



RF EXPOSURE Test Report

Report No.: MTi230322001-05E4
Date of issue: 2023-07-25
Applicant: Dong guan Rong Kai New Material Co., Ltd
Product: Intelligent Cloud Film Cutting Machine
Model(s): BSJ-290GB
FCC ID: 2BBNZ-BSJ-290GB

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>

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Test Result Certification	
Applicant:	Dong guan Rong Kai New Material Co., Ltd
Address:	Room 101, Building 5, No. 142 Tangxialing South Road, Tangxia Town, Dongguan City, Guangdong Province, China
Manufacturer:	Dong guan Rong Kai New Material Co., Ltd
Address:	Room 101, Building 5, No. 142 Tangxialing South Road, Tangxia Town, Dongguan City, Guangdong Province, China
Factory:	Dong guan Rong Kai New Material Co., Ltd
Address:	Room 101, Building 5, No. 142 Tangxialing South Road, Tangxia Town, Dongguan City, Guangdong Province, China
Product description	
Product name:	Intelligent Cloud Film Cutting Machine
Trademark:	ROKECUT
Model name:	BSJ-290GB
Serial Model:	N/A
Standards:	N/A
Test procedure:	KDB 447498 D01 v06
Date of Test	
Date of test:	2023-06-14 to 2023-07-25
Test result:	Pass

Test Engineer :

Maleah Deng

(Maleah Deng)

Reviewed By: :

Leon Chen

(Leon Chen)

Approved By: :

Tom Xue

(Tom Xue)

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, WIFI 802.11n HT40: 2422-2450MHz;

Power density limited: 1mW/ cm²

Antenna Type: PCB Antenna (Bluetooth); FPC Antenna (2.4G WIFI)

Antenna gain: 3.06 dBi (2.4G WIFI); -0.1dBi (Bluetooth)

R=20cm

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

antenna gain Numeric= $10^{(dBi/10)}=10^{(-0.58/10)}=2.02$

BR+EDR:

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
				tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
2402	GFSK	-4.36	(-4)±1	-3	0.501	-0.1	0.98	0.0001	1
2441		-5.08	(-5)±1	-4	0.398	-0.1	0.98	0.0001	1
2480		-4.8	(-4)±1	-3	0.501	-0.1	0.98	0.0001	1
2402	π/4-DQPSK	-3.96	(-3)±1	-2	0.631	-0.1	0.98	0.0001	1
2441		-4.85	(-4)±1	-3	0.501	-0.1	0.98	0.0001	1
2480		-4.61	(-4)±1	-3	0.501	-0.1	0.98	0.0001	1
2402	8DPSK	-3.81	(-3)±1	-2	0.631	-0.1	0.98	0.0001	1
2441		-4.49	(-4)±1	-3	0.501	-0.1	0.98	0.0001	1
2480		-4.28	(-4)±1	-3	0.501	-0.1	0.98	0.0001	1

BLE:

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
				tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
2402	BLE-1M	-2.76	(-2)±1	-1	0.794	-0.1	0.98	0.0002	1
2440		-3.07	(-3)±1	-2	0.631	-0.1	0.98	0.0001	1
2480		-3.27	(-3)±1	-2	0.631	-0.1	0.98	0.0001	1

2.4GWiFi:

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna Gain	Evaluation result at 20cm	Power density Limits (mW/cm ²)
				tune-up power (dBm)	(mW)			
						Numeric		
2412	802.11b	14.67	14±1	15	31.623	2.02	0.01273	1
2437		14.99	14±1	15	31.623	2.02	0.01273	1
2462		15.14	15±1	16	39.811	2.02	0.01602	1
2412	802.11g	15.81	15±1	16	39.811	2.02	0.01602	1
2437		14.53	14±1	15	31.623	2.02	0.01273	1
2462		14.49	14±1	15	31.623	2.02	0.01273	1
2412	802.11n H20	16.06	16±1	17	50.119	2.02	0.02017	1
2437		14.78	14±1	15	31.623	2.02	0.01273	1
2462		14.70	14±1	15	31.623	2.02	0.01273	1
2422	802.11n H40	15.72	15±1	16	39.811	2.02	0.01602	1
2437		14.75	14±1	15	31.623	2.02	0.01273	1
2452		14.03	14±1	15	31.623	2.02	0.01273	1

Conclusion:

The device can transmitter simultaneously.

BR&EDR+2.4G WIFI =0.0001+0.02017=0.02027

BLE+2.4G WIFI=0.0002+0.02017=0.02037

For the max result: 0.02037≤ 1.0 SAR, No SAR is required.

----END OF REPORT----