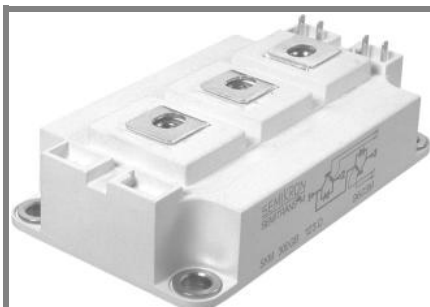


SKM 200GB125D



SEMITRANS® 3

Ultra Fast IGBT Modules

SKM 200GB125D

SKM 200GAL125D

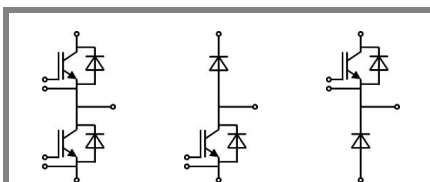
SKM 200GAR125D

Features

- N channel , homogeneous Si
- Low inductance case
- Short tail current with low temperature dependence
- High short circuit capability, self limiting to $6 \times I_{Cnom}$
- 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*

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



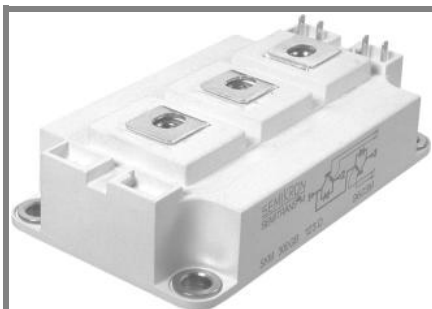
GB

GAL

GAR

Absolute Maximum Ratings				$T_c = 25^\circ\text{C}$, unless otherwise specified	
Symbol	Conditions			Values	Units
IGBT					
V_{CES}	$T_j = 25^\circ\text{C}$			1200	V
I_C	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$		200	A
		$T_{case} = 80^\circ\text{C}$		160	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$			300	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	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$		200	A
		$T_{case} = 80^\circ\text{C}$		130	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$			300	A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150^\circ\text{C}$		1440	A
Freewheeling Diode					
I_F	$T_j = ^\circ\text{C}$	$T_c = 25^\circ\text{C}$		200	A
		$T_c = 80^\circ\text{C}$		130	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$			300	A
I_{FSM}	$t_p = 10\text{ ms};$	$T_j = 150^\circ\text{C}$		1440	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.			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 I _C = 150A		75		ns
t _r				36		ns
E _{on}				14		mJ
t _{d(off)}	R _{Goff} = 4 Ω	T _j = 125 °C V _{GE} = ±15V		420		ns
t _f				25		ns
E _{off}						mJ
R _{th(j-c)}	per IGBT				0,09	K/W



SEMITRANS® 3

Ultra Fast IGBT Modules

SKM 200GB125D

SKM 200GAL125D

SKM 200GAR125D

Features

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- High short circuit capability, self limiting to $6 \times I_{cnom}$
- Fast & soft inverse CAL diodes
- Isolated copper baseplate using DCB Direct Copper Bonding Technology
- Large clearance (13 mm) and creepage distance (20 mm)

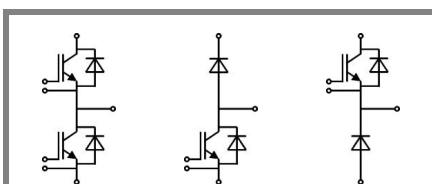
Typical Applications*

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

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.

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.} $T_j = 125$ °C _{chiplev.}		2 1,8	2,5	V V
V_{F0}	$T_j = 25$ °C $T_j = 125$ °C		1,1	1,2	V V
r_F	$T_j = 25$ °C $T_j = 125$ °C		6	8,7	mΩ mΩ
I_{RRM} Q_{rr} E_{rr}	$I_F = 150$ A $di/dt = 5500$ A/μs $V_{GE} = 0$ V; $V_{CC} = 600$ V		230 24		A μC 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.} $T_j = 125$ °C _{chiplev.}		2 1,8	2,5	V V
V_{F0}	$T_j = 25$ °C $T_j = 125$ °C		1,1	1,2	V V
r_F	$T_j = 25$ °C $T_j = 125$ °C		6	8,7	V V
I_{RRM} Q_{rr} E_{rr}	$I_F = 150$ A $di/dt = 5500$ A/μs $V_{GE} = 0$ V; $V_{CC} = 600$ V		230 24		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 $T_{case} = 25$ °C $T_{case} = 125$ °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

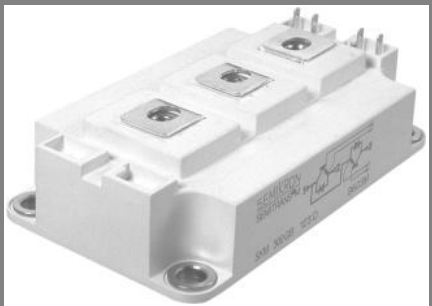


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SKM 200GB125D



SEMITRANS® 3

Ultra Fast IGBT Modules

SKM 200GB125D
SKM 200GAL125D
SKM 200GAR125D

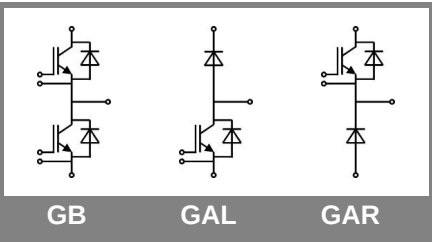
Features

- N channel , homogeneous Si
- Low inductance case
- Short tail current with low temperature dependence
- High short circuit capability, self limiting to $6 \times I_{cnom}$
- 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*

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

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



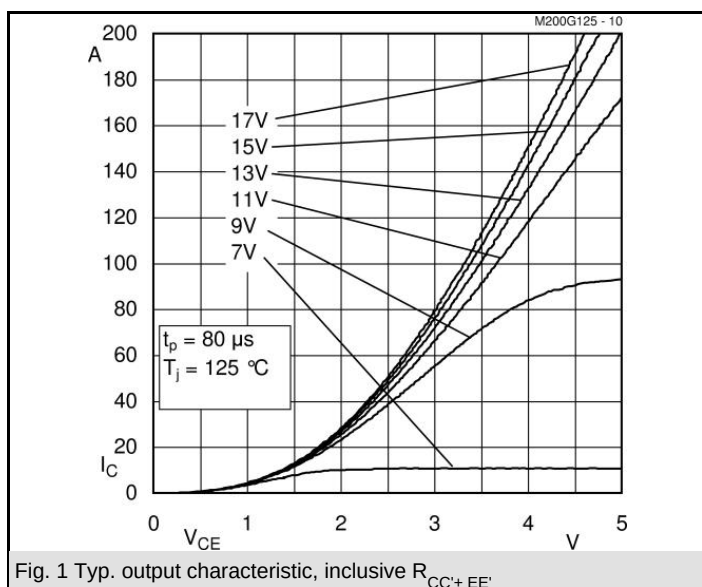


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

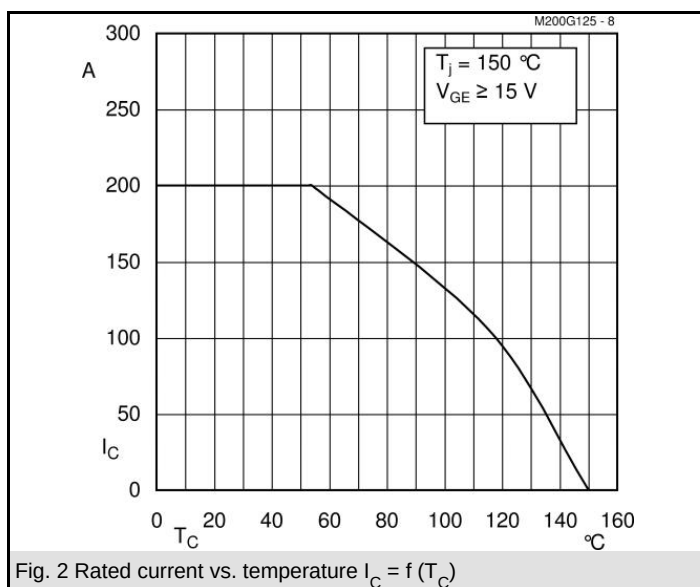


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

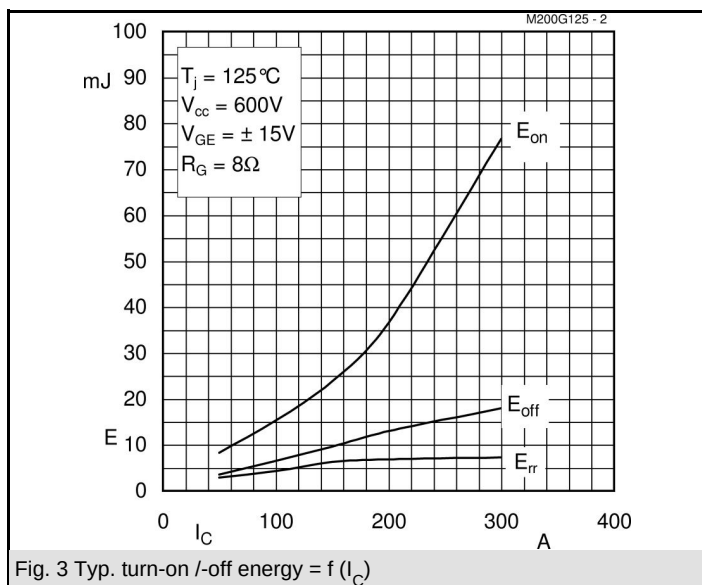


Fig. 3 Typ. turn-on /-off energy = $f(I_C)$

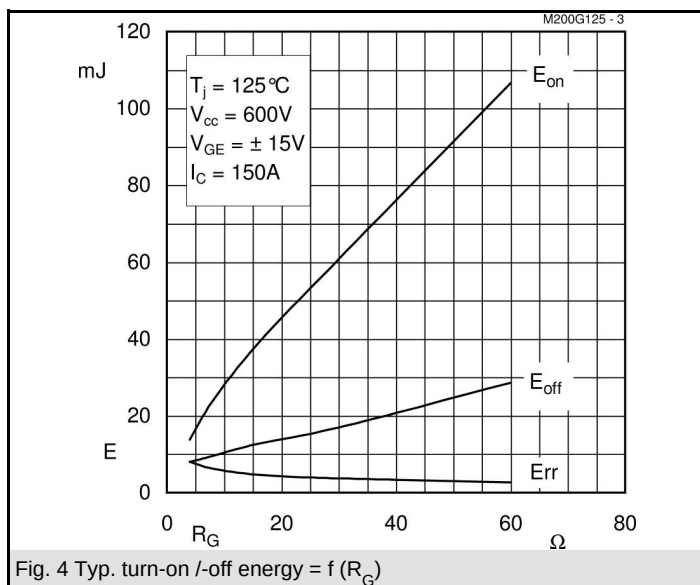


Fig. 4 Typ. turn-on /-off energy = $f(R_G)$

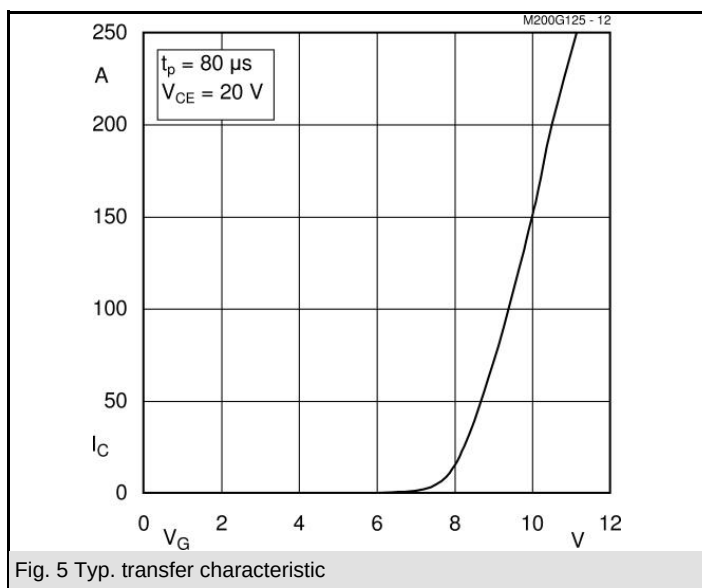


Fig. 5 Typ. transfer characteristic

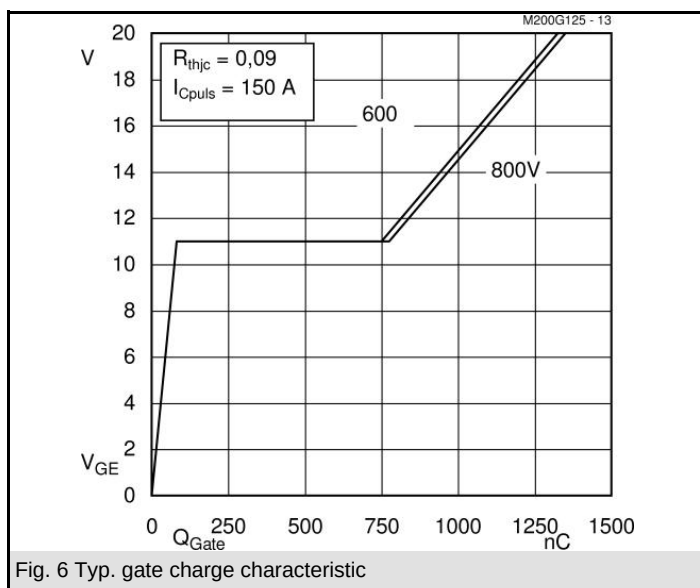
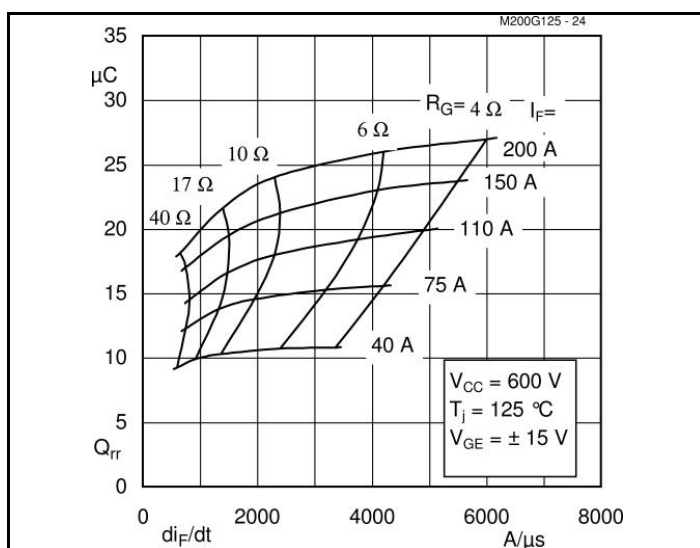
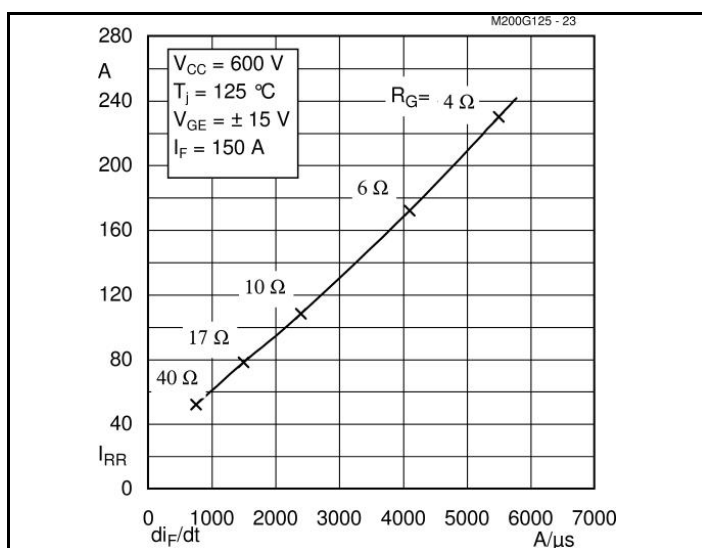
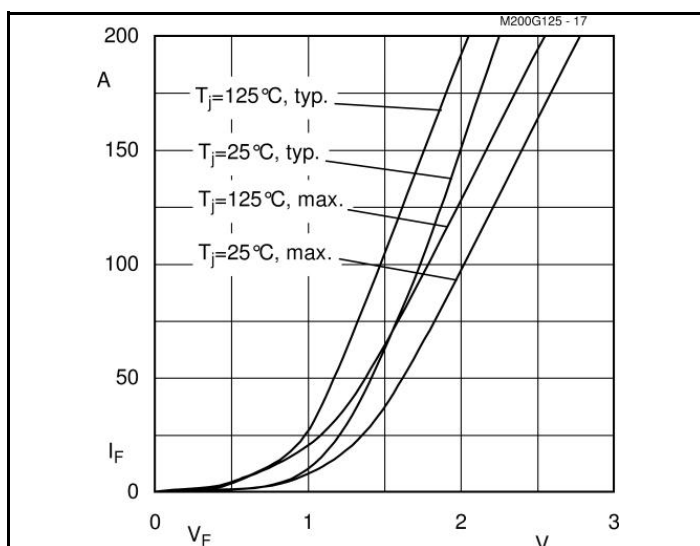
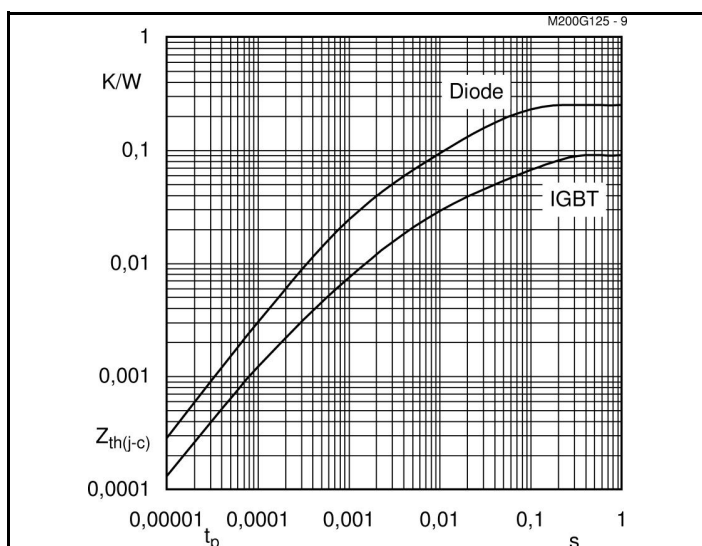
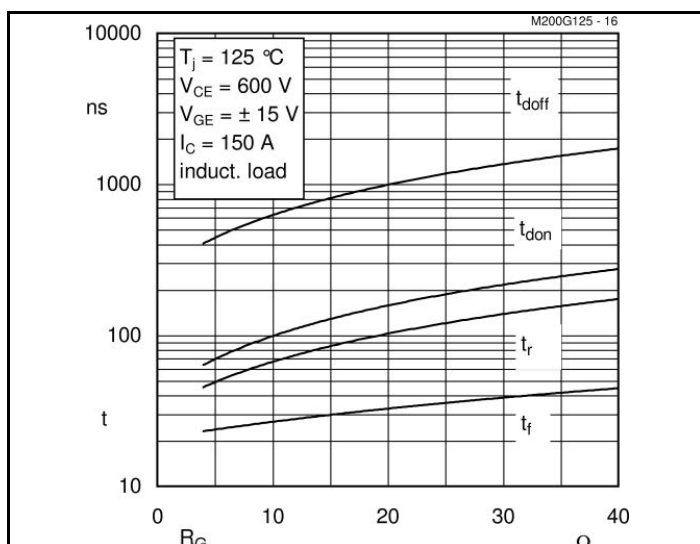
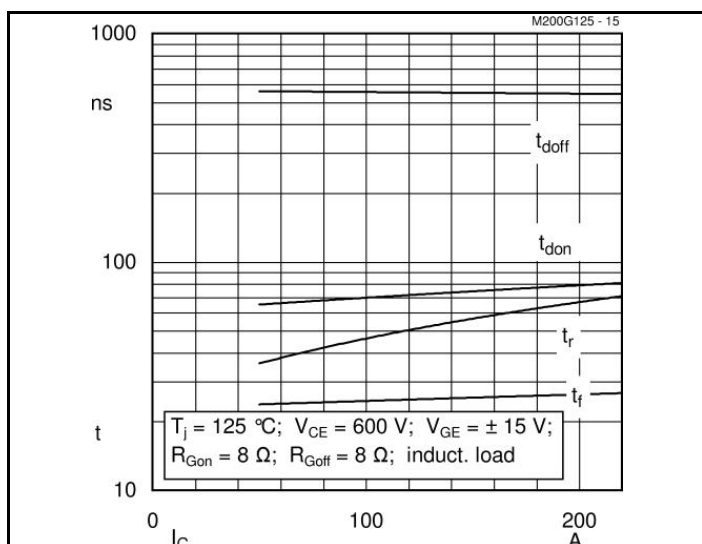
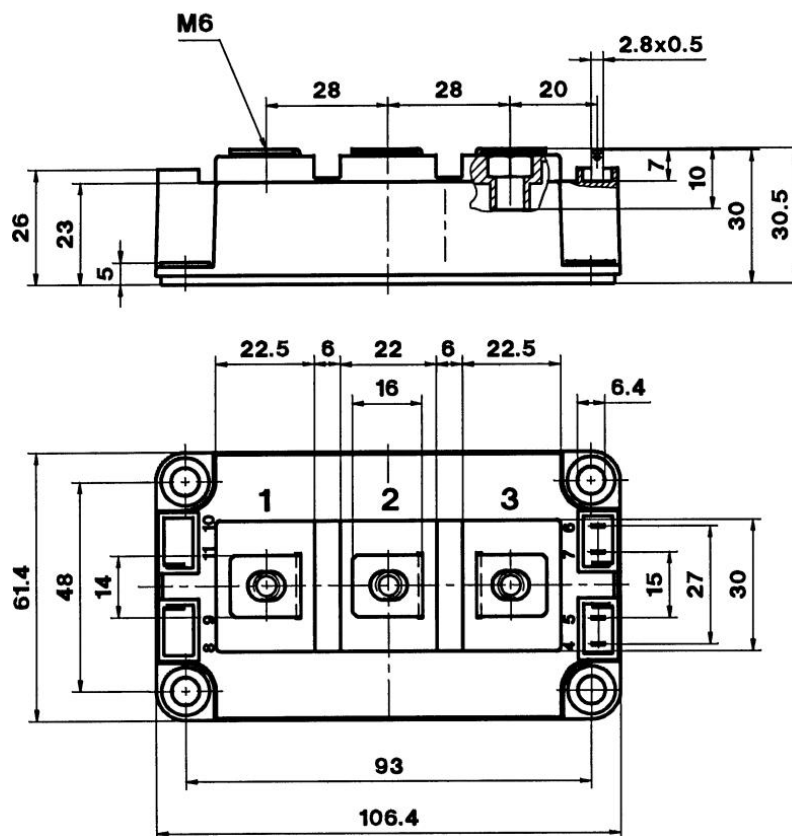
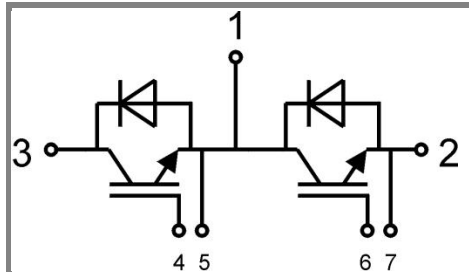


Fig. 6 Typ. gate charge characteristic



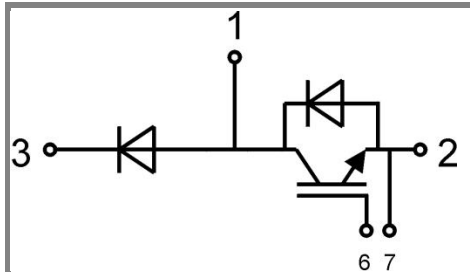


Case D 56



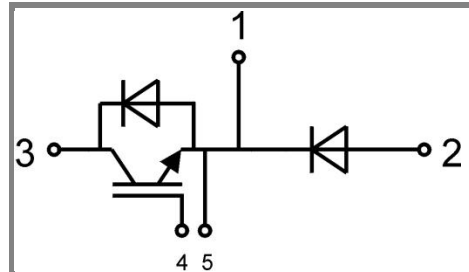
GB

Case D 56



GAL

Case D 57 (→ D 56)



GAR

Case D 58 (→ D 56)