

SKM 75GB123D



SEMITRANS® 2

IGBT Modules

SKM 75GB123D

SKM 75GAL123D

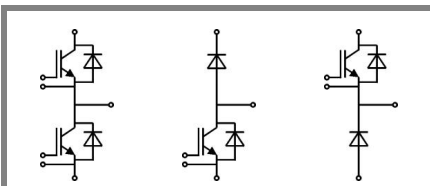
SKM 75GAR123D

Features

- MOS input (voltage controlled)
- 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 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	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	75	A
		$T_{case} = 80\text{ }^\circ\text{C}$	60	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	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	75	A
		$T_{case} = 80\text{ }^\circ\text{C}$	50	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	150		A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150\text{ }^\circ\text{C}$	480	A
Freewheeling 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}	$I_{FRM} = 2 \times I_{Fnom}$	200		A
I_{FSM}	$t_p = 10\text{ ms}; \sin$	$T_j = 150\text{ }^\circ\text{C}$	720	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}	$V_{GE} = 15\text{ V}$	$T_j = 25\text{ }^\circ\text{C}$	22	28	m Ω
		$T_j = 125\text{ }^\circ\text{C}$	30	38	m Ω
$V_{CE(sat)}$	$I_{Cnom} = 50\text{ A}, V_{GE} = 15\text{ V}$		2,5	3	V
C_{ies}			3,3	4,3	nF
C_{oes}	$V_{CE} = 25, V_{GE} = 0\text{ V}$		0,5	0,6	nF
C_{res}			0,22	0,3	nF
Q_G	$V_{GE} = -8 - +20\text{ V}$		500		nC
R_{Gint}	$T_j = \text{ }^\circ\text{C}$		5		Ω
$t_{d(on)}$	$R_{Gon} = 22\text{ }^\circ\Omega$	$V_{CC} = 600\text{ V}$ $I_{Cnom} = 50\text{ A}$ $T_j = 125\text{ }^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$	44	100	ns
t_r			56	100	ns
E_{on}			8		mJ
$t_{d(off)}$	$R_{Goff} = 22\text{ }^\circ\Omega$		380	500	ns
t_f			70	100	ns
E_{off}			5		mJ
$R_{th(j-c)}$	per IGBT			0,27	K/W



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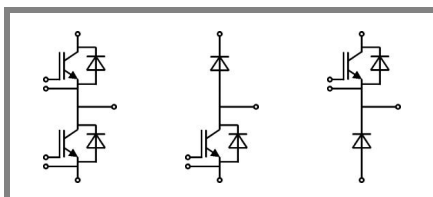
SKM 75GAR123D

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- High short circuit capability, self limiting to $6 \times I_{cnom}$
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Typical Applications

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Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 50 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$	2	2,5	V
		$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$	1,8		V
V_{F0}		$T_j = 25 \text{ }^\circ\text{C}$	1,1	1,2	V
		$T_j = 125 \text{ }^\circ\text{C}$			V
r_F		$T_j = 25 \text{ }^\circ\text{C}$	18	26	mΩ
		$T_j = 125 \text{ }^\circ\text{C}$			mΩ
I_{RRM}	$I_{Fnom} = 50 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$	35		A
Q_{rr}	$di/dt = 800 \text{ A}/\mu\text{s}$				μC
E_{rr}	$V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$				mJ
$R_{th(j-c)D}$	per diode			0,6	K/W
Freewheeling Diode					
$V_F = V_{EC}$	$I_{Fnom} = 50 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$	1,85	2,2	V
		$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$	1,6		V
V_{F0}		$T_j = 25 \text{ }^\circ\text{C}$	1,1	1,2	V
		$T_j = 125 \text{ }^\circ\text{C}$			V
r_F		$T_j = 25 \text{ }^\circ\text{C}$	15	20	V
		$T_j = 125 \text{ }^\circ\text{C}$			V
I_{RRM}	$I_{Fnom} = 50 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$	40		A
Q_{rr}					μC
E_{rr}	$V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$				mJ
$R_{th(j-c)FD}$	per diode			0,5	K/W
Module					
L_{CE}				30	nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25 \text{ }^\circ\text{C}$	0,75		mΩ
		$T_{case} = 125 \text{ }^\circ\text{C}$	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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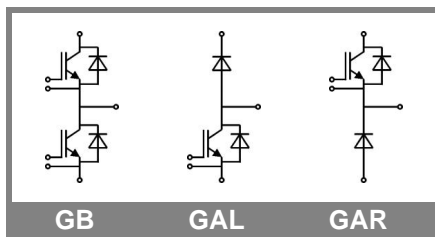
Features

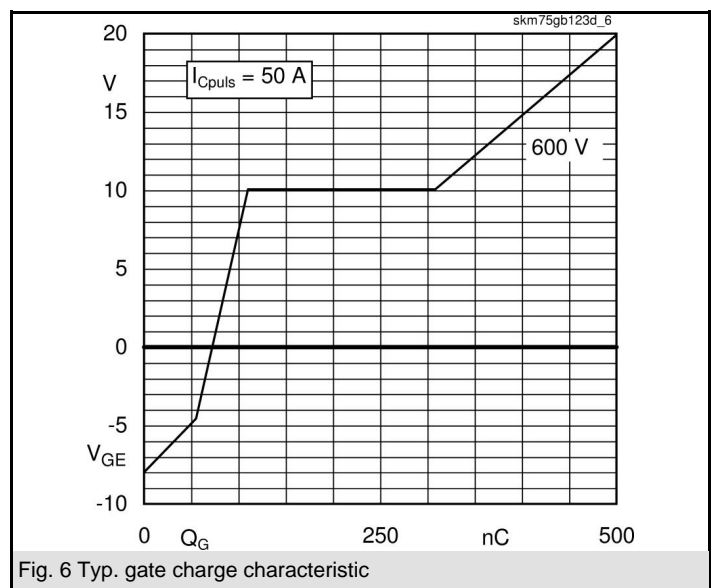
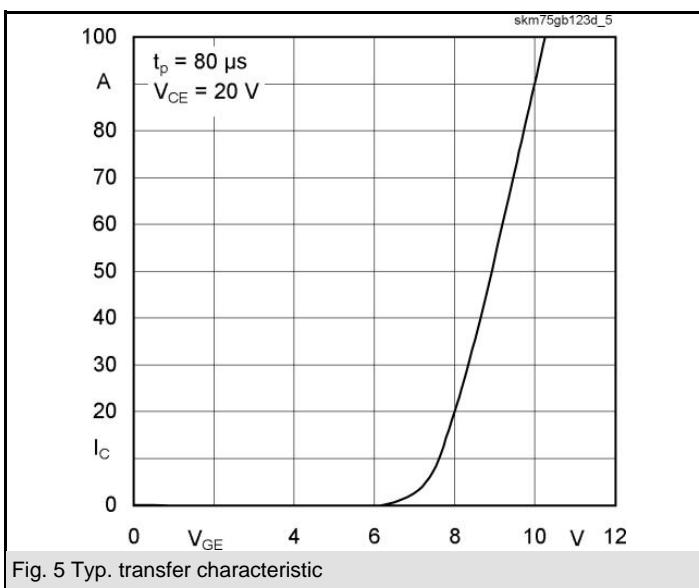
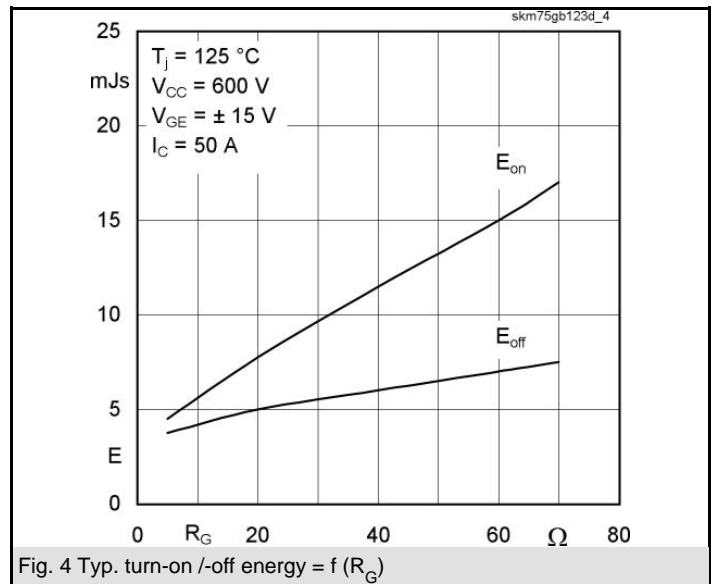
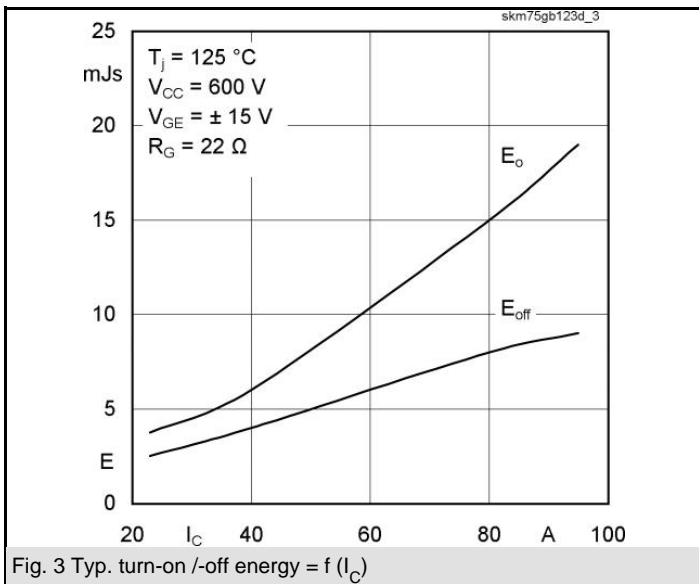
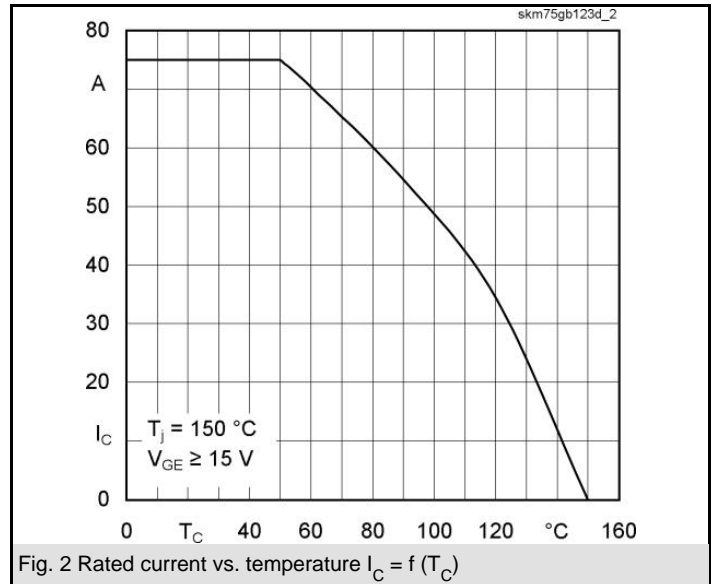
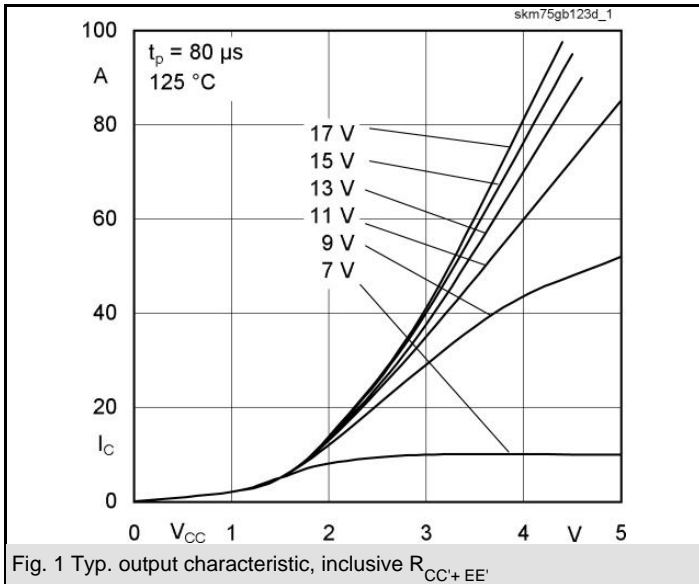
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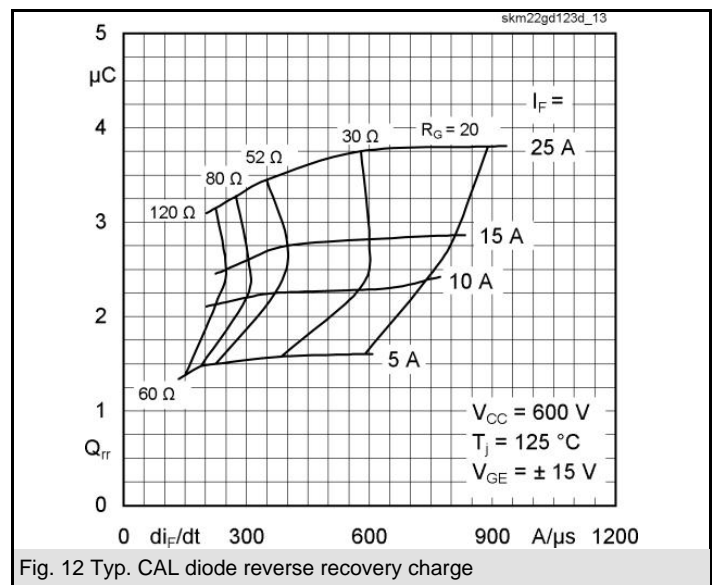
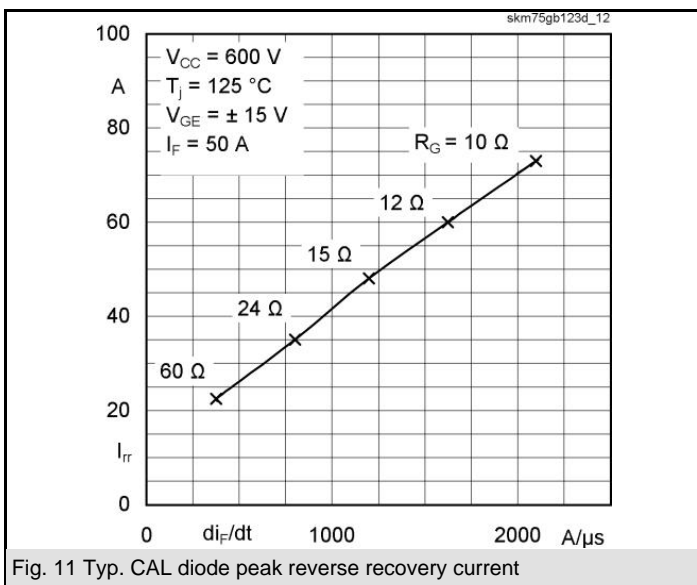
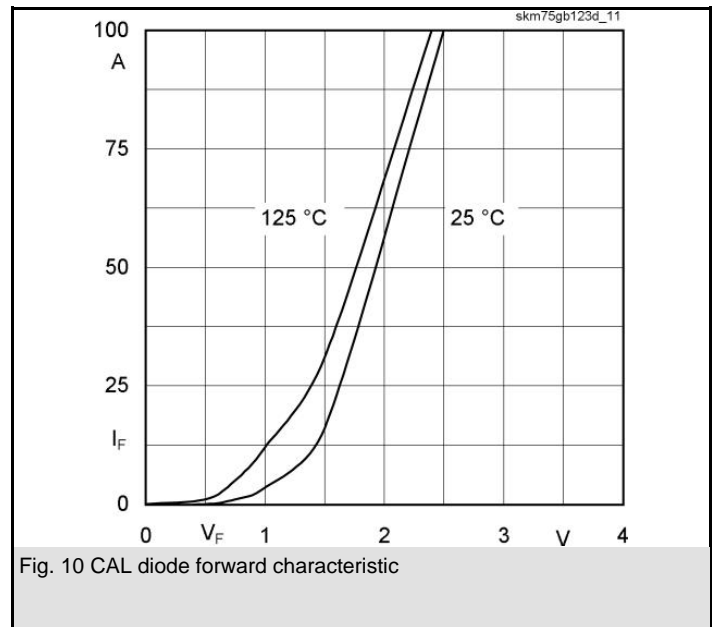
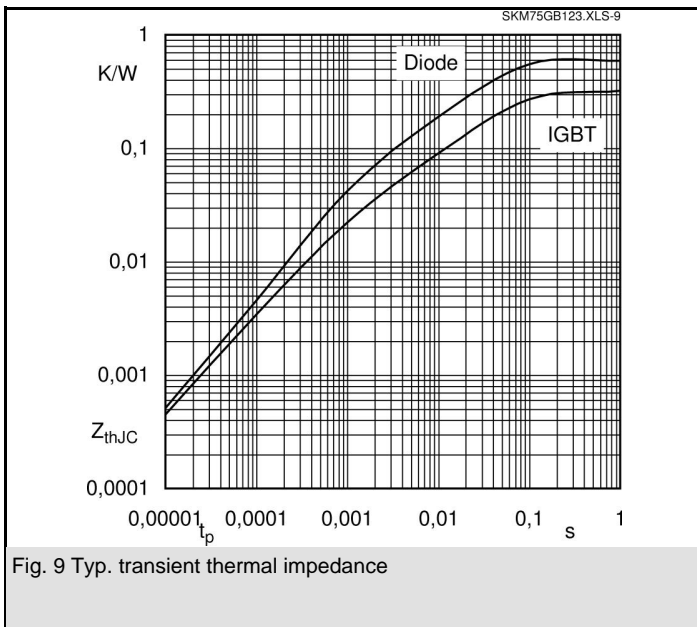
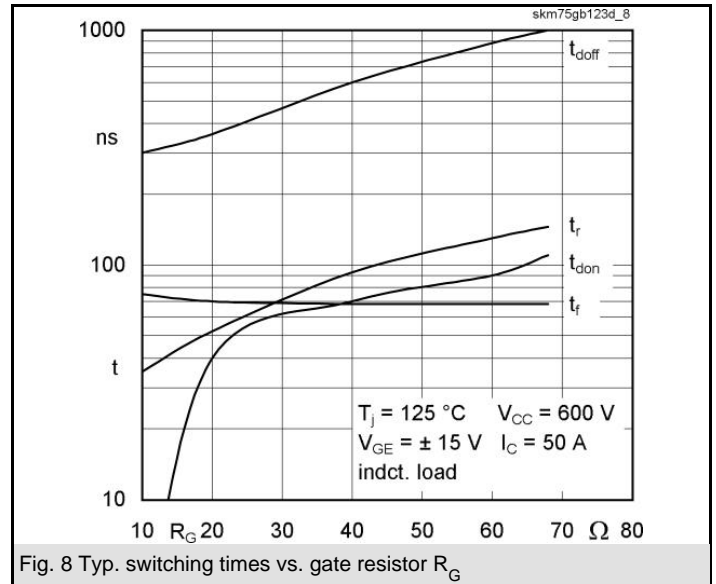
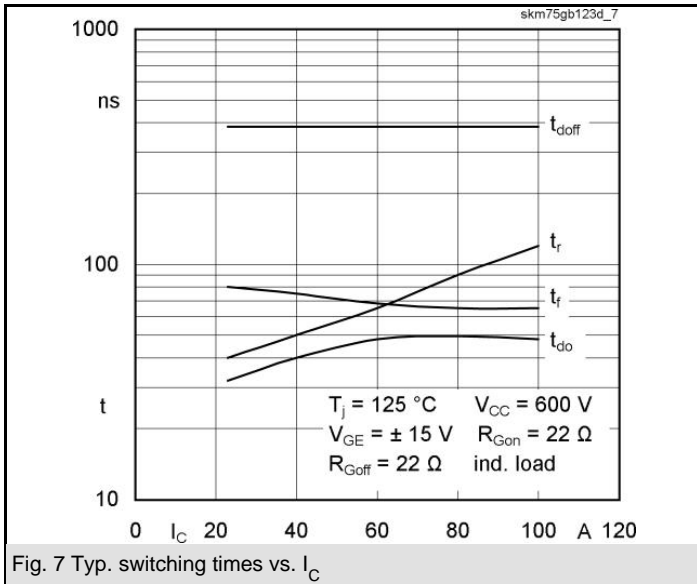
Typical Applications

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- UPS

Z_{th}		Conditions	Values	Units
$Z_{th(j-c)I}$				
$R_{\theta j-c}$	$i = 1$		180	mk/W
$R_{\theta j-c}$	$i = 2$		64	mk/W
$R_{\theta j-c}$	$i = 3$		22	mk/W
$R_{\theta j-c}$	$i = 4$		4	mk/W
$\tau_{th j-c}$	$i = 1$		0,0327	s
$\tau_{th j-c}$	$i = 2$		0,0479	s
$\tau_{th j-c}$	$i = 3$		0,008	s
$\tau_{th j-c}$	$i = 4$		0,005	s
$Z_{th(j-c)D}$				
$R_{\theta j-cD}$	$i = 1$		380	mk/W
$R_{\theta j-cD}$	$i = 2$		190	mk/W
$R_{\theta j-cD}$	$i = 3$		26	mk/W
$R_{\theta j-cD}$	$i = 4$		4	mk/W
$\tau_{th j-cD}$	$i = 1$		0,0947	s
$\tau_{th j-cD}$	$i = 2$		0,006	s
$\tau_{th j-cD}$	$i = 3$		0,08	s
$\tau_{th j-cD}$	$i = 4$		0,003	s





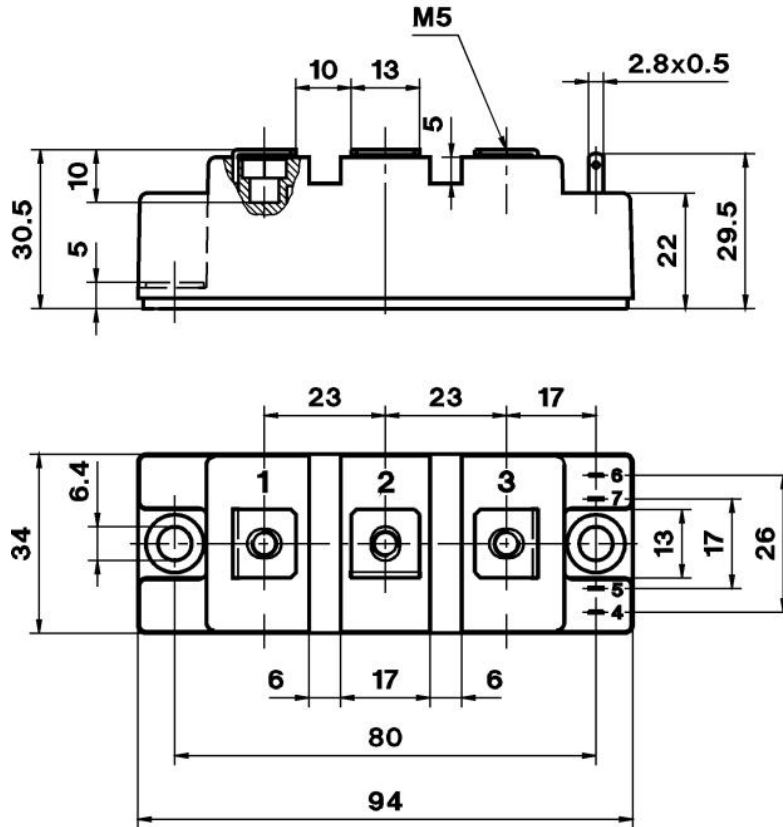


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UL Recognized

CASED61

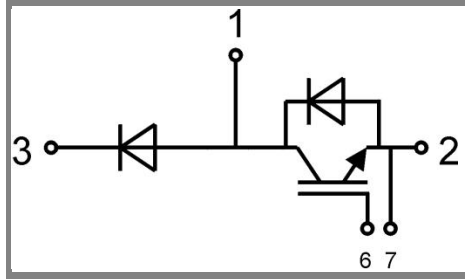
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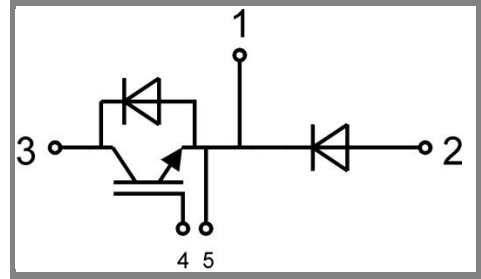
Case D 61



GB Case D 61



GAL Case D 62 (→ D 61)



GAR Case D 63 (→ D 61)