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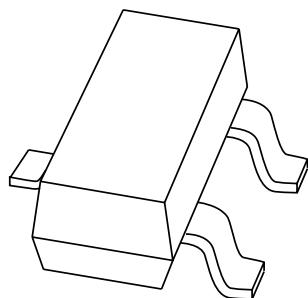
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Kind regards,

Team Nexperia

# DATA SHEET



## **PLVA6xxA series** Low-voltage avalanche regulator diodes

Product data sheet  
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  $1/20$  of conventional series
- Hard breakdown knee
- Low noise: approximately  $1/10$  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 <sup>(1)</sup>
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

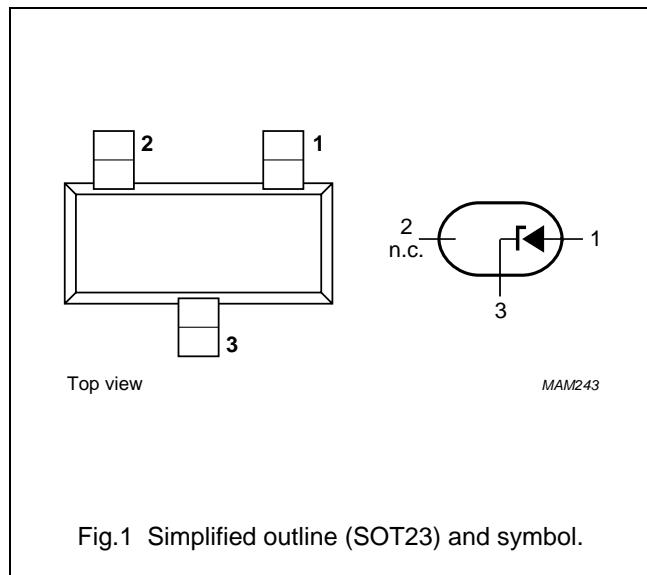


Fig.1 Simplified outline (SOT23) and symbol.

## 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	$t_p = 100 \mu s; \delta = 10\%$	–	250	mA
$P_{ZSM}$	non-repetitive peak reverse power dissipation	$t_p = 100 \mu s; T_j = 150 \text{ }^\circ\text{C}$	–	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

## PLVA6xxA series

## ELECTRICAL CHARACTERISTICS

 $T_j = 25^\circ\text{C}$ ; 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 PLVA650A PLVA653A PLVA656A PLVA659A PLVA662A PLVA665A PLVA668A	$I_Z = 250 \mu\text{A}$	4.80	5.00	5.20	V
			5.10	5.30	5.50	V
			5.40	5.60	5.80	V
			5.70	5.90	6.10	V
			6.00	6.20	6.40	V
			6.30	6.50	6.70	V
			6.60	6.80	7.00	V
			—	—	—	—
$V_Z$	working voltage PLVA650A PLVA653A PLVA656A PLVA659A PLVA662A PLVA665A PLVA668A	$I_Z = 10 \mu\text{A}$	—	4.30	—	V
			—	5.20	—	V
			—	5.51	—	V
			—	5.85	—	V
			—	6.19	—	V
			—	6.49	—	V
			—	6.80	—	V
			—	—	—	—
$R_Z$	dynamic resistance PLVA650A PLVA653A PLVA656A to PLVA668A	1 kHz superimposed; $I_{ZAC}$ is 10% of $I_{ZDC}$ ; $I_Z = 250 \mu\text{A}$	—	—	700	$\Omega$
			—	—	250	$\Omega$
			—	—	100	$\Omega$
			—	—	—	—
$S_Z$	temperature coefficient PLVA650A PLVA653A PLVA656A PLVA659A PLVA662A PLVA665A PLVA668A	$I_Z = 250 \mu\text{A}$	—	0.20	—	$\text{mV/K}$
			—	1.60	—	$\text{mV/K}$
			—	1.90	—	$\text{mV/K}$
			—	2.40	—	$\text{mV/K}$
			—	2.65	—	$\text{mV/K}$
			—	2.90	—	$\text{mV/K}$
			—	3.40	—	$\text{mV/K}$
			—	—	—	—
$I_R$	reverse current PLVA650A PLVA653A PLVA656A PLVA659A PLVA662A PLVA665A PLVA668A	$V_R = 80\% V_Z$ nominal	—	—	20000	nA
			—	—	5000	nA
			—	—	1000	nA
			—	—	500	nA
			—	—	100	nA
			—	—	50	nA
			—	—	10	nA
			—	—	—	—

## Low-voltage avalanche regulator diodes

## PLVA6xxA series

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT	
$I_R$	reverse current PLVA650A	$V_R = 50\% V_Z$ nominal	—	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	
	reverse current PLVA650A			21	—	$\mu$ A	
$I_R$	PLVA653A	$V_R = 90\% V_Z$ nominal	—	3.5	—	$\mu$ A	
	PLVA656A			1.3	—	$\mu$ A	
	PLVA659A			1.0	—	$\mu$ A	
	PLVA662A			0.05	—	$\mu$ A	
	PLVA665A			0.04	—	$\mu$ A	
	PLVA668A			0.006	—	$\mu$ A	
	line regulation PLVA659A to PLVA668A	$I_{LO} = 10 \mu A; I_{HI} = 1 mA$ $I_{LO} = 50 \mu A; I_{HI} = 1 mA$ $I_{LO} = 100 \mu A; I_{HI} = 1 mA$ $I_{LO} = 100 \mu A; I_{HI} = 1 mA$	—	—	0.1	V	
	PLVA656A			—	—	0.1	V
	PLVA650A			—	—	0.4	V
	PLVA653A			—	—	0.2	V
$V_n$	noise voltage density	$f = 1 \text{ kHz}; B = 1 \text{ kHz}; I_Z = 250 \mu A$	—	—	1.0	$\frac{\mu V}{\sqrt{Hz}}$	

## 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.

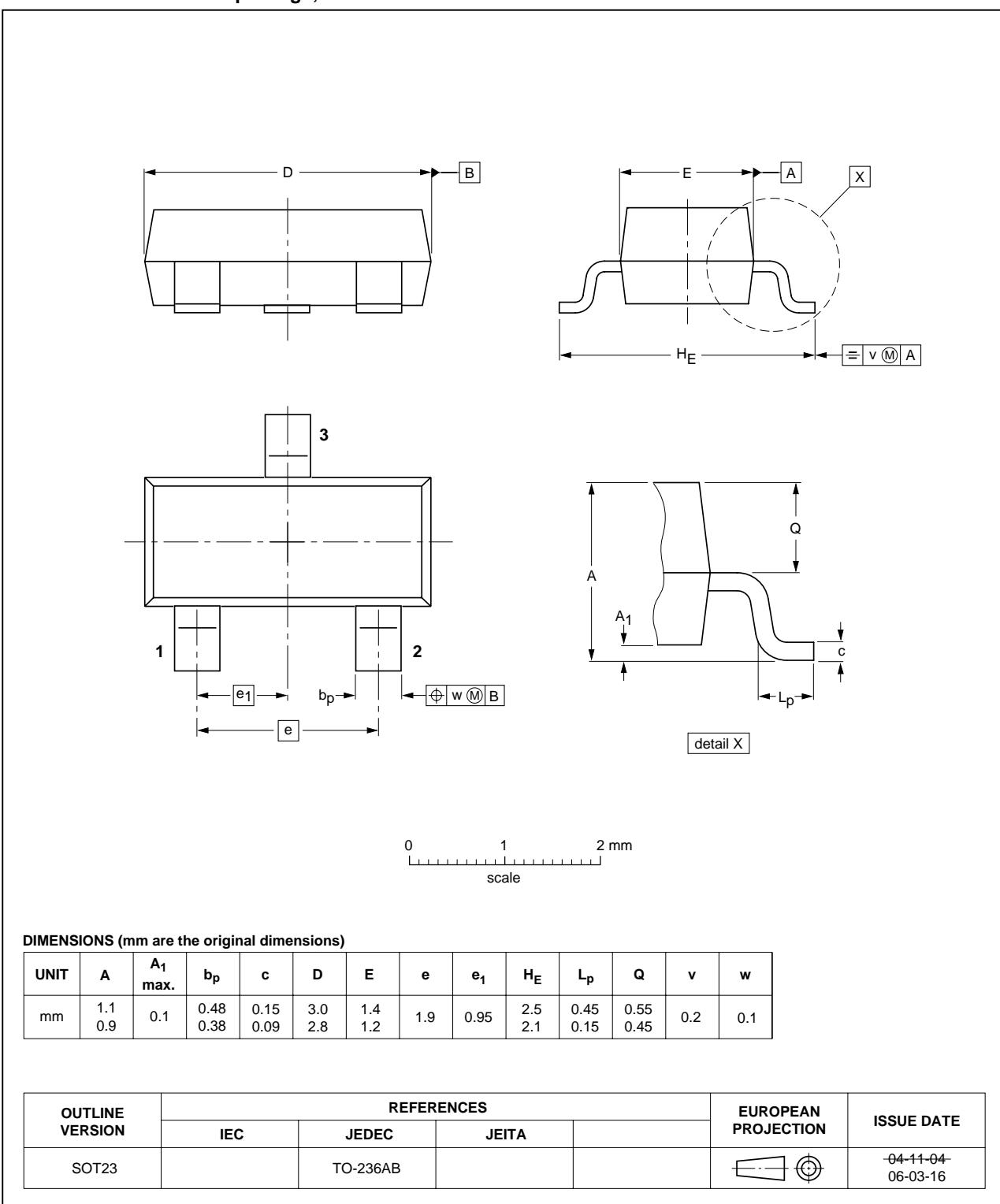
## Low-voltage avalanche regulator diodes

## PLVA6xxA series

## PACKAGE OUTLINE

Plastic surface-mounted package; 3 leads

SOT23



## DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub> max.	b <sub>p</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	l <sub>p</sub>	Q	v	w
mm	1.1 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT23		TO-236AB				-04-11-04- 06-03-16

## Low-voltage avalanche regulator diodes

## PLVA6xxA series

## DATA SHEET STATUS

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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# **NXP Semiconductors**

## **Customer notification**

This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content, except for package outline drawings which were updated to the latest version.

## **Contact information**

For additional information please visit: <http://www.nxp.com>

For sales offices addresses send e-mail to: [salesaddresses@nxp.com](mailto:salesaddresses@nxp.com)

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