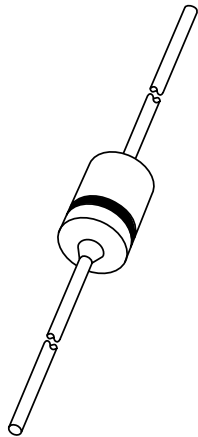


# DATA SHEET



## **PLVA400A series** Low-voltage avalanche regulator diodes

Product specification  
Supersedes data of April 1992

1996 Apr 26

# Low-voltage avalanche regulator diodes

# PLVA400A 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. 400 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 hermetically sealed leaded glass SOD27 (DO-35) packages.

The series consists of PLVA450A to PLVA468A.

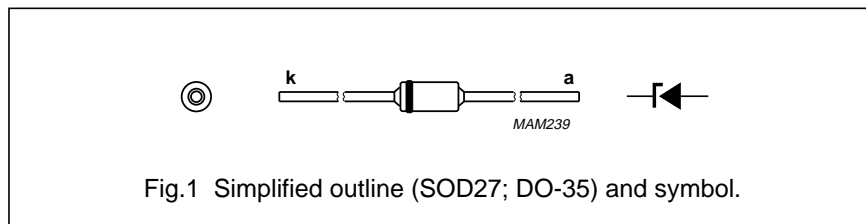


Fig.1 Simplified outline (SOD27; DO-35) and symbol.

## MARKING

TYPE NUMBER	MARKING CODE
PLVA450A	450APH
PLVA453A	453APH
PLVA456A	456APH
PLVA459A	459APH
PLVA462A	462APH
PLVA465A	465APH
PLVA468A	468APH

## 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	$t_p = 100 \mu s; \delta = 10\%$		250	mA
$P_{tot}$	total power dissipation	$T_{tp} \leq 55 \text{ }^\circ\text{C}; \text{ note 1}$	-	400	mW
$P_{ZSM}$	non-repetitive peak reverse power dissipation	$t_p = 100 \mu s; T_j = 150 \text{ }^\circ\text{C}$		30	W
$T_{stg}$	storage temperature		-65	+200	$^\circ\text{C}$
$T_j$	junction temperature		-	175	$^\circ\text{C}$

## Note

1. Lead length 8 mm.

## Low-voltage avalanche regulator diodes

## PLVA400A 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	$I_Z = 250\text{ }\mu\text{A}$				
	PLVA450A		4.80	5.00	5.20	V
	PLVA453A		5.10	5.30	5.50	V
	PLVA456A		5.40	5.60	5.80	V
	PLVA459A		5.70	5.90	6.10	V
	PLVA462A		6.00	6.20	6.40	V
	PLVA465A		6.30	6.50	6.70	V
	PLVA468A		6.60	6.80	7.00	V
$V_Z$	working voltage	$I_Z = 10\text{ }\mu\text{A}$				
	PLVA450A		–	4.30	–	V
	PLVA453A		–	5.20	–	V
	PLVA456A		–	5.51	–	V
	PLVA459A		–	5.85	–	V
	PLVA462A		–	6.19	–	V
	PLVA465A		–	6.49	–	V
	PLVA468A		–	6.80	–	V
$R_Z$	dynamic resistance	1 kHz superimposed; $I_{ZAC}$ is 10% of $I_{ZDC}$ ; $I_Z = 250\text{ }\mu\text{A}$				
	PLVA450A		–	–	700	$\Omega$
	PLVA453A		–	–	250	$\Omega$
	PLVA456A to PLVA468A		–	–	100	$\Omega$
$S_Z$	temperature coefficient	$I_Z = 250\text{ }\mu\text{A}$				
	PLVA450A		–	0.20	–	mV/K
	PLVA453A		–	1.60	–	mV/K
	PLVA456A		–	1.90	–	mV/K
	PLVA459A		–	2.40	–	mV/K
	PLVA462A		–	2.65	–	mV/K
	PLVA465A		–	2.90	–	mV/K
	PLVA468A		–	3.40	–	mV/K
$I_R$	reverse current	$V_R = 80\% V_Z$ nominal				
	PLVA450A		–	–	20000	nA
	PLVA453A		–	–	5000	nA
	PLVA456A		–	–	1000	nA
	PLVA459A		–	–	500	nA
	PLVA462A		–	–	100	nA
	PLVA465A		–	–	50	nA
	PLVA468A		–	–	10	nA

## Low-voltage avalanche regulator diodes

## PLVA400A series

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT	
$I_R$	reverse current	$V_R = 50\% V_Z$ nominal	-	34	-	nA	
	PLVA450A						
	PLVA453A						
	PLVA456A						
	PLVA459A						
	PLVA462A						
	PLVA465A						
	PLVA468A						
$I_R$	reverse current	$V_R = 90\% V_Z$ nominal	-	21	-	$\mu A$	
	PLVA450A						
	PLVA453A						
	PLVA456A						
	PLVA459A						
	PLVA462A						
	PLVA465A						
	PLVA468A						
$\Delta V_Z$	line regulation		-	-	0.1	V	
	PLVA459A to PLVA468A						$I_{LO} = 10 \mu A; I_{Hi} = 1 \text{ mA}$
	PLVA456A						$I_{LO} = 50 \mu A; I_{Hi} = 1 \text{ mA}$
	PLVA450A						$I_{LO} = 100 \mu A; I_{Hi} = 1 \text{ mA}$
PLVA453A	$I_{LO} = 100 \mu A; I_{Hi} = 1 \text{ mA}$						
$V_n$	noise voltage density	$f = 1 \text{ kHz}; B = 1 \text{ kHz}; I_Z = 250 \mu A$	-	-	1.0	$\frac{\mu V}{\sqrt{Hz}}$	

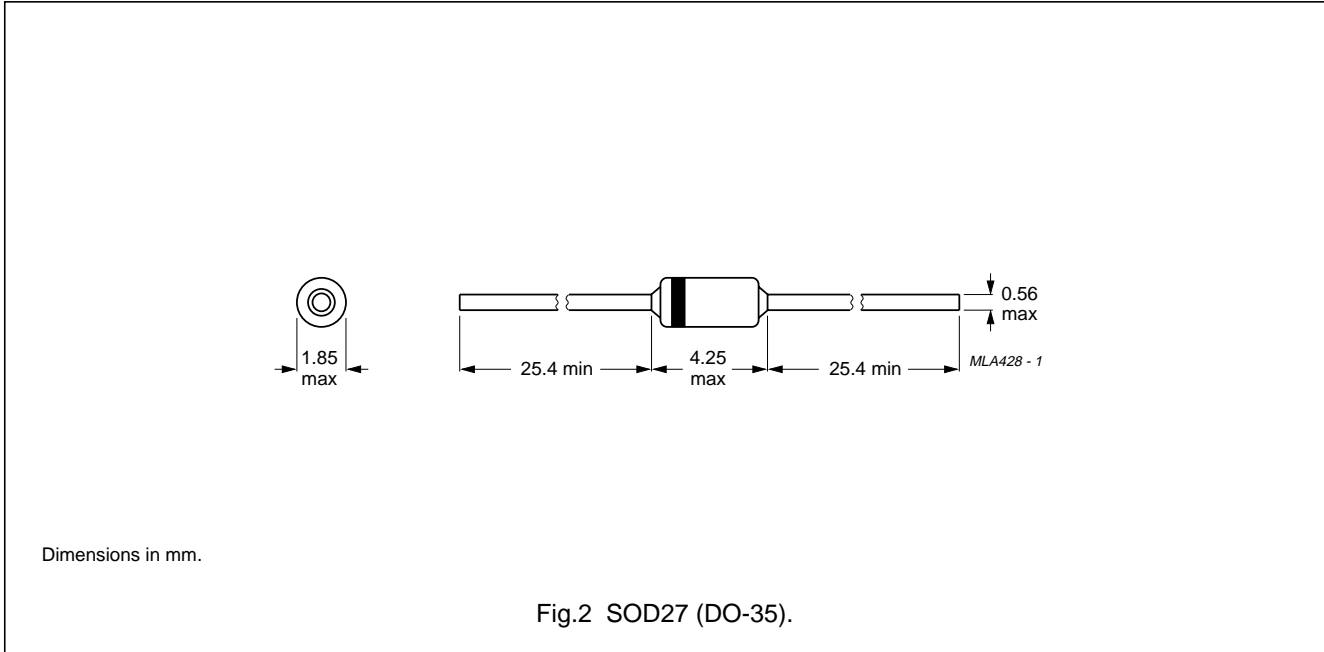
## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th \text{ j-tp}}$	thermal resistance from junction to tie-point	lead length 8 mm.	300	K/W
$R_{th \text{ j-a}}$	thermal resistance from junction to ambient	lead length max.	380	K/W

Low-voltage avalanche regulator diodes

PLVA400A series

PACKAGE OUTLINE



DEFINITIONS

<b>Data sheet status</b>	
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.
<b>Limiting values</b>	
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.	
<b>Application information</b>	
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.