

SKM 300GA123D



SEMITRANS® 4

IGBT Modules

SKM 300GA123D

Features

- MOS input (voltage controlled)
- N channel, Homogeneous Si
- Low inductance case
- Very low tail current with low temperature dependence
- High short circuit capability, self limiting to $6 \times I_{Cnom}$
- Latch-up free
- Fast & soft inverse CAL diodes
- Isolated copper baseplate using DCB Direct Copper Bonding Technology
- Large clearance (12 mm) and creepage distances (20 mm)

Typical Applications

- Switching (not for linear use)



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Absolute Maximum Ratings		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V_{CES}	$T_j = 25\text{ }^\circ\text{C}$	1200		V
I_C	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	300	A
		$T_{case} = 80\text{ }^\circ\text{C}$	220	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	400		A
V_{GES}		± 20		V
t_{psc}	$V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125\text{ }^\circ\text{C}$ $V_{CES} < 1200\text{ V}$	10		μs
Inverse Diode				
I_F	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	300	A
		$T_{case} = 80\text{ }^\circ\text{C}$	200	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	400		A
I_{FSM}	$t_p = 10\text{ ms}; \text{sin.}$	$T_j = 150\text{ }^\circ\text{C}$	2200	A
Module				
$I_{t(RMS)}$		500		A
T_{vj}		- 40 ... + 150 (125)		$^\circ\text{C}$
T_{stg}		- 40...+ 125		$^\circ\text{C}$
V_{isol}	AC, 1 min.	2500		V

Characteristics		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 8\text{ mA}$	4,5	5,5	6,5	V
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$		0,1	0,3	mA
V_{CE0}		$T_j = 25\text{ }^\circ\text{C}$	1,4	1,6	V
		$T_j = 125\text{ }^\circ\text{C}$	1,6	1,8	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25\text{ }^\circ\text{C}$	5,5	7	$\text{m}\Omega$
		$T_j = 125\text{ }^\circ\text{C}$	7,5	9,5	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 200\text{ A}, V_{GE} = 15\text{ V}$		2,5	3	V
C_{ies}			15	19	nF
C_{oes}	$V_{CE} = 25, V_{GE} = 0\text{ V}$		2	2,6	nF
C_{res}	$f = 1\text{ MHz}$		1	1,3	nF
Q_G	$V_{GE} = -8\text{ V} - +20\text{ V}$		2000		nC
R_{Gint}	$T_j = \text{ }^\circ\text{C}$		1,25		Ω
$t_{d(on)}$	$R_{Gon} = 4,7\ \Omega$	$V_{CC} = 600\text{ V}$ $I_{Cnom} = 200\text{ A}$	250	400	ns
t_r			90	160	ns
E_{on}			26		mJ
$t_{d(off)}$	$R_{Goff} = 4,7\ \Omega$	$T_j = 125\text{ }^\circ\text{C}$	550	700	ns
t_f			70	100	ns
E_{off}			22		mJ
$R_{th(j-c)}$	per IGBT			0,075	K/W



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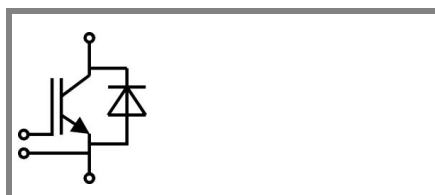
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Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 200 \text{ A}; V_{GE} = 0 \text{ V}$		2	2,5	V
			1,8		V
V_{F0}					V
					V
r_F					mΩ
					mΩ
I_{RRM}	$I_{Fnom} = 200 \text{ A}$		80		A
Q_{rr}			11		μC
E_{rr}	$V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$				mJ
$R_{th(j-c)D}$	per diode			0,15	K/W
Module					
L_{CE}			15	20	nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25 \text{ °C}$	0,18		mΩ
		$T_{case} = 125 \text{ °C}$	0,22		mΩ
$R_{th(c-s)}$	per module			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.

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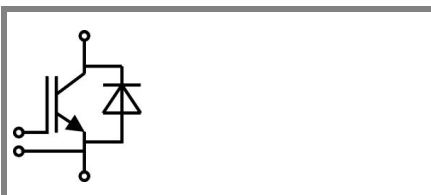
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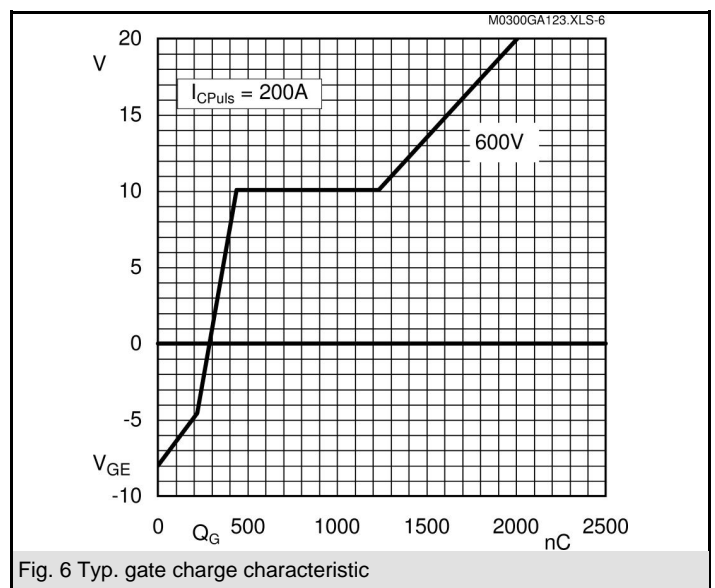
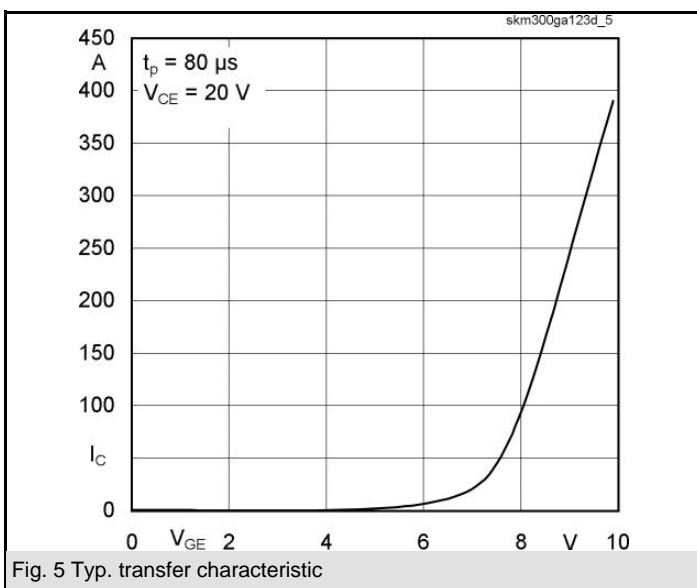
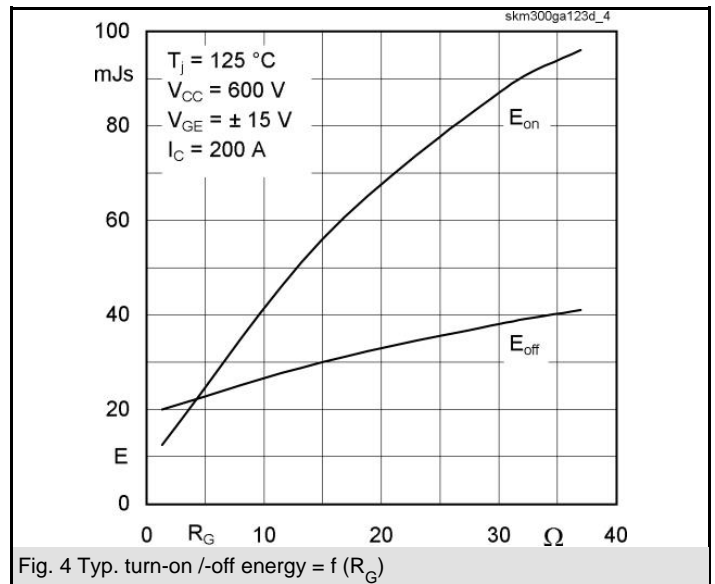
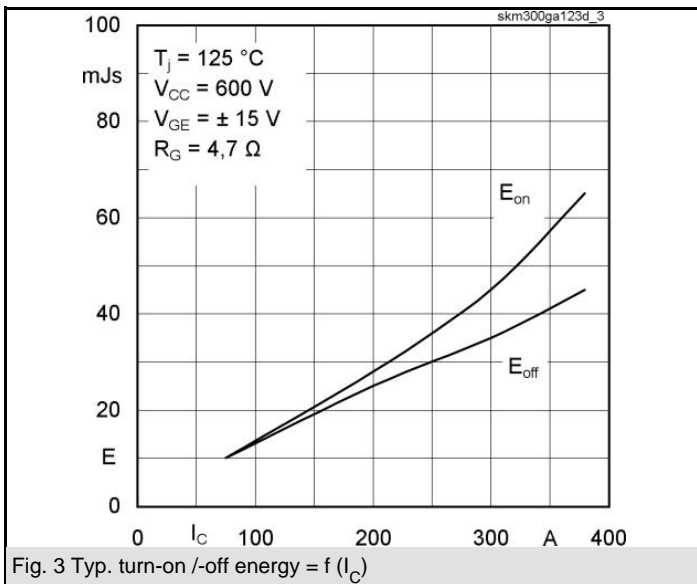
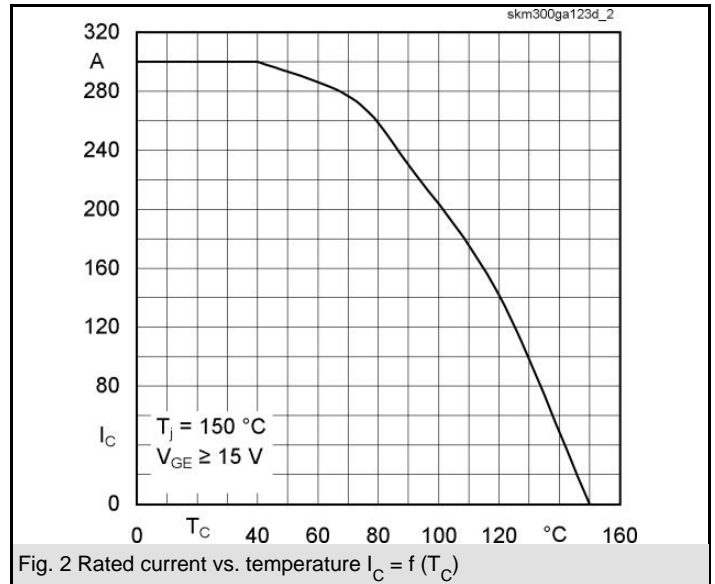
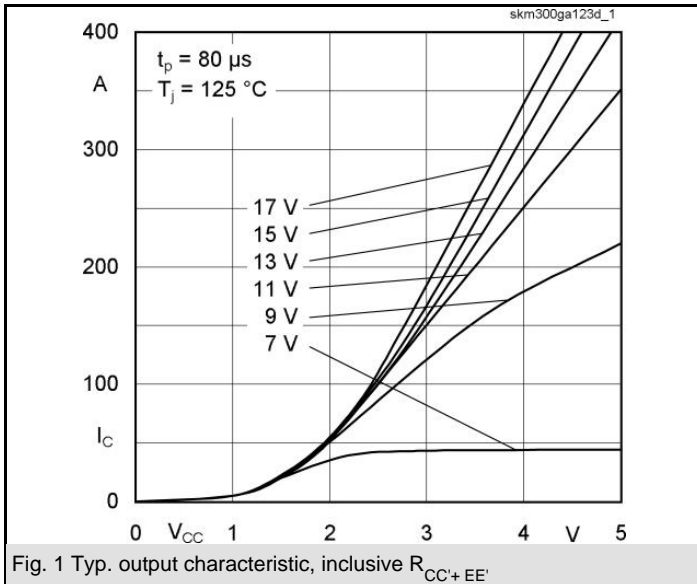
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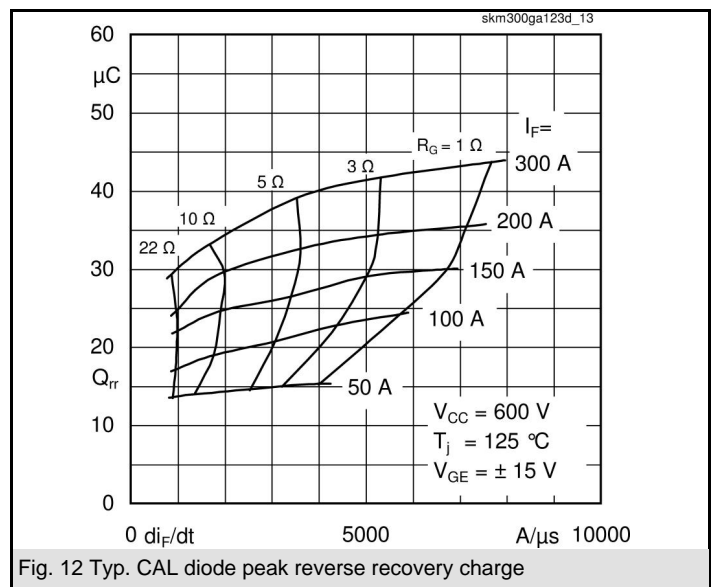
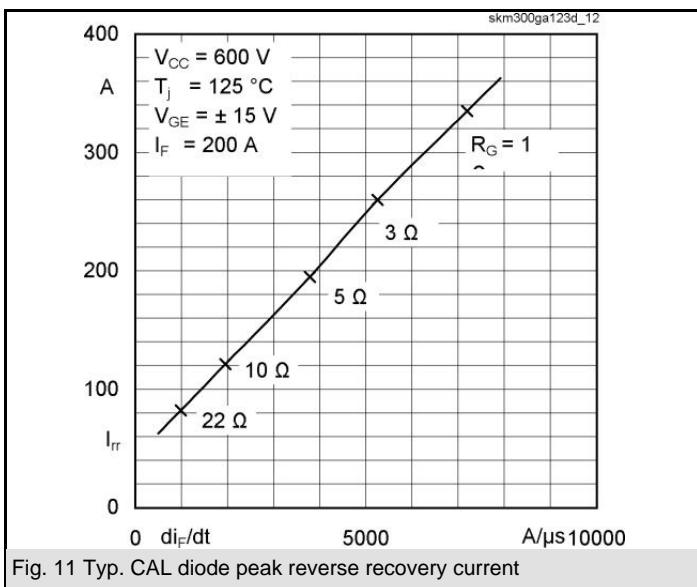
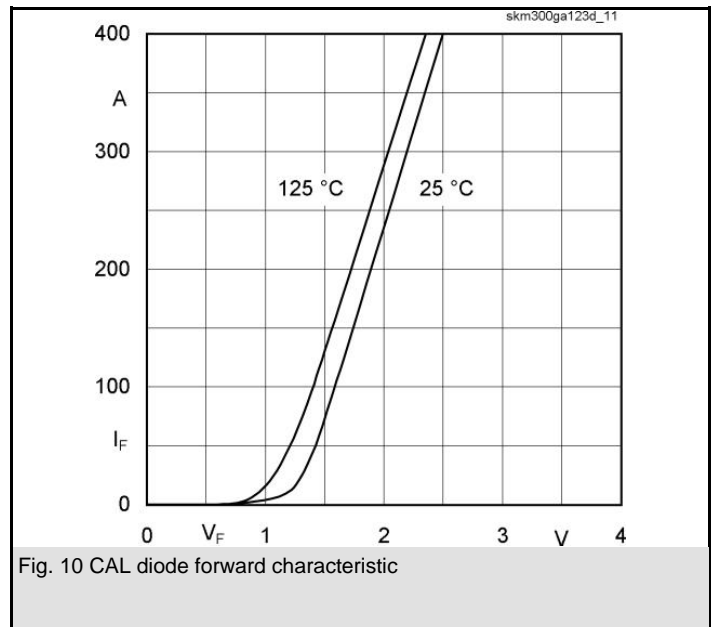
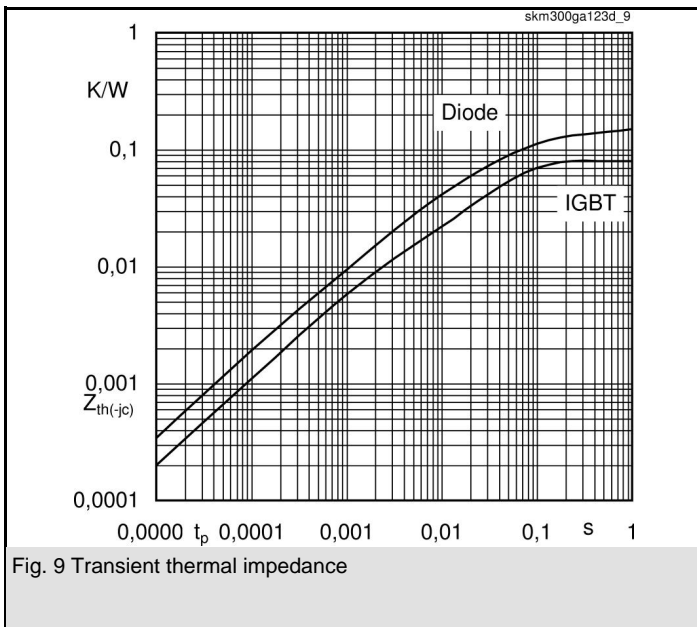
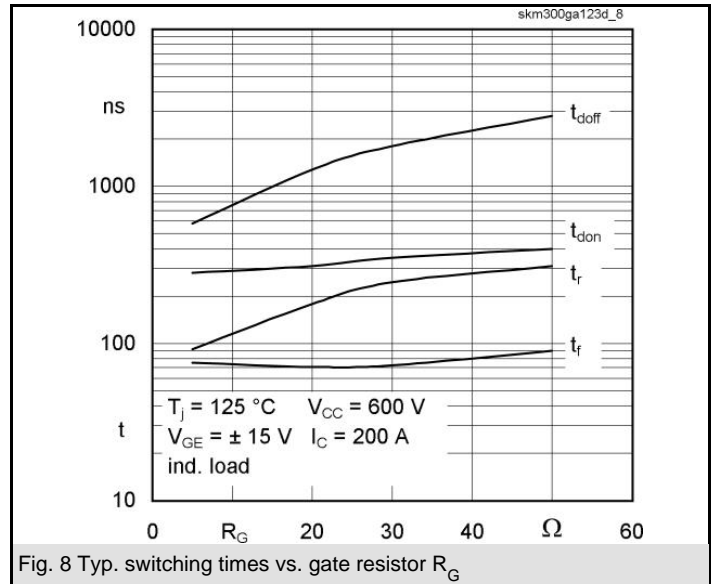
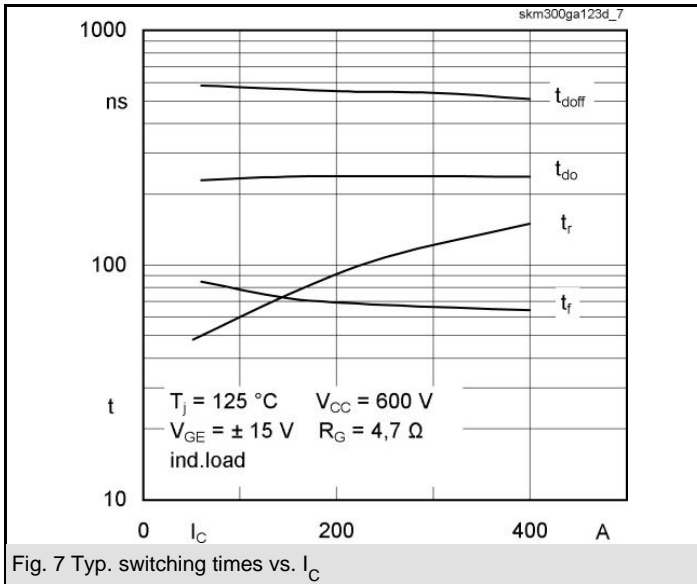
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Z_{th}		Conditions	Values	Units
$Z_{th(j-c)I}$				
$R_{\theta j-c}$		$i = 1$	53	mk/W
$R_{\theta j-c}$		$i = 2$	18,5	mk/W
$R_{\theta j-c}$		$i = 3$	3,1	mk/W
$R_{\theta j-c}$		$i = 4$	0,4	mk/W
$\tau_{th(j-c)}$		$i = 1$	0,04	s
$\tau_{th(j-c)}$		$i = 2$	0,0189	s
$\tau_{th(j-c)}$		$i = 3$	0,0017	s
$\tau_{th(j-c)}$		$i = 4$	0,003	s
$Z_{th(j-c)D}$				
$R_{\theta j-c}$		$i = 1$	85	mk/W
$R_{\theta j-c}$		$i = 2$	30	mk/W
$R_{\theta j-c}$		$i = 3$	8,8	mk/W
$R_{\theta j-c}$		$i = 4$	1,2	mk/W
$\tau_{th(j-c)}$		$i = 1$	0,04	s
$\tau_{th(j-c)}$		$i = 2$	0,0044	s
$\tau_{th(j-c)}$		$i = 3$	0,0078	s
$\tau_{th(j-c)}$		$i = 4$	0,005	s





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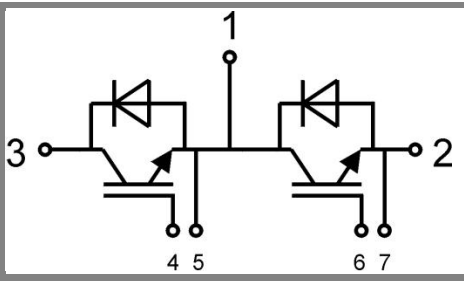
UL Recognized

CASED56

File 63 532



Case D 59



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Case D 59