

# SKM 200GB173D



**SEMITRANS™ 3**

## IGBT Modules

SKM 200GB173D

SKM 200GB173D1

SKM 200GAL173D

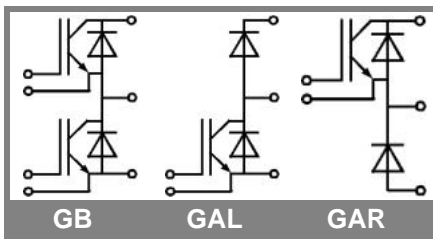
SKM 200GAR173D

### 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 (13 mm) and creepage distance (20 mm)

### Typical Applications

- AC inverter drives on mains 575 - 750 V<sub>AC</sub>
- DC bus voltage 750 - 1200 V<sub>DC</sub>
- Public transport (auxiliary syst.)
- Switching (not for linear use)



Absolute Maximum Ratings		$T_c = 25\text{ °C}$ , unless otherwise specified	
Symbol	Conditions	Values	Units
<b>IGBT</b>			
$V_{CES}$		1700	V
$I_C$	$T_c = 25\text{ (80) °C}$	220 (150)	A
$I_{CRM}$	$t_p = 1\text{ ms}$	300	A
$V_{GES}$		$\pm 20$	V
$T_{vj}$ ( $T_{stg}$ )	$T_{OPERATION} \leq T_{stg}$	- 40 ... + 150 (125)	°C
$V_{isol}$	AC, 1 min.	4000	V

Inverse diode			
Symbol	Conditions	Values	Units
$I_F$	$T_c = 25\text{ (80) °C}$	150 (100)	A
$I_{FRM}$	$t_p = 1\text{ ms}$	300	A
$I_{FSM}$	$t_p = 10\text{ ms; sin.; } T_j = 150\text{ °C}$	1450	A

Freewheeling diode			
Symbol	Conditions	Values	Units
$I_F$	$T_c = 25\text{ (80) °C}$	230 (150)	A
$I_{FRM}$	$t_p = 1\text{ ms}$	400	A
$I_{FSM}$	$t_p = 10\text{ ms; sin.; } T_j = 150\text{ °C}$	2200	A

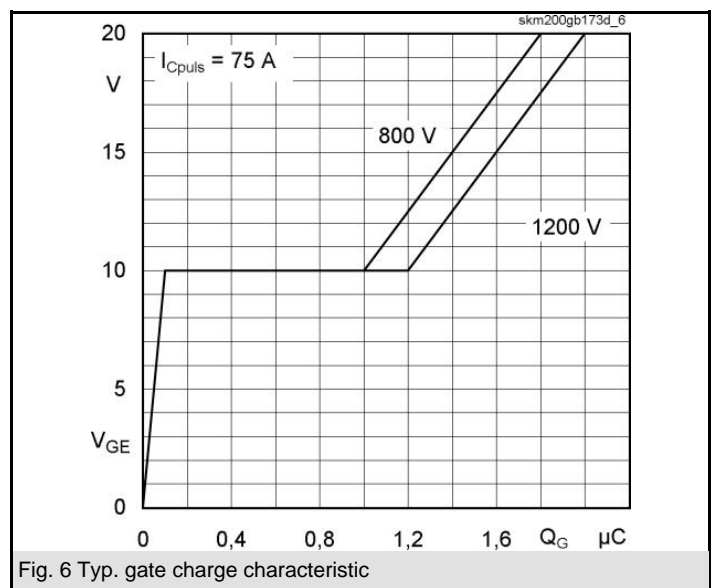
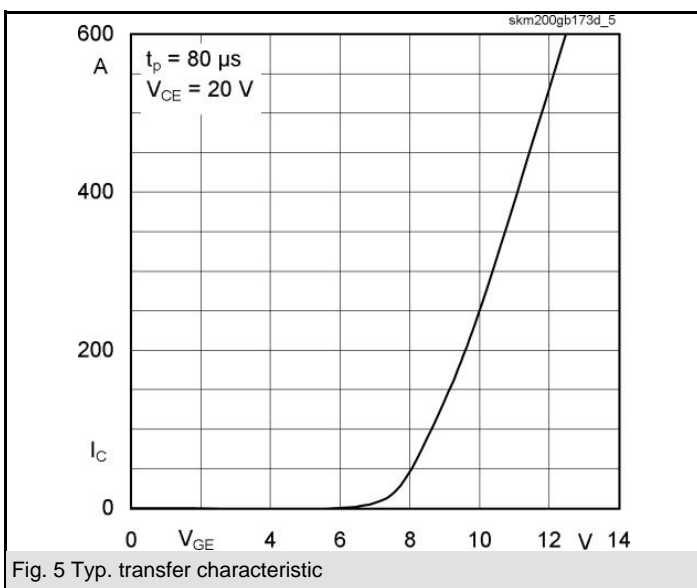
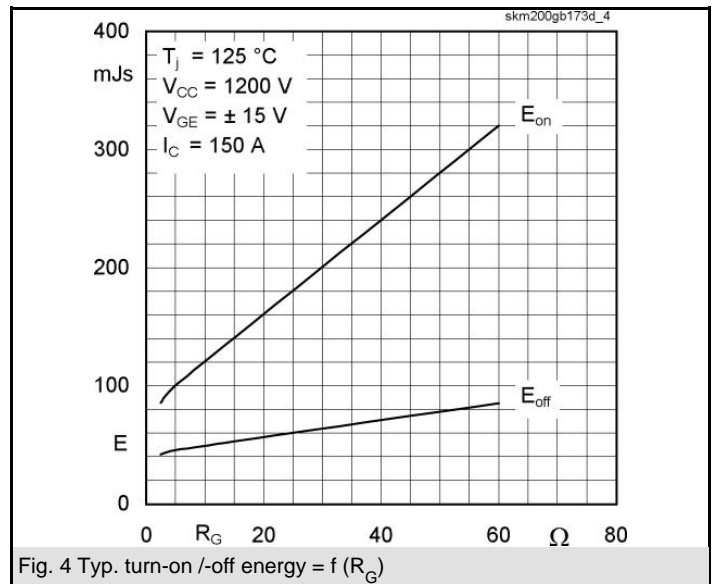
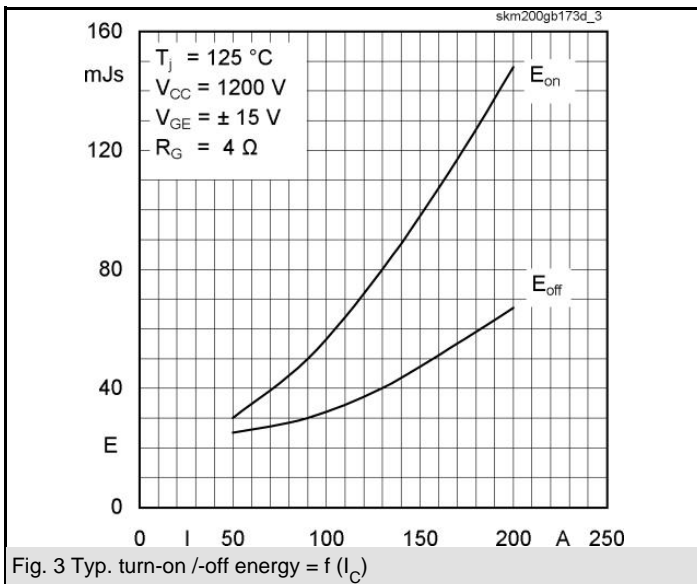
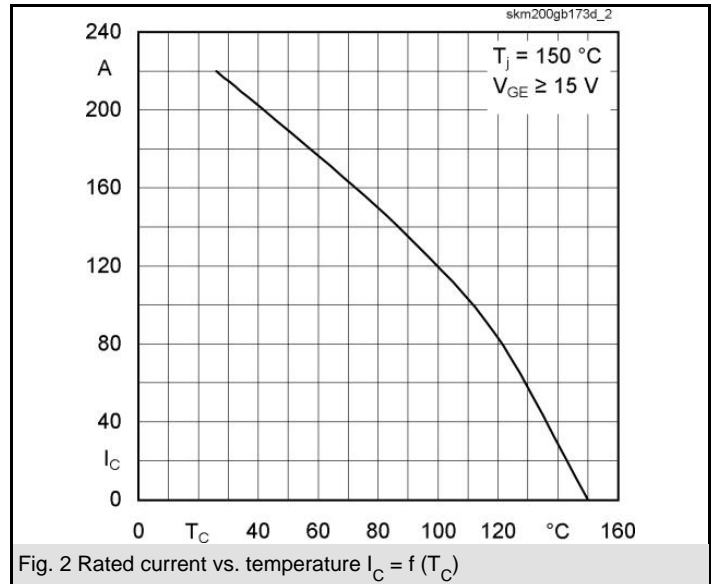
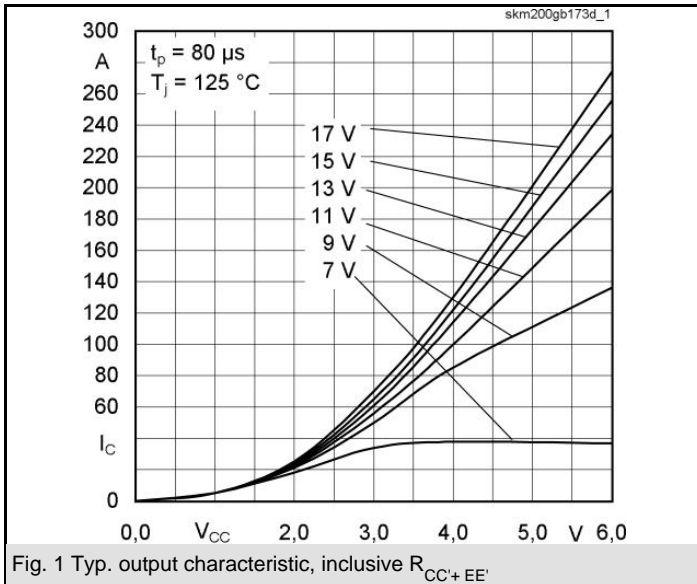
Characteristics		$T_c = 25\text{ °C}$ , unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT</b>					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 10\text{ mA}$	4,8	5,5	6,2	V
$I_{CES}$	$V_{GE} = 0, V_{CE} = V_{CES}, T_j = 25\text{ (125) °C}$		0,1	0,3	mA
$V_{CE(TO)}$	$T_j = 25\text{ (125) °C}$		1,65 (1,9)	1,9 (2,15)	V
$r_{CE}$	$V_{GE} = 15\text{ V}, T_j = 25\text{ (125) °C}$		11,7 (17,3)	13,3 (19)	mΩ
$V_{CE(sat)}$	$I_{Cnom} = 150\text{ A}, V_{GE} = 15\text{ V}$ , chip level		3,4 (4,5)	3,9 (5)	V
$C_{res}$	under following conditions		20		nF
$C_{oes}$	$V_{GE} = 0, V_{CE} = 25\text{ V}, f = 1\text{ MHz}$		2		nF
$C_{res}$			0,55		nF
$L_{CE}$				20	nH
$R_{CC'+EE'}$	res., terminal-chip $T_c = 25\text{ (125) °C}$		0,35 (0,5)		mΩ
$t_{d(on)}$	$V_{CC} = 1200\text{ V}, I_{Cnom} = 150\text{ A}$		580		ns
$t_r$	$R_{Gon} = R_{Goff} = 4\text{ Ω}, T_j = 125\text{ °C}$		100		ns
$t_{d(off)}$	$V_{GE} = \pm 15\text{ V}$		750		ns
$t_f$			40		ns
$E_{on} (E_{off})$			95 (45)		mJ

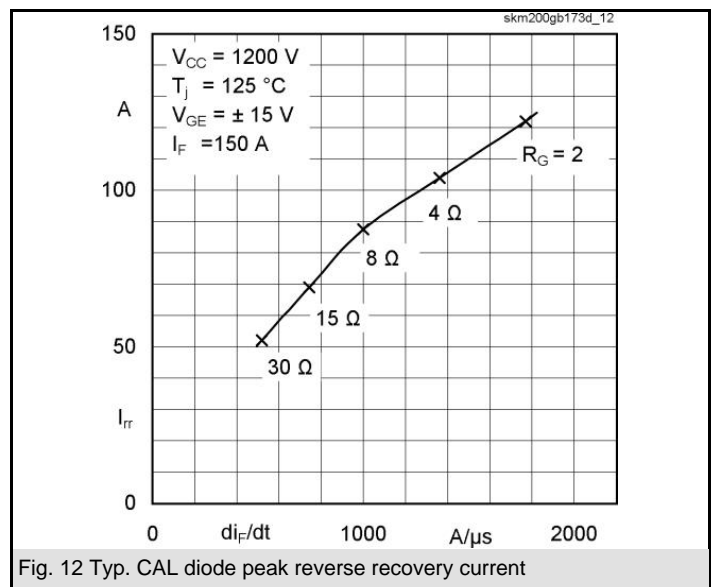
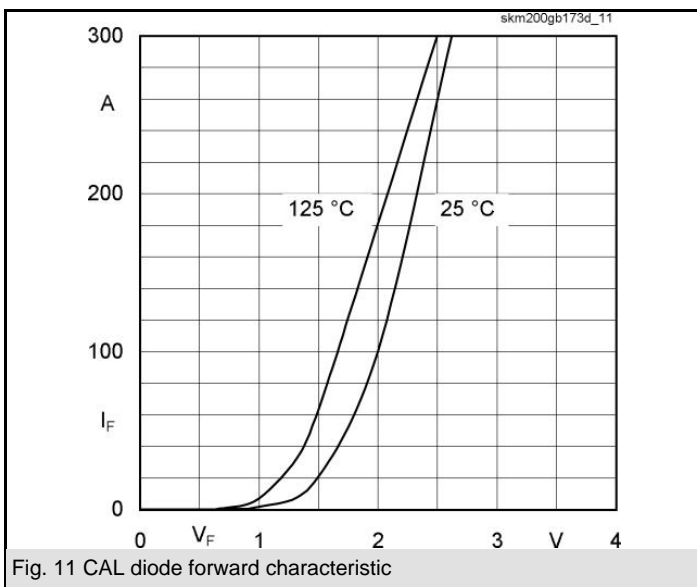
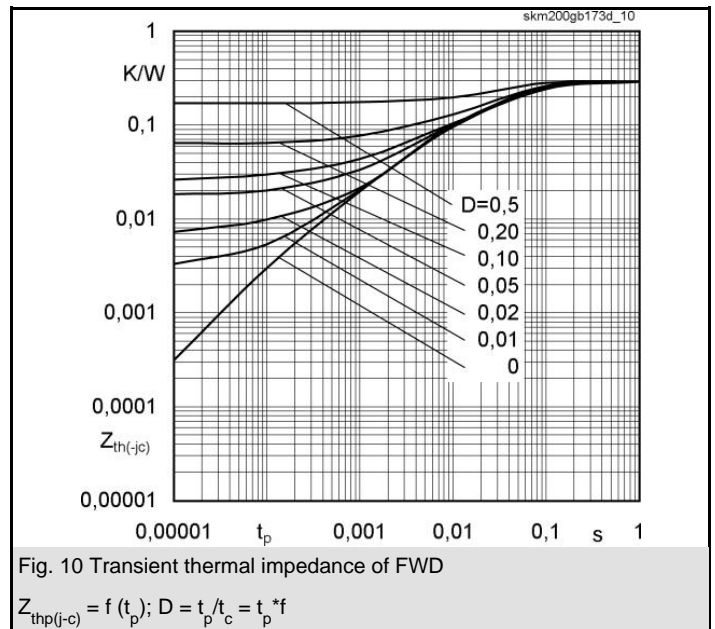
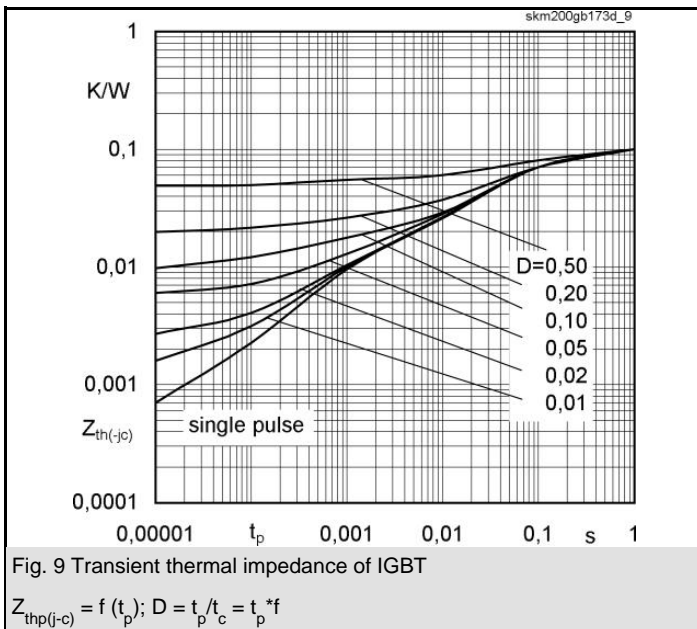
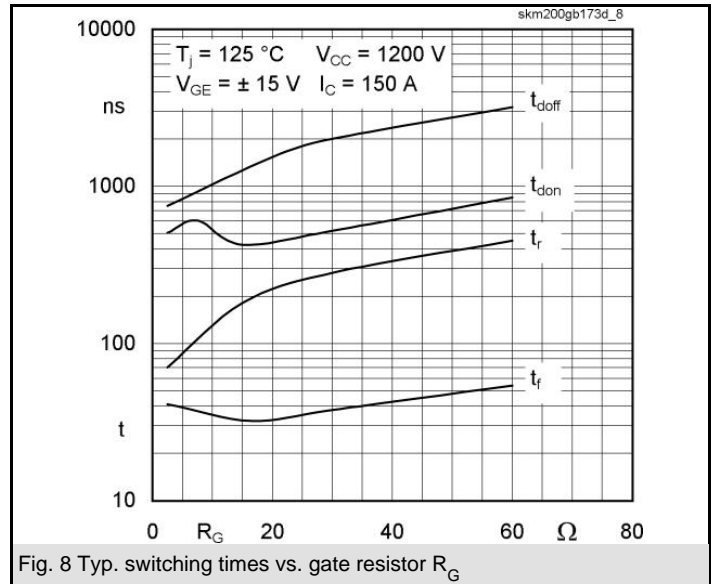
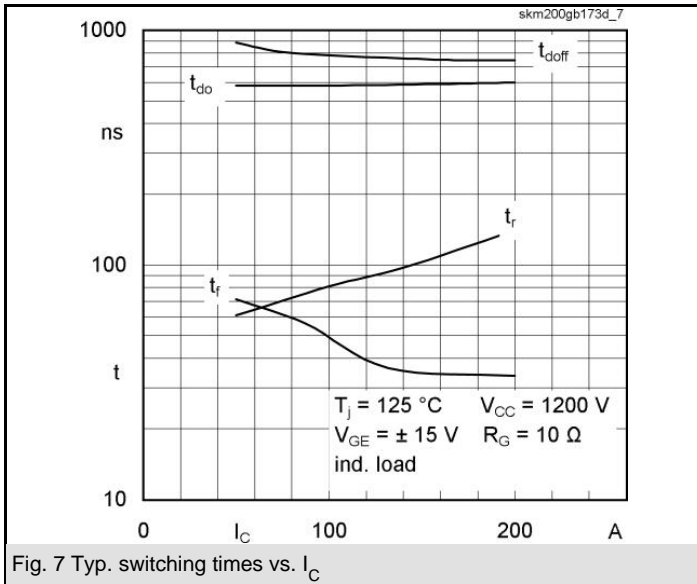
Inverse diode				
Symbol	Conditions	min.	max.	Units
$V_F = V_{EC}$	$I_{Fnom} = 150\text{ A}; V_{GE} = 0\text{ V}; T_j = 25\text{ (125) °C}$	2,2 (1,9)	2,7	V
$V_{(TO)}$	$T_j = 125\text{ ( ) °C}$	1,3	1,5	V
$r_T$	$T_j = 125\text{ ( ) °C}$	4,5	6,2	mΩ
$I_{RRM}$	$I_{Fnom} = 150\text{ A}; T_j = 25\text{ (125) °C}$	60 (85)		A
$Q_{rr}$	$di/dt = 1000\text{ A/μs}$	15 (38)		μC
$E_{rr}$	$V_{GE} = 0\text{ V}$			mJ

FWD				
Symbol	Conditions	min.	max.	Units
$V_F = V_{EC}$	$I_F = 150\text{ A}; V_{GE} = 0\text{ V}, T_j = 25\text{ (125) °C}$	2 (1,8)	2,4	V
$V_{(TO)}$	$T_j = 125\text{ ( ) °C}$	1,3	1,5	V
$r_T$	$T_j = 125\text{ ( ) °C}$	3,5	4,5	mΩ
$I_{RRM}$	$I_F = 150\text{ A}; T_j = 25\text{ (125) °C}$	75 (110)		A
$Q_{rr}$	$di/dt = \text{A/μs}$	20 (50)		μC
$E_{rr}$	$V_{GE} = \text{V}$			mJ

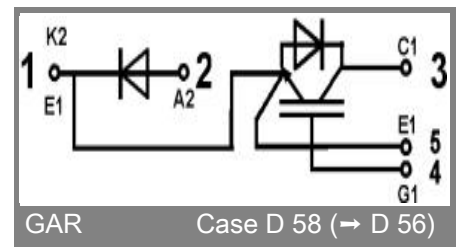
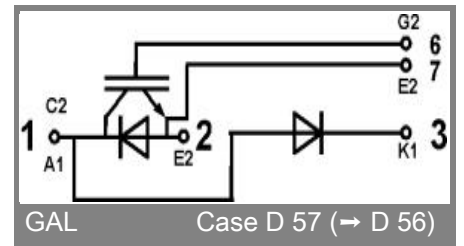
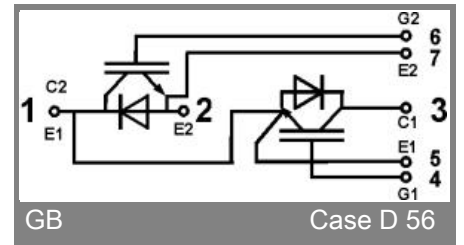
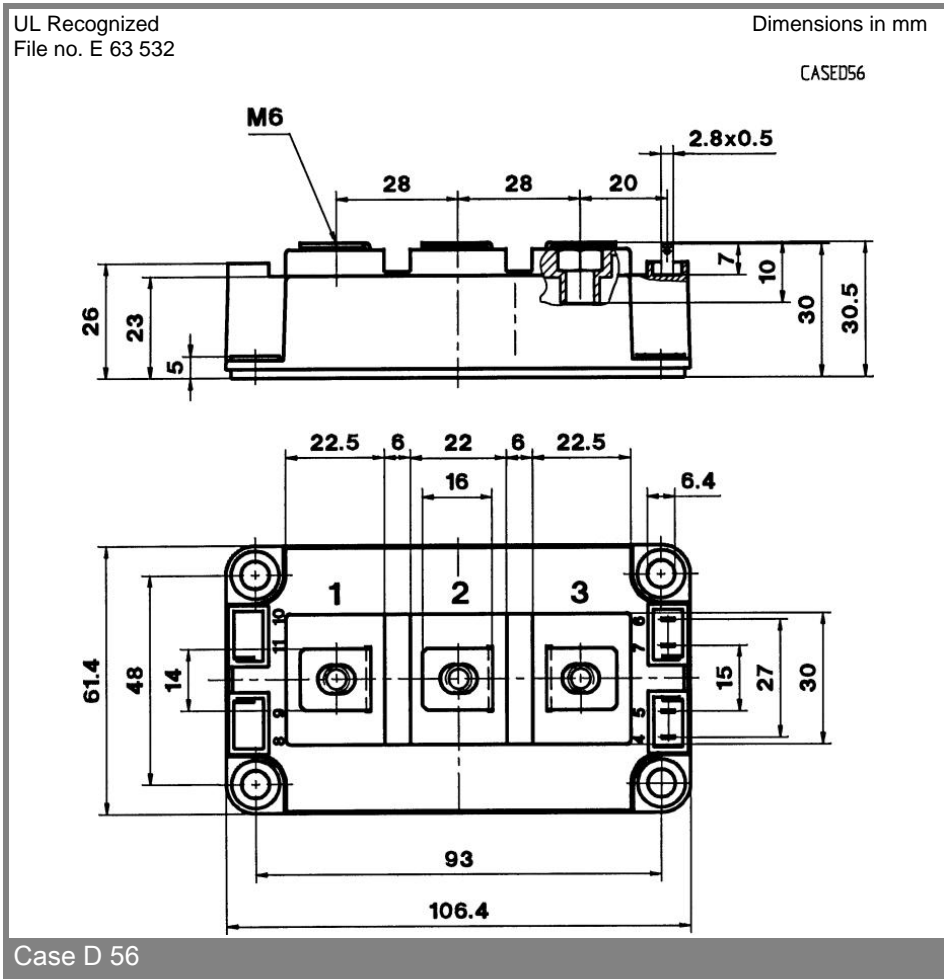
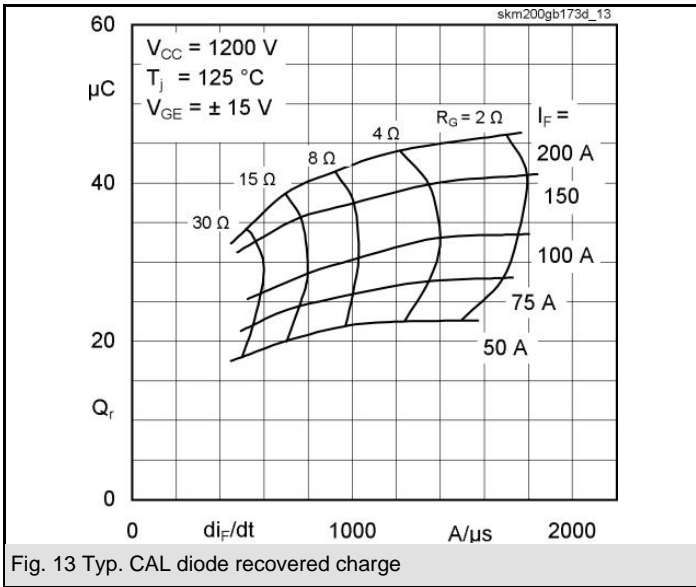
Thermal characteristics			
Symbol	Conditions	Values	Units
$R_{th(j-c)}$	per IGBT	0,1	K/W
$R_{th(j-c)D}$	per Inverse Diode	0,32	K/W
$R_{th(j-c)FD}$	per FWD	0,21	K/W
$R_{th(c-s)}$	per module	0,038	K/W

Mechanical data			
Symbol	Conditions	Values	Units
$M_s$	to heatsink M6	3	Nm
$M_t$	to terminals M6		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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