NXP BYV10-600P diode datasheet

http://www.manuallib.com/nxp/byv10-600p-diode-datasheet.html

Ultrafast power diode in a SOD59 (2-lead TO-220AC) plastic package.

BYV10-600P

Ultrafast power diode

3 January 2014 **Product data sheet**

1. General description

Ultrafast power diode in a SOD59 (2-lead TO-220AC) plastic package.

2. Features and benefits

- Fast switching
- Low leakage current
- Low forward voltage drop
- Low thermal resistance
- Soft recovery characteristic

3. Applications

- High frequency switched-mode power supplies
- Discontinuous Current Mode (DCM) Power Factor Correction (PFC)

4. Quick reference data

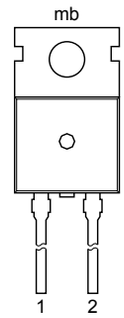
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{RRM}	repetitive peak reverse voltage			-	-	600	V
$I_{F(AV)}$	average forward current	δ = 0.5 ; T_{mb} ≤ 109 °C; square-wave pulse; Fig. 1; Fig. 2; Fig. 3		-	-	10	A
Static characteristics							
V_F	forward voltage	I_F = 10 A; T_j = 150 °C; Fig. 6		-	-	1.6	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		-	20	-	ns

Scan or click this QR code to view the latest information for this product

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode	 **TO-220AC (SOD59)**	
2	A	anode		
mb	mb	mounting base; connected to cathode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BYV10-600P	TO-220AC	plastic single-ended package; heatsink mounted; 1 mounting hole; 2-lead TO-220AC	SOD59

7. Marking

Table 4. Marking codes

Type number	Marking code
BYV10-600P	BYV10-600P

8. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	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	$\delta = 0.5$; $T_{mb} \leq 109$ °C; square-wave pulse; Fig. 1; Fig. 2; Fig. 3		-	10	A
I_{FRM}	repetitive peak forward current	$\delta = 0.5$; $t_p = 25$ µs; $T_{mb} \leq 109$ °C; square-wave pulse		-	20	A

Symbol	Parameter	Conditions		Min	Max	Unit
I_{FSM}	non-repetitive peak forward current	t_p = 10 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; Fig. 4		-	80	A
		t_p = 8.3 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; Fig. 4		-	88	A
T_{stg}	storage temperature			-65	175	°C
T_j	junction temperature			-	175	°C

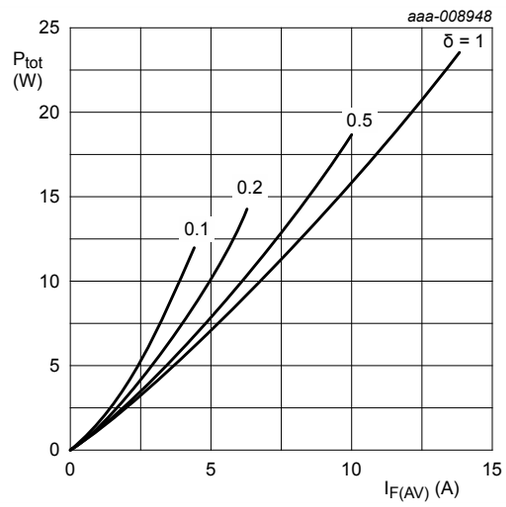


Fig. 1. Forward power dissipation as a function of average forward current; square waveform; maximum values

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

$$V_O = 1.268\ V;\ R_S = 0.031\ \Omega$$

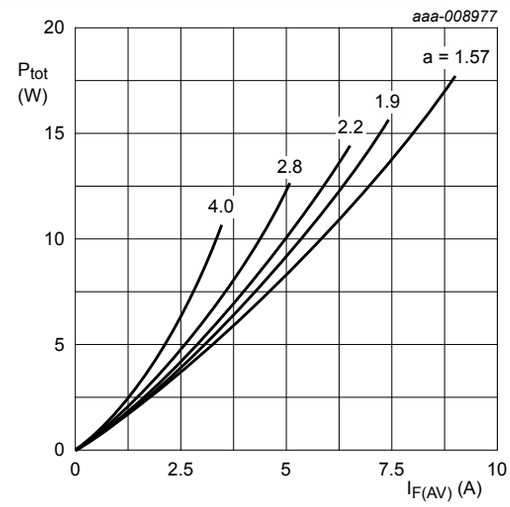


Fig. 2. Forward power dissipation as a function of average forward current; sinusoidal waveform; maximum values

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

$$V_O = 1.268\ V;\ R_S = 0.031\ \Omega$$

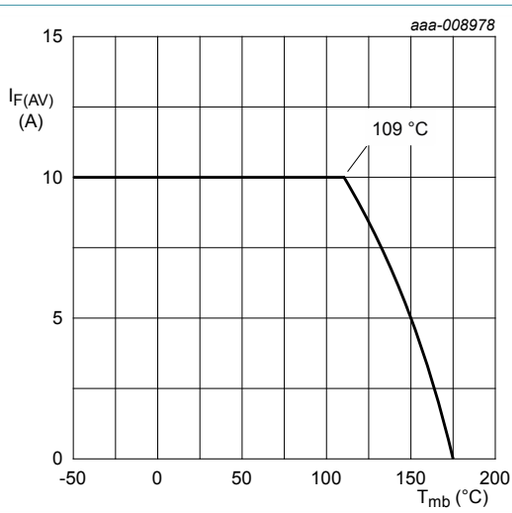


Fig. 3. Forward current as a function of mounting base temperature; maximum values

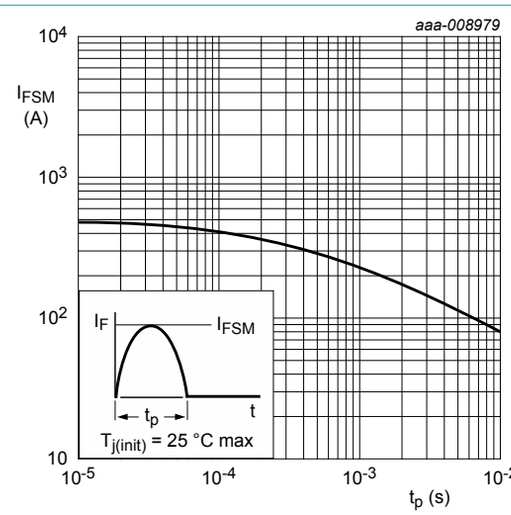


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values

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		-	-	3.5	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air		-	60	-	K/W

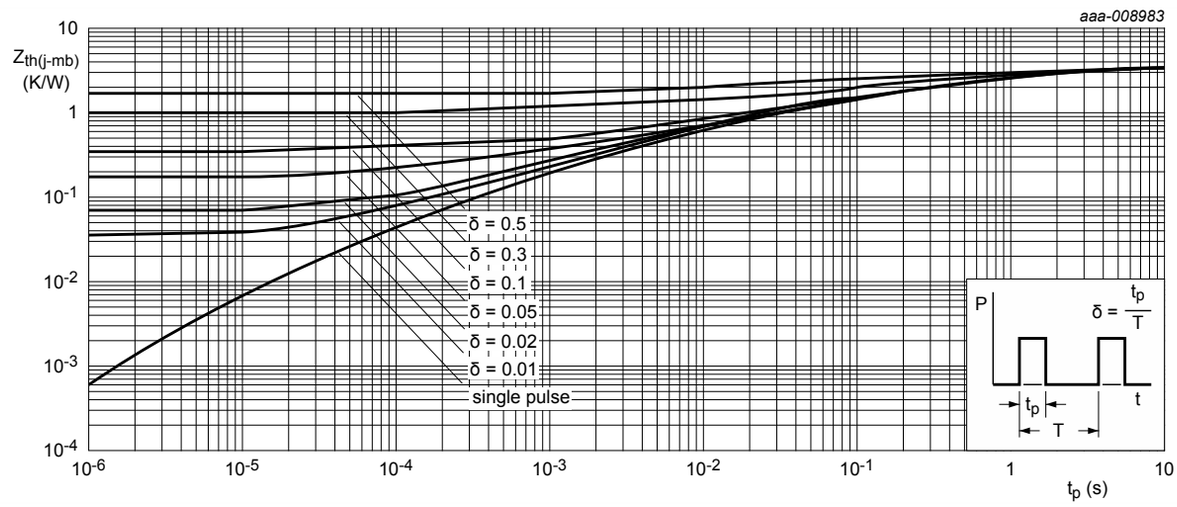


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V_F	forward voltage	I_F = 10 A; T_j = 25 °C; Fig. 6		-	1.5	2	V
		I_F = 10 A; T_j = 150 °C; Fig. 6		-	-	1.6	V
I_R	reverse current	V_R = 600 V; T_j = 25 °C		-	-	10	μA
		V_R = 500 V; T_j = 150 °C		-	-	250	μA
Dynamic characteristics							
t_{rr}	reverse recovery time	I_F = 1 A; V_R = 30 V; dI_F/dt = 50 A/μs; T_j = 25 °C; Fig. 7		-	35	50	ns
		I_F = 1 A; V_R = 30 V; dI_F/dt = 100 A/μs; T_j = 25 °C; Fig. 7		-	20	-	ns

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
		I_F = 10 A; V_R = 200 V; dI_F/dt = 200 A/µs; T_j = 25 °C; Fig. 7		-	40	-	ns

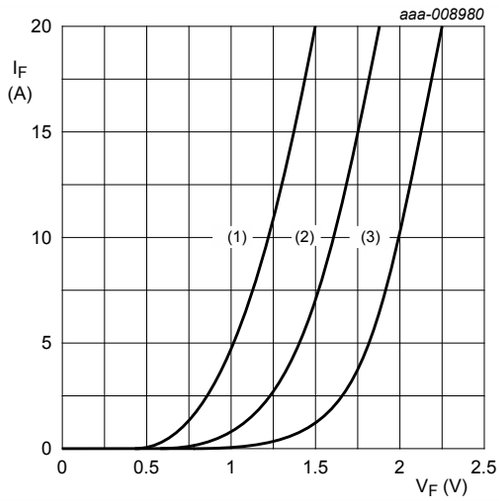


Fig. 6. Forward current as a function of forward voltage

(1) T_j = 150 °C; typical values;
(2) T_j = 150 °C; maximum values;
(3) T_j = 25 °C; maximum values;
V_O = 1.268 V; R_S = 0.031 Ω

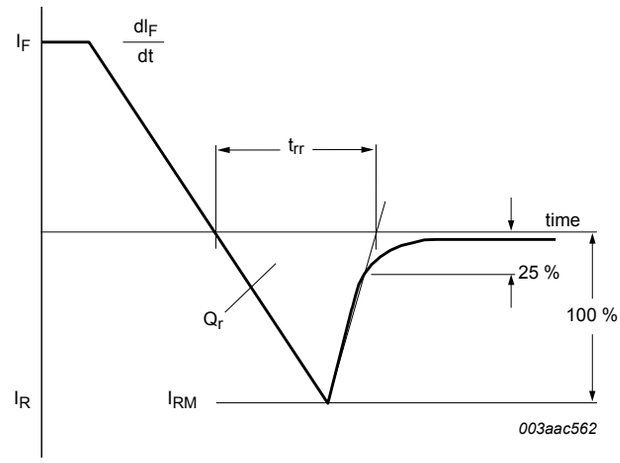
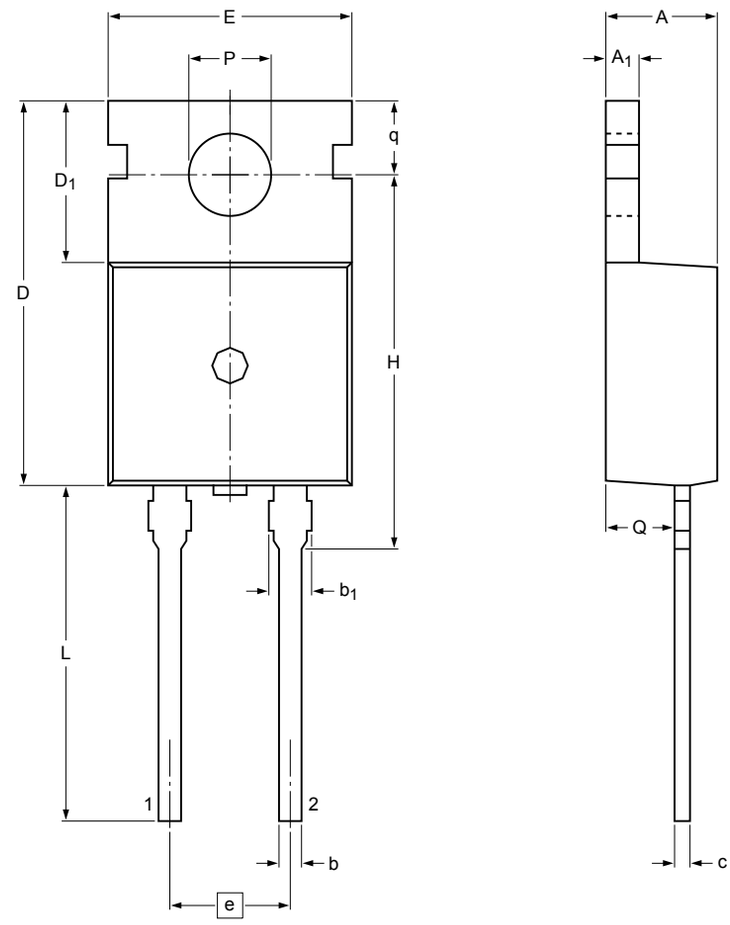


Fig. 7. Reverse recovery definitions; ramp recovery

11. Package outline

Plastic single-ended package; heatsink mounted; 1 mounting hole; 2-lead TO-220AC **SOD59**



0 5 10 mm

scale

Dimensions

Unit		A	A_1	b	b_1[1]	c	D	D_1	E	e	H	L	P	Q	q
mm	max	4.7	1.40	0.95	1.7	0.65	15.8	6.8	10.30	5.08 (REF)	16.25	15.0	3.80	2.6	2.9
	nom														
	min	4.3	1.15	0.70	1.3	0.45	15.6	6.4	9.65		15.70	12.5	3.65	2.2	2.7

Note
1. Protruded dambar are included in the dimension.

sod059_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOD59		2-lead TO-220AC				~~09-08-25~~ 12-11-27

Fig. 8. Package outline TO-220AC (SOD59)

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.
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