



RF EXPOSURE Test Report

Report No.: MTi240723018-04E5

Date of issue: 2024-09-21

Applicant: Dongguan Yucheng Communication Technology Co., Ltd.

Product: AutoLTbx

Model(s): YUC100-U2W, YUC100-A15W, YUC100-U2A, YUC100-U2AC,
YUC100-O2W, YUC100-C2A, YUC100-C2CA

FCC ID: 2BLKI-AUTOLTBX

Shenzhen Microtest Co., Ltd.

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Test Result Certification	
Applicant:	Dongguan Yucheng Communication Technology Co., Ltd.
Address:	Room 203, No. 69 Huaxing Road, Tianxin Community, Qiaotou Town, Dongguan City, Guangdong Province
Manufacturer:	Dongguan Yucheng Communication Technology Co., Ltd.
Address:	Room 203, No. 69 Huaxing Road, Tianxin Community, Qiaotou Town, Dongguan City, Guangdong Province
Product description	
Product name:	AutoLTbx
Trademark:	N/A
Model name:	YUC100-U2W
Serial Model:	YUC100-A15W, YUC100-U2A, YUC100-U2AC, YUC100-O2W, YUC100-C2A, YUC100-C2CA
Standards:	N/A
Test procedure:	KDB 447498 D01 v06 FCC part 2.1091
Date of Test	
Date of test:	2024-09-02 to 2024-09-20
Test result:	Pass

Test Engineer :

Letter. Lan.

(Letter Lan)

Reviewed By :

David. Lee

(David Lee)

Approved By :

Leon Chen

(Leon Chen)

RF EXPOSURE EVALUATION

According to FCC 1.1310: 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 §1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

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

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

MPE Calculation Method

Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where

P_d = Power density in mW/cm²

P_{out} = output power to antenna in mW

G = Numeric gain of the antenna relative to isotropic antenna

π = 3.1415926

R = distance between observation point and center of the radiator in cm(20cm)

P_d the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.



Measurement Result

BT/BLE:

Operation Frequency: 2402-2480MHz,

Power density limited: 1mW/ cm²

2.4GWiFi:

Operation Frequency: WIFI 802.11b/g/n HT20: 2412-2462MHz, n HT40: 2422-2452

Power density limited: 1mW/ cm²

5GWiFi:

802.11a: 20 MHz

802.11n: 20 MHz, 40 MHz

802.11ac: 20 MHz, 40 MHz, 80MHz

Antenna Type: PCB Antenna;

Antenna gain:

2.4G: ANT1: 3.2dBi; ANT2: 2.73dBi; Directional gain: 2.73dBi;

5G: ANT1:0.46dBi; ANT2: 2.02dBi; Directional gain: 2.02dBi;

5.8G: ANT1:1.16dBi; ANT2: 1.81dBi; Directional gain: 1.81dBi;

R=20cm

$mW=10^{(dBm/10)}$

2.4G: antenna 1 gain Numeric= $10^{(dBi/10)}= 10^{(3.2/10)}= 2.09$

2.4G: antenna 2 gain Numeric= $10^{(dBi/10)}= 10^{(2.73/10)}= 1.87$

5G: antenna1 gain Numeric= $10^{(dBi/10)}= 10^{(0.46/10)}= 1.11$

5G: antenna1 gain Numeric= $10^{(dBi/10)}= 10^{(2.02/10)}= 1.59$

5.8G: antenna1 gain Numeric= $10^{(dBi/10)}= 10^{(1.16/10)}= 1.31$

5.8G: antenna1 gain Numeric= $10^{(dBi/10)}= 10^{(1.81/10)}= 1.52$

Bluetooth function is only transmitted by antenna 1.

2.4G WIFI and 5G WIFI cannot work at the same time.

BR+EDR:

Chann el Freq. (MHz)	modulation n	conducte d power	Tune- up powe r (dBm)	Max		Antenna		Evaluation result	Power density Limits
		(dBm)		tune-up power		Gain		(mW/cm ²)	(mW/c m ²)
				(dBm)	(mW)	(dBi)	Numeri c		
2402	GFSK	5.19	5±1	6	3.981	3.2	2.09	0.0017	1
2441		4.70	4±1	5	3.162	3.2	2.09	0.0013	1
2480		3.13	3±1	4	2.512	3.2	2.09	0.0010	1
2402	π/4- DQPSK	3.62	3±1	4	2.512	3.2	2.09	0.0010	1
2441		3.16	3±1	4	2.512	3.2	2.09	0.0010	1
2480		1.87	1±1	2	1.585	3.2	2.09	0.0007	1
2402	8DPSK	4.26	4±1	5	3.162	3.2	2.09	0.0013	1
2441		3.87	3±1	4	2.512	3.2	2.09	0.0010	1
2480		2.66	2±1	3	1.995	3.2	2.09	0.0008	1

BLE:

Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result	Power density Limits
		(dBm)		tune-up power		Gain		(mW/cm ²)	(mW/cm ²)
				(dBm)	(mW)	(dBi)	Numeric		
2402	BLE-1M	4.34	4±1	5	3.162	3.2	2.09	0.0013	1
2440		3.38	3±1	4	2.512	3.2	2.09	0.0010	1
2480		2.08	2±1	3	1.995	3.2	2.09	0.0008	1
2402	BLE-2M	3.84	3±1	4	2.512	3.2	2.09	0.0010	1
2440		3.82	3±1	4	2.512	3.2	2.09	0.0010	1
2480		2.44	2±1	3	1.995	3.2	2.09	0.0008	1



2.4GWiFi SISO:

ANT 1

Channel Freq. (MHz)	modulation	conducted power	Tune-up power	Max		Antenna	Evaluation result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm ²)	(mW/cm ²)
				(dBm)	(mW)	Numeric		
2412	802.11b	10.71	10±1	11	12.589	2.09	0.00470	1
2437		9.01	9±1	10	10.000	2.09	0.00296	1
2462		9.14	9±1	10	10.000	2.09	0.00373	1
2412	802.11g	10.87	10±1	11	12.589	2.09	0.00523	1
2437		10.34	10±1	11	12.589	2.09	0.00523	1
2462		9.68	9±1	10	10.000	2.09	0.00416	1
2412	802.11n H20	22.00	22±1	23	199.526	2.09	0.08293	1
2437		21.95	21±1	22	158.489	2.09	0.06588	1
2462		21.53	21±1	22	158.489	2.09	0.06588	1
2422	802.11n H40	21.76	21±1	22	158.489	2.09	0.06588	1
2437		21.82	21±1	22	158.489	2.09	0.06588	1
2452		21.80	21±1	22	158.489	2.09	0.06588	1

ANT 2

Channel Freq. (MHz)	modulation	conducted power	Tune-up power	Max		Antenna	Evaluation result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm ²)	(mW/cm ²)
				(dBm)	(mW)	Numeric		
2412	802.11b	10.61	10±1	11	12.589	1.87	0.00470	1
2437		8.99	8±1	9	7.943	1.87	0.00296	1
2462		9.28	9±1	10	10.000	1.87	0.00373	1
2412	802.11g	12.67	12±1	13	19.953	1.87	0.00744	1
2437		12.37	12±1	13	19.953	1.87	0.00744	1
2462		9.68	9±1	10	10.000	1.87	0.00373	1
2412	802.11n H20	22.30	22±1	23	199.526	1.87	0.07443	1
2437		22.09	22±1	23	199.526	1.87	0.07443	1
2462		21.72	21±1	22	158.489	1.87	0.05912	1
2422	802.11n H40	22.04	22±1	22	158.489	1.87	0.05912	1
2437		21.95	21±1	22	158.489	1.87	0.05912	1
2452		21.87	21±1	22	158.489	1.87	0.05912	1

MIMO

Channel Freq. (MHz)	modulation	conducted power	Tune-up power	Max		Antenna	Evaluation result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm ²) ANT1/Limits+ ANT2/Limits	(mW/cm ²)
				(dBm)	(mW)	Numeric		
2412	802.11n H20	/	/	/	/	/	0.15736	1
2437		/	/	/	/	/	0.14031	1
2462		/	/	/	/	/	0.125	1
2422	802.11n H40	/	/	/	/	/	0.125	1
2437		/	/	/	/	/	0.125	1
2452		/	/	/	/	/	0.125	1



5G WIFI: UNII-1

SISO ANT1

Channel Freq. (MHz)	modulation	conducted power	Tune-up	Max		Antenna	Evaluation result at 20cm	Power density
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm ²)	(mW/cm ²)
				(dBm)	(mW)	Numeric		
5180	11a	3.06	3±1	4	2.512	1.11	0.00056	1
5200	11a	4.41	4±1	5	3.162	1.11	0.00070	1
5240	11a	6.69	6±1	7	5.012	1.11	0.00111	1
5180	11n (HT20)	5.84	5±1	6	3.981	1.11	0.00088	1
5200	11n (HT20)	5.58	5±1	6	3.981	1.11	0.00088	1
5240	11n (HT20)	6.32	6±1	7	5.012	1.11	0.00111	1
5190	11n (HT40)	4.32	4±1	5	3.162	1.11	0.00070	1
5230	11n (HT40)	7.16	7±1	8	6.310	1.11	0.00140	1
5180	11ac (HT20)	7.90	7±1	8	6.310	1.11	0.00140	1
5200	11ac (HT20)	10.54	10±1	11	12.589	1.11	0.00278	1
5240	11ac (HT20)	9.69	9±1	10	10.000	1.11	0.00221	1
5190	11ac (HT40)	7.40	7±1	8	6.310	1.11	0.00140	1
5230	11ac (HT40)	6.03	6±1	7	5.012	1.11	0.00111	1
5210	11ac (HT80)	10.37	10±1	11	12.589	1.11	0.00278	1

ANT2

Channel Freq. (MHz)	modulation	conducted power	Tune-up	Max		Antenna	Evaluation result at 20cm	Power density
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm ²)	(mW/cm ²)
				(dBm)	(mW)	Numeric		
5180	11a	8.08	3±1	4	2.512	1.59	0.00080	1
5200	11a	9.33	4±1	5	3.162	1.59	0.00100	1
5240	11a	8.66	6±1	7	5.012	1.59	0.00159	1
5180	11n (HT20)	8.39	5±1	6	3.981	1.59	0.00126	1
5200	11n (HT20)	6.98	5±1	6	3.981	1.59	0.00126	1
5240	11n (HT20)	6.13	6±1	7	5.012	1.59	0.00159	1
5190	11n (HT40)	0.61	4±1	5	3.162	1.59	0.00100	1
5230	11n (HT40)	6.36	7±1	8	6.310	1.59	0.00200	1
5180	11ac (HT20)	1.45	7±1	8	6.310	1.59	0.00200	1
5200	11ac (HT20)	5.17	10±1	11	12.589	1.59	0.00399	1
5240	11ac (HT20)	6.23	9±1	10	10.000	1.59	0.00317	1
5190	11ac (HT40)	5.32	7±1	8	6.310	1.59	0.00200	1
5230	11ac (HT40)	6.73	6±1	7	5.012	1.59	0.00159	1
5210	11ac (HT80)	7.60	10±1	11	12.589	1.59	0.00399	1



MIMO

Channel Freq. (MHz)	modulation	conducted power	Tune- up	Max		Antenna	Evaluation result at 20cm	Power density
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm ²) ANT1/Limits+	(mW/cm ²)
				(dBm)	(mW)	Numeric		
5180	11n (HT20)	/	/	/	/	/	0.00214	1
5200	11n (HT20)	/	/	/	/	/	0.00214	1
5240	11n (HT20)	/	/	/	/	/	0.0027	1
5190	11n (HT40)	/	/	/	/	/	0.0017	1
5230	11n (HT40)	/	/	/	/	/	0.0034	1
5180	11ac (HT20)	/	/	/	/	/	0.0034	1
5200	11ac (HT20)	/	/	/	/	/	0.00677	1
5240	11ac (HT20)	/	/	/	/	/	0.00538	1
5190	11ac (HT40)	/	/	/	/	/	0.0034	1
5230	11ac (HT40)	/	/	/	/	/	0.0027	1
5210	11ac (HT80)	/	/	/	/	/	0.00677	1



5G WIFI: UNII-3

SISO ANT 1

Channel Freq. (MHz)	modulation	conducted power	Tune-up	Max		Antenna	Evaluation result at 20cm	Power density
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm ²)	(mW/cm ²)
				(dBm)	(mW)	Numeric		
5745	11a	10.80	10±1	11	12.589	1.31	0.00327	1
5785	11a	11.93	11±1	12	15.849	1.31	0.00412	1
5825	11a	4.44	4±1	5	3.162	1.31	0.00082	1
5745	11n (HT20)	0.18	0±1	1	1.259	1.31	0.00033	1
5785	11n (HT20)	4.54	4±1	5	3.162	1.31	0.00082	1
5825	11n (HT20)	5.12	5±1	6	3.981	1.31	0.00103	1
5755	11n (HT40)	5.87	5±1	6	3.981	1.31	0.00103	1
5795	11n (HT40)	2.87	2±1	3	1.995	1.31	0.00052	1
5745	11ac (HT20)	7.45	7±1	8	6.310	1.31	0.00164	1
5785	11ac (HT20)	4.28	4±1	5	3.162	1.31	0.00082	1
5825	11ac (HT20)	14.17	14±1	15	31.623	1.31	0.00822	1
5755	11ac (HT40)	-1.94	-1±1	0	1.000	1.31	0.00026	1
5795	11ac (HT40)	5.21	5±1	6	3.981	1.31	0.00103	1
5775	11ac (HT80)	6.28	6±1	7	5.012	1.31	0.00130	1

ANT2

Channel Freq. (MHz)	modulation	conducted power	Tune-up	Max		Antenna	Evaluation result at 20cm	Power density
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm ²)	(mW/cm ²)
				(dBm)	(mW)	Numeric		
5745	11a	14.47	14±1	15	31.623	1.52	0.00954	1
5785	11a	15.09	15±1	16	39.811	1.52	0.01202	1
5825	11a	6.84	6±1	7	5.012	1.52	0.00151	1
5745	11n (HT20)	4.30	4±1	5	3.162	1.52	0.00095	1
5785	11n (HT20)	2.42	2±1	3	1.995	1.52	0.00060	1
5825	11n (HT20)	14.81	14±1	15	31.623	1.52	0.00954	1
5755	11n (HT40)	3.57	3±1	4	2.512	1.52	0.00076	1
5795	11n (HT40)	4.59	4±1	5	31.623	1.52	0.00954	1
5745	11ac (HT20)	3.15	3±1	4	2.512	1.52	0.00076	1
5785	11ac (HT20)	3.67	3±1	4	2.512	1.52	0.00076	1
5825	11ac (HT20)	14.05	14±1	15	31.623	1.52	0.00954	1
5755	11ac (HT40)	1.90	1±1	2	1.585	1.52	0.00048	1
5795	11ac (HT40)	4.88	4±1	5	3.162	1.52	0.00095	1
5775	11ac (HT80)	9.38	9±1	10	10.000	1.52	0.00302	1



MIMO

Channel Freq. (MHz)	modulation	conducted power	Tune-up	Max		Antenna	Evaluation result at 20cm	Power density
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm ²) ANT1/Limits+	(mW/cm ²)
				(dBm)	(mW)	Numeric		
5745	11n (HT20)	/	/	/	/	/	0.00128	1
5785	11n (HT20)	/	/	/	/	/	0.00142	1
5825	11n (HT20)	/	/	/	/	/	0.01057	1
5755	11n (HT40)	/	/	/	/	/	0.00179	1
5795	11n (HT40)	/	/	/	/	/	0.01006	1
5745	11ac (HT20)	/	/	/	/	/	0.0024	1
5785	11ac (HT20)	/	/	/	/	/	0.00158	1
5825	11ac (HT20)	/	/	/	/	/	0.01776	1
5755	11ac (HT40)	/	/	/	/	/	0.00074	1
5795	11ac (HT40)	/	/	/	/	/	0.00198	1
5775	11ac (HT80)	/	/	/	/	/	0.00432	1

Conclusion:

Note: WIFI and bluetooth can work at the same time

For the max result: $0.15736 + 0.0017 = 0.15906 \leq 1.0$ SAR, No SAR is required.

----END OF REPORT----