

SEMITOR® 4

IGBT Module

SK100MLI066T

Preliminary Data

Features

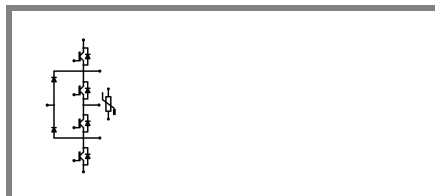
- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- Trench IGBT technology
- CAL technology FWD
- Integrated NTC temperature sensor

Typical Applications*

- Multi level inverter

Remarks

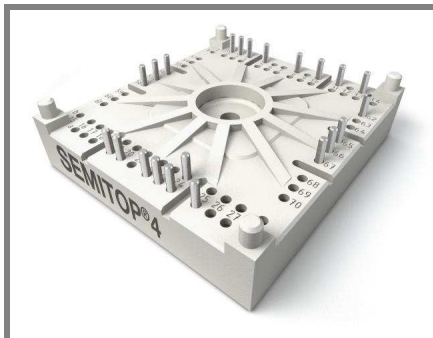
- $V_{isol} = 3000V$ AC, 1s, 50Hz
- Dynamic measure: DUT= IGBT (Gate pin 55) and Neutral Clamp Diode (Kathode pin 56) as free-wheeling diode



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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	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	105 A
		$T_s = 70\text{ °C}$	80 A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	200	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	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	110 A
		$T_s = 70\text{ °C}$	85 A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	200	A
Freewheeling Diode			
I_F	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	110 A
		$T_s = 70\text{ °C}$	85 A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	200	A
Module			
$I_{t(RMS)}$			A
T_{vj}		-40 ... +175	$^{\circ}\text{C}$
T_{stg}		-40 ... +125	$^{\circ}\text{C}$
V_{isol}	AC, 1 min.	2500	V

Characteristics		$T_s = 25\text{ °C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 1,6\text{ mA}$	5	5,8	6,5	V
I_{CES}	$V_{GE} = 0\text{ V}$, $V_{CE} = V_{CES}$	$T_j = 25\text{ °C}$		0,0052	mA
		$T_j = 125\text{ °C}$			mA
I_{GES}	$V_{CE} = 0\text{ V}$, $V_{GE} = 20\text{ V}$			1200	nA
V_{CE0}		$T_j = 25\text{ °C}$	0,8	1,1	V
		$T_j = 150\text{ °C}$	0,7	1	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25\text{ °C}$	6,5	8	$\text{m}\Omega$
		$T_j = 150\text{ °C}$	9,5	10,5	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 100\text{ A}$, $V_{GE} = 15\text{ V}$	$T_j = 25\text{ °C}_{chiplev.}$	1,45	1,85	V
		$T_j = 150\text{ °C}_{chiplev.}$	1,65	2,05	V
C_{ies}	$V_{CE} = 25$, $V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$		6,28	nF
C_{oes}				0,4	nF
C_{res}				0,19	nF
Q_G	$V_{GE} = -7V...+15V$		1000		nC
$t_{d(on)}$	$R_{Gon} = 4\ \Omega$ $di/dt = 3100\text{ A}/\mu\text{s}$	$V_{CC} = 300V$ $I_C = 100A$		136	ns
t_r				48	ns
E_{on}				2,5	mJ
$t_{d(off)}$	$R_{Goff} = 4\ \Omega$ $di/dt = 3100\text{ A}/\mu\text{s}$	$T_j = 150\text{ °C}$ $V_{GE} = -7/+15V$		457	ns
t_f				50	ns
E_{off}				4,2	mJ
$R_{th(j-s)}$	per IGBT		0,65		K/W



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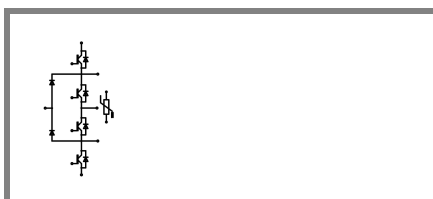
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- Trench IGBT technology
- CAL technology FWD
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Typical Applications*

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Remarks

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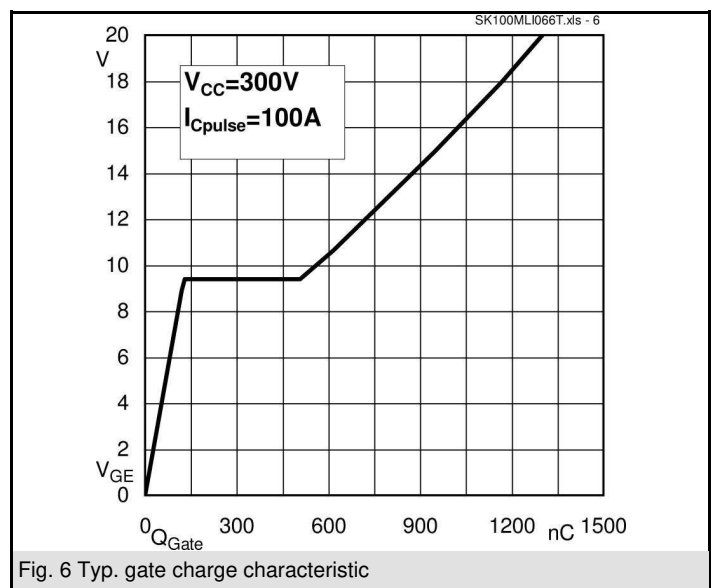
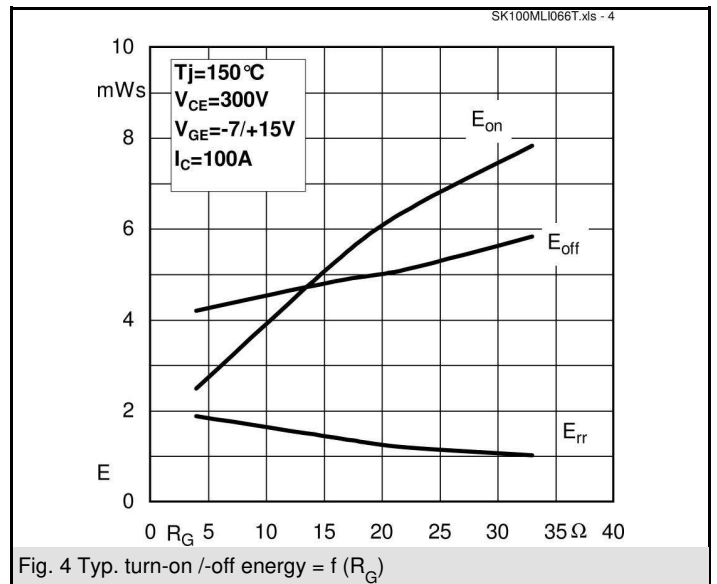
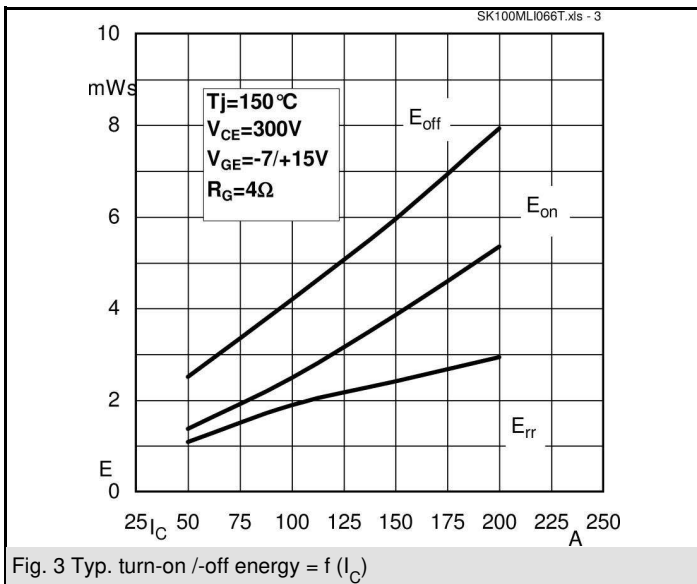
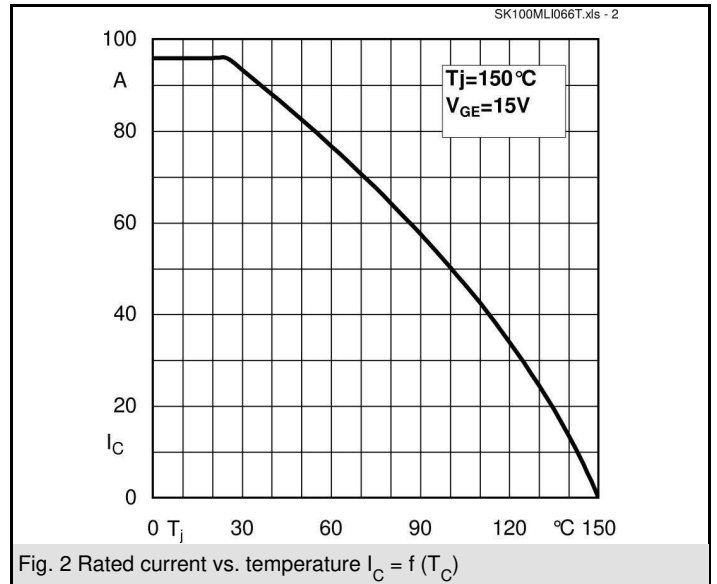
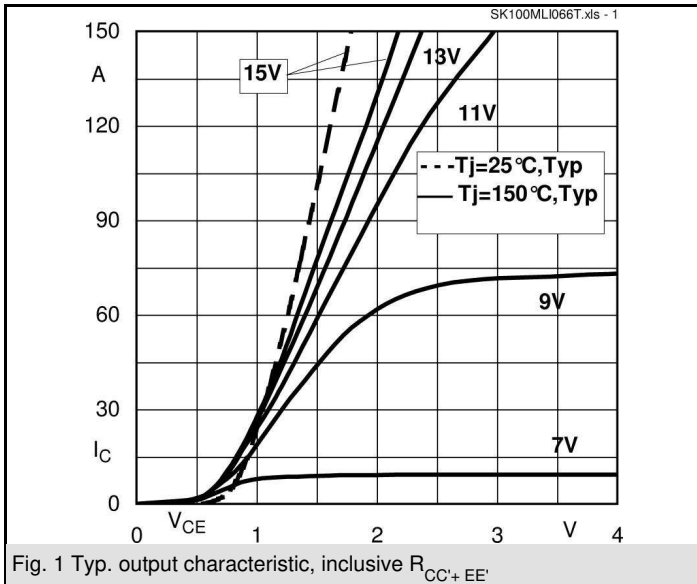


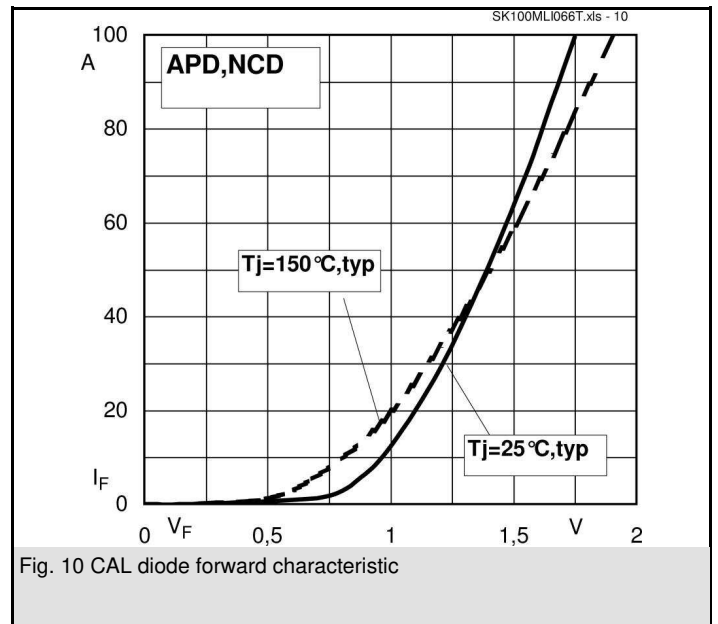
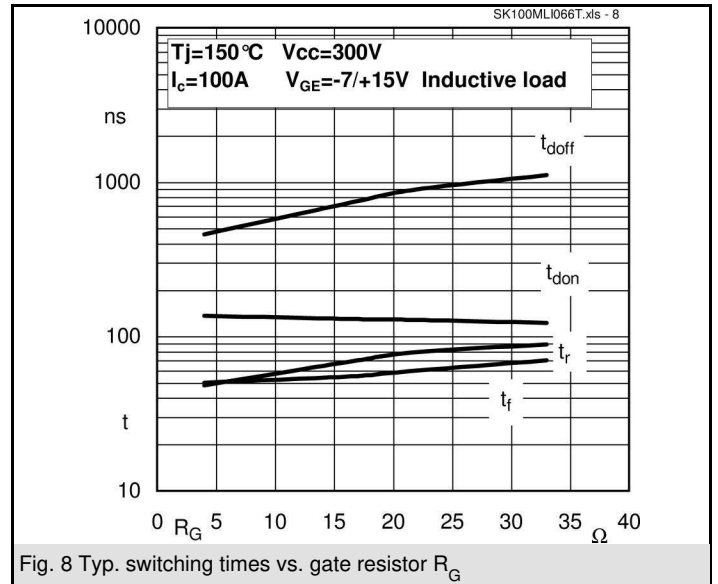
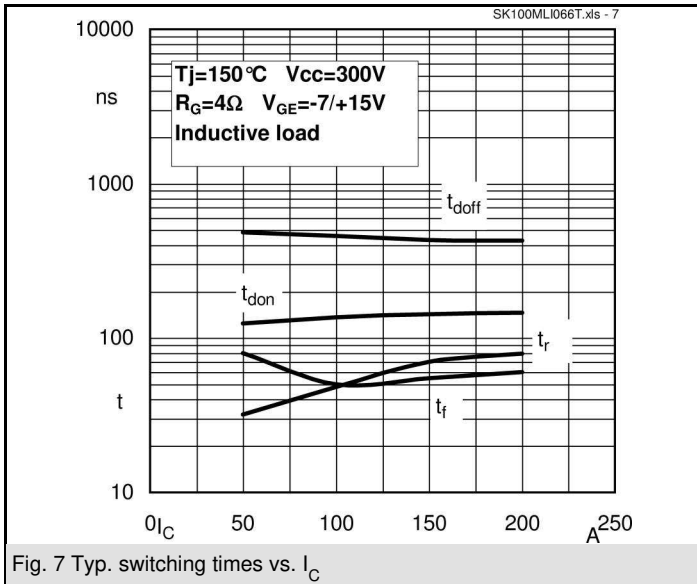
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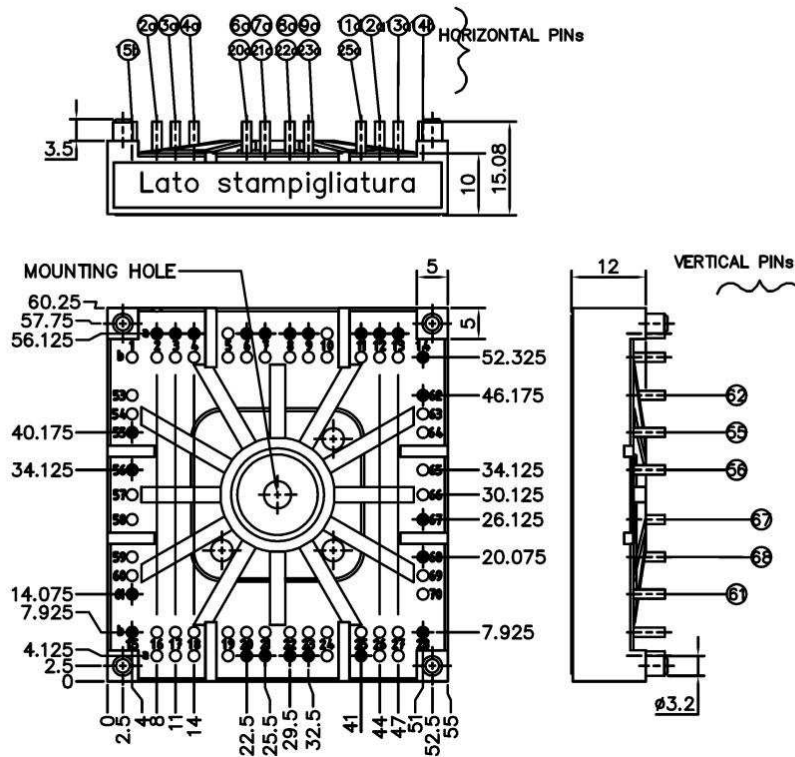
Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 100 A; V_{GE} = 0 V$		$T_j = 25 ^\circ C_{chiplev.}$	1,35	V
			$T_j = 150 ^\circ C_{chiplev.}$	1,31	V
V_{F0}			$T_j = 25 ^\circ C$	0,9	V
			$T_j = 150 ^\circ C$	0,85	V
r_F			$T_j = 25 ^\circ C$	4,5	mΩ
			$T_j = 150 ^\circ C$	6,3	mΩ
I_{RRM}	$I_F = 100 A$	$T_j = 150 ^\circ C$	84		A
Q_{rr}	$di/dt = 3100 A/\mu s$		6		μC
E_{rr}	$V_R = 300V$		1,9		mJ
$R_{th(j-s)D}$	per diode		0,9		K/W
Freewheeling Diode (Neutral Clamp Diode)					
$V_F = V_{EC}$	$I_{Fnom} = 100 A; V_{GE} = 0 V$		$T_j = 25 ^\circ C_{chiplev.}$	1,35	V
			$T_j = 150 ^\circ C_{chiplev.}$	1,31	V
V_{F0}			$T_j = 25 ^\circ C$	0,9	V
			$T_j = 150 ^\circ C$	0,85	V
r_F			$T_j = 25 ^\circ C$	4,5	V
			$T_j = 150 ^\circ C$	6,3	V
I_{RRM}	$I_F = 100 A$	$T_j = 150 ^\circ C$	80		A
Q_{rr}	$di/dt = 3000 A/\mu s$		18		μC
E_{rr}	$V_R = 300V$		1,9		mJ
$R_{th(j-s)FD}$	per diode		0,9		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.

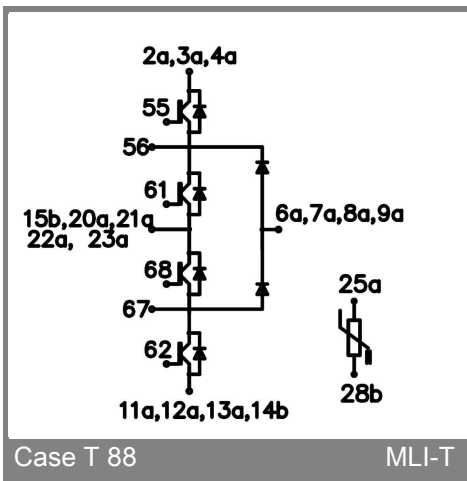
* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and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