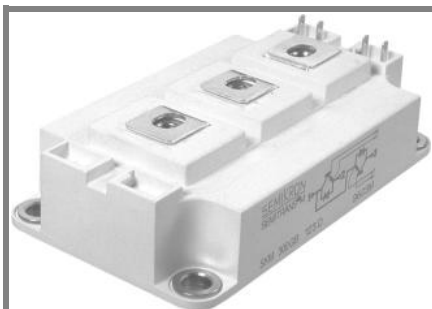


SKM 200GB123D



SEMITRANS® 3

Trench IGBT Modules

SKM 200GB123D

SKM 200GAL123D

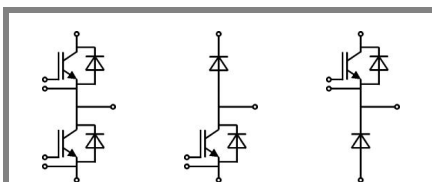
SKM 200GAR123D

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

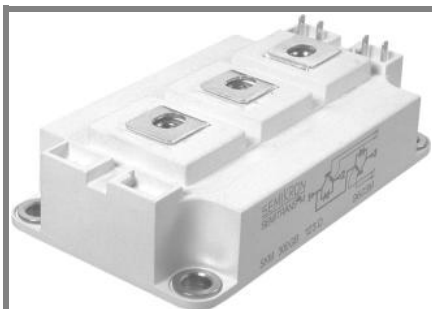
Absolute Maximum Ratings		T _c = 25 °C, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V _{CES}	T _j = 25 °C	1200	V
I _C	T _j = 150 °C	T _{case} = 25 °C	200
		T _{case} = 85 °C	180
I _{CRM}	I _{CRM} =2xI _{Cnom}	300	A
V _{GES}		± 20	V
t _{psc}	V _{CC} = 600 V; V _{GE} ≤ 20 V; T _j = 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 _{Cnom} = 150A T _J = 125 °C V _{GE} = -15V		220	400	ns
t _r				100	200	ns
E _{on}				24		mJ
t _{d(off)}	R _{Goff} = 5,6 Ω			600	800	ns
t _f				70	100	ns
E _{off}				17		mJ
R _{th(j-c)}	per IGBT				0,09	K/W



SEMITRANS® 3

Trench IGBT Modules

SKM 200GB123D

SKM 200GAL123D

SKM 200GAR123D

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- Very low tail current with low temperature dependence
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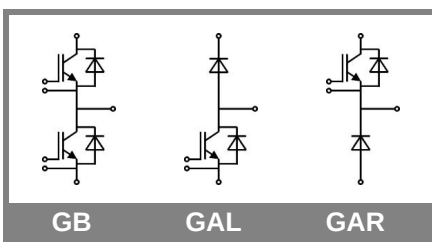
Typical Applications

- AC inverter drives
- UPS

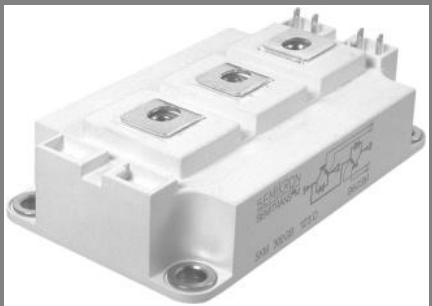
Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 150 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	2	2,5	V
		$T_j = 125^\circ\text{C}_{chiplev.}$	1,8		V
V_{F0}		$T_j = 25^\circ\text{C}$	1,1	1,2	V
		$T_j = 125^\circ\text{C}$			V
r_F		$T_j = 25^\circ\text{C}$	6	8,7	mΩ
		$T_j = 125^\circ\text{C}$			mΩ
I_{RRM}	$I_{Fnom} = 150 \text{ A}$	$T_j = 125^\circ\text{C}$	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					
$V_F = V_{EC}$	$I_{Fnom} = 200 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	2	2,5	V
		$T_j = 125^\circ\text{C}_{chiplev.}$	1,8		V
V_{F0}		$T_j = 25^\circ\text{C}$	1,1	1,2	V
		$T_j = 125^\circ\text{C}$			V
r_F		$T_j = 25^\circ\text{C}$	4,5	6,5	V
		$T_j = 125^\circ\text{C}$			V
I_{RRM}	$I_{Fnom} = 200 \text{ A}$	$T_j = 125^\circ\text{C}$	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	$T_{case} = 25^\circ\text{C}$	0,35		mΩ
		$T_{case} = 125^\circ\text{C}$	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.



SKM 200GB123D



SEMITRANS® 3

Trench IGBT Modules

SKM 200GB123D
SKM 200GAL123D
SKM 200GAR123D

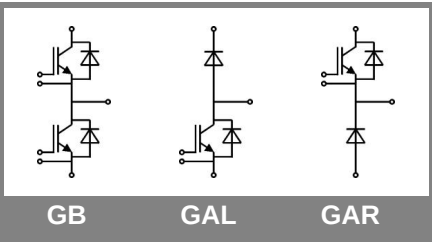
Features

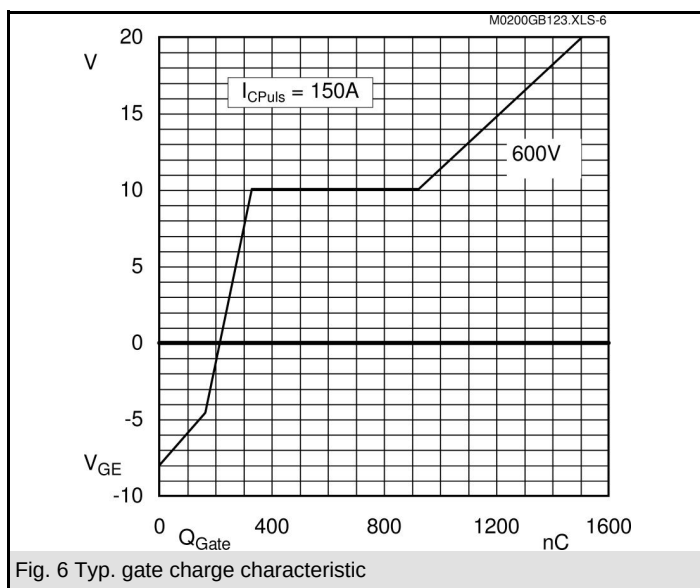
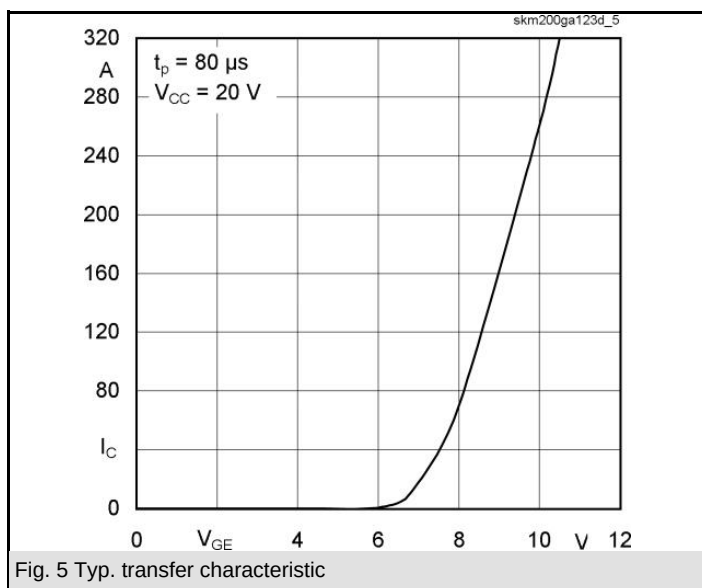
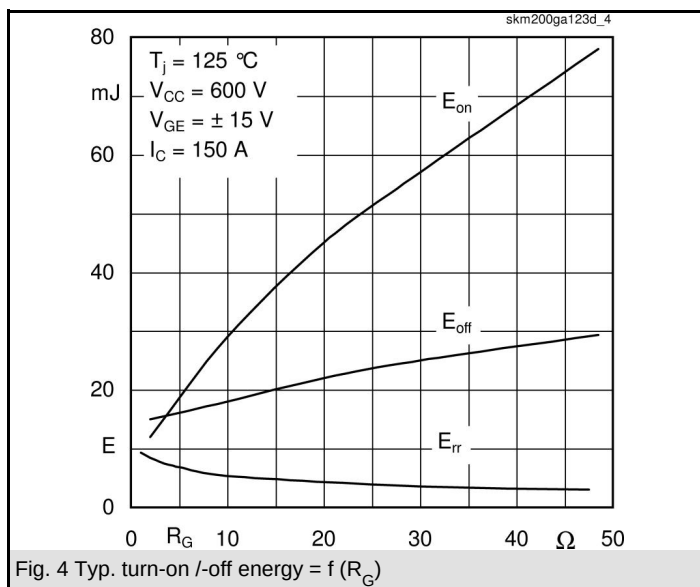
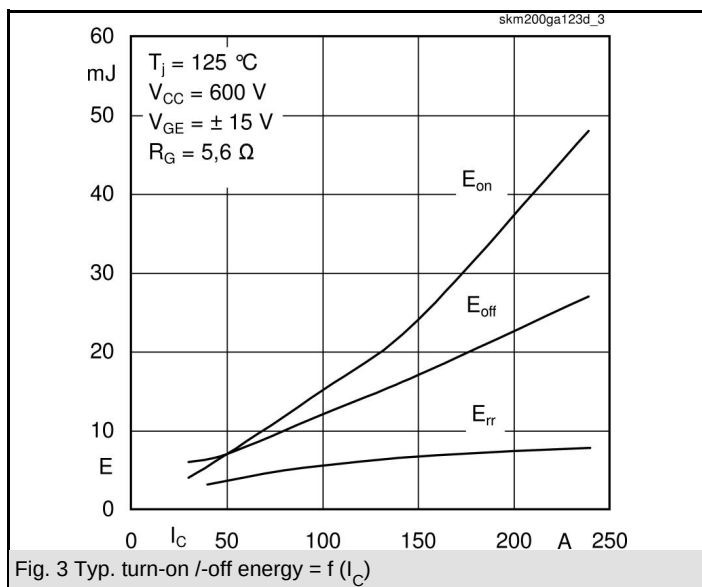
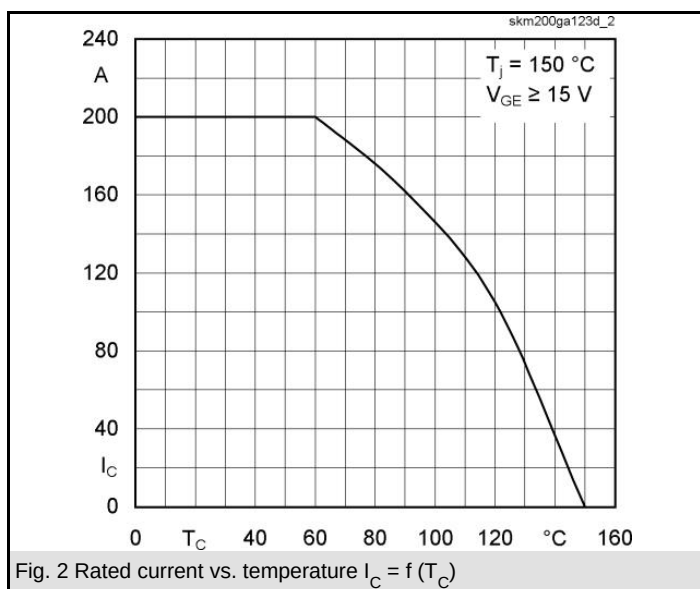
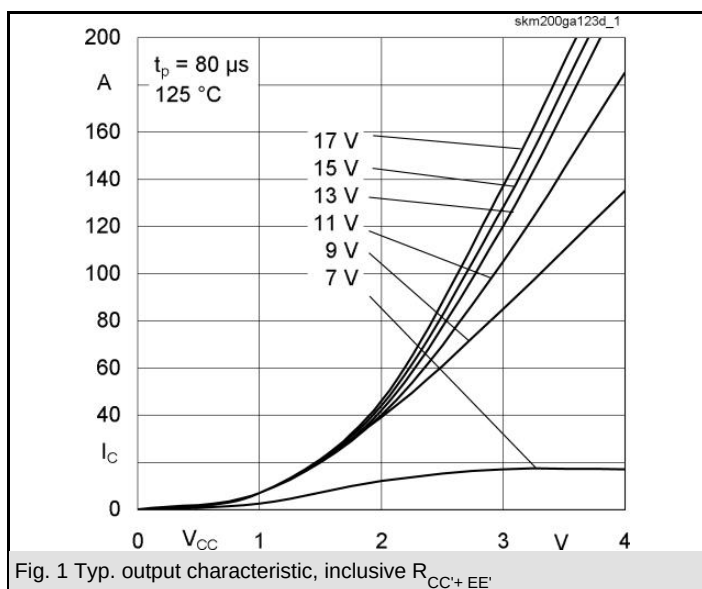
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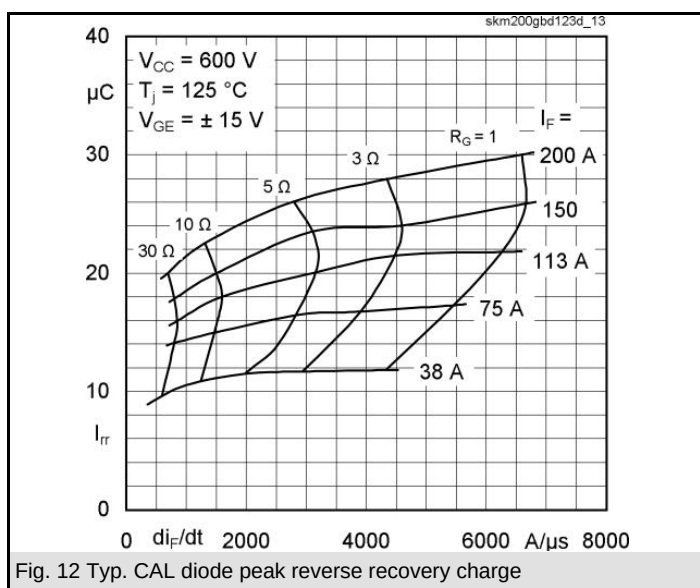
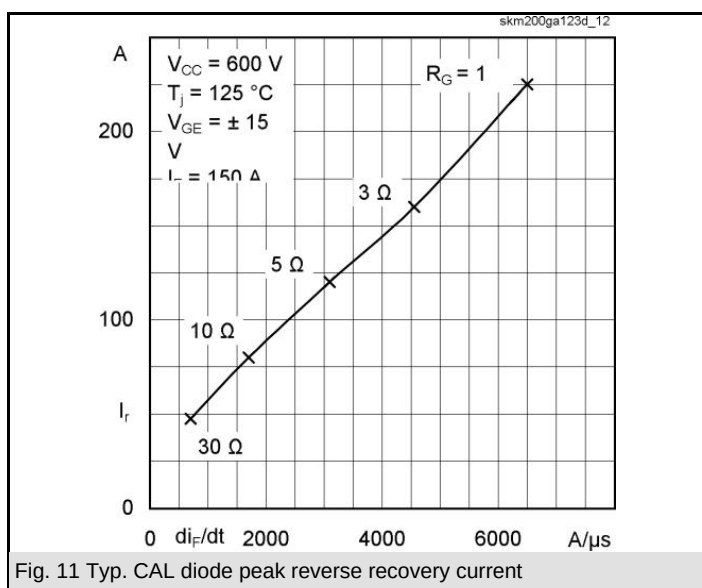
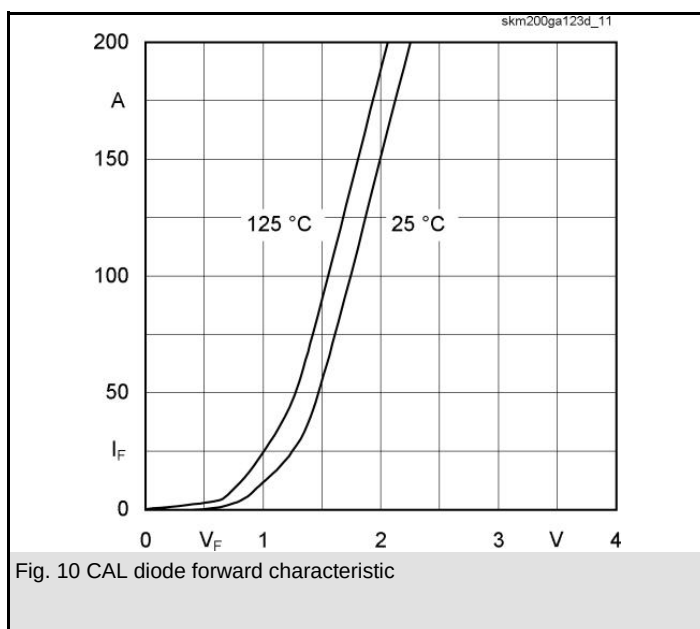
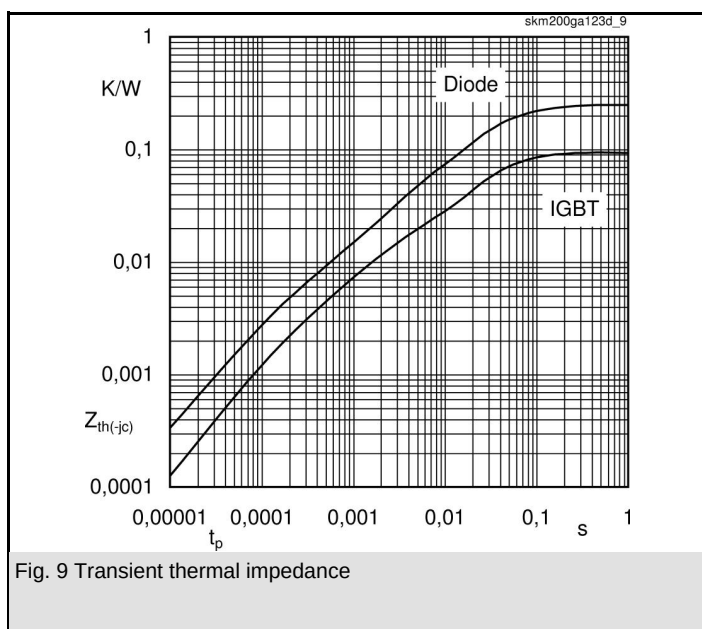
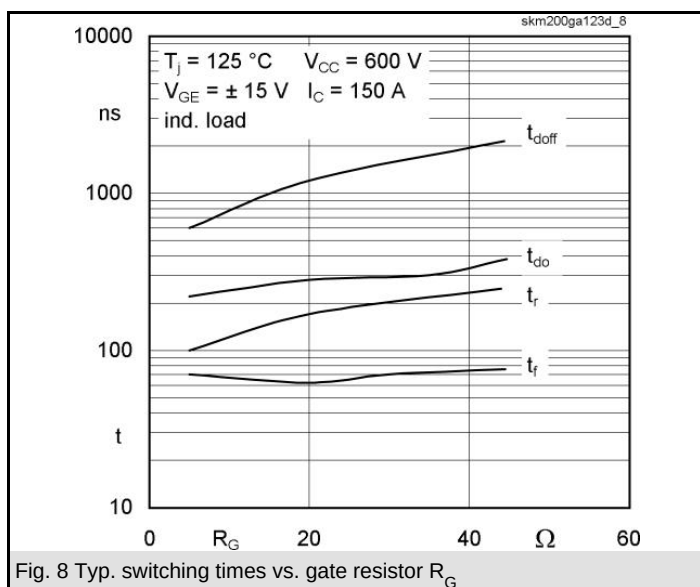
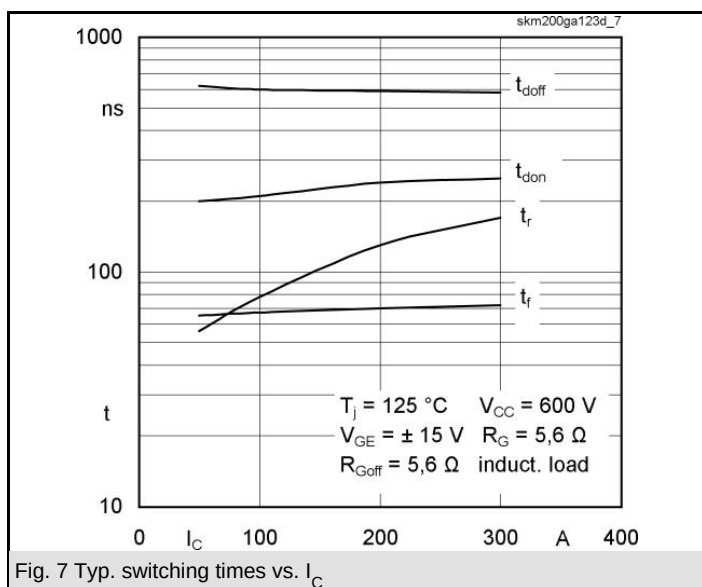
Typical Applications

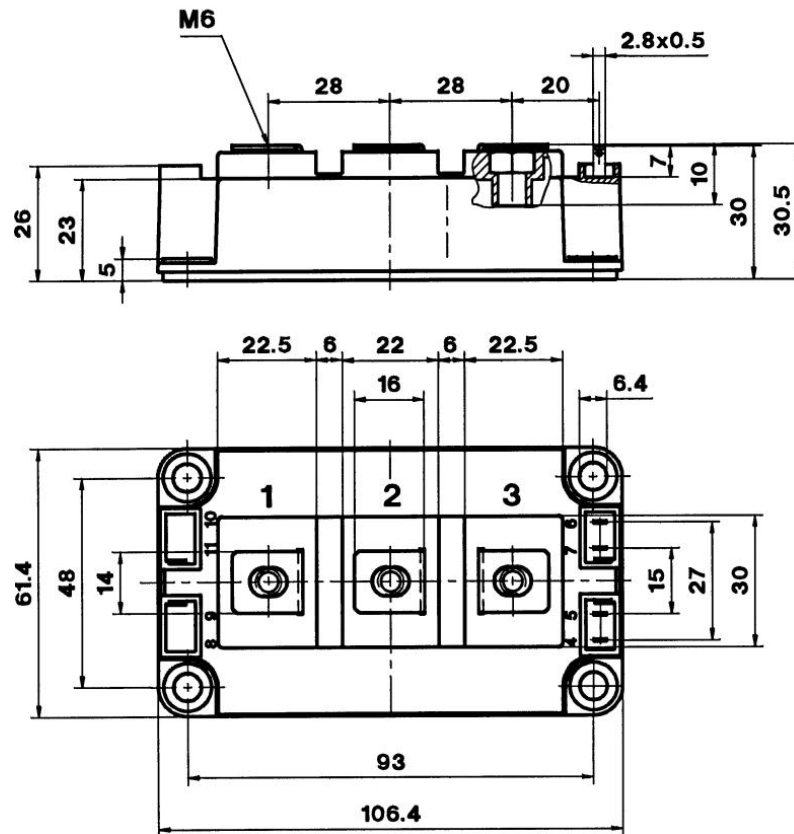
- AC inverter drives
- UPS

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

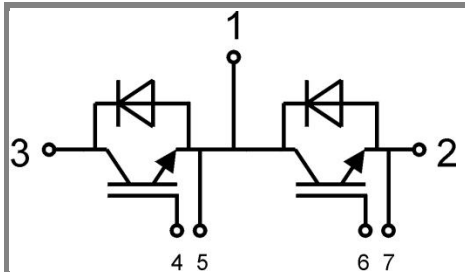






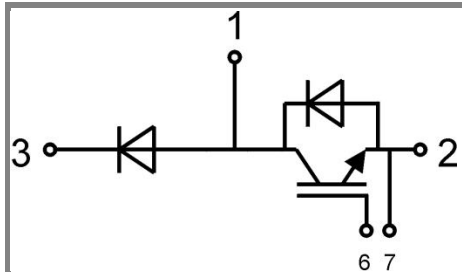


Case D 56



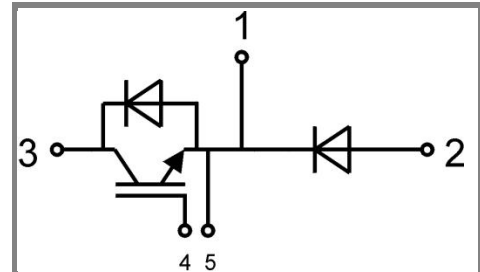
Case D 56

GB



Case D 57 (→ 56)

GAL



Case D 58 (→ 56)

GAR