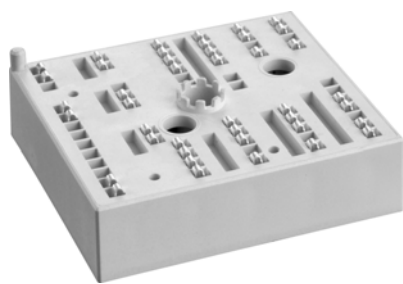


SKiiP 24ACC12T4V10



MiniSKiiP® 2

Twin 6-pack

SKiiP 24ACC12T4V10

Target Data

Features

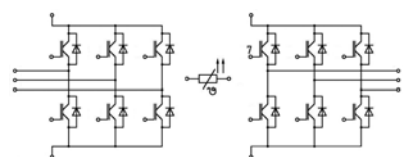
- Trench 4 IGBTs
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised: File no. E63532

Typical Applications*

- 4Q inverters

Remarks

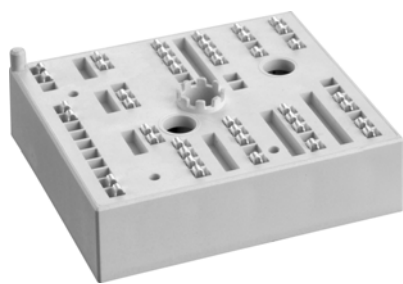
- Max. case temperature limited to $T_C=125^\circ\text{C}$
- Short circuit behaviour of one leg must be verified in the final application



ACC

Absolute Maximum Ratings				
Symbol	Conditions		Values	Unit
IGBT 1 - 6				
V _{CES}	T _j = 25 °C		1200	V
I _C	T _j = 150 °C	T _s = 25 °C	37	A
		T _s = 70 °C	29	A
I _C	T _j = 175 °C	T _s = 25 °C	41	A
		T _s = 70 °C	34	A
I _{Cnom}			25	A
I _{CRM}	I _{CRM} = 3 x I _{Cnom}		75	A
V _{GES}			-20 ... 20	V
t _{psc}	V _{CC} = 800 V V _{GE} ≤ 15 V V _{CES} ≤ 1200 V	T _j = 150 °C	10	µs
T _j			-40 ... 175	°C
IGBT 7 - 12				
V _{CES}	T _j = 25 °C		1200	V
I _C	T _j = 150 °C	T _s = 25 °C	47	A
		T _s = 70 °C	36	A
I _C	T _j = 175 °C	T _s = 25 °C	52	A
		T _s = 70 °C	43	A
I _{Cnom}			35	A
I _{CRM}	I _{CRM} = 3 x I _{Cnom}		105	A
V _{GES}			-20 ... 20	V
t _{psc}	V _{CC} = 800 V V _{GE} ≤ 15 V V _{CES} ≤ 1200 V	T _j = 150 °C	10	µs
T _j			-40 ... 175	°C
Diode 1 - 6				
V _{RRM}	T _j = 25 °C		1200	V
I _F	T _j = 150 °C	T _s = 25 °C	28	A
		T _s = 70 °C	21	A
I _F	T _j = 175 °C	T _s = 25 °C	32	A
		T _s = 70 °C	26	A
I _{Fnom}			25	A
I _{FRM}	I _{FRM} = 3xI _{Fnom}		75	A
I _{FSM}	10 ms, sin 180°, T _j = 150 °C		100	A
T _j			-40 ... 175	°C
Diode 7 - 12				
V _{RRM}	T _j = 25 °C		1200	V
I _F	T _j = 150 °C	T _s = 25 °C	39	A
		T _s = 70 °C	30	A
I _F	T _j = 175 °C	T _s = 25 °C	44	A
		T _s = 70 °C	35	A
I _{Fnom}			35	A
I _{FRM}	I _{FRM} = 3 x I _{Fnom}		105	A
I _{FSM}	10 ms, sin 180°, T _j = 150 °C		170	A
T _j			-40 ... 175	°C
Module				
I _{t(RMS)}	20 A per spring		40	A
T _{stg}			-40 ... 125	°C
V _{isol}	AC sinus 50 Hz, 1 min		2500	V

SKiiP 24ACC12T4V10



MiniSKiiP® 2

Twin 6-pack

SKiiP 24ACC12T4V10

Target Data

Features

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

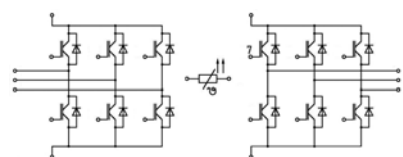
Typical Applications*

- 4Q inverters

Remarks

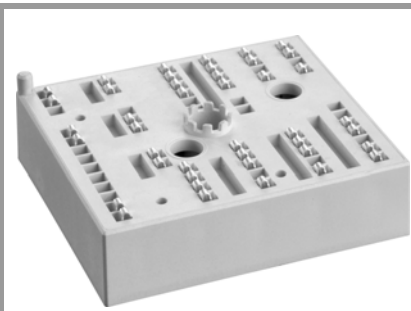
- Max. case temperature limited to $T_C=125^\circ\text{C}$
- Short circuit behaviour of one leg must be verified in the final application

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
IGBT 1 - 6						
V _{CE(sat)}	I _C = 25 A	T _j = 25 °C		1.85	2.10	V
	V _{GE} = 15 V chiplevel	T _j = 150 °C		2.25	2.45	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		42	48	mΩ
		T _j = 150 °C		62	66	mΩ
V _{GE(th)}	V _{GE} = V _{CE} V, I _C = 1 mA		5	5.8	6.5	V
I _{CES}	V _{GE} = 0 V	T _j = 25 °C		0.1	0.3	mA
	V _{CE} = 1200 V					mA
C _{ies}	V _{CE} = 25 V V _{GE} = 0 V	f = 1 MHz		1.43		nF
C _{oes}		f = 1 MHz		0.12		nF
C _{res}		f = 1 MHz		0.09		nF
Q _G	V _{GE} = - 8 V...+ 15 V			142		nC
R _{Gint}	T _j = 25 °C			0		Ω
t _{d(on)}	V _{CC} = 600 V	T _j = 150 °C		44		ns
t _r	I _C = 25 A	T _j = 150 °C		46		ns
E _{on}	R _{G on} = 39 Ω	T _j = 150 °C		3.7		mJ
	R _{G off} = 39 Ω	T _j = 150 °C				
t _{d(off)}	di/dt _{on} = 465 A/μs			330		ns
t _f	di/dt _{off} = 350 A/μs	T _j = 150 °C		62		ns
E _{off}	V _{GE} = +15/-15 V	T _j = 150 °C		2.4		mJ
R _{th(j-s)}	per IGBT, λ _{paste} =0.8 W/K*m			1		K/W
IGBT 7 - 12						
V _{CE(sat)}	I _C = 35 A	T _j = 25 °C		1.85	2.10	V
	V _{GE} = 15 V chiplevel	T _j = 150 °C		2.25	2.45	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		30	34	mΩ
		T _j = 150 °C		44	47	mΩ
V _{GE(th)}	V _{GE} = V _{CE} V, I _C = 1 mA		5	5.8	6.5	V
I _{CES}	V _{GE} = 0 V	T _j = 25 °C		0.1	0.3	mA
	V _{CE} = 1200 V					mA
C _{ies}	V _{CE} = 25 V V _{GE} = 0 V	f = 1 MHz		1.95		nF
C _{oes}		f = 1 MHz		0.16		nF
C _{res}		f = 1 MHz		0.12		nF
Q _G	V _{GE} = - 8 V...+ 15 V			200		nC
R _{Gint}	T _j = 25 °C			0		Ω
t _{d(on)}	V _{CC} = 600 V	T _j = 150 °C		19		ns
t _r	I _C = 35 A	T _j = 150 °C		24		ns
E _{on}	R _{G on} = 16 Ω	T _j = 150 °C		4.2		mJ
	R _{G off} = 16 Ω	T _j = 150 °C				
t _{d(off)}	di/dt _{on} = 1100 A/μs			290		ns
t _f	di/dt _{off} = 760 A/μs	T _j = 150 °C		46		ns
E _{off}	V _{GE} = +15/-15 V	T _j = 150 °C		3.1		mJ
R _{th(j-s)}	per IGBT, λ _{paste} =0.8 W/K*m			0.85		K/W



ACC

SKiiP 24ACC12T4V10



MiniSKiiP® 2

Twin 6-pack

SKiiP 24ACC12T4V10

Target Data

Features

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

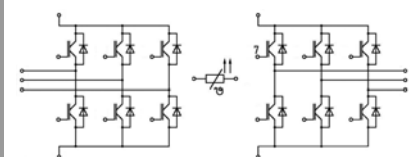
Typical Applications*

- 4Q inverters

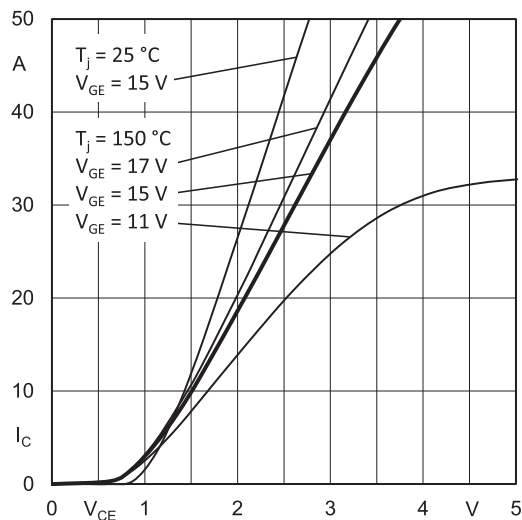
Remarks

- Max. case temperature limited to $T_C=125^{\circ}\text{C}$
- Short circuit behaviour of one leg must be verified in the final application

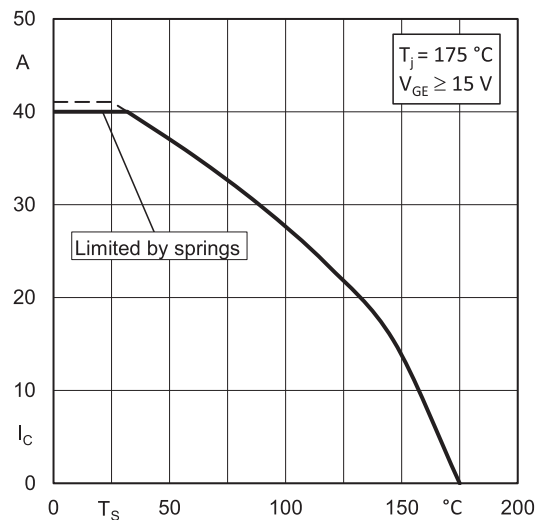
Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Diode 1 - 6						
$V_F = V_{EC}$	$I_F = 25\text{ A}$	$T_j = 25\text{ }^{\circ}\text{C}$		2.4	2.7	V
	$V_{GE} = 0\text{ V}$ chiplevel	$T_j = 150\text{ }^{\circ}\text{C}$		2.5	2.8	V
V_{F0}	chiplevel	$T_j = 25\text{ }^{\circ}\text{C}$		1.3	1.5	V
		$T_j = 150\text{ }^{\circ}\text{C}$		0.9	1.1	V
r_F	chiplevel	$T_j = 25\text{ }^{\circ}\text{C}$		44	50	mΩ
		$T_j = 150\text{ }^{\circ}\text{C}$		62	68	mΩ
I_{RRM}	$I_F = 25\text{ A}$	$T_j = 150\text{ }^{\circ}\text{C}$		19		A
Q_{rr}	$di/dt_{off} = 640\text{ A}/\mu\text{s}$	$T_j = 150\text{ }^{\circ}\text{C}$		4		μC
E_{rr}	$V_{GE} = -15\text{ V}$	$T_j = 150\text{ }^{\circ}\text{C}$		1.64		mJ
	$V_R = 600\text{ V}$					
$R_{th(j-s)}$	per Diode, $\lambda_{paste}=0.8\text{ W/K}\cdot\text{m}$			1.52		K/W
Diode 7 - 12						
$V_F = V_{EC}$	$I_F = 35\text{ A}$	$T_j = 25\text{ }^{\circ}\text{C}$		2.3	2.6	V
	$V_{GE} = 0\text{ V}$ chiplevel	$T_j = 150\text{ }^{\circ}\text{C}$		2.3	2.6	V
V_{F0}	chiplevel	$T_j = 25\text{ }^{\circ}\text{C}$		1.3	1.5	V
		$T_j = 150\text{ }^{\circ}\text{C}$		0.9	1.1	V
r_F	chiplevel	$T_j = 25\text{ }^{\circ}\text{C}$		29	32	mΩ
		$T_j = 150\text{ }^{\circ}\text{C}$		40	43	mΩ
I_{RRM}	$I_F = 35\text{ A}$	$T_j = 150\text{ }^{\circ}\text{C}$		36		A
Q_{rr}	$di/dt_{off} = 1500\text{ A}/\mu\text{s}$	$T_j = 150\text{ }^{\circ}\text{C}$		5.5		μC
E_{rr}	$V_{GE} = -15\text{ V}$	$T_j = 150\text{ }^{\circ}\text{C}$		2.2		mJ
	$V_{CC} = 600\text{ V}$					
$R_{th(j-s)}$	per Diode, $\lambda_{paste}=0.8\text{ W/K}\cdot\text{m}$			1.2		K/W
Module						
M_s	to heat sink		2		2.5	Nm
w				55		g
Temperature Sensor						
R_{100}	$T_r=100^{\circ}\text{C}$ ($R_{25}=1000\Omega$)			1670 ± 3%		Ω
$R(T)$	$R(T)=1000\Omega[1+A(T-25^{\circ}\text{C})+B(T-25^{\circ}\text{C})^2]$, $A = 7.635\cdot 10^{-3}\text{ }^{\circ}\text{C}^{-1}$, $B = 1.731\cdot 10^{-5}\text{ }^{\circ}\text{C}^{-2}$					



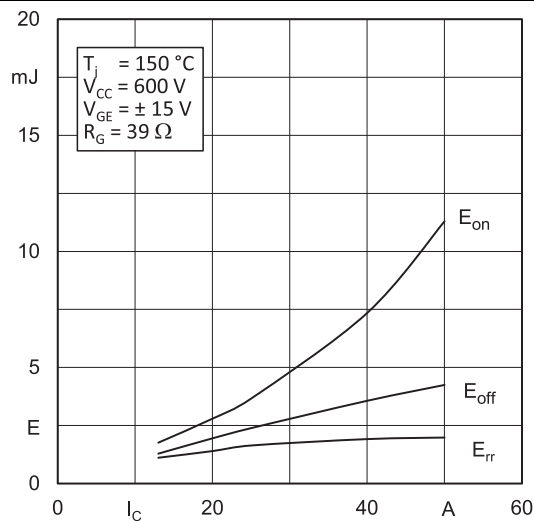
ACC



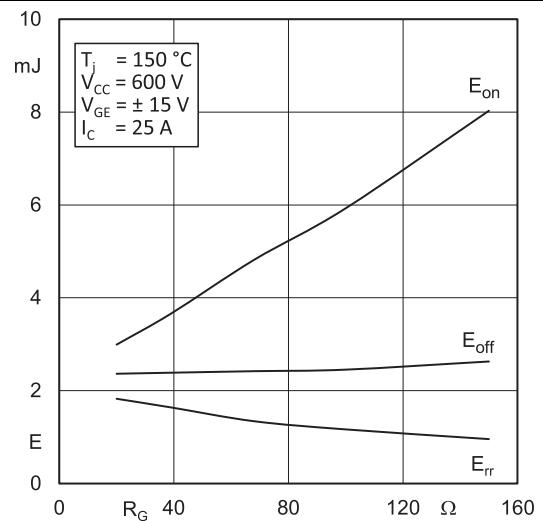
IGBT 1-6 - Fig. 1:
Typ. output characteristic



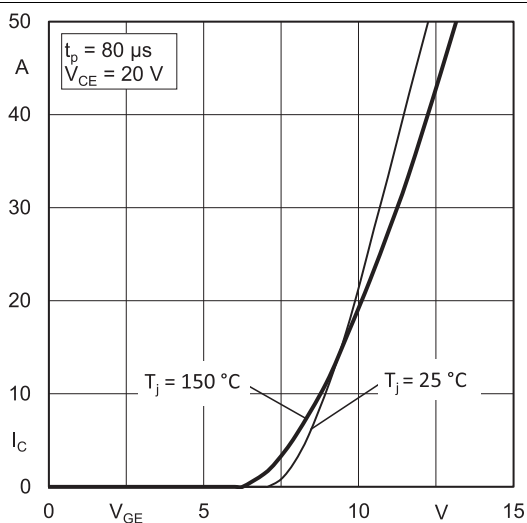
IGBT 1-6 - Fig. 2:
Typ. rated current vs. temperature $I_C = f(T_S)$



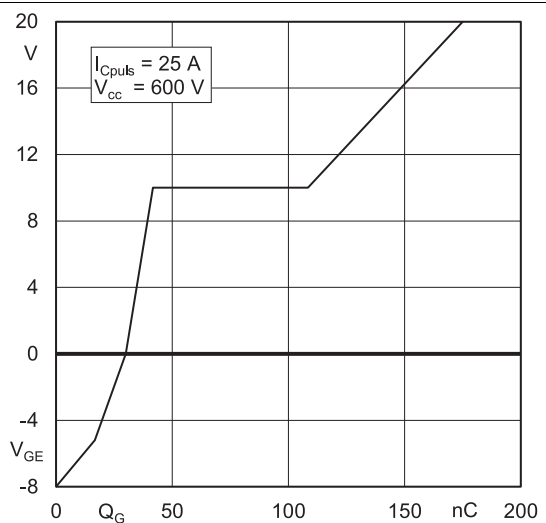
IGBT 1-6 - Fig. 3:
Typ. turn-on /-off energy = $f(I_C)$



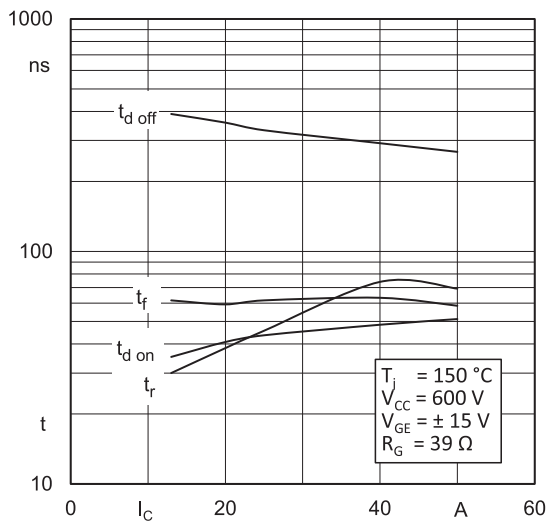
IGBT 1-6 - Fig. 4:
Typ. turn-on /-off energy = $f(R_G)$



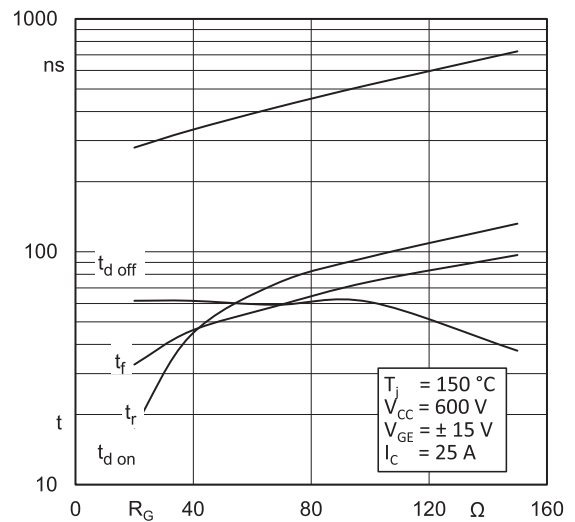
IGBT 1-6 - Fig. 5:
Typ. transfer characteristic



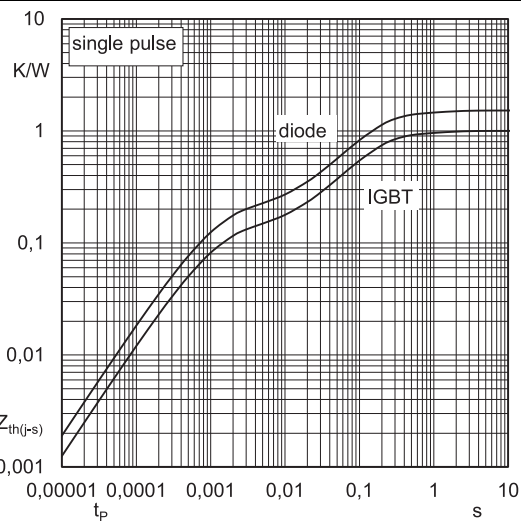
IGBT 1-6 - Fig. 6:
Typ. gate charge characteristic



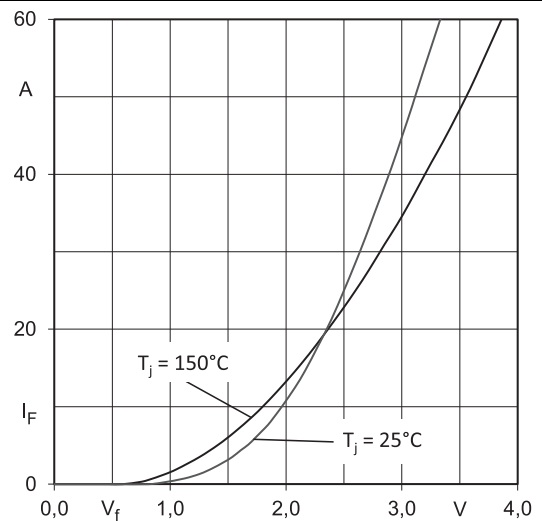
IGBT 1-6 - Fig. 7:
Typ. switching times vs. I_C



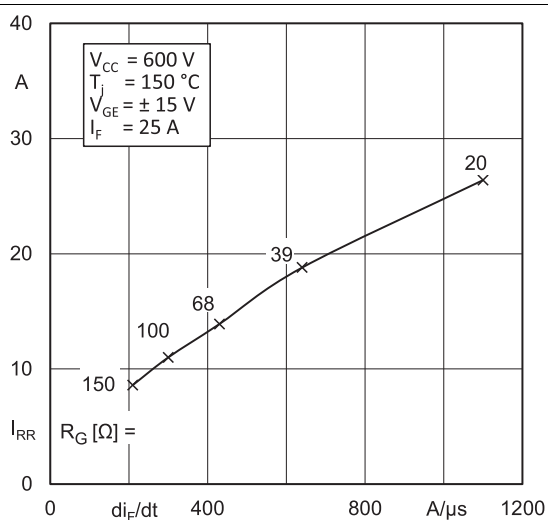
IGBT 1-6 - Fig. 8:
Typ. switching times vs. gate resistor R_G



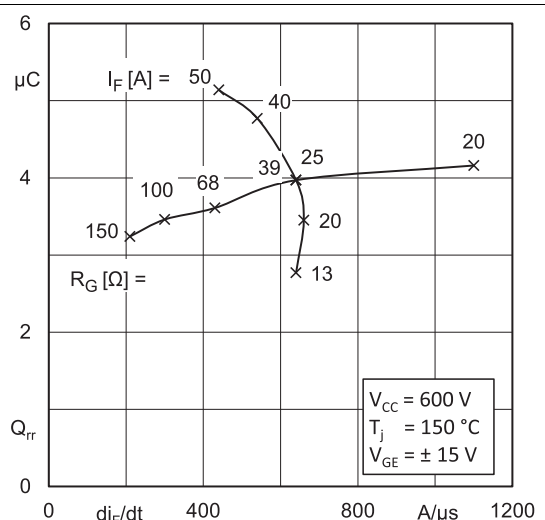
IGBT 1-6 - Fig. 9:
Transient thermal impedance of IGBT and Diode



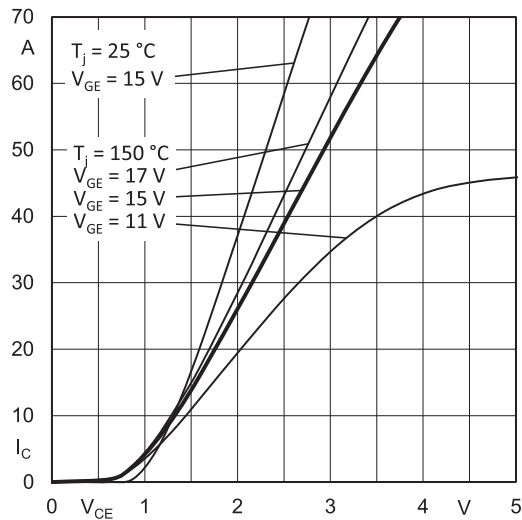
IGBT 1-6 - Fig. 10:
CAL diode forward characteristic



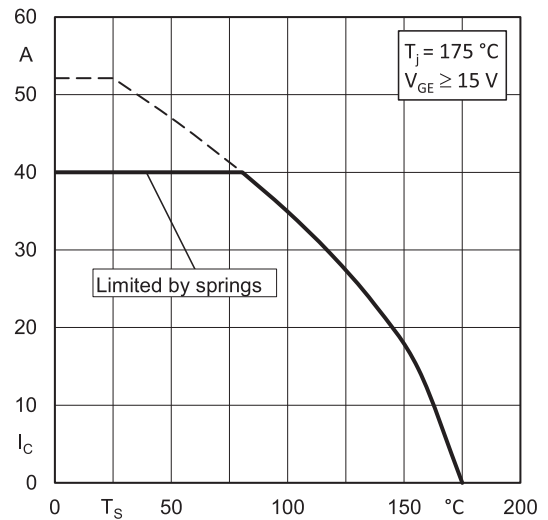
IGBT 1-6 - Fig. 11:
Typ. CAL diode peak reverse recovery current



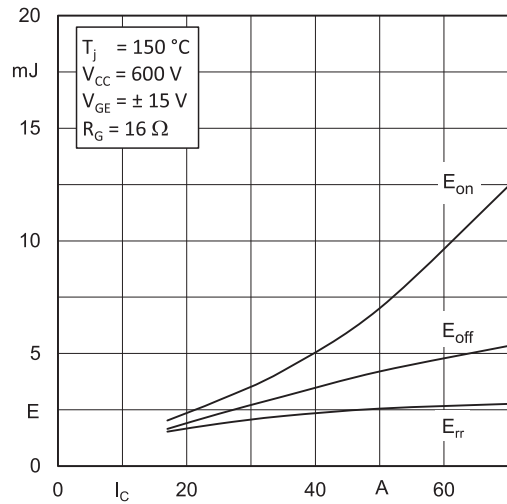
IGBT 1-6 - Fig. 12:
Typ. CAL diode recovery charge



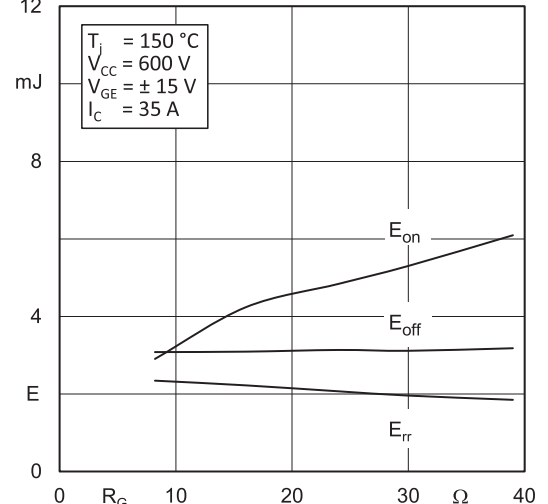
IGBT 7-12 - Fig. 1:
Typ. output characteristic



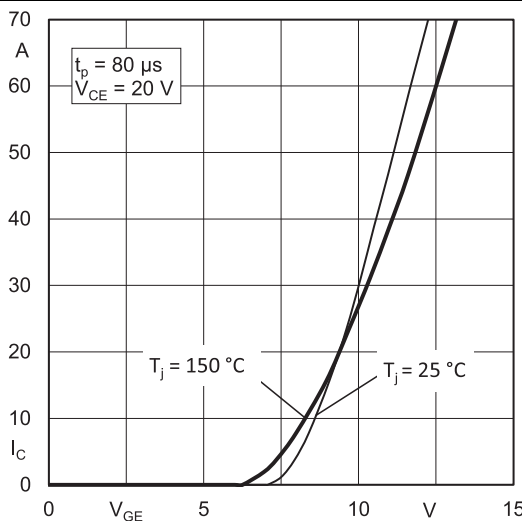
IGBT 7-12 - Fig. 2:
Typ. rated current vs. temperature $I_C = f(T_s)$



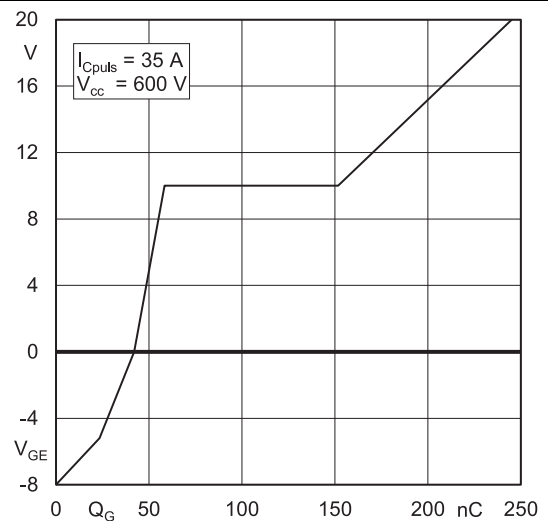
IGBT 7-12 - Fig. 3:
Typ. turn-on /-off energy = $f(I_C)$



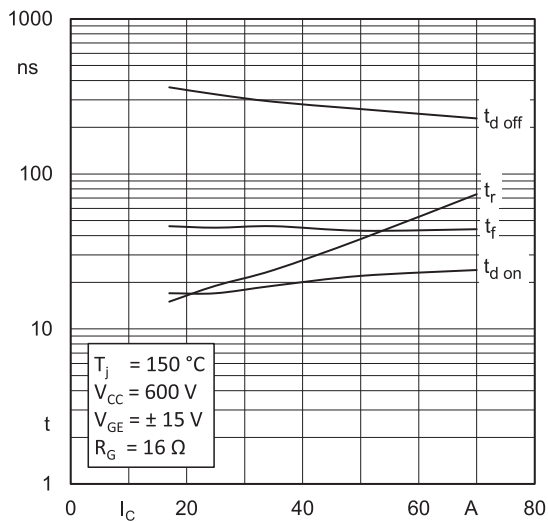
IGBT 7-12 - Fig. 4:
Typ. turn-on /-off energy = $f(R_G)$



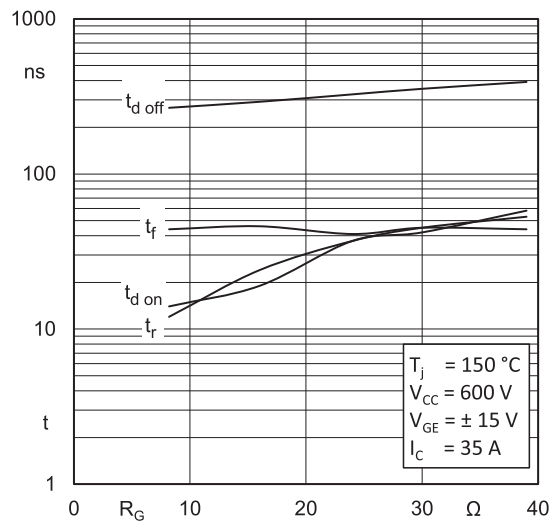
IGBT 7-12 - Fig. 5:
Typ. transfer characteristic



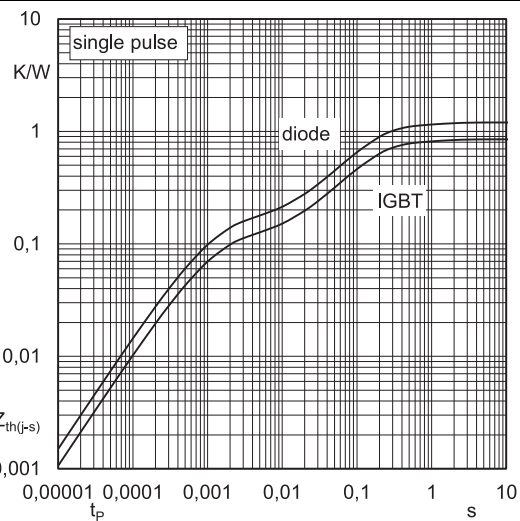
IGBT 7-12 - Fig. 6:
Typ. gate charge characteristic



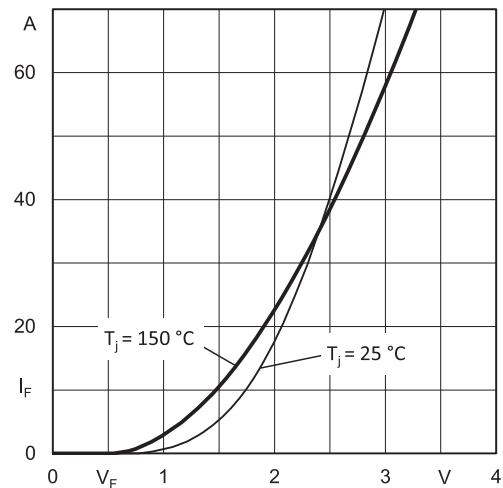
IGBT 7-12 - Fig. 7:
Typ. switching times vs. I_C



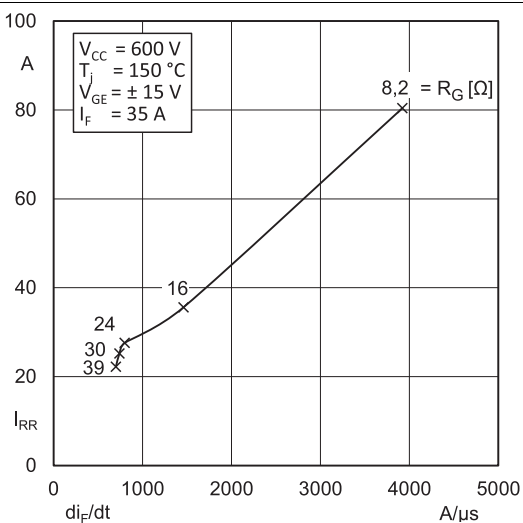
IGBT 7-12 - Fig. 8:
Typ. switching times vs. gate resistor R_G



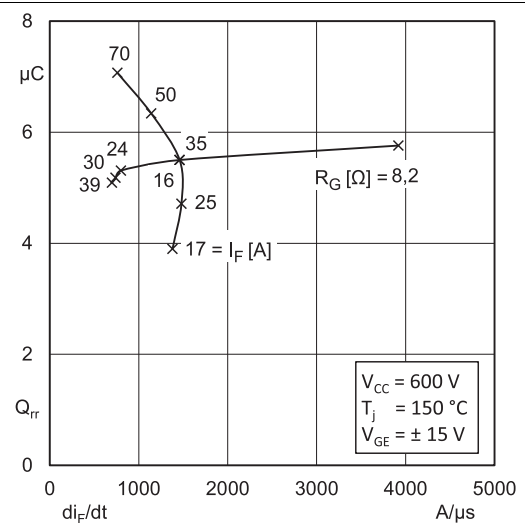
IGBT 7-12 - Fig. 9:
Transient thermal impedance of IGBT and Diode



IGBT 7-12 - Fig. 10:
CAL diode forward characteristic

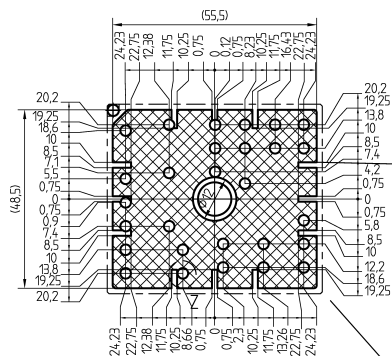


IGBT 7-12 - Fig. 11:
Typ. CAL diode peak reverse recovery current

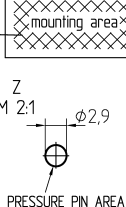


IGBT 7-12 - Fig. 12:
Typ. CAL diode recovery charge

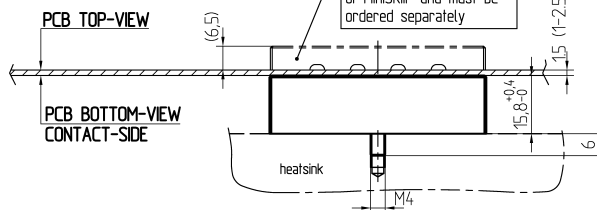
PCB
PCB TOP-VIEW



Only for the standard pressure part:
Accessible for mounting of SMD (max height 3,5) on PCB by customer



MiniSKiiP 2

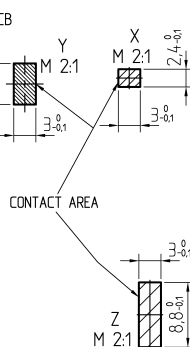
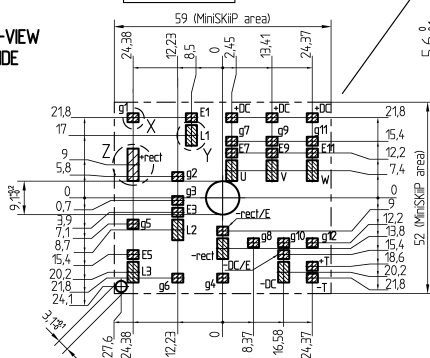


standard pressure part
pressure part is no part of MiniSKiiP and must be ordered separately

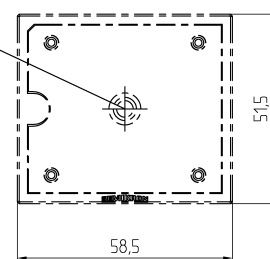
measure: mm

PCB TOP-VIEW
PCB BOTTOM-VIEW CONTACT-SIDE

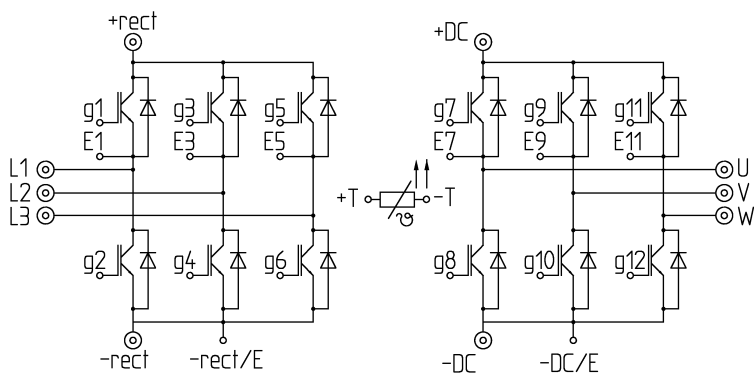
PCB BOTTOM-VIEW CONTACT-SIDE



For mounting please follow the assembly instruction



pinout, dimensions



- ⊙ power connector
- control connector

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.