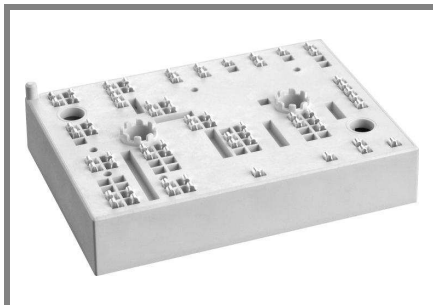


SKiiP 38NAB066V1



MiniSKiiP[®]3

3-phase bridge rectifier +
brake chopper + 3-phase
bridge inverter
SKiiP 38NAB066V1

Features

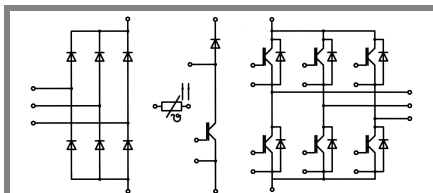
- Trench IGBTs
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised file no. E63532

Typical Applications*

- Inverter up to 22 kVA
- Typical motor power 11 kW

Remarks

- Case temperature limited to $T_C = 125^\circ\text{C}$ max.
- Product reliability results are valid for $T_j = 150^\circ\text{C}$
- SC data: $t_p \leq 6 \text{ s}$; $V_{GE} \leq 15 \text{ V}$; $T_j = 150^\circ\text{C}$; $V_{CC} = 360 \text{ V}$
- V_{CEsat} , $V_F =$ chip level value



NAB

Absolute Maximum Ratings		$T_S = 25^\circ\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT - Inverter, Chopper			
V_{CES}		600	V
I_C	$T_S = 25 (70)^\circ\text{C}$, $T_j = 150^\circ\text{C}$	101 (68)	A
I_C	$T_S = 25 (70)^\circ\text{C}$, $T_j = 175^\circ\text{C}$	112 (83)	A
I_{CRM}	$t_p = 1 \text{ ms}$	200	A
V_{GES}		± 20	V
Diode - Inverter, Chopper			
I_F	$T_S = 25 (70)^\circ\text{C}$, $T_j = 150^\circ\text{C}$	103 (67)	A
I_F	$T_S = 25 (70)^\circ\text{C}$, $T_j = 175^\circ\text{C}$	112 (81)	A
I_{FRM}	$t_p = 1 \text{ ms}$	200	A
Diode - Rectifier			
V_{RRM}		800	V
I_F	$T_S = 70^\circ\text{C}$	61	A
I_{FSM}	$t_p = 10 \text{ ms}$, $\sin 180^\circ$, $T_j = 25^\circ\text{C}$	700	A
i^2t	$t_p = 10 \text{ ms}$, $\sin 180^\circ$, $T_j = 25^\circ\text{C}$	2400	A^2s
I_{tRMS}	per power terminal (20 A / spring)	80	A
T_j	IGBT, Diode	-40...+175	$^\circ\text{C}$
T_{stg}		-40...+125	$^\circ\text{C}$
V_{isol}	AC, 1 min.	2500	V

Characteristics		$T_S = 25^\circ\text{C}$, unless otherwise specified			Units
Symbol	Conditions	min.	typ.	max.	Units
IGBT - Inverter, Chopper					
$V_{CE(sat)}$	$I_{Cnom} = 100 \text{ A}$, $T_j = 25 (150)^\circ\text{C}$	1,05	1,45 (1,65)	1,85 (2,05)	V
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 2 \text{ mA}$		5,8		V
$V_{CE(TO)}$	$T_j = 25 (150)^\circ\text{C}$		0,9 (0,8)	1,1 (1)	V
r_{CE}	$T_j = 25 (150)^\circ\text{C}$		5,5 (8,5)	7,5 (10,5)	$\text{m}\Omega$
C_{ies}	$V_{CE} = 25 \text{ V}$, $V_{GE} = 0 \text{ V}$, $f = 1 \text{ MHz}$		6,15		nF
C_{oes}	$V_{CE} = 25 \text{ V}$, $V_{GE} = 0 \text{ V}$, $f = 1 \text{ MHz}$		1,12		nF
C_{res}	$V_{CE} = 25 \text{ V}$, $V_{GE} = 0 \text{ V}$, $f = 1 \text{ MHz}$		0,9		nF
$R_{CC+EE'}$	spring contact-chip $T_S = 25 (150)^\circ\text{C}$				$\text{m}\Omega$
$R_{th(j-s)}$	per IGBT		0,6		K/W
$t_{d(on)}$	under following conditions		40		ns
t_r	$V_{CC} = 300 \text{ V}$, $V_{GE} = -8\text{V}/+15\text{V}$		40		ns
$t_{d(off)}$	$I_{Cnom} = 100 \text{ A}$, $T_j = 150^\circ\text{C}$		410		ns
t_f	$R_{Gon} = R_{Goff} = 8,2 \Omega$		50		ns
$E_{on} (E_{off})$	inductive load		3,4 (3,5)		mJ
Diode - Inverter, Chopper					
$V_F = V_{EC}$	$I_F = 100 \text{ A}$, $T_j = 25 (150)^\circ\text{C}$		1,3 (1,3)	1,5 (1,5)	V
$V_{(TO)}$	$T_j = 25 (150)^\circ\text{C}$		0,9 (0,8)	1 (0,9)	V
r_T	$T_j = 25 (150)^\circ\text{C}$		4 (5)	5 (6)	$\text{m}\Omega$
$R_{th(j-s)}$	per diode		0,8		K/W
I_{RRM}	under following conditions		102		A
Q_{rr}	$I_{Fnom} = 100 \text{ A}$, $V_R = 300 \text{ V}$		15,4		C
E_{rr}	$V_{GE} = 0 \text{ V}$, $T_j = 150^\circ\text{C}$		3,3		mJ
	$di_F/dt = 2560 \text{ A/s}$				
Diode - Rectifier					
V_F	$I_{Fnom} = 35 \text{ A}$, $T_j = 25^\circ\text{C}$		1,1		V
$V_{(TO)}$	$T_j = 150^\circ\text{C}$		0,8		V
r_T	$T_j = 150^\circ\text{C}$		11		$\text{m}\Omega$
$R_{th(j-s)}$	per diode		0,9		K/W
Temperature Sensor					
R_{ts}	3 %, $T_r = 25 (100)^\circ\text{C}$		1000(1670)		Ω
Mechanical Data					
w			97		g
M_s	Mounting torque	2		2,5	Nm

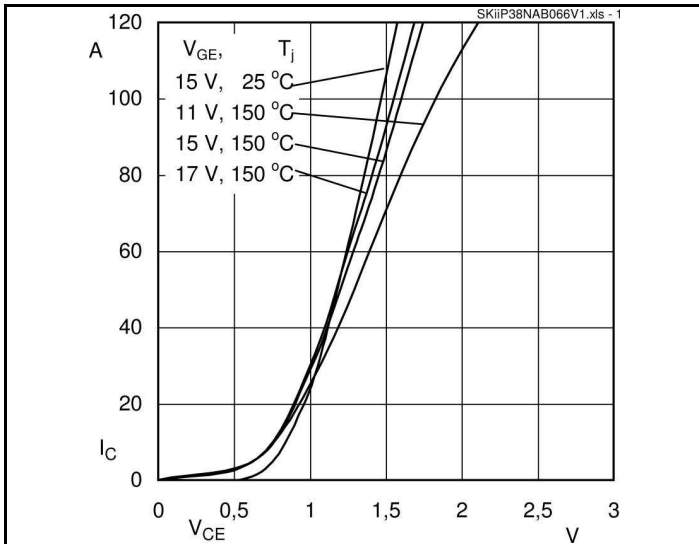


Fig. 1 Typ. output characteristic

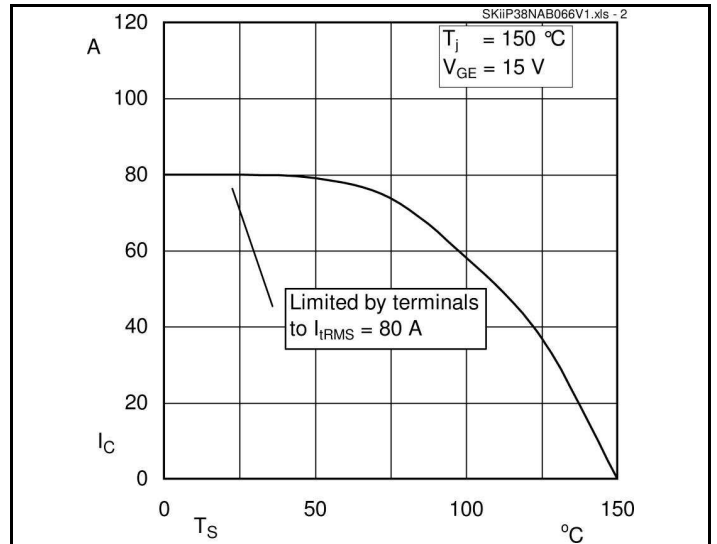


Fig. 2 Typ. rated current vs. temperature

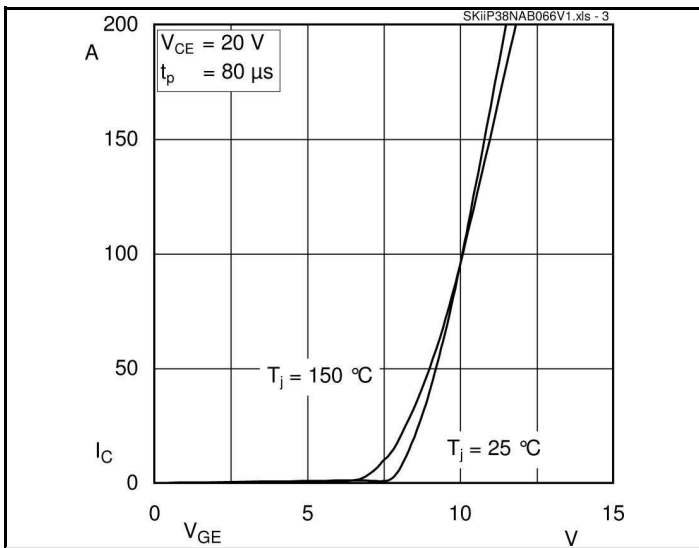


Fig. 3 Typ. transfer characteristic

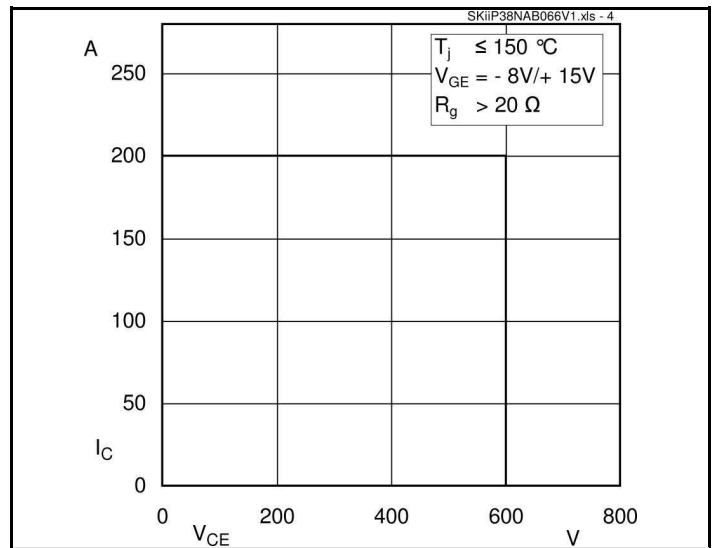


Fig. 4 Reverse bias safe operating area

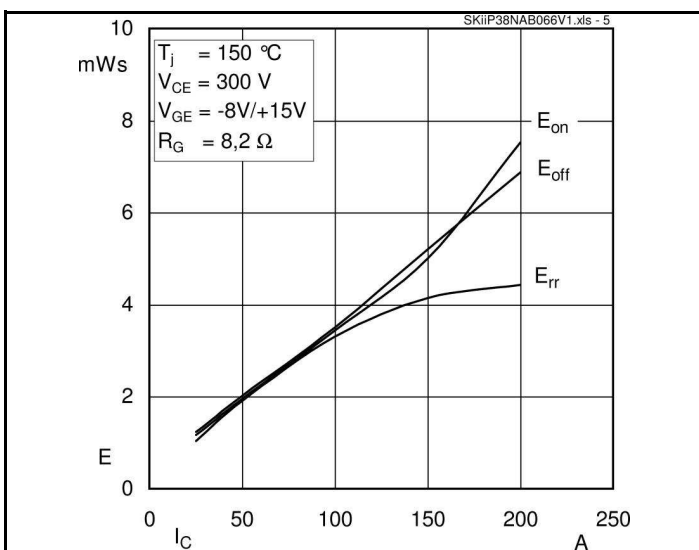


Fig. 5 Typ. turn-on /-off energy = $f(I_C)$

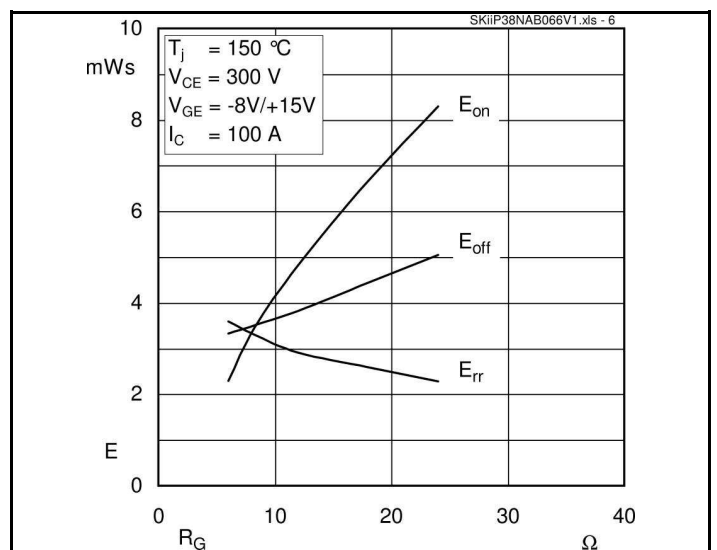


Fig. 6 Typ. turn-on /-off energy = $f(R_G)$

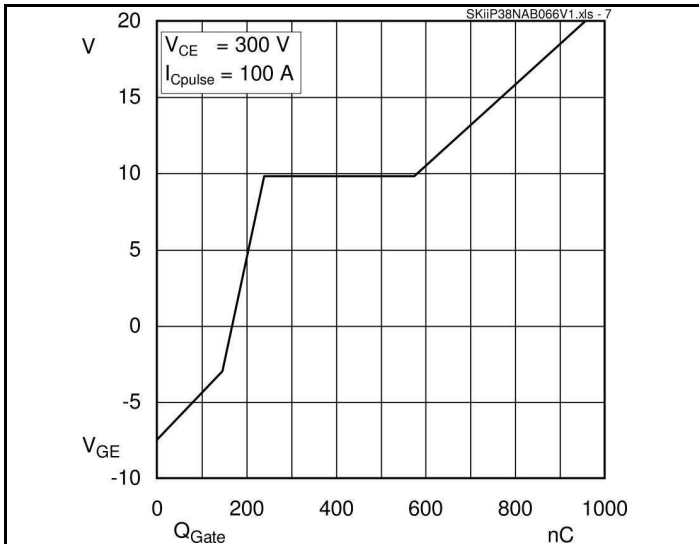


Fig. 7 Typ. gate charge characteristic

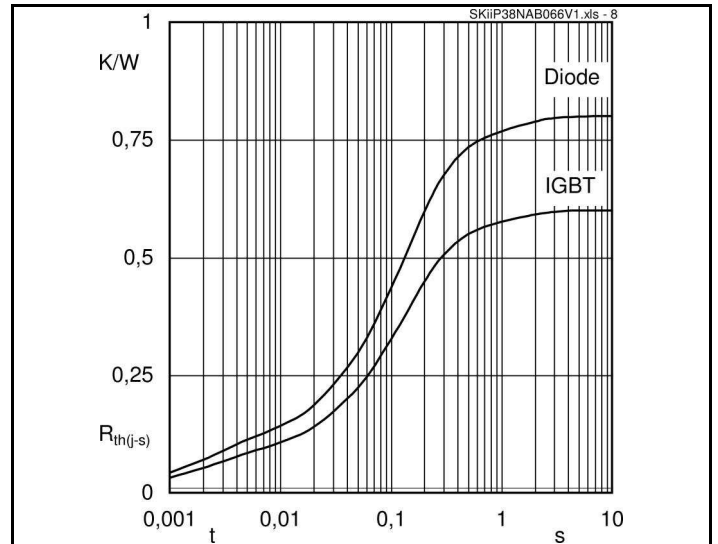


Fig. 8 Typ. thermal impedance

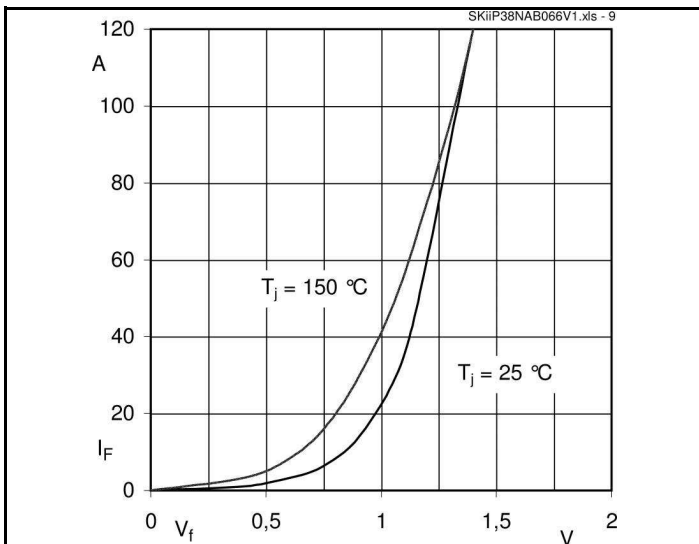


Fig. 9 Typ. freewheeling diode forward characteristic

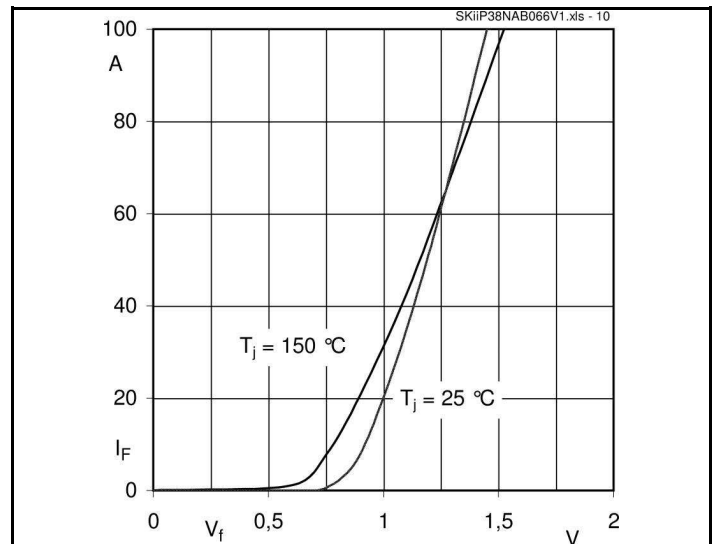


Fig. 10 Typ. input bridge forward characteristic

