Silicon Dual Diode

BYV44-400

400V/30A

DATASHEET

OEM – Philips

Source: Philips Databook 1999

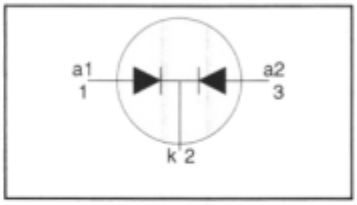
Datasheet Rev. 1.3 – 04/19 – data without warranty / liability

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 V/ 400 V/ 500 V

$V_F \leq 1.12$ V

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

$t_{rr} \leq 60$ 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
		BYV44		-300	-400	-500	
V_{RRM}	Peak repetitive reverse voltage		-	300	400	500	V
V_{RWM}	Crest working reverse voltage		-	300	400	500	V
V_R	Continuous reverse voltage	$T_{mb} \leq 136$˚C	-	300	400	500	V
$I_{O(AV)}$	Average rectified output current (both diodes conducting)[1]	square wave; $\delta = 0.5$; $T_{mb} \leq 94$ ˚C	-		30		A
I_{FRM}	Repetitive peak forward current per diode	t = 25 µs; $\delta = 0.5$; $T_{mb} \leq 94$ ˚C	-		30		A
I_{FSM}	Non-repetitive peak forward current per diode.	t = 10 ms	-		150		A
		t = 8.3 ms sinusoidal; with reapplied $V_{RRM(max)}$	-		160		A
T_{stg}	Storage temperature		-40		150		˚C
T_j	Operating junction temperature		-		150		˚C

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j\text{-}hs}$	Thermal resistance junction to heatsink	per diode	-	-	2.4	K/W
		both diodes conducting	-	-	1.4	K/W
$R_{th\ j\text{-}a}$	Thermal resistance junction to ambient	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 CHARACTERISTICS

characteristics are per diode at T_j = 25 ˚C unless otherwise stated

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

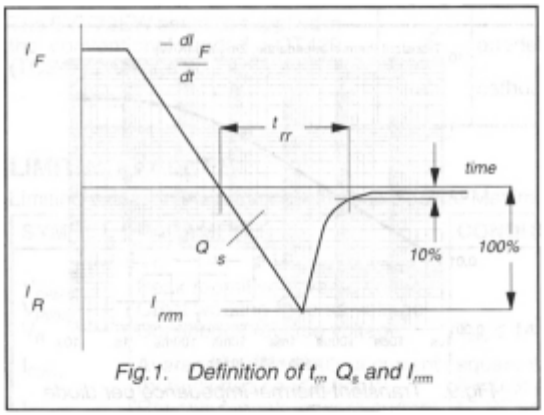

Fig.1. Definition of t_{rr}, Q_s and I_{rrm}

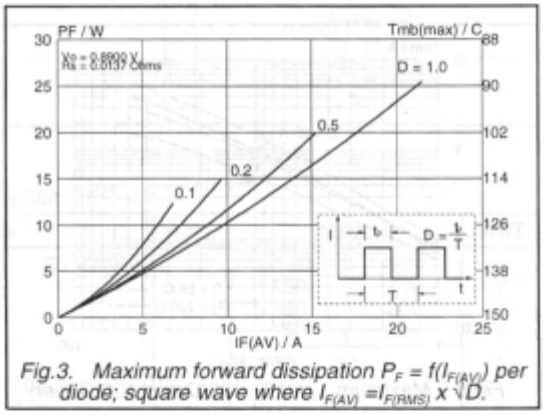

Fig.3. Maximum forward dissipation $P_F = f(I_{F(AV)})$ per diode; square wave where $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$.

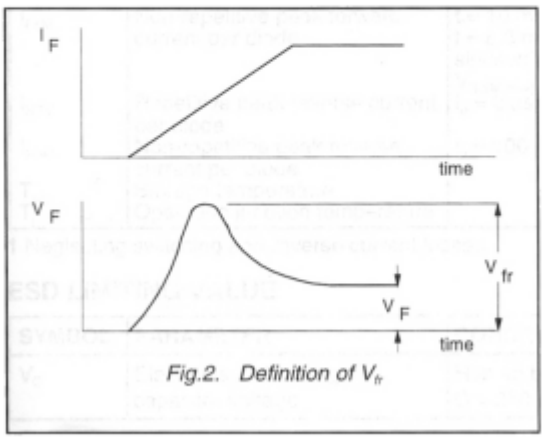

Fig.2. Definition of V_{fr}

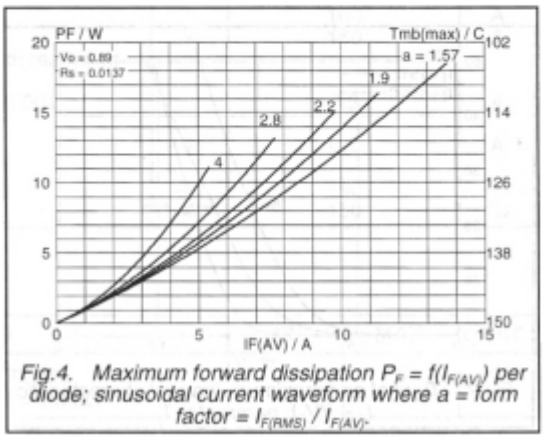

Fig.4. Maximum forward dissipation $P_F = f(I_{F(AV)})$ per diode; sinusoidal current waveform where a = form factor = $I_{F(RMS)} / I_{F(AV)}$.

Dual rectifier diodes
ultrafast

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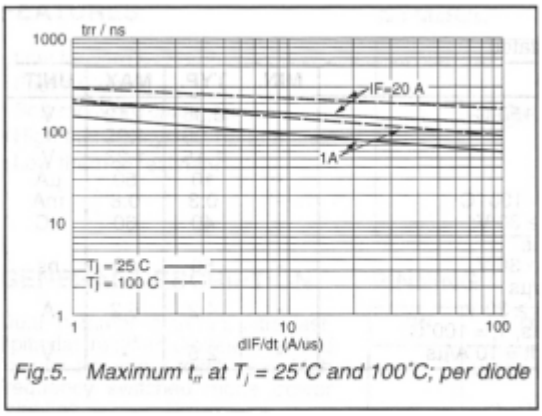

Fig.5. Maximum t_{rr} at T_j = 25˚C and 100˚C; per diode

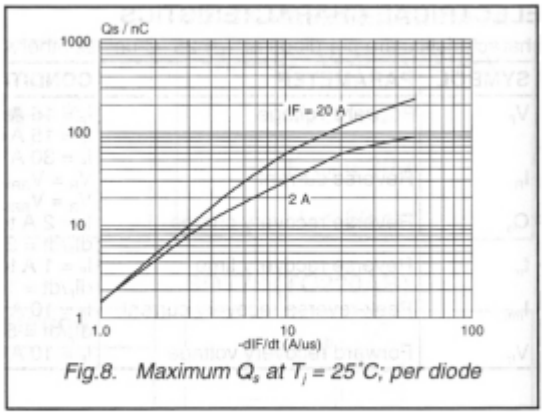

Fig.8. Maximum Q_s at T_j = 25˚C; per diode

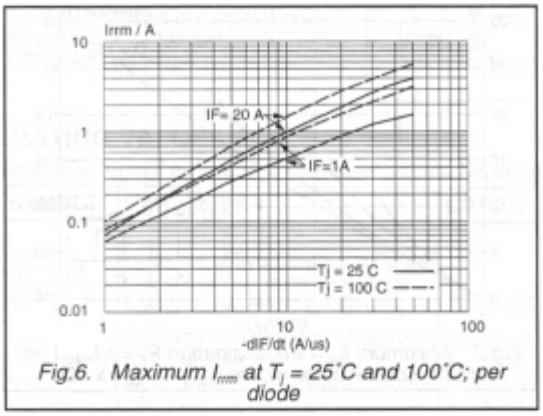

Fig.6. Maximum I_{rrm} at T_j = 25˚C and 100˚C; per diode

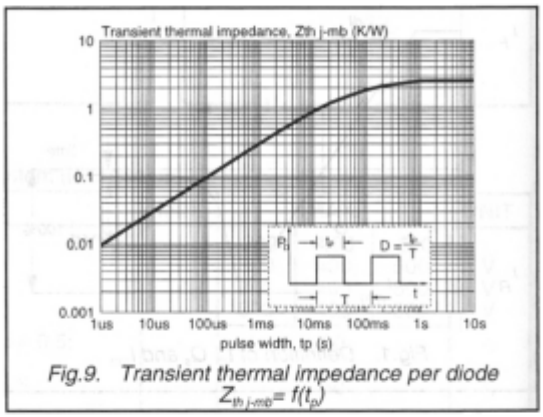

Fig.9. Transient thermal impedance per diode $Z_{th\ j\text{-}mb} = f(t_p)$

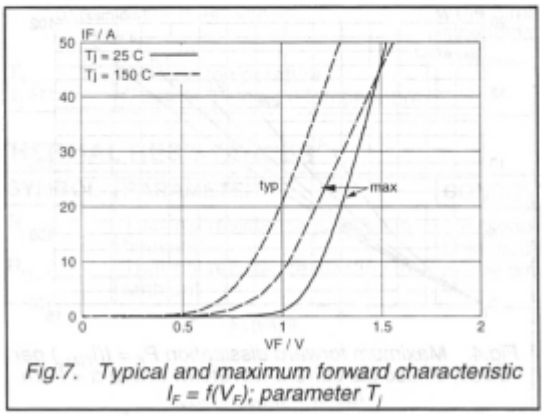

Fig.7. Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j