

# 2944

## QUAD HIGH-CURRENT, HIGH-VOLTAGE SOURCE DRIVER

Capable of driving loads to 4 A at supply voltages to 60 V (inductive loads to 35 V), the UDN2944W is a quad high-current, high-voltage source driver. Each of the four power drivers can provide space- and cost-saving interface between low-level signal-processing circuits and high-power loads in harsh environments.

Individual supply lines have been provided for each pair of drivers so that different supplies can be used to drive multiple loads. The controlling inputs are TTL or CMOS compatible. The outputs include transient-suppression diodes for inductive loads.

This quad Darlington array is designed to serve as an interface between low-level circuitry and peripheral-power loads such as solenoids, motors, incandescent displays, heaters, and similar loads of up to 240 W per channel. The UDN2944W is an ideal complement to the UDN2878W quad 4 A sink driver.

For maximum power-handling capability, the UDN2944W driver is supplied in a 12-pin single in-line, power-tab package that allows efficient attachment of an external heat sink for maximum allowable package power dissipation. An external heat sink is usually required for proper operation of this device. The tab is at ground potential and needs no insulation.

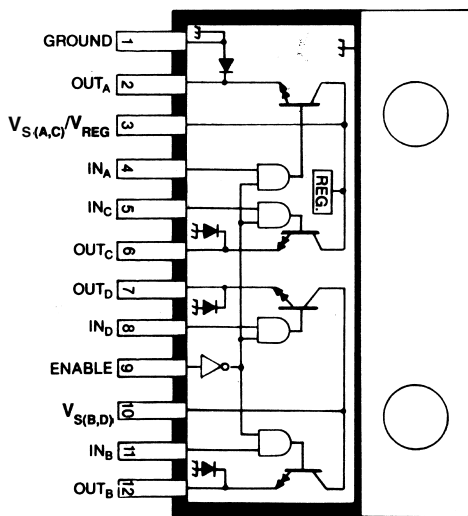
### FEATURES

- Output Current to 4 A
- Output Voltage to 60 V
- Loads to 960 W
- Integral Output Suppression Diodes
- TTL and CMOS Compatible Inputs
- Plastic Single In-Line Package
- Heat-Sink Tab

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

Supply Voltage Range, $V_S$ .....	10 V to 60 V
Output Current, $I_{OUT}$	
(continuous) .....	-4.0 A
(peak) .....	-5.0 A
Input Voltage, $V_{IN}$ .....	15 V
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

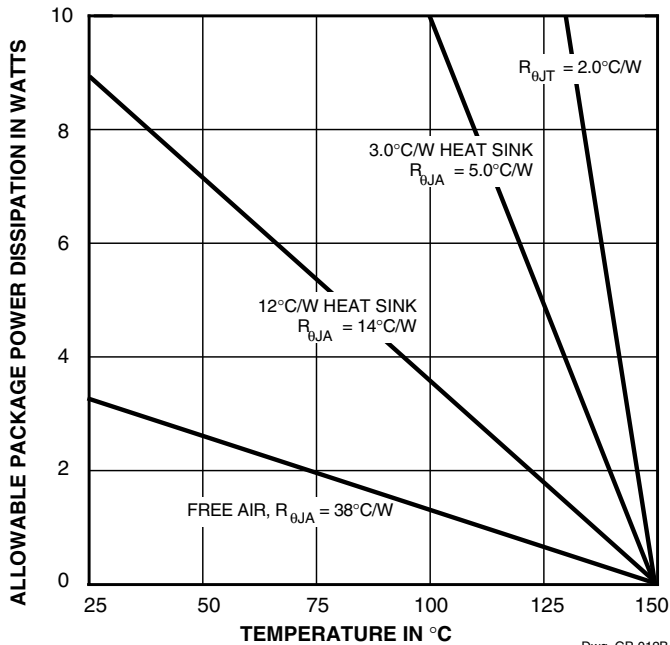
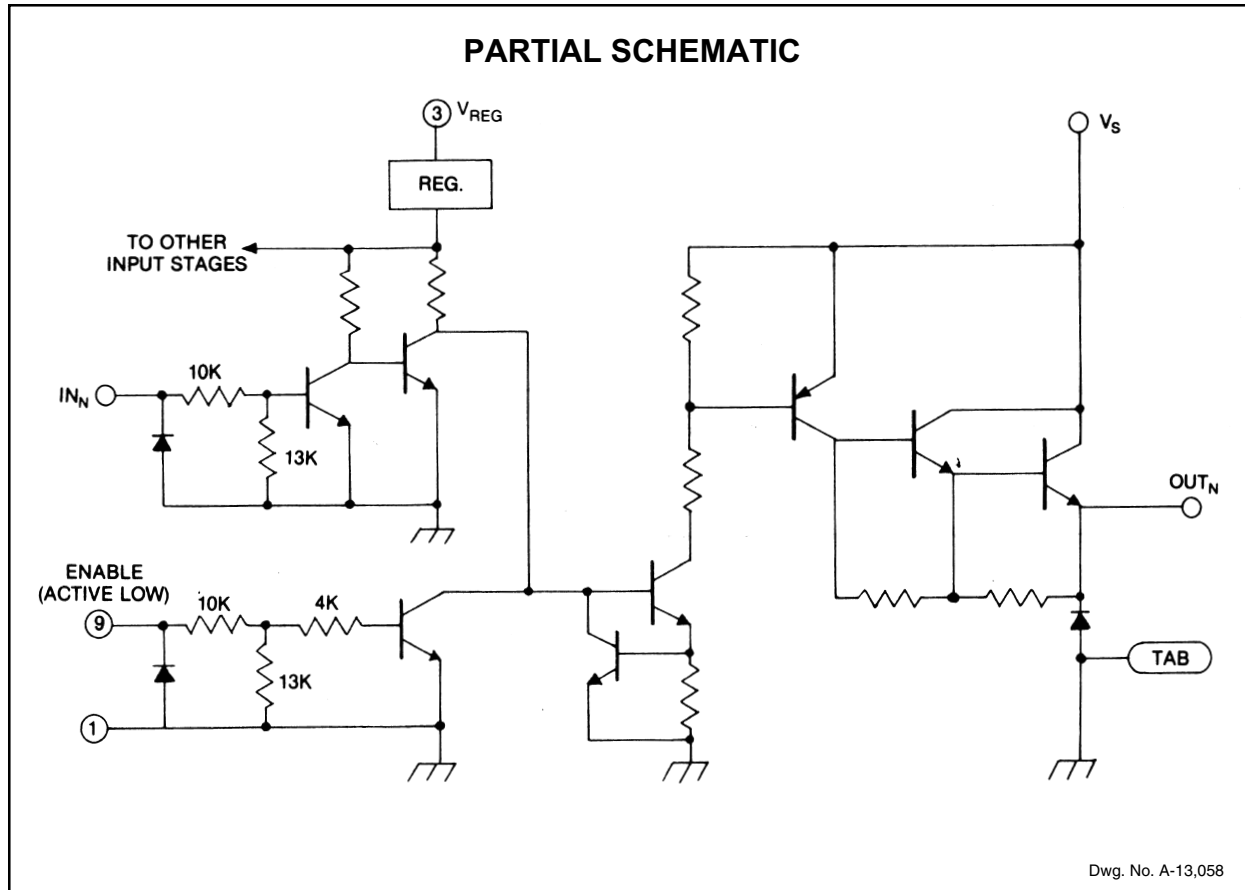
Output current rating will be limited by ambient temperature, duty cycle, heat sinking, air flow, and number of outputs conducting. Under any set of conditions, do not exceed the -5.0 A peak current or a junction temperature of +150°C.



Dwg. No. A-13,054

Always order by complete part number: **UDN2944W**.

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### TRUTH TABLE

INPUT	ENABLE	OUTPUT
L	L	L
H	L	H
L	H	L
H	H	L

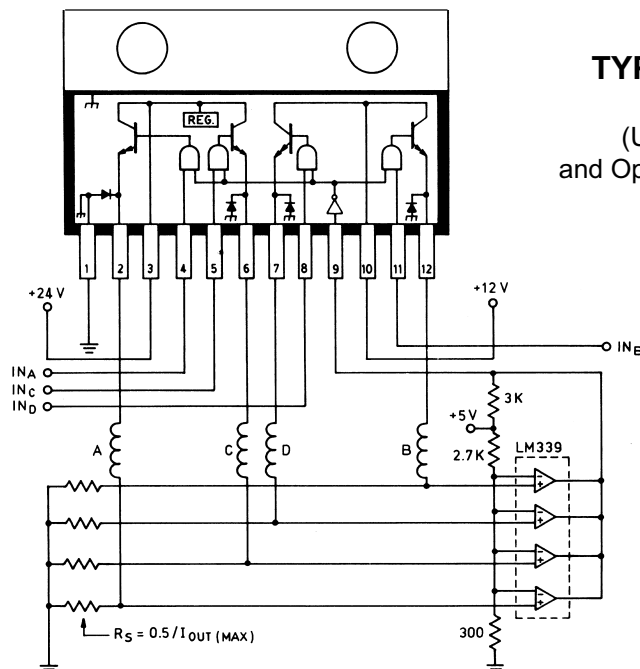
NOTE: Pin 3 must be connected to  $V_S$  for operation of input logic gates.

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**ELECTRICAL CHARACTERISTICS** at  $T_A = +25^\circ\text{C}$ ,  $T_J \leq +150^\circ\text{C}$ ,  $V_S = 60\text{ V}$ ,  $V_{\text{ENABLE}} = 0\text{ V}$   
(unless otherwise noted).

Characteristic	Symbol	Test Conditions	Limits		
			Min.	Max.	Units
Supply Voltage Range	$V_S$		10	60	V
Output Leakage Current	$I_{\text{CEX}}$	$V_{\text{OUT}} = 0\text{ V}$ , $V_{\text{ENABLE}} = 2.4\text{ V}$	—	50	$\mu\text{A}$
Output Sustaining Voltage	$V_{\text{CE(sus)}}$	$I_{\text{OUT}} = -4\text{ A}$ , $L = 3\text{ mH}$	35	—	V
Output Saturation Voltage	$V_{\text{CE(SAT)}}$	$I_{\text{OUT}} = -1\text{ A}$ , $V_{\text{IN}} = 2.4\text{ V}$	—	1.8	V
		$I_{\text{OUT}} = -4\text{ A}$ , $V_{\text{IN}} = 2.4\text{ V}$	—	2.5	V
Input Voltage	Logic 1	$V_{\text{IN}(1)}$ or $V_{\text{ENABLE}(1)}$	2.0	—	V
	Logic 0	$V_{\text{IN}(0)}$ or $V_{\text{ENABLE}(0)}$	—	0.8	V
Input Current	Logic 1	$V_{\text{IN}(1)}$ or $V_{\text{ENABLE}(1)} = 2.4\text{ V}$	—	220	$\mu\text{A}$
		$V_{\text{IN}(1)}$ or $V_{\text{ENABLE}(1)} = 12\text{ V}$	—	1.5	mA
	Logic 0	$V_{\text{IN}(0)}$ or $V_{\text{ENABLE}(0)} = 0.8\text{ V}$	—	50	$\mu\text{A}$
Total Supply Current	$I_S$	All drivers on, All outputs open	—	25	mA
Clamp Diode Leakage Current	$I_R$	$V_R = 60\text{ V}$	—	50	$\mu\text{A}$
Clamp Diode Forward Voltage	$V_F$	$I_F = 4\text{ A}$	—	2.2	V
Turn-On Delay	$t_{\text{ON}}$	$0.5 E_{\text{in}}$ to $0.5 E_{\text{out}}$ , $R_L = 15\ \Omega$	—	2.0	$\mu\text{s}$
Turn-Off Delay	$t_{\text{OFF}}$	$0.5 E_{\text{in}}$ to $0.5 E_{\text{out}}$ , $R_L = 15\ \Omega$	—	10	$\mu\text{s}$

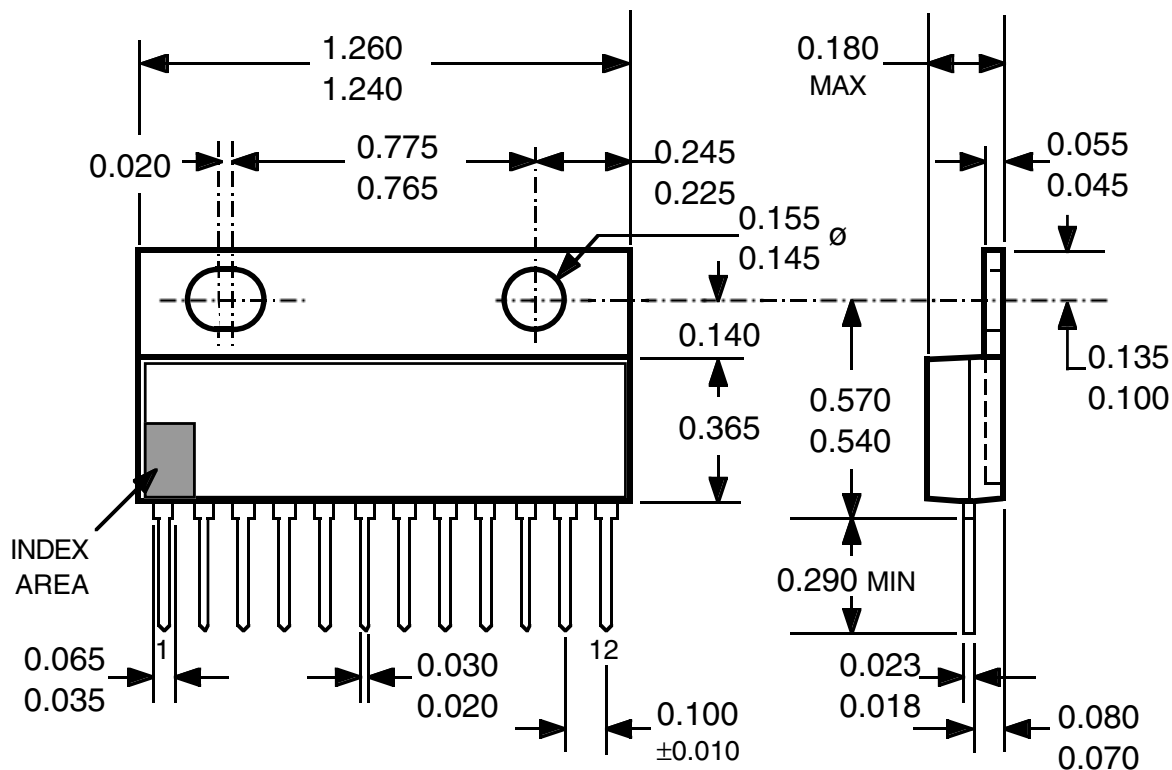
NOTE: Negative current is defined as coming out of (sourcing) the device being tested.



**TYPICAL APPLICATION**  
**QUAD RELAY DRIVE**  
(Using 2 Voltage Sources  
and Optional PWM Current Limiting)

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**Dimensions in Inches**  
 (controlling dimensions)

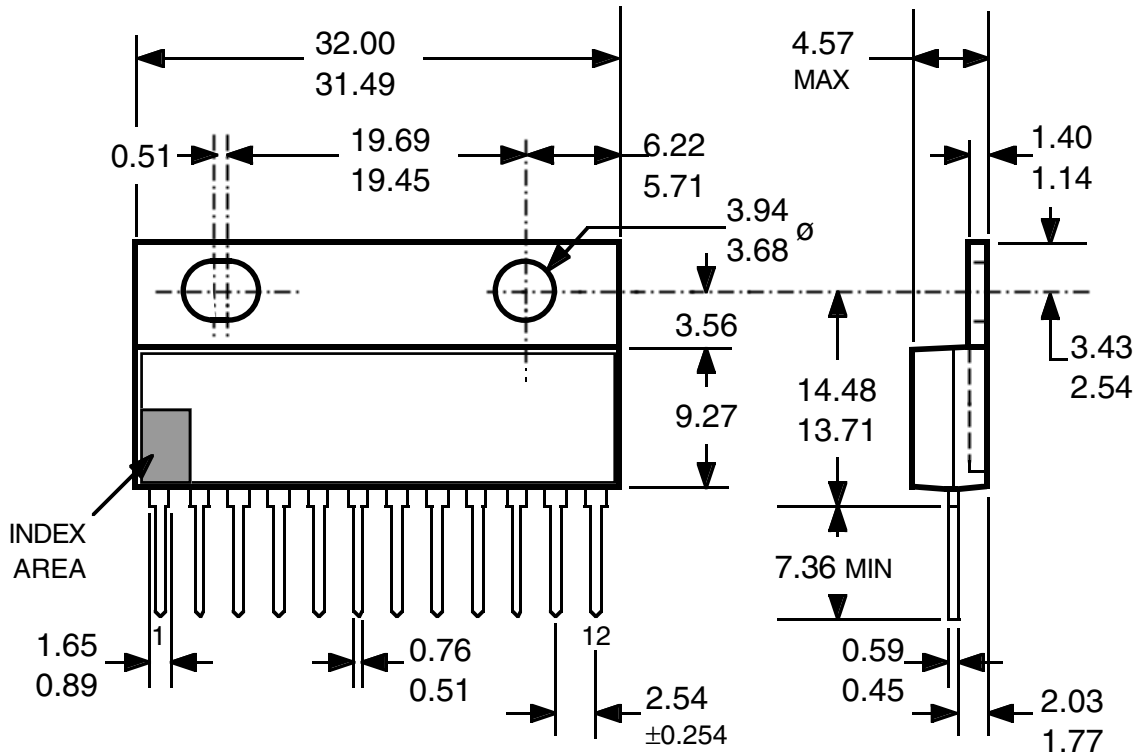


Dwg. MP-007 in

- NOTES:
1. Lead thickness is measured at seating plane or below.
  2. Lead spacing tolerance is non-cumulative.
  3. Exact body and lead configuration at vendor's option within limits shown.
  4. Lead gauge plane is 0.030" below seating plane.
  5. Supplied in standard sticks/tubes of 15 devices.

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**QUAD HIGH-CURRENT,**  
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**Dimensions in Millimeters**  
(for reference only)



Dwg. MP-007 mm

- NOTES: 1. Lead thickness is measured at seating plane or below.  
2. Lead spacing tolerance is non-cumulative.  
3. Exact body and lead configuration at vendor's option within limits shown.  
4. Lead gauge plane is 0.762 mm below seating plane.  
5. Supplied in standard sticks/tubes of 15 devices.

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**POWER SOURCE DRIVERS**

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

Output Ratings *			Features					Part Number †
mA	V	#	Serial Input	Latched Drivers	Diode Clamp	Saturated Outputs	Internal Protection	
-25	60	8	–	X	–	–	–	5815
	60	10	X	X	active pull-down	–	–	5810-F and 6809/10
	60	12	X	X	active pull-down	–	–	5811 and 6811
	60	20	X	X	active pull-down	–	–	5812-F and 6812
	60	32	X	X	active pull-down	–	–	5818-F and 6818
	85	8	–	–	–	–	–	6118
-120	-25	8	–	–	X	X	–	2585
	30	8	–	–	X	X	–	2985
	50	8	X	X	X	X	–	5895
-350	35	8	–	–	X	–	X	2987
	50	8	–	–	X	–	–	2981 and 2982
	50	8	X	X	X	–	–	5891
	-50	8	–	–	X	–	–	2580
	80	8	–	–	X	–	–	2983 and 2984
	80	8	X	X	X	–	–	5890
	-80	8	–	–	X	–	–	2588
-500	6	1	–	–	–	MOSFET	X	2525 and 2535
	6	2	–	–	–	MOSFET	X	2526 and 2536
-4000	60	4	–	–	X	–	–	2944

\* 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.

