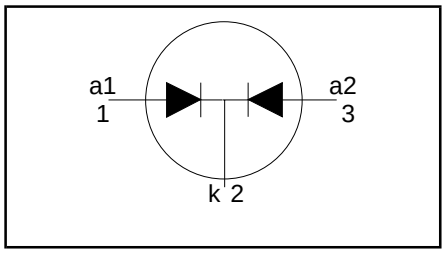
Rectifier diodes Schottky barrier

BYV143F, BYV143X series

FEATURES

- Low forward volt drop
- Fast switching
- Reverse surge capability
- High thermal cycling performance
- Isolated package

SYMBOL



QUICK REFERENCE DATA

V_R = 35 V/ 40 V/ 45 V

$I_{O(AV)}$ = 20 A

$V_F \leq 0.6$ V

GENERAL DESCRIPTION

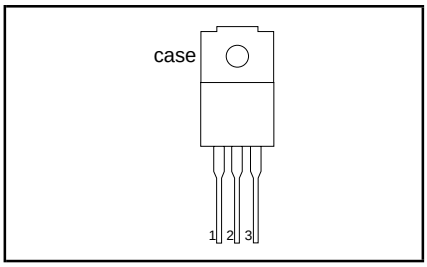
Dual, common cathode schottky rectifier diodes in a plastic envelope with electrically isolated mounting tab. Intended for use as output rectifiers in low voltage, high frequency switched mode power supplies.

The BYV143F series is supplied in the SOT186 package.
The BYV143X series is supplied in the SOT186A package.

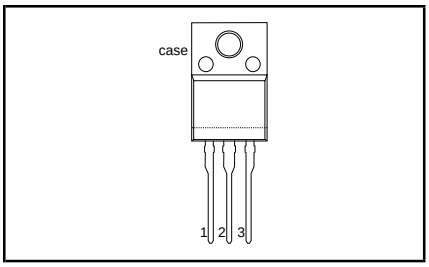
PINNING

PIN	DESCRIPTION
1	anode 1 (a)
2	cathode (k)
3	anode 2 (a)
tab	isolated

SOT186



SOT186A



LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.			UNIT
		BYV143F-		**35**	**40**	**45**	
		BYV143X-		**35**	**40**	**45**	
V_{RRM}	Peak repetitive reverse voltage		-	35	40	45	V
V_{RWM}	Working peak reverse voltage		-	35	40	45	V
V_R	Continuous reverse voltage	$T_{hs} \leq 82$ ˚C	-	35	40	45	V
$I_{O(AV)}$	Average rectified output current (both diodes conducting)	square wave; $\delta = 0.5$; $T_{hs} \leq 83$ ˚C	-		20		A
I_{FRM}	Repetitive peak forward current per diode	square wave; $\delta = 0.5$; $T_{hs} \leq 83$ ˚C	-		20		A
I_{FSM}	Non-repetitive peak forward current per diode	t = 10 ms	-		100		A
		t = 8.3 ms	-		110		A
		sinusoidal; $T_j = 125$ ˚C prior to surge; with reapplied $V_{RRM(max)}$					
I_{RRM}	Peak repetitive reverse surge current per diode	pulse width and repetition rate limited by $T_{j\,max}$	-		1		A
T_j	Operating junction temperature		-		150		˚C
T_{stg}	Storage temperature		- 65		175		˚C

ISOLATION LIMITING VALUE & CHARACTERISTIC

T_{hs} = 25 ˚C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{isol}	Peak isolation voltage from all terminals to external heatsink	SOT186 package; R.H. ≤ 65%; clean and dustfree	-	-	1500	V
V_{isol}	R.M.S. isolation voltage from all terminals to external heatsink	SOT186A package; f = 50-60 Hz; sinusoidal waveform; R.H. ≤ 65%; clean and dustfree	-	-	2500	V
C_{isol}	Capacitance from pin 2 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	per diode	-	-	5.7	K/W
		both diodes (with heatsink compound)	-	-	4.8	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 specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	Forward voltage	I_F = 15 A; T_j = 125˚C	-	0.55	0.62	V
		I_F = 20 A	-	0.65	0.8	V
I_R	Reverse current	$V_R = V_{RWM}$	-	0.12	1.5	mA
		$V_R = V_{RWM}$; T_j = 100˚C	-	15	30	mA
C_d	Junction capacitance	V_R = 5 V; f = 1 MHz, T_j = 25˚C to 125˚C	-	450	-	pF

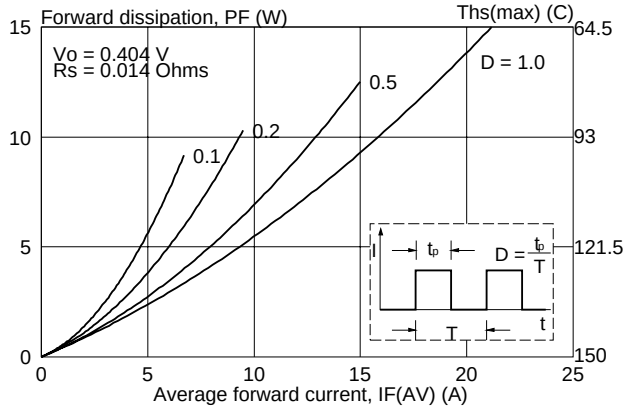


Fig.1. Maximum forward dissipation $P_F = f(I_{F(AV)})$ per diode; square current waveform where $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$.

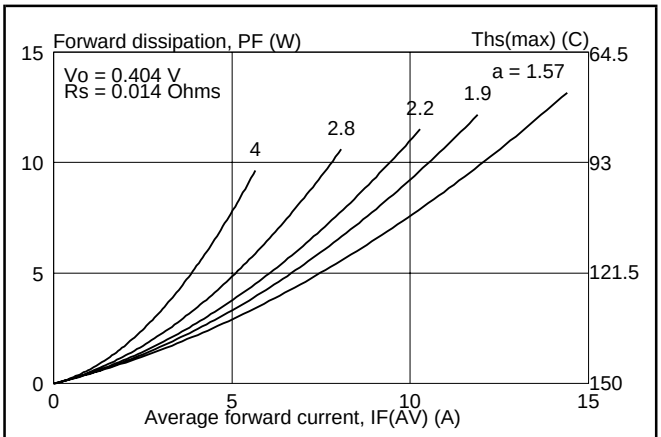


Fig.2. Maximum forward dissipation $P_F = f(I_{F(AV)})$ per diode; sinusoidal current waveform where a = form factor = $I_{F(RMS)} / I_{F(AV)}$.

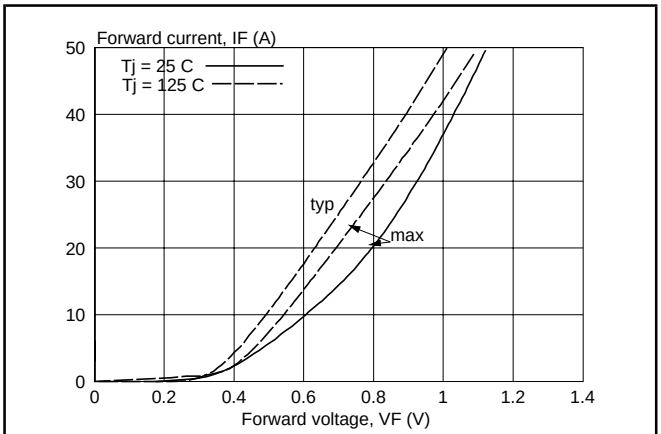


Fig.3. Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j

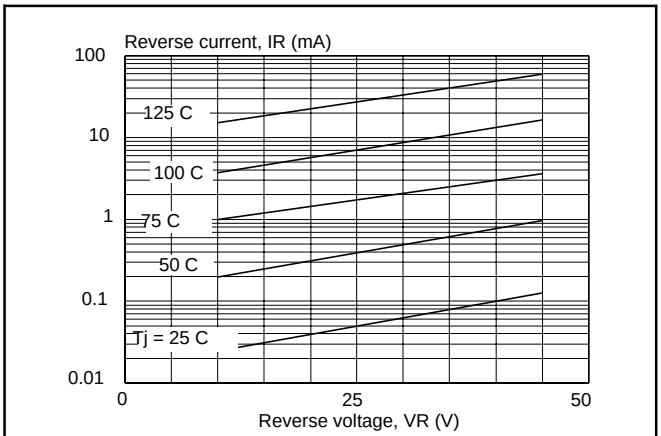


Fig.4. Typical reverse leakage current per diode; $I_R = f(V_R)$; parameter T_j

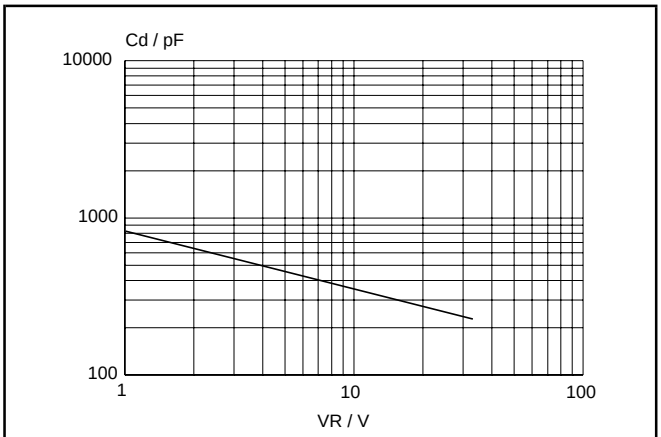


Fig.5. Typical junction capacitance per diode; $C_d = f(V_R)$; f = 1 MHz; T_j = 25˚C to 125 ˚C.

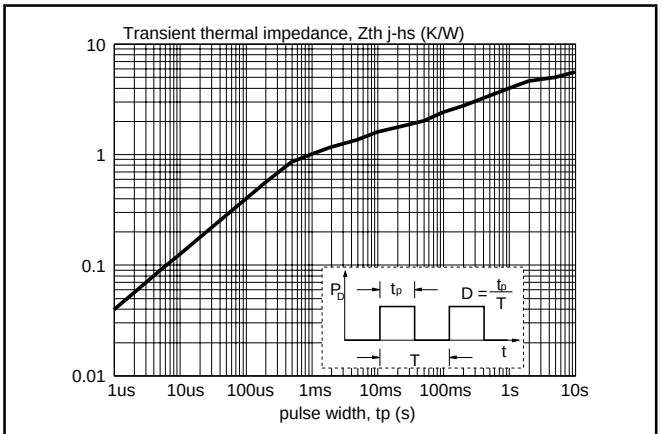


Fig.6. Transient thermal impedance; per diode; $Z_{th\ j\text{-}hs} = f(t_p)$.

MECHANICAL DATA

Dimensions in mm

Net Mass: 2 g

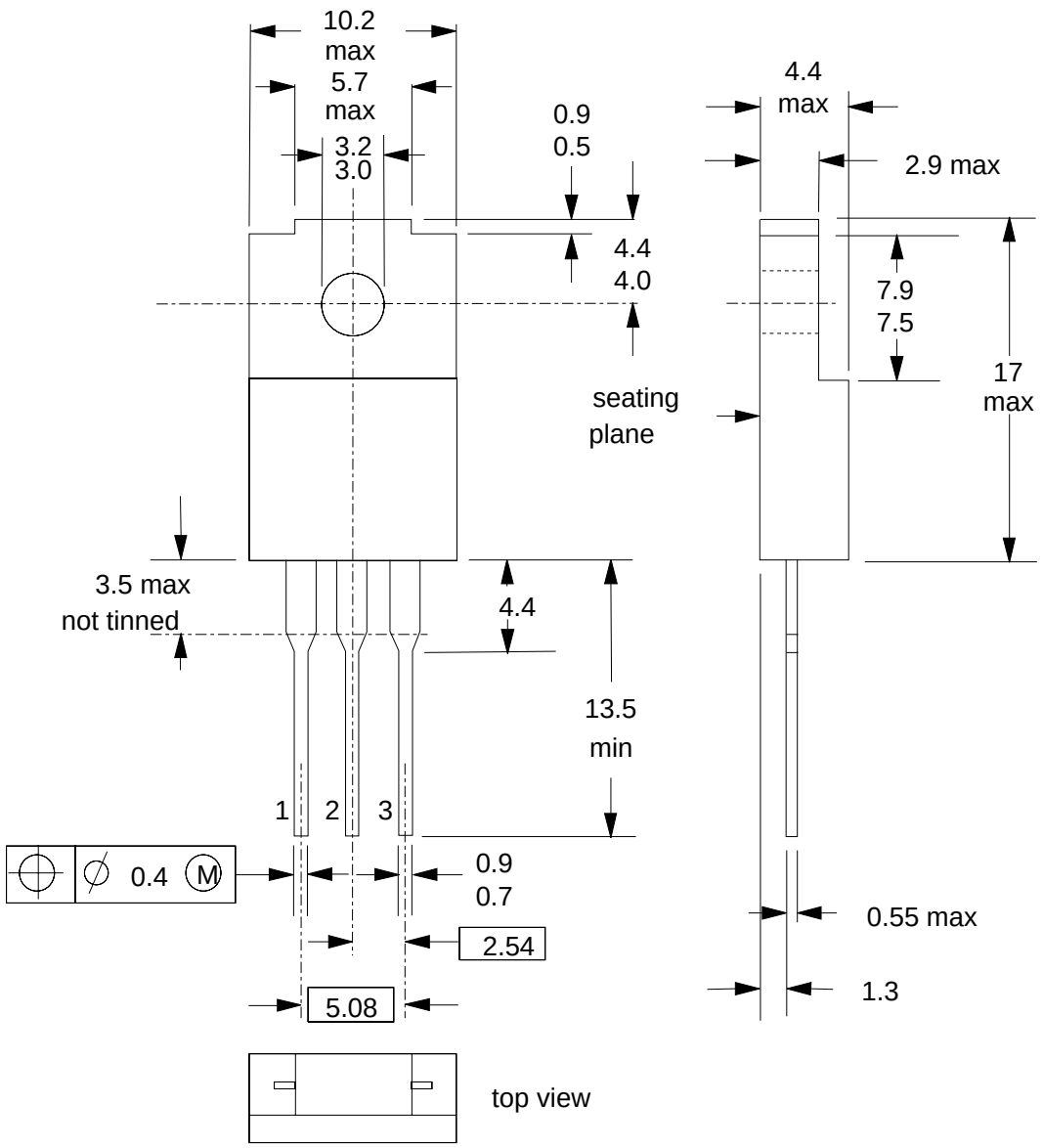


Fig.7. SOT186; The seating plane is electrically isolated from all terminals.

Notes
1. Refer to mounting instructions for F-pack envelopes.
2. Epoxy meets UL94 V0 at 1/8".

MECHANICAL DATA

Dimensions in mm

Net Mass: 2 g

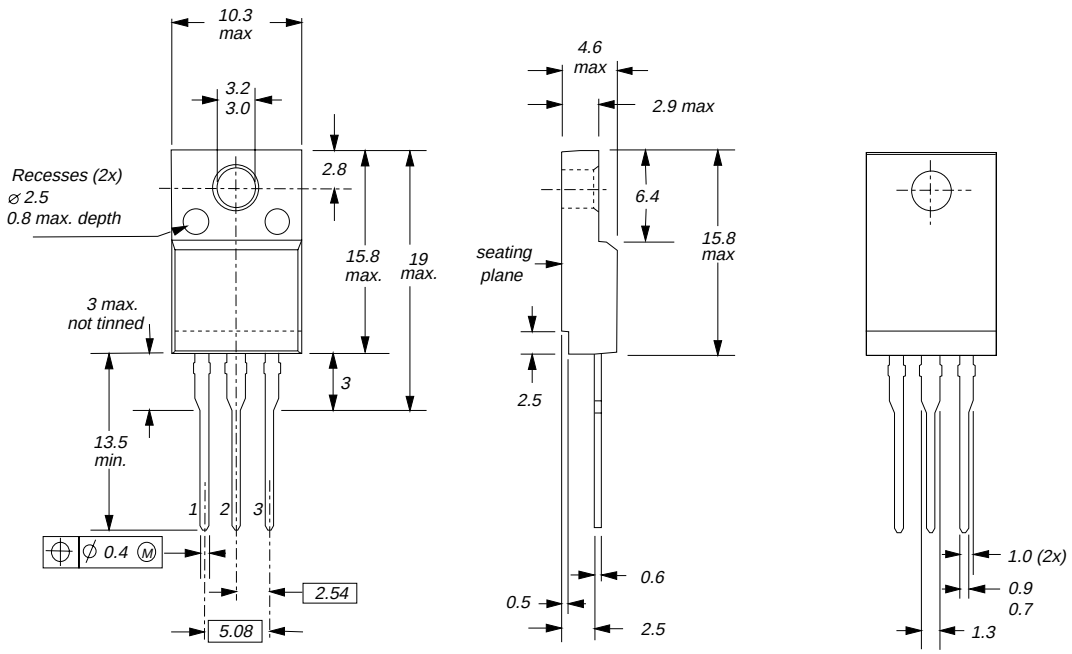


Fig.8. SOT186A; The seating plane is electrically isolated from all terminals.

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

These products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.