Product data sheet

1. General description

Hyperfast power diode in a SOT404 (D2PAK) surface-mountable plastic package.

2. Features and benefits

- Fast switching
- Surface-mountable package
- · Low leakage current
- · Low reverse recovery current
- · Low thermal resistance
- Reduces switching losses in associated MOSFET

3. Applications

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

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	I	Viin	Тур	Max	Unit
V _R	reverse voltage	DC	-		-	600	V
I _{F(AV)}	average forward current	δ = 0.5 ; T _{mb} ≤ 130 °C; square-wave pulse; Fig. 1; Fig. 2; Fig. 3	-		-	8	Α
I _{FRM}	repetitive peak forward current	δ = 0.5 ; t_p = 25 µs; $T_{mb} \le 130$ °C; square-wave pulse	-		-	16	Α
I _{FSM}	non-repetitive peak forward current	t_p = 10 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; Fig. 4	-		-	91	A
		t_p = 8.3 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; Fig. 4	-		-	100	Α
Static chara	acteristics						
V _F	forward voltage	I _F = 8 A; T _j = 25 °C; <u>Fig. 6</u>	-		-	3.4	V
		I _F = 8 A; T _j = 125 °C; <u>Fig. 6</u>	-	•	1.5	1.9	V
		I _F = 8 A; T _j = 150 °C; <u>Fig. 6</u>	-		1.4	-	V
Dynamic ch	aracteristics						
t _{rr}	reverse recovery time	$I_F = 1 \text{ A}$; $V_R = 30 \text{ V}$; $dI_F/dt = 200 \text{ A/}\mu\text{s}$; $T_j = 25 \text{ °C}$; $\frac{\text{Fig. 7}}{}$	-		12	18	ns
		$I_F = 8 \text{ A}; V_R = 400 \text{ V}; dI_F/dt = 500 \text{ A/}\mu\text{s};$ $T_i = 25 \text{ °C}; Fig. 7$	-	ı	19	-	ns

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BYC8B-600P

Hyperfast power diode

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	n.c.	no connection	mb	K — A
2	K	cathode[1]		001aaa020
3	Α	anode		
mb	К	mounting base; connected to cathode	D2PAK (SOT404)	

^[1] It is not possible to connect to pin 2 of the SOT404 package.

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BYC8B-600P	D2PAK	plastic single-ended surface-mounted package (D2PAK); 3 leads (one lead cropped)	SOT404

7. Marking

Table 4. Marking codes

Type number	Marking code
BYC8B-600P	BYC8B-600P

Hyperfast power diode

8. Limiting values

Table 5. 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	δ = 0.5 ; T _{mb} ≤ 130 °C; square-wave pulse; Fig. 1; Fig. 2; Fig. 3	-	8	Α
I _{FRM}	repetitive peak forward current	δ = 0.5 ; t_p = 25 µs; $T_{mb} \le 130$ °C; square-wave pulse	-	16	Α
I _{FSM}	non-repetitive peak forward current	t_p = 10 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; Fig. 4	-	91	Α
		t_p = 8.3 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; Fig. 4	-	100	A
T _{stg}	storage temperature		-65	175	°C
Tj	junction temperature		-	175	°C

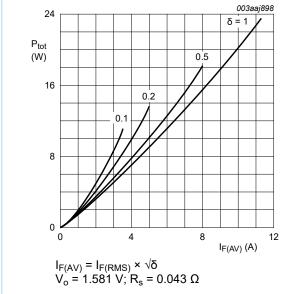


Fig. 1. Forward power dissipation as a function of average forward current; square waveform; maximum values

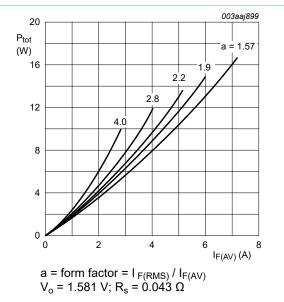


Fig. 2. Forward power dissipation as a function of average forward current; sinusoidal waveform; maximum values

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Hyperfast power diode

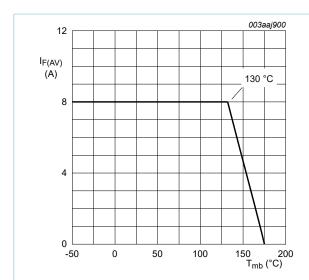


Fig. 3. Average forward current as a function of mounting base temperature; maximum values

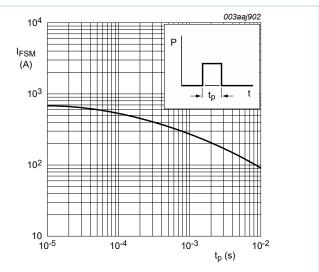


Fig. 4. Non-repetitive peak forward current as a function of pulse width; square waveform; maximum values

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Hyperfast power diode

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
R _{th(j-mb)}	thermal resistance from junction to mounting base	Fig. 5	-	-	2.5	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air	-	60	-	K/W

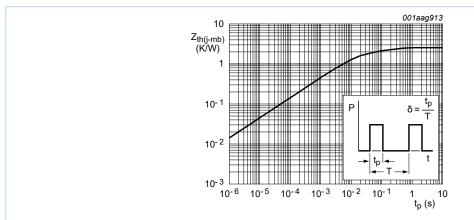


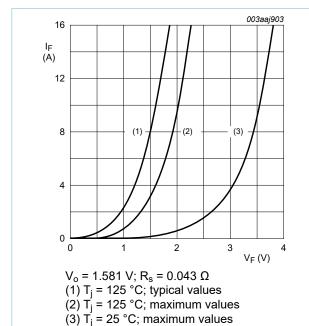
Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse width

Hyperfast power diode

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
Static chara	acteristics					
V _F	forward voltage	I _F = 8 A; T _j = 25 °C; <u>Fig. 6</u>	-	-	3.4	V
		I _F = 8 A; T _j = 125 °C; <u>Fig. 6</u>	-	1.5	1.9	V
		I _F = 8 A; T _j = 150 °C; <u>Fig. 6</u>	-	1.4	-	V
I _R	reverse current	V _R = 600 V; T _j = 25 °C	-	-	20	μA
		V _R = 600 V; T _j = 125 °C	-	-	200	μΑ
Dynamic ch	naracteristics					
t _{rr}	reverse recovery time	$I_F = 1 \text{ A; } V_R = 30 \text{ V; } dI_F/dt = 200 \text{ A/}\mu\text{s;}$ $T_j = 25 \text{ °C; } \frac{\text{Fig. 7}}{}$	-	12	18	ns
		$I_F = 8 \text{ A}; V_R = 400 \text{ V}; dI_F/dt = 500 \text{ A/}\mu\text{s};$ $T_j = 25 \text{ °C}; Fig. 7$	-	19	-	ns
I _{RM}	peak reverse recovery current	$I_F = 8 \text{ A}; V_R = 200 \text{ V}; dI_F/dt = 200 \text{ A/}\mu\text{s};$ $T_j = 25 \text{ °C}; Fig. 7$	-	-	2.2	Α
		$I_F = 8 \text{ A}; V_R = 200 \text{ V}; dI_F/dt = 200 \text{ A/}\mu\text{s};$ $T_j = 125 ^{\circ}\text{C}; Fig. 7$	-	-	6	А
Q _r	recovered charge	$I_F = 8 \text{ A}; V_R = 200 \text{ V}; dI_F/dt = 200 \text{ A/}\mu\text{s};$ $T_j = 25 \text{ °C}; Fig. 7$	-	17	-	nC
		$I_F = 8 \text{ A}; V_R = 200 \text{ V}; dI_F/dt = 200 \text{ A/}\mu\text{s};$ $T_i = 125 ^{\circ}\text{C}; Fig. 7$	-	90	-	nC





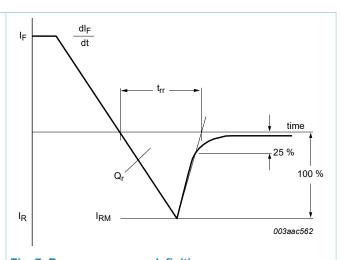
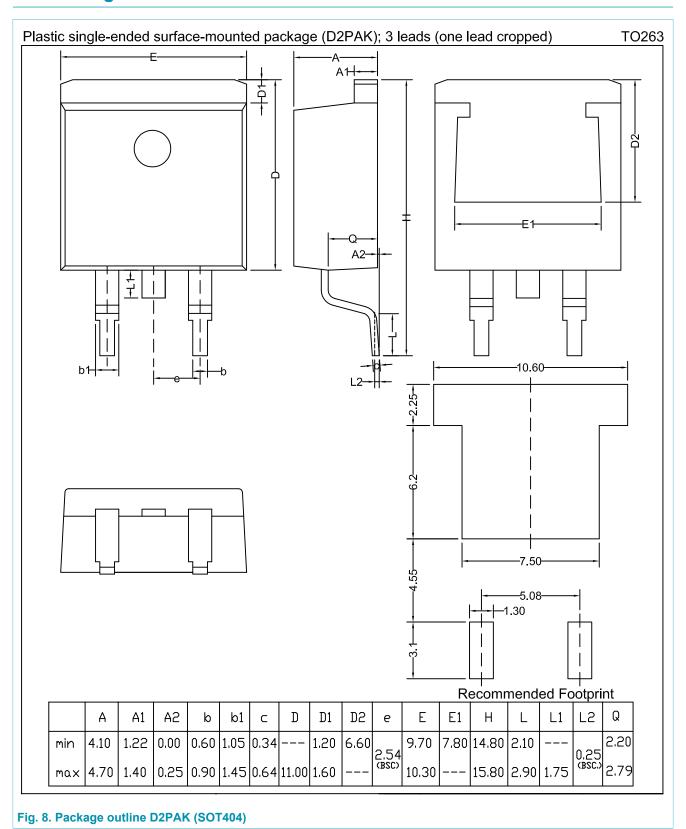


Fig. 7. Reverse recovery definitions; ramp recovery

Hyperfast power diode

11. Package outline



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Hyperfast power diode

12. 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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Product [short] data sheet	Production	This document contains the product specification.

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BYC8B-600P

Hyperfast power diode

13. Contents

1. General description	1
2. Features and benefits	1
3. Applications	1
4. Quick reference data	1
5. Pinning information	2
6. Ordering information	2
7. Marking	2
8. Limiting values	3
9. Thermal characteristics	5
10. Characteristics	6
11. Package outline	7
12. Legal information	8

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Date of release: 13 August 2018

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