## Absolute Maximum Ratings

| Symbol | Conditions [1] | Values | Units |
|---|---|---|---|
| $V_{DS}$ | | 500 | V |
| $V_{DGR}$ | $R_{GS}$ = 20 kΩ | 500 | V |
| $I_D$ | | 56 | A |
| $I_{DM}$ | | 224 | A |
| $V_{GS}$ | | ± 20 | V |
| $P_D$ | | 700 | W |
| $T_j$, $T_{stg}$ | | – 55 . . .+150 | °C |
| $V_{isol}$ | AC, 1 min | 2 500 | V |
| humidity | DIN 40 040 | Class F | |
| climate | DIN IEC 68 T.1 | 55/150/56 | |
| Inverse Diode | | | |
| $I_F$= – $I_D$ | | 56 | A |
| $I_{FM}$= – $I_{DM}$ | | 224 | A |

## Characteristics

| Symbol | Conditions [1] | min. | typ. | max. | Units |
|---|---|---|---|---|---|
| $V_{(BR)DSS}$ | $V_{GS}$ = 0, $I_D$ = 0,25 mA | 500 | – | – | V |
| $V_{GS(th)}$ | $V_{GS}$ = $V_{DS}$, $I_D$ = 1 mA | 2,1 | 3,0 | 4,0 | V |
| $I_{DSS}$ | $V_{GS}$ = 0, $T_j$ = 25 °C | – | 50 | 250 | µA |
| | $V_{DS}$ = 500 V, $T_j$ = 125 °C | – | 300 | 1000 | µA |
| $I_{GSS}$ | $V_{GS}$ = 20 V, $V_{DS}$ = 0 | – | 10 | 100 | nA |
| $R_{DS(on)}$ | $V_{GS}$ = 10 V, $I_D$ = 36 A | – | 90 | 110 | mΩ |
| $g_{fs}$ | $V_{DS}$ = 25 V, $I_D$ = 36 A | 20 | 30 | – | S |
| $C_{CHC}$ | | – | – | 160 | pF |
| $C_{iss}$ | $V_{GS}$ = 0 | – | 22 | 30 | nF |
| $C_{oss}$ | $V_{DS}$ = 25 V | – | 1,6 | 2,4 | nF |
| $C_{rss}$ | f = 1 MHz | – | 0,6 | 1 | nF |
| $L_{DS}$ | | – | – | 20 | nH |
| $t_{d(on)}$ | $V_{DD}$ = 250 V | – | 60 | – | ns |
| $t_r$ | $I_D$ = 36 A | – | 35 | – | ns |
| $t_{d(off)}$ | $V_{GS}$ = 10 V | – | 350 | – | ns |
| $t_f$ | $R_{GS}$ = 3,3 Ω | – | 70 | – | ns |
| Inverse Diode | | | | | |
| $V_{SD}$ | $I_F$ = 110 A, $V_{GS}$ = 0 | – | 1,3 | 1,6 | V |
| $t_{rr}$ | $T_j$ = 25 °C [2] | – | 200 | 280 | ns |
| | $T_j$ = 150 °C [2] | – | 350 | 500 | ns |
| $Q_{rr}$ | $T_j$ = 25/150 °C [2] | – | 1,5/8,5 | 2,5/12 | µC |
| $I_{RRM}$ | $T_j$ = 25/150 °C [2] | – | 12/28 | – | A |
| Thermal Characteristics | | | | | |
| $R_{thjc}$ | | – | – | 0,18 | °C/W |
| $R_{thch}$ | $M_1$, surface 10 µm | – | – | 0,05 | °C/W |

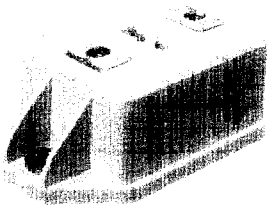
## Mechanical Data

| | | | | | |
|---|---|---|---|---|---|
| $M_1$ | to heatsink, SI Units | 4 | – | 6 | Nm |
| | to heatsink, US Units | 35 | – | 53 | lb.in. |
| $M_2$ | for terminals, SI Units | 2,5 | – | 3,5 | Nm |
| | for terminals, US Units | 22 | – | 24 | lb.in. |
| a | | – | – | 5x9,81 | $m/s^2$ |
| w | | – | – | 150 | g |
| Case | → page B 5 – 2 | D 15 | | | |

[1] $T_{case}$ = 25 °C, unless otherwise specified
[2] $I_F$ = – $I_D$, $V_R$ = 100 V, – $di_F/dt$ = 100 A/µs

# SEMITRANS® M
# Power MOSFET Modules
## SKM 151 F

■ Discontinued 1998



**SEMITRANS M1**

### Features

- N Channel, enhancement mode
- Fast inverse diode
- Short internal connections avoid oscillations
- Switching kW's in less than 1 µs
- Isolated copper baseplate
- All electrical connections on top for easy busbaring
- Large clearances and creepage distances
- UL recognized, file no. E 63 532

### Typical Applications

- Switched mode power supplies
- DC servo and robot drives
- DC choppers
- Resonant and welding inverters
- Induction heaters
- AC motor drives
- Laser power supplies
- UPS equipment
- Plasma cutting
- Not suitable for linear amplification

**This is an electrostatic discharge sensitive device (ESDS). Please observe the international standard IEC 747-1, Chapter IX.**

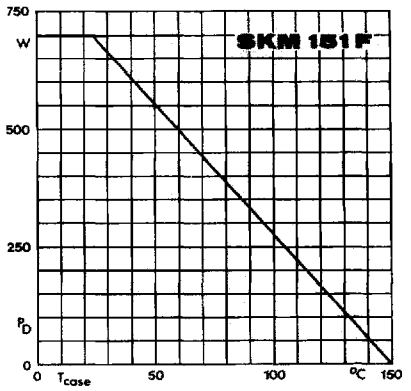



Fig. 1 Rated power dissipation vs. temperature

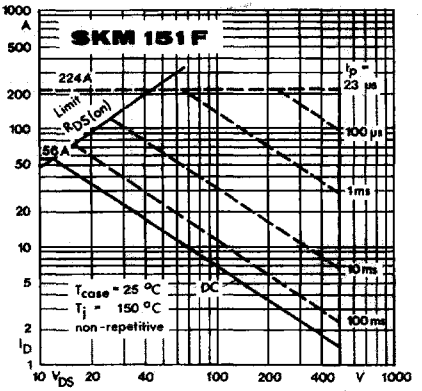



Fig. 2 Maximum safe operating area

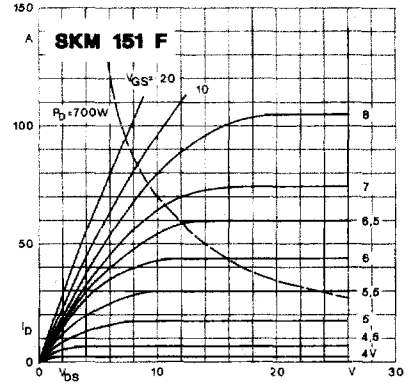



Fig. 3 Output characteristic

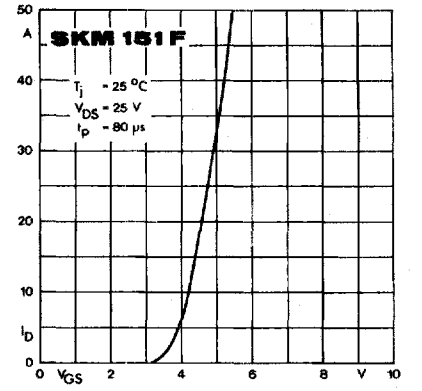



Fig. 4 Transfer characteristic

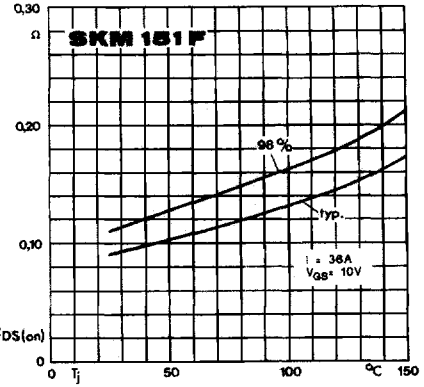



Fig. 5 On-resistance vs. temperature

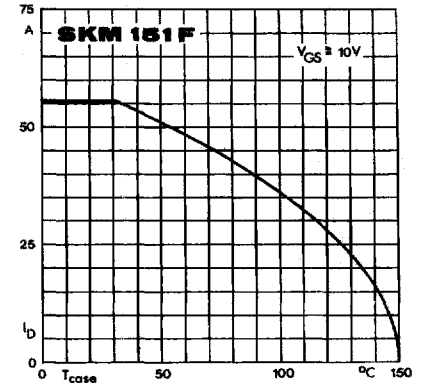



Fig. 6 Rated current vs. temperature

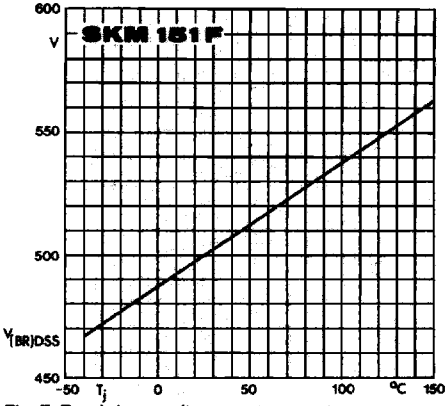



Fig. 7 Breakdown voltage vs. temperature

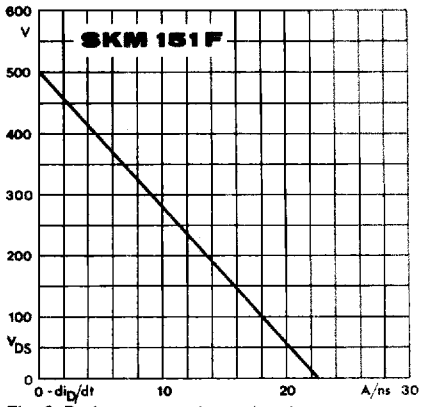



Fig. 8 Drain-source voltage derating

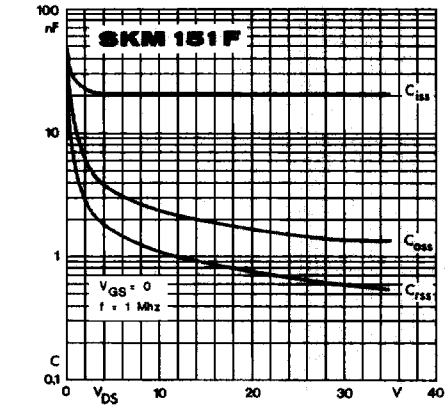



Fig. 9 Capacitances vs. drain-source voltage

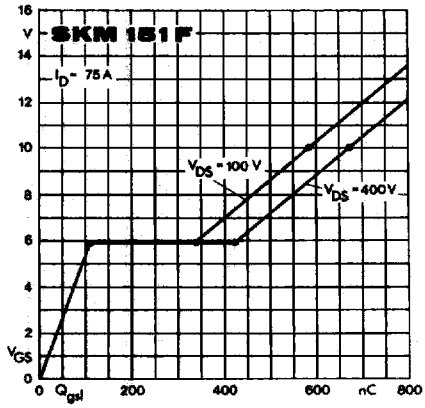



Fig. 10 Gate charge characteristic

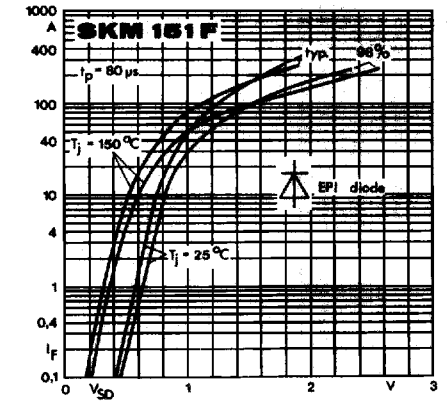



Fig. 11 Diode forward characteristic

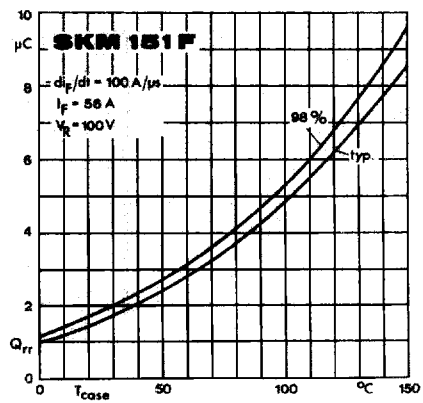



Fig. 12 Diode recovered charge

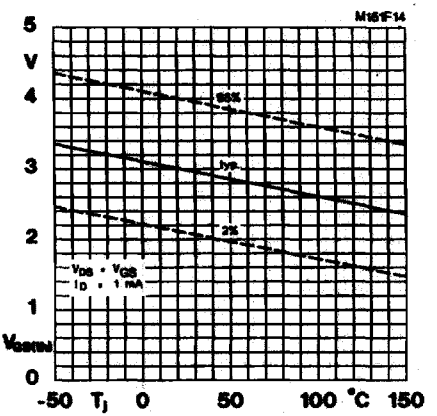



Fig. 14 Gate-source threshold voltage

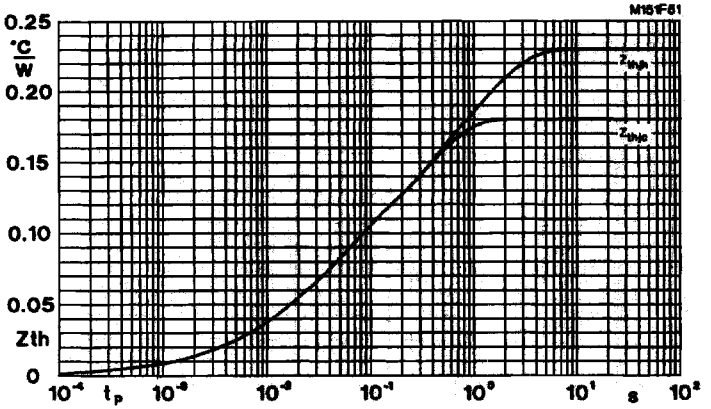



Fig. 51 Transient thermal impedance

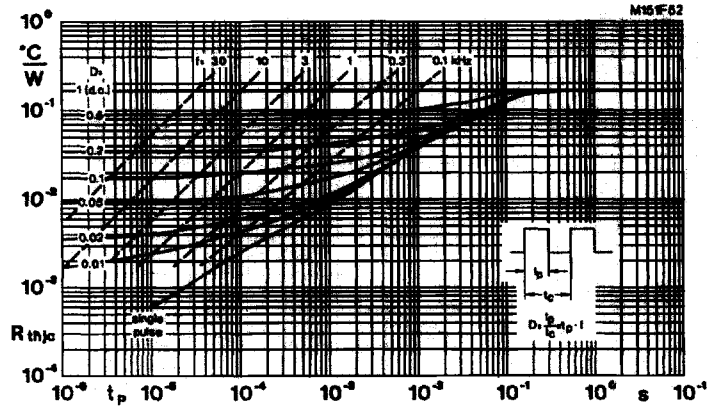



Fig. 52 Thermal impedance under pulse conditions