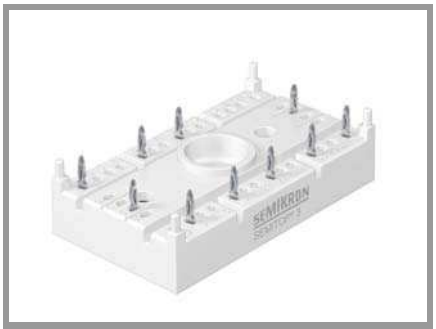
SK 30 MLI 066p



SEMITOP® 3 Press-Fit

3-Level NPC Inverter

SK 30 MLI 066p

Features

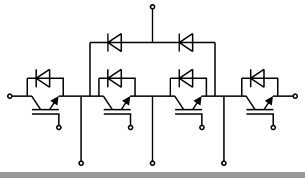
- One screw mounting module
- Solder free mounting with Press-Fit terminals
- Fully compatible with other SEMITOP® Press-Fit types
- Improved thermal performances by aluminium oxide substrate
- Trench IGBT technology
- CAL technology FWD
- Integrated NTC temperature sensor
- UL recognized, file no. E 63 532

Typical Applications*

- 3 Level Inverter
- UPS

Remarks

Dynamic measure: DUT=IGBT (gate pin1) and Neutral Clamp Diode (cathode pin16) as free-wheeling diode



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Absolute Maximum Ratings				
Symbol	**Conditions**		**Values**	**Unit**
IGBT - Inverter				
V_{CES}			600	V
I_C	T_j = 175 °C	T_s = 25 °C	37	A
		T_s = 70 °C	30	A
I_{Cnom}			30	A
I_{CRM}	I_{CRM} = 2 x I_{Cnom}		60	A
V_{GES}			-20 ... 20	V
t_{psc}	V_{CC} = 360 V $V_{GE} \leq$ 15 V $V_{CES} \leq$ 600 V	T_j = 150 °C	6	µs
T_j			-40 ... 175	°C
Inverse diode				
I_F	T_j = 175 °C	T_s = 25 °C	34	A
		T_s = 70 °C	27	A
I_{Fnom}			30	A
I_{FRM}	I_{FRM} = 2 x I_{Fnom}		60	A
I_{FSM}	t_p = 10 ms, sin 180°, T_j = 25 °C		185	A
T_j			-40 ... 175	°C
Clamping diode				
I_F	T_j = 175 °C	T_s = 25 °C	34	A
		T_s = 70 °C	27	A
I_{Fnom}			30	A
I_{FRM}	I_{FRM} = 2 x I_{Fnom}		60	A
I_{FSM}	10 ms, sin 180°, T_j = 25 °C		185	A
T_j			-40 ... 175	°C
Module				
$I_{t(RMS)}$	T_S = 60°C		40	A
T_{stg}			-40 ... 125	°C
V_{isol}	AC, sinusoidal, t = 1 min		2500	V

Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
IGBT						
$V_{CE(sat)}$	I_C = 30 A V_{GE} = 15 V chiplevel	T_j = 25 °C		1.45	1.90	V
		T_j = 150 °C		1.65	2.10	V
V_{CE0}	chiplevel	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		18.3	30	mΩ
		T_j = 150 °C		26.7	40	mΩ
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 0.43 mA		5	5.8	6.5	V
I_{CES}	V_{GE} = 0 V V_{CE} = 600 V	T_j = 25 °C			0.05	mA
						mA
C_{ies}	V_{CE} = 25 V V_{GE} = 0 V	f = 1 MHz		1.63		nF
C_{oes}		f = 1 MHz		0.108		nF
C_{res}		f = 1 MHz		0.05		nF
Q_G	V_{GE} = -7V...+15V			275		nC
R_{Gint}	T_j = 25 °C			0		Ω

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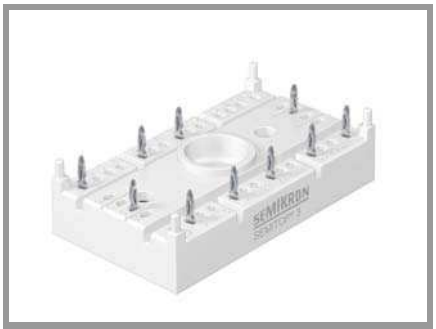

SEMITOP® 3 Press-Fit

3-Level NPC Inverter

SK 30 MLI 066p

Features

- One screw mounting module
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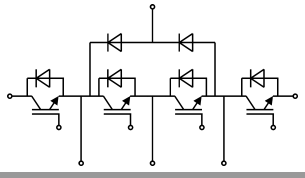
Typical Applications*

- 3 Level Inverter
- UPS

Remarks

Dynamic measure: DUT=IGBT (gate pin1) and Neutral Clamp Diode (cathode pin16) as free-wheeling diode



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Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
$t_{d(on)}$	V_{CC} = 300 V	T_j = 150 °C		24		ns
t_r	I_C = 30 A	T_j = 150 °C		27		ns
E_{on}	V_{GE} = +15/-7 V	T_j = 150 °C		0.97		mJ
$t_{d(off)}$	di/dt_{on} = 2335 A/µs di/dt_{off} = 2335 A/µs	T_j = 150 °C		328		ns
t_f	$R_{G\ on}$ = 25 Ω	T_j = 150 °C		54		ns
E_{off}	$R_{G\ off}$ = 25 Ω	T_j = 150 °C		1.77		mJ
$R_{th(j-s)}$	per IGBT			1.65		K/W

Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
Inverse diode						
$V_F = V_{EC}$	I_F = 30 A	T_j = 25 °C		1.50	1.65	V
	chiplevel	T_j = 150 °C		1.50	1.65	V
V_{F0}		T_j = 25 °C		1	1.1	V
		T_j = 150 °C		0.8	0.9	V
r_F		T_j = 25 °C		16.7	20	mΩ
		T_j = 150 °C		20	23.3	mΩ
I_{RRM}	I_F = 30 A	T_j = 150 °C		30		A
Q_{rr}	di/dt_{off} = 2335 A/µs	T_j = 150 °C		1.6		µC
E_{rr}	V_{GE} = -7 V V_R = 300 V	T_j = 150 °C		0.26		mJ
$R_{th(j-s)}$	per Diode			2.3		K/W
Clamping diode						
$V_F = V_{EC}$	I_F = 30 A	T_j = 25 °C		1.50	1.65	V
	chiplevel	T_j = 150 °C		1.50	1.65	V
V_{F0}		T_j = 25 °C		1	1.1	V
		T_j = 150 °C		0.8	0.9	V
r_F		T_j = 25 °C		16.7	20	mΩ
		T_j = 150 °C		20	23.3	mΩ
I_{RRM}	I_F = 30 A	T_j = 150 °C		30		A
Q_{rr}	di/dt_{off} = 2335 A/µs	T_j = 150 °C		1.6		µC
E_{rr}	V_{GE} = -7 V V_R = 300 V	T_j = 150 °C		0.26		mJ
$R_{th(j-s)}$	per Diode			2.3		K/W
Module						
M_s	to heatsink		2.25		2.5	Nm
w				30		g
Temperature Sensor						
R_{100}						Ω
$B_{100/125}$						K

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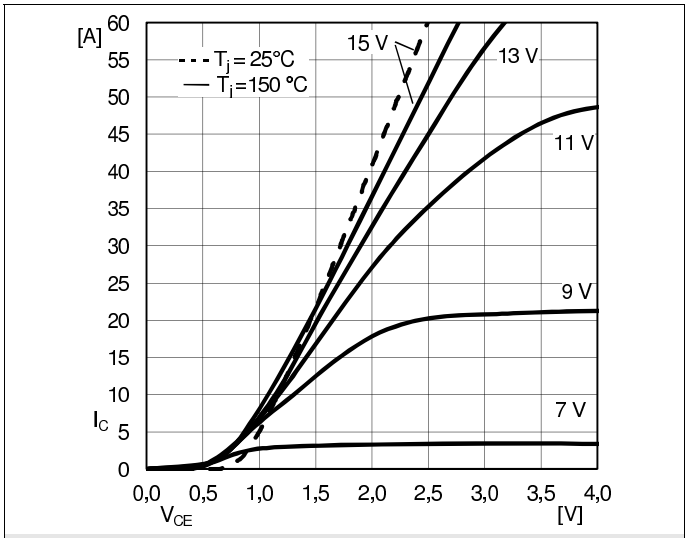


Fig. 1: Typ. IGBT 1 output characteristic, inclusive $R_{CC'+EE'}$

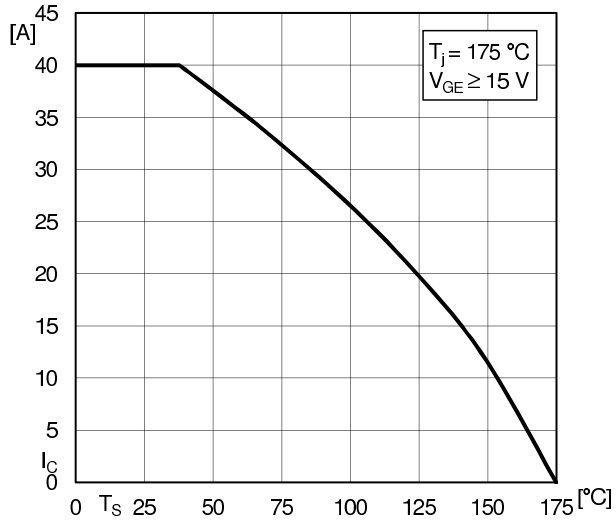


Fig. 2: Rated current vs. temperature $I_C = f(T_S)$

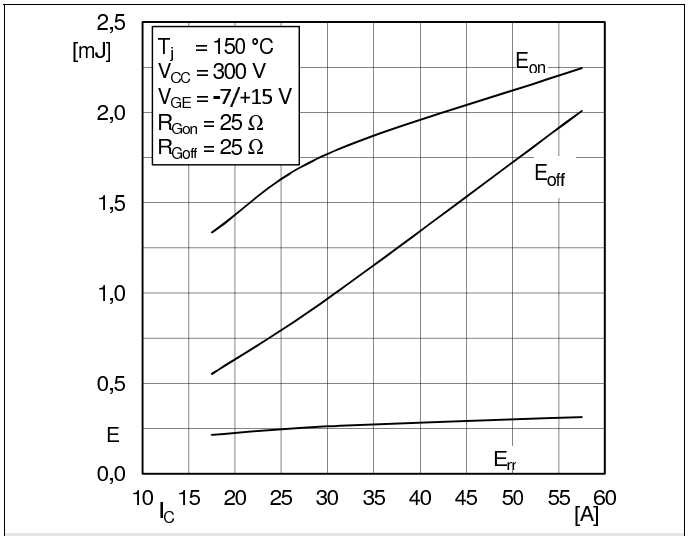


Fig. 3: Typ. turn-on /-off energy = f (I_C)

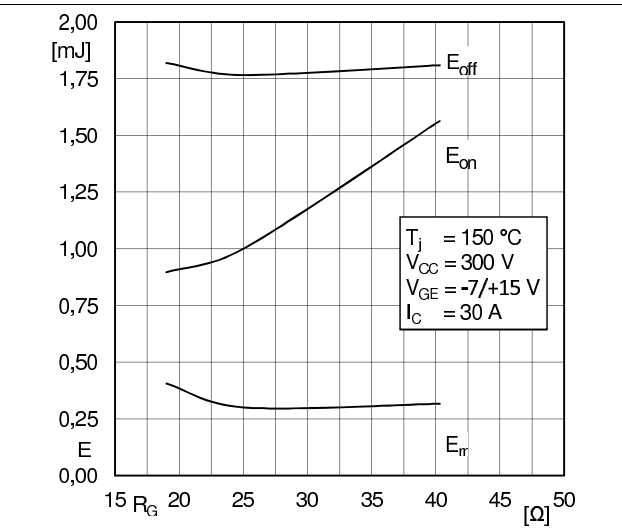


Fig. 4: Typ. turn-on /-off energy = f (R_G)

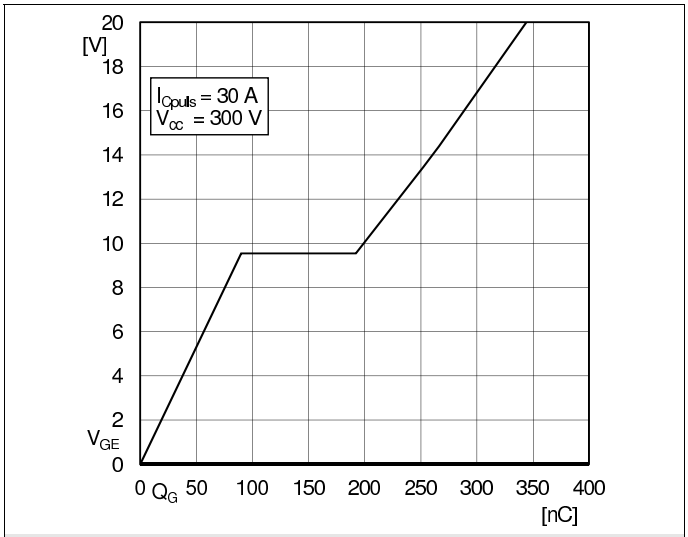


Fig. 6: Typ. gate charge characteristic

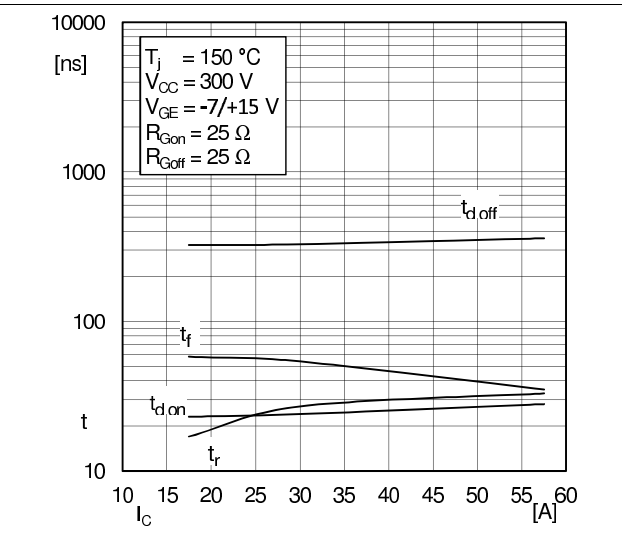


Fig. 7: Typ. switching times vs. I_C

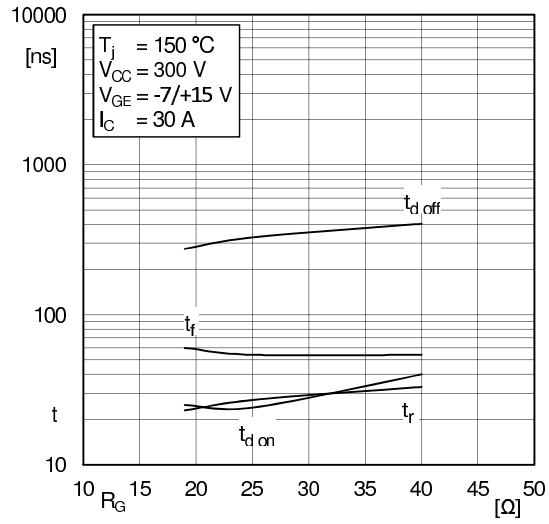


Fig. 8: Typ. switching times vs. gate resistor R_G

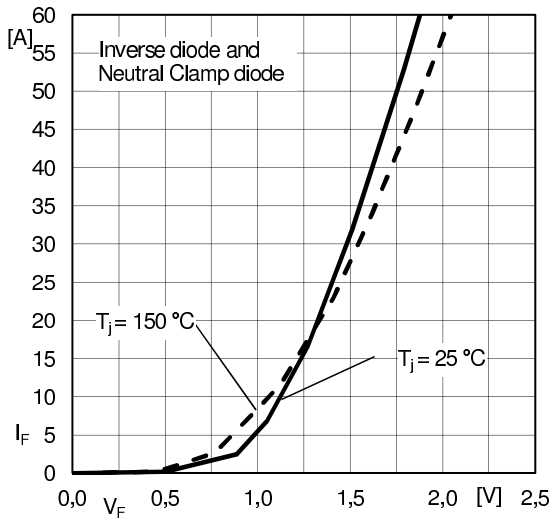
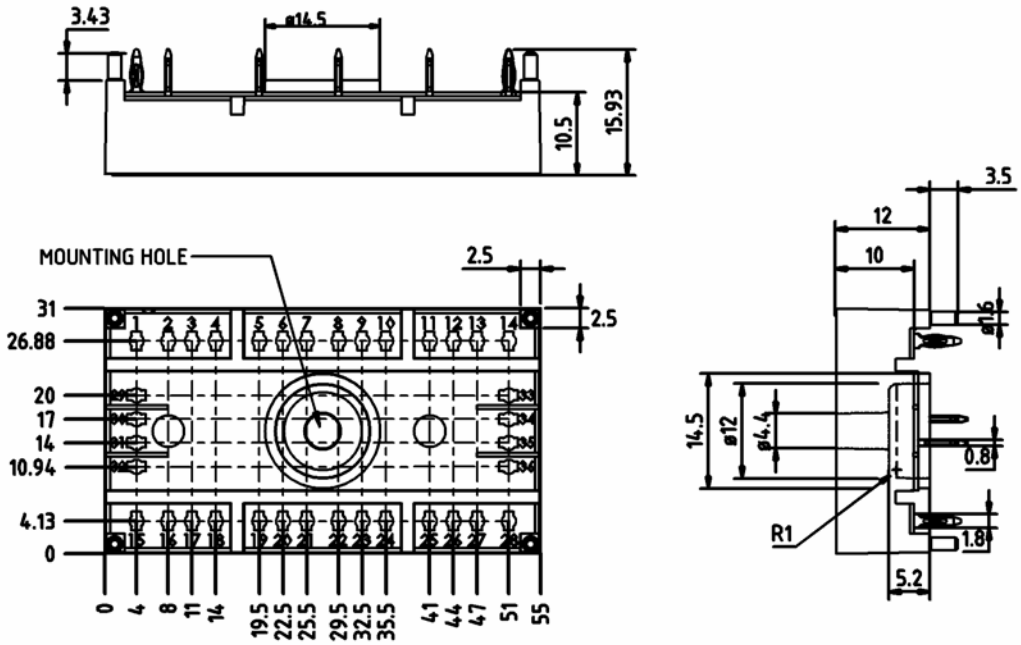


Fig. 10: Typ. Antiparallel and neutral clamp CAL diode forward charact., incl. $R_{CC'+\,EE'}$

dimensions in mm
tolerance system: ISO 2768-m



Suggested drilled hole diameter for terminal pins in the circuit board:
- minimum:1,575mm
- typical: 1,6mm
- maximum: 1,625mm

Suggested hole diameter for the mounting pins in the circuit board: 2mm

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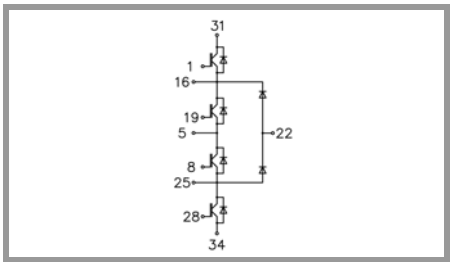
SEMITOP 3 Press-Fit



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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.