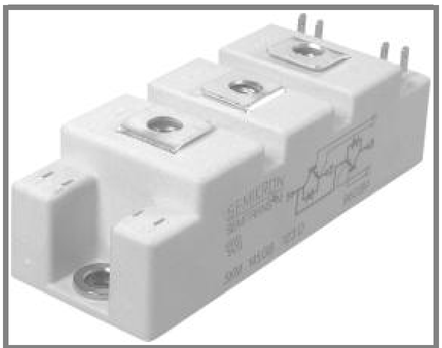
SKM 75GB063D



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}
- Latch-up free
- Fast & soft inverse CAL diodes
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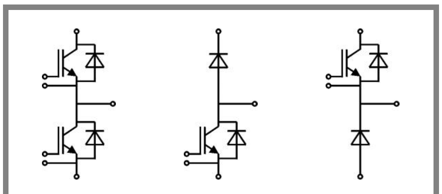
Typical Applications

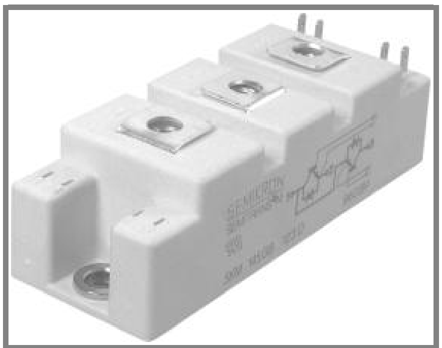
- Switching (not for linear use)
- Switched mode power supplies
- UPS
- Three phase inverters for servo / AC motor speed control
- Pulse frequencies also > 10kHz



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; $V_{GE} \leq$ 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_{Cnom}= 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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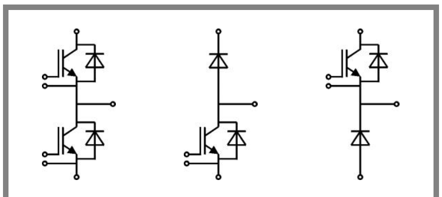
Typical Applications

- Switching (not for linear use)
- Switched mode power supplies
- UPS
- Three phase inverters for servo / AC motor speed control
- Pulse frequencies also > 10kHz



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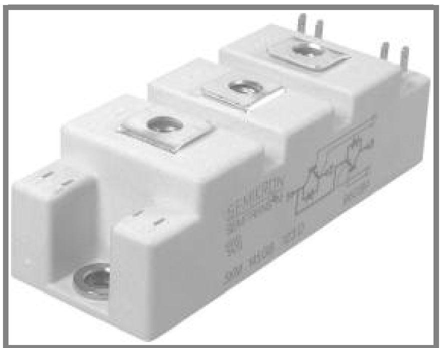
Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 75 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		1,55	1,9	V
		T_j = 125 °$C_{chiplev.}$		1,55		V
V_{F0}		T_j = 125 °C			0,9	V
r_F		T_j = 125 °C		10	13,3	mΩ
I_{RRM}	I_{Fnom} = 75 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_{Fnom} = 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.

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.



SEMITRANS® 2

Symbol	Conditions	Values	Units
Z_{th}			
$Z_{th(j-c)I}$			
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

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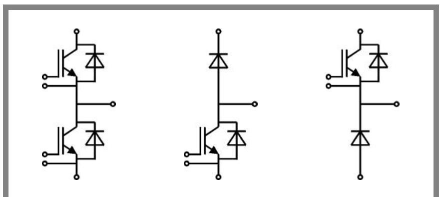

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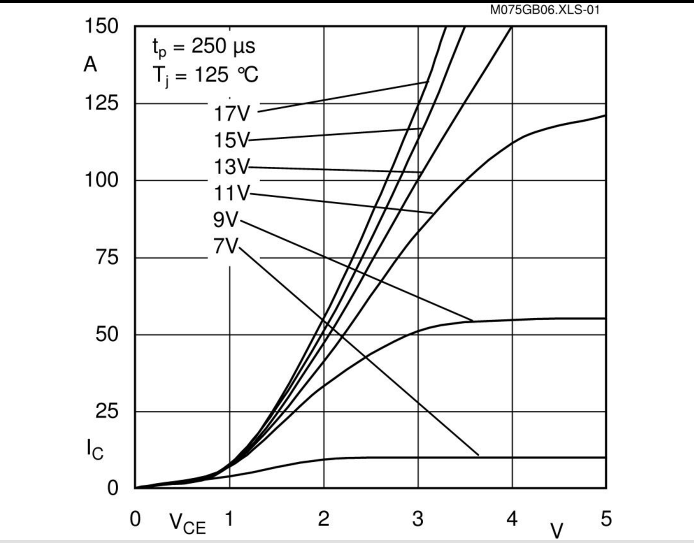


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

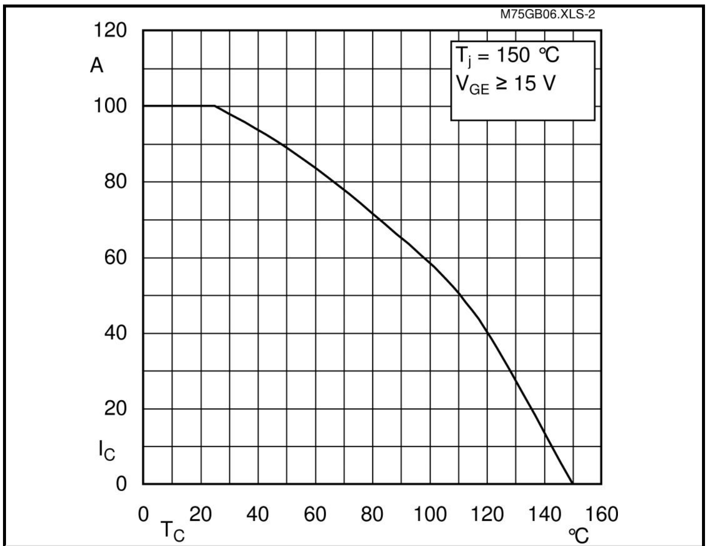


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

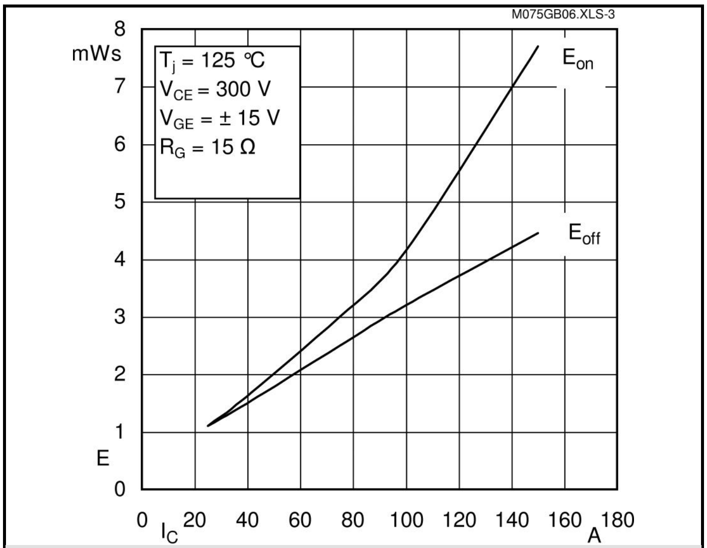


Fig. 3 Typ. turn-on /-off energy = f (I_C)

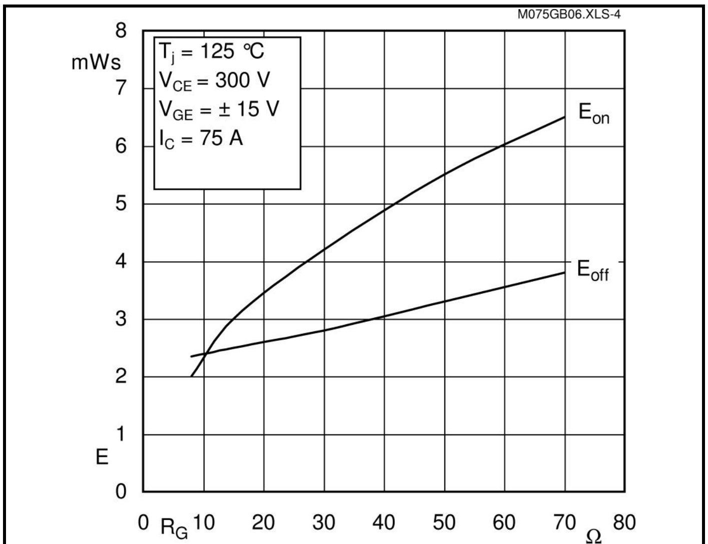


Fig. 4 Typ. turn-on /-off energy = f (R_G)

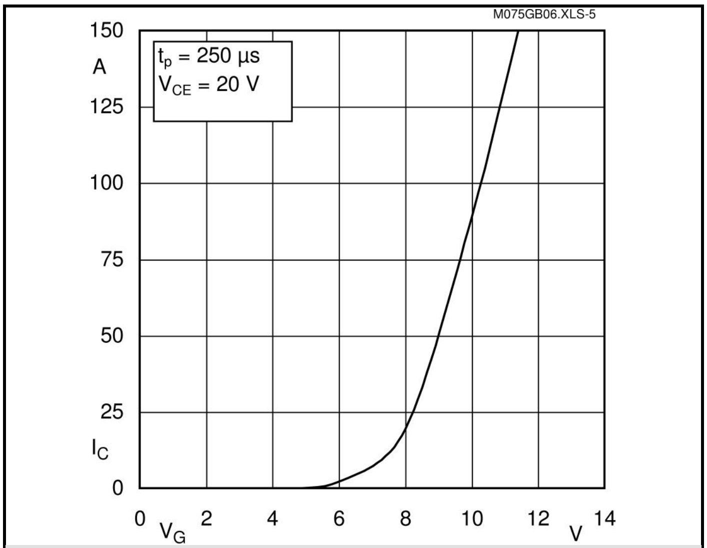


Fig. 5 Typ. transfer characteristic

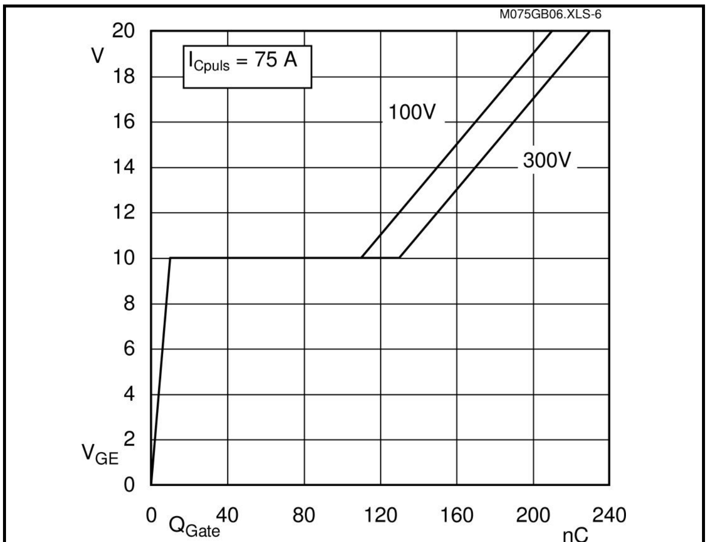


Fig. 6 Typ. gate charge characteristic

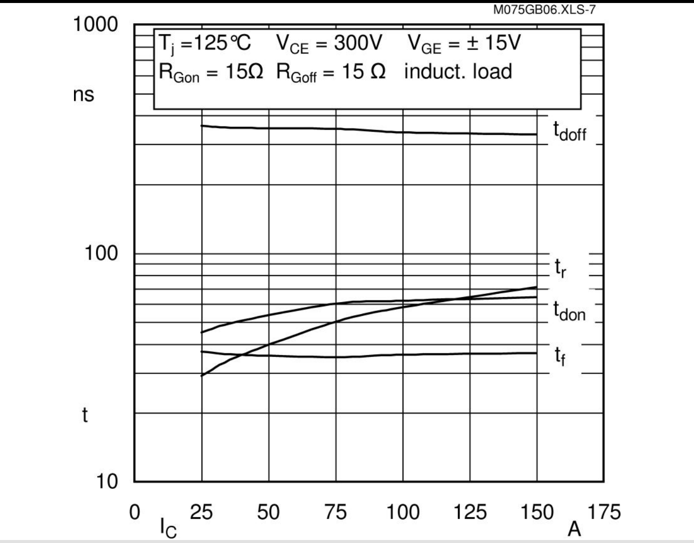


Fig. 7 Typ. switching times vs. I_C

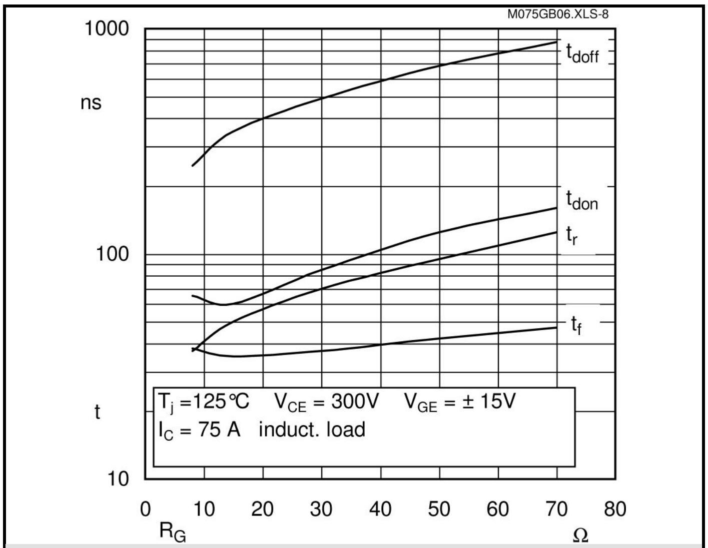


Fig. 8 Typ. switching times vs. gate resistor R_G

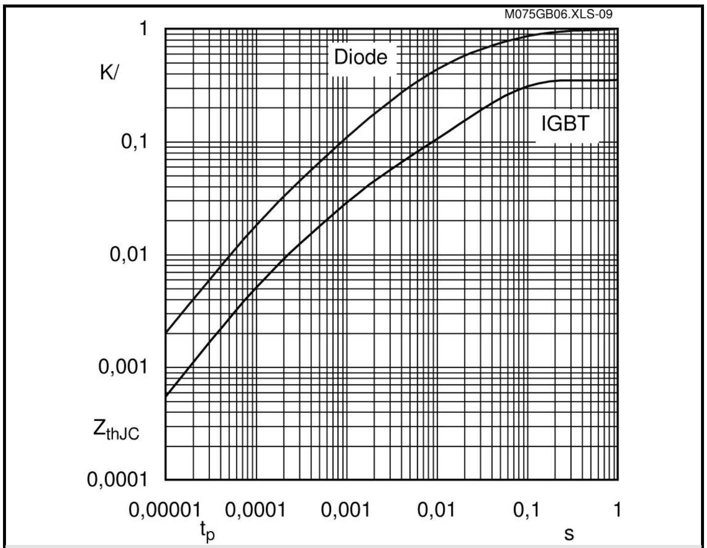


Fig. 9 Transient thermal impedance of IGBT and Diode

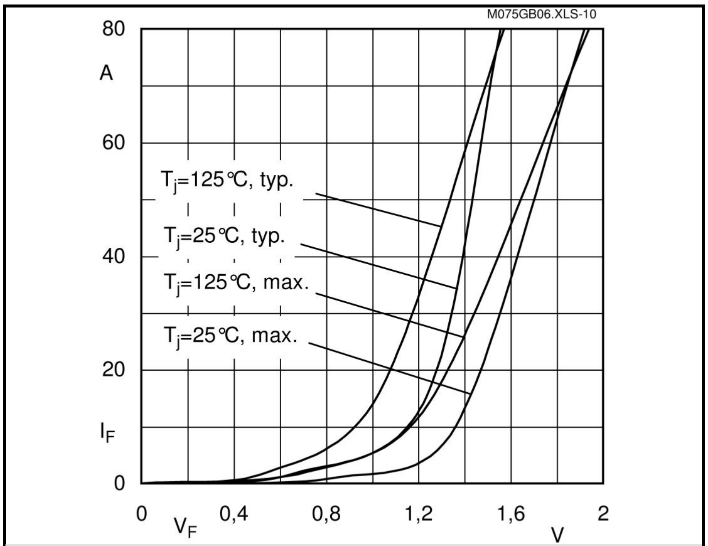


Fig. 10 CAL diode forward characteristic, inclusive $R_{CC'+EE'}$

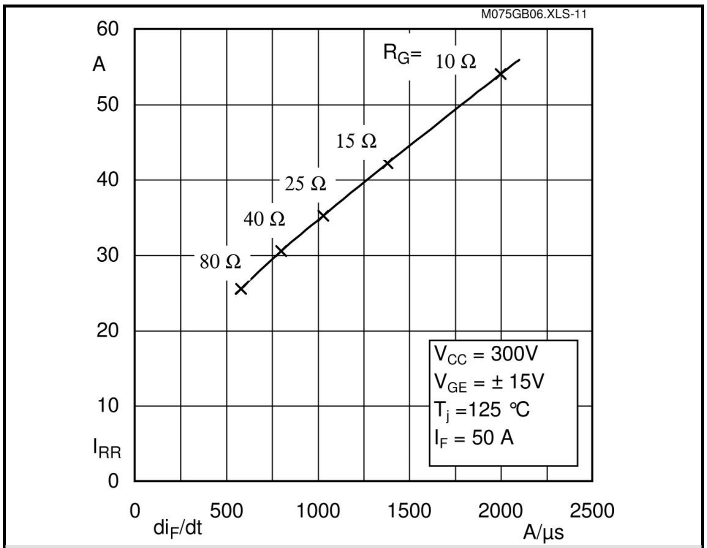


Fig. 11 Typ. CAL diode peak reverse recovery current

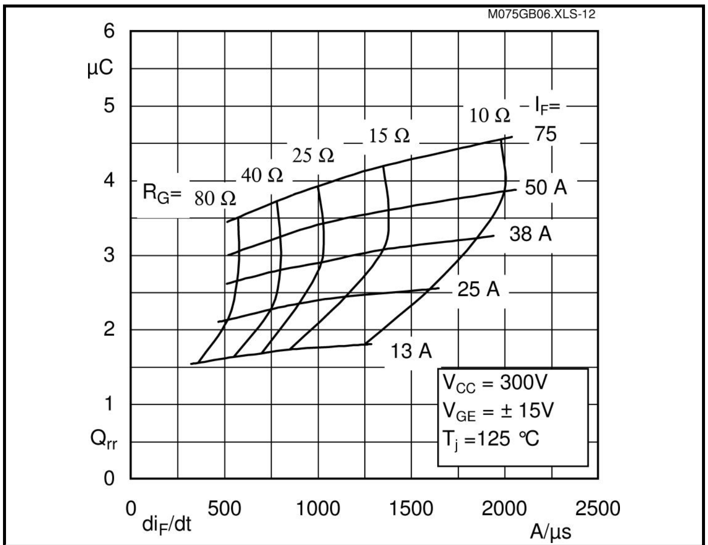
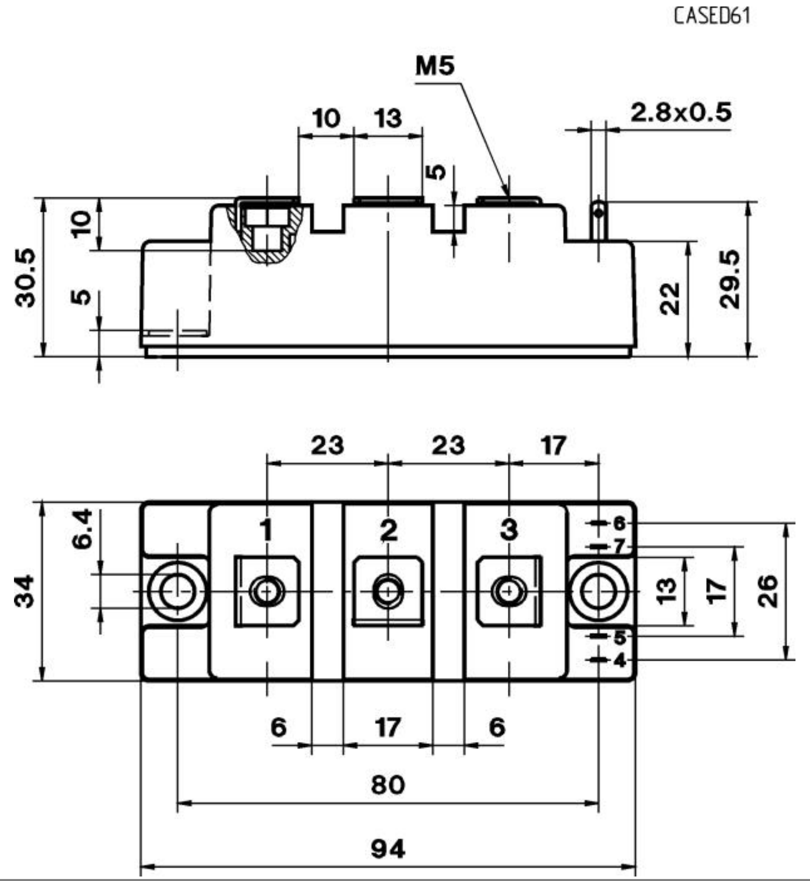
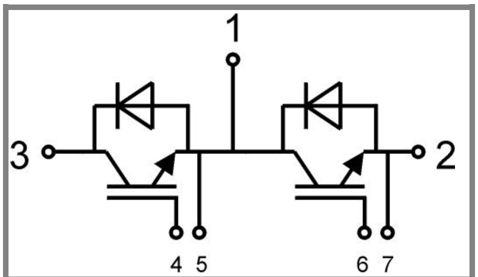


Fig. 12 Typ. CAL diode recovered charge

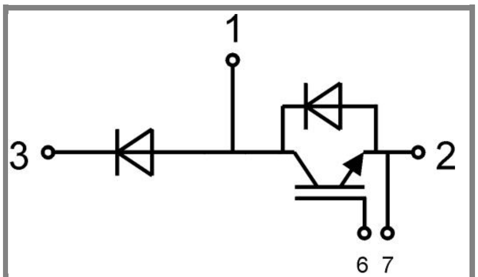
UL recognized File no. E 63 532



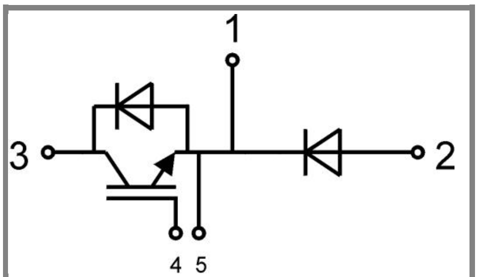
Case D 61



GB Case D 61



GAL Case D 62 (→ D 61)



GAR Case D 63 (→ D 61)

