Report No.: GTS202109000200E04

RF Exposure Report

Applicant:	SHENZHEN WLINK TECHNOLOGY CO., LTD.
Address of Applicant:	2A, F5 Building, TCL International E City, No.1001 Zhongshanyuan Rd., Nanshan Dist., Shenzhen, 518052, China
Manufacturer:	SHENZHEN WLINK TECHNOLOGY CO., LTD.
Address of Manufacturer:	2A, F5 Building, TCL International E City, No.1001 Zhongshanyuan Rd., Nanshan Dist., Shenzhen, 518052, China

Equipment Under Test (EUT)

Product Name:	Industrial 3G/4G Cellular Router
Model No.:	WL-R210
Applicable standards:	EN 62311:2008
Date of report issue:	October 09, 2021
Test Result :	PASS *

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

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives. The protection requirements with respect to electromagnetic compatibility contained in Directive 2014/53/EU are considered.

Robinson Luo
Laboratory Manager

2 Version

Report No.	Version No.	Date	Description
GTS201903000054E04	00	March 11, 2019	Original
GTS202109000200E04	01	October 09, 2021	Change adapter, address of applicant/ manufacturer; Add telecommunication port; Delete factory.

Prepared By: *Project Engineer* ***Date:*** *October 09, 2021*

Check By: *Reviewer* ***Date:*** *October 09, 2021*

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4 General Information

4.1 General Description of EUT

Product Name:	Industrial 3G/4G Cellular Router
Model No.:	WL-R210
Operation Frequency:	UTRA-FDD: BAND 1, BAND 2, BAND 5, BAND 8 E-UTRA: BAND 1, BAND 3, BAND 7, BAND 8, BAND 20 GSM: GSM900, GSM1800. WIFI: 2412MHz ~ 2472MHz
Modulation Type:	UTRA-FDD & E-UTRA: QPSK, 16QAM GSM: GMSK WIFI: DSSS, OFDM
Antenna Type:	External Antenna
Antenna Gain:	UTRA-FDD & E-UTRA:2dBi WIFI:2dBi
Power Supply:	Adapter: Model No.: SAW20-120-1500GD Input: AC 100-240V, 50/60Hz, 0.6A Output: DC 12.0V, 1.5A, 18.0W

4.2 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 Accreditation Program (NVLAP).

4.3 Test Location

All tests were performed at:

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

4.4 Description of Support Units

The EUT has been tested as an independent unit.

4.5 Deviation from Standards

None.

4.6 Abnormalities from Standard Conditions

None.

4.7 Other Information Requested by the Customer

None.

5 Technical Requirements Specification in EN 62311

Test Requirement:	EN 62311
Test Method:	EN 62311
General Description of Applied Standards	EN 62311 Generic standard to demonstrate the compliance of electronic and electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields (0 Hz–300 GHz) is to demonstrate the compliance of apparatus with the basic restrictions or reference levels on exposure of the general public related to electric, magnetic, electromagnetic fields as well as induced and contact current.
Limit:	According to EN 62311, the criteria listed in the below table shall be used to evalouate the environmental inpact of human exposure to radio-frequency (RF) radiation as specified table 2 of Council Recommendation 1999/519/EC.
Test method:	According to the Far field calculation formula:
Result:	Pass

Reference levels for electric, magnetic and electromagnetic fields (0 Hz to 300 GHz, unperturbed rms values)

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (μT)	Equivalent plane wave power density S_{eq} (W/m²)
0-1 Hz	—	$3,2 \times 10^4$	4×10^4	—
1-8 Hz	10 000	$3,2 \times 10^4/f^2$	$4 \times 10^4/f^2$	—
8-25 Hz	10 000	4 000/f	5 000/f	—
0,025-0,8 kHz	250/f	4/f	5/f	—
0,8-3 kHz	250/f	5	6,25	—
3-150 kHz	87	5	6,25	—
0,15-1 MHz	87	0,73/f	0,92/f	—
1-10 MHz	$87/f^{1/2}$	0,73/f	0,92/f	—
10-400 MHz	28	0,073	0,092	2
400-2 000 MHz	$1,375\ f^{1/2}$	$0,0037\ f^{1/2}$	$0,0046\ f^{1/2}$	f/200
2-300 GHz	61	0,16	0,20	10

Notes:

1. f as indicated in the frequency range column.

Far Field Calculation Formula

$$E = \frac{\sqrt{30PG(\theta,\phi)}}{r}$$

G = antenna gain relative to an isotropic antenna

θ, ϕ = elevation and azimuth angles to point of investigation

r = distance from observation point to the antenna

The antenna of the product, under normal use condition is at least 20cm away from the body of the user. Warning statement ot the user for keeing 20cm separation distance and the prohibition of operating to a person has been printed on the user manual. So, this product under normal use is located on electromagnetic far field between the human body.

Measurement Data:

Operation in GSM900

(uplink: 880-915MHz, downlink: 925-960MHz)

Mode	P_{max} (dBm)	Gain (dBi)	$EIRP_{max}$ (dBm)	$EIRP_{max}$ (W)	R (m)	E (v/m)	Reference Level(v/m)	Conclusion
1TS*(1/8)	33.5	2.5	36.00	0.498	0.20	19.32	40.79	PASS
2TS*(2/8)	31.0	2.5	33.50	0.560	0.20	20.49	40.49	PASS
3TS*(3/8)	30.0	2.5	32.50	0.667	0.20	22.36	40.79	PASS
4TS*(4/8)	28.0	2.5	30.50	0.561	0.20	20.51	40.79	PASS

Note:*- based on the maximum tune-up tolerance limit declared by manufacturer. According to the Table above, we can conclude the maximum E-field strength of observation point with a distance from the point to the antenna 0.2m is 22.36V/m, which is below the reference level of 40.79 V/m at 880MHz, so it is into compliance.

Operation in GSM1800

(uplink: 1710-1785MHz, downlink: 1805-1880MHz)

Mode	P_{max} (dBm)	Gain (dBi)	$EIRP_{max}$ (dBm)	$EIRP_{max}$ (W)	R (m)	E (v/m)	Reference Level(v/m)	Conclusion
1TS*(1/8)	30.5	2.5	33.00	0.249	0.20	13.68	56.86	PASS
2TS*(2/8)	28.0	2.5	30.50	0.281	0.20	14.50	56.86	PASS
3TS*(3/8)	27.3	2.5	29.80	0.358	0.20	16.39	56.86	PASS
4TS*(4/8)	25.0	2.5	27.50	0.281	0.20	14.52	56.86	PASS

Note:*- based on the maximum tune-up tolerance limit declared by manufacturer According to the Table above, we can conclude the maximum E-field strength of observation point with a distance from the point to the antenna 0.2m is 16.39V/m, which is below the reference level of 56.86 V/m at 1710MHz, so it is into compliance.

Operation in UMTS Band 1

(uplink: 1920-1980MHz, downlink: 2110-2170MHz)

P_{max} (dBm)	Gain (dBi)	$EIRP_{max}$ (dBm)	$EIRP_{max}$ (W)	R (m)	E (v/m)	Reference Level(v/m)	Conclusion
24.0	2.5	26.50	0.447	0.20	18.30	60.25	PASS

Note:*- based on the maximum tune-up tolerance limit declared by manufacturer According to the Table above, we can conclude the maximum E-field strength of observation point with a distance from the point to the antenna 0.2m is 18.30V/m, which is below the reference level of 60.25 V/m at 1920MHz, so it is into compliance.

Operation in UMTS Band 8

(uplink: 880-915MHz, downlink: 925-960MHz)

P_{max} (dBm)	Gain (dBi)	$EIRP_{max}$ (dBm)	$EIRP_{max}$ (W)	R (m)	E (v/m)	Reference Level(v/m)	Conclusion
24.0	2.5	26.50	0.447	0.20	18.30	40.79	PASS

Note:*- based on the maximum tune-up tolerance limit declared by manufacturer According to the Table above, we can conclude the maximum E-field strength of observation point with a distance from the point to the antenna 0.2m is 18.30V/m, which is below the reference level of 40.79 V/m at 880MHz, so it is into compliance.

Operation in UMTS Band 2
(uplink: 1850 – 1910MHz, downlink: 1930 – 1990MHz)

P_{max} (dBm)	Gain (dBi)	$EIRP_{max}$ (dBm)	$EIRP_{max}$ (W)	R (m)	E (v/m)	Reference Level(v/m)	Conclusion
24.0	2.5	26.50	0.447	0.20	18.30	60.25	PASS

Note:*- based on the maximum tune-up tolerance limit declared by manufacturer According to the Table above, we can conclude the maximum E-field strength of observation point with a distance from the point to the antenna 0.2m is 18.30V/m, which is below the reference level of 60.25 V/m at 1920MHz, so it is into compliance.

Operation in UMTS Band 5
(uplink: 824 – 849MHz, downlink: 869 – 894MHz)

P_{max} (dBm)	Gain (dBi)	$EIRP_{max}$ (dBm)	$EIRP_{max}$ (W)	R (m)	E (v/m)	Reference Level(v/m)	Conclusion
24.0	2.5	26.50	0.447	0.20	18.30	40.79	PASS

Note:*- based on the maximum tune-up tolerance limit declared by manufacturer According to the Table above, we can conclude the maximum E-field strength of observation point with a distance from the point to the antenna 0.2m is 18.30V/m, which is below the reference level of 40.79 V/m at 880MHz, so it is into compliance.

Operation in LTE Band I
(uplink: 1920-1980MHz, downlink: 2110-2170MHz)

P_{max} (dBm)	Gain (dBi)	$EIRP_{max}$ (dBm)	$EIRP_{max}$ (W)	R (m)	E (v/m)	Reference Level(v/m)	Conclusion
23.5	2.5	26.00	0.398	0.20	17.28	60.25	PASS

Note:*- based on the maximum tune-up tolerance limit declared by manufacturer According to the Table above, we can conclude the maximum E-field strength of observation point with a distance from the point to the antenna 0.2m is 17.28V/m, which is below the reference level of 60.25 V/m at 1920MHz, so it is into compliance.

Operation in LTE Band III
(uplink: 1710-1785MHz, downlink: 1805-1880MHz)

P_{max} (dBm)	Gain (dBi)	$EIRP_{max}$ (dBm)	$EIRP_{max}$ (W)	R (m)	E (v/m)	Reference Level(v/m)	Conclusion
23.5	2.5	26.00	0.398	0.20	17.28	56.86	PASS

Note:*- based on the maximum tune-up tolerance limit declared by manufacturer According to the Table above, we can conclude the maximum E-field strength of observation point with a distance from the point to the antenna 0.2m is 17.28V/m, which is below the reference level of 56.86 V/m at 1710MHz, so it is into compliance.

Operation in LTE Band VII
(uplink: 2500-2570MHz, downlink: 2620-2690MHz)

P_{max} (dBm)	Gain (dBi)	$EIRP_{max}$ (dBm)	$EIRP_{max}$ (W)	R (m)	E (v/m)	Reference Level(v/m)	Conclusion
23.5	2.5	26.00	0.398	0.20	17.28	61.00	PASS

Note:*- based on the maximum tune-up tolerance limit declared by manufacturer According to the Table above, we can conclude the maximum E-field strength of observation point with a distance from the point to the antenna 0.2m is 17.28V/m, which is below the reference level of 61.00 V/m at 2500MHz, so it is into compliance.

Operation in LTE Band VIII

(uplink: 880-915MHz, downlink: 925-960MHz)

P_{max} (dBm)	Gain (dBi)	$EIRP_{max}$ (dBm)	$EIRP_{max}$ (W)	R (m)	E (v/m)	Reference Level(v/m)	Conclusion
23.5	2.5	26.00	0.398	0.20	17.28	40.79	PASS

Note:*- based on the maximum tune-up tolerance limit declared by manufacturer According to the Table above, we can conclude the maximum E-field strength of observation point with a distance from the point to the antenna 0.2m is 17.28V/m, which is below the reference level of 40.79 V/m at 880MHz, so it is into compliance.

Operation in LTE Band XX

(uplink: 832-862MHz, downlink: 791-821MHz)

P_{max} (dBm)	Gain (dBi)	$EIRP_{max}$ (dBm)	$EIRP_{max}$ (W)	R (m)	E (v/m)	Reference Level(v/m)	Conclusion
23.5	2.5	26.00	0.398	0.20	17.28	39.66	PASS

Note:*- based on the maximum tune-up tolerance limit declared by manufacturer According to the Table above, we can conclude the maximum E-field strength of observation point with a distance from the point to the antenna 0.2m is 17.28V/m, which is below the reference level of 39.66 V/m at 832MHz, so it is into compliance.

802.11b mode					
Frequency (MHz)	Output Power (dBm)	Output Power (mW)	E Field Strength (V/m)	Limit (V/m)	Result
2412	18.25	66.83	7.08	61.00	Pass
2442	18.18	65.77	7.02		
2472	18.22	66.37	7.06		
802.11g mode					
Frequency (MHz)	Output Power (dBm)	Output Power (mW)	E Field Strength (V/m)	Limit (V/m)	Result
2412	17.76	59.70	6.69	61.00	Pass
2442	17.68	58.61	6.63		
2472	17.62	57.81	6.58		
802.11n(HT20) mode					
Frequency (MHz)	Output Power (dBm)	Output Power (mW)	E Field Strength (V/m)	Limit (V/m)	Result
2412	17.64	58.08	6.60	61.00	Pass
2442	17.54	56.75	6.52		
2472	17.53	56.62	6.52		
802.11n(HT40) mode					
Frequency (MHz)	Output Power (dBm)	Output Power (mW)	E Field Strength (V/m)	Limit (V/m)	Result
2422	14.59	28.77	4.65	61.00	Pass
2442	14.48	28.05	4.59		
2462	14.42	27.67	4.56		

------End------