**Product data sheet** 

# 1. General description

2x30A, 300V Dual ultrafast power diode in a SOT1259 (3-lead TO-3P) 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	Тур	Max	Unit
$V_{RRM}$	repetitive peak reverse voltage			-	-	300	V
I <sub>F(AV)</sub>	average forward current	$\delta$ = 0.5 ; T <sub>mb</sub> ≤ 105 °C; square-wave pulse; Fig. 1; Fig. 2; Fig. 3		-	-	30	А
I <sub>O(AV)</sub>	average output current	$\delta$ = 0.5 ; T <sub>mb</sub> ≤ 105 °C; square-wave pulse; both diodes conducting		-	-	60	А
I <sub>FRM</sub>	repetitive peak forward current	$\delta$ = 0.5 ; $t_p$ = 25 $\mu$ s; $T_{mb} \le$ 105 °C; square-wave pulse		-	-	60	А
I <sub>FSM</sub>	non-repetitive peak forward current	$t_p$ = 10 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; per diode; Fig. 4		-	-	300	А
		$t_p$ = 8.3 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; per diode; Fig. 4		-	-	330	А
Static charact	Static characteristics						
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 30 A; T <sub>j</sub> = 25 °C; <u>Fig. 6</u>		-	1	1.25	V
		I <sub>F</sub> = 30 A; T <sub>j</sub> = 150 °C; <u>Fig. 6</u>		-	0.85	1	V





Symbol	Parameter	Conditions		Min	Тур	Max	Unit
Dynamic characteristics							
t <sub>rr</sub> rev	reverse recovery time	$I_F = 1 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 50 \text{ A/}\mu\text{s};$ $T_j = 25 \text{ °C}; Fig. 7$		-	-	55	ns
		$I_F = 30 \text{ A}; V_R = 200 \text{ V}; dI_F/dt = 200 \text{ A}/$ $\mu$ s; $T_j = 25 ^{\circ}\text{C}; Fig. 7$		-	33	-	ns
		$I_F = 30 \text{ A}; V_R = 200 \text{ V}; dI_F/dt = 200 \text{ A}/$ $\mu$ s; $T_j = 125 \text{ °C}; Fig. 7$		-	62	-	ns

# 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode 1		A1 A2
2	K	cathode	10000	\(\begin{align*} VI \ IV \
3	A2	anode 2		sym125
mb	mb	mounting base; connected to cathode		
			TO3P (SOT1259)	

# 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BYV430K-300P	ТОЗР	Plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO3P	SOT1259

# 7. Marking

Table 4. Marking codes

Type number	Marking code
BYV430K-300P	BYV430K-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 <sub>R</sub>	reverse voltage	DC	-	300	V
I <sub>F(AV)</sub>	average forward current	$\delta$ = 0.5 ; T <sub>mb</sub> ≤ 105 °C; square-wave pulse; <u>Fig. 1</u> ; <u>Fig. 2</u> ; <u>Fig. 3</u>	-	30	Α
I <sub>O(AV)</sub>	average output current	$\delta$ = 0.5 ; T <sub>mb</sub> ≤ 105 °C; square-wave pulse; both diodes conducting	-	60	А
I <sub>FRM</sub>	repetitive peak forward current	$\delta$ = 0.5 ; t <sub>p</sub> = 25 μs; T <sub>mb</sub> ≤ 105 °C; square-wave pulse	-	60	Α
I <sub>FSM</sub>	non-repetitive peak forward current	$t_p$ = 10 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; per diode; Fig. 4	-	300	Α
		$t_p$ = 8.3 ms; $T_{j(init)}$ = 25 °C; sine-wave pulse; per diode; Fig. 4	-	330	Α
T <sub>stg</sub>	storage temperature		-55	175	°C
T <sub>j</sub>	junction temperature		-	175	°C

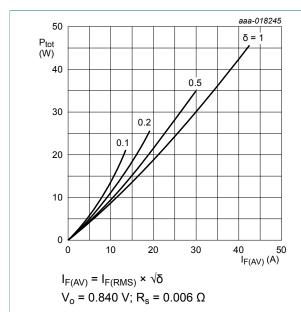


Fig. 1. Forward power dissipation as a function of average forward current; square waveform; per diode; maximum values

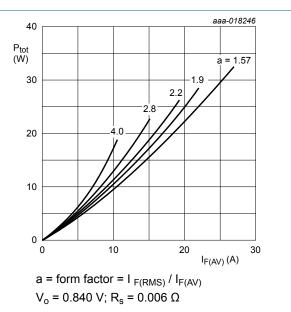


Fig. 2. Forward power dissipation as a function of average forward current; sinusoidal waveform; per diode; maximum values

NXP Semiconductors BYV430K-300P

### **Dual ultrafast power diode**

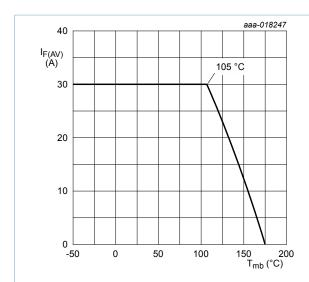


Fig. 3. Average forward current as a function of mounting base temperature; per diode; maximum values

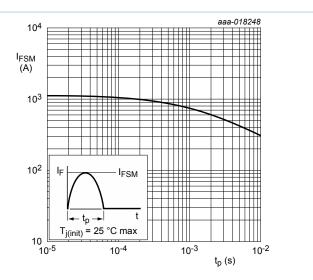
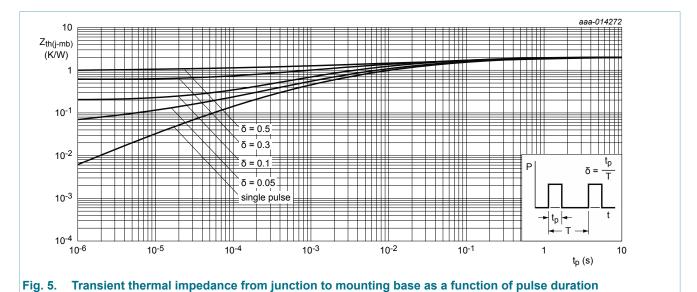


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; per diode; maximum values

## 9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
R <sub>th(j-mb)</sub> thermal resistance from junction to mounting base	from junction to	with heatsink compound; per diode; Fig. 5	-	8.0	2	K/W
	with heatsink compound; both diodes conducting	-	-	1.2	K/W	
R <sub>th(j-a)</sub>	thermal resistance from junction to ambient free air	in free air	-	45	-	K/W



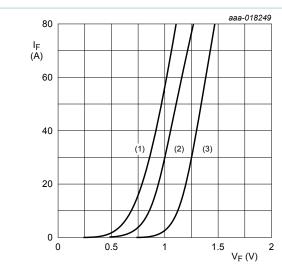
# 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
	characteristics general note	characteristics are per diode unless otherwise stated	-	-	-	
Static chara	acteristics		,			
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 30 A; T <sub>j</sub> = 25 °C; <u>Fig. 6</u>	-	1	1.25	V
		I <sub>F</sub> = 30 A; T <sub>j</sub> = 150 °C; <u>Fig. 6</u>	-	0.85	1	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 300 V; T <sub>j</sub> = 25 °C	-	0.4	10	μA
		V <sub>R</sub> = 300 V; T <sub>j</sub> = 150 °C	-	-	500	μA
Dynamic cl	haracteristics					
Q <sub>r</sub>	recovered charge	$I_F = 30 \text{ A}; V_R = 200 \text{ V}; dI_F/dt = 200 \text{ A}/$ $\mu$ s; $T_j = 25 ^{\circ}\text{C}; Fig. 7$	-	89	-	nC
		$I_F = 30 \text{ A}; V_R = 200 \text{ V}; dI_F/dt = 200 \text{ A}/$ $\mu$ s; $T_j = 125 \text{ °C}; Fig. 7$	-	337	-	nC
t <sub>rr</sub> reverse re	reverse recovery time	$I_F = 1 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 50 \text{ A/}\mu\text{s};$ $T_j = 25 \text{ °C}; Fig. 7$	-	-	55	ns
		$I_F = 30 \text{ A}; V_R = 200 \text{ V}; dI_F/dt = 200 \text{ A}/$ $\mu s; T_j = 25 ^{\circ}C; Fig. 7$	-	33	-	ns
		$I_F = 30 \text{ A}; V_R = 200 \text{ V}; dI_F/dt = 200 \text{ A}/$ $\mu s; T_j = 125 \text{ °C}; Fig. 7$	-	62	-	ns
I <sub>RM</sub>	peak reverse recovery current	$I_F = 30 \text{ A}; V_R = 200 \text{ V}; dI_F/dt = 200 \text{ A}/$ $\mu s; T_j = 25 \text{ °C}; Fig. 7$	-	5.3	-	Α
		$I_F = 30 \text{ A}; V_R = 200 \text{ V}; dI_F/dt = 200 \text{ A}/$ $\mu$ s; $T_j = 125 ^{\circ}\text{C}; Fig. 7$	-	10.5	-	Α

NXP Semiconductors BYV430K-300P

### **Dual ultrafast power diode**



 $V_o$  = 0.840 V;  $R_s$  = 0.006  $\Omega$ 

(1) T<sub>i</sub> = 150 °C; typical values

(2) T<sub>i</sub> = 150 °C; maximum values

(3) T<sub>i</sub> = 25 °C; maximum values

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

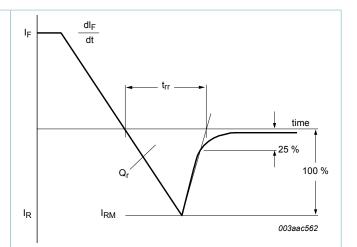


Fig. 7. Reverse recovery definitions; ramp recovery

# 11. Package outline

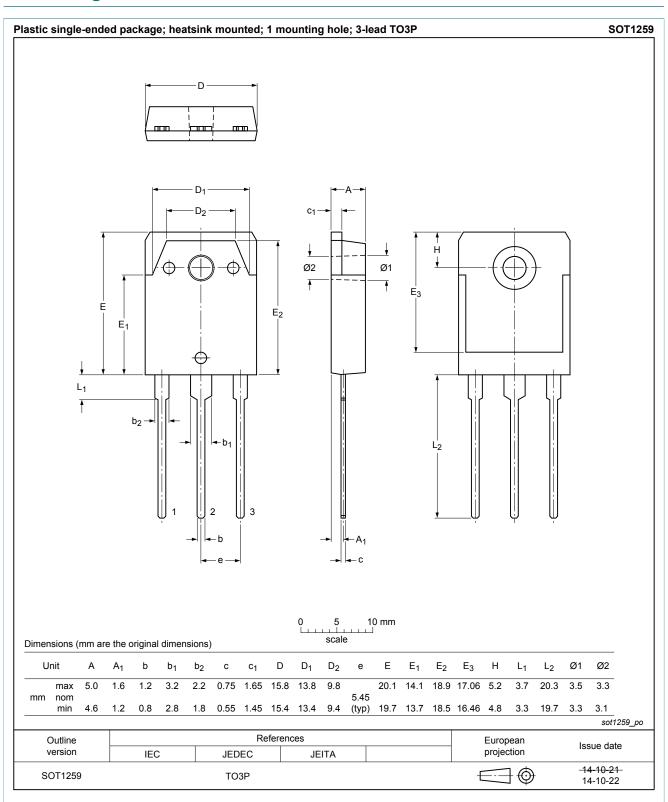


Fig. 8. Package outline TO3P (SOT1259)

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# 12. Legal information

#### 12.1 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.
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