

# SKM 75GB123D



**SEMITRANS® 2**

## IGBT Modules

**SKM 75GB123D**

**SKM 75GAL123D**

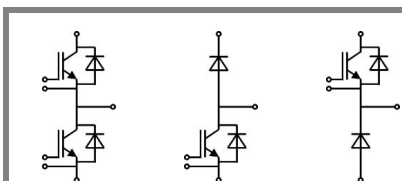
**SKM 75GAR123D**

## Features

- MOS input (voltage controlled)
- 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 (10 mm) and creepage distance (20 mm)

## Typical Applications\*

- AC inverter drives
- UPS



**GB**

**GAL**

**GAR**

Absolute Maximum Ratings			T <sub>c</sub> = 25 °C, unless otherwise specified	
Symbol	Conditions		Values	Units
IGBT				
V <sub>CES</sub>	T <sub>j</sub> = 25 °C		1200	V
I <sub>C</sub>	T <sub>j</sub> = 150 °C	T <sub>case</sub> = 25 °C	75	A
		T <sub>case</sub> = 80 °C	60	A
I <sub>CRM</sub>	I <sub>CRM</sub> =2xI <sub>Cnom</sub>		150	A
V <sub>GES</sub>			± 20	V
t <sub>psc</sub>	V <sub>CC</sub> = 600 V; V <sub>GE</sub> ≤ 20 V; T <sub>j</sub> = 125 °C V <sub>CES</sub> < 1200 V		10	μs
Inverse Diode				
I <sub>F</sub>	T <sub>j</sub> = 150 °C	T <sub>case</sub> = 25 °C	75	A
		T <sub>case</sub> = 80 °C	50	A
I <sub>FRM</sub>	I <sub>FRM</sub> =2xI <sub>Fnom</sub>		150	A
I <sub>FSM</sub>	t <sub>p</sub> = 10 ms; sin.	T <sub>j</sub> = 150 °C	480	A
Freewheeling Diode				
I <sub>F</sub>	T <sub>j</sub> = 150 °C	T <sub>case</sub> = 25 °C	95	A
		T <sub>case</sub> = 80 °C	65	A
I <sub>FRM</sub>	I <sub>FRM</sub> =2xI <sub>Fnom</sub>		200	A
I <sub>FSM</sub>	t <sub>p</sub> = 10 ms; sin	T <sub>j</sub> = 150 °C	720	A
Module				
I <sub>t(RMS)</sub>			200	A
T <sub>vj</sub>			- 40 ...+ 150	°C
T <sub>stg</sub>			- 40 ...+ 125	°C
V <sub>isol</sub>	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> = 2 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		22	28	mΩ
		T <sub>j</sub> = 125°C		30	38	mΩ
V <sub>CE(sat)</sub>	I <sub>Cnom</sub> = 50 A, V <sub>GE</sub> = 15 V	T <sub>j</sub> = °C <sub>chiplev.</sub>		2,5	3	V
C <sub>ies</sub>	V <sub>CE</sub> = 25, V <sub>GE</sub> = 0 V	f = 1 MHz		3,3	4,3	nF
C <sub>oes</sub>				0,5	0,6	nF
C <sub>res</sub>				0,22	0,3	nF
Q <sub>G</sub>	V <sub>GE</sub> = -8 - +20V			500		nC
R <sub>Gint</sub>	T <sub>j</sub> = °C			5		Ω
t <sub>d(on)</sub>	R <sub>Gon</sub> = 22 Ω	V <sub>CC</sub> = 600V I <sub>C</sub> = 50A		44	100	ns
t <sub>r</sub>				56	100	ns
E <sub>on</sub>				8		mJ
t <sub>d(off)</sub>	R <sub>Goff</sub> = 22 Ω	T <sub>j</sub> = 125 °C V <sub>GE</sub> = ±15V		380	500	ns
t <sub>f</sub>				70	100	ns
E <sub>off</sub>				5		mJ
R <sub>th(j-c)</sub>	per IGBT				0,27	K/W

# SKM 75GB123D



**SEMITRANS® 2**

## IGBT Modules

**SKM 75GB123D**

**SKM 75GAL123D**

**SKM 75GAR123D**

### Features

- MOS input (voltage controlled)
- Low inductance case
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- High short circuit capability, self limiting to  $6 \times I_{cnom}$
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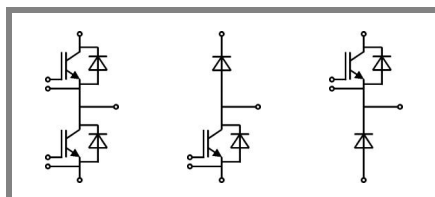
### Typical Applications\*

- AC inverter drives
- UPS

Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
<b>Inverse Diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 50 \text{ A}; V_{GE} = 0 \text{ V}$				
	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$		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
$r_F$					
	$T_j = 25 \text{ }^\circ\text{C}$		18	26	mΩ
	$T_j = 125 \text{ }^\circ\text{C}$				mΩ
$I_{RRM}$	$I_F = 50 \text{ A}$		35		A
$Q_{rr}$	$di/dt = 800 \text{ A}/\mu\text{s}$				μC
$E_{rr}$	$V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$				mJ
$R_{th(j-c)D}$	per diode			0,6	K/W
<b>Freewheeling Diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 50 \text{ A}; V_{GE} = 0 \text{ V}$				
	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$		1,85	2,2	V
	$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$		1,6		V
$V_{F0}$					
	$T_j = 25 \text{ }^\circ\text{C}$		1,1	1,2	V
	$T_j = 125 \text{ }^\circ\text{C}$				V
$r_F$					
	$T_j = 25 \text{ }^\circ\text{C}$		15	20	V
	$T_j = 125 \text{ }^\circ\text{C}$				V
$I_{RRM}$	$I_F = 50 \text{ A}$		40		A
$Q_{rr}$					μC
$E_{rr}$	$V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$				mJ
$R_{th(j-c)FD}$	per diode			0,5	K/W
<b>Module</b>					
$L_{CE}$				30	nH
$R_{CC'+EE'}$	res., terminal-chip				
	$T_{case} = 25 \text{ }^\circ\text{C}$		0,75		mΩ
	$T_{case} = 125 \text{ }^\circ\text{C}$		1		mΩ
$R_{th(c-s)}$	per module			0,05	K/W
$M_s$	to heat sink M6	3		5	Nm
$M_t$	to terminals M5	2,5		5	Nm
w				160	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.



GB

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# SKM 75GB123D



SEMITRANS® 2

## IGBT Modules

SKM 75GB123D  
SKM 75GAL123D  
SKM 75GAR123D

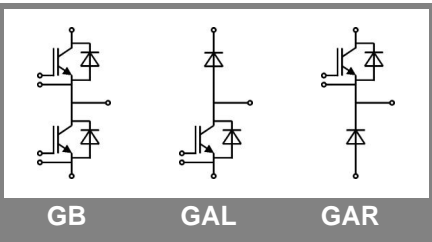
### Features

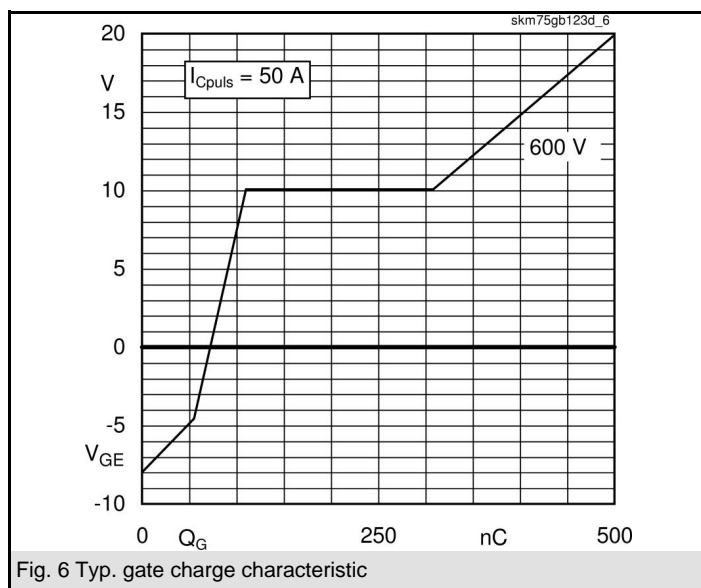
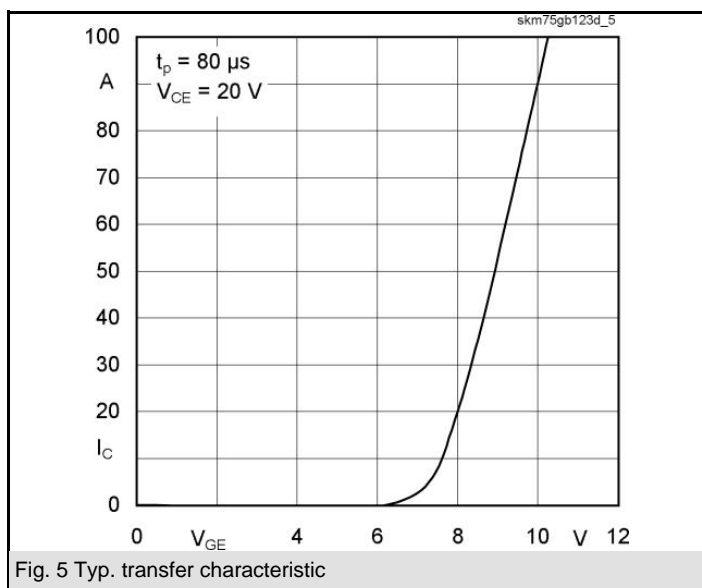
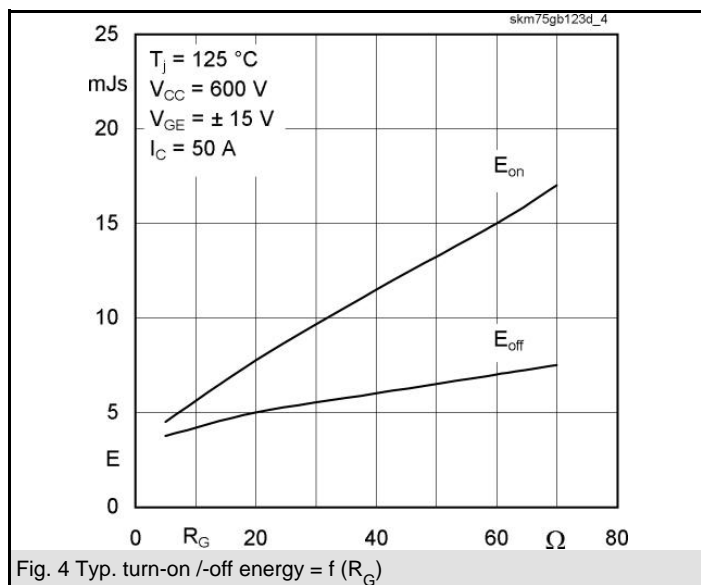
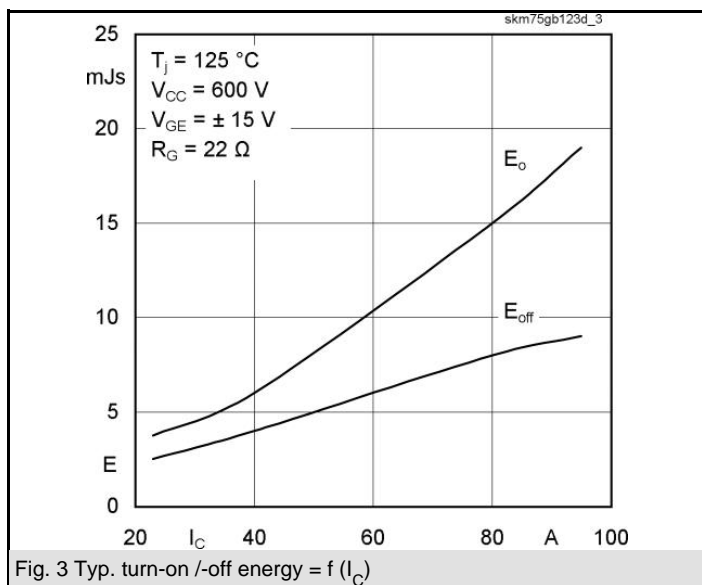
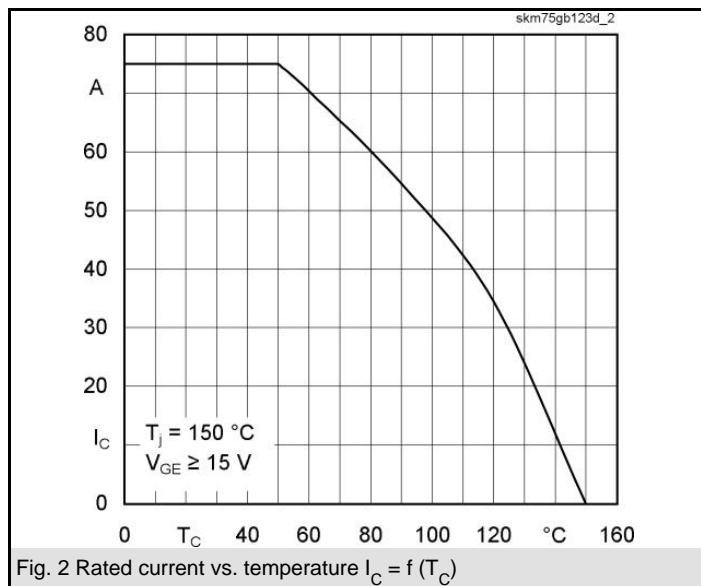
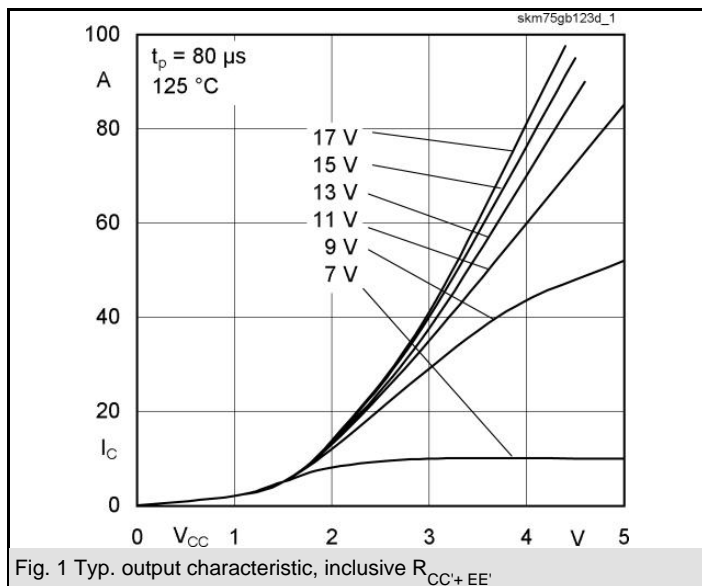
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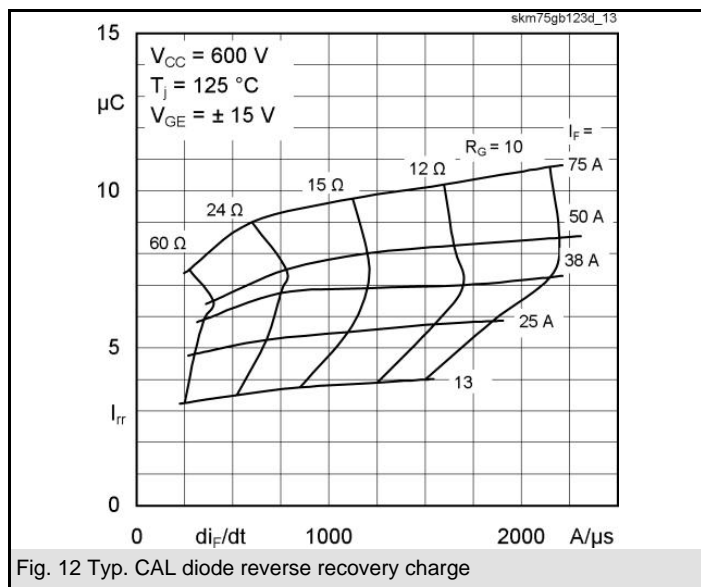
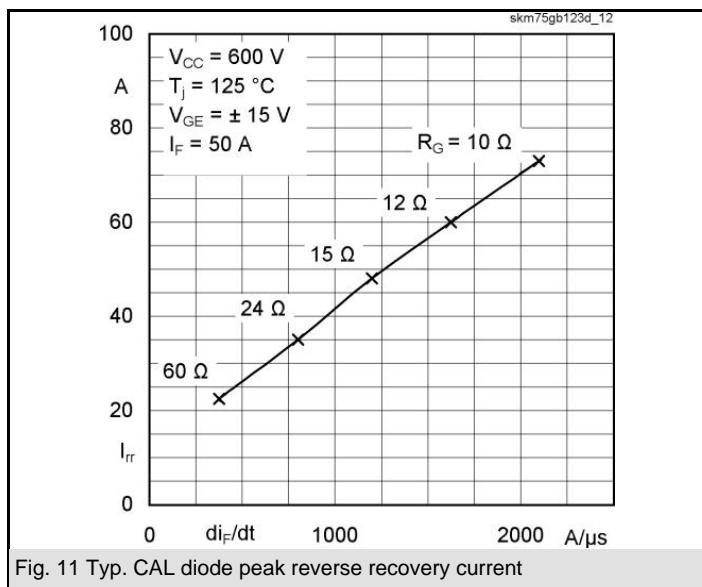
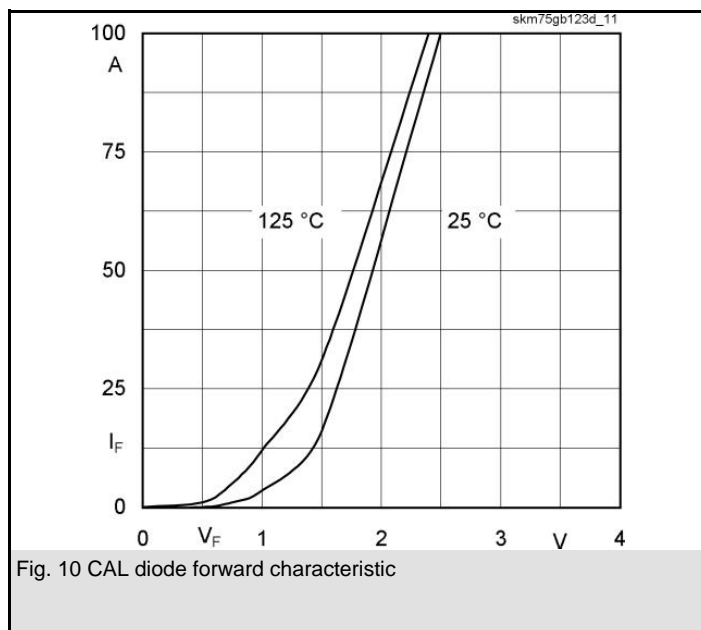
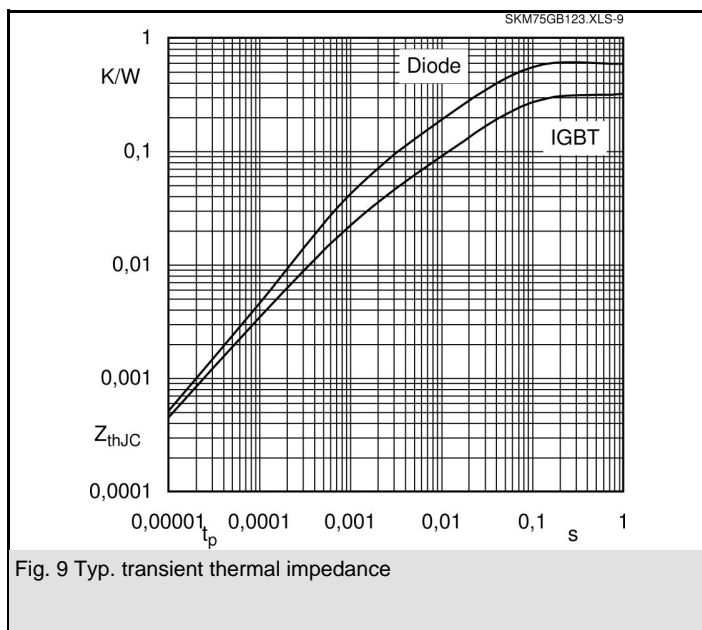
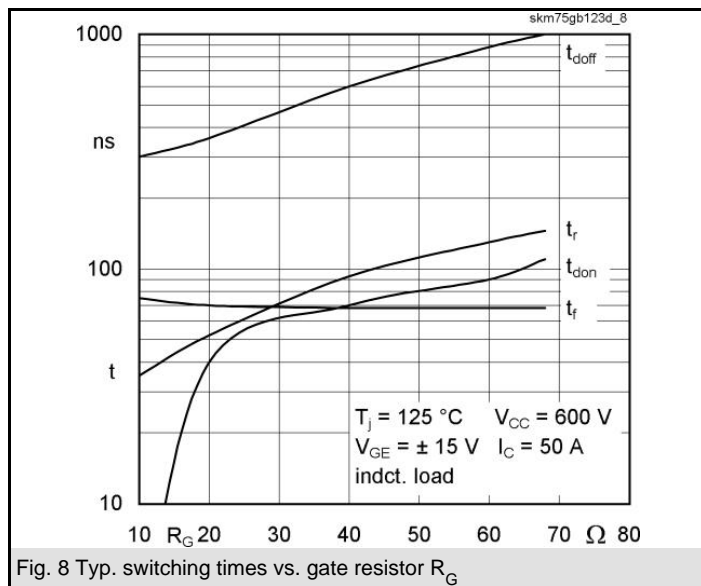
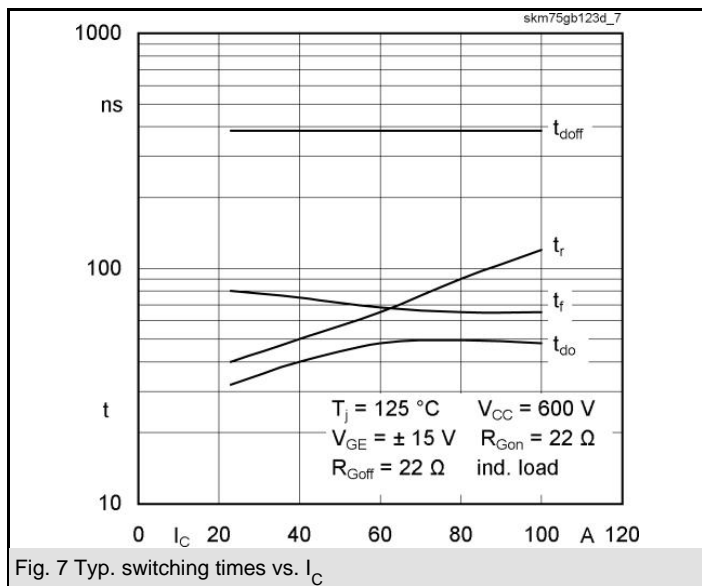
### Typical Applications\*

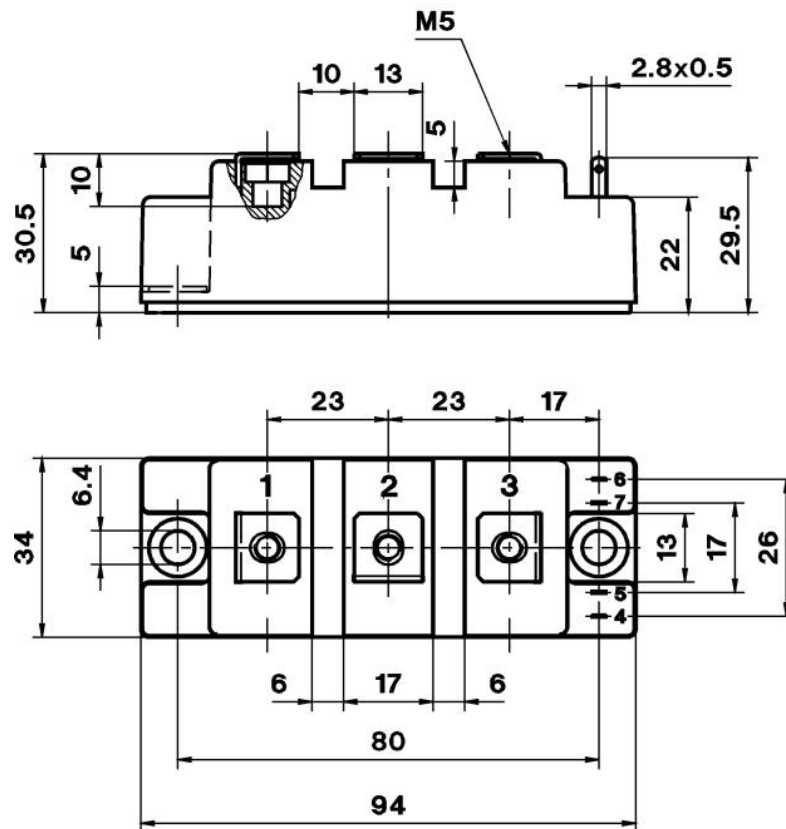
- AC inverter drives
- UPS

$Z_{th}$			
Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
$R_i$	$i = 1$	180	mk/W
$R_i$	$i = 2$	64	mk/W
$R_i$	$i = 3$	22	mk/W
$R_i$	$i = 4$	4	mk/W
$\tau_{u_i}$	$i = 1$	0,0327	s
$\tau_{u_i}$	$i = 2$	0,0479	s
$\tau_{u_i}$	$i = 3$	0,008	s
$\tau_{u_i}$	$i = 4$	0,005	s
$Z_{th(j-c)D}$			
$R_i$	$i = 1$	380	mk/W
$R_i$	$i = 2$	190	mk/W
$R_i$	$i = 3$	26	mk/W
$R_i$	$i = 4$	4	mk/W
$\tau_{u_i}$	$i = 1$	0,0947	s
$\tau_{u_i}$	$i = 2$	0,006	s
$\tau_{u_i}$	$i = 3$	0,08	s
$\tau_{u_i}$	$i = 4$	0,003	s

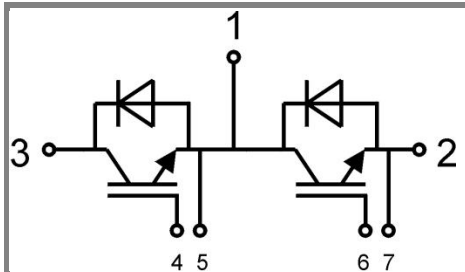






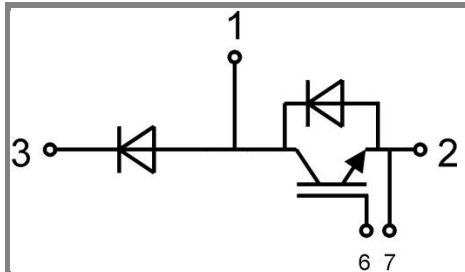


Case D 61



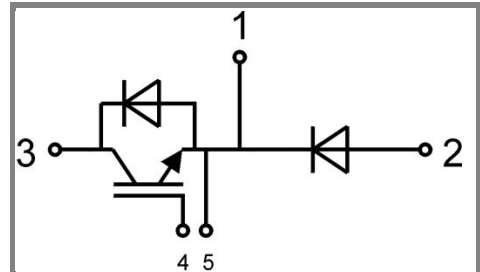
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Case D 61



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Case D 62 (→ D 61)



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Case D 63 (→ D 61)