



Microtest
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RF EXPOSURE Test Report

Report No.: MTi211215005-05E3

Date of issue: Apr. 22, 2022

Applicant: RYDER ELECTRONICS(SHENZHEN)LTD

Product name: Bluetooth 5.0 module

Model(s): BTM-2801, BTM2853

FCC ID: 2A3BF-BTM2801

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>



Instructions

1. The report shall not be partially reproduced without the written consent of the laboratory;
2. The test results of this report are only responsible for the samples submitted;
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5. Any objection to this report shall be submitted to the laboratory within 15 days from the date of receipt of the report.



TEST RESULT CERTIFICATION	
Applicant's name.....:	RYDER ELECTRONICS(SHENZHEN)LTD
Address.....:	139 Da Bao Road, District 33, Bao'an, ShenZhen, China
Manufacturer's Name	RYDER ELECTRONICS(SHENZHEN)LTD
Address.....:	139 Da Bao Road, District 33, Bao'an, ShenZhen, China
Factory's Name	Ryder Electronics(Xinfeng)Ltd.
Address.....:	Xinfeng Industrial Park, Xinfeng Town, 341600, GanZhou City, Jiangxi Province China
Product description	
Product name	Bluetooth 5.0 module
Trademark	N/A
Model Name	BTM-2801
Serial Model	BTM2853
Standards.....:	N/A
Test procedure	KDB 447498 D01 v06
Date of Test	
Date (s) of performance of tests	2022-01-04 ~ 2022-04-21
Test Result.....:	Pass
This device described above has been tested by Shenzhen Microtest Co., Ltd. and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.	

Testing Engineer

:

Yanice Xie

(Yanice Xie)

Technical Manager

:

Leon Chen

(Leon Chen)

Authorized Signatory

:

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

Antenna Type: PCB Antenna;

Antenna gain: 0dBi

R=20cm

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

antenna gain Numeric= $10^{(dBi/10)}=10^{(0/10)}=1$

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/cm2)	(mW/c m2)
				(dBm)	(mW)	(dBi)	Nume ric		
2402	GFSK	4.911	4±1	5	3.162	0	1.00	0.0006	1
2441		4.888	4±1	5	3.162	0	1.00	0.0006	1
2480		4.539	4±1	5	3.162	0	1.00	0.0006	1
2402	π/4- DQPSK	5.669	5±1	6	3.981	0	1.00	0.0008	1
2441		5.647	5±1	6	3.981	0	1.00	0.0008	1
2480		5.135	5±1	6	3.981	0	1.00	0.0008	1
2402	8DPSK	6.128	6±1	7	5.012	0	1.00	0.0010	1
2441		6.015	6±1	7	5.012	0	1.00	0.0010	1
2480		5.640	6±1	7	5.012	0	1.00	0.0010	1

BLE:

1M:

Chann el Freq. (MHz)	modulation n	conducte d power	Tune- up power (dBm)	Max		Antenna		Evaluation result	Power density Limits
		(dBm)		tune-up power		Gain		(mW/cm2)	(mW/cm 2)
				(dBm)	(mW)	(dBi)	Num eric		
2402	GFSK	6.447	6±1	7	5.012	0	1.00	0.0010	1
2440		6.220	6±1	7	5.012	0	1.00	0.0010	1
2480		5.432	6±1	7	5.012	0	1.00	0.0010	1

2M:

Chann el Freq. (MHz)	modulation n	conducte d power	Tune- up power (dBm)	Max		Antenna		Evaluation result	Power density Limits
		(dBm)		tune-up power		Gain		(mW/cm2)	(mW/cm 2)
				(dBm)	(mW)	(dBi)	Num eric		
2402	GFSK	4.864	5±1	6	3.981	0	1.00	0.0008	1
2440		5.420	5±1	6	3.981	0	1.00	0.0008	1
2480		5.438	5±1	6	3.981	0	1.00	0.0008	1

Conclusion:

For the max result: $0.0010 \leq 1.0$ for 1g SAR, No SAR is required.

----END OF REPORT----