

# 2878 AND 2879

## QUAD HIGH-CURRENT DARLINGTON SWITCHES

These quad Darlington arrays are designed to serve as interface between low-level logic and peripheral power devices such as solenoids, motors, incandescent displays, heaters, and similar loads of up to 320 W per channel. Both integrated circuits include transient-suppression diodes that enable use with inductive loads. The input logic is compatible with most TTL, DTL, LSTTL, and 5 V CMOS logic.

Type UDN2878W and UDN2879W 4 A arrays are identical except for output-voltage ratings. The former is rated for operation to 50 V (35 V sustaining), while the latter has a minimum output breakdown rating of 80 V (50 V sustaining). The lower-cost UDN2879W-2 is recommended for applications requiring load currents of 3 A or less. These less expensive devices are identical to the basic parts except for the maximum allowable load-current rating.

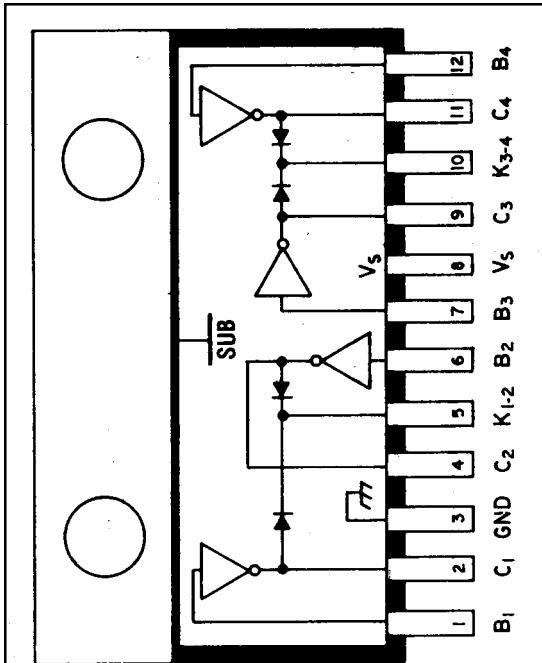
For maximum power-handling capability, all drivers are supplied in a 12-pin single in-line power-tab package. The tab needs no insulation. External heat sinks are usually required for proper operation of these devices.

### FEATURES

- Output Currents to 4 A
- Output Voltages to 80 V
- Loads to 1280 W
- TTL, DTL, or CMOS Compatible Inputs
- Internal Clamp Diodes
- Plastic Single In-Line Package
- Heat-Sink Tab

Always order by complete part number:

Part Number	Max. $I_C$	Max. $V_{CEX}$	Min. $V_{CE(sus)}$
UDN2878W	5.0 A	50 V	35 V
UDN2879W	5.0 A	80 V	50 V
UDN2879W-2	4.0 A	80 V	50 V

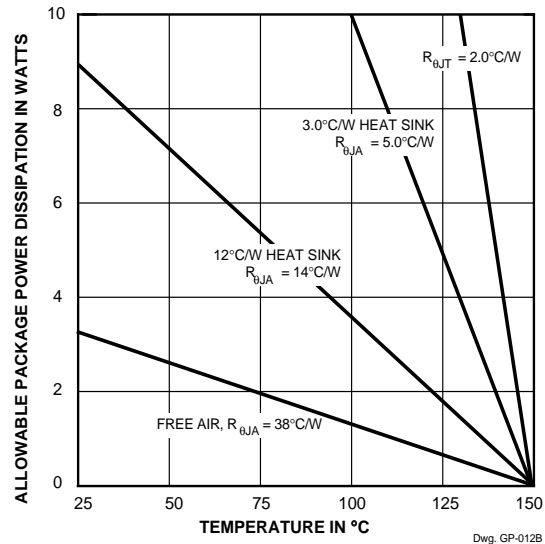


Dwg. No. A-11,974

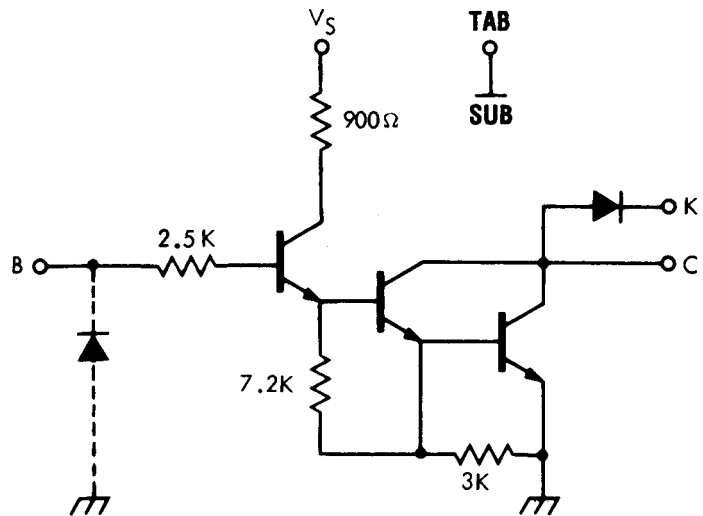
### ABSOLUTE MAXIMUM RATINGS at +25°C Free-Air Temperature for any driver (unless otherwise noted)

Output Voltage, $V_{CEX}$	
(UDN2878W) .....	50 V
(UDN2879W & UDN2879W-2) ..	80 V
Output Current, $I_C$	
(UDN2878W & UDN2879W) ....	5.0 A
(UDN2879W-2) .....	4.0 A
Input Voltage, $V_{IN}$ .....	15 V
Input Current, $I_{IN}$ .....	25 mA
Supply Voltage, $V_S$ .....	10 V
Total Package Power Dissipation, $P_D$ .....	See Graph
Operating Ambient Temperature Range, $T_A$ .....	-20°C to +85°C
Storage Temperature Range, $T_S$ .....	-55°C to +150°C

# 2878 AND 2879 QUAD HIGH-CURRENT DARLINGTON SWITCHES



## PARTIAL SCHEMATIC One of 4 Drivers



Dwg. No. A-12,037

NOTE: Pin 3 must be connected to ground for proper operation.

# 2878 AND 2879 QUAD HIGH-CURRENT DARLINGTON SWITCHES

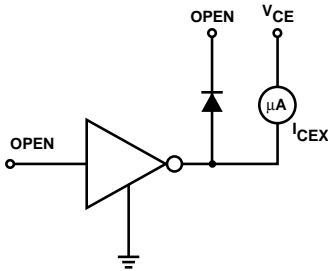
**ELECTRICAL CHARACTERISTICS at  $V_S = 5.0\text{ V}$ ,  $T_A = +25^\circ\text{C}$  (unless otherwise noted).**

Characteristic	Symbol	Test Fig.	Applicable Devices	Test Conditions	Limits		
					Min.	Max.	Units
Output Leakage Current	$I_{CEX}$	1	UDN2878W	$V_{CE} = 50\text{ V}$	—	100	$\mu\text{A}$
				$V_{CE} = 50\text{ V}$ , $T_A = +70^\circ\text{C}$	—	500	$\mu\text{A}$
			UDN2879W/W-2	$V_{CE} = 80\text{ V}$	—	100	$\mu\text{A}$
				$V_{CE} = 80\text{ V}$ , $T_A = +70^\circ\text{C}$	—	500	$\mu\text{A}$
Output Sustaining Voltage	$V_{CE(sus)}$	—	UDN2878W	$I_C = 4\text{ A}$ , $L = 10\text{ mH}$	35	—	V
			UDN2879W	$I_C = 4\text{ A}$ , $L = 10\text{ mH}$	50	—	V
			UDN2879W-2	$I_C = 3\text{ A}$ , $L = 10\text{ mH}$	50	—	V
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	2	All	$I_C = 500\text{ mA}$ , $V_{IN} = 2.75\text{ V}$	—	1.1	V
				$I_C = 1.0\text{ A}$ , $V_{IN} = 2.75\text{ V}$	—	1.3	V
				$I_C = 2.0\text{ A}$ , $V_{IN} = 2.75\text{ V}$	—	1.5	V
				$I_C = 3.0\text{ A}$ , $V_{IN} = 2.75\text{ V}$	—	1.9	V
			UDN2878/79W	$I_C = 4.0\text{ A}$ , $V_{IN} = 3.0\text{ V}$	—	2.4	V
Input Current	$I_{IN}$	3	All	$V_{IN} = 2.75\text{ V}$	—	550	$\mu\text{A}$
				$V_{IN} = 3.75\text{ V}$	—	1000	$\mu\text{A}$
Input Voltage	$V_{IN(ON)}$	4	All	$V_{CE} = 2.2\text{ V}$ , $I_C = 3.0\text{ A}$	—	2.75	V
			UDN2878/79W	$V_{CE} = 2.2\text{ V}$ , $I_C = 4.0\text{ A}$	—	2.75	V
Supply Current per Driver	$I_S$	7	All	$I_C = 500\text{ mA}$ , $V_{IN} = 2.75\text{ V}$	—	6.0	mA
Turn-On Delay	$t_{PLH}$	—	All	$0.5 E_{in}$ to $0.5 E_{out}$	—	1.0	$\mu\text{s}$
Turn-Off Delay	$t_{PHL}$	—	All	$0.5 E_{in}$ to $0.5 E_{out}$ , $I_C = 3.0\text{ A}$	—	1.5	$\mu\text{s}$
Clamp Diode Leakage Current	$I_R$	5	All	$V_R = 50\text{ V}$	—	50	$\mu\text{A}$
				$V_R = 50\text{ V}$ , $T_A = +70^\circ\text{C}$	—	100	$\mu\text{A}$
			UDN2879W/W-2	$V_R = 80\text{ V}$	—	50	$\mu\text{A}$
				$V_R = 80\text{ V}$ , $T_A = +70^\circ\text{C}$	—	100	$\mu\text{A}$
Clamp Diode Forward Voltage	$V_F$	6	All	$I_F = 3.0\text{ A}$	—	2.5	V
			UDN2878/79W	$I_F = 4.0\text{ A}$	—	3.0	V

Caution: High-current tests are pulse tests or require heat sinking.

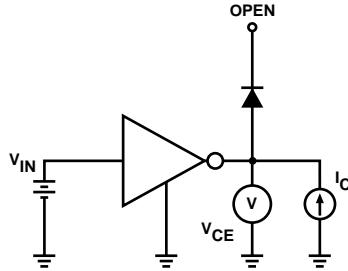
# 2878 AND 2879 QUAD HIGH-CURRENT DARLINGTON SWITCHES

## TEST FIGURES



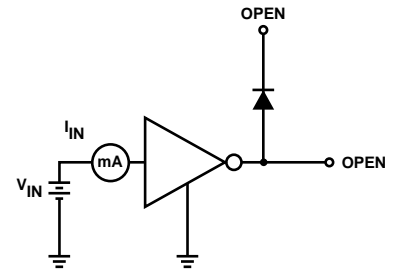
Dwg. No. A-9729A

FIGURE 1



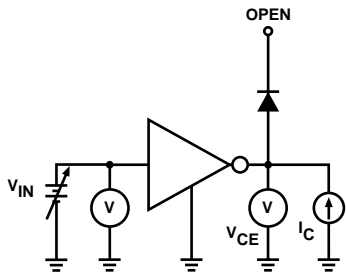
Dwg. No. A-10,350

FIGURE 2



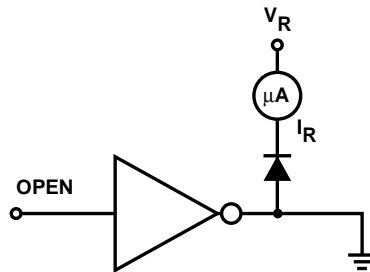
Dwg. No. A-9732

FIGURE 3



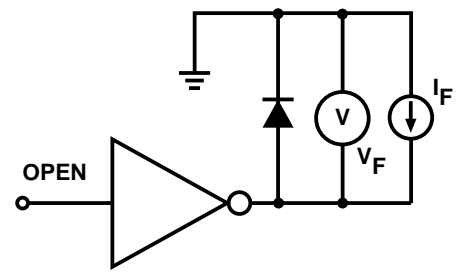
Dwg. No. A-9734A

FIGURE 4



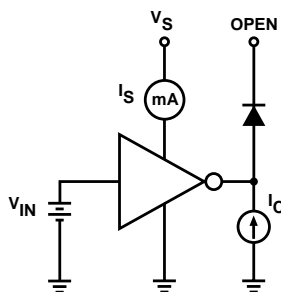
Dwg. No. A-9735A

FIGURE 5



Dwg. No. A-9736

FIGURE 6



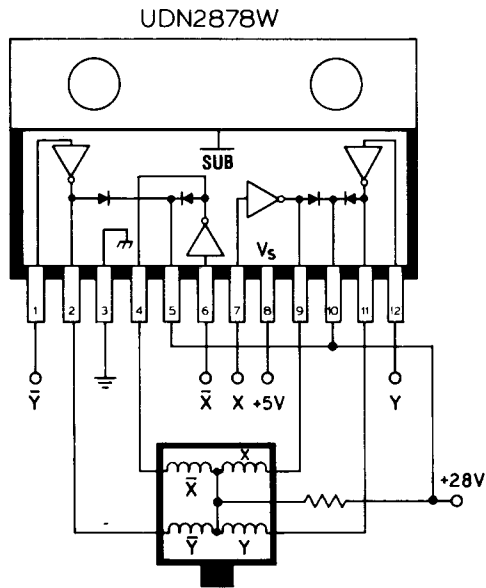
Dwg. No. A-10,351

FIGURE 7

# 2878 AND 2879 QUAD HIGH-CURRENT DARLINGTON SWITCHES

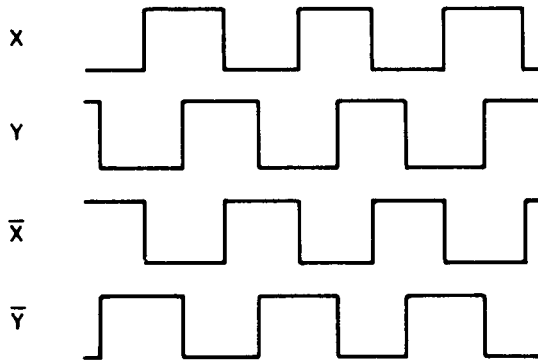
## TYPICAL APPLICATIONS

### INPUT WAVEFORMS



Dwg. No. A-11,975

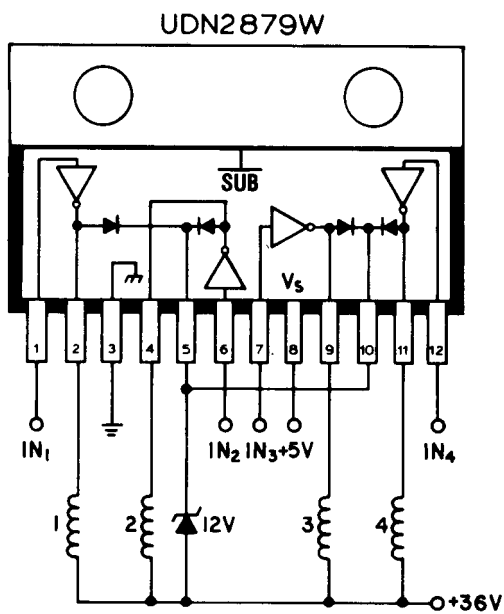
### STEPPER-MOTOR DRIVER



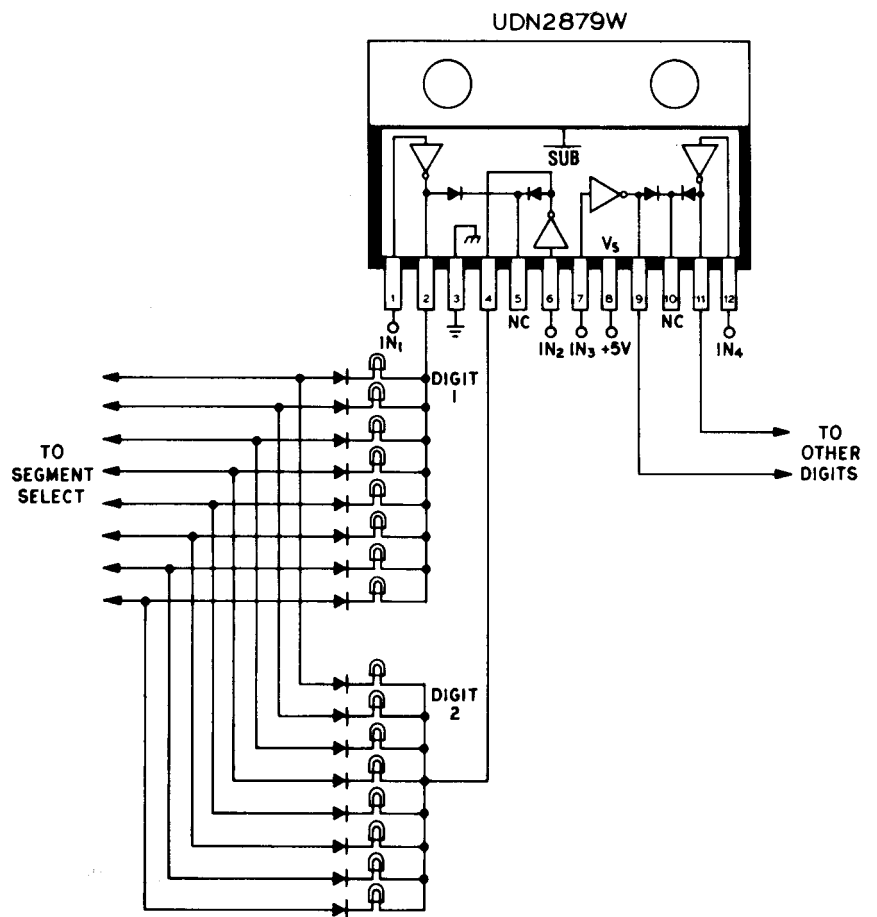
Dwg. No. A-11,795

### DIGIT DRIVER FOR MULTIPLEXED INCANDESCENT LAMP DISPLAY

### PRINT-HAMMER DRIVER



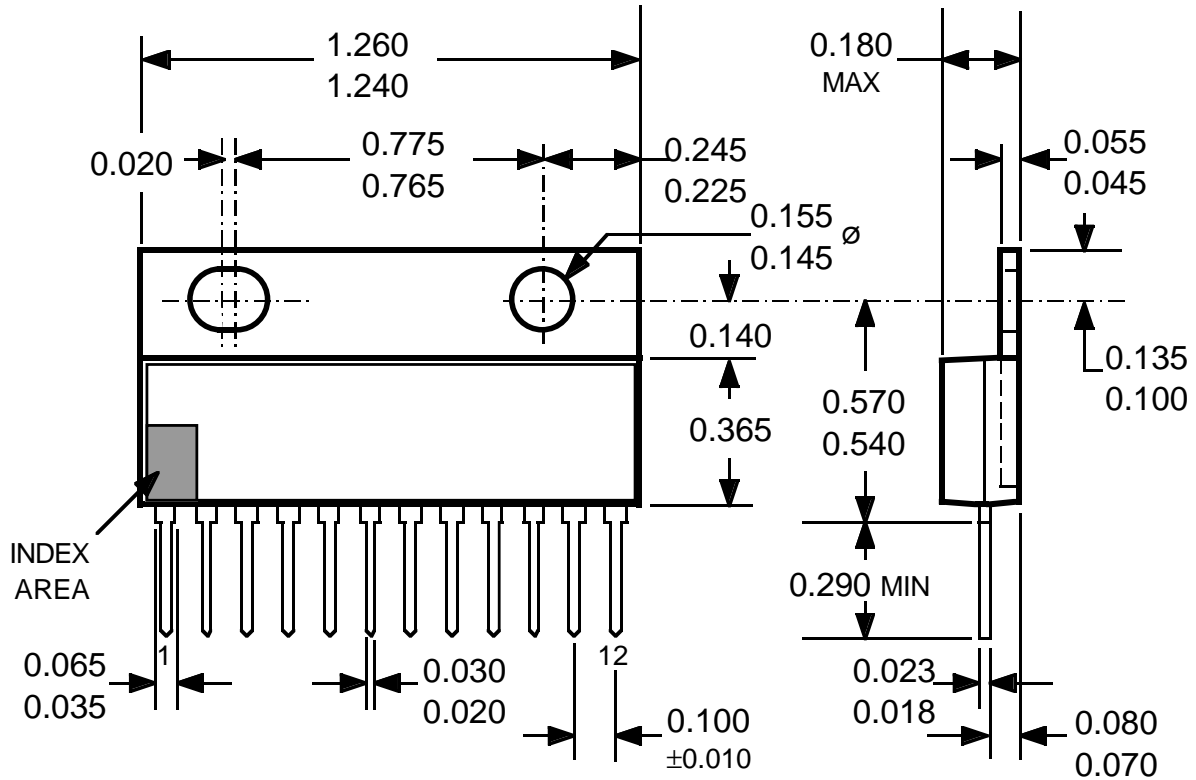
Dwg. No. A-11,976



Dwg. No. B-1512

**2878 AND 2879**  
**QUAD HIGH-CURRENT**  
**DARLINGTON SWITCHES**

**Dimensions in Inches**  
 (controlling dimensions)



Dwg. MP-007 in

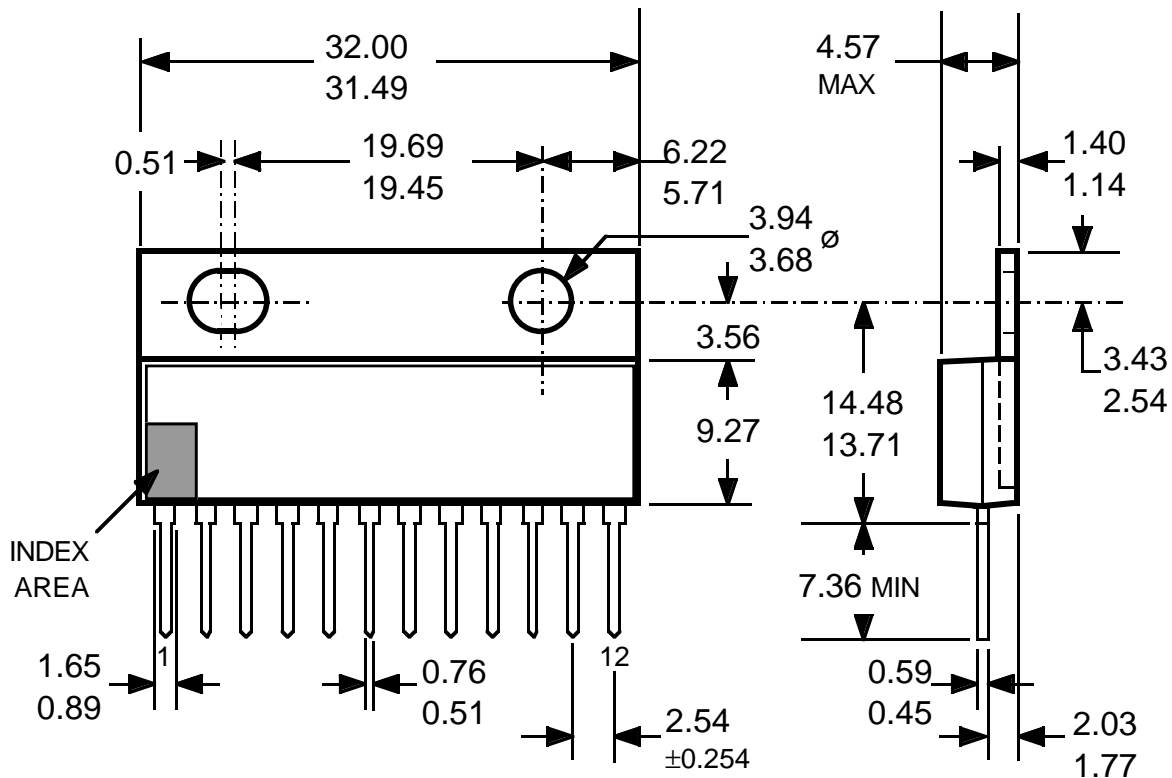
- NOTES:
1. Lead thickness is measured at seating plane or below.
  2. Lead spacing tolerance is non-cumulative.
  3. Exact body and lead configuration at vendor's option within limits shown.
  4. Lead gauge plane is 0.030" below seating plane.
  5. Supplied in standard sticks/tubes of 15 devices.



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

# 2878 AND 2879 QUAD HIGH-CURRENT DARLINGTON SWITCHES

## 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.

*The products described here are manufactured under one or more U.S. patents or U.S. patents pending.*

*Allegro MicroSystems, Inc. reserves the right to make, from time to time, such departures from the detail specifications as may be required to permit improvements in the performance, reliability, or manufacturability of its products. Before placing an order, the user is cautioned to verify that the information being relied upon is current.*

*Allegro products are not authorized for use as critical components in life-support devices or systems without express written approval.*

*The information included herein is believed to be accurate and reliable. However, Allegro MicroSystems, Inc. assumes no responsibility for its use; nor for any infringement of patents or other rights of third parties which may result from its use.*

# 2878 AND 2879 QUAD HIGH-CURRENT DARLINGTON SWITCHES

## 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	
120	24	8	X	X	–	constant current	–	6277	
250	50	8	addressable decoder/driver			DMOS	–	6259	
	50	8	–	X	–	DMOS	–	6273	
	50	8	X	X	–	DMOS	–	6595	
	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	
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	
1800	50	4	–	–	X	–	–	2540	
3000	46	4	stepper motor controller/driver			MOS	–	7026	
	46	4	microstepping controller/driver			MOS	–	7044	

\* 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