MiniSKiiP® 2

H-bridge inverter

SKiiP 26GH12T4V11

Features

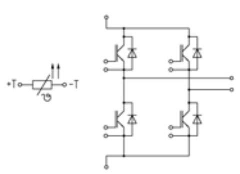
- Trench 4 IGBTs
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised: File no. E63532

Typical Applications*

- Single phase inverter

Remarks

- Case temperature limited to T_C=125°C max.; T_C = T_S (valid for baseplateless modules)
- Product reliability results valid for T_j≤150°C (recommended T_{op}=-40...+150°C)



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Absolute Maximum Ratings				
Symbol	**Conditions**		**Values**	**Unit**
Inverter - IGBT				
V_{CES}	T_j = 25 °C		1200	V
I_C	T_j = 175 °C	T_s = 25 °C	90	A
		T_s = 70 °C	73	A
I_{Cnom}			70	A
I_{CRM}	I_{CRM} = 3 x I_{Cnom}		210	A
V_{GES}			-20 ... 20	V
t_{psc}	V_{CC} = 800 V V_{GE} ≤ 15 V V_{CES} ≤ 1200 V	T_j = 150 °C	10	µs
T_j			-40 ... 175	°C
Inverse - Diode				
I_F	T_j = 175 °C	T_s = 25 °C	83	A
		T_s = 70 °C	66	A
I_{Fnom}			75	A
I_{FRM}	I_{FRM} = 3 x I_{Fnom}		225	A
I_{FSM}	10 ms, sin 180°, T_j = 150 °C		430	A
T_j			-40 ... 175	°C
Module				
$I_{t(RMS)}$	$T_{terminal}$ = 80 °C, 20A per spring		100	A
T_{stg}			-40 ... 125	°C
V_{isol}	AC sinus 50Hz, t = 1 min		2500	V

Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
Inverter - IGBT						
$V_{CE(sat)}$	I_C = 70 A V_{GE} = 15 V chiplevel	T_j = 25 °C		1.85	2.10	V
		T_j = 150 °C		2.25	2.45	V
V_{CE0}	chiplevel	T_j = 25 °C		0.8	0.9	V
		T_j = 150 °C		0.7	0.8	V
r_{CE}	V_{GE} = 15 V chiplevel	T_j = 25 °C		15	17	mΩ
		T_j = 150 °C		22	24	mΩ
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 2 mA		5	5.8	6.5	V
I_{CES}	V_{GE} = 0 V V_{CE} = 1200 V	T_j = 25 °C		0.1	0.3	mA
						mA
C_{ies}	V_{CE} = 25 V V_{GE} = 0 V	f = 1 MHz		3.90		nF
C_{oes}		f = 1 MHz		0.31		nF
C_{res}		f = 1 MHz		0.23		nF
Q_G	- 8 V...+ 15 V			400		nC
R_{Gint}	T_j = 25 °C			0.00		Ω
$t_{d(on)}$	V_{CC} = 600 V I_C = 75 A $R_{G\ on}$ = 9.1 Ω $R_{G\ off}$ = 9.1 Ω di/dt_{on} = 1820 A/µs di/dt_{off} = 900 A/µs V_{GE} = +15/-15 V	T_j = 150 °C		26		ns
t_r		T_j = 150 °C		36		ns
E_{on}		T_j = 150 °C		9.5		mJ
$t_{d(off)}$		T_j = 150 °C		320		ns
t_f		T_j = 150 °C		175		ns
E_{off}		T_j = 150 °C		7.1		mJ
$R_{th(j-s)}$	per IGBT			0.55		K/W

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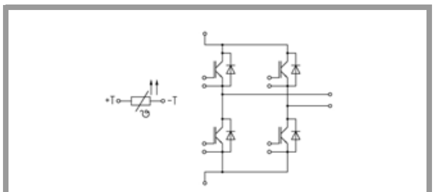

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Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
Inverse - Diode						
V_F = V_{EC}	I_F = 75 A V_{GE} = 0 V chiplevel	T_j = 25 °C		2.2	2.5	V
		T_j = 150 °C		2.1	2.4	V
V_{F0}	chiplevel	T_j = 25 °C		1.3	1.5	V
		T_j = 150 °C		0.9	1.1	V
r_F	chiplevel	T_j = 25 °C		12	13	mΩ
		T_j = 150 °C		16	18	mΩ
I_{RRM}	I_F = 75 A di/dt_{off} = 2120 A/µs V_{GE} = -15 V V_{CC} = 600 V	T_j = 150 °C		80		A
Q_{rr}		T_j = 150 °C		13.3		µC
E_{rr}		T_j = 150 °C		5.6		mJ
$R_{th(j-s)}$	per Diode			0.75		K/W
Module						
M_s	to heat sink		2		2.5	Nm
w				55		g
Temperature Sensor						
R_{100}	T_r=100°C (R_{25}=1000Ω)			1670 ± 3%		Ω
R(T)	R(T)=1000Ω[1+A(T-25°C)+B(T-25°C)^2], A = 7.635*10^{-3} °C^{-1}, B = 1.731*10^{-5} °C^{-2}					

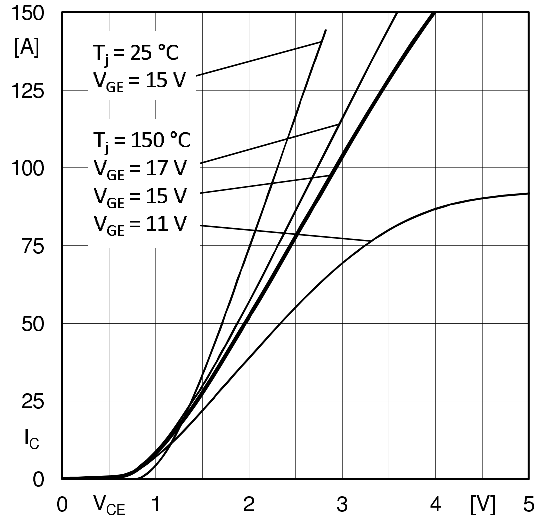


Fig. 1: Typ. output characteristic, inclusive $R_{CC'+EE'}$

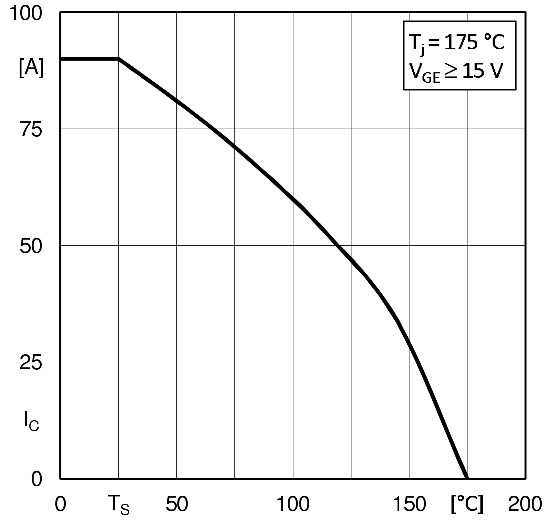


Fig. 2: Rated current vs. temperature $I_C = f(T_S)$

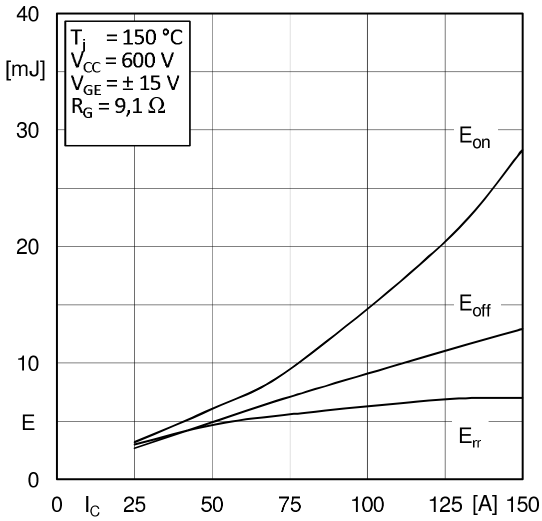


Fig. 3: Typ. turn-on /-off energy = f (I_C)

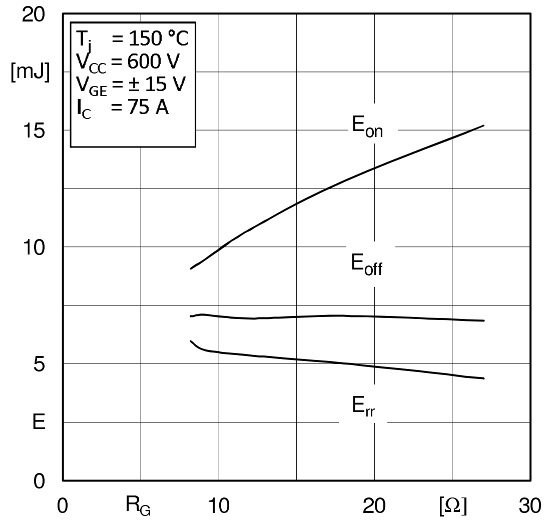


Fig. 4: Typ. turn-on /-off energy = f (R_G)

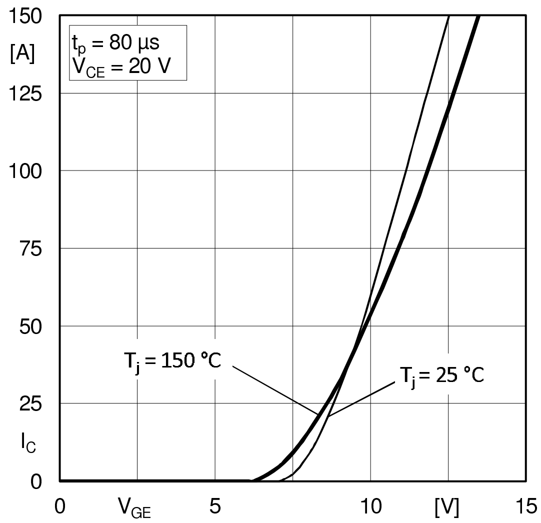


Fig. 5: Typ. transfer characteristic

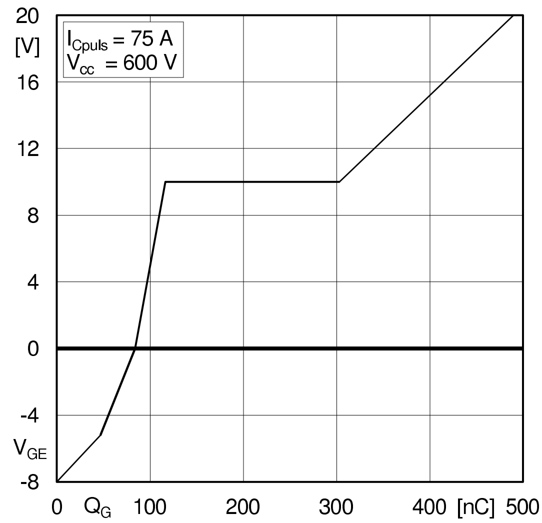


Fig. 6: Typ. gate charge characteristic

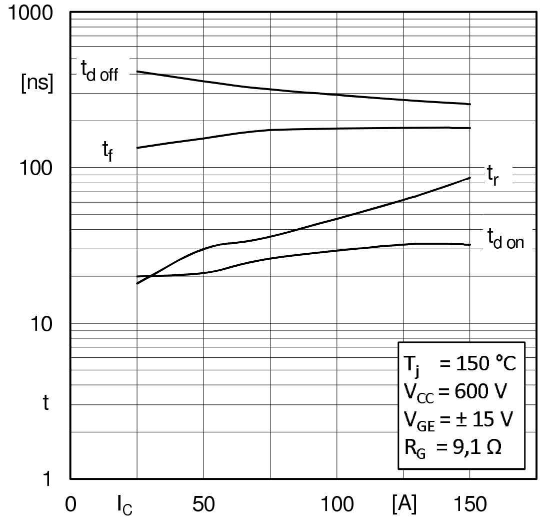


Fig. 7: Typ. switching times vs. I_C

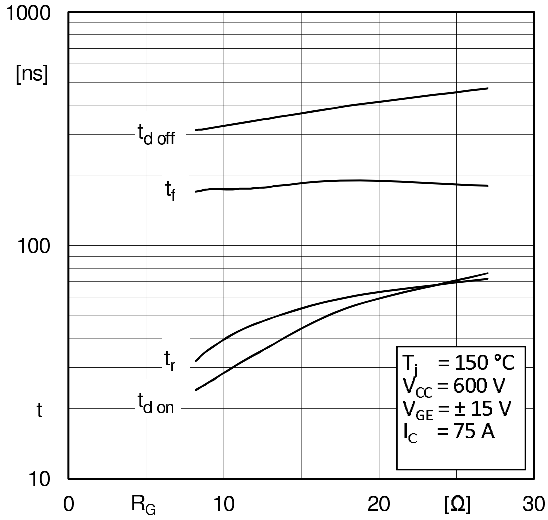


Fig. 8: Typ. switching times vs. gate resistor R_G

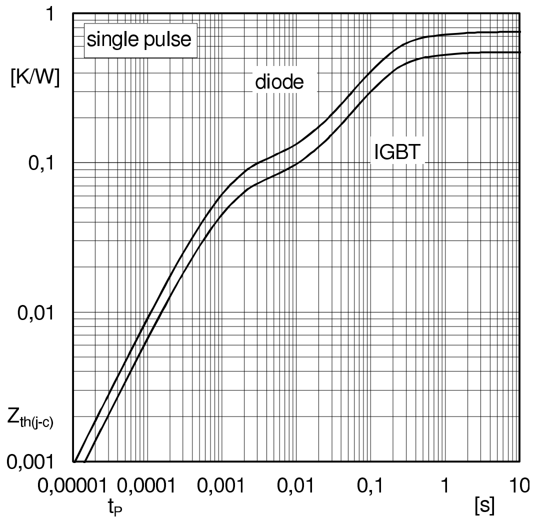


Fig. 9: Transient thermal impedance of IGBT and Diode

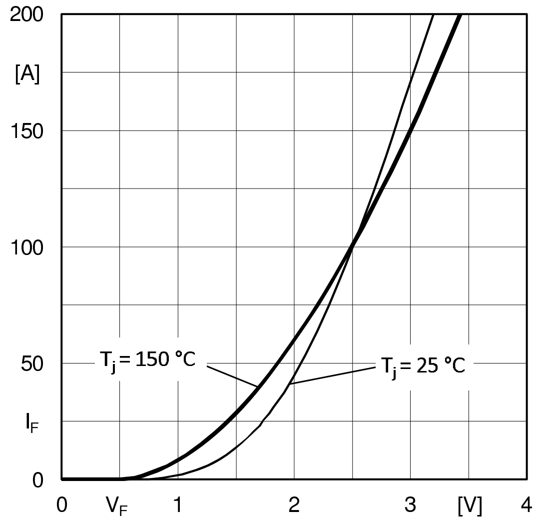


Fig. 10: CAL diode forward characteristic

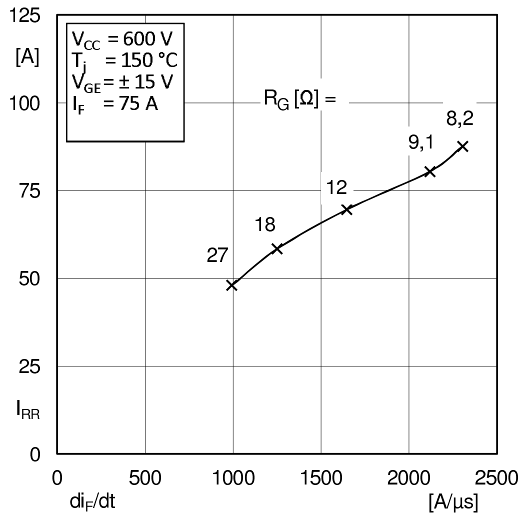


Fig. 11: Typ. CAL diode peak reverse recovery current

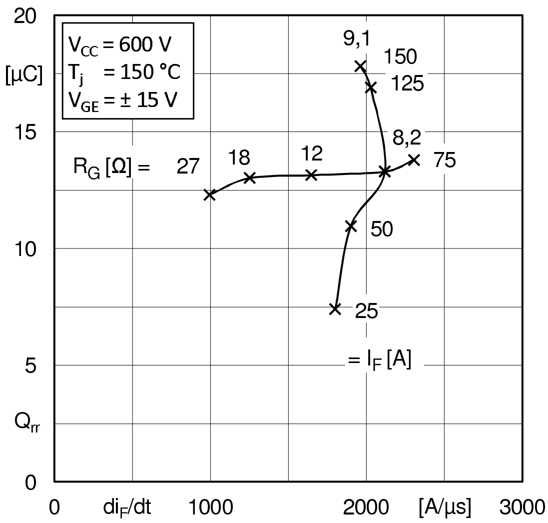
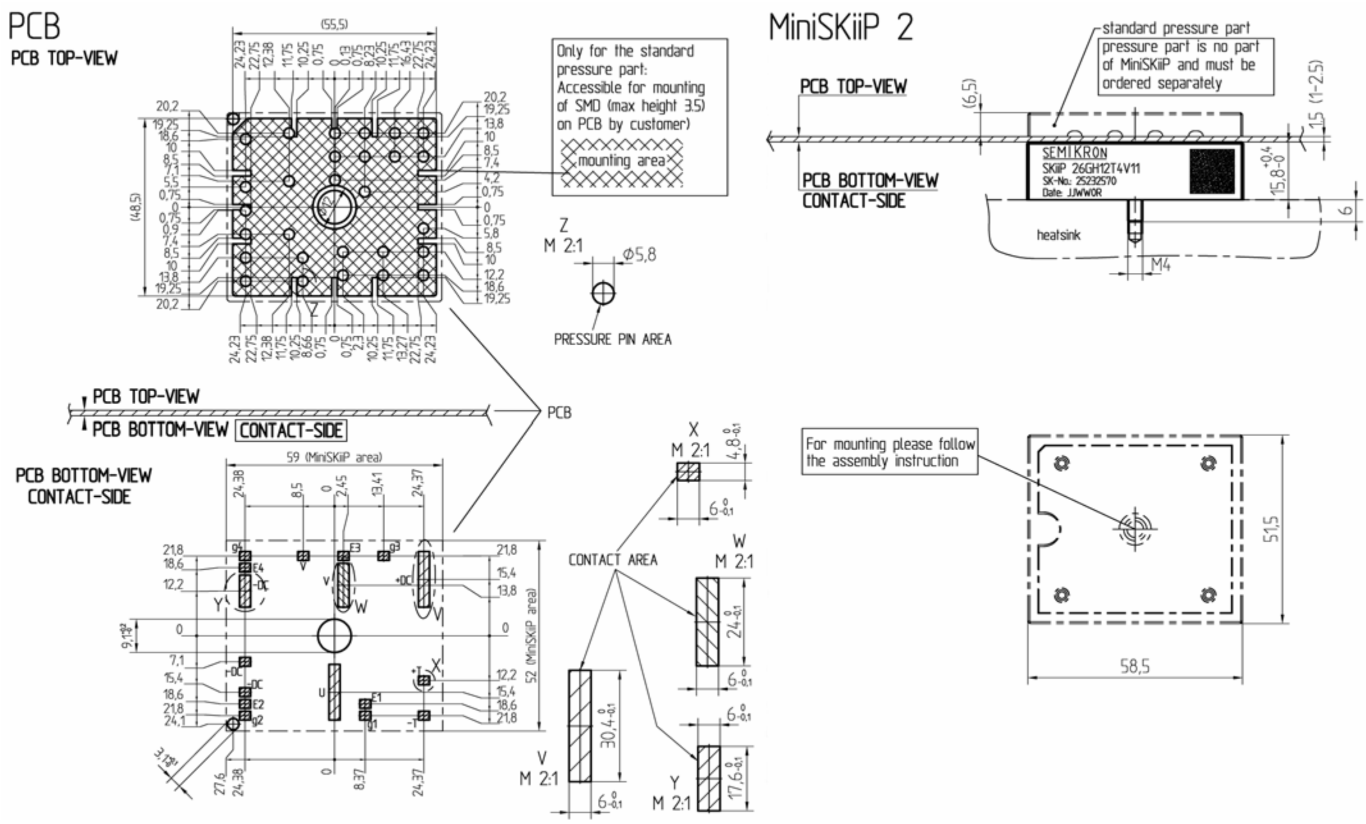
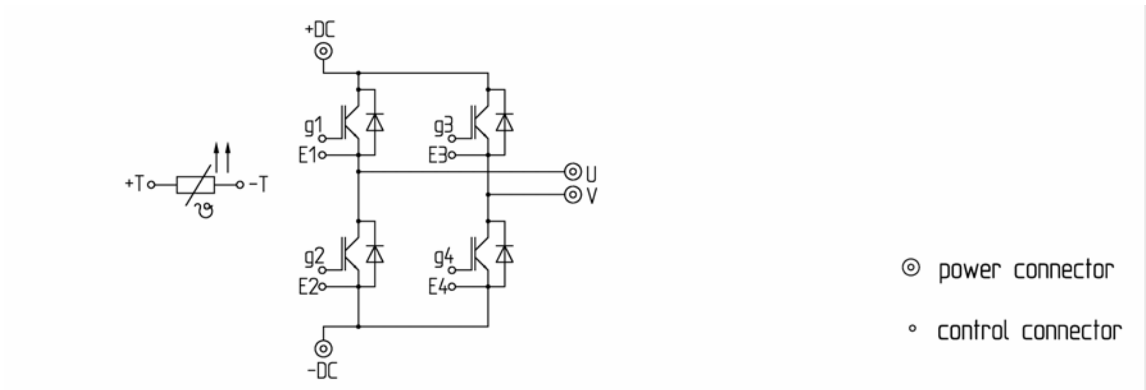


Fig. 12: Typ. CAL diode recovery charge



pinout, dimensions



pinout

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.