

1. General description

Dual ultrafast power diode in a TO263 (D2PAK) surface-mountable plastic package.

2. Features and benefits

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

3. Applications

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

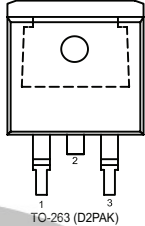
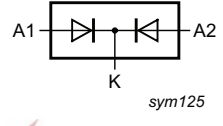
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Values			Unit
Absolute maximum rating						
V_{RRM}	repetitive peak reverse voltage		200			V
$I_{O(AV)}$	average output current	$\delta = 0.5$; square-wave pulse; $T_{mb} \leq 115\text{ °C}$; both diodes conducting; Fig. 1 ; Fig. 2	20			A
I_{RRM}	repetitive peak reverse current	$\delta = 0.001$; $t_p = 2\ \mu\text{s}$;	0.2			A
V_{ESD}	electrostatic discharge voltage	HBM; $C = 250\ \text{pF}$; $R = 1.5\ \text{k}\Omega$; all pins	8			kV
Static characteristics						
V_F	forward voltage	$I_F = 8\ \text{A}$; $T_j = 150\text{ °C}$; Fig. 4	-	0.72	0.85	V
		$I_F = 20\ \text{A}$; $T_j = 25\text{ °C}$	-	1	1.15	V
Dynamic characteristics						
t_{rr}	reverse recovery time	$I_F = 1\ \text{A}$; $V_R = 30\ \text{V}$; $dI_F/dt = 100\ \text{A}/\mu\text{s}$; $T_j = 25\text{ °C}$; 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	 <p>TO-263 (D2PAK)</p>	 <p>sym125</p>
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 TO263 package

6. Ordering information

Table 3. Ordering information

Type number	Package Name	Orderable part number	Packing method	Small packing quantity	Package version	Package issue date
BYV32EB-200	TO263	BYV32EB-200,118	Reel	800	TO263N	26-Sep-2016

7. Marking

Table 4. Marking codes

Type number	Marking codes
BYV32EB-200	BYV32EB-200



8. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions	Values	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	$\delta = 0.5$; square-wave pulse; $T_{mb} \leq 115\text{ }^\circ\text{C}$; both diodes conducting; Fig 1; Fig 2	20	A
I_{FRM}	repetitive peak forward current	$\delta = 0.5$; $t_p = 25\text{ }\mu\text{s}$; $T_{mb} \leq 115\text{ }^\circ\text{C}$; per diode	20	A
I_{FSM}	non-repetitive peak forward current	$t_p = 10\text{ ms}$; sine-wave pulse; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$; per diode	125	A
		$t_p = 8.3\text{ ms}$; sine-wave pulse; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$; per diode	137	A
I_{RRM}	repetitive peak reverse current	$\delta = 0.001$; $t_p = 2\text{ }\mu\text{s}$; per diode	0.2	A
I_{RSM}	non-repetitive peak reverse current	$t_p = 100\text{ }\mu\text{s}$; per diode	0.2	A
T_{stg}	storage temperature		-40 to 150	$^\circ\text{C}$
T_j	junction temperature		150	$^\circ\text{C}$
V_{ESD}	electrostatic discharge voltage	HBM; all pins; $C = 250\text{ pF}$; $R = 1.5\text{ k}\Omega$	8	kV

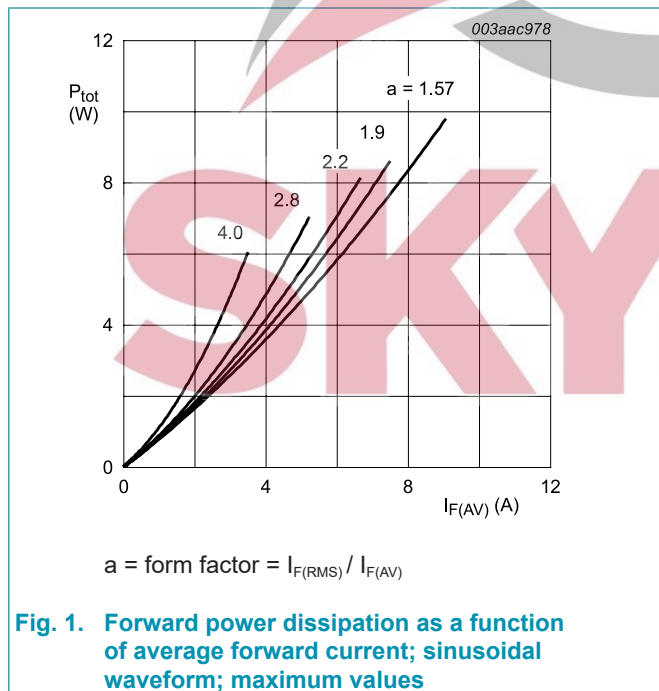


Fig. 1. Forward power dissipation as a function of average forward current; sinusoidal waveform; maximum values

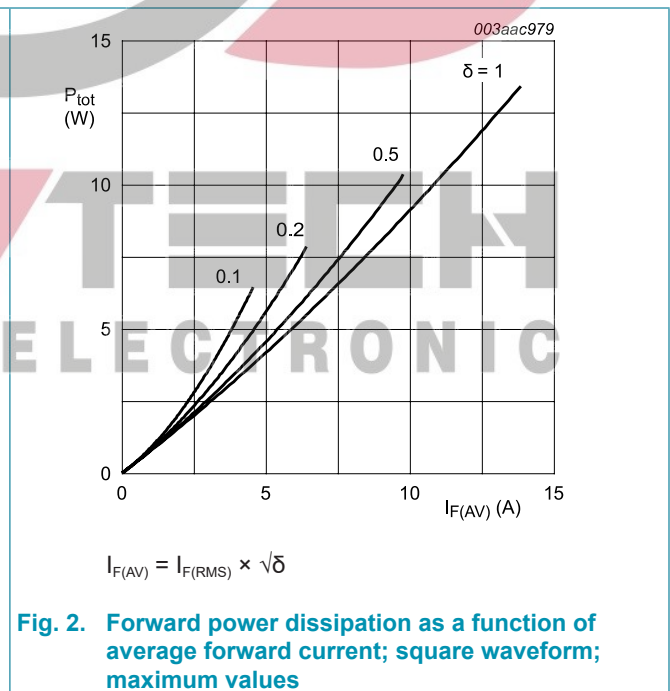


Fig. 2. Forward power dissipation as a function of average forward current; square wave; maximum values

9. Thermal characteristics

Table 6. 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		-	60	-	K/W

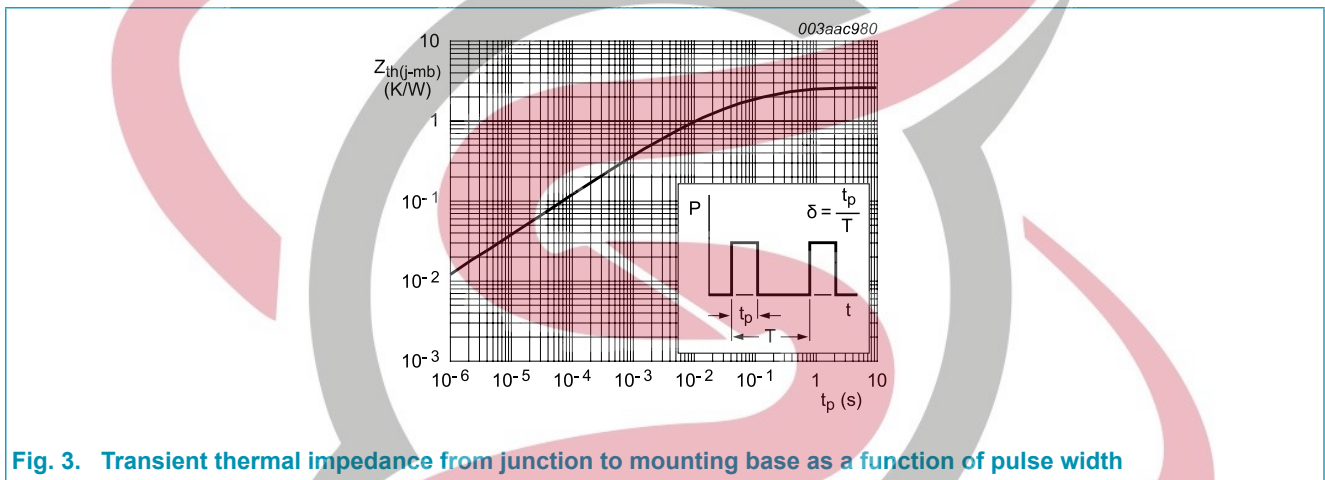


Fig. 3. Transient thermal impedance from junction to mounting base as a function of pulse width



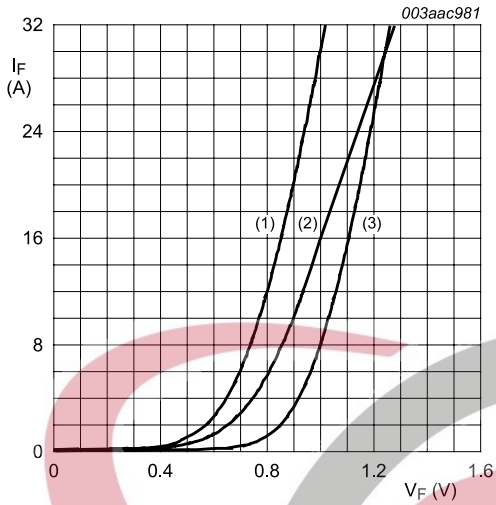
10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V_F	forward voltage	$I_F = 8 \text{ A}; T_J = 150 \text{ }^\circ\text{C}; \text{ Fig. 4}$	-	0.72	0.85	V
		$I_F = 20 \text{ A}; T_J = 25 \text{ }^\circ\text{C}$	-	1	1.15	V
I_R	reverse current	$V_R = 200 \text{ V}; T_J = 25 \text{ }^\circ\text{C}$	-	6	30	μA
		$V_R = 200 \text{ V}; T_J = 100 \text{ }^\circ\text{C}$	-	0.2	0.6	mA
Dynamic characteristics						
Q_r	recovered charge	$I_F = 2 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 20 \text{ A}/\mu\text{s}; T_J = 25 \text{ }^\circ\text{C}$	-	8	12.5	nC
t_{rr}	reverse recovery time	$I_F = 1 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 100 \text{ A}/\mu\text{s}; T_J = 25 \text{ }^\circ\text{C}; \text{ ramp recovery}; \text{ Fig. 5}$	-	20	25	ns
		$I_F = 0.5 \text{ A to } I_R = 1 \text{ A}; T_J = 25 \text{ }^\circ\text{C}; \text{ measured at } I_R = 0.25 \text{ A}; \text{ step recovery}; \text{ Fig. 6}$	-	10	20	ns
V_{FR}	forward recovery voltage	$I_F = 1 \text{ A}; dI_F/dt = 10 \text{ A}/\mu\text{s}; T_J = 25 \text{ }^\circ\text{C}; \text{ Fig. 7}$	-	-	1	V



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(1) $T_j = 150\text{ }^\circ\text{C}$; typical values
 (2) $T_j = 150\text{ }^\circ\text{C}$; maximum values
 (3) $T_j = 25\text{ }^\circ\text{C}$; maximum values

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

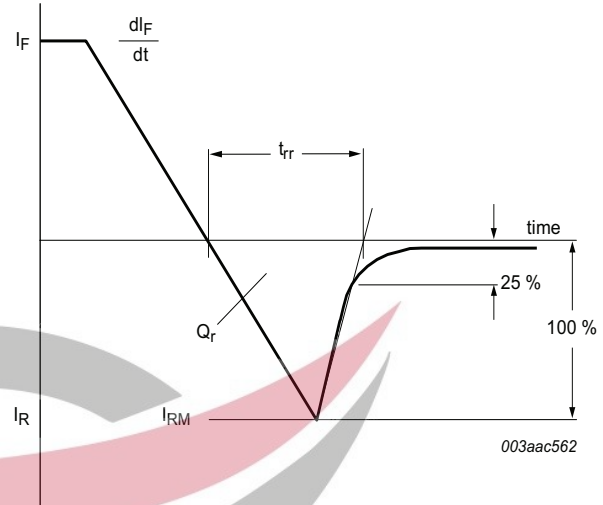


Fig. 5. Reverse recovery definitions; ramp recovery

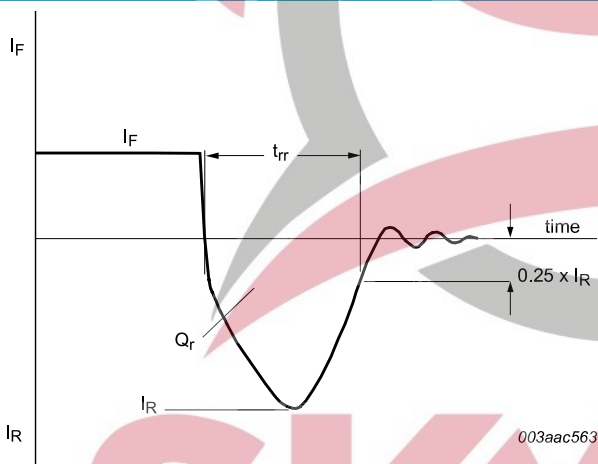


Fig. 6. Reverse recovery definitions; step recovery

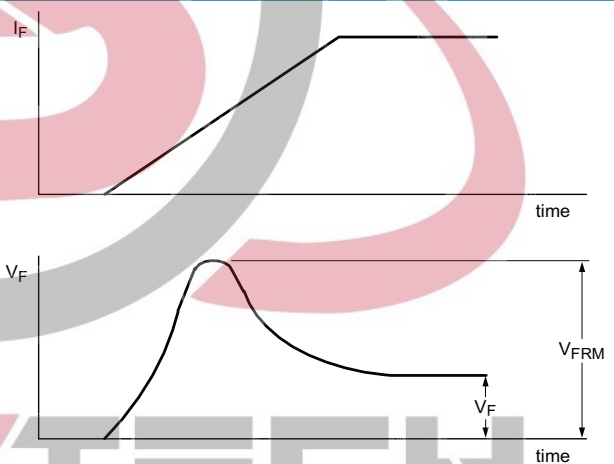
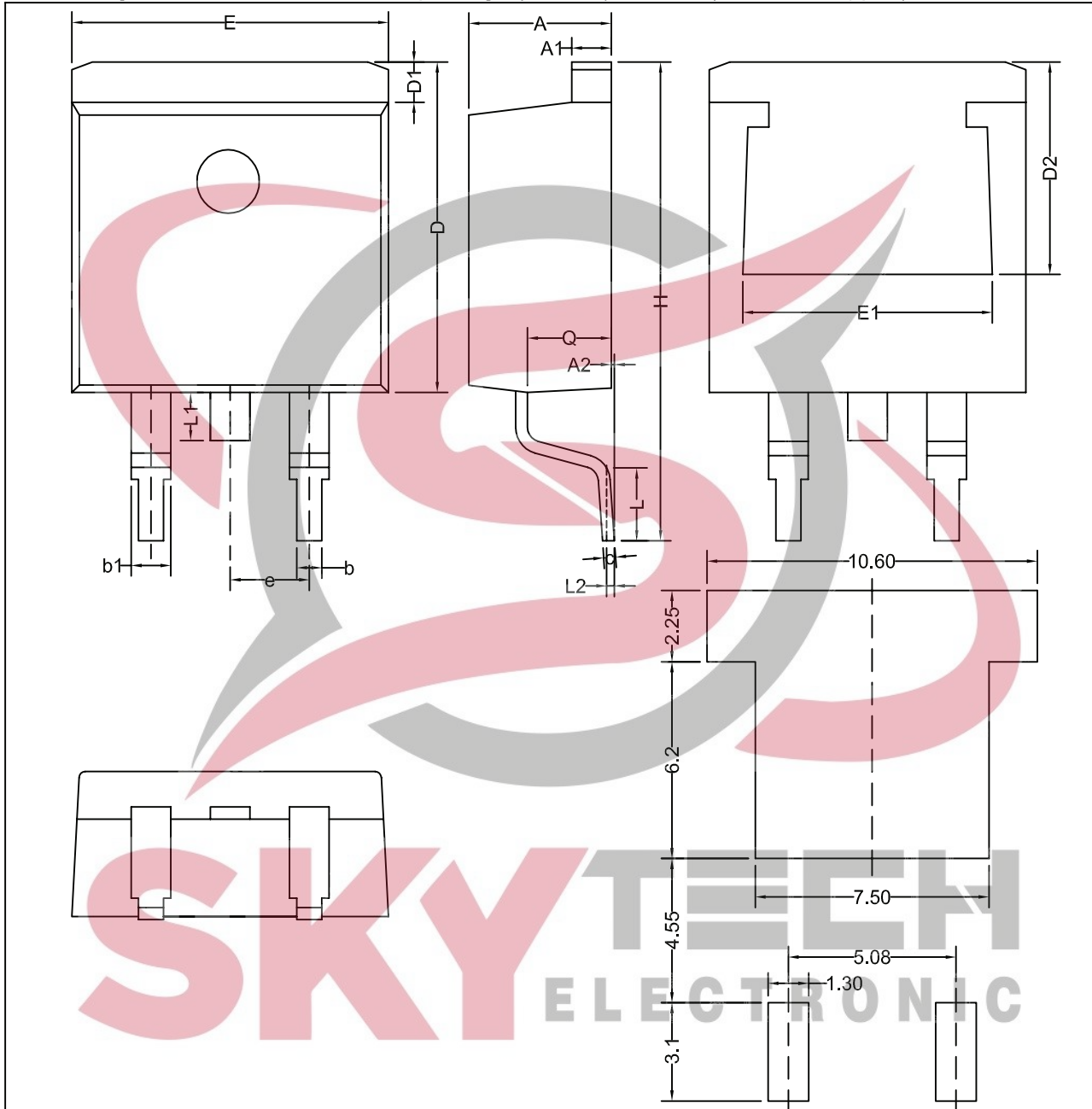


Fig. 7. Forward recovery definitions

11. Package outline

Plastic single-ended surface-mounted package (D2PAK); 3 leads (one lead cropped)

TO263



Recommended Footprint

	A	A1	A2	b	b1	c	D	D1	D2	e	E	E1	H	L	L1	L2	Q
min	4.10	1.22	0.00	0.60	1.05	0.34	---	1.20	6.60	---	9.70	7.80	14.80	2.10	---	---	2.20
max	4.70	1.40	0.25	0.90	1.45	0.64	11.00	1.60	---	2.54 (BSC)	10.30	---	15.80	2.90	1.75	0.25 (BSC)	2.79

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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.
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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