

TEST REPORT

Report No. ······	KS2204S1623E02			
FCC ID······:	2AZVSA323B			
Applicant·····:	TCL OVERSEAS MARKETING LIMITED			
Address	7/F BUILDING 22E, 22 SCIENCE PARK EAST AVENUE, HONG KONG SCIENCE PARK SHATIN NT			
Manufacturer	TCL OVERSEAS MARKETING LIMITED			
Address	7/F BUILDING 22E, 22 SCIENCE PARK EAST AVENUE, HONG KONG SCIENCE PARK SHATIN NT			
Product Name·····:	AIR PURIFIER			
Trade Mark······:	TCL			
Model/Type reference·······:	breeva Pro 700 Premium			
Listed Model(s) ·····:	A700P225G,A700P225W			
Standard······:	FCC CFR Title 47 Part 15 Subpart C Section 15.247			
Date of receipt of test sample:	April.25,2022			
Date of testing	April.25,2022~June.06,2022			
Date of issue	June.06,2022			
Result:	PASS			
Prepared by: (Printed name+ signature)	Sky Dong Shy dang			
Approved by: (Printed Name + Signature)	Neil Wan			
Testing Laboratory Name······:	KSIGN(Guangdong) Testing Co., Ltd.			
Address	West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu,Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, People's Republic of China			
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1.TEST SUMMARY

1.1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15.247: Operation within the bands of 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz.

ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

KDB 558074 D01: The measurement guidance provided herein is applicable only to Digital Transmission System (DTS) devices operating in the 902-928 MHz. 2400-2483.5 MHz and/or 5725-5850 MHz bands under §15.247 of the FCC rules (Title 47 of the Code of Federal Regulations).

1.2. REPORT VERSION

Revised No.	Date of issue	Description
01	June 06,2022	Original

TRF No. FCC Part 15.247_R1



1.3. TEST DESCRIPTION

FCC Part 15 Subpart C(15.247)				
Tood House	Standard Section		Test Engineer	
Test Item	FCC	Result		
Antenna Requirement	15.203	Pass	Tom Chen	
Conducted Emission	15.207	Pass	Tom Chen	
6dB&99% Bandwidth	15.247(a)(2)	Pass	Tom Chen	
Peak Output Power	15.247(b)	Pass	Tom Chen	
Power Spectral Density	15.247(e)	Pass	Tom Chen	
Restricted Band	15.247(d)/15.205	Pass	Tom Chen	
Band Edge and Spurious Emission(Conducted)	15.247(d)	Pass	Tom Chen	
Spurious Emission(Radiated)	15.247(d)&15.209	Pass	Tom Chen	

Note: The measurement uncertainty is not included in the test result.

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Address of the report laboratory

KSIGN(Guangdong) Testing Co., Ltd.

West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, People's Republic of China

Laboratory accreditation

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

CNAS-Lab Code: L13261

KSIGN(Guangdong) Testing Co., Ltd. has been assessed and proved to be in Compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 5457.01

KSIGN(Guangdong) Testing Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

IC Registration No.: CN0096

The 3m alternate test site of KSIGN(Guangdong) Testing Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: CN0096

FCC-Registration No.: CN1272

KSIGN(Guangdong) Testing Co., Ltd. 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.



1.5. 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 TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the KSIGN(Guangdong) Testing Co., Ltd. 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. Below is the best measurement capability for KSIGN(Guangdong) Testing Co., Ltd.

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.42 dB	(1)
Transmitter power Radiated	2.14 dB	(1)
Conducted spurious emissions 9kHz~40GHz	1.60 dB	(1)
Radiated spurious emissions 9kHz~40GHz	2.20 dB	(1)
Conducted Emissions 9kHz~30MHz	3.20 dB	(1)
Radiated Emissions 30~1000MHz	4.70 dB	(1)
Radiated Emissions 1~18GHz	5.00 dB	(1)
Radiated Emissions 18~40GHz	5.54 dB	(1)
Occupied Bandwidth	2.80 dB	(1)

Note (1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

1.6. ENVIRONMENTAL CONDITIONS

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35°C
Relative Humidity:	30~60 %
Air Pressure:	950~1050mba

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2. GENERAL INFORMATION

2.1. GENERAL DESCRIPTION OF EUT

Test Sample Number:	1-1-1(Normal Sample),1-1-2(Engineering Sample)
Product Name:	AIR PURIFIER
Trade Mark:	TCL
Model/Type reference:	breeva Pro 700 Premium
Listed Model(s):	A700P225G,A700P225W
Model Different:	All other aspects of the product are the same, except for the different model names
Power supply(Adapter):	120V/60Hz,43W
Power supply(Battery):	N/A
Hardware version:	V1.0
Software version:	V1.0.0
2.4GHz WIFI	
Modulation:	802.11b: DSSS(CCK, DQPSK, DBPSK) 802.11g/n: OFDM(BPSK,QPSK,16QAM,64QAM)
Operation frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz
Max Peak Output Power:	802.11b: 5.18 dBm 802.11g: 5.36 dBm 802.11n (HT20): 5.32dBm
Channel number:	802.11b/g/n(HT20):11 channels
Test frequency:	CH01: 2412MHz; CH06: 2437MHz;CH11: 2462MHz
Channel separation:	5MHz
Antenna type:	PCB Antenna
Antenna gain:	3.0dBi

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2.2. OPERATION STATE

Operation Frequency List: The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing.

Operation Frequency List:

Channel	Frequency (MHz)
01	2412
02	2417
03	2422
04	2427
05	2432
06	2437
07	2442
08	2447
09	2452
10	2457
11	2462

Note:

1.CH 01~CH 11 for 802.11b/g/n(HT20).

2. The display in grey were the channel selected for testing.

Test mode

For RF test items

The engineering test program was provided and enabled to make EUT continuous transmit (duty cycle>98%).

For AC power line conducted emissions:

The EUT was set to connect with the WLAN AP under large package sizes transmission.

For Radiated spurious emissions test item:

The engineering test program was provided and enabled to make EUT continuous transmit(duty cycle>98%). The EUT in each of three orthogonal axis emissions had been tested ,but only the worst case (X axis) data Recorded in the report.

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2.3. MEASUREMENT INSTRUMENTS LIST

	Tonscend JS0806-2 Test system					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until	
1	Spectrum Analyzer	R&S	FSV40-N	101798	03/04/2023	
2	Vector Signal Generator	Agilent	N5182A	MY50142520	03/04/2023	
3	Analog Signal Generator	HP	83752A	3344A00337	03/04/2023	
4	Power Sensor	Agilent	E9304A	MY50390009	03/04/2023	
5	Power Sensor	Agilent	E9300A	MY41498315	03/04/2023	
6	Wideband Radio Communication Tester	R&S	CMW500	157282	03/04/2023	
7	Climate Chamber	Angul	AGNH80L	1903042120	03/04/2023	
8	Dual Output DC Power Supply	Agilent	E3646A	MY40009992	03/04/2023	
9	RF Control Unit	Tonscend	JS0806-2	/	03/04/2023	

	Transmitter spurious emissions & Receiver spurious emissions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until	
1	EMI Test Receiver	R&S	ESR	102525	03/04/2023	
2	High Pass Filter	Chengdu E-Microwave	OHF-3-18-S	0E01901038	03/04/2023	
3	High Pass Filter	Chengdu E-Microwave	OHF-6.5-18- S	0E01901039	03/04/2023	
4	Spectrum Analyzer	HP	8593E	3831U02087	03/04/2023	
5	Ultra-Broadband logarithmic period Antenna	Schwarzbeck	VULB 9163	01230	12/04/2023	
6	Loop Antenna	Beijin ZHINAN	ZN30900C	18050	03/15/2023	
7	Spectrum Analyzer	R&S	FSV40-N	101798	03/04/2023	
8	Horn Antenna	Schwarzbeck	BBHA 9120 D	2023	03/29/2023	
9	Pre-Amplifier	Schwarzbeck	BBV 9745	9745#129	03/04/2023	
10	Pre-Amplifier	EMCI	EMC051835 SE	980662	03/04/2023	
11	Pre-Amplifier	Schwarzbeck	BBV-9721	57	03/04/2023	
12	Horn Antenna	Schwarzbeck	BBHA 9170	00939	03/04/2023	

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	LISN	R&S	ENV432	1326.6105.02	03/04/2023
2	EMI Test Receiver	R&S	ESR	102524	03/04/2023
3	Manual RF Switch	JS TOYO	/	MSW-01/002	03/04/2023

Note:

1)The Cal. Interval was one year.

2)The cable loss has calculated in test result which connection between each test instruments.

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2.4. TEST SOFTWARE

Software name	Model	Version
Conducted emission Measurement Software	EZ-EMC	EMC-Con 3A1.1
Radiated emission Measurement Software	EZ-EMC	FA-03A.2.RE
Bluetooth and WIFI Test System	JS1120-3	2.5.77.0418

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3. TEST ITEM AND RESULTS

3.1. ANTENNA REQUIREMENT

<u>Requirement</u>

FCC CFR Title 47 Part 15 Subpart C Section 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. 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.

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

<u>Test Result</u>

The directional gain of the antenna less than 6dBi, please refer to the EUT internal photographs antenna photo.

Note: The antenna is permanently fixed to the EUT

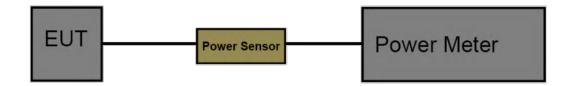


3.2. PEAK OUTPUT POWER

<u>Limit</u>

Test Item	Limit	Frequency Range(MHz)
Peak Output Power	1 Watt or 30 dBm	2400~2483.5

Test Configuration



Test Procedure

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator.
- 2. The measurement is according to ANSI C63.10 (2013) for compliance to FCC 47CFR 15.247 requirements.
- 3. Spectrum Setting:

Set analyser center frequency to DTS channel center frequency. Set the RBW to: 1MHz Set the VBW to: 3MHz Detector: peak Sweep time: auto Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

4. The power sensor video bandwidth is greater than or equal to the DTS bandwidth of the equipment.

Test Mode

Please refer to the clause 2.2

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Test Result

Mode	Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)			
	2412	5.18				
802.11b	2437	5.67				
	2462	5.66				
	2412	4.93				
802.11g	2437	5.23	30			
	2462	5.36				
	2412	4.94				
802.11n (HT20)	2437	5.09				
	2462	5.32				
	Result : PASS					

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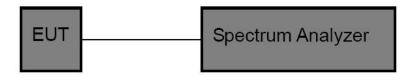


3.3. POWER SPECTRAL DENSITY

<u>Limit</u>

FCC Part 15 Subpart C(15.247)					
Test Item Limit Frequency Range(MHz)					
Power Spectral Density	8dBm(in any 3 kHz)	2400~2483.5			

Test Configuration



Test Procedure

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator.
- The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to ANSI C63.10 (2013) for compliance to FCC 47CFR 15.247 requirements.
- 3. Spectrum Setting:

Set analyser center frequency to DTS channel center frequency.

Set the span to 1.5 times the DTS bandwidth.

Set the RBW to: 10 kHz

Set the VBW to: 30 kHz

Detector: peak

Sweep time: auto

Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

Test Mode

Please refer to the clause 2.2

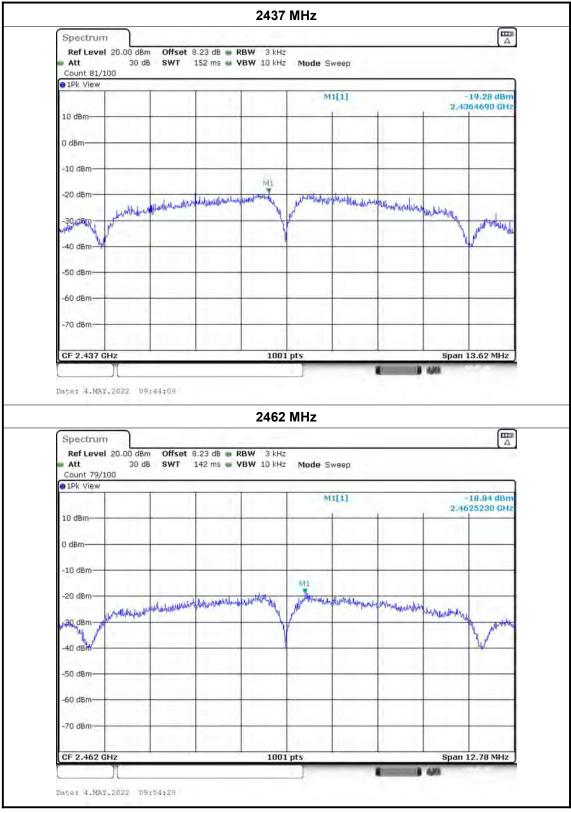
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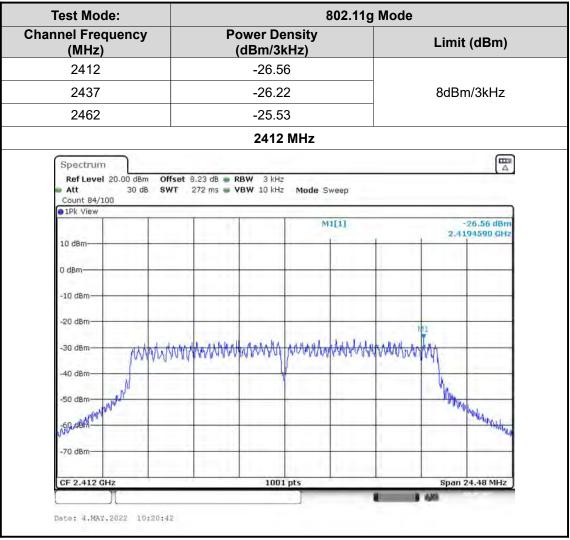


Test Mode:		802.11b	Mode		
hannel Frequency (MHz)	Power D (dBm/3		Limit	(dBm)	
2412	-20.	08			
2437	-19.	28	8dBm/3kHz		
2462	-18.	84			
	241	2 MHz			
Spectrum					
	ffset 8.23 dB B RBW 3 kH WT 152 ms B VBW 10 kH				
1Pk View	1 1				
		M1[1]		20.08 dBm 27210 GHz	
10 dBm		-			
0 dBm		-			
-10 dBm					
-20 dBm	a share in color that we want	MI	Antipulation and the antipularity		
-30 ABM produceropheroph	a has a free of the second of	At and a subconing	and the decision of the state of the	atter talak har	
-40 dBm		T	1	1 min	
-50 dBm					
-60 dBm		-			
-70 dBm					
CF 2.412 GHz	10	01 pts	Span 1	13.62 MHz	
r vr		1001 pts span 13.02 MHZ			

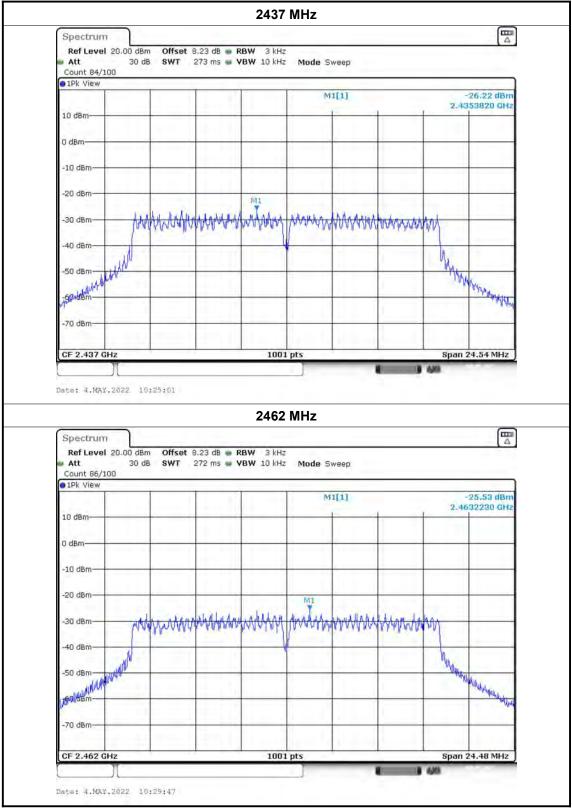






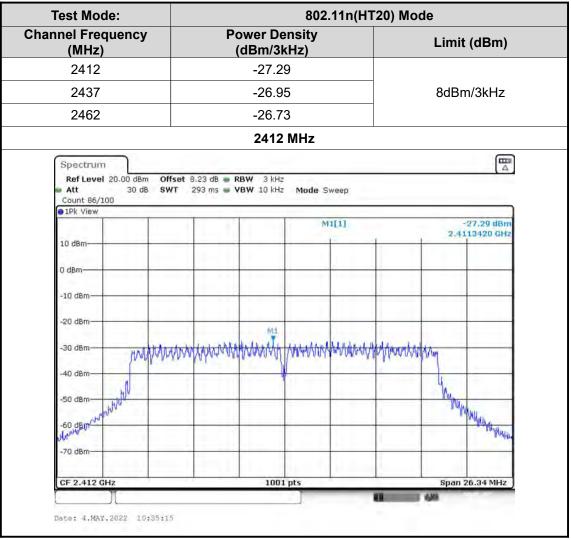




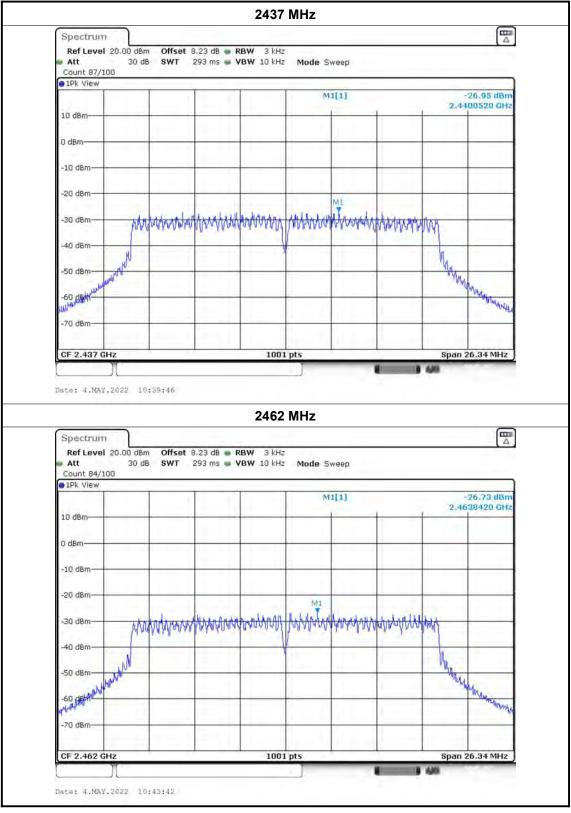


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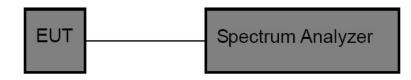


3.4. BANDWIDTH

<u>Limit</u>

Test Item	Limit	Frequency Range(MHz)
Bandwidth	>=500 KHz (6dB bandwidth)	2400~2483.5

Test Configuration



<u>Test</u>

Procedure

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator: 6db Bandwidth
 - (1) Set RBW = 100 kHz.
 - (2) Set the video bandwidth (VBW) \ge 3 RBW.
 - (3) Detector = Peak.
 - (4) Trace mode = Max hold.
 - (5) Sweep = Auto couple.

NOTE: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

<u>Test Mode</u>

Please refer to the clause 2.2.

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Test Results

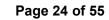
802.11b Mode							
6dB Bandwidt			dth (N	IHz)	L	imit (MHz	
		9.08	3				
		9.08	3			>=0.5	
		8.52	2				
241	12 M	Hz					
W 100 W 300		Mode Sw	veep				
		M1[M2[2.4	-11.73 dBm 074400 GHz -6.56 dBm 124800 GHz	
when	M	Lung	Ч.				
			My	1			
	_		_	y			
				July	munitipu	a have been and a	
			-				
10	001 pts			-	Spar	n 40.0 MHz	
Y-value	3 dBm 6 dBm	Functio	on	Fun	ction Resul	t	
-6.56	51 dB						

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				2437 M					
Spectrum									
Ref Leve	20.00 dBr			BW 100 kHz	12.	1			1.
Att Count 100	30 d	B SWT 1	1 ms 🖷 🕻	BW 300 kHz	Mode Sweep	¢.			
1Pk View	/100								-
ALL AIGH		1 1		1	M1[1]				10.48 dBr
10 dBm					(retest				124400 GH
10 (16)1)-					M2[1]			-	-5.48 dBr
0 dBm			_	- 111	2 1	1		2,43	379600 GH
10.10			MI	many 1	1111.00				
-10 d8m	01 -11.480	dBm	, pole	piloter ()	here				
-20 d8m		-	M	1		Mil			
			, A		V	Y.			
-30 dBm		V				19	1		
-40 d8m		K				_	4		
1.2.1	1.1	1			- 1, 11		1		
-50 dBm	mound	Miner					Unh	Attack Maron	wanter
-60 d8m	Card and a second					_	-	0000	1
-70 d8m	-	1 1							
CF 2.437 0	Hz		_	1001 pt	5	_		Span	40.0 MHz
Marker Type Re	f Trc	X-value	1	Y-value	Function	1	Fue	ction Result	
MI	1	2.43244	GHz	-10.48 dBm	runction		1 411	calon regar	
M2	1	2.43796		-5.48 dBm		-			
D3 M	1 1	9.08	MHZ	-0.94 dB					
	117				2			1.000	
Date: 4.MAS)[1,2022 05	9:43:10		0460 M]			4/6	
Date: 4.MA))[2,2022 DS	9:43:10		2462 M) Hz			40	
	_	9:43:10		2462 M) Hz)	68	Ē
Spectrun			9 - Ah C) Hz			6,65	
Spectrun	_	n Offset 8.2		2462 M RBW 100 kHz 7BW 300 kHz		•		648	(magaza)
Spectrum Ref Leve Att Count 100,	7 I 20.00 dBr 30 d	n Offset 8.2		88W 100 kHz) Hz Mode Sweep	•		408	(mag)
Spectrum Ref Leve	7 I 20.00 dBr 30 d	n Offset 8.2		88W 100 kHz	Mode Sweep	•		408	[4
Spectrum Ref Level Att Count 100, Pk View	7 I 20.00 dBr 30 d	n Offset 8.2		88W 100 kHz					-11.33 dBr
Spectrum Ref Leve Att Count 100,	7 I 20.00 dBr 30 d	n Offset 8.2		88W 100 kHz	Mode Sweep M1[1]				[4
Spectrum Ref Leve Att Count 100, 1Pk View 10 dBm-	7 I 20.00 dBr 30 d	n Offset 8.2	1 ms 🖷	288W 100 kHz 78W 300 kHz	Mode Sweep			2,43	-11.33 dBr 580000 GH
Spectrum Ref Level Att Count 100, Pk View	1 20.00 dBr 30 d	n Offset 8.2	1 ms 🖷	288W 100 kHz 78W 300 kHz	Mode Sweep M1[1]			2,43	-11.33 dBr 80000 GH -5.35 dBr
Spectrum Ref Leve Att Count 100, 1Pk View 10 dBm-	1 20.00 dBr 30 d	n Offset 8.2: B SWT 1	1 ms 🖷	288W 100 kHz 78W 300 kHz	Mode Sweep M1[1]			2,43	-11.33 dBr 80000 GH -5.35 dBr
Spectrum Ref Level Att Count 100, 1Pk View 10 dBm- 0 dBm- -10 dBm-	7 I 20.00 dBr 30 d	n Offset 8.2: B SWT 1	1 ms 🖷	88W 100 kHz	Mode Sweep M1[1]			2,43	-11.33 dBr 80000 GH -5.35 dBr
Spectrum Ref Level Att Count 100, 1Pk View 10 dBm- 0 dBm-	7 I 20.00 dBr 30 d	n Offset 8.2: B SWT 1	1 ms 🖷	288W 100 kHz 78W 300 kHz	Mode Sweep M1[1]	-		2,43	-11.33 dBr 80000 GH -5.35 dBr
Spectrum Ref Level Att Count 100, 1Pk View 10 dBm- 0 dBm- -10 dBm-	7 I 20.00 dBr 30 d	n Offset 8.2: B SWT 1	1 ms 🖷	288W 100 kHz 78W 300 kHz	Mode Sweep M1[1]	May		2,43	-11.33 dBr 80000 GH -5.35 dBr
Spectrum Ref Level Att Ount 100, 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm	7 I 20.00 dBr 30 d	n Offset 8.2: B SWT 1	1 ms 🖷	288W 100 kHz 78W 300 kHz	Mode Sweep M1[1]	May		2,43	-11.33 dBr 80000 GH -5.35 dBr
Spectrum Ref Level Att Count 100, 1Pk View 10 dBm- 0 dBm- -10 dBm- -20 dBm-	7 I 20.00 dBr 30 d	n Offset 8.2: B SWT 1	1 ms 🖷	288W 100 kHz 78W 300 kHz	Mode Sweep M1[1]	May	, , ,	2,43	-11.33 dBr 80000 GH -5.35 dBr
Spectrum Ref Level Att Count 100, 1Pk View 10 dBm- 0 dBm- -10 dBm- -20 dBm- -30 dBm- -30 dBm-	1 20.00 dBr 30 d /100	n Offset 8.23 B SWT 1	1 ms 🖷	288W 100 kHz 78W 300 kHz	Mode Sweep M1[1]	Mary		2.45	-11.33 dBr 880000 GH -5.35 dBr 29600 GH
Spectrum Ref Level Att Count 100, 10 dBm 10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -40 dBm -50 dBm	1 20.00 dBr 30 d /100	n Offset 8.23 B SWT 1	1 ms 🖷	288W 100 kHz 78W 300 kHz	Mode Sweep M1[1]	May	the second secon	2,43	-11.33 dBr 880000 GH -5.35 dBr 29600 GH
Spectrum Ref Level Att Count 100, 1Pk View 10 dBm- 0 dBm- -10 dBm- -20 dBm- -30 dBm- -30 dBm-	1 20.00 dBr 30 d /100	n Offset 8.23 B SWT 1	1 ms 🖷	288W 100 kHz 78W 300 kHz	Mode Sweep M1[1]	Mary	tur la	2.45	-11.33 dBr 880000 GH -5.35 dBr 29600 GH
Spectrum Ref Level Att Count 100, 10 dBm 10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -40 dBm -50 dBm	1 20.00 dBr 30 d /100	n Offset 8.23 B SWT 1	1 ms 🖷	288W 100 kHz 78W 300 kHz	Mode Sweep M1[1]	-	Jun -	2.45	-11.33 dBr 880000 GH -5.35 dBr 29600 GH
Spectrum Ref Level Att Count 100, 1Pk View 10 dBm -10 dBm -20 dBm -20 dBm -30 dBm -40 dBm -50 dBm -50 dBm	1 20.00 dBr 30 d /100	n Offset 8.23 B SWT 1	1 ms 🖷	288W 100 kHz 78W 300 kHz	Mode Sweep M1[1]	-	the second secon	2.45	-11.33 dBr 880000 GH -5.35 dBr 29600 GH
Spectrum Ref Level Att Count 100, 1Pk View 10 dBm -10 dBm -20 dBm -20 dBm -30 dBm -40 dBm -50 dBm -50 dBm	1 20.00 dBr 30 d /100	n Offset 8.23 B SWT 1	1 ms 🖷	288W 100 kHz 78W 300 kHz	Mode Sweep M1[1] M2[1]	-	the	2.45	-11.33 dBr 880000 GH -5.35 dBr 29600 GH
Spectrum Ref Level Att Count 100, 10 dBm 10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -40 dBm -50 dBm -70 dBm -70 dBm CF 2.462 C Marker	1 20.00 dBr 30 d /100	n Offset 8.22 B SWT 1	1 ms 🖷	100 kHz BW 300 kHz	Mode Sweep M1[1] M2[1] M111 M2[1]			2.45 2.46	11.33 dBr 180000 GH -5.35 dBr 529600 GH
Spectrum Ref Level Att Count 100, 10 dBm 10 dBm -10 dBm -20 dBm -20 dBm -30 dBm -30 dBm -40 dBm -70	1 20.00 dBr 30 d /100 01 -11.350	n Offset 8.22 B SWT 1	1 ms = V	28W 100 kHz 78W 300 kHz	Mode Sweep M1[1] M2[1]			2.45	11.33 dBr 180000 GH -5.35 dBr 529600 GH
Spectrum Ref Level Att Count 100, 10 dBm 10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -40 dBm -50 dBm -70 dBm -70 dBm -70 dBm -70 dBm	1 20.00 dBr 30 d /100	n Offset 8.22 B SWT 1	1 ms	100 kHz BW 300 kHz	Mode Sweep M1[1] M2[1] M111 M2[1]			2.45 2.46	11.33 dBr 180000 GH -5.35 dBr 529600 GH
Spectrum Ref Level Att Count 100, 1Pk View 10 dBm -10 dBm -20 dBm -20 dBm -30 dBm -40 dBm -50 dBm -70 dBm -	1 20.00 dBr 30 d /100 01 -11.350 	n Offset 8.22 B SWT 1 CBm CBm K-volue 2.458	GHz GHz GHz	100 kHz //BW 300 kHz //BW 30	Mode Sweep M1[1] M2[1] M111 M2[1]			2.45 2.46	11.33 dBr 180000 GH -5.35 dBr 529600 GH

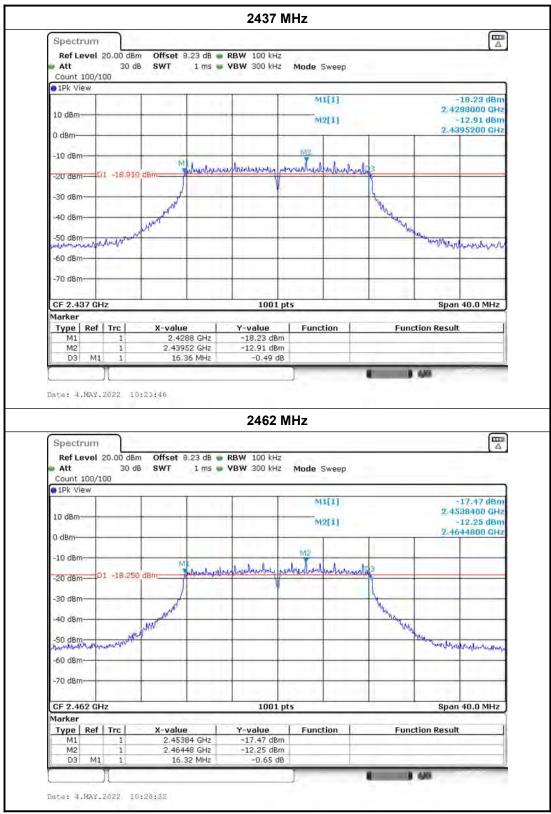
Add:West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China





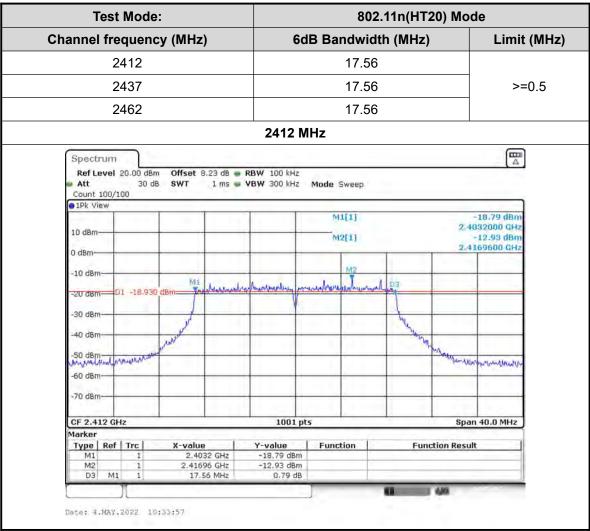
Test Mode:		802	2.11g Mo	de
nannel frequency (MHz)	6dB Bar	ndwidth (N	IHz)	Limit (MHz
2412		16.32		
2437		16.36		>=0.5
2462		16.32		
	2412 M	Hz	1	
Spectrum				(mail and a state of the state
	 RBW 100 kHz VBW 300 kHz 			
10 dBm		M1[1] M2[1]		-18.34 dBn 2.4038400 GH -13.37 dBn 2.4157200 GH
-10 dBm		M		
-20 d8m 01 -19.370 d8m	man phases when your	low marker and the	mlpa	
-30 dBm			1	
-40 dBm			North and	
-50 dBm		- 1. 11 1		marthan manufactor
-70 d8m-				
CF 2.412 GHz	1001 pt	5		Span 40.0 MHz
Marker				
Type Ref Trc X-value M1 1 2.40384 GHz GHz M2 1 2.41572 GHz GHz	Y-value -18.34 dBm -13.37 dBm	Function	Fur	iction Result
D3 M1 1 16.32 MHz	0.44 dB			
			11	440



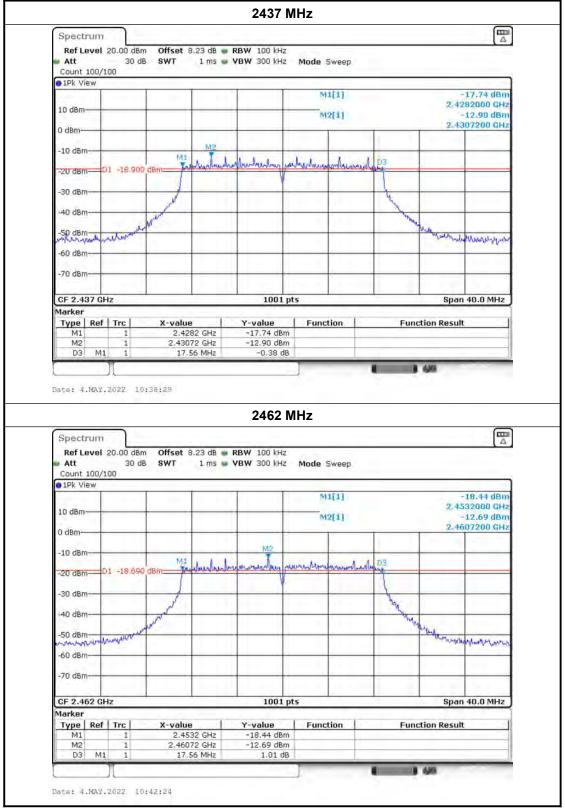


Add : West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China











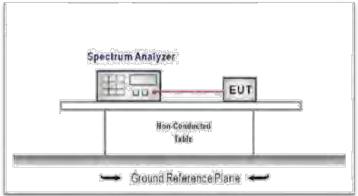
3.5. BAND EDGE AND SPURIOUS EMISSION (CONDUCTED)

<u>Limit</u>

FCC CFR Title 47 Part 15 Subpart C Section15.247 (d):

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

Test Configuration



Test Procedure

- 1. Connect EUT RF Output port to the Spectrum Analyzer through an RF attenuator.
- 2. Spectrum Setting:

RBW=100KHz VBW=300KHz. Detector function: Peak. Trace: Max hold. Sweep = Auto couple.

Allow the trace to stabilize.

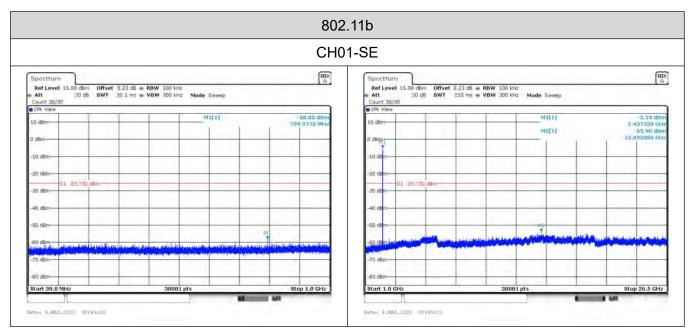
Test Mode

Please refer to the clause 2.2.

TRF No. FCC Part 15.247_R1

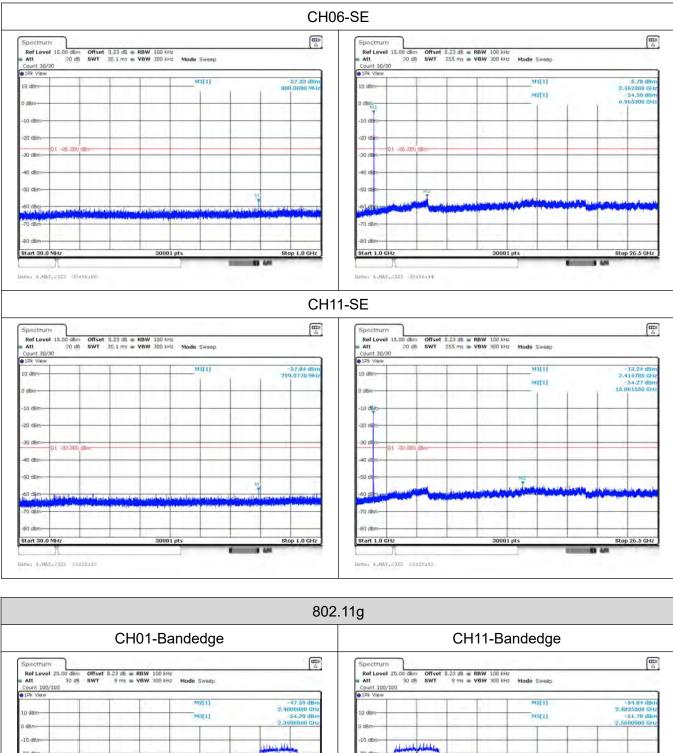


802.11b CH01-Bandedge CH11-Bandedge Spectrum Spectrum Ref Level 20.00 dBm Att 30 dB Ref Level 20.00 dBn Att 30 dB 0 dBm Offset 8.23 dB = RBW 100 kHz 30 dB SWT 8 ms = VBW 300 kHz 0 dBm Offset 8.23 dB = RBW 100 kHz 30 dB SWT 8 ms = VBW 300 kHz Mode Sweep Mode Sweep nt 100/100 100/100 DIPk V M2[1] M2[1] 7.4835000 -53.93 55.01 di to de MU[1] MULT -10 dB 10 dB -20 dB 01 -26.13 30 dBm 40 dBh O dB M 50 dB 50 di 70 d start 2.44 GHz Start 2.3 GHz 2.43 GHz 8001 2.55 GHz 8001 Stor x-value 2.4 GHz Y-value x-value 2.4835 GHz Type | Ref | Trc | Function Function Result Type Ref Trc Function Function Result 1 Y-value -55.01 dBm 53.93 dBm 50.73 dBm -53.70 dBm -50.56 dBm M3 M4 2.5 GHz 2.5151436 GHz M3 M4 2.39 GHz 2.34251 GHz Distan 4.MAY.2023 DBrA0115 Distan 4,9042.2023 DBesa.sto



TRF No. FCC Part 15.247_R1





x-value

8001 pt

| Function

Y-value -47,59 dBm

54.29 dBn 47.13 dBn

20 dB

30 dt

60 d

Start 2.3 GHa

M3 M4

Type Ref Trc

A Inter 4.MAY.2023 IOrZE:05

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hipport

Mi

8001 pts

Function

Y-value -54,84 dBm -51,78 dBm -50,74 dBm

x-value 2,4835 GHz

2.5 GHz 2.4694175 GHz

Stop 2.55 GHz

Function Result

BB AR

-20 dBr

all dBm

40 dB

50 dBr

Start 2.44 GHz

Type | Ref | Trc |

Distan 4.9642.2023 IOradell

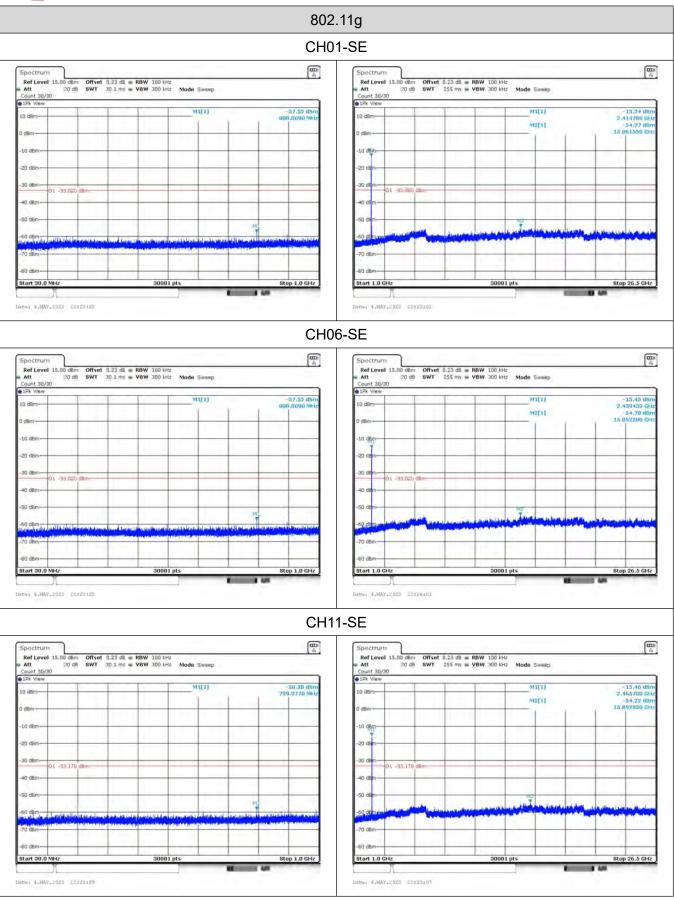
ъ

Function Result

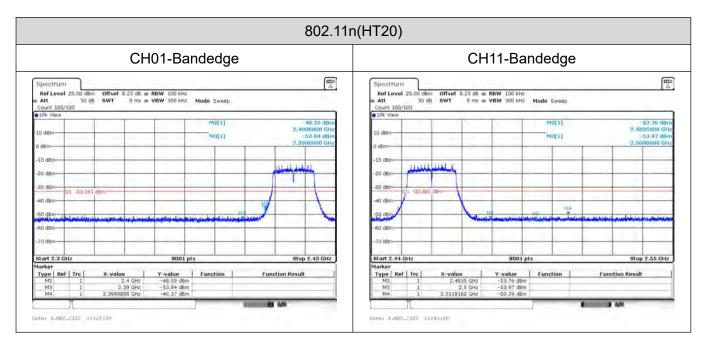
8 A.F

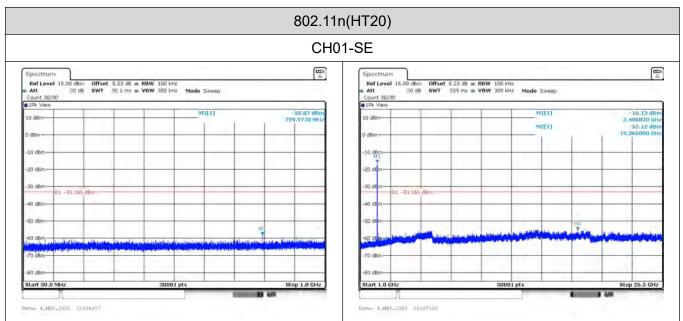
Stop 2.43 GHz



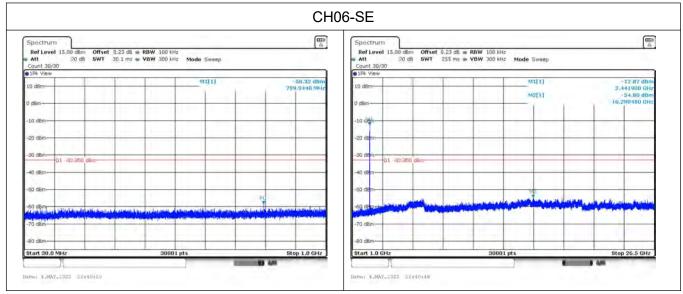


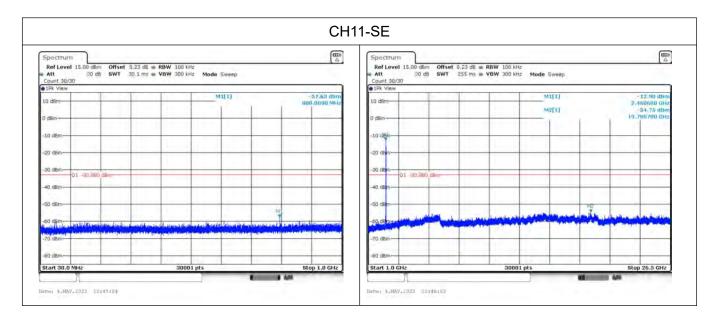












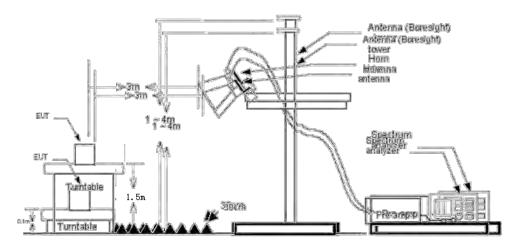


3.6. BAND EDGE EMISSIONS(RADIATED)

<u>Limit</u>

Restricted Frequency Band	(dBuV/m)(at 3m)						
(MHz)	Peak	Average					
2310 ~2390	74	54					
2483.5 ~2500	74	54					
Note: All restriction bands have been tested, only the worst case is reported.							

Test Configuration



Test Procedure

- 1. The EUT was setup and tested according to ANSI C63.10:2013 requirements.
- 2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
- 3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
- 4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
- The receiver set as follow: RBW=1MHz, VBW=3MHz PEAK detector for Peak value. RBW=1MHz, VBW=10Hz with PEAK detector for Average Value.

Test Mode

Please refer to the clause 2.2.

Test Results

Note:

1.Measurement = Reading level + Correct Factor

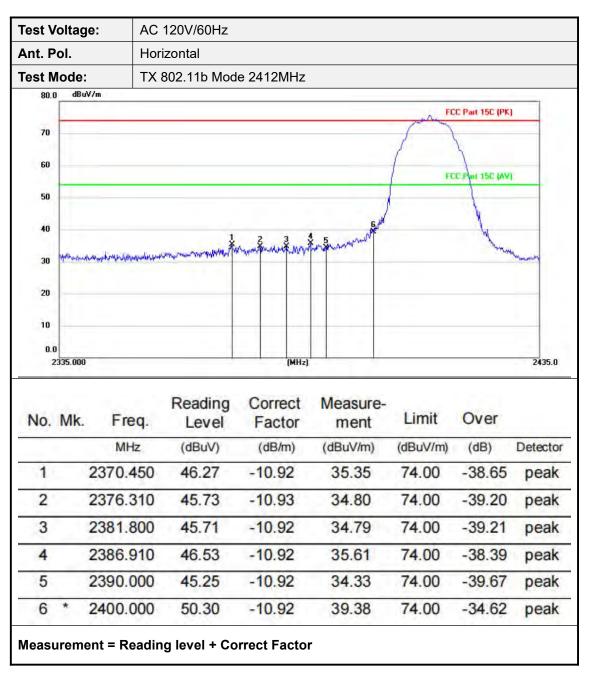
Correct Factor=Antenna Factor + Cable Loss - Preamplifier Factor

2.Pre-scan 802.11b, 802.11g, 802.11n(HT20) and 802.11n (HT40) mode, and found the 802.11b mode which it is worse case, so only show the test data for worse case.

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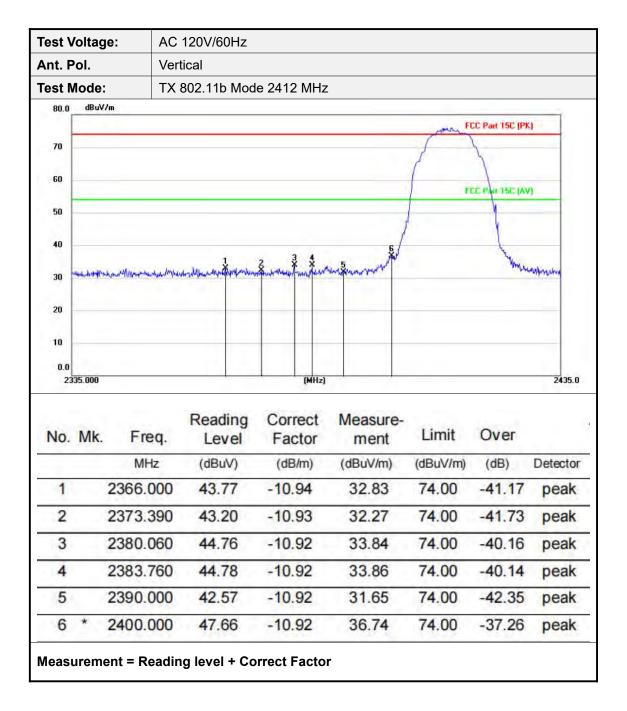
Add:West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China





Add : West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China





Add : West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China



Test Vo	oltage	e: AC 1	20V/60Hz					
Ant. Po	ol.	Horiz	zontal					
Fest M	ode:	TX 8	02.11b Mode	e 2462MHz				
80.0 d	lBu¥/m							
70		Mananana	rang			F	CC Part 15C (P	K)
/0		1	1					
60			1				CC Part 15C (A	0
50		1					CC Pair ISC IA	~
		1						
40		/	hay	1 .	4 5			
30 -144	and the state of t		Warny	- Harrison and a start and a	millen her man	monterensetter	multichaster	NURMONEYM
20								
10								
								_
10 0.0 2440.0	000			(MH2)				2540.
0.0 2440.0	Mk.	Freq.	Reading Level	(MHz) Correct Factor	Measure- ment	Limit	Over	2540
0.0 2440.0	24	Freq. MHz	-	Correct		Limit (dBuV/m)	Over (dB)	
0.0 2440.0	Mk.		Level	Correct Factor	ment	and the second	18.25	2540 Detector peak
0.0 2440.0 NO.	Mk.	MHz	Level (dBuV)	Correct Factor (dB/m)	ment (dBuV/m)	(dBuV/m)	(dB)	Detector
0.0 2440.0 NO.	Mk.	MHz 2483.500	Level (dBuV) 46.68	Correct Factor (dB/m) -10.88	ment (dBuV/m) 35.80	(dBuV/m) 74.00	(dB) -38.20	Detector peak peak
0.0 2440.0 No.	Mk. *	MHz 2483.500 2491.220	Level (dBuV) 46.68 44.85	Correct Factor (dB/m) -10.88 -10.89	ment (dBuV/m) 35.80 33.96	(dBuV/m) 74.00 74.00	(dB) -38.20 -40.04	Detector peak
2440.0 No. 1 2 3	Mk. *	MHz 2483.500 2491.220 2500.000	Level (dBuV) 46.68 44.85 42.55	Correct Factor (dB/m) -10.88 -10.89 -10.88	ment (dBuV/m) 35.80 33.96 31.67	(dBuV/m) 74.00 74.00 74.00	(dB) -38.20 -40.04 -42.33	Detector peak peak peak

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Add:West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China



Test Voltage:		e: AC 1	20V/60Hz								
Ant. Pol.		Vertio	Vertical								
Test Mo	ode:	TX 8	02.11b Mode	2462MHz							
80.0	dBu¥	/m						-			
	-	front	M			FCC	Part 15C (PK)	-			
70		1	y								
60						1000		-			
50	-					FLC	Pail 15C (AV)	-			
50		1									
40	-	M	hula .	di e con	2	5¥	6	_			
30	have been a	wl ^{ar}		- When a show the strength	2 Winner Berthum Mary	man Mille	Mininderterrow	week			
				-							
20								_			
10	-			-			-	_			
0.0								-			
24	40.000			(MHz)				2540.0			
-		1.25	Reading	Correct	Measure-						
No.	Mk.	Freq.	Level	Factor	ment	Limit	Over				
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detecto			
1	2	2483.500	44.41	-10.88	33.53	74.00	-40.47	peak			
2		2493.960	45.05	-10.89	34.16	74.00	-39.84	peak			
3		2500.000	42.37	-10.88	31.49	74.00	-42.51	peak			
4		2512.460	44.27	-10.88	33.39	74.00	-40.61	peak			
	*	2521.460	47.77	-10.87	36.90	74.00	-37.10	peak			
5			45.91	-10.86	35.05	74.00	-38.95	peak			

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3.7. SPURIOUS EMISSION (RADIATED)

<u>Limit</u>

Radiated Emission Limits (9 kHz~1000 MHz)

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Frequency (MHz)	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

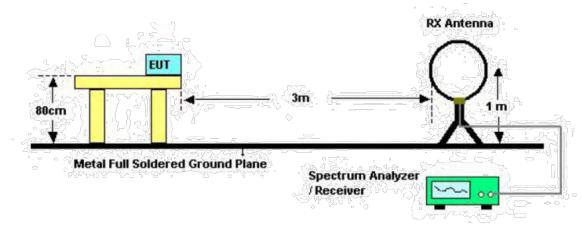
Radiated Emission Limit (Above 1000MHz)

Frequency	Distance Meters(at 3m)			
(MHz)	Peak	Average		
Above 1000	74	54		

Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission Level (dBuV/m)=20log Emission Level (uV/m).

Test Configuration

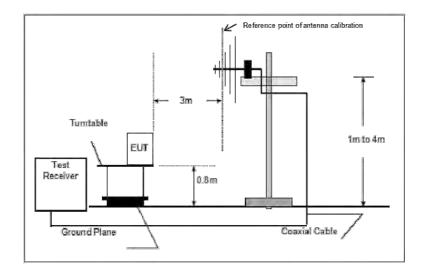


Below 30MHz Test Setup

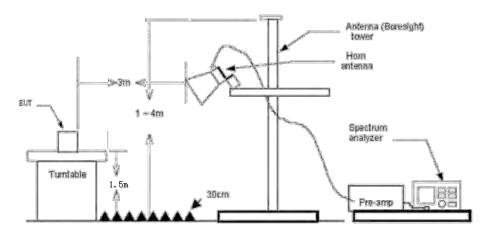
TRF No. FCC Part 15.247_R1

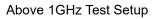
Add : West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China Tel : +(86) 0755-2985 2678 Fax: +(86) 0755-2985 2397 E-mail : info@gdksign.cn Web: www.gdksign.com Page 40 of 55





Below 1000MHz Test Setup





Test Procedure

- 1. The EUT was setup and tested according to ANSI C63.10:2013
- 2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
- 3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
- 4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
- 5. Set to the maximum power setting and enable the EUT transmit continuously.
- 6. Use the following spectrum analyzer settings
 - (1) Span shall wide enough to fully capture the emission being measured;

TRF No. FCC Part 15.247_R1

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(2) Below 1 GHz:

RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold; If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

(3) From 1 GHz to 10th harmonic:

RBW=1MHz, VBW=1MHz Peak detector for Peak value.

RBW=1MHz, VBW=10Hz Peak detector for Peak value.

<u>Test Mode</u>

Please refer to the clause 2.2.

<u>Test Result</u>

9 KHz~30 MHz and 18GHz~25GHz

From 9 KHz~30 MHz and 18GHz~25GHz: Conclusion: PASS

Note:

1) Measurement = Reading level + Correct Factor

Correct Factor=Antenna Factor + Cable Loss -Preamplifier Factor

- 2) The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
- 3) The emission levels of other frequencies are very lower than the limit and not show in test report.
- 4) The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
- 5) Pre-scan 802.11b/g/n(HT20) modulation, and found the 802.11b modulation which it is worse case for above 1GHz, 2412MHz channel which it is worse case for below 1GHz, so only show the test data for worse case.

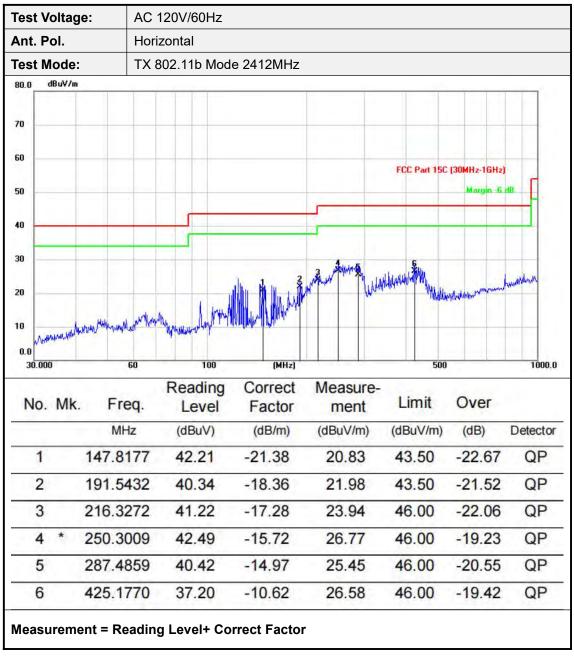
BELOW 30MHz

No emission found between lowest internal used/generated frequencies to 30MHz.

TRF No. FCC Part 15.247_R1

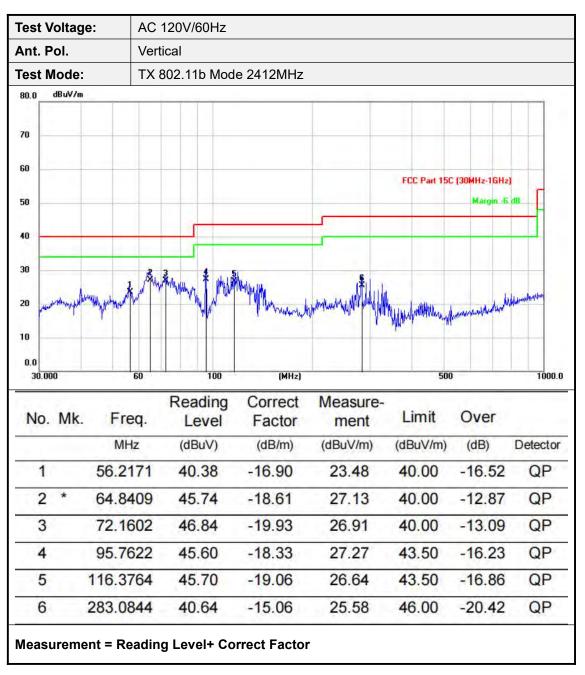
Add:West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China Tel:+(86) 0755-2985 2678 Fax: +(86) 0755-2985 2397 E-mail:info@gdksign.cn Web: www.gdksign.com





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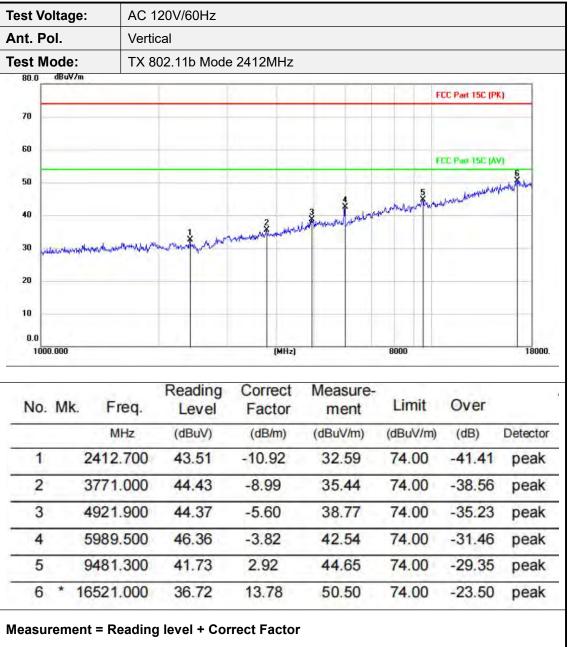
Test Voltage: AC			AC [·]	AC 120V/60Hz								
Ant. Pol. Hor			Hori	Horizontal								
Test Mode: TX 802.11k				302.11b	Mod	e 2412M	Hz					
80.0) d	BuV/m										
										FCC Part 15C	(PK)	
70	-						-					
60	-			_			-			FCC Part 15C	(AV)	
50	1			1		-						
									*	manneganin	Constrained	
40						2	X	Annalation	Musali an analy	***		
30	Inder	hand here the	appendances	Nontheirrord	nump	and the state of t	Anna					
20		1000										
10	-											
0.0 1	000.0	00		4	_		(MHz)		8000		18000	
No.	Mk	. Fn	eq.	Readi Lev	_	Corre		Measure ment	e- Limit	Over		
		M	Ηz	(dBu\	1)	(dB/m	1)	(dBuV/m)	(dBuV/r	m) (dB)	Detector	
1	1	2417.	800	40.8	1	-10.9	1	29.90	74.00	-44.10	peak	
2	-	3199.	800	43.1	9	-10.23	3	32.96	74.00	-41.04	peak	
3		4554.	700	43.0	2	-6.61		36.41	74.00	-37.59	peak	
4		8157.	000	40.7	3	2.03		42.76	74.00	-31.24	peak	
5		10565.	900	39.5	2	5.03	1.1	44.55	74.00	-29.45	peak	
6	*	14125.	700	37.1	4	11.06	5	48.20	74.00	-25.80	peak	

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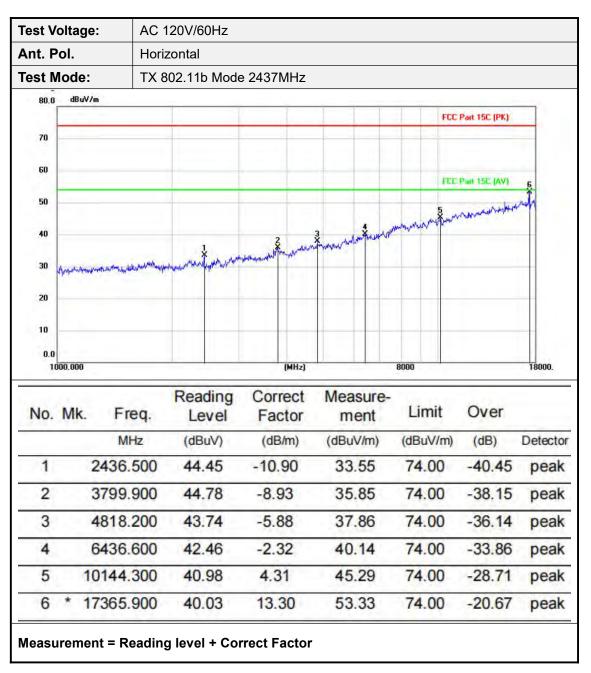
Add : West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China





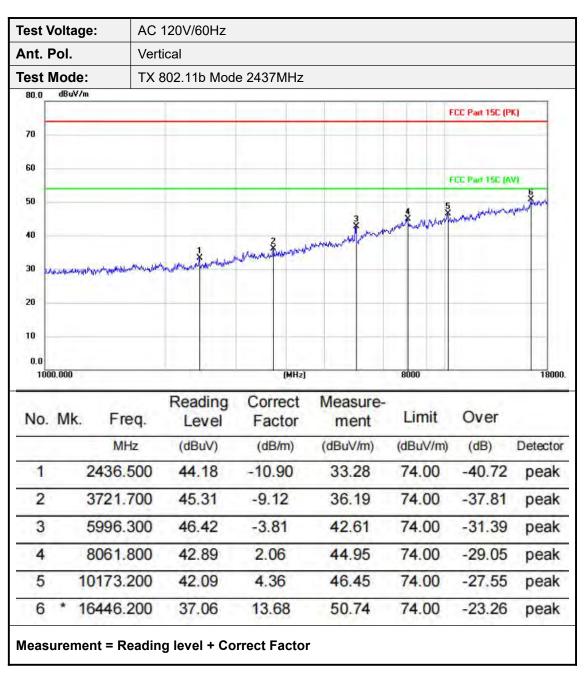
Add : West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China Tel : +(86) 0755-2985 2678 Fax: +(86) 0755-2985 2397 E-mail : info@gdksign.cn Web: www.gdksign.com





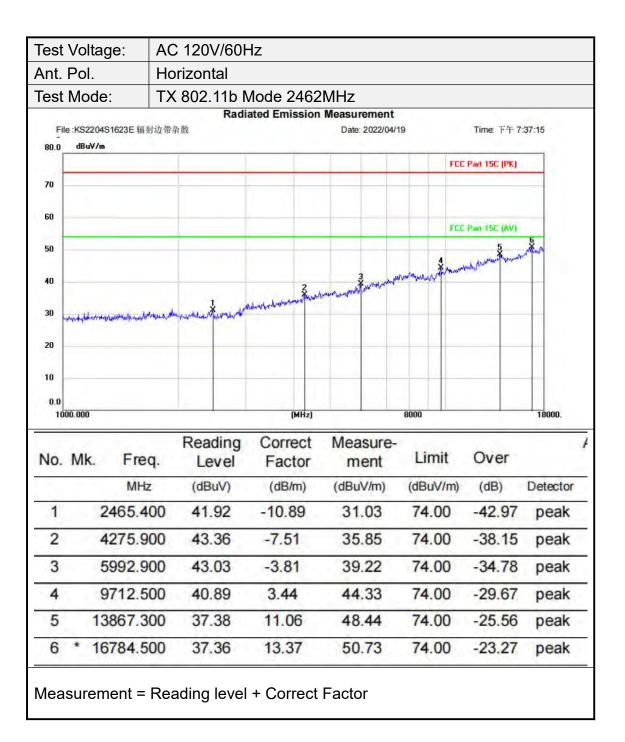
Add : West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China





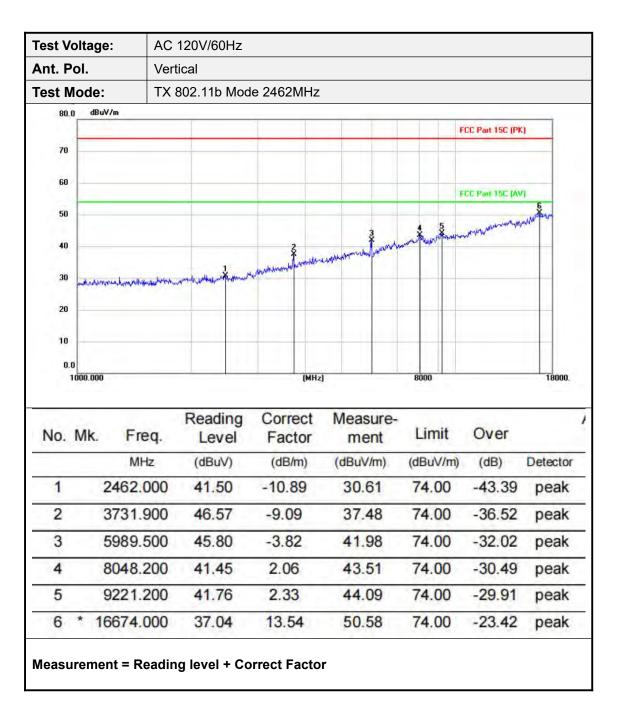
Add:West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China Tel:+(86) 0755-2985 2678 Fax: +(86) 0755-2985 2397 E-mail:info@gdksign.cn Web: www.gdksign.com





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3.8. CONDUCTED EMISSION

<u>Limit</u>

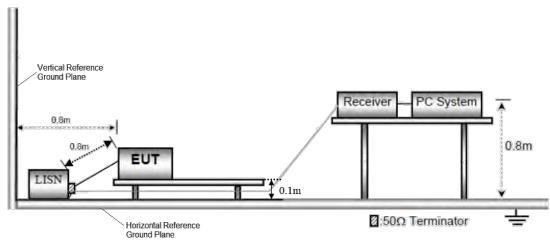
Conducted Emission Test Limit

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

Notes:

- (1) *Decreasing linearly with logarithm of the frequency.
- (2) The lower limit shall apply at the transition frequencies.
- (3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

Test Configuration



Test Procedure

- 1. The EUT was setup according to ANSI C63.10:2013 requirements.
- 2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 0.1m above the conducting ground plane. The vertical conducting plane was located 80 cm to the rear of the EUT. All other surfaces of EUT were at least 0.8m from any other grounded conducting surface.
- The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
- 4. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
- 5. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
- 6. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
- 7. During the above scans, the emissions were maximized by cable manipulation.

Test Mode:

Please refer to the clause 2.2.

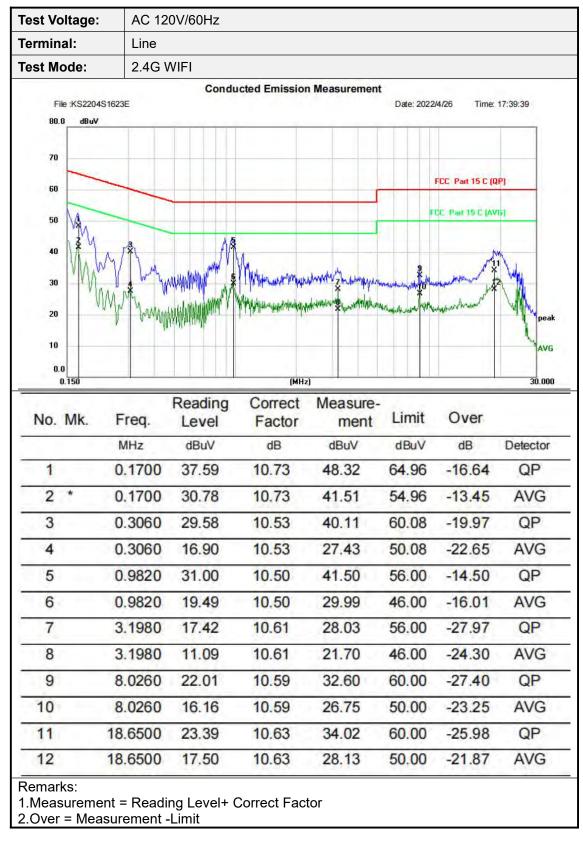
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Bao'an District, Shenzhen, Guangdong, China							
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<u>Test Results</u>

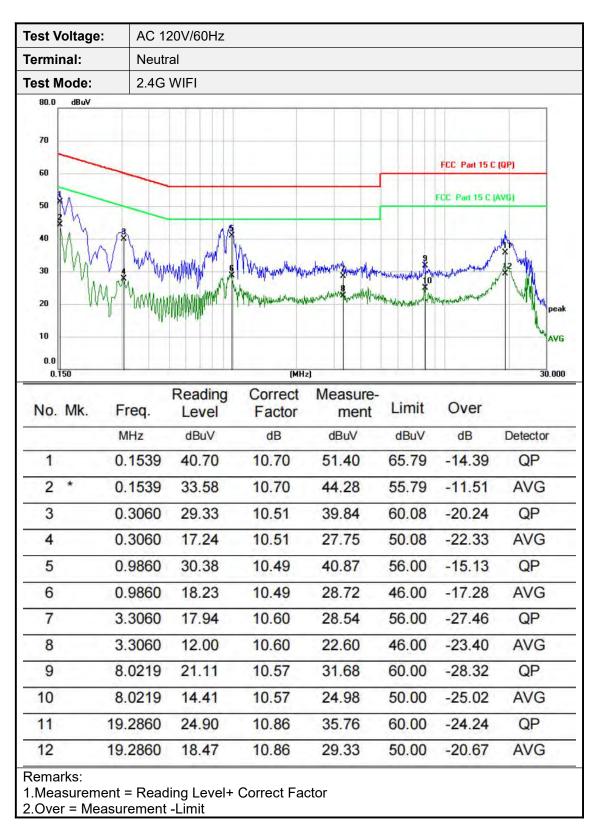
Pre-scan 802.11b/g/n(HT20) modulation, and found the 802.11b modulation 2412MHz which it is worse case, so only show the test data for worse case.



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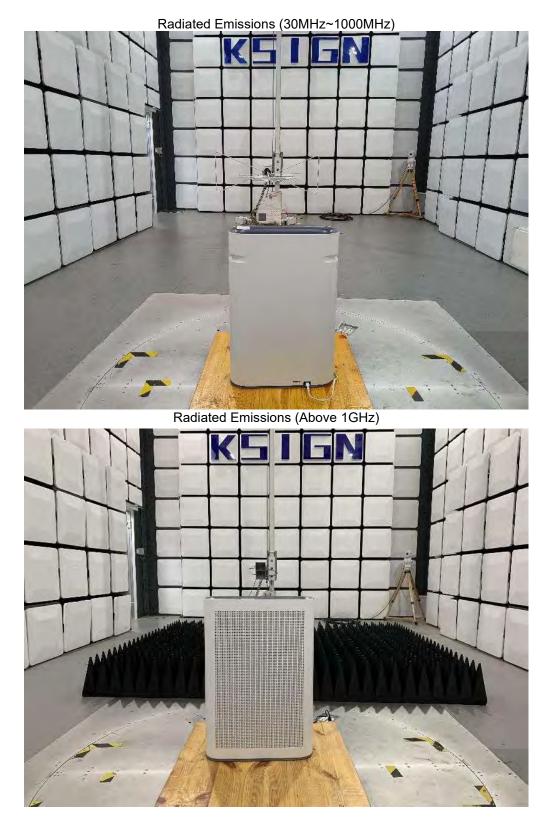


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Conducted Emission



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5.PHOTOGRAPHS OF EUT CONSTRUCTIONAL

Please refer to the report Report No.: KS2204S1623E01

--THE END--

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