

**Interface circuit - relay and lamp-driver****Features**

- High output current
- Adjustable short-circuit protection
- Thermal protection with hysteresis to avoid the intermediate output levels
- Large supply voltage range: + 8V to +45V

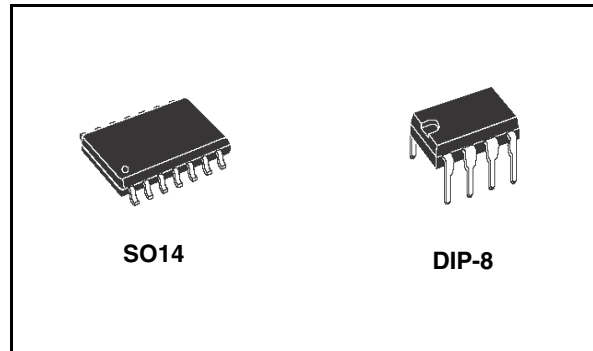
**Description**

The TDE1737 is a monolithic amplifier designed for high current and high voltage applications, specifically to drive lamps, relays and control of stepper motors.

This device is essentially blow-out proof. Current limiting is available to limit the peak output current to a safe value, the adjustment only requires one external resistor. In addition, thermal shut down is provided to keep the I.C. from overheating. If internal dissipation becomes too great, the driver will shut down to prevent excessive heating.

The output is also protected against short-circuits with the positive power supply.

The device operates over a wide range of supply voltages from standard  $\pm 15$  V operational amplifier supplies down to the single + 12 V or + 24 used for industrial electronic systems

**Order codes**

Part number	Temp range, °C	Package	Packing
TDE1737DP	-25°C to +85°C	DIP-8	Tube
TDE1737FP	-25°C to +85°C	SO14	Tube
TDE1737FPT	-25°C to +85°C	SO14	Tape and reel

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# 1 Maximum ratings

## 1.1 Absolute maximum ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	Value	Unit
$V_S$	Supply Voltage	50	V
$V_I$	Input Voltage	50	V
VID	Differential Input Voltage	50	V
$I_O$	Output Current	1000	mA
$P_{tot}$	Power Dissipation	Internally Limited	W
Toper	Operating Free-air Temperature Range for TDE1737	- 25 to + 85	°C
$T_{STG}$	Storage Temperature Range	- 65 to + 150	°C

## 1.2 Thermal data

Table 2. Thermal data

Symbol	Description	Value	Unit
$R_{thJA}$	Thermal Resistance Junction-ambient (DIP-8) Max.	120	°C/W
$R_{thJC}$	Thermal Resistance Junction-case (DIP-8) Max.	50	°C/W
	Junction-ceramic substrate (case glued to substrate)	90	°C/W

## 2 Electrical characteristics

$25^{\circ}\text{C} \leq T_A \leq +85^{\circ}\text{C}$ ,  $+8\text{V} \leq V_{CC} \leq +45\text{V}$ ,  $I_O \leq 300\text{mA}$ ,  $T_J \leq +150^{\circ}\text{C}$  (unless otherwise specified)

**Table 3. Electrical characteristics**

Symbol	Parameter	Min.	Typ.	Max.	Unit
$V_{IO}$	Input Offset Voltage <sup>(1)</sup>	–	2	50	mV
$I_{IB}$	Input Bias Current	–	0.1	1.5	mA
$I_{CC}$	Supply Current ( $V_{CC} = +24\text{V}$ , $I_O = 0$ )	–	3	5	mA
VCM	Common-mode Input Voltage Range	2	–	$V_{CC}-2$	V
ISC	Short-circuit Current Limit ( $R_{SC} = 1.5\Omega$ , $T_{CASE} = +25^{\circ}\text{C}$ )	–	500	–	mA
$V_{CC}-V_O$	Output Saturation Voltage (output low) ( $V_I^+ - V_I \leq 50\text{mV}$ , $I_O = 300\text{mA}$ , $R_{SC} = 0$ )	–	1	1.5	V
$I_{OL}$	Output Leakage Current (output high) ( $V_O = V_{CC} = +24\text{V}$ , $T_A = +25^{\circ}\text{C}$ )	–	–	10	mA

1. The offset voltage given is the maximum value of input voltage required to drive the output voltage within 2V of the ground or the supply voltage.
2. Devices bonded on a 40 cm<sup>2</sup> glass-epoxy printed circuit 0.15cm thick with 4 cm<sup>2</sup> of cooper.

### 3 Pin connections and schematic diagrams

Figure 1. Pin connections (top views)

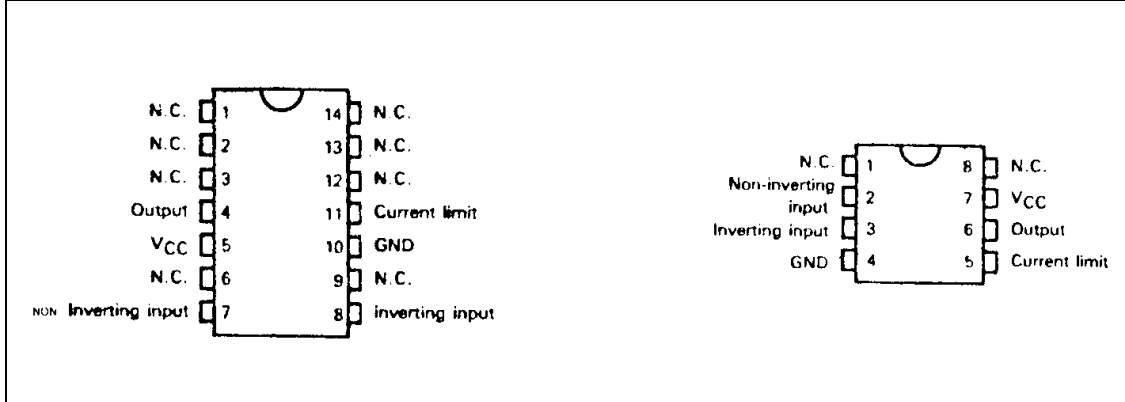
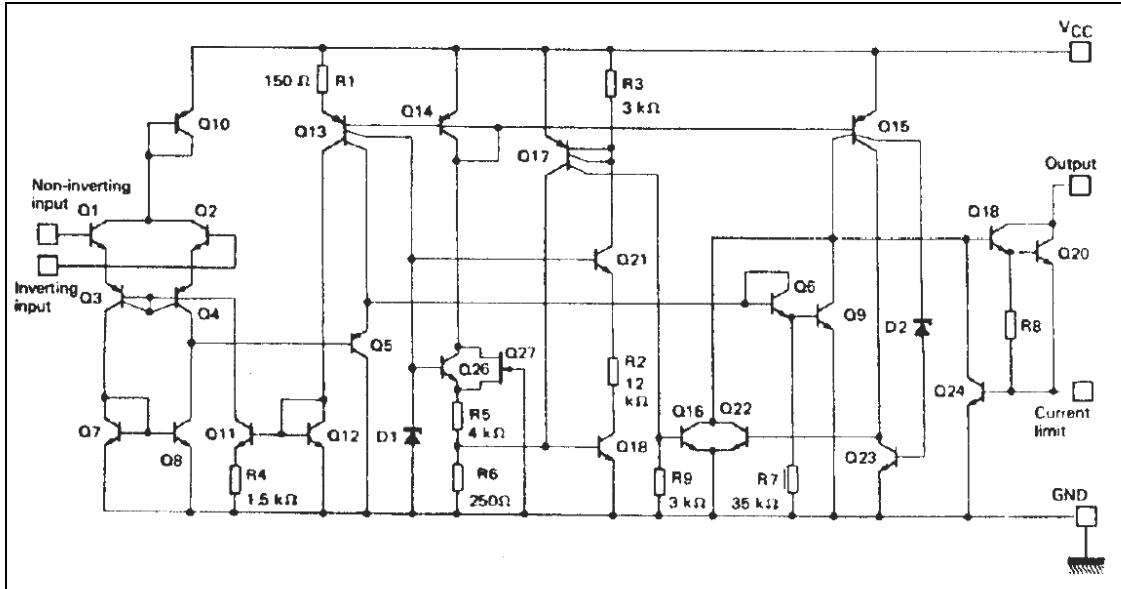
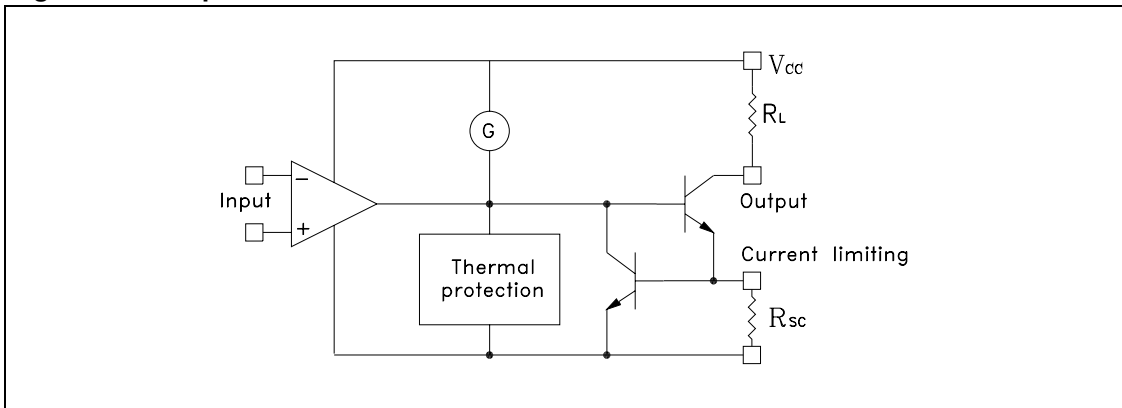


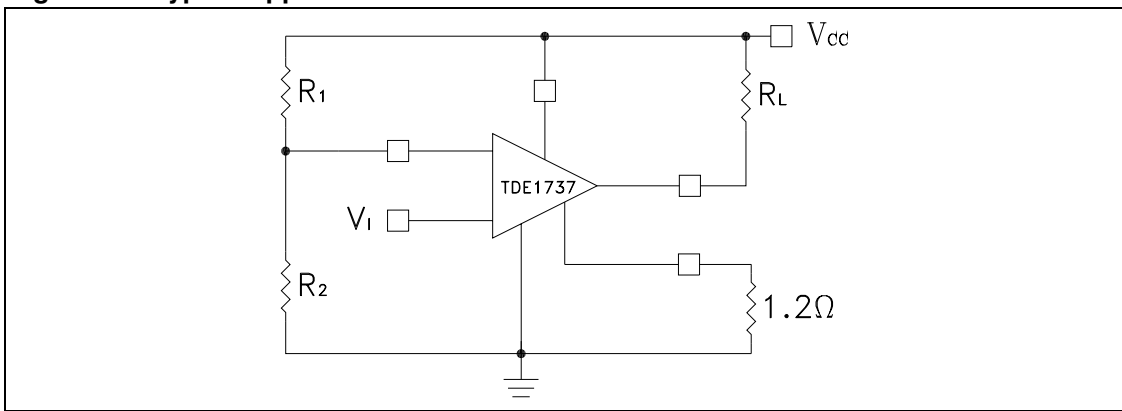
Figure 2. Schematic diagram



**Figure 3. Simplified schematic**



**Figure 4. Typical application**



## 4 Typical application

Figure 5. Available output current vs limiting resistors

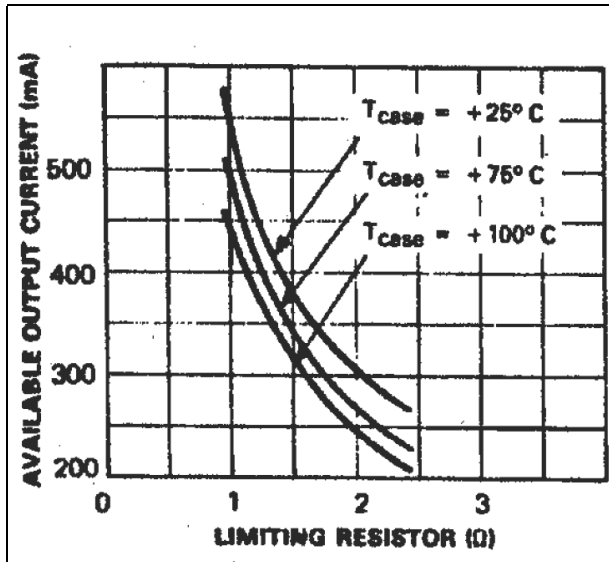


Figure 6. Peak short-circuit vs limiting resistor

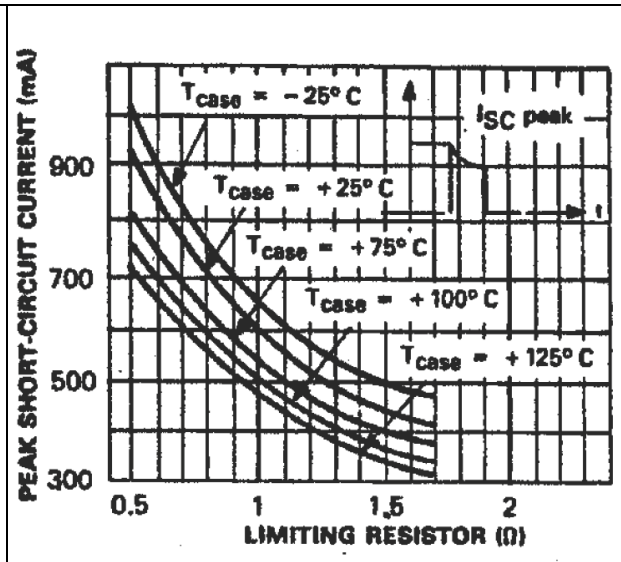


Figure 7. Short-circuit current vs case temperature

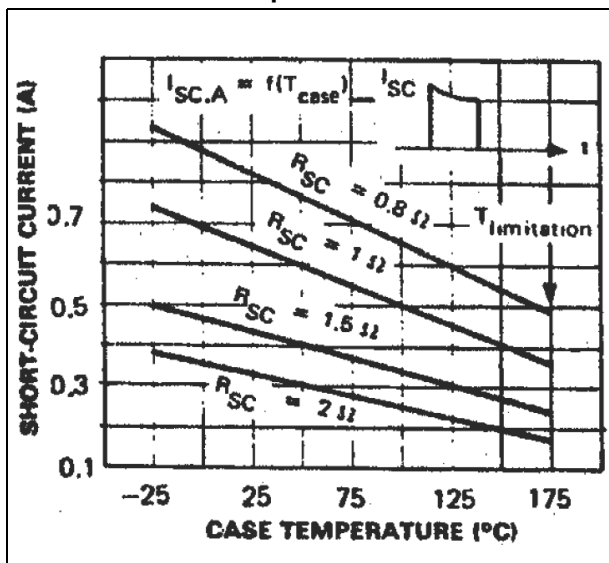


Figure 8. Safe operating area (non repetitive overload)

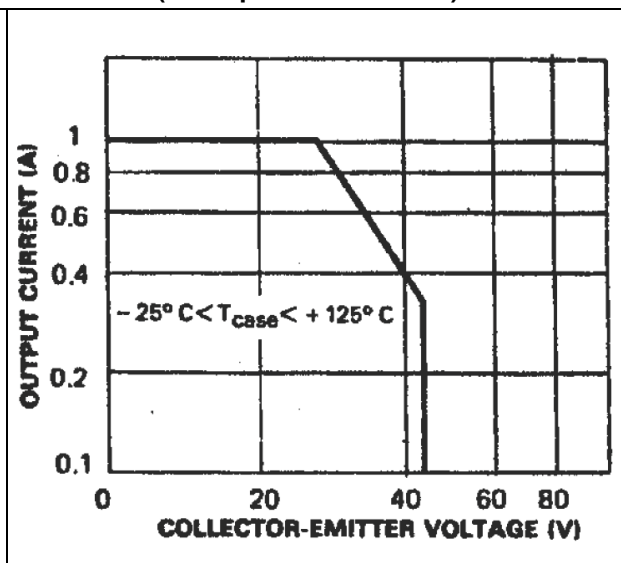
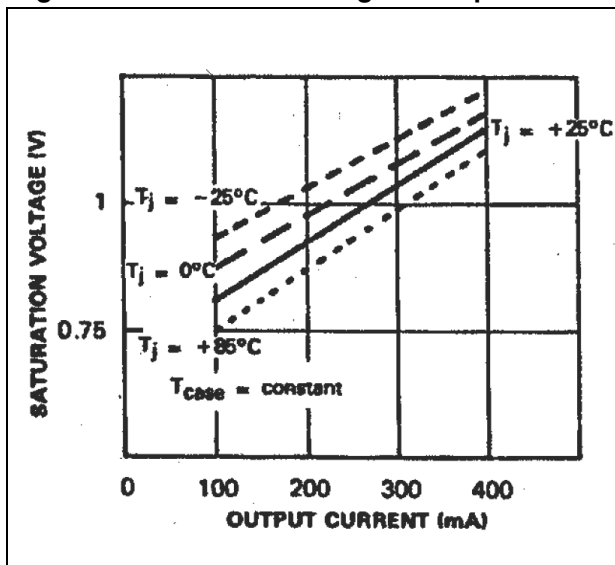


Figure 9. Saturation voltage vs output current





## 5 Package mechanical data

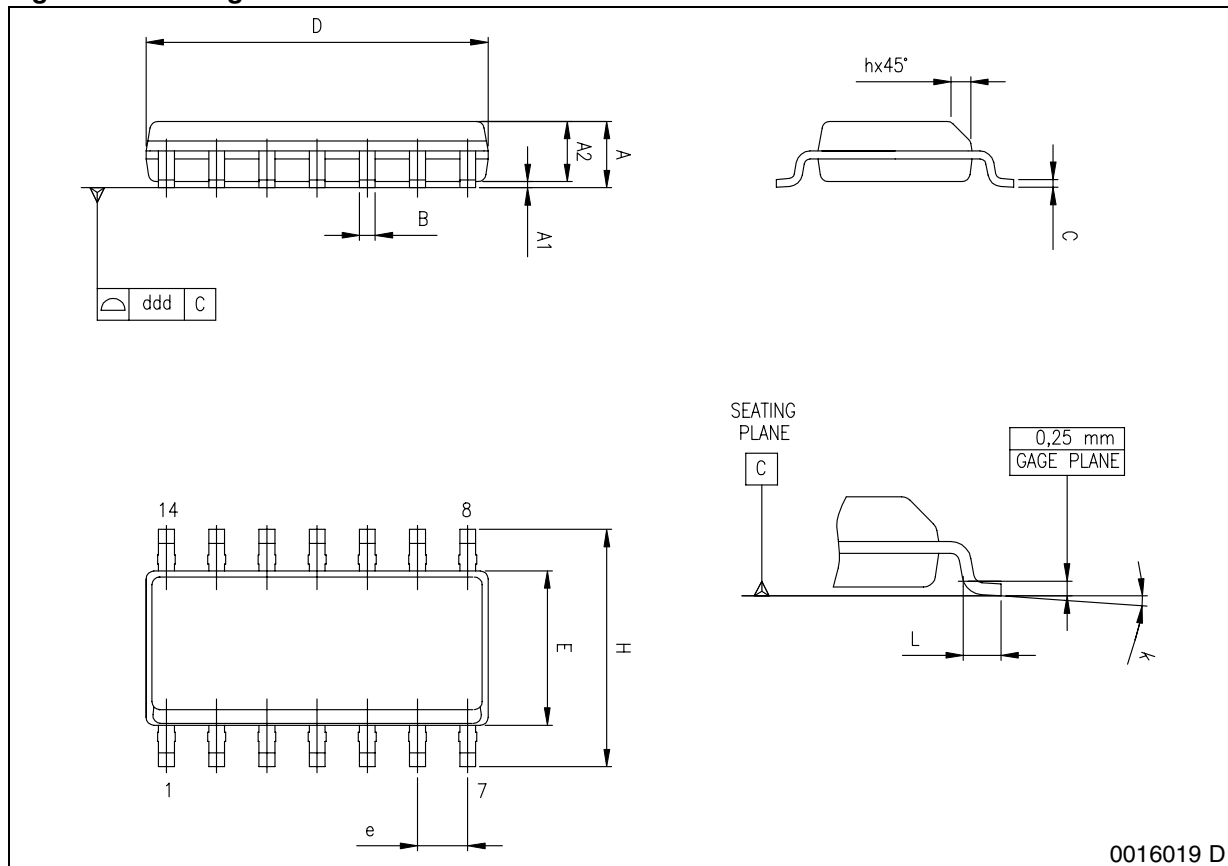
In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: [www.st.com](http://www.st.com)

**Table 4. SO14 Mechanical data**

Dim.	mm			Inch		
	Min	Typ	Max	Min	Typ	Max
A	1.35		1.75	0.053		0.069
A1	0.10		0.30	0.004		0.012
A2	1.10		1.65	0.043		0.065
B	0.33		0.51	0.013		0.020
C	0.19		0.25	0.007		0.01
D <sup>(1)</sup>	8.55		8.75	0.337		0.344
E	3.80		4.0	0.150		0.157
e		1.27			0.050	
H	5.8		6.20	0.228		0.244
h	0.25		0.50	0.01		0.02
L	0.40		1.27	0.016		0.050
k	0° (min.), 8° (max.)					
ddd			0.10			0.004

1. "D" dimension does not include mold flash, protusions or gate burrs. Mold flash, protusions or gate burrs shall not exceed 0.15mm per side.

**Figure 10. Package dimensions**

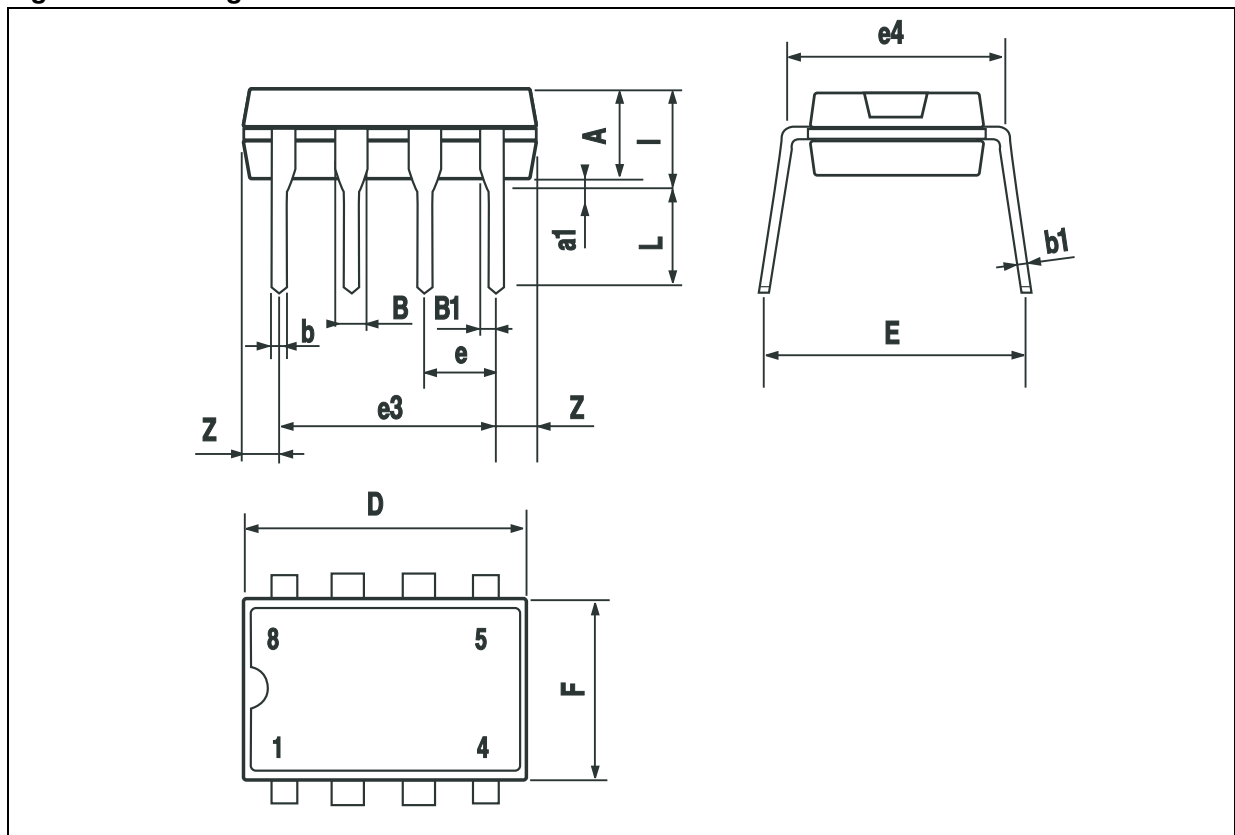


0016019 D

Table 5. DIP-8 Mechanical data

Dim.	mm			Inch		
	Min	Typ	Max	Min	Typ	Max
A		3.32			0.131	
a1	0.51			0.020		
B	1.15		1.65	0.045		0.065
b	0.356		0.55	0.014		0.022
b1	0.204		0.304	0.008		0.012
D			10.92			0.430
E	7.95		9.75	0.313		0.384
e		2.54			0.100	
e3		7.62			0.300	
e4		7.62			0.300	
F			6.6			0.260
l			5.08			0.200
L	3.18		3.81	0.125		0.150
Z			1.52			0.060

Figure 11. Package dimensions



## 6 Revision history

**Table 6. Revision history**

<b>Date</b>	<b>Revision</b>	<b>Changes</b>
12-Sep-2003	1	Initial release
20-Oct-2003	2	Few changes
30-May-2006	3	New template

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