Low-voltage avalanche regulator diodes — PLVA600A 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

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

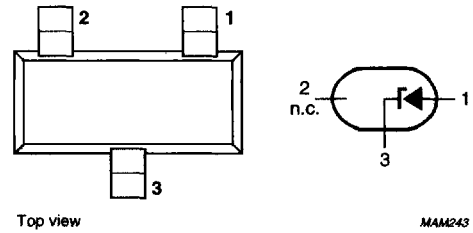

Fig.1 Simplified outline (SOT23) and symbol.

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 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	T_{amb} = 25 °C; note 1	–	250	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				
	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 µA				
	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;				
	PLVA650A	I_{ZAC} is 10% of I_{ZDC}; I_Z = 250 µA	–	–	700	Ω
	PLVA653A		–	–	250	Ω
	PLVA656A to PLVA668A		–	–	100	Ω
S_Z	temperature coefficient	I_Z = 250 µA				
	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

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	–	µA
	PLVA653A		–	3.5	–	µA
	PLVA656A		–	1.3	–	µA
	PLVA659A		–	1.0	–	µA
	PLVA662A		–	0.05	–	µA
	PLVA665A		–	0.04	–	µA
	PLVA668A		–	0.006	–	µA
ΔV_Z	line regulation					
	PLVA659A to PLVA668A	I_{LO} = 10 µA; I_{Hi} = 1 mA	–	–	0.1	V
	PLVA656A	I_{LO} = 50 µA; I_{Hi} = 1 mA	–	–	0.1	V
	PLVA650A	I_{LO} = 100 µA; I_{Hi} = 1 mA	–	–	0.4	V
	PLVA653A	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		330	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.*