



BYV72EW-200

Dual ultrafast power diode

Rev.02 - 18 May 2023

Product data sheet

1. General description

Dual ultrafast power diodes in a TO247 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. Applications

- Output rectifiers in high-frequency switched-mode power supplies

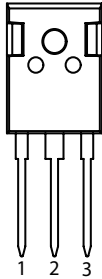
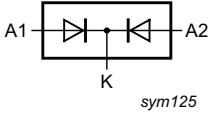
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Values			Unit
Absolute maximum rating						
V_R	repetitive peak reverse voltage	DC	200			V
$I_{F(AV)}$	average forward current	$\delta = 0.5$; $T_{mb} \leq 113$ °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
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V_F	forward voltage	$I_F = 15$ A; $T_j = 25$ °C; per diode; Fig. 6	-	0.95	1.05	V
		$I_F = 30$ A; $T_j = 25$ °C; per diode; Fig. 6	-	1	1.2	V
		$I_F = 15$ A; $T_j = 150$ °C; per diode; 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/ μ s; $T_j = 25$ °C; Fig. 7	-	20	28	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	K	mounting base; connected to cathode		

6. Ordering information

Table 3. Ordering information

Type number	Package Name	Orderable part number	Packing method	Small packing quantity	Package version	Package issue date
BYV72EW-200	TO247	BYV72EW-200,127	Tube	30	SOT429 (L)	25-Mar-2013
					TO247P (P)	31-Mar-2023

7. Marking

Table 4. Marking codes

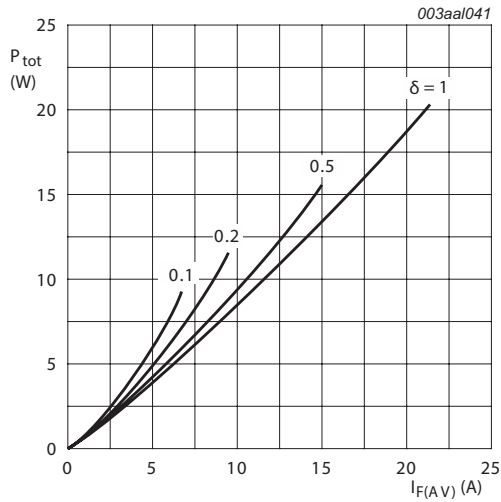
Type number	Marking codes	
	Assembly factory: L	Assembly factory: P
BYV72EW-200	BYV72EW 200 PjLxxxx xx	BYV72EW 200 PjPxxxx xx

8. Limiting values

Table 5. Limiting values

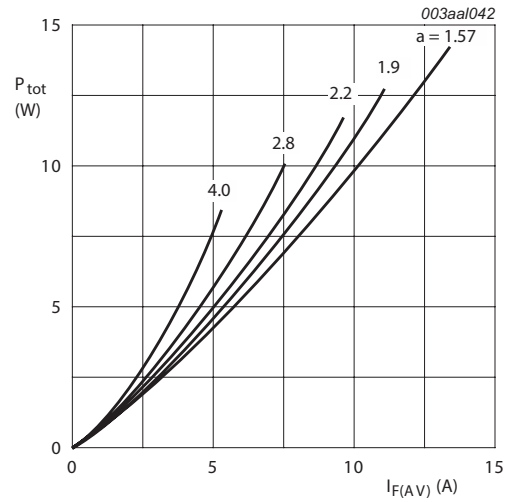
In accordance with the Absolute Maximum Rating System (IEC 60134).

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



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

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



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

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

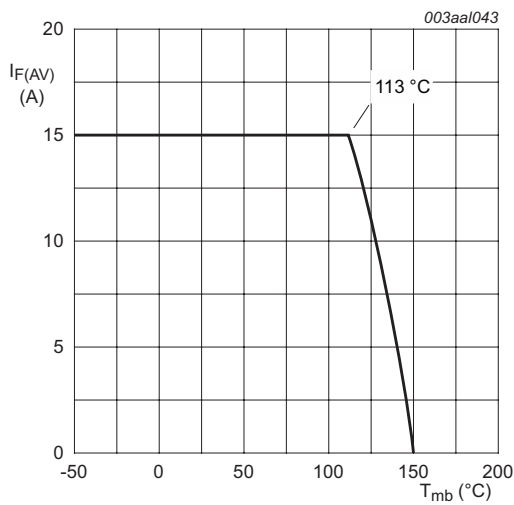


Fig. 3. Average forward current as a function of mounting base temperature; maximum values; per diode

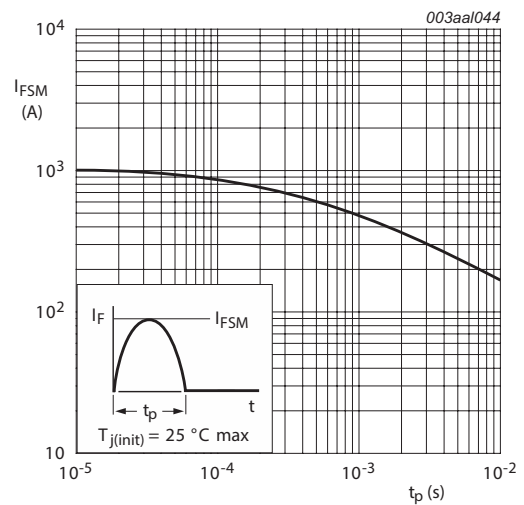


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values; per diode

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	-	-	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

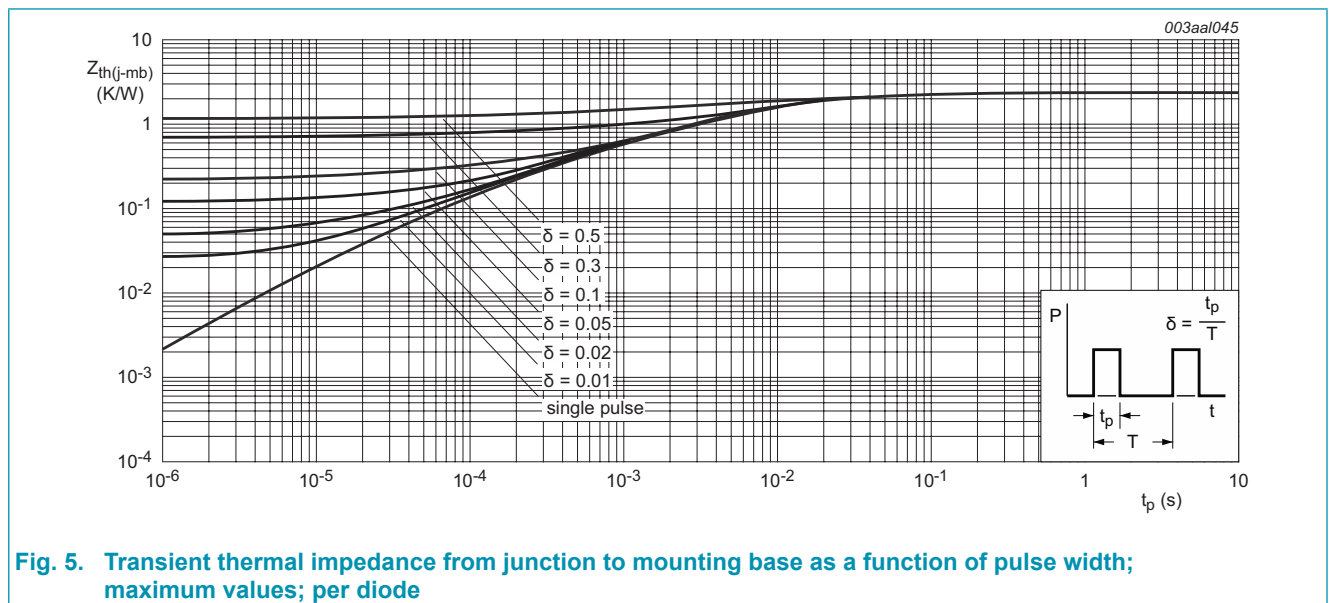
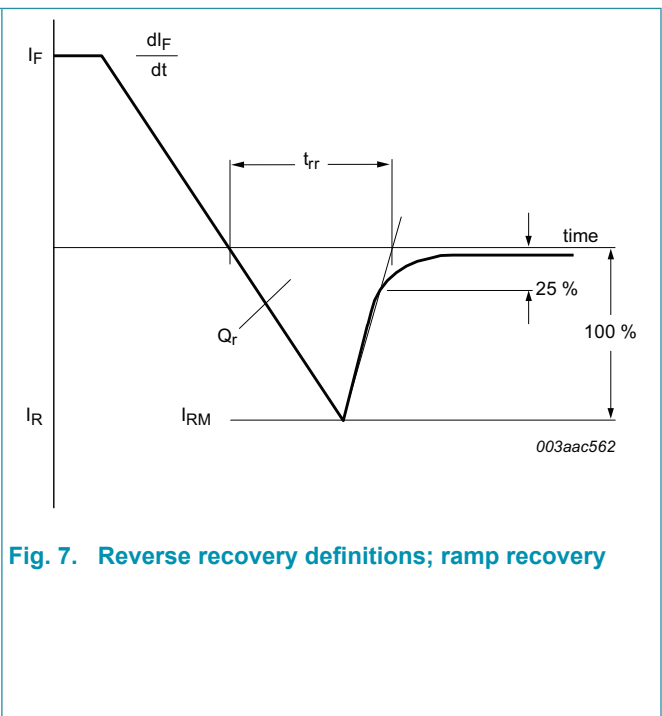
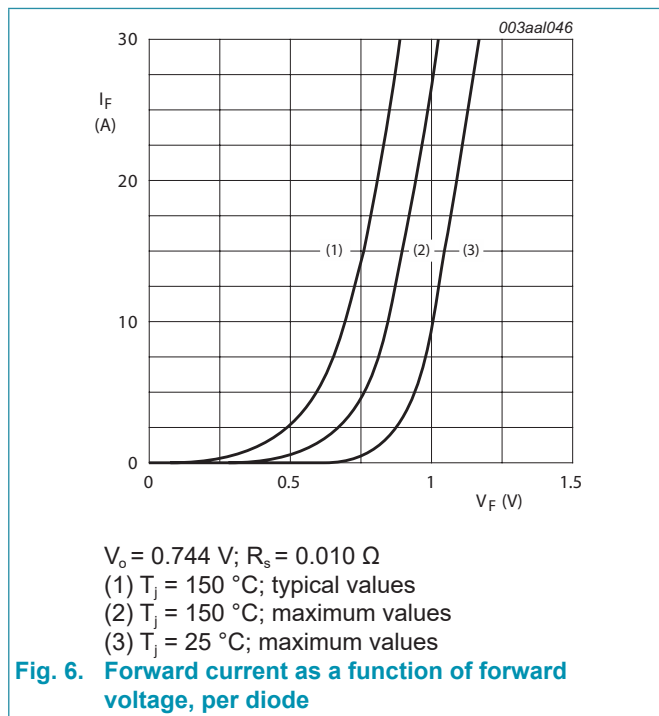


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse width; maximum values; per diode

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V _F	forward voltage	I _F = 15 A; T _j = 25 °C; per diode; Fig. 6	-	0.95	1.05	V
		I _F = 30 A; T _j = 25 °C; per diode; Fig. 6	-	1	1.2	V
		I _F = 15 A; T _j = 150 °C; per diode; Fig. 6	-	0.78	0.9	V
I _R	reverse current	V _R = 200 V; T _j = 25 °C; per diode	-	10	100	μA
		V _R = 200 V; T _j = 100 °C; per diode	-	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



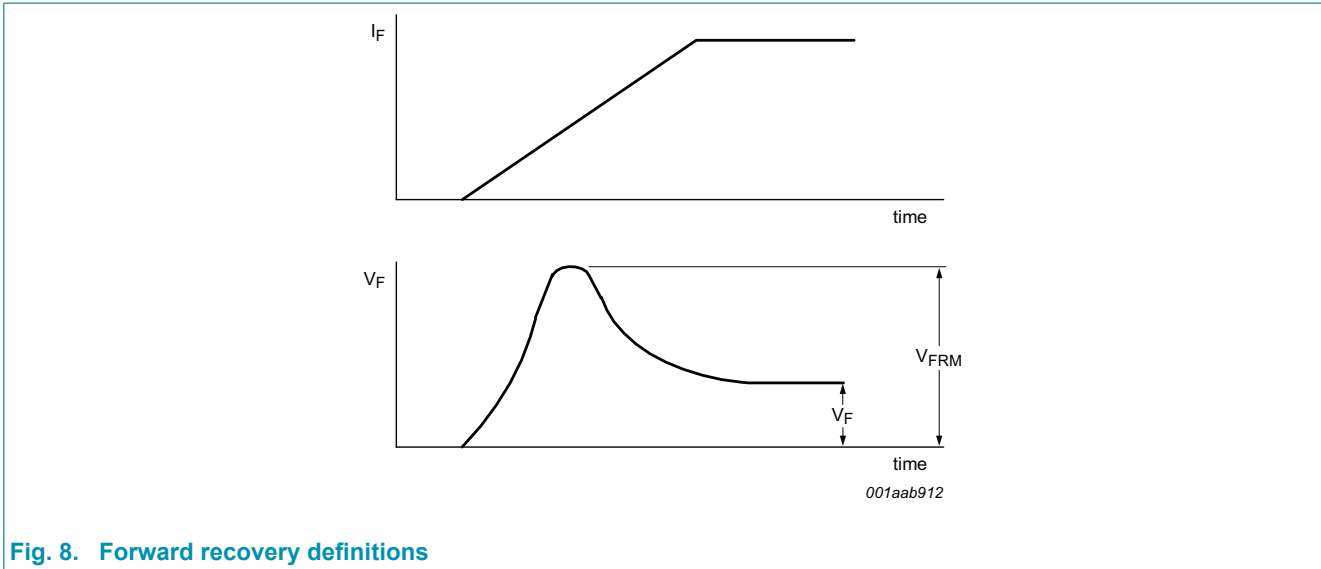
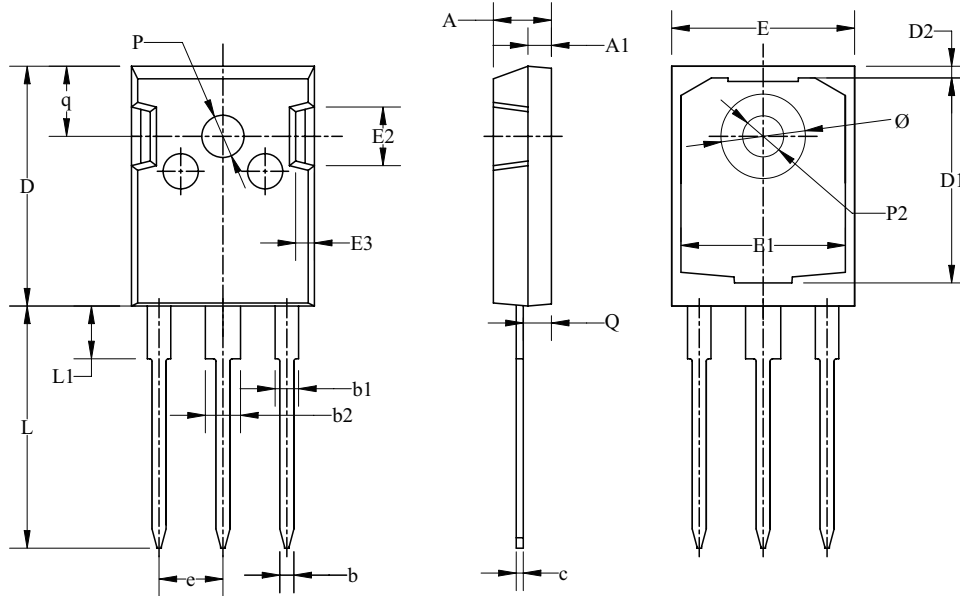


Fig. 8. Forward recovery definitions

Assembly factory: P

Plastic single-ended through-hole pack age; headsink mounted; 1 mounting hole; 3 leads TO-247

TO247



Dim	All Dimensions in Millimeters		
	Min	Typ	Max
A	4.70	4.95	5.20
A1	1.90	2.00	2.10
b	1.00	1.20	1.40
b1	1.80	2.00	2.20
b2	2.80	3.00	3.20
c	0.50	0.60	0.70
D	20.30	20.45	20.60
D1	17.28	17.48	17.68
D2	0.80	1.00	1.20
E	15.45	15.60	15.75
E1	13.82	14.02	14.22
E2	4.80	5.00	5.20
E3	1.40	1.60	1.80
e	5.45 BSC		
L	20.40	20.65	20.90
L1	4.25	4.50	4.75
P2	3.40	3.50	3.60
P	3.50	3.60	3.70
Q	2.20	2.40	2.60
q	5.78	5.98	6.18
Ø	7.10	7.19	7.30

12. 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.
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- [2] The term 'short data sheet' is explained in section "Definitions".
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