

SEMITOR® 4

IGBT Module

SK150MLI066T

Preliminary Data

Features

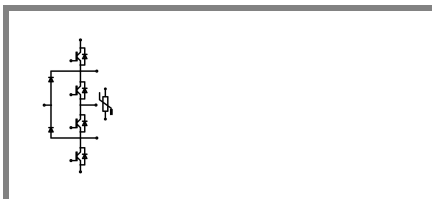
- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- Trench IGBT technology
- CAL technology FWD
- Integrated NTC temperature sensor

Typical Applications*

- Multi level inverter

Remarks

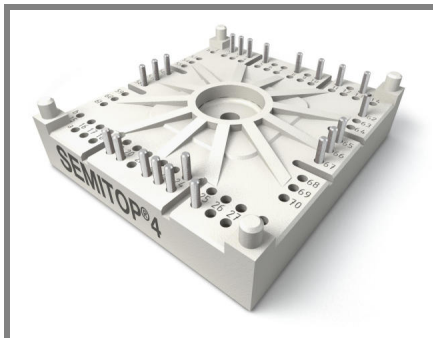
- $V_{isol} = 3000V$ AC, 1s, 50Hz
- Dynamic measure: DUT = IGBT (Gate pin 55) and Neutral Clamp Diode (Kathode pin 56) as free-wheeling diode



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Absolute Maximum Ratings		$T_s = 25\text{ °C}$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V_{CES}	$T_j = 25\text{ °C}$	600		V
I_C	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	151	A
		$T_s = 70\text{ °C}$	120	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	300		A
V_{GES}		± 20		V
t_{psc}	$V_{CC} = 360\text{ V}$; $V_{GE} \leq 20\text{ V}$; $T_j = 125\text{ °C}$ $V_{CES} < 600\text{ V}$	6		µs
Inverse Diode				
I_F	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	115	A
		$T_s = 70\text{ °C}$	90	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	300		A
Freewheeling Diode				
I_F	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	115	A
		$T_s = 70\text{ °C}$	90	A
I_{FRM}		300		A
Module				
$I_{t(RMS)}$				A
T_{vj}		-40 ... +175		°C
T_{stg}		-40 ... +125		°C
V_{isol}	AC, 1 min.	2500		V

Characteristics		$T_s = 25\text{ °C}$, unless otherwise specified				
Symbol	Conditions	min.	typ.	max.	Units	
IGBT						
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 2\text{ mA}$	5	5,8	6,5	V	
I_{CES}	$V_{GE} = 0\text{ V}$, $V_{CE} = V_{CES}$	$T_j = 25\text{ °C}$	0,0076		mA	
		$T_j = 125\text{ °C}$			mA	
I_{GES}	$V_{CE} = 0\text{ V}$, $V_{GE} = 20\text{ V}$	$T_j = 25\text{ °C}$		1200	nA	
V_{CE0}		$T_j = 25\text{ °C}$		0,8	V	
		$T_j = 150\text{ °C}$		0,7	1	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25\text{ °C}$		4	mΩ	
		$T_j = 150\text{ °C}$		6,5	7	mΩ
$V_{CE(sat)}$	$I_{Cnom} = 150\text{ A}$, $V_{GE} = 15\text{ V}$	$T_j = 25\text{ °C}_{chiplev.}$		1,45	V	
		$T_j = 150\text{ °C}_{chiplev.}$		1,65	2,05	V
C_{ies}	$V_{CE} = 25$, $V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$		9,4	nF	
C_{oes}				0,6	nF	
C_{res}				0,29	nF	
Q_G	$V_{GE} = -7V...+15V$			1350	nC	
R_{Gint}	$T_j = 150\text{ °C}$			2	Ω	
$t_{d(on)}$	$R_{Gon} = 4\text{ Ω}$ $di/dt = 4100\text{ A/μs}$	$V_{CC} = 300V$ $I_C = 150A$			100	ns
t_r					54	ns
E_{on}					2,7	mJ
$t_{d(off)}$	$R_{Goff} = 4\text{ Ω}$ $di/dt = 4100\text{ A/μs}$	$T_j = 150\text{ °C}$ $V_{GE} = -7/+15V$			450	ns
t_f					65	ns
E_{off}					5,9	mJ
$R_{th(j-s)}$	per IGBT			0,55	K/W	



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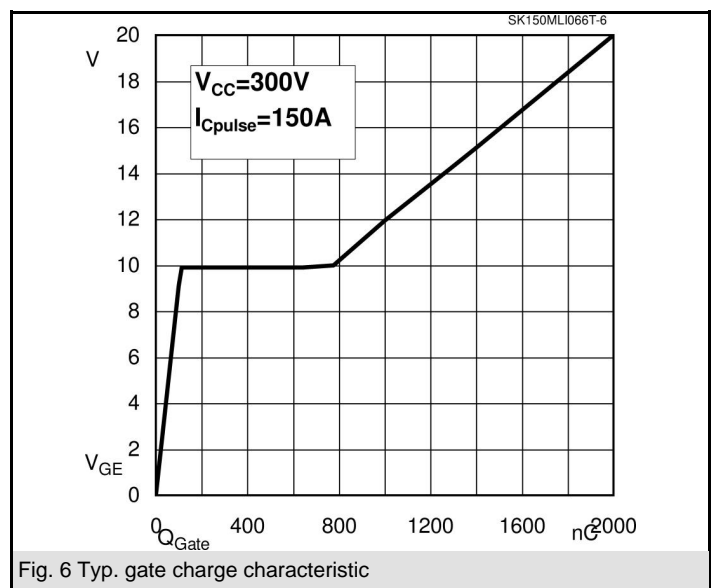
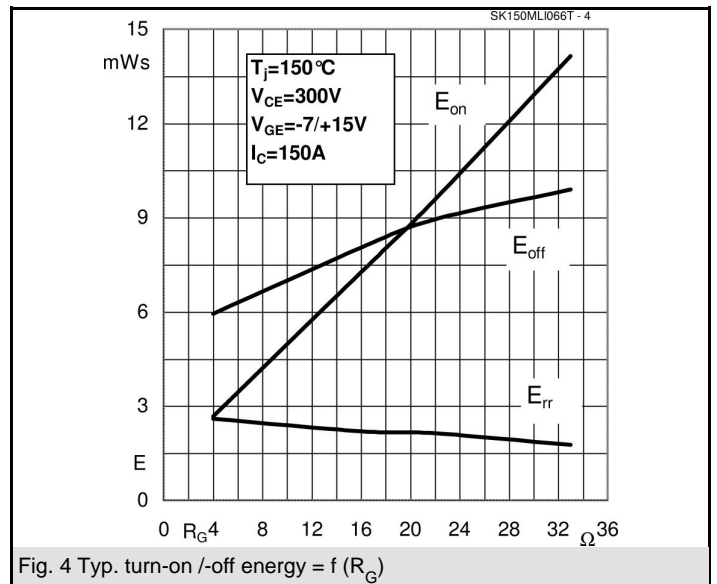
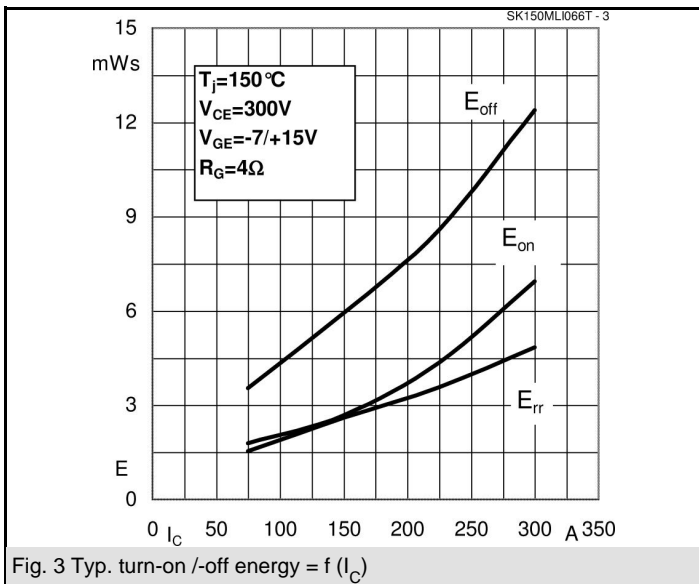
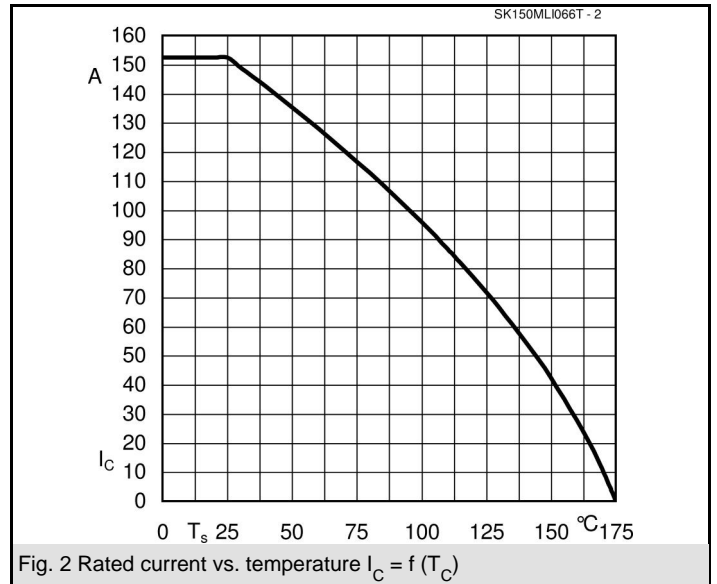
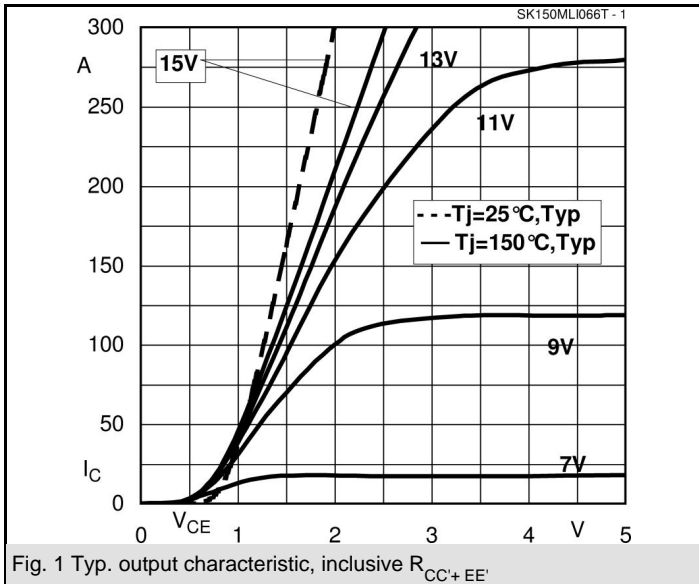


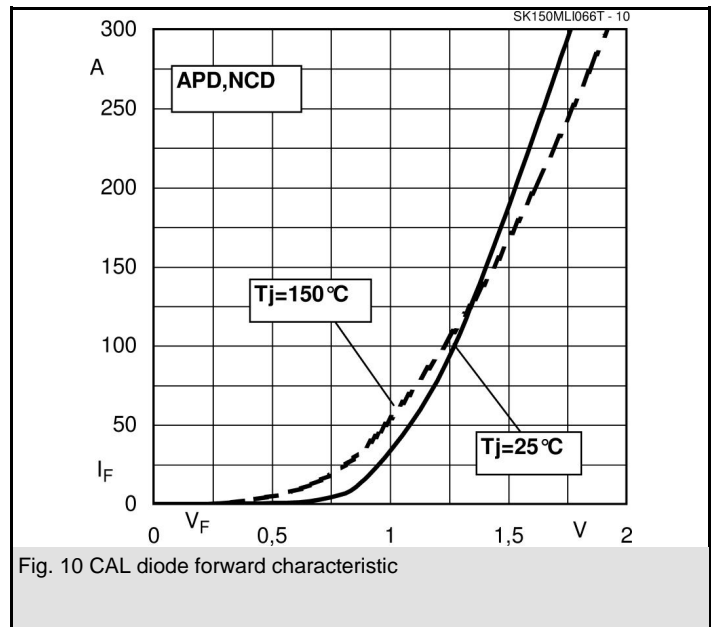
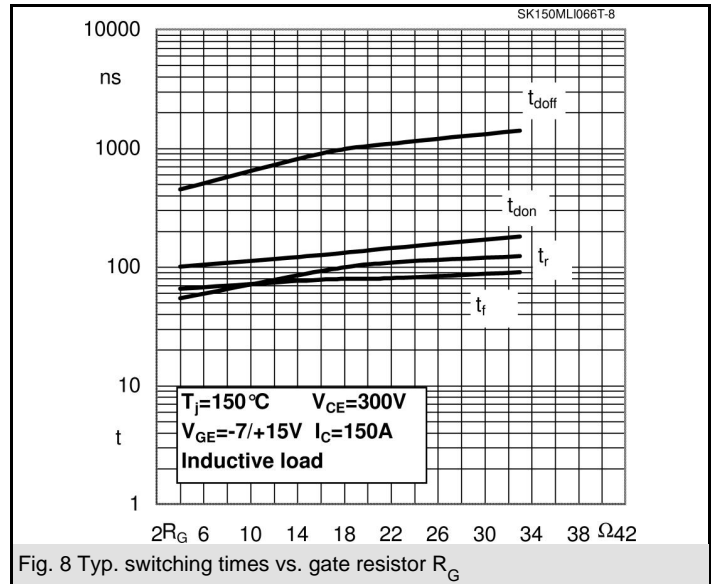
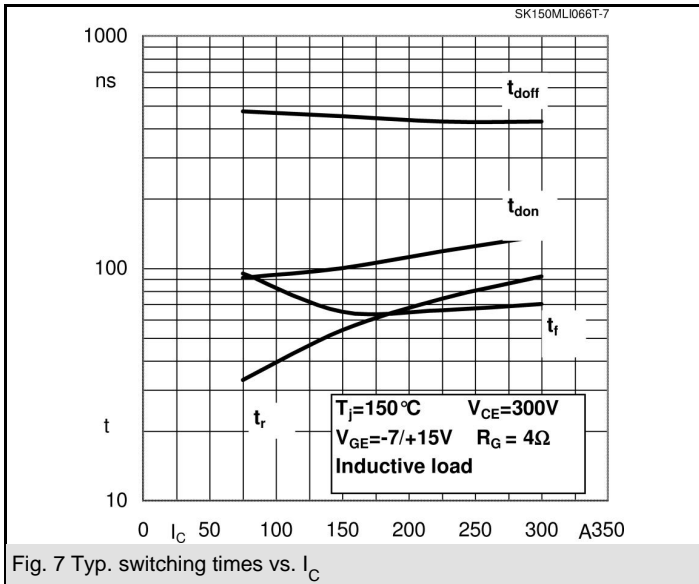
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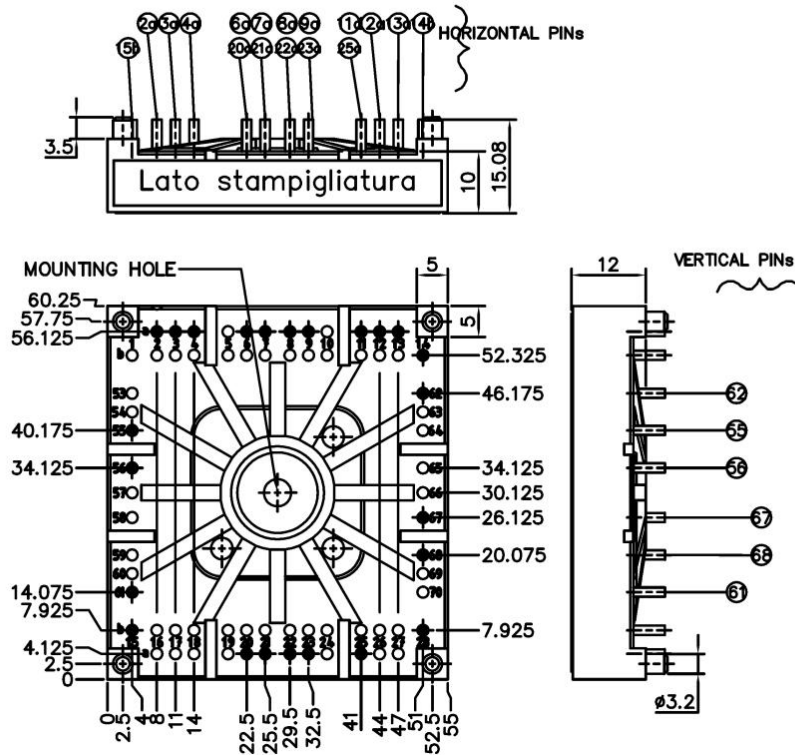
Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 150 A; V_{GE} = 0 V$	$T_j = 25 ^\circ C_{chiplev.}$	1,5	1,7	V
		$T_j = 150 ^\circ C_{chiplev.}$	1,5	1,7	V
V_{F0}		$T_j = 25 ^\circ C$	1	1,1	V
		$T_j = 150 ^\circ C$	0,9	1	V
r_F		$T_j = 25 ^\circ C$	3,5	4	mΩ
		$T_j = 150 ^\circ C$	4	4,7	mΩ
I_{RRM}	$I_F = 150 A$	$T_j = 150 ^\circ C$	130		A
Q_{rr}	$di/dt = 4100 A/\mu s$		8		μC
E_{rr}	$V_R = 300V$		2,6		mJ
$R_{th(j-s)D}$	per diode		0,72		K/W
Freewheeling Diode (Neutral Clamp Diode)					
$V_F = V_{EC}$	$I_{Fnom} = 150 A; V_{GE} = 0 V$	$T_j = 25 ^\circ C_{chiplev.}$	1,5	1,7	V
		$T_j = 150 ^\circ C_{chiplev.}$	1,5	1,7	V
V_{F0}		$T_j = 25 ^\circ C$	1	1,1	V
		$T_j = 150 ^\circ C$	0,9	1	V
r_F		$T_j = 25 ^\circ C$	3,5	4	V
		$T_j = 150 ^\circ C$	4	4,7	V
I_{RRM}	$I_F = 150 A$	$T_j = 150 ^\circ C$	120		A
Q_{rr}	$di/dt = 3100 A/\mu s$		8		μC
E_{rr}	$V_R = 300V$		2,4		mJ
$R_{th(j-s)FD}$	per diode		0,72		K/W
M_s	to heat sink	2,5		2,75	Nm
w			60		g
Temperature sensor					
R_{100}	$T_s = 100^\circ C (R_{25} = 5k\Omega)$		493±5%		Ω

This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

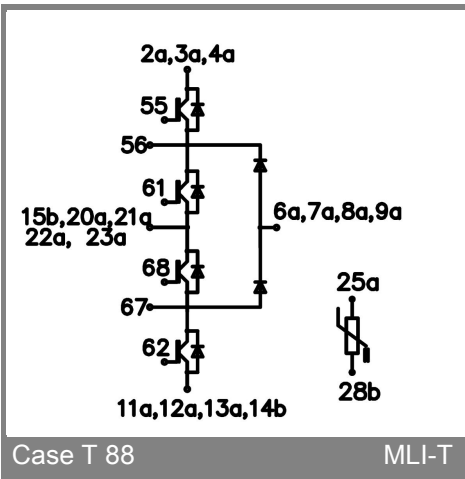
* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our personal.







Case T 88 (Suggested hole diameter for the solder pins in the circuit board: 2mm. Suggested hole diameter for the mounting pins in the circuit board: 3,6mm)



Case T 88

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