



# L3121B

Application Specific Discretes  
A.S.D.<sup>TM</sup>

PROGRAMMABLE TRANSIENT VOLTAGE  
SUPPRESSOR FOR SLIC PROTECTION

### FEATURES

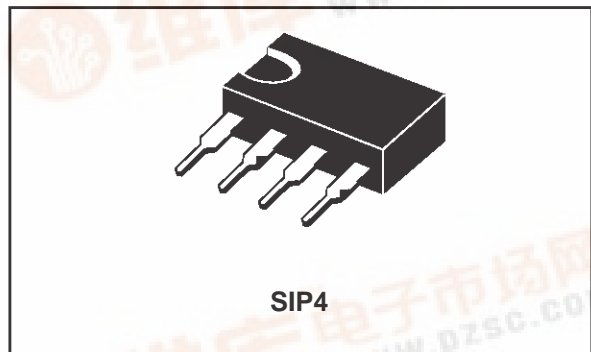
- BIDIRECTIONAL FUNCTION WITH VOLTAGE PROGRAMMABILITY IN BOTH POSITIVE AND NEGATIVE POLARITIES.
- PROGRAMMABLE BREAKDOWN VOLTAGE UP TO 100 V.
- HOLDING CURRENT = 150 mA min.
- HIGH SURGE CURRENT CAPABILITY.  
I<sub>PP</sub> = 100A, 10/1000μs

### DESCRIPTION

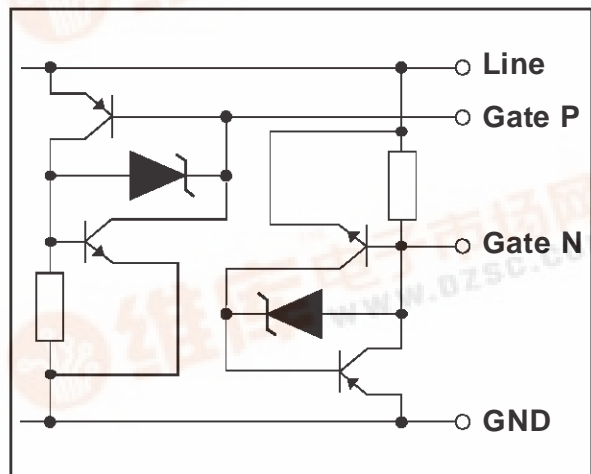
This device has been especially designed to protect a subscriber line interface circuit (SLIC) with an integrated ring generator.

Used with the recommended application circuit, each line (TIP and RING) is protected against positive and negative surges. In the positive polarity, the breakdown voltage is referenced to the +VB, and in the negative polarity, the breakdown voltage is referenced to the -Vbat.

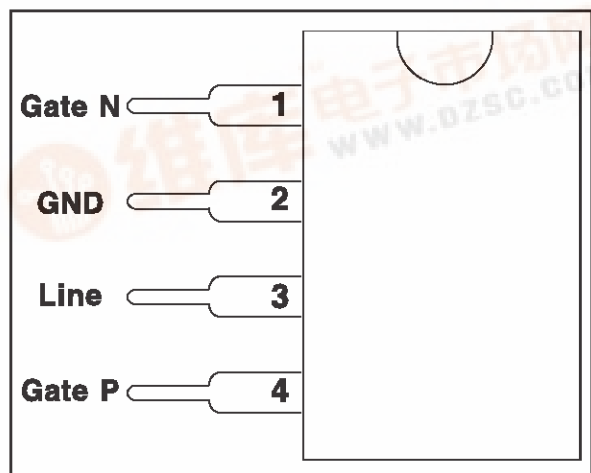
Its high surge current capability makes the L3121B a reliable protection device for very exposed equipment, or when series resistors are very low.



### SCHEMATIC DIAGRAM



### CONNECTION DIAGRAM



## L3121B

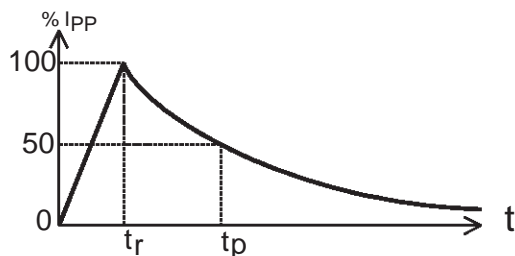
COMPLIES WITH THE FOLLOWING STANDARDS:	Peak Surge Voltage (V)	Voltage Waveform ( $\mu\text{s}$ )	Current Waveform ( $\mu\text{s}$ )	Admissible $I_{pp}$ (A)	Necessary Resistor ( $\Omega$ )
ITU-T K20	4000	10/700	5/310	100	-
VDE0433	4000	10/700	5/310	100	-
VDE0878	4000	1.2/50	1/20	100	-
IEC1000-4-5	level 4 level 4	10/700 1.2/50	5/310 8/20	100 100	- -
FCC Part 68, lightning surge type A	1500 800	10/160 10/560	10/160 10/560	200 100	- -
FCC Part 68, lightning surge type B	1000	9/720	5/320	25	-
BELLCORE TR-NWT-001089 First level	2500 1000	2/10 10/1000	2/10 10/1000	250 100	- -
BELLCORE TR-NWT-001089 Second level	5000	2/10	2/10	250	10

### ABSOLUTE MAXIMUM RATINGS (Tamb = 25°C)

Symbol	Parameter	Value	Unit
$I_{PP}$	Peak pulse current	10/1000 $\mu\text{s}$ 2/10 $\mu\text{s}$	A
$I_{TSM}$	Non repetitive surge peak on-state current	$t_p = 10 \text{ ms}$	A
$V_{MLG}$ $V_{MGL}$	Maximum voltage LINE/GND. Maximum voltage GATE/LINE.	100 80	V V
$T_{stg}$ $T_j$	Storage temperature range Maximum operating junction temperature	- 40 to + 150 + 150	°C °C
$T_L$	Maximum lead temperature for soldering during 10s	260	°C
$T_{op}$	Operating temperature range (see note 1)	- 40 to + 85	°C

Note 1: Variation of electrical parameters is given by curves.

Pulse waveform 10/1000  $\mu\text{s}$

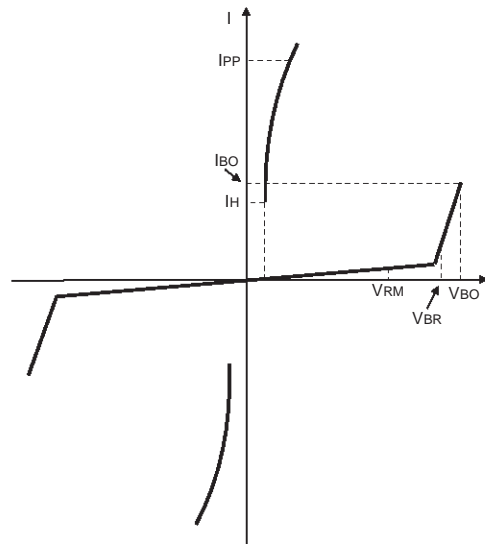


### THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
$R_{th(j-a)}$	Junction-to-ambient	80	°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
C	Capacitance



**1- OPERATION WITHOUT GATE**

Type	$I_{RM}$ @ $V_{RM}$		$V_{BR}$ @ $I_H$		$V_{BO}$ @ $I_{BO}$			$I_H$	C
	max.		min.		max.	typ.	max.	min.	max.
	$\mu\text{A}$	V	V	mA	V	mA	mA	mA	pF
L3121B	5 8	60 90	100	1	180	200	500	150	200

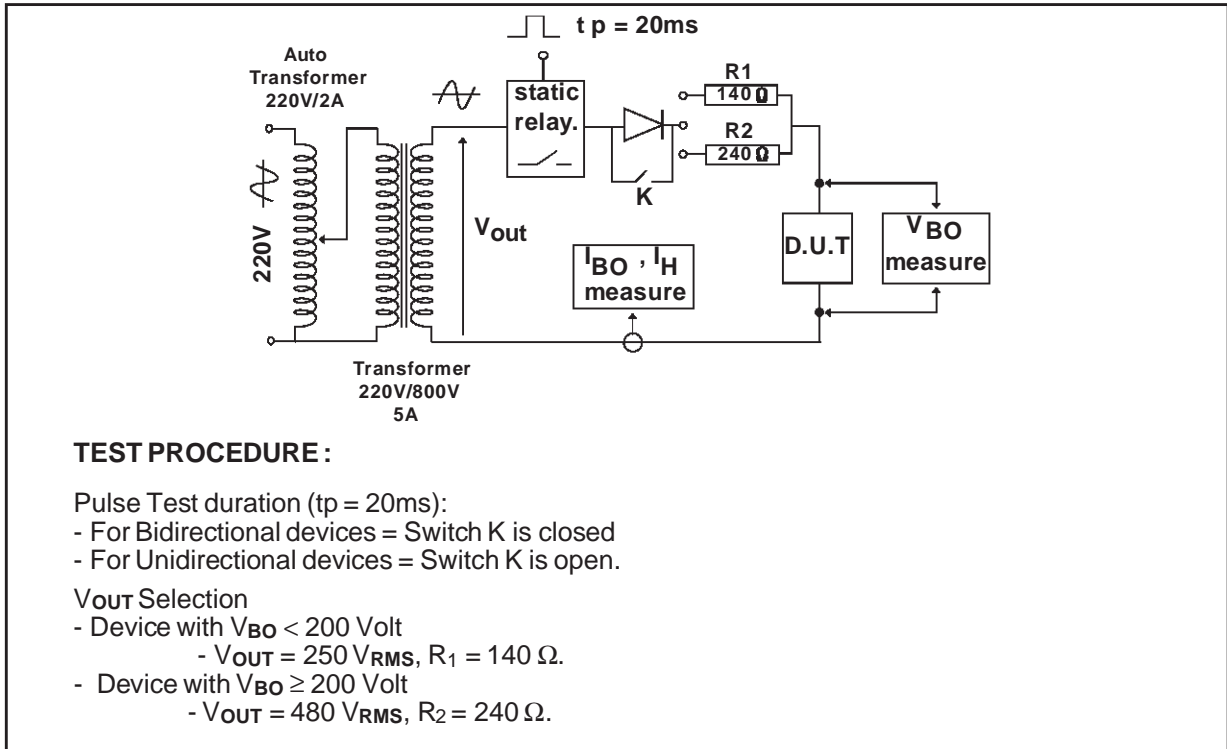
**2- OPERATION WITH GATE**

Type	$V_{GN}$ @ $I_{GN} = 200\text{mA}$		$I_{GN}$ @ $V_{AC} = 60\text{V}$		$I_{GP}$ @ $V_{AC} = 60\text{V}$
	min.	max.	min.	max.	max.
	V	V	mA	mA	mA
L3121B	0.6	1.8	80	200	180

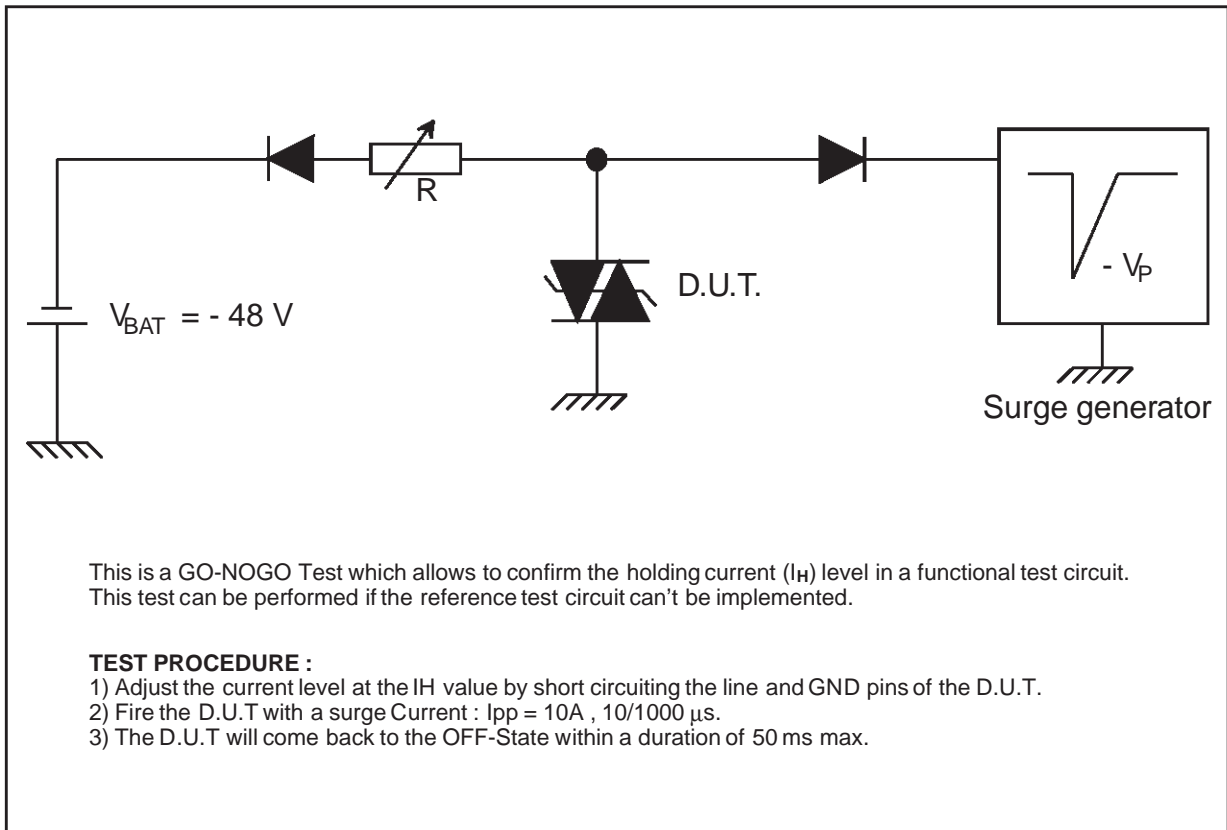
**Note 1** :See the reference test circuits for  $I_H$ ,  $I_{BO}$  and  $V_{BO}$  parameters.

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

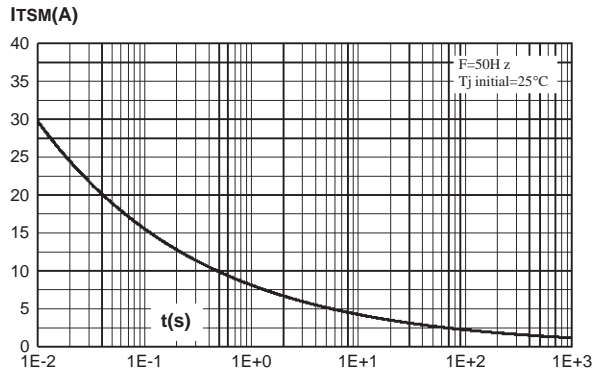
REFERENCE TEST CIRCUIT FOR  $I_{BO}$  and  $V_{BO}$  parameters:



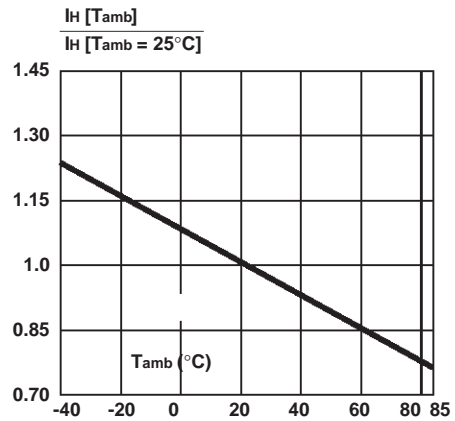
FUNCTIONAL HOLDING CURRENT ( $I_H$ ) TEST CIRCUIT = GO - NOGO TEST.



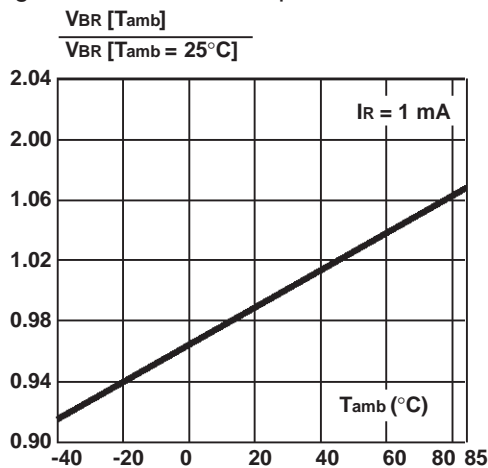
**Fig. 1:** Surge peak current versus overload duration (typical values).



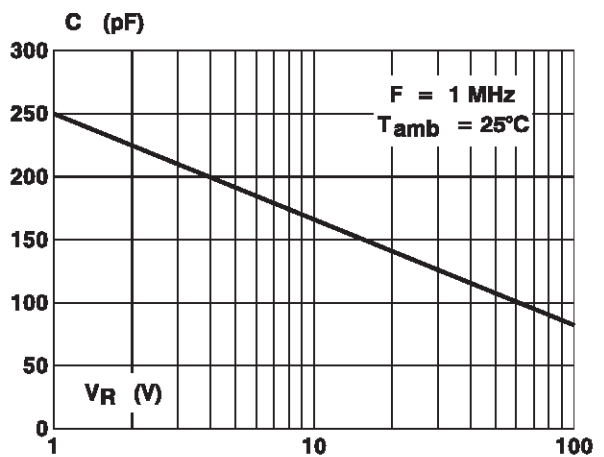
**Fig. 2:** Typical relative variation of holding current versus ambient temperature.



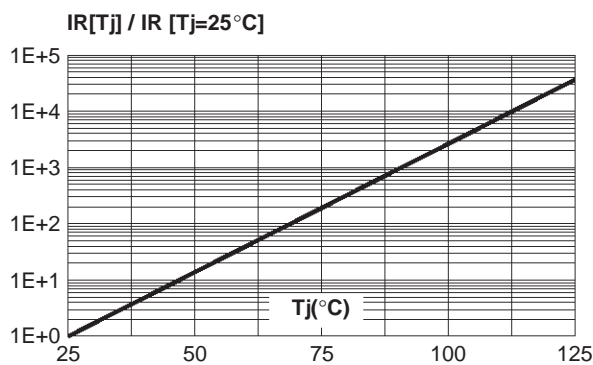
**Fig. 3:** Typical relative variation of breakdown voltage versus ambient temperature.



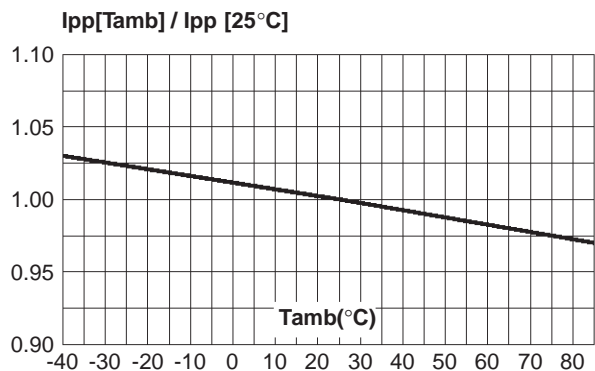
**Fig. 4:** Junction capacitance versus reverse applied voltage.



**Fig. 5:** Typical relative variation of leakage current versus ambient temperature.

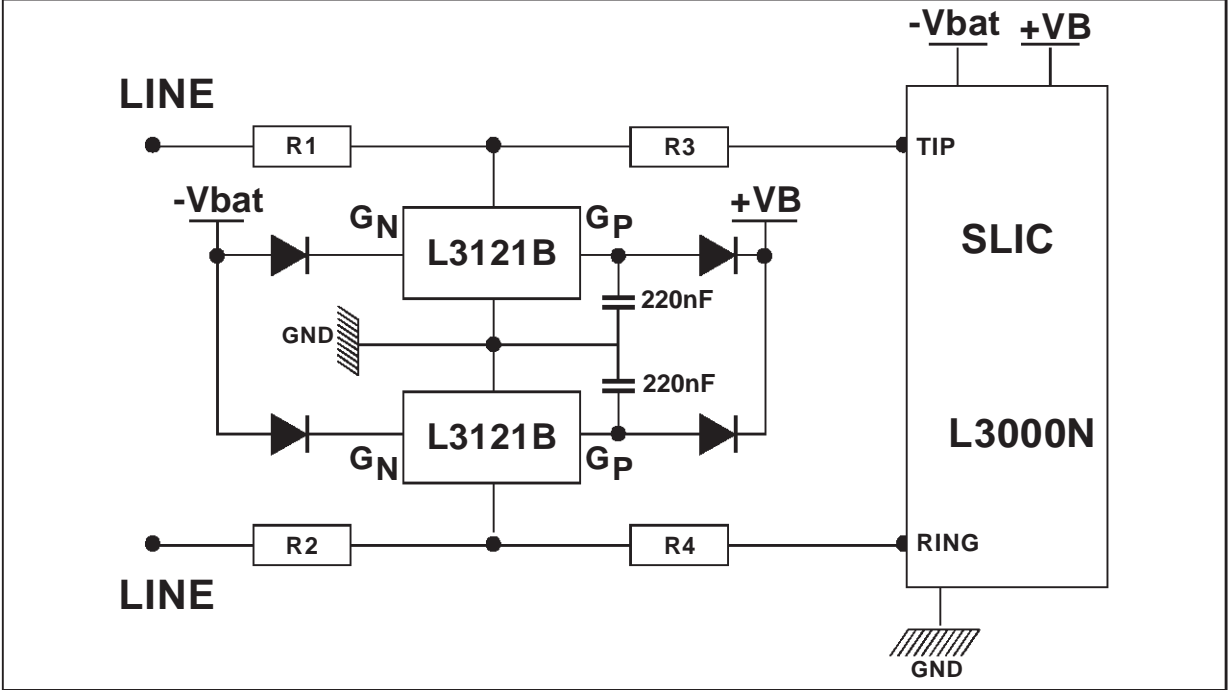


**Fig. 6:** Typical relative variation of peak pulse current (10/1000μs) versus ambient temperature.

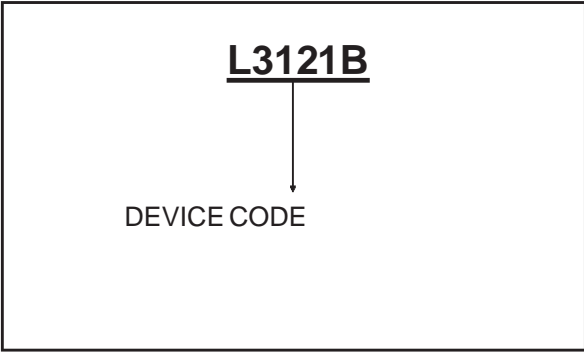


**L3121B**

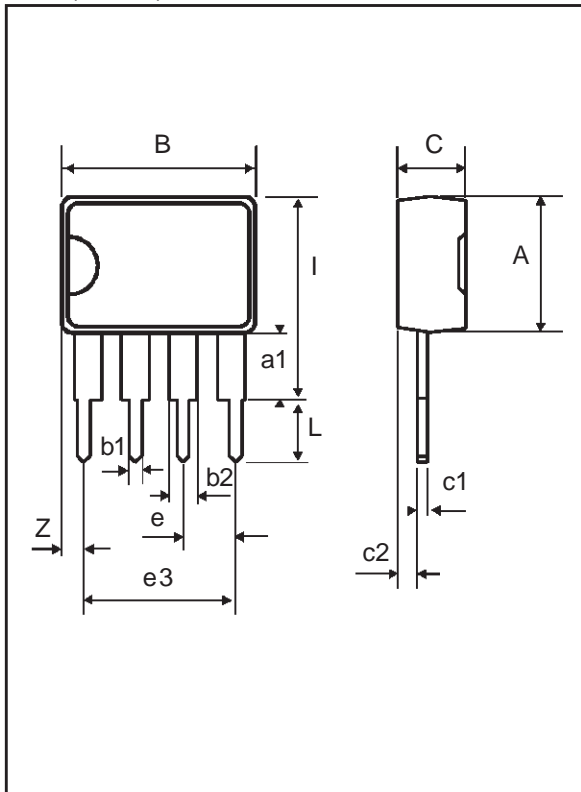
Typical Slic Protection Concept.



**ORDER CODE**



**MARKING** : Logo, Date Code, Part Number

**PACKAGE MECHANICAL DATA**  
 SIP4 (Plastic)


REF.	DIMENSIONS					
	Millimetres			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			7.10			0.280
a1	2.80			0.110		
B			10.15			0.400
b1		0.50			0.020	
b2	1.35		1.75	0.053		0.069
C	3.18		3.43	0.125		0.135
c1	0.38		0.50	0.015		0.020
c2		1.30			0.051	
e		2.54			0.100	
e3		7.62			0.200	
I			10.50			0.413
L		3.30			0.130	
Z			1.50			0.059

Ordre code	Marking	Package	Weight	Base qty	Delivery mode
L3121B		SIP4	0.55 g		

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