IMPORTANT NOTICE

10 December 2015

1. Global joint venture starts operations as WeEn Semiconductors

Dear customer,

As from November 9th, 2015 NXP Semiconductors N.V. and Beijing JianGuang Asset Management Co. Ltd established Bipolar Power joint venture (JV), **WeEn Semiconductors**, which will be used in future Bipolar Power documents together with new contact details.

In this document where the previous NXP references remain, please use the new links as shown below.

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Thank you for your cooperation and understanding,

WeEn Semiconductors

BYV32E-200P

Dual ultrafast power diode

14 May 2015 Product data sheet

1. General description

Dual ultrafast power diode in a SOT78 (TO-220AB) plastic package

2. Features and benefits

- Ultra low leakage current
- High junction temperature up to 175 °C
- 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

- Home appliance power supply

4. Quick reference data

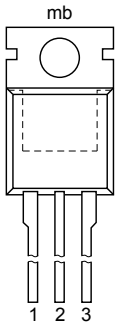
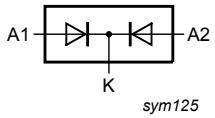
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{RRM}	repetitive peak reverse voltage			-	-	200	V
$I_{O(AV)}$	average output current	δ = 0.5; T_{mb} ≤ 149 °C; Square-ware pulse		-	-	20	A
I_{FSM}	non-repetitive peak forward current	$T_{j(init)}$ = 25 °C; t_p = 8.3 ms; SIN; per diode; Fig. 4		-	-	137	A
I_{RRM}	repetitive peak reverse current	t_p = 2 µs; δ = 0.001; per diode		-	-	0.2	A
V_{ESD}	electrostatic discharge voltage	HBM; C = 250 pF; R = 1.5 kΩ; all pins		-	-	8	kV
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		-	18	25	ns
Static characteristics							
V_F	forward voltage	I_F = 8 A; T_j = 150 °C; Fig. 6		-	0.76	0.85	V

Scan or click this QR code to view the latest information for this product

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode 1	 TO-220AB (SOT78)	
2	K	cathode		
3	A2	anode 2		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BYV32E-200P	TO-220AB	plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB	SOT78

7. Marking

Table 4. Marking codes

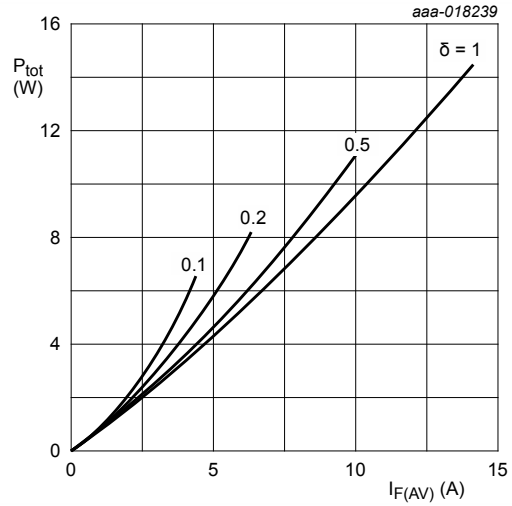
Type number	Marking code
BYV32E-200P	BYV32E-200P

8. Limiting values

Table 5. Limiting values

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

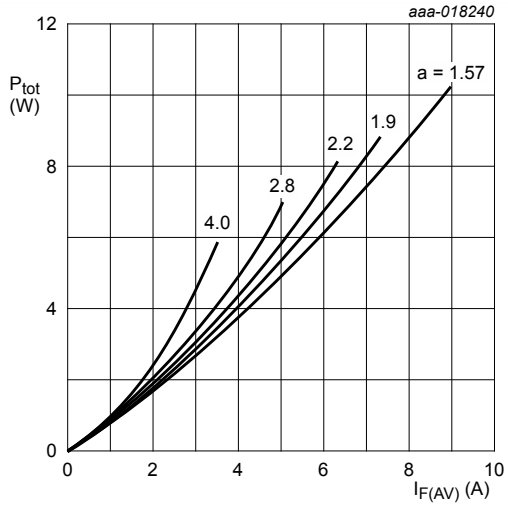
Symbol	Parameter	Conditions		Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage			-	200	V
V_{RWM}	crest working reverse voltage			-	200	V
V_R	reverse voltage	DC		-	200	V
$I_{F(AV)}$	average forward current	δ = 0.5; T_{mb} ≤ 149 °C; Square-ware pulse; Fig. 1; Fig. 2; Fig. 3		-	10	A
$I_{O(AV)}$	average output current	δ = 0.5; T_{mb} ≤ 149 °C; Square-ware pulse		-	20	A
I_{FSM}	non-repetitive peak forward current	SIN; t_p = 10 ms; $T_{j(init)}$ = 25 °C; per diode; Fig. 4		-	125	A
		SIN; t_p = 8.3 ms; $T_{j(init)}$ = 25 °C; per diode; Fig. 4		-	137	A
I_{RRM}	repetitive peak reverse current	δ = 0.001; t_p = 2 µs; per diode		-	0.2	A
I_{RSM}	non-repetitive peak reverse current	t_p = 100 µs; per diode		-	0.2	A
T_{stg}	storage temperature			-65	175	°C
T_j	junction temperature			-	175	°C
V_{ESD}	electrostatic discharge voltage	HBM; C = 250 pF; R = 1.5 kΩ; all pins		-	8	kV



$I_{F(AV)} = I_{F(RMS)} \times \sqrt{\delta}$

V_o = 0.802 V; R_s = 0.015 Ω

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



a = form factor = $I_{F(RMS)} / I_{F(AV)}$

V_o = 0.802 V; R_s = 0.015 Ω

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

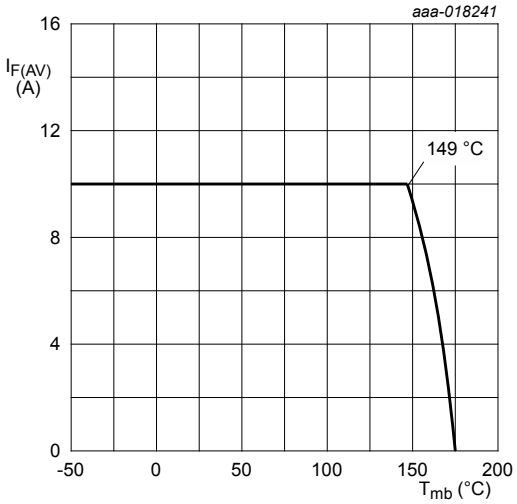


Fig. 3. Forward current as a function of mounting base temperature; maximum values

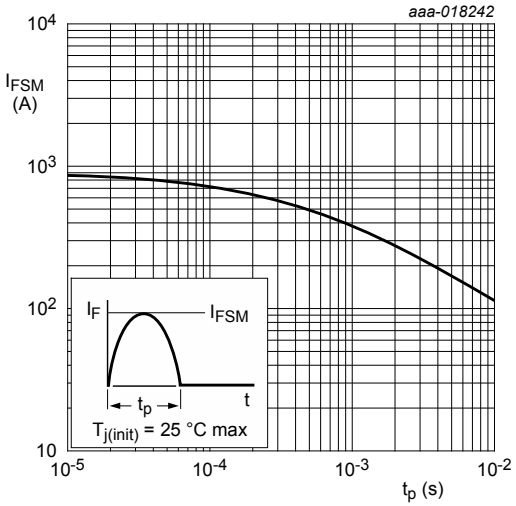


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values

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; both diodes conducting		-	-	1.4	K/W
		with heatsink compound; per diode; Fig. 5		-	-	2.4	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air		-	60	-	K/W

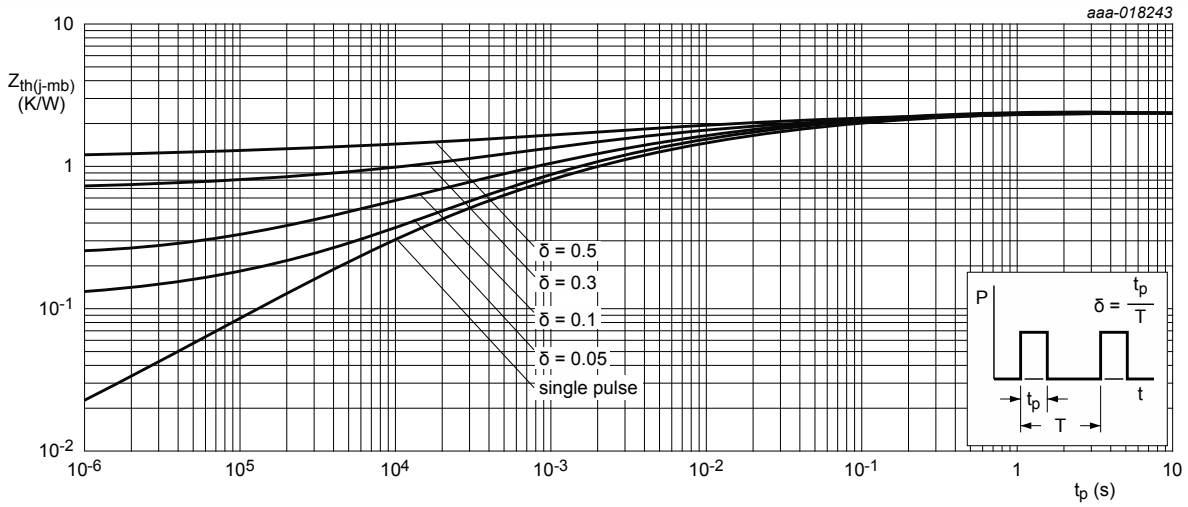
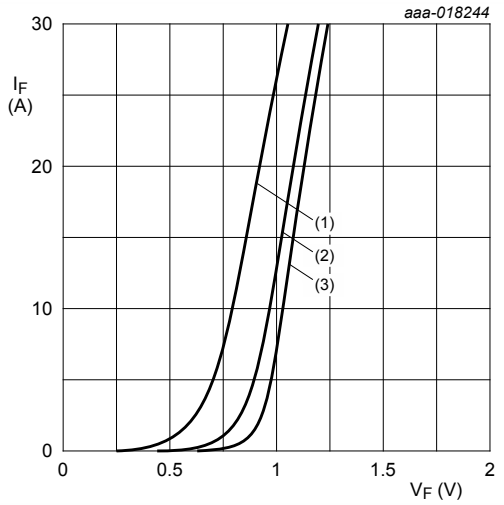


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Dynamic characteristics							
Q_r	recovered charge	I_F = 2 A; V_R = 30 V; dI_F/dt = 20 A/µs; T_j = 25 °C; Fig. 7		-	13.5	-	nC
		I_F = 1 A; V_R = 30 V; dI_F/dt = 100 A/µs; T_j = 25 °C; Fig. 7		-	14.5	-	nC
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		-	18	25	ns
I_{RM}	peak reverse recovery current	I_F = 1 A; V_R = 30 V; dI_F/dt = 100 A/µs; T_j = 25 °C		-	1.7	-	A
Static characteristics							
V_F	forward voltage	I_F = 20 A; T_j = 25 °C; Fig. 6		-	1.06	1.15	V
		I_F = 8 A; T_j = 150 °C; Fig. 6		-	0.76	0.85	V
		I_F = 10 A; T_j = 25 °C; Fig. 6		-	0.95	-	V
I_R	reverse current	V_R = 200 V; T_j = 25 °C		-	0.3	5	µA
		V_R = 200 V; T_j = 150 °C		-	70	250	µA



V_o = 0.802 V; R_s = 0.015 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

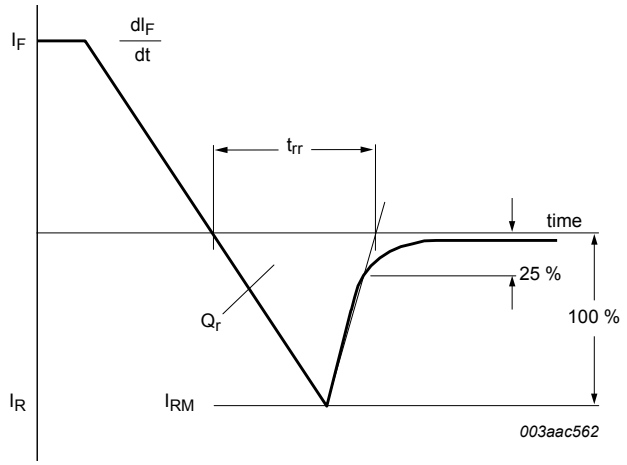
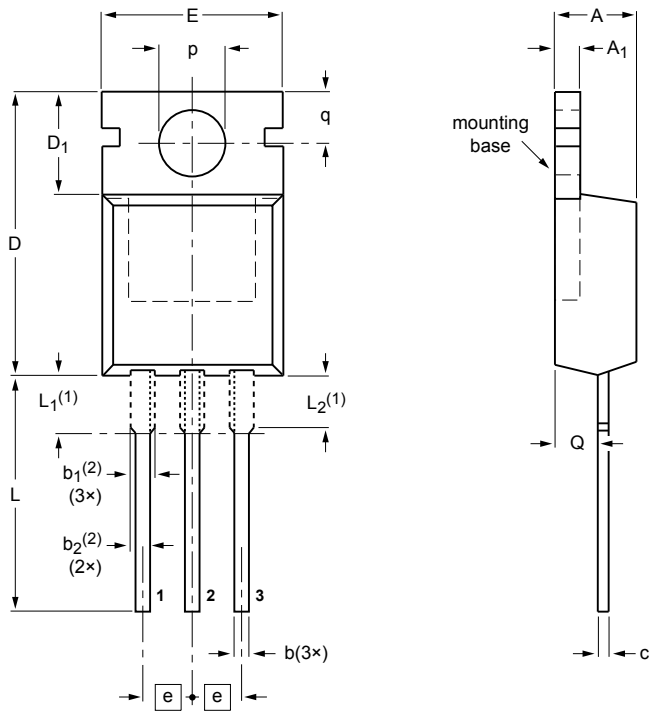


Fig. 7. Reverse recovery definitions; ramp recovery

11. Package outline

Plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB **SOT78**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1	b	b_1(2)	b_2(2)	c	D	D_1	E	e	L	L_1(1)	L_2(1) max.	p	q	Q
mm	4.7 4.1	1.40 1.25	0.9 0.6	1.6 1.0	1.3 1.0	0.7 0.4	16.0 15.2	6.6 5.9	10.3 9.7	2.54	15.0 12.8	3.30 2.79	3.0	3.8 3.5	3.0 2.7	2.6 2.2

Notes

1. Lead shoulder designs may vary.
2. Dimension includes excess dambar.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT78		3-lead TO-220AB	SC-46			~~08-04-23~~ 08-06-13

Fig. 8. Package outline TO-220AB (SOT78)

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.
Product [short] data sheet	Production	This document contains the product specification.

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