

## 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

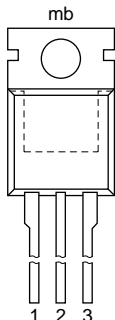
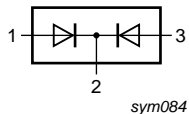
- Output rectifiers in high frequency switched-mode power supplies.

### 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		 <p style="text-align: right;"><i>sym084</i></p>
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	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

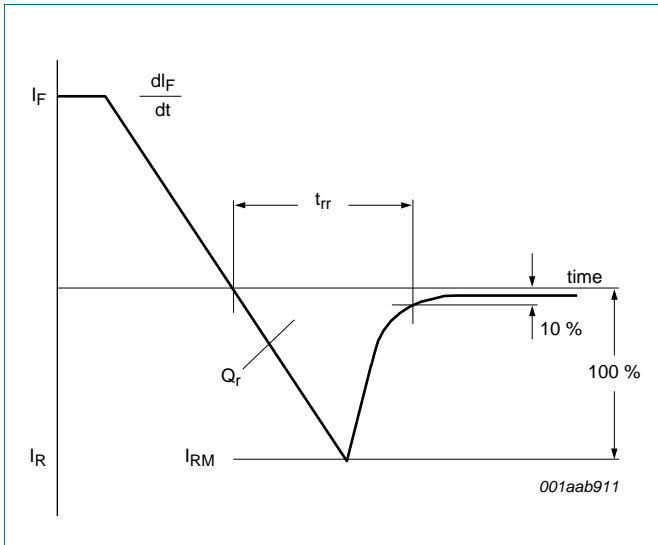


Fig 2. Reverse recovery definitions

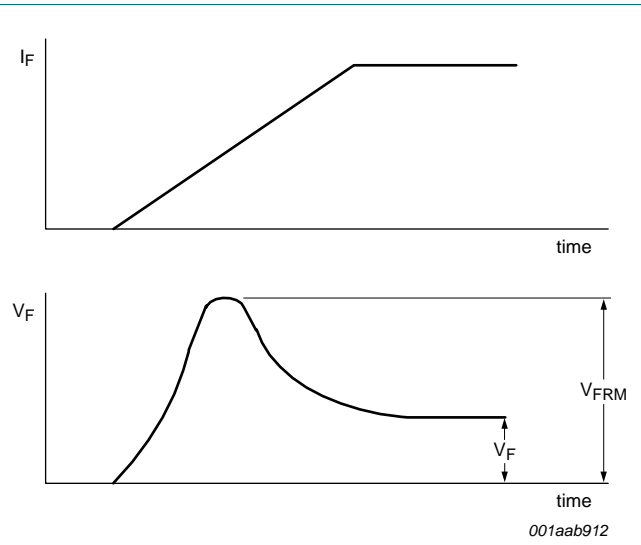


Fig 3. Forward recovery definitions

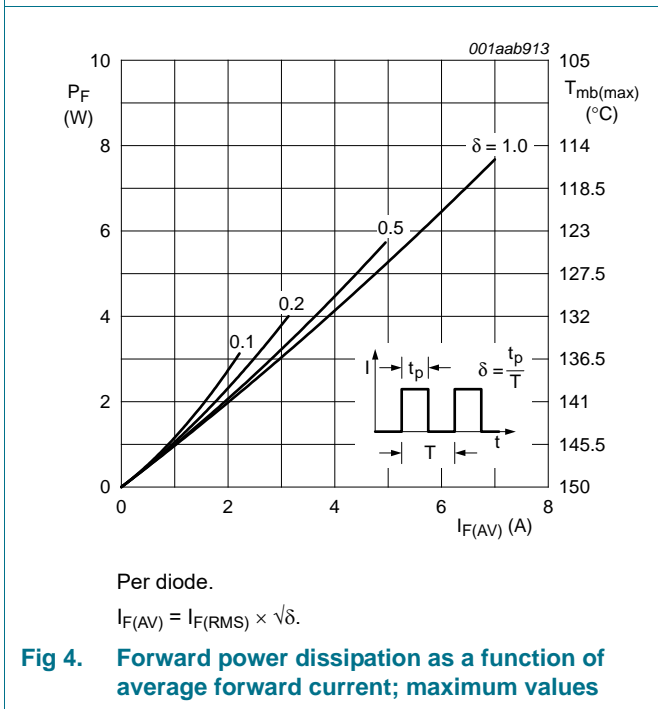


Fig 4. Forward power dissipation as a function of average forward current; maximum values

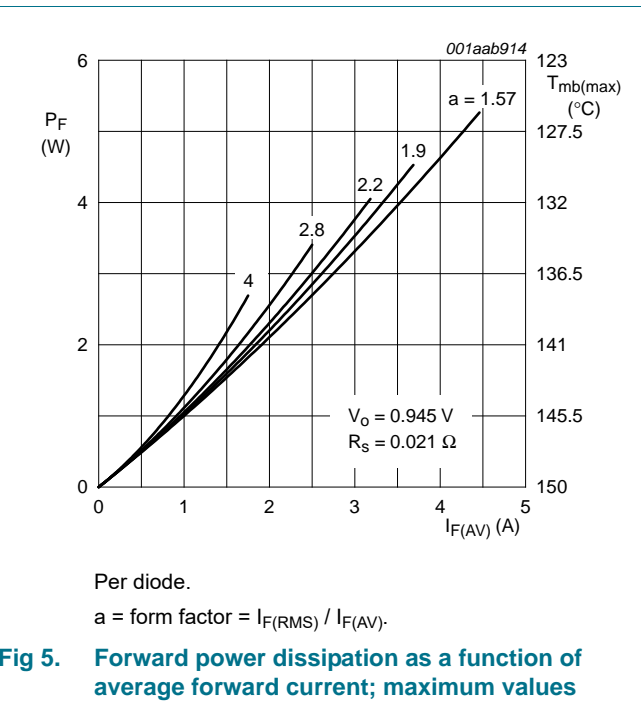
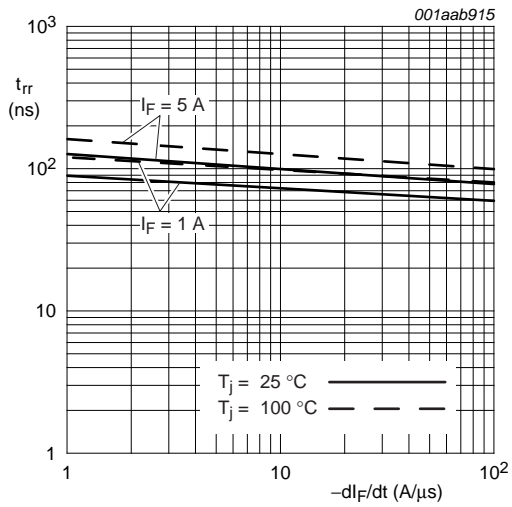
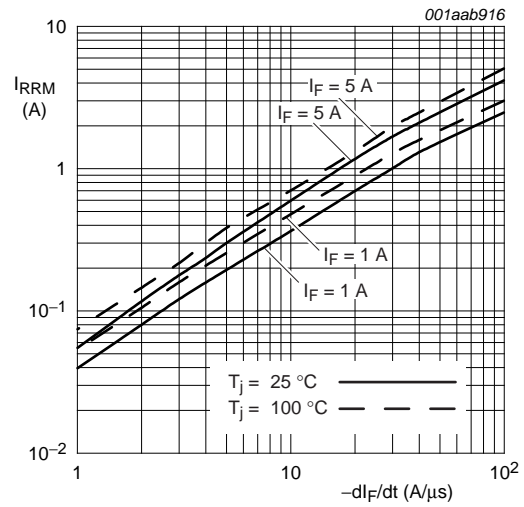


Fig 5. Forward power dissipation as a function of average forward current; maximum values



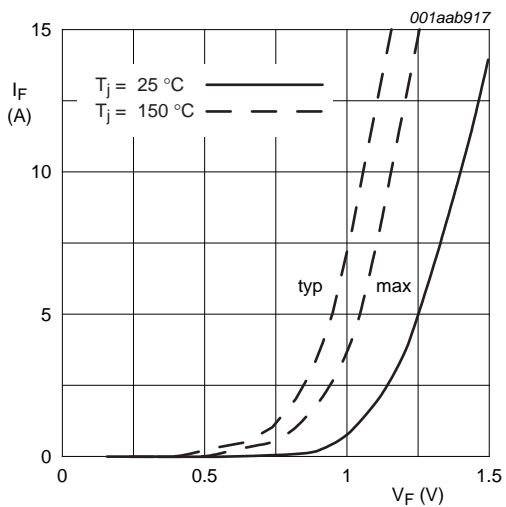
Per diode.

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

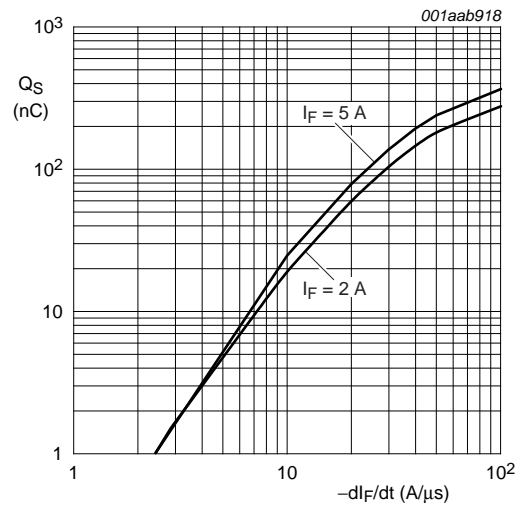


Per diode.

**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.  
Tj = 25 °C.

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

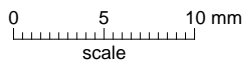
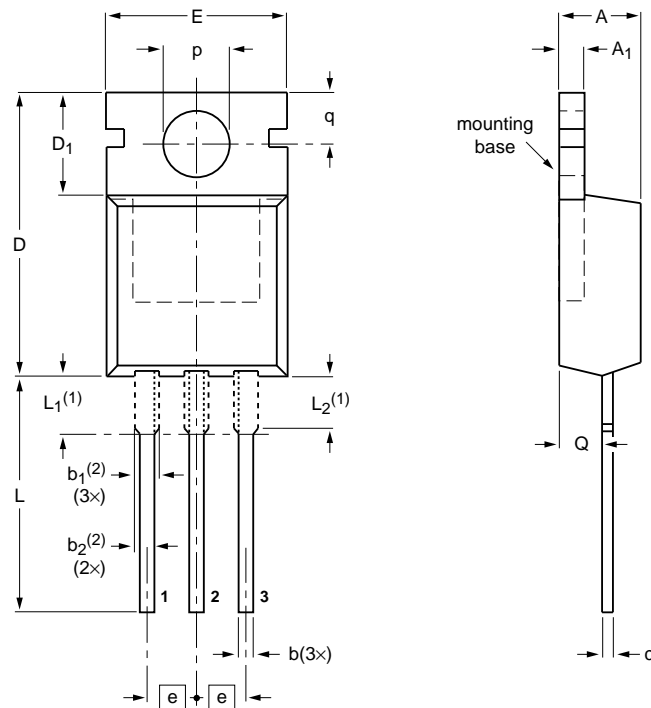
## 7. Package information

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.6	20180929	Product data sheet	-	BYT28_SER v.5
Modifications:	<ul style="list-style-type: none"><li>• Change from NXP version to WeEn version.</li></ul>			
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

### 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".
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