BYV430W-300P

Dual ultrafast power diode

1 September 2015 **Product data sheet**

1. General description

2x30A, 300V dual ultrafast power diode in a SOT429 (3-lead TO-247) plastic package.

2. Features and benefits

- Low forward voltage drop
- Fast Switching
- Soft recovery characteristics
- High thermal cycling performance
- Low thermal resistance

3. Applications

- Telecom power supplies
- Welding machines
- Secondary rectification in SMPS

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{RRM}	repetitive peak reverse voltage			-	-	300	V
$I_{F(AV)}$	average forward current	δ = 0.5 ; T_{mb} ≤ 103 °C; square-wave pulse; per diode; Fig. 1; Fig. 2; Fig. 3		-	-	30	A
$I_{O(AV)}$	average output current	δ = 0.5 ; T_{mb} ≤ 103 °C; square-wave pulse; both diodes conducting		-	-	60	A
I_{FRM}	repetitive peak forward current	δ = 0.5 ; t_p = 25 µs; square-wave pulse; per diode		-	-	60	A
I_{FSM}	non-repetitive peak forward current	t_p = 10 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; per diode; Fig. 4		-	-	300	A
		t_p = 8.3 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; per diode; Fig. 4		-	-	330	A
Static characteristics							
V_F	forward voltage	I_F = 30 A; T_j = 25 °C; Fig. 6		-	1	1.25	V
		I_F = 30 A; T_j = 150 °C; Fig. 6		-	0.85	1	V

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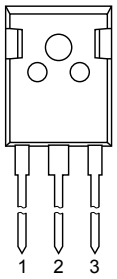
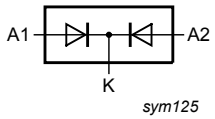
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Dynamic characteristics							
t_{rr}	reverse recovery time	I_F = 1 A; V_R = 30 V; dI_F/dt = 50 A/µs; T_j = 25 °C; Fig. 7		-	-	50	ns
		I_F = 30 A; V_R = 200 V; dI_F/dt = 200 A/µs; T_j = 25 °C; Fig. 7		-	33	-	ns
		I_F = 30 A; V_R = 200 V; dI_F/dt = 200 A/µs; T_j = 125 °C; Fig. 7		-	62	-	ns

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode 1	 TO-247 (SOT429)	
2	K	cathode		
3	A2	anode 2		
mb	K	mounting base; cathode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BYV430W-300P	TO-247	plastic single-ended through-hole package; heatsink mounted; 1 mounting hole; 3 lead TO-247	SOT429

7. Marking

Table 4. Marking codes

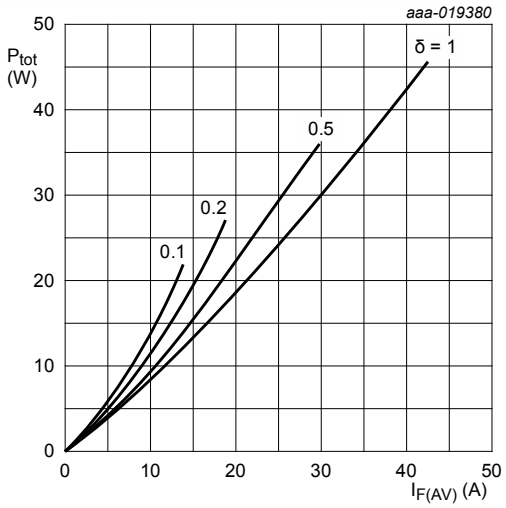
Type number	Marking code
BYV430W-300P	BYV430W-300P

8. Limiting values

Table 5. Limiting values

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

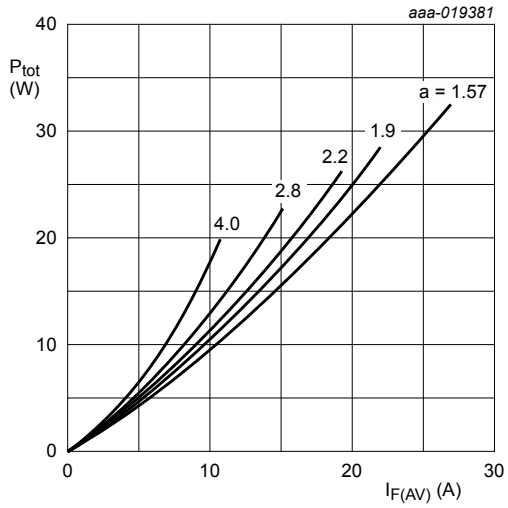
Symbol	Parameter	Conditions		Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage			-	300	V
V_{RWM}	crest working reverse voltage			-	300	V
V_R	reverse voltage	DC		-	300	V
$I_{F(AV)}$	average forward current	δ = 0.5 ; T_{mb} ≤ 103 °C; square-wave pulse; per diode; Fig. 1; Fig. 2; Fig. 3		-	30	A
$I_{O(AV)}$	average output current	δ = 0.5 ; T_{mb} ≤ 103 °C; square-wave pulse; both diodes conducting		-	60	A
I_{FRM}	repetitive peak forward current	δ = 0.5 ; t_p = 25 µs; square-wave pulse; per diode		-	60	A
I_{FSM}	non-repetitive peak forward current	t_p = 10 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; per diode; Fig. 4		-	300	A
		t_p = 8.3 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; per diode; Fig. 4		-	330	A
T_{stg}	storage temperature			-55	175	°C
T_j	junction temperature			-	175	°C



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

V_o = 0.817 V; R_s = 0.006 Ω

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



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

V_o = 0.817 V; R_s = 0.006 Ω

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

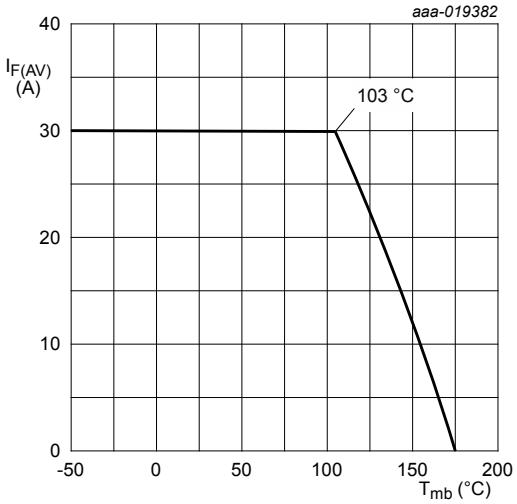


Fig. 3. Average forward current as a function of mounting base temperature; per diode; maximum values

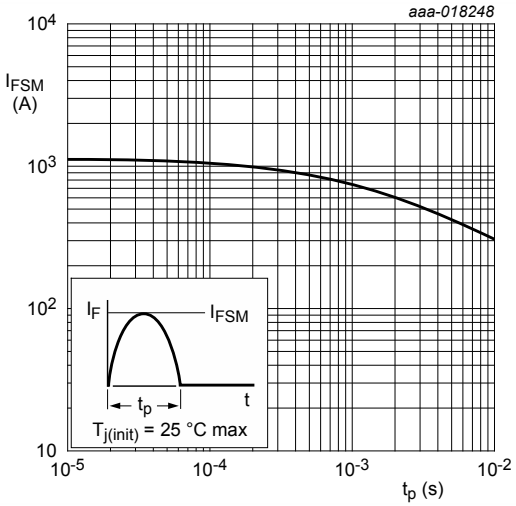


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; per diode; maximum values

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	with heatsink compound; per diode; Fig. 5		-	0.8	2	K/W
		with heatsink compound; both diodes conducting		-	-	1.2	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air		-	45	-	K/W

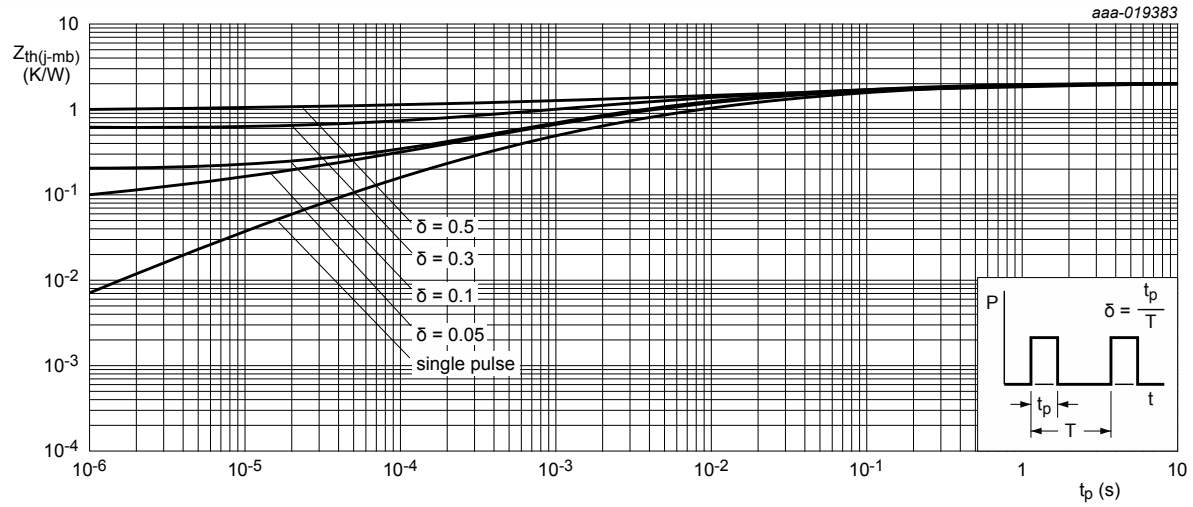
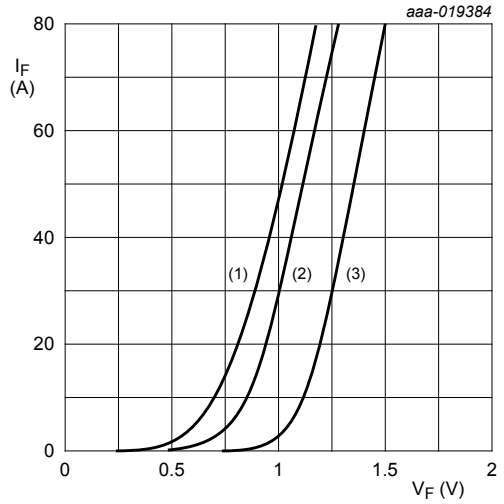


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration; per diode; maximum values

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V_F	forward voltage	I_F = 30 A; T_j = 25 °C; Fig. 6		-	1	1.25	V
		I_F = 30 A; T_j = 150 °C; Fig. 6		-	0.85	1	V
I_R	reverse current	V_R = 300 V; T_j = 25 °C		-	0.4	10	µA
		V_R = 300 V; T_j = 150 °C		-	-	500	µA
Dynamic characteristics							
Q_r	recovered charge	I_F = 30 A; V_R = 200 V; dI_F/dt = 200 A/µs; T_j = 25 °C; Fig. 7		-	89	-	nC
		I_F = 30 A; V_R = 200 V; dI_F/dt = 200 A/µs; T_j = 125 °C; Fig. 7		-	337	-	nC
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		-	-	50	ns
		I_F = 30 A; V_R = 200 V; dI_F/dt = 200 A/µs; T_j = 25 °C; Fig. 7		-	33	-	ns
		I_F = 30 A; V_R = 200 V; dI_F/dt = 200 A/µs; T_j = 125 °C; Fig. 7		-	62	-	ns
I_{RM}	peak reverse recovery current	I_F = 30 A; V_R = 200 V; dI_F/dt = 200 A/µs; T_j = 25 °C; Fig. 7		-	5.3	-	A
		I_F = 30 A; V_R = 200 V; dI_F/dt = 200 A/µs; T_j = 125 °C; Fig. 7		-	10.5	-	A



V_o = 0.817 V; R_s = 0.006 Ω

(1) T_j = 150 °C; typical values

(2) T_j = 150 °C; maximum values

(3) T_j = 25 °C; maximum values

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

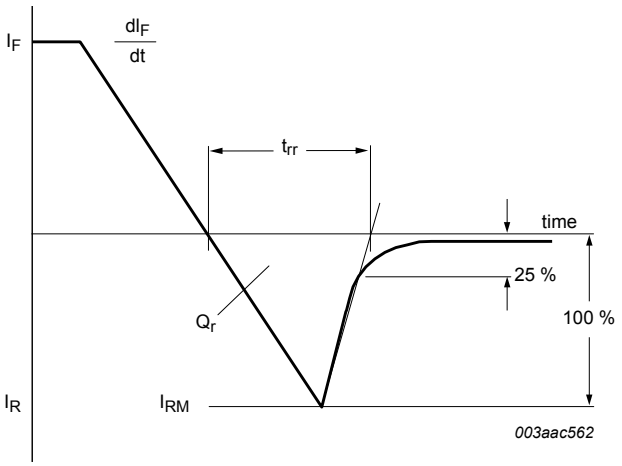
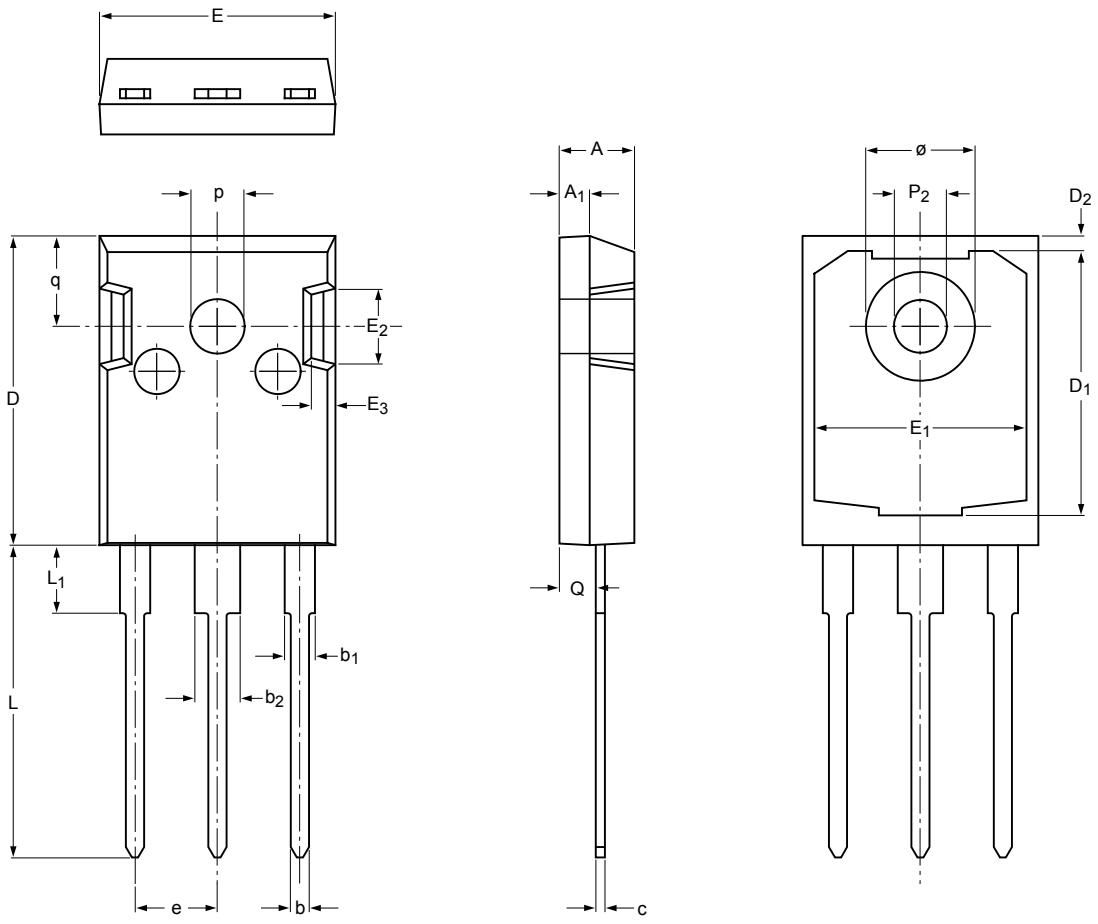


Fig. 7. Reverse recovery definitions; ramp recovery

11. Package outline

Plastic single-ended through-hole package; heatsink mounted; 1 mounting hole; 3-lead TO-247 **SOT429**



Dimensions (mm are the original dimensions)

Unit[1]		A	A_1	b	b_1	b_2	c	D	D_1	D_2	E	E_1	E_2	E_3	e[1]	L	L_1	P_2	p	Q	q	ø
mm	max	5.20	2.10	1.40	2.20	3.20	0.70	20.6	17.68	1.20	15.75	14.22	5.20	1.80		20.90	4.75	3.60	3.70	2.60	6.18	7.30
	nom														5.45							
	min	4.70	1.90	1.00	1.80	2.80	0.50	20.3	17.28	0.80	15.45	13.82	4.80	1.40		20.40	4.25	3.40	3.50	2.20	5.78	7.10

Note
1. Basic spacing between centers.

sot429_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT429		TO-247				~~04-09-14~~ 13-03-25

Fig. 8. Package outline TO-247 (SOT429)

12. Legal information

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