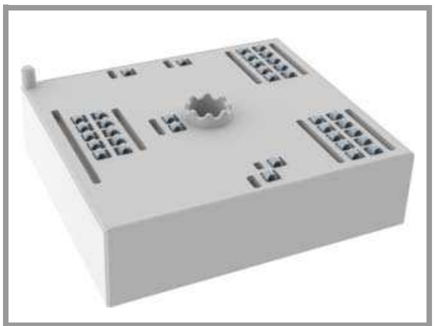


MiniSKiiP® 2 Dual

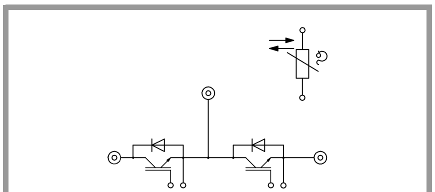
SKiiP 24GB17E4V1

Features

- Trench 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°C
- Product reliability results valid for T_j≤150°C (recommended $T_{j,op}$=-40...+150°C)
- The creepage distance between T-Sensor and ground is 8mm



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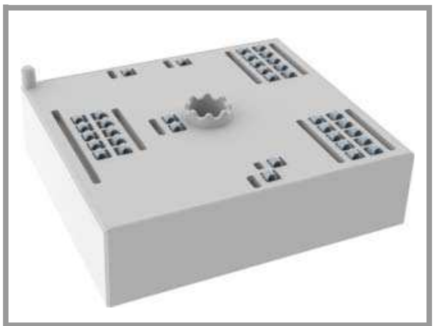
Absolute Maximum Ratings				
Symbol	**Conditions**		**Values**	**Unit**
Inverter - IGBT				
V_{CES}	T_j = 25 °C		1700	V
I_C	T_j = 175 °C	T_s = 25 °C	177	A
		T_s = 70 °C	144	A
I_{Cnom}			150	A
I_{CRM}	I_{CRM} = 3 x I_{Cnom}		450	A
V_{GES}			-20 ... 20	V
t_{psc}	V_{CC} = 1000 V V_{GE} ≤ 15 V V_{CES} ≤ 1700 V	T_j = 150 °C	10	µs
T_j			-40 ... 175	°C
Inverse - Diode				
I_F	T_j = 175 °C	T_s = 25 °C	149	A
		T_s = 70 °C	117	A
I_{Fnom}			150	A
I_{FRM}	I_{FRM} = 2 x I_{Fnom}		300	A
I_{FSM}	10 ms, sin 180°, T_j = 150 °C		810	A
T_j			-40 ... 175	°C
Module				
$I_{t(RMS)}$	$T_{terminal}$ = 80 °C, 20 A per spring		200	A
T_{stg}			-40 ... 125	°C
V_{isol}	AC sinus 50 Hz, t = 1 min		2500	V

Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
Inverter - IGBT						
$V_{CE(sat)}$	I_C = 150 A V_{GE} = 15 V chiplevel	T_j = 25 °C		1.90	2.20	V
		T_j = 150 °C		2.30	2.60	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		7.3	8.7	mΩ
		T_j = 150 °C		11	12	mΩ
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 6 mA		5.2	5.8	6.4	V
I_{CES}	V_{GE} = 0 V V_{CE} = 1700 V	T_j = 25 °C		0.1	0.3	mA
						mA
C_{ies}	V_{CE} = 25 V V_{GE} = 0 V	f = 1 MHz		13.60		nF
C_{oes}		f = 1 MHz		0.53		nF
C_{res}		f = 1 MHz		0.44		nF
Q_G	- 8 V...+ 15 V			1200		nC
R_{Gint}	T_j = 25 °C			4.3		Ω
$t_{d(on)}$	V_{CC} = 900 V I_C = 150 A $R_{G\ on}$ = 2 Ω $R_{G\ off}$ = 2 Ω di/dt$_{on}$ = 4817 A/µs di/dt$_{off}$ = 1088 A/µs du/dt = 5548 V/µs V_{GE} = +15/-15 V L_s = 25 nH			225		ns
t_r				40		ns
E_{on}				26		mJ
$t_{d(off)}$				590		ns
t_f				148		ns
E_{off}				46		mJ
$R_{th(j-s)}$	per IGBT, λ_{paste}=0.8 W/K*m			0.28		K/W



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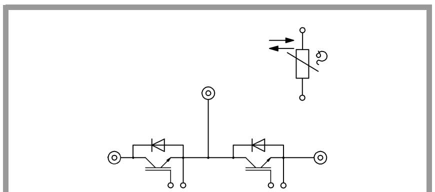

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Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
Inverse - Diode						
$V_F = V_{EC}$	I_F = 150 A V_{GE} = 0 V chiplevel	T_j = 25 °C		2	2.4	V
		T_j = 150 °C		2.1	2.6	V
V_{F0}	chiplevel	T_j = 25 °C		1.3	1.6	V
		T_j = 150 °C		1.1	1.2	V
r_F	chiplevel	T_j = 25 °C		4.5	5.6	mΩ
		T_j = 150 °C		7.1	9	mΩ
I_{RRM}	I_F = 150 A di/dt_{off} = 5270 A/µs V_{GE} = -15 V V_{CC} = 900 V			252		A
Q_{rr}				48.8		µC
E_{rr}				32.4		mJ
$R_{th(j-s)}$	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

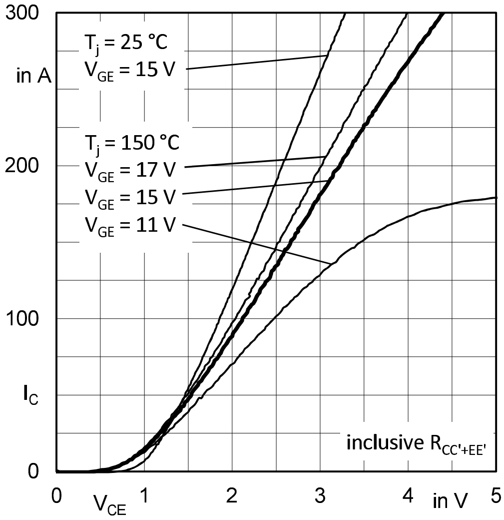


Fig. 1: Typ. output characteristic, inclusive $R_{CC'+EE'}$

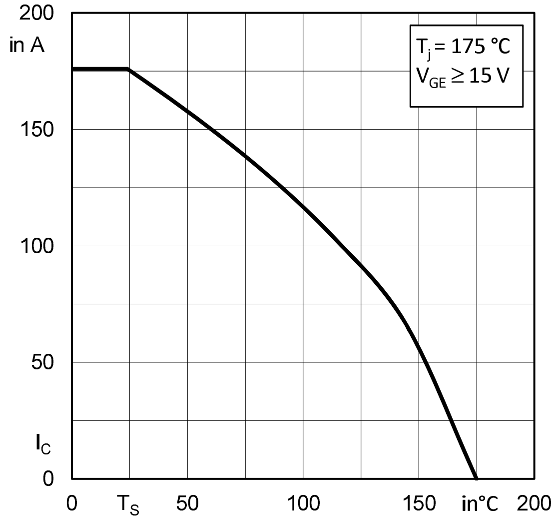


Fig. 2: Rated current vs. temperature $I_C = f(T_S)$

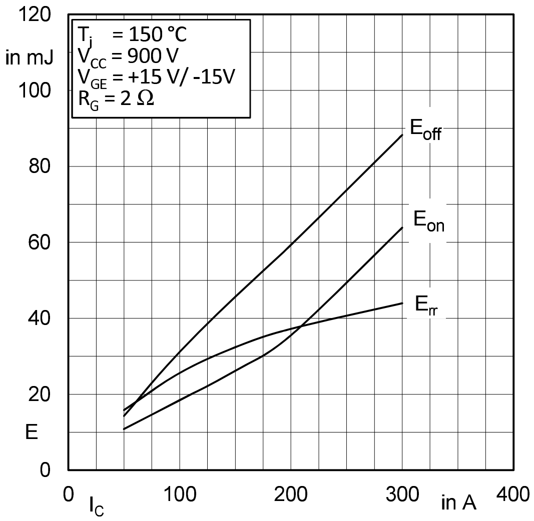


Fig. 3: Typ. turn-on /-off energy = f (I_C)

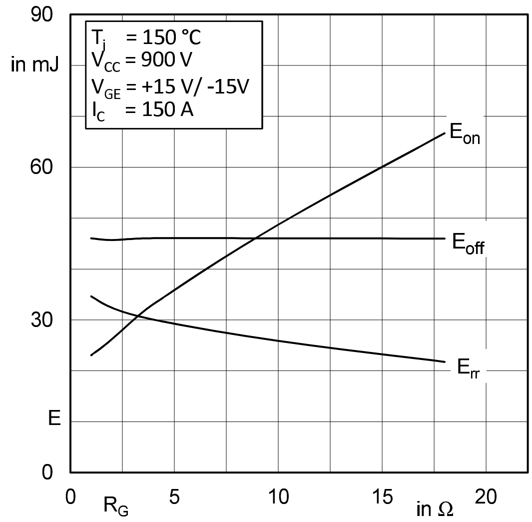


Fig. 4: Typ. turn-on /-off energy = f (R_G)

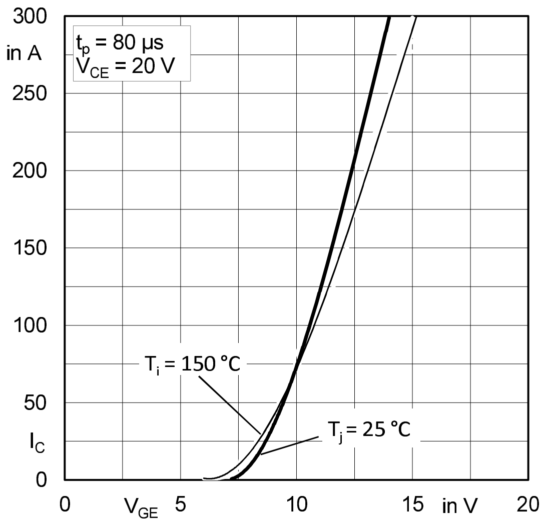


Fig. 5: Typ. transfer characteristic

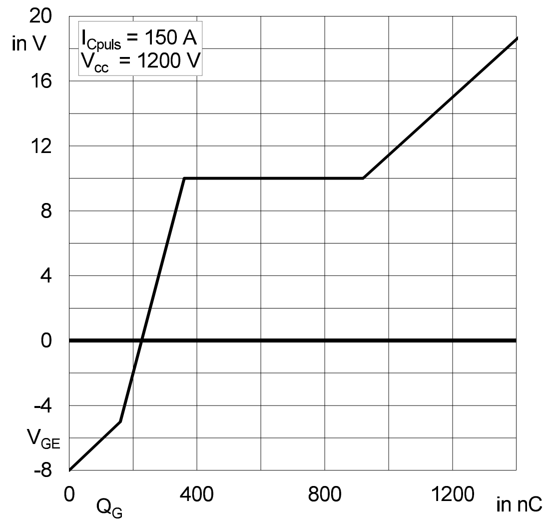


Fig. 6: Typ. gate charge characteristic

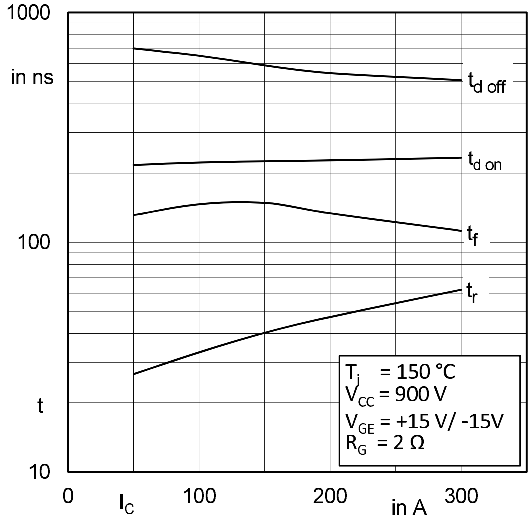


Fig. 7: Typ. switching times vs. I_C

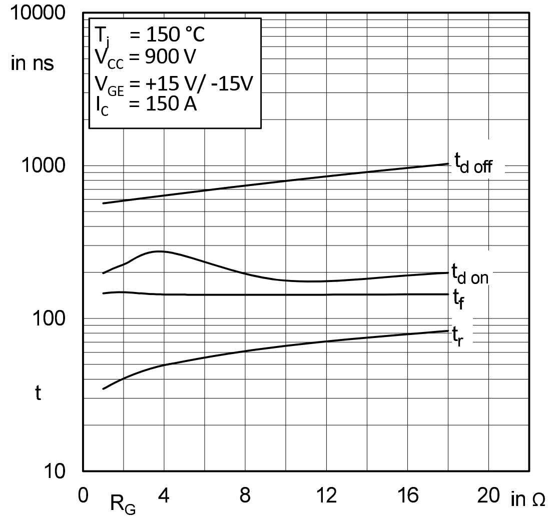


Fig. 8: Typ. switching times vs. gate resistor R_G

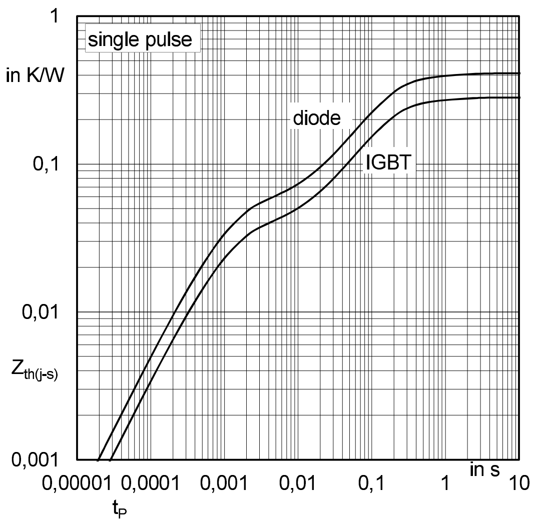


Fig. 9: Transient thermal impedance of IGBT and Diode

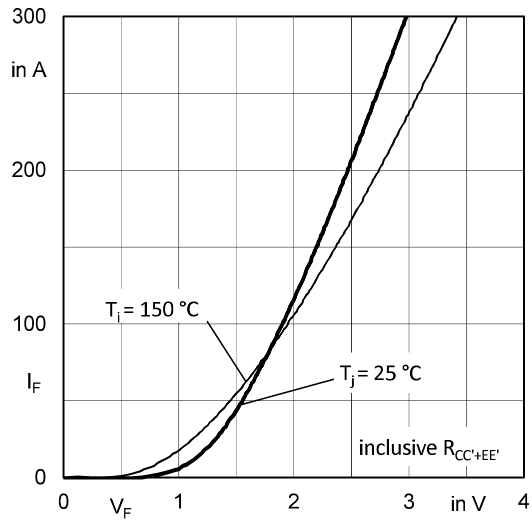


Fig. 10: CAL diode forward characteristic

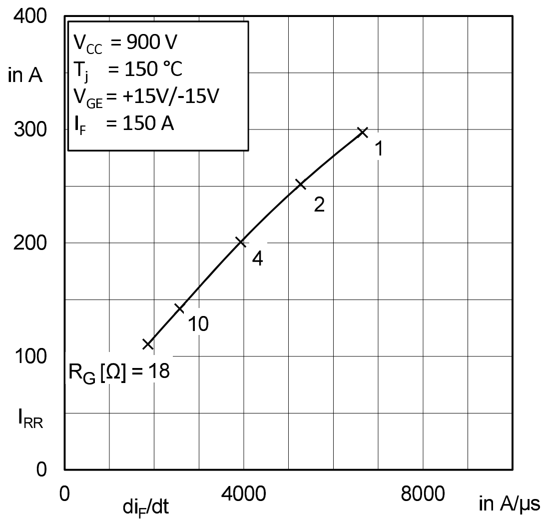


Fig. 11: Typ. CAL diode peak reverse recovery current

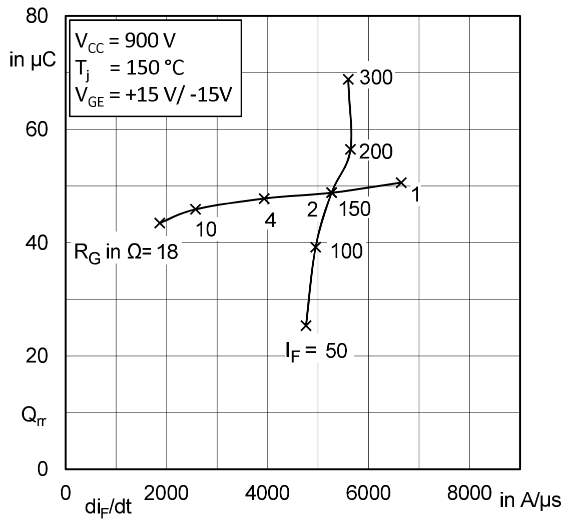
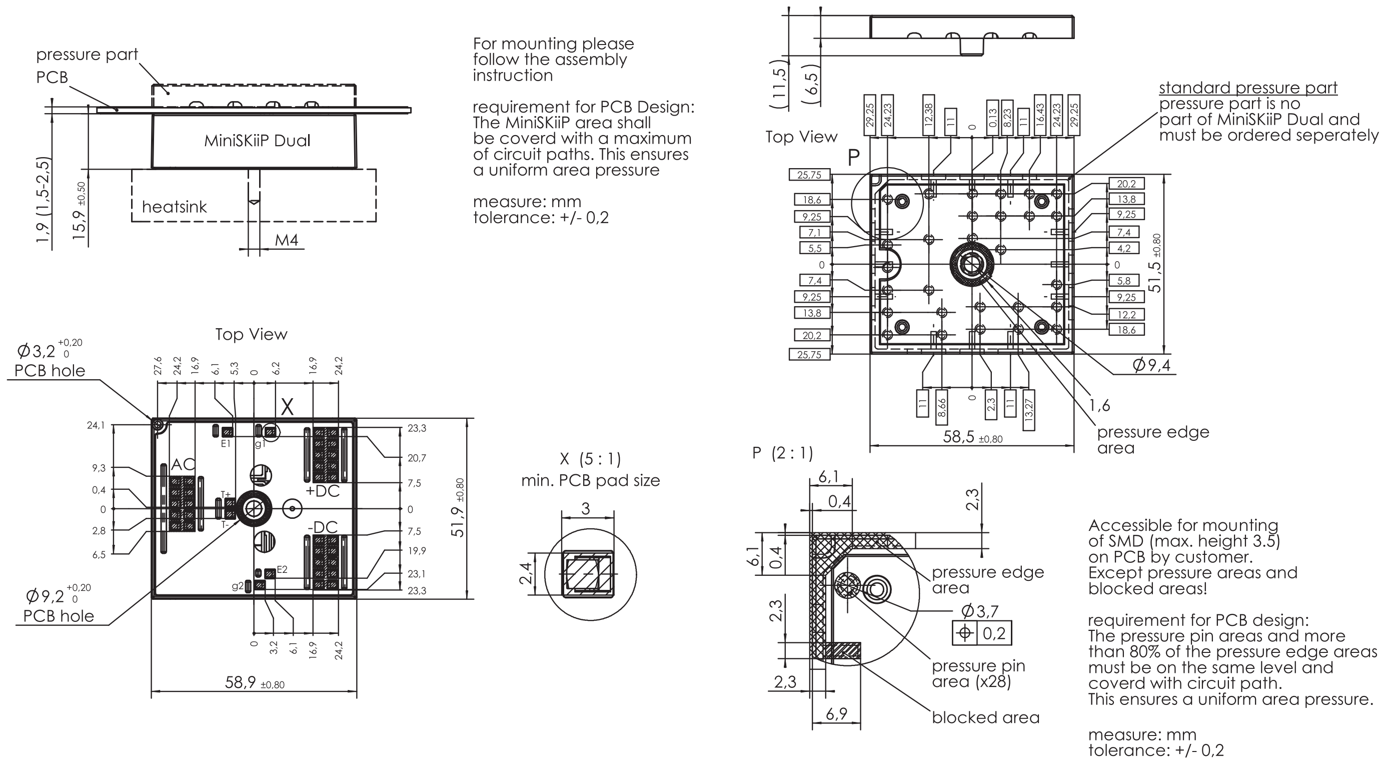
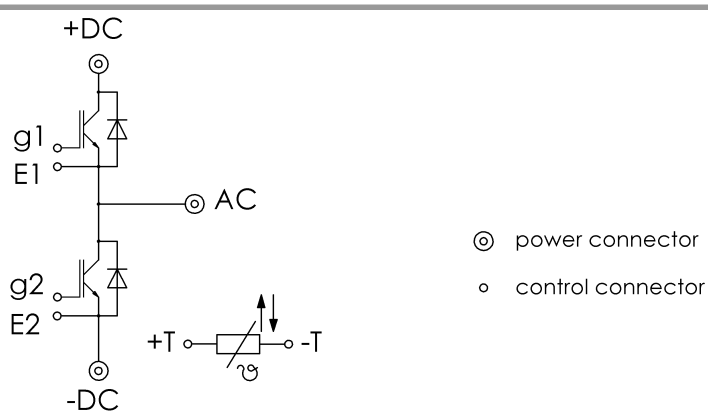


Fig. 12: Typ. CAL diode recovery charge



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.