Silicon Dual Diode

BYV72EW-200

200V/30A

DATASHEET

OEM – Philips

Source: Philips Databook 1999

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

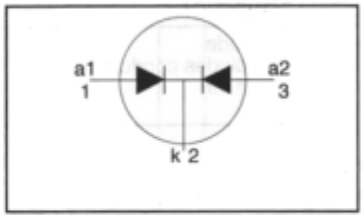
Rectifier diodes ultrafast, rugged

BYV72EW 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

$V_F \leq 0.85$ V

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

I_{RRM} = 0.2 A

$t_{rr} \leq 28$ ns

GENERAL DESCRIPTION

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

The BYV72EW 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
		BYV72EW		-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	$T_{mb} \leq 144$˚C	-	150	200	V
$I_{O(AV)}$	Average rectified output current (both diodes conducting)[1]	square wave $\delta = 0.5$; $T_{mb} \leq 104$ ˚C	-	30		A
I_{FRM}	Repetitive peak forward current per diode	t = 25 µs; $\delta = 0.5$; $T_{mb} \leq 104$ ˚C	-	30		A
I_{FSM}	Non-repetitive peak forward current per diode	t = 10 ms	-	150		A
		t = 8.3 ms sinusoidal; with reapplied $V_{RWM(max)}$	-	160		A
I_{RRM}	Repetitive peak reverse current per diode	t_p = 2 µs; $\delta = 0.001$	-	0.2		A
I_{RSM}	Non-repetitive peak reverse current per diode	t_p = 100 µs	-	0.2		A
T_{stg}	Storage temperature		-40	150		˚C
T_j	Operating junction temperature		-	150		˚C

1 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

Rectifier diodes
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THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j\text{-}mb}$	Thermal resistance junction to mounting base	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	-	45	-	K/W

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	-	0.83	0.90	V
		I_F = 15 A	-	0.95	1.05	V
		I_F = 30 A	-	1.00	1.20	V
I_R	Reverse current	$V_R = V_{RWM}$; T_j = 100 ˚C	-	0.5	1	mA
		$V_R = V_{RWM}$	-	10	100	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	28	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

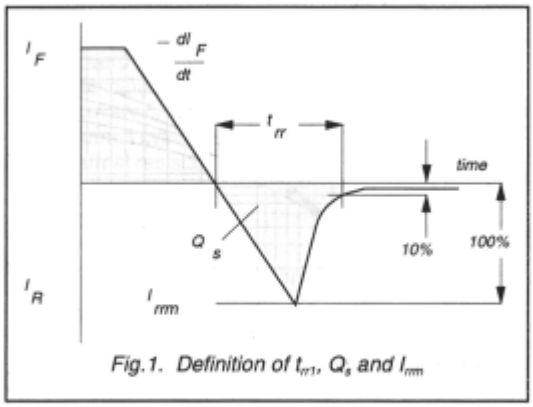

Fig.1. Definition of t_{rr1}, Q_s and I_{rrm}

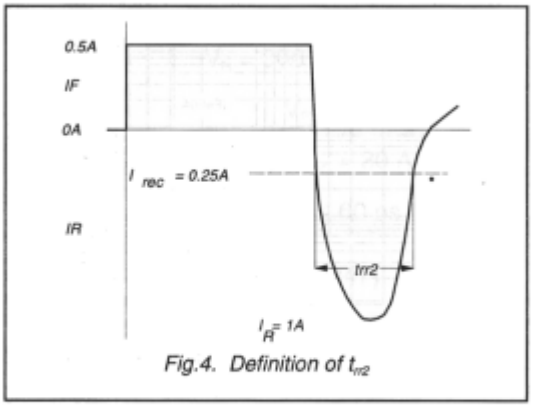

Fig.4. Definition of t_{rr2}

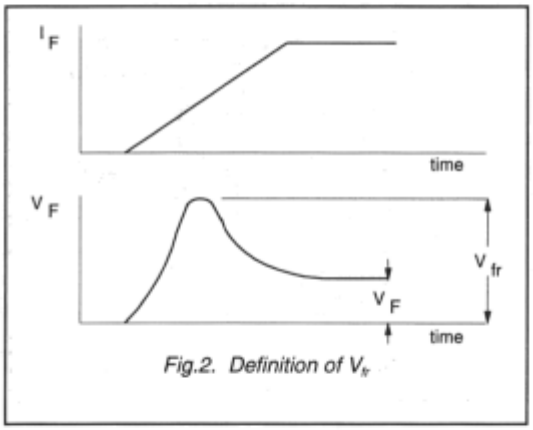

Fig.2. Definition of V_{fr}

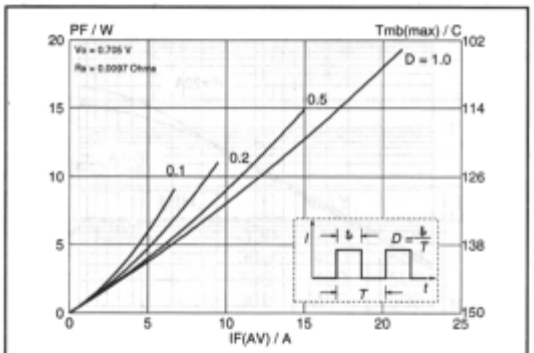

Fig.5. Maximum forward dissipation $P_F = f(I_{F(AV)})$ per diode; square current waveform where $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$.

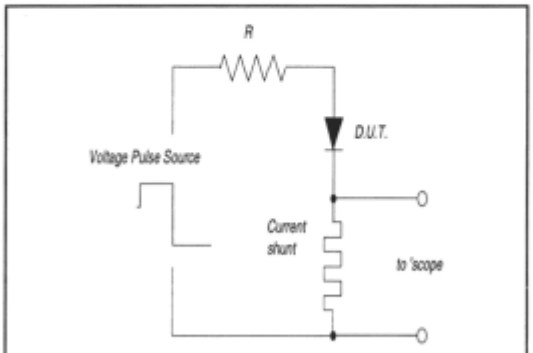

Fig.3. Circuit schematic for t_{rr2}

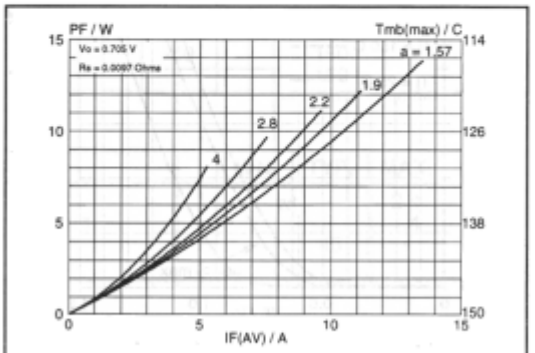

Fig.6. Maximum forward dissipation $P_F = f(I_{F(AV)})$ per diode; sinusoidal current waveform where a = form factor = $I_{F(RMS)} / I_{F(AV)}$.

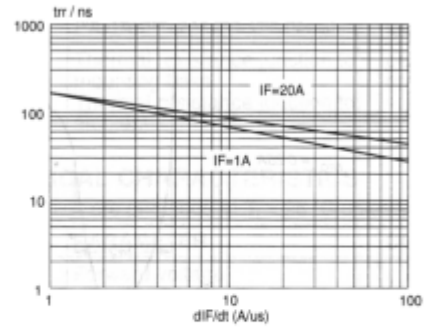

Fig.7. Maximum t_{rr} at T_j = 25 ˚C; per diode

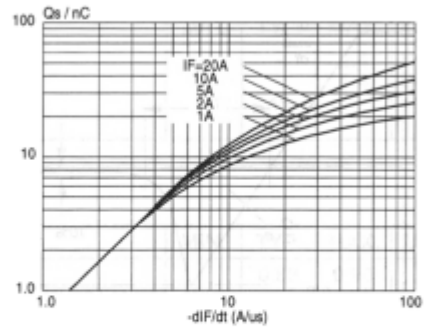

Fig.10. Maximum Q_s at T_j = 25 ˚C; per diode

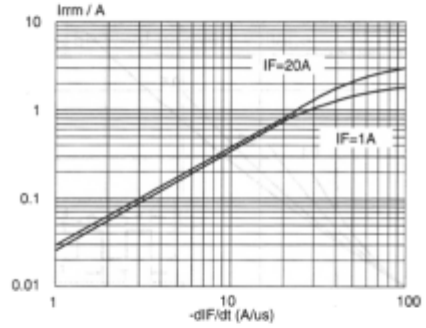

Fig.8. Maximum I_{rrm} at T_j = 25 ˚C; per diode

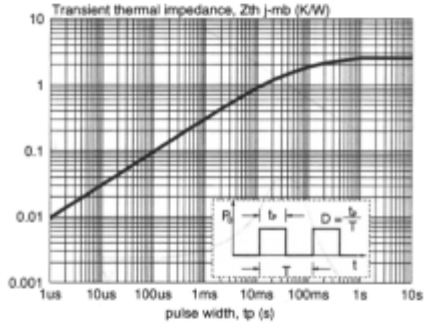

Fig.11. Transient thermal impedance; per diode; $Z_{th\ j\text{-}mb} = f(t_p)$.

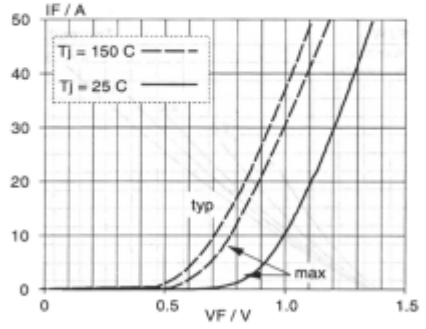

Fig.9. Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j