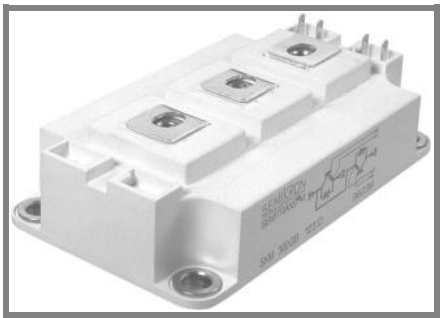
SKM 300GB128D ...



SEMITRANS® 3

SPT IGBT Module

SKM 300GB128D

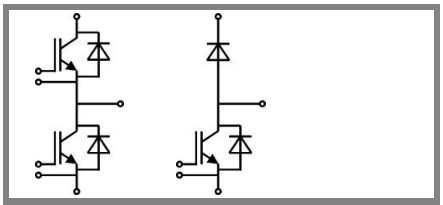
SKM 300GAL128D

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 at f_{sw} up to 20 kHz



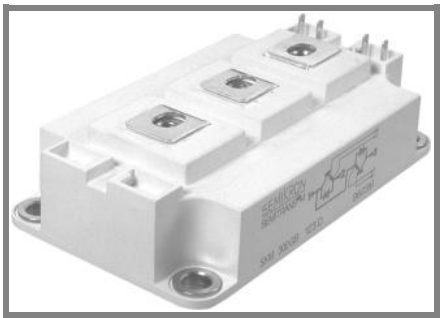
GB **GAL**

Absolute Maximum Ratings T_c = 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	370	A
		T_c = 80 °C	265	A
I_{CRM}	I_{CRM}=2xI_{Cnom}		400	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	260	A
		T_{case} = 80 °C	180	A
I_{FRM}	I_{FRM} = 2xI_{Fnom}		400	A
I_{FSM}	t_p = 10 ms; sin.	T_j = 150 °C	1800	A
Freewheeling Diode				
I_F	T_j = 150 °C	T_{case} = 25 °C	260	A
		T_{case} = 80 °C	180	A
I_{FRM}	I_{FRM} = 2xI_{Fnom}, t_p = 1 ms		400	A
I_{FSM}	t_p = 10 ms; sin.	T_j = 150 °C	1800	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_c = 25 °C, unless otherwise specified

Symbol	Conditions		min.	typ.	max.	Units
IGBT						
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 8 mA		4,5	5,5	6,5	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		4,5	6	mΩ
		T_j = 125°C		6	7,5	mΩ
$V_{CE(sat)}$	I_{Cnom} = 200 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		17		nF
C_{oes}				2		nF
C_{res}				1,9		nF
Q_G	V_{GE} = -8V - +20V			2400		nC
R_{Gint}	T_j = 25 °C			2		Ω
$t_{d(on)}$	R_{Gon} = 5 Ω	V_{CC} = 600V		170		ns
t_r		I_{Cnom}= 200A		55		ns
E_{on}		T_j = 125 °C		22		mJ
$t_{d(off)}$	R_{Goff} = 5 Ω	V_{GE} = ±15V		660		ns
t_f		L_s = 20 nH		60		ns
E_{off}				22		mJ
$R_{th(j-c)}$	per IGBT				0,085	K/W



SEMITRANS® 3

SPT IGBT Module

SKM 300GB128D

SKM 300GAL128D

Features

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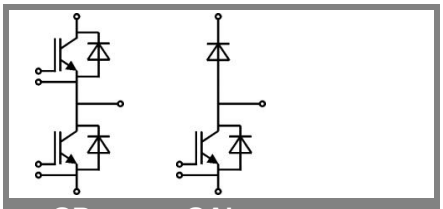


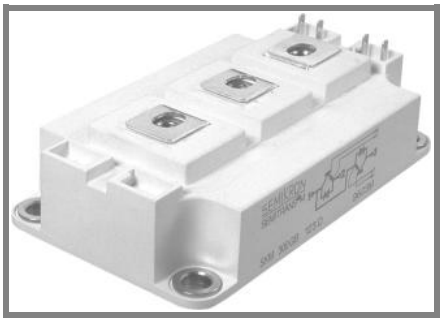
GB **GAL**

Characteristics

Symbol	Conditions		min.	typ.	max.	Units
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 200 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		4,5	6,5	mΩ
I_{RRM}	I_{Fnom} = 200 A	T_j = 125 °C		280		A
Q_{rr}	di/dt = 6300 A/µs	L_S = 20 nH		33		µC
E_{off}	V_{GE} = -15 V; V_{CC} = 600 V			11		mJ
$R_{th(j-c)D}$	per diode				0,18	K/W
FWD						
$V_F = V_{EC}$	I_{Fnom} = 200 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		4,5	6,5	V
I_{RRM}	I_{Fnom} = 200 A	T_j = 25 °C		280		A
Q_{rr}	di/dt = 6300 A/µs	L_S = 20 nH		33		µC
E_{off}	V_{GE} = -15 V; V_{CC} = 600 V			11		mJ
$R_{th(j-c)FD}$	per diode				0,18	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.



SEMITRANS® 3

SPT IGBT Module

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SKM 300GAL128D

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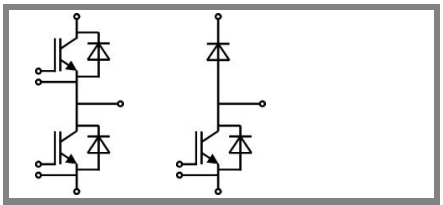


GB **GAL**

Z_{th} Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	i = 1	55	mk/W
R_i	i = 2	26	mk/W
R_i	i = 3	3,5	mk/W
R_i	i = 4	0,5	mk/W
tau_i	i = 1	0,04	s
tau_i	i = 2	0,189	s
tau_i	i = 3	0,0017	s
tau_i	i = 4	0,003	s
$Z_{th(j-c)D}$			
R_i	i = 1	120	mk/W
R_i	i = 2	48	mk/W
R_i	i = 3	10	mk/W
R_i	i = 4	2	mk/W
tau_i	i = 1	0,0727	s
tau_i	i = 2	0,006	s
tau_i	i = 3	0,0078	s
tau_i	i = 4	0,0002	s

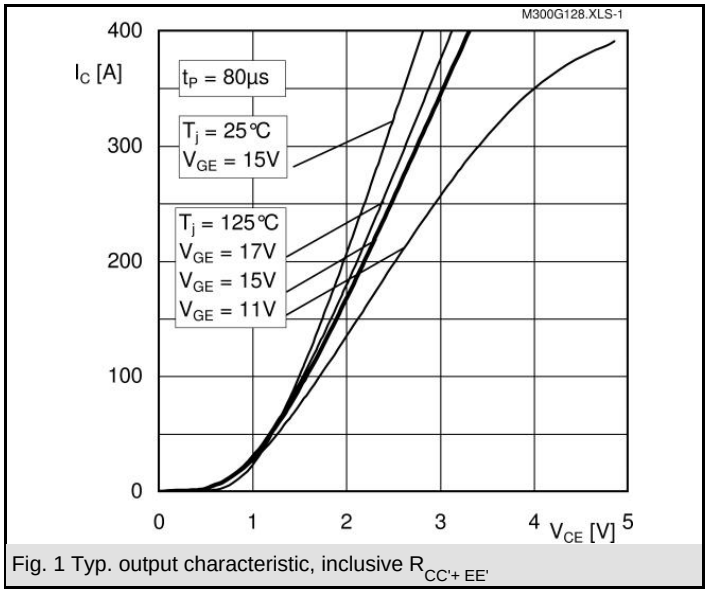


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

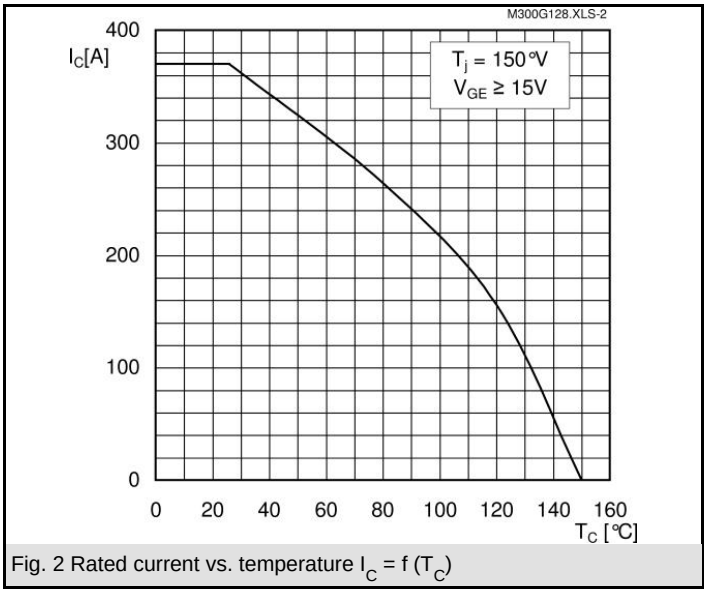


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

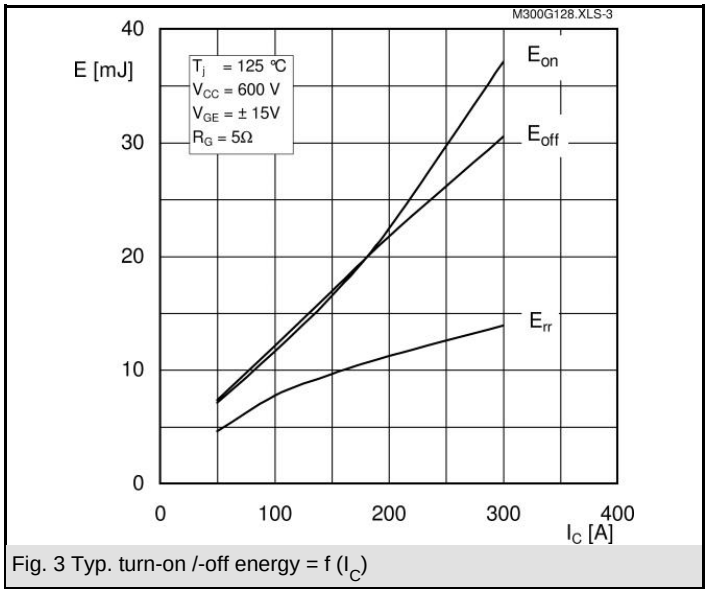


Fig. 3 Typ. turn-on /-off energy = f (I_C)

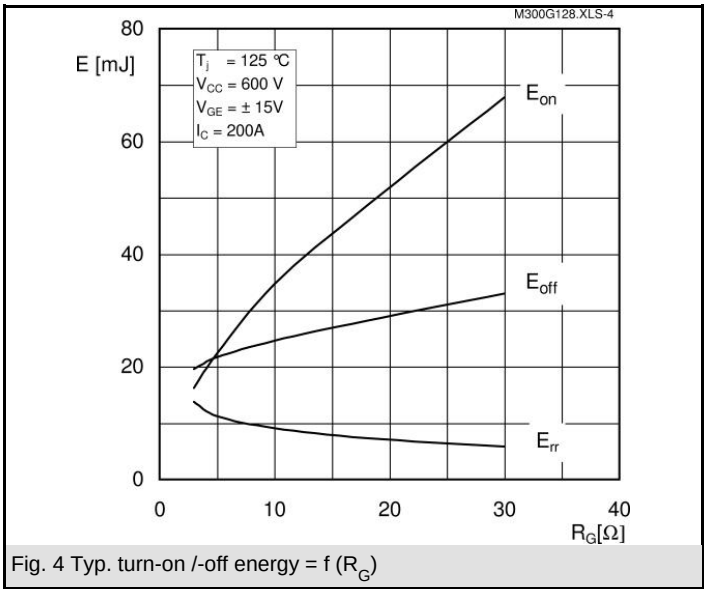


Fig. 4 Typ. turn-on /-off energy = f (R_G)

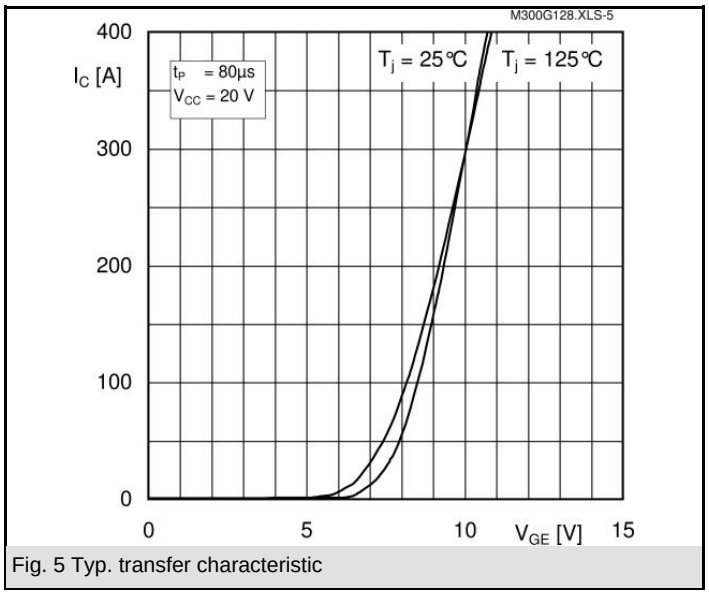


Fig. 5 Typ. transfer characteristic

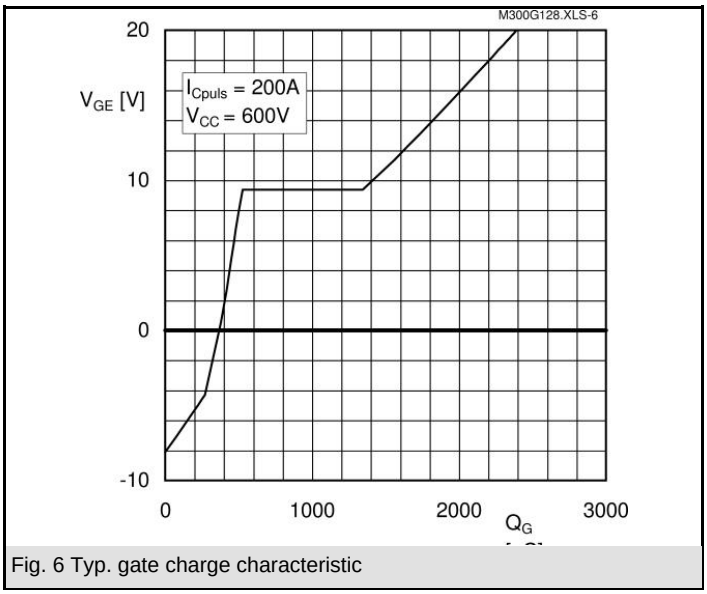


Fig. 6 Typ. gate charge characteristic

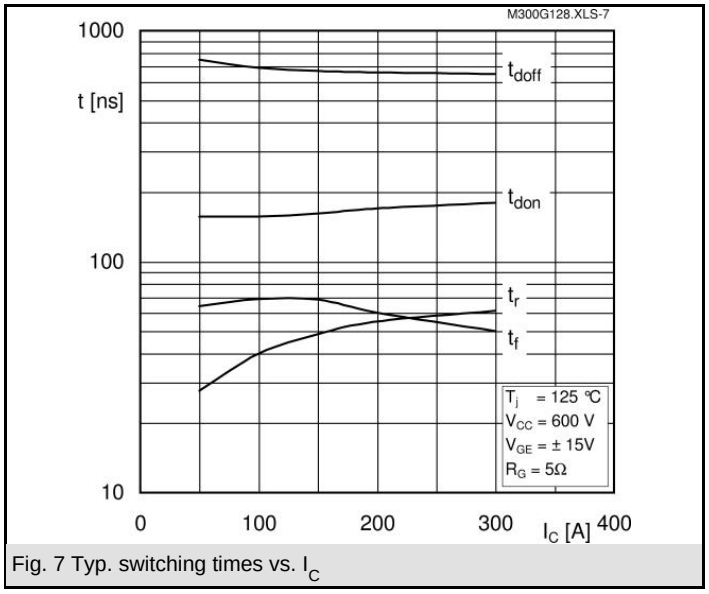


Fig. 7 Typ. switching times vs. I_C

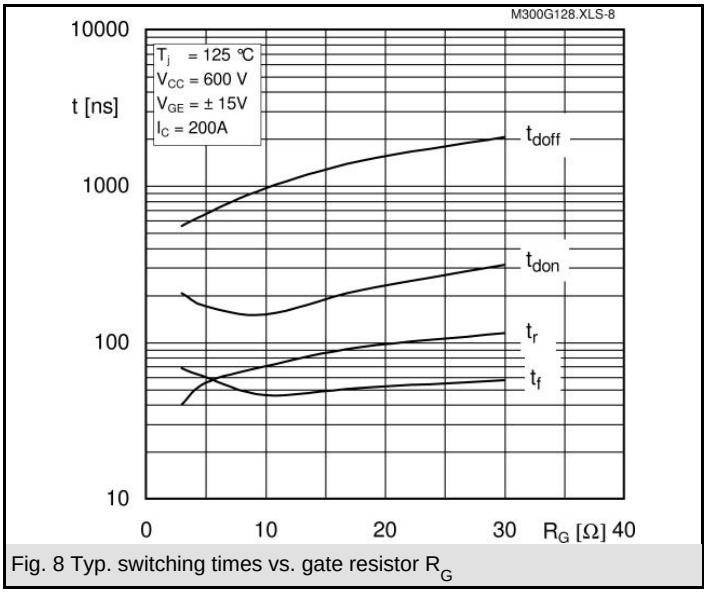


Fig. 8 Typ. switching times vs. gate resistor R_G

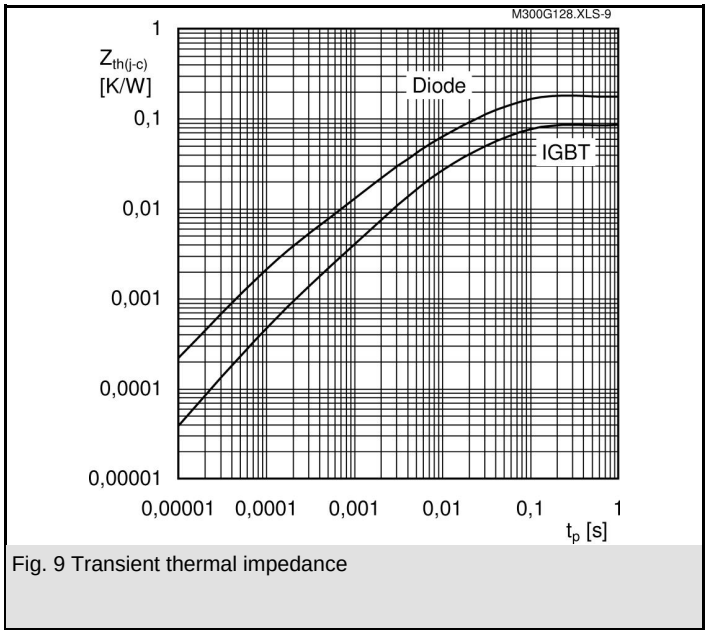


Fig. 9 Transient thermal impedance

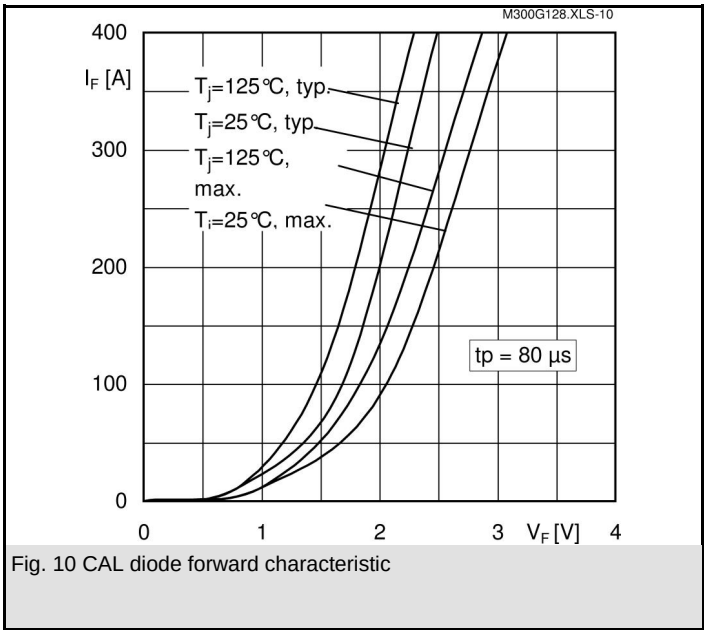


Fig. 10 CAL diode forward characteristic

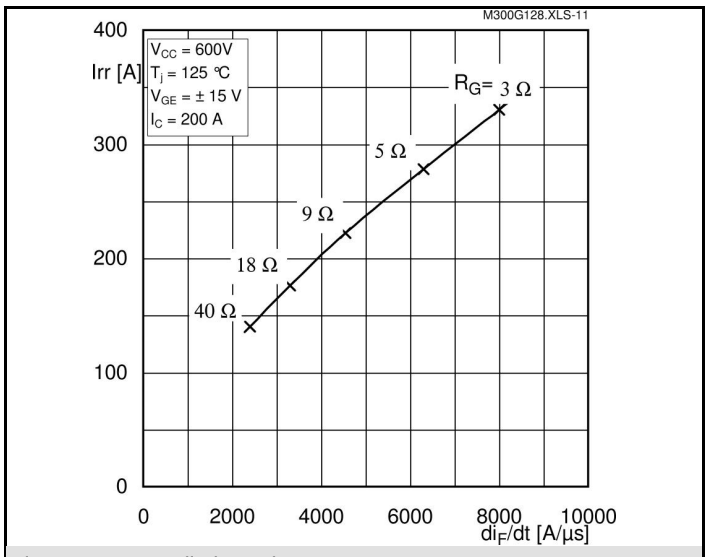


Fig. 11 Typ. CAL diode peak reverse recovery current

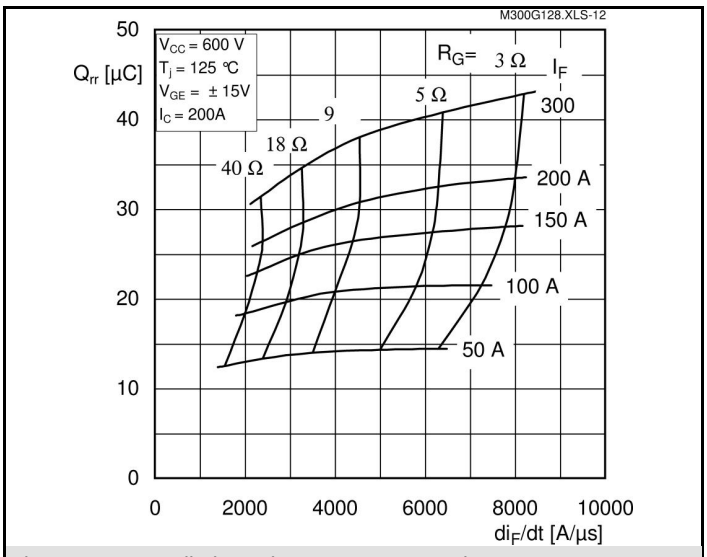
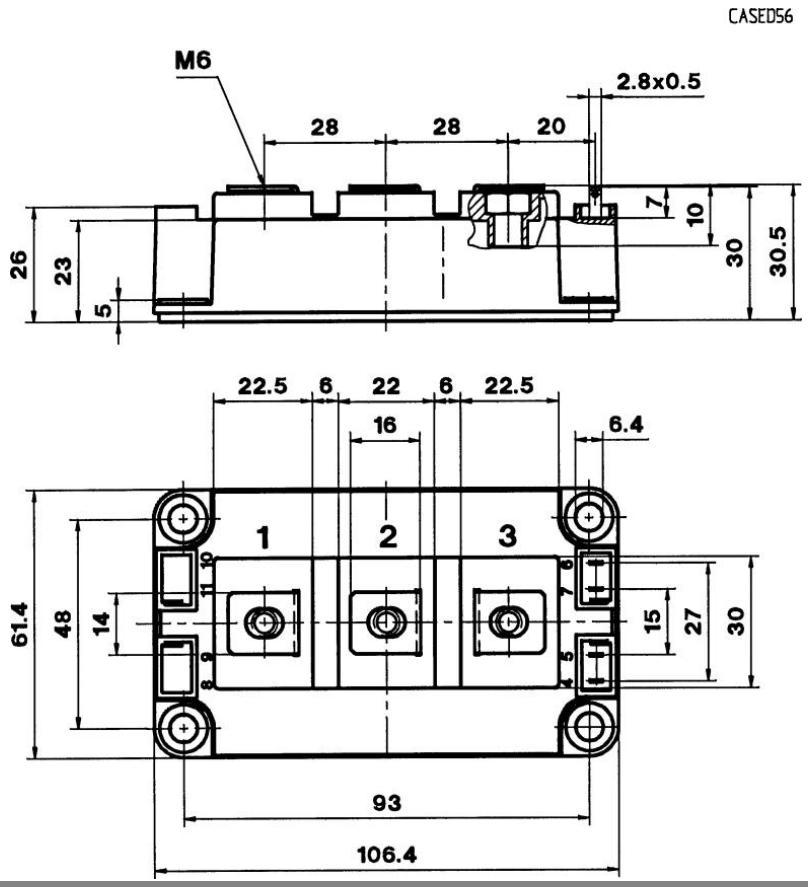


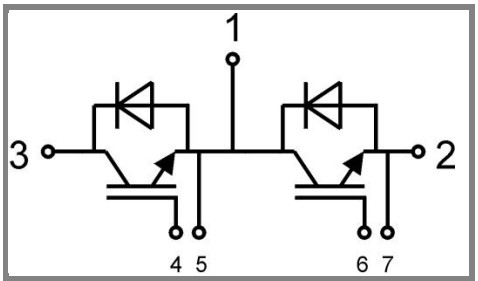
Fig. 12 Typ. CAL diode peak reverse recovery charge

UL Recognized
File no. E 63 532

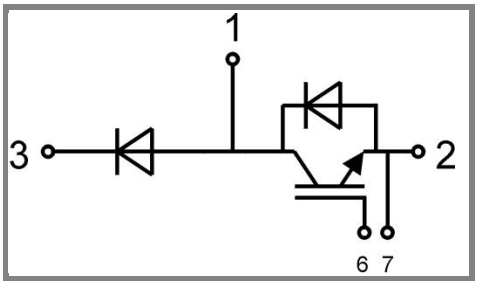
Dimensions in mm



Case D 56



Case D56 GB



Case D57 GAL

