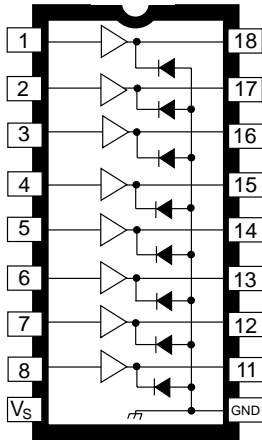


2981 THRU 2984

8-CHANNEL SOURCE DRIVERS

UDN2981A thru UDN2984A



Dwg. No. A-10, 243

Note that the UDN2980A series (dual in-line package) and UDN2980LW series (small-outline IC package) are electrically identical and share a common terminal number assignment.

ABSOLUTE MAXIMUM RATINGS at 25°C Free-Air Temperature

| | |
|---|------------------------|
| Output Voltage Range, V_{CE} (UDN2981A, UDN2982A, UDN2982LW, and A2982SLW) .. | 5 V to 50 V |
| (UDN2983A, UDN2984A, UDN2984LW, and A2984SLW) .. | 35 V to 80 V |
| Input Voltage, V_{IN} (UDN2981A and UDN2983A) | 15 V |
| (UDN2982A, UDN2984A, UDN2982LW, UDN2984LW, A2982SLW, and A2984SLW) | 20 V |
| Output Current, I_{OUT} | -500 mA |
| 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 |

Recommended for high-side switching applications that benefit from separate logic and load grounds, these devices encompass load supply voltages to 80 V and output currents to -500 mA. These 8-channel source drivers are useful for interfacing between low-level logic and high-current loads. Typical loads include relays, solenoids, lamps, stepper and/or servo motors, print hammers, and LEDs.

All devices may be used with 5 V logic systems — TTL, Schottky TTL, DTL, and 5 V CMOS. The UDN2981A, UDN2982A, UDN2982LW, and A2982SLW are electrically interchangeable, will withstand a maximum output off voltage of 50 V, and operate to a minimum of 5 V; the UDN2983A, UDN2984A, UDN2984LW, and A2984SLW drivers are electrically interchangeable, will withstand an output voltage of 80 V, and operate to a minimum of 35 V. All devices in this series integrate input current limiting resistors and output transient suppression diodes, and are activated by an active high input.

The suffix 'A' (all devices) indicates an 18-lead plastic dual in-line package with copper lead frame for optimum power dissipation. Under normal operating conditions, these devices will sustain 120 mA continuously for each of the eight outputs at an ambient temperature of +50°C and a supply of 15 V.

The suffix 'LW' (UDN2982LW and UDN2984LW only) indicates an 18-lead surface-mountable wide-body SOIC package; the A2982SLW and A2984SLW are provided in a 20-lead wide-body SOIC package with improved thermal characteristics.

The UDN2982A, UDN2982LW, A2982SLW, UDN2984A, UDN2984LW, and A2984SLW drivers are also available for operation over an extended temperature range to -40°C. To order, change the prefix 'UDN' to 'UDQ' or the suffix 'SLW' to 'ELW'.

FEATURES

- TTL, DTL, PMOS, or CMOS Compatible Inputs
- 500 mA Output Source Current Capability
- Transient-Protected Outputs
- Output Breakdown Voltage to 80 V
- DIP or SOIC Packaging

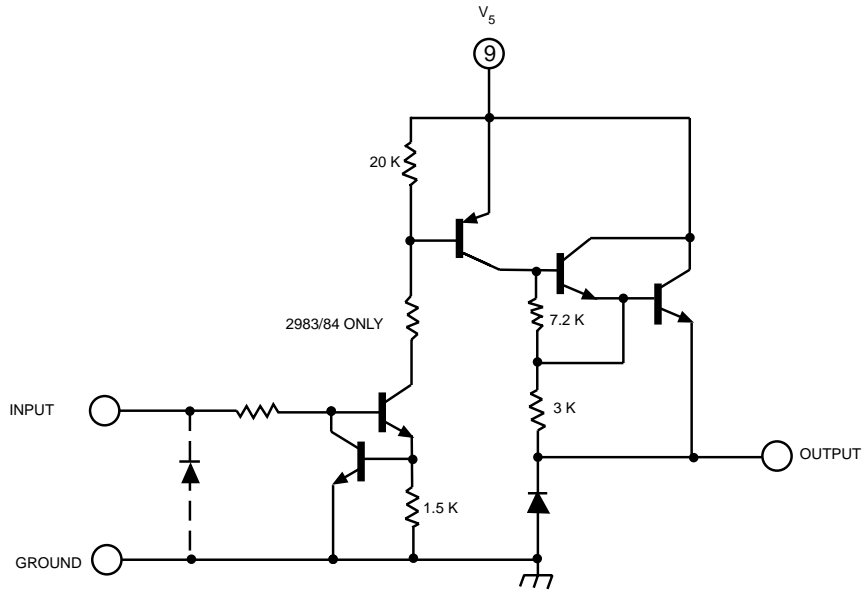
**The A2984SLW, UDN2984A, & UDN2984LW are discontinued.
Shown for reference only.**

Always order by complete part number, e.g., **UDN2981A**.

Note that all devices are not available in all package styles.

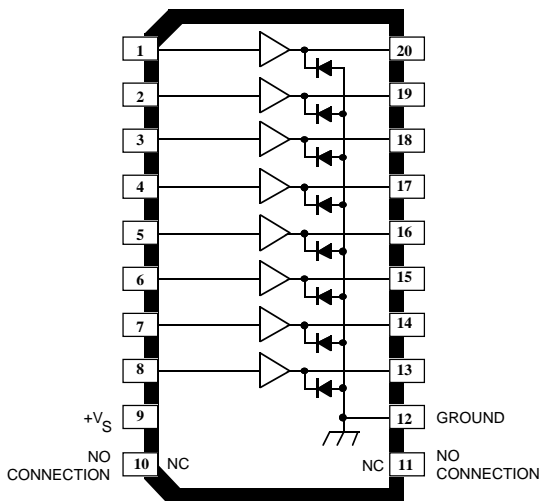
2981 THRU 2984 8-CHANNEL SOURCE DRIVERS

One of Eight Drivers

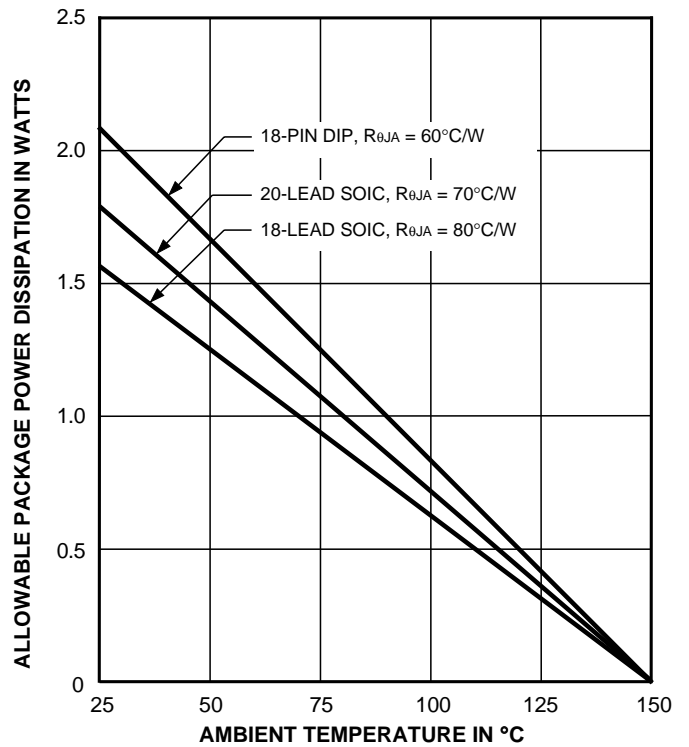


Dwg. No. A-10,242B

A2982SLW and A2984SLW



Dwg. PP-064-2



Dwg. GP-022-4

2981 THRU 2984 8-CHANNEL SOURCE DRIVERS

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

| Characteristic | Symbol | Applicable Devices | Test Conditions | Test Fig. | Limits | | | |
|--------------------------------------|---------------|--------------------|--|-----------|--------|------|------|---------------|
| | | | | | Min. | Typ. | Max. | Units |
| Output Leakage Current | I_{CEX} | 2981/82† | $V_{IN} = 0.4\text{ V}^*$, $V_S = 50\text{ V}$, $T_A = +70^\circ\text{C}$ | 1 | — | — | 200 | μA |
| | | 2983/84† | $V_{IN} = 0.4\text{ V}^*$, $V_S = 80\text{ V}$, $T_A = +70^\circ\text{C}$ | 1 | — | — | 200 | μA |
| Output Sustaining Voltage | $V_{CE(SUS)}$ | 2981/82† | $I_{OUT} = -45\text{ mA}$ | — | 35 | — | — | V |
| | | 2983/84† | $I_{OUT} = -70\text{ mA}$ | — | 45 | — | — | V |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | All | $V_{IN} = 2.4\text{ V}$, $I_{OUT} = -100\text{ mA}$ | 2 | — | 1.6 | 1.8 | V |
| | | | $V_{IN} = 2.4\text{ V}$, $I_{OUT} = -225\text{ mA}$ | 2 | — | 1.7 | 1.9 | V |
| | | | $V_{IN} = 2.4\text{ V}$, $I_{OUT} = -350\text{ mA}$ | 2 | — | 1.8 | 2.0 | V |
| Input Current | $I_{IN(ON)}$ | 2981/83A | $V_{IN} = 2.4\text{ V}$ | 3 | — | 140 | 200 | μA |
| | | | $V_{IN} = 3.85\text{ V}$ | 3 | — | 310 | 450 | μA |
| | | 2982/84† | $V_{IN} = 2.4\text{ V}$ | 3 | — | 140 | 200 | μA |
| | | | $V_{IN} = 12\text{ V}$ | 3 | — | 1.25 | 1.93 | mA |
| Output Source Current (Outputs Open) | I_{OUT} | 2981/83A | $V_{IN} = 2.4\text{ V}$, $V_{CE} = 2.0\text{ V}$ | 2 | -350 | — | — | mA |
| | | 2982/84† | $V_{IN} = 2.4\text{ V}$, $V_{CE} = 2.0\text{ V}$ | 2 | -350 | — | — | mA |
| Supply Current Leakage Current | I_S | 2981/82† | $V_{IN} = 2.4\text{ V}^*$, $V_S = 50\text{ V}$ | 4 | — | — | 10 | mA |
| | | 2983/84† | $V_{IN} = 2.4\text{ V}^*$, $V_S = 80\text{ V}$ | 4 | — | — | 10 | mA |
| Clamp Diode Forward Voltage | I_R | 2981/82† | $V_R = 50\text{ V}$, $V_{IN} = 0.4\text{ V}^*$ | 5 | — | — | 50 | μA |
| | | 2983/84† | $V_R = 80\text{ V}$, $V_{IN} = 0.4\text{ V}^*$ | 5 | — | — | 50 | μA |
| Clamp Diode | V_F | All | $I_F = 350\text{ mA}$ | 6 | — | 1.5 | 2.0 | V |
| Turn-On Delay | t_{ON} | All | $0.5 E_{IN}$ to $0.5 E_{OUT}$, $R_L = 100\Omega$, $V_S = 35\text{ V}$ | — | — | 1.0 | 2.0 | μs |
| Turn-Off Delay | t_{OFF} | All | $0.5 E_{IN}$ to $0.5 E_{OUT}$, $R_L = 100\Omega$, $V_S = 35\text{ V}$, See Note | — | — | 5.0 | 10 | μs |

NOTES: Turn-off delay is influenced by load conditions. Systems applications well below the specified output loading may require timing considerations for some designs, i.e., multiplexed displays or when used in combination with sink drivers in a totem pole configuration.

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

* All inputs simultaneously.

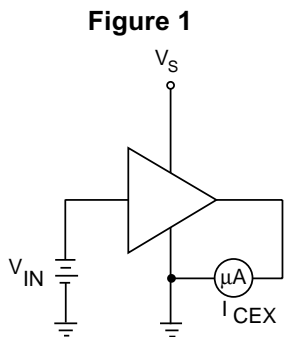
† Complete part number includes a prefix (A or UDN) and a suffix (A or SLW) as follows:

UDN2981A,
UDN2982A, UDN2982LW, or A2982SLW,
UDN2983A,
UDN2984A, UDN2984LW, or A2984SLW.

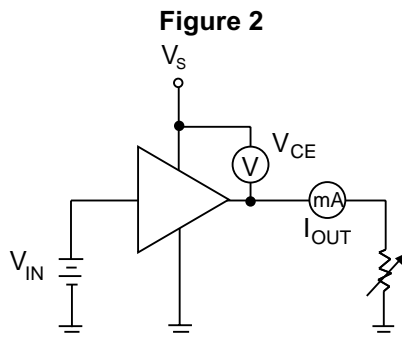
**The A2984SLW, UDN2984A, & UDN2984LW are discontinued.
Shown for reference only.**

2981 THRU 2984 8-CHANNEL SOURCE DRIVERS

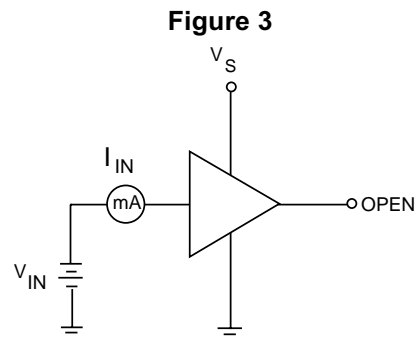
TEST FIGURES



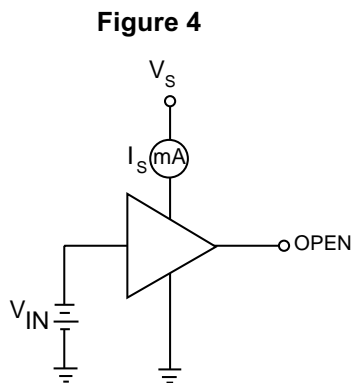
Dwg. No. A-11,083



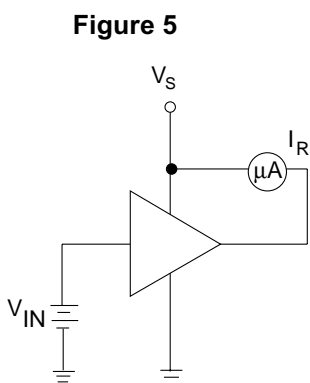
Dwg. No. A-11,084



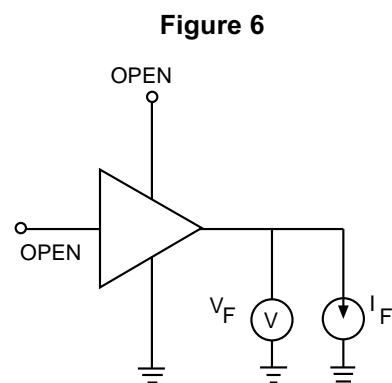
Dwg. No. A-11,085



Dwg. No. A-11,086



Dwg. No. A-11,087

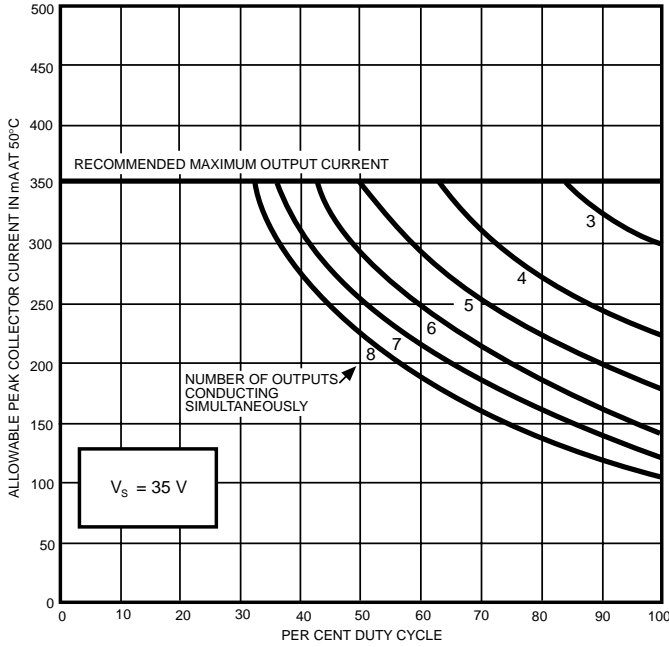


Dwg. No. A-11,088

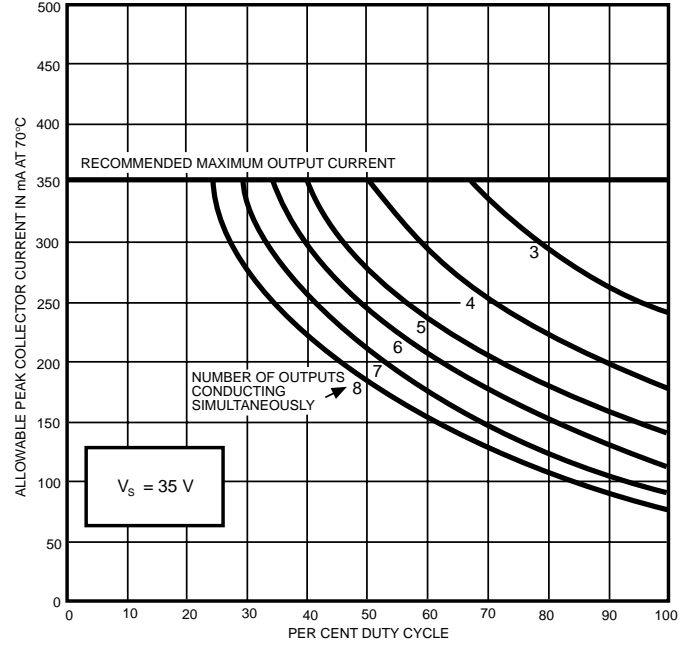
2981 THRU 2984 8-CHANNEL SOURCE DRIVERS

Allowable peak collector current as a function of duty cycle

Series UDN2980A

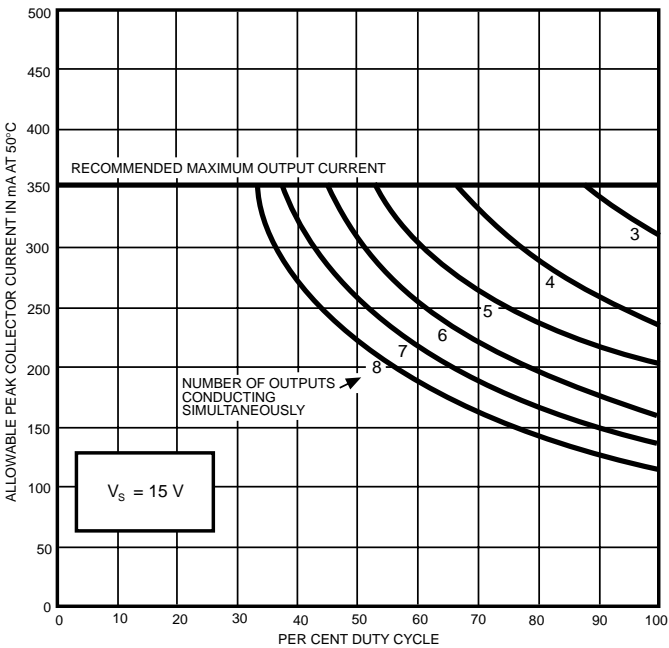


Dwg. No. A-11,106B

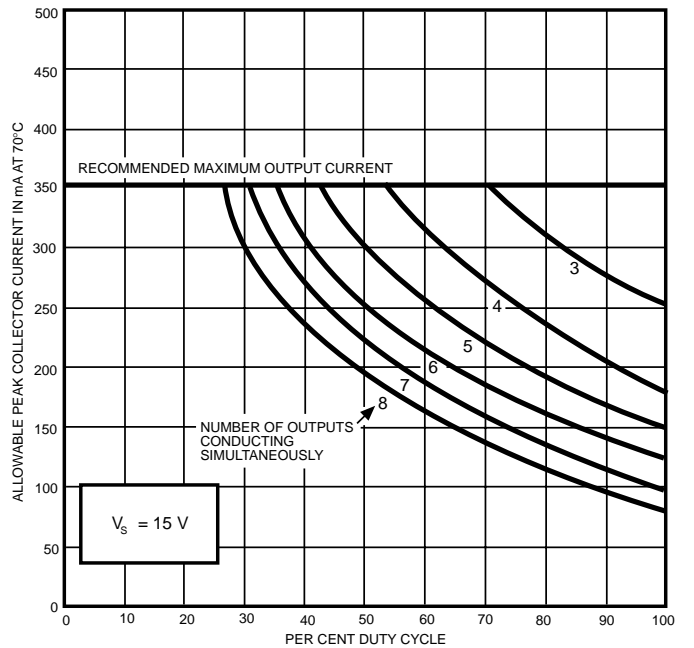


Dwg. No. A-11,111B

UDN2981A and UDN2982A



Dwg. No. A-11,107B

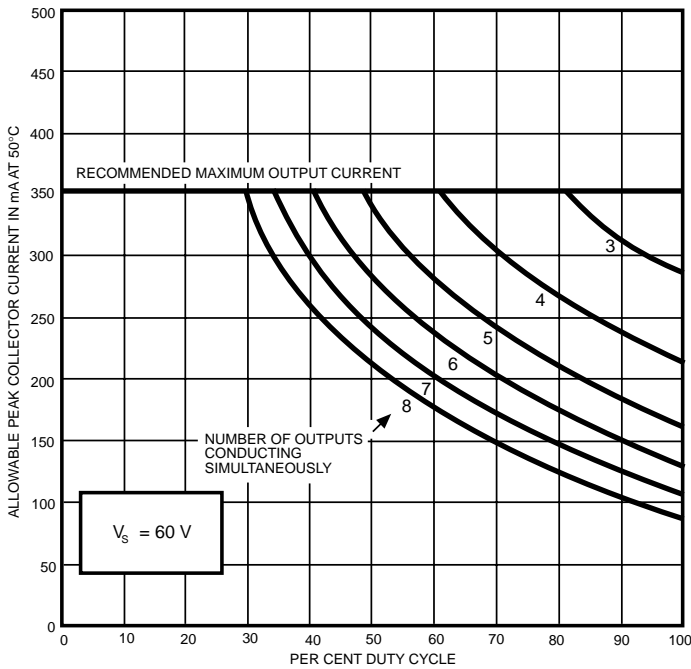


Dwg. No. A-11,108B

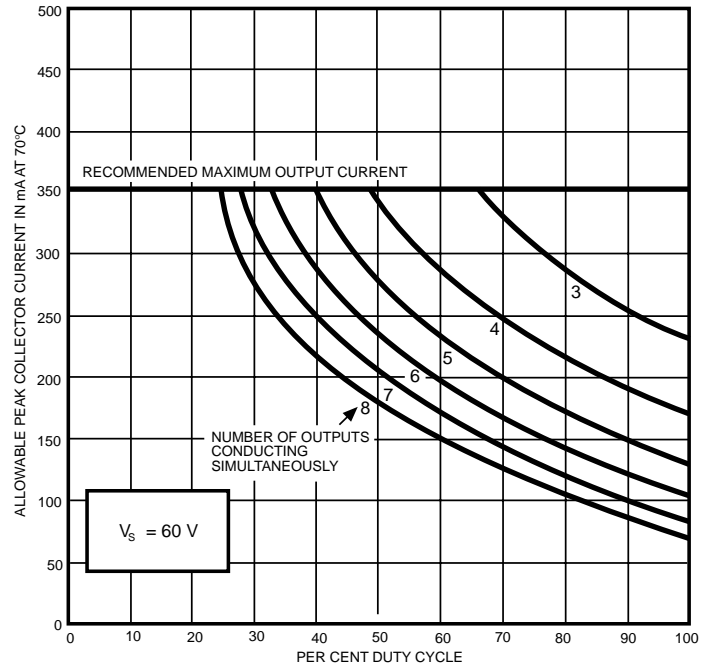
2981 THRU 2984 8-CHANNEL SOURCE DRIVERS

Allowable peak collector current as a function of duty cycle

UDN2983A and UDN2984A

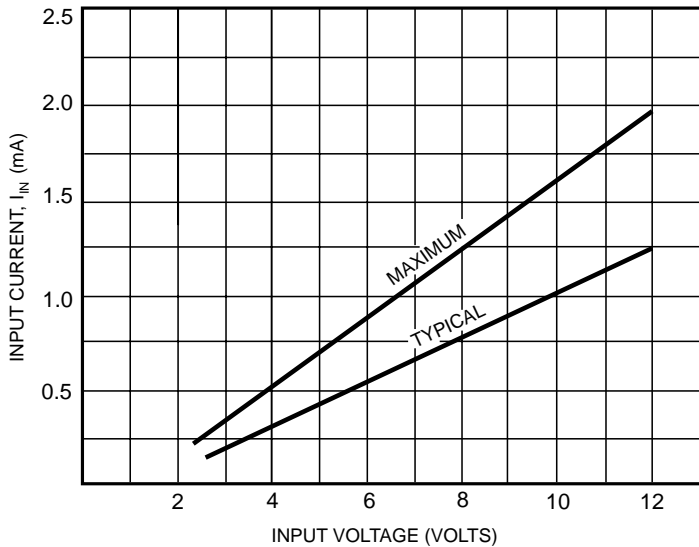


Dwg. No. A-11,109B



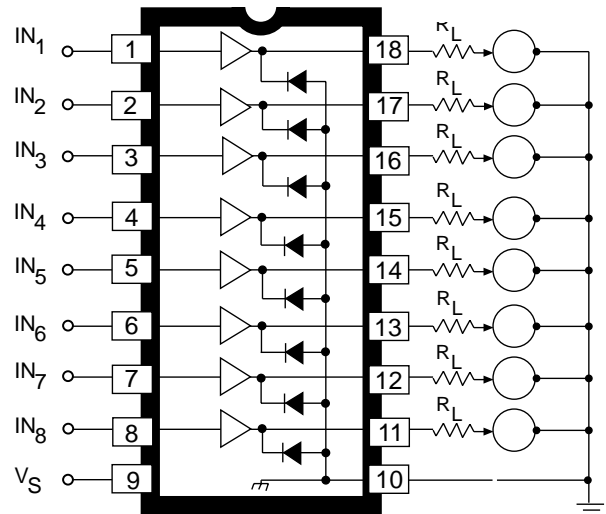
Dwg. No. A-11,110B

Input current as a function of input voltage



Dwg. No. A-11,115B

Typical electroensitive printer application

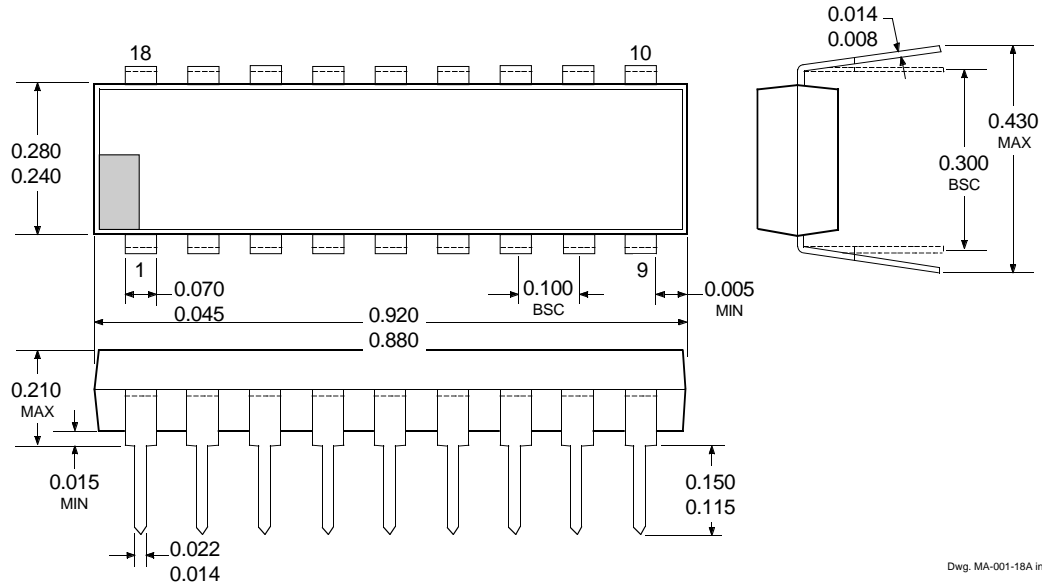


Dwg. No. A-11,113A

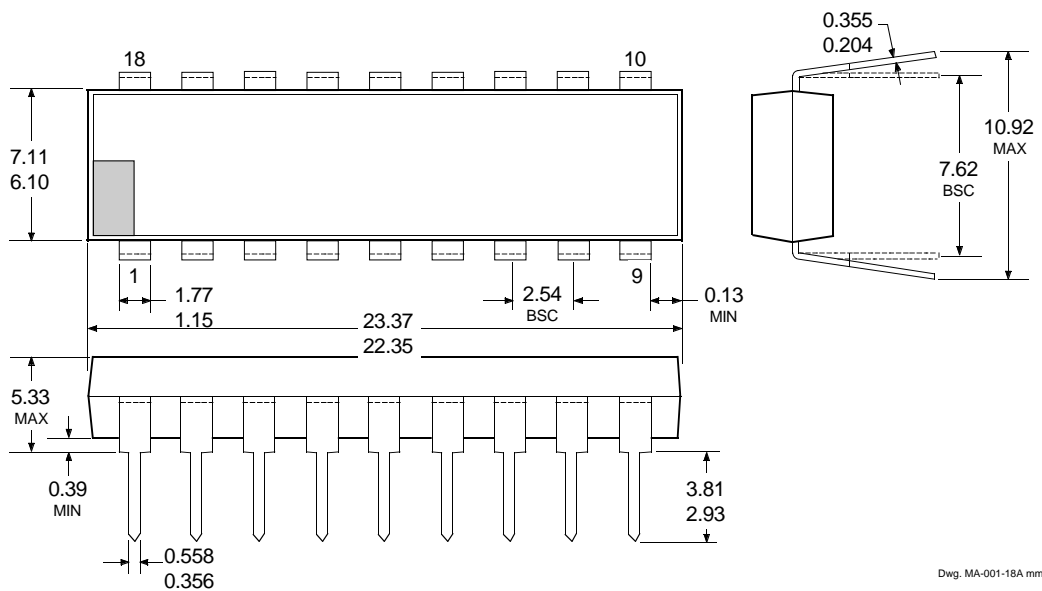
2981 THRU 2984 8-CHANNEL SOURCE DRIVERS

UDN2981A, UDN2982A, UDN2983A, and UDN2984A

Dimensions in Inches (controlling dimensions)



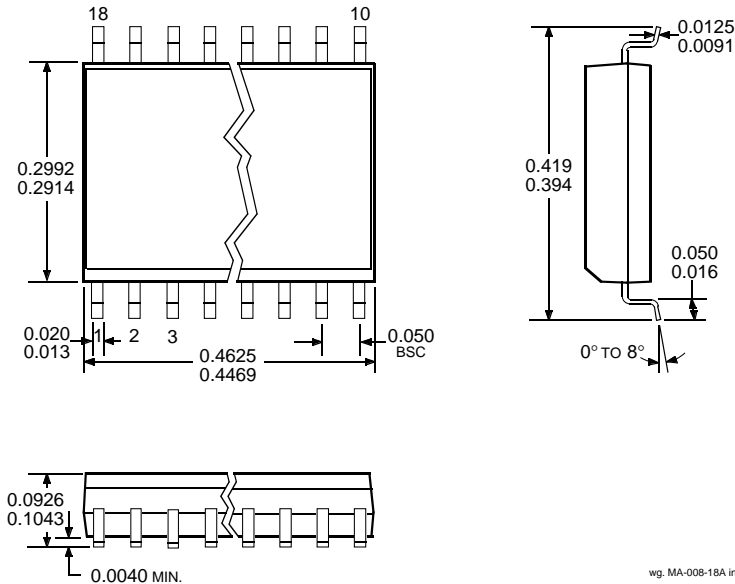
Dimensions in Millimeters (for reference only)



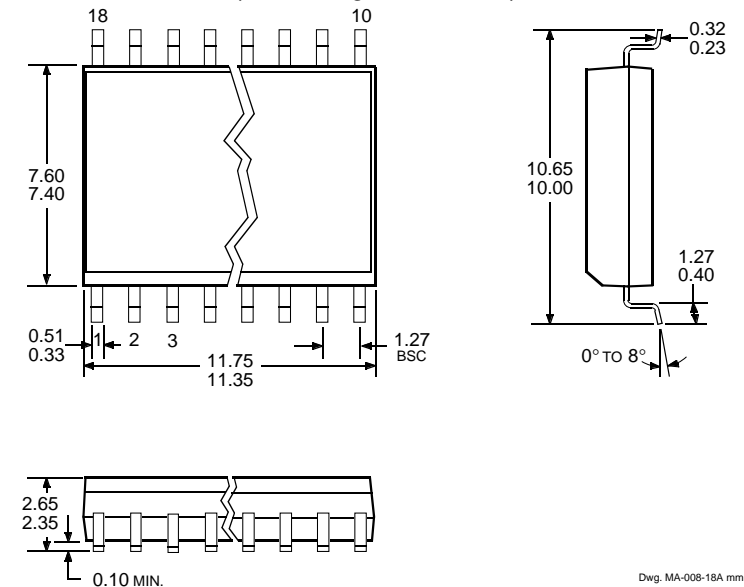
- NOTES: 1. Exact body and lead configuration at vendor's option within limits shown.
 2. Lead spacing tolerance is non-cumulative.
 3. Lead thickness is measured at seating plane or below.
 4. Supplied in standard sticks/tubes of 21 devices.

2981 THRU 2984 8-CHANNEL SOURCE DRIVERS

UDN2982LW and UDN2984LW (add "TR" to part number for tape and reel) Dimensions in Inches (for reference only)



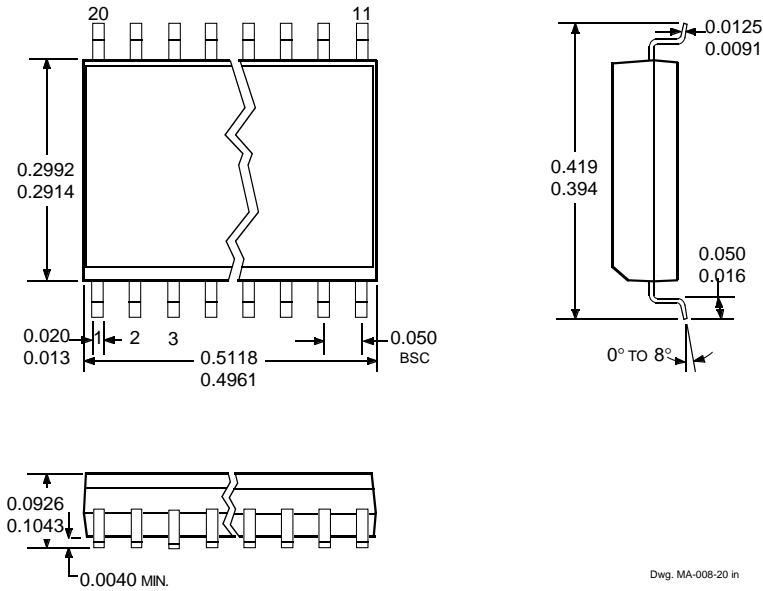
Dimensions in Millimeters (controlling dimensions)



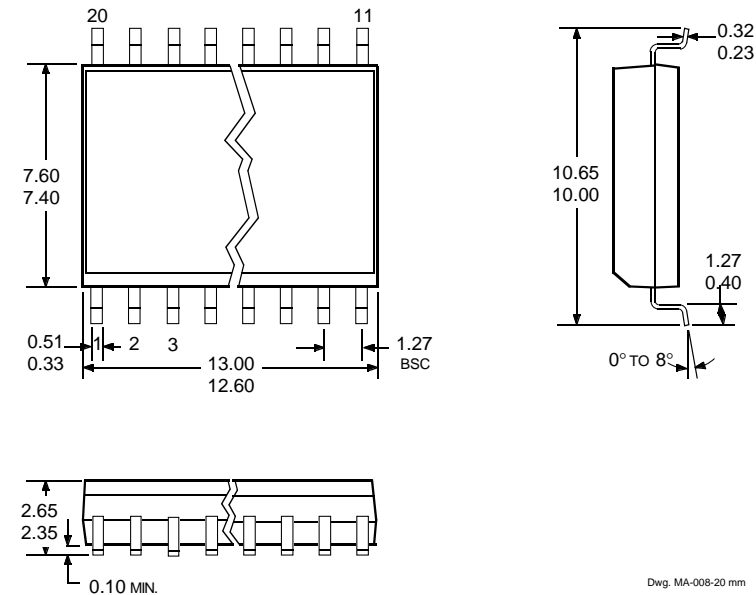
- NOTES: 1. Exact body and lead configuration at vendor's option within limits shown.
2. Lead spacing tolerance is non-cumulative.
3. Supplied in standard sticks/tubes of 41 devices or add "TR" to part number for tape and reel.

2981 THRU 2984 8-CHANNEL SOURCE DRIVERS

A2982SLW and A2984SLW (add "TR" to part number for tape and reel) Dimensions in Inches (for reference only)



Dimensions in Millimeters (controlling dimensions)



- NOTES: 1. Exact body and lead configuration at vendor's option within limits shown.
2. Lead spacing tolerance is non-cumulative.
3. Supplied in standard sticks/tubes of 37 devices or add "TR" to part number for tape and reel.

2981 THRU 2984
8-CHANNEL
SOURCE DRIVERS

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 6810 |
| | 60 | 12 | X | X | active pull-down | – | – | 5811 |
| | 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 |
| | 80 | 8 | X | X | X | – | – | 5890 |
| | -80 | 8 | – | – | X | – | – | 2588 |
| -500 | 6 | 1 | – | – | – | MOSFET | X | 2525 and 2535 |
| | 6 | 2 | – | – | – | MOSFET | X | 2535 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.

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