

# Silicon Diode

## **BYW29EX-200**

200V/8A

# DATASHEET

OEM – Philips

Source: Philips Databook 1999

**Rectifier diodes  
ultrafast, rugged**
**BYW29EX series**
**GENERAL DESCRIPTION**

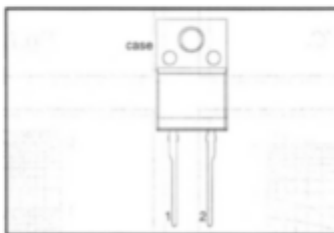
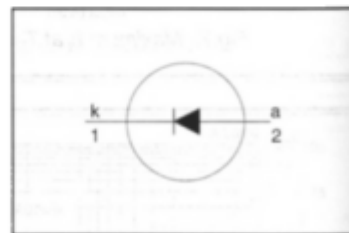
Glass passivated epitaxial rectifier diodes in a full pack plastic envelope, featuring low forward voltage drop, ultra-fast recovery times, soft recovery characteristic and guaranteed reverse surge and ESD capability. They are intended for use in switched mode power supplies and high frequency circuits in general where low conduction and switching losses are essential.

**QUICK REFERENCE DATA**

SYMBOL	PARAMETER	MAX.	MAX.	UNIT
	<b>BYW29EX-</b>	<b>150</b>	<b>200</b>	
$V_{RRM}$	Repetitive peak reverse voltage	150	200	V
$V_F$	Forward voltage	0.895	0.895	V
$I_{F(AV)}$	Forward current	8	8	A
$t_r$	Reverse recovery time	25	25	ns
$I_{RRM}$	Repetitive peak reverse current	0.2	0.2	A

**PINNING - SOD113**

PIN	DESCRIPTION
1	cathode
2	anode
case	isolated

**PIN CONFIGURATION**

**SYMBOL**

**LIMITING VALUES**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.		UNIT
$V_{RRM}$	Repetitive peak reverse voltage		-	-150	-200	V
$V_{RWM}$	Crest working reverse voltage		-	150	200	V
$V_R$	Continuous reverse voltage		-	150	200	V
$I_{F(AV)}$	Average forward current <sup>1</sup>	square wave; $\delta = 0.5$ ; $T_{ns} \leq 106$ °C sinusoidal; $a = 1.57$ ; $T_{ns} \leq 109$ °C	-	8		A
$I_{F(RMS)}$	RMS forward current		-	7.3		A
$I_{FRM}$	Repetitive peak forward current	$t = 25$ $\mu$ s; $\delta = 0.5$ ; $T_{ns} \leq 106$ °C	-	16		A
$I_{FSM}$	Non-repetitive peak forward current	$t = 10$ ms $t = 8.3$ ms sinusoidal; with reapplied	-	80		A
$I_{FSM}$	Non-repetitive peak forward current	$V_{RWM(max)}$ $t = 10$ ms	-	88		A
$I^2t$	$I^2t$ for fusing	$t_p = 2$ $\mu$ s; $\delta = 0.001$	-	32		A <sup>2</sup> s
$I_{RRM}$	Repetitive peak reverse current	$t_p = 100$ $\mu$ s	-	0.2		A
$I_{RSM}$	Non-repetitive peak reverse current		-	0.2		A
$T_{stg}$	Storage temperature		-40	150		°C
$T_j$	Operating junction temperature		-	150		°C

<sup>1</sup> Neglecting switching and reverse current losses

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#### ESD LIMITING VALUE

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_C$	Electrostatic discharge capacitor voltage	Human body model; $C = 250 \text{ pF}$ ; $R = 1.5 \text{ k}\Omega$	-	8	kV

#### ISOLATION LIMITING VALUE & CHARACTERISTIC

$T_{\text{c}} = 25 \text{ }^\circ\text{C}$  unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{\text{isol}}$	R.M.S. isolation voltage from both terminals to external heatsink	$f = 50\text{-}60 \text{ Hz}$ ; sinusoidal waveform; $R.H. \leq 65\%$ ; clean and dustfree	-		2500	V
$C_{\text{isol}}$	Capacitance from both terminals to external heatsink	$f = 1 \text{ MHz}$	-	10	-	pF

#### THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{\text{th j-hs}}$	Thermal resistance junction to heatsink	with heatsink compound	-	-	5.5	K/W
$R_{\text{th j-a}}$	Thermal resistance junction to ambient	without heatsink compound in free air	-	55	7.2	K/W

#### STATIC CHARACTERISTICS

$T = 25 \text{ }^\circ\text{C}$  unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_F$	Forward voltage	$I_F = 8 \text{ A}$ ; $T_J = 150 \text{ }^\circ\text{C}$	-	0.80	0.895	V
		$I_F = 8 \text{ A}$	-	0.92	1.05	V
		$I_F = 20 \text{ A}$	-	1.1	1.3	V
$I_R$	Reverse current	$V_R = V_{RWM}$ ; $T_J = 100 \text{ }^\circ\text{C}$	-	0.2	0.6	mA
		$V_R = V_{RWM}$	-	2	10	$\mu\text{A}$

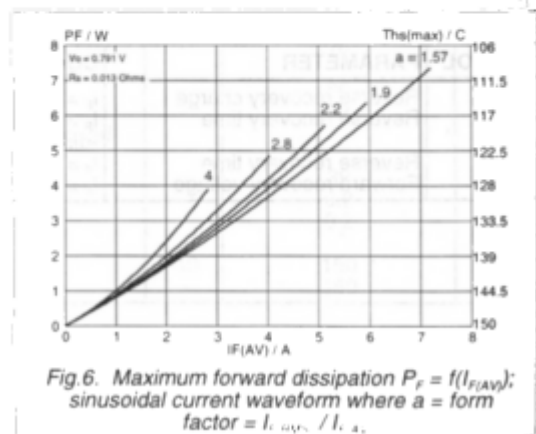
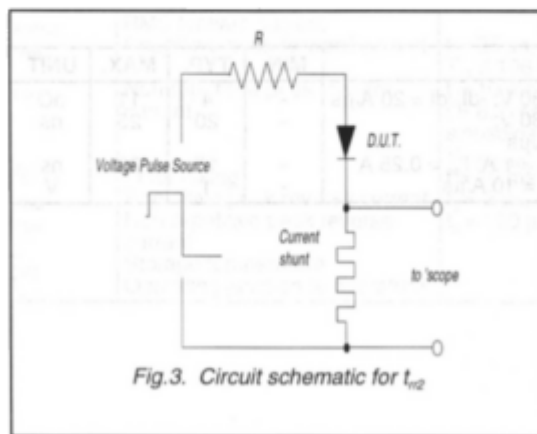
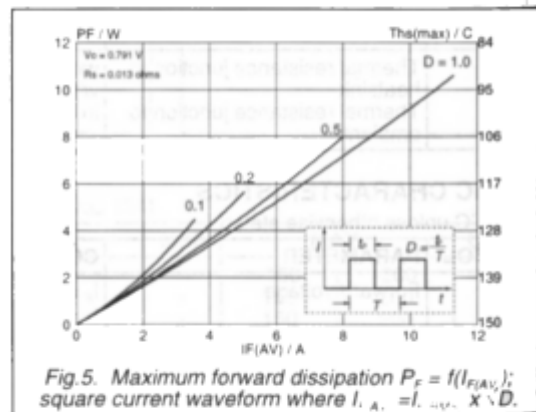
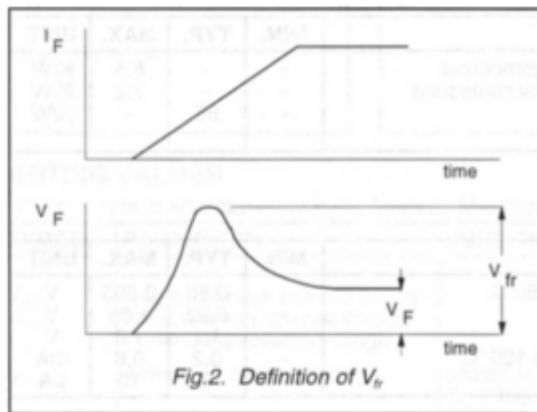
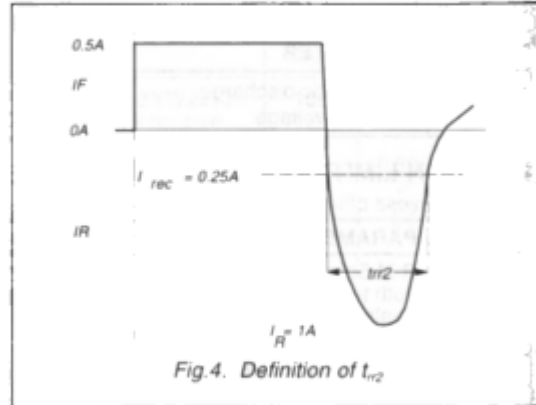
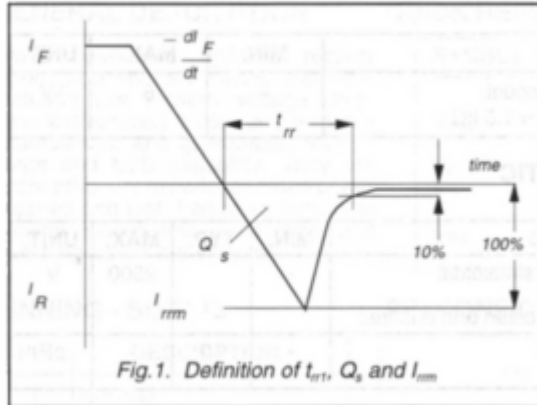
#### DYNAMIC CHARACTERISTICS

$T_J = 25 \text{ }^\circ\text{C}$  unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$Q_s$	Reverse recovery charge	$I_F = 2 \text{ A}$ ; $V_R \geq 30 \text{ V}$ ; $-di_F/dt = 20 \text{ A}/\mu\text{s}$	-	4	11	nC
$t_{rr1}$	Reverse recovery time	$I_F = 1 \text{ A}$ ; $V_R \geq 30 \text{ V}$ ; $-di_F/dt = 100 \text{ A}/\mu\text{s}$	-	20	25	ns
$t_{rr2}$	Reverse recovery time	$I_F = 0.5 \text{ A}$ to $I_R = 1 \text{ A}$ ; $I_{rec} = 0.25 \text{ A}$	-	15	20	ns
$V_{rr}$	Forward recovery voltage	$I_F = 1 \text{ A}$ ; $di_F/dt = 10 \text{ A}/\mu\text{s}$	-	1	-	V

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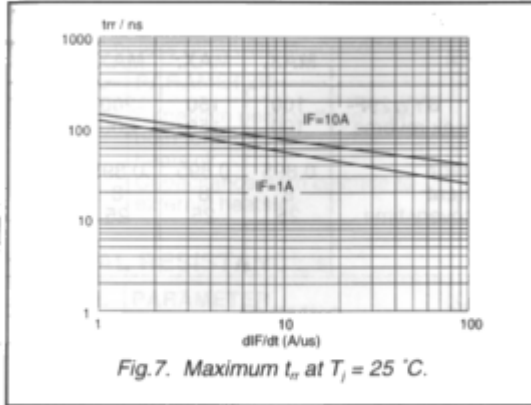


Fig.7. Maximum  $t_{rr}$  at  $T_j = 25^\circ C$ .

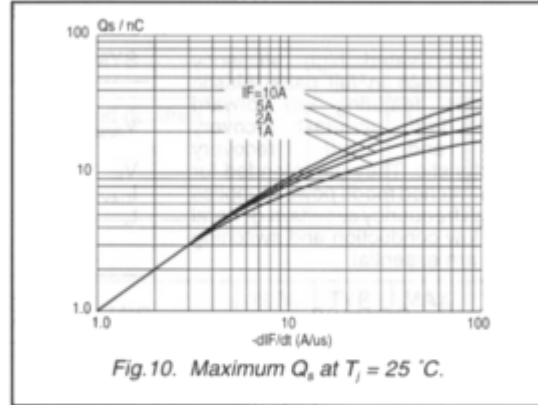


Fig.10. Maximum  $Q_s$  at  $T_j = 25^\circ C$ .

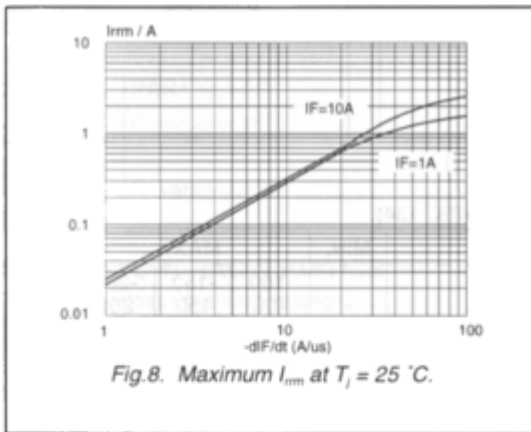


Fig.8. Maximum  $I_{rms}$  at  $T_j = 25^\circ C$ .

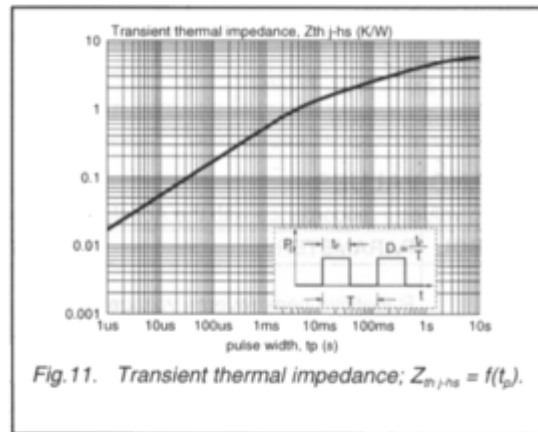


Fig.11. Transient thermal impedance;  $Z_{th(j-hs)} = f(t_p)$ .

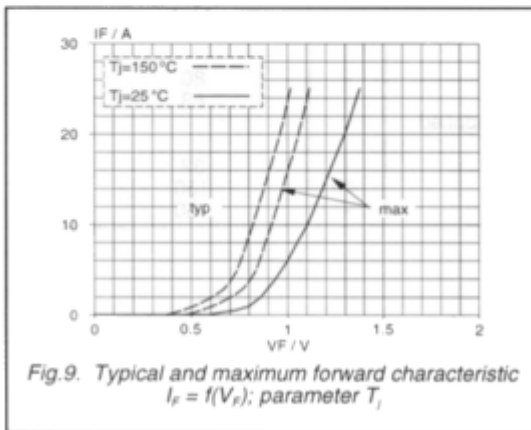


Fig.9. Typical and maximum forward characteristic  $I_F = f(V_F)$ ; parameter  $T_j$