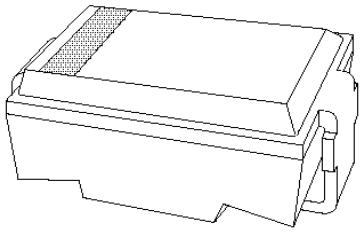
DATA SHEET



SMA BZG01 series
Voltage regulator diodes

Product specification

1999 Dec 23

Philips Semiconductors

PHILIPS

Voltage regulator diodes SMA BZG01 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Ideal for surface mount automotive applications
- Low leakage current
- Excellent stability
- UL 94V-O classified plastic package
- Zener working voltage range: 10 to 270 V for 35 types
- Supplied in 12 mm embossed tape and reel, 1500 and 7500 pieces
- Marking: cathode, date code, type name
- Easy pick and place.

DESCRIPTION

DO-214AC surface mountable package with glass passivated chip.

The well-defined void-free case is of a transfer-moulded thermo-setting plastic. The small rectangular package has two J bent leads.

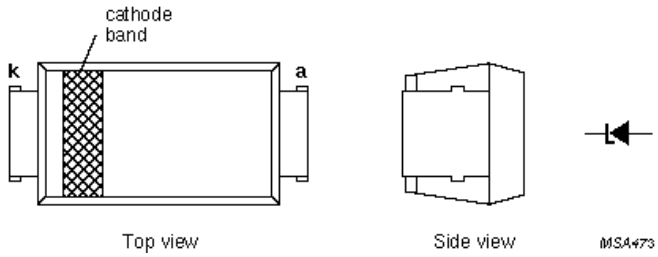


Fig.1 Simplified outline (DO-214AC) and symbol.

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
P_{tot}	total power dissipation	T_{tp} = 100 °C; see Fig.2	–	2.50	W
P_{tot}	total power dissipation	T_{amb} = 25 °C; see Fig.2; device mounted on an Al_2O_3 PCB (see Fig.5)	–	1.50	W
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 µs; square pulse; T_j = 25 °C prior to surge; see Fig.3	–	150	W
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature		−65	+175	°C

ELECTRICAL CHARACTERISTICS

Total series

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 0.1 A; see Fig.4	1.2	V

Per type

T_j = 25 °C unless otherwise specified.

TYPE No. SUFFIX (1)	WORKING VOLTAGE			DIFFERENTIAL RESISTANCE		TEMPERATURE COEFFICIENT		TEST CURRENT	REVERSE CURRENT at REVERSE VOLTAGE	
	V_Z (V) at I_Z			r_{dif} (Ω) at I_Z		S_Z (%/K) at I_Z		I_Z (mA)	I_R (μA)	V_R (V)
	MIN.	NOM.	MAX.	TYP.	MAX.	MIN.	MAX.		MAX.	
C10	9.4	10	10.6	2	7	0.05	0.09	25	10	7.5
C11	10.4	11	11.6	3	8	0.05	0.10	20	4	8.2
C12	11.4	12	12.7	3	9	0.05	0.10	20	3	9.1
C13	12.4	13	14.1	3	10	0.05	0.10	20	2	10
C15	13.8	15	15.6	5	15	0.05	0.10	15	1	11
C16	15.3	16	17.1	5	15	0.06	0.11	15	1	12
C18	16.8	18	19.1	7	20	0.06	0.11	15	1	13
C20	18.8	20	21.2	8	24	0.06	0.11	10	1	15
C22	20.8	22	23.3	8	25	0.06	0.11	10	1	16
C24	22.8	24	25.6	8	25	0.06	0.11	10	1	18
C27	25.1	27	28.9	10	30	0.06	0.11	8	1	20
C30	28	30	32	10	30	0.06	0.11	8	1	22
C33	31	33	35	12	35	0.06	0.11	8	1	24
C36	34	36	38	13	40	0.06	0.11	8	1	27
C39	37	39	41	17	50	0.06	0.11	6	1	30
C43	40	43	46	17	50	0.07	0.12	6	1	33
C47	44	47	50	30	90	0.07	0.12	4	1	36
C51	48	51	54	40	115	0.07	0.12	4	1	39
C56	52	56	60	40	120	0.07	0.12	4	1	43
C62	58	62	66	40	125	0.08	0.13	4	1	47
C68	64	68	72	40	130	0.08	0.13	4	1	51
C75	70	75	79	40	135	0.08	0.13	4	1	56
C82	77	82	87	70	200	0.08	0.13	2.7	1	62
C91	85	91	96	80	250	0.09	0.13	2.7	1	68
C100	94	100	106	120	350	0.09	0.13	2.7	1	75
C110	104	110	116	150	450	0.09	0.13	2.7	1	82

TYPE No. SUFFIX (1)	WORKING VOLTAGE			DIFFERENTIAL RESISTANCE		TEMPERATURE COEFFICIENT		TEST CURRENT	REVERSE CURRENT at REVERSE VOLTAGE	
	V_Z (V) at I_Z			r_{dif} (Ω) at I_Z		S_Z (%/K) at I_Z		I_Z (mA)	I_R (μA)	V_R (V)
	MIN.	NOM.	MAX.	TYP.	MAX.	MIN.	MAX.		MAX.	
C120	114	120	127	200	550	0.09	0.13	2	1	91
C130	124	130	141	250	700	0.09	0.13	2	1	100
C150	138	150	156	300	1000	0.09	0.13	2	1	110
C160	153	160	171	350	1100	0.09	0.13	1.5	1	120
C180	168	180	191	400	1200	0.09	0.13	1.5	1	130
C200	188	200	212	500	1500	0.09	0.13	1.5	1	150
C220	208	220	233	700	2250	0.09	0.13	1	1	160
C240	228	240	256	800	2550	0.09	0.13	1	1	180
C270	251	270	289	1000	3000	0.09	0.13	1	1	200

Note

1. To complete the type number the suffix is added to the basic type number, e.g. BZG01-C130.

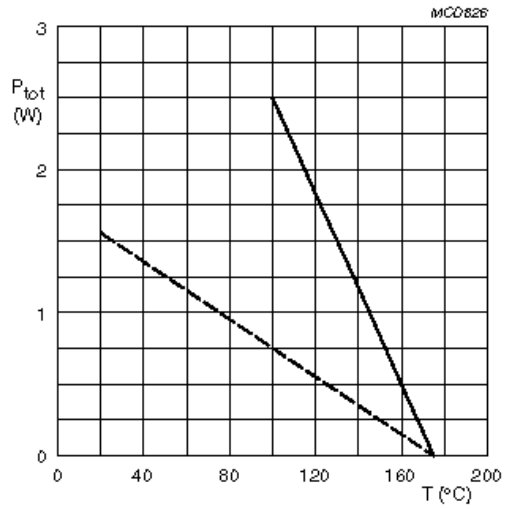
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		30	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W
		note 2	150	K/W

Notes

1. Device mounted on an Al_2O_3 printed-circuit board, 0.7 mm thick; thickness of Cu-layer ≥35 μm, see Fig.5.
2. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.5. For more information please refer to the *'General Part of associated Handbook'*.

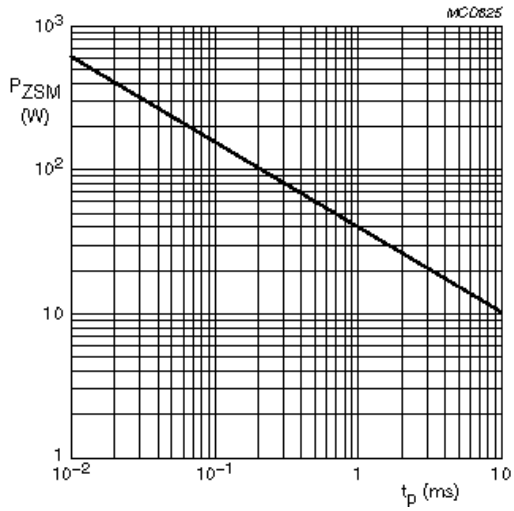
GRAPHICAL DATA



Solid line: tie-point temperature.

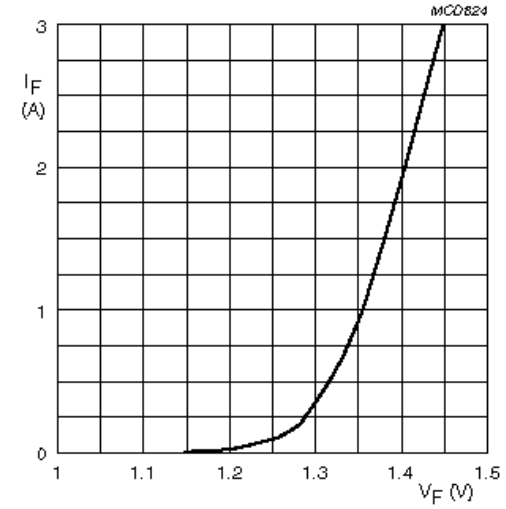
Dotted line: ambient temperature; device mounted on an Al_2O_3 PCB as shown in Fig.5.

Fig.2 Maximum total power dissipation as a function of temperature.



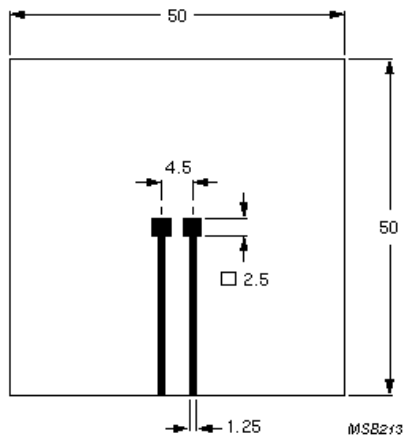
T_j = 25 °C prior to surge.

Fig.3 Maximum non-repetitive peak reverse power dissipation as a function of pulse duration (square pulse).



T_j = 25 °C.

Fig.4 Forward current as a function of forward voltage; typical values.

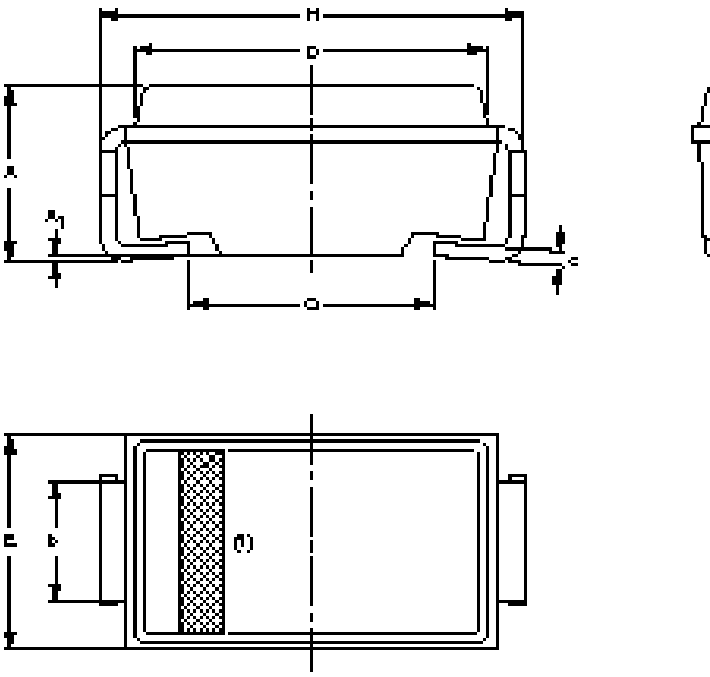


Dimensions in mm.

Fig.5 Printed-circuit board for surface mounting.

PACKAGE OUTLINE

Transfer-moulded thermo-setting plastic small rectangular surface mounted package; 2 connectors SOD124



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1	b	c	D	E	H	Q
mm	2.3 2.0	0.05	1.6 1.4	0.2	4.5 4.3	2.8 2.6	5.5 5.1	3.3 2.7

Note

1. The marking band indicates the cathode.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOD124		DO-214AC				99-10-22

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.