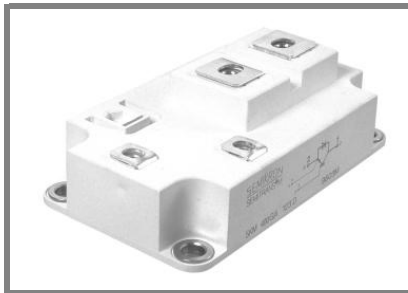


SKM 400GA12T4



SEMITRANS[®] 4

IGBT 4 Modules

SKM 400GA12T4

Target Data

Features

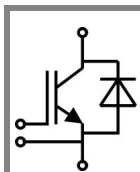
- IGBT4 = 4. Generation (Trench) IGBT
- V_{CEsat} with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_{CNOM}$
- Soft switching 4 Generation CAL diode (CAL4)

Typical Applications

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

Remarks

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



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Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V_{CES}	$T_j = 25^\circ\text{C}$	1200		V
I_C	$T_j = 175^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	610	A
		$T_{case} = 80^\circ\text{C}$	475	A
I_{CRM}	$I_{CRM} = 3 \times I_{CNOM}$	1200		A
V_{GES}		± 20		V
t_{psc}	$V_{CC} = 800\text{ V}; V_{GE} \leq 15\text{ V}; T_j = 150^\circ\text{C}$ $V_{CES} < 1200\text{ V}$	10		μs
Inverse Diode				
I_F	$T_j = 175^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	440	A
		$T_{case} = 80^\circ\text{C}$	330	A
I_{FRM}	$I_{FRM} = 3 \times I_{FNOM}$	1200		A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 175^\circ\text{C}$	2190	A
Module				
$I_{t(RMS)}$		500		A
T_{vj}		-40 ... +175		$^\circ\text{C}$
T_{stg}		-40 ... +125		$^\circ\text{C}$
V_{isol}	AC, 1 min.	4000		V

Characteristics		$T_c = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 16\text{ mA}$	5	5,8	6,5	V
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$	$T_j = 15^\circ\text{C}$			mA
		$T_j = 25^\circ\text{C}$	0,8	0,9	V
V_{CE0}		$T_j = 25^\circ\text{C}$	0,7	0,8	V
		$T_j = 150^\circ\text{C}$			
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	2,5	2,8	$\text{m}\Omega$
		$T_j = 150^\circ\text{C}$	3,8	4	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 400\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	1,8	2	V
		$T_j = 150^\circ\text{C}_{chiplev.}$	2,2	2,4	V
C_{ies}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	24,8		nF
C_{oes}			1,64		nF
C_{res}			1,4		nF
Q_G	$V_{GE} = -8\text{ V} / +15\text{ V}$	2250		nC	
R_{Gint}	$T_j = 25^\circ\text{C}$	1,88		Ω	
$t_{d(on)}$	$R_{Gon} = \Omega$	$V_{CC} = 600\text{ V}$ $I_C = 400\text{ A}$			ns
t_r			44		ns
E_{on}			44		mJ
$t_{d(off)}$	$R_{Goff} = \Omega$	$T_j = 150^\circ\text{C}$ $V_{GE} = -8\text{ V}$			ns
t_f			44		ns
E_{off}			44		mJ
$R_{th(j-c)}$	per IGBT	0,072		K/W	

SKM 400GA12T4



SEMITRANS® 4

IGBT 4 Modules

SKM 400GA12T4

Target Data

Features

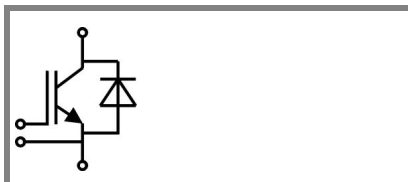
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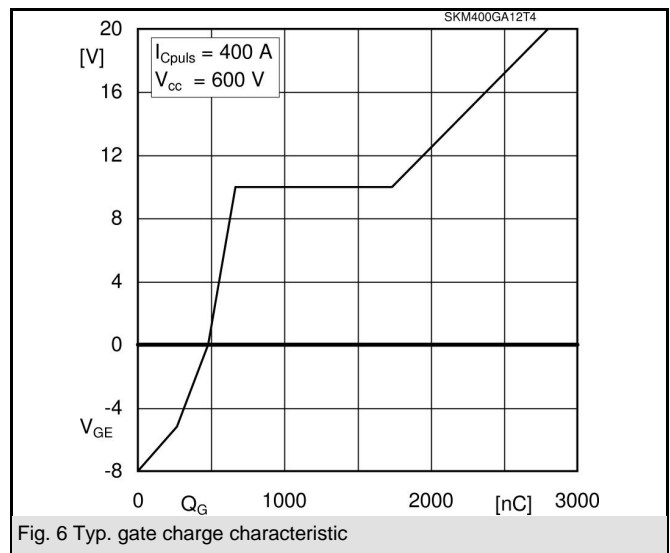
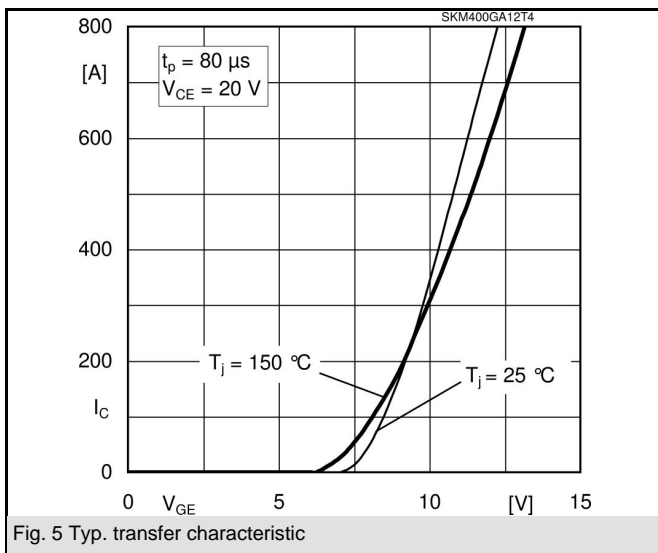
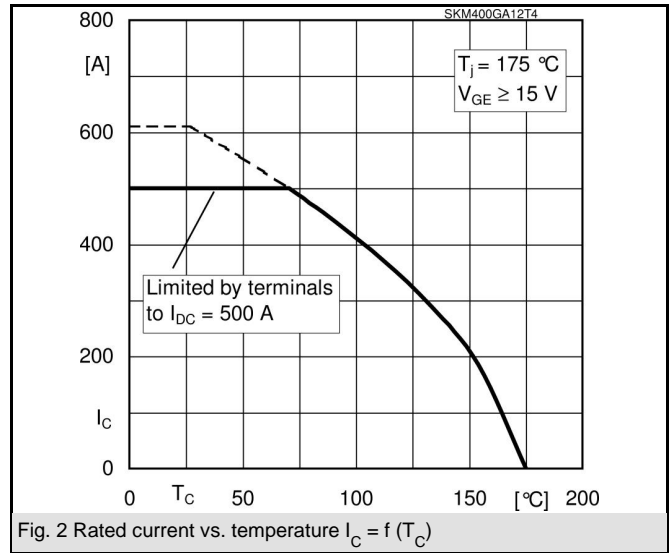
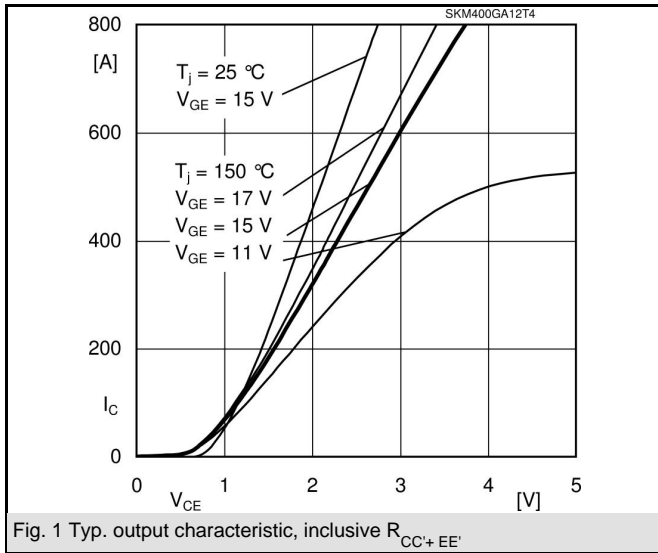


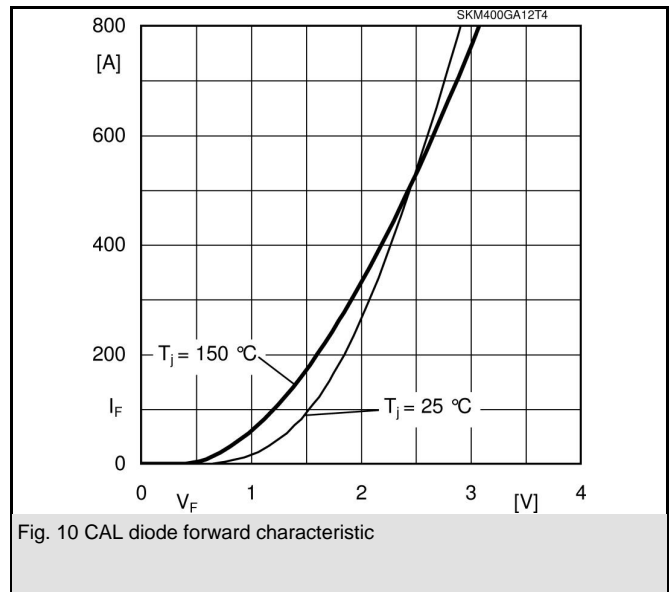
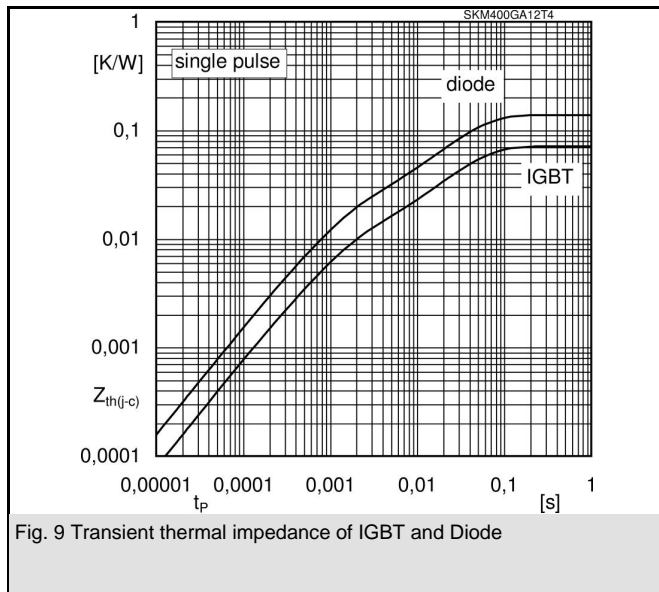
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Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 400 \text{ A}; V_{GE} = 0 \text{ V}$				
			$T_j = 25^\circ\text{C}_{chiplev.}$	2,2	2,5
			$T_j = 150^\circ\text{C}_{chiplev.}$	2,1	2,45
V_{F0}			$T_j = 25^\circ\text{C}$	1,3	1,5
			$T_j = 150^\circ\text{C}$	0,9	1,1
r_F			$T_j = 25^\circ\text{C}$	2,25	2,5
			$T_j = 150^\circ\text{C}$	3	1,35
I_{RRM}	$I_F = 400 \text{ A}$		$T_j = 150^\circ\text{C}$		A
Q_{rr}					μC
E_{rr}	$V_{GE} = -8\text{V}$			30	mJ
$R_{th(j-c)}$	per diode			0,14	K/W
Freewheeling Diode					
$V_F = V_{EC}$	$I_{Fnom} = \text{A}; V_{GE} = \text{V}$		$T_j = ^\circ\text{C}_{chiplev.}$		V
V_{F0}			$T_j = ^\circ\text{C}$		V
r_F			$T_j = ^\circ\text{C}$		V
I_{RRM}	$I_F = \text{A}$		$T_j = ^\circ\text{C}$		A
Q_{rr}					μC
E_{rr}					mJ
	per diode				K/W
Module					
L_{CE}				15	20
R_{CC+EE}	res., terminal-chip		$T_{case} = 25^\circ\text{C}$		0,18
			$T_{case} = 125^\circ\text{C}$		0,22
$R_{th(c-s)}$	per module			0,02	0,038
M_s	to heat sink M6			3	5
M_t	to terminals M6, M4			2,5 (1,1)	5 (2)
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.



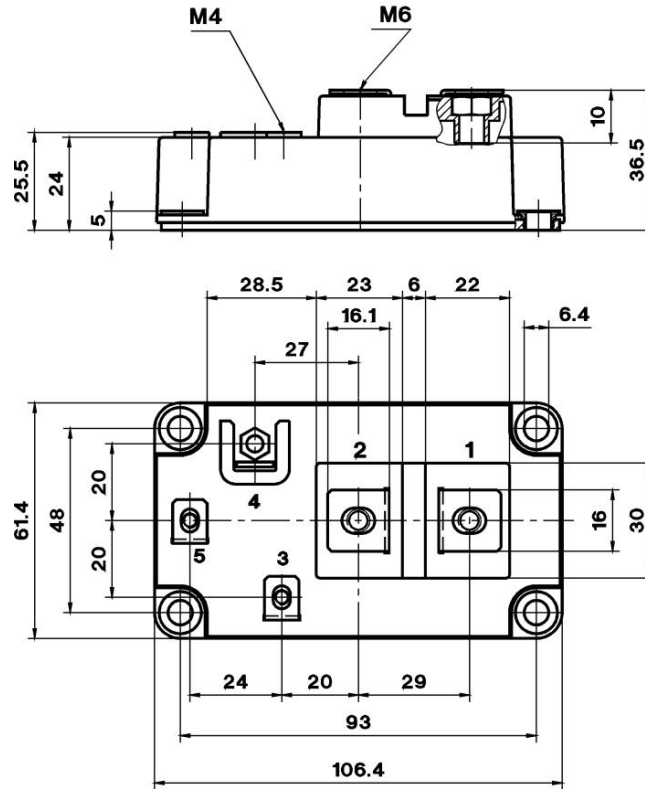


SKM 400GA12T4

UL recognized file

CASED59

no. E 63 532



Case D59

