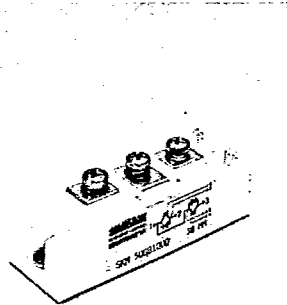


T-33-15

Absolute Maximum Ratings			
Symbol	Conditions ¹⁾	Values	Units
V _{CE}		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

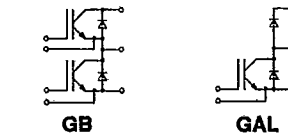
SEMITRANS® M IGBT Modules SKM 50 GB 100 D SKM 50 GAL 100 D

Preliminary Data



Characteristics		min.	typ.	max.	Units
Symbol	Conditions ¹⁾				
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 V _{CE} = 1000 V } T _J = 125 °C	-	0,01	1	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)}	$V_{CC} = 600 V$ $I_C = 50 A$ $V_{GE} = 15 V$ $R_{Gon} = R_{Goff} = 3,3 \Omega$ $T_J = 125 \text{ °C}$ see fig. 21	-	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					
Symbol	Description	SI Units	US Units	SI Units	US Units
M ₁	to heatsink	4	-	6	Nm
M ₂	for terminals	2,5	-	3,5	Nm
a		-	-	5x9,81	m/s ²
w		-	-	250	g
Case	→ page B 6 - 103	GAL	D 33	GB	D 27



- ### 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

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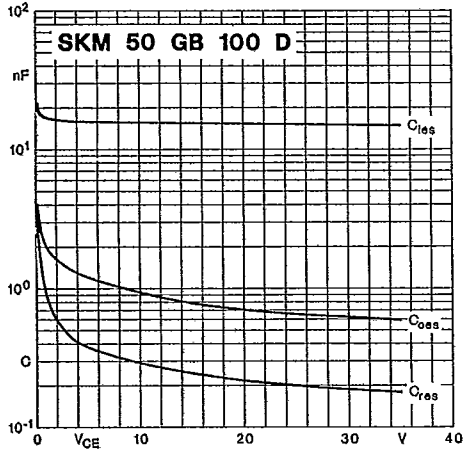


Fig. 19 Capacitances vs. collector-emitter voltage

Fig. 20 Gate charge characteristic

Fig. 11 Diode forward characteristic

Fig. 12 Diode recovered charge

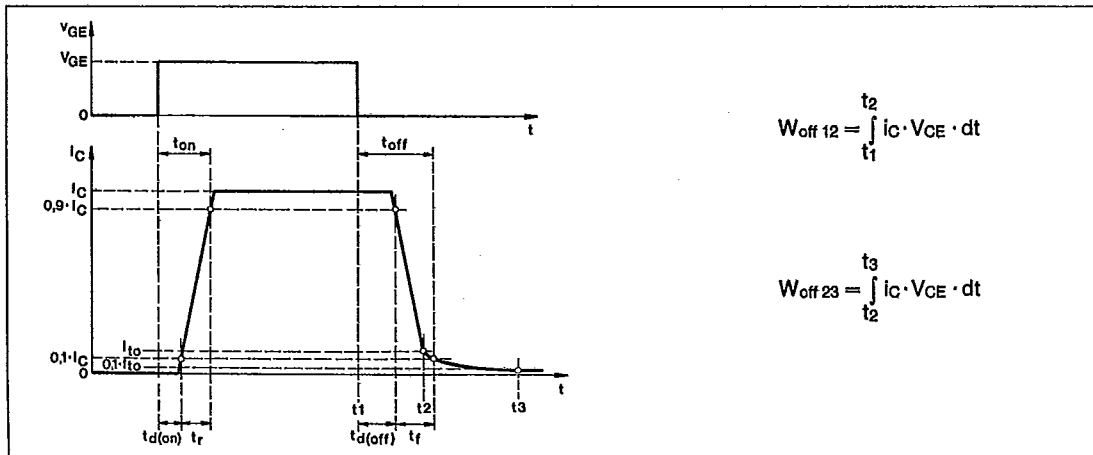


Fig. 21 Switching times and turn-off energies

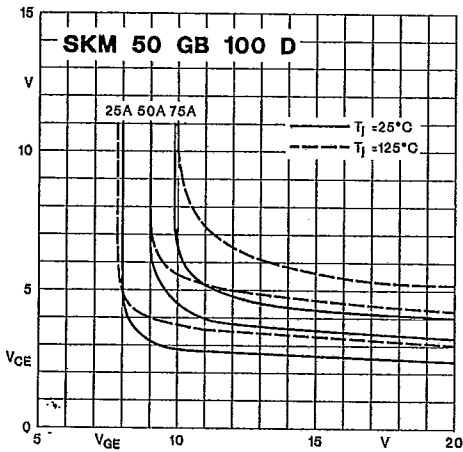


Fig. 22 Saturation characteristics

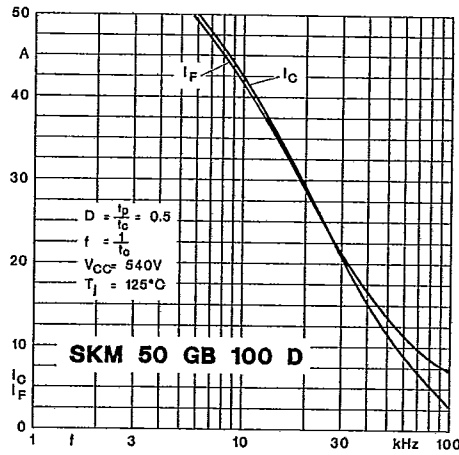


Fig. 23 Current ratings vs. pulse frequency

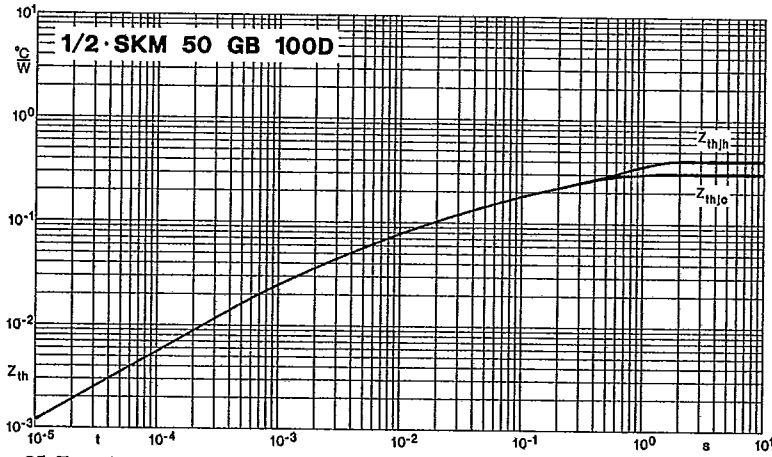


Fig. 25 Transient thermal impedance

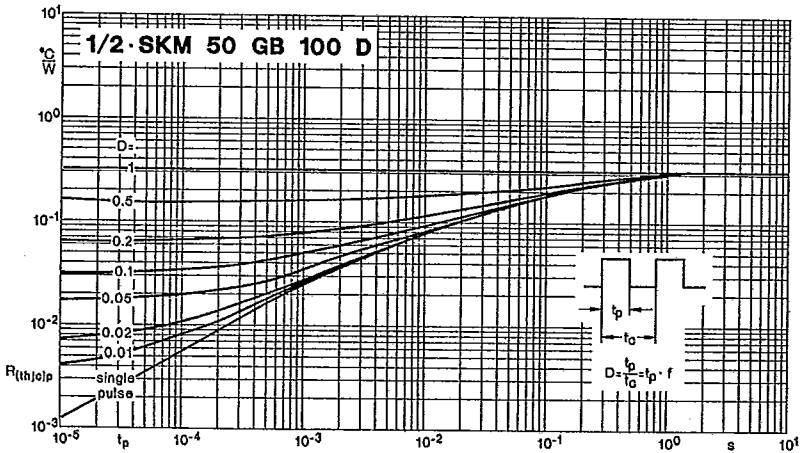


Fig. 26 Thermal impedance under pulse conditions