flowPIM 0	Output Inverter Application	600V/30A

General conditions

3phase SPWM

V_{GEon}	=	15 V
V_{GEoff}	=	0 V
R_{gon}	=	8 Ω
R_{goff}	=	4 Ω

Figure 1	IGBT

Typical average static loss as a function of output current

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

Mi*cosfi = 1

Mi*cosfi = -1

At

T_j = 125 °C

Mi*cosφ from -1 to 1 in steps of 0,2
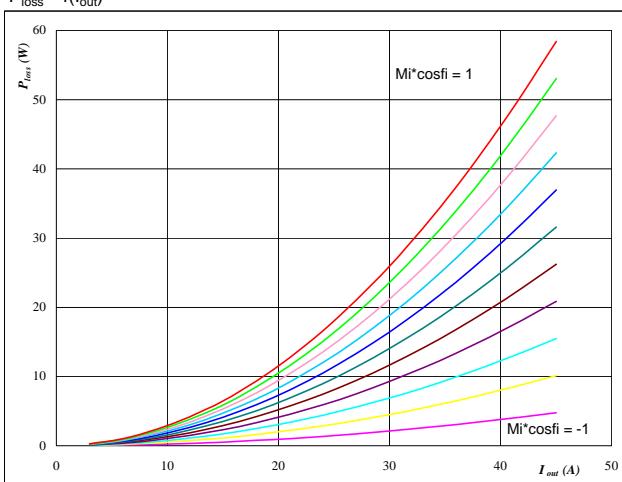
Figure 2	FWD

Typical average static loss as a function of output current

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

Mi*cosf i= -1

Mi*cosfi = 1

At

T_j = 125 °C

Mi*cosφ from -1 to 1 in steps of 0,2
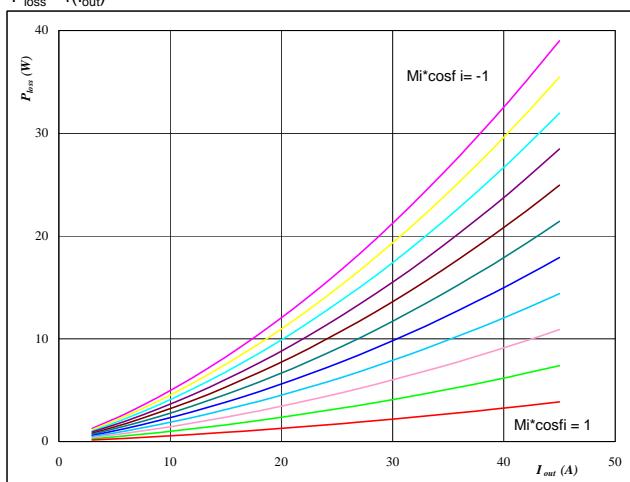
Figure 3	IGBT

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

fsw = 16kHz

fsw = 2kHz

At

T_j = 125 °C

DC link = 320 V

f_{sw} from 2 kHz to 16 kHz in steps of factor 2
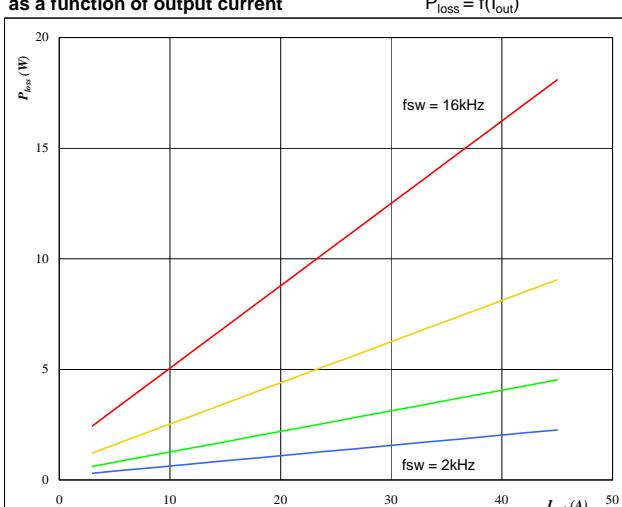
Figure 4	FWD

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

fsw = 16kHz

fsw = 2kHz

At

T_j = 125 °C

DC link = 320 V

f_{sw} from 2 kHz to 16 kHz in steps of factor 2
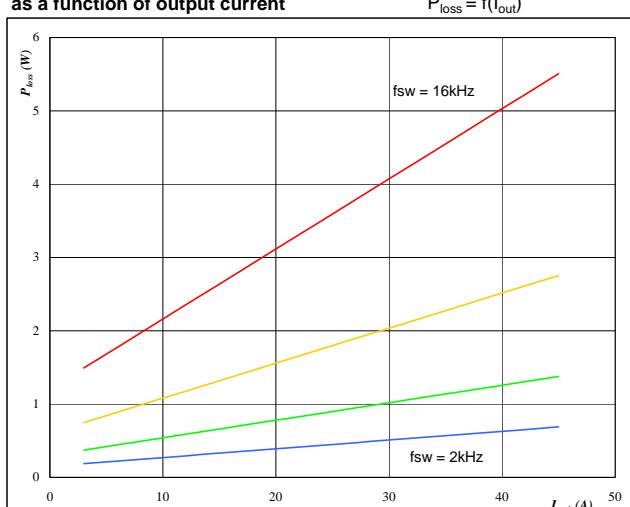
flowPIM 0	Output Inverter Application	600V/30A

Figure 5 — Phase

Typical available 50Hz output current as a function Mi*cosφ $I_{out} = f(Mi*cos\ \varphi)$

Th = 60℃
Th = 100℃

At
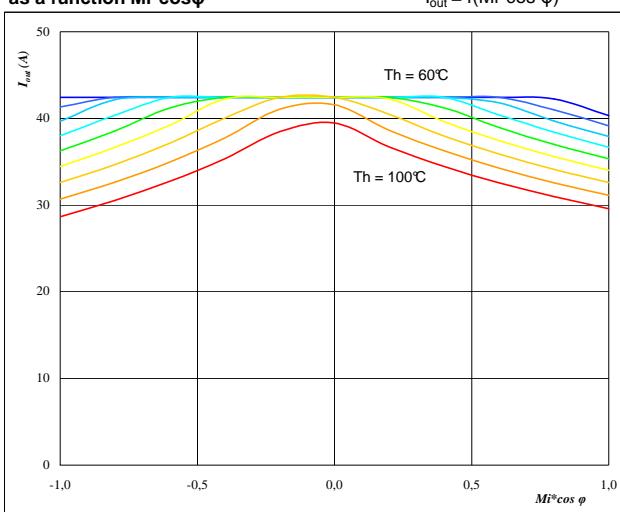
T_j =	125	℃
DC link =	320	V
f_{sw} =	4	kHz
T_h from	60 ℃ to 100 ℃ in steps of 5 ℃	

Figure 6 — Phase

**Typical available 50Hz output current as a function of switching frequency** $I_{out} = f(f_{sw})$

Th = 60℃
Th = 100℃

At

T_j =	125	℃
DC link =	320	V
Mi*cos φ =	0,8	
T_h from	60 ℃ to 100 ℃ in steps of 5 ℃	

Figure 7 — Phase

Typical available 50Hz output current as a function of Mi*cos φ and switching frequency $I_{out} = f(f_{sw}, Mi*cos\ \varphi)$

I_{out} (A)

- 40,0-45,0
- 35,0-40,0
- 30,0-35,0
- 25,0-30,0
- 20,0-25,0
- 15,0-20,0

At

T_j =	125	℃
DC link =	320	V
T_h =	80	℃

Figure 8 — Phase
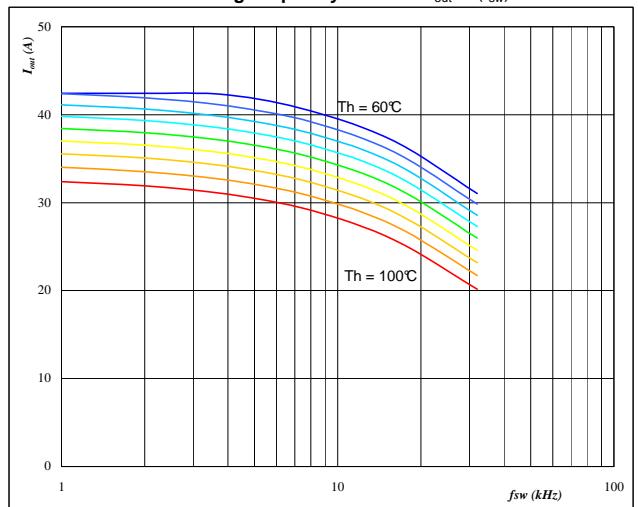
Typical available 0Hz output current as a function of switching frequency $I_{outpeak} = f(f_{sw})$

Th = 60℃
Th = 100℃

At
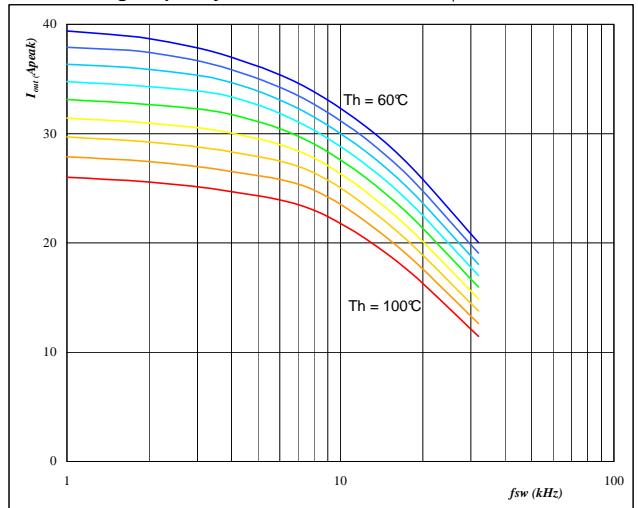
T_j =	125	℃
DC link =	320	V
T_h from	60 ℃ to 100 ℃ in steps of 5 ℃	
Mi =	0	

flowPIM 0	**Output Inverter Application**	**600V/30A**

Figure 9	Inverter

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

At
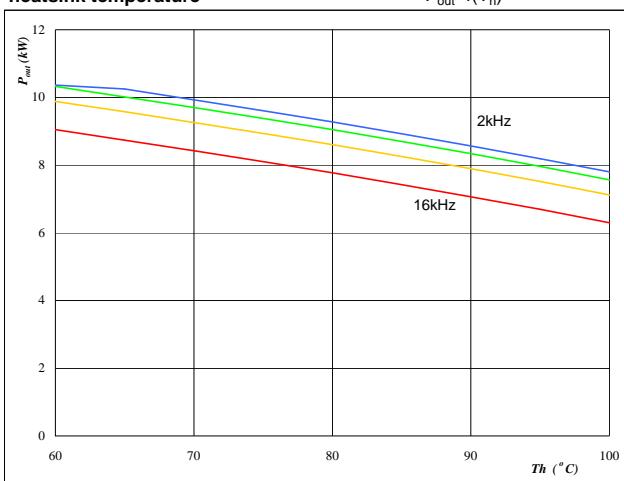
$T_j =$	125	℃
DC link =	320	V
Mi =	1	
cos φ=	0,80	
f_{sw} from	2 kHz to 16 kHz in steps of factor 2	

Figure 10	Inverter

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

At
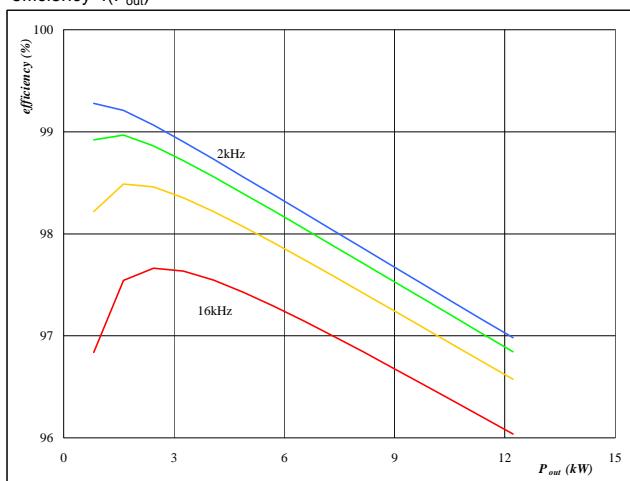
$T_j =$	125	℃
DC link =	320	V
Mi =	1	
cos φ=	0,80	
f_{sw} from	2 kHz to 16 kHz in steps of factor 2	

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)	Motor nominal power (HP/kW)					
	2,00 / 1,47	3,00 / 2,21	5,00 / 3,68	7,50 / 5,52	10,00 / 7,36	15,00 / 11,03
1	543	362	217	145	0	0
2	536	357	214	143	0	0
4	523	348	209	139	0	0
8	497	331	199	133	0	0
16	449	299	180	120	0	0

At
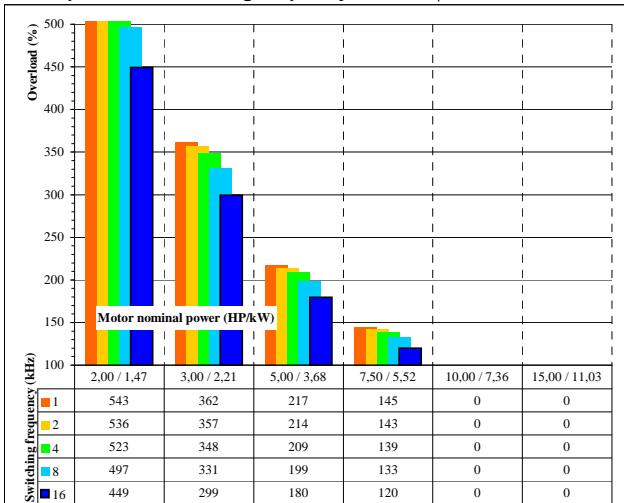
$T_j =$	125	℃
DC link =	320	V
Mi =	1	
cos φ=	0,8	
f_{sw} from	1 kHz to 16kHz in steps of factor 2	
$T_h =$	80	℃
Motor eff =	0,85	