Maximum Permissible Exposure Evaluation

FCC ID: 2BBLG-CHILINKIIOT

1. Client Information

Applicant	:	SHENZHEN CHILINK IOT TECHNOLOGY CO., LTD
Address	:	Room518, 512, Block A, Ming You Industrial Products Displaying&amp, Purchasing Center, Baoyuan Road, Xixiang, Baoan, Shenzhen, Guangdong Province, China
Manufacturer	:	SHENZHEN CHILINK IOT TECHNOLOGY CO., LTD
Address	:	Room518, 512, Block A, Ming You Industrial Products Displaying&amp, Purchasing Center, Baoyuan Road, Xixiang, Baoan, Shenzhen, Guangdong Province, China

2. General Description of EUT

EUT Name	:	Industrial router	
Model(s) No.	:	ZR2720N, ZR2721N, ZR3731N, ZR9721N, IR2730N, IR4731N, IR5731N, SS2031, PS2021, QX210-NW	
Model Difference	:	All these models are identical in the same PCB, layout and electrical circuit, the only difference is names.	
Product Description	:	Operation Frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz LTE Band 2/4/5/12/13/17/25/26/41
Power Supply	:	For Adapter: (Model:TS-A012-120010AY) Input: AC 100V-240V, 50/60Hz 0.4A Output: DC 12V⎓1A	
Software Version	:	V2.5 /V2.6 /V2.7	
Hardware Version	:	V1.1	
Remark: The antenna gain and the adapter provided by the applicant, verified for the RF conduction test and adapter provided by TOBY test lab.			

Note: More test information about the EUT please refer the RF Test Report.

1 A/F., Building.6, Rundongsheng Industrial Zone, Longzhu, Xixiang, Bao'an, Shenzhen, Guangdong, China
Tel: +86 75526509301 Fax: +86 75526509195

MPE Calculations for WIFI

1. **Antenna Gain:**

   2.4G WiFi Probe Antenna: 5dBi.
   LTE Probe Antenna: 5dBi

2. **EUT Operation Condition:**

   Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

3. **Exposure Evaluation:**

   Equation from page 18 of OET Bulletin 65, Edition 97-01

   $$S=(PG)/4\pi R^2$$

   Where

   S: power density
   P: power input to the antenna
   G: power gain of the antenna in the direction of interest relative to an isotropic radiator.
   R: distance to the center of radiation of the antenna

4. Test Result:

Mode	N_{TX}	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/ cm^2) [S]	limit (mW/cm2)
802.11b	1	17.879	18±1	19	5	20	0.0500	1
	1	17.706	18±1	19	5	20	0.0500	1
	1	17.1	17±1	18	5	20	0.0397	1
802.11g	1	17.527	18±1	19	5	20	0.0500	1
	1	17.311	17±1	18	5	20	0.0397	1
	1	16.743	17±1	18	5	20	0.0397	1
802.11 n(HT20)	1	17.227	17±1	18	5	20	0.0397	1
	1	17.573	18±1	19	5	20	0.0500	1
	1	17.028	17±1	18	5	20	0.0397	1
802.11 n(HT40)	1	14.997	15±1	16	5	20	0.0250	1
	1	14.699	15±1	16	5	20	0.0250	1
	1	14.048	14±1	15	5	20	0.0199	1
LTE Band 2	1	24.44	24±1	25	5	20	0.1989	1
LTE Band 4	1	23.82	24±1	25	5	20	0.1989	1
LTE Band 5	1	23.84	24±1	25	5	20	0.1989	0.55
LTE Band 12	1	23.15	23±1	24	5	20	0.1580	0.47
LTE Band 13	1	23.63	24±1	25	5	20	0.1989	0.52
LTE Band 17	1	23.35	23±1	24	5	20	0.1580	0.52
LTE Band 25	1	24.08	24±1	25	5	20	0.1989	1
LTE Band 26A	1	24.00	24±1	25	5	20	0.1989	0.54
LTE Band 26B	1	24.12	24±1	25	5	20	0.1989	0.54
LTE Band 41	1	24.00	24±1	25	5	20	0.1989	1
Note: RF Output power specifies that Maximum Conducted Peak Output Power.								

5. Conclusion:

As specified in Table 1B of 47 CFR 1.1310- Limits for Maximum Permissible Exposure (MPE),

Limits for General Population/ Uncontrolled Exposure

Frequency Range (MHz)	Power density (mW/ cm^2)
300-1,500	F/1500
1,500-100,000	1.0

For 2.4G WiFi&LTE

MPE limit S: 1mW/ cm^2

MPE limit S: 1mW/ cm^2

6. Summary simultaneous transmission results

LTE and Bluetooth support simultaneous transmit the

LTE MPE (Ratio)	2.4GWiFi MPE (Ratio)	simultaneous MPE (Ratio)	MPE Limits (Ratio)
0.1989	0.0500	0.2489	1.0000

So, RF exposure limit warning or SAR test are not required.

The EUT will only be used with a separation of 20cm or greater between the antenna and nearby persons and can therefore be considered a mobile transmitter per 47 CFR2.1091 (b). The RF Exposure Information page from the manual is included here for reference.

-----END OF REPORT-----