

SKM 400GB123D



SEMITRANS® 3

IGBT Modules

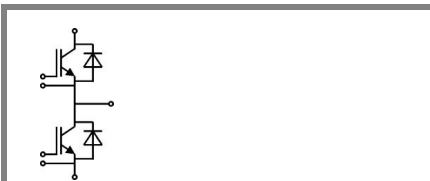
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Features

- 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 CAL diodes
- Isolated copper baseplate using DBC Direct Copper Bonding Technology
- Large clearance (12 mm) and creepage distances (20 mm)

Typical Applications

- AC inverter drives
- UPS



GB

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	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	400	A
		$T_{case} = 80^\circ\text{C}$	330	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	600		A
V_{GES}		± 20		V
t_{psc}	$V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125^\circ\text{C}$ $V_{CES} < 1200\text{ V}$	10		μs
Inverse Diode				
I_F	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	390	A
		$T_{case} = 80^\circ\text{C}$	260	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	600		A
I_{FSM}	$t_p = 10\text{ ms}; \text{sin.}$	$T_j = 150^\circ\text{C}$	2880	A
Module				
$I_{t(RMS)}$		500		A
T_{vj}		- 40...+ 150		$^\circ\text{C}$
T_{stg}		- 40...+ 125		$^\circ\text{C}$
V_{isol}	AC, 1 min.	2500		V

Characteristics		$T_c = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 12\text{ mA}$	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}		$T_j = 25^\circ\text{C}$	1,4	1,6	V
		$T_j = 125^\circ\text{C}$	1,6	1,8	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	3,66	4,66	m Ω
		$T_j = 125^\circ\text{C}$	5	6,33	m Ω
$V_{CE(sat)}$	$I_{Cnom} = 300\text{ A}, V_{GE} = 15\text{ V}$		2,5	3	V
C_{ies}			22	30	nF
C_{oes}	$V_{CE} = 25, V_{GE} = 0\text{ V}$		3,3	4	nF
C_{res}			1,2	1,6	nF
Q_G	$V_{GE} = -8\text{ V} - +20\text{ V}$		3000		nC
R_{Gint}	$T_j = ^\circ\text{C}$		1,25		Ω
$t_{d(on)}$	$R_{Gon} = 3,3\ \Omega$	$V_{CC} = 600\text{ V}$ $I_{Cnom} = 300\text{ A}$	200	400	ns
t_r			115	220	ns
E_{on}			38		mJ
$t_{d(off)}$	$R_{Goff} = 3,3\ \Omega$	$T_j = 125^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$	720	900	ns
t_f			80	100	ns
E_{off}			40		mJ
$R_{th(j-c)}$	per IGBT			0,05	K/W



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Characteristics			min.	typ.	max.	Units
Symbol	Conditions					
Inverse Diode						
$V_F = V_{EC}$	$I_{Fnom} = 300 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$		2	2,5	V
		$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$		1,8		V
V_{F0}		$T_j = 25 \text{ }^\circ\text{C}$		1,1	1,2	V
		$T_j = 125 \text{ }^\circ\text{C}$				V
r_F		$T_j = 25 \text{ }^\circ\text{C}$		3	4,3	mΩ
		$T_j = 125 \text{ }^\circ\text{C}$				mΩ
I_{RRM}	$I_{Fnom} = 300 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$		140		A
Q_{rr}	$di/dt = 2000 \text{ A}/\mu\text{s}$			13		μC
E_{rr}	$V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$					mJ
$R_{th(j-c)D}$	per diode				0,125	K/W
Module						
L_{CE}				15	20	nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25 \text{ }^\circ\text{C}$		0,35		mΩ
		$T_{case} = 125 \text{ }^\circ\text{C}$		0,5		mΩ
$R_{th(c-s)}$	per module				0,038	K/W
M_s	to heat sink M6			3	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.

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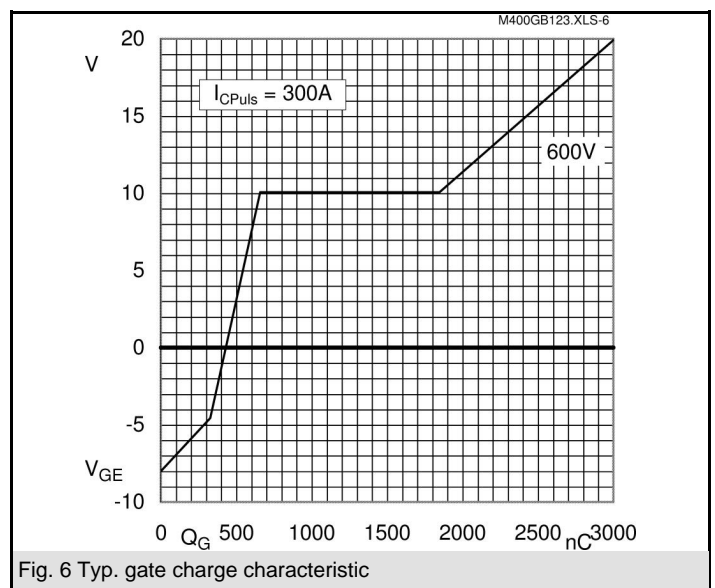
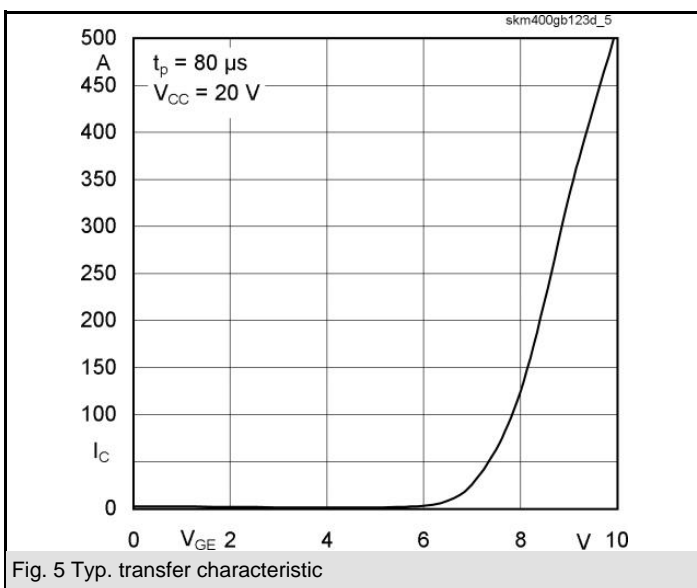
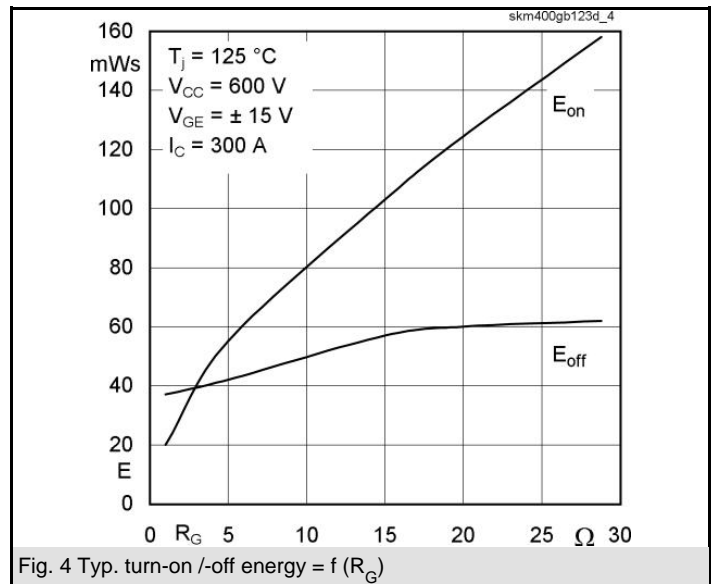
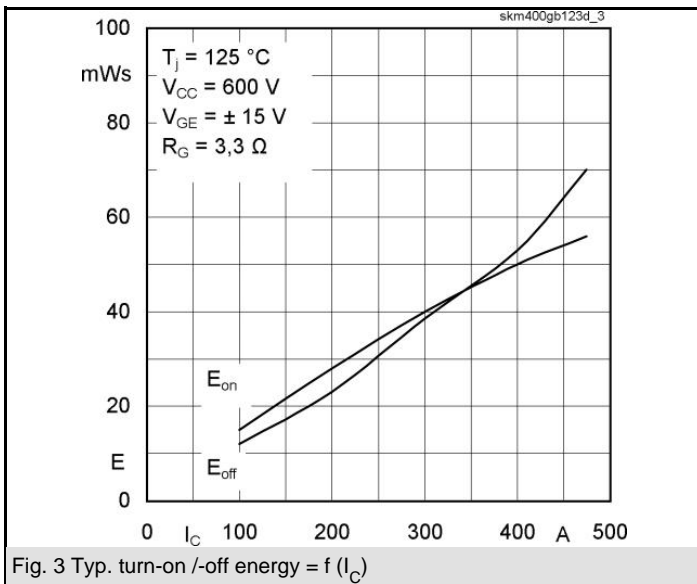
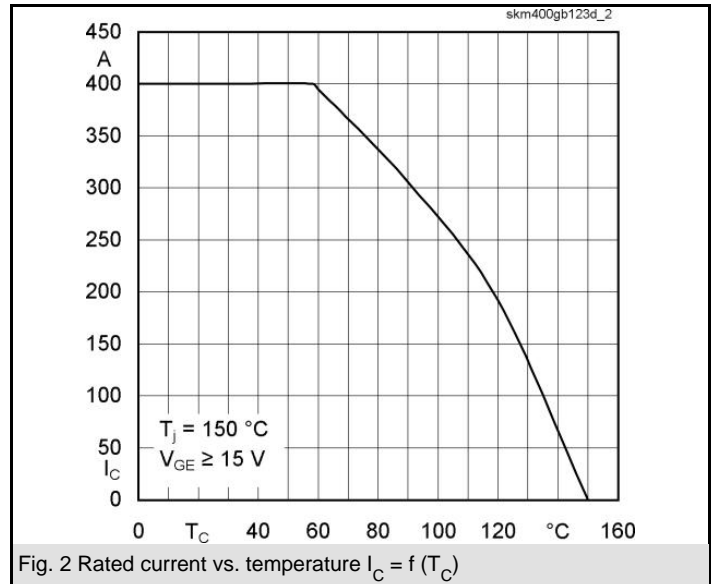
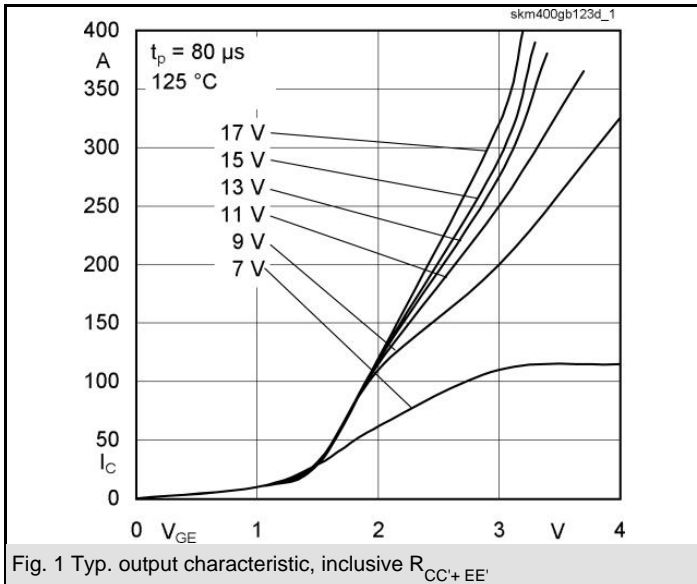
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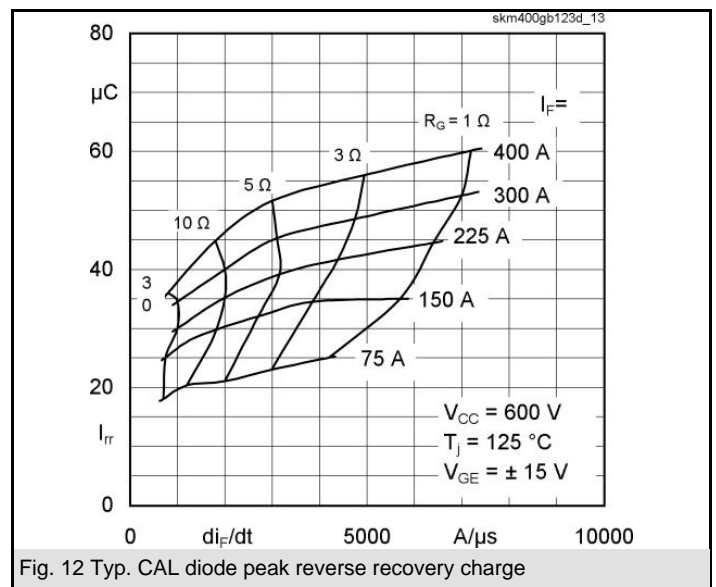
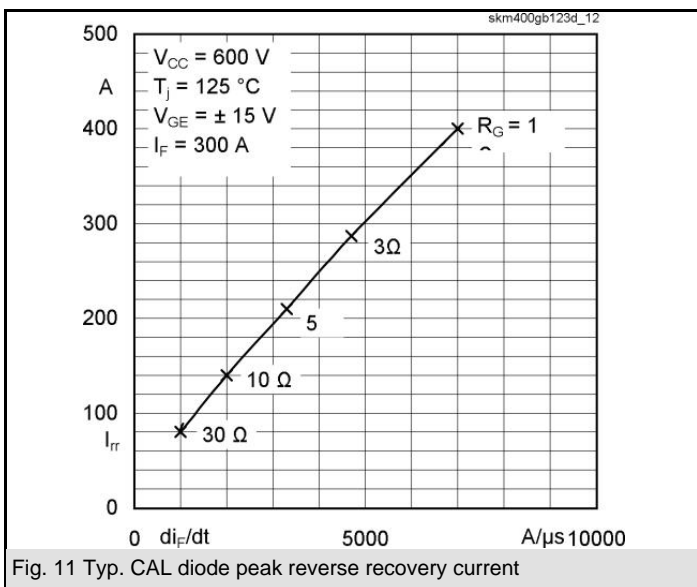
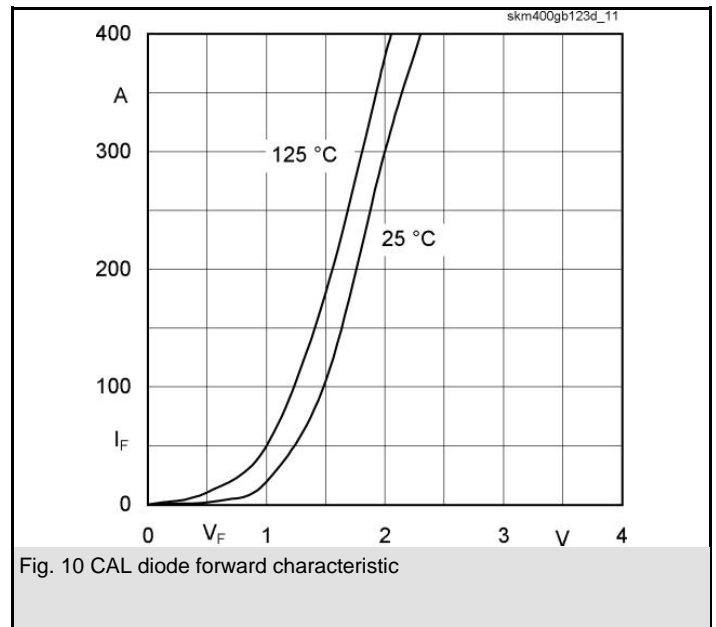
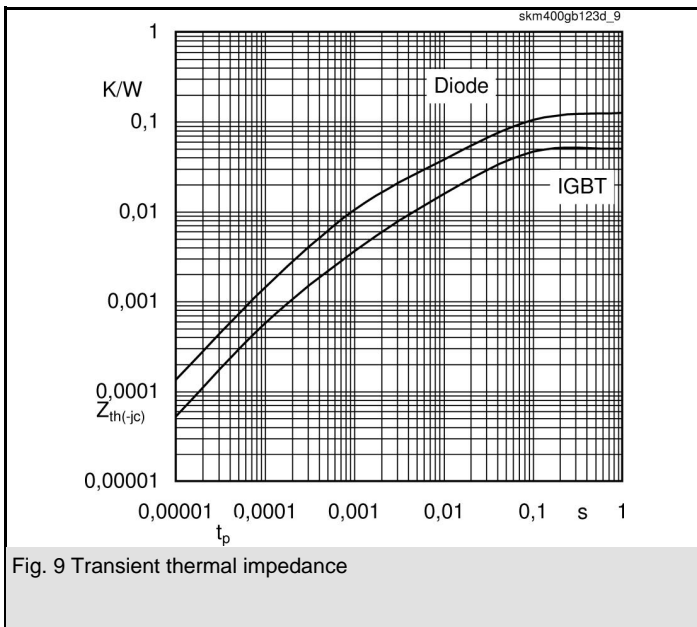
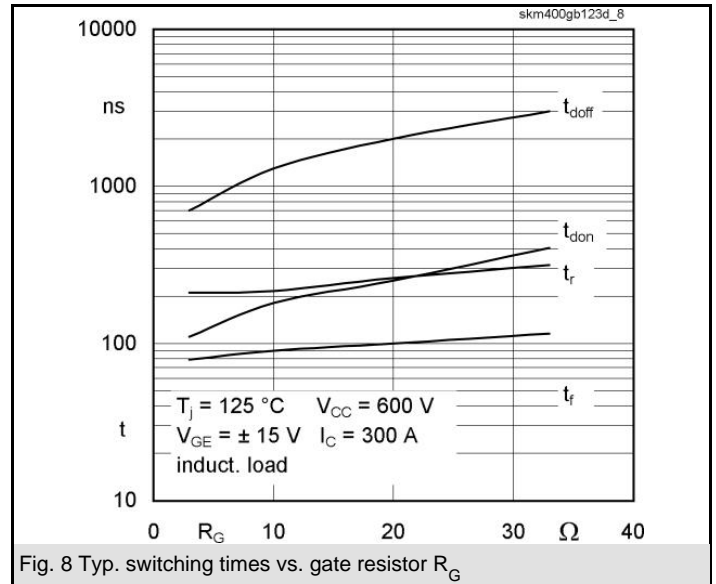
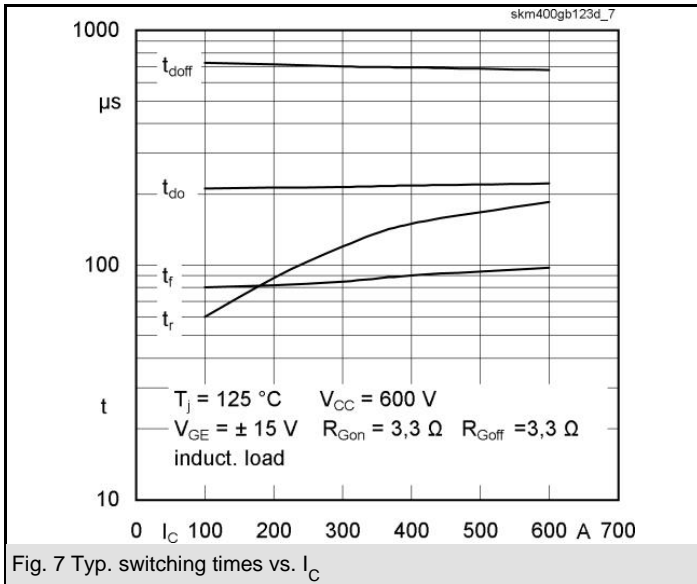
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Z_{th}		Conditions	Values	Units
$Z_{th(j-c)I}$				
$R_{\theta j-c}$	$i = 1$		32	mk/W
$R_{\theta j-c}$	$i = 2$		14	mk/W
$R_{\theta j-c}$	$i = 3$		3,4	mk/W
$R_{\theta j-c}$	$i = 4$		0,6	mk/W
$\tau_{th(j-c)I}$	$i = 1$		0,0447	s
$\tau_{th(j-c)I}$	$i = 2$		0,0122	s
$\tau_{th(j-c)I}$	$i = 3$		0,004	s
$\tau_{th(j-c)I}$	$i = 4$		0,0002	s
$Z_{th(j-c)D}$				
$R_{\theta j-c}$	$i = 1$		80	mk/W
$R_{\theta j-c}$	$i = 2$		33	mk/W
$R_{\theta j-c}$	$i = 3$		10,2	mk/W
$R_{\theta j-c}$	$i = 4$		1,8	mk/W
$\tau_{th(j-c)D}$	$i = 1$		0,05	s
$\tau_{th(j-c)D}$	$i = 2$		0,0057	s
$\tau_{th(j-c)D}$	$i = 3$		0,0034	s
$\tau_{th(j-c)D}$	$i = 4$		0,0003	s





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UL Recognized

CASED56

File 63 532



Case D 56



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Case D 56