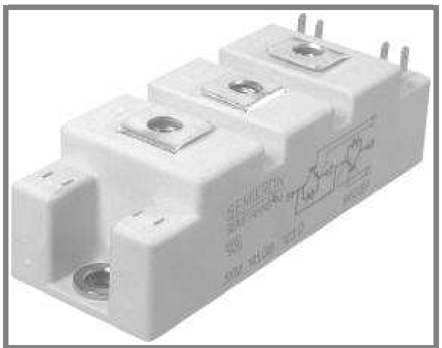
SKM 100GB123D



SEMITRANS® 2

IGBT Modules

SKM 100GB123D

SKM 100GAL123D

SKM 100GAR123D

Features

- MOS input (voltage controlled)
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- Low inductance case
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- Latch-up free
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- Isolated copper baseplate using DCB Direct Copper Bonding Technology
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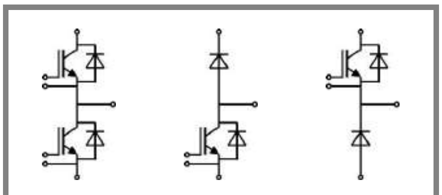
Typical Applications*

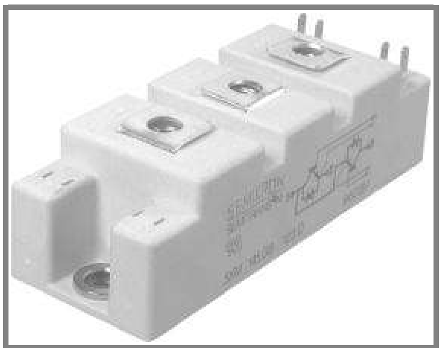
- AC inverter drives
- UPS



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	100	A
		T_{case} = 80 °C	90	A
I_{CRM}	I_{CRM}=2xI_{Cnom}		150	A
V_{GES}			± 20	V
t_{psc}	V_{CC} = 600 V; $V_{GE} \leq$ 20 V; VCES < 1200 V	T_j = 125 °C	10	µs
Inverse Diode				
I_F	T_j = 150 °C	T_{case} = 25 °C	95	A
		T_{case} = 80 °C	65	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		150	A
I_{FSM}	t_p = 10 ms; sin.	T_j = 150 °C	720	A
Freewheeling Diode				
I_F	T_j = 150 °C	T_{case} = 25 °C	130	A
		T_{case} = 80 °C	90	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		200	A
I_{FSM}	t_p = 10 ms; sin.	T_j = 150 °C	900	A
Module				
$I_{t(RMS)}$			200	A
T_{vj}			- 40... + 150	°C
T_{stg}			- 40...+ 125	°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 = 2 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		14,6	18,6	mΩ
		T_j = 125°C		20	25,3	mΩ
$V_{CE(sat)}$	I_{Cnom} = 75 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		5	6,6	nF
C_{oes}				0,72	0,9	nF
C_{res}				0,38	0,5	nF
Q_G	V_{GE} = -8V - +20V			750		nC
R_{Gint}	T_j = °C			5		Ω
$t_{d(on)}$	R_{Gon} = 15 Ω	V_{CC} = 600V, I_C= 75A, T_j = 125 °C, V_{GE} = ± 15V		30	60	ns
t_r				70	140	ns
E_{on}				10		mJ
$t_{d(off)}$	R_{Goff} = 15 Ω			450	600	ns
t_f				70	90	ns
E_{off}				8		mJ
$R_{th(j-c)}$	per IGBT				0,18	K/W



SEMITRANS® 2

IGBT Modules

SKM 100GB123D

SKM 100GAL123D

SKM 100GAR123D

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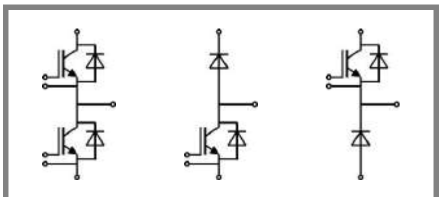
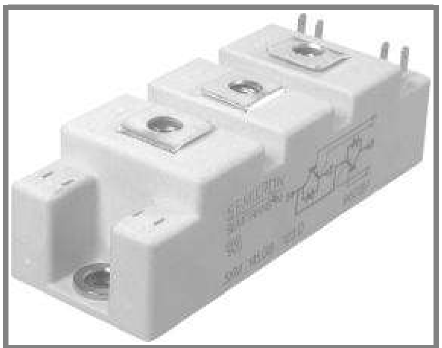


Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 75 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		2	2,5	V
		T_j = 125 °$C_{chiplev.}$		1,8		V
V_{F0}		T_j = 25 °C		1,1	1,2	V
		T_j = 125 °C				V
r_F		T_j = 25 °C		12	17	mΩ
		T_j = 125 °C				mΩ
I_{RRM}	I_F = 75 A	T_j = 125 °C		40		A
Q_{rr}	di/dt = 800 A/µs			3		µC
E_{rr}	V_{GE} = 0 V; V_{CC} = 600 V					mJ
$R_{th(j-c)D}$	per diode				0,5	K/W
Freewheeling Diode						
$V_F = V_{EC}$	I_{Fnom} = 100 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		2	2,5	V
		T_j = 125 °$C_{chiplev.}$		1,8		V
V_{F0}		T_j = 25 °C		1,1	1,2	V
		T_j = 125 °C				V
r_F		T_j = 25 °C		9	13	V
		T_j = 125 °C				V
I_{RRM}	I_F = 100 A	T_j = 25 °C		50		A
Q_{rr}	di/dt = 1000 A/µs			5		µC
E_{rr}	V_{GE} = 0 V; V_{CC} = 600 V					mJ
$R_{th(j-c)FD}$	per diode				0,36	K/W
Module						
L_{CE}					30	nH
$R_{CC'+EE'}$	res., terminal-chip	T_{case}= 25 °C		0,75		mΩ
		T_{case}= 125 °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.



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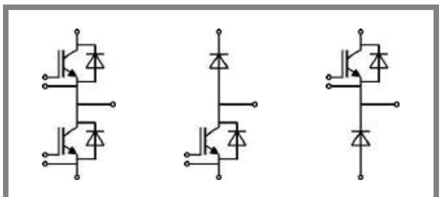


Z_{th} Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	i = 1	162	mk/W
R_i	i = 2	14	mk/W
R_i	i = 3	2,7	mk/W
R_i	i = 4	1,3	mk/W
tau_i	i = 1	0,204	s
tau_i	i = 2	0,0242	s
tau_i	i = 3	0,0013	s
tau_i	i = 4	0	s
$Z_{th(j-c)D}$			
R_i	i = 1	320	mk/W
R_i	i = 2	150	mk/W
R_i	i = 3	0,0265	mk/W
R_i	i = 4	3,5	mk/W
tau_i	i = 1	0,05	s
tau_i	i = 2	0,0104	s
tau_i	i = 3	0,0034	s
tau_i	i = 4	0,0003	s

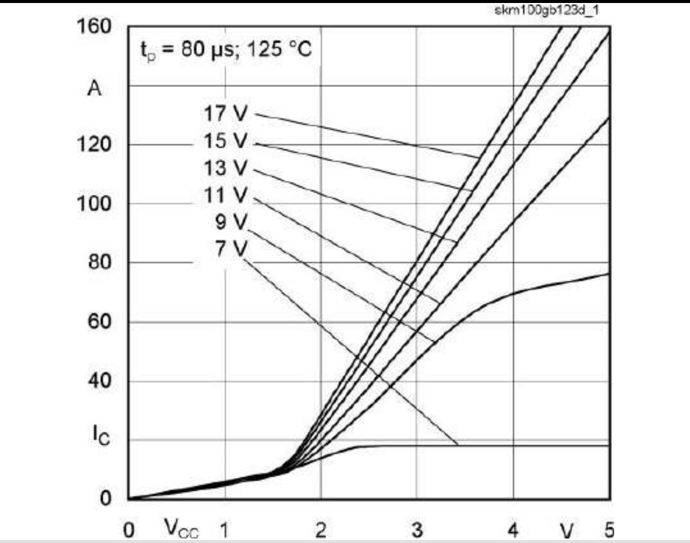


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

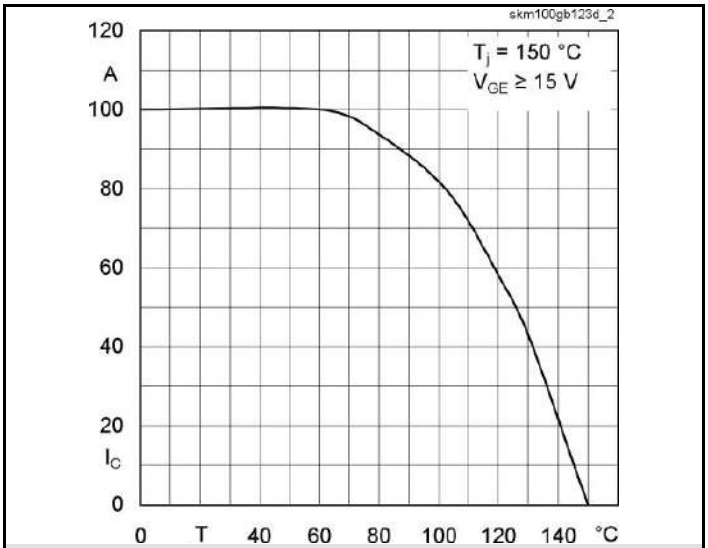


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

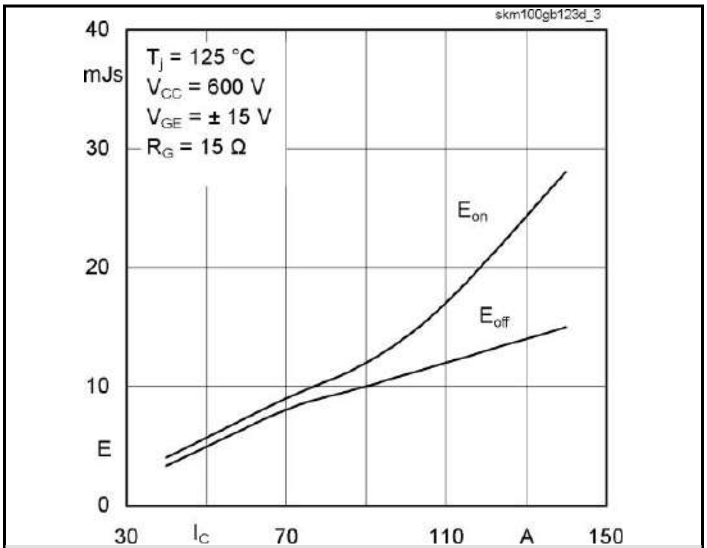


Fig. 3 Typ. turn-on /-off energy = f (I_C)

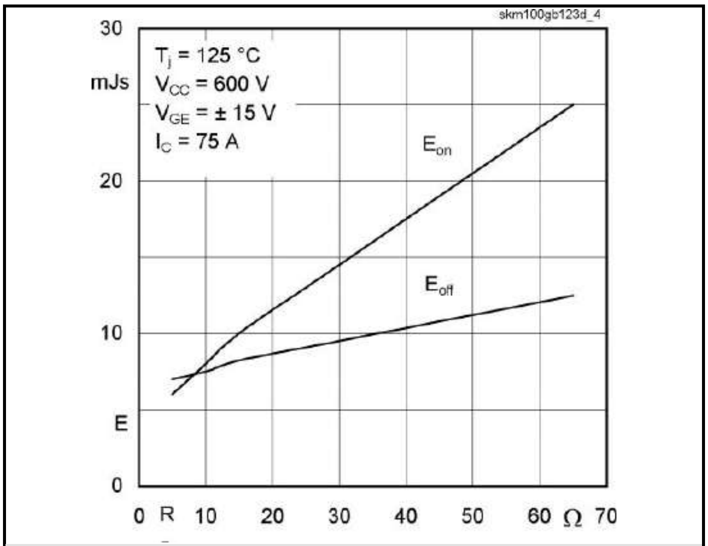


Fig. 4 Typ. turn-on /-off energy = f (R_G)

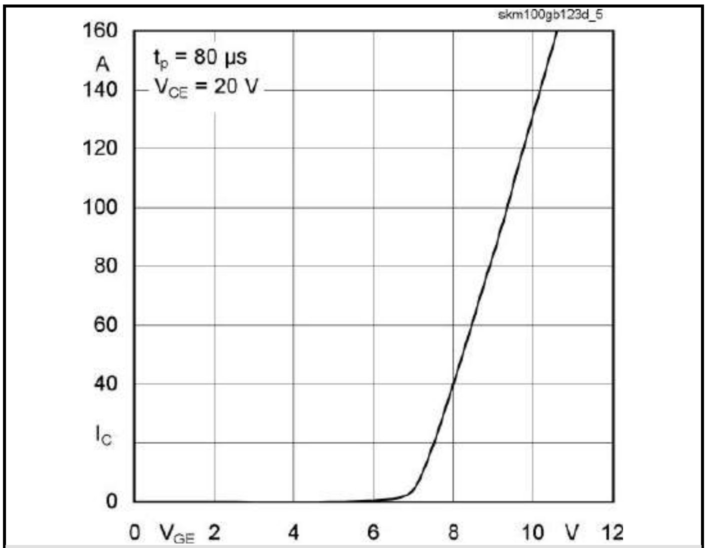


Fig. 5 Typ. transfer characteristic

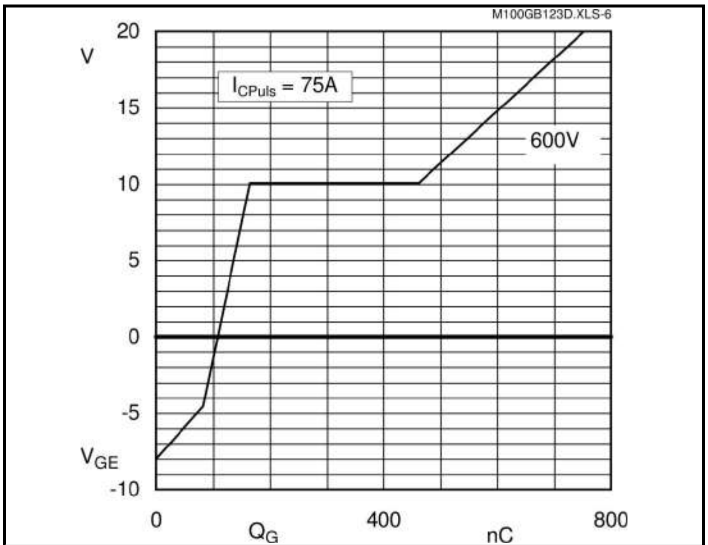


Fig. 6 Typ. gate charge characteristic

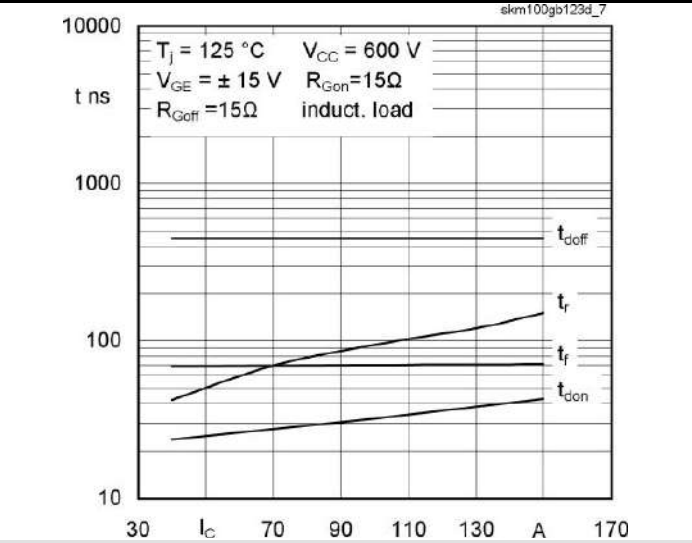


Fig. 7 Typ. switching times vs. I_C

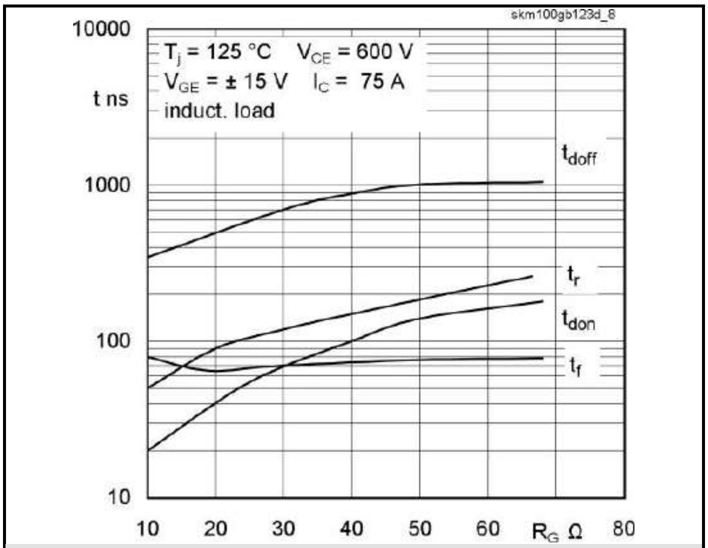


Fig. 8 Typ. switching times vs. gate resistor R_G

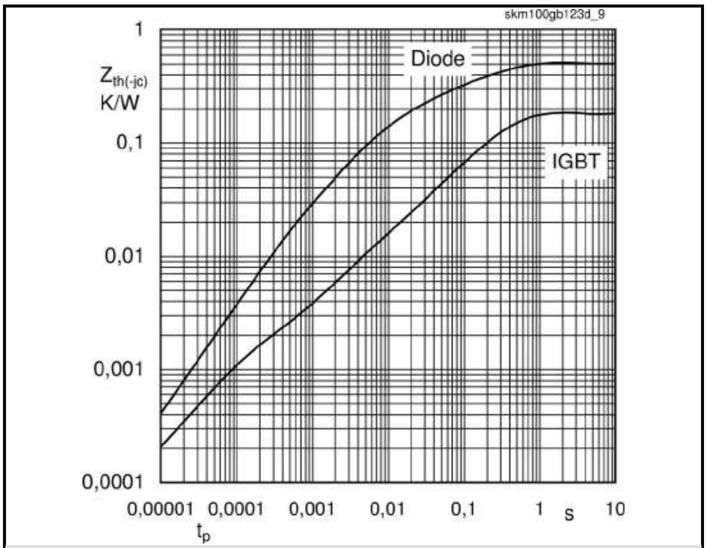


Fig. 9 Transient thermal impedance

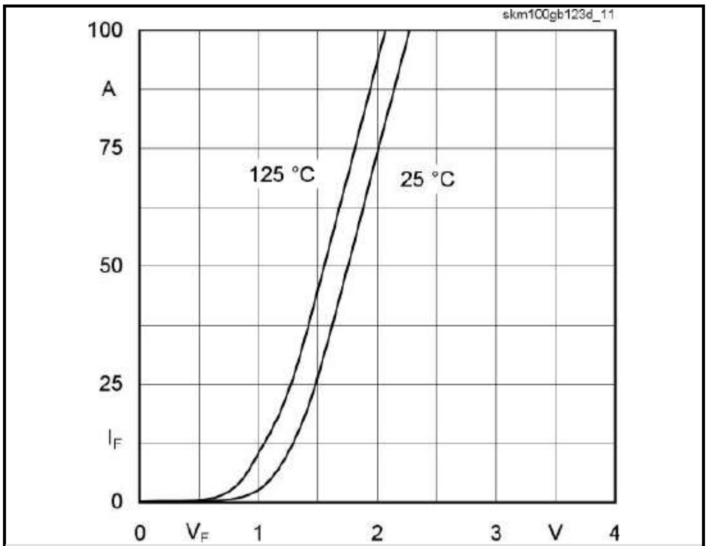


Fig. 10 CAL diode forward characteristic

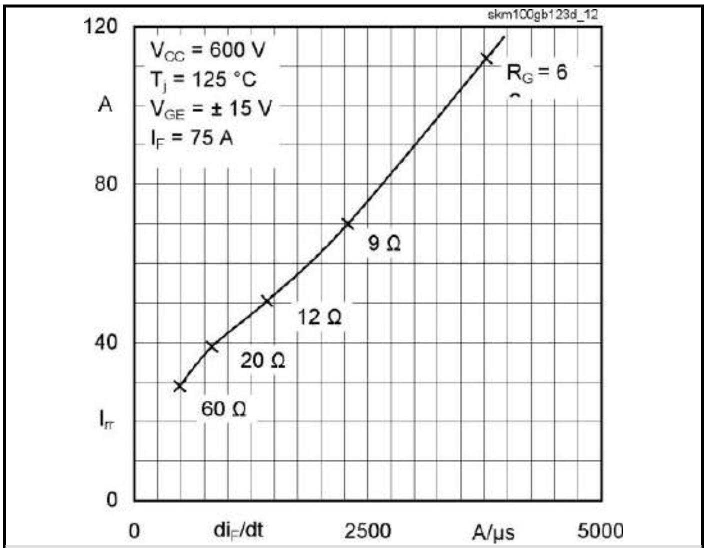


Fig. 11 Typ. CAL diode peak reverse recovery current

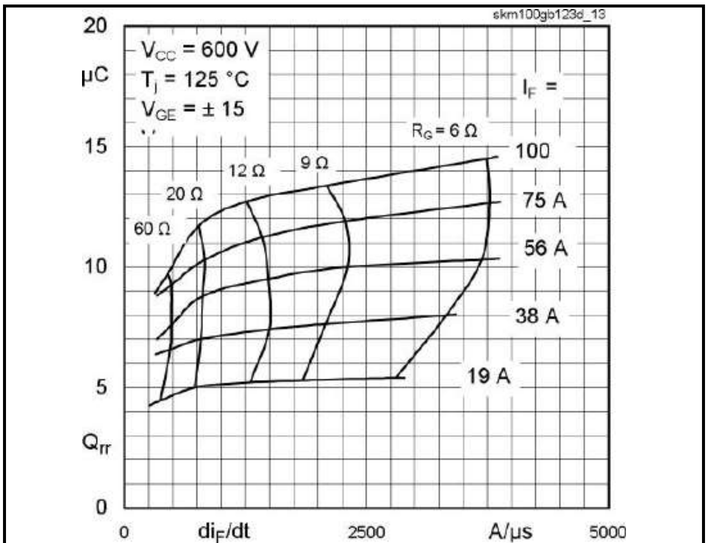
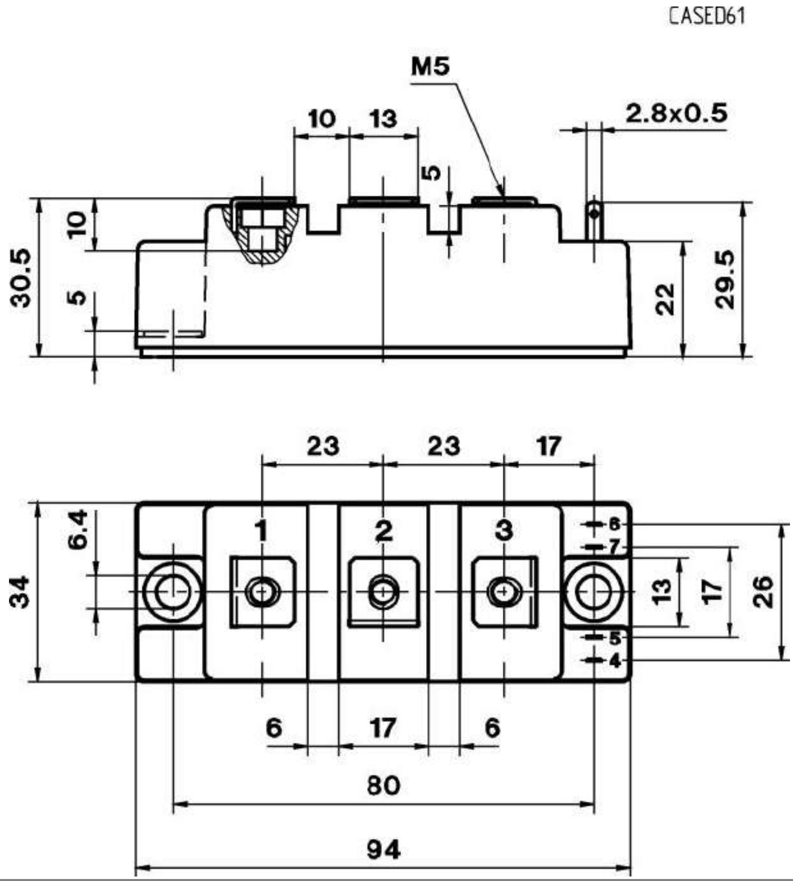


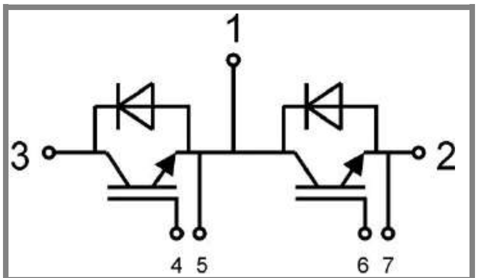
Fig. 12 Typ. CAL diode peak reverse recovery charge

SKM 100GB123D

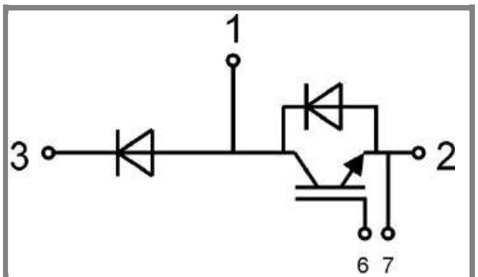
UL Recognized File 63 532



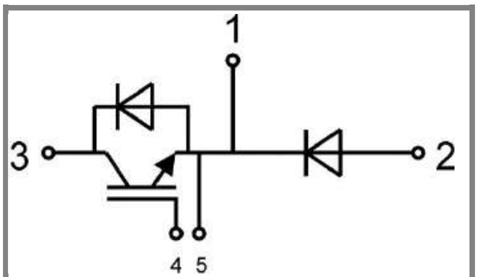
Case D 61



GB Case D 61



GAL Case D 62 (➞ D 61)



GAR Case D 63 (➞ D 61)

