

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

$$V_{GEon} = 15 \text{ V}$$

$$V_{GEoff} = 0 \text{ V}$$

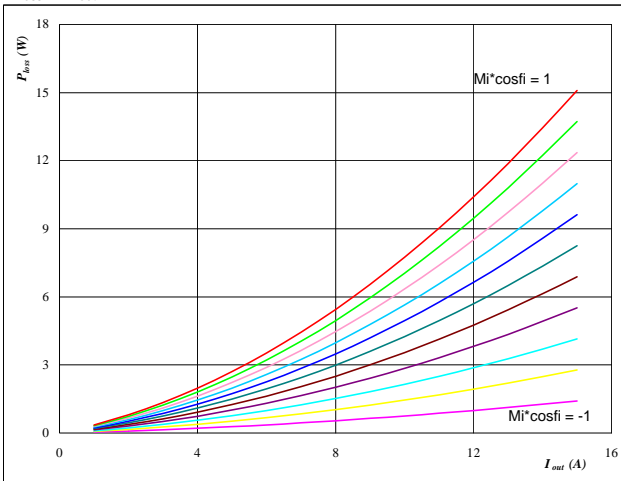
$$R_{gon} = 32 \ \Omega$$

$$R_{goff} = 16 \ \Omega$$

**Figure 1** IGBT

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

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


**At**

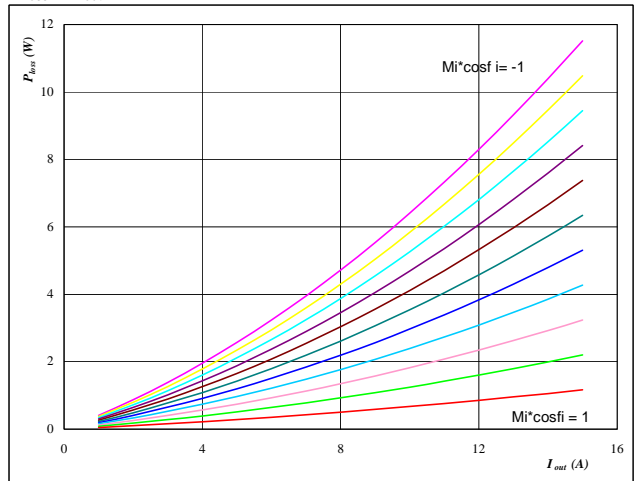
$$T_j = 125 \text{ }^\circ\text{C}$$

 $M_i \cdot \cos\phi$  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**

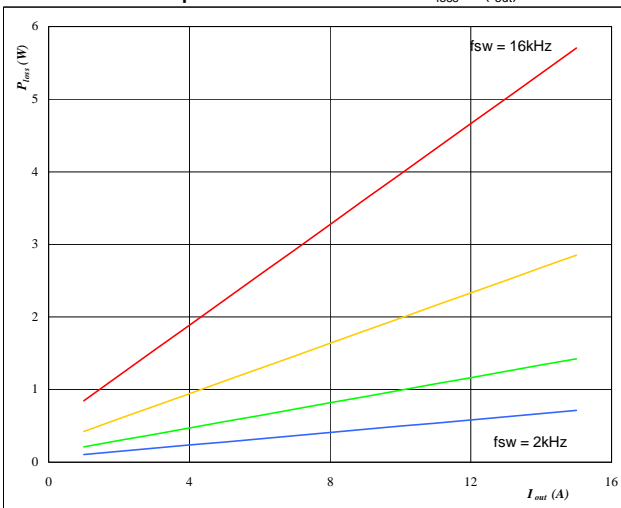
$$T_j = 125 \text{ }^\circ\text{C}$$

 $M_i \cdot \cos\phi$  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**

$$T_j = 125 \text{ }^\circ\text{C}$$

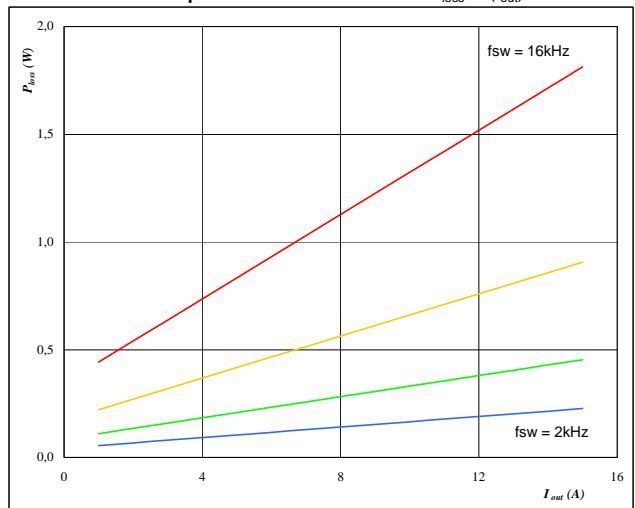
DC link = 320 V

 $f_{sw}$  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**

$$T_j = 125 \text{ }^\circ\text{C}$$

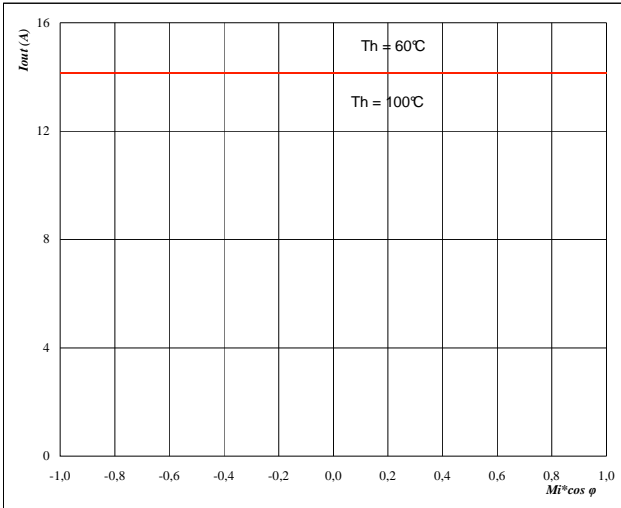
DC link = 320 V

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

**Figure 5** Phase

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

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

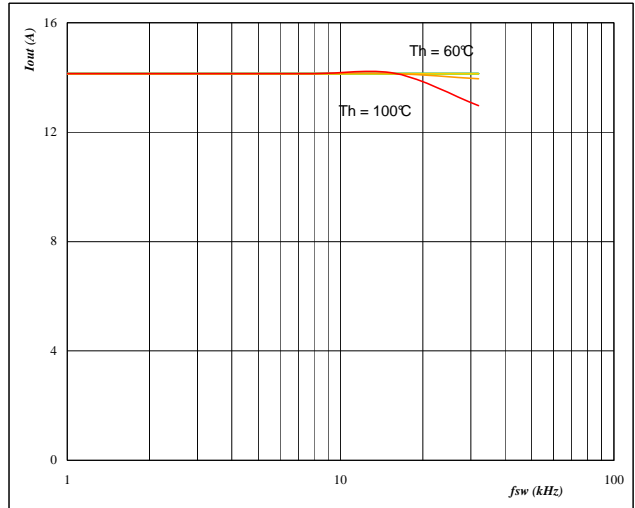


**At**  
 $T_j = 125 \text{ } ^\circ\text{C}$   
 DC link = 320 V  
 $f_{sw} = 4 \text{ kHz}$   
 $T_h$  from 60 °C to 100 °C in steps of 5 °C

**Figure 6** Phase

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

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

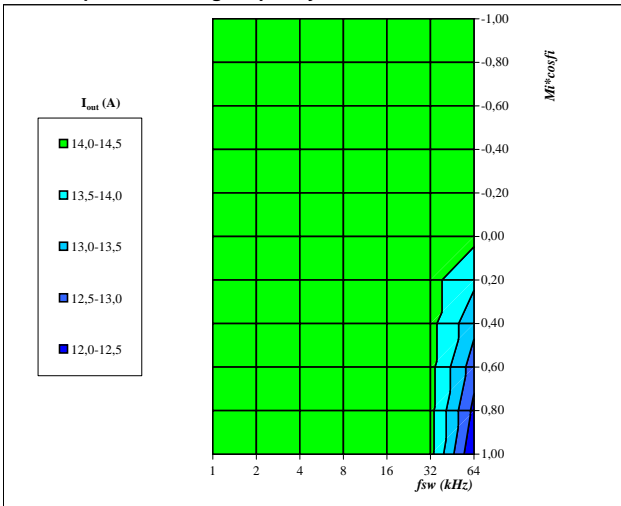


**At**  
 $T_j = 125 \text{ } ^\circ\text{C}$   
 DC link = 320 V  
 $Mi \cdot \cos \varphi = 0,8$   
 $T_h$  from 60 °C to 100 °C in steps of 5 °C

**Figure 7** Phase

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

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

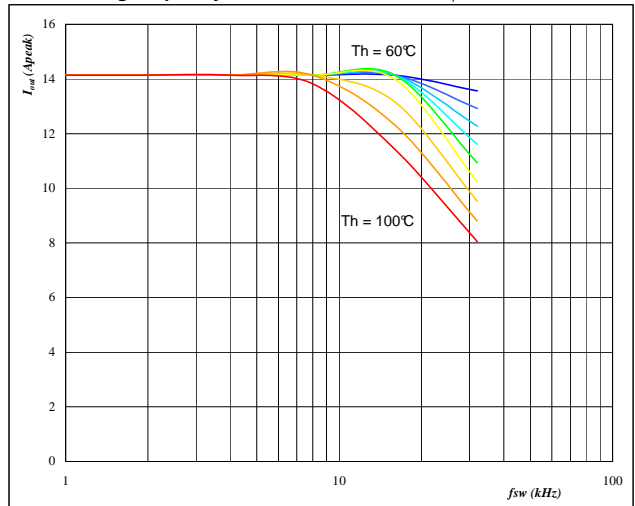


**At**  
 $T_j = 125 \text{ } ^\circ\text{C}$   
 DC link = 320 V  
 $T_h = 80 \text{ } ^\circ\text{C}$

**Figure 8** Phase

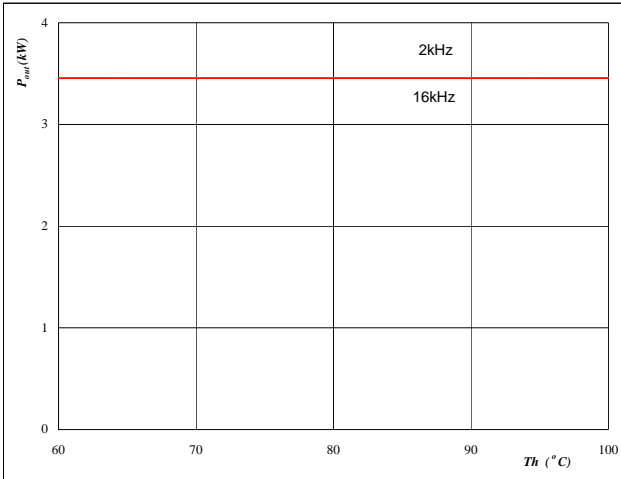
**Typical available 0Hz output current as a function of switching frequency**

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



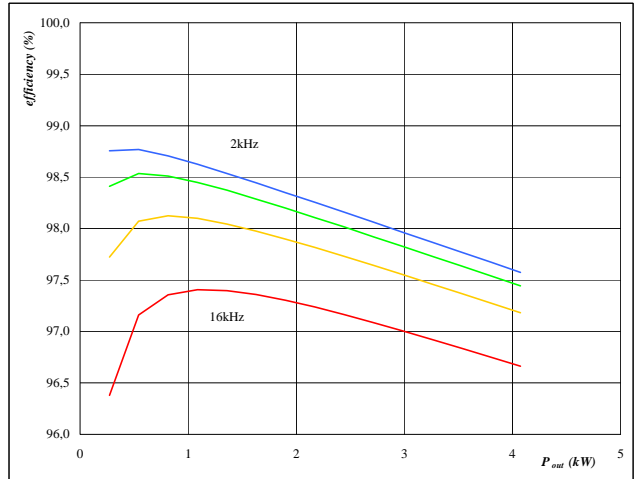
**At**  
 $T_j = 125 \text{ } ^\circ\text{C}$   
 DC link = 320 V  
 $T_h$  from 60 °C to 100 °C in steps of 5 °C  
 $Mi = 0$

**Figure 9** Inverter

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


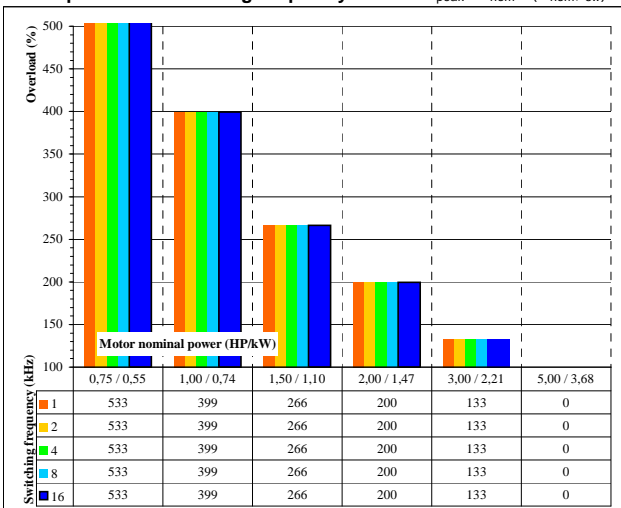
**At**  
 $T_j = 125$  °C  
 DC link = 320 V  
 $M_i = 1$   
 $\cos \varphi = 0,80$   
 $f_{sw}$  from 2 kHz to 16 kHz in steps of factor 2

**Figure 10** Inverter

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


**At**  
 $T_j = 125$  °C  
 DC link = 320 V  
 $M_i = 1$   
 $\cos \varphi = 0,80$   
 $f_{sw}$  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**  
 $T_j = 125$  °C  
 DC link = 320 V  
 $M_i = 1$   
 $\cos \varphi = 0,8$   
 $f_{sw}$  from 1 kHz to 16kHz in steps of factor 2  
 $T_h = 80$  °C  
 Motor eff = 0,85