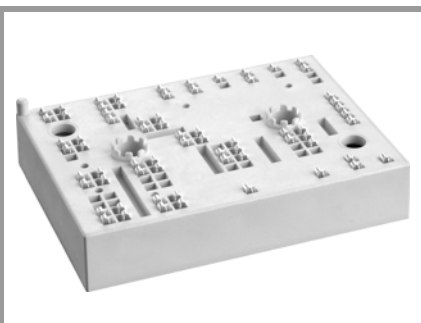


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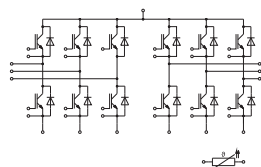
SKiiP 35ACC12F4V1

Features*

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

Remarks

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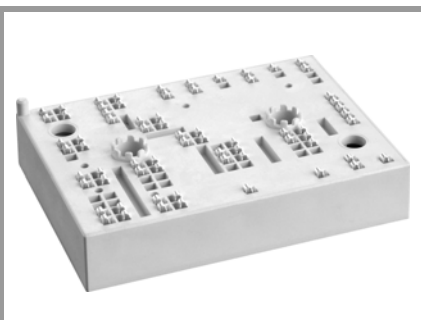


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Absolute Maximum Ratings				
Symbol	Conditions		Values	Unit
Inverter - IGBT				
V_{CES}	$T_j = 25^\circ\text{C}$		1200	V
I_C	$\lambda_{paste} = 0.8 \text{ W/(mK)}$	$T_s = 25^\circ\text{C}$	54	A
		$T_j = 175^\circ\text{C}$	43	A
I_C	$\lambda_{paste} = 2.5 \text{ W/(mK)}$	$T_s = 25^\circ\text{C}$	62	A
		$T_j = 175^\circ\text{C}$	50	A
I_{Cnom}			50	A
I_{CRM}	$I_{CRM} = 3 \times I_{Cnom}$		150	A
V_{GES}			-20 ... 20	V
t_{psc}	$V_{CC} = 800 \text{ V}$	$T_j = 150^\circ\text{C}$	10	μs
	$V_{GE} \leq 15 \text{ V}$			
	$V_{CES} \leq 1200 \text{ V}$			
T_j			-40 ... 175	$^\circ\text{C}$
Inverse - Diode				
I_F	$\lambda_{paste} = 0.8 \text{ W/(mK)}$	$T_s = 25^\circ\text{C}$	58	A
		$T_j = 175^\circ\text{C}$	46	A
I_F	$\lambda_{paste} = 2.5 \text{ W/(mK)}$	$T_s = 25^\circ\text{C}$	65	A
		$T_j = 175^\circ\text{C}$	52	A
I_{Fnom}			50	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$		100	A
I_{FSM}	$t_p = 10 \text{ ms}, \sin 180^\circ, T_j = 150^\circ\text{C}$		270	A
T_j			-40 ... 175	$^\circ\text{C}$
Module				
$I_t(\text{RMS})$	$T_{terminal} = 80^\circ\text{C}, 20 \text{ A per spring}$		40	A
T_{stg}			-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						
$V_{CE(sat)}$	$I_C = 50 \text{ A}$ $V_{GE} = 15 \text{ V}$ chiplevel	$T_j = 25^\circ\text{C}$	2.05	2.42		V
		$T_j = 150^\circ\text{C}$	2.59	2.96		V
V_{CE0}	chiplevel	$T_j = 25^\circ\text{C}$	1.10	1.28		V
		$T_j = 150^\circ\text{C}$	0.95	1.13		V
r_{CE}	$V_{GE} = 15 \text{ V}$ chiplevel	$T_j = 25^\circ\text{C}$	19	23		$\text{m}\Omega$
		$T_j = 150^\circ\text{C}$	33	37		$\text{m}\Omega$
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 1.7 \text{ mA}$		5.2	5.8	6.4	V
I_{CES}	$V_{GE} = 0 \text{ V}, V_{CE} = 1200 \text{ V}, T_j = 25^\circ\text{C}$				0.3	mA
C_{ies}	$V_{CE} = 25 \text{ V}$ $V_{GE} = 0 \text{ V}$	$f = 1 \text{ MHz}$	2.77			nF
C_{oes}		$f = 1 \text{ MHz}$	0.21			nF
C_{res}		$f = 1 \text{ MHz}$	0.16			nF
Q_G	$V_{GE} = -8 \text{ V} \dots +15 \text{ V}$		283			nC
R_{Gint}	$T_j = 25^\circ\text{C}$		4.0			Ω
$t_{d(on)}$	$V_{CC} = 600 \text{ V}$	$T_j = 150^\circ\text{C}$	28			ns
t_r	$I_C = 50 \text{ A}$ $R_{Gon} = 6.2 \Omega$ $R_{Goff} = 0 \Omega$	$T_j = 150^\circ\text{C}$	21			ns
		$T_j = 150^\circ\text{C}$	4.8			mJ
$t_{d(off)}$	$di/dt_{on} = 2508 \text{ A}/\mu\text{s}$	$T_j = 150^\circ\text{C}$	234			ns
t_f	$di/dt_{off} = 1082 \text{ A}/\mu\text{s}$	$T_j = 150^\circ\text{C}$	47			ns
E_{off}	$V_{GE} = +15/-15 \text{ V}$	$T_j = 150^\circ\text{C}$	3.4			mJ
$R_{th(j-s)}$	per IGBT, $\lambda_{paste} = 0.8 \text{ W/(mK)}$		0.87			K/W
$R_{th(j-s)}$	per IGBT, $\lambda_{paste} = 2.5 \text{ W/(mK)}$		0.69			K/W

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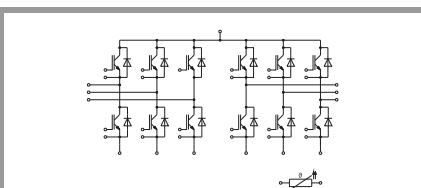
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Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Inverse - Diode						
$V_F = V_{EC}$	$I_F = 50 \text{ A}$ $V_{GE} = 0 \text{ V}$ chipllevel	$T_j = 25^\circ\text{C}$		2.22	2.54	V
		$T_j = 150^\circ\text{C}$		2.18	2.50	V
V_{F0}	chipllevel	$T_j = 25^\circ\text{C}$		1.30	1.50	V
		$T_j = 150^\circ\text{C}$		0.90	1.10	V
r_F	chipllevel	$T_j = 25^\circ\text{C}$		18	21	m Ω
		$T_j = 150^\circ\text{C}$		26	28	m Ω
I_{RRM}	$I_F = 50 \text{ A}$	$T_j = 150^\circ\text{C}$		90.1		A
Q_{rr}	$di/dt_{off} = 2426 \text{ A}/\mu\text{s}$ $V_{GE} = +15/-15 \text{ V}$	$T_j = 150^\circ\text{C}$		8.25		μC
E_{rr}	$V_{CC} = 600 \text{ V}$	$T_j = 150^\circ\text{C}$		3		mJ
$R_{th(j-s)}$	per Diode, $\lambda_{paste}=0.8 \text{ W}/(\text{mK})$			1.02		K/W
$R_{th(j-s)}$	per Diode, $\lambda_{paste}=2.5 \text{ W}/(\text{mK})$			0.84		K/W
Module						
L_{CE}				-		nH
M_s	to heat sink		2		2.5	Nm
W				82		g
Temperature Sensor						
R_{100}	$T_r=100^\circ\text{C}$ ($R_{25}=1000\Omega$)			$1670 \pm 3\%$		Ω
$R(T)$	$R(T)=1000\Omega[1+A(T-25^\circ\text{C})+B(T-25^\circ\text{C})^2]$, $A = 7.635 \cdot 10^{-3} \text{ }^\circ\text{C}^{-1}$, $B = 1.731 \cdot 10^{-5} \text{ }^\circ\text{C}^{-2}$					



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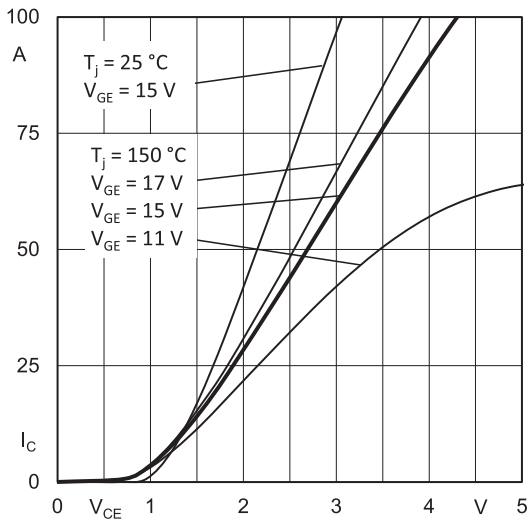


Fig. 1: Typ. output characteristic, inclusive $R_{CC'+EE'}$

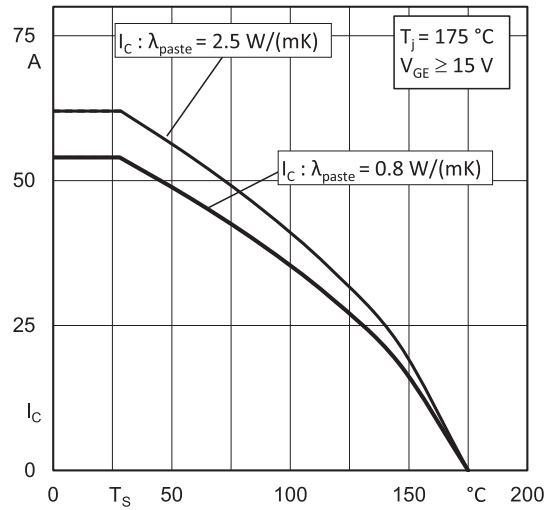


Fig. 2: Rated current vs. temperature $I_C = f(T_S)$

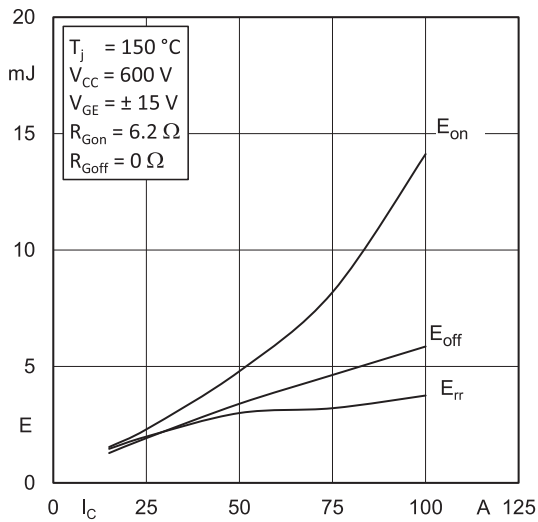


Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

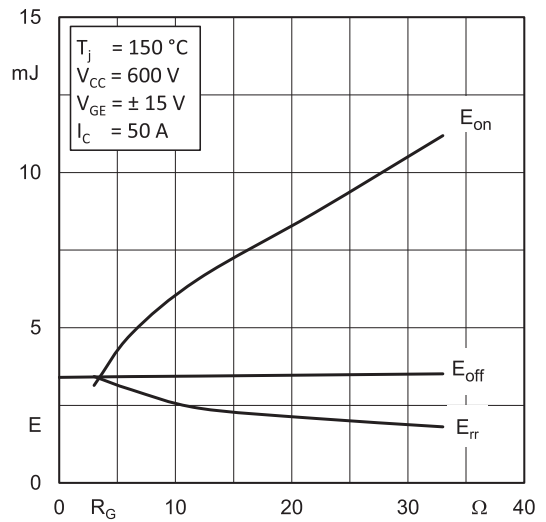


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

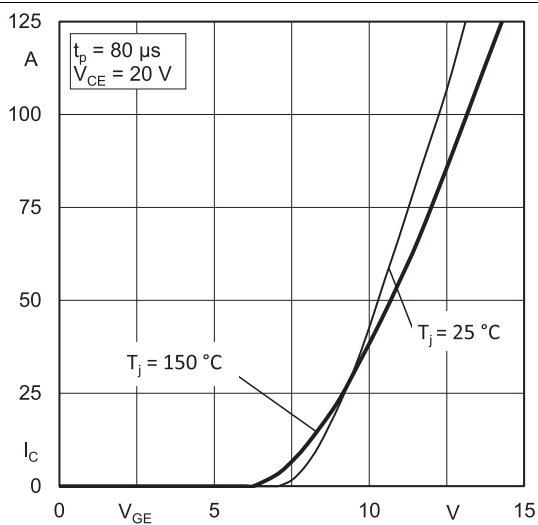


Fig. 5: Typ. transfer characteristic

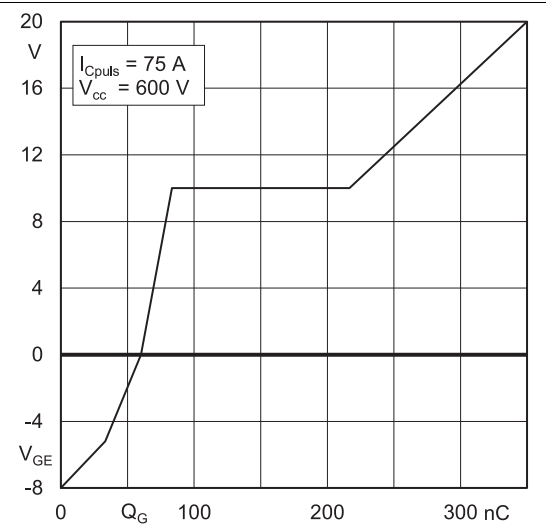


Fig. 6: Typ. gate charge characteristic

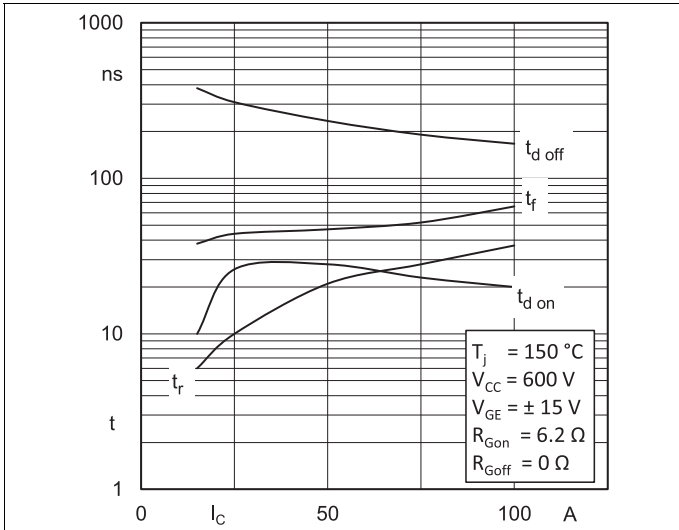


Fig. 7: Typ. switching times vs. I_C

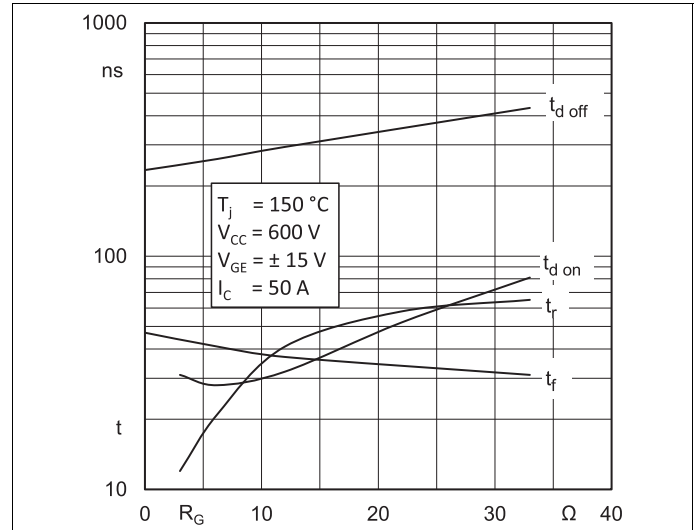


Fig. 8: Typ. switching times vs. gate resistor R_G

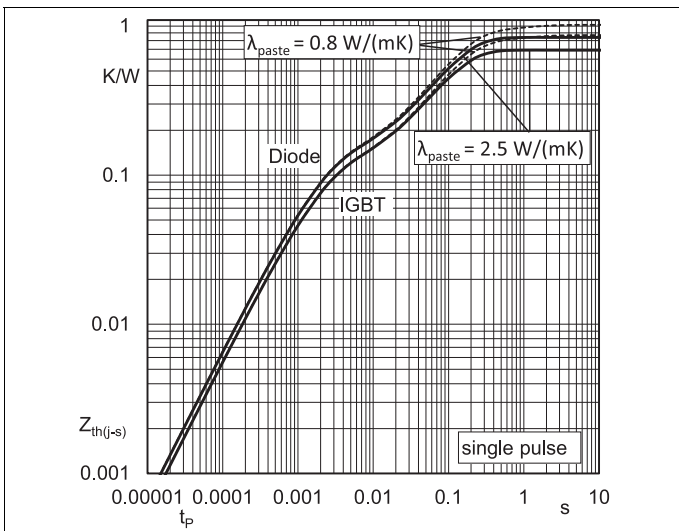


Fig. 9: Transient thermal impedance of IGBT and Diode

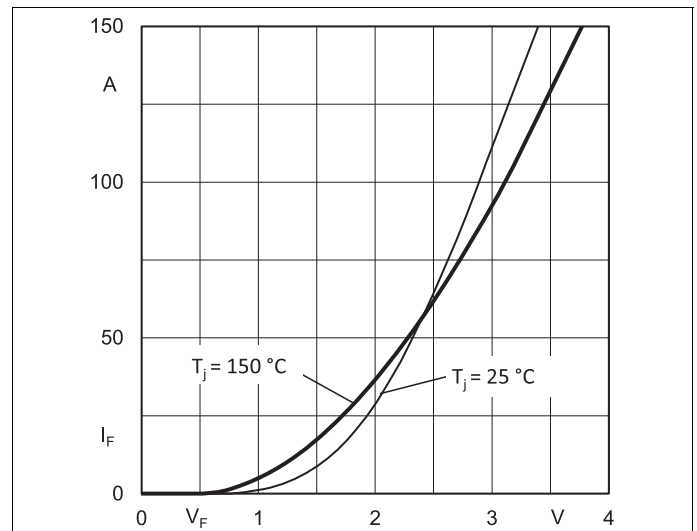


Fig. 10: Typ. CAL diode forward charact., incl. $R_{CC+EE'}$

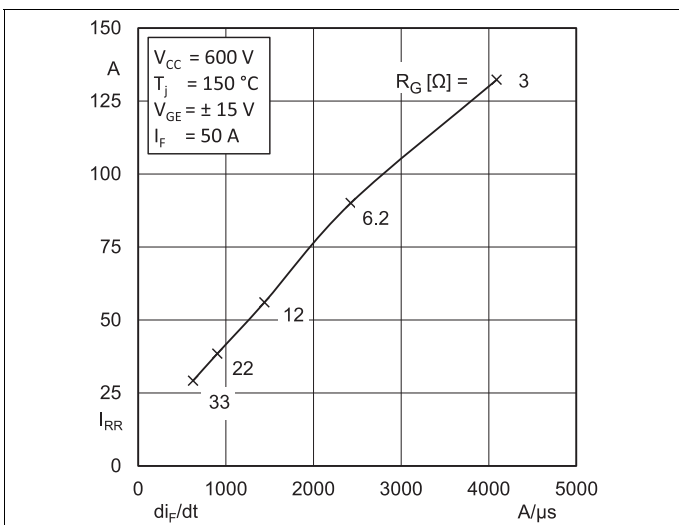


Fig. 11: Typ. CAL diode peak reverse recovery current

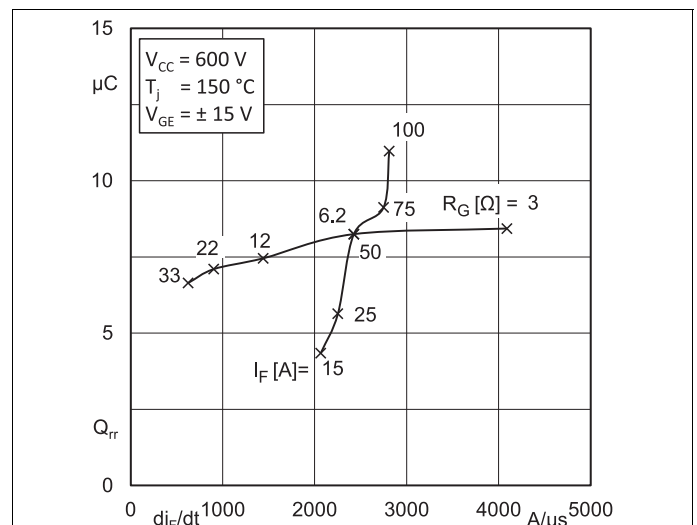
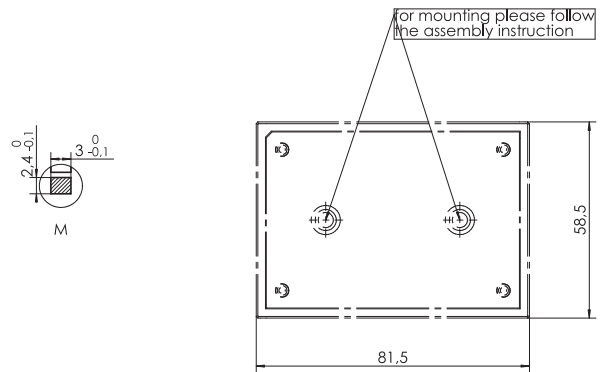
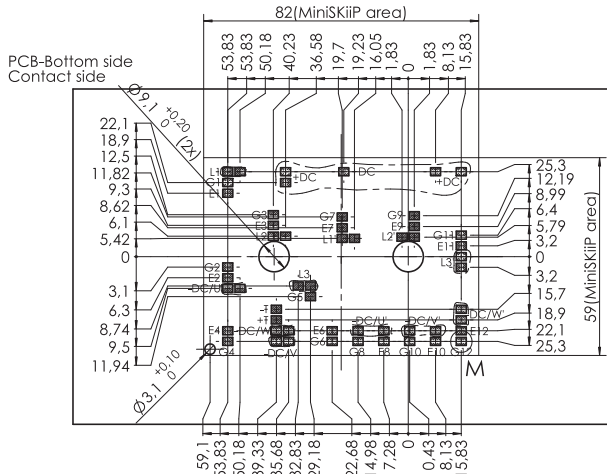
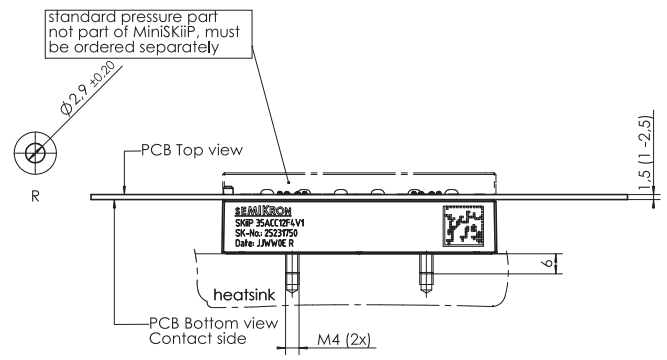
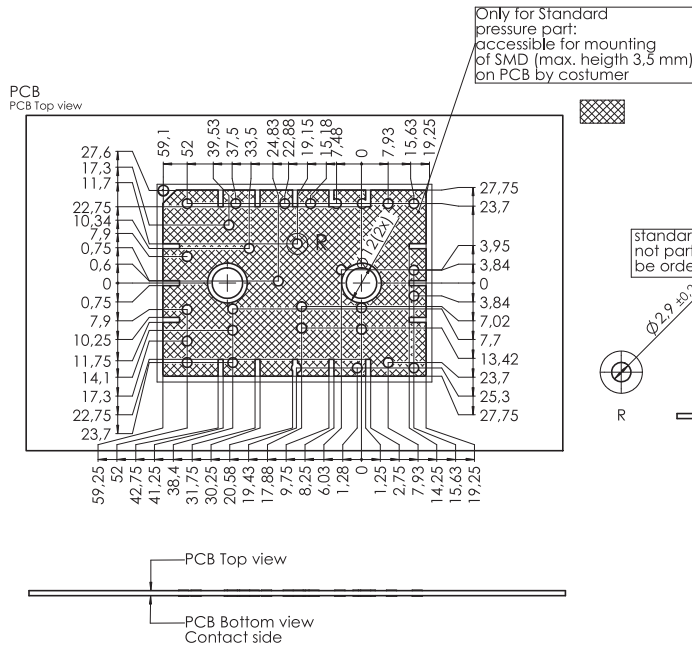
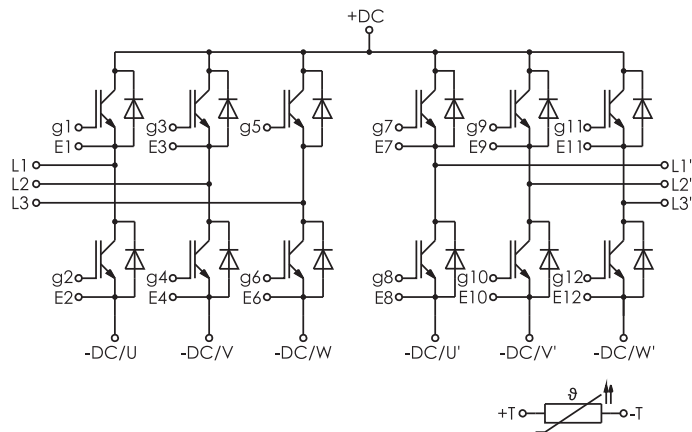


Fig. 12: Typ. CAL diode recovery charge

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Pinout and Dimensions



Pinout

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

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