

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

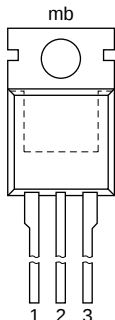
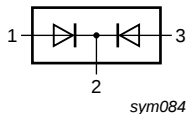
- Output rectifiers in high frequency switched-mode power supplies.

1.4 Quick reference data

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

2. Pinning information

Table 1. Pinning

Pin	Description	Simplified outline	Symbol
1	anode 1		 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	SOT78
BYT28-500		TO-220AB	

4. Limiting values

Table 3. Limiting values

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

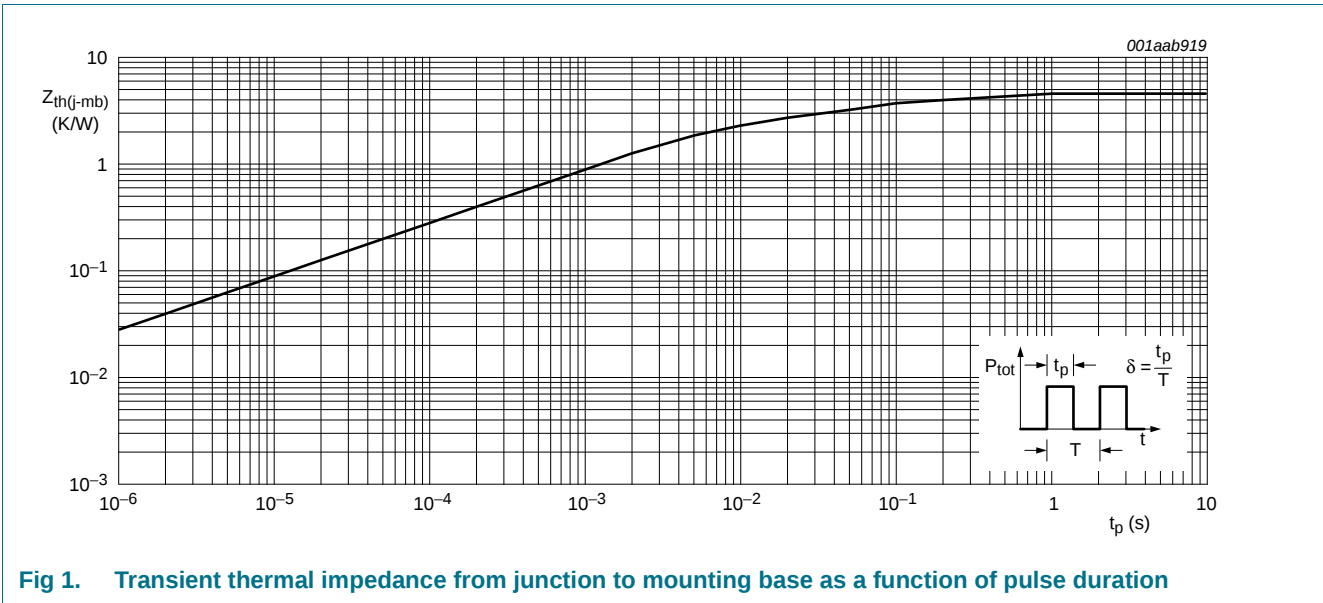
Symbol	Parameter	Conditions	Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage				
	BYT28-300		-	300	V
	BYT28-500		-	500	V
V_R	continuous reverse voltage				
	BYT28-300	$T_{mb} \leq 147\text{ °C}$	-	300	V
	BYT28-500	$T_{mb} \leq 147\text{ °C}$	-	500	V
$I_{O(AV)}$	average rectified output current	both 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 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



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 ≥ 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 ≥ 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 ≥ 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

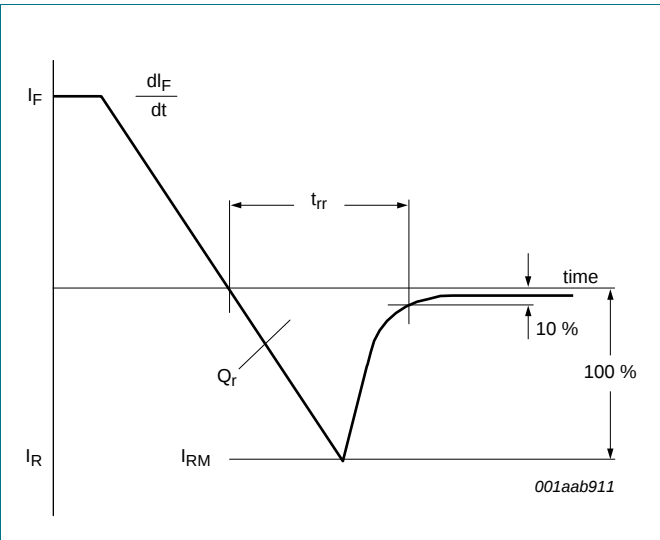


Fig 2. Reverse recovery definitions

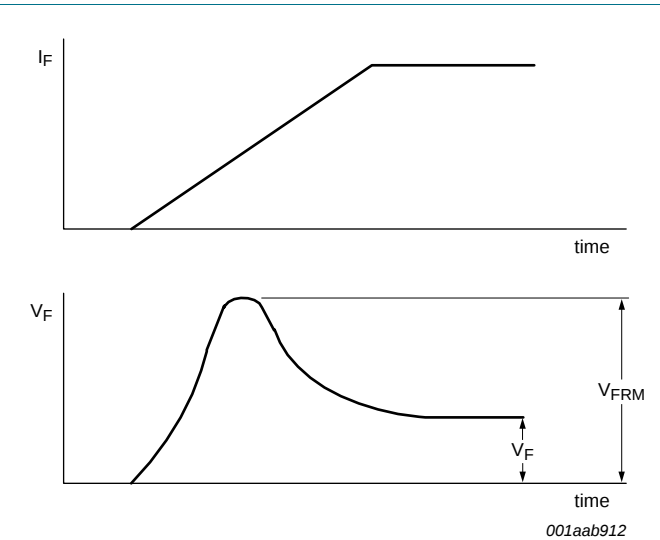


Fig 3. Forward recovery definitions

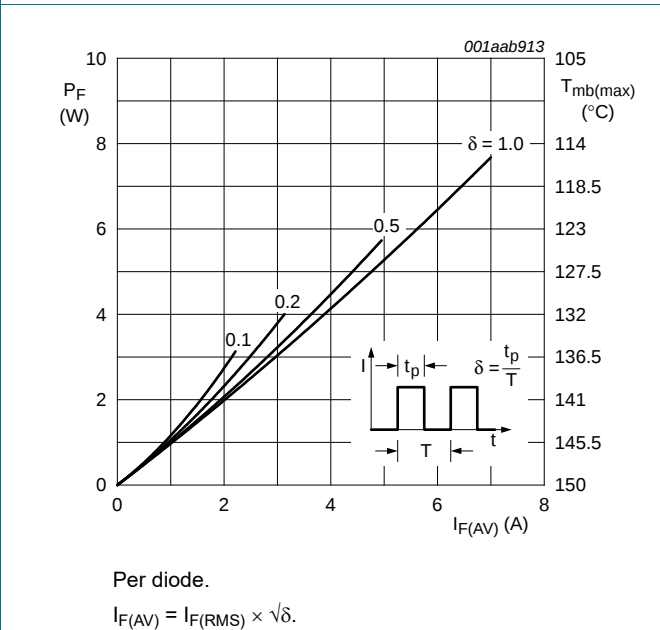


Fig 4. Forward power dissipation as a function of average forward current; maximum values

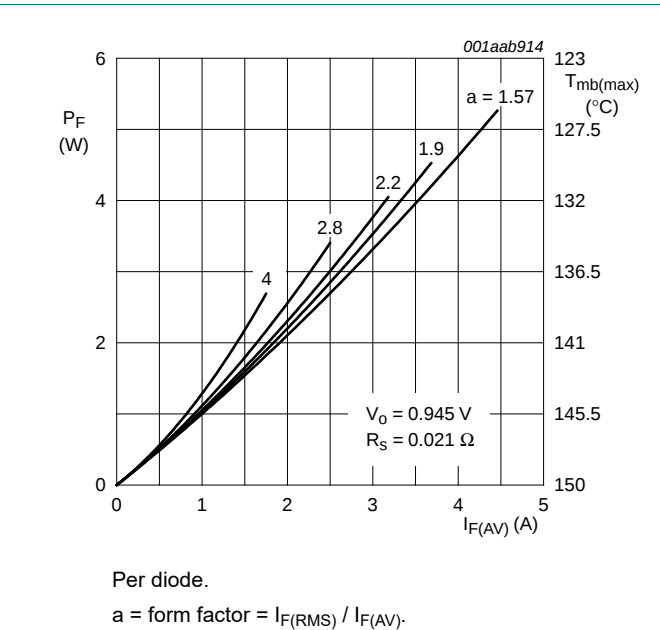
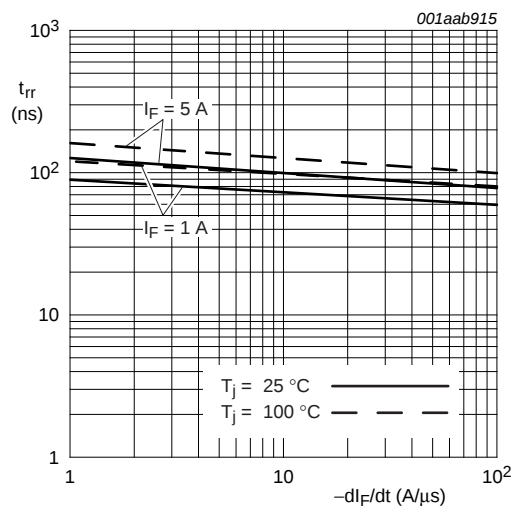
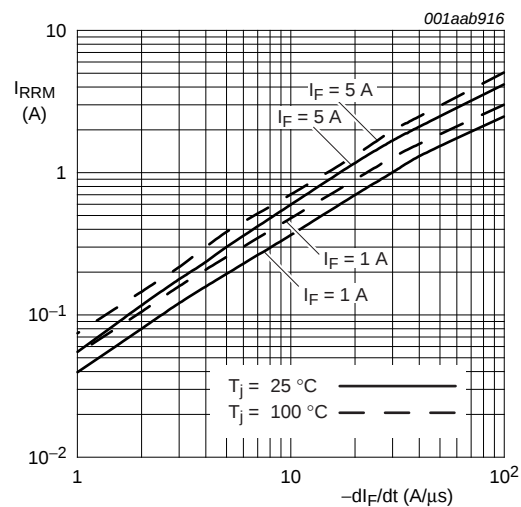


Fig 5. Forward power dissipation as a function of average forward current; maximum values



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

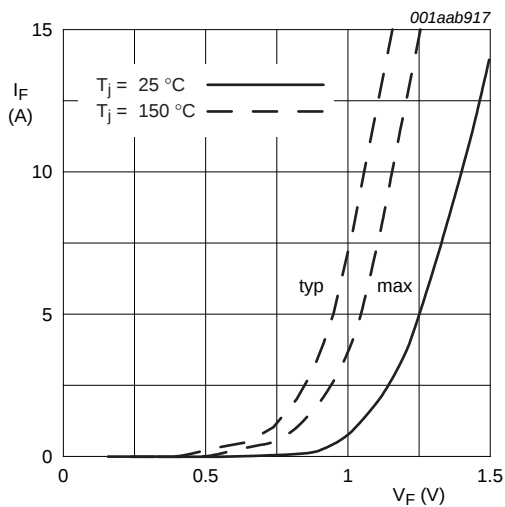
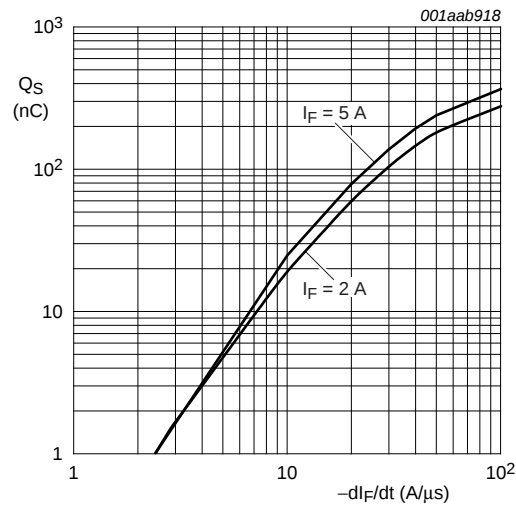


Fig 8. Forward current as a function of forward voltage



Per diode.

$T_J = 25^\circ\text{C}$.

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

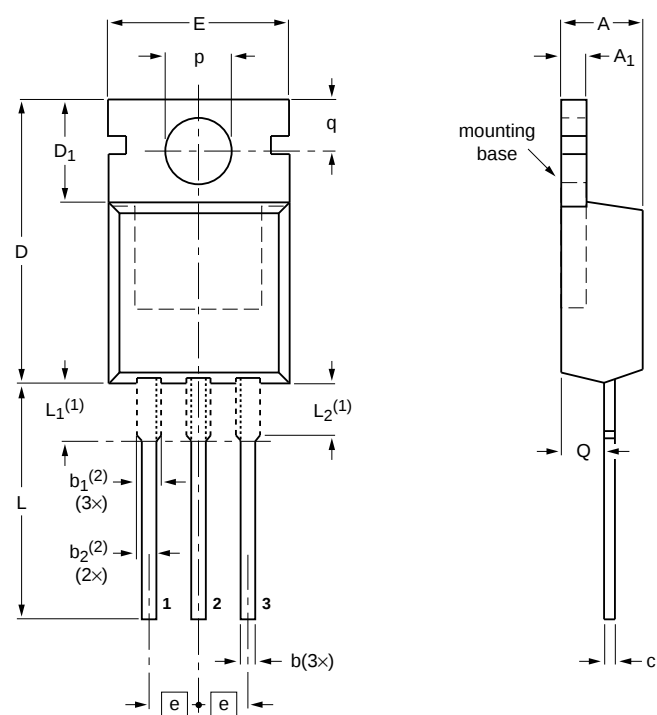
7. Package information

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	-	-