



SEMITRANS® 3

IGBT Modules

SKM 300GB123D

SKM 300GAL123D

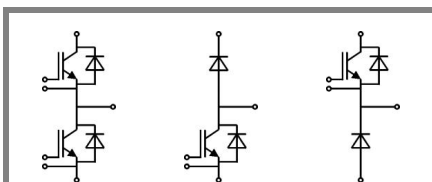
SKM 300GAR123D

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



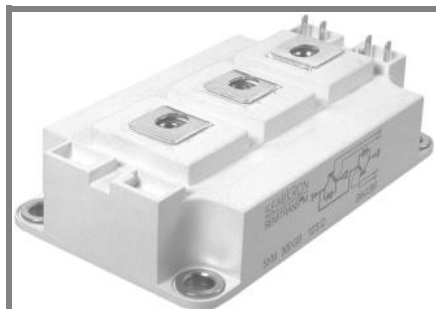
GB

GAL

GAR

Absolute Maximum Ratings			$T_c = 25\text{ }^{\circ}\text{C}$, unless otherwise specified	
Symbol	Conditions		Values	Units
IGBT				
V_{CES}	$T_j = 25\text{ }^{\circ}\text{C}$		1200	V
I_C	$T_j = 150\text{ }^{\circ}\text{C}$	$T_{case} = 25\text{ }^{\circ}\text{C}$	300	A
		$T_{case} = 80\text{ }^{\circ}\text{C}$	220	A
I_{CRM}	$I_{CRM}=2 \times I_{Cnom}$		400	A
V_{GES}			± 20	V
t_{psc}	$V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125\text{ }^{\circ}\text{C}$ $V_{CES} < 1200\text{ V}$		10	μs
Inverse Diode				
I_F	$T_j = 150\text{ }^{\circ}\text{C}$	$T_{case} = 25\text{ }^{\circ}\text{C}$	260	A
		$T_{case} = 80\text{ }^{\circ}\text{C}$	180	A
I_{FRM}	$I_{FRM}=2 \times I_{Fnom}$		400	A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150\text{ }^{\circ}\text{C}$	2200	A
Freewheeling Diode				
I_F	$T_j = 150\text{ }^{\circ}\text{C}$	$T_{case} = 25\text{ }^{\circ}\text{C}$	350	A
		$T_{case} = 80\text{ }^{\circ}\text{C}$	230	A
I_{FRM}	$I_{FRM}=2 \times I_{Fnom}$		600	A
I_{FSM}	$t_p = 10\text{ ms}; \sin$	$T_j = 150\text{ }^{\circ}\text{C}$	2900	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.		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 = 8 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	5,5	7	mΩ
				T _j = 125°C	7,5	9,5	mΩ
V _{CE(sat)}	I _{Cnom} = 200 A, V _{GE} = 15 V			T _j = 25°C _{chiplev.}	2,5	3	V
				T _j = 125°C _{chiplev.}	3,1	3,7	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V f = 1 MHz				18	24	nF
C _{oes}					2,5	3,2	nF
C _{res}					1	1,3	nF
Q _G	-8V - +20V			2000		nC	
R _{Gint}	T _j = °C			2,5		Ω	
t _{d(on)}	R _{Gon} = 4,7 Ω		V _{CC} = 600V I _C = 200A T _j = 125 °C		250	400	ns
t _r					90	160	ns
E _{on}					28		mJ
t _{d(off)}	R _{Goff} = 4,7 Ω				550	700	ns
t _f					70	100	ns
E _{off}					26		mJ
R _{th(j-c)}	per IGBT			0,075		K/W	



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SKM 300GAL123D

SKM 300GAR123D

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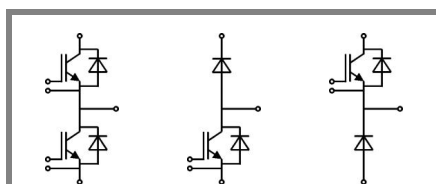
Typical Applications*

- AC inverter drives
- UPS

Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 200 \text{ A}; V_{GE} = 0 \text{ V}$ $T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$		2	2,5	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	mΩ
	$T_j = 125 \text{ }^\circ\text{C}$				mΩ
I_{RRM}	$I_F = 200 \text{ A}$ $T_j = 125 \text{ }^\circ\text{C}$		105		A
Q_{rr}	$di/dt = 4000 \text{ A}/\mu\text{s}$		10		μC
E_{rr}	$V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$				mJ
$R_{th(j-c)D}$	per diode			0,18	K/W
Freewheeling Diode					
$V_F = V_{EC}$	$I_{Fnom} = 300 \text{ A}; V_{GE} = 0 \text{ V}$ $T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$		2	2,5	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	$T_j = 25 \text{ }^\circ\text{C}$		3	4,3	V
	$T_j = 125 \text{ }^\circ\text{C}$				V
I_{RRM}	$I_F = 200 \text{ A}$ $T_j = 125 \text{ }^\circ\text{C}$		140		A
Q_{rr}	$di/dt = 3500 \text{ A}/\mu\text{s}$		34		μC
E_{rr}	$V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$				mJ
$R_{th(j-c)FD}$	per diode			0,15	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		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.

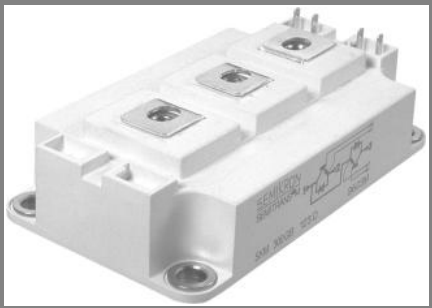


GB

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SKM 300GB123D



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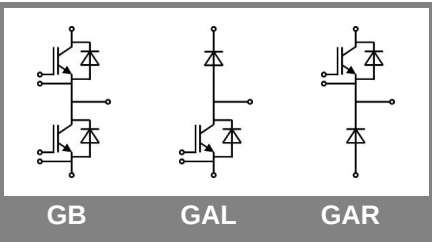
Features

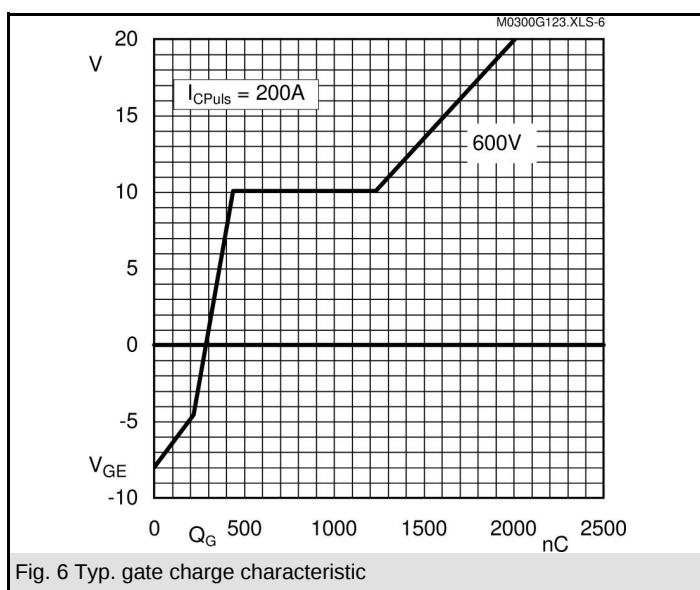
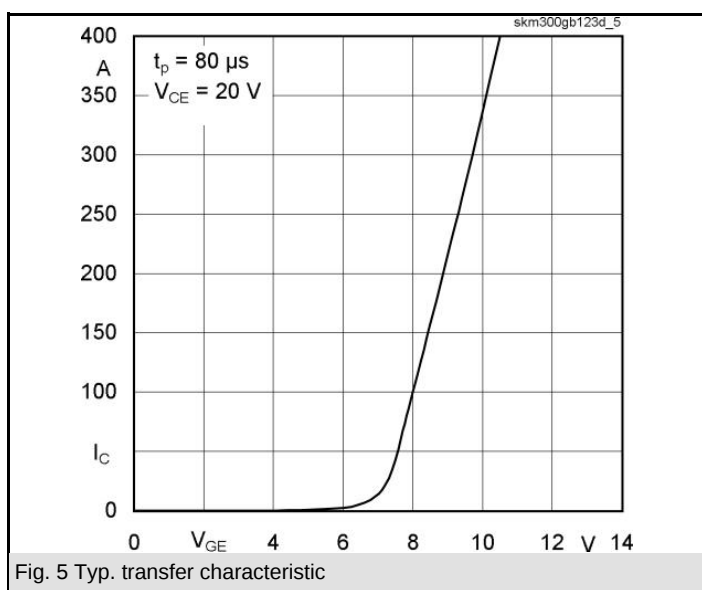
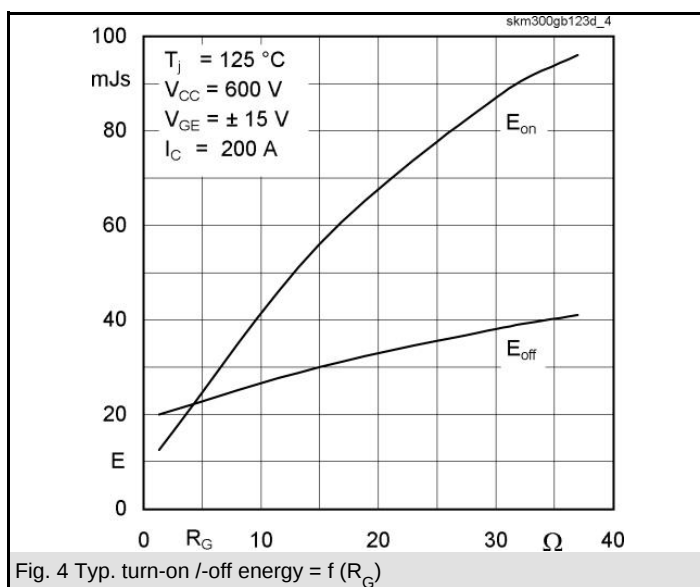
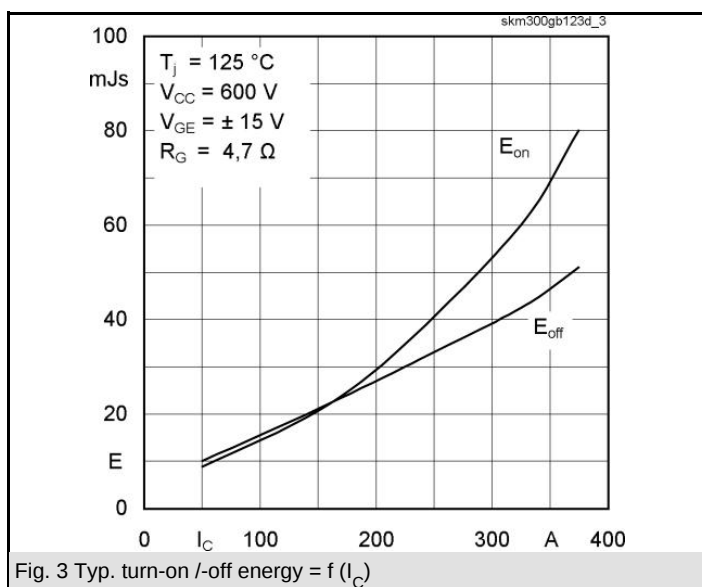
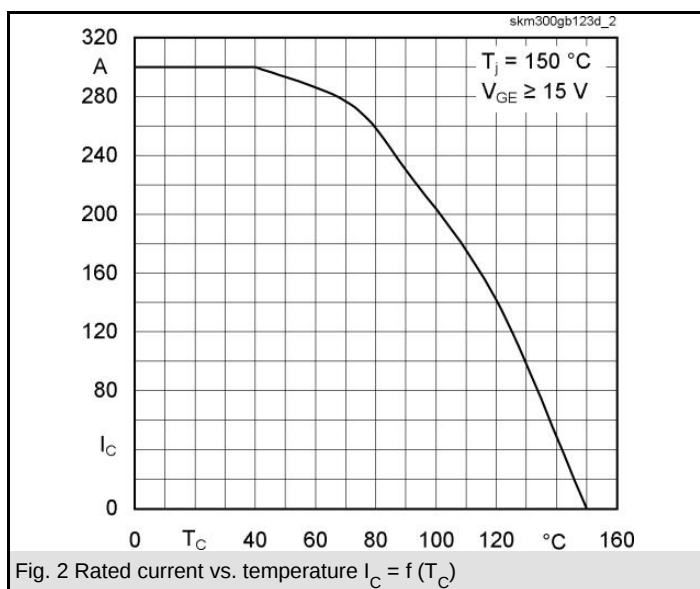
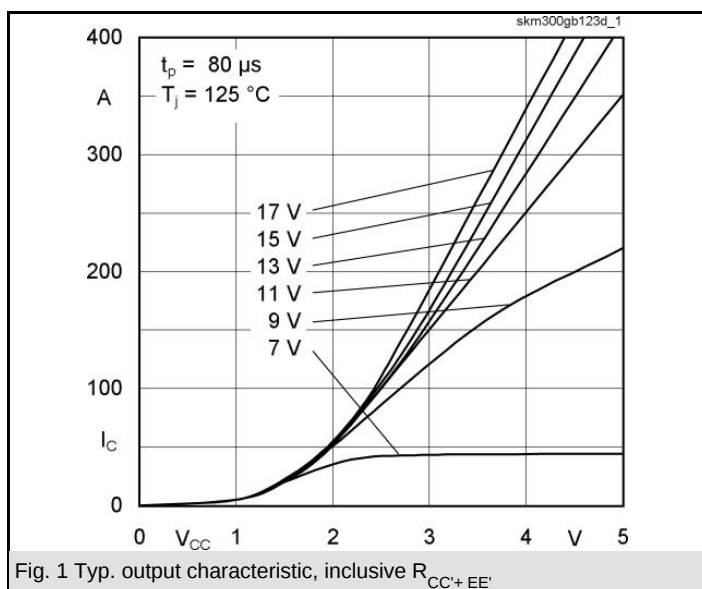
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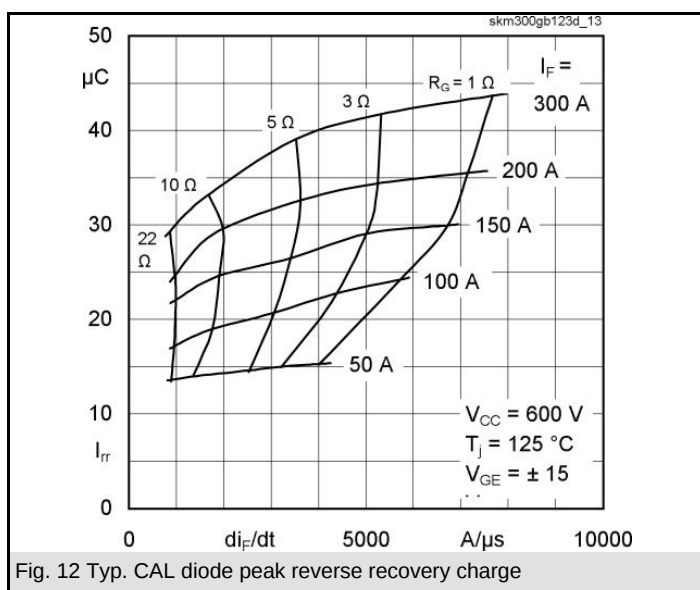
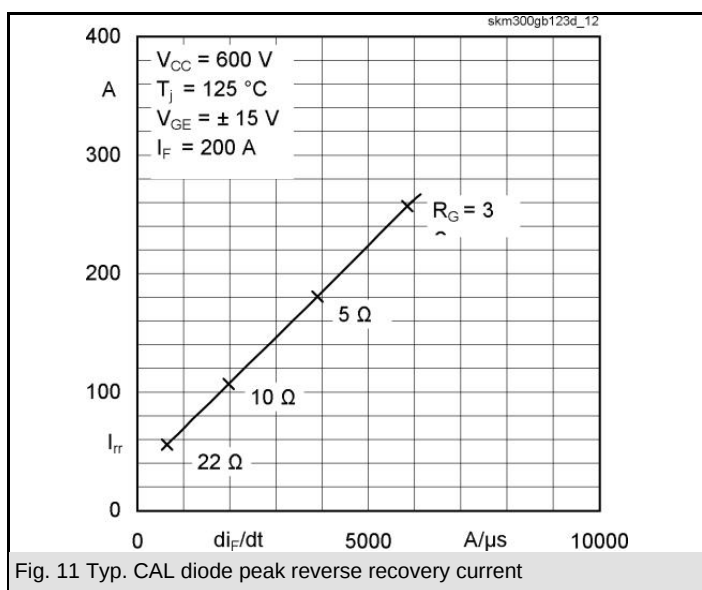
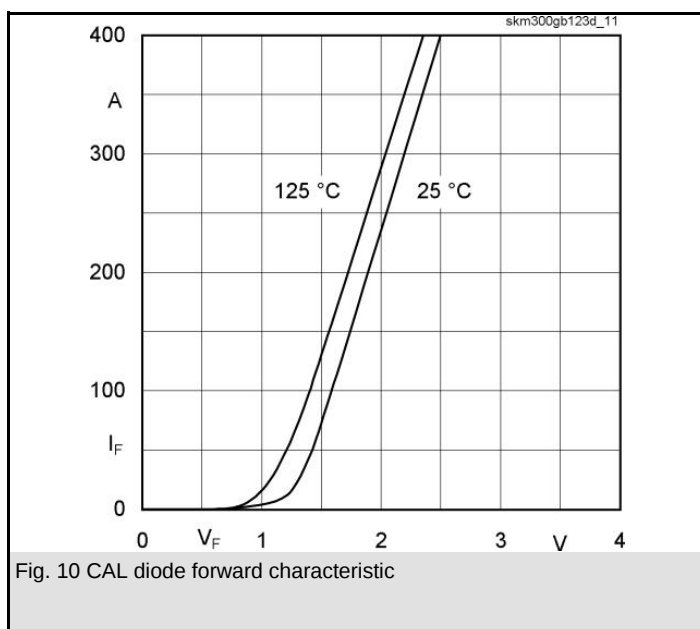
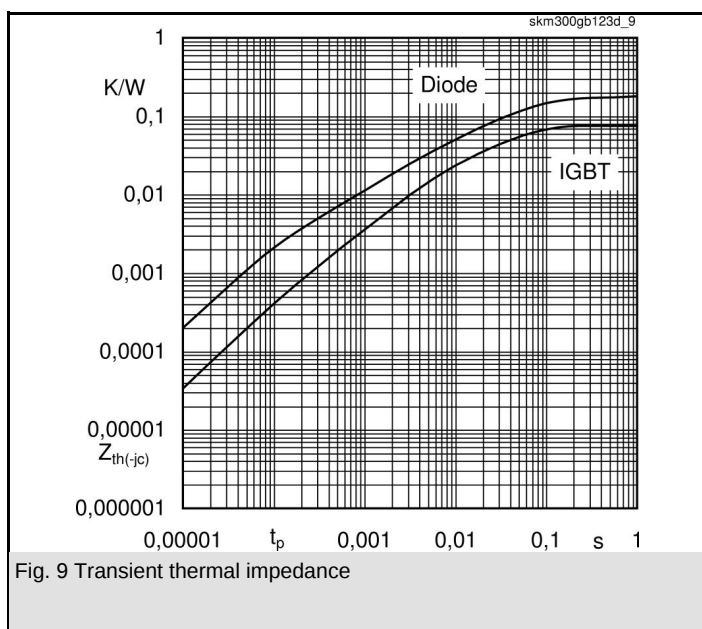
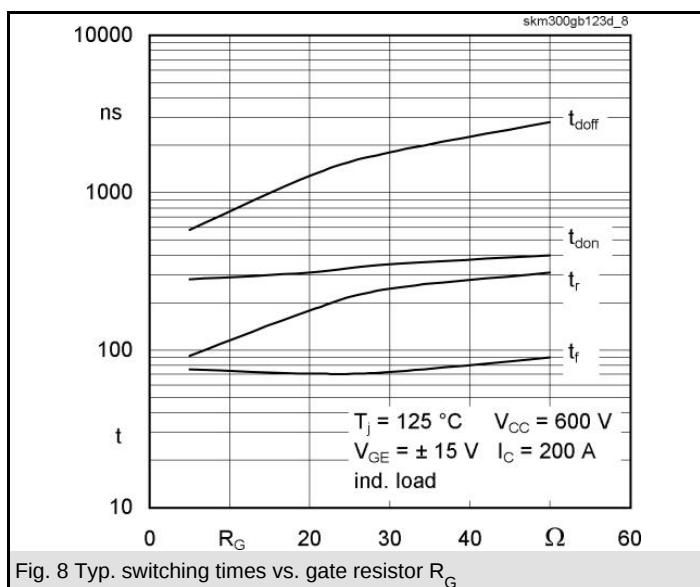
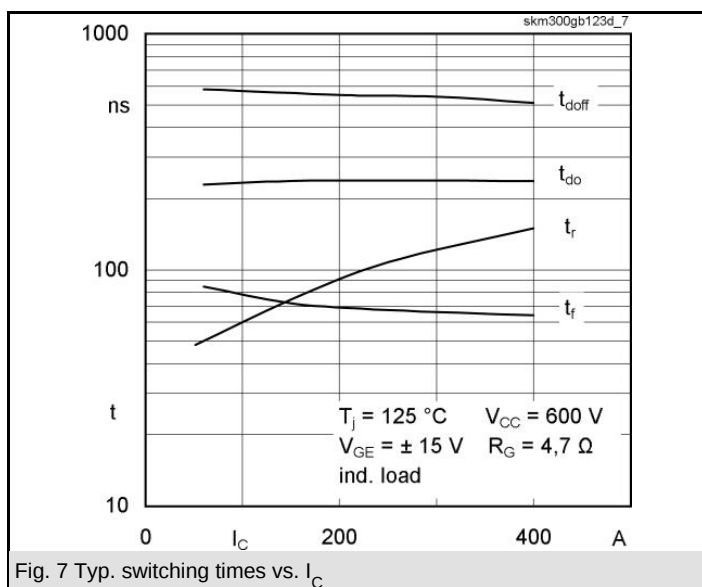
Typical Applications*

- 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
τ_{a_i}	$i = 1$	0,04	s
τ_{a_i}	$i = 2$	0,0189	s
τ_{a_i}	$i = 3$	0,0017	s
τ_{a_i}	$i = 4$	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
τ_{a_i}	$i = 1$	0,0366	s
τ_{a_i}	$i = 2$	0,0113	s
τ_{a_i}	$i = 3$	0,003	s
τ_{a_i}	$i = 4$	0,0002	s

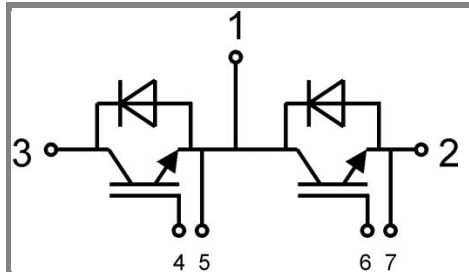






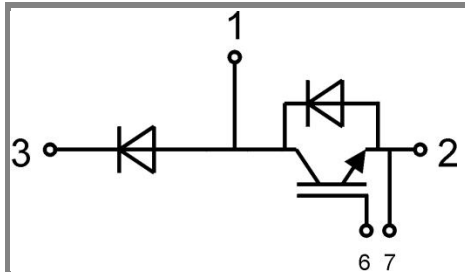


Case D 56



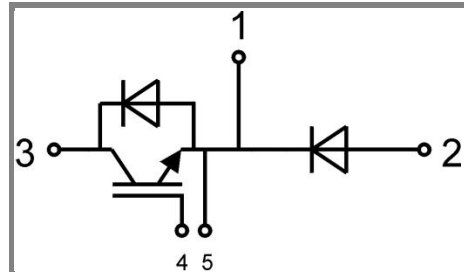
GB

Case D 56



GAL

Case D 57 (→ D 56)



GAR

Case D 58 (→ D 56)