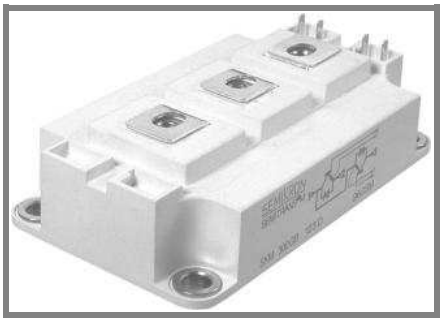
SKM 200GB063D



SEMITRANS® 3

Superfast NPT-IGBT Modules

SKM 200GB063D

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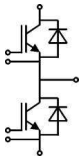

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Absolute Maximum Ratings			T_c = 25 °C, unless otherwise specified	
Symbol	**Conditions**		**Values**	**Units**
IGBT				
V_{CES}	T_j = 25 °C		600	V
I_C	T_j = 150 °C	T_{case} = 25 °C	260	A
		T_{case} = 70 °C	200	A
I_{CRM}	I_{CRM}=2xI_{Cnom}		400	A
V_{GES}			± 20	V
t_{psc}	V_{CC} = 300 V; $V_{GE} \leq$ 20 V; V_{CES} < 600 V	T_j = 125 °C	10	µs
Inverse Diode				
I_F	T_j = 150 °C	T_{case} = 25 °C	200	A
		T_{case} = 80 °C	135	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		400	A
I_{FSM}	t_p = 10 ms; sin.	T_j = 150 °C	1400	A
Module				
$I_{t(RMS)}$			500	A
T_{vj}			- 40 ... + 150	°C
T_{stg}			- 40 ... + 125	°C
V_{isol}	AC, 1 min.		2500	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		0,1	0,3	mA
V_{CE0}		T_j = 25 °C		1,05		V
		T_j = 125 °C		1		V
r_{CE}	V_{GE} = 15 V	T_j = 25°C		5,3		mΩ
		T_j = 125°C		7		mΩ
$V_{CE(sat)}$	I_{Cnom} = 200 A, V_{GE} = 15 V	T_j = 25°C$_{chiplev.}$		2,1	2,5	V
		T_j = 125°C$_{chiplev.}$		2,4	2,8	V
C_{ies}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz		11,2		nF
C_{oes}				1,25		nF
C_{res}				0,75		nF
Q_G	V_{GE} = 0V - +15V			480		nC
R_{Gint}	T_j = °C			0		Ω
$t_{d(on)}$	R_{Gon} = 8 Ω	V_{CC} = 300V		140		ns
t_r		I_C= 200A		70		ns
E_{on}		T_j = 125 °C		11		mJ
$t_{d(off)}$	R_{Goff} = 8 Ω	V_{GE} = ±15V		442		ns
t_f				45		ns
E_{off}				7,5		mJ
$R_{th(j-c)}$	per IGBT				0,14	K/W

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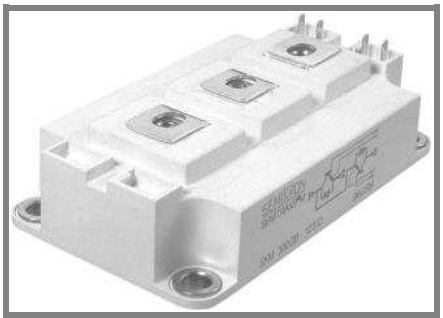

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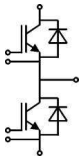

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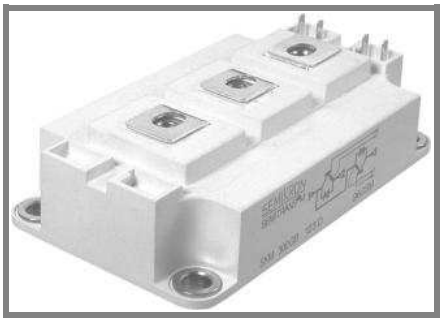
Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 200 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		1,55	1,9	V
		T_j = 125 °$C_{chiplev.}$		1,55		V
V_{F0}		T_j = 125 °C			0,9	V
r_F		T_j = 125 °C		4	5,5	mΩ
I_{RRM}	I_F = 200 A	T_j = 125 °C		75		A
Q_{rr}				12,7		µC
E_{rr}	V_{GE} = -15 V; V_{CC} = 600 V					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.

* 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.



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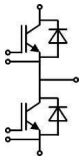

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Z_{th} Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	i = 1	90	mk/W
R_i	i = 2	39	mk/W
R_i	i = 3	9	mk/W
R_i	i = 4	2	mk/W
tau_i	i = 1	0,0416	s
tau_i	i = 2	0,0139	s
tau_i	i = 3	0,0021	s
tau_i	i = 4	0,0001	s
$Z_{th(j-c)D}$			
R_i	i = 1	200	mk/W
R_i	i = 2	84	mk/W
R_i	i = 3	14	mk/W
R_i	i = 4	2	mk/W
tau_i	i = 1	0,0275	s
tau_i	i = 2	0,0413	s
tau_i	i = 3	0,0019	s
tau_i	i = 4	0,004	s

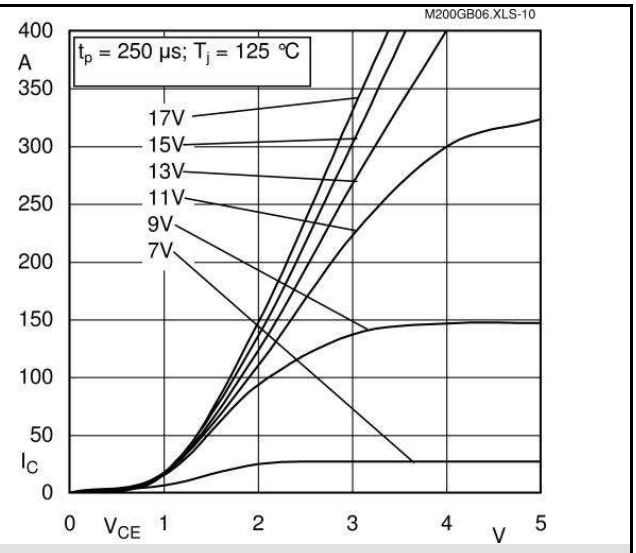

Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

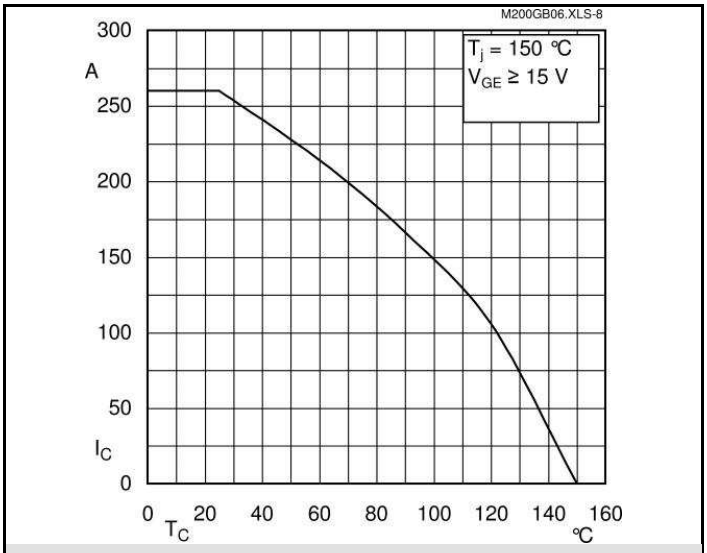

Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

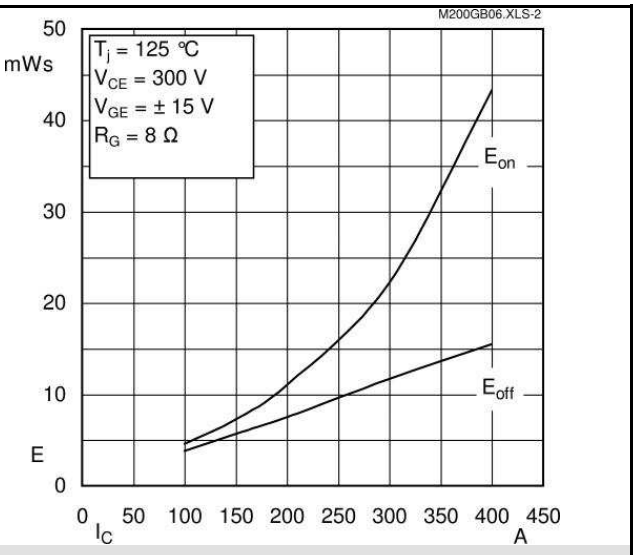

Fig. 3 Typ. turn-on /-off energy = f (I_C)

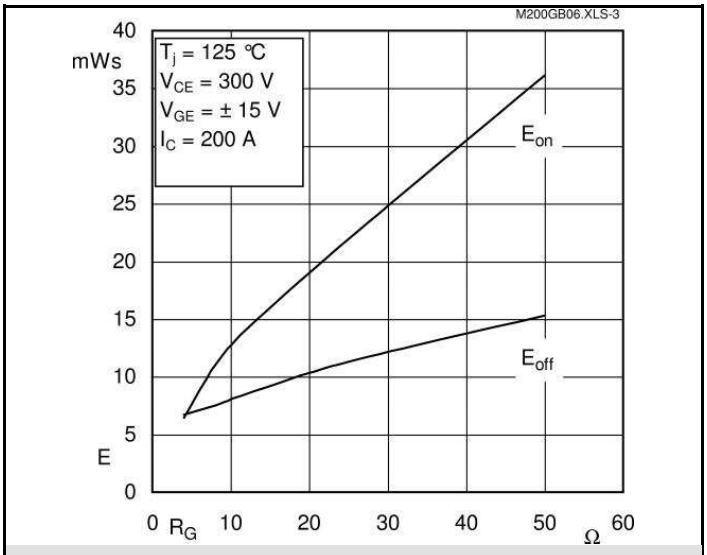

Fig. 4 Typ. turn-on /-off energy = f (R_G)

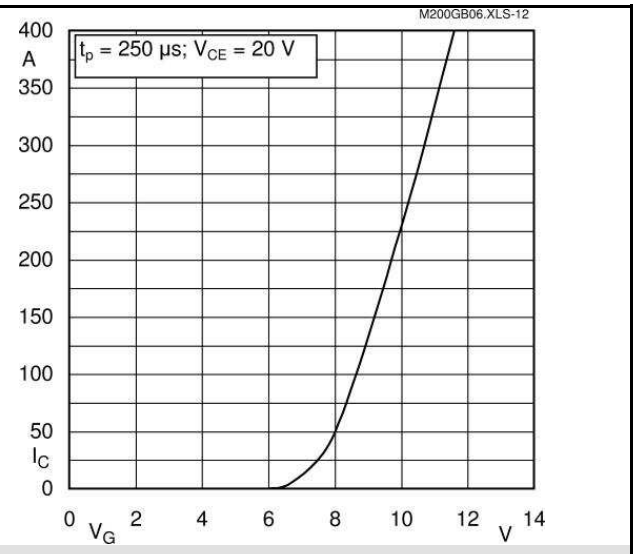

Fig. 5 Typ. transfer characteristic

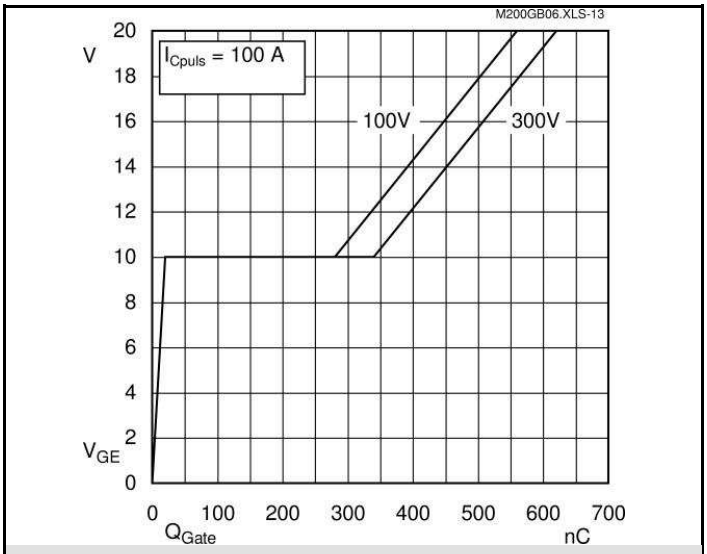

Fig. 6 Typ. gate charge characteristic

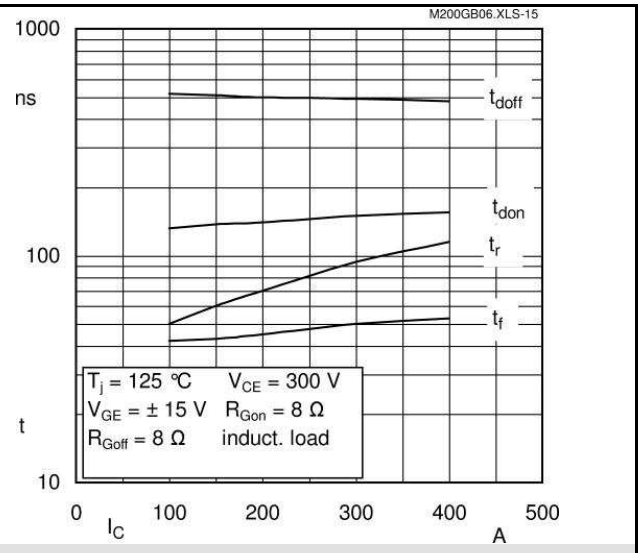

Fig. 7 Typ. switching times vs. I_C

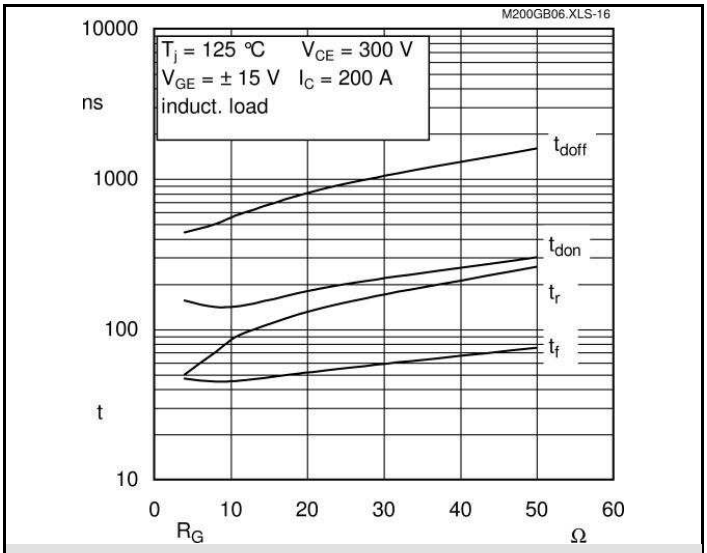

Fig. 8 Typ. switching times vs. gate resistor R_G

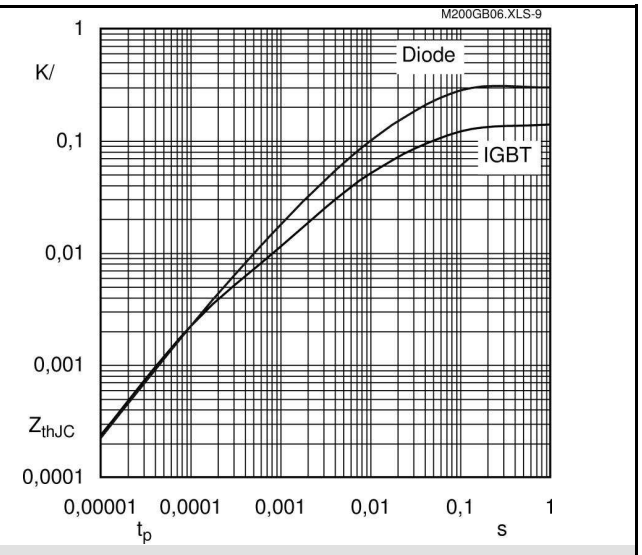

Fig. 9 Transient thermal impedance of IGBT and Diode

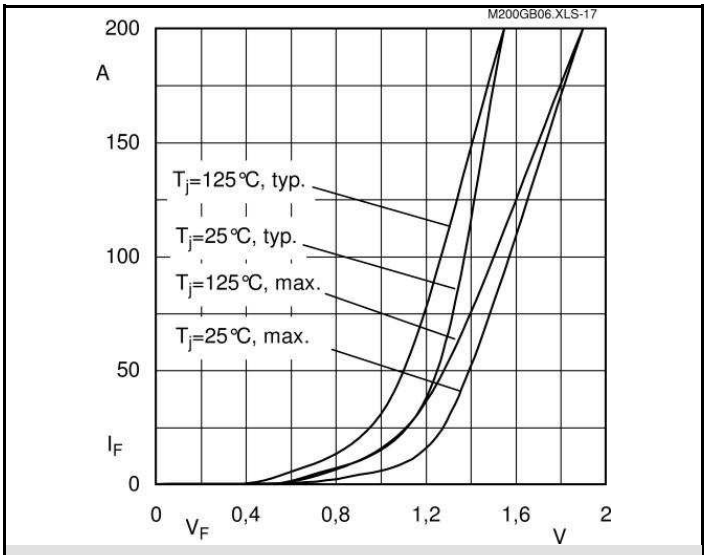

Fig. 10 CAL diode forward characteristic

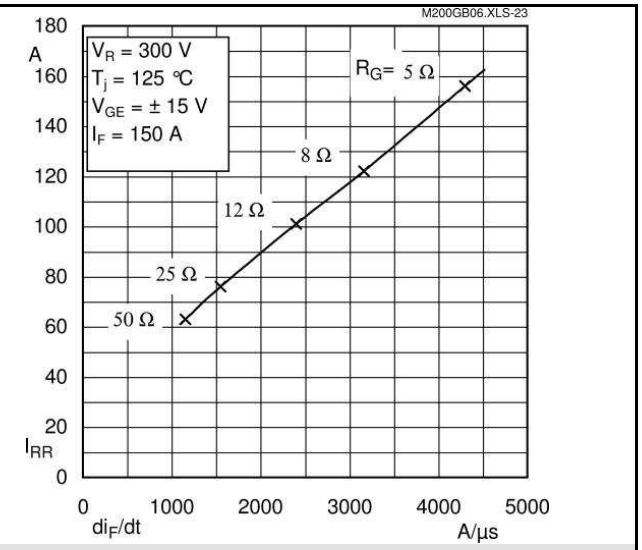

Fig. 11 Typ. CAL diode peak reverse recovery current

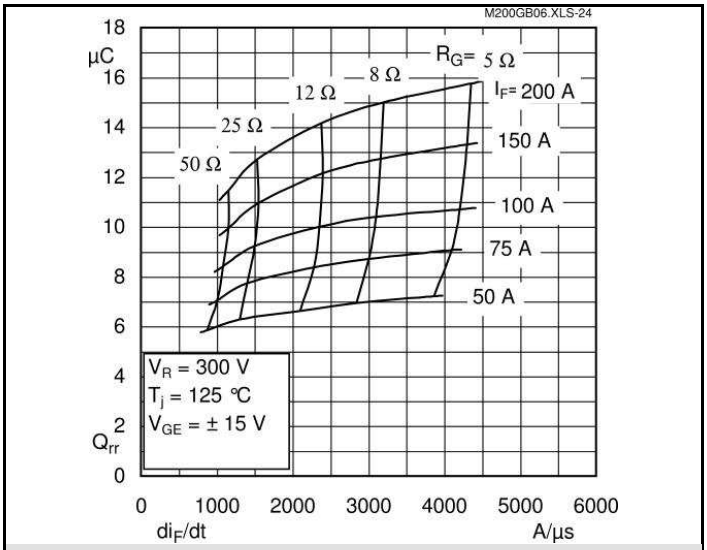

Fig. 12 Typ. CAL diode recovered charge

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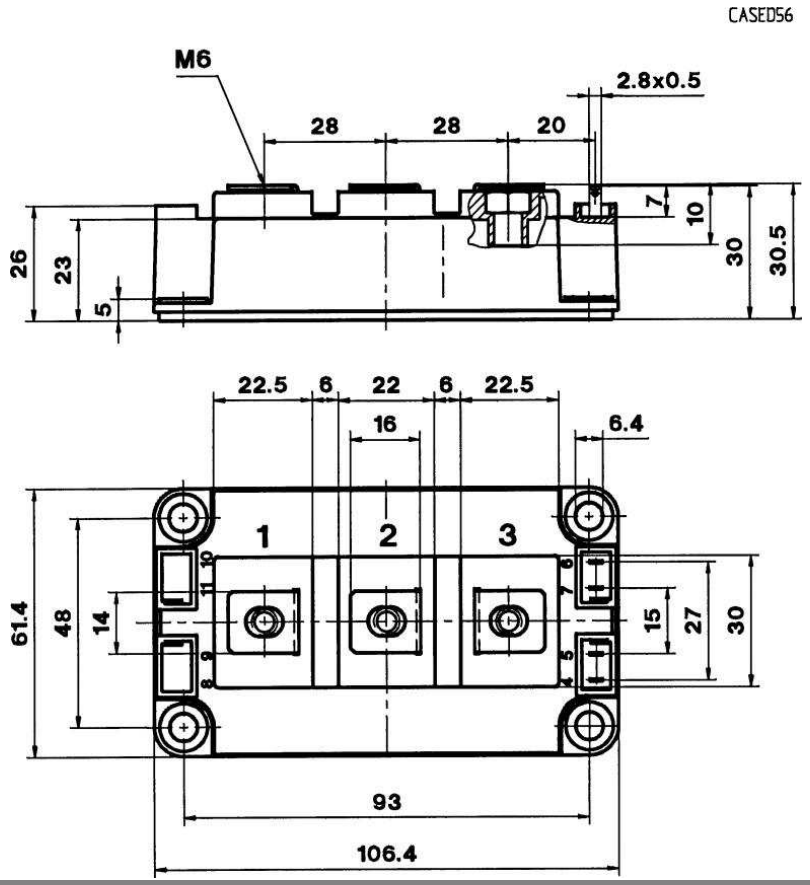
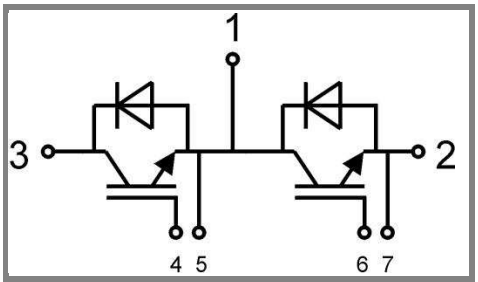
UL recognized File no. E 63 532



Case D 56



GB Case D 56

