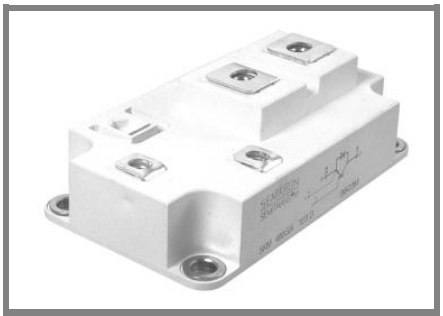
SKM 300GA12T4



IGBT4 Modules

SEMITRANS® 4

SKM 300GA12T4

Target Data

Features

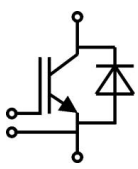
- IGBT4 = 4. Generation (Trench) IGBT
- V_{CEsat} with positive temperature coefficient
- High short circuit capability, self limiting to 6 x I_{CNOM}
- Soft switching 4. Generation CAL diode (CAL4)

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 $T_j \leq 150°$



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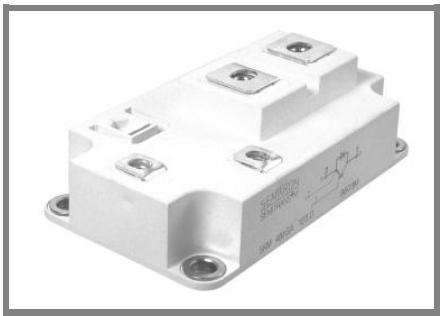
Absolute Maximum Ratings			T_c = 25 °C, unless otherwise specified	
Symbol	**Conditions**		**Values**	**Units**
IGBT				
V_{CES}	T_j = 25 °C		1200	V
I_C	T_j = 175 °C	T_{case} = 25 °C	420	A
		T_{case} = 80 °C	325	A
I_{CRM}	I_{CRM} = 3 x I_{CNOM}		900	A
V_{GES}			± 20	V
t_{psc}	V_{CC} = 600 V; $V_{GE} \leq$ 15 V; V_{CES} < 1200 V	T_j = 150 °C	10	µs
Inverse Diode				
I_F	T_j = 175 °C	T_{case} = 25 °C	350	A
		T_{case} = 80 °C	260	A
I_{FRM}	I_{FRM} = 3 x I_{FNOM}		900	A
I_{FSM}	t_p = 10 ms; sin.	T_j = 175 °C	1720	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 = 12 mA		5	5,8	6,5	V
I_{CES}	V_{GE} = V, V_{CE} = V_{CES}	T_j = °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		3,5	3,8	mΩ
		T_j = 150°C		5,2	5,5	mΩ
$V_{CE(sat)}$	I_{Cnom} = 300 A, V_{GE} = 15 V	T_j = 25°C$_{chiplev.}$		1,85	2,05	V
		T_j = 150°C$_{chiplev.}$		2,25	2,45	V
C_{ies}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz		18,6		nF
C_{oes}				1,2		nF
C_{res}				1		nF
Q_G	V_{GE} = -8V / +15V			1700		nC
R_{Gint}	T_j = 25 °C			2,5		Ω
$t_{d(on)}$	R_{Gon} = Ω	V_{CC} = 600V				ns
t_r						ns
E_{on}		I_{Cnom}= 300A		39		mJ
$t_{d(off)}$	R_{Goff} = Ω	T_j = 150 °C				ns
t_f		V_{GE} = ±15V				ns
E_{off}				26		mJ
$R_{th(j-c)}$	per IGBT				0,11	K/W

SKM 300GA12T4



IGBT4 Modules

SEMITRANS® 4

SKM 300GA12T4

Target Data

Features

- IGBT4 = 4. Generation (Trench) IGBT
- V_{CEsat} with positive temperature coefficient
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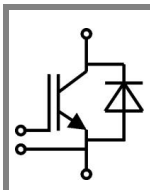

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Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 300 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		2,2	2,5	V
		T_j = 150 °$C_{chiplev.}$		2,1	2,45	V
V_{F0}		T_j = 25 °C		1,3	1,5	V
		T_j = 150 °C		0,9	1,1	V
r_F		T_j = 25 °C		3	3,33	mΩ
		T_j = 150 °C		4	4,5	mΩ
I_{RRM}	I_{Fnom} = 300 A	T_j = 150 °C				A
Q_{rr}						µC
E_{rr}	$V_{GE} \leq$ -8V			22,5		mJ
$R_{th(j-c)}$	per diode				0,17	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_{Fnom} = 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			0,18	mΩ
		T_{case}= 125 °C			0,22	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, M4		2,5 (1,1)		5 (2)	Nm
w					330	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.

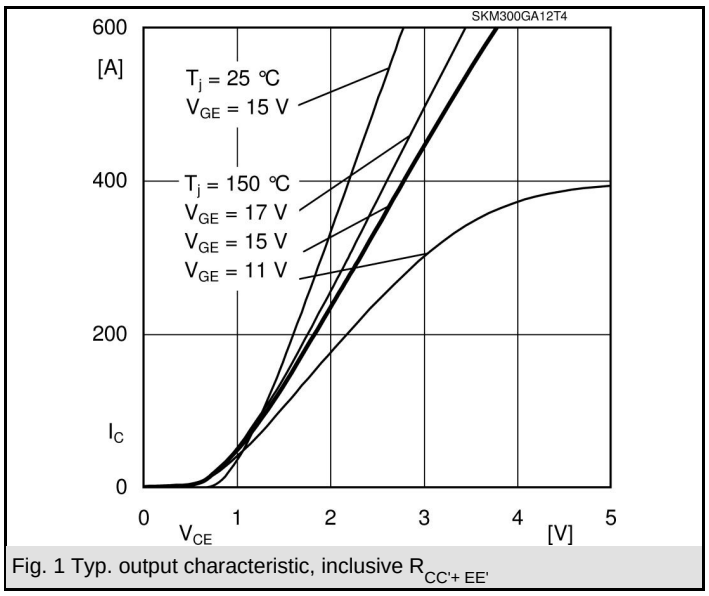


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

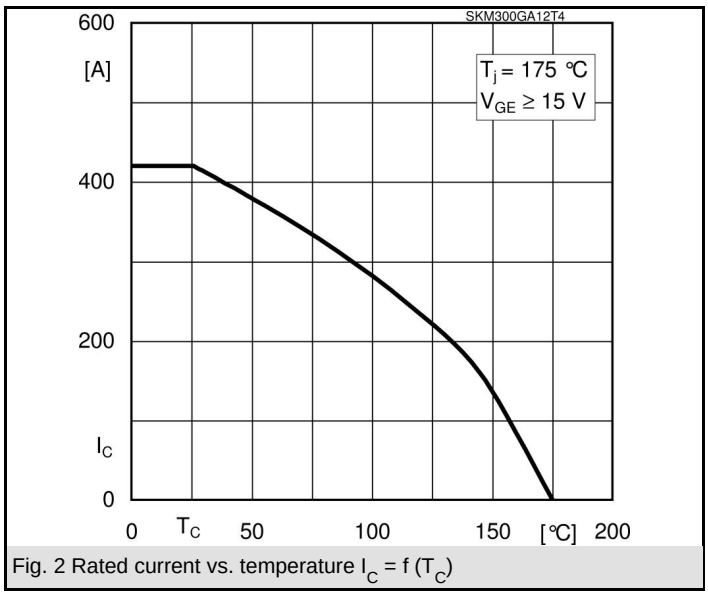


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

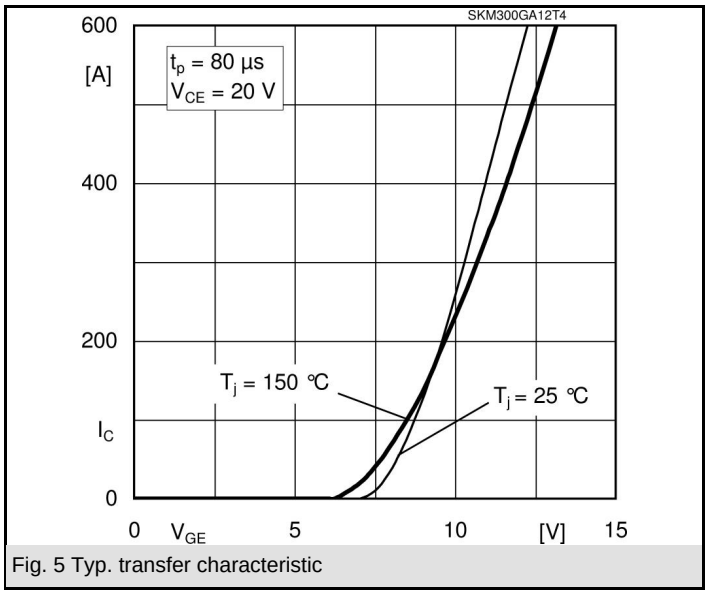


Fig. 5 Typ. transfer characteristic

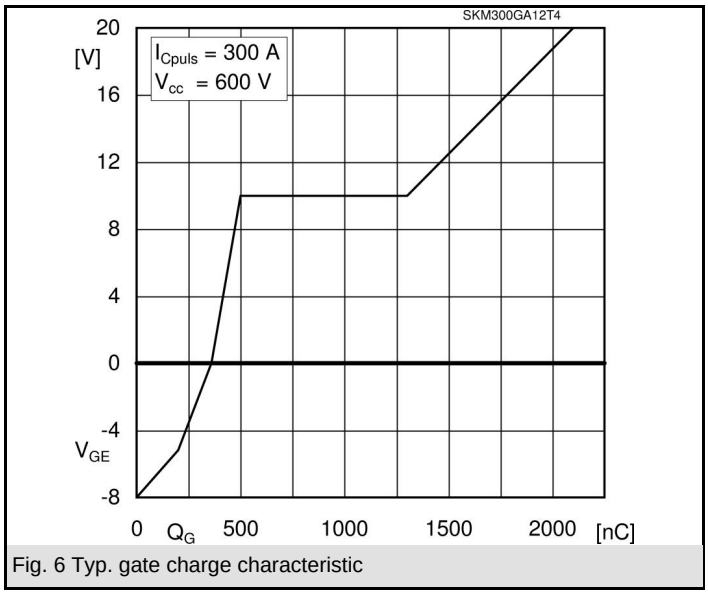


Fig. 6 Typ. gate charge characteristic

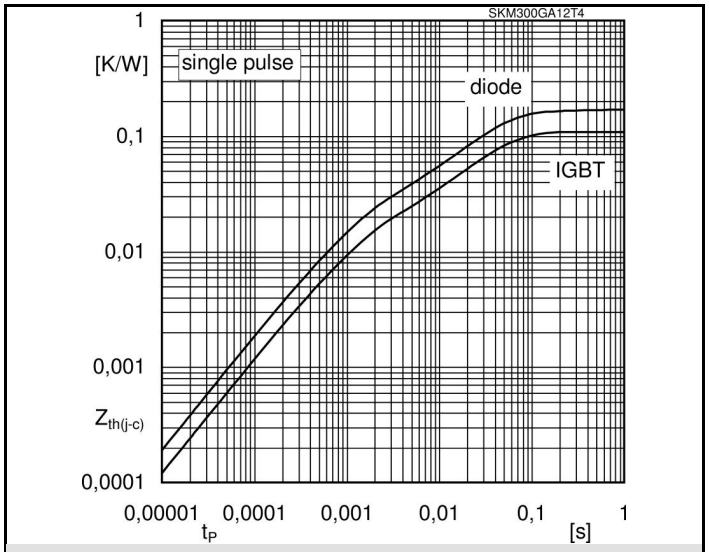


Fig. 9 Transient thermal impedance of IGBT and Diode

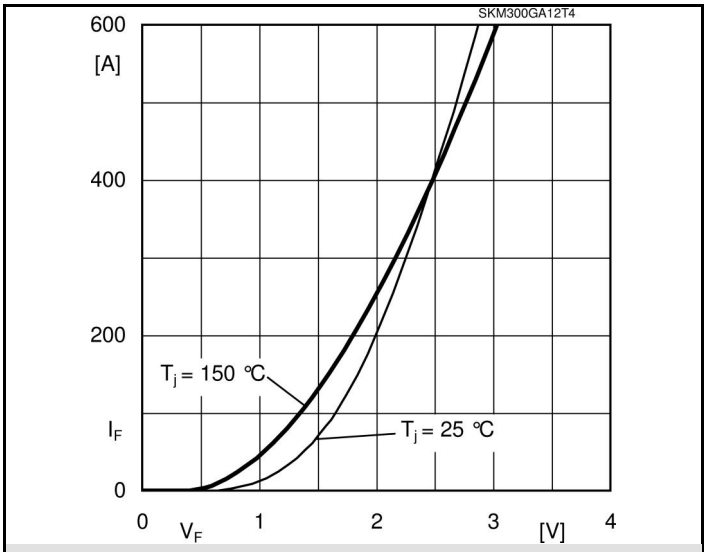
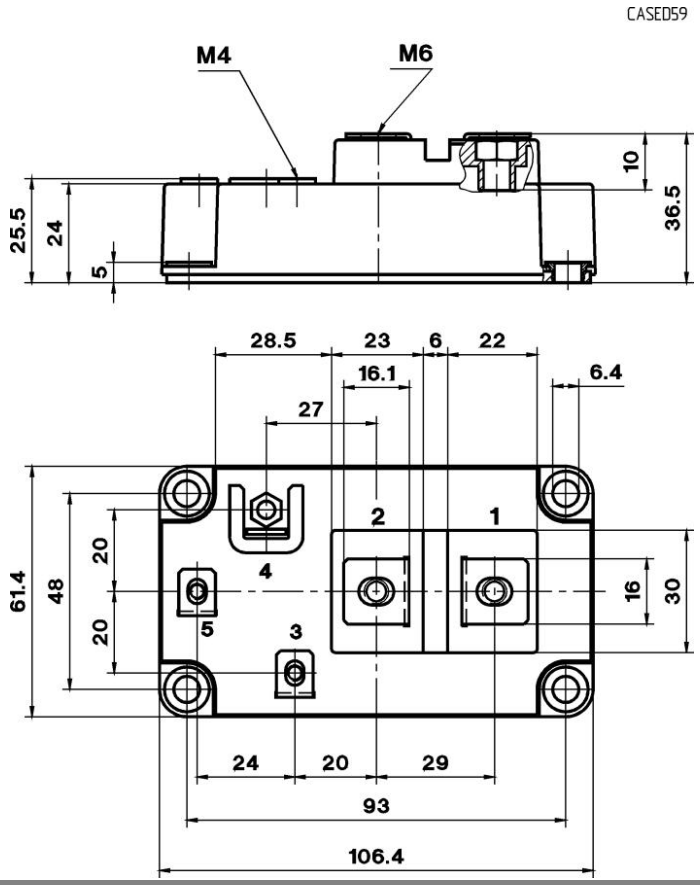
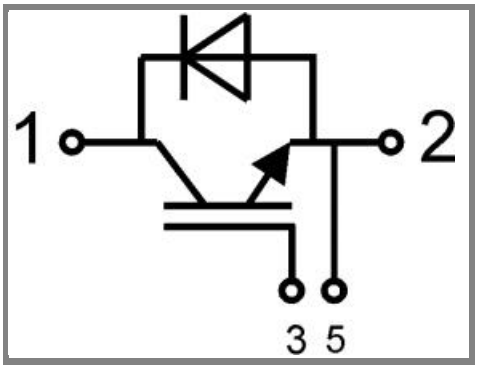


Fig. 10 CAL diode forward characteristic

UL recognized file no. E 63 532



Case D59



GA Case D59

