

Absolute Maximum Ratings			
Symbol	Conditions ¹⁾	Values	Units
V _{CES}		1000	V
V _{CGR}	R _{GE} = 20 kΩ	1000	V
I _C	T _{case} = 70 °C	50	A
I _{CM}	T _{case} = 70 °C	100	A
V _{GES}		± 20	V
P _{tot}	per IGBT, T _{case} = 25 °C	400	W
T _J , T _{stg}		-55 ... +150	°C
V _{isol}	AC, 1 min, 200 μA	2500	V
humidity	DIN 40 040	Class F	
climate	DIN IEC 68 T.1	55/150/56	
Inverse Diode, Free-Wheeling Diode			
I _F = -I _C	T _{case} = 70 °C	50	A
I _{FM} = -I _{CM}	T _{case} = 70 °C	100	A

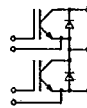
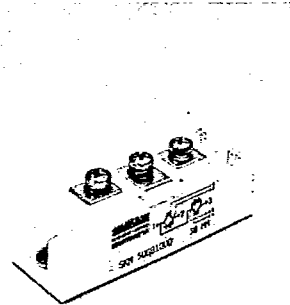
Characteristics					
Symbol	Conditions ¹⁾	min.	typ.	max.	Units
V _{(BR)CES}	V _{GE} = 0, I _C = 1 mA	1000	—	—	V
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 4 mA	4,5	5,5	7	V
I _{CES}	V _{GE} = 0, T _J = 25 °C	—	0,01	1	mA
	V _{CE} = 1000 V T _J = 125 °C	—	—	4	mA
I _{GES}	V _{GE} = 20 V, V _{CE} = 0	—	—	100	nA
V _{CEsat}	V _{GE} = 15 V, I _C = 50 A	—	3,5	5	V
g _{fs}	V _{CE} = 20 V, I _C = 50 A	22	28	—	S
C _{CHC}	per IGBT	—	—	100	pF
C _{ies}	V _{GE} = 0; V _{CE} = 25 V	—	16	—	nF
C _{oes}	f = 1 MHz	—	640	—	pF
C _{res}		—	200	—	pF
L _{CE}		—	—	20	nH
t _{d(on)}	$\left\{ \begin{array}{l} V_{CC} = 600 \text{ V} \\ I_C = 50 \text{ A} \\ V_{GE} = 15 \text{ V} \\ R_{Gon} = R_{Goff} = 3,3 \Omega \\ T_J = 125^\circ \text{C} \\ \text{see fig. 21} \end{array} \right.$	—	100 ³⁾	—	ns
t _r		—	300 ³⁾	—	ns
t _{d(off)}		—	400 ³⁾ /400 ⁴⁾	—	ns
t _f		—	500 ³⁾ /250 ⁴⁾	—	ns
W _{off 12}		—	0,9 ⁴⁾	—	mWs
W _{off 23}		—	1,3 ⁴⁾	—	mWs
Inverse Diode, Free-Wheeling Diode					
V _{EC}	I _F = 50 A, V _{GE} = 0; (T _J = 125 °C)	—	1,8 (1,6)	—	V
t _{rr}	T _J = 25 °C ²⁾	—	—	—	ns
	T _J = 125 °C ²⁾	—	200	—	ns
Q _{rr}	T _J = 25/125 °C ²⁾	—	2/9	—	μC
I _{RRM}	T _J = 25/125 °C ²⁾	—	—	—	A
Thermal Characteristics					
R _{thjc}	per IGBT	—	—	0,31	°C/W
R _{thjc}	per diode	—	—	1,0	°C/W
R _{thch}	per module	—	—	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		–	–	250	g
Case	→ page B 6 – 103	GAL		D 33	
		GB		D 27	

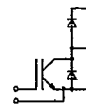
SEMITRANS® M IGBT Modules

SKM 50 GB 100 D
SKM 50 GAL 100 D

Preliminary Data



GB



GAL

Features

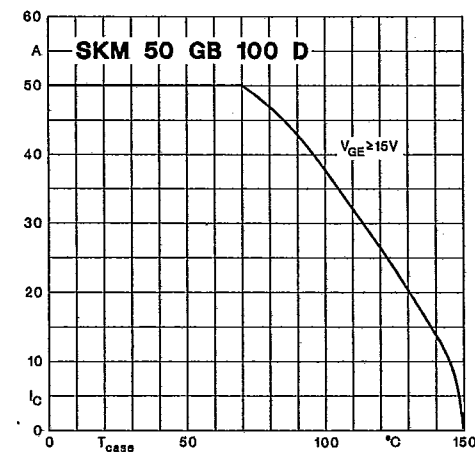
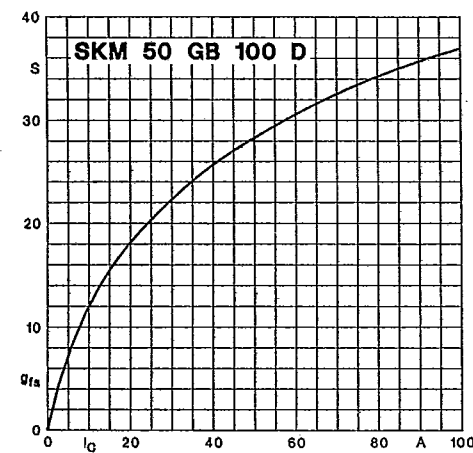
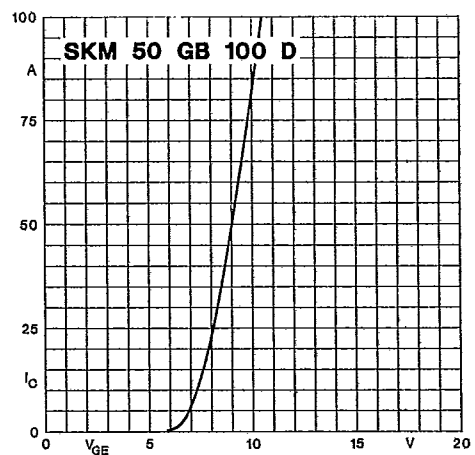
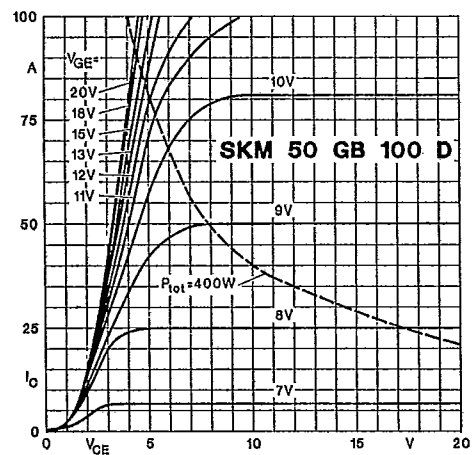
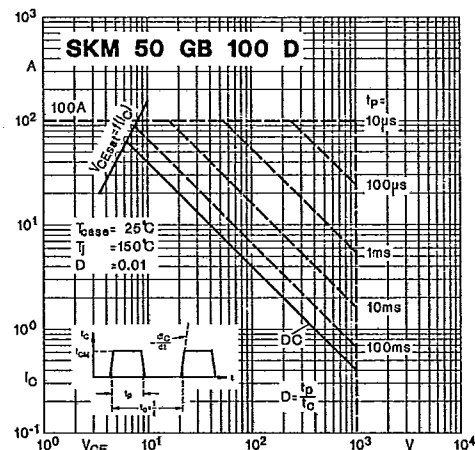
- MOS input (voltage controlled)
- N channel
- Low saturation voltage
- Very low tail current
- Low temperature sensitivity
- Breakdown proof
- High short circuit capability
- No latch-up
- Fast inverse diodes
- Isolated copper baseplate
- Large clearances and creepage distances
- UL recognized, file no. E 63 532

Typical Applications

- Switched mode power supplies
- DC servo and robot drives
- Self-commutated inverters
- DC choppers
- AC motor speed control
- Inductive heating
- Uninterruptible power supplies
- Electronic welders
- General power switching applications
- Pulse frequencies above 15 kHz

IGBT – Insulated Gate Bipolar Transistor

- ¹⁾ T_{case} = 25 °C, unless otherwise specified
- ²⁾ I_F = -I_C, V_R = 600 V, -di_F/dt = 800 A/μs, V_{GE} = 0
- ³⁾ resistive load
- ⁴⁾ inductive load



T-33-15

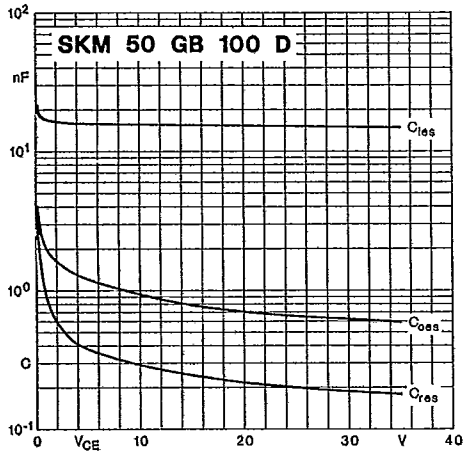


Fig. 19 Capacitances vs. collector-emitter voltage

Fig. 20 Gate charge characteristic

Fig. 11 Diode forward characteristic

Fig. 12 Diode recovered charge

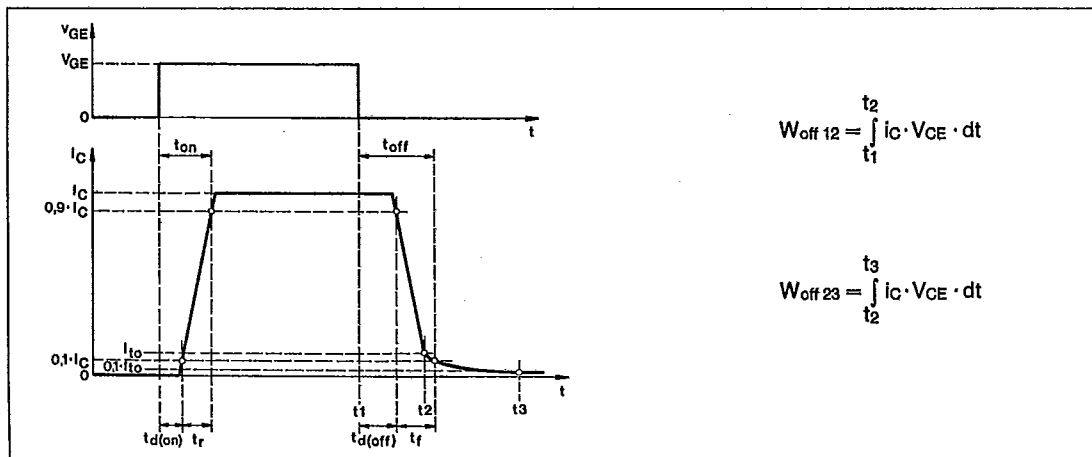


Fig. 21 Switching times and turn-off energies

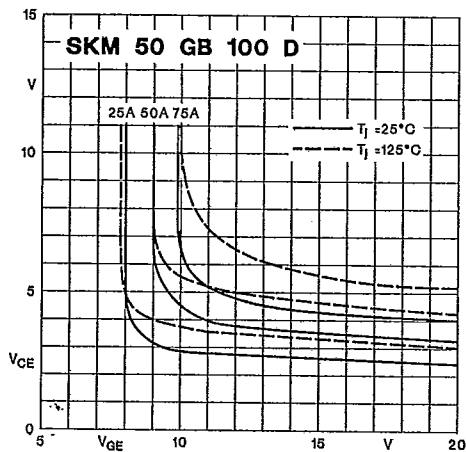


Fig. 22 Saturation characteristics

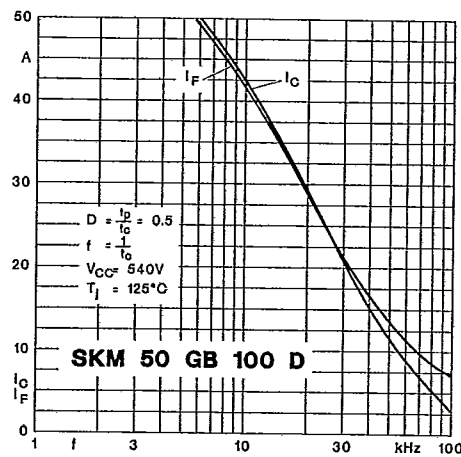


Fig. 23 Current ratings vs. pulse frequency

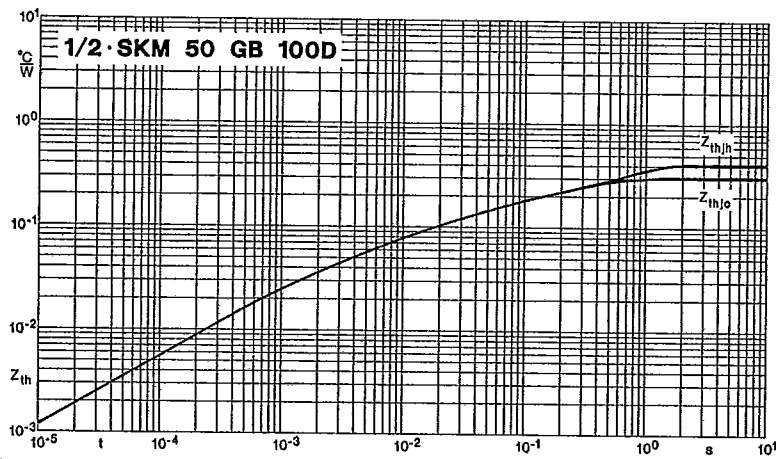


Fig. 25 Transient thermal impedance

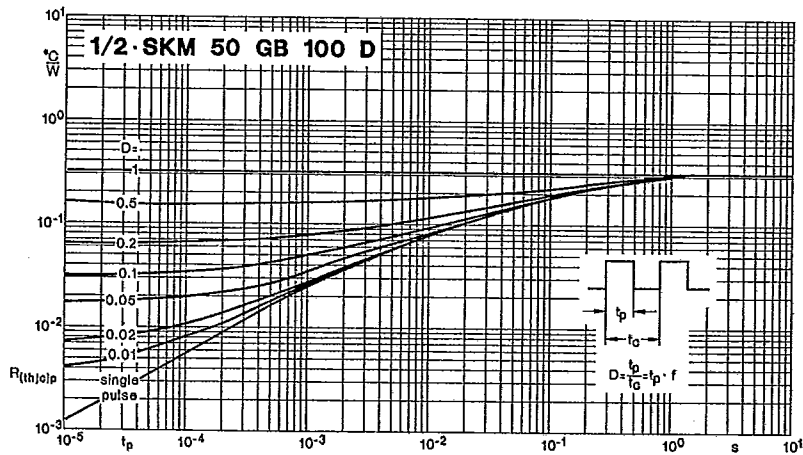


Fig. 26 Thermal impedance under pulse conditions