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Report No.: 2209RSU008-U3 Report Version: V01 Issue Date: 2022-10-17

RF Exposure Evaluation Declaration

FCC ID: VZ43607N

Applicant: Doran Manufacturing LLC

Product: Doran TPMS Sensor for OTR

Model No.: 3607

Brand Name: Doran

FCC Rule Part(s): FCC Part 1.1307

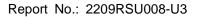
Result: Complies

Reviewed By:			
	Sunny Sun	ilac-MRA	
Approved By:			ACCREDITED
	Robin Wu	- Malalala	TESTING LABORATORY CERTIFICATE #3628.01

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

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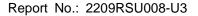
Revision History

Report No.	Version	Description	Issue Date	Note
2209RSU008-U3	Rev. 01	Initial Report	2022-10-17	Valid



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1. General Information

1.1. Applicant

Doran Manufacturing LLC

2851 Massachusetts Avenue Cincinnati, OH 45225 USA

1.2. Manufacturer

Doran Manufacturing LLC

2851 Massachusetts Avenue Cincinnati, OH 45225 USA

1.3. Testing Facility

	Test Site - MRT Suzhou Laboratory Laboratory Location (Suzhou - Wuzhong)						
	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China Laboratory Location (Suzhou - SIP) 4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China						
	Laboratory Accreditations						
	A2LA: 3628.01		CNAS	: L10551			
	FCC: CN1166		ISED:	CN0001			
	VCCI:	□R-20025	☐G-20034	□C-20020	□T-20020		
	VCCI:	□R-20141	□G-20134	□C-20103	□T-20104		
	Test Site – MRT Shenzhen Laboratory						
	Laboratory Location (Shenzhen)						
	1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen,						
	China						
	Laboratory Accre	editations					
	A2LA: 3628.02		CNAS	: L10551			
	FCC: CN1284		ISED:	CN0105			
	Test Site - MRT 1	Гаiwan Laboratory	1				
	Laboratory Location (Taiwan)						
	No. 38, Fuxing 2nd	d Rd., Guishan Dis	t., Taoyuan City 333,	Taiwan (R.O.C.)			
	Laboratory Accre	editations					
	TAF: L3261-19072	25					
	FCC: 291082, TW	3261	ISED:	TW3261			



1.4. Product Information

Product	Doran TPMS Sensor for OTR
Model No.	3607
Brand Name	Doran
Operating Voltage	3.0Vdc (By internal lithium battery)
Operating Temperature	-40 ~ 120°C
_	

Remark:

The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.

1.5. Radio Specification

Frequency Range	434.10MHz
Type of Modulation	FSK
Antenna Type	PCB Antenna
Antenna Gain	0 dBi

1.6. Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

FCC Part 1.1307

1.7. Device Classification

According to the user manual, the device is classified as a Fixed Device. So, the RF exposure evaluation requirements of § 1.1307 for fixed device exposure conditions subject to MPE limits.



2. RF Exposure Evaluation

2.1. Limits

According to FCC §1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in §1.1307(b)

Limits For Maximum Permissible Exposure (MPE)

Frequency Range	Electric Field	Magnetic Field	Power Density	Average Time	
(MHz)	Strength (V/m)	Strength (A/m)	(mW/cm²)	(Minutes)	
(A) Limits for Occupational/ Control Exposures					
0.3-3.0	614	1.63	*(100)	≤6	
3.0-30	1842/f	4.89/f	*(900/f ²)	<6	
30-300	61.4	0.163	1.0	<6	
300-1,500			f/300	<6	
1,500-100,000			5	<6	
	(B) Limits for Gen	eral Population/ Uncor	trolled Exposures		
0.3-1.34	614	1.63	*(100)	<30	
1.34-30	824/f	2.19/f	*(180/f ²)	<30	
30-300	27.5	0.073	0.2	<30	
300-1,500			f/1500	<30	
1,500-100,000			1.0	<30	

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



2.1. MPE Exemptions

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

(Option 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 §1.1307(b)(3)(ii)(A) of this section.

Medical implant devices may only use this exemption and that in paragraph §1.1307(b)(3)(ii)(A);

(Option 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 (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 is given by:

$$P th(mW) = \{ERP_{20cm}(d / 20cm)^x d \le 20cm\}$$

$$P th(mW) = \{ERP_{20cm} 20cm < d \le 40cm\}$$

Where

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

and

$$ERP_{20cm}(mW) = \{2040f \ 0.3GHz \le f < 1.5GHz\}$$

$$ERP_{20cm}(mW) = \{3060 \ 1.5GHz \le f \le 6GHz \$$

(Option 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 $\lambda/2\pi$, 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).



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	1920R ²
1.34-30	3450R ² /f ²
30-300	3.83R ²
300-1,500	0.0128R ² f
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 is paragraph §1.1307(b)(3)(i)(A) of this section. Medical implant devices may only use this exemption and that in paragraph §1.1307(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.

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

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph §1.1307(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 1.1307(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 §1.1307(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 $\lambda/2\pi$ according to the applicable formula of paragraph §1.1307(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 of this chapter.



2.2. Calculated Result

Product	Doran TPMS Sensor for OTR
Test Item	RF Exposure Evaluation

Test Mode	Frequency Range	Max. Fundamental Radiated	Max. EIRP (dBm)	Tune-up EIRP
	(MHz)	Emission (dBµV/m)@3m		(dBm)
SRD	434.1	78.93	-16.27	-10.0

Note 1: The data was cited from the MRT test report, report number: 2209RSU0008-U2.

Note 2: Max. EIRP (dBm) = E (dB μ V/m)@3m -95.2 -4.7 = -16.27 dBm

Note 3: Tune-up EIRP was declared by manufacturer.

For single RF source, Option A

The EUT available maximum time-averaged power is no more than 1 mW (0dBm).

Therefore, the device qualifies for RF exposure exemption.