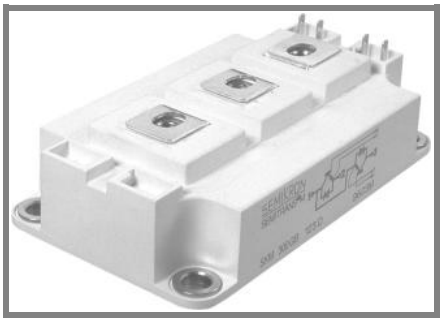
SKM 150GB128D



SEMITRANS® 3

SPT IGBT Modules

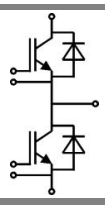
SKM 150GB128D

Features

- 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



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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_c = 25 °C	200	A
		T_c = 80 °C	140	A
I_{CRM}	I_{CRM}=2xI_{Cnom}		200	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	150	A
		T_{case} = 80 °C	100	A
I_{FRM}	I_{FRM} = 2xI_{Fnom}		200	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_c = 25 °C, unless otherwise specified					
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
IGBT						
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 4 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		9	12	mΩ
		T_j = 125°C		12	15	mΩ
$V_{CE(sat)}$	I_{Cnom} = 100 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		8,1		nF
C_{oes}				1,2		nF
C_{res}				1,1		nF
Q_G	V_{GE} = -8V - +20V			1200		nC
R_{Gint}	T_j = 25 °C			2,5		Ω
$t_{d(on)}$	R_{Gon} = 8 Ω	V_{CC} = 600V		80		ns
t_r		I_{Cnom}= 100A		40		ns
E_{on}		T_j = 125 °C		10		mJ
$t_{d(off)}$	R_{Goff} = 8 Ω	V_{GE} = ±15V		460		ns
t_f				65		ns
E_{off}				9		mJ
$R_{th(j-c)}$	per IGBT				0,15	K/W

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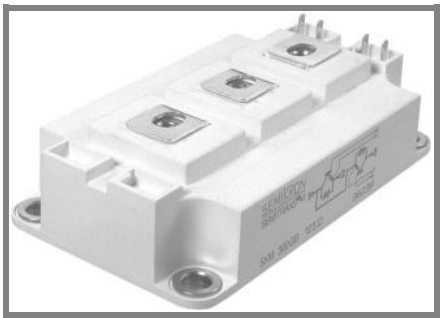

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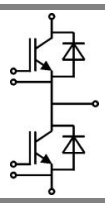

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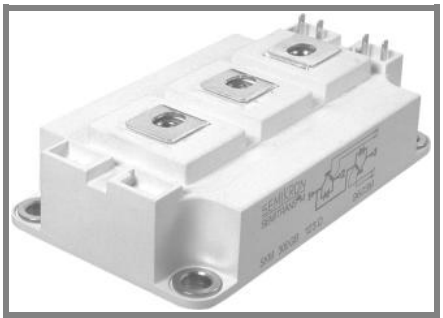
Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 100 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		2	2,5	V
		T_j = 125 °$C_{chiplev.}$		1,8	2,3	V
V_{F0}		T_j = 25 °C		1,1	1,45	V
		T_j = 125 °C			1,25	V
r_F		T_j = 25 °C		9	13	mΩ
		T_j = 125 °C			11	mΩ
I_{RRM}	I_{Fnom} = 100 A	T_j = 125 °C		145		A
Q_{rr}	di/dt = 3600 A/µs			16,5		µC
E_{off}	V_{GE} = -15 V; V_{CC} = 600 V			5,5		mJ
$R_{th(j-c)D}$	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 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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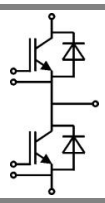

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Z_{th} Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	i = 1	116	mk/W
R_i	i = 2	28	mk/W
R_i	i = 3	5,4	mk/W
R_i	i = 4	0,6	mk/W
tau_i	i = 1	0,0576	s
tau_i	i = 2	0,0073	s
tau_i	i = 3	0,023	s
tau_i	i = 4	0,02	s
$Z_{th(j-c)D}$			
R_i	i = 1	190	mk/W
R_i	i = 2	85	mk/W
R_i	i = 3	21,5	mk/W
R_i	i = 4	3,5	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

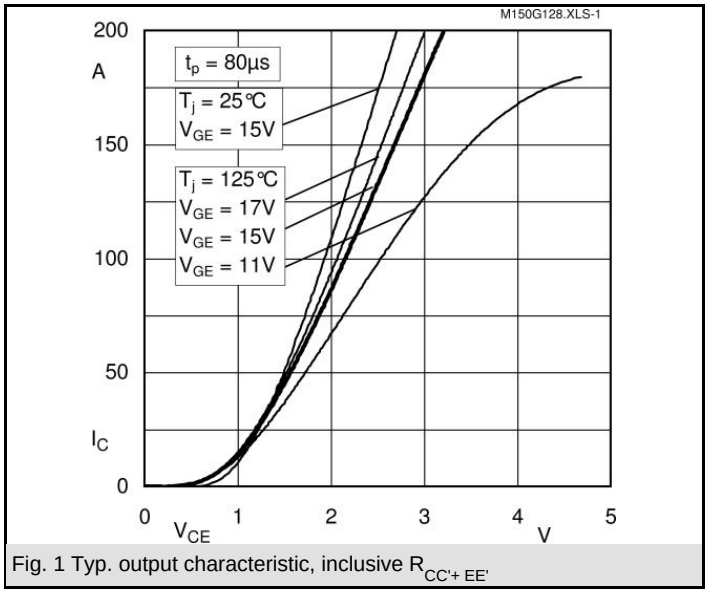

Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

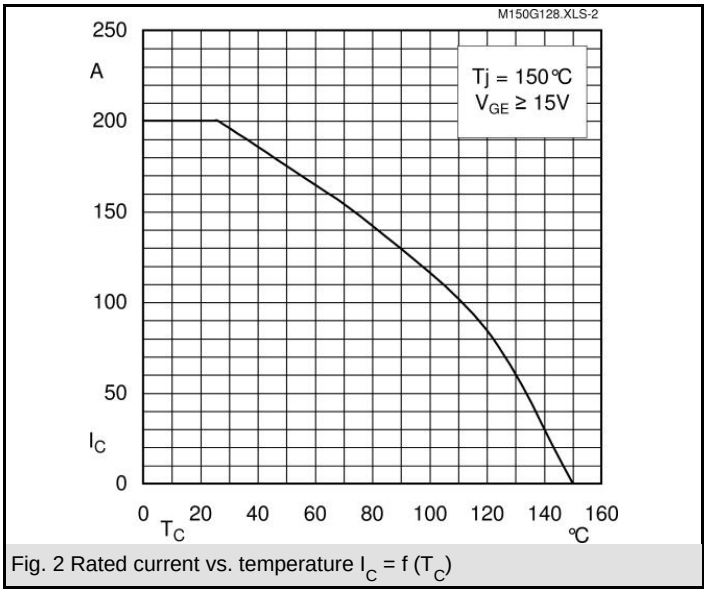

Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

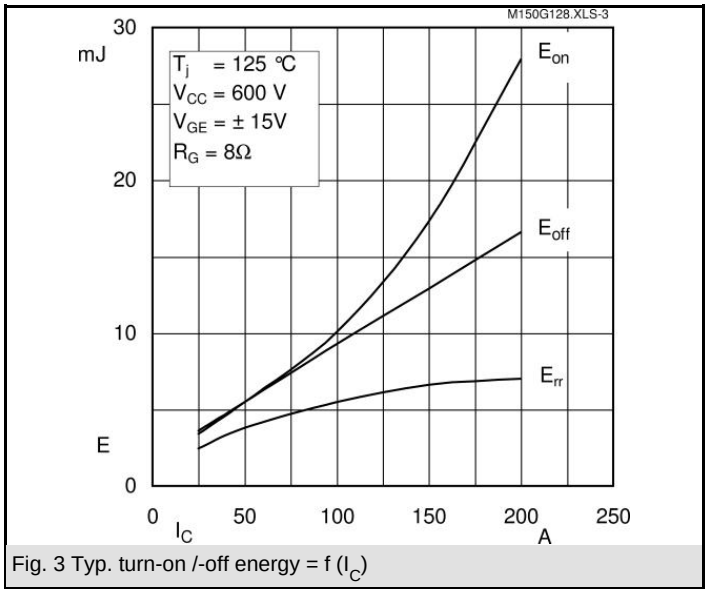

Fig. 3 Typ. turn-on /-off energy = f (I_C)

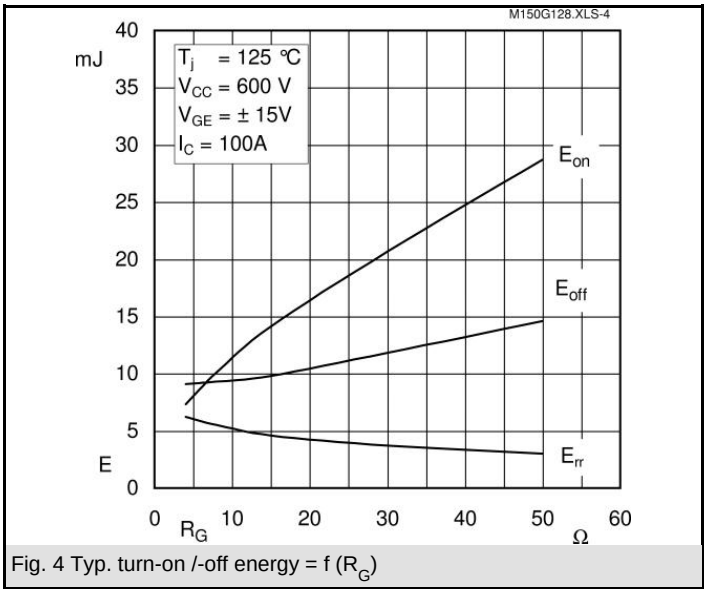

Fig. 4 Typ. turn-on /-off energy = f (R_G)

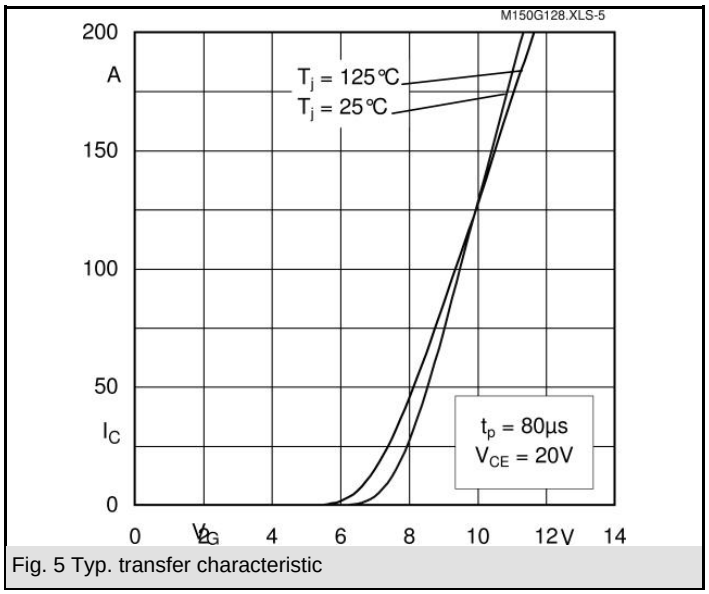

Fig. 5 Typ. transfer characteristic

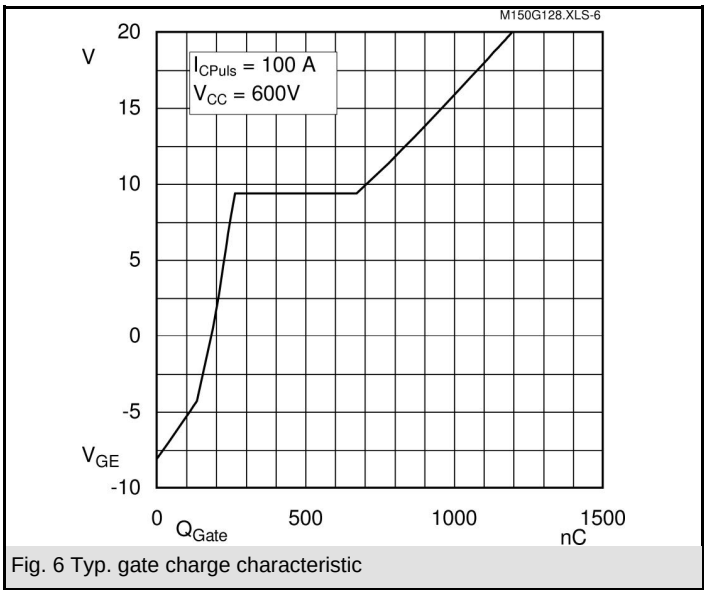

Fig. 6 Typ. gate charge characteristic

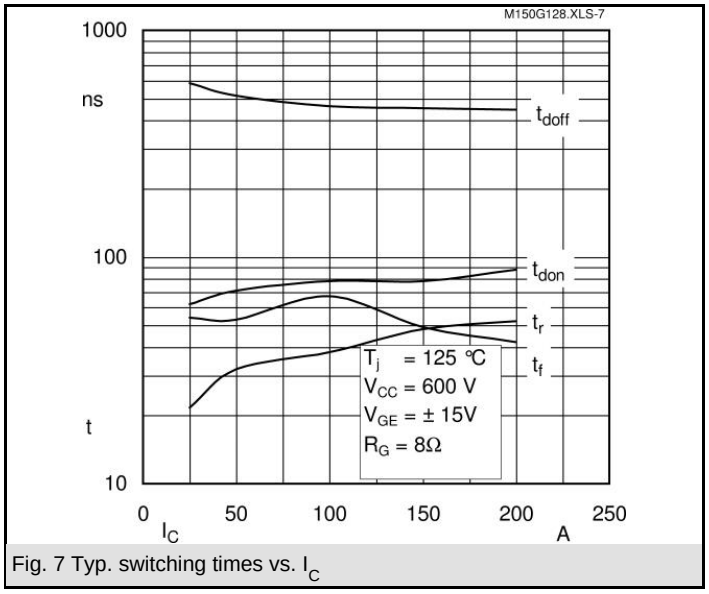

Fig. 7 Typ. switching times vs. I_C

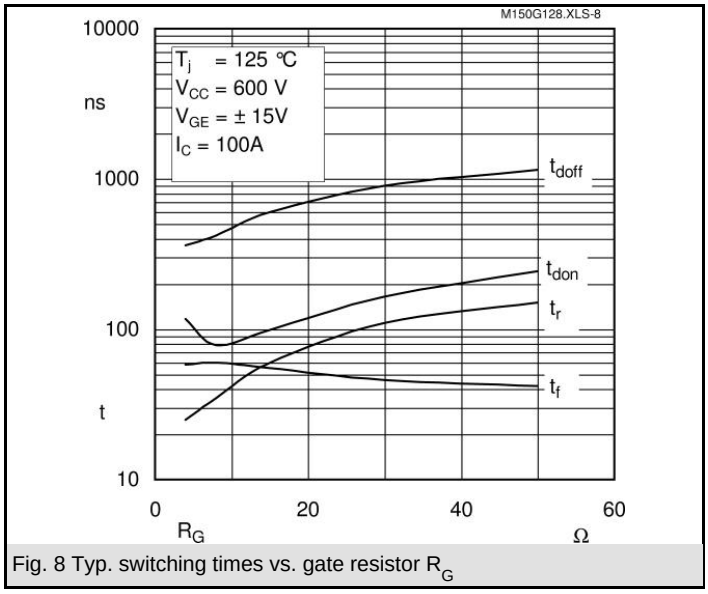

Fig. 8 Typ. switching times vs. gate resistor R_G

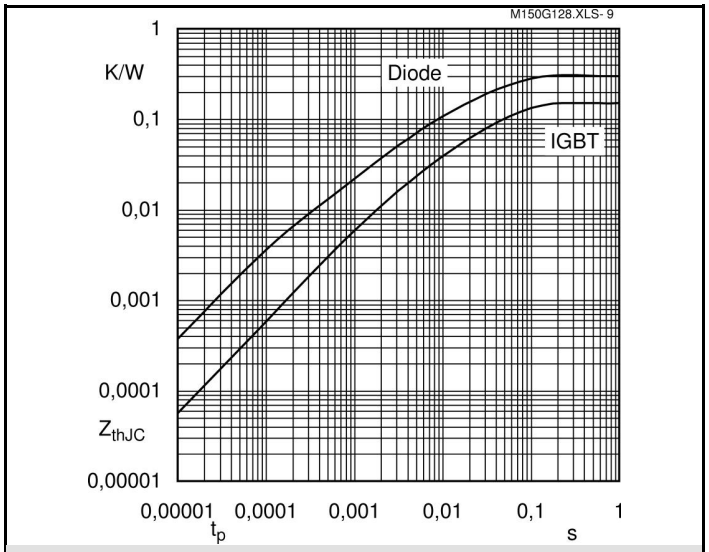

Fig. 9 Transient thermal impedance

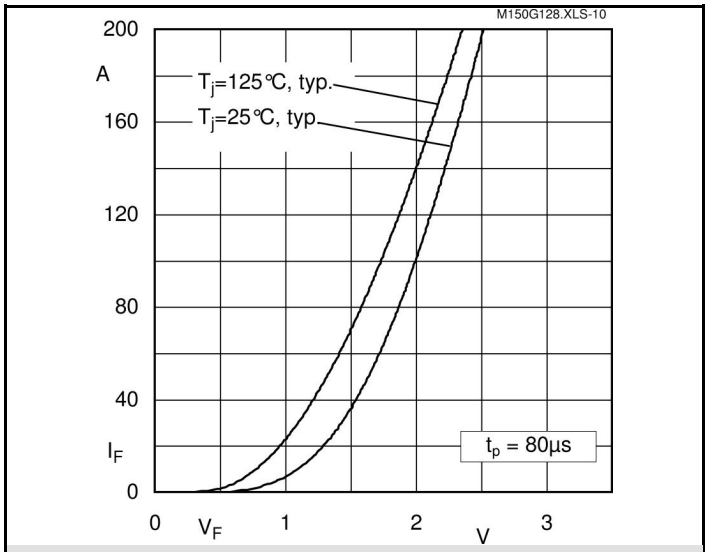

Fig. 10 CAL diode forward characteristic

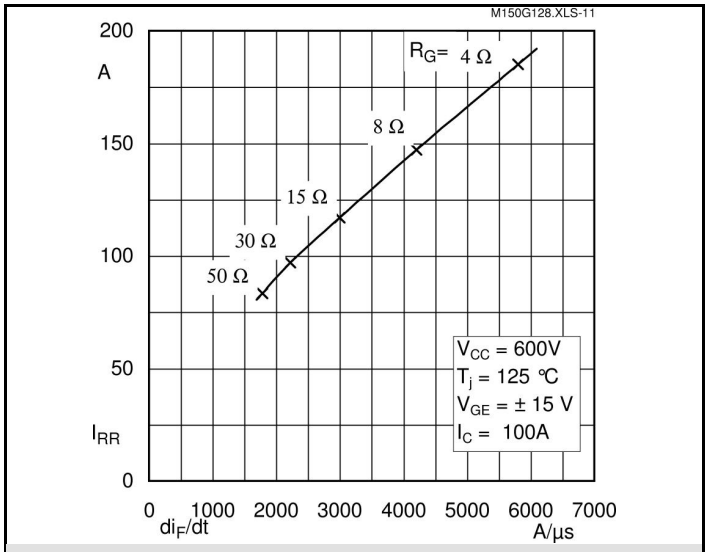

Fig. 11 Typ. CAL diode peak reverse recovery current

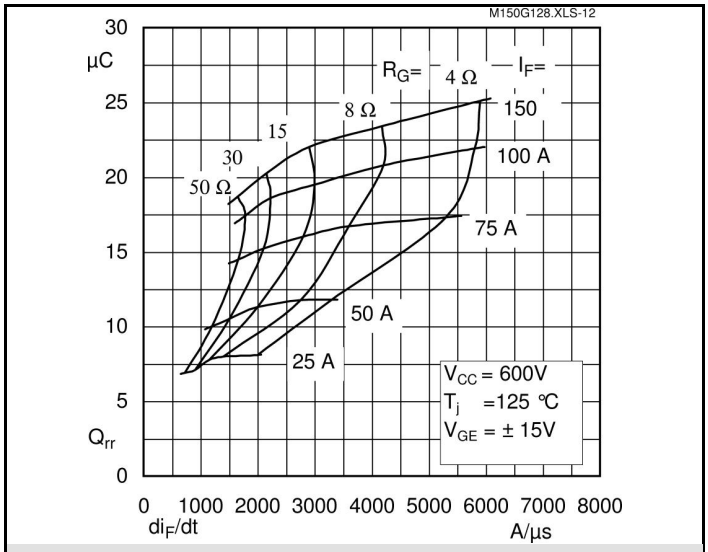

Fig. 12 Typ. CAL diode peak reverse recovery charge

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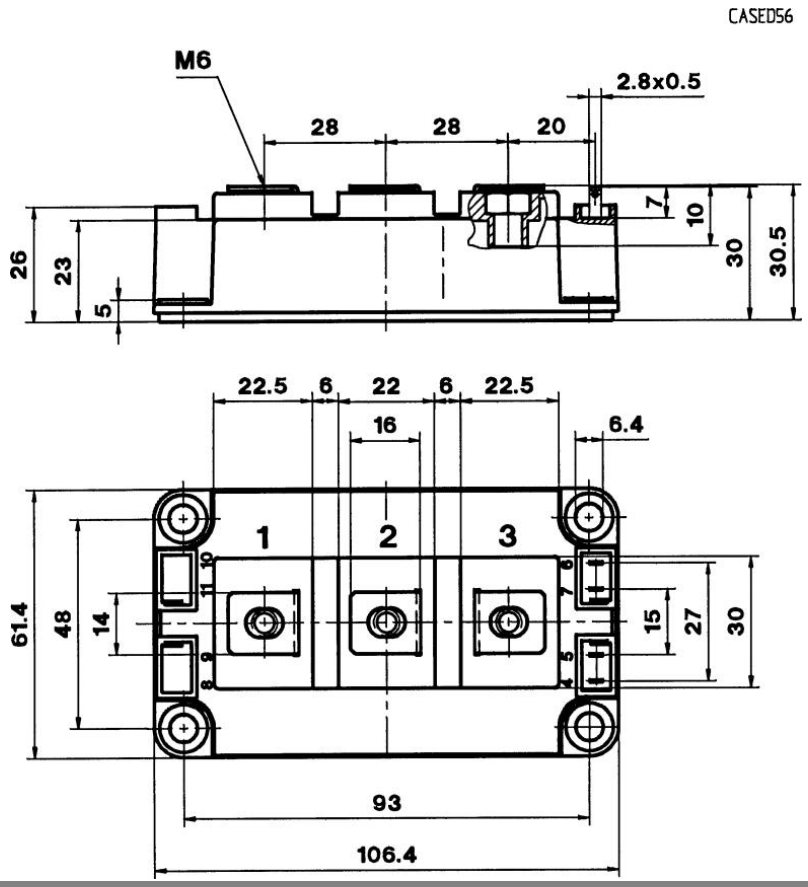
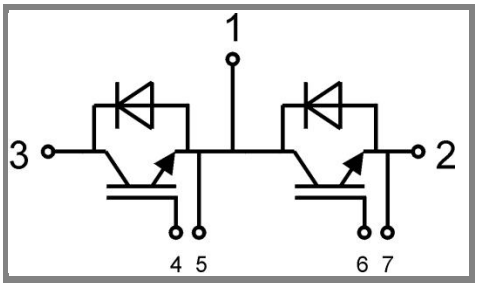
UL Recognized
File no. E 63 532

Dimensions in mm



Case D 56



GB Case D 56

