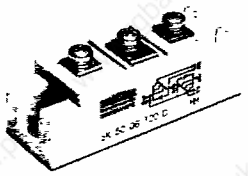
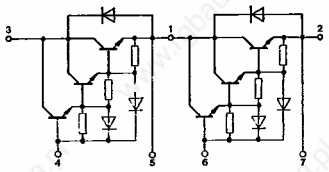
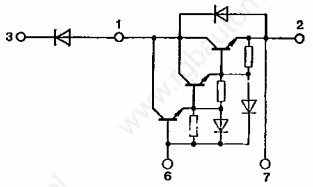
SEMITRANS® 2 NPN
Power Darlington Modules
50 A, 1000 V T-33-35

SK 50 DB 100 D
SK 50 DAL 100 D





DB



DAL

Maximum Ratings

Symbol	Conditions	Values	Units
V_{CEVsus}	I_C = 1 A, V_{BE} = – 2 V	1000	V
V_{CEV}	V_{BE} = – 2 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 ms	100	A
I_F = –I_C	D. C.	50	A
I_B		3	A
P_{tot}	T_{case} = 25 °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

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 ½ module/per module	0,15/0,075	°C/W

Electrical Characteristics[1)]

			min.	typ.	max.	
I_{CEV}	V_{CE} = V_{CEV}, V_{BE} = – 2 V				1	mA
I_{EBO}	I_C = 0, V_{BE} = – 7 V				200	mA
V_{CEsat}[2)]	I_C = 50 A, I_B = 1 A				2,5	V
V_{BEsat}[2)]	I_C = 50 A, I_B = 1 A				3,5	V
h_{21E}[2)]	I_C = 50 A	V_{CE} = 2,8 V	75			
		V_{CE} = 5 V	100			

Switching Characteristics for Resistive Load[1)]

t_{on}	I_C = 50 A		0,8	2,5	µs
t_s	I_{B1} = – I_{B2} = 1 A		11	15	µs
t_f	V_{CC} = 600 V		2	3	µs

Inverse Diode Characteristics[1)]

V_F = –V_{CE}	I_F = – I_C = 50 A				1,75	V
I_{FSM} = – I_{Cp}	sin 180°, 10 ms		500			A
I_{RM}	I_F = – I_C = 50 A, – di_F/dt = 100 A/µs V_{BE} = – 3 V, V_R = V_{CE} = 400 V, T_{vj} = 125 °C			35		A
Q_{rr}				17		µC

Mechanical Data

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 °C unless otherwise stated
2) $t_p \leq$ 300 µs, D ≤ 1,5 %

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)

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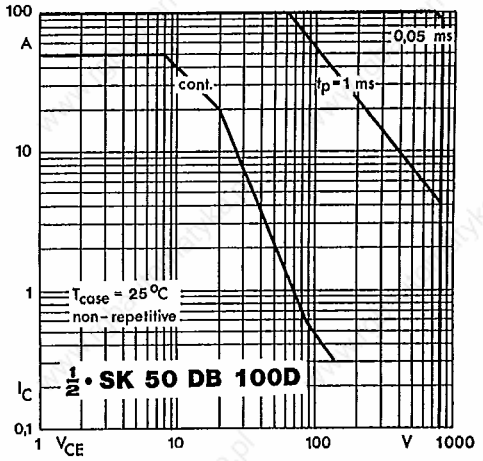

Fig. 1 Forward biased safe operating area (FBSOA)

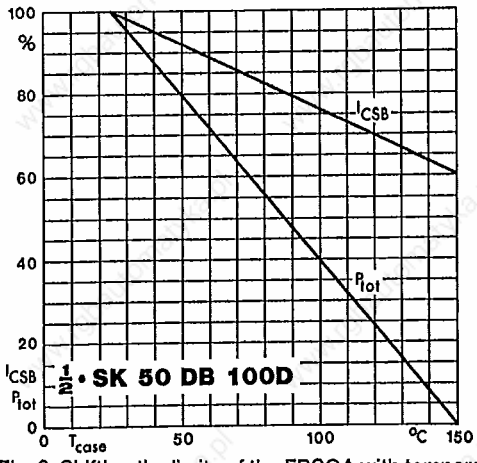

Fig. 2 Shifting the limits of the FBSOA with temperature

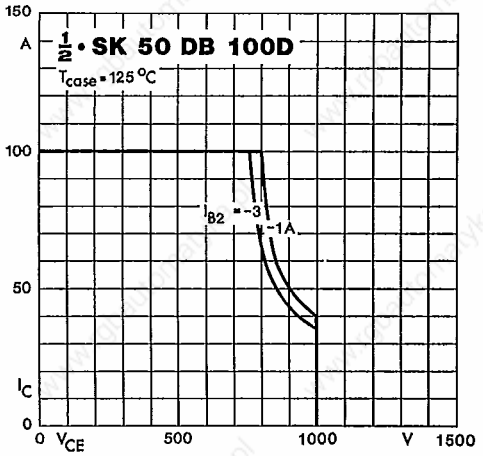

Fig. 3 Reverse biased safe operating area (RBSOA)

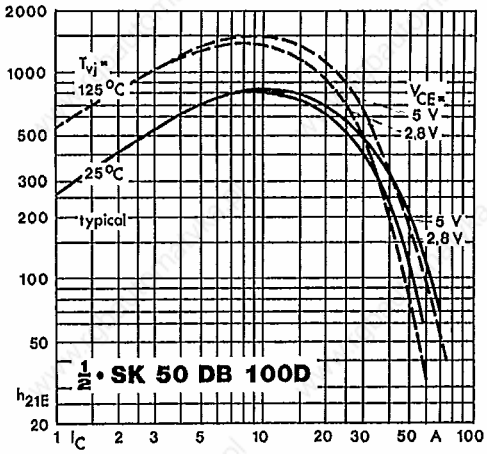

Fig. 4 Forward current transfer ratio vs. coll. current

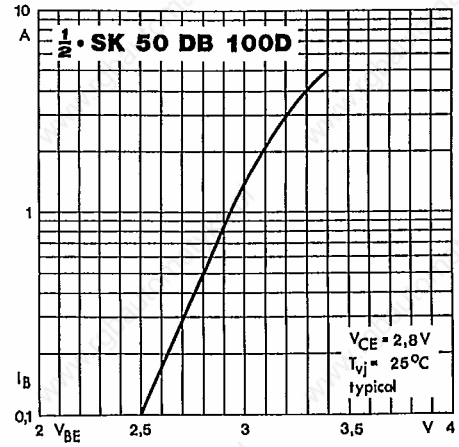

Fig. 5 Base current/voltage characteristic

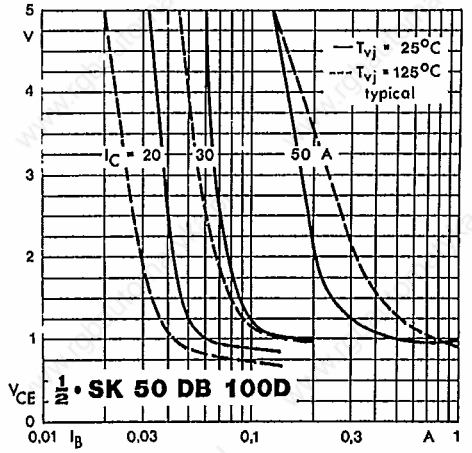

Fig. 6 Collector-emitter voltage vs. base current

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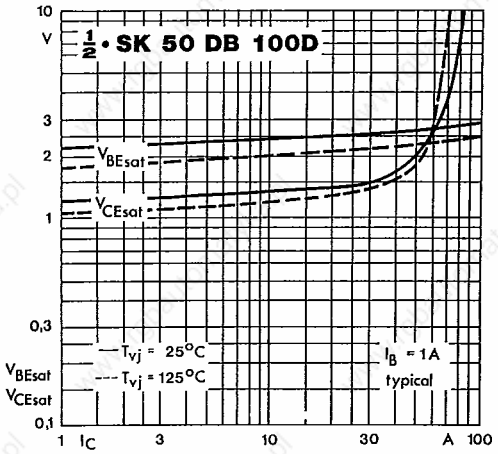

Fig. 7 Saturation voltages vs. collector current

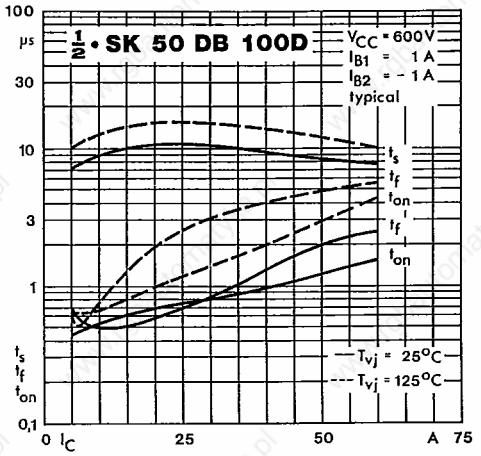

Fig. 8 Switching times vs. collector current

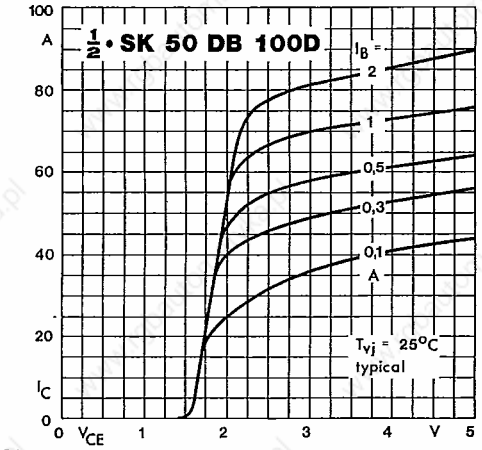

Fig. 9 Collector current/voltage characteristics

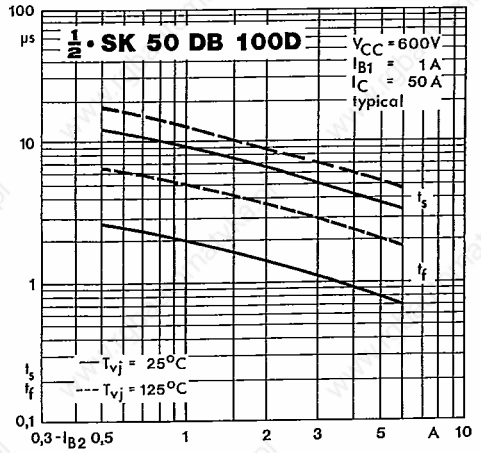

Fig. 10 Turn-off times vs. negative base current

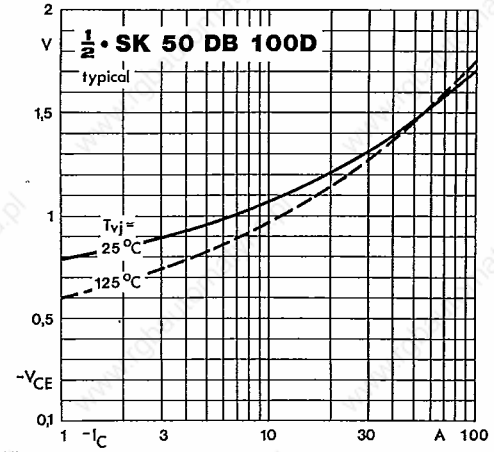

Fig. 11 Inverse diode forward characteristics

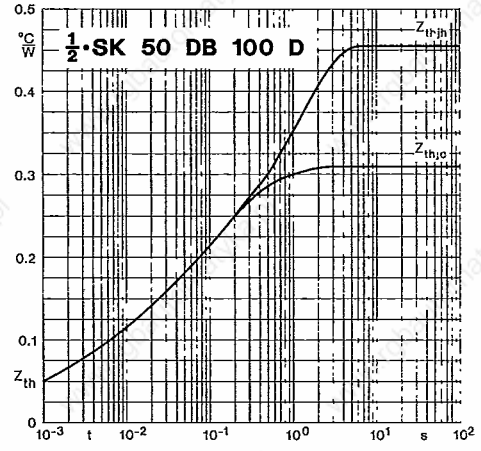

Fig. 12 Transient thermal impedance vs. time

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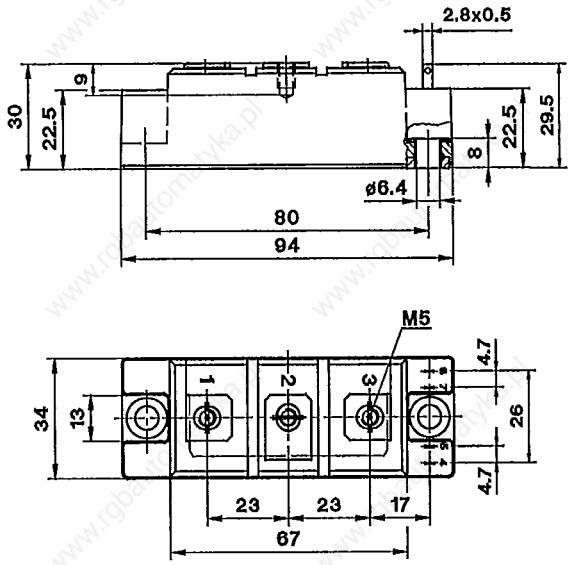
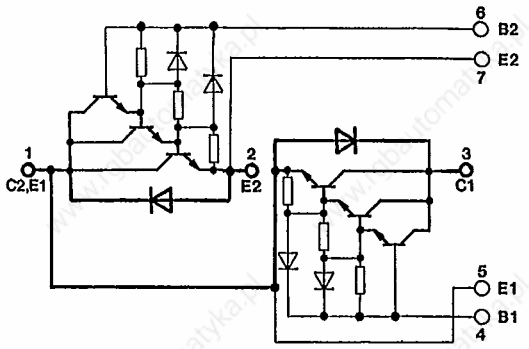
Case D 11 UL recognized, file no. E 63 532

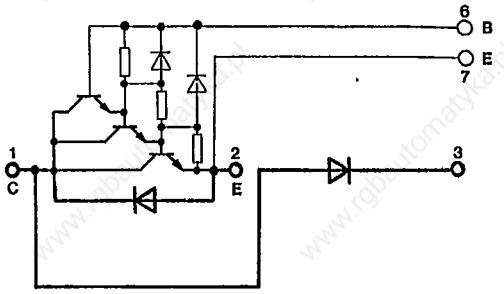




Dimensions in mm

SK 50 DAL 100 D SEMITRANS® 2

Case D 21 UL recognized, file no. 63 532



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