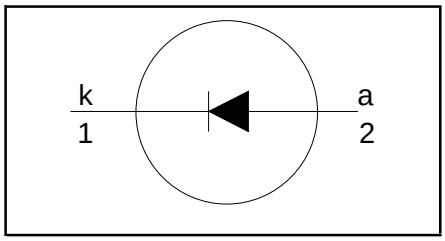
Rectifier diodes fast, soft-recovery

BY229 series

FEATURES

- Low forward volt drop
- Fast switching
- Soft recovery characteristic
- High thermal cycling performance
- Low thermal resistance

SYMBOL



QUICK REFERENCE DATA

V_R = 200 V/ 400 V/ 600 V/800 V

$I_{F(AV)}$ = 8 A

$I_{FSM} \leq$ 60 A

$t_{rr} \leq$ 135 ns

GENERAL DESCRIPTION

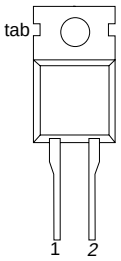
Glass-passivated double diffused rectifier diodes featuring low forward voltage drop, fast reverse recovery and soft recovery characteristic. The devices are intended for use in TV receivers, monitors and switched mode power supplies.

The BY229 series is supplied in the conventional leaded SOD59 (TO220AC) package.

PINNING

PIN	DESCRIPTION
1	cathode
2	anode
tab	cathode

SOD59 (TO220AC)



LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.				UNIT
		BY229		**-200**	**-400**	**-600**	**-800**	
V_{RSM}	Peak non-repetitive reverse voltage		-	200	400	600	800	V
V_{RRM}	Peak repetitive reverse voltage		-	200	400	600	800	V
V_{RWM}	Crest working reverse voltage		-	150	300	500	600	V
V_R	Continuous reverse voltage		-	150	300	500	600	V
$I_{F(AV)}$	Average forward current[1]	square wave; δ = 0.5; $T_{mb} \leq$ 122 ˚C	-	8				A
		sinusoidal; a = 1.57; $T_{mb} \leq$ 125 ˚C	-	7				A
$I_{F(RMS)}$	RMS forward current		-	11				A
I_{FRM}	Repetitive peak forward current	t = 25 µs; δ = 0.5; $T_{mb} \leq$ 122 ˚C	-	16				A
I_{FSM}	Non-repetitive peak forward current.	t = 10 ms	-	60				A
		t = 8.3 ms sinusoidal; T_j = 150 ˚C prior to surge; with reapplied $V_{RWM(max)}$	-	66				A
I^2t	I^2t for fusing	t = 10 ms	-	18				A^2s
T_{stg}	Storage temperature		-40	150				˚C
T_j	Operating junction temperature		-	150				˚C

1 Neglecting switching and reverse current losses.

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j\text{-}mb}$	Thermal resistance junction to mounting base		-	-	2.0	K/W
$R_{th\ j\text{-}a}$	Thermal resistance junction to ambient	in free air.	-	60	-	K/W

STATIC CHARACTERISTICS

T_j = 25 ˚C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	Forward voltage	I_F = 20 A	-	1.5	1.85	V
I_R	Reverse current	$V_R = V_{RWM}$; T_j = 125 ˚C	-	0.1	0.4	mA

DYNAMIC CHARACTERISTICS

T_j = 25 ˚C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
t_{rr}	Reverse recovery time	I_F = 1 A; $V_R \geq$ 30 V; $-dI_F/dt$ = 50 A/µs	-	100	135	ns
Q_s	Reverse recovery charge	I_F = 2 A; $V_R \geq$ 30 V; $-dI_F/dt$ = 20 A/µs	-	0.5	0.7	µC
dI_R/dt	Maximum slope of the reverse recovery current	I_F = 2 A; $-dI_F/dt$ = 20 A/µs	-	50	60	A/µs

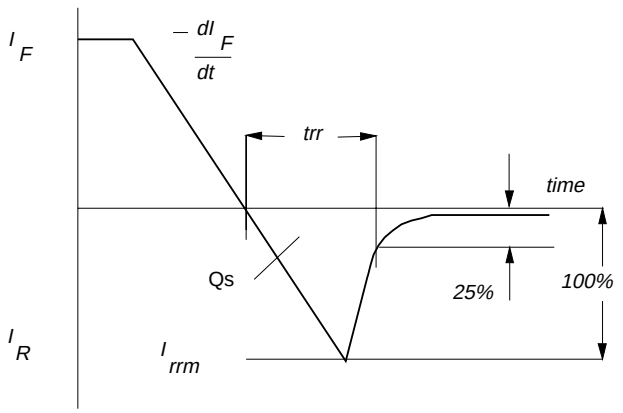


Fig.1. Definition of t_{rr}, Q_s and I_{rrm}

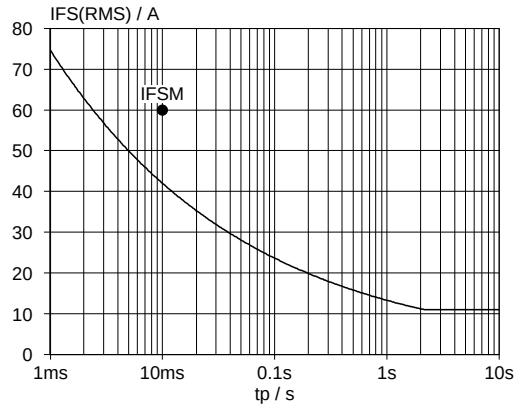


Fig.4. Maximum non-repetitive rms forward current. $I_F = f(t_p)$; sinusoidal current waveform; T_j = 150˚C prior to surge with reapplied V_{RWM}.

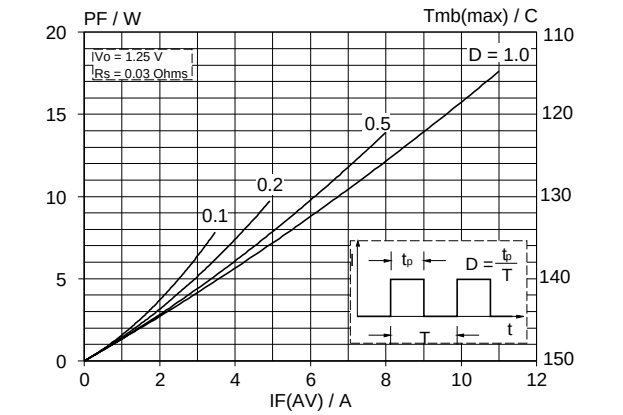


Fig.2. Maximum forward dissipation, $P_F = f(I_{F(AV)})$; square wave current waveform; parameter D = duty cycle = t_p/T.

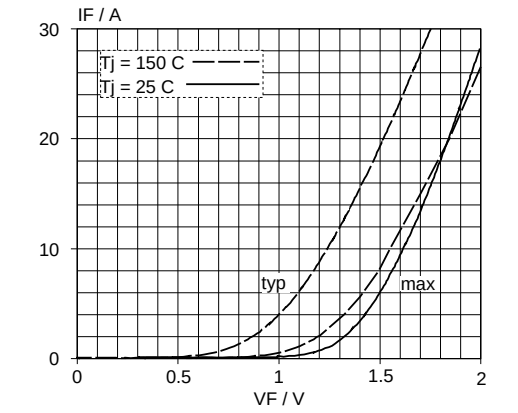


Fig.5. Typical and maximum forward characteristic; $I_F = f(V_F)$; parameter T_j

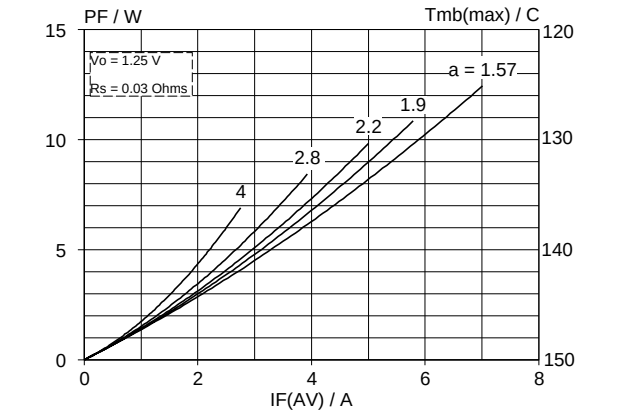


Fig.3. Maximum forward dissipation, $P_F = f(I_{F(AV)})$; sinusoidal current waveform; parameter a = form factor = $I_{F(RMS)}/I_{F(AV)}$.

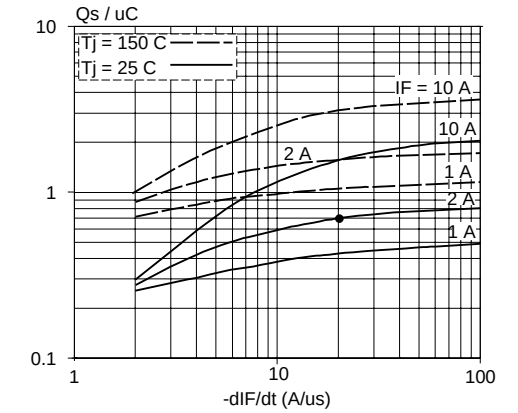


Fig.6. Maximum Q_s at T_j = 25˚C and 150˚C

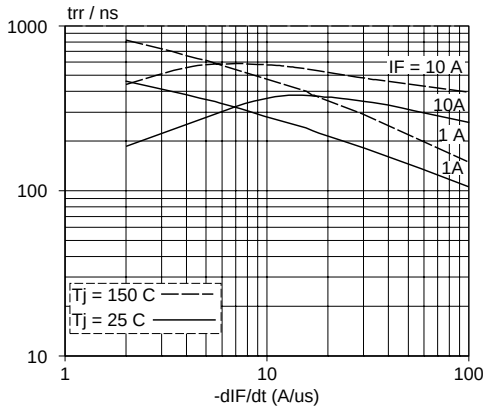


Fig.7. Maximum t_{rr} measured to 25% of I_{rrm}; T_j = 25˚C and 150˚C

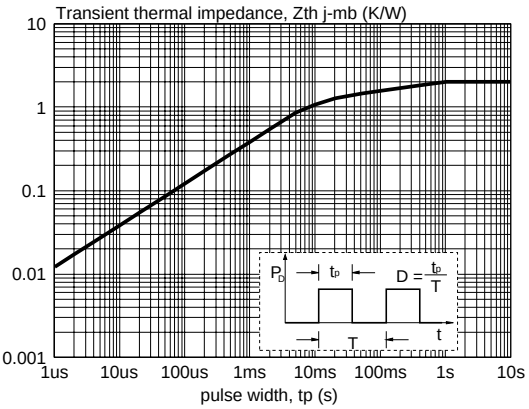


Fig.9. Transient thermal impedance Z_{th} = f(t_p)

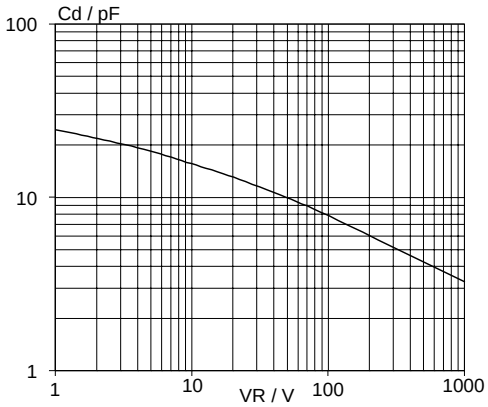


Fig.8. Typical junction capacitance C_d at f = 1 MHz; T_j = 25˚C

MECHANICAL DATA

Dimensions in mm

Net Mass: 2 g

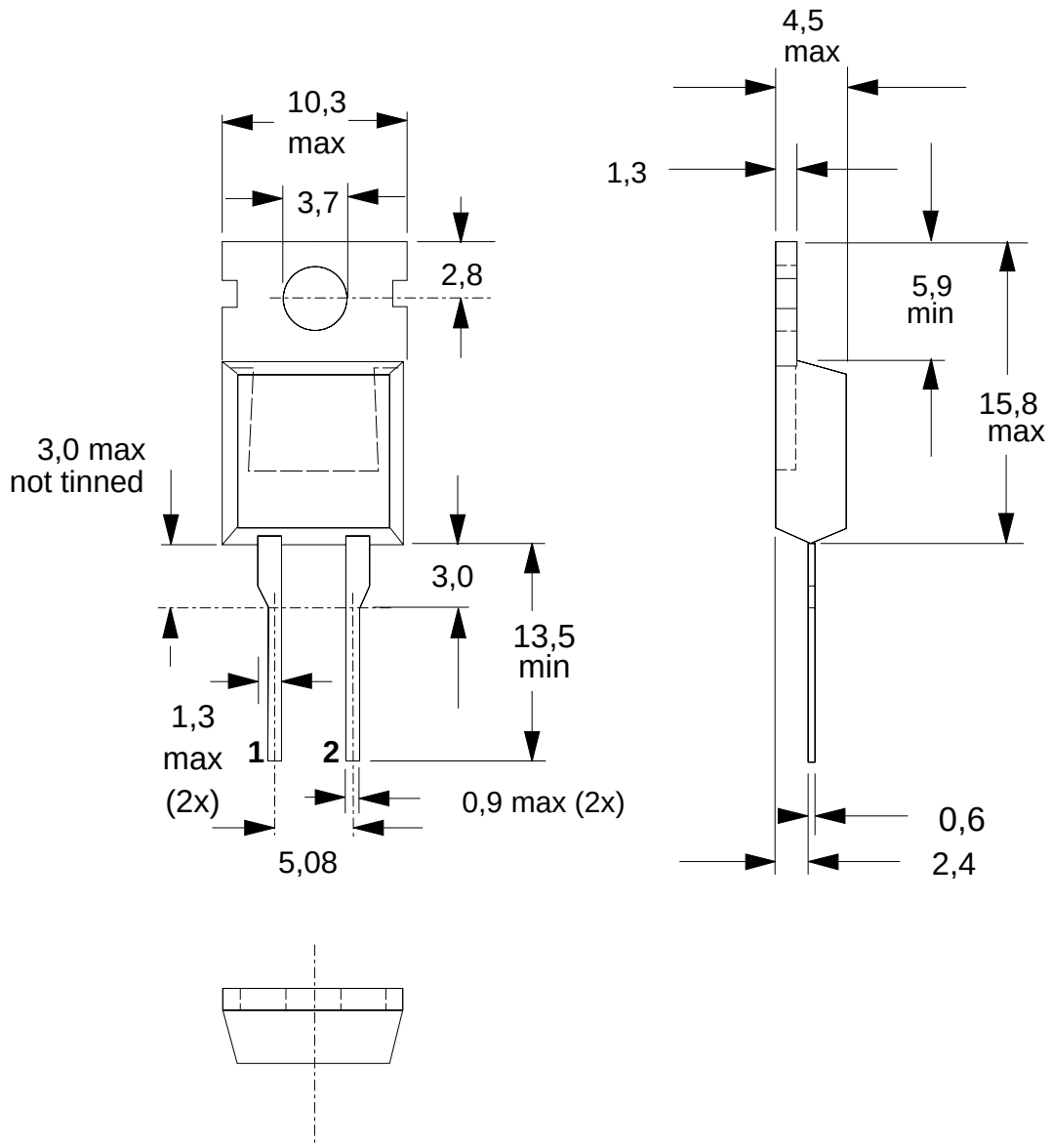


Fig.10. SOD59 (TO220AC). pin 1 connected to mounting base.

Notes
1. Refer to mounting instructions for TO220 envelopes.
2. Epoxy meets UL94 V0 at 1/8".

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 are given 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 this 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 be reasonably 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.