

1. General description

Dual ultrafast power diode in a SOT429 (3-lead TO-247) plastic package.

2. Features and benefits

- Very low on-state loss
- Fast switching
- Soft recovery characteristic minimizes power consuming oscillations
- High reverse surge capability
- High thermal cycling performance
- Low thermal resistance

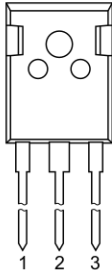
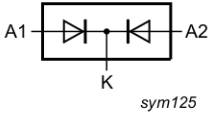
3. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V _R	reverse voltage	DC		-	-	200	V
I _{F(AV)}	average forward current	δ = 0.5 ; T _{mb} ≤ 113 °C; square-wave pulse; per diode; Fig. 1 ; Fig. 2 ; Fig. 3		-	-	15	A
I _{FSM}	non-repetitive peak forward current	t _p = 10 ms; T _{j(init)} = 25 °C; sine-wave pulse; per diode; Fig. 4		-	-	170	A
		t _p = 8.3 ms; T _{j(init)} = 25 °C; sine-wave pulse; per diode		-	-	185	A
Static characteristics							
V _F	forward voltage	I _F = 15 A; T _j = 25 °C; Fig. 6		-	0.95	1.05	V
		I _F = 30 A; T _j = 25 °C; Fig. 6		-	1	1.2	V
		I _F = 15 A; T _j = 150 °C; Fig. 6		-	0.78	0.9	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	28	ns

4. 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		

5. Ordering information

Table 3. Ordering information

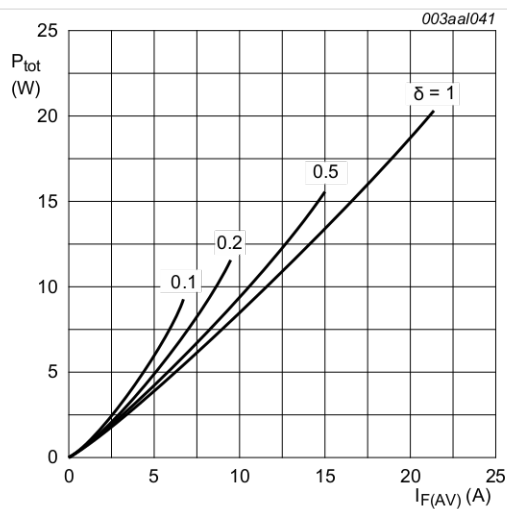
Type number	Package		
	Name	Description	Version
BYV72EW-200	TO-247	plastic single-ended through-hole package; heatsink mounted; 1 mounting hole; 3 lead TO-247	SOT429

6. Limiting values

Table 4. Limiting values

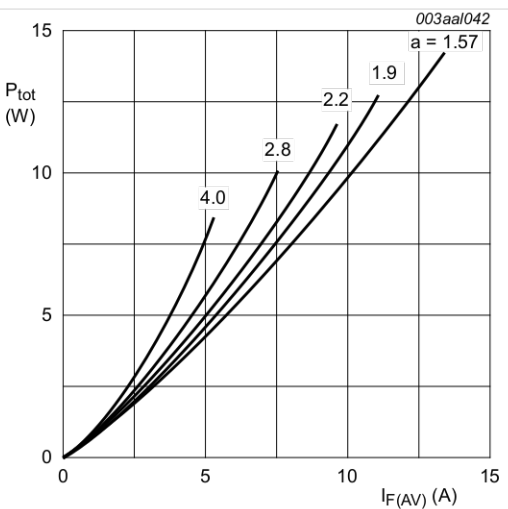
In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions		Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage			-	200	V
V_{RWM}	crest working reverse voltage			-	200	V
V_R	reverse voltage	DC; $T_{mb} \leq 144\text{ °C}$		-	200	V
$I_{F(AV)}$	average forward current	$\delta = 0.5$; $T_{mb} \leq 113\text{ °C}$; square-wave pulse; per diode; Fig. 1 ; Fig. 2 ; Fig. 3		-	15	A
$I_{O(AV)}$	average output current	$\delta = 0.5$; $T_{mb} \leq 104\text{ °C}$; square-wave pulse; both diodes conducting		-	30	A
I_{FSM}	non-repetitive peak forward current	$t_p = 10\text{ ms}$; $T_{j(init)} = 25\text{ °C}$; sine-wave pulse; per diode; Fig. 4		-	170	A
		$t_p = 8.3\text{ ms}$; $T_{j(init)} = 25\text{ °C}$; sine-wave pulse; per diode		-	185	A
I_{RRM}	repetitive peak reverse current	$\delta = 0.001$; $t_p = 2\text{ }\mu\text{s}$; per diode		-	0.2	A
I_{RSM}	non-repetitive peak reverse current	$t_p = 100\text{ }\mu\text{s}$; per diode		-	0.2	A
T_{stg}	storage temperature			-40	150	°C
T_j	junction temperature			-	150	°C
Electrostatic discharge						
V_{ESD}	electrostatic discharge voltage	HBM; $C = 250\text{ pF}$; $R = 1.5\text{ k}\Omega$		-	8	kV



$$I_{F(AV)} = I_{F(RMS)} \times \sqrt{\delta}$$
$$V_o = 0.744 \text{ V}; R_s = 0.010 \text{ } \Omega$$

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



$$a = \text{form factor} = I_{F(RMS)} / I_{F(AV)}$$
$$V_o = 0.744 \text{ V}; R_s = 0.010 \text{ } \Omega$$

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

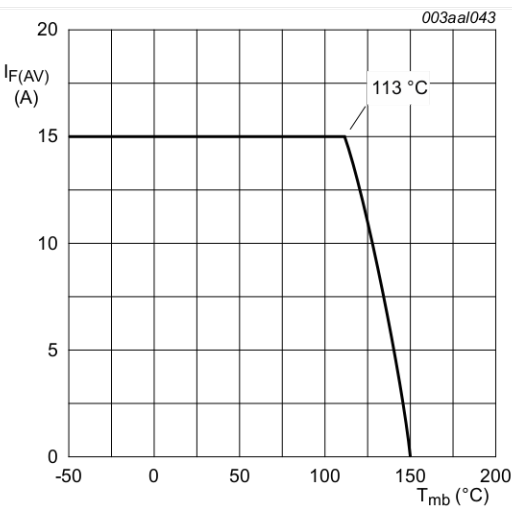


Fig. 3. Average forward current as a function of mounting base temperature; per diode; maximum values

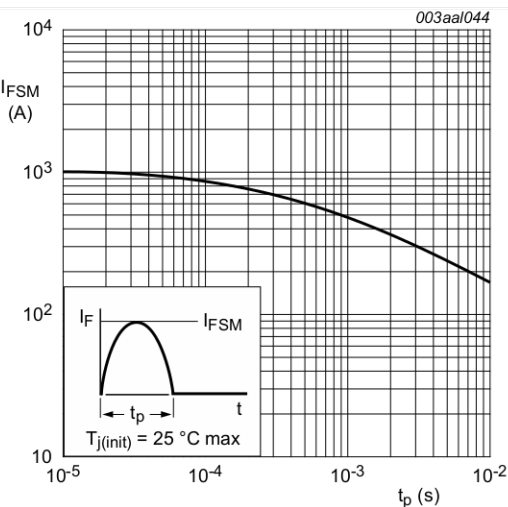


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; per diode; maximum values

7. Thermal characteristics

Table 5. 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	-	-	2.4	K/W
		with heatsink compound; both diodes conducting	-	-	1.4	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air	-	45	-	K/W

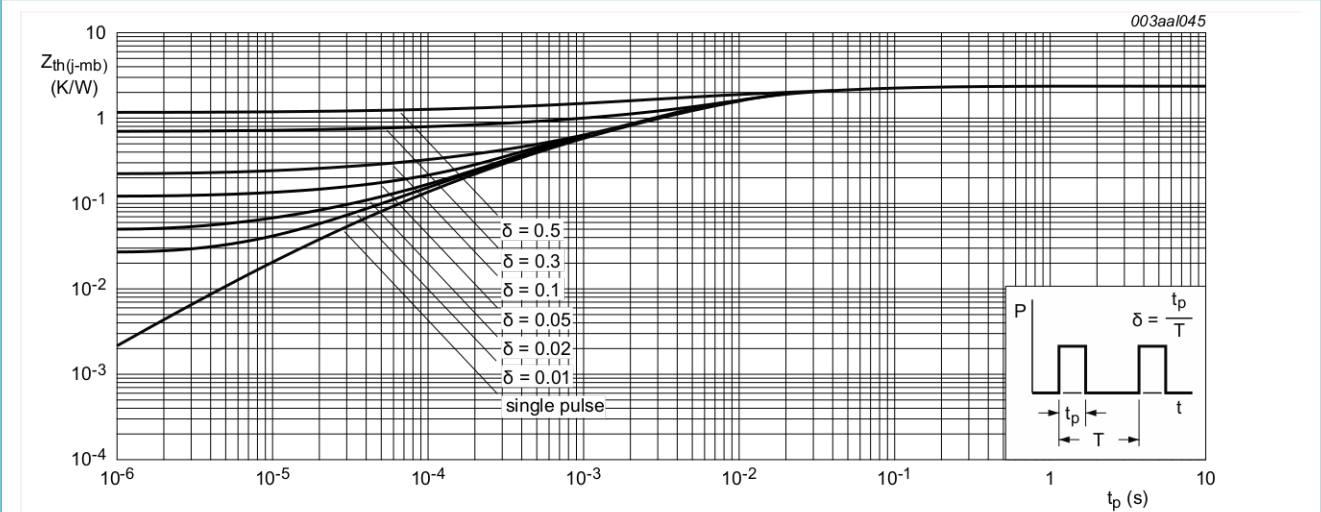
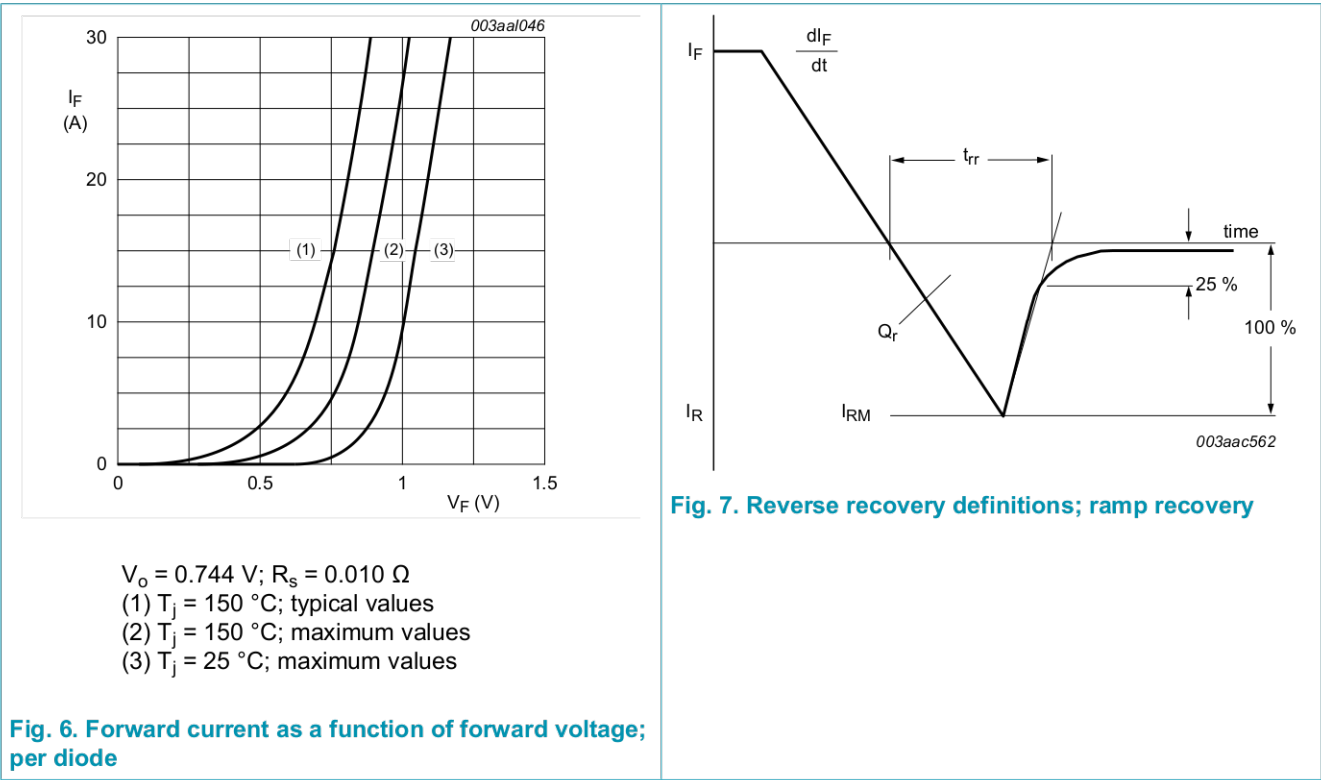


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse width; per diode; maximum values

8. Characteristics

Table 6. Characteristics
characteristics are per diode unless otherwise stated

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V _F	forward voltage	I _F = 15 A; T _j = 25 °C; Fig. 6		-	0.95	1.05	V
		I _F = 30 A; T _j = 25 °C; Fig. 6		-	1	1.2	V
		I _F = 15 A; T _j = 150 °C; Fig. 6		-	0.78	0.9	V
I _R	reverse current	V _R = 200 V; T _j = 25 °C		-	10	100	μA
		V _R = 200 V; T _j = 100 °C		-	0.5	1	mA
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	28	ns
Q _r	recovered charge	I _F = 2 A; V _R = 30 V; dI _F /dt = 20 A/μs; T _j = 25 °C; Fig. 7		-	6	15	nC
V _{FR}	forward recovery voltage	I _F = 1 A; dI _F /dt = 10 A/μs; T _j = 25 °C; Fig. 8		-	1	-	V



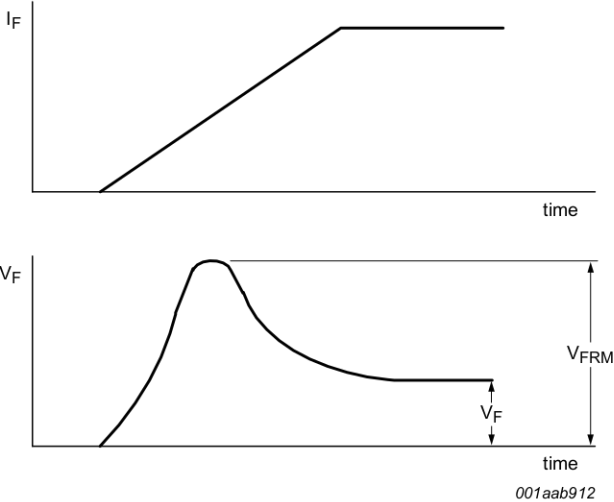
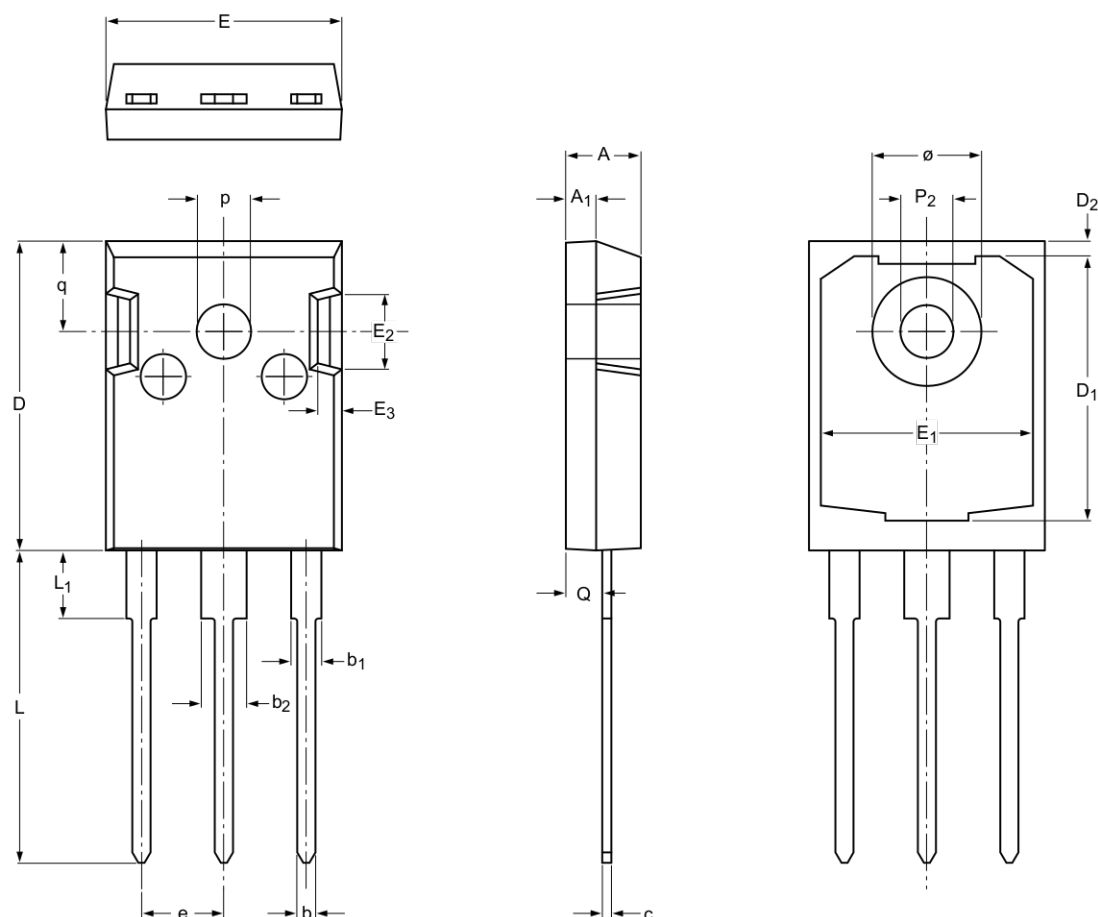


Fig. 8. Forward recovery definitions

9. Package outline

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

SOT429



A horizontal scale bar with a vertical tick mark at the left end labeled '0' and another at the right end labeled '20 mm'. There are 20 equal intervals between the ends, each marked with a vertical tick. The word 'scale' is centered below the bar.

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	5.45	20.90	4.75	3.60	3.70	2.60	6.18	7.30
	nom 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. 9. Package outline TO-247 (SOT429)

10. Legal information

Data sheet status

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.

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
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Date of release: 26 September 2018