Rectifier diodes ultrafast

BYR29 series

GENERAL DESCRIPTION

Glass passivated, high efficiency, rugged rectifier diodes in a plastic envelope, featuring low forward voltage drop, ultra fast reverse recovery times and soft recovery characteristic. They are intended for use in switched mode power supplies and high frequency circuits in general, where both low conduction losses and low switching losses are essential.

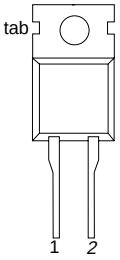
QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	MAX.	MAX.	MAX.	UNIT
	BYR29-	**500**	**600**	**700**	**800**	
V_{RRM}	Repetitive peak reverse voltage	500	600	700	800	V
V_F	Forward voltage	1.5	1.5	1.5	1.5	V
$I_{F(AV)}$	Average forward current	8	8	8	8	A
t_{rr}	Reverse recovery time	75	75	75	75	ns

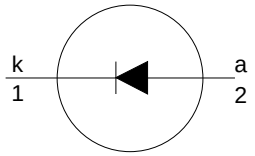
PINNING - TO220AC

PIN	DESCRIPTION
1	cathode (k)
2	anode (a)
tab	cathode (k)

PIN CONFIGURATION



SYMBOL



LIMITING VALUES

Limiting values in accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.				UNIT
				-500	**-600**	**-700**	**-800**	
V_{RRM}	Repetitive peak reverse voltage		-	500	600	700	800	V
V_{RWM}	Crest working reverse voltage		-	500	600	700	800	V
V_R	Continuous reverse voltage		-	500	600	700	800	V
$I_{F(AV)}$	Average forward current[1]	square wave; $\delta = 0.5$; $T_{mb} \leq 115$ ˚C	-	8				A
		sinusoidal; a = 1.57; $T_{mb} \leq 115$ ˚C	-	7.2				A
$I_{F(RMS)}$	RMS forward current		-	11.3				A
I_{FRM}	Repetitive peak forward current	t = 25 µs; $\delta = 0.5$; $T_{mb} \leq 115$ ˚C	-	16				A
I_{FSM}	Non-repetitive peak forward current	t = 10 ms	-	60				A
		t = 8.3 ms sinusoidal; with reapplied $V_{RRM(max)}$	-	66				A
I^2t	I^2t for fusing	t = 10 ms	-	18				A^2s
T_{stg}	Storage temperature		-40	150				˚C
T_j	Operating junction temperature		-	150				˚C

1 Neglecting switching and reverse current losses

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j\text{-}mb}$	Thermal resistance junction to mounting base		-	-	2.5	K/W
$R_{th\ j\text{-}a}$	Thermal resistance junction to ambient	in free air.	-	60	-	K/W

STATIC CHARACTERISTICS

T_j = 25 ˚C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	Forward voltage	I_F = 8 A; T_j = 150˚C	-	1.07	1.50	V
		I_F = 20 A	-	1.75	1.95	V
I_R	Reverse current	$V_R = V_{RRM}$	-	1.0	10	µA
		$V_R = V_{RRM}$; T_j = 100 ˚C	-	0.1	0.2	mA

DYNAMIC CHARACTERISTICS

T_j = 25 ˚C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Q_s	Reverse recovery charge	I_F = 2 A to $V_R \geq$ 30 V; dI_F/dt = 20 A/µs	-	150	200	nC
t_{rr}	Reverse recovery time	I_F = 1 A to $V_R \geq$ 30 V; dI_F/dt = 100 A/µs	-	60	75	ns
I_{rrm}	Peak reverse recovery current	I_F = 10 A to $V_R \geq$ 30 V; dI_F/dt = 50 A/µs; T_j = 100 ˚C	-	-	6	A
V_{fr}	Forward recovery voltage	I_F = 10 A; dI_F/dt = 10 A/µs	-	5.0	-	V

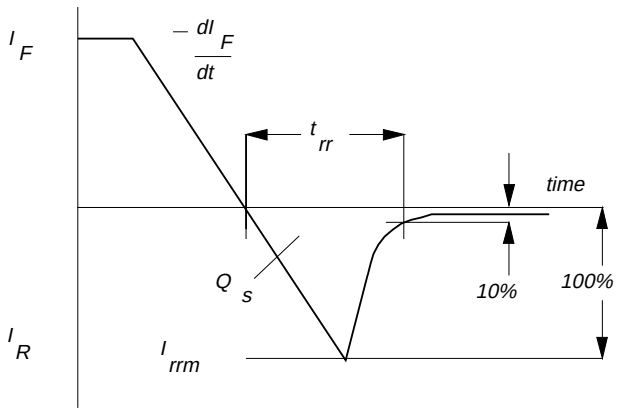


Fig.1. Definition of t_{rr}, Q_s and I_{rrm}

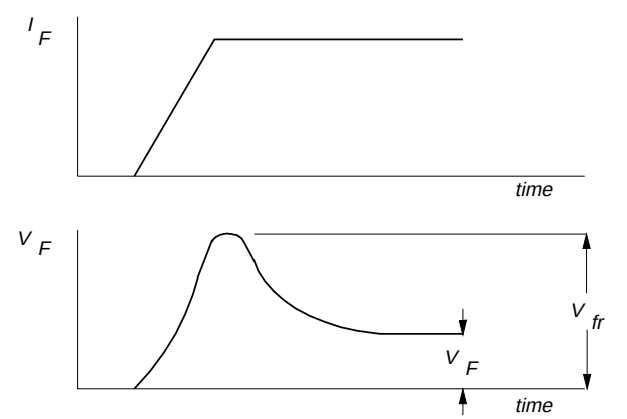


Fig.2. Definition of V_{fr}

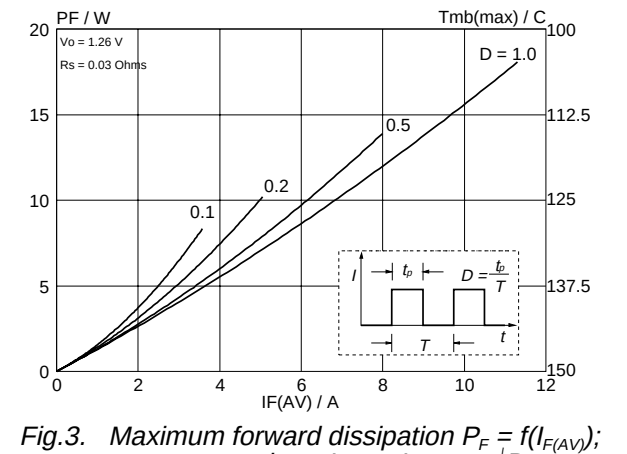


Fig.3. Maximum forward dissipation $P_F = f(I_{F(AV)})$; square wave where $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$.

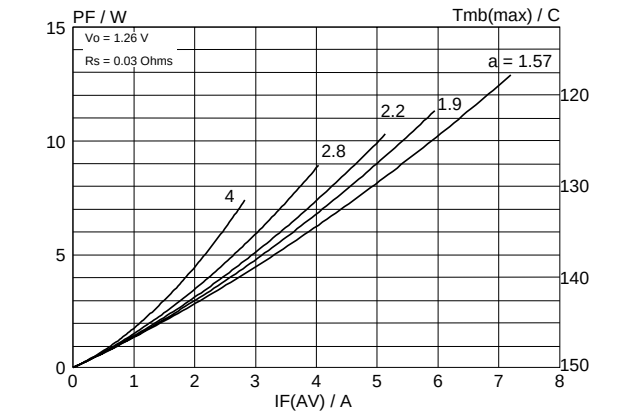


Fig.4. Maximum forward dissipation $P_F = f(I_{F(AV)})$; sinusoidal current waveform where a = form factor = $I_{F(RMS)} / I_{F(AV)}$.

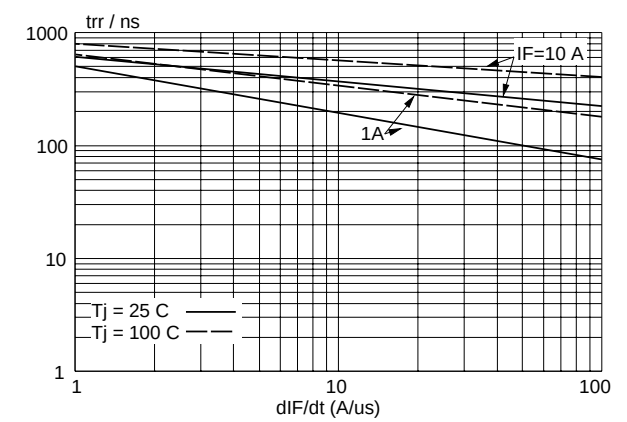


Fig.5. Maximum t_{rr} at T_j = 25˚C and 100˚C.

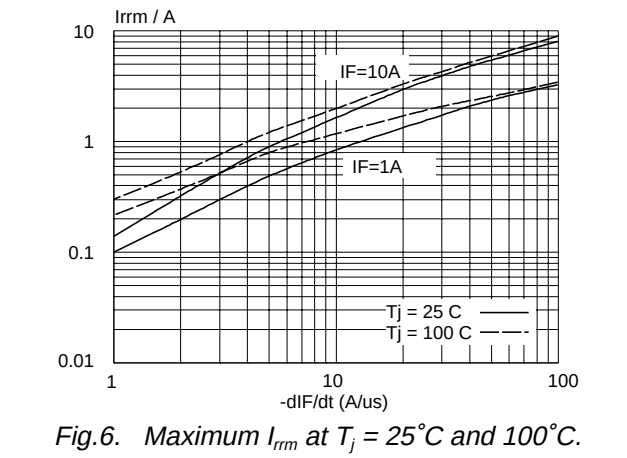


Fig.6. Maximum I_{rrm} at T_j = 25˚C and 100˚C.

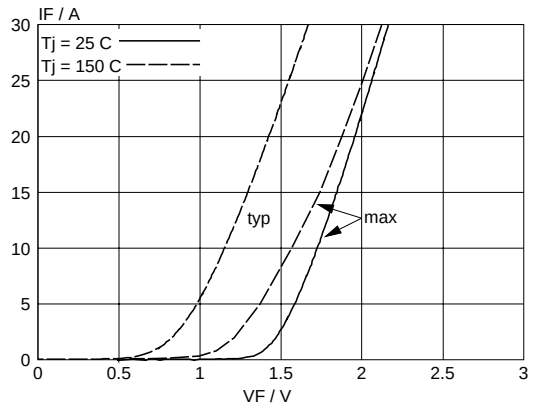


Fig.7. Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j

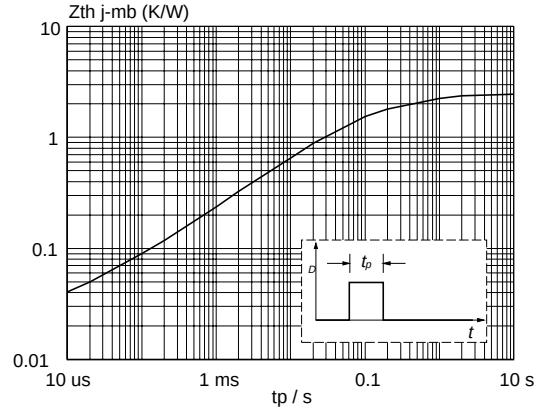


Fig.9. Transient thermal impedance $Z_{th} = f(t_p)$

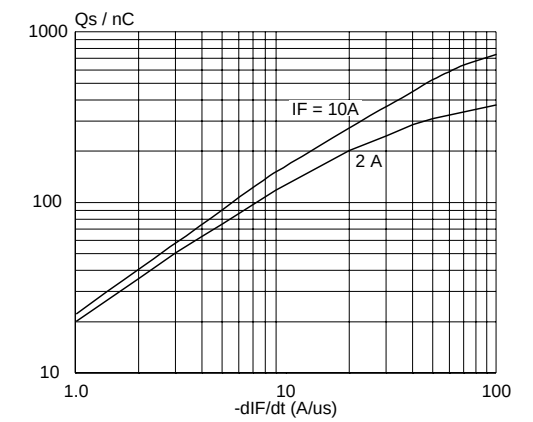


Fig.8. Maximum Q_s at $T_j = 25˚C$

MECHANICAL DATA

Dimensions in mm

Net Mass: 2 g

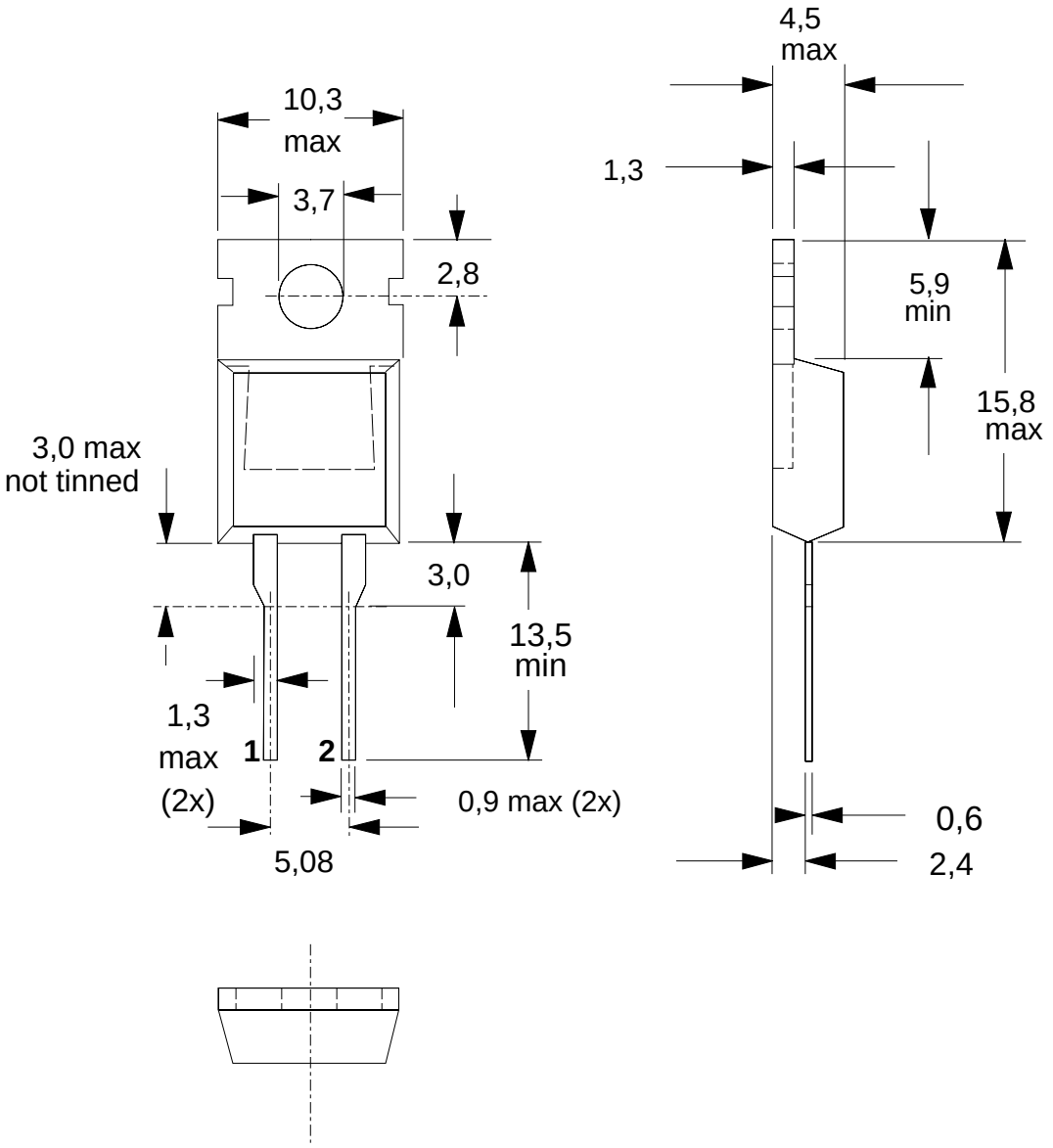


Fig.10. TO220AC; pin 1 connected to mounting base.

Notes
1. Refer to mounting instructions for TO220 envelopes.
2. Epoxy meets UL94 V0 at 1/8".

DEFINITIONS

Data sheet status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values are given in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of this specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

LIFE SUPPORT APPLICATIONS

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