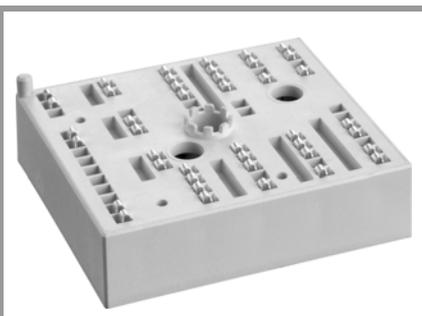# SKiiP25AC12T4V25

MiniSKiiP® 2
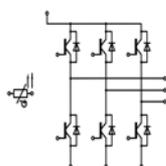
SKiiP25AC12T4V25

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 26 kVA
- Typical motor power 15 kW

Remarks

- V_{CEsat} , V_F= chip level value
- Case temp. limited to T_C = 125°C max. (for baseplateless modules $T_C = T_S$)
- product rel. results valid for $T_j \le 150$ (recomm. T_{op} = -40 … +150°C)
- Dynamic test results for V_{cc} = 600V, $R_{Gon/off}$ = 12Ω, I_c = 50A, V_{GE} = ±15V: E_{on} = 5.6mJ, E_{off} = 6.1mJ, E_{rr} = 3.3mJ, di/dt_{on} = 1440A/µs, t_{don} = 58ns, t_r = 43ns, di/dt_{off} = 600A/µs, t_{doff} = 370ns, t_f = 65ns

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	69	A
		T_s = 70 °C	56	A
I_{Cnom}			50	A
I_{CRM}	I_{CRM} = 3 x I_{Cnom}		150	A
V_{GES}			-20 … 20	V
t_{psc}	V_{CC} = 800 V $V_{GE} \le$ 15 V $V_{CES} \le$ 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	60	A
		T_s = 70 °C	48	A
I_{Fnom}			50	A
I_{FRM}	I_{FRM} = 3 x I_{Fnom}		150	A
I_{FSM}	10 ms, sin 180°, T_j = 150 °C		270	A
T_j			-40 … 175	°C
Module				
$I_{t(RMS)}$	$T_{terminal}$ = 80 °C, 20A per spring		60	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 = 50 A V_{GE} = 15 V chiplevel	T_j = 25 °C		1.85	2.10	V
		T_j = 150 °C		2.20	2.40	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		21	24	mΩ
		T_j = 150 °C		30	32	mΩ
$V_{GE(th)}$	$V_{GE} = V_{CE}$, I_C = 1.7 mA		5	5.8	6.5	V
I_{CES}	V_{GE} = 0 V V_{CE} = 1200 V	T_j = 25 °C		0.1	0.3	mA
						mA
C_{ies}	V_{CE} = 25 V V_{GE} = 0 V	f = 1 MHz		2.77		nF
C_{oes}		f = 1 MHz		0.20		nF
C_{res}		f = 1 MHz		0.16		nF
Q_G	- 8 V…+ 15 V			283		nC
R_{Gint}	T_j = 25 °C			4		Ω
$t_{d(on)}$	V_{CC} = 800 V	T_j = 150 °C		45		ns
t_r	I_C = 22 A	T_j = 150 °C		19		ns
E_{on}	$R_{G\,on}$ = 12 Ω $R_{G\,off}$ = 1 Ω	T_j = 150 °C		3.4		mJ
$t_{d(off)}$	di/dt_{on} = 1640 A/µs	T_j = 150 °C		480		ns
t_f	di/dt_{off} = 320 A/µs	T_j = 150 °C		44		ns
E_{off}	V_{GE} = +15/0 V	T_j = 150 °C		3.1		mJ
$R_{th(j-s)}$	per IGBT			0.71		K/W

SKiiP25AC12T4V25

MiniSKiiP® 2

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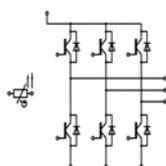- UL recognised file no. E63532

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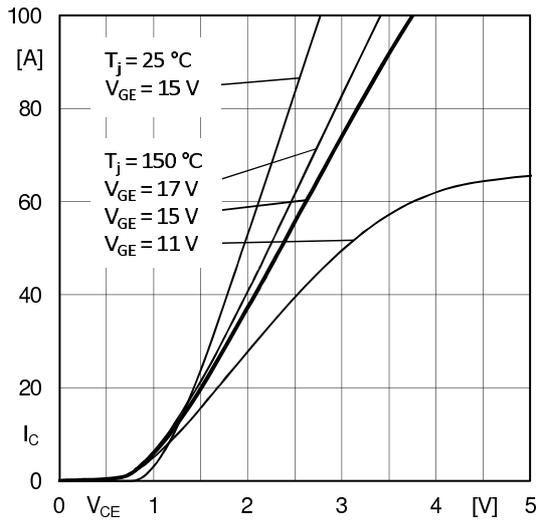| Characteristics			min.	typ.	max.	Unit
Symbol	Conditions		min.	typ.	max.	Unit
Inverse - Diode						
$V_F = V_{EC}$	I_F = 50 A V_{GE} = 0 V chiplevel	T_j = 25 °C		2.2	2.5	V
		T_j = 150 °C		2.2	2.5	V
V_{F0}		T_j = 25 °C		1.3	1.5	V
		T_j = 150 °C		0.9	1.1	V
r_F		T_j = 25 °C		18	21	mΩ
		T_j = 150 °C		26	28	mΩ
I_{RRM}	I_F = 22 A di/dt_{off} = 1680 A/µs V_{GE} = 0 V V_{CC} = 800 V	T_j = 150 °C		0		A
Q_{rr}		T_j = 150 °C		5.5		µC
E_{rr}		T_j = 150 °C		2.9		mJ
$R_{th(j-s)}$	per Diode			0.95		K/W
Module						
M_s	to heat sink		2		2.5	Nm
w				65		g
Temperatur Sensor						
R_{100}	T_C=100°C (R_{25}=1000Ω)			1670 ± 3%		Ω
R(T)	R(T)=1000Ω[1+A(T-25°C)+B(T-25°C)^2], A = 7.635*10^{-3} °C^{-1}, B = 1.731*10^{-5} °C^{-2}					

AC

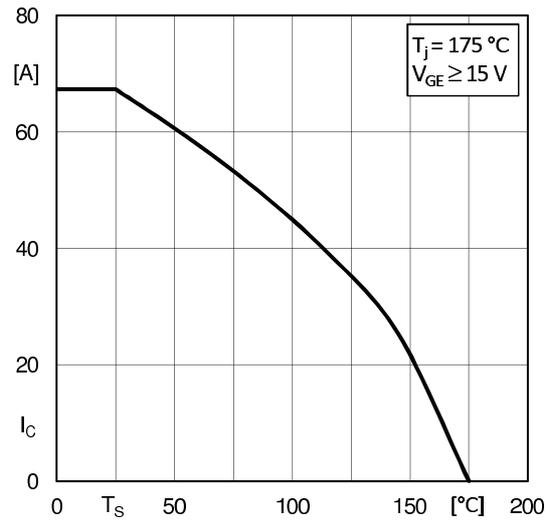Fig. 1: Typ. output characteristic, inclusive $R_{CC'+ EE'}$

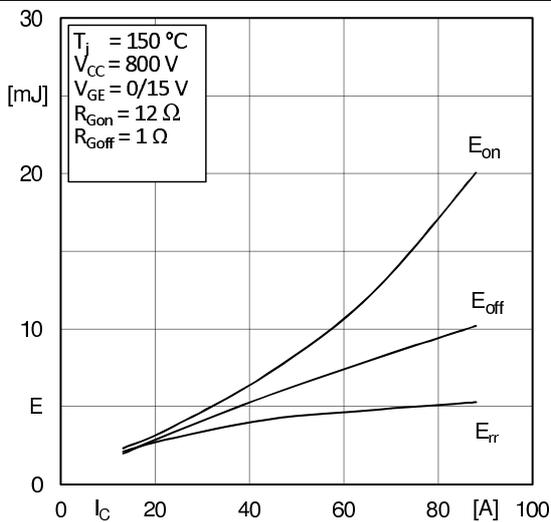Fig. 2: Rated current vs. temperature $I_C = f (T_S)$

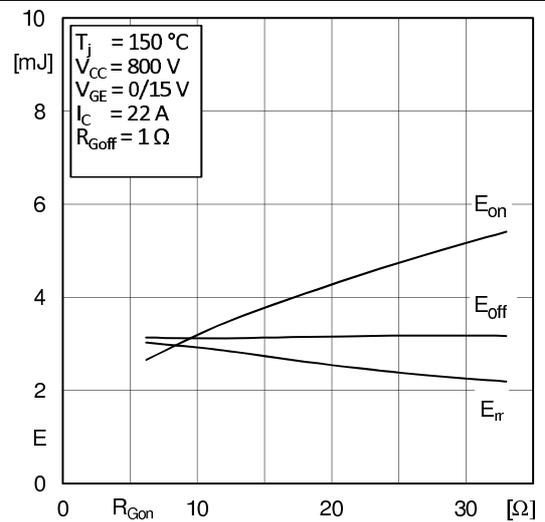Fig. 3: Typ. turn-on /-off energy = f (I_C)
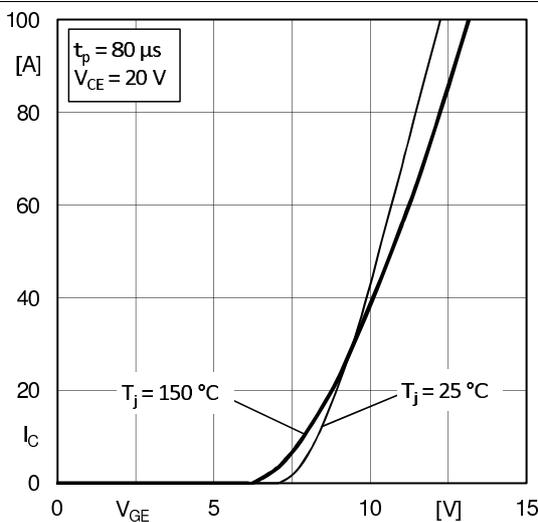
Fig. 4: Typ. turn-on /-off energy = f (R_G)

Fig. 5: Typ. transfer characteristic
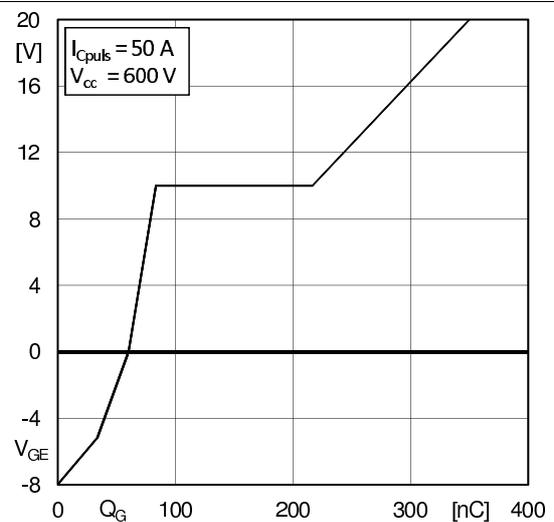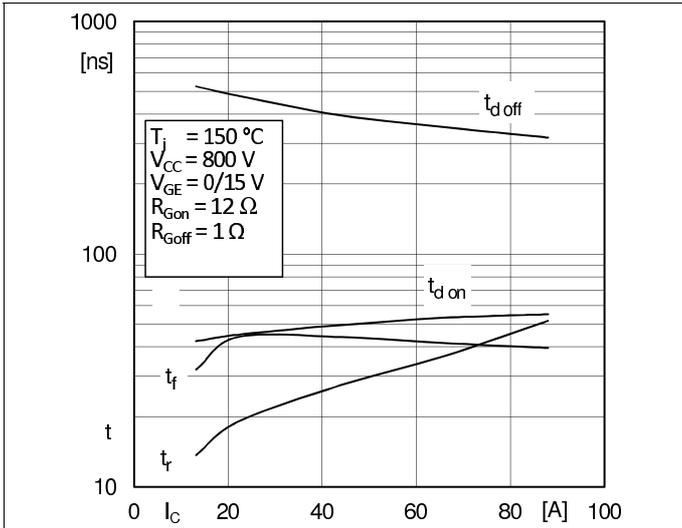
Fig. 6: Typ. gate charge characteristic
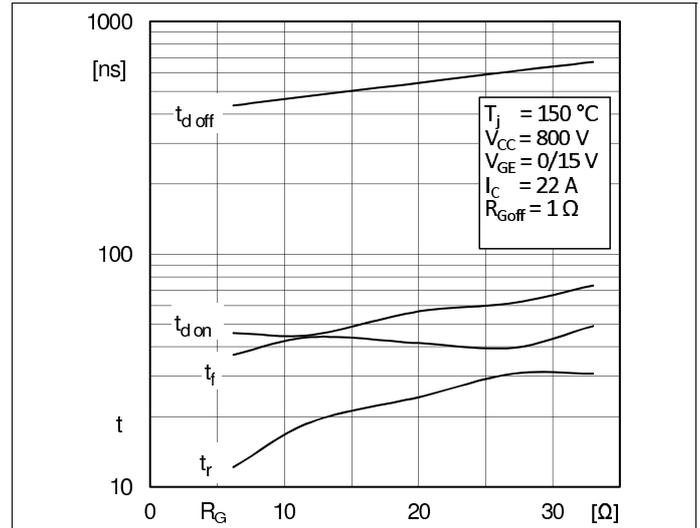
Fig. 7: Typ. switching times vs. I_C

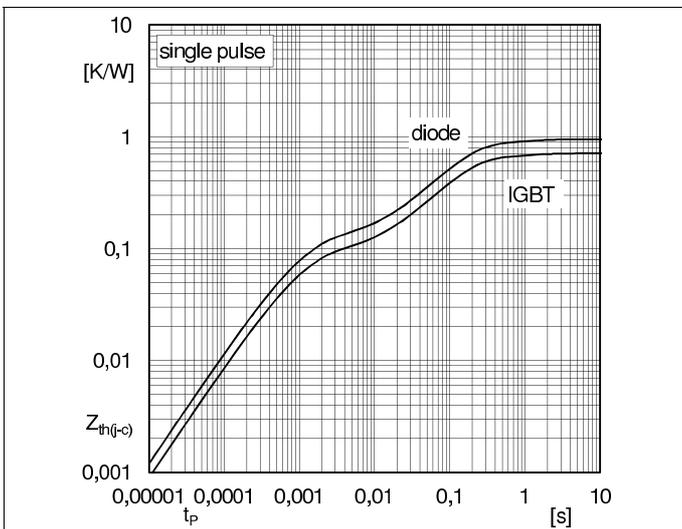Fig. 8: Typ. switching times vs. gate resistor R_G

Fig. 9: Transient thermal impedance of IGBT and Diode
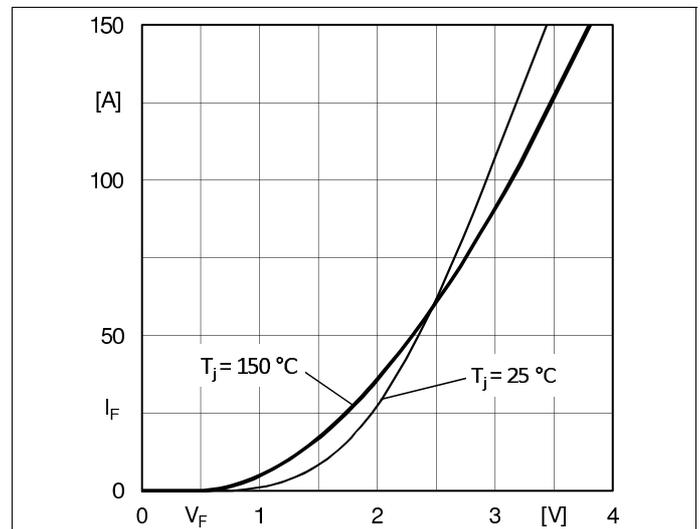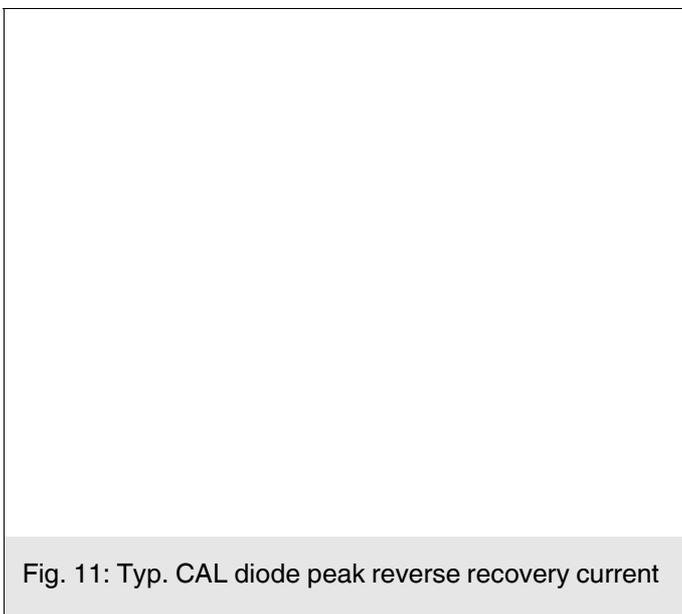
Fig. 10: CAL diode forward characteristic
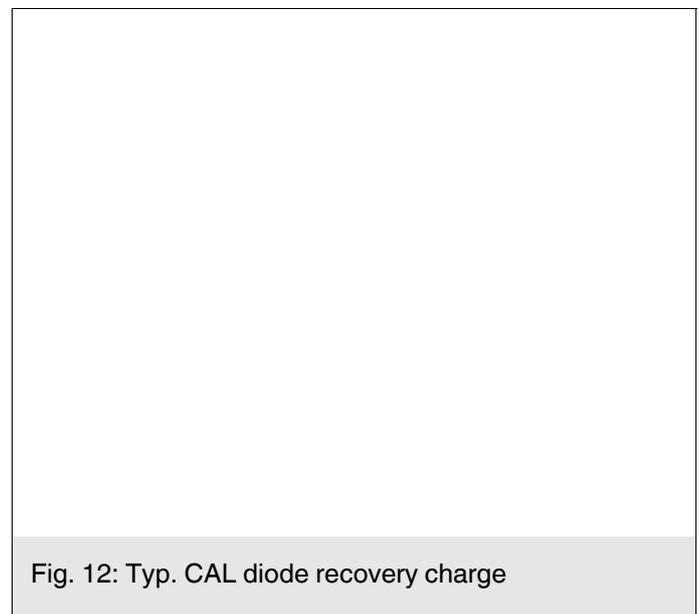
Fig. 11: Typ. CAL diode peak reverse recovery current

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