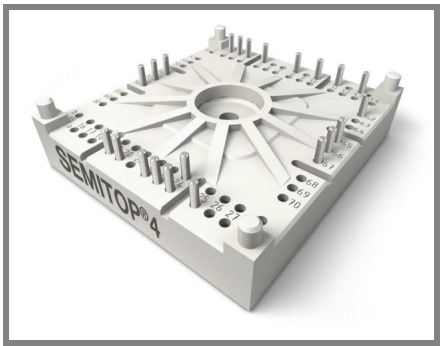
SK100MLI066T



SEMITOP® 4

IGBT Module

SK100MLI066T

Preliminary Data

Features

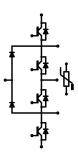
- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- Trench IGBT technology
- CAL technology FWD
- Integrated NTC temperature sensor

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

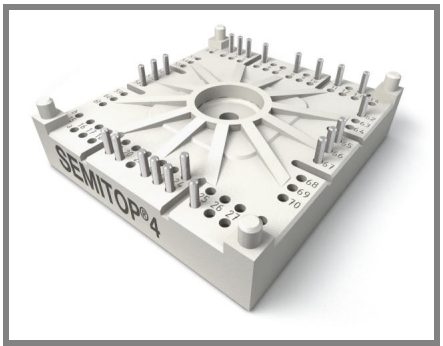


MLI-T

Absolute Maximum Ratings			T_s = 25 °C, unless otherwise specified	
Symbol	**Conditions**		**Values**	**Units**
IGBT				
V_{CES}	T_j = 25 °C		600	V
I_C	T_j = 175 °C	T_s = 25 °C	105	A
		T_s = 70 °C	80	A
I_{CRM}	I_{CRM}= 2 x I_{Cnom}		200	A
V_{GES}			± 20	V
t_{psc}	V_{CC} = 360 V; $V_{GE} \leq$ 20 V; V_{CES} < 600 V	T_j = 125 °C	6	µs
Inverse Diode				
I_F	T_j = 175 °C	T_s = 25 °C	110	A
		T_s = 70 °C	85	A
I_{FRM}	I_{FRM}= 2 x I_{Fnom}		200	A
Freewheeling Diode				
I_F	T_j = 175 °C	T_s = 25 °C	110	A
		T_s = 70 °C	85	A
I_{FRM}	I_{FRM}= 2 x I_{Fnom}		200	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 °C, unless otherwise specified			
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
IGBT						
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 1,6 mA		5	5,8	6,5	V
I_{CES}	V_{GE} = 0 V, V_{CE} = V_{CES}	T_j = 25 °C			0,0052	mA
		T_j = 125 °C				mA
I_{GES}	V_{CE} = 0 V, V_{GE} = 20 V	T_j = 25 °C			1200	nA
V_{CE0}		T_j = 25 °C		0,8	1,1	V
		T_j = 150 °C		0,7	1	V
r_{CE}	V_{GE} = 15 V	T_j = 25°C		6,5	8	mΩ
		T_j = 150°C		9,5	10,5	mΩ
$V_{CE(sat)}$	I_{Cnom} = 100 A, V_{GE} = 15 V	T_j = 25°C$_{chiplev.}$		1,45	1,85	V
		T_j = 150°C$_{chiplev.}$		1,65	2,05	V
C_{ies}				6,28		nF
C_{oes}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz		0,4		nF
C_{res}				0,19		nF
Q_G	V_{GE}=-7V...+15V			1000		nC
$t_{d(on)}$				136		ns
t_r	R_{Gon} = 4 Ω	V_{CC} = 300V		48		ns
E_{on}	di/dt = 3100 A/µs	I_C= 100A		2,5		mJ
$t_{d(off)}$	R_{Goff} = 4 Ω	T_j = 150 °C		457		ns
t_f	di/dt = 3100 A/µs	V_{GE}=-7/+15V		50		ns
E_{off}				4,2		mJ
$R_{th(j-s)}$	per IGBT			0,65		K/W

SK100MLI066T



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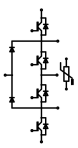
Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 100 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		1,35		V
		T_j = 150 °$C_{chiplev.}$		1,31		V
V_{F0}		T_j = 25 °C		0,9		V
		T_j = 150 °C		0,85		V
r_F		T_j = 25 °C		4,5		mΩ
		T_j = 150 °C		6,3		mΩ
I_{RRM}	I_F = 100 A	T_j = 150 °C		84		A
Q_{rr}	di/dt = 3100 A/µs			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 °$C_{chiplev.}$		1,35		V
		T_j = 150 °$C_{chiplev.}$		1,31		V
V_{F0}		T_j = 25 °C		0,9		V
		T_j = 150 °C		0,85		V
r_F		T_j = 25 °C		4,5		V
		T_j = 150 °C		6,3		V
I_{RRM}	I_F = 100 A	T_j = 150 °C		80		A
Q_{rr}	di/dt = 3000 A/µs			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°C (R_{25}=5kΩ)			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.



MLI-T

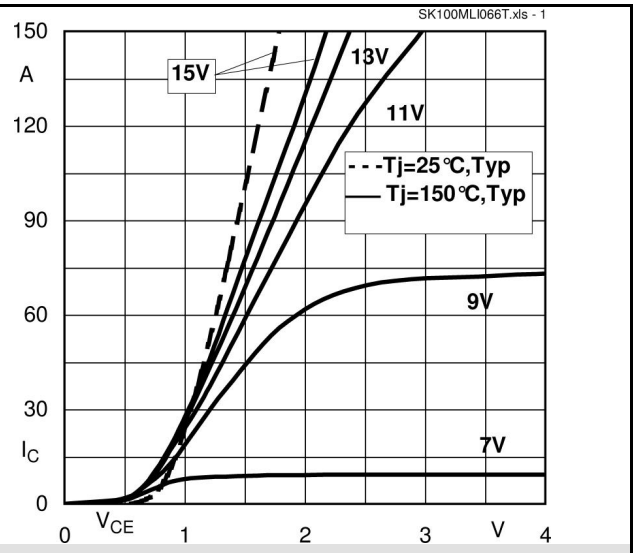


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

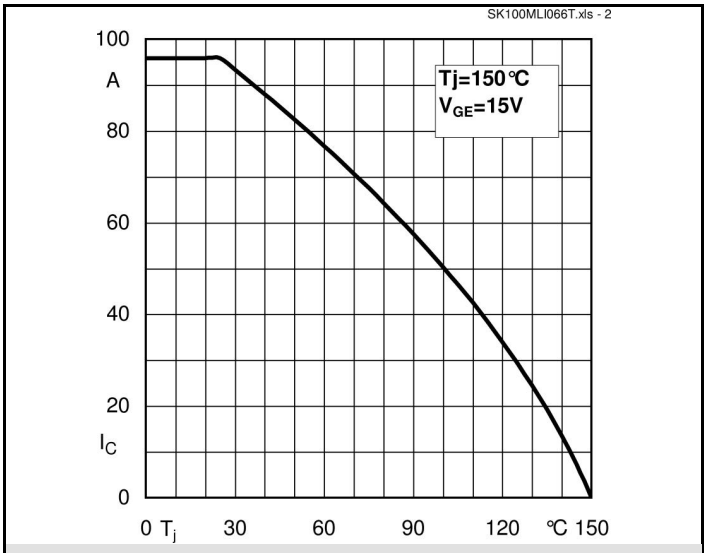


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

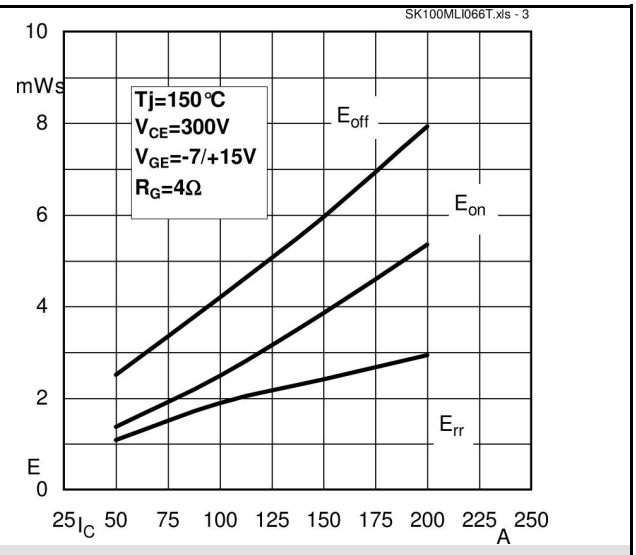


Fig. 3 Typ. turn-on /-off energy = f (I_C)

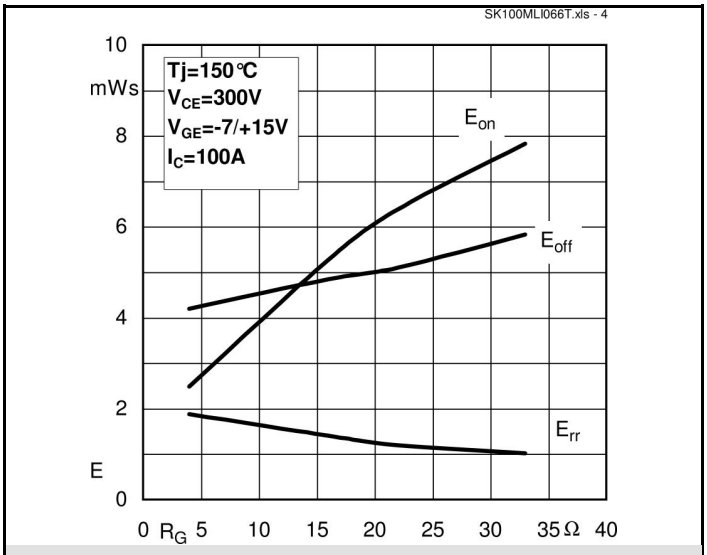


Fig. 4 Typ. turn-on /-off energy = f (R_G)

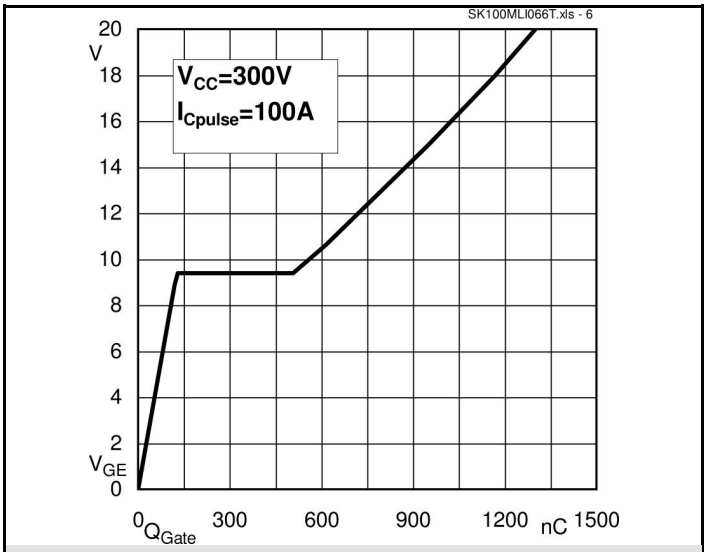


Fig. 6 Typ. gate charge characteristic

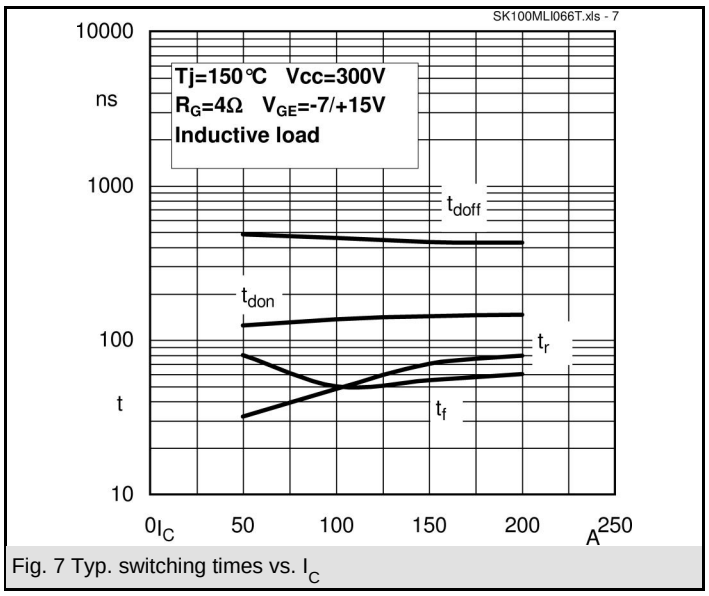


Fig. 7 Typ. switching times vs. I_C

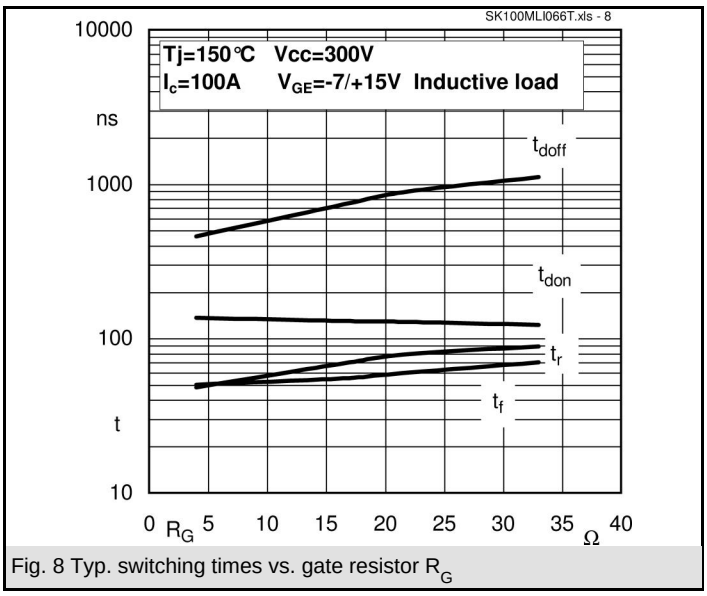


Fig. 8 Typ. switching times vs. gate resistor R_G

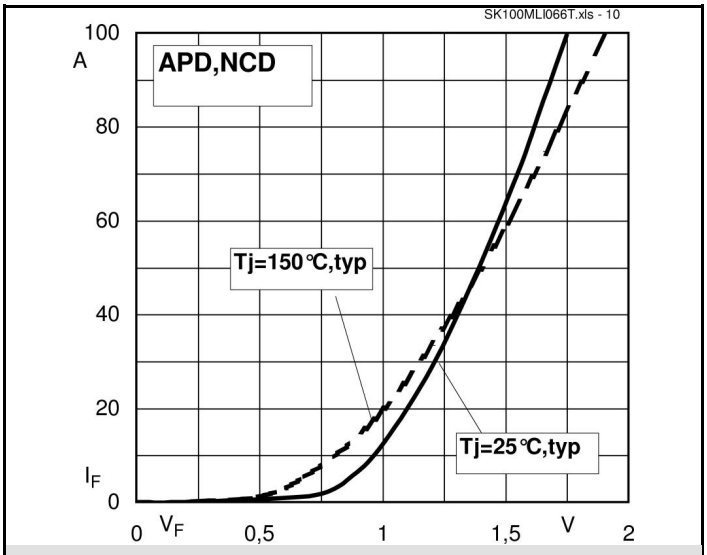
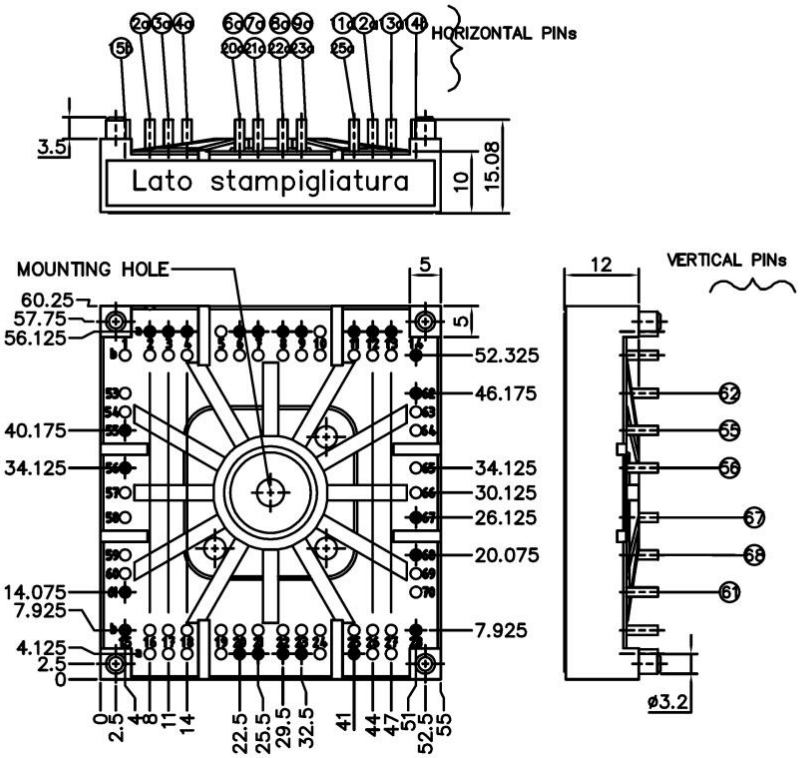
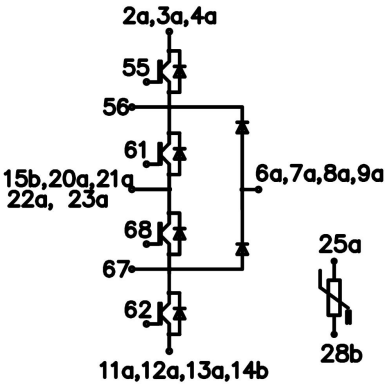


Fig. 10 CAL diode forward characteristic

UL recognized file no. E 63 532



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 MLI-T

