2580, 2585, AND 2588

8-CHANNEL SOURCE DRIVERS

UDN2580A and UDN2585A

Dwg. No. A-11,359

This versatile family of integrated circuits will work with many combinations of logic- and load-voltage levels, meeting interface requirements beyond the capabilities of standard logic buffers. Series UDN2580A and A2580SLW source drivers can drive incandescent, LED, or vacuum fluorescent displays. Internal transient-suppression diodes permit the drivers to be used with inductive loads such as relays, solenoids, dc and stepping motors, and magnetic print hammers.

The Types UDN2580A and A2580SLW are high-current source drivers used to switch the ground ends of loads that are directly connected to a -50 V supply. Typical loads are telephone relays, PIN diodes, and LEDs.

The UDN2585A and A2585SLW are drivers designed for applications requiring low output saturation voltages. Typical loads are low-voltage LEDs and incandescent displays. The eight non-Darlington, 25 V outputs will simultaneously sustain continuous load currents of -120 mA at ambient temperatures to +70°C.

The UDN2588A and A2588SLW have separate logic and driver supply lines. Their eight drivers can serve as an interface between positive logic (TTL, CMOS, PMOS) or negative logic (NMOS) and either negative or split-load supplies to -80 V.

These drivers are packaged in plastic DIPs (suffix A) or surface-mountable wide-body SOICs (suffix LW), and are rated for operation over the temperature range of -20°C to +85°C.

FEATURES

■ TTL, CMOS, PMOS, NMOS Compatible

■ High Output-Current Rating

■ Internal Transient Suppression

■ Efficient Input/Output Structure

■ Through-Hole and Surface-Mount Packages

**The UDN2580A and A2580SLW are discontinued
— shown for reference only.
The UDN2588A and A2588SLW are
last-time buy. Orders accepted until October 28, 2002**

ABSOLUTE MAXIMUM RATINGS

See next page.

Always order by complete part number, e.g., UDN2580A .

_Allegro_ ®
MicroSystems, Inc.

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

	UDN2580A A2580SLW	UDN2585A A2585SLW	UDN2588A A2588SLW
Output Voltage, V_{CE}	50 V	25 V	80 V
Supply Voltage, V_S (ref. sub.)	50 V	25 V	80 V
Supply Voltage, V_{CC} (ref. sub.)	—	—	80 V
Input Voltage, V_{IN} (ref. V_S)	-30 V	-20 V	-30 V
Total Output Current, ($I_C + I_S$)	-500 mA	-250 mA	-500 mA
Substrate Current I_{SUB}	3.0 A	2.0 A	3.0 A

Package Power Dissipation, P_D (single output) . . . . **1.0 W**

(total package) . . . . **See Graph**

Operating Temperature Range, T_A . . . . **-20°C to +85°C**

Storage Temperature Range, T_S . . . .**-55°C to +150°C**
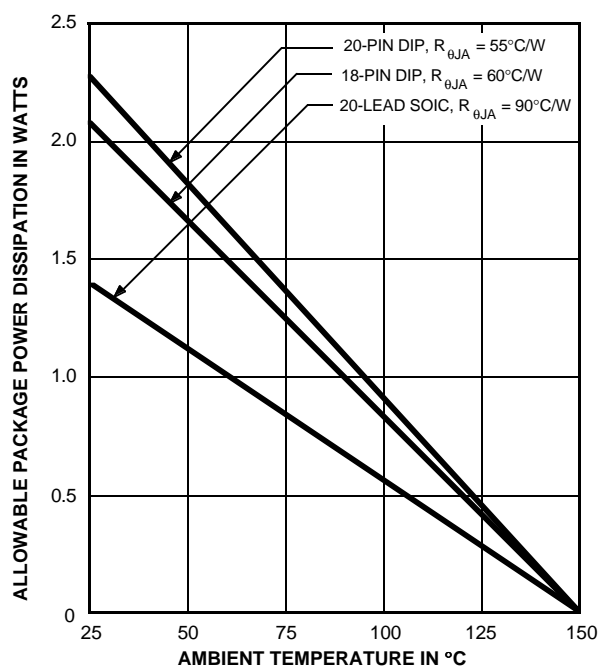
Dwg. GP-022-1A

2580, 2585, AND 2588
8-CHANNEL
SOURCE DRIVERS

For simplification, these devices are characterized on the following pages with specific voltages for inputs, logic supply (V_S), load supply (V_{EE}), and collector supply (V_{CC}). Typical use of the UDN2580A and A2580SLW is with negative-referenced logic. The more common application of the UDN2585A, A2585SLW, UDN2588A and A2588SLW are with positive-referenced logic supplies. In application, the devices are capable of operation over a wide range of logic and supply voltage levels:

TYPICAL OPERATING VOLTAGES

V_S	$V_{IN(ON)}$	$V_{IN(OFF)}$	V_{CC}	$V_{EE(MAX)}$	Device Types
0 V	-15 V to -3.6 V	-0.5 V to 0 V	NA	-25 V	UDN2585A & A2585SLW
				-50 V	UDN2580A & A2580SLW
+5 V	0 V to +1.4 V	+4.5 V to +5 V	NA	-20 V	UDN2585A & A2585SLW
				-45 V	UDN2580A & A2580SLW
			≤ 5 V	-75 V	UDN2588A & A2588SLW
+12 V	0 V to +8.4 V	+11.5 V to +12 V	NA	-13 V	UDN2585A & A2585SLW
				-38 V	UDN2580A & A2580SLW
			≤12 V	-68 V	UDN2588A & A2588SLW
+15 V	0 V to +11.4 V	+14.5 V to +15 V	NA	-10V	UDN2585A & A2585SLW
				-35 V	UDN2580A & A2580SLW
			≤15 V	-65 V	UDN2588A & A2588SLW

NOTE: The substrate must be tied to the most negative point in the external circuit to maintain isolation between drivers and to provide for normal circuit operation.

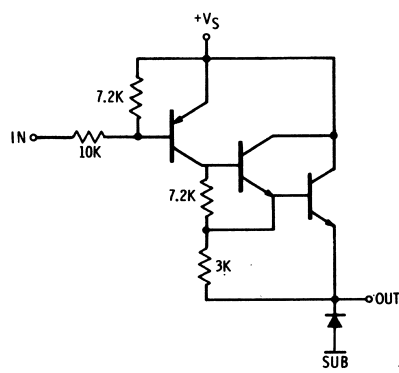www.allegromicro.com

2580, 2585, AND 2588
8-CHANNEL
SOURCE DRIVERS

UDN2580A and A2580SLW
ELECTRICAL CHARACTERISTICS at T_A = +25°C, V_S = 0 V, V_{EE} = -45 V (unless otherwise noted).

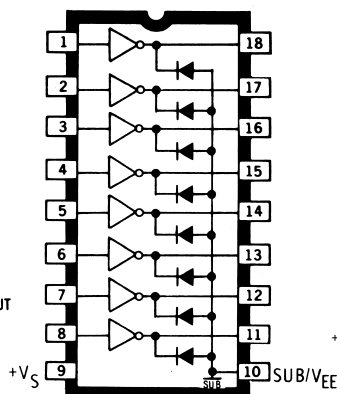| Characteristic	Symbol	Test Conditions	Min.	Max.	Units
Output Leakage Current	I_{CEX}	V_{IN} = -0.5 V, V_{OUT} = V_{EE} = -50 V	—	50	μA
		V_{IN} = -0.4 V, V_{OUT} = V_{EE} = -50 V, T_A = 70°C	—	100	μA
Output Sustaining Voltage	$V_{CE(SUS)}$	V_{IN} = -0.4 V, I_{OUT} = -25 mA, Note 1	35	—	V
Output Saturation Voltage	$V_{CE(SAT)}$	V_{IN} = -2.4 V, I_{OUT} = -100 mA	—	1.8	V
		V_{IN} = -3.0 V, I_{OUT} = -225 mA	—	1.9	V
		V_{IN} = -3.6 V, I_{OUT} = -350 mA	—	2.0	V
Input Current	$I_{IN(ON)}$	V_{IN} = -3.6 V, I_{OUT} = -350 mA	—	-500	μA
		V_{IN} = -15 V, I_{OUT} = -350 mA	—	-2.1	mA
	$I_{IN(OFF)}$	I_{OUT} = -500 μA, T_A = 70°C, Note 3	-50	—	μA
Input Voltage	$V_{IN(ON)}$	I_{OUT} = -100 mA, $V_{CE} \leq$ 1.8 V, Note 4	—	-2.4	V
		I_{OUT} = -225 mA, $V_{CE} \leq$ 1.9 V, Note 4	—	-3.0	V
		I_{OUT} = -350 mA, $V_{CE} \leq$ 2.0 V, Note 4	—	-3.6	V
	$V_{IN(OFF)}$	I_{OUT} = -500 μA, T_A = 70°C	-0.2	—	V
Clamp Diode Leakage Current	I_R	V_R = 50 V, T_A = 70°C	—	50	μA
Clamp Diode Forward Voltage	V_F	I_F = 350 mA	—	2.0	V
Input Capacitance	C_{IN}		—	25	pF
Turn-On Delay	t_{PHL}	0.5 E_{IN} to 0.5 E_{OUT}	—	5.0	μs
Turn-Off Delay	t_{PLH}	0.5 E_{IN} to 0.5 E_{OUT}	—	5.0	μs

NOTES:
1. Pulsed test, $t_p \leq$ 300 μs, duty cycle ≤ 2%.

2. Negative current is defined as coming out of the specified device pin.

3. The $I_{IN(OFF)}$ current limit guarantees against partial turn-on of the output.

4. The $V_{IN(ON)}$ voltage limit guarantees a minimum output source current per the specified conditions.

5. The substrate must always be tied to the most negative point and must be at least 4.0 V below V_S.
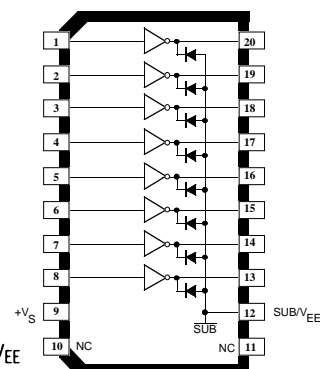
PARTIAL SCHEMATIC

Dwg. No. A-11,358

UDN2580A

Dwg. No. A-11,359

A2580SLW

Dwg. PP-064

UDN2585A and A2585SLW
ELECTRICAL CHARACTERISTICS at T_A = +25°C, V_S = 0 V, V_{EE} = -20 V (unless otherwise noted).

Characteristic	Symbol	Test Conditions	Min.	Max.	Units
Output Leakage Current	I_{CEX}	V_{IN} = -0.5 V, V_{OUT} = V_{EE} = -25 V	—	50	µA
		V_{IN} = -0.4 V, V_{OUT} = V_{EE} = -25 V, T_A = 70°C	—	100	µA
Output Sustaining Voltage	$V_{CE(SUS)}$	V_{IN} = -0.4 V, I_{OUT} = -25 mA, Note 1	15	—	V
Output Saturation Voltage	$V_{CE(SAT)}$	V_{IN} = -4.6 V, I_{OUT} = -60 mA	—	1.1	V
		V_{IN} = -4.6 V, I_{OUT} = -120 mA	—	1.2	V
Input Current	$I_{IN(ON)}$	V_{IN} = -4.6 V, I_{OUT} = -120 mA	—	-1.6	mA
		V_{IN} = -14.6 V, I_{OUT} = -120 mA	—	-5.0	mA
Input Voltage	$V_{IN(ON)}$	I_{OUT} = -120 mA, V_{CE} ≤1.2 V, Note 3	—	-4.6	V
	$V_{IN(OFF)}$	I_{OUT} = -100 µA, T_A = 70°C	-0.4	—	V
Clamp Diode Leakage Current	I_R	V_R = 25 V, T_A = 70°C	—	50	µA
Clamp Diode Forward Voltage	V_F	I_F = 120 mA	—	2.0	V
Input Capacitance	C_{IN}		—	25	pF
Turn-On Delay	t_{PHL}	0.5 E_{IN} to 0.5 E_{OUT}	—	5.0	µs
Turn-Off Delay	t_{PLH}	0.5 E_{IN} to 0.5 E_{OUT}	—	5.0	µs

NOTES: 1. Pulsed test, t_p ≤ 300 µs, duty cycle ≤ 2%.
2. Negative current is defined as coming out of the specified device pin.
3. The $V_{IN(ON)}$ voltage limit guarantees a minimum output source current per the specified conditions.
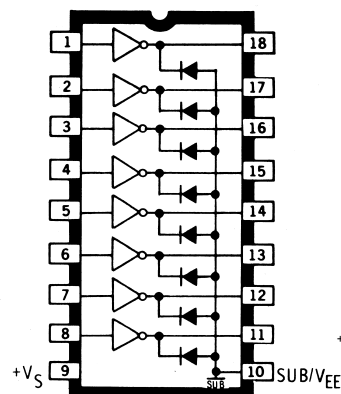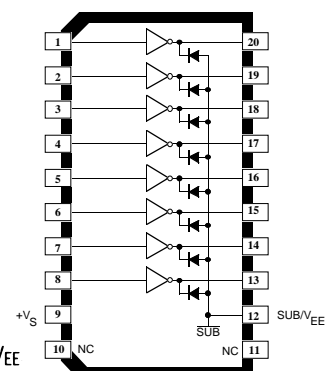4. The substrate must always be tied to the most negative point and must be at least 4.0 V below V_S.

PARTIAL SCHEMATIC   **UDN2585A**   **A2585SLW**
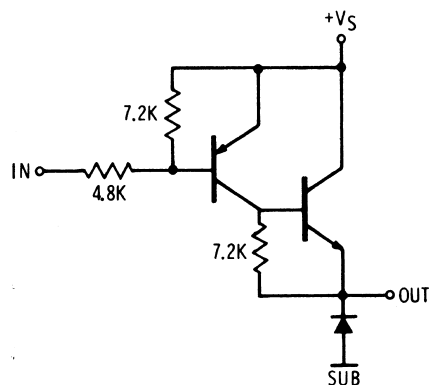
Dwg. No. A-11,360   Dwg. No. A-11,359   Dwg. PP-064

UDN2588A and A2588SLW
ELECTRICAL CHARACTERISTICS at T_A = +25°C, V_S = 5.0 V, V_{CC} = 5.0 V, V_{EE} = -40 V
(unless otherwise noted).

Characteristic	Symbol	Test Conditions	Min.	Max.	Units
			Limits		
Output Leakage Current	I_{CEX}	$V_{IN} \geq 4.5$ V, $V_{OUT} = V_{EE} = -75$ V	—	50	µA
Output Sustaining Voltage	$V_{CE(SUS)}$	$V_{IN} \geq 4.6$ V, $V_{EE} = -70$ V, $I_{OUT} = -25$ mA, Note 1	50	—	V
Output Saturation Voltage	$V_{CE(SAT)}$	$V_{IN} = 2.6$ V, $I_{OUT} = -100$ mA, Ref. V_{CC}	—	1.8	V
		$V_{IN} = 2.0$ V, $I_{OUT} = -225$ mA, Ref. V_{CC}	—	1.9	V
		$V_{IN} = 1.4$ V, $I_{OUT} = -350$ mA, Ref. V_{CC}	—	2.0	V
Input Current	$I_{IN(ON)}$	$V_{IN} = 1.4$ V, $I_{OUT} = -350$ mA	—	-500	µA
		$V_S = 15$ V, $V_{EE} = -30$ V, $V_{IN} = 0$ V, $I_{OUT} = -350$ mA	—	-2.1	mA
	$I_{IN(OFF)}$	$I_{OUT} = -500$ µA, $T_A = 70$°C, Note 3	-50	—	µA
Input Voltage	$V_{IN(ON)}$	$I_{OUT} = -100$ mA, $V_{CE} \leq 1.8$ V, Note 4	—	2.6	V
		$I_{OUT} = -225$ mA, $V_{CE} \leq 1.9$ V, Note 4	—	2.0	V
		$I_{OUT} = -350$ mA, $V_{CE} \leq 2.0$ V, Note 4	—	1.4	V
	$V_{IN(OFF)}$	$I_{OUT} = -500$ µA	4.8	—	V
Clamp Diode Leakage Current	I_R	$V_R = 80$ V	—	50	µA
Clamp Diode Forward Voltage	V_F	$I_F = 350$ mA	—	2.0	V
Input Capacitance	C_{IN}		—	25	pF
Turn-On Delay	t_{PLH}	0.5 E_{IN} to 0.5 E_{OUT}	—	5.0	µs
Turn-Off Delay	t_{PLH}	0.5 E_{IN} to 0.5 E_{OUT}	—	5.0	µs

NOTES: 1. Pulsed test, $t_p \leq 300$ µs, duty cycle $\leq$ 2%.

2. Negative current is defined as coming out of the specified device pin.

3. The $I_{IN(OFF)}$ current limit guarantees against partial turn-on of the output.

4. The $V_{IN(ON)}$ voltage limit guarantees a minimum output source current per the specified conditions.
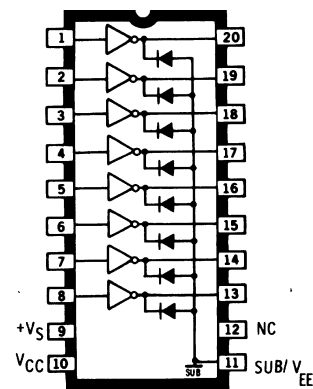
5. The substrate must always be tied to the most negative point and must be at least 4.0 V below V_S.

6. V_{CC} must be equal to or less positive than V_S.
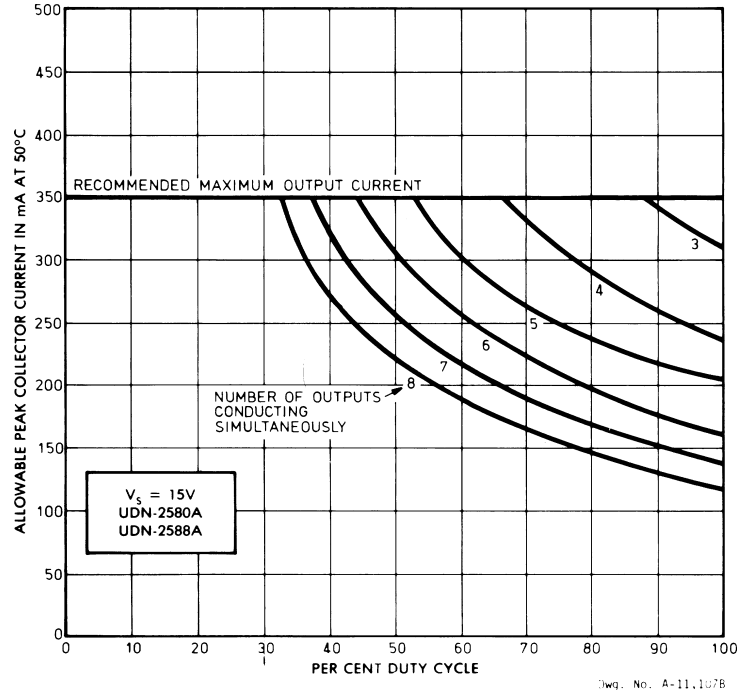
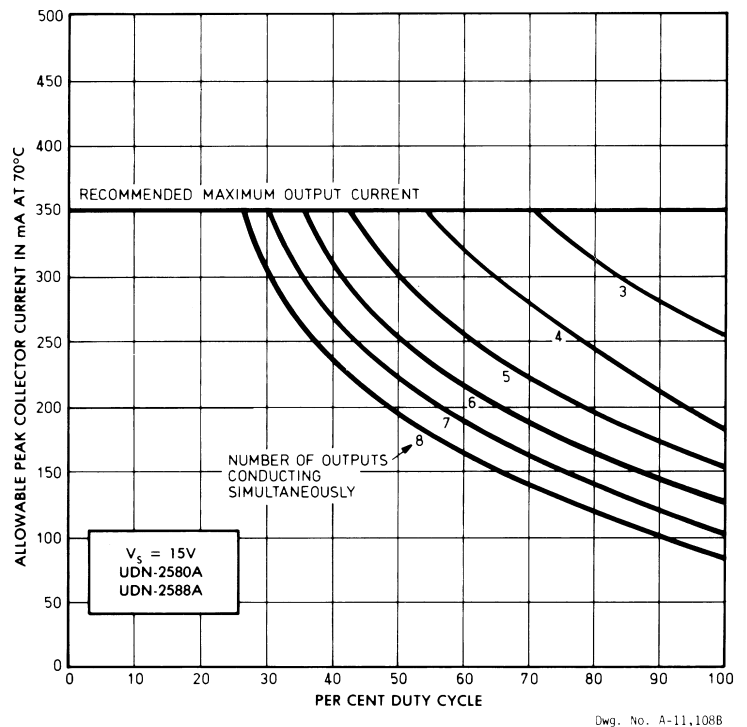## PARTIAL SCHEMATIC
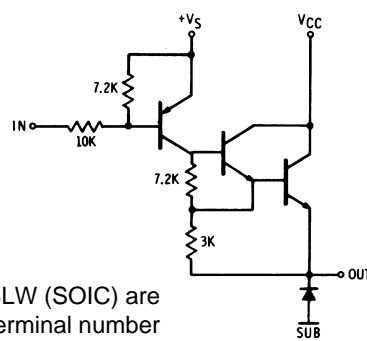
Dwg. No. A-11,361

Dwg. No. A-11,357

Note the UDN2588A (DIP) and the A2588SLW (SOIC) are electrically identical and share a common terminal number assignment.

ALLOWABLE PEAK COLLECTOR CURRENT AT 50°C AS A FUNCTION OF DUTY CYCLE

Dwg. No. A-11,107B

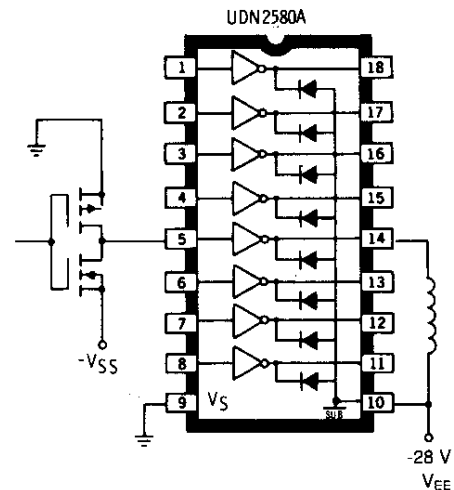## ALLOWABLE PEAK COLLECTOR CURRENT AT 70°C AS A FUNCTION OF DUTY CYCLE

Dwg. No. A-11,108B

TYPICAL APPLICATIONS
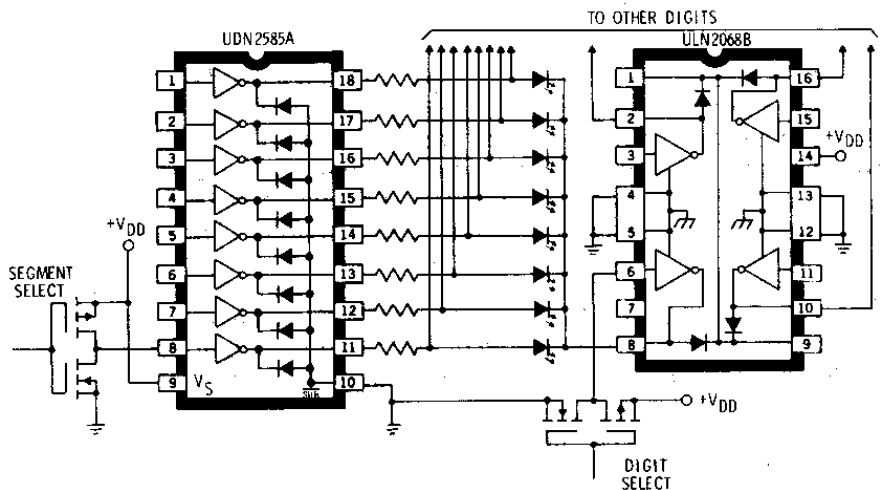
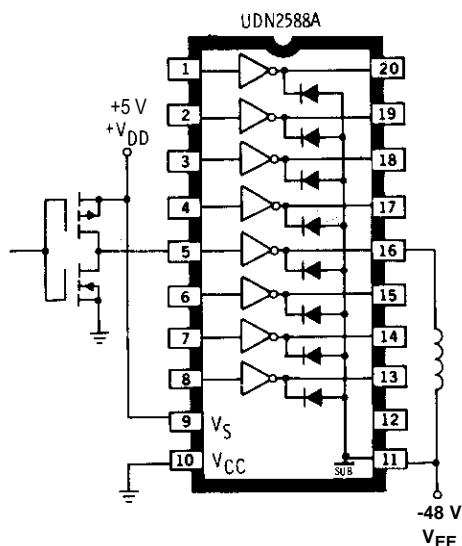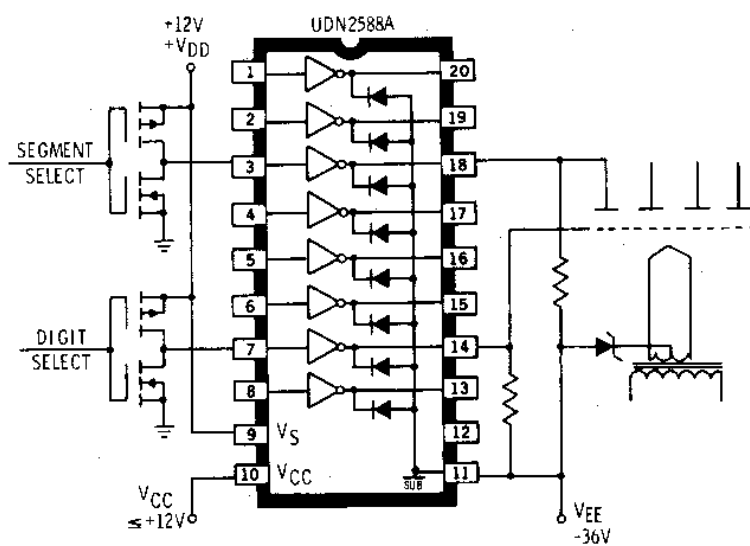**COMMON-CATHODE LED DRIVER**

Dwg. No. A-11,356

**TELECOMMUNICATIONS
RELAY DRIVER
(Negative Logic)**

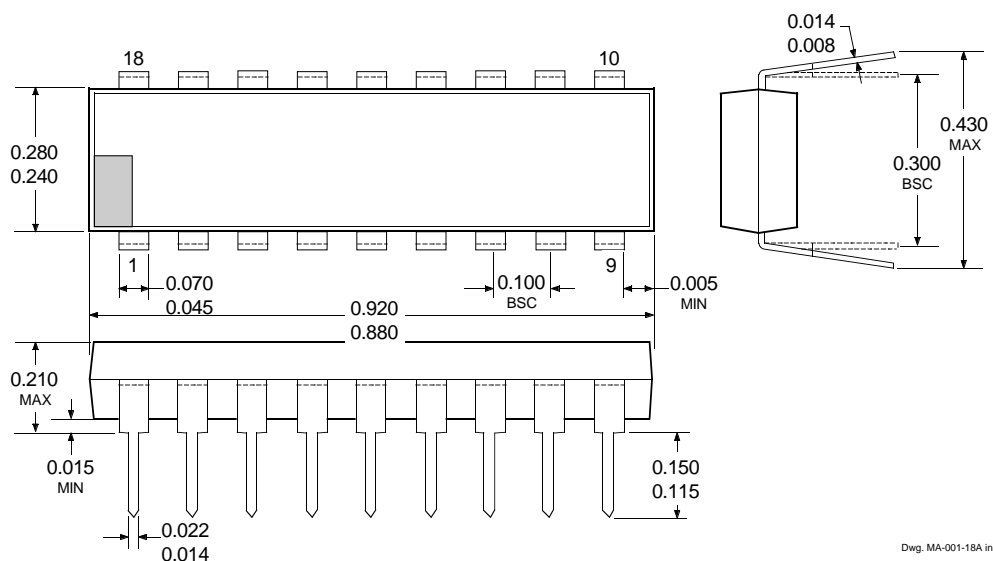Dwg. No. A-11,362A

**TELECOMMUNICATIONS RELAY DRIVER
(Positive Logic)**

Dwg. No. A-11,363
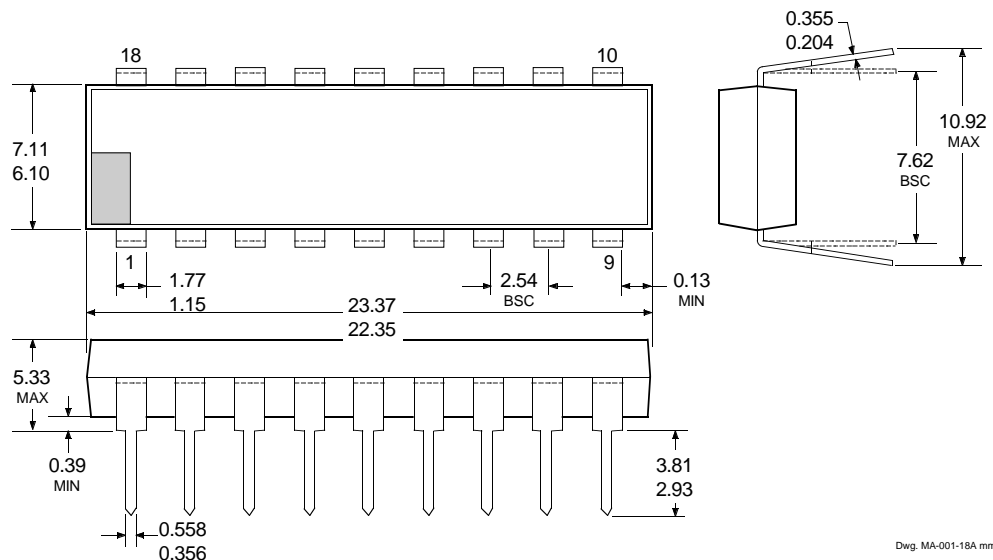
**VACUUM-FLUORESCENT DISPLAY DRIVER
(Split Supply)**

UDN2580A and UDN2585A

Dimensions in Inches
(controlling dimensions)

18   10

0.280
0.240

1

0.014
0.008

0.430
MAX

0.300
BSC

0.070
0.045

0.100
BSC

9

0.005
MIN

0.920
0.880

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

0.355
0.204

10.92
MAX

7.62
BSC

1.77
1.15

2.54
BSC

9

0.13
MIN

23.37
22.35

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.
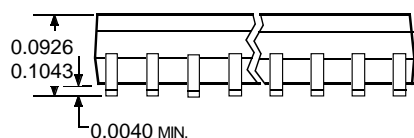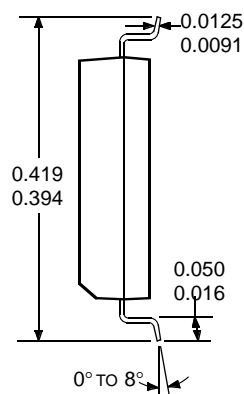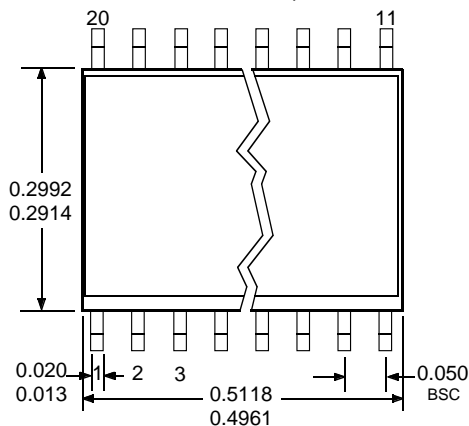4. Supplied in standard sticks/tubes of 21 devices.

A2580SLW, A2585SLW, and A2588SLW
(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.
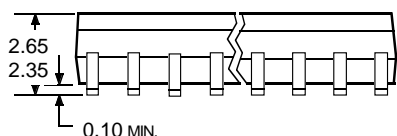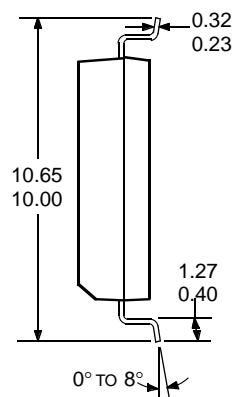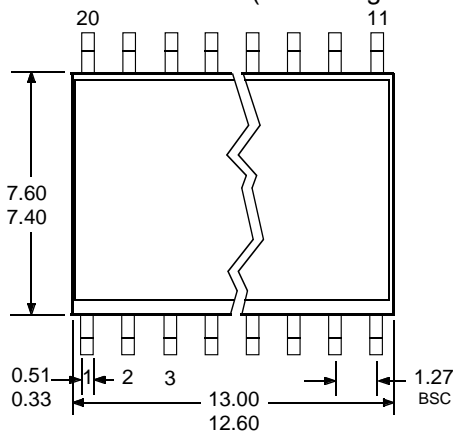
Dwg. MA-008-20 mm

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.
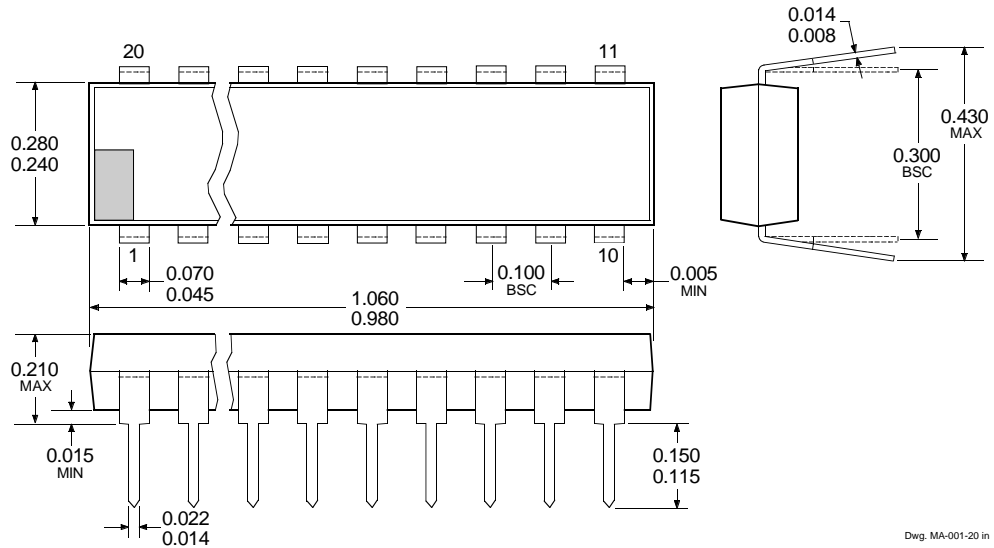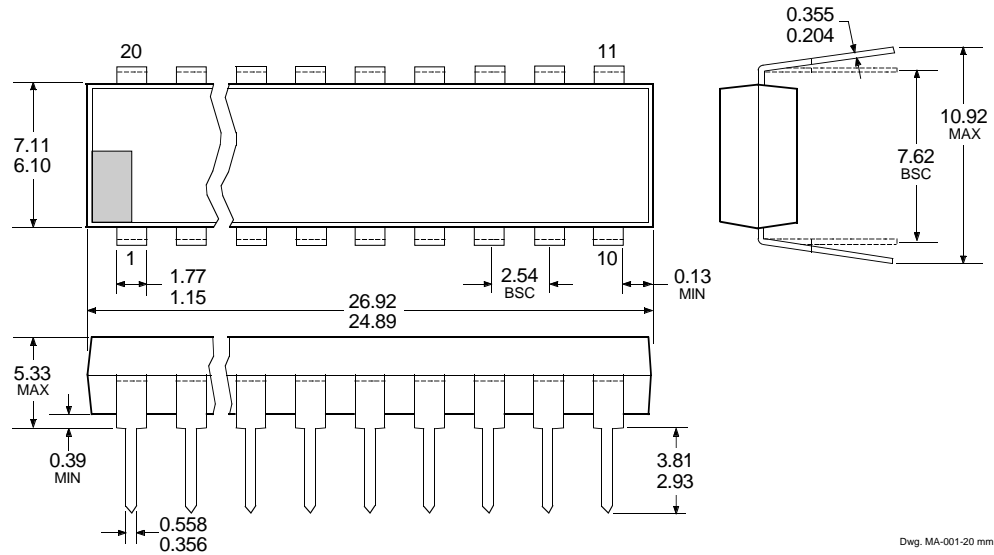
UDN2588A

Dimensions in Inches
(controlling dimensions)

Dwg. MA-001-20 in

Dimensions in Millimeters
(for reference only)

Dwg. MA-001-20 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 18 devices.

2580, 2585, AND 2588
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.

Find price and stock options from leading distributors for 2580 on Findchips.com:

https://findchips.com/search/2580