

UDN-2841B AND UDN-2845B QUAD DARLINGTON 1.5 A DRIVERS

FEATURES

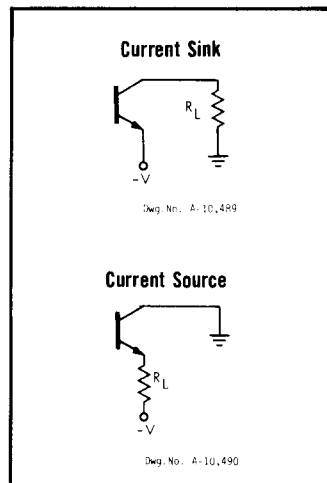
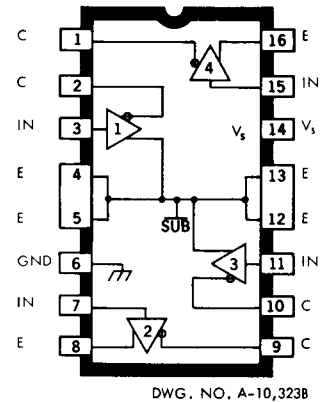
- Inputs Compatible with DTL, TTL, LSTTL, CMOS
- - 50 V Darlington Outputs
- Current-Sink or Sink-and-Source Combination
- 16-Pin Dual In-Line Plastic Package

THIS PAIR OF QUAD DARLINGTON switches is designed for high-current, high-voltage peripheral driver applications. They provide solutions to interface problems involving electronic discharge printers, d-c motor drive (bipolar or unipolar), telephone relays, PIN diodes, LEDs, and other high-current loads operating with negative voltage supplies.

Type UDN-2841B is for current-sink applications in which the load is connected to ground. The outputs switch the negative supply. The input PNP transistor in each driver serves as a level translator. The first NPN stage provides current gain to drive the Darlington-pair outputs.

Type UDN-2845B is a current-sink, current-source combination in a single dual in-line plastic package. It can be used in bipolar switching applications in which neither end of the load is at ground potential.

Types UDN-2841 and UDN-2845B are intended for use with 5 V TTL, Schottky TTL, DTL, and CMOS logic. Both drivers reduce component count, lower system costs, and reduce circuit and board complexity.

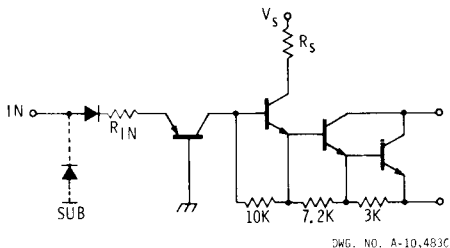


4

**ABSOLUTE MAXIMUM RATINGS
at +25°C Free-Air Temperature
For Single Darlington Output
(Unless Otherwise Noted)**

Output Voltage, $V_{CE(OFF)}$	50 V
Output Sustaining Voltage, $V_{CE(SUS)}$	35 V
Substrate Voltage, V_{SUB}	-50 V
Continuous Output Current, I_{OUT}	1.75 A
Supply Voltage, V_S	10 V
Input Voltage, V_{IN}	10 V
Power Dissipation, P_D (one output)	See Graph
Operating Temperature Range, T_A	-20°C to +85°C
Storage Temperature Range, T_S	-55°C to +150°C

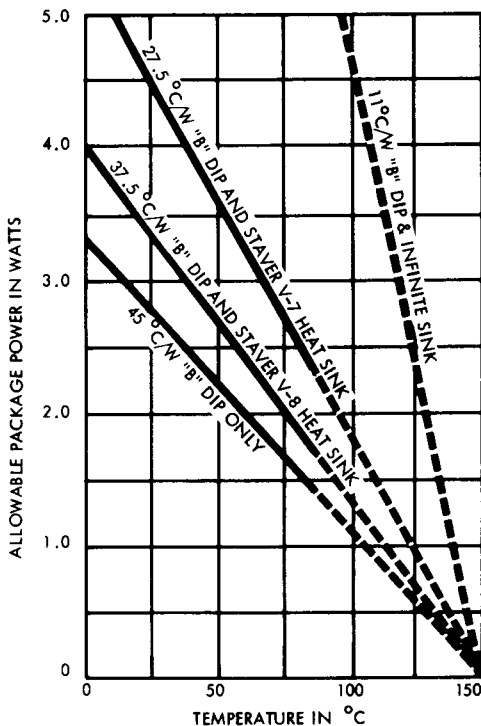
**SCHEMATIC
(Each Driver)**



Type Number	Resistor Values in k Ω			
	Amplifier 1 & 3		Amplifier 2 & 4	
	R_{IN}	R_S	R_{IN}	R_S
UDN-2841B	3.3	15	3.3	15
UDN-2845B	3.3	15	3.3	1

NOTE: The substrate terminals must be tied to the most negative point in the external circuit to maintain isolation between transistors and to provide for normal device operation.

**ALLOWABLE POWER DISSIPATION
AS A FUNCTION OF TEMPERATURE**



DWG. NO. A-10,488C

ELECTRICAL CHARACTERISTICS at $T_A = +25^\circ\text{C}$ (unless otherwise noted)

Characteristic	Symbol	Test Conditions	Limits			
			Min.	Typ.	Max.	Units
Output Leakage Current	I_{CEX}	$V_{EE} = -50\text{V}, V_{IN} = 0.4\text{V}, T_A = 25^\circ\text{C}$	—	—	100	μA
		$V_{EE} = -50\text{V}, V_{IN} = 0.4\text{V}, T_A = 70^\circ\text{C}$	—	—	500	μA
Output Sustaining Voltage	$V_{CE(SUS)}$	$V_{EE} = -50\text{V}, V_{IN} = 0.4\text{V}, I_{OUT} = 100\text{mA}$	35	50	—	V
Output Saturation Voltage	$V_{CE(SAT)}$	$I_{OUT} = 500\text{mA}$	—	—	1.1	V
		$I_{OUT} = 1.0\text{A}$ (Note 1)	—	—	1.4	V
		$I_{OUT} = 1.5\text{A}$ (Note 1)	—	—	1.6	V
Input Current	$I_{IN(ON)}$	$I_{OUT} = 500\text{mA}, V_{IN} = 2.4\text{V}$	—	300	500	μA
Input Voltage (Note 1)	$V_{IN(ON)}$	$I_{OUT} = 1.5\text{A}$	—	—	2.4	V
Supply Current (Note 1)	I_S	$I_{OUT} = 500\text{mA}, \text{UDN-2841B, UDN-2845B}$ (Note 2)	—	2.5	3.75	mA
		$I_{OUT} = 500\text{mA}, \text{UDN-2845B}$ (Note 3)	—	3.3	7.5	mA
Turn-On Delay	$t_{D(ON)}$	$R_L = 39\Omega, 0.5V_{IN}$ to $0.5V_{OUT}$	—	—	2.0	μs
Turn-Off Delay	$t_{D(OFF)}$	$R_L = 39\Omega, 0.5V_{IN}$ to $0.5V_{OUT}$	—	—	5.0	μs

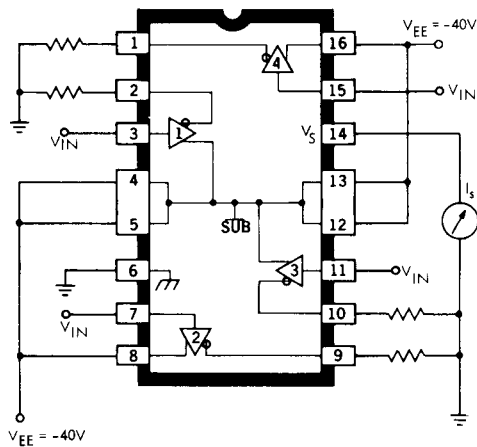
NOTES:

- Each driver tested separately.
- Drivers 1 & 3 (sink drivers) only, $V_S = 0\text{V}, V_{EE} = -40\text{V}$.
- Drivers 2 & 4 (source drivers) only, $V_S = 5\text{V}, V_{EE} = -40\text{V}$.

4

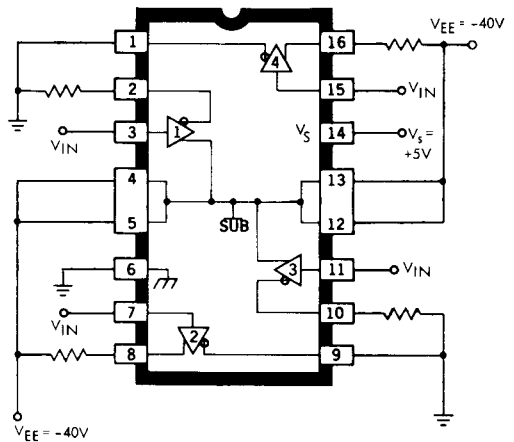
TEST CIRCUITS

UDN-2841B



DWG. NO. A-10,487A

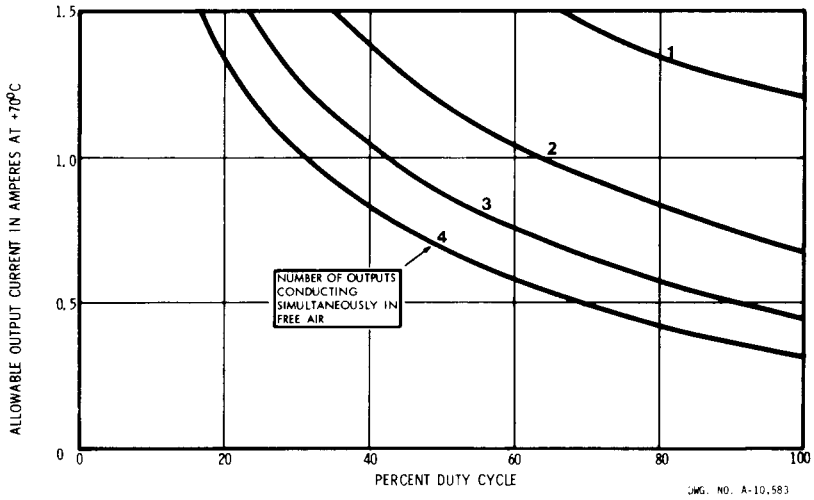
UDN-2845B



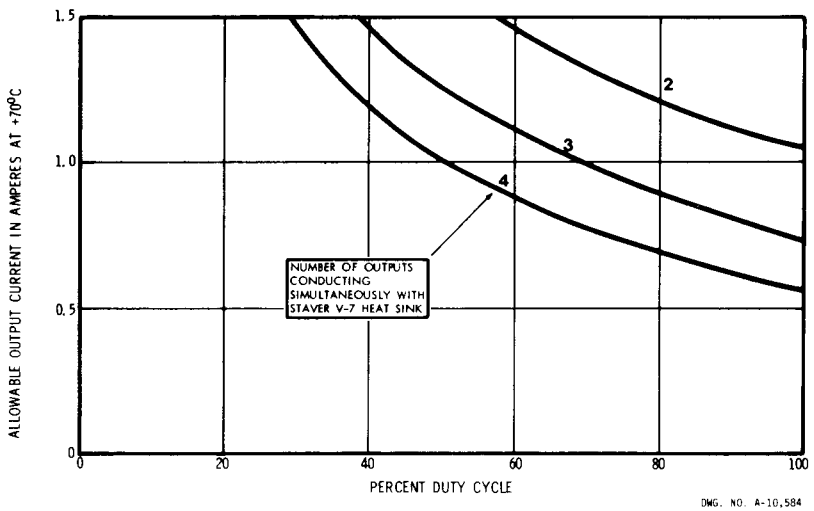
DWG. NO. A-10,484A

ALLOWABLE OUTPUT CURRENT
AS A FUNCTION OF DUTY CYCLE

WITHOUT HEAT SINK

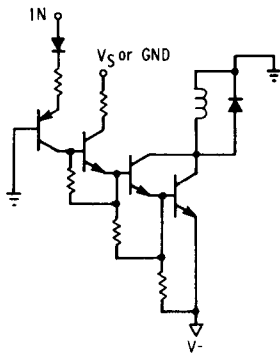


WITH STAVER V-7 HEAT SINK



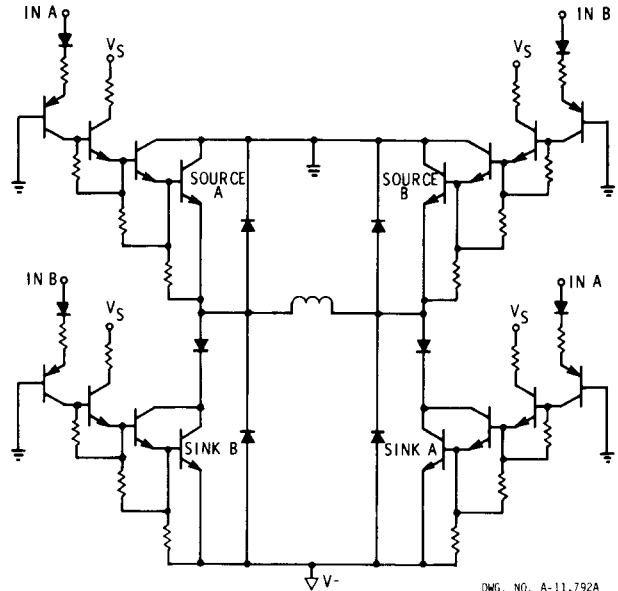
OUTPUT-STAGE TRANSIENT PROTECTION

When switching inductive loads, the output transistors of UDN-2841B and UDN-2845B drivers should be protected by a suitable clamping technique. The simplest approach is to clamp each output with a discrete diode, as shown in Figures 1 and 2.



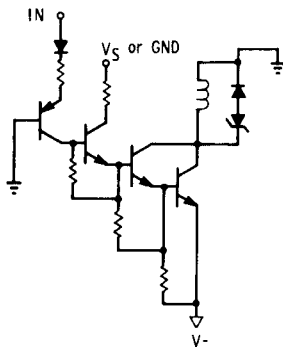
DWG. NO. A-11,790A

Figure 1
UDN-2841B



DWG. NO. A-11,792A

Figure 2
UDN-2845B



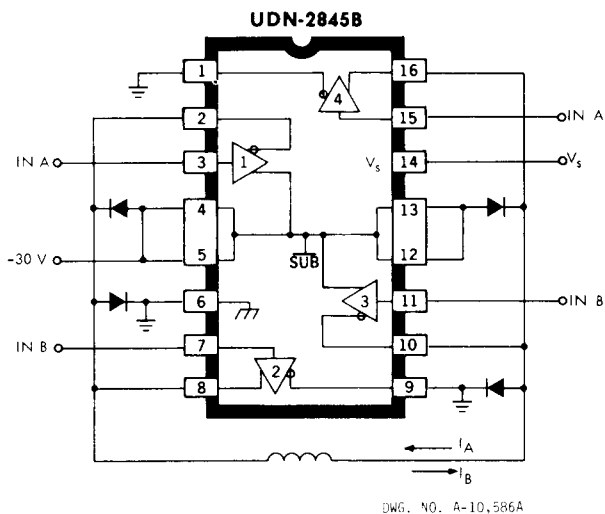
DWG. NO. A-11,787A

Figure 3
UDN-2841B

For improved turnoff, a combination diode/Zener diode scheme can be used. The Zener diode in the clamp circuit of Figure 3 allows the flyback voltage to rise above the supply voltage, speeding turnoff of the load. An appropriate resistor can be substituted for the Zener diode. With a 1 A load, substitution of a 15Ω resistor results in operation similar to that of the Zener diode circuit.

TYPICAL APPLICATIONS

BIPOLAR MOTOR DRIVER



ELECTROSENSITIVE PRINTER INTERFACE

