

## 1. General description

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

## 2. Features and benefits

- High thermal cycling performance
- Low on-state losses
- Low thermal resistance
- Soft recovery characteristic
- Surface-mountable package

## 3. Applications

- Dual Mode (DCM and CCM) PFC
- Power Factor Correction (PFC) for Interleaved Topology

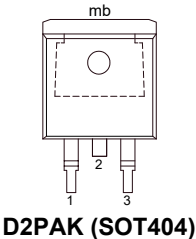
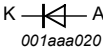
## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V <sub>R</sub>	reverse voltage	DC		-	-	600	V
I <sub>F(AV)</sub>	average forward current	δ = 0.5 ; T <sub>mb</sub> ≤ 115 °C; SQW; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a>		-	-	9	A
I <sub>FRM</sub>	repetitive peak forward current	δ = 0.5 ; t <sub>p</sub> = 25 μs; T <sub>mb</sub> ≤ 115 °C; SQW		-	-	18	A
I <sub>FSM</sub>	non-repetitive peak forward current	t <sub>p</sub> = 10 ms; T <sub>j(init)</sub> = 25 °C; SIN; <a href="#">Fig. 3</a>		-	-	91	A
		t <sub>p</sub> = 8.3 ms; T <sub>j(init)</sub> = 25 °C; SIN; <a href="#">Fig. 3</a>		-	-	100	A
Static characteristics							
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 8 A; T <sub>J</sub> = 25 °C; <a href="#">Fig. 5</a>		-	1.45	1.9	V
		I <sub>F</sub> = 8 A; T <sub>J</sub> = 150 °C; <a href="#">Fig. 5</a>		-	1.25	1.7	V
Dynamic characteristics							
t <sub>rr</sub>	reverse recovery time	I <sub>F</sub> = 1 A; V <sub>R</sub> = 30 V; dI <sub>F</sub> /dt = 100 A/μs; T <sub>J</sub> = 25 °C; <a href="#">Fig. 6</a>		-	17.5	35	ns

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	n.c.	no connection		
2	K	cathode <sup>[1]</sup>		
3	A	anode		
mb	K	mounting base; cathode		

[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
BYV29FB-600	D2PAK	plastic single-ended surface-mounted package (D2PAK); 3 leads (one lead cropped)	SOT404

7. Limiting values

Table 4. Limiting values  
In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>RRM</sub>	repetitive peak reverse voltage		-	600	V
V <sub>RWM</sub>	crest working reverse voltage		-	600	V
V <sub>R</sub>	reverse voltage	DC	-	600	V
I <sub>F(AV)</sub>	average forward current	δ = 0.5 ; T <sub>mb</sub> ≤ 115 °C; SQW; Fig. 1; Fig. 2	-	9	A
I <sub>FRM</sub>	repetitive peak forward current	δ = 0.5 ; t <sub>p</sub> = 25 μs; T <sub>mb</sub> ≤ 115 °C; SQW	-	18	A
I <sub>FSM</sub>	non-repetitive peak forward current	t <sub>p</sub> = 10 ms; T <sub>j(init)</sub> = 25 °C; SIN; Fig. 3	-	91	A
		t <sub>p</sub> = 8.3 ms; T <sub>j(init)</sub> = 25 °C; SIN; Fig. 3	-	100	A
T <sub>stg</sub>	storage temperature		-40	150	°C
T <sub>j</sub>	junction temperature		-	150	°C

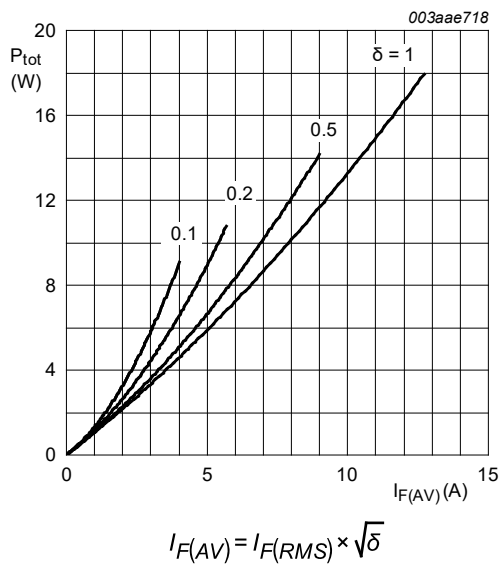


Fig. 1. Forward power dissipation as a function of average forward current; square waveform; maximum values

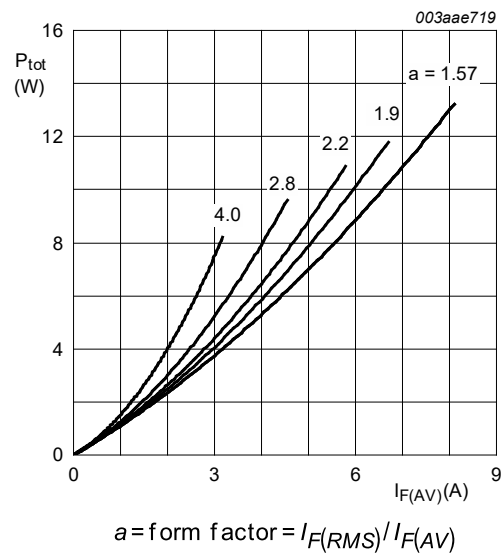
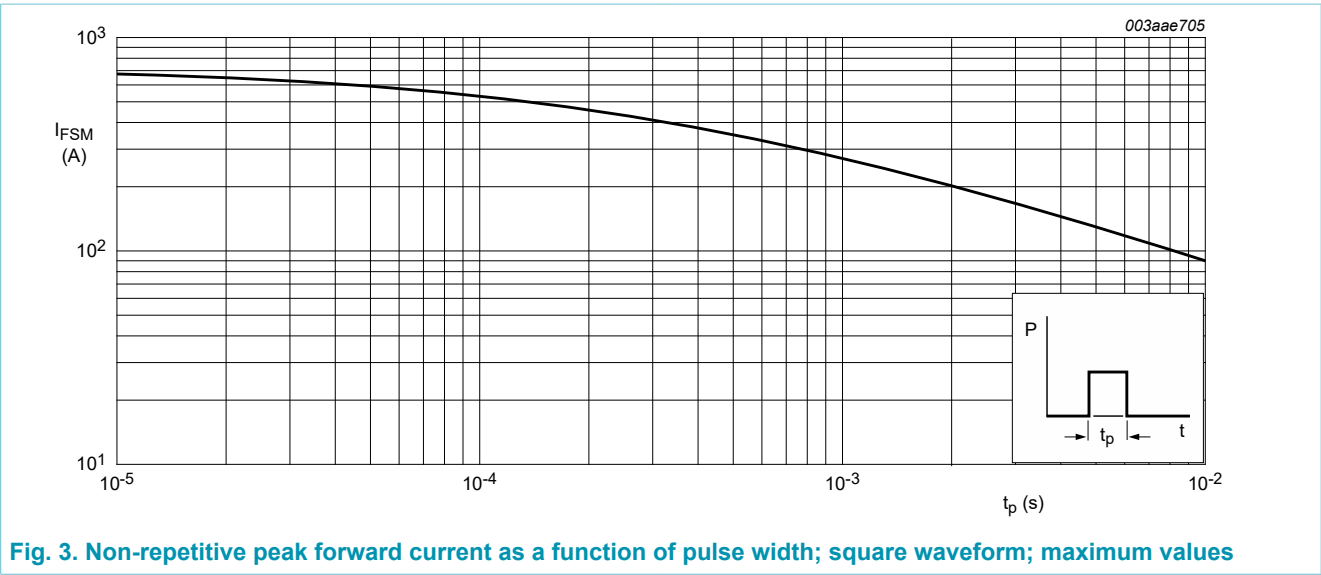


Fig. 2. Forward power dissipation as a function of average forward current; sinusoidal waveform; maximum values

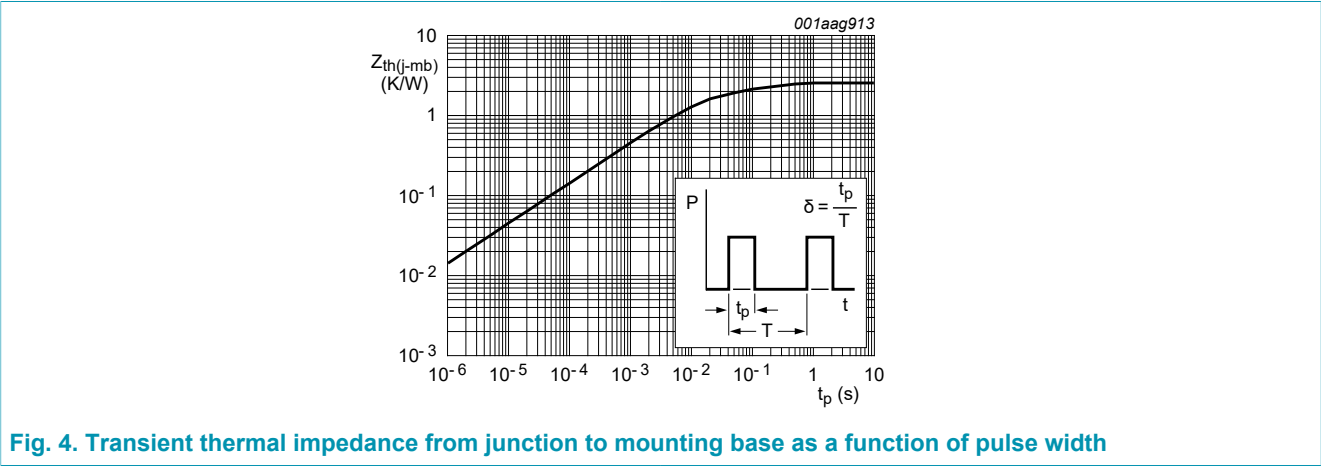


8. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	<a href="#">Fig. 4</a>		-	-	2.5	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air	<a href="#">[1]</a>	-	50	-	K/W

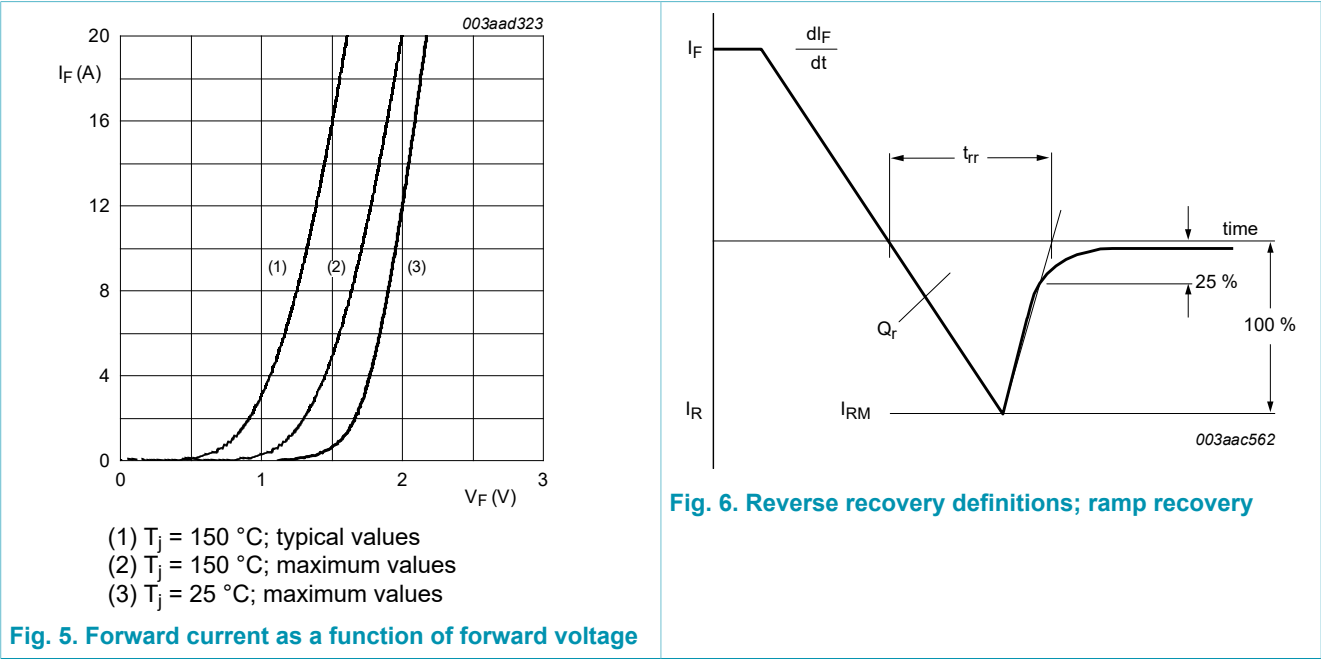
[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.



9. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 8 A; T <sub>j</sub> = 25 °C; <a href="#">Fig. 5</a>		-	1.45	1.9	V
		I <sub>F</sub> = 8 A; T <sub>j</sub> = 150 °C; <a href="#">Fig. 5</a>		-	1.25	1.7	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 600 V; T <sub>j</sub> = 100 °C		-	-	1.5	mA
		V <sub>R</sub> = 600 V; T <sub>j</sub> = 25 °C		-	-	50	μA
Dynamic characteristics							
t <sub>rr</sub>	reverse recovery time	I <sub>F</sub> = 1 A; V <sub>R</sub> = 30 V; dI <sub>F</sub> /dt = 100 A/μs; T <sub>j</sub> = 25 °C; <a href="#">Fig. 6</a>		-	17.5	35	ns
I <sub>RM</sub>	peak reverse recovery current	I <sub>F</sub> = 1 A; V <sub>R</sub> = 30 V; dI <sub>F</sub> /dt = 100 A/μs		-	1.5	-	A
Q <sub>r</sub>	recovered charge			-	13	-	nC
V <sub>FR</sub>	forward recovery voltage	I <sub>F</sub> = 1 A; dI <sub>F</sub> /dt = 100 A/μs; <a href="#">Fig. 7</a>		-	3.2	-	V



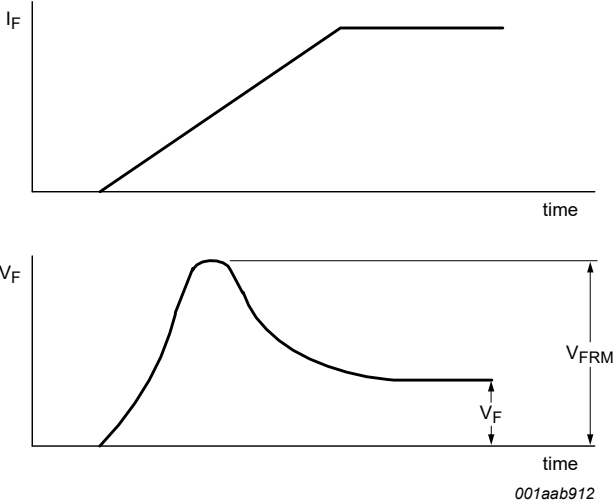


Fig. 7. Forward recovery definitions

10. Package outline

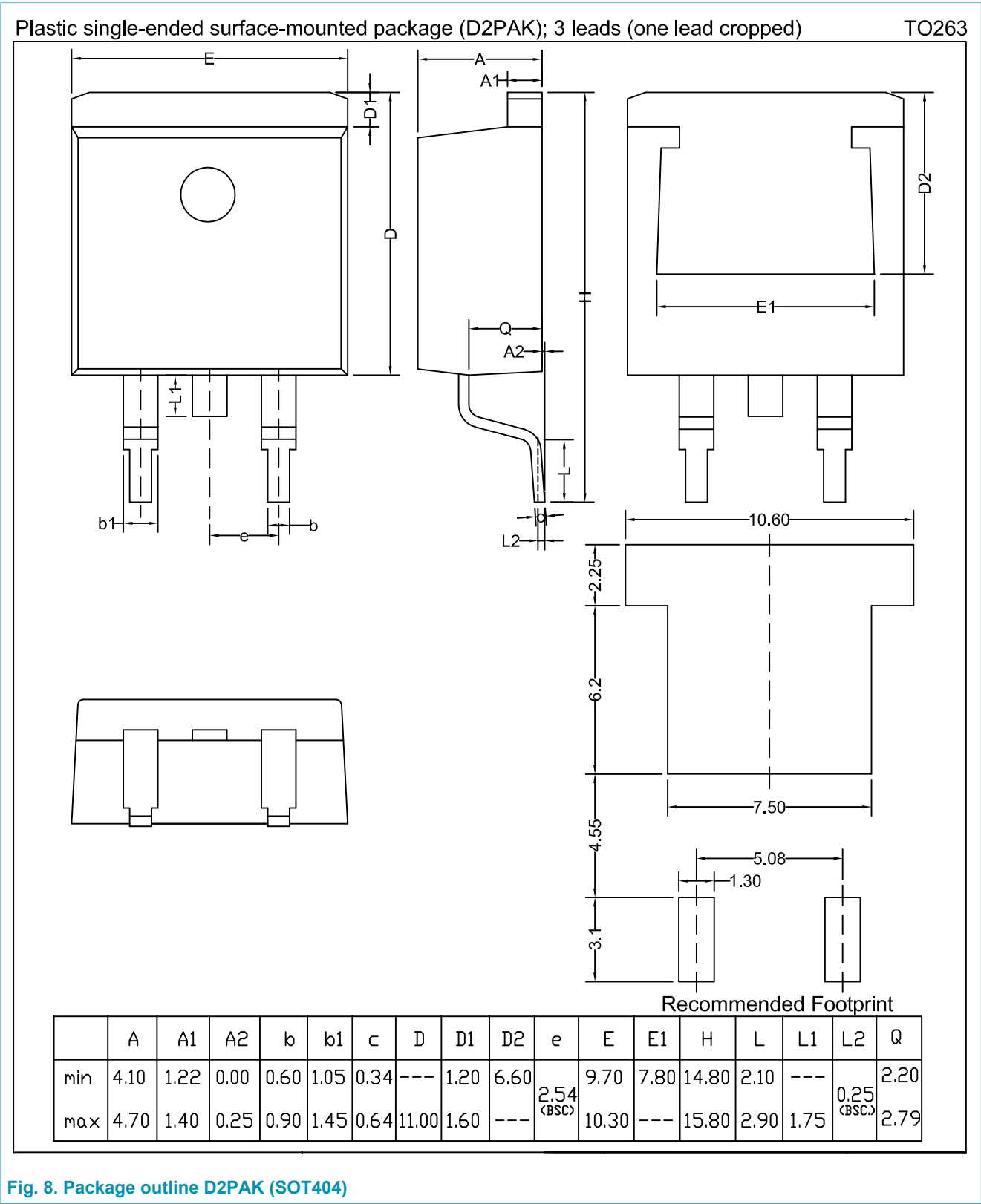


Fig. 8. Package outline D2PAK (SOT404)



## 11. 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.
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