

Silicon Diode

BYT28-500

500V/10A

DATASHEET

OEM – Philips

Source: Philips Databook 1999

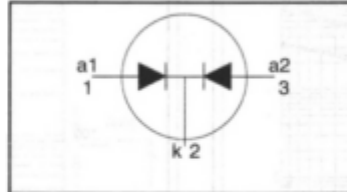
Dual rectifier diodes ultrafast

BYT28 series

FEATURES

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

SYMBOL



QUICK REFERENCE DATA

$$V_R = 300 \text{ V} / 400 \text{ V} / 500 \text{ V}$$

$$V_F \leq 1.05 \text{ V}$$

$$I_{O(AV)} = 10 \text{ A}$$

$$t_{rr} \leq 60 \text{ ns}$$

GENERAL DESCRIPTION

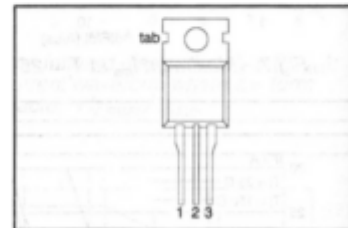
Dual, common cathode, ultra-fast, epitaxial rectifier diodes intended for use as output rectifiers in high frequency switched mode power supplies.

The BYT28 series is supplied in the conventional leaded SOT78 (TO220AB) package.

PINNING

PIN	DESCRIPTION
1	cathode
2	anode
tab	cathode

SOT78 (TO220AB)



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	$T_{mb} \leq 147^\circ\text{C}$	-	300	400	500	V
V_R	Continuous reverse voltage		-	300	400	500	V
$I_{O(AV)}$	Average rectified output current (both diodes conducting) ¹	square wave; $\delta = 0.5$;	-	10			A
I_{FSM}	Non-repetitive peak forward current per diode.	$T_{mb} \leq 115^\circ\text{C}$	-	50			A
		$t = 10 \text{ ms}$ $t = 8.3 \text{ ms}$ sinusoidal; with reapplied $V_{RRM(max)}$	-	55			A
T_{stg}	Storage temperature		-40	150			$^\circ\text{C}$
T_j	Operating junction temperature		-	150			$^\circ\text{C}$

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th(j-hs)}$	Thermal resistance junction to heatsink	per diode	-	-	4.5	K/W
$R_{th(j-a)}$	Thermal resistance junction to ambient	both diodes conducting	-	-	3.0	K/W
		in free air.	-	60	-	K/W

¹ Neglecting switching and reverse current losses.

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ELECTRICAL CHARACTERISTICS

characteristics are per diode at $T_J = 25\text{ }^\circ\text{C}$ unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	Forward voltage	$I_F = 5\text{ A}; T_J = 150\text{ }^\circ\text{C}$	-	0.95	1.05	V
I_R	Reverse current	$I_F = 10\text{ A}$ $V_R = V_{RRM}$	-	1.30	1.40	V
Q_s	Reverse recovery charge	$V_R = V_{RRM}; T_J = 100\text{ }^\circ\text{C}$ $I_F = 2\text{ A to } V_R \geq 30\text{ V};$ $dI_F/dt = 20\text{ A}/\mu\text{s}$	-	2.0	10	μA
t_{rr}	Reverse recovery time	$V_R = V_{RRM}; T_J = 100\text{ }^\circ\text{C}$ $I_F = 1\text{ A to } V_R \geq 30\text{ V};$ $dI_F/dt = 100\text{ A}/\mu\text{s}$	-	10	200	μA
I_{rm}	Peak reverse recovery current	$V_R = V_{RRM}; T_J = 100\text{ }^\circ\text{C}$ $I_F = 1\text{ A to } V_R \geq 30\text{ V};$ $dI_F/dt = 50\text{ A}/\mu\text{s}$	-	50	60	nC
V_{fr}	Forward recovery voltage	$I_F = 5\text{ A to } V_R \geq 30\text{ V};$ $dI_F/dt = 50\text{ A}/\mu\text{s}; T_J = 100\text{ }^\circ\text{C}$ $I_F = 1\text{ A}; dI_F/dt = 10\text{ A}/\mu\text{s}$	-	50	60	ns
			-	2.0	3.0	A
			-	2.5	-	V

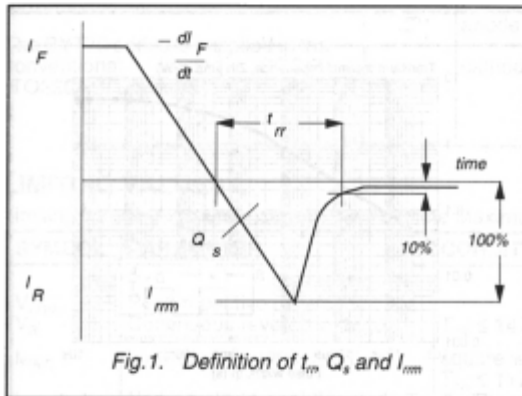


Fig.1. Definition of t_{rr} , Q_s and I_{rm}

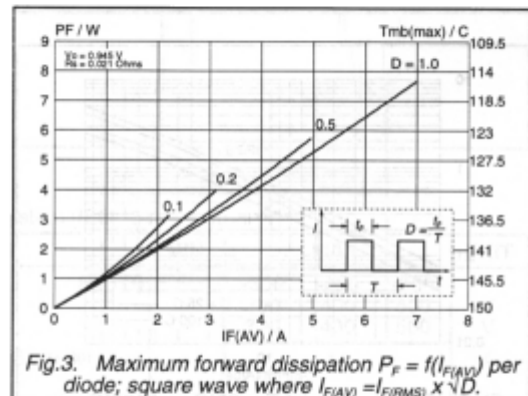


Fig.3. Maximum forward dissipation $P_F = f(I_{F(AV)})$ per diode; square wave where $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$.

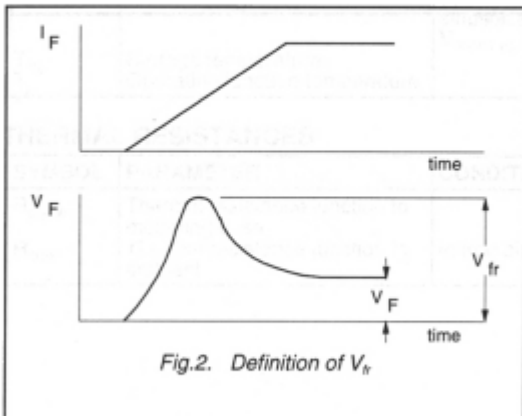


Fig.2. Definition of V_{fr}

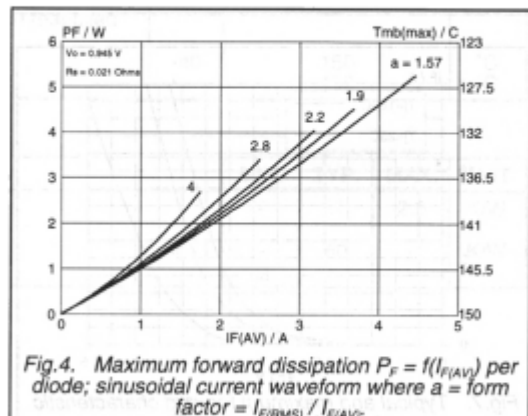


Fig.4. Maximum forward dissipation $P_F = f(I_{F(AV)})$ per diode; sinusoidal current waveform where $a = \text{form factor} = I_{F(RMS)} / I_{F(AV)}$.

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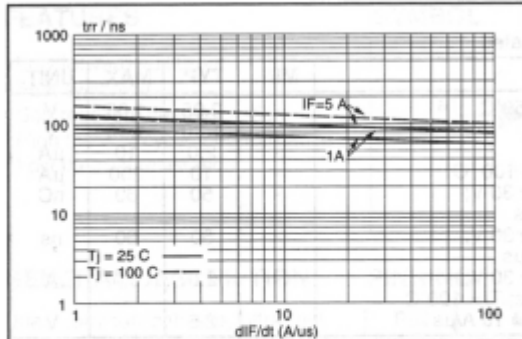


Fig.5. Maximum t_{rr} at $T_j = 25^\circ\text{C}$ and 100°C ; per diode

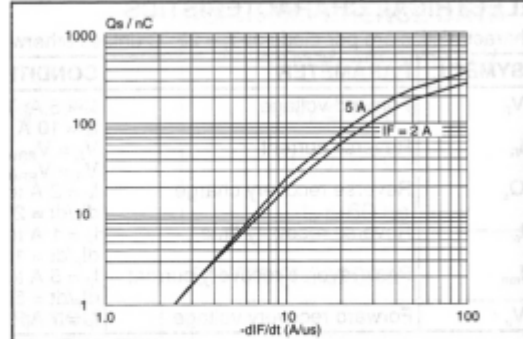


Fig.8. Maximum Q_s at $T_j = 25^\circ\text{C}$; per diode.

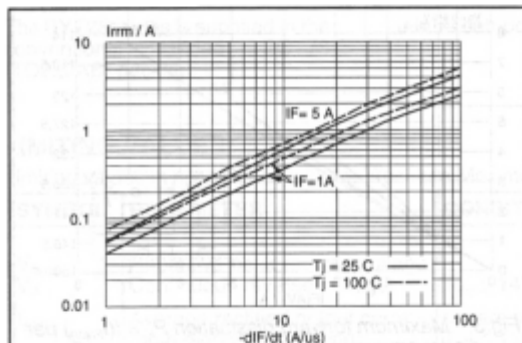


Fig.6. Maximum I_{rrm} at $T_j = 25^\circ\text{C}$ and 100°C ; per diode.

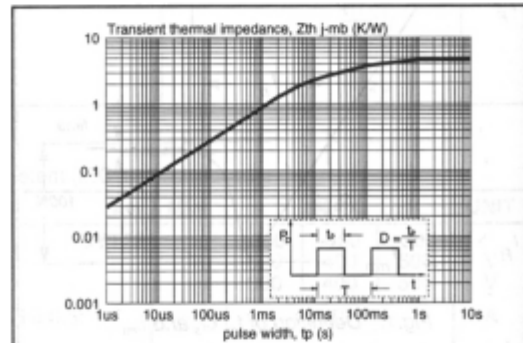


Fig.9. Transient thermal impedance per diode $Z_{th} = f(t_p)$

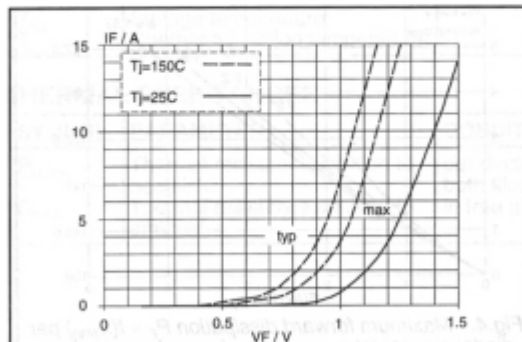


Fig.7. Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j