Rectifier diode fast, high-voltage

BY359-1500

GENERAL DESCRIPTION

Glass-passivated double diffused rectifier diode in a plastic envelope featuring low forward voltage drop, fast reverse recovery and soft recovery characteristic. The device is intended for use in TV receivers, series resonant switched mode power supplies and other high voltage circuits.

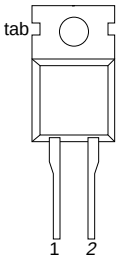
QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{RRM}	Repetitive peak reverse voltage	1500	V
V_F	Forward voltage	1.5	V
$I_{F(AV)}$	Average forward current	10	A
I_{FSM}	Non-repetitive peak forward current	60	A
t_{rr}	Reverse recovery time	0.6	µs

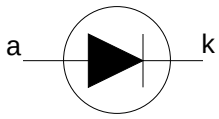
PINNING - TO220AC

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
V_{RSM}	Non-repetitive peak reverse voltage		-	1500	V
V_{RRM}	Repetitive peak reverse voltage		-	1500	V
V_{RWM}	Crest working reverse voltage		-	1300	V
$I_{F(AV)}$	Average forward current[1]	sinusoidal; a = 1.57; $T_{mb} \leq 110$ ˚C	-	10	A
$I_{F(RMS)}$	RMS forward current		-	15.7	A
I_{FRM}	Repetitive peak forward current	sinusoidal; a = 1.57	-	60	A
I_{FSM}	Non-repetitive peak forward current	t = 10 ms	-	60	A
		t = 8.3 ms	-	66	A
		sinusoidal; T_j = 150 ˚C prior to surge; with reapplied $V_{RWM(max)}$			
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

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j\text{-}mb}$	Thermal resistance junction to mounting base		-	-	2.0	K/W
$R_{th\ j\text{-}a}$	Thermal resistance junction to ambient	in free air.	-	60	-	K/W

1 Neglecting switching and reverse current losses.

STATIC CHARACTERISTICS

T_j = 25 ˚C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	Forward voltage	I_F = 20 A	-	1.3	1.8	V
		I_F = 10 A; T_j = 150˚C	-	1.00	1.5	V
I_R	Reverse current	V_R = 1300 V	-	10	100	µA
		V_R = 1300 V; T_j = 100 ˚C	-	50	300	µA

DYNAMIC CHARACTERISTICS

T_j = 25 ˚C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
t_{rr}	Reverse recovery time	I_F = 2 A; $V_R \geq$ 30 V; -dI_F/dt = 20 A/µs	-	0.47	0.6	µs
Q_s	Reverse recovery charge	I_F = 2 A; $V_R \geq$ 30 V; -dI_F/dt = 20 A/µs	-	1.6	2.0	µC
V_{fr}	Peak forward recovery voltage	I_F = 10 A; dI_F/dt = 30 A/µs	-	11.0	-	V

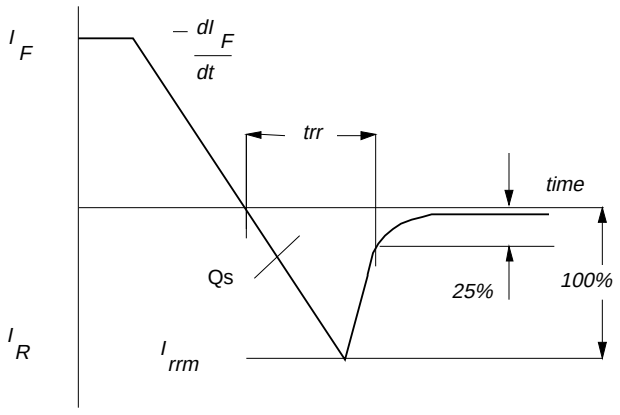


Fig.1. Definition of t_{rr}, Q_s and I_{rrm}

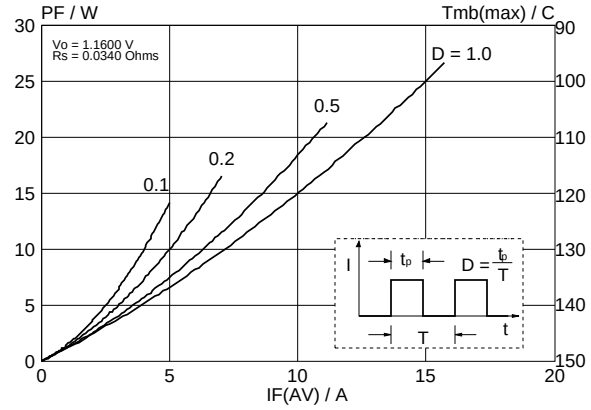


Fig.3. Maximum forward dissipation $P_F = f(I_{F(AV)})$; square wave where $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$.

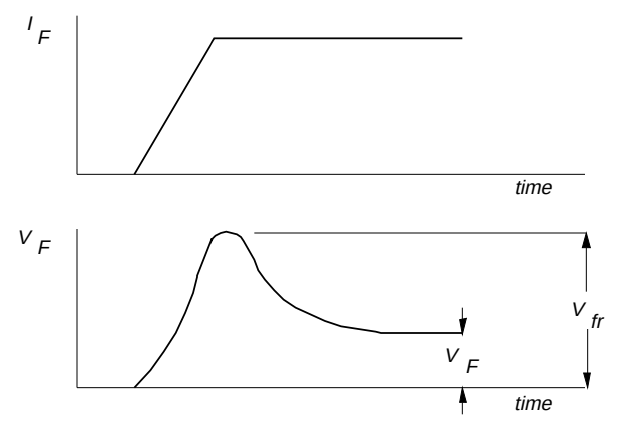


Fig.2. Definition of V_{fr}

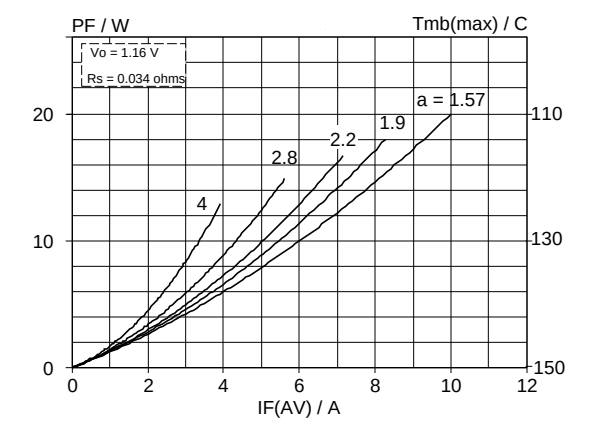


Fig.4. Maximum forward dissipation $P_F = f(I_{F(AV)})$; sinusoidal current waveform where a = form factor = $I_{F(RMS)} / I_{F(AV)}$.

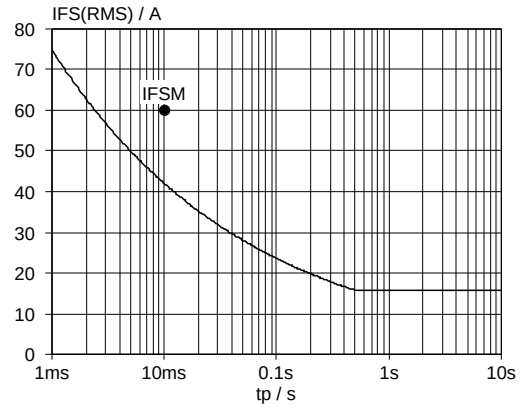


Fig.5. Maximum non-repetitive rms forward current. $I_F = f(t_p)$; sinusoidal current waveform; T_j = 150˚C prior to surge with reapplied V_{RWM}.

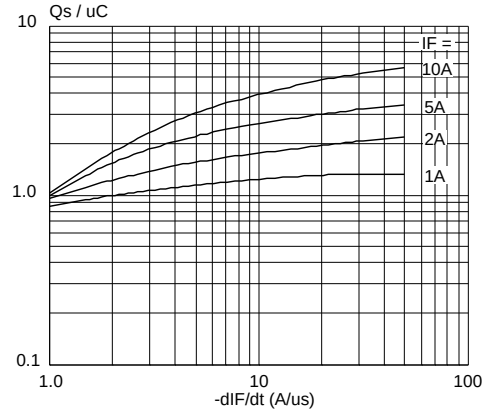


Fig.8. Maximum reverse recovery charge $Q_s = f(dI_F/dt)$; parameter T_j

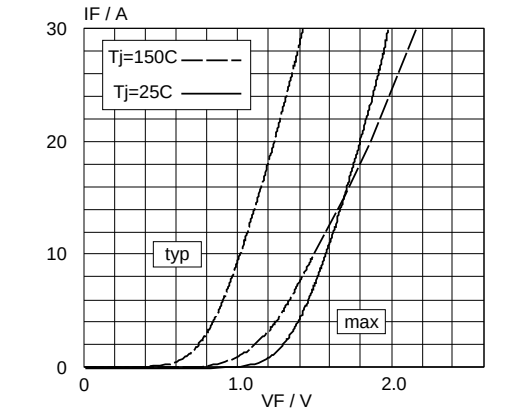


Fig.6. Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j

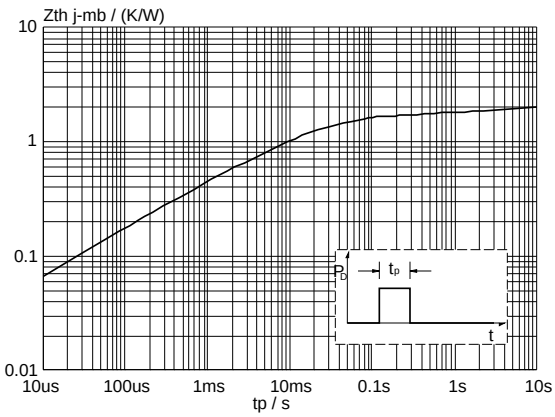


Fig.9. Transient thermal impedance $Z_{th} = f(t_p)$

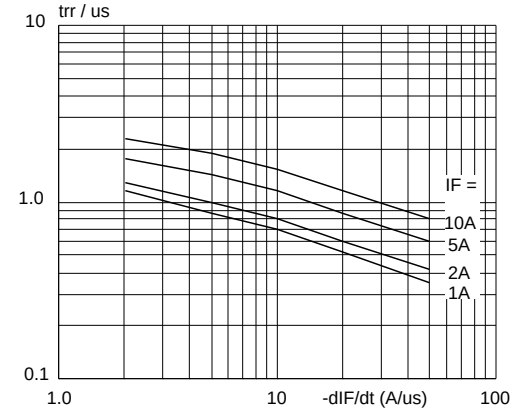


Fig.7. Maximum reverse recovery time $t_{rr} = f(dI_F/dt)$; parameter T_j

MECHANICAL DATA

Dimensions in mm

Net Mass: 2 g

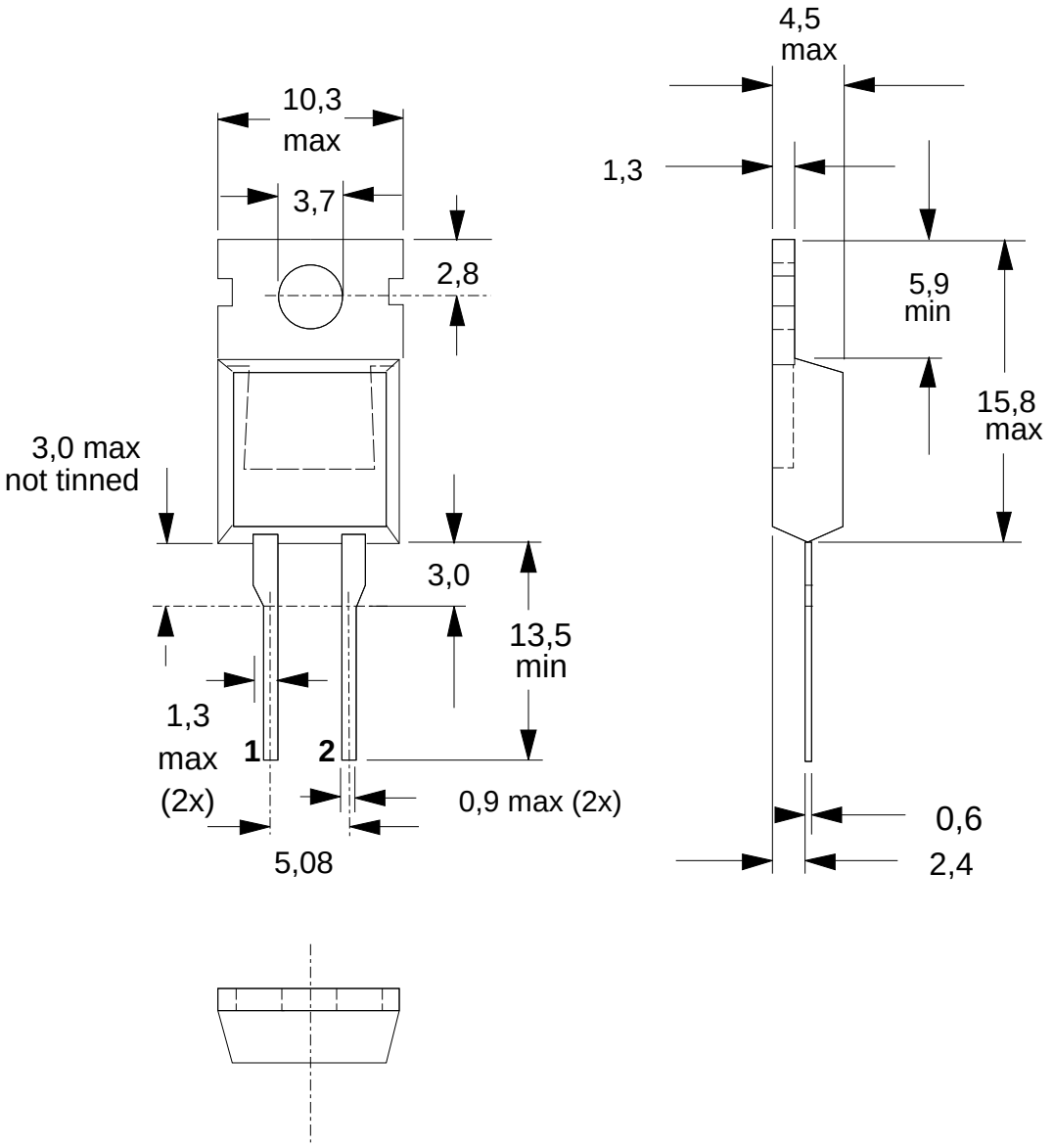


Fig.10. TO220AC; pin 1 connected to mounting base.

Notes
1. Accessories supplied on request: 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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