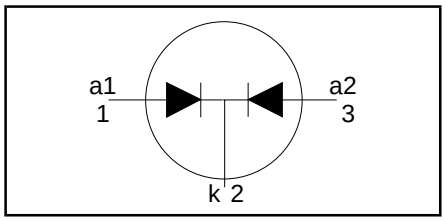
Rectifier diodes Schottky barrier

PBYR2045CT, PBYR2045CTB 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 V/ 45 V

$I_{O(AV)}$ = 20 A

$V_F \leq 0.57$ V

GENERAL DESCRIPTION

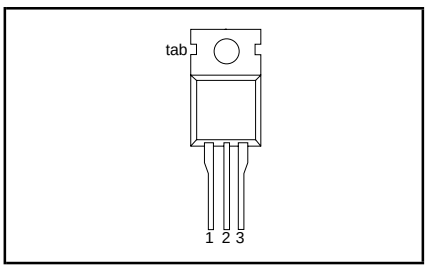
Dual, common cathode schottky rectifier diodes in a conventional leaded plastic package and a surface mounting plastic package. Intended for use as output rectifiers in low voltage, high frequency switched mode power supplies.

The PBYR2045CT series is supplied in the SOT78 conventional leaded package.
The PBYR2045CTB series is supplied in the SOT404 surface mounting package.

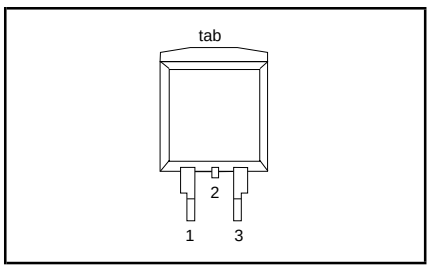
PINNING

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

SOT78 (TO220AB)



SOT404



LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.		UNIT
		PBYR20 PBYR20		**40CT 40CTB**	**45CT 45CTB**	
V_{RRM}	Peak repetitive reverse voltage		-	40	45	V
V_{RWM}	Working peak reverse voltage		-	40	45	V
V_R	Continuous reverse voltage	$T_{mb} \leq 106$ ˚C	-	40	45	V
$I_{O(AV)}$	Average rectified forward current (both diodes conducting)	square wave; $\delta = 0.5$; $T_{mb} \leq 128$ ˚C	-	20		A
I_{FRM}	Repetitive peak forward current per diode	square wave; $\delta = 0.5$; $T_{mb} \leq 128$ ˚C	-	20		A
I_{FSM}	Non-repetitive peak forward current per diode	t = 10 ms	-	135		A
		t = 8.3 ms sinusoidal; T_j = 125 ˚C prior to surge; with reapplied $V_{RRM(max)}$	-	150		A
I_{RRM}	Peak repetitive reverse surge current per diode	pulse width and repetition rate limited by $T_{j\,max}$	-	1		A
T_j	Operating junction temperature		-	150		˚C
T_{stg}	Storage temperature		- 65	175		˚C

1. It is not possible to make connection to pin 2 of the SOT404 pckage.

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j\text{-}mb}$	Thermal resistance junction to mounting base	per diode	-	-	2	K/W
		both diodes	-	-	1.5	K/W
$R_{th\ j\text{-}a}$	Thermal resistance junction to ambient	SOT78 package in free air	-	60	-	K/W
		SOT404 package, pcb mounted, minimum footprint, FR4 board	-	50	-	K/W

ELECTRICAL CHARACTERISTICS

T_j = 25 ˚C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	Forward voltage per diode	I_F = 10 A; T_j = 125˚C	-	0.45	0.57	V
		I_F = 20 A; T_j = 125˚C	-	0.64	0.72	V
		I_F = 20 A	-	0.64	0.84	V
I_R	Reverse current per diode	$V_R = V_{RWM}$	-	0.3	1.3	mA
		$V_R = V_{RWM}$; T_j = 100˚C	-	22	35	mA
C_d	Junction capacitance per diode	V_R = 5 V; f = 1 MHz, T_j = 25˚C to 125˚C	-	380	-	pF

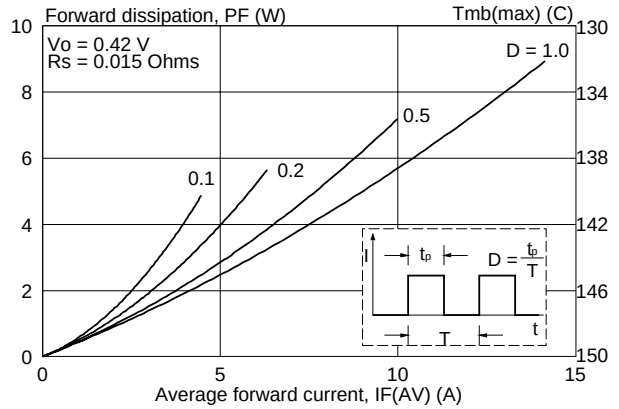


Fig.1. Maximum forward dissipation $P_F = f(I_{F(AV)})$ per diode; square current waveform where $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$.

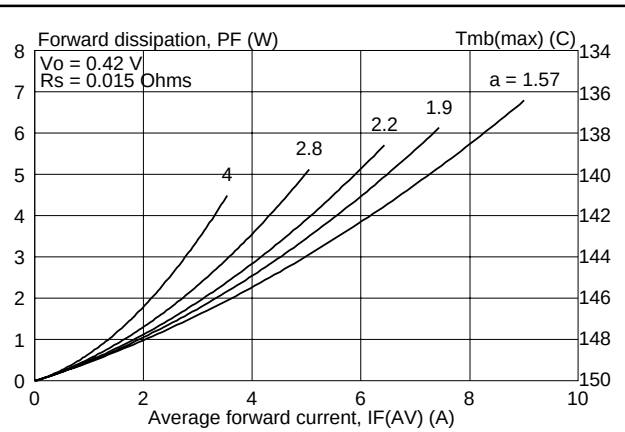


Fig.2. Maximum forward dissipation $P_F = f(I_{F(AV)})$ per diode; sinusoidal current waveform where a = form factor = $I_{F(RMS)} / I_{F(AV)}$.

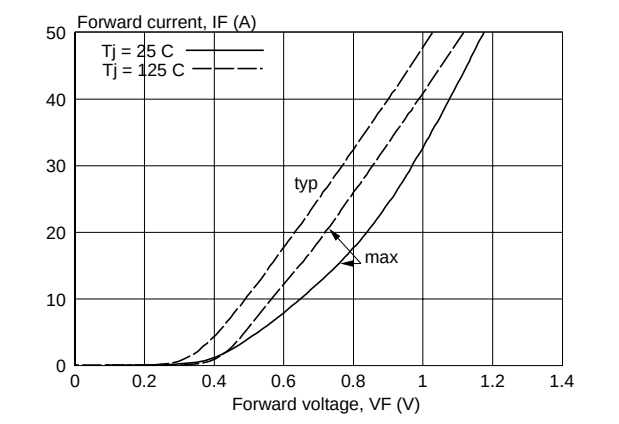


Fig.3. Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j

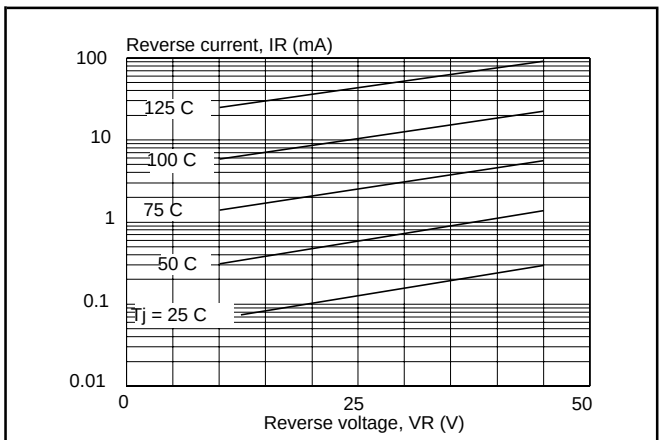


Fig.4. Typical reverse leakage current per diode; $I_R = f(V_R)$; parameter T_j

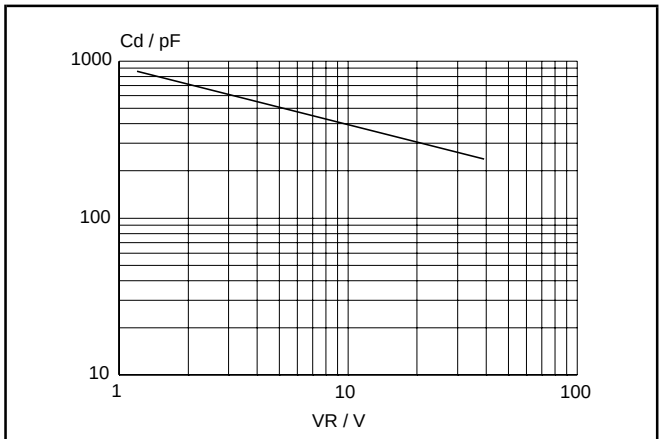


Fig.5. Typical junction capacitance per diode; $C_d = f(V_R)$; f = 1 MHz; T_j = 25˚C to 125 ˚C.

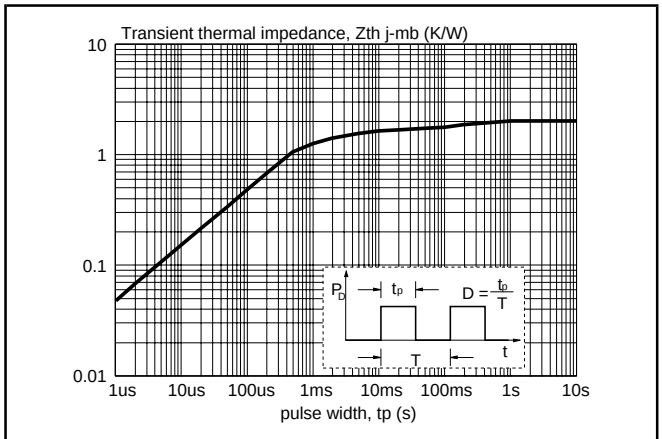


Fig.6. Transient thermal impedance per diode; $Z_{th\ j\text{-}mb} = f(t_p)$.

MECHANICAL DATA

Dimensions in mm

Net Mass: 2 g

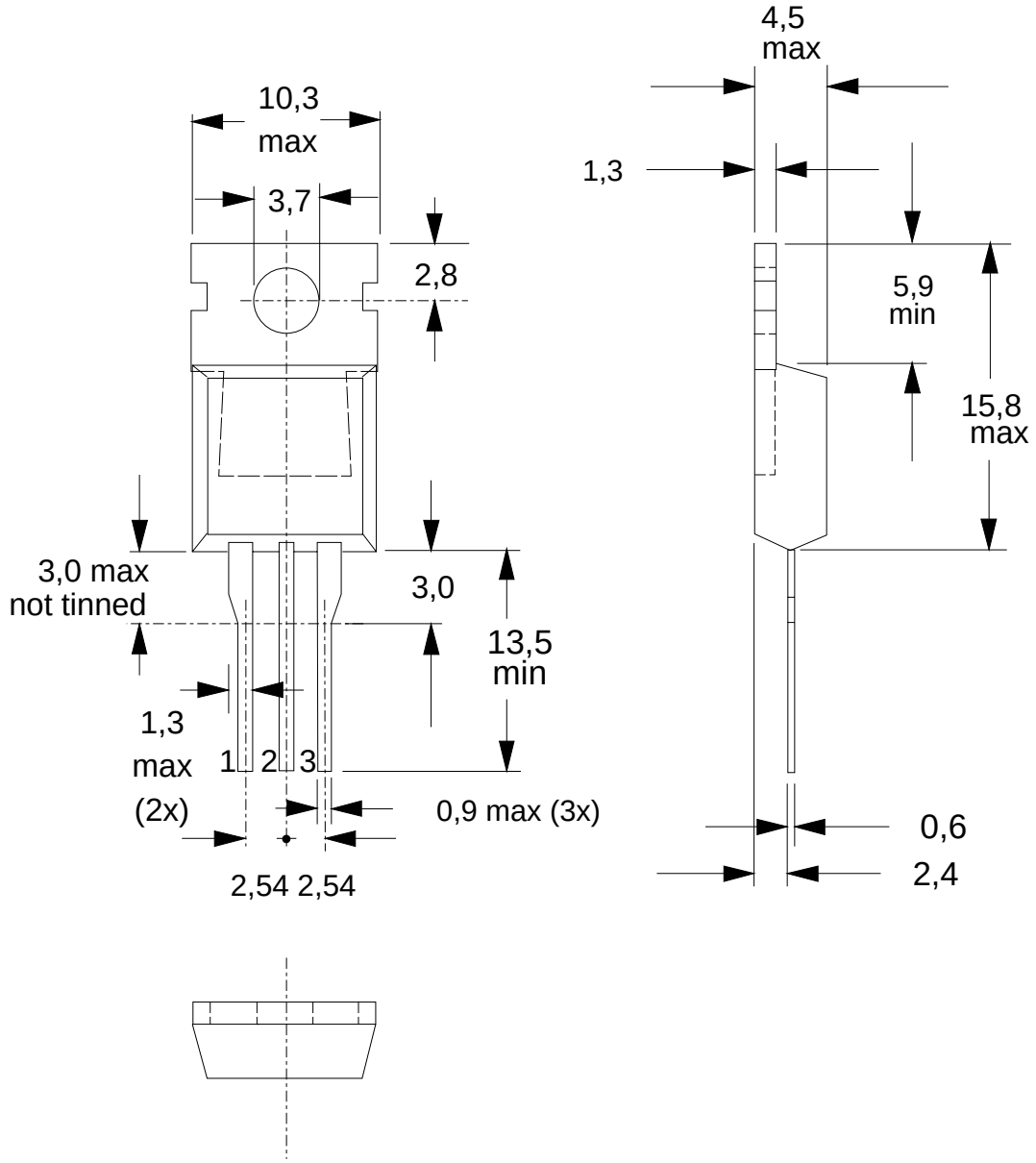


Fig.7. SOT78 (TO220AB); pin 2 connected to mounting base.

Notes
1. Refer to mounting instructions for SOT78 (TO220) envelopes.
2. Epoxy meets UL94 V0 at 1/8".

MECHANICAL DATA

Dimensions in mm

Net Mass: 1.4 g

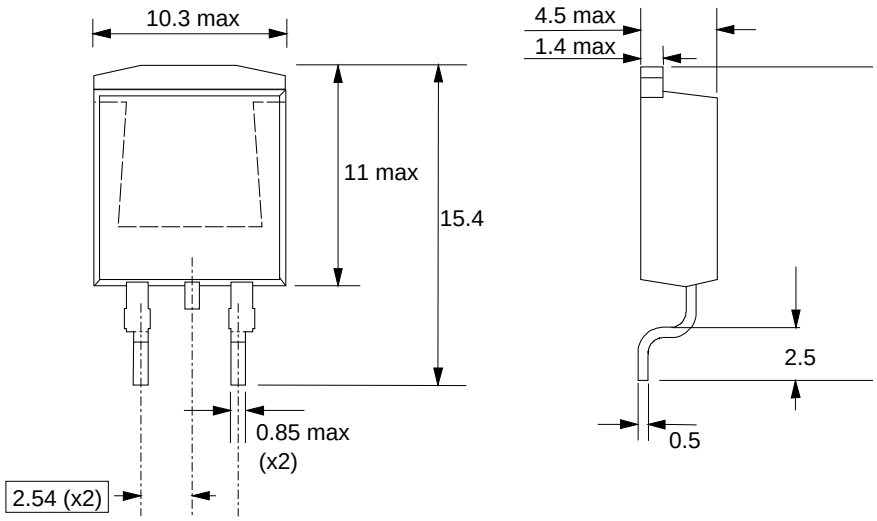


Fig.8. SOT404 : centre pin connected to mounting base.

MOUNTING INSTRUCTIONS

Dimensions in mm

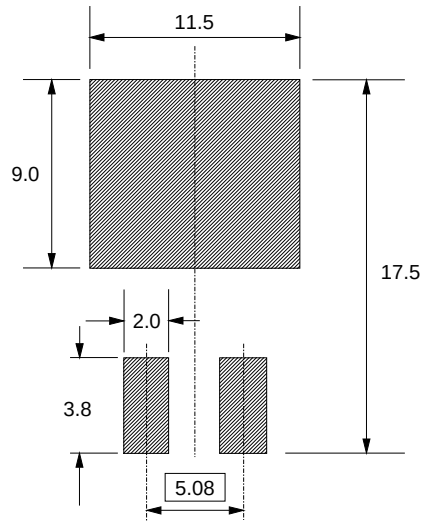


Fig.9. SOT404 : soldering pattern for surface mounting.

Notes

1. Epoxy meets UL94 V0 at 1/8".

DEFINITIONS

Data sheet status	
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.
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.	

LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.