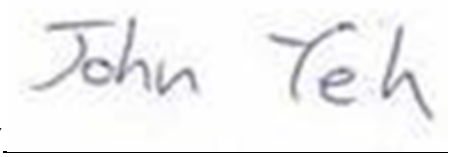
RF EXPOSURE REPORT

FCC Applicant:	YOKE Industrial Corp. #39, 33rd Road, Taichung Industrial Park, Taichung 407, Taiwan
Product Name:	RFID Bluetooth Reader
Brand Name:	BlueSupra
Model No.:	1735
Model Difference:	N/A
Report Number:	TESA2304000256ES
FCC ID	2APZV-BLUESUPRA1735
Issue Date:	Jan. 22, 2024

Approved By 

John Yeh

We hereby certify that:

The above equipment was evaluated by SGS Taiwan Ltd. The evaluation in this report is in compliance with FCC KDB 447498 D01v06.

The results of this report relate only to the sample identified in this report.

Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
TESA2304000256ES	00	Original.	Jun. 21, 2023	Cindy Chou	
TESA2304000256ES	01	Modify comment	Jan. 12, 2024	Cindy Chou	*
TESA2304000256ES	02	Modify comment	Jan. 22, 2024	Cindy Chou	*

Note:

1、The remark "*" indicates modification of the report upon requests from certification body.

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1 DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

1.1 Product Description

Product Name:	RFID Bluetooth Reader
Brand Name:	BlueSupra
Model No.:	1735
Model Difference:	N/A

1.2 RF specification

Radio Technology:	NFC
Operating Frequency	13.56MHz
Transmit Power	31.38dBuV/m at 30m.
Number of Channels	1
Modulation Type	ASK
Antenna Type	Coil

1.3 Antenna Information:

Antenna Type	Supplier	Freq. (MHz)	Peak Antenna Gain (dBi)
Chip	Raytac	2.4GHz	**-0.65**

The antenna information is provided by the applicant.

2 RF EXPOSURE EVALUATION FOR PORTABLE CONDITIONS

2.1 FCC Standard Applicable:

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

2.1.1 As per KDB 447498 D01 4.3.1,

Step a: For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g Head & Body SAR and ≤ 7.5 for 10-g extremity Hand SAR, where

- *f(GHz) is the RF channel transmit frequency in GHz*
- *Power and distance are rounded to the nearest mW and mm before calculation*
- *The result is rounded to one decimal place for comparison*
- *The values 3.0 and 7.5 are referred to as numeric thresholds in **step b)** below*

Step b: For 100 MHz to 6 GHz and test separation distances > 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following (also illustrated in Appendix B):

1) {[Power allowed at numeric threshold for 50 mm in step a)] + [(test separation distance – 50 mm)·(f(MHz)/150)]} mW, for 100 MHz to 1500 MHz

2) {[Power allowed at numeric threshold for 50 mm in step a)] + [(test separation distance – 50 mm)·10]} mW, for > 1500 MHz and ≤ 6 GHz

Step c: For frequencies below 100 MHz, the following may be considered for SAR test exclusion (also illustrated in Appendix C):

1) For test separation distances > 50 mm and < 200 mm, the power threshold at the corresponding test separation distance at 100 MHz in step b) is multiplied by [1 + log(100/f(MHz))]

2) For test separation distances ≤ 50 mm, the power threshold determined by the equation in c) 1) for 50 mm and 100 MHz is multiplied by ½

3) SAR measurement procedures are not established below 100 MHz

2.2 Measurement Result:

Step a:

This is a portable device and the max. output power including tune-up tolerance is 6.31 (mW), lower than the threshold given and derived as formula given above, where

=6.31(mW)/5(mm)*√2.442(GHz) = 1.972 < 3.0

Frequency (MHz)	Max. output power including tune-up tolerance(dBm)	Max. output power including tune-up tolerance(mW)	Distance (mm)	Result	≤ 3.0 for 1-g SAR
2442	8	6.31	5	1.972	TRUE

As the result of calculation result indicates, the RF exposure generating from given transmitter (transmitter employed digital modulation) can be excluded from SAR measurement, and is deemed compliant with RF exposure as per FCC.

2.2.1 As per KDB447498D01v06 4.3.1 c)

SAR test exclusion threshold for NFC (13.56MHz) shall be evaluated as below,

a) For *test separation distances* ≤ 50 mm, the power threshold determined by the equation in 4.3.1 c) 1) for 50 mm and 100 MHz is multiplied by ½

b) The power threshold at 50mm/100 MHz in 4.3.1 b) is multiplied by [1 + log(100/f(MHz))] where f is 13.56MHz

c) The power threshold in 4.3.1 b) is [Power allowed at numeric threshold for 50 mm in 4.3.1 a)] + [(test separation distance – 50 mm)·(f(MHz)/150)] mW, for 100 MHz to 1500 MHz where test separation distance is 50mm, frequency is 100MHz.

d) Power allowed at numeric threshold for 50 mm in 4.3.1 a) is $[3/\sqrt{f_{(GHz)}}]\cdot$(test separation distance)

Hence, SAR test exclusion threshold is calculated in reverse sequence:
d) : $[3/\sqrt{0.1}]\cdot 50 = 474.3416$mW
c) : 474.3416 + (50-50)·(100/150) = 474.3416mW
b) : 474.3416·[1+log(100/13.56)] = 885.9469mW
a) : 885.9469 · 0.5 = 442.973mW

Step c:

Frequency (MHz)	E-FIELD dBuV/m	Test Distance (m)	EIRP (dBm)	EIRP (mW)	Threshold (mW)
13.56	31.38	30	-43.77757	0.0000419	442.973

Note:

Distance Factor = 40log(Test Distance (m) / Separation Distance (m))

E-FIELD (dBuV/m) = E-FIELD (dBuV/m) + Distance Factor(dB)

EIRP (dBm)= (E-FIELD(dBuV/m)+ 20log(d(m))-104.7

EIRP(W)= (10^(EIRP(dBm)/10))/1000

Power (dBm)	dis. (mm)	freq. (MHz)	result
8	5	2480	0.265
-43.77757	5	13.56	0.000

Collocated Calculation

Operation Mode	Result	Sum	Threshold
BLE	0.265	0.265	1.6
NFC	0.000		