



STD93003

HIGH VOLTAGE FAST-SWITCHING PNP POWER TRANSISTOR

- REVERSE PINS OUT Vs STANDARD IPAK (TO-251) / DPAK (TO-252) PACKAGES
- MEDIUM VOLTAGE CAPABILITY
- LOW SPREAD OF DYNAMIC PARAMETERS
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- VERY HIGH SWITCHING SPEED
- SURFACE-MOUNTING DPAK (TO-252) POWER PACKAGE IN TAPE & REEL (Suffix "T4")
- THROUGH-HOLE IPAK (TO-251) POWER PACKAGE IN TUBE (Suffix "-1")

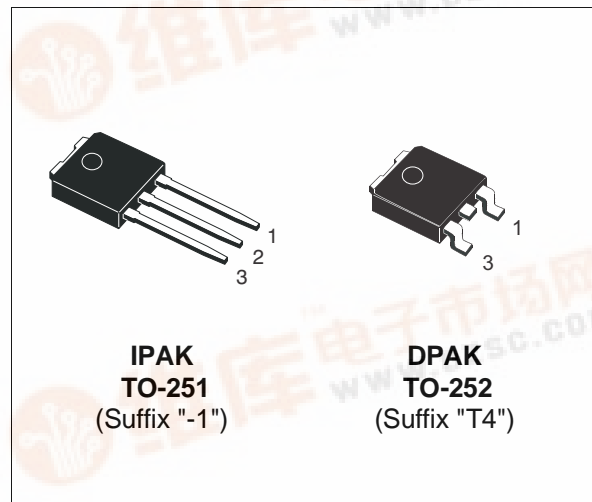
APPLICATIONS:

- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING

DESCRIPTION

The device is manufactured using high voltage Multi-Epitaxial Planar technology for high switching speeds and medium voltage capability. It uses a Cellular Emitter structure with planar edge termination to enhance switching speeds while maintaining the wide RBSOA.

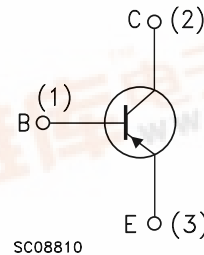
The STD93003 is expressly designed for a new solution to be used in compact fluorescent lamps, where it is coupled with the STD83003, its complementary NPN transistor.



IPAK TO-251
(Suffix "-1")

DPAK TO-252
(Suffix "T4")

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CES}	Collector-Emitter Voltage ($V_{BE} = 0$)	-500	V
V_{CEO}	Collector-Emitter Voltage ($I_B = 0$)	-400	V
V_{EBO}	Emitter-Base Voltage ($I_C = 0, I_B = -0.75$ A, $t_p < 10\mu s, T_j < 150^\circ C$)	$V_{(BR)EBO}$	V
I_C	Collector Current	-1.5	A
I_{CM}	Collector Peak Current ($t_p < 5$ ms)	-3	A
I_B	Base Current	-0.75	A
I_{BM}	Base Peak Current ($t_p < 5$ ms)	-1.5	A
P_{tot}	Total Dissipation at $T_c = 25^\circ C$	20	W
T_{stg}	Storage Temperature	-65 to 150	$^\circ C$
T_j	Max. Operating Junction Temperature	150	$^\circ C$



STD93003

THERMAL DATA

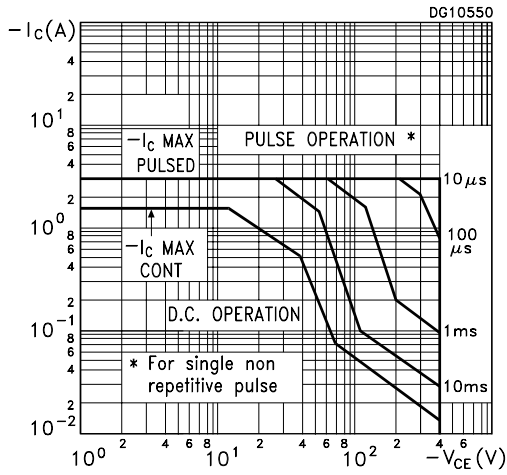
R _{thj-case}	Thermal Resistance Junction-case	Max	6.25	°C/W
R _{thj-amb}	Thermal Resistance Junction-ambient	Max	100	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

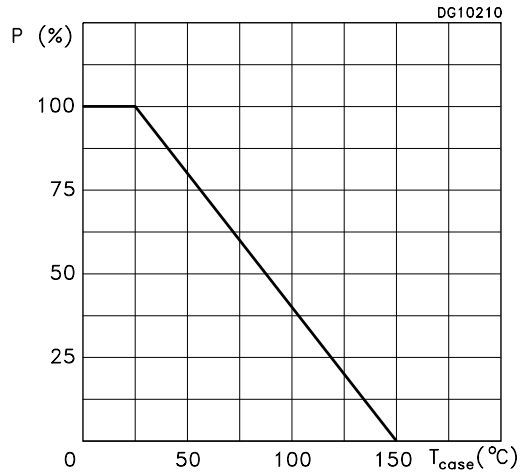
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I _{CES}	Collector Cut-off Current (V _{BE} = 0)	V _{CE} = -500V V _{CE} = -500V T _j = 125°C			-1 -5	mA mA
V _{(BR)EBO}	Emitter Base Breakdown Voltage (I _C = 0)	I _E = -10 mA	-5		-10	V
V _{CEO(sus)*}	Collector-Emitter Sustaining Voltage (I _B = 0)	I _C = -10 mA L = 25 mH	-400			V
V _{CE(sat)*}	Collector-Emitter Saturation Voltage	I _C = -0.5 A I _C = -0.35 A			-0.5 -0.5	V V
V _{BE(sat)*}	Base-Emitter Saturation Voltage	I _C = -0.5 A I _B = -0.1 A			-1	V
h _{FE*}	DC Current Gain	I _C = -10 mA I _C = -0.35 A I _C = -1 A	10 16 4	25	32	
t _r t _s t _f	RESISTIVE LOAD Rise Time Storage Time Fall Time	I _C = -0.35 A I _{B1} = -70 mA T _p ≥ 25 μs		90 2.2 0.1		ns μs μs
t _s t _f	INDUCTIVE LOAD Storage Time Fall Time	I _C = -0.5 A V _{BE(off)} = 5 V V _{clamp} = 300 V		400 40		ns ns
E _{sb}	Avalanche Energy	L = 4 mH I _{BR} ≤ 2.5 A C = 1.8 nF 25°C < T _C < 125°C	12			mJ

* Pulsed: Pulse duration = 300μs, duty cycle = 1.5 %.

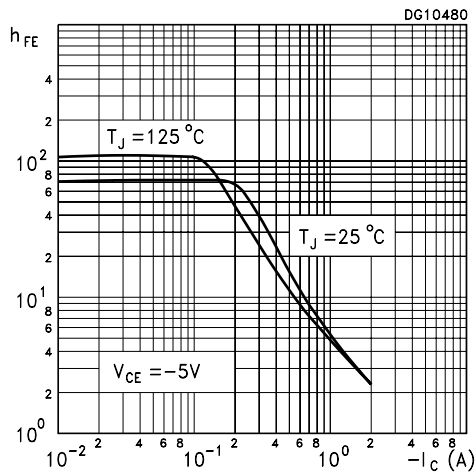
Safe Operating Area



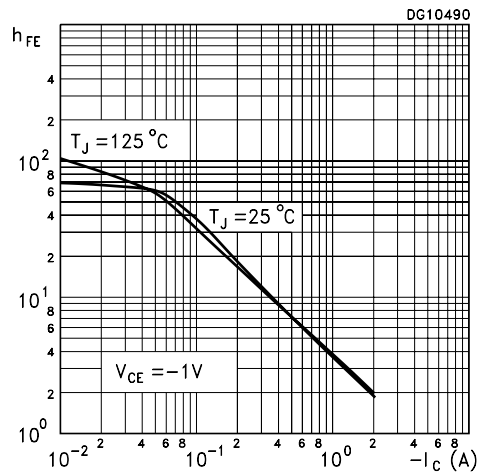
Derating Curve



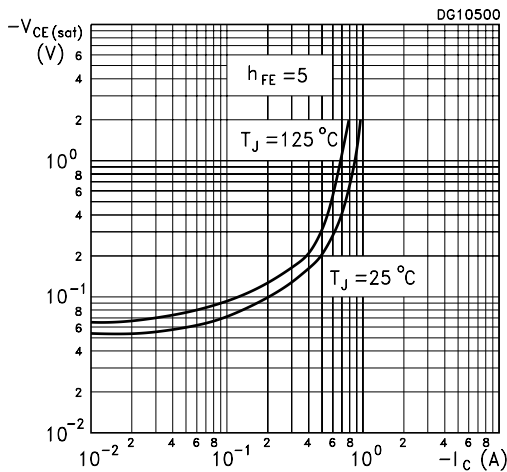
DC Current Gain



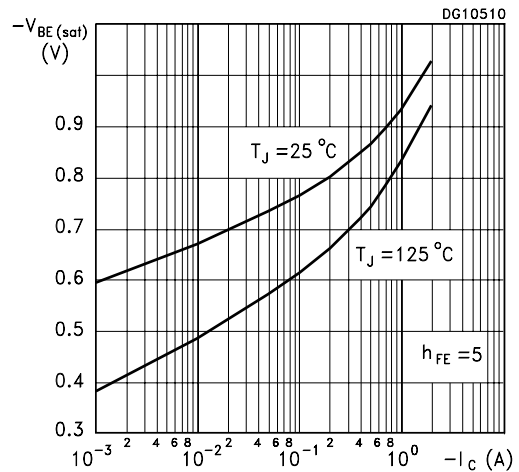
DC Current Gain



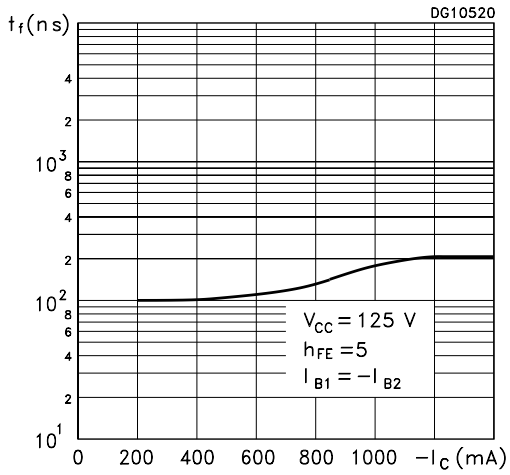
Collector Emitter Saturation Voltage



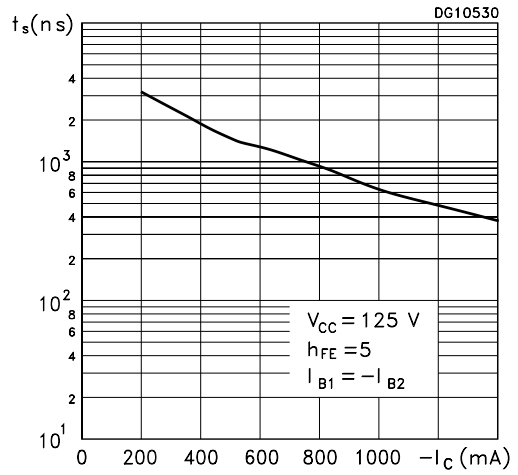
Base Emitter Saturation Voltage



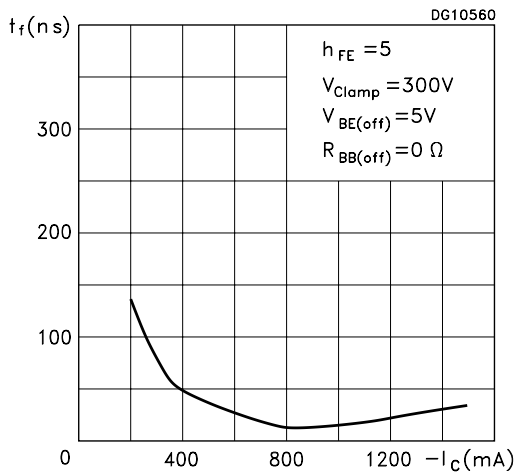
Resistive Fall Time



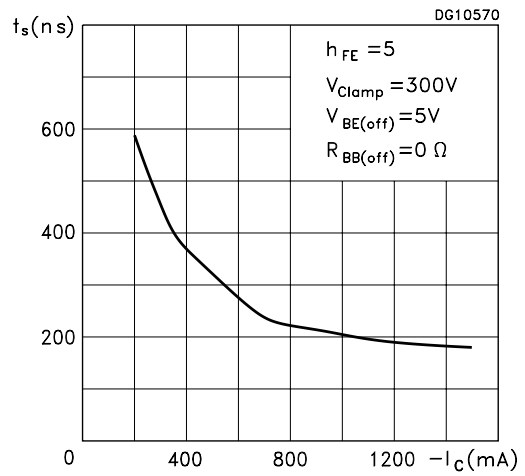
Resistive Storage Time



Inductive Fall Time



Inductive Storage Time



Reverse Biased SOA

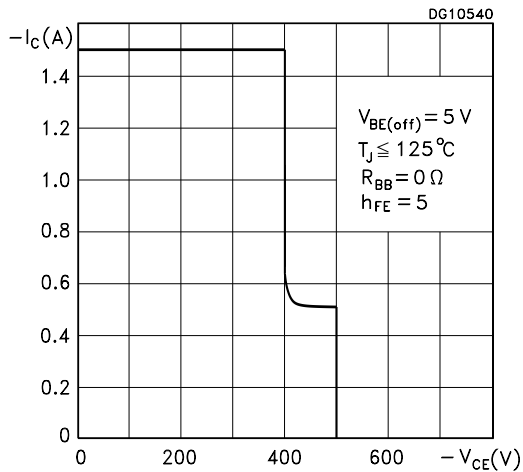


Figure 1: Inductive Load Switching Test Circuit.

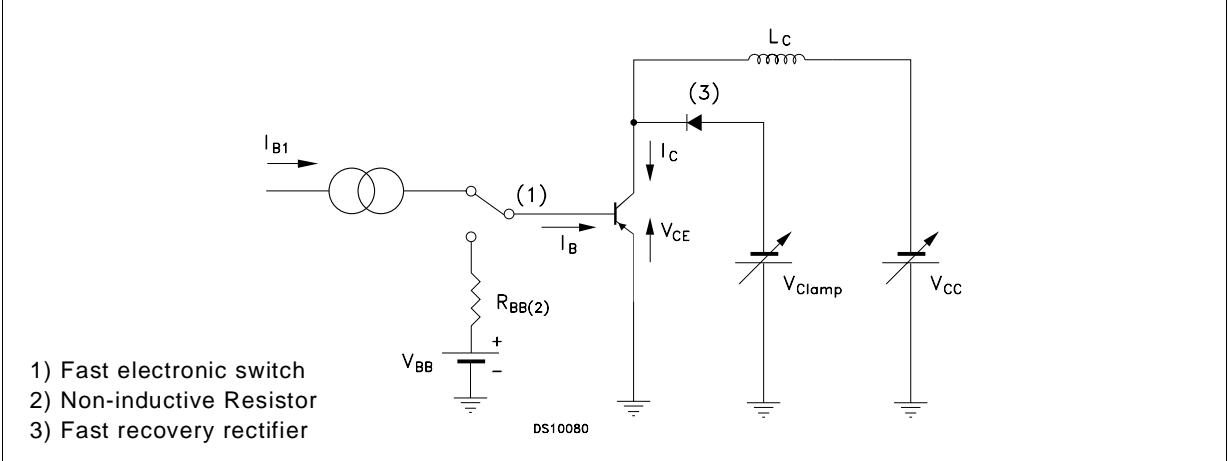
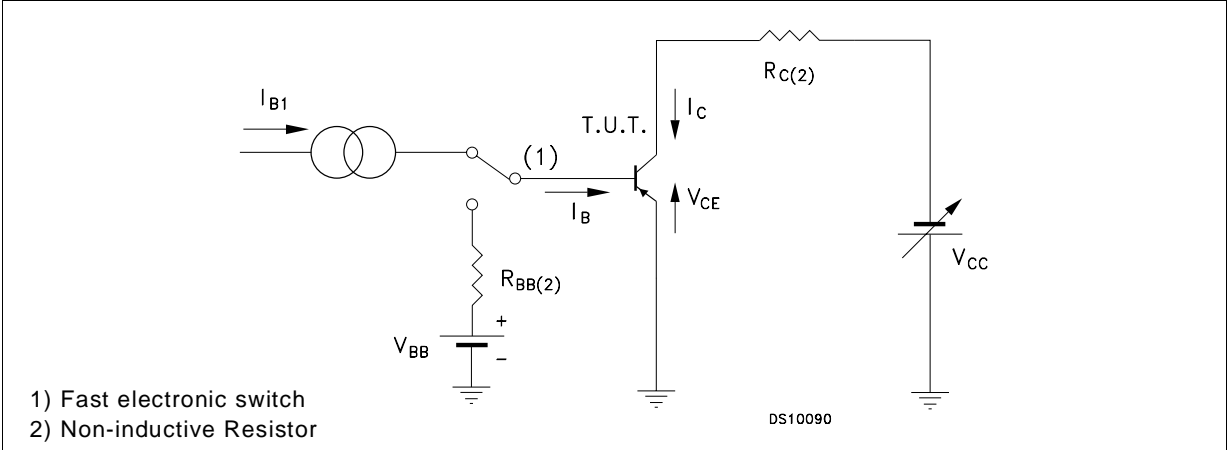
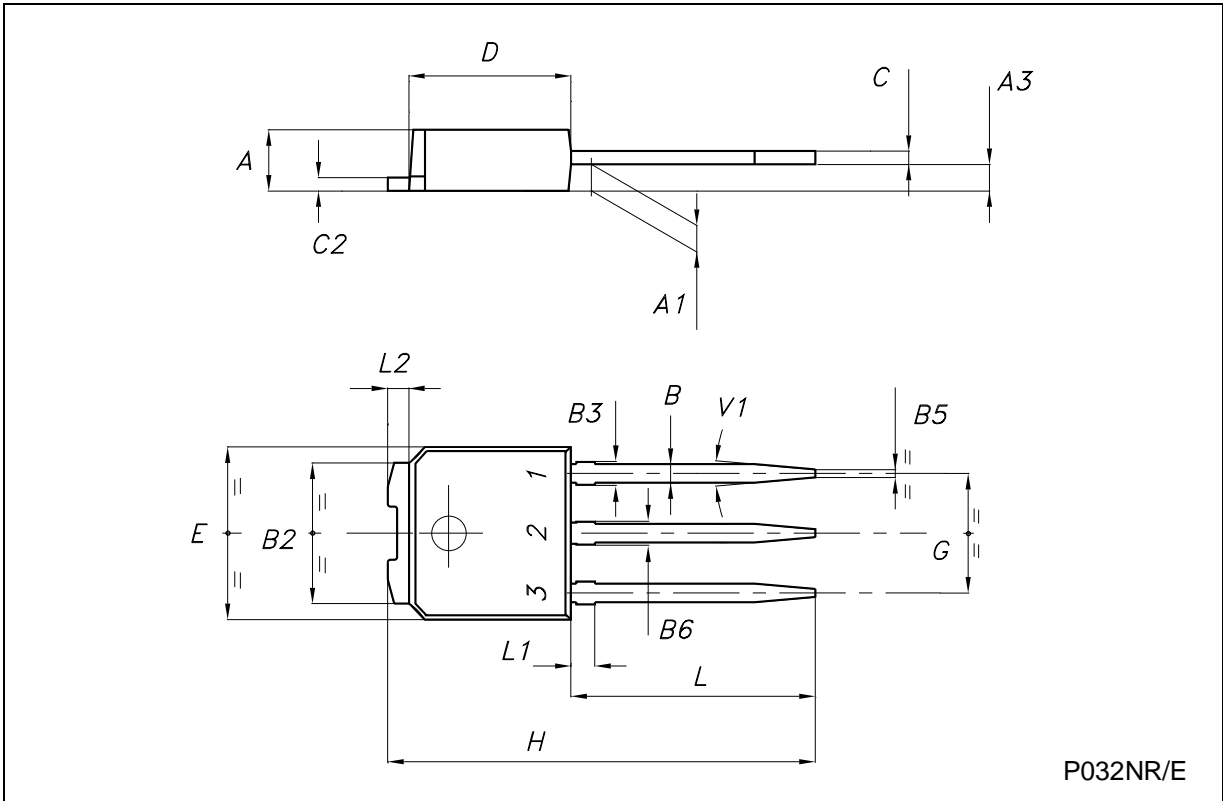


Figure 2: Resistive Load Switching Test Circuit.



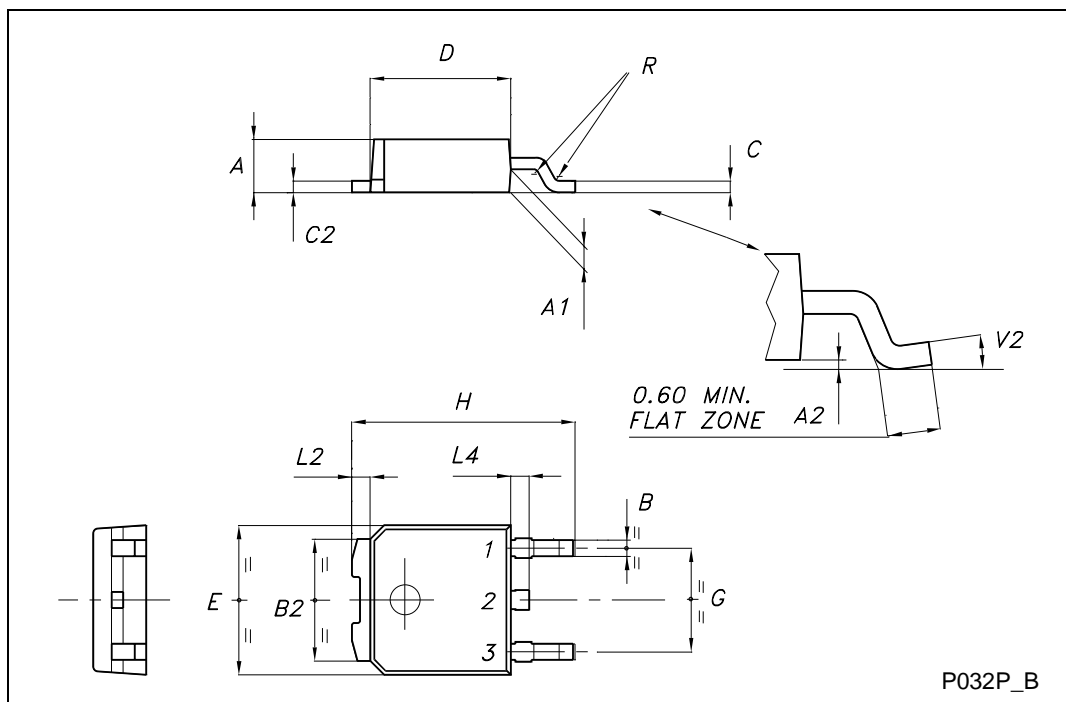
TO-251 (IPAK) MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	2.20		2.40	0.087		0.094
A1	0.90		1.10	0.035		0.043
A3	0.70		1.30	0.028		0.051
B	0.64		0.90	0.025		0.035
B2	5.20		5.40	0.204		0.213
B3			0.85			0.033
B5		0.30			0.012	
B6			0.95			0.037
C	0.45		0.60	0.018		0.024
C2	0.48		0.60	0.019		0.024
D	6.00		6.20	0.237		0.244
E	6.40		6.60	0.252		0.260
G	4.40		4.60	0.173		0.181
H	15.90		16.30	0.626		0.642
L	9.00		9.40	0.354		0.370
L1	0.80		1.20	0.031		0.047
L2		0.80	1.00		0.031	0.039
V1		10°			10°	



TO-252 (DPAK) MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	2.20		2.40	0.087		0.094
A1	0.90		1.10	0.035		0.043
A2	0.03		0.23	0.001		0.009
B	0.64		0.90	0.025		0.035
B2	5.20		5.40	0.204		0.213
C	0.45		0.60	0.018		0.024
C2	0.48		0.60	0.019		0.024
D	6.00		6.20	0.236		0.244
E	6.40		6.60	0.252		0.260
G	4.40		4.60	0.173		0.181
H	9.35		10.10	0.368		0.398
L2		0.8			0.031	
L4	0.60		1.00	0.024		0.039
V2	0°		8°	0°		0°



Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specification mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a trademark of STMicroelectronics

© 2002 STMicroelectronics – Printed in Italy – All Rights Reserved
STMicroelectronics GROUP OF COMPANIES

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

<http://www.st.com>