

TEST REPORT

Report No.:	BCTC2412610398-2E			
Applicant:	Shenzhen JX ROBOT Technology Co., Ltd			
Product Name:	3 axis foldable gimbal			
Test Model:	MOGO			
Tested Date:	2024-12-26 to 2025-01-09			
Issued Date:	2025-01-10			
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FCC ID: 2APQ9-MOGO

Product Name:	3 axis foldable gimbal
Trademark:	N/A
Model/Type Reference:	MOGO
Prepared For:	Shenzhen JX ROBOT Technology Co., Ltd
Address:	903, Building 1, 7th Industrial Zone, Yulv Community, Yutang Street, Guangming District, Shenzhen, Guangdong, China
Manufacturer:	Shenzhen JX ROBOT Technology Co., Ltd
Address:	903, Building 1, 7th Industrial Zone, Yulv Community, Yutang Street, Guangming District, Shenzhen, Guangdong, China
Prepared By:	Shenzhen BCTC Testing Co., Ltd.
Address:	1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date:	2024-12-26
Sample Tested Date:	2024-12-26 to 2025-01-09
Issue Date:	2025-01-10
Report No.:	BCTC2412610398-2E
Test Standards:	FCC Part15.247 ANSI C63.10-2013
Test Results:	PASS
Remark:	This is Bluetooth BLE radio test report.

Tested by: Zil

Eric Yang/Project Handler

Approved by:

Zero Zhou/Reviewer

The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen BCTC Testing Co., Ltd, this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client.

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(Note: N/A Means Not Applicable)

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1. Version

Report No.	Issue Date	Description	Approved
BCTC2412610398-2E	2025-01-10	Original	Valid

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2. Test Summary

The Product has been tested according to the following specifications:

No.	Test Parameter	Clause No.	Results
1	Conducted Emission	15.207	PASS
2	6dB Bandwidth	15.247 (a)(2)	PASS
3	Peak Output Power	15.247 (b)	PASS
4	Radiated Spurious Emission	15.247 (d), 15.205	PASS
5	Power Spectral Density	15.247 (e)	PASS
6	Restricted Band of Operation	15.205	PASS
7	Band Edge (Out of Band Emissions)	15.247(d)	PASS
8	Antenna Requirement	15.203	PASS





3. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Uncertainty
1	3m chamber Radiated spurious emission(30MHz-1GHz)	U=4.3dB
2	3m chamber Radiated spurious emission(9KHz-30MHz)	U=3.7dB
3	3m chamber Radiated spurious emission(1GHz-18GHz)	U=4.5dB
4	3m chamber Radiated spurious emission(18GHz-40GHz)	U=3.34dB
5	Conducted Emission (150kHz-30MHz)	U=3.20dB
6	Conducted Adjacent channel power	U=1.38dB
7	Conducted output power uncertainty Above 1G	U=1.576dB
8	Conducted output power uncertainty below 1G	U=1.28dB
9	humidity uncertainty	U=5.3%
10	Temperature uncertainty	U=0.59°C



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4. Product Information And Test Setup

4.1 Product Information

Model/Type Reference:	MOGO
Model Differences:	N/A
PCB:	L7Cpro-DK-H1-V06
Hardware Version:	5.3
Software Version:	N/A
Operation Frequency:	2402-2480MHz
Type of Modulation:	GFSK 1Mbps, GFSK 2Mbps,
Number Of Channel	40CH
Antenna installation:	PCB antenna
Antenna Gain:	 -0.39 dBi Remark: The antenna gain of the product comes from the antenna report provided by the customer, and the test data is affected by the customer information. The antenna gain of the product is provided by the customer, and the test data is affected by the customer information.
Ratings:	DC 3.6V From battery, DC 5V From adapter

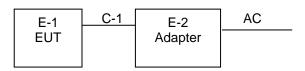
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4.2 Test Setup Configuration

See test photographs attached in *EUT TEST SETUP PHOTOGRAPHS* for the actual connections between Product and support equipment.

Conducted Emission:



Radiated Spurious Emission:



4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note
E-2	Adapter	N/A	CD226	N/A	Auxiliary

ltem	Shielded Type	Ferrite Core	Length	Note
C-1			1m	DC cable unshielded

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

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4.4 Channel List

	Channel List				
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2402	11	2422	21	2442
02	2404	12	2424	22	2444
03	2406	13	2426	23	2446
~	~	~	~	~	~
09	2418	19	2438	39	2478
10	2420	20	2440	40	2480

4.5 Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

For All Mode	Description	Modulation Type	
Mode 1	CH01		
Mode 2	CH20	GFSK(1Mbps)	
Mode 3 CH40			
Mode 4	CH01		
Mode 5	Mode 5 CH20		
Mode 6	CH40		
Mode 7	Link mode (Conducted Emission & Radiated emission)		

Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

(2) Fully-charged battery is used during the test

4.6 Table of parameters of text software setting

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters

Test software Version		FCC_assist_1.0.2.2	
Frequency	2402 MHz	2440 MHz	2480 MHz
Parameters	DEF	DEF	DEF



5. Test Facility And Test Instrument Used

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at Shenzhen BCTC Testing Co., Ltd. Address: 1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

FCC Test Firm Registration Number: 712850

A2LA certificate registration number is: CN1212

ISED Registered No.: 23583

ISED CAB identifier: CN0017

5.2 Test Instrument Used

Conducted Emissions Test								
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.			
Receiver	R&S	ESR3	102075	May 16, 2024	May 15, 2025			
LISN	R&S	ENV216	101375	May 16, 2024	May 15, 2025			
Software	Frad	EZ-EMC	EMC-CON 3A1	/	١			
Pulse limiter	Schwarzbeck	VTSD9561-F	01323	May 16, 2024	May 15, 2025			

	RF Conducted Test								
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.				
Power Metter	Keysight	E4419	I.	May 16, 2024	May 15, 2025				
Power Sensor (AV)	Keysight	E9300A		May 16, 2024	May 15, 2025				
Signal Analyzer20kH z-26.5GHz	Keysight	N9020A	MY49100060	May 16, 2024	May 15, 2025				
Spectrum Analyzer9kHz- 40GHz	R&S	FSP40	100363	May 16, 2024	May 15, 2025				
Radio frequency control box	MAIWEI	MW100-RFC B		\ \					
Software	MAIWEI	MTS 8310							



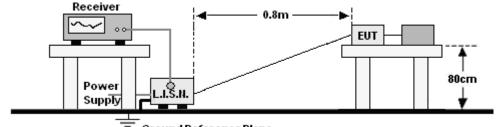
Radiated Emissions Test (966 Chamber01)								
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.			
966 chamber	ChengYu	966 Room	966	May 15, 2023	May 14, 2026			
Receiver	R&S	ESR3	102075	May 16, 2024	May 15, 2025			
Receiver	R&S	ESRP	101154	May 16, 2024	May 15, 2025			
Amplifier	Schwarzbeck	BBV9744	9744-0037	May 16, 2024	May 15, 2025			
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	942	May 21, 2024	May 20, 2025			
Loop Antenna(9KHz -30MHz)	Schwarzbeck	FMZB1519B	00014	May 21, 2024	May 20, 2025			
Amplifier	SKET	LAPA_01G1 8G-45dB	SK202104090 1	May 16, 2024	May 15, 2025			
Horn Antenna	Schwarzbeck	BBHA9120D	1541	May 21, 2024	May 20, 2025			
Amplifier(18G Hz-40GHz)	MITEQ	TTA1840-35- HG	2034381	May 16, 2024	May 15, 2025			
Horn Antenn(18GH z-40GHz)	Schwarzbeck	BBHA9170	00822	May 21, 2024	May 20, 2025			
Spectrum Analyzer9kHz- 40GHz	R&S	FSP40	100363	May 16, 2024	May 15, 2025			
Software	Frad	EZ-EMC	FA-03A2 RE	\	Λ_{j}			

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6. Conducted Emissions

6.1 Block Diagram Of Test Setup



Ground Reference Plane

6.2 Limit

	Limit	(dBuV)
Frequency (MHz)	Quas-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Notes:

1. *Decreasing linearly with logarithm of frequency.

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

6.3 Test procedure

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

a. The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).

b. The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.

c. For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

6.4 EUT Operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

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6.5 Test Result

Ter	Temperature: 26 °C				Rela	Relative Humidity:					54%RH							
Pre	ressure: 101KPa					Test	Test Voltage:				A	AC 120V/60Hz						
Tes	st Mode:		Mod	le 7				Pola	rizatior	า:			L	-				
90.0	1																	
80													+	+				-
70													_	_				_
60																F	CC/IC QP	
			~													F	CC/IC AV	
50		3	-															
40		Ă.A					10							-		11 X		_
30			AAA	14.M	AИ	MAN		Million all		Hildu		ųμ		<u>II.</u>	\$44.HA	M,		dw.
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10							101 1 10		<u> </u>					+			9999e-1 1	AVG
0													+	-				-
-10	.150							MHz)										30.000
	mark:							M112J										30.000
1. A	All readings a						e values	6.		N.						;		
	Factor = Inse Measuremen						Factor											
	Over = Meas			nit														1
Ν	lo. Mk.	Free	q.		adir evel	-	Corre Fac		Meas m	ent		Li	mi	t	0	ver		
		MHz	Z				dB		dBu	IV		d	Зu	V	c	B	Dete	ctor
	1	0.21	174	2	6.31		20.0	7	46.3	88		62	.9	2	-1	6.54	Q	P
	2	0.21	174	1	2.61		20.0	7	32.6	8		52	.9	2	-2	0.24	A١	/G
	3	0.33	338	2	1.90)	20.0	7	41.9	97		59	.3	6	-1	7.39	Q	P
	4	0.33	338	1	0.13	3	20.0	7	30.2	20		49	.3	6	-19	9.16	A١	/G
	5	0.54	193	5	5.93		20.0	8	26.0)1		46	.0	0	-19	9.99	A١	/G
	6	0.54	193	1	7.42	2	20.0	8	37.5	50		56	.0	0	-18	8.50	Q	P
	7 *	0.92	202	2	0.59)	20.0	9	40.6	8		56	.0	0	-1	5.32	Q	P
	•		202															
	8	0.92			2.08		20.0	9	22.1	7		46	.0	0	-23	3.83	A١	/G
	9	0.92	282	2	2.08 2.51		20.0 20.1					46 46				3.83 3.39		/G /G
			282 071	2				0	22.1	61			.0	0	-2		A١	
	9	1.70	282 071 071	2	2.51	5	20.1	0	22.1 22.6	61 5		46	.0 .0	0	-2: -2	3.39	A۱ Q	/G
	9 10	1.70 1.70	282 071 071 509	2 2 1 1	2.51 5.05	5	20.1 20.1	0 0 7	22.1 22.6 35.1	61 5 81		46 56	.0 .0 .0	0 0 0	-2: -2: -2:	3.39 0.85	A\ Q Q	/G P

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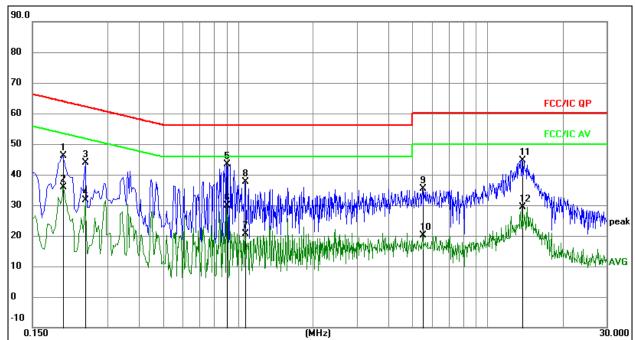
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Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage:	AC 120V/60Hz
Test Mode:	Mode 7	Polarization:	Ν



Remark:

1. All readings are Quasi-Peak and Average values.

2. Factor = Insertion Loss + Cable Loss.

3. Measurement = Reading Level + Correct Factor

4. Over	= Measu	urement - Lir	nit					
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.1995	26.05	20.07	46.12	63.63	-17.51	QP
2		0.1995	15.76	20.07	35.83	53.63	-17.80	AVG
3		0.2445	23.85	20.07	43.92	61.94	-18.02	QP
4		0.2445	11.49	20.07	31.56	51.94	-20.38	AVG
5	*	0.9014	23.40	20.09	43.49	56.00	-12.51	QP
6		0.9014	9.85	20.09	29.94	46.00	-16.06	AVG
7		1.0679	0.54	20.09	20.63	46.00	-25.37	AVG
8		1.0679	17.50	20.09	37.59	56.00	-18.41	QP
9		5.5005	15.24	20.15	35.39	60.00	-24.61	QP
10		5.5005	-0.06	20.15	20.09	50.00	-29.91	AVG
11		13.8165	24.35	20.28	44.63	60.00	-15.37	QP
12		13. <mark>816</mark> 5	9.10	20.28	29.38	50.00	-20.62	AVG
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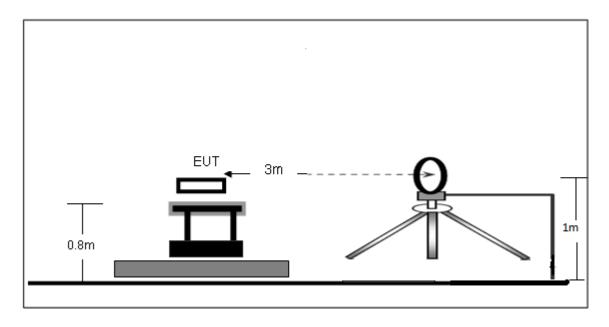
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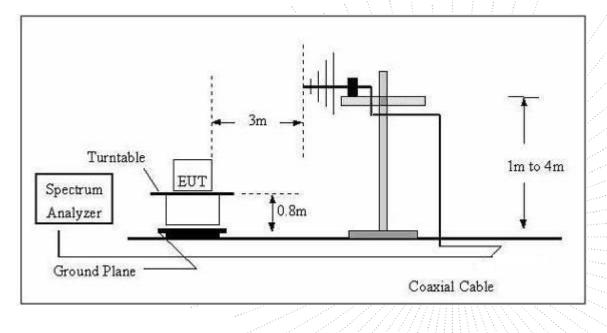


7. Radiated Emissions

- 7.1 Block Diagram Of Test Setup
 - (A) Radiated Emission Test-Up Frequency Below 30MHz







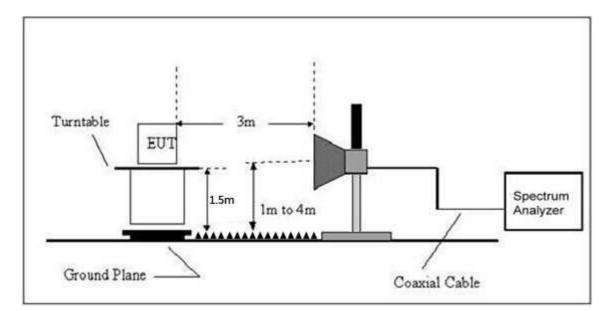
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(C) Radiated Emission Test-Up Frequency Above 1GHz



7.2 Limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Field Strength	Distance	Field Strength Limit at 3m Distance				
(MHz) uV/m		uV/m	dBuV/m			
2400/F(kHz)	300	10000 * 2400/F(kHz)	20log ^{(2400/F(kHz))} + 80			
24000/F(kHz)	30	100 * 24000/F(kHz)	20log ^{(24000/F(kHz))} + 40			
30	30	100 * 30	20log ⁽³⁰⁾ + 40			
100	3	100	20log ⁽¹⁰⁰⁾			
150	3	150	20log ⁽¹⁵⁰⁾			
200	3	200	20log ⁽²⁰⁰⁾			
500	3	500	20log ⁽⁵⁰⁰⁾			
	uV/m 2400/F(kHz) 24000/F(kHz) 30 100 150 200	uV/m (m) 2400/F(kHz) 300 24000/F(kHz) 30 30 30 100 3 150 3 200 3	uV/m (m) uV/m 2400/F(kHz) 300 10000 * 2400/F(kHz) 24000/F(kHz) 30 100 * 24000/F(kHz) 30 30 100 * 24000/F(kHz) 30 30 100 * 30 100 3 100 150 3 150 200 3 200			

Limits Of Radiated Emission Measurement (Above 1000MHz)

	Limit (dBuV/m)) (at 3M)
Frequency (MHz)	Peak	Average
Above 1000	74	54

Notes:

(1)The limit for radiated test was performed according to FCC PART 15C.

(2)The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

Frequency Range Of Radiated Measurement

ΞD



(a) For an intentional radiator the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in this paragraph:

(1) If the intentional radiator operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

(2) If the intentional radiator operates at or above 10 GHz and below 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.

(3) If the intentional radiator operates at or above 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower, unless specified otherwise elsewhere in the rules.

(4) If the intentional radiator operates at or above 95 GHz: To the third harmonic of the highest fundamental frequency or to 750 GHz, whichever is lower, unless specified otherwise elsewhere in the rules.

(5) If the intentional radiator contains a digital device, regardless of whether this digital device controls the functions of the intentional radiator or the digital device is used for additional control or function purposes other than to enable the operation of the intentional radiator, the frequency range shall be investigated up to the range specified in paragraphs (a) (1)through (4) of this section or the range applicable to the digital device, as shown in paragraph (b)(1) of this section, whichever is the higher frequency range of investigation.

7.3 Test procedure

Receiver Parameter	Setting
Attenuation	Auto
9kHz~150kHz	RBW 200Hz for QP
150kHz~30MHz	RBW 9kHz for QP
30MHz~1000MHz	RBW 120kHz for QP

Spectrum Parameter	Setting
1-25GHz	RBW 1 MHz /VBW 1 MHz for Peak, RBW 1 MHz / VBW 10Hz for Average

Below 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.

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.



Above 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.

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 and the rota 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, the middlest channel, the Highest channel. Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

7.4 EUT operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

7.5 Test Result

Below 30MHz

Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage:	DC 3.6V
Test Mode:	Mode 7	Test voltage.	DC 3.6V

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
		<u></u>		PASS
				PASS

Note:

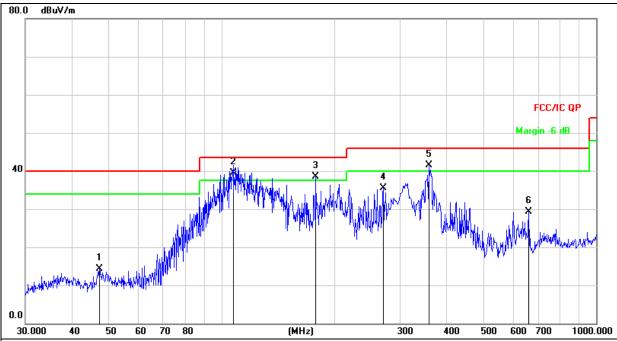
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =40 log (specific distance/test distance)(dB); Limit line = specific limits(dBuv) + distance extrapolation factor.



Between 30MHz – 1GHz

Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage:	DC 3.6V
Test Mode:	Mode 7	Polarization:	Horizontal



Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.
 Measurement = Reading Level + Correct Factor

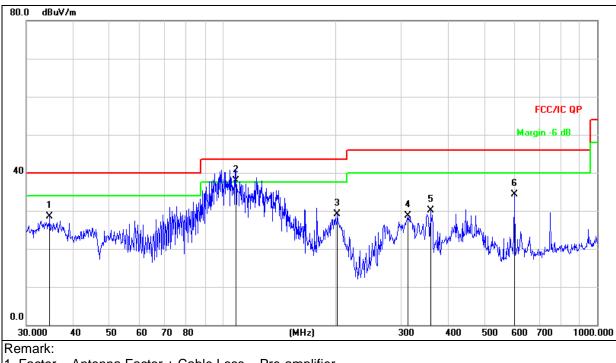
Over = Measurement	- Limit	t
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0.0101	- 1010	Jasurement Li	i i i i i i i i i i i i i i i i i i i					
No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		47.3253	28.39	-14.12	14.27	40.00	-25.73	QP
2	*	107.5100	55.92	-16.46	39.46	43.50	-4.04	QP
3	İ	178.7583	55.82	-17.30	38.52	43.50	-4.98	QP
4		270.3747	49.35	-13.86	35.49	46.00	-10.51	QP
5	ļ	357.9286	52.92	-11.38	41.54	46.00	-4.46	QP
6		661.1504	35.37	-6.06	29.31	46.00	-16.69	QP

E



Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage:	DC 3.6V
Test Mode:	Mode 7	Polarization:	Vertical



1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

2. Measurement = Reading Level + Correct Factor

3. Ove	r = IVI	easurement - L	imit					
No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		34.6385	44.33	-15.75	28.58	40.00	-11.42	QP
2	*	108.6470	54.50	-16.54	37.96	43.50	-5.54	QP
3		202.8104	44.68	-15.64	29.04	43.50	-14.46	QP
4		312.1794	41.43	-12.81	28.62	46.00	-17.38	QP
5		359.1860	41.56	-11.36	30.20	46.00	-15.80	QP
6		601.4265	41.28	-7.00	34.28	46.00	-11.72	QP



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Between 1GHz – 25GHz 1Mbps

			GFSK				
Polar	Frequency	Reading Level	Correct Factor	Measure-m ent	Limits	Over	Detector
(H/V)	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/ m)	(dB)	Туре
			Low chan	nel			
V	4804.00	70.09	-19.99	50.10	74.00	-23.90	PK
V	4804.00	61.77	-19.99	41.78	54.00	-12.22	AV
V	7206.00	59.12	-14.22	44.90	74.00	-29.10	PK
V	7206.00	49.69	-14.22	35.47	54.00	-18.53	AV
Н	4804.00	65.96	-19.99	45.97	74.00	-28.03	PK
Н	4804.00	56.17	-19.99	36.18	54.00	-17.82	AV
Н	7206.00	56.71	-14.22	42.49	74.00	-31.51	PK
Н	7206.00	48.29	-14.22	34.07	54.00	-19.93	AV
			Middle cha	nnel		•	
V	4880.00	67.56	-19.84	47.72	74.00	-26.28	PK
V	4880.00	60.22	-19.84	40.38	54.00	-13.62	AV
V	7320.00	58.03	-13.90	44.13	74.00	-29.87	PK
V	7320.00	48.59	-13.90	34.69	54.00	-19.31	AV
Н	4880.00	66.20	-19.84	46.36	74.00	-27.64	PK
Н	4880.00	55.83	-19.84	35.99	54.00	-18.01	AV
Н	7320.00	55.69	-13.90	41.79	74.00	-32.21	PK
Н	7320.00	46.93	-13.90	33.03	54.00	-20.97	AV
			High chan	nel			
V	4960.00	70.56	-19.68	50.88	74.00	-23.12	PK
V	4960.00	62.52	-19.68	42.84	54.00	-11.16	AV
V	7440.00	61.73	-13.57	48.16	74.00	-25.84	PK
V	7440.00	52.62	-13.57	39.05	54.00	-14.95	AV
Н	4960.00	69.17	-19.68	49.49	74.00	-24.51	PK
Н	4960.00	58.58	-19.68	38.90	54.00	-15.10	AV
Н	7440.00	59.26	-13.57	45.69	74.00	-28.31	PK
Н	7440.00	50.76	-13.57	37.19	54.00	-16.81	AV

Remark:

1. Measurement = Reading Level + Correct Factor, Correct Factor = Antenna Factor + Cable Loss – Pre-amplifier. Over= Measurement - Limit

2.If peak below the average limit, the average emission was no test.

3. In restricted bands of operation, The spurious emissions below the permissible value more than 20dB4. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

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2Mbps

			GFSK				
Polar	Frequency	Reading Level	Correct Factor	Measure-m ent	Limits	Over	Detector
(H/V)	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/ m)	(dB)	Туре
			Low chan	nel			
V	4804.00	72.72	-19.99	52.73	74.00	-21.27	PK
V	4804.00	64.55	-19.99	44.56	54.00	-9.44	AV
V	7206.00	64.89	-14.22	50.67	74.00	-23.33	PK
V	7206.00	53.95	-14.22	39.73	54.00	-14.27	AV
Н	4804.00	68.86	-19.99	48.87	74.00	-25.13	PK
Н	4804.00	58.33	-19.99	38.34	54.00	-15.66	AV
Н	7206.00	63.69	-14.22	49.47	74.00	-24.53	PK
Н	7206.00	56.38	-14.22	42.16	54.00	-11.84	AV
		•	Middle char	nel		•	
V	4880.00	71.50	-19.84	51.66	74.00	-22.34	PK
V	4880.00	63.85	-19.84	44.01	54.00	-9.99	AV
V	7320.00	60.69	-13.90	46.79	74.00	-27.21	PK
V	7320.00	52.58	-13.90	38.68	54.00	-15.32	AV
Н	4880.00	66.54	-19.84	46.70	74.00	-27.30	PK
Н	4880.00	56.74	-19.84	36.90	54.00	-17.10	AV
Н	7320.00	58.67	-13.90	44.77	74.00	-29.23	PK
Н	7320.00	50.50	-13.90	36.60	54.00	-17.40	AV
			High chan	nel			
V	4960.00	72.71	-19.68	53.03	74.00	-20.97	PK
V	4960.00	64.37	-19.68	44.69	54.00	-9.31	AV
V	7440.00	65.57	-13.57	52.00	74.00	-22.00	PK
V	7440.00	55.06	-13.57	41.49	54.00	-12.51	AV
Н	4960.00	70.52	-19.68	50.84	74.00	-23.16	PK
Н	4960.00	60.75	-19.68	41.07	54.00	-12.93	AV
Н	7440.00	64.40	-13.57	50.83	74.00	-23.17	PK
Н	7440.00	56.60	-13.57	43.03	54.00	-10.97	AV

Remark:

1. Measurement = Reading Level + Correct Factor, Correct Factor = Antenna Factor + Cable Loss – Pre-amplifier. Over= Measurement - Limit

2.If peak below the average limit, the average emission was no test.

3. In restricted bands of operation, The spurious emissions below the permissible value more than 20dB4. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

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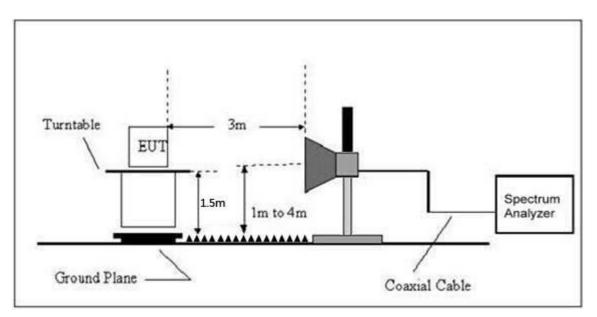
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8. Radiated Band Emission Measurement And Restricted Bands Of Operation

8.1 Block Diagram Of Test Setup

Radiated Emission Test-Up Frequency Above 1GHz



8.2 Limit

FCC Part15 C Section 15.209 and 15.205

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²
13.36-13.41			



Limits Of Radiated Emission Measurement (Above 1000MHz)

Frequency (MHz)	Limit (dBuV/m) (at 3M)		
r requency (wriz)	Peak	Average	
Above 1000	74	54	

Notes:

(1)The limit for radiated test was performed according to FCC PART 15C.

(2)The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

8.3 Test Procedure

Receiver Parameter	Setting
Attenuation	Auto
Start Frequency	2300MHz
Stop Frequency	2520
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Above 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.

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 and the rota 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, the Highest channel.

Note: Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.



8.4 EUT Operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

8.5 Test Result

GFSK(1Mbps) Constrained Constrained	Test mode	Polar (H/V)	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor	Measure- ment (dBuV/m)		nits V/m)	Over	Result
H 2390.00 72.31 -25.43 46.88 74.00 54.00 -27.12 PA H 2400.00 74.70 -25.40 49.30 74.00 54.00 -24.70 PA V 2390.00 71.57 -25.43 46.14 74.00 54.00 -27.86 PA V 2400.00 71.84 -25.40 46.44 74.00 54.00 -27.86 PA H 2483.50 70.47 -25.15 45.32 74.00 54.00 -28.68 PA H 2483.50 70.47 -25.15 45.32 74.00 54.00 -28.68 PA H 2483.50 71.17 -25.15 46.02 74.00 54.00 -27.98 PA V 2483.50 71.17 -25.15 46.02 74.00 54.00 -32.24 PA V 2390.00 73.01 -25.43 47.58 74.00 54.00 -26.42 PA H <				(ubuv/iii)	(dB)	PK	PK	AV	PK	
GFSK(1Mbps) H 2400.00 74.70 -25.40 49.30 74.00 54.00 -24.70 P/A V 2390.00 71.57 -25.43 46.14 74.00 54.00 -27.86 P/A V 2400.00 71.57 -25.43 46.14 74.00 54.00 -27.86 P/A V 2400.00 71.84 -25.40 46.44 74.00 54.00 -27.56 P/A H 2483.50 70.47 -25.15 45.32 74.00 54.00 -28.68 P/A H 2500.00 66.71 -25.10 42.61 74.00 54.00 -31.39 P/A V 2483.50 71.17 -25.15 46.02 74.00 54.00 -27.98 P/A V 2500.00 66.86 -25.10 41.76 74.00 54.00 -26.42 P/A H 2390.00 73.01 -25.43 47.58 74.00 54.00 -26.75 P/A					Low Chan	nel 2402MHz				
V 2390.00 71.57 -25.43 46.14 74.00 54.00 -27.86 PA V 2400.00 71.84 -25.40 46.44 74.00 54.00 -27.86 PA High Chamel 2480MHz H 2483.50 70.47 -25.15 45.32 74.00 54.00 -28.68 PA H 2500.00 67.71 -25.10 42.61 74.00 54.00 -31.39 PA V 2483.50 71.17 -25.15 46.02 74.00 54.00 -31.39 PA V 2483.50 71.17 -25.15 46.02 74.00 54.00 -31.39 PA V 2500.00 66.86 -25.10 41.76 74.00 54.00 -32.24 PA V 2390.00 73.01 -25.43 47.58 74.00 54.00 -26.42 PA H 2400.00 75.64 -25.40 50.24 74.00 54.00 -26.75		Н	2390.00	72.31	-25.43	46.88	74.00	54.00	-27.12	PASS
V 2400.00 71.84 -25.40 46.44 74.00 54.00 -27.56 PA High Channel 2480MHz High Channel 2480MHz High Channel 2480MHz PA H 2483.50 70.47 -25.15 45.32 74.00 54.00 -28.68 PA H 2500.00 67.71 -25.10 42.61 74.00 54.00 -31.39 PA V 2483.50 71.17 -25.15 46.02 74.00 54.00 -27.98 PA V 2500.00 66.86 -25.10 41.76 74.00 54.00 -31.39 PA V 2500.00 66.86 -25.10 41.76 74.00 54.00 -32.24 PA V 2390.00 73.01 -25.43 47.58 74.00 54.00 -26.42 PA H 2400.00 75.64 -25.40 50.24 74.00 54.00 -26.75 PA V 2390.00 72.68 -25.40		Н	2400.00	74.70	-25.40	49.30	74.00	54.00	-24.70	PASS
GFSK(1Mbps) High Channel 2480MHz H 2483.50 70.47 -25.15 45.32 74.00 54.00 -28.68 PA H 2500.00 67.71 -25.10 42.61 74.00 54.00 -31.39 PA V 2483.50 71.17 -25.15 46.02 74.00 54.00 -27.98 PA V 2483.50 71.17 -25.15 46.02 74.00 54.00 -27.98 PA V 2500.00 66.86 -25.10 41.76 74.00 54.00 -32.24 PA V 2500.00 73.01 -25.43 47.58 74.00 54.00 -32.24 PA H 2390.00 73.01 -25.43 47.58 74.00 54.00 -26.42 PA H 2400.00 75.64 -25.40 50.24 74.00 54.00 -26.75 PA V 2390.00 72.68 -25.40 47.64 74.00 54.00		V	2390.00	71.57	-25.43	46.14	74.00	54.00	-27.86	PASS
High Channel 2480MHZ H 2483.50 70.47 -25.15 45.32 74.00 54.00 -28.68 PA H 2500.00 67.71 -25.10 42.61 74.00 54.00 -31.39 PA V 2483.50 71.17 -25.15 46.02 74.00 54.00 -27.98 PA V 2500.00 66.86 -25.10 41.76 74.00 54.00 -27.98 PA V 2500.00 66.86 -25.10 41.76 74.00 54.00 -27.98 PA V 2500.00 66.86 -25.10 41.76 74.00 54.00 -32.24 PA H 2390.00 73.01 -25.43 47.58 74.00 54.00 -26.42 PA H 2400.00 75.64 -25.40 50.24 74.00 54.00 -26.75 PA V 2390.00 72.68 -25.40 47.25 74.00 54.00 -26.36 <t< th=""><td>GESK(1Mbpc)</td><td>V</td><td>2400.00</td><td>71.84</td><td>-25.40</td><td>46.44</td><td>74.00</td><td>54.00</td><td>-27.56</td><td>PASS</td></t<>	GESK(1Mbpc)	V	2400.00	71.84	-25.40	46.44	74.00	54.00	-27.56	PASS
H 2500.00 67.71 -25.10 42.61 74.00 54.00 -31.39 PA V 2483.50 71.17 -25.15 46.02 74.00 54.00 -27.98 PA V 2500.00 66.86 -25.10 41.76 74.00 54.00 -32.24 PA V 2500.00 66.86 -25.10 41.76 74.00 54.00 -32.24 PA Low Channel 2402MHz H 2390.00 73.01 -25.43 47.58 74.00 54.00 -26.42 PA H 2400.00 75.64 -25.40 50.24 74.00 54.00 -26.75 PA V 2390.00 72.68 -25.43 47.25 74.00 54.00 -26.75 PA V 2400.00 73.04 -25.40 47.64 74.00 54.00 -26.36 PA V 2400.00 73.04 -25.40 47.64 74.00 54.00 -26.36 PA	GESK(TWDPS)				High Chan	nel 2480MHz				
V 2483.50 71.17 -25.15 46.02 74.00 54.00 -27.98 PA V 2500.00 66.86 -25.10 41.76 74.00 54.00 -32.24 PA Low Channel 2402MHz H 2390.00 73.01 -25.43 47.58 74.00 54.00 -26.42 PA H 2390.00 73.01 -25.43 47.58 74.00 54.00 -26.42 PA H 2390.00 73.01 -25.43 47.58 74.00 54.00 -26.42 PA V 2390.00 73.64 -25.40 50.24 74.00 54.00 -26.75 PA V 2390.00 72.68 -25.43 47.25 74.00 54.00 -26.75 PA V 2400.00 73.04 -25.40 47.64 74.00 54.00 -26.36 PA High Channel 2480MHz High Channel 2480MHz High Channel 2480MHz High Channel 2480MHz High Channel 2480MH		Н	2483.50	70.47	-25.15	45.32	74.00	54.00	-28.68	PASS
V 2500.00 66.86 -25.10 41.76 74.00 54.00 -32.24 PA Low Channel 2402MHz H 2390.00 73.01 -25.43 47.58 74.00 54.00 -26.42 PA H 2400.00 75.64 -25.40 50.24 74.00 54.00 -26.42 PA V 2390.00 73.64 -25.40 50.24 74.00 54.00 -26.75 PA V 2390.00 72.68 -25.43 47.25 74.00 54.00 -26.75 PA V 2400.00 73.04 -25.40 47.64 74.00 54.00 -26.75 PA V 2400.00 73.04 -25.40 47.64 74.00 54.00 -26.36 PA High Channel 2480MHz H 2483.50 73.27 -25.15 48.12 74.00 54.00 -25.88 PA		Н	2500.00	67.71	-25.10	42.61	74.00	54.00	-31.39	PASS
Low Channel 2402MHz H 2390.00 73.01 -25.43 47.58 74.00 54.00 -26.42 PA H 2400.00 75.64 -25.40 50.24 74.00 54.00 -26.42 PA V 2390.00 72.68 -25.43 47.25 74.00 54.00 -26.75 PA V 2390.00 72.68 -25.40 47.64 74.00 54.00 -26.75 PA V 2400.00 73.04 -25.40 47.64 74.00 54.00 -26.36 PA H 2483.50 73.27 -25.15 48.12 74.00 54.00 -26.36 PA		V	2483.50	71.17	-25.15	46.02	74.00	54.00	-27.98	PASS
H 2390.00 73.01 -25.43 47.58 74.00 54.00 -26.42 PA H 2400.00 75.64 -25.40 50.24 74.00 54.00 -26.42 PA V 2390.00 72.68 -25.43 47.25 74.00 54.00 -23.76 PA V 2390.00 72.68 -25.43 47.25 74.00 54.00 -26.75 PA V 2400.00 73.04 -25.40 47.64 74.00 54.00 -26.36 PA H 2483.50 73.27 -25.15 48.12 74.00 54.00 -26.36 PA		V	2500.00	66.86	-25.10	41.76	74.00	54.00	-32.24	PASS
H 2400.00 75.64 -25.40 50.24 74.00 54.00 -23.76 PA V 2390.00 72.68 -25.43 47.25 74.00 54.00 -26.75 PA V 2400.00 73.04 -25.40 47.64 74.00 54.00 -26.75 PA High Channel 2480MHz H 2483.50 73.27 -25.15 48.12 74.00 54.00 -25.88 PA					Low Chan	nel 2402MHz				
V 2390.00 72.68 -25.43 47.25 74.00 54.00 -26.75 PA V 2400.00 73.04 -25.40 47.64 74.00 54.00 -26.75 PA High Channel 2480MHz H 2483.50 73.27 -25.15 48.12 74.00 54.00 -26.76 PA		H	2390.00	73.01	-25.43	47.58	74.00	54.00	-26.42	PASS
V 2400.00 73.04 -25.40 47.64 74.00 54.00 -26.36 PA High Channel 2480MHz H 2483.50 73.27 -25.15 48.12 74.00 54.00 -26.36 PA		Н	2400.00	75.64	-25.40	50.24	74.00	54.00	-23.76	PASS
High Channel 2480MHz H 2483.50 73.27 -25.15 48.12 74.00 54.00 -25.88 PA		V	2390.00	72.68	-25.43	47.25	74.00	54.00	-26.75	PASS
High Channel 2480MHZ H 2483.50 73.27 -25.15 48.12 74.00 54.00 -25.88 PA	CESK(2Mbpc)	V	2400.00	73.04	-25.40	47.64	74.00	54.00	-26.36	PASS
	Gron(ziviops)				High Chan	nel 2480MHz			/	
H 2500.00 68.67 -25.10 43.57 74.00 54.00 -30.43 PA		Н	2483.50	73.27	-25.15	48.12	74.00	54.00	-25.88	PASS
		Н	2500.00	68.67	-25.10	43.57	74.00	54.00	-30.43	PASS
V 2483.50 70.94 -25.15 45.79 74.00 54.00 -28.21 PA		V	2483.50	70.94	-25.15	45.79	74.00	54.00	-28.21	PASS
V 2500.00 66.66 -25.10 41.56 74.00 54.00 -32.44 PA		V	2500.00	66.66	-25.10	41.56	74.00	54.00	-32.44	PASS

Remark:

1. Measurement = Reading Level + Correct Factor, Correct Factor = Antenna Factor + Cable Loss – Pre-amplifier.

2. If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.

3. In restricted bands of operation, The spurious emissions below the permissible value more than 20dB

4. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



9. Power Spectral Density Test

9.1 Block Diagram Of Test Setup



9.2 Limit

	FCC Part	15 (15.247), Subpart C				
Section	Section Test Item Limit Frequency Range (MHz) Result					
15.247	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS		

Limits Of Radiated Emission Measurement (Above 1000MHz)

9.3 Test procedure

1. Set analyzer center frequency to DTS channel center frequency.

- 2. Set the span to 1.5 times the DTS bandwidth.
- 3. Set the RBW to: 3 kHz
- 4. Set the VBW \geq 3 x RBW.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.

9. Use the peak marker function to determine the maximum amplitude level within the RBW.

10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

9.4 EUT Operating Conditions.

The EUT tested system was configured as the statements of 4.6 Unless otherwise a special operating condition is specified in the follows during the testing. Note: Power Spectral Density(dBm)=Reading+Cable Loss

DOI



9.5 Test Result

Temperature:	26 ℃	Relative Hu	Relative Humidity:		
Pressure:	101KPa	Test Voltag	e: DC 3.6\		V
Mode	Frequency	Power Spectral Density(dBm/3kHz)	Limit (dBm	n/3kHz)	Result
	2402 MHz	-18.15	8		PASS
GFSK(1Mbps)	2440 MHz	-18.13	8		PASS
	2480 MHz	-18.27	8		PASS
	2402 MHz	-21.38	8		PASS
GFSK(2Mbps)	2440 MHz	-21.45	8		PASS
	2480 MHz	-21.55	8		PASS

No. : BCTC/RF-EMC-005

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		t Graphs BLE 1M 2402MHz		
Agilent Spectrum Analyzer - Swept SA	FSDINVINI			
RL RF 50 Ω AC enter Freq 2.402000000	GHz PNO: Wide ↔ Trig: Free Rur IFGain:Low #Atten: 30 dB	Avg Type: Log-Pwr n Avg Hold: 100/100	06:35:33 PM Dec 26, 2024 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N	Frequency
Ref Offset 2.59 dB D dB/div Ref 20.00 dBm	in our level		402 030 4 GHz -18.154 dBm	Auto Tuno
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0.0		.1		Start Free 2.401493750 GH
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				CF Stej 101.250 kH Auto Ma
0.0				Freq Offse 0 H
enter 2.4020000 GHz			Span 1.013 MHz	
Res BW 3.0 kHz	#VBW 10 kHz	Sweep 10	6.8 ms (1001 pts)	
		BLE 1M 2440MHz		
Agilent Spectrum Analyzer - Swept SA	I SD NVNI L			
RL RF 50 Ω AC enter Freq 2.440000000	CHZ PNO: Wide ↔ Trig: Free Rur IFGain:Low #Atten: 30 dB	Avg Type: Log-Pwr n Avg Hold: 100/100	06:37:44 PM Dec 26, 2024 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N	Frequency
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	1 mlmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm			2.44000000 GH Start Free 2.439484750 GH 2.440515250 GH CF Step 103.050 kH Auto Freq Offse 0 H
	*VBW 10 kHz			Start Free 2.439484750 GH Stop Free 2.440515250 GH 103.050 kH 103.050 kH Auto Freq Offse



	ectrum Analyzer - Swept SA						¢ 🛃
enter F	RF 50 Ω AC		SENSE:INT	ALIGN AUT Avg Type: Log-Pv	Vr TRA	PM Dec 26, 2024	Frequency
		PNO: Wide ↔ IFGain:Low	Trig: Free Run #Atten: 30 dB	Avg Hold: 100/100			
	Ref Offset 2.61 dB			Mkr1	2.479 84	0 3 GHz 67 dBm	Auto Tun
0 dB/div ^{og}	Ref 20.00 dBm				-10.2		
10.0							Center Fre 2.48000000 GH
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enter 2.	4800000 GHz						
Res BW	3 0 kHz	#VBV	V 10 kHz	Sween	Span 102.7 ms	973.5 kHz (1001 pts)	
	3.0 kHz	#VBV	V 10 kHz	-	Span 102.7 ms	973.5 kHz (1001 pts)	
	3.0 kHz			-	102.7 ms	973.5 KHZ (1001 pts)	
SG Agilent Spe	3.0 kHz sctrum Analyzer - Swept SA RF 50 Ω AC			st/ LE 2M 2402M	102.7 ms atus HZ	(1001 pts)	
SG Agilent Spe R L	ectrum Analyzer - Swept SA	PS 0 GHz PNO: Wide ↔		STA	102.7 ms	(1001 pts)	Frequency
SG Agilent Spe R L	setrum Analyzer - Swept SA RF 50 Ω AC Freq 2.402000000	PS 0 GHz		STA LE 2M 2402MI ALIGN AUT Avg Type: Log-Pv Avg Hold: 100/100	102.7 ms ATUS HZ 0 06:41:06 Vr TRA TN C	(1001 pts) PMDec 26, 2024 CE 1 2 3 4 5 6 PE M WWW FT P N N N N	Frequency
Agilent Spe RL Center F	ectrum Analyzer - Swept SA RF 50 Ω AC	PS 0 GHz PNO: Wide ↔		STA LE 2M 2402MI ALIGN AUT Avg Type: Log-Pv Avg Hold: 100/100	102.7 ms ATUS HZ 0 06:41:06 Wr TRA T 1 2.402 03	(1001 pts) PMDec 26, 2024 CE 1 2 3 4 5 6 PE M WWW FT P N N N N	Frequency
Agilent Spe RL Center F	retrum Analyzer - Swept SA RF 50 Ω AC Freq 2.402000000 Ref Offset 2.59 dB	PS 0 GHz PNO: Wide ↔		STA LE 2M 2402MI ALIGN AUT Avg Type: Log-Pv Avg Hold: 100/100	102.7 ms ATUS HZ 0 06:41:06 Wr TRA T 1 2.402 03	(1001 pts)	Frequency Auto Tun
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Agilent Spe RL Center F	retrum Analyzer - Swept SA RF 50 Ω AC Freq 2.402000000 Ref Offset 2.59 dB	PS 0 GHz PNO: Wide ↔		STA LE 2M 2402MI ALIGN AUT Avg Type: Log-Pv Avg Hold: 100/100	102.7 ms ATUS HZ 0 06:41:06 Wr TRA T 1 2.402 03	(1001 pts)	Frequency Auto Tun Center Fre 2.402000000 GF Start Fre
Agilent Spe RL Center F	retrum Analyzer - Swept SA RF 50 Ω AC Freq 2.402000000 Ref Offset 2.59 dB	PS 0 GHz PNO: Wide ↔		STA LE 2M 2402MI ALIGN AUT Avg Type: Log-Pv Avg Hold: 100/100	102.7 ms ATUS HZ 0 06:41:06 Wr TRA T 1 2.402 03	(1001 pts)	Frequency Auto Tun Center Fre 2.402000000 GF Start Fre
Agilent Spe RL Conter F Conter F	Ref Offset 2.59 dB Ref 20.00 dBm	PS 0 GHz PRO: Wide → IFGain:Low	D NVNT B	STZ LE 2M 2402MI ALIGN AUT Avg Type: Log-Pv Avg Hold: 100/100 MKr1	102.7 ms	(1001 pts)	Frequency Auto Tun Center Fre 2.402000000 GH Start Fre 2.401140500 GH
Agilent Spe RL Center F	Ref Offset 2.59 dB Ref 20.00 dBm	PS 0 GHz PRO: Wide → IFGain:Low	D NVNT B	STZ	102.7 ms	(1001 pts)	Frequency Auto Tur Center Fre 2.40200000 GF Start Fre 2.401140500 GF Stop Fre 2.402859500 GF
G Agilent Spe RL Center F 10.0 10.0 10.0 10.0 10.0 10.0	Ref Offset 2.59 dB Ref 20.00 dBm	PS 0 GHz PRO: Wide → IFGain:Low	D NVNT B	STZ LE 2M 2402MI ALIGN AUT Avg Type: Log-Pv Avg Hold: 100/100 MKr1	102.7 ms	(1001 pts)	Frequency Auto Tun Center Fre 2.402000000 GF Start Fre 2.401140500 GF Stop Fre 2.402859500 GF
G Agilent Spe RL Center F 10.0 10.0 10.0 10.0 10.0 10.0	Ref Offset 2.59 dB Ref 20.00 dBm	PS 0 GHz PRO: Wide → IFGain:Low	D NVNT B	STZ LE 2M 2402MI ALIGN AUT Avg Type: Log-Pv Avg Hold: 100/100 MKr1	102.7 ms	(1001 pts)	Start Fre 2.402000000 GF 2.40200000 GF 2.401140500 GF 2.402859500 GF 2.402859500 GF 2.402859500 GF 2.402859500 GF CF Ste 171.900 kF
Agilent Spe RL Center F 10.0	Ref Offset 2.59 dB Ref 20.00 dBm	PS 0 GHz PRO: Wide → IFGain:Low	D NVNT B	STZ LE 2M 2402MI ALIGN AUT Avg Type: Log-Pv Avg Hold: 100/100 MKr1	102.7 ms	(1001 pts)	Frequency Auto Tun Center Fre 2.402000000 GF Start Fre 2.401140500 GF Stop Fre 2.402859500 GF CF Ste
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G Agilent Spe I Agilent Spe G RL G B I RL I I I	Ref Offset 2.59 dB Ref 20.00 dBm	PS 0 GHz PRO: Wide → IFGain:Low	D NVNT B	STZ LE 2M 2402MI ALIGN AUT Avg Type: Log-Pv Avg Hold: 100/100 MKr1	102.7 ms	(1001 pts)	Start Fre 2.402000000 GF 2.402000000 GF 2.401140500 GF 2.401140500 GF 2.402859500 GF 2.402859500 GF 2.402859500 GF 2.402859500 GF CF Ste 171.900 kF Auto
G Agilent Spel RL RL Code/div G Code/div G <td>Ref Offset 2.59 dB Ref 20.00 dBm</td> <td>PS 0 GHz PRO: Wide → IFGain:Low</td> <td>D NVNT B</td> <td>STZ LE 2M 2402MI ALIGN AUT Avg Type: Log-Pv Avg Hold: 100/100 MKr1</td> <td>102.7 ms</td> <td>(1001 pts)</td> <td>Start Fre 2.402000000 GF 2.402000000 GF 2.401140500 GF 2.401140500 GF 2.402859500 GF 2.402859500 GF 171.900 KF Auto Mato Mato Freq Offse</td>	Ref Offset 2.59 dB Ref 20.00 dBm	PS 0 GHz PRO: Wide → IFGain:Low	D NVNT B	STZ LE 2M 2402MI ALIGN AUT Avg Type: Log-Pv Avg Hold: 100/100 MKr1	102.7 ms	(1001 pts)	Start Fre 2.402000000 GF 2.402000000 GF 2.401140500 GF 2.401140500 GF 2.402859500 GF 2.402859500 GF 171.900 KF Auto Mato Mato Freq Offse
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Agilent Spectrum Analyzer - Swept SA R L RF 50 Ω AC	S	ENSE:INT	ALIGN AUTO	06:42:41 PM	Dec 26, 2024	
enter Freq 2.440000000 G	PNO: Wide ↔ Trig: Fro IFGain:Low #Atten:	ee Run Avg	Type: Log-Pwr Hold: 100/100	TRACE TYPE DET	1 2 3 4 5 6 MWWWWW P NNNNN	Frequency
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les BW 3.0 kHz	#VBW 10 kHz		Sweep 18 STATUS	span 1.7 31.9 ms (1	725 MHz 001 pts)	
les BW 3.0 kHz		NT BLE 2M	STATUS	31.9 ms (1	725 MHz 001 pts)	
es BW 3.0 kHz	PSD NVN		STATUS	31.9 ms (1	725 MHz 001 pts) Dec 26, 2024	
es BW 3.0 kHz Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC enter Freq 2.480000000 G	PSD NVN	NT BLE 2M ENSE:INT Avg ee Run Avg	status 2480MHz	31.9 ms (1	001 pts)	Frequency
Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC Enter Freq 2.480000000 C Ref Offset 2.61 dB	PSD NVN s BHZ PN0: Wide →→ Trig: Fr	NT BLE 2M ENSE:INT Avg ee Run Avg	STATUS 2480MHz ALIGN AUTO Type: Log-Pwr	31.9 ms (1 06:44:45 PM TRACE TYPE DET	001 pts)	Frequency
Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC enter Freq 2.480000000 C	PSD NVN s BHZ PN0: Wide →→ Trig: Fr	NT BLE 2M ENSE:INT Avg ee Run Avg	STATUS 2480MHz ALIGN AUTO Type: Log-Pwr Hold: 100/100	31.9 ms (1 06:44:45 PM TRACE TYPE DET 79 976 (001 pts)	Frequency Auto Tun
Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC enter Freq 2.480000000 G Ref Offset 2.61 dB GB/div Ref 20.00 dBm	PSD NVN s BHZ PN0: Wide →→ Trig: Fr	NT BLE 2M ENSE:INT Avg ee Run Avg	STATUS 2480MHz ALIGN AUTO Type: Log-Pwr Hold: 100/100	31.9 ms (1 06:44:45 PM TRACE TYPE DET 79 976 (001 pts)	Frequency Auto Tun Center Fre
Agilent Spectrum Analyzer - Swept SA Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC enter Freq 2.480000000 G Ref Offset 2.61 dB dB/div Ref 20.00 dBm	PSD NVN s BHZ PN0: Wide →→ Trig: Fr	NT BLE 2M ENSE:INT Avg ee Run Avg	STATUS 2480MHz ALIGN AUTO Type: Log-Pwr Hold: 100/100	31.9 ms (1 06:44:45 PM TRACE TYPE DET 79 976 (001 pts)	Frequency Auto Tun Center Fre 2.480000000 GH
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Aglient Spectrum Analyzer - Swept SA RL RF 50 Ω AC enter Freq 2.480000000 C Ref Offset 2.61 dB Ref 20.00 dBm	PSD NVN	NT BLE 2M ENSE:INT Avg ee Run Avg	STATUS 2480MHz ALIGN AUTO Type: Log-Pwr Hold: 100/100 Mkr1 2.4	06:44:45 PM TRACE TYPE DET 79 976 C -21.54	001 pts)	Frequency Auto Tun Center Fre 2.48000000 GF Start Fre 2.479145000 GF Stop Fre
Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC enter Freq 2.480000000 C GB/div Ref Offset 2.61 dB GB/div Ref 20.00 dBm 0 0 0 0 0 0	PSD NVN	NT BLE 2M ENSE:INT Avg ee Run Avg	STATUS 2480MHz ALIGN AUTO Type: Log-Pwr Hold: 100/100 Mkr1 2.4	06:44:35 РМ ТКАСЕ ТУРЕ 979 976 С -21.54	001 pts)	Frequency Auto Tun Center Fre 2.48000000 GH Start Fre 2.479145000 GH Stop Fre
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Res BW 3.0 kHz Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC Penter Freq 2.480000000 C GB/div Ref Offset 2.61 dB 00 0 0 00 0 0 00 0 0 00 0 0 00 0 0 00 0 0	PSD NVN	NT BLE 2M ENSE:INT Avg ee Run Avg	STATUS 2480MHz ALIGN AUTO Type: Log-Pwr Hold: 100/100 Mkr1 2.4	06:44:35 РМ ТКАСЕ ТУРЕ 979 976 С -21.54	Dec 26, 2024 12345 6 Market Market Market Dec 26, 2024 12345 6 Market Market Mark	Frequency Auto Tun Center Fre 2.480000000 GF Start Fre 2.479145000 GF 2.479145000 GF 2.480855000 GF 2.480855000 GF 2.480855000 GF 2.480855000 GF
Res BW 3.0 kHz Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC enter Freq 2.480000000 C	PSD NVN	NT BLE 2M ENSE:INT Avg ee Run Avg	STATUS 2480MHz ALIGN AUTO Type: Log-Pwr Hold: 100/100 Mkr1 2.4	06:44:35 РМ ТКАСЕ ТУРЕ 979 976 С -21.54	Dec 26, 2024 12345 6 Market Market Market Dec 26, 2024 12345 6 Market Market Mark	Frequency Auto Tun Center Fre 2.480000000 GF Start Fre 2.479145000 GF 2.479145000 GF 2.480855000 GF 2.480855000 GF 2.480855000 GF 2.480855000 GF
Res BW 3.0 kHz Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC Penter Freq 2.480000000 G B/div Ref Offset 2.61 dB GB/div Ref 20.00 dBm 0	PSD NVN	NT BLE 2M ENSE:INT Avg ee Run Avg	STATUS 2480MHz ALIGN AUTO Type: Log-Pwr Hold: 100/100 Mkr1 2.4	06:44:35 РМ ТКАСЕ ТУРЕ 979 976 С -21.54	Dec 26, 2024 12345 6 Market Market Market Dec 26, 2024 12345 6 Market Market Mark	Frequency Auto Tun Center Fre 2.480000000 GF Start Fre 2.479145000 GF 2.479145000 GF 2.480855000 GF 2.480855000 GF 2.480855000 GF 2.480855000 GF
Ref Offset 2.61 dB Ref 2.48000000 G Ref Offset 2.61 dB Ref 20.00 dBm	PSD NVN	NT BLE 2M ENSE:INT Avg ee Run Avg	STATUS 2480MHz ALIGN AUTO Type: Log-Pwr Hold: 100/100 Mkr1 2.4	06:44:35 РМ ТКАСЕ ТУРЕ 979 976 С -21.54	Dec 26, 2024 12345 6 Market Market Market Dec 26, 2024 12345 6 Market Market Mark	Auto Tun Center Fre 2.48000000 GF 2.479145000 GF 2.479145000 GF 2.480855000 GF 2.480855000 GF

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10. Bandwidth Test

10.1 Block Diagram Of Test Setup



10.2 Limit

FCC Part15 (15.247) , Subpart C						
Section	Test Item	Limit	Frequency Range (MHz)	Result		
15.247(a)(2)	Bandwidth	>= 500KHz (-6dB bandwidth)	2400-2483.5	PASS		

10.3 Test procedure

- 1. Set RBW = 100 kHz.
- 2. Set the video bandwidth (VBW) \ge 3 x RBW.
- 3. Detector = Peak.
- 4. Trace mode = max hold.
- 5. Sweep = auto couple.
- 6. Allow the trace to stabilize.

7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

10.4 EUT operating Conditions

The EUT tested system was configured as the statements of 4.6 Unless otherwise a special operating condition is specified in the follows during the testing. Note: Power Spectral Density(dBm)=Reading+Cable Loss

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10.5 Test Result

Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage:	DC 3.6V

Mode	Frequency (MHz)	-6dB bandwidth (MHz)	Limit (kHz)	Result
	2402	0.675	500	Pass
GFSK(1Mbps)	2440	0.687	500	Pass
	2480	0.649	500	Pass
	2402	1.146	500	Pass
GFSK(2Mbps)	2440	1.150	500	Pass
	2480	1.140	500	Pass



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11. Peak Output Power Test

11.1 Block Diagram Of Test Setup



11.2 Limit

FCC Part15 (15.247) , Subpart C					
Section		Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

11.3 Test Procedure

a. The EUT was directly connected to the Power meter

11.4 EUT Operating Conditions

The EUT tested system was configured as the statements of 4.6 Unless otherwise a special operating condition is specified in the follows during the testing.

Note: Power Spectral Density(dBm)=Reading+Cable Loss

11.5 Test Result

Temperature:	26 ℃	Relative Humidity: 54	4%RH
Pressure:	101KPa	Test Voltage: DC	C 3.6V

Mode	Frequency(MHz)	Maximum Conducted Output Power(PK) (dBm)	Conducted Output Power Limit(dBm)	
GFSK(1Mbps)	2402	-1.99	30	
	2440	-1.92	30	
	2480	-2.19	30	
GFSK(2Mbps)	2402	-1.89	30	
	2440	-1.82	30	
	2480	-1.97	30	



12. 100 kHz Bandwidth Of Frequency Band Edge

12.1 Block Diagram Of Test Setup



12.2 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.

12.3 Test procedure

Using the following spectrum analyzer setting:

- a) Set the RBW = 100KHz.
- b) Set the VBW = 300KHz.
- c) Sweep time = auto couple.
- d) Detector function = peak.
- e) Trace mode = max hold.
- f) Allow trace to fully stabilize.

12.4 EUT operating Conditions

The EUT tested system was configured as the statements of 4.6 Unless otherwise a special operating condition is specified in the follows during the testing. Note: Power Spectral Density(dBm)=Reading+Cable Loss

12.5 Test Result

Temperature:	26 ℃	Relative Humidity:	54%RH	
Pressure:	101KPa	Test Voltage:	DC 3.6V	





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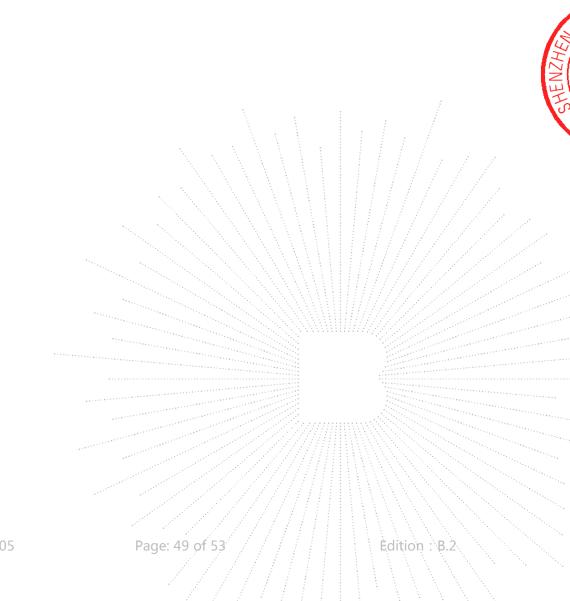
13. Antenna Requirement

13.1 Limit

15.203 requirement: For intentional device, according to 15.203: 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.

13.2 Test Result

The EUT antenna is PCB antenna, fulfill the requirement of this section.





14. EUT Photographs

EUT Photo



NOTE: Appendix-Photographs Of EUT Constructional Details

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15. EUT Test Setup Photographs

Conducted emissions



Radiated Measurement Photos



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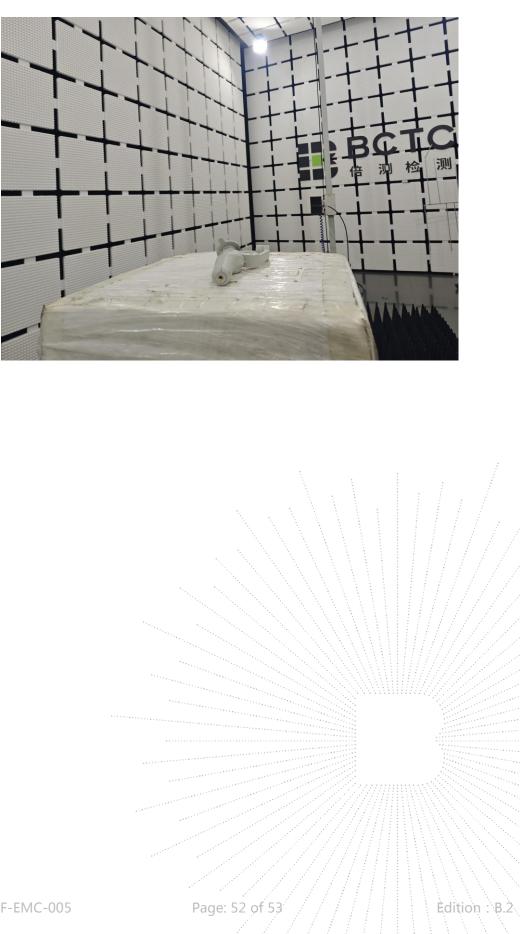
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STATEMENT

- 1. The equipment lists are traceable to the national reference standards.
- 2. The test report can not be partially copied unless prior written approval is issued from our lab.
- 3. The test report is invalid without the "special seal for inspection and testing".
- 4. The test report is invalid without the signature of the approver.
- 5. The test process and test result is only related to the Unit Under Test.

6. Sample information is provided by the client and the laboratory is not responsible for its authenticity.

7. The quality system of our laboratory is in accordance with ISO/IEC17025.

8. If there is any objection to this test report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

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***** END *****

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