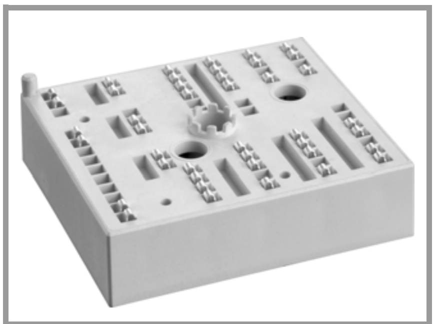

MiniSKiiP® 2

Twelvepack

SKiiP 24ACC12T7V1

Features*

- 1200V Generation 7 IGBTs (T7)
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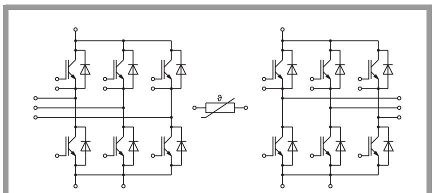


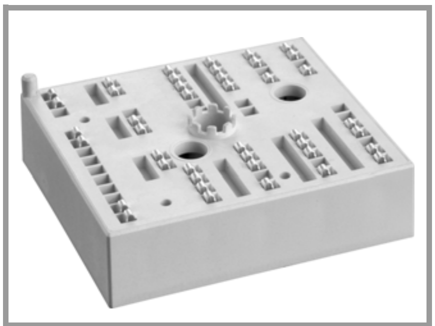
ACC

Absolute Maximum Ratings

Symbol	Conditions		Values	Unit
Inverter - IGBT				
V_{CES}	T_j = 25 °C		1200	V
I_C	λ_{paste}=0.8 W/(mK) T_j = 175 °C	T_s = 70 °C	43	A
		T_s = 100 °C	35	A
I_C	λ_{paste}=2.5 W/(mK) T_j = 175 °C	T_s = 70 °C	48	A
		T_s = 100 °C	39	A
I_{Cnom}			35	A
I_{CRM}			70	A
V_{GES}			-20 ... 20	V
t_{psc}	V_{CC} = 800 V V_{GE} ≤ 15 V V_{CES} ≤ 1200 V	T_j = 175 °C	7	µs
T_j			-40 ... 175	°C
Inverse - Diode				
V_{RRM}	T_j = 25 °C		1200	V
I_F	λ_{paste}=0.8 W/(mK) T_j = 175 °C	T_s = 70 °C	33	A
		T_s = 100 °C	27	A
I_F	λ_{paste}=2.5 W/(mK) T_j = 175 °C	T_s = 70 °C	37	A
		T_s = 100 °C	30	A
I_{FRM}			70	A
I_{FSM}	t_p = 10 ms, sin 180°, T_j = 150 °C		170	A
T_j			-40 ... 175	°C
Module				
$I_{t(RMS)}$	$T_{terminal}$ = 80 °C, 20 A per spring		40	A
T_{stg}	module without TIM		-40 ... 125	°C
V_{isol}	AC sinus 50 Hz, t = 1 min		2500	V

Characteristics

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



MiniSKiiP® 2

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SKiiP 24ACC12T7V1

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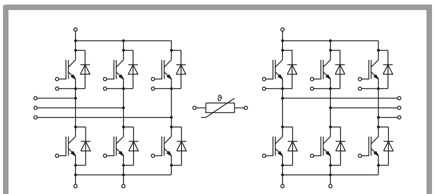

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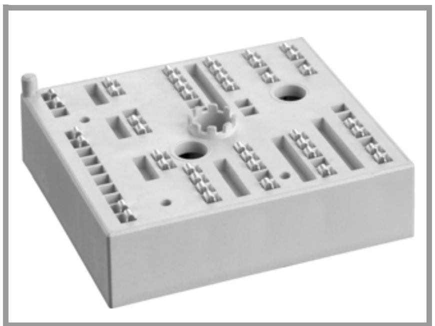
Characteristics

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

Characteristics

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



MiniSKiiP® 2

Twelvepack

SKiiP 24ACC12T7V1

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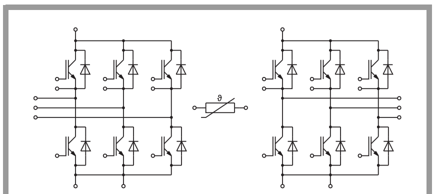

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Characteristics					
Symbol	**Conditions**	**min.**	**typ.**	**max.**	**Unit**
Temperature Sensor					
R_{100}	T_r=100°C (R_{25}=1000Ω)		1670 ± 3%		Ω
$R_{(T)}$	$R_{(T)}=1000\Omega[1+A(T-25°C)+B(T-25°C)^2]$, $A = 7.635 \cdot 10^{-3} °C^{-1}$, $B = 1.731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

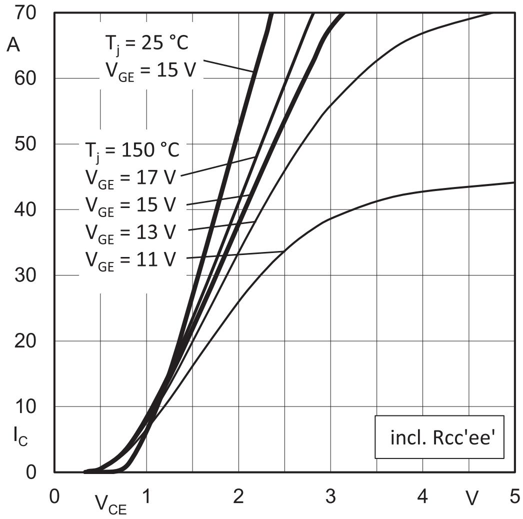


Fig. 1: Typ. output characteristic

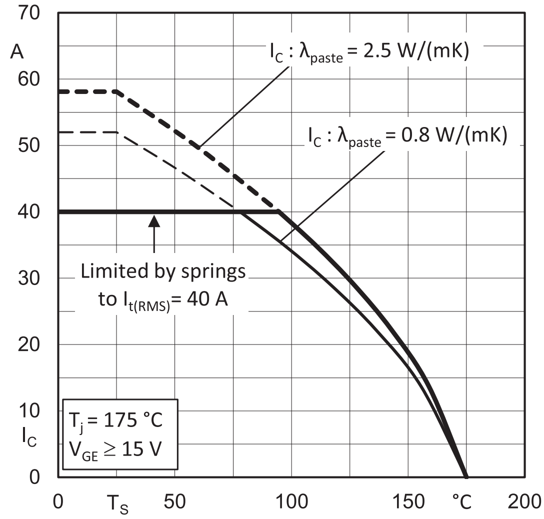


Fig. 2: Rated current vs. temperature I_C = f (T_S)

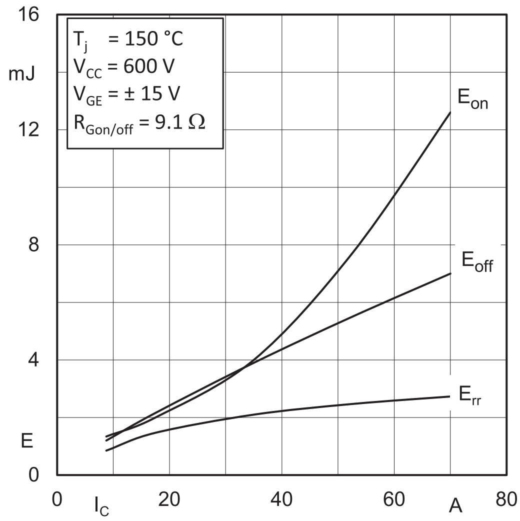


Fig. 3: Typ. turn-on /-off energy = f (I_C)

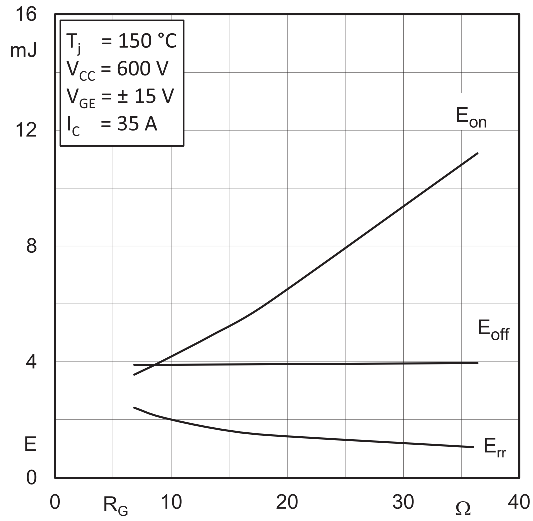


Fig. 4: Typ. turn-on /-off energy = f (R_G)

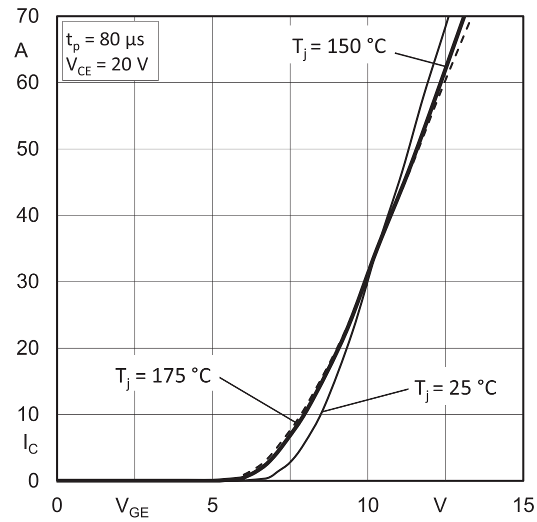


Fig. 5: Typ. transfer characteristic

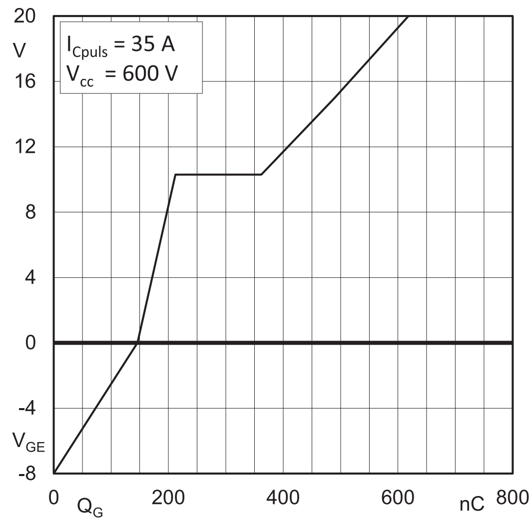


Fig. 6: Typ. gate charge characteristic

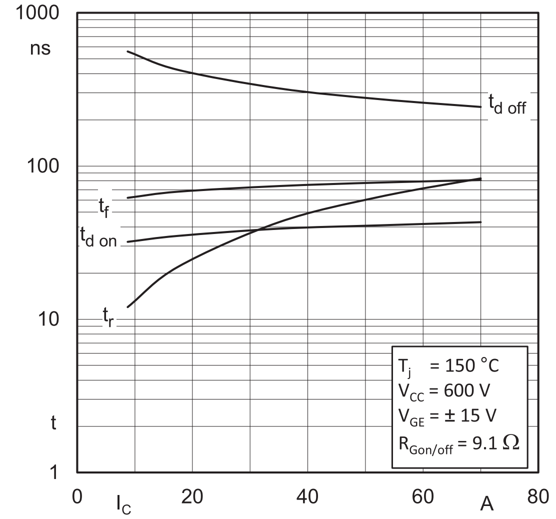


Fig. 7: Typ. switching times vs. I_C

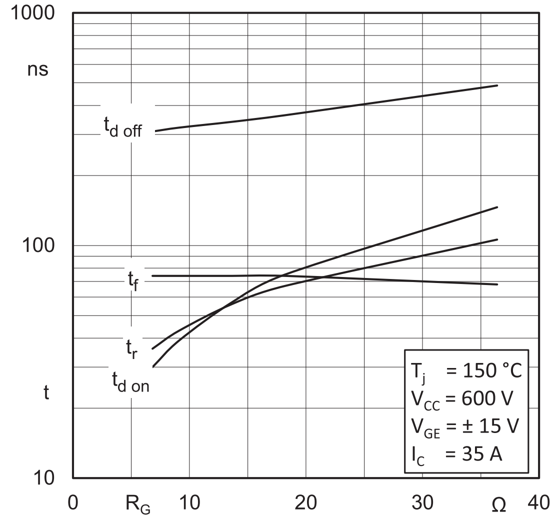


Fig. 8: Typ. switching times vs. gate resistor R_G

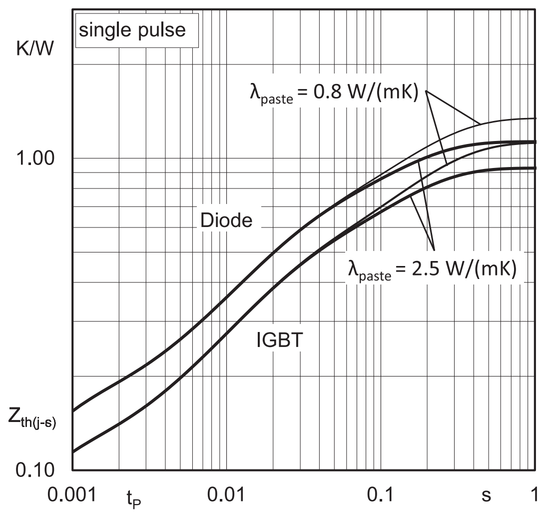


Fig. 9: Typ. transient thermal impedance

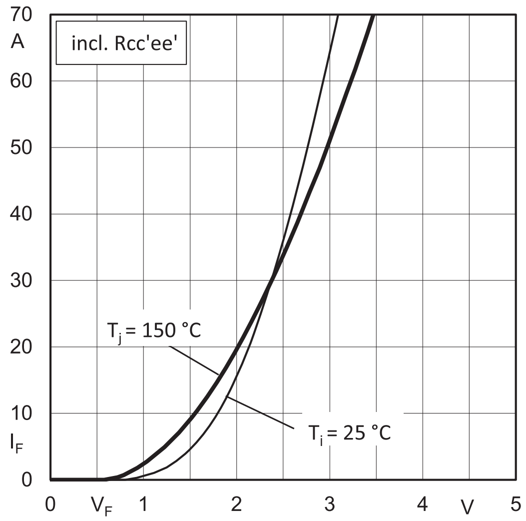


Fig. 10: Typ. CAL diode forward characteristic

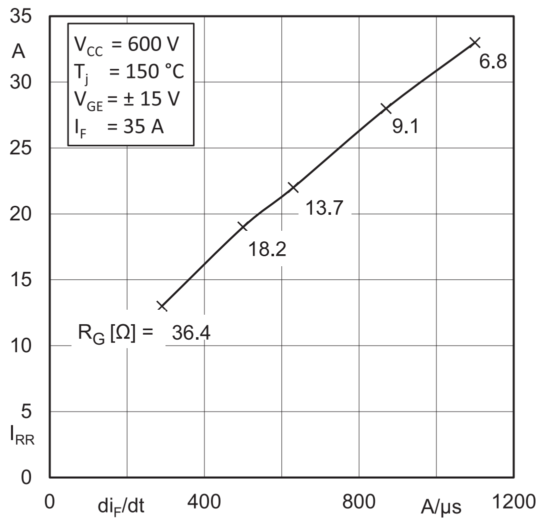


Fig. 11: Typ. CAL diode peak reverse recovery current

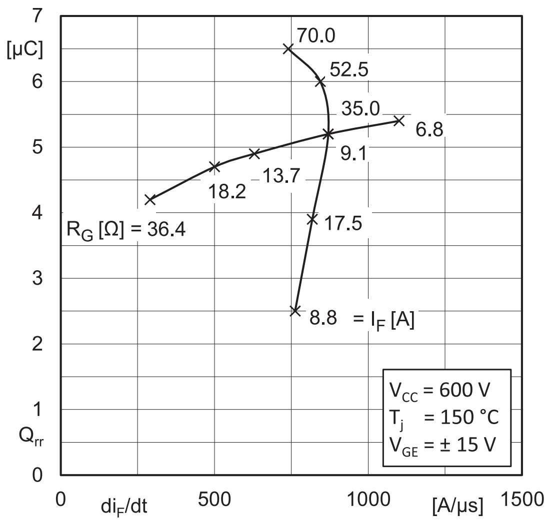
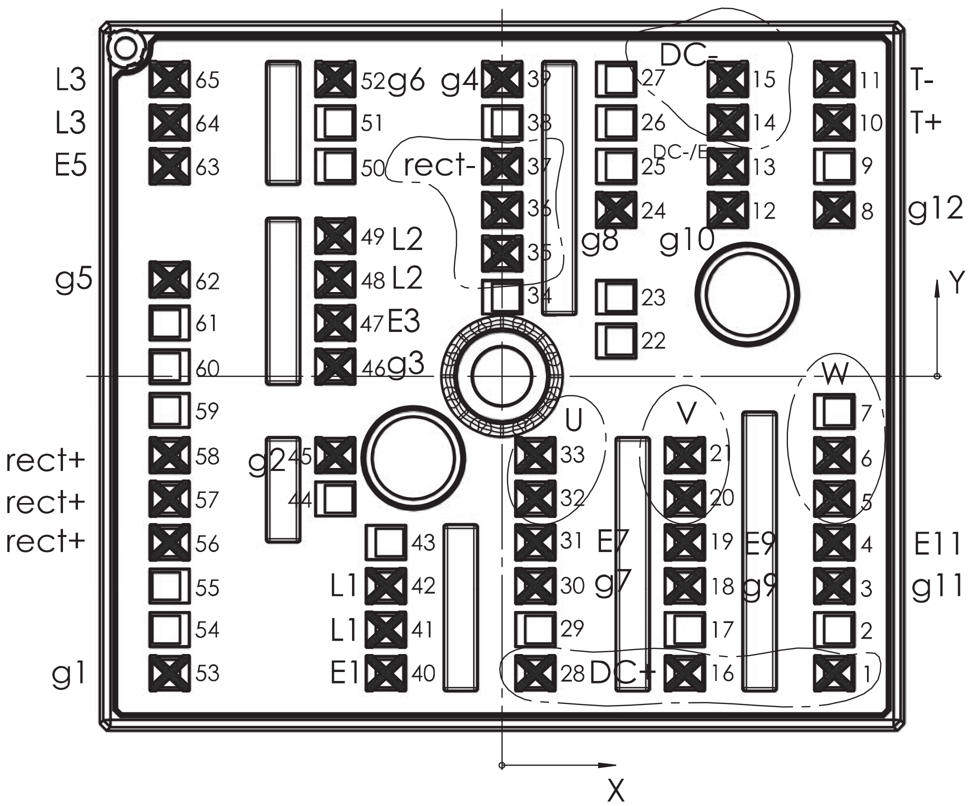


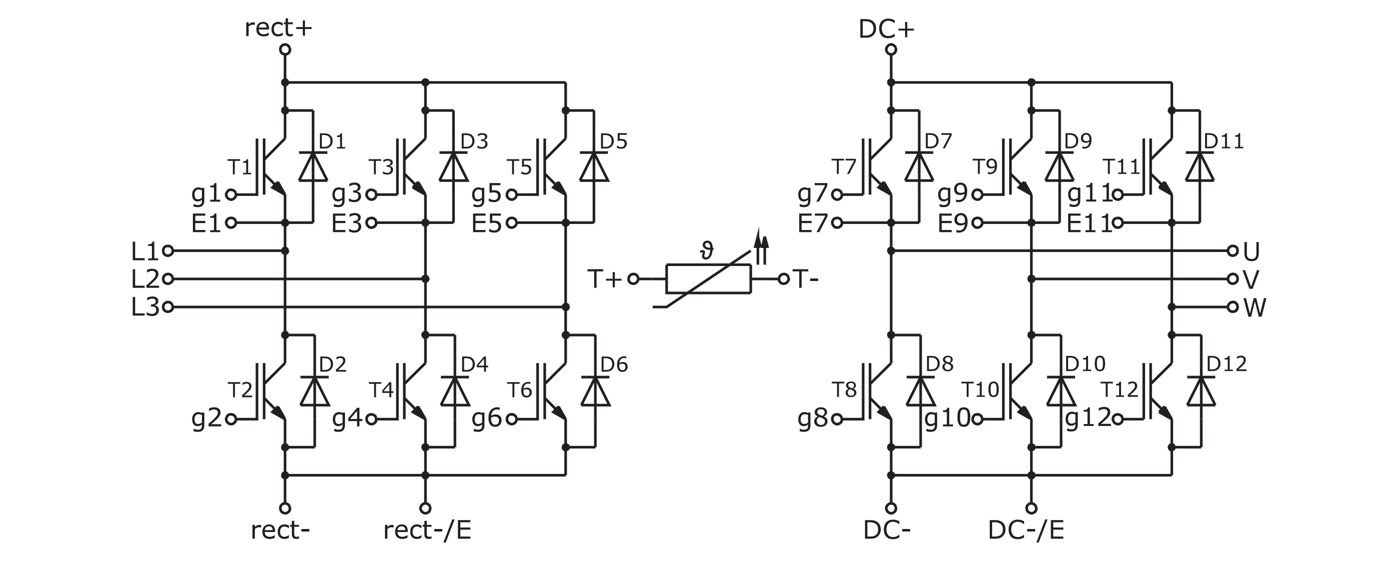
Fig. 12: Typ. CAL diode recovery charge

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.

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