

1. General description

Ultrafast power diode in TO-263 (D2PAK) plastic package.

2. Features and benefits

- Low on-state loss
- Low leakage current
- Soft reverse recovery characteristics
- High thermal cycling performance

3. Applications

- Home appliance power supply
- Discontinuous Current Mode (DCM) Power Factor Correction (PFC)

4. Quick reference data

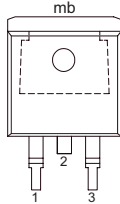
Table 1. Quick reference data

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Symbol	Parameter	Conditions	Values				Unit
Absolute maximum rating							
V _{RRM}	repetitive peak reverse voltage		600				V
I _{F(AV)}	average forward current	δ = 0.5 ; square-wave pulse; T _{mb} ≤ 128 °C; Fig. 1 ; Fig. 2 ; Fig. 3	15				A
I _{FRM}	repetitive peak forward current	δ = 0.5 ; t _p = 25 μs; T _{mb} ≤ 128 °C; square-wave pulse	30				A
I _{FSM}	non-repetitive peak forward current	t _p = 10 ms; T _{j(init)} = 25 °C; sine-wave pulse; Fig. 4	150				A
		t _p = 8.3 ms; T _{j(init)} = 25 °C; sine-wave pulse;	165				A
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V _F	forward voltage	I _F = 15 A; T _j = 25 °C; Fig. 6		-	1.1	1.38	V
		I _F = 15 A; T _j = 125 °C; Fig. 6		-	0.96	1.25	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; Fig. 7		-	50	60	ns

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	n.c.	no connected		
2	K	cathode[1]		
3	A	anode		
mb	mb	mounting base; connected to cathod		

[1] It is not possible to connect to pin 2 of the TO-263 package.

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BYT79B-600P	TO-263	plastic single-ended surface-mounted package (D2PAK); 3-leads (one lead cropped)	D2PAK

7. Marking

Table 4. Marking codes

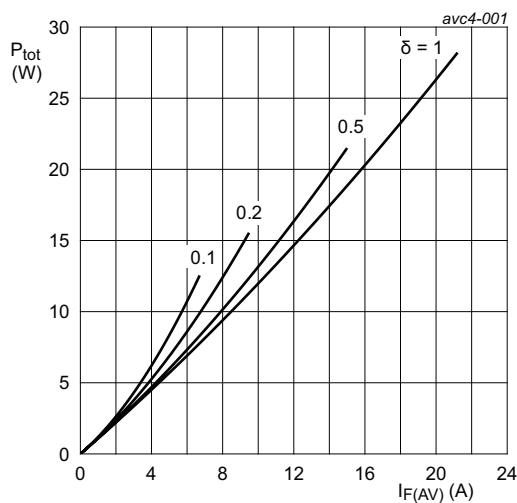
Type number	Marking codes
BYT79B-600P	BYT79B-600P

8. Limiting values

Table 5. Limiting values

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

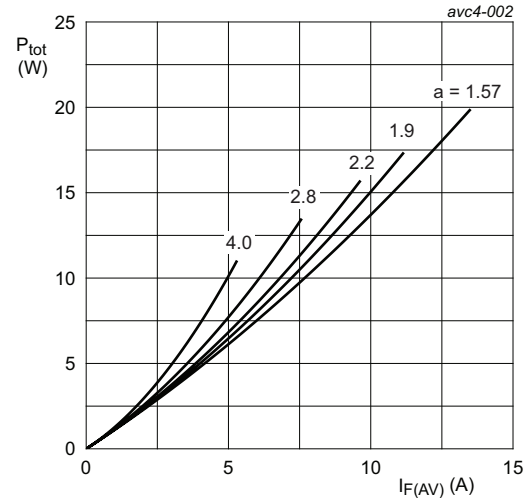
Symbol	Parameter	Conditions	Values	Unit
V_{RRM}	repetitive peak reverse voltage		600	V
V_{RWM}	crest working reverse voltage		600	V
V_R	reverse voltage	DC	600	V
$I_{F(AV)}$	average forward current	$\delta = 0.5$; square-wave pulse; $T_{mb} \leq 128^\circ\text{C}$; Fig. 1 ; Fig. 2 ; Fig. 3	15	A
I_{FRM}	repetitive peak forward current	$\delta = 0.5$; $t_p = 25\ \mu\text{s}$; $T_{mb} \leq 128^\circ\text{C}$; square-wave pulse	30	A
I_{FSM}	non-repetitive peak forward current	$t_p = 10\ \text{ms}$; $T_{j(\text{init})} = 25^\circ\text{C}$; sine-wave pulse; Fig. 4	150	A
		$t_p = 8.3\ \text{ms}$; $T_{j(\text{init})} = 25^\circ\text{C}$; sine-wave pulse;	165	A
T_{stg}	storage temperature		-65 to 175	$^\circ\text{C}$
T_j	junction temperature		175	$^\circ\text{C}$



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

$$V_o = 1.080\ \text{V}; R_s = 0.0118\ \Omega$$

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



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

$$V_o = 1.080\ \text{V}; R_s = 0.0118\ \Omega$$

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

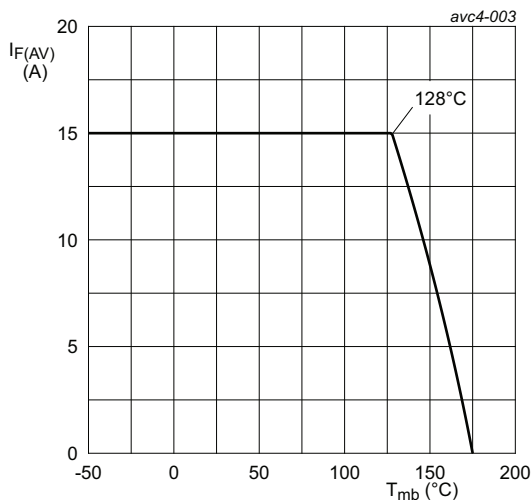


Fig. 3. Forward current as a function of mounting base temperature; maximum values

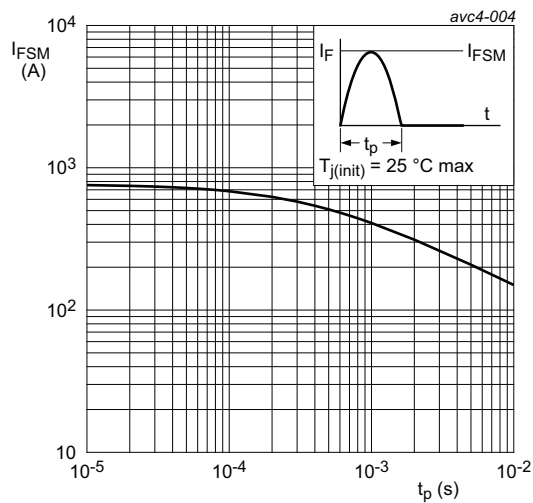


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values

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	Fig. 5		-	-	2.2	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air		-	50	-	K/W

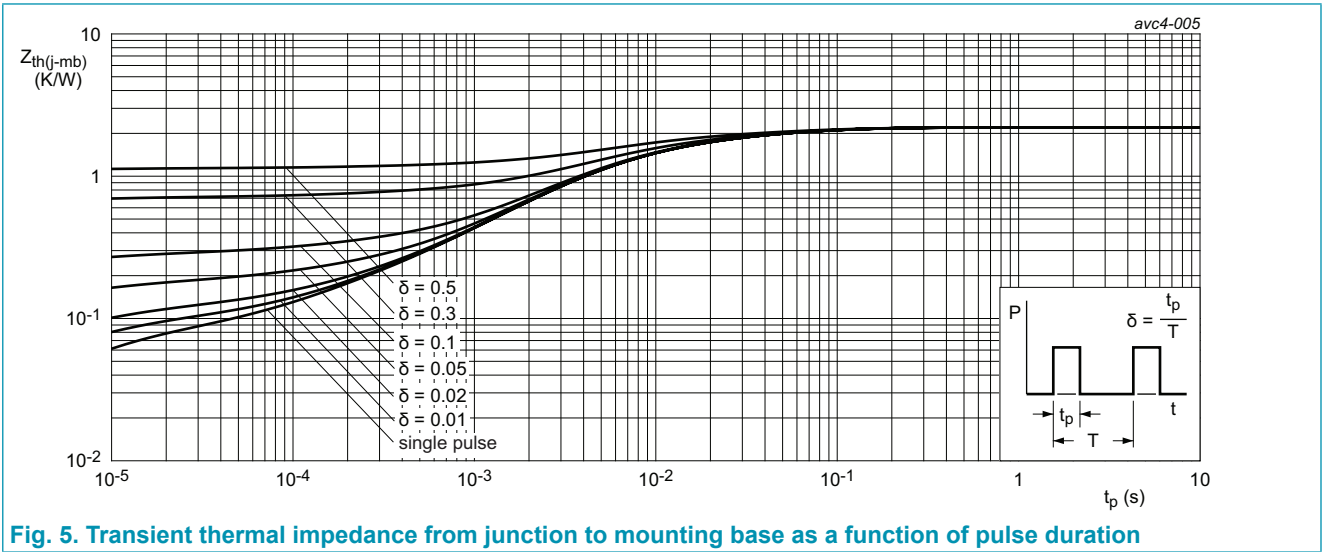
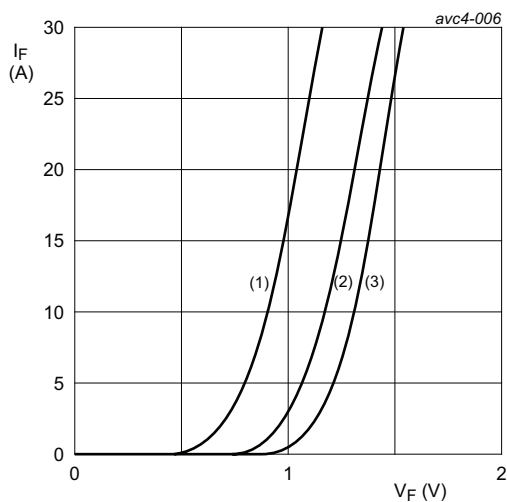


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V _F	forward current	I _F = 15 A; T _j = 25 °C; Fig. 6		-	1.1	1.38	V
		I _F = 15 A; T _j = 125 °C; Fig. 6		-	0.96	1.25	V
I _R	reverse current	V _R = 600 V; T _j = 25 °C		-	1	10	μA
		V _R = 600 V; T _j = 125 °C		-	80	200	μA
Dynamic characteristics							
I _{RM}	peak reverse recovery current	I _F = 1 A; V _R = 30 V; dI _F /dt = 100 A/μs; T _j = 25 °C; Fig. 7		-	3	-	A
t _{rr}	reverse recovery time	I _F = 1 A; V _R = 30 V; dI _F /dt = 100 A/μs; T _j = 25 °C; Fig. 7		-	50	60	ns
Q _r	reverse charge	I _F = 1 A; V _R = 30 V; dI _F /dt = 100 A/μs; T _j = 25 °C; Fig. 7		-	60	-	nC
		I _F = 2 A; V _R = 30 V; dI _F /dt = 20 A/μs; T _j = 25 °C; Fig. 7		-	60	110	nC



$V_o = 1.080 \text{ V}; R_s = 0.0118 \text{ } \Omega$

(1) $T_j = 125 \text{ }^\circ\text{C}$; typical values

(2) $T_j = 125 \text{ }^\circ\text{C}$; maximum values

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

Fig. 6. Forward current as a function of forward voltage

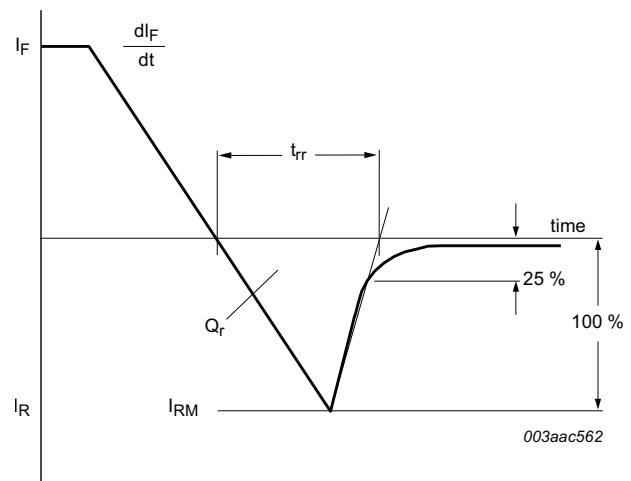
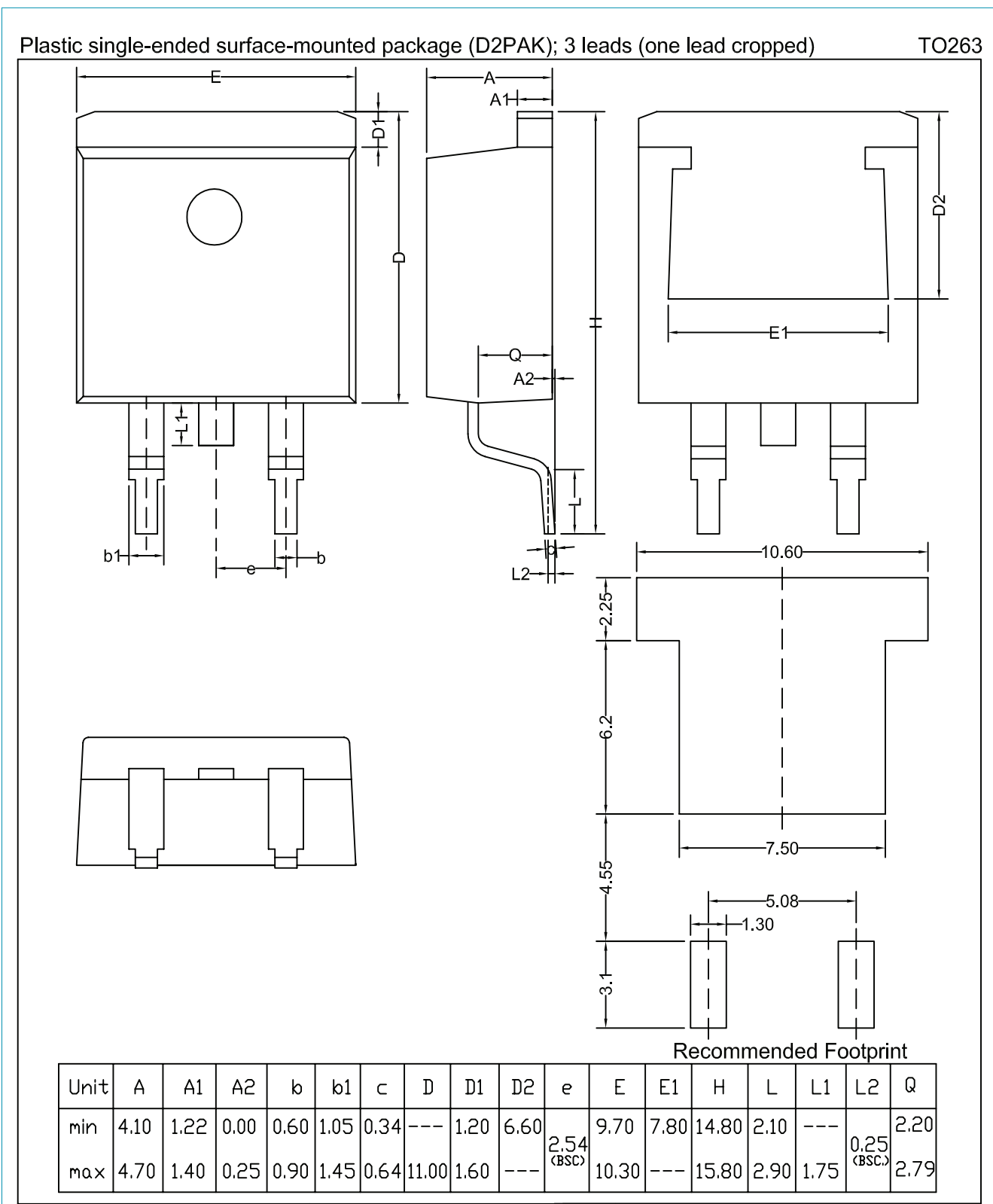


Fig. 7. Reverse recovery definitions; ramp recovery

11. Package outline



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.
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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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

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moschip.ru_9