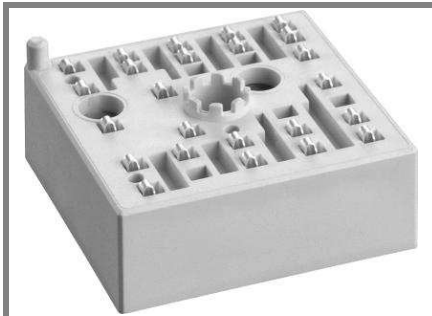


SKiiP 13NAB065V1



MiniSKiiP® 1

3-phase bridge rectifier +
brake chopper + 3-phase
bridge inverter
SKiiP 13NAB065V1

Features

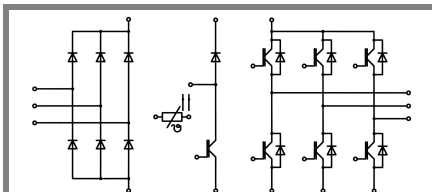
- Ultrafast NPT IGBTs
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised file no. E63532

Typical Applications*

- Inverter up to 5,6 kVA
- Typical motor power 3,0 kW

Remarks

- V_{CEsat} , V_F = chip level value



NAB

Absolute Maximum Ratings		$T_s = 25\text{ °C}$, unless otherwise specified		
Symbol	Conditions	Values	Units	
IGBT - Inverter, Chopper				
V_{CES}	$T_s = 25\text{ (70) °C}$	600	V	
I_C		24 (18)	A	
I_{CRM}		30	A	
V_{GES}		± 20	V	
T_j		- 40 ... + 150	°C	
Diode - Inverter, Chopper				
I_F	$T_s = 25\text{ (70) °C}$	26 (19)	A	
I_{FRM}		30	A	
T_j		- 40 ... + 150	°C	
Diode - Rectifier				
V_{RRM}	$T_s = 70\text{ °C}$	800	V	
I_F		35	A	
I_{FSM}		$t_p = 10\text{ ms, sin } 180\text{ °, } T_j = 25\text{ °C}$	220	A
i^2t		$t_p = 10\text{ ms, sin } 180\text{ °, } T_j = 25\text{ °C}$	240	A ² s
T_j		- 40 ... + 150	°C	
Module				
I_{tRMS}	per power terminal (20 A / spring)	20	A	
T_{stg}		- 40 ... + 125	°C	
V_{isol}	AC, 1 min.	2500	V	

Characteristics		$T_s = 25\text{ °C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT - Inverter, Chopper					
V_{CEsat}	$I_{Cnom} = 15\text{ A, } T_j = 25\text{ (125) °C}$		2 (2,2)	2,5 (2,7)	V
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 0,5\text{ mA}$	3	4	5	V
$V_{CE(TO)}$	$T_j = 25\text{ (125) °C}$		1,2 (1,1)	1,3 (1,2)	V
r_T	$T_j = 25\text{ (125) °C}$		53 (73)	80 (100)	mΩ
C_{ies}	$V_{CE} = 25\text{ V, } V_{GE} = 0\text{ V, } f = 1\text{ MHz}$		0,77		nF
C_{oes}	$V_{CE} = 25\text{ V, } V_{GE} = 0\text{ V, } f = 1\text{ MHz}$		0,12		nF
C_{res}	$V_{CE} = 25\text{ V, } V_{GE} = 0\text{ V, } f = 1\text{ MHz}$		0,06		nF
$R_{th(j-s)}$	per IGBT		1,4		K/W
$t_{d(on)}$	under following conditions		20		ns
t_r	$V_{CC} = 300\text{ V, } V_{GE} = \pm 15\text{ V}$		30		ns
$t_{d(off)}$	$I_{Cnom} = 15\text{ A, } T_j = 125\text{ °C}$		195		ns
t_f	$R_{Gon} = R_{Goff} = 50\text{ Ω}$		10		ns
E_{on}	inductive load		0,6		mJ
E_{off}			0,3		mJ
Diode - Inverter, Chopper					
$V_F = V_{EC}$	$I_{Fnom} = 15\text{ A, } T_j = 25\text{ (125) °C}$		1,4 (1,4)	1,7 (1,7)	V
$V_{(TO)}$	$T_j = 25\text{ (125) °C}$		1 (0,9)	1,1 (1)	V
r_T	$T_j = 25\text{ (125) °C}$		30 (33)	40 (47)	mΩ
$R_{th(j-s)}$	per diode		2,2		K/W
I_{RRM}	under following conditions		22		A
Q_{rr}	$I_{Fnom} = 15\text{ A, } V_R = 300\text{ V}$		1,5		μC
E_{rr}	$V_{GE} = 0\text{ V, } T_j = 125\text{ °C}$		0,4		mJ
	$di_F/dt = 1100\text{ A/μs}$				
Diode - Rectifier					
V_F	$I_{Fnom} = 15\text{ A, } T_j = 25\text{ °C}$		1,1		V
$V_{(TO)}$	$T_j = 150\text{ °C}$		0,8		V
r_T	$T_j = 150\text{ °C}$		20		mΩ
$R_{th(j-s)}$	per diode		1,5		K/W
Temperature Sensor					
R_{ts}	3 %, $T_r = 25\text{ (100) °C}$		1000(1670)		Ω
Mechanical Data					
w			35		g
M_s	Mounting torque	2		2,5	Nm

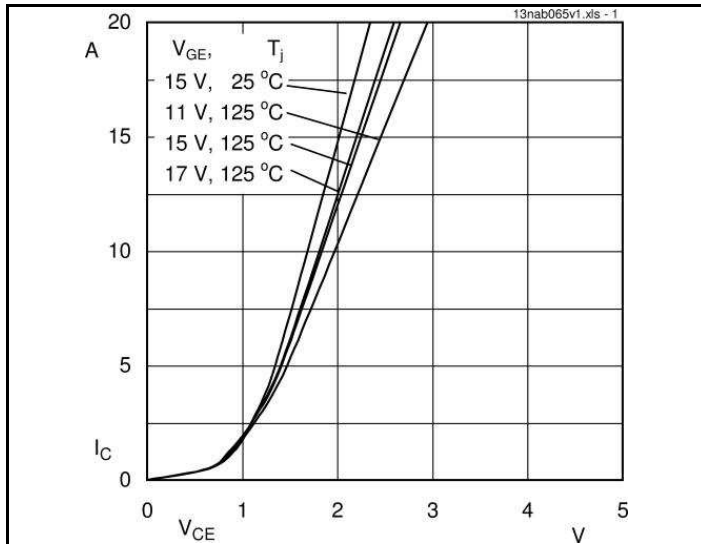


Fig. 1 Typ. output characteristic

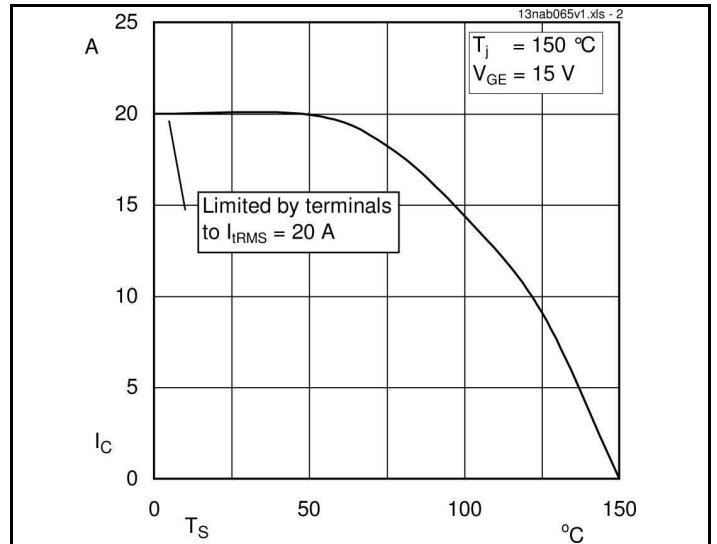


Fig. 2 Typ. rated current vs. temperature

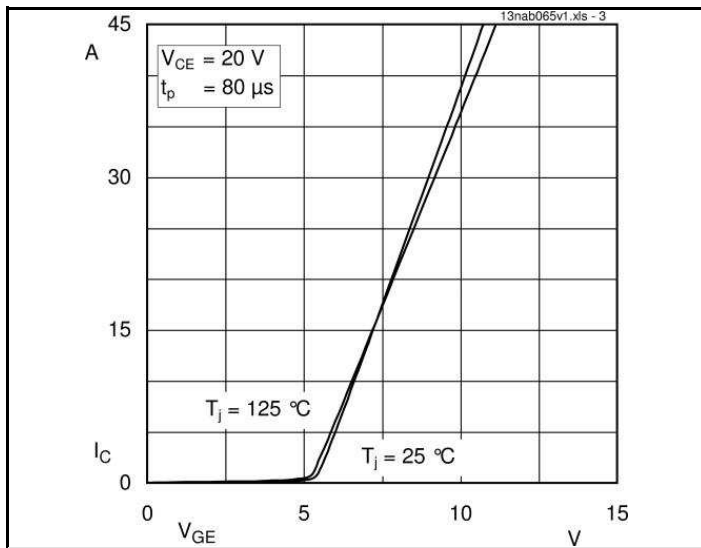


Fig. 3 Typ. transfer characteristic

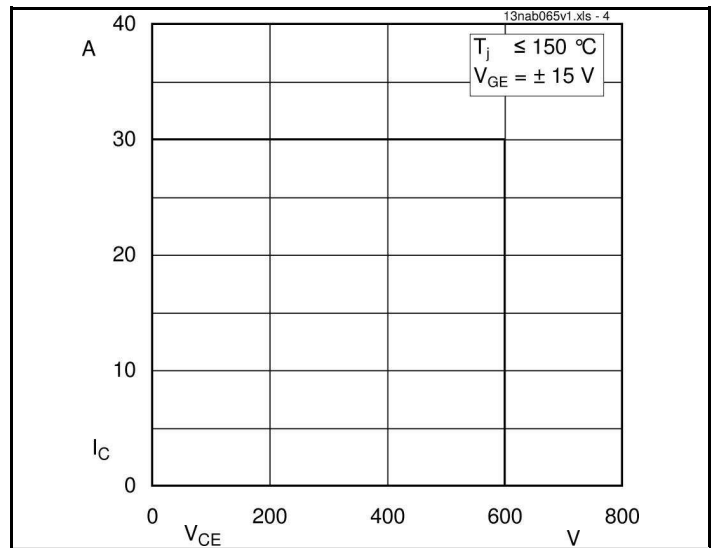


Fig. 4 Reverse bias safe operating area

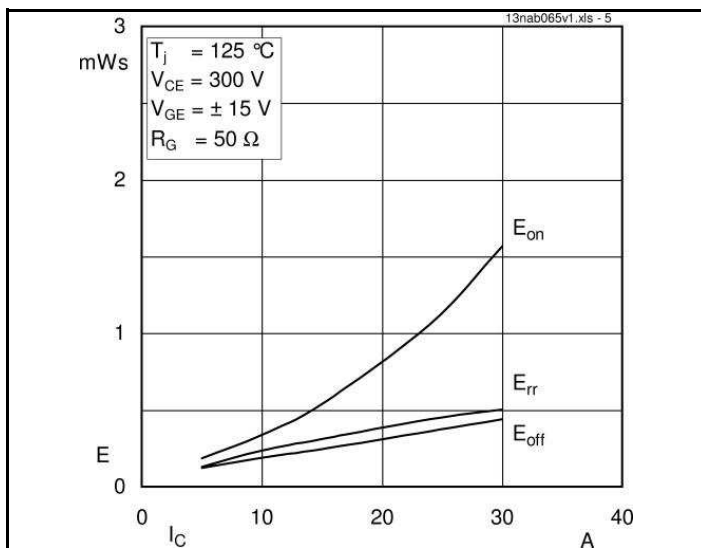


Fig. 5 Typ. Turn-on /-off energy = $f(I_C)$

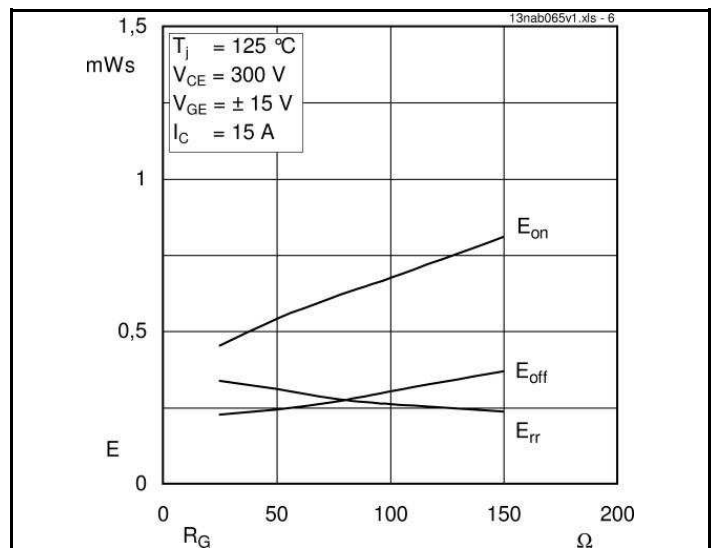


Fig. 6 Typ. Turn-on /-off energy = $f(R_G)$

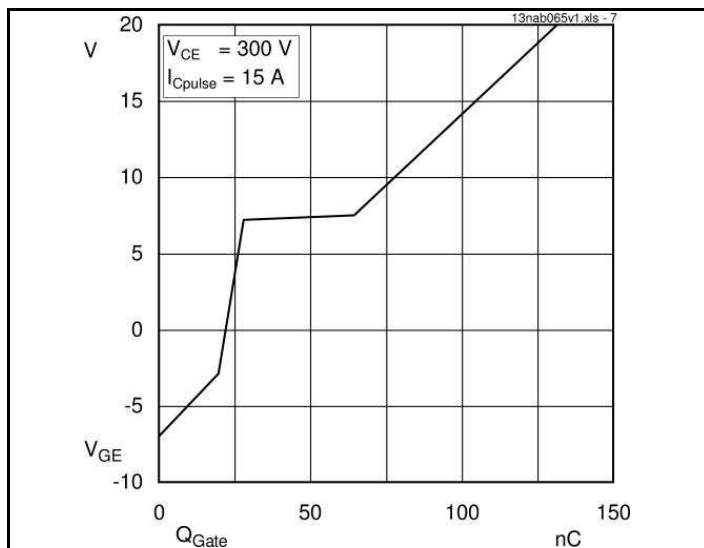


Fig. 7 Typ. gate charge characteristic

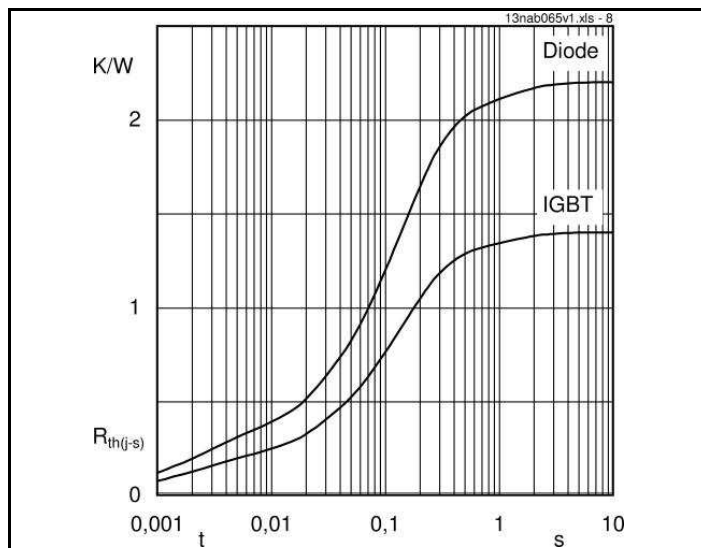


Fig. 8 Typ. thermal impedance

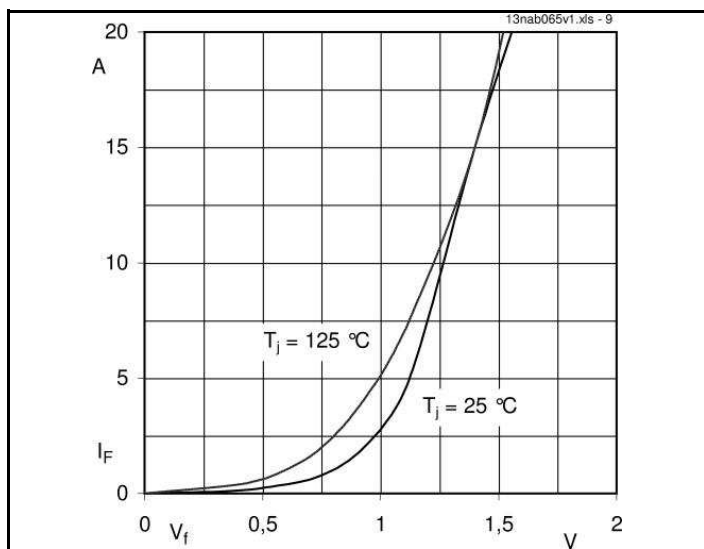


Fig. 9 Typ. freewheeling diode forward characteristic

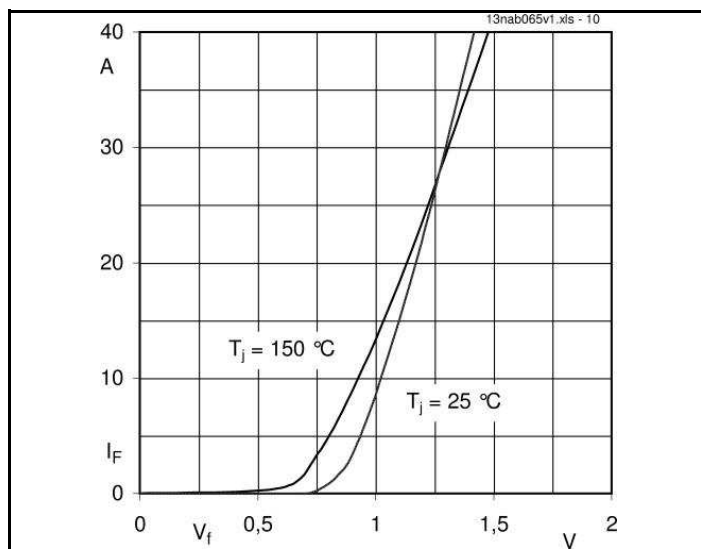


Fig. 10 Typ. input bridge forward characteristic

