

SKM 150GB123D

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SEMITRANS® 3

IGBT Modules

SKM 150GB123D

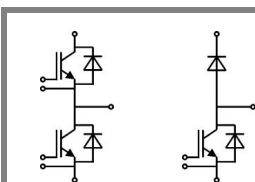
SKM 150GAL123D

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 (12 mm) and creepage distances (20 mm)

Typical Applications

- AC inverter drives
- UPS



GB

GAL

Absolute Maximum Ratings		$T_c = 25\text{ }^{\circ}\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}	$T_j = 25\text{ }^{\circ}\text{C}$	1200	V
I_C	$T_j = 150\text{ }^{\circ}\text{C}$	$T_{case} = 25\text{ }^{\circ}\text{C}$	A
		$T_{case} = 80\text{ }^{\circ}\text{C}$	A
I_{CRM}	$I_{CRM}=2 \times I_{Cnom}$	200	A
V_{GES}		± 20	V
t_{psc}	$V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125\text{ }^{\circ}\text{C}$ $V_{CES} < 1200\text{ V}$	10	μs
Inverse Diode			
I_F	$T_j = 150\text{ }^{\circ}\text{C}$	$T_{case} = 25\text{ }^{\circ}\text{C}$	A
		$T_{case} = 80\text{ }^{\circ}\text{C}$	A
I_{FRM}	$I_{FRM}=2 \times I_{Fnom}$	200	A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150\text{ }^{\circ}\text{C}$	A
Freewheeling Diode			
I_F	$T_j = 150\text{ }^{\circ}\text{C}$	$T_{case} = 25\text{ }^{\circ}\text{C}$	A
		$T_{case} = 80\text{ }^{\circ}\text{C}$	A
I_{FRM}		300	A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150\text{ }^{\circ}\text{C}$	A
Module			
$I_{t(RMS)}$		500	A
T_{vj}		- 40 ... + 150	$^{\circ}\text{C}$
T_{stg}		-40 ... + 125	$^{\circ}\text{C}$
V_{isol}	AC, 1 min.	2500	V

Characteristics		$T_c = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 4\text{ mA}$	4,5	5,5	6,5	V
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$		0,1	0,3	$T_j = 25^\circ\text{C}$ mA
					$T_j = 125^\circ\text{C}$ mA
V_{CE0}			1,4	1,6	$T_j = 25^\circ\text{C}$ V
					$T_j = 125^\circ\text{C}$ V
r_{CE}	$V_{GE} = 15\text{ V}$		11	14	$T_j = 25^\circ\text{C}$ $m\Omega$
					$T_j = 125^\circ\text{C}$ $m\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 100\text{ A}, V_{GE} = 15\text{ V}$		2,5	3	$T_j = ^\circ\text{C}_{chipleve.}$ V
C_{ies}	$V_{CE} = 25, V_{GE} = 0\text{ V}$		6,5	8,5	nF
C_{oes}			1	1,5	nF
C_{res}			0,5	0,6	nF
Q_G	$V_{GE} = -8\text{ V} - +20\text{ V}$		1000		nC
R_{Gint}	$T_j = ^\circ\text{C}$		2,5		Ω
$t_{d(on)}$	$R_{Gon} = 6,8\ \Omega$	$V_{CC} = 600\text{ V}$ $I_{Cnom} = 100\text{ A}$	160	320	ns
t_r			80	160	ns
E_{on}	$R_{Goff} = 6,8\ \Omega$	$T_j = 125^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$	13		mJ
$t_{d(off)}$			400	520	ns
t_f			70	100	ns
E_{off}	per IGBT		11		mJ
$R_{th(j-c)}$				0,15	K/W

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Typical Applications

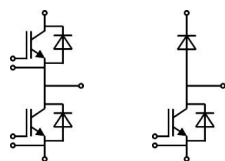
- AC inverter drives
- UPS

Characteristics

Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 100 \text{ A}; V_{GE} = 0 \text{ V}$ $T_j = 25^\circ\text{C}_{chiplev.}$ $T_j = 125^\circ\text{C}_{chiplev.}$		2 1,8	2,5	V V
V_{F0}	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$		1,1	1,2	V V
r_F	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$		9	13	mΩ mΩ
I_{RRM} Q_{rr} E_{rr}	$I_{Fnom} = 100 \text{ A}$ $di/dt = 1000 \text{ A}/\mu\text{s}$ $V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$		50 5		A μC mJ
$R_{th(j-c)D}$	per diode			0,3	K/W
Freewheeling Diode					
$V_F = V_{EC}$	$I_{Fnom} = 150 \text{ A}; V_{GE} = 0 \text{ V}$ $T_j = 25^\circ\text{C}_{chiplev.}$ $T_j = 125^\circ\text{C}_{chiplev.}$		2 1,8	2,5	V V
V_{F0}	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$		1,1	1,2	V V
r_F	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$		6	8,7	V V
I_{RRM} Q_{rr} E_{rr}	$I_{Fnom} = 100 \text{ A}$ $V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$		40 5		A μC mJ
$R_{th(j-c)FD}$	per diode			0,25	K/W
Module					
L_{CE}			15	20	nH
$R_{CC'+EE'}$	res., terminal-chip $T_{case} = 25^\circ\text{C}$ $T_{case} = 125^\circ\text{C}$		0,35 0,5		mΩ 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.



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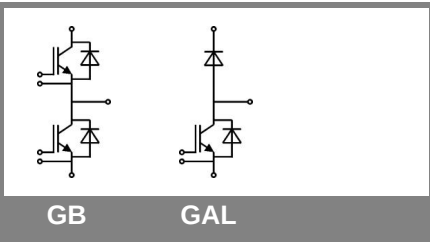
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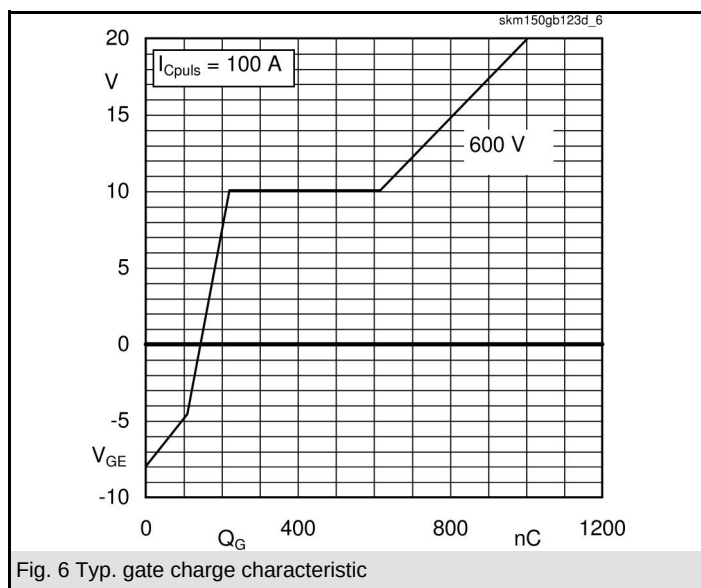
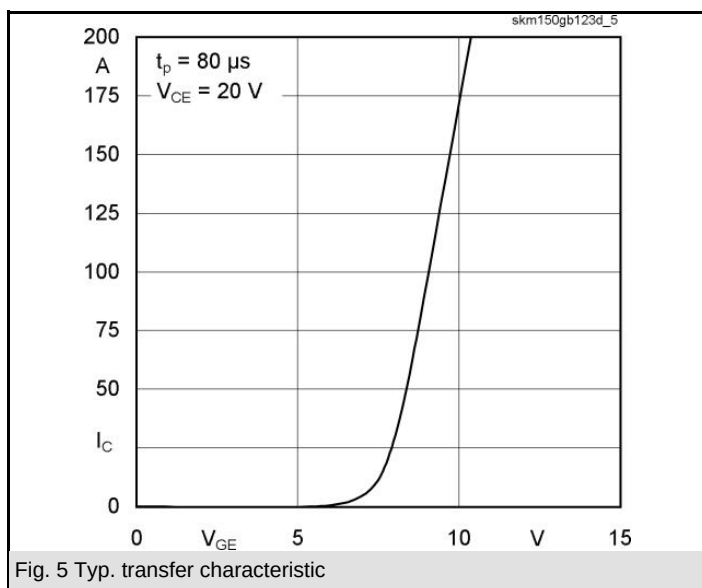
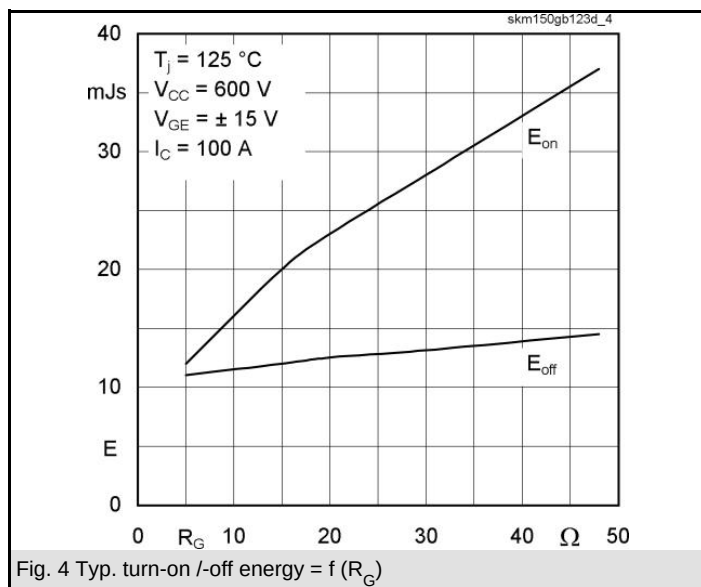
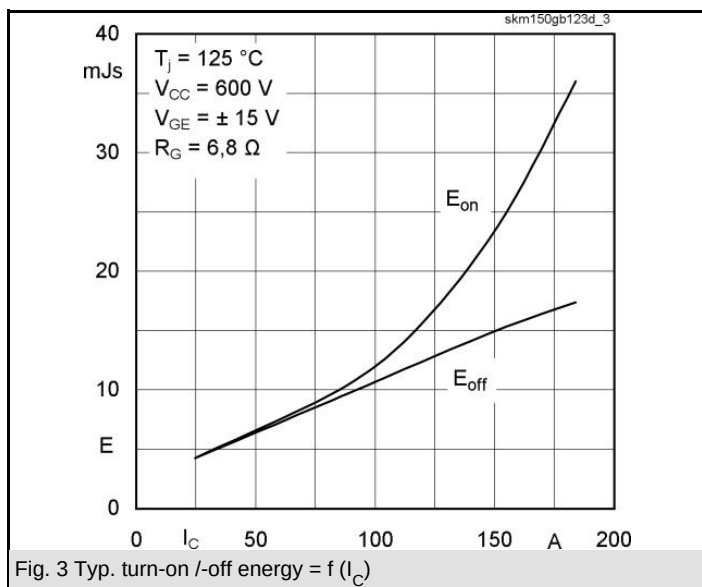
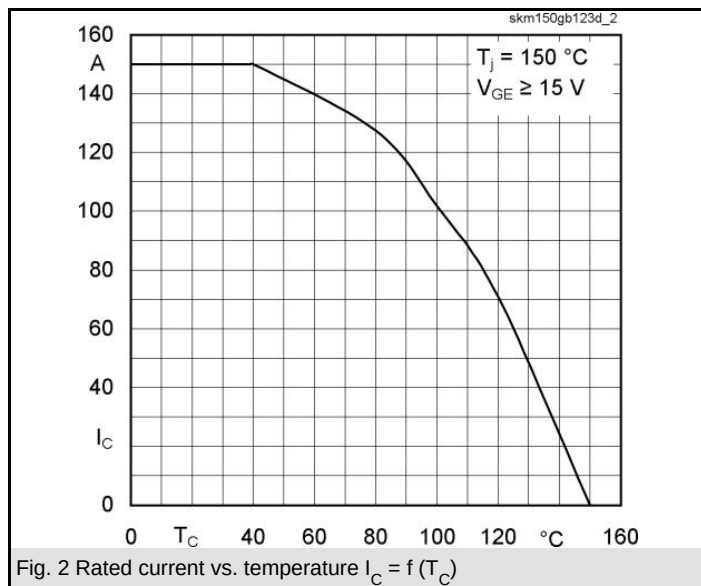
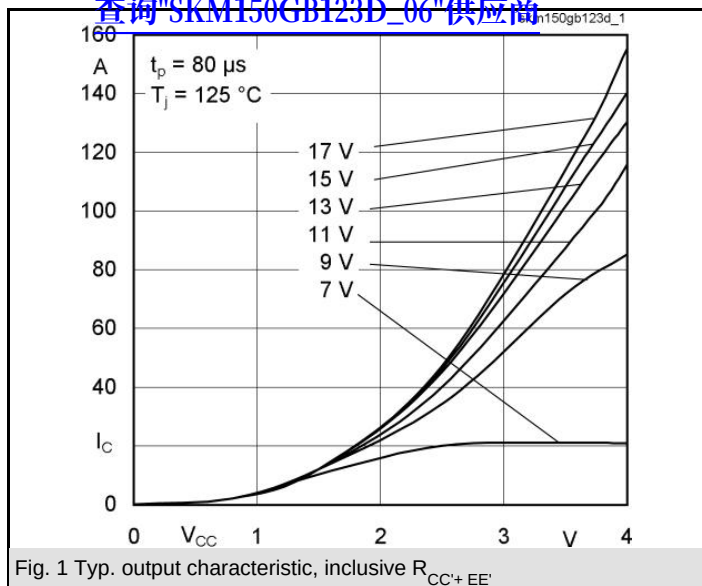
Typical Applications

- AC inverter drives
- UPS

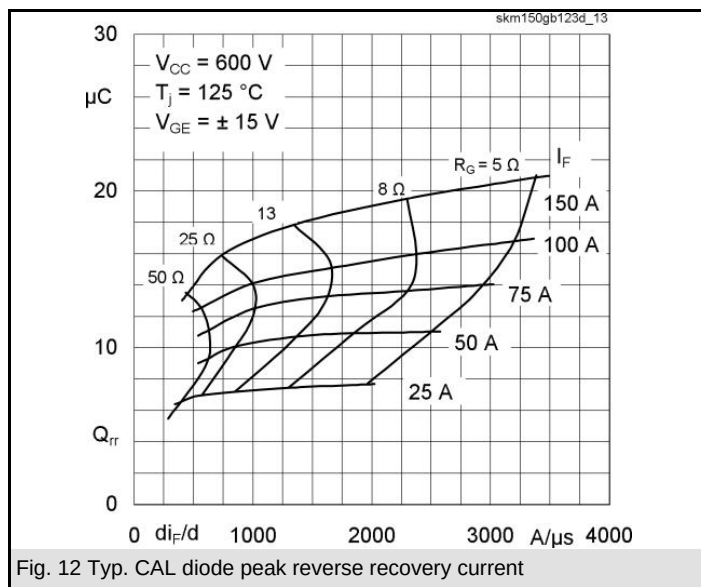
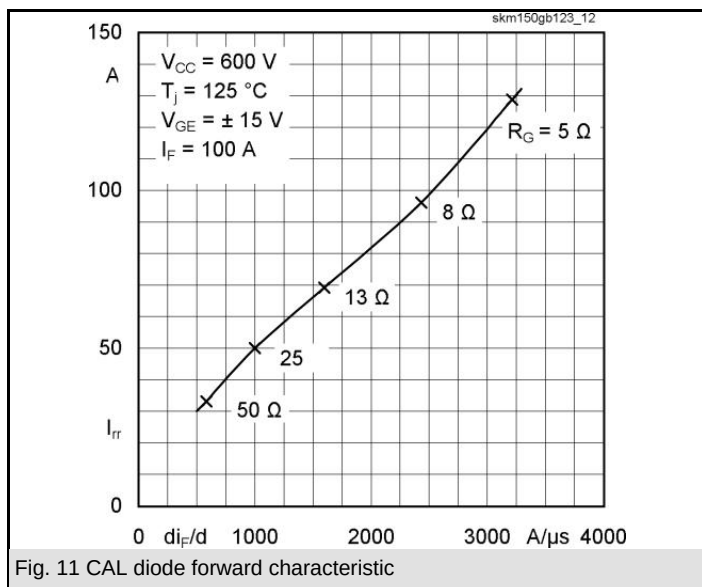
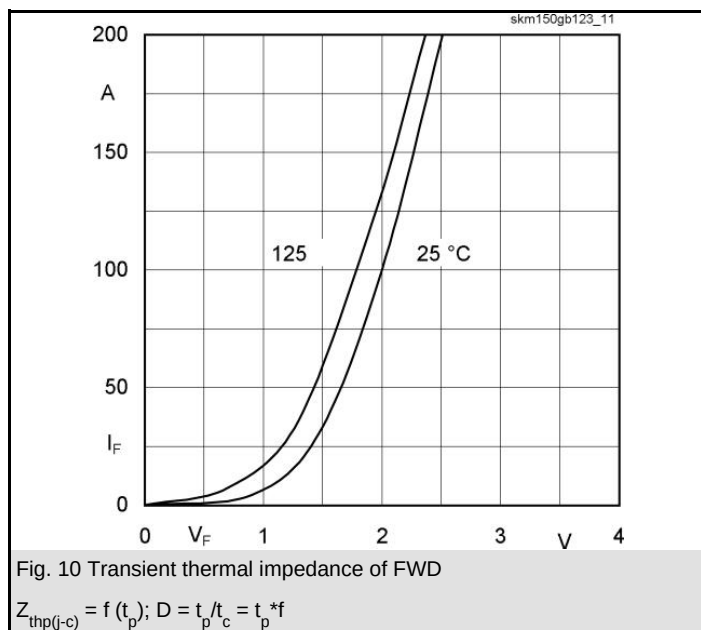
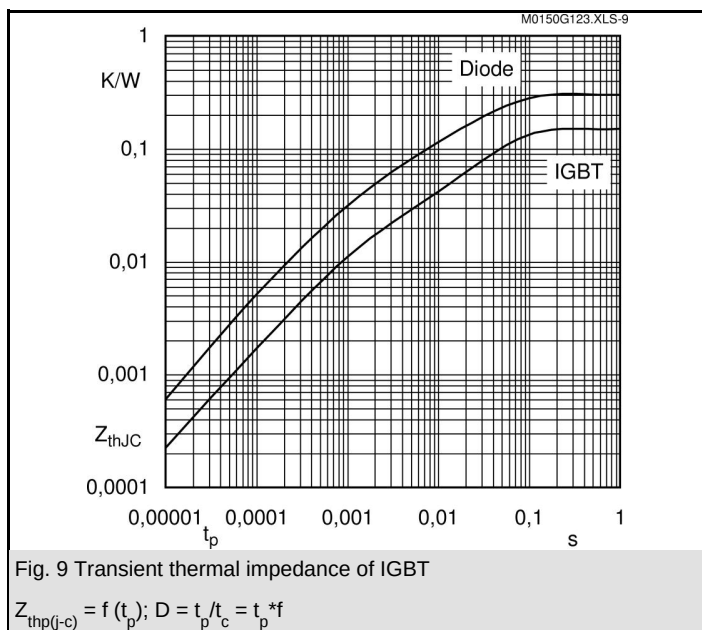
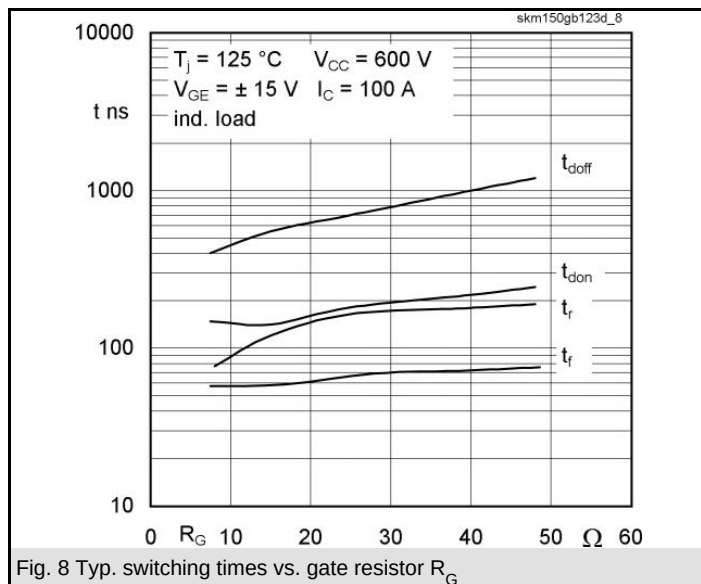
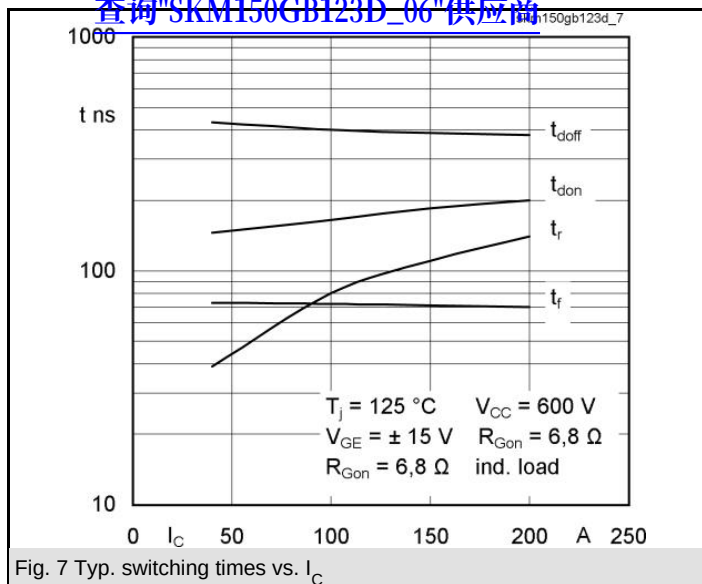
Symbol	Conditions	Values	Units
Z_{th(j-c)I}			
R _i	i = 1	105	mk/W
R _i	i = 2	35	mk/W
R _i	i = 3	8	mk/W
R _i	i = 4	2	mk/W
tau _i	i = 1	0,03	s
tau _i	i = 2	0,03	s
tau _i	i = 3	0,0014	s
tau _i	i = 4	0,0001	s
Z_{th(j-c)D}			
R _i	i = 1	210	mk/W
R _i	i = 2	70	mk/W
R _i	i = 3	16	mk/W
R _i	i = 4	4	mk/W
tau _i	i = 1	0,0623	s
tau _i	i = 2	0,0083	s
tau _i	i = 3	0,003	s
tau _i	i = 4	0,0002	s



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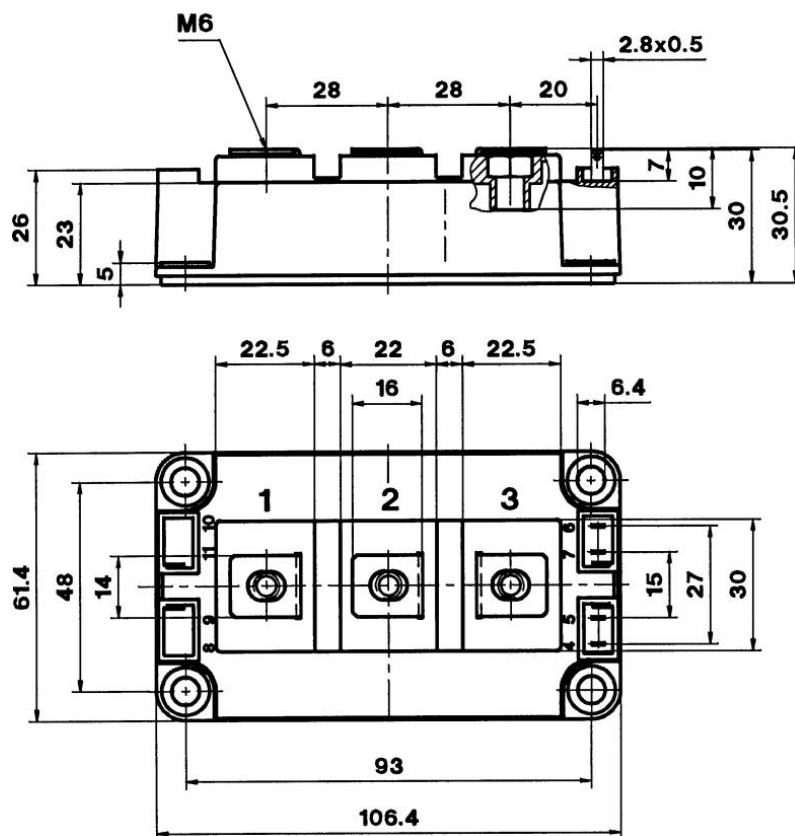


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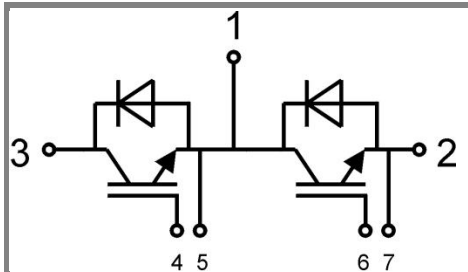
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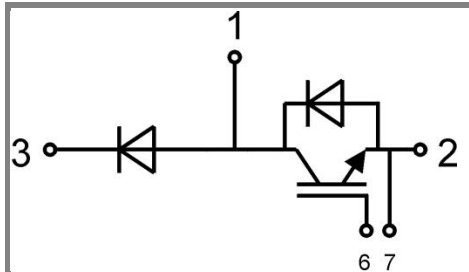


Case D 56



GB

Case D 56



GAL

Case D 57 (→ D 56)