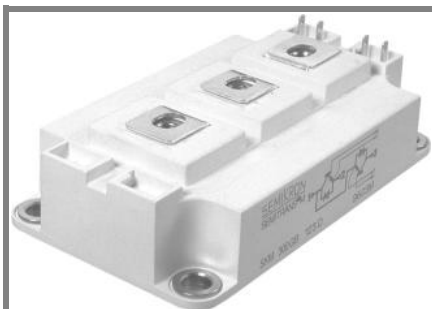




SEMITRANS® 3

IGBT Modules

SKM 200GB123D

SKM 200GAL123D

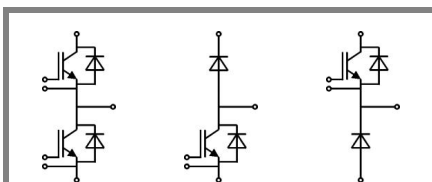
SKM 200GAR123D

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 Technology
- Large clearance (13 mm) and creepage distances (20 mm)

Typical Applications

- AC inverter drives
- UPS



GB

GAL

GAR

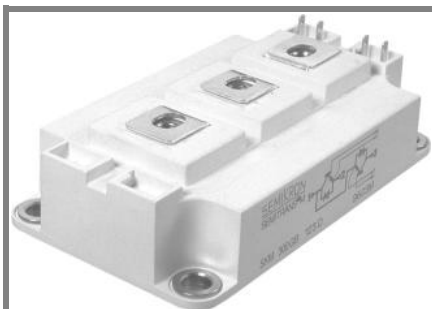
Absolute Maximum Ratings		T _c = 25 °C, unless otherwise specified		
Symbol	Conditions	Values	Units	
IGBT				
V _{CES}	T _j = 25 °C	1200	V	
I _C	T _j = 150 °C	T _{case} = 25 °C	200	A
		T _{case} = 85 °C	180	A
I _{CRM}	I _{CRM} =2xI _{Cnom}	300	A	
V _{GES}		± 20	V	
t _{psc}	V _{CC} = 600 V; V _{GE} ≤ 20 V; T _j = 125 °C V _{CES} < 1200 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	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	260	A
		$T_{case} = 80^\circ\text{C}$	180	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$		400	A
I_{FSM}	$t_p = 10\text{ ms; sin.}$	$T_j = 150^\circ\text{C}$	1800	A

Module				
$I_{t(RMS)}$			500	A
T_{vj}			- 40 ... + 150 (125)	$^\circ\text{C}$
T_{stg}			- 40...+ 125	$^\circ\text{C}$
V_{isol}	AC, 1 min.		2500	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		0,1	0,3	mA
V _{CE0}		T _j = 25 °C		1,4	1,6	V
		T _j = 125 °C		1,6	1,8	V
r _{CE}	V _{GE} = 15 V	T _j = 25°C		7,33	9,33	mΩ
		T _j = 125°C		10	12,66	mΩ
V _{CE(sat)}	I _{Cnom} = 150 A, V _{GE} = 15 V	T _j = °C _{chiplev.}		2,5	3	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} = -8V - +20V			1500		nC
R _{Gint}	T _j = °C			2,5		Ω
t _{d(on)}	R _{Gon} = 5,6 Ω	V _{CC} = 600V I _C = 150A		220	400	ns
t _r				100	200	ns
E _{on}	R _{Goff} = 5,6 Ω	T _j = 125 °C V _{GE} = -15V		24		mJ
t _{d(off)}				600	800	ns
t _f				70	100	ns
E _{off}				17		mJ
R _{th(j-c)}	per IGBT				0,09	K/W



SEMITRANS® 3

IGBT Modules

SKM 200GB123D

SKM 200GAL123D

SKM 200GAR123D

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 Technology
- Large clearance (13 mm) and creepage distances (20 mm)

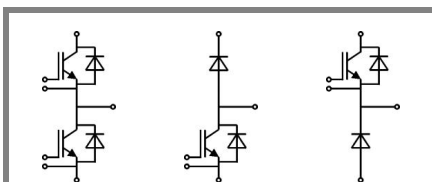
Typical Applications

- AC inverter drives
- UPS

Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 150 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$	2	2,5	V
		$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$	1,8		V
V_{F0}		$T_j = 25 \text{ }^\circ\text{C}$	1,1	1,2	V
		$T_j = 125 \text{ }^\circ\text{C}$			V
r_F		$T_j = 25 \text{ }^\circ\text{C}$	6	8,7	mΩ
		$T_j = 125 \text{ }^\circ\text{C}$			mΩ
I_{RRM}	$I_F = 150 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$	90		A
Q_{rr}	$di/dt = 1500 \text{ A}/\mu\text{s}$		8		μC
E_{rr}	$V_{GE} = -15 \text{ V}; V_{CC} = 600 \text{ V}$		6,6		mJ
$R_{th(j-c)D}$	per diode			0,25	K/W
Freewheeling Diode					
$V_F = V_{EC}$	$I_{Fnom} = 200 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$	2	2,5	V
		$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$	1,8		V
V_{F0}		$T_j = 25 \text{ }^\circ\text{C}$	1,1	1,2	V
		$T_j = 125 \text{ }^\circ\text{C}$			V
r_F		$T_j = 25 \text{ }^\circ\text{C}$	4,5	6,5	V
		$T_j = 125 \text{ }^\circ\text{C}$			V
I_{RRM}	$I_F = 200 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$	120		A
Q_{rr}	$di/dt = 2000 \text{ A}/\mu\text{s}$		11		μC
E_{rr}	$V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$				mJ
$R_{th(j-c)FD}$	per diode			0,18	K/W
Module					
L_{CE}			15	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 M6		3	5	Nm
M_t	to terminals M6, M4		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.

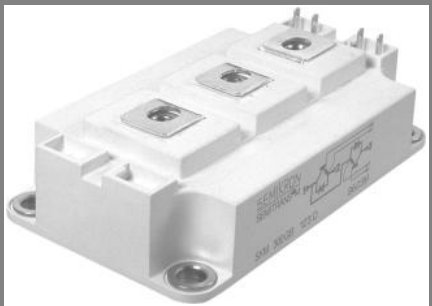


GB

GAL

GAR

SKM 200GB123D



SEMITRANS® 3

IGBT Modules

SKM 200GB123D
SKM 200GAL123D
SKM 200GAR123D

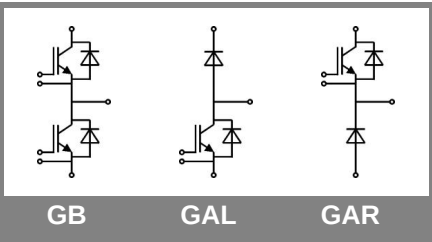
Features

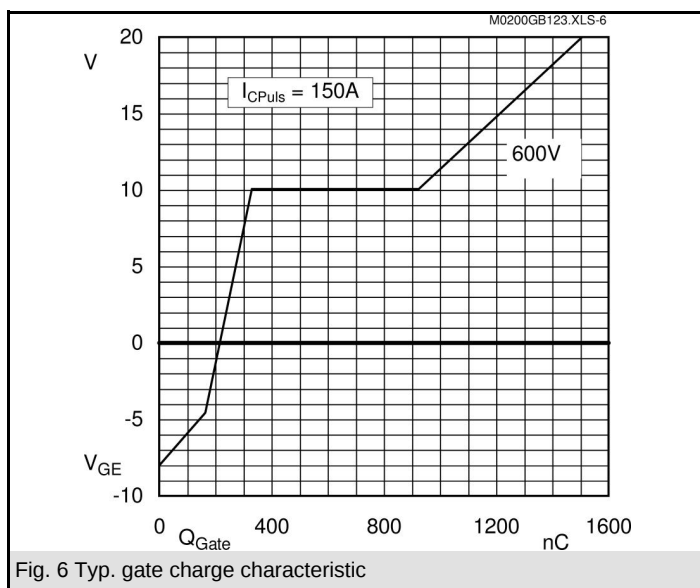
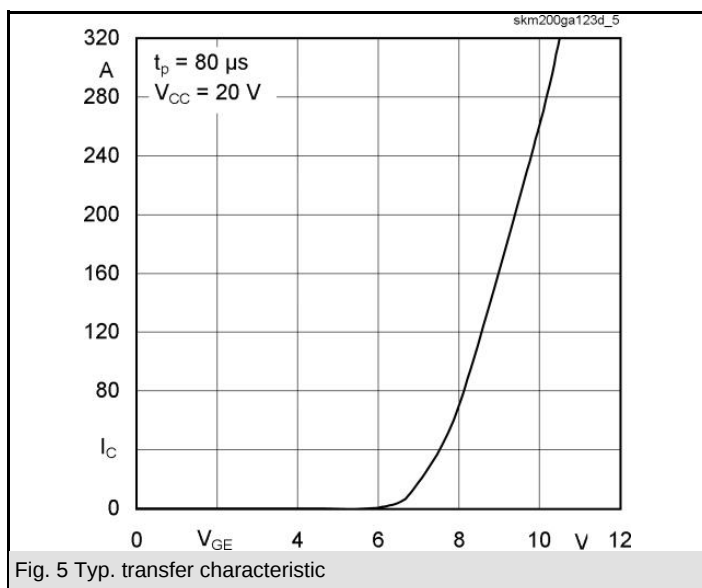
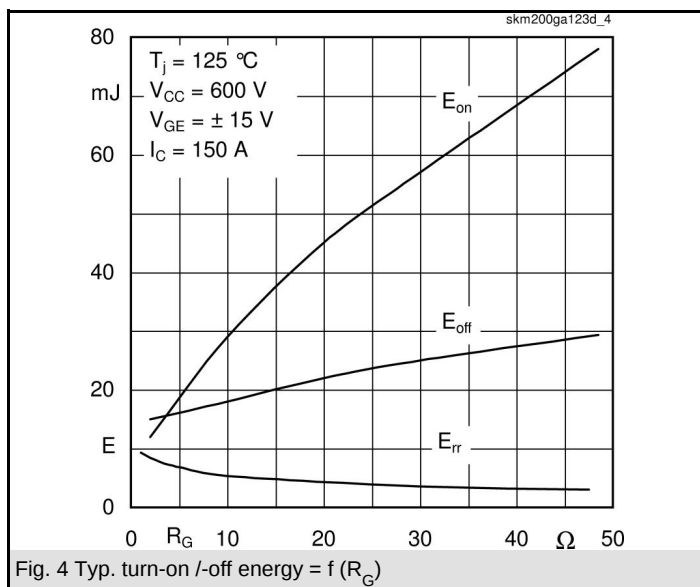
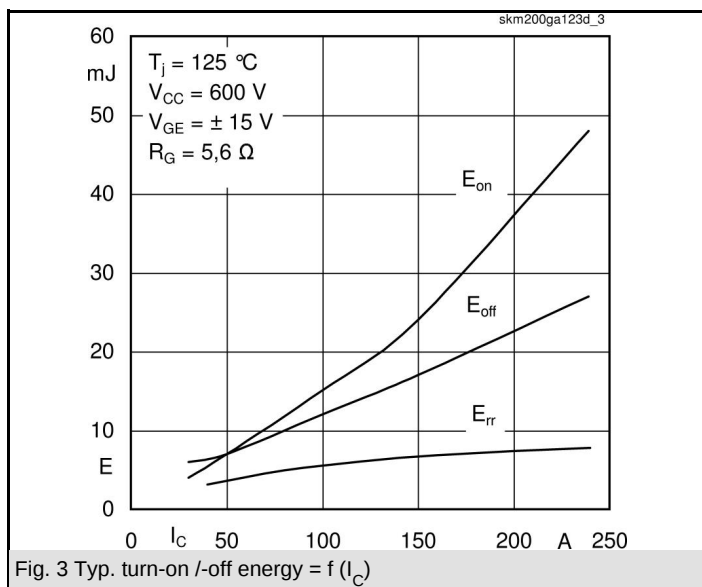
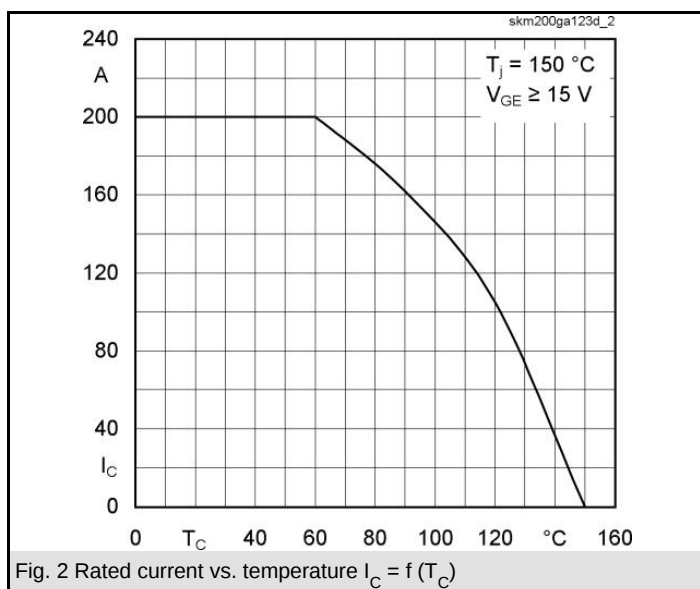
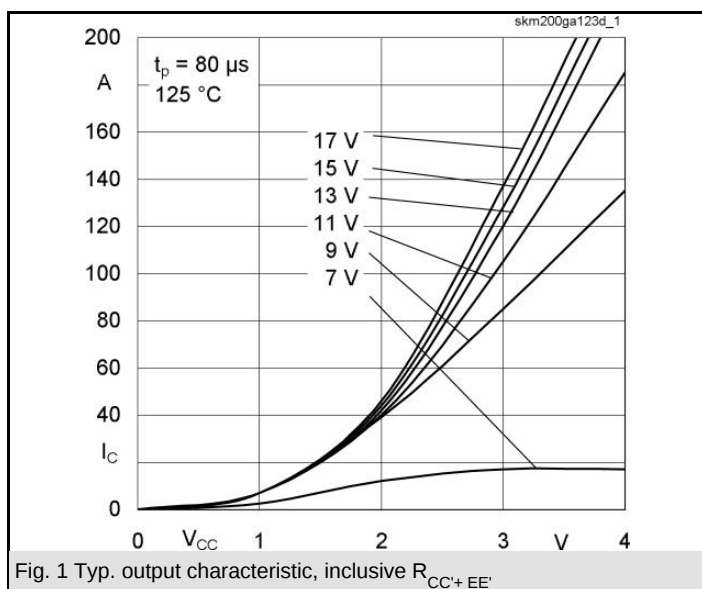
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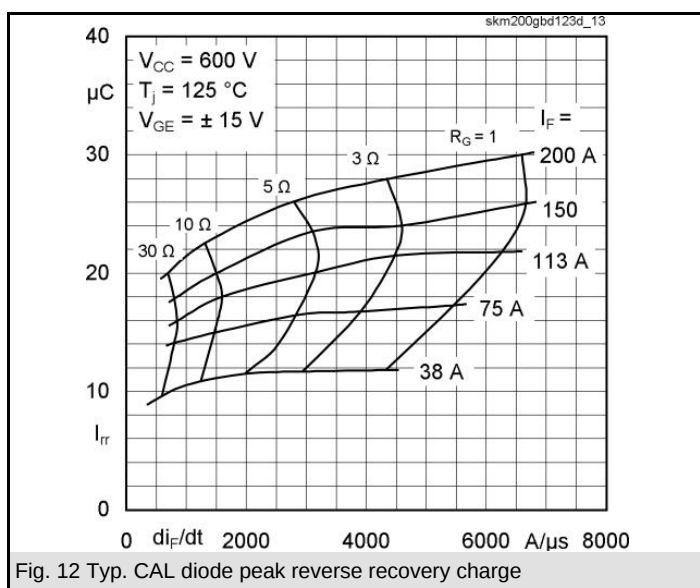
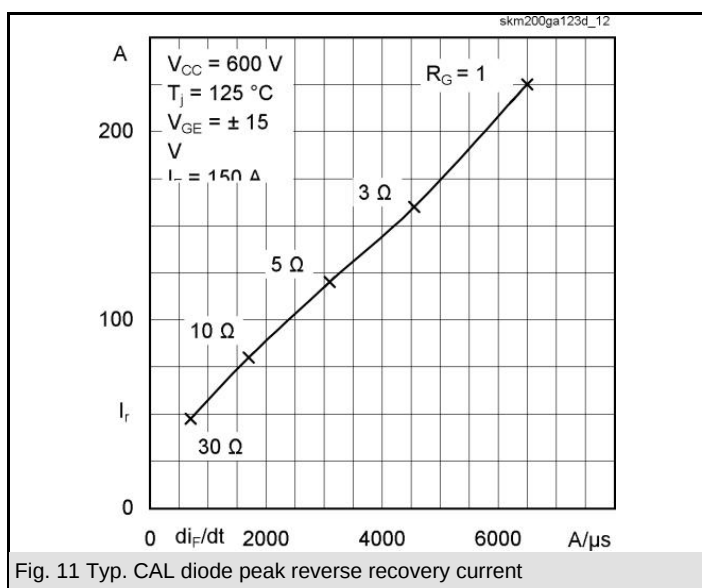
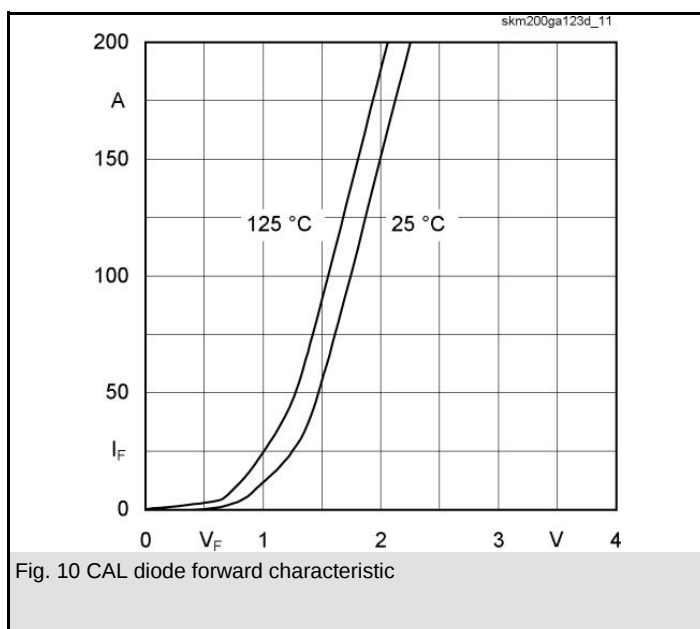
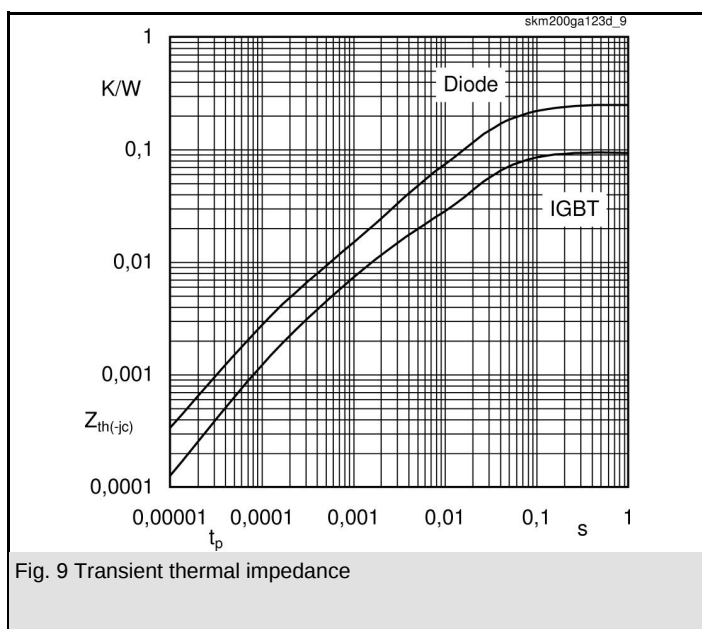
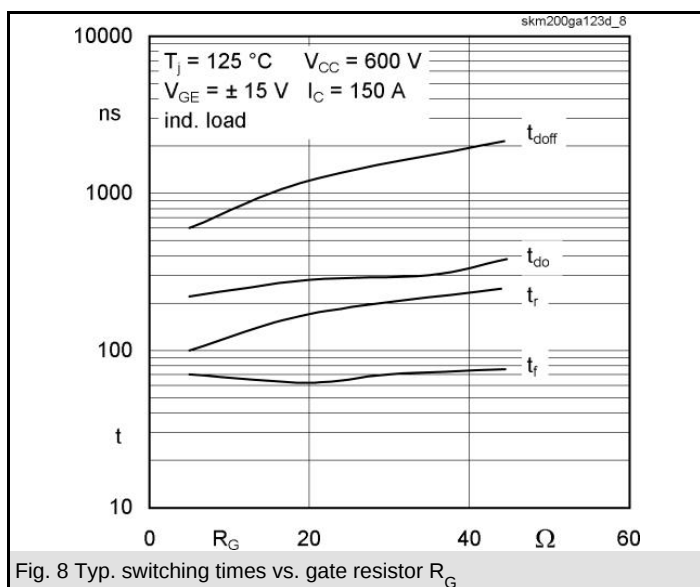
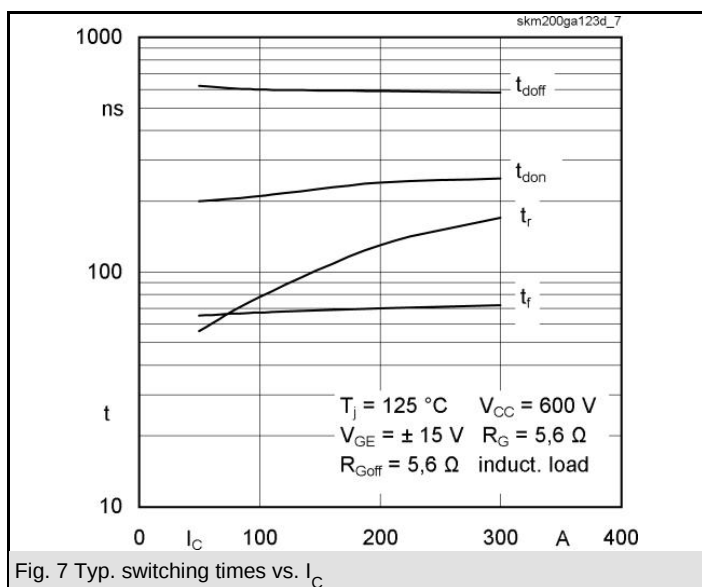
Typical Applications

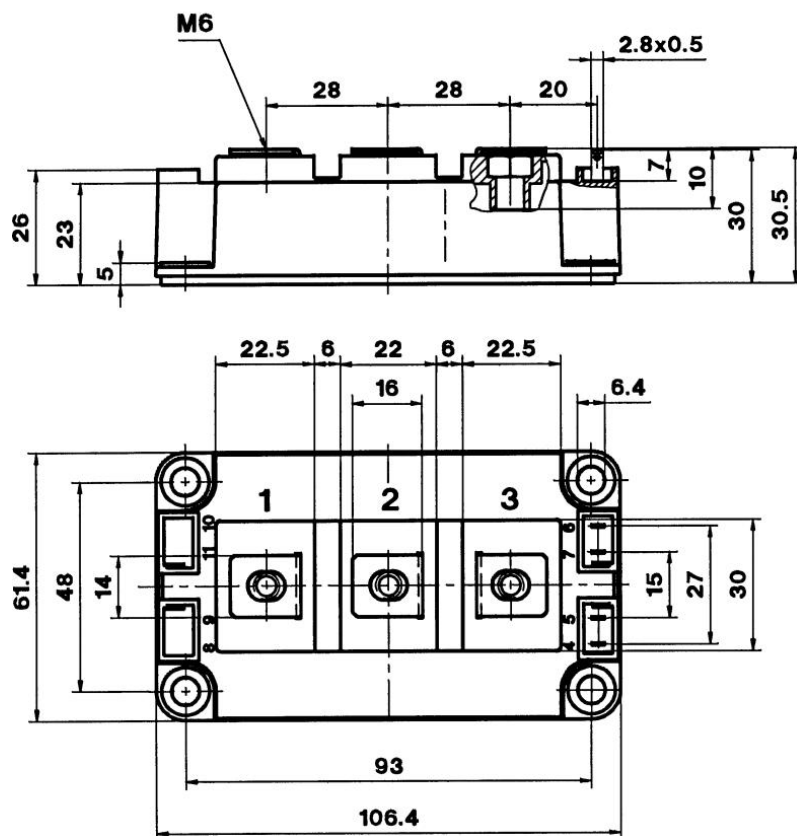
- AC inverter drives
- UPS

Z_{th} Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	$i = 1$	59	mk/W
R_i	$i = 2$	23	mk/W
R_i	$i = 3$	6,8	mk/W
R_i	$i = 4$	1,2	mk/W
τ_{a_i}	$i = 1$	0,03	s
τ_{a_i}	$i = 2$	0,0087	s
τ_{a_i}	$i = 3$	0,002	s
τ_{a_i}	$i = 4$	0,0002	s
$Z_{th(j-c)D}$			
R_i	$i = 1$	170	mk/W
R_i	$i = 2$	66	mk/W
R_i	$i = 3$	12	mk/W
R_i	$i = 4$	2	mk/W
τ_{a_i}	$i = 1$	0,0348	s
τ_{a_i}	$i = 2$	0,0072	s
τ_{a_i}	$i = 3$	0,077	s
τ_{a_i}	$i = 4$	0,0002	s

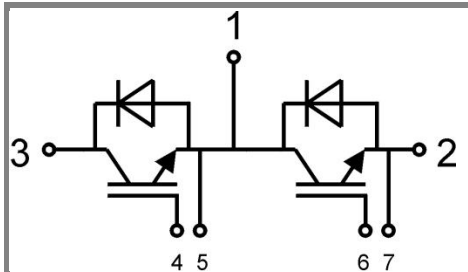






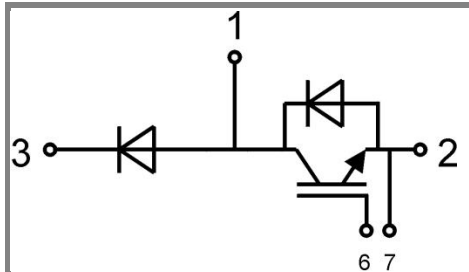


Case D 56



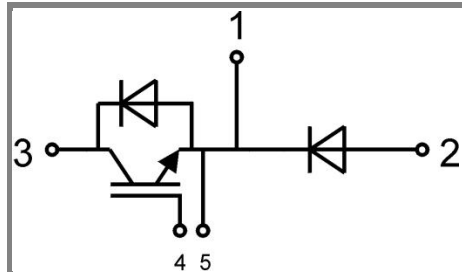
Case D 56

GB



Case D 57
(56)

GAL



Case D 58
(56)

GAR