SGS-THOMSON MICROELECTRONICS

# TMBYV 10-60

## SMALL SIGNAL SCHOTTKY DIODE

**DESCRIPTION**

Metal to silicon rectifier diode 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.

**MELF**
(Glass)

**ABSOLUTE MAXIMUM RATINGS** (limiting values)

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $V_{RRM}$ | Repetitive Peak Reverse Voltage | | 60 | V |
| $I_{F(AV)}$ | Average Forward Current | $T_i$ = 25 °C | 1 | A |
| $I_{FSM}$ | Surge non Repetitive Forward Current | $T_i$ = 25 °C<br>$t_p$ = 10ms | 20<br>Sinusoidal Pulse | A |
| | | $T_i$ = 25 °C<br>$t_p$ = 300µs | 40<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 |

## ELECTRICAL CHARACTERISTICS

STATIC CHARACTERISTICS

| Symbol | Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_R$* | $T_j$ = 25°C | $V_R = V_{RRM}$ | | | 0.5 | mA |
| | $T_j$ = 100°C | | | | 10 | |
| $V_F$* | $I_F$ = 1A | $T_j$ = 25°C | | | 0.7 | V |
| | $I_F$ = 3A | | | | 1 | |

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

DYNAMIC CHARACTERISTICS

| Symbol | Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| C | $T_j$ = 25°C | $V_R$ = 0 | | 150 | | pF |
| | $T_j$ = 25°C | $V_R$ = 5V | | 40 | | |

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).

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

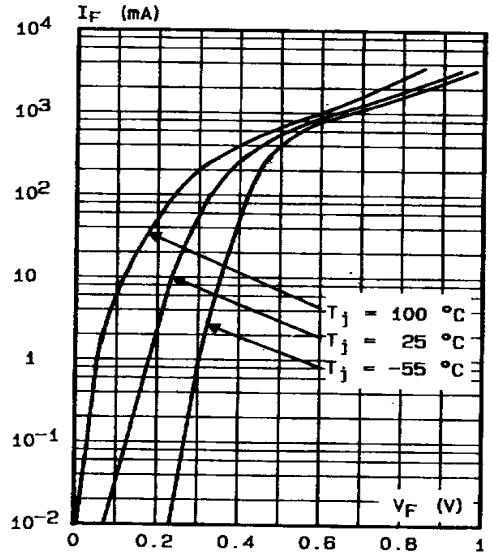



**Figure 2. Forward current versus forward voltage at high level (typical values).**

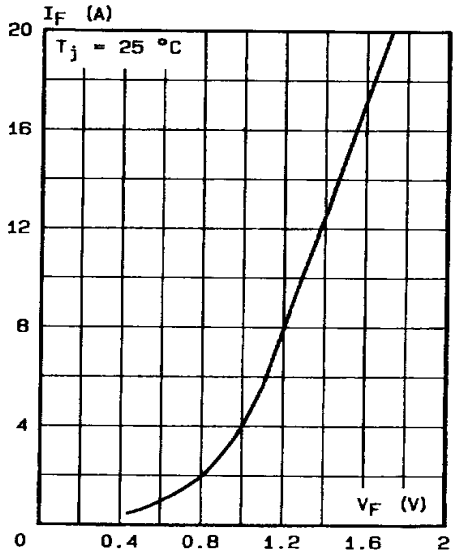



**Figure 3. Reverse current versus junction temperature.**

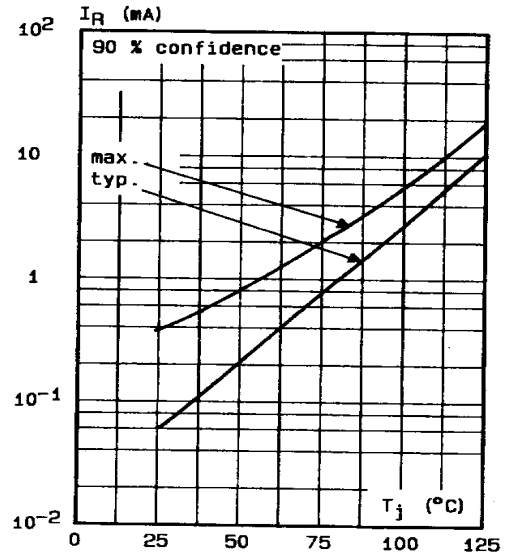



**Figure 4. Reverse current versus $V_{RRM}$ in per cent.**

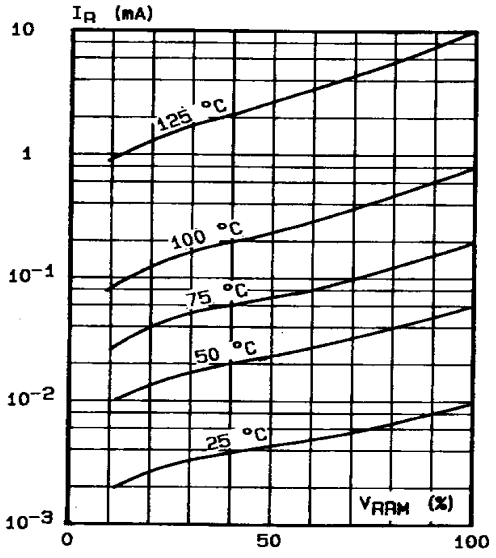


**Figure 5. Capacitance C versus reverse applied voltage $V_R$ (typical values)**

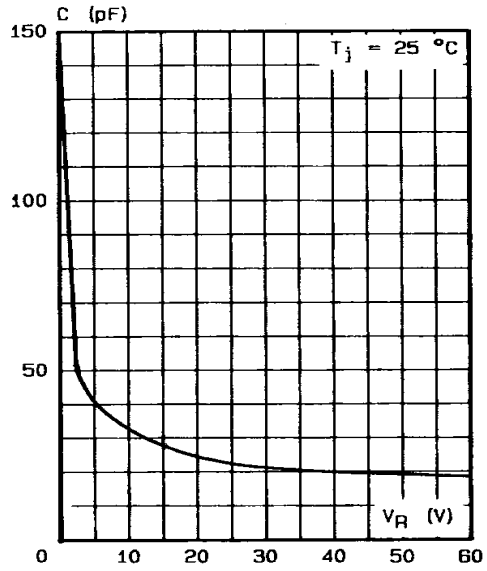



**Figure 6. Surge non repetitive forward current for a rectangular pulse with t ≤ 10 ms.**

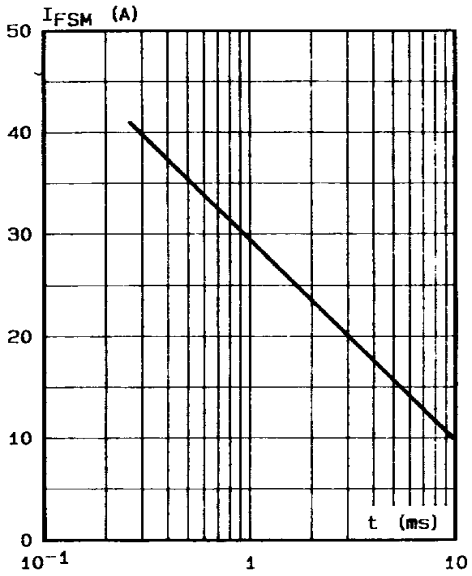
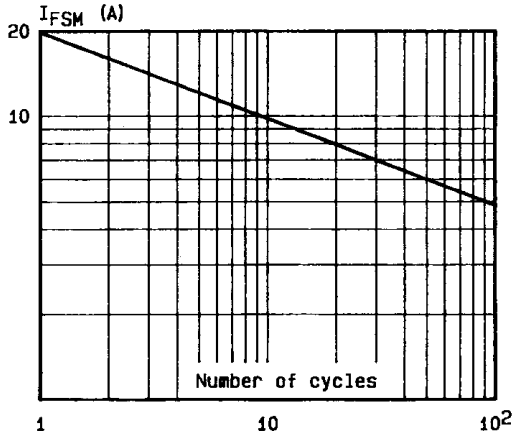
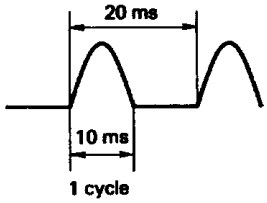


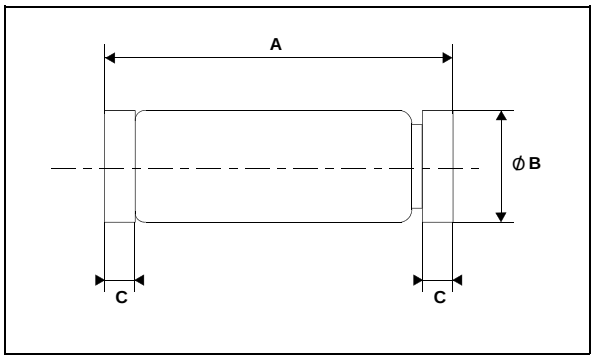

**Figure 7. Surge non repetitive forward current versus number of cycles.**



**PACKAGE MECHANICAL DATA**

MELF Glass




| REF. | DIMENSIONS | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 4.80 | 5.20 | 0.19 | 0.20 |
| B | 2.55 | 2.65 | 0.10 | 0.10 |
| C | 0.45 | 0.55 | 0.02 | 0.02 |

Marking: ring at cathode end.
Weight: 0.15g

**FOOT PRINT DIMENSIONS** (Millimeter)