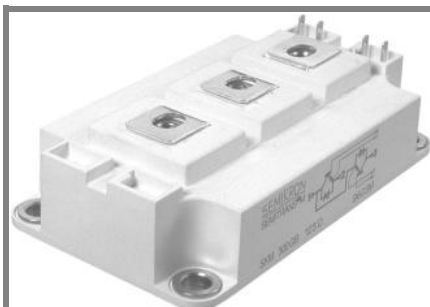


# SKM 300GB123D



**SEMITRANS® 3**

## IGBT Modules

**SKM 300GB123D**

**SKM 300GAL123D**

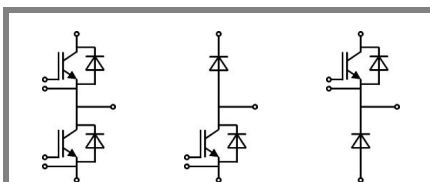
**SKM 300GAR123D**

## 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 (12 mm) and creepage distance (20 mm)

## Typical Applications\*

- AC inverter drives
- UPS



**GB**

**GAL**

**GAR**

Absolute Maximum Ratings				$T_c = 25^\circ\text{C}$ , unless otherwise specified	
Symbol	Conditions			Values	Units
<b>IGBT</b>					
$V_{CES}$	$T_j = 25^\circ\text{C}$			1200	V
$I_C$	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$		300	A
		$T_{case} = 80^\circ\text{C}$		220	A
$I_{CRM}$	$I_{CRM} = 2 \times I_{Cnom}$			400	A
$V_{GES}$				$\pm 20$	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	$\mu\text{s}$
<b>Inverse Diode</b>					
$I_F$	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$		260	A
		$T_{case} = 80^\circ\text{C}$		180	A
$I_{FRM}$	$I_{FRM} = 2 \times I_{Fnom}$			400	A
$I_{FSM}$	$t_p = 10\text{ ms}; \sin.$	$T_j = 150^\circ\text{C}$		2200	A
<b>Freewheeling Diode</b>					
$I_F$	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$		350	A
		$T_{case} = 80^\circ\text{C}$		230	A
$I_{FRM}$	$I_{FRM} = 2 \times I_{Fnom}$			600	A
$I_{FSM}$	$t_p = 10\text{ ms}; \sin$	$T_j = 150^\circ\text{C}$		2900	A
<b>Module</b>					
$I_{t(RMS)}$				500	A
$T_{vj}$				- 40...+ 150	$^\circ\text{C}$
$T_{stg}$				- 40...+ 125	$^\circ\text{C}$
$V_{isol}$	AC, 1 min.			2500	V

Characteristics			T <sub>c</sub> = 25 °C, unless otherwise specified			
Symbol	Conditions		min.	typ.	max.	Units
IGBT						
V <sub>GE(th)</sub>	V <sub>GE</sub> = V <sub>CE</sub> , I <sub>C</sub> = 8 mA		4,5	5,5	6,5	V
I <sub>CES</sub>	V <sub>GE</sub> = 0 V, V <sub>CE</sub> = V <sub>CES</sub>	T <sub>j</sub> = 25 °C		0,1	0,3	mA
V <sub>CE0</sub>		T <sub>j</sub> = 25 °C		1,4	1,6	V
		T <sub>j</sub> = 125 °C		1,6	1,8	V
r <sub>CE</sub>	V <sub>GE</sub> = 15 V	T <sub>j</sub> = 25°C		5,5	7	mΩ
		T <sub>j</sub> = 125°C		7,5	9,5	mΩ
V <sub>CE(sat)</sub>	I <sub>Cnom</sub> = 200 A, V <sub>GE</sub> = 15 V	T <sub>j</sub> = 25°C <sub>chiplev.</sub>		2,5	3	V
		T <sub>j</sub> = 125°C <sub>chiplev.</sub>		3,1	3,7	V
C <sub>ies</sub>	V <sub>CE</sub> = 25, V <sub>GE</sub> = 0 V	f = 1 MHz		18	24	nF
C <sub>oes</sub>				2,5	3,2	nF
C <sub>res</sub>				1	1,3	nF
Q <sub>G</sub>	-8V - +20V			2000		nC
R <sub>Gint</sub>	T <sub>j</sub> = °C			2,5		Ω
t <sub>d(on)</sub>	R <sub>Gon</sub> = 4,7 Ω	V <sub>CC</sub> = 600V I <sub>C</sub> = 200A T <sub>j</sub> = 125 °C		250	400	ns
t <sub>r</sub>				90	160	ns
E <sub>on</sub>				28		mJ
t <sub>d(off)</sub>	R <sub>Goff</sub> = 4,7 Ω			550	700	ns
t <sub>f</sub>				70	100	ns
E <sub>off</sub>				26		mJ
R <sub>th(j-c)</sub>	per IGBT			0,075		K/W



**SEMITRANS® 3**

## IGBT Modules

**SKM 300GB123D**

**SKM 300GAL123D**

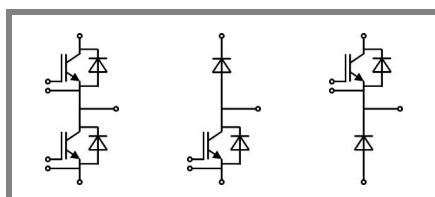
**SKM 300GAR123D**

### 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 (12 mm) and creepage distance (20 mm)

### Typical Applications\*

- AC inverter drives
- UPS



GB

GAL

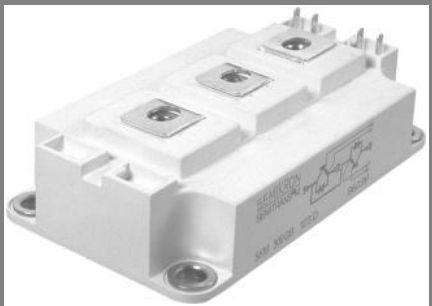
GAR

Characteristics							
Symbol	Conditions			min.	typ.	max.	Units
Inverse Diode							
V <sub>F</sub> = V <sub>EC</sub>	I <sub>Fnom</sub> = 200 A; V <sub>GE</sub> = 0 V	T <sub>j</sub> = 25 °C <sub>chiplev.</sub>		2	2,5		V
V <sub>F0</sub>		T <sub>j</sub> = 25 °C		1,1	1,2		V
		T <sub>j</sub> = 125 °C					V
r <sub>F</sub>		T <sub>j</sub> = 25 °C		4,5	6,5		mΩ
		T <sub>j</sub> = 125 °C					mΩ
I <sub>RRM</sub>	I <sub>F</sub> = 200 A	T <sub>j</sub> = 125 °C		105			A
Q <sub>rr</sub>	di/dt = 4000 A/μs			10			μC
E <sub>rr</sub>	V <sub>GE</sub> = 0 V; V <sub>CC</sub> = 600 V						mJ
R <sub>th(j-c)D</sub>	per diode					0,18	K/W
Freewheeling Diode							
V <sub>F</sub> = V <sub>EC</sub>	I <sub>Fnom</sub> = 300 A; V <sub>GE</sub> = 0 V	T <sub>j</sub> = 25 °C <sub>chiplev.</sub>		2	2,5		V
V <sub>F0</sub>		T <sub>j</sub> = 25 °C		1,1	1,2		V
		T <sub>j</sub> = 125 °C					V
r <sub>F</sub>		T <sub>j</sub> = 25 °C		3	4,3		V
		T <sub>j</sub> = 125 °C					V
I <sub>RRM</sub>	I <sub>F</sub> = 200 A	T <sub>j</sub> = 125 °C		140			A
Q <sub>rr</sub>	di/dt = 3500 A/μs			34			μC
E <sub>rr</sub>	V <sub>GE</sub> = 0 V; V <sub>CC</sub> = 600 V						mJ
R <sub>th(j-c)FD</sub>	per diode					0,15	K/W
Module							
L <sub>CE</sub>				15	20		nH
R <sub>CC'+EE'</sub>	res., terminal-chip	T <sub>case</sub> = 25 °C		0,35			mΩ
		T <sub>case</sub> = 125 °C		0,5			mΩ
R <sub>th(c-s)</sub>	per module					0,038	K/W
M <sub>s</sub>	to heat sink M6			3		5	Nm
M <sub>t</sub>	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.

# SKM 300GB123D



SEMITRANS® 3

## IGBT Modules

SKM 300GB123D  
SKM 300GAL123D  
SKM 300GAR123D

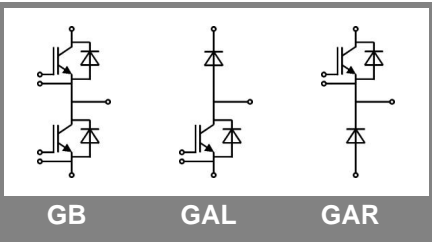
### Features

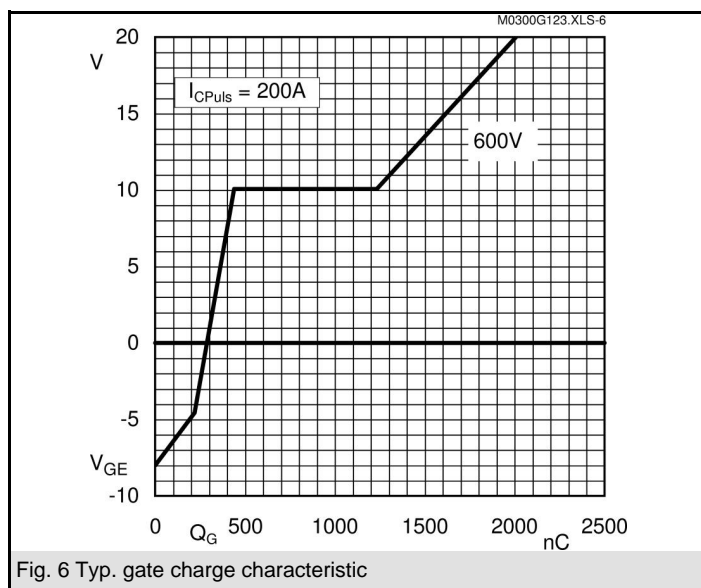
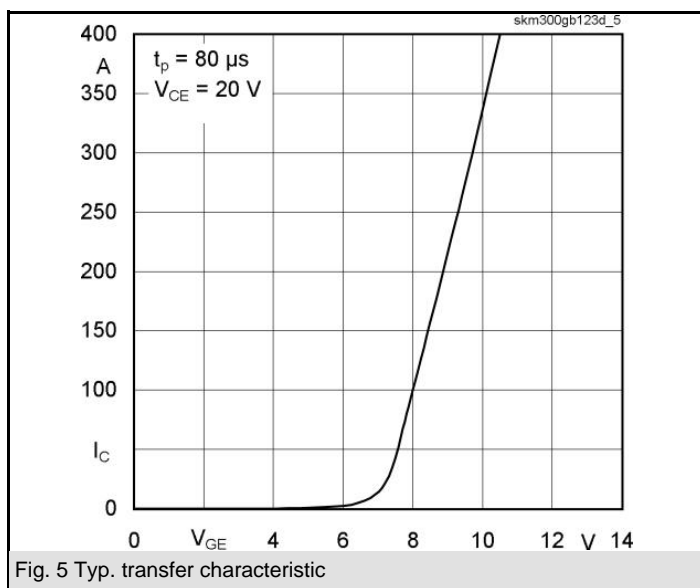
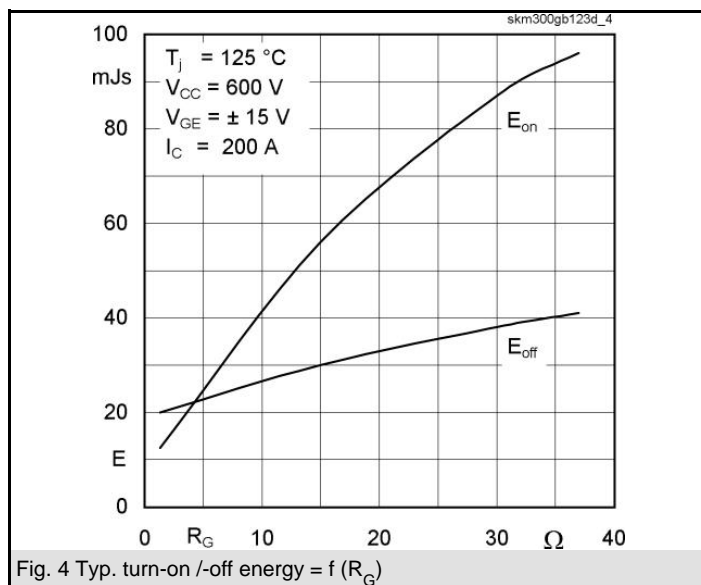
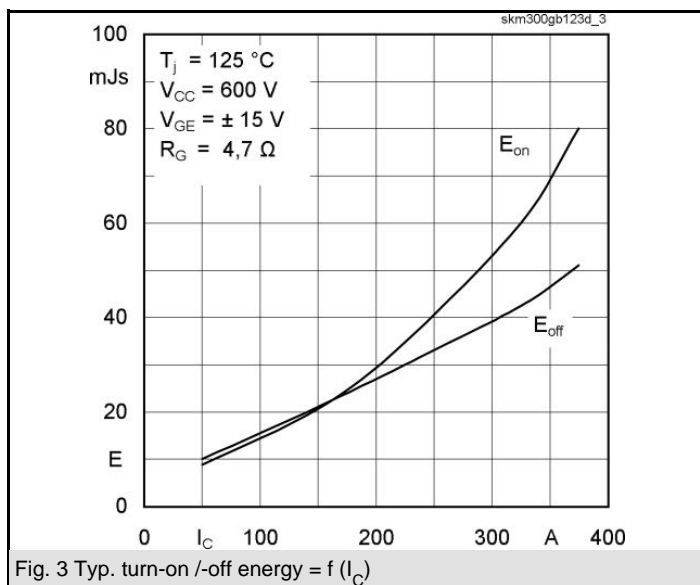
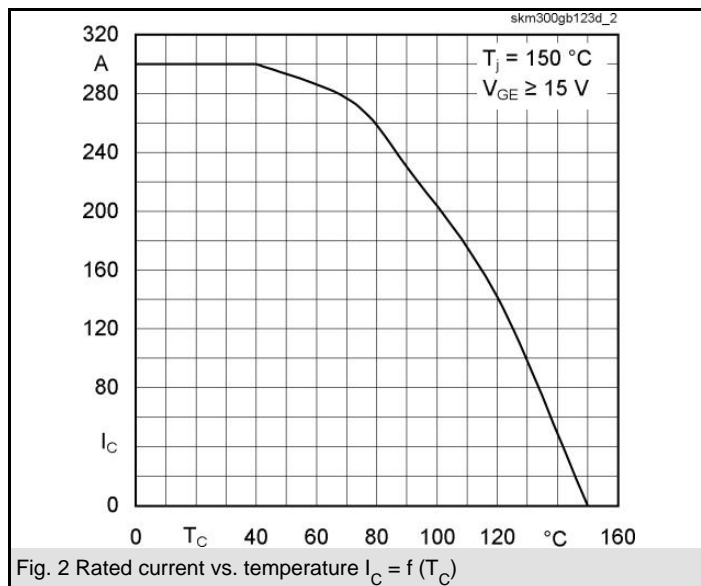
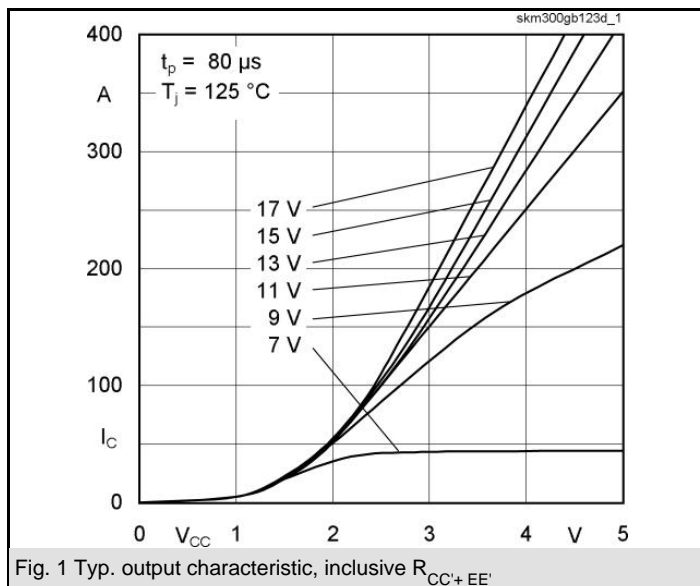
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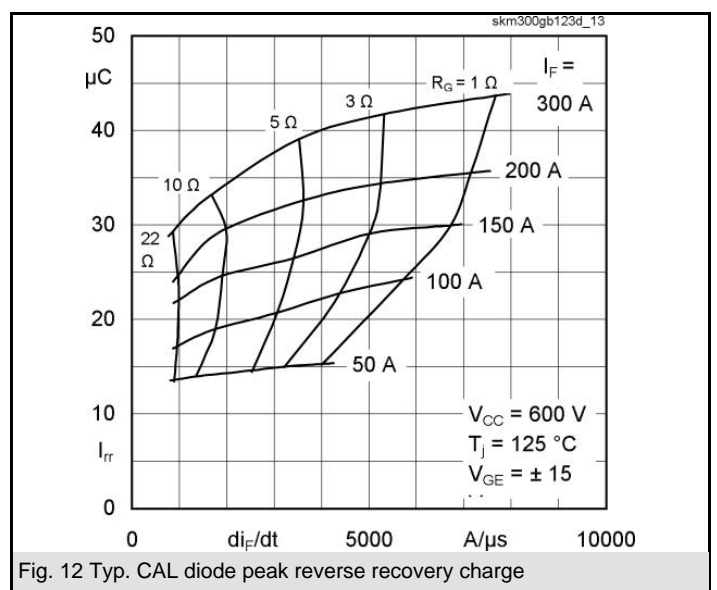
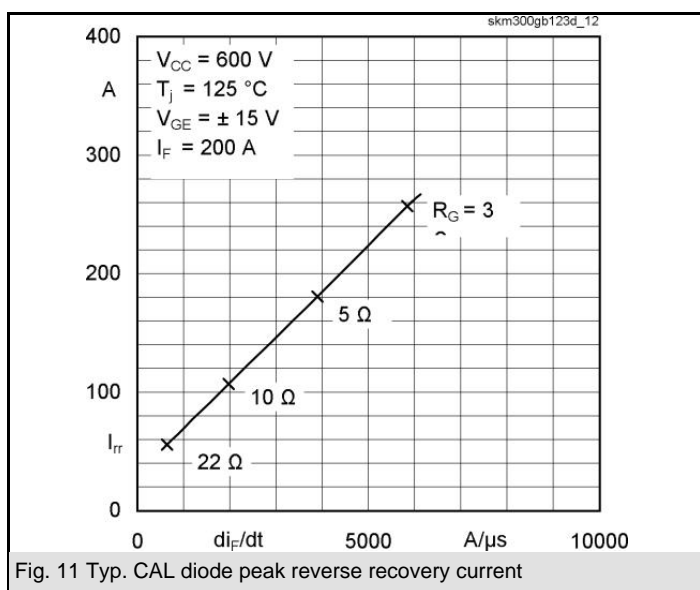
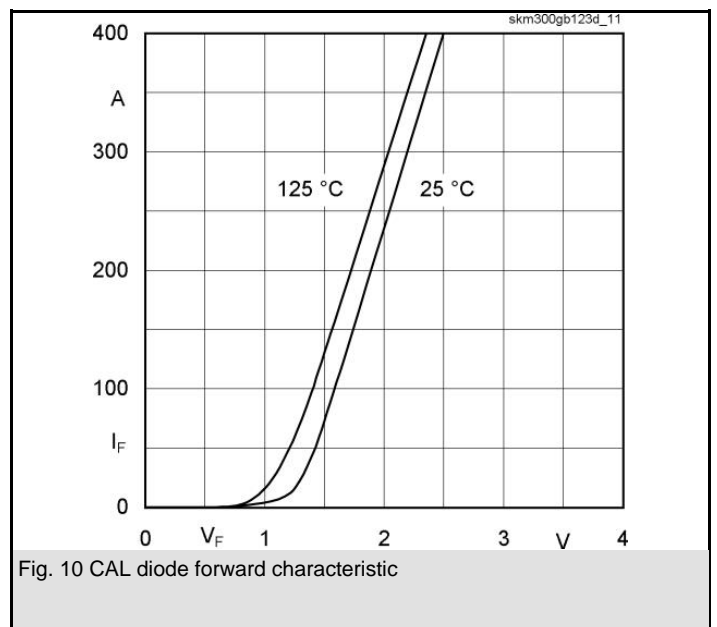
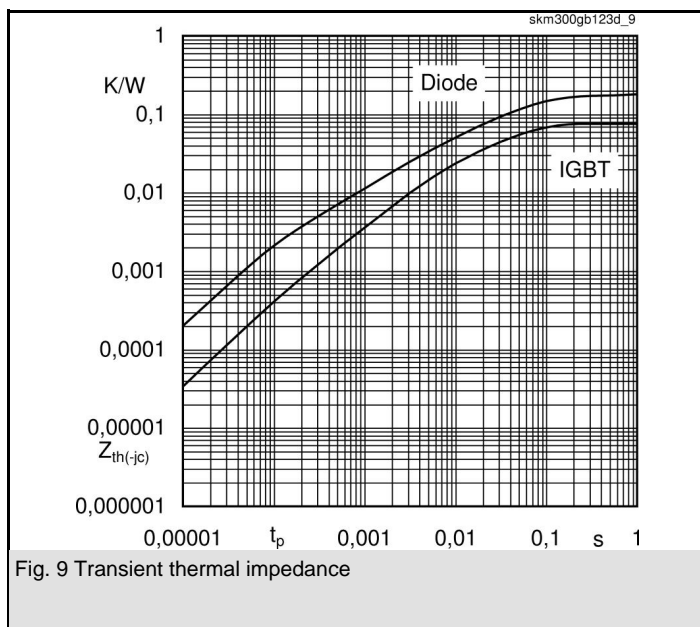
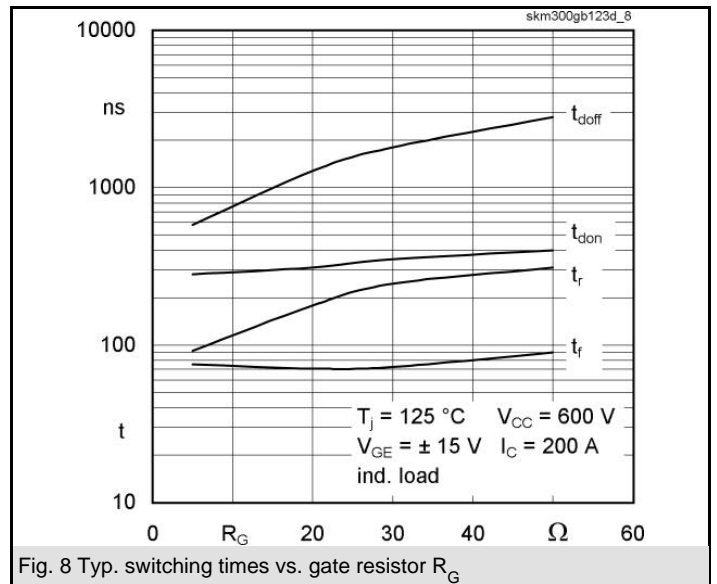
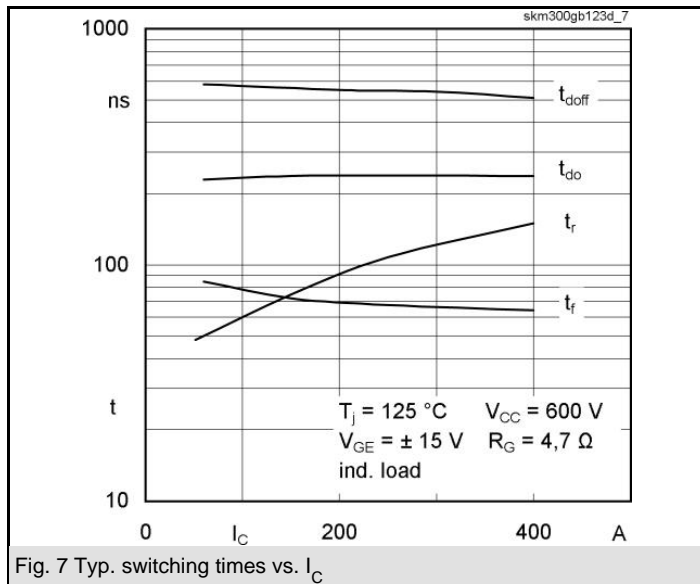
### Typical Applications\*

- AC inverter drives
- UPS

$Z_{th}$ Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
$R_i$	$i = 1$	53	mk/W
$R_i$	$i = 2$	18,5	mk/W
$R_i$	$i = 3$	3,1	mk/W
$R_i$	$i = 4$	0,4	mk/W
$\tau_{ui}$	$i = 1$	0,04	s
$\tau_{ui}$	$i = 2$	0,0189	s
$\tau_{ui}$	$i = 3$	0,0017	s
$\tau_{ui}$	$i = 4$	0,003	s
$Z_{th(j-c)D}$			
$R_i$	$i = 1$	0,1151	mk/W
$R_i$	$i = 2$	0,0525	mk/W
$R_i$	$i = 3$	0,0111	mk/W
$R_i$	$i = 4$	0,0022	mk/W
$\tau_{ui}$	$i = 1$	0,0366	s
$\tau_{ui}$	$i = 2$	0,0113	s
$\tau_{ui}$	$i = 3$	0,003	s
$\tau_{ui}$	$i = 4$	0,0002	s





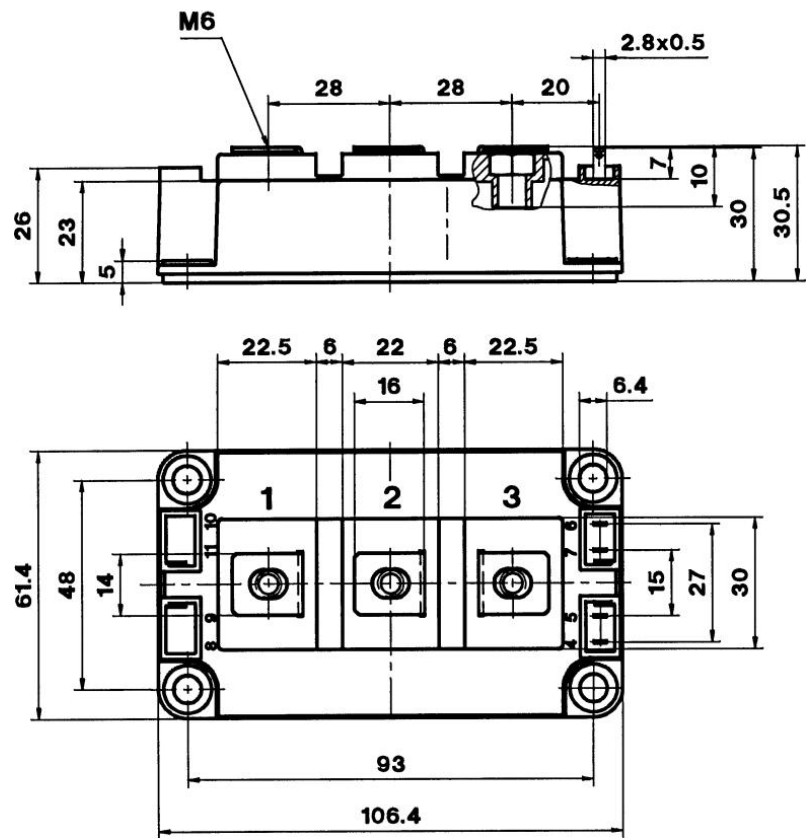


SKM 300GB123D

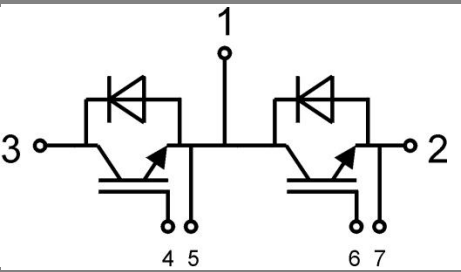
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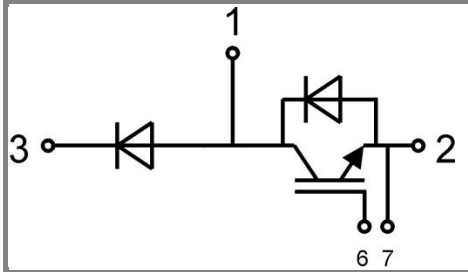
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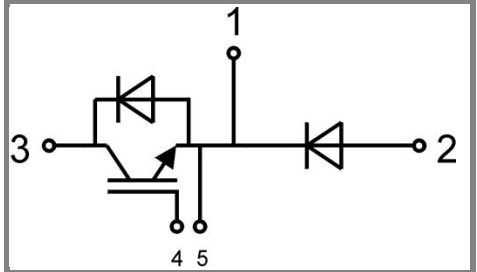
Case D 56



GB Case D 56



GAL Case D 57 (→ D 56 )



GAR Case D 58 (→ D 56 )