

TEST REPORT

Report No.: BCTC2206910999-1E

Applicant: ROCKPI TRADING LIMITED

Product Name: ROCK Pi 4/ROCK 4

Model/Type
reference: ROCK 4 SE

Tested Date: 2021-09-15 to 2021-09-29

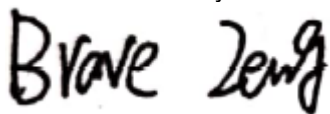
Issued Date: 2022-07-02

Shenzhen BCTC Testing Co., Ltd.



Product Name: ROCK Pi 4/ROCK 4
Trademark: N/A
Model/Type reference: ROCK 4 SE
ROCK Pi 4 A, ROCK Pi 4 B, ROCK Pi 4 A+, ROCK Pi 4 B+, ROCK 4 SE,
ROCK 4 A, ROCK 4 B, ROCK 4 A+, ROCK 4 B+
Prepared For: ROCKPI TRADING LIMITED
Address: Room 11, 27 / f, Ga wah international centre, 191 Javaroad, north point, Hong Kong
Manufacturer: ROCKPI TRADING LIMITED
Address: Room 11, 27 / f, Ga wah international centre, 191 Javaroad, north point, Hong Kong
Prepared By: Shenzhen BCTC Testing Co., Ltd.
Address: 1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Tangwei, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China.
Sample Received Date: 2021-09-15
Sample tested Date: 2021-09-15 to 2021-09-29
Issue Date: 2022-07-02
Report No.: BCTC2206910999-1E
Test Standards: EN IEC 62311:2020
Test Results: PASS
Remark: This is RED Health test report.
All test data come from the report of No. BCTC2109795863-1E

Tested by:



Brave Zeng/ Project Handler

Approved by:



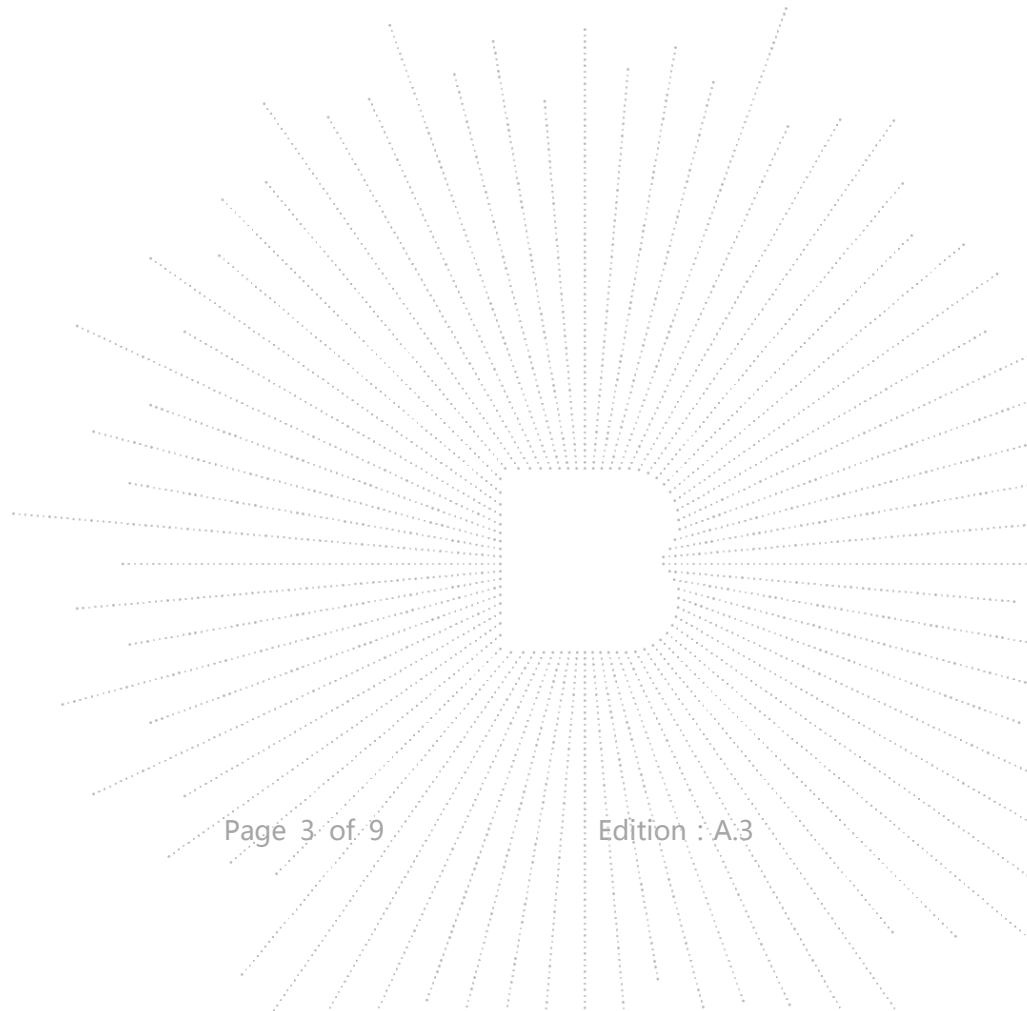
Zero Zhou/Reviewer

The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen BCTC Testing Co., Ltd, this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client.

Table Of Content

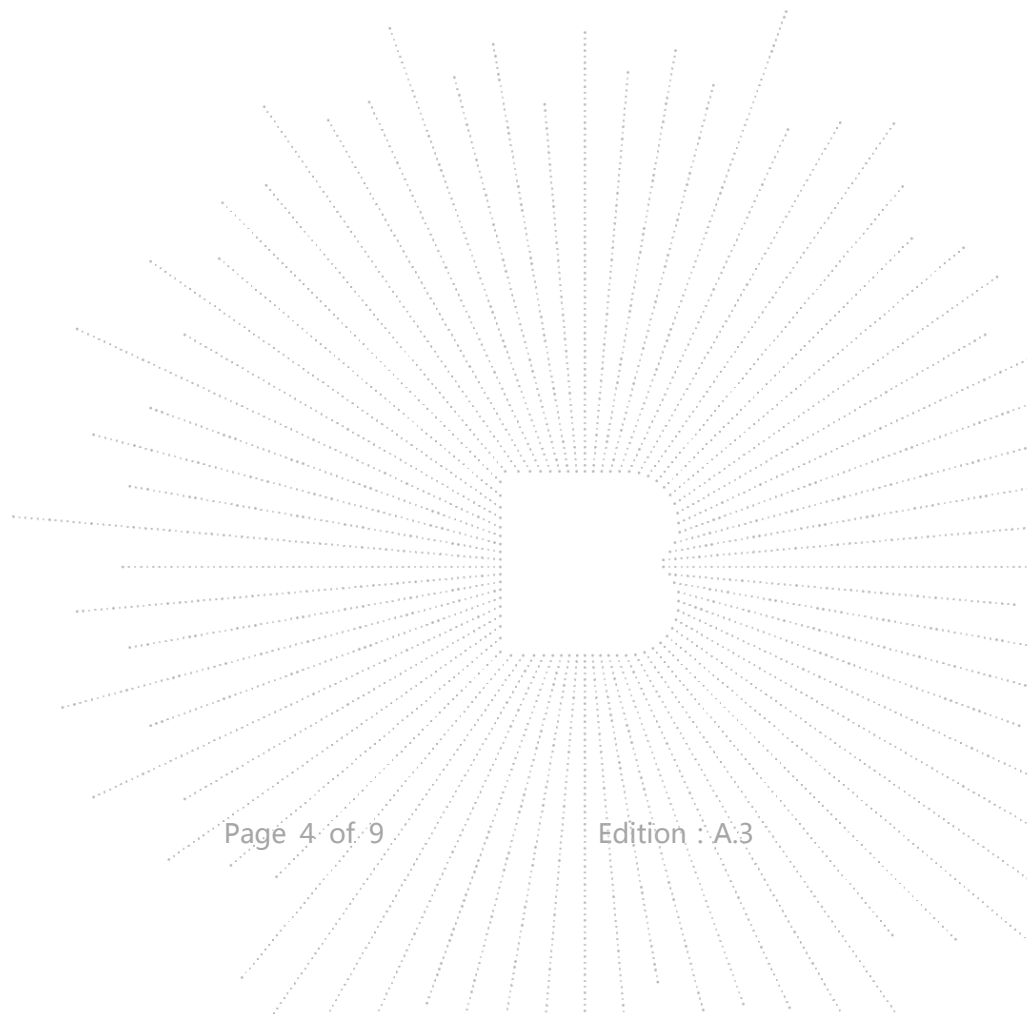
Test Report Declaration	Page
1. Version	4
2. Product Information And Test Setup	5
2.1 Product Information.....	5
3. Health Requirements.....	6
3.1 Limits.....	6
3.2 Exposure Evaluation	7
4. EUT Photographs.....	8

(Note: N/A Means Not Applicable)



1. Version

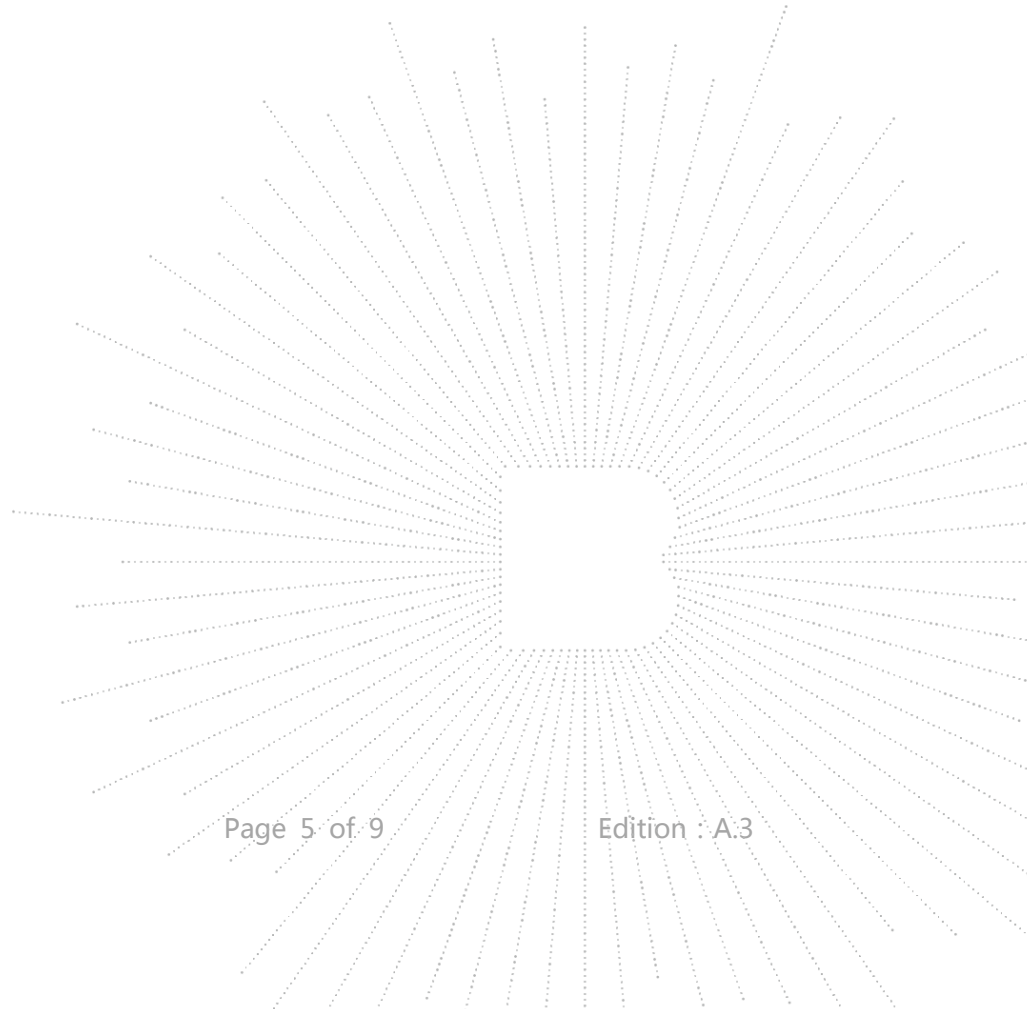
Report No.	Issue Date	Description	Approved
BCTC2206910999-1E	2022-07-02	Original	Valid



2. Product Information And Test Setup

2.1 Product Information

Model/Type reference:	ROCK 4 SE ROCK Pi 4 A, ROCK Pi 4 B, ROCK Pi 4 A+, ROCK Pi 4 B+, ROCK 4 SE, ROCK 4 A, ROCK 4 B, ROCK 4 A+, ROCK 4 B+
Model differences:	All the model are the same circuit and RF module, except model names.
Hardware Version:	N/A
Software Version:	N/A
Operation Frequency:	WiFi(2.4GHz): IEEE 802.11b/g/n HT20: 2412MHz-2472MHz WiFi (5.1GHz): IEEE 802.11a/n/ac HT20/HT40/HT80:5180-5240MHz Bluetooth (BLE) 2402-2480MHz Bluetooth (EDR): 2402-2480MHz
Max. RF output power:	Bluetooth (BLE): -1.69 dBm Bluetooth(EDR): 2.51dBm WiFi (2.4GHz) : 8.94 dBm WiFi (5.1GHz): 8.14 dBm
Type of Modulation:	Bluetooth (BLE): GFSK Bluetooth(EDR): GFSK, $\pi/4$ DQPSK, 8DPSK WiFi: DSSS, OFDM
Antenna installation:	Internal antenna
Antenna Gain:	1dBi
Ratings:	DC 5V



3. Health Requirements

3.1 Limits

According to Council Recommendation: the criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation.

Reference levels for electric, magnetic and electromagnetic fields (0Hz to 300GHz, unperturbed RMS values)

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (μ T)	Equivalent plane wave power density Seq (W/m ²)
0-1 Hz	-	3.2×10^4	4×10^4	-
1-8 Hz	10000	$3.2 \times 10^4 / f^2$	$4 \times 10^4 / f^2$	-
8-25 Hz	10000	4000/f	5000/f	-
0.025-0.8 kHz	250/f	4/f	5/f	-
0.8-3 kHz	250/f	5	6.25	-
3-150 kHz	87	5	6.25	-
0.15-1 MHz	87	0.73/f	0.92/f	-
1-10 MHz	$87 f^{1/2}$	0.73/f	0.92/f	-
10-400 MHz	28	0.073	0.095	2
400-2000 MHz	$1.375 f^{1/2}$	$0.0037 f^{1/2}$	$0.0046 f^{1/2}$	f/200
2-300 GHz	61	0.16	0.2	10

Note:

- f as indicated in the frequency range column.
- For frequencies between 100 kHz and 10 GHz, Seq, E², H² and B² are to be averaged over any six-minute period.
- For frequencies exceeding 10 GHz, Seq, E², H² and B² are to be averaged over any $68 / f^{1.05}$ minute period (f in GHz).

3.2 Exposure Evaluation

From Council Recommendation 1999/519/EC table 2, the maximum power density is 10 W/m².

Power density (S) is calculated by the following formula:

$$S = PG * \text{Duty factor} / 4\pi R^2$$

P = Peak Power Input to antenna (Watts)

G =Antenna Gain (numeric)

R = distance to the center of radiation of antenna (in meter) = 0.20 m

Note:

1) $P \text{ (Watts)} = (10^{(dBm / 10)}) / 1000$

2) $G \text{ (Antenna gain in numeric)} = 10^{(Antenna gain in dBi / 10)}$

3) Duty factor=1.0

4) $\pi = 3.142$

Bluetooth (EDR):

Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (W)	Duty factor	Calculated RF Exposure (W/ m ²)	Limit (W/ m ²)
1	1.259	2.51	0.002	1.00	0.0045	10

Bluetooth (BLE):

Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (W)	Duty factor	Calculated RF Exposure (W/ m ²)	Limit (W/ m ²)
1	1.259	-1.69	0.001	1.00	0.0017	10

2.4GHz WIFI:

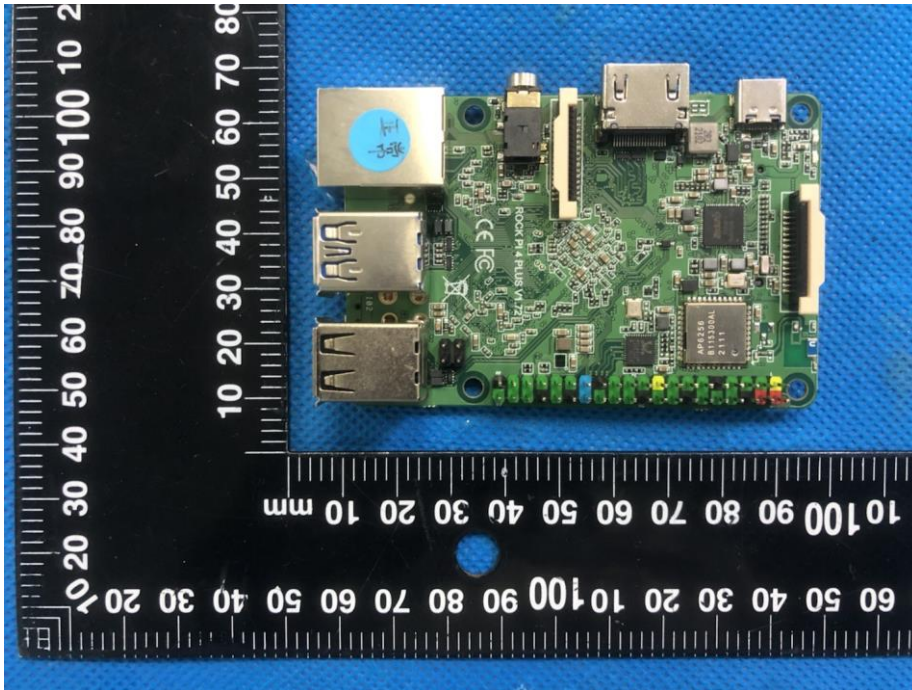
Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (W)	Duty factor	Calculated RF Exposure (W/ m ²)	Limit (W/ m ²)
1	1.259	8.94	0.008	1.00	0.0196	10

5.1GHz WIFI:

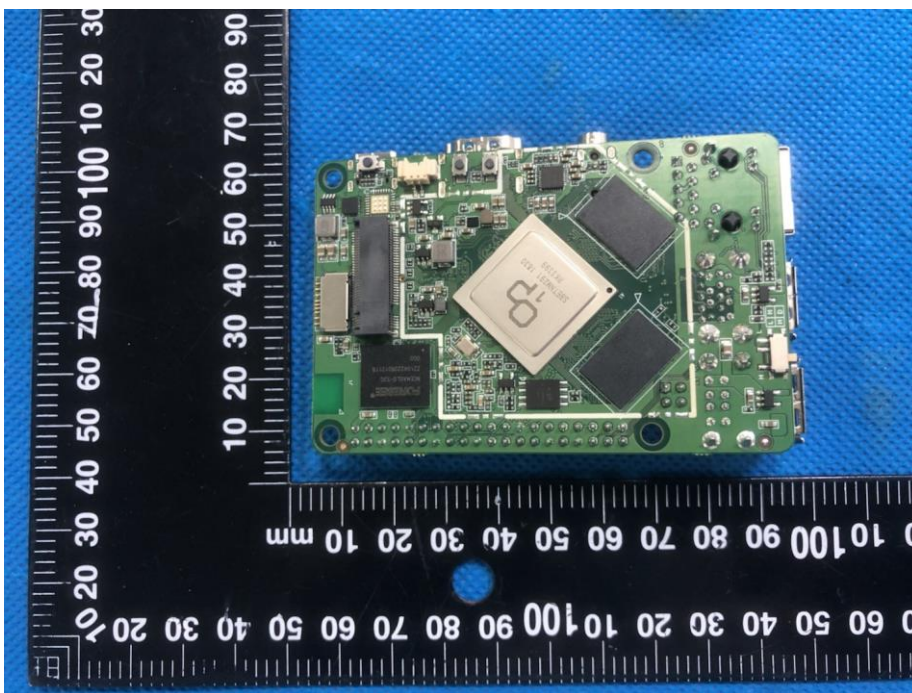
Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (W)	Duty factor	Calculated RF Exposure (W/ m ²)	Limit (W/ m ²)
1	1.259	8.14	0.007	1.00	0.0163	10

4. EUT Photographs

EUT Photo 1



EUT Photo 2



STATEMENT

- 1.The equipment lists are traceable to the national reference standards.
- 2.The test report can not be partially copied unless prior written approval is issued from our lab.
- 3.The test report is invalid without stamp of laboratory.
- 4.The test report is invalid without signature of person(s) testing and authorizing.
- 5.The test process and test result is only related to the Unit Under Test.
- 6.The quality system of our laboratory is in accordance with ISO/IEC17025.
- 7.If there is any objection to report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

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***** **END** *****