

SKM200GBD126D



SEMITRANS™ 3

Trench IGBT Modules

SKM 200GBD126D

Preliminary Data

Features

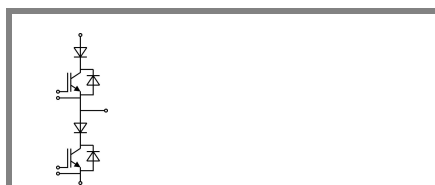
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_C$

Typical Applications*

- Matrix Converter
- Resonant Inverter
- Current Source Inverter

Remarks

- The Fig.1 to Fig.9 are based on measurements of the SKM200GB126D
- The series diodes (FWD) have the data of the inverse diodes of SKM 300GB126D



GBD

Absolute Maximum Ratings		$T_{case} = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V_{CES}	$T_j = 25^\circ\text{C}$	1200		V
I_C	$T_j = 150^\circ\text{C}$	$T_c = 25^\circ\text{C}$	240	A
		$T_c = 80^\circ\text{C}$	170	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	480		A
V_{GES}		± 20		V
t_{psc}	$V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125^\circ\text{C}$ $V_{CES} < 1200\text{ V}$	10		µs
Inverse Diode				
I_F	$T_j = ^\circ\text{C}$	$T_c = 25^\circ\text{C}$	25	A
		$T_c = 80^\circ\text{C}$	15	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	50		A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150^\circ\text{C}$	200	A
Freewheeling Diode				
I_F	$T_j = ^\circ\text{C}$	$T_c = 25^\circ\text{C}$	250	A
		$T_c = 80^\circ\text{C}$	170	A
I_{FRM}		480		A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150^\circ\text{C}$	720	A
Module				
$I_{t(RMS)}$		500		A
T_{vj}		- 40 ... +150 (125)		°C
T_{stg}		125		°C
V_{isol}	AC, 1 min.	4000		V

Characteristics		$T_{case} = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 6\text{ mA}$	5	5,8	6,5	V
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$	$T_j = 25^\circ\text{C}$	1,3		mA
		$T_j = 125^\circ\text{C}$			mA
V_{CE0}		$T_j = 25^\circ\text{C}$	1	1,2	V
		$T_j = 125^\circ\text{C}$	0,9	1,1	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	4,7	6,3	mΩ
		$T_j = 125^\circ\text{C}$	7,3	9	mΩ
$V_{CE(sat)}$	$I_{Cnom} = 150\text{ A}, V_{GE} = 15\text{ V}$	$T_j = ^\circ\text{C}_{chiplev.}$	1,7	2,15	V
C_{ies}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	10,8		nF
C_{oes}			0,9		nF
C_{res}			0,9		nF
$t_{d(on)}$	$R_{Gon} = 1,5\ \Omega$	$V_{CC} = 600\text{ V}$ $I_C = 150\text{ A}$	260		ns
t_r			40		ns
E_{on}	$R_{Goff} = 5\ \Omega$	$T_j = 125^\circ\text{C}$	18		mJ
$t_{d(off)}$			540		ns
t_f			110		ns
E_{off}			24		mJ
$R_{th(j-c)}$	per IGBT	0,13		K/W	



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Typical Applications*

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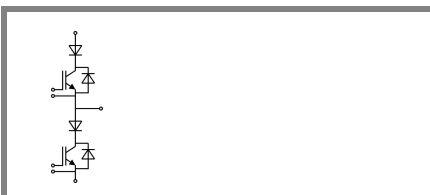
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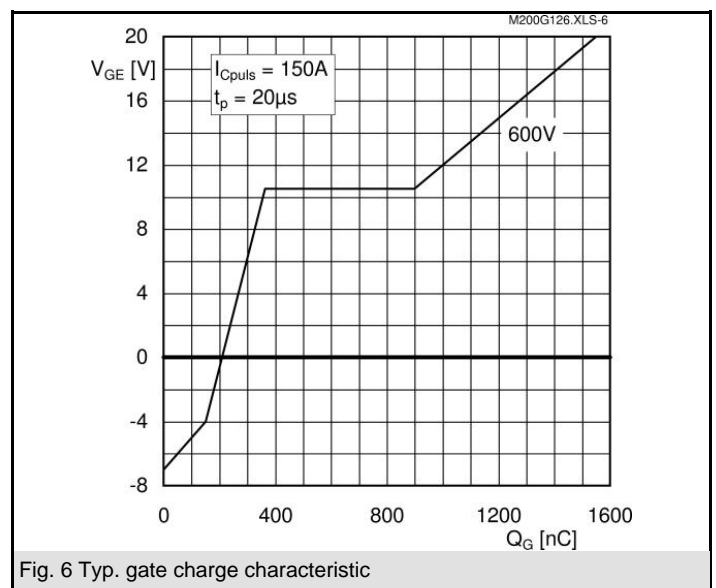
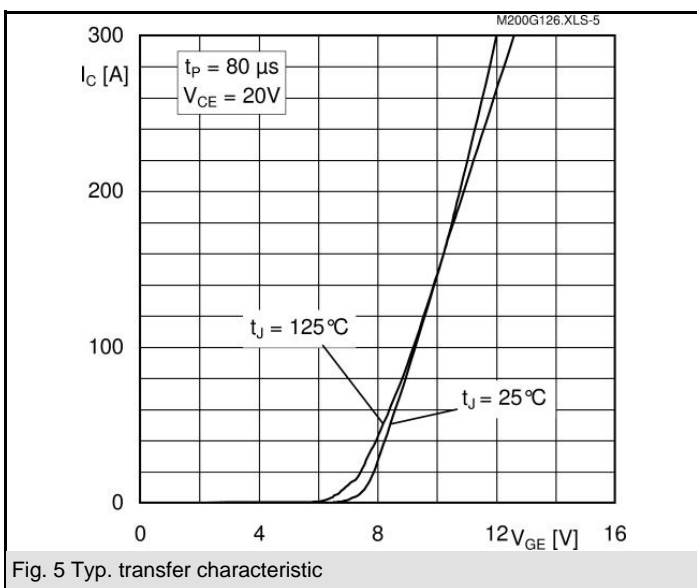
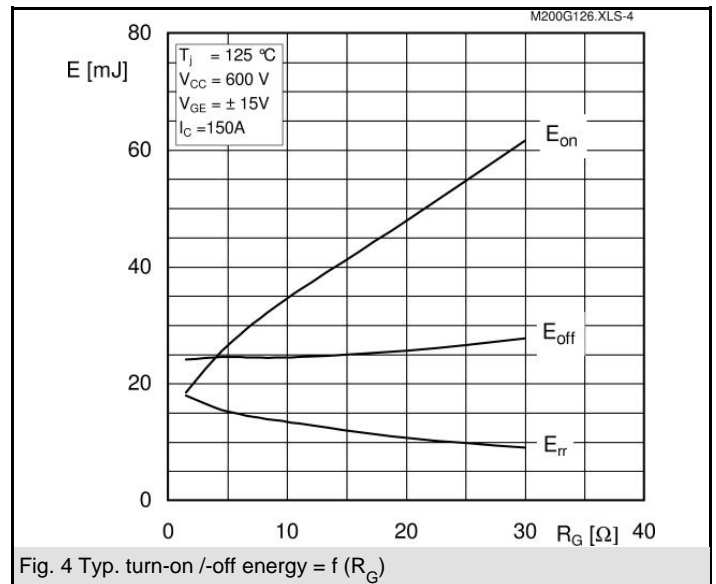
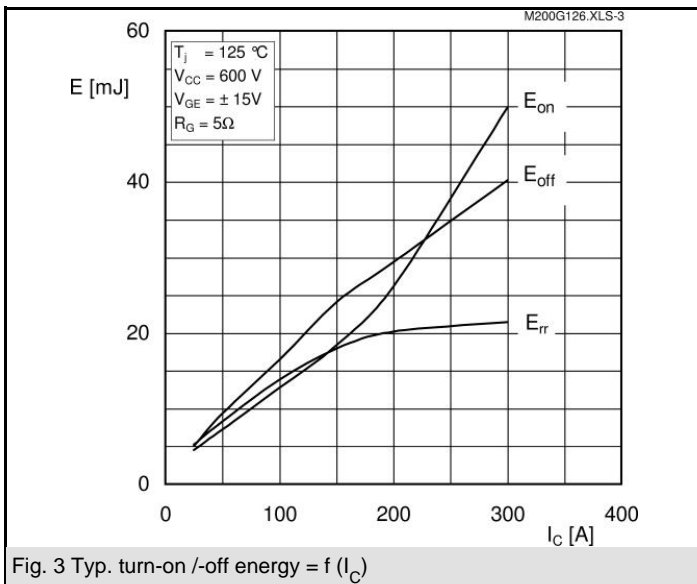
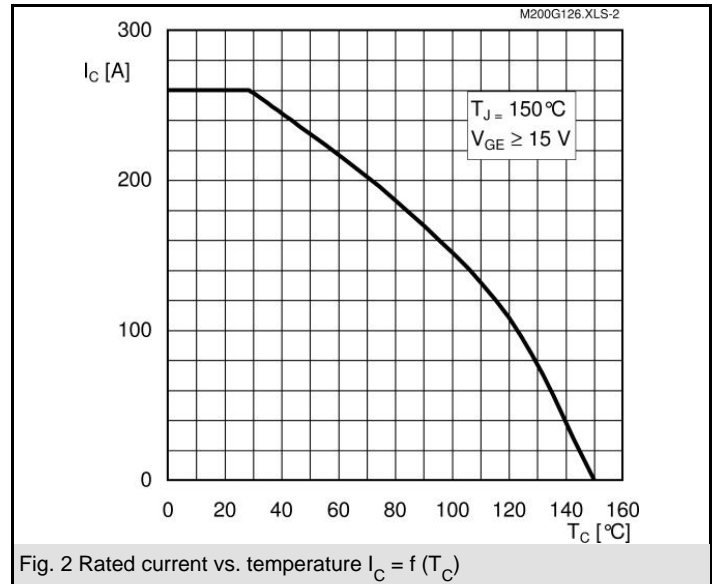
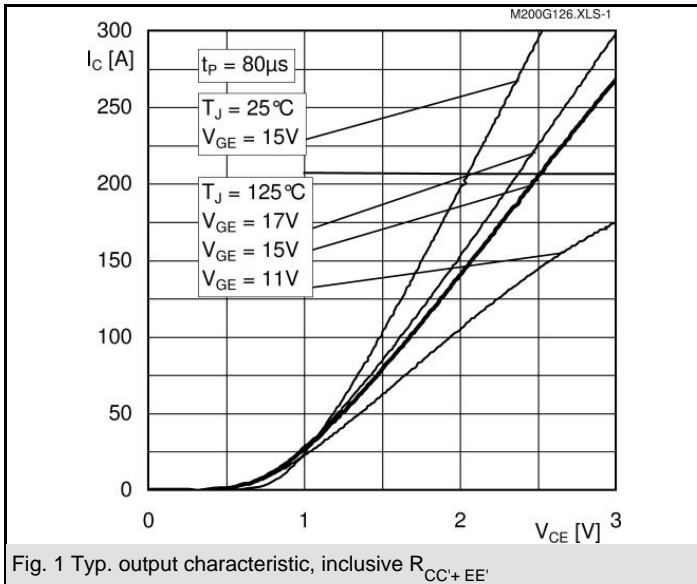
Characteristics			min.	typ.	max.	Units
Symbol	Conditions					
Inverse diode						
$V_F = V_{EC}$	$I_{Fnom} = 15 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$		2	2,5	V
		$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$		1,8		V
V_{F0}		$T_j = 25 \text{ }^\circ\text{C}$				V
		$T_j = 125 \text{ }^\circ\text{C}$			1,2	V
r_F		$T_j = 25 \text{ }^\circ\text{C}$				mΩ
		$T_j = 125 \text{ }^\circ\text{C}$		45	70	mΩ
I_{RRM}	$I_F = 15 \text{ A}$	$T_j = 25 \text{ }^\circ\text{C}$		12		A
Q_{rr}	$di/dt = 150 \text{ A}/\mu\text{s}$			1		μC
E_{rr}	$V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$					mJ
$R_{th(j-c)D}$	per diode				1,5	K/W
FWD						
$V_F = V_{EC}$	$I_{Fnom} = 200 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$		1,6	1,8	V
		$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$		1,6	1,8	V
V_{F0}		$T_j = 25 \text{ }^\circ\text{C}$		1	1,1	V
		$T_j = 125 \text{ }^\circ\text{C}$		0,8	0,9	V
r_F		$T_j = 25 \text{ }^\circ\text{C}$		3	3,5	V
		$T_j = 125 \text{ }^\circ\text{C}$		4	4,5	V
I_{RRM}	$I_F = 200 \text{ A}$	$T_j = 25 \text{ }^\circ\text{C}$		290		A
Q_{rr}	$di/dt = 6200 \text{ A}/\mu\text{s}$			44		μC
E_{rr}	$V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$			18		mJ
$R_{th(j-c)FD}$	per diode				0,25	K/W
Module						
L_{CE}					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			3	5	Nm
M_t	to terminals			2,5	5	Nm
w					325	g

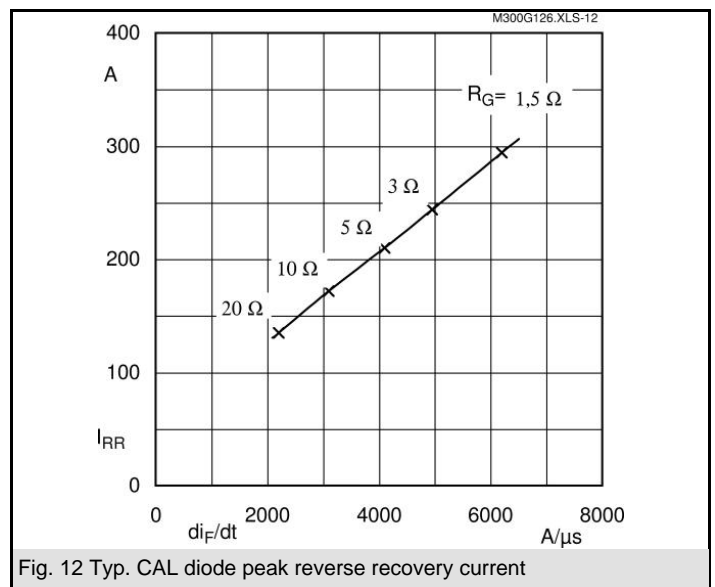
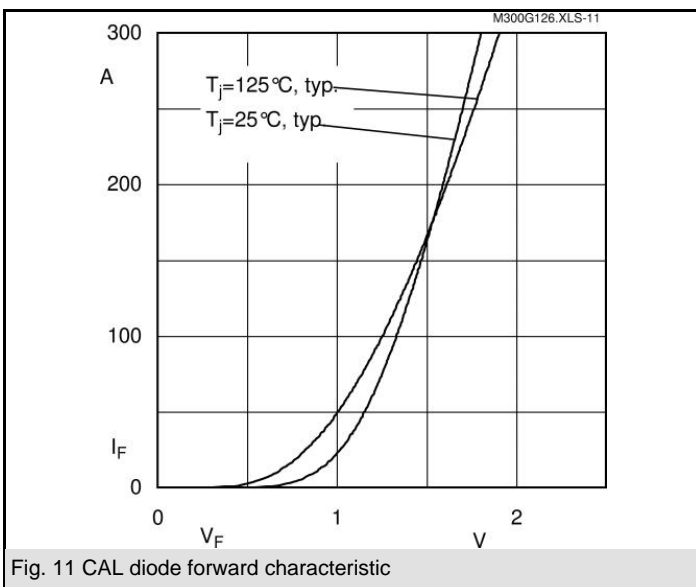
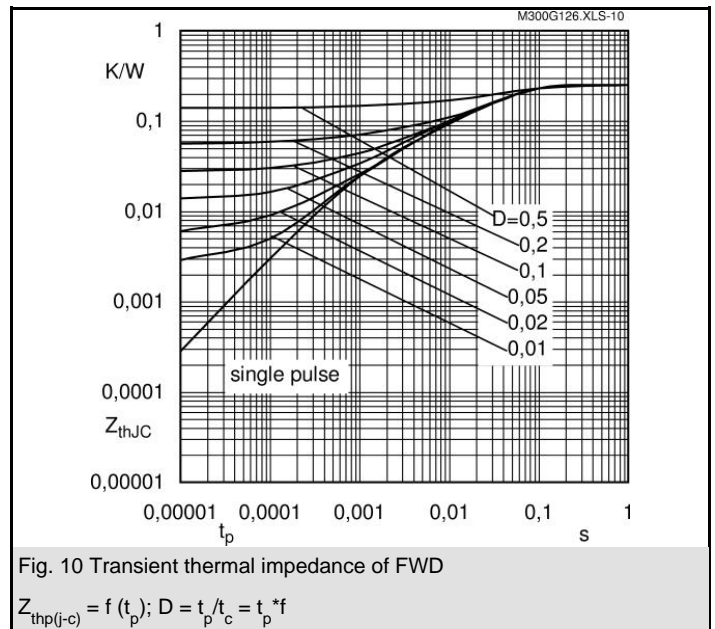
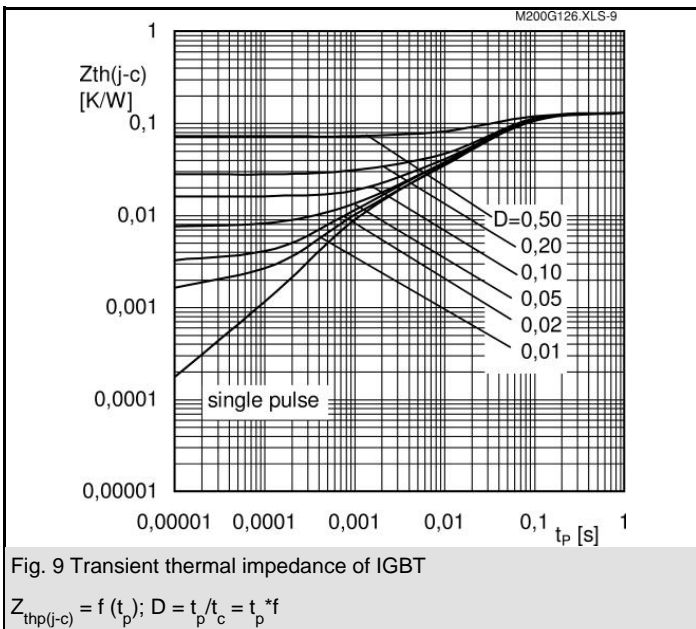
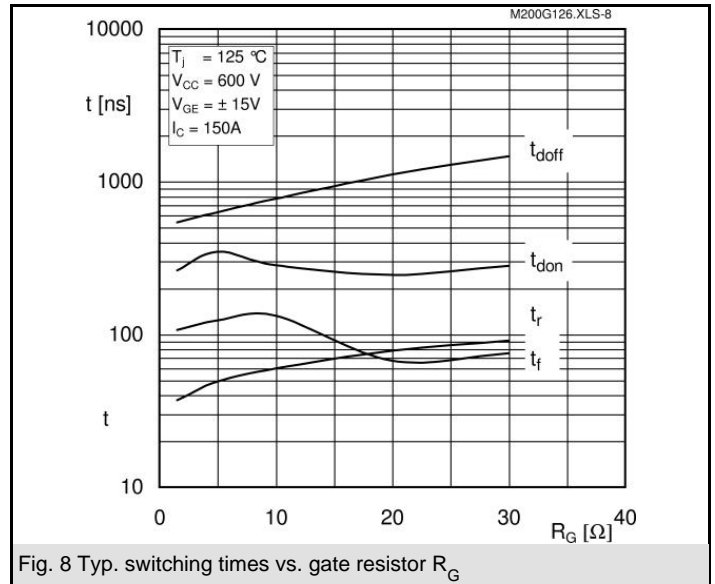
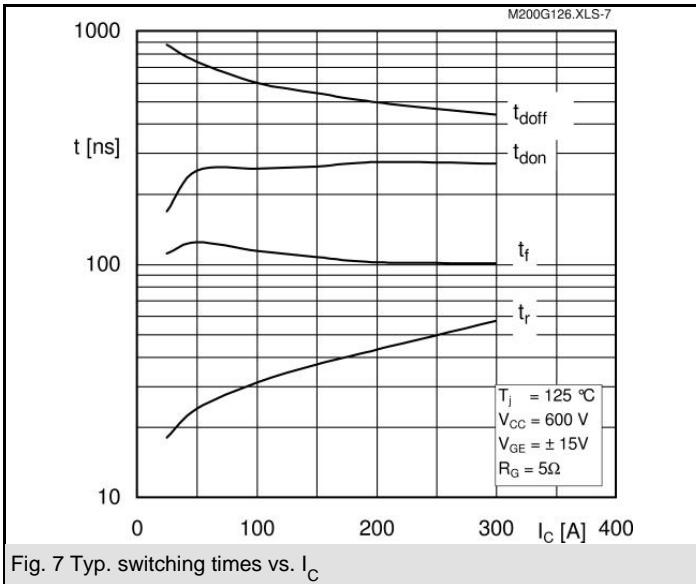
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

* 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.



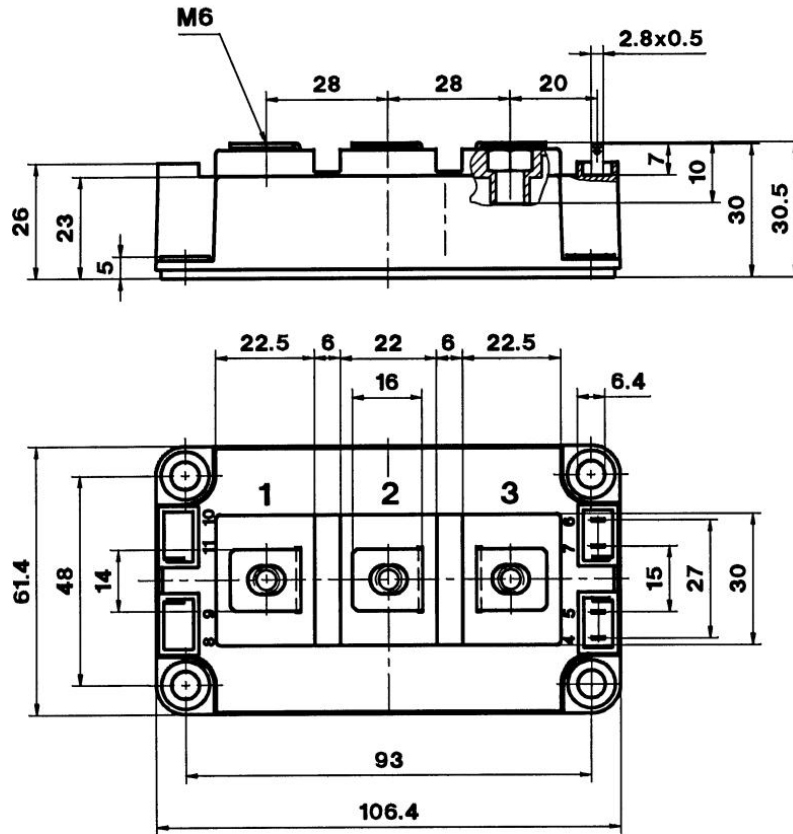
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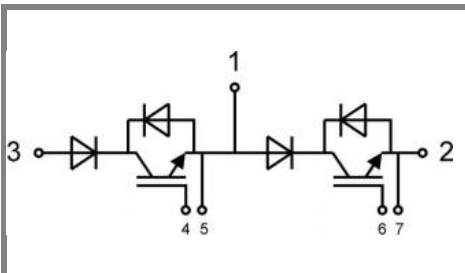


SKM200GBD126D

CASED56



Case D 56



Case D56

GBD