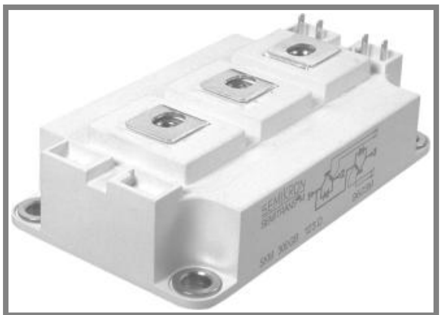
SKM 300GB126D



SEMITRANS® 3

Trench IGBT Module

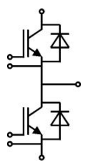
SKM 300GB126D

Features

- Trench = Trenchgate technology
- V_{CEsat} with positive temperature coefficient
- High short circuit capability, self limiting to 6 x I_c

Typical Applications*

- Electronic welders
- AC inverter drives
- UPS



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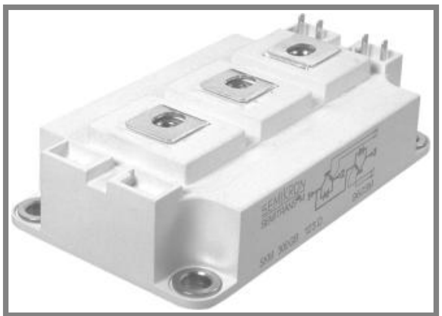
Absolute Maximum Ratings			T_c = 25 °C, unless otherwise specified	
Symbol	**Conditions**		**Values**	**Units**
IGBT				
V_{CES}	T_j = 25 °C		1200	V
I_C	T_j = 150 °C	T_{case} = 25 °C	310	A
		T_{case} = 80 °C	200	A
I_{CRM}	I_{CRM}=2xI_{Cnom}		400	A
V_{GES}			± 20	V
t_{psc}	V_{CC} = 600 V; $V_{GE} \leq$ 20 V; V_{CES} < 1200 V	T_j = 125 °C	10	µs
Inverse Diode				
I_F	T_j = 150 °C	T_{case} = 25 °C	250	A
		T_{case} = 80 °C	170	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		400	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		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
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		3,5	4,7	mΩ
		T_j = 125°C		5,5	6,8	mΩ
$V_{CE(sat)}$	I_{Cnom} = 200 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}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz		15		nF
C_{oes}				1,2		nF
C_{res}				1,1		nF
Q_G	V_{GE} = -8V - +20V			1800		nC
R_{Gint}	T_j = 25 °C			3,8		Ω
$t_{d(on)}$	R_{Gon} = 1,5 Ω	V_{CC} = 600V		280		ns
t_r		I_C= 200A		37		ns
E_{on}		T_j = 125 °C		21		mJ
$t_{d(off)}$	R_{Goff} = 1,5 Ω	V_{GE} = ± 15V		560		ns
t_f				100		ns
E_{off}				33		mJ
$R_{th(j-c)}$	per IGBT				0,12	K/W



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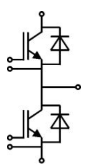

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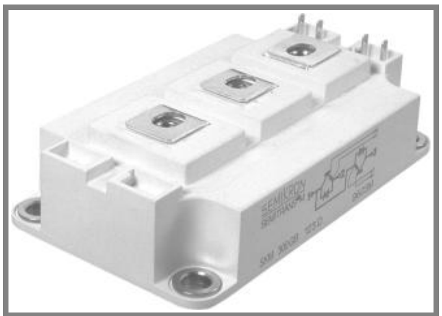
Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
Inverse diode						
$V_F = V_{EC}$	I_{Fnom} = 200 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		1,6	1,8	V
		T_j = 125 °$C_{chiplev.}$		1,6	1,8	V
V_{F0}		T_j = 25 °C		1	1,1	V
		T_j = 125 °C		0,8	0,9	V
r_F		T_j = 25 °C		3	3,5	mΩ
		T_j = 125 °C		4	4,5	mΩ
I_{RRM}	I_F = 200 A	T_j = 125 °C		290		A
Q_{rr}	di/dt = 6200 A/µs			44		µC
E_{rr}	V_{GE} = -15 V; V_{CC} = 600 V			18		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.

* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our personal.

SKM 300GB126D



SEMITRANS® 3

Trench IGBT Module

SKM 300GB126D

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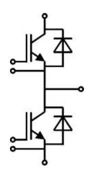

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Z_{th} Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	i = 1	80	mk/W
R_i	i = 2	30	mk/W
R_i	i = 3	8,5	mk/W
R_i	i = 4	1,5	mk/W
tau_i	i = 1	0,0576	s
tau_i	i = 2	0,01	s
tau_i	i = 3	0,002	s
tau_i	i = 4	0,0002	s
$Z_{th(j-c)D}$			
R_i	i = 1	150	mk/W
R_i	i = 2	75	mk/W
R_i	i = 3	22	mk/W
R_i	i = 4	3	mk/W
tau_i	i = 1	0,0331	s
tau_i	i = 2	0,0113	s
tau_i	i = 3	0,0012	s
tau_i	i = 4	0,001	s

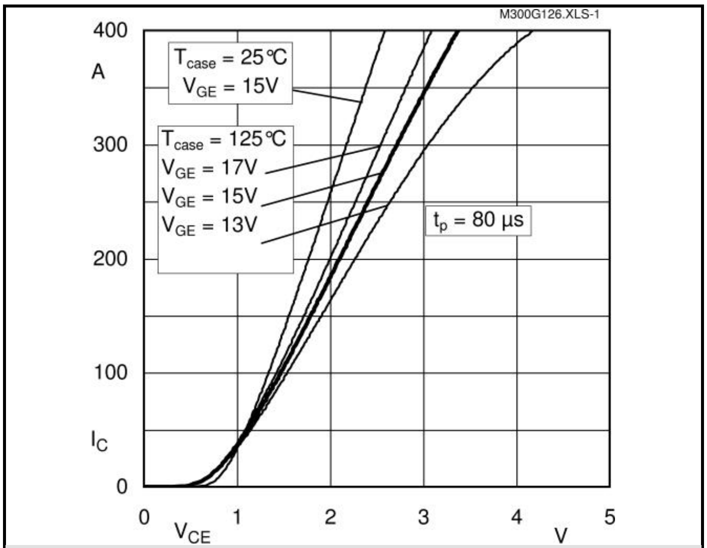


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

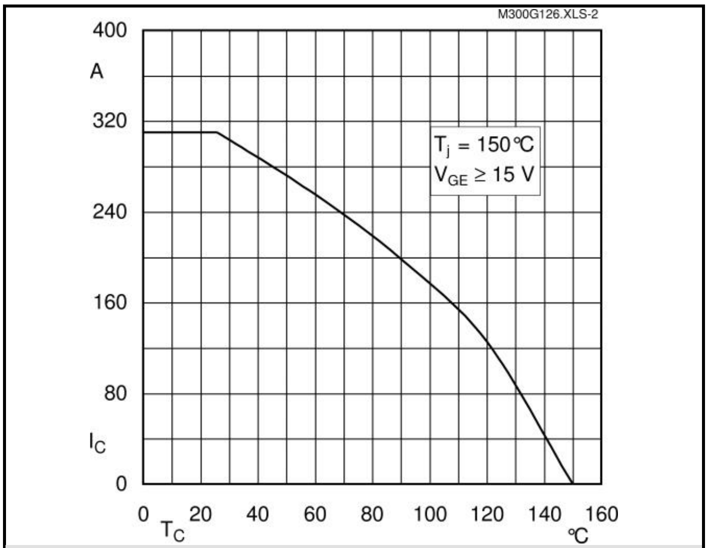


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

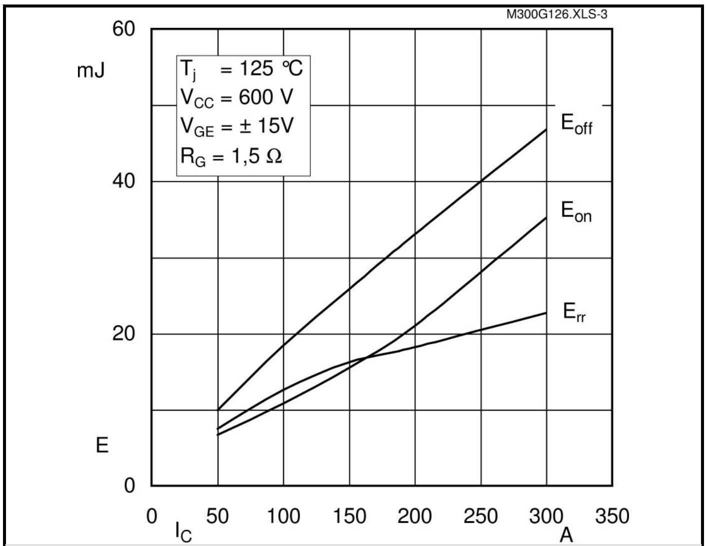


Fig. 3 Typ. turn-on /-off energy = f (I_C)

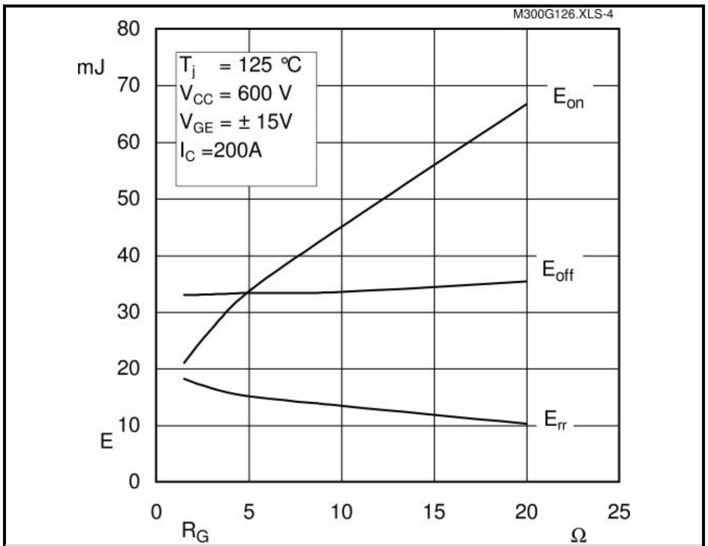


Fig. 4 Typ. turn-on /-off energy = f (R_G)

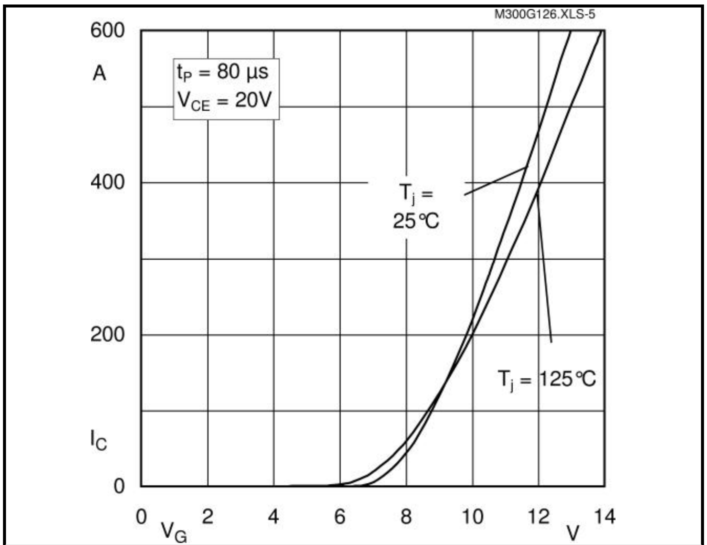


Fig. 5 Typ. transfer characteristic

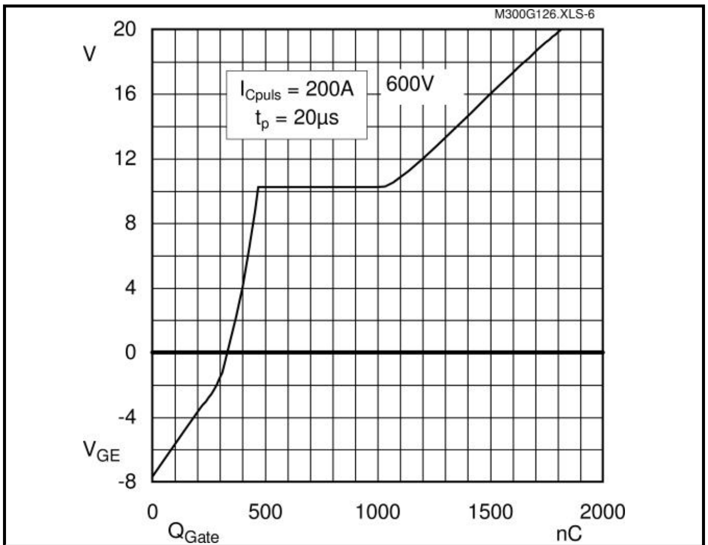


Fig. 6 Typ. gate charge characteristic

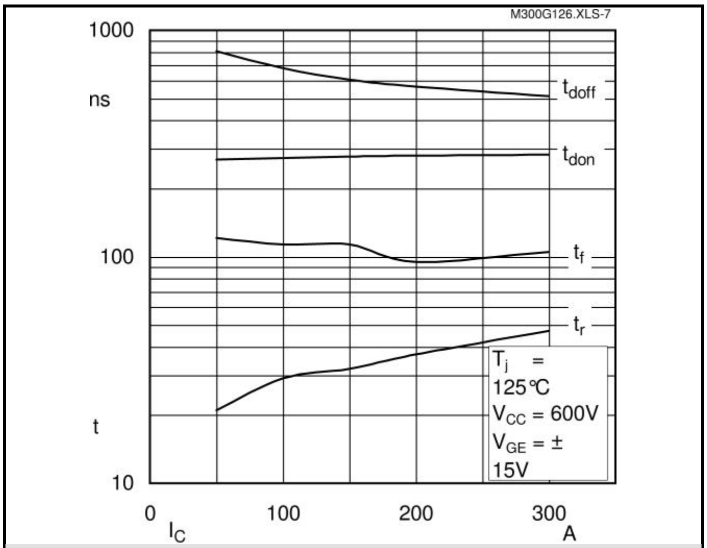


Fig. 7 Typ. switching times vs. I_C

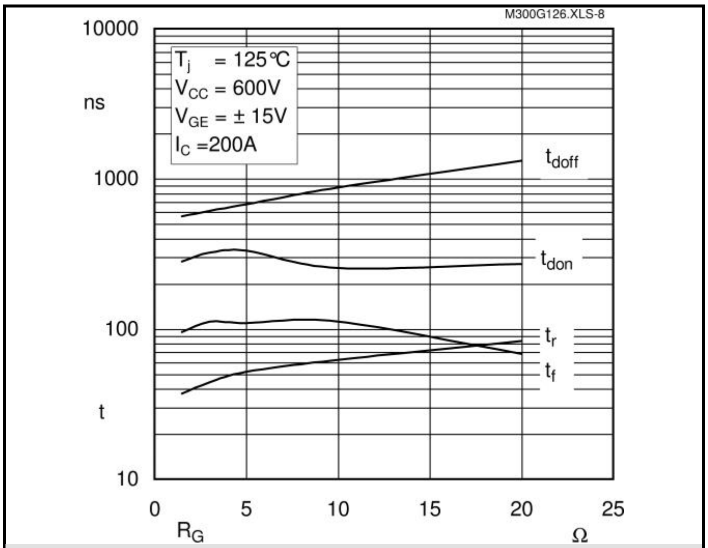


Fig. 8 Typ. switching times vs. gate resistor R_G

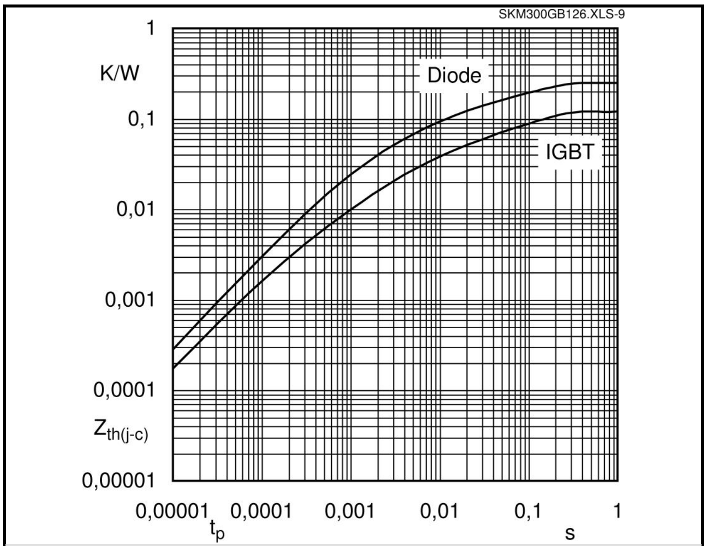


Fig. 9 Transient thermal impedance

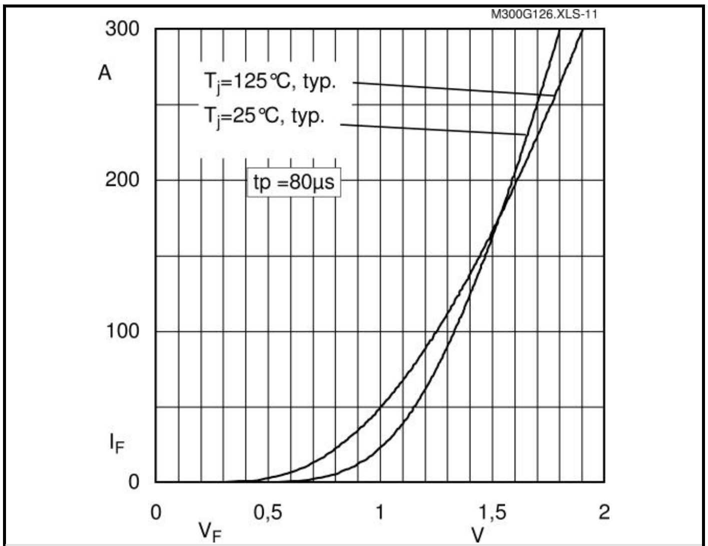


Fig. 10 CAL diode forward characteristic

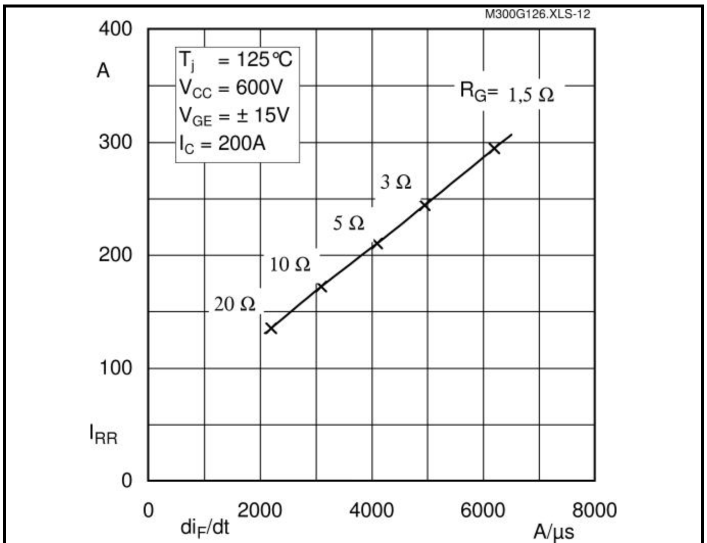


Fig. 11 Typ. CAL diode peak reverse recovery current

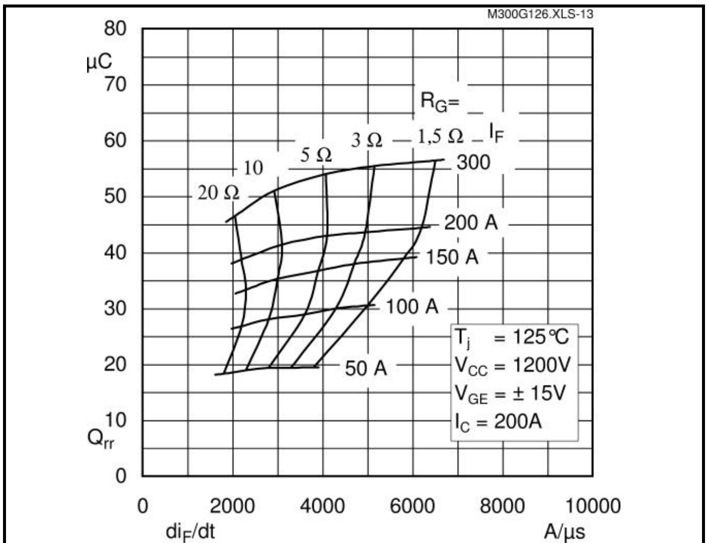
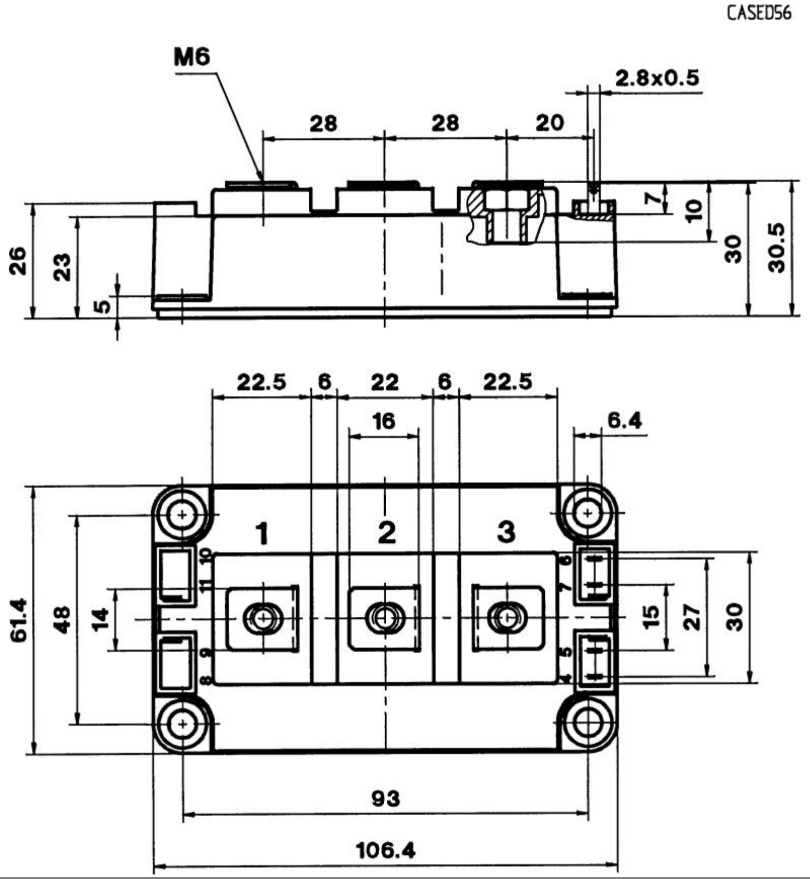


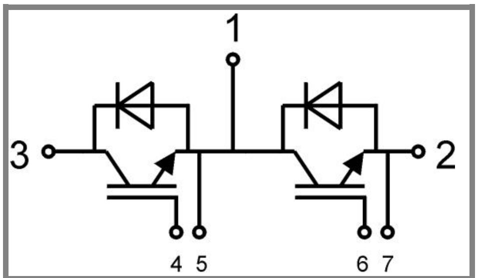
Fig. 12 Typ. CAL diode peak reverse recovery charge

UL Recognized

File 63 532



Case D 56



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Case D 56

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