

## RF Exposure Exemption

**Applicant** : **Uniform Industrial Corp.**

**Product Name** : **Contactless Smart Card Reader**

**Trade Name** : **UIC**

**Model Number** : **UIC680EZ**

**Applicable Standard** : **47 CFR § 2.1093**

**Received Date** : **Nov. 29, 2023**

**Issued Date** : **Jan. 19, 2024**

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Taiwan Accreditation Foundation accreditation number: 1330

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**Approved By :**



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## Revision History

<i>Rev.</i>	<i>Issued Date</i>	<i>Description</i>	<i>Revised by</i>
00	Jan. 19, 2024	Initial Issue	Rowan Hsieh

## 1. General Information

### 1.1 Reference Applicable Standard

Standard	Description	Version
IEEE C95.1	American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 300 KHz to 100 GHz, New York.	1992
47 CFR § 2.1091	Radiofrequency radiation exposure evaluation: mobile devices.	-
47 CFR § 1.1310	Radiofrequency radiation exposure limits.	-
KDB 447498 D04	RF exposure procedures and equipment authorization policies for mobile and portable devices	v01

## 1.2 Testing Location

### Test Facilities

Company Name: Eurofins E&E Wireless Taiwan Co., Ltd.  
 Address: No. 140-1, Changan Street, Bade District, Taoyuan City 334025, Taiwan  
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### Test Site Location

- No. 140-1, Changan Street, Bade District, Taoyuan City 334025, Taiwan
- No. 2, Wuquan 5th Rd. Wugu Dist., New Taipei City, Taiwan

### Laboratory Accreditation

Location	TAF	FCC	ISED
No. 140-1, Changan Street, Bade District, Taoyuan City 334025, Taiwan	Accreditation No.: 1330	Designation No.: TW0010	Company No.: 7381A CAB ID: TW1330
No. 2, Wuquan 5th Rd. Wugu Dist., New Taipei City, Taiwan	Accreditation No.: 1330	Designation No.: TW0034	Company No.: 28922 CAB ID: TW1330

## 2. Description of Equipment under Test (EUT)

<b>Applicant</b>	Uniform Industrial Corp. 2901 Bayview Dr, Fremont, CA 94538		
<b>Product Name</b>	Contactless Smart Card Reader		
<b>Trade Name</b>	UIC		
<b>Model Number</b>	UIC680EZ		
<b>FCC ID</b>	TFJUIC680EZ		
<b>Use Distance</b>	20 cm		
<b>Antenna Information</b>	Trade Name	Model No.	Type
	UIC	UIC680EZ	Loop Antenna

**Note:**

The above information of DUT was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

### 2.1 RF Specification

<b>NFC</b>	
Operation Frequency	13.56 MHz
Modulation	ASK

### 3. RF Exposure Limit

For devices that operate at larger distances from persons, where there are minimal RF coupling interactions between a device and the user or nearby persons, RF exposure compliance using maximum permissible exposure (MPE) limits is applied. The limits for MPE is listed as below:

<b>Limits for General Population / Uncontrolled Exposure</b>				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time E  <sup>2</sup> , H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824 / f	2.19 / f	(180 / f <sup>2</sup> )*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	F / 1,500	30
1,500-100,000	-	-	1.0	30
<b>Limits for Occupational / Controlled Exposure</b>				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time E  <sup>2</sup> , H  <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1,842 / f	4.89 / f	(900 / f <sup>2</sup> )*	6
30-300	61.4	0.163	1.0	6
300-1,500	-	-	F / 300	6
1,500-100,000	-	-	5	6

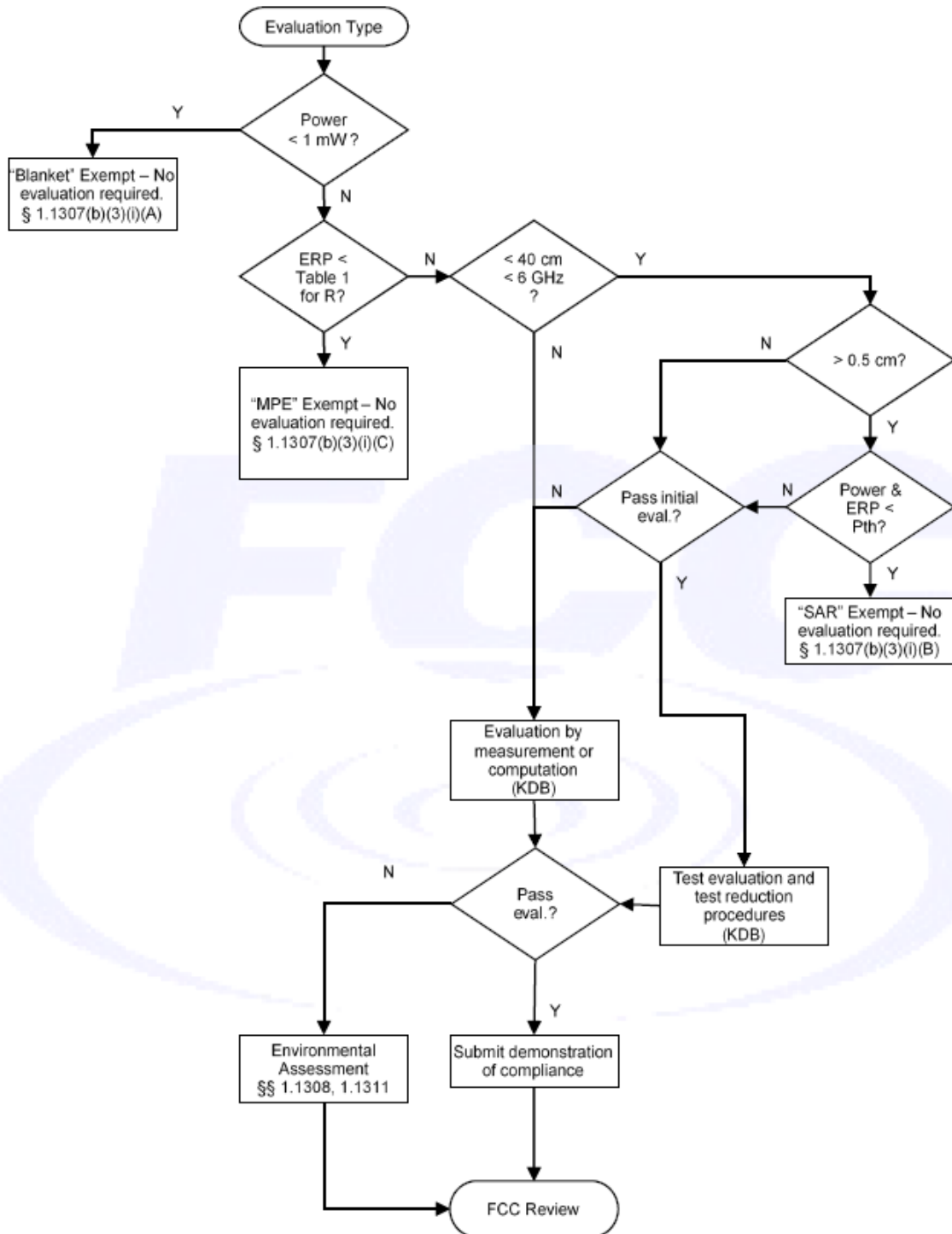
f = frequency in MHz. \* = Plane-wave equivalent power density.

## 4. RF Exposure Assessment

### 4.1 Exemption Evaluation

Exemption evaluation was performed according to the appendix A and B in KDB447498 D04.

The General Sequence for Determination of Procedure demonstrated in Figure A.1 of KDB447498 D04 was applied.





## 4.2 Human Exposure Assessment

Due to the design and installation of this product, it is not possible to conduct SAR evaluation. This is because client either manufactures or supplies the antenna(s) that will be used in the installation of this product. Therefore, this product will be evaluated as a mobile device per 47 CFR § 1.1310 titled "Radiofrequency radiation exposure limits", generally referred to as MPE limits.

In 47 CFR § 2.1091, paragraph (b) defines a mobile device 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 cm is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons."

### Exposure evaluation

$$S_{eip} = \frac{EIRP}{4\pi d^2} = \frac{PG}{4\pi d^2} (W / m^2)$$

Where

S: is the input power (W);

G: is the antenna gain;

d : is the distance between antennas and evaluation point (m).

## 5. Maximum Transmitting Mode Evaluation

### Antenna transmission description

NFC : 1TX (Diversity)

## 6. Result

Band	Frequency (MHz)	Near-Field Result (dBuA/m)	ERP (mW)	<§1.1307(b)(3)(i)(A)> 1 mW Exemption Threshold ERP (mW)
NFC	13.56	53.64	0.00046993	1.00

**Note:**

- ERP of RFID is converted by the Near-Field radiated test result for 10m.
- The Formula of Near-Field Result at 10m is  $93.64 - 40 \cdot \log(10 / 1) \text{ dBuV/m} = 53.64 \text{ dBuV/m}$ .

## 7. Conclusion

The result shows that this device is qualified for 1 mW Test Exemption in KDB447498. Therefore, MPE testing is not required.

\*\*\*\*\* End of Report \*\*\*\*\*