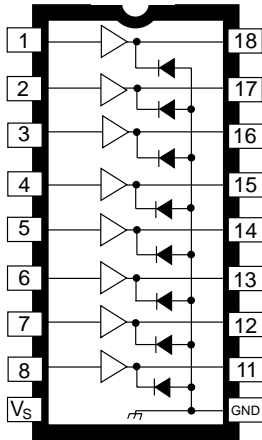# 2981 THRU 2984

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.

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'.
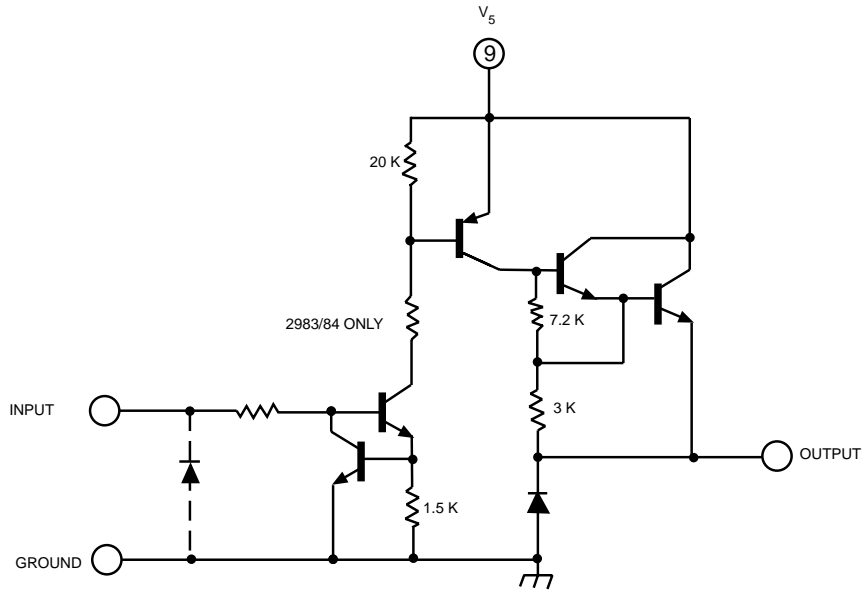
FEATURES

- 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

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**

Always order by complete part number, e.g., **UDN2981A**.
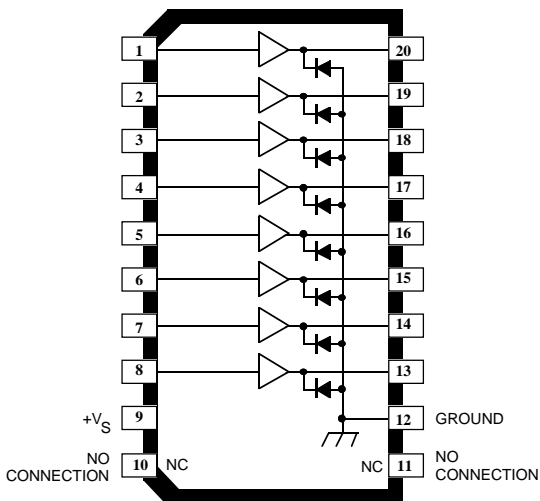Note that all devices are not available in all package styles.

Allegro ®
MicroSystems, Inc.

One of Eight Drivers

V₅

20 K

2983/84 ONLY

INPUT

7.2 K

3 K

OUTPUT

1.5 K

GROUND

Dwg. No. A-10,242B

A2982SLW and A2984SLW

1		20
2		19
3		18
4		17
5		16
6		15
7		14
8		13

+V$_S$ 9 | | 12 GROUND

NO CONNECTION 10 NC | | NC 11 NO CONNECTION

Dwg. PP-064-2

ALLOWABLE PACKAGE POWER DISSIPATION IN WATTS

18-PIN DIP, RθJA = 60°C/W

20-LEAD SOIC, RθJA = 90°C/W

18-LEAD SOIC, RθJA = 94°C/W

AMBIENT TEMPERATURE IN °C

Dwg. GP-022-4A

Allegro® MicroSystems, Inc.
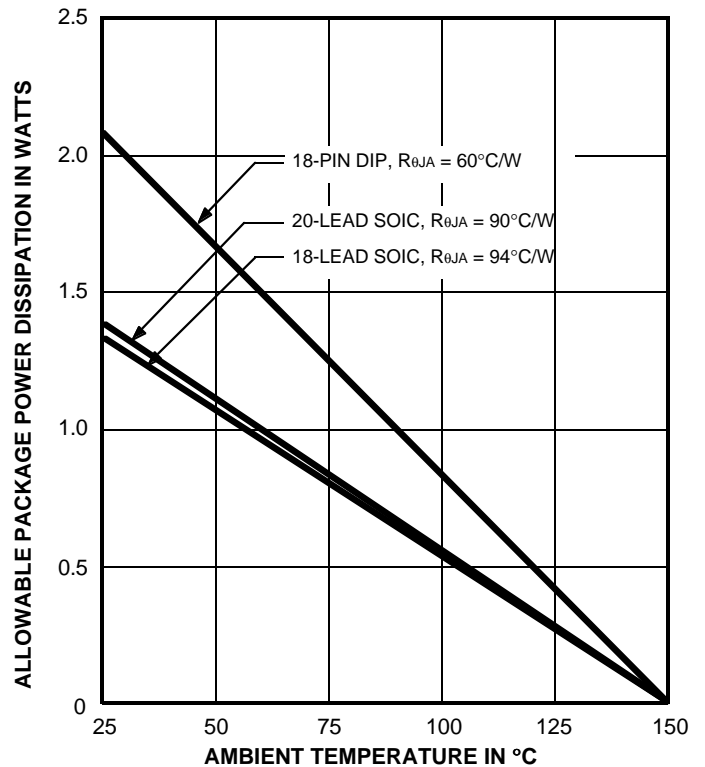
ELECTRICAL CHARACTERISTICS at T_A = +25°C (unless otherwise specified).

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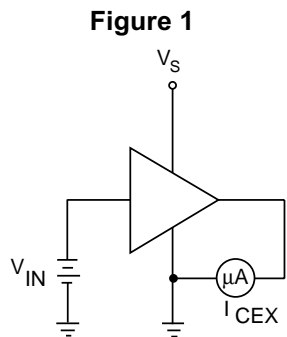
* All inputs simultaneously.

† Complete part number includes a prefix (A or UDN) and a suffix (A or SLW) as follows:
UDN2981A,
UDN2982A, UDN2982LW, or A2982SLW,
UDN2983A,
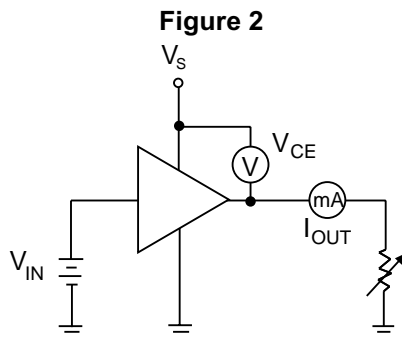UDN2984A, UDN2984LW, or A2984SLW.

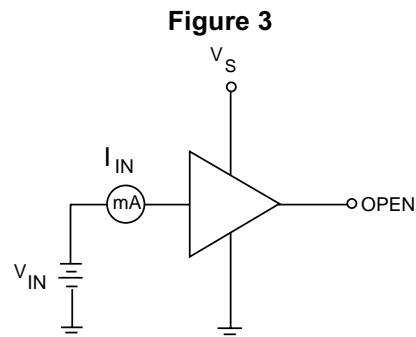**The A2984SLW, UDN2984A, & UDN2984LW are discontinued. Shown for reference only.**

TEST FIGURES

Figure 1

V_S

V_{IN}

I_{CEX}

μA

Dwg. No. A-11,083

Figure 2

V_S

V_{CE}

V

V_{IN}

mA

I_{OUT}

Dwg. No. A-11,084

Figure 3

V_S

I_{IN}

mA

V_{IN}

OPEN

Dwg. No. A-11,085

Figure 4

V_S

I_S mA

V_{IN}

OPEN

Dwg. No. A-11,086

Figure 5

V_S

I_R

μA

V_{IN}

Dwg. No. A-11,087

Figure 6

OPEN

OPEN

V_F

V

I_F

Dwg. No. A-11,088

4
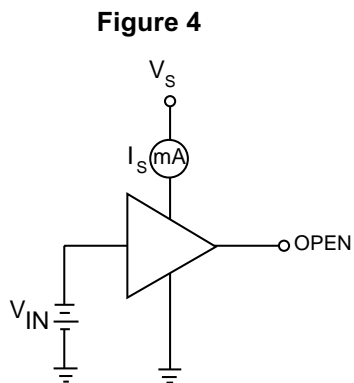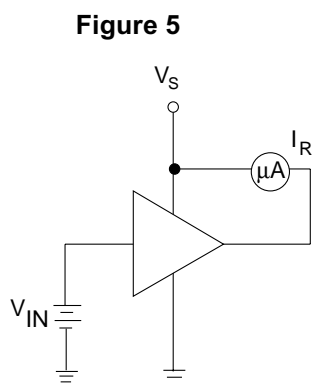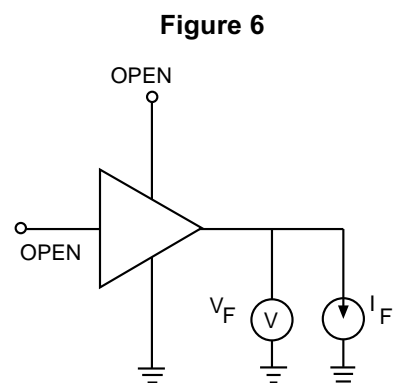
Allowable peak collector current
as a function of duty cycle

Series UDN2980A
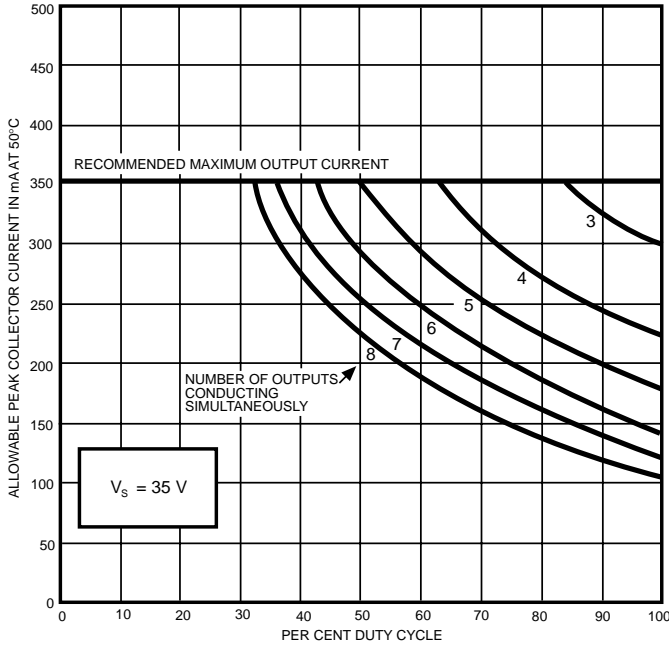
Dwg. No. A-11,106B
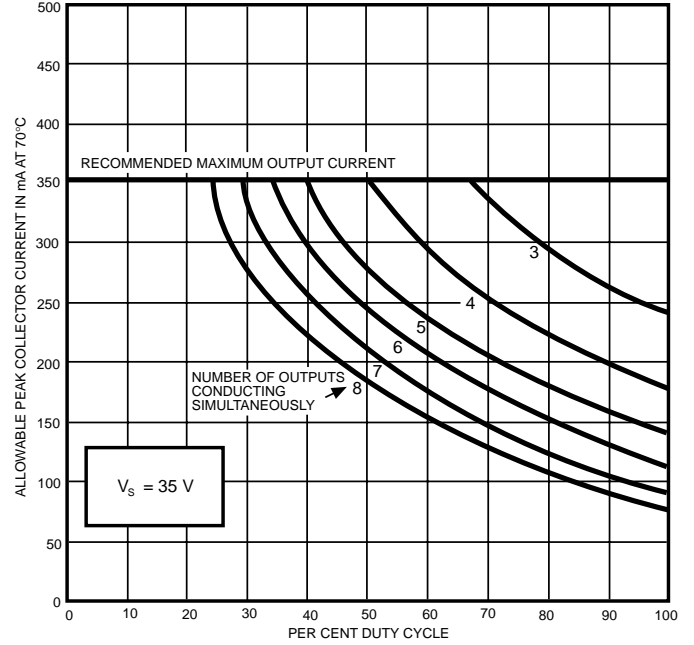
Dwg. No. A-11,111B

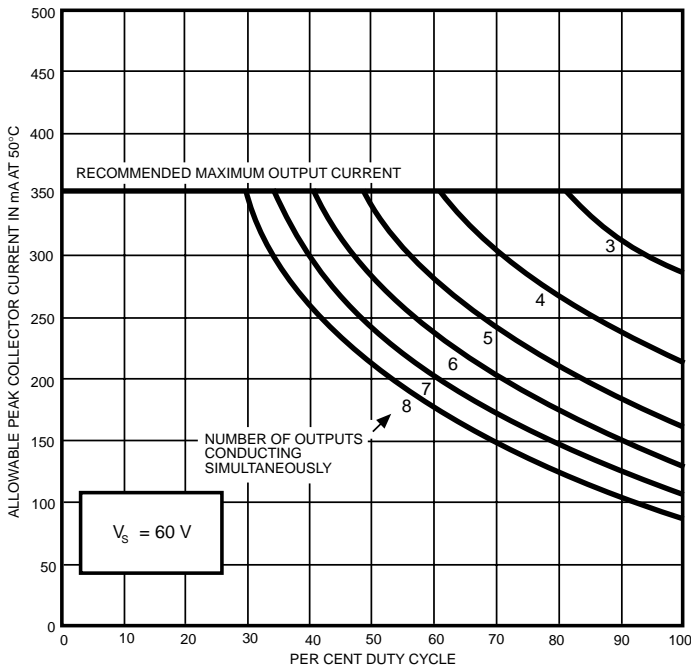### UDN2981A and UDN2982A
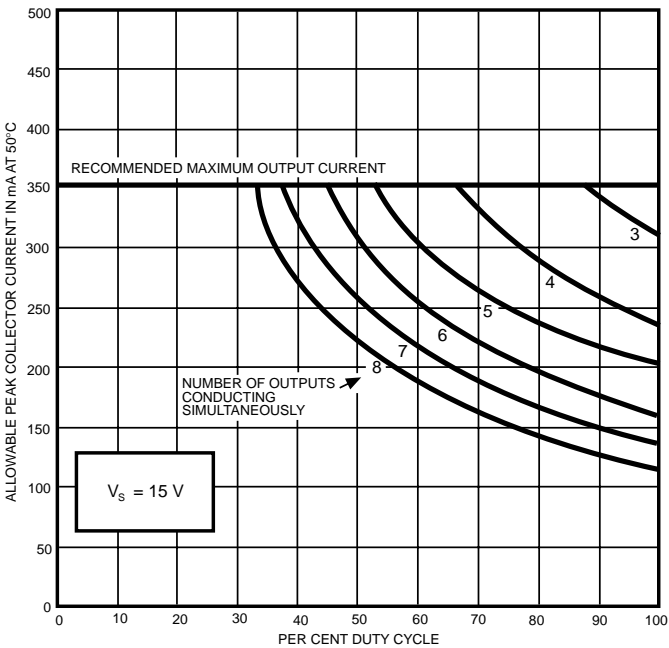
Dwg. No. A-11,107B
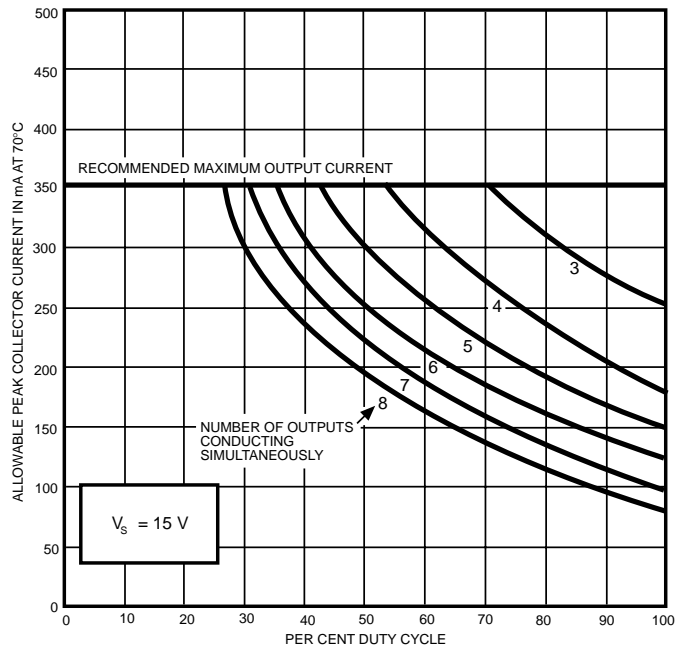
Dwg. No. A-11,108B

Allowable peak collector current as a function of duty cycle
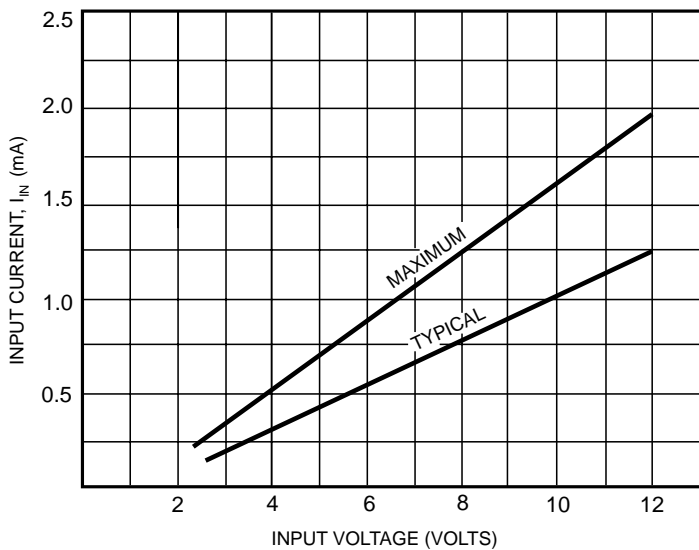
UDN2983A and UDN2984A
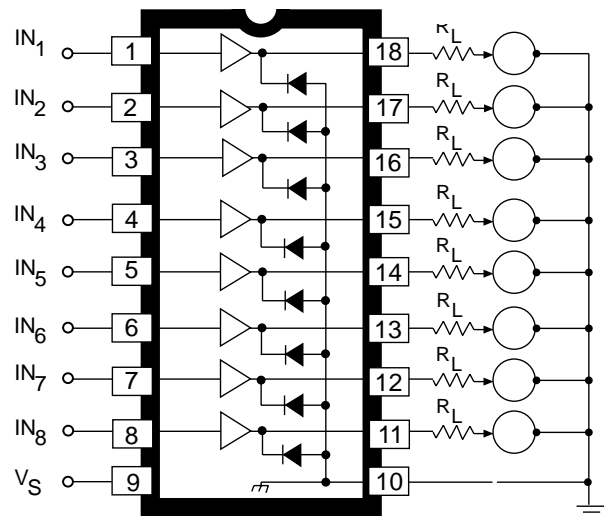

Dwg. No. A-11,109B
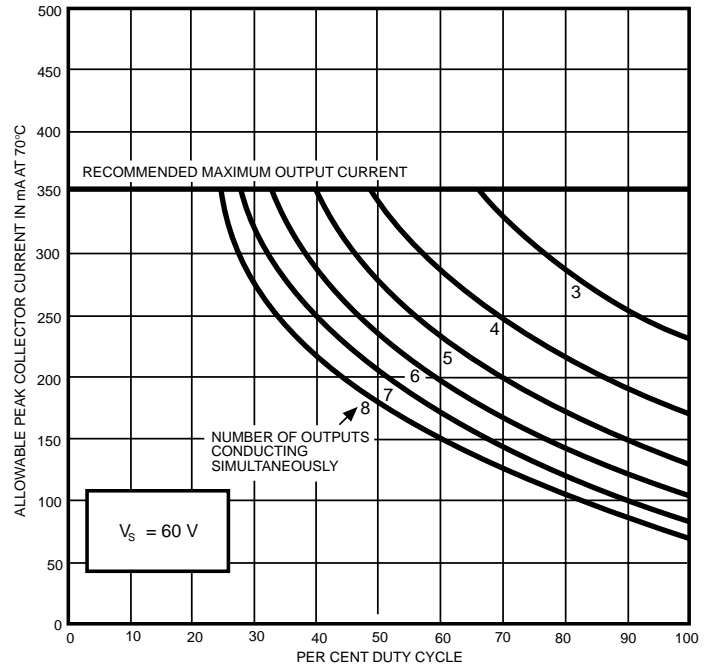
Dwg. No. A-11,110B

Input current as a function of input voltage

Dwg. No. A-11,115B

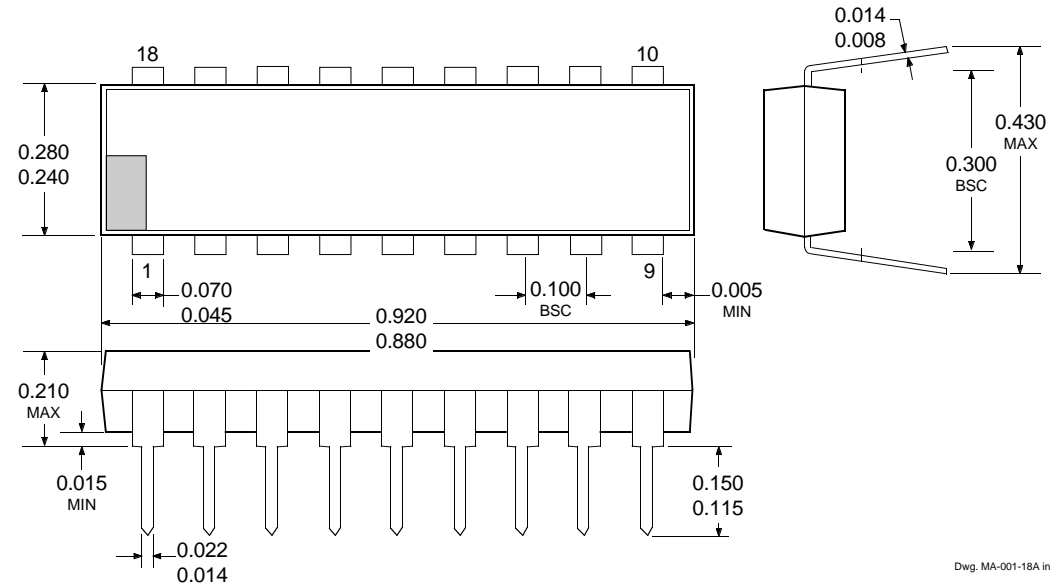## Typical electrosensitive printer application
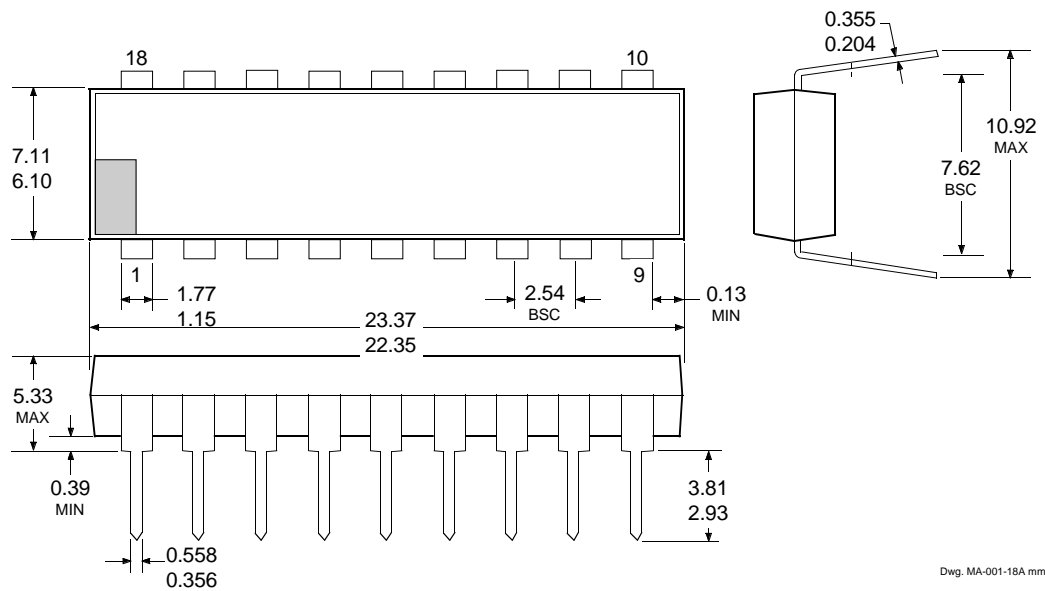

Dwg. No. A-11,113A

UDN2981A, UDN2982A, UDN2983A, and UDN2984A

Dimensions in Inches
(controlling dimensions)

18   10

0.280
0.240

1   9

0.070
0.045

0.100
BSC

0.005
MIN

0.920
0.880

0.014
0.008

0.430
MAX

0.300
BSC

0.210
MAX

0.015
MIN

0.022
0.014

0.150
0.115

Dwg. MA-001-18A in

Dimensions in Millimeters
(for reference only)

18   10

7.11
6.10

1   9

1.77
1.15

2.54
BSC

0.13
MIN

23.37
22.35

0.355
0.204

10.92
MAX

7.62
BSC

5.33
MAX

0.39
MIN
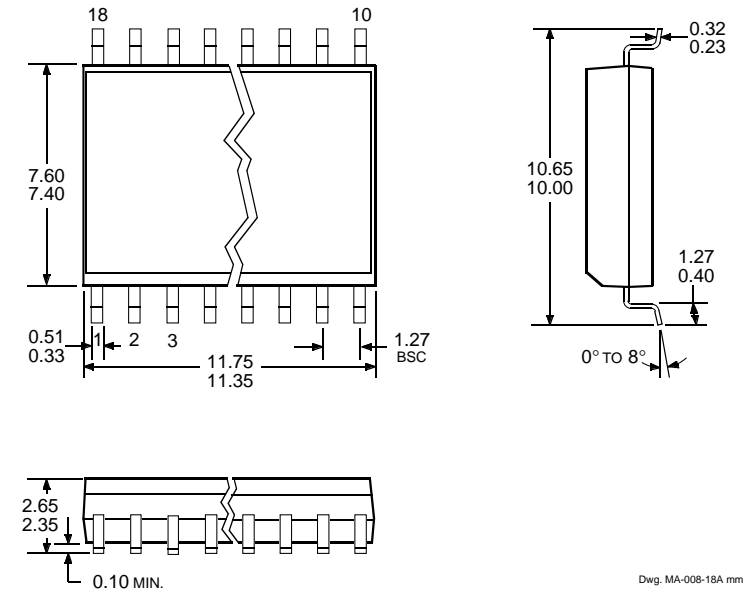
0.558
0.356

3.81
2.93

Dwg. MA-001-18A mm

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.

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

18   10

0.2992
0.2914

0.0125
0.0091

0.419
0.394

0.050
0.016

0° TO 8°

0.020
0.013

1 2 3

0.4625
0.4469

0.050
BSC

0.0926
0.1043

0.0040 MIN.

Dwg. MA-008-18A in

Dimensions in Millimeters
(controlling dimensions)

18   10

7.60
7.40

0.32
0.23

10.65
10.00

1.27
0.40

0° TO 8°

0.51
0.33

1 2 3

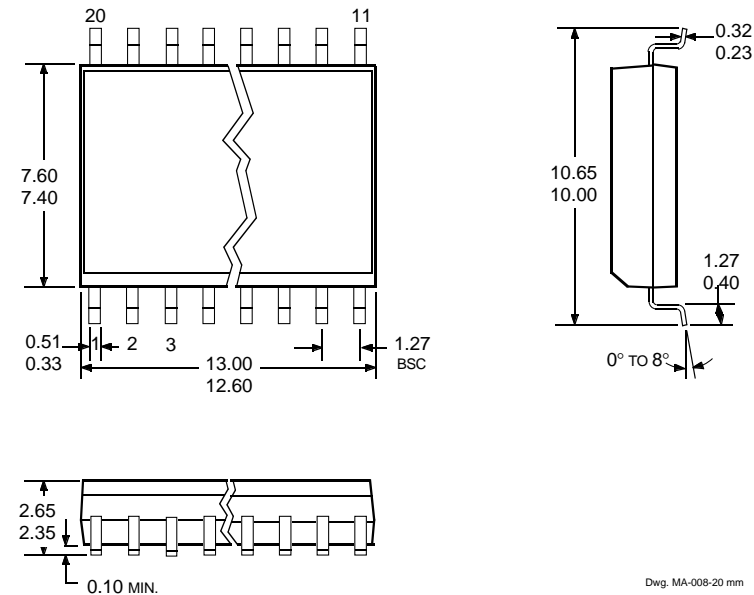11.75
11.35

1.27
BSC

2.65
2.35

0.10 MIN.

Dwg. MA-008-18A mm

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

Allegro® MicroSystems, Inc.

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

A2982SLW and A2984SLW
(add "TR" to part number for tape and reel)
Dimensions in Inches
(for reference only)
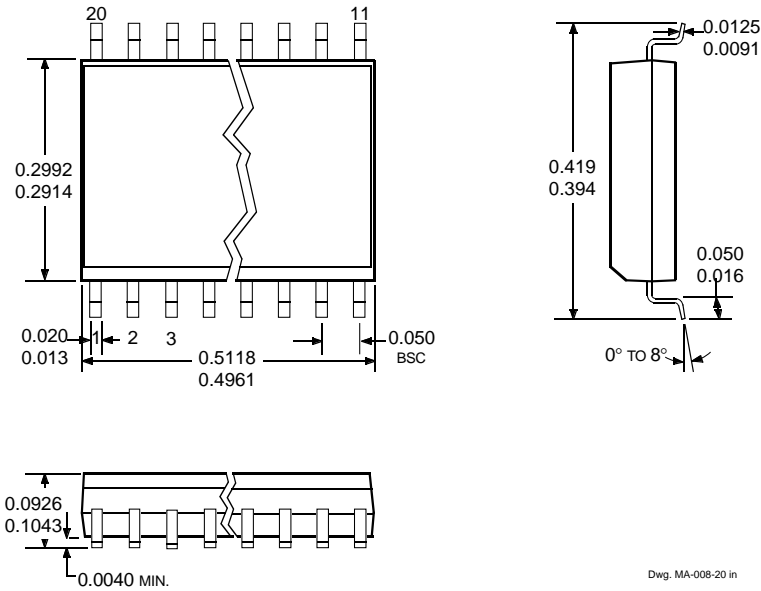
20   11

0.2992
0.2914

0.020   1   2   3   0.050
0.013   0.5118   BSC
              0.4961

0.0125
0.0091

0.419
0.394

0.050
0.016

0° TO 8°

0.0926
0.1043

0.0040 MIN.

Dwg. MA-008-20 in

Dimensions in Millimeters
(controlling dimensions)

20   11

7.60
7.40

0.51   1   2   3   1.27
0.33   13.00   BSC
              12.60

0.32
0.23

10.65
10.00

1.27
0.40

0° TO 8°

2.65
2.35

0.10 MIN.

Dwg. MA-008-20 mm

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

Allegro MicroSystems, Inc.

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