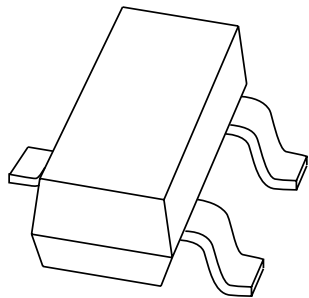


DATA SHEET



PLVA6xxA series Low-voltage avalanche regulator diodes

Product specification
Supersedes data of 1999 May 25

2004 Jan 14

Low-voltage avalanche regulator diodes

PLVA6xxA series

FEATURES

- Very low dynamic impedance at low currents: approximately $\frac{1}{20}$ of conventional series
- Hard breakdown knee
- Low noise: approximately $\frac{1}{10}$ of conventional series
- Total power dissipation: max. 250 mW
- Small tolerances of V_Z
- Working voltage range: nominal 5.00 to 6.80 V
- Non-repetitive peak reverse power dissipation: maximal 30 W.

APPLICATIONS

- Low current, low power, low noise applications
- CMOS RAM back-up circuits
- Voltage stabilizers
- Voltage limiters
- Smoke detector relays.

DESCRIPTION

High performance voltage regulator diodes in small SOT23 plastic SMD packages.

The series consists of PLVA650A to PLVA668A.

MARKING

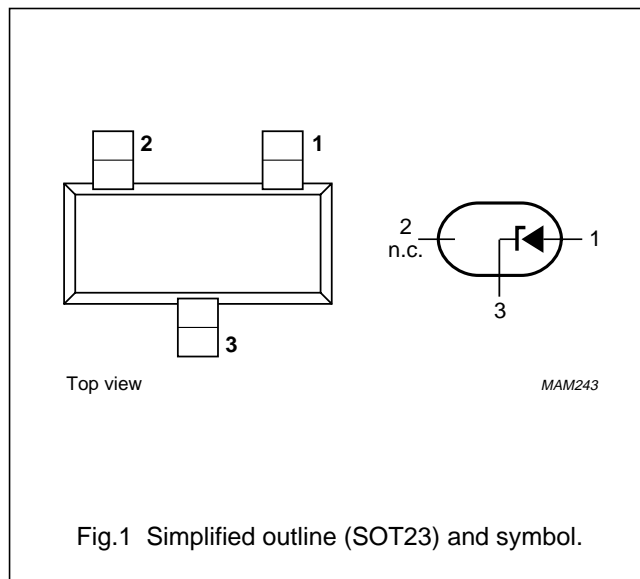
TYPE NUMBER	MARKING CODE ⁽¹⁾
PLVA650A	*9A
PLVA653A	*9B
PLVA656A	*9C
PLVA659A	*9D
PLVA662A	*9E
PLVA665A	*9F
PLVA668A	*9G

Note

1. * = p: Made in Hong Kong.
* = t: Made in Malaysia.
* = W: Made in China.

PINNING

PIN	DESCRIPTION
1	anode
2	not connected
3	cathode



Low-voltage avalanche regulator diodes

PLVA6xxA series

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
PLVA6xxA	–	plastic surface mounted package; 3 leads	SOT23

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_F	continuous forward current		–	250	mA
I_{ZRM}	repetitive peak working current	$t_p = 100 \mu\text{s}$; $\delta = 10\%$	–	250	mA
P_{ZSM}	non-repetitive peak reverse power dissipation	$t_p = 100 \mu\text{s}$; $T_j = 150 \text{ }^\circ\text{C}$	–	30	W
P_{tot}	total power dissipation	$T_{amb} = 25 \text{ }^\circ\text{C}$; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	$^\circ\text{C}$
T_j	junction temperature		–	150	$^\circ\text{C}$

Note

1. Device mounted on an FR4 printed circuit-board.

Low-voltage avalanche regulator diodes

PLVA6xxA series

ELECTRICAL CHARACTERISTICS $T_j = 25\text{ }^\circ\text{C}$; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	$I_F = 10\text{ mA}$	–	–	0.9	V
V_Z	working voltage	$I_Z = 250\text{ }\mu\text{A}$				
	PLVA650A		4.80	5.00	5.20	V
	PLVA653A		5.10	5.30	5.50	V
	PLVA656A		5.40	5.60	5.80	V
	PLVA659A		5.70	5.90	6.10	V
	PLVA662A		6.00	6.20	6.40	V
	PLVA665A		6.30	6.50	6.70	V
	PLVA668A		6.60	6.80	7.00	V
V_Z	working voltage	$I_Z = 10\text{ }\mu\text{A}$				
	PLVA650A		–	4.30	–	V
	PLVA653A		–	5.20	–	V
	PLVA656A		–	5.51	–	V
	PLVA659A		–	5.85	–	V
	PLVA662A		–	6.19	–	V
	PLVA665A		–	6.49	–	V
	PLVA668A		–	6.80	–	V
R_Z	dynamic resistance	1 kHz superimposed; I_{ZAC} is 10% of I_{ZDC} ; $I_Z = 250\text{ }\mu\text{A}$				
	PLVA650A		–	–	700	Ω
	PLVA653A		–	–	250	Ω
	PLVA656A to PLVA668A		–	–	100	Ω
S_Z	temperature coefficient	$I_Z = 250\text{ }\mu\text{A}$				
	PLVA650A		–	0.20	–	mV/K
	PLVA653A		–	1.60	–	mV/K
	PLVA656A		–	1.90	–	mV/K
	PLVA659A		–	2.40	–	mV/K
	PLVA662A		–	2.65	–	mV/K
	PLVA665A		–	2.90	–	mV/K
	PLVA668A		–	3.40	–	mV/K
I_R	reverse current	$V_R = 80\% V_Z$ nominal				
	PLVA650A		–	–	20000	nA
	PLVA653A		–	–	5000	nA
	PLVA656A		–	–	1000	nA
	PLVA659A		–	–	500	nA
	PLVA662A		–	–	100	nA
	PLVA665A		–	–	50	nA
	PLVA668A		–	–	10	nA

Low-voltage avalanche regulator diodes

PLVA6xxA series

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	$V_R = 50\% V_Z$ nominal	–	34	–	nA
	PLVA650A					
	PLVA653A					
	PLVA656A					
	PLVA659A					
	PLVA662A					
	PLVA665A					
	PLVA668A					
I_R	reverse current	$V_R = 90\% V_Z$ nominal	–	21	–	μA
	PLVA650A					
	PLVA653A					
	PLVA656A					
	PLVA659A					
	PLVA662A					
	PLVA665A					
	PLVA668A					
ΔV_Z	line regulation		–	–	0.1	V
	PLVA659A to PLVA668A					
	PLVA656A					
	PLVA650A					
PLVA653A						
V_n	noise voltage density	$f = 1 \text{ kHz}; B = 1 \text{ kHz}; I_Z = 250 \mu\text{A}$	–	–	1.0	$\frac{\mu\text{V}}{\sqrt{\text{Hz}}}$

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th(j-tp)}$	thermal resistance from junction to tie-point		330	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

1. Device mounted on an FR4 printed circuit-board.

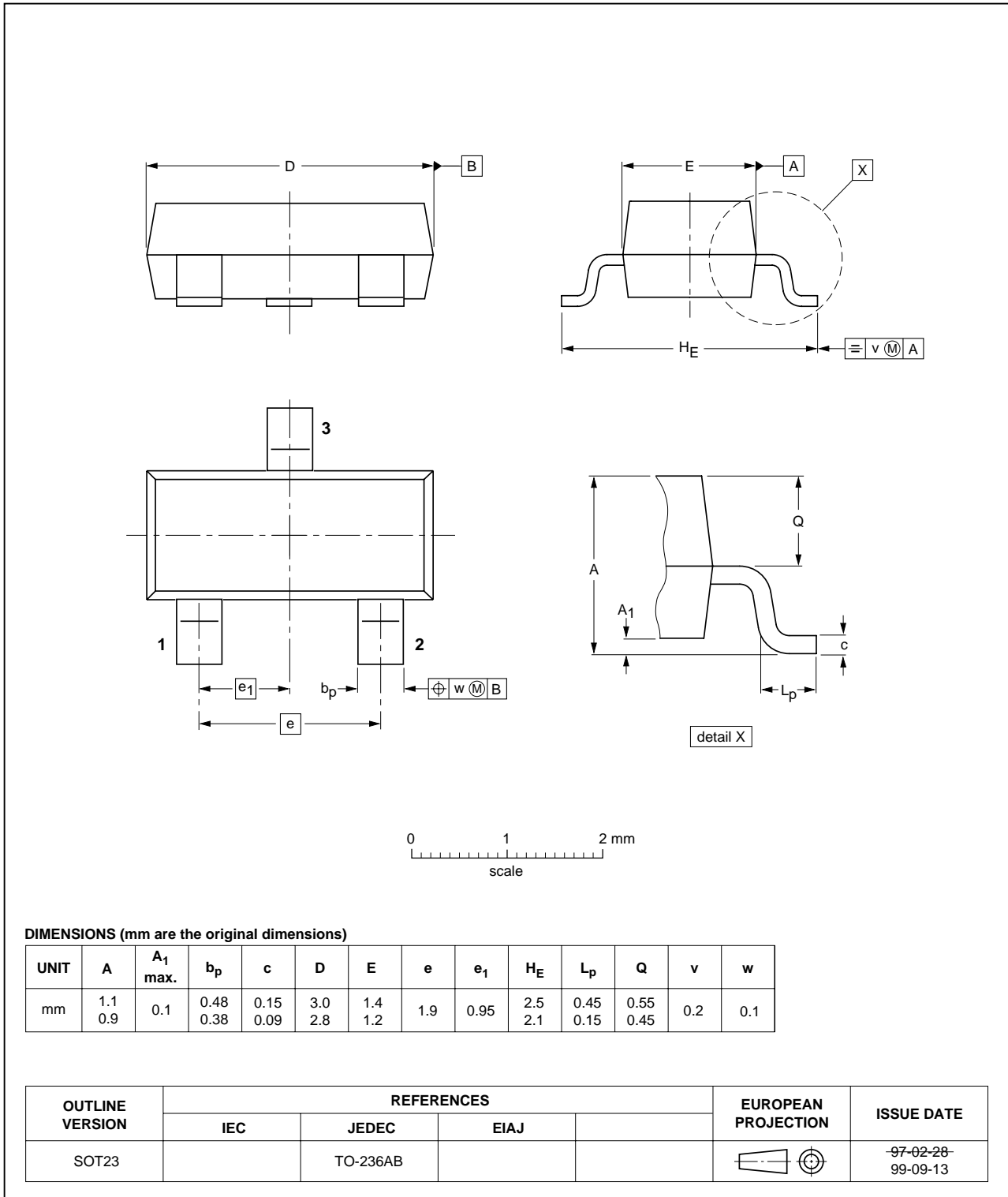
Low-voltage avalanche regulator diodes

PLVA6xxA series

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



Low-voltage avalanche regulator diodes

PLVA6xxA series

DATA SHEET STATUS

LEVEL	DATA SHEET STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾⁽³⁾	DEFINITION
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
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Notes

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DEFINITIONS

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Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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