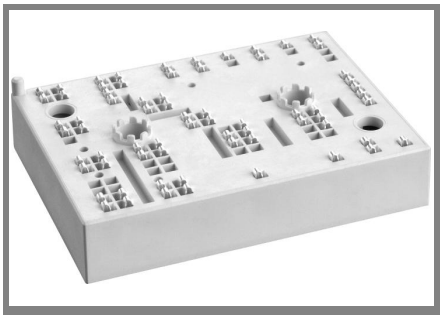
SKiiP 38AC12T4V1



MiniSKiiP®3

3-phase bridge inverter

SKiiP 38AC12T4V1

Features

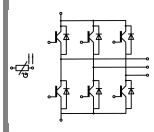
- Trench 4 IGBT´s
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised file no. E63532

Typical Applications

- Inverter up to 41 kVA
- Typical motor power 22 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 $T_j \leq 150$ (recomm. T_{op} = -40 ... +150°C)
- For short circuit: Soft R_{Goff} recommended

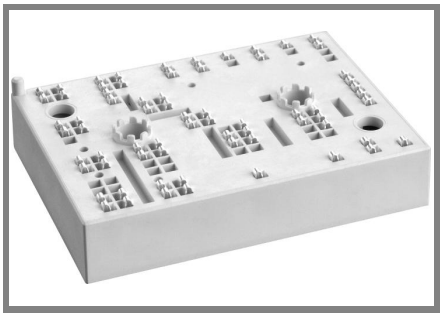


AC

Absolute Maximum Ratings	T_s = 25 °C, unless otherwise specified			
Symbol	**Conditions**		**Values**	**Units**
IGBT				
V_{CES}	T_j = 25 °C		1200	V
I_C	T_j = 175 °C	T_c = 25 °C	115	A
		T_c = 70 °C	93	A
I_{CRM}	I_{CRM} = 3xI_{Cnom}		300	A
V_{GES}			±20	V
t_{psc}	V_{CC} = 800 V; $V_{GE} \leq$ 15 V; V_{CES} < 1200 V	T_j = 150 °C	10	µs
Inverse Diode				
I_F	T_j = 175 °C	T_c = 25 °C	99	A
		T_c = 70 °C	79	A
I_{FRM}	I_{CRM} = 3xI_{Cnom}		300	A
I_{FSM}	t_p = 10 ms; sin	T_j = 150 °C	548	A
Module				
$I_{t(RMS)}$			160	A
T_{vj}			-40...+150	°C
T_{stg}			-40...+125	°C
V_{isol}	AC, 1 min.		2500	V

Characteristics	T_s = 25 °C, unless otherwise specified					
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
IGBT						
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 4 mA		5	5,8	6,5	V
I_{CES}	V_{GE} = 0 V, V_{CE} = V_{CES}	T_j = 25 °C			0,3	mA
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		10	11	mΩ
		T_j = 150°C		15	16	mΩ
$V_{CE(sat)}$	I_{Cnom} = 100 A, V_{GE} = 15 V	T_j = 25°C$_{chiplev.}$		1,8	2	V
		T_j = 150°C$_{chiplev.}$		2,2	2,4	V
C_{ies}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz		6,2		nF
C_{oes}				0,41		nF
C_{res}				0,35		nF
Q_G	V_{GE} = -8...+15V			565		nC
R_{Gint}	T_j = 25 °C			7,5		Ω
$t_{d(on)}$	R_{Gon} = 1 Ω di/dt = 2080 A/µs	V_{CC} = 600V I_C= 100A T_j = 150 °C V_{GE} = ±15V		160		ns
t_r				45		ns
E_{on}				13,7		mJ
$t_{d(off)}$	R_{Goff} = 1 Ω di/dt = 1240 A/µs			395		ns
t_f				73		ns
E_{off}				9,7		mJ
$R_{th(j-s)}$	per IGBT			0,48		K/W

SKiiP 38AC12T4V1



MiniSKiiP®3

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SKiiP 38AC12T4V1

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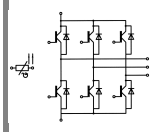

AC

Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 100 A; V_{GE} = 15 V	T_j = 25 °$C_{chiplev.}$		2,2	2,5	V
		T_j = 150 °$C_{chiplev.}$		2,1	2,45	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		9	10	mΩ
		T_j = 150 °C		12	13,5	mΩ
I_{RRM}	I_F = 100 A	T_j = 125 °C		112		A
Q_{rr}	di/dt = 2680 A/µs			16		µC
E_{rr}	V_{GE} = ±15V			6,5		mJ
$R_{th(j-s)}$	per diode			0,66		K/W
M_s	to heat sink		2		2,5	Nm
w				95		g
Temperature sensor						
R_{ts}	3%, Tr = 25°C			1000		Ω
R_{ts}	3%, Tr = 100°C			1670		Ω

This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.

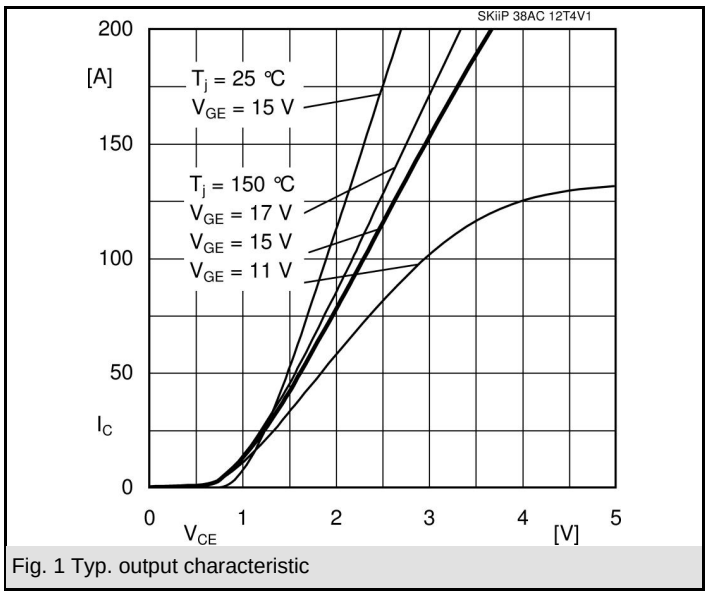

Fig. 1 Typ. output characteristic

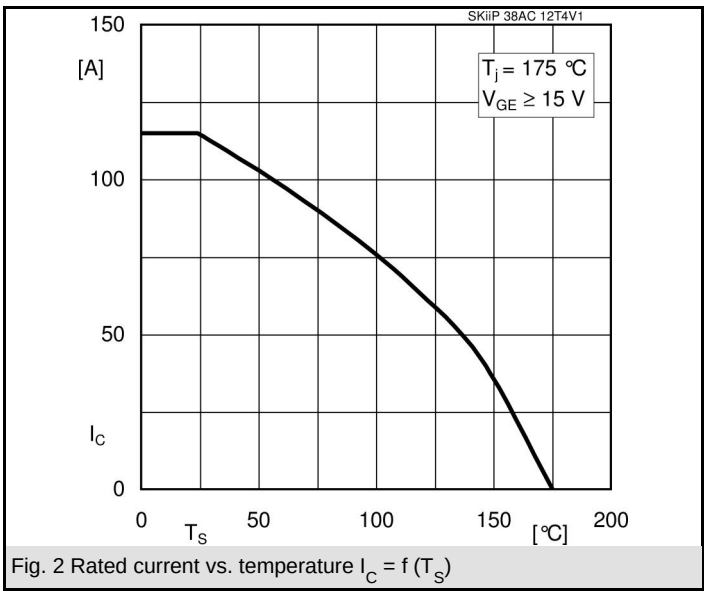

Fig. 2 Rated current vs. temperature $I_C = f(T_S)$

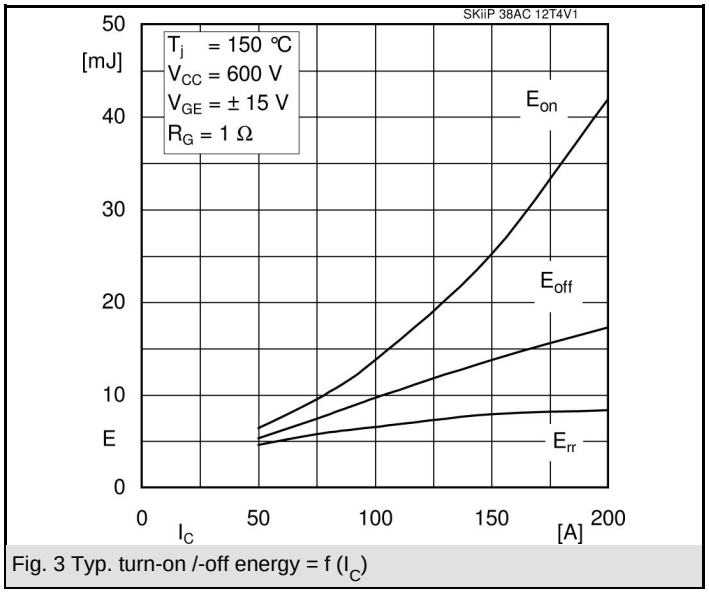

Fig. 3 Typ. turn-on /-off energy = f (I_C)

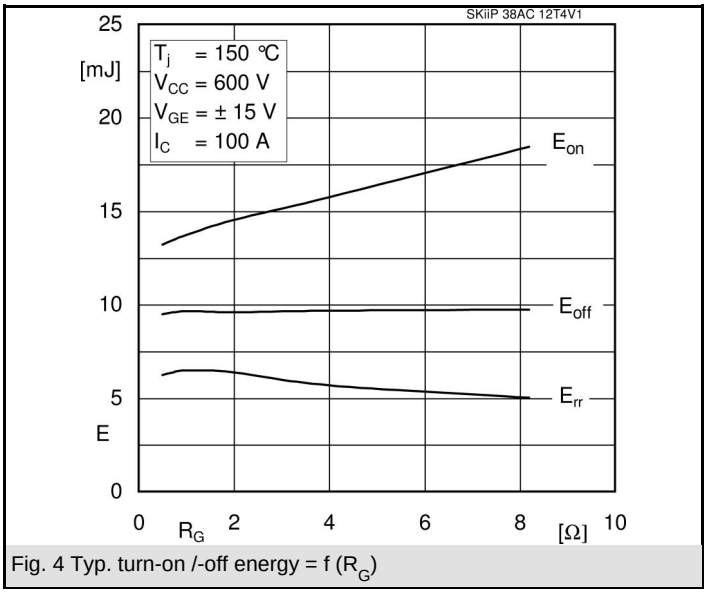

Fig. 4 Typ. turn-on /-off energy = f (R_G)

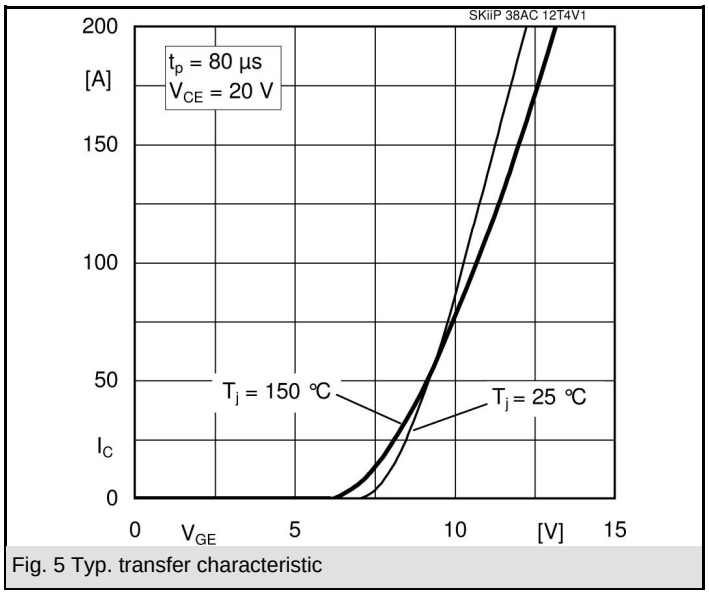

Fig. 5 Typ. transfer characteristic

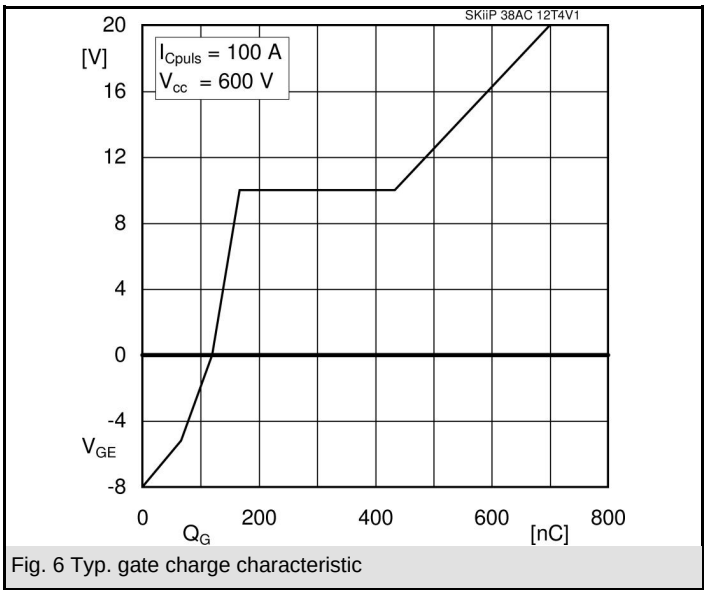

Fig. 6 Typ. gate charge characteristic

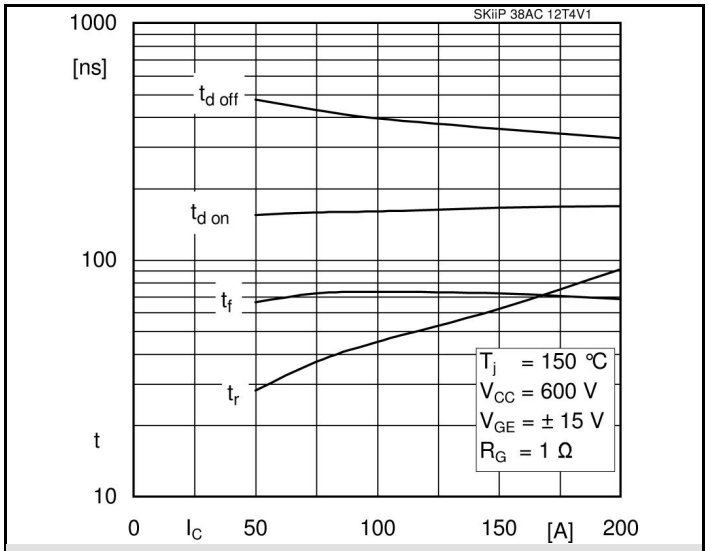

Fig. 7 Typ. switching times vs. I_C

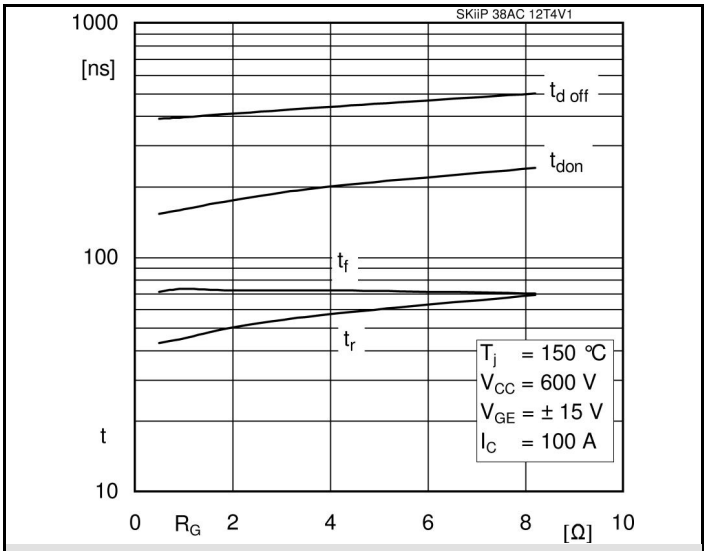

Fig. 8 Typ. switching times vs. gate resistor R_G

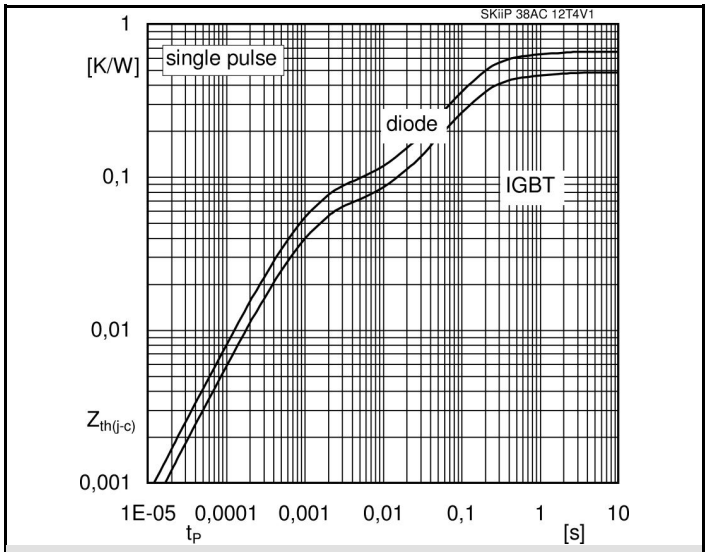

Fig. 9 Transient thermal impedance of IGBT and Diode

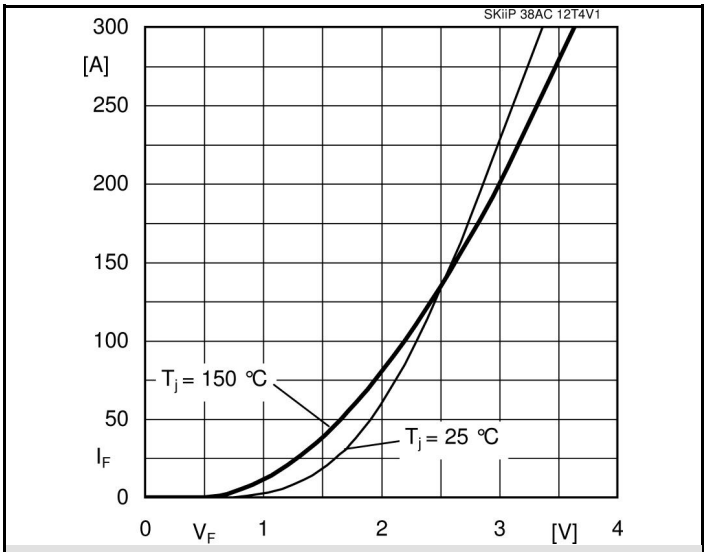

Fig. 10 CAL diode forward characteristic

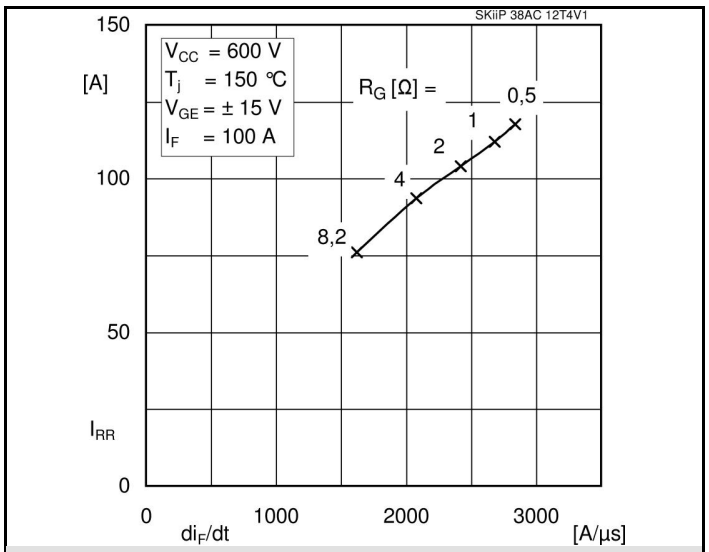

Fig. 11 Typ. CAL diode peak reverse recovery current

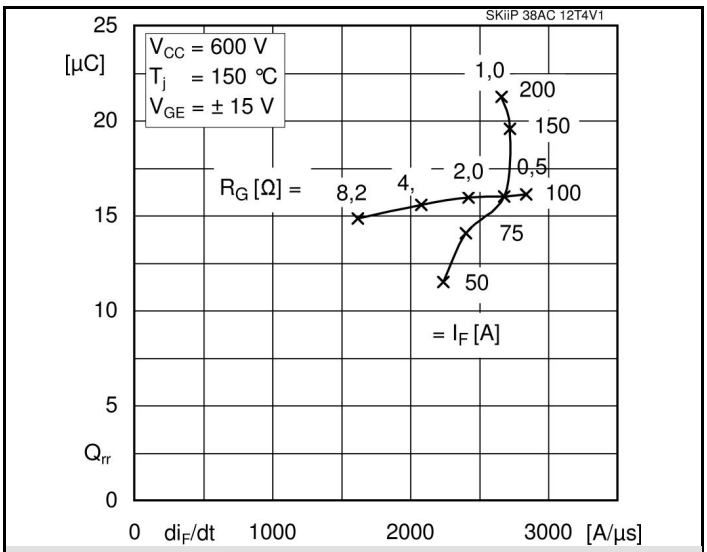

Fig. 12 Typ. CAL diode recovered charge

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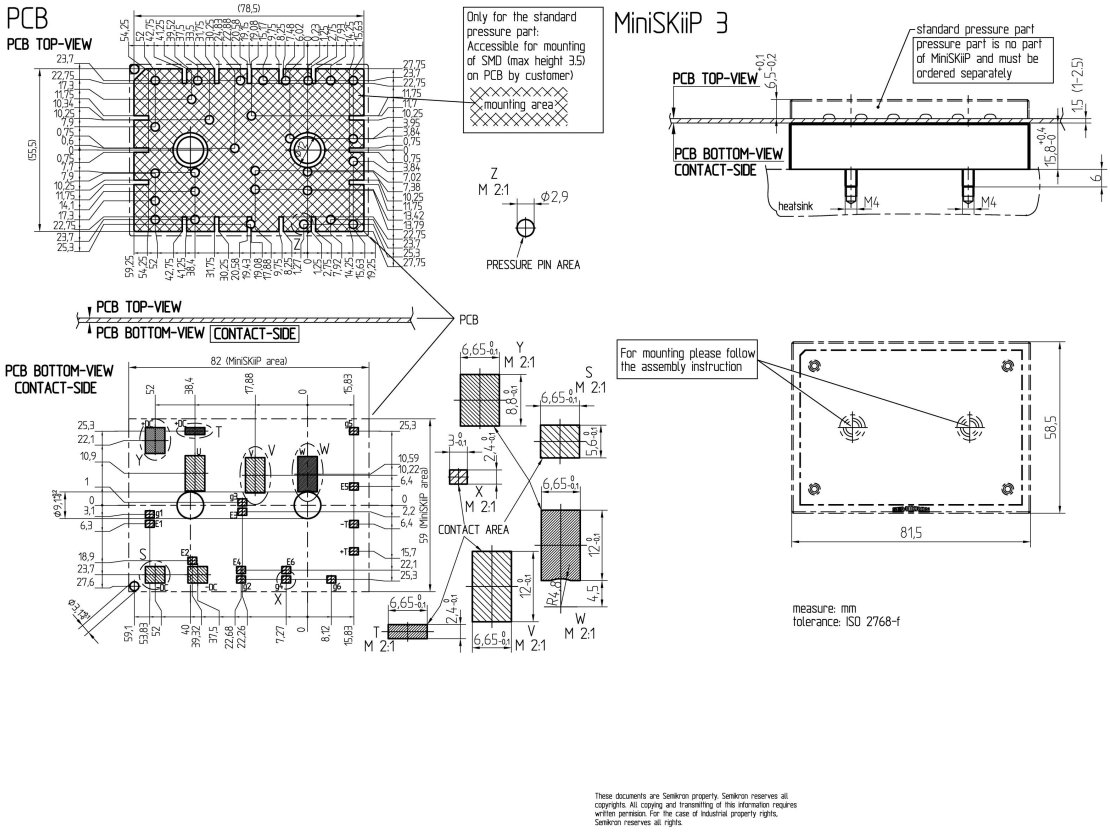
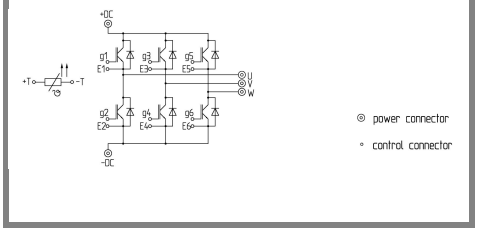
UL recognized file no. E 63 532



case



pinout

