



RF Exposure Evaluation Declaration

Report No.: S20230803196904

Issue Date: 09-26-2023

Applicant: Targa Telematics spa
Address: Via Reginato,87-31100 Treviso(TV)-Italy
FCC ID: 2AVLG-MTR2023
Product: Multi-Technology Reader
Model No.: EMC3090-P
Trade Mark: 
FCC Rule Part(s): CFR 47, FCC Part 2.1091 Radio frequency radiation exposure evaluation: mobile devices.
Item Receipt date: August 03, 2023
Test Date: August 23 ~ September 21, 2023

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The test results relate only to the samples tested.
 This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 558074 D01. Test results reported herein relate only to the item(s) tested.
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Revision History

Report No.	Version	Description	Issue Date
S20230803196904	Rev. 01	/	09-26-2023

1. PRODUCT INFORMATION

1.1. Equipment Description

Product Name:	Multi-Technology Reader
Model Name:	MTR2023
Trade Mark:	
Input Voltage Range:	DC 8V~32V, 1A

1.2. Product Specification Subjective to this Report

Operating Range:	125 kHz, 13.56 MHz, 5817MHz
Type of Modulation:	125 kHz: OOK 13.56 MHz: ASK 5817 MHz: ASK
Antenna Type:	125 kHz: Coil Antenna 13.56 MHz: PCB Antenna 5817 MHz: PCB Antenna
Antenna Gain:	125 kHz: 0dBi(Max) 13.56 MHz: 0dBi(Max) 5817 MHz: -2dBi(Max)

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 (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (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
300-1500	--	--	f/300	<6
1500-100,000	--	--	5	<6
(B) Limits for General Population/ Uncontrolled Exposures				
0.3-3.0	614	1.63	*(100)	<30
3.0-30	824/f	2.19/f	*(900/f ²)	<30
30-300	27.5	0.073	0.2	<30
300-1500	--	--	f/1500	<30
1500-100,000	--	--	1.0	<30

f= Frequency in MHz .

*= Plane-wave equivalent power density

Calculation Formula: $Pd = (Pout \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

Pd = power density in mW/cm²

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

r = distance between observation point and center of the radiator in cm

Pd is the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

2.2. Test Result of RF Exposure Evaluation

Product	Multi-Technology Reader
Test Item	RF Exposure Evaluation

Mode	Frequency (MHz)	E(dB μ V/m)	PG		MPE (mW/cm ²)	MPE Limits (mW/cm ²)
			(dBm)	(mW)		
Radar	5817	88.61	-6.59	0.22	0.00004	1.00

Note:

1. MPE use distance is 20cm from manufacturer declaration of user manual.
2. Use the maximum gain of all bands when evaluating
3. According ANSI C63.10-2013 above 1000 MHz, $E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2$, for $d=3\text{m}$.

Test Result:

Test Model:	MTR2023	Test Mode:	Transimit
Environment:	Temp: 24°C; Humi:52%	Engineer:	Amos Xia
Test Result:	Pass		

E- Field Strength:

Frequency (MHz)	Test Data (V/m)	Limits (V/m)
0.125	10.68	614
13.56	6.54	60.77

Note:

1. According with KDB 680106, Emissions between 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of Section 1.1310.
2. The distance for test position is 20cm.

CONCULISON:

The Max Power Density at R (20 cm) = $0.00004\text{mW}/\text{cm}^2 < 1\text{mW}/\text{cm}^2$.
So the EUT complies with the requirement.

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