EV62314A
Datasheet

V 1.3

Revision History

Date	Version	Description
12/30/2022	V 1.0	Initial version, change IPWM frequency inputs range
1/30/2023	V 1.1	DI01, DI02 is IPWM configurable
3/3/2023	V 1.2	Add two channels of hardwire wake up signals DI11 and DI12 Housing Description Add descriptions of installing required fixing hole
3/6/2023	V 1.3	Change PWM Input descriptions: SPEED1/DI21, SPEED2/DI22 can be multiplexed as DI inputs

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Chapter 1 General Information

1.1 Introduction

VCU (Vehicle Control Unit) is the master controller for electric vehicles.

It receives the driver's input signals, such as pedal signals, vehicle speed signals, gear signals and other input signals, cooperating with motor, battery pack and other accessory systems to meet the driving torque requirements, and achieve the functions such as fault diagnosis and processing, vehicle status monitoring, vehicle mode conversion, etc.

VCU is the main control unit for vehicle control network or CAN bus network.

1.1.1 **Functionality**

EV62134A has the following functions:

Table 1.1.1.1 EV62134A Features

Features
1 Key switch (KEYON) 2 Hardwire wake-up signals DI11, DI12 2 Power supply (BATT) 2 5V Outputs: Max current 50 mA 3 CAN bus ports (supports CAN flashing), CANA supports arbitrary frame wake-up 1 LIN bus port (support wake-up) 10 Digital signal inputs: 5 channels active high, 5 channels active low. Two of them is PWM input configurable. 8 Analog signal inputs: 3 channels of 0-5V voltage type input, 2 channels of 0-5V resistor type input, and 3 channels of 0-32V voltage type input 2 Frequency signal inputs 4 High-side driver outputs: 2 Pulse-Width-Modulation (PWM) output configurable 10 Low-side driver outputs: 2 PWM output configurable Hardware watchdog

1.1.2 **Mechanical Specification**

The housing of VCU is formed by aluminum die-casting and assembled with silicone rubber seals. There is no special treatment or plating on the surface, no sharp burrs, or sharp edges. The dimensions of the VCU housing are as follows (excluding the female end of the VCU connector, in mm):

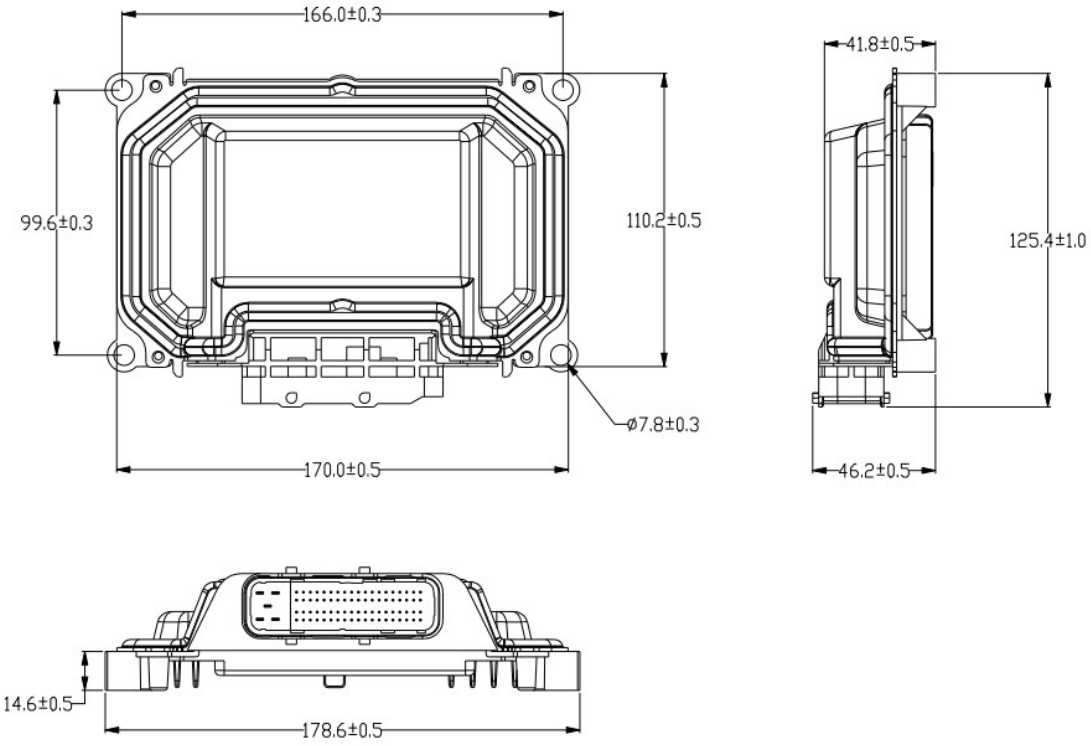


Figure 1 VCU Housing Size

The appearance of the housing is as follows:

Figure 2 VCU Housing Appearance

The type of screwdriver that used for disassembling the housing: Torx T15.
The product identification label is affixed to the VCU housing, which contains the product identification code, customer information, date, batch number, serial number, etc.

1.1.3 **Connector Kits**

VCU uses the world-renowned “TE connectivity” brand connector kits, which is a qualified product that meets the automotive safety level and has 121 pins. The specific models of the connector kits are as follows.

Table 1.1.3.1 Harness Connector Info

#	Name	Part number	Supplier	URL
1	PCB Pin Seat	BS832	BS	
2	81P Housing	368290-1	TE	https://www.te.com.cn/chn-zh/product-368290-1.html#scetion-pdp-related-info-compatible
3	Terminal (wire diameter 0.2-0.35)	5-928999-1	TE	https://www.te.com.cn/chn-zh/product-5-928999-1.html
4	Terminal (wire diameter 0.5-0.75)	5-963715-1	TE	https://www.te.com.cn/chn-zh/product-5-963715-1.html
5	Terminal (wire	927771-3	TE	https://www.te.com.cn/chn-zh/product-927771-3.html

	diameter 0.75-1.0)			
6	Terminal (wire diameter 1.5-2.5)	927768-3	TE	https://www.te.com.cn/chn-zh/product-927768-3.html

Connector’s Pin distribution is shown below:

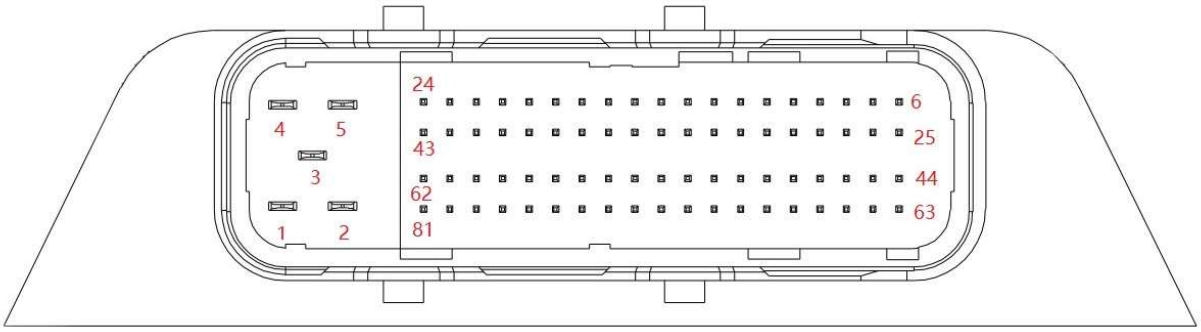


Figure 3 Connector’s Pin Distribution Diagram

1.1.4 **Chip Information**

Table 1.1.4.1 Chip Info

Feature	**Detail**
Micro Control Core	32-bit NXP S32K314
Maximum Frequency	160MHZ
Flash	4MB
SRAM	512KB
Floating Point Capability	Yes
SBC Microprocessor	MC33CFS6500

1.1.5 **Power Supply**

EV62314A requires 2 channels of continuous power supplies (pin1, pin3), and the VCU is powered on through the KEYON switch (pin59).

1.1.6 **BootLoader**

The default BootLoader of EV62314A uses UDS protocol.

Chapter 2 Interface Description

2.1 Pin Definition

Table 2.1.1 Pin Definition

Signal Name	PIN	Function	Interface Description	Note
Power Supply				
BATT	1 3	Power Supply	Power Supply 12V/24V	9-32V
5V1	62 81	5V Sensor Supply 1	External sensor 5V power supply	5V ± 2%, Maximum 50 mA
5V2	24 43	5V Sensor Supply 2	External sensor 5V power supply	
PGND	2 4 5 46 47	Ground	Power Ground	
GND	14 21 32 33 40 41	Signal Ground	External 5V sensor ground	
Analog Input				
AI01	72	Analog input 1	Analog input 0~5V	12 bits precision
AI02	73	Analog input 2	Analog input 0~5V	12 bits precision
AI03	53	Analog input 3	Analog input 0~5V	12 bits precision
AI04	54	Analog input 4	0 ~ 5V resistor type input	12 bits precision
AI05	71	Analog input 5	0 ~ 5V resistor type input	12 bits precision
AI06	52	Analog input 6	Analog input 0~32V	12 bits precision
AI07	51	Analog input 7	Analog input 0~32V	12 bits precision
AI08	70	Analog input 8	Analog input 0~32V	12 bits precision
Power-On Signal				
KEYON	59	Key Input Signal	Digital Signal Input 0~BATT	
DI11	40	AC/DC Charging wake-up signal	Digital Signal Input 0~BATT	Active-high
DI12	78	AC/DC Charging wake-up signal	Digital Signal Input 0~BATT	Active-high
Digital Input				

DI01	60	Digital Input 01	Digital Input 0~32V	Active high, PWM configurable, frequency range 1Hz – 2 KHz
DI02	75	Digital Input 02	Digital Input 0~32V	Active high, PWM configurable, frequency range 1Hz – 2 KHz
DI03	80	Digital Input 03	Digital Input 0~32V	Active high
DI04	55	Digital Input 04	Digital Input 0~32V	Active high
DI05	79	Digital Input 05	Digital Input 0~32V	Active high
DI06	74	Digital Input 06	Digital Input 0~32V	Active low
DI07	16	Digital Input 07	Digital Input 0~32V	Active low
DI08	35	Digital Input 08	Digital Input 0~32V	Active low
DI09	34	Digital Input 09	Digital Input 0~32V	Active low
DI10	15	Digital Input 10	Digital Input 0~32V	Active low
Frequency Input				
SPEED1/ DI21	27	Frequency Input 1	Frequency/Digital signal 0~32V	Active-high, frequency input range 20Hz-2KHz
SPEED2/ DI22	28	Frequency Input 2	Frequency/Digital signal 0~32V	Active-high, frequency input range 20Hz-2KHz
Output Signal				
HSO01	17 36	High side output 01	Rated 1A, Peak 3A	
HSO02	18 37	High side output 02	Rated 1A, Peak 3A	
HSO03	19 38	High side output 03	Rated 1A, Peak 3A	PWM configurable, frequency range 1Hz-2KHz
HSO04	20 39	High side output 04	Rated 1A, Peak 3A	PWM configurable, frequency range 1Hz-2KHz
LSO01	45	Low side output 01	Rated 3A, Peak 4A	
LSO02	44	Low side output 02	Rated 3A, Peak 4A	
LSO03	49	Low side output 03	Rated 3A, Peak 4A	
LSO04	48	Low side output 04	Rated 3A, Peak 4A	
LSO05	68	Low side output 05	Rated 1A, Peak 1.5A	
LSO06	64	Low side output 06	Rated 1A, Peak 1.5A	
LSO07	65	Low side output 07	Rated 0.5A, Peak 1A	
LSO08	63	Low side output 08	Rated 0.5A, Peak 1A	
LSO09	66	Low side output 09	Rated 0.5A, Peak 1A	PWM configurable, frequency range 1Hz-2KHz
LSO10	67	Low side output 10	Rated 0.5A, Peak 1A	PWM configurable, frequency range 1Hz-2KHz

Serial Communication Interface				
CANA_H	23	CANA H	Include 120Ohm Terminal Resistance	Supports arbitrary frame wake up, support CAN flashing
CANA_L	22	CANA L		
CANB_H	31	CANB H	Include 120Ohm Terminal Resistance	Supports CAN flashing
CANB_L	30	CANB L		
CANC_H	12	CANC H	Include 120Ohm Terminal Resistance	Supports CAN flashing
CANC_L	13	CANC L		
CAN_SHILD1	29	CAN_A Shielded Wire		
CAN_SHILD2	26	CAN_B Shielded wire		
LIN	42	LIN BUS		Support wake up

2.2 Pin Description

2.2.1 **Analog Signal Input**

Description

The analog input channel circuits have the same structures, including EMC capacitors, pull-up/pull-down resistors, and first-order low-pass filter circuit.

Main difference:

- Resistance value of pull-up/pull-down resistor
- Pull-up voltage
- Filter’s Time-constant

Schematic

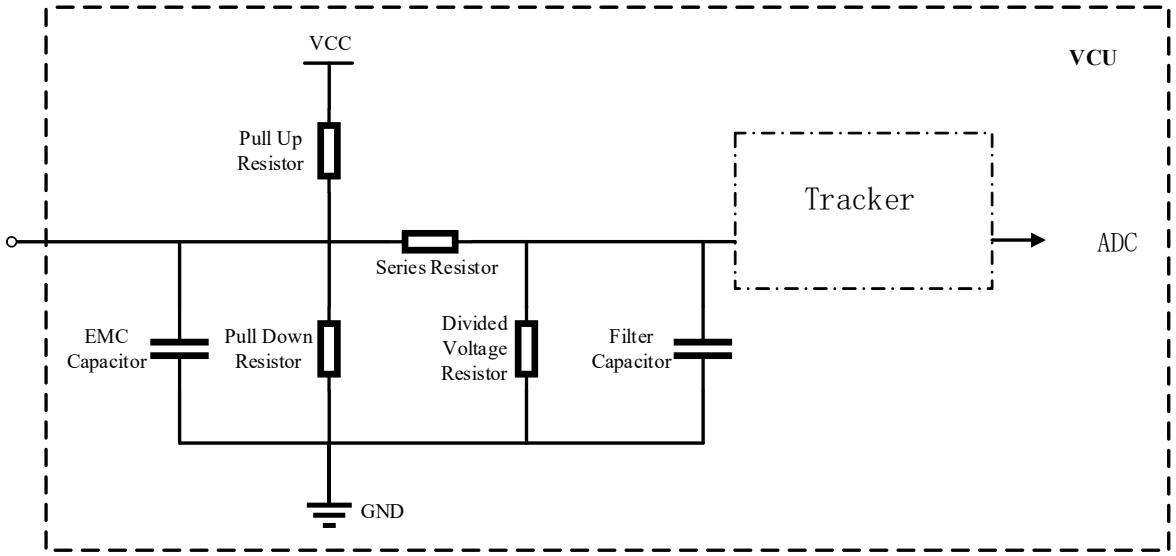


Figure 4 Schematic of Analog Signal Input Channel

Table 2.2.1.1 Analog Signal Input Channel Parameter

Pin #	AI	EMC Capacitor	Pull Up Resistor		Pull down Resistor	Series Resistor	Divided Voltage Resistor	Filter Capacitor	Operation Range		Input Range		Conditions / Remarks
		(F)	to U_B (Ohm)	to 5V (Ohm)	to GND (Ohm)	(Ohm)	(Ohm)	(F)	V_{low}	V_{high}	Min	Max	
72	AI01	100n	--	--	--	22k	--	1n	0V	5V	0V	5V	
73	AI02	100n	--	--	--	22k	--	1n	0V	5V	0V	5V	
53	AI03	100n	--	--	--	22k	--	1n	0V	5V	0V	5V	
54	AI04	100n	--	10K	--	22k	--	1n	0V	5V	0V	5V	
71	AI05	100n	--	10K	--	22k	--	1n	0V	5V	0V	5V	
52	AI06	100n	--	--	--	22k	3.48k	1n	0V	32V	0V	32V	
51	AI07	100n	--	--	--	22k	3.48k	1n	0V	32V	0V	32V	
70	AI08	100n	--	--	--	22k	3.48k	1n	0V	32V	0V	32V	
	BATT	--	--	--	--	22k	3.48k	1n	0V	32V	0V	32V	

Note:
1) "--" denotes Not installed.
2) U_B denotes BATT voltage.

2.2.2 **Digital Signal Input**

Description

The digital input channel circuits have the same structures, including EMC capacitors, pull-up/pull-down resistors, voltage divider resistors, and a first-order low-pass filter.

Main difference:

- Resistance of pull-up/pull-down resistor
- Selection of pull up/down resistor
- Filter's Time-constant

Schematic

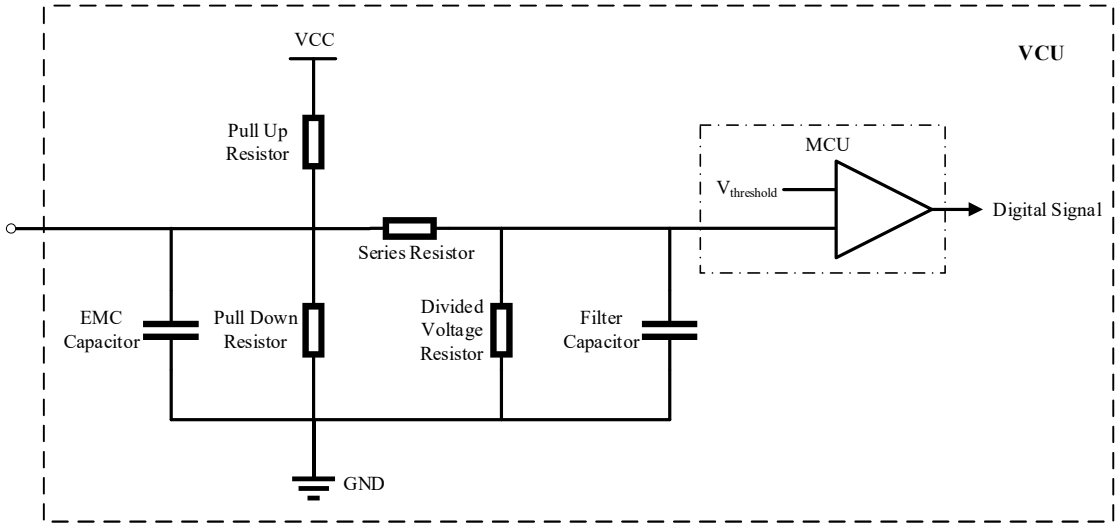


Figure 5 Schematic of Digital Signal Input Channel

Table 2.2.2.1 Digital Signal Input Channel Parameter

Pin #	DI	EMC Capacitor	Filter Capacitor	Pull Up Resistor		Pull Down Resistor	Series Resistor	Divided Voltage Resistor	Operation Threshold for Input Signal		Input Range		Conditions/ Remarks
		(F)	(F)	to U_B(Ohm)	to 5V(Ohm)	(Ohm)	(Ohm)	(Ohm)	V_{low}	V_{high}	Min	Max	
60	DI01/ SPEED3	10n	100p	--	--	10k	100k	68k	4V	9V	0V	U_B	PWM Input configurable, frequency range 1Hz – 2 KHz
75	DI02/ SPEED4	10n	100p	--	--	10k	100k	68k	4V	9V	0V	U_B	PWM Input configurable, frequency range 1Hz – 2 KHz
80	DI03	10n	100p	--	--	10k	100k	68k	4V	9V	0V	U_B	
55	DI04	10n	100p	--	--	10k	100k	68k	4V	9V	0V	U_B	
79	DI05	10n	100p	--	--	10k	100k	68k	4V	9V	0V	U_B	
74	DI06	10n	100p	10k	--	--	100k	68k	4V	9V	0V	U_B	
16	DI07	10n	100p	10k	--	--	100k	68k	4V	9V	0V	U_B	
35	DI08	10n	100p	10k	--	--	100k	68k	4V	9V	0V	U_B	
34	DI09	10n	100p	10k	--	--	100k	68k	4V	9V	0V	U_B	
15	DI10	10n	100p	10k	--	--	100k	68k	4V	9V	0V	U_B	
40	DI11	10n	100p	--	--	10k	100k	68k	4V	9V	0V	U_B	Wakeup Signal
78	DI12	10n	100p	--	--	10k	100k	68k	4V	9V	0V	U_B	Wakeup Signal
59	KEYON	10n	100p	--	--	10k	100k	68k	4V	9V	0V	U_B	Wakeup Signal

Note:

1) "--" denotes Not installed.

2) U_B denotes BATT voltage.
3) KEYON/DI05 Only used for key signal

2.2.3 **Frequency Signal Input**

Description

The frequency input channel circuits have similar structures, including EMC capacitors, pull-up/pull-down resistors, voltage divider resistors and a first-order low-pass filter circuit.
Main difference:

- Resistance of pull-up/pull-down resistor
- Pull-up or pull-down
- Filter's Time-constant

Schematic

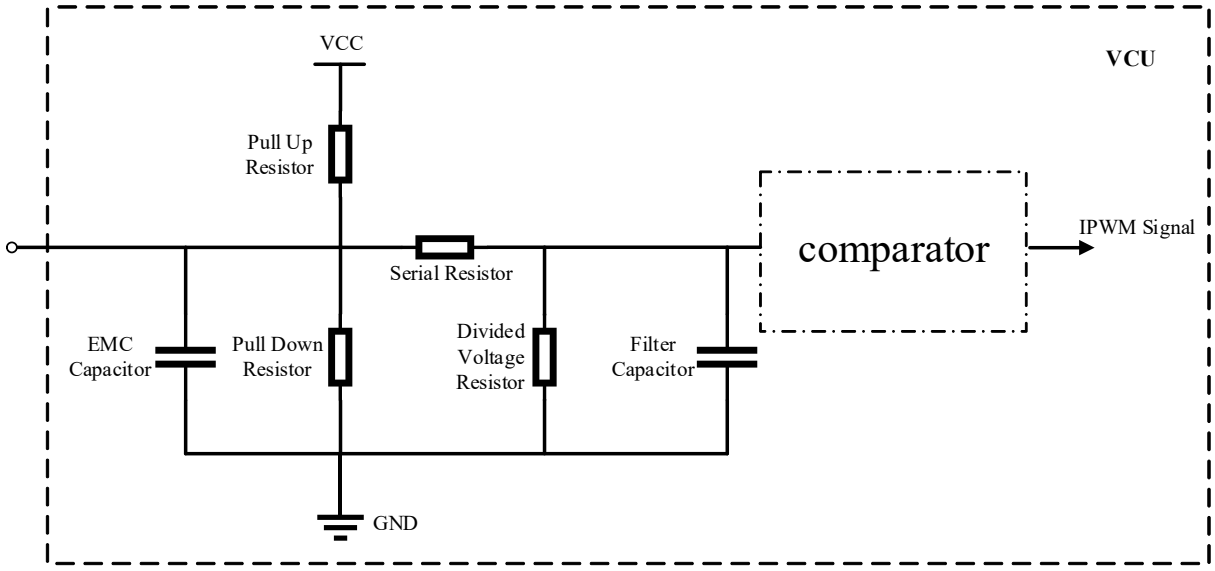


Figure 6 Schematic Diagram of Frequency Signal Input Channel

Table 2.2.3.1 Frequency Signal Input Channel Parameter

Pin #	SPEED	EMC Capacitor	Filter Capacitor	Pull Up Resistor		Pull Down Resistor	Series Resistor	Divided Voltage Resistor	Operation Threshold for Input Signal		Input Range	
		(F)	(F)	to U_B(Ohm)	to 5V(Ohm)	(Ohm)	(Ohm)	(Ohm)	V_{low}	V_{high}	Min	Max
27	SPEED1/DI21	100p	100p	--	--	10k	100k	68k	4V	9V	0V	U_B
28	SPEED2/DI22	100p	100p	--	--	10k	100k	68k	4V	9V	0V	U_B

Note:
1) "--" denotes Not installed.
2) U_B denotes BATT voltage.

The frequency and duty cycle reference values of the frequency signal input channel are shown in the following table (test conditions: BATT=12V, pulse input amplitude=10V, pulse input offset=5V),

Table 2.2.3.2 Frequency Signal Input Channel Frequency and Duty Cycle Reference Value

Input Frequency	Detected Frequency	Input Duty Cycle	Detected Duty Cycle	Input Duty Cycle	Detected Duty Cycle	Input Duty Cycle	Detected Duty Cycle
100Hz	100Hz	10.0%	9.92%	50.0%	49.92%	90.0%	89.92%
1000Hz	1000Hz	10.0%	9.67%	50.0%	49.60%	90.0%	90.32%
2000Hz	2000Hz	10.0%	9.12%	50.0%	49.38%	90.0%	90.32 %

2.2.4 **Low-side Driver**

Description

The low-side driver is a switch to control peripheral devices. All low-side driver channels have fault diagnosis function.

Main difference:

- Current value
- With/without Freewheel diode
- PWM Capability

Schematic

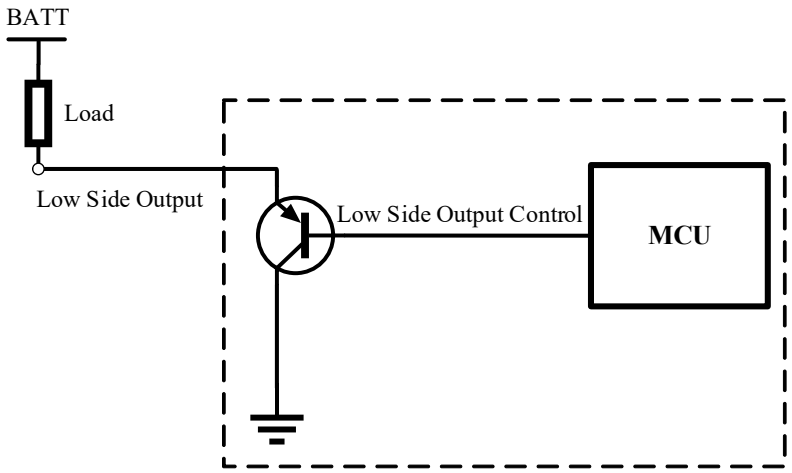


Figure 7 Schematic Diagram of Low-Side Driver Channel

Table 2.2.4.1 Low-Side Driver Channel Parameter

Pin #	Description	EMC Capacitor	Output Current	Free Wheeling Diode	Conditions / Remarks
		(F)	Max		
45	LS_01	100n	4A	No	

44	LS_02	100n	4A	No	
49	LS_03	100n	4A	No	
48	LS_04	100n	4A	No	
68	LS_05	100n	1.5A	No	
64	LS_06	100n	1.5A	No	
65	LS_07	100n	1A	No	
63	LS_08	100n	1A	No	
66	LS_09	100n	1A	No	OPWM Configurable
67	LS_10	100n	1A	No	OPWM Configurable

Note:
1. "--" denotes Not installed
2. Please refer to the **Power Control Output** section in EcoCoder manual, before using any low-side drivers, set PWR12V_DRVP as 1.
3. The total load of all low-side driver channels should not exceed 5A.

Table 2.2.4.2 Fault diagnosis of low-side driver

Low-Side Driver Channel	Fault	
	Disable	Enable
LSO01, LSO02, LSO03, LSO04, LSO05, LSO06, LSO07, LSO08, LSO09, LSO10	•No load •Short to ground	•Short to power

Note:
1) Please refer to "**Diagnostic Blocks**" section in EcoCoder manual for the usage of diagnostic functions.
2) All low-side driver channels have short-circuited protection. When it is enabled, if a channel is short-circuited to the ground, it will automatically activate the short-circuit protection function. This function may cause the channel to have a fault code jump phenomenon in this case, which is normal.
3) When LSO09, LSO10 are configured as OPWM, the reference values of frequency and duty cycle are shown in the following table (test conditions: BATT = 12V, load = 24 Ohm, duty cycle is all calculated as positive duty cycle).

Table 2.2.4.3 LS OPWM Frequency and Duty Cycle Reference Value

Set Frequency	Output Frequency	Set Duty Cycle	Output Duty Cycle	Set Duty Cycle	Output Duty Cycle	Set Duty Cycle	Output Duty Cycle
100Hz	100Hz	10.0%	10.4%	50.0%	50%	90.0%	90.4%
1000Hz	1000Hz	10.0%	10.8%	50.0%	50.5%	90.0%	91.2%
2000Hz	2000Hz	10.0%	11.1%	50.0%	51.6%	90.0%	91.6%

2.2.5 **High-side Driver**

Description

High-side driver is the high side switch controlled by GPIO can be used as a switch for driving peripheral devices.
All high-side driver channels have a fault diagnosis function.
Main difference:

- Current value
- PWM Capability
- Drian current
- With/without freewheel diode

Schematic

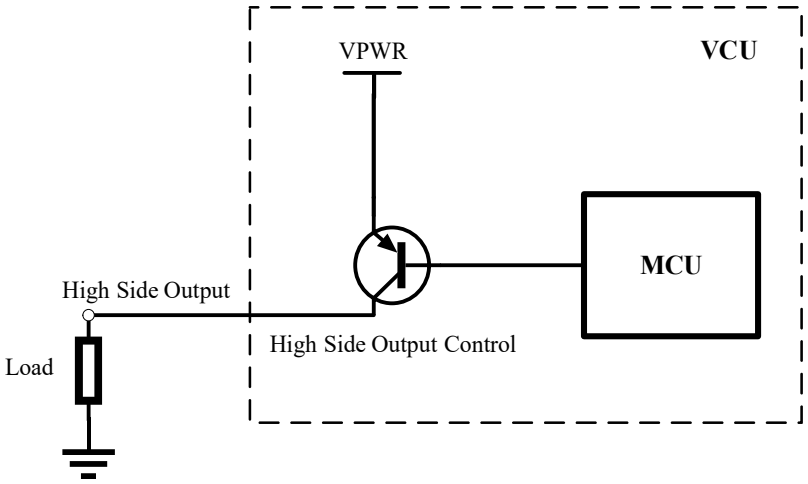


Figure 8 Schematic Diagram of High-Side Driver Channel

Table 2.2.5.1 High-Side Driver Channel Parameter

Pin-No	Description	EMC Cap	Output current	Leakage Current	Free Wheeling Diode	Conditions / Remarks
		(F)	Max(A)	Max(uA)		
17 36	HSO01	100n	1	3	No	
18 37	HSO02	100n	1	3	No	
19 38	HSO03	100n	1	3	No	OPWM Configurable
20 39	HSO04	100n	1	3	No	OPWM Configurable

Note:

1. Before using any high-side channels, please set **PWR12V_DRVP as 1**, according to the instruction of EcoCoder manual **Power Control Output** block section.
2. **The total load of all high-side driver channels should not exceed 5A.**

Table 2.2.5.2 Fault Diagnosis of High-side Driver

High-side driver channel	Fault	
	Disable	Enable
HSO01, HSO02, HSO03, HSO04	•Short to power supply	•No load •Short to ground •Short to power

Note:

1) Please refer to EcoCoder manual for the usage of the **Diagnostic Blocks**.

2) When HSO031 and HSO04 are configured as OPWM, the reference values of frequency and duty cycle are shown in the following table (test conditions: BATT = 12V, load = 24 Ohm, duty cycle is all calculated as positive duty cycle).

Table 2.2.5.3 HS OPWM Frequency and Duty Cycle Reference Value

Preset Frequency	Output Frequency	Preset Duty Cycle	Output Duty Cycle	Preset Duty Cycle	Output Duty Cycle	Preset Duty Cycle	Output Duty Cycle
100Hz	100Hz	10.0%	10.4%	50.0%	50%	90.0%	90.4%
1000Hz	1000Hz	10.0%	10.8%	50.0%	50.5%	90.0%	91.2%
2000Hz	2000Hz	10.0%	11.1%	50.0%	51.6%	90.0%	91.6%

2.2.6 **CAN Bus**

Description

CAN interface is used for communication between VCU and other vehicle controllers, the transmission rate could be 1Mbps. Support CAN flashing, CAN_A port is integrated in power chip and support arbitrary frame wake up.

Schematic

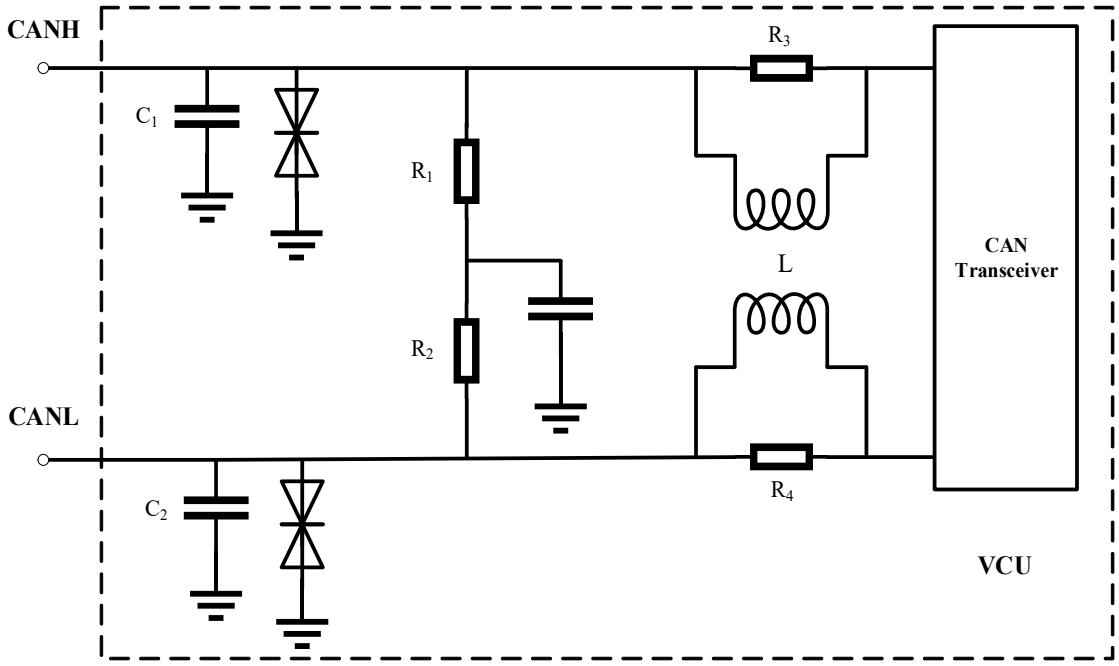


Figure 9 CAN Bus Schematic

Table 2.2.6.1 CAN Bus interface

Pin #	CAN	EMC Capacitor C_1, C_2 (F)	R_1, R_2 (Ohm)	Choke L	Conditions / Remarks
23	CANA H	47p	60	Yes	Support ISO11898-5, support CAN arbitrary frame wake up, support CAN flashing
22	CANA L	47p	60		
31	CANB H	47p	60	Yes	Support ISO11898-5, support CAN flashing
30	CANB L	47p	60		
12	CANC H	47p	60	Yes	Support ISO11898-5, support CAN flashing
13	CANC L	47p	60		

2.2.7 **LIN Bus**

Description

LIN (Local Interconnect Network) bus supports master/slave node communication mode, with short-to-power protection feature. Support wake up function

Schematic

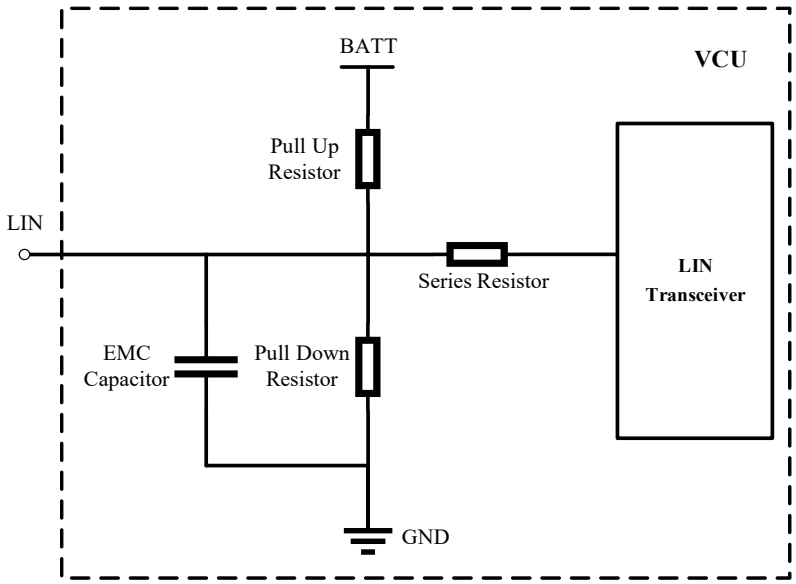


Figure 10 LIN Bus Schematic

Table 2.2.7.1 LIN Bus Parameter

Pin #	LIN	EMC Capacitor	Pull Up Resistor	Pull Down Resistor	Series Resistor	Conditions / Remarks
			to U_B (Ohm)	to GND (Ohm)	(Ohm)	
42	LIN_BUS	10n	6.1k	--	--	--

2.2.8 **5V Output**

Description

The 5V voltage output channel can provide 5V power supply for external sensors and has the following functions:

- Accurate 5V output for internal IC power supply
- 2 Channels of sensor 5V power supply output
- Reverse polarity connection protection, short circuit protection, over-temperature protection

Table 2.2.8.1 5V Sensor Power Output Parameter

Pin #	Description	Imax(mA)	Output Voltage
62 81	5V supply voltage 1	50	5V±2%
24 43	5V supply voltage 2	50	5V±2%

Chapter 3 Technical Performance

3.1 Electrical Characteristics

Item	Design Specifications
Operating Voltage	DC 12 V / 24V (9~32V)
Operating Temperature	-40 °C ~85 °C
Working Humidity	0~95%, No Condensation
Storage Temperature	-40 °C ~85 °C
Quiescent Current	<1mA
Rated Power Consumption	3 W (No Load)
Protection Level	IP67
Weight	≤ 550g
Controller Size	177×128×45
Material	Die-Cast Aluminum

3.2 Electrical Performance Standard

Item	Test Standard
Direct Current Supply Voltage	ISO 16750-2
Overvoltage (12V, High Temperature)	ISO 16750-2
Slow Decrease and Increase of Supply Voltage	ISO 16750-2
Superimposed Alternating Voltage	ISO 16750-2
Reversed Voltage	ISO 16750-2
Low Voltage Reset Features	ISO 16750-2
Low Voltage Start Features	ISO 16750-2
Open Circuit Tests – Single Line Interruption	ISO 16750-2
Open Circuit Tests – Multiple Line Interruption	ISO 16750-2
Short Circuit Protection	ISO 16750-2
Withstand Voltage	ISO 16750-2
Insulation Resistance	ISO 16750-2

3.3 Environmental Standards

Item	Test Standard
Waterproof (IP67)	IEC/EN 60529
Dustproof (IP67)	ISO 20653
Salt Spray Leakage Function and Corrosion Test	ISO 16750-4
Mechanical Shock Test	ISO 16750-3
Vibration Test	ISO 16750-3
Drop Test	ISO 16750-3
Temperature Shock	ISO 16750- 4
Electrical Operation at Circulating Ambient Temperature	ISO 16750-4
High and Low Temperature Operation Experiment	ISO 16750-4
High and Low Temperature Experiment	ISO 16750-4
Temperature and Humidity Cycle	IEC 60068-2-30
Constant Temperature and Humidity	ISO 16750-4

3.4 EMC Test Standard

Item	Test Standard
Voltage Transient Emissions Test	ISO7637-2
Conducted Emission (CE-V)	CISPR25
Conducted Emission (CE-C)	CISPR25
Radiation Emission (RE-ALSE)	CISPR25
Radiation Immunity Experiment (I/O)-ICC	ISO7637-3
Radiation Immunity Experiment BCI-Substitution Method	ISO11452-4
Radiation Immunity Experiment (RI)	ISO11452-2
Low Frequency Magnetic Field Immunity	ISO11452-8
ESD	GMW3097

Chapter 4 Installation Requirements

It is recommended to install the VCU in the cockpit. If the OEM wants to assemble the VCU in another location, the corresponding installation location should be evaluated by engineers from both Ecotron and the OEM.

The precautions for VCU installation are as follows:

1. The VCU and wiring harness installation should be firm and reliable, and there should be no looseness. Avoid supporting the wiring harness by VCU. At the same time, the arrangement of the VCU wiring harness should prevent and protect all wires in the wiring harness from damage due to wear and to overheat.
2. Try to avoid installing in places where dust is easy to gather. A large amount of dust accumulation will affect the reliability of VCU work.
3. VCU should keep away from the location where the temperature of the housing itself may exceed 85°C. At the same time, it is necessary to prevent the surrounding parts from releasing heat to the VCU.
4. Avoid installing the VCU in locations where oil, moisture, and water droplets are likely to splash on it.
5. Avoid the possibility of additional mechanical shock and external impact due to the installation position and fixing method of the VCU and avoid installing the VCU at the resonance point of the car body.
6. Avoid installing the VCU where it may come into contact with the battery or other parts that are prone to seepage of acid and alkaline solutions and near the VCU power terminal.
7. VCU should be installed in the horizontal and vertical position according to the connector downwards and maintain a certain angle to prevent water from entering the connector. In the horizontal direction, the recommended installation angle is -170° to -10°, as shown in Figure 13 below. In the vertical direction, the recommended installation angle is -170°~ -10°, as shown in Figure 14 below.

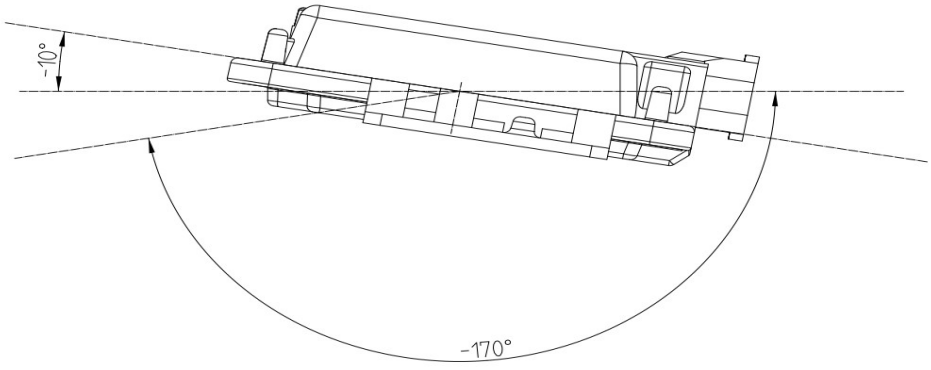
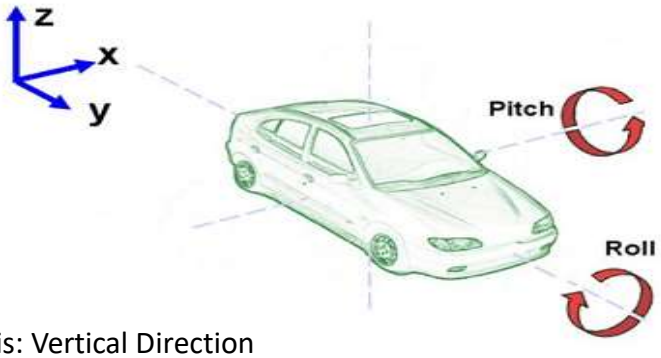


Figure 11 Horizontal Installation Angle



Z Axis: Vertical Direction
X Y Axes: Horizontal Direction

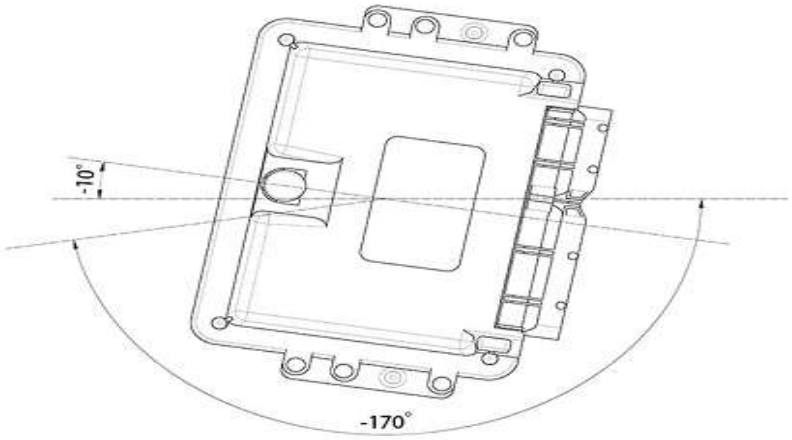


Figure 12 Vertical Installation Angle

Ecotron recommends using the six installation points on the VCU for installation and fixation. 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 adopts 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.