



**THE DATASHEET OF
BYQ28ED-200PLJ**



1. General description

Ultrafast, dual common cathode, epitaxial rectifier diodes in a SOT428 (DPAK) plastic package.

2. Features and benefits

- Fast switching
- Low thermal resistance
- Soft recovery characteristic
- Low forward voltage drop
- Reverse surge capability
- High thermal cycling performance

3. Applications

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

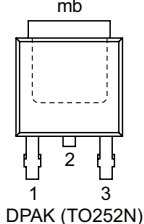
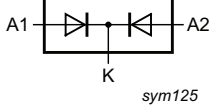
4. Quick reference data

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; $T_{mb} \leq 125$ °C; both diodes conducting; Fig. 1 ; Fig. 2 ; Fig. 3	10			A
I_{FRM}	repetitive peak forward current	$\delta = 0.5$; $t_p = 25$ μ s; $T_{mb} \leq 130$ °C; square-wave pulse ; per diode	10			A
I_{FSM}	non-repetitive peak forward current	$t_p = 10$ ms; $T_{j(init)} = 25$ °C; sine-wave pulse; per diode; Fig. 4	50			A
		$t_p = 8.3$ ms; $T_{j(init)} = 25$ °C; sine-wave pulse; per diode	55			A
I_{RM}	peak reverse recovery current	$t_p = 2$ μ s; $\delta = 0.001$	0.2			A
I_{RSM}	non-repetitive peak reverse current	$t_p = 100$ μ s	0.2			A
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V_F	forward voltage	$I_F = 5$ A; $T_j = 25$ °C; per diode; Fig. 6	-	0.95	1.1	V
		$I_F = 5$ A; $T_j = 150$ °C; per diode; Fig. 6	-	0.8	0.895	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; per diode; Fig. 7	-	15	25	ns

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A	anode	 <p>DPAK (TO252N)</p>	
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
BYQ28ED-200PL	TO-252	plastic single-ended surface-mounted package (DPAK); 3-leads (one lead cropped)	DPAK

7. Marking

Table 4. Marking codes

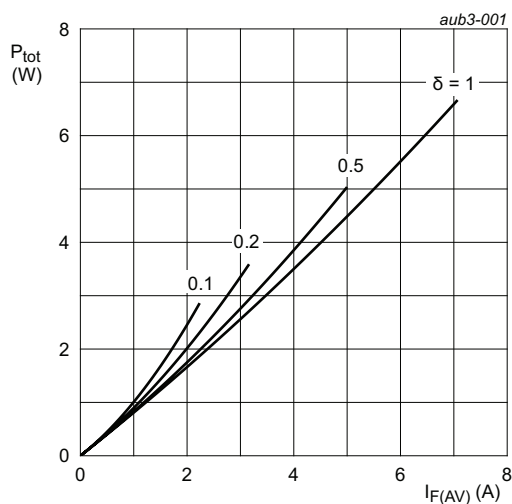
Type number	Marking codes
BYQ28ED-200PL	BYQ28ED-200PL

8. Limiting values

Table 5. Limiting values

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

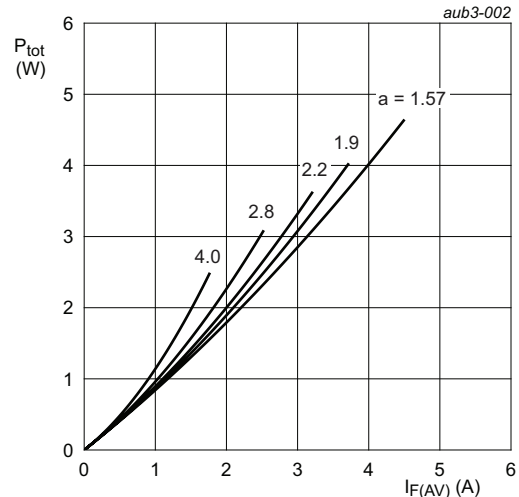
Symbol	Parameter	Conditions	Values	Unit
V_{RRM}	repetitive peak reverse voltage		200	V
V_{RWM}	crest working reverse voltage		200	V
V_R	reverse voltage	DC	200	V
$I_{O(AV)}$	average output current	$\delta = 0.5$; square-wave pulse; $T_{mb} \leq 125\text{ }^\circ\text{C}$; both diodes conducting; Fig. 1 ; Fig. 2 ; Fig. 3	10	A
I_{FRM}	repetitive peak forward current	$\delta = 0.5$; $t_p = 25\text{ }\mu\text{s}$; $T_{mb} \leq 130\text{ }^\circ\text{C}$; square-wave pulse; per diode	10	A
I_{FSM}	non-repetitive peak forward current	$t_p = 10\text{ ms}$; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$; sine-wave pulse; per diode; Fig. 4	50	A
		$t_p = 8.3\text{ ms}$; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$; sine-wave pulse; per diode	55	A
I_{RM}	peak reverse recovery current	$t_p = 2\text{ }\mu\text{s}$; $\delta = 0.001$	0.2	A
I_{RSM}	non-repetitive peak reverse current	$t_p = 100\text{ }\mu\text{s}$	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	all pin; human body model; $C = 250\text{ pF}$; $R = 1.5\text{ k}\Omega$	8	kV



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

$$V_o = 0.787\text{ V}; R_s = 0.0220\text{ }\Omega$$

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



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

$$V_o = 0.787\text{ V}; R_s = 0.0220\text{ }\Omega$$

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

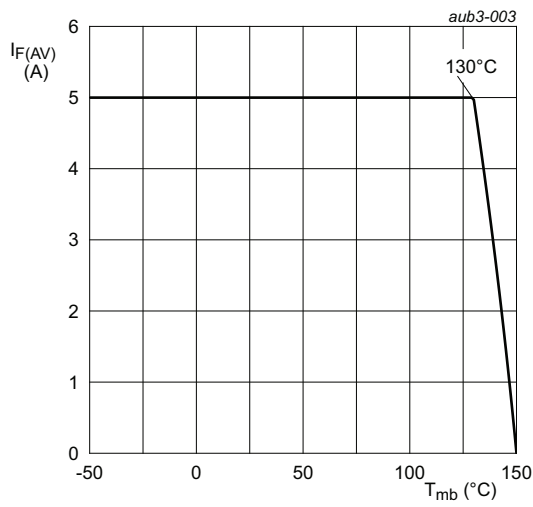


Fig. 3. Forward current as a function of mounting base temperature; maximum values; per diode

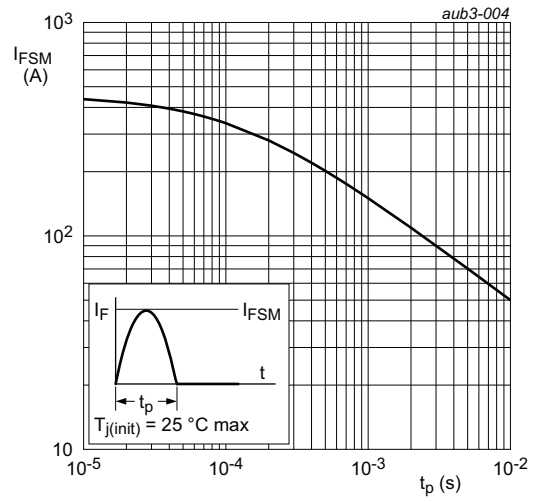


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values; per diode

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	-	-	4	K/W
		both diodes conducting; Fig. 5	-	-	2.5	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air	-	60	-	K/W

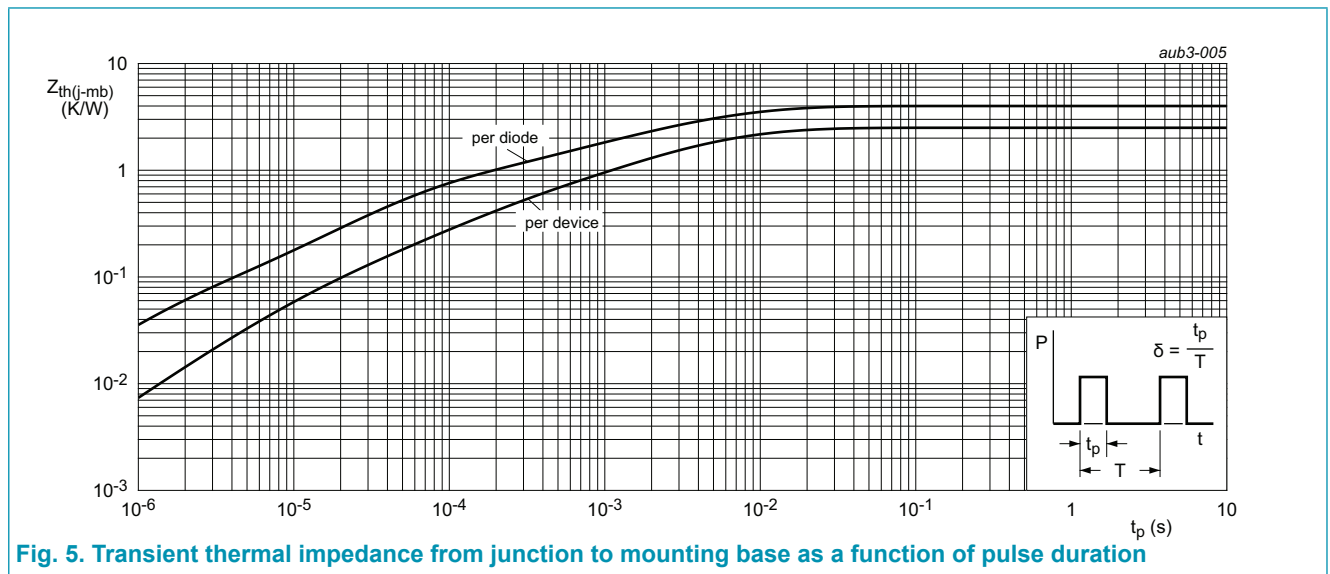
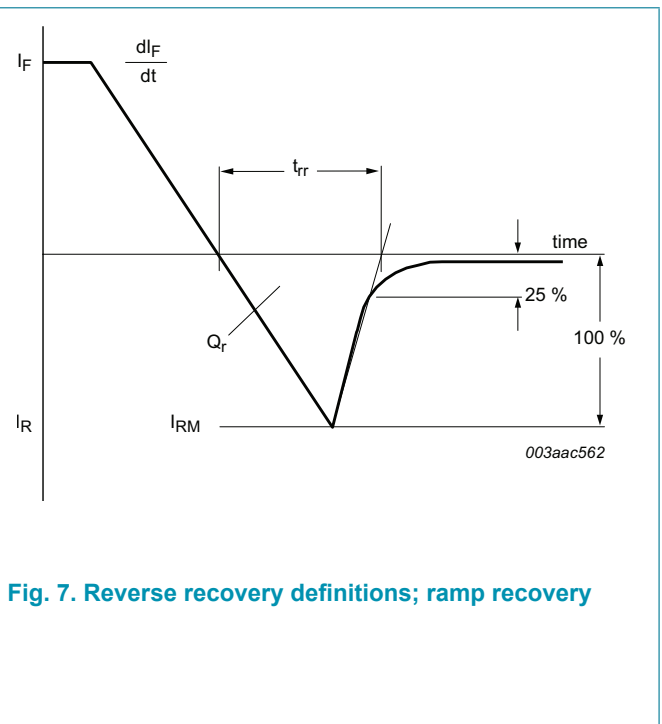
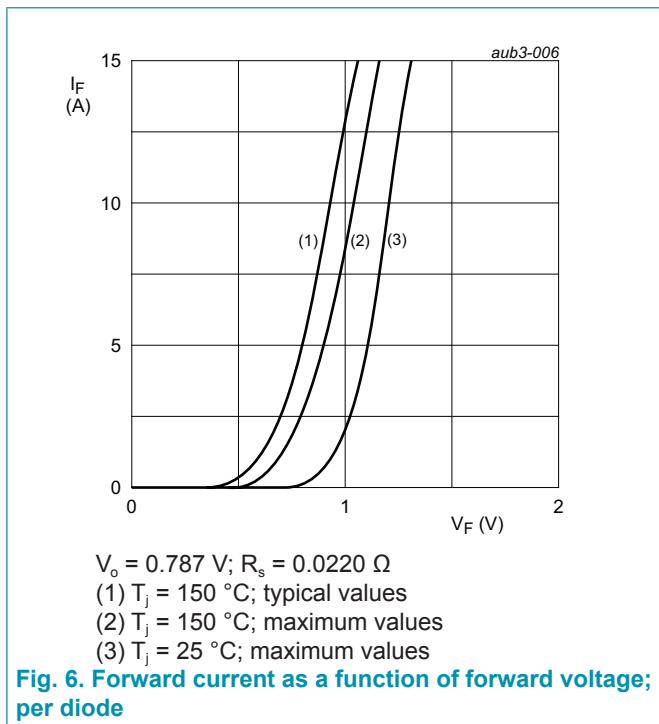


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration

10. Characteristics

Table 7. Characteristics

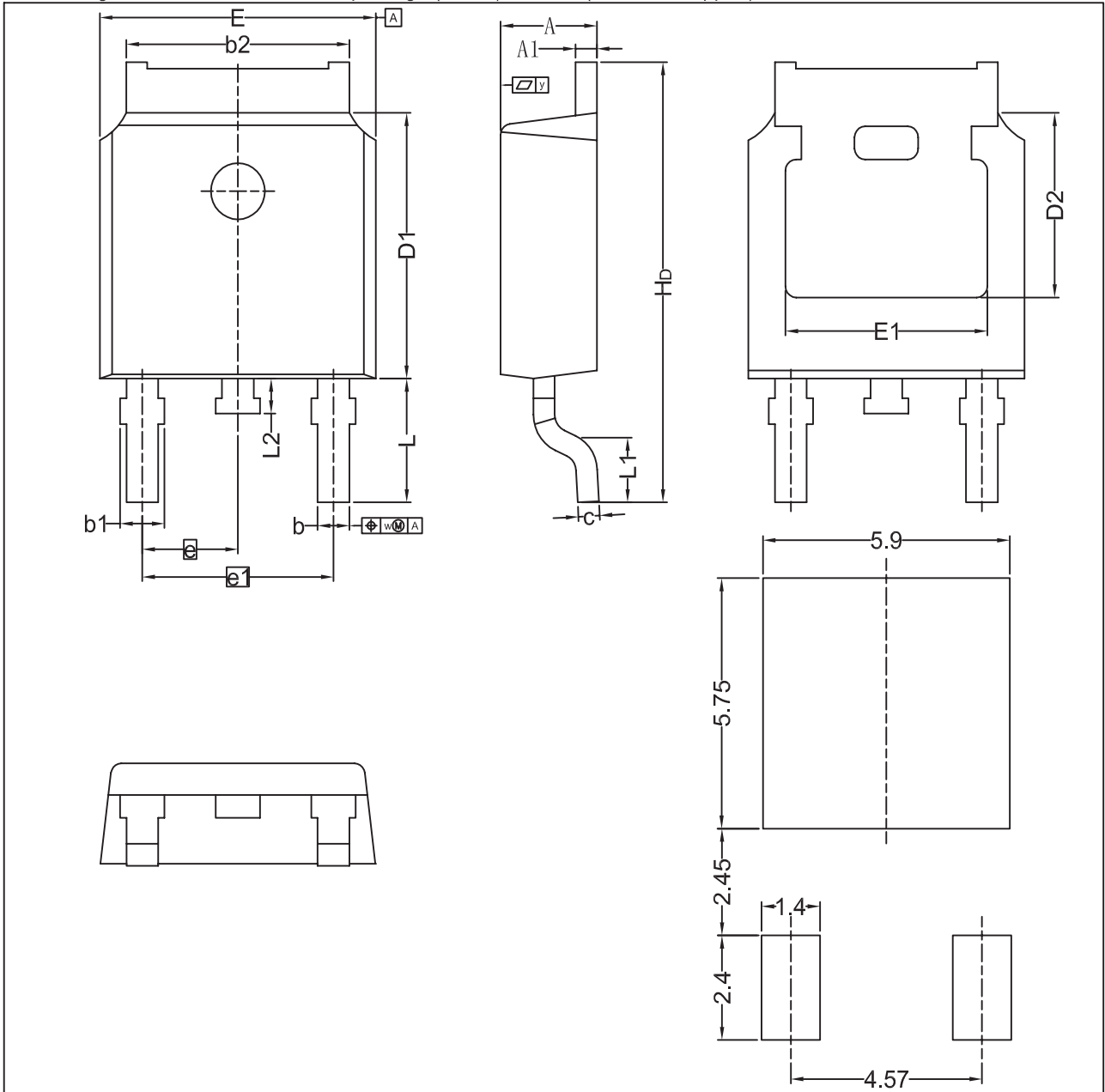
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V_F	forward current	$I_F = 5 \text{ A}; T_j = 25 \text{ }^\circ\text{C};$ per diode; Fig. 6	-	0.95	1.1	V
		$I_F = 10 \text{ A}; T_j = 25 \text{ }^\circ\text{C};$ per diode; Fig. 6	-	1.1	1.25	V
		$I_F = 5 \text{ A}; T_j = 150 \text{ }^\circ\text{C};$ per diode; Fig. 6	-	0.8	0.895	V
I_R	reverse current	$V_R = 200 \text{ V}; T_j = 25 \text{ }^\circ\text{C};$ per diode	-	2	10	μA
		$V_R = 200 \text{ V}; T_j = 100 \text{ }^\circ\text{C};$ per diode	-	0.1	0.2	mA
Dynamic characteristics						
Q_r	reverse charge	$I_F = 2 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 20 \text{ A}/\mu\text{s};$ $T_j = 25 \text{ }^\circ\text{C};$ per diode; Fig. 7	-	4	9	nC
t_{rr}	reverse recovery time	$I_F = 1 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 100 \text{ A}/\mu\text{s};$ $T_j = 25 \text{ }^\circ\text{C};$ per diode; Fig. 7	-	15	25	ns
I_{RM}	peak reverse recovery current	$I_F = 5 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 50 \text{ A}/\mu\text{s};$ $T_j = 25 \text{ }^\circ\text{C};$ per diode; Fig. 7	-	0.5	0.7	A
V_{FR}	forward recovery voltage	$I_F = 1 \text{ A}; dI_F/dt = 10 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C};$ per diode	-	1	-	V



11. Package outline

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

TO252



Recommended Footprint

Unit	A	A1	b	b1	b2	c	D1	D2	E	E1	e	e1	H _D	L	L1	L2	w	y
min	2.22	0.46	0.71	0.72	5.00	0.20	5.98	4.00	6.47	4.45	2.285	4.57	9.60	2.90 (Ref.)	0.50	0.50	0.20	
mm nom																		
max	2.38	0.93	0.89	1.10	5.46	0.56	6.22	---	6.73	---			10.40	---	0.90			0.20

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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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