

# SKM 100GB173D



SEMITRANS™ 2

## IGBT Modules

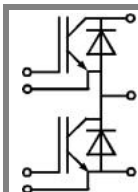
### SKM 100GB173D

#### Features

- N channel, Homogeneous Si
- 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

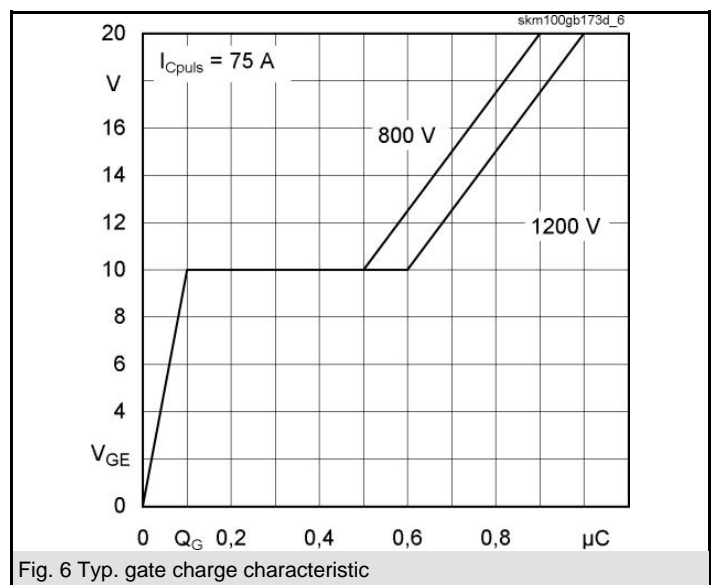
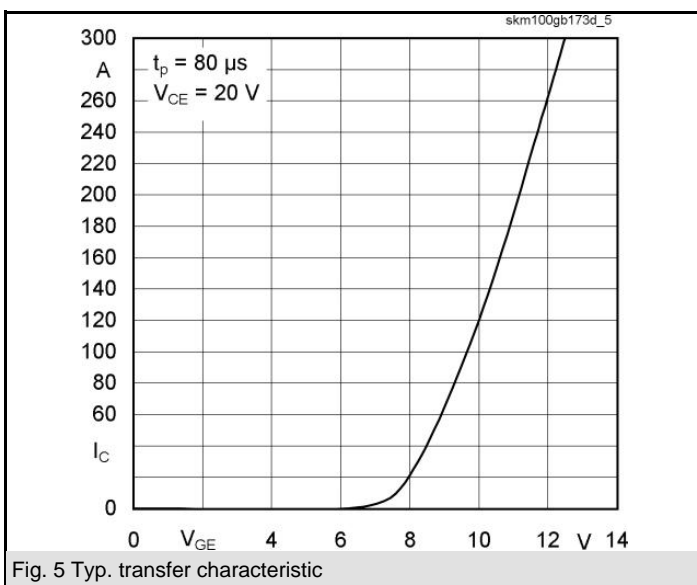
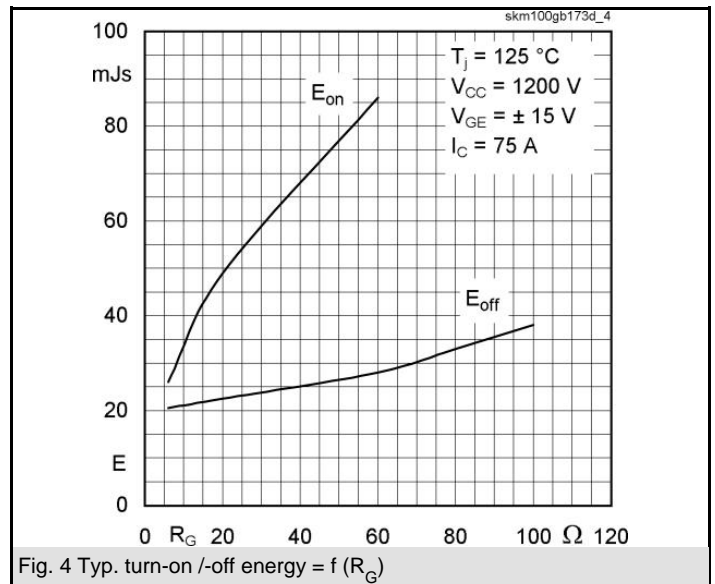
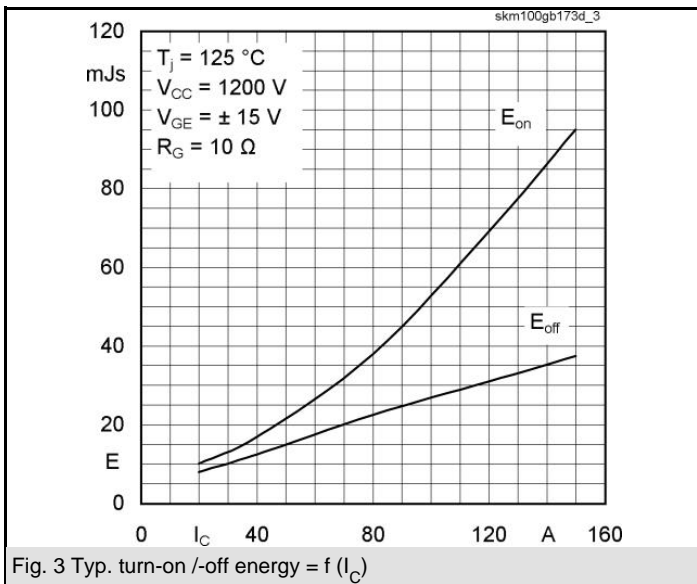
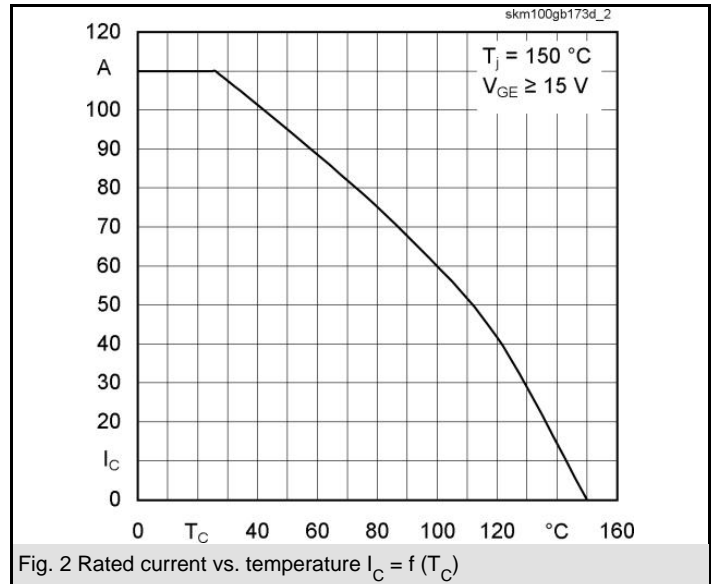
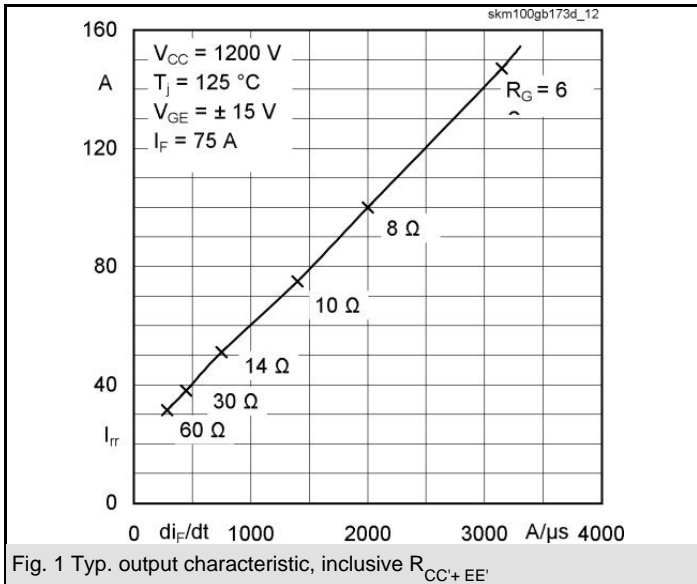
- AC inverter drives on mains 575 - 750 V<sub>AC</sub>
- DC bus voltage 750 - 1200 V<sub>DC</sub>
- Public transport (auxiliary syst.)
- Switching (not for linear use)

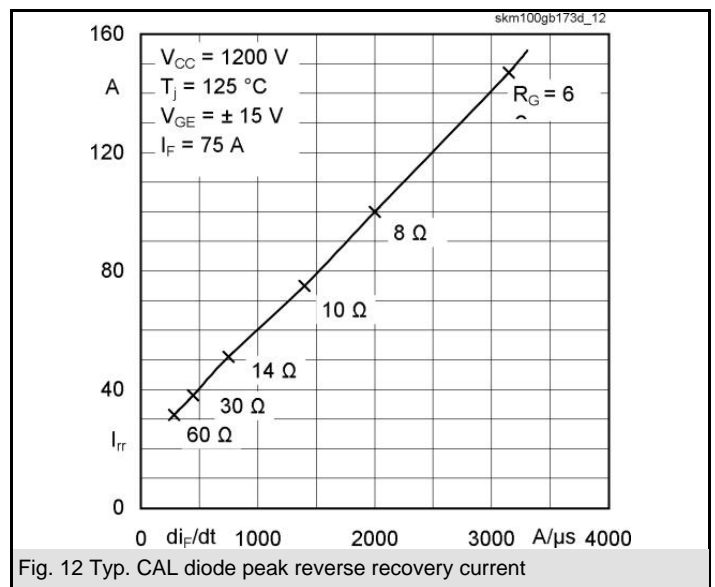
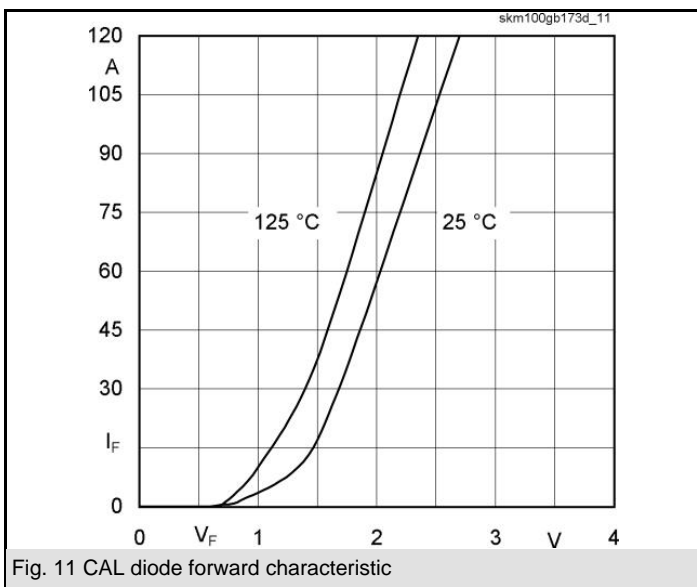
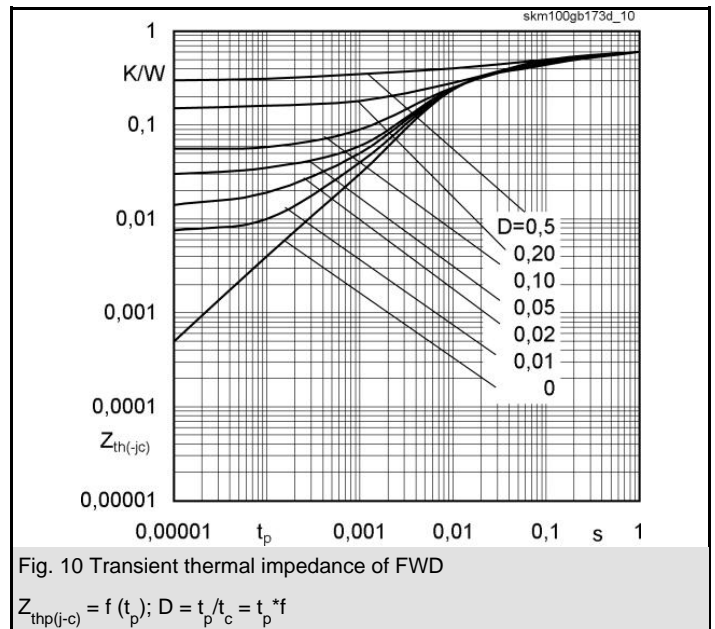
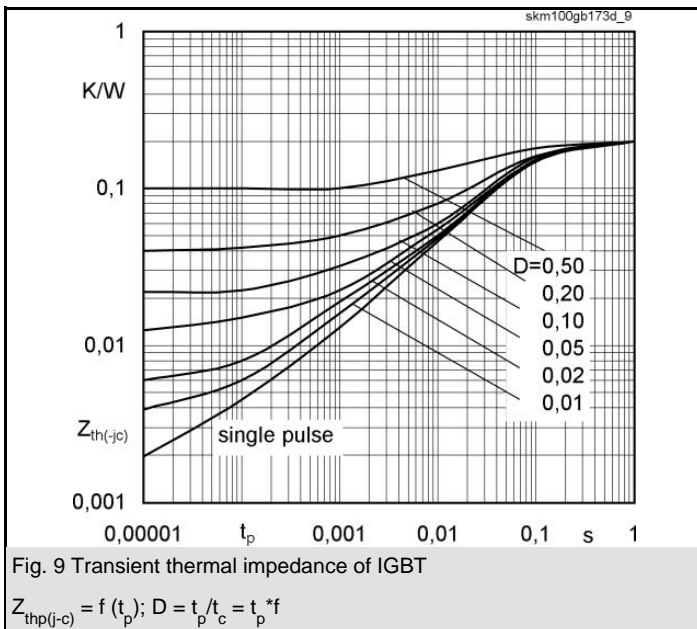
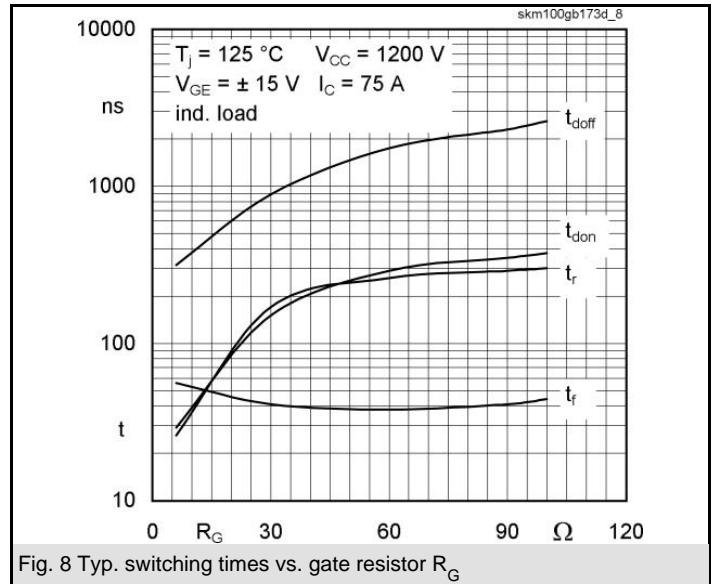
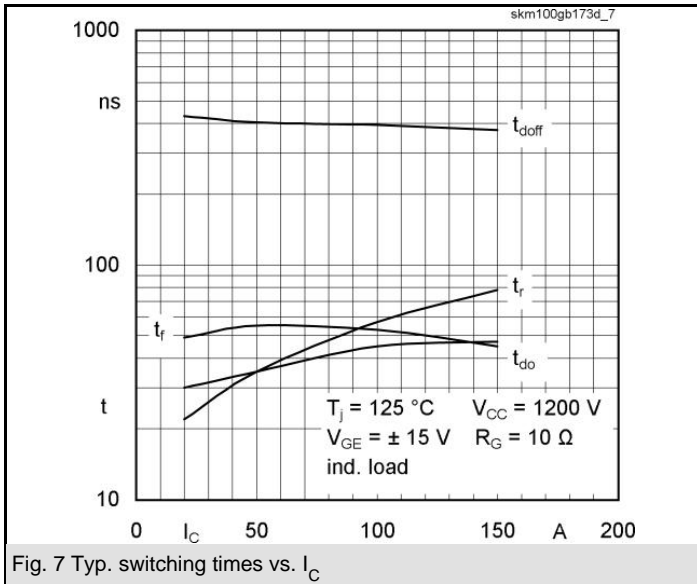


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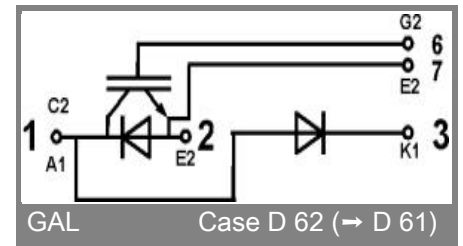
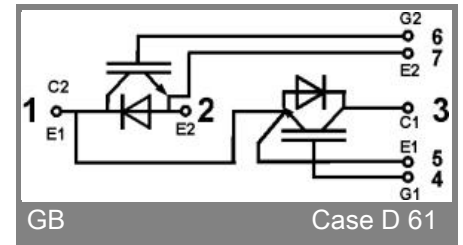
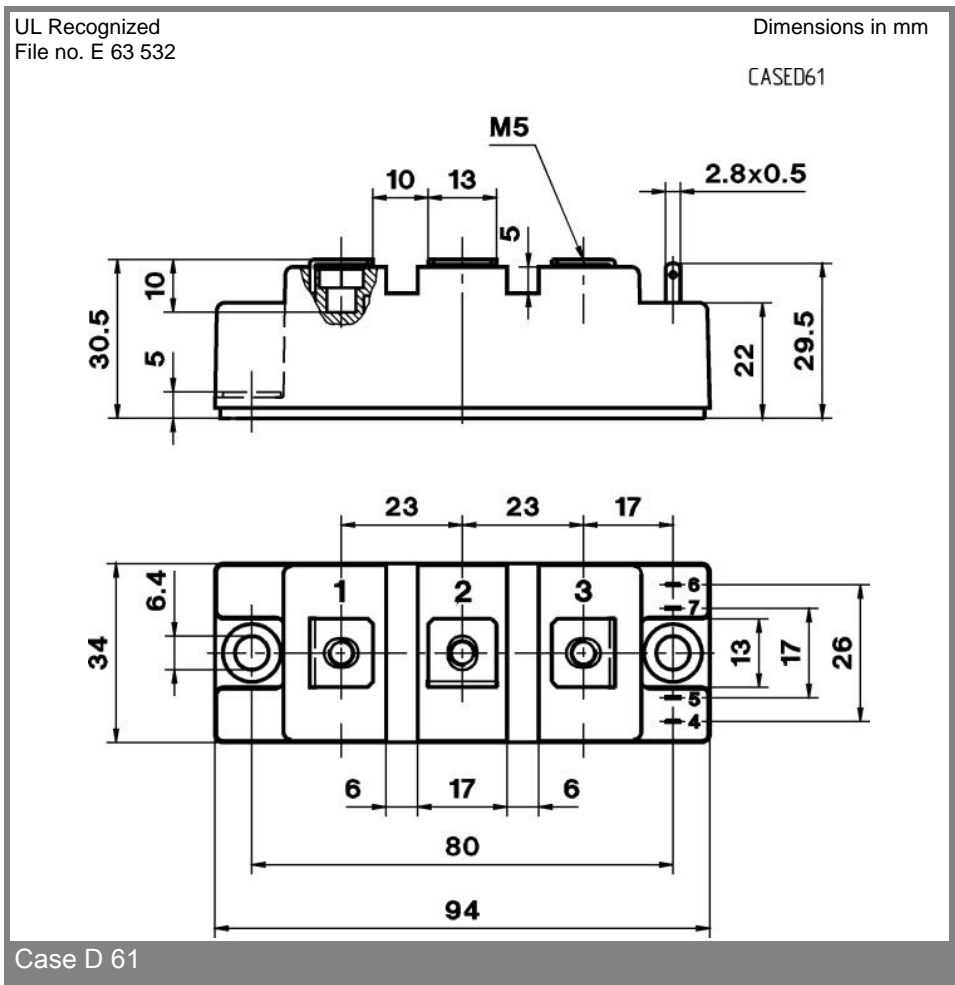
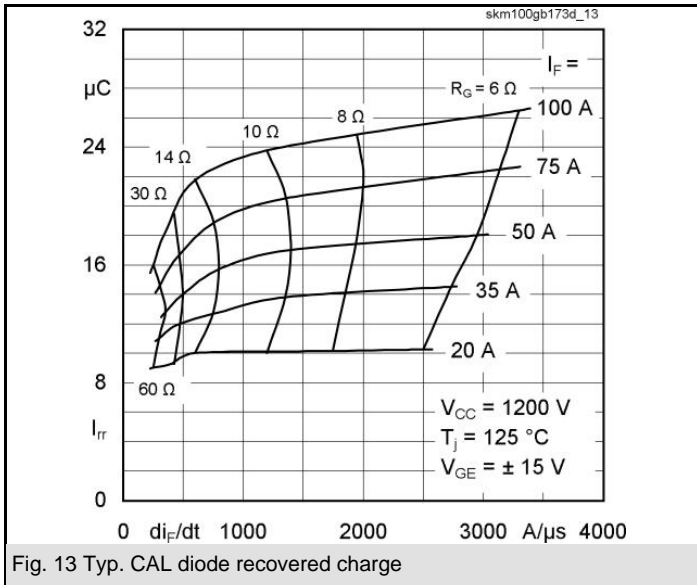
Absolute Maximum Ratings		$T_c = 25\text{ }^\circ\text{C}$ , unless otherwise specified	
Symbol	Conditions	Values	Units
<b>IGBT</b>			
$V_{CES}$		1700	V
$I_C$	$T_c = 25\text{ (}80\text{) }^\circ\text{C}$	110 (75)	A
$I_{CRM}$	$t_p = 1\text{ ms}$	150	A
$V_{GES}$		$\pm 20$	V
$T_{vj}$ ( $T_{stg}$ )	$T_{OPERATION} \leq T_{stg}$	- 40 ... + 150 (125)	$^\circ\text{C}$
$V_{isol}$	AC, 1 min.	4000	V
<b>Inverse diode</b>			
$I_F$	$T_c = 25\text{ (}80\text{) }^\circ\text{C}$	80 (50)	A
$I_{FRM}$	$t_p = 1\text{ ms}$	150	A
$I_{FSM}$	$t_p = 10\text{ ms; sin.; } T_j = 150\text{ }^\circ\text{C}$	720	A

Characteristics		$T_c = 25\text{ }^\circ\text{C}$ , unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT</b>					
$V_{GE(th)}$	$V_{GE} = V_{CE}; I_C = 6\text{ mA}$	4,8	5,5	6,2	V
$I_{CES}$	$V_{GE} = 0; V_{CE} = V_{CES}; T_j = 25\text{ (}125\text{) }^\circ\text{C}$		0,1	0,3	mA
$V_{CE(TO)}$	$T_j = 25\text{ (}125\text{) }^\circ\text{C}$		1,65 (1,9)	1,9 (2,15)	V
$r_{CE}$	$V_{GE} = 15\text{ V; } T_j = 25\text{ (}125\text{) }^\circ\text{C}$		23,3 (33,3)	26,6 (38)	m $\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 75\text{ A; } V_{GE} = 15\text{ V; chip level}$		3,4 (4,4)	3,9 (5)	V
$C_{ies}$	under following conditions		11		nF
$C_{oes}$	$V_{GE} = 0; V_{CE} = 25\text{ V; } f = 1\text{ MHz}$		1		nF
$C_{res}$			0,28		nF
$L_{CE}$				30	nH
$R_{CC+EE}$	res., terminal-chip $T_c = 0,75\text{ (}1\text{) }^\circ\text{C}$				m $\Omega$
$t_{d(on)}$	$V_{CC} = 1200\text{ V; } I_{Cnom} = 75\text{ A}$		40		ns
$t_r$	$R_{Gon} = R_{Goff} = 10\text{ }^\circ\Omega; T_j = 125\text{ }^\circ\text{C}$		45		ns
$t_{d(off)}$	$V_{GE} = \pm 15\text{ V}$		400		ns
$t_f$			56		ns
$E_{on} (E_{off})$			35 (21)		mJ
<b>Inverse diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 75\text{ A; } V_{GE} = 0\text{ V; } T_j = 25\text{ (}125\text{) }^\circ\text{C}$		2,2 (2)	2,7 (2,3)	V
$V_{(TO)}$	$T_j = 125\text{ (} )^\circ\text{C}$		1,3	1,5	V
$r_T$	$T_j = 125\text{ (} )^\circ\text{C}$		9	13	m $\Omega$
$I_{RRM}$	$I_{Fnom} = 75\text{ A; } T_j = 25\text{ (}125\text{) }^\circ\text{C}$		38 (51)		A
$Q_{rr}$	$di/dt = \text{A}/\mu\text{s}$		8 (19)		$\mu\text{C}$
$E_{rr}$	$V_{GE} = \text{V}$				mJ
<b>FWD</b>					
$V_F = V_{EC}$	$I_F = 100\text{ A; } V_{GE} = \text{V; } T_j = 25\text{ (}125\text{) }^\circ\text{C}$		2,2 (1,9)	2,7 (2,4)	V
$V_{(TO)}$	$T_j = 125\text{ (} )^\circ\text{C}$		1,2	1,5	V
$r_T$	$T_j = 125\text{ (} )^\circ\text{C}$		7	9	m $\Omega$
$I_{RRM}$	$I_F = 100\text{ A; } T_j = 25\text{ (}125\text{) }^\circ\text{C}$				A
$Q_{rr}$	$di/dt = \text{A}/\mu\text{s}$		10 (27)		$\mu\text{C}$
$E_{rr}$	$V_{GE} = \text{V}$				mJ
<b>Thermal characteristics</b>					
$R_{th(j-c)}$	per IGBT			0,2	K/W
$R_{th(j-c)D}$	per Inverse Diode			0,63	K/W
$R_{th(j-c)FD}$	per FWD			0,4	K/W
$R_{th(c-s)}$	per module			0,05	K/W
<b>Mechanical data</b>					
$M_s$	to heatsink M6	3		5	Nm
$M_t$	to terminals M5	2,5		5	Nm
w				160	g





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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.