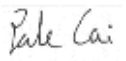
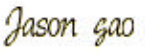
TEST REPORT

Report Number.....:	91314-23-73-23-PP003	
Date of issue .....:	2024-01-05	
Prepared by (+signature).....:	Pale	
Reviewer (+signature).....:	Duke	
Approved by (+signature).....:	Jason	
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 Gateway	
Trade Mark.....:	Rigel	
Model/Type reference.....:	SA-BLEGW01	
FCC ID.....:	2BDLPR1001GW	
Date of receipt of test item .....:	2023-10-30	
Date (s) of performance of test:	2023-11-01 to 2024-01-04	
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
91314-23-73-23-PP003	2024-01-05	Original Report

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1. EUT Specification

Characteristics	Description
Product:	BLE Gateway
Model Number:	SA-BLEGW01
Sample:	1#
Device Type:	Bluetooth V5.0 BLE 2.4G WIFI
Data Rate:	1Mbps or 2Mbps for GFSK modulation 802.11b/g/n(20MHz, 40MHz) for WIFI
Modulation:	GFSK for BLE DSSS with DBPSK/DQPSK/CCK for 802.11b; OFDM with BPSK/QPSK/16QAM/64QAM for 802.11g/n
Operating Frequency Range(s) :	2402-2480MHz for Bluetooth DTS 2412-2462MHz for WIFI
Number of Channels:	40 Channels for Bluetooth DTS 11 channels for 802.11b/g/n(HT20); 7 Channels for 802.11n(HT40);
Transmit Power Max:	-6.55 dBm (0.000221 W) for BLE 3.32 dBm (0.002148 W) for WIFI
Antenna Gain:	1.70 dBi for BLE 3.71 dBi for WIFI
Power supply:	Input: DC 5V 1A
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: Pd= (Pout*G)\ (4*pi*R2)

Where

Pd= Power density in mW/cm^2

Pout=output power to antenna in mW

G= Numeric gain of the antenna relative to isotropic antenna

Pi=3.1416

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

Pd the limit of MPE, $1mW/cm^2$. If we know the maximum gain of the nd total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

3. Measurement Result

Wifi 2.4G
Antenna gain: 3.71 dBi

modulation	Channel Freq. (MHz)	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
11b	2412	2.27	±1	3.27	2.35	0.000992	1
	2437	1.89	±1	2.89	2.35	0.000909	1
	2462	3.32	±1	4.32	2.35	0.001264	1
11g	2412	-2.73	±1	-1.73	2.35	0.000314	1
	2437	-2.87	±1	-1.87	2.35	0.000304	1
	2462	-1.65	±1	-0.65	2.35	0.000402	1
11n HT20	2412	-3.85	±1	-2.85	2.35	0.000243	1
	2437	-4.04	±1	-3.04	2.35	0.000232	1
	2462	-2.37	±1	-1.37	2.35	0.000341	1
11n HT40	2422	-4.62	±1	-3.62	2.35	0.000203	1
	2437	-3.43	±1	-2.43	2.35	0.000267	1
	2452	-2.54	±1	-1.54	2.35	0.000328	1

BT/BLE
Antenna gain: 1.70 dBi

modulation	Channel Freq. (MHz)	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
GFSK（BLE: 1Mbps）	2402	-6.62	±1	-5.62	1.48	0.000079	1
	2440	-8.07	±1	-7.07	1.48	0.000059	1
	2480	-7.71	±1	-6.71	1.48	0.000062	1
GFSK（BLE: 2Mbps）	2402	-6.55	±1	-5.55	1.48	0.000082	1
	2440	-8.01	±1	-7.01	1.48	0.000059	1
	2480	-7.59	±1	-6.59	1.48	0.000065	1

CONCLUSION of simultaneous transmitter
Both of the module 1 and module 2 can transmit simultaneously, the formula of calculated the MPE is:
CPD1/LPD1+CPD2/LPD2+……etc. < 1
CPD = Calculation power density
LPD = Limit of power density
Therefore the worst-case situation is 0.001264 /1.00+0.000082 /1.00 = 0.001346, which is less than “1”,
This confirmed that the device comply with FCC 1.1310 MPE limit.

Therefore the worst-case situation is 0.001346, which is less than “1”,
This confirmed that the device comply with FCC 1.1310 MPE limit.

*** End of Report ***

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