

RF Exposure Evaluation Report

Under:
47 CFR Part 2.1091
KDB447498 D01 General RF Exposure Guidance v06
Operation within the band
☒2400-2483.5MHz
☒DTS - Digital Transmission System ☒Limited single-modular

Prepared For :
RADIANT RFID LLC
1023 Springdale Road Bldg 4, Suite B Austin TX 78721

FCC ID: 2AHP7-BLET21

EUT: BCN-P6700(nRF521810)

Model: RADMEDIA-BLE-T21

November 10, 2022

Issue Date:

Original Report

Report Type:



Test Engineer: Jacky Huang



Review By: Apollo Liu / Manager

©2022 Ke Mei Ou Laboratory Co., Ltd.

Table of Contents

1. General Information	4
1. 1 Notes	4
1. 2 Testing Laboratory	4
1. 3 Details of Applicant	4
1. 4 Application Details	4
1. 5 Details of Factory	4
1. 6 Test Item	4
1. 7 Applicable Standards	5
2. Technical Test	6
2. 1 Summary of Test Results	6
3. EUT Modifications	6
4. FCC Maximum Permissible Exposure (MPE)	7
4. 1 Limit of MPE	7
4. 2 RF Exposure Requirements	7
4. 3 Conclusion	7

Report Revision History

Report #	Version	Description	Issued Date
KSZ2021060901J02	Rev.01	Initial issue of report	June 28, 2022
KSZ2021060901J02	Rev.02	Update cover page & section 1.3 of report	November 10, 2022

1. General Information

1.1 Notes

The test results of this report relate exclusively to the test item specified in 1.6. The Ke Mei Ou Laboratory does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the Ke Mei Ou Laboratory.

1.2 Testing Laboratory

Test Firm Name:	Ke Mei Ou Lab Co., Ltd.
Test Firm Address:	2013-2016, 20th Floor, Business Center, Jiahui Xin Cheng, No 3027, Shen Nan Road, Fu Tian, Shen Zhen, Guang Dong, P. R. China
FCC Designation Number:	CN1532
Test Firm Registration Number:	344480
Internet:	www.kmolab.com
Email:	kmo@kmolab.com
ANSI-ASQ National Accreditation Board/ACLASS ISO/IEC 17025 Accredited Lab for telecommunication standards. The Registration Number is AT-1532. The testing quality system meets with ISO/IEC-17025 requirements. This approval results is accepted by MRA of ILAC.	

1.3 Details of Applicant

Name	RADIANT RFID LLC
Address	1023 Springdale Road Bldg 4, Suite B Austin TX 78721

1.4 Application Details

Date of Receipt of Application	: June 9, 2021
Date of Receipt of Test Item	: August 13, 2021
Date of Test	: August 30, 2021 ~ June 28, 2022

1.5 Details of Factory

Name	Hana Microelectronics Public Co., Ltd.
Address	Saha Group Industrial Park Lamphun 123 Moo 5, T.Pasak, A.Muang, Lamphun 51000, Thailand

1.6 Test Item

EUT Feature	
EUT Description:	BCN-P6700(nRF521810)
Brand Name:	Radiant RFID
Basic Mode:	RADMEDIA-BLE-T21
Family Model:	RADMEDIA-BLE-T22
EUT RF Technology:	☒ Bluetooth v4.2 LE
Equipment Class:	☒ DTS - Digital Transmission System ☒ Limited single-modular
HW Version:	v1.1.0
SW Version:	-
EUT Stage:	☒ Identical Prototype
Note: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.	

Additional Information

Standard Product Specification				
Tx/Rx Frequency Range	☑2400-2483.5MHz			
Number of Channels	40 (37 hopping + 3 advertising channel)			
Carrier Frequency of Each Channel	f=2402+k MHz (k=0,2,4...,39)			
Antenna Type / Gain	Chain Number	Antenna Gain	Internal	External
Antenna Type / Gain	1	3.3dBi	☑PCB	☐Dipole
Type of Modulation	☑GFSK			
EUT Operational Condition	☐AC → ☐Other			
	☑DC → ☑Other → ☐From Battery ☑2.0~3.3Vdc			
Specification of Accessory				
☐AC/DC Adapter # (Charger)	Brand Name	N/A	Model Name	N/A
	Power Rating	N/A		

1. 7 Applicable Standards

Applicable Standards	
According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards: 47 CFR Part 2.1091 KDB 447498 D04 Interim General RF Exposure Guidance v01	
Note:	All test items were verified and recorded according to the standards and without any deviation during the test.

2. Technical Test

2.1 Summary of Test Results

The EUT has been tested according to the following specifications:

FCC Rules	Test Type	Limit	Result	Notes
47 CFR Part 2.1091	Exposure Evaluation	< 1.0m W/cm ²	PASS	Complies.

3. EUT Modifications

No modification by test lab.

4. FCC Maximum Permissible Exposure (MPE)

4.1 Limit of MPE

(A) Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
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
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

(B) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
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
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

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

4.2 RF Exposure Requirements

RF Exposure Requirements	
The MPE was calculated to show compliance with the power density limit.	
☒ $S = \frac{P * G}{4 * \pi * r^2}$ Where: ➤ S=Power density ➤ P=Power input to antenna ➤ G=Power gain of the antenna relative to an isotropic radiator ➤ R=Distance to the center of radiation of the antenna	☐ $E(V/m) = \frac{\sqrt{30 * P * G}}{r}; S(W/m^2) = \frac{E^2}{377} \text{ or } S = \frac{30 * P * G}{377 * r^2}$ Where: ➤ E=Electric field (V/m) ➤ P=Power output power (W) ➤ G=Power gain of the antenna relative to an isotropic radiator ➤ R= Distance to the center of radiation of the antenna

4.3 Conclusion

☒ Test Mode 1	Compliance with FCC Rules				
Mode/Band	Maximum Antenna gain (dBi)	Maximum tune-up Conducted Power (dBm)	Evaluation Distance(cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
2.4GHz	3.3	2.19	20	0.00070	1.0
Conclusion: EUT complies with the FCC requirement.					
Device Category:	☒ Other				
Exposure Evaluation:	☒ MPE				

-----End of Report -----