

1. General description

Ultrafast power diode in a 2-leads TO-220 plastic package.

2. Features and benefits

- Low forward voltage drop
- 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)

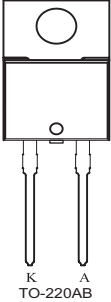

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Values			Unit
Absolute maximum rating						
V_{RRM}	repetitive peak reverse voltage		600			V
$I_{F(AV)}$	average forward current	$\delta = 0.5$; square-wave pulse; $T_{mb} \leq 150$ °C; Fig. 1 ; Fig. 2 ; Fig. 3	9			A
I_{FRM}	repetitive peak forward current	$\delta = 0.5$; $t_p = 25$ μ s; $T_{mb} \leq 150$ °C; square-wave pulse	18			A
I_{FSM}	non-repetitive peak forward current	$t_p = 10$ ms; $T_{j(init)} = 25$ °C; sine-wave pulse; Fig. 4	120			A
		$t_p = 8.3$ ms; $T_{j(init)} = 25$ °C; sine-wave pulse;	132			A
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V_F	forward voltage	$I_F = 8$ A; $T_j = 25$ °C; Fig. 6	-	1.05	1.3	V
		$I_F = 8$ A; $T_j = 150$ °C; Fig. 6	-	0.9	1.1	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; Fig. 7	-	40	75	ns

5. Pinning information

Table 2. Pinning information

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

6. Ordering information

Table 3. Ordering information

Type number	Package		Version
	Name	Description	
BYV29-600P	TO-220AB	plastic single-ended package; heatsink mounted; 1 mounting hole; 2-leads TO-220AB	TO-220AB

7. Marking

Table 4. Marking codes

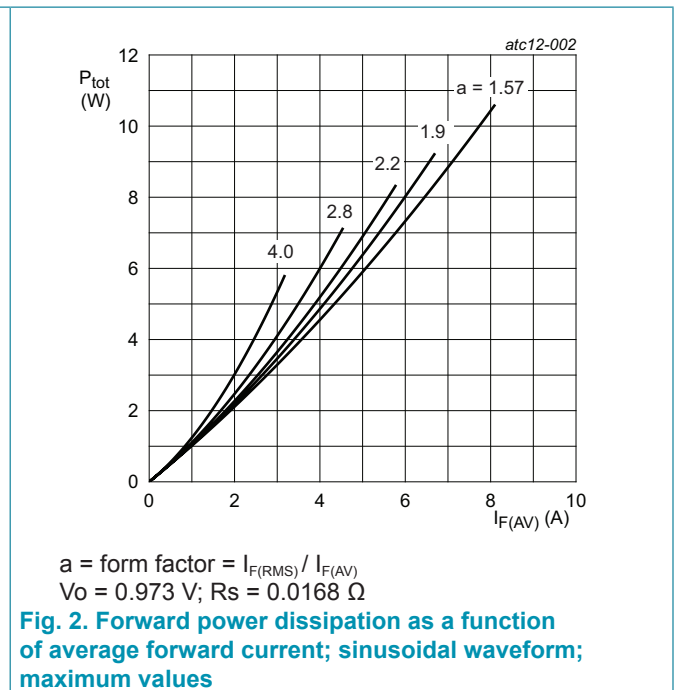
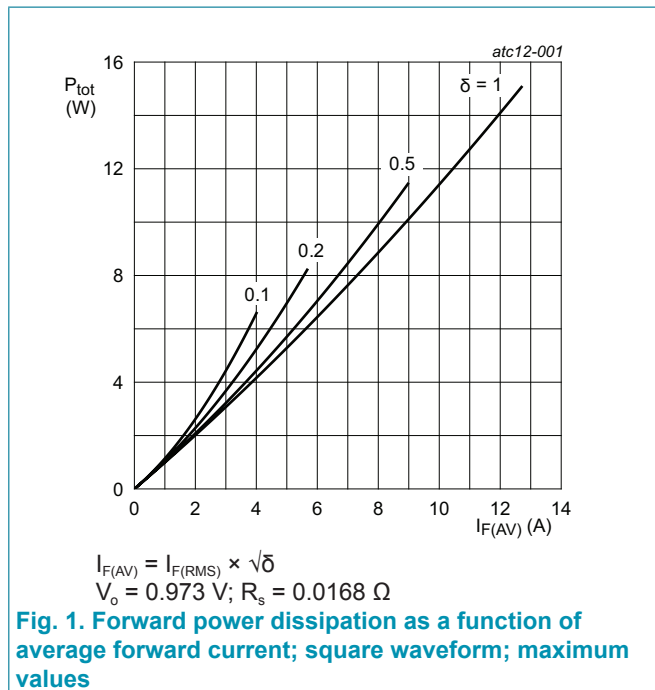
Type number	Marking codes
BYV29-600P	BYV29-600P

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; $T_{mb} \leq 150\text{ }^\circ\text{C}$; Fig. 1 ; Fig. 2 ; Fig. 3	9	A
I_{FRM}	repetitive peak forward current	$\delta = 0.5$; $t_p = 25\text{ }\mu\text{s}$; $T_{mb} \leq 150\text{ }^\circ\text{C}$; square-wave pulse	18	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; Fig. 4	120	A
		$t_p = 8.3\text{ ms}$; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$; sine-wave pulse;	132	A
T_{stg}	storage temperature		-55 to 175	$^\circ\text{C}$
T_j	junction temperature		175	$^\circ\text{C}$



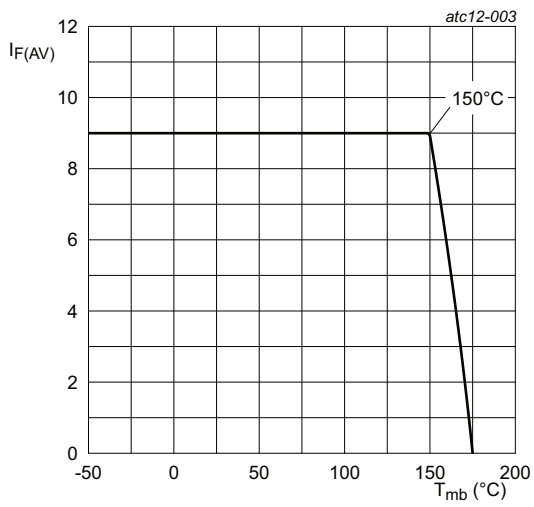


Fig. 3. Forward current as a function of mounting base temperature; maximum values

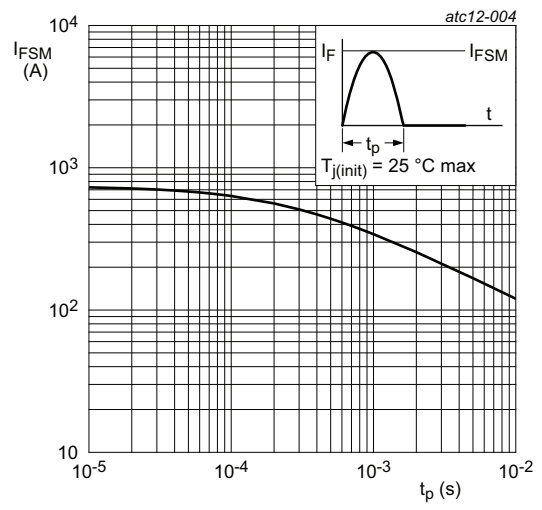


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values

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	-	55	-	K/W

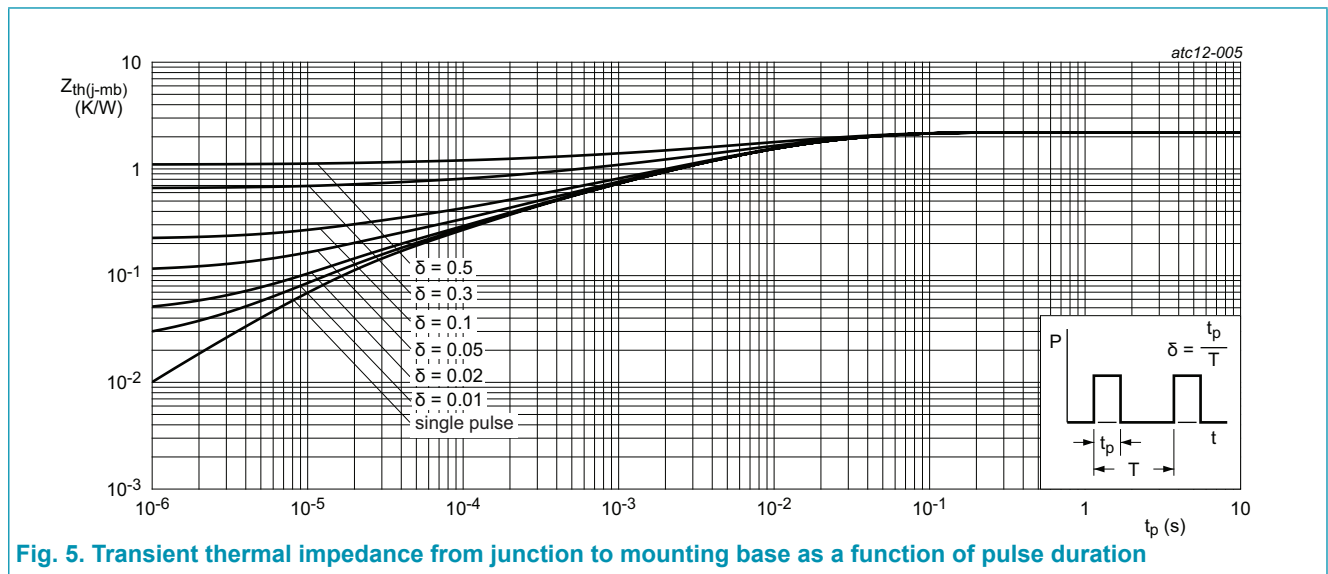
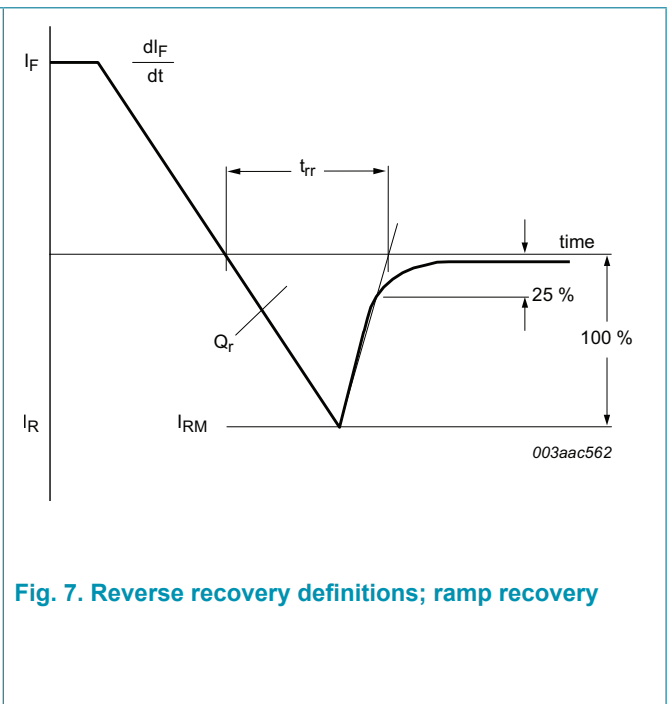
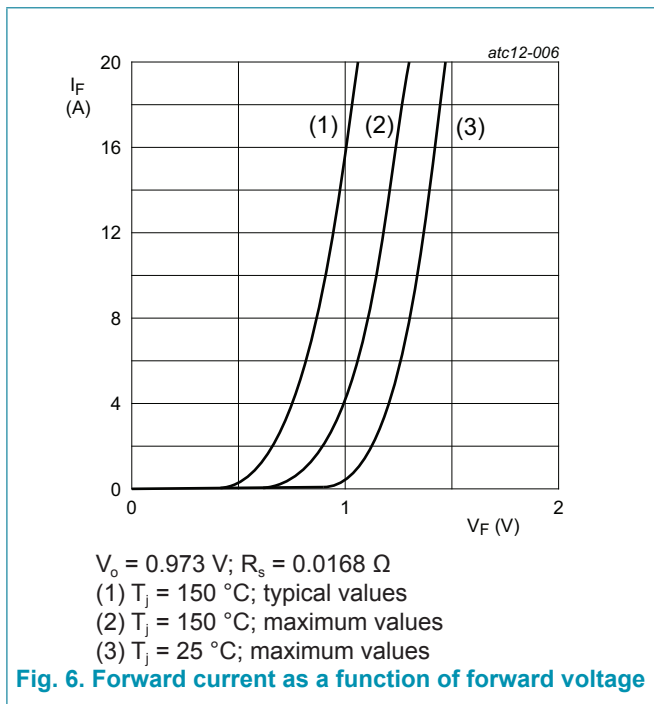


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration

10. Characteristics

Table 7. Characteristics

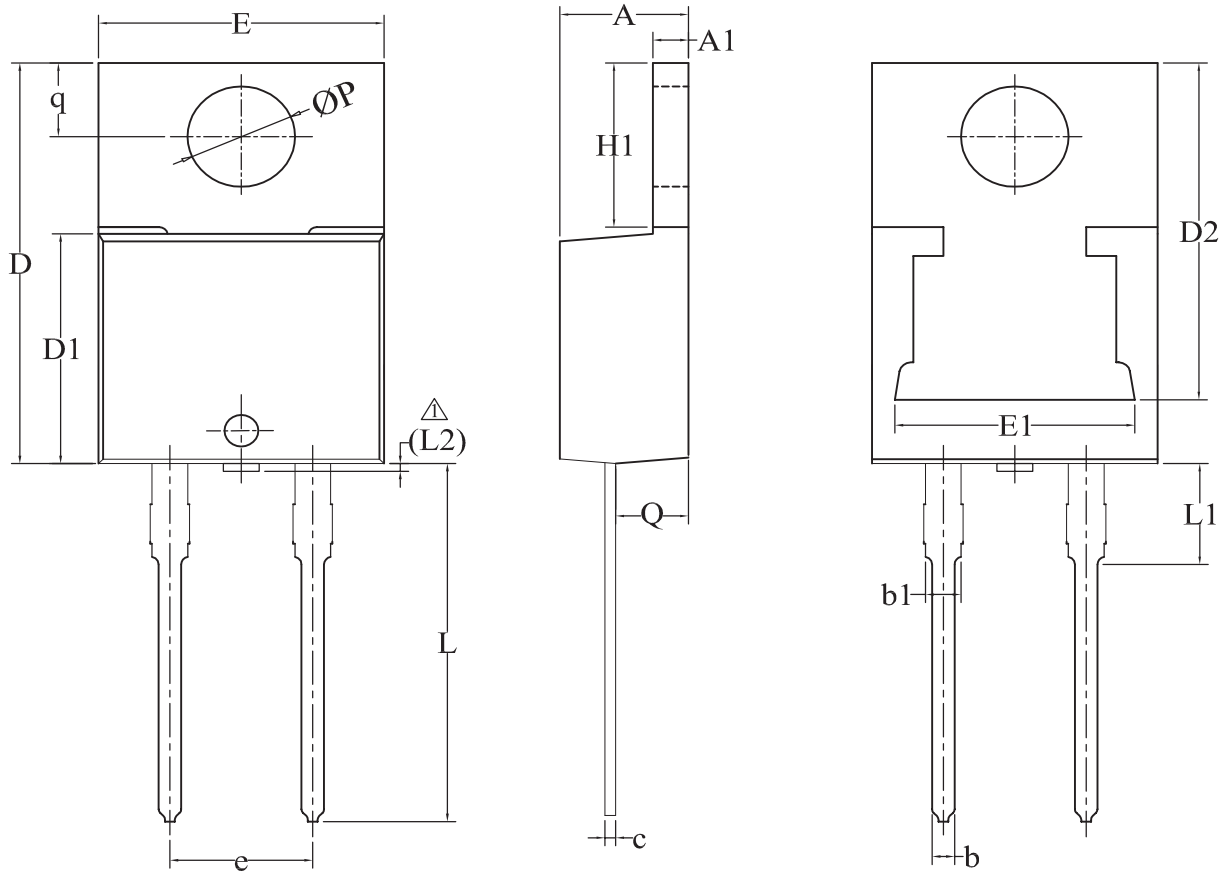
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V_F	forward current	$I_F = 8 \text{ A}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 6}$	-	1.05	1.3	V
		$I_F = 8 \text{ A}; T_j = 150 \text{ }^\circ\text{C}; \text{ Fig. 6}$	-	0.9	1.1	V
I_R	reverse current	$V_R = 600 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$	-	-	10	μA
		$V_R = 600 \text{ V}; T_j = 150 \text{ }^\circ\text{C}$	-	-	0.4	mA
Dynamic characteristics						
Q_r	reverse charge	$I_F = 1 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 100 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 7}$	-	55	-	nC
t_{rr}	reverse recovery time	$I_F = 1 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 100 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 7}$	-	40	75	ns
I_{RM}	peak reverse recovery current	$I_F = 1 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 50 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 7}$	-	1.9	-	A
		$I_F = 1 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 100 \text{ A}/\mu\text{s}; T_j = 25 \text{ }^\circ\text{C}; \text{ Fig. 7}$	-	2.8	-	A



11. Package outline

Plastic single-ended package; heatsink mounted; 1 mounting hole; 2 leads TO-220AB

TO220-2L



Unit	A	A1	b	b1	c	D	D1	D2	E	E1	e	H1	L	L1	L2	P	Q	q
MM	min	4.35	1.14	0.69	1.08	0.36	14.95	8.50	12.20	10.00	8.25	6.00	13.00	3.40		3.70	2.40	2.60
	max	4.75	1.40	1.01	1.67	0.61	15.55	9.02	12.88	10.40	8.89	5.08 (BSC)	6.40	14.00	3.80	0.35	3.95	2.80

Notes:
 ▲ L2 protrusion is the mold resin not metal.

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.
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