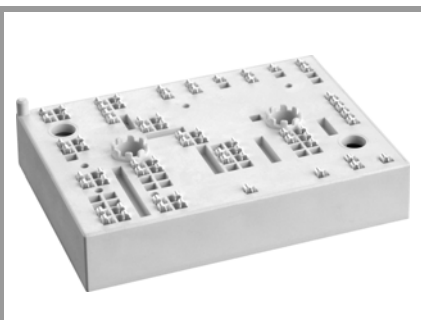


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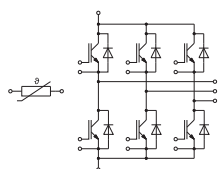
SKiiP 38AC12T7V1

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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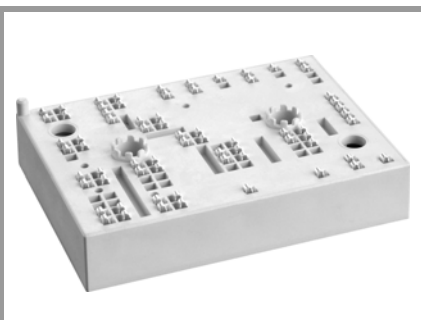


AC

Absolute Maximum Ratings				
Symbol	Conditions		Values	Unit
Inverter - IGBT				
V_{CES}	$T_j = 25\text{ °C}$		1200	V
I_C	$\lambda_{paste} = 0.8\text{ W/(mK)}$	$T_s = 70\text{ °C}$	96	A
		$T_s = 100\text{ °C}$	77	A
I_C	$\lambda_{paste} = 2.5\text{ W/(mK)}$	$T_s = 70\text{ °C}$	114	A
		$T_s = 100\text{ °C}$	92	A
I_{Chom}			100	A
I_{CRM}			200	A
V_{GES}			-20 ... 20	V
t_{psc}	$V_{CC} = 800\text{ V}$ $V_{GE} \leq 15\text{ V}$ $V_{CES} \leq 1200\text{ V}$	$T_j = 175\text{ °C}$	7	μs
T_j			-40 ... 175	$^{\circ}\text{C}$
Inverse - Diode				
V_{RRM}	$T_j = 25\text{ °C}$		1200	V
I_F	$\lambda_{paste} = 0.8\text{ W/(mK)}$	$T_s = 70\text{ °C}$	76	A
		$T_s = 100\text{ °C}$	61	A
I_F	$\lambda_{paste} = 2.5\text{ W/(mK)}$	$T_s = 70\text{ °C}$	89	A
		$T_s = 100\text{ °C}$	71	A
I_{FRM}			200	A
I_{FSM}	$t_p = 10\text{ ms, sin } 180^{\circ}, T_j = 150\text{ °C}$		550	A
T_j			-40 ... 175	$^{\circ}\text{C}$
Module				
$I_{t(RMS)}$	$T_{terminal} = 80\text{ °C}, 20\text{ A per spring}$		160	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						
$V_{CE(sat)}$	$I_C = 100\text{ A}$ $V_{GE} = 15\text{ V}$ chipelevel	$T_j = 25\text{ °C}$	1.55	1.70		V
		$T_j = 150\text{ °C}$	1.73	1.88		V
		$T_j = 175\text{ °C}$	1.77	1.92		V
V_{CE0}	chipelevel	$T_j = 25\text{ °C}$	1.00	1.05		V
		$T_j = 150\text{ °C}$	0.80	0.85		V
		$T_j = 175\text{ °C}$	0.75	0.80		V
r_{CE}	$V_{GE} = 15\text{ V}$ chipelevel	$T_j = 25\text{ °C}$	5.5	6.5		$\text{m}\Omega$
		$T_j = 150\text{ °C}$	9.3	10		$\text{m}\Omega$
		$T_j = 175\text{ °C}$	10	11		$\text{m}\Omega$
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 2.05\text{ mA}$		5.15	5.8	6.45	V
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = 1200\text{ V}, T_j = 25\text{ °C}$				1	mA
C_{ies}				20.00		nF
C_{oes}	$V_{CE} = 25\text{ V}$	$f = 1\text{ MHz}$		0.25		nF
C_{res}	$V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$		0.07		nF
Q_G	$V_{GE} = -8\text{ V} \dots +15\text{ V}$			1400		nC
R_{Gint}	$T_j = 25\text{ °C}$			1.5		Ω

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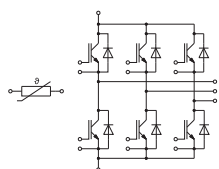
SKiiP 38AC12T7V1

Features*

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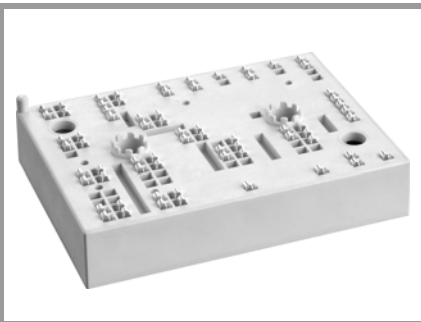


AC

Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
Inverter - IGBT					
$t_{d(on)}$		$T_j = 25\text{ °C}$	151		ns
		$T_j = 150\text{ °C}$	157		ns
		$T_j = 175\text{ °C}$	156		ns
t_r	$V_{CC} = 600\text{ V}$ $I_C = 100\text{ A}$	$T_j = 25\text{ °C}$	34		ns
		$T_j = 150\text{ °C}$	40		ns
		$T_j = 175\text{ °C}$	42		ns
E_{on}	$R_{G, on} = 1.7\ \Omega$ $R_{G, off} = 1.7\ \Omega$ $V_{GE} = +15/-15\text{ V}$	$T_j = 25\text{ °C}$	5.7		mJ
		$T_j = 150\text{ °C}$	10		mJ
		$T_j = 175\text{ °C}$	12		mJ
$t_{d(off)}$		$T_j = 25\text{ °C}$	282		ns
		@ $T_j = 150\text{ °C}$: $T_j = 150\text{ °C}$	372		ns
		$T_j = 175\text{ °C}$	397		ns
t_f	$di/dt_{on} = 2620\text{ A}/\mu\text{s}$ $di/dt_{off} = 1030\text{ A}/\mu\text{s}$ $dv/dt = 3680\text{ V}/\mu\text{s}$	$T_j = 25\text{ °C}$	60		ns
		$T_j = 150\text{ °C}$	92		ns
		$T_j = 175\text{ °C}$	112		ns
E_{off}		$T_j = 25\text{ °C}$	6.5		mJ
		$T_j = 150\text{ °C}$	11		mJ
		$T_j = 175\text{ °C}$	12		mJ
$R_{th(j-s)}$	per IGBT, $\lambda_{paste} = 0.8\text{ W}/(\text{mK})$		0.59		K/W
$R_{th(j-s)}$	per IGBT, $\lambda_{paste} = 2.5\text{ W}/(\text{mK})$		0.45		K/W

Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
Inverse - Diode					
$V_F = V_{EC}$	$I_F = 100\text{ A}$ $V_{GE} = 0\text{ V}$ chipllevel	$T_j = 25\text{ °C}$	2.20	2.52	V
		$T_j = 150\text{ °C}$	2.15	2.47	V
		$T_j = 175\text{ °C}$	2.00	2.31	V
V_{F0}	chipllevel	$T_j = 25\text{ °C}$	1.30	1.50	V
		$T_j = 150\text{ °C}$	0.90	1.10	V
		$T_j = 175\text{ °C}$	0.82	0.98	V
r_F	chipllevel	$T_j = 25\text{ °C}$	9.0	10	m Ω
		$T_j = 150\text{ °C}$	13	14	m Ω
		$T_j = 175\text{ °C}$	12	13	m Ω
I_{RRM}		$T_j = 25\text{ °C}$	69		A
		$T_j = 150\text{ °C}$	92		A
		$T_j = 175\text{ °C}$	110		A
Q_{rr}	$I_F = 100\text{ A}$ $V_{GE} = +15/-15\text{ V}$ $V_{CC} = 600\text{ V}$	$T_j = 25\text{ °C}$	5.2		μC
		$T_j = 150\text{ °C}$	15.7		μC
		@ $T_j = 150\text{ °C}$: $T_j = 175\text{ °C}$	16.3		μC
E_{rr}	$di/dt_{off} = 2590\text{ A}/\mu\text{s}$	$T_j = 25\text{ °C}$	1.7		mJ
		$T_j = 150\text{ °C}$	5.7		mJ
		$T_j = 175\text{ °C}$	7.6		mJ
$R_{th(j-s)}$	per Diode, $\lambda_{paste} = 0.8\text{ W}/(\text{mK})$		0.7		K/W
$R_{th(j-s)}$	per Diode, $\lambda_{paste} = 2.5\text{ W}/(\text{mK})$		0.55		K/W
Module					
L_{CE}			-		nH
M_s	to heat sink	2		2.5	Nm
w			82		g

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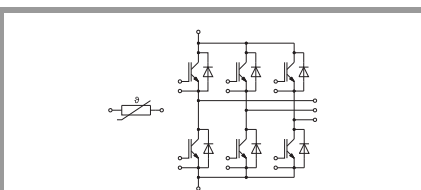
Features*

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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
$R_{(T)}$	$R_{(T)} = 1000\Omega [1 + A(T - 25\text{ °C}) + B(T - 25\text{ °C})^2]$ $A = 7.635 \cdot 10^{-3}\text{ °C}^{-1}$, $B = 1.731 \cdot 10^{-5}\text{ °C}^{-2}$				



AC

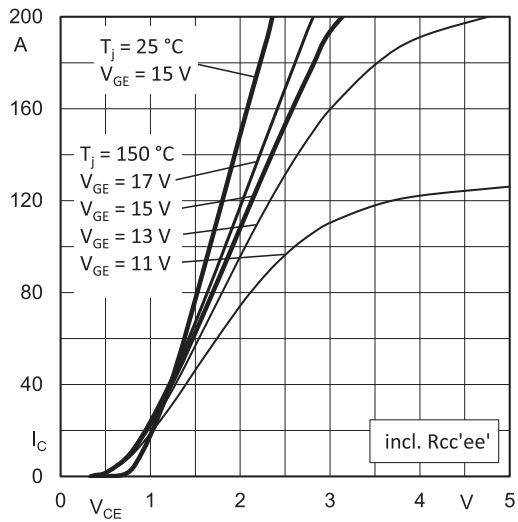


Fig. 1: Typ. output characteristic

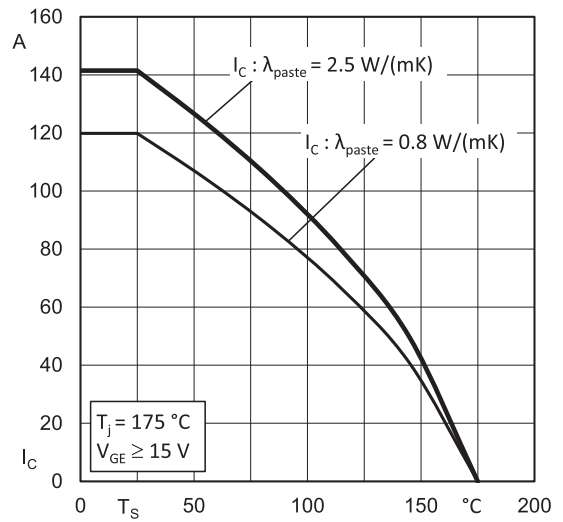


Fig. 2: Rated current vs. temperature $I_C = f(T_s)$

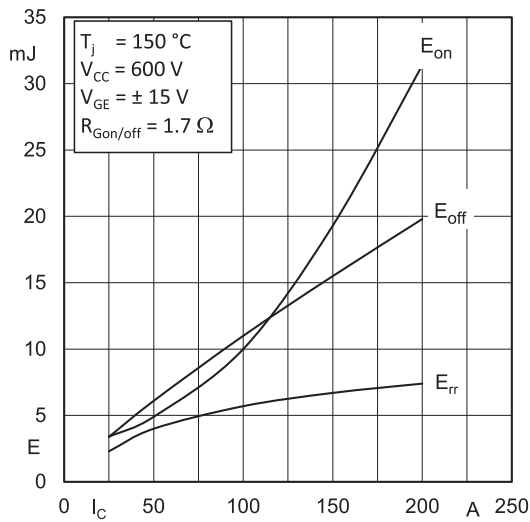


Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

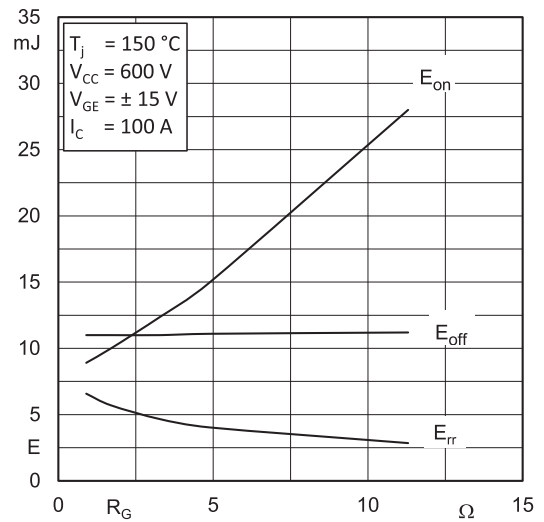


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

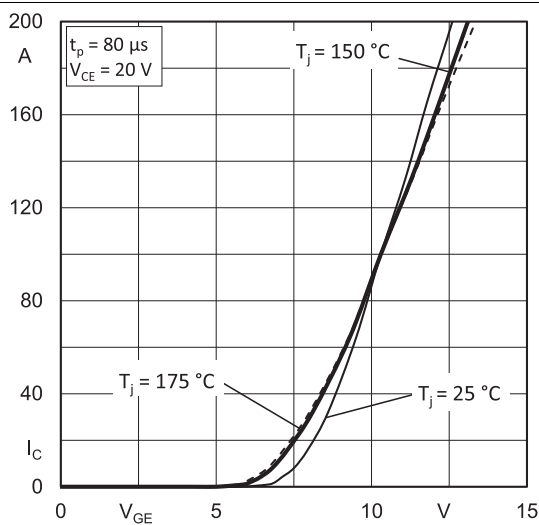


Fig. 5: Typ. transfer characteristic

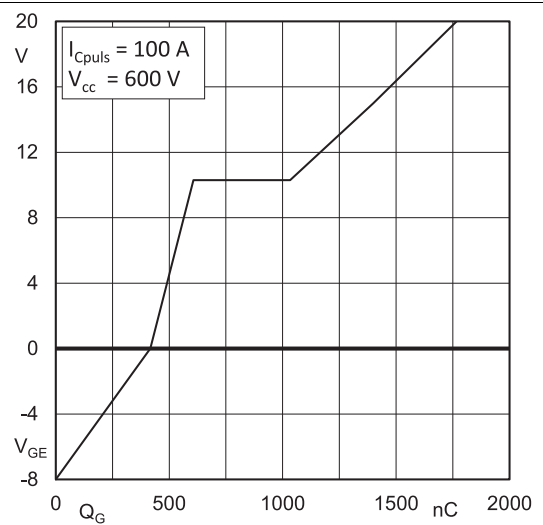


Fig. 6: Typ. gate charge characteristic

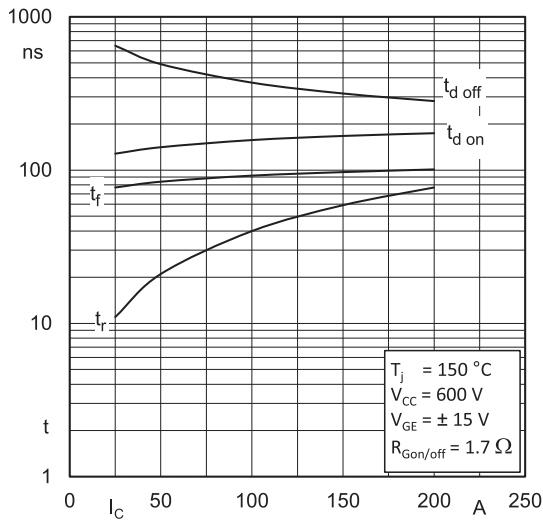


Fig. 7: Typ. switching times vs. I_C

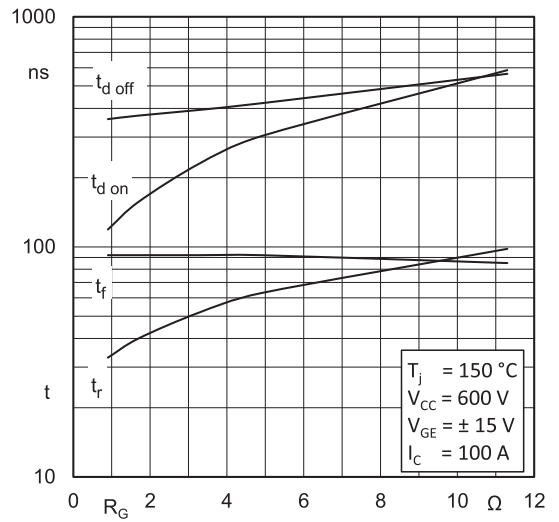


Fig. 8: Typ. switching times vs. gate resistor R_G

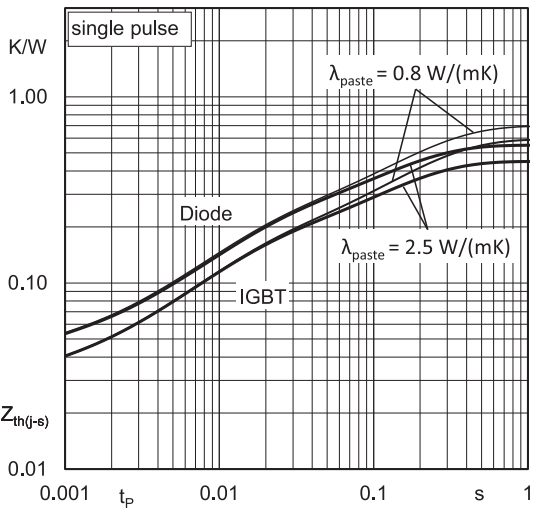


Fig. 9: Typ. transient thermal impedance

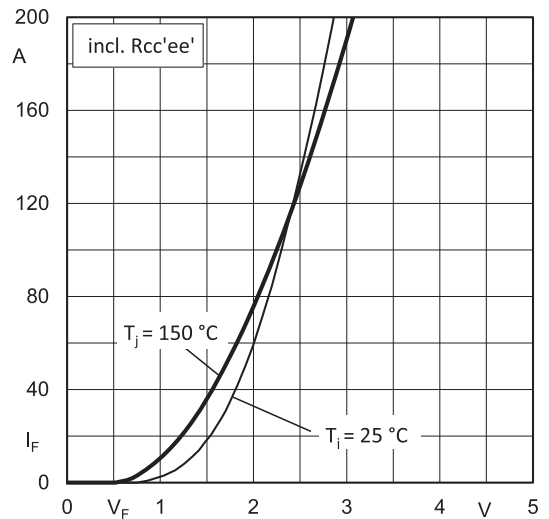


Fig. 10: Typ. CAL diode forward characteristic

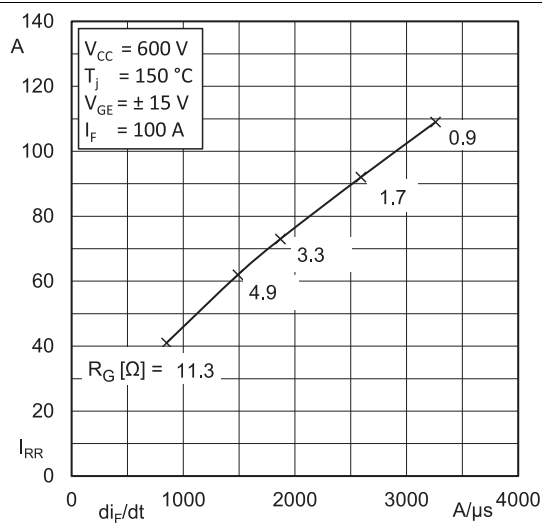


Fig. 11: Typ. CAL diode peak reverse recovery current

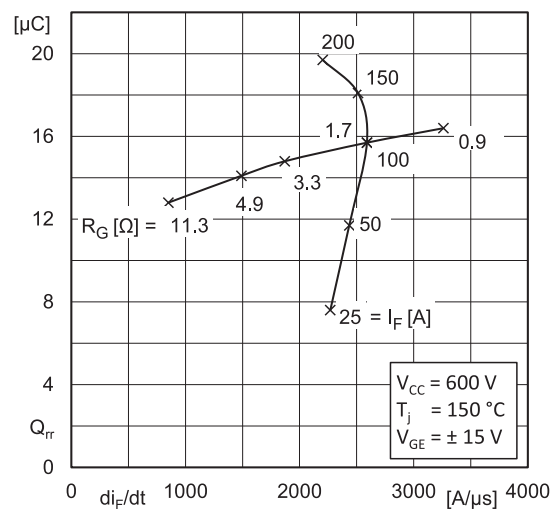
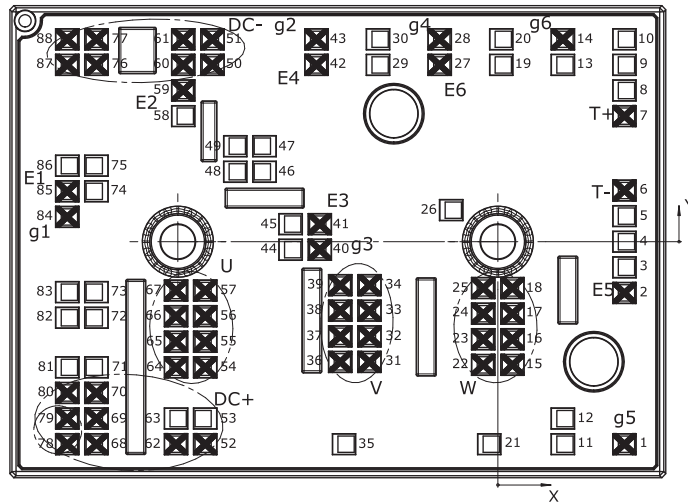


Fig. 12: Typ. CAL diode recovery charge

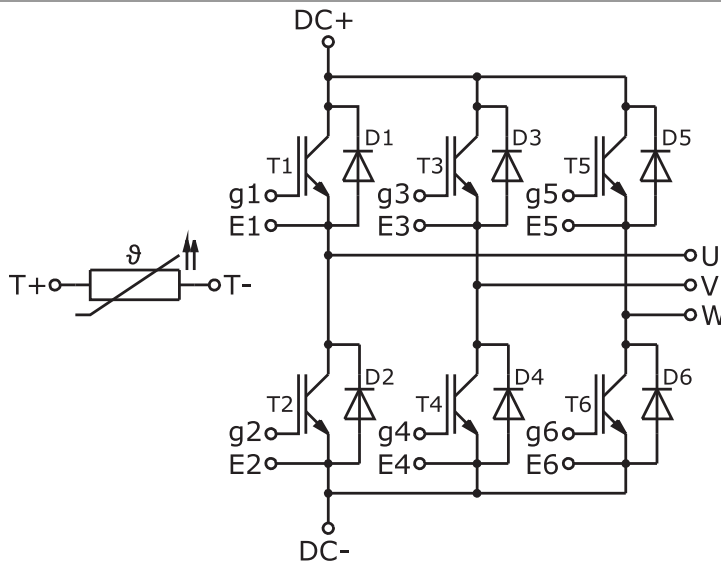
SKiiP 38AC12T7V1

Pin out											
Pin	X	Y	Function	Pin	X	Y	Function	Pin	X	Y	Function
1	15,83	-25,30	g5	31	-16,05	-15,02	V	61	-39,33	25,30	DC-
2	15,83	-6,40	E5	32	-16,05	-11,82	V	62	-40,23	-25,30	DC+
3	15,83	-3,20		33	-16,05	-8,62	V	63	-40,23	-22,10	
4	15,83	0		34	-16,05	-5,42	V	64	-40,23	-15,70	U
5	15,83	3,20		35	-19,23	-25,30		65	-40,23	-12,50	U
6	15,83	6,40	T-	36	-19,70	-15,02	V	66	-40,23	-9,30	U
7	15,83	15,70	T+	37	-19,70	-11,82	V	67	-40,23	-6,10	U
8	15,83	18,90		38	-19,70	-8,62	V	68	-50,18	-25,30	DC+
9	15,83	22,10		39	-19,70	-5,42	V	69	-50,18	-22,10	DC+
10	15,83	25,30		40	-22,26	-1,00	g3	70	-50,18	-18,90	DC+
11	8,13	-25,30		41	-22,26	2,20	E3	71	-50,18	-15,70	
12	8,13	-22,10		42	-22,68	22,10	E4	72	-50,18	-9,50	
13	8,13	22,10		43	-22,68	25,30	g2	73	-50,18	-6,30	
14	8,13	25,30	g6	44	-25,91	-1,00		74	-50,18	6,30	
15	1,83	-15,39	W	45	-25,91	2,20		75	-50,18	9,50	
16	1,83	-12,19	W	46	-29,18	8,74		76	-50,18	22,10	DC-
17	1,83	-8,99	W	47	-29,18	11,94		77	-50,18	25,30	DC-
18	1,83	-5,79	W	48	-32,83	8,74		78	-53,83	-25,30	DC+
19	0,43	22,10		49	-32,83	11,94		79	-53,83	-22,10	DC+
20	0,43	25,30		50	-35,68	22,10	DC-	80	-53,83	-18,90	DC+
21	-1,08	-25,30		51	-35,68	25,30	DC-	81	-53,83	-15,70	
22	-1,83	-15,39	W	52	-36,58	-25,30	DC+	82	-53,83	-9,50	
23	-1,83	-12,19	W	53	-36,58	-22,10		83	-53,83	-6,30	
24	-1,83	-8,99	W	54	-36,58	-15,70	U	84	-53,83	3,10	g1
25	-1,83	-5,79	W	55	-36,58	-12,50	U	85	-53,83	6,30	E1
26	-5,83	3,95		56	-36,58	-9,30	U	86	-53,83	9,50	
27	-7,28	22,10	E6	57	-36,58	-6,10	U	87	-53,83	22,10	DC-
28	-7,28	25,30	g4	58	-39,33	15,70		88	-53,83	25,30	DC-
29	-14,98	22,10		59	-39,33	18,90	E2				
30	-14,98	25,30		60	-39,33	22,10	DC-				

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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