SCHOTTKY-BARRIER DOUBLE RECTIFIER DIODES

Low-leakage platinum-barrier double rectifier diodes in SOT-186 (full-pack) plastic envelopes featuring low forward voltage drop, low capacitance and absence of stored charge. Their electrical isolation makes them ideal for mounting on a common heatsink alongside other components without the need for additional insulators. They are intended for use in switched-mode power supplies and high-frequency circuits in general, where both low conduction losses and absence of stored charge are essential. Their single chip (monolithic) construction allows both diodes to be paralleled without the need for derating. They can also withstand reverse voltage transients and have guaranteed reverse avalanche surge capability. The series consists of common-cathode types.

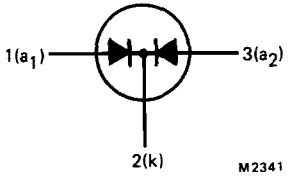
QUICK REFERENCE DATA

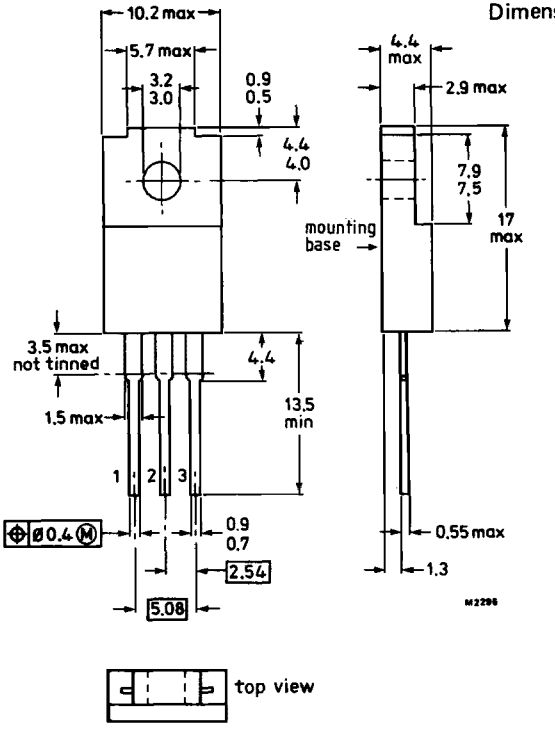
Per diode, unless otherwise stated			PBYR1535CTF	1540CTF	1545CTF	
Repetitive peak reverse voltage	V_{RRM}	max.	35	40	45	V
Output current (both diodes conducting)	I_O	max.		15		A
Forward voltage	V_F	<		0.57		V
Junction temperature	T_j	max.		150		°C

MECHANICAL DATA

Dimensions in mm

Fig.1 SOT-186 (full-pack).





Net mass: 2 g.

The mounting base is electrically isolated from all terminals.

Accessories supplied on request (see data sheets Mounting instructions for F-pack devices and Accessories for SOT-186 envelopes).

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC134).

			PBYR1535CTF	1540CTF	1545CTF	
Voltages (per diode)						
Repetitive peak reverse voltage	V_{RRM}	max.	35	40	45	V
Crest working reverse voltage	V_{RWM}	max.	35	40	45	V
Continuous reverse voltage	V_R	max.	35	40	45	V
Currents						
Average forward current square wave; $\delta = 0.5$; up to $T_h = 100\ ^oC$						
per diode	$I_{F(AV)}$	max.		7.5		A
per device	I_O	max.		15		A
Repetitive peak forward current per diode (note 1) $t_p = 25\ \mu s$; $\delta = 0.5$; $T_h = 100\ ^oC$	I_{FRM}	max.		15		A
Non-repetitive peak forward current (per device) half sinewave, $T_j = 125\ ^oC$ prior to surge; with reapplied V_{RWM} max						
$t = 10$ ms	I_{FSM}	max.		135		A
$t = 8.3$ ms	I_{FSM}	max.		150		A
I^2t for fusing ($t = 10$ ms; per device)	I^2t	max.		93		A^2s
Reverse surge current (per diode)						
$t_p = 2\ \mu s$; $\delta = 0.001$	I_{RRM}	max.		1.0		A
$t_p = 100\ \mu s$	I_{RSM}	max.		1.0		A
Temperatures						
Storage temperature	T_{stg}			−65 to +175		°C
Junction temperature	T_j	max.		150		°C
CHARACTERSTICS (per diode)						
Forward voltage (note 2)						
$I_F = 7.5$ A; $T_j = 125\ ^oC$	V_F	<		0.57		V
$I_F = 15$ A; $T_j = 125\ ^oC$	V_F	<		0.72		V
$I_F = 15$ A; $T_j = 25\ ^oC$	V_F	<		0.84		V
Reverse current						
$V_R = V_{RWM}$ max; $T_j = 125\ ^oC$	I_R	<		15		mA
$V_R = V_{RWM}$ max; $T_j = 25\ ^oC$	I_R	<		0.1		mA
ISOLATION						
Isolation voltage from all terminals to external heatsink (peak value) (note 3)	$V_{(isol)M}$	max.		1500		V
Isolation capacitance between all terminals and external heatsink	$C_{(isol)}$	typ.		12		pF

Notes:

1. At rated reverse voltage V_R.
2. Measured under pulse conditions to avoid excessive dissipation.
3. Repetitive peak operation with RH ⩽ 65% under clean and dust-free conditions.

THERMAL RESISTANCE

From junction to external heatsink with minimum of 2 kgf (20 newtons) pressure on the centre of the envelope.

a. both diodes conducting: with heatsink compound	$R_{th\ j\text{-}h}$	=	5.2	K/W
b. per diode: with heatsink compound	$R_{th\ j\text{-}h}$	=	6.1	K/W

Free air operation

The quoted value of $R_{th\ j\text{-}a}$ should be used only when no leads of other components run to the same tie point.

Thermal resistance from junction to ambient in free air, mounted on a printed circuit board	$R_{th\ j\text{-}a}$	=	55	K/W

MOUNTING INSTRUCTIONS

1. The device may be soldered directly into the circuit, but the maximum permissible temperature of the soldering iron or bath is 275 °C; the heat source must not be in contact with the joint for more than 5 seconds. Soldered joints must be at least 4.7 mm from the seal.
2. The leads should not be bent less than 2.4 mm from the seal, and should be supported during bending. The bend radius must be no less than 1 mm.
3. Mounting by means of a spring clip is the best mounting method because it offers a good thermal contact under the crystal area and slightly lower $R_{th\ j\text{-}h}$ values than screw mounting. The force exerted on the top of the device by the clip should be at least 2 kgf (20 newtons) to ensure good thermal contact and must not exceed 3.5 kgf (35 newtons) to avoid damage to the device.
4. If screw mounting is used, it should be M3 cross-recess pan head.
   Minimum torque to ensure good thermal contact: 5.5 kgf (0.55 Nm)
   Maximum torque to avoid damage to the device: 8.0 kgf (0.80 Nm)
5. For good thermal contact, heatsink compound should be used between mounting base and heatsink. Values of $R_{th\ j\text{-}h}$ given for mounting with heatsink compound refer to the use of a metallic oxide-loaded compound. Ordinary silicone grease is not recommended.
6. Rivet mounting.
   It is not recommended to use rivets, since extensive damage could result to the plastic, which could destroy the insulating properties of the device.
7. The heatsink must have a flatness in the mounting area of 0.02 mm maximum per 10 mm. Mounting holes must be deburred.

OPERATING NOTES

The various components of junction temperature rise above ambient are illustrated in Fig.2.

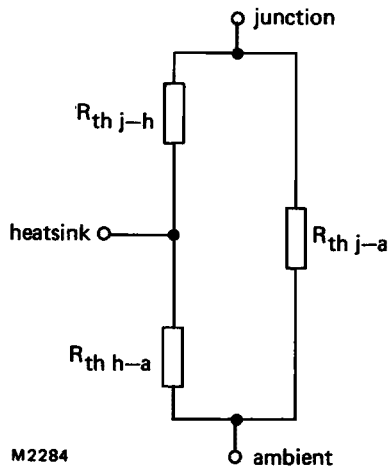


Fig.2.

Any measurement of heatsink temperature should be immediately adjacent to the device.