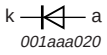
Rectifier diodes ultrafast, rugged

BYV79E series

FEATURES

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

SYMBOL



001aaa020

QUICK REFERENCE DATA

V_R = 150 V/ 200 V

$V_F \leq 0.9$ V

$I_{F(AV)}$ = 14 A

$I_{RRM} \leq 0.2$ A

$t_{rr} \leq 30$ ns

GENERAL DESCRIPTION

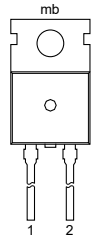
Ultra-fast, epitaxial rectifier diodes intended for use as output rectifiers in high frequency switched mode power supplies.

The BYV79E series is supplied in the conventional leaded SOD59 (TO220AC) package.

PINNING

PIN	DESCRIPTION
1	cathode
2	anode
tab	cathode

SOD59 (TO220AC)



TO-220AC (SOD59)

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.		UNIT
		BYV79E		**-150**	**-200**	
V_{RRM}	Peak repetitive reverse voltage		-	150	200	V
V_{RWM}	Crest working reverse voltage		-	150	200	V
V_R	Continuous reverse voltage	$T_{mb} \leq 145$˚C	-	150	200	V
$I_{F(AV)}$	Average forward current[1]	square wave $\delta = 0.5$; $T_{mb} \leq 120$ ˚C	-	14		A
I_{FRM}	Repetitive peak forward current	t = 25 µs; $\delta = 0.5$; $T_{mb} \leq 120$ ˚C	-	28		A
I_{FSM}	Non-repetitive peak forward current	t = 10 ms	-	150		A
		t = 8.3 ms sinusoidal; with reapplied $V_{RWM(max)}$	-	160		A
I_{RRM}	Repetitive peak reverse current	$t_p = 2$ µs; $\delta = 0.001$	-	0.2		A
I_{RSM}	Non-repetitive peak reverse current	$t_p = 100$ µs	-	0.2		A
T_{stg}	Storage temperature		-40	150		˚C
T_j	Operating junction temperature		-	150		˚C

1. Neglecting switching and reverse current losses.

ESD LIMITING VALUE

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_C	Electrostatic discharge capacitor voltage	Human body model; C = 250 pF; R = 1.5 kΩ	-	8	kV

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j\text{-}mb}$	Thermal resistance junction to mounting base		-	-	2	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 = 14 A; T_j = 150˚C	-	0.83	0.90	V
		I_F = 14 A	-	0.95	1.05	V
		I_F = 50 A	-	1.2	1.4	V
I_R	Reverse current	$V_R = V_{RWM}$; T_j = 100 ˚C	-	0.5	1.3	mA
		$V_R = V_{RWM}$	-	5	50	µA
Q_s	Reverse recovery charge	I_F = 2 A; $V_R \geq$ 30 V; $-dI_F/dt$ = 20 A/µs	-	6	15	nC
t_{rr1}	Reverse recovery time	I_F = 1 A; $V_R \geq$ 30 V; $-dI_F/dt$ = 100 A/µs	-	20	30	ns
t_{rr2}	Reverse recovery time	I_F = 0.5 A to I_R = 1 A; I_{rec} = 0.25 A	-	13	22	ns
V_{fr}	Forward recovery voltage	I_F = 1 A; dI_F/dt = 10 A/µs	-	1	-	V

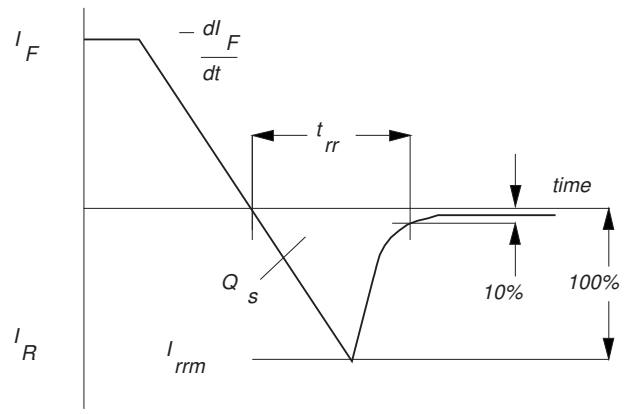


Fig.1. Definition of t_{rr1}, Q_s and I_{rrm}

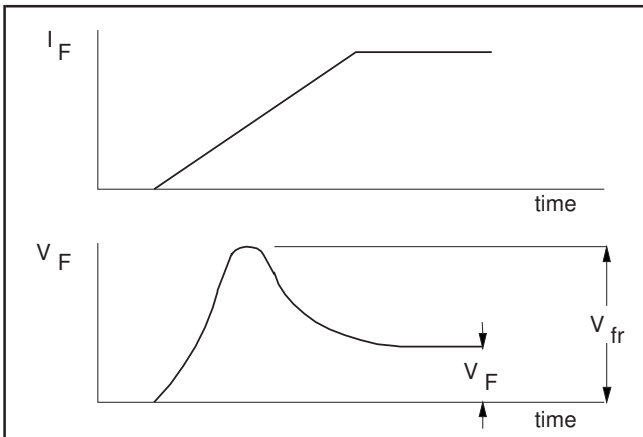


Fig.2. Definition of V_{fr}

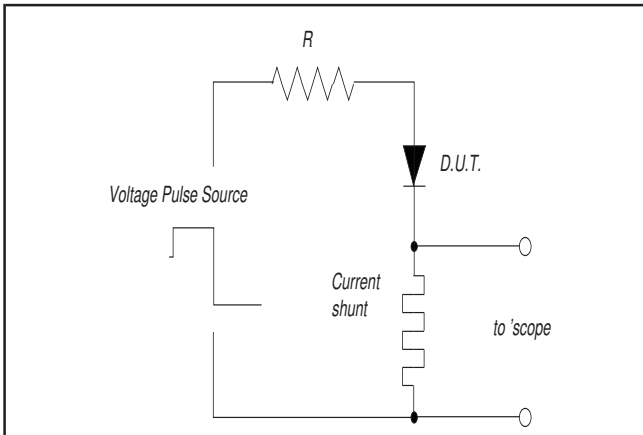


Fig.3. Circuit schematic for t_{rr2}

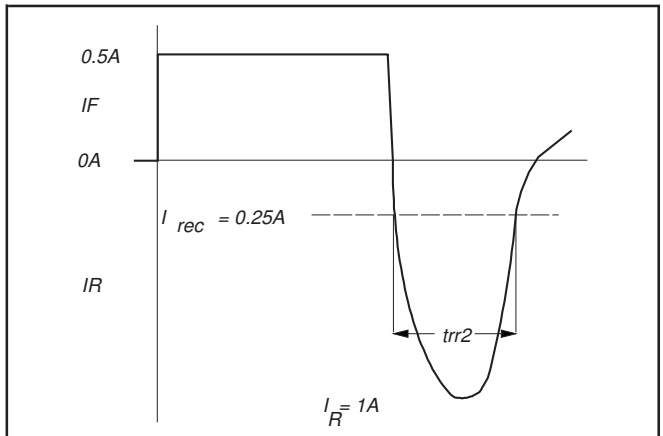


Fig.4. Definition of t_{rr2}

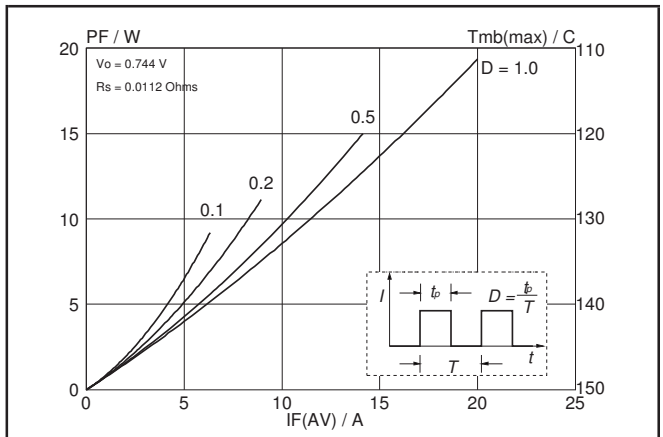


Fig.5. Maximum forward dissipation $P_F = f(I_{F(AV)})$; square current waveform where $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$.

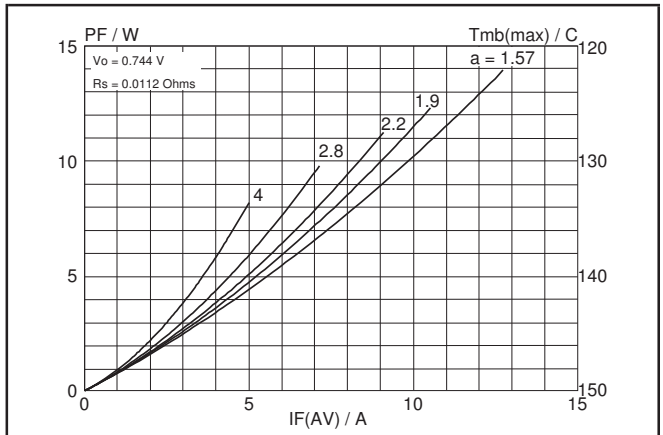


Fig.6. Maximum forward dissipation $P_F = f(I_{F(AV)})$; sinusoidal current waveform where a = form factor = $I_{F(RMS)} / I_{F(AV)}$.

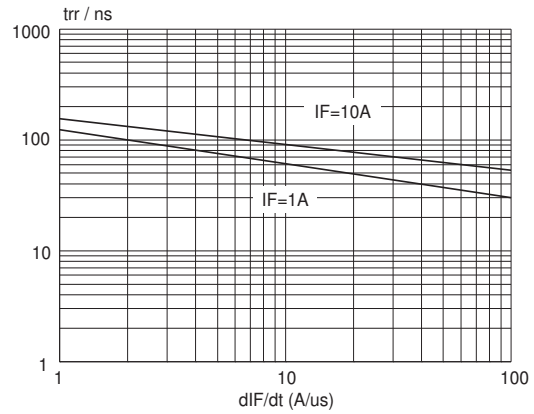


Fig.7. Maximum t_{rr} at T_j = 25 ˚C.

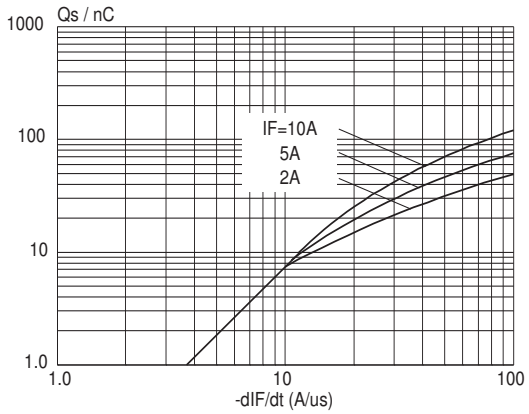


Fig.10. Maximum Q_s at T_j = 25 ˚C.

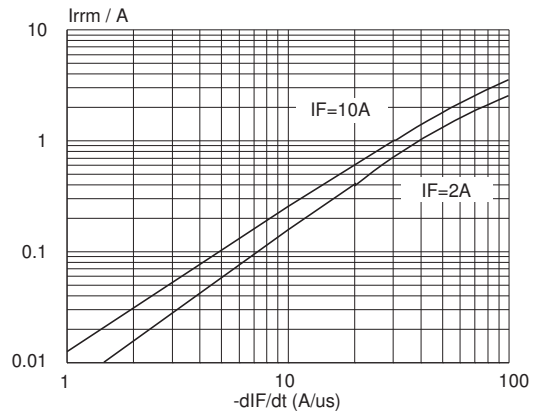


Fig.8. Maximum I_{rrm} at T_j = 25 ˚C.

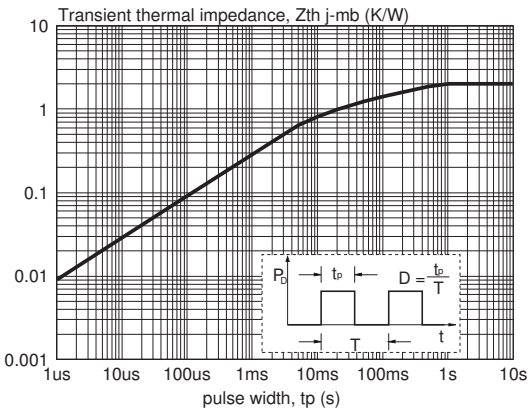


Fig.11. Transient thermal impedance; $Z_{th\ j\text{-}mb} = f(t_p)$.

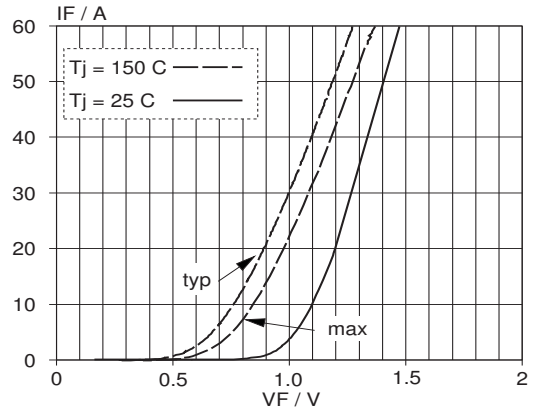
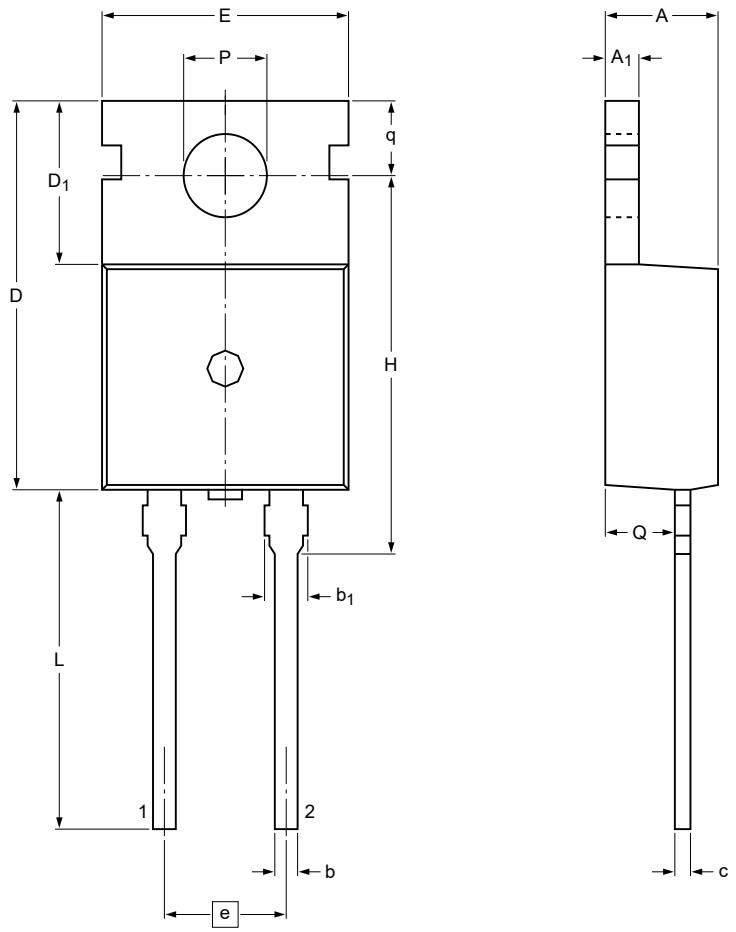


Fig.9. Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j

MECHANICAL DATA

Plastic single-ended package; heatsink mounted; 1 mounting hole; 2-lead TO-220AC **SOD59**



Dimensions

Unit		A	A_1	b	b_1[(1)]	c	D	D_1	E	e	H	L	P	Q	q
mm	max	4.7	1.40	0.95	1.7	0.65	15.8	6.8	10.30	5.08 (REF)	16.25	15.0	3.80	2.6	2.9
	nom														
	min	4.3	1.15	0.70	1.3	0.45	15.6	6.4	9.65		15.70	12.5	3.65	2.2	2.7

Note
1. Protruded dambar are included in the dimension.

sod059_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOD59	2-lead TO-220AC					~~09-08-25~~ 12-11-27

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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