Silicon Dual Diode

BYV79EB-200

200V/14A

DATASHEET

OEM – Philips

Source: Philips Databook 1999

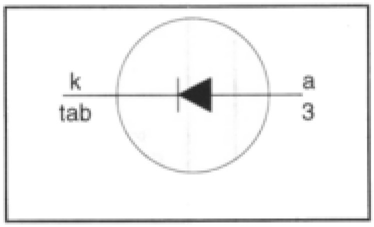
Rectifier diodes ultrafast, rugged

BYV79EB series

FEATURES

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

SYMBOL



QUICK REFERENCE DATA

V_R = 150 V/ 200 V

$V_F \leq 0.9$ V

$I_{F(AV)}$ = 14 A

I_{RRM} = 0.2 A

$t_{rr} \leq 30$ ns

GENERAL DESCRIPTION

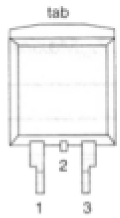
Ultra-fast, epitaxial rectifier diodes intended for use as output rectifiers in high frequency switched mode power supplies.

The BYV79EB series is supplied in the surface mounting SOT404 package.

PINNING

PIN	DESCRIPTION
1	no connection
2	cathode [1]
3	anode
tab	cathode

SOT404



LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.		UNIT
		BYV79EB		-150	-200	
V_{RRM}	Peak repetitive reverse voltage		-	150	200	V
V_{RWM}	Crest working reverse voltage		-	150	200	V
V_R	Continuous reverse voltage	$T_{mb} \leq 145$˚C	-	150	200	V
$I_{F(AV)}$	Average rectified forward current [2]	square wave $\delta = 0.5$; $T_{mb} \leq 120$ ˚C	-	14		A
I_{FRM}	Repetitive peak forward current per diode	t = 25 µs; $\delta = 0.5$; $T_{mb} \leq 120$ ˚C	-	28		A
I_{FSM}	Non-repetitive peak forward current	t = 10 ms	-	150		A
		t = 8.3 ms sinusoidal; with reapplied $V_{RRM(max)}$	-	160		A
I_{RRM}	Repetitive peak reverse current	t_p = 2 µs; $\delta = 0.001$	-	0.2		A
I_{RSM}	Non-repetitive peak reverse current	t_p = 100 µs	-	0.2		A
T_{stg}	Storage temperature		-40	150		˚C
T_j	Operating junction temperature		-	150		˚C

1. It is not possible to make connection to pin 2 of the SOT404 package
2. Neglecting switching and reverse current losses.

ESD LIMITING VALUE

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_C	Electrostatic discharge capacitor voltage	Human body model; C = 250 pF; R = 1.5 kΩ	-	8	kV

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j\text{-}mb}$	Thermal resistance junction to mounting base		-	-	2	K/W
$R_{th\ j\text{-}a}$	Thermal resistance junction to ambient	minimum footprint, FR4 board	-	50	-	K/W

ELECTRICAL CHARACTERISTICS

T_j = 25 ˚C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	Forward voltage	I_F = 14 A; T_j = 150˚C	-	0.83	0.90	V
		I_F = 14 A	-	0.95	1.05	V
		I_F = 50 A	-	1.2	1.4	V
I_R	Reverse current	$V_R = V_{RRM}$; T_j = 100 ˚C	-	0.5	1.3	mA
		$V_R = V_{RRM}$	-	5	50	µA
Q_s	Reverse recovery charge	I_F = 2 A; $V_R \geq$ 30 V; $-dI_F/dt$ = 20 A/µs	-	6	15	nC
t_{rr1}	Reverse recovery time	I_F = 1 A; $V_R \geq$ 30 V; $-dI_F/dt$ = 100 A/µs	-	20	30	ns
t_{rr2}	Reverse recovery time	I_F = 0.5 A to I_R = 1 A; I_{rec} = 0.25 A	-	13	22	ns
V_{fr}	Forward recovery voltage	I_F = 1 A; dI_F/dt = 10 A/µs	-	1	-	V

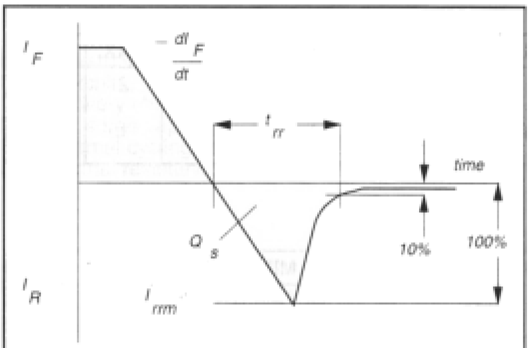


Fig.1. Definition of t_{rr1}, Q_s and I_{rrm}

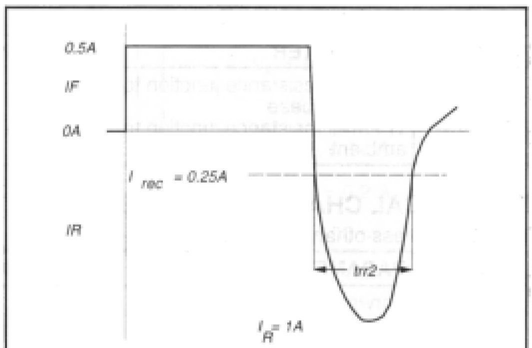


Fig.4. Definition of t_{rr2}

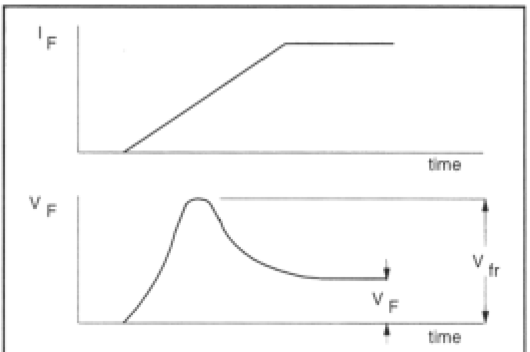


Fig.2. Definition of V_{fr}

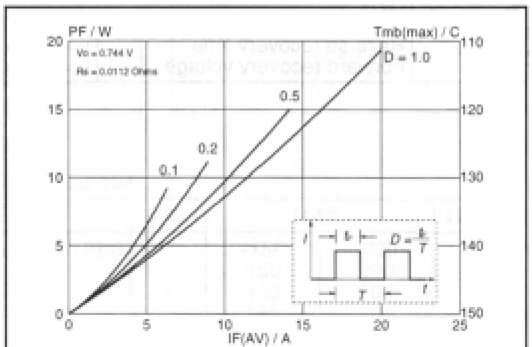


Fig.5. Maximum forward dissipation $P_F = f(I_{F(AV)})$; square current waveform where $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$.

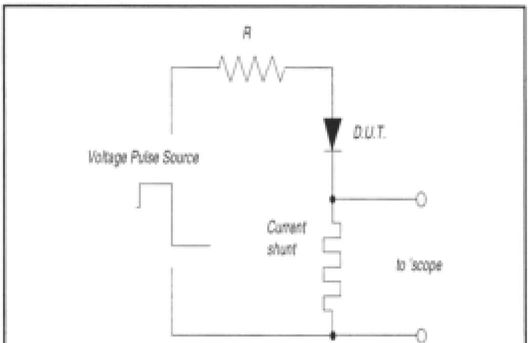


Fig.3. Circuit schematic for t_{rr2}

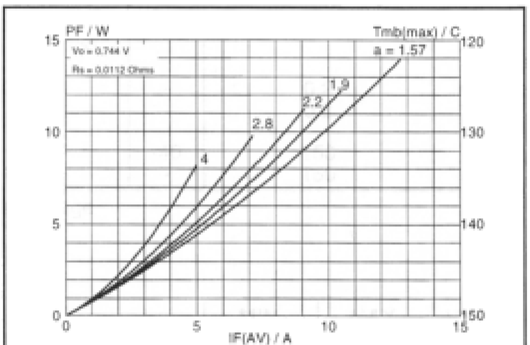


Fig.6. Maximum forward dissipation $P_F = f(I_{F(AV)})$; sinusoidal current waveform where a = form factor = $I_{F(RMS)} / I_{F(AV)}$.

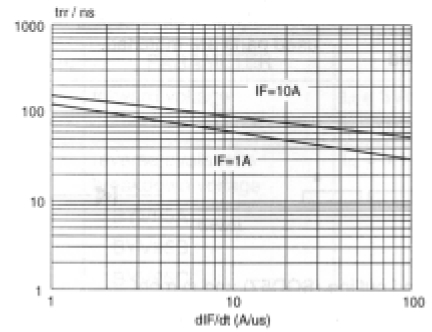


Fig.7. Maximum t_{rr} at T_j = 25 ˚C.

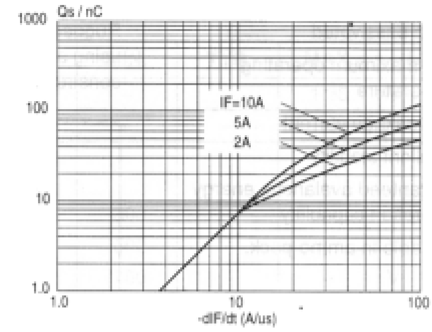


Fig.10. Maximum Q_s at T_j = 25 ˚C.

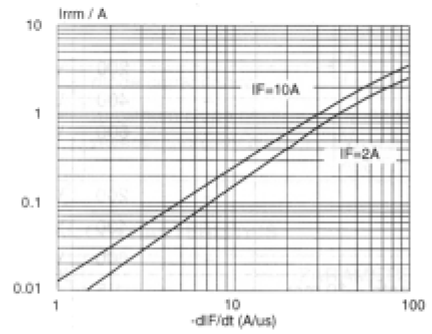


Fig.8. Maximum I_{rrm} at T_j = 25 ˚C.

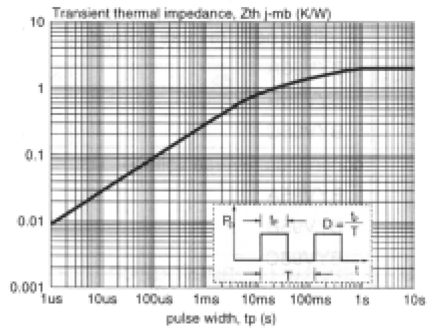


Fig.11. Transient thermal impedance; $Z_{th\ j\text{-}mb} = f(t_p)$.

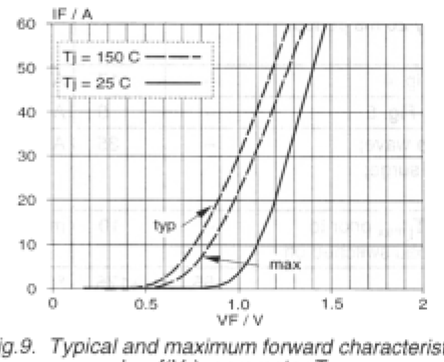


Fig.9. Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j