

Silicon Dual Diode

BYV44-300

300V/30A

DATASHEET

OEM – Philips

Source: Philips Databook 1999

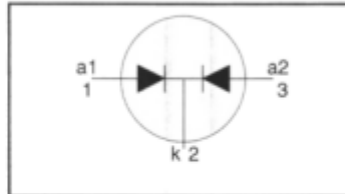
Dual rectifier diodes ultrafast

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

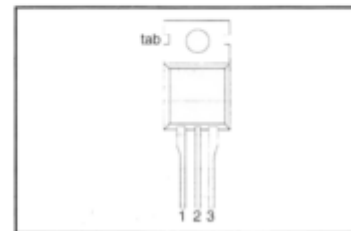
Dual, common cathode, ultra-fast, epitaxial rectifier diodes intended for use as output rectifiers in high frequency switched mode power supplies.

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	BYV44 $T_{me} \leq 136^\circ\text{C}$	-	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) ¹	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
		$t = 8.3 \text{ ms}$	-	160			A
T_{stg}	Storage temperature	$V_{RRM(max)}$	-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

¹ Neglecting switching and reverse current losses.

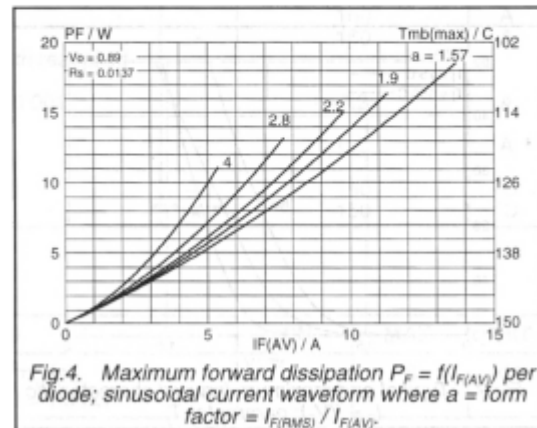
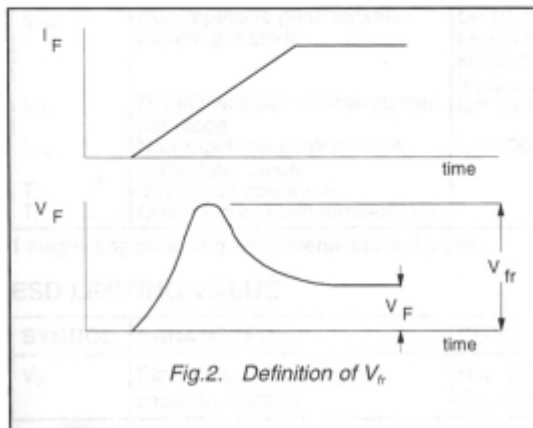
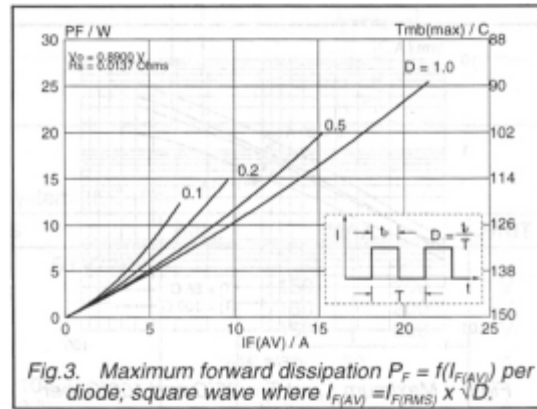
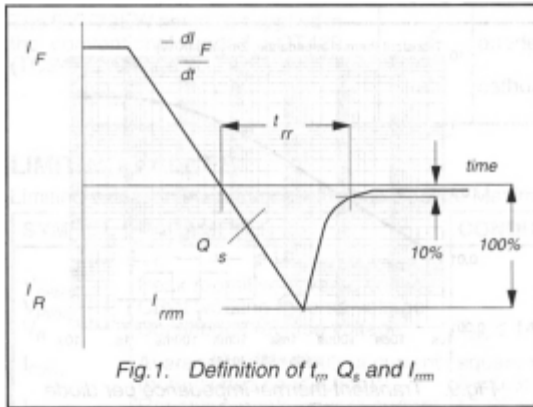
For output currents in excess of 20 A, the cathode connection should be made to the metal mounting tab.

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	Forward voltage	$I_F = 15\text{ A}; T_j = 150\text{ }^\circ\text{C}$	-	0.95	1.12	V
		$I_F = 15\text{ A}$	-	1.08	1.25	V
		$I_F = 30\text{ A}$	-	1.15	1.36	V
I_R	Reverse current	$V_R = V_{RRM}; T_j = 100\text{ }^\circ\text{C}$	-	10	50	μA
		$V_R = V_{RRM}; T_j = 100\text{ }^\circ\text{C}$	-	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	$I_F = 10\text{ A to } V_R \geq 30\text{ V};$ $di_F/dt = 50\text{ A}/\mu\text{s}; T_j = 100\text{ }^\circ\text{C}$	-	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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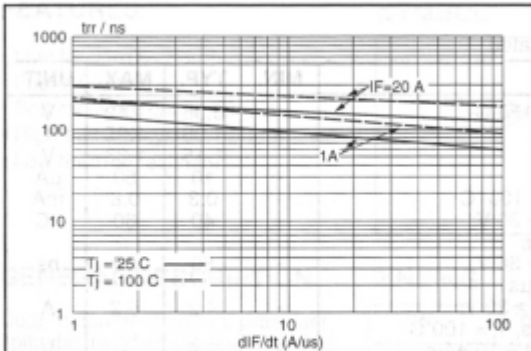


Fig.5. Maximum t_{rr} at $T_j = 25^\circ\text{C}$ and 100°C ; per diode

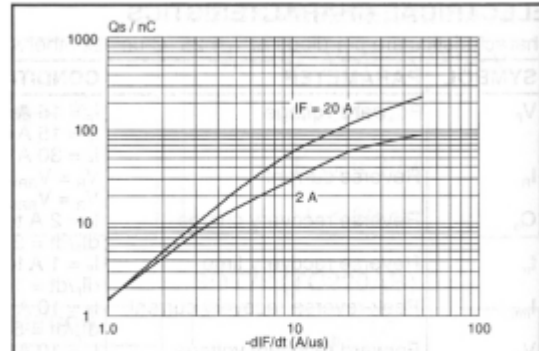


Fig.8. Maximum Q_s at $T_j = 25^\circ\text{C}$; per diode

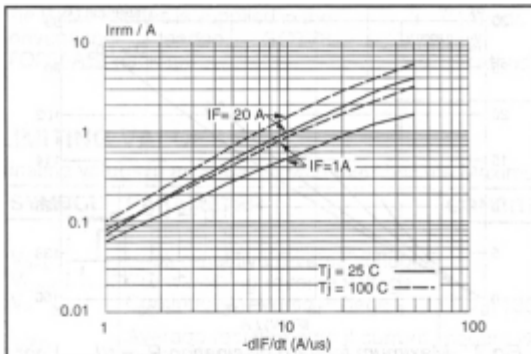


Fig.6. Maximum I_{rrm} at $T_j = 25^\circ\text{C}$ and 100°C ; per diode

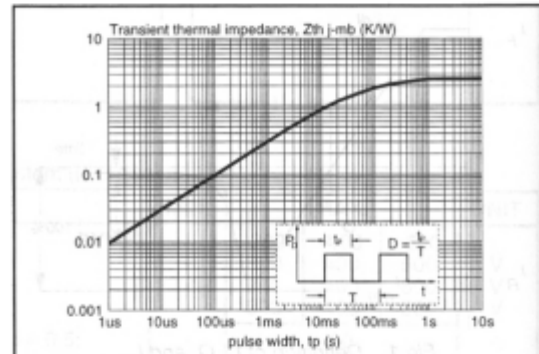


Fig.9. Transient thermal impedance per diode $Z_{th\ j-mb} = f(t_p)$

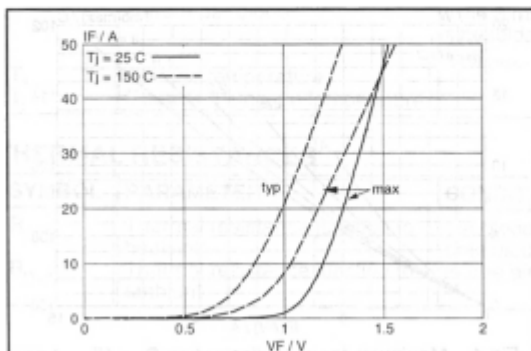


Fig.7. Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j