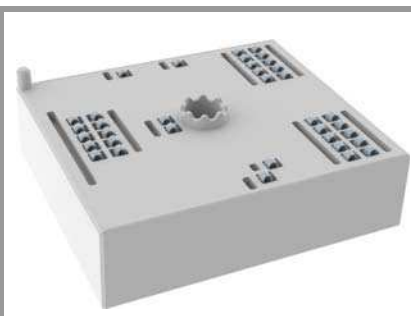


SKiIP24GB12T4V1



MiniSKiIP® 2 Dual

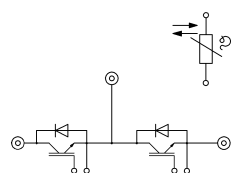
SKiIP24GB12T4V1

Features

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

Remarks

- Max. case temperature limited to $T_C = 125^\circ\text{C}$
- Product reliability results valid for $T_j \leq 150^\circ\text{C}$ (recommended $T_{j,op} = -40 \dots +150^\circ\text{C}$)



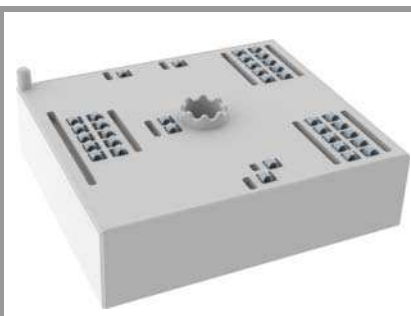
GB

Absolute Maximum Ratings

Symbol	Conditions	Values	Unit
Inverter - IGBT			
V_{CES}	$T_j = 25^\circ\text{C}$	1200	V
I_C	$T_j = 175^\circ\text{C}$	$T_s = 25^\circ\text{C}$	170
		$T_s = 70^\circ\text{C}$	138
I_{Cnom}		150	A
I_{CRM}	$I_{CRM} = 3 \times I_{Cnom}$	450	A
V_{GES}		-20 ... 20	V
t_{psc}	$V_{CC} = 800\text{ V}$ $V_{GE} \leq 15\text{ V}$ $V_{CES} \leq 1200\text{ V}$	$T_j = 150^\circ\text{C}$	10
T_j		-40 ... 175	$^\circ\text{C}$
Inverse - Diode			
I_F	$T_j = 175^\circ\text{C}$	$T_s = 25^\circ\text{C}$	157
		$T_s = 70^\circ\text{C}$	125
I_{Fnom}		150	A
I_{FRM}	$I_{FRM} = 3 \times I_{Fnom}$	450	A
I_{FSM}	10 ms, sin 180° , $T_j = 150^\circ\text{C}$	774	A
T_j		-40 ... 175	$^\circ\text{C}$
Module			
$I_{t(RMS)}$	$T_{terminal} = 80^\circ\text{C}$, 20 A per spring	200	A
T_{stg}		-40 ... 125	$^\circ\text{C}$
V_{isol}	AC sinus 50 Hz, $t = 1\text{ min}$	2500	V

Characteristics

Symbol	Conditions	min.	typ.	max.	Unit
Inverter - IGBT					
$V_{CE(sat)}$	$I_C = 150\text{ A}$ $V_{GE} = 15\text{ V}$ chipelevel	$T_j = 25^\circ\text{C}$	1.85	2.10	V
		$T_j = 150^\circ\text{C}$	2.25	2.45	V
V_{CE0}	chipelevel	$T_j = 25^\circ\text{C}$	0.8	0.9	V
		$T_j = 150^\circ\text{C}$	0.7	0.8	V
r_{CE}	$V_{GE} = 15\text{ V}$ chipelevel	$T_j = 25^\circ\text{C}$	7	8	m Ω
		$T_j = 150^\circ\text{C}$	10	11	m Ω
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 6\text{ mA}$	5	5.8	6.5	V
I_{CES}	$V_{GE} = 0\text{ V}$ $V_{CE} = 1200\text{ V}$	$T_j = 25^\circ\text{C}$	0.1	0.3	mA
					mA
C_{ies}	$V_{CE} = 25\text{ V}$ $V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	8.80		nF
C_{oes}		$f = 1\text{ MHz}$	0.58		nF
C_{res}		$f = 1\text{ MHz}$	0.47		nF
Q_G	- 8 V...+ 15 V		850		nC
R_{Gint}	$T_j = 25^\circ\text{C}$		5		Ω
$t_{d(on)}$	$V_{CC} = 600\text{ V}$	$T_j = 150^\circ\text{C}$	136		ns
t_r	$I_C = 150\text{ A}$ $R_{G on} = 2\text{ }\Omega$	$T_j = 150^\circ\text{C}$	39		ns
		$T_j = 150^\circ\text{C}$	10.8		mJ
E_{on}	$R_{G off} = 2\text{ }\Omega$	$T_j = 150^\circ\text{C}$			
$t_{d(off)}$	$di/dt_{on} = 4700\text{ A}/\mu\text{s}$	$T_j = 150^\circ\text{C}$	391		ns
t_f	$di/dt_{off} = 1600\text{ A}/\mu\text{s}$ $du/dt = 6000\text{ V}/\mu\text{s}$	$T_j = 150^\circ\text{C}$	82		ns
		$T_j = 150^\circ\text{C}$			
E_{off}	$V_{GE} = +15/-15\text{ V}$ $L_s = 25\text{ nH}$	$T_j = 150^\circ\text{C}$	15.6		mJ
$R_{th(j-s)}$	per IGBT, $\lambda_{paste} = 0.8\text{ W/K}\cdot\text{m}$		0.32		K/W



MiniSKiiP® 2 Dual

SKiiP24GB12T4V1

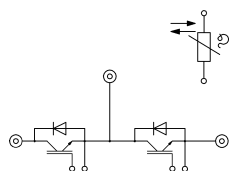
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Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Inverse - Diode						
V _F = V _{EC}	I _F = 150 A	T _j = 25 °C		2.2	2.5	V
	V _{GE} = 0 V	T _j = 150 °C		2.1	2.4	V
	chiplevel					
V _{F0}		T _j = 25 °C		1.3	1.5	V
	chiplevel	T _j = 150 °C		0.9	1.1	V
r _F		T _j = 25 °C		5.8	6.6	mΩ
	chiplevel	T _j = 150 °C		8.1	8.8	mΩ
I _{RRM}	I _F = 150 A	T _j = 150 °C		191		A
Q _{rr}	di/dt _{off} = 5000 A/μs	T _j = 150 °C		25		μC
E _{rr}	V _{GE} = -15 V	T _j = 150 °C		10.3		mJ
	V _{CC} = 600 V					
R _{th(j-s)}	per Diode, λ _{paste} =0.8 W/K*m			0.41		K/W
Module						
L _{CE}				20		nH
M _s	to heat sink			2	2.5	Nm
w				50		g
Temperature Sensor						
R ₁₀₀	T _c =100°C (R ₂₅ =5 kΩ)			493 ± 5%		Ω
B _{25/85}	R(T)=R ₂₅ *exp[B _{25/85} *(1/T-1/298)], [T]=K			3420		K



GB

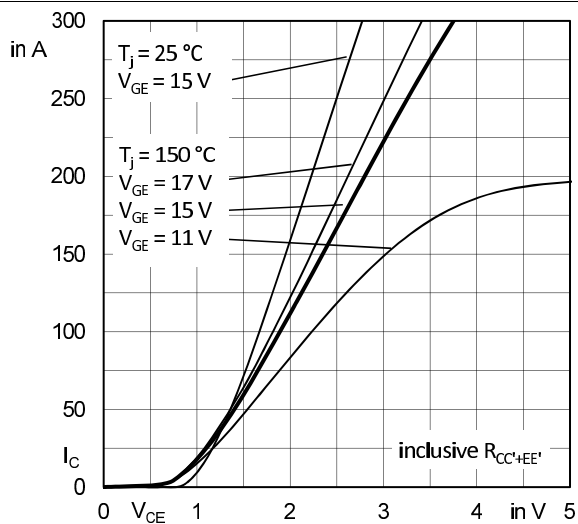


Fig. 1: Typ. output characteristic, inclusive $R_{CC'+EE'}$

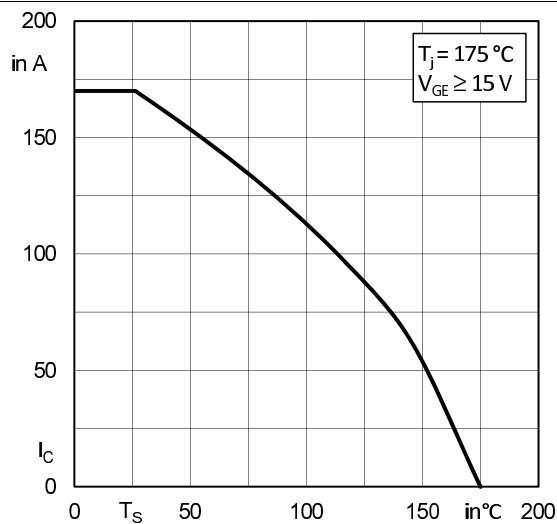


Fig. 2: Rated current vs. temperature $I_C = f(T_S)$

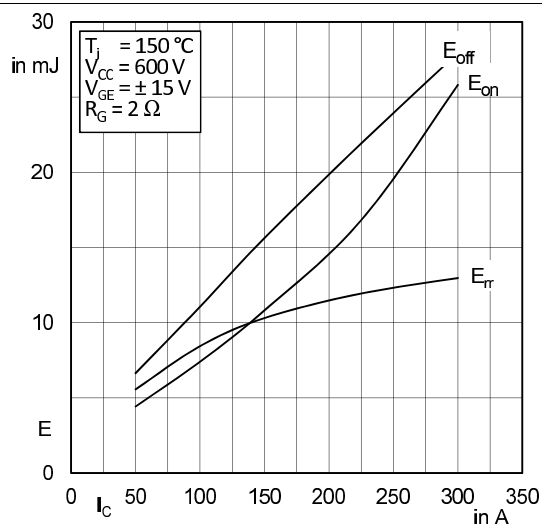


Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

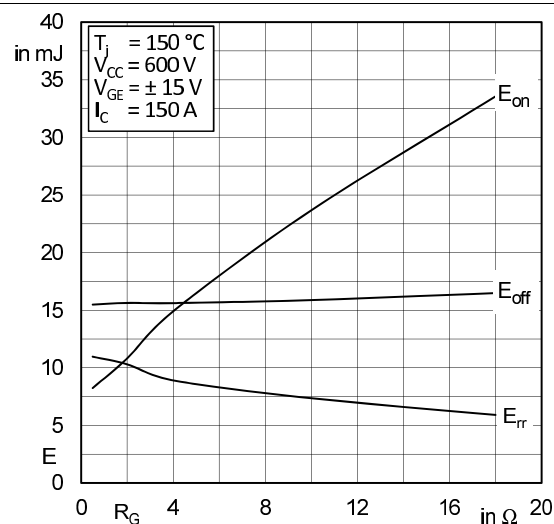


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

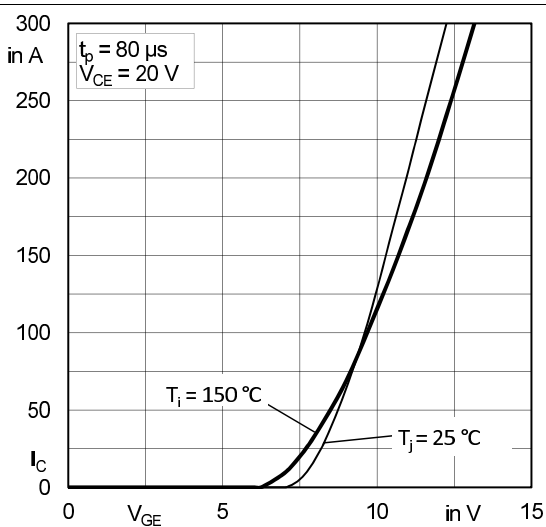


Fig. 5: Typ. transfer characteristic

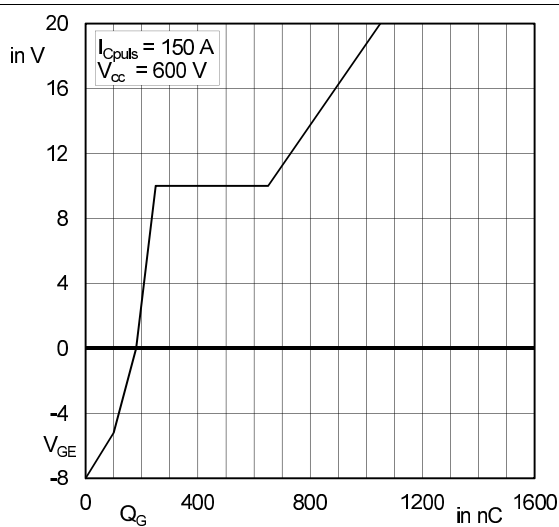
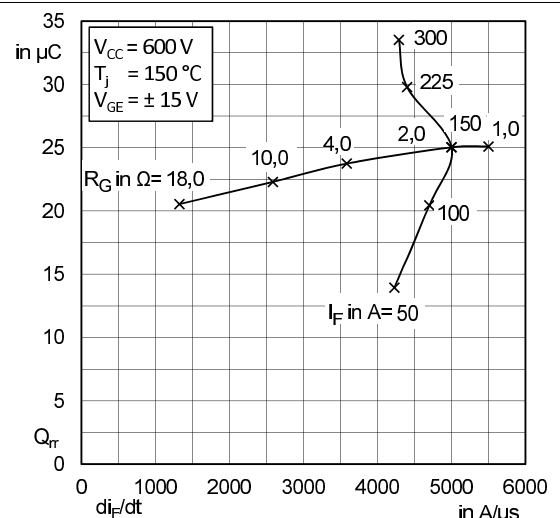
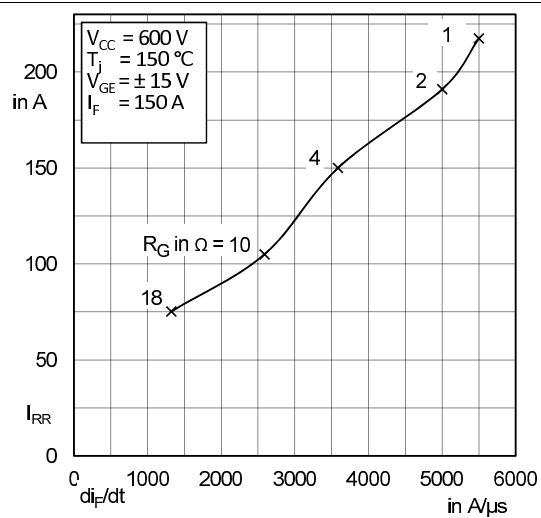
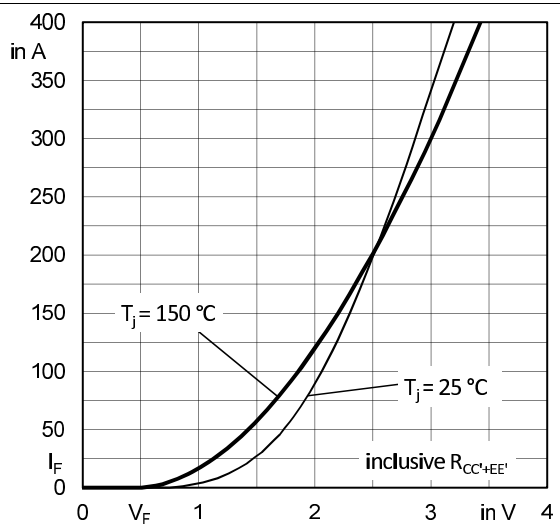
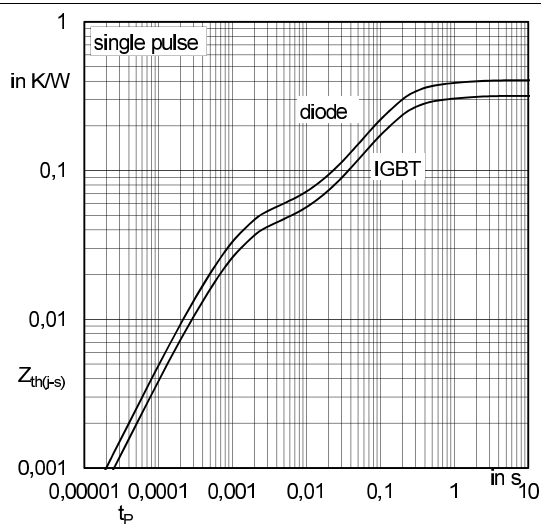
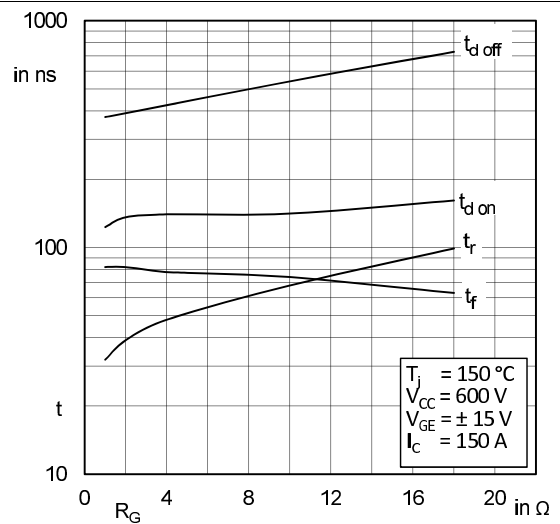
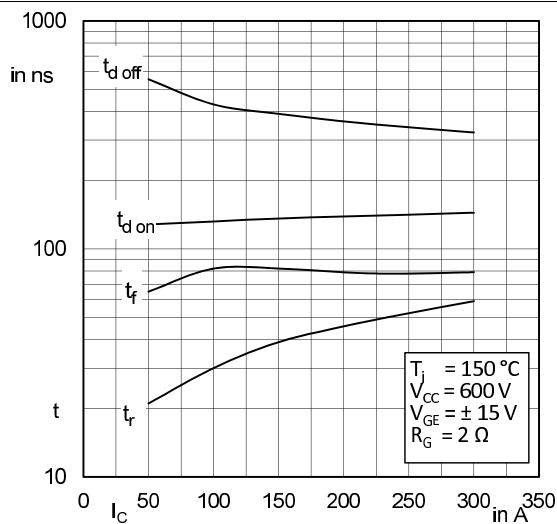
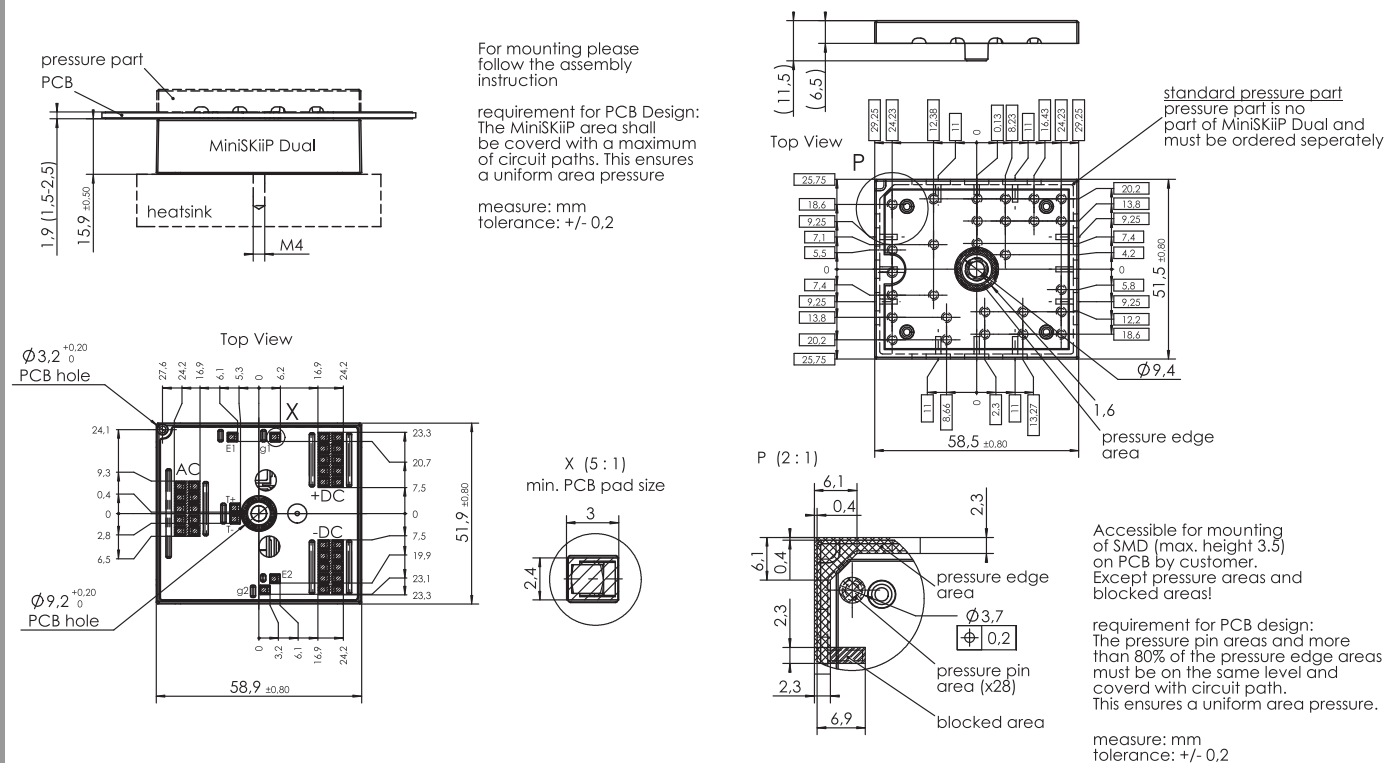
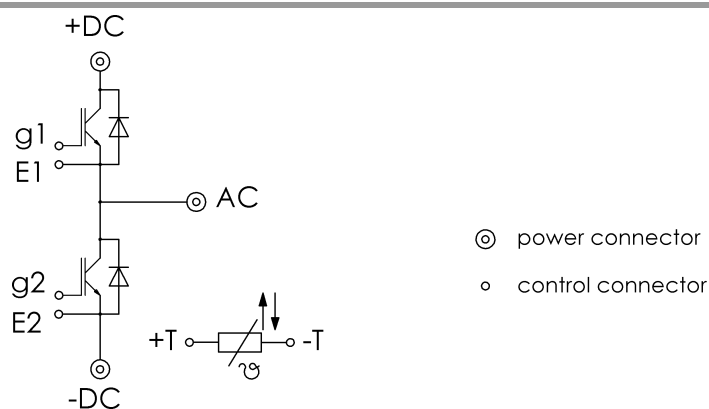


Fig. 6: Typ. gate charge characteristic





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.