

EMS (Embedded Module Series)

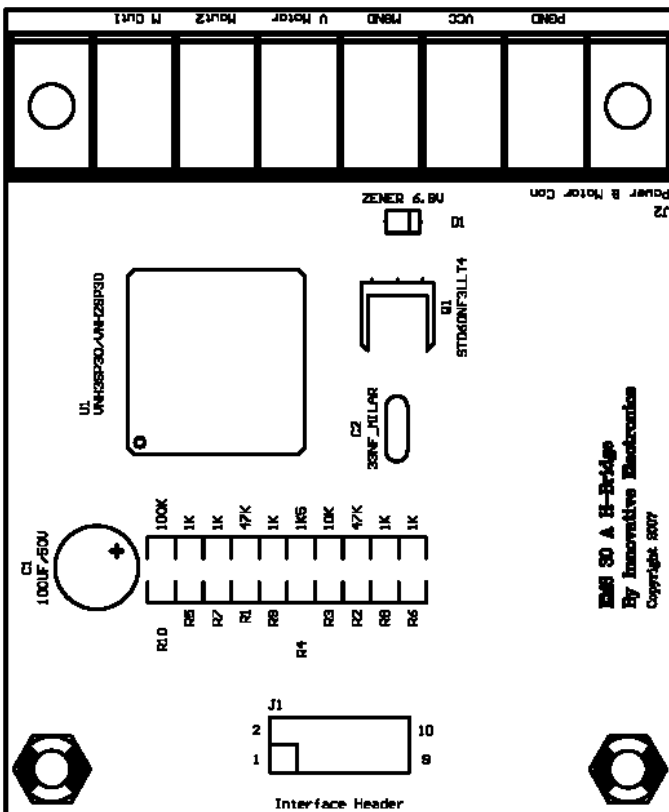
30 A H-Bridge rev. 1

Embedded Module Series (EMS) 30 A H-Bridge is a VN3SP30 based H-Bridge driver designed to generate 2 ways drive with continuous current up to 30 A at 5.5 Volts to 36 Volts voltage (up to 16 V for IC VN2SP30). This module is equipped with a current sensor that can be used as a feedback to the controller. This module can drive inductive loads such as relay, solenoid, DC motor, motor stepper, and other kinds of load.

Specifications

1. Consists of 1 full H-Bridge driver. A current sense circuitry for IC VN2SP30 is available.
2. Can pass 30 A continuous current.
3. Load voltage ranges from 5.5 V to 36 V (up to 16 V for IC VN2SP30).
4. Compatible with TTL and CMOS level input.
5. Power supply input for the driver (VCC) is separated from power supply input for the loads (V Mot).
6. Tri-state output.
7. PWM frequency up to 20 KHz.
8. Fault Detection.
9. Short circuit protection.
10. Overtemperature protection.
11. Undervoltage and Overvoltage Shutdown.
12. Reverse Battery Protection.

Layout



Pin Interface Header J1 Allocation			
Pin	Name	I/O	Function
1	MIN1	I	Input pin to determine the MOUT1 output
2	MIN2	I	Input pin to determine the MOUT2 output
3	MEN1	I/O	Enable pin for MOUT1 output Give High logic to activate half H-Bridge 1, give Low logic externally to deactivate half H-Bridge 1 If there is a faulty condition (thermal shutdown, undervoltage, overvoltage, etc.), then this pin will be pulled low internally by H-Bridge module to report the faulty condition
4	MEN2	I/O	Enable pin for MOUT2 output Give High logic to activate half H-Bridge 2, give Low logic externally to deactivate half H-Bridge 2 If there is a faulty condition (thermal shutdown, undervoltage, overvoltage, etc.), then this pin will be pulled low internally by H-Bridge module to report the faulty condition
5	MCS	O	Analog output voltage proportional to load current (output range 0-5 V) Available for IC VN2SP30
6	MPWM	I	Input pin to control H-Bridge by PWM
7, 9	VCC	-	Connected to power supply for input (5 Volt)
8, 10	PGND	-	Reference point for power supply input

The current (In Ampere) passing through H-Bridge can be calculated with the following equation:

$$I = \frac{\text{Output_voltages_on_MCS_pin}}{1500} \times 11370$$

Power & Motor Con J2 Connector Allocation	
Name	Function
PGND	Ground reference for power supply input
VCC	Connected to power supply input (5 Volt)
MGND	Ground reference for power supply for the load
V MOTOR (V MOT)	Connected to power supply for the load
MOUT2	Output of second half H-Bridge
MOUT1	Output of first half H-Bridge

Truth table from the H-Bridge module is as follows:

H-Bridge module work status	Input and Status					Output	
	MPWM	MIN1	MIN2	MEN1	MEN2	MOUT1	MOUT2
Forward	H	H	L	H	H	V MOT	MGND
Reverse	H	L	H	H	H	MGND	V MOT
Brake to GND	H	L	L	H	H	MGND	MGND
Brake to VCC	X	H	H	H	H	V MOT	V MOT
Free Running Stop	L	L	L	H	H	OPEN	OPEN
Free Running Stop	L	H	L	H	H	V MOT	OPEN
Free Running Stop	L	L	H	H	H	OPEN	V MOT
Fault on OUT1 and OUT2	X	X	X	L	L	OPEN	OPEN
Fault on OUT1	H	X	H	L	H	OPEN	V MOT
Fault on OUT1	H	X	L	L	H	OPEN	MGND
Fault on OUT2	H	H	X	H	L	V MOT	OPEN
Fault on OUT2	H	L	X	H	L	MGND	OPEN

Description:

H = High
X = don't care
L = Low
Z = High Impedance (Tri-state)

CD/DVD Content

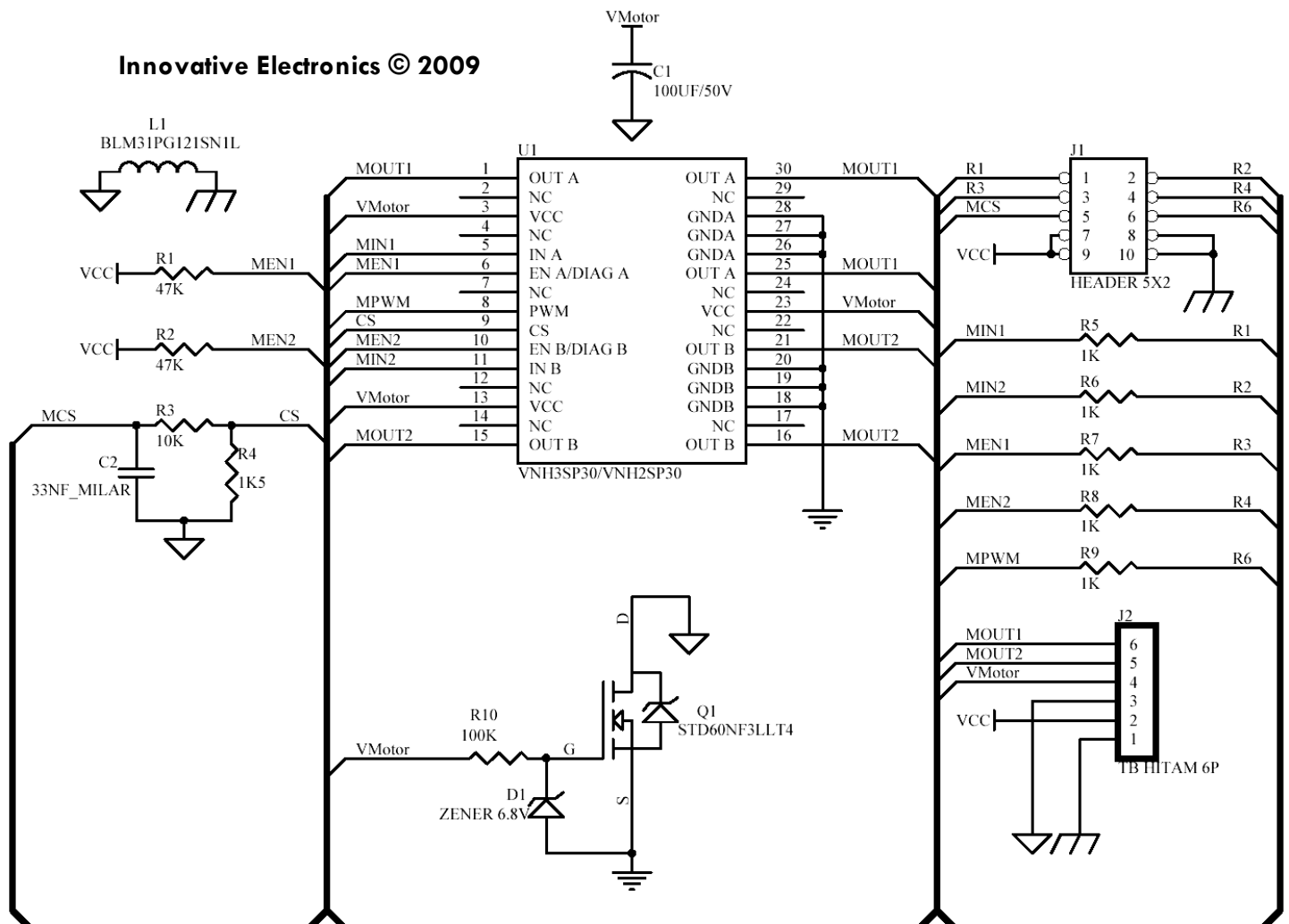
1. EMS 30 A H-Bridge Manual & Quick Start.
2. Datasheet.
3. Innovative Electronics Website.

Testing Procedure

- Connect the power supply source for input (VCC) and the power supply for load (V Mot).
- Perform testing by giving a High logic (+5V) or Low (0V) to the input (**MIN1**, **MIN2**, **MEN1**, **MEN2**, and **MPWM**) that matches the truth table.
- Output terminals (**MOUT1** and **MOUT2**) will produce output voltage that matches the functions stated in the truth table.

◆ Thank you for your confidence in using our products, if there are difficulties, questions, or suggestions regarding this product please contact our technical support :

support@innovativeelectronics.com



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