

Maximum Ratings

| Symbol | Conditions | Values | Units |
|-----------------|--------------------------------------------|--------------|-------|
| $V_{CEV_{sus}}$ | $I_C = 1\text{ A}, V_{BE} = -2\text{ V}$ | 1000 | V |
| V_{CEV} | $V_{BE} = -2\text{ V}$ | 1000 | V |
| V_{CBO} | $I_E = 0$ | 1000 | V |
| V_{EBO} | $I_C = 0$ | 7 | V |
| I_C | D. C. | 50 | A |
| I_{CM} | $t_p = 1\text{ ms}$ | 100 | A |
| $I_F = -I_C$ | D. C. | 50 | A |
| I_B | | 3 | A |
| P_{tot} | $T_{case} = 25\text{ °C}$, per darlington | 400 | W |
| T_{vj} | | -40 ... +150 | °C |
| T_{stg} | | -40 ... +125 | °C |
| V_{isol} | a. c. 50 Hz, r.m.s. | 2500~ | V |

Thermal Characteristics

| Symbol | Conditions | Values | Units |
|------------|---------------------------|------------|-------|
| R_{thjc} | per darlington/per module | 0,31/0,15 | °C/W |
| R_{thjc} | per diode/per module | 1,2/0,6 | °C/W |
| R_{thch} | per 1/2 module/per module | 0,15/0,075 | °C/W |

Electrical Characteristics¹⁾

| Symbol | Conditions | min. | typ. | max. | Units |
|------------------|------------------------------------------|-------------------------|------|------|-------|
| I_{CEV} | $V_{CE} = V_{CEV}, V_{BE} = -2\text{ V}$ | | | 1 | mA |
| I_{EBO} | $I_C = 0, V_{BE} = -7\text{ V}$ | | | 200 | mA |
| $V_{CEsat}^{2)}$ | $I_C = 50\text{ A}, I_B = 1\text{ A}$ | | | 2,5 | V |
| $V_{BEsat}^{2)}$ | $I_C = 50\text{ A}, I_B = 1\text{ A}$ | | | 3,5 | V |
| $h_{21E}^{2)}$ | $I_C = 50\text{ A}$ | $V_{CE} = 2,8\text{ V}$ | 75 | | |
| | | $V_{CE} = 5\text{ V}$ | 100 | | |

Switching Characteristics for Resistive Load¹⁾

| Symbol | Conditions | | | | Units |
|----------|-----------------------------------------------------------------------------------|--|-----|-----|-------|
| t_{on} | $I_C = 50\text{ A}$ $I_{B1} = -I_{B2} = 1\text{ A}$ $V_{CC} = 600\text{ V}$ | | 0,8 | 2,5 | µs |
| t_s | | | 11 | 15 | µs |
| t_f | | | 2 | 3 | µs |

Inverse Diode Characteristics¹⁾

| Symbol | Conditions | | | | Units |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|------|-------|
| $V_F = -V_{CE}$ | $I_F = -I_C = 50\text{ A}$ | | | 1,75 | V |
| $I_{FSM} = -I_{CP}$ | $\sin 180^\circ, 10\text{ ms}$ | 500 | | | A |
| I_{RM} | $I_F = -I_C = 50\text{ A}, -di_F/dt = 100\text{ A}/\mu\text{s}$ $V_{BE} = -3\text{ V}, V_R = V_{CE} = 400\text{ V},$ $T_{vj} = 125\text{ °C}$ | | 35 | | A |
| Q_{rr} | | | 17 | | µC |

Mechanical Data

| Symbol | Description | SI units | | | Units |
|--------|----------------------|----------|------|----|---------|
| | | US units | | | |
| M_1 | Case to heatsink | SI units | 3 | 6 | Nm |
| | | US units | 27 | 53 | lb. in. |
| M_2 | Busbars to terminals | SI units | 2,5 | 5 | Nm |
| | | US units | 22 | 44 | lb. in. |
| w | | | 250 | | g |
| Case | | DB | D 11 | | |
| | | DAL | D 21 | | |

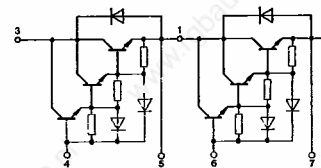
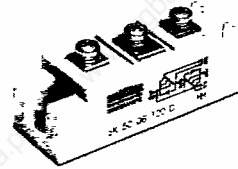
¹⁾ $T_{case} = 25\text{ °C}$ unless otherwise stated

²⁾ $t_p \leq 300\text{ µs}, D \leq 1,5\%$

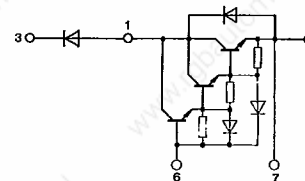
SEMITRANS® 2 NPN Power Darlington Modules

50 A, 1000 V **T-33-3S**

SK 50 DB 100 D
SK 50 DAL 100 D



DB



DAL

Features

- Isolated baseplate (ease of mounting of one or several modules on one heatsink)
- All electrical connections on top (ease of interconnecting of modules with busbars/PCB)
- Large clearances and creepage distances
- Parallel connected fast recovery inverse diode
- UL recognized, file no. 63 532

Typical Applications

- Switched mode power supplies
- DC servo and robot drives
- AC motor controls
- Brake choppers (DAL)

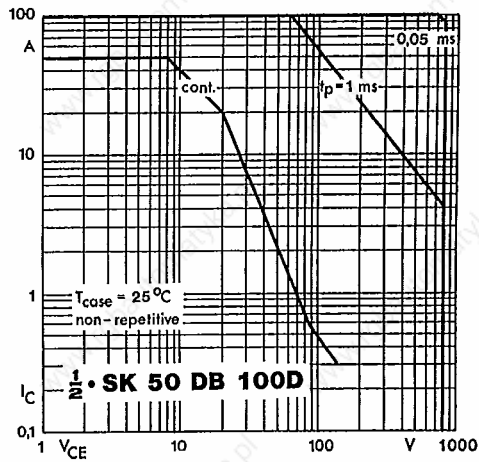


Fig. 1 Forward biased safe operating area (FBSOA)

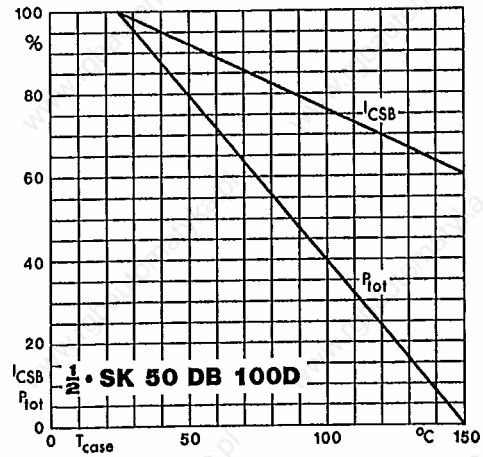


Fig. 2 Shifting the limits of the FBSOA with temperature

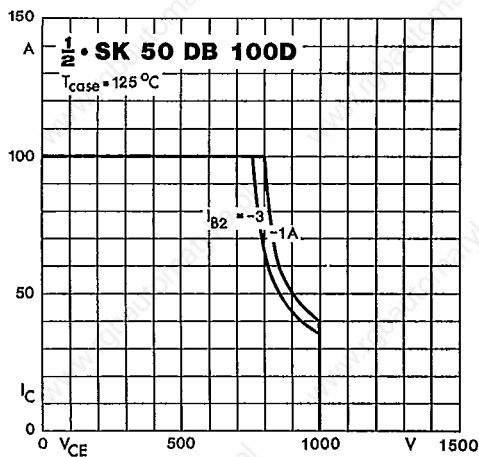


Fig. 3 Reverse biased safe operating area (RBSOA)

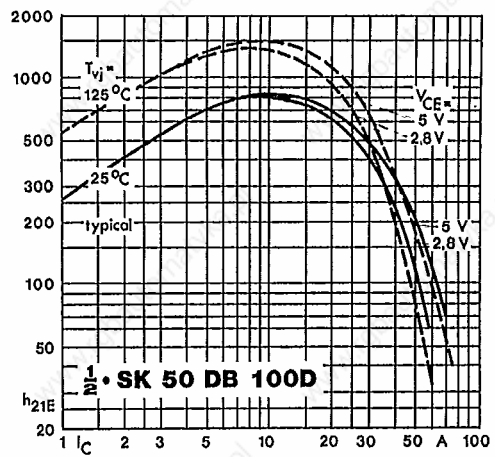


Fig. 4 Forward current transfer ratio vs. coll. current

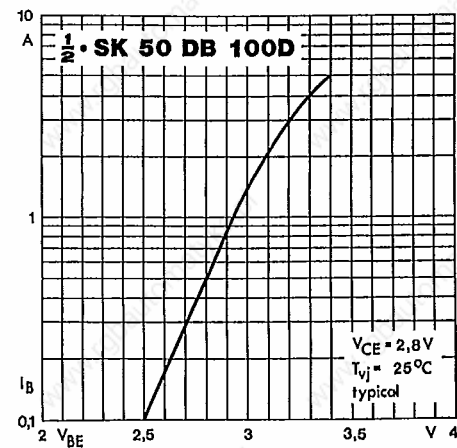


Fig. 5 Base current/voltage characteristic

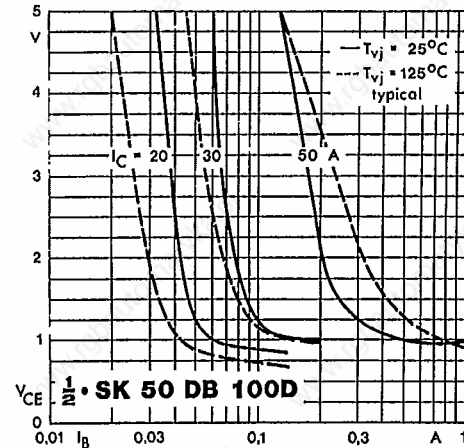


Fig. 6 Collector-emitter voltage vs. base current

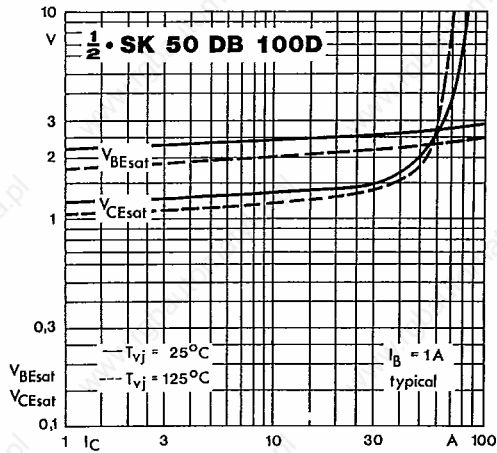


Fig. 7 Saturation voltages vs. collector current

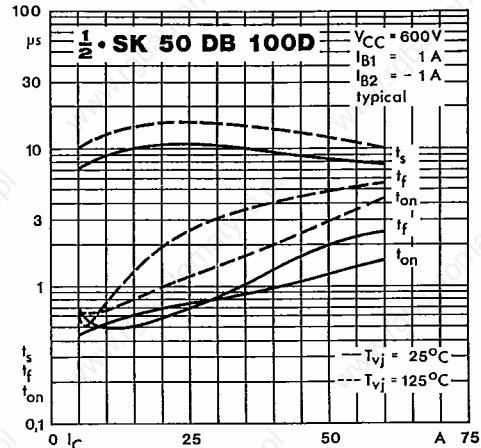


Fig. 8 Switching times vs. collector current

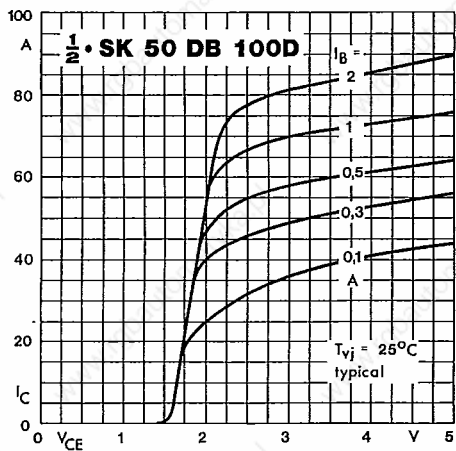


Fig. 9 Collector current/voltage characteristics

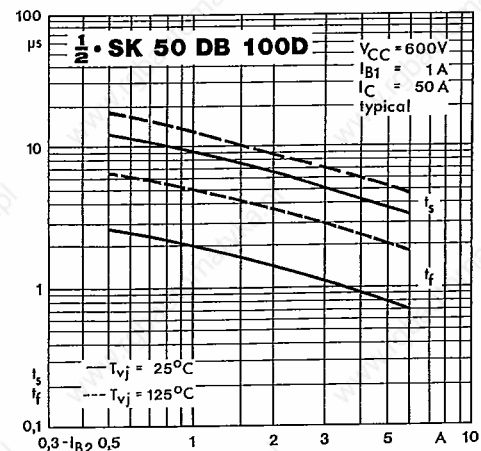


Fig. 10 Turn-off times vs. negative base current

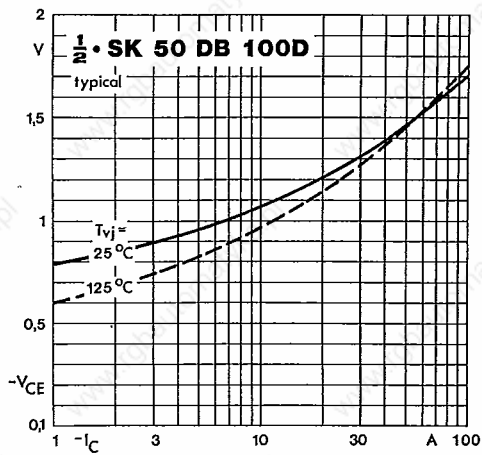


Fig. 11 Inverse diode forward characteristics

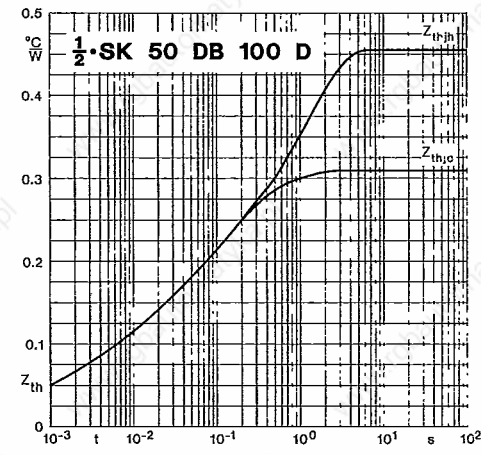


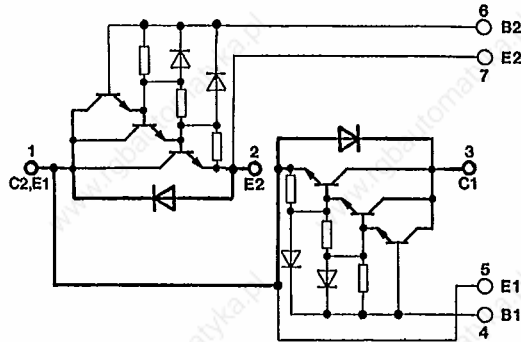
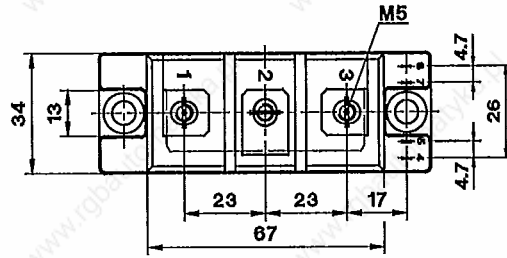
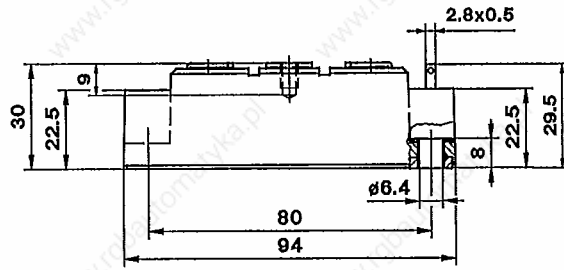
Fig. 12 Transient thermal impedance vs. time

SK 50 DB 100 D

Case D 11

SEMITRANS[®] 2

UL recognized, file no. E 63 532



Dimensions in mm

SK 50 DAL 100 D

Case D 21

SEMITRANS[®] 2

UL recognized, file no. 63 532

