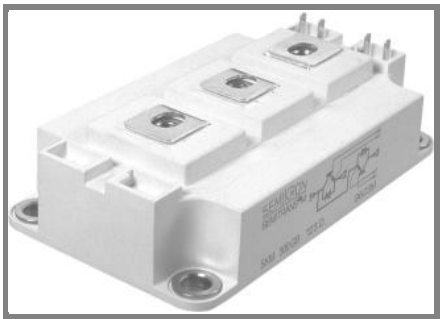
SKM 200GB128D



SEMITRANS® 3

SPT IGBT Module

SKM 200GB128D

Features

- Homogeneous Si
- SPT = Soft-Punch-Through technology
- V_{CEsat} with positive temperature coefficient
- High short circuit capability, self limiting to 6 x I_c

Typical Applications

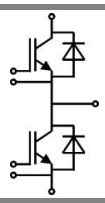
- AC inverter drives
- UPS
- Electronic welders f_{sw} up to 20kHz

Absolute Maximum Ratings T_c = 25 °C, unless otherwise specified

Symbol	Conditions		Values	Units
IGBT				
V_{CES}	T_j = 150 °C		1200	V
I_C	T_j = 150 °C	T_c = 25 °C	300	A
		T_c = 80 °C	220	A
I_{CRM}	I_{CRM} = 2xI_{Cnom}, t_p = 1 ms		300	A
V_{GES}			± 20	V
t_{psc}	V_{CC} = 600 V; $V_{GE} \leq$ 20 V; V_{CES} < 1200 V	T_j = 125 °C	10	µs
Inverse Diode				
I_F	T_j = 150 °C	T_{case} = 25 °C	190	A
		T_{case} = 80 °C	130	A
I_{FRM}	I_{FRM} = 2xI_{Fnom}, t_p = 1 ms		300	A
I_{FSM}	t_p = 10 ms; sin.	T_j = 150 °C	1440	A
Module				
$I_{t(RMS)}$			500	A
T_{vj}			- 40... + 150	°C
T_{stg}	$T_{OPERATION} \leq T_{stg}$		- 40... + 125	°C
V_{isol}	AC, 1 min.		4000	V

Characteristics T_c = 25 °C, unless otherwise specified

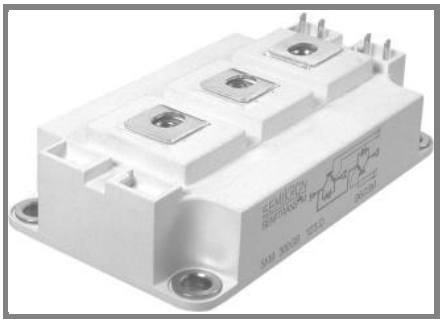
Symbol	Conditions		min.	typ.	max.	Units
IGBT						
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 6 mA		4,5	5,5	6,45	V
I_{CES}	V_{GE} = 0 V, V_{CE} = V_{CES}	T_j = 25 °C		0,2	0,6	mA
V_{CE0}		T_j = 25 °C		1	1,15	V
		T_j = 125 °C		0,9	1,05	V
r_{CE}	V_{GE} = 15 V	T_j = 25°C		6	8	mΩ
		T_j = 125°C		8	10	mΩ
$V_{CE(sat)}$	I_{Cnom} = 150 A, V_{GE} = 15 V	T_j = 25°C$_{chiplev.}$		1,9	2,35	V
		T_j = 125°C$_{chiplev.}$		2,1	2,55	V
C_{ies}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz		13		nF
C_{oes}				2		nF
C_{res}				2		nF
Q_G	V_{GE} = -8V- +20V			1700		nC
R_{Gint}	T_j = 25 °C			2,5		Ω
$t_{d(on)}$	R_{Gon} = 7 Ω di/dt = 4800 A/µs	V_{CC} = 600V I_{Cnom}= 150A T_j = 125 °C V_{GE} = ±15V L_s = 20 nH		125		ns
t_r				50		ns
E_{on}				18		mJ
$t_{d(off)}$	R_{Goff} = 7 Ω			620		ns
t_f				55		ns
E_{off}				15		mJ
$R_{th(j-c)}$	per IGBT				0,095	K/W



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- High short circuit capability, self limiting to 6 x I_c

Typical Applications

- AC inverter drives
- UPS
- Electronic welders f_{sw} up to 20kHz



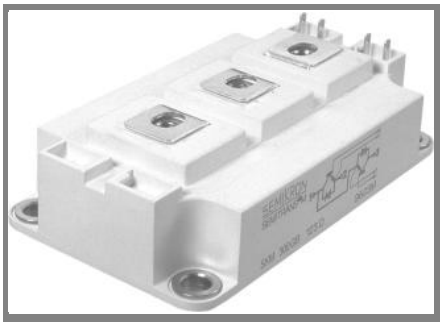
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Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 150 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		2	2,5	V
		T_j = 125 °$C_{chiplev.}$		1,8		V
V_{F0}		T_j = 25 °C		1,1	1,2	V
r_F		T_j = 25 °C		6	7,8	mΩ
I_{RRM}	I_{Fnom} = 150 A	T_j = 125 °C		190		A
Q_{rr}	di/dt = 4800 A/µs			24		µC
E_{off}	V_{GE} = -15 V; V_{CC} = 600 V			8		mJ
$R_{th(j-c)D}$	per diode				0,25	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 M6		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.

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SPT IGBT Module

SKM 200GB128D

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Z_{th} Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	i = 1	65	mk/W
R_i	i = 2	22	mk/W
R_i	i = 3	6,8	mk/W
R_i	i = 4	1,2	mk/W
tau_i	i = 1	0,0744	s
tau_i	i = 2	0,0078	s
tau_i	i = 3	0,0016	s
tau_i	i = 4	0,0002	s
$Z_{th(j-c)D}$			
R_i	i = 1	155	mk/W
R_i	i = 2	71	mk/W
R_i	i = 3	21	mk/W
R_i	i = 4	3	mk/W
tau_i	i = 1	0,0716	s
tau_i	i = 2	0,0056	s
tau_i	i = 3	0,0042	s
tau_i	i = 4	0,0002	s

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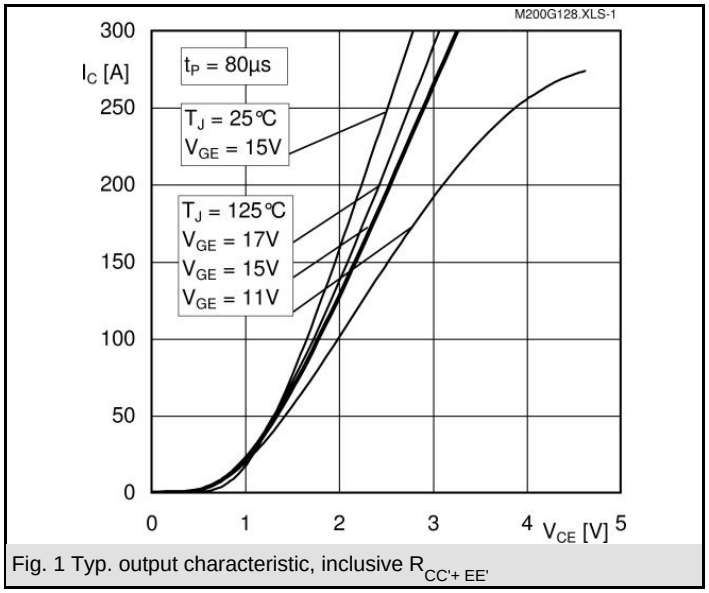


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

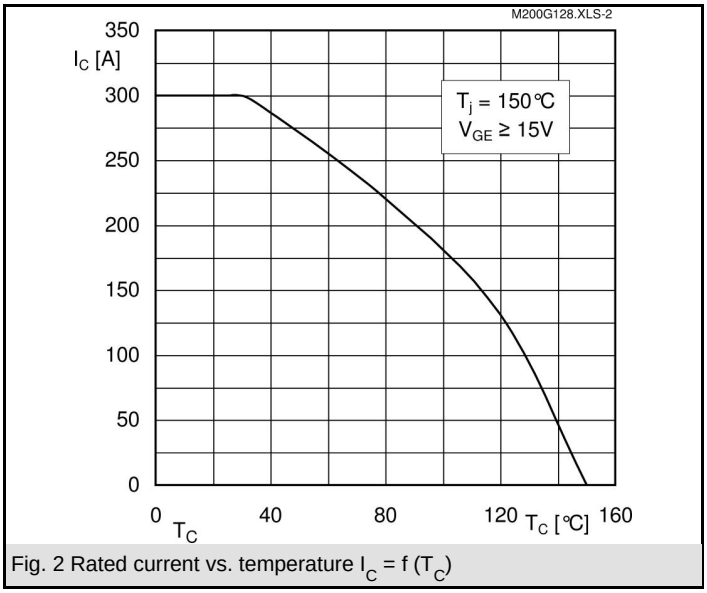


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

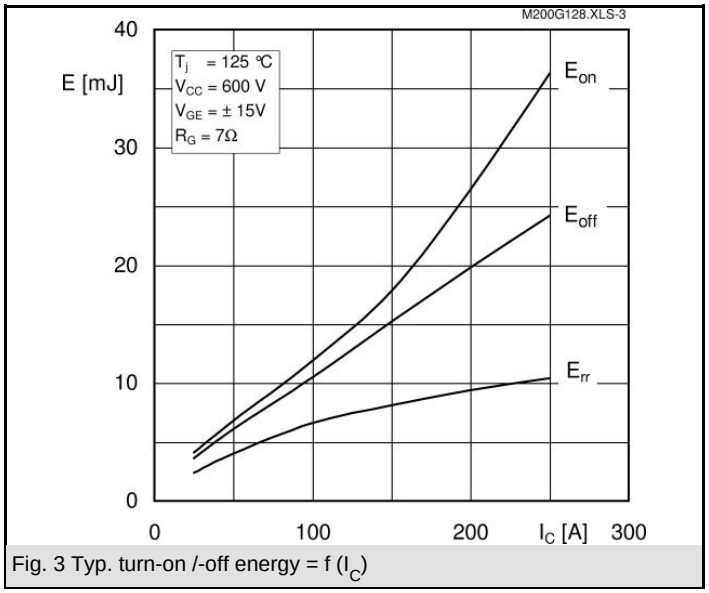


Fig. 3 Typ. turn-on /-off energy = f (I_C)

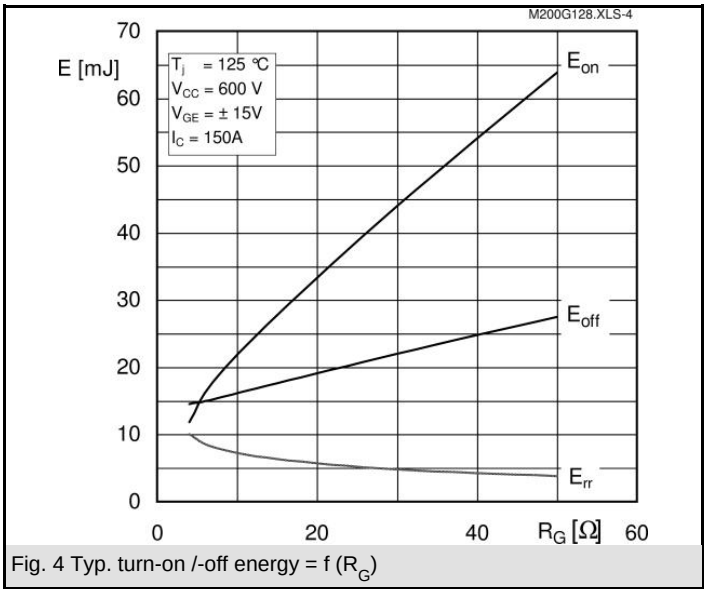


Fig. 4 Typ. turn-on /-off energy = f (R_G)

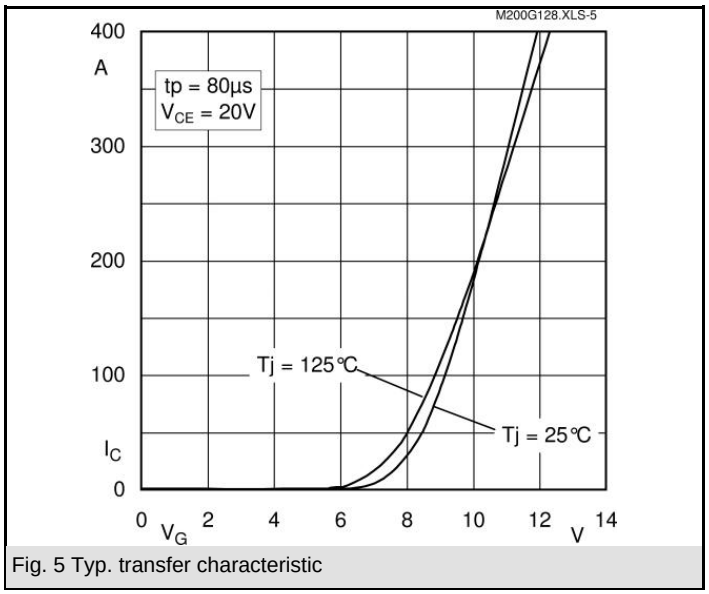


Fig. 5 Typ. transfer characteristic

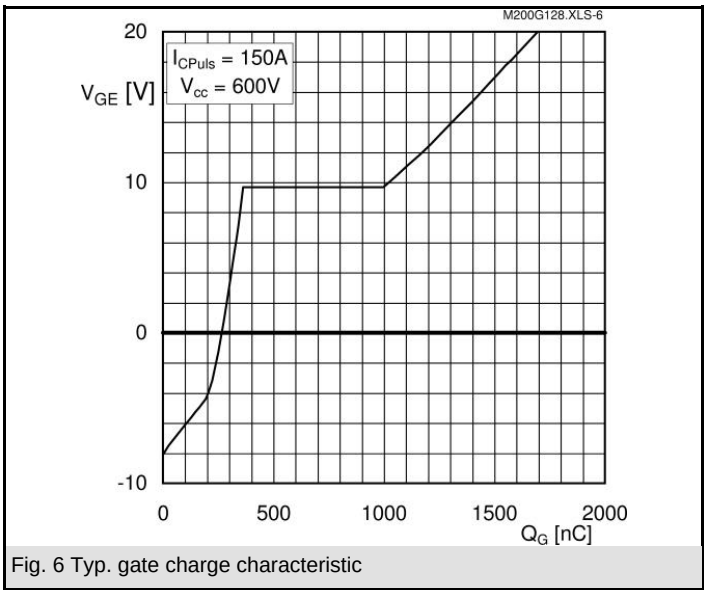


Fig. 6 Typ. gate charge characteristic

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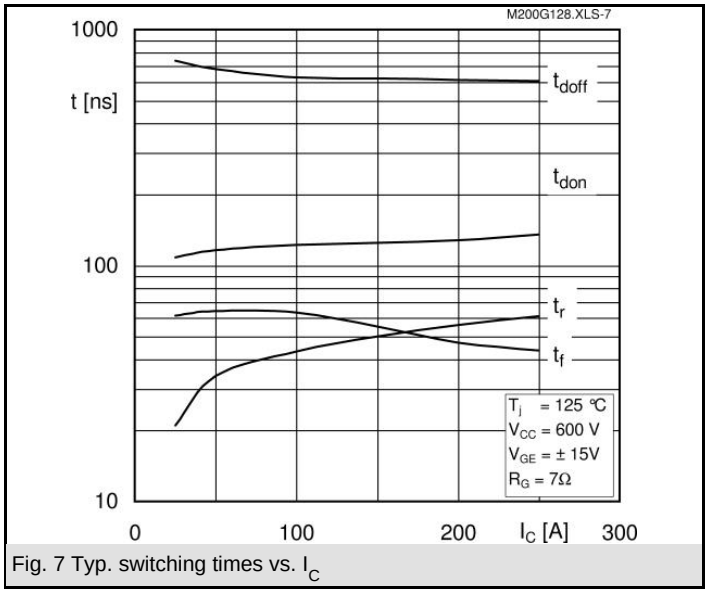


Fig. 7 Typ. switching times vs. I_C

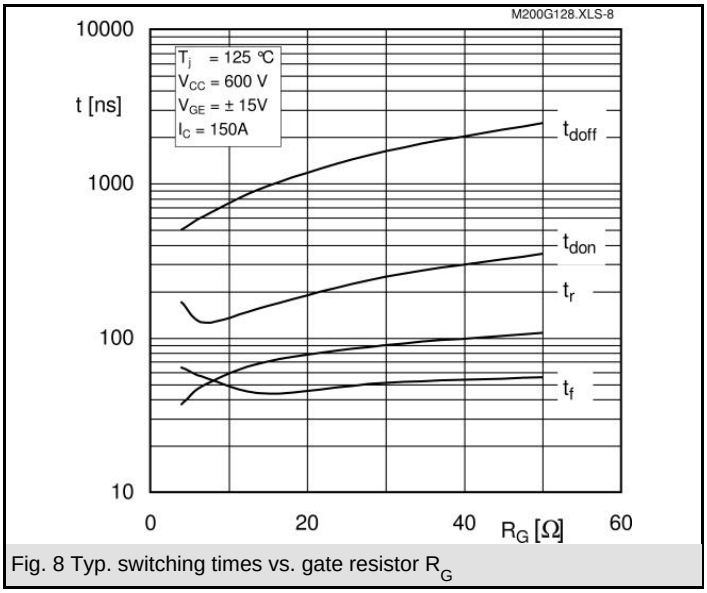


Fig. 8 Typ. switching times vs. gate resistor R_G

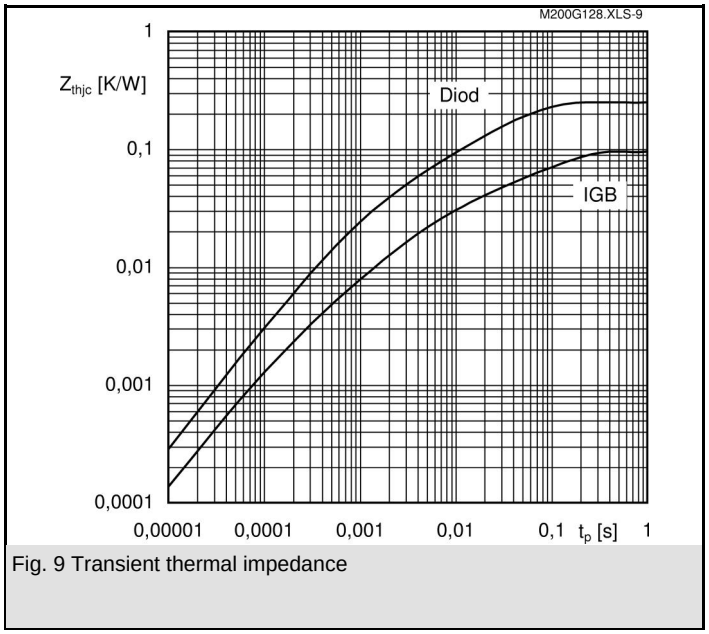


Fig. 9 Transient thermal impedance

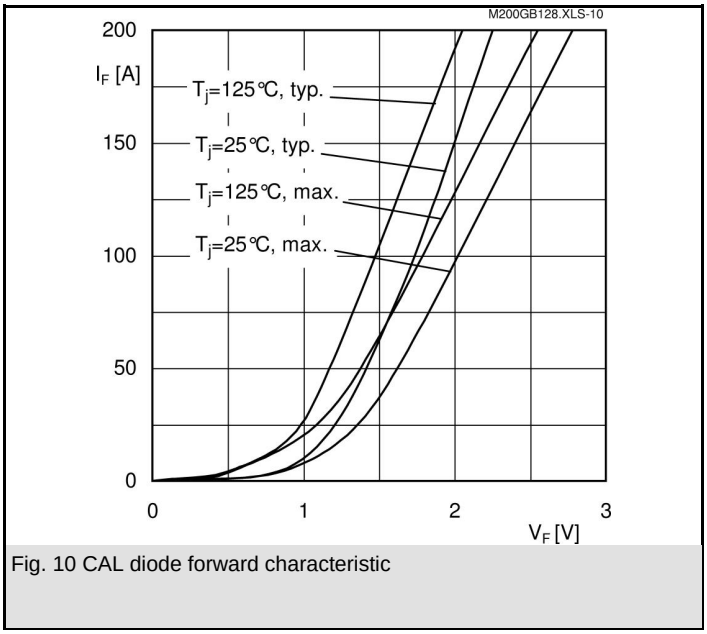


Fig. 10 CAL diode forward characteristic

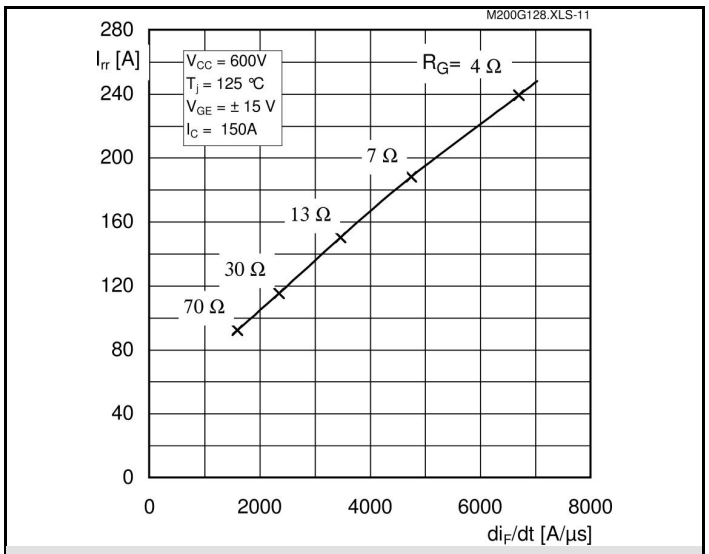


Fig. 11 Typ. CAL diode peak reverse recovery current

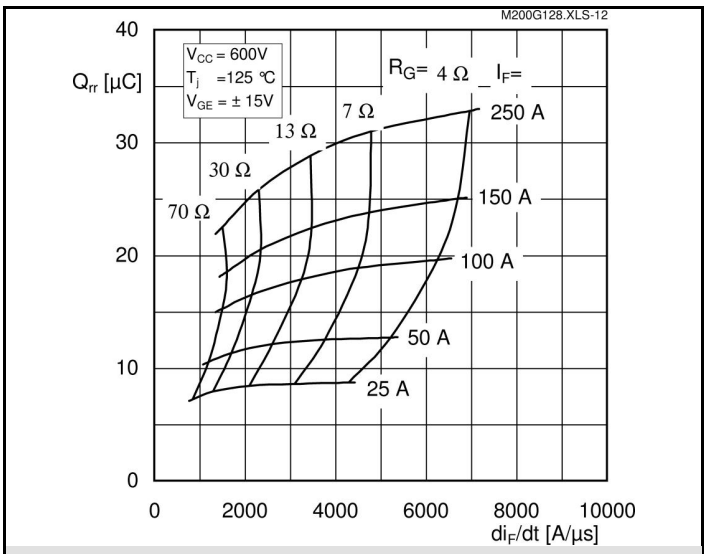


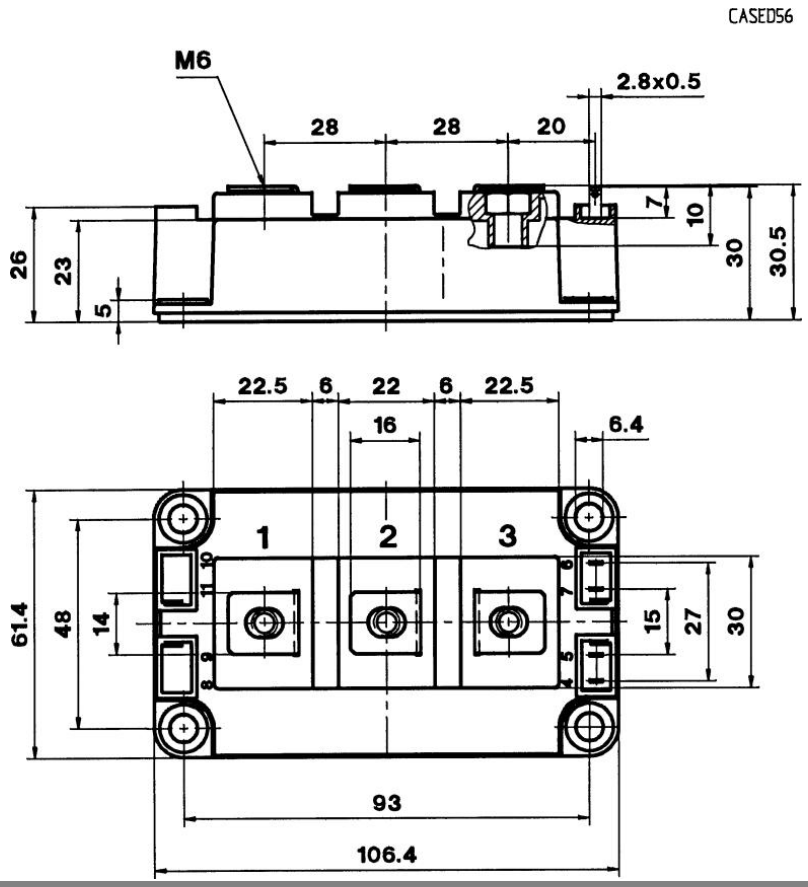
Fig. 12 Typ. CAL diode peak reverse recovery charge

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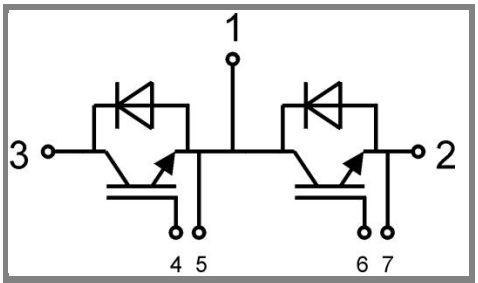
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UL Recognized
File no. E 63 532

Dimensions in mm



Case D 56



GB Case D 56

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