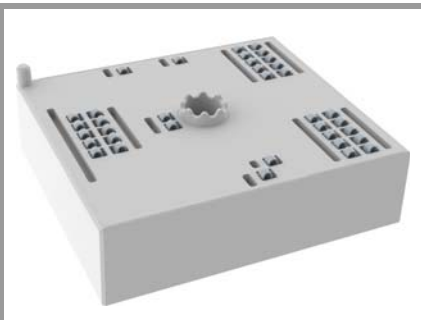


SKiiP 26GB07E3V1



MiniSKiiP® 2 Dual

Half-Bridge

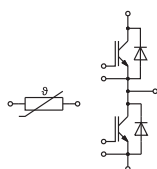
SKiiP 26GB07E3V1

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 $T_{j,op} = -40 \dots +150^\circ\text{C}$)
- MiniSKiiP "Technical Explanations" and "Mounting Instructions" are part of the data sheet. Please refer to both documents for further information

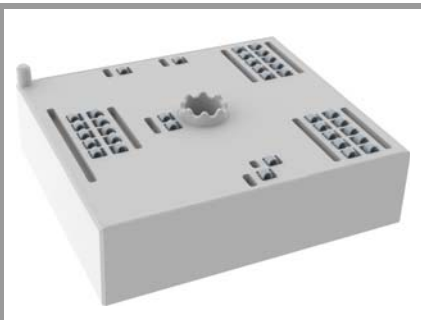


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Absolute Maximum Ratings				
Symbol	Conditions	Values	Unit	
Inverter - IGBT				
V_{CES}	$T_j = 25^\circ\text{C}$	650	V	
I_C	$T_j = 175^\circ\text{C}$	$T_s = 25^\circ\text{C}$	229	A
		$T_s = 70^\circ\text{C}$	183	A
I_{Cnom}		200	A	
I_{CRM}		600	A	
V_{GES}		-20 ... 20	V	
t_{psc}	$V_{CC} = 360\text{ V}$ $V_{GE} \leq 15\text{ V}$ $V_{CES} \leq 650\text{ V}$	$T_j = 150^\circ\text{C}$	6	μs
T_j		-40 ... 175	$^\circ\text{C}$	
Inverse - Diode				
I_F	$T_j = 175^\circ\text{C}$	$T_s = 25^\circ\text{C}$	235	A
		$T_s = 70^\circ\text{C}$	184	A
I_{FRM}		400	A	
I_{FSM}	10 ms, sin 180°, $T_j = 150^\circ\text{C}$	1224	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}	module without TIM	-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					
$V_{CE(sat)}$	$I_C = 200\text{ A}$ $V_{GE} = 15\text{ V}$ chipelevel	$T_j = 25^\circ\text{C}$	1.45	1.85	V
		$T_j = 150^\circ\text{C}$	1.70	2.10	V
V_{CE0}	chipelevel	$T_j = 25^\circ\text{C}$	0.90	1.00	V
		$T_j = 150^\circ\text{C}$	0.82	0.90	V
r_{CE}	$V_{GE} = 15\text{ V}$ chipelevel	$T_j = 25^\circ\text{C}$	2.8	4.3	$\text{m}\Omega$
		$T_j = 150^\circ\text{C}$	4.4	6.0	$\text{m}\Omega$
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 3.2\text{ mA}$	5	5.8	6.5	V
I_{CES}	$V_{GE} = 0\text{ V}$ $V_{CE} = 650\text{ V}$	$T_j = 25^\circ\text{C}$		2.0	mA
				-	mA
C_{ies}	$V_{CE} = 25\text{ V}$	$f = 1\text{ MHz}$	12.32		nF
C_{oes}	$V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	0.77		nF
C_{res}		$f = 1\text{ MHz}$	0.37		nF
Q_G	-8 V ... +15 V		1600		nC
R_{Gint}	$T_j = 25^\circ\text{C}$		1.0		Ω
$t_{d(on)}$	$V_{CC} = 300\text{ V}$ $I_C = 200\text{ A}$	$T_j = 150^\circ\text{C}$	64		ns
t_r	$R_{G on} = 4\ \Omega$ $R_{G off} = 4\ \Omega$	$T_j = 150^\circ\text{C}$	62		ns
		$T_j = 150^\circ\text{C}$	4.4		mJ
$t_{d(off)}$	$di/dt_{on} = 4095\text{ A}/\mu\text{s}$	$T_j = 150^\circ\text{C}$	486		ns
t_f	$di/dt_{off} = 3935\text{ A}/\mu\text{s}$ $dv/dt = 5020\text{ V}/\mu\text{s}$	$T_j = 150^\circ\text{C}$	60		ns
		$T_j = 150^\circ\text{C}$	7.4		mJ
E_{off}	$V_{GE} = +15/-8\text{ V}$ $L_s = 25\text{ nH}$	$T_j = 150^\circ\text{C}$			mJ
$R_{th(j-s)}$	per IGBT, $\lambda_{paste} = 0.8\text{ W}/(\text{K}\cdot\text{m})$		0.28		K/W

SKiiP 26GB07E3V1



MiniSKiiP® 2 Dual

Half-Bridge

SKiiP 26GB07E3V1

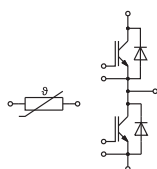
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Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Inverse - Diode						
$V_F = V_{EC}$	$I_F = 200 \text{ A}$ $V_{GE} = 0 \text{ V}$ chipllevel	$T_j = 25^\circ\text{C}$		1.40	1.76	V
		$T_j = 150^\circ\text{C}$		1.38	1.77	V
V_{F0}	chipllevel	$T_j = 25^\circ\text{C}$		1.04	1.24	V
		$T_j = 150^\circ\text{C}$		0.85	0.99	V
r_F	chipllevel	$T_j = 25^\circ\text{C}$		1.78	2.6	m Ω
		$T_j = 150^\circ\text{C}$		2.7	3.9	m Ω
I_{RRM}	$I_F = 200 \text{ A}$	$T_j = 150^\circ\text{C}$		190		A
Q_{rr}	$di/dt_{off} = 3754 \text{ A}/\mu\text{s}$	$T_j = 150^\circ\text{C}$		20.6		μC
E_{rr}	$V_{GE} = -8 \text{ V}$ $V_{CC} = 300 \text{ V}$	$T_j = 150^\circ\text{C}$		4.5		mJ
$R_{th(j-s)}$	per Diode, $\lambda_{paste}=0.8 \text{ W}/(\text{K}\cdot\text{m})$			0.35		K/W
Module						
L_{CE}				20		nH
M_s	to heat sink		2		2.5	Nm
w				50		g
Temperature Sensor						
R_{100}	$T_c=100^\circ\text{C}$ ($R_{25}=5 \text{ k}\Omega$)			$493 \pm 5\%$		Ω
$B_{25/85}$	$R_{(T)}=R_{25} \cdot \exp[B_{25/85} \cdot (1/T-1/298)]$, $T[\text{K}]$			3420		K



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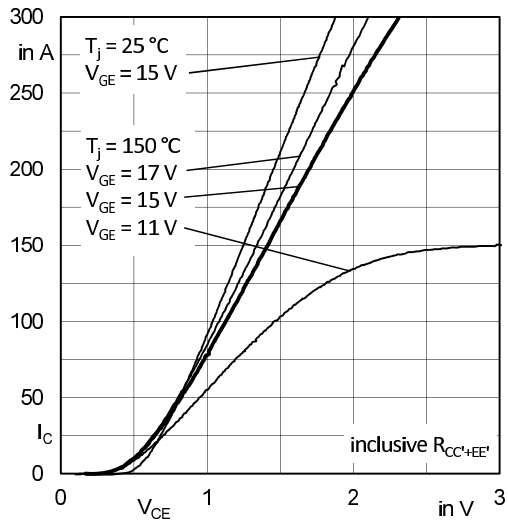


Fig. 1: Typ. output characteristic

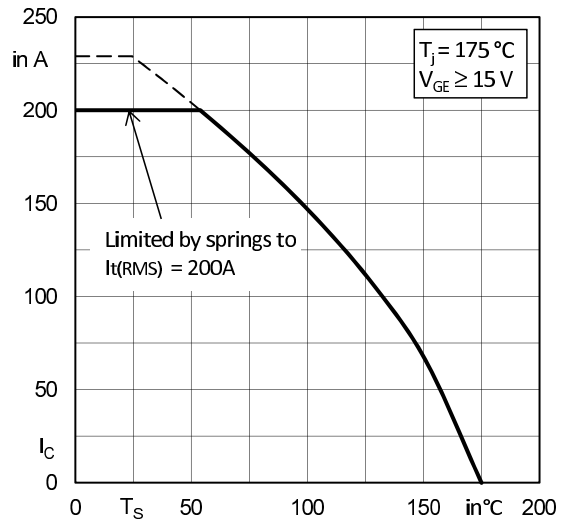


Fig. 2: Rated current vs. temperature $I_C = f(T_s)$

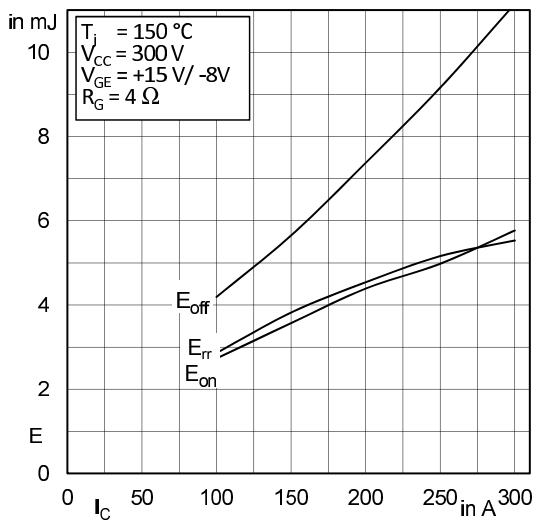


Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

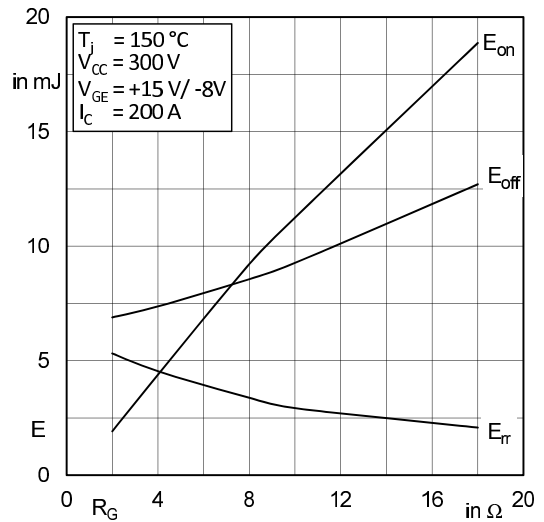


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

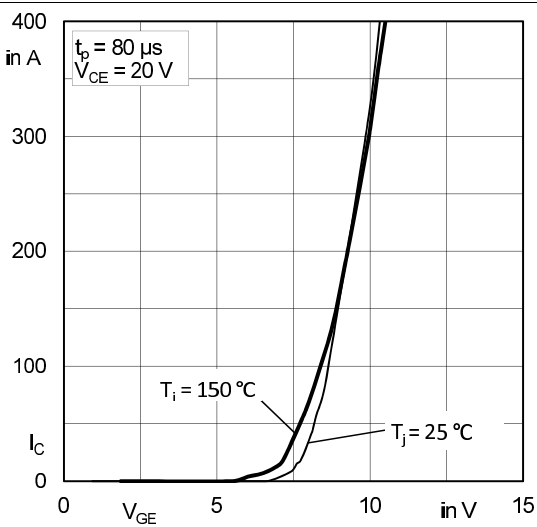


Fig. 5: Typ. transfer characteristic

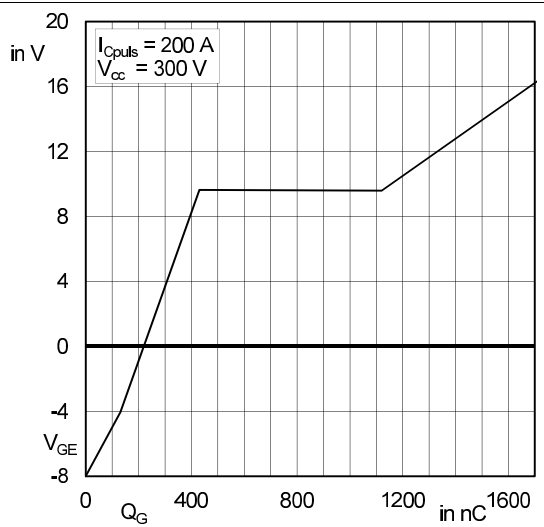


Fig. 6: Typ. gate charge characteristic

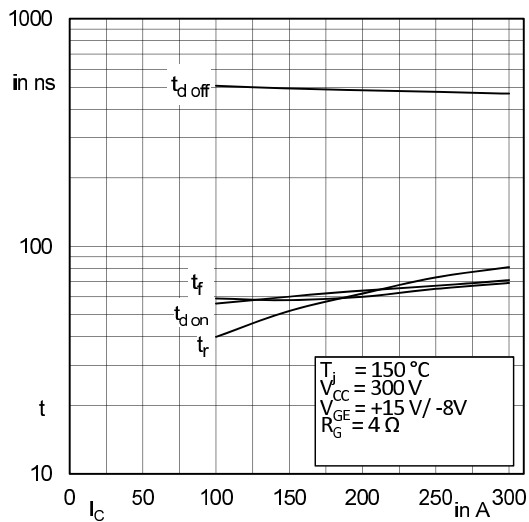


Fig. 7: Typ. switching times vs. I_C

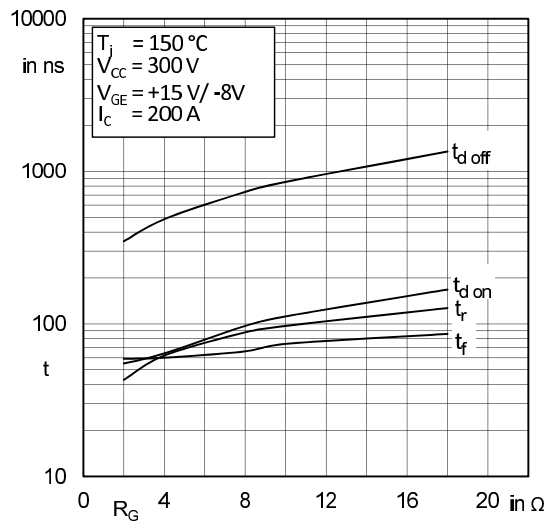


Fig. 8: Typ. switching times vs. gate resistor R_G

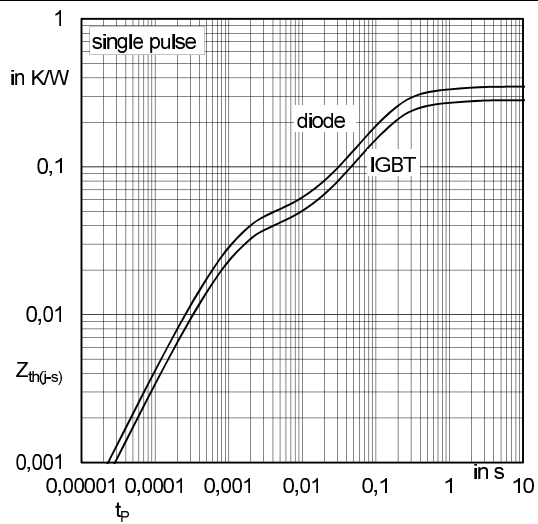


Fig. 9: Typ. transient thermal impedance

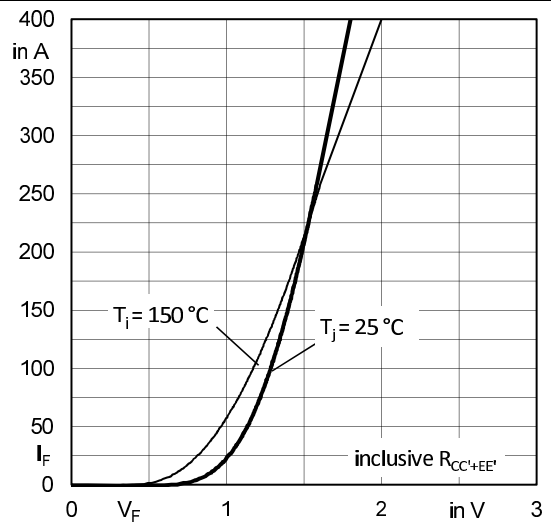


Fig. 10: Typ. CAL diode forward characteristic

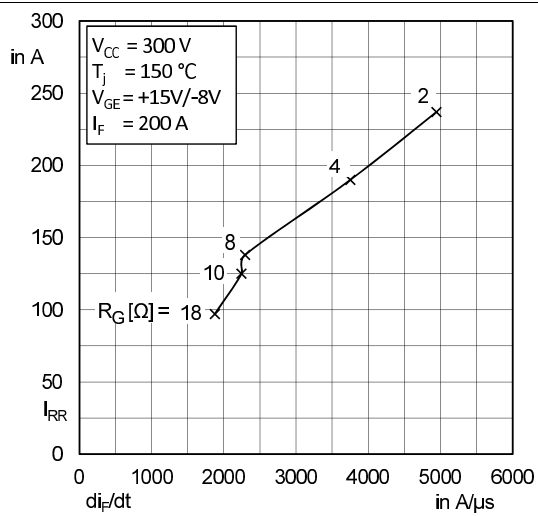


Fig. 11: Typ. CAL diode peak reverse recovery current

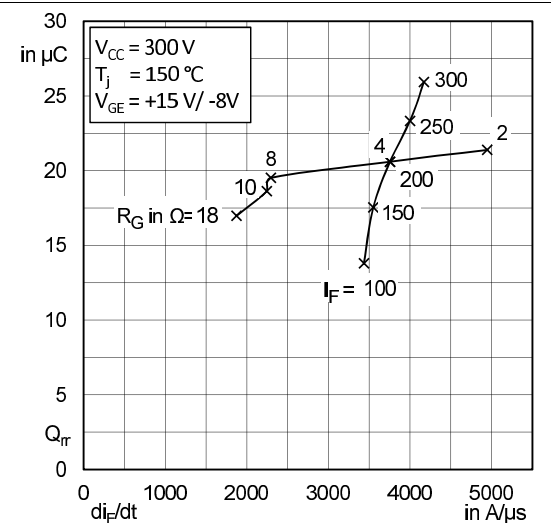
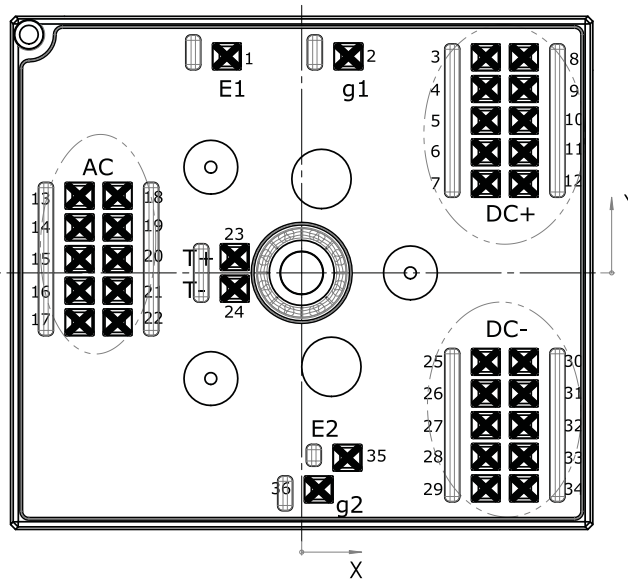


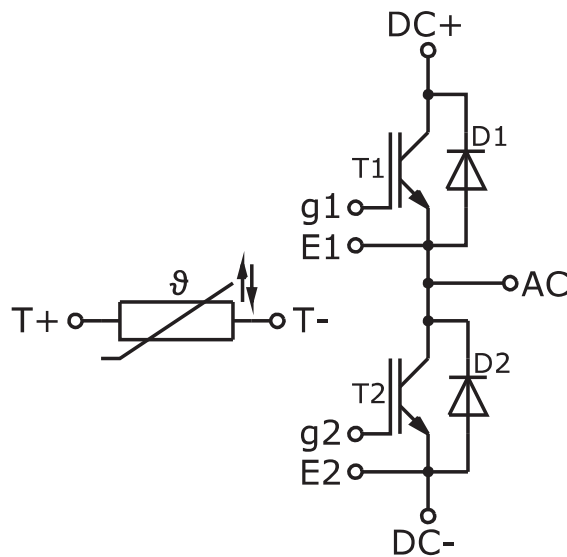
Fig. 12: Typ. CAL diode recovery charge

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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