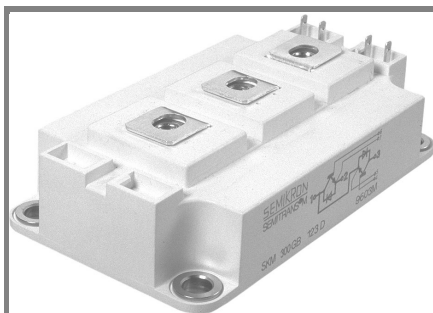


# SKM 400GB123D



SEMITRANS™ 3

## IGBT Modules

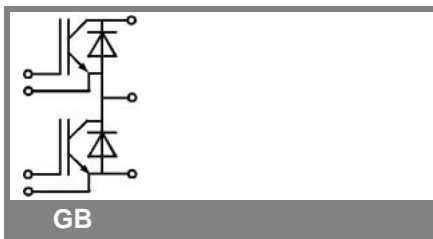
### SKM 400GB123D

#### 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)

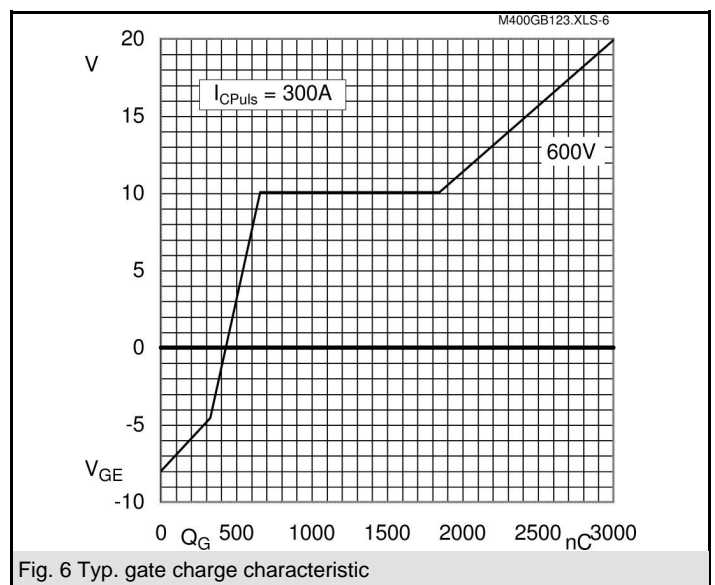
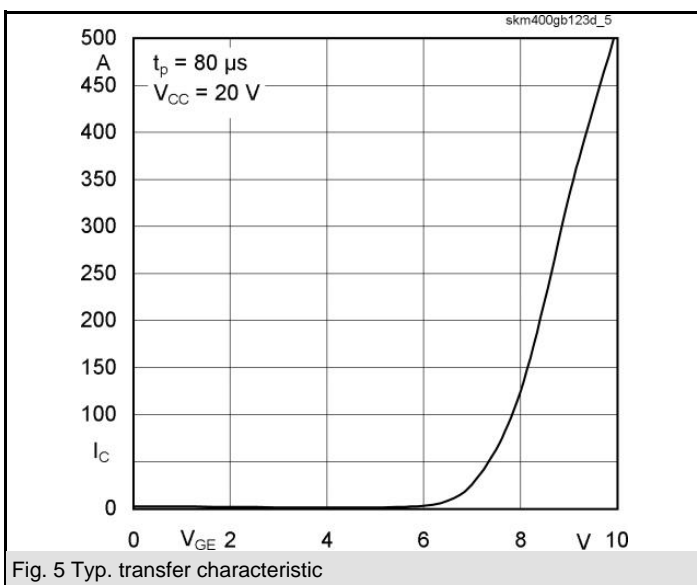
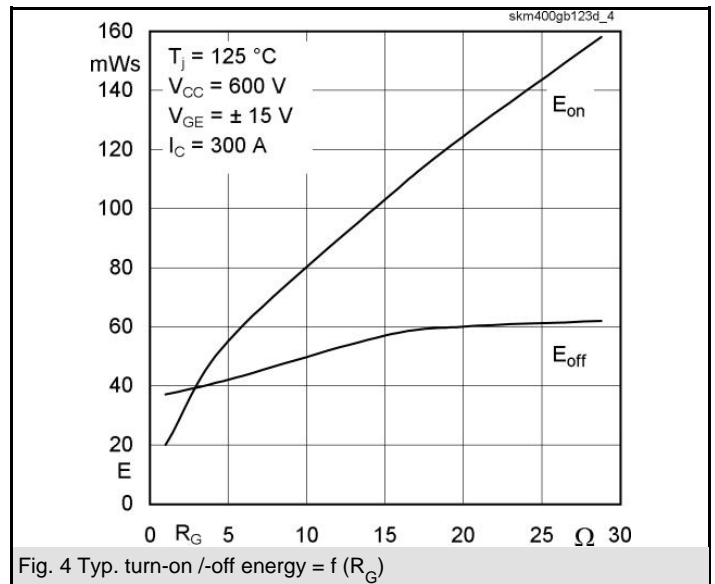
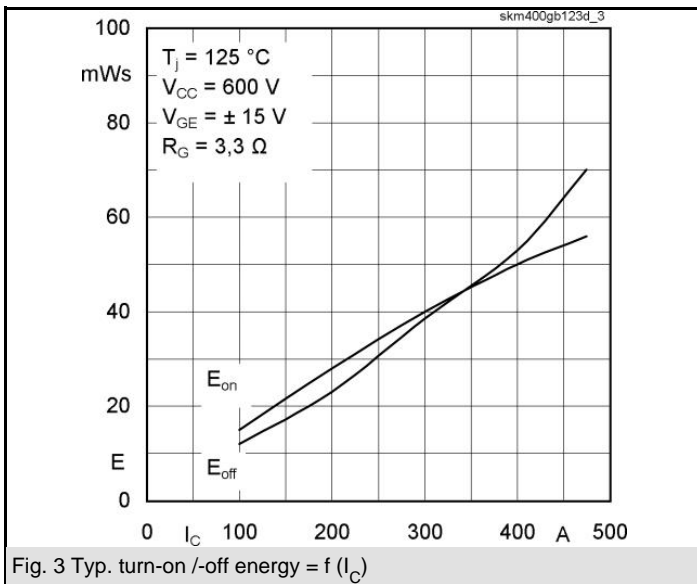
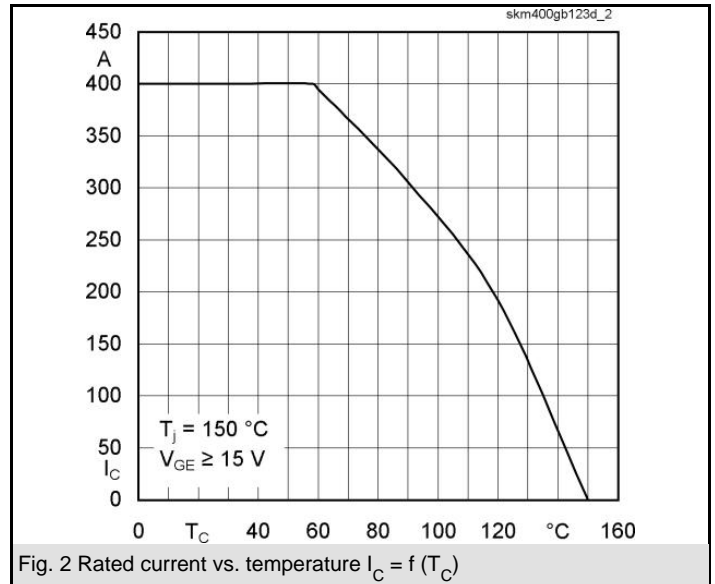
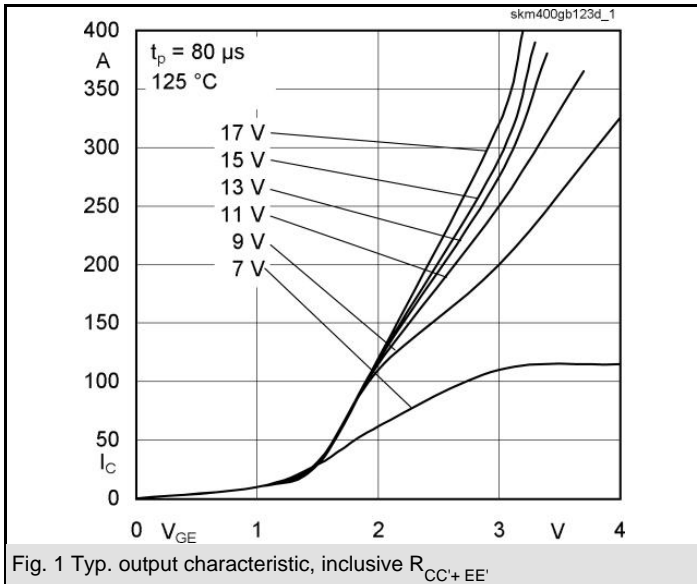
#### Typical Applications

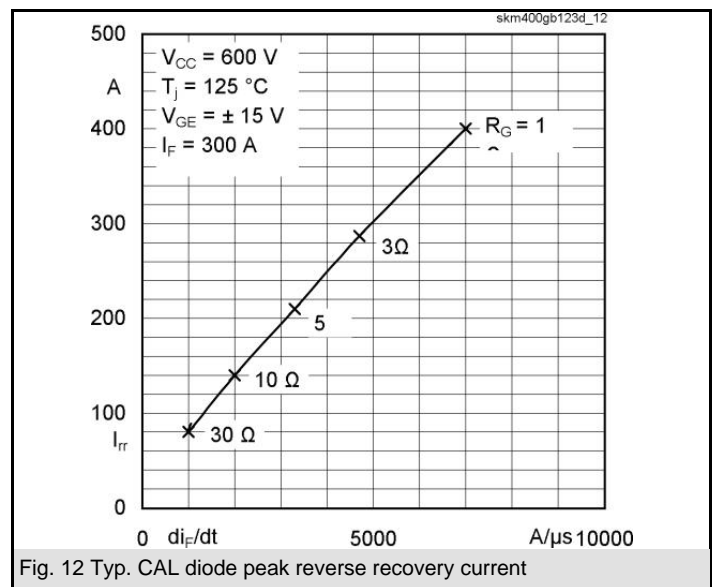
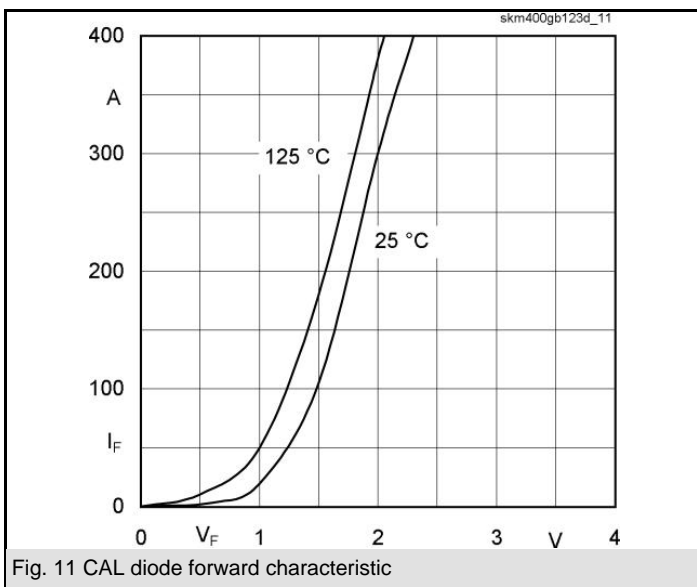
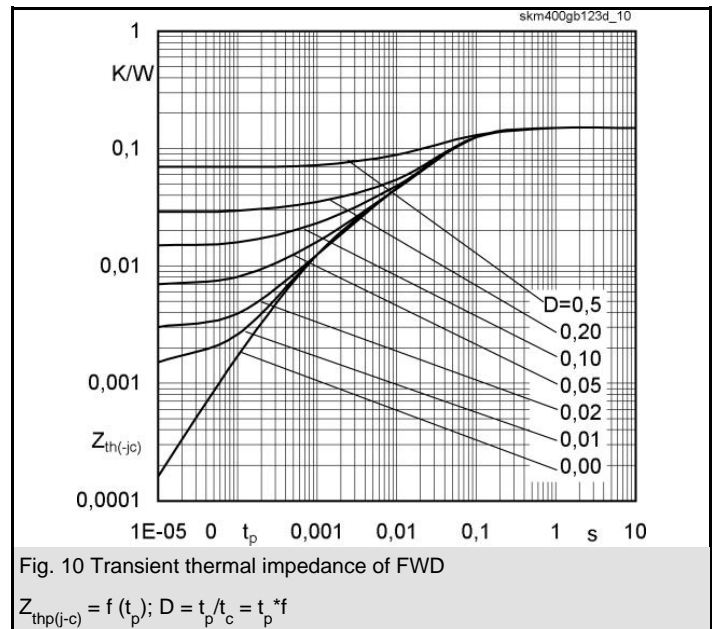
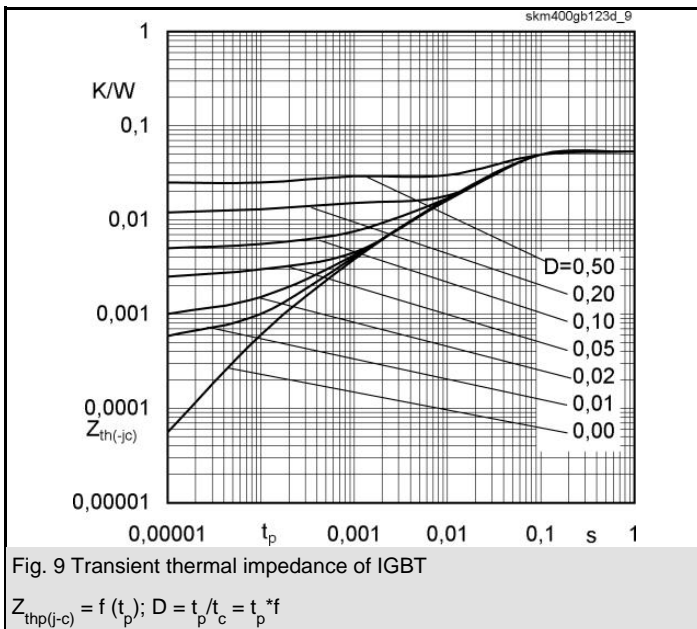
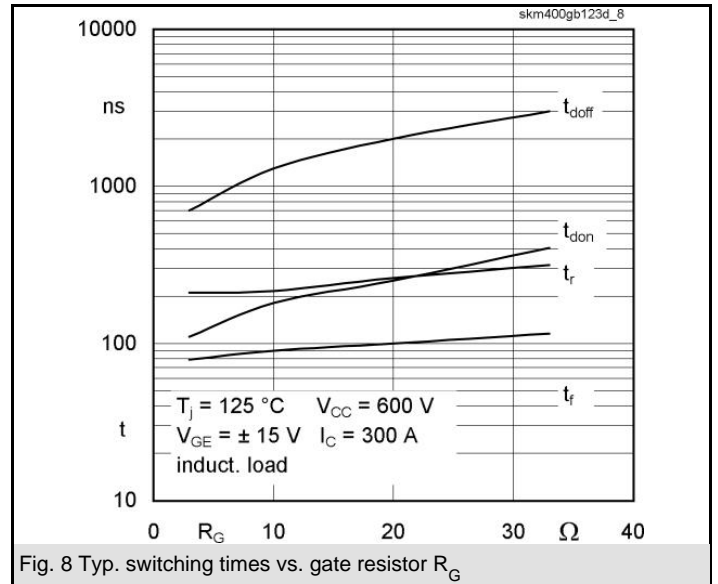
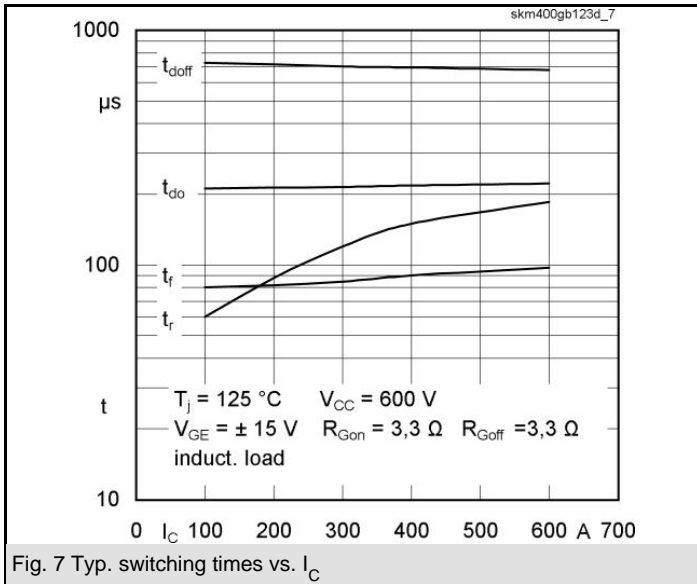
- Switching (not for linear use)



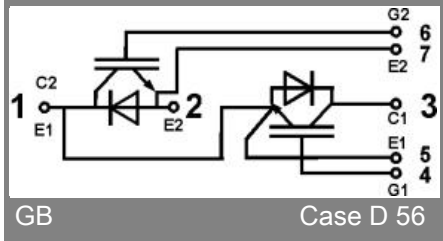
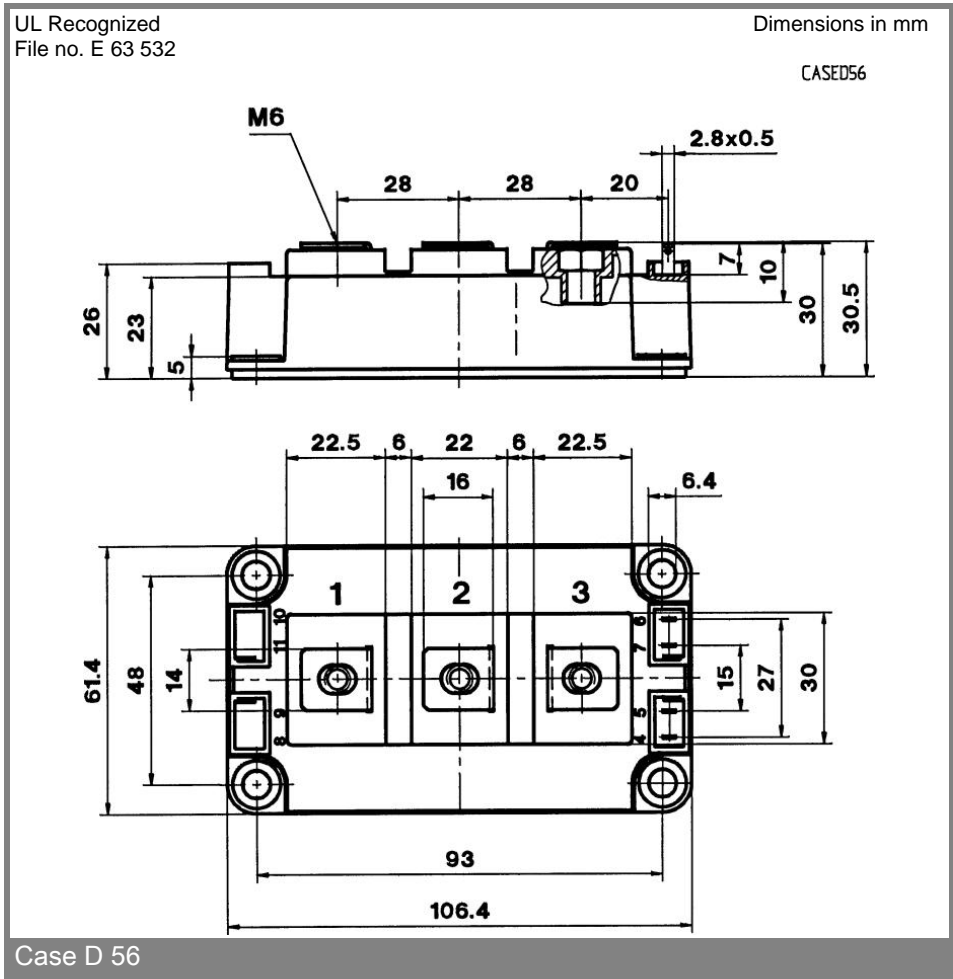
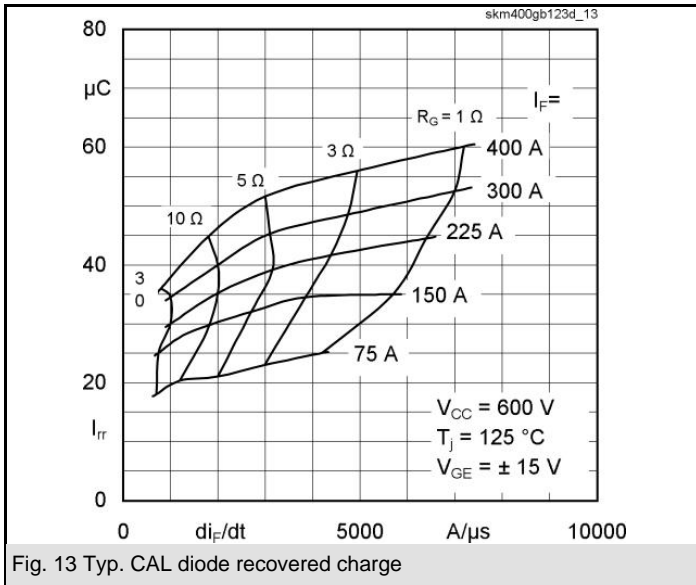
Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$ , unless otherwise specified	
Symbol	Conditions	Values	Units
<b>IGBT</b>			
$V_{CES}$		1200	V
$I_C$	$T_c = 25 (80)^\circ\text{C}$	400 (330)	A
$I_{CRM}$	$t_p = 1 \text{ ms}$	600	A
$V_{GES}$		$\pm 20$	V
$T_{vj}$ ( $T_{stg}$ )	$T_{OPERATION} \leq T_{stg}$	- 40 ... + 150 (125)	$^\circ\text{C}$
$V_{isol}$	AC, 1 min.	2500	V
<b>Inverse diode</b>			
$I_F$	$T_c = 25 (80)^\circ\text{C}$	390 (260)	A
$I_{FRM}$	$t_p = 1 \text{ ms}$	600	A
$I_{FSM}$	$t_p = 10 \text{ ms}$ ; sin.; $T_j = 150^\circ\text{C}$	2900	A

Characteristics		$T_c = 25^\circ\text{C}$ , unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT</b>					
$V_{GE(th)}$	$V_{GE} = V_{CE}$ ; $I_C = 12 \text{ mA}$	4,5	5,5	6,5	V
$I_{CES}$	$V_{GE} = 0$ ; $V_{CE} = V_{CES}$ ; $T_j = 25 (125)^\circ\text{C}$		0,1	0,3	mA
$V_{CE(TO)}$	$T_j = 25 (125)^\circ\text{C}$		1,4 (1,6)	1,6 (1,8)	V
$r_{CE}$	$V_{GE} = 15 \text{ V}$ ; $T_j = 25 (125)^\circ\text{C}$		3,66 (5)	4,66 (6,33)	m $\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 300 \text{ A}$ ; $V_{GE} = 15 \text{ V}$ ; chip level		2,5 (3,1)	3 (3,7)	V
$C_{ies}$	under following conditions		22	30	nF
$C_{oes}$	$V_{GE} = 0$ ; $V_{CE} = 25 \text{ V}$ ; $f = 1 \text{ MHz}$		3,3	4	nF
$C_{res}$			1,2	1,6	nF
$L_{CE}$				20	nH
$R_{CC'+EE'}$	res.; terminal-chip $T_c = 25 (125)^\circ\text{C}$		0,35 (0,5)		m $\Omega$
$t_{d(on)}$	$V_{CC} = 600 \text{ V}$ ; $I_{Cnom} = 300 \text{ A}$		200	400	ns
$t_r$	$R_{Gon} = R_{Goff} = 3,3 \Omega$ ; $T_j = 125^\circ\text{C}$		115	220	ns
$t_{d(off)}$	$V_{GE} = \pm 15 \text{ V}$		720	900	ns
$t_f$			80	100	ns
$E_{on} (E_{off})$			38 (40)		mJ
<b>Inverse diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 300 \text{ A}$ ; $V_{GE} = 0 \text{ V}$ ; $T_j = 25 (125)^\circ\text{C}$		2 (1,8)	2,5	V
$V_{(TO)}$	$T_j = 125 ( )^\circ\text{C}$			1,2	V
$r_T$	$T_j = 125 ( )^\circ\text{C}$		2,5	3,5	m $\Omega$
$I_{RRM}$	$I_{Fnom} = 300 \text{ A}$ ; $T_j = 25 ( 125 )^\circ\text{C}$		85 (140)		A
$Q_{rr}$	$di/dt = 2000 \text{ A}/\mu\text{s}$		13 (40)		$\mu\text{C}$
$E_{rr}$	$V_{GE} = V$				mJ
<b>Thermal characteristics</b>					
$R_{th(j-c)}$	per IGBT			0,05	K/W
$R_{th(j-c)D}$	per Inverse Diode			0,125	K/W
$R_{th(c-s)}$	per module			0,038	K/W
<b>Mechanical data</b>					
$M_s$	to heatsink M6	3		5	Nm
$M_t$	to terminals M6				Nm
w				325	g





# SKM 400GB123D



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.