



中认信通
CHINA CERTIFICATION ICT CO.,LTD (DONGGUAN)



MAXIMUM PERMISSIBLE EXPOSURE EVALUATION REPORT

Applicant: Beijing COTX Networks Technologies Co.,Ltd.

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District, Beijing

IC: 5th fl. bldg.21, Tiantong Science Park, Changping District, Beijing

FCC ID: 2A2A2X5

IC: 27674-X5

HVIN: X5-V1.10

Product Name: Cotx x5 hotspot

Standard(s): 47 CFR §1.1310, 47 CFR §2.1091,

47 CFR §15.247(i), 7 CFR §15.407(f)

RSS-102 Issue 5 March 2015, Amendment 1

(February 2, 2021)

The above equipment has been tested and found compliant with the requirement of the relative standards by China Certification ICT Co., Ltd (Dongguan)

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Test Facility

The Test site used by China Certification ICT Co., Ltd (Dongguan) to collect test data is located on the No. 113, Pingkang Road, Dalang Town, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 442868, the FCC Designation No. : CN1314.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0123.

Declarations

China Certification ICT Co., Ltd (Dongguan) is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol “▲”. Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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1.1 MAXIMUM PERMISSIBLE EXPOSURE (MPE)

1.1.1 Applicable Standard

FCC §15.247 (i) & §15.407 (f) & §1.1310 & §2.1091

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See §1.1307(b)(1) of this chapter.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm²)	Averaging Time (minutes)
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

According to RSS-102 § 4Table 4, RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)

Table 4: RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m²)	Reference Period (minutes)
0.003-10 ²¹	83	90	-	Instantaneous*
0.1-10	-	0.73/ f	-	6**
1.1-10	87/ f ^{0.5}	-	-	6**
10-20	27.46	0.0728	2	6
20-48	58.07/ f ^{0.25}	0.1540/ f ^{0.25}	8.944/ f ^{0.5}	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 f ^{0.3417}	0.008335 f ^{0.3417}	0.02619f ^{0.6834}	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ f ^{1.2}
150000-300000	0.158 f ^{0.5}	4.21 x 10 ⁻⁴ f ^{0.5}	6.67 x 10 ⁻⁵ f	616000/ f ^{1.2}

Note: f is frequency in MHz.
 *Based on nerve stimulation (NS).
 ** Based on specific absorption rate (SAR).

1.1.2 Procedure

Prediction of power density at the distance of the applicable MPE limit

$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm²);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

1.1.3 EUT Information ▲ :

Operation Modes	Operation Frequency (MHz)	Conducted output power including Tune-up Tolerance (dBm)	Maximum Antenna Gain (dBi)
Lora-DSS	902.3-914.9	20	3.5
Lora-DTS	923.3-927.5	27	3.5
BLE	2402-2480	-3	6.0
WLAN 2.4G	2412-2462	18	6.0
WLAN 5.8G	5725-5850	8	6.0
LTE B2	1850-1910	23	3.0
LTE B4	1710-1755	24	3.0
LTE B5	824-849	24	3.0
LTE B12	699-716	24	3.0
LTE B13	777-787	22	3.0
LTE B25	1850-1915	22	3.0
LTE B26	814-849	23	3.0
LTE B41	2496-2690(FCC) 2570-2620(ISED)	22	3.0
LTE B66	1710-1780	22	3.0

Note:

1. The Above Parameters were provided by the manufacturer.
2. The device contains WWAN module, FCC ID: 2AJYU-8PYA008, IC: 23761-8PYA009.
3. The WLAN 2.4G,5G or BLE can't transmit simultaneously, Wi-Fi/BLE can transmit simultaneously with Lora and WWAN

1.1.4 Calculated Result:

Radio	Frequency (MHz)	Antenna Gain		Conducted output power including Tune-up Tolerance		Evaluation Distance (cm)	Power Density		MPE Limit (mW/cm ²)	
		(dBi)	(numeric)	(dBm)	(mW)		(mW/cm ²)	(W/m ²)	FCC	ISED
Lora-DSS	902.3-914.9	3.5	2.24	20	100.00	25	0.029	0.285	0.60	2.74
Lora-DTS	923.3-927.5	3.5	2.24	27	501.19	25	0.143	1.429	0.62	2.78
BLE	2402-2480	6	3.98	-3	0.50	25	0.000	0.003	1.0	5.35
WLAN 2.4G	2412-2462	6	3.98	18	63.10	25	0.032	0.320	1.0	5.37
WLAN 5.8G	5725-5850	6	3.98	8	6.31	25	0.003	0.032	1.0	9.71
LTE B2	1850-1910	3	2.00	23	199.53	25	0.051	0.507	1.0	4.48
LTE B4	1710-1755	3	2.00	24	251.19	25	0.064	0.638	1.0	4.24
LTE B5	824-849	3	2.00	24	251.19	25	0.064	0.638	0.55	2.58
LTE B12	699-716	3	2.00	24	251.19	25	0.064	0.638	0.47	2.30
LTE B13	777-787	3	2.00	22	158.49	25	0.040	0.403	0.52	2.47
LTE B25	1850-1915	3	2.00	22	158.49	25	0.040	0.403	1.0	4.48
LTE B26	814-849	3	2.00	23	199.53	25	0.051	0.507	0.54	2.55
LTE B41	2496-2690(FCC) 2570-2620(ISED)	3	2.00	22	158.49	25	0.040	0.403	1.0	5.60
LTE B66	1710-1780	3	2.00	22	158.49	25	0.040	0.403	1.0	4.24

The device contains WWAN module, FCC ID: 2AJYU-8PYA008, IC:23761-8PYA009.

The WLAN 2.4G,5G or BLE can't transmit simultaneously, Wi-Fi/BLE can transmit simultaneously with Lora and WWAN:

$$\sum_i \frac{S_i}{S_{Limit,i}}$$

$$=S_{WLAN}/S_{limit-WLAN} + S_{Lora}/S_{limit-Lora} + S_{WWAN}/S_{limit-WWAN}$$

Worst for FCC:

$$=0.032/1.0+0.143/0.62+0.064/0.47$$

$$=0.40$$

$$< 1.0$$

Result: The device meet FCC MPE at 25 cm distance

Worst for ISED:

$$=0.32/5.37+1.429/2.78+0.638/2.30$$

$$=0.85$$

$$< 1.0$$

Result: The device meet ISED MPE at 25 cm distance

===== END OF REPORT =====