EV82397A
Datasheet

V1.0

Revision History

Modified Date	Version	Description
Feb, 2025	V1.0	Initial release

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1. System Description

The EV82397A is a next-generation domain-fusion integrated controller developed by Ecotron. It can function as a Chassis Domain Controller (CDC) or a Zone Control Unit (ZCU). Serving as a core control unit of the vehicle, it is responsible for coordinating and managing multiple subsystems, including the powertrain system, energy management system, and chassis system.

The controller supports integration of vehicle-level control functions such as power management, energy management, braking, steering, and suspension—covering lateral, longitudinal, and vertical dynamics. It also supports vehicle status monitoring and gateway data communication.

1.1 Functions

The EV82397A has the following functions:

Table 1: EV82397A Specifications

1 channel key signal (KEYON)
2 hard-wire wake-up signals (WAKE 1, WAKE2)
4 channels power supply voltage (BATT)
6 5V voltage outputs
1 12V voltage output
1 24V voltage output
8-channel CAN communication interface (supports CAN flashing and CANFD): 4 channels support specific frame wake-up
1 10 /100Mbps automotive ethernet port
4 H-bridge outputs, rated 35A, peak 50A @ 0.2s
1 LIN channel, host mode only
24 analog signal input channels:
16 channels for 0–5V voltage-type input
4 channels for resistance-type input, supporting PT100/PT1000 sensors
4 channels for 4–20mA current-type input
25 digital signal input channels:
13 channels with high-level active input
12 channels with low-level active input
4 frequency signal input channels
20 high-side drive control outputs, 4 of which can be multiplexed as OPWM channels
6 low-side drive control outputs
6 low-level active frequency output channels, also configurable as low-side constant current outputs
Built-in 6-axis gyroscope
Hardware watchdog

1.2 Mechanical Properties

The DCU housing is made of aluminum die-casting and assembled with silicone seals. There is no special treatment or coating on the outside of the housing, and there are no sharp burrs or sharp edges.

The DCU housing are as follows (excluding the female end of the DCU connector, in mm):

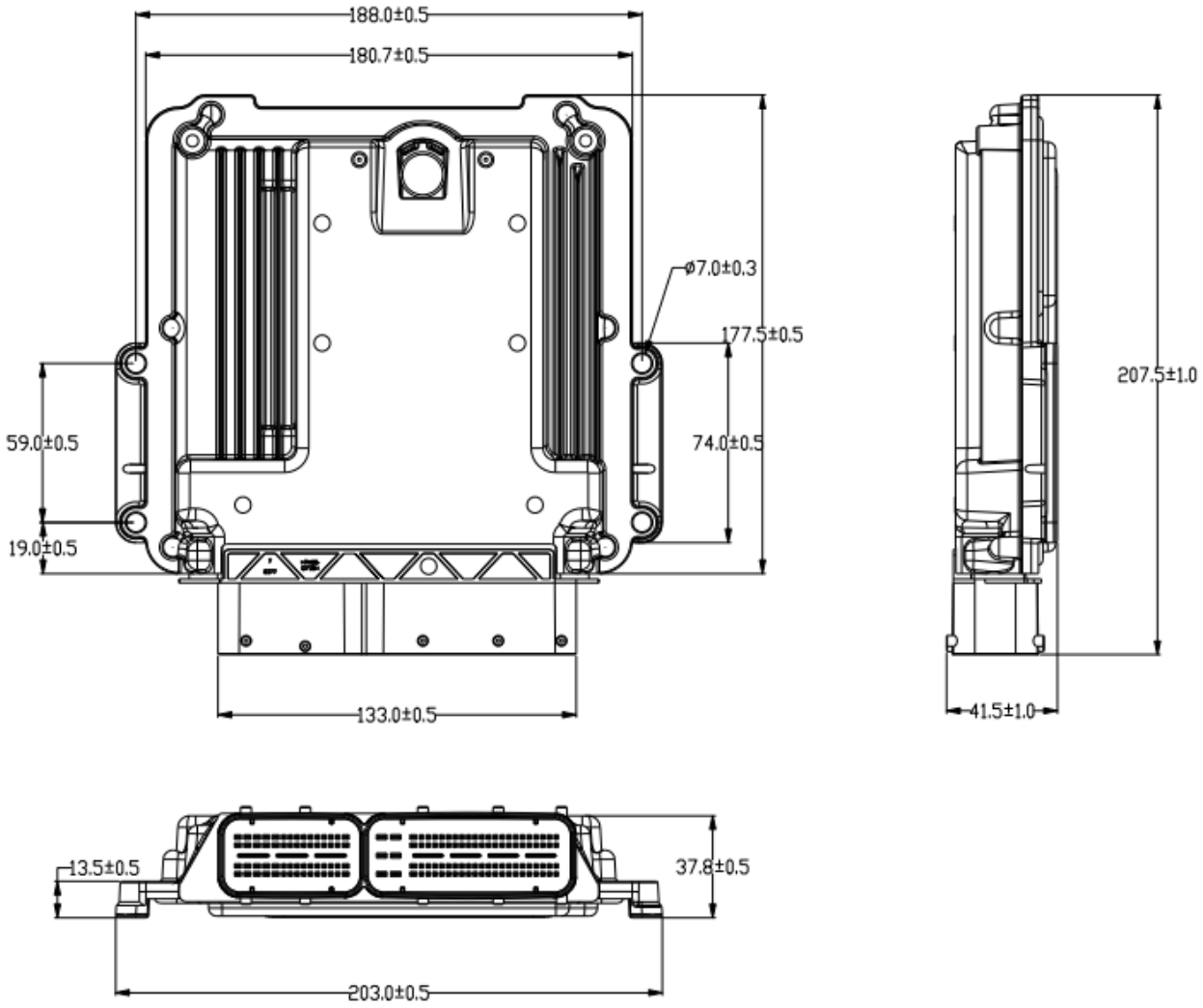

Figure 1 DCU Housing Dimensions

The appearance of the Housing is as follows:

Figure 2 DCU Housing Appearance

Screwdriver type used to disassemble and assemble the housing is T15 hexagon socket screw.

The DCU Housing, which contains a product identification code, customer information, date, batch number, serial number, etc.

The plug-in connector is shown in the figure below:

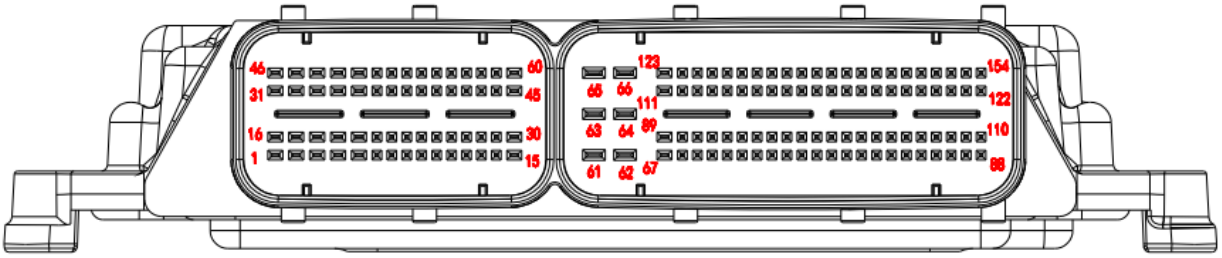

Figure 3 Connector and pinout diagram

1.3 Connector

No.	Name	Part No.	Manufacturer
1	94P Connector Housing	3-1355136-3	TE
2	60P Connector Housing	2-1355123-3	TE
3	94P Connector Cover	1-1355132-2	TE
4	60P Connector Cover	1-1355122-2	TE
5	Connector Lever	1-1355133-1	TE
6	94P Retainer	1-1355134-1	TE

7	60P Retainer	1-1355118-1	TE
8	94P Retainer	1-1355135-1	TE
9	Large Receptacle Terminal (Wire Diameter 0.2-0.35）	1241396-1	TE
10	Medium Receptacle Terminal (Wire Diameter 0.5-0.75)	1241608-1	TE
11	Small Receptacle Terminal (Wire Diameter 0.75-1.0)	968221-1	TE
12	PCB Pin Header	BS852	BS

1.4 Tech Specs

Feature	Detail
Micro Control Unit	32-bit Infineon TC397TP
System Basis Chip (SBC)	TLF35584
Maximum Frequency	300MHz
Flash	16M
EEPROM	64K
SRAM	6.9M
Floating Point Capability	Yes

1.5 Recommended Software Tools

Controller Model	EV82397A
Main chip	Infineon TC397TP
Integrated Development Environment	HighTec Tricore Tool Chain
EcoCoder Version	EcoCoder-v2.9.15 R2 or above
EcoFlash Version	EcoFlash-v1.1.8.8 or above
EcoCAL Version	EcoCAL-V2.1.8.10 or above

1.6 Description of Bootloader

Bootloader of this controller supports the UDS protocol by default.

2. Technical performance

2.1 Electrical Characteristics Parameters

Characteristic	Design Specification
Operating Voltage	DC 12V/24V (9~32V)
Operating Temperature	-40 ℃ ~85 ℃
Operating Humidity	0~95%, no condensation
Storage Temperature	-40 ℃ ~85 ℃
Quiescent Current	<3 mA
Rated Power Consumption	3W (excluding load power)
Protection level	IP67
Weight	≤ 850Gg
Dimensions	207 × 203 × 38 mm
Housing Material	Die-cast aluminum
Housing Characteristics	Equipped with waterproof breathable valve, good heat dissipation

2.2 Electrical Performance Standards

Item	Standard
Overvoltage (high temperature)	ISO 16750-2
Jump voltage	ISO 16750-2
AC voltage superposition test	ISO 16750-2
Supply voltage ramp down and ramp up	ISO 16750-2
The supply voltage drops momentarily	ISO 16750-2
Reset performance for voltage sag	ISO 16750-2
Startup Features	ISO 16750-2
Reverse voltage	ISO 16750-2
Reference Ground and Supply Offsets	ISO 16750-2
Open circuit experiment-single line open circuit	ISO 16750-2
Open circuit experiment-multi-line open circuit	ISO 16750-2
Short circuit protection	ISO 16750-2
Withstand voltage	ISO 16750-2
Insulation resistance	ISO 16750-2

2.3 Environmental Test Standards

Item	Test Standard
Waterproof (IP67)	IEC/EN 60529
Dustproof (IP67)	ISO 20653
Salt spray leakage function and corrosion test	ISO 16750-4
Mechanical vibration shock test	ISO 16750-3
Vibration test	ISO 16750-3
Drop test	ISO 16750-3
Temperature shock	ISO 16750-4
Electrical operation at cyclic ambient temperature	ISO 16750-4
High and low temperature operation experiment	ISO 16750-4
High and low temperature experiments	ISO 16750-4
Temperature and humidity cycle	IEC 60068-2-30
Constant temperature and humidity	ISO 16750-4

2.4 EMC Test Standards

Item	Test Standard
Transient Conducted Emissions	ISO7637-2
Conducted emission test CE -V	CISPR25
Conducted emission test CE -C	CISPR25
Radiated emission experiment RE-ALSE method	CISPR25
Radiated immunity test (I/O) - ICC method	ISO7637-3
Radiated Immunity Test BCI-Substitution Method	ISO11452-4
Radiated immunity test RI	ISO11452-2
Low frequency magnetic field immunity	ISO11452-8
Electrostatic Discharge (ESD)	GMW3097

3. Installation Requirements

It is recommended to install the VCU in the cockpit. If the OEM wants to assemble the VCU in another location, Ecotron's engineers and the OEM's engineers should evaluate the corresponding installation location together.

Precautions for VCU installation are as follows:

1) The VCU and the wiring harness should be installed firmly and reliably without any looseness and please avoid supporting the wiring harness through VCU. At the same time, the layout of the VCU wiring harness should prevent and protect all wires in the wiring harness from damage due to wear and overheating.
2) Try to avoid installing it in places where dust easily accumulates. Large amounts of dust accumulation will affect the reliability of VCU work.
3) Keep away from any environment where the temperature of the housing may exceed 85°C. and the heat released by surrounding parts shall be prevented from radiating to VCU.
4) Avoid installing the VCU in locations that are oily, humid, or prone to splashing water.
5) Avoid the possibility of additional mechanical vibration and external force impact due to the installation position and fixing method of VCU and avoid installing VCU at the resonance point of vehicle body.
6) Avoid installing the VCU near the parts that may contact the battery or other acid-base solutions that are easy to seep out, and the places where the VCU is easy to be corroded.
7) Avoid installing the VCU near the positive terminal of the battery and the terminal of the ignition power supply.
8) The VCU should be installed at a certain angle to avoid the inflow of water from the connector. In the horizontal direction, the recommended installation angle is - 170 ° to - 10 °. In the vertical direction, the recommended installation angle is - 170 ° ~ - 10 °. As shown in the figure below.

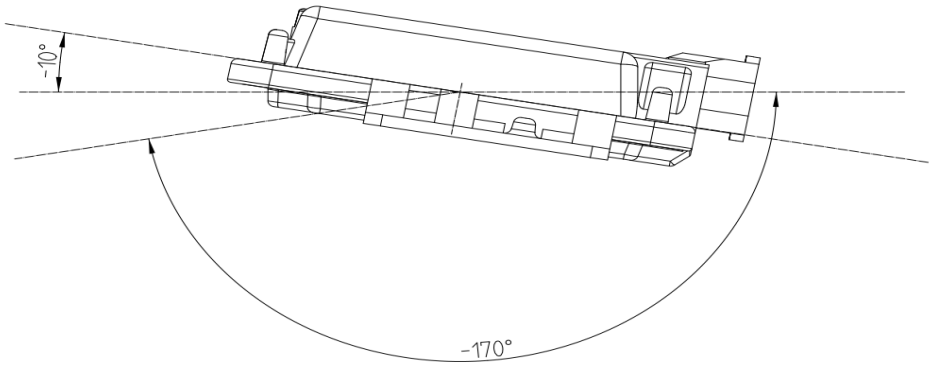

Figure 16 Horizontal installation angle

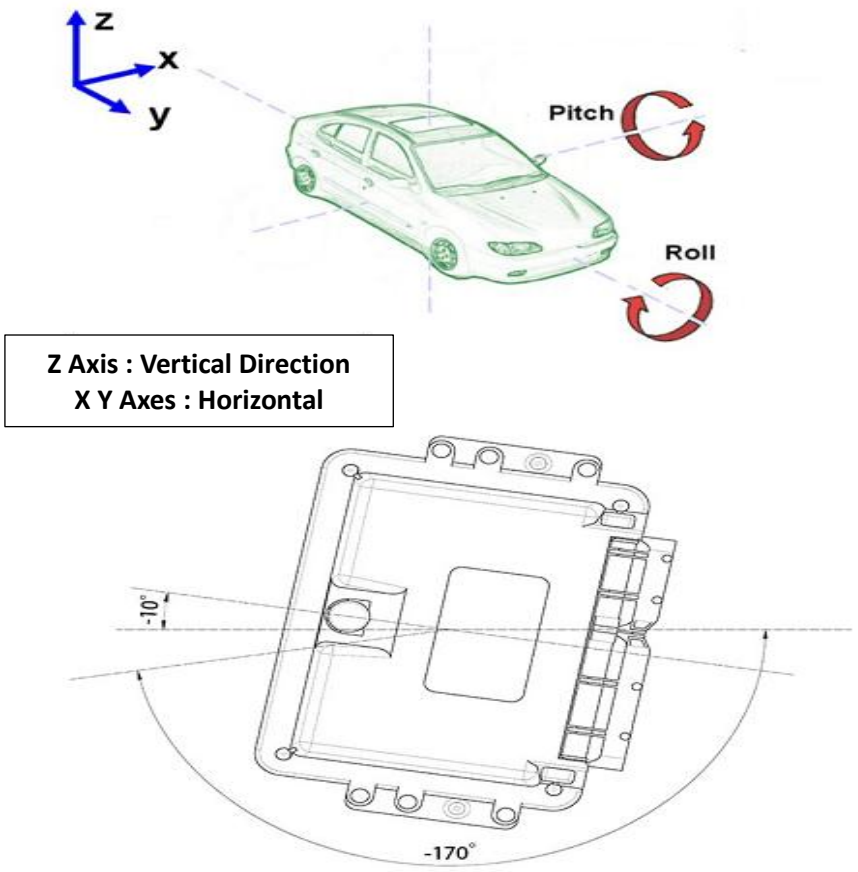

Figure 17 Vertical installation angle

Ecotron recommends using the four mounting holes on the VCU for installation. It is recommended to use metal materials such as aluminum alloy for the mounting bracket. The housing should have a reliable electrical connection with the vehicle body through the bracket. If other materials are used, the customer must ensure that they can meet the requirements of VCU for vibration, heat dissipation, temperature, EMC, etc. If there is any deviation, it needs to be confirmed with ECOTRON.

The VCU system connects to the ground through the vehicle's body. The specific requirement is to directly connect the ground wire in the wiring harness to the vehicle's body and ensure reliable electrical connections.

Mechanical Installation Recommendations: (Users can modify according to their vehicle requirements)

Recommended screw specifications for installation: M6 nut, M6*25 screw.

Recommended tightening torque: 7 N·m.

Recommended dimensions and parameters for additional vibration-damping pads: inner diameter 6mm, outer diameter 20mm, thickness 15mm.