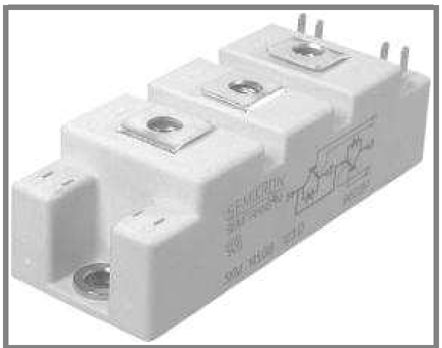
SKM 75GB063D



SEMITRANS® 2

Superfast NPT-IGBT Modules

SKM 75GB063D

SKM 75GAR063D

SKM 75GAL063D

Features

- N channel, homogeneous Si-structure (NPT-Non punch-through IGBT)
- Low tail current with low temperature dependence
- High short circuit capability, self limiting if term. G is clamped to E
- Pos. temp.-coeff. of V_{CEsat}
- Very low C_{ies}, C_{oes}, C_{res}
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Typical Applications*

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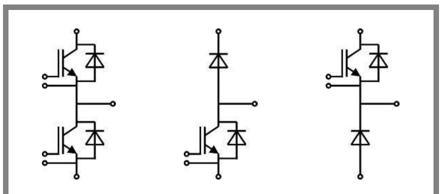
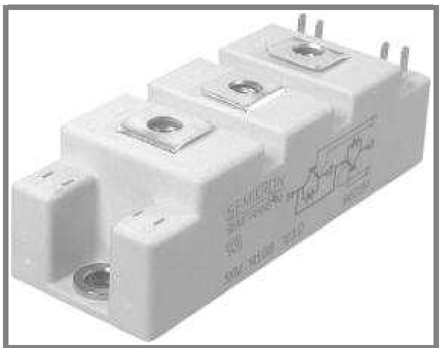
- Switched mode power supplies
- UPS
- Three phase inverters for servo / AC motor speed control
- Pulse frequencies also > 10kHz



GB GAL GAR

Absolute Maximum Ratings			T_c = 25 °C, unless otherwise specified	
Symbol	**Conditions**		**Values**	**Units**
IGBT				
V_{CES}	T_j = 25 °C		600	V
I_C	T_j = 150 °C	T_{case} = 25 °C	100	A
		T_{case} = 75 °C	75	A
I_{CRM}	I_{CRM}=2xI_{Cnom}		150	A
V_{GES}			± 20	V
t_{psc}	V_{CC} = 300 V; V_{GE} ≤ 20 V; V_{CES} < 600 V	T_j = 125 °C	10	µs
Inverse Diode				
I_F	T_j = 150 °C	T_{case} = 25 °C	75	A
		T_{case} = 80 °C	50	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		150	A
I_{FSM}	t_p = 10 ms; sin.	T_j = 150 °C	440	A
Freewheeling Diode				
I_F	T_j = 150 °C	T_c = 25 °C	100	A
		T_c = 80 °C	75	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		200	A
I_{FSM}	t_p = 10 ms; sin	T_j = 150 °C	720	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 = 1 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		1,05		V
		T_j = 125 °C		1		V
r_{CE}	V_{GE} = 15 V	T_j = 25°C		14		mΩ
		T_j = 125°C		18,7		mΩ
$V_{CE(sat)}$	I_{Cnom} = 75 A, V_{GE} = 15 V	T_j = 25°$C_{chiplev.}$		2,1	2,5	V
		T_j = 125°$C_{chiplev.}$		2,4	2,8	V
C_{ies}				4,2		nF
C_{oes}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz		0,5		nF
C_{res}				0,3		nF
Q_G	V_{GE} = 0V...+15V			180		nC
R_{Gint}	T_j = °C			0		Ω
$t_{d(on)}$				60		ns
t_r	R_{Gon} = 15 Ω	V_{CC} = 300V		50		ns
E_{on}		I_C= 75A		3		mJ
$t_{d(off)}$	R_{Goff} = 15 Ω	T_j = 125 °C		350		ns
t_f		V_{GE} = ±15V		35		ns
E_{off}				2,5		mJ
$R_{th(j-c)}$	per IGBT				0,35	K/W



SEMITRANS® 2

Superfast NPT-IGBT Modules

SKM 75GB063D

SKM 75GAR063D

SKM 75GAL063D

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- Switched mode power supplies
- UPS
- Three phase inverters for servo / AC motor speed control
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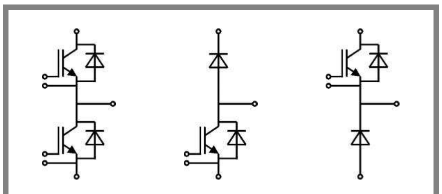
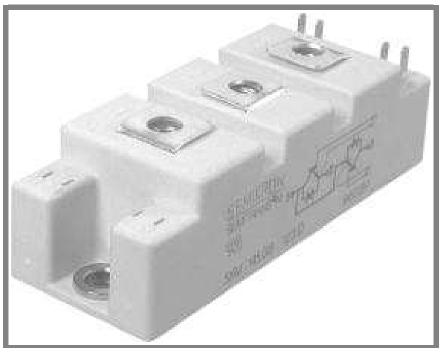


GB GAL GAR

Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 75 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		1,55	1,9	V
		T_j = 125 °$C_{chiplev.}$		1,55		V
V_{F0}		T_j = 125 °C			0,9	V
r_F		T_j = 125 °C		10	13,3	mΩ
I_{RRM}	I_F = 75 A	T_j = 125 °C		30		A
Q_{rr}	di/dt = 800 A/µs			3,7		µC
E_{rr}	V_{GE} = -15 V; V_{CC} = 300 V					mJ
$R_{th(j-c)D}$	per diode				0,72	K/W
Freewheeling Diode						
$V_F = V_{EC}$	I_{Fnom} = 100 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		1,55	1,9	V
		T_j = 125 °$C_{chiplev.}$		1,55		V
V_{F0}		T_j = 125 °C			0,9	V
r_F		T_j = 125 °C		8	10	V
I_{RRM}	I_F = 100 A	T_j = 125 °C		44		A
Q_{rr}	di/dt = 0 A/µs			6		µC
E_{rr}	V_{GE} = -15 V; V_{CC} = 300 V					mJ
$R_{th(j-c)FD}$	per diode				0,6	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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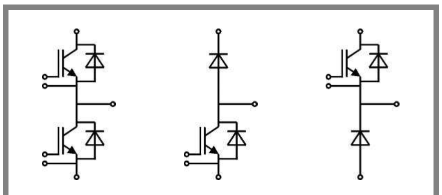

GB GAL GAR

Z_{th} Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	i = 1	250	mk/W
R_i	i = 2	70	mk/W
R_i	i = 3	25	mk/W
R_i	i = 4	5	mk/W
tau_i	i = 1	0,0874	s
tau_i	i = 2	0,0078	s
tau_i	i = 3	0,0017	s
tau_i	i = 4	0,0001	s
$Z_{th(j-c)D}$			
R_i	i = 1	550	mk/W
R_i	i = 2	340	mk/W
R_i	i = 3	92	mk/W
R_i	i = 4	18	mk/W
tau_i	i = 1	0,0761	s
tau_i	i = 2	0,0045	s
tau_i	i = 3	0,011	s
tau_i	i = 4	0,0002	s

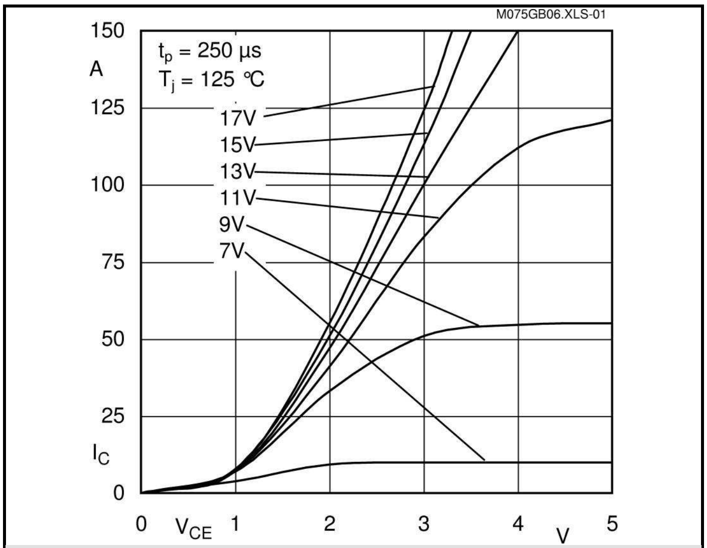

Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

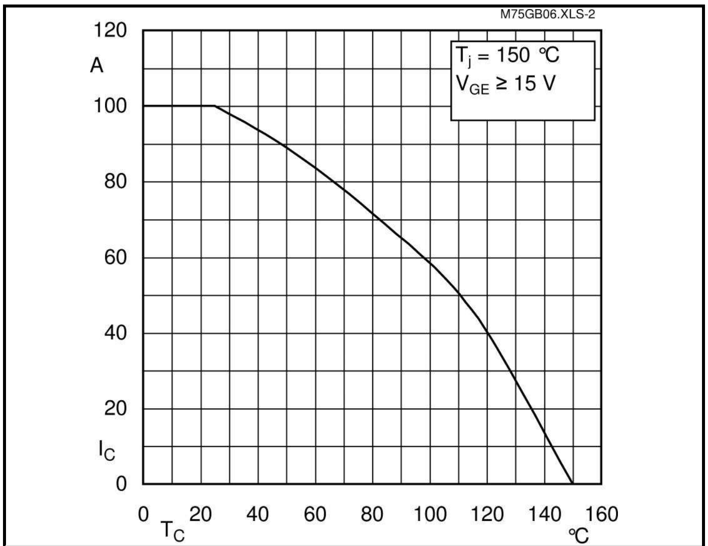

Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

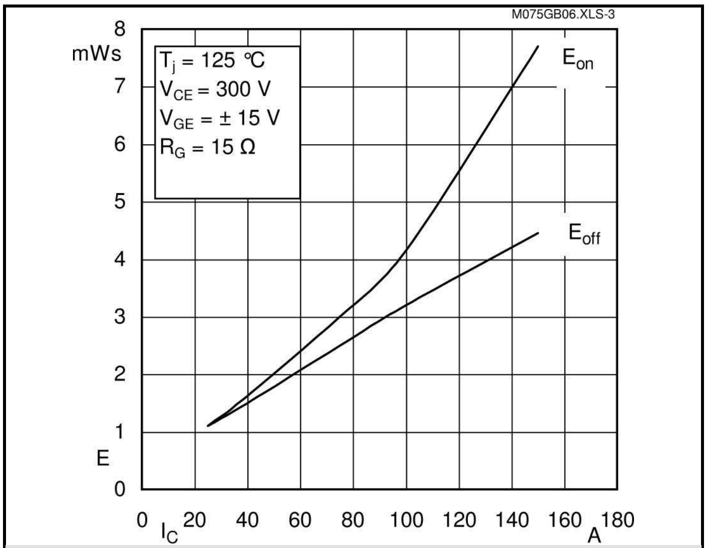

Fig. 3 Typ. turn-on /-off energy = f (I_C)

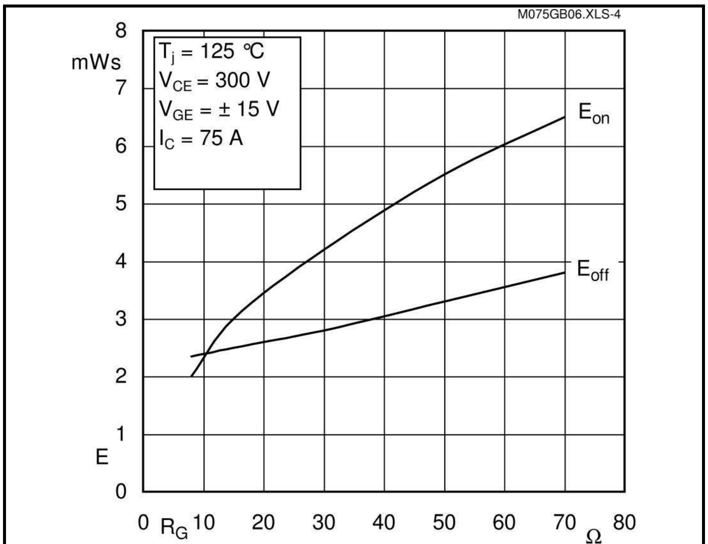

Fig. 4 Typ. turn-on /-off energy = f (R_G)

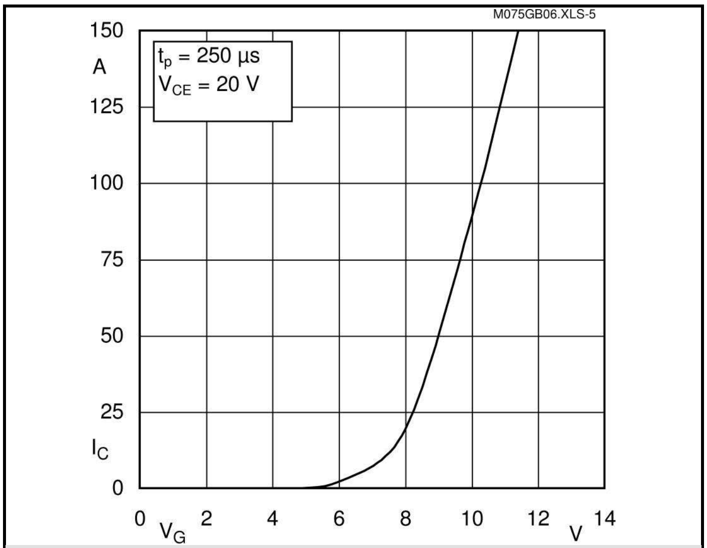

Fig. 5 Typ. transfer characteristic

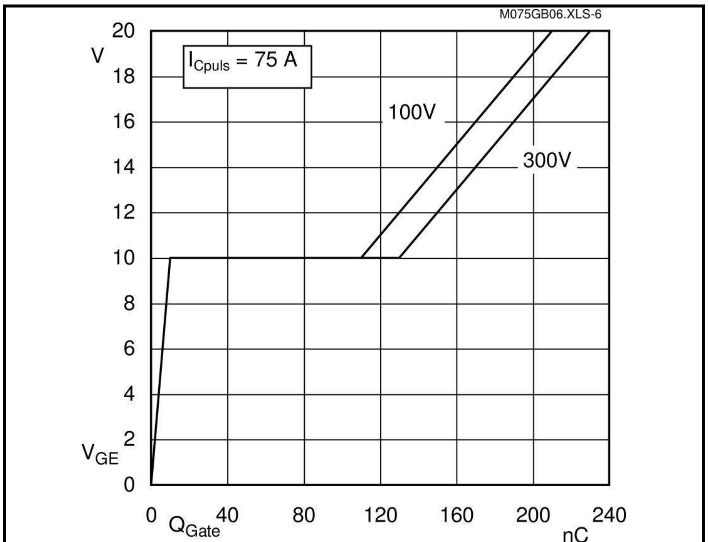

Fig. 6 Typ. gate charge characteristic

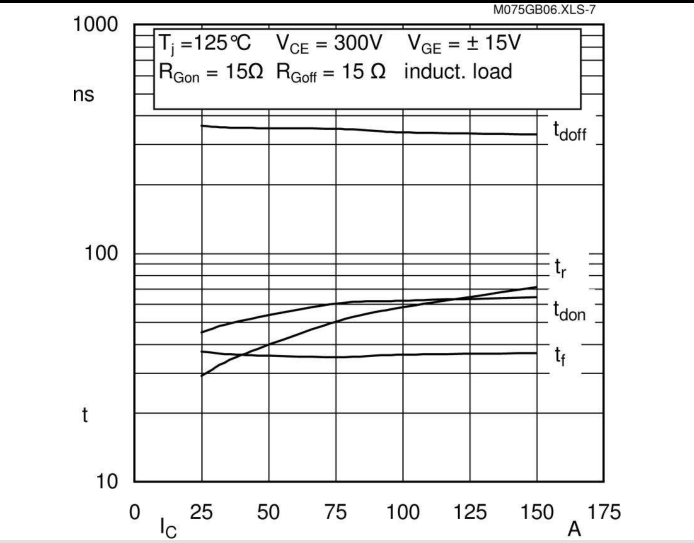

Fig. 7 Typ. switching times vs. I_C

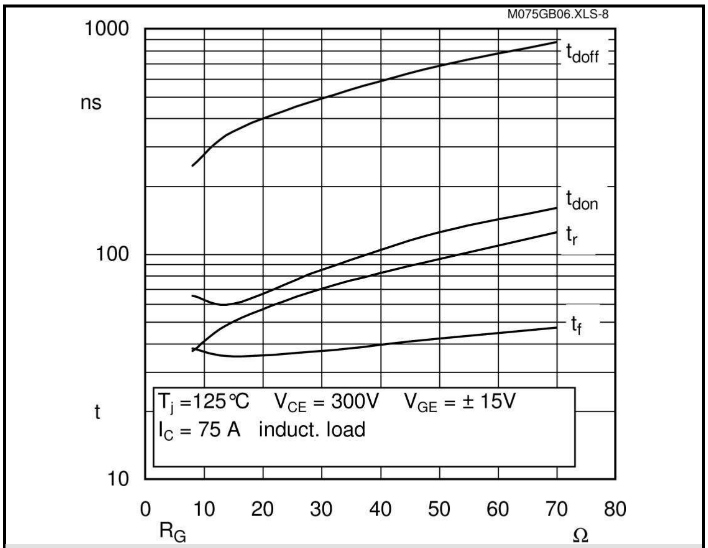

Fig. 8 Typ. switching times vs. gate resistor R_G

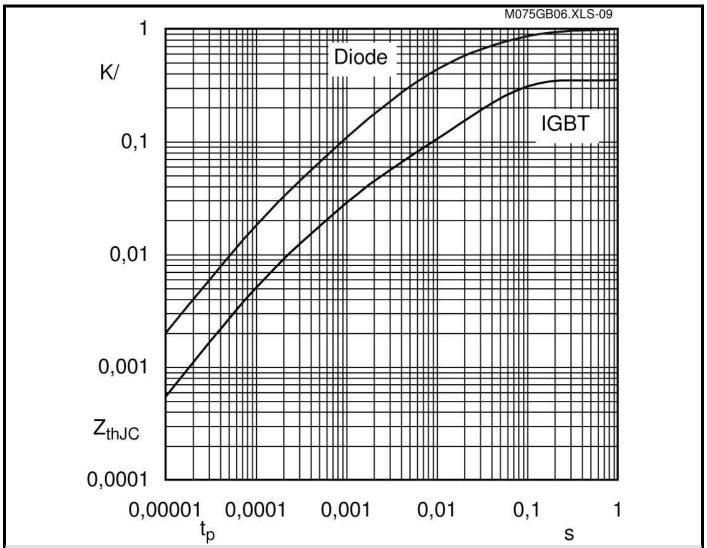

Fig. 9 Transient thermal impedance of IGBT and Diode

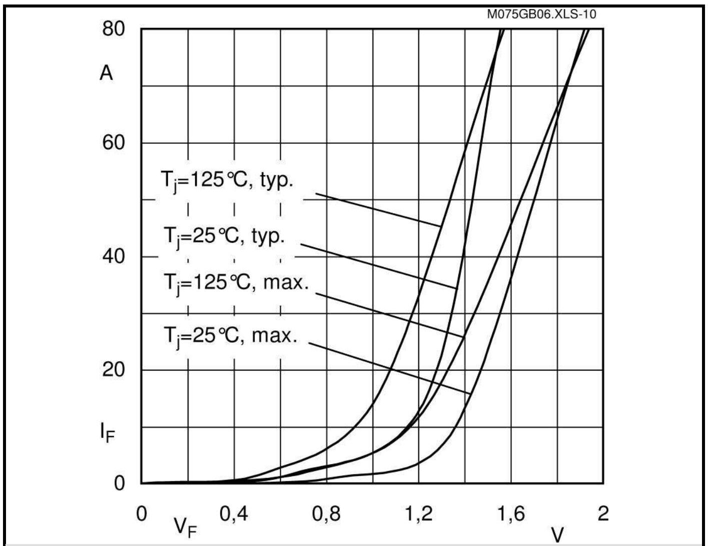

Fig. 10 CAL diode forward characteristic, inclusive $R_{CC'+EE'}$

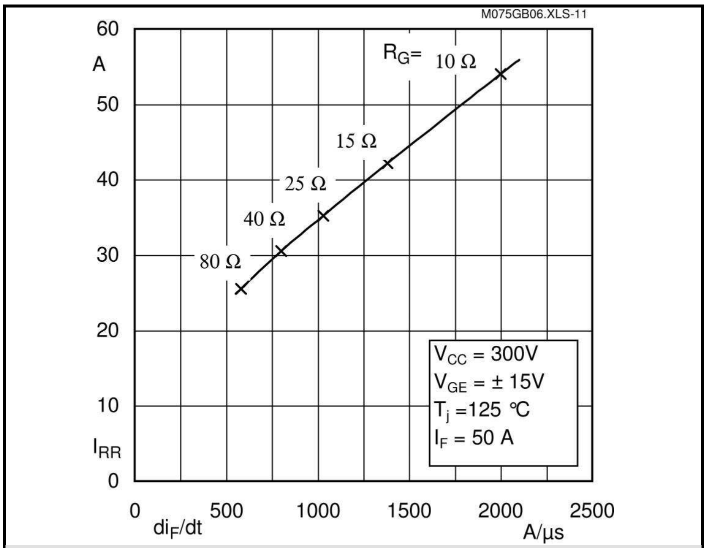

Fig. 11 Typ. CAL diode peak reverse recovery current

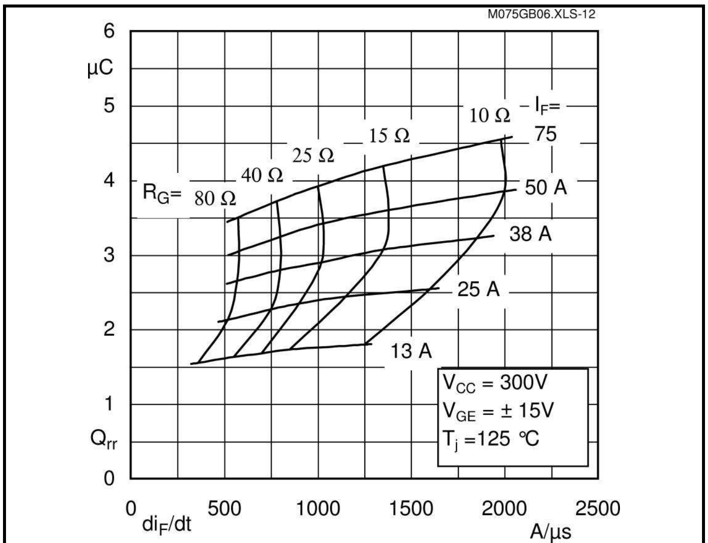

Fig. 12 Typ. CAL diode recovered charge

UL recognized

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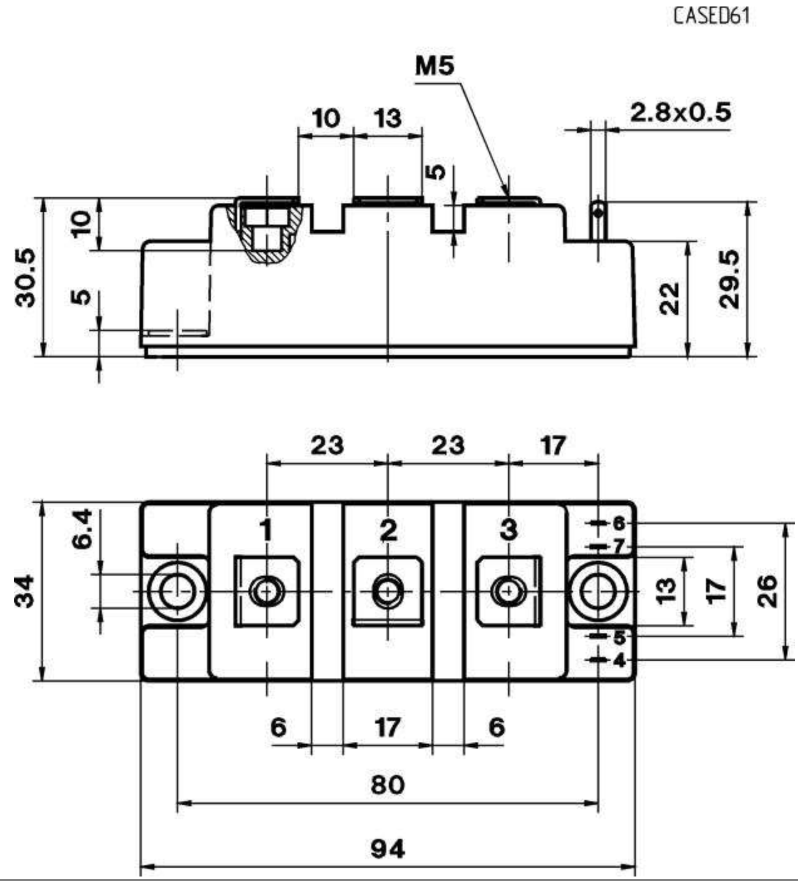
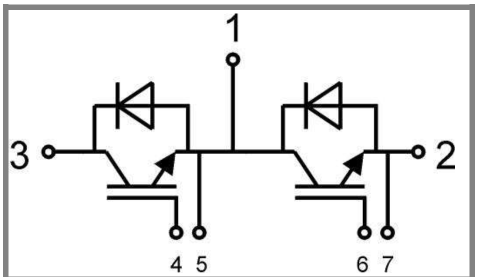
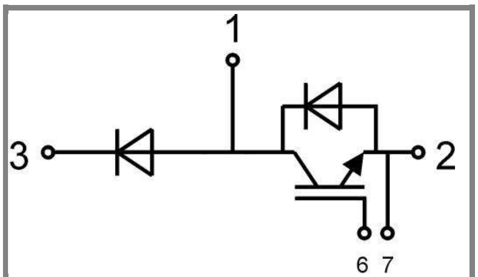


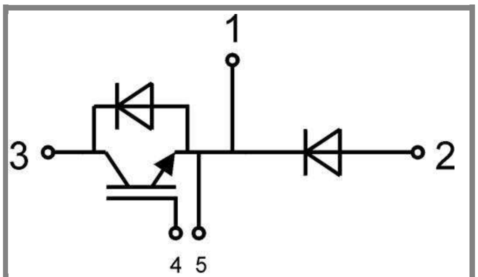
Case D 61



GB Case D 61



GAL Case D 62 (→ D 61)



GAR Case D 63 (→ D 61)

