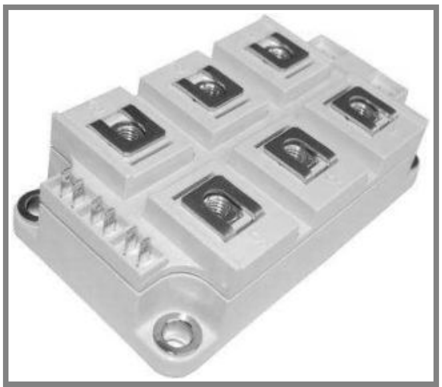
SKM300MLI066TAT



SEMITRANS® 5

Trench IGBT Modules

SKM300MLI066TAT

Features

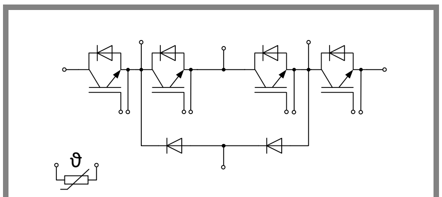
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- Integrated NTC temperature sensor

Typical Applications*

- UPS
- 3 Level Inverter

Remarks

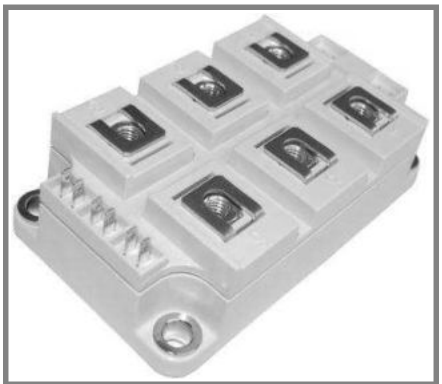
- Case temperature limited to T_c =125°C max
- Recommended T_{op} = -40..+150°C for IGBT; T_{op}=-40..+125°C for diode
- T_{vj} is intended as absolute maximum rating, limited by diode
- Fig.2 is referred to IGBT current capability



MLI-TAT

Absolute Maximum Ratings		T_{case} = 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_c = 25 °C	400	A
		T_c = 80 °C	300	A
I_{CRM}	I_{CRM}=2xI_{Cnom}		600	A
V_{GES}			± 20	V
t_{psc}	V_{CC} = 360 V; V_{GE} ≤ 15 V; VCES < 600 V	T_j = 150 °C	6	µs
Inverse Diode				
I_F	T_j = 150 °C	T_c = 25 °C	324	A
		T_c = 80 °C	211	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		420	A
I_{FSM}	t_p = 10 ms; half sine wave	T_j = 150 °C	2100	A
Freewheeling Diode				
I_F	T_j = 150 °C	T_c = 25 °C	324	A
		T_c = 80 °C	211	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		420	A
I_{FSM}	t_p = 10 ms; half sine wave	T_j = 150 °C	2100	A
Module				
$I_{t(RMS)}$			500	A
T_{vj}			- 40 ... + 150	°C
T_{stg}			- 40 ... + 125	°C
V_{isol}	AC, 1 min.		2500	V

Characteristics		T_{case} = 25°C, unless otherwise specified				
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
IGBT						
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 4,8 mA		5	5,8	6,5	V
I_{CES}	V_{GE} = 0 V, V_{CE} = V_{CES}	T_j = 25 °C			0,5	mA
I_{GES}	V_{CE} = 0 V, V_{GE} = 20 V	T_j = 25 °C			1200	nA
V_{CE0}		T_j = 25 °C		0,9	1	V
		T_j = 150 °C		0,85	0,9	V
r_{CE}	V_{GE} = 15 V	T_j = 25°C		1,8	3	mΩ
		T_j = 150°C		2,7	3,8	mΩ
$V_{CE(sat)}$	I_{Cnom} = 300 A, V_{GE} = 15 V	T_j = 25°$C_{chiplev.}$		1,45	1,9	V
		T_j = 150°$C_{chiplev.}$		1,7	2,1	V
C_{ies}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz		18,4		nF
C_{oes}				1,14		nF
C_{res}				0,54		nF
Q_G	V_{GE} = -15V...+15V			3900		nC
R_{Gint}	T_j = °C			1		Ω
$t_{d(on)}$	R_{Gon} = 2,2 Ω di/dt = 3400 A/µs	V_{CC} = 300V I_C= 300A T_j = 125 °C V_{GE} = --15V/+15V		140		ns
t_r				89		ns
E_{on}				3,5		mJ
$t_{d(off)}$	R_{Goff} = 2,2 Ω di/dt = 3400 A/µs			433		ns
t_f				116		ns
E_{off}				10,1		mJ
$R_{th(j-c)}$	per IGBT			0,15		K/W



SEMITRANS® 5

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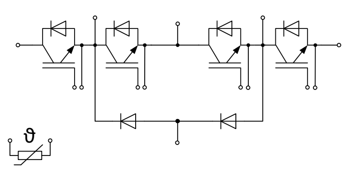


MLI-TAT

Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 245 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		1,35	1,6	V
		T_j = 125 °$C_{chiplev.}$		1,35	1,6	V
V_{F0}		T_j = 25 °C		1	1,1	V
		T_j = 125 °C		0,9	1	V
r_F		T_j = 25 °C		1,42	2	mΩ
		T_j = 125 °C		1,8	2,4	mΩ
I_{RRM}	I_F = 245 A	T_j = 125 °C				A
Q_{rr}						µC
E_{rr}	V_{GE} = -8 V; V_{CC} = 300 V					mJ
$R_{th(j-c)D}$	per diode			0,28		K/W
Free-wheeling diode (Neutral Clamp Diode)						
$V_F = V_{EC}$	I_{Fnom} = 245 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		1,35	1,6	V
		T_j = 125 °$C_{chiplev.}$		1,35	1,6	V
V_{F0}		T_j = 25 °C		1	1,1	V
		T_j = 125 °C		0,9	1	V
r_F		T_j = 25 °C		1,42	2	V
		T_j = 125 °C		1,8	2,4	V
I_{RRM}	I_F = 300 A	T_j = 125 °C		194		A
Q_{rr}	di/dt = 3400 A/µs			13		µC
E_{rr}	V_{GE} = 0 V; V_{CC} = 300 V			4		mJ
$R_{th(j-c)FD}$	per diode			0,28		K/W
$R_{th(c-s)}$	per module				0,038	K/W
M_s	to heat sink M6		3		5	Nm
M_t	to terminals M6		2,5		5	Nm
w					310	g
Temperature sensor						
R_{100}	T_s=100°C (R_{25}=5kΩ)			493±5%		Ω
						K

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

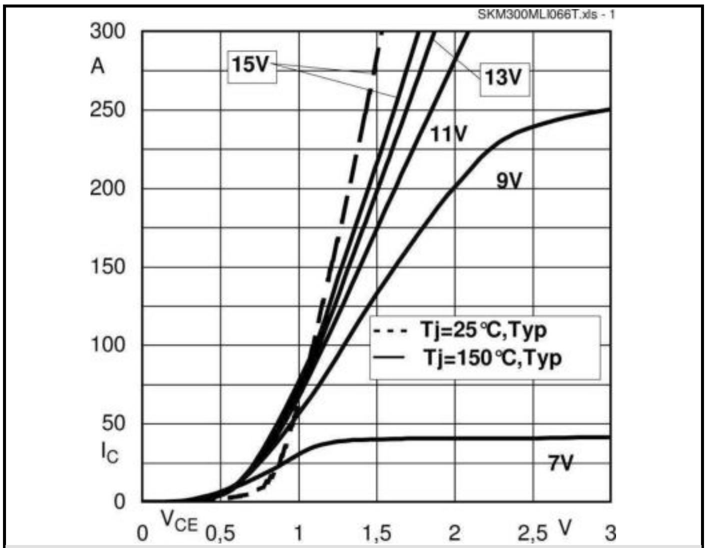


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

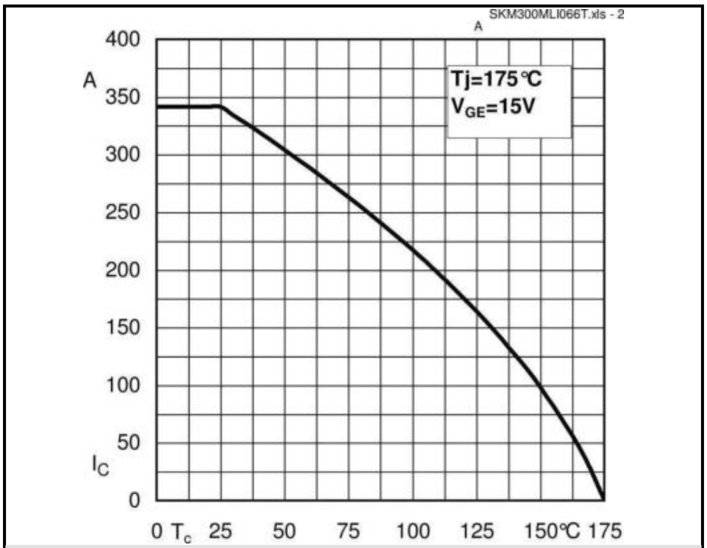


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

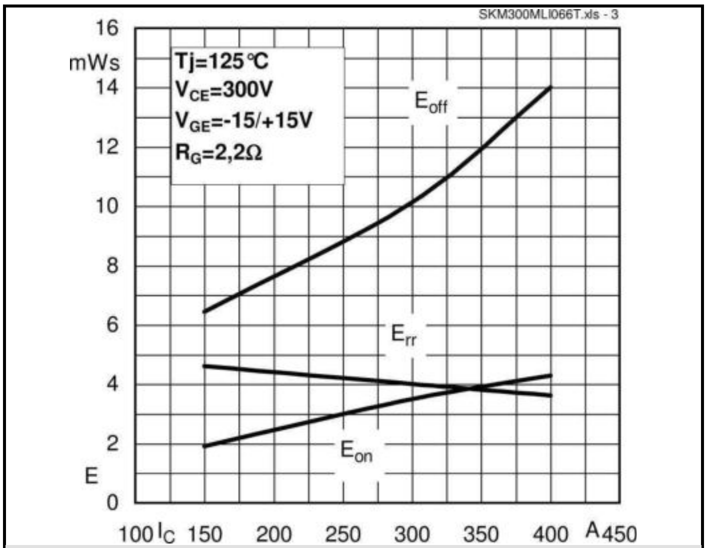


Fig. 3 Typ. turn-on /-off energy = f (I_C)

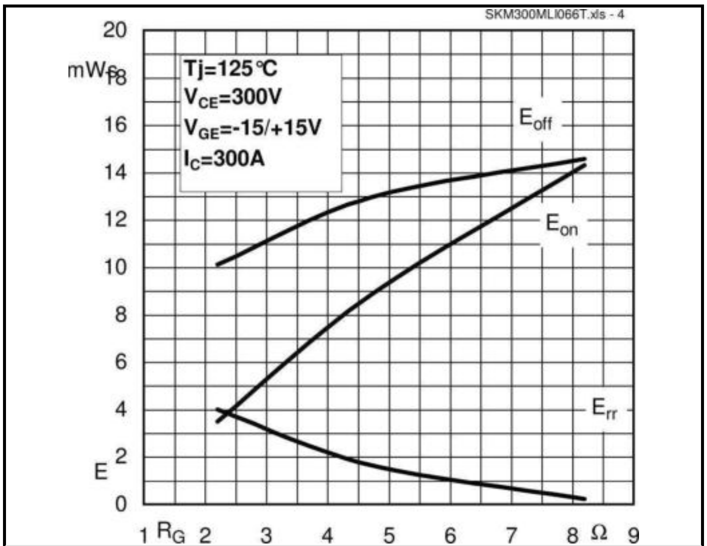


Fig. 4 Typ. turn-on /-off energy = f (R_G)

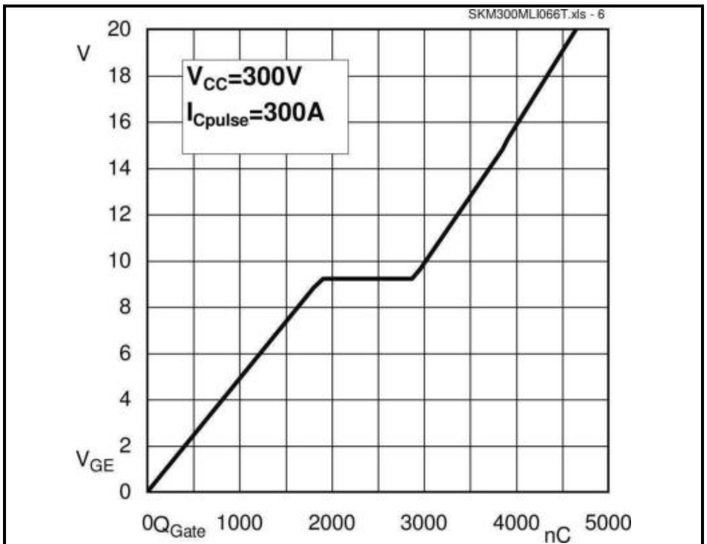


Fig. 6 Typ. gate charge characteristic

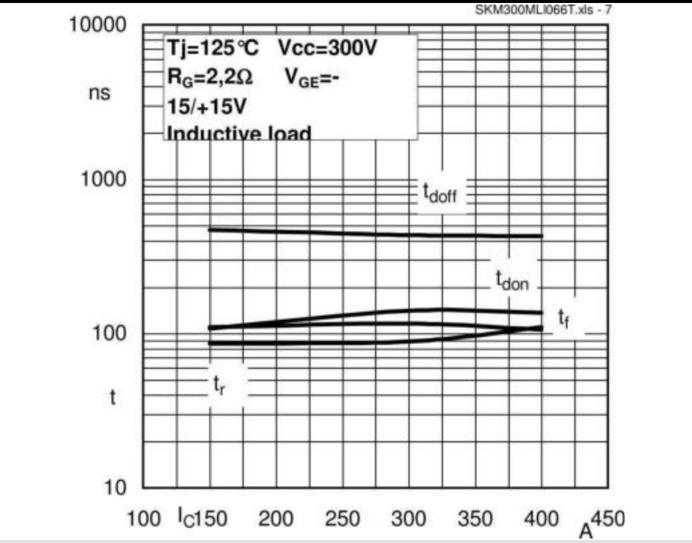


Fig. 7 Typ. switching times vs. I_C

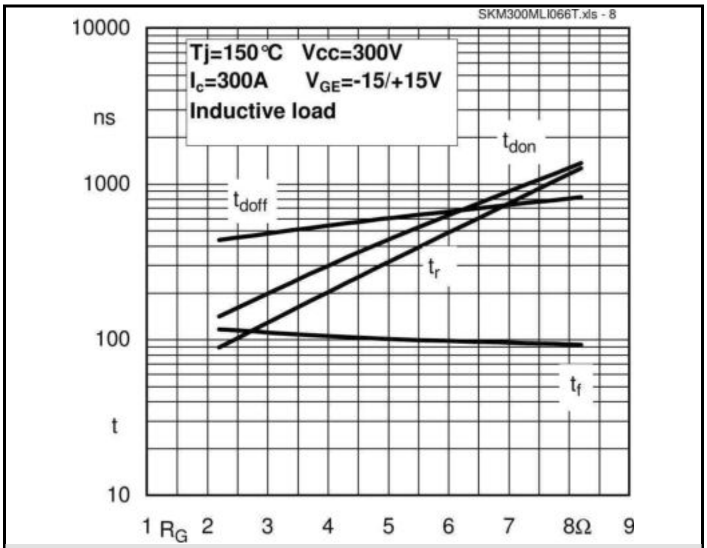


Fig. 8 Typ. switching times vs. gate resistor R_G

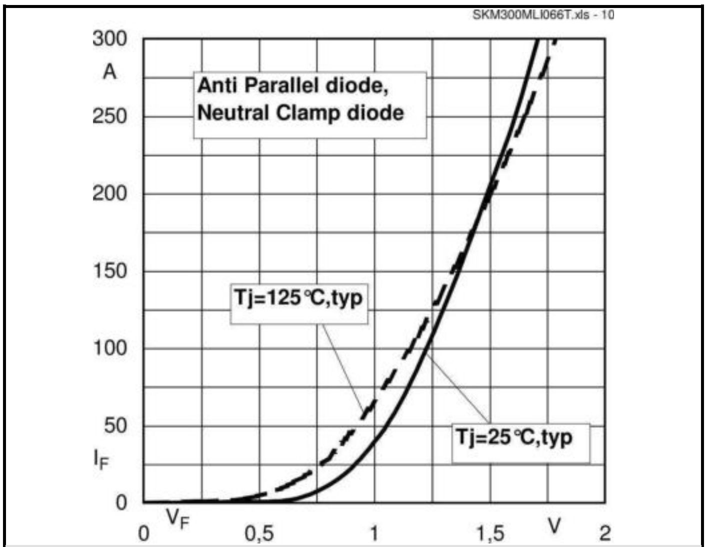
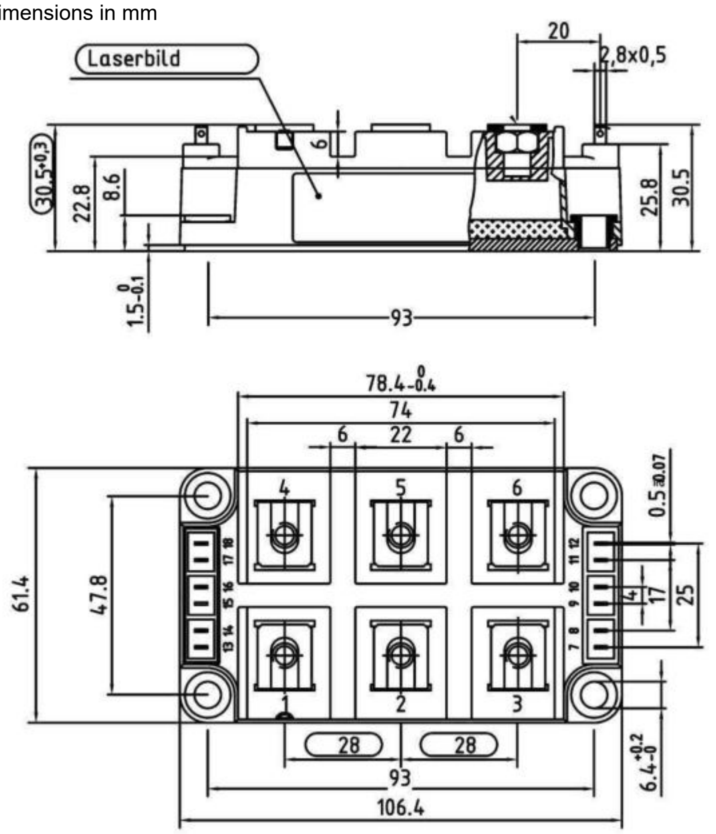


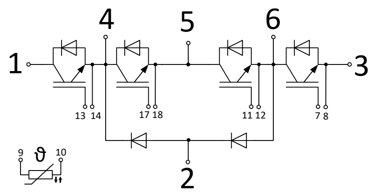
Fig. 10 CAL diode forward characteristic

UL recognized file no. E 63 532

Dimensions in mm



Case D62



MLI-TAT Case D62

