



# BYV430K-300P

Dual ultrafast power diode

1 September 2015

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	Typ	Max	Unit
$V_{RRM}$	repetitive peak reverse voltage			-	-	300	V
$I_{F(AV)}$	average forward current	$\delta = 0.5$ ; $T_{mb} \leq 105$ °C; square-wave pulse; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a> ; <a href="#">Fig. 3</a>		-	-	30	A
$I_{O(AV)}$	average output current	$\delta = 0.5$ ; $T_{mb} \leq 105$ °C; square-wave pulse; both diodes conducting		-	-	60	A
$I_{FRM}$	repetitive peak forward current	$\delta = 0.5$ ; $t_p = 25$ µs; $T_{mb} \leq 105$ °C; square-wave pulse		-	-	60	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 10$ ms; $T_{j(init)} = 25$ °C; sine-wave pulse; per diode; <a href="#">Fig. 4</a>		-	-	300	A
		$t_p = 8.3$ ms; $T_{j(init)} = 25$ °C; sine-wave pulse; per diode; <a href="#">Fig. 4</a>		-	-	330	A
<b>Static characteristics</b>							
$V_F$	forward voltage	$I_F = 30$ A; $T_j = 25$ °C; <a href="#">Fig. 6</a>		-	1	1.25	V
		$I_F = 30$ A; $T_j = 150$ °C; <a href="#">Fig. 6</a>		-	0.85	1	V



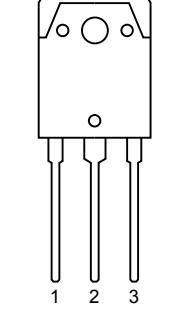
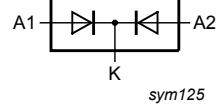
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Symbol	Parameter	Conditions		Min	Typ	Max	Unit
<b>Dynamic characteristics</b>							
t <sub>rr</sub>	reverse recovery time	I <sub>F</sub> = 1 A; V <sub>R</sub> = 30 V; dI <sub>F</sub> /dt = 50 A/μs; T <sub>j</sub> = 25 °C; <a href="#">Fig. 7</a>		-	-	55	ns
		I <sub>F</sub> = 30 A; V <sub>R</sub> = 200 V; dI <sub>F</sub> /dt = 200 A/μs; T <sub>j</sub> = 25 °C; <a href="#">Fig. 7</a>		-	33	-	ns
		I <sub>F</sub> = 30 A; V <sub>R</sub> = 200 V; dI <sub>F</sub> /dt = 200 A/μs; T <sub>j</sub> = 125 °C; <a href="#">Fig. 7</a>		-	62	-	ns

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode 1		
2	K	cathode		
3	A2	anode 2		
mb	mb	mounting base; connected to cathode	 TO3P (SOT1259)	 sym125

## 6. Ordering information

Table 3. Ordering information

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

## 7. Marking

Table 4. Marking codes

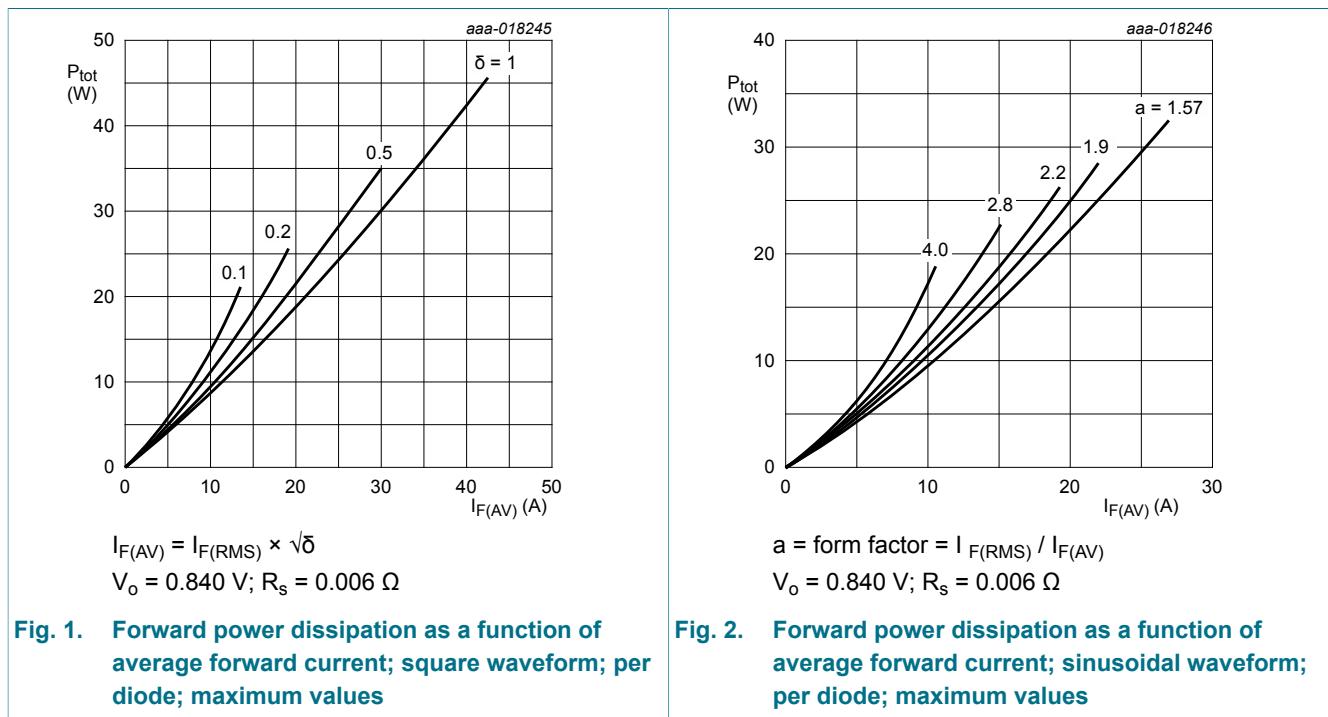
Type number	Marking code
BYV430K-300P	BYV430K-300P

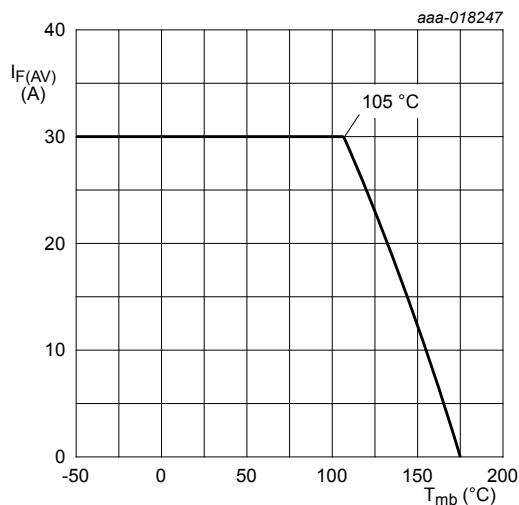
## 8. Limiting values

**Table 5. Limiting values**

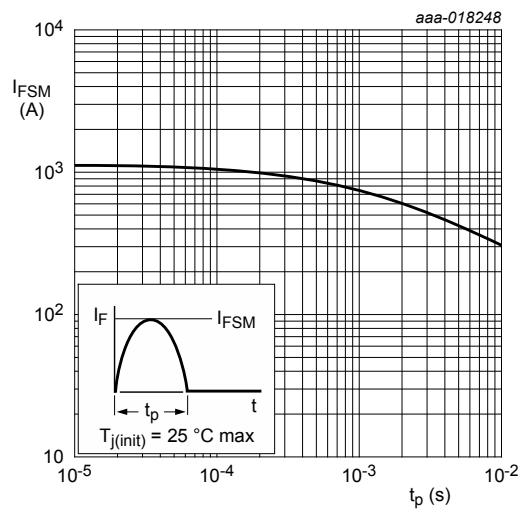
In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions		Min	Max	Unit
$V_{RRM}$	repetitive peak reverse voltage			-	300	V
$V_{RWM}$	crest working reverse voltage			-	300	V
$V_R$	reverse voltage	DC		-	300	V
$I_{F(AV)}$	average forward current	$\delta = 0.5$ ; $T_{mb} \leq 105$ °C; square-wave pulse; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a> ; <a href="#">Fig. 3</a>		-	30	A
$I_{O(AV)}$	average output current	$\delta = 0.5$ ; $T_{mb} \leq 105$ °C; square-wave pulse; both diodes conducting		-	60	A
$I_{FRM}$	repetitive peak forward current	$\delta = 0.5$ ; $t_p = 25$ µs; $T_{mb} \leq 105$ °C; square-wave pulse		-	60	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 10$ ms; $T_{j(init)} = 25$ °C; sine-wave pulse; per diode; <a href="#">Fig. 4</a>		-	300	A
		$t_p = 8.3$ ms; $T_{j(init)} = 25$ °C; sine-wave pulse; per diode; <a href="#">Fig. 4</a>		-	330	A
$T_{stg}$	storage temperature			-55	175	°C
$T_j$	junction temperature			-	175	°C





**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; <a href="#">Fig. 5</a>	-	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

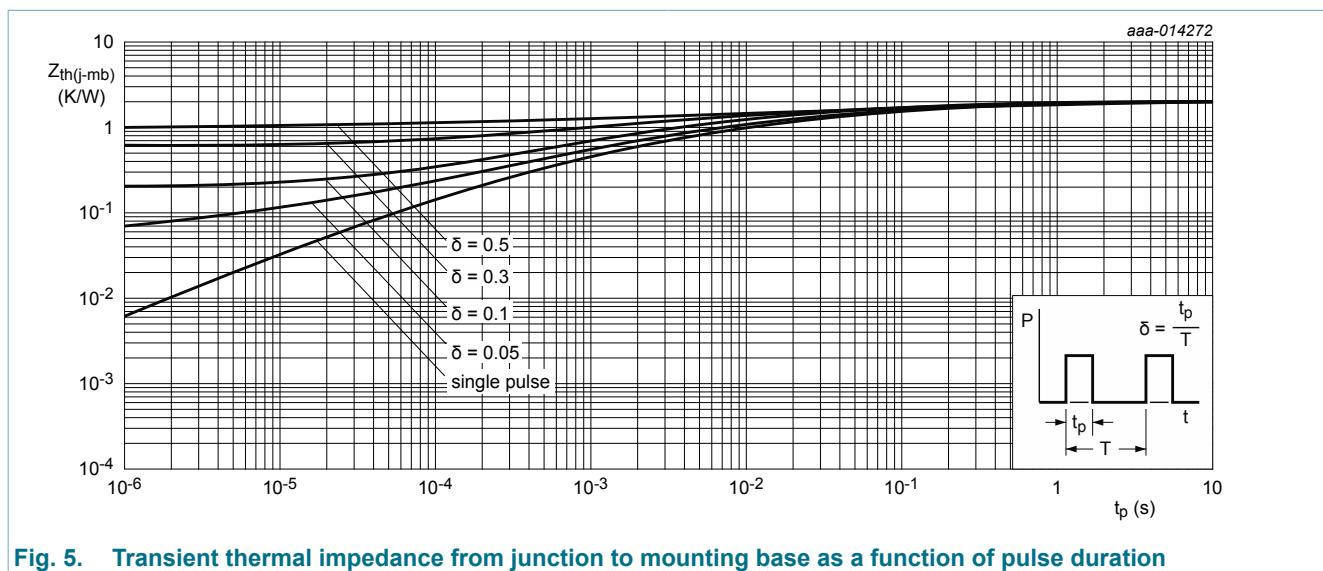
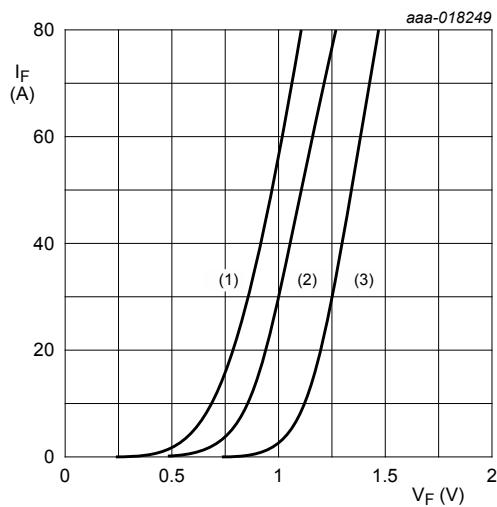


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration

## 10. Characteristics

**Table 7. Characteristics**

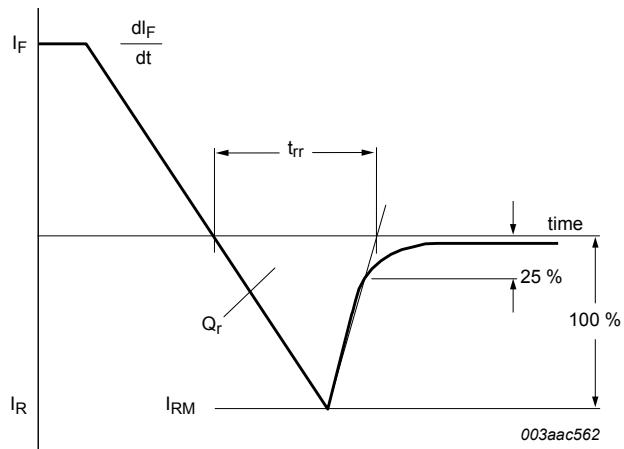
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
	characteristics general note	characteristics are per diode unless otherwise stated		-	-	-	
<b>Static characteristics</b>							
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 30 A; T <sub>j</sub> = 25 °C; <a href="#">Fig. 6</a>		-	1	1.25	V
		I <sub>F</sub> = 30 A; T <sub>j</sub> = 150 °C; <a href="#">Fig. 6</a>		-	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
<b>Dynamic characteristics</b>							
Q <sub>r</sub>	recovered charge	I <sub>F</sub> = 30 A; V <sub>R</sub> = 200 V; dI <sub>F</sub> /dt = 200 A/µs; T <sub>j</sub> = 25 °C; <a href="#">Fig. 7</a>		-	89	-	nC
		I <sub>F</sub> = 30 A; V <sub>R</sub> = 200 V; dI <sub>F</sub> /dt = 200 A/µs; T <sub>j</sub> = 125 °C; <a href="#">Fig. 7</a>		-	337	-	nC
t <sub>rr</sub>	reverse recovery time	I <sub>F</sub> = 1 A; V <sub>R</sub> = 30 V; dI <sub>F</sub> /dt = 50 A/µs; T <sub>j</sub> = 25 °C; <a href="#">Fig. 7</a>		-	-	55	ns
		I <sub>F</sub> = 30 A; V <sub>R</sub> = 200 V; dI <sub>F</sub> /dt = 200 A/µs; T <sub>j</sub> = 25 °C; <a href="#">Fig. 7</a>		-	33	-	ns
		I <sub>F</sub> = 30 A; V <sub>R</sub> = 200 V; dI <sub>F</sub> /dt = 200 A/µs; T <sub>j</sub> = 125 °C; <a href="#">Fig. 7</a>		-	62	-	ns
I <sub>RM</sub>	peak reverse recovery current	I <sub>F</sub> = 30 A; V <sub>R</sub> = 200 V; dI <sub>F</sub> /dt = 200 A/µs; T <sub>j</sub> = 25 °C; <a href="#">Fig. 7</a>		-	5.3	-	A
		I <sub>F</sub> = 30 A; V <sub>R</sub> = 200 V; dI <sub>F</sub> /dt = 200 A/µs; T <sub>j</sub> = 125 °C; <a href="#">Fig. 7</a>		-	10.5	-	A



$V_0 = 0.840$  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

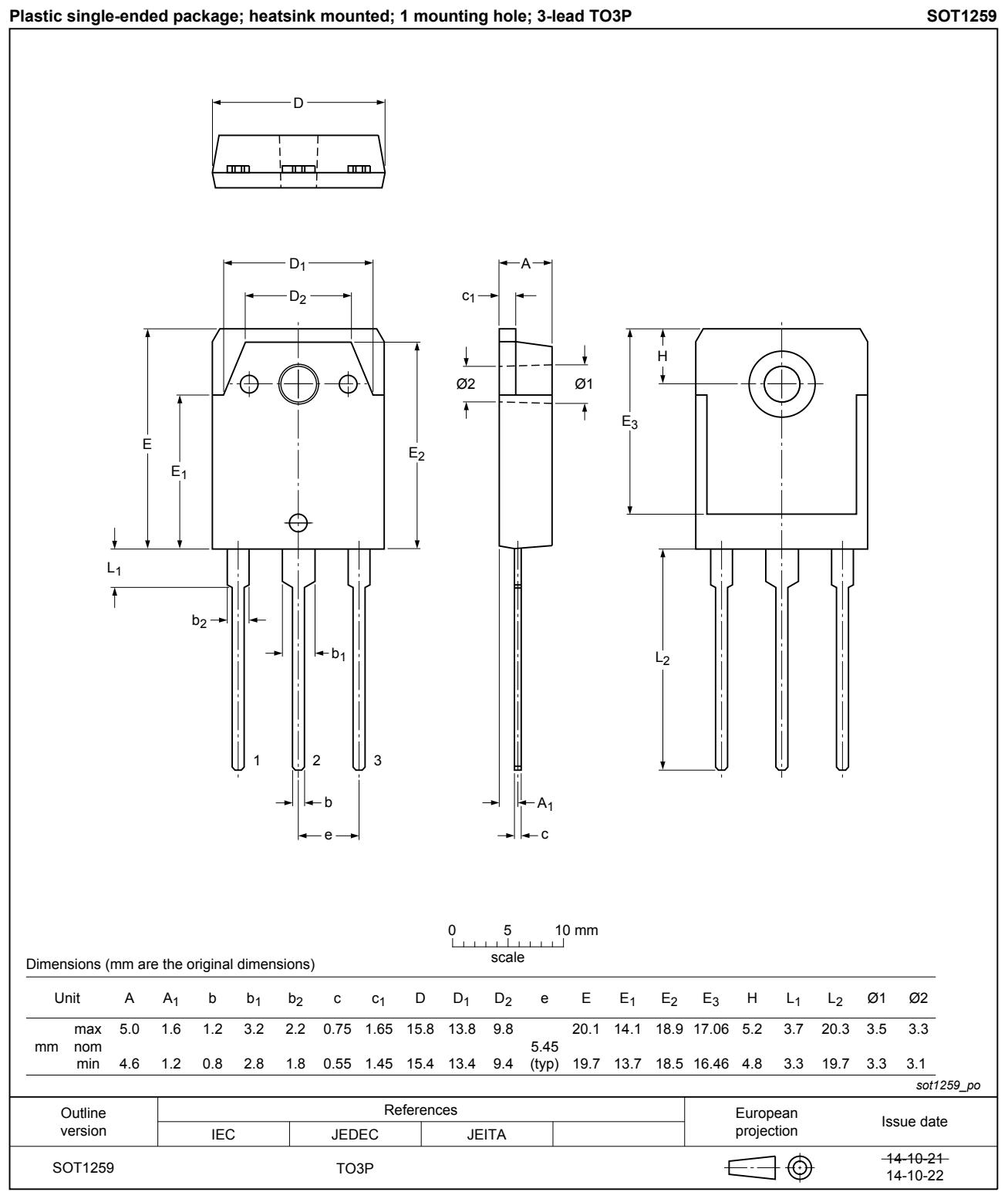


Fig. 8. Package outline TO3P (SOT1259)

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Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
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