

SKM 100GB123D



SEMITRANS® 2

IGBT Modules

SKM 100GB123D

SKM 100GAL123D

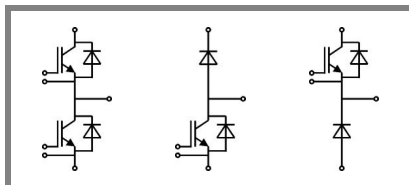
SKM 100GAR123D

Features

- MOS input (voltage controlled)
- N channel, Homogeneous Si
- Low inductance case
- Very low tail current with low temperature dependence
- High short circuit capability, self limiting to $6 \times I_{Cnom}$
- Latch-up free
- Fast & soft inverse CAL diodes
- Isolated copper baseplate using DCB Direct Copper Bonding Technology
- Large clearance (10 mm) and creepage distances (20 mm)

Typical Applications

- AC inverter drives
- UPS



GB

GAL

GAR

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	100	A
		T _{case} = 80 °C	90	A
I _{CRM}	I _{CRM} =2xI _{Cnom}		150	A
V _{GES}			± 20	V
t _{pSC}	V _{CC} = 600 V; V _{GE} ≤ 20 V; T _j = 125 °C V _{CES} < 1200 V		10	µs

Inverse Diode					
I_F	$T_j = 150^\circ\text{C}$		$T_{case} = 25^\circ\text{C}$	95	A
			$T_{case} = 80^\circ\text{C}$	65	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$			150	A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$		$T_j = 150^\circ\text{C}$	720	A

Freewheeling Diode					
I_F	$T_j = 150^\circ\text{C}$		$T_{case} = 25^\circ\text{C}$	130	A
			$T_{case} = 80^\circ\text{C}$	90	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$			200	A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$		$T_j = 150^\circ\text{C}$	900	A

Module					
$I_{t(RMS)}$				200	A
T_{vj}				- 40... + 150	$^\circ\text{C}$
T_{stg}				- 40... + 125	$^\circ\text{C}$
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			0,1	0,3	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			14,6	18,6	mΩ
	T _j = 125°C			20	25,3	mΩ
V _{CE(sat)}	I _{Cnom} = 75 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			5	6,6	nF
C _{oes}				0,72	0,9	nF
C _{res}				0,38	0,5	nF
Q _G	V _{GE} = -8V - +20V			750		nC
R _{Gint}	T _j = °C			5		Ω
t _{d(on)}	R _{Gon} = 15 Ω	V _{CC} = 600V I _C = 75A		30	60	ns
t _r				70	140	ns
E _{on}				10		mJ
t _{d(off)}	R _{Goff} = 15 Ω	T _j = 125 °C V _{GE} = ± 15V		450	600	ns
t _f				70	90	ns
E _{off}				8		mJ
R _{th(j-c)}	per IGBT				0,18	K/W



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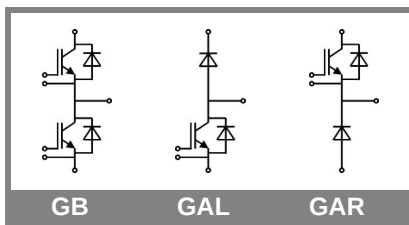
Typical Applications

- AC inverter drives
- UPS

Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 75 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	2	2,5	V
		$T_j = 125^\circ\text{C}_{chiplev.}$	1,8		V
V_{F0}		$T_j = 25^\circ\text{C}$	1,1	1,2	V
		$T_j = 125^\circ\text{C}$			V
r_F		$T_j = 25^\circ\text{C}$	12	17	mΩ
		$T_j = 125^\circ\text{C}$			mΩ
I_{RRM}	$I_F = 75 \text{ A}$	$T_j = 125^\circ\text{C}$	40		A
Q_{rr}	$di/dt = 800 \text{ A}/\mu\text{s}$		3		μC
E_{rr}	$V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$				mJ
$R_{th(j-c)D}$	per diode			0,5	K/W
Freewheeling Diode					
$V_F = V_{EC}$	$I_{Fnom} = 100 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	2	2,5	V
		$T_j = 125^\circ\text{C}_{chiplev.}$	1,8		V
V_{F0}		$T_j = 25^\circ\text{C}$	1,1	1,2	V
		$T_j = 125^\circ\text{C}$			V
r_F		$T_j = 25^\circ\text{C}$	9	13	V
		$T_j = 125^\circ\text{C}$			V
I_{RRM}	$I_F = 100 \text{ A}$	$T_j = 25^\circ\text{C}$	50		A
Q_{rr}	$di/dt = 1000 \text{ A}/\mu\text{s}$		5		μC
E_{rr}	$V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$				mJ
$R_{th(j-c)FD}$	per diode			0,36	K/W
Module					
L_{CE}				30	nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25^\circ\text{C}$	0,75		mΩ
		$T_{case} = 125^\circ\text{C}$	1		mΩ
$R_{th(c-s)}$	per module			0,05	K/W
M_s	to heat sink M6		3	5	Nm
M_t	to terminals M5		2,5	5	Nm
w				160	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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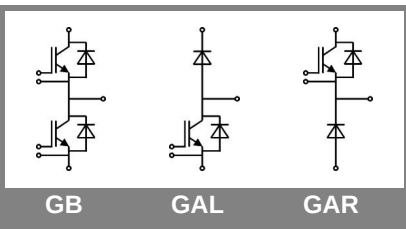
Features

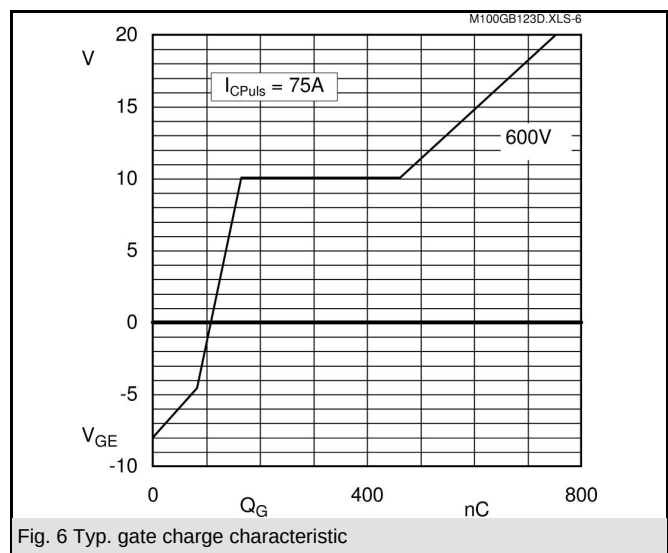
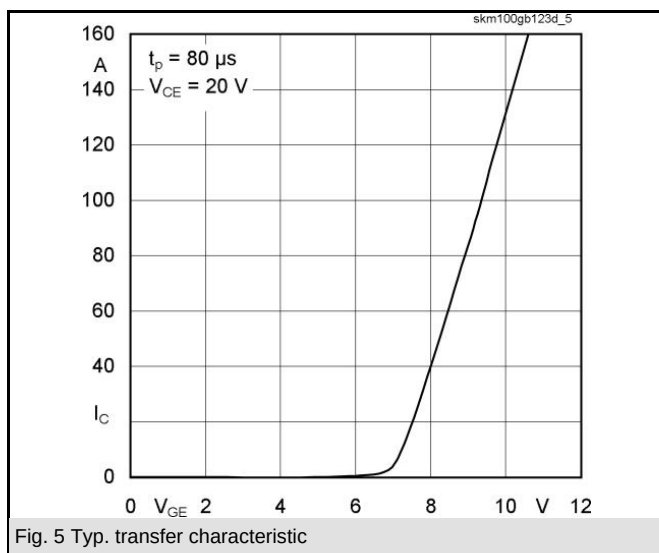
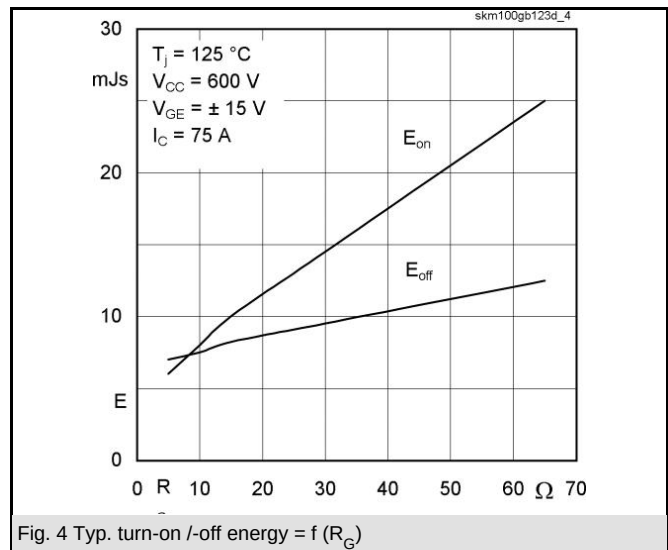
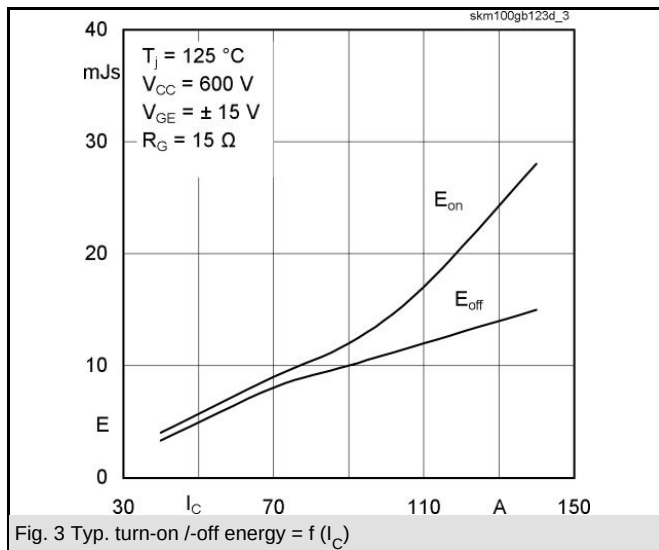
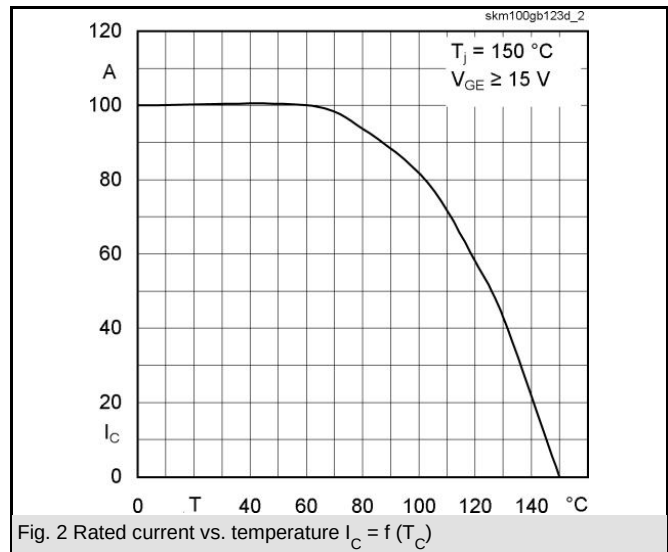
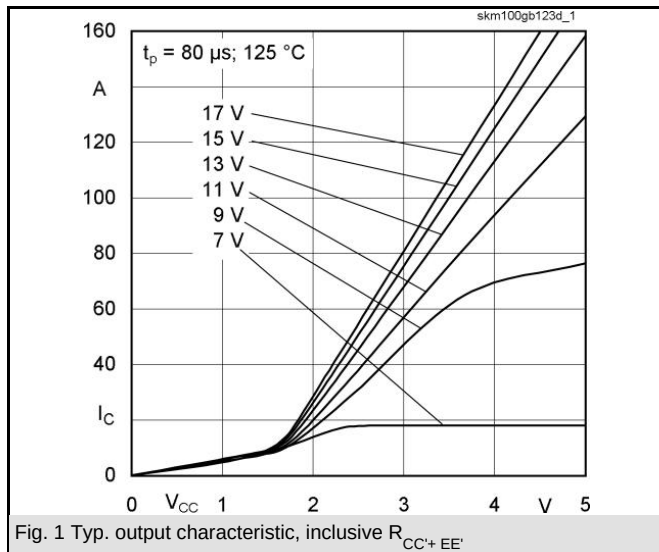
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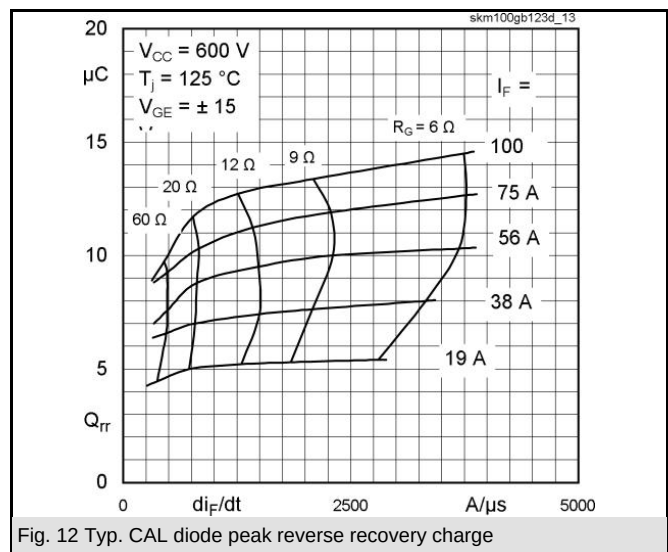
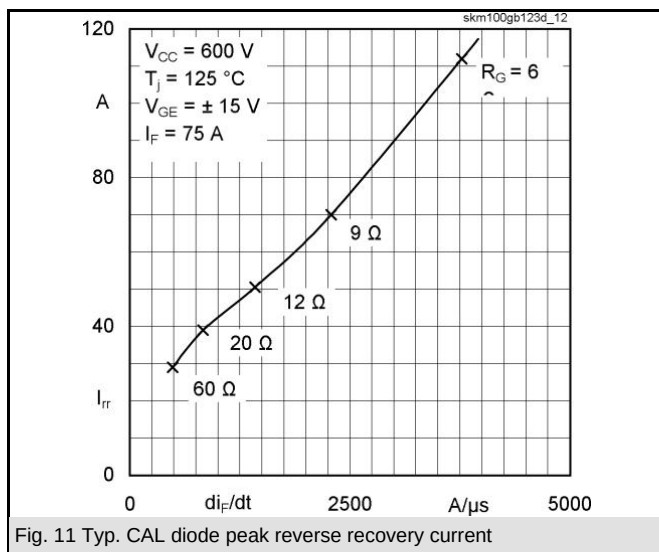
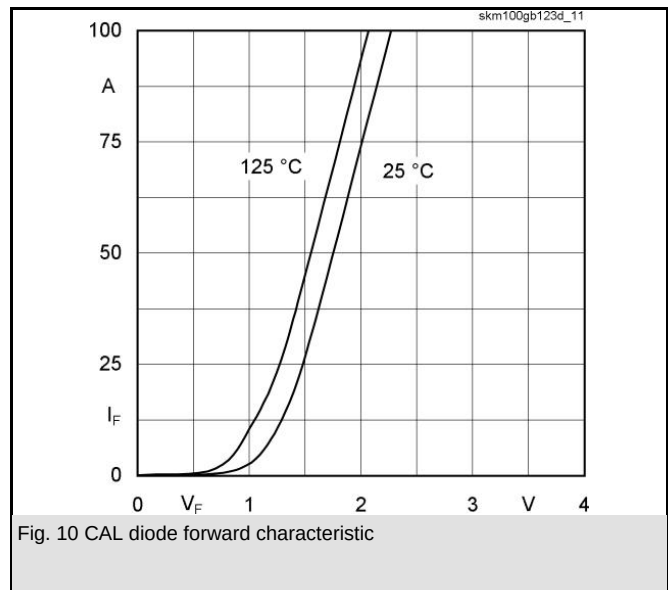
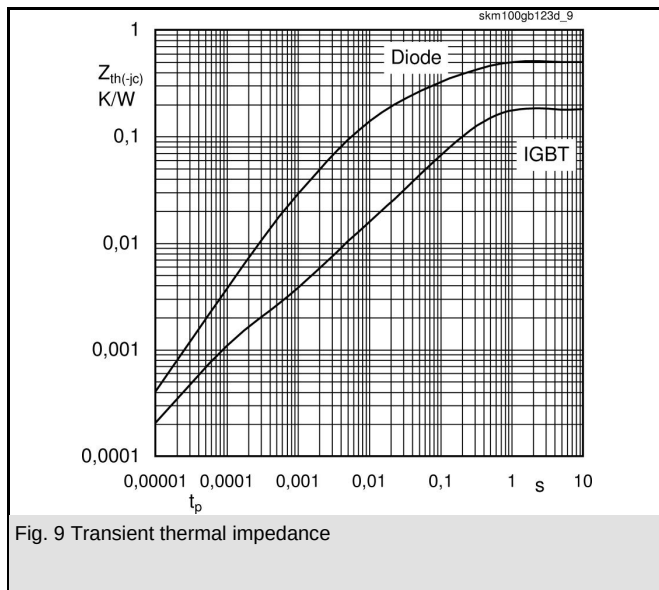
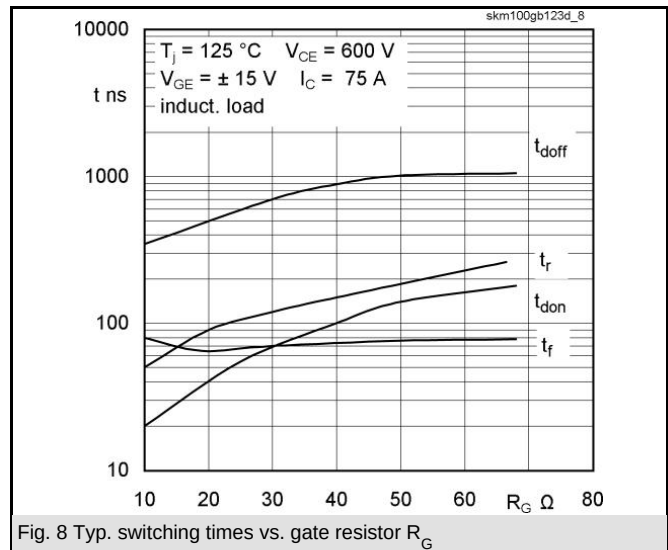
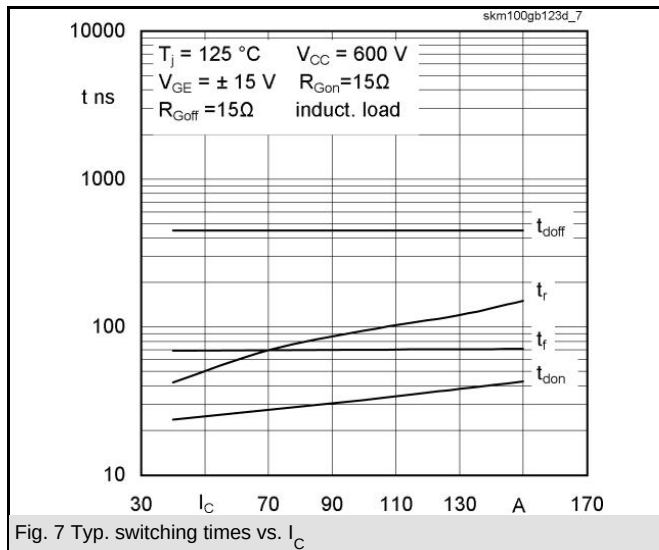
Typical Applications

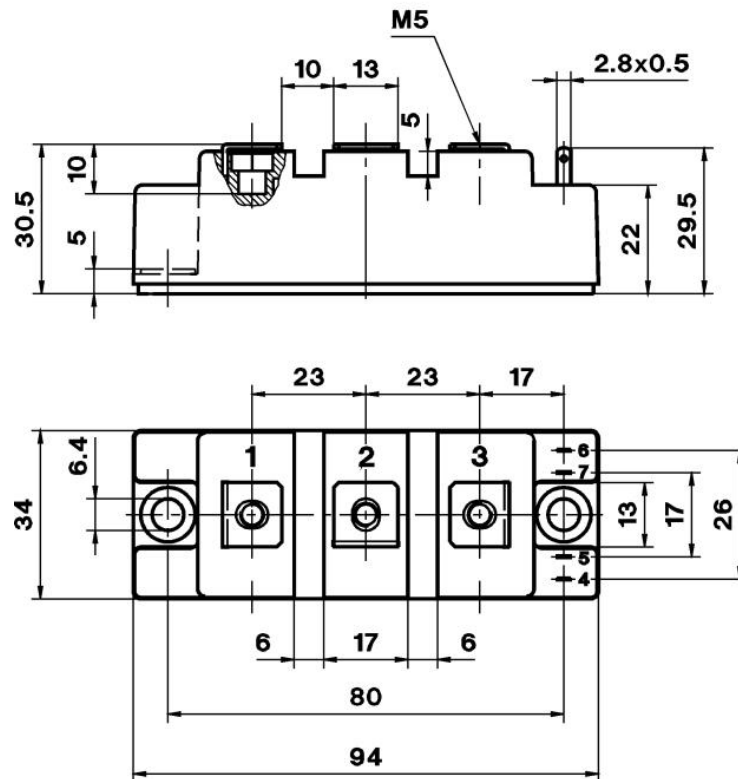
- AC inverter drives
- UPS

Z_{th}			
Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	$i = 1$	162	mk/W
R_i	$i = 2$	14	mk/W
R_i	$i = 3$	2,7	mk/W
R_i	$i = 4$	1,3	mk/W
τ_{ui}	$i = 1$	0,204	s
τ_{ui}	$i = 2$	0,0242	s
τ_{ui}	$i = 3$	0,0013	s
τ_{ui}	$i = 4$	0	s
$Z_{th(j-c)D}$			
R_i	$i = 1$	320	mk/W
R_i	$i = 2$	150	mk/W
R_i	$i = 3$	0,0265	mk/W
R_i	$i = 4$	3,5	mk/W
τ_{ui}	$i = 1$	0,05	s
τ_{ui}	$i = 2$	0,0104	s
τ_{ui}	$i = 3$	0,0034	s
τ_{ui}	$i = 4$	0,0003	s

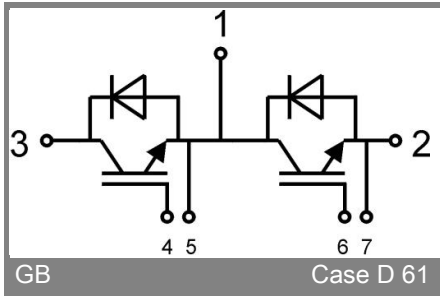






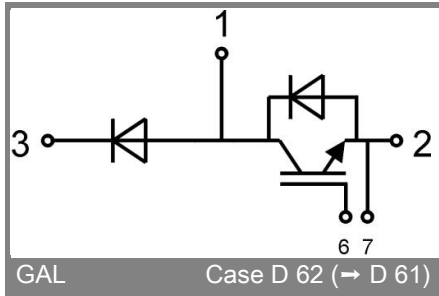


Case D 61



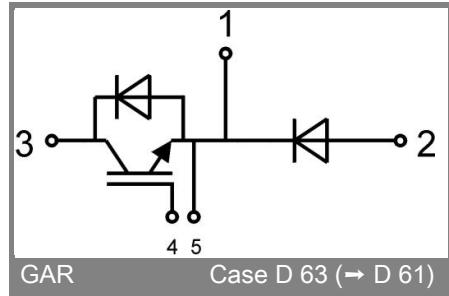
GB

Case D 61



GAL

Case D 62 (→ D 61)



GAR

Case D 63 (→ D 61)