



L3100B L3100B1

Application Specific Discretes
A.S.D.TM

OVERVOLTAGE AND OVERCURRENT PROTECTION FOR TELECOM LINE

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.

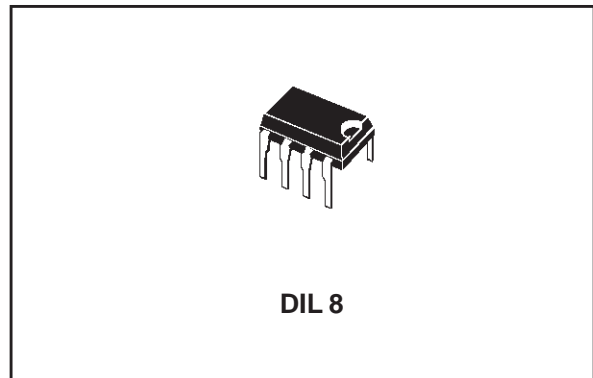
Its high surge current capability makes the L3100B a reliable protection device for very exposed equipment, or when series resistors are very low. The breakdown voltage can be easily programmed by using an external zener diode.

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

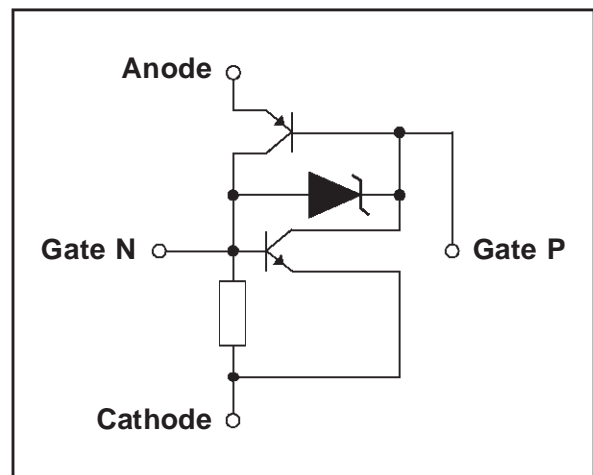
The current limiting function is achieved with the use of a resistor between the gate N and the cathode. The value of the resistor will determine the level of the desired current.

COMPLIES WITH THE FOLLOWING STANDARDS :

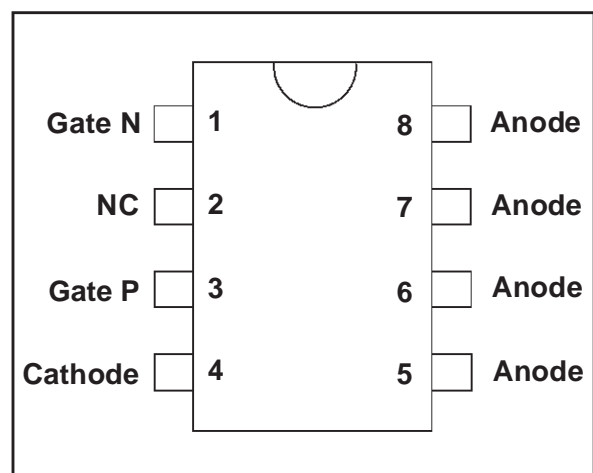
CCITT K17 - K20	10/700 μs	1.5	kV
	5/310 μs	38	A
VDE 0433	10/700 μs	2	kV
	5/200 μs	50	A
CNET	0.5/700 μs	1.5	kV
	0.2/310 μs	38	A



SCHEMATIC DIAGRAM



CONNECTION DIAGRAM



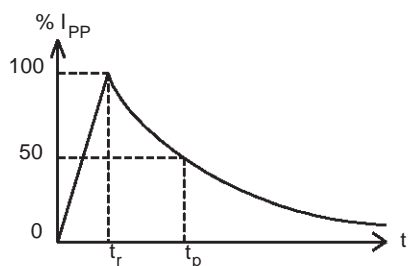
TM: ASD is trademarks of SGS-THOMSON Microelectronics.

L3100B/L3100B1

ABSOLUTE MAXIMUM RATINGS ($T_{amb}=25\text{ }^{\circ}\text{C}$)

Symbol	Parameter	Value	Unit
I_{PP}	Peak pulse current (see note 1)	10/1000 μs 8/20 μs	A
I_{TSM}	Non repetitive surge peak on-state current	$t_p = 10\text{ ms}$	A
T_{stg} T_j	Storage temperature range Maximum operating junction temperature	- 40 to + 150 + 150	$^{\circ}\text{C}$ $^{\circ}\text{C}$
T_L	Maximum lead temperature for soldering during 10s	230	$^{\circ}\text{C}$

Note 1 : Pulse waveform 10/1000 μs

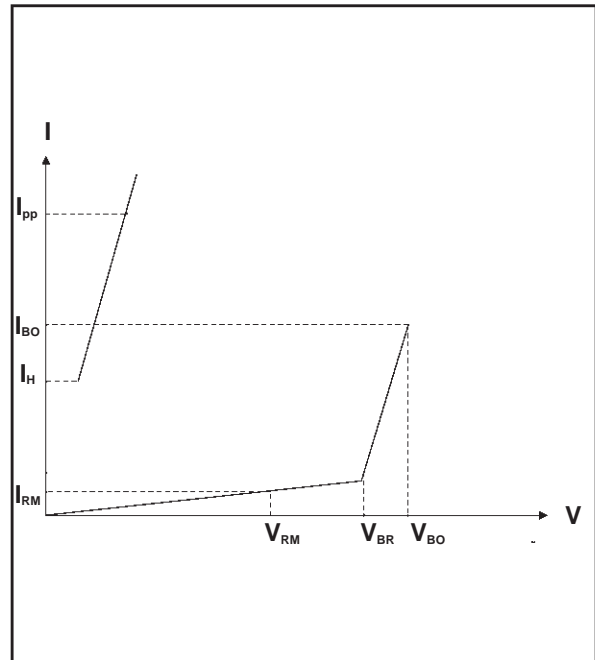


THERMAL RESISTANCE

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

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$)

Symbol	Parameter
V_{RM}	Stand-off voltage
I_{RM}	Reverse leakage current
V_{BR}	Breakdown voltage
V_{BO}	Breakover voltage
I_H	Holding current
I_{BO}	Breakover current
I_{PP}	Peak pulse current
V_{GN}	Gate voltage
I_{GN}, I_{GP}	Triggering gate current
V_{RGN}	Reverse gate voltage
C	Capacitance



OPERATION WITHOUT GATE

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

OPERATION WITH GATES

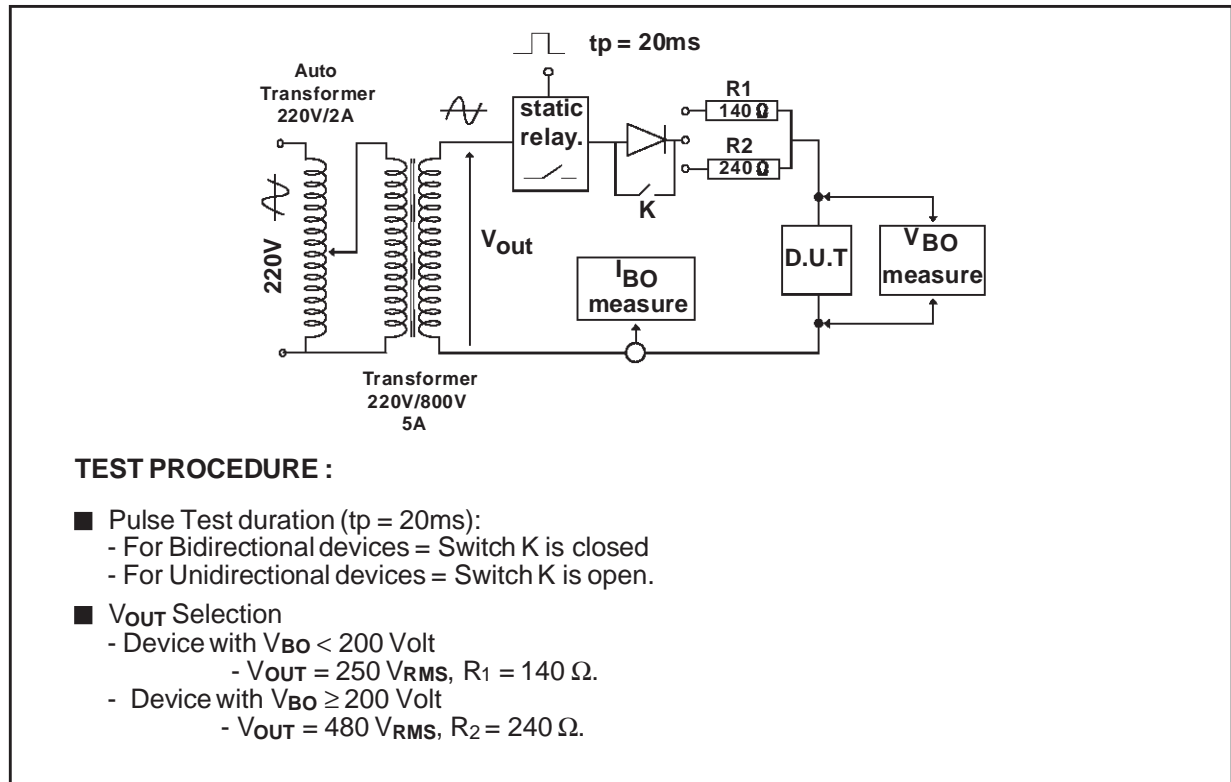
Type	V_{GN} @ $I_{GN} = 200\text{ mA}$		I_{GN} @ $V_{AC} = 100\text{ V}$		V_{RGN} @ $I_G = 1\text{ mA}$	I_{GP} @ $V_{AC} = 100\text{ V}$
	min.	max.	min.	max.	min.	max.
	V	V	mA	mA	V	mA
L3100B/B1	0.6	1.8	30	200	0.7	150

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

Note 2 : $V_R = 5\text{ V}$, $F = 1\text{ MHz}$.

L3100B/L3100B1

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



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

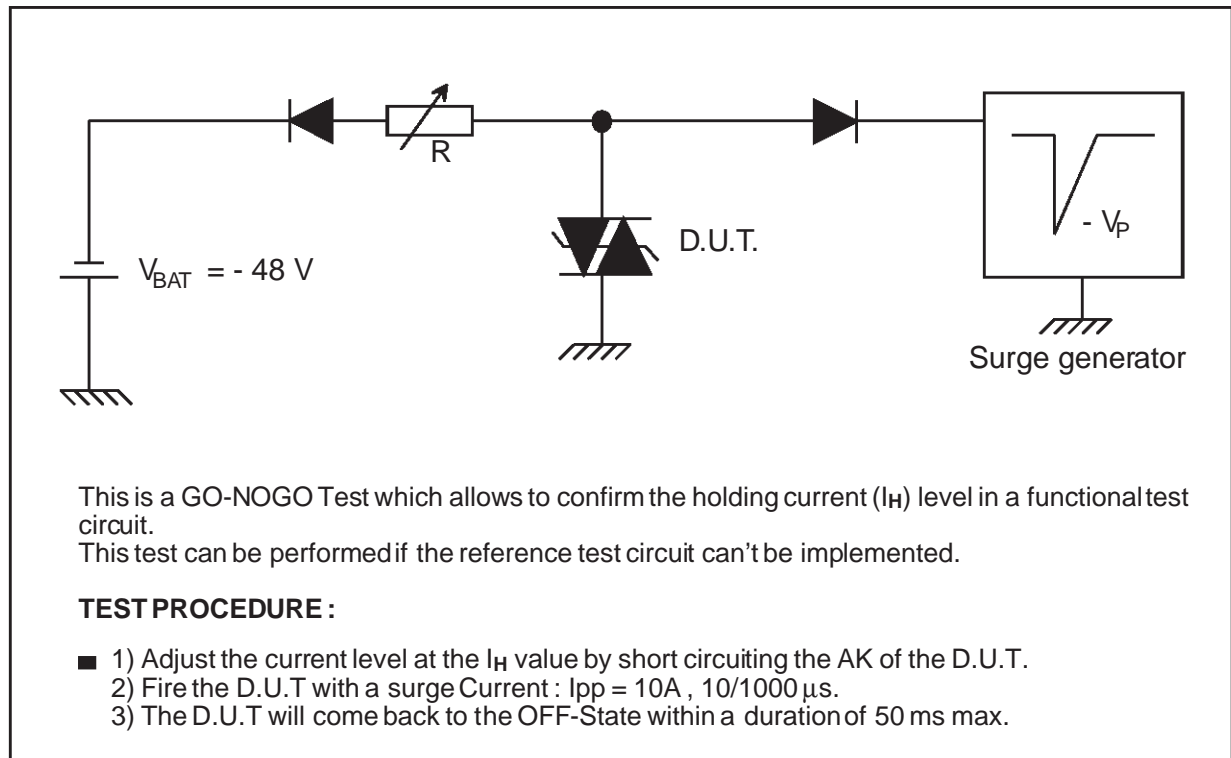


Figure 1 : Surge peak current versus overload duration.

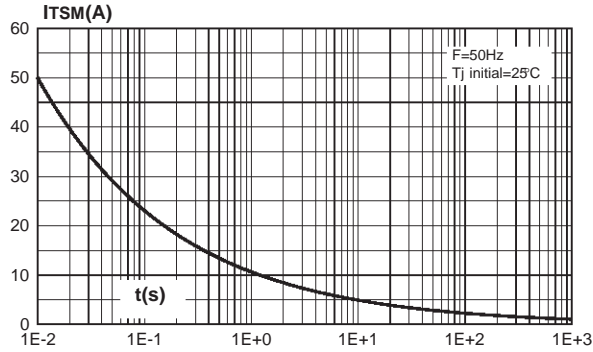


Figure 2 : Relative variation of holding current versus junction temperature.

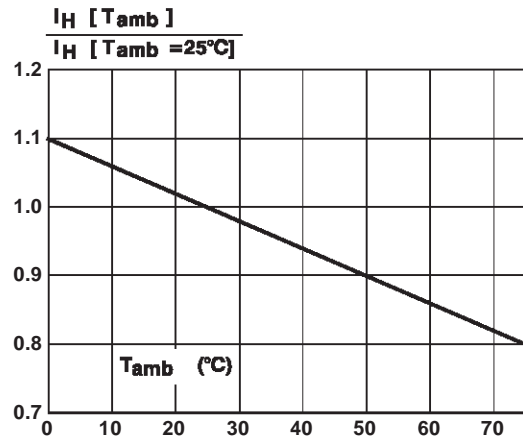


Figure 3 : Relative variation of breakdown voltage versus ambient temperature.

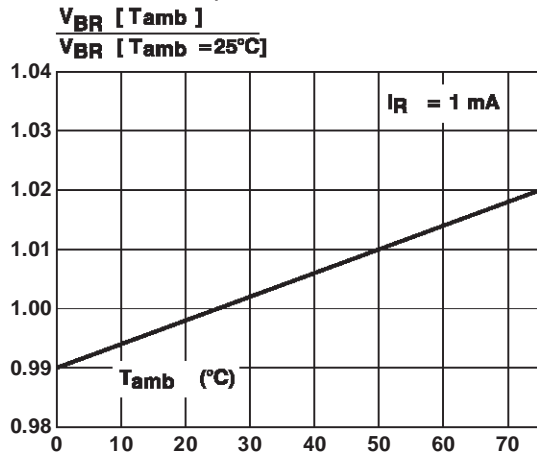
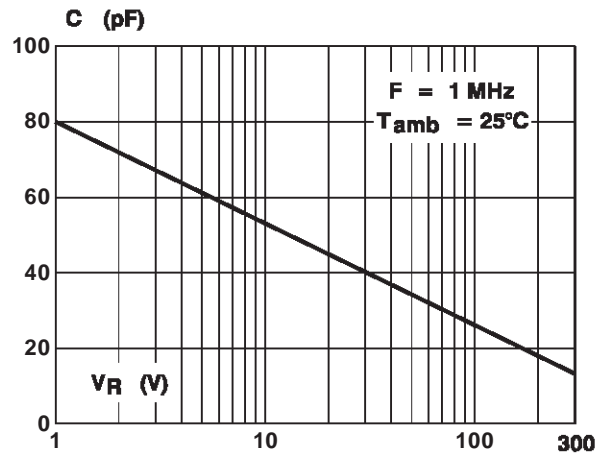


Figure 4 : Junction capacitance versus reverse applied voltage.



L3100B/L3100B1

APPLICATION CIRCUIT

Overvoltage Protection and Current limitation

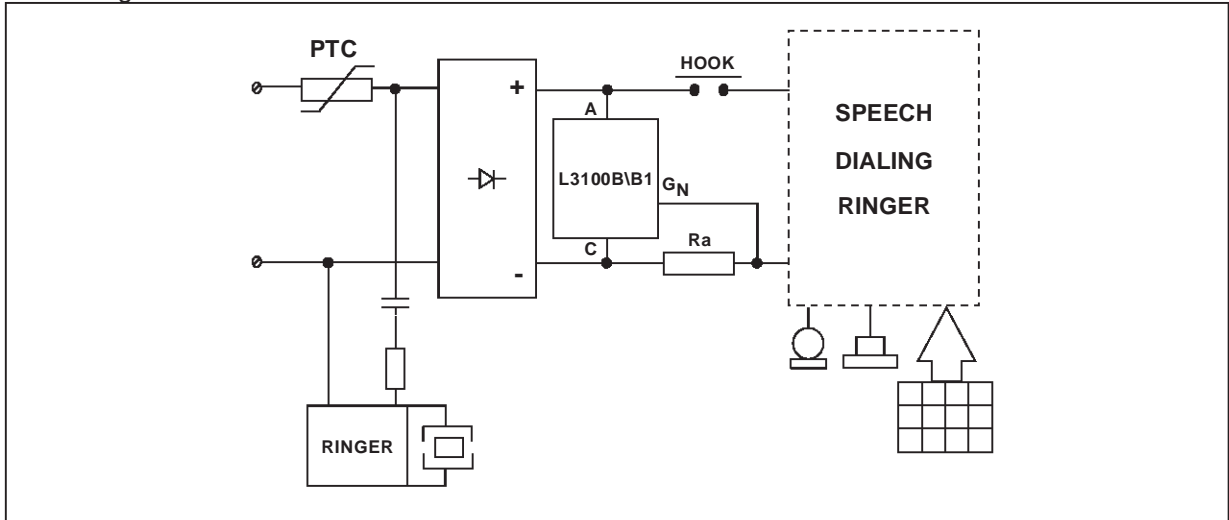
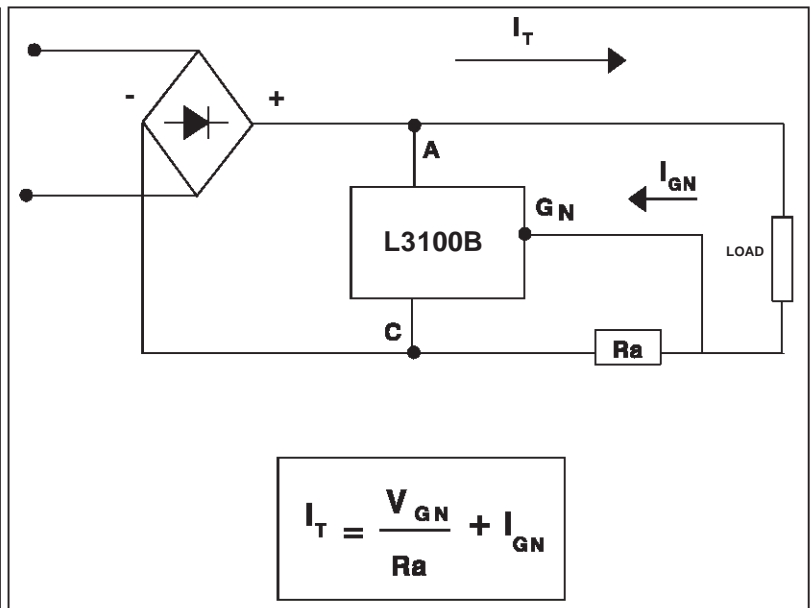


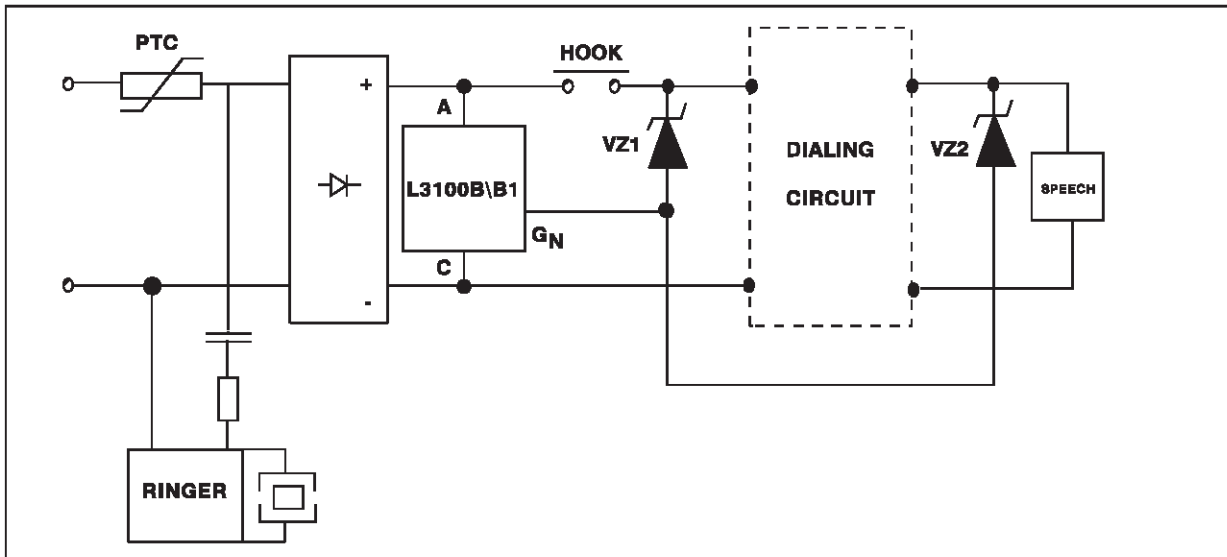
Table below gives the tolerance of the limited current I_T for each standardized resistor value. The formula (1) has been used with V_{GN} values specified at the typical gate current level I_{GN} .

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



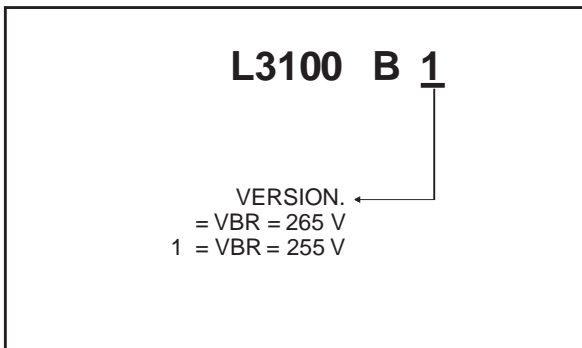
V_{GN} @ I_{GN}		
Min.	Max.	Typ.
V	V	mA
0.75	0.95	100

Ground key telephone set Protection

**PROTECTION MODES :**

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

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

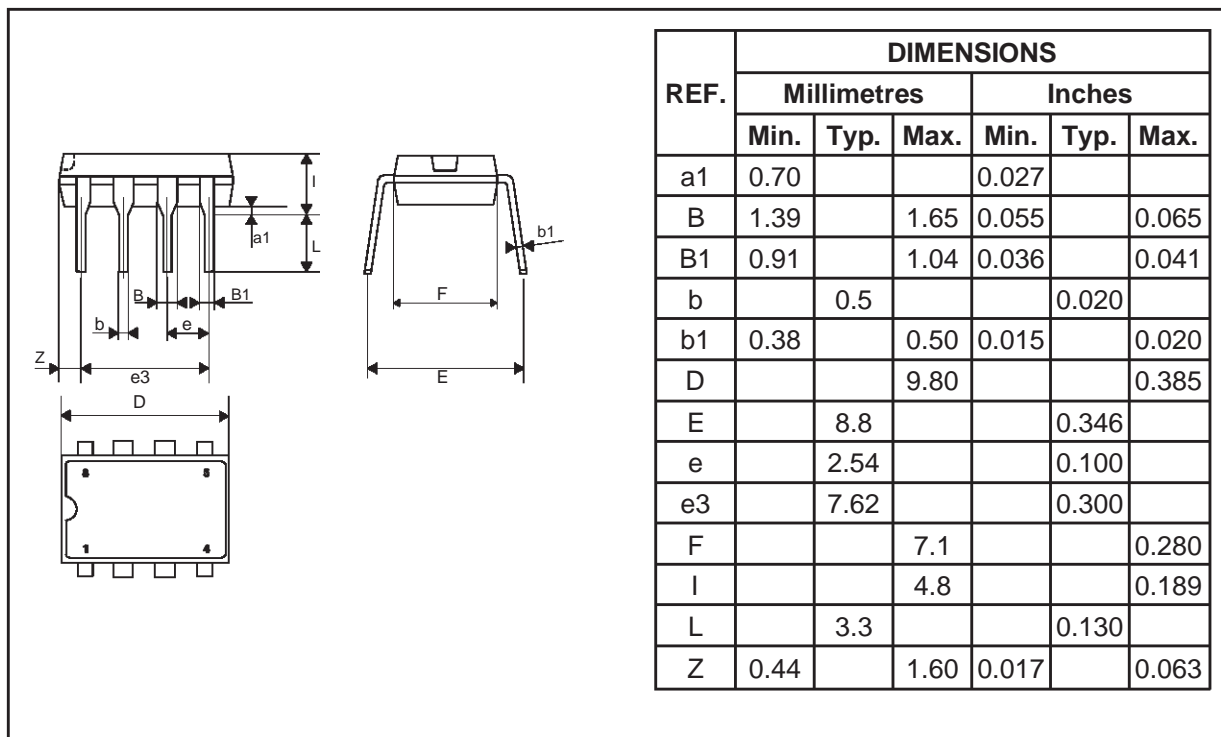
ORDER CODE

MARKING : Logo, Date Code, part Number.

L3100B/L3100B1

PACKAGE MECHANICAL DATA.

DIL 8 (Plastic)



Weight:0.59 g

Packaging : Product supplied in antistatic tubes.

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. Specifications 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 registered trademark of STMicroelectronics

© 1998 STMicroelectronics - Printed in Italy - All rights reserved.

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - France - Germany - Italy - Japan - Korea - Malaysia - Malta - Mexico - Morocco - The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.