Silicon Diode

BY459X-1500S

1500V/10A

DATASHEET

OEM – Philips

Source: Philips Databook 1999

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

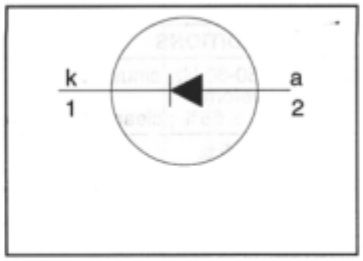
Damper diode fast, high-voltage

BY459X-1500, BY459X-1500S

FEATURES

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

SYMBOL



QUICK REFERENCE DATA

V_R = 1500 V

$V_F \leq$ 1.2 V / 1.25 V

$I_{F(peak)}$ = 12 A (f = 48 kHz)

$I_{F(peak)}$ = 10 A (f = 82 kHz)

$I_{FSM} \leq$ 100 A

$t_{rr} \leq$ 350 ns / 220 ns

GENERAL DESCRIPTION

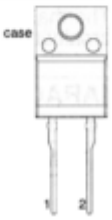
Glass-passivated double diffused rectifier diode featuring fast forward recovery and low forward recovery voltage. The device is intended for use in HDTV receivers and multi-sync monitor horizontal deflection circuits.

The BY459X series is supplied in the conventional leaded SOD113 package.

PINNING

PIN	DESCRIPTION
1	cathode
2	anode
tab	isolated

SOD113



LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.		UNIT
V_{RSM}	Peak non repetitive reverse voltage		-	1500		V
V_{RRM}	Peak repetitive reverse voltage		-	1500		V
V_{RWM}	Crest working reverse voltage		-	1300		V
				-1500	-1500S	
$I_{F(peak)}$	Peak working forward current	f = 48 kHz;	-	12	-	A
		f = 82 kHz;	-	-	10	A
I_{FRM}	Peak repetitive forward current	t = 100 µs	-	100		A
$I_{F(RMS)}$	RMS forward current		-	30		A
I_{FSM}	Peak non-repetitive forward current	t = 10 ms	-	100		A
		t = 8.3 ms	-	110		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

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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

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j\text{-}hs}$	Thermal resistance junction to heatsink	with heatsink compound	-	-	4.8	K/W
		without heatsink compound	-	-	5.9	K/W
$R_{th\ j\text{-}a}$	Thermal resistance junction to ambient	in free air.	-	55	-	K/W

STATIC CHARACTERISTICS

T_j = 25 °C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	TYP.		MAX.		UNIT
		BY459X-	1500	1500S	1500	1500S	
V_F	Forward voltage	I_F = 6.5 A	0.95	1.05	1.30	1.35	V
		I_F = 6.5 A; T_j = 125 °C	0.85	0.95	1.20	1.25	V
I_R	Reverse current	V_R = 1300 V	-	250	-	250	µA
		V_R = 1300 V; T_j = 125 °C	-	1	-	1	mA

DYNAMIC CHARACTERISTICS

T_j = 25 °C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	TYP.		MAX.		UNIT
		BY459X-	1500	1500S	1500	1500S	
t_{rr}	Reverse recovery time	I_F = 1 A, $V_R \geq$ 30 V;	0.25	0.17	0.35	0.22	µs
Q_s	Reverse recovery charge	I_F = 2 A, $-dI_F/dt$ = 20 A/µs	2.0	0.70	3.0	0.95	µC
V_{fr}	Peak forward recovery voltage	I_F = 6.5A, dI_F/dt = 50A/µs	8.0	11.0	14.0	19.0	V
t_{fr}	Forward recovery time	I_F = 6.5A, dI_F/dt = 50A/µs	170	200	250	300	ns

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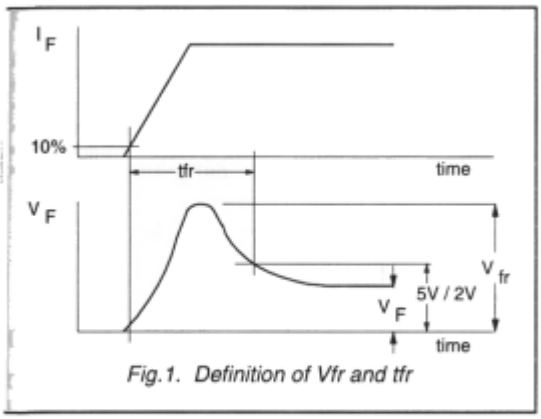

Fig.1. Definition of Vfr and tfr

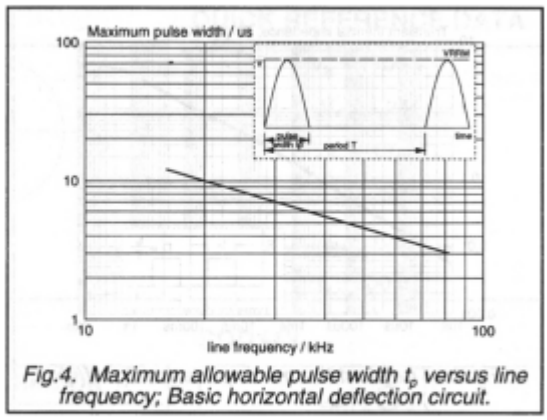

Fig.4. Maximum allowable pulse width t_p versus line frequency; Basic horizontal deflection circuit.

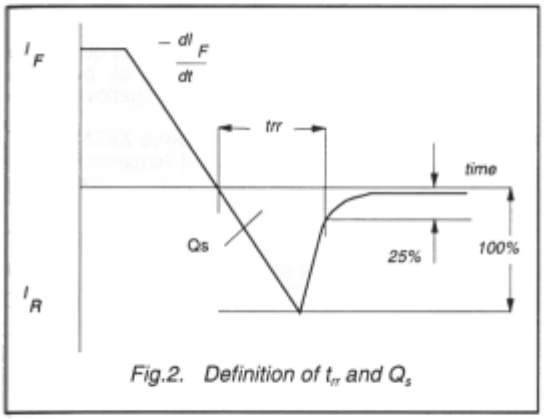

Fig.2. Definition of t_{rr} and Q_s

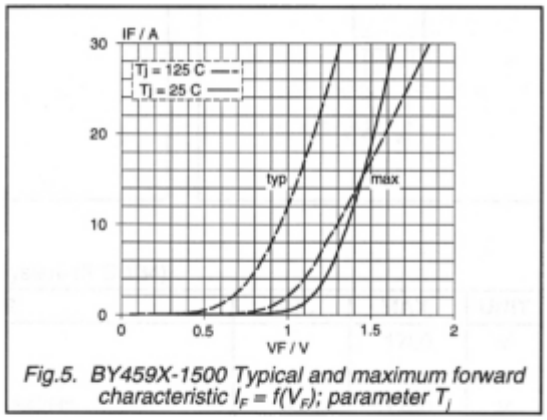

Fig.5. BY459X-1500 Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j

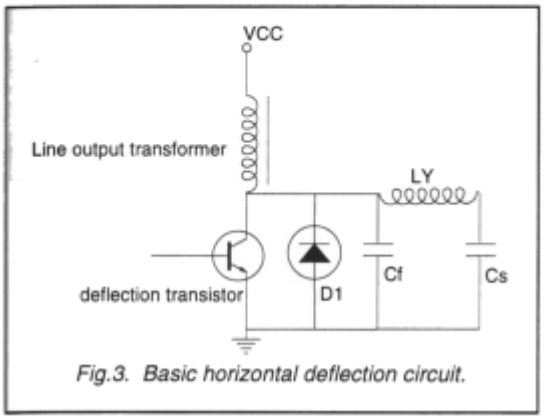

Fig.3. Basic horizontal deflection circuit.

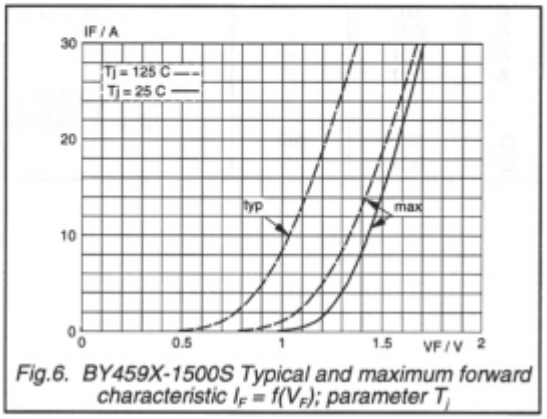

Fig.6. BY459X-1500S Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j

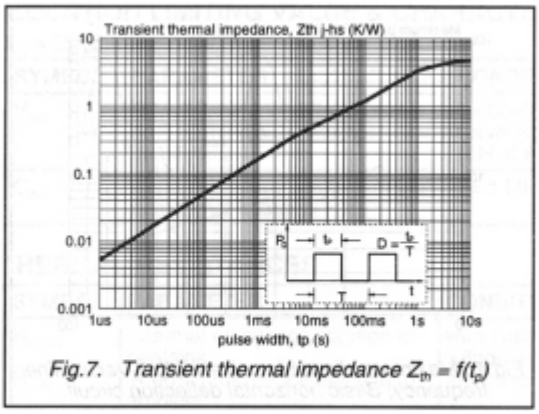

Fig.7. Transient thermal impedance $Z_{th} = f(t_p)$