

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.

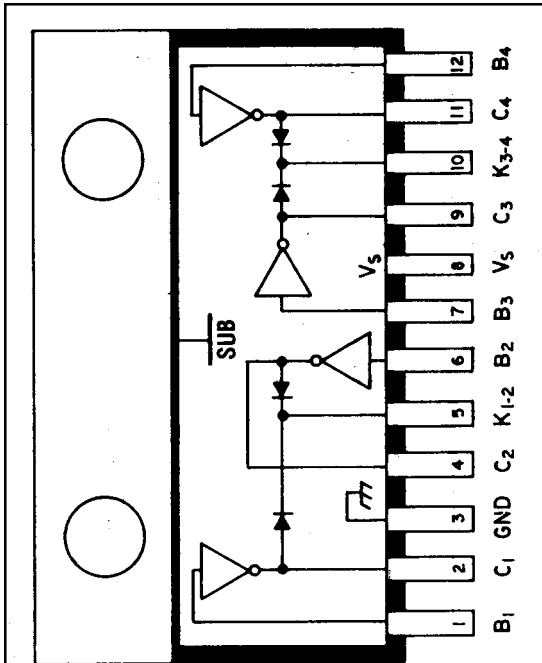
For maximum power-handling capability, all drivers are supplied in a 12-pin single in-line power-tab package. The tab needs no insulation. External heat sinks are usually required for proper operation of these devices.

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 |

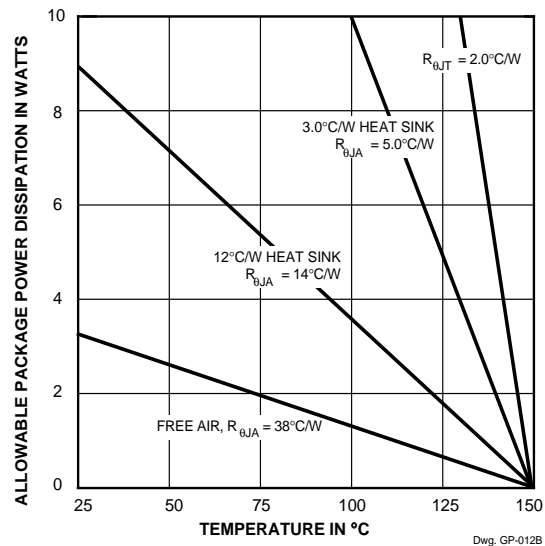


Dwg. No. A-11,974

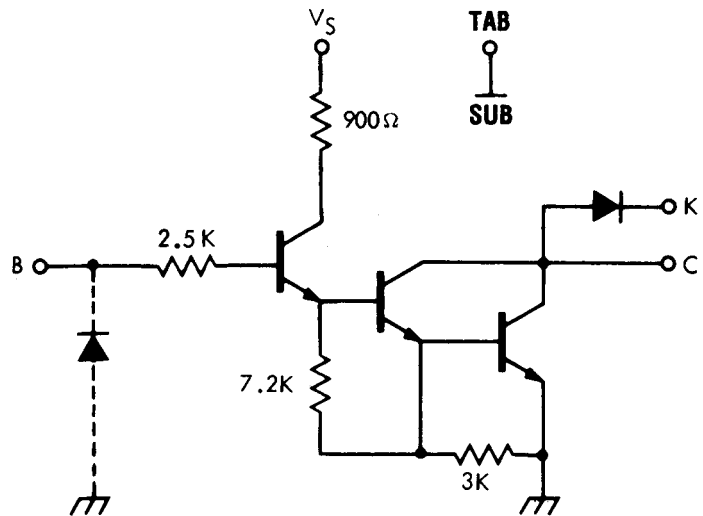
ABSOLUTE MAXIMUM RATINGS at +25°C Free-Air Temperature for any driver (unless otherwise noted)

| | |
|---|-----------------|
| 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 |

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PARTIAL SCHEMATIC One of 4 Drivers



Dwg. No. A-12,037

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

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DARLINGTON SWITCHES

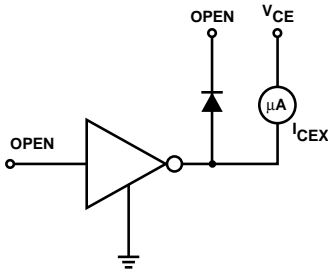
ELECTRICAL CHARACTERISTICS at $V_S = 5.0\text{ V}$, $T_A = +25^\circ\text{C}$ (unless otherwise noted).

| 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 | μA |
| | | | | $V_{CE} = 50\text{ V}$, $T_A = +70^\circ\text{C}$ | — | 500 | μA |
| | | | UDN2879W/W-2 | $V_{CE} = 80\text{ V}$ | — | 100 | μA |
| | | | | $V_{CE} = 80\text{ V}$, $T_A = +70^\circ\text{C}$ | — | 500 | μA |
| 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 | μA |
| | | | | $V_{IN} = 3.75\text{ V}$ | — | 1000 | μA |
| 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 | μs |
| Turn-Off Delay | t_{PHL} | — | All | $0.5 E_{in}$ to $0.5 E_{out}$, $I_C = 3.0\text{ A}$ | — | 1.5 | μs |
| Clamp Diode Leakage Current | I_R | 5 | All | $V_R = 50\text{ V}$ | — | 50 | μA |
| | | | | $V_R = 50\text{ V}$, $T_A = +70^\circ\text{C}$ | — | 100 | μA |
| | | | UDN2879W/W-2 | $V_R = 80\text{ V}$ | — | 50 | μA |
| | | | | $V_R = 80\text{ V}$, $T_A = +70^\circ\text{C}$ | — | 100 | μA |
| 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.

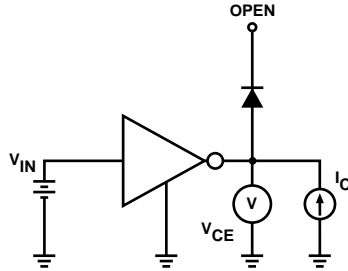
2878 AND 2879 QUAD HIGH-CURRENT DARLINGTON SWITCHES

TEST FIGURES



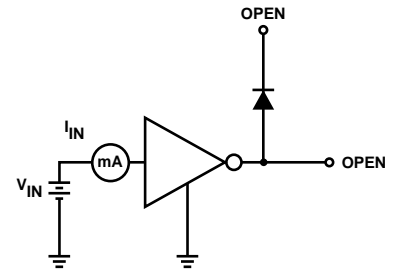
Dwg. No. A-9729A

FIGURE 1



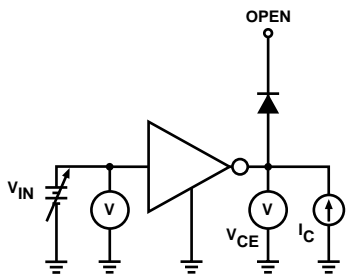
Dwg. No. A-10,350

FIGURE 2



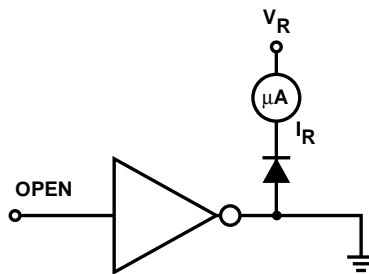
Dwg. No. A-9732

FIGURE 3



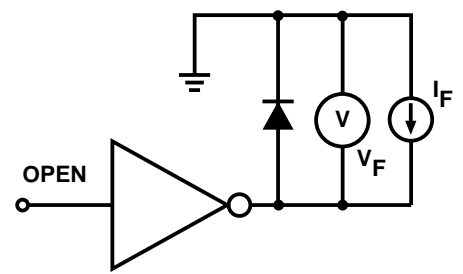
Dwg. No. A-9734A

FIGURE 4



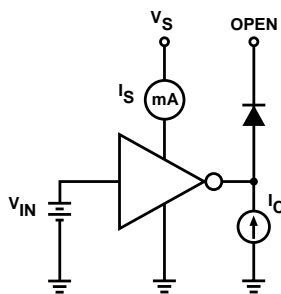
Dwg. No. A-9735A

FIGURE 5



Dwg. No. A-9736

FIGURE 6



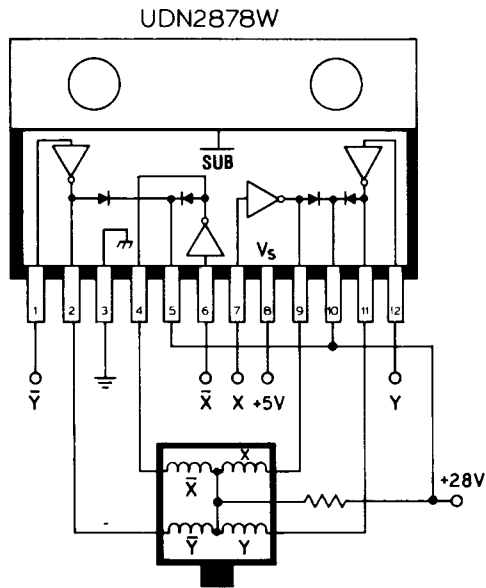
Dwg. No. A-10,351

FIGURE 7

2878 AND 2879 QUAD HIGH-CURRENT DARLINGTON SWITCHES

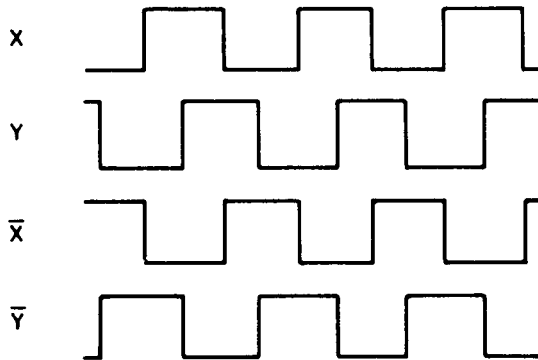
TYPICAL APPLICATIONS

INPUT WAVEFORMS



Dwg. No. A-11,975

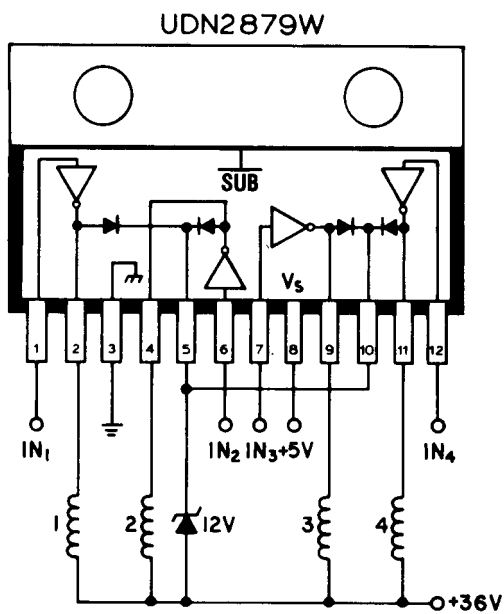
STEPPER-MOTOR DRIVER



Dwg. No. A-11,795

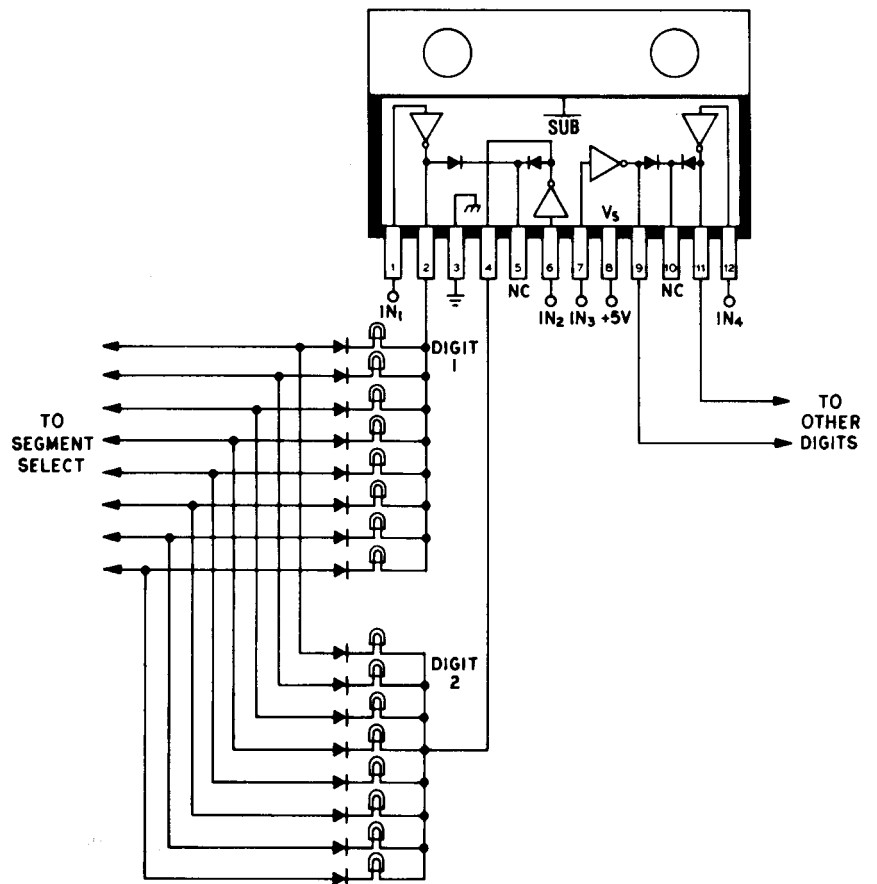
DIGIT DRIVER FOR MULTIPLEXED INCANDESCENT LAMP DISPLAY

PRINT-HAMMER DRIVER



Dwg. No. A-11,976

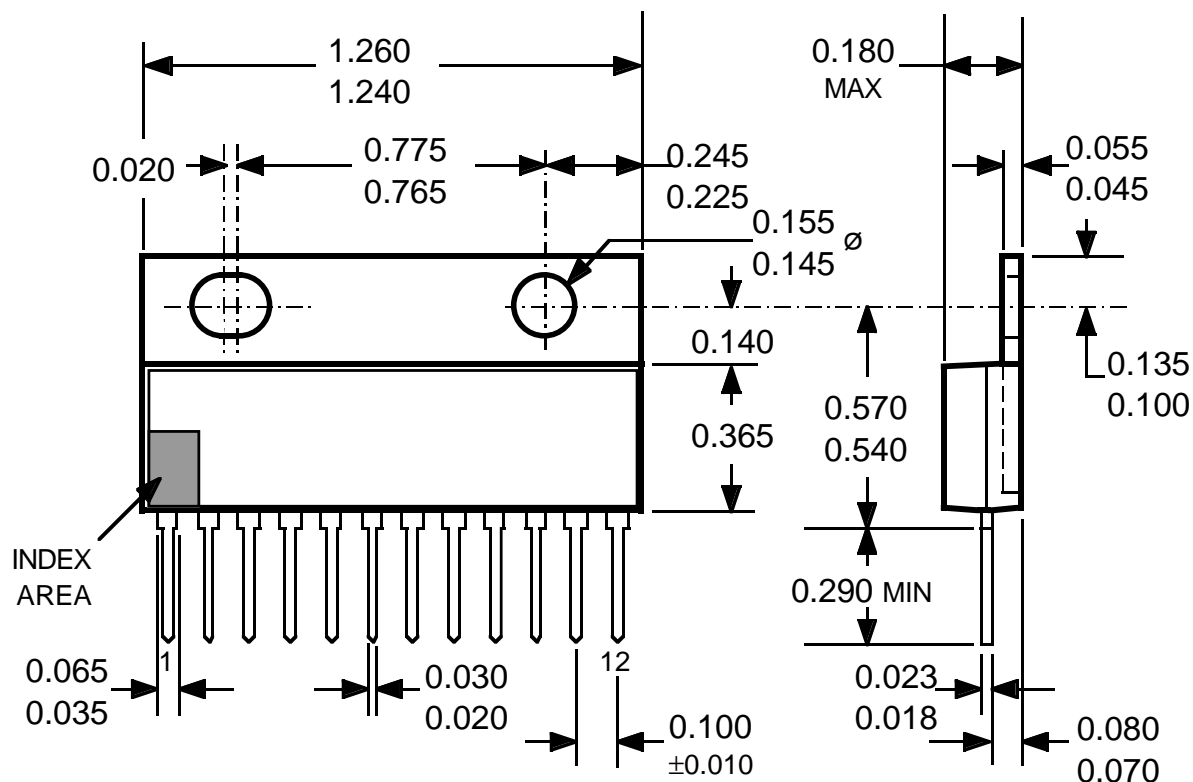
UDN2879W



Dwg. No. B-1512

2878 AND 2879
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Dimensions in Inches
 (controlling dimensions)



Dwg. MP-007 in

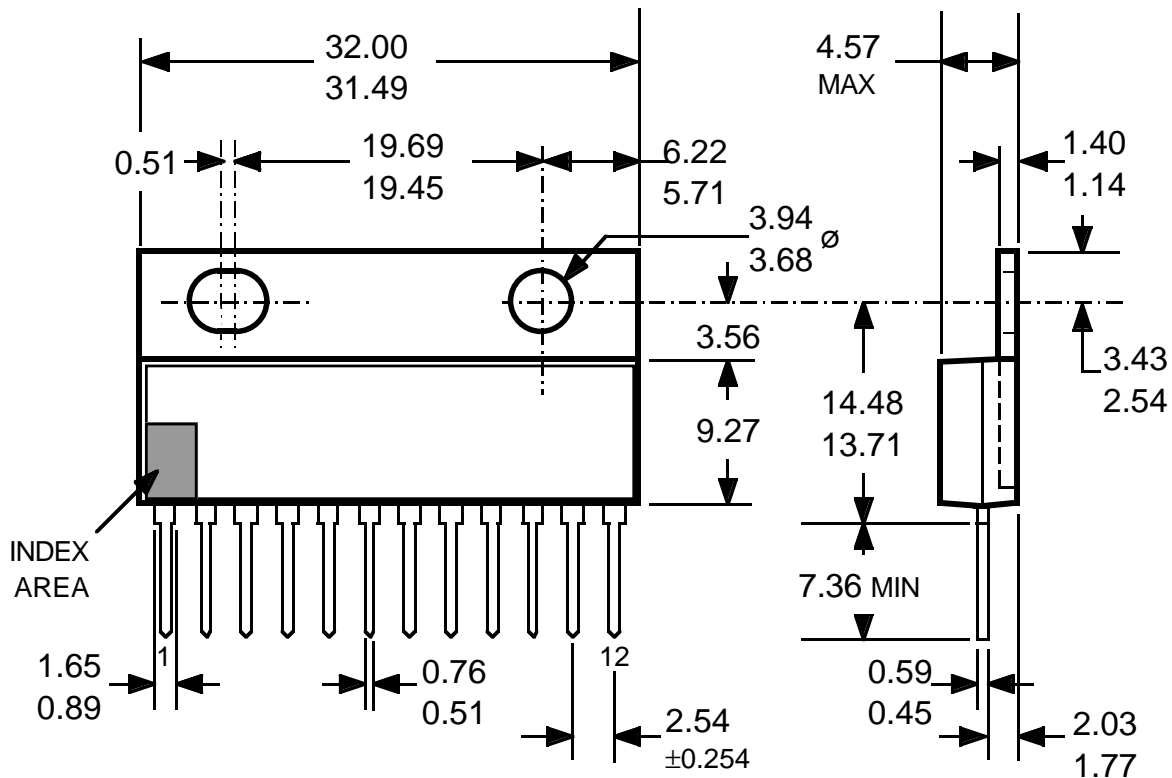
- NOTES:
1. Lead thickness is measured at seating plane or below.
 2. Lead spacing tolerance is non-cumulative.
 3. Exact body and lead configuration at vendor's option within limits shown.
 4. Lead gauge plane is 0.030" below seating plane.
 5. Supplied in standard sticks/tubes of 15 devices.



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

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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.

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

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POWER SINK 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 | 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.



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Worcester, Massachusetts 01615-0036 (508) 853-5000