

1. General description

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

2. Features and benefits

- High reverse voltage surge capability
- High thermal cycling performance
- Low thermal resistance
- Soft recovery characteristic minimizes power consuming oscillations
- Surface-mountable package
- Very low on-state loss

3. Applications

- Output rectifiers in high-frequency switched-mode power supplies

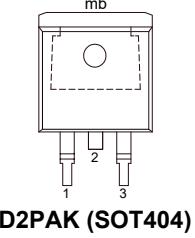
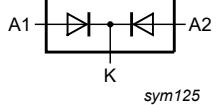
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{RRM}	repetitive peak reverse voltage			-	-	200	V
$I_{O(AV)}$	average output current	$\delta = 0.5$; $T_{mb} \leq 115$ °C; SQW; both diodes conducting; Fig. 1 ; Fig. 2		-	-	20	A
I_{RRM}	repetitive peak reverse current	$\delta = 0.001$; $t_p = 2$ μ s		-	-	0.2	A
V_{ESD}	electrostatic discharge voltage	HBM; C = 250 pF; R = 1.5 k Ω ; all pins		-	-	8	kV
Static characteristics							
V_F	forward voltage	$I_F = 8$ A; $T_j = 150$ °C; Fig. 4		-	0.72	0.85	V
		$I_F = 20$ A; $T_j = 25$ °C		-	1	1.15	V
Dynamic characteristics							
t_{rr}	reverse recovery time	$I_F = 1$ A; $V_R = 30$ V; $dI_F/dt = 100$ A/ μ s; $T_j = 25$ °C; ramp recovery; Fig. 5		-	20	25	ns

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode 1		 sym125
2	K	cathode[1]		
3	A2	anode 2		
mb	K	mounting base; cathode		

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

6. Ordering information

Table 3. Ordering information

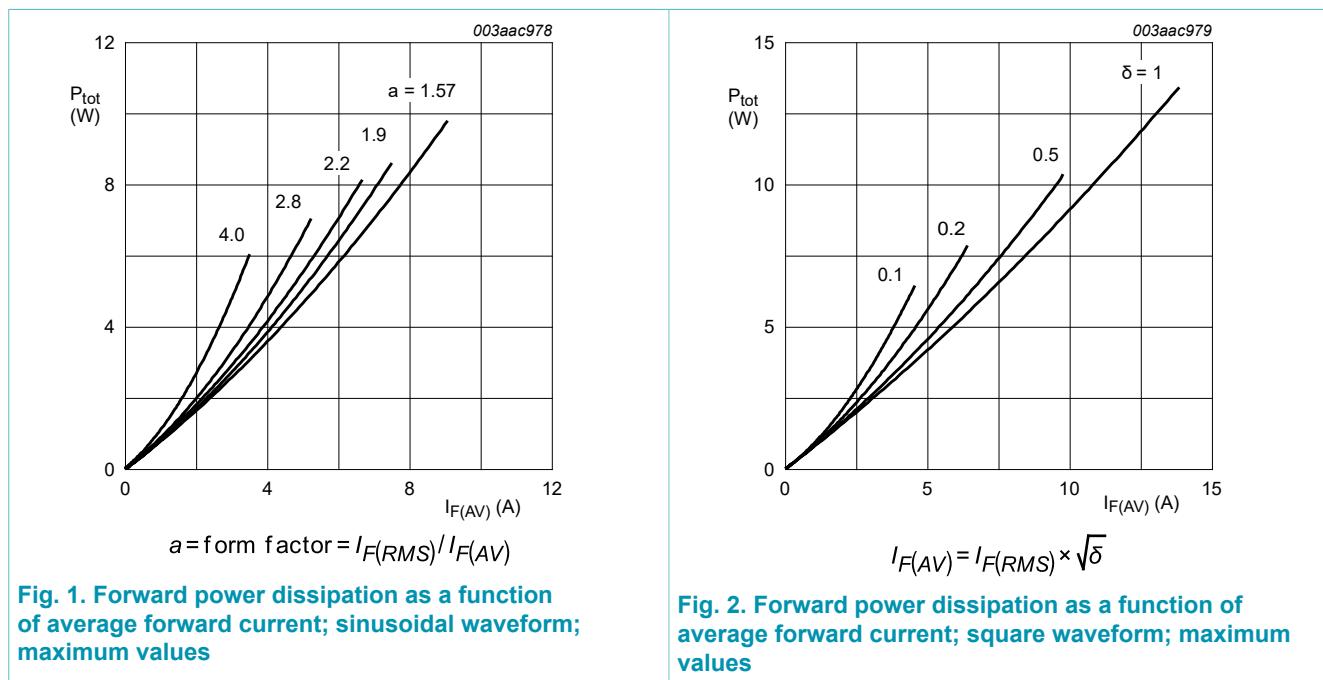
Type number	Package			Version
	Name	Description		
BYV32EB-200	D2PAK	plastic single-ended surface-mounted package (D2PAK); 3 leads (one lead cropped)		SOT404

7. Limiting values

Table 4. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage			-	200	V
V_{RWM}	crest working reverse voltage			-	200	V
V_R	reverse voltage	DC		-	200	V
$I_{O(AV)}$	average output current	$\delta = 0.5$; $T_{mb} \leq 115^\circ\text{C}$; SQW; both diodes conducting; Fig. 1 ; Fig. 2		-	20	A
I_{FRM}	repetitive peak forward current	$\delta = 0.5$; $t_p = 25 \mu\text{s}$; $T_{mb} \leq 115^\circ\text{C}$; per diode		-	20	A
I_{FSM}	non-repetitive peak forward current	$t_p = 8.3 \text{ ms}$; $T_{j(\text{init})} = 25^\circ\text{C}$; SIN; per diode		-	137	A
		$t_p = 10 \text{ ms}$; $T_{j(\text{init})} = 25^\circ\text{C}$; SIN; per diode		-	125	A
I_{RRM}	repetitive peak reverse current	$\delta = 0.001$; $t_p = 2 \mu\text{s}$		-	0.2	A
I_{RSM}	non-repetitive peak reverse current	$t_p = 100 \mu\text{s}$		-	0.2	A
T_{stg}	storage temperature			-40	150	°C
T_j	junction temperature			-	150	°C
V_{ESD}	electrostatic discharge voltage	HBM; $C = 250 \text{ pF}$; $R = 1.5 \text{ k}\Omega$; all pins		-	8	kV



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	with heatsink compound; both diodes conducting	-	-	1.6	K/W
		with heatsink compound; per diode; Fig. 3	-	-	2.4	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	minimum footprint FR4 board	-	50	-	K/W

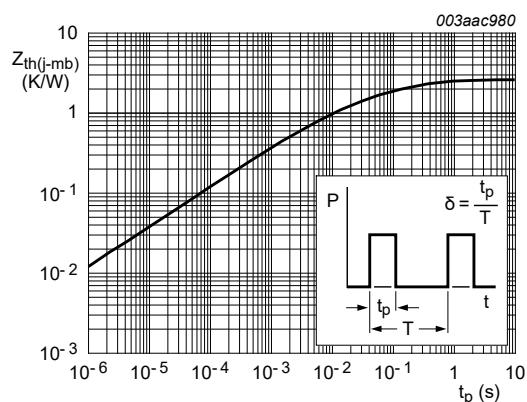


Fig. 3. Transient thermal impedance from junction to mounting base as a function of pulse width

9. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V _F	forward voltage	I _F = 8 A; T _j = 150 °C; Fig. 4		-	0.72	0.85	V
		I _F = 20 A; T _j = 25 °C		-	1	1.15	V
I _R	reverse current	V _R = 200 V; T _j = 25 °C		-	6	30	μA
		V _R = 200 V; T _j = 100 °C		-	0.2	0.6	mA
Dynamic characteristics							
t _{rr}	reverse recovery time	I _F = 1 A; V _R = 30 V; dI _F /dt = 100 A/μs; T _j = 25 °C; ramp recovery; Fig. 5		-	20	25	ns
		I _F = 0.5 A; I _R = 1 A; T _j = 25 °C; measured at reverse current = 0.25 A; step recovery; Fig. 6		-	10	20	ns
Q _r	recovered charge	I _F = 2 A; V _R = 30 V; dI _F /dt = 20 A/μs		-	8	12.5	nC
V _{FR}	forward recovery voltage	I _F = 1 A; dI _F /dt = 10 A/μs; Fig. 7		-	-	1	V

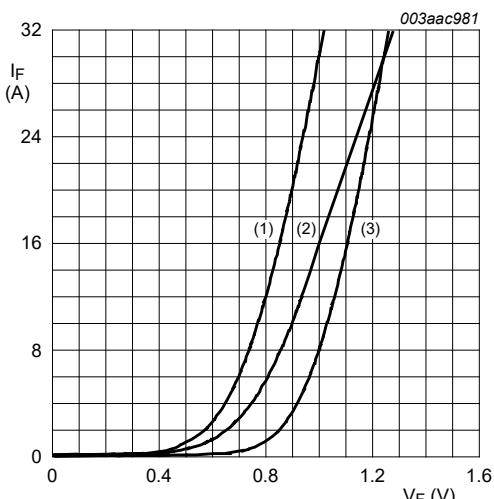


Fig. 4. Forward current as a function of forward voltage

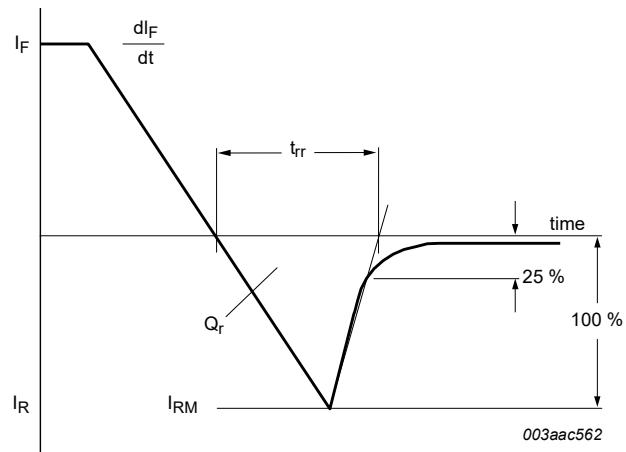


Fig. 5.

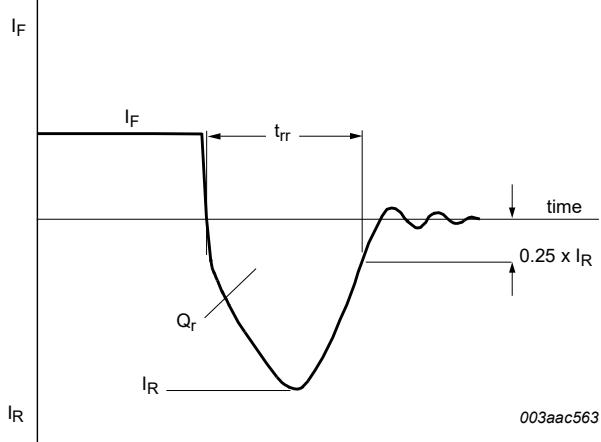


Fig. 6. Reverse recovery definitions; step recovery

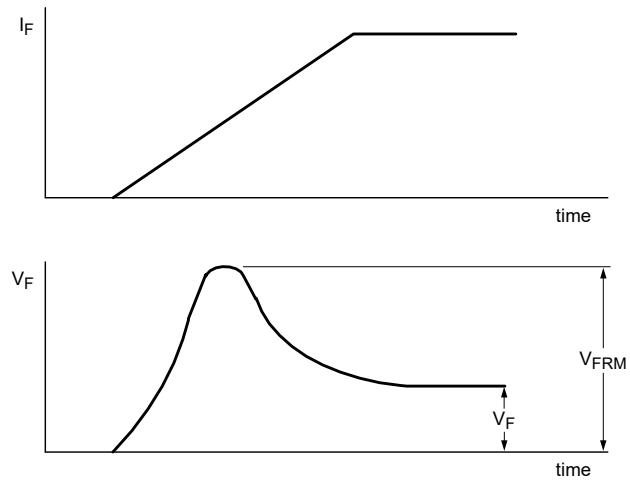


Fig. 7. Forward recovery definitions

10. Package outline

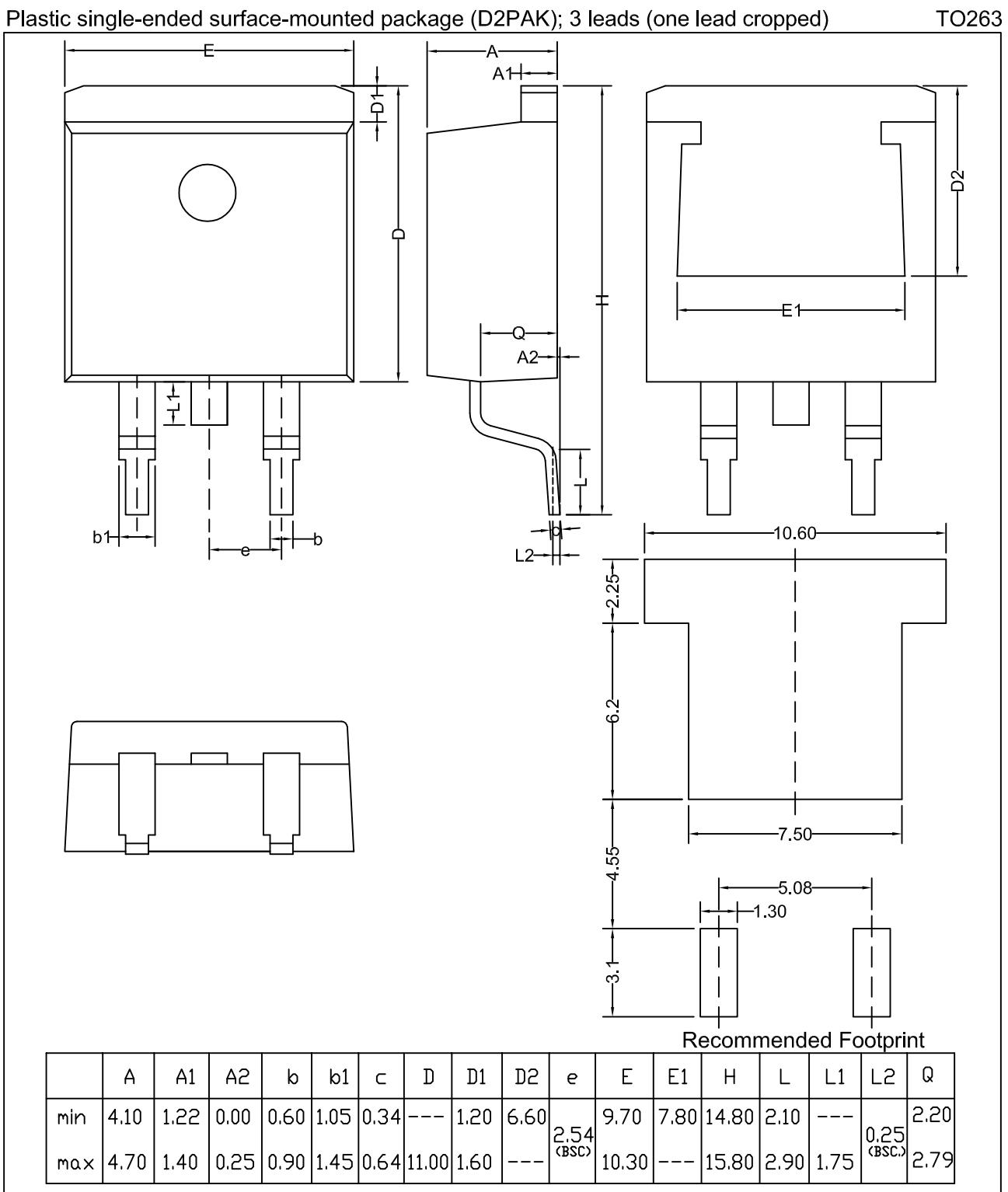


Fig. 8. Package outline D2PAK (SOT404)

11. 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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