

Application Specific Discretes A.S.D.™

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 IPP = 100A 10/1000 μs

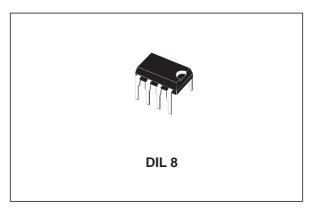
DESCRIPTION

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

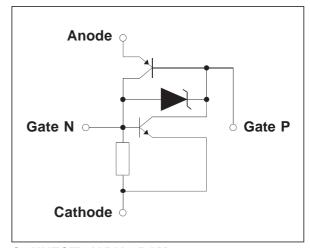
Its high surge current capability makes the L3100B a reliable protection device for very exposed equipment, or when series resistors are very low. The breakdown voltage can be easily programmed by using an external zener diode.

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.



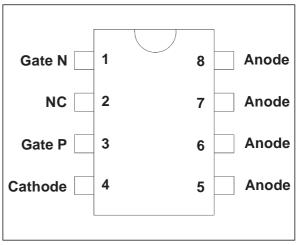
SCHEMATIC DIAGRAM



COMPLIES WITH THE FOLLOWING STANDARDS:

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

CONNECTION DIAGRAM



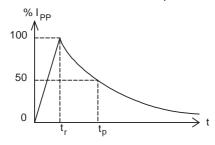
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ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C)

Symbol	Parameter		Value	Unit
Ірр	Peak pulse current (see note 1)	10/1000 μs 8/20 μs	100 250	А
I _{TSM}	Non repetitive surge peak on-state current	tp = 10 ms	50	А
T _{stg} T _j	Storage temperature range Maximum operating junction temperature	9	- 40 to + 150 + 150	°C °C
TL	Maximum lead temperature for soldering	during 10s	230	°C

Note 1 : Pulse waveform 10/1000 μs



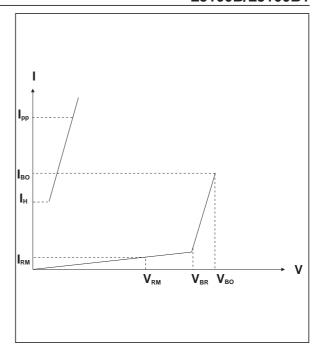
THERMAL RESISTANCE

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Symbol	Parameter	Value	Unit
R _{th (j-a)}	Junction-to-ambient	80	°C/W

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C)

Symbol	Parameter
V _{RM}	Stand-off voltage
I _{RM}	Reverse leakage current
V _{BR}	Breakdown voltage
V _{BO}	Breakover voltage
l _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
С	Capacitance



OPERATION WITHOUT GATE

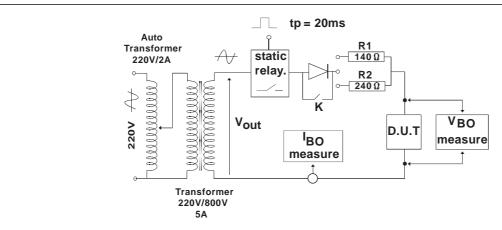
	I _{RM} @	V _{RM}	V _{BR} (@ I R	V _{BO}	@	I _{BO}	I _H	С
Type	max.		min.		max.	min.	max.	min.	max.
туре						note 1		note 1	note 2
	μ Α	V	V	mA	٧	mA	mA	mA	рF
L3100B	6 40	60 250	265	1	350	200	500	280	100
L3100B1	6 40	60 250	255	1	350	200	500	210	100

OPERATION WITH GATES

	V _{GN} @ I _{GN} = 200 mA		I _{GN} @ V	AC = 100V	V _{RGN} @ I _G = 1mA	I _{GP} @ V _{AC} = 100V	
Туре	min.	max.	min.	min. max. n		max.	
	V	V	mA	mA	V	mA	
L3100B/B1	0.6	1.8	30	200	0.7	150	

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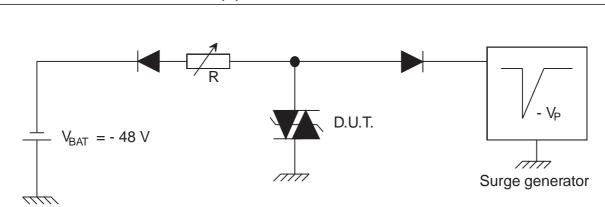
REFERENCE TEST CIRCUIT FOR I_{BO} and V_{BO} parameters :



TEST PROCEDURE:

- Pulse Test duration (tp = 20ms):
 - For Bidirectional devices = Switch K is closed
 - For Unidirectional devices = Switch K is open.
- Vout Selection
 - Device with $V_{\mbox{\footnotesize{BO}}}$ < 200 Volt
 - Vout = 250 V_{RMS}, R₁ = 140 Ω . Device with V_{BO} | 200 Volt
 - - $V_{OUT} = 480 V_{RMS}$, $R_2 = 240 \Omega$.

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



This is a GO-NOGO Test which allows to confirm the holding current (I_H) level in a functional test circuit.

This test can be performed if the reference test circuit can't be implemented.

TEST PROCEDURE:

- 1) Adjust the current level at the I_H value by short circuiting the AK of the D.U.T.
 - 2) Fire the D.U.T with a surge Current : Ipp = 10A, $10/1000 \mu s$.
 - 3) The D.U.T will come back to the OFF-State within a duration of 50 ms max.

Figure 1 : Surge peak current versus overload duration.

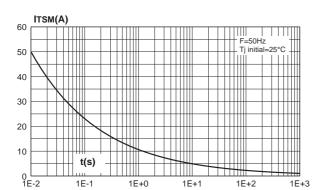


Figure 2: Relative variation of holding current versus junction temperature.

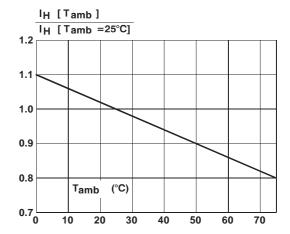


Figure 3: Relative variation of breakdown voltage versus ambient temperature.

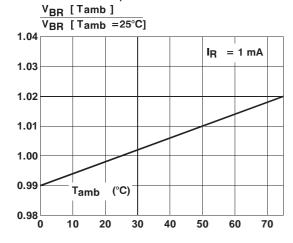
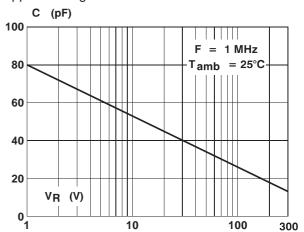


Figure 4: Junction capacitance versus reverse applied voltage.



APPLICATION CIRCUIT

Overvoltage Protection and Current limitation

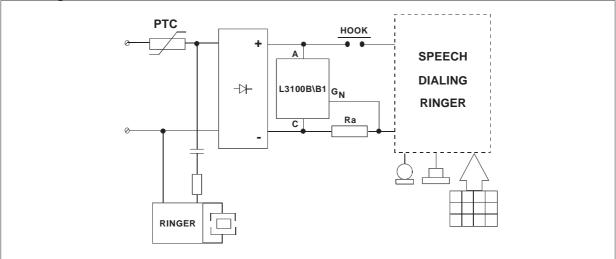
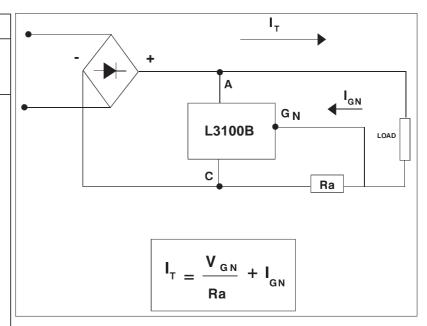


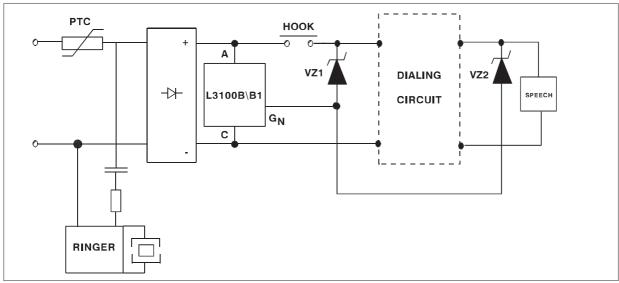
Table below gives the tolerance of the limited current I_T for each standardized resistor value. The formula (1) has been used with V_{GN} values specified at the typical gate current level I_{GN} .

CURRENT TOLERANCE R IT IT Ω mA mA (±5%) min ma 3.00 268 533 3.30 246 503 3.60 228 478 3.90 213 450 4.30 196 433 4.70 181 413 5.10 170 390 5.60 158 379 6.20 145 366 6.80 135 347 7.50 152 333 8.20 117 322 9.10 108 310	
Ω (±5%) mA min mA max 3.00 268 533 3.30 246 503 3.60 228 476 3.90 213 456 4.30 196 433 4.70 181 413 5.10 170 396 5.60 158 379 6.20 145 36 6.80 135 34 7.50 152 333 8.20 117 322	
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10.10 101 299 11.00 95 29 12.00 90 283 13.00 85 27 15.00 78 263 16.00 75 263 18.00 70 250 20.00 66 250 22.00 62 249 24.00 60 242	33 33 33 33 33 33 33 33 33 33 33 33 33



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

Ground key telephone set Protection

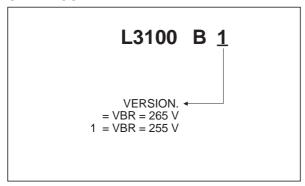


PROTECTION MODES:

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.

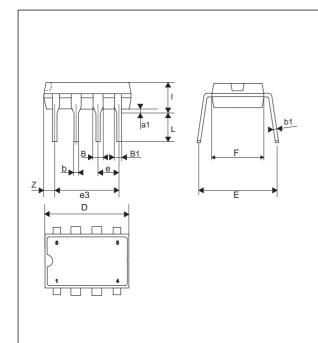
ORDER CODE



MARKING: Logo, Date Code,part Number.

PACKAGE MECHANICAL DATA.

DIL 8 (Plastic)



	DIMENSIONS							
REF.	Mi	llimetr	es		Inches	;		
	Min.	Тур.	Max.	Min.	Тур.	Max.		
a1	0.70			0.027				
В	1.39		1.65	0.055		0.065		
B1	0.91		1.04	0.036		0.041		
b		0.5			0.020			
b1	0.38		0.50	0.015		0.020		
D			9.80			0.385		
Е		8.8			0.346			
е		2.54			0.100			
e3		7.62			0.300			
F			7.1			0.280		
ı			4.8			0.189		
L		3.3			0.130			
Z	0.44		1.60	0.017		0.063		

Weight: 0.59 g

Packaging: Product supplied in antistatic tubes.

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