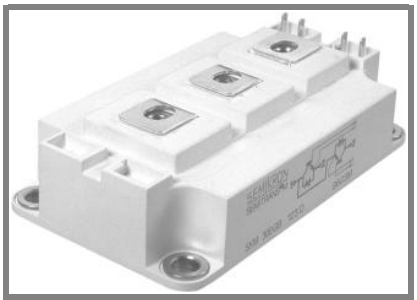
SKM 200GB12T4



SEMITRANS® 3

IGBT4 Modules

SKM 200GB12T4

SKM 200GAL12T4

Features

- IGBT4 = 4. Generation (Trench) IGBT
- V_{CEsat} with positive temperature coefficient
- High short circuit capability, self limiting to 6 x I_{CNOM}
- Soft switching 4. Generation CAL diode (CAL4)

Typical Applications

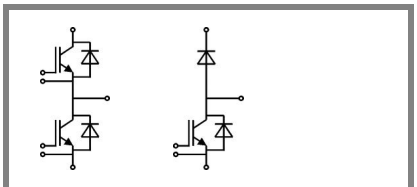
- AC inverter drives
- UPS
- Electronic welders at f_{sw} up to 20 kHz

Remarks

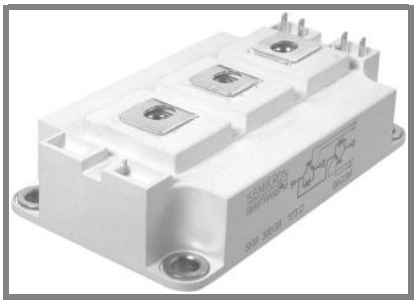
- Case temperature limited to T_c = 125°C max, recomm. T_{op} = -40 ... +150°C, product rel. results valid for $T_j \leq 150°$

Absolute Maximum Ratings	T_c = 25 °C, unless otherwise specified			
Symbol	**Conditions**		**Values**	**Units**
IGBT				
V_{CES}	T_j = 25 °C		1200	V
I_C	T_j = 175 °C	T_{case} = 25 °C	310	A
		T_{case} = 80 °C	240	A
I_{CRM}	I_{CRM} = 3 x I_{CNOM}		600	A
V_{GES}			± 20	V
t_{psc}	V_{CC} = 800 V; $V_{GE} \leq$ 15 V; V_{CES} < 1200 V	T_j = 150 °C	10	µs
Inverse Diode				
I_F	T_j = 175 °C	T_{case} = 25 °C	230	A
		T_{case} = 80 °C	175	A
I_{FRM}	I_{FRM} = 3 x I_{FNOM}		600	A
I_{FSM}	t_p = 10 ms; sin.	T_j = 175 °C	1100	A
Module				
$I_{t(RMS)}$			500	A
T_{vj}			-40 ... +175	°C
T_{stg}			-40 ... +125	°C
V_{isol}	AC, 1 min.		4000	V

Characteristics	T_c = 25 °C, unless otherwise specified					
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
IGBT						
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 8 mA		5	5,8	6,5	V
I_{CES}	V_{GE} = 0 V, V_{CE} = V_{CES}	T_j = 25 °C				mA
V_{CE0}		T_j = 25 °C		0,8	0,9	V
		T_j = 150 °C		0,7	0,8	V
r_{CE}	V_{GE} = 15 V	T_j = 25°C		5	5,5	mΩ
		T_j = 150°C		7,5	8	mΩ
$V_{CE(sat)}$	I_{Cnom} = 200 A, V_{GE} = 15 V	T_j = 25°C$_{chiplev.}$		1,8	2	V
		T_j = 150°C$_{chiplev.}$		2,2	2,4	V
C_{ies}				12,3		nF
C_{oes}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz		0,81		nF
C_{res}				0,69		nF
Q_G	VGE = -8V / +15V			1130		nC
R_{Gint}	T_j = 25 °C			3,75		Ω
$t_{d(on)}$				185		ns
t_r	R_{Gon} = 1 Ω	V_{CC} = 600V		40		ns
E_{on}	di/dt = 5500 A/µs	I_C= 200A		21,3		mJ
$t_{d(off)}$	R_{Goff} = 1 Ω	T_j = 150 °C		425		ns
t_f	di/dt = 2300 A/µs	$V_{GE} \leq$ -8V		82		ns
E_{off}				20,2		mJ
$R_{th(j-c)}$	per IGBT				0,14	K/W



GB GAL



SEMITRANS® 3

IGBT4 Modules

SKM 200GB12T4

SKM 200GAL12T4

Features

- IGBT4 = 4. Generation (Trench) IGBT
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- UPS
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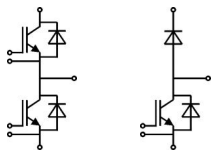


GB GAL

Characteristics

Symbol	Conditions		min.	typ.	max.	Units
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 200 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		2,2	2,5	V
		T_j = 150 °$C_{chiplev.}$		2,1	2,45	V
V_{F0}		T_j = 25 °C		1,3	1,5	V
		T_j = 150 °C		0,9	1,1	V
r_F		T_j = 25 °C		4,5	5	mΩ
		T_j = 150 °C		6	6,75	mΩ
I_{RRM}	I_F = 200 A	T_j = 150 °C		174		A
Q_{rr}	di/dt = 4450 A/µs			33,1		µC
E_{rr}	$V_{GE} \leq$ -8V			13		mJ
$R_{th(j-c)}$	per diode				0,26	K/W
Freewheeling Diode						
$V_F = V_{EC}$	I_{Fnom} = A; V_{GE} = V	T_j = °$C_{chiplev.}$				V
V_{F0}		T_j = °C				V
r_F		T_j = °C				V
I_{RRM}	I_F = A	T_j = °C				A
Q_{rr}						µC
E_{rr}						mJ
	per diode					K/W
Module						
L_{CE}				15	20	nH
$R_{CC'+EE'}$	res., terminal-chip	T_{case}= 25 °C			0,35	mΩ
		T_{case}= 125 °C			0,5	mΩ
$R_{th(c-s)}$	per module			0,02	0,038	K/W
M_s	to heat sink M6		3		5	Nm
M_t	to terminals M6		2,5		5	Nm
w					325	g

This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.

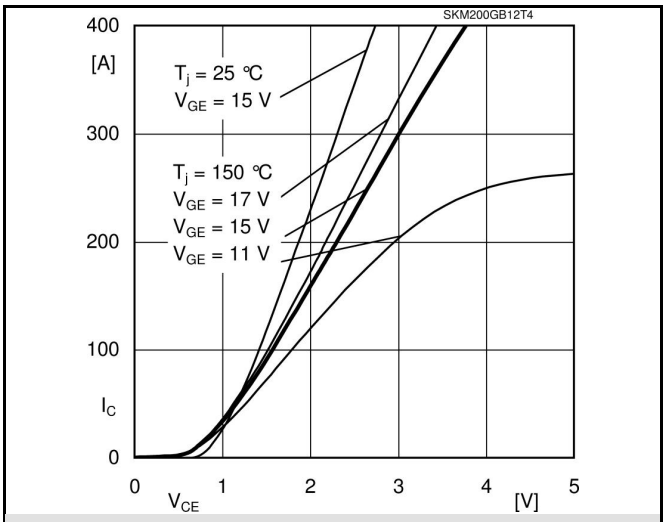


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

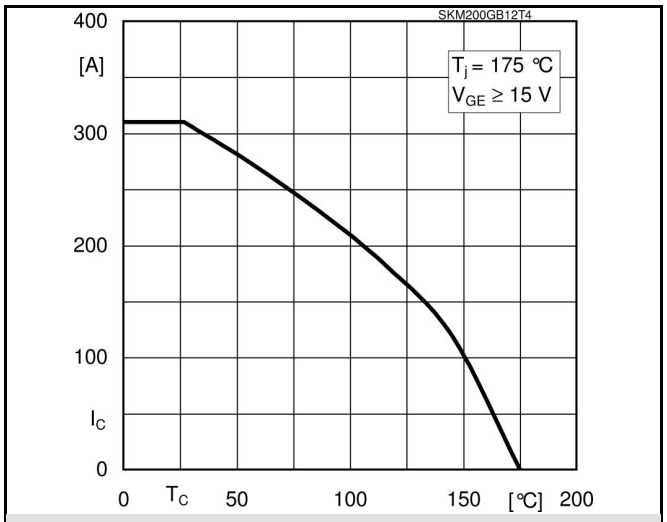


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

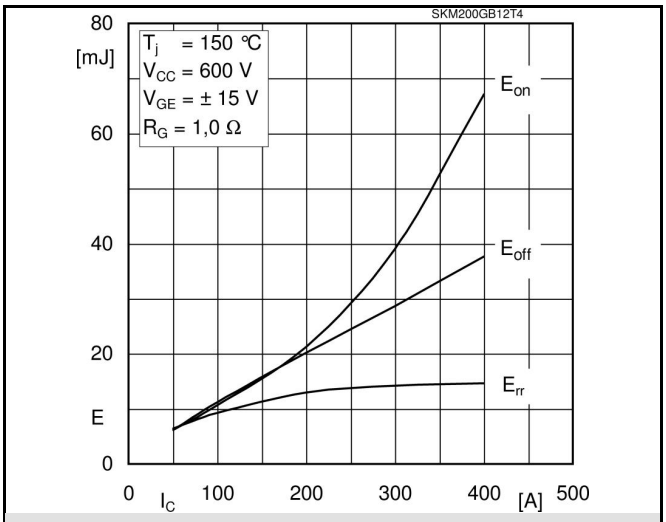


Fig. 3 Typ. turn-on /-off energy = f (I_C)

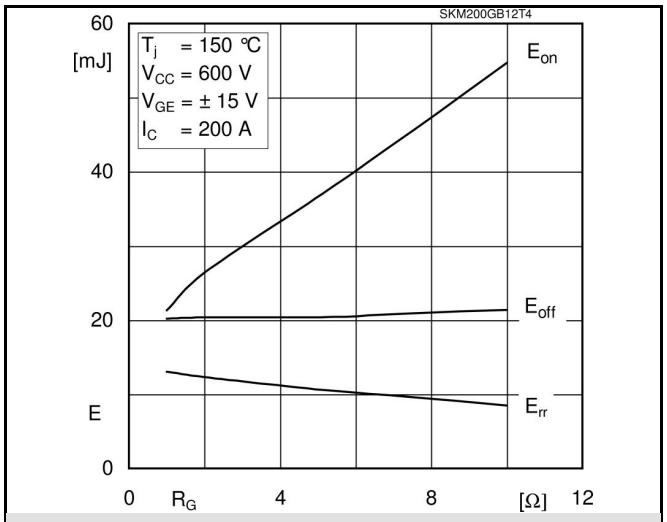


Fig. 4 Typ. turn-on /-off energy = f (R_G)

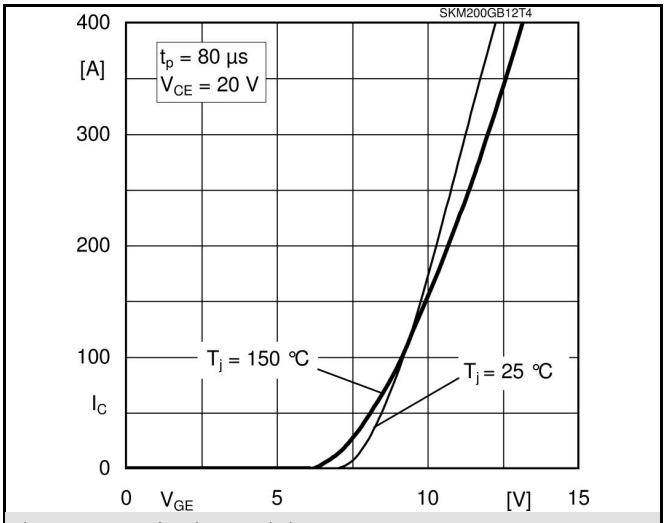


Fig. 5 Typ. transfer characteristic

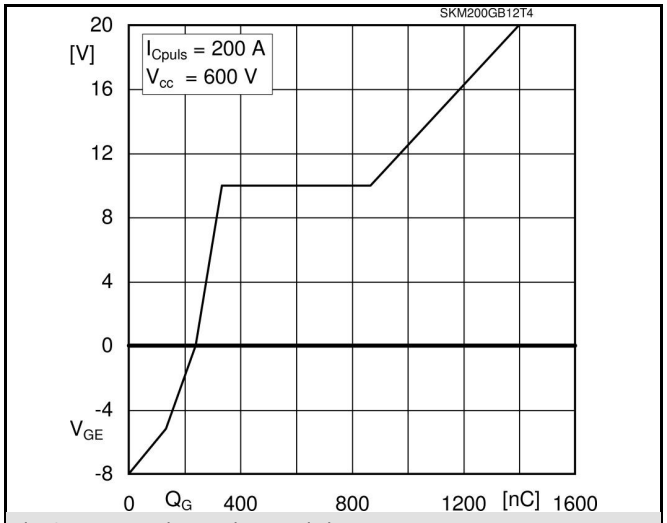


Fig. 6 Typ. gate charge characteristic

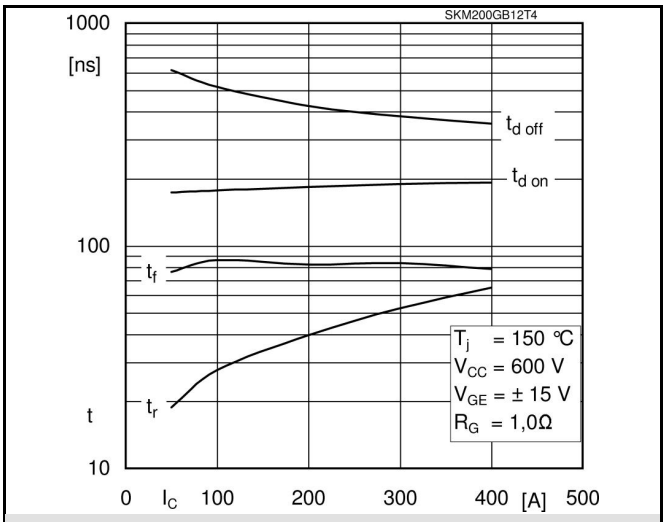


Fig. 7 Typ. switching times vs. I_C

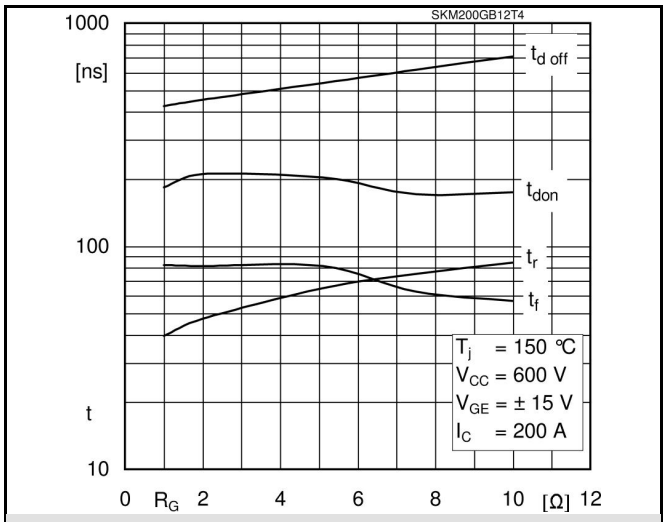


Fig. 8 Typ. switching times vs. gate resistor R_G

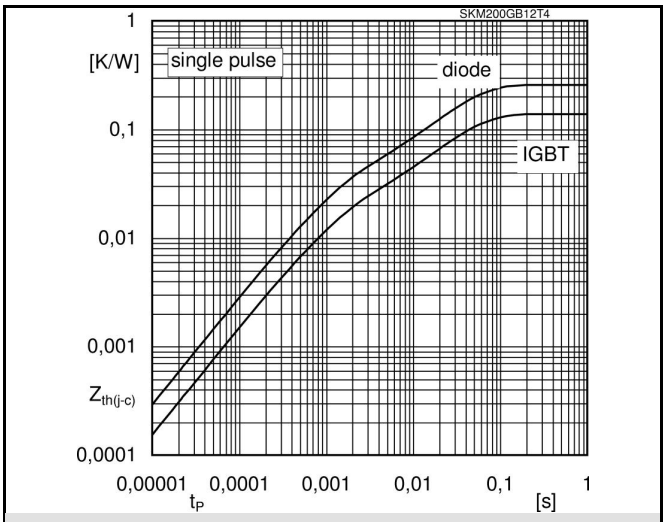


Fig. 9 Transient thermal impedance of IGBT and Diode

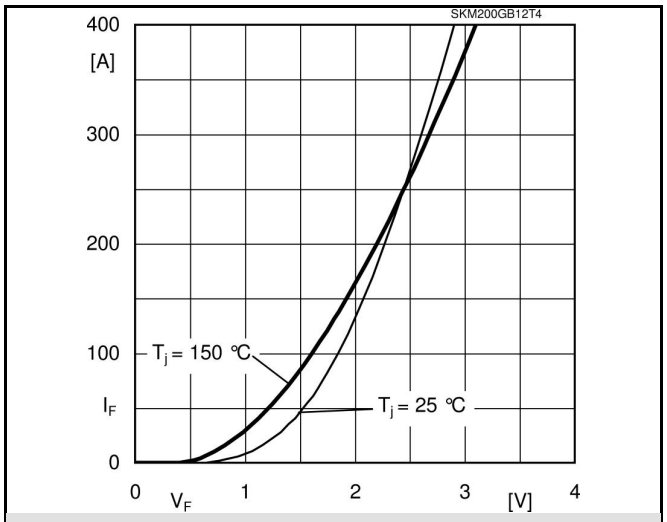


Fig. 10 CAL diode forward characteristic

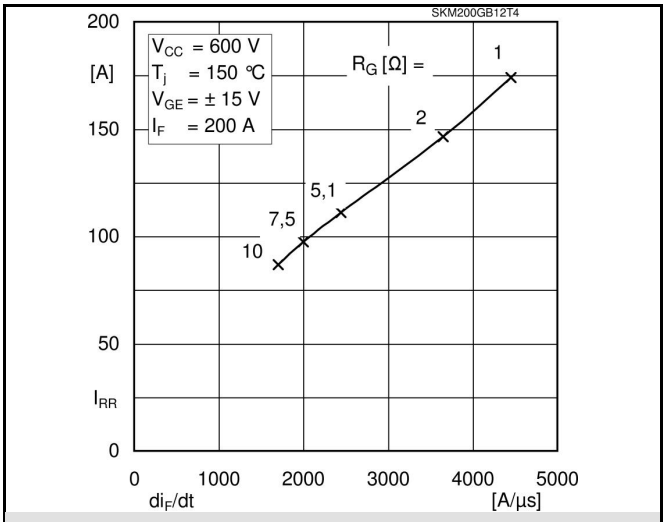


Fig. 11 Typ. CAL diode peak reverse recovery current

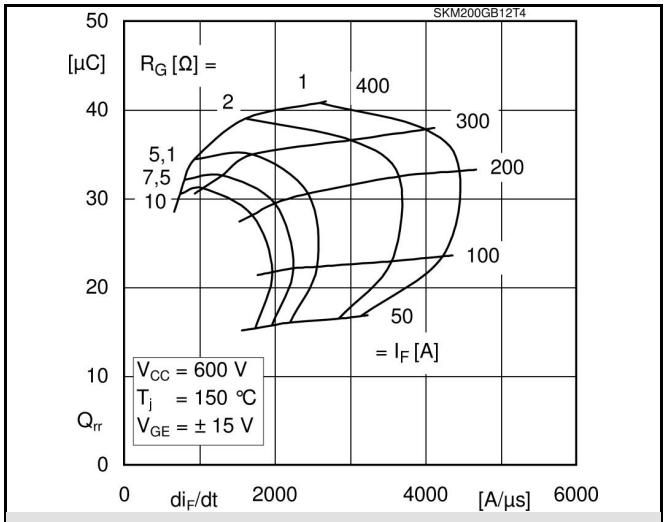
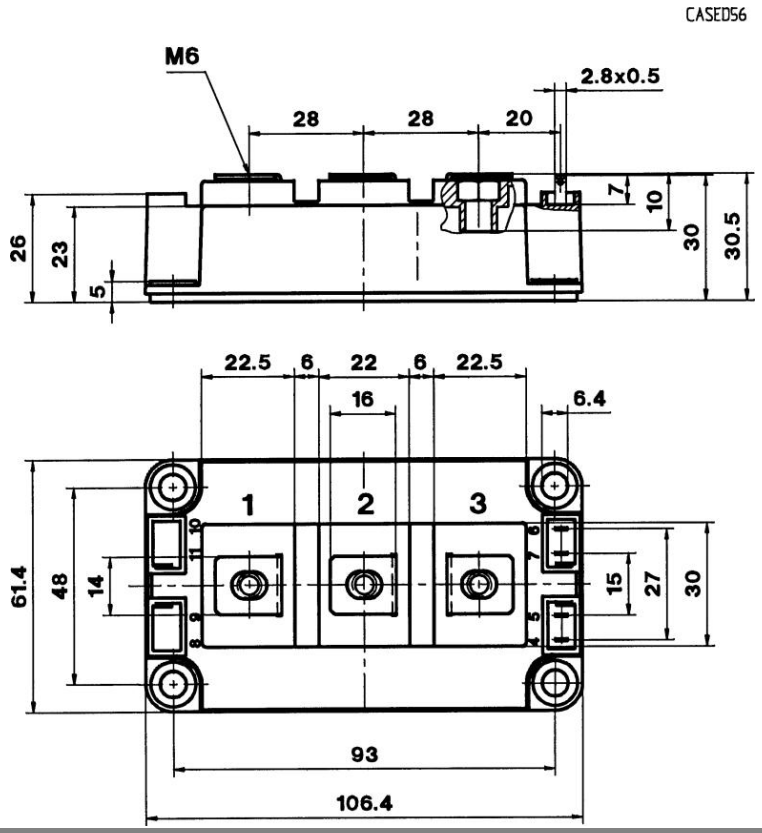
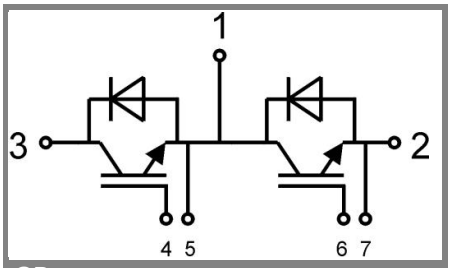


Fig. 12 Typ. CAL diode recovered charge

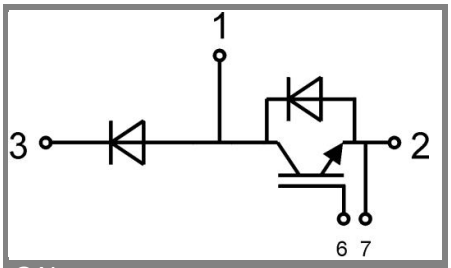
UL recognized file no. E 63 532



Case D56



GB



GAL

