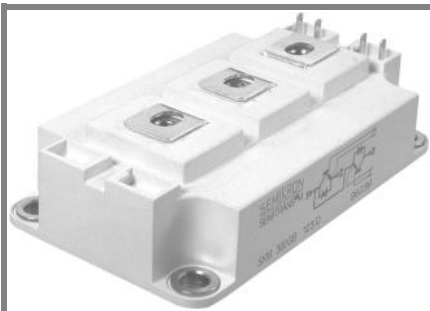


# SKM 200GB173D



**SEMITRANS® 3**

## IGBT Modules

**SKM 200GB173D**

**SKM 200GB173D1**

**SKM 200GAL173D**

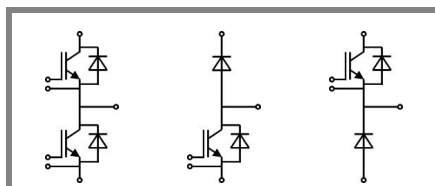
**SKM 200GAR173D**

## 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)



**GB**

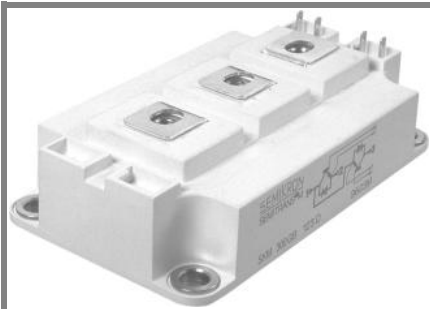
**GAL**

**GAR**

Absolute Maximum Ratings		$T_c = 25\text{ }^\circ\text{C}$ , unless otherwise specified		
Symbol	Conditions	Values		Units
<b>IGBT</b>				
$V_{CES}$	$T_j = 25\text{ }^\circ\text{C}$	1700		V
$I_C$	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	220	A
		$T_{case} = 80\text{ }^\circ\text{C}$	150	A
$I_{CRM}$	$I_{CRM} = 2 \times I_{Cnom}$	300		A
$V_{GES}$		$\pm 20$		V
$t_{psc}$	$V_{CC} = 1200\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125\text{ }^\circ\text{C}$ $V_{CES} < 1700\text{ V}$	10		$\mu\text{s}$
<b>Inverse Diode</b>				
$I_F$	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	150	A
		$T_{case} = 80\text{ }^\circ\text{C}$	100	A
$I_{FRM}$	$I_{FRM} = 2 \times I_{Fnom}$	300		A
$I_{FSM}$	$t_p = 10\text{ ms}; \sin.$	$T_j = 150\text{ }^\circ\text{C}$	1450	A
<b>Freewheeling Diode</b>				
$I_F$	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	230	A
		$T_{case} = 80\text{ }^\circ\text{C}$	150	A
$I_{FRM}$	$I_{FRM} = 2 \times I_{Fnom}$	400		A
$I_{FSM}$	$t_p = 10\text{ ms}; \sin$	$T_j = 150\text{ }^\circ\text{C}$	2200	A
<b>Module</b>				
$I_{t(RMS)}$		500		A
$T_{vj}$		- 40 ... + 150		$^\circ\text{C}$
$T_{stg}$		- 40 ... + 125		$^\circ\text{C}$
$V_{isol}$	AC, 1 min.	4000		V

Characteristics		$T_c = 25\text{ }^\circ\text{C}$ , 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
$I_{CES}$	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$				
$V_{CE0}$		$T_j = 25\text{ }^\circ\text{C}$	0,1	0,3	mA
		$T_j = 125\text{ }^\circ\text{C}$	1,65	1,9	V
$r_{CE}$	$V_{GE} = 15\text{ V}$	$T_j = 25\text{ }^\circ\text{C}$	11,7	13,3	$\text{m}\Omega$
		$T_j = 125\text{ }^\circ\text{C}$	17,3	19	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 150\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25\text{ }^\circ\text{C}_{chiplev.}$	3,4	3,9	V
		$T_j = 125\text{ }^\circ\text{C}_{chiplev.}$	4,5	5	V
$C_{ies}$	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	20		nF
$C_{oes}$			2		nF
$C_{res}$			0,55		nF
$Q_G$	$V_{GE} = 0\text{V}/+20\text{V}$	2000		nC	
$t_{d(on)}$	$R_{Gon} = 4\text{ }\Omega$	$V_{CC} = 1200\text{V}$ $I_C = 150\text{A}$	580		ns
$t_r$			100		ns
$E_{on}$	$R_{Goff} = 4\text{ }\Omega$	$T_j = 125\text{ }^\circ\text{C}$ $V_{GE} = \pm 15\text{V}$	95		mJ
$t_{d(off)}$			750		ns
$t_f$			40		ns
$E_{off}$			45		mJ
$R_{th(j-c)}$	per IGBT			0,1	K/W

# SKM 200GB173D



**SEMITRANS® 3**

## IGBT Modules

**SKM 200GB173D**

**SKM 200GB173D1**

**SKM 200GAL173D**

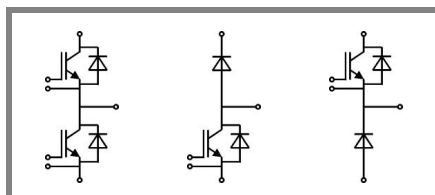
**SKM 200GAR173D**

### 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)



**GB**

**GAL**

**GAR**

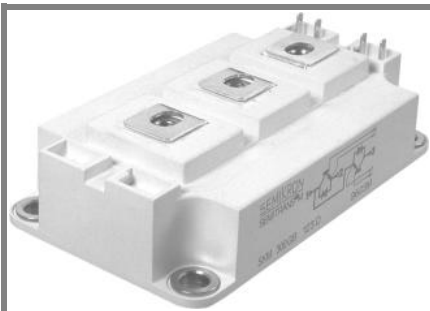
### Characteristics

Symbol	Conditions	min.	typ.	max.	Units
<b>Inverse Diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 150 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$	2,2	2,7	V
		$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$	1,9		V
$V_{F0}$		$T_j = 125 \text{ }^\circ\text{C}$	1,3	1,5	V
$r_F$		$T_j = 125 \text{ }^\circ\text{C}$	4,5	6,2	mΩ
$I_{RRM}$	$I_F = 150 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$	85		A
$Q_{rr}$	$di/dt = 1000 \text{ A}/\mu\text{s}$		38		μC
$E_{rr}$	$V_{GE} = -15 \text{ V}; V_{CC} = 1200 \text{ V}$				mJ
$R_{th(j-c)D}$	per diode			0,32	K/W
<b>FWD</b>					
$V_F = V_{EC}$	$I_{Fnom} = 150 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$	2	2,4	V
		$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$	1,8		V
$V_{F0}$		$T_j = 125 \text{ }^\circ\text{C}$	1,3	1,5	V
$r_F$		$T_j = 125 \text{ }^\circ\text{C}$	3,5	4,5	V
$I_{RRM}$	$I_F = 150 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$	110		A
$Q_{rr}$			50		μC
$E_{rr}$	$V_{GE} = -15 \text{ V}; V_{CC} = 1200 \text{ V}$				mJ
$R_{th(j-c)FD}$	per diode			0,21	K/W
<b>Module</b>					
$L_{CE}$			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.

\* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our personal.

# SKM 200GB173D



**SEMITRANS® 3**

## IGBT Modules

**SKM 200GB173D**

**SKM 200GB173D1**

**SKM 200GAL173D**

**SKM 200GAR173D**

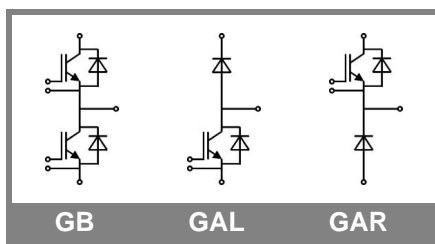
### Features

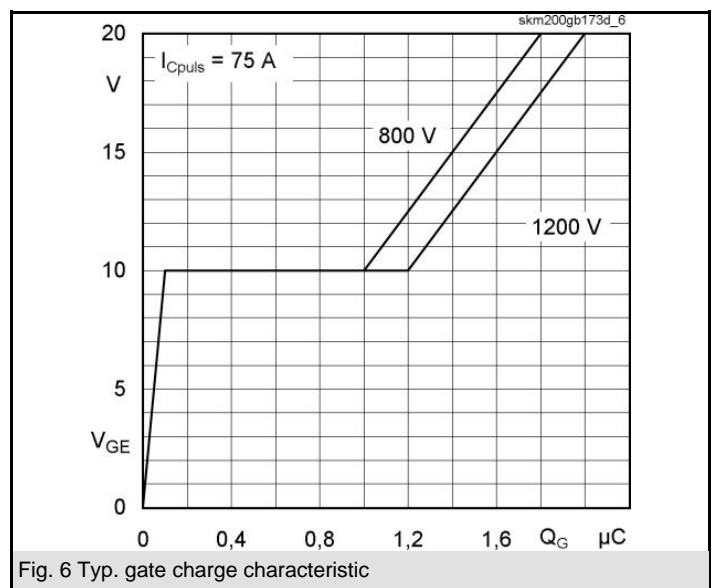
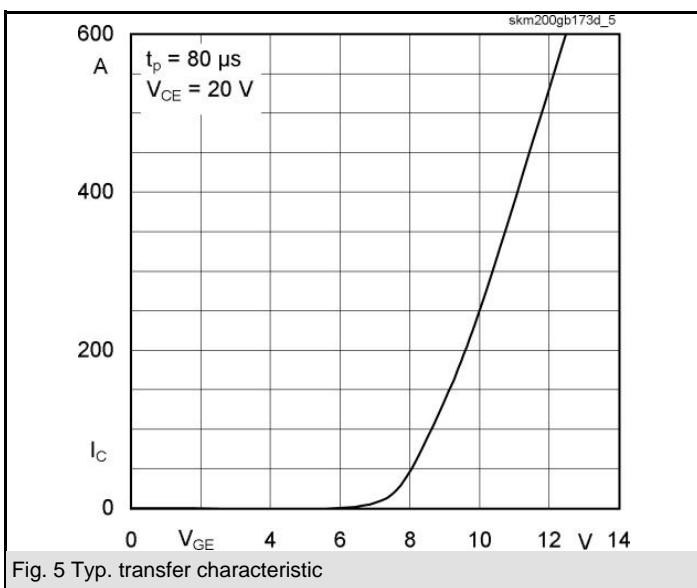
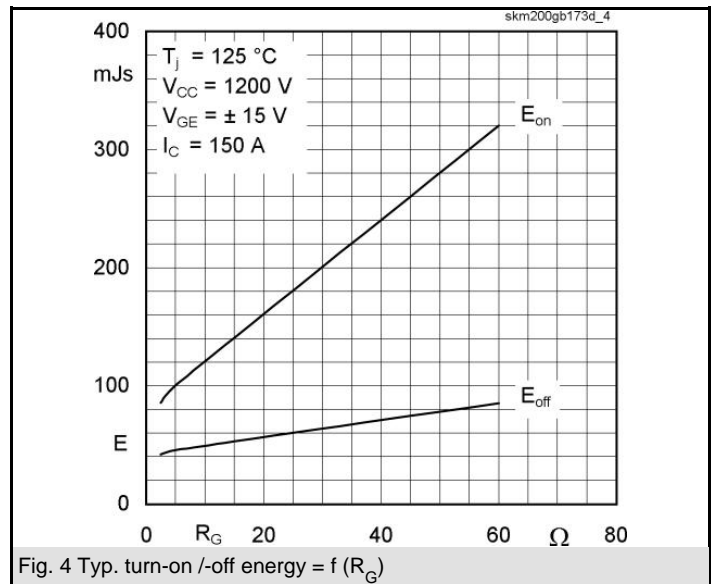
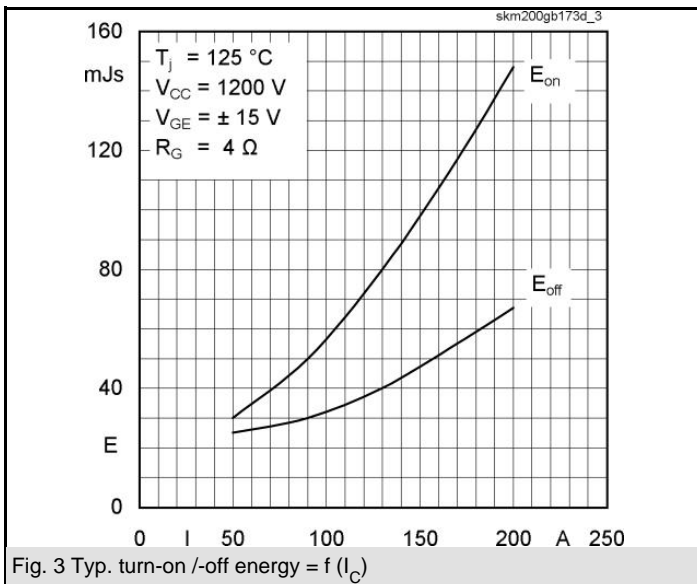
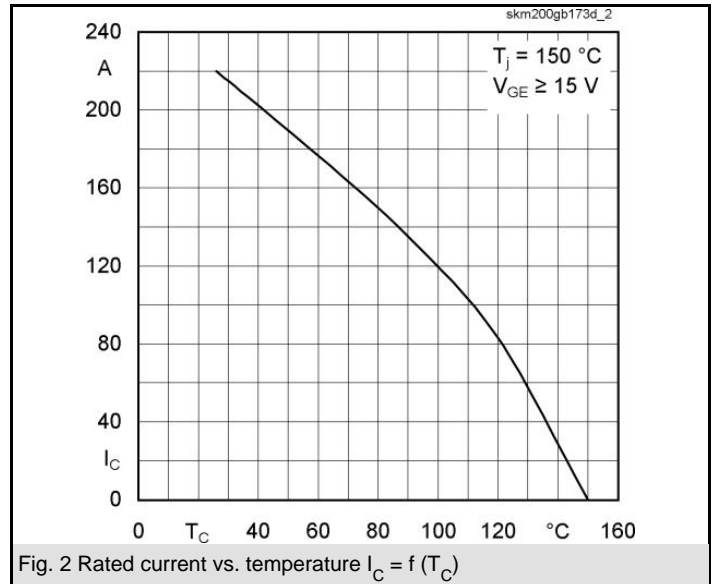
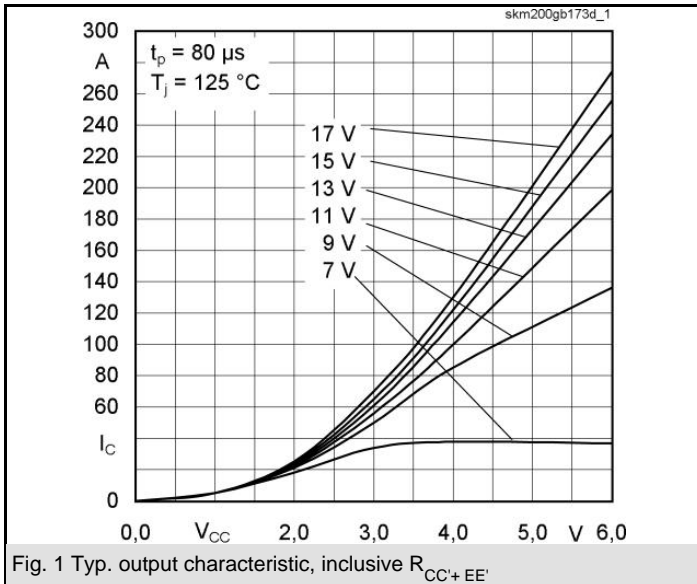
- MOS input (voltage controlled)
- N channel , Homogeneous Si
- Low inductance case
- Very low tail current with low temperature dependence
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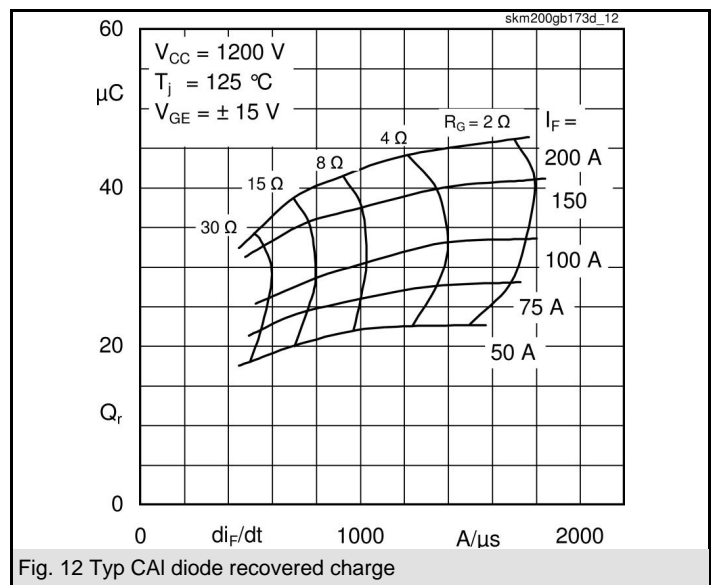
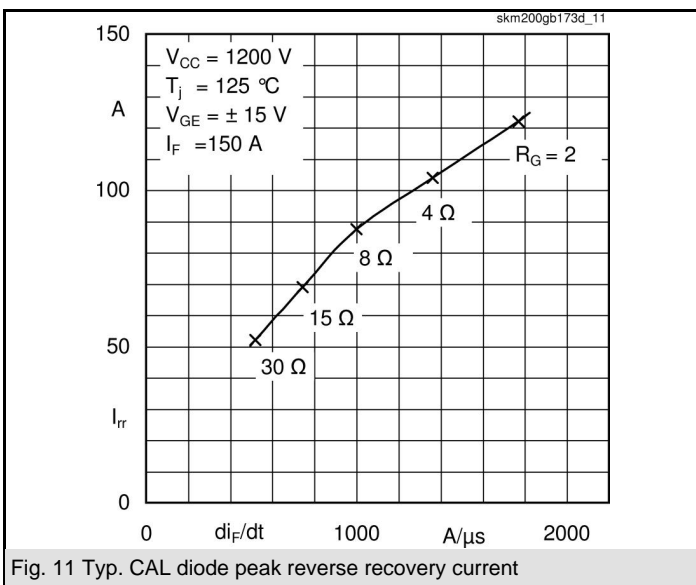
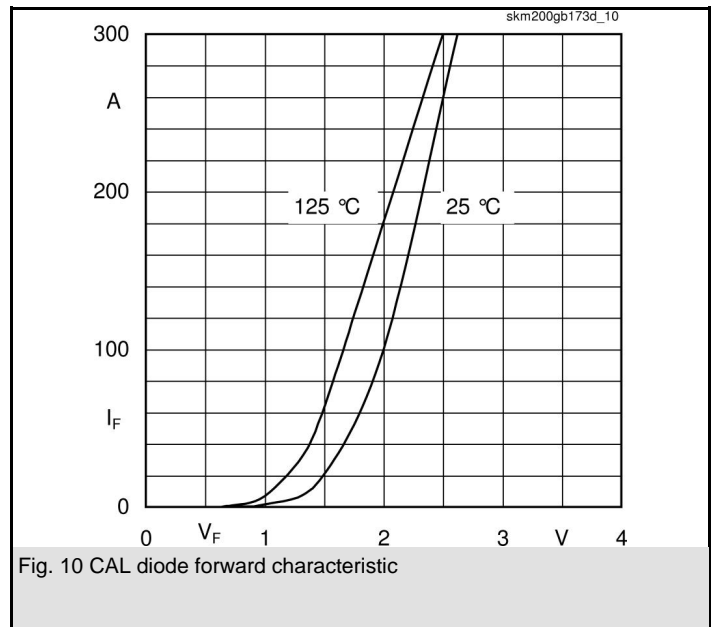
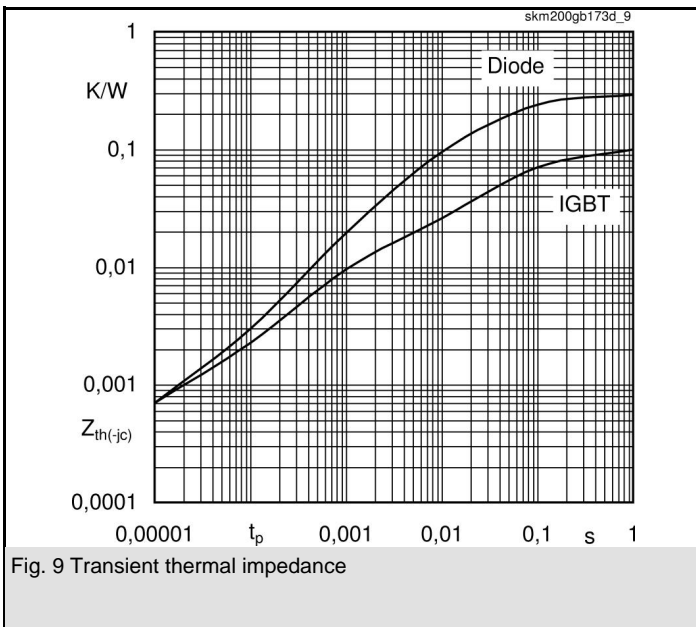
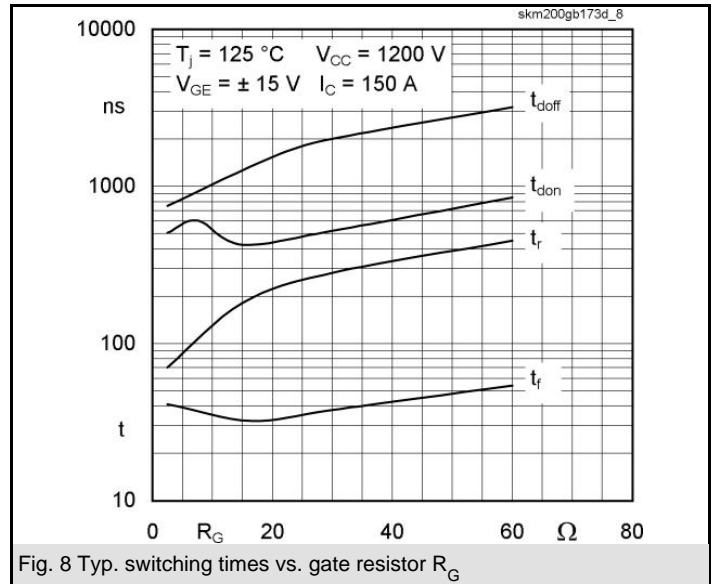
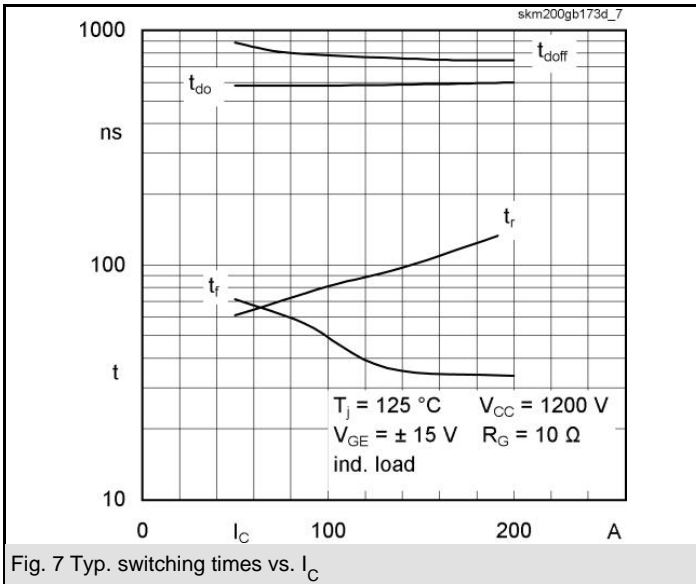
### Typical Applications\*

- 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)

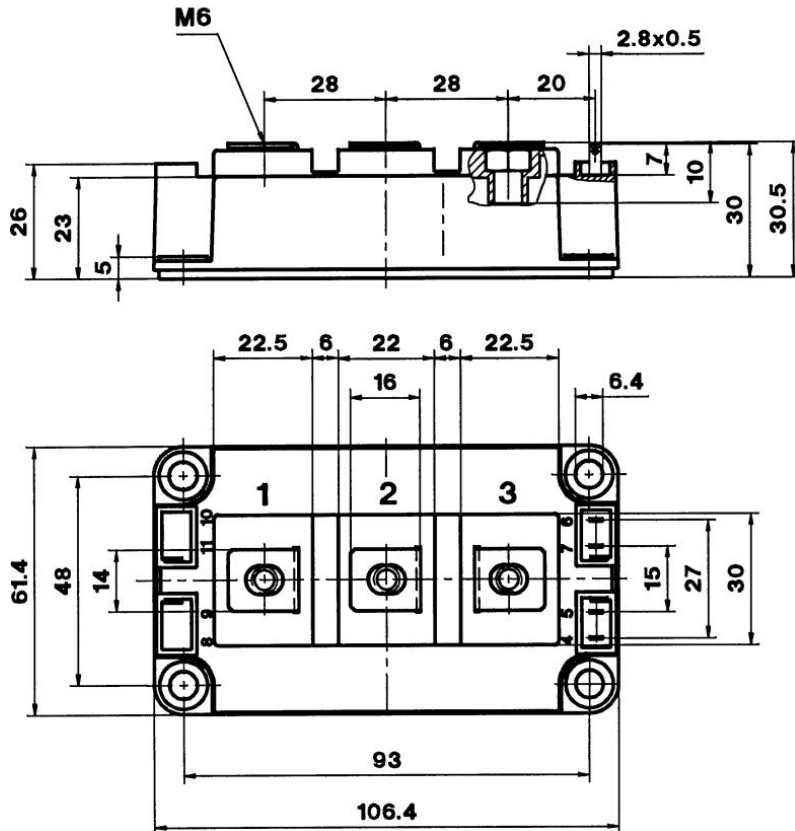
$Z_{th}$			
Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
$R_f$	i = 1	72	mk/W
$R_f$	i = 2	19	mk/W
$R_f$	i = 3	6,9	mk/W
$R_f$	i = 4	2,1	mk/W
$\tau_{u_i}$	i = 1	0,0946	s
$\tau_{u_i}$	i = 2	0,011	s
$\tau_{u_i}$	i = 3	0,0011	s
$\tau_{u_i}$	i = 4	0	s
$Z_{th(j-c)D}$			
$R_f$	i = 1	230	mk/W
$R_f$	i = 2	70	mk/W
$R_f$	i = 3	17	mk/W
$R_f$	i = 4	3	mk/W
$\tau_{u_i}$	i = 1	0,0839	s
$\tau_{u_i}$	i = 2	0,0069	s
$\tau_{u_i}$	i = 3	0,0028	s
$\tau_{u_i}$	i = 4	0,0002	s



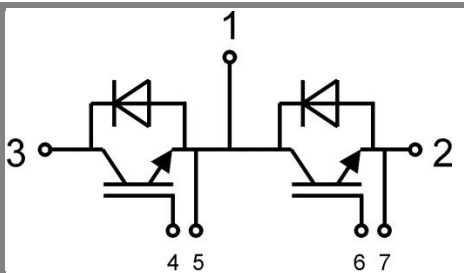




CASED56

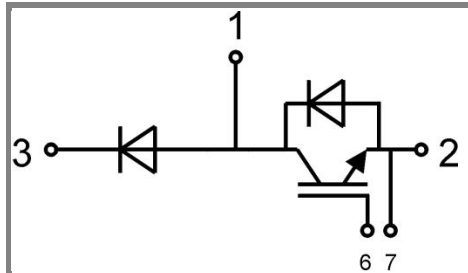


Case D 56



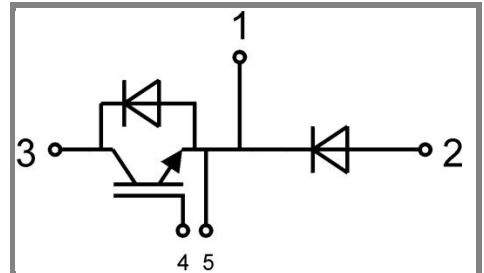
GB

Case D 56



GAL

Case D 57 (→ D 56)



GAR

Case D 58 (→ D 56)