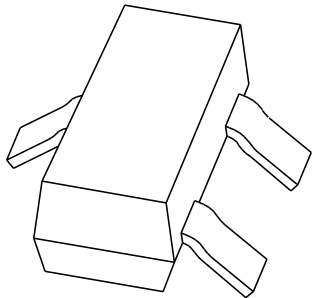


DATA SHEET



PLVA600A series Low-voltage avalanche regulator diodes

Product specification
Supersedes data of November 1993
File under Discrete Semiconductors, SC01

1996 Apr 26

Low-voltage avalanche regulator diodes

PLVA600A 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: nom. 5.0 to 6.8 V
- Non-repetitive peak reverse power dissipation: max. 30 W.

APPLICATIONS

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

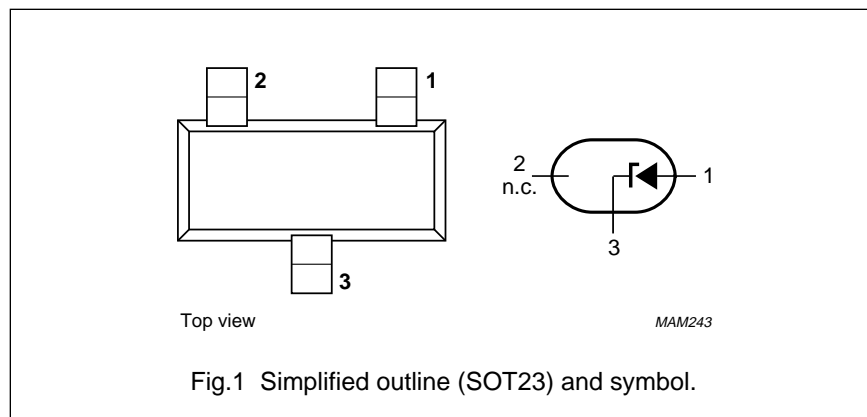
DESCRIPTION

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

The series consists of PLVA650A to PLVA668A.

PINNING

PIN	DESCRIPTION
1	anode
2	not connected
3	cathode



MARKING

TYPE NUMBER	MARKING CODE
PLVA650A	p9A
PLVA653A	p9B
PLVA656A	p9C
PLVA659A	p9D
PLVA662A	p9E
PLVA665A	p9F
PLVA668A	p9G

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

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	$T_{amb} = 25 \text{ }^\circ\text{C}; \text{note 1}$	–	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

PLVA600A 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

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SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	$V_R = 50\% V_Z$ nominal				
	PLVA650A		–	34	–	nA
	PLVA653A		–	22	–	nA
	PLVA656A		–	1.1	–	nA
	PLVA659A		–	0.9	–	nA
	PLVA662A		–	0.9	–	nA
	PLVA665A		–	0.9	–	nA
	PLVA668A		–	0.8	–	nA
I_R	reverse current	$V_R = 90\% V_Z$ nominal				
	PLVA650A		–	21	–	μ A
	PLVA653A		–	3.5	–	μ A
	PLVA656A		–	1.3	–	μ A
	PLVA659A		–	1.0	–	μ A
	PLVA662A		–	0.05	–	μ A
	PLVA665A		–	0.04	–	μ A
	PLVA668A		–	0.006	–	μ A
ΔV_Z	line regulation					
	PLVA659A to PLVA668A	$I_{LO} = 10 \mu\text{A}; I_{Hi} = 1 \text{ mA}$	–	–	0.1	V
	PLVA656A	$I_{LO} = 50 \mu\text{A}; I_{Hi} = 1 \text{ mA}$	–	–	0.1	V
	PLVA650A	$I_{LO} = 100 \mu\text{A}; I_{Hi} = 1 \text{ mA}$	–	–	0.4	V
	PLVA653A	$I_{LO} = 100 \mu\text{A}; I_{Hi} = 1 \text{ mA}$	–	–	0.2	V
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

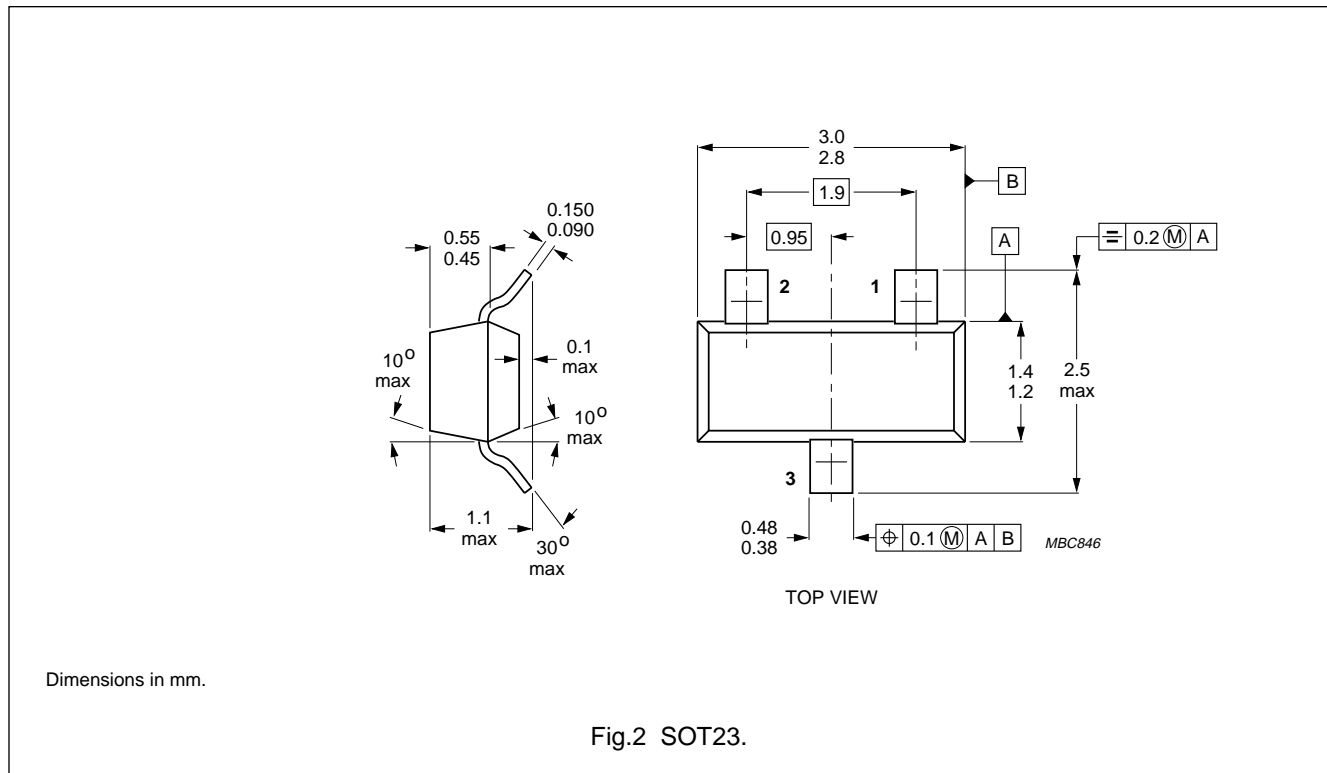
Note

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

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PACKAGE OUTLINE



DEFINITIONS

Data sheet status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). 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.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.