Dual rectifier diodes ultrafast

BYV34 series

GENERAL DESCRIPTION

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

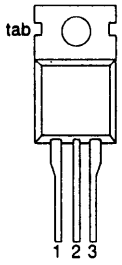
QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	MAX.	MAX.	UNIT
	BYV34-	300	400	500	
V_{RRM}	Repetitive peak reverse voltage	300	400	500	V
V_F	Forward voltage	1.05	1.05	1.05	V
$I_{O(AV)}$	Average output current (both diodes conducting)	20	20	20	A
t_{rr}	Reverse recovery time	60	60	60	ns

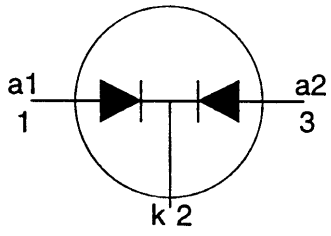
PINNING - TO220AB

PIN	DESCRIPTION
1	anode 1 (a)
2	cathode (k)
3	anode 2 (a)
tab	cathode (k)

PIN CONFIGURATION



SYMBOL



LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.			UNIT
				-300	-400	-500	
V_{RRM}	Repetitive peak reverse voltage		-	300	400	500	V
V_{RWM}	Crest working reverse voltage		-	300	400	500	V
V_R	Continuous reverse voltage	$T_{mb} \leq 138$°C	-	300	400	500	V
$I_{O(AV)}$	Average output current (both diodes conducting)[1]	square wave; $\delta = 0.5$; $T_{mb} \leq 115$ °C	-	20			A
		sinusoidal; a = 1.57; $T_{mb} \leq 116$ °C	-	18			A
$I_{O(RMS)}$	RMS output current (both diodes conducting)		-	28			A
I_{FRM}	Repetitive peak forward current per diode	t = 25 µs; $\delta = 0.5$; $T_{mb} \leq 115$ °C	-	20			A
I_{FSM}	Non-repetitive peak forward current per diode.	t = 10 ms	-	120			A
		t = 8.3 ms sinusoidal; with reapplied $V_{RRM(max)}$	-	132			A
I^2t	I^2t for fusing	t = 10 ms	-	72			A^2s
T_{stg}	Storage temperature		-40	150			°C
T_j	Operating junction temperature		-	150			°C

C/C : 302-3310

1 Neglecting switching and reverse current losses

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	-	-	1.6	K/W
$R_{th\ j\text{-}a}$	Thermal resistance junction to ambient	in free air.	-	60	-	K/W

STATIC CHARACTERISTICS

T_j = 25 °C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	Forward voltage (per diode)	I_F = 10 A; T_j = 150°C	-	0.87	1.05	V
		I_F = 20 A	-	1.10	1.35	V
I_R	Reverse current (per diode)	$V_R = V_{RRM}$	-	10	50	μA
		$V_R = V_{RRM}$; T_j = 100 °C	-	0.2	0.6	mA

DYNAMIC CHARACTERISTICS

T_j = 25 °C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Q_s	Reverse recovery charge (per diode)	I_F = 2 A to $V_R \geq$ 30 V; dI_F/dt = 20 A/μs	-	50	60	nC
t_{rr}	Reverse recovery time (per diode)	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 (per diode)	I_F = 10 A to $V_R \geq$ 30 V; dI_F/dt = 50 A/μs; T_j = 100°C	-	4.0	5.0	A
V_{fr}	Forward recovery voltage (per diode)	I_F = 10 A; dI_F/dt = 10 A/μs	-	2.5	-	V

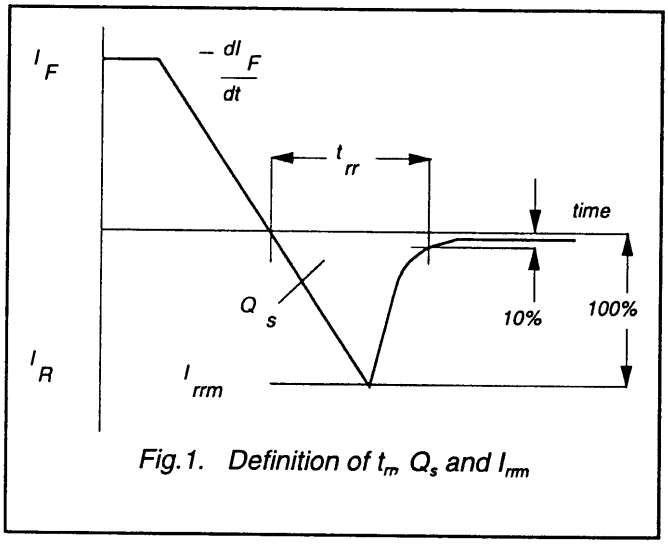


Fig.1. Definition of t_{rr}, Q_s and I_{rrm}

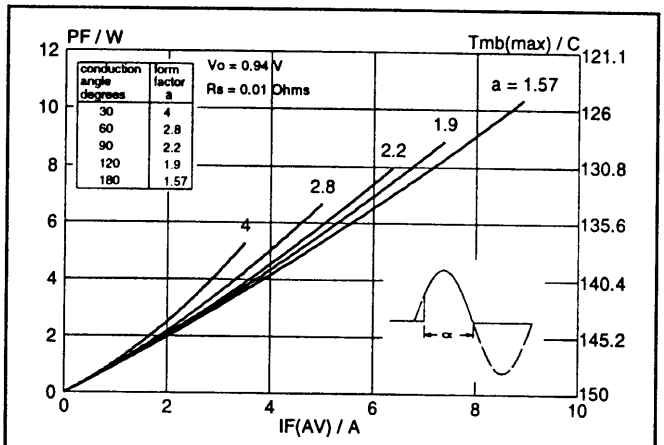


Fig.4. Maximum forward dissipation $P_F = f(I_{F(AV)})$ per diode; sinusoidal current waveform where a = form factor = $I_{F(RMS)} / I_{F(AV)}$.

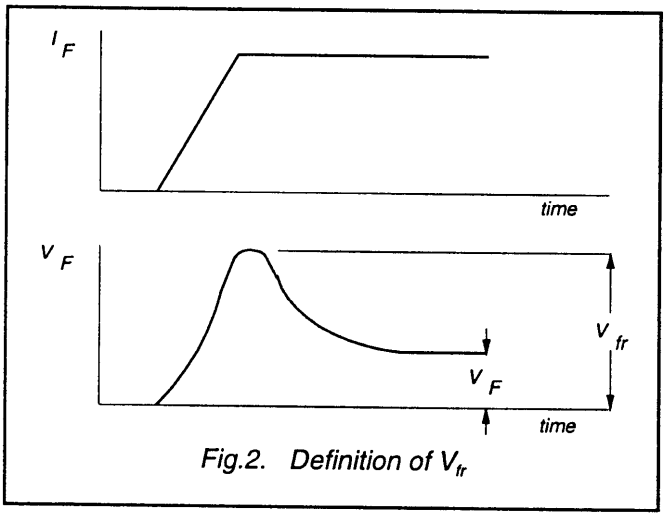


Fig.2. Definition of V_{fr}

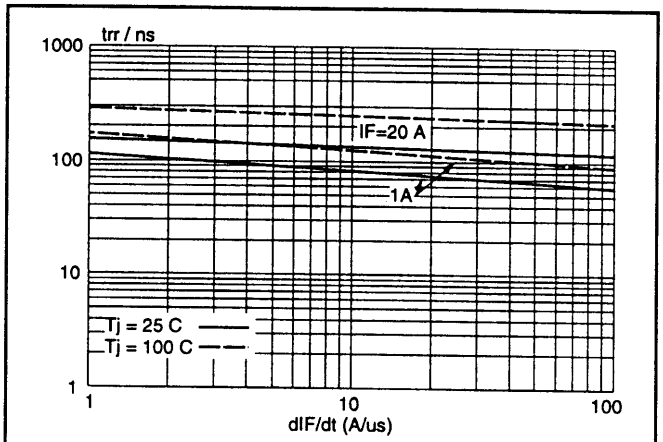


Fig.5. Maximum t_{rr} at T_j = 25°C and 100°C; per diode

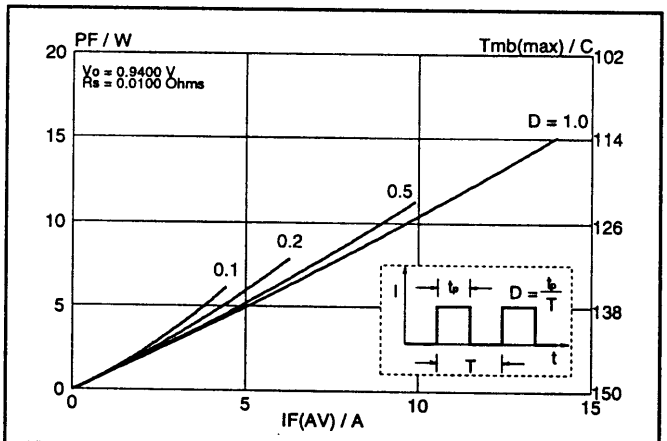


Fig.3. Maximum forward dissipation $P_F = f(I_{F(AV)})$ per diode; square wave where $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$.

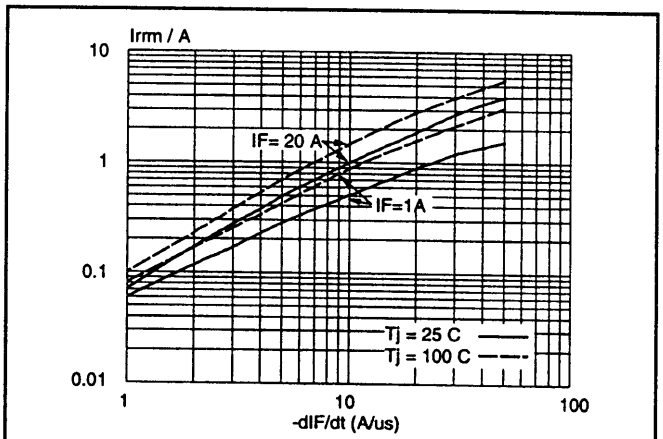


Fig.6. Maximum I_{rrm} at T_j = 25°C and 100°C; per diode.

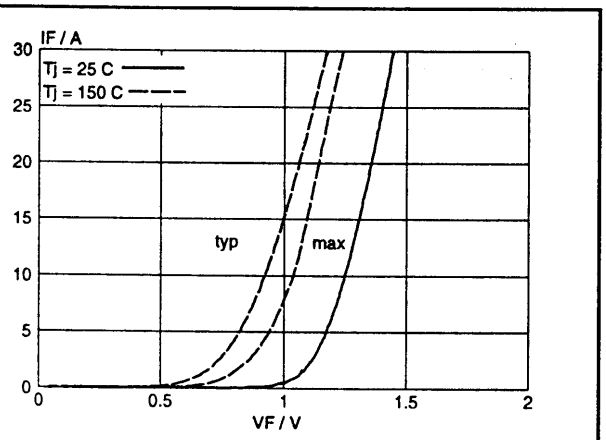


Fig.7. Typical and maximum forward characteristic

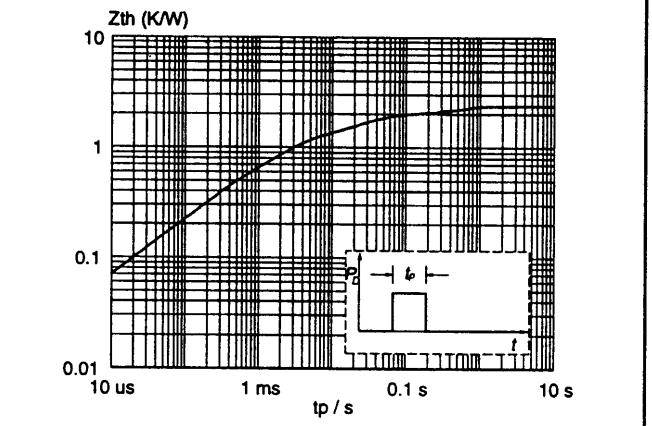


Fig.9. Transient thermal impedance per diode $Z_{th\ j\text{-}mb} = f(t_p)$

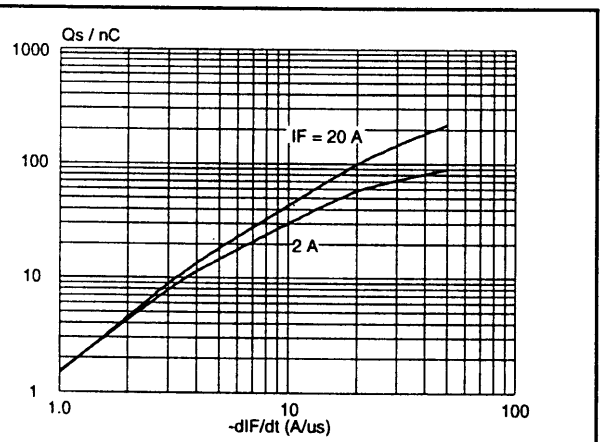


Fig.8. Maximum Q_s at $T_j = 25°C$; per diode.