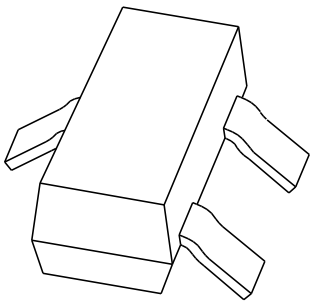
DATA SHEET



PLVA2600A series
Low-voltage avalanche regulator double diodes

Product specification
Supersedes data of February 1994
File under Discrete Semiconductors, SC01

1996 May 06

Philips
Semiconductors

PHILIPS

Low-voltage avalanche regulator double diodes

PLVA2600A 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: 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

The PLVA2600A series consists of two high performance voltage regulator diodes with common anodes, in small plastic SMD SOT23 packages.

The series consists of PLVA2650A to PLVA2668A.

PINNING

PIN	DESCRIPTION
1	cathode (k1)
2	cathode (k2)
3	common anode

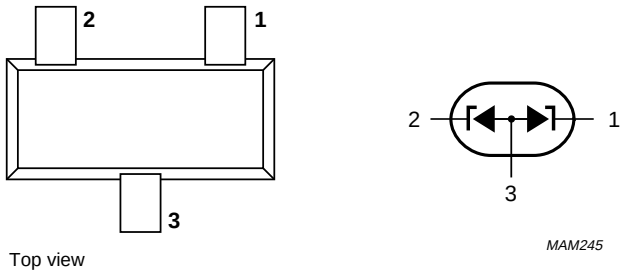


Fig.1 Simplified outline (SOT23) and symbol.

MARKING

TYPE NUMBER	MARKING CODE
PLVA2650A	p9J
PLVA2653A	p9K
PLVA2656A	p9L
PLVA2659A	p9M
PLVA2662A	p9N
PLVA2665A	p9O
PLVA2668A	p9P

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 μs; δ = 10%		250	mA
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 μs; T_j = 150 °C		30	W
P_{tot}	total power dissipation	single diode loaded; T_{amb} = 25 °C; note 1	–	250	mW
		double diode loaded; T_{amb} = 25 °C; note 1	–	180	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

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

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 10 mA	–	–	0.9	V
V_Z	working voltage	I_Z = 250 μA				
	PLVA2650A		4.80	5.00	5.20	V
	PLVA2653A		5.10	5.30	5.50	V
	PLVA2656A		5.40	5.60	5.80	V
	PLVA2659A		5.70	5.90	6.10	V
	PLVA2662A		6.00	6.20	6.40	V
	PLVA2665A		6.30	6.50	6.70	V
	PLVA2668A		6.60	6.80	7.00	V
V_Z	working voltage	I_Z = 10 μA				
	PLVA2650A		–	4.30	–	V
	PLVA2653A		–	5.20	–	V
	PLVA2656A		–	5.51	–	V
	PLVA2659A		–	5.85	–	V
	PLVA2662A		–	6.19	–	V
	PLVA2665A		–	6.49	–	V
	PLVA2668A		–	6.80	–	V
R_Z	dynamic resistance	1 kHz superimposed;				
	PLVA2650A	I_{ZAC} is 10% of I_{ZDC}; I_Z = 250 μA	–	–	700	Ω
	PLVA2653A		–	–	250	Ω
	PLVA2656A to PLVA2668A		–	–	100	Ω
S_Z	temperature coefficient	I_Z = 250 μA				
	PLVA2650A		–	0.20	–	mV/K
	PLVA2653A		–	1.60	–	mV/K
	PLVA2656A		–	1.90	–	mV/K
	PLVA2659A		–	2.40	–	mV/K
	PLVA2662A		–	2.65	–	mV/K
	PLVA2665A		–	2.90	–	mV/K
	PLVA2668A		–	3.40	–	mV/K
I_R	reverse current	V_R = 80% V_Z nominal				
	PLVA2650A		–	–	20000	nA
	PLVA2653A		–	–	5000	nA
	PLVA2656A		–	–	1000	nA
	PLVA2659A		–	–	500	nA
	PLVA2662A		–	–	100	nA
	PLVA2665A		–	–	50	nA
	PLVA2668A		–	–	10	nA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 50% V_Z nominal				
	PLVA2650A		–	34	–	nA
	PLVA2653A		–	22	–	nA
	PLVA2656A		–	1.1	–	nA
	PLVA2659A		–	0.9	–	nA
	PLVA2662A		–	0.9	–	nA
	PLVA2665A		–	0.9	–	nA
	PLVA2668A		–	0.8	–	nA
I_R	reverse current	V_R = 90% V_Z nominal				
	PLVA2650A		–	21	–	µA
	PLVA2653A		–	3.5	–	µA
	PLVA2656A		–	1.3	–	µA
	PLVA2659A		–	1.0	–	µA
	PLVA2662A		–	0.05	–	µA
	PLVA2665A		–	0.04	–	µA
	PLVA2668A		–	0.006	–	µA
ΔV_Z	line regulation					
	PLVA2659A to PLVA2668A	I_{LO} = 10 µA; I_{Hi} = 1 mA	–	–	0.1	V
	PLVA2656A	I_{LO} = 50 µA; I_{Hi} = 1 mA	–	–	0.1	V
	PLVA2650A	I_{LO} = 100 µA; I_{Hi} = 1 mA	–	–	0.4	V
	PLVA2653A	I_{LO} = 100 µA; I_{Hi} = 1 mA	–	–	0.2	V
V_n	noise voltage density	f = 1 kHz; B = 1 kHz; I_Z = 250 µA	–	–	1.0	$\frac{\mu V}{\sqrt{Hz}}$

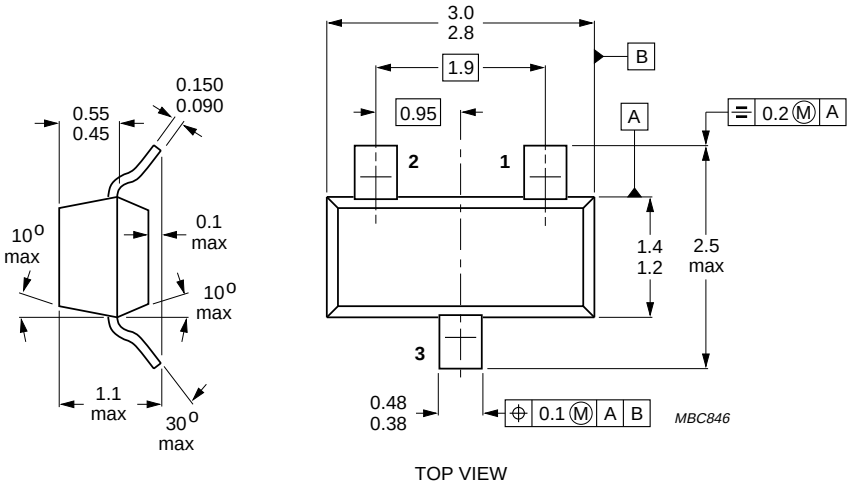
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		360	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

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

PACKAGE OUTLINE



Dimensions in mm.

Fig.2 SOT23.

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.