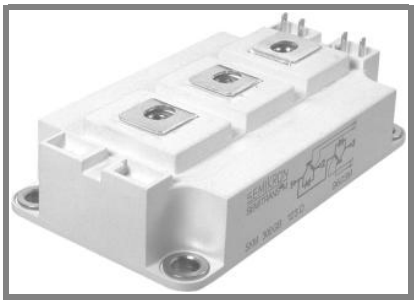
SKM 200GB125D



SEMITRANS® 3

Ultra Fast IGBT Modules

SKM 200GB125D

SKM 200GAL125D

SKM 200GAR125D

Features

- N channel , homogeneous Si
- Low inductance case
- Short tail current with low temperature dependence
- High short circuit capability, self limiting to 6 x I_{cnom}
- Fast & soft inverse CAL diodes
- Isolated copper baseplate using DCB Direct Copper Bonding Technology
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Typical Applications*

- Switched mode power supplies at f_{sw} > 20 kHz
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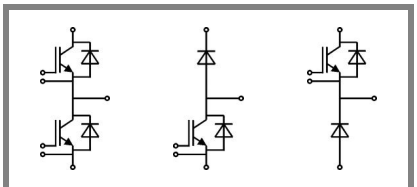
- Inductive heating
- Electronic welders at f_{sw} > 20 kHz

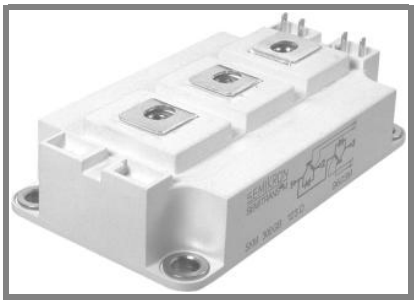


GB GAL GAR

Absolute Maximum Ratings			T_c = 25 °C, unless otherwise specified	
Symbol	**Conditions**		**Values**	**Units**
IGBT				
V_{CES}	T_j = 25 °C		1200	V
I_C	T_j = 150 °C	T_{case} = 25 °C	200	A
		T_{case} = 80 °C	160	A
I_{CRM}	I_{CRM}=2xI_{Cnom}		300	A
V_{GES}			± 20	V
t_{psc}	V_{CC} = 600 V; $V_{GE} \leq$ 20 V; V_{CES} < 1200 V	T_j = 125 °C	10	µs
Inverse Diode				
I_F	T_j = 150 °C	T_{case} = 25 °C	200	A
		T_{case} = 80 °C	130	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		300	A
I_{FSM}	t_p = 10 ms; sin.	T_j = 150 °C	1440	A
Freewheeling Diode				
I_F	T_j = °C	T_c = 25 °C	200	A
		T_c = 80 °C	130	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		300	A
I_{FSM}	t_p = 10 ms;	T_j = 150 °C	1440	A
Module				
$I_{t(RMS)}$			500	A
T_{vj}			- 40...+ 150	°C
T_{stg}			- 40...+ 125	°C
V_{isol}	AC, 1 min.		4000	V

Characteristics			T_c = 25 °C, unless otherwise specified			
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
IGBT						
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 6 mA		4,5	5,5	6,5	V
I_{CES}	V_{GE} = 0 V, V_{CE} = V_{CES}	T_j = 25 °C		0,15	0,45	mA
V_{CE0}		T_j = 25 °C		1,5	1,75	V
		T_j = 125 °C				V
r_{CE}	V_{GE} = 15 V	T_j = 25°C		12	14	mΩ
		T_j = 125°C				mΩ
$V_{CE(sat)}$	I_{Cnom} = 150 A, V_{GE} = 15 V	T_j = °$C_{chiplev.}$		3,3	3,85	V
C_{ies}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz		10	13	nF
C_{oes}				1,5	2	nF
C_{res}				0,8	1,2	nF
Q_G	V_{GE} = 0V - +20V			1300		nC
R_{Gint}	T_j = °C			2,5		Ω
$t_{d(on)}$	R_{Gon} = 4 Ω	V_{CC} = 600V		75		ns
t_r		I_C= 150A		36		ns
E_{on}		T_j = 125 °C		14		mJ
$t_{d(off)}$	R_{Goff} = 4 Ω	V_{GE} = ±15V		420		ns
t_f				25		ns
E_{off}						mJ
$R_{th(j-c)}$	per IGBT				0,09	K/W

SKM 200GB125D



SEMITRANS® 3

Ultra Fast IGBT Modules

SKM 200GB125D

SKM 200GAL125D

SKM 200GAR125D

Features

- N channel , homogeneous Si
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- Large clearance (13 mm) and creepage distance (20 mm)

Typical Applications*

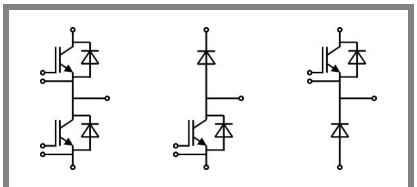
- Switched mode power supplies at f_{sw} > 20 kHz
- Resonant inverters up to 100 kHz
- Inductive heating
- Electronic welders at f_{sw} > 20 kHz

Characteristics

Symbol	Conditions		min.	typ.	max.	Units
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 150 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		2	2,5	V
		T_j = 125 °$C_{chiplev.}$		1,8		V
V_{F0}		T_j = 25 °C		1,1	1,2	V
		T_j = 125 °C				V
r_F		T_j = 25 °C		6	8,7	mΩ
		T_j = 125 °C				mΩ
I_{RRM}	I_F = 150 A	T_j = 125 °C		230		A
Q_{rr}	di/dt = 5500 A/µs			24		µC
E_{rr}	V_{GE} = 0 V; V_{CC} = 600 V					mJ
$R_{th(j-c)D}$	per diode				0,25	K/W
Freewheeling Diode						
$V_F = V_{EC}$	I_{Fnom} = 150 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		2	2,5	V
		T_j = 125 °$C_{chiplev.}$		1,8		V
V_{F0}		T_j = 25 °C		1,1	1,2	V
		T_j = 125 °C				V
r_F		T_j = 25 °C		6	8,7	V
		T_j = 125 °C				V
I_{RRM}	I_F = 150 A	T_j = 125 °C		230		A
Q_{rr}	di/dt = 5500 A/µs			24		µC
E_{rr}	V_{GE} = 0 V; V_{CC} = 600 V					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 °C		0,35		mΩ
		T_{case}= 125 °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.

* 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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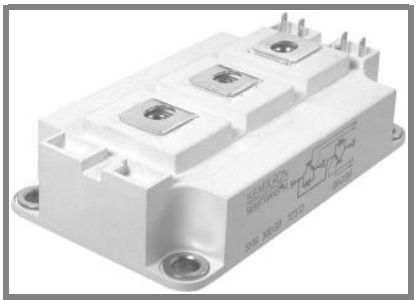
SKM 200GB125D



SEMITRANS® 3

Ultra Fast IGBT Modules

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SKM 200GAR125D

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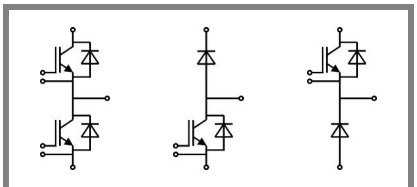

GB GAL GAR

Z_{th} Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	i = 1	60	mk/W
R_i	i = 2	23	mk/W
R_i	i = 3	5,9	mk/W
R_i	i = 4	1,1	mk/W
tau_i	i = 1	0,0744	s
tau_i	i = 2	0,0087	s
tau_i	i = 3	0,002	s
tau_i	i = 4	0,0015	s
$Z_{th(j-c)D}$			
R_i	i = 1	160	mk/W
R_i	i = 2	67	mk/W
R_i	i = 3	20	mk/W
R_i	i = 4	3	mk/W
tau_i	i = 1	0,0536	s
tau_i	i = 2	0,0034	s
tau_i	i = 3	0,077	s
tau_i	i = 4	0,0003	s

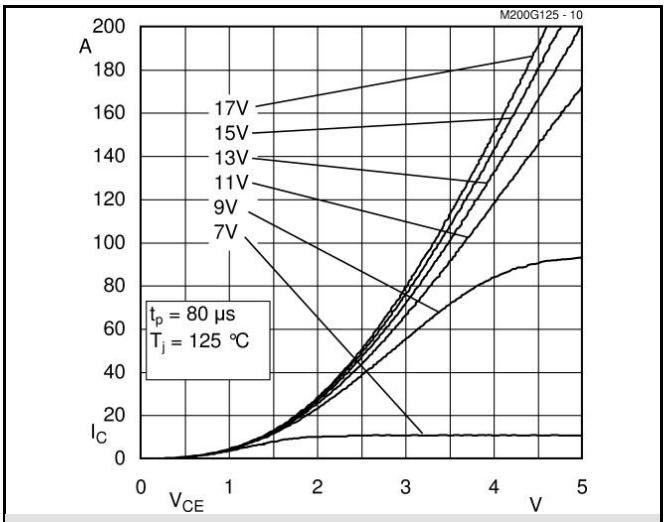

Fig. 1 Typ. output characteristic, inclusive $R_{CC'+ EE'}$

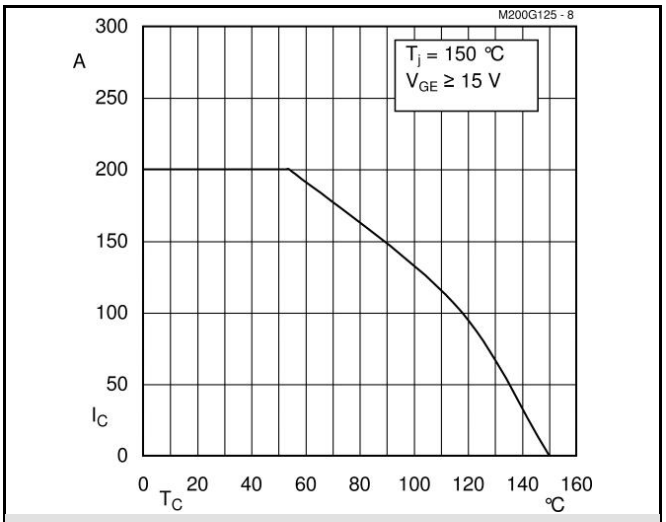

Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

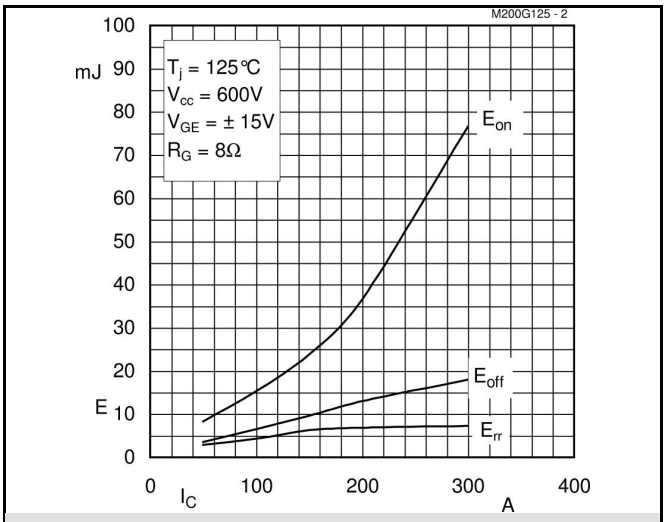

Fig. 3 Typ. turn-on /-off energy = f (I_C)

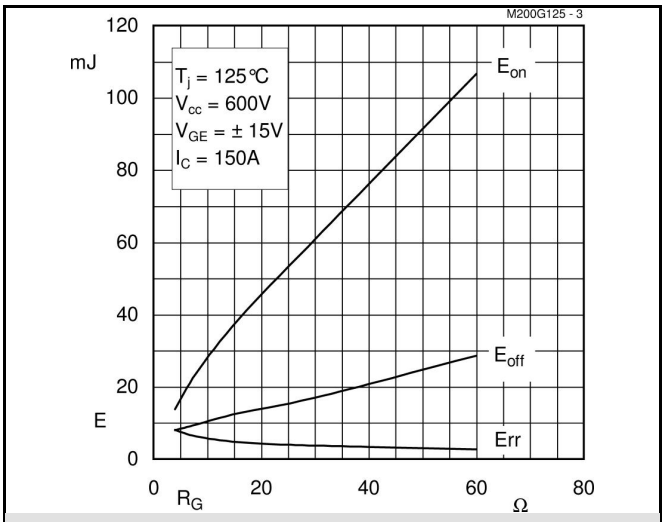

Fig. 4 Typ. turn-on /-off energy = f (R_G)

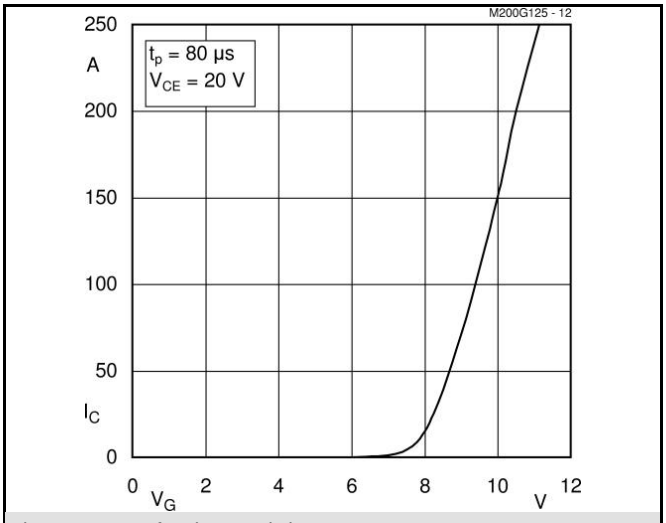

Fig. 5 Typ. transfer characteristic

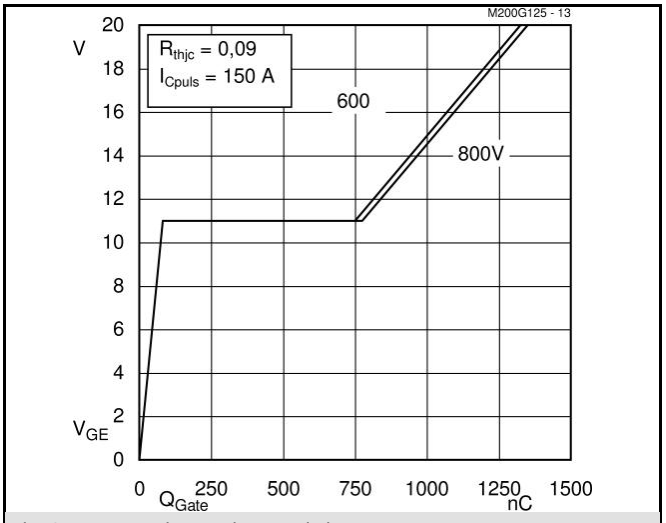

Fig. 6 Typ. gate charge characteristic

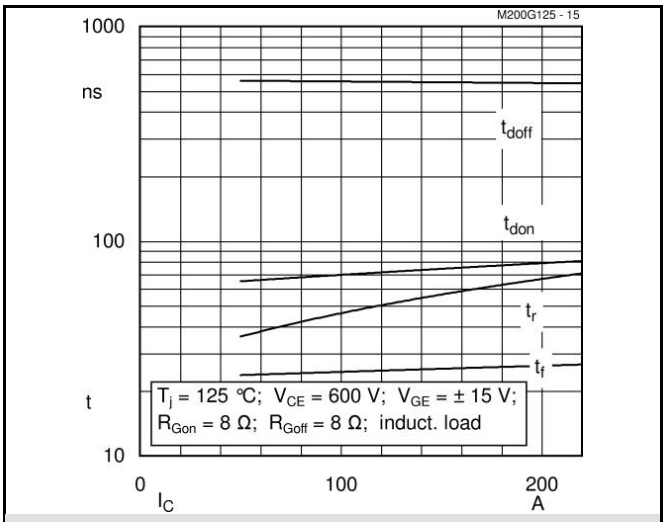

Fig. 7 Typ. switching times vs. I_C

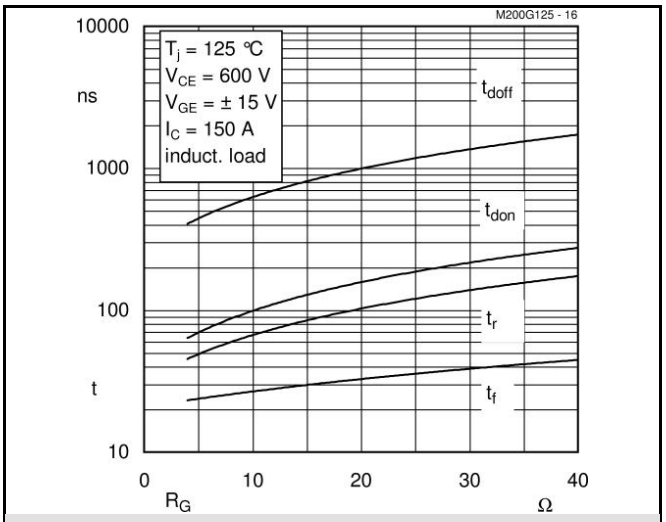

Fig. 8 Typ. switching times vs. gate resistor R_G

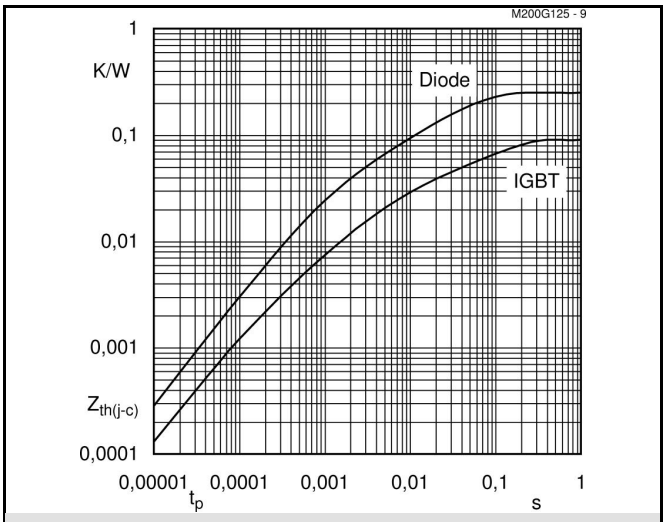

Fig. 9 Transient thermal impedance

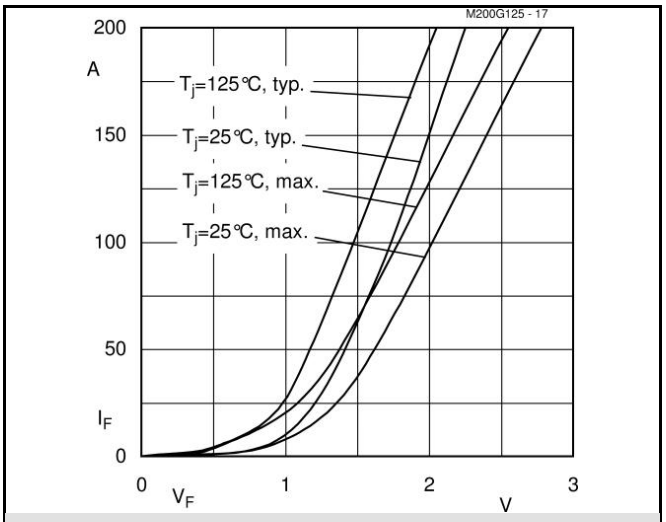

Fig. 10 CAL diode forward characteristic

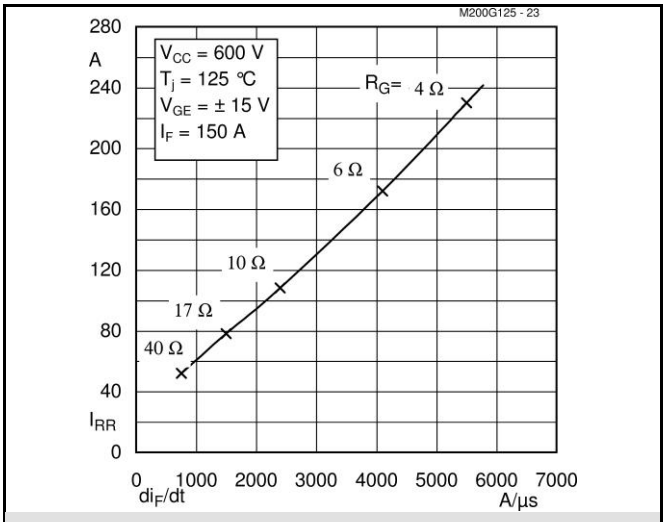

Fig. 11 Typ. CAL diode peak reverse recovery current

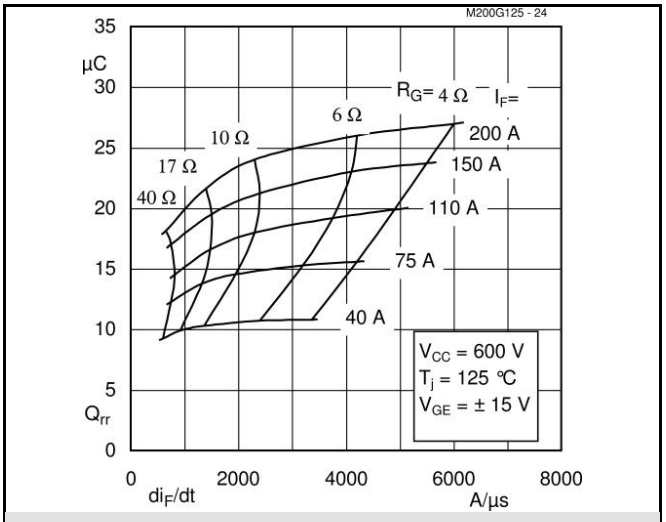

Fig. 12 Typ. CAL diode peak reverse recovery charge

UL Recognized File 63 532

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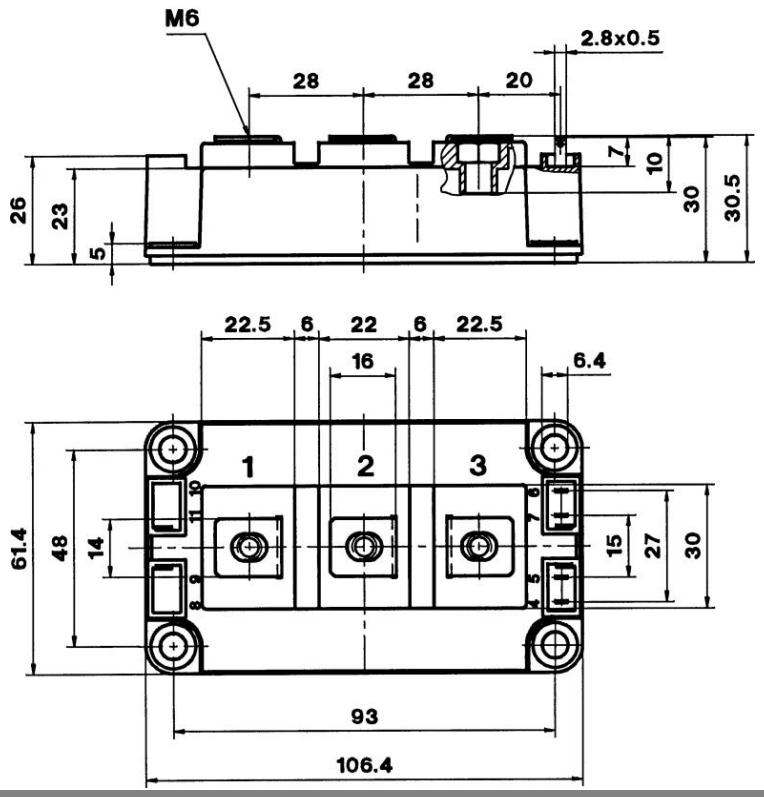
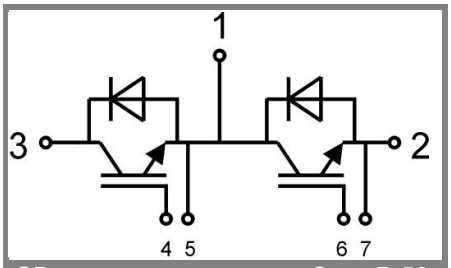
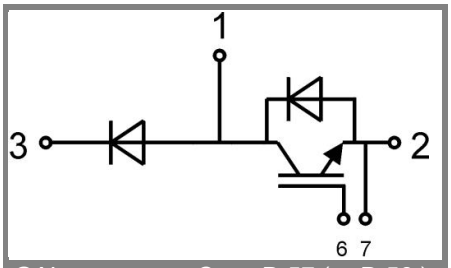


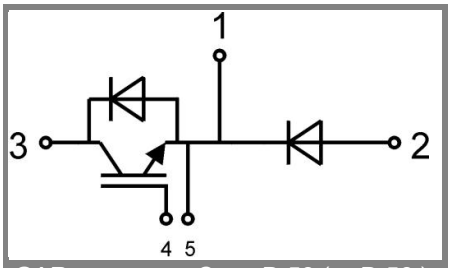
Case D 56



GB Case D 56



GAL Case D 57 (➞ D 56)



GAR Case D 58 (➞ D 56)