CONTROLLED AVALANCHE RECTIFIER DIODES

Glass passivated rectifier diodes in hermetically sealed axial-leaded ID* envelopes and intended for general purpose rectifier applications.

The device is capable of absorbing reverse transient energy.

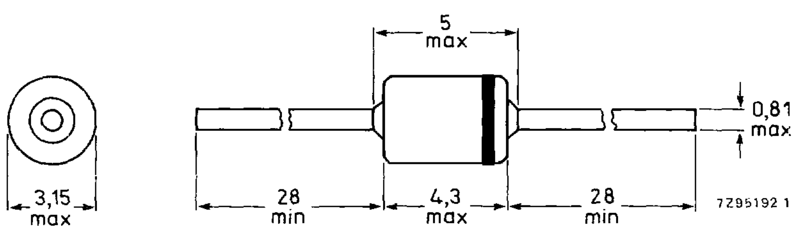
QUICK REFERENCE DATA

			BYD14D	G	J	K	M	
Crest working voltage	V_{RWM}	max.	200	400	600	800	1000	V
Reverse avalanche breakdown voltage	$V_{(BR)R}$	>	225	450	650	900	1100	V
		<	1600	1600	1600	1600	1600	
Average forward current	$I_{F(AV)}$	max.			2			A
Non-repetitive peak forward current	I_{FSM}	max.			50			A
Non-repetitive peak reverse avalanche energy	E_{RSM}	max.			40			mJ
Junction temperature	T_j	max.			175			°C

MECHANICAL DATA

Dimensions in mm

Fig. 1 SOD-84.



The marking band indicates the cathode.

* Implosion Diode.

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134).

			BYD14D	G	J	K	M	
Crest working voltage	V_{RWM}	max.	200	400	600	800	1000	V
Continuous reverse voltage	V_R	max.	200	400	600	800	1000	V
Average forward current (averaged over any 20 ms period)								
T_{tp} = 45 °C; lead length 10 mm	$I_{F(AV)}$	max.			2			A
T_{amb} = 60 °C; see Fig. 2	$I_{F(AV)}$	max.			1			A
Repetitive peak forward current T_{tp} = 45 °C; f = 50 Hz; a = 4,5 (inclusive derating for T_{jmax} at V_{RRM} = 1000 V)	I_{FRM}	max.			20			A
Non-repetitive peak forward current t = 10 ms, half-sinewave (see Fig. 10)	I_{FSM}	max.			50			A
Non-repetitive peak reverse avalanche energy; I_R = 0,8 A; T_j = 25 °C prior to surge; with inductive load switched off	E_{RSM}	max.			40			mJ
Storage temperature	T_{stg}				−65 to +175			°C
Junction temperature	T_j	max.			175			°C

THERMAL RESISTANCE

Influence of mounting method

1. Thermal resistance from junction to tie-point at a lead length of 10 mm	$R_{th\ j\text{-}tp}$	=	50	K/W
2. Thermal resistance from junction to ambient; device mounted on an 1,5 mm thick epoxy-glass printed circuit board; Cu-thickness ⩾ 40 μm; Fig. 2 (see "Thermal model")	$R_{th\ j\text{-}a}$	=	105	K/W

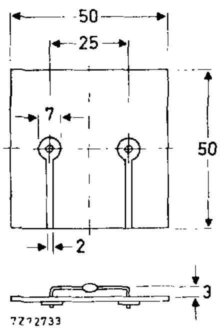


Fig. 2 Mounted on a printed-circuit board.

CHARACTERISTICS

T_j = 25 °C unless otherwise specified

			BYD14D	G	J	K	M	
Forward voltage*								
I_F = 3 A	V_F	<	1,15	1,15	1,15	1,15	1,15	V
I_F = 3 A; T_j = T_{jmax}	V_F	<	1,05	1,05	1,05	1,05	1,05	V
Reverse avalanche breakdown voltage								
I_R = 0,1 mA	$V_{(BR)R}$	>	225	450	650	900	1100	V
		<	1600	1600	1600	1600	1600	V
Reverse current								
V_R = V_{RWMmax}**	I_R	<			1			μA
V_R = V_{RWMmax}; T_j = 165 °C	I_R	<			150			μA
Reverse recovery when switched from I_F = 1 A to $V_R \geq$ 30 V with $-dI_F/dt$ = 5 A/μs								
recovery charge	Q_s	typ.			3			μC
recovery time	t_{rr}	typ.			2,5			μs
Diode capacitance at f = 1 MHz								
V_R = 0	C_d	typ.			50			pF

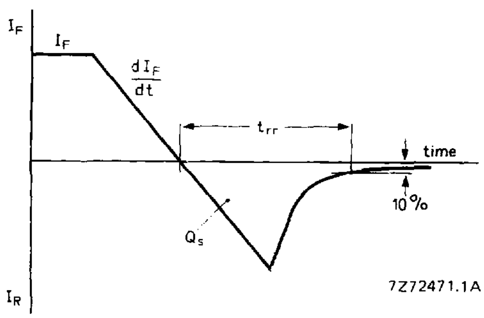


Fig. 3 Definitions of t_{rr}, Q_s and dI_F/dt.

* Measured under pulse conditions to avoid excessive dissipation.
** Illuminance ≤ 500 lux (daylight); relative humidity < 65%.

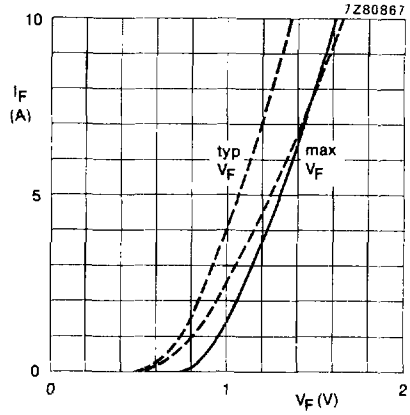


Fig. 4 Forward voltage;
——— T_j = 25 °C; ------------ T_j = 175 °C.

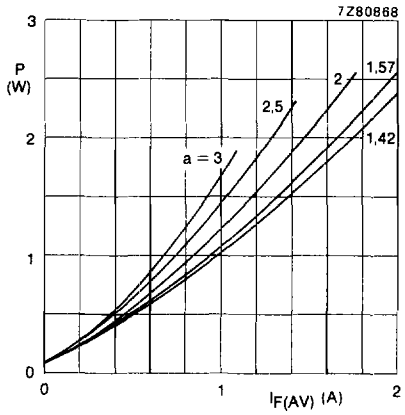


Fig. 5 Maximum values steady state power dissipation (forward plus leakage current) as a function of the average a forward current.

$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWMmax}$.

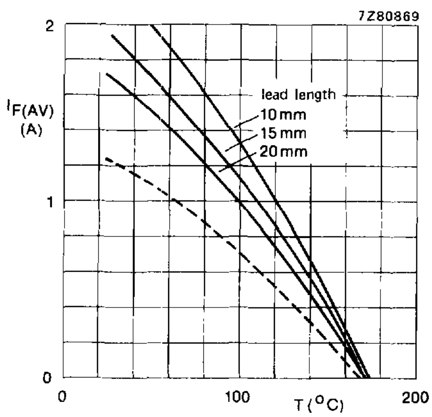


Fig. 6 Maximum average forward current as a function of temperature; the curves include losses due to reverse leakage.

$V_R = V_{RWMmax}$, δ = 0,5; a = 1,57.

------ = ambient temperature and device mounted as shown in Fig. 2

—— = tie-point temperature

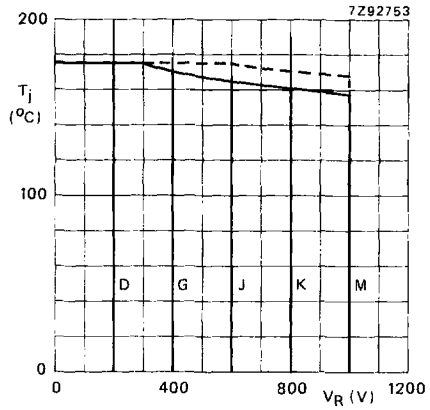


Fig. 7 Maximum permissible junction temperature as a function of reverse voltage; ——— = V_R; - - - - = V_{RWM}, δ = 0,5, device mounted as shown in Fig. 2.

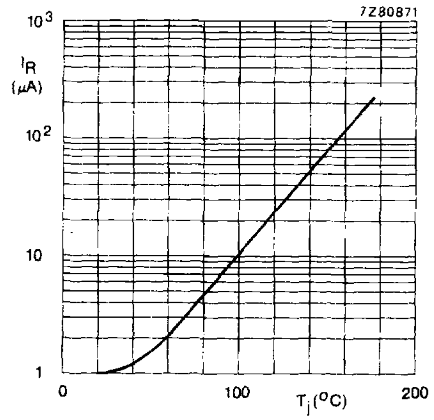


Fig. 8 Maximum values reverse current as a function of junction temperature; $V_R = V_{RWMmax}$.

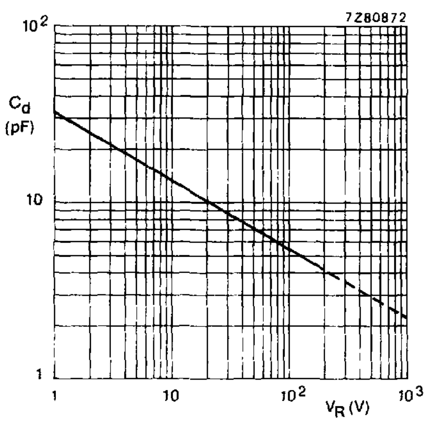


Fig. 9 Capacitance as a function of reverse voltage; f = 1 MHz; T_j = 25 °C; typical values.

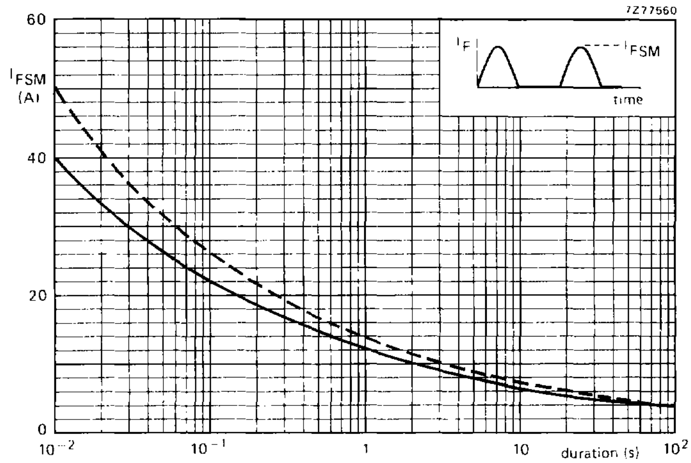
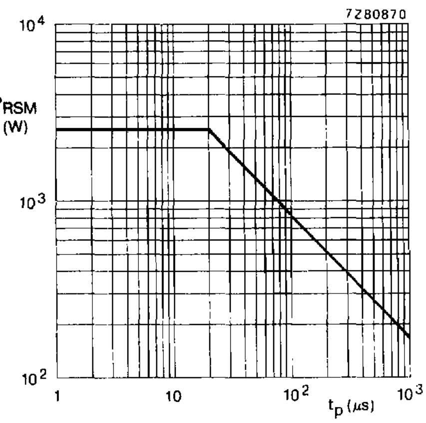


Fig. 10 Maximum permissible non-repetitive peak forward current based on sinusoidal currents; f = 50 Hz.

.... T_j = 25 °C prior to surge; V_R = 0

———— T_j = $T_{j\,max}$ prior to surge; V_R = $V_{RWM\,max}$.



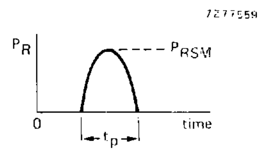


Fig. 11 Non-repetitive peak reverse power in the avalanche region; T_j = 25 °C prior to surge; typical values.