PBYR2045CTF, PBYR2045CTX series

Rectifier diodes Schottky barrier

FEATURES

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

 $\begin{array}{c|c} a1 \\ 1 \\ 1 \\ k 2 \end{array}$

QUICK REFERENCE DATA

Product specification

$$V_{R} = 40 \text{ V}/45 \text{ V}$$

 $I_{O(AV)} = 20 \text{ A}$
 $V_{T} \le 0.57 \text{ V}$

GENERAL DESCRIPTION

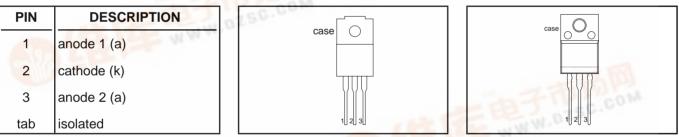
Dual, common cathode schottky rectifier diodes in a plastic envelope with electrically isolated mounting tab. Intended for use as output rectifiers in low voltage, high frequency switched mode power supplies.

The PBYR2045CTF series is supplied in the SOT186 package. The PBYR2045CTX series is supplied in the SOT186A package.

PINNING

SOT186

SOT186A



LIMITING VALUES

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

SYMBOL			MIN.	MA	UNIT	
	SELEE WWW.D	PBYR20 PBYR20		40CTF 40CTX	45CTF 45CTX	
V _{RRM}	Peak repetitive reverse voltage		-	40	45	V
V _{RWM}	Working peak reverse voltage		-	40	45	V
V _R	Continuous reverse voltage	$T_{hs} \le 84 \degree C$		40	45	V
I _{O(AV)}	Average rectified output current (both diodes conducting)	square wave; $\delta = 0.5$; T _{hs} \leq 78 °C	1-1	20		A
I _{FRM}	Repetitive peak forward current per diode	square wave; δ = 0.5; T _{bs} ≤ 78 °C	-	20		A
I _{FSM}	Non-repetitive peak forward current per diode	t = 10 ms t = 8.3 ms sinusoidal: T _i = 125 °C prior to	-	10 11		AA
RRM	Peak repetitive reverse surge current per diode	surge; with reapplied $V_{RRM(max)}$ pulse width and repetition rate limited by T_{jmax}	-	1		A
Tj	Operating junction temperature	Jiliaa	-	15	0	°C
T _{stg}	Storage temperature		- 65	5 175		°C

SYMBOL

Product specification

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ISOLATION LIMITING VALUE & CHARACTERISTIC

 $T_{hs} = 25$ °C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V _{isol}	Peak isolation voltage from all terminals to external heatsink	SOT186 package; R.H. \leq 65%; clean and dustfree	-	-	1500	V
V _{isol}	R.M.S. isolation voltage from all terminals to external heatsink	SOT186A package; f = 50-60 Hz; sinusoidal waveform; R.H. \leq 65%; clean and dustfree	-	-	2500	V
C _{isol}	Capacitance from pin 2 to external heatsink	f = 1 MHz	-	10	-	рF

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
R_{thj-hs}	Thermal resistance junction to heatsink	per diode both diodes	-		6 5	K/W K/W
R _{th j-a}	Thermal resistance junction to ambient	(with heatsink compound) in free air	-	55	-	K/W

ELECTRICAL CHARACTERISTICS

 $T_i = 25$ °C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
VF	Forward voltage	I _F = 10 A; T _i = 125°C	-	0.45	0.57	V
· ·		$I_{\rm F} = 20 \text{ A}; T_{\rm i} = 125^{\circ} \text{C}$	-	0.64	0.72	V
		$I_{\rm F} = 20 {\rm A}$	-	0.64	0.84	V
I _R	Reverse current	$\dot{V}_{R} = V_{RWM}$	-	0.3	1.3	mA
		V _R = V _{RWM} ; T _j = 100°C V _R = 5 V; f = 1 MHz, T _i = 25°C to 125°C	-	22	35	mA
C _d	Junction capacitance	$V_{R} = 5 \text{ V}; \text{ f} = 1 \text{ MHz}, \text{ T}_{j} = 25 ^{\circ}\text{C} \text{ to } 125 ^{\circ}\text{C}$	-	380	-	рF

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Ths(max) (C) 90 Forward dissipation, PF (W) Reverse current, IR (mA) 10 100 Vo = 0.42 V Rs = 0.015 Ohms D = 1.0 -125 C 8 102 10 0.5 Ξ100 C 114 6 0.2 0.1 75 C 1 126 4 -50 C t₀ 0.1 = 25 C 138 2 t т 0 150 0.01 15 5 10 0 0 50 25 Average forward current, IF(AV) (A) Reverse voltage, VR (V) Fig.1. Maximum forward dissipation $P_F = f(I_{F(AV)})$ per diode; square current waveform where Fig.4. Typical reverse leakage current per diode; $I_R = f(V_R)$; parameter T_i $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}.$ Ths(max) (C) Forward dissipation, PF (W) Cd / pF 8 1000 Vo = 0.42 V Rs = 0.015 Ohms a = 1.57 108 7 1.9 22 6 114 2.8 5 120 126 4 100 3 132 2 138 1 144 10 150 0 10 100 2 4 6 Average forward current, IF(AV) (A) 0 8 10 VR / V Fig.2. Maximum forward dissipation $P_F = f(I_{F(AV)})$ per diode; sinusoidal current waveform where a = form Fig.5. Typical junction capacitance per diode; $C_d = f(V_R); f = 1 \text{ MHz}; T_j = 25^{\circ}C \text{ to } 125^{\circ}C.$ factor = $I_{F(RMS)} / I_{F(AV)}$. Transient thermal impedance, Zth j-hs (K/W) Forward current, IF (A) 50 10 Tj = 25 C Tj = 125 C 40 1 30 typ 20 0.1 max 10 0.01 0 10us 100us 1ms 10ms 100ms 1us 1s 10s ົດ 0.2 0.4 0.6 0.8 1.2 1.4 pulse width, tp (s) Forward voltage, VF (V) Fig.3. Typical and maximum forward characteristic Fig.6. Transient thermal impedance per diode; $I_F = f(V_F)$; parameter T $Z_{th j-hs} = f(t_p).$

Product specification

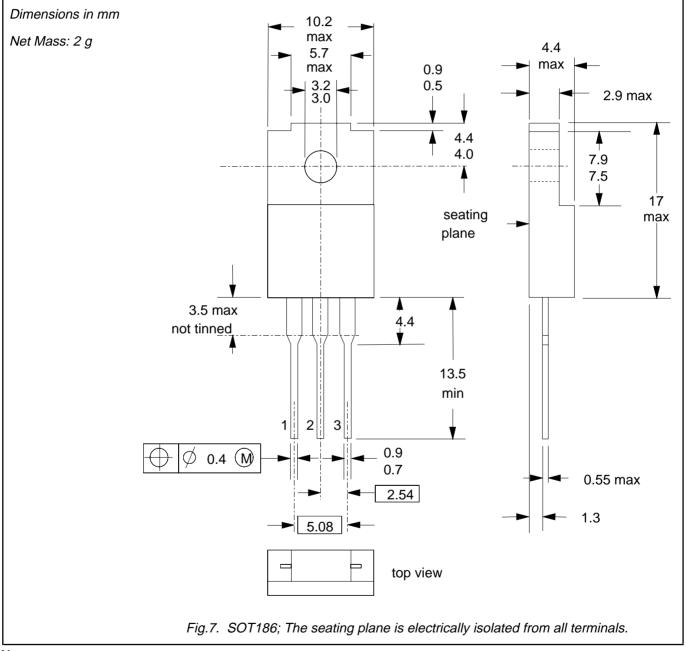
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Product specification

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MECHANICAL DATA



Notes

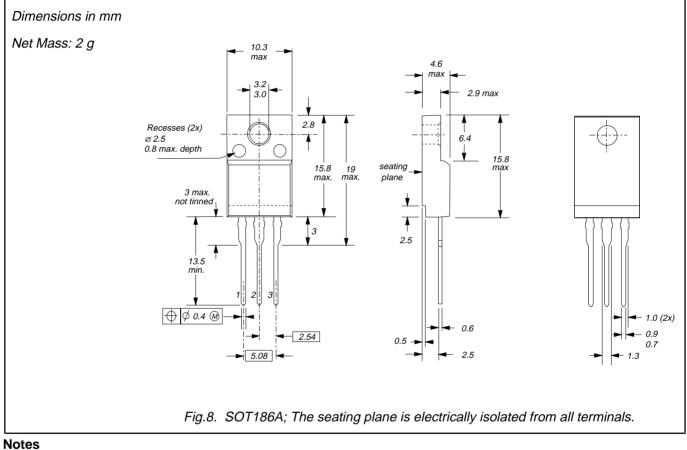
Refer to mounting instructions for F-pack envelopes.
Epoxy meets UL94 V0 at 1/8".

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MECHANICAL DATA



Refer to mounting instructions for F-pack envelopes.
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DEFINITIONS

Data sheet status						
Objective specification	Dbjective specification This data sheet contains target or goal specifications for product development.					
Preliminary specification	ation This data sheet contains preliminary data; supplementary data may be published later.					
Product specification	on This data sheet contains final product specifications.					
Limiting values	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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