Silicon Diode

BY559-1500

1500V/10A

DATASHEET

OEM – Philips

Source: Philips Databook 1999

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

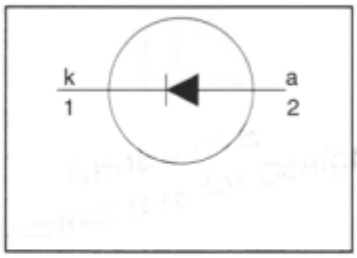
Rectifier diode fast, high-voltage

BY559-1500

FEATURES

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

SYMBOL



QUICK REFERENCE DATA

V_R = 1500 V

$V_F \leq 1.2$ V

$V_{fr} \leq 14$ V

$t_{rr} \leq 250$ ns

$I_{F(AV)}$ = 10 A

$I_{FSM} \leq 100$ A

GENERAL DESCRIPTION

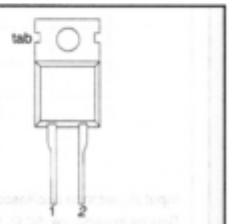
Glass-passivated double diffused rectifier diode featuring fast forward recovery and low forward recovery voltage. The device is intended for use in multi-sync monitor horizontal deflection circuits with maximum scan rates from 82 kHz to 120 kHz.

The BY559 series is supplied in the conventional leaded SOD59 (TO220AC) package.

PINNING

PIN	DESCRIPTION
1	cathode
2	anode
tab	cathode

SOD59 (TO220AC)



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		-	1500	V
V_{RWM}	Crest working reverse voltage		-	1300	V
I_{FWM}	Peak working forward current	f = 120 kHz;	-	10	A
I_{FRM}	Peak repetitive forward current	t = 100 µs	-	150	A
I_{FSM}	Peak non-repetitive forward current	t = 10 ms	-	180	A
		t = 8.3 ms	-	200	A
		sinusoidal; T_j = 150 ˚C prior to surge; with reapplied $V_{RWM(max)}$			
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		-	-	1.0	K/W
$R_{th\ j\text{-}a}$	Thermal resistance junction to ambient	in free air	-	60	-	K/W

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STATIC CHARACTERISTICS

T_j = 25 °C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	Forward voltage	I_F = 10 A	-	1.0	1.25	V
		I_F = 10 A; T_j = 125 °C	-	0.79	0.9	V
I_R	Reverse current	$V_R = V_{RWMmax}$	-	-	0.5	mA
		$V_R = V_{RWMmax}$; T_j = 125 °C	-	-	2.0	mA

DYNAMIC CHARACTERISTICS

T_j = 25 °C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{fr}	Forward recovery voltage	I_F = 10 A; dI_F/dt = 50 A/µs	-	7	11	V
t_{fr}	Forward recovery time	I_F = 10 A; dI_F/dt = 50 A/µs; V_F = 5 V	-	250	350	ns
		I_F = 10 A; dI_F/dt = 50 A/µs; V_F = 2 V	-	450	600	ns
t_{rr}	Reverse recovery time	I_F = 1 A; $-dI_F/dt$ = 50 A/µs; $V_R \geq$ 30 V	-	0.75	1.0	µs
Q_s	Reverse recovery charge	I_F = 2 A; $-dI_F/dt$ = 20 A/µs; $V_R \geq$ 30 V	-	4.0	5.0	µC

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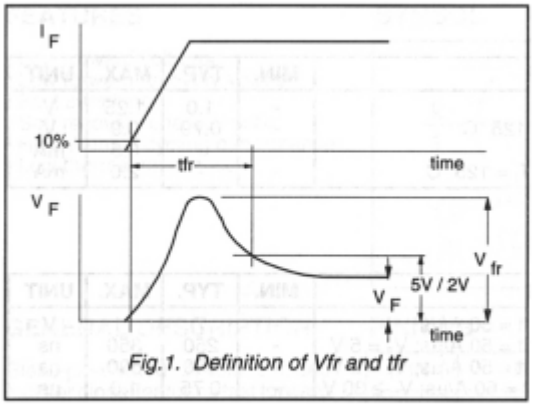

Fig.1. Definition of Vfr and tfr

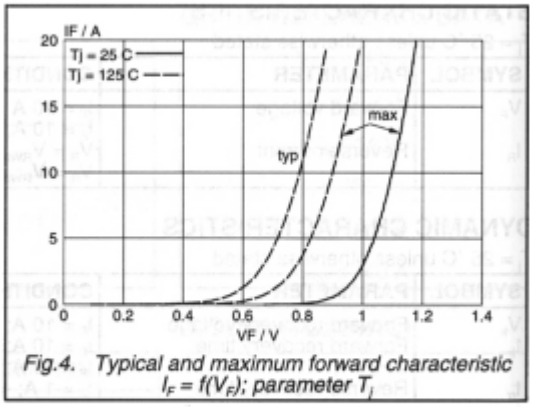

Fig.4. Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j

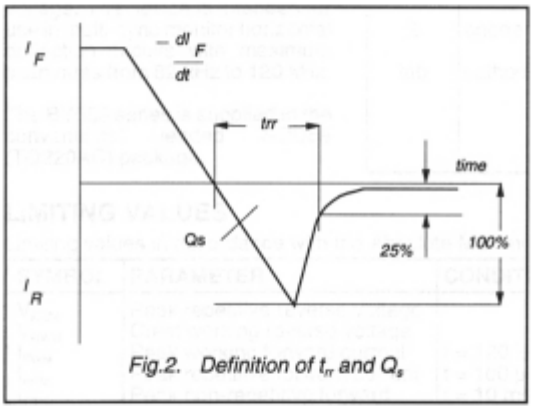

Fig.2. Definition of t_{rr} and Q_s

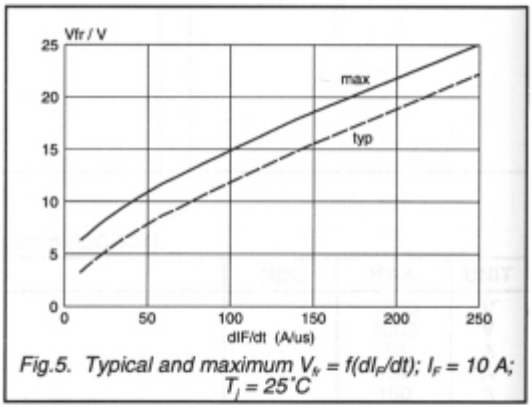

Fig.5. Typical and maximum $V_{fr} = f(dI_F/dt)$; I_F = 10 A; T_j = 25˚C

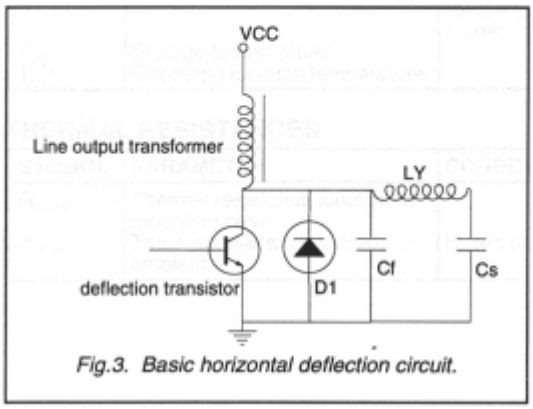

Fig.3. Basic horizontal deflection circuit.

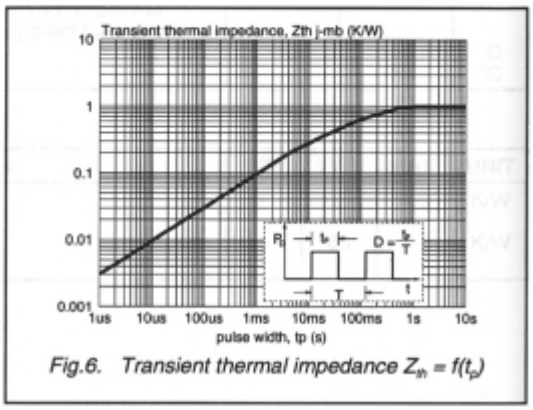

Fig.6. Transient thermal impedance $Z_{th} = f(t_p)$