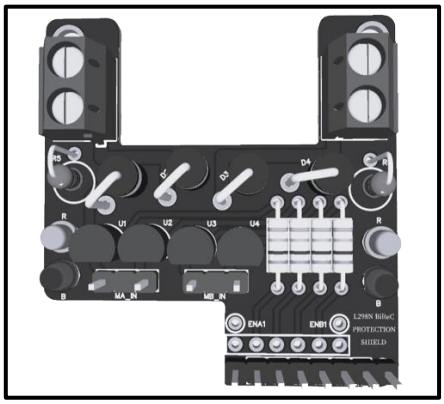
R2AD MODULE *(Bilateral Reverse Current Protection Circuit)*



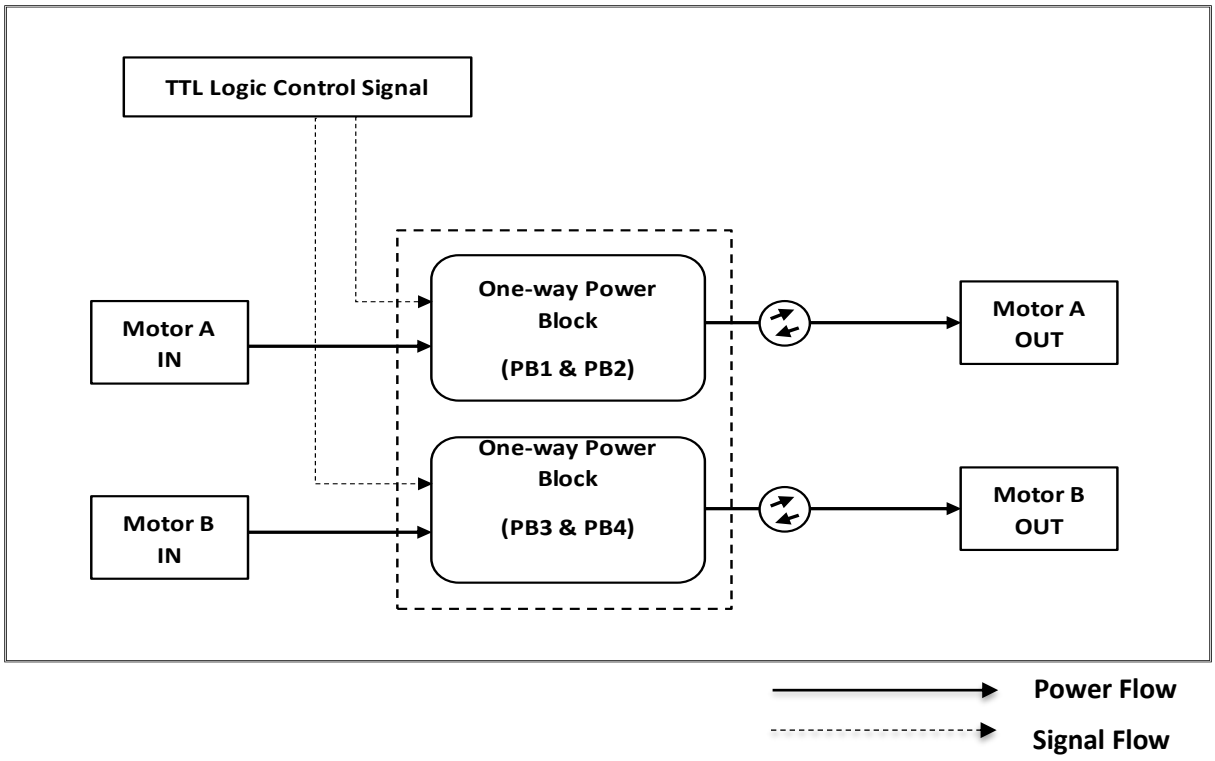
Features:

- Operating Voltage up to 24V
- Peak Current up to 4.5A
- Lower Saturation Voltage
- More Reliability & Repeatability
- In-built Energy Flow Indicators
- Multi-Port Outputs
- Compatible Shield for L298N Driver Module

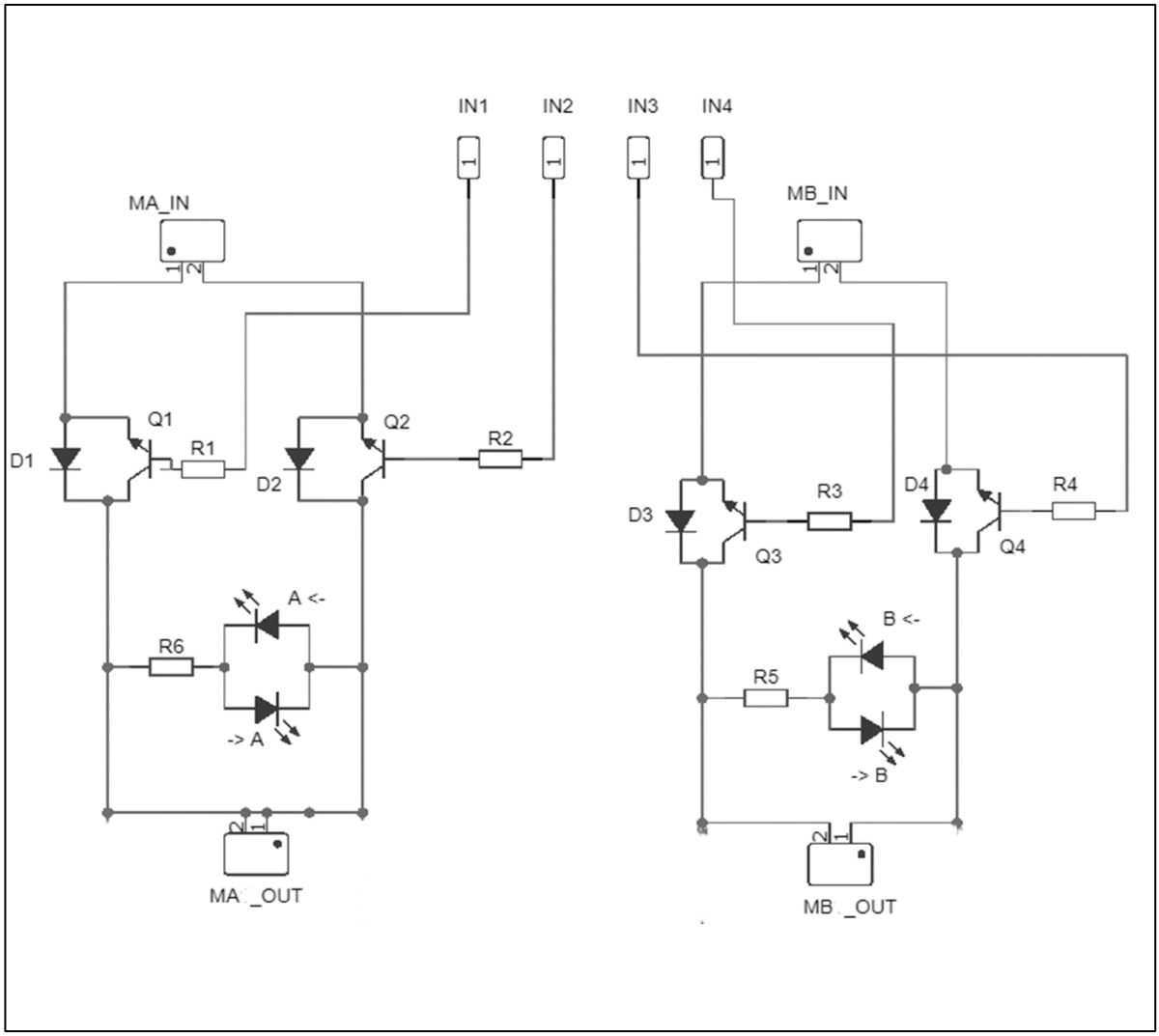
Description:

The R2AD reverse current protection circuit drives 2A loads with great efficiency, minimal ripple, and good line and back EMF protection. It drives DC, solenoids, and stepping motors using TTL logic levels. The one-way power block enables the input-to-load current to bipolarly transition with the master motor driver's input signals. NPN transistors and power diodes prevent load-induced reverse current in the one-way power block. Shaded on-board LEDs show two-wheeled driving systems' energy flow.

Functional Block Diagram:



Circuit Diagram:



Absolute maximum ratings

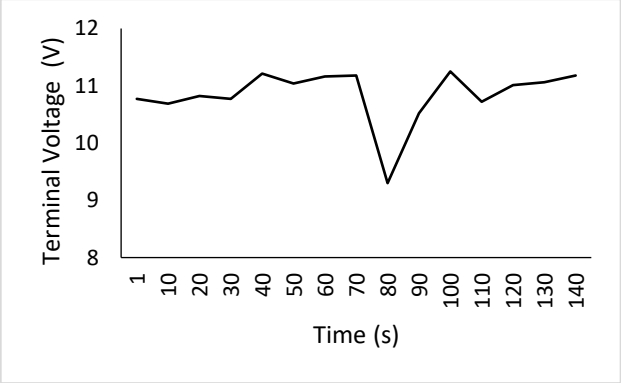
Symbol	Parameters	Values	Units
V_S	Power Supply	50	V
V_{SS}	Logic Supply Voltage	7	V
V_I, V_E	Input and Enable Voltage	-0.3 to 7	V
I_O	Peak Operating Current Non Repetitive (t=100s) Repetitive (80% on -20% off; t_{on} = 10ms) DC Operation	 3 2.5 2	 A A A
V_{sens}	Sensing Voltage	-1 to 2.3	V
P_{tot}	Total Power Dissipation (T_{case} = 75°C)	30	W
T_{op}	Junction Operating Temperature	-25 to 130	°C
T_{stg}, T_j	Storage and Junction Temperature	-40 to 150	°C

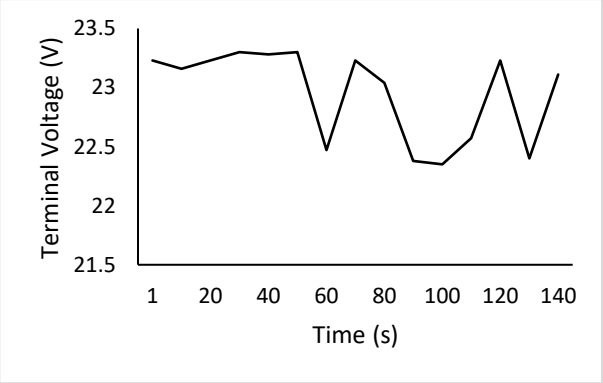
Electrical Characteristics:

Symbol	Parameters	Test Condition	Min.	Typ.	Max.	Units
Vin	Input Operating Voltage	Operating Condition	2.5		46	V
Vss	Logic Supply Voltage		4.5	5	7	V
Iq	Quiescent Supply Current			13 50	22 70	mA mA
I_L	Switch Current Limit			10		A
V_{CEsat}	Source Saturation Voltage	I_L = 1A I_L = 2A	0.95	1.35 2	1.7 2.7	V
V_D	Total Voltage drop	I_L = 1A I_L = 2A	0.1	0.3	0.5	V
V_{sens}	Sensing Voltage (IN 1 – 4)		-1 (1)		2	V
D_{MAX}	Max. Duty Cycle			100		%
η	Efficiency	V_{in} = 12V, I_{out} = 3A		97		%
η	Efficiency	V_{in} = 12V, I_{out} = 3A		99		%

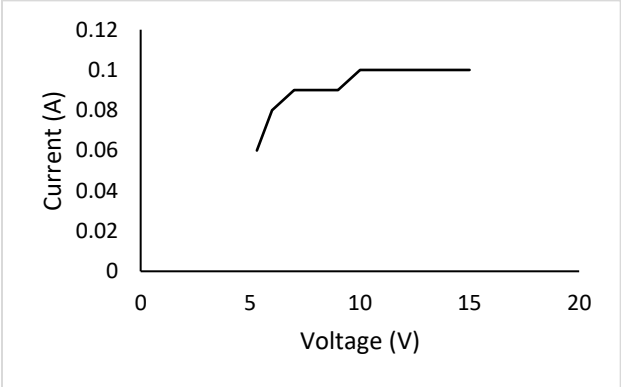
Performance Graphs:

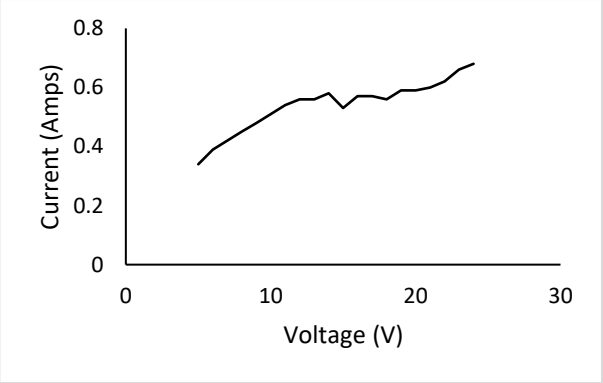
(i) Typical Saturation Voltage vs. Time ***[12V and 24V DC Load]***



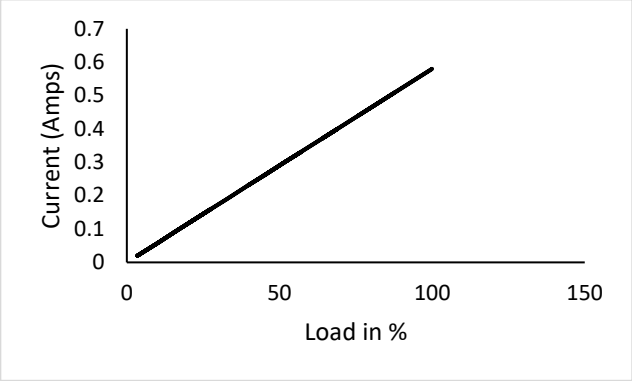


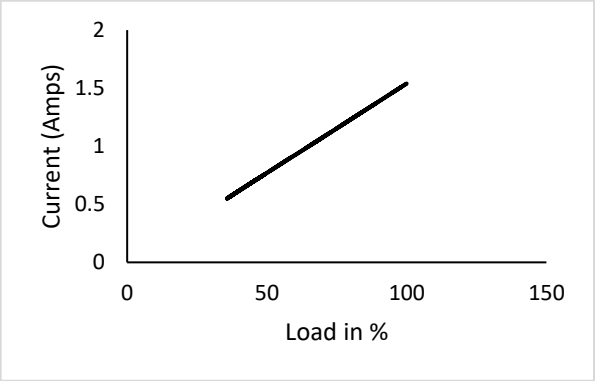
(ii) Terminal Voltage vs Output Current



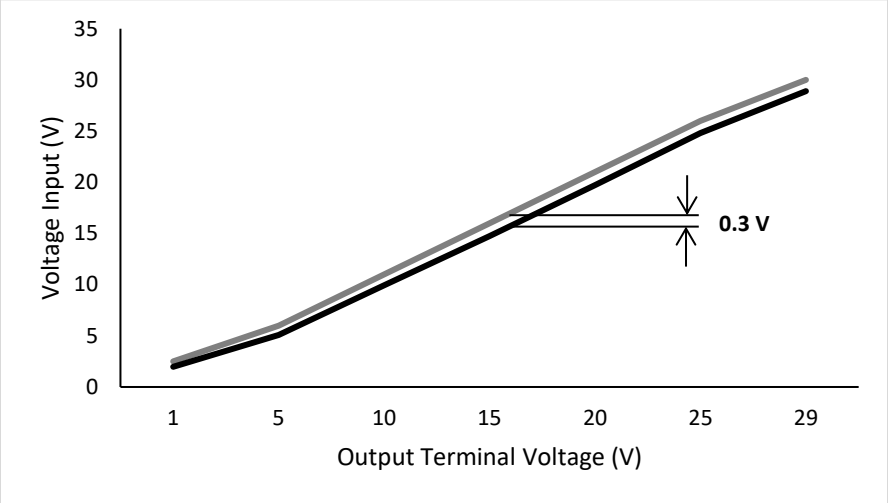


(iii) mechanical Load vs Load current ***[12V and 24V DC Load]***





(iv) Voltage drop Curve



Mechanical Data:

DIM	mm			inch		
	Min.	Typ.	Max.	Min.	Typ.	Max.
a	42.9	43.0	43.1	1.688	1.692	1.696
b	23.9	24.0	24.1	0.94	0.944	0.948
c	44.9	45.0	45.1	1.767	1.771	1.775
d	20.9	21.0	21.1	0.822	0.826	0.83
e	21.9	22.0	22.1	0.862	0.866	0.87
f	9.9	10.0	10.1	0.389	0.393	0.397
g	34.9	35.0	35.1	0.374	1.377	1.38

