

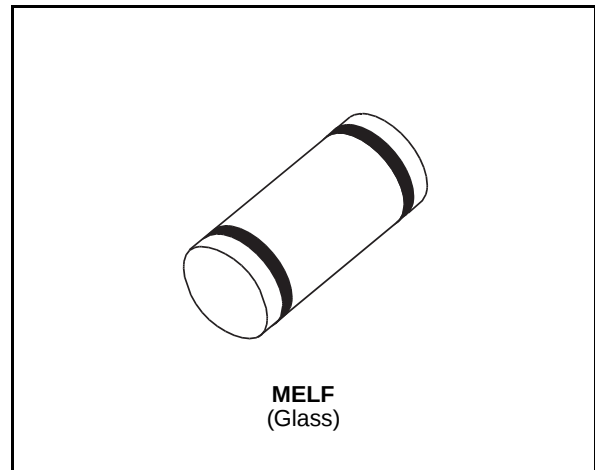


# TMBYV 10-40

## SMALL SIGNAL SCHOTTKY DIODES

### DESCRIPTION

Metal to silicon rectifier diodes in glass case featuring very low forward voltage drop and fast recovery time, intended for low voltage switching mode power supply, polarity protection and high frequency circuits.



### ABSOLUTE MAXIMUM RATINGS (limiting values)

| Symbol             | Parameter                                         |                                                | Value                      | Unit     |
|--------------------|---------------------------------------------------|------------------------------------------------|----------------------------|----------|
| $V_{RRM}$          | Repetitive Peak Reverse Voltage                   |                                                | 40                         | V        |
| $I_F (AV)$         | Average Forward Current                           | $T_i = 60\text{ °C}$                           | 1                          | A        |
| $I_{FSM}$          | Surge non Repetitive Forward Current              | $T_i = 25\text{ °C}$<br>$t_p = 10\text{ms}$    | 25<br>Sinusoidal Pulse     | A        |
|                    |                                                   | $T_i = 25\text{ °C}$<br>$t_p = 300\mu\text{s}$ | 50<br>Rectangular Pulse    |          |
| $T_{stg}$<br>$T_j$ | Storage and Junction Temperature Range            |                                                | - 65 to 150<br>- 65 to 125 | °C<br>°C |
| $T_L$              | Maximum Lead Temperature for Soldering during 15s |                                                | 260                        | °C       |

### THERMAL RESISTANCE

| Symbol        | Parameter      | Value | Unit |
|---------------|----------------|-------|------|
| $R_{th(j-l)}$ | Junction-leads | 110   | °C/W |

\* Pulse test:  $t_p \leq 300\mu\text{s}$   $\delta < 2\%$ .

**ELECTRICAL CHARACTERISTICS**  
STATIC CHARACTERISTICS

| Symbol  | Test Conditions           |                          | Min. | Typ. | Max. | Unit |
|---------|---------------------------|--------------------------|------|------|------|------|
| $I_R^*$ | $T_j = 25^\circ\text{C}$  | $V_R = V_{RRM}$          |      |      | 0.5  | mA   |
|         | $T_j = 100^\circ\text{C}$ |                          |      |      | 10   |      |
| $V_F^*$ | $I_F = 1\text{A}$         | $T_j = 25^\circ\text{C}$ |      |      | 0.55 | V    |
|         | $I_F = 3\text{A}$         |                          |      |      | 0.85 |      |

\*\* Pulse test:  $t_p \leq 300\mu\text{s}$   $\delta < 2\%$ .

**DYNAMIC CHARACTERISTICS**

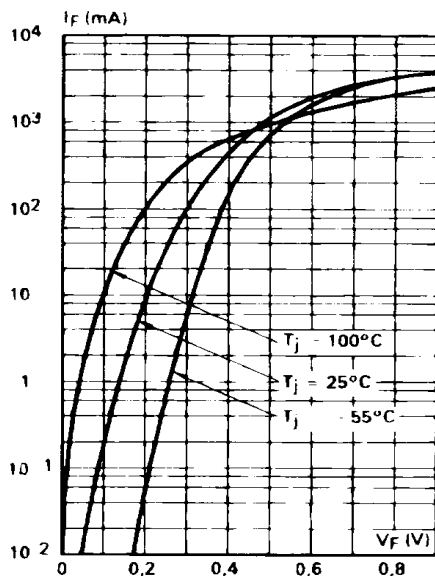
| Symbol | Test Conditions          |           | Min. | Typ. | Max. | Unit |
|--------|--------------------------|-----------|------|------|------|------|
| C      | $T_j = 25^\circ\text{C}$ | $V_R = 0$ |      | 220  |      | pF   |

Forward current flow in a Schottky rectifier is due to majority carrier conduction. So reverse recovery is not affected by storage charge as in conventional PN junction diodes.

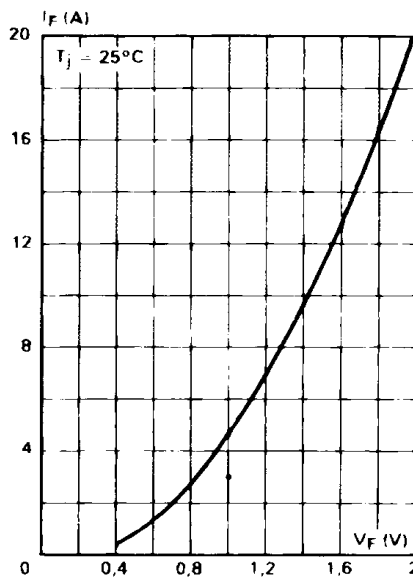
Nevertheless, when the device switches from forward biased condition to reverse blocking state, current is required to charge the depletion capacitance of the diode.

This current depends only of diode capacitance and external circuit impedance. Satisfactory circuit behaviour analysis may be performed assuming that Schottky rectifier consists of an ideal diode in parallel with a variable capacitance equal to the junction capacitance (see fig. 5 page 4/4).

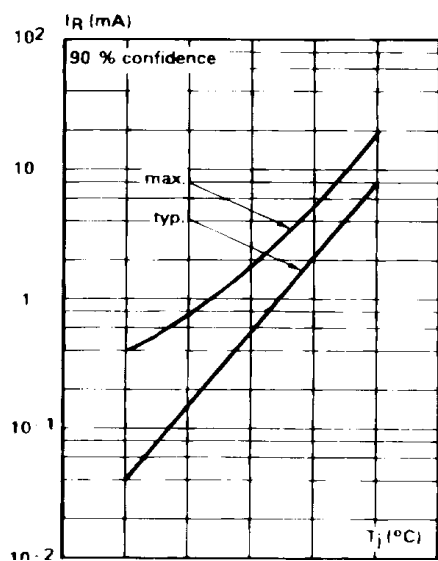
**Fig. 1 :** Forward current versus forward voltage at low level (typical values).



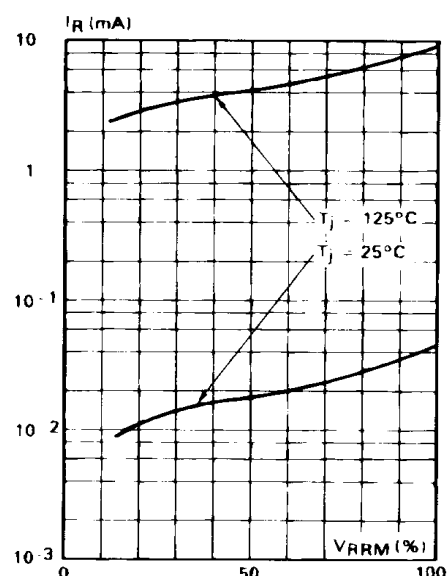
**Fig. 2 :** Forward current versus forward voltage at high level (typical values).



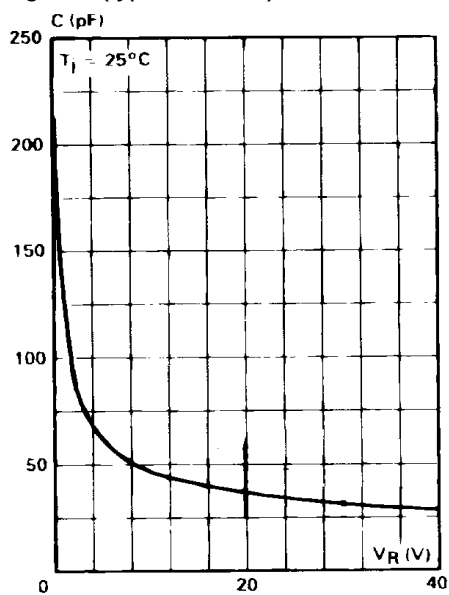
**Fig. 3 :** Reverse current versus junction temperature.



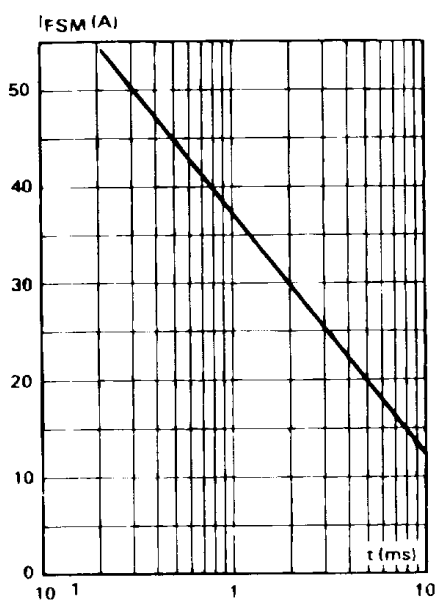
**Fig. 4 :** Reverse current versus VRRM in per cent.



**Fig. 5 :** Capacitance C versus reverse applied voltage  $V_R$  (typical values)

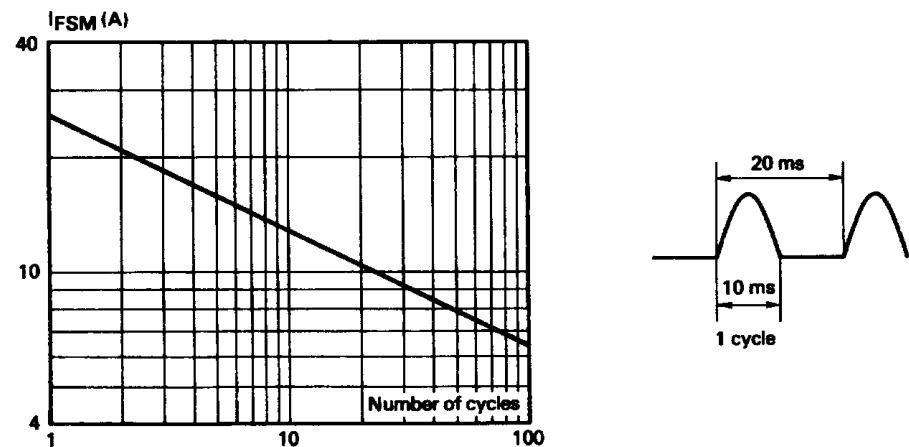


**Fig. 6 :** Surge non repetitive forward current for a rectangular pulse with  $t \hat{=} 10$  ms.

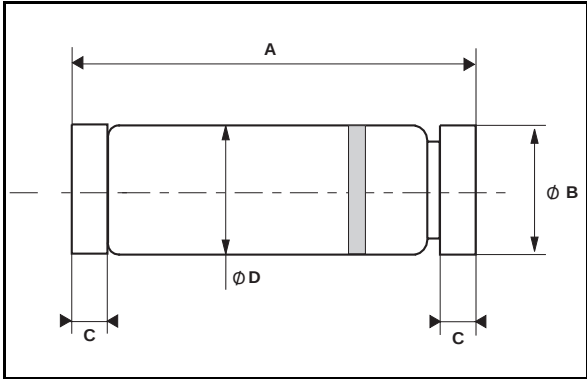


TMBYV10-40

Fig. 7 : Surge non repetitive forward current versus number of cycles.

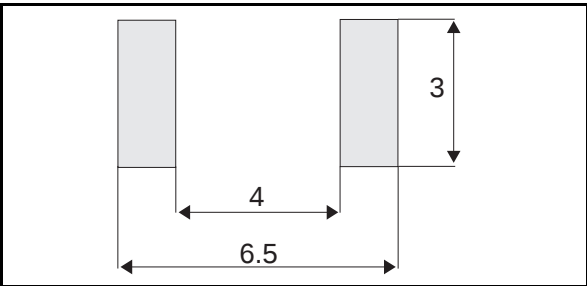


PACKAGE MECHANICAL DATA  
MELF Glass



| REF. | DIMENSIONS  |      |      |        |       |       |
|------|-------------|------|------|--------|-------|-------|
|      | Millimeters |      |      | Inches |       |       |
|      | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A    | 4.80        |      | 5.20 | 0.189  |       | 0.205 |
| Ø B  | 2.50        |      | 2.65 | 0.098  |       | 0.104 |
| C    | 0.45        |      | 0.60 | 0.018  |       | 0.024 |
| Ø D  |             | 2.50 |      |        | 0.098 |       |

FOOT PRINT DIMENSIONS (Millimeter)



Cooling method: by convection and conduction  
Marking: ring at cathode end.  
Weight: 0.139g

ORDERING CODE : TMBYV10-40 FILM

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics  
© 1999 STMicroelectronics - Printed in Italy - All rights reserved.  
STMicroelectronics GROUP OF COMPANIES  
Australia - Brazil - China - Finland - France - Germany - Hong Kong - India - Italy - Japan - Malaysia  
Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - U.S.A.  
<http://www.st.com>

