

MiniSKiiP® 3 PIM

Output Inverter Application

1200V/100A

General conditions

3phase SPWM

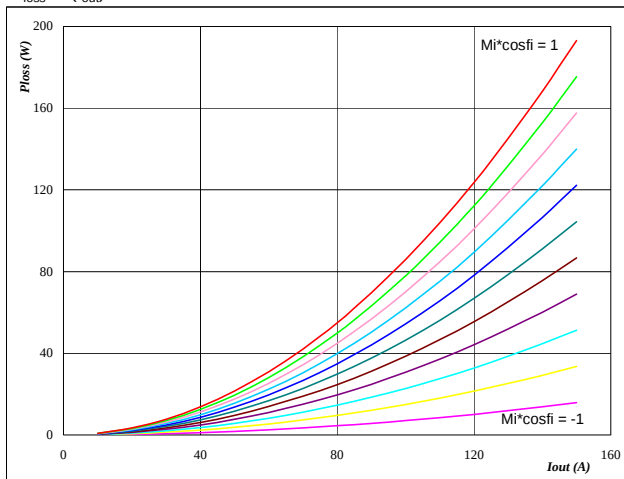
$V_{GEon} = 15 \text{ V}$
 $V_{GEoff} = -15 \text{ V}$
 $R_{gon} = 8 \Omega$
 $R_{goff} = 8 \Omega$

Figure 1

IGBT

Typical average static loss as a function of output current

$$P_{loss} = f(I_{out})$$



At

$T_j = 150 \text{ } ^\circ\text{C}$

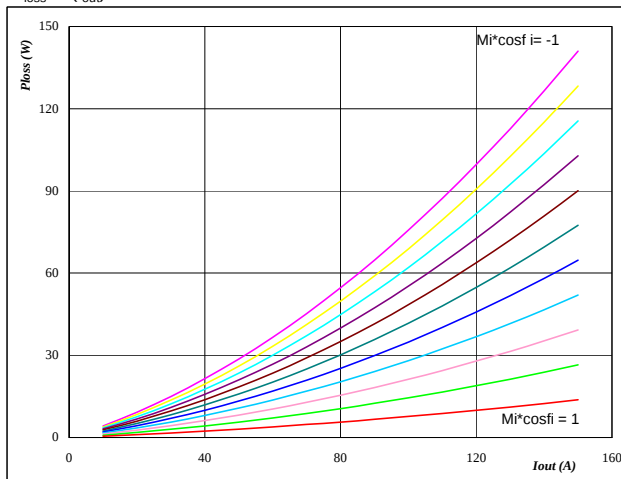
$M_i \cdot \cos \phi_i$ from -1 to 1 in steps of 0,2

Figure 2

FWD

Typical average static loss as a function of output current

$$P_{loss} = f(I_{out})$$



At

$T_j = 150 \text{ } ^\circ\text{C}$

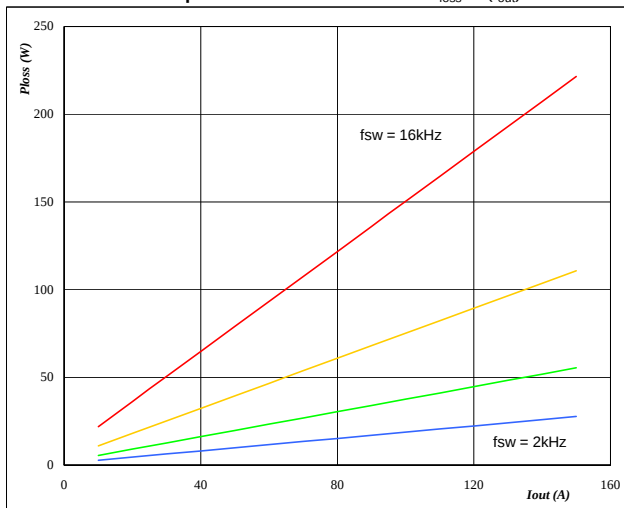
$M_i \cdot \cos \phi_i$ from -1 to 1 in steps of 0,2

Figure 3

IGBT

Typical average switching loss as a function of output current

$$P_{loss} = f(I_{out})$$



At

$T_j = 150 \text{ } ^\circ\text{C}$

DC link = 600 V

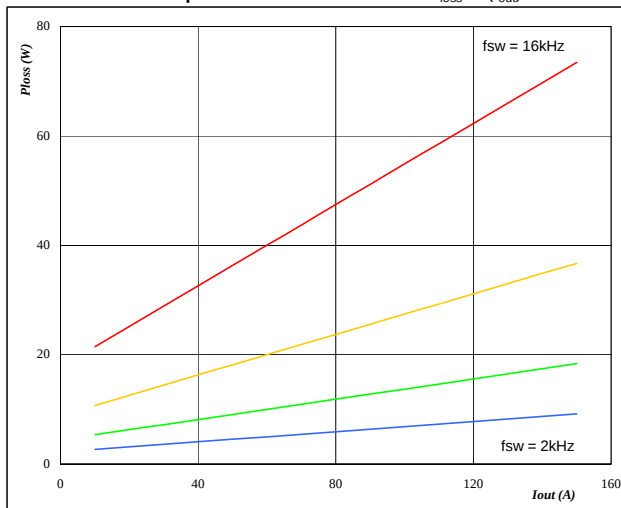
f_{sw} from 2 kHz to 16 kHz in steps of factor 2

Figure 4

FWD

Typical average switching loss as a function of output current

$$P_{loss} = f(I_{out})$$



At

$T_j = 150 \text{ } ^\circ\text{C}$

DC link = 600 V

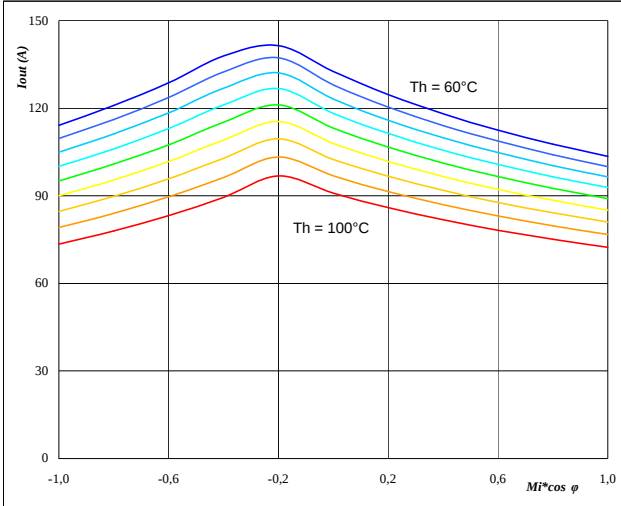
f_{sw} from 2 kHz to 16 kHz in steps of factor 2

Figure 5

Phase

Typical available 50Hz output current
as a function $Mi \cdot \cos \varphi$

$$I_{out} = f(Mi \cdot \cos \varphi)$$



At

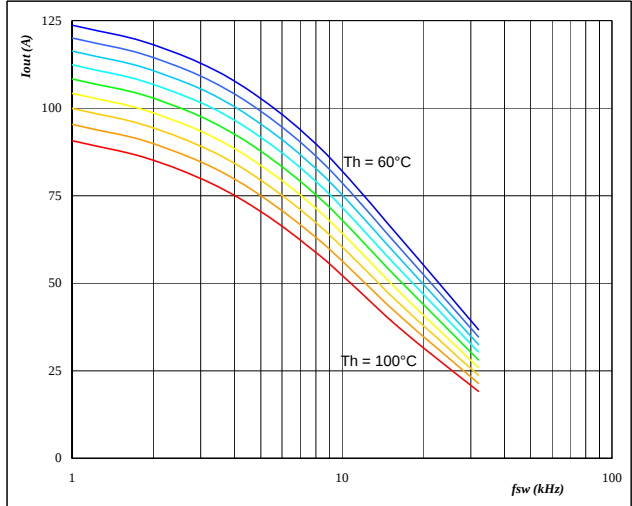
$T_j = 150$ °C
DC link = 600 V
 $f_{sw} = 4$ kHz
 T_h from 60 °C to 100 °C in steps of 5 °C

Figure 6

Phase

Typical available 50Hz output current
as a function of switching frequency

$$I_{out} = f(f_{sw})$$



At

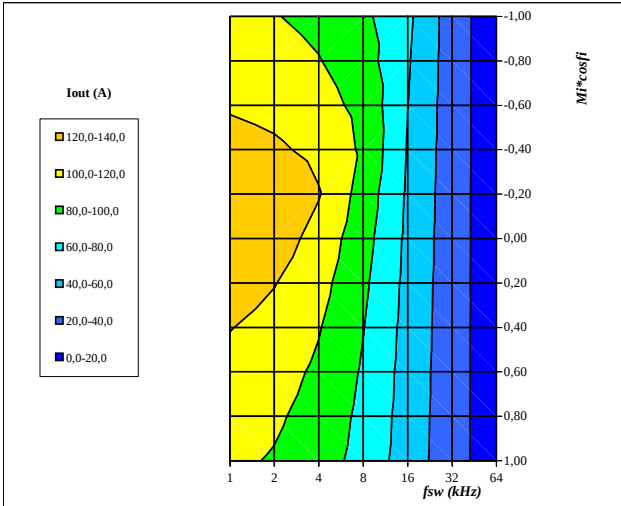
$T_j = 150$ °C
DC link = 600 V
 $Mi \cdot \cos \varphi = 0,8$
 T_h from 60 °C to 100 °C in steps of 5 °C

Figure 7

Phase

Typical available 50Hz output current as a function of
 $Mi \cdot \cos \varphi$ and switching frequency

$$I_{out} = f(f_{sw}, Mi \cdot \cos \varphi)$$



At

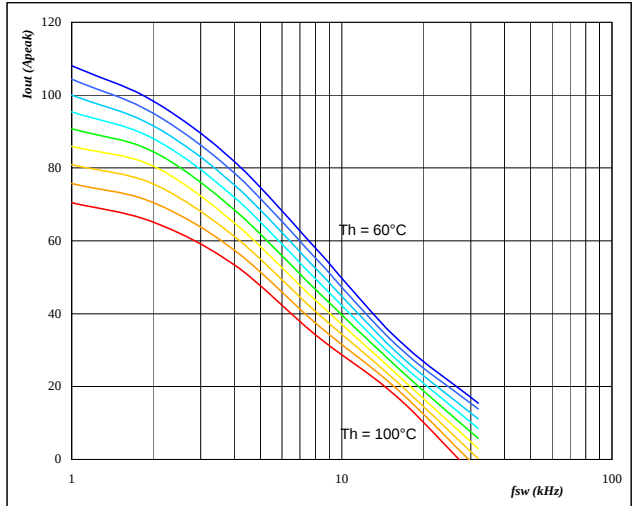
$T_j = 150$ °C
DC link = 600 V
 $T_h = 80$ °C

Figure 8

Phase

Typical available 0Hz output current as a function
of switching frequency

$$I_{outpeak} = f(f_{sw})$$



At

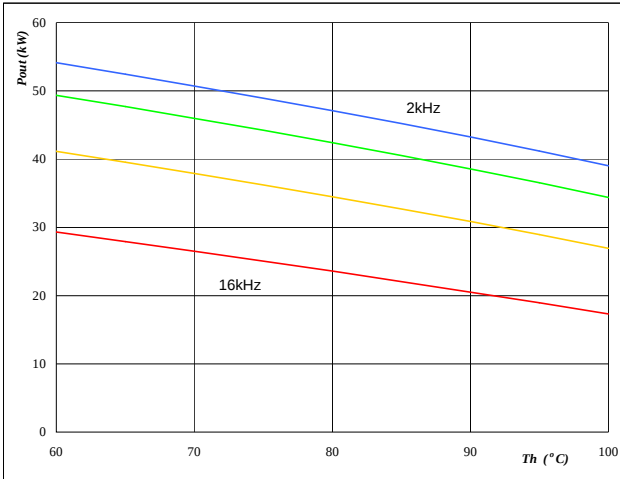
$T_j = 150$ °C
DC link = 600 V
 T_h from 60 °C to 100 °C in steps of 5 °C
 $Mi = 0$

Figure 9

Inverter

Typical available peak output power as a function of heatsink temperature

$$P_{out}=f(T_h)$$



At

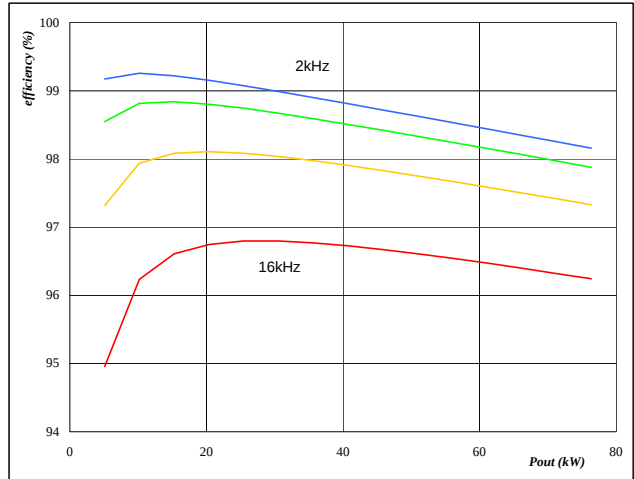
$T_j = 150$ °C
DC link = 600 V
Mi = 1
 $\cos \varphi = 0,80$
 f_{sw} from 2 kHz to 16 kHz in steps of factor 2

Figure 10

Inverter

Typical efficiency as a function of output power

$$\text{efficiency}=f(P_{out})$$



At

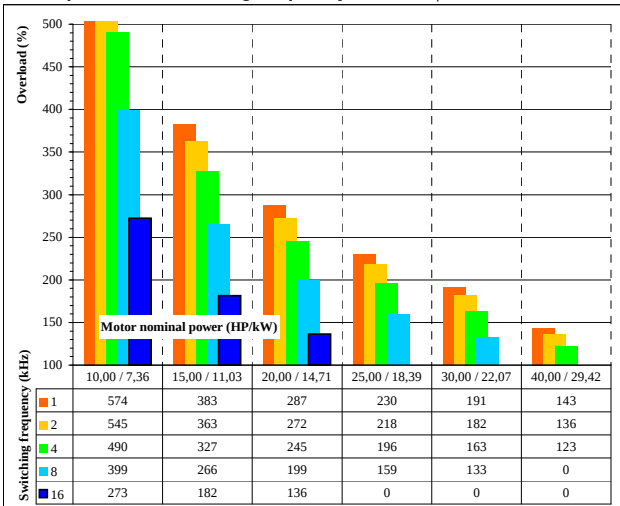
$T_j = 150$ °C
DC link = 600 V
Mi = 1
 $\cos \varphi = 0,80$
 f_{sw} from 2 kHz to 16 kHz in steps of factor 2

Figure 11

Inverter

Typical available overload factor as a function of motor power and switching frequency

$$P_{peak} / P_{nom}=f(P_{nom},f_{sw})$$



At

$T_j = 150$ °C
DC link = 600 V
Mi = 1
 $\cos \varphi = 0,8$
 f_{sw} from 1 kHz to 16kHz in steps of factor 2
 $T_h = 80$ °C
Motor eff = 0,85