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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If you have any questions related to this document, please contact our nearest sales office via e-mail or phone (details via salesaddresses@ween-semi.com).

Thank you for your cooperation and understanding,

WeEn Semiconductors

BYT28 series

Dual rectifier diodes ultrafast

Rev. 5 — 3 November 2011 Product data sheet

1. Product profile

1.1 General description

Dual, common cathode, ultrafast, epitaxial rectifier diodes in the SOT78 (TO-220AB) leaded package.

1.2 Features and benefits

- Low forward voltage drop
- Soft recovery characteristics
- Low thermal resistance.
- Fast switching
- High thermal cycling performance

1.3 Applications

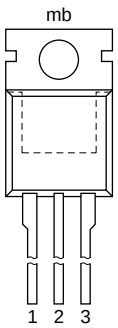
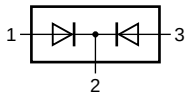
- Output rectifiers in high frequency switched-mode power supplies.

1.4 Quick reference data

- $V_R \leq 300$ V (BYT28-300)
- $V_R \leq 500$ V (BYT28-500)
- $V_F \leq 1.05$ V.
- $I_{O(AV)} \leq 10$ A
- $t_{rr} \leq 60$ ns

2. Pinning information

Table 1. Pinning

Pin	Description	Simplified outline	Symbol
1	anode 1	 SOT78	 sym084
2	cathode		
3	anode 2		
mb	mounting base; connected to cathode		

3. Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
BYT28-300	TO-220AB	plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB	SOT78
BYT28-500			

4. Limiting values

Table 3. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage					
	BYT28-300			-	300	V
	BYT28-500			-	500	V
V_R	continuous reverse voltage					
	BYT28-300	$T_{mb} \leq 147$ °C		-	300	V
	BYT28-500	$T_{mb} \leq 147$ °C		-	500	V
$I_{O(AV)}$	average rectified output current	both diodes conducting; square wave; $\delta = 0.5$; $T_{mb} \leq 115$ °C	[1]	-	10	A
I_{FSM}	non-repetitive peak forward current per diode	t = 10 ms		-	50	A
		t = 8.3 ms sinusoidal; with reapplied $V_{RRM(max)}$		-	55	A
T_{stg}	storage temperature			−40	+150	°C
T_j	junction temperature			-	150	°C

[1] Neglecting switching and reverse current losses.

5. Thermal characteristics

Table 4. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	per diode; see Figure 1	-	-	4.5	K/W
		both diodes conducting	-	-	3	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	-	60	-	K/W

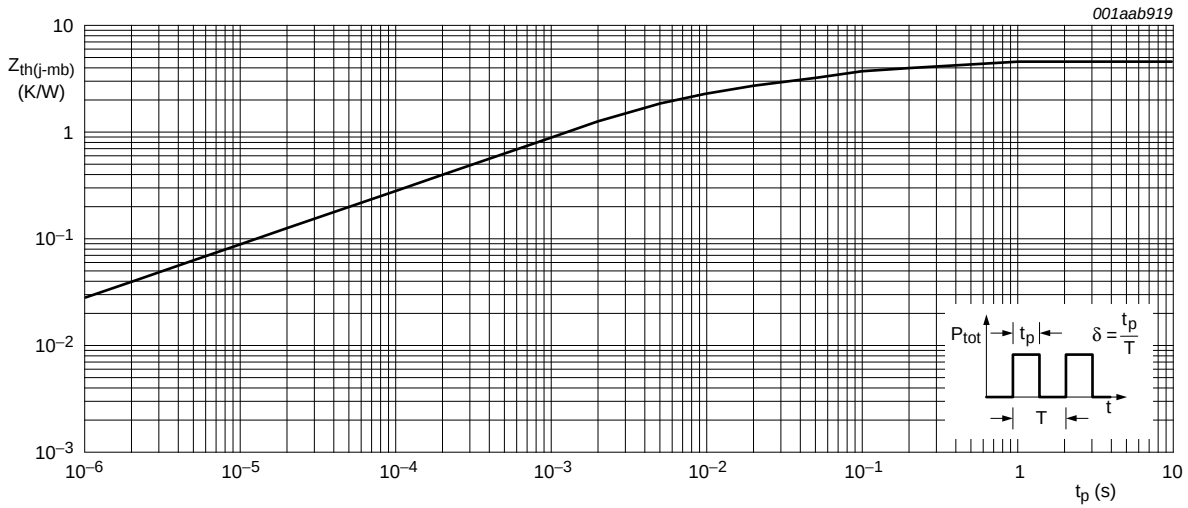


Fig 1. Transient thermal impedance from junction to mounting base as a function of pulse duration

6. Characteristics

Table 5. Characteristics

T_j = 25 °C; unless otherwise stated.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Characteristics are per diode						
V_F	forward voltage	I_F = 5 A; T_j = 150 °C	-	0.95	1.05	V
		I_F = 10 A	-	1.3	1.4	V
I_R	reverse current	$V_R = V_{RRM}$	-	2	10	μA
		$V_R = V_{RRM}$; T_j = 100 °C	-	10	200	μA
Q_S	reverse recovery charge	I_F = 2 A; $V_R \geq$ 30 V; $-dI_F/dt$ = 20 A/μs; see Figure 9	-	50	60	nC
t_{rr}	reverse recovery time	I_F = 1 A; $V_R \geq$ 30 V; $-dI_F/dt$ = 100 A/μs; see Figure 6	-	50	60	ns
I_{RRM}	repetitive peak reverse current	I_F = 5 A; $V_R \geq$ 30 V; $-dI_F/dt$ = 50 A/μs; T_j = 100 °C; see Figure 7	-	2	3	A
V_{fr}	forward recovery voltage	I_F = 1 A; dI_F/dt = 10 A/μs	-	2.5	-	V

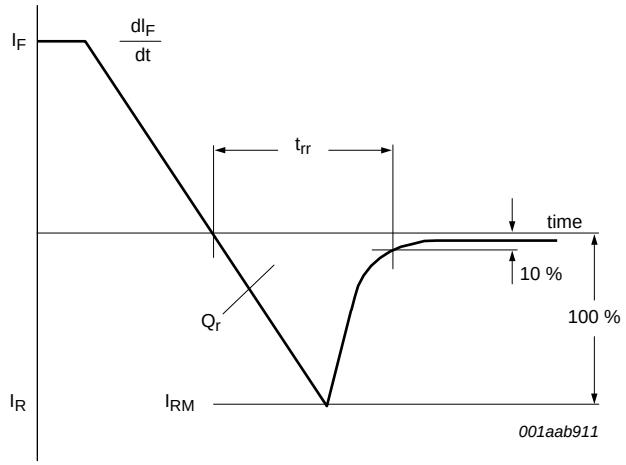


Fig 2. Reverse recovery definitions

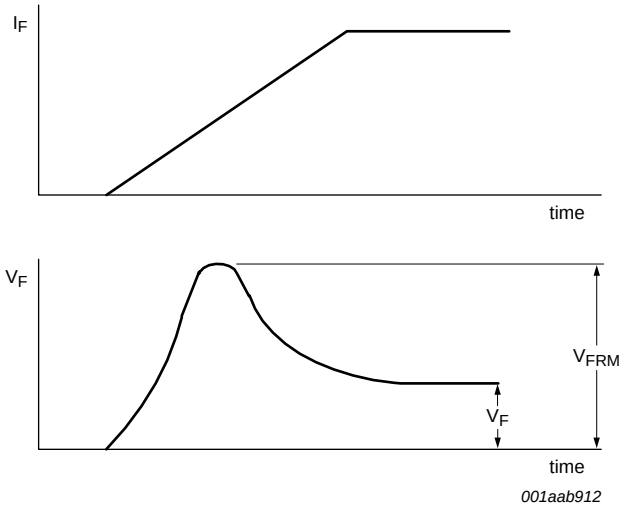
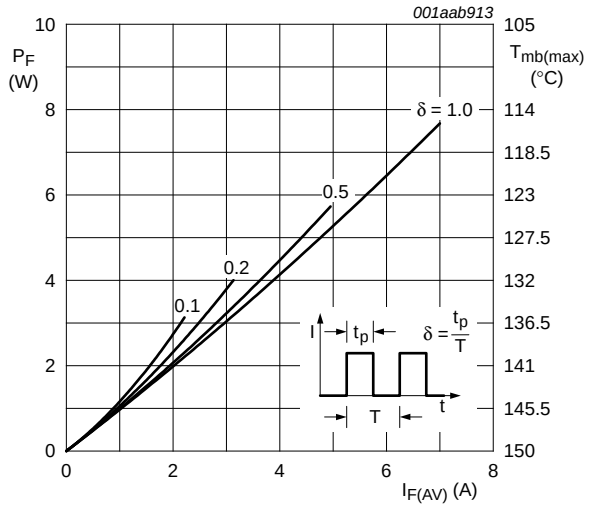


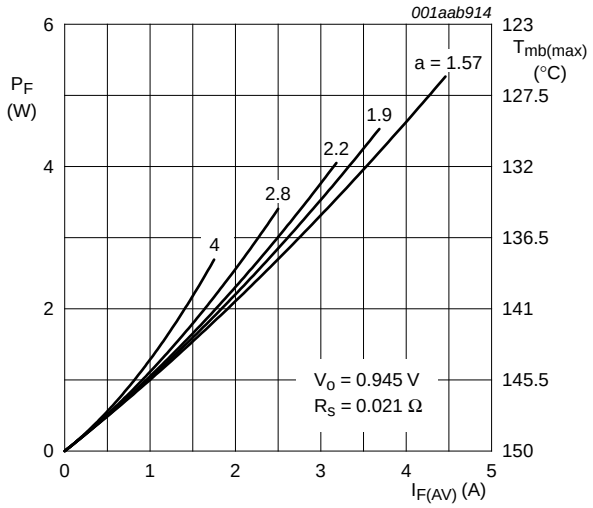
Fig 3. Forward recovery definitions



Per diode.

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

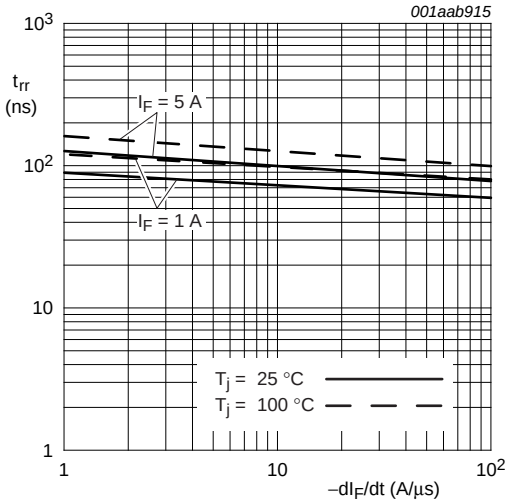
Fig 4. Forward power dissipation as a function of average forward current; maximum values



Per diode.

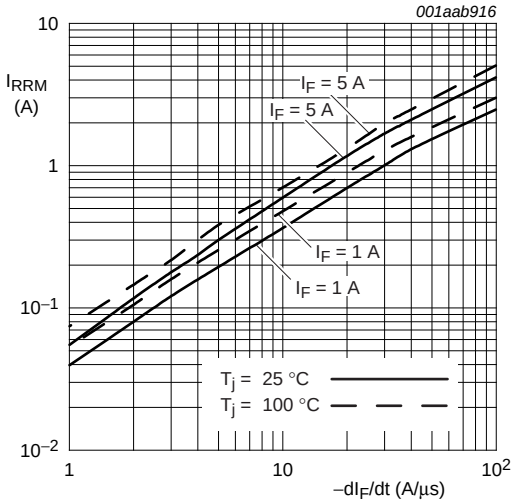
a = form factor = $I_{F(RMS)}$ / $I_{F(AV)}$.

Fig 5. Forward power dissipation as a function of average forward current; maximum values



Per diode.

Fig 6. Reverse recovery time as a function of time differential forward current; maximum values



Per diode.

Fig 7. Repetitive peak reverse current as a function of time differential forward current; maximum values

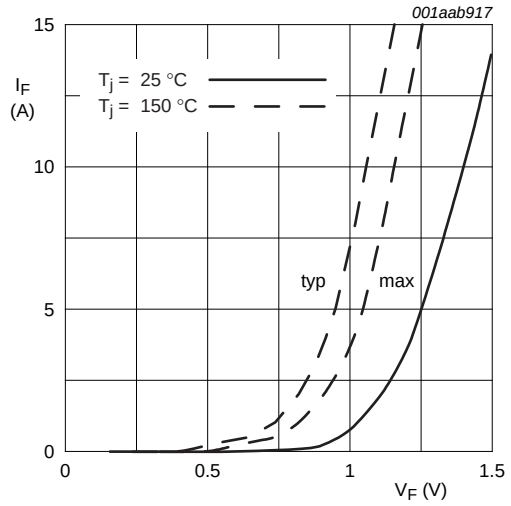
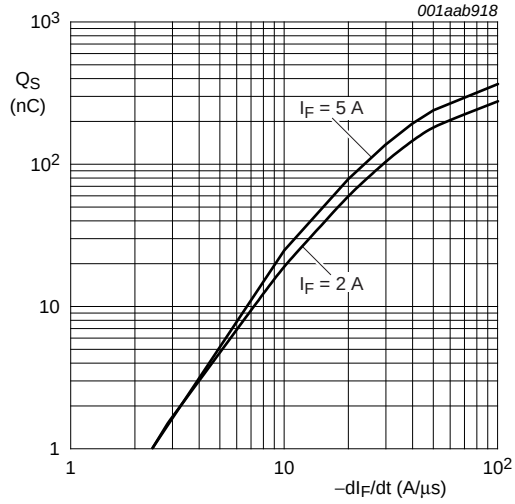


Fig 8. Forward current as a function of forward voltage



Per diode.

T_j = 25 °C.

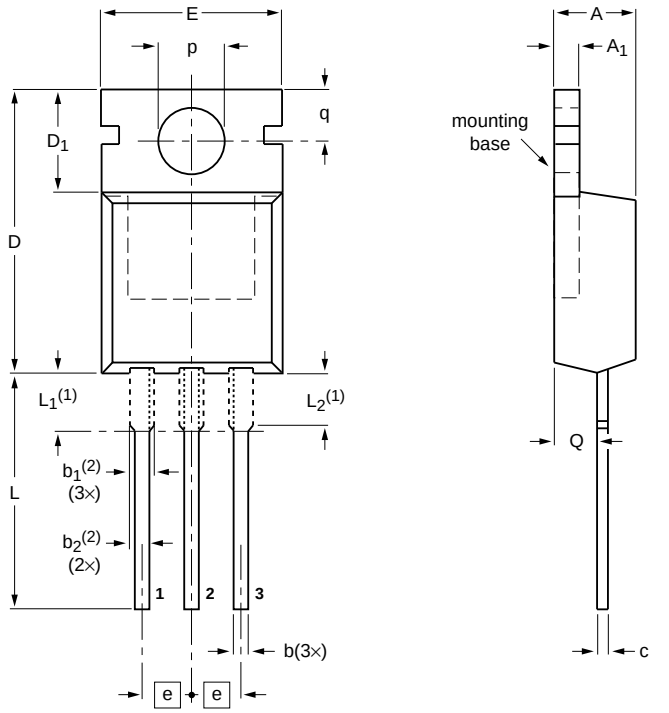
Fig 9. Reverse recovery charge as a function of time differential forward current; maximum values

7. Package information

Epoxy meets UL94 V0 at 1/8 inch.

8. 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 10. Package outline SOT78 (SC-46)

9. Revision history

Table 6. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BYT28_SER v.5	20111103	Product data sheet	-	BYT28_SER v.4
Modifications:	• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors. • Legal texts have been adapted to the new company name where appropriate.			
BYT28_SER v.4	20041122	Product data sheet	-	BYT28_SERIES v.3
BYT28_SERIES v.3	19981001	Product specification	-	BYT28_SERIES v.2
BYT28_SERIES v.2	19980901	Product specification	-	BYT28_SERIES v.1
BYT28_SERIES v.1	19960201	Product specification	-	-

10. Legal information

10.1 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.

[1] Please consult the most recently issued document before initiating or completing a design.

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

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nxp.com.

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12. Contents

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