

SEMISTOP® 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

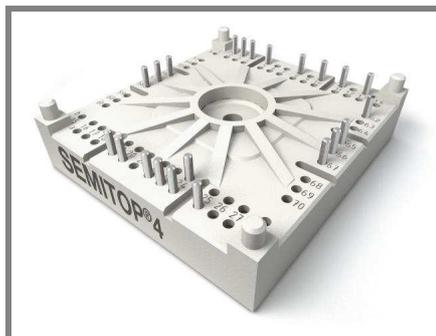
- $V_{isol} = 3000V$ AC, 1s, 50Hz
- Dynamic measure: DUT= IGBT (Gate pin 55) and Neutral Clamp Diode (Kathode pin 56) as free-wheeling diode



MLI-T

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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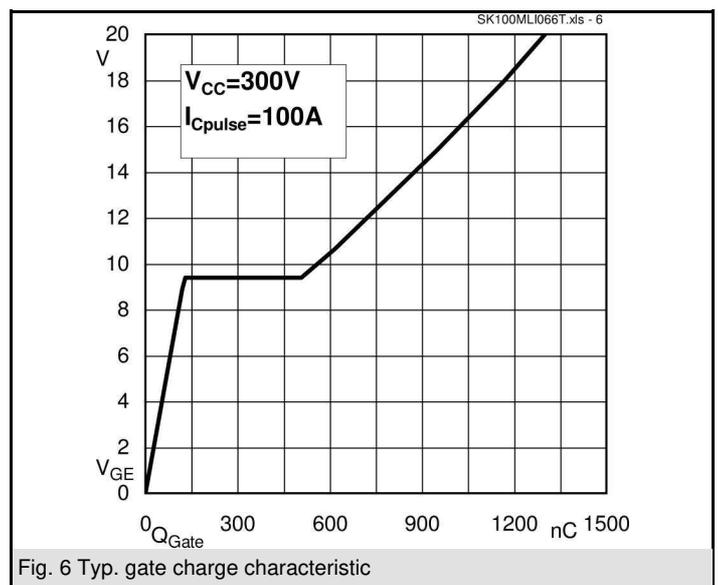
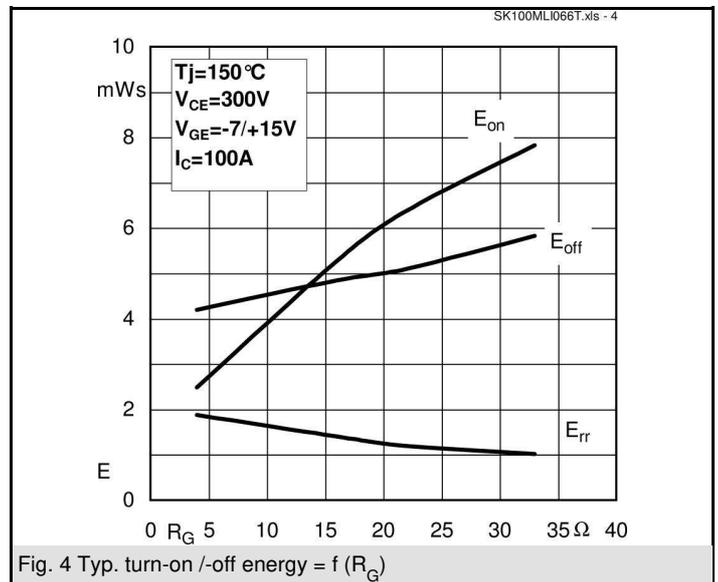
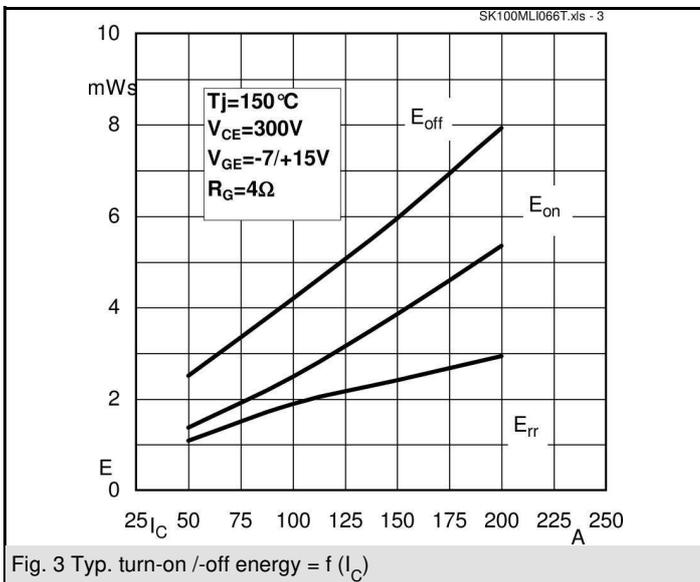
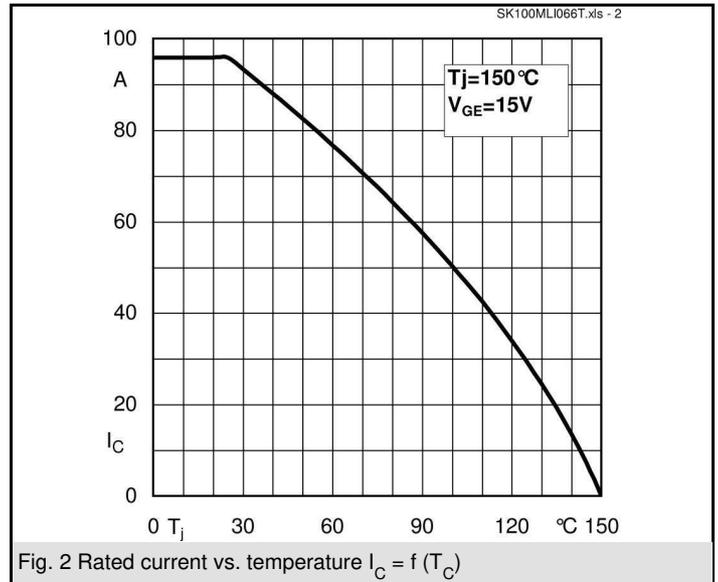
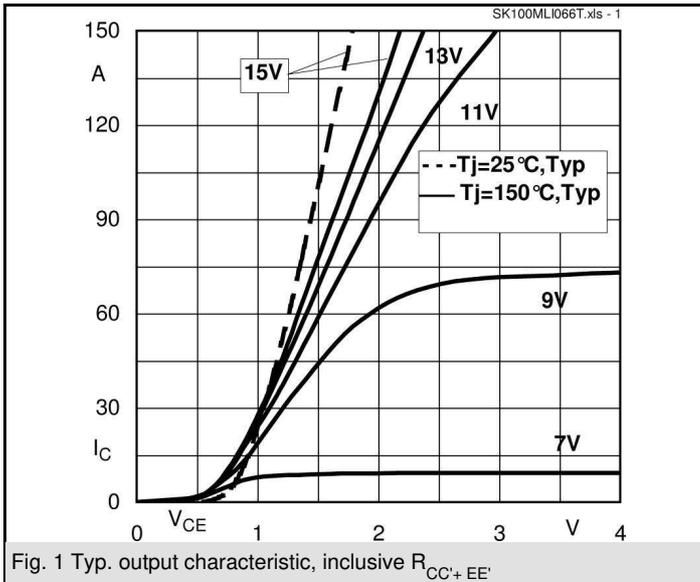


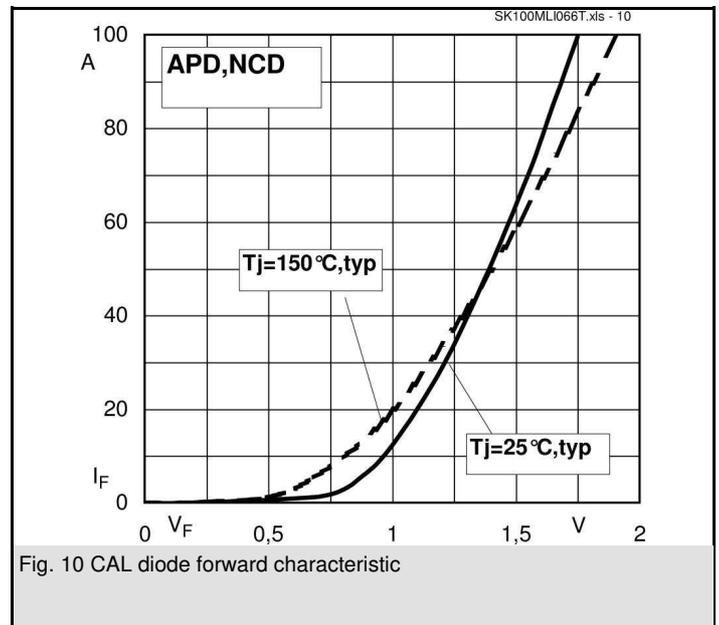
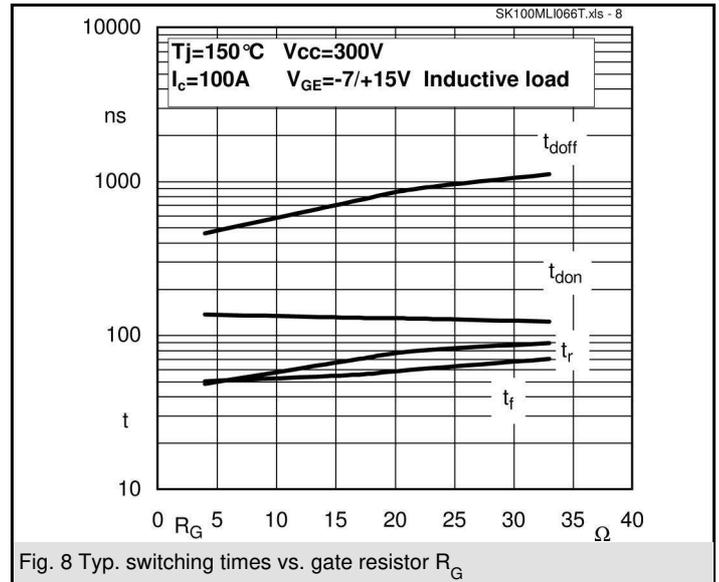
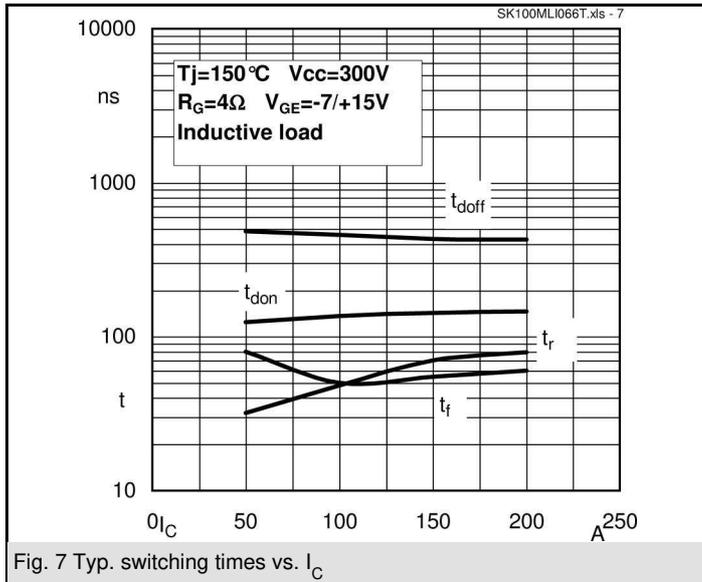
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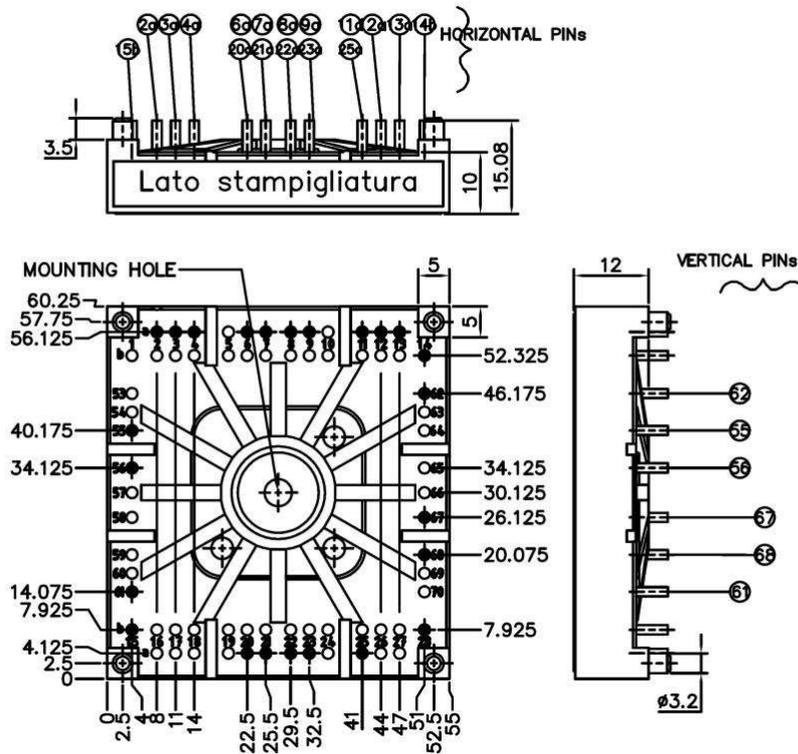
Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 100 A; V_{GE} = 0 V$		$T_j = 25 ^\circ C_{chiplev.}$	1,35	V
			$T_j = 150 ^\circ C_{chiplev.}$	1,31	V
V_{F0}			$T_j = 25 ^\circ C$	0,9	V
			$T_j = 150 ^\circ C$	0,85	V
r_F			$T_j = 25 ^\circ C$	4,5	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.

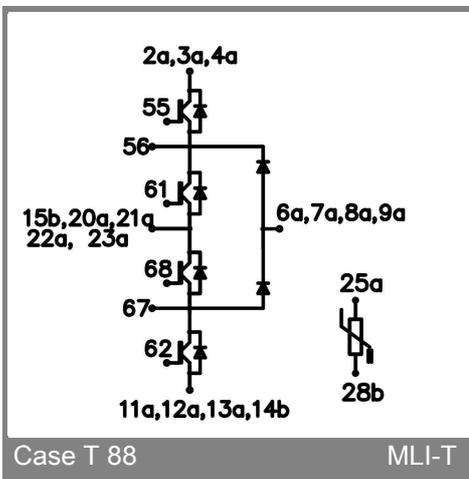
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Case T 88 (Suggested hole diameter for the solder pins in the circuit board: 2mm. Suggested hole diameter for the mounting pins in the circuit board: 3,6mm)



Case T 88

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