

DATA SHEET

BYC5B-600

Rectifier diode

ultrafast, low switching loss

Product specification

March 2001



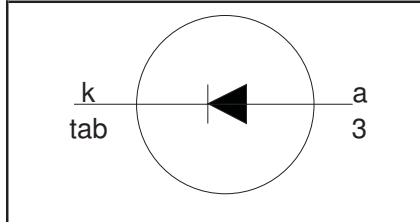
Rectifier diode ultrafast, low switching loss

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FEATURES

- Extremely fast switching
- Low reverse recovery current
- Low thermal resistance
- Reduces switching losses in associated MOSFET

SYMBOL



QUICK REFERENCE DATA

$V_R = 600\text{ V}$
$V_F \leq 1.75\text{ V}$
$I_{F(AV)} = 5\text{ A}$
$t_{rr} = 19\text{ ns (typ)}$

APPLICATIONS

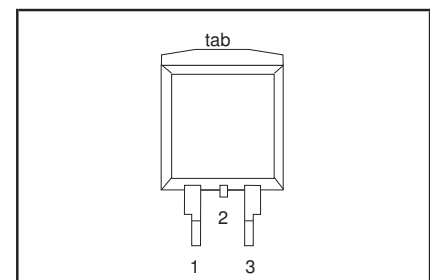
- Active power factor correction
- Half-bridge lighting ballasts
- Half-bridge/ full-bridge switched mode power supplies.

The BYC5B-600 is supplied in the SOT404 surface mounting package.

PINNING

PIN	DESCRIPTION
1	no connection
2	cathode ¹
3	anode
tab	cathode

SOT404



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		-	600	V
V_{RWM}	Crest working reverse voltage		-	600	V
V_R	Continuous reverse voltage	$T_{mb} \leq 110\text{ °C}$	-	500	V
$I_{F(AV)}$	Average forward current	$\delta = 0.5$; with reappplied $V_{RRM(max)}$; $T_{mb} \leq 89\text{ °C}$	-	5	A
I_{FRM}	Repetitive peak forward current	$\delta = 0.5$; with reappplied $V_{RRM(max)}$; $T_{mb} \leq 89\text{ °C}$	-	10	A
I_{FSM}	Non-repetitive peak forward current.	$t = 10\text{ ms}$	-	40	A
		$t = 8.3\text{ ms}$	-	44	A
		sinusoidal; $T_j = 150\text{ °C}$ prior to surge with reappplied $V_{RWM(max)}$			
T_{stg}	Storage temperature		-40	150	°C
T_j	Operating junction temperature		-	150	°C

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j-mb}$	Thermal resistance junction to mounting base		-	-	2.5	K/W
$R_{th\ j-a}$	Thermal resistance junction to ambient	minimum footprint, FR4 board	-	50	-	K/W

¹ it is not possible to make connection to pin 2 of the SOT404 package

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ELECTRICAL CHARACTERISTICS

$T_j = 25\text{ }^\circ\text{C}$ unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	Forward voltage	$I_F = 5\text{ A}; T_j = 150\text{ }^\circ\text{C}$	-	1.4	1.75	V
		$I_F = 10\text{ A}; T_j = 150\text{ }^\circ\text{C}$	-	1.75	2.2	V
I_R	Reverse current	$I_F = 5\text{ A}; V_R = 600\text{ V}$	-	2.0	2.9	V
		$V_R = 500\text{ V}; T_j = 100\text{ }^\circ\text{C}$	-	9	100	μA
			-	0.9	3.0	mA
t_{rr}	Reverse recovery time	$I_F = 1\text{ A}; V_R = 30\text{ V}; dI_F/dt = 50\text{ A}/\mu\text{s}$	-	30	50	ns
t_{rr}	Reverse recovery time	$I_F = 5\text{ A}; V_R = 400\text{ V}; dI_F/dt = 500\text{ A}/\mu\text{s}$	-	19	-	ns
t_{rr}	Reverse recovery time	$I_F = 5\text{ A}; V_R = 400\text{ V}; dI_F/dt = 500\text{ A}/\mu\text{s}; T_j = 100\text{ }^\circ\text{C}$	-	25	30	ns
I_{rrm}	Peak reverse recovery current	$I_F = 5\text{ A}; V_R = 400\text{ V}; dI_F/dt = 50\text{ A}/\mu\text{s}; T_j = 125\text{ }^\circ\text{C}$	-	0.7	3	A
I_{rrm}	Peak reverse recovery current	$I_F = 5\text{ A}; V_R = 400\text{ V}; dI_F/dt = 500\text{ A}/\mu\text{s}; T_j = 125\text{ }^\circ\text{C}$	-	8	11	A
V_{fr}	Forward recovery voltage	$I_F = 10\text{ A}; dI_F/dt = 100\text{ A}/\mu\text{s}$	-	9	11	V

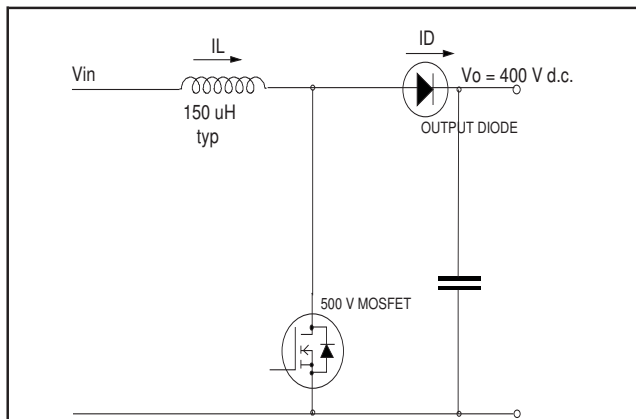


Fig.1. Typical application, output rectifier in boost converter power factor correction circuit. Continuous conduction mode, where the transistor turns on whilst forward current is still flowing in the diode.

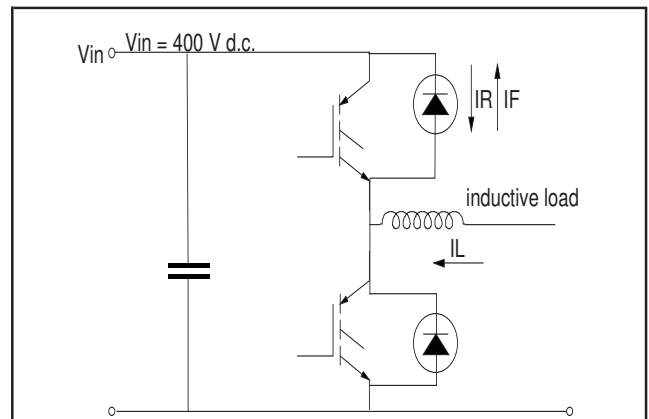
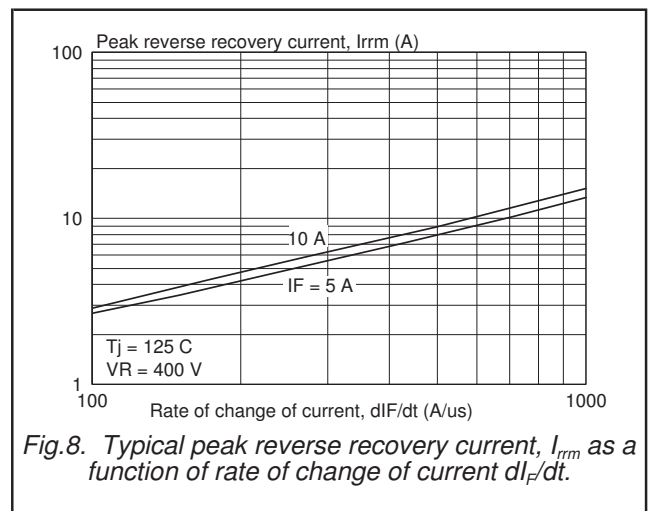
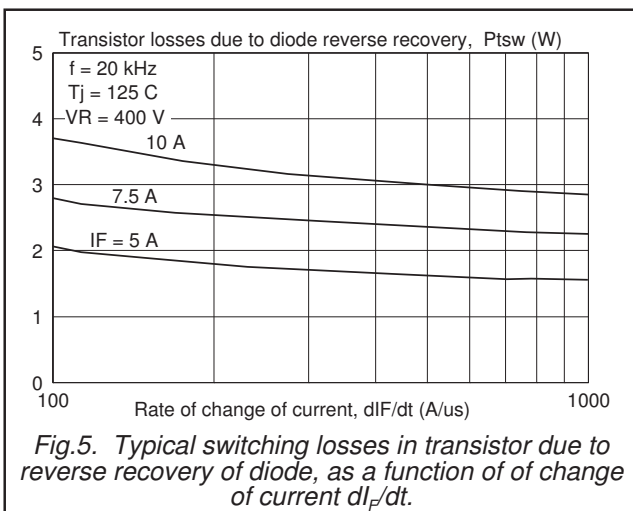
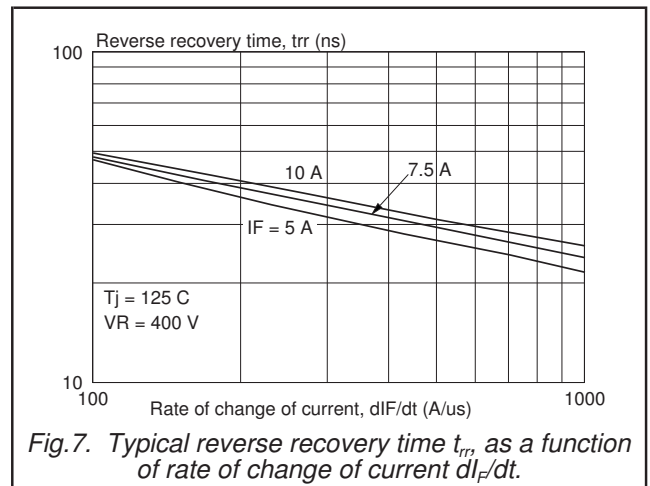
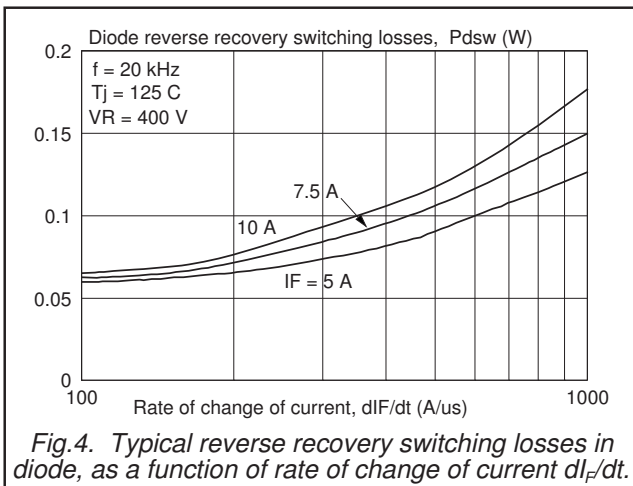
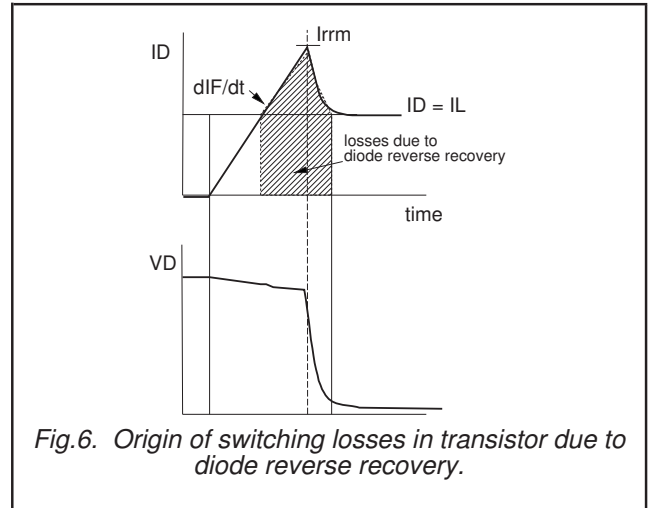
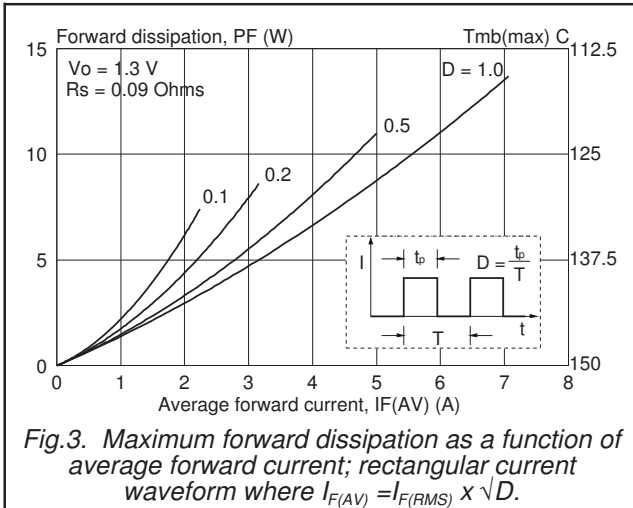


Fig.2. Typical application, freewheeling diode in half bridge converter. Continuous conduction mode, where each transistor turns on whilst forward current is still flowing in the other bridge leg diode.

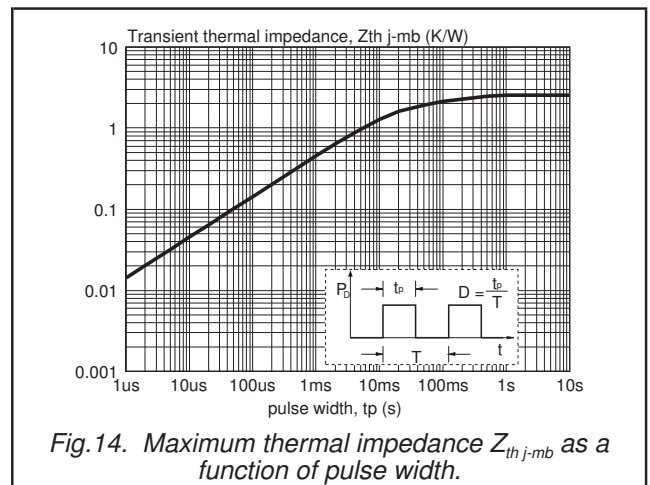
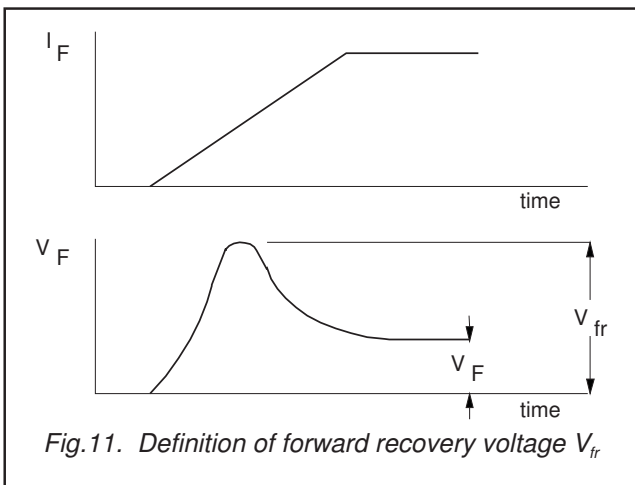
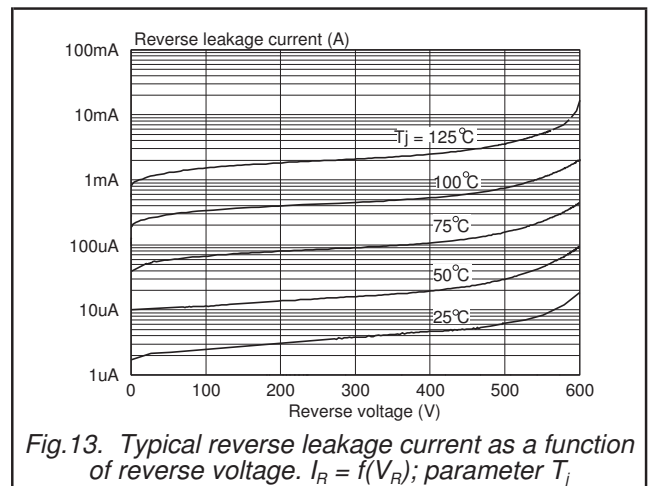
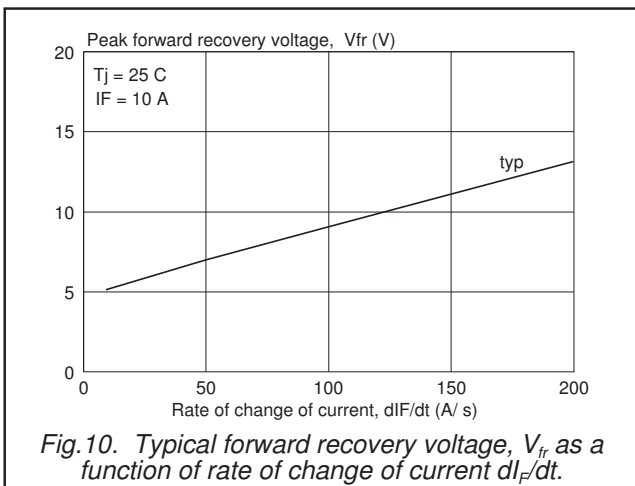
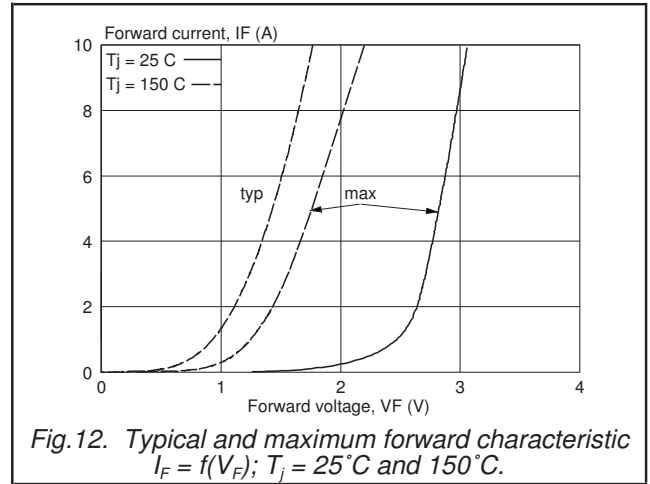
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MECHANICAL DATA

Dimensions in mm

Net Mass: 1.4 g

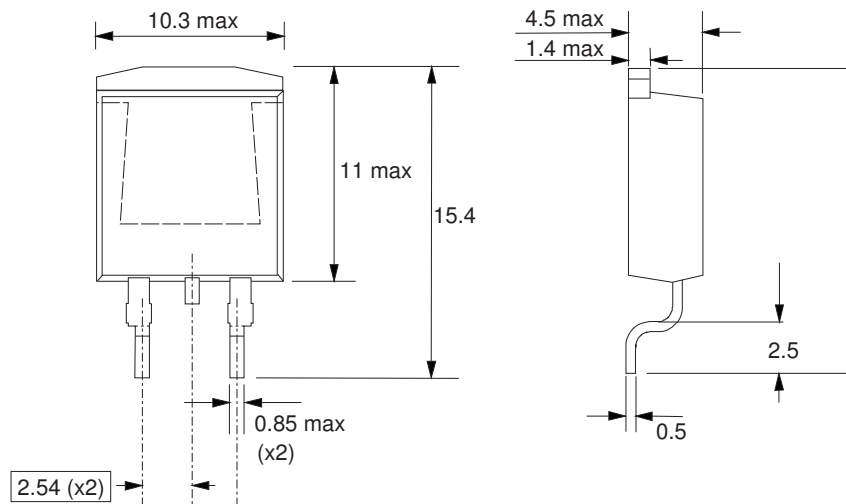


Fig. 15. SOT404 : centre pin connected to mounting base.

MOUNTING INSTRUCTIONS

Dimensions in mm

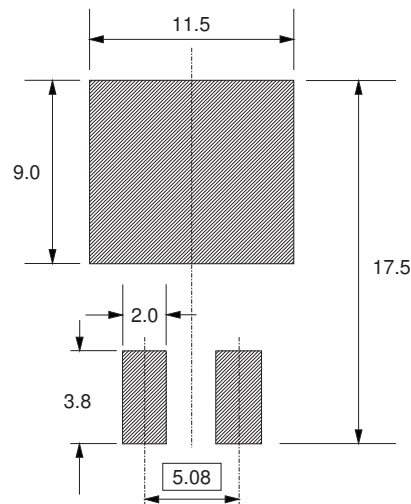


Fig. 16. SOT404 : soldering pattern for surface mounting.

Notes

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

Legal information

DATA SHEET STATUS

DOCUMENT STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	DEFINITION
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Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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