

SKiiP 12AC12T4V1



MiniSKiiP® 1

SKiiP 12AC12T4V1

Features

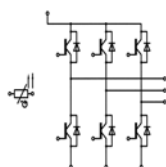
- Trench 4 IGBT's
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised file no. E63532

Typical Applications*

- Inverter up to 12 kVA
- Typical motor power 5,5 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. $T_{op} = -40 \dots +150^\circ\text{C}$)



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	18	A
		T _s = 70 °C	18	A
I _{Cnom}			15	A
I _{CRM}	I _{CRM} = 3 x I _{Cnom}		45	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	23	A
		T _s = 70 °C	18	A
I _{Fnom}			15	A
I _{FRM}	I _{FRM} = 3 x I _{Fnom}		45	A
I _{FSM}	10 ms, sin 180°, T _j = 150 °C		65	A
T _j			-40 ... 175	°C
Module				
I _{t(RMS)}	T _{terminal} = 80 °C, 20A per spring		20	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 = 15 A	T _j = 25 °C		1.85	2.10	V
	V _{GE} = 15 V chiplevel	T _j = 150 °C		2.25	2.45	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		70	80	mΩ
		T _j = 150 °C		103	110	mΩ
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 1 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 V _{GE} = 0 V	f = 1 MHz		0.90		nF
C _{oes}		f = 1 MHz		0.08		nF
C _{res}		f = 1 MHz		0.06		nF
Q _G	- 8 V...+ 15 V			85		nC
R _{Gint}	T _j = 25 °C			0.00		Ω
t _{d(on)}	V _{CC} = 600 V	T _j = 150 °C		31		ns
t _r	I _C = 15 A	T _j = 150 °C		30		ns
E _{on}	R _{G on} = 39 Ω	T _j = 150 °C		1.65		mJ
	R _{G off} = 39 Ω					
t _{d(off)}	di/dt _{on} = 400 A/μs	T _j = 150 °C		315		ns
t _f	di/dt _{off} = 200 A/μs	T _j = 150 °C		66		ns
E _{off}	V _{GE} = +15/-15 V	T _j = 150 °C		1.5		mJ
R _{th(j-s)}	per IGBT			1.3		K/W

SKiiP 12AC12T4V1



MiniSKiiP® 1

SKiiP 12AC12T4V1

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

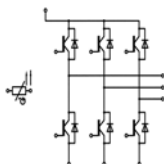
Typical Applications*

- Inverter up to 12 kVA
- Typical motor power 5,5 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. $T_{op} = -40 \dots +150^\circ\text{C}$)

Characteristics					
Symbol	Conditions		min.	typ.	max. Unit
Inverse - Diode					
$V_F = V_{EC}$	$I_F = 15 \text{ A}$ $V_{GE} = 0 \text{ V}$ chiplevel	$T_j = 25^\circ\text{C}$		2.4	2.7 V
		$T_j = 150^\circ\text{C}$		2.4	2.8 V
V_{F0}		$T_j = 25^\circ\text{C}$		1.3	1.5 V
		$T_j = 150^\circ\text{C}$		0.9	1.1 V
r_F		$T_j = 25^\circ\text{C}$		72	81 mΩ
		$T_j = 150^\circ\text{C}$		103	111 mΩ
I_{RRM}	$I_F = 15 \text{ A}$	$T_j = 150^\circ\text{C}$		12	A
Q_{rr}	$di/dt_{off} = 500 \text{ A}/\mu\text{s}$ $V_{GE} = -15 \text{ V}$	$T_j = 150^\circ\text{C}$		2	μC
E_{rr}	$V_{CC} = 600 \text{ V}$	$T_j = 150^\circ\text{C}$		0.79	mJ
$R_{th(j-s)}$	per Diode			1.92	K/W
Module					
M_s	to heat sink		2	2.5	Nm
w				35	g
Temperatur Sensor					
R_{100}	$T_C = 100^\circ\text{C}$ ($R_{25} = 1000\Omega$)			$1670 \pm 3\%$	Ω
$R(T)$	$R(T) = 1000\Omega [1 + A(T - 25^\circ\text{C}) + B(T - 25^\circ\text{C})^2]$], $A = 7.635 \cdot 10^{-3} \text{ }^\circ\text{C}^{-1}$, $B = 1.731 \cdot 10^{-5} \text{ }^\circ\text{C}^{-2}$				



AC

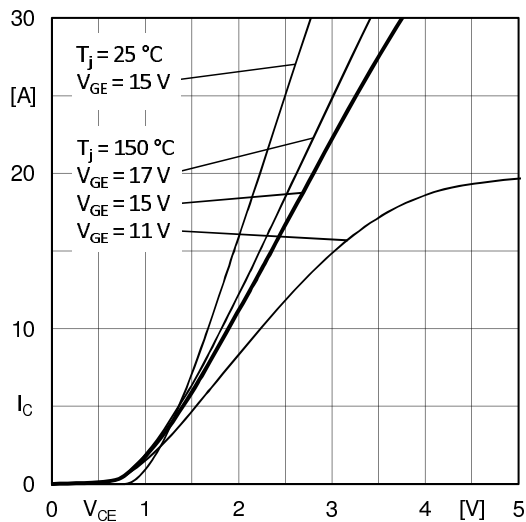


Fig. 1: Typ. output characteristic, inclusive $R_{CC'} + E_{E'}$

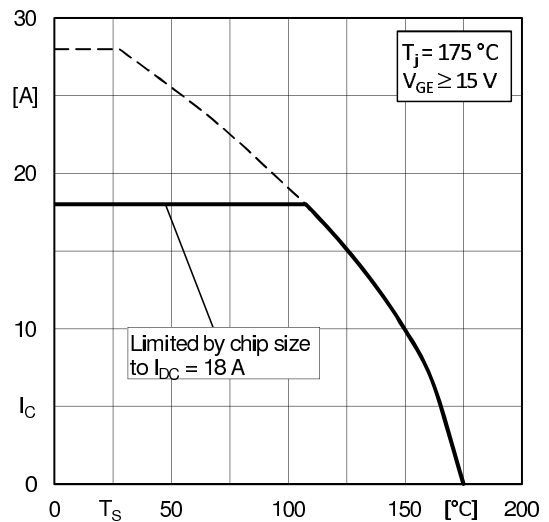


Fig. 2: Rated current vs. temperature $I_C = f(T_S)$

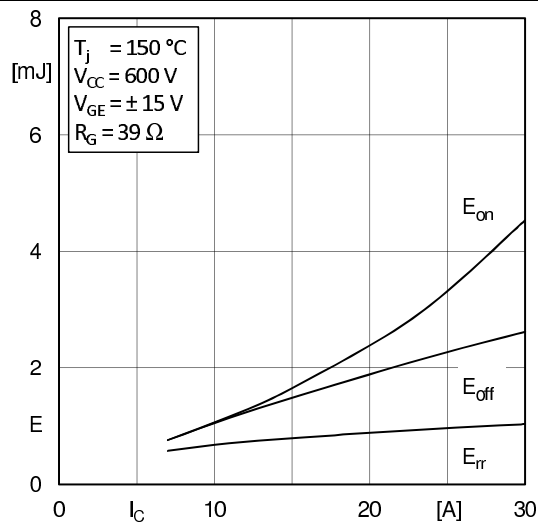


Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

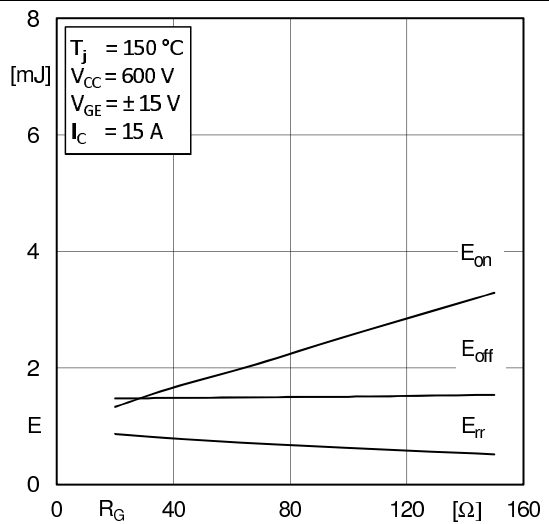


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

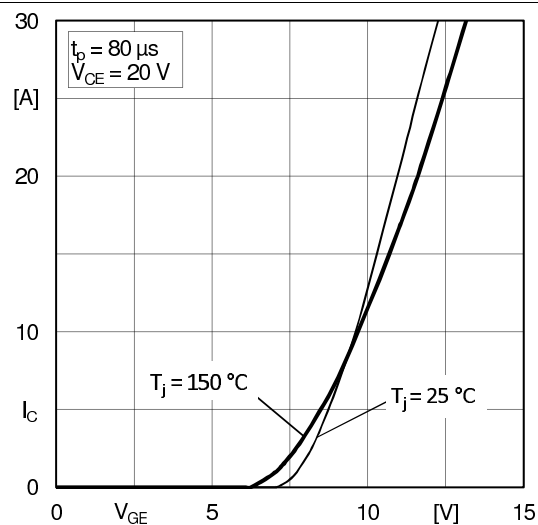


Fig. 5: Typ. transfer characteristic

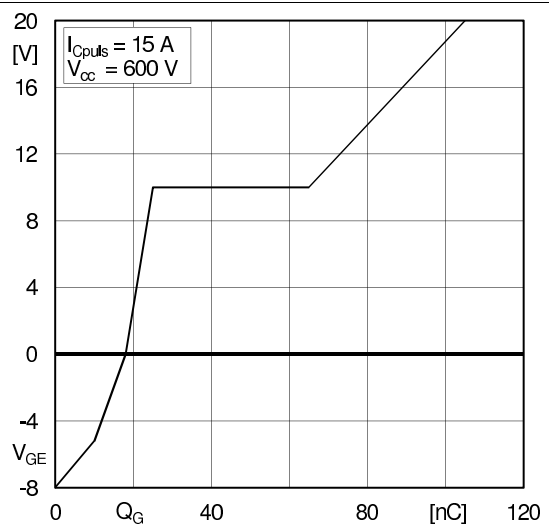
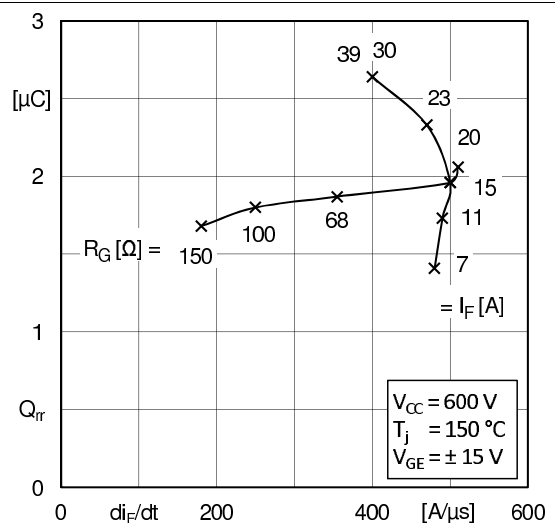
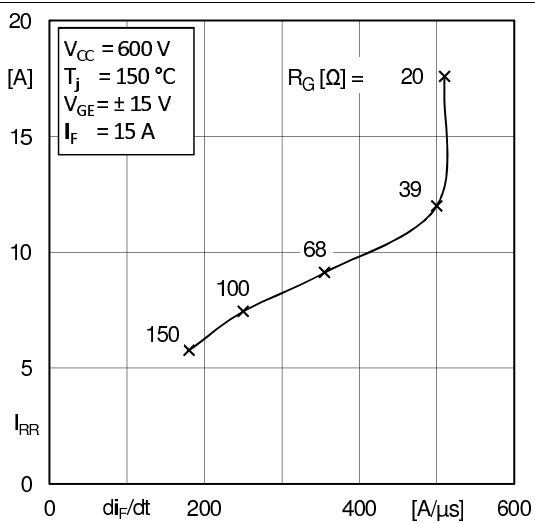
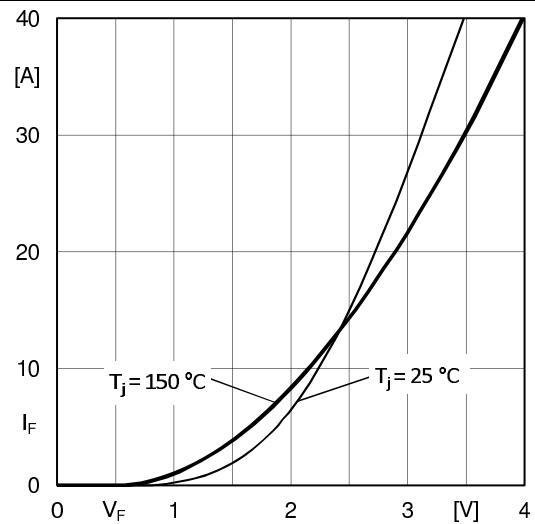
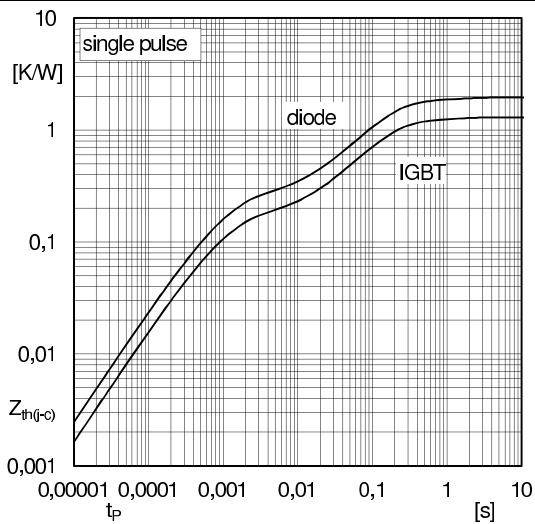
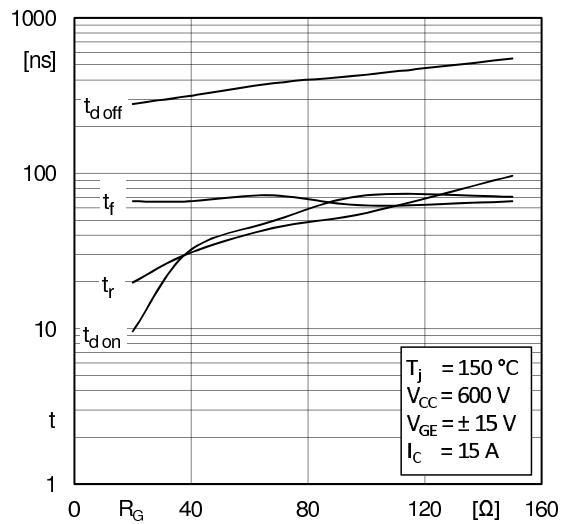
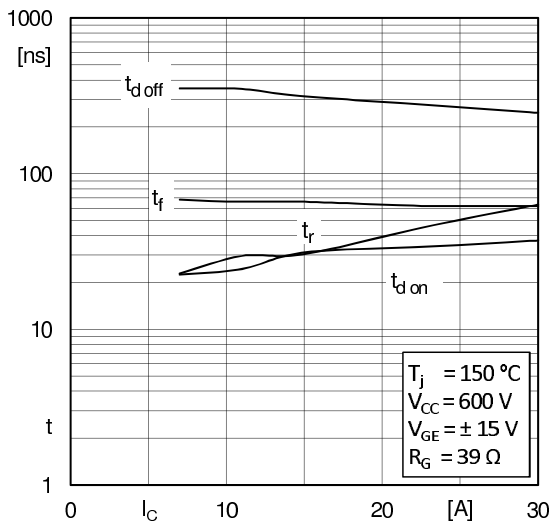
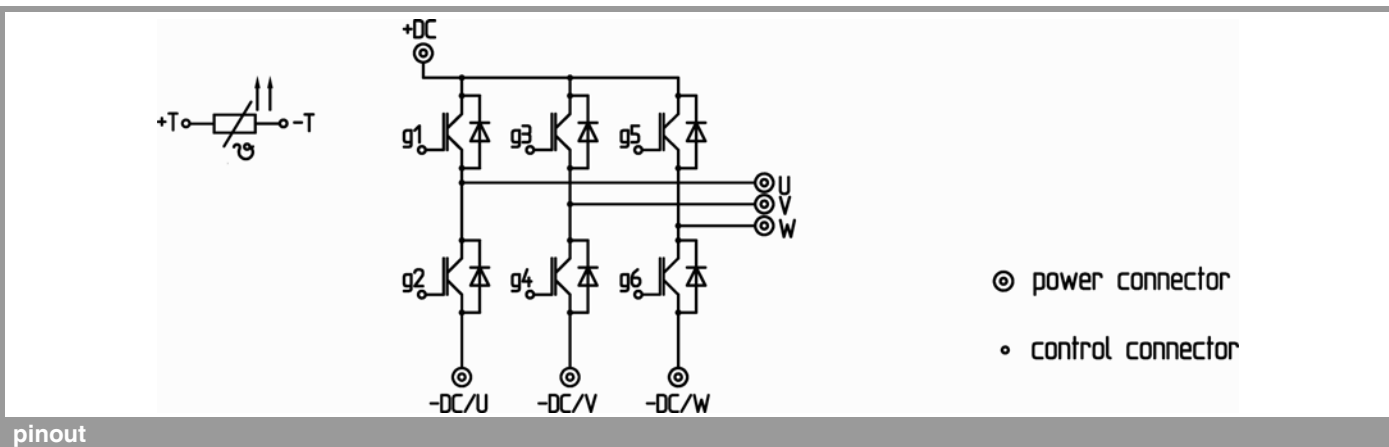
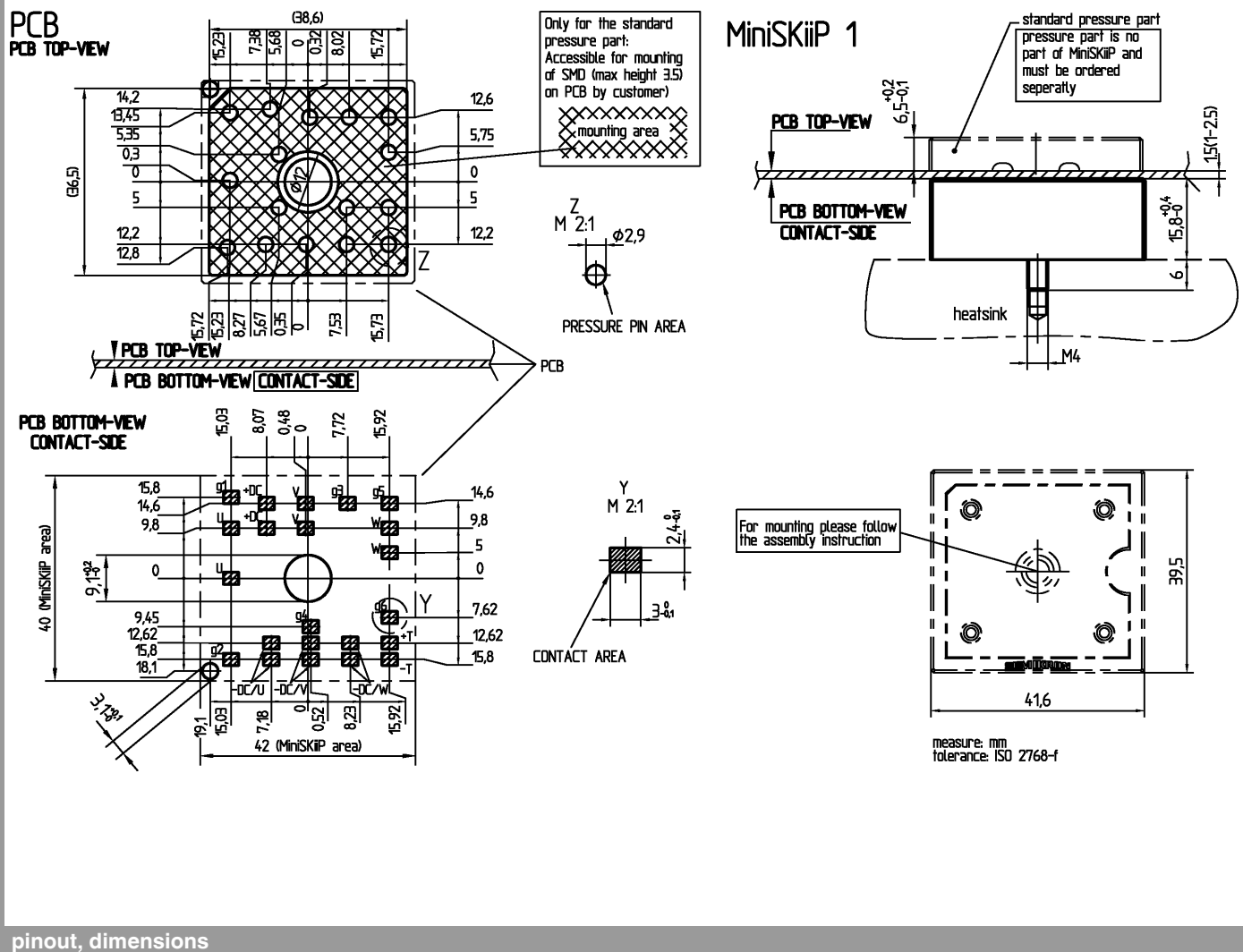


Fig. 6: Typ. gate charge characteristic





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.