

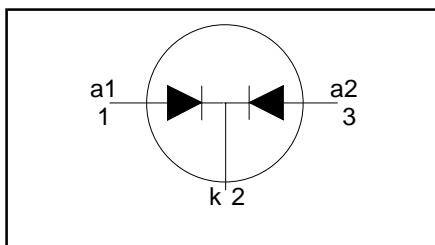
Dual rectifier diodes ultrafast

BYV74W series

FEATURES

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

SYMBOL



QUICK REFERENCE DATA

$V_R = 300 \text{ V} / 400 \text{ V} / 500 \text{ V}$
$V_F \leq 1.12 \text{ V}$
$I_{O(AV)} = 30 \text{ A}$
$t_{fr} \leq 60 \text{ ns}$

GENERAL DESCRIPTION

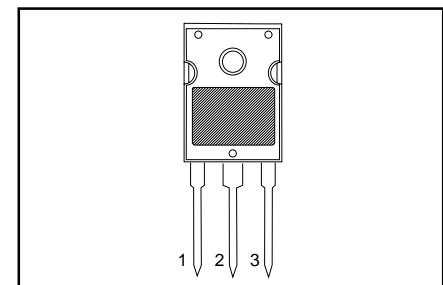
Dual, common cathode, ultra-fast, epitaxial rectifier diodes intended for use as output rectifiers in high frequency switched mode power supplies.

The BYV74W series is supplied in the conventional leaded SOT429 (TO247) package.

PINNING

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

SOT429 (TO247)



LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.		UNIT
V_{RRM}	Peak repetitive reverse voltage	BYV74W	-	-300	-400	V
V_{RWM}	Crest working reverse voltage		300	400	500	
V_R	Continuous reverse voltage	$T_{mb} \leq 136^\circ\text{C}$	-	300	400	V
$I_{O(AV)}$	Average rectified output current (both diodes conducting) ¹	$T_{mb} \leq 94^\circ\text{C}$ square wave; $\delta = 0.5$;	-	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.	$t = 10 \text{ ms}$ $t = 8.3 \text{ ms}$ sinusoidal; with reapplied $V_{RRM(\text{max})}$	-	150		A
T_{stg}	Storage temperature		-40	150		°C
T_j	Operating junction temperature		-	150		°C

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th,j-hs}$	Thermal resistance junction to heatsink	per diode	-	-	2.4	K/W
$R_{th,j-a}$	Thermal resistance junction to ambient	both diodes conducting in free air.	-	45	1.4	K/W

¹ Neglecting switching and reverse current losses.

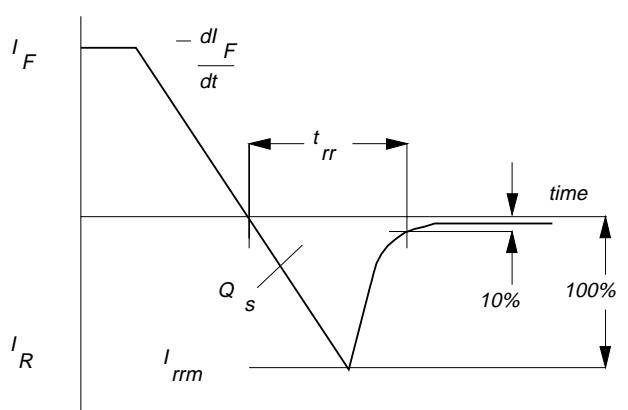
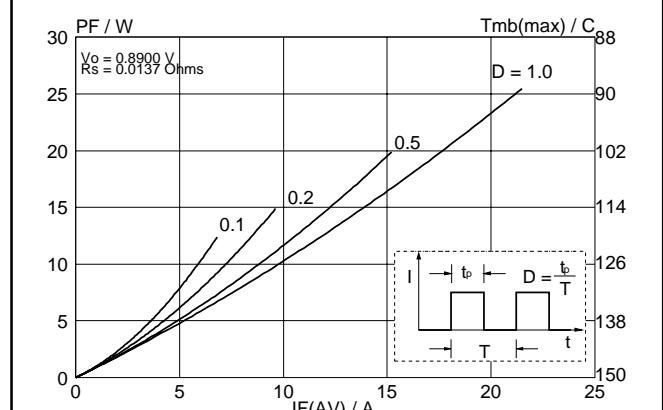
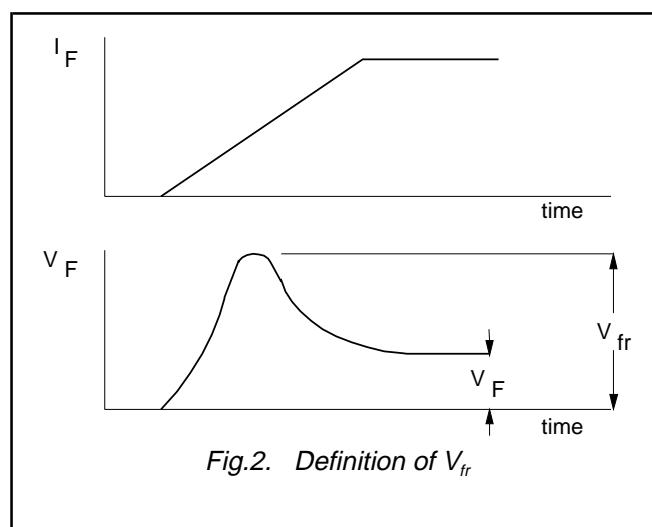
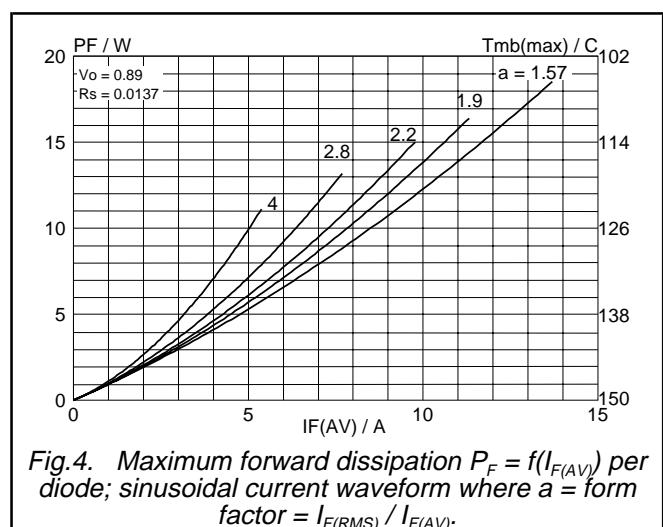
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ELECTRICAL CHARACTERISTICS

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	$I_F = 15 \text{ A}; T_j = 150^\circ\text{C}$ $I_F = 15 \text{ A}$ $I_F = 30 \text{ A}$	-	0.95	1.12	V
I_R	Reverse current	$V_R = V_{RRM}$ $V_R = V_{RRM}; T_j = 100^\circ\text{C}$	-	1.08	1.25	V
Q_s	Reverse recovery charge	$I_F = 2 \text{ A to } V_R \geq 30 \text{ V};$ $dI_F/dt = 20 \text{ A}/\mu\text{s}$	-	1.15	1.36	V
t_{rr}	Reverse recovery time	$I_F = 1 \text{ A to } V_R \geq 30 \text{ V};$ $dI_F/dt = 100 \text{ A}/\mu\text{s}$	-	0.3	0.8	μA
I_{rrm}	Peak reverse recovery current	$I_F = 10 \text{ A to } V_R \geq 30 \text{ V};$ $dI_F/dt = 50 \text{ A}/\mu\text{s}; T_j = 100^\circ\text{C}$	-	40	60	mA
V_{fr}	Forward recovery voltage	$I_F = 10 \text{ A}; dI_F/dt = 10 \text{ A}/\mu\text{s}$	-	50	60	nC
			-	2.5	-	ns
			-	4.2	5.2	A
			-	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 $a = \text{form factor} = I_{F(RMS)} / I_{F(AV)}$.

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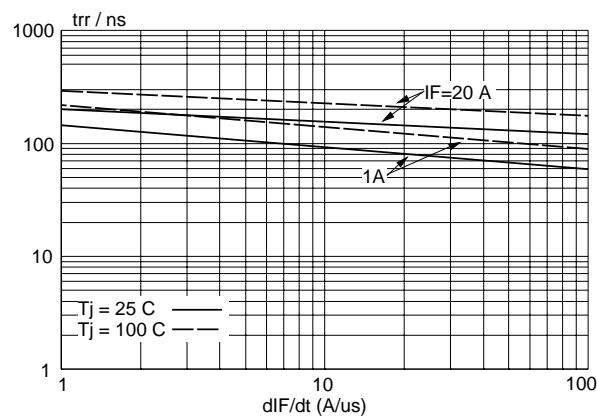


Fig.5. Maximum t_{rr} at $T_j = 25^\circ\text{C}$ and 100°C ; per diode

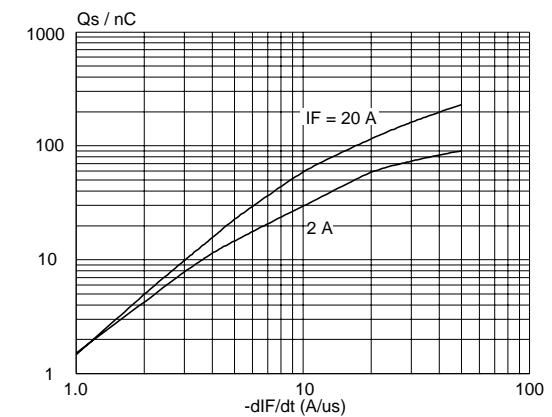


Fig.8. Maximum Q_s at $T_j = 25^\circ\text{C}$; per diode

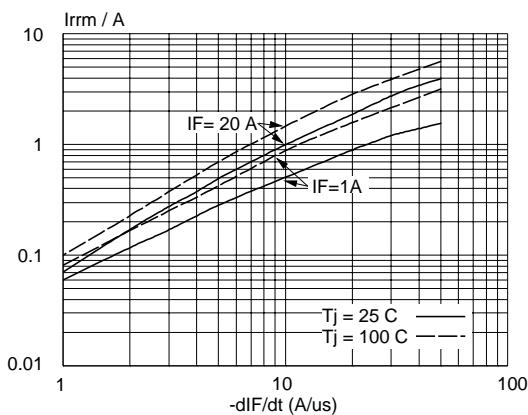


Fig.6. Maximum I_{rrm} at $T_j = 25^\circ\text{C}$ and 100°C ; per diode

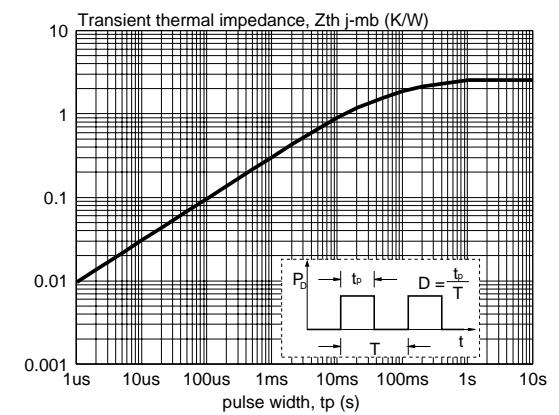


Fig.9. Transient thermal impedance per diode
 $Z_{th\ j\ -mb} = f(t_p)$

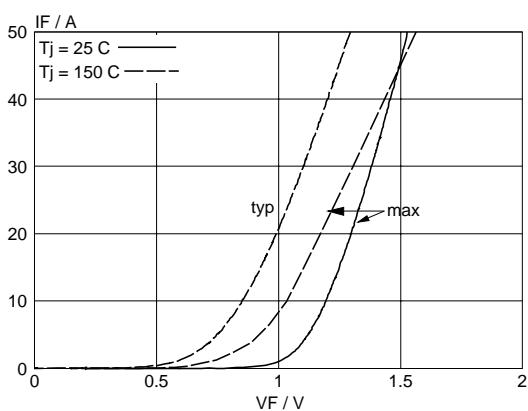


Fig.7. Typical and maximum forward characteristic
 $I_F = f(V_F)$; parameter T_j

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MECHANICAL DATA

Dimensions in mm

Net Mass: 5 g

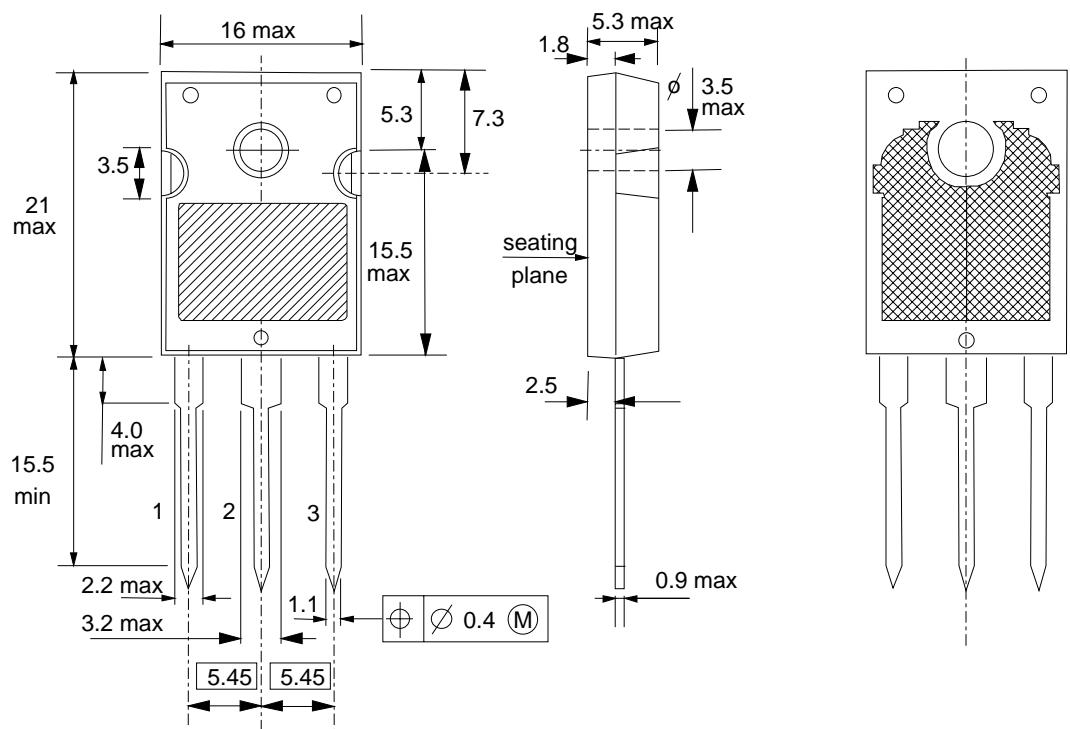


Fig.10. SOT429 (TO247); pin 2 connected to mounting base.

Notes

1. Refer to mounting instructions for SOT429 envelope.
2. Epoxy meets UL94 V0 at 1/8".

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DEFINITIONS

Data sheet status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values are given in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of this specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	
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