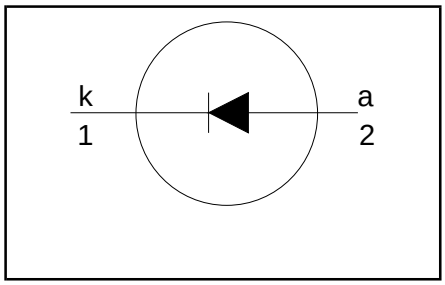
Rectifier diodes ultrafast

BYR29F series

FEATURES

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

SYMBOL



QUICK REFERENCE DATA

V_R = 500 V/ 600 V/ 700 V / 800 V

$V_F \leq 1.5$ V

$I_{F(AV)} = 8$ A

$t_{rr} \leq 75$ ns

GENERAL DESCRIPTION

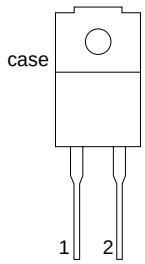
Ultra-fast, epitaxial rectifier diodes intended for use as output rectifiers in high frequency switched mode power supplies.

The BYR29F series is supplied in the conventional leaded SOD100 package.

PINNING

PIN	DESCRIPTION
1	cathode
2	anode
tab	isolated

SOD100



LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.				UNIT
		BYR29F		**-500**	**-600**	**-700**	**-800**	
V_{RRM}	Peak repetitive reverse voltage		-	500	600	700	800	V
V_{RWM}	Crest working reverse voltage		-	500	600	700	800	V
V_R	Continuous reverse voltage	$T_{hs} \leq 136$ ˚C	-	500	600	700	800	V
$I_{F(AV)}$	Average forward current[1]	square wave; $\delta = 0.5$; $T_{hs} \leq 73$ ˚C	-	8				A
I_{FRM}	Repetitive peak forward current	t = 25 µs; $\delta = 0.5$; $T_{hs} \leq 73$ ˚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
T_{stg}	Storage temperature		-40	150				˚C
T_j	Operating junction temperature		-	150				˚C

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}	Repetitive peak voltage from both terminals to external heatsink	R.H. ≤ 65% ; clean and dustfree	-		1500	V
C_{isol}	Capacitance from cathode to external heatsink	f = 1 MHz	-	12	-	pF

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j\text{-}hs}$	Thermal resistance junction to heatsink	with heatsink compound	-	-	5.5	K/W
		without heatsink compound	-	-	7.2	K/W
$R_{th\ j\text{-}a}$	Thermal resistance junction to ambient	in free air.	-	55	-	K/W

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	-	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
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

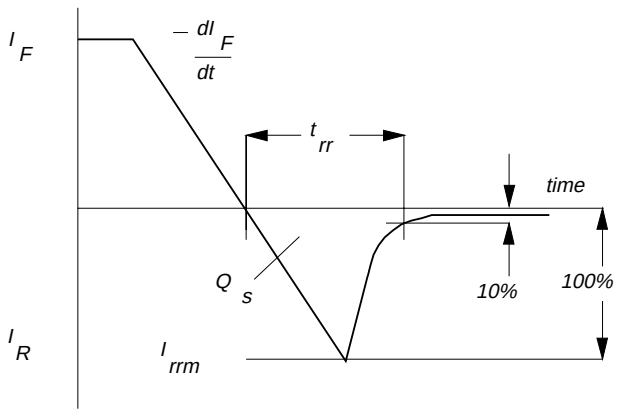


Fig.1. Definition of t_{rr}, Q_s and I_{rrm}

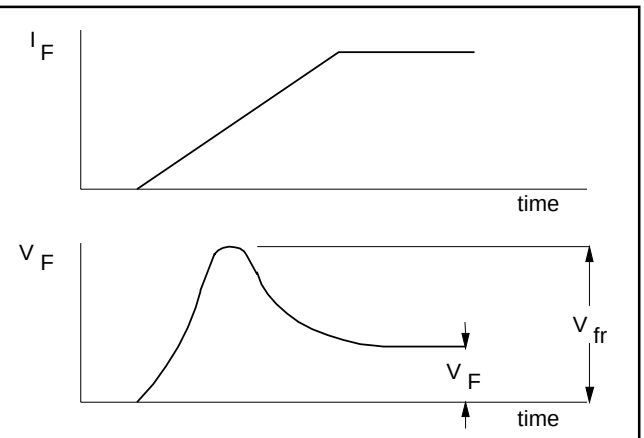


Fig.2. Definition of V_{fr}

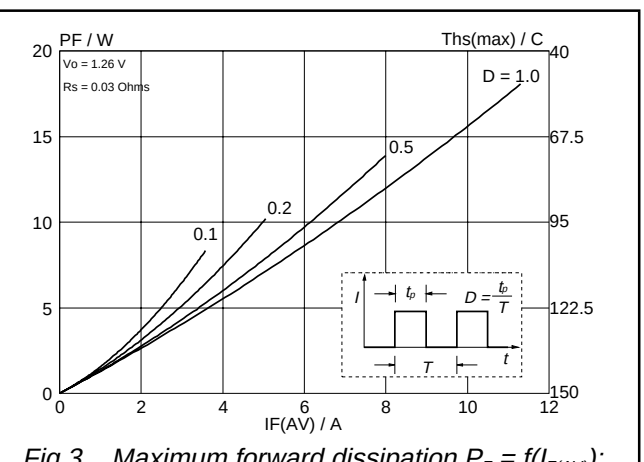


Fig.3. Maximum forward dissipation $P_F = f(I_{F(AV)})$; square wave where $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$.

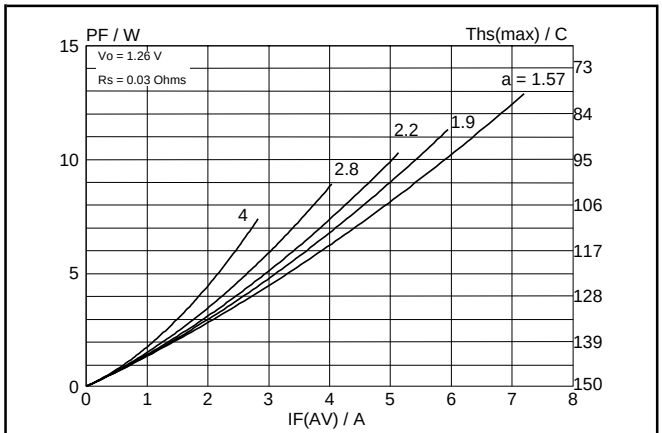


Fig.4. Maximum forward dissipation $P_F = f(I_{F(AV)})$; sinusoidal current waveform where a = form factor = $I_{F(RMS)} / I_{F(AV)}$.

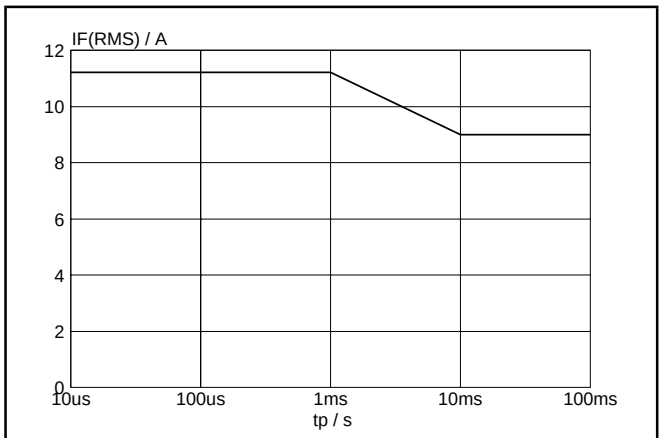


Fig.5. Maximum permissible rms current $I_{F(RMS)}$ versus pulse width.

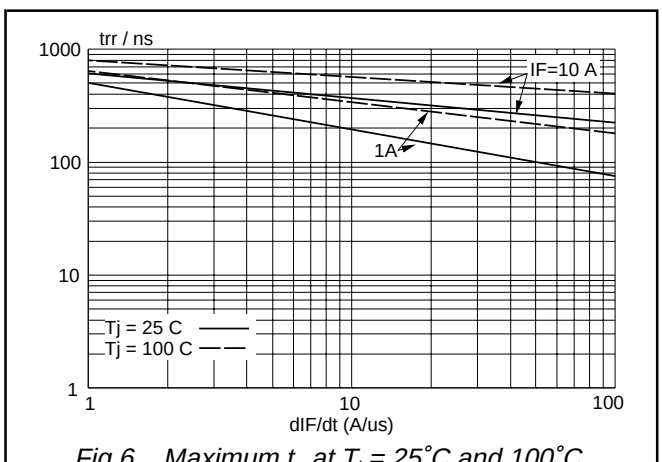


Fig.6. Maximum t_{rr} at T_j = 25˚C and 100˚C.

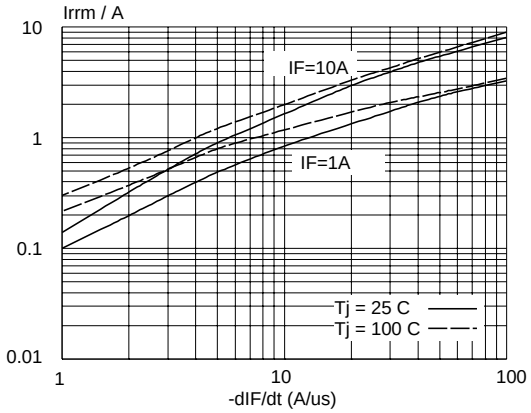


Fig.7. Maximum I_{rrm} at T_j = 25˚C and 100˚C.

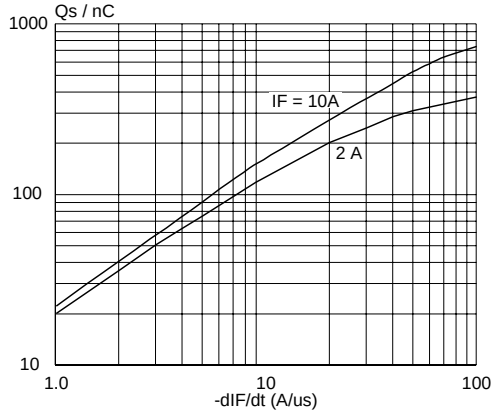


Fig.9. Maximum Q_s at T_j = 25˚C

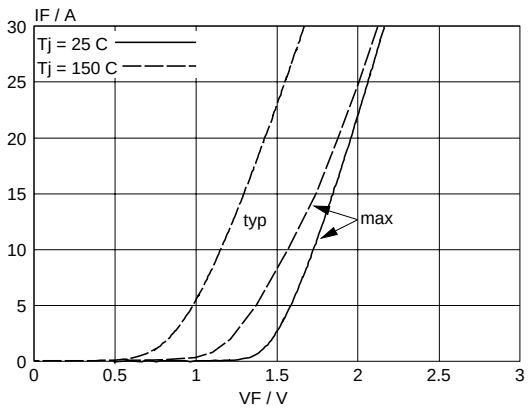


Fig.8. Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j

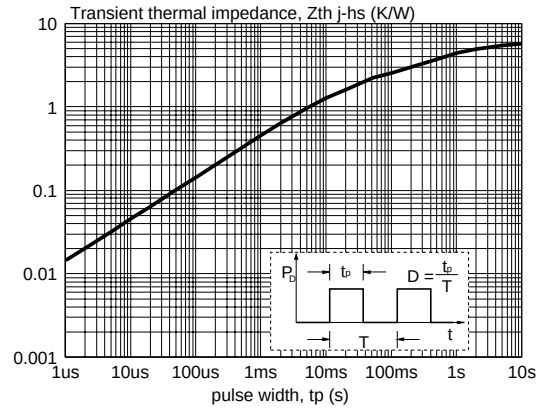


Fig.10. Transient thermal impedance $Z_{th} = f(t_p)$

MECHANICAL DATA

Dimensions in mm

Net Mass: 2 g

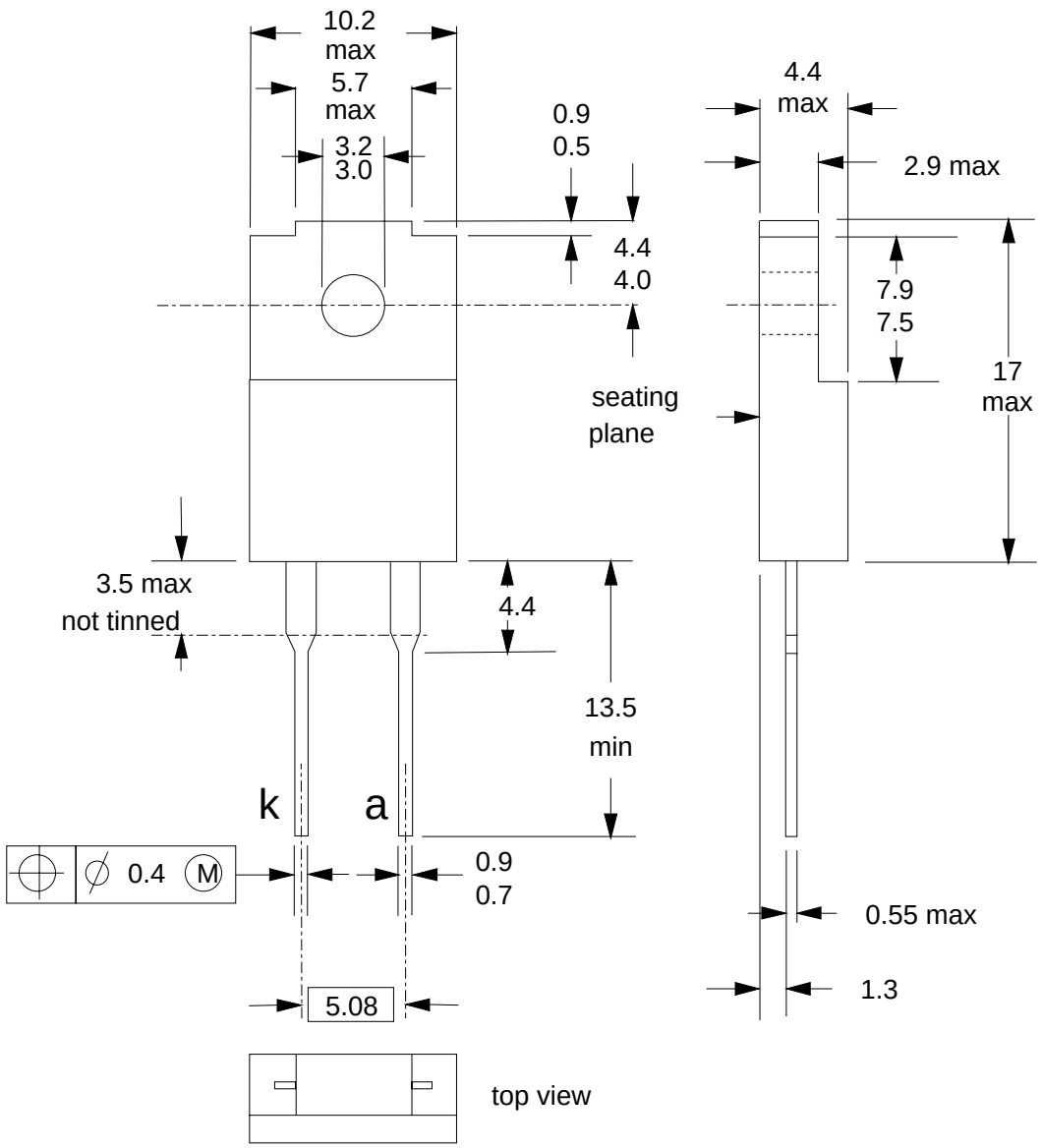


Fig.11. SOD100; The seating plane is electrically isolated from all terminals.

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.	

LIFE SUPPORT APPLICATIONS

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