flow PIM0+PFC — Output Inverter Application — 600 V / 6 A

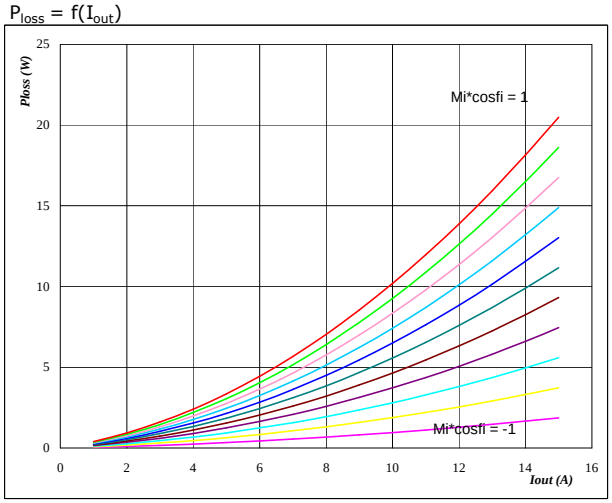
General conditions

3phase SPWM		
V_{GEon}	=	15 V
V_{GEoff}	=	-15 V
R_{gon}	=	64 Ω
R_{goff}	=	64 Ω

Figure 1 IGBT

Typical average static loss as a function of output current

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



At

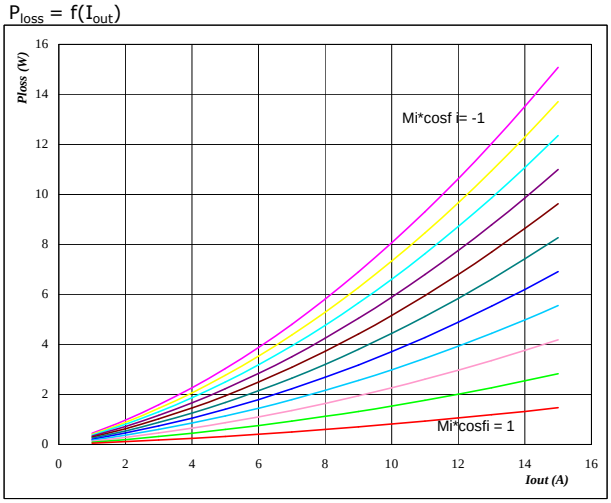
T_j = 125 °C

Mi*cosφ from -1 to 1 in steps of 0,2

Figure 2 FWD

Typical average static loss as a function of output current

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



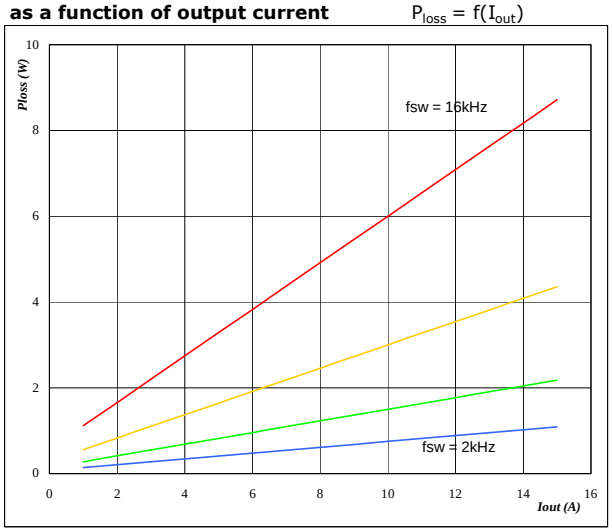
At

T_j = 125 °C

Mi*cosφ 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

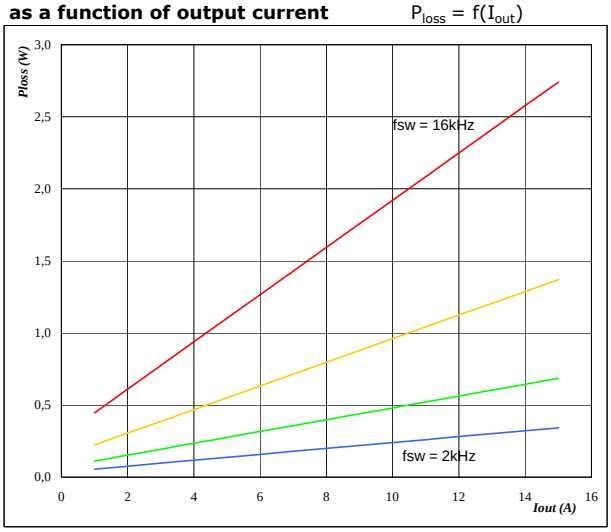
T_j = 125 °C

DC link = 400 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

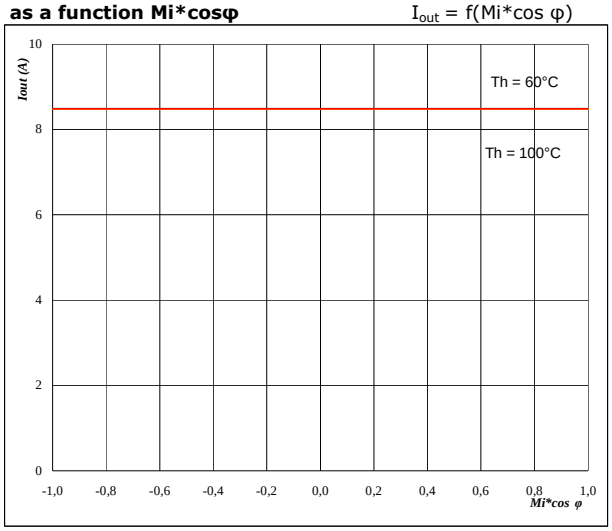
T_j = 125 °C

DC link = 400 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*cosφ $I_{out} = f(Mi*\cos\varphi)$

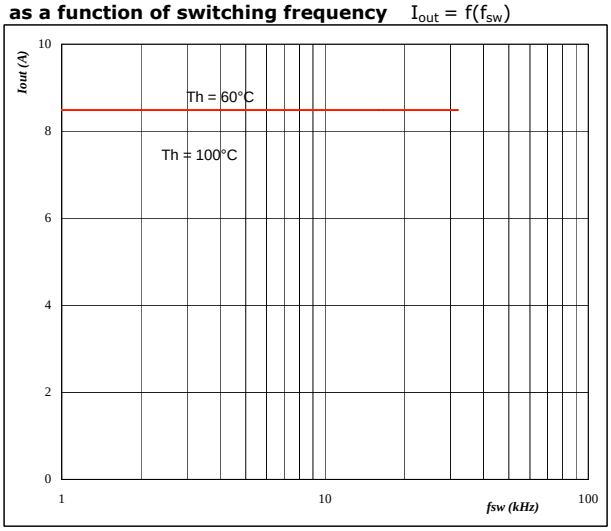


At

T_j =	125	°C
DC link =	400	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 $I_{out} = f(f_{sw})$

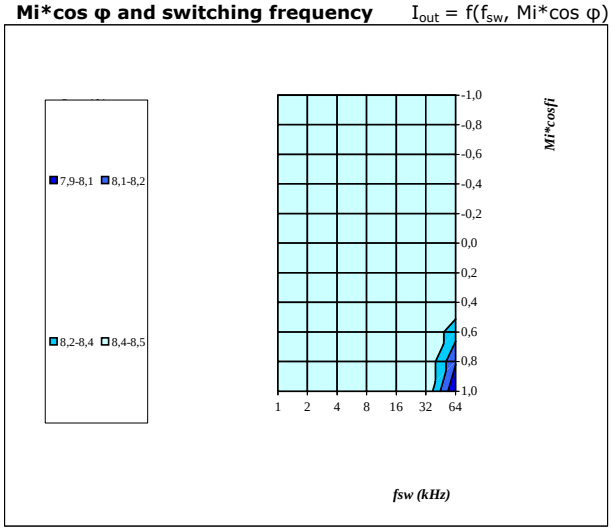


At

T_j =	125	°C
DC link =	400	V
Mi*cos φ =	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*cos φ and switching frequency $I_{out} = f(f_{sw}, Mi*\cos\varphi)$

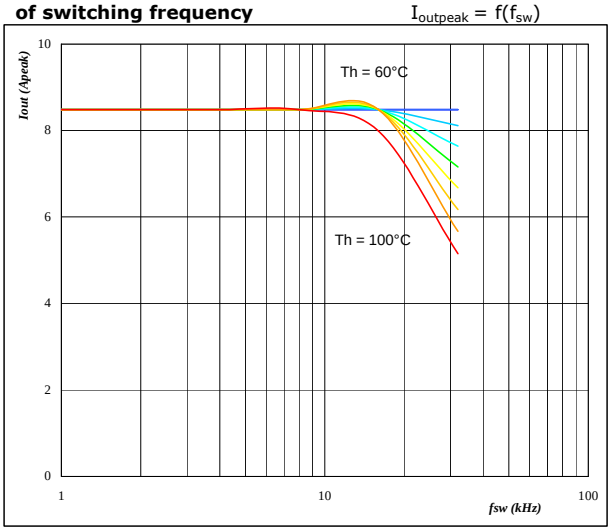


At

T_j =	125	°C
DC link =	400	V
T_h =	80	°C

Figure 8 Phase

Typical available 0Hz output current as a function of switching frequency $I_{outpeak} = f(f_{sw})$

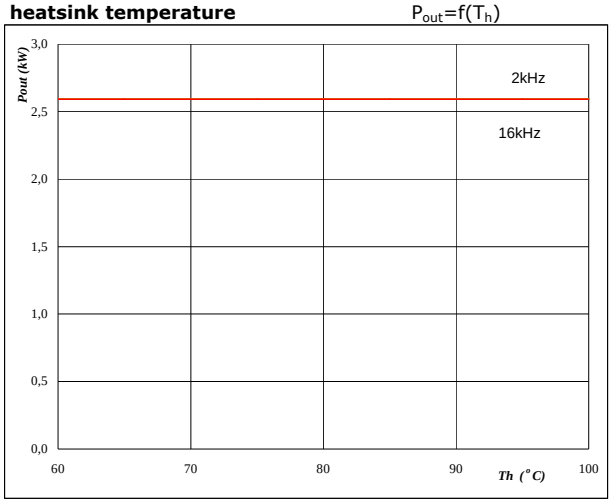


At

T_j =	125	°C
DC link =	400	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 $P_{out}=f(T_h)$

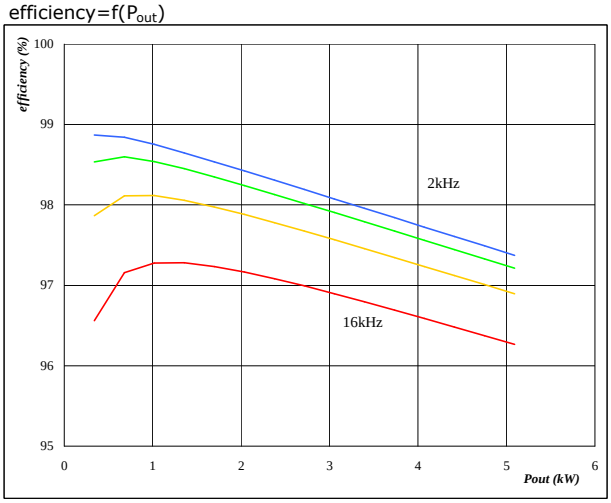


At

T_j =	125	°C
DC link =	400	V
Mi =	1	
cos φ=	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})

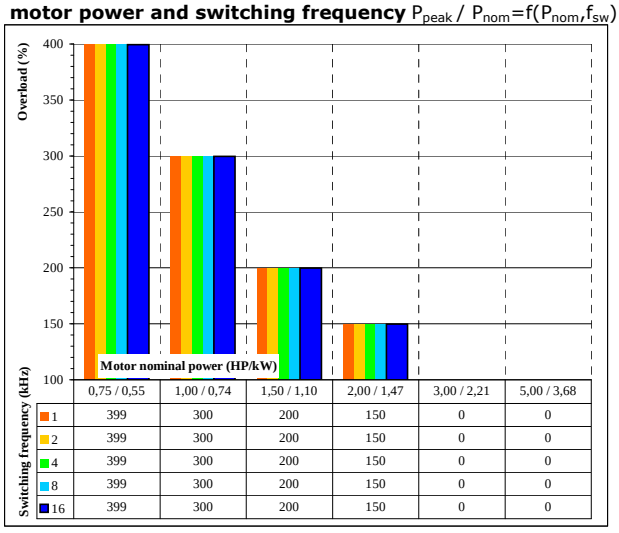


At

T_j =	125	°C
DC link =	400	V
Mi =	1	
cos φ=	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} / $P_{nom}=f(P_{nom},f_{sw})$



Switching frequency (kHz)	0,75 / 0,55	1,00 / 0,74	1,50 / 1,10	2,00 / 1,47	3,00 / 2,21	5,00 / 3,68
1	399	300	200	150	0	0
2	399	300	200	150	0	0
4	399	300	200	150	0	0
8	399	300	200	150	0	0
16	399	300	200	150	0	0

At

T_j =	125	°C
DC link =	400	V
Mi =	1	
cos φ=	0,8	
f_{sw} from	1 kHz to 16kHz in steps of factor 2	
T_h =	80	°C
Motor eff =	0,85	

flow PIM0 + PFC	**Boost PFC Application**	600 V / 6 A

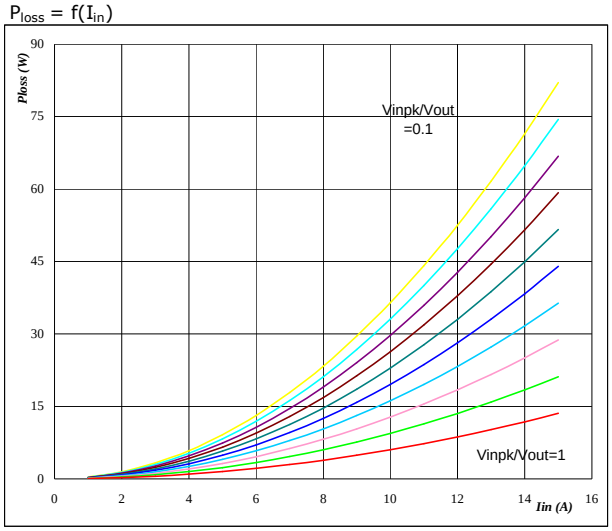
General conditions

Boost PFC	
V_{GEon}	= 10 V
V_{GEoff}	= 0 V
R_{gon}	= 4 Ω
R_{goff}	= 4 Ω
V_{in}	= V_{inpk}*sinωt

Figure 1 MOSFET

Typical average static loss as a function of input current

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



At

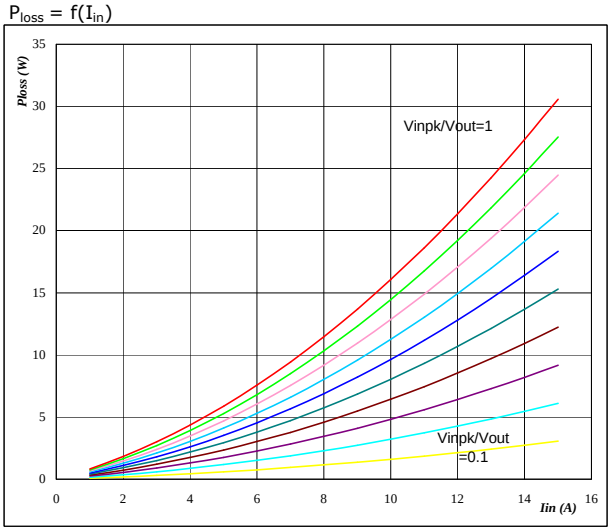
T_j = 125 °C

Vinpk / Vout from 0,1 to 1 in steps of 0,1

Figure 2 FWD

Typical average static loss as a function of input current

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



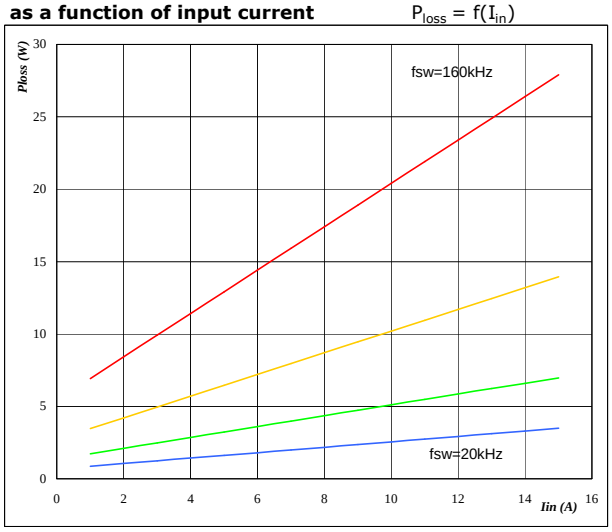
At

T_j = 125 °C

Vinpk / Vout from 0,1 to 1 in steps of 0,1

Figure 3 MOSFET

Typical average switching loss as a function of input current $P_{loss} = f(I_{in})$



At

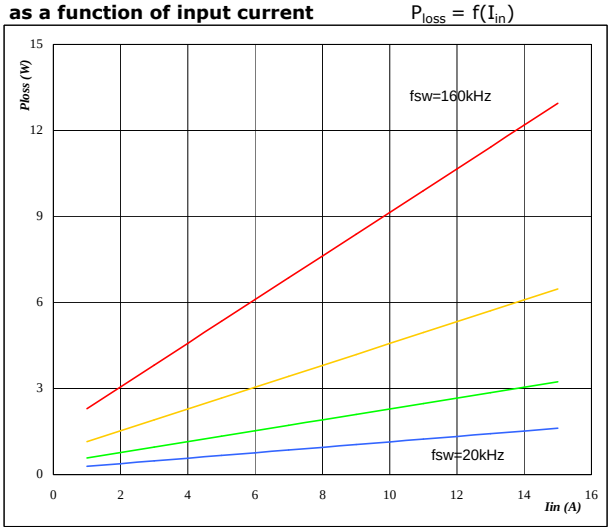
T_j = 125 °C

DC link = 400 V

fsw from 20 kHz to 160 kHz in steps of factor 2

Figure 4 FWD

Typical average switching loss as a function of input current $P_{loss} = f(I_{in})$



At

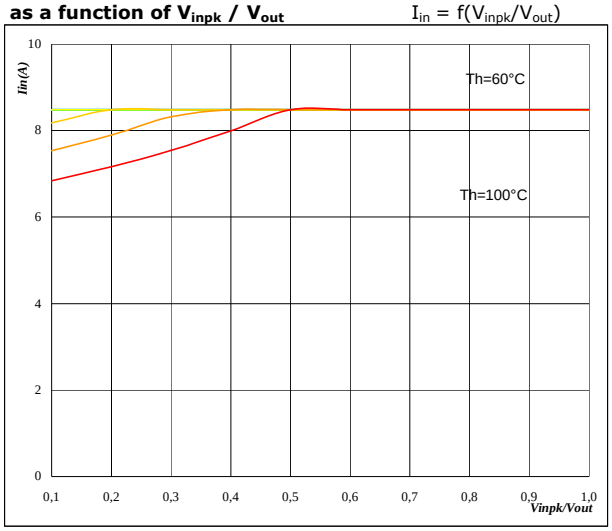
T_j = 125 °C

DC link = 400 V

fsw from 20 kHz to 160 kHz in steps of factor 2

Figure 5 PFC

Typical available input current as a function of V_{inpk} / V_{out} $I_{in} = f(V_{inpk}/V_{out})$

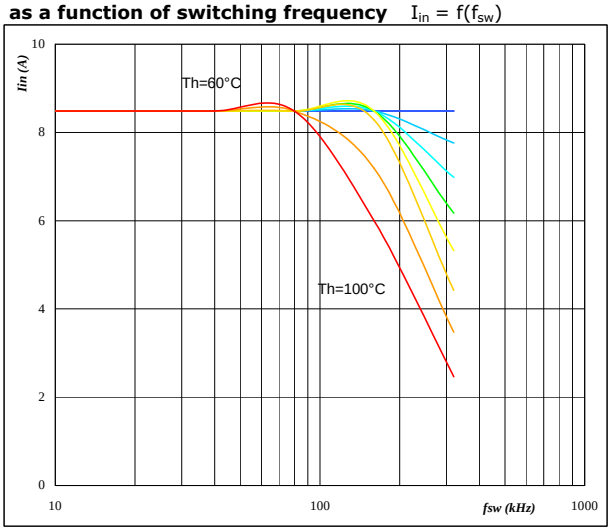


At

T_j = 125 °C
DC link = 400 V
fsw = 20 kHz
Th from 60 °C to 100 °C in steps of 5 °C

Figure 6 PFC

Typical available input current as a function of switching frequency $I_{in} = f(f_{sw})$

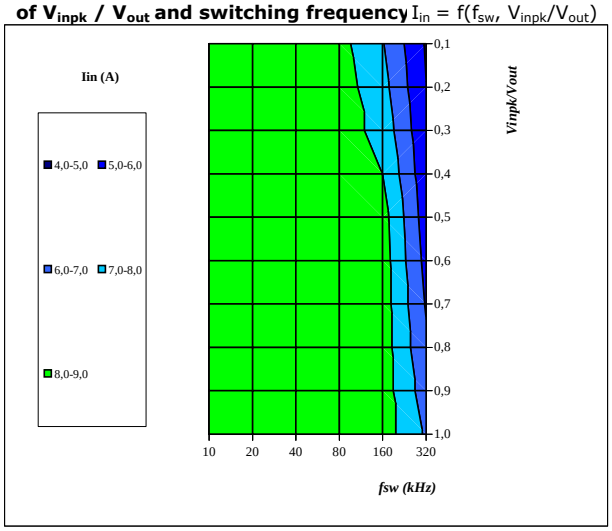


At

T_j = 125 °C
DC link = 400 V
V_{inpk}/V_{out} = 0,8
Th from 60 °C to 100 °C in steps of 5 °C

Figure 7 PFC

Typical available input current as a function of V_{inpk} / V_{out} and switching frequency $I_{in} = f(f_{sw}, V_{inpk}/V_{out})$

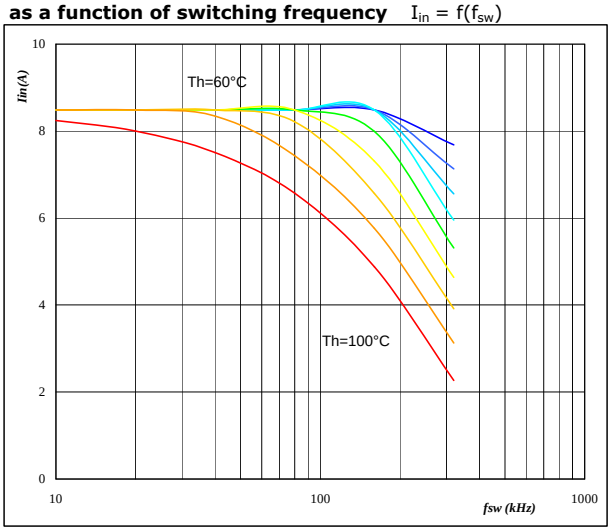


At

T_j = 125 °C
DC link = 400 V
T_h = 80 °C

Figure 8 PFC

Typical available input current as a function of switching frequency $I_{in} = f(f_{sw})$

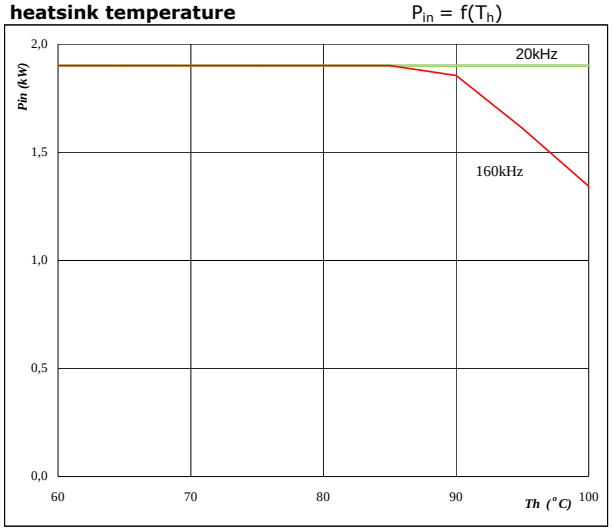


At

T_j = 125 °C
DC link = 400 V
V_{inpk}/V_{out} = 0,4
Th from 60 °C to 100 °C in steps of 5 °C

Figure 9 PFC

Typical available electric input power as a function of heatsink temperature $P_{in} = f(T_h)$

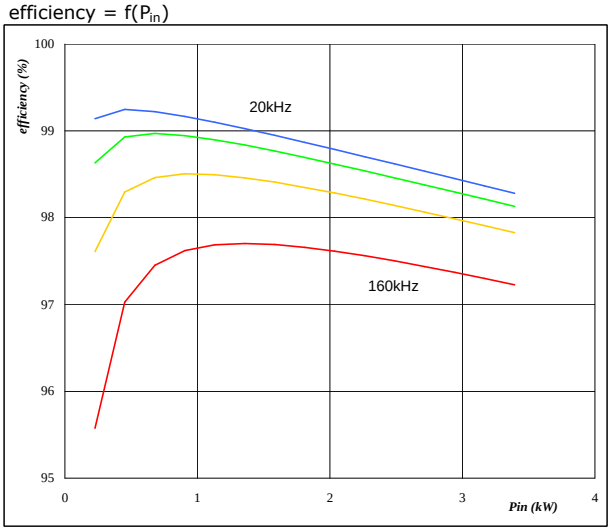


At

T_j = 125 °C
DC link = 400 V
V_{inpk}/V_{out} = 0,8 kHz
fsw from 20 kHz to 160 kHz in steps of factor 2

Figure 10 PFC

Typical efficiency as a function of input power efficiency = $f(P_{in})$

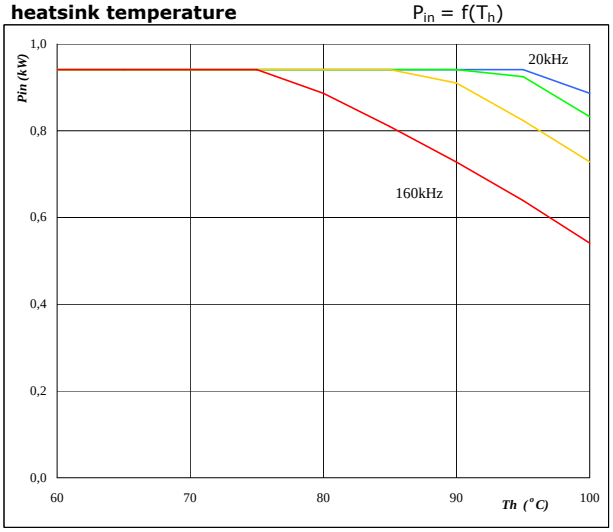


At

T_j = 125 °C
DC link = 400 V
V_{inpk}/V_{out} = 0,8 kHz
fsw from 20 kHz to 160 kHz in steps of factor 2

Figure 11 PFC

Typical available electric input power as a function of heatsink temperature $P_{in} = f(T_h)$

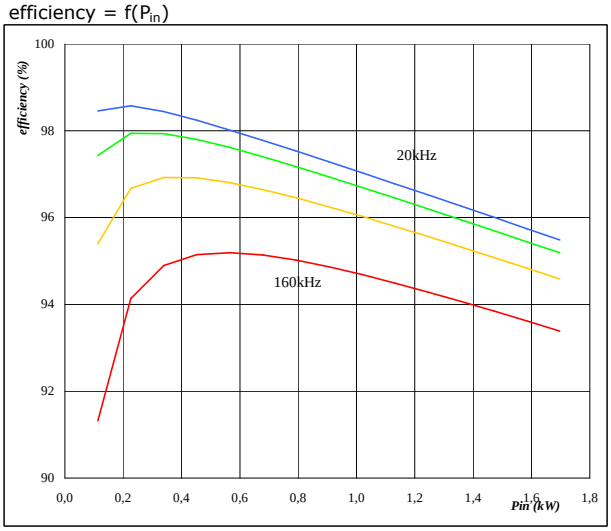


At

T_j = 125 °C
DC link = 400 V
V_{inpk}/V_{out} = 0,4
fsw from 20 kHz to 160 kHz in steps of factor 2

Figure 12 PFC

Typical efficiency as a function of input power efficiency = $f(P_{in})$



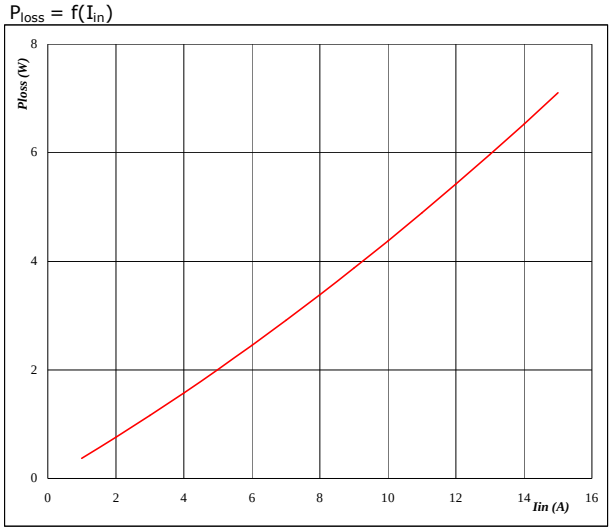
At

T_j = 125 °C
DC link = 400 V
V_{inpk}/V_{out} = 0,4
fsw from 20 kHz to 160 kHz in steps of factor 2

Figure 13 Rectifier

Typical average static loss as a function of input current

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



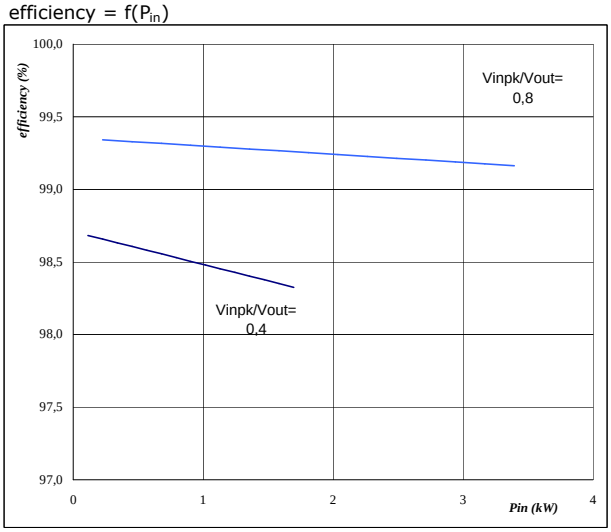
At

T_j = 125 °C

Figure 14 Rectifier Bridge

Typical efficiency as a function of input power

efficiency = $f(P_{in})$



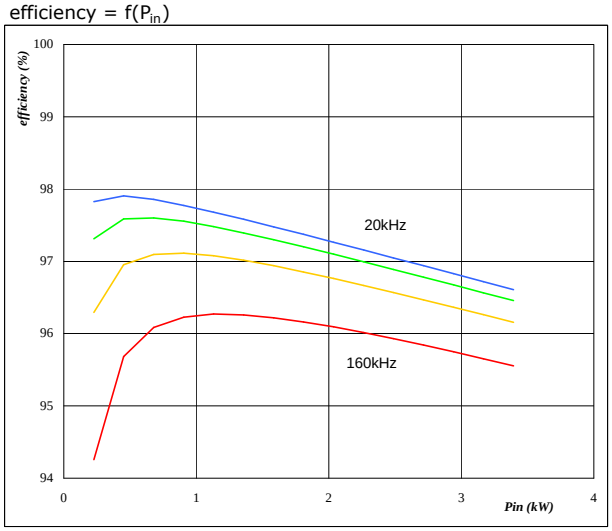
At

T_j = 125 °C

Figure 15 Overall

Typical efficiency as a function of input power

efficiency = $f(P_{in})$



At

T_j = 125 °C

DC link = 400 V

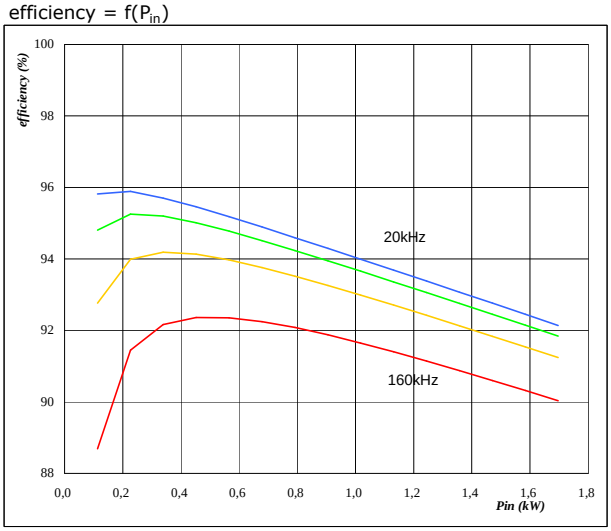
V_{inpk}/V_{out} = 0,8 kHz

fsw from 20 kHz to 160 kHz in steps of factor 2

Figure 16 Overall

Typical efficiency as a function of input power

efficiency = $f(P_{in})$



At

T_j = °C

DC link = 400 V

V_{inpk}/V_{out} = 0,4 kHz

fsw from 20 kHz to 160 kHz in steps of factor 2