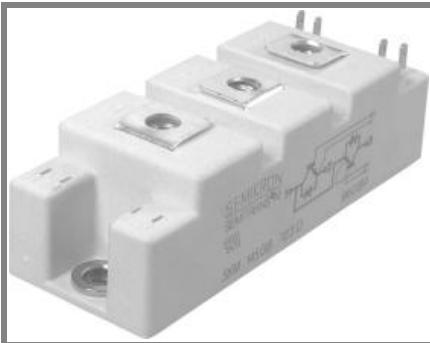


# SKM 145GB123D



SEMITRANS® 2

## IGBT Modules

SKM 145GB123D

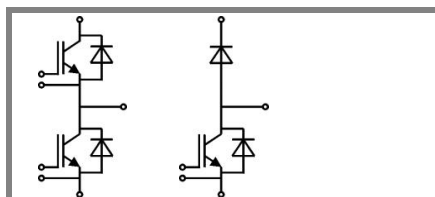
SKM 145GAL123D

### 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
- Large clearance (10 mm) and creepage distances (20 mm)

### Typical Applications

- Switching (not for linear use)
- AC inverter drives

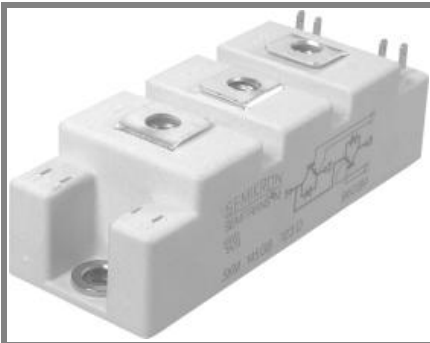


GB

GAL

Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$ , unless otherwise specified		
Symbol	Conditions	Values		Units
<b>IGBT</b>				
$V_{CES}$	$T_j = 25^\circ\text{C}$	1200		V
$I_C$	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	145	A
		$T_{case} = 80^\circ\text{C}$	110	A
$I_{CRM}$	$I_{CRM} = 2 \times I_{Cnom}$	200		A
$V_{GES}$		$\pm 20$		V
$t_{psc}$	$V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125^\circ\text{C}$ $V_{CES} < 1200\text{ V}$	10		$\mu\text{s}$
<b>Inverse Diode</b>				
$I_F$	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	130	A
		$T_{case} = 80^\circ\text{C}$	90	A
$I_{FRM}$	$I_{FRM} = 2 \times I_{Fnom}$	200		A
$I_{FSM}$	$t_p = 10\text{ ms}; \text{sin.}$	$T_j = 150^\circ\text{C}$	900	A
<b>Freewheeling Diode</b>				
$I_F$	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	170	A
		$T_{case} = 80^\circ\text{C}$	115	A
$I_{FRM}$	$I_{FRM} = 2 \times I_{Fnom}; t_p = 1\text{ ms}$	300		A
$I_{FSM}$	$t_p = 10\text{ ms}; \text{sin.}$	$T_j = 150^\circ\text{C}$	1440	A
<b>Module</b>				
$I_{t(RMS)}$		200		A
$T_{vj}$		- 40 ... + 150		$^\circ\text{C}$
$T_{stg}$		- 40 ... + 125		$^\circ\text{C}$
$V_{isol}$	AC, 1 min.	2500		V

Characteristics		$T_c = 25^\circ\text{C}$ , unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT</b>					
$V_{GE(th)}$	$V_{GE} = V_{CE}; I_C = 4\text{ mA}$	4,5	5,5	6,5	V
$I_{CES}$	$V_{GE} = 0\text{ V}; V_{CE} = V_{CES}; T_j = 25^\circ\text{C}$		0,1	0,3	mA
$V_{CE0}$		$T_j = 25^\circ\text{C}$	1,4	1,6	V
		$T_j = 125^\circ\text{C}$	1,6	1,8	V
$r_{CE}$	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	11	14	$\text{m}\Omega$
		$T_j = 125^\circ\text{C}$	15	19	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 100\text{ A}; V_{GE} = 15\text{ V}; T_j = ^\circ\text{C}_{chiplev.}$		2,5	3	V
$C_{ies}$	$V_{CE} = 25; V_{GE} = 0\text{ V}; f = 1\text{ MHz}$		6,5	8,5	nF
$C_{oes}$			1	1,5	nF
$C_{res}$			0,5	0,6	nF
$Q_G$	$V_{GE} = -8\text{ V} - +20\text{ V}$		1000		nC
$R_{Gint}$	$T_j = ^\circ\text{C}$		5		$\Omega$
$t_{d(on)}$	$R_{Gon} = 6,8\ \Omega$	$V_{CC} = 600\text{ V}$ $I_{Cnom} = 100\text{ A}$	160	320	ns
$t_r$			80	160	ns
$E_{on}$	$R_{Goff} = 6,8\ \Omega$	$T_j = 125^\circ\text{C}$ $V_{GE} = -15\text{ V}$	16		mJ
$t_{d(off)}$			400	520	ns
$t_f$			70	100	ns
$E_{off}$			12		mJ
$R_{th(j-c)}$	per IGBT			0,15	K/W



**SEMITRANS® 2**

## IGBT Modules

**SKM 145GB123D**

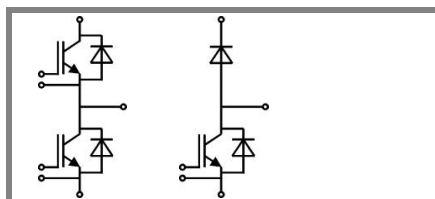
**SKM 145GAL123D**

### 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
- Large clearance (10 mm) and creepage distances (20 mm)

### Typical Applications

- Switching (not for linear use)
- AC inverter drives



GB

GAL

Characteristics		min.	typ.	max.	Units
<b>Inverse Diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 100 \text{ A}; V_{GE} = 0 \text{ V}$		2	2,5	V
			1,8		V
$V_{F0}$			1,1	1,4	V
					V
$r_F$			9	11	mΩ
					mΩ
$I_{RRM}$	$I_{Fnom} = 100 \text{ A}$		35		A
$Q_{rr}$	$di/dt = 1000 \text{ A}/\mu\text{s}$		5		μC
$E_{off}$	$V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$				mJ
$R_{th(j-c)D}$	per diode			0,36	K/W
<b>Freewheeling Diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 150 \text{ A}; V_{GE} = 0 \text{ V}$		2	2,5	V
			1,8		V
$V_{F0}$			1,1	1,4	V
					V
$r_F$			9	11	V
					V
$I_{RRM}$	$I_{Fnom} = 150 \text{ A}$		55		A
$Q_{rr}$			8		μC
$E_{off}$	$V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$				mJ
$R_{th(j-c)FD}$	per diode			0,3	K/W
<b>Module</b>					
$L_{CE}$				30	nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25 \text{ °C}$	0,75		mΩ
		$T_{case} = 125 \text{ °C}$	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.

# SKM 145GB123D



**SEMITRANS<sup>®</sup> 2**

## IGBT Modules

**SKM 145GB123D**

**SKM 145GAL123D**

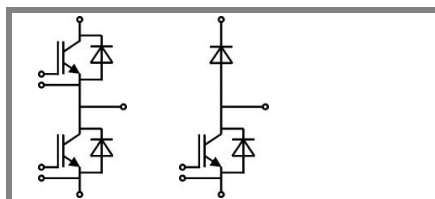
### Features

- 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
- Large clearance (10 mm) and creepage distances (20 mm)

### Typical Applications

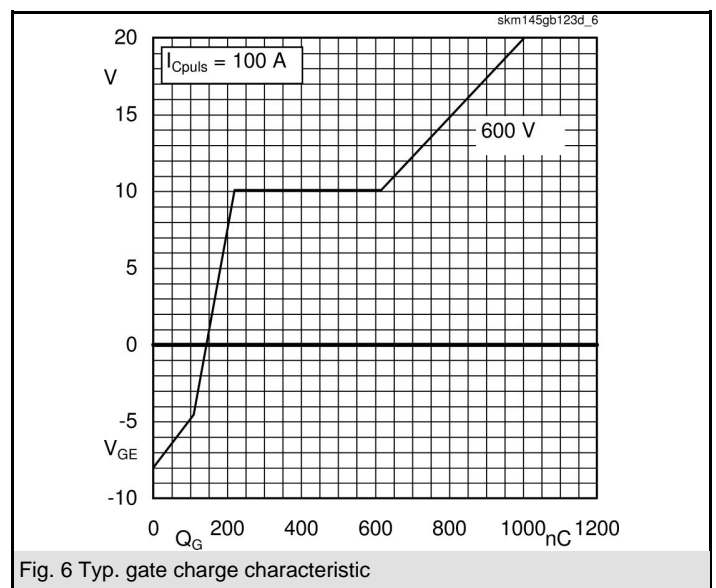
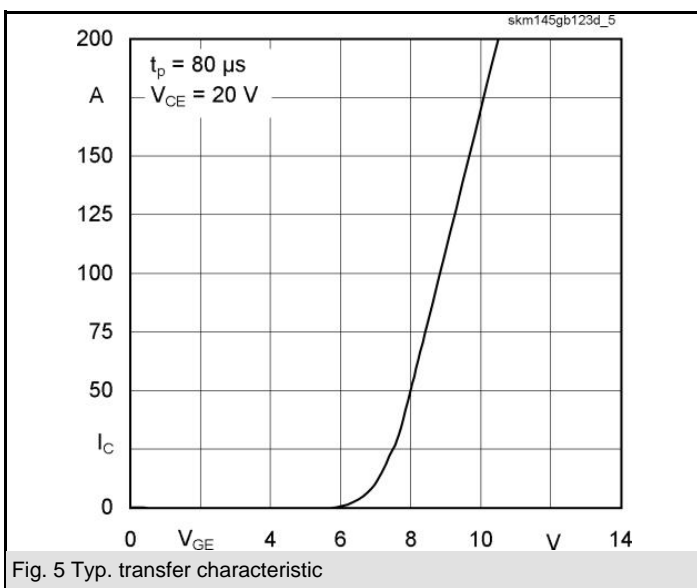
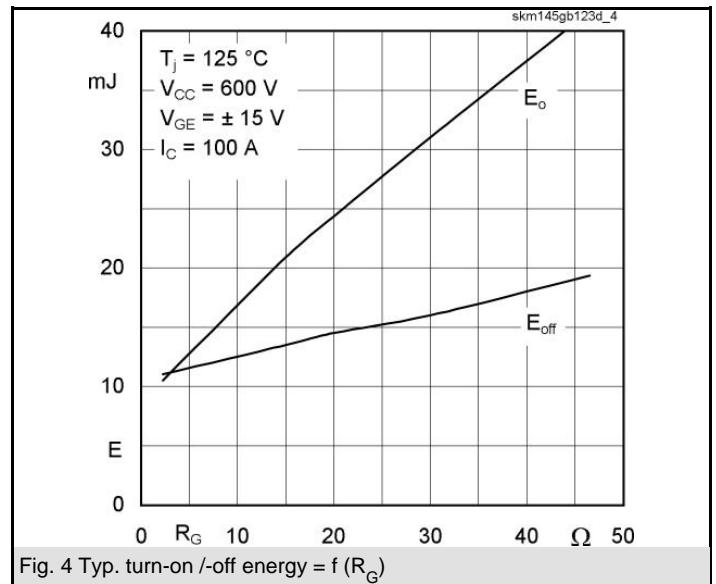
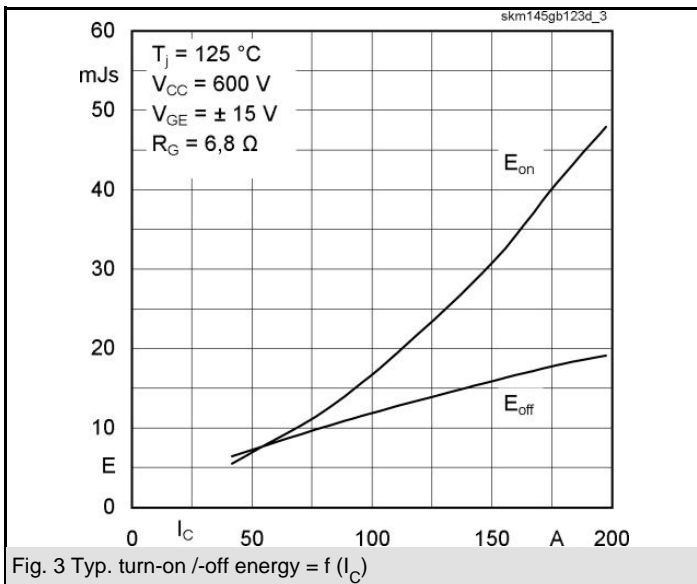
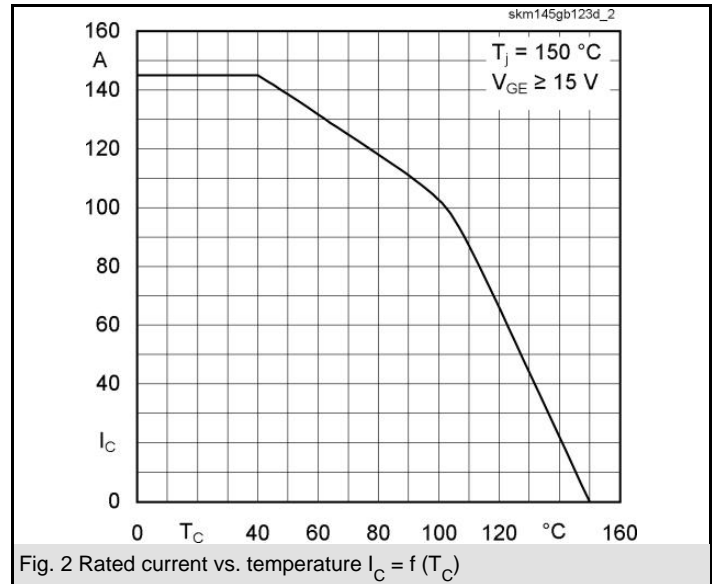
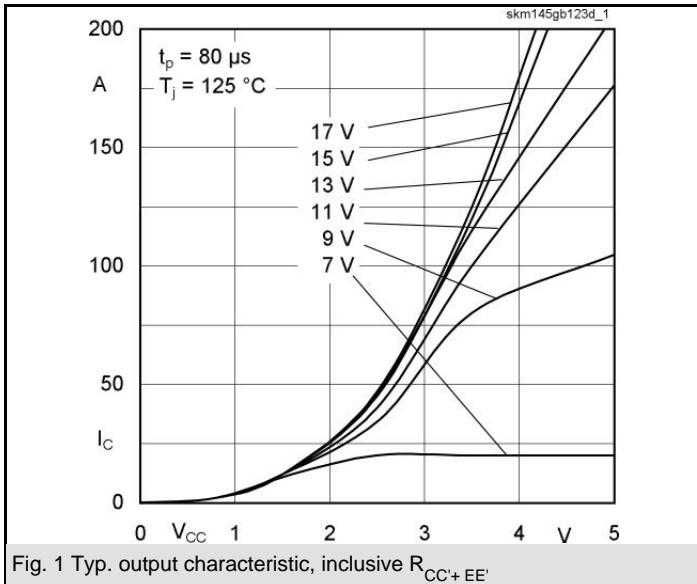
- Switching (not for linear use)
- AC inverter drives

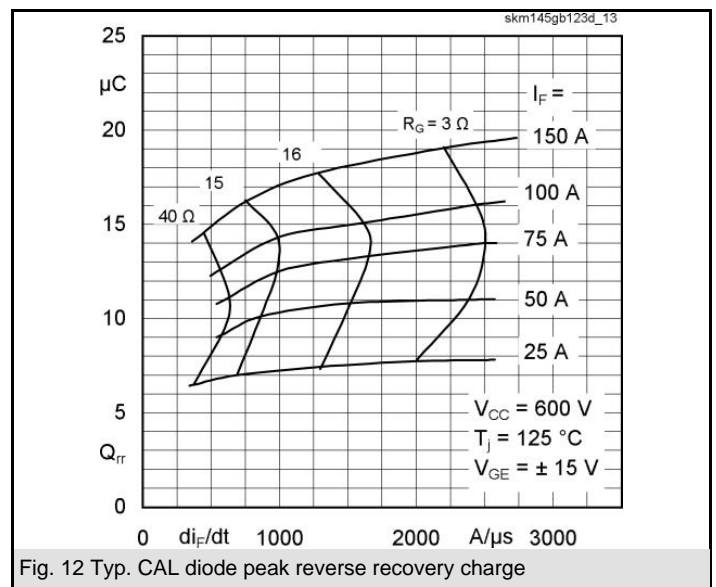
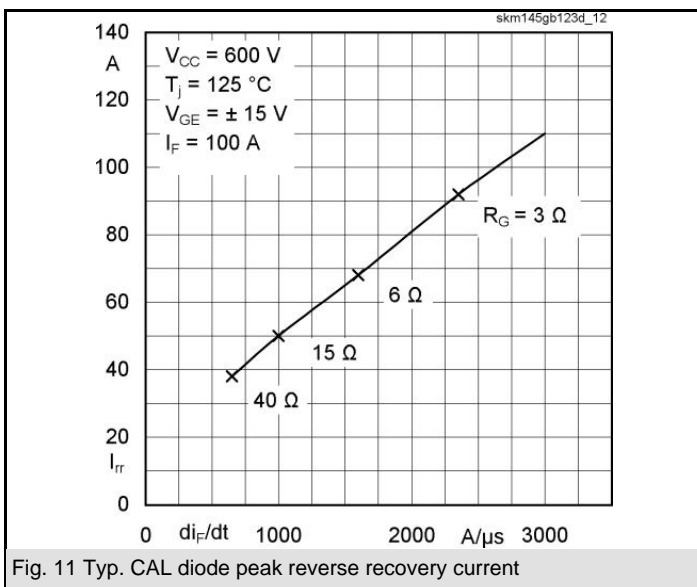
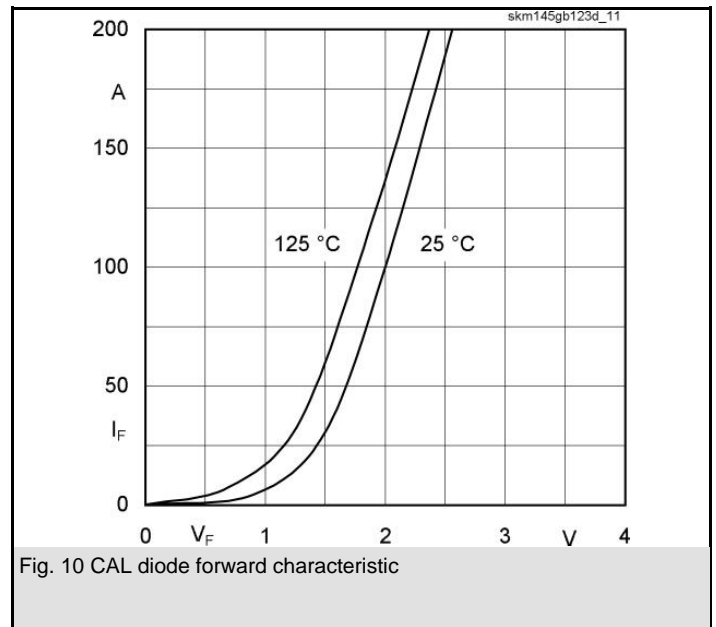
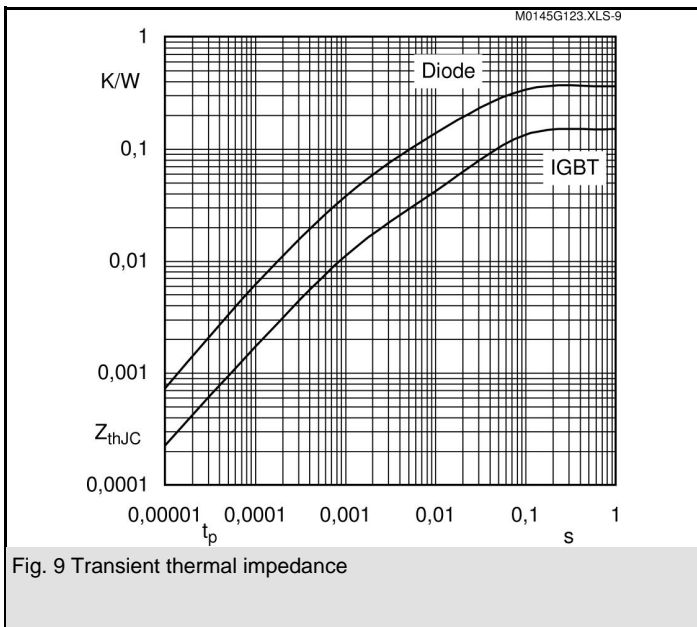
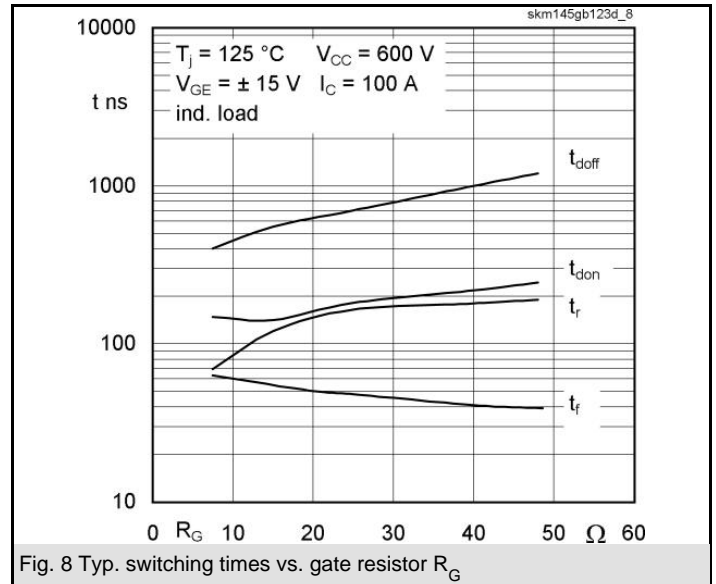
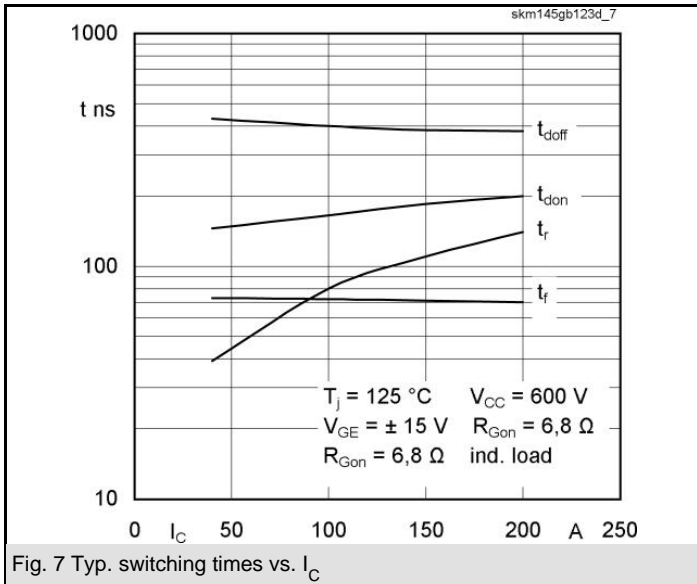
$Z_{th}$		Conditions	Values	Units
<b><math>Z_{th(j-c)I}</math></b>				
$R_{\theta j-c}$		$i = 1$	100	mk/W
$R_{\theta j-c}$		$i = 2$	38	mk/W
$R_{\theta j-c}$		$i = 3$	10	mk/W
$R_{\theta j-c}$		$i = 4$	2	mk/W
$\tau_{th j-c}$		$i = 1$	0,03	s
$\tau_{th j-c}$		$i = 2$	0,0287	s
$\tau_{th j-c}$		$i = 3$	0,0012	s
$\tau_{th j-c}$		$i = 4$	0,0002	s
<b><math>Z_{th(j-c)D}</math></b>				
$R_{\theta j-c}$		$i = 1$	240	mk/W
$R_{\theta j-c}$		$i = 2$	95	mk/W
$R_{\theta j-c}$		$i = 3$	22	mk/W
$R_{\theta j-c}$		$i = 4$	3	mk/W
$\tau_{th j-c}$		$i = 1$	0,054	s
$\tau_{th j-c}$		$i = 2$	0,0113	s
$\tau_{th j-c}$		$i = 3$	0,0012	s
$\tau_{th j-c}$		$i = 4$	0,005	s



GB

GAL



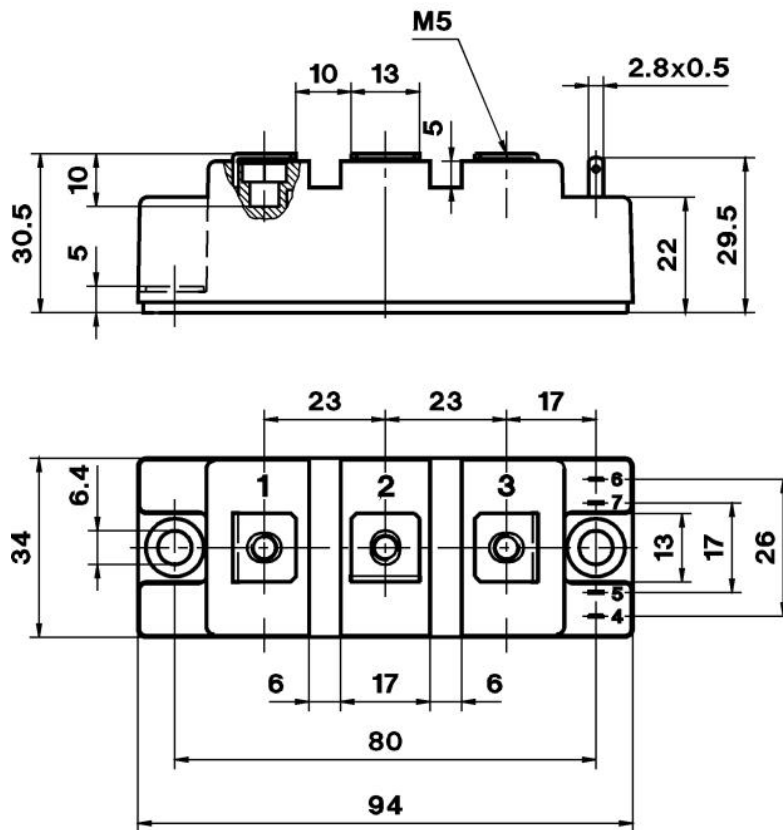


# SKM 145GB123D

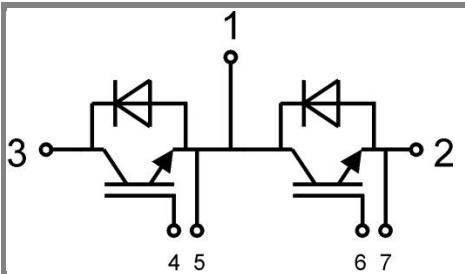
UL Recognized  
File no. E 63 532

Dimensions in mm

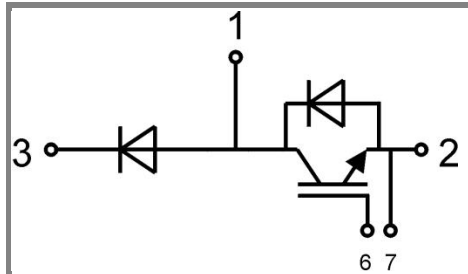
CASED61



Case D 61



GB Case D 61



GAL Case D 62 (→ D 61)