



香港商立德國際商品試驗有限公司桃園分公司

Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

Referencing Test Data

Table of Contents

<u>1</u>	Original General Descriptions of EUT	2
<u>2</u>	Form Factor and Photos	2
<u>3</u>	PCB Photos	4
<u>4</u>	Referencing test items	5
<u>5</u>	Spot-Check Test Plan	6
<u>6</u>	Output power	6
<u>7</u>	Radiated emission – Band edge and Harmonics (Above 1GHz).....	10
<u>8</u>	Radiated emission (Below 1GHz).....	12
<u>9</u>	Acceptance criteria for spot check.....	14

1. Original General Descriptions of EUT

Equipment		Referenced Device	Model Variant Device		
FCC ID		RAXHT3000W	RAXWR3200		
FCC Granted Date		11/18/2021	NA		
Test Model		HT3000W	WR3200		
RF characteristics		2TX WLAN 2.4GHz 2412 – 2462 MHz	2TX WLAN 2.4GHz 2412 – 2462 MHz		
		2TX WLAN 5GHz 5180.0 - 5240.0 MHz 5260.0 - 5320.0 MHz 5500.0 - 5720.0 MHz 5745.0 - 5825.0 MHz	2TX WLAN 5GHz 5180.0 - 5240.0 MHz 5260.0 - 5320.0 MHz 5500.0 - 5720.0 MHz 5745.0 - 5825.0 MHz		
		Difference		1. W/O MoCA component	1. Add MoCA component 2. DC Jack change
		Hardware		Identical internal printed circuit board layouts	
				Have a common design and components except MoCA component WLAN CHIP:WLAN 2.4GHz: QCN5022/ WLAN 5GHz: QCN5052	

Variant spot-check test results are within the tune-up tolerance range specified and are compliant with applicable rule part(s).

2. Form Factor and Photos

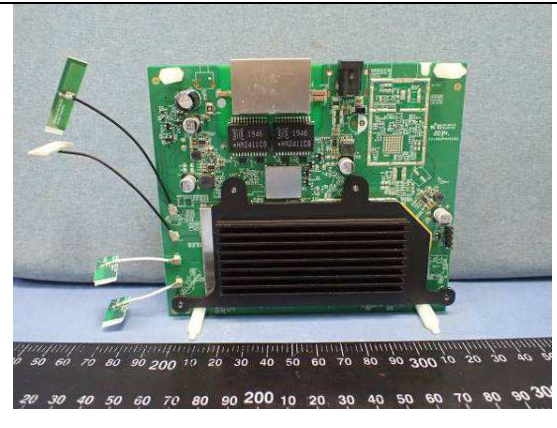
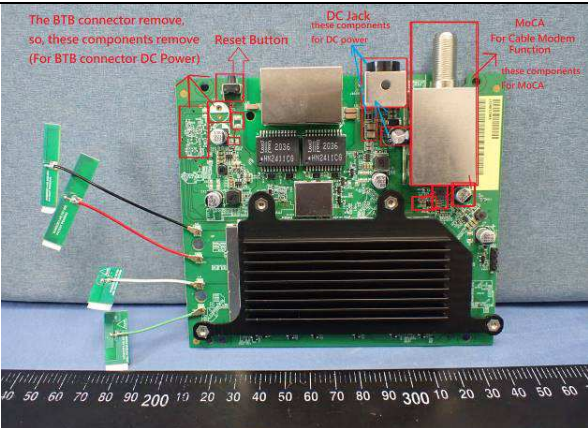
base on FCC KDB guidance 484596 Rules ,

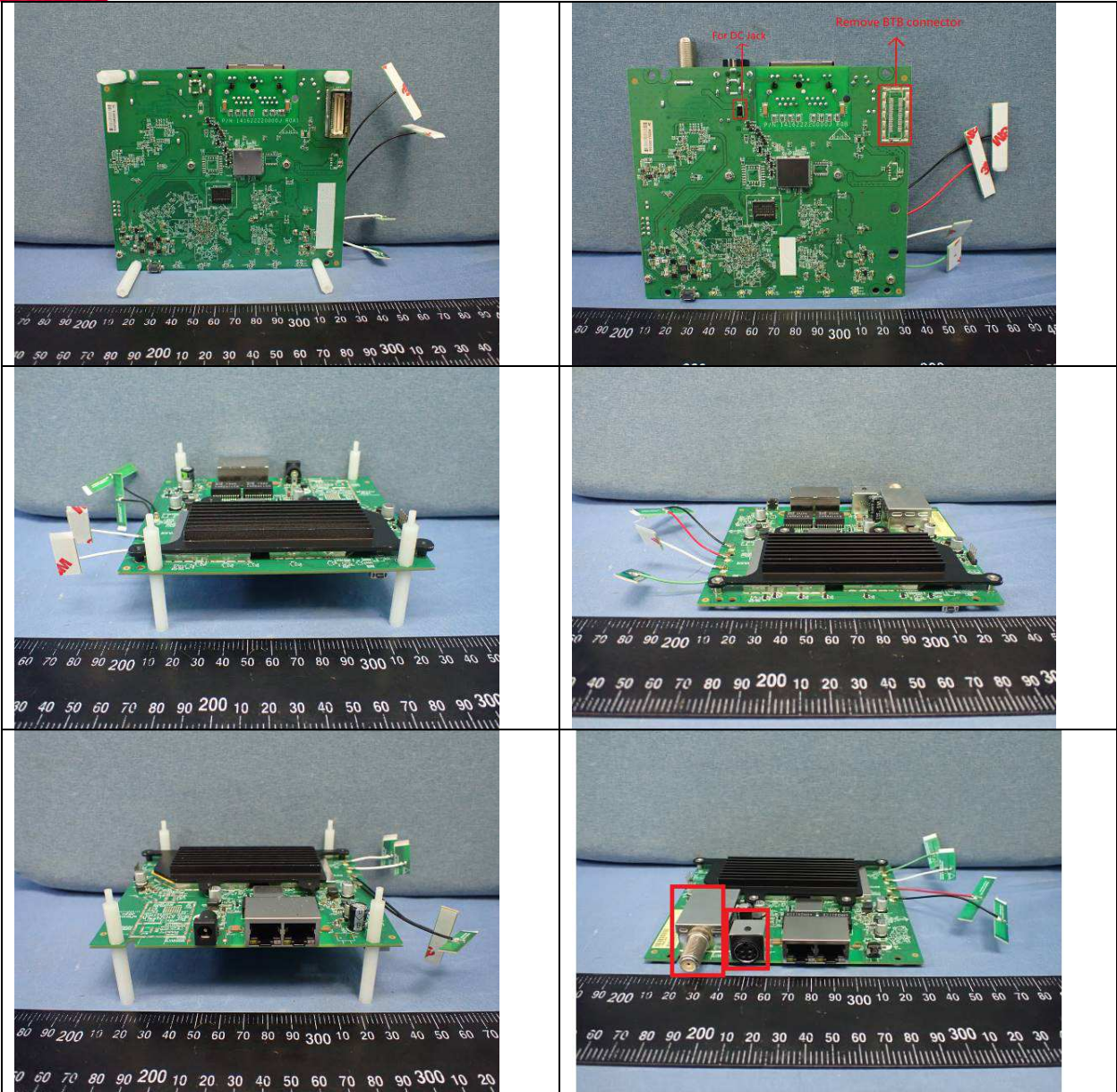
The printed circuit board layouts the same ; RF technologies the same (WiFi 2.4G & WiFi 5G)

Difference : **add MoCA component** and **Change DC Jack**


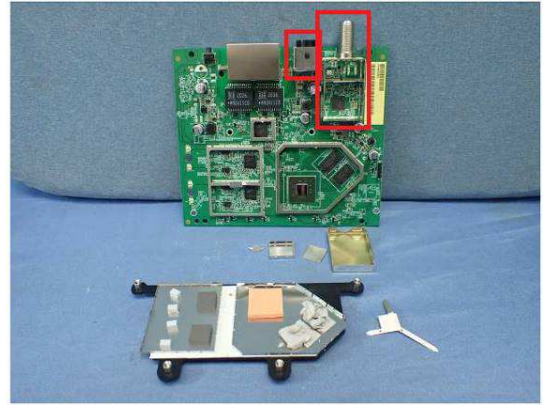
Change DC Jack ; For difference PSU Adapter

MoCA : For Cable Modem Function

Referenced Device	Model variant
FCC ID: RAXHT3000W	FCC ID: RAXWR3200
	



3. PCB Photos

Referenced Device	Model variant
FCC ID: RAXHT3000W	FCC ID: RAXWR3200
 A photograph of a green printed circuit board (PCB) for the referenced device. The board is populated with various electronic components, including a large central chip, several capacitors, and connectors. Below the main board, a smaller, partially disassembled component is visible, showing a yellow label and some surface components.	 A photograph of a green PCB for the model variant. This board is similar to the referenced device but includes a red rectangular box highlighting a specific component in the upper right quadrant. Below the main board, a smaller, partially disassembled component is visible, similar to the one in the referenced device image.



4. Referencing test items

Part 15C

FCC Clause	Test Items	Referenced Test Data	Note
15.247(b)	Conducted Output Power	Y	
15.207	AC Power Line Conducted Emission	N	
15.205/ 15.209/ 15.247(d)	Radiated Emissions and Band Edge Measurement	Y	
15.247(d)	Antenna Port Emission	Y	
15.247(a)(2)	6dB bandwidth	Y	
15.247(e)	Power Density	Y	

Part 15E

FCC Clause	Test Items	Referenced Test Data	Note
15.407(a)(1/2/3)	Conducted Output Power	Y	
15.207	AC Power Line Conducted Emission	N	
15.407(b) (1/2/3/4 (i/ii))	Radiated Emissions and Band Edge Measurement	Y	
15.407(a)(1/2/3)	26dBc bandwidth	Y	
-	99% Occupied bandwidth	Y	
15.407(e)	6dB bandwidth	Y	
15.407(a)(1/2/3)	Power Density	Y	
15.407(g)	Frequency Stability	Y	
15.407(h)	DFS	N	

Variant spot-check test results are within the tune-up tolerance range specified and are compliant with applicable rule part(s).



5. Spot- Check Test Plan

Amount of test samples: 1 sample

Equipment Class	Rule Part	Test Items	Frequency Band	Test Modes	Test Channel
DTS	Part 15C	Conducted output power	2412-2462 MHz	802.11 b/g/n/ax	Low/ Mid/ High
		Radiated emission - Band edge and Harmonics (Above 1GHz)		One channel with maximum power among 802.11 b/g/n/ax	One channel with maximum power
		Radiated emission (Below 1GHz)			
		AC Power Line Conducted Emission			
NII	Part 15E	Conducted output power	5180-5240MHz, 5260-5320MHz, 5500-5720MHz 5745-5825MHz	802.11 a/n/ac/ax	Low/ Mid/ High for each sub band
		Radiated emission - Band edge and Harmonics (Above 1GHz)		One channel with maximum power among 802.11 a/n/ac/ax	One channel with maximum power
		Radiated emission (Below 1GHz)			
		AC Power Line Conducted Emission			
		DFS	5500-5720MHz	ALL Re-test	ALL Re-test

Note: RF Conducted output power were confirmed and the same as Referenced Device (FCC ID: RAXHT3000W)

Variant spot-check test results are within the tune-up tolerance range specified and are compliant with applicable rule part(s).

Original Report Test Data:

Please find attached the PDF File:

RAXHT3000W (Referenced Device) original Data.PDF

6. output power

RF Conducted output power were confirmed within 0.5dB



2.4G Power

Composite Antenna Gain Type		Antenna Gain (dBi)			Chain0	Chain1	Directional Gain		Certification Power
Correlated		2400 ~ 2483.5 MHz:			1.90	2.10	2.10		Power Meter Average Sensor
Mode	Data Rate	Channel	Frequency (MHz)	Power Setting	Chain0	Chain1	Total	Limit	
					Avg (dBm)	Avg (dBm)	Avg (dBm)	Avg (dBm)	PASS / FAIL
11b	1Mbps	1	2412	23.5	23.65	24.04	26.86	30.00	PASS
		6	2437	23.5	23.83	24.13	26.99	30.00	PASS
		11	2462	23.5	23.88	24.11	27.01	30.00	PASS
11g	6Mbps	1	2412	21	21.07	21.77	24.44	30.00	PASS
		6	2437	23.5	23.72	24.05	26.90	30.00	PASS
		11	2462	22.5	22.68	23.27	26.00	30.00	PASS
VHT20 2.4G	MCS0NSS1	1	2412	21.5	21.00	21.60	24.32	30.00	PASS
		6	2437	23.5	23.10	23.64	26.39	30.00	PASS
		11	2462	21.5	20.99	21.59	24.31	30.00	PASS
VHT40 2.4G	MCS0NSS1	3	2422	16.5	16.86	16.91	19.90	30.00	PASS
		6	2437	22	21.94	22.49	25.23	30.00	PASS
		9	2452	16.5	16.77	17.07	19.93	30.00	PASS
11ax20 2.4G	MCS0 6.5Mbps	1	2412	21.5	21.11	21.68	24.41	30.00	PASS
		6	2437	23.5	23.21	23.77	26.51	30.00	PASS
		11	2462	21.5	21.10	21.76	24.45	30.00	PASS
11ax40 2.4G	MCS0 6.5Mbps	3	2422	16.5	16.98	17.03	20.02	30.00	PASS
		6	2437	22	22.07	22.62	25.36	30.00	PASS
		9	2452	16.5	16.90	17.22	20.07	30.00	PASS

5G Power

Composite Antenna	Antenna Gain (dBi)	Chain	Chain1	Directional	Certification Power
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Gain Type					0			Gain		
Correlated		5150 ~ 5250 MHz:			2.50	3.00	3.00		Power Meter Average Sensor	
		5250 ~ 5350 MHz:			2.50	3.00	3.00			
		5470 ~ 5725 MHz:			2.50	3.00	3.00			
		5725 ~ 5850 MHz:			2.50	3.00	3.00			
Mode	Data Rate	Channel	Frequency (MHz)	Power Setting	Chain 0	Chain1	Total	Limit		
					Avg (dBm)	Avg (dBm)	Avg (dBm)	Avg (dBm)	PASS / FAIL	
11a	6Mbps	36	5180	23.5	23.89	24.50	27.22	30.00	PASS	
		40	5200	23.5	23.62	23.77	26.71	30.00	PASS	
		48	5240	23.5	23.18	22.93	26.07	30.00	PASS	
		52	5260	20.5	20.50	20.24	23.38	24.00	PASS	
		60	5300	20.5	20.45	20.03	23.26	24.00	PASS	
		64	5320	21	20.32	20.21	23.28	24.00	PASS	
		100	5500	20.5	20.46	20.49	23.49	24.00	PASS	
		116	5580	20.5	20.69	20.50	23.61	24.00	PASS	
		140	5700	22	20.76	20.36	23.57	24.00	PASS	
		144	5720	22	20.62	20.30	23.47	24.00	PASS	
		149	5745	25	23.57	22.90	26.26	30.00	PASS	
		157	5785	25	23.30	23.05	26.19	30.00	PASS	
		165	5825	25.5	23.59	23.27	26.44	30.00	PASS	

11ac20 5G	MCS0NSS1	36	5180	23.5	23.19	22.26	25.76	30.00	PASS
		40	5200	24	23.19	22.93	26.07	30.00	PASS
		48	5240	24	23.00	22.84	25.93	30.00	PASS
		52	5260	21	20.19	19.95	23.08	24.00	PASS
		60	5300	21.5	20.51	20.37	23.45	24.00	PASS
		64	5320	22	20.68	20.28	23.49	24.00	PASS
		100	5500	21	20.32	20.37	23.36	24.00	PASS
		116	5580	21	20.54	20.25	23.41	24.00	PASS
		140	5700	22.5	20.50	20.11	23.32	24.00	PASS
		144	5720	22.5	20.52	20.20	23.37	24.00	PASS
		149	5745	25.5	23.17	22.56	25.89	30.00	PASS
		157	5785	26	23.34	23.12	26.24	30.00	PASS
		165	5825	26	23.35	22.94	26.16	30.00	PASS

11ac40	MCS0NSS1	38	5190	22	22.09	21.69	24.90	30.00	PASS
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5G		46	5230	23.5	23.12	22.94	26.04	30.00	PASS
		54	5270	20.5	20.57	20.19	23.39	24.00	PASS
		62	5310	20.5	18.83	20.08	22.51	24.00	PASS
		102	5510	20	19.86	20.10	22.99	24.00	PASS
		110	5550	20	20.25	20.17	23.22	24.00	PASS
		134	5670	21.5	20.46	20.17	23.33	24.00	PASS
		142	5710	21.5	20.50	20.16	23.34	24.00	PASS
		151	5755	25	23.17	22.79	25.99	30.00	PASS
		159	5795	24.5	22.53	22.46	25.51	30.00	PASS

11ac80 5G	MCS0NSS1	42	5210	21	20.73	20.62	23.69	30.00	PASS
		58	5290	18	17.69	17.51	20.61	24.00	PASS
		106	5530	20.5	20.00	20.33	23.18	24.00	PASS
		122	5610	19.5	20.10	20.37	23.25	24.00	PASS
		138	5690	19.5	20.08	20.28	23.19	24.00	PASS
		155	5775	23	21.01	20.64	23.84	30.00	PASS

11ax20 5G	MCS0NSS1	36	5180	23.5	23.35	22.31	25.87	30.00	PASS
		40	5200	24	23.40	23.16	26.29	30.00	PASS
		48	5240	24	23.22	22.94	26.09	30.00	PASS
		52	5260	21	20.28	20.01	23.16	24.00	PASS
		60	5300	21.5	20.57	20.45	23.52	24.00	PASS
		64	5320	22	20.73	20.33	23.54	24.00	PASS
		100	5500	21	20.46	20.49	23.49	24.00	PASS
		116	5580	21	20.71	20.44	23.59	24.00	PASS
		140	5700	22.5	20.69	20.31	23.51	24.00	PASS
		144	5720	22.5	20.70	20.34	23.53	24.00	PASS
		149	5745	25.5	23.32	22.67	26.02	30.00	PASS
		157	5785	26	23.46	23.24	26.36	30.00	PASS
165	5825	26	23.47	23.08	26.29	30.00	PASS		

11ax40 5G	MCS0NSS1	38	5190	22	22.27	21.90	25.10	30.00	PASS
		46	5230	23.5	23.30	23.15	26.24	30.00	PASS
		54	5270	20.5	20.71	20.34	23.54	24.00	PASS
		62	5310	20.5	19.07	20.28	22.73	24.00	PASS
		102	5510	20	20.02	20.25	23.15	24.00	PASS
		110	5550	20	20.53	20.42	23.49	24.00	PASS



		134	5670	21.5	20.73	20.40	23.58	24.00	PASS
		142	5710	21.5	20.70	20.31	23.52	24.00	PASS
		151	5755	25	23.41	22.95	26.20	30.00	PASS
		159	5795	24.5	22.71	22.72	25.73	30.00	PASS

11ax80 5G	MCS0NSS1	42	5210	21	20.95	20.82	23.90	30.00	PASS
		58	5290	18	17.82	17.69	20.77	24.00	PASS
		106	5530	20.5	20.25	20.47	23.37	24.00	PASS
		122	5610	19.5	20.30	20.58	23.45	24.00	PASS
		138	5690	19.5	20.29	20.52	23.42	24.00	PASS
		155	5775	23	21.18	20.81	24.01	30.00	PASS

7. Radiated emission – Band edge and Harmonics (Above 1GHz)

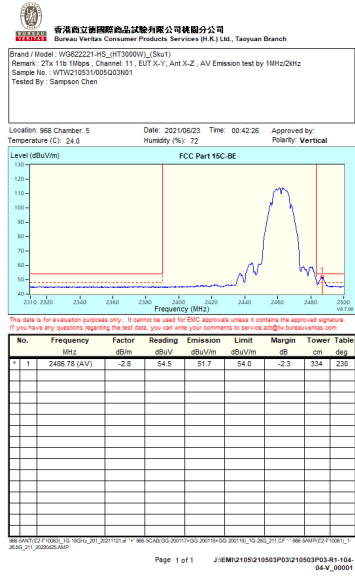
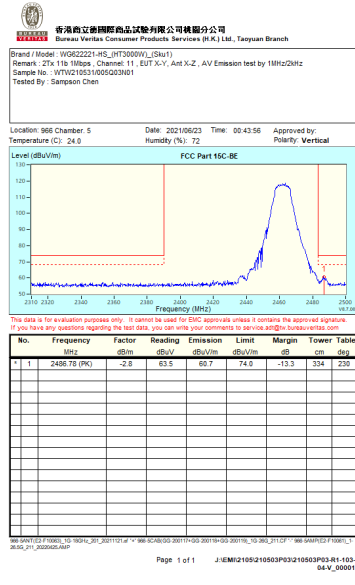
802.11b Channel 11

Horizontal (Peak)	Horizontal (Average)																																
<div style="text-align: center; font-size: small;"> 香港商立德國際商品試驗有限公司桃園分公司 Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch </div> <div style="font-size: x-small; margin-top: 5px;"> Brand / Model: WGR2221-HS_jHT3000V1_15x1 Remark: 2Tx 11b 11Mbps - Channel 11, EUT X-Y, Ant X-Z, AV Emission test by 1MHz/2kHz Sample No.: WTR210231005003001 Tested By: Sampson Chen </div> <div style="font-size: x-small; margin-top: 5px;"> Location: 966 Chamber: 5 Date: 2021/06/23 Time: 00:39:52 Approved by: Temperature (C): 24.0 Humidity (%): 72 Polarity: Horizontal </div> <div style="text-align: center; margin-top: 5px;"> FCC Part 15C-BE </div> <div style="font-size: x-small; margin-top: 5px;"> This data is for evaluation purposes only. It cannot be used for EMC approvals unless it contains the approved signature. If you have any questions regarding the test data, you can write your comments to service.en@bureauveritas.com </div> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>No.</th> <th>Frequency MHz</th> <th>Factor dBm</th> <th>Reading dBuV</th> <th>Emission dBuV/m</th> <th>Limit dBuV/m</th> <th>Margin dB</th> <th>Tower Table cm deg</th> </tr> </thead> <tbody> <tr> <td>* 1</td> <td>2487.08 (PK)</td> <td>-2.8</td> <td>63.0</td> <td>60.2</td> <td>74.0</td> <td>-13.8</td> <td>390 348</td> </tr> </tbody> </table> <div style="font-size: x-small; margin-top: 5px;"> WGR2221-HS_jHT3000V1_15x1 WTR210231005003001 </div> <div style="font-size: x-small; margin-top: 5px;"> Page 1 of 1 J:\EMC\2105210503P03\210503P03-R1-103-044_00001 </div>	No.	Frequency MHz	Factor dBm	Reading dBuV	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower Table cm deg	* 1	2487.08 (PK)	-2.8	63.0	60.2	74.0	-13.8	390 348	<div style="text-align: center; font-size: small;"> 香港商立德國際商品試驗有限公司桃園分公司 Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch </div> <div style="font-size: x-small; margin-top: 5px;"> Brand / Model: WGR2221-HS_jHT3000V1_15x1 Remark: 2Tx 11b 11Mbps - Channel 11, EUT X-Y, Ant X-Z, AV Emission test by 1MHz/2kHz Sample No.: WTR210231005003001 Tested By: Sampson Chen </div> <div style="font-size: x-small; margin-top: 5px;"> Location: 966 Chamber: 5 Date: 2021/06/23 Time: 00:37:46 Approved by: Temperature (C): 24.0 Humidity (%): 72 Polarity: Horizontal </div> <div style="text-align: center; margin-top: 5px;"> FCC Part 15C-BE </div> <div style="font-size: x-small; margin-top: 5px;"> This data is for evaluation purposes only. It cannot be used for EMC approvals unless it contains the approved signature. If you have any questions regarding the test data, you can write your comments to service.en@bureauveritas.com </div> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>No.</th> <th>Frequency MHz</th> <th>Factor dBm</th> <th>Reading dBuV</th> <th>Emission dBuV/m</th> <th>Limit dBuV/m</th> <th>Margin dB</th> <th>Tower Table cm deg</th> </tr> </thead> <tbody> <tr> <td>* 1</td> <td>2487.08 (AV)</td> <td>-2.8</td> <td>54.6</td> <td>51.8</td> <td>54.0</td> <td>-2.2</td> <td>390 348</td> </tr> </tbody> </table> <div style="font-size: x-small; margin-top: 5px;"> WGR2221-HS_jHT3000V1_15x1 WTR210231005003001 </div> <div style="font-size: x-small; margin-top: 5px;"> Page 1 of 1 J:\EMC\2105210503P03\210503P03-R1-104-044_00001 </div>	No.	Frequency MHz	Factor dBm	Reading dBuV	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower Table cm deg	* 1	2487.08 (AV)	-2.8	54.6	51.8	54.0	-2.2	390 348
No.	Frequency MHz	Factor dBm	Reading dBuV	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower Table cm deg																										
* 1	2487.08 (PK)	-2.8	63.0	60.2	74.0	-13.8	390 348																										
No.	Frequency MHz	Factor dBm	Reading dBuV	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower Table cm deg																										
* 1	2487.08 (AV)	-2.8	54.6	51.8	54.0	-2.2	390 348																										
Vertical (Peak)	Vertical (Average)																																



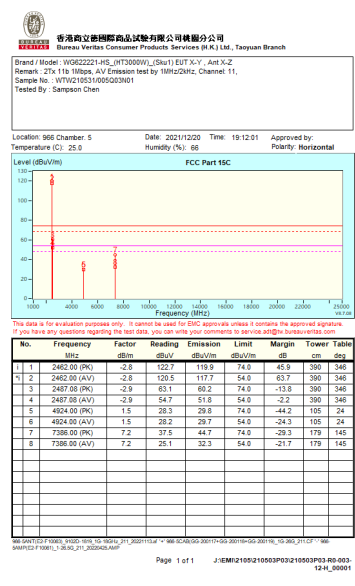
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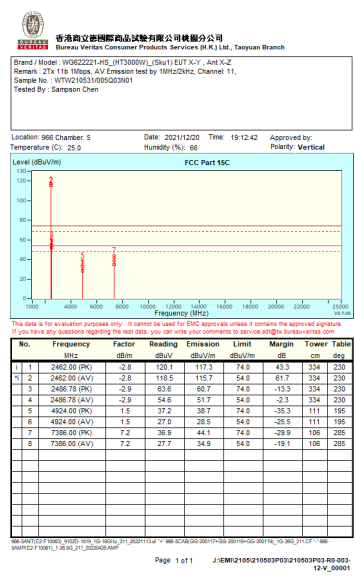


802.11b Channel 11

Horizontal



Vertical



802.11a Channel 36

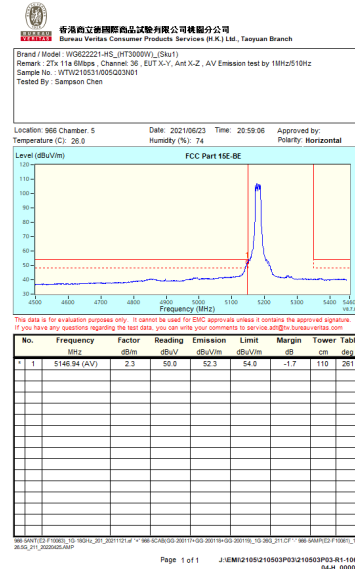
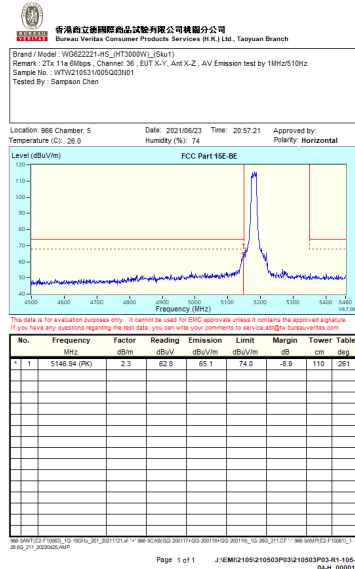
Horizontal (Peak)

Horizontal (Average)



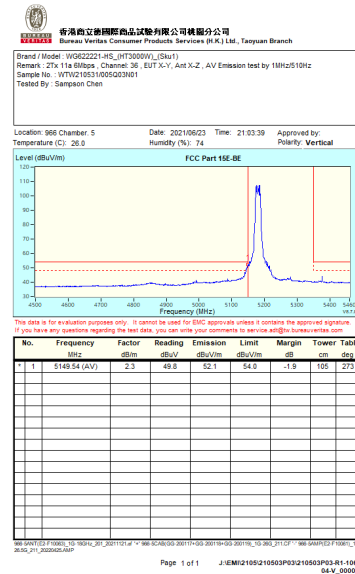
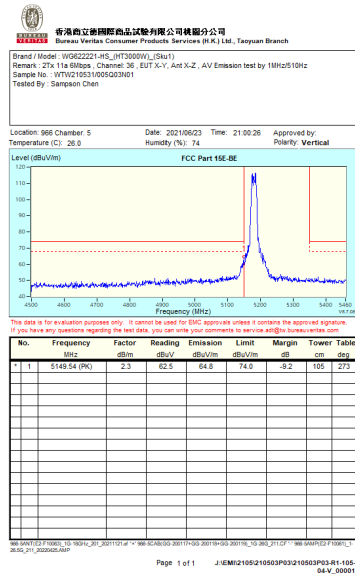
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Vertical (Peak)

Vertical (Average)



802.11a Channel 36

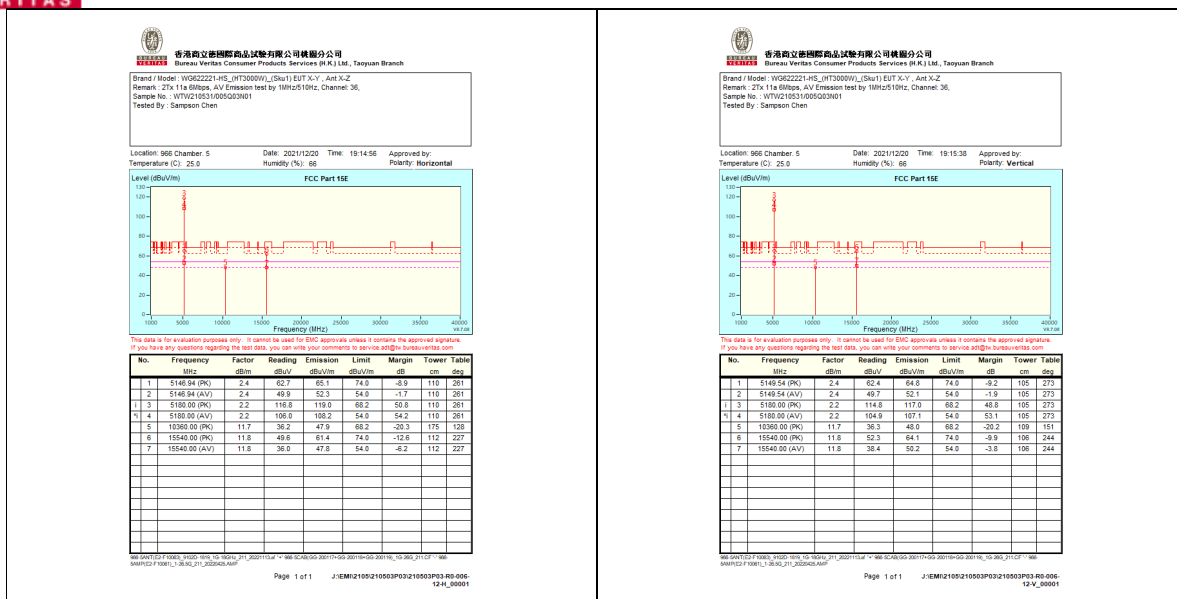
Horizontal

Vertical

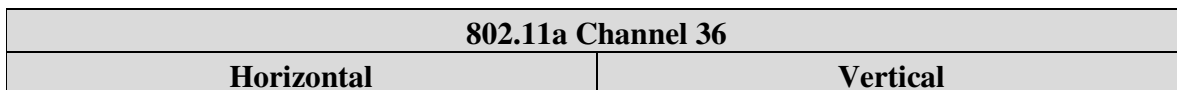
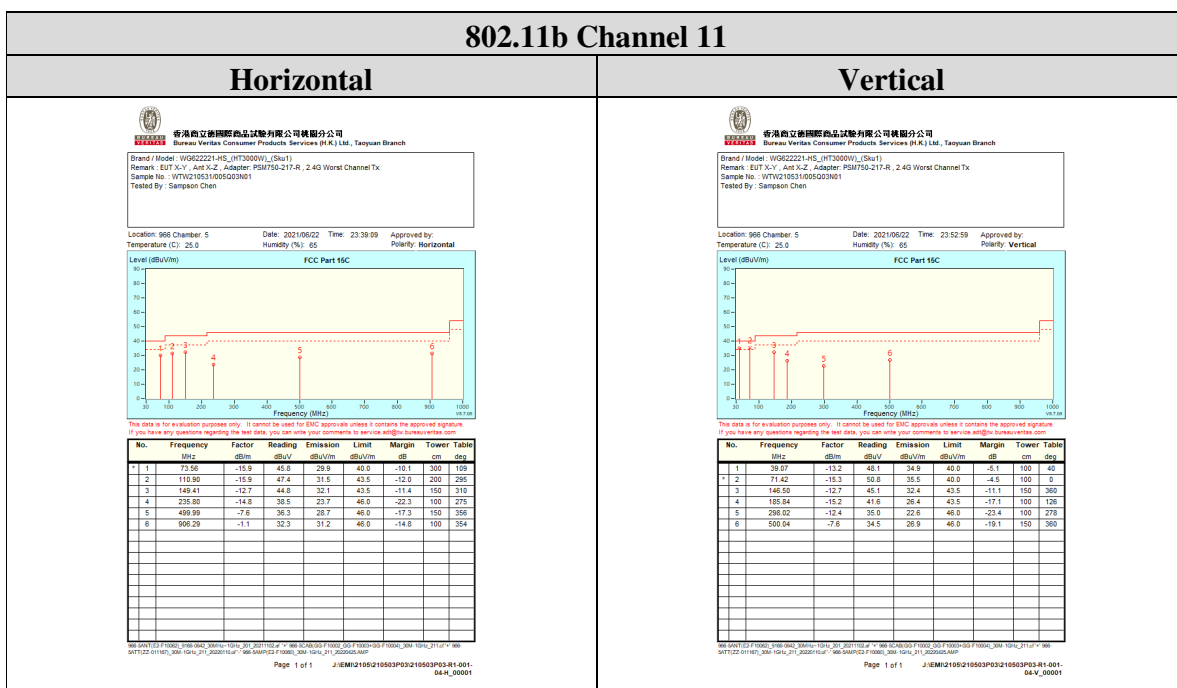


香港商立德國際商品試驗有限公司桃園分公司

Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch



8. Radiated emission (Below 1GHz)





香港商立德國際商品試驗有限公司桃園分公司
Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

Brand / Model: WIG22221-HS_H73000W1 (Sta1)
Remark: EUT X-Y, Ant X-Z, Adapter: PSM750-217-R, 5G Worst Channel Tx
Sample No.: WTW21052105030301
Tested By: Sampson Chen

Location: 966 Chamber: 5 Date: 2021/06/23 Time: 00:14:46 Approved by:
Temperature (C): 25.0 Humidity (%): 65 Polarity: Horizontal

This data is for evaluation purposes only. It cannot be used for EMC approvals unless it contains the approved signature. If you have any questions regarding the test data, you can write your comments to service.asia@bureauveritas.com

No.	Frequency MHz	Factor dBm	Reading dBμV	Emission dBμV/m	Limit dB	Margin dB	Tower cm	deg
1	74.50	-18.1	46.5	30.4	40.0	-9.6	300	150
2	111.60	-15.7	47.5	31.8	43.5	-11.7	200	200
3	149.11	-12.7	44.5	31.8	43.5	-11.7	150	307
4	238.95	-14.7	39.0	24.3	46.0	-21.7	100	275
5	500.00	-7.8	36.0	29.2	46.0	-16.8	150	340
6	906.96	-1.1	32.9	31.8	46.0	-14.2	100	350

Page 1 of 1 J:\EMC\2105210503\PD3\210503PD3-R1-002-04-V_0001

香港商立德國際商品試驗有限公司桃園分公司
Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

Brand / Model: WIG22221-HS_H73000W1 (Sta1)
Remark: EUT X-Y, Ant X-Z, Adapter: PSM750-217-R, 5G Worst Channel Tx
Sample No.: WTW21052105030301
Tested By: Sampson Chen

Location: 966 Chamber: 5 Date: 2021/06/23 Time: 00:13:33 Approved by:
Temperature (C): 25.0 Humidity (%): 65 Polarity: Vertical

This data is for evaluation purposes only. It cannot be used for EMC approvals unless it contains the approved signature. If you have any questions regarding the test data, you can write your comments to service.asia@bureauveritas.com

No.	Frequency MHz	Factor dBm	Reading dBμV	Emission dBμV/m	Limit dB	Margin dB	Tower cm	deg
1	39.40	-13.3	48.4	35.1	40.0	-4.9	100	37
2	72.12	-15.5	51.4	35.0	40.0	-4.1	100	21
3	146.79	-12.6	45.1	32.5	43.5	-11.0	150	538
4	187.01	-15.3	42.3	27.0	43.5	-16.5	100	137
5	296.71	-13.3	35.0	22.7	46.0	-23.3	100	275
6	500.75	-7.6	34.9	27.3	46.0	-18.7	150	348

Page 1 of 1 J:\EMC\2105210503\PD3\210503PD3-R1-002-04-V_0001

9. Acceptance criteria for spot check

Test Items	Frequency	Deviation Tolerance	Acceptance criteria
Conducted Output power	All operating band	-0.5 dB	The test result compare to the test result of Referenced device must be within Deviation Tolerance and must be lower than limitation for each operating band.
Spurious Emission up to 1GHz (Below 1GHz)	30MHz~1000MHz	+/- 3.0 dB	The worst value of test result for variant device compare to the test result of Referenced device must be within Deviation Tolerance and must be lower than limitation.
Spurious Emission above 1GHz	1GHz~40GHz	+/- 3.0 dB	The worst value of test result for variant device compare to the test result of Referenced device must be within Deviation Tolerance and must be lower than limitation.

Variant spot-check test results are within the tune-up tolerance range specified and are compliant with applicable rule part(s).