

Philips Semiconductors

Product specification

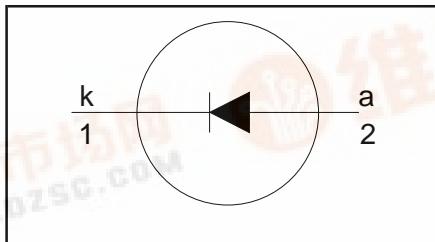
## Rectifier diodes Schottky barrier

## PBYR745F, PBYR745X series

### FEATURES

- Low forward volt drop
- Fast switching
- Reverse surge capability
- High thermal cycling performance
- Isolated mounting tab

### SYMBOL



### QUICK REFERENCE DATA

$V_R = 40 \text{ V} / 45 \text{ V}$   
 $I_{F(AV)} = 7.5 \text{ A}$   
 $V_F \leq 0.57 \text{ V}$

### GENERAL DESCRIPTION

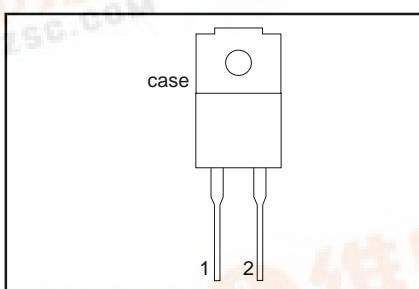
Schottky rectifier diodes in a plastic envelope with electrically isolated mounting tab. Intended for use as output rectifiers in low voltage, high frequency switched mode power supplies.

The PBYR745F series is supplied in the SOD100 package.  
The PBYR745X series is supplied in the SOD113 package.

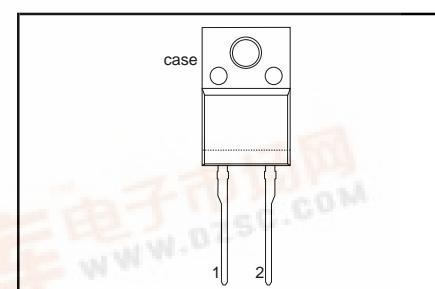
### PINNING

PIN	DESCRIPTION
1	cathode
2	anode
tab	isolated

### SOD100



### SOD113



### 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	PBYR7 PBYR7	-	40F 40X 40	V
$V_{RWM}$	Working peak reverse voltage		-	40	V
$V_R$	Continuous reverse voltage	$T_{hs} \leq 103 \text{ }^\circ\text{C}$	-	40	V
$I_{F(AV)}$	Average rectified forward current	square wave; $\delta = 0.5$ ; $T_{hs} \leq 123 \text{ }^\circ\text{C}$	-	7.5	A
$I_{FRM}$	Repetitive peak forward current	square wave; $\delta = 0.5$ ; $T_{hs} \leq 123 \text{ }^\circ\text{C}$	-	15	A
$I_{FSM}$	Non-repetitive peak forward current	$t = 10 \text{ ms}$ $t = 8.3 \text{ ms}$	-	100 110	A
$I_{RRM}$	Peak repetitive reverse surge current	sinusoidal; $T_j = 125 \text{ }^\circ\text{C}$ prior to surge; with reapply $V_{RRM(max)}$ pulse width and repetition rate limited by $T_{j max}$	-	1	A
$T_j$	Operating junction temperature		-	150	$^\circ\text{C}$
$T_{sta}$	Storage temperature		- 65	175	$^\circ\text{C}$

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**ISOLATION LIMITING VALUE & CHARACTERISTIC** $T_{hs} = 25^\circ\text{C}$  unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{isol}$	Peak isolation voltage from both terminals to external heatsink	SOD100 package; R.H. $\leq 65\%$ ; clean and dustfree	-	-	1500	V
$V_{isol}$	R.M.S. isolation voltage from both terminals to external heatsink	SOD113 package; $f = 50\text{-}60\text{ Hz}$ ; sinusoidal waveform; R.H. $\leq 65\%$ ; clean and dustfree	-	-	2500	V
$C_{isol}$	Capacitance from pin 1 to external heatsink	$f = 1\text{ MHz}$	-	10	-	pF

**THERMAL RESISTANCES**

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th j-hs}$	Thermal resistance junction to heatsink	with heatsink compound	-	-	5.5	K/W
$R_{th j-a}$	Thermal resistance junction to ambient	in free air	-	55	-	K/W

**ELECTRICAL CHARACTERISTICS** $T_j = 25^\circ\text{C}$  unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_F$	Forward voltage	$I_F = 7.5\text{ A}; T_j = 125^\circ\text{C}$	-	0.45	0.57	V
		$I_F = 15\text{ A}; T_j = 125^\circ\text{C}$	-	0.65	0.72	V
		$I_F = 15\text{ A}$	-	0.64	0.84	V
$I_R$	Reverse current	$V_R = V_{RWM}$	-	0.13	1	mA
		$V_R = V_{RWM}; T_j = 100^\circ\text{C}$	-	17	22	mA
$C_d$	Junction capacitance	$V_R = 5\text{ V}; f = 1\text{ MHz}, T_j = 25^\circ\text{C to } 125^\circ\text{C}$	-	270	-	pF

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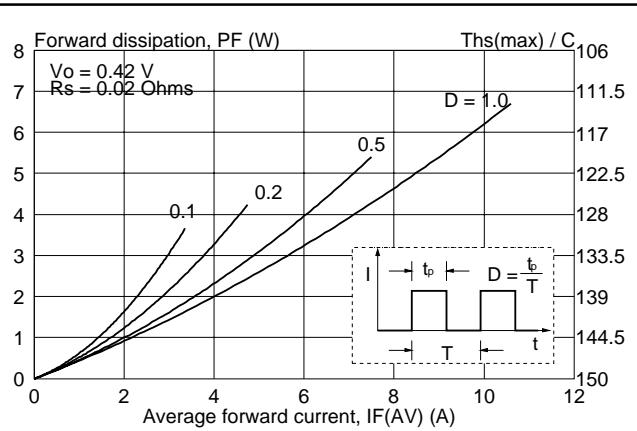


Fig.1. Maximum forward dissipation  $P_F = f(I_{F(AV)})$ ;  
square current waveform where  $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$ .

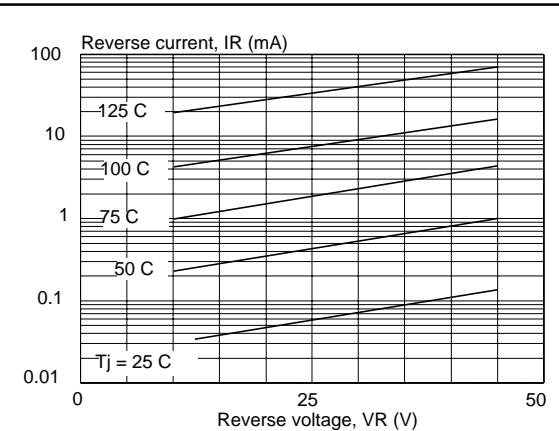


Fig.4. Typical reverse leakage current;  $I_R = f(V_R)$ ;  
parameter  $T_j$

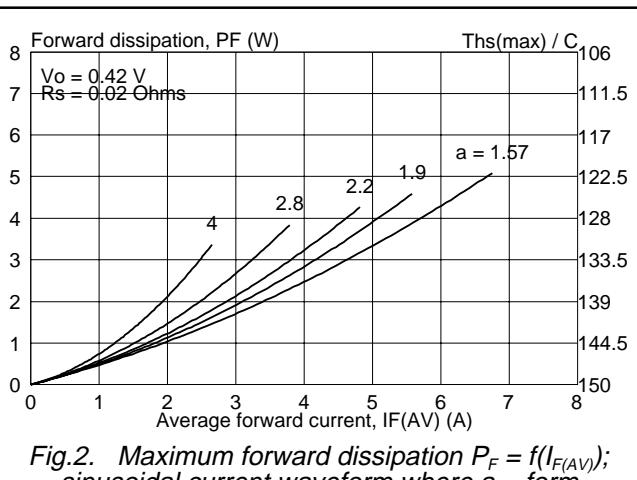


Fig.2. Maximum forward dissipation  $P_F = f(I_{F(AV)})$ ;  
sinusoidal current waveform where  $a = \text{form}$   
 $\text{factor} = I_{F(RMS)} / I_{F(AV)}$ .

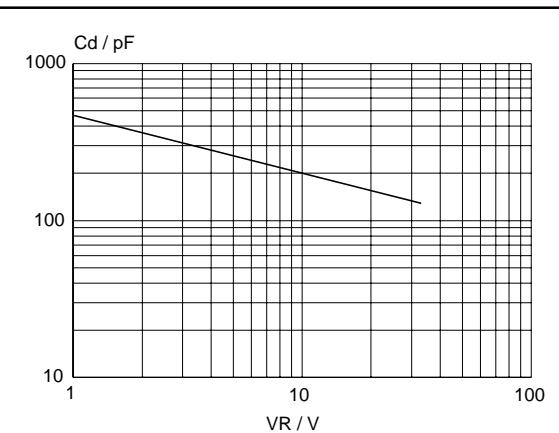


Fig.5. Typical junction capacitance;  $C_d = f(V_R)$ ;  
 $f = 1 \text{ MHz}$ ;  $T_j = 25^\circ C$  to  $125^\circ C$ .

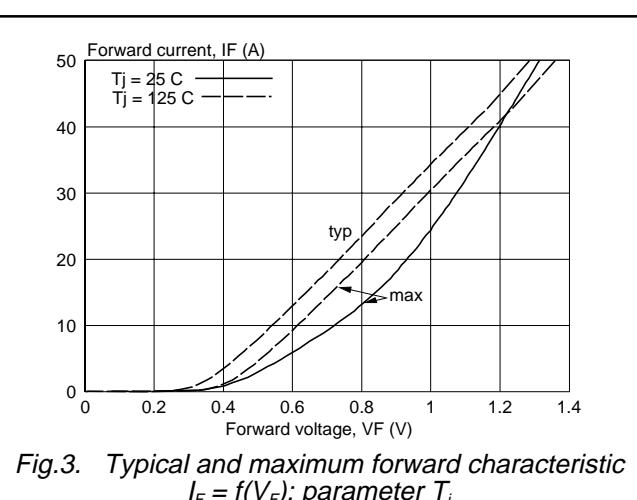


Fig.3. Typical and maximum forward characteristic  
 $I_F = f(V_F)$ ; parameter  $T_j$ .

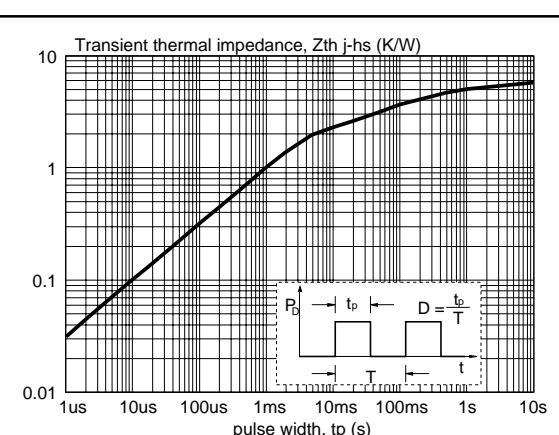


Fig.6. Transient thermal impedance;  $Z_{th,j-hs} = f(t_p)$ .

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## MECHANICAL DATA

Dimensions in mm

Net Mass: 2 g

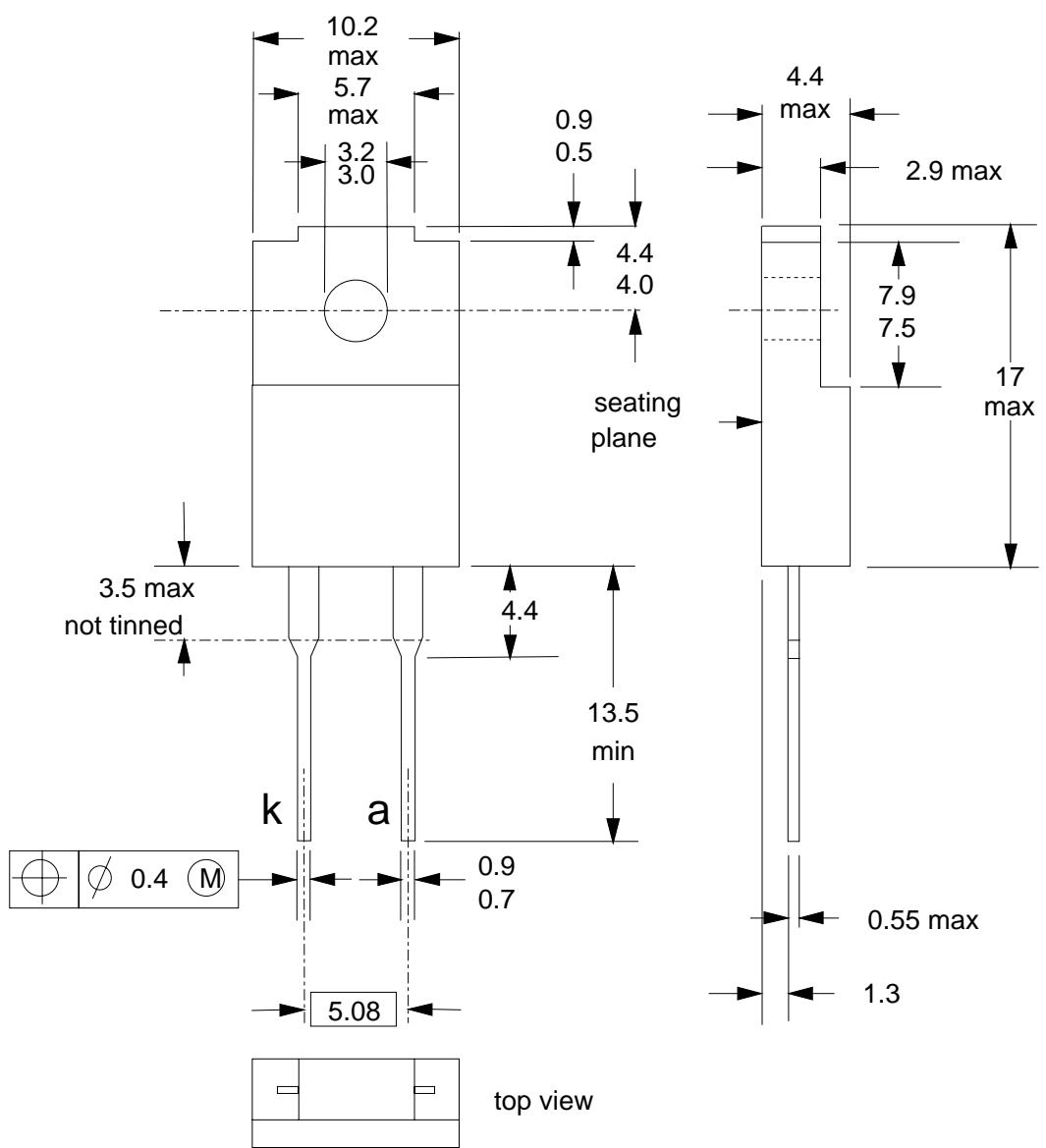


Fig.7. SOD100; The seating plane is electrically isolated from all terminals.

## Notes

1. Refer to mounting instructions for F-pack envelopes.
2. Epoxy meets UL94 V0 at 1/8".

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## MECHANICAL DATA

Dimensions in mm

Net Mass: 2 g

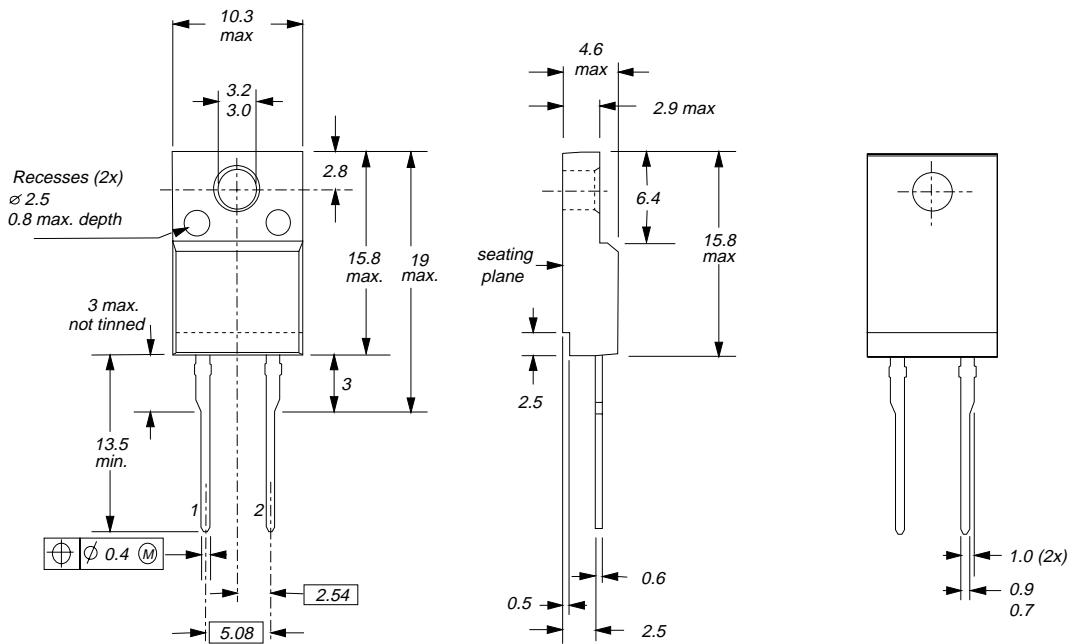


Fig.8. SOD113; The seating plane is electrically isolated from all terminals.

## Notes

1. Refer to mounting instructions for F-pack envelopes.
2. Epoxy meets UL94 V0 at 1/8".

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## 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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