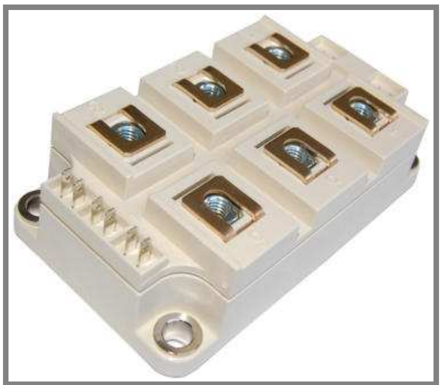
SKM200MLI066TAT



SEMITRANS® 5

Trench IGBT Modules

SKM200MLI066TAT

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
- T_{vj} is intended as absolute maximum rating
- Fig.2 is referred to IGBT current capability

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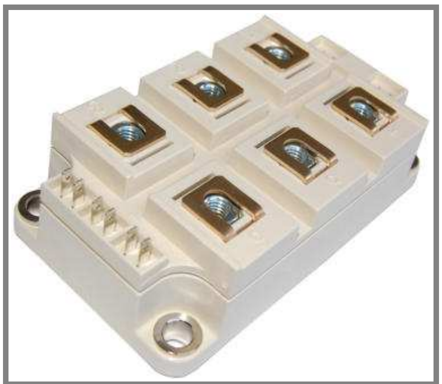
Absolute Maximum Ratings — T_{case} = 25°C, unless otherwise specified

Symbol	Conditions		Values	Units
IGBT				
V_{CES}	T_j = 25 °C		600	V
I_C	T_j = 175 °C	T_c = 25 °C	280	A
		T_c = 80 °C	210	A
I_{CRM}	I_{CRM}=2xI_{Cnom}		400	A
V_{GES}			± 20	V
t_{psc}	V_{CC} = 360 V; $V_{GE} \leq$ 15 V; V_{CES} < 600 V	T_j = 150 °C	6	µs
Inverse Diode				
I_F	T_j = 175 °C	T_c = 25 °C	270	A
		T_c = 80 °C	200	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		400	A
I_{FSM}	t_p = 10 ms; half sine wave	T_j = 150 °C	1310	A
Freewheeling Diode				
I_F	T_j = 175 °C	T_c = 25 °C	270	A
		T_c = 80 °C	200	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		400	A
I_{FSM}	t_p = 10 ms; half sine wave	T_j = 150 °C	1310	A
Module				
$I_{t(RMS)}$			500	A
T_{vj}			- 40 ... + 175	°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 = 3,2 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		0,7	0,8	V
r_{CE}	V_{GE} = 15 V	T_j = 25°C		2,7	4,5	mΩ
		T_j = 150°C		5	6,5	mΩ
$V_{CE(sat)}$	I_{Cnom} = 200 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		12,3		nF
C_{oes}				0,76		nF
C_{res}				0,36		nF
Q_G	V_{GE} = -15V...+15V			2254		nC
R_{Gint}	T_j = 25 °C			1		Ω
$t_{d(on)}$	R_{Gon} = 22 Ω di/dt = 2000 A/µs	V_{CC} = 300V I_C= 200A T_j = 150 °C V_{GE} = -15V/+15V		78		ns
t_r				68		ns
E_{on}				2,53		mJ
$t_{d(off)}$	R_{Goff} = 1 Ω di/dt = 2000 A/µs			314		ns
t_f				80		ns
E_{off}				6,82		mJ
$R_{th(j-c)}$	per IGBT			0,21		K/W



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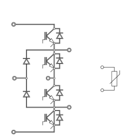

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Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 200 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		1,4	1,6	V
		T_j = 150 °$C_{chiplev.}$		1,4	1,6	V
V_{F0}		T_j = 25 °C		0,95	1	V
		T_j = 150 °C		0,85	0,9	V
r_F		T_j = 25 °C		2	3	mΩ
		T_j = 150 °C		2,7	3,5	mΩ
I_{RRM}	I_F = 200 A	T_j = 150 °C				A
Q_{rr}	di/dt = 2000 A/µs					µC
E_{rr}	V_{GE} = -15... +15 V; V_{CC} = 300 V			4		mJ
$R_{th(j-c)D}$	per diode			0,39		K/W
Free-wheeling diode (Neutral Clamp Diode)						
$V_F = V_{EC}$	I_{Fnom} = 200 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		1,4	1,6	V
		T_j = 150 °$C_{chiplev.}$		1,4	1,6	V
V_{F0}		T_j = 25 °C		0,95	1	V
		T_j = 150 °C		0,85	0,9	V
r_F		T_j = 25 °C		2	3	V
		T_j = 150 °C		2,7	3,5	V
I_{RRM}	I_F = 200 A	T_j = 150 °C		175,8		A
Q_{rr}	di/dt = 2000 A/µs			12		µC
E_{rr}	V_{GE} = -15...+15 V; V_{CC} = 300 V			4		mJ
$R_{th(j-c)FD}$	per diode			0,39		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.

* 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 staff.

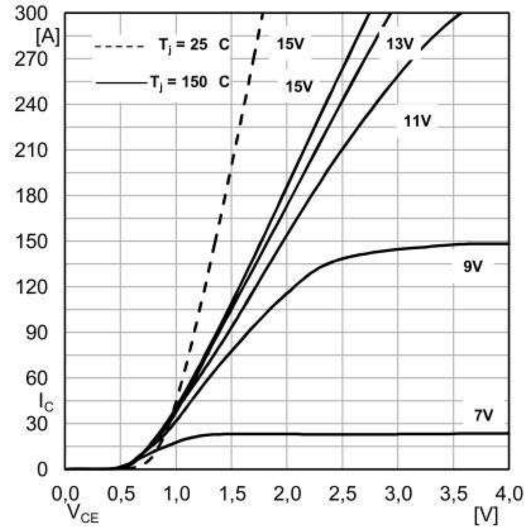


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+ EE'}$

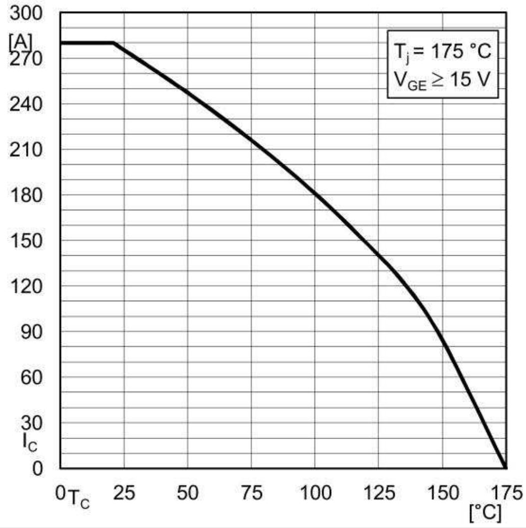


Fig. 2 Rated current vs. temperature I_C = f (T_C)

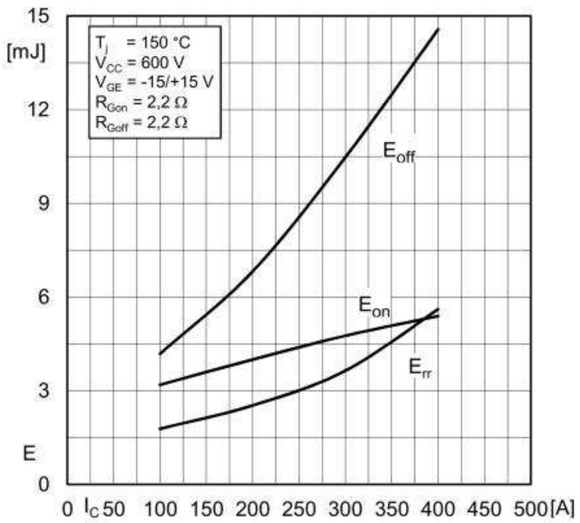


Fig. 3 Typ. turn-on /-off energy = f (I_C)

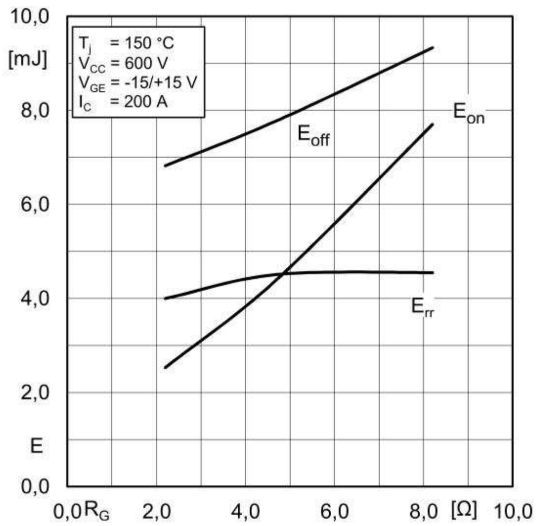


Fig. 4 Typ. turn-on /-off energy = f (R_G)

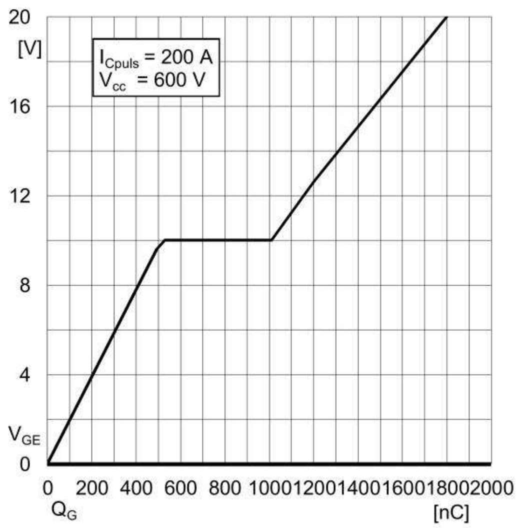


Fig. 6 Typ. gate charge characteristic

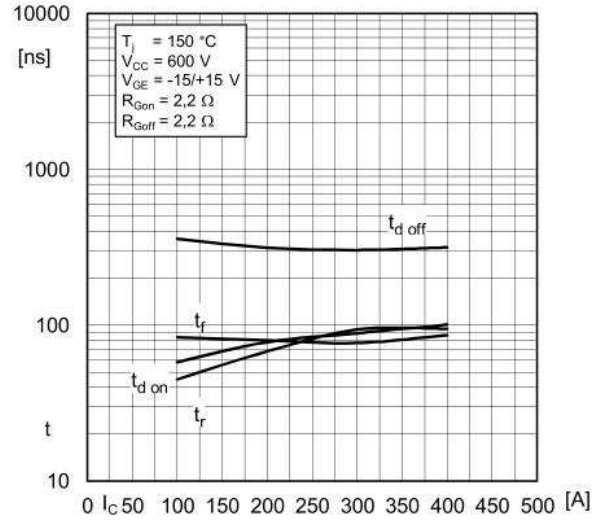


Fig. 7 Typ. switching times vs. I_C

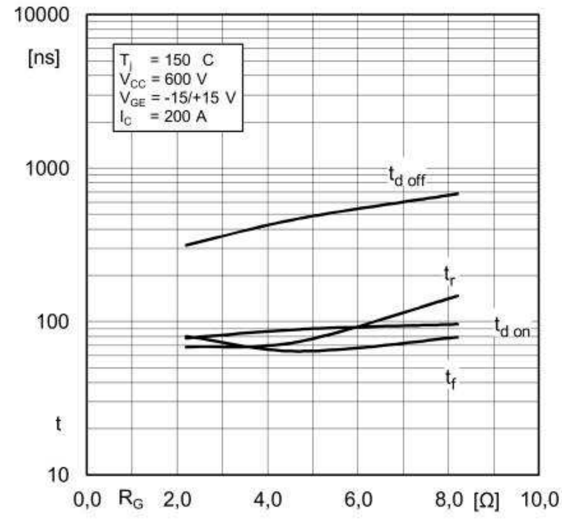


Fig. 8 Typ. switching times vs. gate resistor R_G

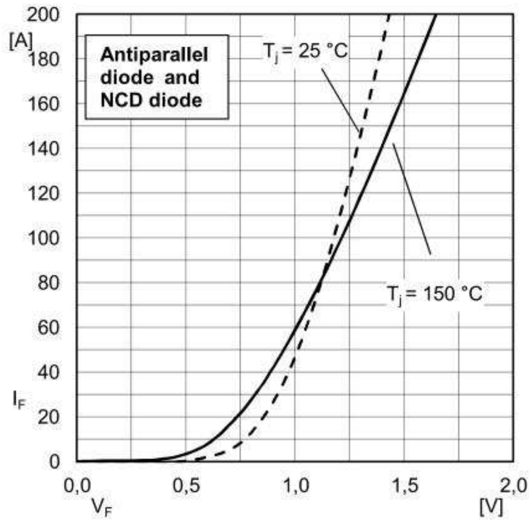
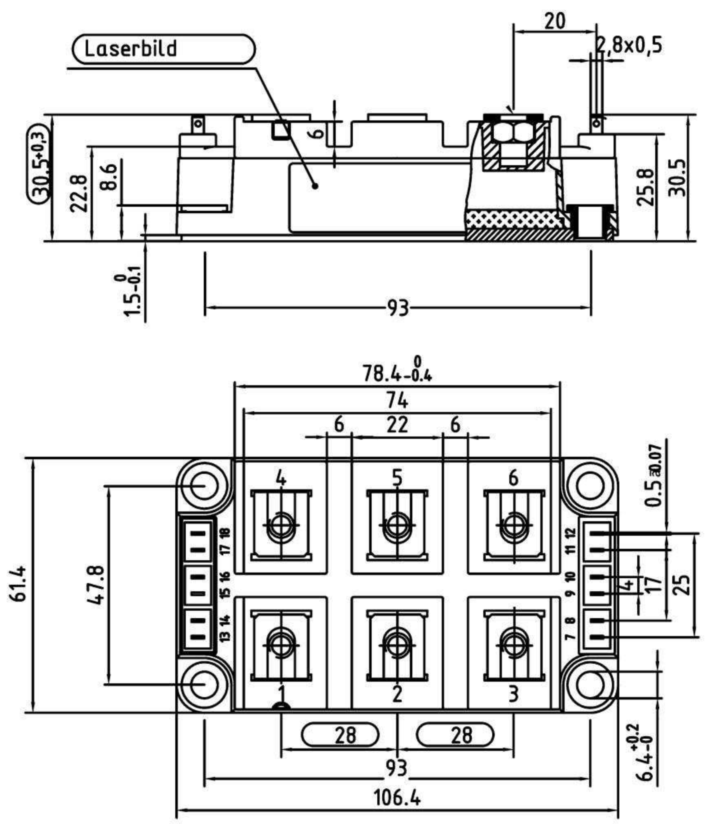
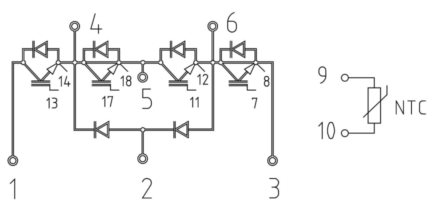


Fig. 10 CAL diode forward characteristic

UL recognized file no. E 63 532



Case D62



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