

TEST REPORT

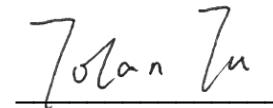
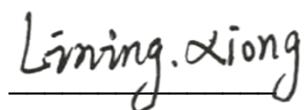
Applicant: Dagobah Systems Inc
Address: 651 N. Broad Street Suite 206 Middletown, DE 19709 United States
Equipment Type: ATA (Analog Telephone Adaptor) Gateway
Model Name: PC228
Brand Name: TELCLOUD / POTSCAST
FCC ID: 2BON3-TC228
Test Standard: 47 CFR Part 2.1091
KDB 447498 D04 v01
Sample Arrival Date: Mar. 12, 2025
Test Date: Mar. 17, 2025 - Apr. 14, 2025
Date of Issue: Apr. 22, 2025

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

Tested by: Xiong Lining**Checked by:** Xu Rui**Approved by:** Tolan Tu

(Testing Director)



Revision History

Version	Issue Date	Revisions Content
<u>Rev. 01</u>	<u>Apr. 22, 2025</u>	<u>Initial Issue</u>

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1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	<input type="checkbox"/> Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China <input checked="" type="checkbox"/> 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Dagobah Systems Inc
Address	651 N. Broad Street Suite 206 Middletown, DE 19709 United States

2.2 Manufacturer Information

Manufacturer	Dagobah Systems Inc
Address	651 N. Broad Street Suite 206 Middletown, DE 19709 United States

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Name	ATA (Analog Telephone Adaptor) Gateway
Model Name Under Test	PC228
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	P3
Software Version	PC-228_v1.2
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.5 Technical Information

Network and Wireless connectivity	3G Network WCDMA HSDPA HSUPA Band 2/4/5 4G Network LTE FDD Band 2/4/5/12/13/14/66/71 2.4G WIFI 802.11b, 802.11g, 802.11n (HT20/40) 5G WIFI 802.11a, 802.11n (HT20/40), 802.11ac (VHT20/40/80)
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The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	LTE, WIFI				
Frequency Range	WCDMA Band 2	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz		
	WCDMA Band 4	TX: 1710 ~ 1755 MHz	RX: 2110 ~ 2155 MHz		
	WCDMA Band 5	TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz		
	LTE Band 2	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz		
	LTE Band 4	TX: 1710 ~ 1755 MHz	RX: 2110 ~ 2155 MHz		
	LTE Band 5	TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz		
	LTE Band 12	TX: 699 ~ 716 MHz	RX: 729 ~ 746 MHz		
	LTE Band 13	TX: 777 ~ 787 MHz	RX: 746 ~ 756 MHz		
	LTE Band 14	TX: 788 ~ 798 MHz	RX: 758 ~ 768 MHz		
	LTE Band 66	TX: 1710 ~ 1780 MHz	RX: 2110 ~ 2180 MHz		
	LTE Band 71	TX: 663 ~ 698 MHz	RX: 617 ~ 652 MHz		
	2.4G WIFI	2412 ~ 2462 MHz			
	5G WIFI	U-NII-1: 5150 ~ 5250MHz U-NII-3: 5725 ~ 5850MHz			
Antenna Type	WWAN: External Antenna WLAN: External Antenna				
Exposure Category	General Population/Uncontrolled exposure				
Product Type	Mobile Device				

3 SUMMARY OF TEST RESULT

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 2.1091	Radiofrequency radiation exposure evaluation: mobile devices
2	KDB 447498 D04 v01	447498 D04 Interim General RF Exposure Guidance v01

4 DEVICE CATEGORY AND LEVELS LIMITS

Mobile Devices:

CFR Title 47 §2.1091(b)

For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.

FCC KDB 447498 D04 General RF Exposure Guidance v01 Limit

Evaluation of compliance with the exposure limits in § 1.1310 is necessary if the ERP of the device is greater than ERP_{20cm} in Formula (B.1) [repeated from § 2.1091(c)(1) and § 1.1307(b)(1)(i)(B)].

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B.1})$$

If the ERP is not easily obtained, then the available maximum time-averaged power may be used (i. e., without consideration of ERP only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole).

SAR-based exemptions are constant at separation distances between 20 cm and 40 cm to avoid discontinuities in the threshold when transitioning between SAR-based and MPE-based exemption criteria at 40 cm, considering the importance of reflections.

The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold P_{th} (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by Formula (B.2).

$$P_{th} (\text{mW}) = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad (\text{B.2})$$

where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

and f is in GHz, d is the separation distance (cm), and $ERP_{20\text{cm}}$ is per Formula (B.1). The example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

Frequency (MHz)	Distance (mm)									
	5	10	15	20	25	30	35	40	45	50
300	39	65	88	110	129	148	166	184	201	217
450	22	44	67	89	112	135	158	180	203	226
835	9	25	44	66	90	116	145	175	207	240
1900	3	12	26	44	66	92	122	157	195	236
2450	3	10	22	38	59	83	111	143	179	219
3600	2	8	18	32	49	71	96	125	158	195
5800	1	6	14	25	40	58	80	106	136	169

According with FCC KDB 447498 D04, Appendix A, Per § 1.1307(b)(3)(i)(A), a single RF source is exempt RF device (from the requirement to show data demonstrating compliance to RF exposure limits, as previously mentioned) if the available maximum time-averaged power is no more than 1 mW, regardless of separation distance.

This exemption applies to all operating configurations and exposure conditions, for the frequency range 100 kHz to 100 GHz, regardless of fixed, mobile, or portable device exposure conditions. This is a standalone exemption, and it cannot be applied in conjunction with any other test exemption.

When maximum available power each individual transmitting antenna within the same time averaging period is ≤ 1 mW, and the nearest parts of the antenna structures of the simultaneously operating transmitters are separated by at least 2 cm.

When the aggregate maximum available power of all transmitting antennas is ≤ 1 mW in the same time-averaging period.

5 ASSESSMENT RESULT

5.1 Output Power

WLAN			
Mode	2.4G Max	5GWIFI(U-NII-1) Max	5GWIFI(U-NII-3) Max
Conducted Power (dBm)	25.84	21.89	23.82
Antenna Gain (dBi)	2.70	1.40	2.60
EIRP (dBm)	28.54	23.29	26.42

Note: This report listed the worst case conducted power value, please refer to RF test report No. BL-SH2530225-601 and 602 for more details.

WCDMA			
Mode	Band 2	Band 4	Band 5
Conducted Power (dBm)	22.55	22.27	22.64
Antenna Gain (dBi)	4.40	3.10	3.20
EIRP (dBm)	26.95	25.37	23.69

Note: This report listed the worst case conducted power value, please refer to RF test report No.BL-SH2530225-501 for more details.

LTE								
Mode	Band 2	Band 4	Band 5	Band 12	Band 13	Band 14	Band 66	Band 71
Conducted Power (dBm)	23.77	23.40	23.89	23.29	23.41	23.30	23.50	23.38
Antenna Gain (dBi)	4.40	3.10	3.20	3.30	2.70	3.00	3.20	2.30
ERP/EIRP (dBm)	28.17	26.50	24.94	24.44	23.96	24.15	26.70	23.53

Note: This report listed the worst case conducted power value, please refer to RF test report No.BL-SH2530225-501 for more details.

5.2 Tune-up power

Mode		Conducted Power Range (dBm)	EIRP Range (dBm)	ERP Range (dBm)
WCDMA	Band 2	【21.50,23.50】	【25.90,27.90】	【23.75,25.75】
	Band 4	【21.50,23.50】	【24.60,26.60】	【22.45,24.45】
	Band 5	【21.50,23.50】	/	【22.55,24.55】
LTE	Band 2	【22.50,24.50】	【26.90,28.90】	【24.75,26.75】
	Band 4	【22.50,24.50】	【25.60,27.60】	【23.45,25.45】
	Band 5	【23.00,25.00】	/	【24.05,26.05】
	Band 12	【22.50,24.50】	/	【23.65,25.65】
	Band 13	【22.50,24.50】	/	【23.05,25.05】
	Band 14	【22.50,24.50】	/	【23.35,25.35】
	Band 66	【22.50,24.50】	【25.17,27.17】	【23.55,25.55】
	Band 71	【22.50,24.50】	/	【22.65,24.65】
2.4GWIFI		【25.00,27.00】	【27.70,29.70】	【25.55,27.55】
5GWIFI(U-NII-1: 5150-5250MHz)		【21.00,23.00】	【22.40,24.40】	【20.25,22.25】
5GWIFI(U-NII-3: 5725-5850MHz)		【23.00,25.00】	【25.60,27.60】	【23.45,25.45】
Note1: ERP= EIRP -2.15dB.				
Note2: According KDB 447498 D04, used the greater of maximum conducted power and ERP to compare with the threshold value Pth.				

5.3 RF Exposure Evaluation Result

Evolution mode		f(MHz)	Distance (cm)	Maximum power (dBm)	Maximum power (mw)	Threshold Power (mW)	P/Plimit	Verdict
WCDMA	Band 2	1850	20	25.75	375.84	3060.00	0.1228	Pass
	Band 4	1710	20	24.45	278.61	3060.00	0.0910	Pass
	Band 5	824	20	24.55	285.10	1680.96	0.1696	Pass
LTE	Band 2	1850	20	26.75	473.15	3060.00	0.1546	Pass
	Band 4	1710	20	25.45	350.75	3060.00	0.1146	Pass
	Band 5	824	20	26.05	402.72	1680.96	0.2396	Pass
	Band 12	699	20	25.65	367.28	1425.96	0.2576	Pass
	Band 13	777	20	25.05	319.89	1585.08	0.2018	Pass
	Band 14	788	20	25.35	342.77	1607.52	0.2132	Pass
	Band 66	1710	20	25.55	358.92	3060.00	0.1173	Pass
	Band 71	663	20	24.65	291.74	1352.52	0.2157	Pass
2.4GWIFI		2412	20	27.55	568.85	3060.00	0.1859	Pass
5GWIFI(U-NII-1: 5150-5250MHz)		5150	20	23.00	199.53	3060.00	0.0652	Pass
5GWIFI(U-NII-3: 5725-5850MHz)		5725	20	25.45	350.75	3060.00	0.1146	Pass

5.4 Collocated Power Calculation

Evolution mode	Frequency(MHz)	Power /Limit	$\Sigma(\text{Power / Limit})$ of WWAN + WLAN	Verdict
Band 12	699MHz ~ 716MHz	0.2576	0.4435	Pass
2.4GWIFI	2412 MHz ~ 2462 MHz	0.1859		

Note:

1. $\Sigma(\text{Power / Limit})$: This is a summation of [(power for each transmitter/ antenna included in the simultaneous transmission)/ (corresponding Power limit)], for WWAN+ WLAN.
2. Both of the WWAN+ WLAN can transmit simultaneously, the formula of calculated the Power is $CP1 / LP1 + CP2 / LP2 + \dots$ etc. < 1
 CP = Calculation power
 LP = Limit of power
3. The worst-case situation is 0.4435, which is less than "1". This confirmed that the device comply with FCC KDB 447498 D04 Power limit.
4. The DUT work frequency range used is 824 MHz ~ 849 MHz, 1850 MHz ~ 1910 MHz, 1710 MHz ~ 1780 MHz, 663 MHz ~ 698 MHz, 699 MHz ~ 716 MHz, 777 ~ 787 MHz, 788 ~ 798 MHz, 2402MHz ~ 2480 MHz, 5150 ~ 5250 MHz, 5725 ~ 5850 MHz the result close to the limit by the above formula, so we select worst case power to calculate the exclusion power threshold.
5. More power list please refer to RF test report.

5.5 Conclusion

This EUT is deemed to comply with the reference level limits, therefore the basic restrictions are compliant with human exposure limits.

Statement

1. The laboratory guarantees the scientificity, accuracy and impartiality of the test, and is responsible for all the information in the report, except the information provided by the customer. The customer is responsible for the impact of the information provided on the validity of the results.
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7. Any objection shall be raised to the laboratory within 30 days after receiving the report.

--END OF REPORT--