SEMIKRON

Absolute Maximum Ratings	T_{case} = 25 °C, unless otherwise specified		
Symbol	**Conditions**	**Values**	**Units**
IGBT			
V_{CES}		1200	V
I_C	T_{case} = 25 (80) °C	285 (205)	A
I_{CRM}	T_{case} = 25 (80) °C, t_p =1 ms	650 (470)	A
V_{GES}		± 20	V
T_{vj}, (T_{stg})	$T_{OPERATION} \leq T_{stg}$	– 40 ... +150 (125)	°C
V_{isol}	AC, 1 min.	4000	V
Inverse Diode			
$I_{FAV} = -I_C$	T_{case} = 25 (80) °C	190 (130)	A
I_{FRM}	T_{case} = 25 (80) °C, t_p < 1 ms	650 (470)	A
I_{FSM}	t_p = 10 ms; sin.; T_j = 150 °C	1450	A
Freewheeling Diode			
$I_{FAV} = -I_C$	T_{case} = 25 (80) °C		A
I_{FRM}	T_{case} = 25 (80) °C, t_p < 1 ms		A
I_{FSM}	t_p = 10 ms; sin.; T_j = 150 °C		A

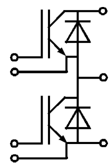
Characteristics	T_{case} = 25 °C, unless otherwise specified				
Symbol	**Conditions**	**min.**	**typ.**	**max.**	**Units**
IGBT					
$V_{GE(TO)}$	$V_{GE} = V_{CE}$, I_C = 6 mA	4,5	5,5	6,45	V
I_{CES}	V_{GE} = 0, $V_{CE} = V_{CES}$, T_j = 25 (125) °C			tbd	mA
$V_{CE(TO)}$	T_j = 25 (125) °C		1,0 (0,9)	1,15	V
r_{CE}	V_{GE} = 15 V, T_j = 25 (125) °C		6,7 (9,3)	8,3(tbd)	mΩ
$V_{CE(sat)}$	I_C = 150 A, V_{GE} = 15 V, chip level		2,0 (2,3)	2,4	V
C_{ies}			13		nF
C_{oes}	V_{GE} = 0, V_{CE} = 25 V, f = 1 MHz		2		nF
C_{res}			2		nF
L_{CE}				20	nH
$R_{CC'+EE'}$	resistance, terminal-chip 25 (125) °C		0,35 (0,5)		mΩ
	under following conditions:				
$t_{d(on)}$	V_{CC} = 600 V, I_C = 150 A		125		ns
t_r	$R_{Gon} = R_{Goff}$ = 7 Ω, T_j = 125 °C,		50		ns
$t_{d(off)}$	V_{GE} ± 15 V		620		ns
t_f			55		ns
E_{on} (E_{off})			18 (15)		mJ
Inverse Diode	under following conditions:				
$V_F = V_{EC}$	I_F = 150 A; V_{GE} = 0 V; T_j = 25 (125) °C		2,0 (1,8)	2,5	V
$V_{T(TO)}$	T_j = 25 (125) °C		1,1 (tbd)	1,2	V
r_T	T_j = 25 (125) °C		6 (tbd)	8,7(tbd)	mΩ
I_{RRM}	I_F = 150 A; T_j = 125 °C		190		A
Q_{rr}	di/dt = 4800 A/µs		24		µC
E_{rr}	V_{GE} = 0 V		8		mJ
FWD	under following conditions:				
$V_F = V_{EC}$	I_F = A; V_{GE} = 0 V; T_j = 25 (125) °C				V
V_{TO}	T_j = 25 (125) °C				V
r_T	T_j = 25 (125) °C				mΩ
I_{RRM}	I_F = A; T_j = 125 °C				A
Q_{rr}	V_{GE} = 0 V				µC
E_{rr}					mJ
Thermal Characteristics					
$R_{th(j-c)}$	per IGBT			0,095	K/W
$R_{th(j-c)D}$	per Inverse Diode			0,25	K/W
$R_{th(j-c)FD}$	per FWD			–	K/W
$R_{th(c-s)}$	per module			0,038	K/W
Mechanical Data					
M_s	to heatsink (M6)	3		5	Nm
M_t	for terminals (M5)	2,5		5	Nm
w				325	g

SEMITRANS™ M
SPT IGBT Module

SKM 200 GB 128 D

Preliminary Data

SEMITRANS 3



GB

Features

- Homogeneous Si
- SPT = Soft-Punch-Through technology
- $V_{CE(sat)}$ 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

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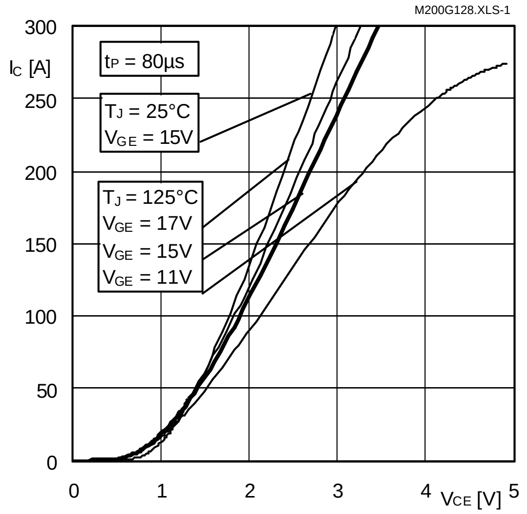

Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

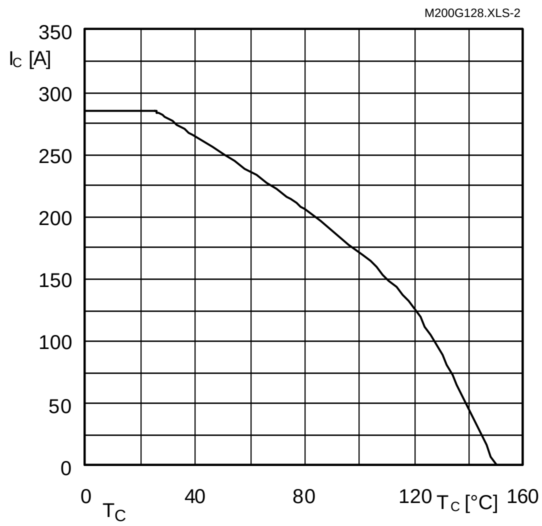

Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

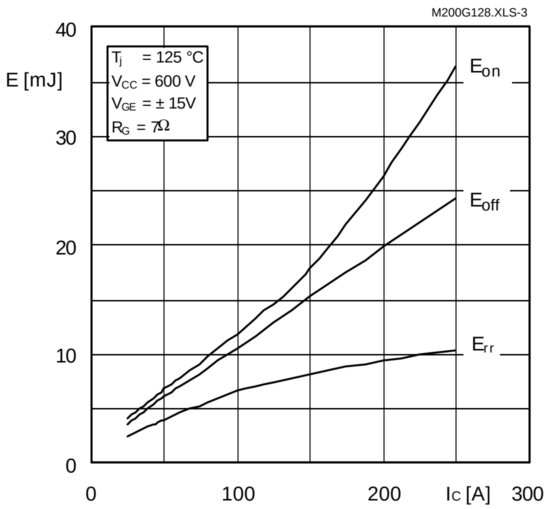

Fig. 3 Typ. turn-on /-off energy = f (I_C)

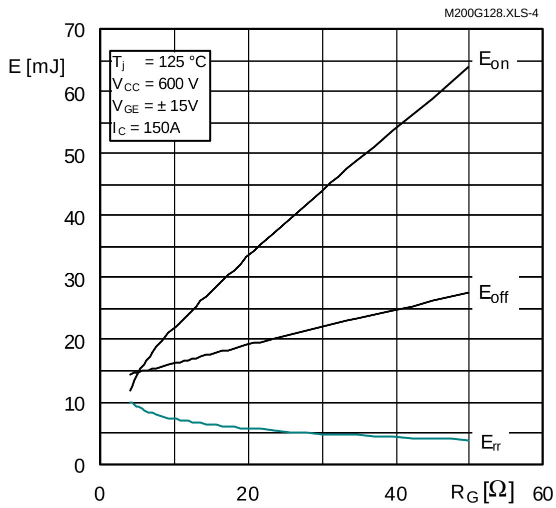

Fig. 4 Typ. turn-on /-off energy = f (R_G)

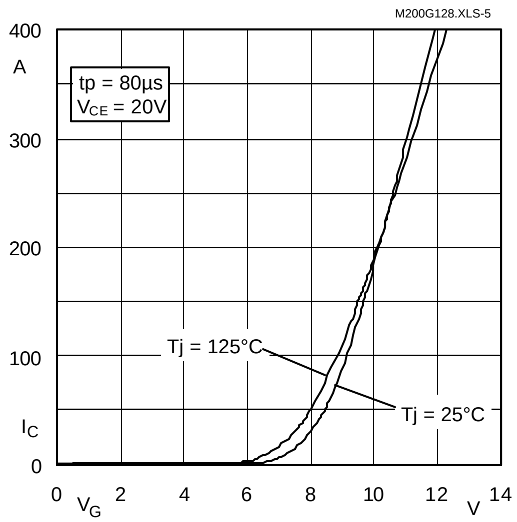

Fig. 5 Typ. transfer characteristic

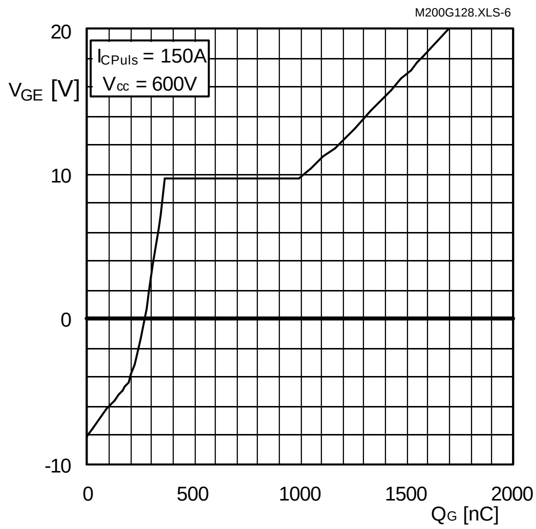

Fig. 6 Typ. gate charge characteristic

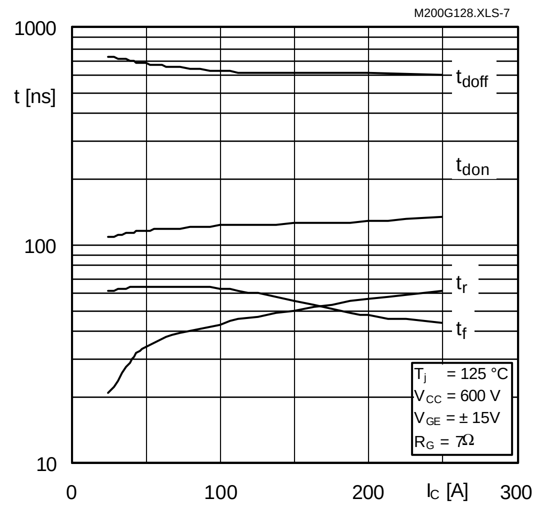

Fig. 7 Typ. switching times vs. I_C

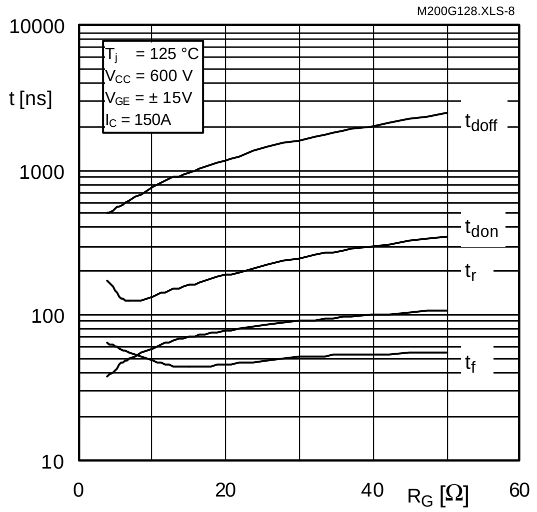

Fig. 8 Typ. switching times vs. gate resistor R_G

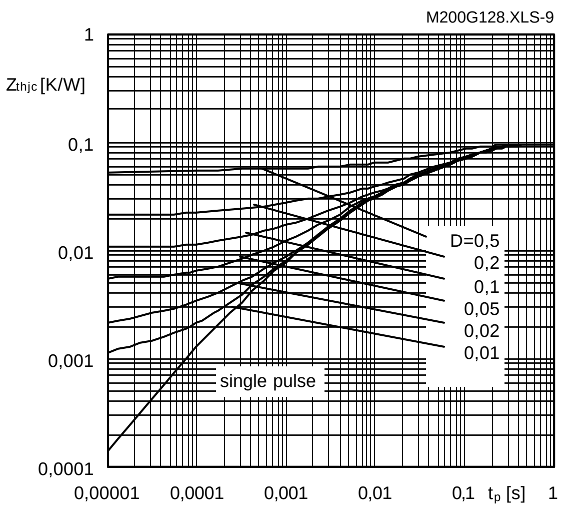

Fig. 9 Transient thermal impedance of IGBT $Z_{thp(j-c)} = f(t_p)$; $D = t_p / t_c = t_p \cdot f$

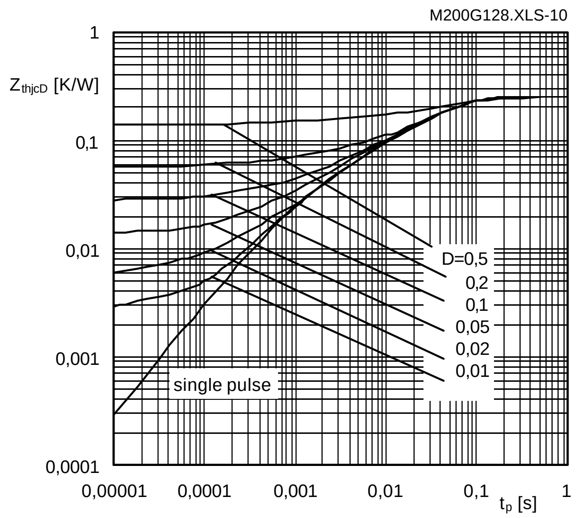

Fig. 10 Transient thermal impedance of FWD $Z_{thp(j-c)D} = f(t_p)$; $D = t_p / t_c = t_p \cdot f$

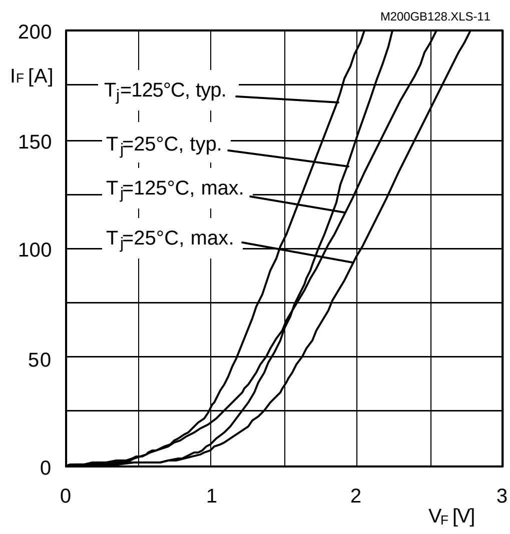

Fig. 11 CAL diode forward characteristic

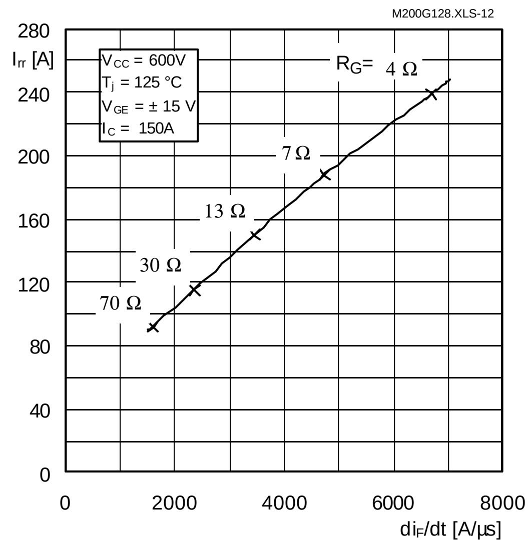

Fig. 12 Typ. CAL diode peak reverse recovery current

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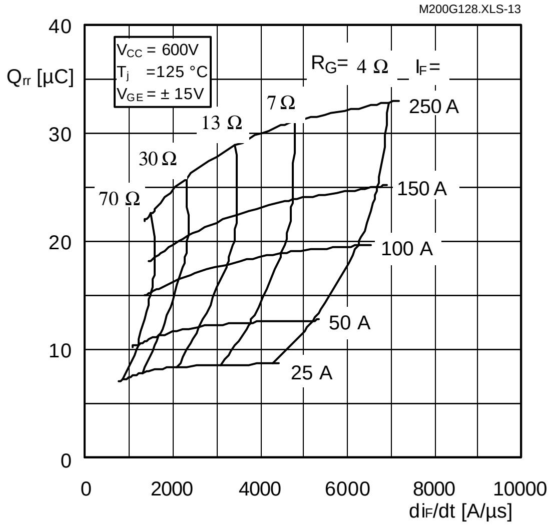


Fig. 13 Typ. CAL diode recovered charge

This is an electrostatic discharge sensitive device (ESDS).

Please observe the international standard IEC 60747-1, Chapter IX.

Packing Unit	12 pcs	SEMIBOX D
Mounting Kit	10 pcs	Ident-No. 33321100

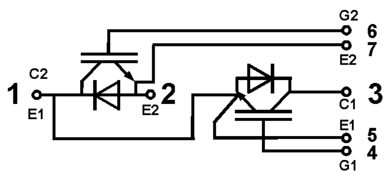
SEMITRANS 3

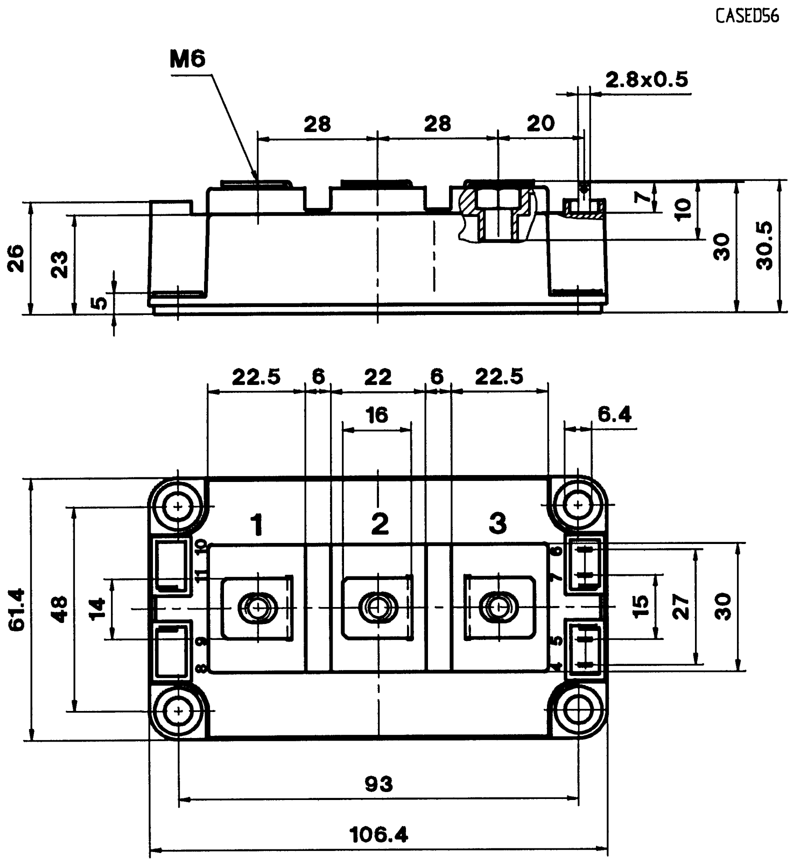
Case D 56

UL Recognized

File no. E 63 532

SKM 200 GB 128 D





Dimensions in mm

Case outline and circuit diagrams