

**General conditions**
**3phase SPWM**

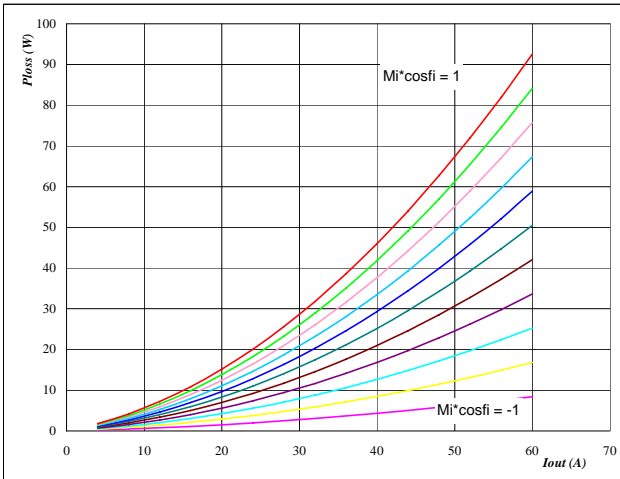
$V_{GEon}$	=	15 V
$V_{GEoff}$	=	-15 V
$R_{gon}$	=	16 $\Omega$
$R_{goff}$	=	16 $\Omega$

**Figure 1**

IGBT

**Typical average static loss as a function of output current**

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

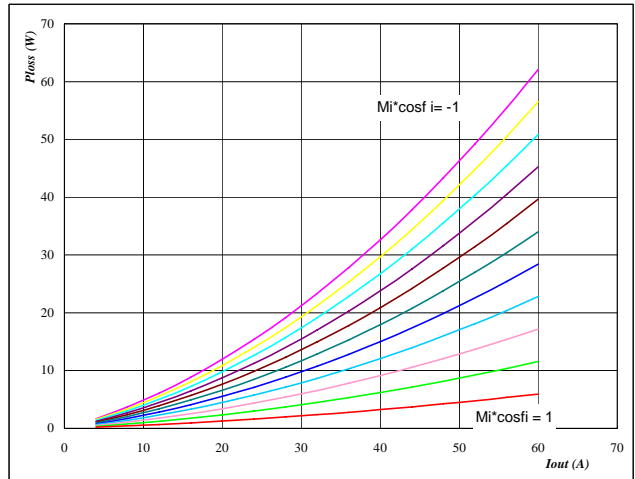

**At**
 $T_j = 150 \text{ } ^\circ\text{C}$ 
 $Mi \cdot \cos\phi_i$  from -1 to 1 in steps of 0,2

**Figure 2**

FRED

**Typical average static loss as a function of output current**

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

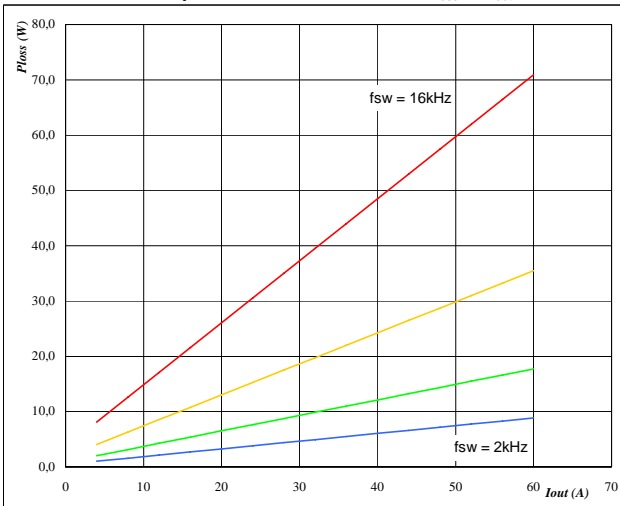

**At**
 $T_j = 150 \text{ } ^\circ\text{C}$ 
 $Mi \cdot \cos\phi_i$  from -1 to 1 in steps of 0,2

**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

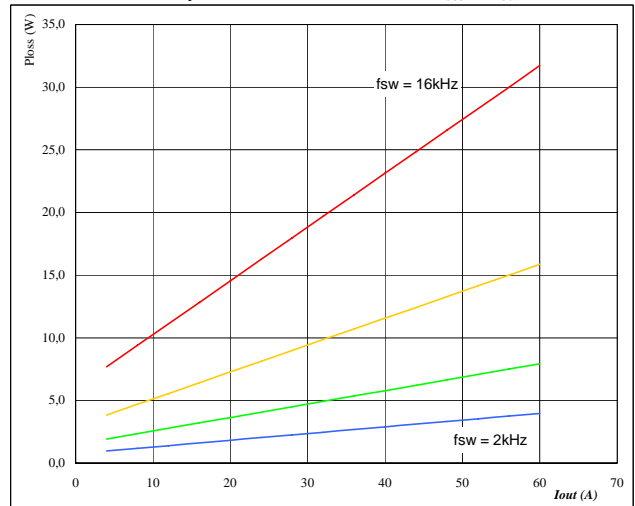
 $f_{sw}$  from 2 kHz to 16 kHz in steps of factor 2

**Figure 4**

FRED

**Typical average switching loss as a function of output current**

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


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

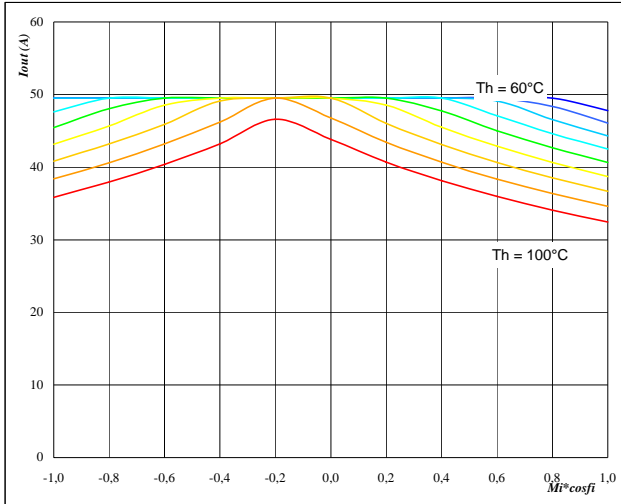
DC link = 600 V

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

**Figure 5** Phase

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

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

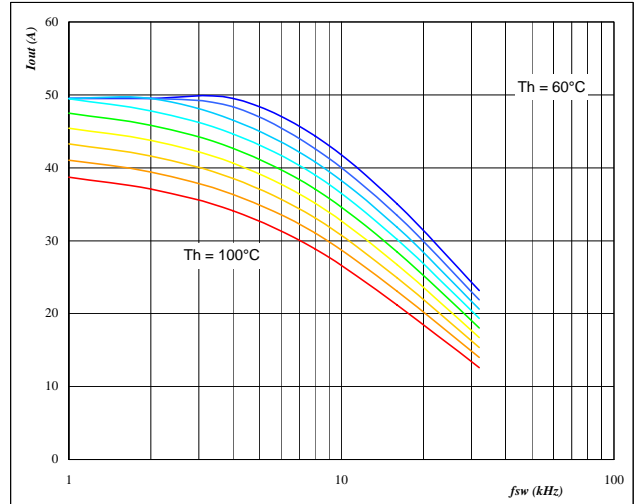


**At**  
 $T_j = 150$  °C  
 DC link = 600 V  
 $f_{sw} = 4$  kHz  
 $T_h$  from 60 °C to 100 °C in steps of 5 °C

**Figure 6** Phase

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

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

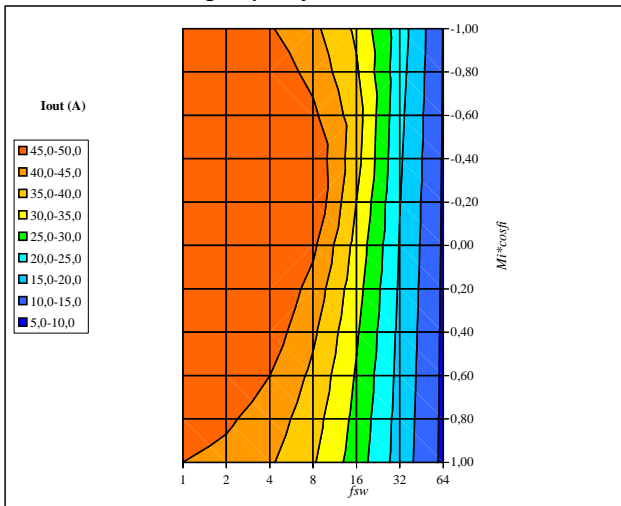


**At**  
 $T_j = 150$  °C  
 DC link = 600 V  
 $Mi \cdot \cos\phi_i = 0,8$   
 $T_h$  from 60 °C to 100 °C in steps of 5 °C

**Figure 7** Phase

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

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

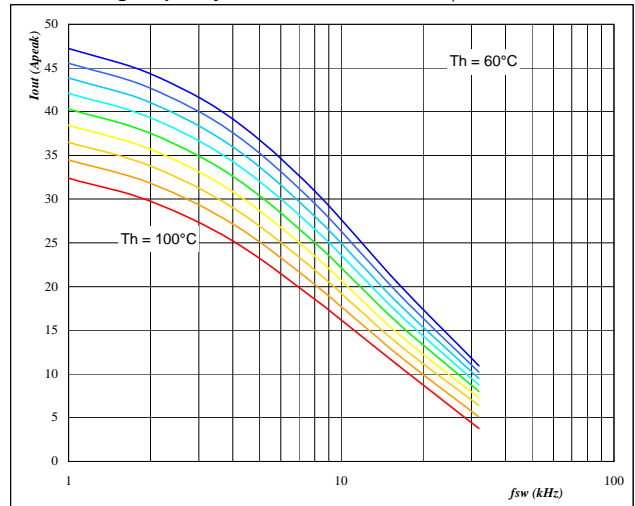


**At**  
 $T_j = 150$  °C  
 DC link = 600 V  
 $T_h = 80$  °C

**Figure 8** Phase

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

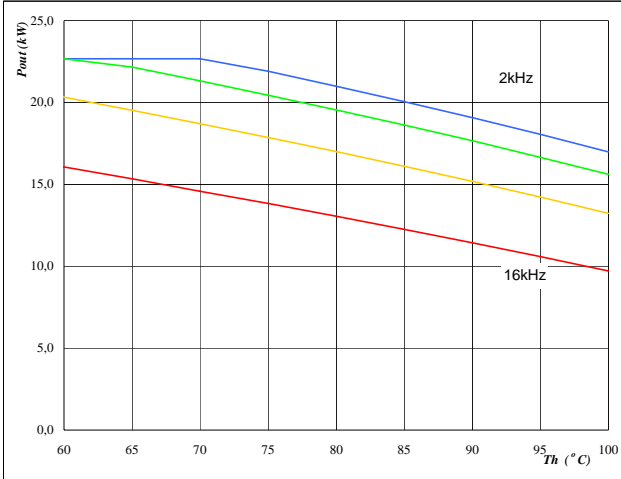
$$I_{outpeak} = f(f_{sw})$$



**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

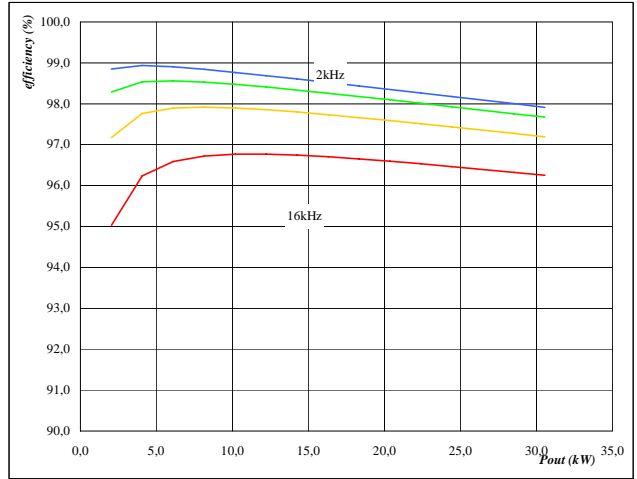
Typical available peak output power as a function of heatsink temperature  
 $P_{out}=f(T_h)$



At  
 $T_j = 150 \text{ } ^\circ\text{C}$   
 DC link = 600 V  
 $M_i = 1$   
 $\cos\phi_i = 0,80$   
 fsw from 2 kHz to 16 kHz in steps of factor 2

Figure 10 Inverter

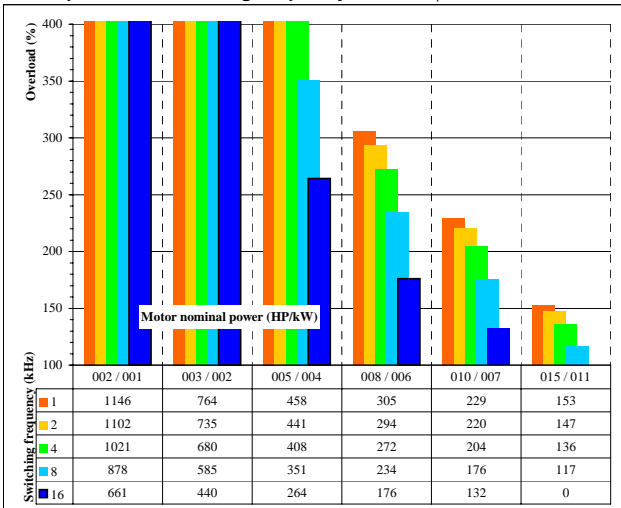
Typical efficiency as a function of output power  
efficiency=f( $P_{out}$ )



At  
 $T_j = 150 \text{ } ^\circ\text{C}$   
 DC link = 600 V  
 $M_i = 1$   
 $\cos\phi_i = 0,80$   
 fsw 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  
 $T_j = 150 \text{ } ^\circ\text{C}$   
 DC link = 600 V  
 $M_i = 1$   
 $\cos\phi_i = 0,8$   
 fsw from 1 kHz to 16kHz in steps of factor 2  
 $T_h = 90 \text{ } ^\circ\text{C}$   
 Motor eff = 0,85

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