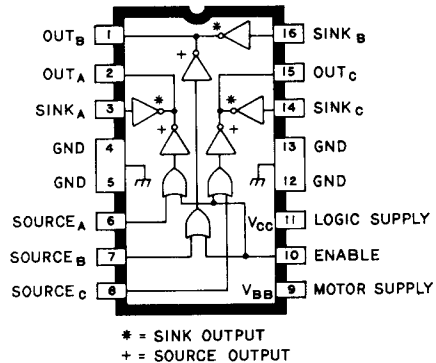


UDN-2933B AND UDN-2934B 3-CHANNEL HALF-BRIDGE MOTOR DRIVERS

FEATURES

- Output Currents to 1 A
- Output Voltages to 30 V
- Low Output-Saturation Voltage
- Transient-Protected Outputs
- Tri-State Outputs
- TTL or CMOS Compatible Inputs
- Reliable Monolithic Construction



Dwg. No. A-12,356

DEVELOPED for use in 3-phase brushless d-c motor applications, Types UDN-2933B and UDN-2934B provide drive capabilities to 1 A and 30 V. Saturated drivers provide for low output voltage drops at maximum rated current.

The 1 A half-bridge drivers differ only in input circuitry: Type UDN-2933B is compatible with TTL and 5 V CMOS; Type UDN-2934B is used with 12 V CMOS.

Monolithic construction and a 16-pin dual in-line package with centered heat-sink contact tabs enable

cost-effective and reliable systems designs supported by excellent power dissipation ratings, minimum size, and ease of installation. The package configuration allows easy attachment of an inexpensive heat sink. It fits a standard IC socket or printed wiring board layout.

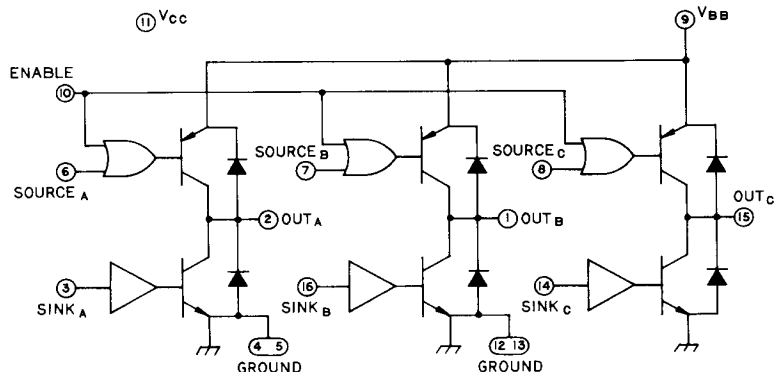
Half-bridge drivers with Darlington outputs (Type UDN-2935Z and UDN-2950Z) are supplied in TO-220 power-tab packages for operation with load currents of up to 3.5 A.

ABSOLUTE MAXIMUM RATINGS at +25°C Free-Air Temperature

Motor Supply Voltage, V_{BB}	30 V
Logic Supply Voltage Range, V_{CC}	
(UDN-2933B)	4.5 V to 7.0 V
(UDN-2934B)	10 V to 15 V
Logic Input Voltage, V_{IN}	V_{CC}
Output Current, I_{OUT}	± 1.0 A
Package Power Dissipation, P_D	See Graph
Operating Temperature Range, T_A	-20°C to +85°C
Storage Temperature Range, T_S	-55°C to +150°C

UDN-2933B AND UDN-2934B 3-CHANNEL HALF-BRIDGE MOTOR DRIVERS

FUNCTIONAL BLOCK DIAGRAM

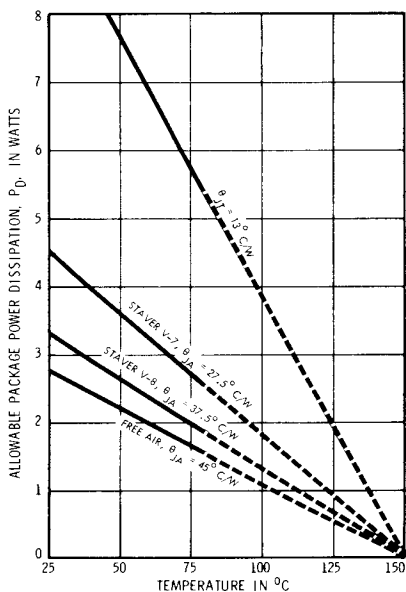


Dwg. No. A-12,357

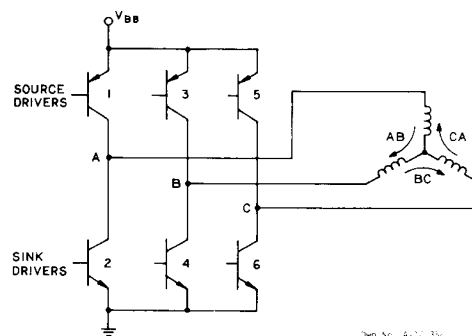
TRUTH TABLE

Sink Driver Input	Source Driver Input	Enable Input	Output
Low	Low	Low	High
Low	High	Low	Open
High	Low	Low	Disallowed
High	High	Low	Low
High	Any	High	Low
Low	Any	High	Open

ALLOWABLE POWER DISSIPATION AS A FUNCTION OF AMBIENT TEMPERATURE



Dwg. No. A-11,793A



Dwg. No. A-12,357

TYPICAL COMMUTATION SEQUENCE

Drivers ON*	Motor Current	Elec. Degrees
1 + 4	AB	0
1 + 6	- CA	60
3 + 6	BC	120
3 + 2	- AB	180
5 + 2	CA	240
5 + 4	- BC	300

*Enable input must be low; Source drivers are turned ON with a logic low, sink drivers are turned ON with a logic high.

ELECTRICAL CHARACTERISTICS at $T_A = +25^\circ\text{C}$, $V_{BB} = 30\text{ V}$, $V_{CC} = 5\text{ V}$ (UDN-2933B) or $V_{CC} = 12\text{ V}$ (UDN-2934B), $T_{TAB} \leq +70^\circ\text{C}$

Characteristic	Symbol	Applicable Devices	Test Conditions	Limits			
				Min.	Typ.	Max.	Units
Output Leakage Current	I_{CEX}	Both	All Drivers OFF, $V_{OUT} = 0\text{ V}$	—	— 5.0	— 100	μA
			All Drivers OFF, $V_{OUT} = 30\text{ V}$	—	5.0	100	μA
Output Saturation Voltage	$V_{CE(SAT)}$	Both	$I_{OUT} = -100\text{ mA}$	—	0.80	1.1	V
			$I_{OUT} = 100\text{ mA}$	—	0.08	0.2	V
			$I_{OUT} = -250\text{ mA}$	—	0.90	1.2	V
			$I_{OUT} = 250\text{ mA}$	—	0.13	0.3	V
			$I_{OUT} = -500\text{ mA}$	—	1.1	1.5	V
			$I_{OUT} = 500\text{ mA}$	—	0.25	0.6	V
			$I_{OUT} = -800\text{ mA}$	—	1.3	1.8	V
			$I_{OUT} = 800\text{ mA}$	—	0.45	0.8	V
Output Sustaining Voltage	$V_{CE(SUS)}$	Both	$I_{OUT} = \pm 800\text{ mA}$, $L = 3\text{ mH}$	30	—	—	V
Motor Supply Current	I_{BB}	Both	All Drivers OFF	—	50	200	μA
			1 Source + 1 Sink ON, No Loads	—	1.0	1.3	mA
Clamp Diode Forward Voltage	V_F	Both	$I_F = 500\text{ mA}$	—	1.3	2.0	V
			$I_F = 800\text{ mA}$	—	1.3	2.0	V
Logic Input Voltage	$V_{IN(1)}$	UDN-2933B		2.4	—	—	V
		UDN-2934B		8.0	—	—	V
	$V_{IN(0)}$	UDN-2933B		—	—	0.8	V
		UDN-2934B		—	—	4.0	V
Logic Input Current	$I_{IN(1)}$	UDN-2933B	$V_{IN} = 2.4\text{ V}$	—	<1.0	10	μA
		UDN-2934B	$V_{IN} = 8.0\text{ V}$	—	<1.0	10	μA
	$I_{IN(0)}$	Both	$V_{IN} = 0.8\text{ V}$	—	— 50	— 300	μA
Logic Supply Current	I_{CC}	Both	All Drivers OFF	—	1.7	3.0	mA
			1 Source + 1 Sink ON	—	30	40	mA
Output Rise Time	t_r	Both	$I_{OUT} = -500\text{ mA}$, $V_{BB} = 20\text{ V}$	—	250	—	ns
			$I_{OUT} = 500\text{ mA}$, $V_{BB} = 20\text{ V}$	—	30	—	ns
Output Fall Time	t_f	Both	$I_{OUT} = -500\text{ mA}$, $V_{BB} = 20\text{ V}$	—	500	—	ns
			$I_{OUT} = 500\text{ mA}$, $V_{BB} = 20\text{ V}$	—	50	—	ns

NOTES: 1. Each driver is tested separately.

2. Positive (negative) current is defined as going into (coming out of) the specified device pin.