

# DATA SHEET

## **BYC5-600**

Rectifier diode

ultrafast, low switching loss

Product specification

September 2018

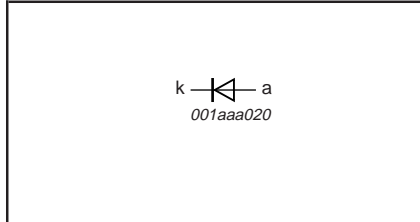
# Rectifier diode ultrafast, low switching loss

**BYC5-600**

## 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

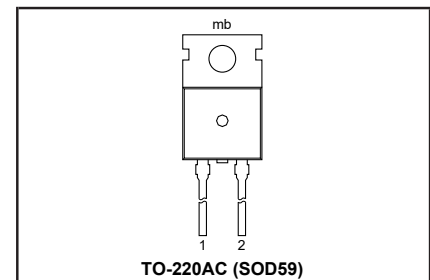
- Active power factor correction
- Half-bridge lighting ballasts
- Half-bridge/ full-bridge switched mode power supplies.

The BYC5-600 is supplied in the SOD59 (TO220AC) conventional leaded package.

## PINNING

PIN	DESCRIPTION
1	cathode
2	anode
tab	cathode

## SOD59 (TO220AC)



## 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 reapplied $V_{RRM(max)}$ ; $T_{mb} \leq 89\text{ °C}$	-	5	A
$I_{FRM}$	Repetitive peak forward current	$\delta = 0.5$ ; with reapplied $V_{RRM(max)}$ ; $T_{mb} \leq 89\text{ °C}$	-	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			
$T_{stg}$	Storage temperature	with reapplied $V_{RWM(max)}$	-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	in free air.	-	60	-	K/W

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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	$\mu\text{A}$
			-	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

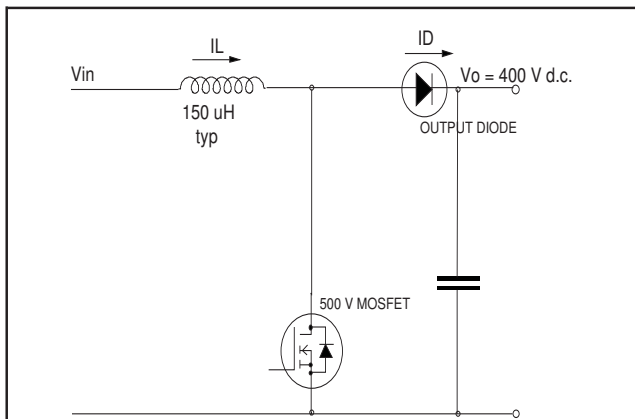


Fig.1. Typical application, output rectifier in boost converter power factor correction circuit. Continuous conduction mode, where the transistor turns on whilst forward current is still flowing in the diode.

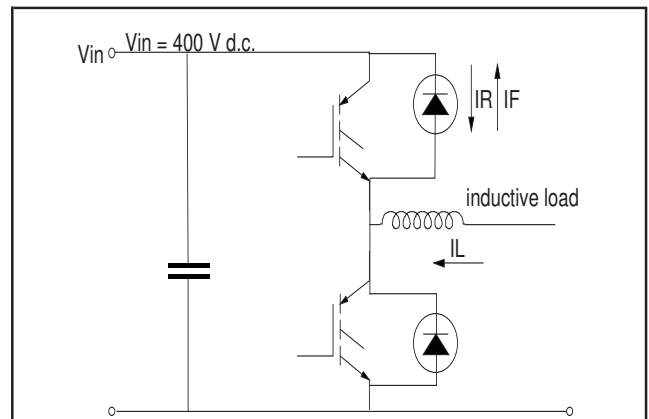
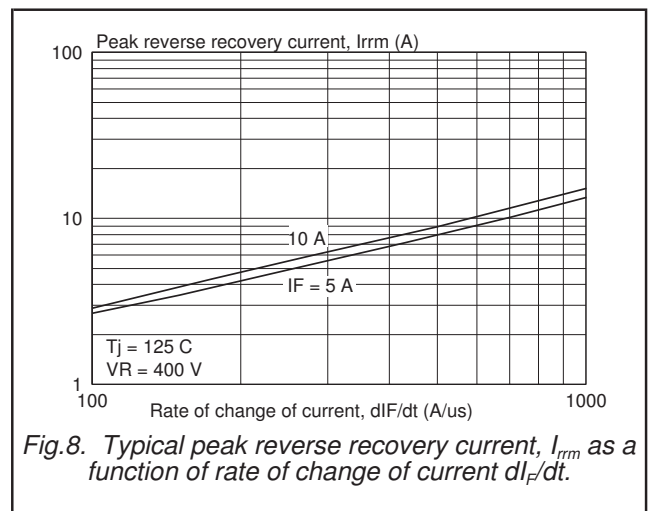
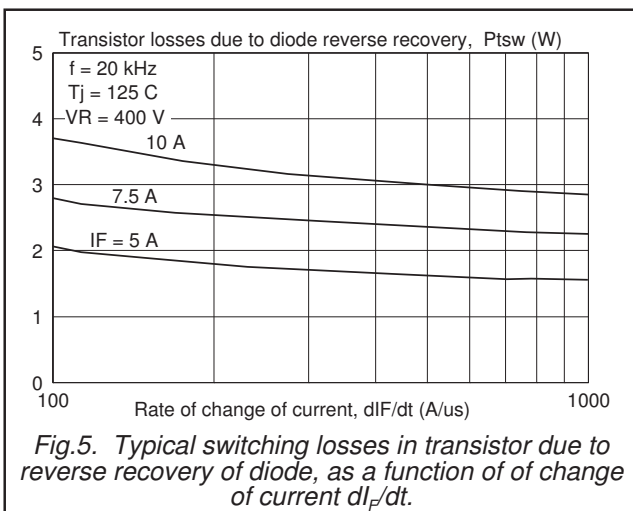
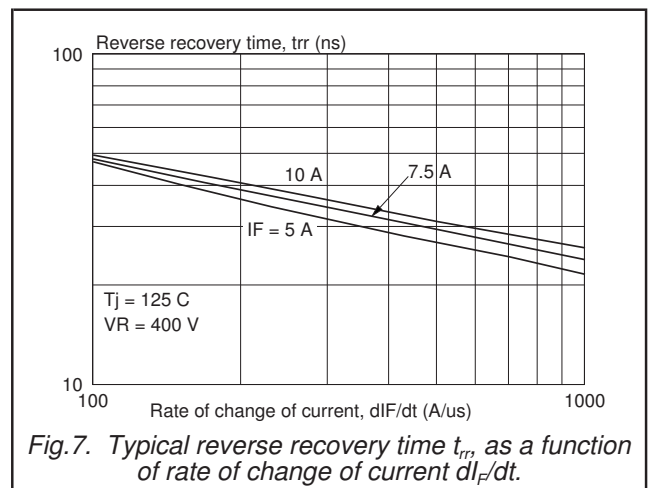
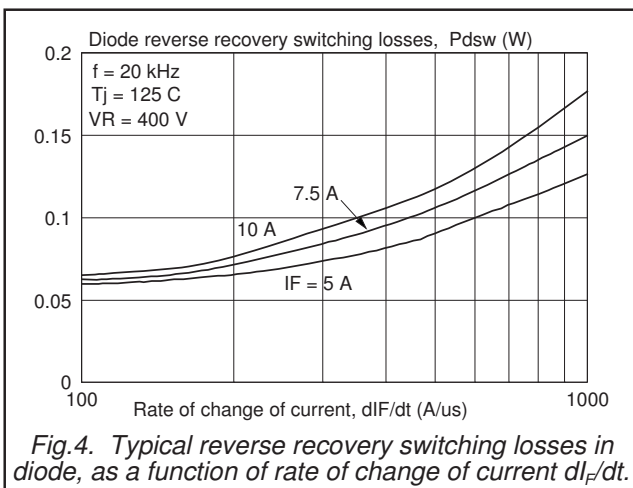
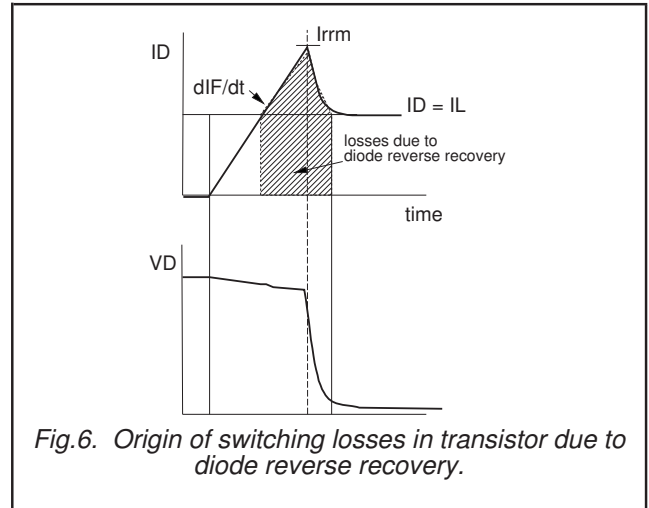
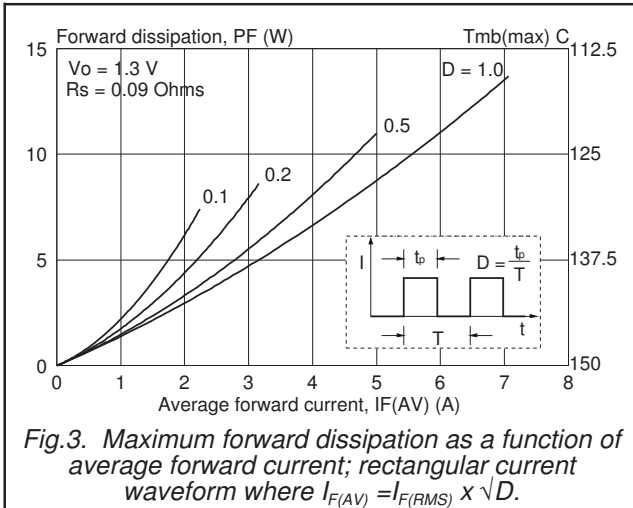


Fig.2. Typical application, freewheeling diode in half bridge converter. Continuous conduction mode, where each transistor turns on whilst forward current is still flowing in the other bridge leg diode.

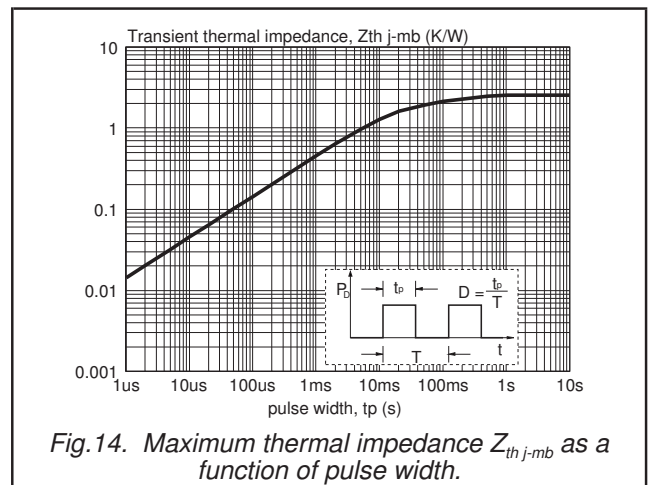
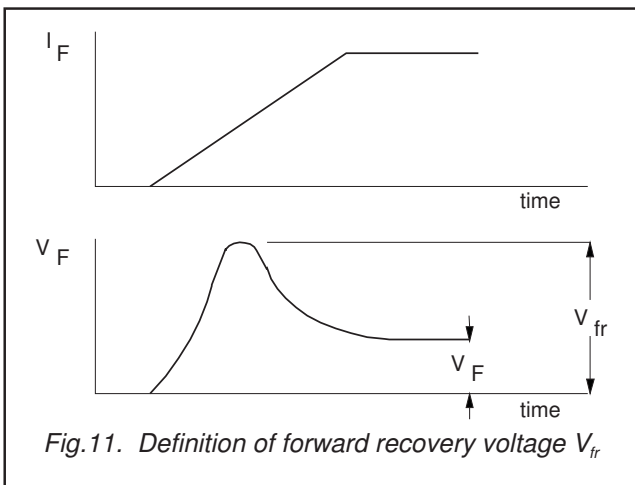
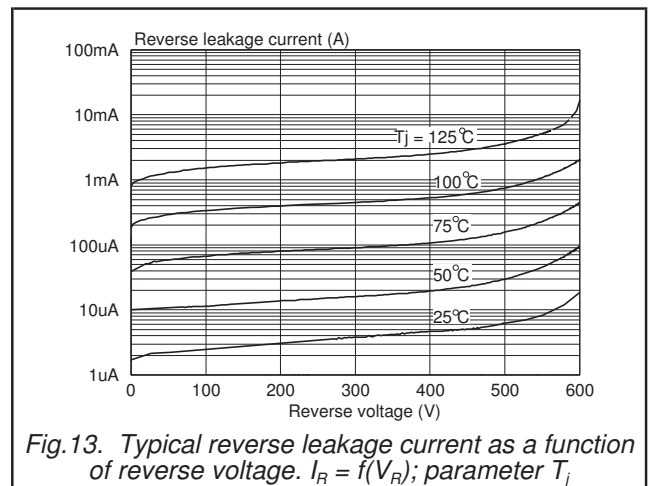
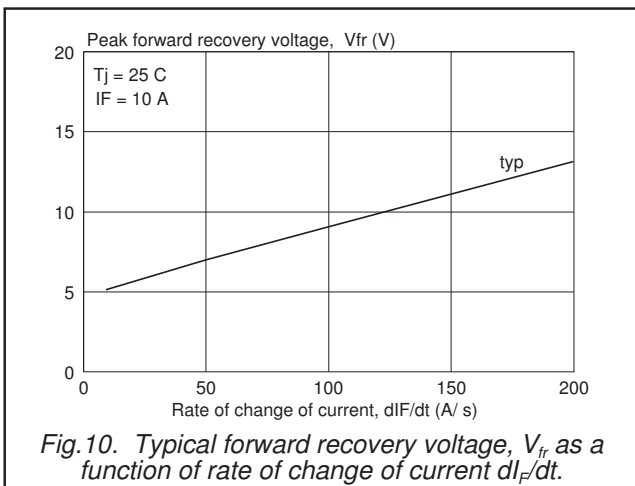
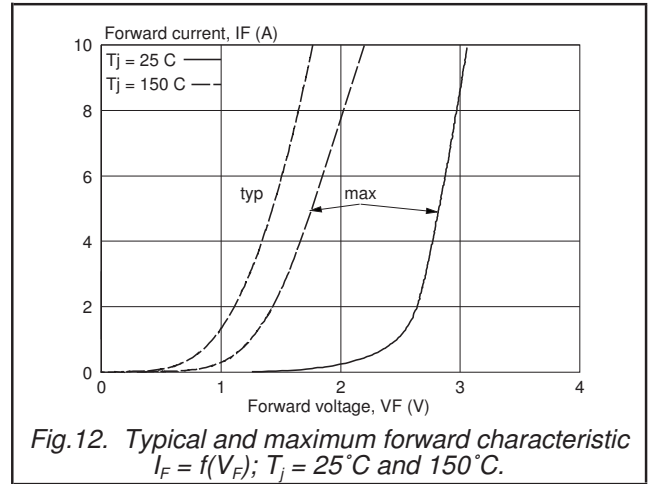
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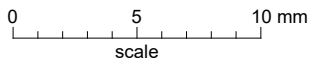
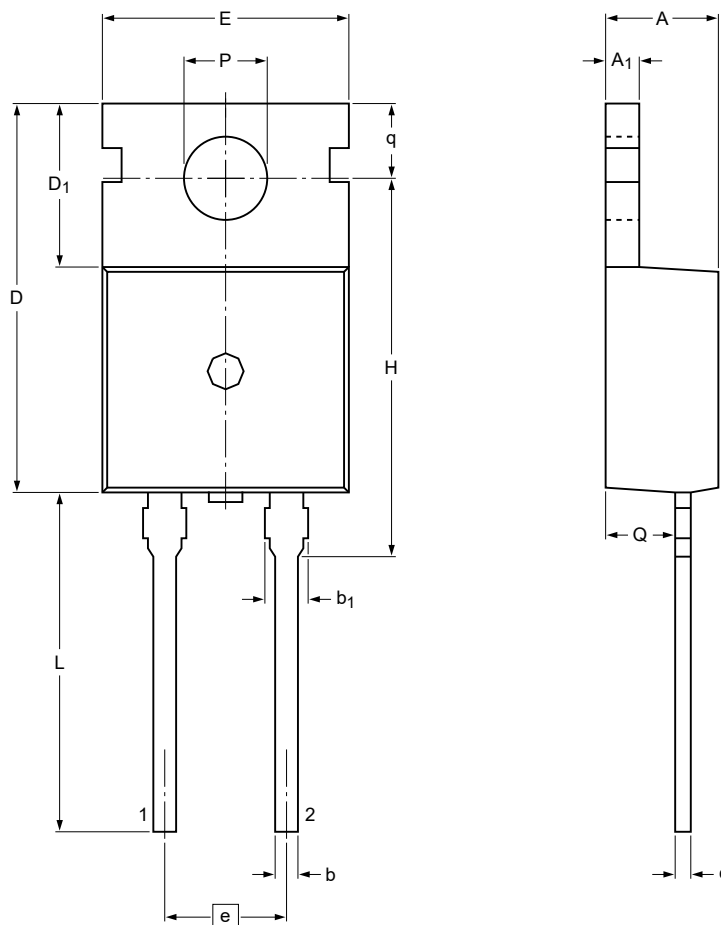
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MECHANICAL DATA

Plastic single-ended package; heatsink mounted; 1 mounting hole; 2-lead TO-220AC

SOD59



Dimensions

Unit	A	A <sub>1</sub>	b	b <sub>1</sub> <sup>(1)</sup>	c	D	D <sub>1</sub>	E	e	H	L	P	Q	q	
max	4.7	1.40	0.95	1.7	0.65	15.8	6.8	10.30	5.08 (REF)	16.25	15.0	3.80	2.6	2.9	
nom															
min	4.3	1.15	0.70	1.3	0.45	15.6	6.4	9.65		15.70	12.5	3.65	2.2	2.7	

Note

1. Protruded dambar are included in the dimension.

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Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOD59	2-lead TO-220AC					09-08-25 12-11-27

## Legal information

### Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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