

SKM 300GB123D



SEMITRANS® 3

IGBT Modules

SKM 300GB123D

SKM 300GAL123D

SKM 300GAR123D

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 (12 mm) and creepage distance (20 mm)

Typical Applications

- AC inverter drives
- UPS



GB

GAL

GAR

Absolute Maximum Ratings		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	Values		Units	
IGBT					
V_{CES}	$T_j = 25\text{ }^\circ\text{C}$	1200		V	
I_C	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	300	A	
		$T_{case} = 80\text{ }^\circ\text{C}$	220	A	
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	400		A	
V_{GES}		± 20		V	
t_{psc}	$V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125\text{ }^\circ\text{C}$ $V_{CES} < 1200\text{ V}$	10		μs	
Inverse Diode					
I_F	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	260	A	
		$T_{case} = 80\text{ }^\circ\text{C}$	180	A	
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	400		A	
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150\text{ }^\circ\text{C}$	2200		A
Freewheeling Diode					
I_F	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	350	A	
		$T_{case} = 80\text{ }^\circ\text{C}$	230	A	
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	600		A	
I_{FSM}	$t_p = 10\text{ ms}; \sin$	$T_j = 150\text{ }^\circ\text{C}$	2900		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.	2500		V	

Characteristics		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 8\text{ mA}$	4,5	5,5	6,5	V
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$		0,1	0,3	mA
V_{CE0}		$T_j = 25\text{ }^\circ\text{C}$	1,4	1,6	V
		$T_j = 125\text{ }^\circ\text{C}$	1,6	1,8	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25\text{ }^\circ\text{C}$	5,5	7	m Ω
		$T_j = 125\text{ }^\circ\text{C}$	7,5	9,5	m Ω
$V_{CE(sat)}$	$I_{Cnom} = 200\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25\text{ }^\circ\text{C}_{chiplev.}$	2,5	3	V
		$T_j = 125\text{ }^\circ\text{C}_{chiplev.}$	3,1	3,7	V
C_{ies}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	18	24	nF
C_{oes}			2,5	3,2	nF
C_{res}			1	1,3	nF
Q_G	-8V - +20V	2000		nC	
R_{Gint}	$T_j = \text{ }^\circ\text{C}$	2,5		Ω	
$t_{d(on)}$	$R_{Gon} = 4,7\text{ } \Omega$	$V_{CC} = 600\text{ V}$ $I_{Cnom} = 200\text{ A}$ $T_j = 125\text{ }^\circ\text{C}$	250	400	ns
			90	160	ns
E_{on}	$R_{Goff} = 4,7\text{ } \Omega$		28		mJ
$t_{d(off)}$			550	700	ns
t_f			70	100	ns
E_{off}			26		mJ
$R_{th(j-c)}$	per IGBT			0,075	K/W



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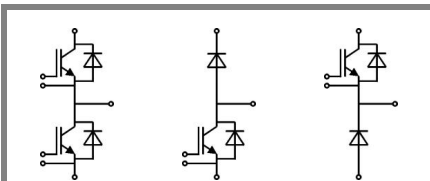
SKM 300GAR123D

Features

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Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 200 \text{ A}; V_{GE} = 0 \text{ V}$		2	2,5	V
V_{F0}			1,1	1,2	V
					V
r_F			4,5	6,5	mΩ
					mΩ
I_{RRM}	$I_{Fnom} = 200 \text{ A}$		105		A
Q_{rr}	$di/dt = 4000 \text{ A}/\mu\text{s}$		10		μC
E_{rr}	$V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$				mJ
$R_{th(j-c)D}$	per diode			0,18	K/W
Freewheeling Diode					
$V_F = V_{EC}$	$I_{Fnom} = 300 \text{ A}; V_{GE} = 0 \text{ V}$		2	2,5	V
V_{F0}			1,1	1,2	V
					V
r_F			3	4,3	V
					V
I_{RRM}	$I_{Fnom} = 200 \text{ A}$		140		A
Q_{rr}	$di/dt = 3500 \text{ A}/\mu\text{s}$		34		μC
E_{rr}	$V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$				mJ
$R_{th(j-c)FD}$	per diode			0,15	K/W
Module					
L_{CE}			15	20	nH
R_{CC+EE}	res., terminal-chip	$T_{case} = 25 \text{ °C}$	0,35		mΩ
		$T_{case} = 125 \text{ °C}$	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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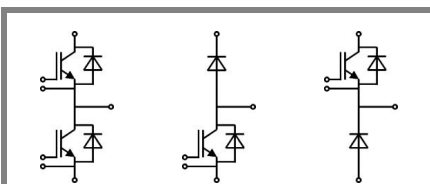
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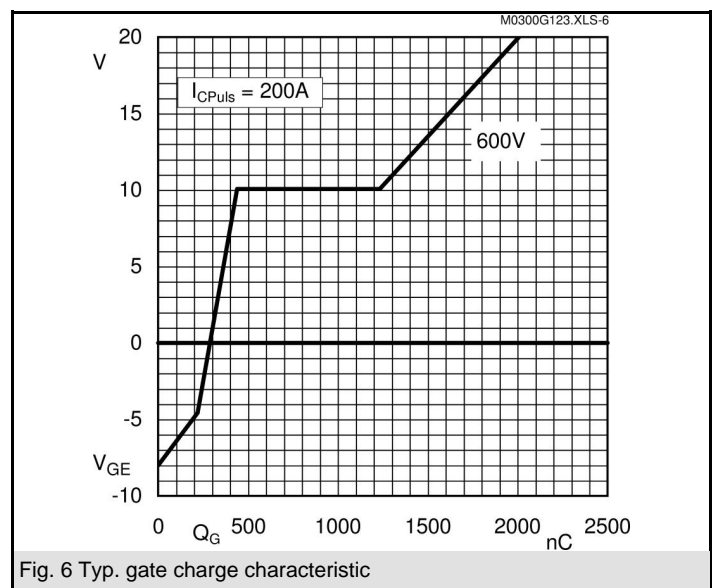
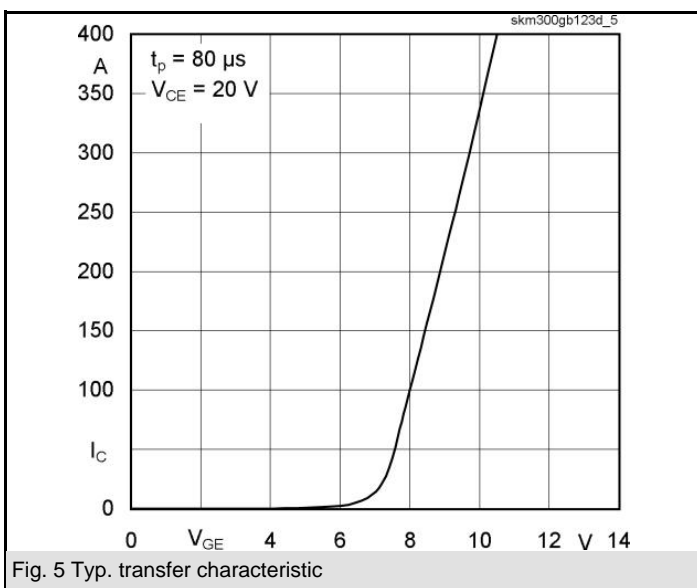
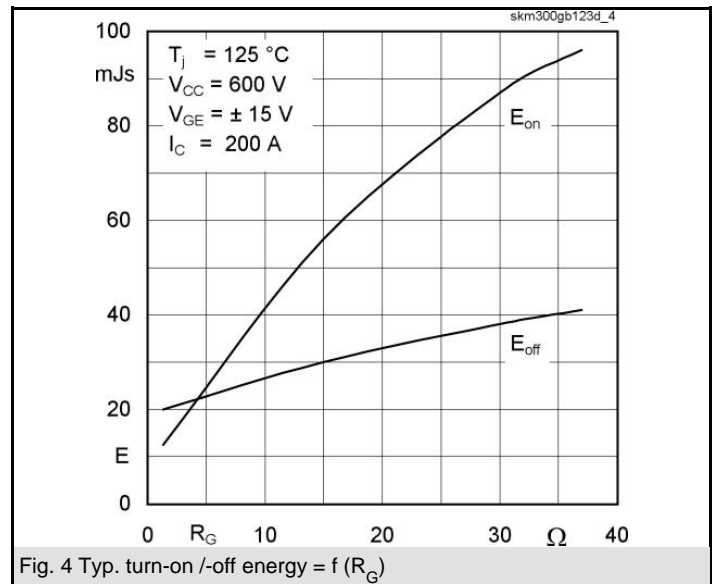
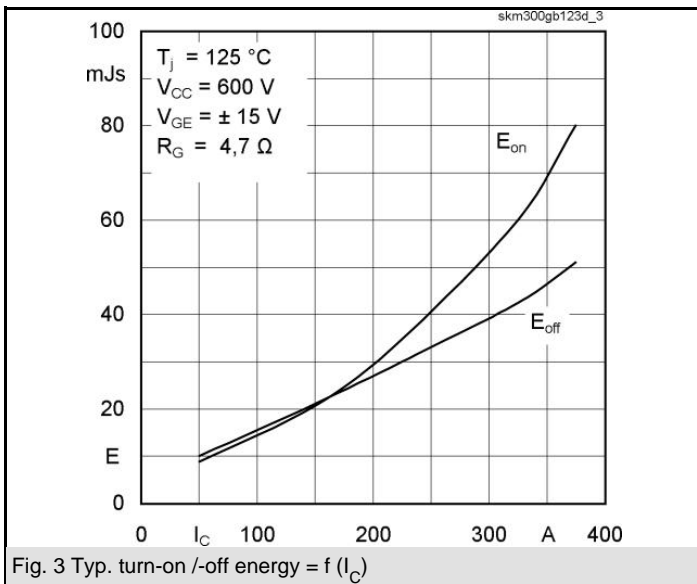
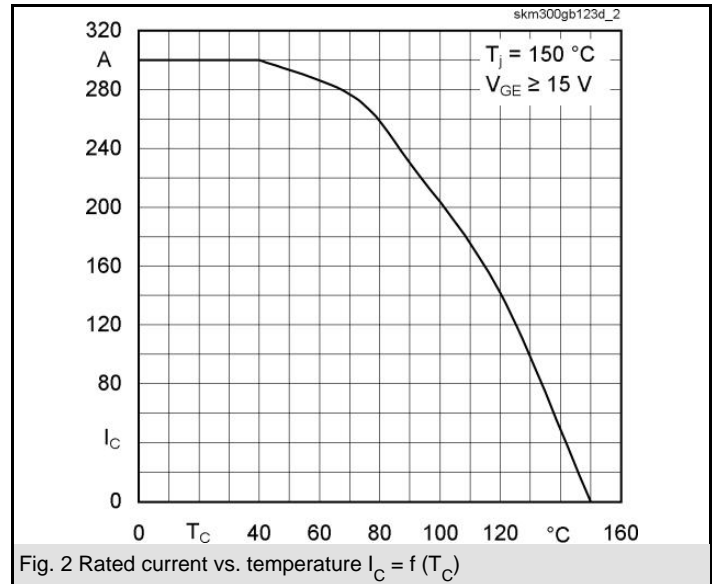
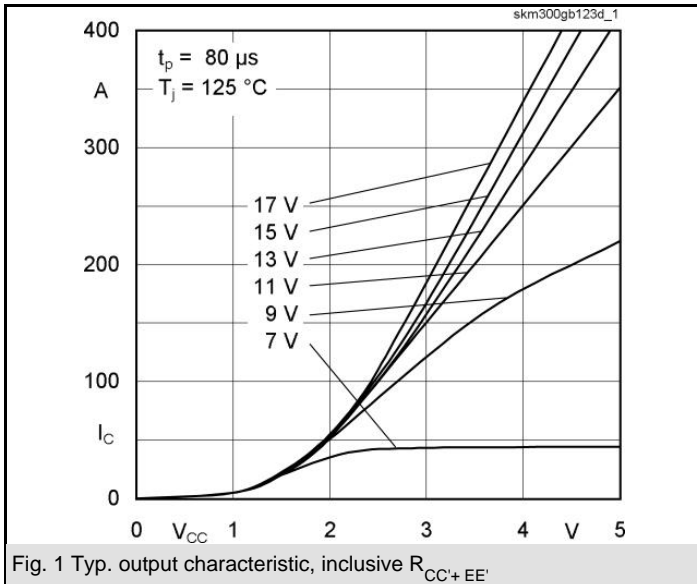
Z_{th}		Conditions	Values	Units
Symbol				
$Z_{th(j-c)I}$				
$R_{\theta j-c1}$	$i = 1$		53	mk/W
$R_{\theta j-c2}$	$i = 2$		18,5	mk/W
$R_{\theta j-c3}$	$i = 3$		3,1	mk/W
$R_{\theta j-c4}$	$i = 4$		0,4	mk/W
τ_{i1}	$i = 1$		0,04	s
τ_{i2}	$i = 2$		0,0189	s
τ_{i3}	$i = 3$		0,0017	s
τ_{i4}	$i = 4$		0,003	s
$Z_{th(j-c)D}$				
$R_{\theta j-cD1}$	$i = 1$		0,1151	mk/W
$R_{\theta j-cD2}$	$i = 2$		0,0525	mk/W
$R_{\theta j-cD3}$	$i = 3$		0,0111	mk/W
$R_{\theta j-cD4}$	$i = 4$		0,0022	mk/W
τ_{iD1}	$i = 1$		0,0366	s
τ_{iD2}	$i = 2$		0,0113	s
τ_{iD3}	$i = 3$		0,003	s
τ_{iD4}	$i = 4$		0,0002	s

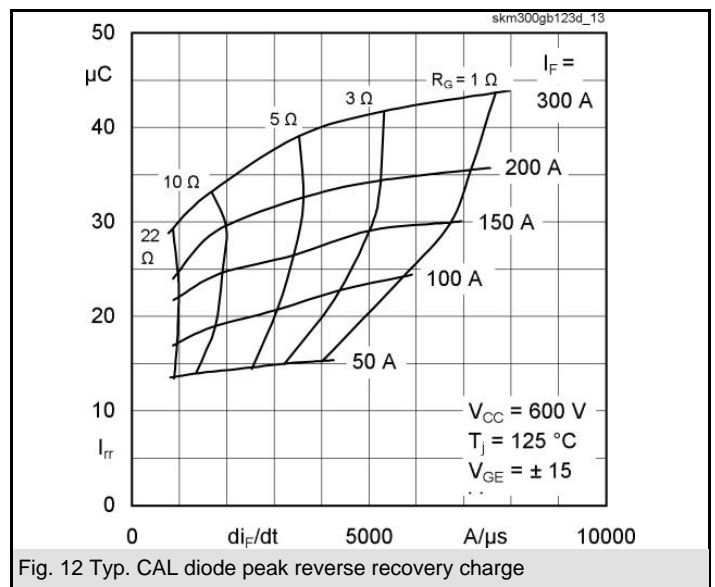
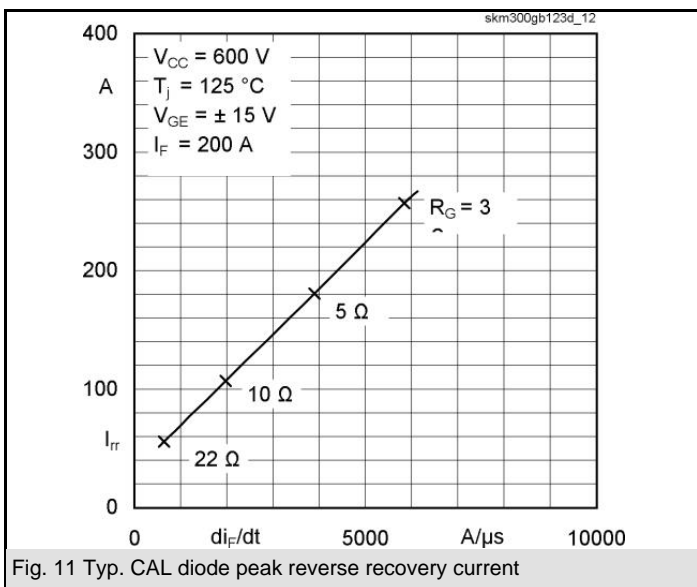
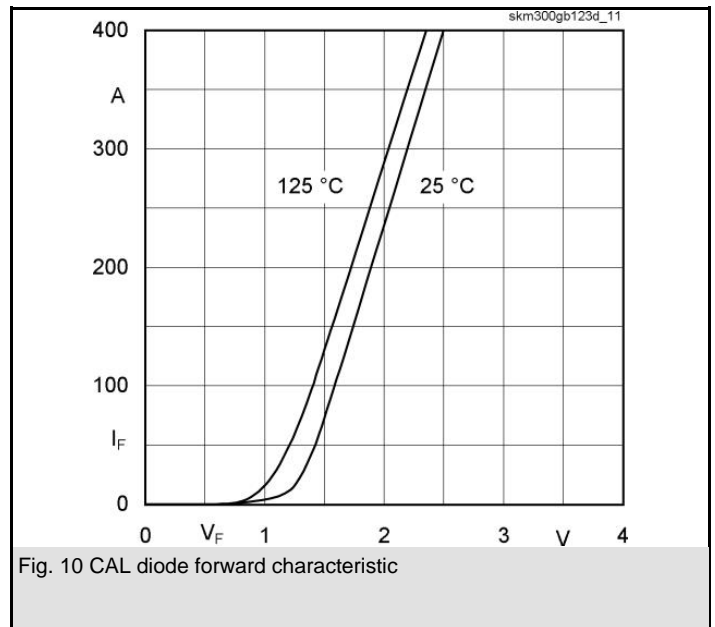
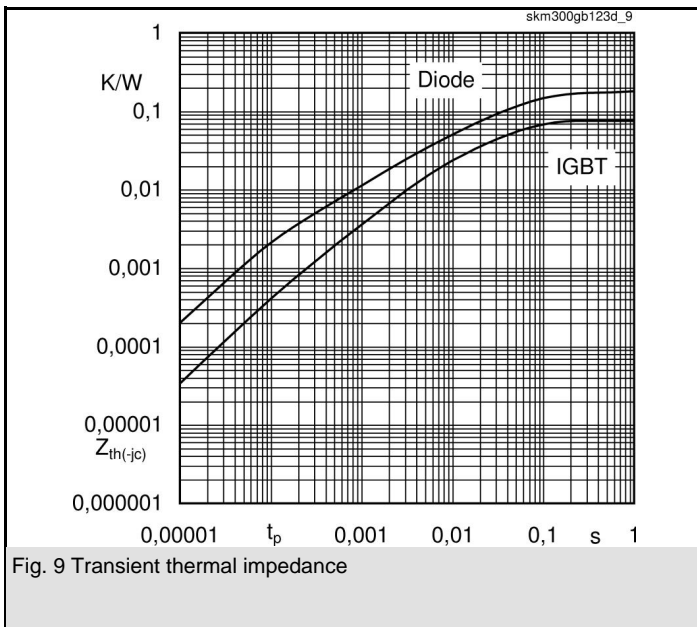
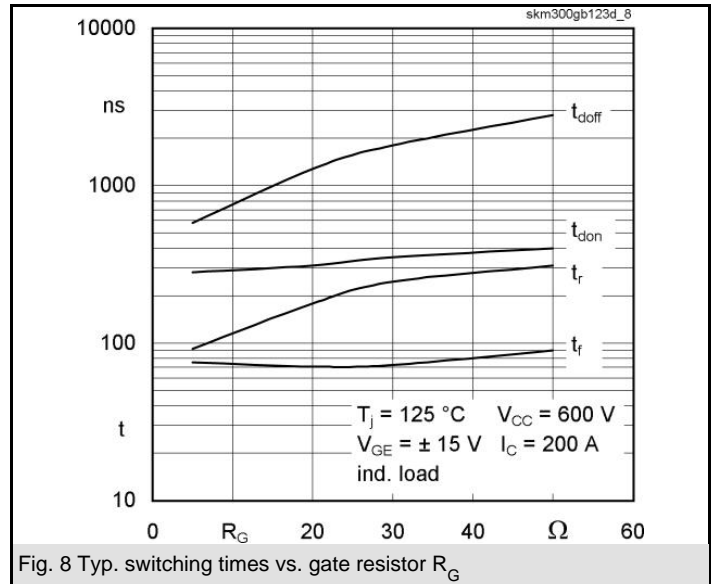
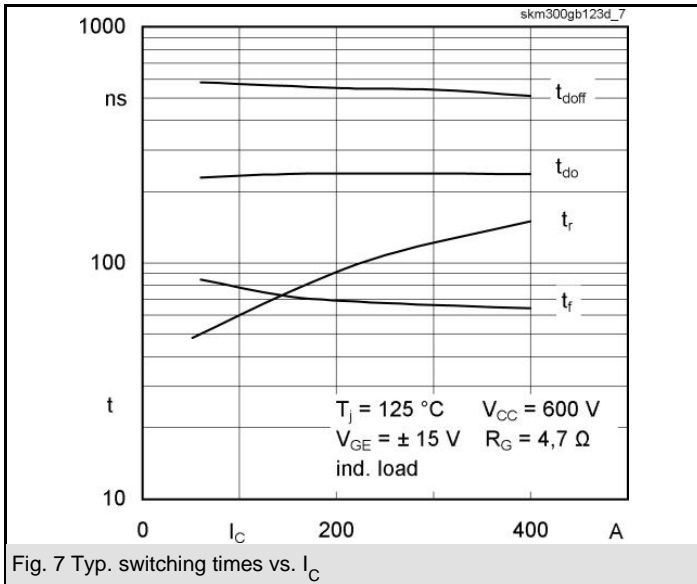


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SKM 300GB123D

UL Recognized

CASED56

File 63 532



Case D 56



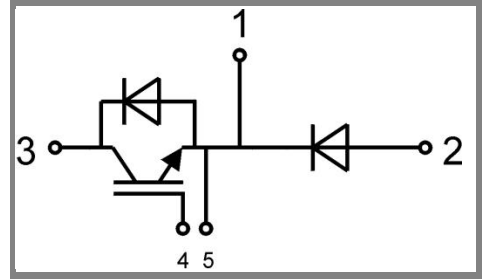
GB

Case D 56



GAL

Case D 57 (→ D 56)



GAR

Case D 58 (→ D 56)