3 AMP Low Voltage H-Bridge Datasheet
S17-3A-LV-HBRIDGE

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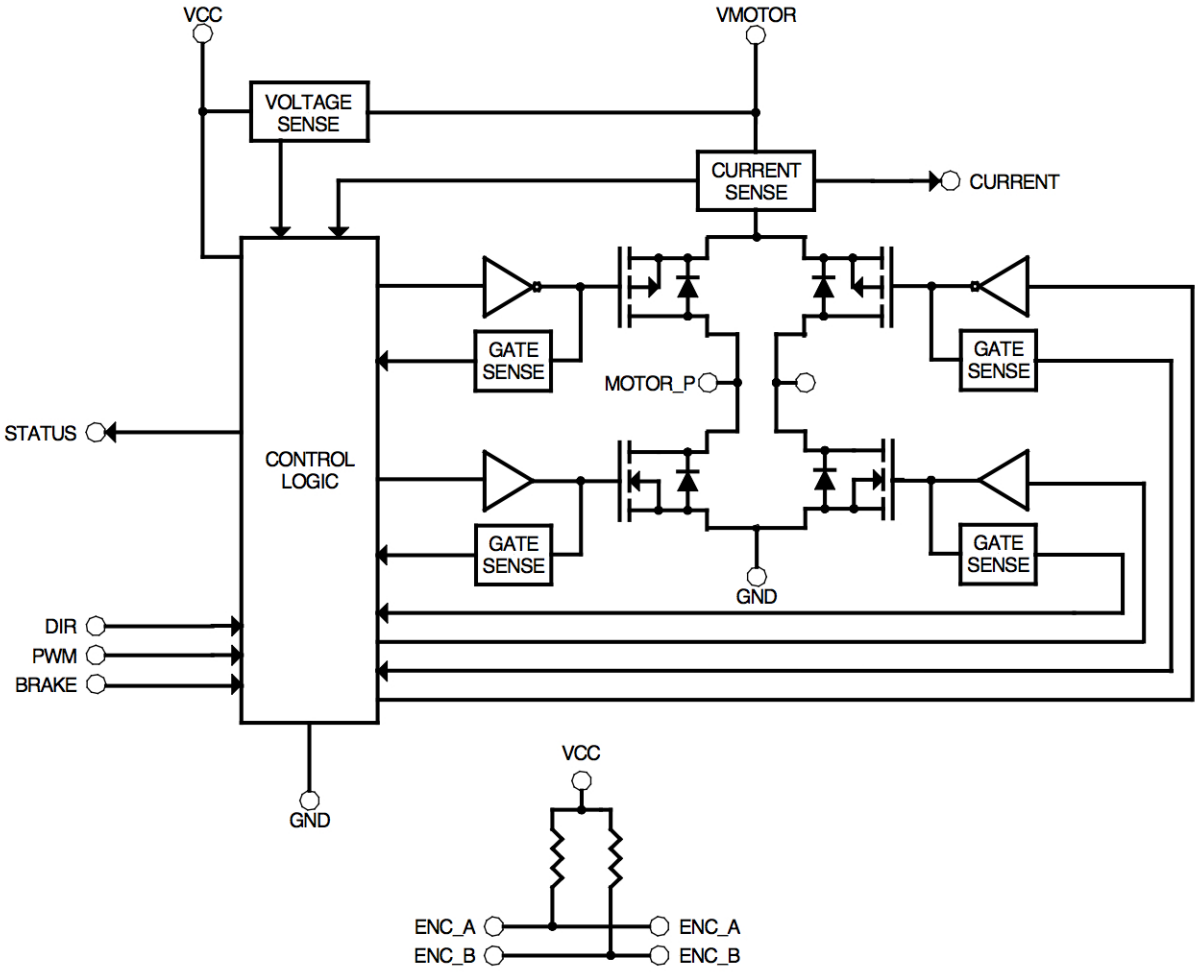
General Description

The Low Voltage H-Bridge motor driver is designed specifically for battery operation using 4 to 10 NiCad/NiMH cells, or 4 to 8 Alkaline cells, with a continuous current handling capability of 3.5A. An assembly option allows operation from 1 or 2 cells also with a continuous current handling capability of 3A. Conforming to the Acroname HBridge standard, the Low Voltage H-Bridge motor driver easily connects to all Acroname BrainStem modules, providing the ideal solution for complete low voltage motion control. Using the integrated motor/encoder connector, combined motor and encoder devices connect with ease.

Specifications	
Supply Voltage	3.6V to 12.0V*
Continuous Output Current	3.5A
Logic Supply Voltage	-0.5V to 5.5V
Power Dissipation	3W
MOSFET Temperature Range	-25°C to +100°C
Ambient Operating Temperature Range	0°C to +50°C
Inputs	TTL and CMOS compatible
PWM Output Frequency	2.4 - 50 kHz
*Alternate assembly allows 0V to 3.5V operation	

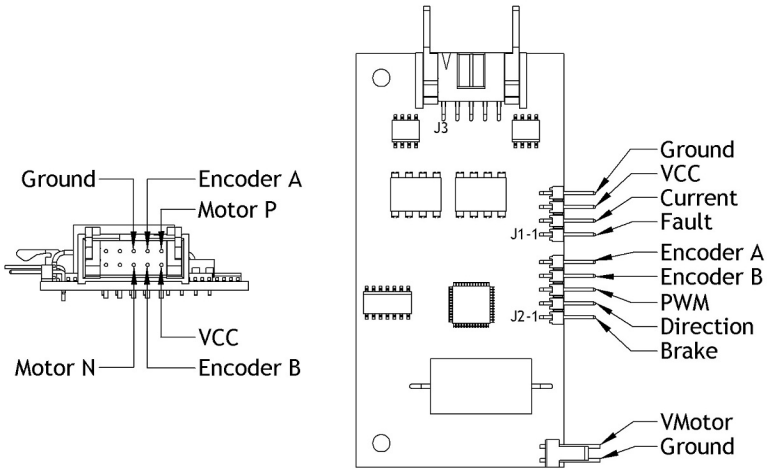


Functional Block Diagram

Recommended and Absolute Maximum Ratings*		
Value	Recommended	Absolute Maximum
Motor Voltage (4-8 or 10 cell option, VMOTOR)	3.6V to 12V	0V to 15V
Motor Voltage (1-2 cell option, VMOTOR)	0 to 3.5V	0 to 4.5V
Continuous Output Current (IMOTOR)		3.5A
Logic Voltage (Vcc)	0V to 3.5V	-0.5V to 5.5V
Logic Input Voltage (VIN)	0V to VCC	-0.5V to 5.5V
Logic Supply Current (ICC)		50mA
Logic Output Current (IOUT)		+-14mA
Combined MOSFET Power Dissipation		3W
MOSFET Junction Temperature		-25°C to +100°C
Storage Temperature		-30
Ambient Operating Temperature	0°C to +50°C	
*Operation beyond these limits may damage the device. Proper device operation is guaranteed when operating within the limits specified under Recommended table values. Proper device operation is not guaranteed when exceeding Absolute Maximum table values.		

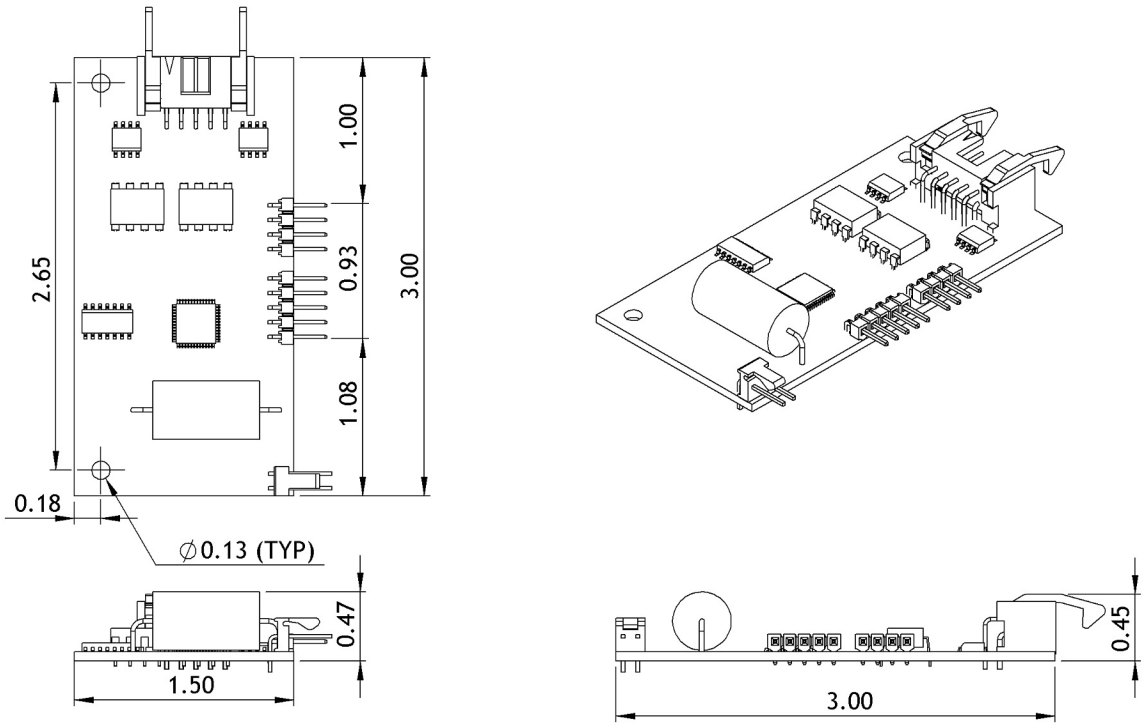
Moto 1.0 Interface Pin Connectors			
J1,1	FAULT	Digital Output	FAULT is active (logic high) when the driver is functioning properly. It will become inactive (logic low) due to an over current or under voltage condition. When FAULT is inactive (logic low), the driver will be placed in a floating (free spin) state.
J1,2	CURRENT	Analog Output	CURRENT is an analog voltage signal corresponding to the amount of current flowing through the driver. The units are 1 Volt/Amp.
J1,3	VCC	Logic Power Input	VCC is logic power input and is nominally 5V.
J1,4	GND	Logic Ground	GND is the logic ground reference
J2,1	BRAKE	Digital Input	The BRAKE input will cause one of three actions to occur depending on the state of DIR and PWM (see Table 1). When BRAKE is active (logic high), it will: turn on both low side MOSFETs shunting both motor terminals to GND; turn on both high side MOSFETs shunting both motor terminals to VMOTOR; or float the motor terminals.
J2,2	DIR	Digital Input	The DIR input controls the direction of the motor (See Table 1)
J2,3	PWM	Digital Input	The PWM input controls when a voltage is applied to the motor (see Table 1).
J2,4	ENC_B	Digital Output	ENC_B is a passthrough of the quadrature encoder channel B from the Motor Connector. There is a 4.75K pull-up resistor between this signal and VCC.
J2,5	ENC_A	Digital Output	ENC_A is a passthrough of the quadrature encoder channel A from the Motor Connector. There is a 4.75K pull-up resistor between this signal and VCC.

Motor Connector			
J3,1	MOTOR_P	Analog Output	MOTOR_P should connect to the motor terminal such that when a positive voltage is applied with respect to MOTOR_N, the motor spins forward.
J3,2	VCC	Logic Power Output	VCC is connected to logic power (passed from the Interface Connector) and is intended to be used by the encoder.
J3,3	ENC_A	Digital Input	ENC_A is channel A of the quadrature encoder. When the motor spins forward, channel A should lead channel B. There is a 4.75K pull-up resistor between this signal and VCC.
J3,4	ENC_B	Digital Input	ENC_B is channel B of the quadrature encoder. When the motor spins in reverse, channel B should lead channel A. There is a 4.75K pull-up resistor between this signal and VCC.
J3,5	GND	Logic Ground	GND is connected to logic ground (passed from the Interface Connector) and is intended to be used by the encoder.
J3,6	MOTOR_N	Analog Output	MOTOR_N should connect to the motor terminal such that when a positive voltage is applied with respect to MOTOR_P, the motor spins in reverse.



Pinout (conforms to Acroname H-Bridge standard)

Table 1: Control Logic						
BRAKE	DIR	PWM	FAULT(*)	MOTOR_P	MOTOR_N	Function
0	0	0	1	VMOTOR	VMOTOR	Brake High
0	0	1	1	GND	VMOTOR	Reverse
0	1	0	1	VMOTOR	VMOTOR	Brake High
0	1	1	1	VMOTOR	GND	Forward
1	0	0	1	FLOAT	FLOAT	Free Spin
1	0	1	1	GND	GND	Brake Low
1	1	0	1	FLOAT	FLOAT	Free Spin
1	1	1	1	VMOTOR	VMOTOR	Brake High
X	X	X	0	FLOAT	FLOAT	Free Spin
*When an error condition occurs the FAULT pin is brought low and the motor is placed in a free spin state irrespective of the the state of the BRAKE, DIR, and PWM pin states.						



Dimensions (in inches)