

# TEST REPORT

**Application No.:** HKEM2212001095AT  
**Applicant:** Wittra Networks AB  
**Address of Applicant:** Vastra Jarnvagsgatan 3,11164 Stockholm, Sweden  
**Equipment Under Test (EUT):**  
**EUT Name:** Wittra Unified Gateway  
**Model No.:** UNIFIED-GATEWAY-1.0-US  
**FCC ID:** 2AYHX00515  
**IC:** 26847-00515  
**HVIN:** UNIFIED GATEWAY-1.0-US  
**Standard(s) :** 47 CFR Part 1.1307; 47 CFR Part 2.1091  
 KDB447498 D04 Interim General RF Exposure Guidance v01  
 RSS102 Issue 5 March 2015  
**Date of Receipt:** 2022-12-15  
**Date of Test:** 2022-12-20 to 2023-02-16  
**Date of Issue:** 2023-02-17

<b>Test Result:</b>	The submitted sample was found to comply with the test requirement
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**Law Man Kit**  
EMC Manager

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Revision Record			
Revision No.	Date	Report superseded	Remark

<b>Authorized for issue by:</b>			
			
		<b>Panny Leung</b> /Project Engineer	
			
		<b>Law Man Kit</b> /Reviewer	

## 2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
RF Exposure	47 CFR Part 1.1307, 47 CFR Part 2.1091, KDB 447498 D01	KDB447498D01	KDB447498D01	PASS
RF Exposure	RSS102 Issue 5	RSS-102 Section 2.5.1	RSS102 Issue 5	PASS

### Declaration of EUT Family Grouping:

N/A

### Abbreviation:

- Tx: In this whole report Tx (or tx) means Transmitter.  
 Rx: In this whole report Rx (or rx) means Receiver.  
 RF: In this whole report RF means Radiated Frequency.  
 CH: In this whole report CH means channel.  
 Volt: In this whole report Volt means Voltage.  
 Temp: In this whole report Temp means Temperature.  
 Humid: In this whole report Humid means humidity.  
 Press: In this whole report Press means Pressure.  
 N/A: In this whole report not application.



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## 4 General Information

### 4.1 Details of E.U.T.

Power supply:	Adaptor Model: KSA-36W-120300D5 Input: AC 100-240V, 50/60Hz, 1.0A Output: DC 12.0V, 3.0A, 36.0W and DC 3V ('CR2032' size battery x 1)
Test voltage:	AC 120V DC 3V
Cable:	Power Cable: 143cm unshielded 2 wires DC cable
Antenna Gain:	SubGhz: 2dBi Mioty: 2dBi BLE: 3.5dBi
Antenna Type:	SubGhz: Dipole Antenna Mioty: Integral Antenna BLE: PIFA
Modulation Type:	SubGhz: GFSK Mioty: MSK/GMSK BLE: GFSK
Number of Channels:	SubGhz: 51 Mioty: 50 BLE: 40
Operation Frequency:	SubGhz: 902.60MHz to 927.40MHz Mioty: 915.25MHz to 916.75MHz BLE: 2402MHz to 2480MHz
Spectrum Spread Technology:	SubGhz: Frequency Hopping Spread Spectrum (FHSS) Mioty: Frequency Hopping Spread Spectrum (FHSS) BLE: Digital modulation
Series number:	A1
Hardware Version:	UNIFIED GATEWAY-1.0-US
Software Version:	Radio FW v1.
	Remark: Power level setting was not adjustable and fixed default through SW Version.

Frequency List

SubGhz:

Ch Number	Frequency	Min frequency	Max frequency	Used by 802.15.4
0	902.2	902.1	902.3	
1	902.4	902.3	902.5	
2	902.6	902.5	902.7	X
3	902.8	902.7	902.9	X
4	903	902.9	903.1	
5	903.2	903.1	903.3	
6	903.4	903.3	903.5	X
7	903.6	903.5	903.7	X
8	903.8	903.7	903.9	
9	904	903.9	904.1	
10	904.2	904.1	904.3	
11	904.4	904.3	904.5	
12	904.6	904.5	904.7	
13	904.8	904.7	904.9	
14	905	904.9	905.1	
15	905.2	905.1	905.3	
16	905.4	905.3	905.5	
17	905.6	905.5	905.7	
18	905.8	905.7	905.9	
19	906	905.9	906.1	
20	906.2	906.1	906.3	X
21	906.4	906.3	906.5	X
22	906.6	906.5	906.7	X
23	906.8	906.7	906.9	
24	907	906.9	907.1	X
25	907.2	907.1	907.3	
26	907.4	907.3	907.5	
27	907.6	907.5	907.7	X
28	907.8	907.7	907.9	X
29	908	907.9	908.1	
30	908.2	908.1	908.3	X
31	908.4	908.3	908.5	
32	908.6	908.5	908.7	
33	908.8	908.7	908.9	X
34	909	908.9	909.1	X
35	909.2	909.1	909.3	
36	909.4	909.3	909.5	X
37	909.6	909.5	909.7	X
38	909.8	909.7	909.9	
39	910	909.9	910.1	X
40	910.2	910.1	910.3	
41	910.4	910.3	910.5	X
42	910.6	910.5	910.7	X
43	910.8	910.7	910.9	X
44	911	910.9	911.1	

45	911.2	911.1	911.3	X
46	911.4	911.3	911.5	X
47	911.6	911.5	911.7	
48	911.8	911.7	911.9	X
49	912	911.9	912.1	X
50	912.2	912.1	912.3	
51	912.4	912.3	912.5	X
52	912.6	912.5	912.7	X
53	912.8	912.7	912.9	
54	913	912.9	913.1	X
55	913.2	913.1	913.3	X
56	913.4	913.3	913.5	
57	913.6	913.5	913.7	X
58	913.8	913.7	913.9	
59	914	913.9	914.1	
60	914.2	914.1	914.3	
61	914.4	914.3	914.5	
62	914.6	914.5	914.7	
63	914.8	914.7	914.9	
64	915	914.9	915.1	
65	915.2	915.1	915.3	
66	915.4	915.3	915.5	
67	915.6	915.5	915.7	
68	915.8	915.7	915.9	
69	916	915.9	916.1	
70	916.2	916.1	916.3	
71	916.4	916.3	916.5	
72	916.6	916.5	916.7	
73	916.8	916.7	916.9	
74	917	916.9	917.1	
75	917.2	917.1	917.3	
76	917.4	917.3	917.5	
77	917.6	917.5	917.7	
78	917.8	917.7	917.9	
79	918	917.9	918.1	X
80	918.2	918.1	918.3	
81	918.4	918.3	918.5	X
82	918.6	918.5	918.7	X
83	918.8	918.7	918.9	
84	919	918.9	919.1	X
85	919.2	919.1	919.3	X
86	919.4	919.3	919.5	
87	919.6	919.5	919.7	X
88	919.8	919.7	919.9	
89	920	919.9	920.1	
90	920.2	920.1	920.3	X
91	920.4	920.3	920.5	X
92	920.6	920.5	920.7	
93	920.8	920.7	920.9	X
94	921	920.9	921.1	X
95	921.2	921.1	921.3	
96	921.4	921.3	921.5	X
97	921.6	921.5	921.7	X
98	921.8	921.7	921.9	

99	922	921.9	922.1	X
100	922.2	922.1	922.3	X
101	922.4	922.3	922.5	
102	922.6	922.5	922.7	X
103	922.8	922.7	922.9	
104	923	922.9	923.1	X
105	923.2	923.1	923.3	X
106	923.4	923.3	923.5	
107	923.6	923.5	923.7	X
108	923.8	923.7	923.9	X
109	924	923.9	924.1	
110	924.2	924.1	924.3	
111	924.4	924.3	924.5	
112	924.6	924.5	924.7	
113	924.8	924.7	924.9	
114	925	924.9	925.1	
115	925.2	925.1	925.3	
116	925.4	925.3	925.5	
117	925.6	925.5	925.7	
118	925.8	925.7	925.9	
119	926	925.9	926.1	
120	926.2	926.1	926.3	X
121	926.4	926.3	926.5	
122	926.6	926.5	926.7	
123	926.8	926.7	926.9	X
124	927	926.9	927.1	
125	927.2	927.1	927.3	X
126	927.4	927.3	927.5	X
127	927.6	927.5	927.7	
128	927.8	927.7	927.9	

Remark: 1. Test frequencies are the lowest channel: 902.06 MHz, the middle channel: 913.60 MHz and highest channel: 927.40 MHz





Mioty:

Channel A carrier frequency:

c	C <sub>RF</sub>	f <sub>TX</sub> in Hz	c	C <sub>RF</sub>	f <sub>TX</sub> in Hz	c	C <sub>RF</sub>	f <sub>TX</sub> in Hz
24	5	916754675.3	15	5	916497595.2	6	5	916240515.1
24	4	916752294.9	15	4	916495214.8	6	4	916238134.8
24	3	916749914.6	15	3	916492834.5	6	3	916235754.4
24	2	916747534.2	15	2	916490454.1	6	2	916233374.0
24	1	916745153.8	15	1	916488073.7	6	1	916230993.7
24	0	916742773.4	15	0	916485693.4	6	0	916228613.3
24	-1	916740393.1	15	-1	916483313.0	6	-1	916226232.9
24	-2	916738012.7	15	-2	916480932.6	6	-2	916223852.5
24	-3	916735632.3	15	-3	916478552.2	6	-3	916221472.2
24	-4	916733252.0	15	-4	916476171.9	6	-4	916219091.8
24	-5	916730871.6	15	-5	916473791.5	6	-5	916216711.4
		916728491.2			916471411.1			916214331.1
23	5	916726110.8	14	5	916469030.8	5	5	916211950.7
23	4	916723730.5	14	4	916466650.4	5	4	916209570.3
23	3	916721350.1	14	3	916464270.0	5	3	916207189.9
23	2	916718969.7	14	2	916461889.6	5	2	916204809.6
23	1	916716589.4	14	1	916459509.3	5	1	916202429.2
23	0	916714209.0	14	0	916457128.9	5	0	916200048.8
23	-1	916711828.6	14	-1	916454748.5	5	-1	916197668.5
23	-2	916709448.2	14	-2	916452368.2	5	-2	916195288.1
23	-3	916707067.9	14	-3	916449987.8	5	-3	916192907.7
23	-4	916704687.5	14	-4	916447607.4	5	-4	916190527.3
23	-5	916702307.1	14	-5	916445227.1	5	-5	916188147.0
		916699926.8			916442846.7			916185766.6
22	5	916697546.4	13	5	916440466.3	4	5	916183386.2
22	4	916695166.0	13	4	916438085.9	4	4	916181005.9
22	3	916692785.6	13	3	916435705.5	4	3	916178625.5
22	2	916690405.3	13	2	916433325.2	4	2	916176245.1
22	1	916688024.9	13	1	916430944.8	4	1	916173864.7
22	0	916685644.5	13	0	916428564.5	4	0	916171484.4
22	-1	916683264.2	13	-1	916426184.1	4	-1	916169104.0

22	-2	916680883.8	13	-2	916423803.7	4	-2	916166723.6
22	-3	916678503.4	13	-3	916421423.3	4	-3	916164343.3
22	-4	916676123.0	13	-4	916419043.0	4	-4	916161962.9
	-5	916673742.7	13	-5	916416662.6	4	-5	916159582.5
		916671362.3			916414282.2			916157202.1
21	5	916668981.9	12	5	916411901.9	3	5	916154821.8
21	4	916666601.6	12	4	916409521.5	3	4	916152441.4
21	3	916664221.2	12	3	916407141.1	3	3	916150061.0
21	2	916661840.8	12	2	916404760.7	3	2	916147680.7
21	1	916659460.4	12	1	916402380.4	3	1	916145300.3
21	0	916657080.1	12	0	916400000.0	3	0	916142919.9
21	-1	916654699.7	12	-1	916397619.6	3	-1	916140539.6
21	-2	916652319.3	12	-2	916395239.3	3	-2	916138159.2
21	-3	916649939.0	12	-3	916392858.9	3	-3	916135778.8
21	-4	916647558.6	12	-4	916390478.5	3	-4	916133398.4
21	-5	916645178.2	12	-5	916388098.1	3	-5	916131018.1
		916642797.9			916385717.8			916128637.7
20	5	916640417.5	11	5	916383337.4	2	5	916126257.3
20	4	916638037.1	11	4	916380957.0	2	4	916123877.0
20	3	916635656.7	11	3	916378576.7	2	3	916121496.6
20	2	916633276.4	11	2	916376196.3	2	2	916119116.2
20	1	916630896.0	11	1	916373815.9	2	1	916116735.8
20	0	916628515.6	11	0	916371435.5	2	0	916114355.5
20	-1	916626135.3	11	-1	916369055.2	2	-1	916111975.1
20	-2	916623754.9	11	-2	916366674.8	2	-2	916109594.7
20	-3	916621374.5	11	-3	916364294.4	2	-3	916107214.4
20	-4	916618994.1	11	-4	916361914.1	2	-4	916104834.0
20	-5	916616613.8	11	-5	916359533.7	2	-5	916102453.6
		916614233.4			916357153.3			916100073.2
19	5	916611853.0	10	5	916354772.9	1	5	916097692.9
19	4	916609472.7	10	4	916352392.6	1	4	916095312.5
19	3	916607092.3	10	3	916350012.2	1	3	916092932.1
19	2	916604711.9	10	2	916347631.8	1	2	916090551.8
19	1	916602331.5	10	1	916345251.5	1	1	916088171.4
19	0	916599951.2	10	0	916342871.1	1	0	916085791.0
19	-1	916597570.8	10	-1	916340490.7	1	-1	916083410.6
19	-2	916595190.4	10	-2	916338110.4	1	-2	916081030.3
19	-3	916592810.1	10	-3	916335730.0	1	-3	916078649.9
19	-4	916590429.7	10	-4	916333349.6	1	-4	916076269.5
19	-5	916588049.3	10	-5	916330969.2	1	-5	916073889.2
		916585668.9			916328588.9			916071508.8
18	5	916583288.6	9	5	916326208.5	0	5	916069128.4
18	4	916580908.2	9	4	916323828.1	0	4	916066748.0
18	3	916578527.8	9	3	916321447.8	0	3	916064367.7

18	2	916576147.5	9	2	916319067.4	0	2	916061987.3
18	1	916573767.1	9	1	916316687.0	0	1	916059606.9
18	0	916571386.7	9	0	916314306.6	0	0	916057226.6
18	-1	916569006.3	9	-1	916311926.3	0	-1	916054846.2
18	-2	916566626.0	9	-2	916309545.9	0	-2	916052465.8
18	-3	916564245.6	9	-3	916307165.5	0	-3	916050085.4
18	-4	916561865.2	9	-4	916304785.2	0	-4	916047705.1
18	-5	916559484.9	9	-5	916302404.8	0	-5	916045324.7
		916557104.5			916300024.4			
17	5	916554724.1	8	5	916297644.0			
17	4	916552343.8	8	4	916295263.7			
17	3	916549963.4	8	3	916292883.3			
17	2	916547583.0	8	2	916290502.9			
17	1	916545202.6	8	1	916288122.6			
17	0	916542822.3	8	0	916285742.2			
17	-1	916540441.9	8	-1	916283361.8			
17	-2	916538061.5	8	-2	916280981.4			
17	-3	916535681.2	8	-3	916278601.1			
17	-4	916533300.8	8	-4	916276220.7			
17	-5	916530920.4	8	-5	916273840.3			
		916528540.0			916271460.0			
16	5	916526159.7	7	5	916269079.6			
16	4	916523779.3	7	4	916266699.2			
16	3	916521398.9	7	3	916264318.8			
16	2	916519018.6	7	2	916261938.5			
16	1	916516638.2	7	1	916259558.1			
16	0	916514257.8	7	0	916257177.7			
16	-1	916511877.4	7	-1	916254797.4			
16	-2	916509497.1	7	-2	916252417.0			
16	-3	916507116.7	7	-3	916250036.6			
16	-4	916504736.3	7	-4	916247656.3			
16	-5	916502356.0	7	-5	916245275.9			
		916499975.6			916242895.5			

Channel B carrier frequency:

c	C <sub>RF</sub>	f <sub>TX</sub> in Hz	c	C <sub>RF</sub>	f <sub>TX</sub> in Hz	c	C <sub>RF</sub>	f <sub>TX</sub> in Hz
24	5	915954870.6	15	5	915697790.5	6	5	915440710.4
24	4	915952490.2	15	4	915695410.2	6	4	915438330.1
24	3	915950109.9	15	3	915693029.8	6	3	915435949.7
24	2	915947729.5	15	2	915690649.4	6	2	915433569.3
24	1	915945349.1	15	1	915688269.0	6	1	915431189.0

24	0	915942968.8	15	0	915685888.7	6	0	915428808.6
24	-1	915940588.4	15	-1	915683508.3	6	-1	915426428.2
24	-2	915938208.0	15	-2	915681127.9	6	-2	915424047.9
24	-3	915935827.6	15	-3	915678747.6	6	-3	915421667.5
24	-4	915933447.3	15	-4	915676367.2	6	-4	915419287.1
24	-5	915931066.9	15	-5	915673986.8	6	-5	915416906.7
		915928686.5			915671606.4			915414526.4
23	5	915926306.2	14	5	915669226.1	5	5	915412146.0
23	4	915923925.8	14	4	915666845.7	5	4	915409765.6
23	3	915921545.4	14	3	915664465.3	5	3	915407385.3
23	2	915919165.0	14	2	915662085.0	5	2	915405004.9
23	1	915916784.7	14	1	915659704.6	5	1	915402624.5
23	0	915914404.3	14	0	915657324.2	5	0	915400244.1
23	-1	915912023.9	14	-1	915654943.8	5	-1	915397863.8
23	-2	915909643.6	14	-2	915652563.5	5	-2	915395483.4
23	-3	915907263.2	14	-3	915650183.1	5	-3	915393103.0
23	-4	915904882.8	14	-4	915647802.7	5	-4	915390722.7
23	-5	915902502.4	14	-5	915645422.4	5	-5	915388342.3
		915900122.1			915643042.0			915385961.9
22	5	915897741.7	13	5	915640661.6	4	5	915383581.5
22	4	915895361.3	13	4	915638281.3	4	4	915381201.2
22	3	915892981.0	13	3	915635900.9	4	3	915378820.8
22	2	915890600.6	13	2	915633520.5	4	2	915376440.4
22	1	915888220.2	13	1	915631140.1	4	1	915374060.1
22	0	915885839.8	13	0	915628759.8	4	0	915371679.7
22	-1	915883459.5	13	-1	915626379.4	4	-1	915369299.3
22	-2	915881079.1	13	-2	915623999.0	4	-2	915366918.9
22	-3	915878698.7	13	-3	915621618.7	4	-3	915364538.6
22	-4	915876318.4	13	-4	915619238.3	4	-4	915362158.2
22	-5	915873938.0	13	-5	915616857.9	4	-5	915359777.8
		915871557.6			915614477.5			915357397.5
21	5	915869177.2	12	5	915612097.2	3	5	915355017.1
21	4	915866796.9	12	4	915609716.8	3	4	915352636.7
21	3	915864416.5	12	3	915607336.4	3	3	915350256.3
21	2	915862036.1	12	2	915604956.1	3	2	915347876.0
21	1	915859655.8	12	1	915602575.7	3	1	915345495.6
21	0	915857275.4	12	0	915600195.3	3	0	915343115.2
21	-1	915854895.0	12	-1	915597814.9	3	-1	915340734.9
21	-2	915852514.6	12	-2	915595434.6	3	-2	915338354.5
21	-3	915850134.3	12	-3	915593054.2	3	-3	915335974.1
21	-4	915847753.9	12	-4	915590673.8	3	-4	915333593.8
21	-5	915845373.5	12	-5	915588293.5	3	-5	915331213.4
		915842993.2			915585913.1			915328833.0
20	5	915840612.8	11	5	915583532.7	2	5	915326452.6

20	4	915838232.4	11	4	915581152.3	2	4	915324072.3
20	3	915835852.1	11	3	915578772.0	2	3	915321691.9
20	2	915833471.7	11	2	915576391.6	2	2	915319311.5
20	1	915831091.3	11	1	915574011.2	2	1	915316931.2
20	0	915828710.9	11	0	915571630.9	2	0	915314550.8
20	-1	915826330.6	11	-1	915569250.5	2	-1	915312170.4
20	-2	915823950.2	11	-2	915566870.1	2	-2	915309790.0
20	-3	915821569.8	11	-3	915564489.7	2	-3	915307409.7
20	-4	915819189.5	11	-4	915562109.4	2	-4	915305029.3
20	-5	915816809.1	11	-5	915559729.0	2	-5	915302648.9
		915814428.7			915557348.6			915300268.6
19	5	915812048.3	10	5	915554968.3	1	5	915297888.2
19	4	915809668.0	10	4	915552587.9	1	4	915295507.8
19	3	915807287.6	10	3	915550207.5	1	3	915293127.4
19	2	915804907.2	10	2	915547827.1	1	2	915290747.1
19	1	915802526.9	10	1	915545446.8	1	1	915288366.7
19	0	915800146.5	10	0	915543066.4	1	0	915285986.3
19	-1	915797766.1	10	-1	915540686.0	1	-1	915283606.0
19	-2	915795385.7	10	-2	915538305.7	1	-2	915281225.6
19	-3	915793005.4	10	-3	915535925.3	1	-3	915278845.2
19	-4	915790625.0	10	-4	915533544.9	1	-4	915276464.8
19	-5	915788244.6	10	-5	915531164.6	1	-5	915274084.5
		915785864.3			915528784.2			915271704.1
18	5	915783483.9	9	5	915526403.8	0	5	915269323.7
18	4	915781103.5	9	4	915524023.4	0	4	915266943.4
18	3	915778723.1	9	3	915521643.1	0	3	915264563.0
18	2	915776342.8	9	2	915519262.7	0	2	915262182.6
18	1	915773962.4	9	1	915516882.3	0	1	915259802.2
18	0	915771582.0	9	0	915514502.0	0	0	915257421.9
18	-1	915769201.7	9	-1	915512121.6	0	-1	915255041.5
18	-2	915766821.3	9	-2	915509741.2	0	-2	915252661.1
18	-3	915764440.9	9	-3	915507360.8	0	-3	915250280.8
18	-4	915762060.5	9	-4	915504980.5	0	-4	915247900.4
18	-5	915759680.2	9	-5	915502600.1	0	-5	915245520.0
		915757299.8			915500219.7			
17	5	915754919.4	8	5	915497839.4			
17	4	915752539.1	8	4	915495459.0			
17	3	915750158.7	8	3	915493078.6			
17	2	915747778.3	8	2	915490698.2			
17	1	915745397.9	8	1	915488317.9			
17	0	915743017.6	8	0	915485937.5			
17	-1	915740637.2	8	-1	915483557.1			
17	-2	915738256.8	8	-2	915481176.8			
17	-3	915735876.5	8	-3	915478796.4			

17	-4	915733496.1	8	-4	915476416.0			
17	-5	915731115.7	8	-5	915474035.6			
		915728735.4			915471655.3			
16	5	915726355.0	7	5	915469274.9			
16	4	915723974.6	7	4	915466894.5			
16	3	915721594.2	7	3	915464514.2			
16	2	915719213.9	7	2	915462133.8			
16	1	915716833.5	7	1	915459753.4			
16	0	915714453.1	7	0	915457373.0			
16	-1	915712072.8	7	-1	915454992.7			
16	-2	915709692.4	7	-2	915452612.3			
16	-3	915707312.0	7	-3	915450231.9			
16	-4	915704931.6	7	-4	915447851.6			
16	-5	915702551.3	7	-5	915445471.2			
		915700170.9			915443090.8			

BLE:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
<b>0</b>	<b>2402</b>	20	2442
1	2404	21	2444
2	2406	22	2446
3	2408	23	2448
4	2410	24	2450
5	2402	25	2452
6	2414	26	2454
7	2416	27	2456
8	2418	28	2458
9	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2480
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
<b>19</b>	<b>2440</b>	<b>39</b>	<b>2480</b>

#### 4.2 Description of Support Units

The EUT has been with corresponding accessories as below:

Supplied by SGS:

Description	Manufacturer	Model No.	Serial No.
Notebook	Dell	Inspiron 15	4RZCWN2

#### 4.3 Test Location

All tests were performed at:

SGS Hong Kong Limited  
Unit 2 and 3, G/F, Block A, Po Lung Centre,  
11 Wang Chiu Road, Kowloon Bay, Kowloon, Hong Kong  
Tel: +852 2305 2570 Fax: +852 2756 4480

No tests were sub-contracted.

#### 4.4 Test Facility

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

• **IAS Accreditation (Lab Code: TL-817)**

SGS Hong Kong Limited has met the requirements of AC89, IAS Accreditation Criteria for Testing Laboratories, and has demonstrated compliance with ISO/IEC Standard 17025:2017, General requirements for the competence of testing and calibration laboratories. This organization is accredited to provide the services specified in the scope of accreditation maintained on the IAS website ([www.iasonline.org](http://www.iasonline.org)).

The report must not be used by the client to claim product certification, approval, or endorsement by IAS, NIST, or any agency of the Federal Government.

• **FCC Recognized Accredited Test Firm (CAB Registration No.: 514599)**

SGS Hong Kong Limited has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: HK0015, Test Firm Registration Number: 514599.

• **Industry Canada (Site Registration No.: 26103; CAB Identifier No.: HK0015)**

SGS Hong Kong Limited has been recognized by Department of Innovation, Science and Economic Development (ISED) Canada as a wireless testing laboratory. The acceptance letter from the ISED is maintained in our files. CAB Identifier No: HK0015, Site Registration Number: 26103.

#### 4.5 Deviation from Standards

None

#### 4.6 Abnormalities from Standard Conditions

None

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## 5 Radio Spectrum Technical Requirement

### 5.1 RF Exposure

#### 5.1.1 Test Requirement:

CFR 47 Part 1.1310

Limit:

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in Part1.1307(b)

**TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)**

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposure</b>				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f <sup>2</sup>	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f <sup>2</sup>	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz

\* = Plane-wave equivalent power density

According to IEEE C95.3:2002 section 5.5.1.1, The power density S at a point on the axis at a distance d from a transmitting antenna is given by the Friis free-space transmission formula

$$S = \frac{PG}{4\pi d^2}$$

*S* = power density (mW/cm<sup>2</sup>)  
*P* = the net power delivered to the antenna (mW)  
*G* = gain of the antenna in linear scale  
*d* = distance between observation point and center of the radiator (cm)



### 5.1.1 IC Radiofrequency radiation

According to RSS-102 Issue 5, section 2.5.2 Exemption.

RF exposure evaluation is required if the separation distance between the user and the device's radiating element is greater than 20 cm, except when the device operates as follows:

below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);

at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $22.48/f^{0.5}W$  (adjusted for tune-up tolerance), where  $f$  is in MHz;

at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);

at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $1.31 \times 10^{-2} f^{0.6834} W$  (adjusted for tune-up tolerance), where  $f$  is in MHz;

at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

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**5.1.2 EUT RF Exposure Evaluation**

SubGhz:

Antenna Gain: 2dBi

The maximum Gain measured in fully anechoic chamber is 1.585 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

For FCC;

FHSS:

Channel	Frequency (MHz)	Conduct power (including Tune-up tolerance) (dBm)	Conduct power (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit	Weighted MPE Ratios	Result
Low	902.60	9.46	8.831	0.0035	0.6017	0.0058	PASS
Middle	913.60	9.00	7.943	0.0032	0.6091	0.0052	PASS
High	927.40	9.37	8.650	0.0034	0.6183	0.0056	PASS

For IC:

FHSS:

Channel	Frequency (MHz)	Conduct power (including Tune-up tolerance) (dBm)	E.I.R.P (dBm)	E.I.R.P (W)	Limit (W)	Weighted Power Ratios	Result
Low	902.60	9.46	11.46	0.014	1.371	0.010	PASS
Middle	913.60	9.00	11.00	0.013	1.382	0.009	PASS
High	927.40	9.37	11.37	0.014	1.397	0.010	PASS

Note:

1. Refer to report No. HKEM221200109502 for EUT test conducted power value.



Mioty:

Antenna Gain: 2dBi

The maximum Gain measured in fully anechoic chamber is 1.585 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

For FCC;

FHSS:

Channel	Frequency (MHz)	Conduct power (including Tune-up tolerance) (dBm)	Conduct power (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit	Weighted MPE Ratios	Result
Low	915.25	13.08	20.324	0.0064	0.6102	0.0105	PASS
High	916.75	13.52	22.491	0.0071	0.6112	0.0116	PASS

For IC:

FHSS:

Channel	Frequency (MHz)	Conduct power (including Tune-up tolerance) (dBm)	E.I.R.P (dBm)	E.I.R.P (W)	Limit (W)	Weighted Power Ratios	Result
Low	915.25	13.08	15.08	0.0322	1.3842	0.0233	PASS
High	916.75	13.52	15.5	0.0356	1.3857	0.0257	PASS

Note:

1. Refer to report No. HKEM221200109502 for EUT test conducted power value.



BLE:

Antenna Gain: 3.5dBi according to the test report UL-RPT-RP13337971-1216A V2.0.

The maximum Gain measured in fully anechoic chamber is 2.24 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

For FCC;

Conduct power data taken from the test report UL-RPT-RP13337971-1216A V2.0 (FCC ID:2ABCB-RPICM4, original FCC ID:2ABCB-RPIRM0), the worst-case conduct power is 4.7dBm.

Frequency (MHz)	Conduct power (including Tune-up tolerance) (dBm)	Conduct power (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit	Weighted MPE Ratios	Result
2402	4.6	2.884	0.0013	1	0.0013	PASS
2440	4.7	2.951	0.0013	1	0.0013	PASS
2480	4.2	2.630	0.0012	1	0.0012	PASS

For IC:

Conduct power data taken from the test report UL-RPT-RP13337971-1216A V2.0 (IC: 20953-RPICM4, original IC:20953-RPIRM0), the worst-case conduct power is 4.7dBm.

Frequency (MHz)	Conduct power (including Tune-up tolerance) (dBm)	E.I.R.P (dBm)	E.I.R.P (W)	Limit (W)	Weighted Power Ratios	Result
2402	4.6	8.1	0.006	2.68	0.0024	PASS
2440	4.7	8.2	0.007	2.71	0.0024	PASS
2480	4.2	7.7	0.006	2.74	0.0022	PASS

For simultaneous transmission of SubGhz, Mioty and BLE:

For FCC:

SubGhz Maximum MPE Ratios	Mioty Maximum MPE Ratios	BLE Maximum MPE Ratios	Total Weighted MPE Ratios	Limit	Result
0.0058	0.0116	0.0013	0.0187	1	PASS

For IC:

SubGhz Maximum MPE Ratios	Mioty Maximum MPE Ratios	BLE Maximum MPE Ratios	Total Weighted Power Ratios	Limit	Result
0.01	0.0257	0.0024	0.0381	1	PASS



## 6 Photographs

Remark: Photos refer to Appendix: External Photo, Internal Photo, and Setup Photo

- End of the Report -

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