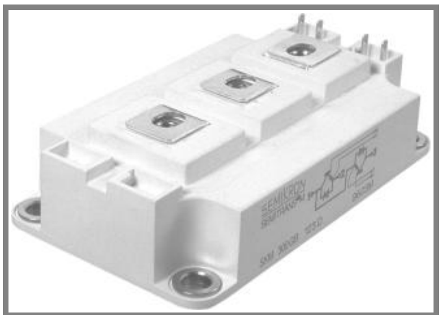
SKM 200GB126D ...



SEMITRANS® 3

Trench IGBT Modules

SKM 200GB126D

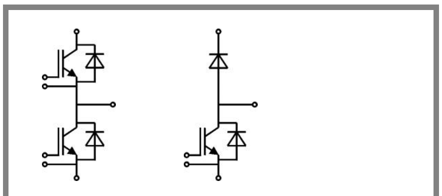
SKM 200GAL126D

Features

- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability, self limiting to 6 x I_C

Typical Applications

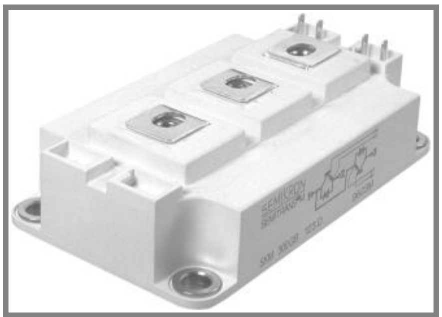
- Electronic welders
- AC inverter drives
- UPS



GB **GAL**

Absolute Maximum Ratings		T_{case} = 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_c = 25 °C	260	A
		T_c = 80 °C	190	A
I_{CRM}	I_{CRM}=2xI_{Cnom}		300	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_c = 25 °C	200	A
		T_c = 80 °C	140	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		300	A
I_{FSM}	t_p = 10 ms; sin.	T_j = 150 °C	1100	A
Freewheeling Diode				
I_F	T_j = 150 °C	T_c = 25 °C	200	A
		T_c = 80 °C	140	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		300	A
I_{FSM}	t_p = 10 ms; sin.	T_j = 150 °C	1100	A
Module				
$I_{t(RMS)}$			500	A
T_{vj}			- 40 ... + 150	°C
T_{stg}			- 40 ... + 125	°C
V_{isol}	AC, 1 min.		4000	V

Characteristics		T_{case} = 25°C, unless otherwise specified				
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
IGBT						
$V_{GE(th)}$	$V_{GE} = V_{CE}$, I_C = 6 mA		5	5,8	6,5	V
I_{CES}	V_{GE} = 0 V, $V_{CE} = V_{CES}$	T_j = 25 °C		0,1	0,3	mA
		T_j = 125 °C				mA
V_{CE0}		T_j = 25 °C		1	1,2	V
		T_j = 125 °C		0,9	1,1	V
r_{CE}	V_{GE} = 15 V	T_j = 25°C		4,7	6,3	mΩ
		T_j = 125°C		7,3	9	mΩ
$V_{CE(sat)}$	I_{Cnom} = 150 A, V_{GE} = 15 V	T_j = 25°$C_{chiplev.}$		1,7	2,15	V
		T_j = 125°$C_{chiplev.}$		2	2,45	V
C_{ies}				10,8		nF
C_{oes}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz		0,9		nF
C_{res}				0,9		nF
Q_G	V_{GE} = -8V - +20V			1530		nC
R_{Gint}	T_j = 25 °C			5		Ω
$t_{d(on)}$				260		ns
t_r	R_{Gon} = 1,5 Ω	V_{CC} = 600V		40		ns
E_{on}		I_{Cnom}= 150A		18		mJ
$t_{d(off)}$	R_{Goff} = 1,5 Ω	T_j = 125 °C		540		ns
t_f		V_{GE} = ±15V		110		ns
E_{off}						mJ
$R_{th(j-c)}$	per IGBT				0,13	K/W



SEMITRANS® 3

Trench IGBT Modules

SKM 200GB126D

SKM 200GAL126D

Features

- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability, self limiting to 6 x I_C

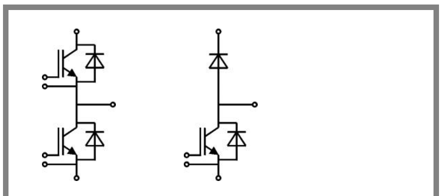
Typical Applications

- Electronic welders
- AC inverter drives
- UPS

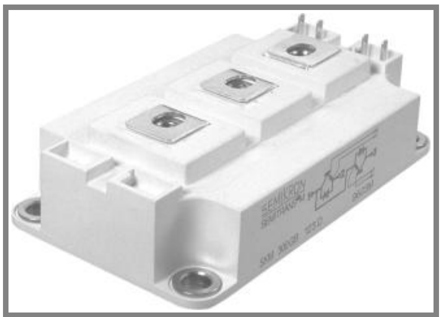
Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
Inverse diode						
$V_F = V_{EC}$	I_{Fnom} = 150 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		1,6	1,8	V
		T_j = 125 °$C_{chiplev.}$		1,6	1,8	V
V_{F0}		T_j = 25 °C		1	1,1	V
		T_j = 125 °C		0,8	0,9	V
r_F		T_j = 25 °C		4	4,7	mΩ
		T_j = 125 °C		5,3	6	mΩ
I_{RRM}	I_{Fnom} = 150 A	T_j = 125 °C		240		A
Q_{rr}	di/dt = 5000 A/µs			42		µC
E_{rr}	V_{GE} = -15 V; V_{CC} = 600 V					mJ
$R_{th(j-c)D}$	per diode				0,3	K/W
FWD						
$V_F = V_{EC}$	I_{Fnom} = 150 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		1,6	1,8	V
		T_j = 125 °$C_{chiplev.}$		1,6	1,8	V
V_{F0}		T_j = 25 °C		1	1,1	V
		T_j = 125 °C		0,8	0,9	V
r_F		T_j = 25 °C		4	4,7	V
		T_j = 125 °C		5,3	6	V
I_{RRM}	I_{Fnom} = 150 A	T_j = 125 °C		240		A
Q_{rr}	di/dt = 5000 A/µs			42		µC
E_{rr}	V_{GE} = -15 V; V_{CC} = 600 V					mJ
$R_{th(j-c)FD}$	per diode				0,3	K/W
Module						
L_{CE}				15	20	nH
$R_{CC'+EE'}$	res., terminal-chip	T_{case}= 25 °C		0,35		mΩ
		T_{case}= 125 °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 M5		2,5		5	Nm
w					325	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.



GB **GAL**



SEMITRANS® 3

Trench IGBT Modules

SKM 200GB126D

SKM 200GAL126D

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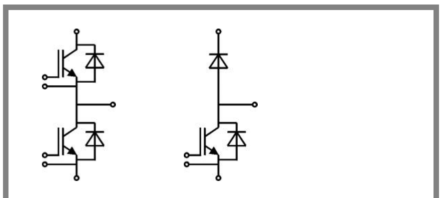


GB GAL

Z_{th} Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	i = 1	95	mk/W
R_i	i = 2	27	mk/W
R_i	i = 3	6,7	mk/W
R_i	i = 4	1,3	mk/W
tau_i	i = 1	0,0744	s
tau_i	i = 2	0,0087	s
tau_i	i = 3	0,002	s
tau_i	i = 4	0,0001	s
$Z_{th(j-c)D}$			
R_i	i = 1	200	mk/W
R_i	i = 2	80	mk/W
R_i	i = 3	17	mk/W
R_i	i = 4	3	mk/W
tau_i	i = 1	0,0536	s
tau_i	i = 2	0,0056	s
tau_i	i = 3	0,09	s
tau_i	i = 4	0,0002	s

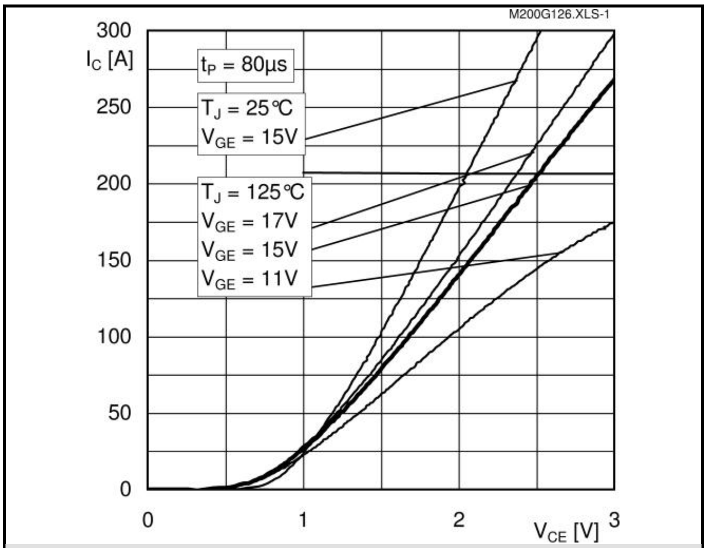


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

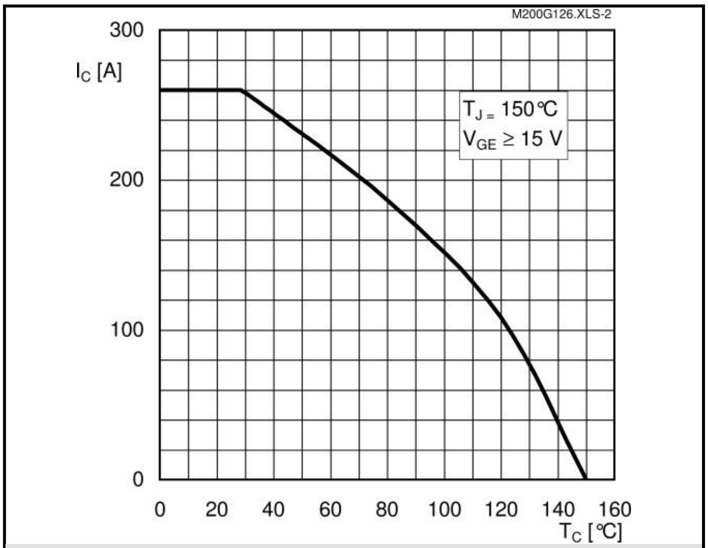


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

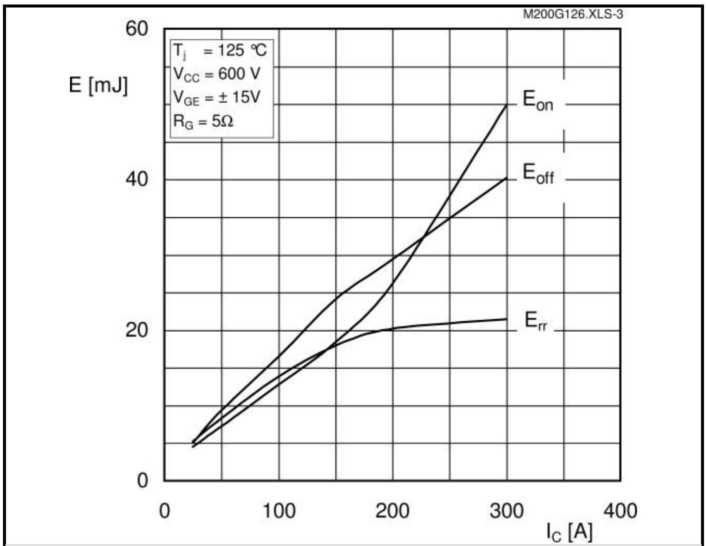


Fig. 3 Typ. turn-on /-off energy = f (I_C)

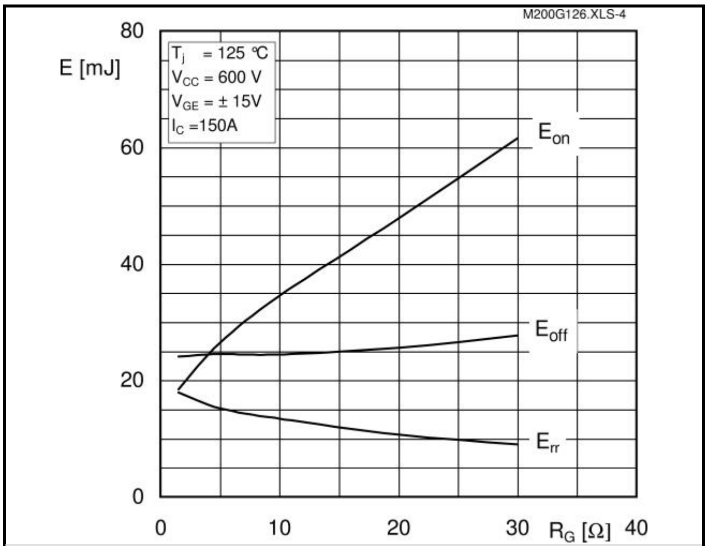


Fig. 4 Typ. turn-on /-off energy = f (R_G)

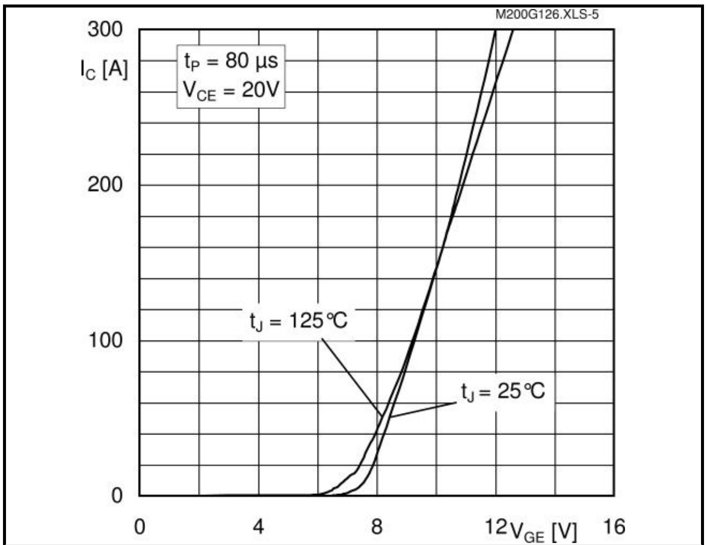


Fig. 5 Typ. transfer characteristic

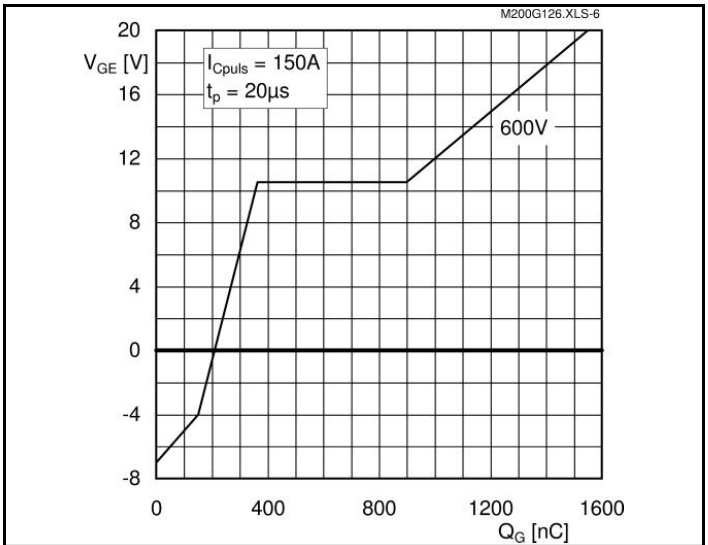


Fig. 6 Typ. gate charge characteristic

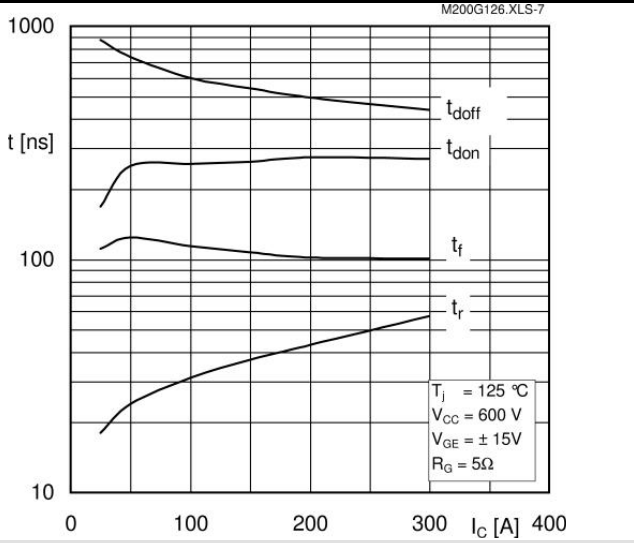


Fig. 7 Typ. switching times vs. I_C

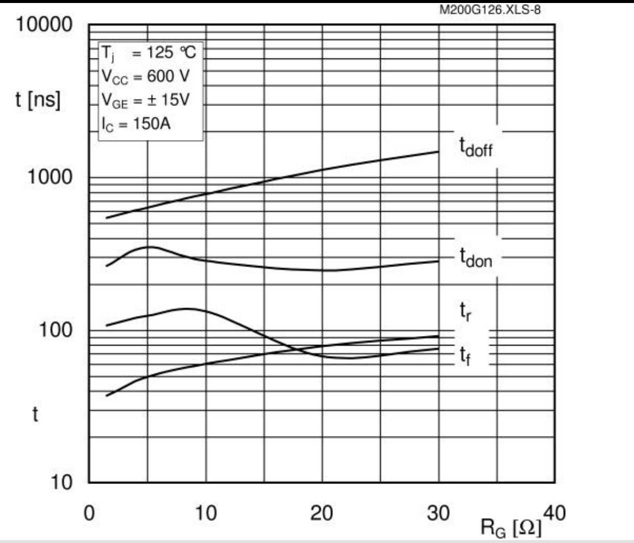


Fig. 8 Typ. switching times vs. gate resistor R_G

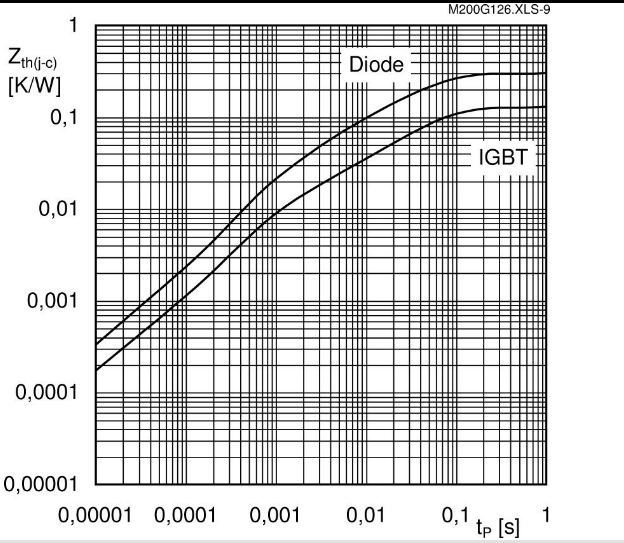


Fig. 9 Transient thermal impedance of IGBT

$Z_{thp(j-c)}$ = f (t_p); D = t_p/t_c = t_p*f

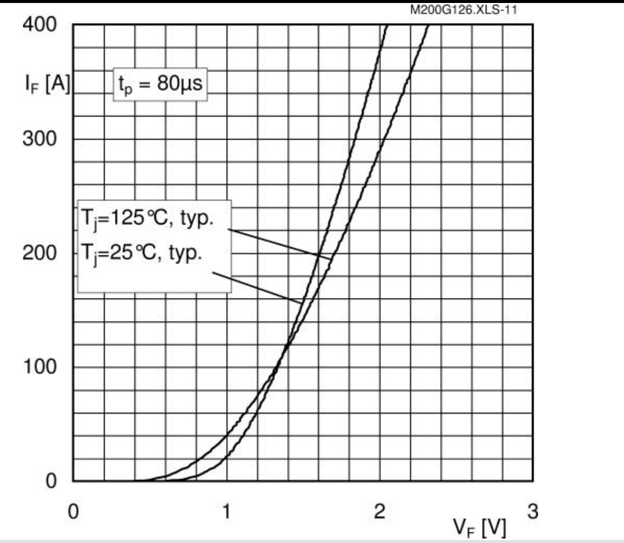


Fig. 10 Transient thermal impedance of FWD

$Z_{thp(j-c)}$ = f (t_p); D = t_p/t_c = t_p*f

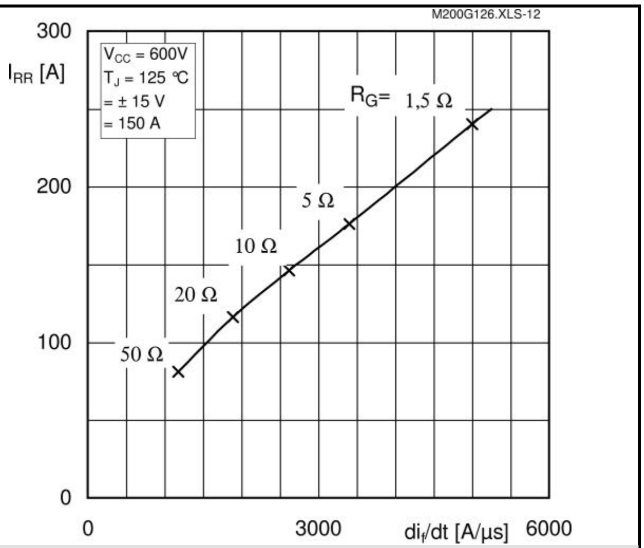


Fig. 11 CAL diode forward characteristic

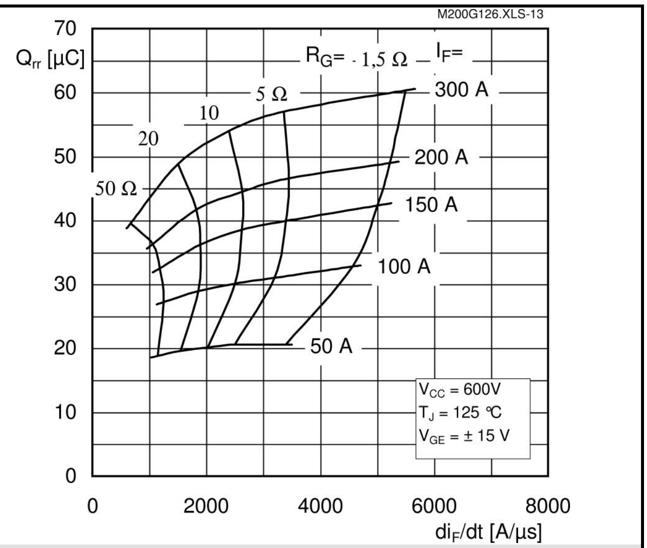
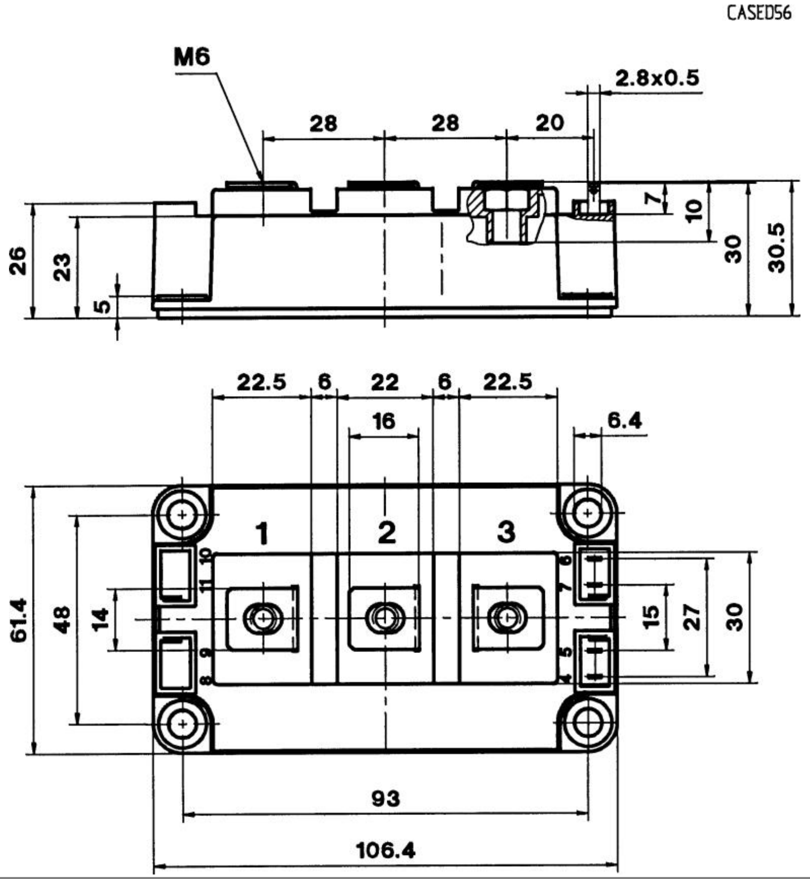
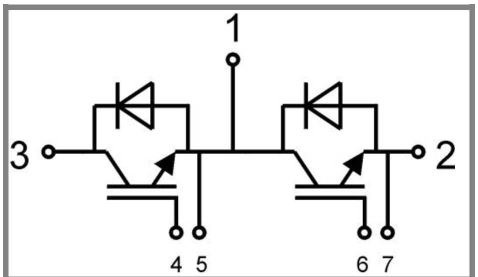


Fig. 12 Typ. CAL diode peak reverse recovery current

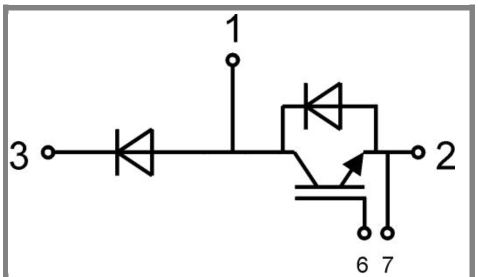
UL Recognized File 63 532



Case D 56



Case D56 GB



Case D57 GAL

