SKM 75GD123D

SEMITRANS® 6

Standard IGBT Modules

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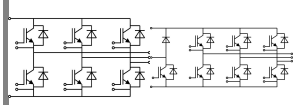
SKM 75GDL123D

Features

- MOS input (voltage controlled)
- N channel, homogeneous Si
- Low inductance case
- Very low tail current with low temperature dependence
- High short circuit capability, selt limiting to 6 x I_{cnom}
- Latch-up free
- Fast & soft inverse Cal diodes
- Isolated copper baseplate using DCB Direct Bonding Technology
- Large clearance (9 mm) and creepage distance (13 mm)

Typical Applications

- Switched mode power supplies
- DC servo and robot drives
- Three phase inverters for AC motor speed control
- Switching (not for linear use)



GD GDL

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	75	A
		T_{case} = 80 °C	50	A
I_{CRM}	I_{CRM}=2xI_{Cnom}		100	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	75	A
		T_{case} = 80 °C	50	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		100	A
I_{FSM}	t_p = 10 ms; sin.	T_j = 150 °C	550	A
Module				
$I_{t(RMS)}$			100	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 = 2 mA		4,5	5,5	6,5	V
I_{CES}	V_{GE} = 0 V, V_{CE} = V_{CES}	T_j = 25 °C		0,4	1,2	mA
V_{CE0}		T_j = 25 °C		1,4	1,6	V
		T_j = 125 °C		1,6	1,8	V
r_{CE}	V_{GE} = 15 V	T_j = 25°C		22	28	mΩ
		T_j = 125°C		30	38	mΩ
$V_{CE(sat)}$	I_{Cnom} = 50 A, V_{GE} = 15 V	T_j = °$C_{chiplev.}$		2,5	3	V
C_{ies}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz		3,3	4,3	nF
C_{oes}				0,5	0,6	nF
C_{res}				0,22	0,3	nF
$t_{d(on)}$	R_{Gon} = 22 Ω	V_{CC} = 600V		44	100	ns
t_r		I_{Cnom}= 50A		56	100	ns
E_{on}		T_j = 125 °C		8		mJ
$t_{d(off)}$	R_{Goff} = 22 Ω	V_{GE} = ± 15V		380	500	ns
t_f				70	100	ns
E_{off}				5		mJ
$R_{th(j-c)}$	per IGBT				0,32	K/W

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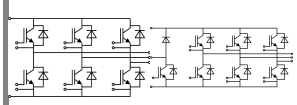

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Characteristics

Symbol	Conditions		min.	typ.	max.	Units
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 50 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		18	26	mΩ
		T_j = 125 °C				mΩ
I_{RRM}	I_{Fnom} = 50 A	T_j = 125 °C		35		A
Q_{rr}	di/dt = 800 A/µs			7		µC
E_{rr}	V_{GE} = 0 V; V_{CC} = 600 V			2,2		mJ
$R_{th(j-c)D}$	per diode				0,6	K/W
Module						
L_{CE}					60	nH
$R_{th(c-s)}$	per module				0,05	K/W
M_s	to heat sink M5					Nm
M_t	to terminals		4		5	Nm
w					175	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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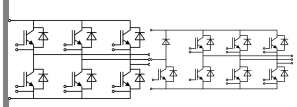

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Z_{th}

Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	i = 1	240	mk/W
R_i	i = 2	68	mk/W
R_i	i = 3	9,2	mk/W
R_i	i = 4	2,8	mk/W
tau_i	i = 1	0,06	s
tau_i	i = 2	0,0228	s
tau_i	i = 3	0,0013	s
tau_i	i = 4	0,0002	s
$Z_{th(j-c)D}$			
R_i	i = 1	400	mk/W
R_i	i = 2	168	mk/W
R_i	i = 3	28	mk/W
R_i	i = 4	4	mk/W
tau_i	i = 1	0,0831	s
tau_i	i = 2	0,0112	s
tau_i	i = 3	0,0013	s
tau_i	i = 4	0,08	s

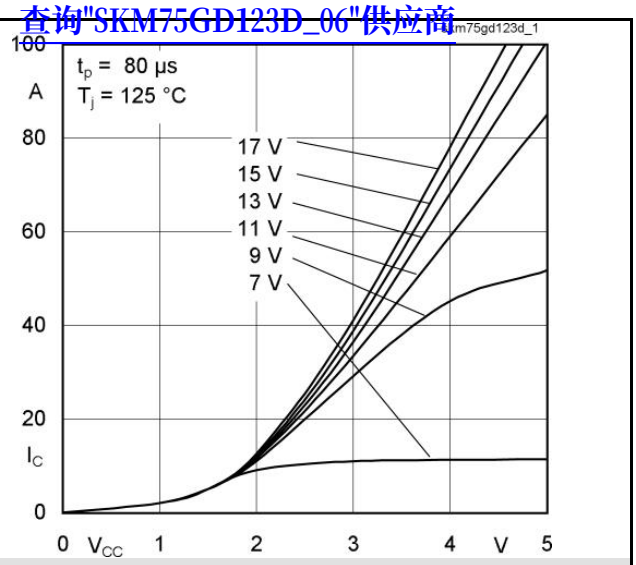

Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

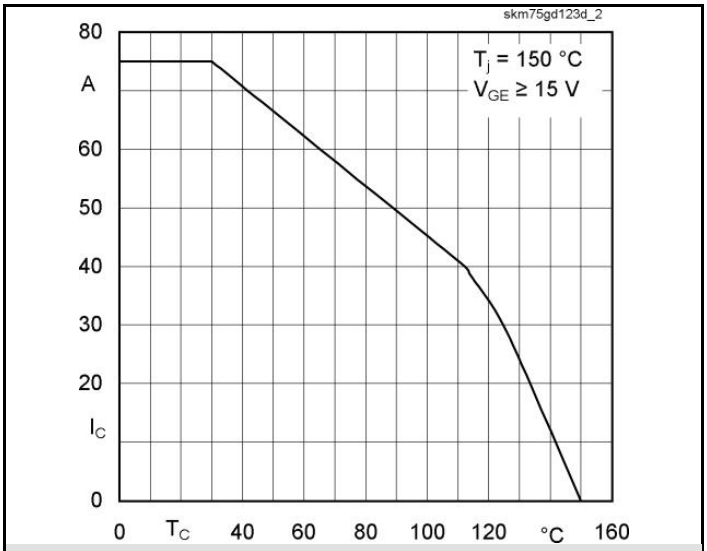

Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

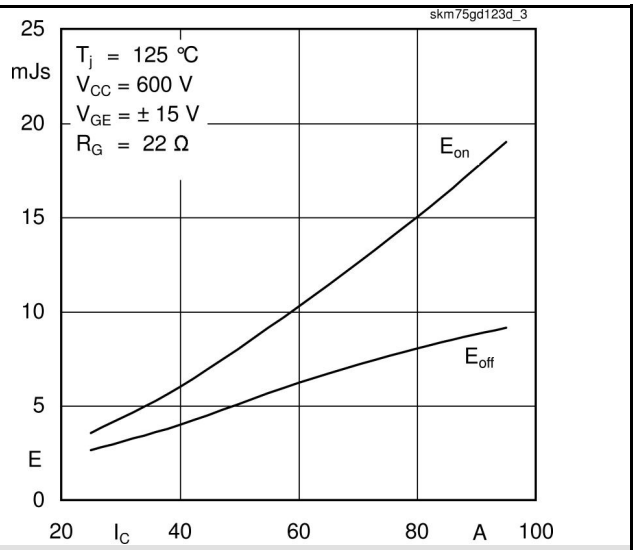

Fig. 3 Typ. turn-on /-off energy = f (I_C)

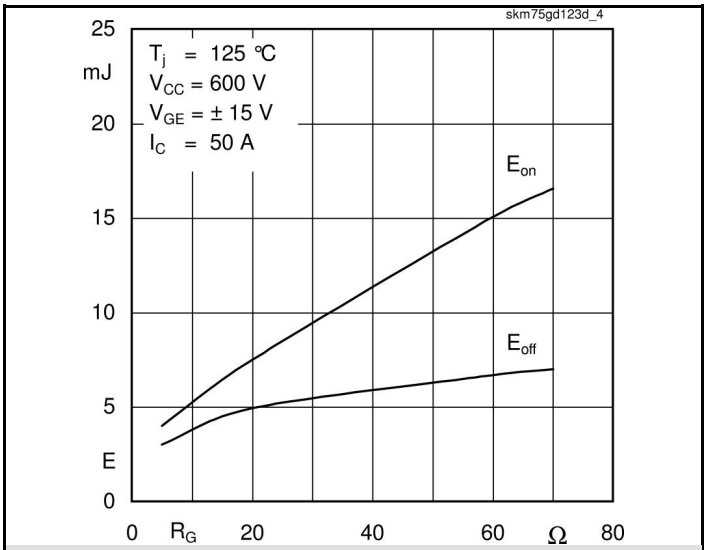

Fig. 4 Typ. turn-on /-off energy = f (R_G)

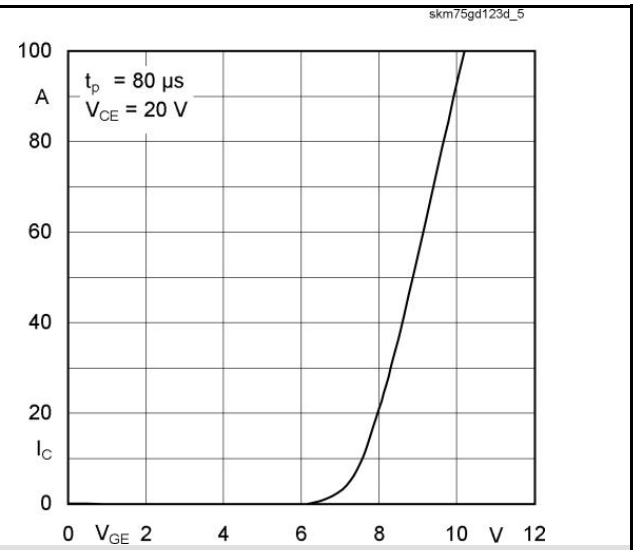

Fig. 5 Typ. transfer characteristic

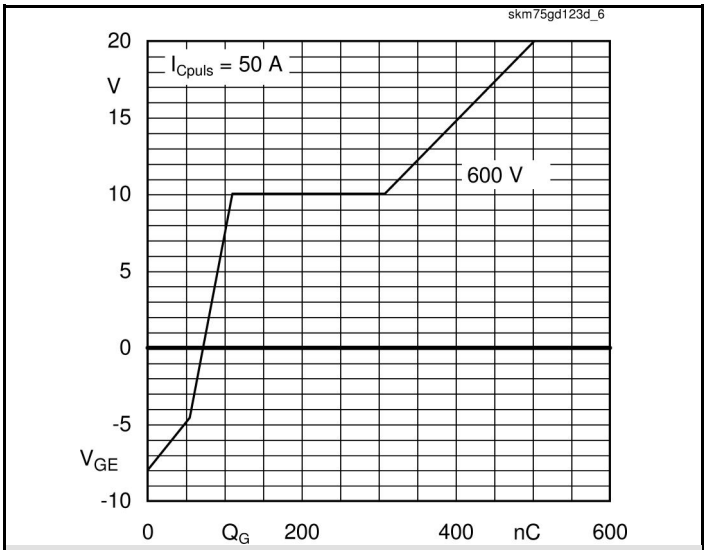

Fig. 6 Typ. gate charge characteristic

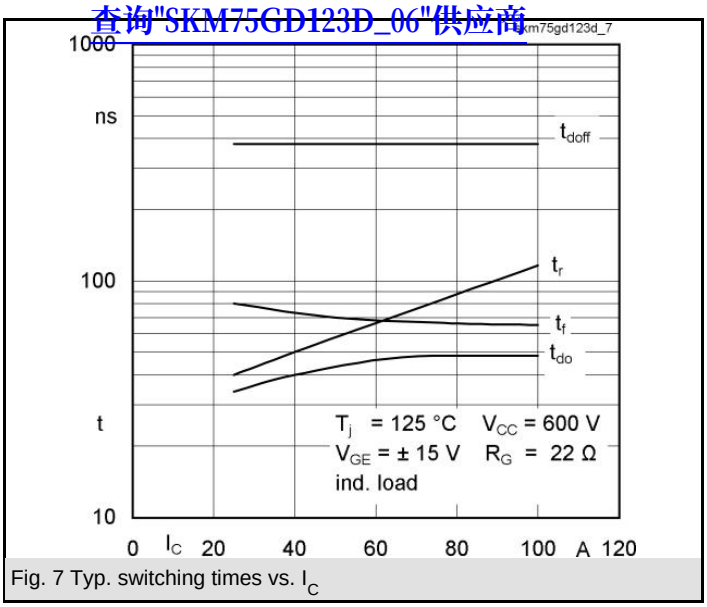

Fig. 7 Typ. switching times vs. I_C

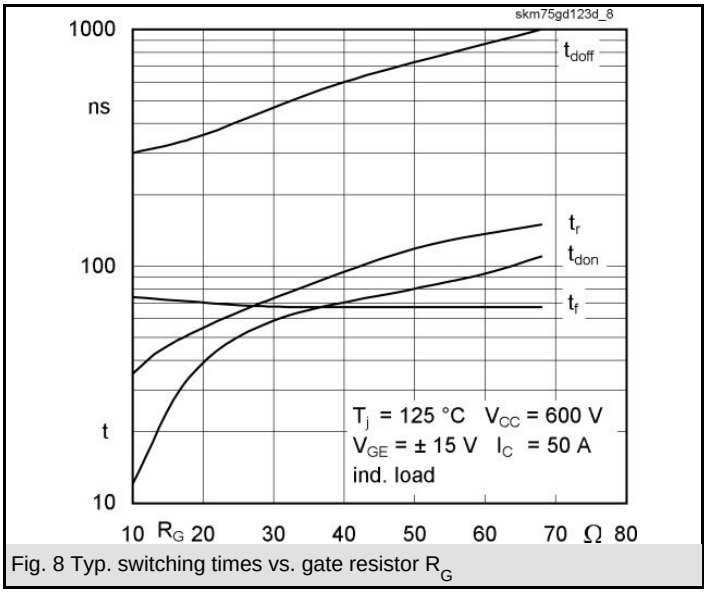

Fig. 8 Typ. switching times vs. gate resistor R_G

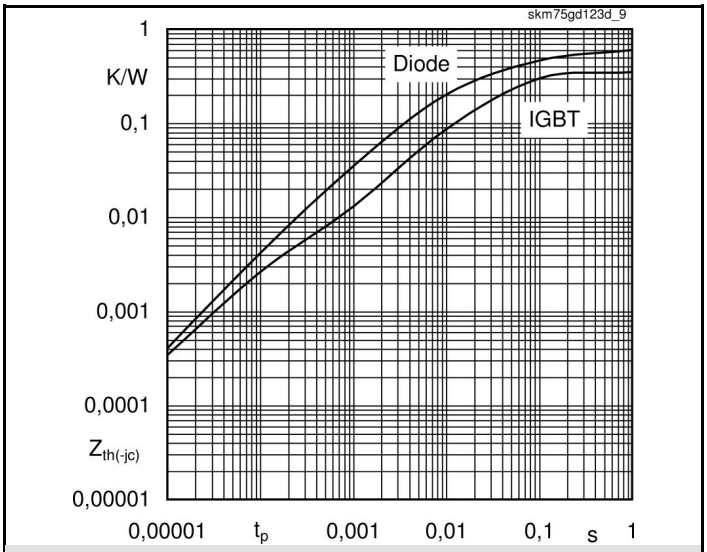

Fig. 9 Transient thermal impedance

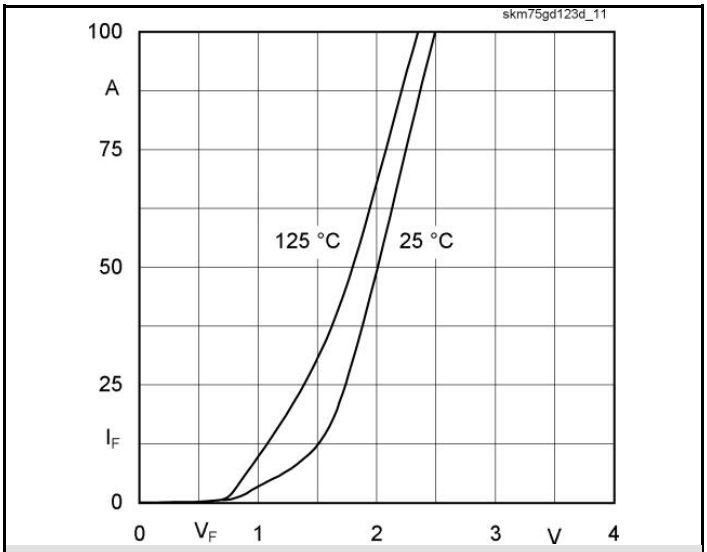

Fig. 10 CAL diode forward characteristic

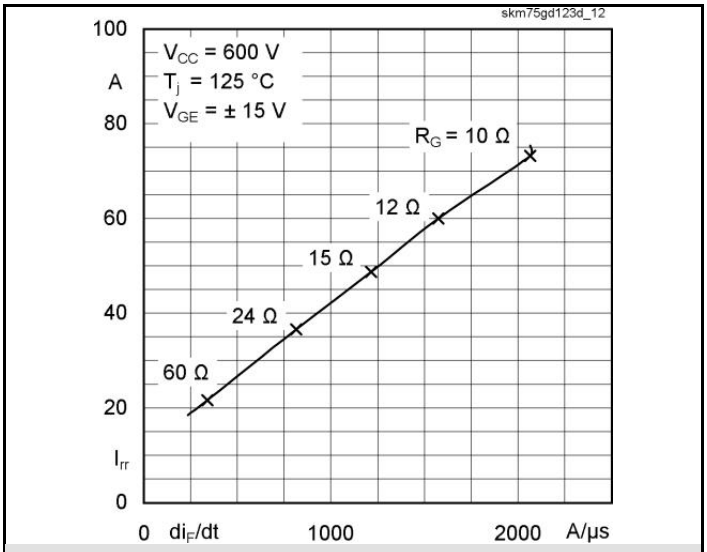

Fig. 11 Typ. CAL diode peak reverse recovery current

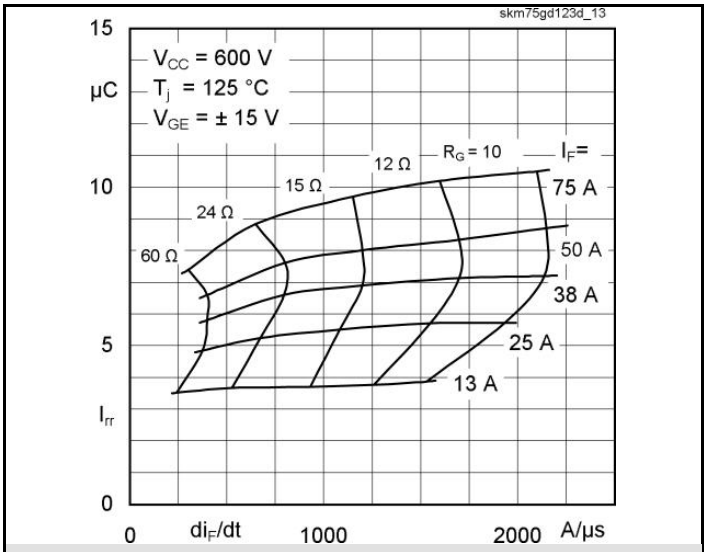

Fig. 12 Typ. CAL diode peak reverse recovery charge

UL Recognized File 63 532

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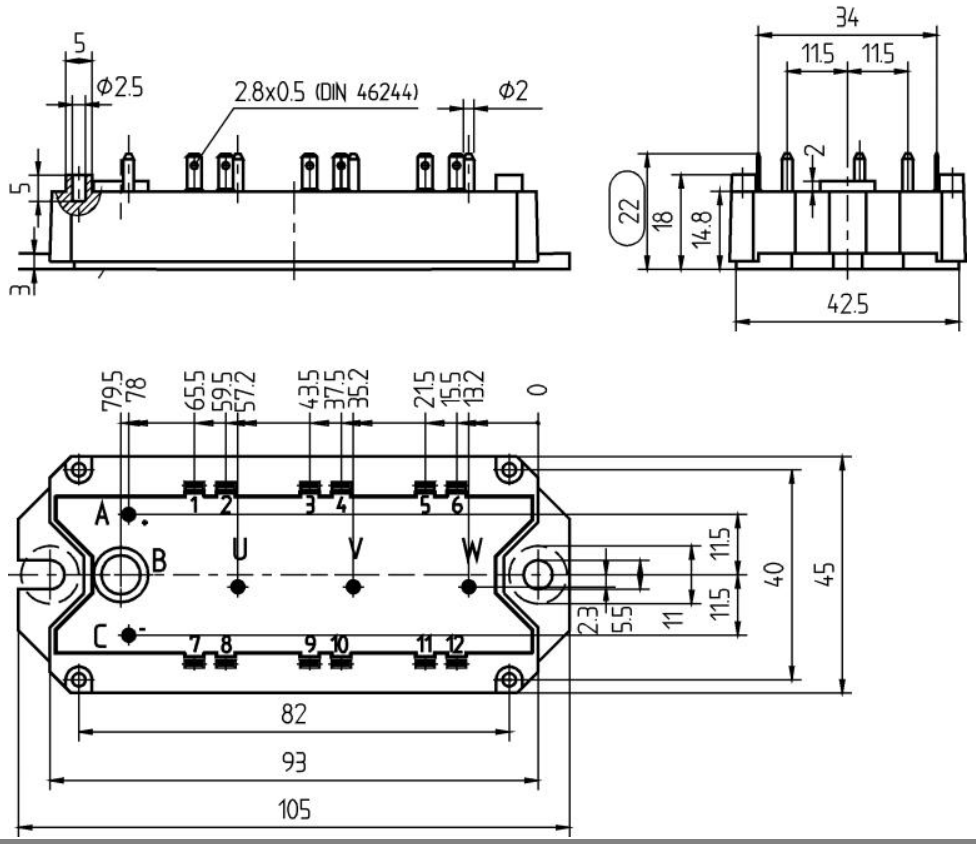
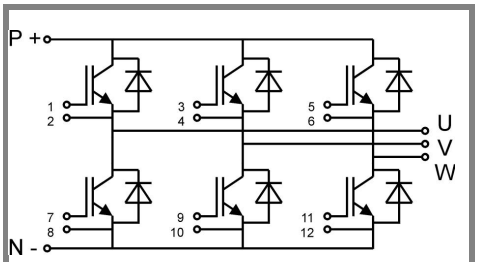
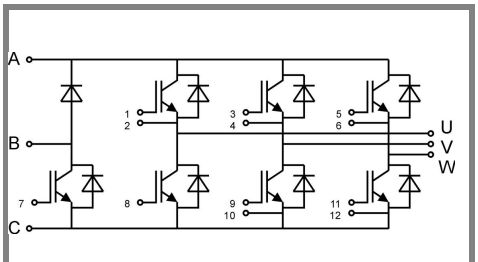


Case D 56a



Case D 67 GD



Case D 73 GDL

