Backburner Labs Inc.

By-A-Nose Rodeo Gate Timer

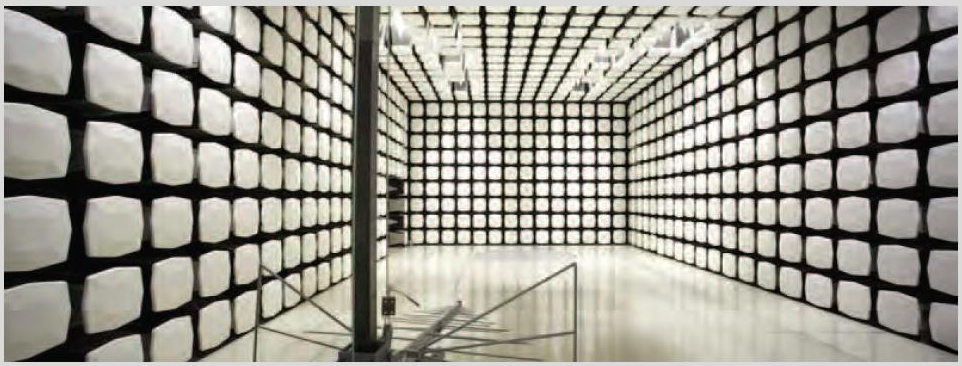
FCC 1.1307:2024

802.11b/g/n (Gates)

802.11b/g/n (Pendant (OTA Update))

Bluetooth Low Energy (Pendant (OTA Update))

Report: BKBN0001.0 Rev 1, Issue Date: December 9, 2024



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CERTIFICATE OF EVALUATION

Last Date of Evaluation: December 5, 2024
Backburner Labs Inc.
EUT: By-A-Nose Rodeo Gate Timer

RF Exposure Evaluation

Standards

Specification	Method
FCC 1.1307:2024	FCC 1.1307:2024

Results

Method Clause	Description	Applied	Results	Comments
(b)(3)(i)(B)	Exemption From RF Exposure Evaluation	Yes	Pass	Gate Timers minimum distance = 20 cm Pendant (Worn) minimum distance = 5 mm Pendant (OTA Update) minimum distance = 20cm

Deviations From Evaluation Standards

None

Approved By:

Donald Facteau, Process Architect

REVISION HISTORY

Revision Number	Description	Date (yyyy-mm-dd)	Page Number
00	None		
01	Recalculated Assessment	2024-12-09	11,12
	Updated Certificate of Evaluation, Exposure Condition and Product Descriptions to match new assessment		3, 7, 8
	Changed WiFi reference to “b/g/n”		1, 8, 11, 12

ACCREDITATIONS AND AUTHORIZATIONS

United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Each laboratory is accredited by A2LA to ISO / IEC 17025, and as a product certifier to ISO / IEC 17065 which allows Element to certify transmitters to FCC and IC specifications.

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB) and as a CAB for the acceptance of test data.

European Union

European Commission – Recognized as an EU Notified Body validated for the EMCD and RED Directives.

United Kingdom

BEIS – Recognized by the UK as an Approved Body under the UK Radio Equipment and UK EMC Regulations.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

MSIT / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Israel

MOC – Recognized by MOC as a CAB for the acceptance of test data.

Hong Kong

OFCA – Recognized by OFCA as a CAB for the acceptance of test data.

Vietnam

MIC – Recognized by MIC as a CAB for the acceptance of test data.

SCOPE

For details on the Scopes of our Accreditations, please visit:

California Minnesota Oregon Texas Washington

FACILITIES

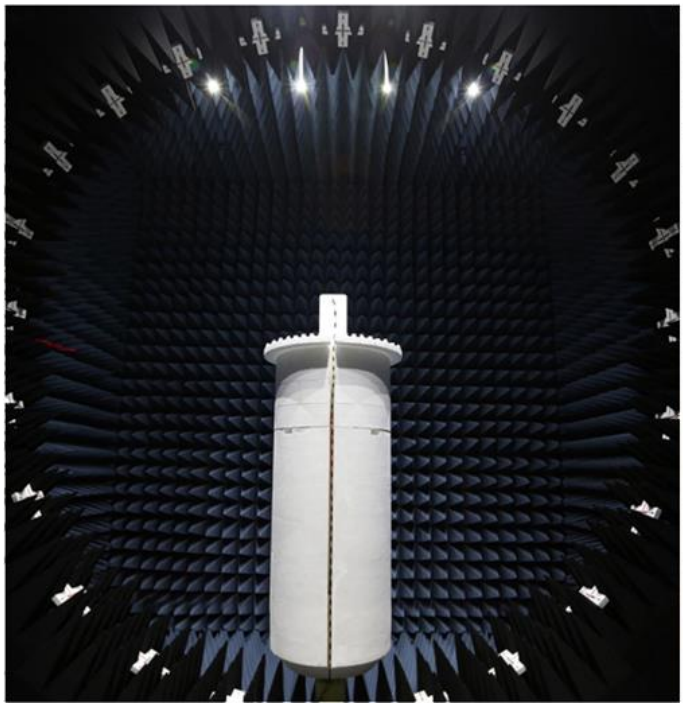
element
2024.09.23

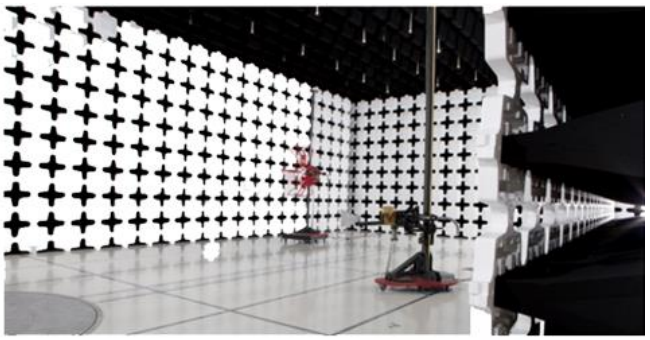
Testing was performed at the following location(s)

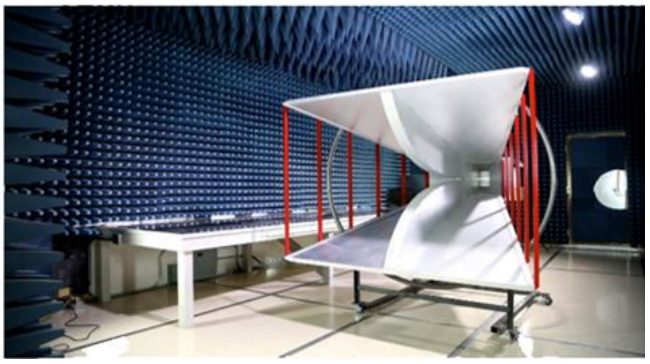
	Location	Labs (1)	Address	A2LA (2)	ISED (3)	BSMI (4)	VCCI (5)	CAB (6)	FDA (7)
☐	California	OC01-17	41 Tesla Irvine, CA 92618 (949) 861-8918	3310.04	2834B	SL2-IN-E-1154R	A-0029	US0158	TL-55
☐	Minnesota	MN01-11	9349 W Broadway Ave. Brooklyn Park, MN 55445 (612) 638-5136	3310.05	2834E	SL2-IN-E-1152R	A-0109	US0175	TL-57
☐	Oregon	EV01-12	6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	3310.02	2834D	SL2-IN-E-1017	A-0108	US0017	TL-56
☐	Plano Texas	PT01-15	1701 E Plano Pkwy, Ste 150 Plano, TX 75074 (972) 509-2566	214.19	32637	SL2-IN-E-057R	A-0426	US0054	N/A
☐	Washington	NC01-05	19201 120th Ave NE Bothell, WA 98011 (425) 984-6600	3310.06	2834F	SL2-IN-E-1153R	A-0110	US0157	TL-67
☐	Offsite	N/A	See Product Description	N/A	N/A	N/A	N/A	N/A	N/A

See data sheets for specific labs

(1) The lab designations denote individual rooms within each location. (OC01, OC02, OC03, etc.)
(2) A2LA Certificate No.
(3) ISED Company No.
(4) BSMI No.
(5) VCCI Site Filing No.
(6) CAB Identifier. Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA
(7) FDA ASCA No.







PRODUCT DESCRIPTION

Client and Equipment Under Evaluation Information

Company Name:	Backburner Labs Inc.
Address:	3040 Wilder Street N
City, State, Zip:	St. Paul, MN 55113
Evaluation Requested By:	Tyler Perry
EUT:	By-A-Nose Rodeo Gate Timer
Date of Evaluation:	12/5/2024

Information Provided by the Party Requesting the Evaluation

Functional Description of the Equipment:
The equipment is a 3-node system that is used for timing horse barrel racing at rodeos. Contains Wi-Fi/BT module FCC ID: 2BKES-BANRT-A Three configurations were evaluated: Gate Timer: WiFi only at a distance of 20 cm Pendant (Worn): WiFi and BLE at a distance of 5 mm Pendant (OTA Update): WiFi and BLE at a distance of 20 cm

Objective:
To demonstrate compliance with FCC Requirements for RF exposure for 1.1307 RF exempt devices

RF EXPOSURE CONDITION

The following RF Exposure conditions were used for the assessment documented in this report:	
Intended Use	Portable
Location on Body (if applicable)	Head/Torso
How is the Device Used	Pendant (Worn): WiFi and BLE
Radios Contained in the Same Host Device	802.11b/g/n Bluetooth Low Energy
Simultaneous Transmitting Radios	None
Body Worn Accessories	NA
Environment	General Population/Uncontrolled Exposure

The following RF Exposure conditions were used for the assessment documented in this report:	
Intended Use	Mobile
Location on Body (if applicable)	Head/Torso
How is the Device Used	Pendant (OTA Update): WiFi and BLE Gate Timer (OTA Update): WiFi
Radios Contained in the Same Host Device	802.11b/g/n Bluetooth Low Energy
Simultaneous Transmitting Radios	None
Body Worn Accessories	NA
Environment	General Population/Uncontrolled Exposure

EXEMPTION FROM RF EXPOSURE EVALUATION

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EXRPT.2024.05.10.0

OVERVIEW

Section 1.3 of KDB 44798 D04 v01 states that, "Under the new rules, all radio services and operations are subject to Routine Evaluation [§§ 1.1307(b)(1), 2.1033(f), etc.], unless shown to qualify under the exemptions provided in the rules and OET Lab policies for equipment authorization."

The glossary of KDB 447498 D04 v01 specifies that an exempt RF device is defined "solely from the obligation to perform a routine environmental evaluation to demonstrate compliance with the RF exposure limits in § 1.1310; it is not exemption from the equipment authorization procedures described in 47 CFR Part 2, not exemption from general obligations of compliance with the RF exposure limits in § 1.1310 of this chapter, and not exemption from determination of whether there is no significant effect on the quality of the human environment under § 1.1306." Compliance with the exemption criteria defined in 1.1307(b) confirm compliance with the limits in § 1.1310.

COMPLIANCE WITH FCC 1.1310

Per 1.1307(b)(3), (i) For single RF sources (*i.e.,* any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

(A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);

(B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by:

$$P_{th}(mW) = \begin{cases} ERP_{20\ cm}(d/20\ cm)^{x} & d \le 20\ cm \\ ERP_{20\ cm} & 20\ cm\ < d\ \le 40\ cm \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\ cm}\sqrt{f}}\right)\ and\ f\ is\ in\ GHz\,;$$

And

$$ERP_{20\ cm}(mW) = \begin{cases} 2040f & 0.3\ GHz\ \le f\ < 1.5\ GHz \\ 3060 & 1.5\ GHz\ \le f\ \le 6\ GHz \end{cases}$$

(C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least λ/2π, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of λ/4 or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

TABLE 1 TO §1.1307(b)(3)(i)(C)—SINGLE RF SOURCES SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2.
1.34-30	3,450 R^2/f^2.
30-300	3.83 R^2.
300-1,500	0.0128 R^2f.
1,500-100,000	19.2R^2.

(ii) For multiple RF sources: Multiple RF sources are exempt if:

(A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required). This exemption may not be used in conjunction with other exemption criteria other than those is paragraph (b)(3)(i)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(i)(A).

(B) in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^{a} \frac{P_i}{P_{th,i}} + \sum_{j=1}^{b} \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k} \leq 1$$

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(B) of this section for P_{th}, including existing exempt transmitters and those being added.

b = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(C) of this section for Threshold ERP, including existing exempt transmitters and those being added.

c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

P_i = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source *i* at a distance between 0.5 cm and 40 cm (inclusive).

$P_{th,i}$ = the exemption threshold power (P_{th}) according to paragraph (b)(3)(i)(B) of this section for fixed, mobile, or portable RF source *i.*

ERP_j = the ERP of fixed, mobile, or portable RF source *j.*

$ERP_{th,j}$ = exemption threshold ERP for fixed, mobile, or portable RF source *j,* at a distance of at least λ/2π according to the applicable formula of paragraph (b)(3)(i)(C) of this section.

$Evaluated_k$ = the maximum reported SAR or MPE of fixed, mobile, or portable RF source *k* either in the device or at the transmitter site from an existing evaluation at the location of exposure.

$Exposure\ Limit_k$ = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source *k,* as applicable from §1.1310

The relationship between EIRP and ERP is:

$$ERP\ (dBm) = EIRP\ (dBm) - 2.14\ dB$$

Where EIRP is the sum of the conducted power (dBm) and the antenna gain (dBi).

EXEMPTION FROM RF EXPOSURE EVALUATION

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ASSESSMENT

The exemption from RF exposure evaluation is summarized in the following table(s):

Gate Timer:

Radio	Transmit Frequency (MHz)	Conducted Output Power	Power Tolerance (dB)	Duty Cycle	Antenna Assembly Gain (dBi)	Minimum Separation Distance (cm)	Calculated Radiated Exposure Power (mW) ERP	Calculated Conducted Exposure Power (mW dBm)	Limit (mW)	Compliant
802.11b/g/n: Gates	2412	18 dBm	2.0	30.0%	2.4	20	31.8	30.0	3060	Yes
802.11b/g/n: Gates	2462	18 dBm	2.0	30.0%	2.4	20	31.8	30.0	3060	Yes

The information in the table above was obtained from: Customer supplied information. Assessment completed using update mode, 30% duty cycle as worst-case scenario.

The rated value was used in these calculations.

Pendant (Worn):

Radio	Transmit Frequency (MHz)	Conducted Output Power	Power Tolerance (dB)	Duty Cycle	Antenna Assembly Gain (dBi)	Minimum Separation Distance (cm)	Calculated Radiated Exposure Power (mW) ERP	Calculated Conducted Exposure Power (mW dBm)	Limit (mW)	Compliant
Bluetooth Low Energy: Pendant (Worn)	2483.5	-3 dBm	2.0	0.5%	5	0.5	0.0	0.0	2.7	Yes
Bluetooth Low Energy: Pendant (Worn)	2400	-3 dBm	2.0	0.5%	5	0.5	0.0	0.0	2.8	Yes
802.11b/g/n: Pendant (Worn)	2462	18 dBm	2.0	0.5%	5	0.5	1.0	0.5	2.7	Yes
802.11b/g/n: Pendant (Worn)	2412	18 dBm	2.0	0.5%	5	0.5	1.0	0.5	2.8	Yes

The information in the table above was obtained from: Customer supplied information. Assessment completed using 0.5% duty cycle as worst-case scenario.

The rated value was used in these calculations.

EXEMPTION FROM RF EXPOSURE EVALUATION

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Pendant (OTA Update):

Radio	Transmit Frequency (MHz)	Conducted Output Power	Power Tolerance (dB)	Duty Cycle	Antenna Assembly Gain (dBi)	Minimum Separation Distance (cm)	Calculated Radiated Exposure Power (mW) ERP	Calculated Conducted Exposure Power (mW dBm)	Limit (mW)	Compliant
Bluetooth Low Energy: Pendant (OTA Update)	2483.5	-3 dBm	2.0	30.0%	5	20	0.5	0.2	3060.0	Yes
Bluetooth Low Energy: Pendant (OTA Update)	2400	-3 dBm	2.0	30.0%	5	20	0.5	0.2	3060.0	Yes
802.11b/g/n: Pendant (OTA Update)	2462	18 dBm	2.0	30.0%	5	20	57.8	30.0	3060.0	Yes
802.11b/g/n: Pendant (OTA Update)	2412	18 dBm	2.0	30.0%	5	20	57.8	30.0	3060.0	Yes

The information in the table above was obtained from: Customer supplied information. Assessment completed using update mode, 30% duty cycle as worst-case scenario.

The rated value was used in these calculations.

Evaluator: Chuck Heller

Backburner Labs Inc.

Element Quote BKBN0001-R4

DUTY CYCLE CALCULATIONS

Periodic Transmissions

Description	Period(seconds)	Payload (bytes)	Duty Cycle (%)*
Status Message	**0.033**	**21**	**0.51%**
Heartbeat	3	7	0.002%
Batt. Status	30	12	0.0003%

* Assuming 1 Mbps data rate

Event-driven Transmissions

- On connect, 1 time message burst (Rx, Tx to pendant)
- Interaction from app creates events that result in Wifi transmission. These are not on a regular or predictable cadence.

OTA Updates

The system has over-the-air (OTA) update capability. **The user will be allowed to update only when the units are charging (connected to the wall). This will be enforced by the firmware.**

When an OTA update is initiated, the following happens:

- BLE communication from phone to pendant (10 min 1.3MB file, two-way comm)
- Wifi from pendant to Rx and Tx (1.3MB file over 30 seconds)
- This operation takes places over a 30 second period at a **duty cycle of 30%** - calculation below:

Transfer time	30 seconds
Size	1084176 bytes
Max packet size	250 bytes
Wifi Bit rate	1000000 bps
Data Transfer rate	289113.6 bps
Packets per second	1156.4544 packets
Packet transmission time	0.00025 seconds
Duty cycle	28.91%

End of Test Report