



RF EXPOSURE REPORT

Product: Industrial Dual SIM Cellular VPN Router

Model Name: R3000-L4L

FCC ID: 2AAJGR3KL

Applicant: Guangzhou Robustel Technologies Co., Limited

Address: 3rd Floor, Building F, Kehui Park, No.95, Daguan Road,

Tianhe District, Guangzhou 510660, China

Manufacturer: Guangzhou Robustel Technologies Co., Limited

Address: 3rd Floor, Building F, Kehui Park, No.95, Daguan Road,

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Prepared by: Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch

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Report No.: RF170607W003

Received Date: Jun. 07, 2017

Test Date: Jun. 08, 2017 ~ Jun. 20, 2017

Issued Date: Jun. 21, 2017

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF170607W003	Original release	Jun. 21, 2017

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1 CERTIFICATION

PRODUCT: Industrial Dual SIM Cellular VPN Router

BRAND NAME: Robustel

MODEL NAME: R3000-L4L

APPLICANT: Guangzhou Robustel Technologies Co., Limited

TESTED: Jun. 08, 2017 ~ Jun. 20, 2017

TEST SAMPLE: Production Unit

STANDARDS: FCC Part 2 (Section 2.1091)

FCC OET Bulletin 65, Supplement C (01-01)

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.1

The above equipment has been tested by **Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch** and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : _______, DATE: _______, Jun. 21, 2017

(Harry Li/ Engineer)

APPROVED BY: _______, **DATE**: _______, **DATE**: _______, Jun. 21, 2017

(Sam Tung / Manager)

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2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Industrial Dual	SIM Cellular VPN Router			
MODEL NAME	R3000-L4L				
ADDITIONAL MODELS	R3000-L3P, R3	3000-L3H			
POWER SUPPLY	DC 12V				
OPERATING TEMPERATURE RANGE	-40 ~ 85°C				
MODULATION TYPE	LTE QPSK, 16QAM				
OPERATING FREQUENCY	LTE	1710.7MHz ~ 1754.3MHz (FOR LTE Band4) 779.5MHZ ~ 784.5MHZ (FOR LTE Band13)			
ANTENNA GAIN	Fixed External	Antenna with 2.17dBi			
HW VERSION	V1.1.0				
SW VERSION	V2.9.1				
I/O PORTS	Refer to user's	manual			
CABLE SUPPLIED	N/A				

NOTE:

- 1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- 2. Additional models R3000-L3P, R3000-L3H are identical with the test model R3000-L4L except the model NO. for marketing purpose.
- 3. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

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3 RF EXPOSURE

3.1 LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

FREQUENCY RANGE (MHz)												
LIMI	LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE											
300-1500			F/1500	30								
1500-100,000			1.0	30								

F = Frequency in MHz

3.2 MPE CALCULATION FORMULA

Pd = (Pout*G) / (4*pi*r2)

where

Pd = power density in mW/cm2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

3.3 CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

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3.4 CONDUCTED POWER

LTE BAND 4

LTE BANI	LTE Band 4										
BW	Modulation	RB	RB	Low CH 19957	Mid CH 20175	High CH 20393	MPR				
BW	Wiodulation	Size	Offset	Frequency 1710.7 MHz	Frequency 1732.5 MHz	Frequency 1754.3 MHz	WIFIX				
		1	0	22.63	22.66	22.86	0				
		1	2	22.59	22.62	22.82	0				
		1	5	22.56	22.59	22.79	0				
	QPSK	3	0	22.61	22.64	22.84	0				
		3	1	22.57	22.60	22.80	0				
		3	3	22.54	22.57	22.77	0				
4 45411-		6	0	21.73	21.76	21.96	1				
1.4MHz	16QAM	1	0	21.88	21.91	22.11	1				
		1	2	21.83	21.86	22.06	1				
		1	5	21.78	21.81	22.01	1				
		3	0	21.87	21.90	22.10	1				
		3	1	21.82	21.85	22.05	1				
		3	3	21.77	21.80	22.00	1				
		6	0	20.69	20.72	0.72 20.92					
BW	Modulation	RB Size	RB	Low CH 19965	Mid CH 20175	High CH 20385	MPR				
BW			Offset	Frequency 1711.5 MHz	Frequency 1732.5 MHz	Frequency 1753.5 MHz	WIFK				
	QPSK	1	0	22.64	22.67	22.87	0				
		1	7	22.60	22.63	22.83	0				
		1	14	22.57	22.60 22.80		0				
		8	0	21.86	21.89 22.09		1				
		8	3	21.82	21.85	22.05	1				
		8	7	21.78	21.81 22.01		1				
0.8411-		15	0	21.74	21.77 21.97		1				
3 MHz		1	0	21.89	21.92	22.12	1				
		1	7	21.84	21.87	22.07	1				
		1	14	21.79	21.82	22.02	1				
	16QAM	8	0	20.90	20.93	21.13	2				
		8	3	20.84	20.87	21.07	2				
		8	7	20.82	20.85	21.05	2				
		15	0	20.70	20.73	20.93	2				

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	LTE Band 4									
BW	Madulation	RB	RB	Low CH 19975	Mid CH 20175	High CH 20375	MPR			
BW	Modulation	Size	Offset	Frequency 1712.5 MHz	Frequency 1732.5 MHz	Frequency 1752.5 MHz	IVIPK			
		1	0	22.67	22.70	22.90	0			
		1	12	22.63	22.66	22.86	0			
		1	24	22.60	22.63	22.83	0			
	QPSK	12	0	21.89	21.92	22.12	1			
		12	6	21.85	21.88	22.08	1			
		12	13	21.81	21.84	22.04	1			
5 MILL		25	0	21.77	21.80	22.00	1			
5 MHz	16QAM	1	0	21.92	21.95	22.15	1			
		1	12	21.87	21.90	22.10	1			
		1	24	21.82	21.85	22.05	1			
		12	0	20.93	20.96 21.16		2			
		12	6	20.87	20.90	90 21.10				
		12	13	20.85	20.88 21.08		2			
		25	0	20.73	20.76 20.96		2			
BW	Modulation	RB	RB	Low CH 20000	Mid CH 20175	High CH 20350	MPR			
DVV	Wodulation	Size	Offset	Frequency 1715 MHz	Frequency 1732.5 MHz	Frequency 1750 MHz	WIFK			
	QPSK	1	0	22.71	22.74	22.94	0			
		1	24	22.67	22.70	22.90	0			
		1	49	22.64	22.67 22.87		0			
		25	0	21.93	21.96 22.16		1			
		25	12	21.89	21.92	22.12	1			
		25	25	21.85	21.88	22.08	1			
40 MU-		50	0	21.81	21.84	22.04	1			
10 MHz		1	0	21.96	21.99	22.19	1			
		1	24	21.91	21.94	22.14	1			
		1	49	21.86	21.89	22.09	1			
	16QAM	25	0	20.97	21.00	21.20	2			
		25	12	20.91	20.94	21.14	2			
		25	25	20.89	20.92	21.12	2			
		50	0	20.77	20.80	21.00	2			

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				LTE Band 4			
BW	Modulation	RB	RB	Low CH 20025	Mid CH 20175	High CH 20325	MPR
DW	Modulation	Size	Offset	Frequency 1717.5 MHz	Frequency 1732.5 MHz	Frequency 1747.5 MHz	IVIPR
		1	0	22.77	22.80	23.00	0
		1	37	22.73	22.76	22.96	0
		1	74	22.70	22.73	22.93	0
	QPSK	36	0	21.99	22.02	22.22	1
		36	19	21.95	21.98	22.18	1
		36	39	21.91	21.94	22.14	1
45 MIL-		75	0	21.87	21.90	22.10	1
15 MHz		1	0	22.02	22.05	22.25	1
		1	37	21.97	22.00	22.20	1
	16QAM	1	74	21.92	21.95	22.15	1
		36	0	21.03	21.06	21.26	2
		36	19	20.97	21.00	21.20	2
		36	39	20.95	20.98	21.18	2
		75	0	20.83	20.86	21.06	2
DW.	Modulation	RB	RB	Low CH 20050	Mid CH 20175	High CH 20300	
BW		Size	Offset	Frequency 1720 MHz	Frequency 1732.5 MHz	Frequency 1745 MHz	MPR
	QPSK	1	0	22.80	22.83	23.03	0
		1	50	22.76	22.79	22.99	0
		1	99	22.73	22.76	22.96	0
		50	0	22.02	22.05	22.25	1
		50	25	21.98	22.01	22.21	1
		50	50	21.94	21.97	22.17	1
000411-		100	0	21.90	21.93 22.13		1
20MHz		1	0	22.05	22.08	22.28	1
		1	50	22.00	22.03	22.23	1
		1	99	21.95	21.98	22.18	1
	16QAM	50	0	21.06	21.09	21.29	2
		50	25	21.00	21.03	21.23	2
		50	50	20.98	21.01	21.21	2
		100	0	20.86	20.89	21.09	2

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LTE BAND 13

LTE BAN	D 13			LTE Band 13			
BW	Modulation	RB	RB	Low CH 23205	Mid CH 23230	High CH 23255	MPR
	Woddiation	Size	Offset	Frequency 779.5 MHz	Frequency 782.0 MHz	Frequency 784.5 MHz	WII IX
		1	0	22.44	22.54	22.42	0
		1	12	22.40	22.50	22.38	0
		1	24	22.37	22.47	22.35	0
	QPSK	12	0	21.67	21.77	21.65	1
		12	6	21.63	21.73	21.61	1
		12	13	21.59	21.69	21.57	1
5 MH-		25	0	21.55	21.65	21.53	1
5 MHz		1	0	21.70	21.80	21.68	1
		1	12	21.65	21.75	21.63	1
		1	24	21.60	21.70	21.58	1
	16QAM	12	0	20.68	20.78 20.66		2
		12	6	20.66	20.76 20.64		2
		12	13	20.64	20.74 20.62		2
		25	0	20.53	20.63	0.63 20.51	
	Modulation	RB RB	RB	СН	CH 23230	СН	- MPR
BW		Size	Offset	Frequency MHz	Frequency 782.0 MHz	Frequency MHz	
	QPSK	1	0	-	22.56	-	0
		1	24	-	22.52	-	0
		1	49	-	22.49	-	0
		25	0	-	21.79	-	1
		25	12	-	21.75	-	1
		25	25	-	21.71	-	1
40 8411-		50	0	-	21.67	-	1
10 MHz		1	0	-	21.82	-	1
		1	24	-	21.77	-	1
		1	49	-	21.72	-	1
	16QAM	25	0	-	20.80	-	2
		25	12	-	20.78	-	2
		25	25	-	20.76	-	2
		50	0	-	20.65	-	2

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3.5 CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

LTE

Band	Frequency (MHz)	Operating Mode	Antenna Gain (dBi)	Tune-up Power (dBm)	E.I.R.P Power (mW)	Power Density (mW/cm^2)	limit (mW/cm^2)	PASS/ FAIL
Band4	1745	QPSK	2.17	23.5	368.978	0.073	1.00	PASS
Band13	782.0	QPSK	2.17	23.0	328.852	0.065	0.52	PASS

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