

# SKM 150GB173D



**SEMITRANS® 3**

## IGBT Modules

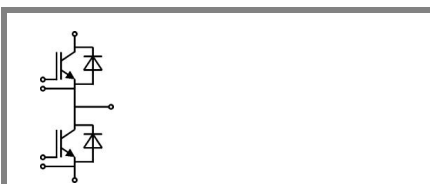
### SKM 150GB173D

#### 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
- Large clearance (13 mm) and creepage distances (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**

Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$ , unless otherwise specified		
Symbol	Conditions	Values		Units
<b>IGBT</b>				
$V_{CES}$	$T_j = 25^\circ\text{C}$	1700		V
$I_C$	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	150	A
		$T_{case} = 80^\circ\text{C}$	100	A
$I_{CRM}$	$I_{CRM} = 2 \times I_{Cnom}$	200		A
$V_{GES}$		$\pm 20$		V
$t_{psc}$	$V_{CC} = 1200\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125^\circ\text{C}$ $V_{CES} < 1700\text{ V}$	10		$\mu\text{s}$
<b>Inverse Diode</b>				
$I_F$	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	125	A
		$T_{case} = 80^\circ\text{C}$	80	A
$I_{FRM}$	$I_{FRM} = 2 \times I_{Fnom}$	200		A
$I_{FSM}$	$t_p = 10\text{ ms}; \text{sin.}$	$T_j = 150^\circ\text{C}$	1100	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		$T_c = 25^\circ\text{C}$ , unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT</b>					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 8\text{ mA}$	4,8	5,5	6,2	V
$I_{CES}$	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$	$T_j = 25^\circ\text{C}$	0,1	0,3	mA
		$T_j = 125^\circ\text{C}$	1,65	1,9	V
$V_{CE0}$			1,9	2,15	V
$r_{CE}$	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	17,5	20	$\text{m}\Omega$
		$T_j = 125^\circ\text{C}$	23	28,5	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 100\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	3,4	3,9	V
		$T_j = 125^\circ\text{C}_{chiplev.}$	4,2	5	V
$C_{res}$	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	16		nF
$C_{oes}$			1,3		nF
$C_{res}$			0,5		nF
$t_{d(on)}$	$R_{Gon} = 5\ \Omega$	$V_{CC} = 1200\text{ V}$ $I_{Cnom} = 100\text{ A}$	470		ns
$t_r$			90		ns
$E_{on}$	$R_{Goff} = 5\ \Omega$	$T_j = 125^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$	60		mJ
$t_{d(off)}$			650		ns
$t_f$			50		ns
$E_{off}$			32		mJ
$R_{th(j-c)}$	per IGBT			0,125	K/W

# SKM 150GB173D



**SEMITRANS® 3**

## IGBT Modules

**SKM 150GB173D**

### 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
- Large clearance (13 mm) and creepage distances (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**

### Characteristics

Symbol	Conditions	min.	typ.	max.	Units
<b>Inverse Diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 100 \text{ A}; V_{GE} = 0 \text{ V}$		2,2	2,7	V
			1,9	2,4	V
					V
$V_{F0}$			1,2	1,5	V
$r_F$			7	9	mΩ
$I_{RRM}$	$I_{Fnom} = 100 \text{ A}$		70		A
$Q_{rr}$	$di/dt = 1000 \text{ A}/\mu\text{s}$		27		μC
$E_{rr}$	$V_{GE} = -15 \text{ V}; V_{CC} = 1200 \text{ V}$				mJ
$R_{th(j-c)D}$	per diode			0,4	K/W
<b>Module</b>					
$L_{CE}$			15	20	nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25 \text{ °C}$	0,35		mΩ
		$T_{case} = 125 \text{ °C}$	0,5		mΩ
$R_{th(c-s)}$	per module			0,038	K/W
$M_s$	to heat sink M6		3	5	Nm
$M_t$	to terminals M6		2,5	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.

# SKM 150GB173D



**SEMITRANS® 3**

## IGBT Modules

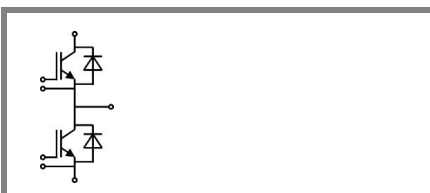
**SKM 150GB173D**

### 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
- Large clearance (13 mm) and creepage distances (20 mm)

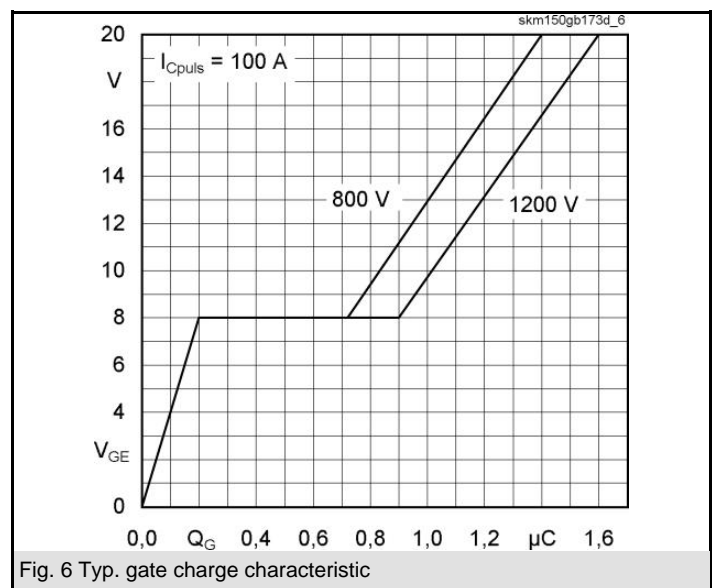
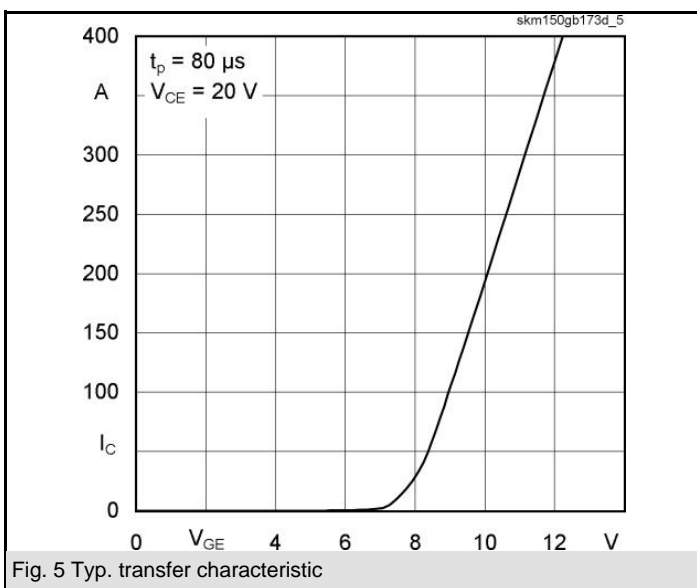
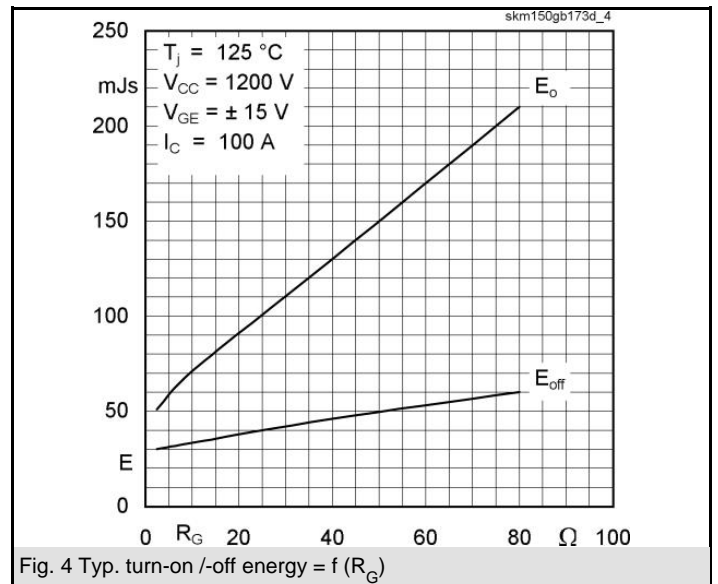
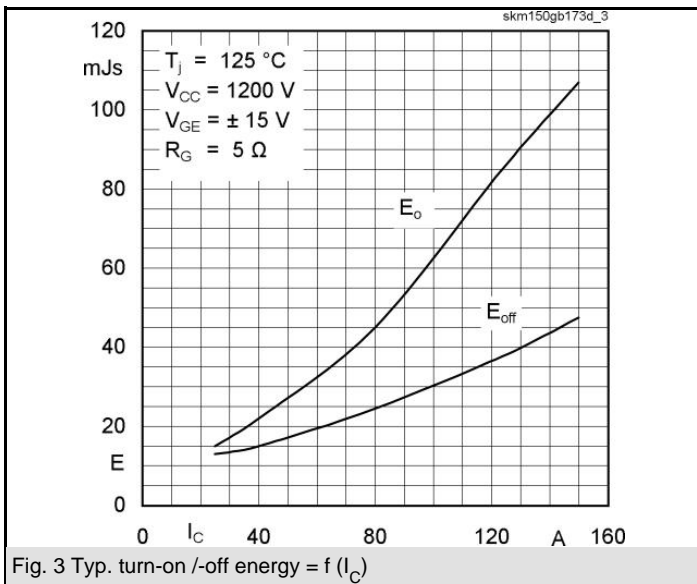
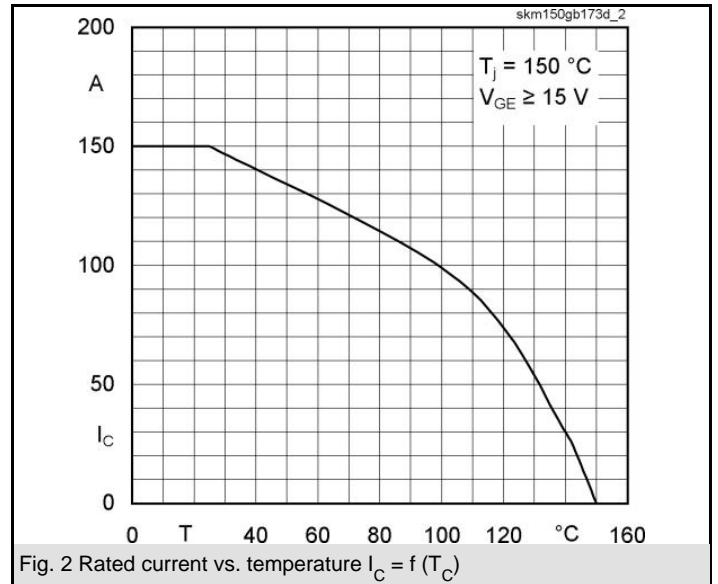
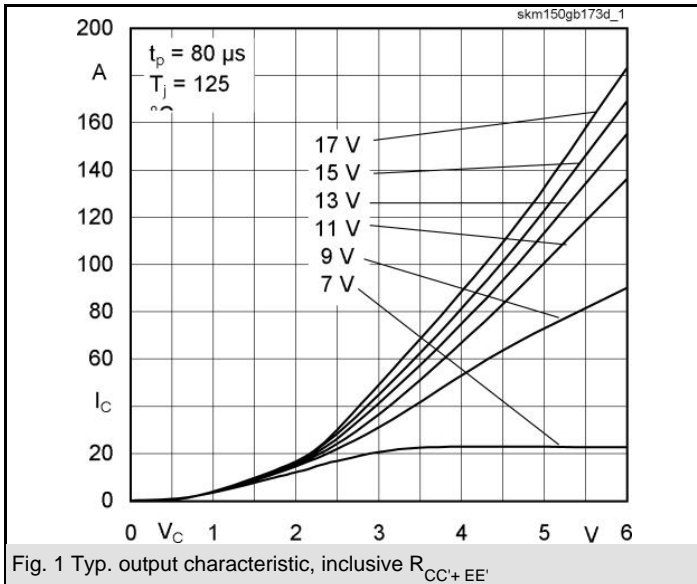
### Typical Applications

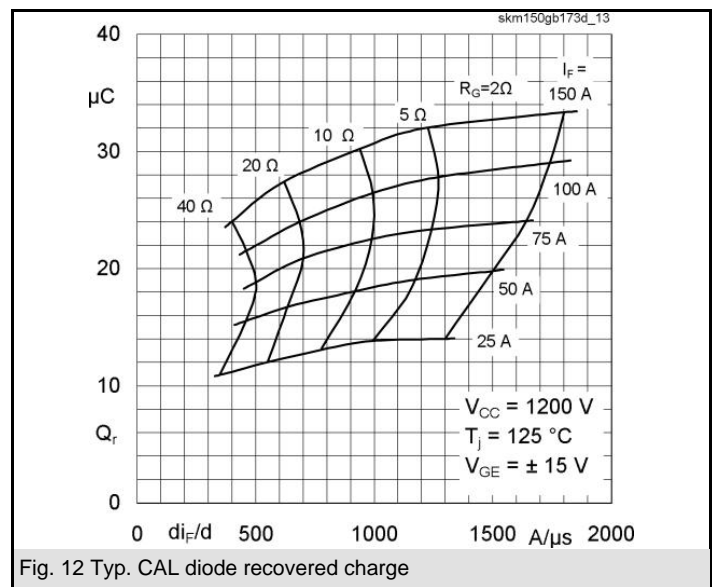
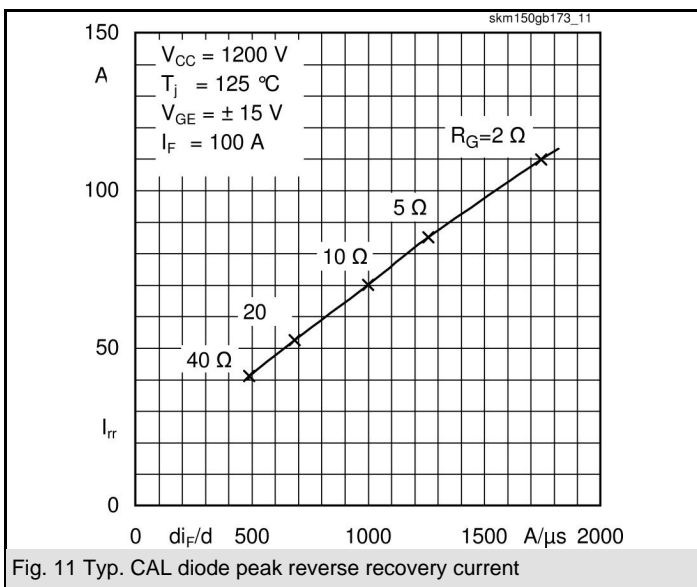
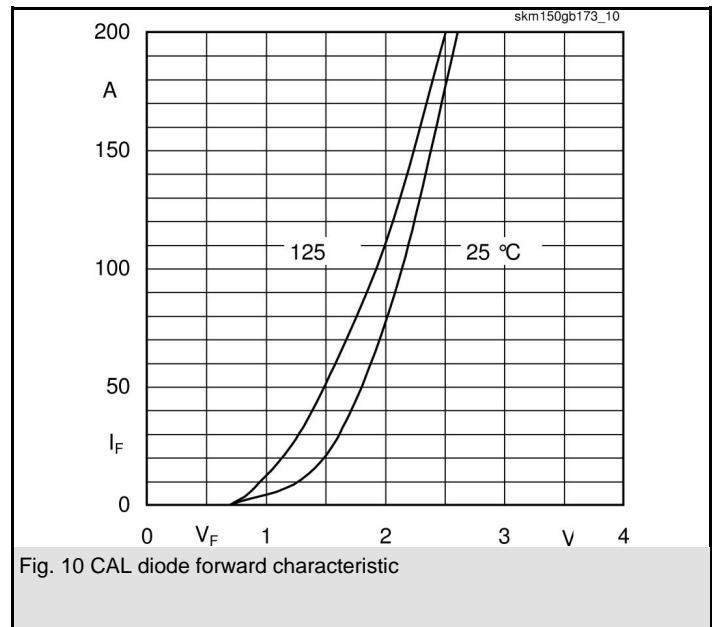
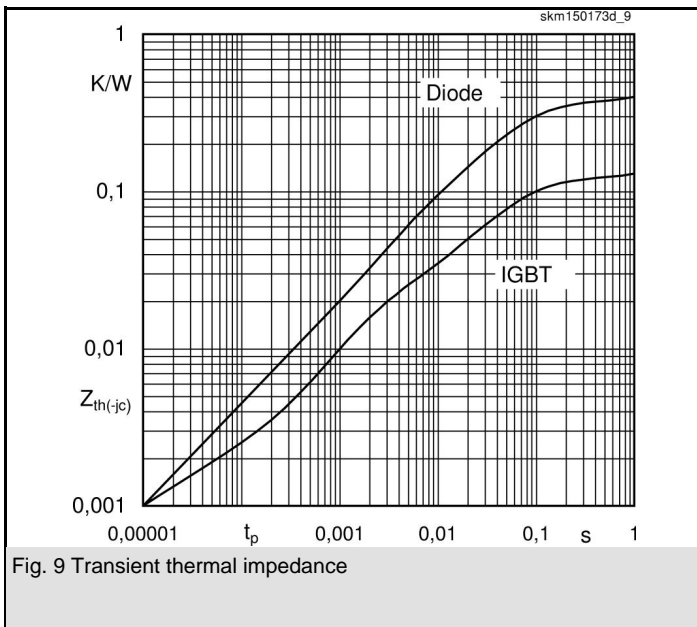
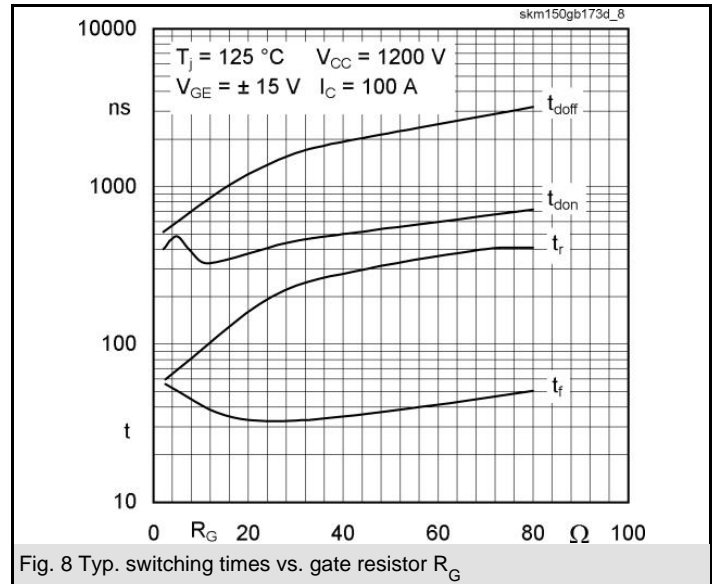
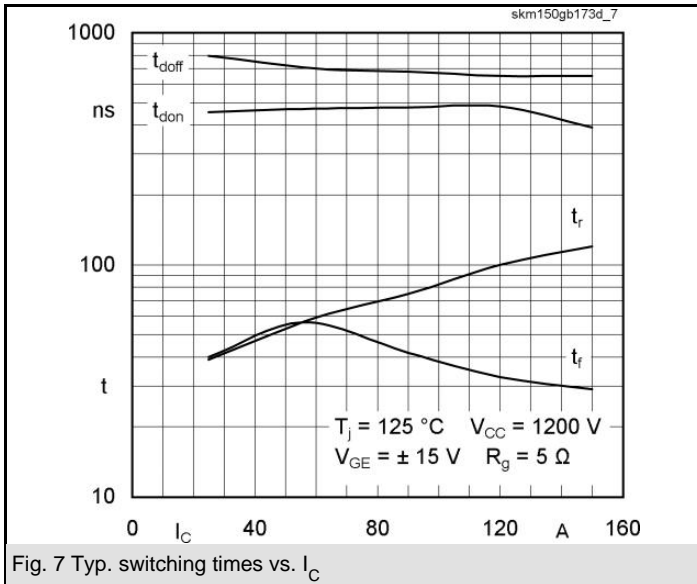
- AC inverter drives on mains 575 - 750 V<sub>AC</sub>
- DC bus voltage 750 - 1200 V<sub>DC</sub>
- Public transport (auxiliary syst.)
- Switching (not for linear use)



**GB**

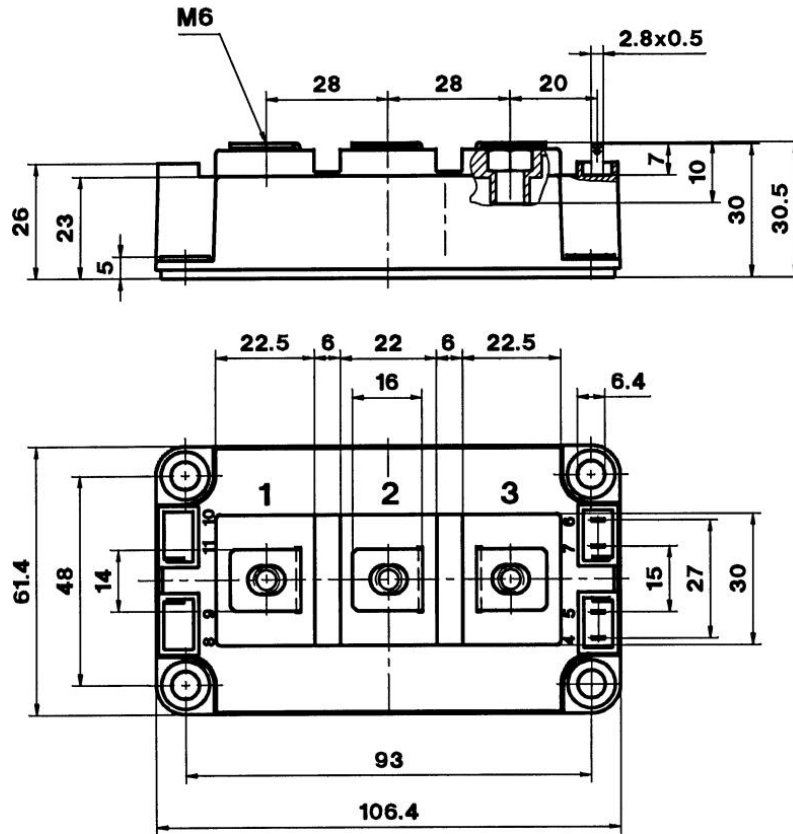
$Z_{th}$		Conditions	Values	Units
<b>Symbol</b>				
$Z_{th(j-c)I}$				
$R_{\theta j-c}$	$i = 1$		90	mk/W
$R_{\theta j-c}$	$i = 2$		25	mk/W
$R_{\theta j-c}$	$i = 3$		7,5	mk/W
$R_{\theta j-c}$	$i = 4$		2,5	mk/W
$\tau_{th(j-c)I}$	$i = 1$		0,0342	s
$\tau_{th(j-c)I}$	$i = 2$		0,046	s
$\tau_{th(j-c)I}$	$i = 3$		0,0018	s
$\tau_{th(j-c)I}$	$i = 4$		0	s
<b>Symbol</b>				
$Z_{th(j-c)D}$				
$R_{\theta j-c}$	$i = 1$		310	mk/W
$R_{\theta j-c}$	$i = 2$		70	mk/W
$R_{\theta j-c}$	$i = 3$		18	mk/W
$R_{\theta j-c}$	$i = 4$		2	mk/W
$\tau_{th(j-c)D}$	$i = 1$		0,0839	s
$\tau_{th(j-c)D}$	$i = 2$		0,0069	s
$\tau_{th(j-c)D}$	$i = 3$		0,0028	s
$\tau_{th(j-c)D}$	$i = 4$		0,0005	s



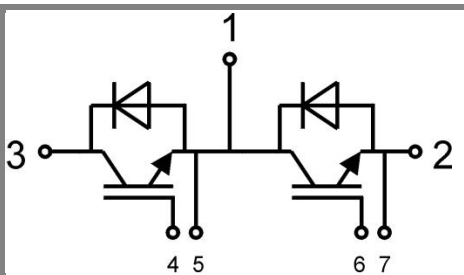


# SKM 150GB173D

CASED56



Case D 56



GB

Case D56