

1. General description

Dual ultrafast power diode in TO263 (D2PAK) plastic package.

2. Features and benefits

- Low on-state loss
- Ultra low leakage
- Fast switching
- Soft recovery characteristic minimizes power consuming oscillations
- High reverse surge capability
- High thermal cycling performance
- Low thermal resistance

3. Applications

- Home appliance power supply

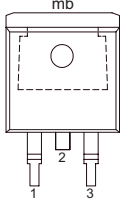
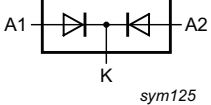
4. Quick reference data

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	δ = 0.5 ; square-wave pulse; T _{mb} ≤ 143 °C; both diodes conducting; Fig. 1 ; Fig. 2 ; Fig. 3	20			A
I _{FRM}	repetitive peak forward current	δ = 0.5 ; t _p = 25 μs; T _{mb} ≤ 151 °C; square-wave pulse ; per diode	20			A
I _{FSM}	non-repetitive peak forward current	t _p = 10 ms; T _{j(init)} = 25 °C; sine-wave pulse; per diode; Fig. 4	125			A
		t _p = 8.3 ms; T _{j(init)} = 25 °C; sine-wave pulse; per diode	137			A
I _{RRM}	repetitive peak reverse current	square-wave pulse; f = 1 kHz; t _p = 2 μs; per diode	0.2			A
V _{ESD}	electrostatic discharge voltage	all pin; human body model; C = 250 pF; R = 1.5 kΩ	8			kV
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V _F	forward voltage	I _F = 20A; T _j = 25 °C; per diode; Fig. 6	-	1.06	1.15	V
		I _F = 8 A; T _j = 150 °C; per diode; Fig. 6	-	0.76	0.85	V
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; per diode; Fig. 7	-	18	25	ns

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A	anode		
2	K	cathode		
3	A	anode		
mb	mb	mounting base; connected to cathod		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BYV32EB-200P	TO-263	plastic single-ended surface-mounted package (DPAK); 3-leads (one lead cropped)	DPAK

7. Marking

Table 4. Marking codes

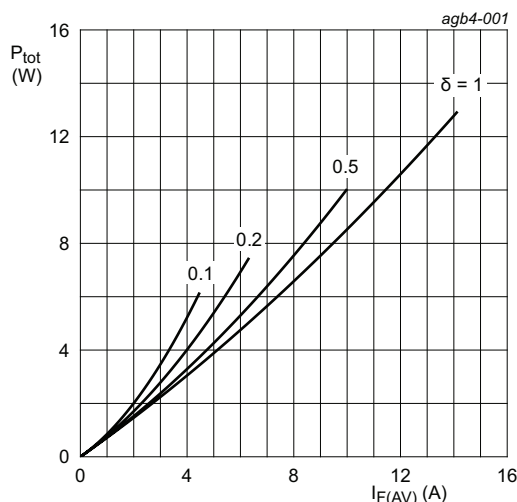
Type number	Marking codes
BYV32EB-200P	BYV32EB-200P

8. Limiting values

Table 5. Limiting values

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

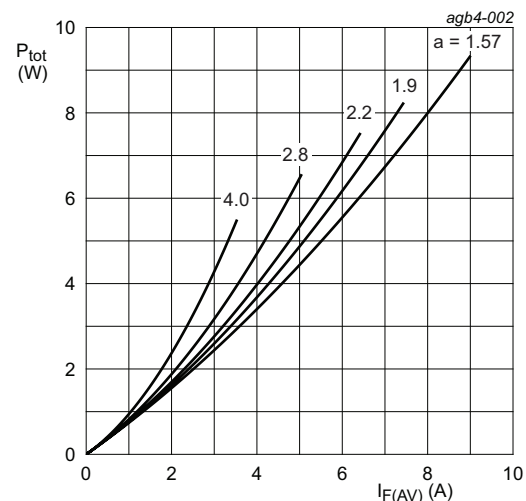
Symbol	Parameter	Conditions	Values	Unit
V_{RRM}	repetitive peak reverse voltage		200	V
V_{RWM}	crest working reverse voltage		200	V
V_R	reverse voltage	DC	200	V
$I_{O(AV)}$	average output current	$\delta = 0.5$; square-wave pulse; $T_{mb} \leq 143^\circ\text{C}$; both diodes conducting; Fig. 1 ; Fig. 2 ; Fig. 3	20	A
I_{FRM}	repetitive peak forward current	$\delta = 0.5$; $t_p = 25\ \mu\text{s}$; $T_{mb} \leq 151^\circ\text{C}$; square-wave pulse; per diode	20	A
I_{FSM}	non-repetitive peak forward current	$t_p = 10\ \text{ms}$; $T_{j(\text{init})} = 25^\circ\text{C}$; sine-wave pulse; per diode; Fig. 4	125	A
		$t_p = 8.3\ \text{ms}$; $T_{j(\text{init})} = 25^\circ\text{C}$; sine-wave pulse; per diode	137	A
I_{RRM}	repetitive peak reverse current	square-wave pulse; $f = 1\ \text{kHz}$; $t_p = 2\ \mu\text{s}$; per diode	0.2	A
I_{RSM}	non-repetitive peak reverse current	square-wave pulse; $t_p = 100\ \mu\text{s}$; per diode	0.2	A
T_{stg}	storage temperature		-65 to 175	$^\circ\text{C}$
T_j	junction temperature		175	$^\circ\text{C}$
V_{ESD}	electrostatic discharge voltage	all pin; human body model; $C = 250\ \text{pF}$; $R = 1.5\ \text{k}\Omega$	8	8kV



$$I_{F(AV)} = I_{F(RMS)} \times \sqrt{\delta}$$

$$V_o = 0.702\ \text{V}; R_s = 0.0151\ \Omega$$

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



$$a = \text{form factor} = I_{F(RMS)} / I_{F(AV)}$$

$$V_o = 0.702\ \text{V}; R_s = 0.0151\ \Omega$$

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

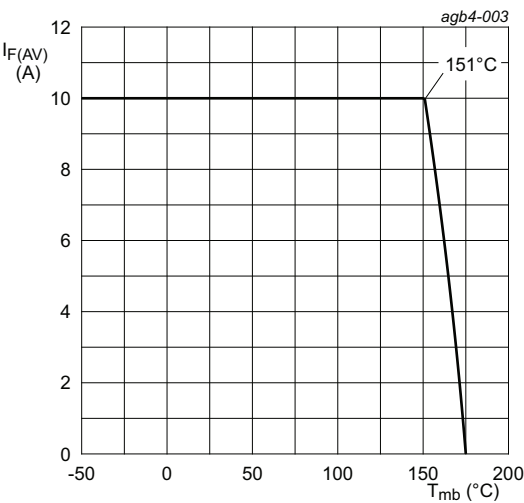


Fig. 3. Forward current as a function of mounting base temperature; maximum values; per diode

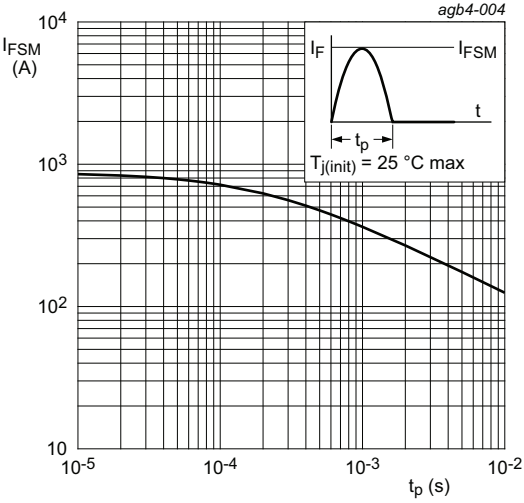


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values; per diode

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	per diode; Fig. 5	-	-	2.4	K/W
		both diodes conducting; Fig. 5	-	-	1.6	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air	-	50	-	K/W

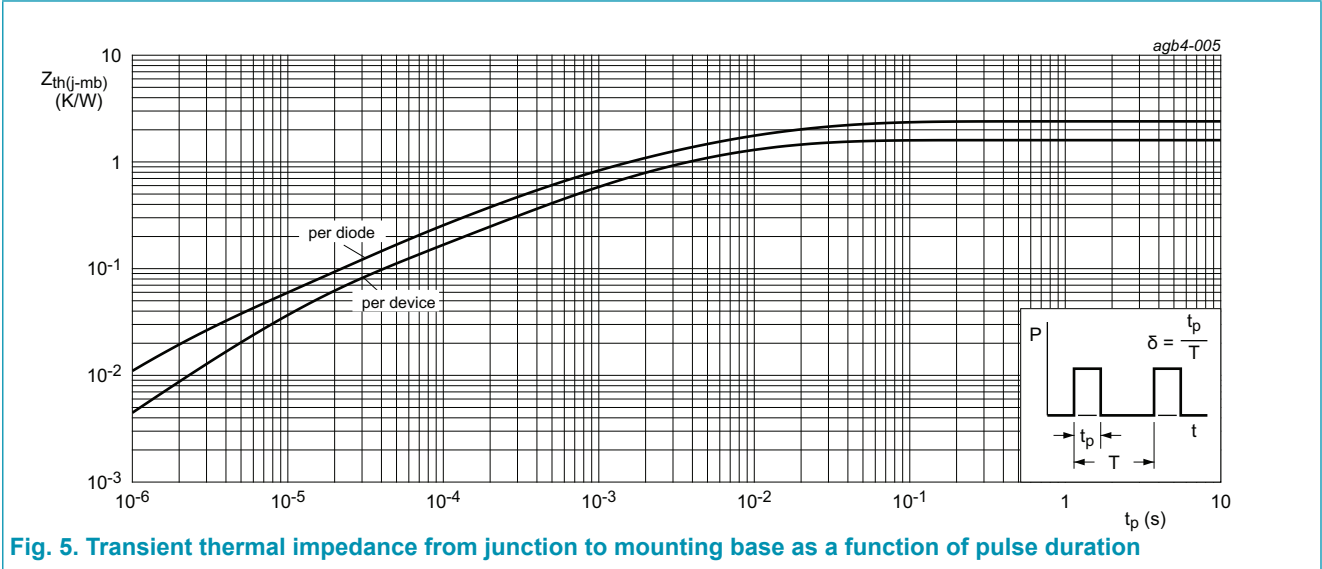
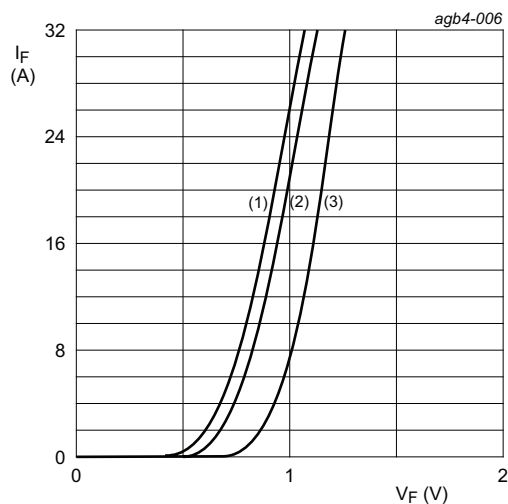


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V _F	forward current	I _F = 20 A; T _J = 25 °C; per diode; Fig. 6		-	1.06	1.15	V
		I _F = 10 A; T _J = 25 °C; per diode; Fig. 6		-	0.95	-	V
		I _F = 8 A; T _J = 150 °C; per diode; Fig. 6		-	0.76	0.85	V
I _R	reverse current	V _R = 200 V; T _J = 25 °C; per diode		-	0.3	5	μA
		V _R = 200 V; T _J = 150 °C; per diode		-	70	250	μA
Dynamic characteristics							
Q _r	reverse charge	I _F = 1 A; V _R = 30 V; dI _F /dt = 100 A/μs; T _J = 25 °C; per diode; Fig. 7		-	14.5	-	nC
		I _F = 2 A; V _R = 30 V; dI _F /dt = 20 A/μs; T _J = 25 °C; per diode; Fig. 7			13.5	-	nC
t _{rr}	reverse recovery time	I _F = 1 A; V _R = 30 V; dI _F /dt = 100 A/μs; T _J = 25 °C; per diode; Fig. 7		-	18	25	ns
I _{RM}	peak reverse recovery current	I _F = 1 A; V _R = 30 V; dI _F /dt = 100 A/μs; T _J = 25 °C; per diode; Fig. 7		-	1.7	-	A



$V_o = 0.702\text{ V}; R_s = 0.0151\text{ }\Omega$

(1) $T_j = 150\text{ °C};$ typical values

(2) $T_j = 150\text{ °C};$ maximum values

(3) $T_j = 25\text{ °C};$ maximum values

Fig. 6. Forward current as a function of forward voltage; per diode

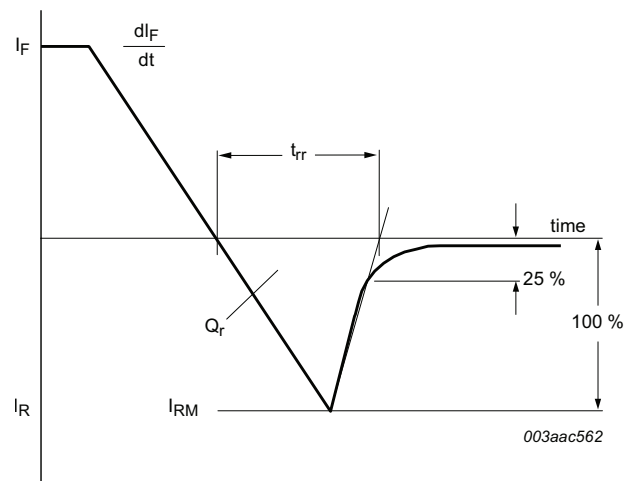
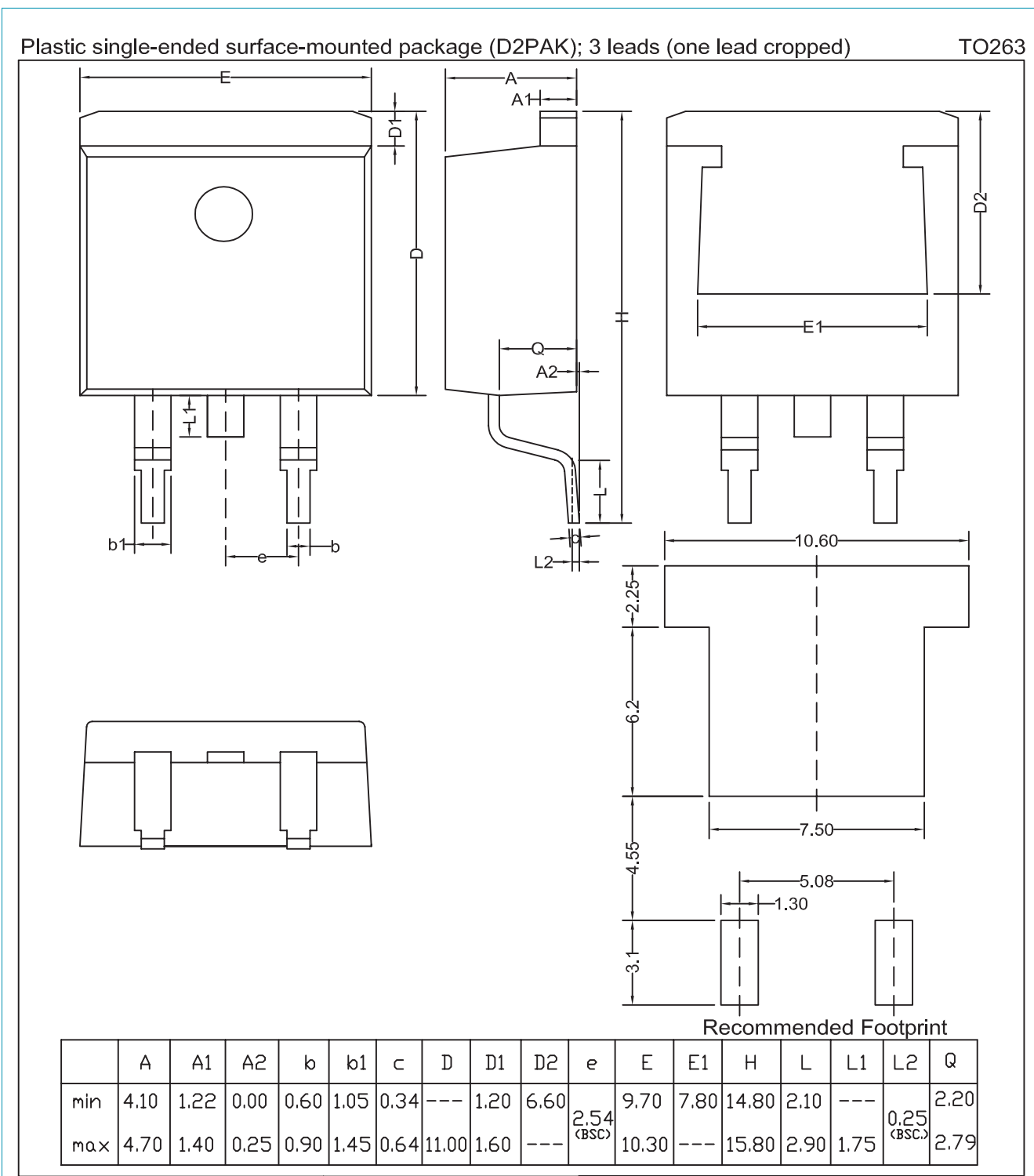


Fig. 7. Reverse recovery definitions; ramp recovery

11. Package outline



12. 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.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
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