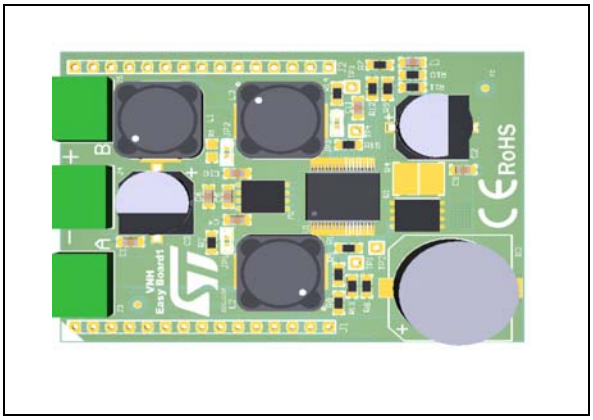
EV-VNHD7012AY

VNHD7012AY Evaluation board

Data brief



Features

Parameter	Symbol	Value	Unit
Max transient supply voltage	V_{CC}	38	V
Operating voltage range	V_{CC}	4 to 28	V
Typ.on-state resistance	RON per channel	12	mΩ
Current limitation (typ)	I_{LIMH}	38	A
Stand-by current (max)	I_{STBY}	10	µA

- Simple single IC application board dedicated for VNHD7012AY
- Provides electrical connectivity and thermal heat-sinking for easy prototyping

Description

EV-VNHD7012AY provides you an easy way to connect ST VIPower M0-7 HBridge drivers into your existing prototype circuitry. This evaluation board comes preassembled with VNHD7012AY H-Bridge. On board minimum set of electrical components (as for device datasheet recommendation) is enabling the user to directly connect the load, the power supply and the microcontroller without any additional effort in external component design and connection. VNHD7012AY is a full bridge motor driver intended for a wide range of automotive applications. The device incorporates a full protected dual high-side driver and the drivers and protections for the two external power MOSFETs in low-side configuration. The device is designed using STMicroelectronics well known and proven proprietary VIPower® technology that allows to efficiently integrate on the same die a true PowerMOSFET with an intelligent signal/ protection circuitry. The device is housed in a PowerSSO-36 exposed pad package to optimize the dissipation performances. The input signals INA and INB can directly interface the microcontroller to select the motor direction and the brake conditions. Two selection pins (SEL0 and SEL1) are available to address to the microcontroller the information available on the MultiSense. The MultiSense pin allows to monitor the motor current, provides a voltage proportional to the battery value and the information on the temperature of the chip. The integrated protections are: load current limitation, overload active power limitation (with latch-off), overtemperature shutdown (with latch-off) and cross current protection. The PWM, up to 20 KHz, allows to control the speed of the motor in all possible conditions.

Table 1. Device summary

Order code	Reference
EV-VNHD7012AY	EV-VNHD7012AY Evaluation Board

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1 Design recommendation

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

Figure 1. VNHD7012AY evaluation board schematic

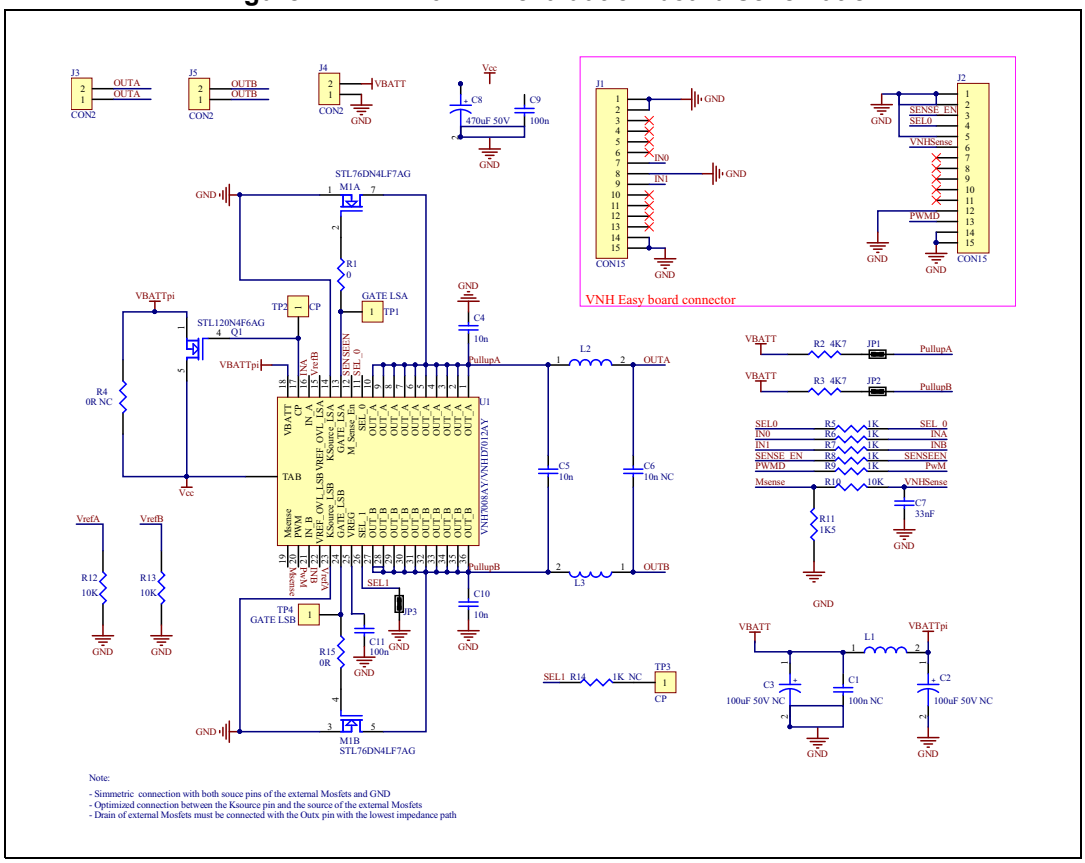


Figure 2. VNHD7012AY evaluation board top layout

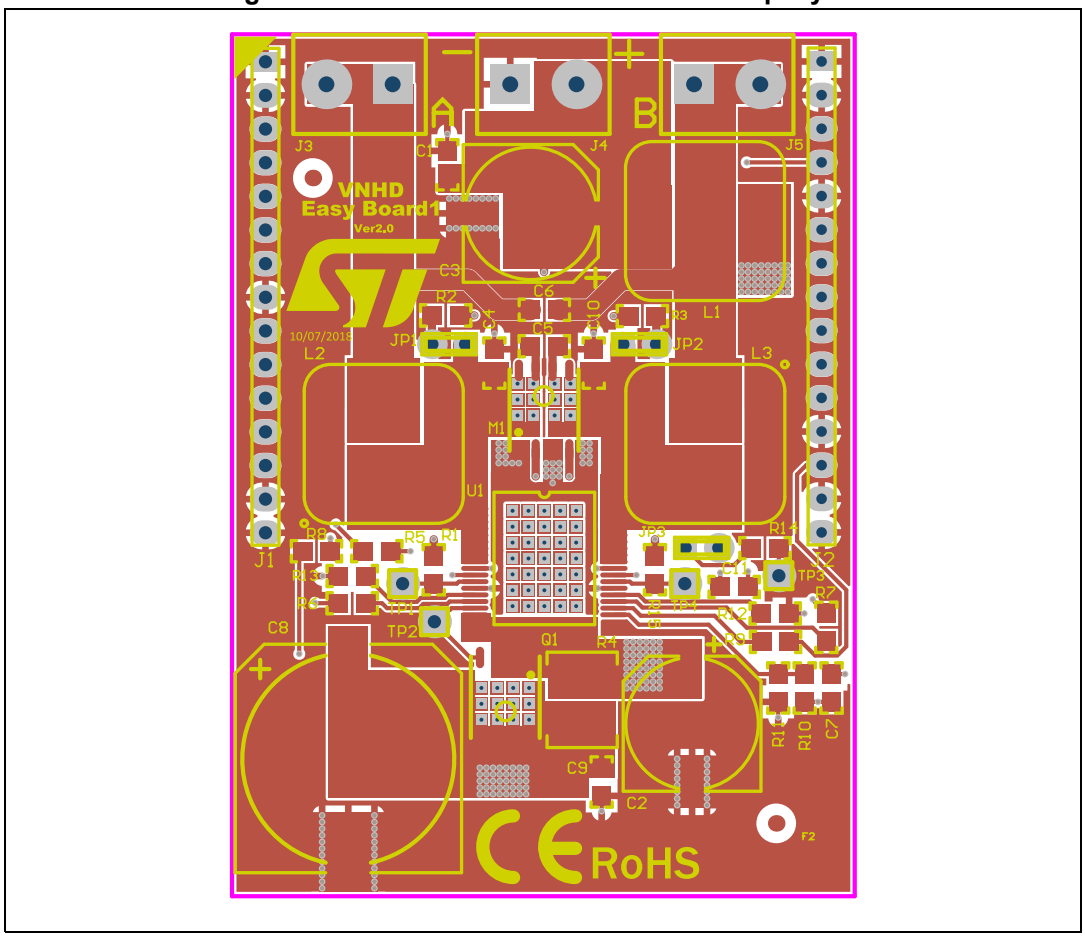
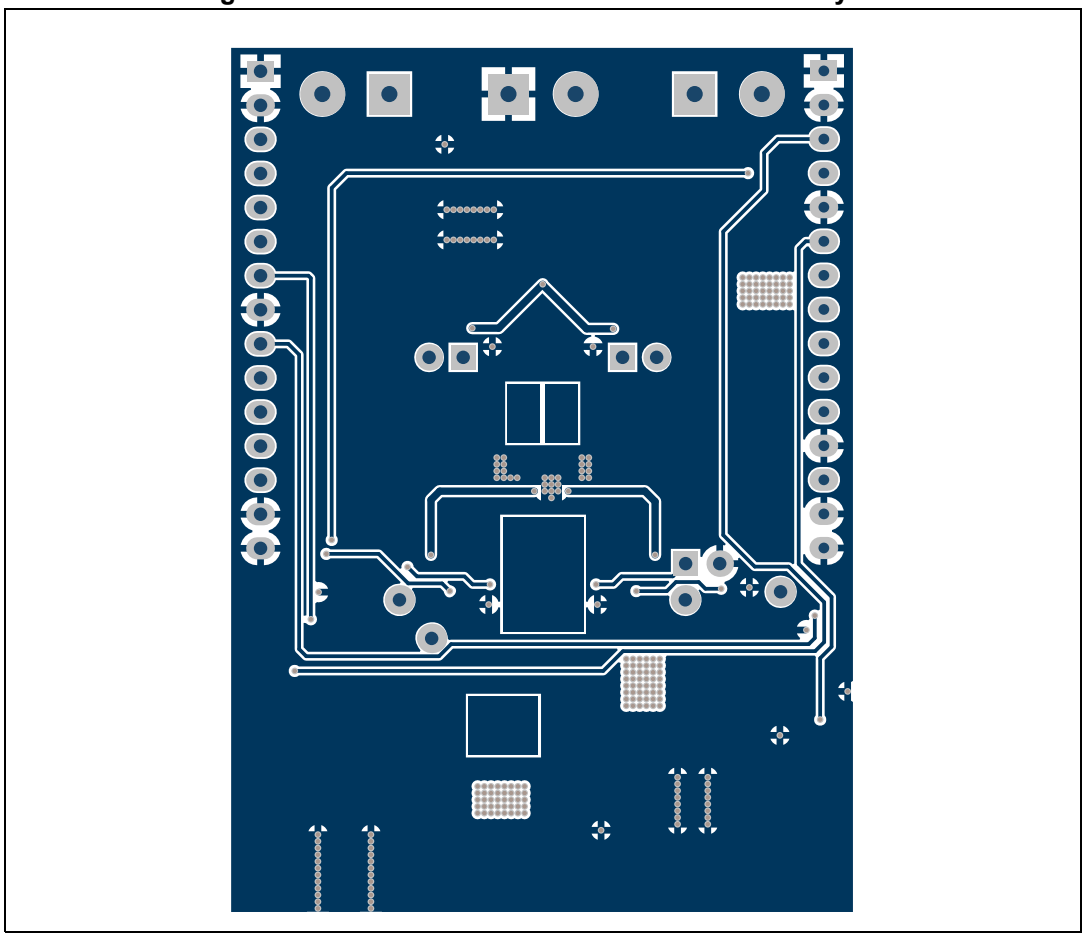


Figure 3. VNHD7012AY evaluation board bottom layout



2 Board connections

Table 2. Pin connection and function

Connector	Board lead number	Device pin function
J2	1, 2, 5, 12, 14, 15	GND
J2	3	SENSE_EN
J2	4	SEL0
J2	6	MULTI-SENSE
J2	13	PWM
J1	1, 2, 8, 14, 15	GND
J1	7	INA
J1	9	INB
J3	1, 2	OUTA
J4	2	VBAT
J4	1	GND
J5	1, 2	OUTB
TP1	1	GATE_LSA
TP2	1	CP
TP3	1	SEL1
TP4	1	GATE_LSB

Table 3. BOM

Component	Value
C1	100 nF nc
C2, C3	100 µF 50V nc
C4, C5, C10	10 nF
C6	10nF nc
C7	33nF
C8	470 µF 50V
C9, C11	100 nF
L1, L2, L3	INDUCTOR-SHORTED
M1	STL76DN4LF7AG
Q1	STL120N4F6AG
R1, R15	0R
R2, R3	4.7 KΩ
R4	OR nc
R5, R6, R7, R8, R9, R10	1 KΩ
R11	1.5 KΩ
R12, R13	10 KΩ
R14	1 KΩ nc

3 Thermal data

Table 4. EV-VNHD7012AY thermal data

Symbol	Parameter	Max	Unit
$R_{thj\text{-}amb}$	Thermal resistance junction-ambient HSD (MAX)	28	°C/W

Table 5. PCB specification

Symbol	Parameter	Max	Unit
Board dimensions	-	45x65	mm
Number of Cu layer	-	4	µm
Layer Cu thickness	-	35	mm
Board finish thickness	-	1.6 +/-10%	-
Board Material	-	FR4	-
Thermal vias separation	-	1.1 mm	mm
Thermal vias diameter	-	0.5 mm	mm

4 Revision history

Table 6. Document revision history

Date	Revision	Changes
22-May-2018	1	Initial release.
18-Oct-2018	2	Updated *Figure 2: VNHD7012AY evaluation board top layout* and *Figure 3: VNHD7012AY evaluation board bottom layout*. Minor text changes.
13-Nov-2019	3	Updated *Figure 1: VNHD7012AY evaluation board schematic* and *Table 2: Pin connection and function*