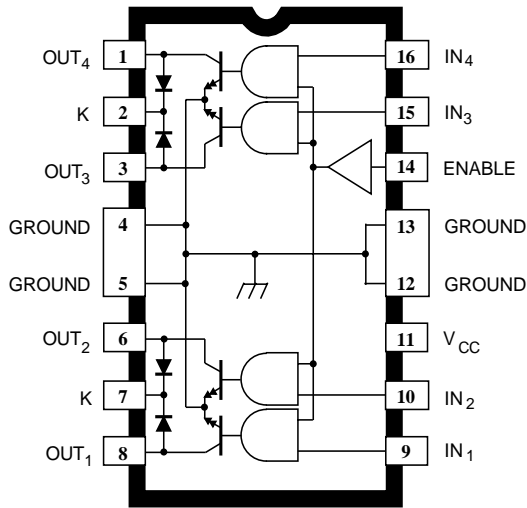


# 2540

Data Sheet  
29317C\*

## QUAD DARLINGTON POWER DRIVER

UDN2540B



Dwg. PP-017-2

### ABSOLUTE MAXIMUM RATINGS at $T_A = 25^\circ\text{C}$

Output Voltage, $V_{OUT}$ .....	50 V
Output Current, $I_{OUT}$ (peak) .....	2.5 A
(continuous) .....	1.8 A
Logic Supply Voltage, $V_{CC}$ .....	7.0 V
Input Voltage, $V_{IN}$ .....	7.0 V
Package Power Dissipation, $P_D$ .....	See Graph
Operating Temperature Range, $T_A$ .....	$-20^\circ\text{C}$ to $+85^\circ\text{C}$
Storage Temperature Range, $T_S$ .....	$-55^\circ\text{C}$ to $+150^\circ\text{C}$

Combining AND logic gates and inverting high-current bipolar outputs, the UDN2540B and A2540SLB quad Darlington power drivers provide interface between low-level signal-processing circuits and power loads totaling 360 W. Each of the four independent outputs can sink up to 1.8 A in the on state with peak inrush currents to 2.5 A. The four power outputs are each comprised of an open-collector Darlington driver and an internal flyback/clamp diode for switching inductive loads. They feature a minimum breakdown and sustaining voltage of 50 V. The logic inputs are compatible with TTL and 5 V CMOS logic systems.

Typical applications include print heads, relays, solenoids, and dc stepping motors. These drivers can also be used to drive high-current incandescent lamps, LEDs, and heaters.

The UDN2540B is supplied in a 16-pin batwing power DIP; the A2540SLB is supplied in a 20-lead batwing power SOIC for surface-mount applications. The batwing construction provides for maximum package power dissipation in a standard construction. At  $25^\circ\text{C}$ , and with only 1 sq. in. of copper foil at the ground tabs, either package is capable of safely dissipating more than 2 W.

### FEATURES

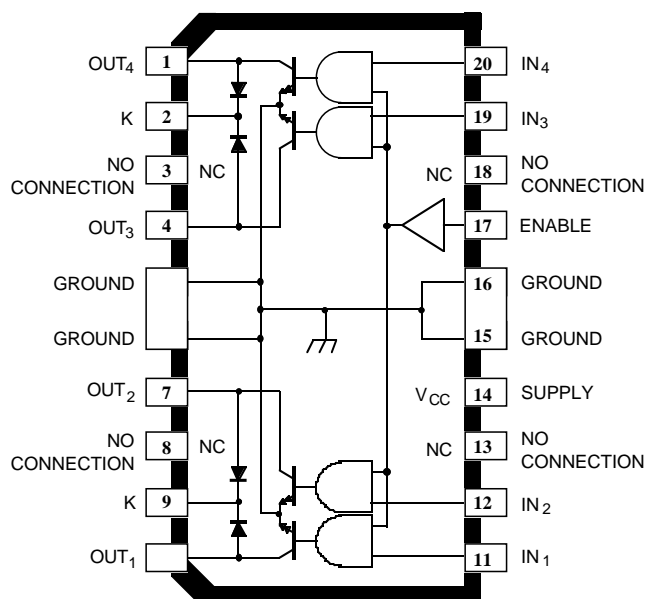
- 1.8 A Continuous Output Current
- Output Voltage to 50 V
- TTL and 5 V CMOS Compatible Inputs
- Efficient Input/Output Pinning
- Integral Transient-Suppression Diodes
- Replaces L6221A and L6221CD

Always order by complete part number:

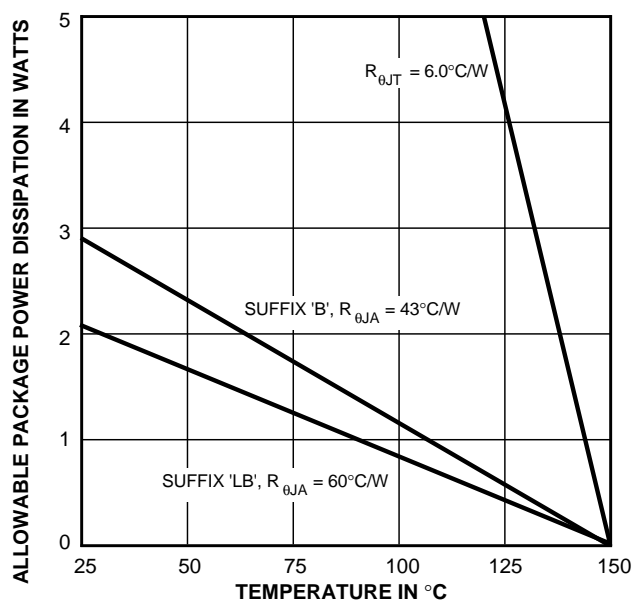
Part Number	Package
UDN2540B	16-pin batwing DIP
A2540SLB	20-lead batwing SOIC

# 2540 QUAD DARLINGTON POWER DRIVER

**A2540SLB**



Dwg. PP-017-3



Dwg. GP-049-3

## TRUTH TABLE

ENABLE	IN <sub>N</sub>	OUT <sub>N</sub>
H	H	ON
—	L	OFF
L	X	OFF

X = Don't care.

# 2540 QUAD DARLINGTON POWER DRIVER

## ELECTRICAL CHARACTERISTICS at $T_A = 25^\circ\text{C}$ , $T_J \leq 150^\circ\text{C}$ , $V_{CC} = 4.75\text{ V to } 5.25\text{ V}$ .

Characteristic	Symbol	Test Conditions	Limits			
			Min.	Typ.	Max.	Units
Output Leakage Current	$I_{CEX}$	$V_{OUT} = 50\text{ V}$ , $V_{IN} = 0.8\text{ V}$ , $V_{EN} = 2.4\text{ V}$	—	<1.0	100	$\mu\text{A}$
		$V_{OUT} = 50\text{ V}$ , $V_{IN} = 2.4\text{ V}$ , $V_{EN} = 0.8\text{ V}$	—	<1.0	100	$\mu\text{A}$
Output Sustaining Voltage	$V_{CE(sus)}$	$I_{OUT} = 1.8\text{ A}$ , $L = 3.0\text{ mH}$	50	—	—	V
Output Saturation Voltage	$V_{CE(SAT)}$	$I_{OUT} = 600\text{ mA}$ , $V_{IN} = V_{EN} = 2.4\text{ V}$	—	0.9	1.0	V
		$I_{OUT} = 1.0\text{ A}$ , $V_{IN} = V_{EN} = 2.4\text{ V}$	—	1.0	1.2	V
		$I_{OUT} = 1.8\text{ A}$ , $V_{IN} = V_{EN} = 2.4\text{ V}$	—	1.3	1.6	V
Input Voltage	Logic 1	$V_{IN(1)}$ or $V_{EN(1)}$	2.4	—	—	V
	Logic 0	$V_{IN(0)}$ or $V_{EN(0)}$	—	—	0.8	V
Input Current	Logic 1	$V_{IN(1)}$ or $V_{EN(1)} = 2.4\text{ V}$	—	—	10	$\mu\text{A}$
	Logic 0	$V_{IN(0)}$ or $V_{EN(0)} = 0.8\text{ V}$	—	—	-100	$\mu\text{A}$
Total Supply Current	$I_{CC}$	$V_{IN}^* = V_{EN} = 2.4\text{ V}$ , $V_{CC} = 5.0\text{ V}$ , Outputs Open	—	14	20	mA
		$V_{IN}^* = V_{EN} = 0.8\text{ V}$ , $V_{CC} = 5.0\text{ V}$	—	0.4	2.0	mA
Clamp Diode Forward Voltage	$V_F$	$I_F = 1.0\text{ A}$	—	1.3	1.6	V
		$I_F = 1.8\text{ A}$	—	1.6	2.0	V
Clamp Diode Leakage Current	$I_R$	$V_R = 50\text{ V}$	—	<1.0	100	$\mu\text{A}$

Typical Data is for design information only.

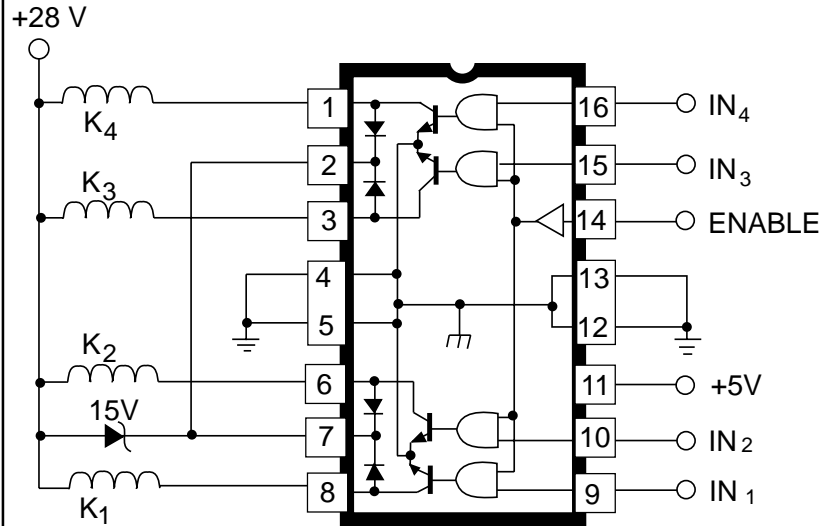
Negative current is defined as coming out of (sourcing) the specified terminal.

As used here, -100 is defined as greater than +10 (absolute magnitude convention) and the minimum is implicitly zero.

\*All inputs simultaneously, all other tests are performed with each input tested separately.

# 2540 QUAD DARLINGTON POWER DRIVER

## TYPICAL APPLICATION (QUAD RELAY DRIVER WITH ZENER FLYBACK)



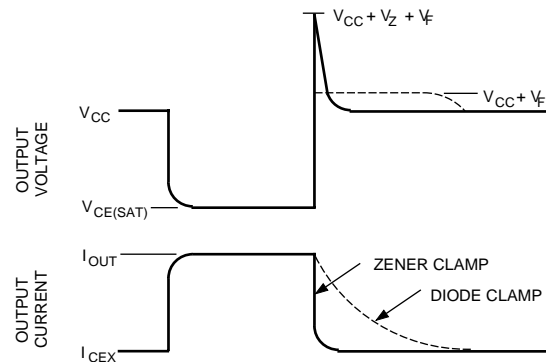
Dwg. EP-016

## APPLICATIONS INFORMATION

A typical application is shown for driving four high-current relays, solenoids, or print heads. A Zener diode is used to increase the flyback voltage, providing a much faster inductive load turn-off current decay, resulting in faster dropout (reduced relay contact arcing), and improved performance. The maximum Zener voltage, plus the load supply voltage, plus the flyback diode forward voltage must not exceed the device's rated sustaining voltage.

With external control circuitry, the ENABLE input can be used for chopper (PWM) applications. If the ENABLE input is not used, it should be tied high.

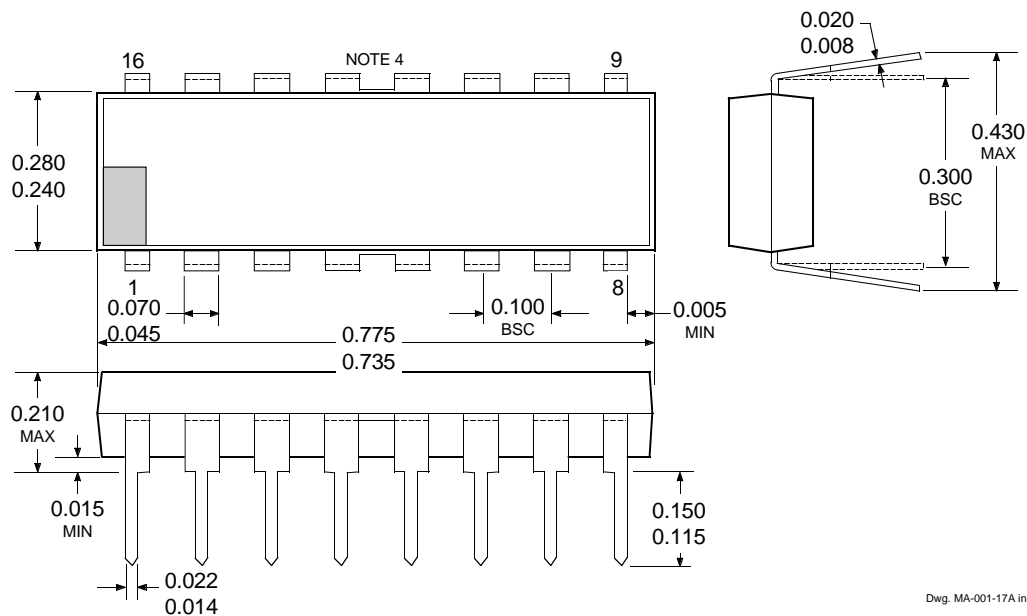
All inputs will float high if open circuited.



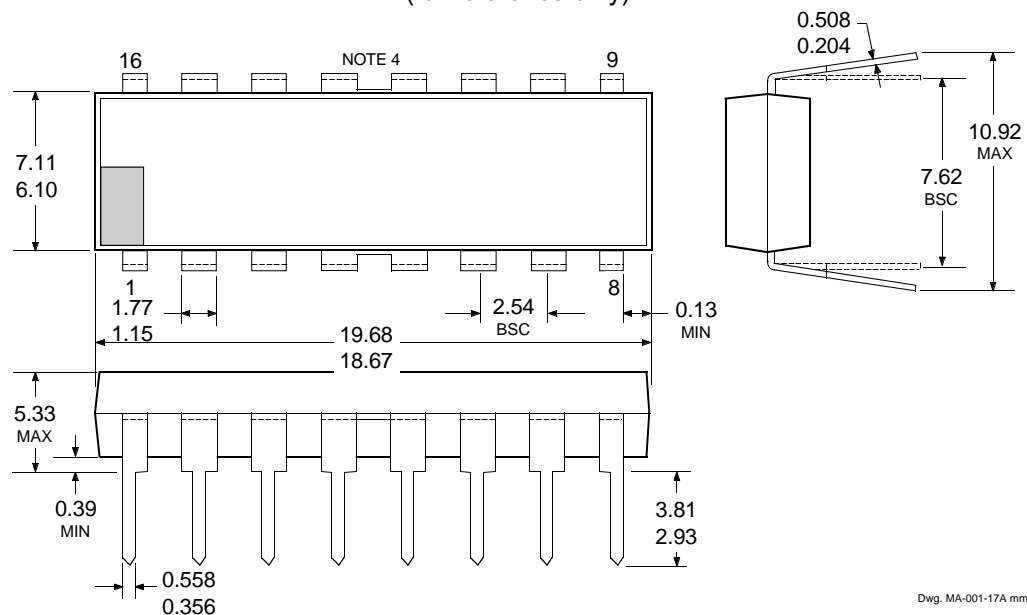
Dwg. WP-001

# 2540 QUAD DARLINGTON POWER DRIVER

## UDN2540B Dimensions in Inches (controlling dimensions)



## Dimensions in Millimeters (for reference only)

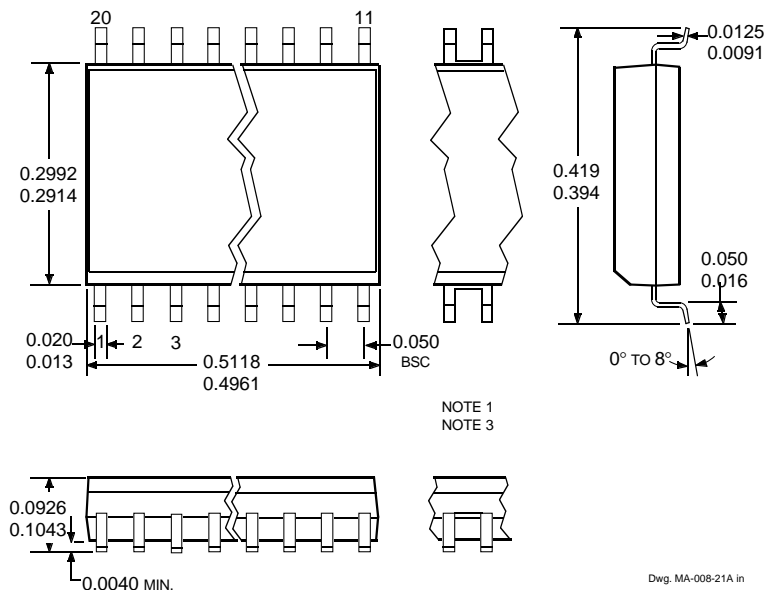


- NOTES: 1. Leads 1, 8, 9, and 16 may be half leads at vendor's option.  
2. Lead thickness is measured at seating plane or below.  
3. Lead spacing tolerance is non-cumulative.  
4. Webbed lead frame. Leads indicated are internally one piece.  
5. Exact body and lead configuration at vendor's option within limits shown.

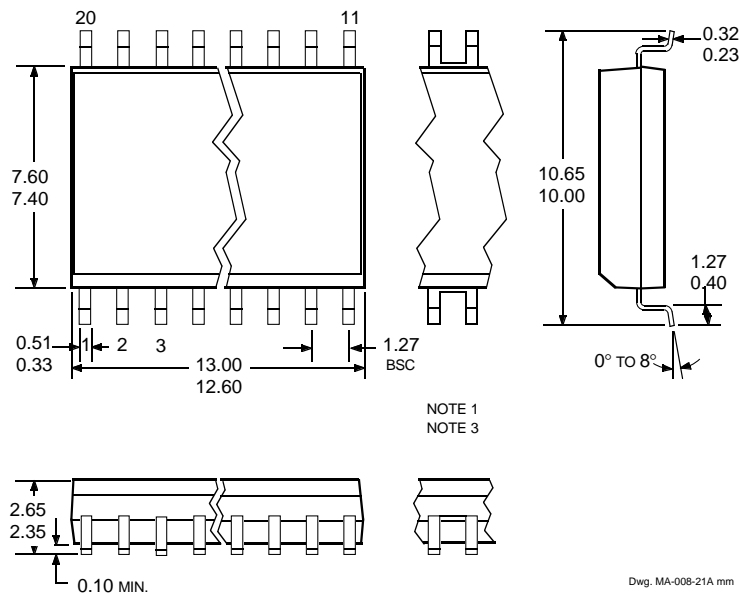
# 2540 QUAD DARLINGTON POWER DRIVER

## A2540SLB

Dimensions in Inches  
(for reference only)



Dimensions in Millimeters  
(controlling dimensions)



- NOTES: 1. Webbed lead frame. Leads 5, 6, 15, and 16 are internally one piece.  
2. Lead spacing tolerance is non-cumulative.  
3. Exact body and lead configuration at vendor's option within limits shown.

**2540**  
**QUAD DARLINGTON**  
**POWER DRIVER**

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# 2540 QUAD DARLINGTON POWER DRIVER

## POWER SINK DRIVERS

IN ORDER OF 1) OUTPUT CURRENT, 2) OUTPUT VOLTAGE, 3) NUMBER OF DRIVERS

Output Ratings *			Features					Part Number <sup>†</sup>
mA	V	#	Serial Input	Latched Drivers	Diode Clamp	Outputs	Internal Protection	
75	17	8	X	X	—	constant current	—	6275
	17	16	X	X	—	constant current	—	6276
100	20	8	—	—	—	saturated	—	2595
	30	32	X	X	—	—	—	5833
	40	32	X	X	—	saturated	—	5832
	50	8	addressable decoder/driver			DMOS	—	6B259
	50	8	—	X	—	DMOS	—	6B273
	50	8	X	X	—	DMOS	—	6B595
250	50	8	addressable decoder/driver			DMOS	—	6259
	50	8	—	X	—	DMOS	—	6273
	50	8	X	X	—	DMOS	—	6595
300	45	1	—	Hall sensor/driver	X	—	X	5140
	50	8	—	—	X	saturated	—	2596
	60	4	—	—	X	saturated	X	2557
350	50	4	—	X	X	—	—	5800
	50	7	—	—	X	—	—	2003
	50	7	—	—	X	—	—	2004
	50	8	—	—	X	—	—	2803
	50	8	—	X	X	—	—	5801
	50	8	X	X	—	—	—	5821
	50	8	X	X	X	—	—	5841
	50	8	addressable decoder/driver			DMOS	—	6A259
	50	8	X	X	—	DMOS	—	6A595
	80	8	X	X	—	—	—	5822
	80	8	X	X	X	—	—	5842
	95	7	—	—	X	—	—	2023
	95	7	—	—	X	—	—	2024
450	30	28	dual 4- to 14-line decoder/driver			—	—	6817
600	60	4	—	—	—	saturated	X	2547
	60	4	—	—	X	saturated	X	2549 and 2559
700	60	4	—	—	X	saturated	X	2543
750	50	8	—	—	X	saturated	—	2597
900	14	2	—	Hall sensor/driver	X	saturated	X	3625
	26	2	—	Hall sensor/driver	X	saturated	X	3626
1000	46	4	stepper motor controller/driver			MOS	—	7024 and 7029
1200	46	4	microstepping controller/driver			MOS	—	7042
1250	50	4	stepper motor translator/driver			—	X	5804
	50	4	—	—	X	—	—	2068
1500	80	4	—	—	X	—	—	2065 and 2069
1800	50	4	—	—	X	—	—	2540
3000	46	4	stepper motor controller/driver			MOS	—	7026
	46	4	microstepping controller/driver			MOS	—	7044
4000	50	4	—	—	X	—	—	2878
	80	4	—	—	X	—	—	2879

\* Current is maximum specified test condition, voltage is maximum rating. See specification for sustaining voltage limits or over-current protection voltage limits.

† Complete part number includes additional characters to indicate operating temperature range and package style.



115 Northeast Cutoff, Box 15036  
Worcester, Massachusetts 01615-0036 (508) 853-5000