



Rev. 5 - February 9th, 2023

A7508

800V/50 μ A High Efficiency HV Power Supply



Register your device

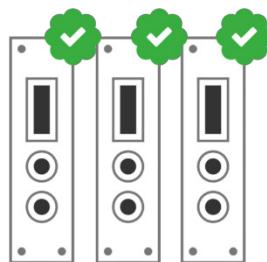
Register your device to your **MyCAEN+** account and get access to our customer services, such as notification for new firmware or software upgrade, tracking service procedures or open a ticket for assistance. **MyCAEN+** accounts have a dedicated support service for their registered products. A set of basic information can be shared with the operator, speeding up the troubleshooting process and improving the efficiency of the support interactions.

MyCAEN+ dashboard is designed to offer you a direct access to all our after sales services. Registration is totally free, to create an account go to <https://www.caen.it/become-mycaenplus-user> and fill the registration form with your data.



1

create a MyCAEN+ account



2

register your devices



3

get support and more!



<https://www.caen.it/become-mycaenplus-user/>

Purpose of this User Manual



This document is the A7508 User's Manual; it contains information about the installation, the configuration and the use of the device.

Change Document Record

Date	Revision	Changes
7 April 2017	0	Initial release
29 May 2017	1	Updated § 3
14 October 2022	2	Vset / Vout, Vmon / Vout, Iset / Iout, Imon / Iout Coefficent
29 November 2022	3	Vset / Vout, Vmon / Vout, Iset / Iout, Imon / Iout Coefficent
24 January 2023	4	Updated specs
9 February 2023		Updated Layout added §7 §8

Manufacturer Contacts



CAEN S.p.A.

Via Vetraia, 11 55049 Viareggio (LU) - ITALY
Tel. +39.0584.388.398 Fax +39.0584.388.959
www.caen.it | info@caen.it

© CAEN SpA – 2021

Limitation of Responsibility

If the warnings contained in this manual are not followed, CAEN will not be responsible for damage caused by improper use of the device. The manufacturer declines all responsibility for damage resulting from failure to comply with the instructions for use of the product. The equipment must be used as described in the user manual, with particular regard to the intended use, using only accessories as specified by the manufacturer. No modification or repair can be performed.

Disclaimer

No part of this manual may be reproduced in any form or by any means, electronic, mechanical, recording, or otherwise, without the prior written permission of CAEN spa. The information contained herein has been carefully checked and is believed to be accurate; however, no responsibility is assumed for inaccuracies. CAEN spa reserves the right to modify its products specifications without giving any notice; for up to date information please visit www.caen.it.

Made in Italy

We remark that all our boards have been designed and assembled in Italy. In a challenging environment where a competitive edge is often obtained at the cost of lower wages and declining working conditions, we proudly acknowledge that all those who participated in the production and distribution process of our devices were reasonably paid and worked in a safe environment (this is true for the boards marked "MADE IN ITALY", while we cannot guarantee for third-party manufactures).



Index

Purpose of this User Manual	3
Change Document Record	3
Manufacturer Contacts.....	3
Limitation of Responsibility	3
Disclaimer	3
Made in Italy	3
1 Safety Notices	5
2 Overview.....	7
Ordering Option	7
3 Technical Specifications.....	8
Vset / Vout and Vmon / Vout Coefficient (-45 C° to +65 C°)	11
Iset / Iout and Imon / Iout Coefficient (-45 C° to +65 C°)	11
4 Packaging	12
External Connection	12
5 Instructions for Cleaning	13
Cleaning the Touchscreen	13
Cleaning the air vents	13
General cleaning safety precautions	13
6 Device decommissioning	14
7 Disposal.....	15
8 Technical Support.....	16

List of Figures

Fig. 1: Mod. A7508.....	7
Fig. 2: Male strip header of A7508	8
Fig. 3: Efficiency vs Vout and Temperature	9
Fig. 4: Power consumptions @ 800 V vs Temperature	9
Fig. 5: Temperature coefficient vs Vout	10
Fig. 6: Uniformity of a Lot ($\Delta V_{out}/V_{out}$)	10
Fig. 7: Integral non-linearity ($\Delta V_{out}/V_{out}$).....	10
Fig. 8: Offset current Vs, Vout and Temperature	11
Fig. 9: A7508 External packaging (all dimension in mm)	12
Fig. 10: A7508 pins position (bottom view).....	12

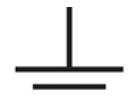
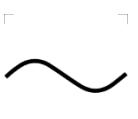
List of Tables

Tab. 1: Table of models and related items	7
Tab. 2: A7508 Technical Specifications.....	8
Tab. 3: Table of Vset / Vout and Vmon / Vout coefficient.....	11
Tab. 4: Table of Iset / I _{max} out and Imon / Iout coefficient.....	11

1 Safety Notices

N.B. Read carefully the “SAFETY, STORAGE AND SETUP INFORMATION PRODUCT SUPPORT SERVICE AND REPAIR” document provided with the product before starting any operation.

The following HAZARD SYMBOLS may be reported on the unit:

	Caution, refer to product manual
	Caution, risk of electrical shock
	Protective conductor terminal
	Earth (Ground) Terminal
	Alternating Current
	Three-Phase Alternating Current

The following symbol may be reported in the present manual:

	General warning statement
---	---------------------------

The symbol could be followed by the following terms:

- **DANGER:** indicates a hazardous situation which, if not avoided, will result in serious injury or death.
- **WARNING:** indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- **CAUTION:** indicates a situation or condition that, if not avoided, could cause physical injury or damage the product and / or its environment.

CAUTION: To avoid potential hazards



**USE THE PRODUCT ONLY AS SPECIFIED.
ONLY QUALIFIED PERSONNEL SHOULD PERFORM SERVICE PROCEDURES**

CAUTION: Avoid Electric Overload



**TO AVOID ELECTRIC SHOCK OR FIRE HAZARD, DO NOT POWER A LOAD
OUTSIDE OF ITS SPECIFIED RANGE**

CAUTION: Avoid Electric Shock



**TO AVOID INJURY OR LOSS OF LIFE, DO NOT CONNECT OR DISCONNECT
CABLES WHILE THEY ARE CONNECTED TO A VOLTAGE SOURCE**

CAUTION: Do Not Operate without Covers



**TO AVOID ELECTRIC SHOCK OR FIRE HAZARD, DO NOT OPERATE THIS
PRODUCT WITH COVERS OR PANELS REMOVED**

CAUTION: Do Not Operate in Wet/Damp Conditions



**TO AVOID ELECTRIC SHOCK, DO NOT OPERATE THIS PRODUCT IN WET
OR DAMP CONDITIONS**

CAUTION: Do Not Operate in an Explosive Atmosphere



**TO AVOID INJURY OR FIRE HAZARD, DO NOT OPERATE THIS PRODUCT
IN AN EXPLOSIVE ATMOSPHERE**



**THIS DEVICE SHOULD BE INSTALLED AND USED BY SKILLED TECHNICIAN
ONLY OR UNDER HIS SUPERVISION**



**DO NOT OPERATE WITH SUSPECTED FAILURES.
IF YOU SUSPECT THIS PRODUCT TO BE DAMAGED, PLEASE CONTACT
THE TECHNICAL SUPPORT**

2 Overview

The CAEN Mod. A7508 is a compact high efficiency power supply providing a programmable and monitorable output voltage ranging from 0 to 800 V, when supplied with a +5 V input.

It is available with either positive or negative output voltage.

The board is provided with an over-current protection: if a current larger than the I_{out} maximum value is drawn, the module is not being damaged.

The output voltage is regulated by providing a 0 to +2 V external voltage (V_{set}).

The module is engineered on a FR4 PCB, coated and housed in DC01 steel box. CAD Altium library components and 3D step models are available on request.

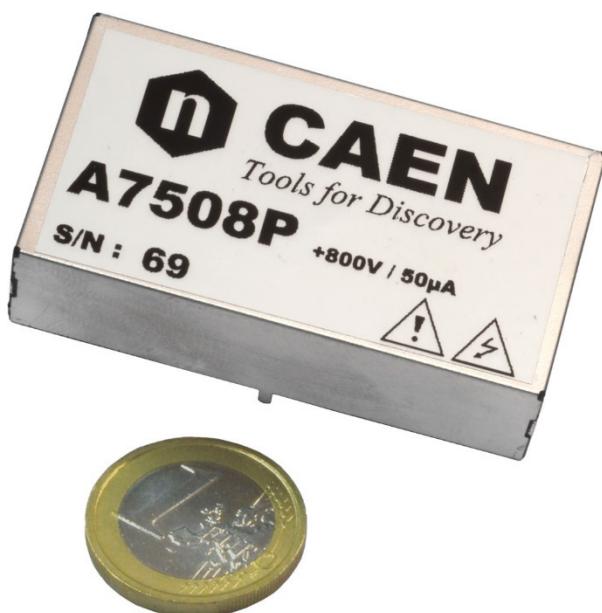


Fig. 1: Mod. A7508

Ordering Option

Board Models	Description	Product Code
A7508N	A7508N -800V 50 μ A HV Power Supply Module (5V in)	WA7508NXAAAA
A7508P	A7508P +800V 50 μ A HV Power Supply Module (5V in)	WA7508PXAAAA

Tab. 1: Table of models and related items

3 Technical Specifications

Packaging	Material: DC01; dimension: W=29 mm; L=54 mm; H=16 mm	
Contact pins	Male strip header; 2.54mm step; phosphor bronze; UL94V0 insulator (see Fig. 2)	
Operating temperature	-40° C ÷ +70° C	
Storage temperature	-55° C ÷ +85° C	
Voltage Supply (Vin)	+5 V ± 5%	
Output Voltage (Vout)	0 ÷ ±800 V	
Output polarity	Available positive or negative	
Enable	If Enable > 3.5 V	Channel active
	If Enable < 1 V	Channel disabled
Vmon Output (positive analog monitor)	0 ÷ +2 V	
Vset Input (positive analog command)	0 ÷ +2 V Important!: Vset must not exceed 2 V (Vout is not limited)	
Iset Input (positive analog command)	0 ÷ +2 V	
Imon Output (positive analog monitor)	0 ÷ +2 V	
Status OVC bit	0÷5 V (High = OVC)	
ΔVout/Vout (for ±5% Vin variations)	<1.5 X 10 ⁻³ @ full scale	
Maximum Output Current (Iout)	50 µA @ ±800 V	
Power requirement	<100 mW; @ 800 V / 50 µA (Rload ≈ 17 MΩ)	
Efficiency	~ 50% @ Vout = 800 V (-45° C ÷ +70° C)	
Output Ripple (Full Load)	Typical 3mVpp; Maximum 5mVpp	
Vout / Temperature coefficient	< 50 ppm / °C	
Vset vs. Vout Integral Non Linearity	<±0.3% (-60° C ÷ +60° C) ; Valid if Vout > 25% of full scale range	
Vmon vs. Vout Integral Non Linearity	<±0.3% (-60° C ÷ +60° C) ; Valid if Vout > 25% of full scale range	
Electromagnetic compatibility	Weak emission of electromagnetic impulse and RF; one-piece metal shielding with several ground connections	
Protection	Over current short circuit, sparks and humidity	

Tab. 2: A7508 Technical Specifications

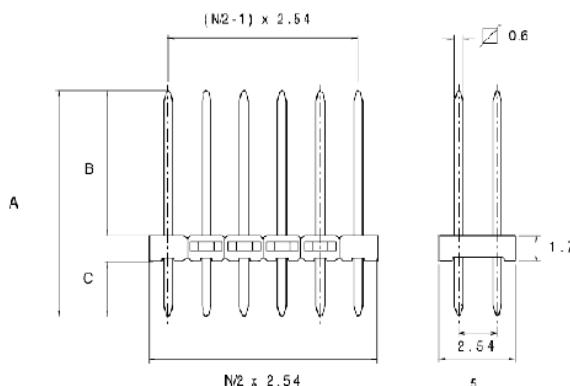


Fig. 2: Male strip header of A7508

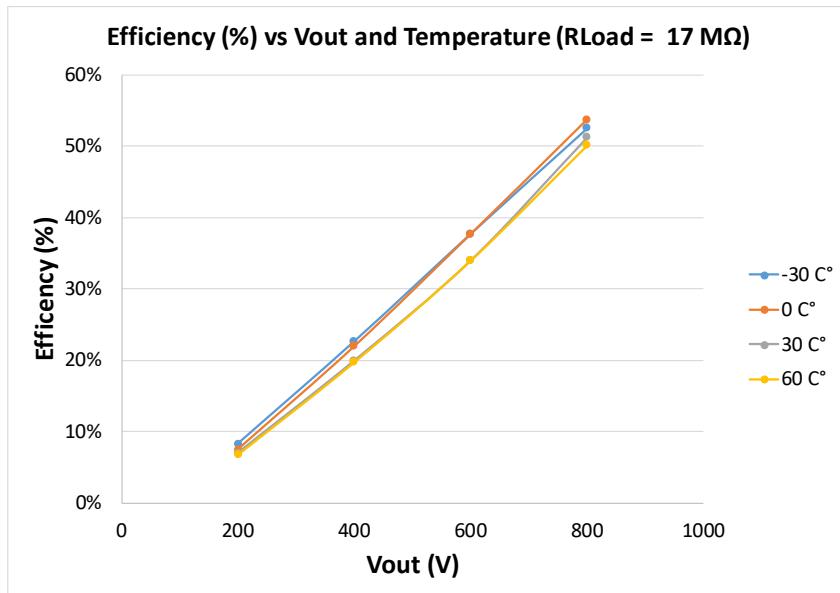


Fig. 3: Efficiency vs Vout and Temperature

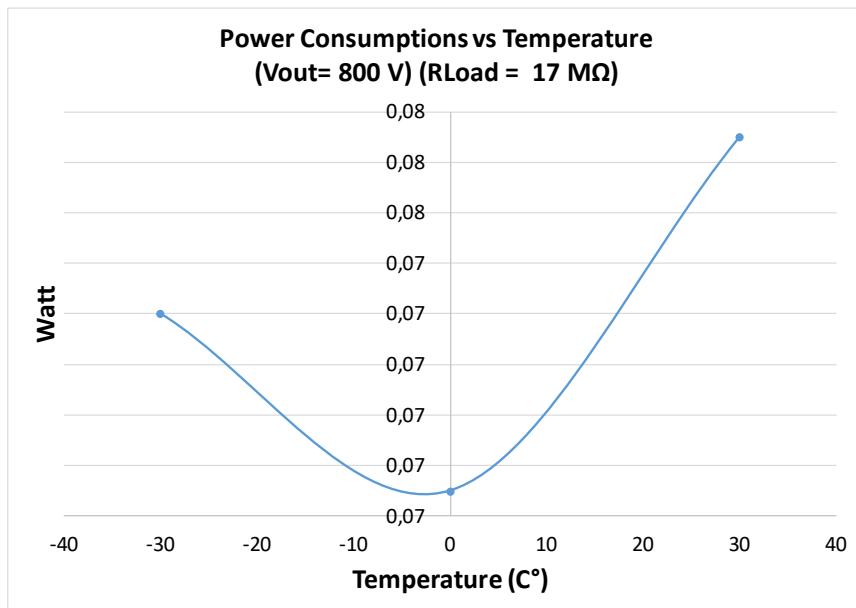


Fig. 4: Power consumptions @ 800 V vs Temperature

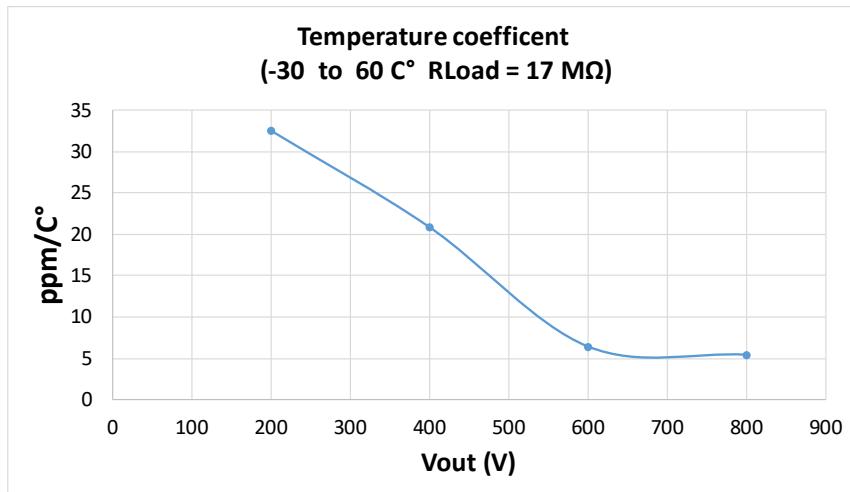


Fig. 5: Temperature coefficient vs Vout

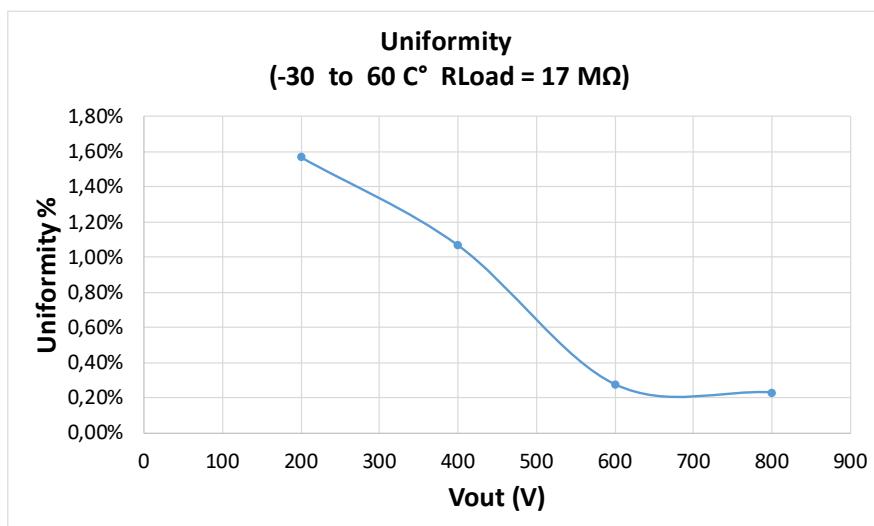


Fig. 6: Uniformity of a Lot ($\Delta V_{out}/V_{out}$)

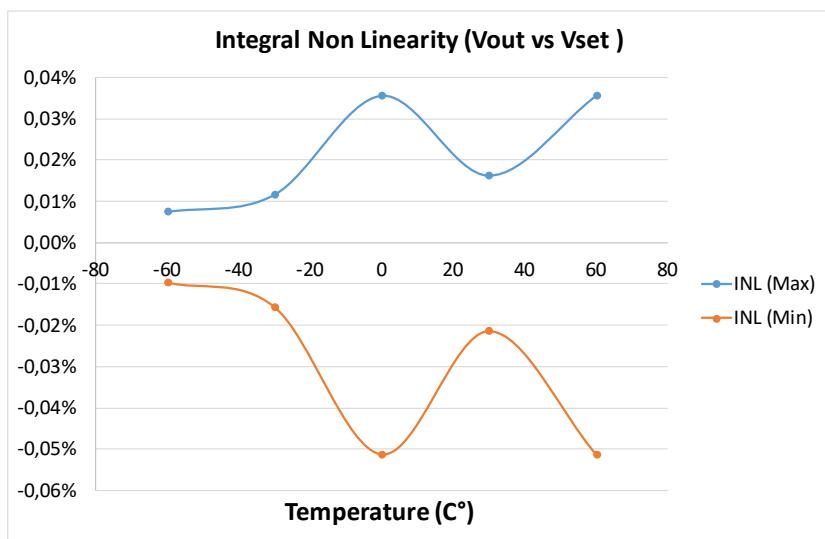


Fig. 7: Integral non-linearity ($\Delta V_{out}/V_{out}$)

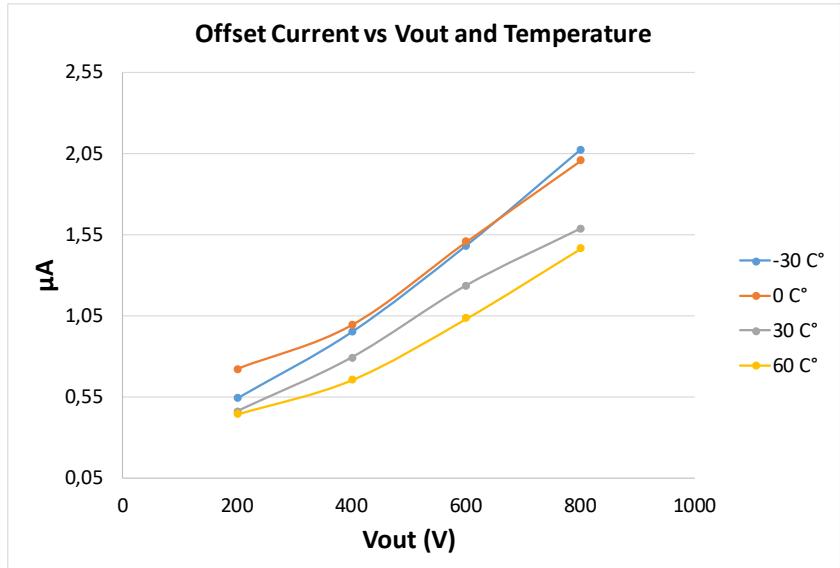


Fig. 8: Offset current Vs, Vout and Temperature

Vset / Vout and Vmon / Vout Coefficient (-45 C° to +65 C°)

Model	A7508P	A7508N	
Vout/ Vset	400	400	Accuracy: ± 1% with Vout > 25% of full scale
Vout / Vmon	400	400	Accuracy: ± 1% with Vout > 25% of full scale

Tab. 3: Table of Vset / Vout and Vmon / Vout coefficient

Example: if Vset = 1 V, then HV Output = 400 V ± 4 V

Example: if Vmon = 1.5 V, then HV Output = 600 V ± 6 V

Iset / Iout and Imon / Iout Coefficient (-45 C° to +65 C°)

Model	A7508P	A7508N	
I _{max} out/ Iset	25(*)	25(*)	Accuracy: ± 5% with Vout > 25% of full scale (nominal load)
I _{out} / I _{mon}	25(*)	25(*)	Accuracy: ± 5% with Vout > 25% of full scale (nominal load)

Tab. 4: Table of Iset / I_{max} out and I_{mon} / I_{out} coefficient

(*) Iset and I_{mon} expressed in V, I_{max} out and I_{out} expressed in μA. N.B.: In parallel to the load we have a 300 MΩ resistor for the voltage feedback; therefore the I_{mon} current with load ∞ is Vout/300MΩ

Example: if Iset = 2 V, then I_{max} out = 50 μA ± 2500 nA

Example: if I_{mon} = 1 V, then I_{out} = 25 μA ± 1250 nA

4 Packaging

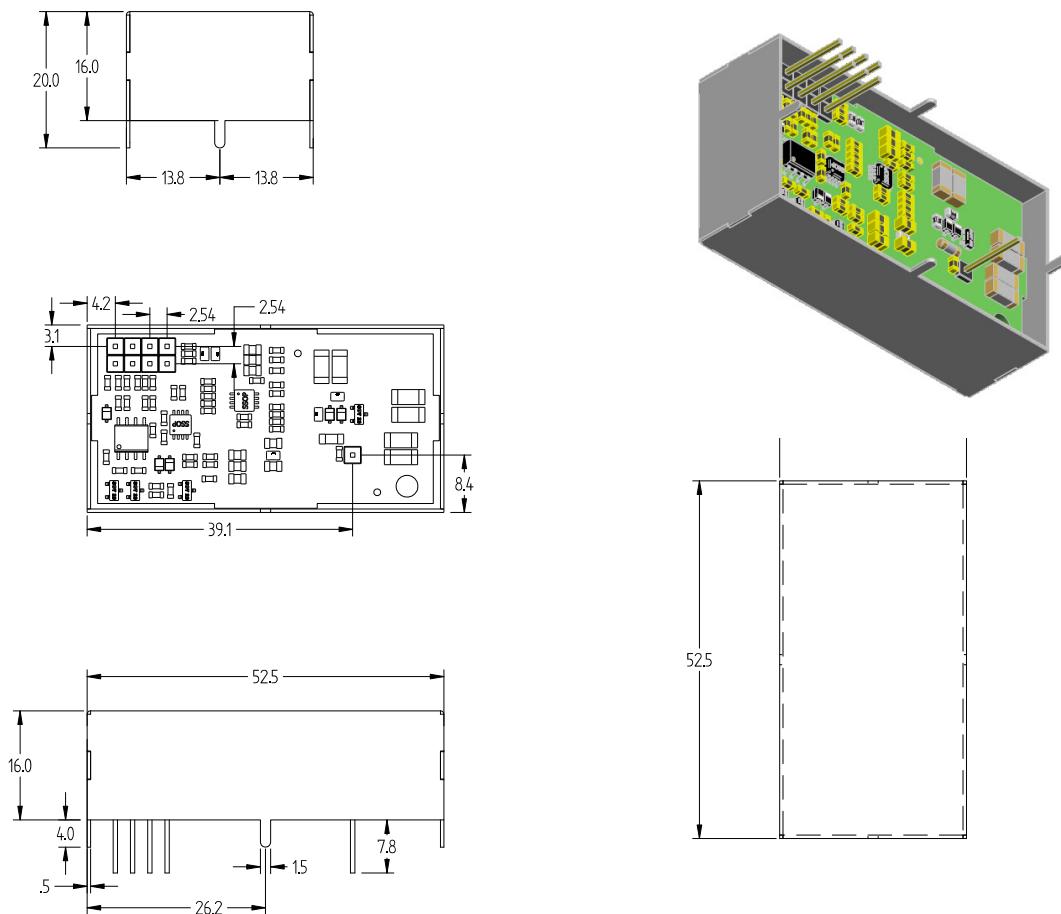


Fig. 9: A7508 External packaging (all dimension in mm)

External Connection

The following diagram describes the Pin assignment:

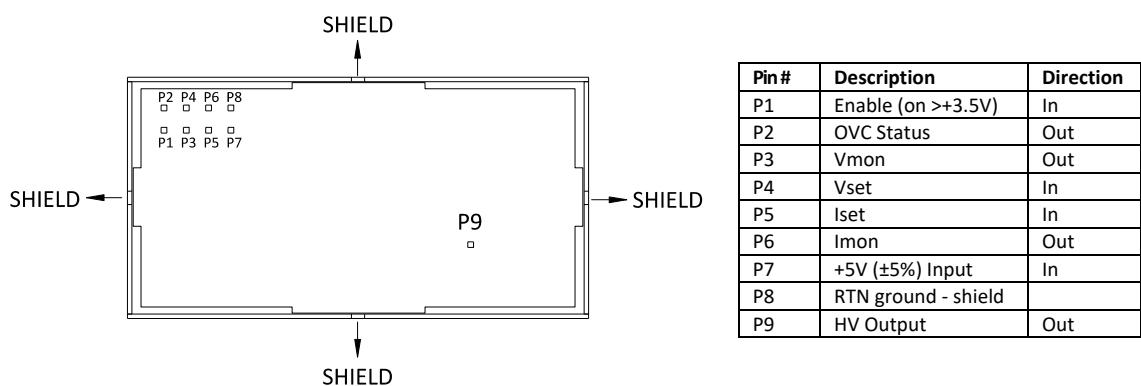


Fig. 10: A7508 pins position (bottom view)

5 Instructions for Cleaning

The equipment may be cleaned with isopropyl alcohol or deionized water and air dried. Clean the exterior of the product only.

Do not apply cleaner directly to the items or allow liquids to enter or spill on the product.

Cleaning the Touchscreen

To clean the touchscreen (if present), wipe the screen with a towelette designed for cleaning monitors or with a clean cloth moistened with water.

Do not use sprays or aerosols directly on the screen; the liquid may seep into the housing and damage a component. Never use solvents or flammable liquids on the screen.

Cleaning the air vents

It is recommended to occasionally clean the air vents (if present) on all vented sides of the board. Lint, dust, and other foreign matter can block the vents and limit the airflow. Be sure to unplug the board before cleaning the air vents and follow the general cleaning safety precautions.

General cleaning safety precautions

CAEN recommends cleaning the device using the following precautions:

- Never use solvents or flammable solutions to clean the board.
- Never immerse any parts in water or cleaning solutions; apply any liquids to a clean cloth and then use the cloth on the component.
- Always unplug the board when cleaning with liquids or damp cloths.
- Always unplug the board before cleaning the air vents.
- Wear safety glasses equipped with side shields when cleaning the board

6 Device decommissioning

After its intended service, it is recommended to perform the following actions:

- Detach all the signal/input/output cable
- Wrap the device in its protective packaging
- Insert the device in its packaging (if present)



THE DEVICE SHALL BE STORED ONLY AT THE ENVIRONMENT CONDITIONS SPECIFIED IN THE MANUAL, OTHERWISE PERFORMANCES AND SAFETY WILL NOT BE GUARANTEED

7 Disposal

The disposal of the equipment must be managed in accordance with Directive 2012/19 / EU on waste electrical and electronic equipment (WEEE).



The crossed bin symbol indicates that the device shall not be disposed with regular residual waste.

8 Technical Support

To contact CAEN specialists for requests on the software, hardware, and board return and repair, it is necessary a MyCAEN+ account on www.caen.it:

<https://www.caen.it/support-services/getting-started-with-mycaen-portal/>

All the instructions for use the Support platform are in the document:



A paper copy of the document is delivered with CAEN boards.

The document is downloadable for free in PDF digital format at:

https://www.caen.it/wp-content/uploads/2022/11/Safety_information_Product_support_W.pdf

**CAEN S.p.A.**

Via Vetraia 11
55049 - Viareggio
Italy
Phone +39 0584 388 398
Fax +39 0584 388 959
info@caen.it
www.caen.it

**CAEN GmbH**

Brunnenweg 9
64331 Weiterstadt
Germany
Tel. +49 (0)212 254 4077
Mobile +49 (0)151 16 548 484
info@caen-de.com
www.caen-de.com

CAEN Technologies, Inc.

1 Edgewater Street - Suite 101
Staten Island, NY 10305
USA
Phone: +1 (718) 981-0401
Fax: +1 (718) 556-9185
info@caentechnologies.com
www.caentechnologies.com

CAENspa INDIA Private Limited

B205, BLDG42, B Wing,
Azad Nagar Sangam CHS,
Mhada Layout, Azad Nagar, Andheri (W)
Mumbai, Mumbai City,
Maharashtra, India, 400053
info@caen-india.in
www.caen-india.in



Copyright © CAEN SpA. All rights reserved. Information in this publication supersedes all earlier versions. Specifications subject to change without notice.