

**PROGRAMMABLE TRANSIENT VOLTAGE SUPPRESSOR
AND CURRENT LIMITER**

FEATURES

- UNIDIRECTIONAL FUNCTION
- PROGRAMMABLE BREAKDOWN VOLTAGE UP TO 265 V
- PROGRAMMABLE CURRENT LIMITATION FROM 50 mA TO 550 mA
- HIGH SURGE CURRENT CAPABILITY
 $I_{PP} = 100A \quad 10/1000 \mu s$

DESCRIPTION

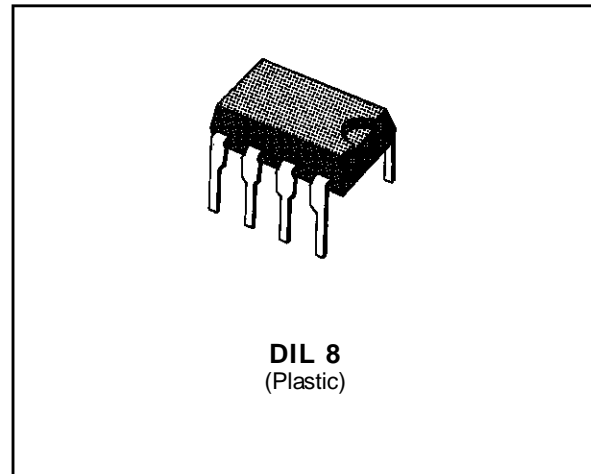
Dedicated to sensitive telecom equipment protection, this device can provide both voltage protection and current limitation with a very tight tolerance.

Its high surge current capability makes the L3100B a reliable protection device for very exposed equipment, or when series resistors are very low.

The breakdown voltage can be easily programmed by using an external zener diode.

A multiple protection mode can also be performed when using several zener diodes, providing each line interface with an optimized protection level.

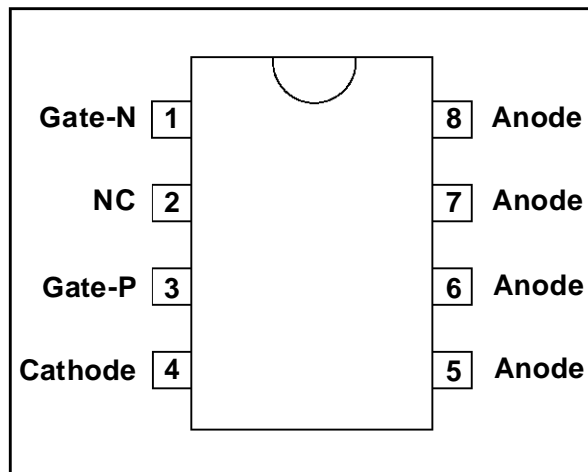
The current limiting function is achieved with the use of a resistor between the gate and the cathode. The value of the resistor will determine the level of the desired current.



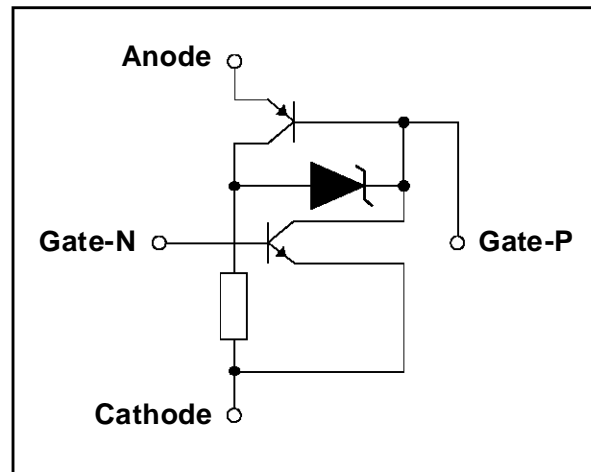
IN ACCORDANCE WITH FOLLOWING STANDARDS :

CCITT K17 - K20	{	10/700 μs	1.5 kV
		5/310 μs	38 A
VDE 0433	{	10/700 μs	2 kV
		5/200 μs	50 A
CNET	{	0.5/700 μs	1.5 kV
		0.2/310 μs	38 A

CONNECTION DIAGRAM



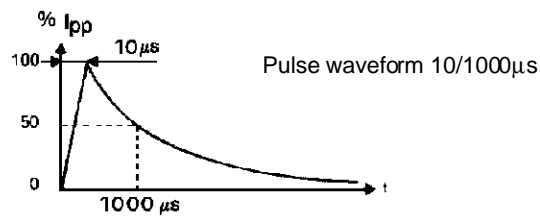
SCHEMATIC DIAGRAM



L3100B/L3100B1

ABSOLUTE RATINGS (limiting values) ($-40^{\circ}\text{C} \leq T_{\text{amb}} \leq +85^{\circ}\text{C}$)

Symbol	Parameter	Value	Unit
I_{PP}	Peak pulse current	10/1000 μs 8/20 μs	A
I_{TSM}	Non repetitive surge peak on-state current	$t_p = 10 \text{ ms}$	A
di/dt	Critical rate of rise of on-state current	Non repetitive	A/ μs
dv/dt	Critical rate of rise of off-state voltage	67% V_{BR}	KV/ μs
T_{stg} T_j	Storage and operating junction temperature range	- 40 to + 150 + 150	$^{\circ}\text{C}$ $^{\circ}\text{C}$

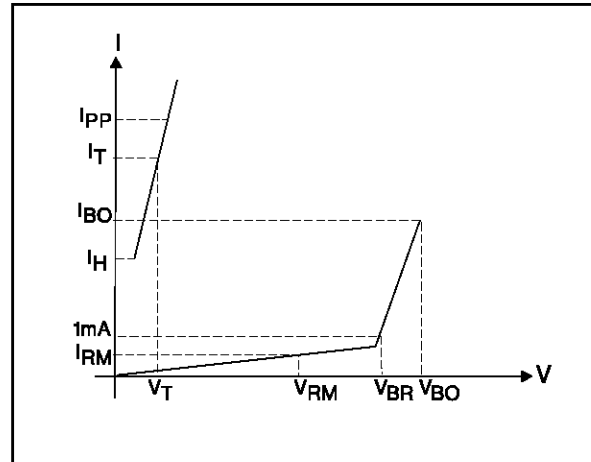


THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
$R_{th(j-a)}$	Junction-to-ambient	80	$^{\circ}\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS.

Symbol	Parameter
V_{RM}	Stand-off voltage
V_{BR}	Breakdown voltage
V_{BO}	Breakover voltage
I_H	Holding current
V_T	On-state voltage @ I_T
I_{BO}	Breakover current
I_{PP}	Peak pulse current
V_G	Gate voltage
I_G	Firing gate current

**OPERATION WITHOUT GATE.**

Type	I_{RM} @ V_{RM} max		V_{BR} @ I_R min		V_{BO} max	I_{BO} min note 1	I_{BO} max	I_H min note 1	V_T max note 2	C max note 3
	μA	V	V	mA	V	mA	mA	mA	V	pF
L3100B	6 40	60 250	265	1	350	200	500	280	2	100
L3100B1	6 40	60 250	255	1	350	200	500	210	2	100

OPERATION WITH GATES.

Type	V_{GN} @ $I_{GN} = 200$ mA		I_{GN} @ $V_{AC} = 100V$		V_{RGN} @ $I_G = 1$ mA	I_{GP} @ $V_{AC} = 100V$
	min	max	min	max	min	max
	V	V	mA	mA	V	mA
L3100B/B1	0.6	1.8	30	200	0.7	150

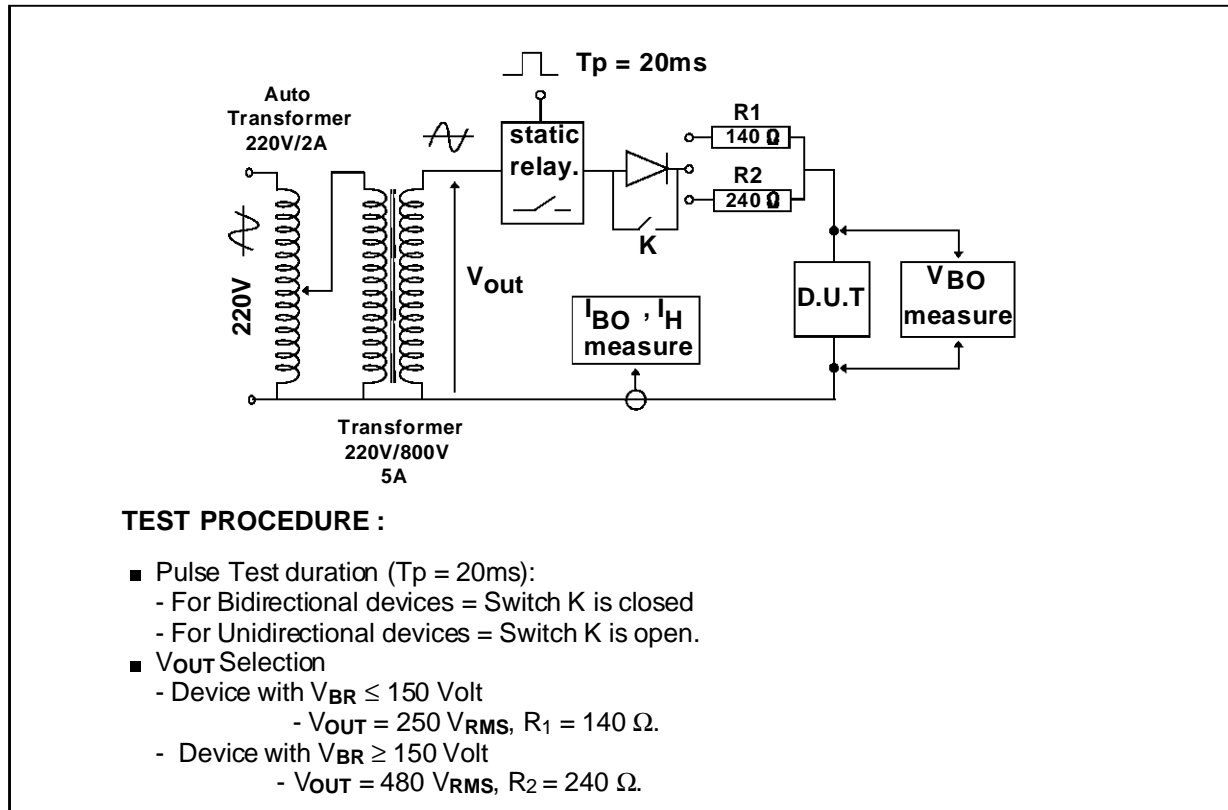
All parameters tested at 25°C, except where indicated otherwise.

Note 1 : See the reference test circuit for I_H , I_{BO} and V_{BO} parameters.

Note 2 : Square pulse $T_P = 500\mu s$ - $I_T = 1A$.

Note 3 : $V_R = 5V$, $f = 1MHz$.

REFERENCE TEST CIRCUIT FOR I_H , I_{BO} and V_{BO} parameters :



FUNCTIONAL HOLDING CURRENT (I_H) TEST CIRCUIT = GO - NOGO TEST.

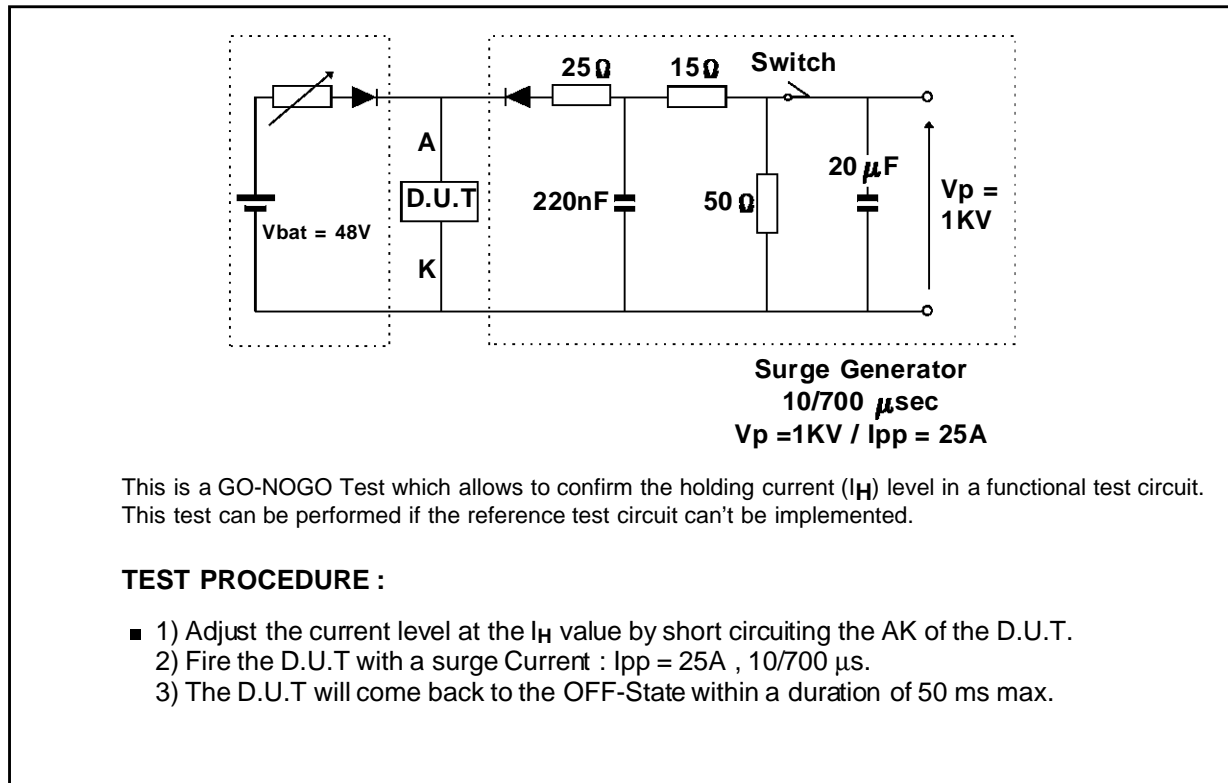


Figure 1 : Non-repetitive surge peak on state current versus number of cycles. (with sinusoidal pulse: F = 50 Hz).

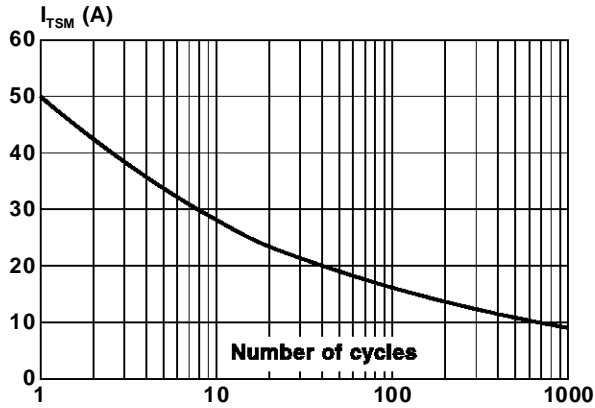


Figure 2 : Relative variation of holding current versus junction temperature.

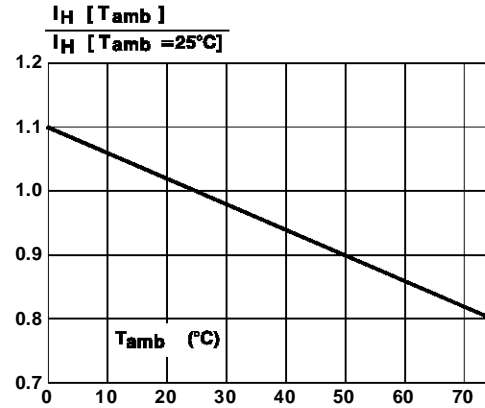


Figure 3 : Relative variation of breakdown voltage versus ambient temperature.

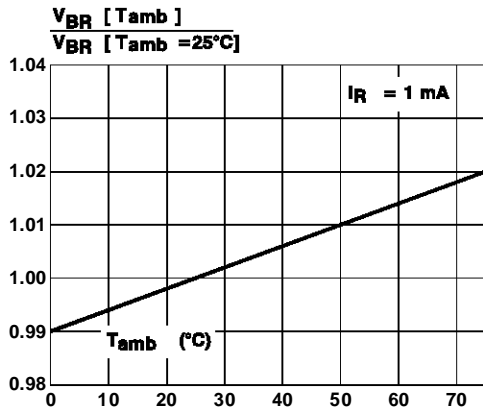
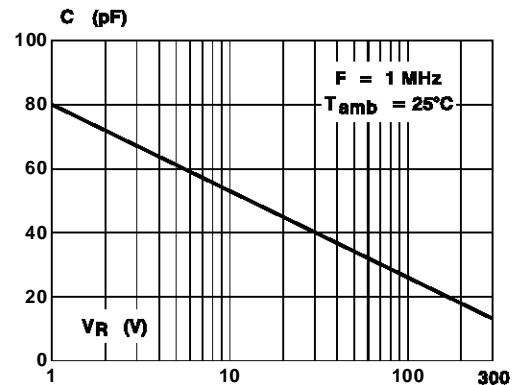


Figure 4 : Junction capacitance versus reverse applied voltage.



APPLICATION CIRCUIT

Overvoltage Protection and Current limitation

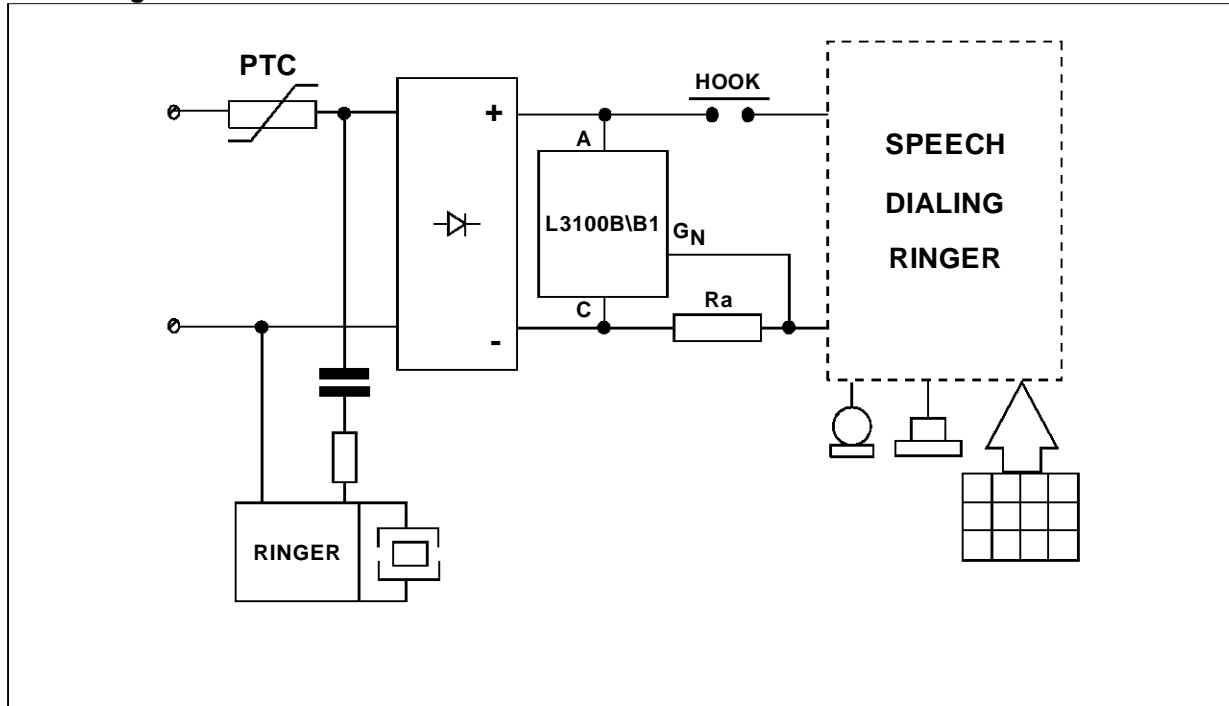
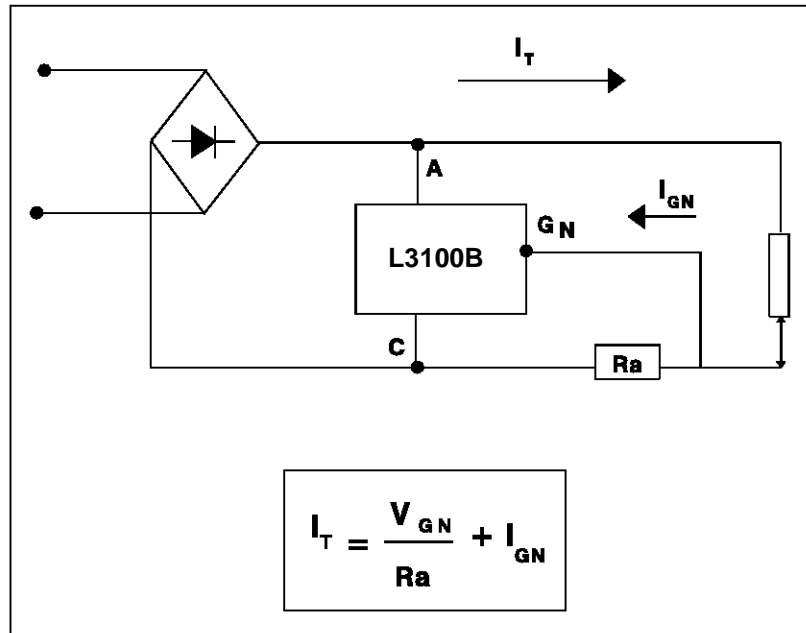


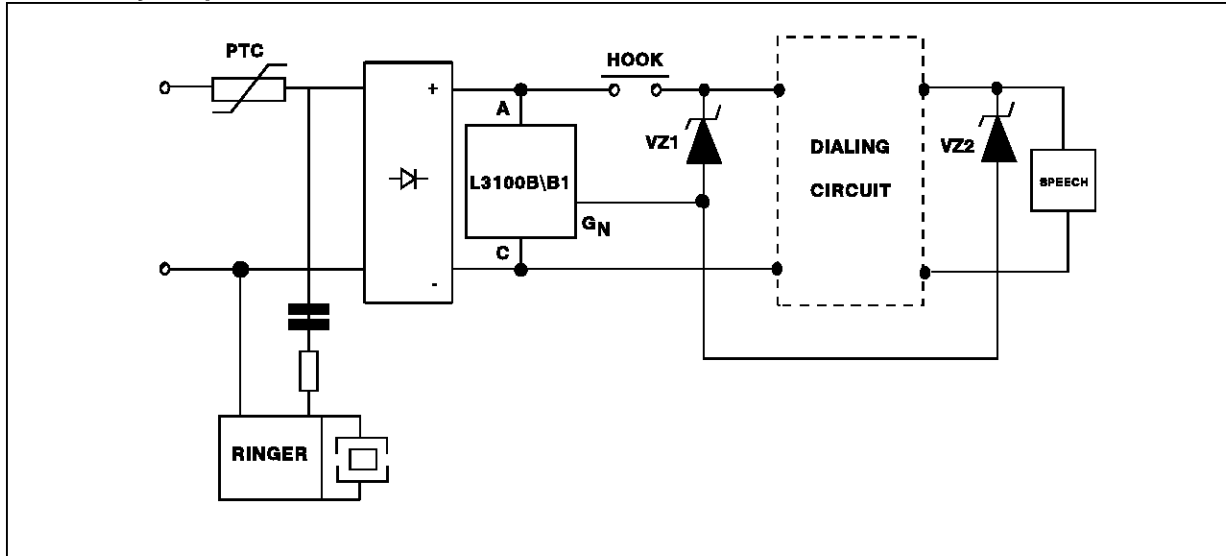
Table below gives the tolerance of the limited current I_T for each standardized resistor value. The formula (1) has been used with V_{GN} values specified at the typical gate current level I_{GN} .

CURRENT TOLERANCE		
R Ω (± 5%)	I_T mA min	I_T mA max
3.00	268	533
3.30	246	503
3.60	228	478
3.90	213	456
4.30	196	433
4.70	181	413
5.10	170	396
5.60	158	379
6.20	145	361
6.80	135	347
7.50	152	333
8.20	117	322
9.10	108	310
10.10	101	299
11.00	95	291
12.00	90	283
13.00	85	277
15.00	78	266
16.00	75	263
18.00	70	256
20.00	66	250
22.00	62	245
24.00	60	242
27.00	56	237
30.00	54	233



V_{GN} @ I_{GN}		
Min	Max	Typ.
V	V	mA
0.75	0.95	100

Ground key telephone set Protection

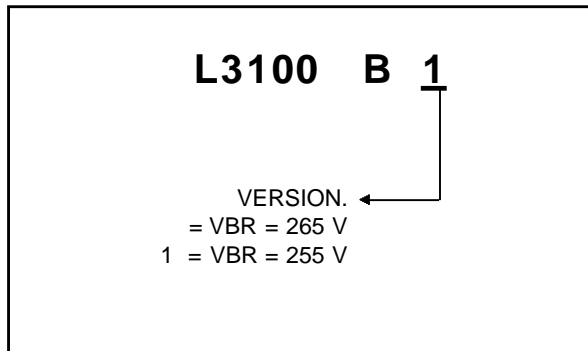


PROTECTION MODES :

OFF HOOK = Ringer circuit protection is ensured with breakdown voltage at 265 V.

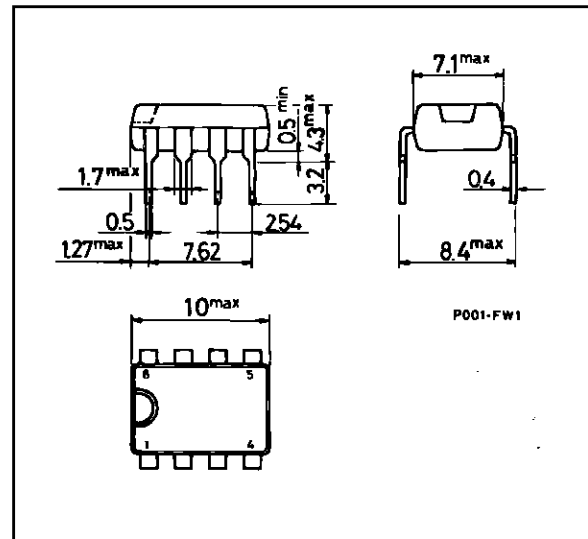
ON HOOK = In dialing mode and in conversation mode, the breakdown voltage of L3100B can be adapted to different levels with two zener diodes.

ORDER CODE



PACKAGE MECHANICAL DATA (in millimeters).

DIL 8 Plastic



MARKING : Logo, Date Code, part Number.

PACKAGING : Products supplied in antistatic tubes.

Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics 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 SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1994 SGS-THOMSON Microelectronics - All Rights Reserved

Purchase of I²C Components by SGS-THOMSON Microelectronics, conveys a licence under the Philips I²C Patent. Rights to use these components in an I²C system, is granted provided that the system conforms to the I²C Standard Specification as defined by Philips.

SGS-THOMSON Microelectronics GROUP OF COMPANIES
Australia - Brazil - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands -
Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A