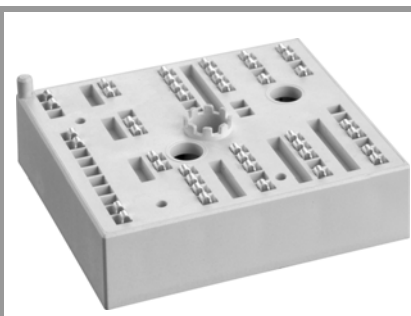


SKiiP 24ACC12T7V1



MiniSKiiP® 2

Twelvepack

SKiiP 24ACC12T7V1

Features*

- 1200V Generation 7 IGBTs (T7)
- Robust and soft switching freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognized: File no. E63532

Remarks

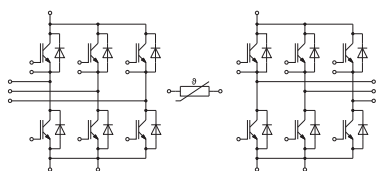
- Max. case temperature limited to $T_C = T_S = 125^\circ\text{C}$
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- Inverter-IGBT: T1-T12
- Inverse-Diode: D1-D12

Absolute Maximum Ratings

Symbol	Conditions	Values	Unit
Inverter - IGBT			
V_{CES}	$T_j = 25^\circ\text{C}$	1200	V
I_C	$\lambda_{paste}=0.8\text{ W/(mK)}$	$T_s = 70^\circ\text{C}$	A
	$T_j = 175^\circ\text{C}$	$T_s = 100^\circ\text{C}$	A
I_C	$\lambda_{paste}=2.5\text{ W/(mK)}$	$T_s = 70^\circ\text{C}$	A
	$T_j = 175^\circ\text{C}$	$T_s = 100^\circ\text{C}$	A
I_{Cnom}		35	A
I_{CRM}		70	A
V_{GES}		-20 ... 20	V
t_{psc}	$V_{CC} = 800\text{ V}$ $V_{GE} \leq 15\text{ V}$ $V_{CES} \leq 1200\text{ V}$	$T_j = 175^\circ\text{C}$	μs
T_j		-40 ... 175	$^\circ\text{C}$
Inverse - Diode			
V_{RRM}	$T_j = 25^\circ\text{C}$	1200	V
I_F	$\lambda_{paste}=0.8\text{ W/(mK)}$	$T_s = 70^\circ\text{C}$	A
	$T_j = 175^\circ\text{C}$	$T_s = 100^\circ\text{C}$	A
I_F	$\lambda_{paste}=2.5\text{ W/(mK)}$	$T_s = 70^\circ\text{C}$	A
	$T_j = 175^\circ\text{C}$	$T_s = 100^\circ\text{C}$	A
I_{FRM}		70	A
I_{FSM}	$t_p = 10\text{ ms, sin } 180^\circ, T_j = 150^\circ\text{C}$	170	A
T_j		-40 ... 175	$^\circ\text{C}$
Module			
$I_{t(RMS)}$	$T_{terminal} = 80^\circ\text{C}, 20\text{ A per spring}$	40	A
T_{stg}	module without TIM	-40 ... 125	$^\circ\text{C}$
V_{isol}	AC sinus 50 Hz, $t = 1\text{ min}$	2500	V

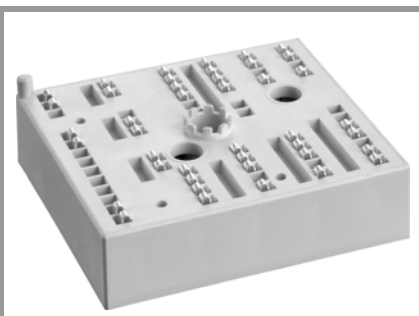
Characteristics

Symbol	Conditions	min.	typ.	max.	Unit
Inverter - IGBT					
$V_{CE(sat)}$	$I_C = 35\text{ A}$	$T_j = 25^\circ\text{C}$	1.60	1.75	V
	$V_{GE} = 15\text{ V}$	$T_j = 150^\circ\text{C}$	1.78	1.93	V
	chiplevel	$T_j = 175^\circ\text{C}$	1.82	1.97	V
V_{CE0}		$T_j = 25^\circ\text{C}$	1.00	1.05	V
	chiplevel	$T_j = 150^\circ\text{C}$	0.80	0.85	V
		$T_j = 175^\circ\text{C}$	0.75	0.80	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	17	20	$\text{m}\Omega$
	chiplevel	$T_j = 150^\circ\text{C}$	28	31	$\text{m}\Omega$
		$T_j = 175^\circ\text{C}$	31	33	$\text{m}\Omega$
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 0.75\text{ mA}$	5.15	5.8	6.45	V
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = 1200\text{ V}, T_j = 25^\circ\text{C}$			1	mA
C_{ies}	$V_{CE} = 25\text{ V}$	$f = 1\text{ MHz}$	6.60		nF
C_{oes}	$V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	0.09		nF
C_{res}		$f = 1\text{ MHz}$	0.02		nF
Q_G	$V_{GE} = -8\text{ V} \dots +15\text{ V}$		490		nC
R_{Gint}	$T_j = 25^\circ\text{C}$		0		Ω



ACC

SKiiP 24ACC12T7V1



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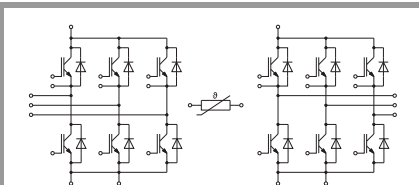
SKiiP 24ACC12T7V1

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- Robust and soft switching freewheeling diodes in CAL technology
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- UL recognized: File no. E63532

Remarks

- Max. case temperature limited to $T_C = T_S = 125^\circ\text{C}$
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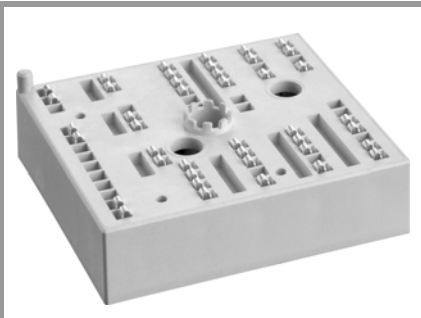


ACC

Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
Inverter - IGBT					
$t_{d(on)}$	$V_{CC} = 600\text{ V}$ $I_C = 35\text{ A}$ $R_{G\ on} = 9.1\ \Omega$ $R_{G\ off} = 9.1\ \Omega$ $V_{GE} = +15/-15\text{ V}$	$T_j = 25^\circ\text{C}$	37		ns
		$T_j = 150^\circ\text{C}$	39		ns
		$T_j = 175^\circ\text{C}$	40		ns
t_r		$T_j = 25^\circ\text{C}$	37		ns
		$T_j = 150^\circ\text{C}$	43		ns
		$T_j = 175^\circ\text{C}$	46		ns
E_{on}	$T_j = 25^\circ\text{C}$ $T_j = 150^\circ\text{C}$ $T_j = 175^\circ\text{C}$		2.8		mJ
			4		mJ
			4.2		mJ
$t_{d(off)}$		$T_j = 25^\circ\text{C}$	231		ns
		$T_j = 150^\circ\text{C}$	321		ns
		$T_j = 175^\circ\text{C}$	346		ns
t_f	$@ T_j = 150^\circ\text{C}$: $di/dt_{on} = 860\text{ A}/\mu\text{s}$ $di/dt_{off} = 380\text{ A}/\mu\text{s}$ $dv/dt = 3610\text{ V}/\mu\text{s}$	$T_j = 25^\circ\text{C}$	48		ns
		$T_j = 150^\circ\text{C}$	74		ns
		$T_j = 175^\circ\text{C}$	90		ns
E_{off}		$T_j = 25^\circ\text{C}$	2.3		mJ
		$T_j = 150^\circ\text{C}$	3.9		mJ
		$T_j = 175^\circ\text{C}$	4.2		mJ
$R_{th(j-s)}$	per IGBT, $\lambda_{paste} = 0.8\text{ W}/(\text{mK})$		1.12		K/W
$R_{th(j-s)}$	per IGBT, $\lambda_{paste} = 2.5\text{ W}/(\text{mK})$		0.93		K/W

Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
Inverse - Diode					
$V_F = V_{EC}$	$I_F = 35\text{ A}$ $V_{GE} = 0\text{ V}$ chipelevel	$T_j = 25^\circ\text{C}$	2.30	2.62	V
		$T_j = 150^\circ\text{C}$	2.29	2.62	V
		$T_j = 175^\circ\text{C}$	2.14	2.46	V
V_{F0}	chipelevel	$T_j = 25^\circ\text{C}$	1.30	1.50	V
		$T_j = 150^\circ\text{C}$	0.90	1.10	V
		$T_j = 175^\circ\text{C}$	0.82	0.98	V
r_F	chipelevel	$T_j = 25^\circ\text{C}$	29	32	m Ω
		$T_j = 150^\circ\text{C}$	40	43	m Ω
		$T_j = 175^\circ\text{C}$	38	42	m Ω
I_{RRM}	$I_F = 35\text{ A}$ $V_{GE} = +15/-15\text{ V}$ $V_{CC} = 600\text{ V}$	$T_j = 25^\circ\text{C}$	22		A
		$T_j = 150^\circ\text{C}$	28		A
		$T_j = 175^\circ\text{C}$	33		A
Q_{rr}		$T_j = 25^\circ\text{C}$	2		μC
		$T_j = 150^\circ\text{C}$	5.2		μC
		$T_j = 175^\circ\text{C}$	5.7		μC
E_{rr}	$@ T_j = 150^\circ\text{C}$: $di/dt_{off} = 870\text{ A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$	0.65		mJ
		$T_j = 150^\circ\text{C}$	2.1		mJ
		$T_j = 175^\circ\text{C}$	2.7		mJ
$R_{th(j-s)}$	per Diode, $\lambda_{paste} = 0.8\text{ W}/(\text{mK})$		1.34		K/W
$R_{th(j-s)}$	per Diode, $\lambda_{paste} = 2.5\text{ W}/(\text{mK})$		1.13		K/W
Module					
L_{CE}			-		nH
M_s	to heat sink	2		2.5	Nm
w			55		g

SKiiP 24ACC12T7V1



MiniSKiiP® 2

Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
Temperature Sensor					
R_{100}	$T_r=100^{\circ}\text{C}$ ($R_{25}=1000\Omega$)		$1670 \pm 3\%$		Ω
$R_{(T)}$	$R_{(T)}=1000\Omega[1+A(T-25^{\circ}\text{C})+B(T-25^{\circ}\text{C})^2]$ $A = 7.635 \cdot 10^{-3} \text{ }^{\circ}\text{C}^{-1}$, $B = 1.731 \cdot 10^{-5} \text{ }^{\circ}\text{C}^{-2}$				

Twelvepack

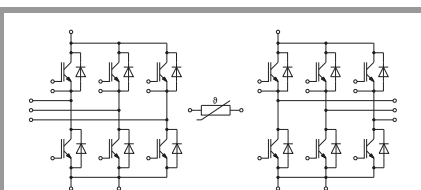
SKiiP 24ACC12T7V1

Features*

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ACC

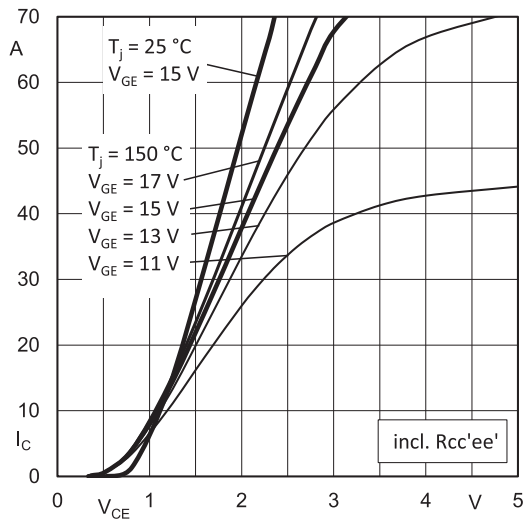


Fig. 1: Typ. output characteristic

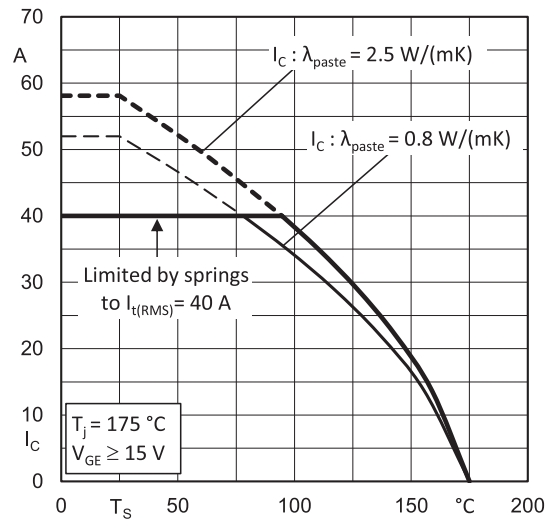


Fig. 2: Rated current vs. temperature $I_C = f(T_S)$

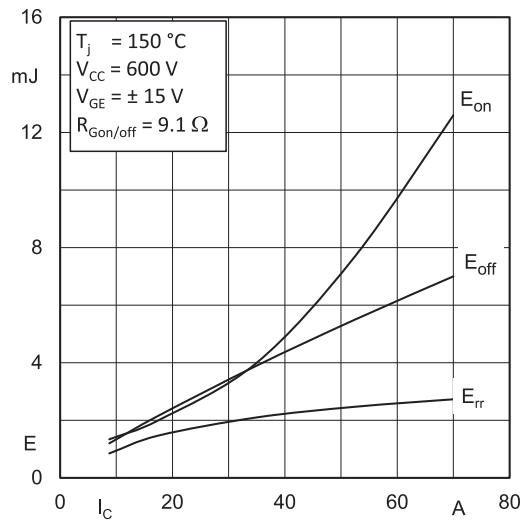


Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

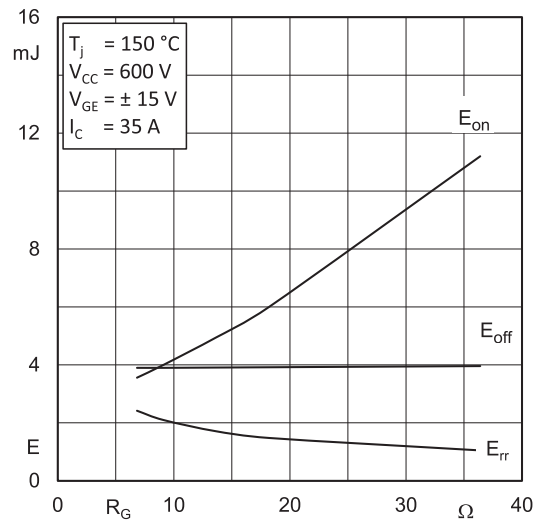


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

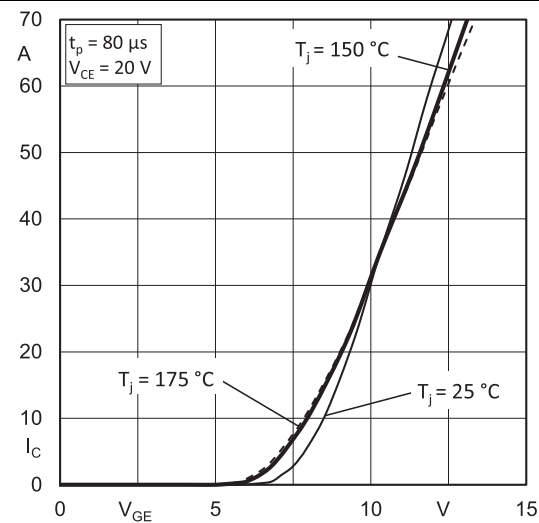


Fig. 5: Typ. transfer characteristic

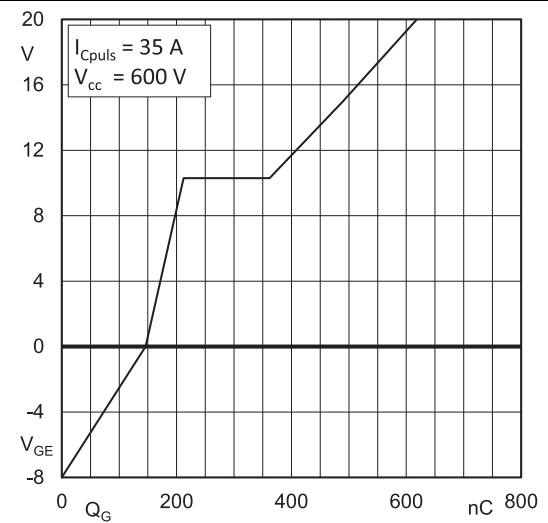


Fig. 6: Typ. gate charge characteristic

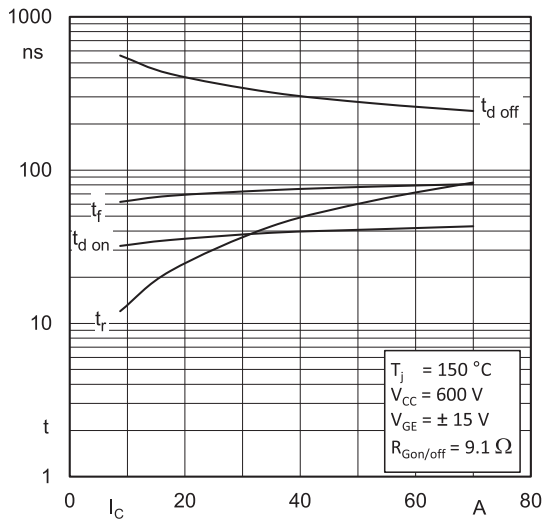


Fig. 7: Typ. switching times vs. I_C

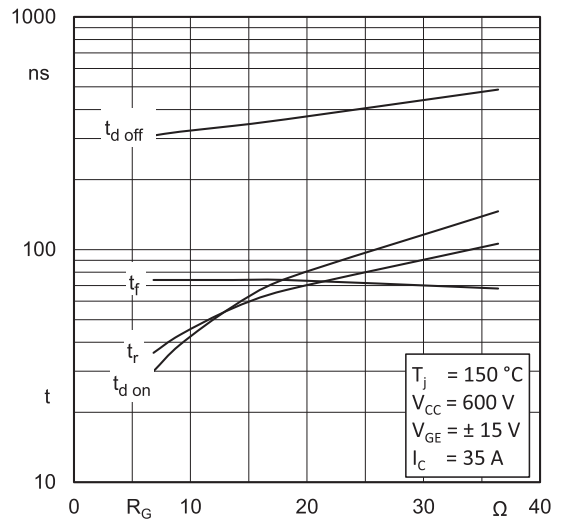


Fig. 8: Typ. switching times vs. gate resistor R_G

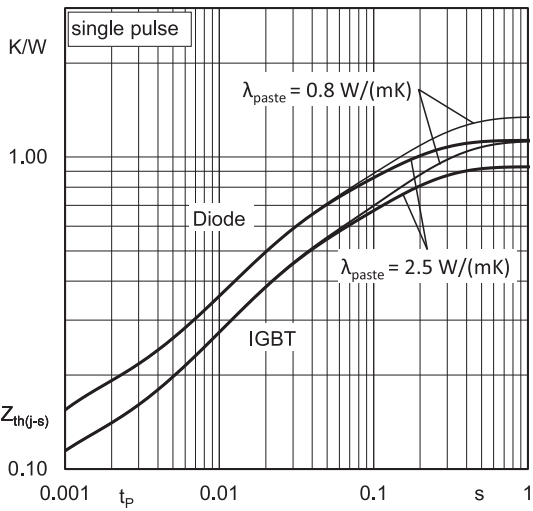


Fig. 9: Typ. transient thermal impedance

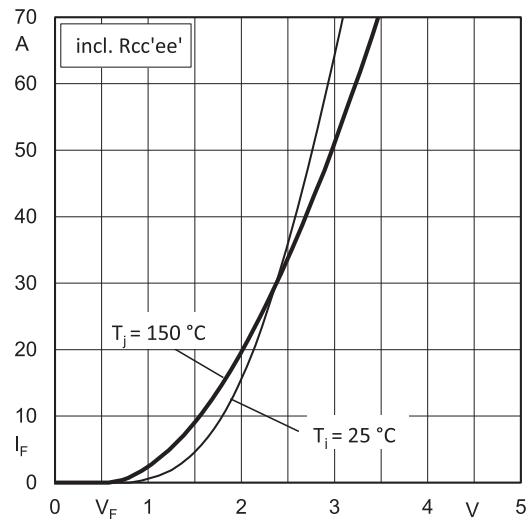


Fig. 10: Typ. CAL diode forward characteristic

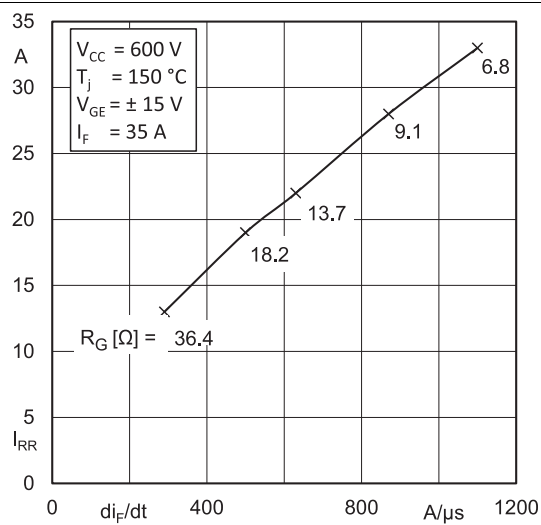


Fig. 11: Typ. CAL diode peak reverse recovery current

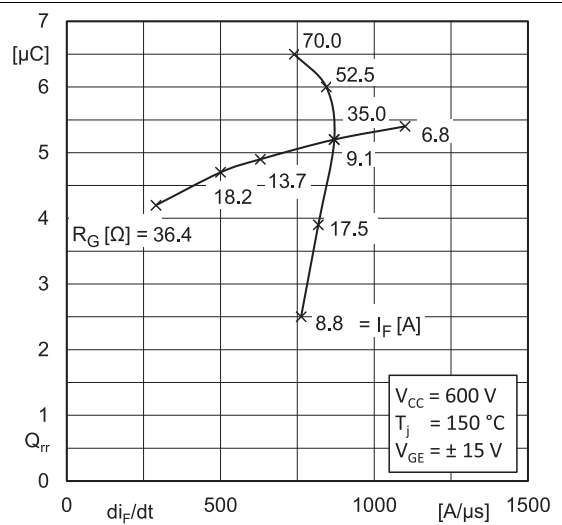
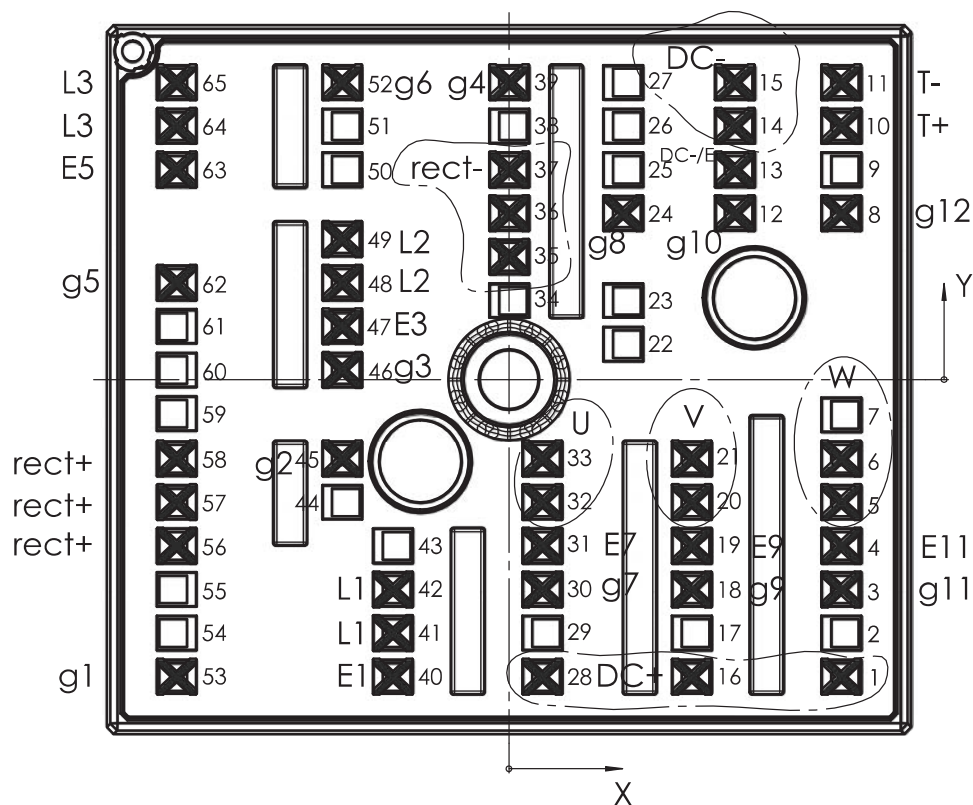


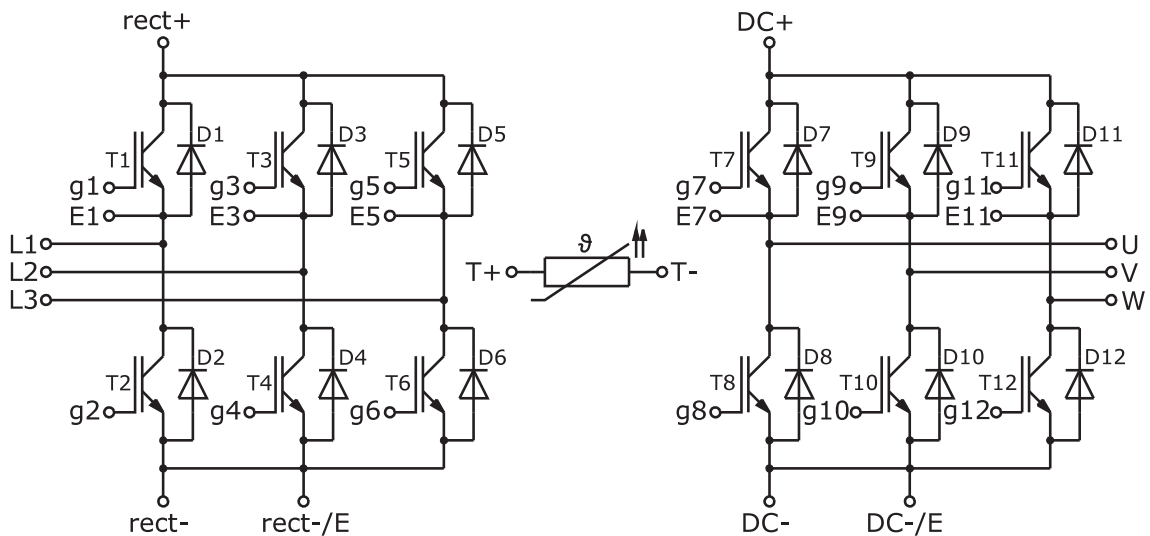
Fig. 12: Typ. CAL diode recovery charge

Pin out											
Pin	X	Y	Function	Pin	X	Y	Function	Pin	X	Y	Function
1	24,38	-21,8	DC+	23				45	-12,23	-5,8	g2
2				24	8,38	12,2	g8	46	-12,23	0,7	g3
3	24,38	-15,4	g11	25				47	-12,23	3,9	E3
4	24,38	-12,2	E11	26				48	-12,23	7,1	L2
5	24,38	-9	W	27				49	-12,23	10,3	L2
6	24,38	-5,8	W	28	2,46	-21,8	DC+	50			
7				29				51			
8	24,38	12,2	g12	30	2,46	-15,4	g7	52	-12,23	21,8	g6
9				31	2,46	-12,2	E7	53	-24,38	-21,8	g1
10	24,38	18,6	T+	32	2,46	-9	U	54			
11	24,38	21,8	T-	33	2,46	-5,8	U	55			
12	16,58	12,2	g10	34				56	-24,38	-12,2	rect+
13	16,58	15,4	DC-/E	35	0,03	9	rect-	57	-24,38	-9	rect+
14	16,58	18,6	DC-	36	0,03	12,2	rect-	58	-24,38	-5,8	rect+
15	16,58	21,8	DC-	37	0,03	15,4	rect-	59			
16	13,42	-21,8	DC+	38				60			
17				39	0,03	21,8	g4	61			
18	13,42	-15,4	g9	40	-8,51	-21,8	E1	62	-24,38	7,1	g5
19	13,42	-12,2	E9	41	-8,51	-18,6	L1	63	-24,38	15,4	E5
20	13,42	-9	U	42	-8,51	-15,4	L1	64	-24,38	18,6	L3
21	13,42	-5,8	U	43				65	-24,38	21,8	L3
22				44							

all values in mm



Pinout



Pinout

This is an electrostatic discharge sensitive device (ESDS) due to international standard IEC 61340.

*IMPORTANT INFORMATION AND WARNINGS

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