

Report No: FCS202311089W01

Issued for

Applicant:	Shen zhen shi Hang shi Ke ji you xian gong si
Address:	Room 501, Building 19-1,Bantian Third Industrial Zone, Bantian Street,Longgang District, Shenzhen , Guangdong,china 518129
Product Name:	Portable car display screen
Brand Name:	N/A
Model Name:	X70
Series Model:	X70-1,X20,X30,X90,Q5,A70,A90,A100,B70,B90,B100 C50,C70,C80,C90,C100,C200,C300,C400,C500,G50 G70,G90,G100
FCC ID:	2BDT2-X70
Add: Room 105 Floor Ba	By: Flux Compliance Service Laboratory o hao Technology Building 1 NO.15 Gong ye West Road Hi-Tech Industrial, Song shan lake Dongguan

Fax:769-27280901 http://www.FCS-lab.com

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TEST RESULT CERTIFICATION

• •	
Applicant's Name:	Shen zhen shi Hang shi Ke ji you xian gong si
Address:	Room 501, Building 19-1,Bantian Third Industrial Zone, Bantian Street,Longgang District, Shenzhen , Guangdong,china 518129
Manufacture's Name:	Shen zhen shi Hang shi Ke ji you xian gong si
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Model Name:	X70
Series Model:	X70-1,X20,X30,X90,Q5,A70,A90,A100,B70,B90,B100 C50,C70,C80,C90,C100,C200,C300,C400,C500,G50
Test Standards:	FCC Part15.247
Test Procedure:	ANSI C63.10-2013
results show that the equipment us applicable only to the tested satisfies report shall not be reproduct Service Laboratory, this documents	been tested by Flux Compliance Service Laboratory, the test inder test (EUT) is in compliance with the FCC requirements. And it imple identified in the report. The except in full, without the written approval of Flux Compliance in the may be altered or revised by Flux Compliance Service all be noted in the revision of the document.
Date (s) of performance of tests.:	Nov 08, 2023 ~ Nov 27, 2023
Date of Issue:	Nov 27, 2023

Test Result.....: Pass

Tested by

(Scott Shen)

Scott shen

Reviewed by : Dukedow

(Duke Qian)

Approved by :

(Jack Wang)



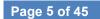


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Revision History

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Rev.	Issue Date	Effect Page	Contents
00	Nov 27 2023	N/A	Initial Issue



1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards: KDB 558074 D01 15.247 Meas Guidance v05r02

	FCC Part 15.247,Subpart C		
Standard Section	Test Item	Judgment	Remark
FCC 15.247 (a) (2)	6dB Bandwidth	PASS	
FCC 15.247 (b) (3)	Conducted Output Power	N/A	
FCC 15.247 (e)	Power Spectral Density	PASS	
FCC 15.247 (d)	Band-edge and Spurious Emissions (Conducted)	PASS	
FCC 15.247 (d)	Dadiated Spurious Emissions		
FCC 15.209	Radiated Spurious Emissions	PASS	
FCC 15.205			
FCC 15.247 (d)	Dadiated Dand Edge Compliance		
FCC 15.209	Radiated Band Edge Compliance	PASS	
FCC 15.205			
FCC 15.207	Power Line Conducted Emission	PASS	
FCC 15.203	Antenna requirement	PASS	
15.205	Restricted Band Edge Emission	PASS	

NOTE:

- (1)" N/A" denotes test is not applicable in this Test Report
- (2) All tests are according to ANSI C63.10-2013



1.1 TEST FACTORY

Company Name:	Flux Compliance Service Laboratory			
Address:	Room 105 Floor Bao hao Technology Building 1 NO.15 Gong ye West Road Hi-Tech Industrial, Song shan lake Dongguan			
Telephone:	+86-769-27280901			
Fax:	+86-769-27280901			
Laboray Accreditations:				
FCC Test Firm Registration Number:		514908		
CNAS Number:		L15566		
Designation number:		CN0127		
A2LA accreditation number:		5545.01		
ISED Number:		25801		
CAB ID:		CN0097		

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1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement \mathbf{y} $\pm \mathbf{U}$, where expended uncertainty \mathbf{U} is based on a standard uncertainty multiplied by a coverage factor of $\mathbf{k=2}$, providing a level of confidence of approximately $\mathbf{95}$ %.

No.	Item	Uncertainty
1	RF output power, conducted	±0.68dB
2	Unwanted Emissions, conducted	±2.988 dB
3	Conducted Emission (9KHz-150KHz)	±4.13 dB
4	Conducted Emission (150KHz-30MHz)	±4.74 dB
5	All emissions radiated (9KHz -30MHz)	±3.1 dB
6	All emissions,radiated(<1G) 30MHz-1000MHz	\pm 5.2 dB
7	All emissions,radiated 1GHz -18GHz	±4.66 dB
8	All emissions,radiated 18GHz -40GHz	±4.31 dB
9	Occupied bandwidth	±0.3 dB
10	Power Spectral Density	±0.48dB



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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Portable car display screen
Trade Name	N/A
Model Name	X70
Series Model	X70-1,X20,X30,X90,Q5,A70,A90,A100,B70,B90,B100 C50,C70,C80,C90,C100,C200,C300,C400,C500,G50 G70,G90,G100
Model Difference	We (Shen zhen shi Hang shi Ke ji you xian gong si) hereby state that all the models are electrical identical including the same software parameter and hardware design (i.e., circuit design, PCB Layout, RF module/circuit, ntenna type(s) and antenna location, components on PCB, etc.,), same mechanical structure and design (including product enclosure, materials, etc.,), the only difference is the model name and appearance color.
Channel List	Please refer to the Note 2.
	IEEE 802.11b: 2412MHz-2462MHz
Operation frequency	IEEE 802.11g: 2412MHz-2462MHz
	IEEE 802.11n HT20: 2412MHz-2462MHz
	IEEE 802.11b: DSSS (CCK, QPSK, BPSK)
Modulation:	IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20,: OFDM (64QAM, 16QAM, QPSK, BPSK)
	IEEE 802.11b: 1, 2, 5.5, 11 Mbps
Transmitter rate:	IEEE 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
	IEEE 802.11n HT20: up to 20MHz max 65Mbps
Power supply	Input:DC 12-24V
Battery	N/A
Number of samples	FCS202311089
Hardware version number	V1.0
Software version number	V1.0
Connecting I/O Port(s)	Please refer to the User's Manual

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



2.

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

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	WIFI-ANT-001	Internal antenna	N/A	-0.6 dBi	Antenna

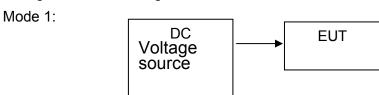
1

2.2 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

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.

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Block diagram of EUT configuration for test



Test software: MP819xVC.exe

The test softeware was used to control EUT work in continuous TX mode, and select test channel, Wireless mode as below table

Mode	Setting Tx Power	data rate (Mbps)	Channel	Frequency (MHz)
-	0	(see Note)	LOUGHA	2442
AND THE RESERVE OF THE PARTY OF	8	1	LCHCH1	2412
IEEE 802.11b	8	1	MCH: CH6	2437
	8	1	HCH:CH11	2462
	20	6	LCH: CH1	2412
IEEE 802.11g	20	6	MCH: CH6	2437
	20	6	HCH: CH11	2462
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	20	MCS8	LCH:CH1	2412
EEE 802.11n HT20	20	MCS8	MCH: CH6	2437
	20	MCS8	HCHCH11	2462

Note:

- (1) According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test,
- (2) During the test, the dutycycle>98%, the test voltage was tuned from 85% to 115% of the Nominal rate supply votage, and found that the worst case was the nominal rated supply condition, So the report just shows that condition's data



2.3 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
1	Voltage source	ZHAOXIN	RXN-605D-II	N/A	Test using

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
1	N/A	N/A	N/A	N/A	N/A

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in <code>[Length]</code> column.
- (3) "YES" is means "shielded" "with core"; "NO" is means "unshielded" "without core".



2.4 EQUIPMENTS LIST

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESCI	FCS-E014	2023. 08.29	2024. 08.28
Signal Analyzer	R&S	FSV40-N	FCS-E012	2023. 08.29	2024. 08.28
Active loop Antenna	ZHINAN	ZN30900C	FCS-E013	2023. 08.29	2024. 08.28
Bilog Antenna	SCHWARZBECK	VULB 9168	FCS-E002	2023. 08.29	2024. 08.28
Horn Antenna	SCHWARZBECK	BBHA 9120D	FCS-E003	2023. 08.29	2024. 08.28
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	FCS-E018	2023. 08.29	2024. 08.28
Pre-Amplifier(0.1M-3G Hz)	EMCI	EM330N	FCS-E004	2023. 08.29	2024. 08.28
Pre-Amplifier (1G-18GHz)	N/A	TSAMP-0518SE	FCS-E014	2023. 08.29	2024. 08.28
Pre-Amplifier (18G-40GHz)	TERA-MW	TRLA-0400	FCS-E019	2023. 08.29	2024. 08.28
Temperature & Humidity	HTC-1	victor	FCS-E005	2023. 08.29	2024. 08.28

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESRP	FCS-E014	2023. 08.29	2024. 08.28
LISN	R&S	ENV216	FCS-E007	2023. 08.29	2024. 08.28
LISN	ETS	3810/2NM	FCS-E009	2023. 08.29	2024. 08.28
Temperature &	HTC-1	victor	FCS-E008	2023. 08.29	2024. 08.28
Humidity		violo:	. 00 2000		

RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
MXA SIGNAL Analyzer	Keysight	N9020A	FCS-W005	2023. 08.29	2024. 08.28
MXG Vector Signal	Agilent	N5182A	FCS-W004	2023. 08.29	2024. 08.28
Spectrum Analyzer	R&S	FSV-40	FCS-E025	2023. 08.29	2024. 08.28
Power Sensor	Agilent	RPR3006W	FCS-W002	2023. 08.29	2024. 08.28
Wireless Communications Test Set	R&S	CMW 500	FCS-W006	2023. 08.29	2024. 08.28



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3. 6DB BANDWIDTH

3.1 Limit

For direct sequence systems, the minimum 6dB bandwidth shall be at least 500 kHz

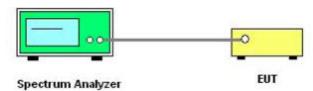
3.2 Test Procedure

- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) Set the spectrum analyzer as follows

RBW: 100kHz
VBW: 300kHz
Detector Mode: Peak
Sweep time: auto
Trace mode Max hold

(3) Allow the trace to stabilize, 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

3.3 Test setup



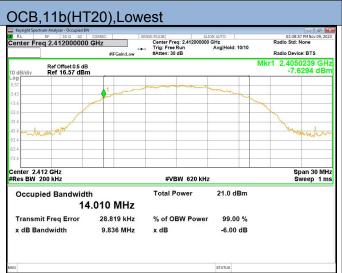


3.4 Test results

TestMode	Channel (MHz)	6dB Bandwidth (MHz)	99%OBW (MHz)	Limit [MHz]	Verdict
802.11b	2412MHz	9.420	14.010	0.5	Pass
802.11b	2437MHz	8.760	13.857	0.5	Pass
802.11b	2462MHz	9.840	14.111	0.5	Pass
802.11g	2412MHz	16.440	16.758	0.5	Pass
802.11g	2437MHz	16.350	16.641	0.5	Pass
802.11g	2462MHz	16.410	16.765	0.5	Pass
802.11n 20	2412MHz	17.640	17.863	0.5	Pass
802.11n 20	2437MHz	17.340	17.763	0.5	Pass
802.11n 20	2462MHz	17.640	17.898	0.5	Pass

3.5 Original Test Data



















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4 CONDUCTED OUTPUT POWER

4.1 limit

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.2 test procedure

- a. Connect each EUT's antenna output to Power Sensor by RF cable and attenuator
- b. The EUT was set to continuously transmitting in the max power during the test.

4.3 TEST SETUP



4.5 test results

TestMode	Channel (MHz)	Result (dBm)	Limit (dBm)	Verdict
802.11b	2412MHz	14.37	30	Pass
802.11b	2437MHz	14.05	30	Pass
802.11b	2462MHz	14.14	30	Pass
802.11g	2412MHz	14.29	30	Pass
802.11g	2437MHz	13.19	30	Pass
802.11g	2462MHz	13.14	30	Pass
802.11n 20	2412MHz	12.90	30	Pass
802.11n 20	2437MHz	12.18	30	Pass
802.11n 20	2462MHz	12.21	30	Pass

5. POWER SPECTRAL DENSITY

5.1 LIMIT

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

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5.2 TEST PROCEDURE

- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) Set the spectrum analyzer as follows:

Center frequency DTS Channel center frequency

RBW: $3 \text{ kHz} \le \text{RBW} \le 100 \text{ kHz}$

VBW: ≥ 3RBW

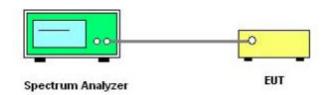
Span 1.5 times the DTS bandwidth

Detector Mode: Peak
Sweep time: auto

Trace mode Max hold

- (3) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude level within the RBW
- (4) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

5.3 TEST SETUP

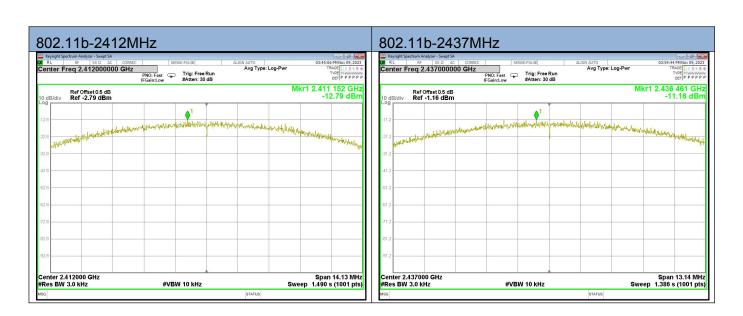




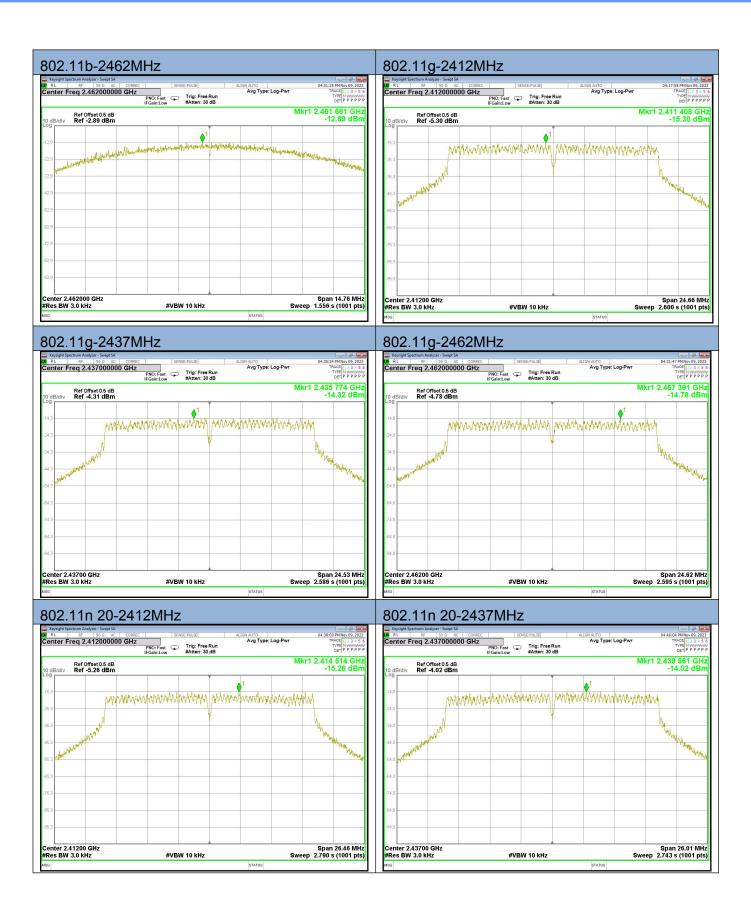
5.4 TEST RESULTS

TestMode	Channel (MHz)	Result (dBm/3KHz)	Limit (dBm/3KHz)	Verdict
802.11b	2412MHz	-12.79	8	Pass
802.11b	2437MHz	-11.16	8	Pass
802.11b	2462MHz	-12.89	8	Pass
802.11g	2412MHz	-15.30	8	Pass
802.11g	2437MHz	-14.31	8	Pass
802.11g	2462MHz	-14.78	8	Pass
802.11n 20	2412MHz	-15.26	8	Pass
802.11n 20	2437MHz	-14.02	8	Pass
802.11n 20	2462MHz	-14.76	8	Pass

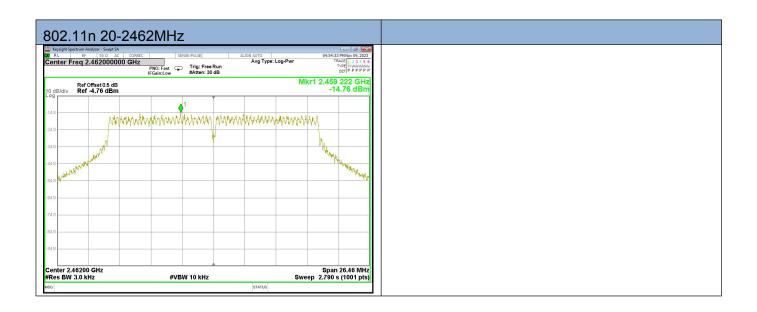
5.5 original test data













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6. Band edge and spurious(conducted)

6.1 LIMIT

In any 100kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 30dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

6.2 TEST PROCEDURE

- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) Establish a reference level by using the following procedure:

Center frequency DTS Channel center

frequency

RBW: 100kHz VBW: 300kHz

Span 1.5times the DTS bandwidth

Detector Mode: Peak
Sweep time: auto

Trace mode Max hold

- (3) Establish Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.
- (4) Set the spectrum analyzer as follows:

RBW: 100kHz VBW: 300kHz

Span Encompass frequency range to be

measured

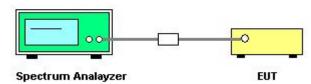
Number of measurement points ≥span/RBW

Detector Mode: Peak
Sweep time: auto

Trace mode Max hold

(5) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude of all unwanted emissions outside of the authorized frequency band

6.3 TEST SETUP





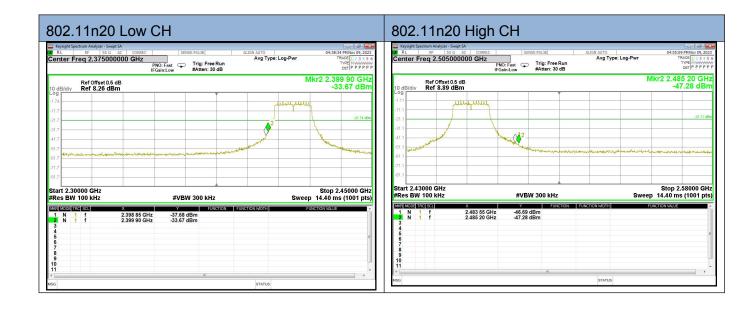
6.5 TEST RESULTS

Eut set mode	CH or Frequency	Result
802.11b	CH1	Pass
	CH11	Pass
802.11g	CH1	Pass
	CH11	Pass
802.11n 20	CH1	Pass
	CH11	Pass

6.5 Original test data

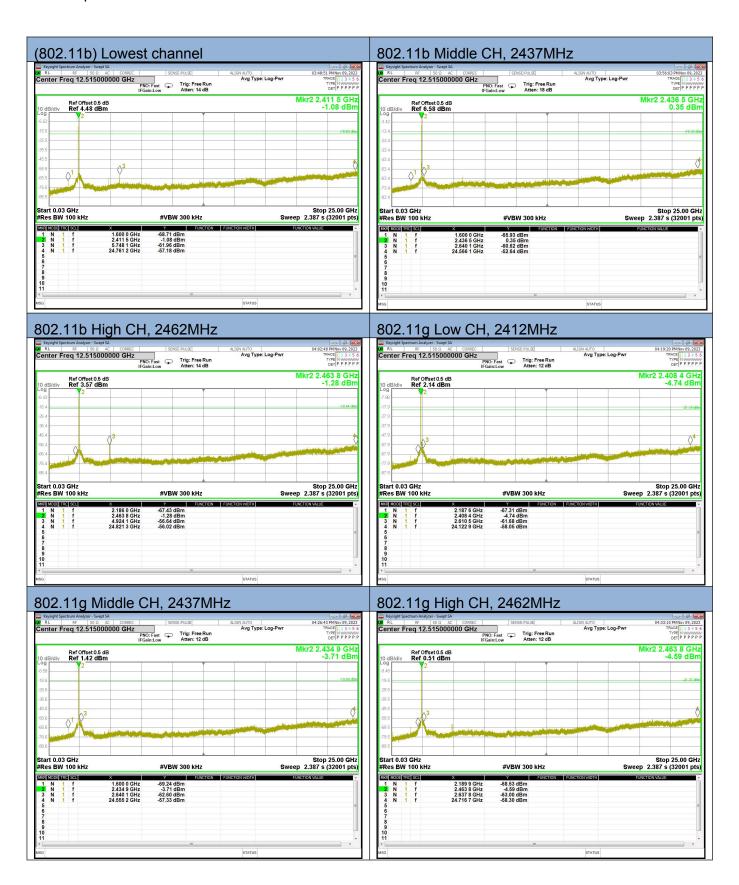




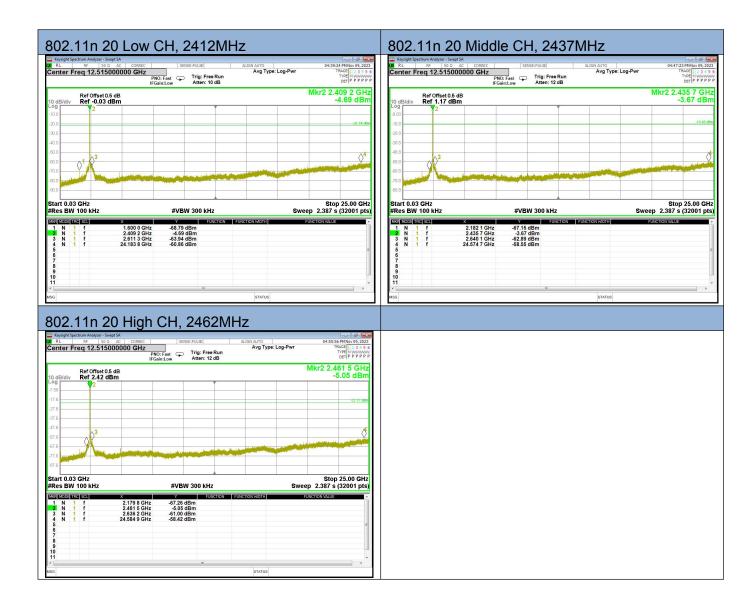




6.6 Spurious emissions 30MHz-25GHz









7 RADIATED EMISSION MEASUREMENT

7.1 RADIATED EMISSION LIMITS

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the Restricted band specified on Part15.205(a)&209(a) limit in the table and according to ANSI C63.10-2013 below has to be followed

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LIMITS OF RADIATED EMISSION MEASUREMENT (0.009MHz - 1000MHz)

	Field Other a state	,
Frequencies	Field Strength	Measurement Distance
(MHz)	(micorvolts/meter)	(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

LIMITS OF RADIATED EMISSION MEASUREMENT (1GHz-25 GHz)

	(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).

For Radiated Emission

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/AV
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	10th carrier hamonic(Peak/AV)
RB / VB (emission in restricted	
band)	PK=1MHz / 1MHz, AV=1 MHz /10 Hz

For Band edge

Spectrum Parameter	Setting
Detector	Peak/AV
Start/Stop Frequency	Lower Band Edge: 2300 to 2403 MHz
	Upper Band Edge: 2479 to 2500 MHz
RB / VB (emission in restricted band)	PK=1MHz / 1MHz, AV=1 MHz / 10 Hz





Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

7.2 TEST PROCEDURE

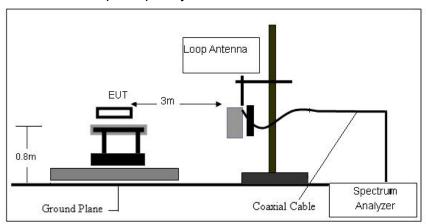
- a. The measuring distance of at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
- b. The EUT was placed on the top of a rotating table 0.8 meters (above 1GHz is 1.5 m) above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment shall be 0.8 m(above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then QuasiPeak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos. Note:

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

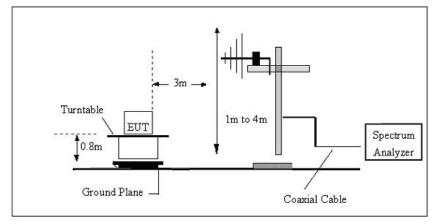


7.3 TESTSETUP

(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



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

