

# Silicon Dual Diode

## **BYV44-500**

500V/30A

# DATASHEET

OEM – Philips

Source: Philips Databook 1999

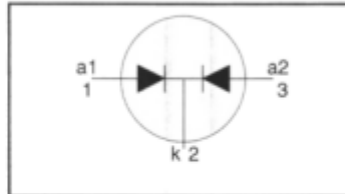
## Dual rectifier diodes ultrafast

## BYV44 series

### FEATURES

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

### SYMBOL



### QUICK REFERENCE DATA

$$V_R = 300 \text{ V} / 400 \text{ V} / 500 \text{ V}$$

$$V_F \leq 1.12 \text{ V}$$

$$I_{O(AV)} = 30 \text{ A}$$

$$t_{rr} \leq 60 \text{ ns}$$

### GENERAL DESCRIPTION

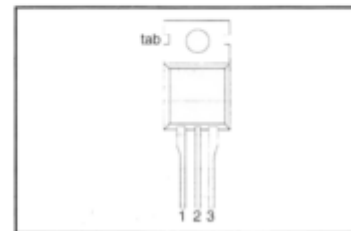
Dual, common cathode, ultra-fast, epitaxial rectifier diodes intended for use as output rectifiers in high frequency switched mode power supplies.

The BYV44 series is supplied in the conventional leaded SOT78 (TO220AB) package.

### PINNING

PIN	DESCRIPTION
1	anode 1
2	cathode
3	anode 2
tab	cathode

### SOT78 (TO220AB)



### LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.			UNIT
				-300	-400	-500	
$V_{RRM}$	Peak repetitive reverse voltage	<b>BYV44</b> $T_{me} \leq 136^\circ\text{C}$	-	-300	-400	-500	V
$V_{RWM}$	Crest working reverse voltage		-	300	400	500	V
$V_R$	Continuous reverse voltage		-	300	400	500	V
$I_{O(AV)}$	Average rectified output current (both diodes conducting) <sup>1</sup>	square wave; $\delta = 0.5$ ; $T_{mb} \leq 94^\circ\text{C}$	-	30			A
$I_{FRM}$	Repetitive peak forward current per diode	$t = 25 \mu\text{s}$ ; $\delta = 0.5$ ; $T_{mb} \leq 94^\circ\text{C}$	-	30			A
$I_{FSM}$	Non-repetitive peak forward current per diode.	$t = 10 \text{ ms}$	-	150			A
		$t = 8.3 \text{ ms}$ sinusoidal; with reapplied $V_{RRM(max)}$	-	160			A
$T_{stg}$	Storage temperature		-40	150			$^\circ\text{C}$
$T_J$	Operating junction temperature		-	150			$^\circ\text{C}$

### THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th(j-hs)}$	Thermal resistance junction to heatsink	per diode	-	-	2.4	K/W
$R_{th(j-a)}$	Thermal resistance junction to ambient	both diodes conducting	-	-	1.4	K/W
		in free air.	-	60	-	K/W

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

For output currents in excess of 20 A, the cathode connection should be made to the metal mounting tab.

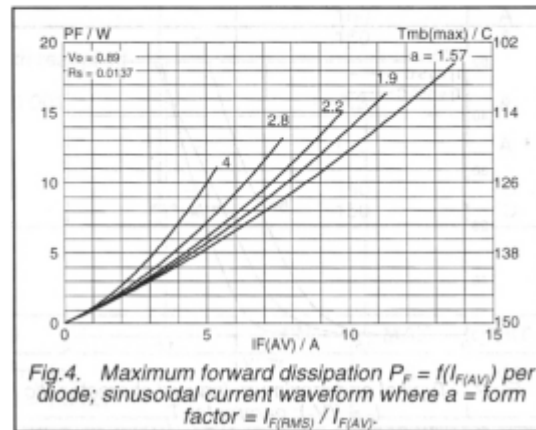
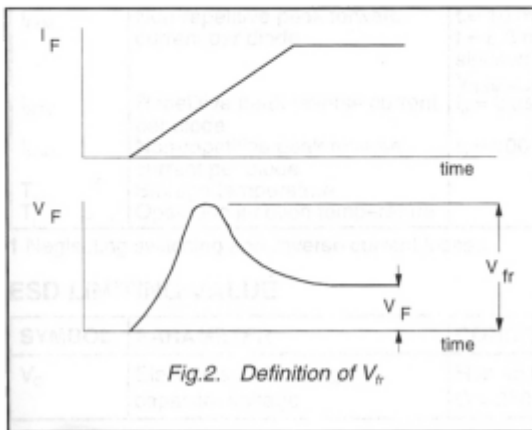
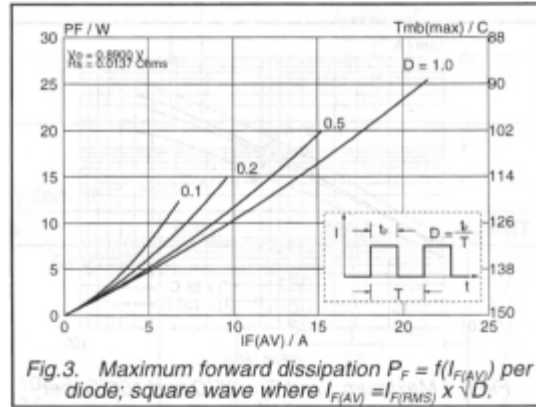
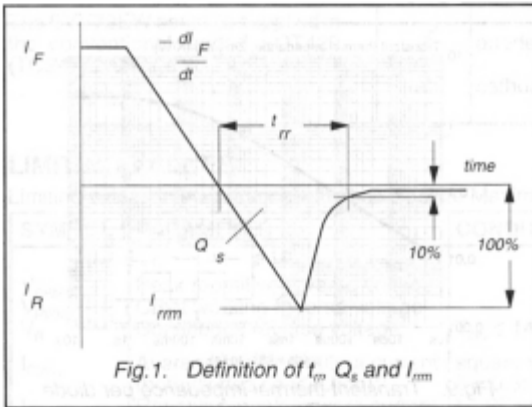
Dual rectifier diodes  
ultrafast

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**ELECTRICAL CHARACTERISTICS**

characteristics are per diode at  $T_j = 25^\circ\text{C}$  unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_F$	Forward voltage	$I_F = 15\text{ A}; T_j = 150^\circ\text{C}$	-	0.95	1.12	V
		$I_F = 15\text{ A}$	-	1.08	1.25	V
		$I_F = 30\text{ A}$	-	-	1.15	1.36
$I_R$	Reverse current	$V_R = V_{RRM}; T_j = 100^\circ\text{C}$	-	10	50	$\mu\text{A}$
		$V_R = V_{RRM}; T_j = 100^\circ\text{C}$	-	0.3	0.8	mA
$Q_s$	Reverse recovery charge	$I_F = 2\text{ A to } V_R \geq 30\text{ V};$ $di_F/dt = 20\text{ A}/\mu\text{s}$	-	40	60	nC
$t_{rr}$	Reverse recovery time	$I_F = 1\text{ A to } V_R \geq 30\text{ V};$ $di_F/dt = 100\text{ A}/\mu\text{s}$	-	50	60	ns
$I_{rrm}$	Peak reverse recovery current	$I_F = 10\text{ A to } V_R \geq 30\text{ V};$ $di_F/dt = 50\text{ A}/\mu\text{s}; T_j = 100^\circ\text{C}$	-	4.2	5.2	A
$V_{fr}$	Forward recovery voltage	$I_F = 10\text{ A}; di_F/dt = 10\text{ A}/\mu\text{s}$	-	2.5	-	V



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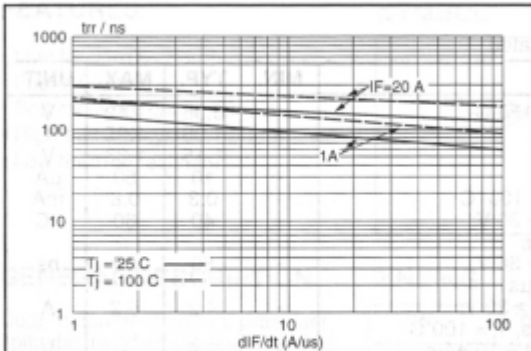


Fig.5. Maximum  $t_{rr}$  at  $T_j = 25^\circ\text{C}$  and  $100^\circ\text{C}$ ; per diode

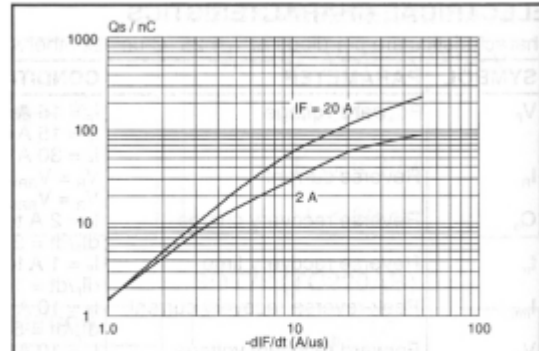


Fig.8. Maximum  $Q_s$  at  $T_j = 25^\circ\text{C}$ ; per diode

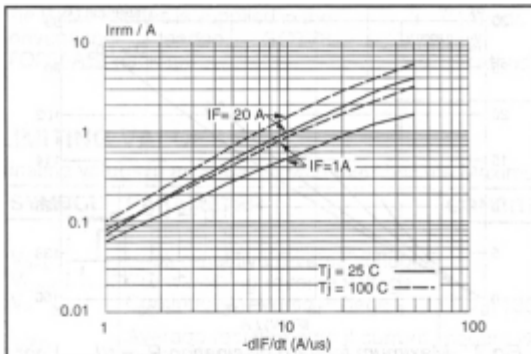


Fig.6. Maximum  $I_{rrm}$  at  $T_j = 25^\circ\text{C}$  and  $100^\circ\text{C}$ ; per diode

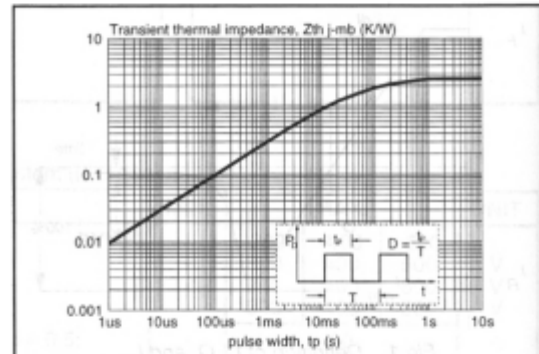


Fig.9. Transient thermal impedance per diode  $Z_{th(j-mb)} = f(t_p)$

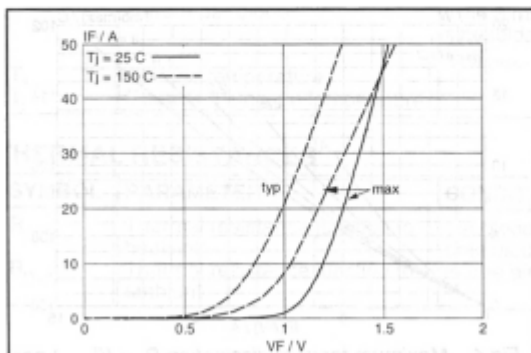


Fig.7. Typical and maximum forward characteristic  $I_F = f(V_F)$ ; parameter  $T_j$