

SKM 100GB123D



SEMITRANS® 2

IGBT Modules

SKM 100GB123D

SKM 100GAL123D

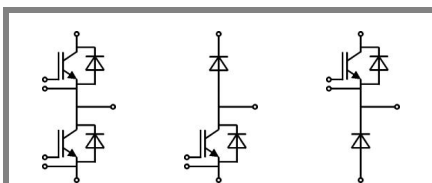
SKM 100GAR123D

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



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GAL

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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	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	100	A
		$T_{case} = 80\text{ }^\circ\text{C}$	90	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	150		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	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	95	A
		$T_{case} = 80\text{ }^\circ\text{C}$	65	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	150		A
I_{FSM}	$t_p = 10\text{ ms}; \text{sin.}$	$T_j = 150\text{ }^\circ\text{C}$	720	A
Freewheeling Diode				
I_F	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	130	A
		$T_{case} = 80\text{ }^\circ\text{C}$	90	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	200		A
I_{FSM}	$t_p = 10\text{ ms}; \text{sin.}$	$T_j = 150\text{ }^\circ\text{C}$	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		$T_C = 25\text{ }^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 2\text{ mA}$	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}	$V_{GE} = 15\text{ V}$	$T_j = 25\text{ }^\circ\text{C}$	14,6	18,6	m Ω
		$T_j = 125\text{ }^\circ\text{C}$	20	25,3	m Ω
$V_{CE(sat)}$	$I_{Cnom} = 75\text{ A}, V_{GE} = 15\text{ V}$		2,5	3	V
C_{ies}			5	6,6	nF
C_{oes}	$V_{CE} = 25, V_{GE} = 0\text{ V}$		0,72	0,9	nF
C_{res}	$f = 1\text{ MHz}$		0,38	0,5	nF
Q_G	$V_{GE} = -8\text{ V} - +20\text{ V}$		750		nC
R_{Gint}	$T_j = \text{ }^\circ\text{C}$		5		Ω
$t_{d(on)}$	$R_{Gon} = 15\text{ }^\circ\Omega$	$V_{CC} = 600\text{ V}$ $I_C = 75\text{ A}$	30	60	ns
t_r			70	140	ns
E_{on}			10		mJ
$t_{d(off)}$	$R_{Goff} = 15\text{ }^\circ\Omega$	$T_j = 125\text{ }^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$	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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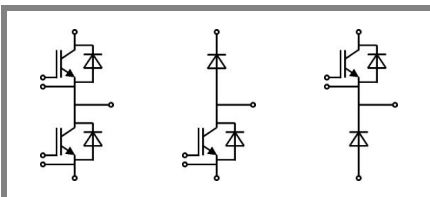
SKM 100GAR123D

Features

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Characteristics			min.	typ.	max.	Units
Inverse Diode						
$V_F = V_{EC}$	$I_{Fnom} = 75 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$ $T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$		2 1,8	2,5	V V
V_{F0}		$T_j = 25 \text{ }^\circ\text{C}$ $T_j = 125 \text{ }^\circ\text{C}$		1,1	1,2	V V
r_F		$T_j = 25 \text{ }^\circ\text{C}$ $T_j = 125 \text{ }^\circ\text{C}$		12	17	mΩ mΩ
I_{RRM} Q_{rr} E_{rr}	$I_F = 75 \text{ A}$ $di/dt = 800 \text{ A}/\mu\text{s}$ $V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$	$T_j = 125 \text{ }^\circ\text{C}$		40 3		A μC mJ
$R_{th(j-c)D}$	per diode				0,5	K/W
Freewheeling Diode						
$V_F = V_{EC}$	$I_{Fnom} = 100 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$ $T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$		2 1,8	2,5	V V
V_{F0}		$T_j = 25 \text{ }^\circ\text{C}$ $T_j = 125 \text{ }^\circ\text{C}$		1,1	1,2	V V
r_F		$T_j = 25 \text{ }^\circ\text{C}$ $T_j = 125 \text{ }^\circ\text{C}$		9	13	V V
I_{RRM} Q_{rr} E_{rr}	$I_F = 100 \text{ A}$ $di/dt = 1000 \text{ A}/\mu\text{s}$ $V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}$		50 5		A μC mJ
$R_{th(j-c)FD}$	per diode				0,36	K/W
Module						
L_{CE}					30	nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25 \text{ }^\circ\text{C}$ $T_{case} = 125 \text{ }^\circ\text{C}$		0,75 1		mΩ 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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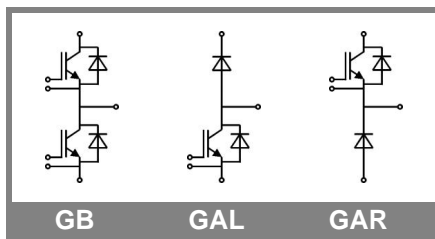
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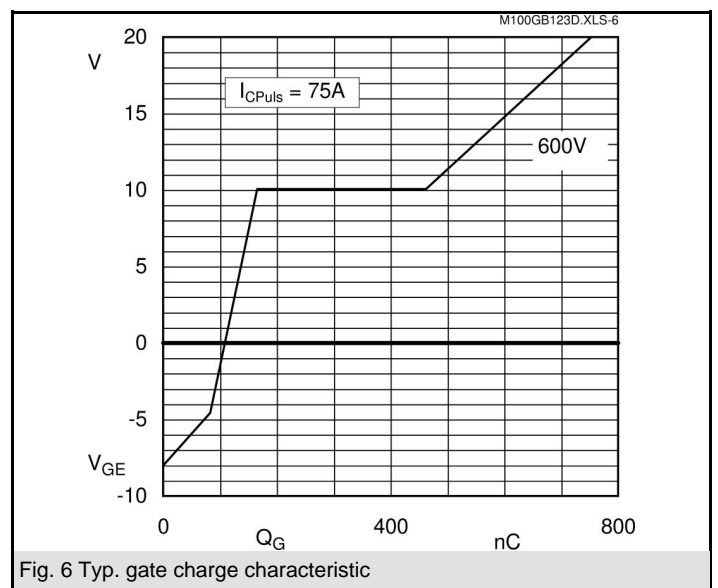
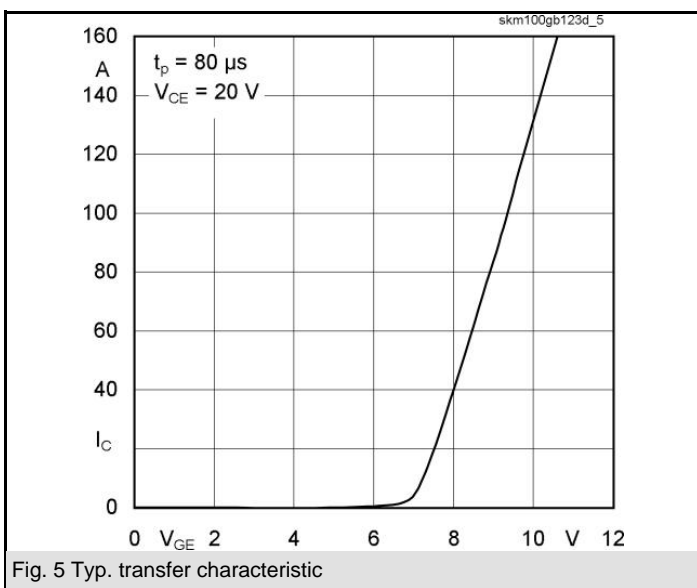
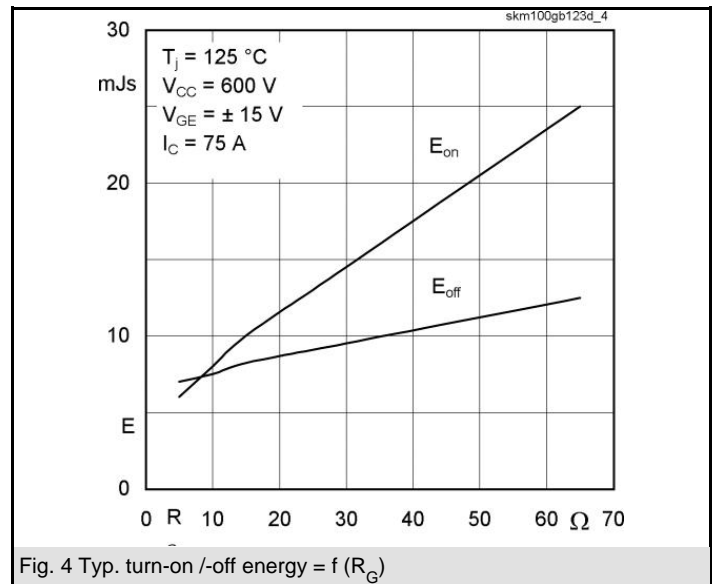
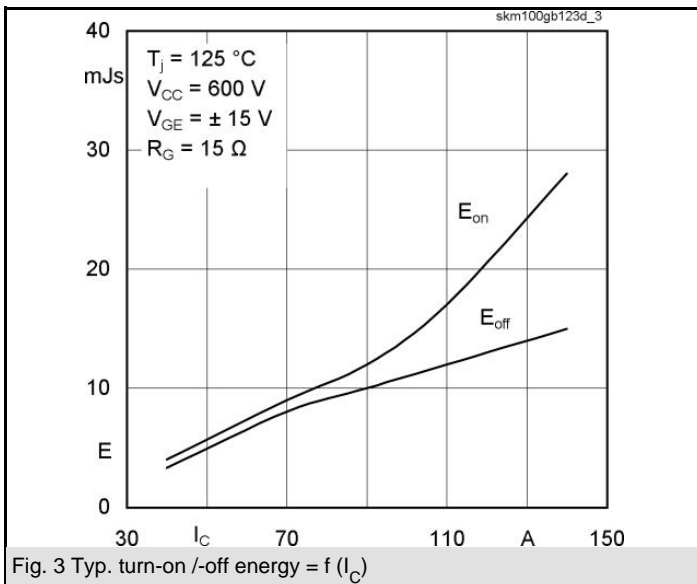
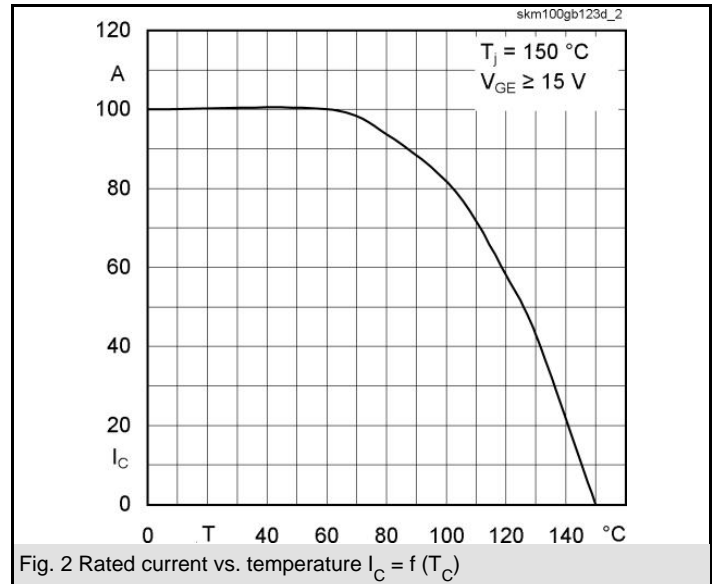
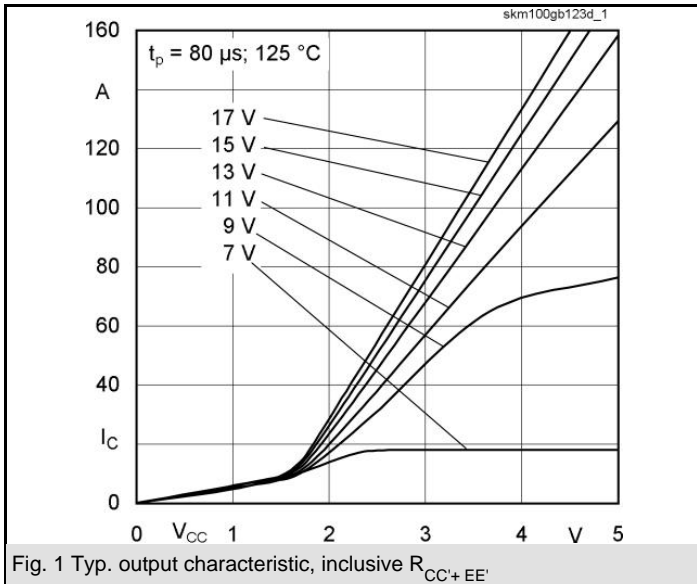
Z_{th}		Conditions	Values	Units
$Z_{th(j-c)I}$				
$R_{\theta j-c}$	$i = 1$		162	mk/W
$R_{\theta j-c}$	$i = 2$		14	mk/W
$R_{\theta j-c}$	$i = 3$		2,7	mk/W
$R_{\theta j-c}$	$i = 4$		1,3	mk/W
$\tau_{th(j-c)}$	$i = 1$		0,204	s
$\tau_{th(j-c)}$	$i = 2$		0,0242	s
$\tau_{th(j-c)}$	$i = 3$		0,0013	s
$\tau_{th(j-c)}$	$i = 4$		0	s
$Z_{th(j-c)D}$				
$R_{\theta j-cD}$	$i = 1$		320	mk/W
$R_{\theta j-cD}$	$i = 2$		150	mk/W
$R_{\theta j-cD}$	$i = 3$		0,0265	mk/W
$R_{\theta j-cD}$	$i = 4$		3,5	mk/W
$\tau_{th(j-c)D}$	$i = 1$		0,05	s
$\tau_{th(j-c)D}$	$i = 2$		0,0104	s
$\tau_{th(j-c)D}$	$i = 3$		0,0034	s
$\tau_{th(j-c)D}$	$i = 4$		0,0003	s

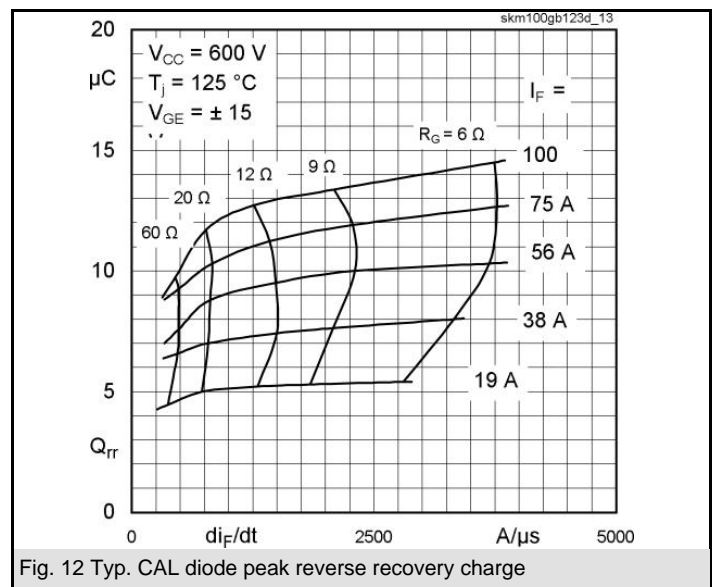
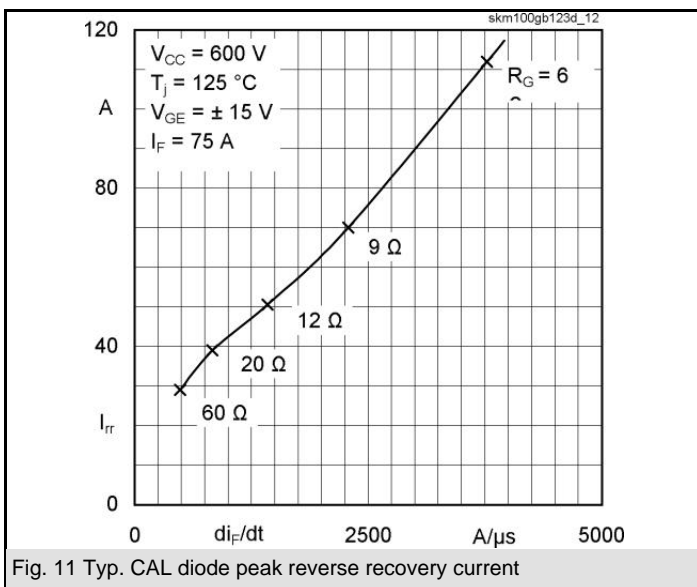
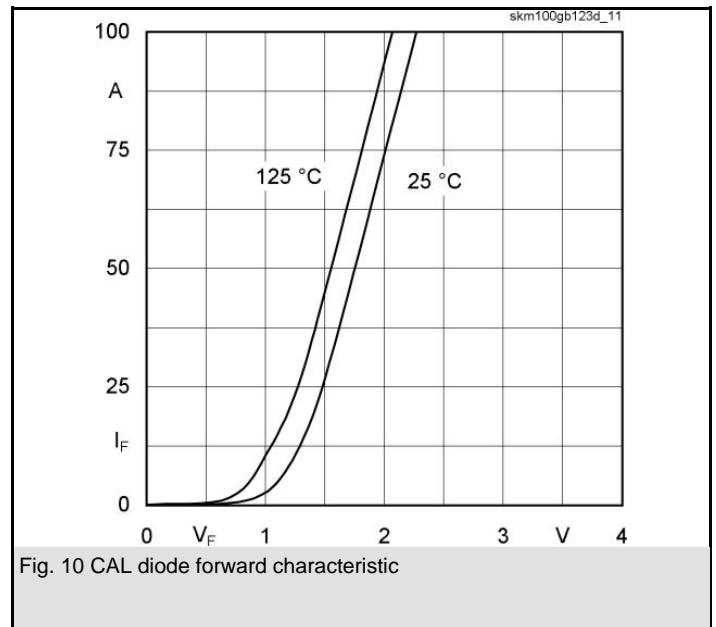
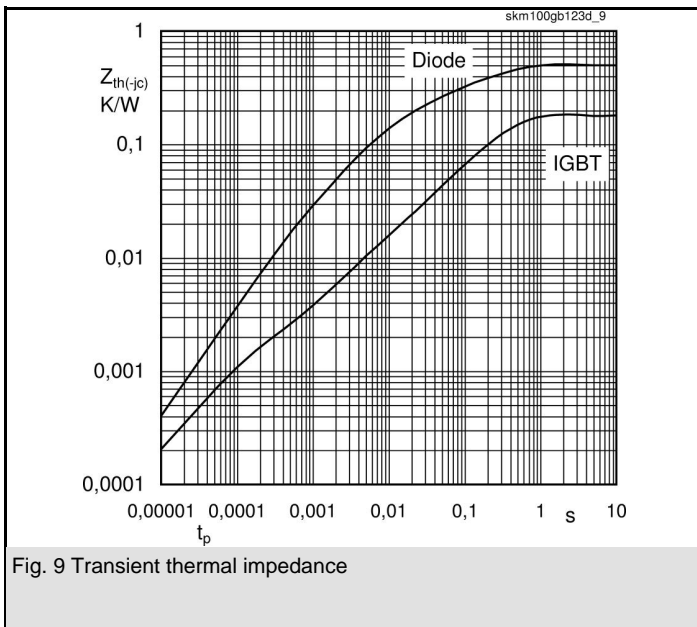
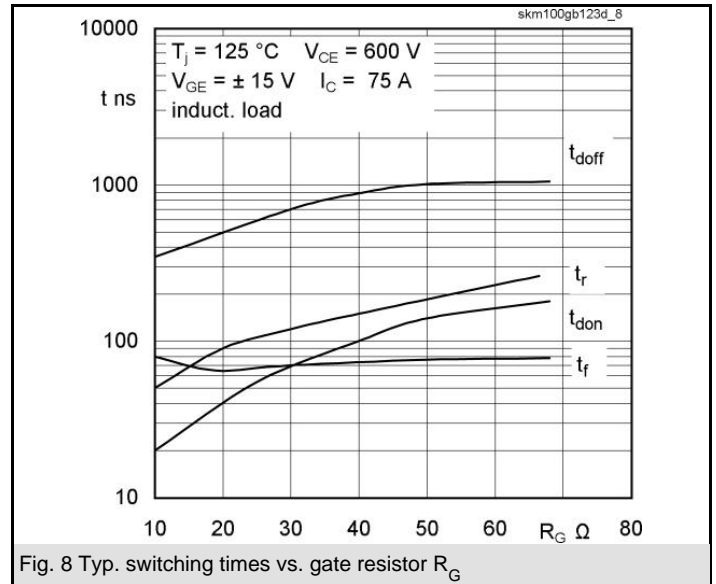
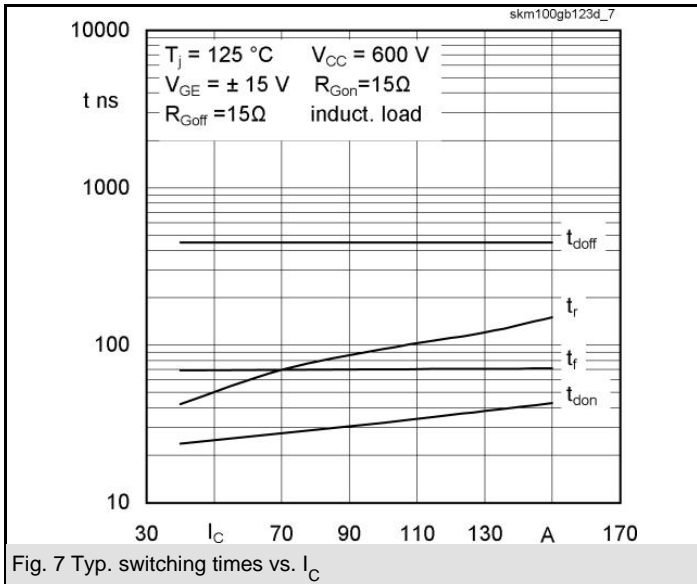


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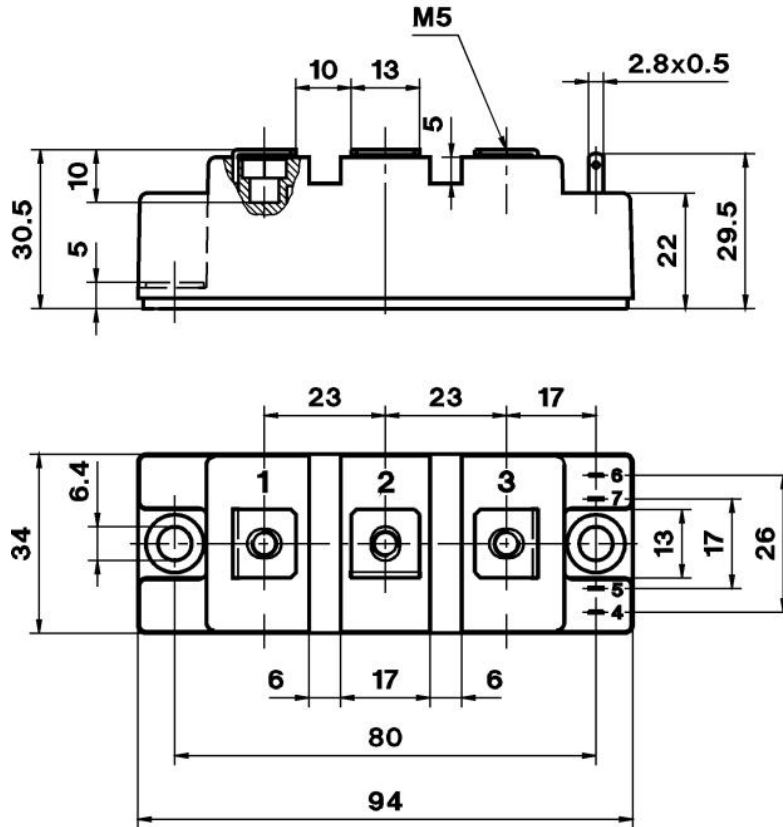


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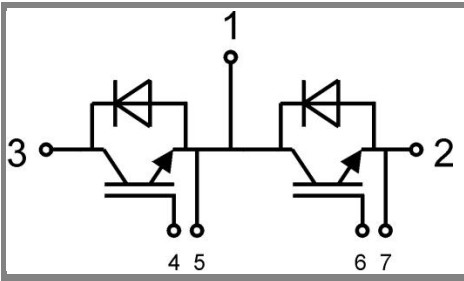
UL Recognized

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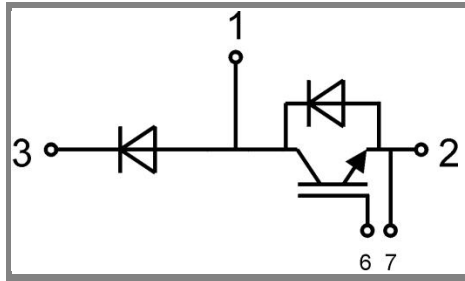
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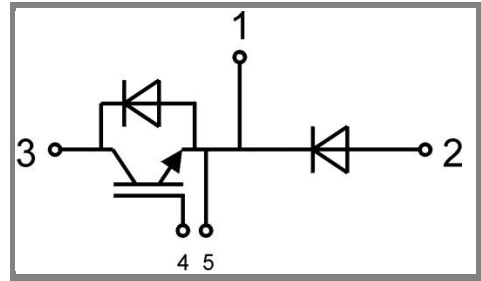
Case D 61



GB Case D 61



GAL Case D 62 (→ D 61)



GAR Case D 63 (→ D 61)