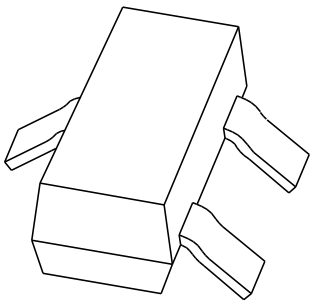
DATA SHEET



PMBZ5226B to PMBZ5257B
Voltage regulator diodes

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

1996 Apr 26

Philips
Semiconductors

PHILIPS

Voltage regulator diodes PMBZ5226B to PMBZ5257B

FEATURES

- Total power dissipation: max. 250 mW
- Tolerance series: ±5%
- Working voltage range: nom. 3.3 to 75 V
- Non-repetitive peak reverse power dissipation: max. 40 W.

APPLICATIONS

- General regulation functions.

DESCRIPTION

Low-power voltage regulator diodes in small plastic SMD SOT23 packages.

The series consists of 32 types with nominal working voltages from 3.3 to 75 V.

PINNING

PIN	DESCRIPTION
1	anode
2	not connected
3	cathode

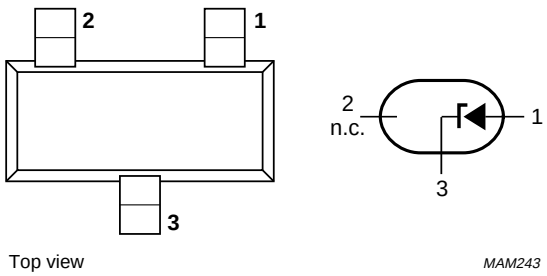


Fig.1 Simplified outline (SOT23) and symbol.

MARKING

TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE
PMBZ5226B	p8A	PMBZ5234B	p8J	PMBZ5242B	p8S	PMBZ5250B	81A
PMBZ5227B	p8B	PMBZ5235B	p8K	PMBZ5243B	p8T	PMBZ5251B	81B
PMBZ5228B	p8C	PMBZ5236B	p8L	PMBZ5244B	p8U	PMBZ5252B	81C
PMBZ5229B	p8D	PMBZ5237B	p8M	PMBZ5245B	p8V	PMBZ5253B	81D
PMBZ5230B	p8E	PMBZ5238B	p8N	PMBZ5246B	p8W	PMBZ5254B	81E
PMBZ5231B	p8F	PMBZ5239B	p8P	PMBZ5247B	p8X	PMBZ5255B	81F
PMBZ5232B	p8G	PMBZ5240B	p8Q	PMBZ5248B	p8Y	PMBZ5256B	81G
PMBZ5233B	p8H	PMBZ5241B	p8R	PMBZ5249B	p8Z	PMBZ5257B	81H

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_F	continuous forward current		–	200	mA
I_{ZSM}	non-repetitive peak reverse current	t_p = 100 μs; square wave; T_j = 25 °C prior to surge	see Table “Per type”		
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	300	mW
		T_{amb} = 25 °C; note 2	–	250	mW
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 μs; square wave; T_j = 25 °C prior to surge; see Fig.2	–	40	W
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Notes

1. Device mounted on a ceramic substrate of $8 \times 10 \times 0.7$ mm.
2. Device mounted on an FR4 printed circuit-board.

ELECTRICAL CHARACTERISTICS

Total series

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 200 mA; see Fig.3	1.1	V

Per type

T_j = 25 °C; unless otherwise specified.

TYPE No.	WORKING VOLTAGE V_Z (V)(1) at I_{Ztest}	DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_{Ztest}	TEMP. COEFF. S_Z (%/K) at I_Z(2)	TEST CURRENT I_{Ztest} (mA)	DIODE CAP. C_d (pF) at f = 1 MHz; at V_R = 0 V	REVERSE CURRENT at REVERSE VOLTAGE		NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 μs; T_{amb} = 25 °C
						I_R (μA)	V_R (V)	
	NOM.	MAX.	TYP.		MAX.	MAX.		MAX.
PMBZ5226B	3.3	1600	–0.064	20	450	25	1.0	6.0
PMBZ5227B	3.6	1700	–0.065	20	450	15	1.0	6.0
PMBZ5228B	3.9	1900	–0.063	20	450	10	1.0	6.0
PMBZ5229B	4.3	2000	–0.058	20	450	5	1.0	6.0
PMBZ5230B	4.7	2000	–0.047	20	450	5	1.0	6.0
PMBZ5231B	5.1	2000	–0.013	20	300	5	2.0	6.0
PMBZ5232B	5.6	1600	+0.023	20	300	5	3.0	6.0
PMBZ5233B	6.0	1600	+0.023	20	300	5	3.5	6.0
PMBZ5234B	6.2	1000	+0.039	20	200	5	4.0	6.0
PMBZ5235B	6.8	750	+0.040	20	200	3	5.0	6.0
PMBZ5236B	7.5	500	+0.047	20	150	3	6.0	4.0
PMBZ5237B	8.2	500	+0.052	20	150	3	6.5	4.0
PMBZ5238B	8.7	600	+0.053	20	150	3	6.5	3.5
PMBZ5239B	9.1	600	+0.055	20	150	3	7.0	3.0
PMBZ5240B	10	600	+0.055	20	90	3	8.0	3.0
PMBZ5241B	11	600	+0.058	20	85	2	8.4	2.5
PMBZ5242B	12	600	+0.062	20	85	1	9.1	2.5
PMBZ5243B	13	600	+0.065	9.5	80	0.5	9.9	2.5
PMBZ5244B	14	600	+0.067	9.0	80	0.1	10	2.0
PMBZ5245B	15	600	+0.073	8.5	75	0.1	11	2.0
PMBZ5246B	16	600	+0.073	7.8	75	0.1	12	1.5
PMBZ5247B	17	600	+0.073	7.4	75	0.1	13	1.5
PMBZ5248B	18	600	+0.078	7.0	70	0.1	14	1.5
PMBZ5249B	19	600	+0.078	6.6	70	0.1	14	1.5
PMBZ5250B	20	600	+0.080	6.2	60	0.1	15	1.5
PMBZ5251B	22	600	+0.080	5.6	60	0.1	17	1.25

TYPE No.	WORKING VOLTAGE V_Z (V)[1] at I_{Ztest}	DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_{Ztest}	TEMP. COEFF. S_Z (%/K) at I_Z[2]	TEST CURRENT I_{Ztest} (mA)	DIODE CAP. C_d (pF) at f = 1 MHz; at V_R = 0 V	REVERSE CURRENT at REVERSE VOLTAGE		NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 μs; T_{amb} = 25 °C
						I_R (μA)	V_R (V)	
	NOM.	MAX.	TYP.		MAX.	MAX.		MAX.
PMBZ5252B	24	600	+0.081	5.2	55	0.1	18	1.25
PMBZ5253B	25	600	+0.082	5.0	55	0.1	19	1.25
PMBZ5254B	27	600	+0.085	4.6	50	0.1	21	1.0
PMBZ5255B	28	600	+0.085	4.5	50	0.1	21	1.0
PMBZ5256B	30	600	+0.085	4.2	50	0.1	23	1.0
PMBZ5257B	33	700	+0.085	3.8	45	0.1	25	0.9

Notes

1. V_Z is measured with device at thermal equilibrium while mounted on a ceramic substrate of $8 \times 10 \times 0.7$ mm.
2. For types PMBZ5226B to PMBZ5242B the I_Z current is 7.5 mA; for PMBZ5243B and higher $I_Z = I_{Ztest}$. S_Z values valid between 25 °C and 125 °C.

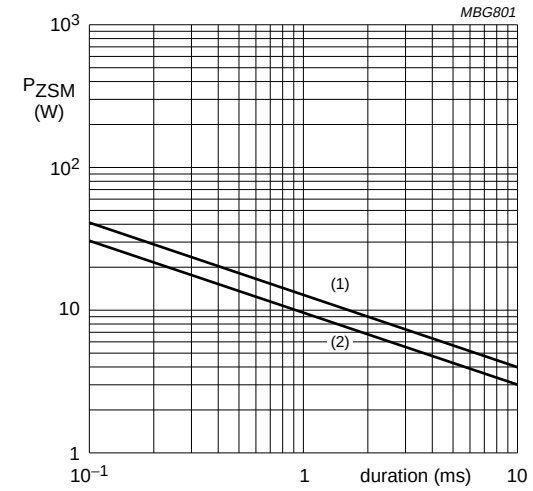
THERMAL CHARACTERISTICS

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 a printed-circuit board.

GRAPHICAL DATA



(1) T_j = 25 °C (prior to surge).
(2) T_j = 150 °C (prior to surge).

Fig.2 Maximum permissible non-repetitive peak reverse power dissipation versus duration.

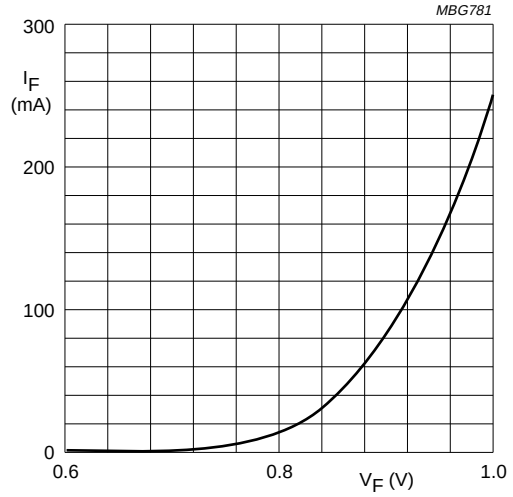
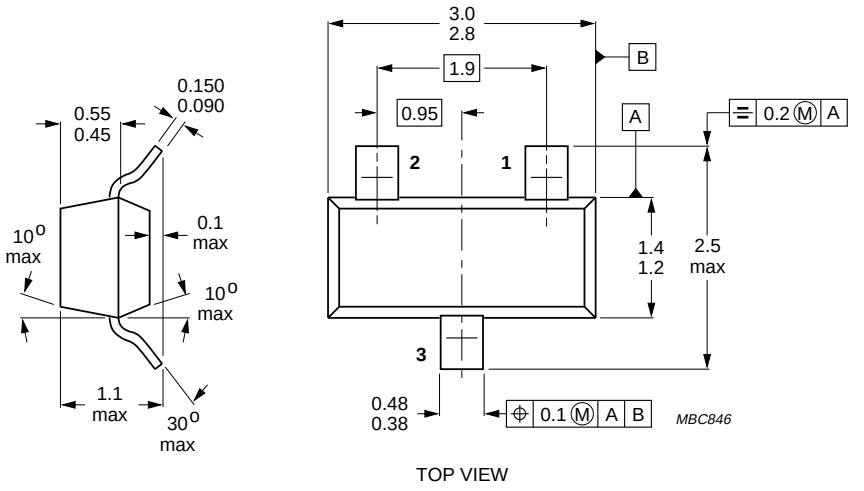


Fig.3 Forward current as a function of forward voltage; typical values.

PACKAGE OUTLINE



Dimensions in mm.

Fig.4 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.