Silicon Diode

BYR29F-800

800V/8A

DATASHEET

OEM – Philips

Source: Philips Databook 1999

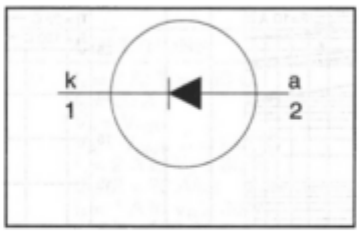
Datasheet Rev. 1.3 – 04/19 – data without warranty / liability

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

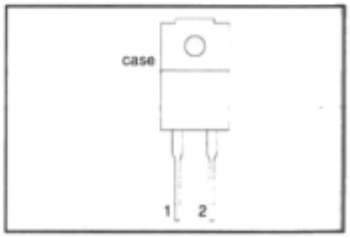
Ultra-fast, epitaxial rectifier diodes intended for use as output rectifiers in high frequency switched mode power supplies.

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

Rectifier diodes
ultrafast

BYR29F series

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

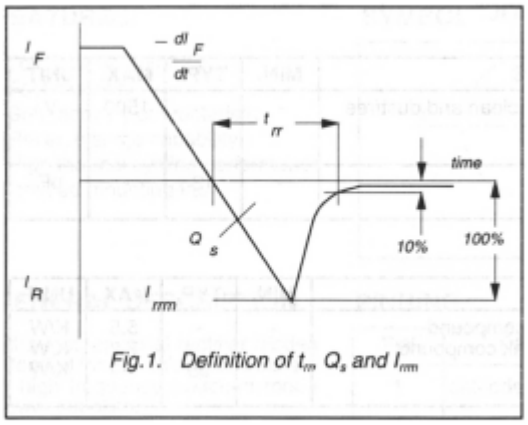


Fig.1. Definition of t_{rr}, Q_s and I_{rrm}

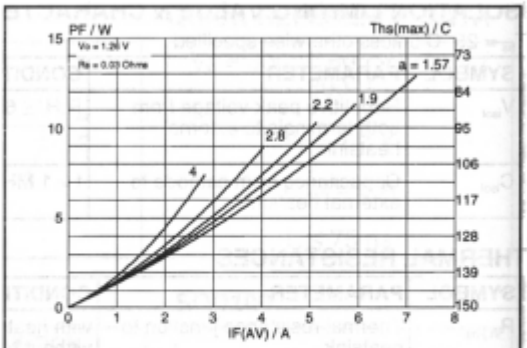


Fig.4. Maximum forward dissipation $P_F = f(I_{F(AV)})$; sinusoidal current waveform where a = form factor = $I_{F(RMS)} / I_{F(AV)}$.

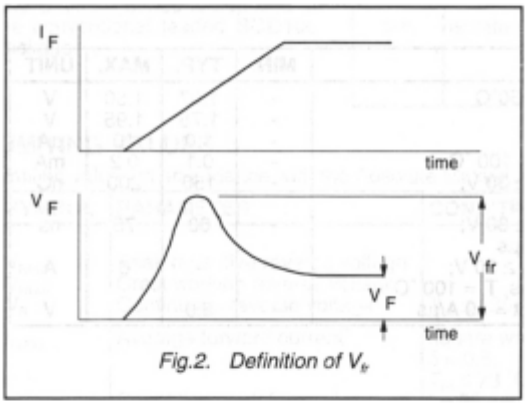


Fig.2. Definition of V_{fr}

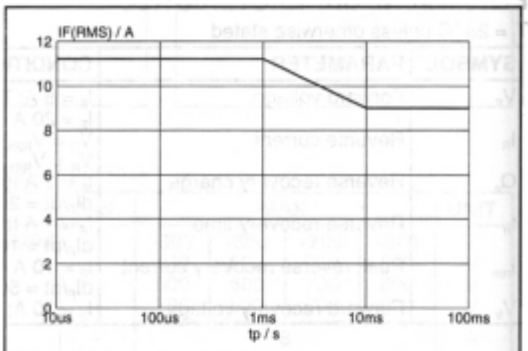


Fig.5. Maximum permissible rms current $I_{F(RMS)}$ versus pulse width.

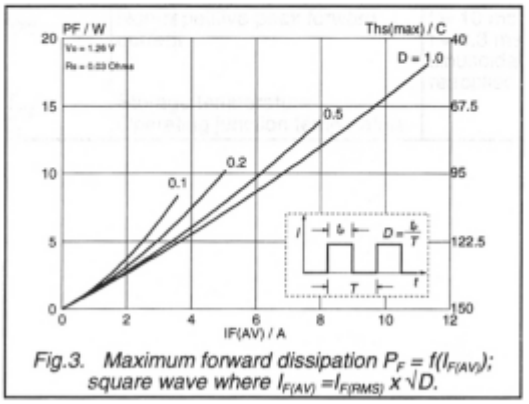


Fig.3. Maximum forward dissipation $P_F = f(I_{F(AV)})$; square wave where $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$.

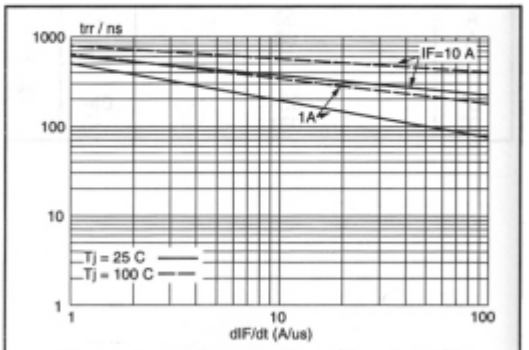


Fig.6. Maximum t_{rr} at $T_j = 25^{\circ}C$ and $100^{\circ}C$.

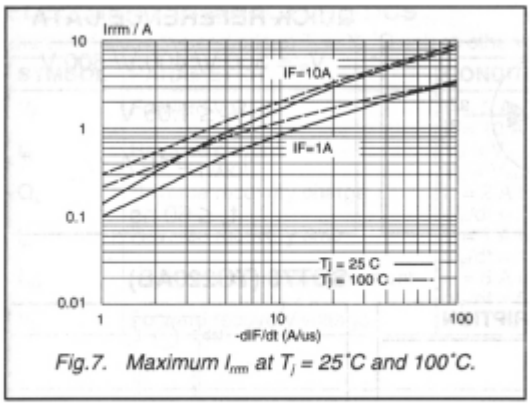


Fig.7. Maximum I_{rrm} at T_j = 25˚C and 100˚C.

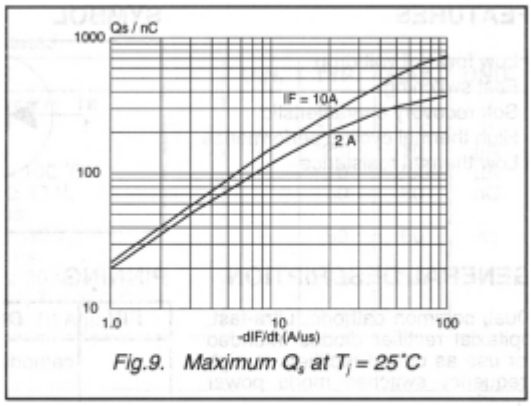


Fig.9. Maximum Q_s at T_j = 25˚C

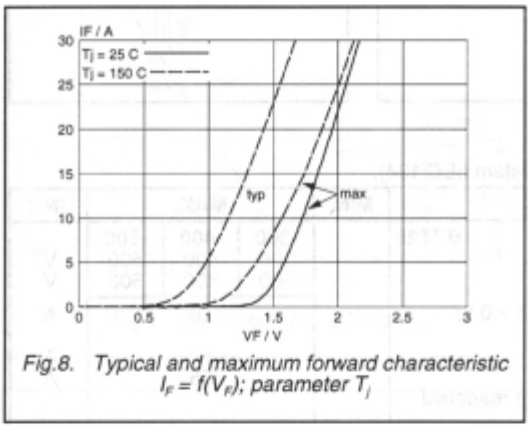


Fig.8. Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j

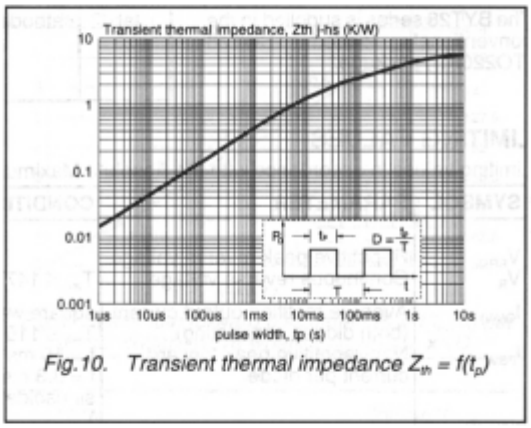


Fig.10. Transient thermal impedance $Z_{th} = f(t_p)$