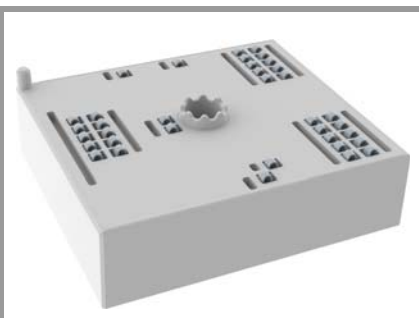


SKiiP 24GB07E3V1



MiniSKiiP® 2 Dual

Half-Bridge

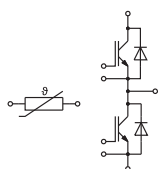
SKiiP 24GB07E3V1

Features*

- 650V Trench IGBTs
- Robust and soft 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 $T_{j,op} = -40 \dots +150^\circ\text{C}$)

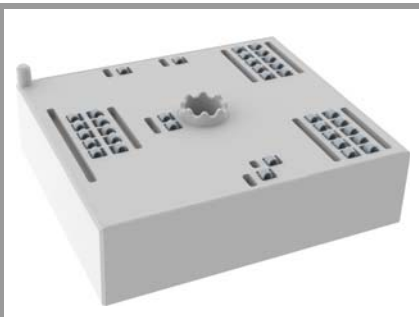


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Absolute Maximum Ratings				
Symbol	Conditions		Values	Unit
Inverter - IGBT				
V _{CES}	T _j = 25 °C		650	V
I _C	T _j = 175 °C	T _s = 25 °C	184	A
		T _s = 70 °C	148	A
I _{Cnom}			150	A
I _{CRM}			450	A
V _{GES}			-20 ... 20	V
t _{psc}	V _{CC} = 360 V V _{GE} ≤ 15 V V _{CES} ≤ 650 V	T _j = 150 °C	6	µs
T _j			-40 ... 175	°C
Inverse - Diode				
I _F	T _j = 175 °C	T _s = 25 °C	161	A
		T _s = 70 °C	128	A
I _{FRM}			300	A
I _{FSM}	10 ms, sin 180°, T _j = 150 °C		828	A
T _j			-40 ... 175	°C
Module				
I _{t(RMS)}	T _{terminal} = 80 °C, T _{terminal} = 80°C, 20A per spring		200	A
T _{stg}	module without TIM		-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	T _j = 25 °C		1.45	1.77	V
	V _{GE} = 15 V chipelevel	T _j = 150 °C		1.70	2.10	V
V _{CE0}	chipelevel	T _j = 25 °C		0.90	1.00	V
		T _j = 150 °C		0.82	0.90	V
r _{CE}	V _{GE} = 15 V chipelevel	T _j = 25 °C		3.7	5.1	mΩ
		T _j = 150 °C		5.9	8.0	mΩ
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 2.4 mA		5.1	5.8	6.4	V
I _{CES}	V _{GE} = 0 V	T _j = 25 °C			1.5	mA
	V _{CE} = 650 V			-		mA
C _{ies}	V _{CE} = 25 V V _{GE} = 0 V	f = 1 MHz		9.24		nF
C _{oes}		f = 1 MHz		0.60		nF
C _{res}		f = 1 MHz		0.27		nF
Q _G	- 8 V...+ 15 V			1360		nC
R _{Gint}	T _j = 25 °C			2.0		Ω
t _{d(on)}	V _{CC} = 300 V	T _j = 150 °C		107		ns
t _r	I _C = 150 A	T _j = 150 °C		42		ns
E _{on}	R _{G on} = 3 Ω	T _j = 150 °C		2.2		mJ
t _{d(off)}	R _{G off} = 3 Ω	T _j = 150 °C		383		ns
t _f	di/dt _{on} = 4228 A/μs	T _j = 150 °C		47		ns
	di/dt _{off} = 2857 A/μs	T _j = 150 °C				
E _{off}	dv/dt = 5140 V/μs	T _j = 150 °C		5.1		mJ
	V _{GE} = +15/-8 V L _S = 25 nH					
R _{th(j-s)}	per IGBT, λ _{paste} =0.8 W/(K*m)			0.33		K/W

SKiiP 24GB07E3V1



MiniSKiiP® 2 Dual

Half-Bridge

SKiiP 24GB07E3V1

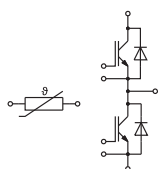
Features*

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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		1.54	1.97	V
	V _{GE} = 0 V chiplevel	T _j = 150 °C		1.60	2.09	V
V _{F0}	chiplevel	T _j = 25 °C		1.04	1.24	V
		T _j = 150 °C		0.85	0.99	V
r _F	chiplevel	T _j = 25 °C		3.3	4.9	mΩ
		T _j = 150 °C		5.0	7.3	mΩ
I _{RRM}	I _F = 150 A	T _j = 150 °C		175		A
Q _{rr}	di/dt _{off} = 4058 A/μs	T _j = 150 °C		14.9		μC
E _{rr}	V _{GE} = -8 V	T _j = 150 °C		3.7		mJ
	V _{CC} = 300 V					
R _{th(j-s)}	per Diode, λ _{paste} =0.8 W/(K*m)			0.45		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

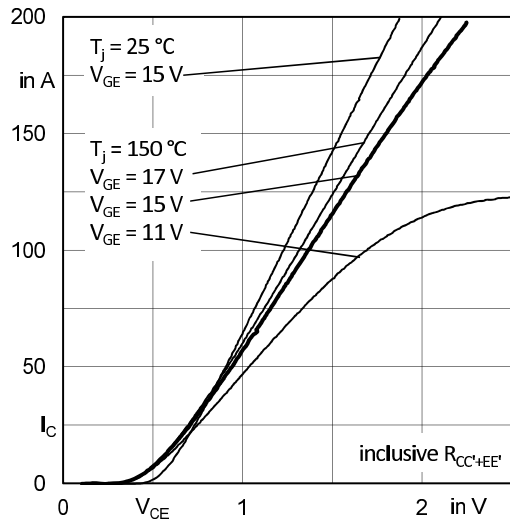


Fig. 1: Typ. output characteristic

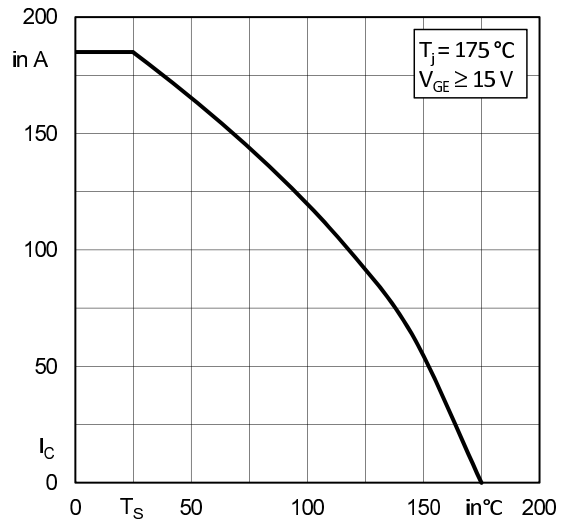


Fig. 2: Rated current vs. temperature $I_C = f(T_S)$

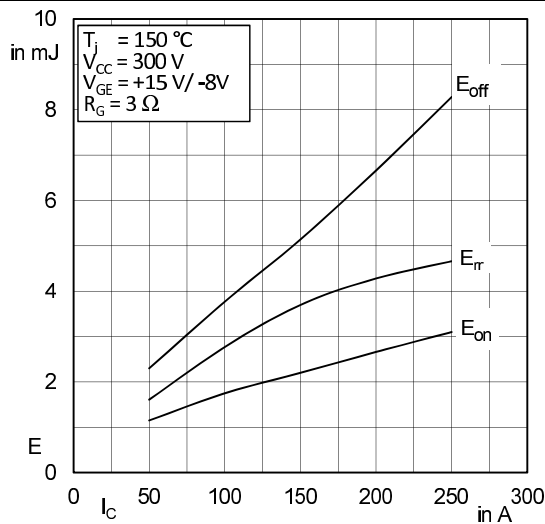


Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

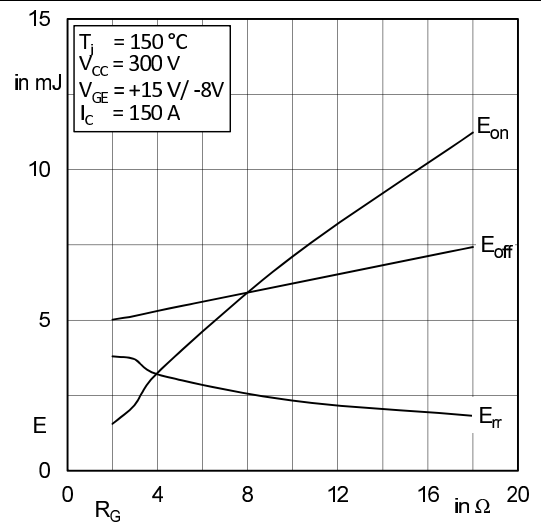


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

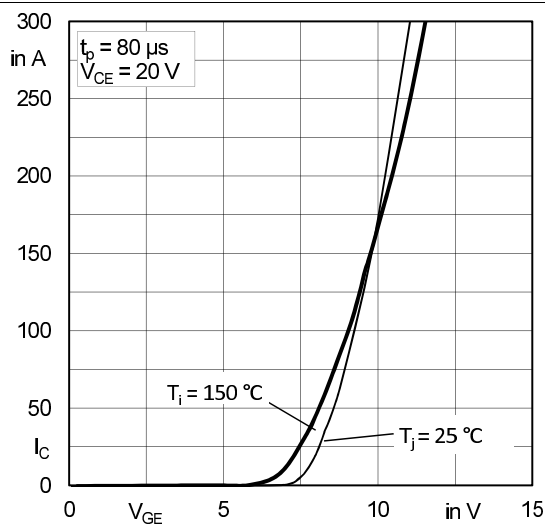


Fig. 5: Typ. transfer characteristic

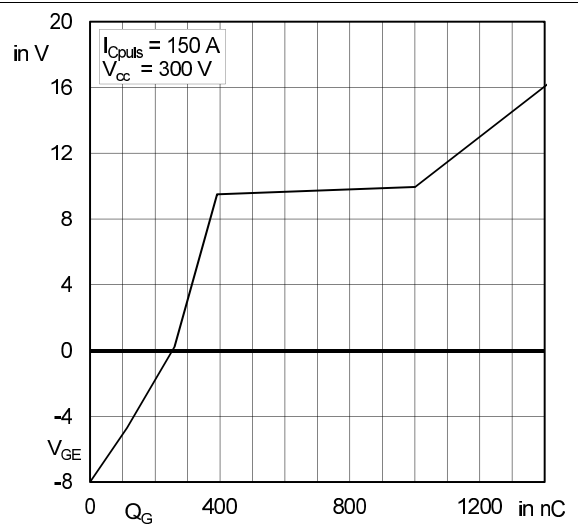


Fig. 6: Typ. gate charge characteristic

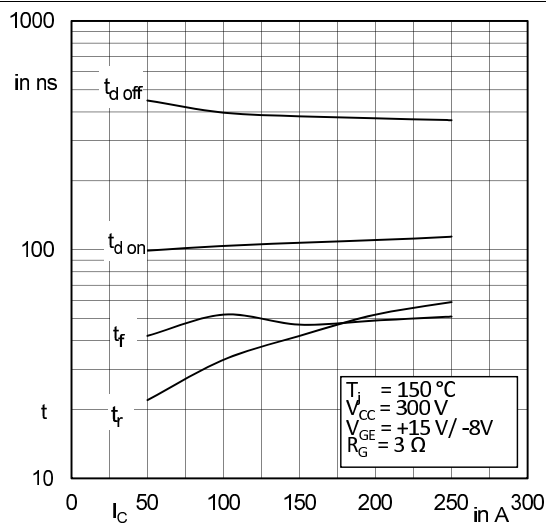


Fig. 7: Typ. switching times vs. I_C

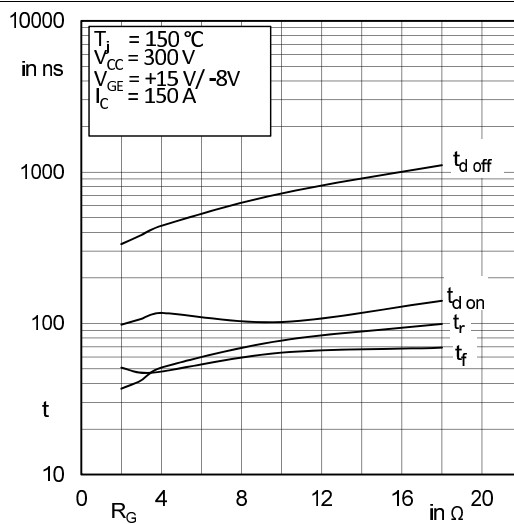


Fig. 8: Typ. switching times vs. gate resistor R_G

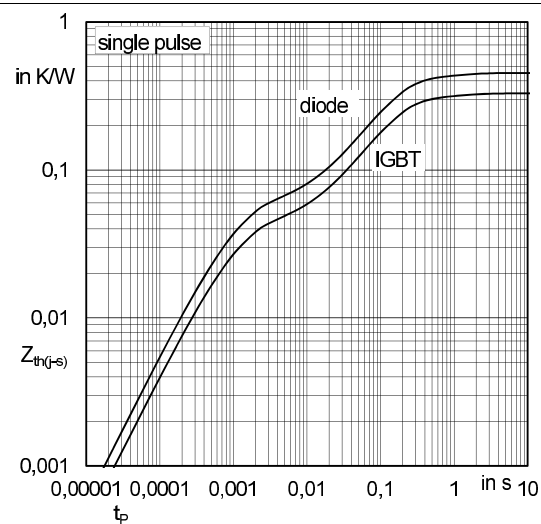


Fig. 9: Typ. transient thermal impedance

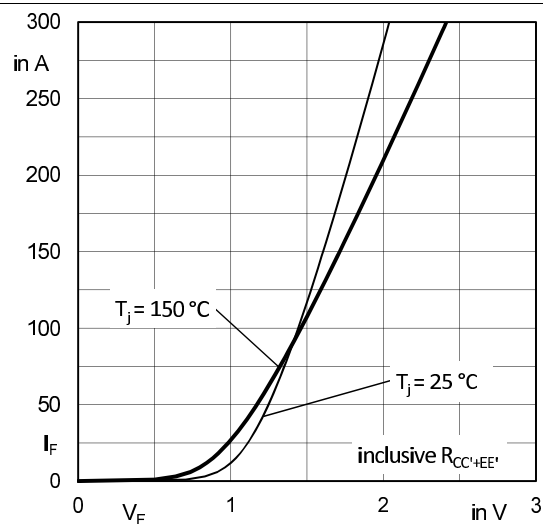


Fig. 10: Typ. CAL diode forward characteristic

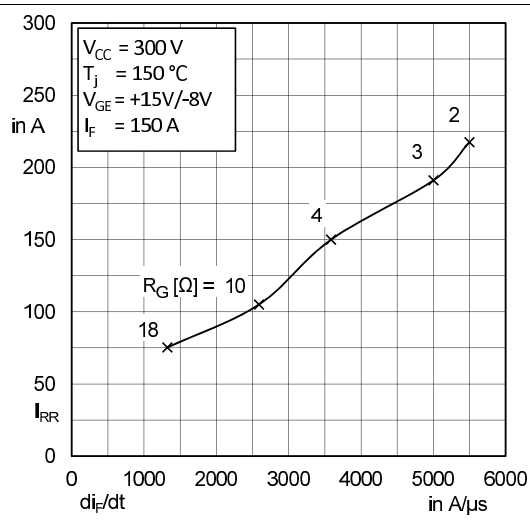


Fig. 11: Typ. CAL diode peak reverse recovery current

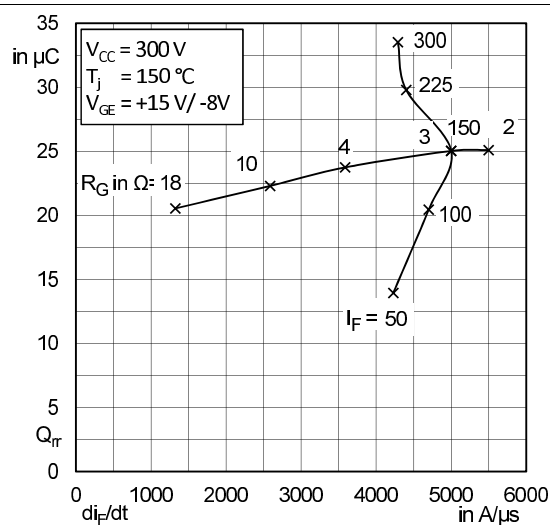
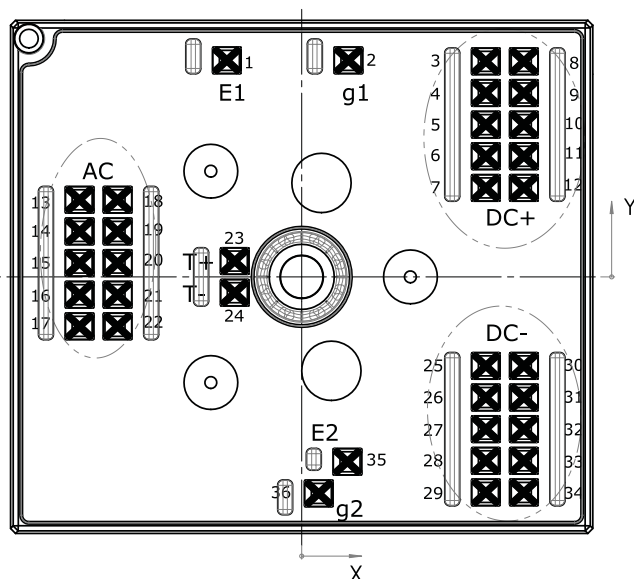


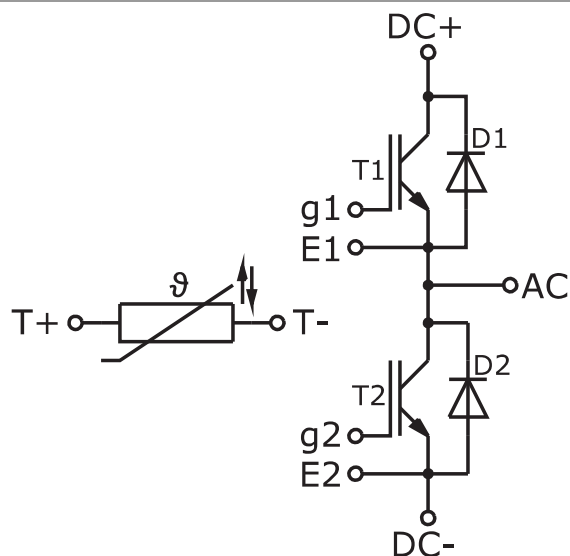
Fig. 12: Typ. CAL diode recovery charge

Pin out							
Pin	X	Y	Function	Pin	X	Y	Function
1	-7,58	21,9	E1	19	-18,63	4,6	AC
2	4,73	21,9	g1	20	-18,63	1,4	AC
3	18,63	21,8	DC+	21	-18,63	-1,8	AC
4	18,63	18,6	DC+	22	-18,63	-5	AC
5	18,63	15,4	DC+	23	-6,78	1,6	T+
6	18,63	12,2	DC+	24	-6,78	-1,6	T-
7	18,63	9	DC+	25	18,63	-9	DC-
8	22,48	21,8	DC+	26	18,63	-12,2	DC-
9	22,48	18,6	DC+	27	18,63	-15,4	DC-
10	22,48	15,4	DC+	28	18,63	-18,6	DC-
11	22,48	12,2	DC+	29	18,63	-21,8	DC-
12	22,48	9	DC+	30	22,48	-9	DC-
13	-22,48	7,8	AC	31	22,48	-12,2	DC-
14	-22,48	4,6	AC	32	22,48	-15,4	DC-
15	-22,48	1,4	AC	33	22,48	-18,6	DC-
16	-22,48	-1,8	AC	34	22,48	-21,8	DC-
17	-22,48	-5	AC	35	4,63	-18,7	E2
18	-18,63	7,8	AC	36	1,73	-21,9	g2

all values in [mm]



Pinout and Dimensions



Pinout

This is an electrostatic discharge sensitive device (ESDS) due to international standard IEC 61340.

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