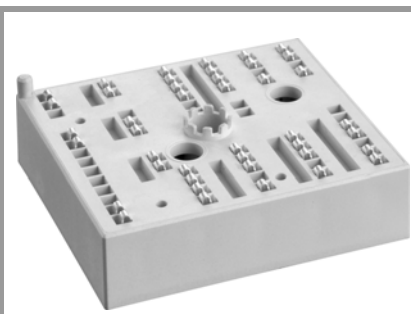


SKiiP 27AC12T7V1



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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

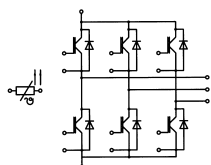
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- Product reliability results valid for $T_J \leq 150^\circ\text{C}$ (recommended $T_{J,op} = -40 \dots +150^\circ\text{C}$)
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Absolute Maximum Ratings

Symbol	Conditions	Values	Unit
Inverter - IGBT			
V_{CES}	$T_J = 25^\circ\text{C}$	1200	V
I_C	$\lambda_{paste} = 0.8 \text{ W/(mK)}$	$T_S = 70^\circ\text{C}$	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}		75	A
I_{CRM}		150	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			
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}		150	A
I_{FSM}	$t_p = 10 \text{ ms, sin } 180^\circ, T_J = 150^\circ\text{C}$	430	A
T_J		-40 ... 175	$^\circ\text{C}$
Module			
$I_{t(RMS)}$	$T_{terminal} = 80^\circ\text{C}, 20 \text{ A per spring}$	100	A
T_{stg}	module without TIM	-40 ... 125	$^\circ\text{C}$
V_{isol}	AC sinus 50 Hz, $t = 1 \text{ min}$	2500	V

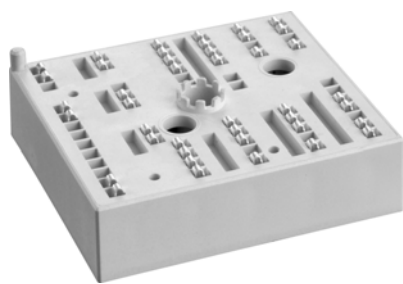
Characteristics

Symbol	Conditions	min.	typ.	max.	Unit
Inverter - IGBT					
$V_{CE(sat)}$	$I_C = 75 \text{ A}$	$T_J = 25^\circ\text{C}$	1.55	1.70	V
	$V_{GE} = 15 \text{ V}$	$T_J = 150^\circ\text{C}$	1.72	1.96	V
	chiplevel	$T_J = 175^\circ\text{C}$	1.75	2.01	V
V_{CE0}		$T_J = 25^\circ\text{C}$	0.90	1.00	V
	chiplevel	$T_J = 150^\circ\text{C}$	0.75	0.83	V
		$T_J = 175^\circ\text{C}$	0.72	0.80	V
r_{CE}	$V_{GE} = 15 \text{ V}$	$T_J = 25^\circ\text{C}$	8.7	9.3	$\text{m}\Omega$
	chiplevel	$T_J = 150^\circ\text{C}$	13	15	$\text{m}\Omega$
		$T_J = 175^\circ\text{C}$	14	16	$\text{m}\Omega$
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 1.7 \text{ mA}$	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}		$f = 1 \text{ MHz}$	15.10		nF
C_{oes}	$V_{CE} = 25 \text{ V}$	$f = 1 \text{ MHz}$	0.19		nF
C_{res}	$V_{GE} = 0 \text{ V}$	$f = 1 \text{ MHz}$	0.54		nF
Q_G	$V_{GE} = -8 \text{ V} \dots +15 \text{ V}$		1050		nC
R_{Gint}	$T_J = 25^\circ\text{C}$		2.0		Ω



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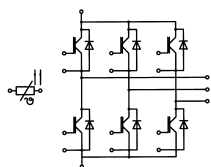
SKiiP 27AC12T7V1

Features*

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- 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 $T_C = T_S = 125^\circ\text{C}$
- Product reliability results valid for $T_j \leq 150^\circ\text{C}$ (recommended $T_{j,op} = -40 \dots +150^\circ\text{C}$)
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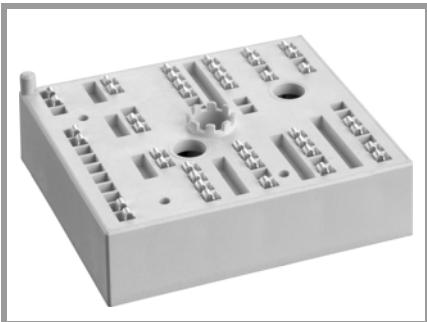


AC

Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
Inverter - IGBT					
$t_{d(on)}$	$V_{CC} = 600\text{ V}$ $I_C = 75\text{ A}$ $R_{G\ on} = 2.3\ \Omega$ $R_{G\ off} = 2.3\ \Omega$ $V_{GE} = +15/-15\text{ V}$	$T_j = 25^\circ\text{C}$	137		ns
		$T_j = 150^\circ\text{C}$	142		ns
		$T_j = 175^\circ\text{C}$	142		ns
t_r		$T_j = 25^\circ\text{C}$	35		ns
		$T_j = 150^\circ\text{C}$	41		ns
		$T_j = 175^\circ\text{C}$	44		ns
E_{on}	$R_{G\ on} = 2.3\ \Omega$ $R_{G\ off} = 2.3\ \Omega$ $V_{GE} = +15/-15\text{ V}$	$T_j = 25^\circ\text{C}$	6.6		mJ
		$T_j = 150^\circ\text{C}$	9.3		mJ
		$T_j = 175^\circ\text{C}$	9.9		mJ
$t_{d(off)}$		$T_j = 25^\circ\text{C}$	250		ns
		$T_j = 150^\circ\text{C}$	340		ns
		$T_j = 175^\circ\text{C}$	365		ns
t_f	$@ T_j = 150^\circ\text{C}:$ $di/dt_{on} = 1940\text{ A}/\mu\text{s}$ $di/dt_{off} = 780\text{ A}/\mu\text{s}$ $dv/dt = 3650\text{ V}/\mu\text{s}$	$T_j = 25^\circ\text{C}$	56		ns
		$T_j = 150^\circ\text{C}$	86		ns
		$T_j = 175^\circ\text{C}$	103		ns
E_{off}		$T_j = 25^\circ\text{C}$	4.7		mJ
		$T_j = 150^\circ\text{C}$	8.1		mJ
		$T_j = 175^\circ\text{C}$	8.8		mJ
$R_{th(j-s)}$	per IGBT, $\lambda_{paste} = 0.8\text{ W}/(\text{mK})$		0.75		K/W
$R_{th(j-s)}$	per IGBT, $\lambda_{paste} = 2.5\text{ W}/(\text{mK})$		0.59		K/W

Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
Inverse - Diode					
$V_F = V_{EC}$	$I_F = 75\text{ A}$ $V_{GE} = 0\text{ V}$ chiplevel	$T_j = 25^\circ\text{C}$	2.17	2.49	V
		$T_j = 150^\circ\text{C}$	2.11	2.42	V
		$T_j = 175^\circ\text{C}$	1.96	2.27	V
V_{F0}	chiplevel	$T_j = 25^\circ\text{C}$	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	chiplevel	$T_j = 25^\circ\text{C}$	12	13	m Ω
		$T_j = 150^\circ\text{C}$	16	18	m Ω
		$T_j = 175^\circ\text{C}$	15	17	m Ω
I_{RRM}	$I_F = 75\text{ A}$ $V_{GE} = +15/-15\text{ V}$ $V_{CC} = 600\text{ V}$	$T_j = 25^\circ\text{C}$	50		A
		$T_j = 150^\circ\text{C}$	67		A
		$T_j = 175^\circ\text{C}$	80		A
Q_{rr}		$T_j = 25^\circ\text{C}$	4		μC
		$T_j = 150^\circ\text{C}$	11.6		μC
		$T_j = 175^\circ\text{C}$	12.2		μC
E_{rr}	$@ T_j = 150^\circ\text{C}:$ $di/dt_{off} = 1930\text{ A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$	1.3		mJ
		$T_j = 150^\circ\text{C}$	4.3		mJ
		$T_j = 175^\circ\text{C}$	5.7		mJ
$R_{th(j-s)}$	per Diode, $\lambda_{paste} = 0.8\text{ W}/(\text{mK})$		0.85		K/W
$R_{th(j-s)}$	per Diode, $\lambda_{paste} = 2.5\text{ W}/(\text{mK})$		0.68		K/W
Module					
L_{CE}			-		nH
M_s	to heat sink	2		2.5	Nm
w			55		g

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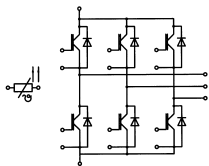
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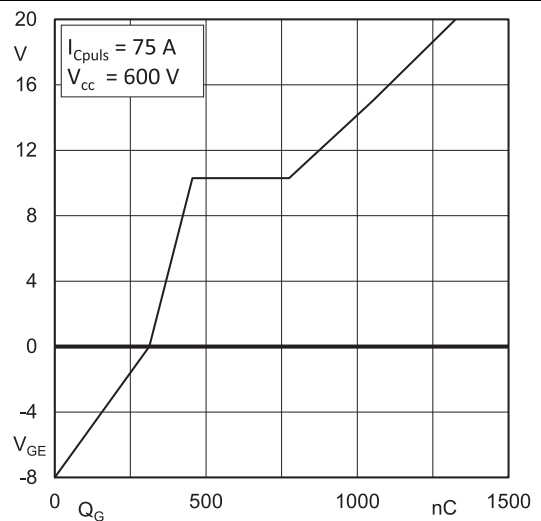
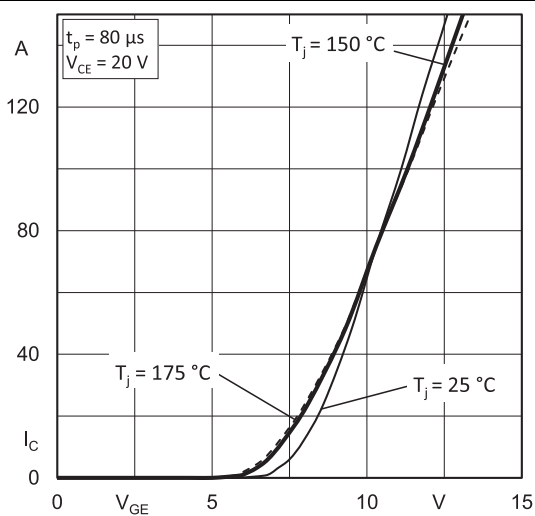
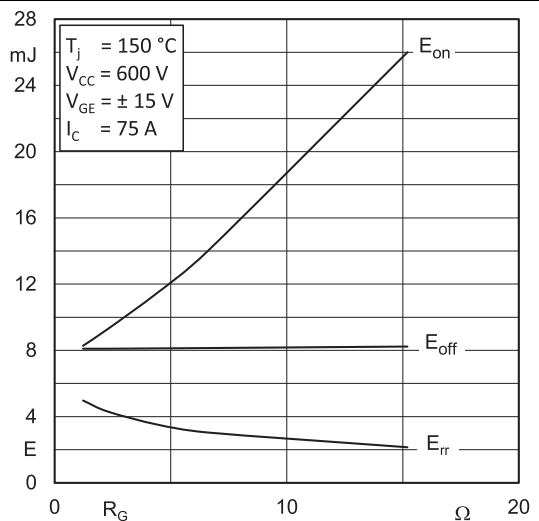
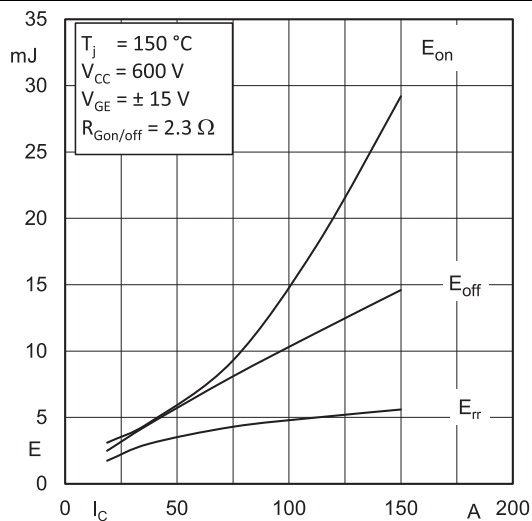
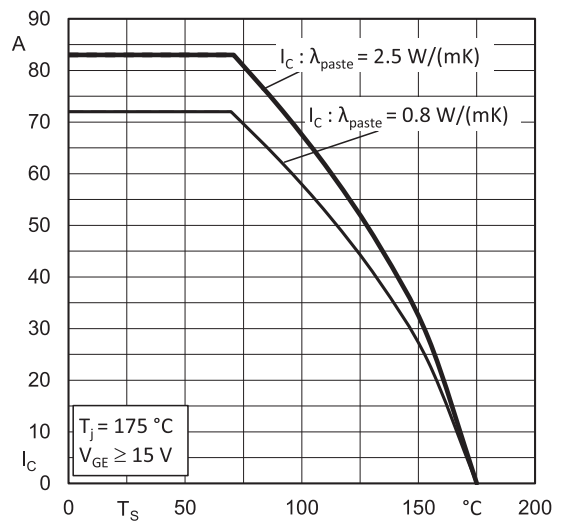
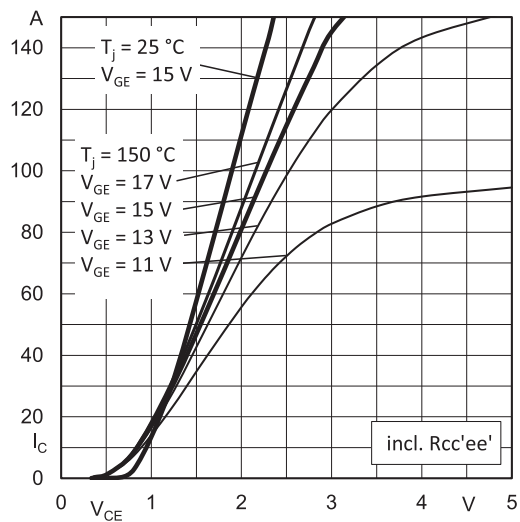
Remarks

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



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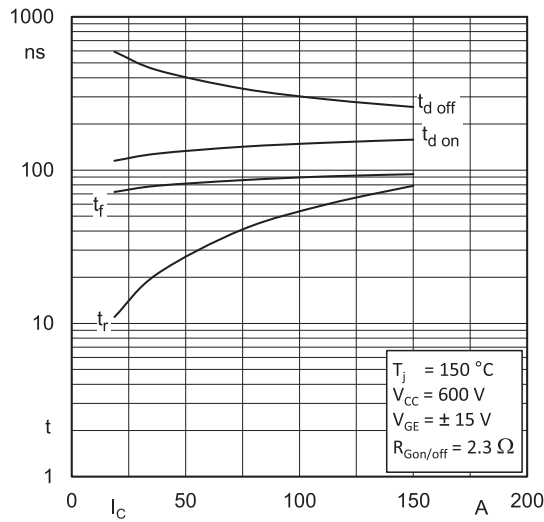


Fig. 7: Typ. switching times vs. I_C

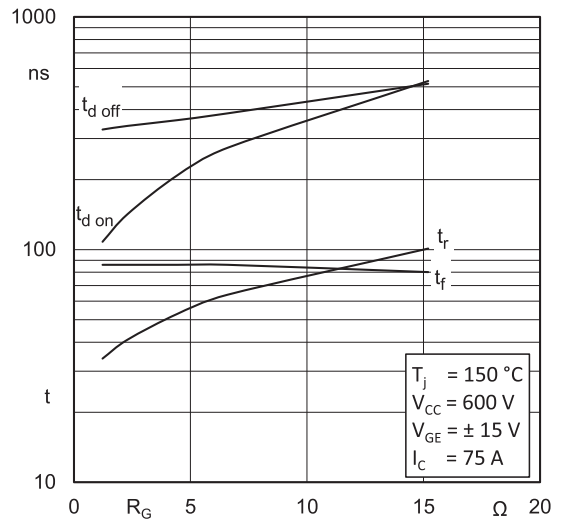


Fig. 8: Typ. switching times vs. gate resistor R_G

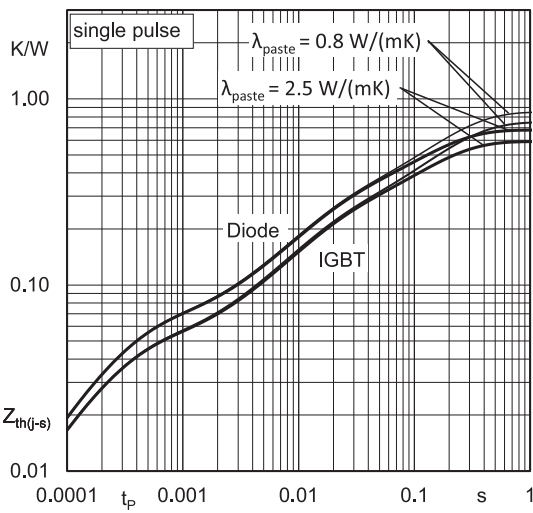


Fig. 9: Transient thermal impedance

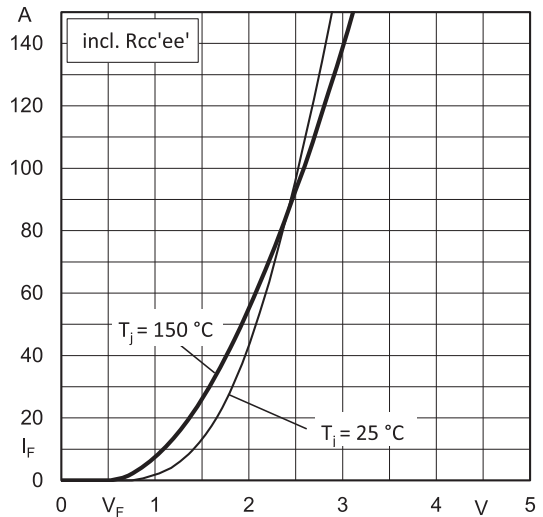


Fig. 10: Typ. CAL diode forward characteristic

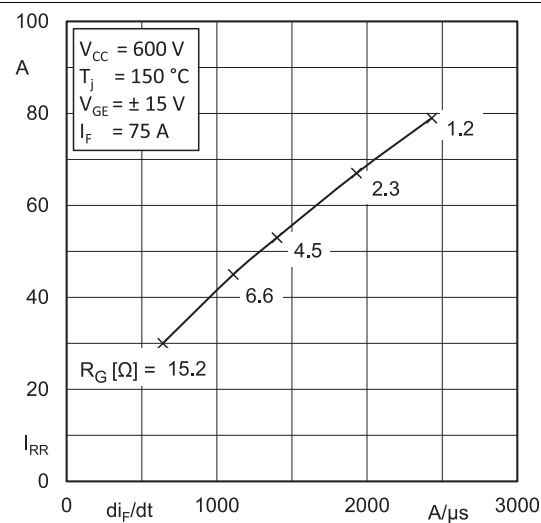


Fig. 11: Typ. CAL diode peak reverse recovery current

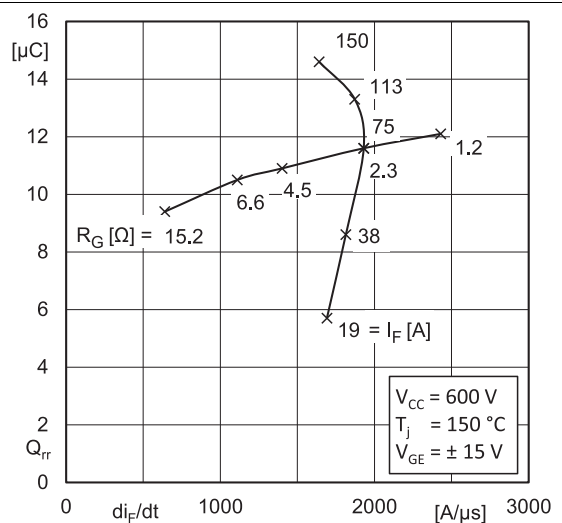
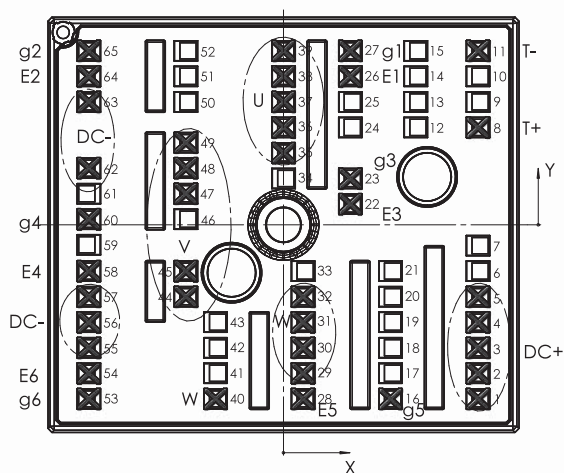


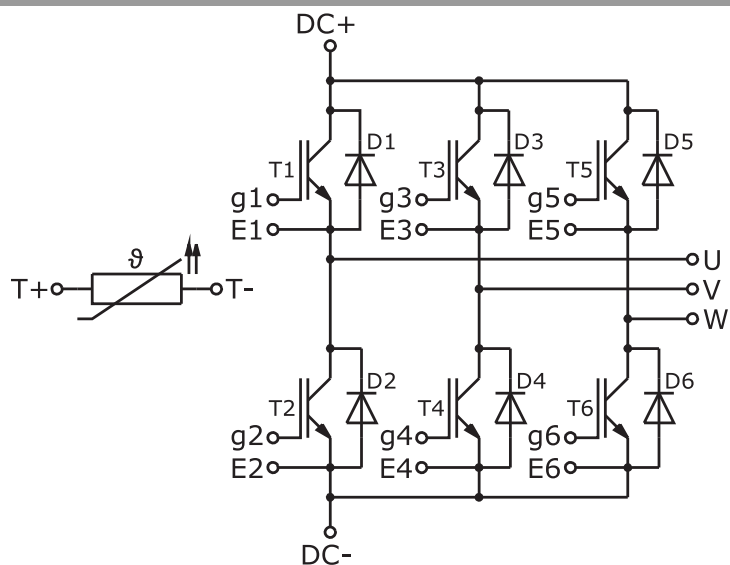
Fig. 12: Typ. CAL diode recovery charge

Pin out											
Pin	X	Y	Function	Pin	X	Y	Function	Pin	X	Y	Function
1	24,38	-21,8	DC+	23	8,38	5,8	g3	45	-12,23	-5,8	V
2	24,38	-18,6	DC+	24				46			
3	24,38	-15,4	DC+	25				47	-12,23	3,9	V
4	24,38	-12,2	DC+	26	8,38	18,6	E1	48	-12,23	7,1	V
5	24,38	-9	DC+	27	8,38	21,8	g1	49	-12,23	10,3	V
6				28	2,46	-21,8	E5	50			
7				29	2,46	-18,6	W	51			
8	24,38	12,2	T+	30	2,46	-15,4	W	52			
9				31	2,46	-12,2	W	53	-24,38	-21,8	g6
10				32	2,46	-9	W	54	-24,38	-18,6	E6
11	24,38	21,8	T-	33				55	-24,38	-15,4	DC-
12				34				56	-24,38	-12,2	DC-
13				35	0,03	9	U	57	-24,38	-9	DC-
14				36	0,03	12,2	U	58	-24,38	-5,8	E4
15				37	0,03	15,4	U	59			
16	13,42	-21,8	g5	38	0,03	18,6	U	60	-24,38	0,7	g4
17				39	0,03	21,8	U	61			
18				40	-8,51	-21,8	W	62	-24,38	7,1	DC-
19				41				63	-24,38	15,4	DC-
20				42				64	-24,38	18,6	E2
21				43				65	-24,38	21,8	g2
22	8,38	2,6	E3	44	-12,23	-9	V				

all values in mm



Pinout and Dimensions



Pinout

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

***IMPORTANT INFORMATION AND WARNINGS**

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