

BYC8-600P

Hyperfast power diode

24 July 2012

Product data sheet

1. Product profile

1.1 General description

Hyperfast power diode in a SOD59 (2-lead TO-220AC) plastic package.

1.2 Features and benefits

- Fast switching
- Low leakage current
- Low reverse recovery current
- Low thermal resistance
- Reduces switching losses in associated MOSFET

1.3 Applications

- Continuous Current Mode (CCM) Power Factor Correction (PFC)
- Half-bridge/full-bridge switched-mode power supplies

1.4 Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{RRM}	repetitive peak reverse voltage		-	-	600	V
$I_{F(AV)}$	average forward current	SQW; $\delta = 0.5$; $T_{mb} \leq 130\text{ }^{\circ}\text{C}$; Fig. 1 ; Fig. 2 ; Fig. 3	-	-	8	A
Static characteristics						
V_F	forward voltage	$I_F = 8\text{ A}$; $T_J = 125\text{ }^{\circ}\text{C}$; Fig. 6	-	1.5	1.9	V
Dynamic characteristics						
t_{rr}	reverse recovery time	$I_F = 1\text{ A}$; $V_R = 30\text{ V}$; $dI_F/dt = 200\text{ A/s}$; $T_J = 25\text{ }^{\circ}\text{C}$; Fig. 7	-	12	18	ns

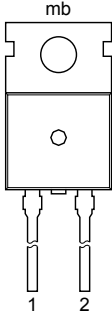
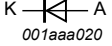


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2. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode	 TO-220AC (SOD59)	
2	A	anode		
mb	mb	mounting base; connected to cathode		

3. Ordering information

Table 3. Ordering information

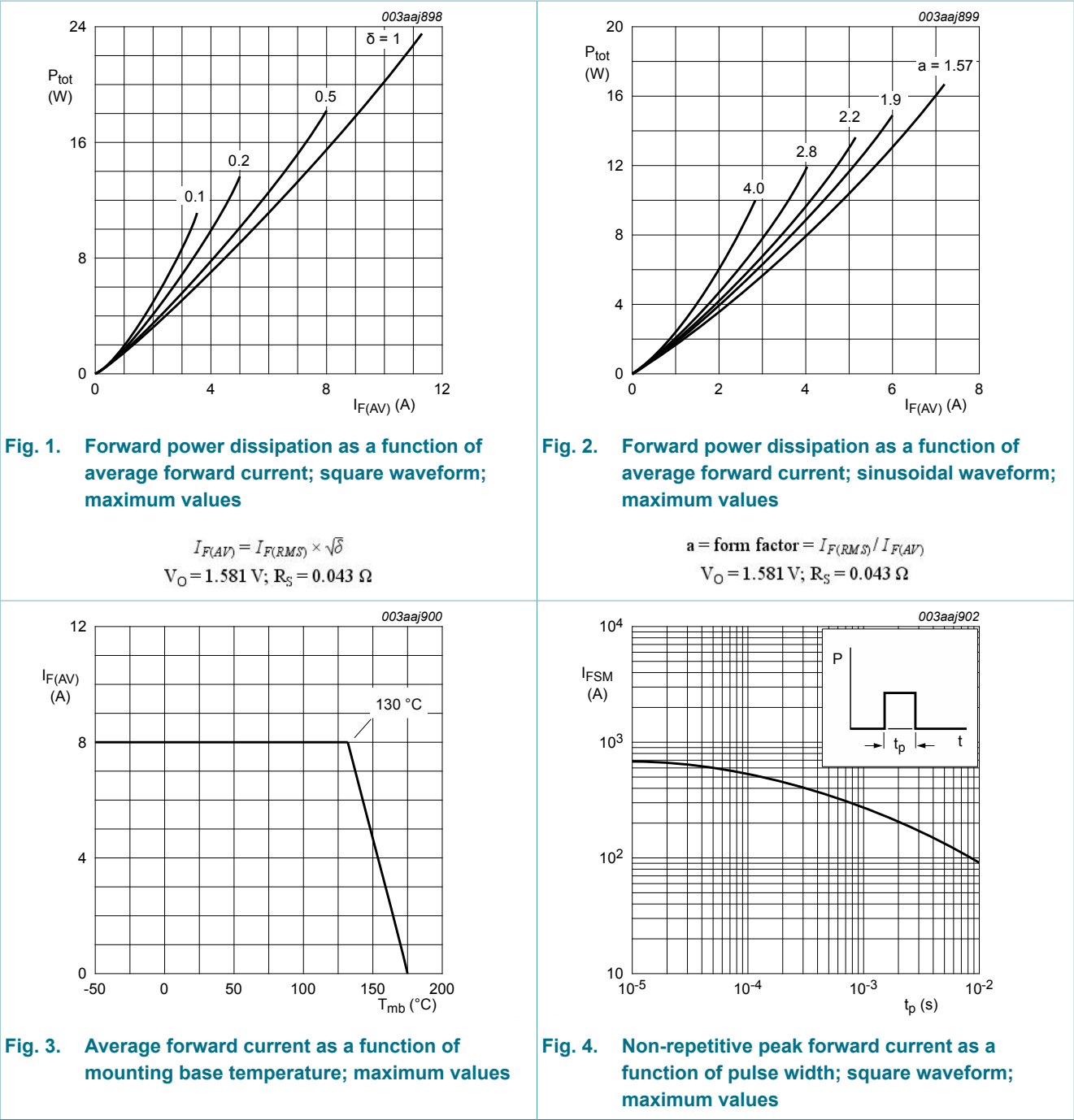
Type number	Package		
	Name	Description	Version
BYC8-600P	TO-220AC	plastic single-ended package; heatsink mounted; 1 mounting hole; 2-lead TO-220AC	SOD59

4. Limiting values

Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage		-	600	V
V_{RWM}	crest working reverse voltage		-	600	V
V_R	reverse voltage	DC	-	600	V
$I_{F(AV)}$	average forward current	SQW; $\delta = 0.5$; $T_{mb} \leq 130\text{ °C}$; Fig. 1 ; Fig. 2 ; Fig. 3	-	8	A
I_{FRM}	repetitive peak forward current	SQW; $\delta = 0.5$; $t_p = 25\text{ }\mu\text{s}$; $T_{mb} \leq 130\text{ °C}$	-	16	A
I_{FSM}	non-repetitive peak forward current	SIN; $t_p = 10\text{ ms}$; $T_{j(init)} = 25\text{ °C}$; Fig. 4	-	91	A
		SIN; $t_p = 8.3\text{ ms}$; $T_{j(init)} = 25\text{ °C}$; Fig. 4	-	100	A
T_{stg}	storage temperature		-65	175	°C
T_j	junction temperature		-	175	°C



5. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	Fig. 5	-	-	2.5	K/W

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air		-	60	-	K/W

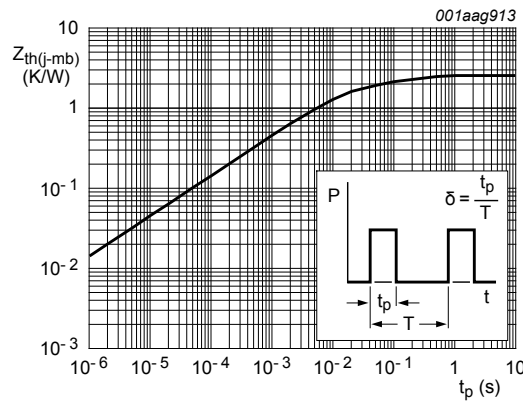


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse width

6. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V_F	forward voltage	$I_F = 8\text{ A}$; $T_j = 25\text{ °C}$; Fig. 6		-	-	3.4	V
		$I_F = 8\text{ A}$; $T_j = 125\text{ °C}$; Fig. 6		-	1.5	1.9	V
I_R	reverse current	$V_R = 600\text{ V}$; $T_j = 25\text{ °C}$		-	-	20	μA
		$V_R = 600\text{ V}$; $T_j = 125\text{ °C}$		-	-	200	μA
Dynamic characteristics							
Q_r	recovered charge	$I_F = 8\text{ A}$; $V_R = 200\text{ V}$; $dI_F/dt = 200\text{ A/s}$; $T_j = 25\text{ °C}$; Fig. 7		-	17	-	nC
		$I_F = 8\text{ A}$; $V_R = 200\text{ V}$; $dI_F/dt = 200\text{ A/s}$; $T_j = 125\text{ °C}$; Fig. 7		-	90	-	nC
t_{rr}	reverse recovery time	$I_F = 1\text{ A}$; $V_R = 30\text{ V}$; $dI_F/dt = 200\text{ A/s}$; $T_j = 25\text{ °C}$; Fig. 7		-	12	18	ns
I_{RM}	peak reverse recovery current	$I_F = 8\text{ A}$; $V_R = 200\text{ V}$; $dI_F/dt = 200\text{ A/s}$; $T_j = 25\text{ °C}$; Fig. 7		-	-	2.2	A
		$I_F = 8\text{ A}$; $V_R = 200\text{ V}$; $dI_F/dt = 200\text{ A/s}$; $T_j = 125\text{ °C}$; Fig. 7		-	-	6	A

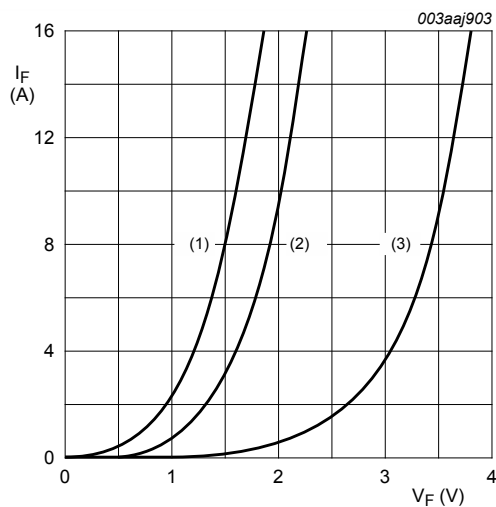


Fig. 6. Forward current as a function of forward voltage

- (1) $T_j = 125\text{ °C}$; typical values;
 - (2) $T_j = 125\text{ °C}$; maximum values;
 - (3) $T_j = 25\text{ °C}$; maximum values;
- $V_O = 1.581\text{ V}$; $R_S = 0.043\text{ }\Omega$

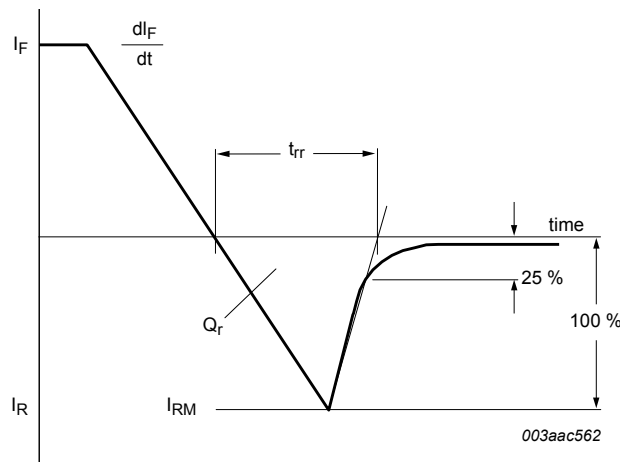


Fig. 7. Reverse recovery definitions; ramp recovery

7. Package outline

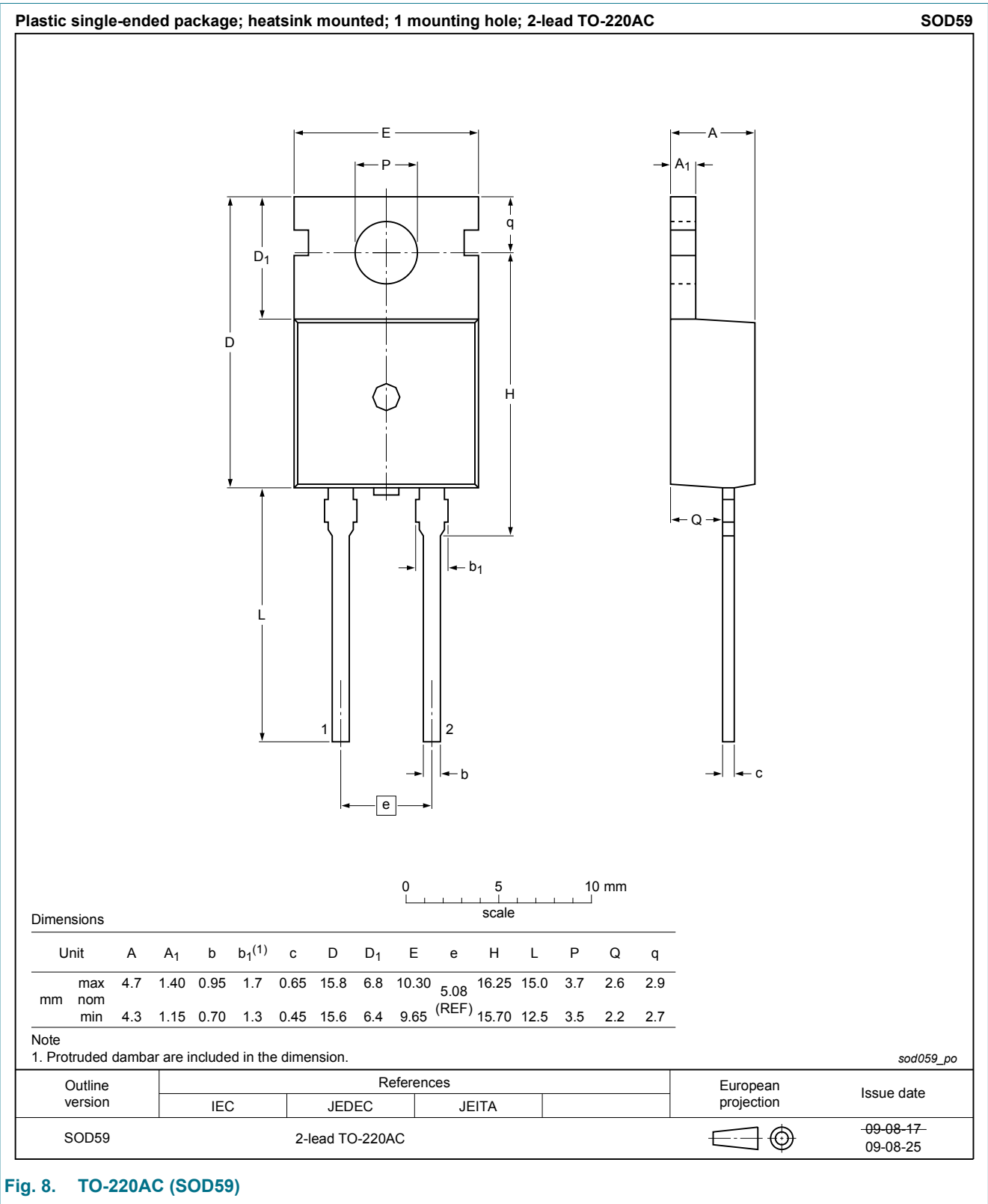


Fig. 8. TO-220AC (SOD59)

8. Legal information

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