

SKM 200GB125D



SEMITRANS® 3

Ultra Fast IGBT Modules

SKM 200GB125D

SKM 200GAL125D

SKM 200GAR125D

Features

- N channel , homogeneous Si
- Low inductance case
- Short tail current with low temperature dependence
- High short circuit capability, self limiting to $6 \times I_{Cnom}$
- Fast & soft inverse CAL diodes
- Isolated copper baseplate using DCB Direct Copper Bonding Technology
- Large clearance (13 mm) and creepage distance (20 mm)

Typical Applications

- Switched mode power supplies at $f_{sw} > 20$ kHz
- Resonant inverters up to 100 kHz
- Inductive heating
- Electronic welders at $f_{sw} > 20$ kHz



GB

GAL

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Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V_{CES}	$T_j = 25^\circ\text{C}$	1200		V
I_C	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	200	A
		$T_{case} = 80^\circ\text{C}$	160	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	300		A
V_{GES}		± 20		V
t_{psc}	$V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125^\circ\text{C}$ $V_{CES} < 1200\text{ V}$	10		μs
Inverse Diode				
I_F	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	200	A
		$T_{case} = 80^\circ\text{C}$	130	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	300		A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150^\circ\text{C}$	1440	A
Freewheeling Diode				
I_F	$T_j = ^\circ\text{C}$	$T_c = 25^\circ\text{C}$	200	A
		$T_c = 80^\circ\text{C}$	130	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	300		A
I_{FSM}	$t_p = 10\text{ ms};$	$T_j = 150^\circ\text{C}$	1440	A
Module				
$I_{t(RMS)}$		500		A
T_{vj}		- 40...+ 150		$^\circ\text{C}$
T_{stg}		- 40...+ 125		$^\circ\text{C}$
V_{isol}	AC, 1 min.	4000		V

Characteristics		$T_c = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 6\text{ mA}$	4,5	5,5	6,5	V
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$		0,15	0,45	mA
V_{CE0}		$T_j = 25^\circ\text{C}$	1,5	1,75	V
		$T_j = 125^\circ\text{C}$			V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	12	14	$\text{m}\Omega$
		$T_j = 125^\circ\text{C}$			$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 150\text{ A}, V_{GE} = 15\text{ V}$		3,3	3,85	V
C_{ies}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	10	13	nF
C_{oes}			1,5	2	nF
C_{res}			0,8	1,2	nF
Q_G	$V_{GE} = 0\text{ V} - +20\text{ V}$		1300		nC
R_{Gint}	$T_j = ^\circ\text{C}$		2,5		Ω
$t_{d(on)}$	$R_{Gon} = 4\ \Omega$	$V_{CC} = 600\text{ V}$ $I_C = 150\text{ A}$	75		ns
t_r			36		ns
E_{on}	$R_{Goff} = 4\ \Omega$	$T_j = 125^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$	14		mJ
$t_{d(off)}$			420		ns
t_f			25		ns
E_{off}					mJ
$R_{th(j-c)}$	per IGBT			0,09	K/W

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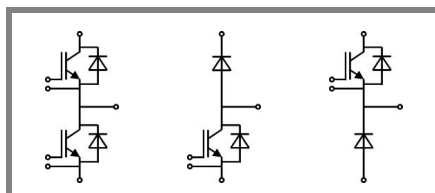
SKM 200GAR125D

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Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 150$ 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
		$T_j = 125$ °C			V
r_F		$T_j = 25$ °C	6	8,7	mΩ
		$T_j = 125$ °C			mΩ
I_{RRM}	$I_F = 150$ A	$T_j = 125$ °C	230		A
Q_{rr}	$di/dt = 5500$ A/μs		24		μC
E_{rr}	$V_{GE} = 0$ V; $V_{CC} = 600$ V				mJ
$R_{th(j-c)D}$	per diode			0,25	K/W
Freewheeling Diode					
$V_F = V_{EC}$	$I_{Fnom} = 150$ 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
		$T_j = 125$ °C			V
r_F		$T_j = 25$ °C	6	8,7	V
		$T_j = 125$ °C			V
I_{RRM}	$I_F = 150$ A	$T_j = 125$ °C	230		A
Q_{rr}	$di/dt = 5500$ A/μs		24		μC
E_{rr}	$V_{GE} = 0$ V; $V_{CC} = 600$ V				mJ
$R_{th(j-c)FD}$	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.

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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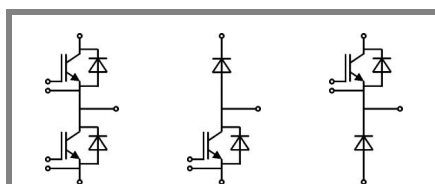
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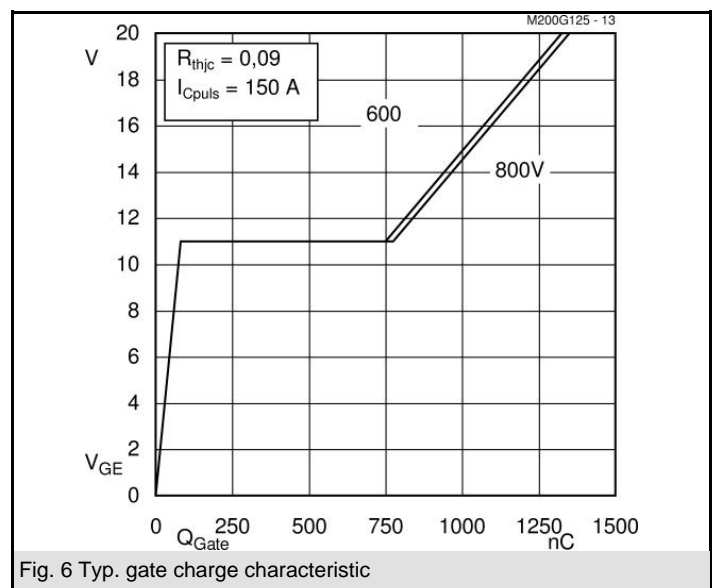
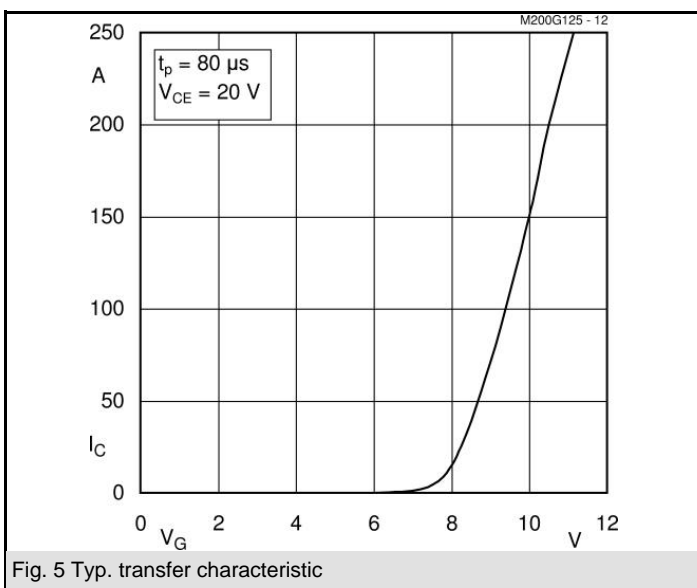
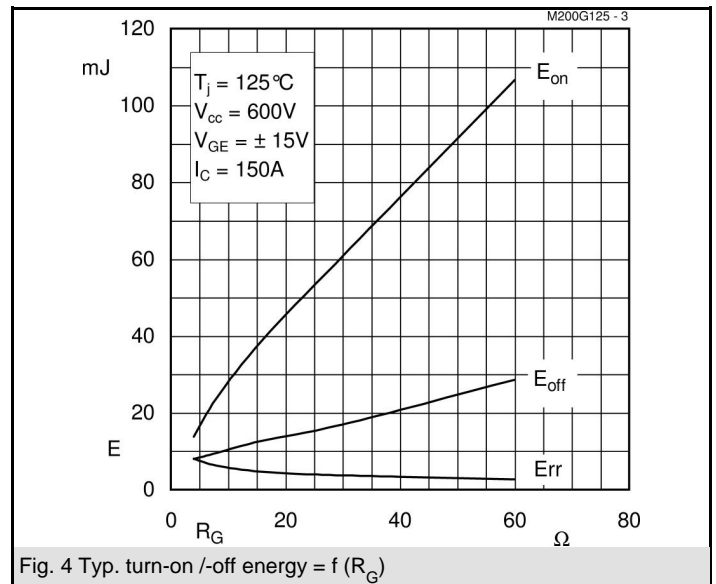
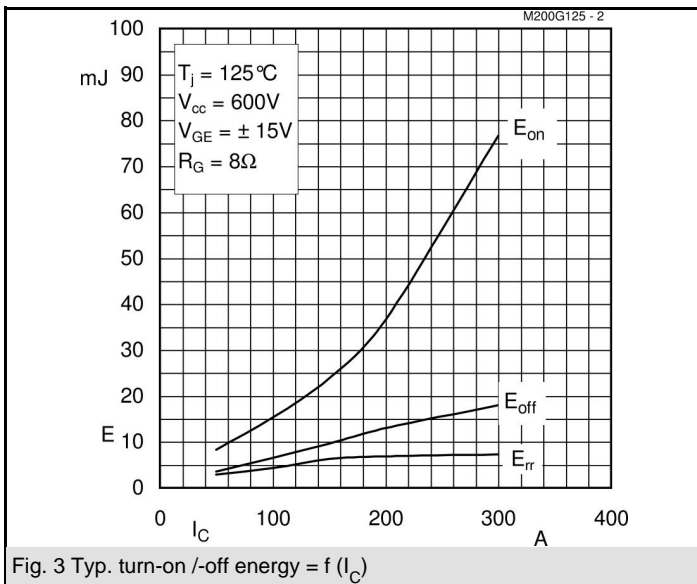
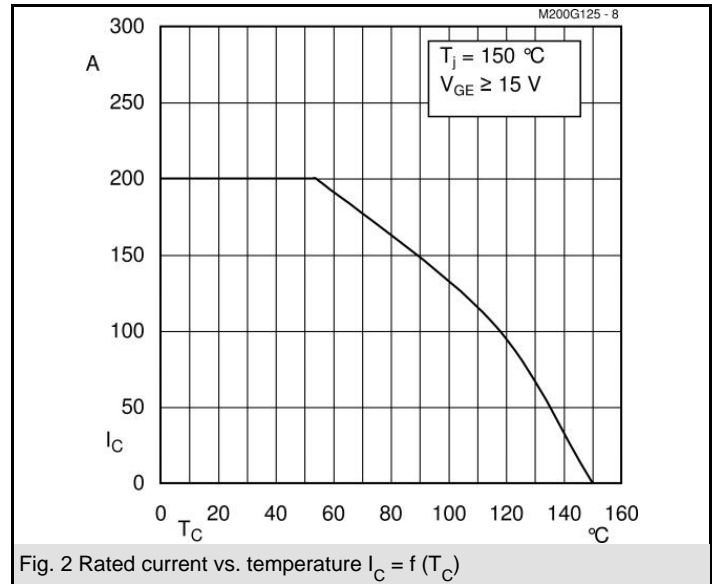
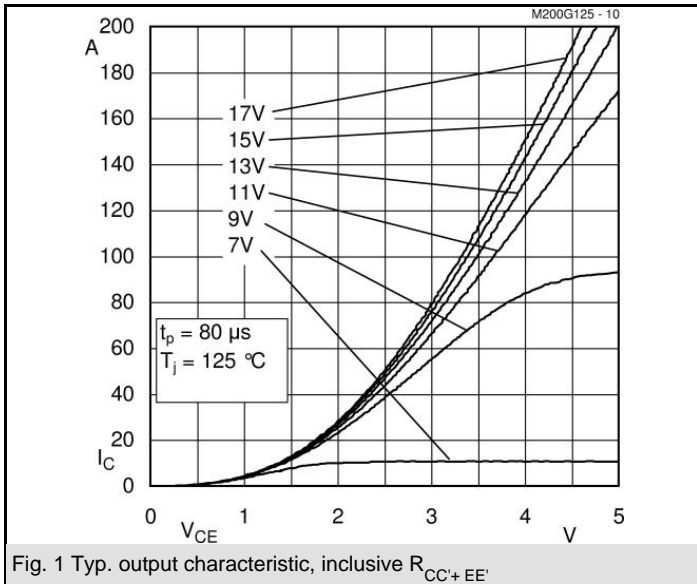
Z_{th}		Conditions	Values	Units
$Z_{th(j-c)I}$				
$R_{\theta j-c}$		$i = 1$	60	mk/W
$R_{\theta j-c}$		$i = 2$	23	mk/W
$R_{\theta j-c}$		$i = 3$	5,9	mk/W
$R_{\theta j-c}$		$i = 4$	1,1	mk/W
$\tau_{th(j-c)}$		$i = 1$	0,0744	s
$\tau_{th(j-c)}$		$i = 2$	0,0087	s
$\tau_{th(j-c)}$		$i = 3$	0,002	s
$\tau_{th(j-c)}$		$i = 4$	0,0015	s
$Z_{th(j-c)D}$				
$R_{\theta j-c}$		$i = 1$	160	mk/W
$R_{\theta j-c}$		$i = 2$	67	mk/W
$R_{\theta j-c}$		$i = 3$	20	mk/W
$R_{\theta j-c}$		$i = 4$	3	mk/W
$\tau_{th(j-c)}$		$i = 1$	0,0536	s
$\tau_{th(j-c)}$		$i = 2$	0,0034	s
$\tau_{th(j-c)}$		$i = 3$	0,077	s
$\tau_{th(j-c)}$		$i = 4$	0,0003	s

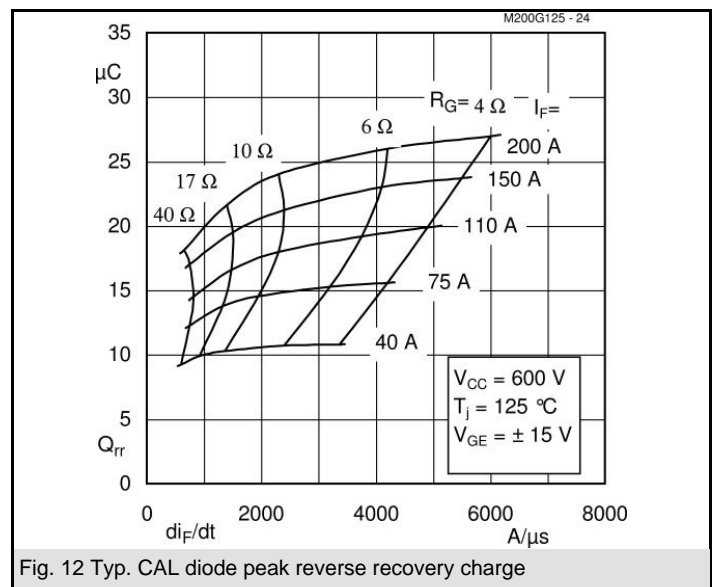
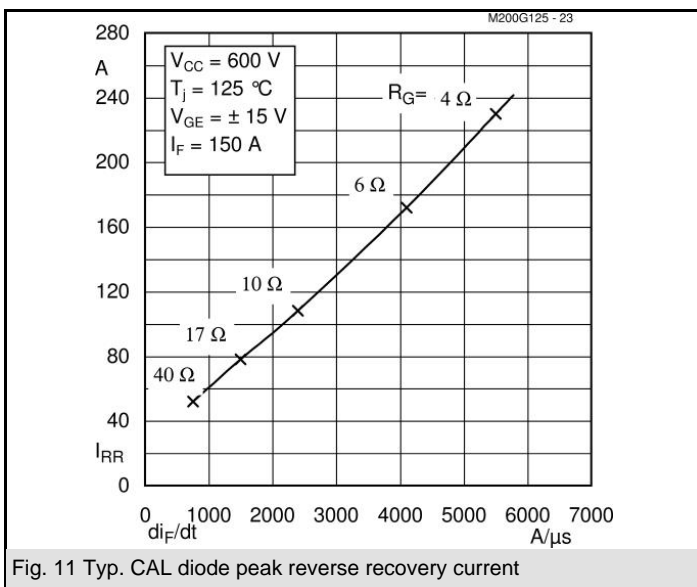
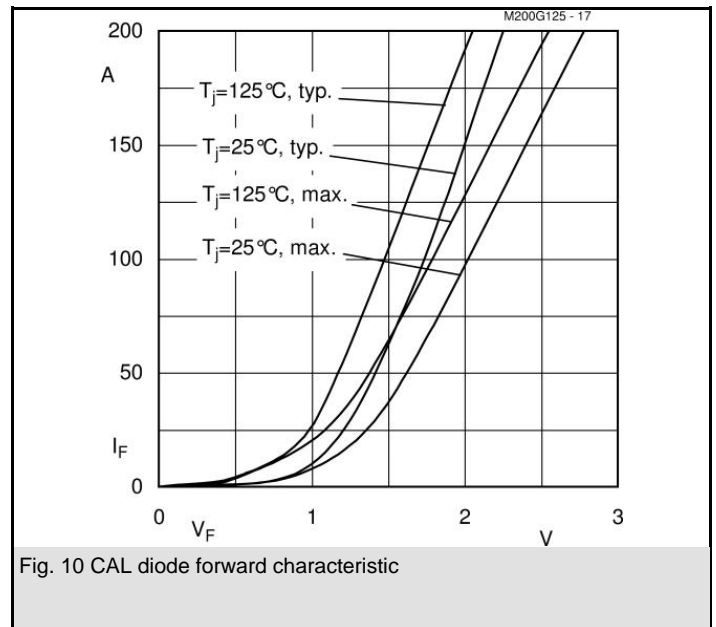
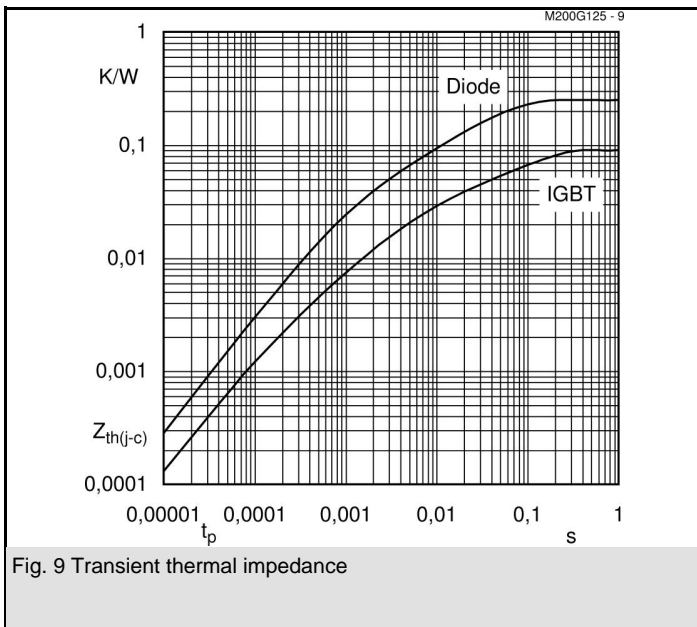
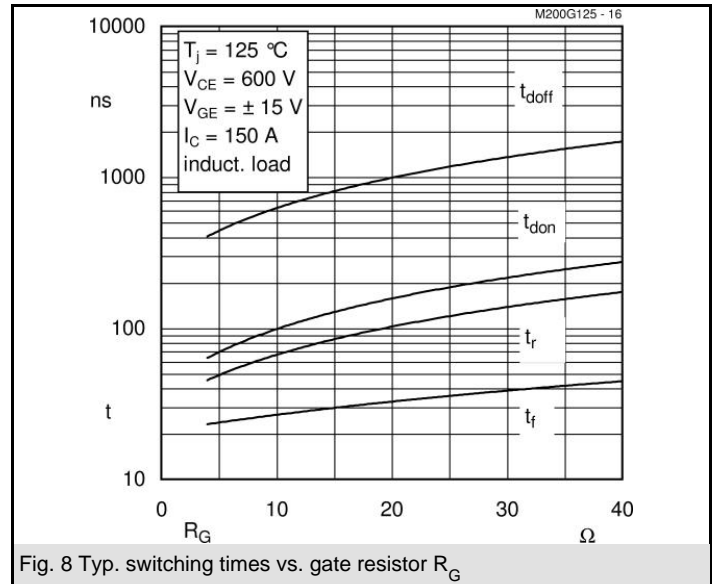
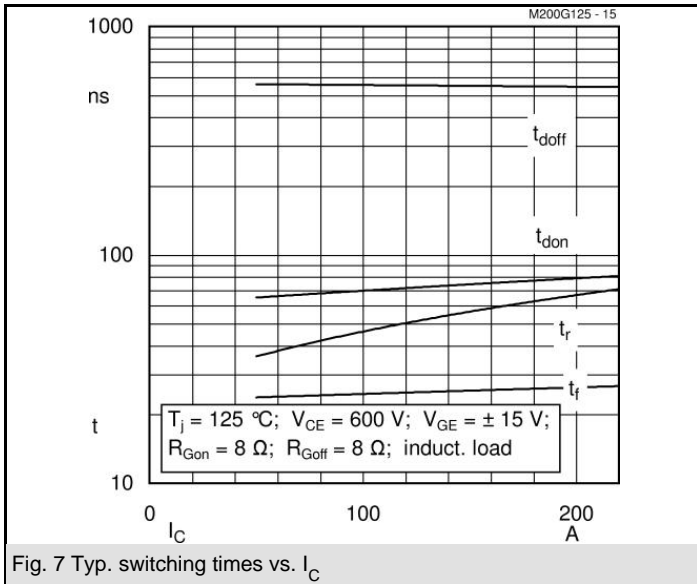


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UL Recognized

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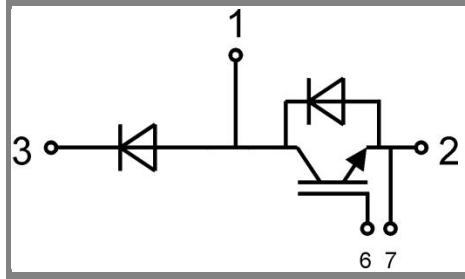
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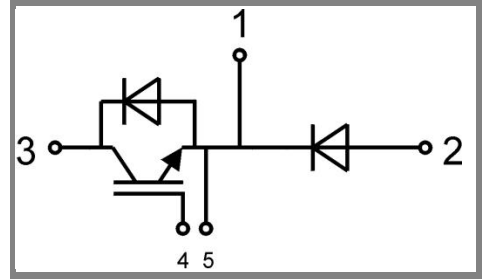
Case D 56



GB Case D 56



GAL Case D 57 (→ D 56)



GAR Case D 58 (→ D 56)