

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

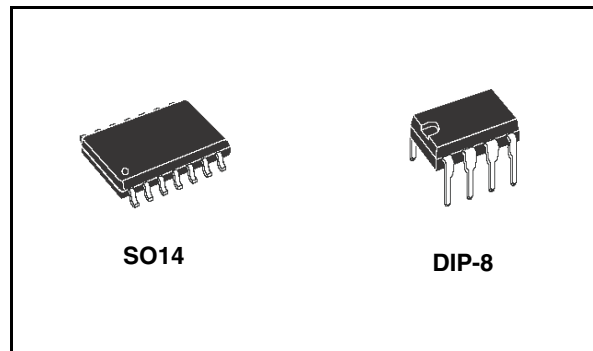
Description

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 ± 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

Contents

1	Maximum ratings	3
1.1	Absolute maximum ratings	3
1.2	Thermal data	3
2	Electrical characteristics	4
3	Pin connections and schematic diagrams	5
4	Typical application	7
5	Package mechanical data	9
6	Revision history	12

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
V_{ID}	Differential Input Voltage	50	V
I_O	Output Current	1000	mA
P_{tot}	Power Dissipation	Internally Limited	W
T_{oper}	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 ⁽¹⁾	–	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 cm² glass-epoxy printed circuit 0.15cm thick with 4 cm² of cooper.

3 Pin connections and schematic diagrams

Figure 1. Pin connections (top views)

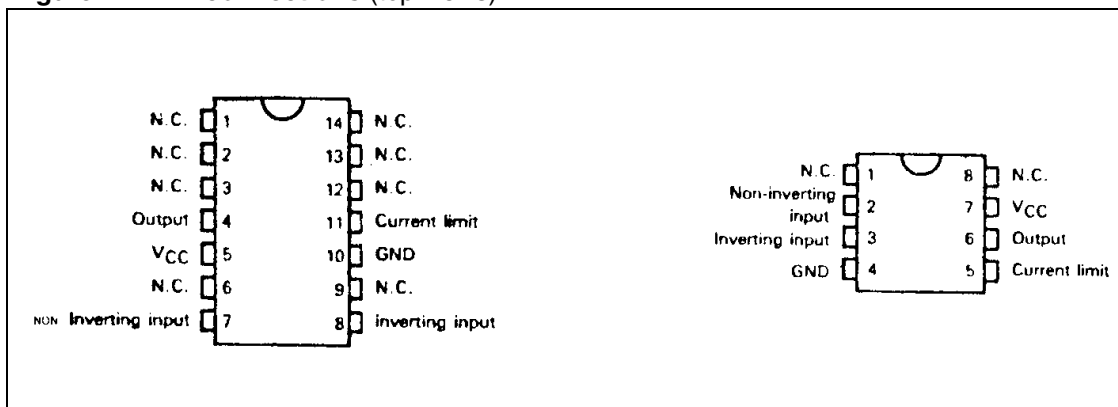


Figure 2. Schematic diagram

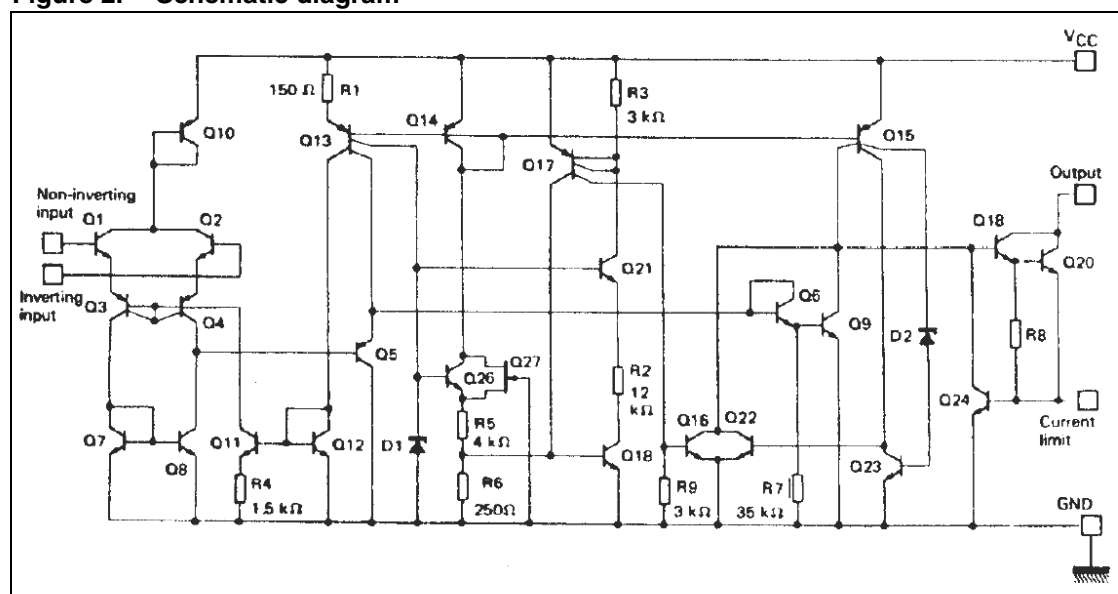
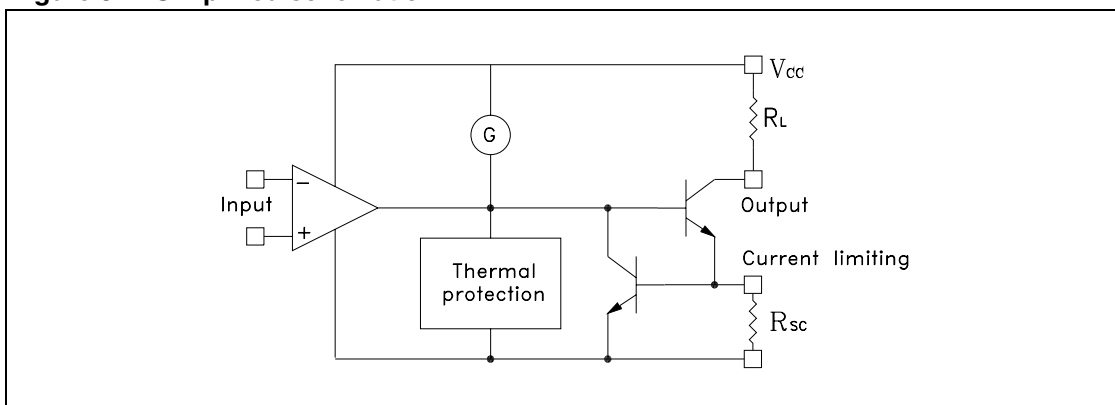
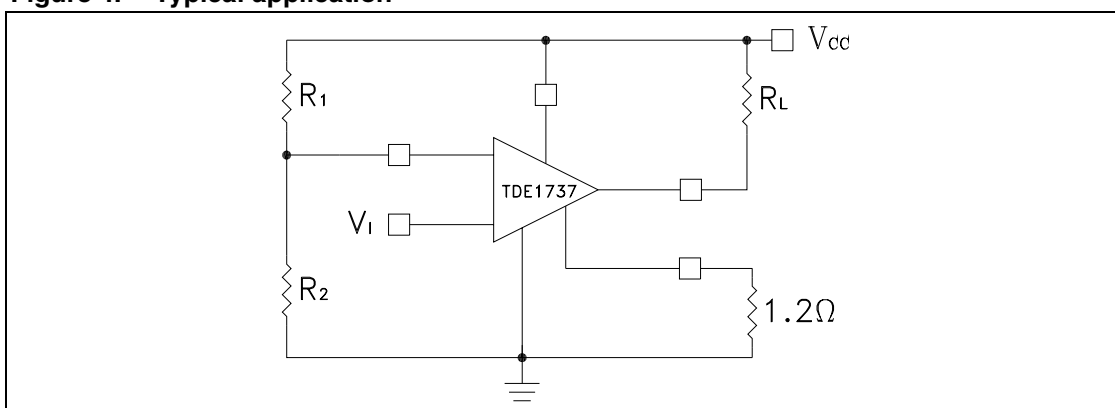


Figure 3. Simplified schematic**Figure 4. Typical application**

4 Typical application

Figure 5. Available output current vs limiting resistors

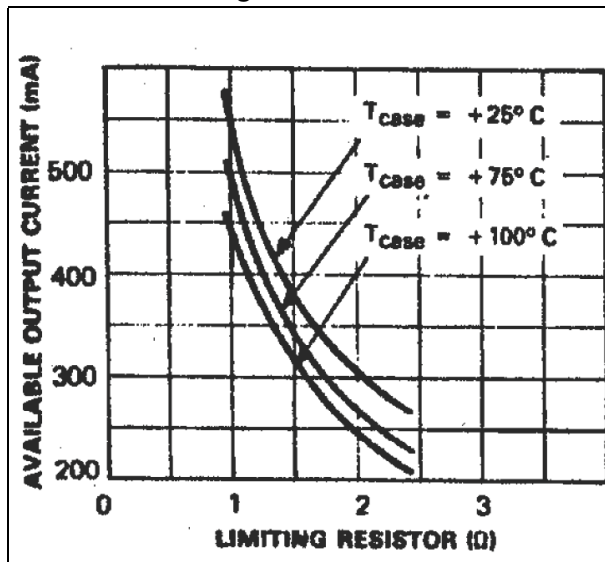


Figure 6. Peak short-circuit vs limiting resistor

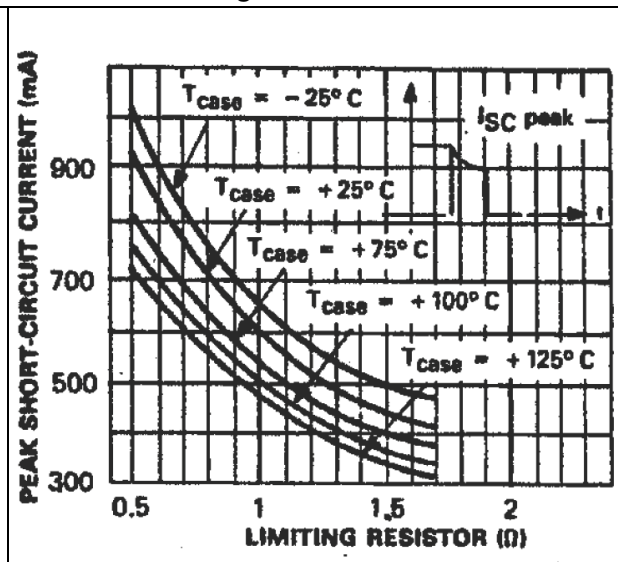


Figure 7. Short-circuit current vs case temperature

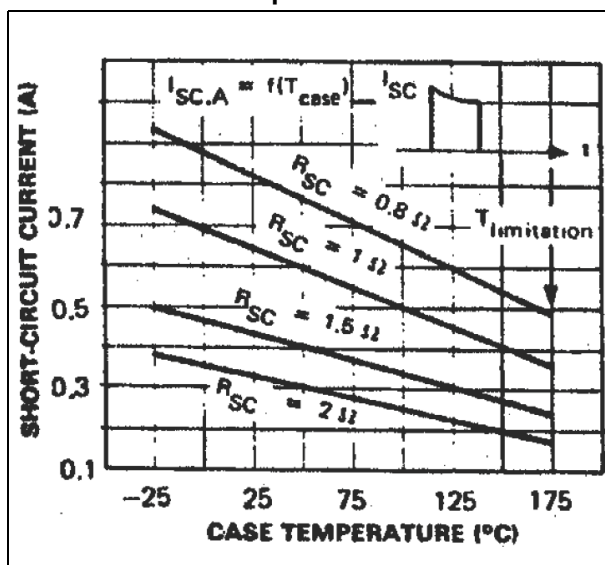


Figure 8. Safe operating area (non repetitive overload)

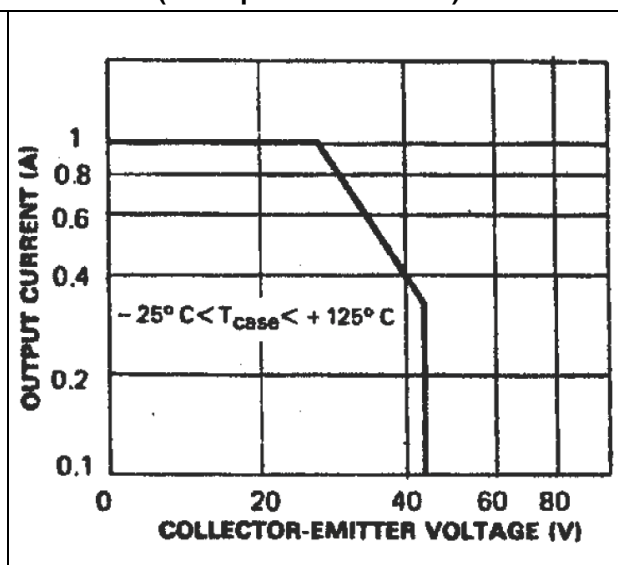
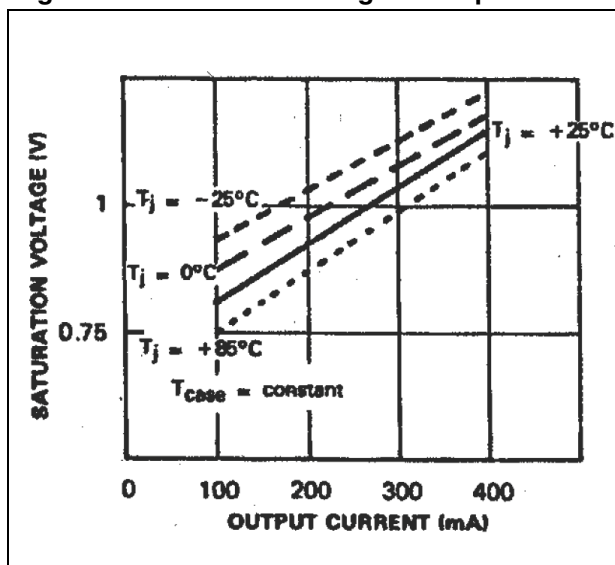


Figure 9. Saturation voltage vs output current



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

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 ⁽¹⁾	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.

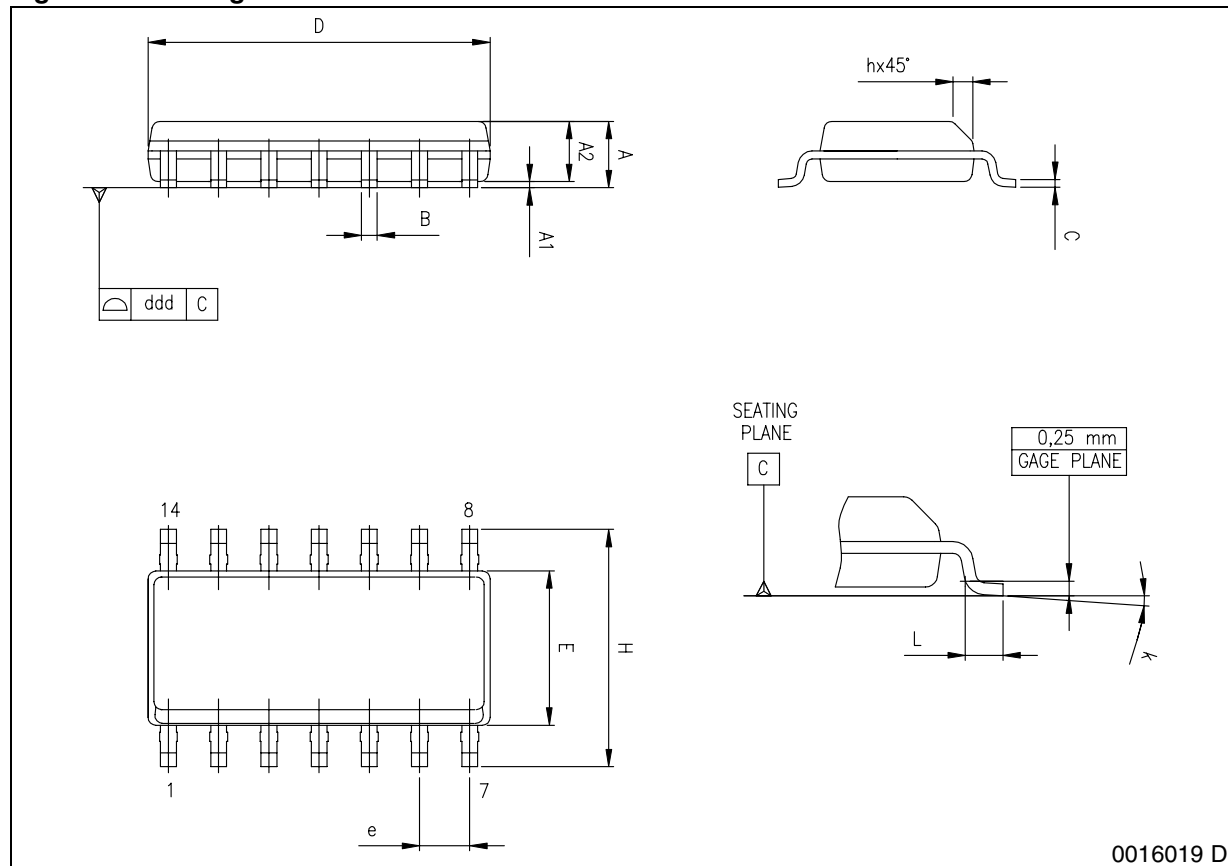
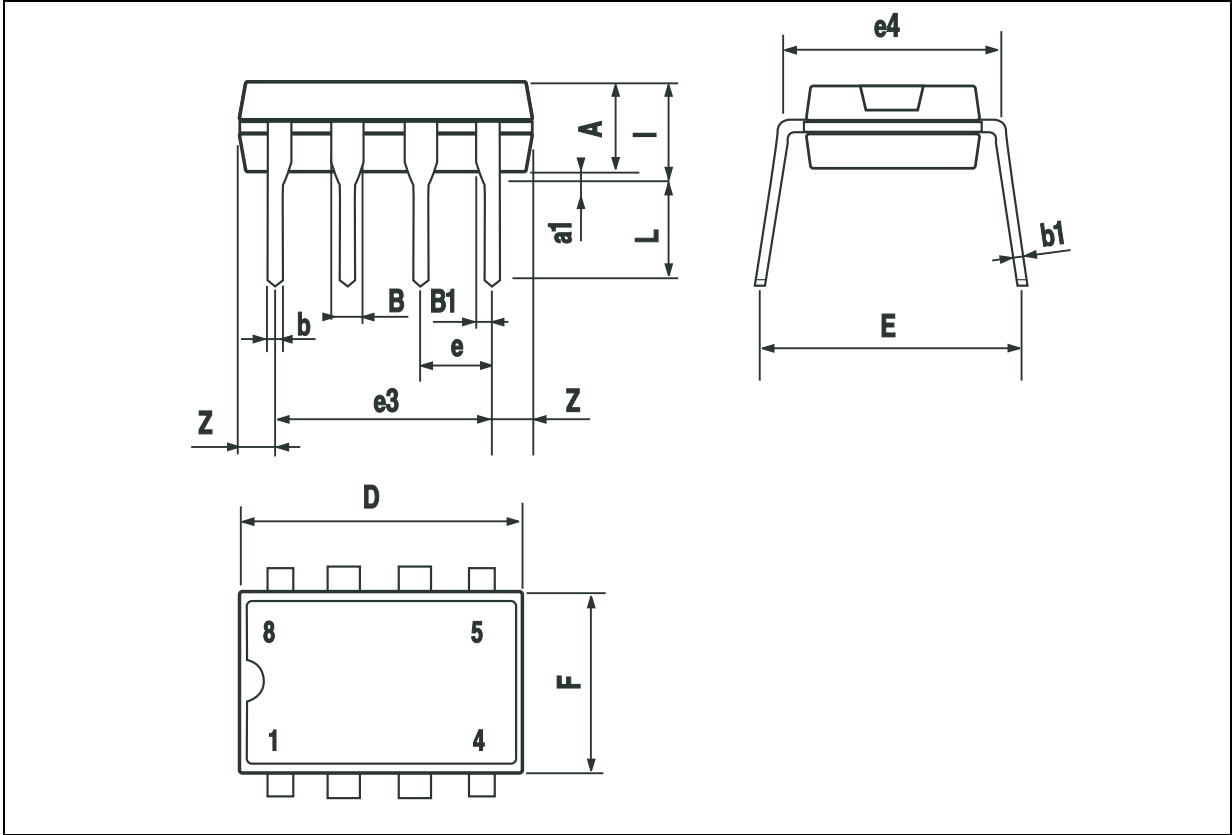
Figure 10. Package dimensions

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
I			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

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

Please Read Carefully:

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED REPRESENTATIVE OF ST, ST PRODUCTS ARE NOT DESIGNED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS, WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE.

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

© 2006 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com

