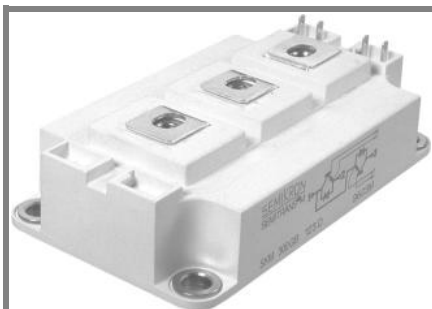


SKM 200GB176D...



SEMITRANS® 3

Trench IGBT Modules

SKM 200GB176D

SKM 200GAL176D

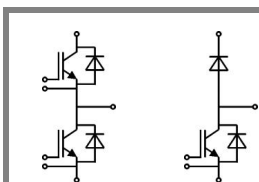
Preliminary Data

Features

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

Typical Applications

- AC inverter drives mains 575 - 750 V AC
- Public transport (auxiliary syst.)

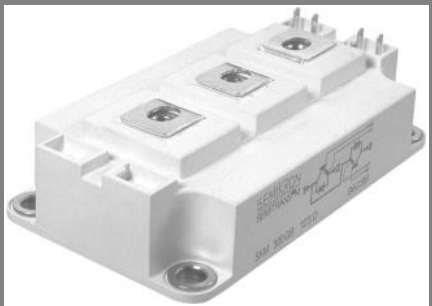


GB

GAL

Absolute Maximum Ratings			$T_c = 25\text{ }^{\circ}\text{C}$, unless otherwise specified	
Symbol	Conditions		Values	Units
IGBT				
V_{CES}	$T_j = 25\text{ }^{\circ}\text{C}$		1700	V
I_C	$T_j = 150\text{ }^{\circ}\text{C}$	$T_c = 25\text{ }^{\circ}\text{C}$	260	A
		$T_c = 80\text{ }^{\circ}\text{C}$	180	A
I_{CRM}	$I_{CRM}=2 \times I_{Cnom}$		300	A
V_{GES}			± 20	V
t_{psc}	$V_{CC} = 1200\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125\text{ }^{\circ}\text{C}$ $V_{CES} < 1700\text{ V}$		10	μs
Inverse Diode				
I_F	$T_j = 150\text{ }^{\circ}\text{C}$	$T_c = 25\text{ }^{\circ}\text{C}$	210	A
		$T_c = 80\text{ }^{\circ}\text{C}$	140	A
I_{FRM}	$I_{FRM}=2 \times I_{Fnom}$		300	A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150\text{ }^{\circ}\text{C}$	1100	A
Freewheeling Diode				
I_F	$T_j = 150\text{ }^{\circ}\text{C}$	$T_{case} = 25\text{ }^{\circ}\text{C}$	210	A
		$T_{case} = 80\text{ }^{\circ}\text{C}$	140	A
I_{FRM}	$I_{FRM}=2 \times I_{Fnom}$		300	A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150\text{ }^{\circ}\text{C}$	1100	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		5,2	5,8	6,4	V
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES}	T _j = 25 °C		0,1	0,3	mA
V _{CE0}		T _j = 25 °C		1	1,2	V
		T _j = 125 °C		0,9	1,1	V
r _{CE}	V _{GE} = 15 V	T _j = 25°C		6,7	8,3	mΩ
		T _j = 125°C		10	12	mΩ
V _{CE(sat)}	I _{Cnom} = 150 A, V _{GE} = 15 V	T _j = 25°C _{chiplev.}		2	2,45	V
		T _j = 125°C _{chiplev.}		2,4	2,9	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V	f = 1 MHz		11,4		nF
C _{oes}				0,55		nF
C _{res}				0,44		nF
Q _G	V _{GE} = -8V...+15V			1200		nC
R _{Gint}	T _j = 25 °C			4,25		Ω
t _{d(on)}	R _{Gon} = 5 Ω	V _{CC} = 1200V I _C = 150A		360		ns
t _r				45		ns
E _{on}				93		mJ
t _{d(off)}	R _{Goff} = 5 Ω	T _j = 125 °C V _{GE} = ± 15V		760		ns
t _f				140		ns
E _{off}				58		mJ
R _{th(j-c)}	per IGBT				0,12	K/W



SEMITRANS® 3

Trench IGBT Modules

SKM 200GB176D
SKM 200GAL176D

Preliminary Data

Features

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- V_{CEsat} with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_c$

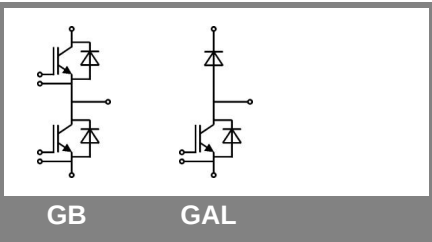
Typical Applications

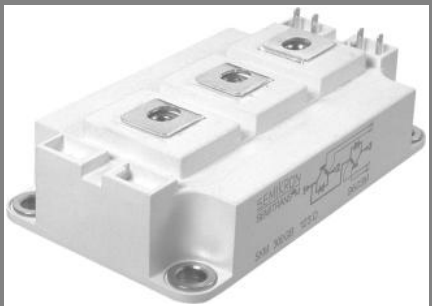
- AC inverter drives mains 575 - 750 V AC
- Public transport (auxiliary syst.)

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.}		1,7	1,9	V
		T _j = 125 °C _{chiplev.}		1,7	1,9	V
V _{F0}		T _j = 25 °C		1,1	1,3	V
		T _j = 125 °C		0,9	1,1	V
r _F		T _j = 25 °C		4	4	mΩ
		T _j = 125 °C		5,3	5,3	mΩ
I _{RRM}	I _F = 150 A	T _j = 125 °C		195		A
Q _{rr}	di/dt = 3700 A/μs			52		μC
E _{rr}	V _{GE} = -15 V; V _{CC} = 1200 V			31		mJ
R _{th(j-c)D}	per diode				0,25	K/W
FWD						
V _F = V _{EC}	I _{Fnom} = 150 A; V _{GE} = 0 V	T _j = 25 °C _{chiplev.}		1,7	1,9	V
		T _j = 125 °C _{chiplev.}		1,7	1,9	V
V _{F0}		T _j = 25 °C		1,1	1,3	V
		T _j = 125 °C		0,9	1,1	V
r _F		T _j = 25 °C		4	4	V
		T _j = 125 °C		5,3	5,3	V
I _{RRM}	I _F = 150 A	T _j = 125 °C		195		A
Q _{rr}	di/dt = 3700 A/μs			52		μC
E _{rr}	V _{GE} = -15 V; V _{CC} = 1200 V			31		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.

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.





SEMITRANS® 3

Trench IGBT Modules

SKM 200GB176D
SKM 200GAL176D

Preliminary Data

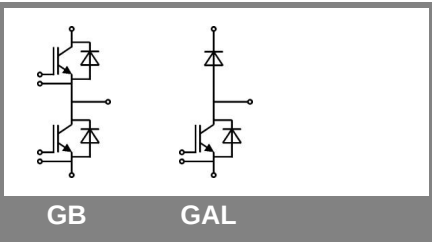
Features

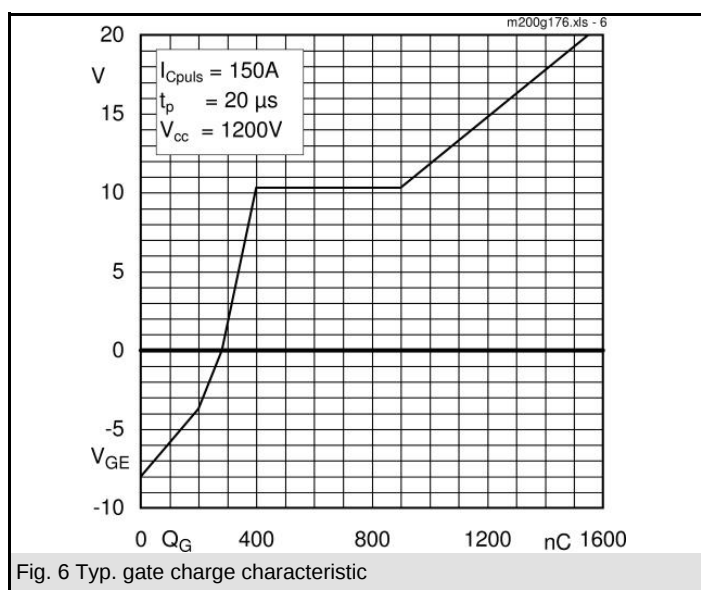
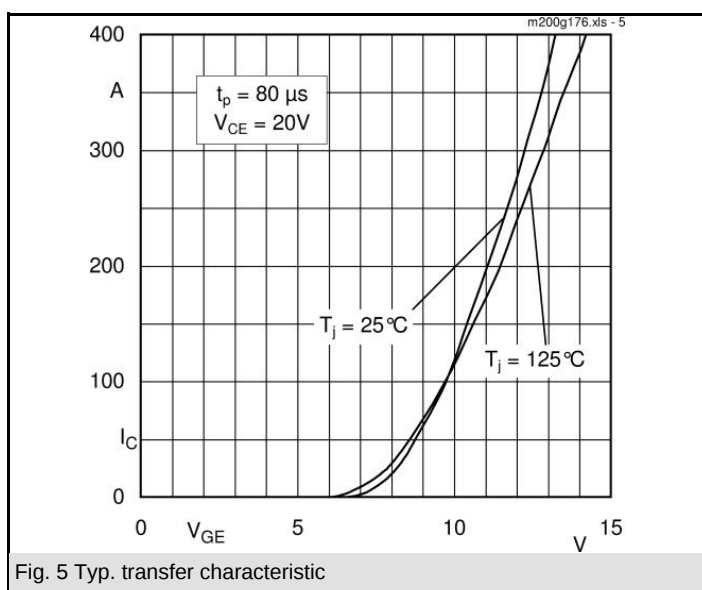
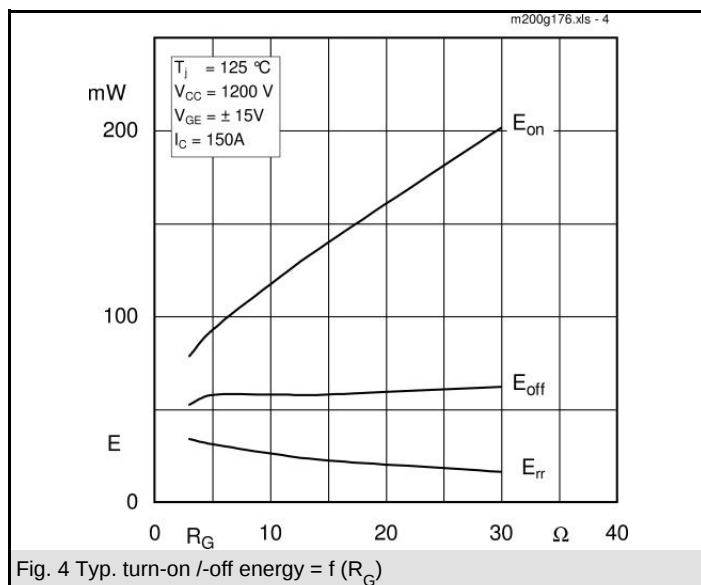
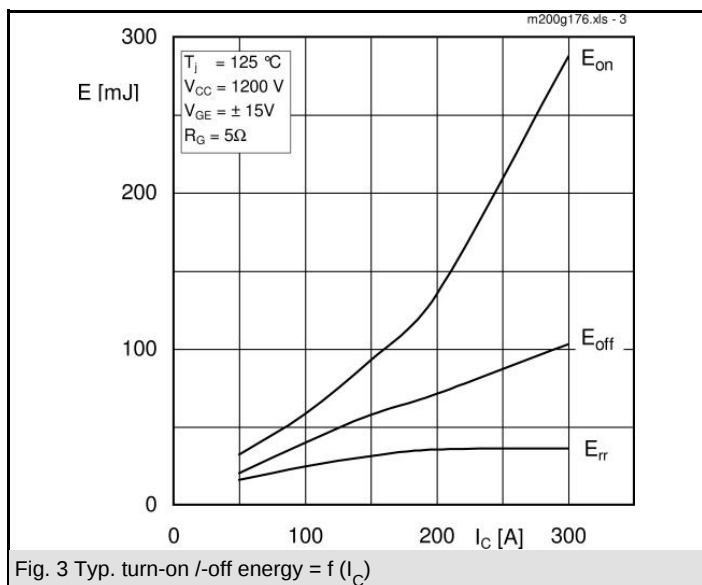
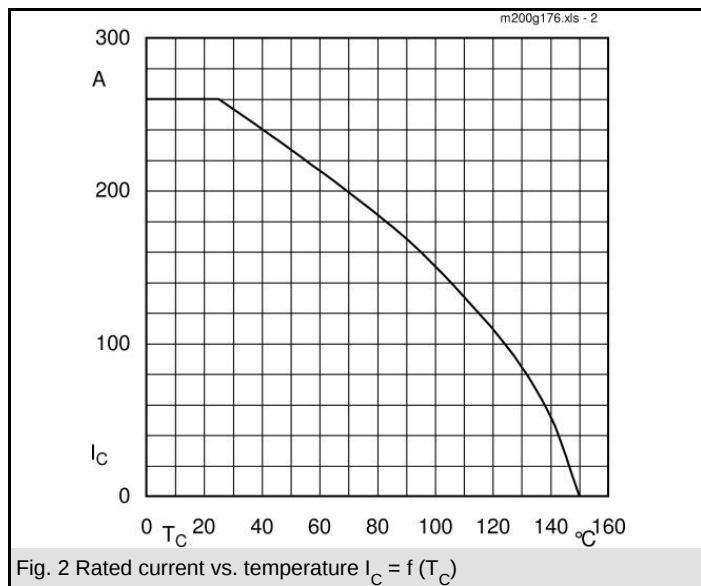
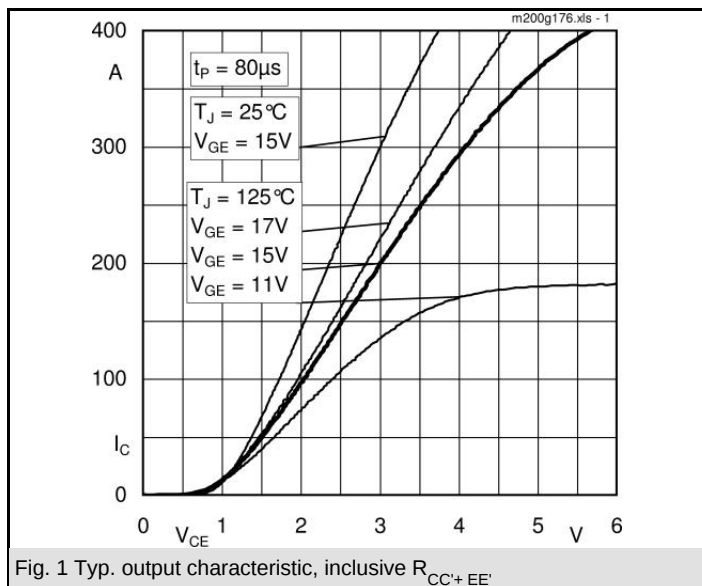
- Homogeneous Si
- Trench = Trenchgate technology
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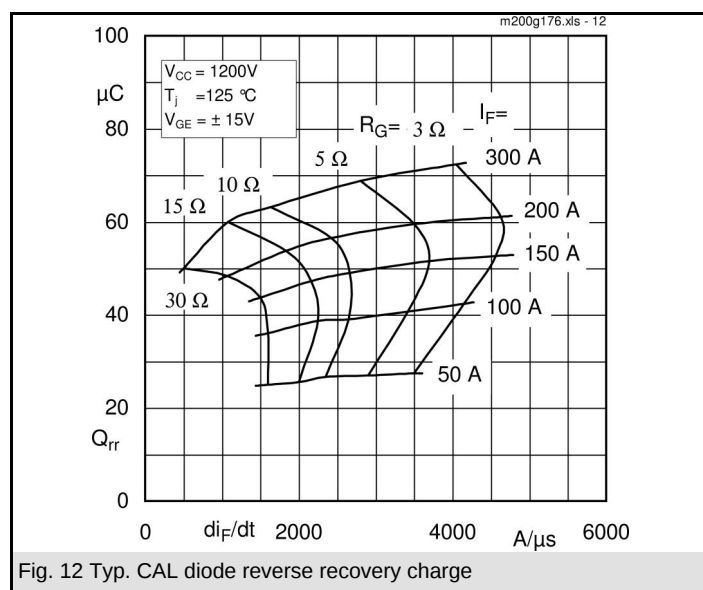
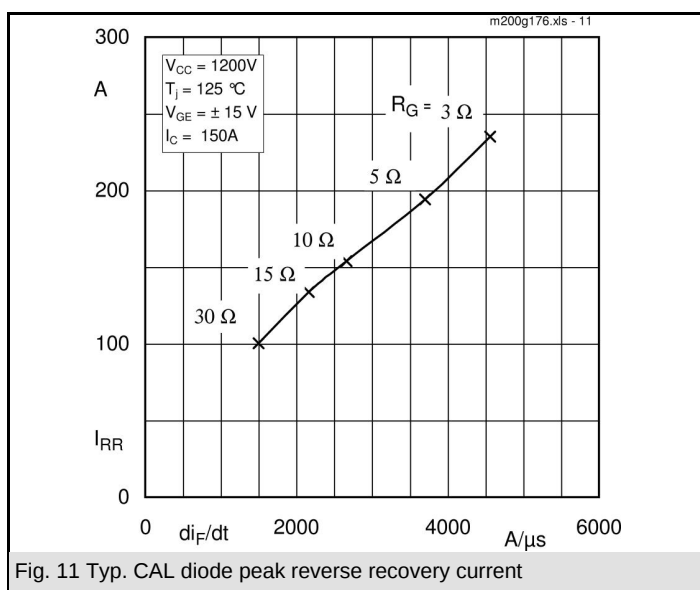
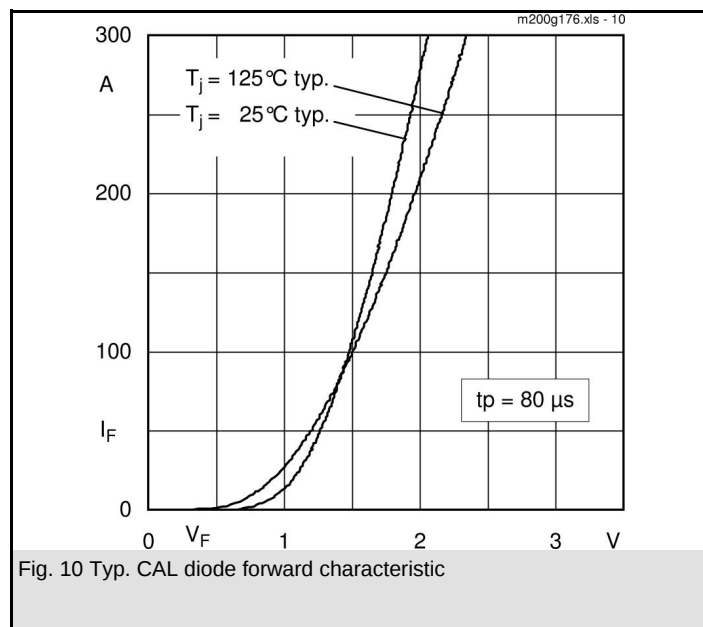
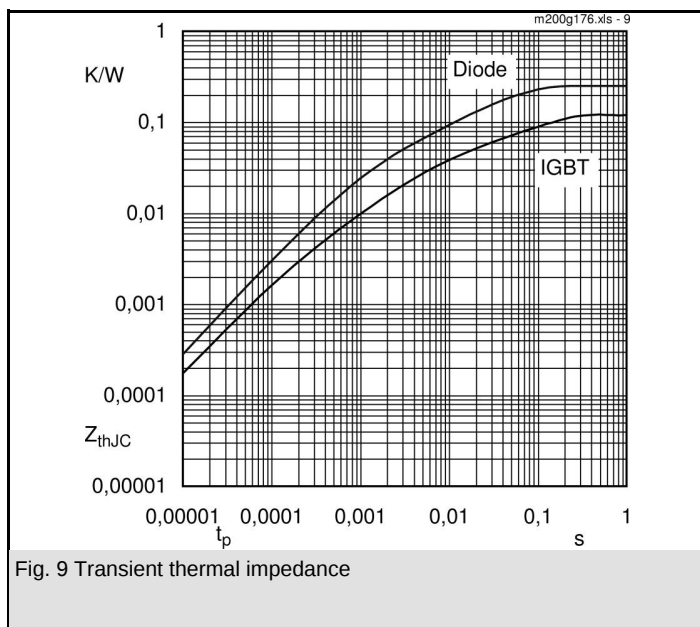
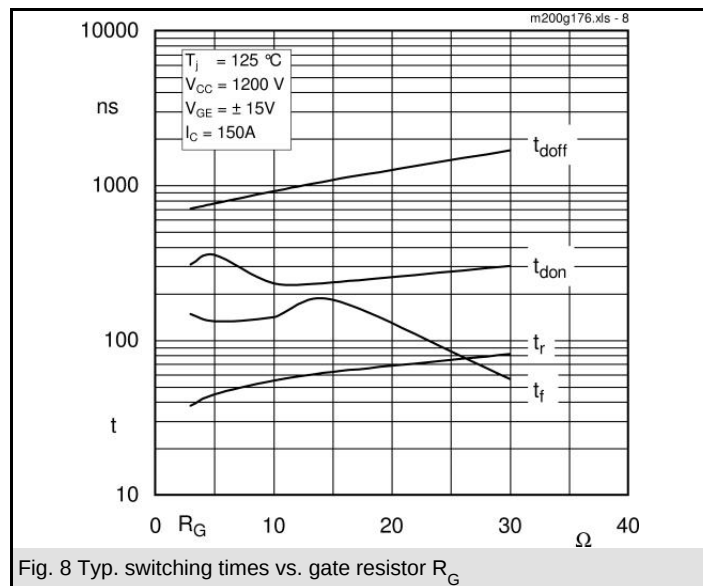
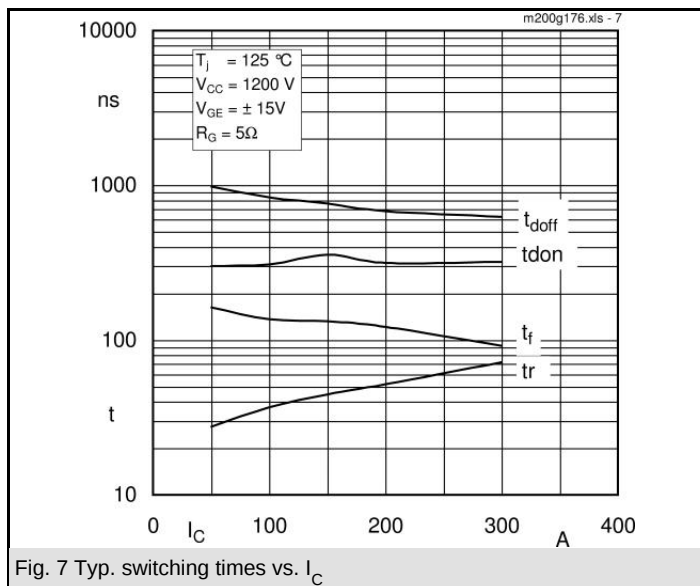
Typical Applications

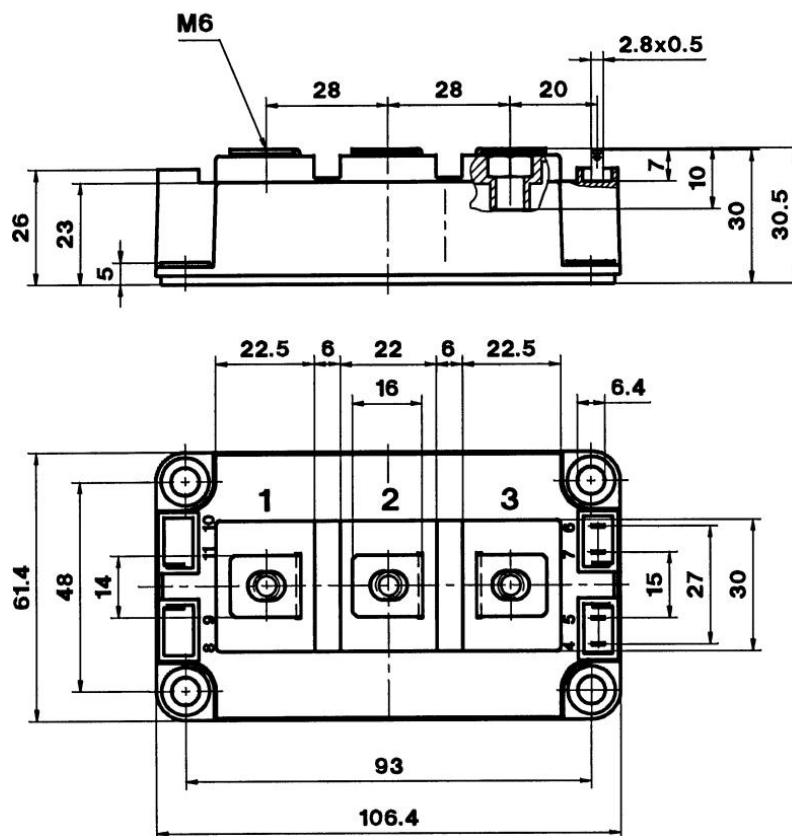
- AC inverter drives mains 575 - 750 V AC
- Public transport (auxiliary syst.)

Z_{th}			
Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	$i = 1$	80	mk/W
R_i	$i = 2$	30	mk/W
R_i	$i = 3$	8,2	mk/W
R_i	$i = 4$	1,8	mk/W
τ_{ui}	$i = 1$	0,0753	s
τ_{ui}	$i = 2$	0,01	s
τ_{ui}	$i = 3$	0,0008	s
τ_{ui}	$i = 4$	0,0003	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
τ_{ui}	$i = 1$	0,0382	s
τ_{ui}	$i = 2$	0,009	s
τ_{ui}	$i = 3$	0,0009	s
τ_{ui}	$i = 4$	0,005	s

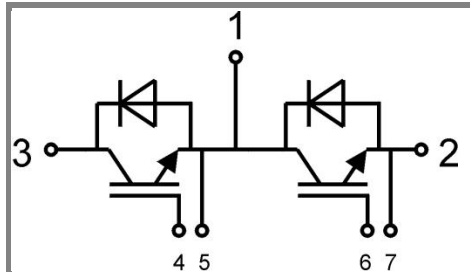






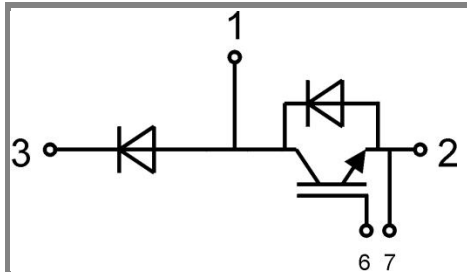


Case D 56



GB

Case D 56



GAL

Case D 57