



# 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		
2	cathode		
3	anode 2		
mb	mounting base; connected to cathode		



### 3. Ordering information

**Table 2.** Ordering information

Type number	Package		Version
	Name	Description	
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	$T_{mb} \leq 147\text{ °C}$	-	300	V
	BYT28-500	$T_{mb} \leq 147\text{ °C}$	-	500	V
$I_{O(AV)}$	average rectified output current	both diodes conducting; square wave; $\delta = 0.5$ ; $T_{mb} \leq 115\text{ °C}$	[1] -	10	A
$I_{FSM}$	non-repetitive peak forward current per diode	$t = 10\text{ ms}$	-	50	A
		$t = 8.3\text{ ms}$ 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 <a href="#">Figure 1</a>	-	-	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

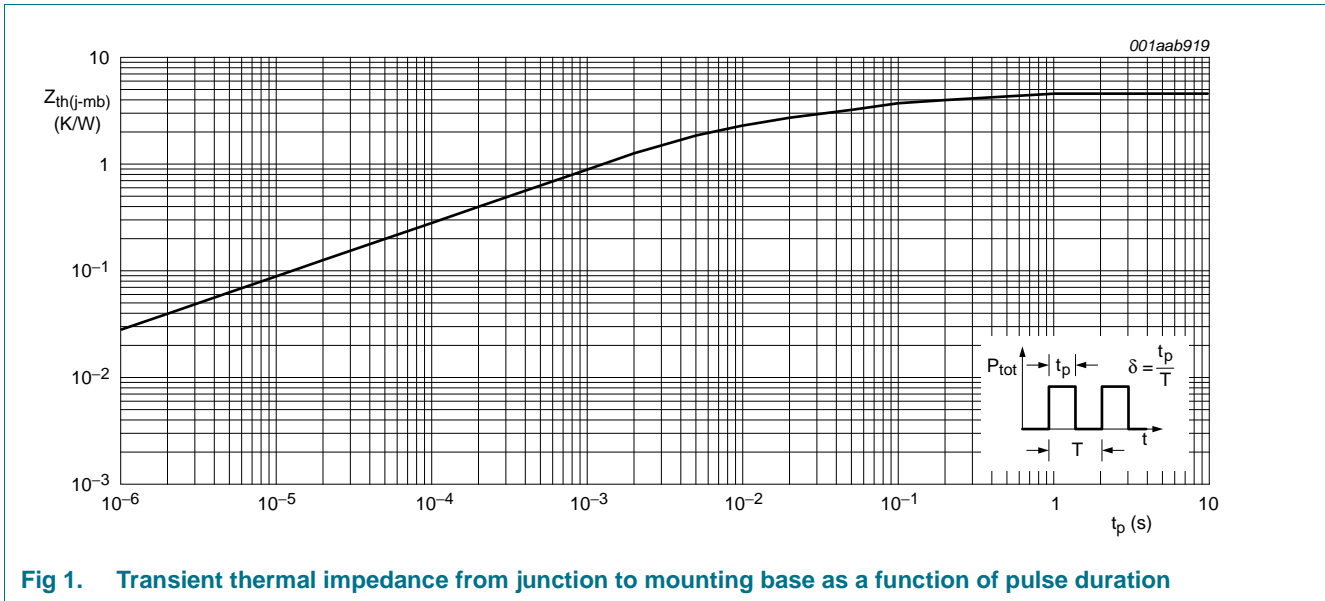


Fig 1. Transient thermal impedance from junction to mounting base as a function of pulse duration

## 6. Characteristics

Table 5. Characteristics

$T_j = 25\text{ °C}$ ; unless otherwise stated.

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

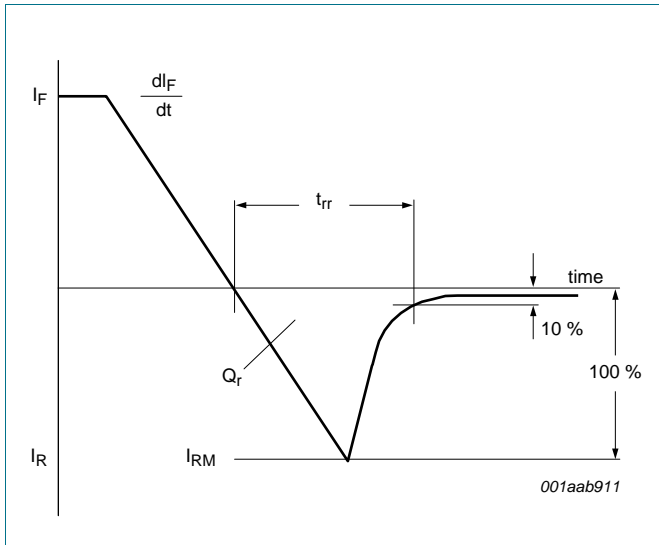


Fig 2. Reverse recovery definitions

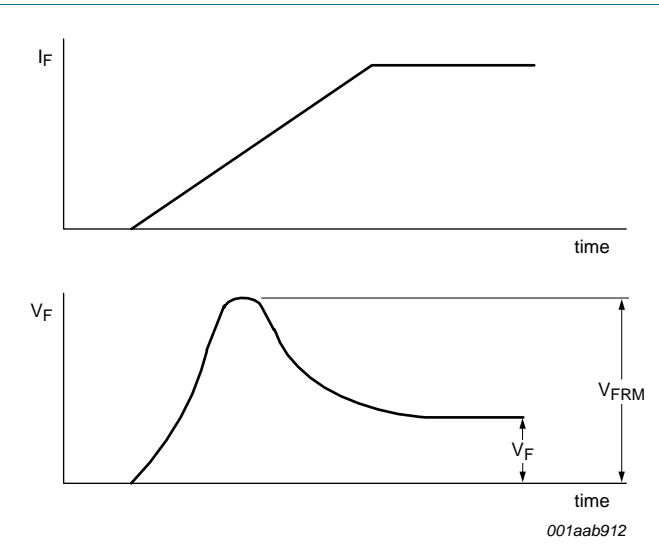
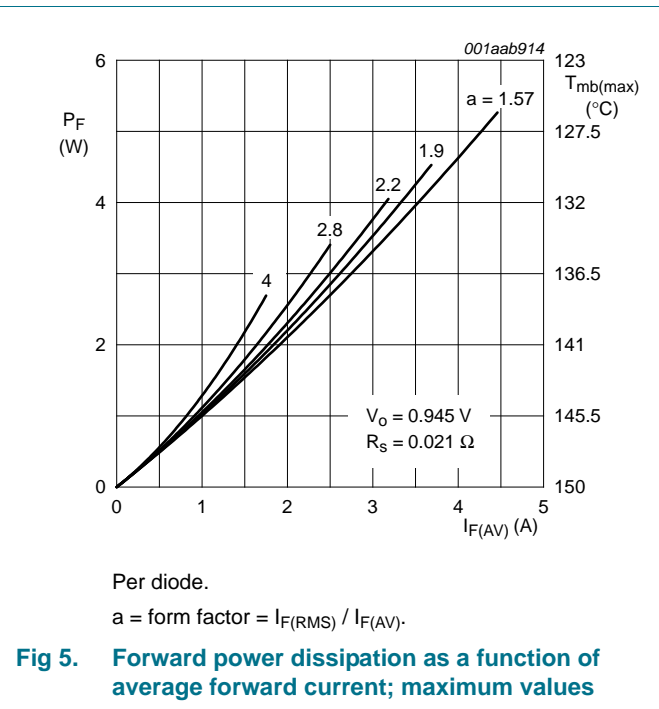
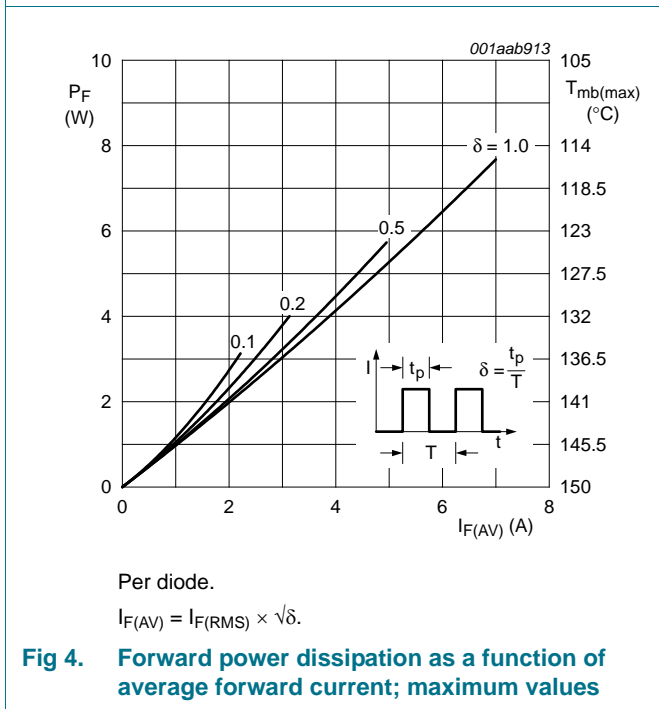
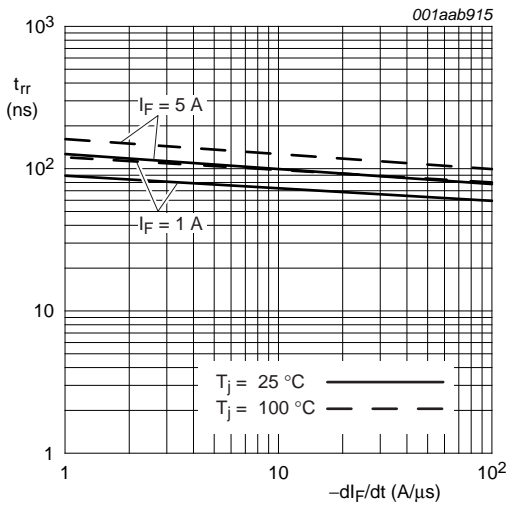


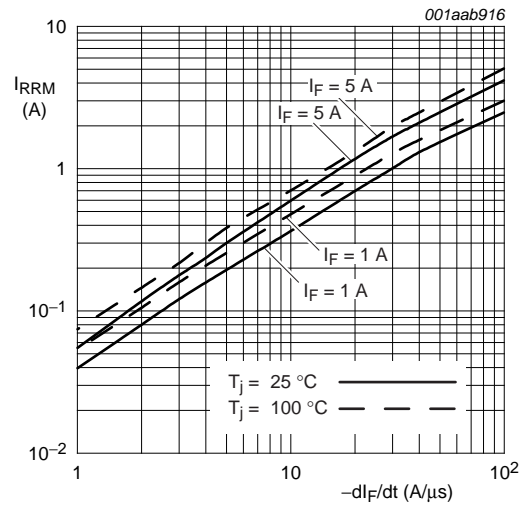
Fig 3. Forward recovery definitions





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

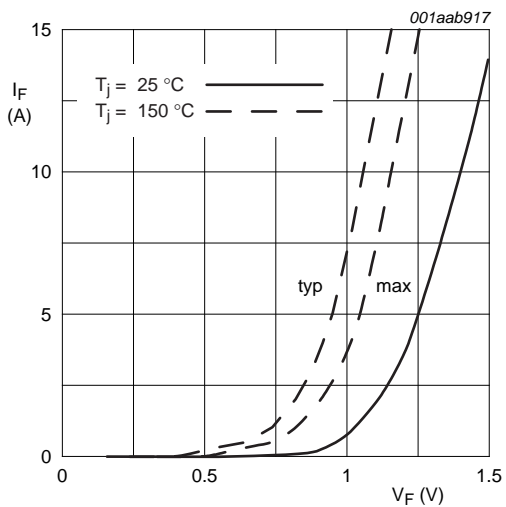
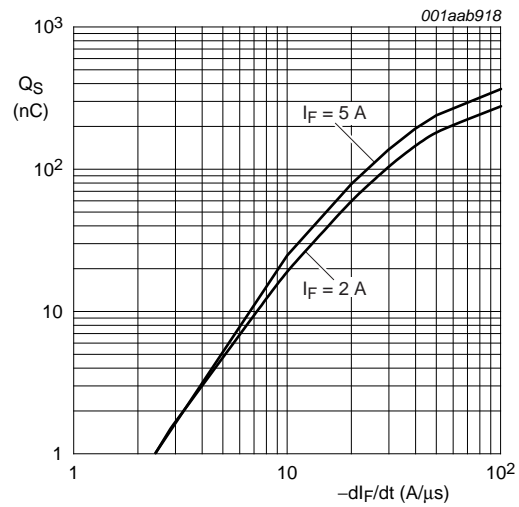


Fig 8. Forward current as a function of forward voltage



Per diode.  
T<sub>J</sub> = 25 °C.

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

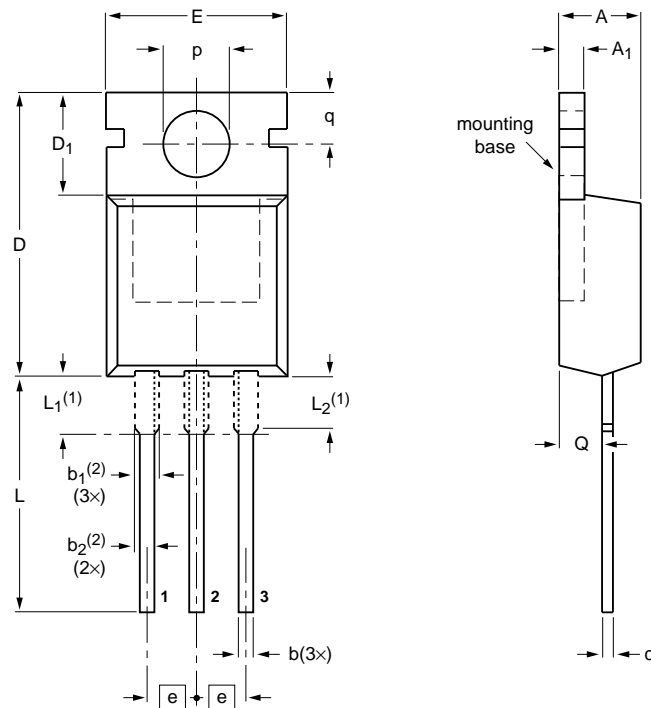
## 7. Package information

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 <sub>1</sub>	b	b <sub>1</sub> ( <sup>2</sup> )	b <sub>2</sub> ( <sup>2</sup> )	c	D	D <sub>1</sub>	E	e	L	L <sub>1</sub> ( <sup>1</sup> )	L <sub>2</sub> ( <sup>1</sup> ) 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:		<ul style="list-style-type: none"><li>• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li><li>• Legal texts have been adapted to the new company name where appropriate.</li></ul>		
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 <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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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