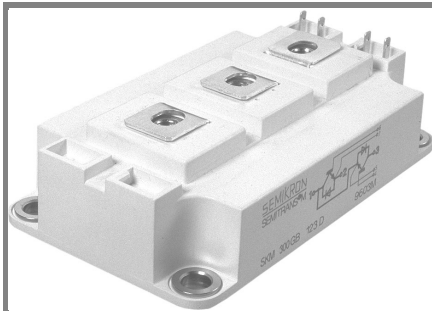


SKM 300GB123D



SEMITRANS™ 3

IGBT Modules

SKM 300GB123D

SKM 300GAL123D

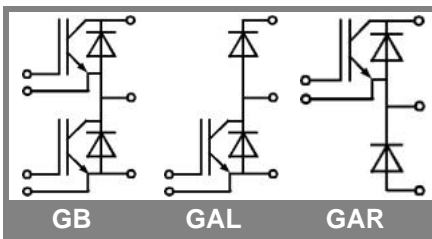
SKM 300GAR123D

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 distance (20 mm)

Typical Applications

- Switching (not for linear use)
- AC inverter drives
- UPS



Absolute Maximum Ratings		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}		1200	V
I_C	$T_c = 25\text{ (80) }^\circ\text{C}$	300 (220)	A
I_{CRM}	$t_p = 1\text{ ms}$	400	A
V_{GES}		± 20	V
T_{vj} (T_{stg})	$T_{OPERATION} \leq T_{stg}$	- 40 ... + 150 (125)	$^\circ\text{C}$
V_{isol}	AC, 1 min.	2500	V

Inverse diode		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
I_F	$T_c = 25\text{ (80) }^\circ\text{C}$	260 (180)	A
I_{FRM}	$t_p = 1\text{ ms}$	400	A
I_{FSM}	$t_p = 10\text{ ms}$; sin.; $T_j = 150\text{ }^\circ\text{C}$	2200	A

Freewheeling diode		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
I_F	$T_c = 25\text{ (80) }^\circ\text{C}$	350 (230)	A
I_{FRM}	$t_p = 1\text{ ms}$	600	A
I_{FSM}	$t_p = 10\text{ ms}$; sin.; $T_j = 150\text{ }^\circ\text{C}$	2900	A

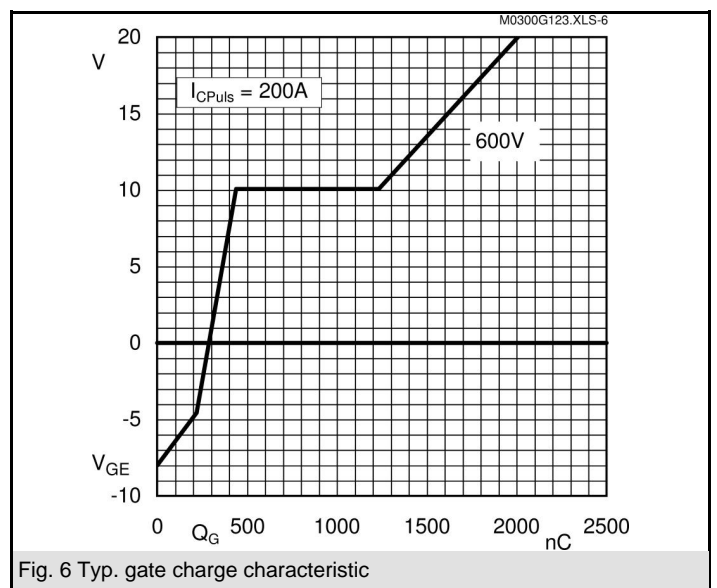
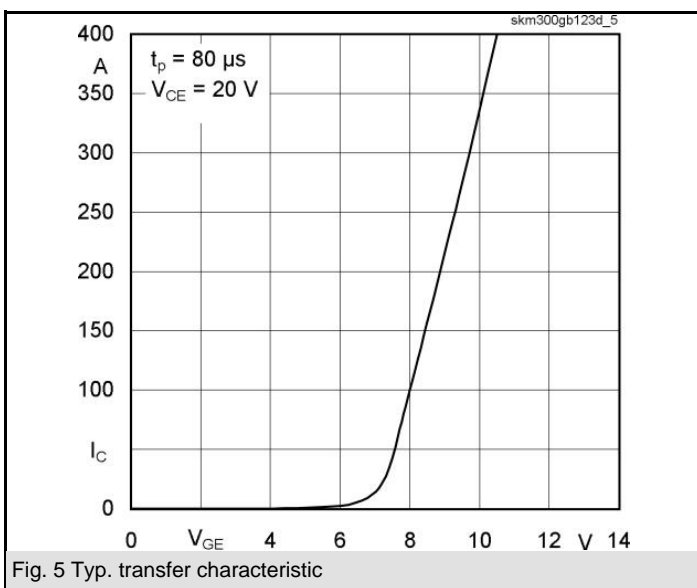
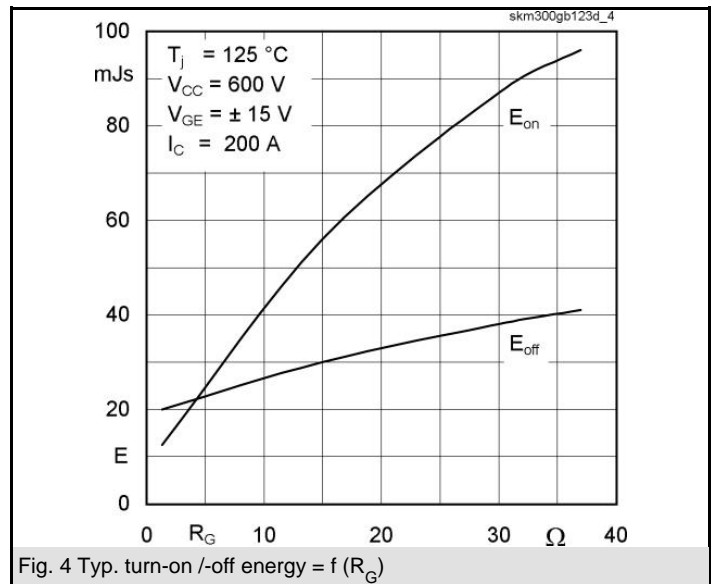
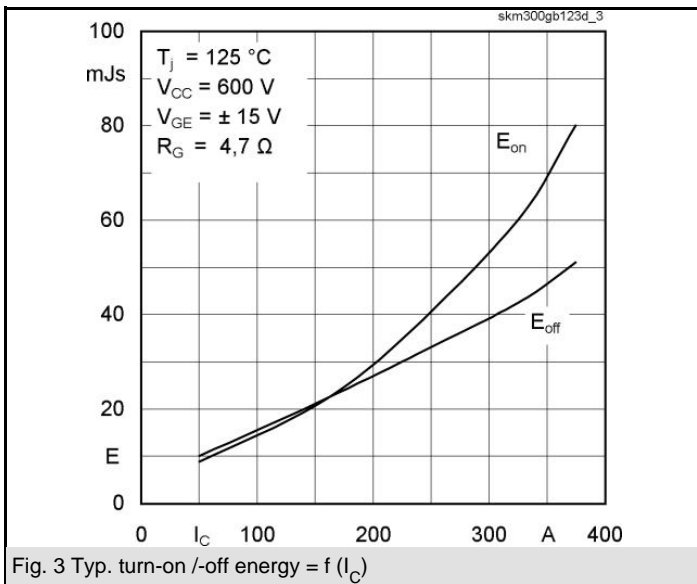
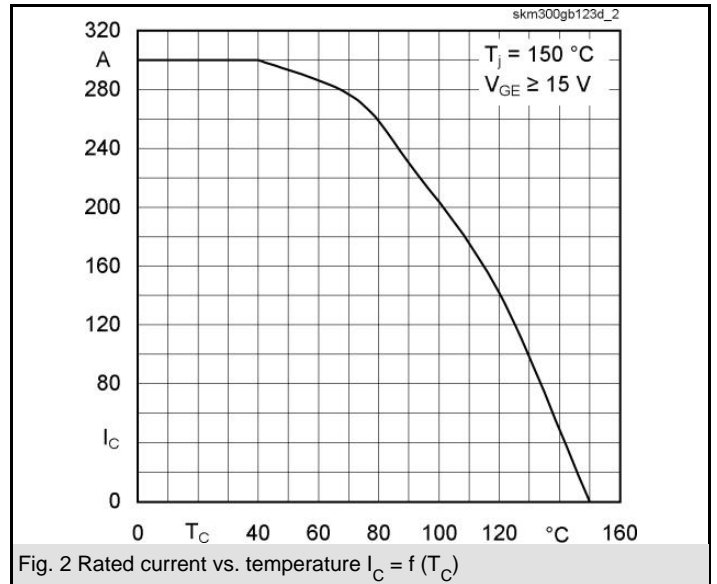
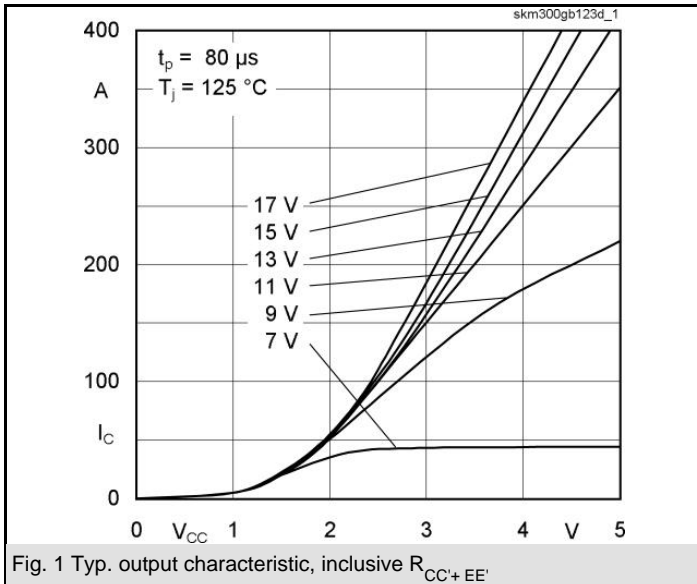
Characteristics		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified			Units
Symbol	Conditions	min.	typ.	max.	
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 8\text{ mA}$	4,5	5,5	6,5	V
I_{CES}	$V_{GE} = 0$, $V_{CE} = V_{CES}$, $T_j = 25\text{ (125) }^\circ\text{C}$		0,1	0,3	mA
$V_{CE(TO)}$	$T_j = 25\text{ (125) }^\circ\text{C}$		1,4 (1,6)	1,6 (1,8)	V
r_{CE}	$V_{GE} = 15\text{ V}$, $T_j = 25\text{ (125) }^\circ\text{C}$		5,5 (7,5)	7 (9,5)	m Ω
$V_{CE(sat)}$	$I_{Cnom} = 200\text{ A}$, $V_{GE} = 15\text{ V}$, chip level		2,5 (3,1)	3 (3,7)	V
C_{res}	under following conditions		18	24	nF
C_{oes}	$V_{GE} = 0$, $V_{CE} = 25\text{ V}$, $f = 1\text{ MHz}$		2,5	3,2	nF
C_{res}			1	1,3	nF
L_{CE}				20	nH
$R_{CC'+EE'}$	res., terminal-chip $T_c = 25\text{ (125) }^\circ\text{C}$		0,35 (0,5)		m Ω
$t_{d(on)}$	$V_{CC} = 600\text{ V}$, $I_{Cnom} = 200\text{ A}$		250	400	ns
t_r	$R_{Gon} = R_{Goff} = 4,7\text{ }^\circ\Omega$, $T_j = 125\text{ }^\circ\text{C}$		90	160	ns
$t_{d(off)}$	$V_{GE} = \pm 15\text{ V}$		550	700	ns
t_f			70	100	ns
$E_{on} (E_{off})$			28 (26)		mJ

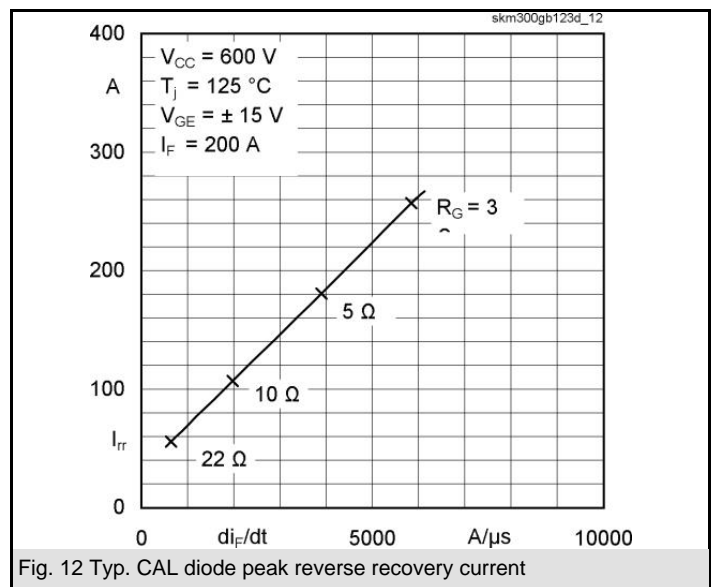
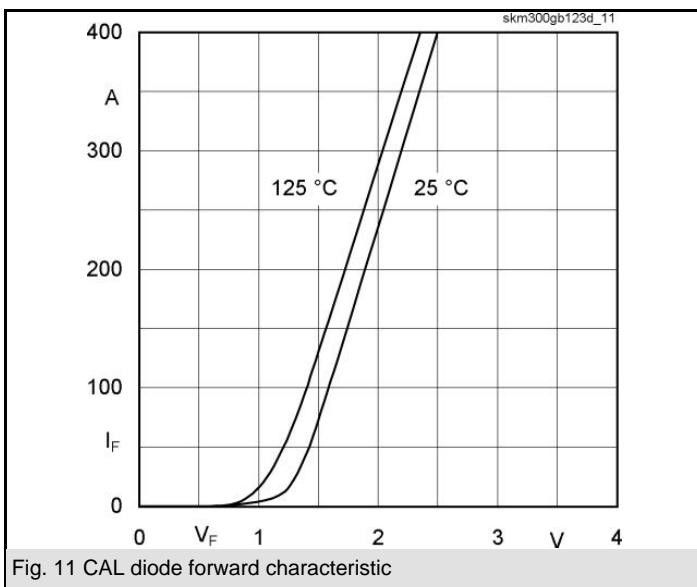
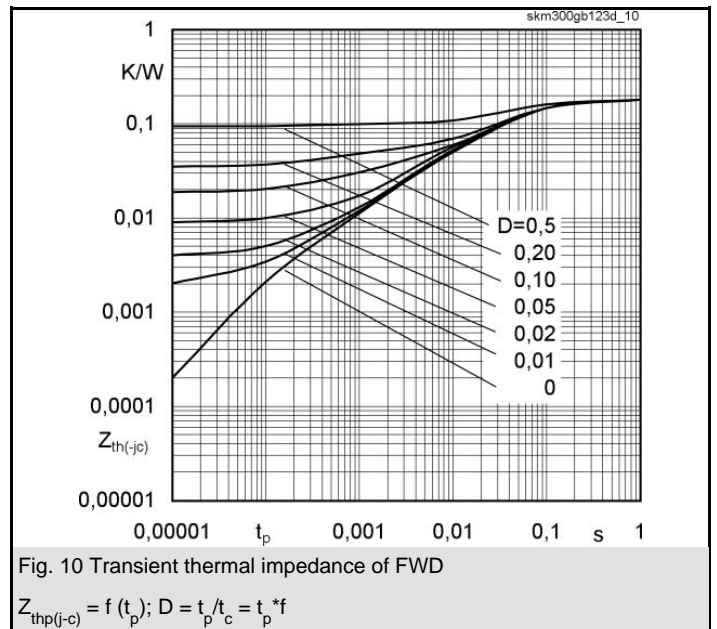
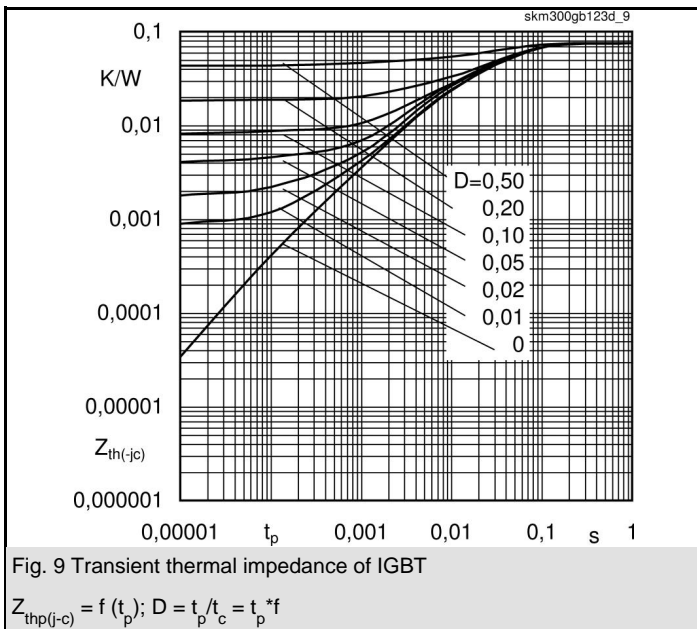
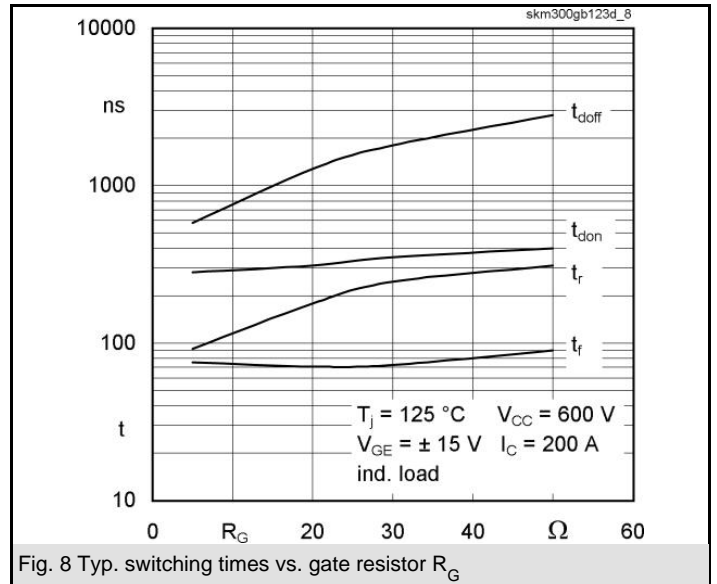
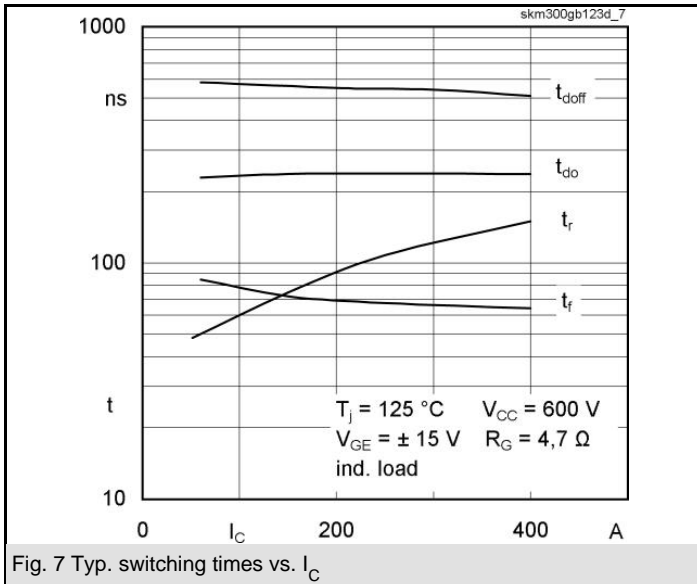
Inverse diode		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified			Units
Symbol	Conditions	min.	typ.	max.	
$V_F = V_{EC}$	$I_{Fnom} = 200\text{ A}$; $V_{GE} = 0\text{ V}$; $T_j = 25\text{ (125) }^\circ\text{C}$		2 (1,8)	2,5	V
$V_{(TO)}$	$T_j = 25\text{ (125) }^\circ\text{C}$		1,1	1,2	V
r_T	$T_j = 25\text{ (125) }^\circ\text{C}$		4,5	6,5	m Ω
I_{RRM}	$I_{Fnom} = 200\text{ A}$; $T_j = 125\text{ () }^\circ\text{C}$		190		A
Q_{rr}	$di/dt = 4000\text{ A}/\mu\text{s}$		35		μC
E_{rr}	$V_{GE} = 0\text{ V}$		8,5		mJ

FWD		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified			Units
Symbol	Conditions	min.	typ.	max.	
$V_F = V_{EC}$	$I_F = 300\text{ A}$; $V_{GE} = 0\text{ V}$, $T_j = 25\text{ (125) }^\circ\text{C}$		2 (1,8)	2,5	V
$V_{(TO)}$	$T_j = 25\text{ (125) }^\circ\text{C}$		1,1	1,2	V
r_T	$T_j = 25\text{ (125) }^\circ\text{C}$		3	4,3	m Ω
I_{RRM}	$I_F = 200\text{ A}$; $T_j = 125\text{ () }^\circ\text{C}$		220		A
Q_{rr}	$di/dt = 3500\text{ A}/\mu\text{s}$		53		μC
E_{rr}	$V_{GE} = 0\text{ V}$				mJ

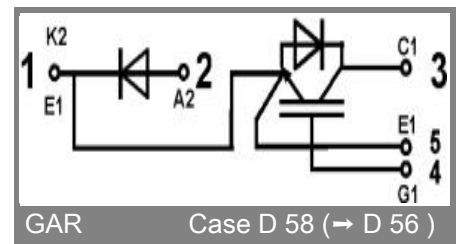
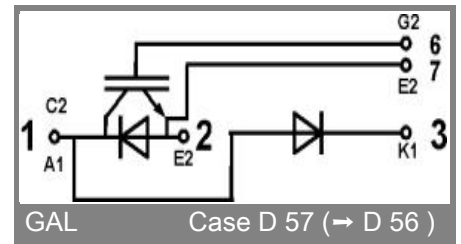
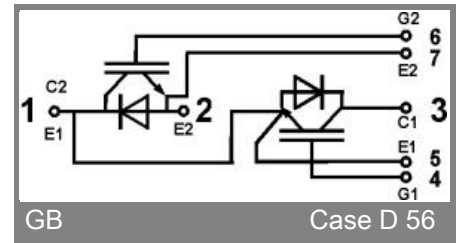
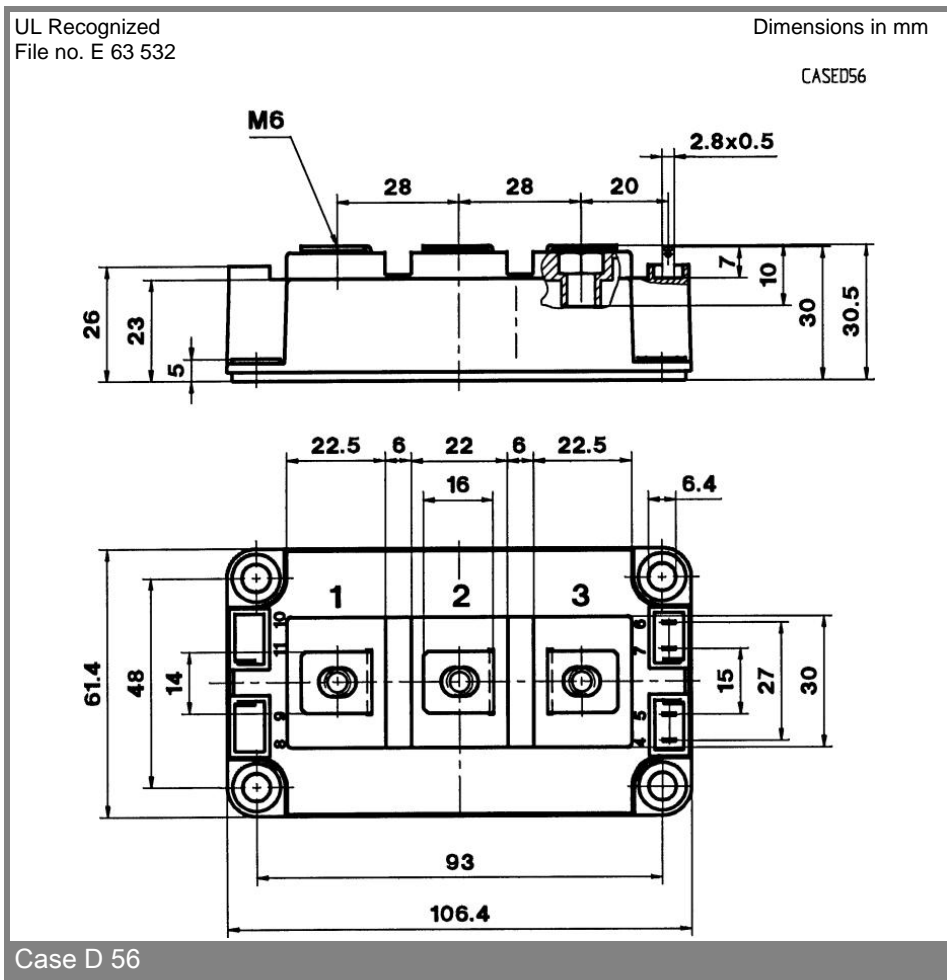
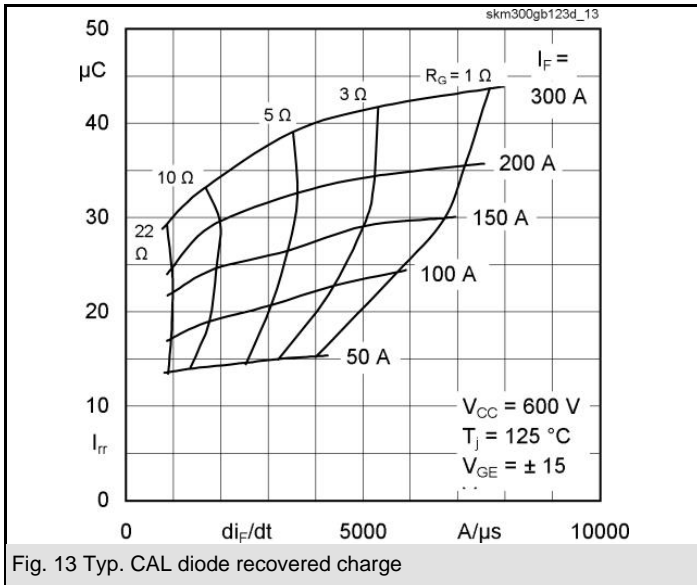
Thermal characteristics		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
$R_{th(j-c)}$	per IGBT	0,075	K/W
$R_{th(j-c)D}$	per Inverse Diode	0,18	K/W
$R_{th(j-c)FD}$	per FWD	0,15	K/W
$R_{th(c-s)}$	per module	0,038	K/W

Mechanical data		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
M_s	to heatsink M6	3	Nm
M_t	to terminals M6	2,5	Nm
w			325 g





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This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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