

TEST REPORT

Report Number.....:	90108-24-72-24-PP002	
Date of issue	2024-01-20	
Prepared by (+signature)	Pale	<i>Pale Cai</i>
Reviewer (+signature)	Duke	<i>Duke Chen</i>
Approved by (+signature)	Jason	<i>Jason gao</i>
Testing Laboratory name	SLG-CPC Testlaboratory Co., Ltd.	
Address	No. 11, Wu Song Road, Dongcheng District, Dongguan, Guangdong Province, China 523117	
Applicant's name	Rigel Technology (S) PTE LTD	
Address	20 CHANGI BUSINESS PARK CENTRAL 2, RIGEL INNOVATION CENTRE, Singapore 486031	
Manufacturer's name	Rigel Technology (S) PTE LTD	
Address	20 CHANGI BUSINESS PARK CENTRAL 2, RIGEL INNOVATION CENTRE, Singapore 486031	
Factory's name	Rigel Technology (S) PTE LTD	
Address	20 CHANGI BUSINESS PARK CENTRAL 2, RIGEL INNOVATION CENTRE, Singapore 486031	
Standard(s)	FCC 1.1310: §1.1307(b)	
Test item description.....:	BLE sensor	
Trade Mark.....:	Rigel	
Model/Type reference	SA-BLETD01, SA-BLEPH01, SA-BLESB01, SA-BLEWB01, SA-BLETMPHMD01	
FCC ID.....:	2BDLPR1002TOF	
Date of receipt of test item	2024-01-09	
Date (s) of performance of test:	2024-01-10 to 2024-01-19	
Summary of Test Results.....:	Pass	
The Summary of Test Results based on a technical opinion belongs to the standard(s).		
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Modified History

Report No.	Revision Date	Summary
90108-24-72-24-PP003	2024-01-20	Original Report

1. EUT Specification

Characteristics	Description
Product:	BLE sensor
Model Number:	SA-BLETD01, SA-BLEPH01, SA-BLESB01, SA-BLEWB01, SA-BLETMPHMD01 (All models are identical except for the model name and color; All tests were performed on model SA-BLETD01)
Sample:	1#
Device Type:	Bluetooth V5.0 BLE
Data Rate:	1Mbps for GFSK modulation
Modulation:	GFSK for BLE
Operating Frequency Range(s) :	2402-2480MHz for Bluetooth DTS
Number of Channels:	40 Channels for Bluetooth DTS
Transmit Power Max:	-2.59 dBm (0.000550 W) for BLE
Antenna Gain:	2.12 dBi for BLE
Power supply:	Input: DC 3V battery
Evaluation applied:	☒ MPE Evaluation ☐ SAR Evaluation

2. Test Requirement:

RF EXPOSURE EVALUATION

According to 447498 D01 V06: 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)	Average Time
(A) Limits for Occupational/Control Exposures				
300-1500	--	--	F/300	6
1500-100000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300-1500	--	--	F/1500	6
1500-100000	--	--	1	30

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 = 3.1416

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

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.

RF Exposure Information: The radiated output power of this device meets the limits of FCC/IC radio frequency exposure limits. This device should be operated with a minimum separation distance of 20cm (8 inches) between the equipment and a person's body.

3. Measurement Result

BT/BLE

Antenna gain: 2.12 dBi

modulation	Channel Freq. (MHz)	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
GFSK (BLE: 1Mbps)	2402	-2.94	-3±1	-2	1.63	0.000204	1
	2440	-2.67	-3±1	-2	1.63	0.000204	1
	2480	-2.59	-3±1	-2	1.63	0.000204	1

Therefore the worst-case situation is 0.000204, which is less than “1”,
This confirmed that the device comply with FCC 1.1310 MPE limit.

*** End of Report ***

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