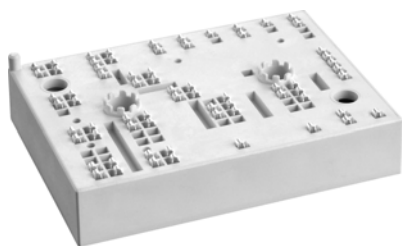


SKiiP 38AC12T4V1



MiniSKiiP® 3

SKiiP 38AC12T4V1

Features

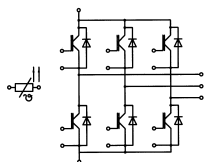
- Trench 4 IGBT's
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised file no. E63532

Typical Applications*

- Inverter up to 41 kVA
- Typical motor power 22 kW

Remarks

- V_{CEsat} , V_F = chip level value
- Case temp. limited to $T_C = 125^\circ\text{C}$ max. (for baseplateless modules $T_C = T_S$)
- product rel. results valid for $T_j \leq 150$ (recomm. $T_{op} = -40 \dots +150^\circ\text{C}$)
- For short circuit: Soft R_{Goff} recommended



AC

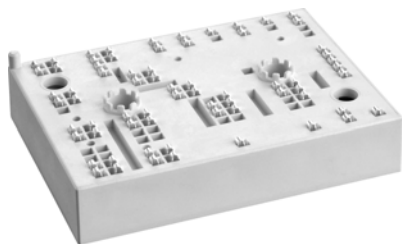
Absolute Maximum Ratings

Symbol	Conditions		Values	Unit
Inverter - IGBT				
V _{CES}	T _j = 25 °C		1200	V
I _C	T _j = 175 °C	T _s = 25 °C	115	A
		T _s = 70 °C	93	A
I _{Cnom}			100	A
I _{CRM}	I _{CRM} = 3 x I _{Cnom}		300	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	100	A
		T _s = 70 °C	79	A
I _{Fnom}			100	A
I _{FRM}	I _{FRM} = 3 x I _{Fnom}		300	A
I _{FSM}	10 ms, sin 180°, T _j = 150 °C		550	A
T _j			-40 ... 175	°C
Module				
I _{t(RMS)}	T _{terminal} = 80 °C, 20A per spring		160	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 = 100 A	T _j = 25 °C		1.80	2.05	V
	V _{GE} = 15 V chiplevel	T _j = 150 °C		2.20	2.40	V
V _{CE0}		T _j = 25 °C		0.8	0.9	V
		T _j = 150 °C		0.7	0.8	V
r _{CE}	V _{GE} = 15 V	T _j = 25 °C		10	12	mΩ
		T _j = 150 °C		15	16	mΩ
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 4 mA		5	5.8	6.5	V
I _{CES}	V _{GE} = 0 V	T _j = 25 °C		0.1	0.3	mA
	V _{CE} = 1200 V					mA
C _{ies}	V _{CE} = 25 V	f = 1 MHz		6.15		nF
C _{oes}	V _{GE} = 0 V	f = 1 MHz		0.41		nF
C _{res}		f = 1 MHz		0.34		nF
Q _G	- 8 V...+ 15 V			565		nC
R _{Gint}	T _j = 25 °C			7.50		Ω
t _{d(on)}	V _{CC} = 600 V	T _j = 150 °C		160		ns
t _r	I _C = 100 A	T _j = 150 °C		45		ns
E _{on}	R _{G on} = 1 Ω	T _j = 150 °C		13.7		mJ
t _{d(off)}	R _{G off} = 1 Ω	T _j = 150 °C		395		ns
t _f	di/dt _{on} = 2080 A/μs	T _j = 150 °C		73		ns
E _{off}	di/dt _{off} = 1240 A/μs	T _j = 150 °C		9.7		mJ
	V _{GE} = +15/-15 V	T _j = 150 °C				
R _{th(j-s)}	per IGBT			0.48		K/W

SKiiP 38AC12T4V1



MiniSKiiP® 3

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Features

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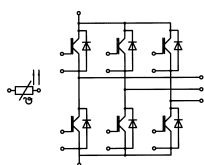
Typical Applications*

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- Typical motor power 22 kW

Remarks

- V_{CEsat} , V_F = chip level value
- Case temp. limited to $T_C = 125^\circ\text{C}$ max. (for baseplateless modules $T_C = T_S$)
- product rel. results valid for $T_j \leq 150$ (recomm. $T_{op} = -40 \dots +150^\circ\text{C}$)
- For short circuit: Soft R_{Goff} recommended

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Inverse - Diode						
V _F = V _{EC}	I _F = 100 A	T _j = 25 °C		2.2	2.5	V
	V _{GE} = 0 V chiplevel	T _j = 150 °C		2.1	2.5	V
V _{F0}		T _j = 25 °C		1.3	1.5	V
		T _j = 150 °C		0.9	1.1	V
r _F		T _j = 25 °C		9.0	10	mΩ
		T _j = 150 °C		13	14	mΩ
I _{RRM}	I _F = 100 A	T _j = 150 °C		112		A
Q _{rr}	di/dt _{off} = 2680 A/μs	T _j = 150 °C		16		μC
E _{rr}	V _{GE} = -15 V	T _j = 150 °C		6.5		mJ
	V _{CC} = 600 V					
R _{th(j-s)}	per Diode			0.66		K/W
Module						
M _s	to heat sink		2		2.5	Nm
w				95		g
Temperatur Sensor						
R ₁₀₀	T _C =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					



AC

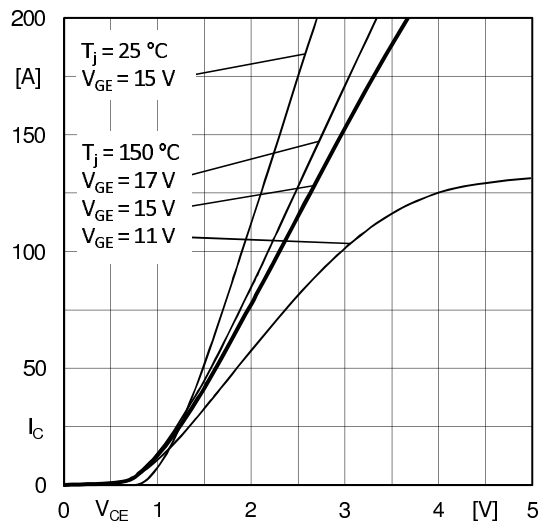


Fig. 1: Typ. output characteristic, inclusive $R_{CC'} + E_{E'}$

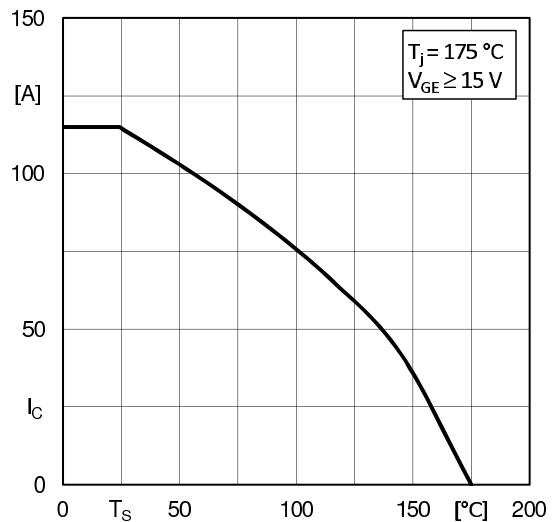


Fig. 2: Rated current vs. temperature $I_C = f(T_S)$

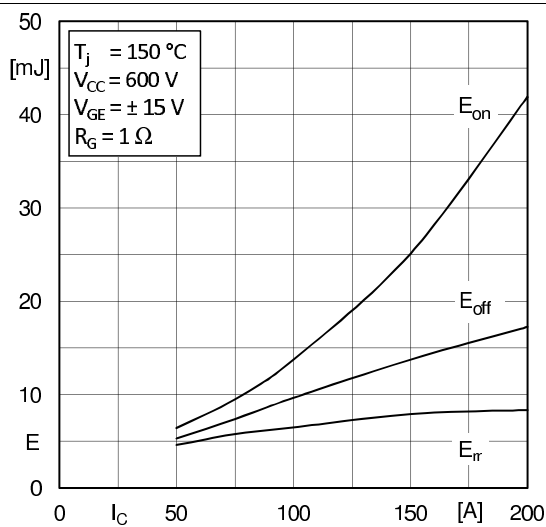


Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

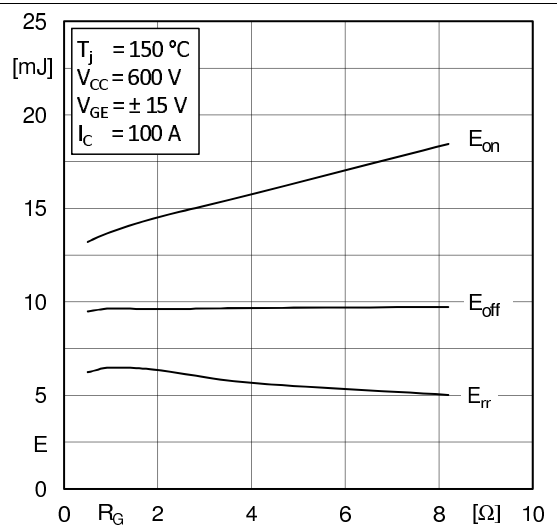


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

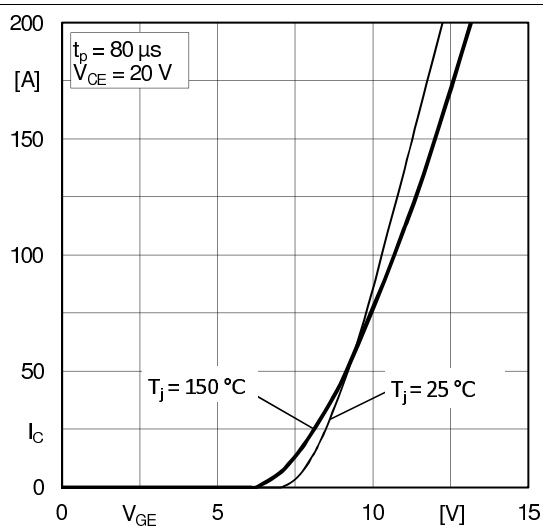


Fig. 5: Typ. transfer characteristic

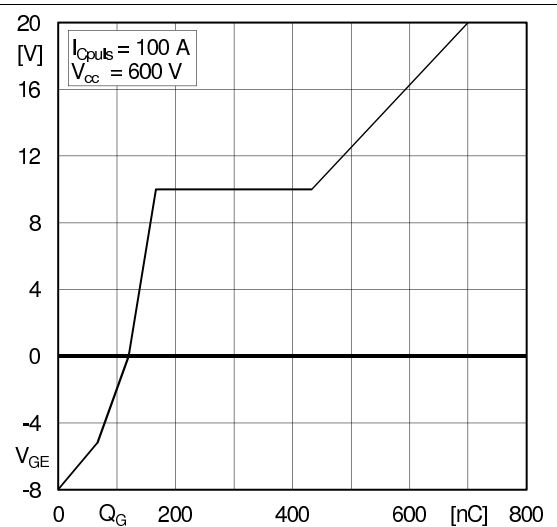
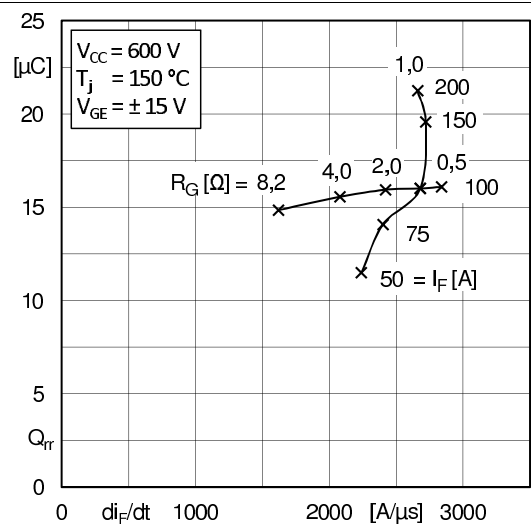
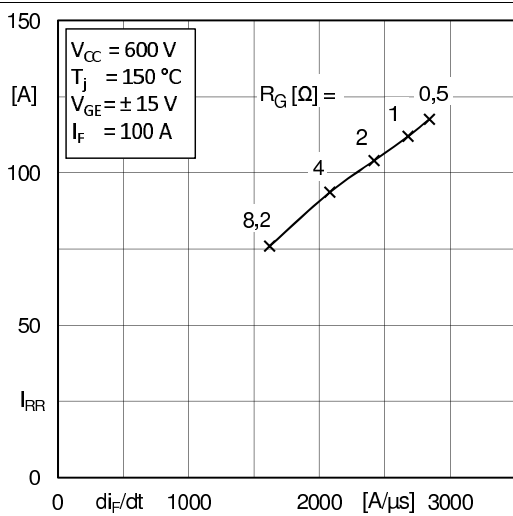
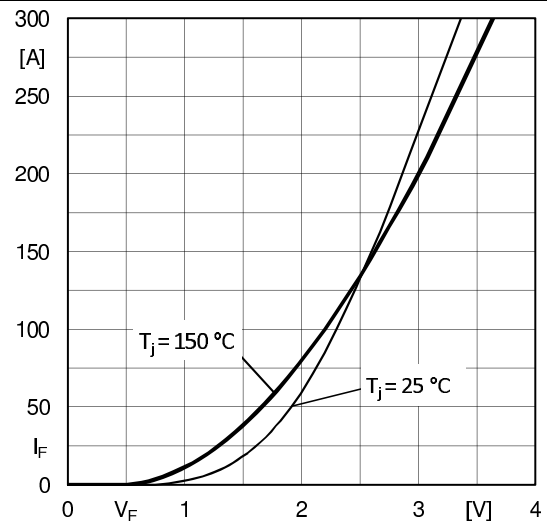
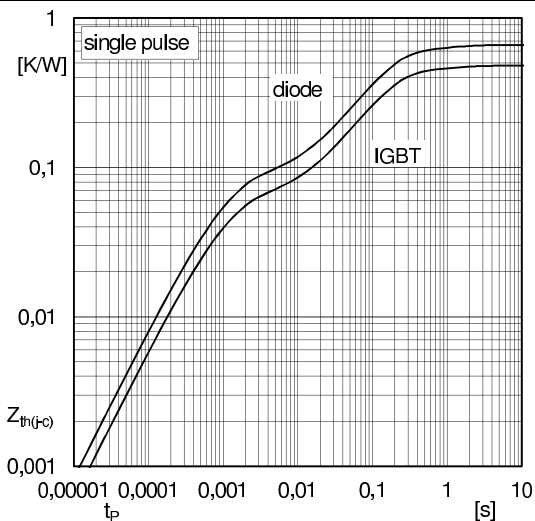
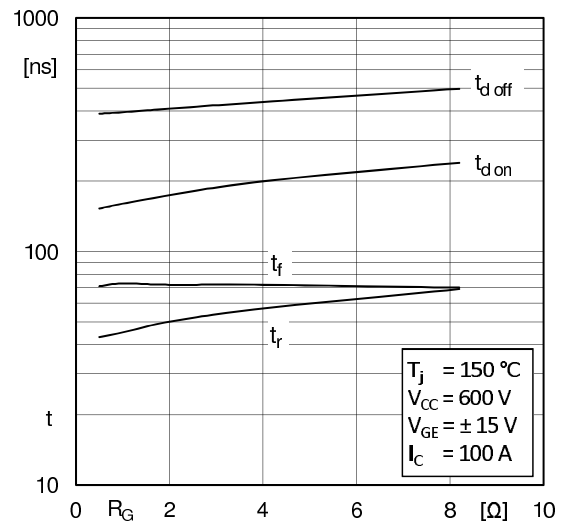
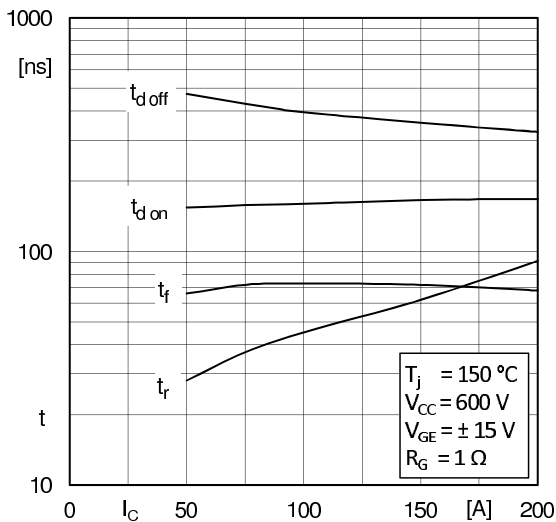
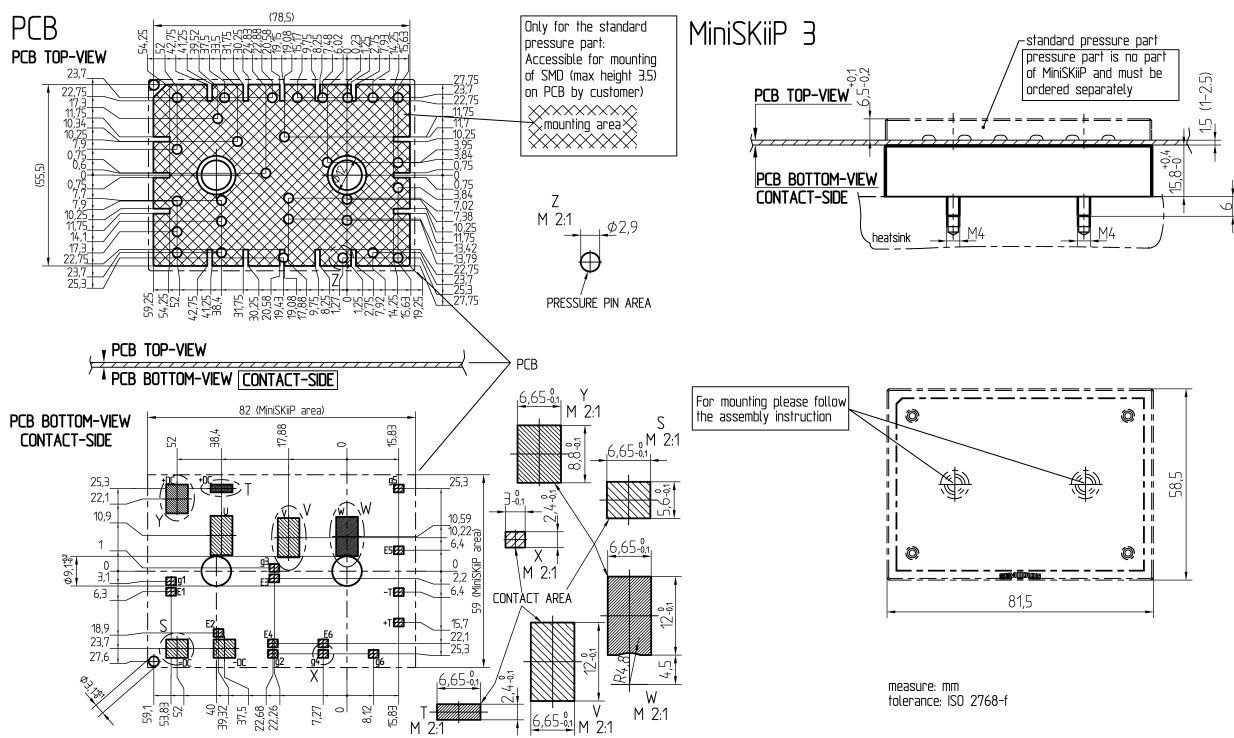


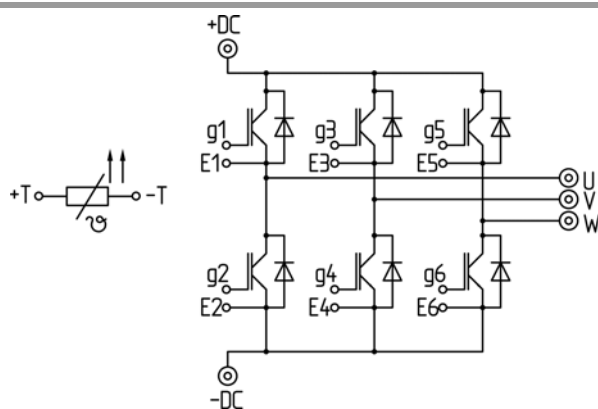
Fig. 6: Typ. gate charge characteristic



pinout, dimensions



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- ⊙ power connector
- control connector

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.