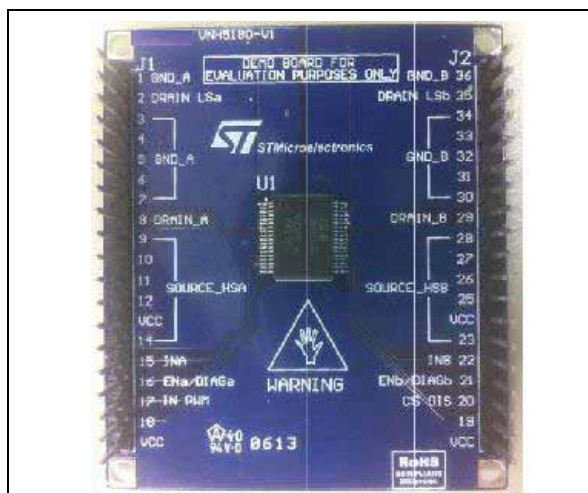


VNH5180A evaluation board

Data brief



Description

EV-VNH5180A provides you an easy way to connect ST's surface mounted VIPower[®] H-Bridge drivers into your existing prototype circuitry. This evaluation board comes preassembled with VNH5180A-E H-Bridge.

The VNH5180A-E is a system in package H-Bridge manufactured in the ST proprietary VIPower M0- 5 technology and housed in the PowerSSO-36 package. The VNH5180A-E is designed to drive 12 V automotive bidirectional load such as a PMDC motor. The VNH5180A-E provides protection, diagnostics and easy 3 V and 5 V CMOS-compatible interface with any microcontroller.

The device integrates advanced protection functions such as load current limitation, inrush and active overload management by power limitation, overtemperature shut-off with autorestart and overvoltage active clamp. A dedicated analog current sense pin is associated with every output channel in order to provide Enhanced diagnostic functions including fast detection of overload and short-circuit to ground through power limitation indication, overtemperature indication, short-circuit to V_{CC} protection and diagnosis as well as on-state and off-state open-load detection. The current sensing and diagnostic feedback of the whole device can be disabled by pulling the CS_DIS pin high to allow sharing of the external sense resistor with other similar devices.

Features

Parameter	Symbol	Value	Unit
Max supply voltage	V_{CC}	41	V
Operating voltage range	V_{CC}	5.5 to 18	V
Max on-state resistance (per leg)	R_{ON}	50	m Ω
High-side current limitation (typ)	I_{UMH}	42	A
Off-state supply current	I_S	3	μ A

- Simple single IC application board dedicated for VNH5180-E
- Provides thermal heat-sinking for ease of use in prototyping
- Provides electrical connectivity for easy prototyping

Table 1. Device summary

Order codes	Reference
EV-VNH5180	EV-VNH5180A evaluation board

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2 Thermal data

Table 2. VNH5180A thermal data

Symbol	Parameter	Max. value	Unit
$R_{thj-amb}$ HSD	Thermal resistance junction-ambient (MAX)	31	°C/W
$R_{thj-amb}$ LSD	Thermal resistance junction-ambient (MAX)	40	°C/W

Table 3. PCB specifications

Parameter	Value	Unit
Board dimensions	51 x 58	mm
Number of Cu layer	2	—
Layer Cu thickness	70	μm
Board finish thickness	1.6 +/- 10%	mm
Board Material	FR4	—
Thermal vias separation	1.2	mm
Thermal vias diameter	0.3 +/- 0.08	mm

3 Board connector reference

Figure 2. Board layout

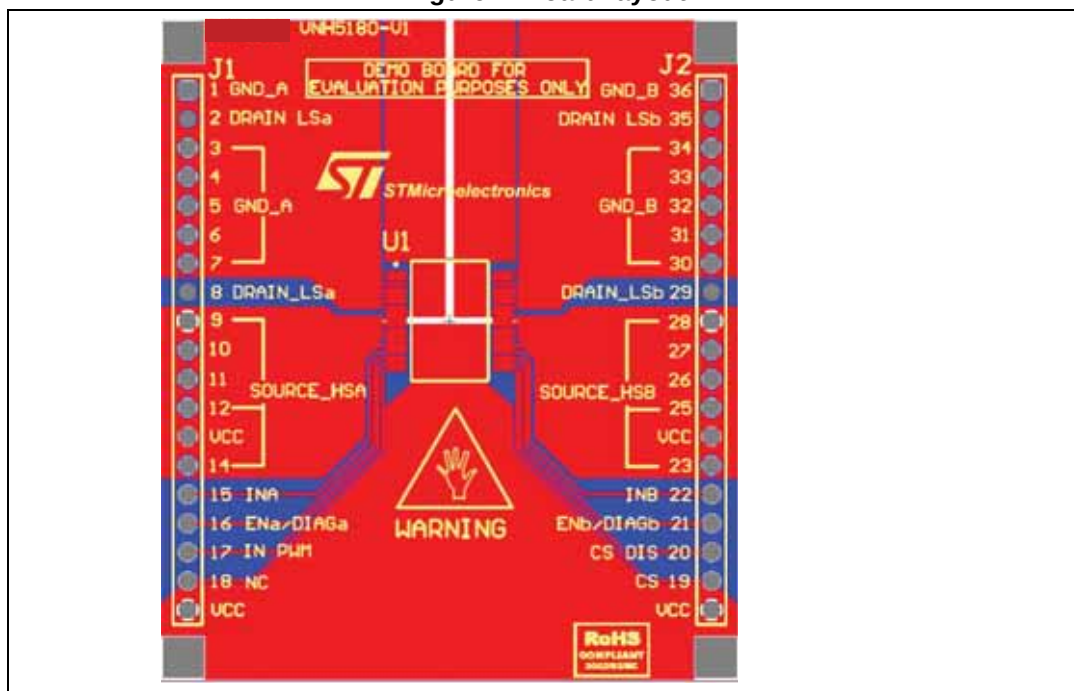


Table 4. Board connector specification

Connector	Board lead number	Device pin function ⁽¹⁾
J1	1	GND_A
J1	2	Drain_LSa
J1	3	GND_A
J1	4	GND_A
J1	5	GND_A
J1	6	GND_A
J1	7	GND_A
J1	8	Drain_LSa
J1	9	SOURCE_HSa
J1	10	SOURCE_HSa
J1	11	SOURCE_HSa
J1	12	SOURCE_HSa
J1	13	V _{CC}
J1	14	SOURCE_HSa
J1	15	INA
J1	16	ENa/DIAGa

Table 4. Board connector specification (continued)

Connector	Board lead number	Device pin function ⁽¹⁾
J1	17	IN_PWM
J1	18	NC
J1	V _{CC}	V _{CC}
J2	V _{CC}	V _{CC}
J2	19	CS
J2	20	CS_DIS
J2	21	ENb/DIAGb
J2	22	INB
J2	23	SOURCE_HSb
J2	24	V _{CC}
J2	25	SOURCE_HSb
J2	26	SOURCE_HSb
J2	27	SOURCE_HSb
J2	28	SOURCE_HSb
J2	29	Drain_LSb
J2	30	GND_B
J2	31	GND_B
J2	32	GND_B
J2	33	GND_B
J2	34	GND_B
J2	35	DRAIN_LSb
J2	36	GND_B

1. For further clarification on pin functions please refer to the related datasheet (see [Appendix A: Reference documents](#)).

4 Package information

4.1 ECOPACK[®] packages

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK[®] packages, depending on their level of environmental compliance. ECOPACK[®] specifications, grade definitions and product status are available at: www.st.com. ECOPACK[®] is an ST trademark.

Appendix A Reference documents

- VIPower M0-5 and M0-5Enhanced high-side drivers (UM1556, DocID 023520)
- Evaluation Product Licence Agreement on www.st.com

Revision history

Table 5. Document revision history

Date	Revision	Changes
29-Jul-2013	1	Initial release.
17-Sep-2013	2	Updated disclaimer.
11-Feb-2014	3	Updated Description .

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