

Philips Semiconductors

Product specification

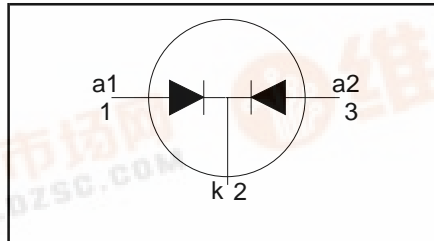
## Rectifier diodes Schottky barrier

## PBYR4045WT series

### FEATURES

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

### SYMBOL



### QUICK REFERENCE DATA

$$V_R = 40 \text{ V} / 45 \text{ V}$$

$$I_{F(AV)} = 40 \text{ A}$$

$$V_F \leq 0.58 \text{ V}$$

### GENERAL DESCRIPTION

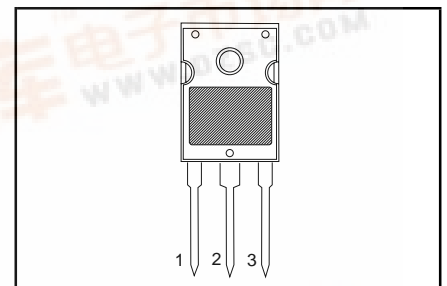
Dual, common cathode schottky rectifier diodes in a plastic envelope. Intended for use as output rectifiers in low voltage, high frequency switched mode power supplies.

The PBYR4045WT series is supplied in the conventional leaded SOT429 (TO247) package.

### PINNING

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

### SOT429 (TO247)



### LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.		UNIT
PBYR40				40WT	45WT	
$V_{RRM}$	Peak repetitive reverse voltage		-	40	45	V
$V_{RWM}$	Working peak reverse voltage		-	40	45	V
$V_R$	Continuous reverse voltage	$T_{mb} \leq 107^\circ\text{C}$	-	40	45	V
$I_{O(AV)}$	Average output current (both diodes conducting)	square wave; $\delta = 0.5$ ; $T_{mb} \leq 120^\circ\text{C}$	-	40		A
$I_{FRM}$	Repetitive peak forward current	square wave; $\delta = 0.5$ ; $T_{mb} \leq 120^\circ\text{C}$	-	40		A
$I_{FSM}$	Non-repetitive peak forward current	$t = 10 \text{ ms}$	-	300		A
		$t = 8.3 \text{ ms}$	-	325		A
$I_{RRM}$	Peak repetitive reverse surge current	sinusoidal; $T_j = 125^\circ\text{C}$ prior to surge; with reapplied $V_{RRM(max)}$ pulse width and repetition rate limited by $T_{jmax}$	-	2		A
$T_j$	Operating junction temperature		-	150		$^\circ\text{C}$
$T_{stg}$	Storage temperature		- 65	150		$^\circ\text{C}$

### THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th j-mb}$	Thermal resistance junction to mounting base	per diode	-	-	1.4	K/W
$R_{th j-a}$	Thermal resistance junction to ambient	both diodes in free air	-	-	1	K/W
			-	45	-	K/W

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ELECTRICAL CHARACTERISTICS

T<sub>j</sub> = 25 °C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V <sub>F</sub>	Forward voltage per diode	I <sub>F</sub> = 20 A; T <sub>j</sub> = 125°C	-	0.5	0.58	V
		I <sub>F</sub> = 40 A; T <sub>j</sub> = 125°C	-	0.68	0.75	V
		I <sub>F</sub> = 20 A	-	0.51	0.6	V
		I <sub>F</sub> = 40 A	-	0.67	0.76	V
I <sub>R</sub>	Reverse current per diode	V <sub>R</sub> = V <sub>RWM</sub>	-	0.4	2.5	mA
		V <sub>R</sub> = V <sub>RWM</sub> ; T <sub>j</sub> = 100°C	-	25	70	mA
C <sub>d</sub>	Junction capacitance	V <sub>R</sub> = 5 V; f = 1 MHz, T <sub>j</sub> = 25°C to 125°C	-	700	-	pF

# Rectifier diodes

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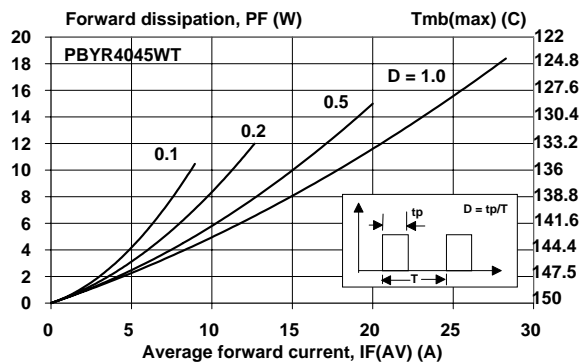


Fig. 1. Maximum forward dissipation  $P_F = f(I_{F(AV)})$  per diode; square current waveform where  $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$ .

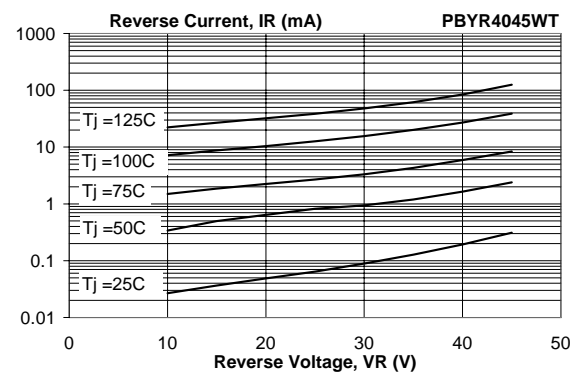


Fig. 4. Typical reverse leakage current per diode;  $I_R = f(V_R)$ ; parameter  $T_j$

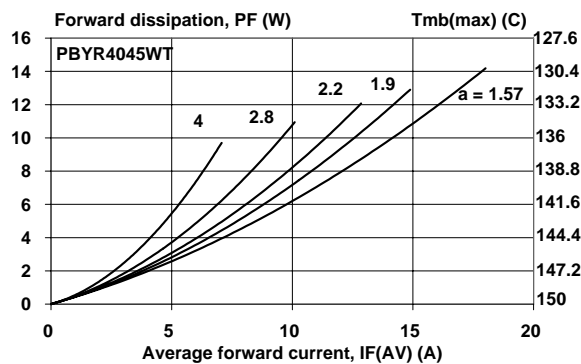


Fig. 2. Maximum forward dissipation  $P_F = f(I_{F(AV)})$  per diode; sinusoidal current waveform where  $a = \text{form factor} = I_{F(RMS)} / I_{F(AV)}$ .

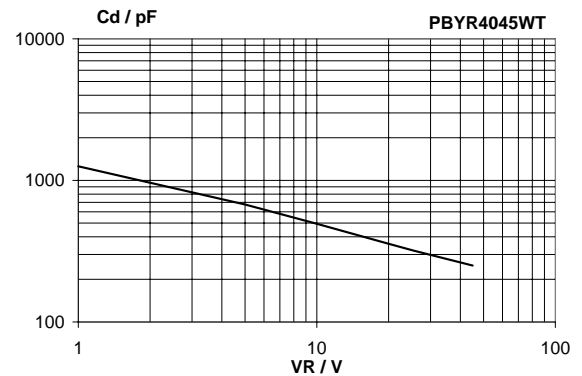


Fig. 5. Typical junction capacitance per diode;  $C_d = f(V_R)$ ;  $f = 1 \text{ MHz}$ ;  $T_j = 25^\circ\text{C}$  to  $125^\circ\text{C}$ .

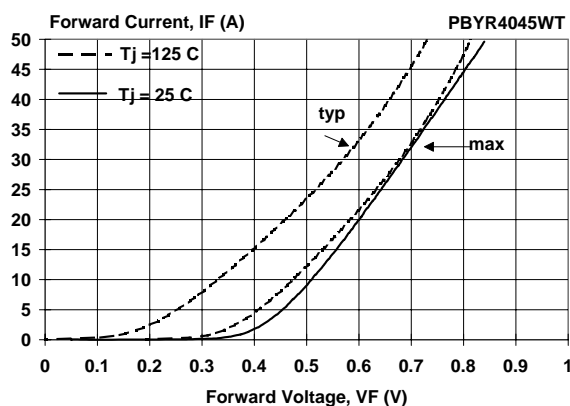


Fig. 3. Typical and maximum forward characteristic  $I_F = f(V_F)$ ; parameter  $T_j$

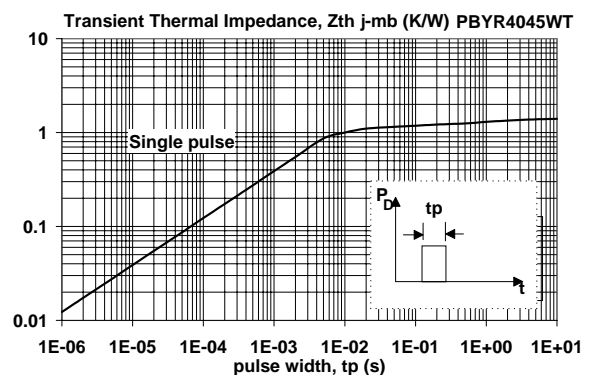
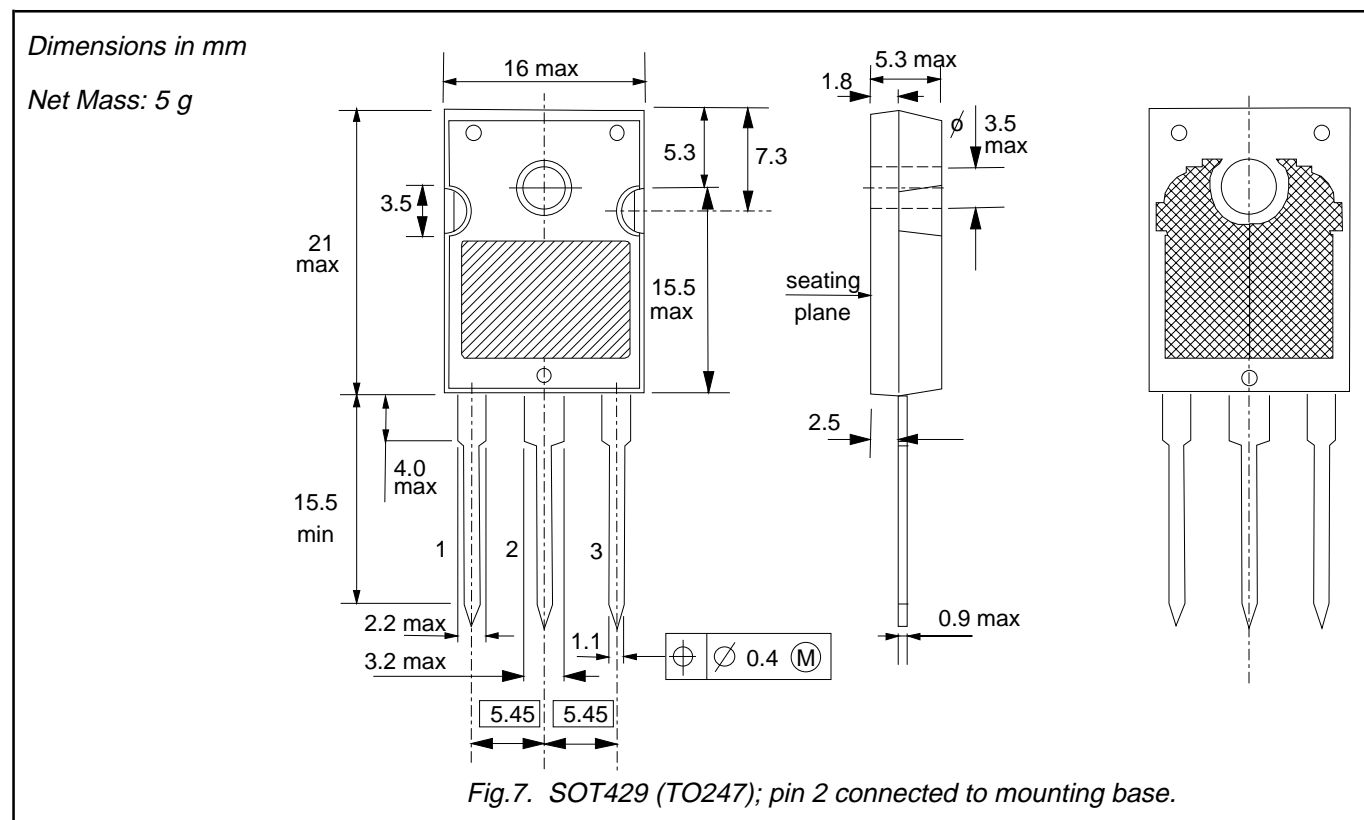


Fig. 6. Transient thermal impedance per diode;  $Z_{th j-mb} = f(t_p)$ .

Rectifier diodes  
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## MECHANICAL DATA



## Notes

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

**Rectifier diodes  
Schottky barrier****PBYR4045WT series****DEFINITIONS**

<b>Data sheet status</b>	
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.
<b>Limiting values</b>	
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.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	
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