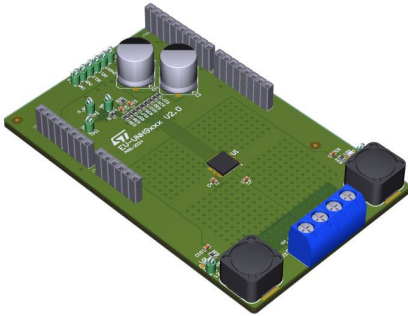


EV-VNH90xxAQ evaluation board



Product status link

EV-VNH9030AQ, EV-VNH9045AQ,
EV-VNH9090AQ

Order code	Reference
EV-VNH9030AQ	EV-VNH9030AQ evaluation board
EV-VNH9045AQ	EV-VNH9045AQ evaluation board
EV-VNH9090AQ	EV-VNH9090AQ evaluation board

Features

Parameter	Symbol	Value
Max transient supply voltage	V_{CC}	36 V
Operating voltage range	V_{CC}	4 to 28 V
Stand-by current (max)	I_{STBY}	1 μ A
On board device options		R_{ON}
VNH9030AQ	30 m Ω	35 A
VNH9045AQ	45 m Ω	23 A
VNH9090AQ	82 m Ω	15 A

- Simple single IC application board dedicated for VNH90xxAQ
- Provides electrical connectivity and thermal heat-sinking for easy prototyping

Description

EV-VNH9030AQ, EV-VNH9045AQ and EV-VNH9090AQ provide you an easy way to connect ST VIPower M0-9 DC motor drivers into your existing prototype circuitry. This evaluation board comes preassembled with VNH90xxAQ. On board the minimum set of electrical components (as for device datasheet recommendation), enabling the user to directly connect the load, the power supply and the microcontroller without any additional effort in external component design and connection.

VNH90xxAQ is a full bridge motor driver intended for a wide range of automotive applications. The device incorporates a dual monolithic high-side driver and two low-side switches. Both switches are designed using ST proprietary VIPower M09 technology which allows efficient integration of a true power MOSFET with intelligent signal/protection circuitry on the same die. The three dies are assembled in a QFN 6x6 package equipped with three exposed islands for optimized dissipation performances.

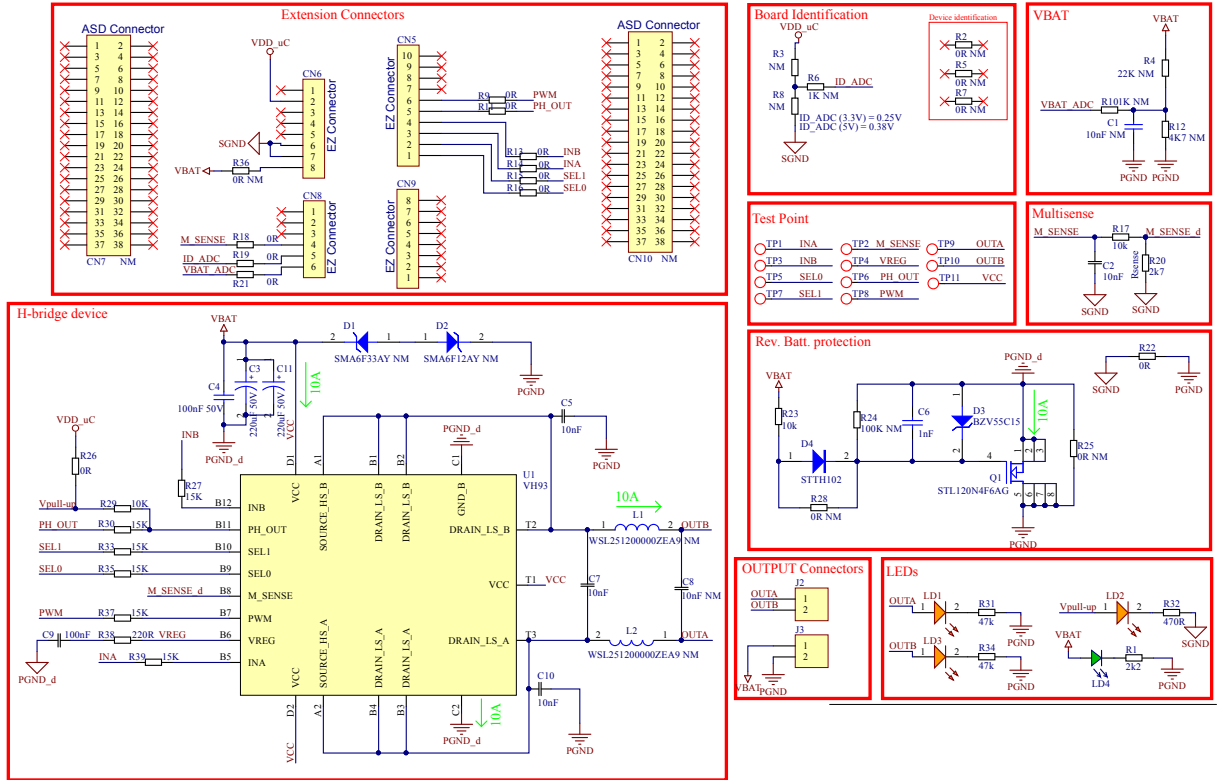
This package is specifically designed for the harsh automotive environment and offers improved thermal performance thanks to exposed die pads. The input signals INA and INB can directly interface the microcontroller to select the motor direction and the brake condition. Two selection pins (SEL0 and SEL1) are available to address to the microcontroller the information available on the multisense pin and Phase_OUT pin. The multisense pin allows to monitor the motor current by delivering a current proportional to the motor current value and also provides the diagnostic feedback. The Phase_OUT pin provides feedback of OUT status confirming the motor is driven properly.

The PWM, up to 25 kHz, allows to control the speed of the motor in all possible conditions.

1 Design recommendation

This evaluation board provides mounting and some heat sinking capability for prototype development.

Figure 1. VNH90xxAQ evaluation board schematic



2 Board connection

The Figure 2 shows the placement of the connectors to be used for supplying the evaluation board, connecting the load and controlling the functionality and diagnostic of the device.

Figure 2. Evaluation board connection

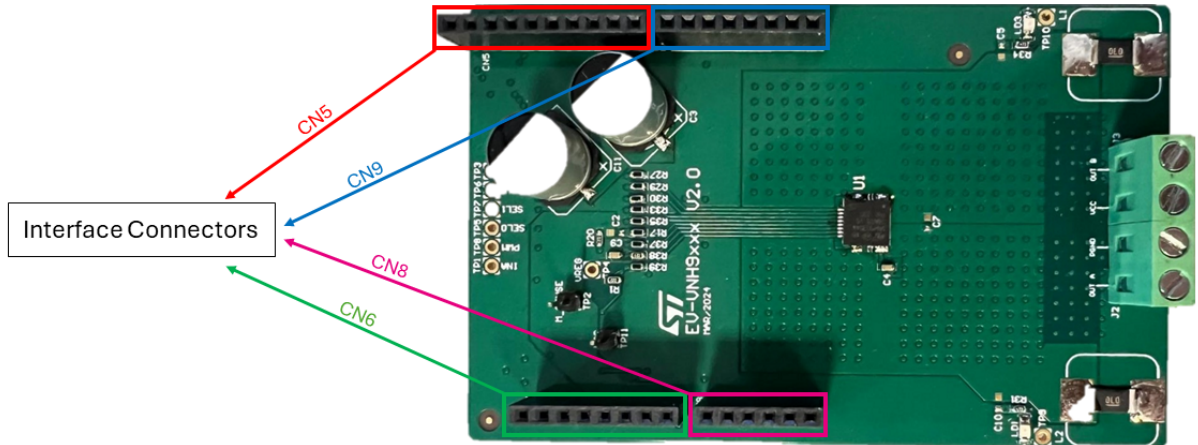


Table 1. Pin connection and functions

Connector	Pin number	Pin function
CN5	1	SEL_0
CN5	2	SEL_1
CN5	3	INA
CN5	4	INB
CN5	5	PH_OUT
CN5	6	PWM
CN6	6	SGND
CN6	7	SGND
CN8	4	M SENSE
CN8	5	ID_ADC
CN8	6	VBAT ADC

Table 2. PCB specifications

Parameter	Value	Unit
Board dimensions	65.74 x 93.13	mm
Number of Cu layer	4	-
Layer Cu thickness	70 top and bottom 35 inners	µm
Board finish thickness	1.6 ±10%	mm
Board material	FR4	-
Thermal vias separation	0.5	mm
Thermal vias diameter	0.3	mm

Revision history

Table 3. Document revision history

Date	Version	Changes
17-Oct-2024	1	Initial release.
14-Nov-2024	2	Updated Figure 1. VNH90xxAQ evaluation board schematic.



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