

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

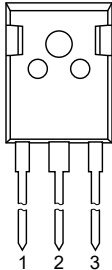
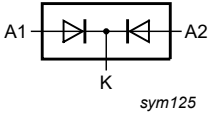
3. Quick reference data

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)	 sym125
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

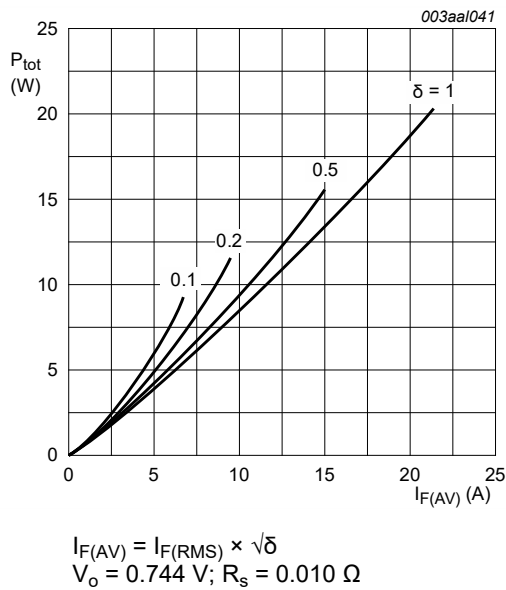


Fig. 1. Forward power dissipation as a function of average forward current; square waveform; per diode; maximum values

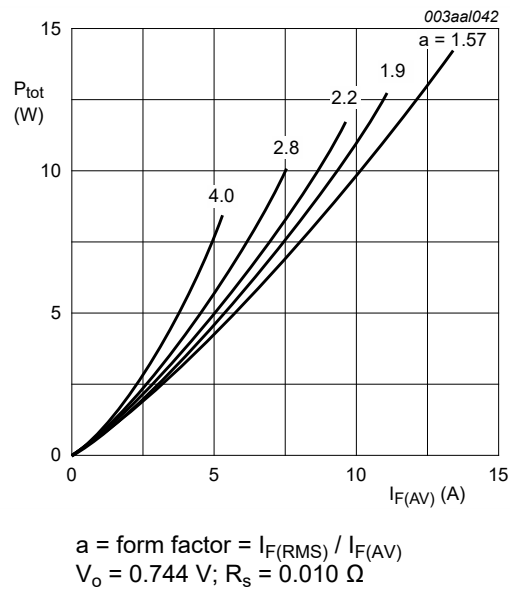


Fig. 2. Forward power dissipation as a function of average forward current; sinusoidal waveform; per diode; maximum values

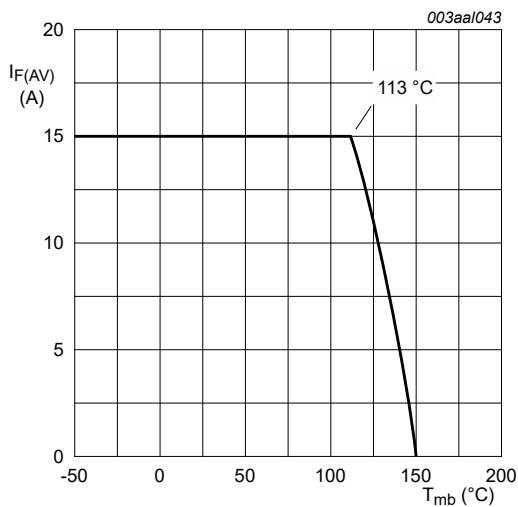


Fig. 3. Average forward current as a function of mounting base temperature; per diode; maximum values

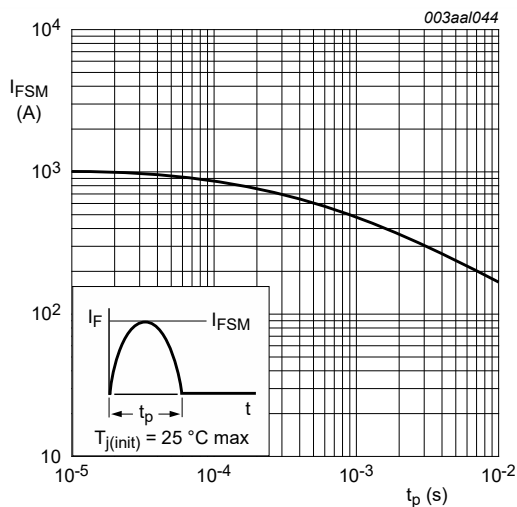


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; per diode; maximum values

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

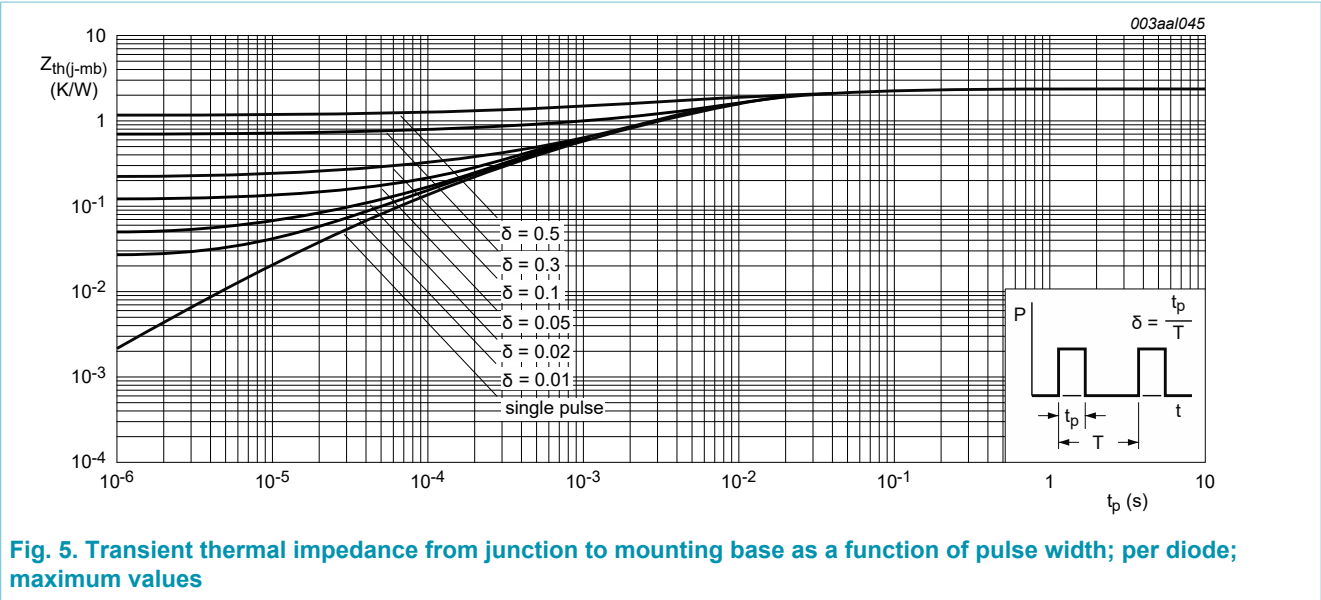
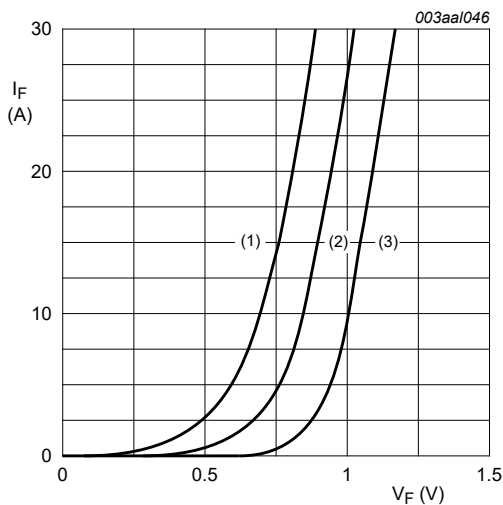


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse width; per diode; maximum values

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



V_o = 0.744 V; R_s = 0.010 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

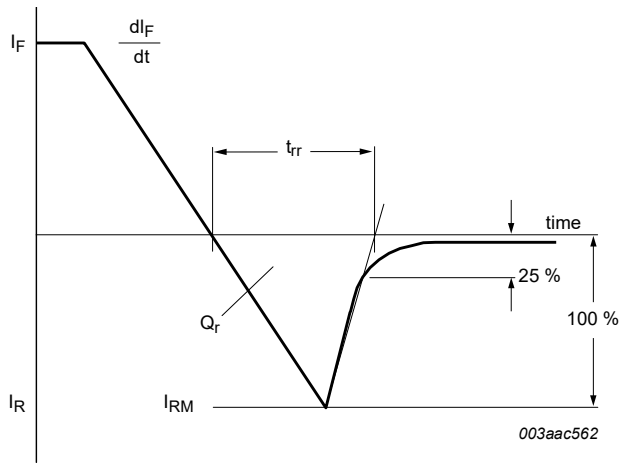


Fig. 7. Reverse recovery definitions; ramp recovery

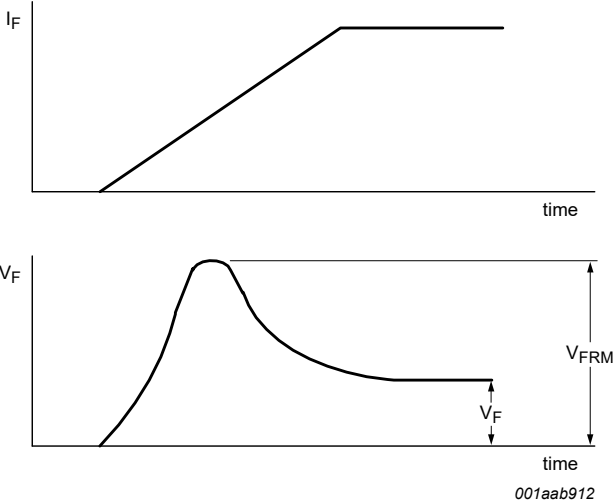


Fig. 8. Forward recovery definitions

9. Package outline

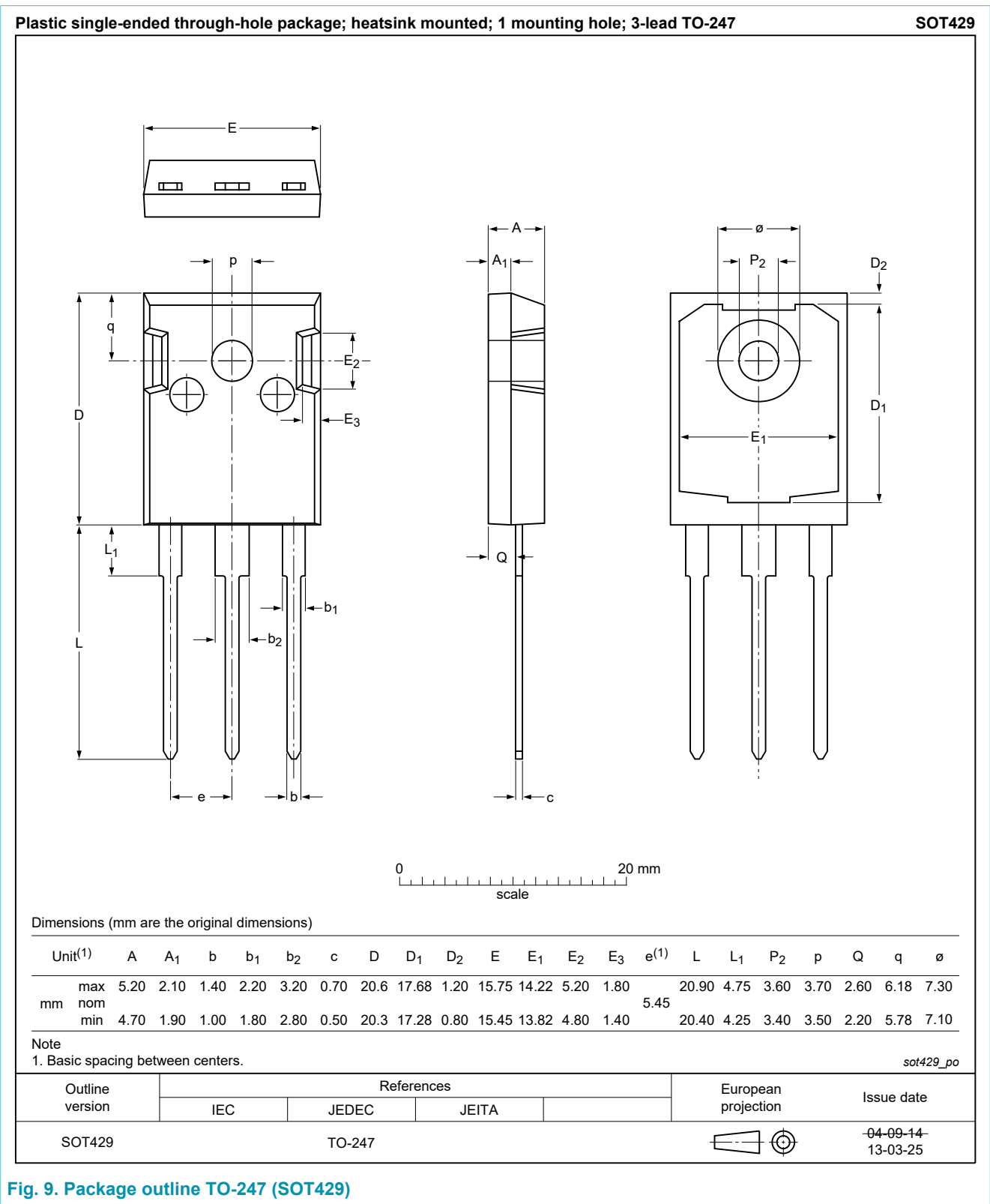


Fig. 9. Package outline TO-247 (SOT429)

10. 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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11. Contents

1. General description..... 1

2. Features and benefits..... 1

3. Quick reference data..... 1

4. Pinning information..... 2

5. Ordering information..... 2

6. Limiting values..... 3

7. Thermal characteristics..... 5

8. Characteristics..... 6

9. Package outline..... 8

10. Legal information..... 9

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