## GTS Global United Technology Services Co., Ltd.

Report No.: GTSL202108000157F03

## **TEST REPORT**

Applicant:	Guangdong Unis Technology, Co., Ltd						
Address of Applicant:	Zheng An Road 1, West District, Zhongshan, GuangDong						
Manufacturer:	Guangdong Unis Technology, Co., Ltd						
Address of Manufacturer: Equipment Under Test (	Zheng An Road 1, West District, Zhongshan, GuangDong (EUT)						
Product Name:	portal						
Model No.:	A-453						

Model No.:	A-453
Trade Mark:	UNIS
FCC ID:	2AQKM-A453
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247
Date of sample receipt:	Aug. 16,2021
Date of Test:	Aug. 16,2021-Aug. 30,2021
Date of report issued:	Aug. 30,2021
Test Result :	PASS *

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

Authorized Signature:



Robinson Luo Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver. Page 1 of 39



### 2 Version

Version No.	Date	Description				
00 Aug. 30,2021		Original				
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Prepared By:

Josephillu

Date:

Aug. 30,2021

**Project Engineer** 

Check By:

oppusor (un) Reviewer

Date:

Aug. 30,2021

### Report No.: GTSL202108000157F03

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## 4 Test Summary

Test Item	Section	Result
Antenna requirement	FCC part 15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	FCC part 15.207	Pass
Conducted Peak Output Power	FCC part 15.247 (b)(3)	Pass
6dB Bandwidth	FCC part 15.247 (a)(2)	Pass
Power Spectral Density	FCC part 15.247 (e)	Pass
Band Edge	FCC part 15.247(d)	Pass
Spurious Emission	FCC part 15.205/15.209	Pass

Remark: Test according to ANSI C63.10:2013 and RSS-Gen Pass: The EUT complies with the essential requirements in the standard.

#### **Measurement Uncertainty**

Test Item	Frequency Range	Measurement Uncertainty	Notes (1)	
Radiated Emission	30MHz-200MHz	3.8039dB		
Radiated Emission	200MHz-1GHz	3.9679dB	(1)	
Radiated Emission	1GHz-18GHz	4.29dB	(1)	
Radiated Emission	18GHz-40GHz	3.30dB	(1)	
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	3.44dB	(1)	



## **5** General Information

### 5.1 General Description of EUT

Product Name:	portal
Model No.:	A-453
Test sample(s) ID:	GTSL202108000157-1
Sample(s) Status:	Engineer sample
Hardware Version:	UBMB32_V2.1
Software Version:	7.1.2
Channel numbers:	802.11b/802.11g /802.11n(HT20): 11
Channel separation:	5MHz
Modulation technology:	802.11b: Direct Sequence Spread Spectrum (DSSS) 802.11g/802.11n(H20) Orthogonal Frequency Division Multiplexing (OFDM)
Antenna Type:	FPC Antenna
Antenna gain:	2.04dBi
Power supply:	DC 12V From External Circuit
Adapter Information:	Adapter 1: Mode: KPL-060F-VI Input: AC 100-240V, 50/60Hz, 1.7A Output: DC 12V, 5A, 60W Adapter 2: Mode: PA-1061-81 Input: AC100-240V, 50/60Hz, 1.6A Output: DC 12V, 5A, 60W



Operation Frequency each of channel								
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency	
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz	
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz	
3	2422MHz	6	2437MHz	9	2452MHz			

#### Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Test channel	Frequency (MHz)				
	802.11b/802.11g/802.11n(HT20)				
Lowest channel	2412MHz	1			
Middle channel	2437MHz	1			
Highest channel	2462MHz	6 6 6 1 6 6			



#### 5.2 Test mode

#### Transmitting mode

Keep the EUT in continuously transmitting mode

Remark: During the test, the dutycycle >98%, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

	Pre-scan all kind of o	data rate in lowest cha	annel, and found the	follow list which it was	s worst case.
6	Mode	802.11b	802.11g	802.11n(HT20)	ê 1 ê
5	Data rate	1Mbps	6Mbps	6.5Mbps	1

#### 5.3 Description of Support Units

None.

#### 5.4 Deviation from Standards

#### None.

#### 5.5 Abnormalities from Standard Conditions

None.

#### 5.6 Test Facility

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

#### • FCC—Registration No.: 381383

Designation Number: CN5029

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files.

#### • IC — Registration No.: 9079A

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

#### • NVLAP (LAB CODE:600179-0)

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accred itation Program (NVLAP).

#### 5.7 Test Location

e	All tests were performed at:				
	Global United Technology Services Co., Ltd.				
68	Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang				
2	Road, Baoan District, Shenzhen, Guangdong, China 518102				
	Tel: 0755-27798480				
4	Fax: 0755-27798960				

#### 5.8 Additional Instructions

Test Software	Special test command provided by manufacturer								
Power level setup	Default	le le	Ø	12	£	D	le le	ß	L.



## 6 Test Instruments list

Rad	iated Emission:		10 10 IN	45	la la	10 10
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 02 2020	July. 01 2025
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 24 2021	June. 23 2022
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 24 2021	June. 23 2022
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 24 2021	June. 23 2022
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 24 2021	June. 23 2022
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 24 2021	June. 23 2022
9	Coaxial Cable	GTS	N/A	GTS211	June. 24 2021	June. 23 2022
10	Coaxial cable	GTS	N/A	GTS210	June. 24 2021	June. 23 2022
11	Coaxial Cable	GTS	N/A	GTS212	June. 24 2021	June. 23 2022
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 24 2021	June. 23 2022
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 24 2021	June. 23 2022
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 24 2021	June. 23 2022
15	Band filter	Amindeon	82346	GTS219	June. 24 2021	June. 23 2022
16	Power Meter	Anritsu	ML2495A	GTS540	June. 24 2021	June. 23 2022
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 24 2021	June. 23 2022
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 24 2021	June. 23 2022
19	Splitter	Agilent	11636B	GTS237	June. 24 2021	June. 23 2022
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 24 2021	June. 23 2022
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 18 2020	Oct. 17 2021
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 18 2020	Oct. 17 2021
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 18 2020	Oct. 17 2021
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 24 2021	June. 23 2022



Cond	lucted Emission					
ltem	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.15 2019	May.14 2022
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 24 2021	June. 23 2022
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 24 2021	June. 23 2022
4	ENV216 2-L-V- NETZNACHB.DE	ROHDE&SCHWARZ	ENV216	GTS226	June. 24 2021	June. 23 2022
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 24 2021	June. 23 2022
8	Absorbing clamp	Elektronik- Feinmechanik	MDS21	GTS229	June. 24 2021	June. 23 2022
9	ISN	SCHWARZBECK	NTFM 8158	GTS565	June. 24 2021	June. 23 2022
10	High voltage probe	SCHWARZBECK	TK9420	GTS537	July. 09 2021	July. 08 2022

RF Conducted Test:									
ltem	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)			
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	June. 24 2021	June. 23 2022			
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 24 2021	June. 23 2022			
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 24 2021	June. 23 2022			
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 24 2021	June. 23 2022			
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 24 2021	June. 23 2022			
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 24 2021	June. 23 2022			
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 24 2021	June. 23 2022			
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 24 2021	June. 23 2022			

Gene	General used equipment:							
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)		
_1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 24 2021	June. 23 2022		
2	Barometer	ChangChun	DYM3	GTS255	June. 24 2021	June. 23 2022		



### 7 Test results and Measurement Data

#### 7.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c)			
15 202 requirements		1		5

#### 15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

#### 15.247(c) (1)(i) requirement:

(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.

#### **EUT Antenna:**

The antennas are FPC antenna, the best case gain of the antennas are 2.04dBi, reference to the appendix II for details

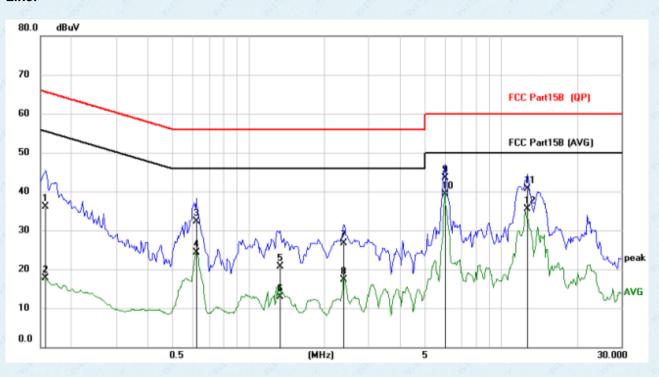


#### 7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207			0 0 0 0				
Test Method:	ANSI C63.10:2013	E E	6	(distance)				
Test Frequency Range:	150KHz to 30MHz	150KHz to 30MHz						
Receiver setup:	RBW=9KHz, VBW=30KHz, S	RBW=9KHz, VBW=30KHz, Sweep time=auto						
Limit:	Frequency range (MHz)		mit (dBuV)	2				
		Quasi-peak		rage				
	0.15-0.5	66 to 56*		0 46*				
	0.5-5 5-30	56 60	2	-6 -0				
	* Decreases with the logarithr							
Test setup:	Reference Plane		•					
Test procedure:	LISN       40cm       80cm         AUX       equipment       E.U.T         Fequipment       E.U.T       Test table/Insulation plane         Remark       E.U.T. Equipment Under Test       LISN Line Impedence Stabilization Network         Test table height=0.8m       1. The E.U.T and simulators at line impedance stabilization 500hm/50uH coupling import         2. The peripheral devices are LISN that provides a 500hm termination. (Please refer to photographs).	Filter A Filter A EMI Receiver are connected to the n network (L.I.S.N. edance for the mean also connected to m/50uH coupling ir	). This provides asuring equipm the main powe npedance with	s a ent. er through a 50ohm				
	3. Both sides of A.C. line are interference. In order to fin positions of equipment and according to ANSI C63.10:	d the maximum en I all of the interface 2013 on conducte	nission, the related to a cables must b	ative e changed				
Test Instruments:	<ol> <li>Both sides of A.C. line are interference. In order to fin positions of equipment and</li> </ol>	d the maximum en I all of the interface 2013 on conducte	nission, the related to a cables must b	ative e changed				
Test Instruments: Test mode:	3. Both sides of A.C. line are interference. In order to fin positions of equipment and according to ANSI C63.10:	d the maximum en I all of the interface 2013 on conducter	nission, the related to a cables must b	ative e changed				
	<ul> <li>Both sides of A.C. line are interference. In order to fin positions of equipment and according to ANSI C63.10:</li> <li>Refer to section 6.0 for details</li> <li>Refer to section 5.2 for details</li> </ul>	d the maximum en I all of the interface 2013 on conducter	nission, the related to a cables must b	ative e changed				
Test mode:	<ul> <li>Both sides of A.C. line are interference. In order to fin positions of equipment and according to ANSI C63.10:</li> <li>Refer to section 6.0 for details</li> <li>Refer to section 5.2 for details</li> </ul>	d the maximum en I all of the interface 2013 on conducter	nission, the rela e cables must b d measuremen	ative le changed t.				

Remark: Adapter 1 and Adapter 2 all have been tested, only worse case Adapter 1 is reported.

## Measurement data Line:

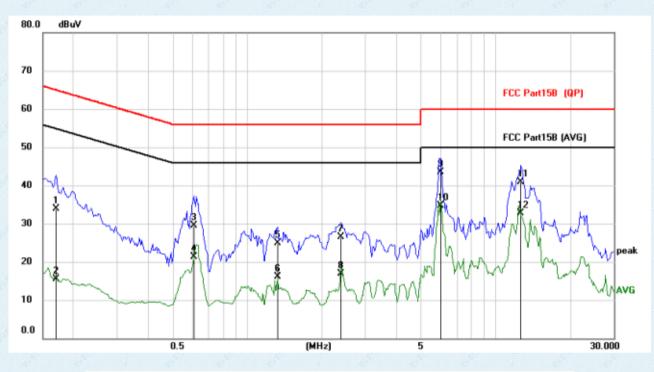


	No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
			MHz	dBuV	dB	dBuV	dBuV	dB	Detector
	1		0.1578	25.16	10.93	36.09	65.58	-29.49	QP
	2		0.1578	6.71	10.93	17.64	55.58	-37.94	AVG
-	3		0.6219	21.35	10.92	32.27	56.00	-23.73	QP
	4		0.6219	13.29	10.92	24.21	46.00	-21.79	AVG
Ī	5		1.3356	9.82	10.94	20.76	56.00	-35.24	QP
Ī	6		1.3356	1.99	10.94	12.93	46.00	-33.07	AVG
	7		2.3925	15.68	10.98	26.66	56.00	-29.34	QP
	8		2.3925	6.32	10.98	17.30	46.00	-28.70	AVG
	9		5.9952	32.33	11.15	43.48	60.00	-16.52	QP
	10	*	5.9952	28.24	11.15	39.39	50.00	-10.61	AVG
	11		12.7266	29.27	11.42	40.69	60.00	-19.31	QP
	12		12.7266	24.12	11.42	35.54	50.00	-14.46	AVG
_									

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#### Neutral:



	Reading Level	Correct Factor	ment	Limit	Over	
MHz	dBuV	dB	dBuV	dBuV	dB	Detector
0.1695	23.07	10.92	33.99	64.98	-30.99	QP
0.1695	4.55	10.92	15.47	54.98	-39.51	AVG
0.6102	18.53	10.92	29.45	56.00	-26.55	QP
0.6102	10.33	10.92	21.25	46.00	-24.75	AVG
1.3239	13.90	10.94	24.84	56.00	-31.16	QP
1.3239	5.17	10.94	16.11	46.00	-29.89	AVG
2.3925	15.54	10.98	26.52	56.00	-29.48	QP
2.3925	5.89	10.98	16.87	46.00	-29.13	AVG
5.9952	32.31	11.15	43.46	60.00	-16.54	QP
5.9952	23.54	11.15	34.69	50.00	-15.31	AVG
12.6915	29.49	11.42	40.91	60.00	-19.09	QP
12.6915	21.33	11.42	32.75	50.00	-17.25	AVG
	MHz 0.1695 0.1695 0.6102 0.6102 1.3239 1.3239 2.3925 2.3925 2.3925 5.9952 5.9952 12.6915	K.         Freq.         Level           MHz         dBuV           0.1695         23.07           0.1695         4.55           0.6102         18.53           0.6102         10.33           1.3239         5.17           2.3925         15.54           2.3925         5.89           5.9952         32.31           5.9952         23.54           12.6915         29.49	K.         Freq.         Level         Factor           MHz         dBuV         dB           0.1695         23.07         10.92           0.1695         4.55         10.92           0.1695         4.55         10.92           0.6102         18.53         10.92           0.6102         10.33         10.92           1.3239         13.90         10.94           1.3239         5.17         10.94           2.3925         15.54         10.98           2.3925         5.89         10.98           5.9952         32.31         11.15           5.9952         23.54         11.42	K.         Freq.         Level         Factor         ment           MHz         dBuV         dB         dBuV           0.1695         23.07         10.92         33.99           0.1695         4.55         10.92         15.47           0.6102         18.53         10.92         29.45           0.6102         10.33         10.92         21.25           1.3239         13.90         10.94         24.84           1.3239         5.17         10.94         16.11           2.3925         15.54         10.98         26.52           2.3925         5.89         10.98         16.87           5.9952         32.31         11.15         43.46           5.9952         23.54         11.15         34.69           12.6915         29.49         11.42         40.91	K.         Freq.         Level         Factor         ment         Limit           MHz         dBuV         dB         dBuV         dBuV         dBuV         dBuV           0.1695         23.07         10.92         33.99         64.98         0.1695         4.55         10.92         15.47         54.98           0.6102         18.53         10.92         29.45         56.00         0.6102         10.33         10.92         21.25         46.00           1.3239         13.90         10.94         24.84         56.00         1.3239         5.17         10.94         16.11         46.00           2.3925         15.54         10.98         26.52         56.00         5.9952         32.31         11.15         43.46         60.00           5.9952         32.31         11.15         34.69         50.00         12.6915         29.49         11.42         40.91         60.00	K.         Freq.         Level         Factor         ment         Limit         Over           MHz         dBuV         dB         dBuV         dBuV         dB         dBuV         dB           0.1695         23.07         10.92         33.99         64.98         -30.99           0.1695         4.55         10.92         15.47         54.98         -39.51           0.6102         18.53         10.92         29.45         56.00         -26.55           0.6102         10.33         10.92         21.25         46.00         -24.75           1.3239         13.90         10.94         24.84         56.00         -31.16           1.3239         5.17         10.94         16.11         46.00         -29.89           2.3925         15.54         10.98         26.52         56.00         -29.48           2.3925         5.89         10.98         16.87         46.00         -29.13           5.9952         32.31         11.15         43.46         60.00         -16.54           5.9952         23.54         11.15         34.69         50.00         -15.31           12.6915         29.49         11.42         4

#### Notes:

An initial pre-scan was performed on the line and neutral lines with peak detector.
 Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
 Final Level = Receiver Read level + LISN Factor + Cable Loss

If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.



### 7.3 Conducted Peak Output Power

Test Requirement :	FCC Part15 C Section 15.247 (b)(3)
Test Method :	KDB558074 D01 15.247 Meas Guidance v05r02
Limit:	30dBm
Test setup:	Power Meter   E.U.T   Non-Conducted Table Ground Reference Plane
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test environment:	Temp.:         24 °C         Humid.:         51%         Press.:         1012mbar
Test voltage:	AC 120V, 60Hz
Test results:	Pass

#### **Measurement Data**

Test CH	Р	Limit(dBm)	Result		
Test off	802.11b	802.11g 802.11n(HT20)			Result
Lowest	8.09	7.24	7.17	0	2 2
Middle	7.77	6.93	6.90	30.00	Pass
Highest	7.28	6.42	6.39	0 8	8



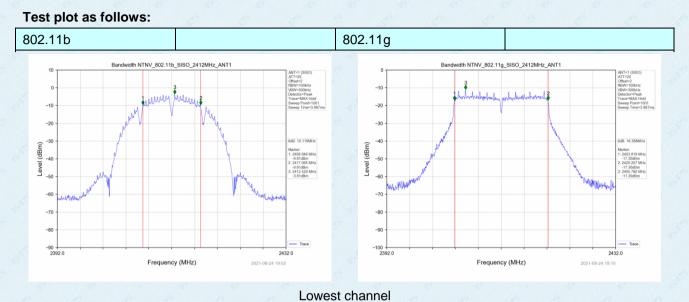
#### 7.4 Channel Bandwidth

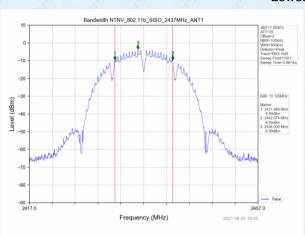
Test Requirement :	FCC Part1	FCC Part15 C Section 15.247 (a)(2)						
Test Method :	KDB55807	4 D01 15.24	7 Meas Guio	lance v05r02	6	6		
Limit:	>500KHz		8 8	6	2 B	5 6		
Test setup:	Sp 	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane						
Test Instruments:	Refer to se	ction 6.0 for	details	0	9 9	6		
Test mode:	Refer to se	ction 5.2 for	details	10 I.				
Test environment:	Temp.:	24 °C	Humid.:	51%	Press.:	1012mbar		
Test voltage:	AC 120V, 6	60Hz	6	8	6	8		
Test results:	Pass	8 8	S	8 8	S.	8 8		

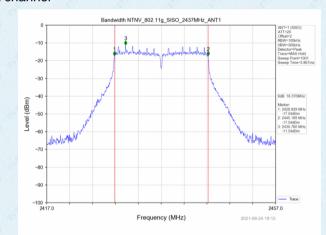
#### **Measurement Data**

Test CH	CI	Limit(KHz)	Result		
	802.11b		Result		
Lowest	10.119	16.388	17.579	1 6	6
Middle	10.125	16.370	17.590	>500	Pass
Highest	10.152	16.424	17.597	2. 8	

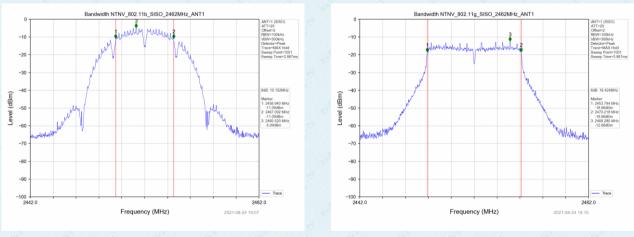






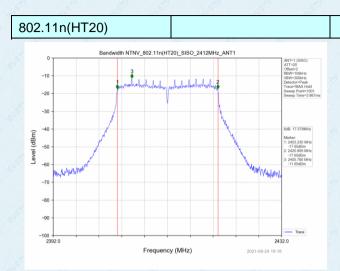




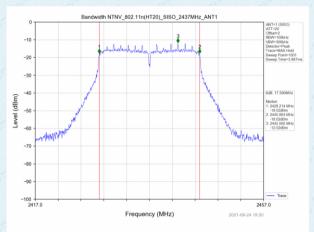


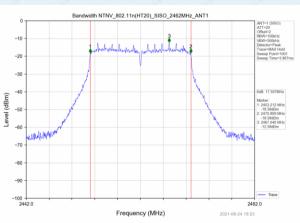
Highest channel





Lowest channel





#### Middle channel

Highest channel



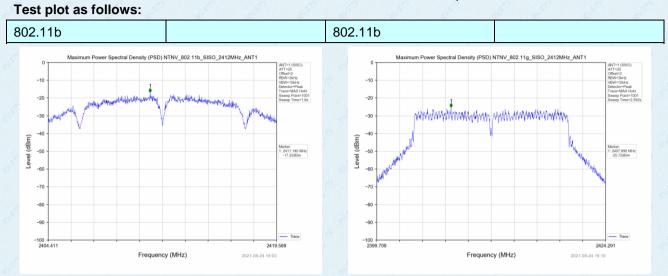
### 7.5 Power Spectral Density

Test Requirement:	FCC Part1	FCC Part15 C Section 15.247 (e)							
Test Method:	KDB55807	KDB558074 D01 15.247 Meas Guidance v05r02							
Limit:	8dBm/3kH	z	6 6	6	6	- 8 - 6			
Test setup:	S	Nor							
Test Instruments:	Refer to se	ection 6.0 for	details			<u> </u>			
Test mode:	10	ection 5.2 for	0						
Test environment:	Temp.:	24 °C	Humid.:	51%	Press.:	1012mbar			
Test voltage:	AC 120V,	60Hz	8	E.	E.	8 6			
Test results:	Pass	8 8	E.	8 8	J.	8 8			

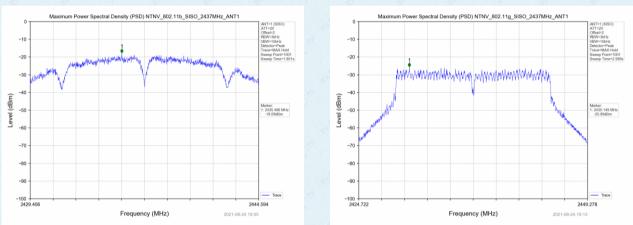
#### **Measurement Data**

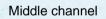
Test CH	Power	Spectral Density (dBm	n/3kHz)	Limit	Result
1651 011	802.11b	802.11g	802.11n(HT20)	(dBm/3kHz)	Result
Lowest	-17.22	-25.72	-25.06	S. S.	
Middle	-18.09	-25.89	-23.98	8.00	Pass
Highest	-18.29	-26.27	-26.56		5

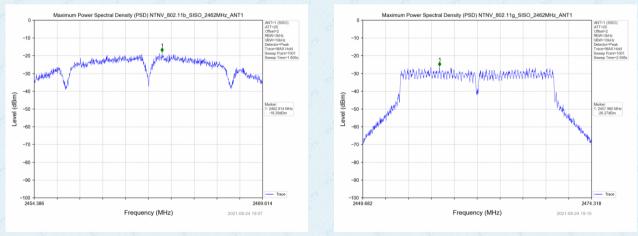
Report No.: GTSL202108000157F03



Lowest channel

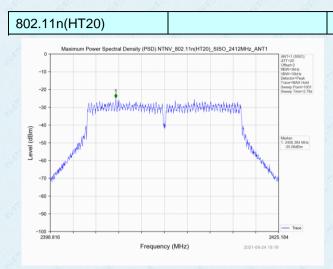




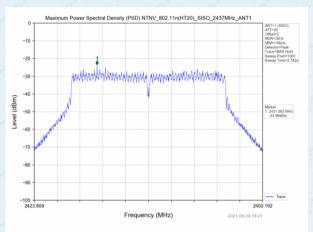


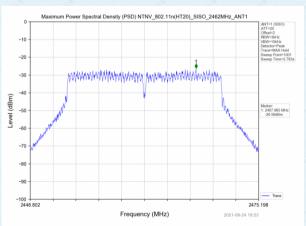
Highest channel





Lowest channel





#### Middle channel

Highest channel

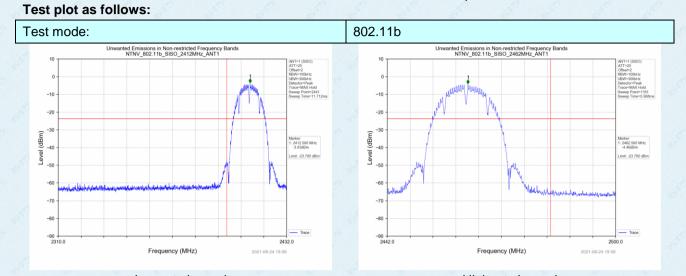


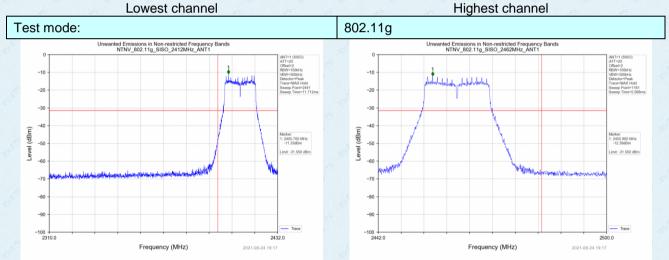
### 7.6 Band edges

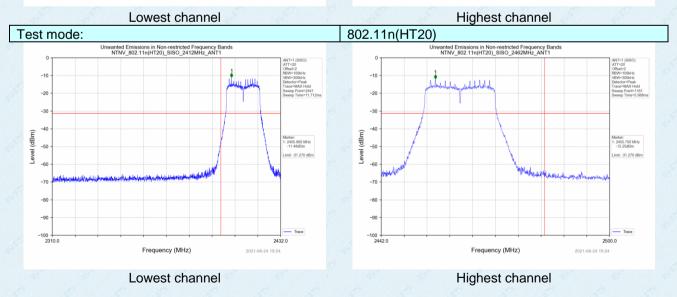
#### 7.6.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)	
Test Method:	KDB558074 D01 15.247 Meas Guidance v05r02	6
Limit:	In any 100 kHz bandwidth outside the frequency band in whice spectrum intentional radiator is operating, the radio frequency is produced by the intentional radiator shall be at least 20 dB the 100 kHz bandwidth within the band that contains the high the desired power, based on either an RF conducted or a rad measurement.	y power that below that in est level of
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane	
Test Instruments:	Refer to section 6.0 for details	le le
Test mode:	Refer to section 5.2 for details	2 10
Test environment:	Temp.: 24 °C Humid.: 51% Press.:	1012mbar
Test voltage:	AC 120V, 60Hz	S.
Test results:	Pass	

#### Report No.: GTSL202108000157F03









#### 7.6.2 Radiated Emission Method

Test Requirement:	FCC Part15 C S	Section 15.209	and 15.205	8	S	8 8		
Test Method:	ANSI C63.10: 2	013	40	10	5	100 C		
Test Frequency Range:	All of the restric 2500MHz) data		tested, only	the wor	st band's	(2310MHz to		
Test site:	Measurement D	istance: 3m	S. 19	<b>S</b>	10	e e		
Receiver setup:	Frequency	Frequency Detector RBW VBW						
		Peak	1MHz	3MH		Value Peak		
	Above 1GHz	Average	1MHz	3MH	z A	verage		
Limit:	Freque		Limit (dBuV	1.1		Value		
			54.0			verage		
	Above 1	GHz	74.0		6	Peak		
Test Procedure:	Tum Tables EUT:	< 3m> Y Test Anter < 1m _ 4r Receiver-	n >v					
	<ul> <li>determine the</li> <li>2. The EUT was antenna, whi tower.</li> <li>3. The antenna ground to de horizontal an measurement</li> <li>4. For each sus and then the and the rota the maximunt</li> <li>5. The test-rece Specified Ba</li> <li>6. If the emission limit specified the EUT wou 10dB margin average mett</li> <li>7. The radiation And found th</li> </ul>	t a 3 meter ca e position of the s set 3 meters ch was mount height is varie termine the m d vertical pola it. pected emission antenna was table was turn in reading. siver system wo ndwidth with N on level of the d, then testing Id be reported would be re-the hod as specifie	mber. The tall he highest race away from the ed on the top ed from one n aximum value rizations of the ton, the EUT tuned to heig ed from 0 dee vas set to Pea Maximum Hole EUT in peak could be stop I. Otherwise t ested one by ed and then r tts are perform oning which i	ble was diation. The interfe- of a var meter to f e of the f he anten was arra hts from grees to ak Detec d Mode. mode w oped and he emiss one usir eported med in X t is wors	rotated 36 erence-rec riable-heig four meter field streng na are set anged to its 1 meter to 360 degre at Function vas 10dB lo d the peak sions that ng peak, q in a data s $\zeta$ , Y, Z axis	0 degrees to ceiving ht antenna rs above the gth. Both to make the s worst case o 4 meters ees to find and ower than the values of did not have uasi-peak or sheet. s positioning.		
Test Instruments:	Refer to section			0	2 10	0		
Test mode:	Refer to section	2/ 1	(6)	1	5	8		
Test any iron ment	Temp.: 25	°C Hum	nid.: 50%	Ser .	Press.:	1012mbar		
Test environment:								
Test voltage:	AC 120V, 60Hz Pass	2 8	8 6	2	g B			

#### Measurement data:

### Report No.: GTSL202108000157F03

est mode:		802.11g	Test ch	annel:	Lowest		
eak value:		e e .	6 6 A	0			
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	
2390	65.59	-5.68	59.91	74.00	-14.09	Horizontal	
2390	65.74	-5.68	60.06	74.00	-13.94	Vertical	
8 B	5 E D D	0 0		10 10 10 10 10	2 2		
	2 8	\$ 5 0	2 5	\$ ×	2 2		
Remark: Factor	= Antenna Fact	or + Cable Loss -	Pre-amplifier.	S. S.	8 8	8 1	
Average value:	2 - 8	L. L.	2 1	la de	9 9 5	e g	
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	
2390	46.38	-5.68	40.70	54.00	-13.30	Horizontal	
2390	46.22	-5.68	40.54	54.00	-13.46	Vertical	
R	8 8	2 8	8 8	8 8	8 8	8 1	

Remark: Factor = Antenna Factor + Cable Loss - Pre-amplifier.



est mode:	est mode:		Test ch	annel:	Highest	
Peak value:		8 10 10				2 S 2 40
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.5	65.75	-5.85	59.90	74.00	-14.10	Horizontal
2483.5	65.82	-5.65	60.17	74.00	-13.83	Vertical
E ge	2 2				2 2	2
	1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0			

#### Average value:

Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarizatior
2483.5	45.50	-5.85	39.65	54.00	-14.35	Horizontal
2483.5	45.24	-5.65	39.59	54.00	-14.41	Vertical
S.	2 2 6	e 8	8 8	8 8	8 8	8 6
8 8	2 8	8 8	2 8	8 6	2 2 6	8

Remarks:

1. Only the worst case Main Antenna test data.

2. The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.

3. Final Level =Receiver Read level + Antenna Factor + Cable Loss - Preamplifier Factor

4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. During the test, pre-scan the 802.11b/802.11g/802.11n (H20) modulation, and found the 802.11b modulation which it is worse case.

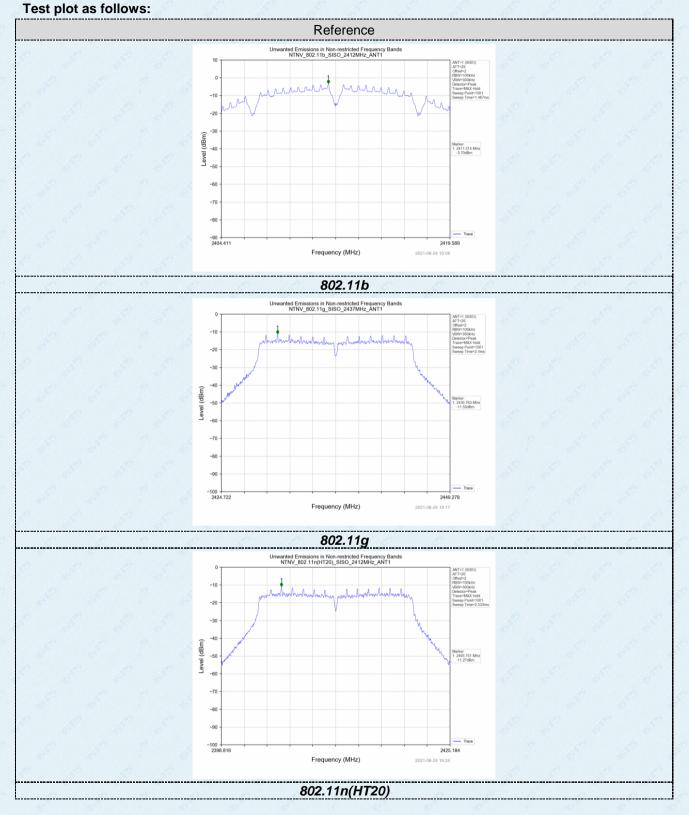


### 7.7 Spurious Emission

#### 7.7.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)	C.
Test Method:	KDB558074 D01 15.247 Meas Guidance v05r02	5
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spectrum intentional radiator is operating, the radio frequency pow is produced by the intentional radiator shall be at least 20 dB below the 100 kHz bandwidth within the band that contains the highest least the desired power, based on either an RF conducted or a radiated measurement.	ver that w that in evel of
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane	
Test Instruments:	Refer to section 6.0 for details	<u>e</u>
		2
Test mode:	Refer to section 5.2 for details	19
Test environment:	Temp.:24 °CHumid.:51%Press.:10	12mbar
Test voltage:	AC 120V, 60Hz	

#### Report No.: GTSL202108000157F03

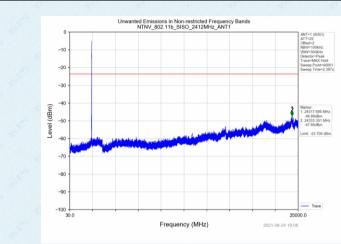




802.11b

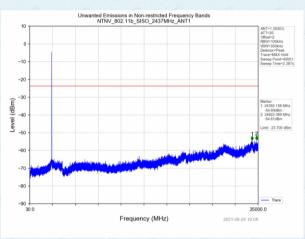
Lowest channel

#### Report No.: GTSL202108000157F03

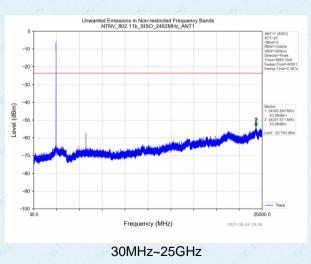


#### 30MHz~25GHz

#### Middle channel



30MHz~25GHz



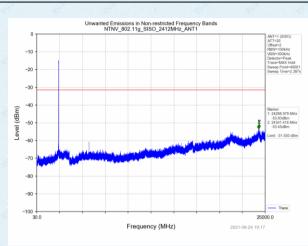
#### Global United Technology Services Co., Ltd. No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102 Telephone: +86 (0) 755 2779 8480 Fax: +86 (0) 755 2779 8960

## Highest channel

802.11g

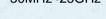
Lowest channel

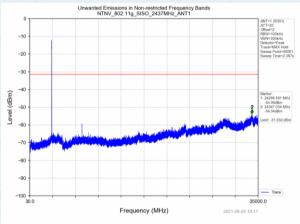
#### Report No.: GTSL202108000157F03



30MHz~25GHz

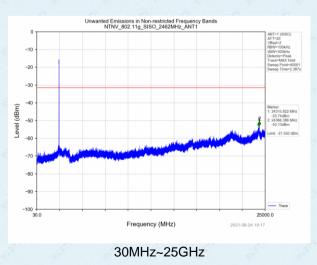
Middle channel





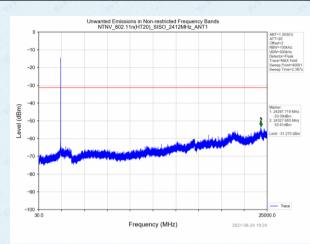
30MHz~25GHz

#### Highest channel



802.11n(HT20) Lowest channel

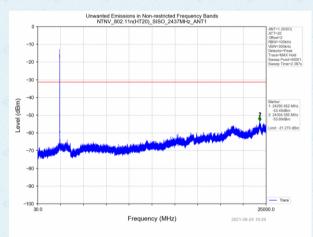
#### Report No.: GTSL202108000157F03



30MHz~25GHz

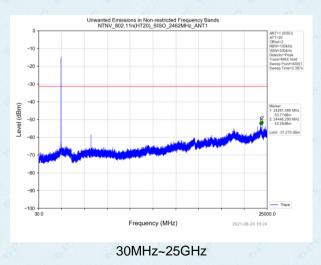
#### Middle channel





30MHz~25GHz

#### Highest channel





Test Requirement:	FCC Part15 C Section 15.209							
Test Method:	ANSI C63.10: 2013		0 0	1			0	
Test Frequency Range:	9kHz to 25GHz	5	6	6		6	0 0	
Test site:	Measurement Distar	nce: 3	3m	6	6			
Receiver setup:	Frequency	ſ	Detector	RBV	V VB	N	Value	
	9KHz-150KHz	Q	uasi-peak	200⊢	lz 600	Hz	Quasi-peak	
	150KHz-30MHz	Qı	uasi-peak	9KH	z 30K	Hz	Quasi-peak	
	30MHz-1GHz	Q	uasi-peak	100KI	Hz 300k	Hz	Quasi-peak	
	Above 1GHz		Peak	1MH	z 3M	Ηz	Peak	2
	Above ronz	4	Peak	1MH	z 10	lz	Average	
Limit:	Frequency		Limit (u∨	//m)	Value		Measurement Distance	
	0.009MHz-0.490M	IHz	2400/F(k	(Hz)	QP	9	300m	
	0.490MHz-1.705M	Hz	24000/F(I	KHz)	QP	"	300m	
	1.705MHz-30MH	1.705MHz-30MHz				in the second	30m	
	30MHz-88MHz	8	100	and the second	QP			ĺ
	88MHz-216MHz	2	150	6	QP	6		
	216MHz-960MH	z	200	8	QP	9	3m	
	960MHz-1GHz		500		QP	1	om	1
	Above 1GHz		500	4	Average	0		
	710010112		5000	e .	Peak		0 0	L
Test setup:	For radiated emiss	sions	from 9kH	z to 30	MHz	1	- 13 - 13 - 14 - 13 - 13 - 13 - 13 - 13 - 13 - 13 - 13	
	EUT		< 3m > Test An	ttenna		111111111111111111111111111111111111111		

#### 7.7.2 Radiated Emission Method

For radiated emissions from 30MHz to1GHz

GTS	
	Report No.: GTSL202108000157F03
	< 80cm > < 80cm > < Receivery Preamplifiery
	For radiated emissions above 1GHz
	<pre></pre>
Test Procedure:	<ol> <li>The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>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.</li> <li>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.</li> <li>The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>If the emission level of the EUT in peak mode was 10dB lower than the</li> </ol>
	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.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details



	19 I I I I I I I I I I I I I I I I I I I		6	Report No.	: GTSL202108	8000157F03
Test voltage:	AC120V 60	Hz	and the second se	6 6		8
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V, 6	0Hz	8	8	0 3	8 8
Test results:	Pass	9	0 0	ß	9 9	£

Remarks:

- 1. Only the worst case Main Antenna test data.
- 2. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.
- 3. Adapter 1 and Adapter 2 all have been tested, only worse case Adapter 1 is reported.

#### Measurement data:

#### ■ 9kHz~30MHz

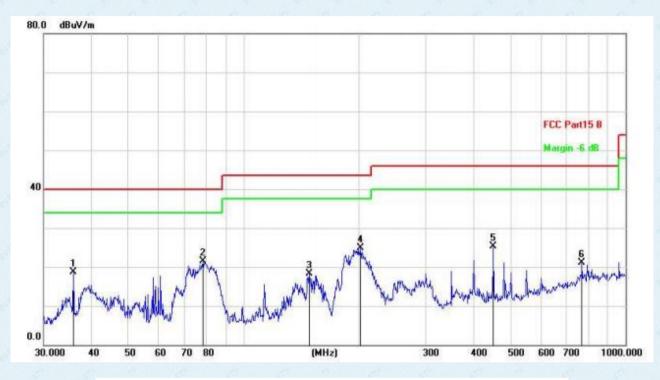
The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

Report No.: GTSL202108000157F03

#### Below 1GHz

Pre-scan all test modes, found worst case at 802.11b 2437MHz, and so only show the test result of 802.11b 2437MHz

#### Horizontal:



N	No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
			MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
	1		35.8746	37.02	-18.23	18.79	40.00	-21.21	QP
	2	*	78.4133	42.16	-20.67	21.49	40.00	-18.51	QP
	3		148.4410	36.01	-17.74	18.27	43.50	-25.23	QP
	4		202.8104	45.05	-20.08	24.97	43.50	-18.53	QP
	5		451.1350	41.43	-16.05	25.38	46.00	-20.62	QP
	6		768.7481	31.69	-10.57	21.12	46.00	-24.88	QP

Final Level =Receiver Read level + Correct Factor

#### Vertical:

Report No.: GTSL202108000157F03



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	35.1278	50.71	-18.27	32.44	40.00	-7.56	QP
2		40.5591	49.10	-18.01	31.09	40.00	-8.91	QP
3		71.8320	47.13	-20.10	27.03	40.00	-12.97	QP
4		138.8735	48.55	-18.59	29.96	43.50	-13.54	QP
5		255.6231	38.15	-19.27	18.88	46.00	-27.12	QP
6		501.1790	35.00	-14.73	20.27	46.00	-25.73	QP

Final Level =Receiver Read level + Correct Factor



#### Above 1GHz

Note: During the test, pre-scan the 802.11b/802.11g/802.11n (H20) modulation, and found the 802.11b modulation which it is worse case.

Test mode: 802.11		1b	Test chann	est channel: Lowest		
Peak value:	2 12	Q Q	2 2	Q Q	2 2	Ð
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarizatior
4824	61.35	-3.67	57.68	74.00	-16.32	Vertical
7236	60.28	-0.90	59.38	74.00	-14.62	Vertical
4824	61.42	-3.67	57.75	74.00	-16.25	Horizontal
7236	60.10	-0.90	59.20	74.00	-14.80	Horizontal
<u></u>	8 <u>-</u> 6	<u> </u>	E <u>E</u> 6	4		
, e <sup>r</sup> , e <sup>r</sup>	6	8 <u>-</u> 8				·

#### Average value:

Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarizatior
4824	45.28	-3.64	41.64	54.00	-12.36	Vertical
7236	44.38	-0.90	43.48	54.00	-10.52	Vertical
4824	45.37	-3.64	41.73	54.00	-12.27	Horizontal
7236	44.64	-0.90	43.74	54.00	-10.26	Horizontal
е 	0 7		2 7	9 - <u>-</u> 2		g g
g g	· · ·	2 2	<i>L</i>	g g	2 <i>1</i> 2	

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

2. "\*", means this data is the too weak instrument of signal is unable to test.



Fest mode: 802.11		1b	Test chann	el:	Middle		
Peak value:	10 10 V		in in i				
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarizatior	
4874	61.38	-3.53	57.85	74.00	-16.15	Vertical	
7311	60.25	-0.85	59.40	74.00	-14.60	Vertical	
4874	61.33	-3.53	57.80	74.00	-16.20	Horizontal	
7311	59.88	-0.85	59.03	74.00	-14.97	Horizontal	
8 8	2 &	S B	7 8	8 - 8	2 8	4	
2- <u>1</u> - 1	e <u>e</u> e		2 2 6	2 <u>1</u>	8 4	8 8	

#### Average value:

Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarizatior
4874	45.28	-3.53	41.75	54.00	-12.25	Vertical
7311	44.94	-0.85	44.09	54.00	-9.91	Vertical
4874	45.26	-3.53	41.73	54.00	-12.27	Horizontal
7311	44.87	-0.85	44.02	54.00	-9.98	Horizontal
4	8 <u>6 -</u> 8	<u> </u>	8 <u>6</u> 6	<u>4</u>	1 <u>1</u>	é é
a <u>-</u>		<u></u>				<u></u>

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

#### Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

2. *"\**", means this data is the too weak instrument of signal is unable to test.



Fest mode: 802.11		1b	Test chann	Test channel:		
Peak value:	10 10 V		10 10 V		in in	
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarizatior
4924	60.35	-3.49	56.86	74.00	-17.14	Vertical
7386	59.59	-0.78	58.81	74.00	-15.19	Vertical
4924	60.42	-3.49	56.93	74.00	-17.07	Horizontal
7386	59.71	-0.78	58.93	74.00	-15.07	Horizontal
8 8	7 8	S S	7 &	8 8	2 8	4
2 - <u>2</u> - 2	e <u>e</u> e		8 4- 6	<u></u>	8 1	å å

#### Average value:

Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarizatior
4924	45.62	-3.49	42.13	54.00	-11.87	Vertical
7386	45.28	-0.78	44.50	54.00	-9.50	Vertical
4924	45.72	-3.49	42.23	54.00	-11.77	Horizontal
7386	45.02	-0.78	44.24	54.00	-9.76	Horizontal
<u>£</u>	8 <u>6-</u> 8	<u> </u>	E <u>E</u> E	<u>4</u>	1 <u>1</u>	8 8
a	<u> </u>	<u></u>			6	<u></u>

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

2. *"\**", means this data is the too weak instrument of signal is unable to test.



### 8 Test Setup Photo

Reference to the appendix I for details.

## 9 EUT Constructional Details

Reference to the appendix II for details.

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