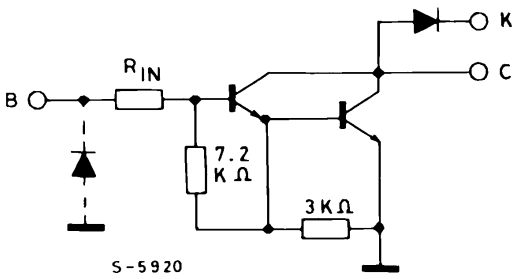
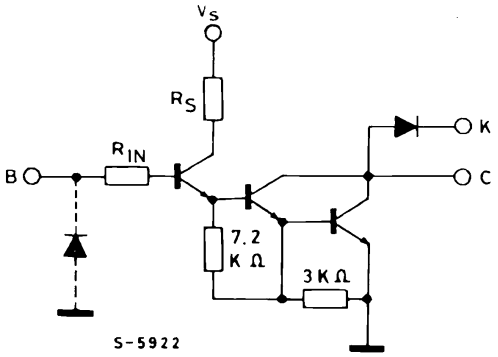
Contents

1 Diagram

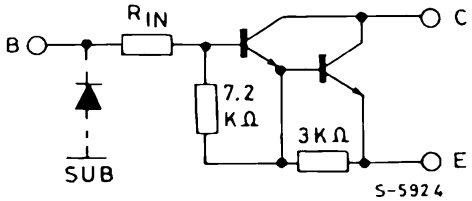
Figure 1. Schematic diagrams



ULN2064B: R_{IN} = 350Ω
ULN2066B: R_{IN} = 3kΩ



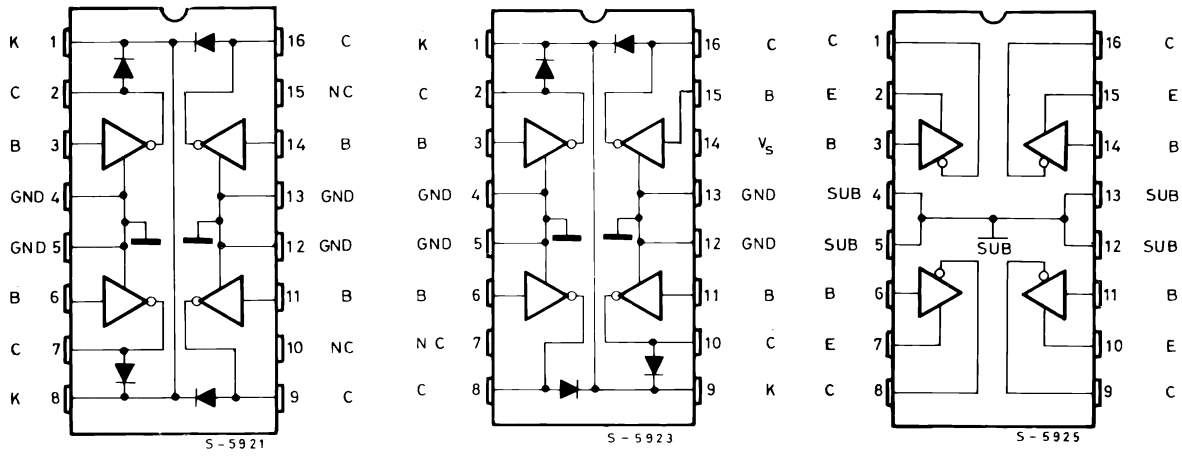
ULN2068B: R_{IN} = 2.5kΩ, R_S = 900Ω



ULN2074B: R_{IN} = 350Ω

2 Pin configuration

Figure 2. Pin connections (top view)



ULN2064B
ULN2066B

ULN2068B

ULN2074B

3 Maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CEX}	Output voltage	50	V
$V_{CE(SUS)}$	Output sustaining voltage	35	V
I_O	Output current	1.75	A
V_I	Input voltage ULN2066B - 2074B	30	V
	Input voltage ULN2064B - 2068B	15	
I_I	Input current	25	mA
V_S	Supply voltage for ULN2068B	10	V
P_{TOT}	Power dissipation at T_{PINS} = 90 °C	4.3	W
	Power dissipation at T_{AMB} = 70 °C	1	
T_{AMB}	Operating ambient temperature range	- 20 to 85	°C
T_{STG}	Storage temperature	- 55 to 150	°C

4 Electrical characteristics

Table 3. Electrical characteristics (T_A = 25 °C unless otherwise specified).

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
I_{CEX}	Output leakage current (*Figure 5*)	V_{CE} = 50V, T_A = 25°C			100	µA
		V_{CE} = 50V, T_A = 70°C			500	
$V_{CE(SUS)}$	Collector-emitter sustaining voltage (*Figure 4*)	I_C = 100mA, V_I = 0.4V	35			V
$V_{CE(SAT)}$	Collector-emitter saturation voltage (*Figure 5*)	I_C = 500mA, I_B = 325µA			1.1	V
		I_C = 750mA, I_B = 935µA			1.2	
		I_C = 1A, I_B = 1.25mA			1.3	
		I_C = 1.25A, I_B = 2mA			1.4	
$I_{I(ON)}$	Input current (*Figure 6*)	for ULN2064B and ULN2074B V_I = 2.4V V_I = 3.75V	 1.4 3.3		 4.3 9.6	mA
		for ULN2066B, V_I = 5V V_I = 12V	 0.6 1.7		 1.8 5.2	
		for ULN2068B, V_I = 2.75V V_I = 3.75V			 0.55 1.0	
$V_{I(ON)}$	Input voltage (*Figure 7*)	V_{CE}= 2V, I_C = 1A ULN2064B, ULN2074B, ULN2066B V_{CE}= 2V, I_C = 1.5A ULN2064B, ULN2074B, ULN2066B ULN2068B			 2 6.5 2.5 10 2.75	V
I_S	Supply current (*Figure 10*)	for ULN2068B, V_I = 2.75V, I_C = 500mA			6	mA
t_{PLH}	Turn-on delay time	0.5 V_I to 0.5V_O			1	µs
t_{PHL}	Turn-off delay time	0.5 V_I to 0.5V_O			1.5	µs
I_R	Clamp diode leakage current (*Figure 8*)	For ULN2064B - ULN2066B - ULN2068B, V_R = 50V T_A = 25°C T_A = 70°C			 50 100	µA
V_F	Clamp diode forward voltage (*Figure 9*)	For ULN2064B - ULN2066B - ULN2068B I_F = 1A I_F = 1.5A			 1.75 2	V

Note: Input voltage is with reference to the substrate (no connection to any other pins) for the ULN2074B reference is ground for all other types.

Note: 1 Input current may be limited by maximum allowable input voltage.

5 Test circuits

Figure 3. Output leakage current

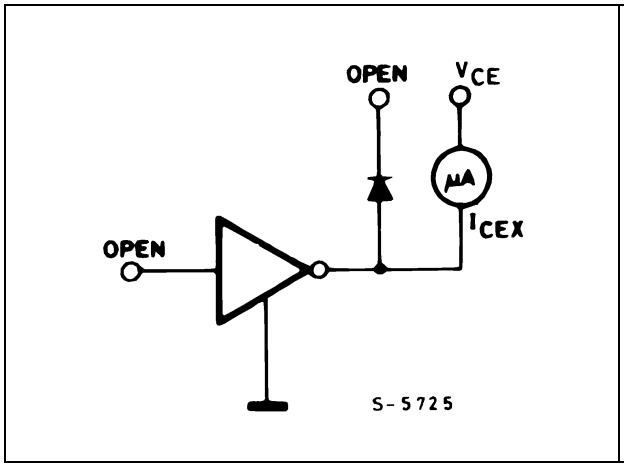


Figure 4. Collector-emitter sustaining voltage

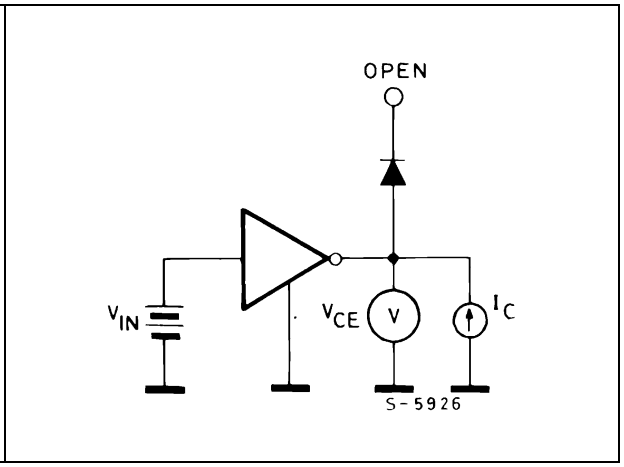


Figure 5. Collector-emitter saturation voltage

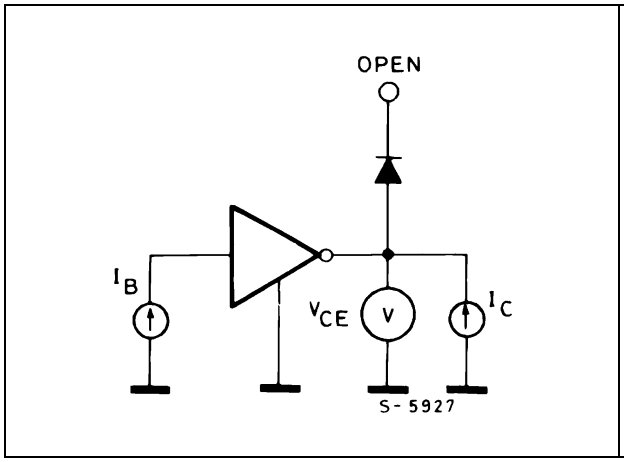


Figure 6. Input current (ON)

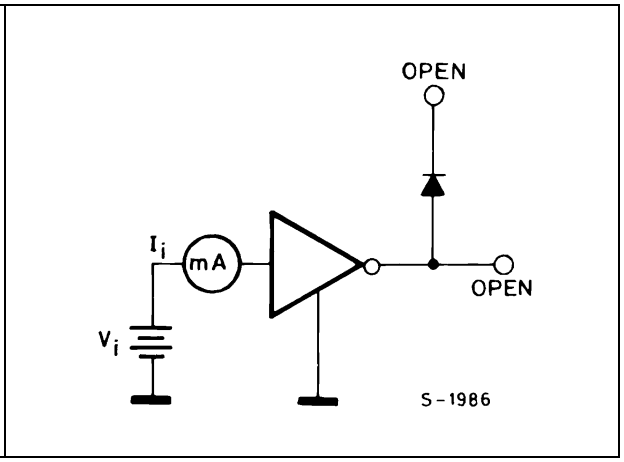


Figure 7. Input voltage

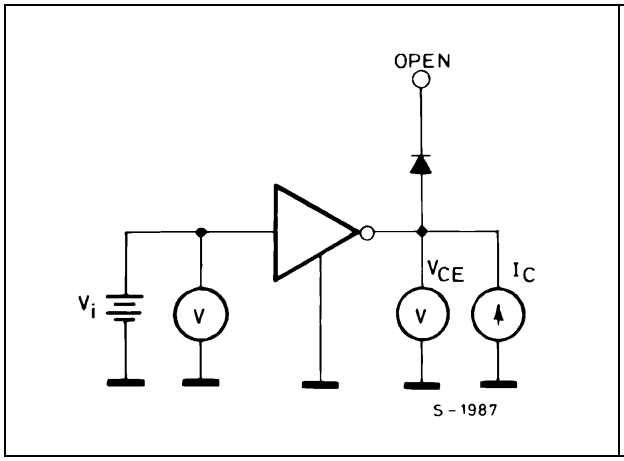


Figure 8. Clamp diode leakage current

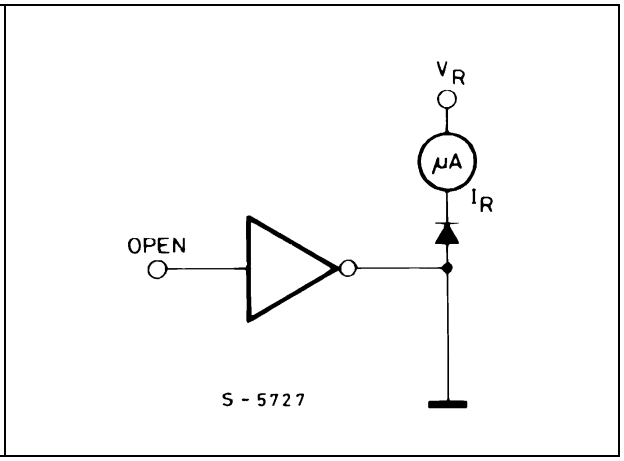


Figure 9. Clamp diode forward voltage

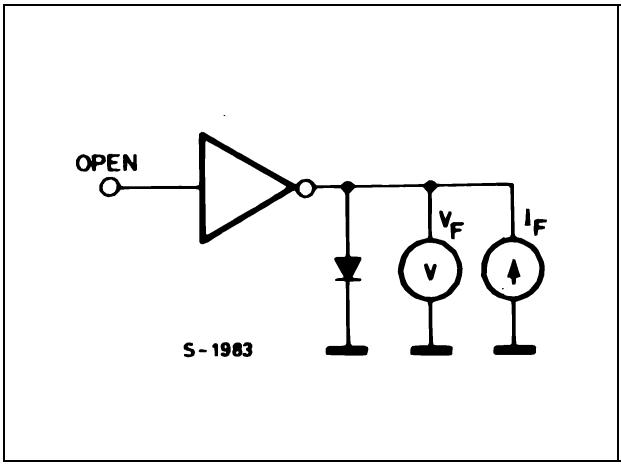


Figure 10. Supply current

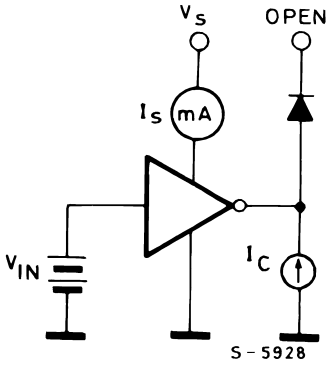


Figure 11. Input current as a function of input voltage

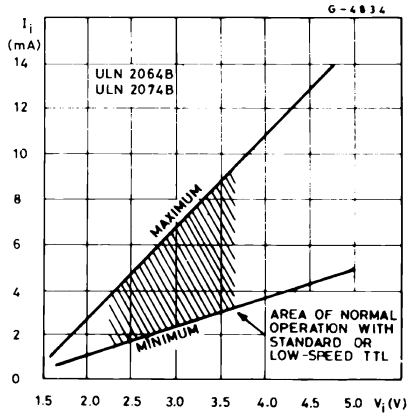


Figure 12. Input current as a function of input voltage

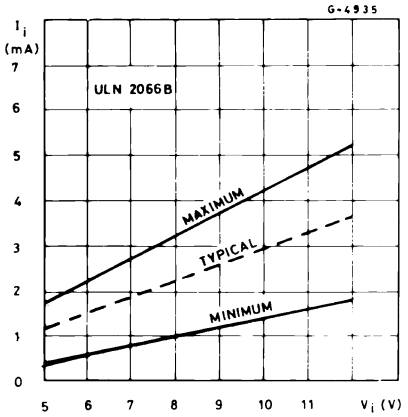
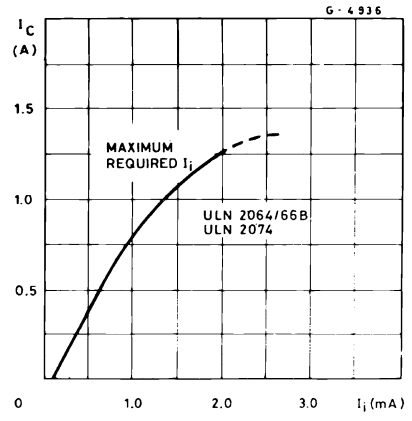


Figure 13. Collector current as a function of input current



6 Mounting instructions

The R_{thJA} can be reduced by soldering the GND pins to a suitable copper area of the printed circuit board (*Figure 14*) or to an external heatsink (*Figure 15*).

The diagram of *Figure 16* shows the maximum dissipated power P_{TOT} and the R_{thJA} as a function of the side "α" of two equal square copper areas having a thickness of 35 µ (1.4 mils).

During soldering the pins temperature must not exceed 260 °C and the soldering time must not be longer than 12 seconds.

The external heatsink or printed circuit copper area must be connected to electrical ground.

Figure 14. Example of P.C. board area which is used as heatsink

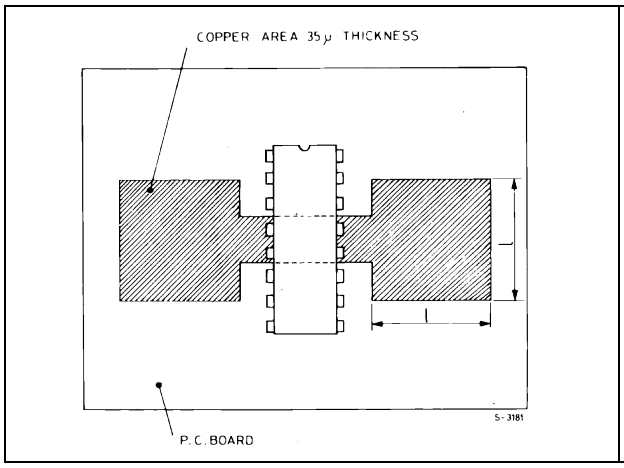


Figure 15. External heatsink mounting example

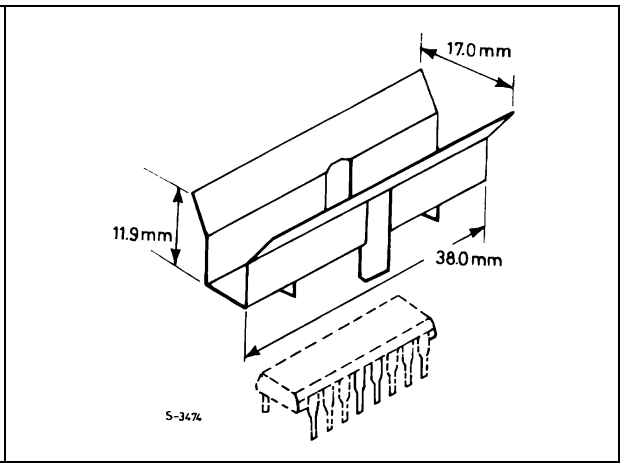


Figure 16. Maximum dissipated power and junction to ambient thermal resistance vs. side "α"

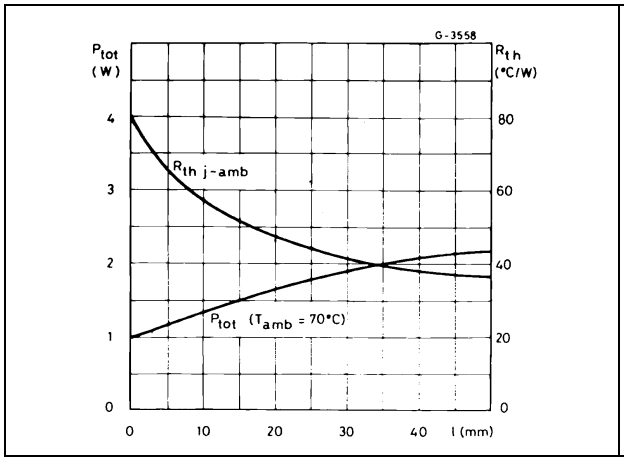
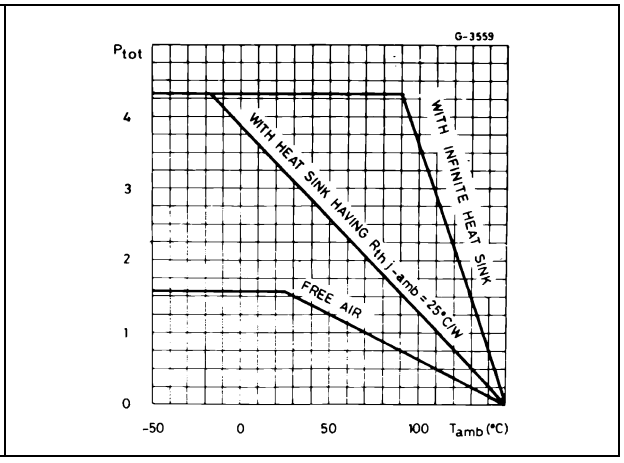


Figure 17. Maximum allowable power dissipation vs. ambient temperature



7 Typical applications

Figure 18. Common-anode LED drivers

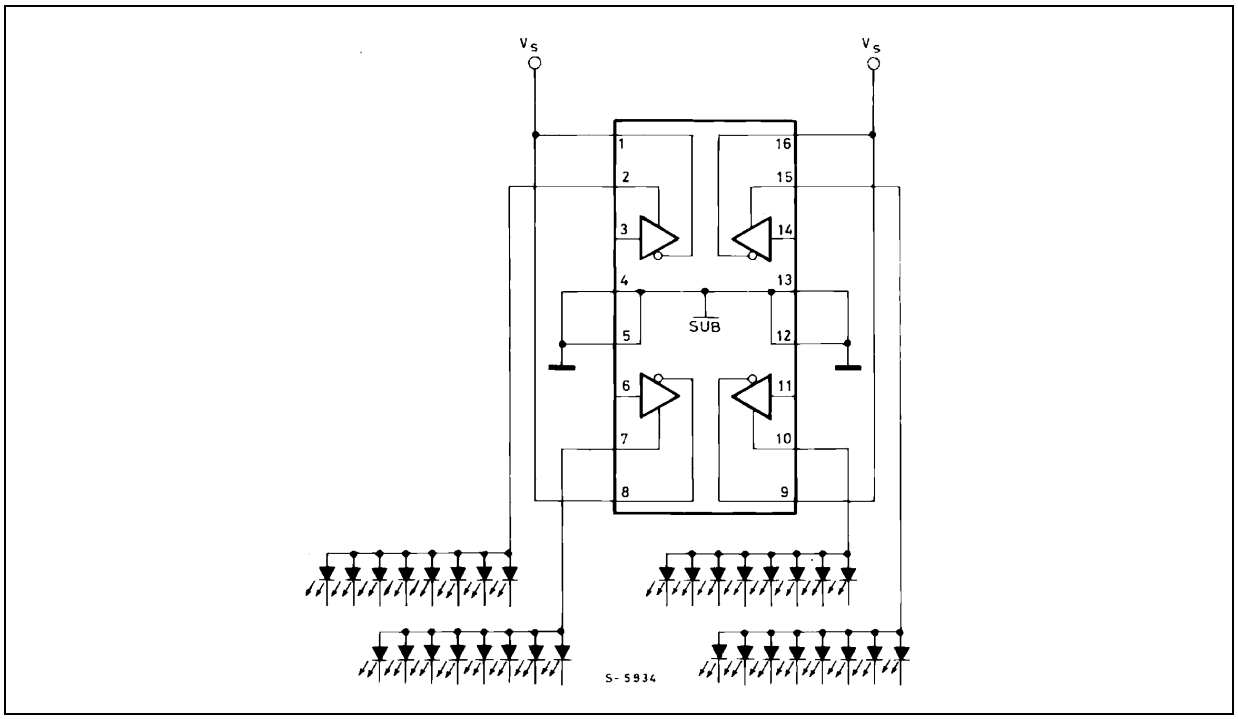
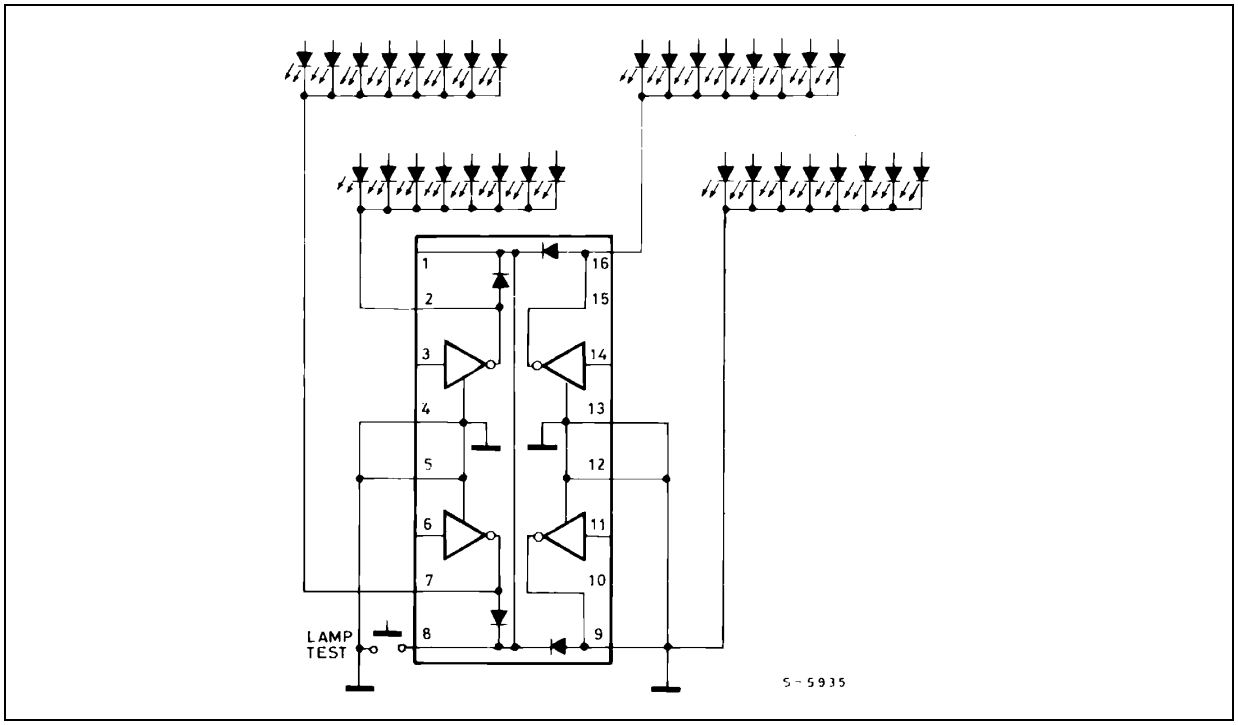


Figure 19. Common-cathode LED drivers

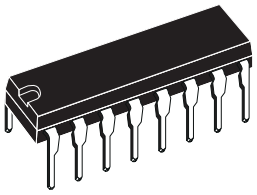


8 Package mechanical data

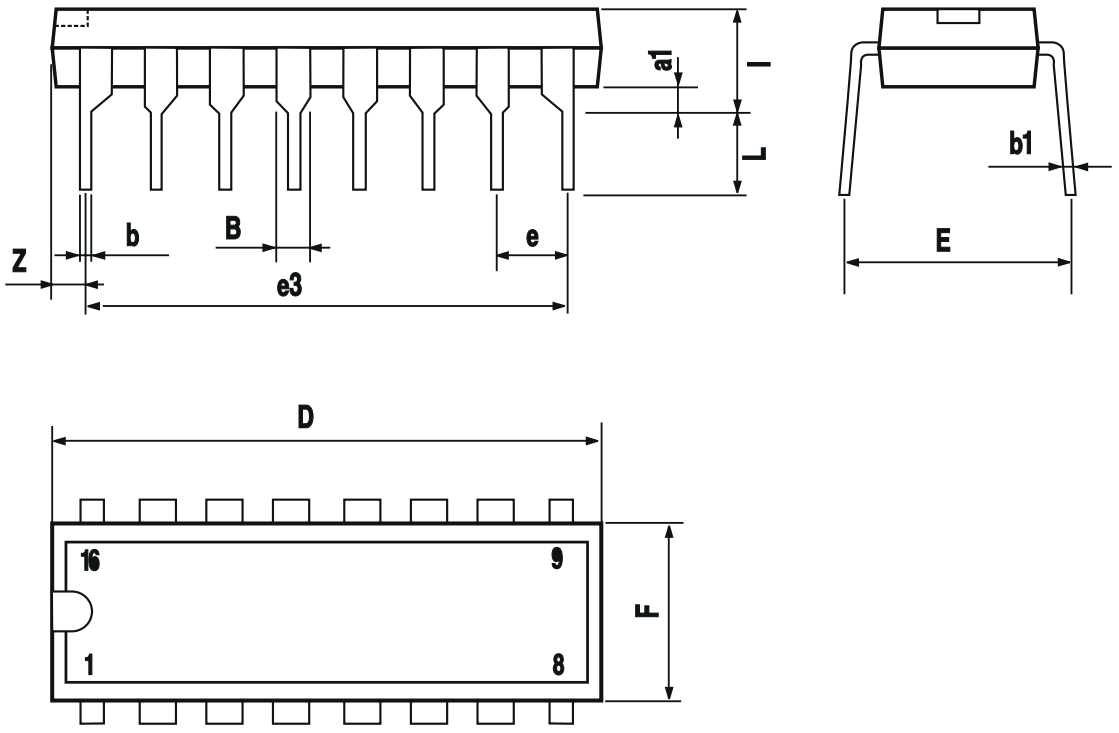
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

Dim.	mm			inch.		
	Min.	Typ.	Max.	Min.	Typ.	Max.
a1	0.51			0.020		
B	0.85		1.40	0.033		0.055
b		0.50			0.020	
b1	0.38		0.50	0.015		0.020
D			20.0			0.787
E		8.80			0.346	
e		2.54			0.100	
e3		17.78			0.700	
F			7.10			0.280
I			5.10			0.201
L		3.30			0.130	
Z			1.27			0.050

OUTLINE AND MECHANICAL DATA



PowerDIP-16



9 Revision history

Table 4. Document revision history

Date	Revision	Changes
12-Sep-2003	1	First release
22-Jan-2009	2	Modified *Table 1 on page 1*.