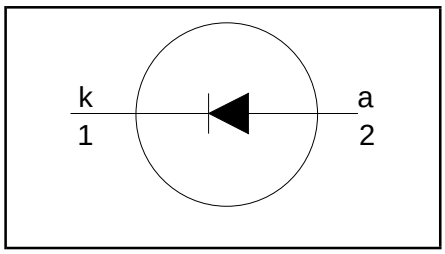
Rectifier diodes ultrafast

BYV29X-600

FEATURES

- Low forward volt drop
- Fast switching
- Soft recovery characteristic
- High thermal cycling performance
- Low thermal resistance

SYMBOL



QUICK REFERENCE DATA

V_R = 600V

$V_F \leq 1.03$ V

$I_{F(peak)}$ = 7 A

$t_{rr} \leq 60$ ns

GENERAL DESCRIPTION

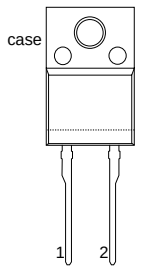
Ultra-fast, epitaxial rectifier diodes intended for use as output rectifiers in high frequency switched mode power supplies.

The BYV29X-600 is supplied in the conventional leaded SOD113 (SOT186a) package.

PINNING

PIN	DESCRIPTION
1	cathode
2	anode
tab	isolated

SOD113 (SOT186a)



LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	Peak repetitive reverse voltage		-	600	V
V_{RWM}	Crest working reverse voltage		-	600	V
V_R	Continuous reverse voltage		-	600	V
$I_{F(AV)}$	Average forward current[1]	square wave; $\delta = 0.5$; $T_{mb} \leq 100$ ˚C	-	9	A
I_{FRM}	Repetitive peak forward current	t = 25 µs; $\delta = 0.5$; $T_{mb} \leq 100$ ˚C	-	18	A
I_{FSM}	Non-repetitive peak forward current.	t = 10 ms	-	70	A
		t = 8.3 ms sinusoidal; with reapplied $V_{RRM(max)}$	-	77	A
T_{stg}	Storage temperature		-40	150	˚C
T_j	Operating junction temperature		-	150	˚C

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j\text{-}hs}$	Thermal resistance junction to heat sink		-	-	5.5	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.

ISOLATION LIMITING VALUE & CHARACTERISTIC

T_{hs} = 25 ˚C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{isol}	R.M.S. isolation voltage from both terminals to external heatsink	f = 50-60 Hz; sinusoidal waveform; R.H. ≤ 65% ; clean and dustfree	-		2500	V
C_{isol}	Capacitance from both terminals to external heatsink	f = 1 MHz	-	10	-	pF

ELECTRICAL 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	-	0.90	1.03	V
		I_F = 8 A	-	1.05	1.25	V
		I_F = 20 A	-	1.30	1.45	V
I_R	Reverse current	$V_R = V_{RRM}$	-	2.0	50	µA
		$V_R = V_{RRM}$; T_j = 100 ˚C	-	0.1	0.35	mA
Q_s	Reverse recovery charge	I_F = 2 A to $V_R \geq$ 30 V; dI_F/dt = 20 A/µs	-	40	70	nC
t_{rr}	Reverse recovery time	I_F = 1 A to $V_R \geq$ 30 V; dI_F/dt = 100 A/µs	-	50	60	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	-	3.0	5.5	A
V_{fr}	Forward recovery voltage	I_F = 10 A; dI_F/dt = 10 A/µs	-	3.2	-	V

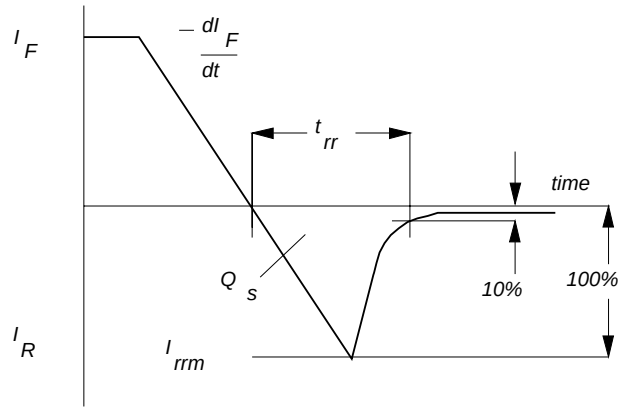


Fig.1. Definition of t_{rr}, Q_s and I_{rrm}

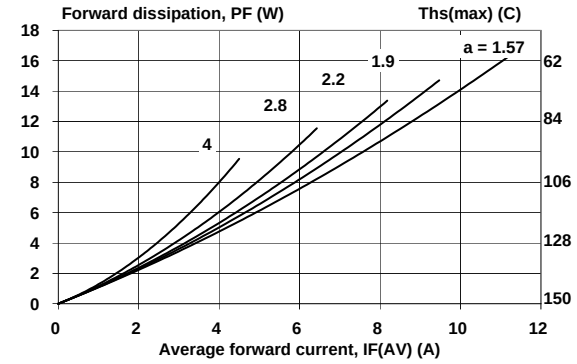


Fig.4. Maximum forward dissipation $P_F = f(I_{F(AV)})$; sinusoidal current waveform where a = form factor = $I_{F(RMS)} / I_{F(AV)}$.

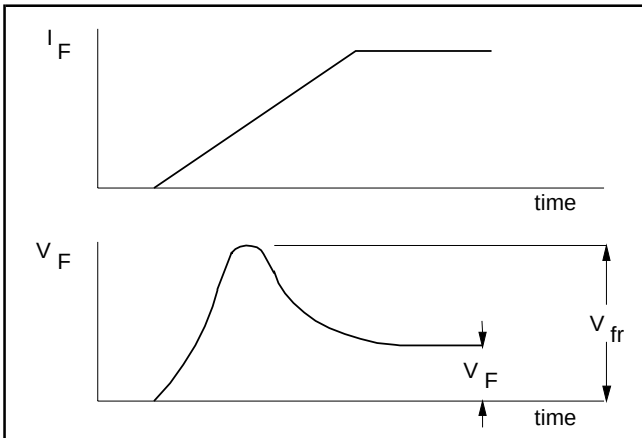


Fig.2. Definition of V_{fr}

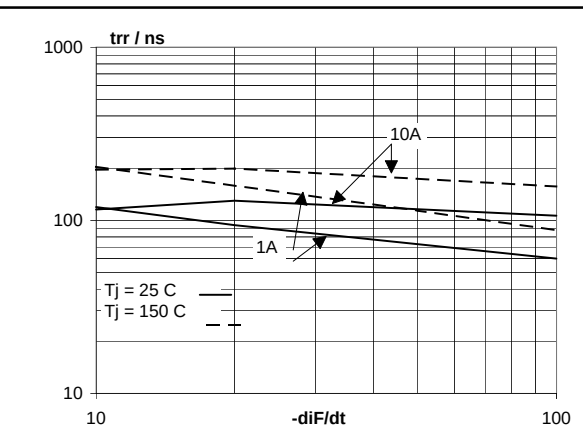


Fig.5. Maximum t_{rr} at T_j = 25˚C and 100˚C

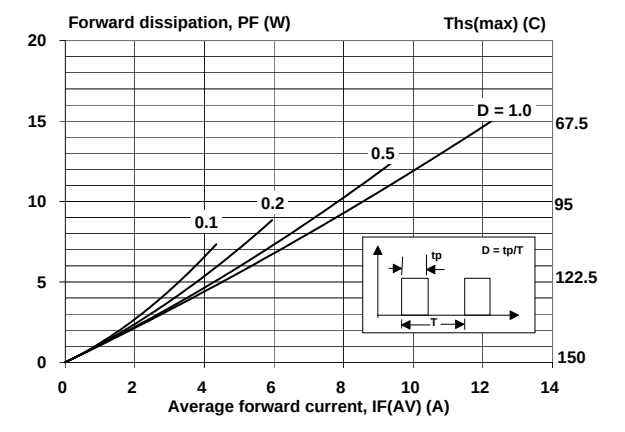


Fig.3. Maximum forward dissipation $P_F = f(I_{F(AV)})$; square wave where $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$.

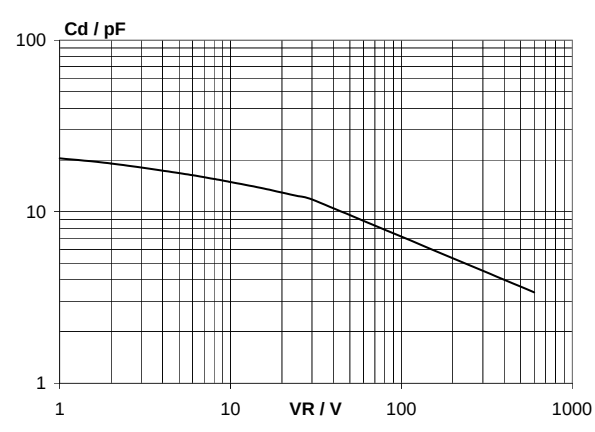


Fig.6. Typical junction capacitance C_d at f = 1 MHz; T_j = 25˚C

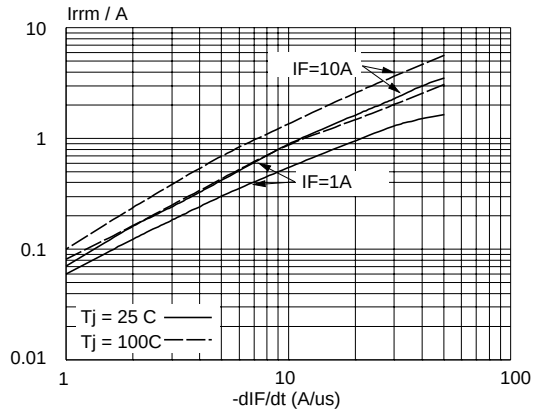


Fig.7. Maximum I_{rrm} at T_j = 25˚C and 100˚C.

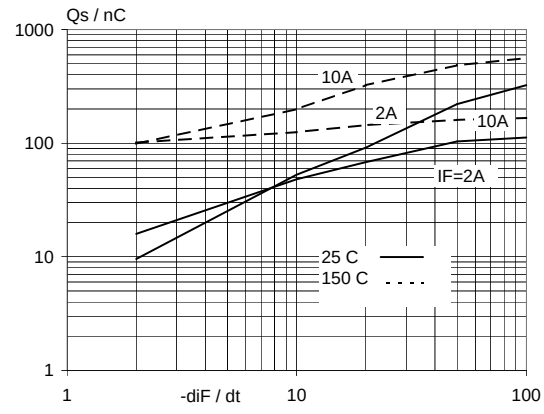


Fig.9. Maximum Q_s at T_j = 25˚C

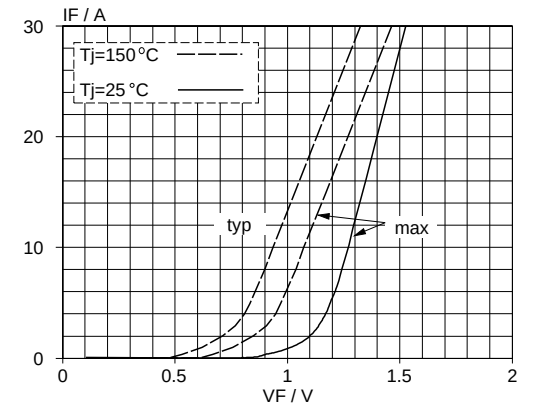


Fig.8. Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j

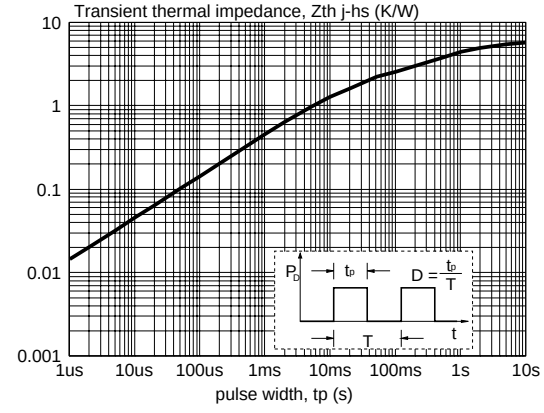


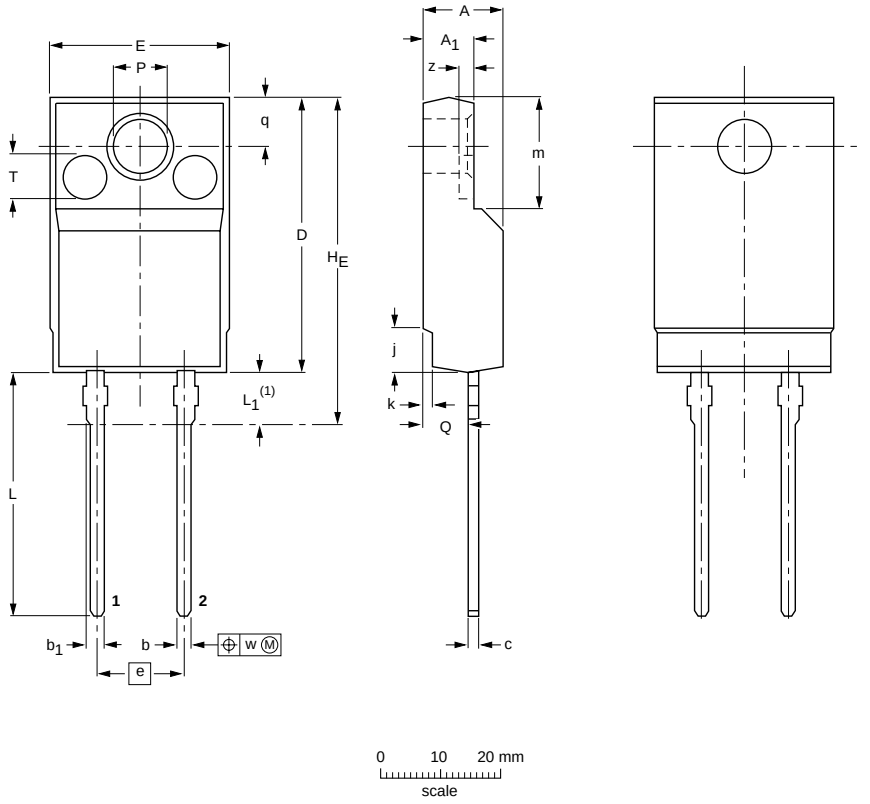
Fig.10. Transient thermal impedance $Z_{th\ j\text{-}mb} = f(t_p)$

MECHANICAL DATA

Dimensions in mm

Net Mass: 2 g

Plastic single-ended package; isolated heatsink mounted; 1 mounting hole; 2-leads TO-220 'full pack' **SOD113**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1	b	b_1	c	D	E	e	H_E max.	j	k	L	L_1(1)	m	P	Q	q	T	w	z(2)
mm	4.6 4.0	2.9 2.5	0.9 0.7	1.1 0.9	0.7 0.4	15.8 15.2	10.3 9.7	5.08	19.0	2.7 2.3	0.6 0.4	14.4 13.5	3.3 2.8	6.5 6.3	3.2 3.0	2.6 2.3	2.6	2.55	0.4	0.8

Notes

1. Terminals are uncontrolled within zone L_1.
2. z is depth of T.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOD113		2-lead TO-220				97-06-11

Fig.11. SOD113; The seating plane is electrically isolated from all terminals.

Notes

1. Refer to mounting instructions for F-pack 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.	

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