

## Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Report No.: CCISE190111801

# **TEST REPORT**

Applicant: Nebra Ltd

Address of Applicant: Unit 4 Bells Yew Green Business Court, Bells Yew Green, Kent,

TN3 9BJ, United Kindgom

**Equipment Under Test (EUT)** 

Product Name: Bright Pi

Model No.: v1.0

**Applicable standards:** AS/NZS 61000.6.3:2012

Date of sample receipt: 12 Feb., 2019

**Date of Test:** 13 May, to 23 Oct., 2019

Date of report issue: 24 Oct., 2019

Test Result: PASS\*

\* In the configuration tested, the EUT complied with the standards specified above.





Laboratory Manager
This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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### 2 Version

Version No.	Date	Description
00	24 Oct., 2019	Original

Tested by: Mike. DU Date: 24 Oct., 2019

Test Engineer

Reviewed by: Date: 24 Oct., 2019

**Project Engineer** 





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## **Test Summary**

Test	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission	AS/NZS 61000.6.3	AS/NZS 61000.6.3	See Table 1	PASS
Conducted Emission	AS/NZS 61000.6.3	AS/NZS 61000.6.3	See Table 1	N/A

Remark:

\* UT is the nominal supply voltage. Pass: Meet the requirements, N/A: not applicable.



## 5 General Information

### **5.1 Client Information**

Applicant:	Nebra Ltd
Address:	Unit 4 Bells Yew Green Business Court, Bells Yew Green, Kent, TN3 9BJ, United Kindgom
Manufacturer:	Nebra Ltd
Address:	Unit 4 Bells Yew Green Business Court, Bells Yew Green, Kent, TN3 9BJ, United Kindgom
Factory	Sunsoar Tech Co. Ltd
Address:	9F, A block, Nanchang Huafeng The Second Industrial Zone, Hangkong Road, Xixiang Town, Bao'an District, Shenzhen City, China

## 5.2 General Description of E.U.T.

Product Name:	Bright Pi
Model No.:	v1.0
Hardware version:	v1.0
Software version:	v1.0
Power supply:	DC 3.3V

## 5.3 Test mode and voltage

On mode:	Keep the EUT in working mode	
Test voltage:	AC 240V/50Hz	

## 5.4 Description of Support Units

Manufacturer	Description	Model	S/N	FCC ID/DoC
Pi supply	Raspberry Pi 3 Model B	Raspberry Pi 3 Model B	N/A	DoC
RS Components Ltd	Switching Adapter	DSA-13PFC-05 FCA	N/A	N/A

## 5.5 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%)
Conducted Emission (9kHz ~ 30MHz)	±1.60 dB
Radiated Emission (9kHz ~ 30MHz)	±3.12 dB
Radiated Emission (30MHz ~ 1000MHz)	±4.54 dB
Radiated Emission (1GHz ~ 18GHz)	±5.84 dB
Radiated Emission (18GHz ~ 26.5GHz)	±3.36 dB

## 5.6 Description of Cable Used

Cable Type	Description	Length	From	То
N/A	N/A	N/A	N/A	N/A

Shenzhen Zhongjian Nanfang Testing Co., Ltd.
No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,
Bao'an District, Shenzhen, Guangdong, China
Telephone: +86 (0) 755 23118282 Fax: +86 (0) 755 23116366

### 5.7 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

#### • FCC - Registration No.: CN1211

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The Registration No. is 727551.

#### • IC - Registration No.: CN0021

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

#### CNAS - Registration No.: CNAS L6048

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

#### A2LA - Registration No.: 4346.01

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/4346-01.pdf

### 5.8 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,

Bao'an District, Shenzhen, Guangdong, China Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info@ccis-cb.com, Website: http://www.ccis-cb.com

### 5.9 Test Instruments list

Radiated Emission:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	SAEMC	9m*6m*6m	966	07-22-2017	07-21-2020
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-18-2019	03-17-2020
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-18-2019	03-17-2020
EMI Test Software	AUDIX	E3	\	/ersion: 6.110919	b
Pre-amplifier	HP	8447D	2944A09358	03-18-2019	03-17-2020
Pre-amplifier	CD	PAP-1G18	11804	03-18-2019	03-17-2020
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-18-2019	03-17-2020
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-18-2019	03-17-2020
Simulated Station	Anritsu	MT8820C	6201026545	03-18-2019	03-17-2020
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-18-2019	03-17-2020
Cable	MICRO-COAX	MFR64639	K10742-5	03-18-2019	03-17-2020
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-18-2019	03-17-2020

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Telephone: +86 (0) 755 23116366



## **6 Test Results**

## 6.1 EMI (Emission)

### 6.1.1 Radiated Emission

6.1.1	Radiated Emission						
	Test Requirement:	AS/NZS 61000.6.3					
	Test Method:	AS/NZS 61000.6.3					
	Test Frequency Range:	30MHz to 6GHz					
	Test Distance:	3m					
	Receiver setup:	Frequency	De	tector	RBW	VBW	Remark
		30MHz-1GHz	Qua	si-peak	100kHz	300kHz	QP Value
		Above 1GHz	Р	eak	1MHz	3MHz	PK Value
		Above 10112	Ave	erage	1MHz	3MHz	AV Value
	Limit:	Frequency		Limi	t (dBuV/m @3m)		Remark
		30MHz-230MH	Z		40.0		P Value
		230MHz-1GHz			47.0		P Value
		1GHz-3GHz			50.0	Д	V Value
		10112 00112			70.0	F	YK Value
		3GHz-6GHz			54.0		V Value
					74.0		YK Value
	Test setup:	Below 1GHz:			Above	1GHz:	
		Revenance point of animal calibration animal calibration (inaginary circular periphery)  Revenance point of animal calibration (inaginary circular periphery)		Antena Tower  Antena Tower  Gortrole  Gortrole			
	Test Procedure:	<ol> <li>30MHz to 1GHz:</li> <li>The radiated emissions test was conducted in a semi-anechoic chamber.</li> <li>The table top EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.</li> <li>Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT.</li> <li>The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.         Above 1GHz:     </li> <li>The radiated emissions test was conducted in a fully-anechoic chamber.</li> <li>The table top EUT was placed upon anon-metallic table 0.8m above the</li> </ol>					



	<ul> <li>ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.</li> <li>3. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emission spectrum plots of the EUT.</li> <li>4. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.</li> </ul>
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

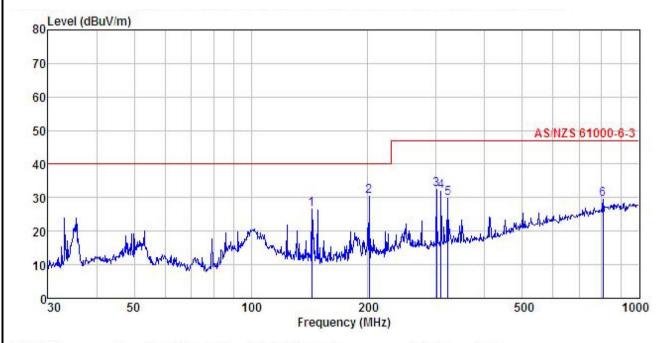




#### **Measurement Data:**

#### **Below 1GHz:**

Product Name:	Bright Pi	Product Model:	v1.0
Test By:	Mike	Test mode:	On mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Vertical
Test Voltage:	AC 240/50Hz	Environment:	Temp: 24℃ Huni: 57%



	Freq		Antenna Factor				Limit Line		Remark
-	MHz	—dBu∜	<u>dB</u> /m	<u>ab</u>	<u>ab</u>	$\overline{dBuV/m}$	$\overline{dBuV/m}$	<u>ab</u>	
1	143.326	44.14	9.31	2.44	29.25	26.64	40.00	-13.36	QP
2	201.393	45.85	10.64	2.87	28.82	30.54	40.00	-9.46	QP
2	300.367	44.35	13.63	2.94	28.45	32.47	47.00	-14.53	QP
4	308.913	43.68	13.79	2.97	28.47	31.97	47.00	-15.03	QP
5	321.061	41.20	14.03	3.01	28.50	29.74	47.00	-17.26	QP
6	807.429	31.70	21.66	4.33	28.17	29.52	47.00	-17.48	QP

#### Remark:

<sup>1.</sup> Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.

<sup>2.</sup> The emission levels of other frequencies are very lower than the limit and not show in test report.





Produc	t Name:	Bright	: Pi			Product	Model:	v1.0			
Test By	<b>'</b> :	Mike				Test mo	de:	On mo	de		
Test Fr	equency:	30 MH	lz ~ 1 GH	łz		Polariza	ition:	Horizoi	ntal		
Test Vo	ltage:	AC 24	10/50Hz			Environ	ment:	Temp:	<b>24</b> ℃	Huni: 5	7%
	and Albadillar										
80 LE	evel (dBuV/m)										
70											
60											
50									A:	S/NZS 6100	0-6-3
40							4				
30							3	5		6	7
20	1					lj.	2	May	Juliani	ALMAN TOWN SHIP AND A	WHAT
	Munumen Mr.	rability	U. orla	paratrophilips app	Maria de Jos	White	may have don't	.m.frita	MATE .		
10		. An inter	Man Jayan .								
030	5	0		100	Frague	200 ncy (MHz)			500		1000
		Read	Intenna	Cable	Preamp		Limit	Over			
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark		
	MHz	dBu∜	dB/m	dB	dB	dBuV/m	$\overline{dBuV/m}$	<u>dB</u>			
1	35.251	40.21	11.24		29.95		40.00	-17.43			
2 3	250.301 275.157	35.83 38.05	12.70 13.18	2.81 2.87			47.00 47.00	-24.20 -21.39			
4	300.367	51.43	13.63	2.94	28.45	39.55	47.00	-7.45	QP		
5	325.596	37.64	14.14	3.02	28.51	26.29	47.00	-20.71			

4.33 28.17 34.21 47.00 -12.79 QP

#### Remark:

21.66

807.429 36.39

<sup>1.</sup> Final Level = Receiver Read level + Antenna Factor + Cable Loss - Preamplifier Factor.

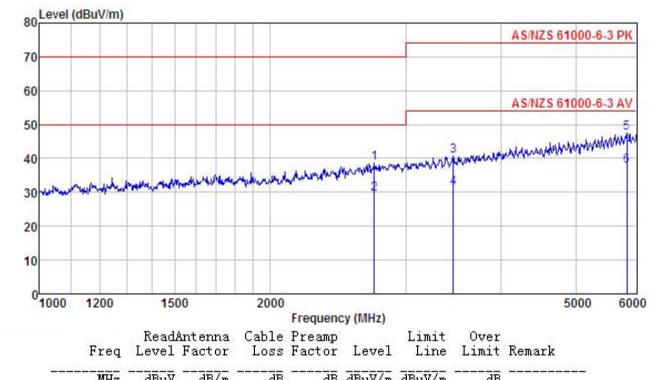
<sup>2.</sup> The emission levels of other frequencies are very lower than the limit and not show in test report.





#### **Above 1GHz:**

Product Name:	Bright Pi	Product Model:	v1.0
Test By:	Mike	Test mode:	On mode
Test Frequency:	1 GHz ~ 6 GHz	Polarization:	Vertical
Test Voltage:	AC 240/50Hz	Environment:	Temp: 24℃ Huni: 57%



	rreq	rever	ractor	LOSS	ractor	rever	Line	Limit	Kemark
	MHz	dBu∜	$-\overline{dB}/\overline{m}$	<u>d</u> B	<u>ab</u>	dBuV/m	dBuV/m	<u>dB</u>	
1	2732.391	45.60	27.94	5.07				-31.33	
2	2732.391	36.51	27.94	5.07	41.73	29.58	50.00	-20.42	Average
3	3461.456	45.78	28.59	5.71	41.42	40.84	74.00	-33.16	Peak
4	3461.456	36.26	28.59	5.71	41.42	31.32	54.00	-22.68	Average
5	5830.433	46.12	32.67	7.90				-26.59	
6	5830.433	36.52	32.67	7.90	42.03	37.81	54.00	-16.19	Average

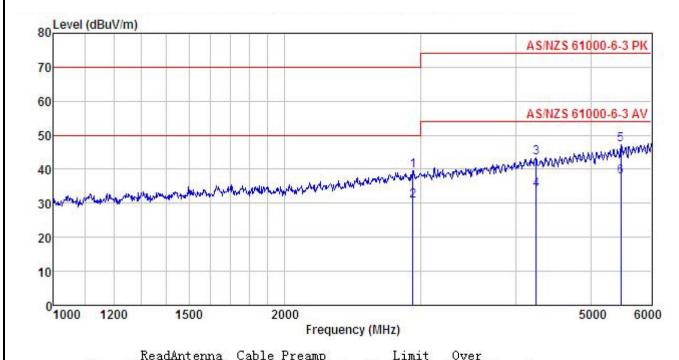
#### Remark:

- 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor.
- 2. The emission levels of other frequencies are very lower than the limit and not show in test report.





Product Name:	Bright Pi	Product Model:	v1.0
Test By:	Mike	Test mode:	On mode
Test Frequency:	1 GHz ~ 6 GHz	Polarization:	Horizontal
Test Voltage:	AC 240/50Hz	Environment:	Temp: 24℃ Huni: 57%



	Freq		Factor					Limit	Remark
	MHz	dBu∜	— <u>d</u> B/π		<u>ab</u>	$\overline{dB} \overline{uV/m}$	$\overline{dBuV/m}$	<u>dB</u>	
1	2935.411	45.59	28.37	5.29	41.55	39.57	70.00	-30.43	Peak
2	2935.411	36.58	28.37	5.29	41.55	30.56	50.00	-19.44	Average
3	4245.883	46.18	30.35		41.84				
4	4245.883	36.78	30.35	6.47	41.84	34.04	54.00	-19.96	Average
5	5476.026	46.66	32.54	7.19	41.84	47.20	74.00	-26.80	Peak
6	5476.026	37.11	32.54	7.19	41.84	37.65	54.00	-16.35	Average

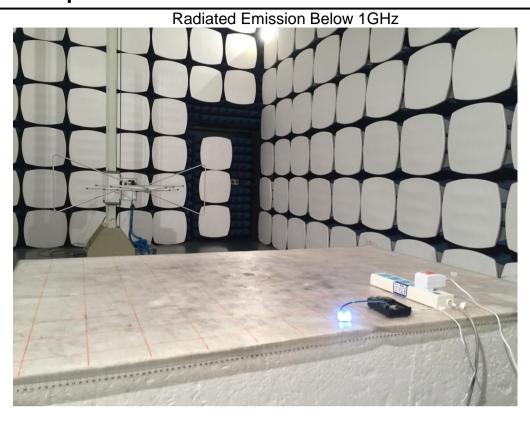
#### Remark:

- 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor.
- 2. The emission levels of other frequencies are very lower than the limit and not show in test report.





## 7 Test Setup Photo



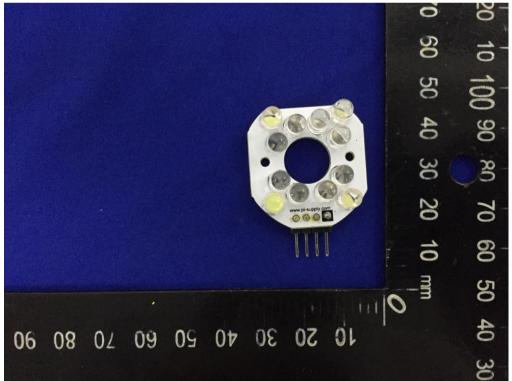






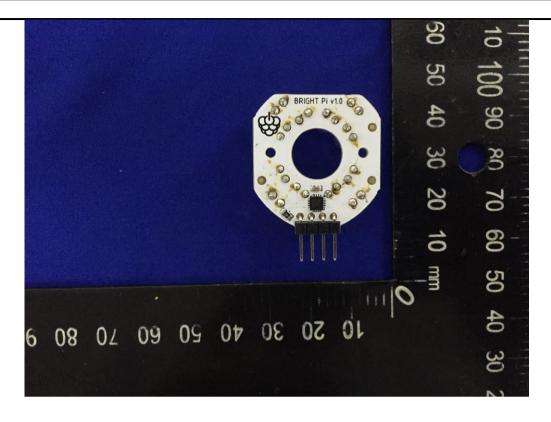
## 8 EUT Constructional Details

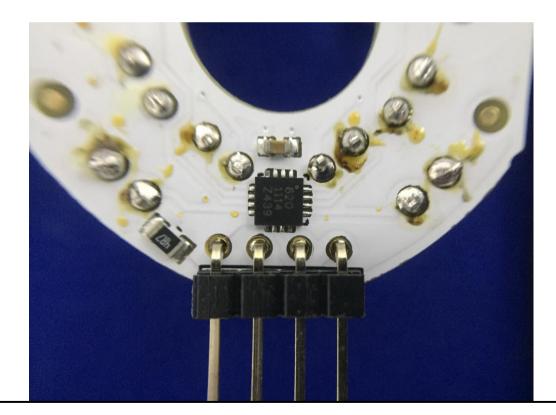












-----End of report-----