

Radio Test Report

Report No: STS2407130H02

Issued for

Buddi Limited

Talbot House, 17 Church Street, Rickmansworth, WD3 1DE,
Hertfordshire, UK

Product Name: Smart Beacon V2.2

Brand Name: Buddi Limited

Model Name: T7-BUD-A-TEEU-B-2.2DS

Series Model(s): 3450012

FCC ID: ZDLSB2

Test Standards: FCC 47CFR §2.1091

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen STS Test Services Co., Ltd

**TEST REPORT**

Applicant's Name: Buddi Limited
Address: Talbot House, 17 Church Street, Rickmansworth, WD3 1DE, Hertfordshire, UK

Manufacturer's Name: Buddi Limited
Address: Talbot House, 17 Church Street, Rickmansworth, WD3 1DE, Hertfordshire, UK

Product Description

Product Name: Smart Beacon V2.2
Brand: Buddi Limited
Model Number: T7-BUD-A-TEEU-B-2.2DS

Series Model(s): 3450012

Standards: FCC 47CFR §2.1091
447498 D04 Interim General RF Exposure Guidance v01

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Date of Test

Date of receipt of test item: 15 May 2023
Date (s) of performance of tests: 15 May 2023 ~ 27 June 2023
Date of Issue: 28 Aug. 2024
Test Result: **Pass**

Testing Engineer : *Aaron Bu*

(Aaron Bu)

Technical Manager : *Tony Liu*

(Tony Liu)

Authorized Signatory : *Bovey Yang*

(Bovey Yang)





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**Revision History**

Rev.	Issue Date	Report No.	Effect Page	Contents
00	27 June 2023	STS2305096H01	ALL	Initial Issue
00	28 Aug. 2024	STS2407130H02	ALL	Update hardware version number, model name and series model



1. GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Smart Beacon V2.2								
Brand	Buddi Limited								
Model Number	T7-BUD-A-TEEU-B-2.2DS								
Series Model(s)	3450012								
Model Difference	The difference only in the model name.								
Product Description	<p>The EUT is Smart Beacon V2.2.</p> <table border="1"><tr><td>Operation Frequency:</td><td>2.4G WLAN: 802.11b/g/n 20: 2412~2462 MHz ISM: 914.5MHz, 917.5MHz, 921.00MHz GSM: 850: 824 MHz ~ 849MHz 1900: 1850 MHz ~ 1910MHz WCDMA: Band V: 824 MHz ~ 849 MHz Band II: 1850 MHz ~ 1910 MHz LTE: Band 2:1850~1910MHz Band 5:824~849MHz Band 12:699~716MHz</td></tr><tr><td>Modulation Type:</td><td>2.4G WLAN: 802.11b(DSSS):CCK,DQPSK,DBPSK 802.11g(OFDM):BPSK,QPSK,16-QAM,64-QAM 802.11n(OFDM):BPSK,QPSK,16-QAM,64-QAM ISM: FSK GSM: GMSK for GPRS; GMSK and 8PSK for EDGE WCDMA: QPSK; HSDPA:QPSK/16QAM LTE: QPSK /16QAM</td></tr><tr><td>Antenna gain:</td><td>2.4G WLAN: 3.5dBi ISM: 1.4dBi GSM850/WCDMA B5/LTE B5: 1dBi GSM1900/WCDMA B2/LTE B2: 2.5dBi LTE B12: 0.5dBi</td></tr><tr><td>Antenna Designation:</td><td>2.4G WLAN: SMD Antenna ISM: Standalone Antenna GSM:/WCDMA/LTE: SMD Antenna</td></tr></table>	Operation Frequency:	2.4G WLAN: 802.11b/g/n 20: 2412~2462 MHz ISM: 914.5MHz, 917.5MHz, 921.00MHz GSM: 850: 824 MHz ~ 849MHz 1900: 1850 MHz ~ 1910MHz WCDMA: Band V: 824 MHz ~ 849 MHz Band II: 1850 MHz ~ 1910 MHz LTE: Band 2:1850~1910MHz Band 5:824~849MHz Band 12:699~716MHz	Modulation Type:	2.4G WLAN: 802.11b(DSSS):CCK,DQPSK,DBPSK 802.11g(OFDM):BPSK,QPSK,16-QAM,64-QAM 802.11n(OFDM):BPSK,QPSK,16-QAM,64-QAM ISM: FSK GSM: GMSK for GPRS; GMSK and 8PSK for EDGE WCDMA: QPSK; HSDPA:QPSK/16QAM LTE: QPSK /16QAM	Antenna gain:	2.4G WLAN: 3.5dBi ISM: 1.4dBi GSM850/WCDMA B5/LTE B5: 1dBi GSM1900/WCDMA B2/LTE B2: 2.5dBi LTE B12: 0.5dBi	Antenna Designation:	2.4G WLAN: SMD Antenna ISM: Standalone Antenna GSM:/WCDMA/LTE: SMD Antenna
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Antenna Designation:	2.4G WLAN: SMD Antenna ISM: Standalone Antenna GSM:/WCDMA/LTE: SMD Antenna								
Adapter	Input: 100 ~ 240VAC, 47~63hz, 0.4A Output: DC 5V 2.4A								
Battery	Rated Voltage: 3.7V Charge Limit Voltage: 4.2V Capacity: 3100mAh								
Hardware Version	v14.1								
Software Version	1.40.5								



1.2 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD

Add. : 101, Building B, Zhuoke Science Park, No.190 Chongqing Road, ZhanChengShequ, Fuhai Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01



2. FCC 47CFR §2.1091 REQUIREMENT

2.1 TEST STANDARDS

Follow the maximum permissible exposure (MPE) limits specified in 447498 D04 Interim General Radio Frequency Exposure Guidelines v01. The gain of the antenna used in the product was extracted from the supplied antenna data sheet and the maximum total power input to the antenna was also measured. Calculate the distance from the product to the MPE limit by the formula.

2.2 LIMIT

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 Part 1.1307. 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 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by:

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

Where

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

and

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

d = the separation distance (cm);



(C) Or using below table 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 $\lambda/2\pi$, 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 $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

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	$19.2R^2$.



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 in paragraph (b)(3)(i)(A) of Part 1.1307. 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 Part 1.1307 for Pth, 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 Part 1.1307 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.

Pi = 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).

Pth,i = the exemption threshold power (Pth) according to paragraph (b)(3)(i)(B) of this section for fixed, mobile, or portable RF source i.

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

ERPth,j = exemption threshold ERP for fixed, mobile, or portable RF source j, at a distance of at least $\lambda/2\pi$ according to the applicable formula of paragraph (b)(3)(i)(C) of Part 1.1307.

Evaluatedk = 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 Limitk = 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.



2.3 TEST RESULT

Turn up

Mode	Detector	Turn up Power
914.5 MHz	AV	8±1dBm
2.4G WLAN	AV	17.8±1dBm
GPRS 850	AV	28.7±1dBm
GPRS 1900	AV	28±1dBm
WCDMA Band 2	AV	23±1dBm
WCDMA Band 5	AV	23±1dBm
LTE Band 2	AV	23±1dBm
LTE Band 5	AV	24±1dBm
LTE Band 12	AV	20±1dBm

Protocol	Fre. (MHz)	Separation distance (cm)	Max Turn up power (dBm)	ANT Gain (dBi)	Max EIRP (dBm)	Max ERP (dBm)	Max ERP (W)	Limit (W)	Ratio	Result
914.5 MHz	914.5	20	9	1.4	10.4	8.25	0.007	0.468	0.014	Pass
2.4G WLAN	2437	20	18.8	3.5	22.3	20.15	0.104	0.768	0.135	Pass
GPRS 850	824	20	29.70	1	27.69	25.54	0.358	0.422	0.849	Pass
GPRS 1900	1850	20	29.00	2.5	28.49	26.34	0.431	0.768	0.561	Pass
WCDMA Band 2	1850	20	24.00	2.5	26.50	24.35	0.272	0.768	0.355	Pass
WCDMA Band 5	824	20	24.00	1	25.00	22.85	0.193	0.422	0.457	Pass
LTE Band 2	1850	20	24.00	2.5	26.50	24.35	0.272	0.768	0.355	Pass
LTE Band 5	824	20	25.00	1	26.00	23.85	0.243	0.422	0.575	Pass
LTE Band 12	699	20	21.00	0.5	21.50	19.35	0.086	0.358	0.241	Pass



Multiple transmission:

ISM+WLAN+GSM=0.014+0.135+0.849=0.998<1

ISM+WLAN+WCDMA =0.014+0.135+0.457=0.606<1

ISM+WLAN+LTE=0.014+0.135+0.575=0.724<1

Note: 1. The Maximum power is less than the limit, complies with the exemption requirements.

*****END OF THE REPORT*****