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## FCC RF Exposure Test Report



Certificate #6613.01

# FCC RF Exposure Test Report

**Report No.** : PSU-QBJ2408220111SA01  
**Applicant** : MUNIC  
**Address** : 39 AVENUE DE PARIS 94800 VILLEJUIF – FRANCE  
**Product** : telematics embedded system  
ALARM.COM CAR CONNECTOR  
**FCC ID** : A6GC4D-4MUSACV8  
**Brand** : MUNIC  
ALARM.COM  
**Model No.** : C4D-4MUSAC\_V8  
ADC-CC110  
**Standards** : FCC Part 2 (Section 2.1091)  
KDB 447498 D01 General RF Exposure Guidance v06  
**Sample Received Date** : Aug. 23, 2024  
**Date of Testing** : Aug. 23, 2024 ~ Sep. 20, 2024  
**Test Lab** : The FCC Site Registration No. is 525120; The Designation No. is CN1171.  
**Issued By** : Huarui 7layers High Technology (Suzhou) Co., Ltd.  
**Address** : Tower N, Innovation Center, 88 Zuyi Road, High-tech District, Suzhou City,  
Anhui Province China

**CERTIFICATION:** The above equipment have been tested by **Huarui 7Layers High Technology (Suzhou) Co., Ltd.**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's SAR characteristics under the conditions specified in this report. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product certification, approval, or endorsement by A2LA or any government agencies.

Chang Gao

Sim Peibo

Prepared By :

(Chang Gao/ Engineer)

Approved By :

(Peibo Sun /Manager)

This report is governed by, and incorporates by reference, the Conditions of Testing as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/> and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. Statements of conformity are based on simple acceptance criteria without taking measurement uncertainty into account, unless otherwise requested in writing. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.



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## Release Control Record

Report No.	Reason for Change	Date Issued
PSU-QBJ2408220111SA01	Original Release	Sep. 20, 2024

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**1. Description of Equipment Under Test**

EUT Type*	telematics embedded system	
FCC ID*	A6GC4D-4MUSACV8	
Brand Name*	MUNIC ALARM.COM	
Model Name*	C4D-4MUSAC_V8 ADC-CC110	
Frequency Bands (Unit: MHz)	GSM	824.2MHz ~ 848.8MHz (FOR GSM 850) 1850.2MHz ~ 1909.8MHz (FOR GSM 1900)
	LTE	1850.7MHz ~ 1909.3MHz (FOR LTE Band2) 1710.7MHz ~ 1754.3MHz (FOR LTE Band4) 699.7MHz ~ 715.3MHz (FOR LTE Band12)
	WLAN	2412 ~ 2462MHz for 11b/g/n(HT20/40)
	Bluetooth/BT_LE	2402MHz ~ 2480MHz
Modulations*	BT_LE	GFSK
	Bluetooth	GFSK, π/4-DQPSK, 8DPSK
	WLAN	DSSS, OFDM, OFDMA
	GSM/GPRS/EDGE	GMSK, 8PSK
	LTE	QPSK/16QAM
HW VERSION*	HC4D-4MUSAC_V8.01	
SW VERSION*	SC4D-4MUSAC_V8.01	
Antenna Type*	Fixed Internal Antenna	
EUT Stage*	Production Unit	

**Note:**

- \*Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information , Test Lab is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.
- The above EUT information is declared by manufacturer and for more detailed features description please refers to the manufacturer's specifications or User's Manual.
- The differences between model C4D-4MUSAC\_V8 and ADC-CC110 are as following.

Description	1st	2rd
Product name	Telematic Embedded System	ALARM.COM CAR CONNECTOR
Brand Name	MUNIC	ALARM.COM
Model Name	C4D-4MUSAC_V8	ADC-CC110
Differences	/	Use of a different product name (ALARM.COM CAR CONNECTOR), model name (ADC-CC110) and a different trademark (ALARM.COM) for marketing and client requirements.

**4 List of Accessory:**

ACCESSORIES	BRAND	MODEL	SPECIFICATION
Battery	Howell	Li-polymer 552535H	Capacity: Li-ion, 450mAh



## 2. MPE(Maximum Permissible Exposure) Assessment

### 2.1 Introduction

According to 47 CFR §2.1091, a mobile device is defined 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 transmitting antenna and the body of the user or nearby persons. In this context, the term “fixed location” means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 cm separation requirement. The limits to be used for MPE evaluation are specified in §1.1310. All unlicensed personal communications service (PCS) devices and unlicensed NII devices shall be subject to the limits for general population/uncontrolled exposure.

### 2.2 RF Radiation Exposure Limits

According to 47 CFR §1.1310, the criteria listed in below table shall be used to evaluate the environmental impact of human exposure to RF radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093.

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (min)
(A) Limits for Occupational / Controlled Exposures				
0.3 – 3.0	614	1.63	100	6
3.0 – 30	1842/f	4.89/f	900/f <sup>2</sup>	6
30 – 300	61.4	0.163	1.0	6
300 – 1500	-	-	f/300	6
1500 – 100000	-	-	5	6
(B) Limits for General Population / Uncontrolled Exposures				
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/1500	30
1500 – 100000	-	-	1.0	30

Limits for maximum permissible exposure (MPE)

#### Notes:

1. f = frequency in MHz
2. Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided they are made aware of the potential for exposure.
3. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.



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### **2.3 MPE Assessment Method**

Calculations can be made to predict RF field strength and power density levels around typical RF sources. For example, in the case of a single radiating antenna, a prediction for power density in the far-field of the antenna can be made by use of the general Equations below. This equation is generally accurate in the far-field of an antenna but will over-predict power density in the near field, where they could be used for making a "worst case" or conservative prediction.

$$\text{Power Density (S)} = \frac{PG}{4\pi R^2} = \frac{\text{EIRP}}{4\pi R^2}$$

Where

S = Power Density, unit in mW/cm<sup>2</sup>

P = Power input to the antenna, unit in mW

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna, unit in cm

EIRP = Effective isotropically radiated power

### **2.4 MPE Calculation for Standalone Operations**

The manufacturer expects that the radiated component of this device will not close to the human body during normal usage and the warning statement was also stated in the user instruction. Since the transmitting antenna will be kept at least 20 cm away from the human body, the MPE level is calculated based on this condition and the result is listed in below table.



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### RF Exposure Evaluation Results:

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Output Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (mW)	EIRP/ERP Limit (dBm)	Power Density at 20cm (mW/cm^2)	Limit (mW/cm^2)	Gain according to EIRP (dBi)	Gain according to PD (dBi)	Max Gain Allowed (dBi)	Conclusion
GPRS 850 (1 Tx slot)	824.2	0.5	33.0	33.50	281.838	38.45	0.056	0.549	7.60	10.39	7.60	Pass
GPRS 850 (2 Tx slots)	824.2	0.5	33.0	33.50	562.341	38.45	0.112	0.549	7.60	7.39	7.39	Pass
GPRS 850 (3 Tx slots)	824.2	0.5	32.0	32.50	666.807	38.45	0.133	0.549	8.60	6.65	6.65	Pass
GPRS 850 (4 Tx slots)	824.2	0.5	30.5	31.00	630.957	38.45	0.126	0.549	10.10	6.89	6.89	Pass
EGPRS 850 (1 Tx slot)	824.2	0.5	26.0	26.50	56.234	38.45	0.011	0.549	14.60	17.39	14.60	Pass
EGPRS 850 (2 Tx slots)	824.2	0.5	26.0	26.50	112.202	38.45	0.022	0.549	14.60	14.39	14.39	Pass
EGPRS 850 (3 Tx slots)	824.2	0.5	26.0	26.50	167.880	38.45	0.033	0.549	14.60	12.65	12.65	Pass
EGPRS 850 (4 Tx slots)	824.2	0.5	26.0	26.50	223.872	38.45	0.045	0.549	14.60	11.39	11.39	Pass
GPRS 1900 (1 Tx slot)	1850.2	0.8	30.0	30.80	151.356	33.01	0.030	1.000	3.01	16.00	3.01	Pass
GPRS 1900 (2 Tx slots)	1850.2	0.8	30.0	30.80	301.995	33.01	0.060	1.000	3.01	13.00	3.01	Pass
GPRS 1900 (3 Tx slots)	1850.2	0.8	30.0	30.80	451.856	33.01	0.090	1.000	3.01	11.26	3.01	Pass
GPRS 1900 (4 Tx slots)	1850.2	0.8	30.0	30.80	602.560	33.01	0.120	1.000	3.01	10.00	3.01	Pass
EGPRS 1900 (1 Tx slot)	1850.2	0.8	26.0	26.80	60.256	33.01	0.012	1.000	7.01	20.00	7.01	Pass
EGPRS 1900 (2 Tx slots)	1850.2	0.8	26.0	26.80	120.226	33.01	0.024	1.000	7.01	17.00	7.01	Pass
EGPRS 1900 (3 Tx slots)	1850.2	0.8	26.0	26.80	179.887	33.01	0.036	1.000	7.01	15.26	7.01	Pass
EGPRS 1900 (4 Tx slots)	1850.2	0.8	26.0	26.80	239.883	33.01	0.048	1.000	7.01	14.00	7.01	Pass
LTE Band 2	1850.7	0.8	23.0	23.80	239.883	33.01	0.048	1.000	10.01	14.00	10.01	Pass
LTE Band 4	1710.7	0.8	23.0	23.80	239.883	30.00	0.048	1.000	7.00	14.00	7.00	Pass
LTE Band 12	699.7	0.5	24.0	24.50	281.838	34.77	0.056	0.466	12.92	9.68	9.68	Pass
Bluetooth EDR	2402	0.17	8	8.17	6.561	36.00	0.001	1.000	28.00	29.00	28.00	Pass
Bluetooth LE	2402	0.17	9	9.17	8.260	36.00	0.002	1.000	27.00	28.00	27.00	Pass
2.4GHz WLAN	2412.0	0.17	21	21.17	130.918	36.00	0.026	1.000	15.00	16.00	15.00	Pass



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### **3. Information on the Testing Laboratories**

We, Huarui 7layers High Technology (Suzhou) Co., Ltd. ,were founded in 2020 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

Huarui 7Layers High Technology (Suzhou) Co., Ltd.

Lab Address:

Tower N, Innovation Center, 88 Zuyi Road, High-tech District, Suzhou City, Anhui Province

Accredited Test Lab Cert 6613.01

If you have any comments, please feel free to contact us at the following:

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