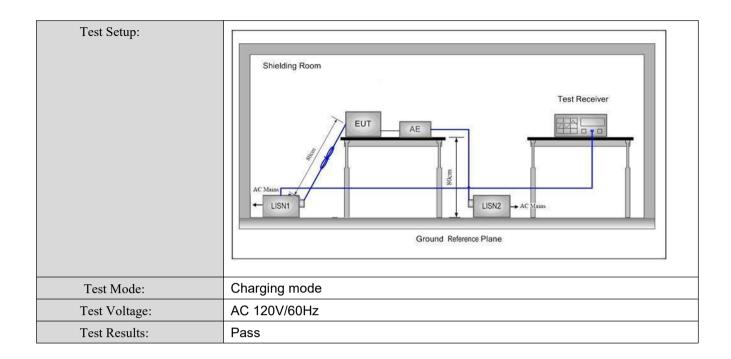


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5.2 Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207					
Test Method:	ANSI C63.10: 2013					
Test Frequency Range:	150kHz to 30MHz					
Limit:	E (MIL)	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:	The mains terminal disturl room.	bance voltage test was	s conducted in a shie	elded		
	2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω li 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 sam	ne way as the LISN 1 fo	or the unit being			
	measured. A multiple sock	•	·			
	power cables to a single Li exceeded.	ISN provided the rating	of the LISN was not	•		
	3) The tabletop EUT was place	ced upon a non-metallio	c table 0.8m above th	he		
	ground reference plane. A	•	rangement, the EUT	was		
	placed on the horizontal gr	•				
	4) The test was performed wi	•	•			
	of the EUT shall be 0.4 m to vertical ground reference p	•	•	ie		
	reference plane. The LISN		•	he		
	unit under test and bonded	•	•			
	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 ed	• •		2.		
	5) In order to find the maximu		•			
	equipment and all of the in		changed according	to		
	ANSI C63.10: 2013 on con	iducted measurement.				

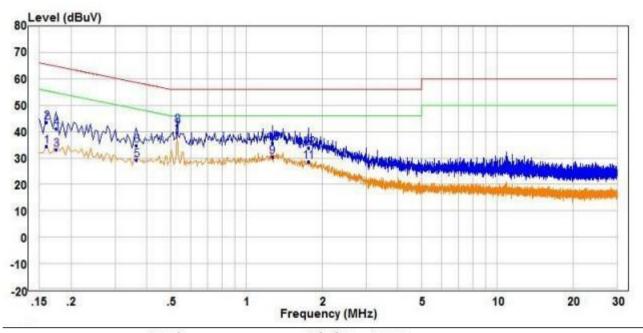






Measurement Data

Live line:



		Read		92 92	Limit			
	Freq	Level	Factor	Level	Line	Limit	Remark	Pol/Phase
_	MHZ	dBuV	dB	dBuV	dBuV	dB		- 0
1	0.160	24.59	9.68	34.27	55.46	-21.19	Average	Line
2	0.160	33.99	9.68	43.67	65.46	-21.79	QP	Line
3 4 5	0.175	23.58	9.65	33.23	54.72	-21.49	Average	Line
4	0.175	31.48	9.65	41.13	64.72	-23.59	QP	Line
5	0.365	19.56	9.57	29.13	48.61	-19.48	Average	Line
6	0.365	25.10	9.57	34.67	58.61	-23.94	QP	Line
7 PP	0.530	29.81	9.73	39.54	46.00	-6.46	Average	Line
8 QP	0.530	32.47	9.73	42.20	56.00	-13.80	QP	Line
9	1.270	19.98	10.37	30.35	46.00	-15.65	Average	Line
10	1.270	25.24	10.37	35.61	56.00	-20.39	QP	Line
11	1.765	17.45	11.30	28.75	46.00	-17.25	Average	Line
12	1.765	22.39	11.30	33.69	56.00	-22.31	QP	Line

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.





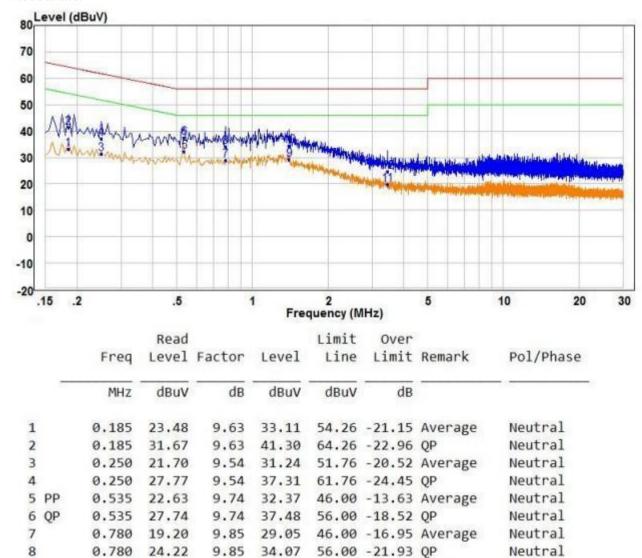
Neutral

Neutral

Neutral

Neutral

Neutral line:



29.24 46.00 -16.76 Average

19.96 46.00 -26.04 Average

34.39 56.00 -21.61 QP

24.80 56.00 -31.20 QP

Remark:

9

10

11

12

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

9.72

9.72

9.77

9.77

2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.

1.400 19.52

1.400 24.67

3.455 15.03

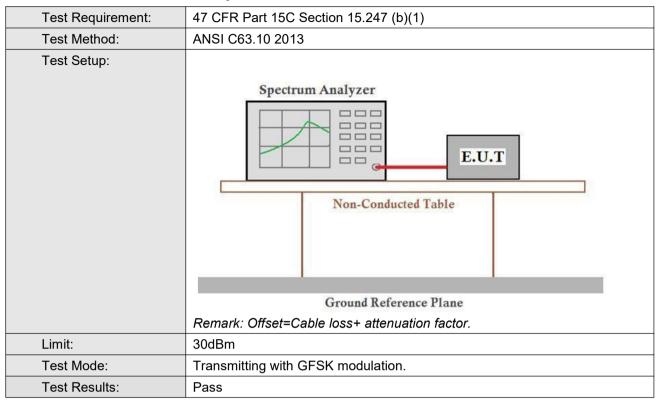
10.19

3.455

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

ANT1

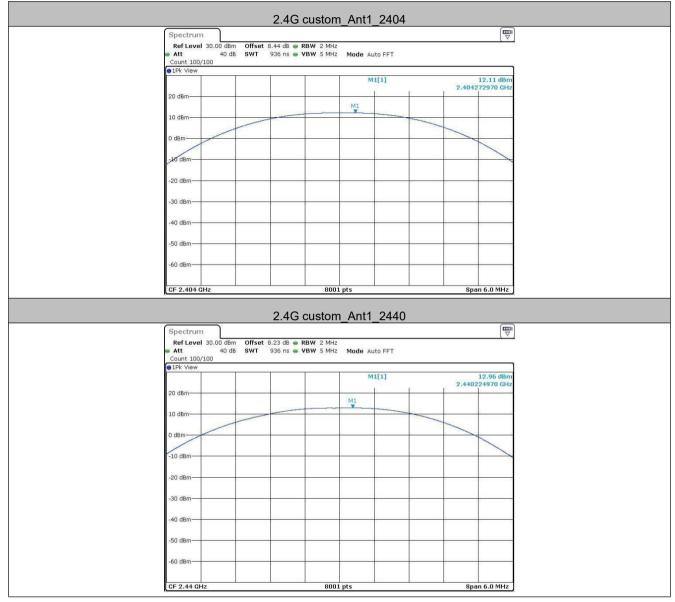
GFSK mode (1Mbps)					
Test channel Peak Output Power (dBm) Limit (dBm) Result					
Lowest	12.11	30.00	Pass		
Middle	12.96	30.00	Pass		
Highest	13.64	30.00	Pass		

ANT2

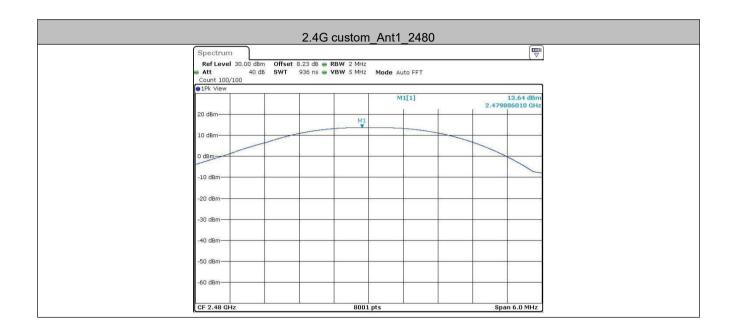
GFSK mode (1Mbps)					
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result		
Lowest	12.07	30.00	Pass		
Middle	12.91	30.00	Pass		
Highest	13.65	30.00	Pass		





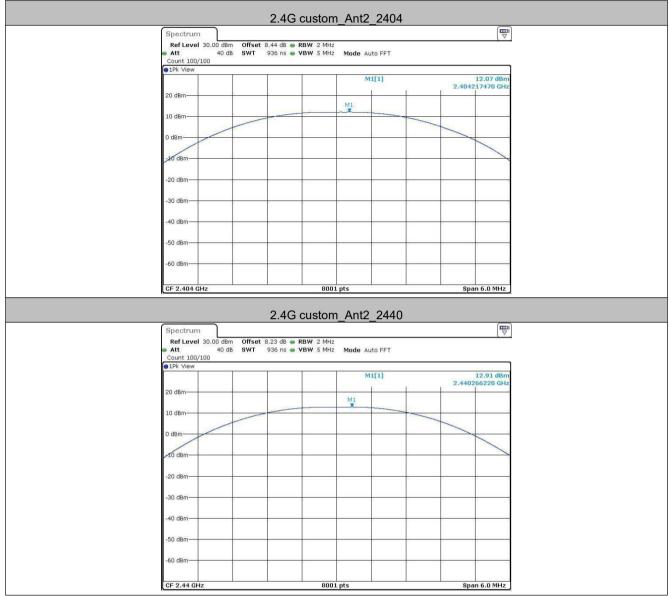




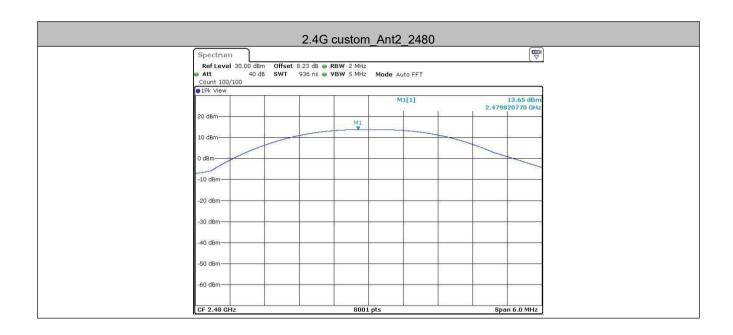






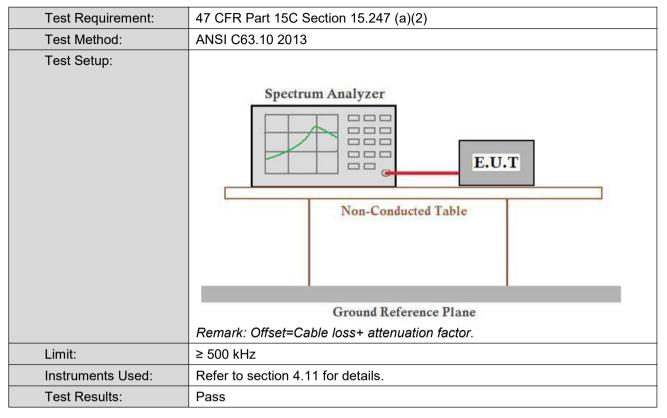








5.4 6dB Occupy Bandwidth



Measurement Data

ANT1:

GFSK mode (1Mbps)						
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result			
Lowest	0.68	≥500	Pass			
Middle	0.67	≥500	Pass			
Highest	0.66	≥500	Pass			

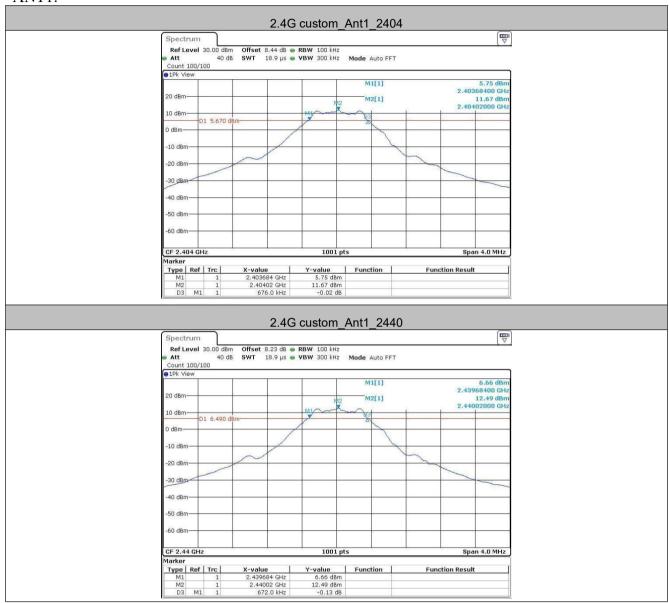
ANT2:

GFSK mode (1Mbps)						
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result			
Lowest 0.68		≥500	Pass			
Middle	0.68	≥500	Pass			
Highest	0.67	≥500	Pass			

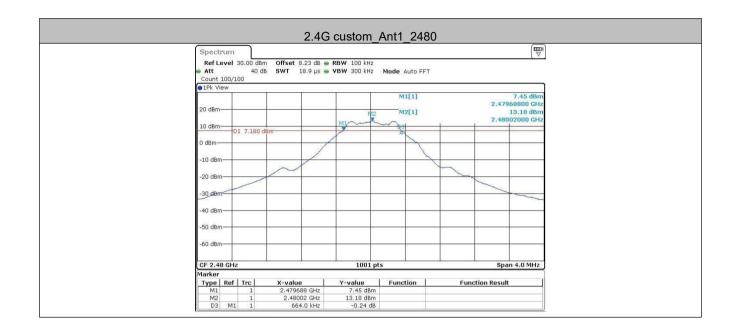


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ANT1:



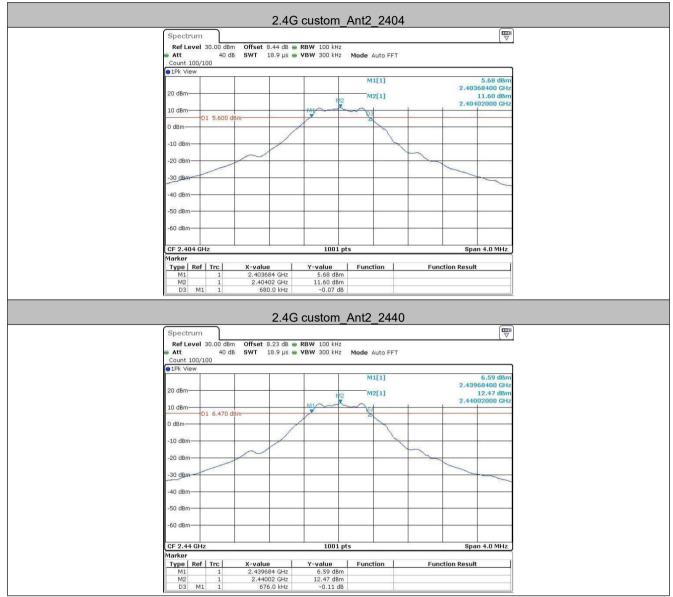




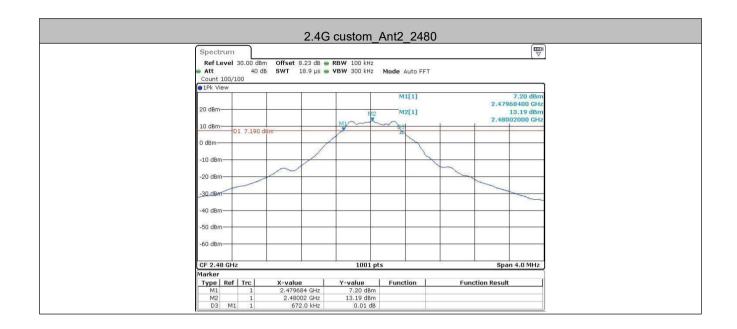


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ANT2:

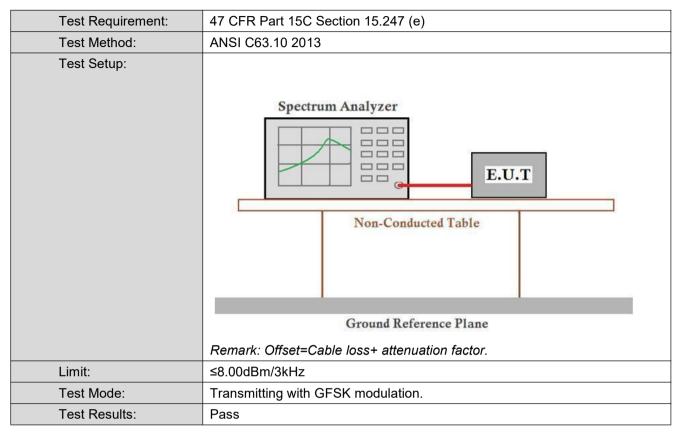








5.5 Power Spectral Density



Measurement Data

ANT1:

GFSK mode (1Mbps)							
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result				
Lowest	-2.5	≤8.00	Pass				
Middle	-1.58	≤8.00	Pass				
Highest	-0.99	≤8.00	Pass				

ANT2:

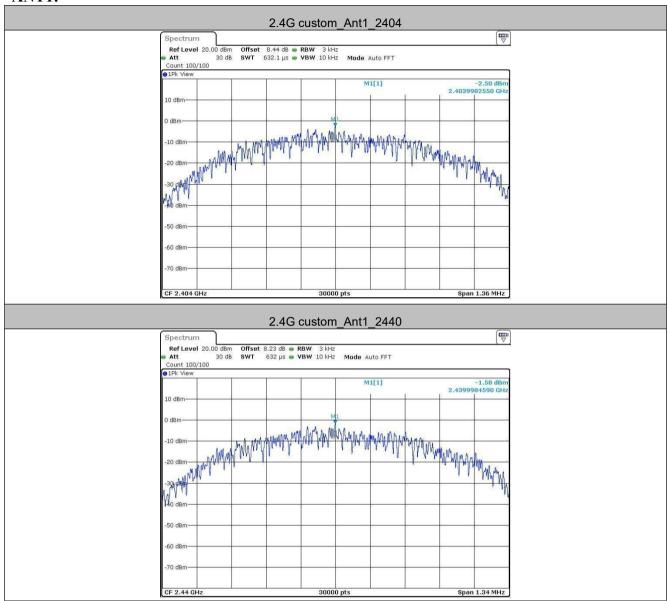
GFSK mode (1Mbps)						
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result			
Lowest	-2.6	≤8.00	Pass			
Middle	-1.59	≤8.00	Pass			
Highest	-0.98	≤8.00	Pass			



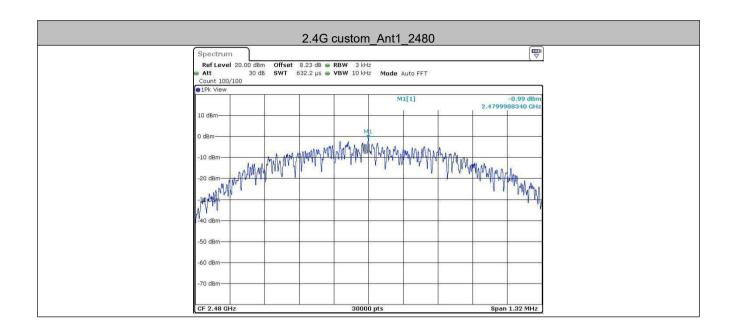
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Test plot as follows:

ANT1:



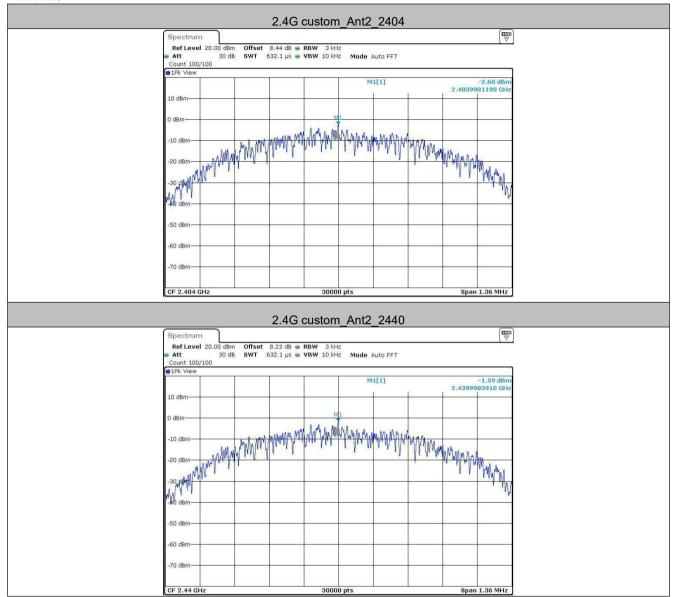




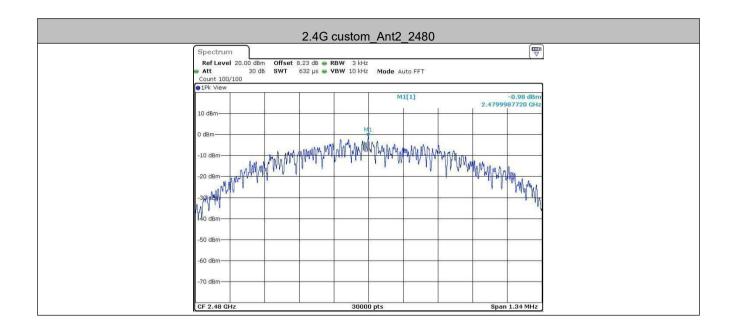


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ANT2:



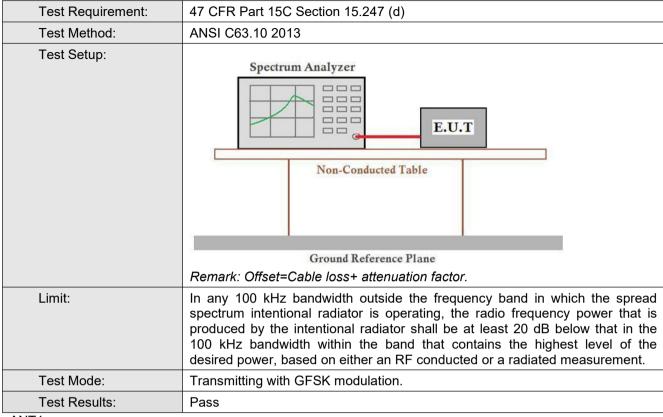






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5.6 Band-edge for RF Conducted Emissions



ANT1:

TestMode	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
2.4G	Low	2404	11.71	-34.11	≤-8.29	PASS
custom	High	2480	13.21	-32.06	≤-6.79	PASS

ANT2:

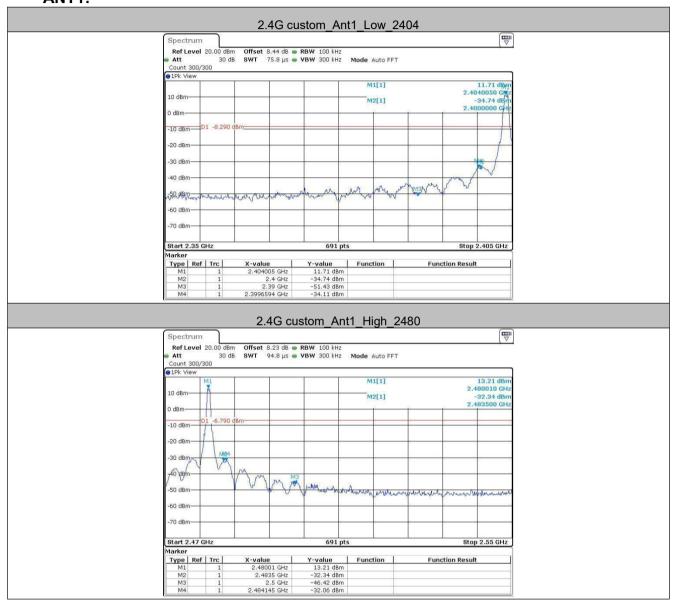
TestMode	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
2.4G	Low	2404	11.66	-33.21	≤-8.34	PASS
custom	High	2480	13.20	-31.56	≤-6.8	PASS



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Test plot as follows:

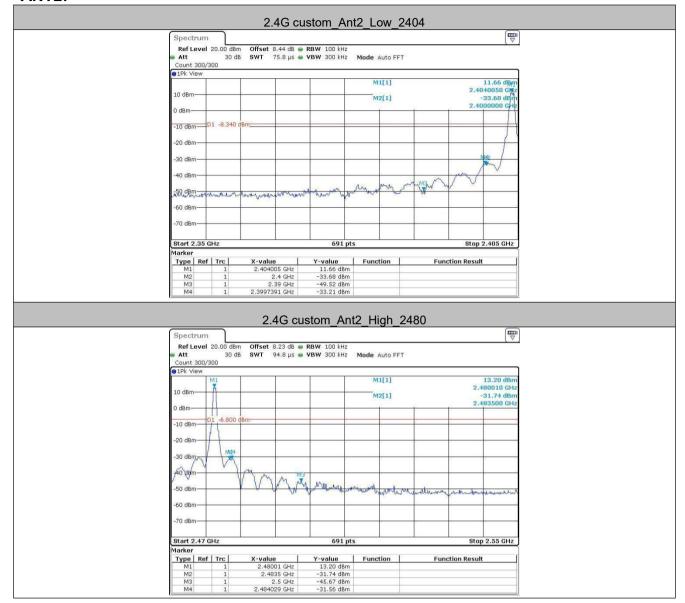
ANT1:





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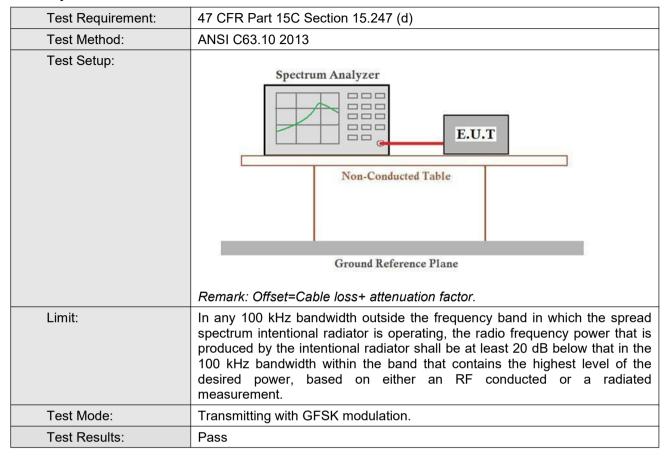
ANT2:







5.7 Spurious RF Conducted Emissions





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Test plot as follows:

ANT1:

