

# IGD-1-424-P1N4-DL-FA



IGBT Module stack

Absolute maximum ratings		$T_{AMBIENT} = T_{AIR\ COOLING} = 40^{\circ}C$ unless otherwise specified	
Symbol	Conditions	Values	Unit
$I_{OUT\ MAX}$	Maximum continuous output current	200	ARMS
$V_{OUT\ MAX}$	Maximum output voltage	500	VAC
$V_{BUS\ MAX}$	Maximum DC Bus voltage in operation	900	VDC
$F_{OUT}$	Inverter Output frequency	500	Hz
$F_{SW}$	Maximum switching frequency	25	kHz

Electrical characteristics		$T_{AMBIENT} = T_{AIR\ COOLING} = 40^{\circ}C$ unless otherwise specified			
Symbol	Conditions	min	typ	max	Unit
<b>AC phase</b>					
$I_{OUT\ RATED}$	Rated output current	V <sub>BUS</sub> =750Vdc, No overload, T <sub>j</sub> <150°C, Power factor PF = 1, Cabinet airflow in operation at 400m3/h		200	ARMS
$V_{OUT}$	Output voltage	Fan airflow through heatsink at 900 m3/h		400	VAC
$P_{OUT}$	Rated output power			140	kW
$F_{SW}$	Inverter switching frequency			3	kHz
$F_{OUT}$	Output frequency			50	Hz
<b>DC Bus</b>					
$V_{BUS}$	Rated DC voltage			750	Vdc
<b>Efficiency</b>					
$P_{LOSS\ INV}$	Total power losses			1 915	W
$\eta$	Inverter efficiency			>98	%
<b>Filtering characteristics</b>					
$V_{BUS}$	Rated DC voltage applied to the caps bank without switching			1 100	Vdc
$V_{DC\ CAPACITOR}$	Max DC voltage applied to the caps bank (max 30% of LTE) without switching			1 100	Vdc
$\tau_{d5\%}$	Discharge time of the capacitors (5%)			285	s
CDC	Capacitor bank capacity	1,43		1,68	mF
LTE	Calculated LTE of the caps with forced air cooling			> 100	kH
<b>Stack Insulation</b>					
$V_{ISOL}$	Frame / Power stage AC/DC (insulation test voltage DC, 60s)			3 200	V

## SEMIKUBE - Size T0.5

3-phase inverter

Ordering No. 08800445

Description IGD-1-424-P1N4-DL-FA

Option 0C 0N 0P K - 0X - 1F2

### Features

- Designed in regards to EN50178 recommendations
- RoHS compliant
- Fast mounting and dismounting
- Very high life-time expectancy
- Integrated voltage, current and temperature sensors
- Air cooled power stacks

### Typical Applications

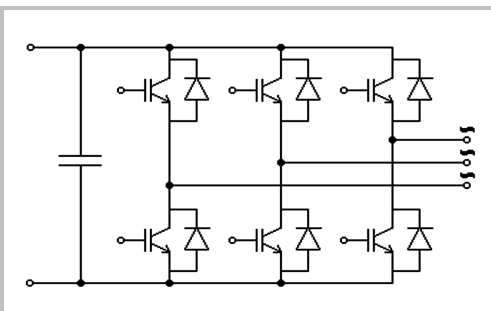
- Industrial applications
- Solar Inverters

### Footnotes

1) the user shall ensure that the ambient air shall be ventilated in order not to create temperature hot spots.

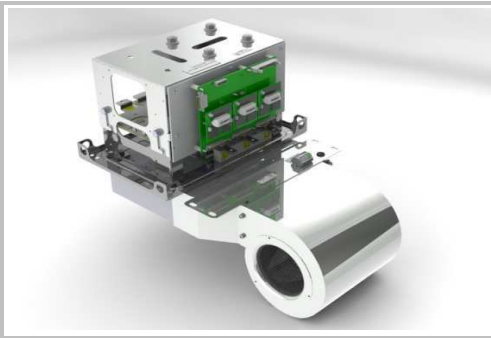
### REMARKS

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B6CI

# IGD-1-424-P1N4-DL-FA



IGBT Module stack

Environmental conditions					
Characteristics	Conditions	min	typ	max	Unit
<b>Climatic</b>					
Ambient temperature 1)	IEC 60721-3-3, class 3K3 extended In operation	-25		55	°C
Humidity	IEC 60721-3-3, class 3K3 no condensation no icing	5		85	%
<b>Mechanical</b>					
Installation altitude	without derating			1 000	m
Protection index	IEC 60529		IP00		-
Pollution degree	EN 50178		2		-
Weight total	3-phase inverter including heatsink fan		25		kg
<b>Thermal data</b>					
V <sub>SUPPLY</sub>	Heatsink fan AC voltage supply		230		V <sub>AC</sub>
P <sub>FAN</sub>	at 50Hz Rated power at V <sub>SUPPLY</sub>		300		W

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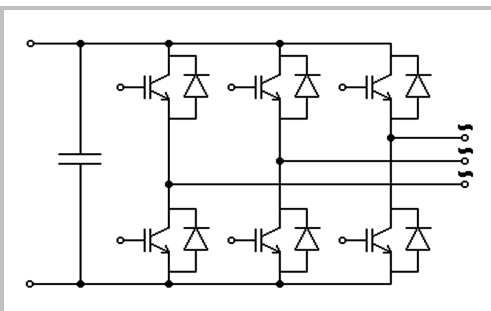
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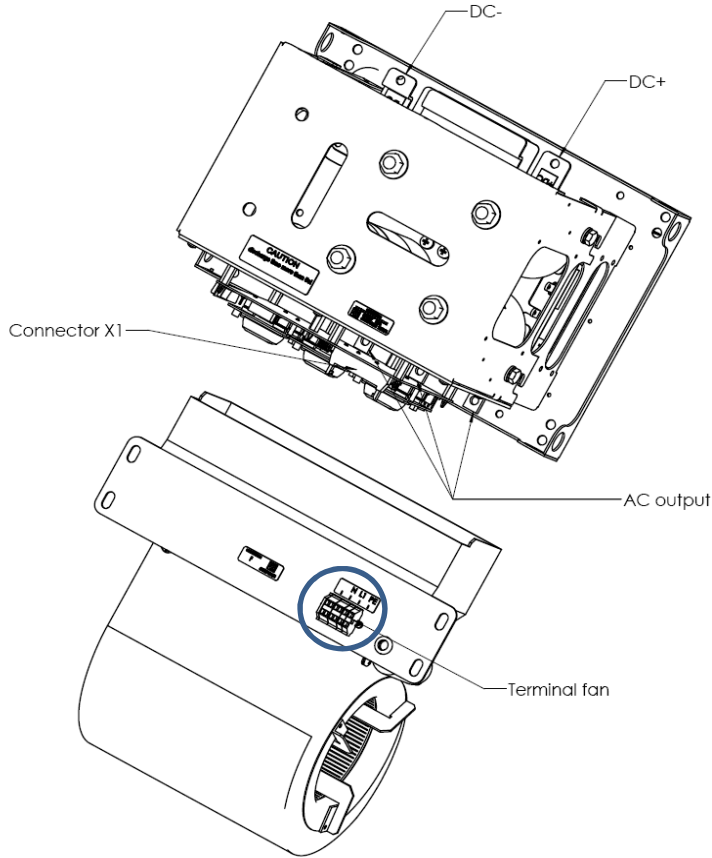
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Gate Driver Characteristics					
<i>T<sub>AMBIENT</sub> = 25°C unless otherwise specified</i>					
Symbol	Conditions	min	typ	max	Unit
<b>Gate Driver / controller data</b>					
V <sub>s</sub>	supply voltage	21,6	24	26,4	V <sub>DC</sub>
I <sub>SO</sub>	Supply primary current No load	360			mA
	Max. Supply primary current			1 500	mA
V <sub>IT+</sub>	input threshold voltage HIGH			0,7 x V <sub>s</sub>	V <sub>DC</sub>
V <sub>IT-</sub>	input threshold voltage LOW	0,3 x V <sub>s</sub>			V <sub>DC</sub>
R <sub>IN</sub>	Input resistance		17		kΩ
C <sub>IN</sub>	Input capacitance		1		nF
<b>Measurement &amp; protection</b>					
DC link voltage sensing U <sub>DC analogue OUT</sub>	Scaling		10		mV.V <sup>-1</sup>
	Accuracy of analogue signal @ T <sub>a</sub> =25°C	-2		+2	%
	Temperature coefficient			0,03	%.K <sup>-1</sup>
	max. load current			5	mA
	Max. voltage range			15	V <sub>DC</sub>
	Max measurable DC Link Voltage			1 200	V <sub>DC</sub>
Current sensing I <sub>analogue OUT</sub> per phase	Scaling		24		mV.A <sup>-1</sup>
	Accuracy of analogue signal	-4		+4	%
	Temperature coefficient			0,07	%.K <sup>-1</sup>
	Max. output current			5	mA
	Max. voltage range			15	V <sub>DC</sub>
I <sub>TRIPSC</sub>	Over current trip level		450		A <sub>PEAK</sub>
Temperature sensing T <sub>analogue OUT</sub>	Scaling		10		mV.°C <sup>-1</sup>
	Minimum measurable temperature	25			°C
	Max. output current			5	mA
	Max. voltage range			15	V <sub>DC</sub>
T <sub>TP</sub>	Over temperature protection	95	100	105	°C
T <sub>TH</sub>	Threshold level for reset after failure event	70			°C

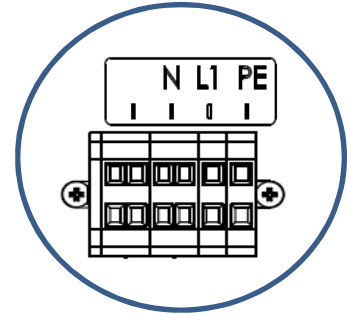


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Electrical connection

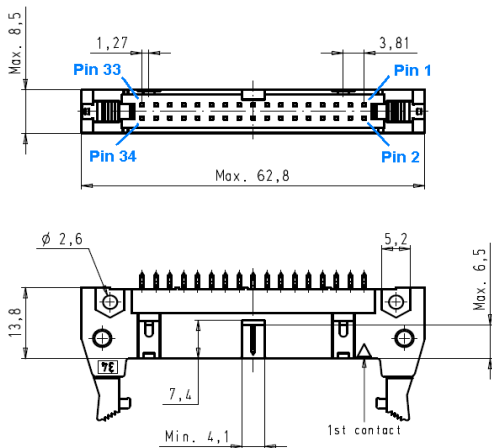


Terminal fan power supply connection



Driver connector type

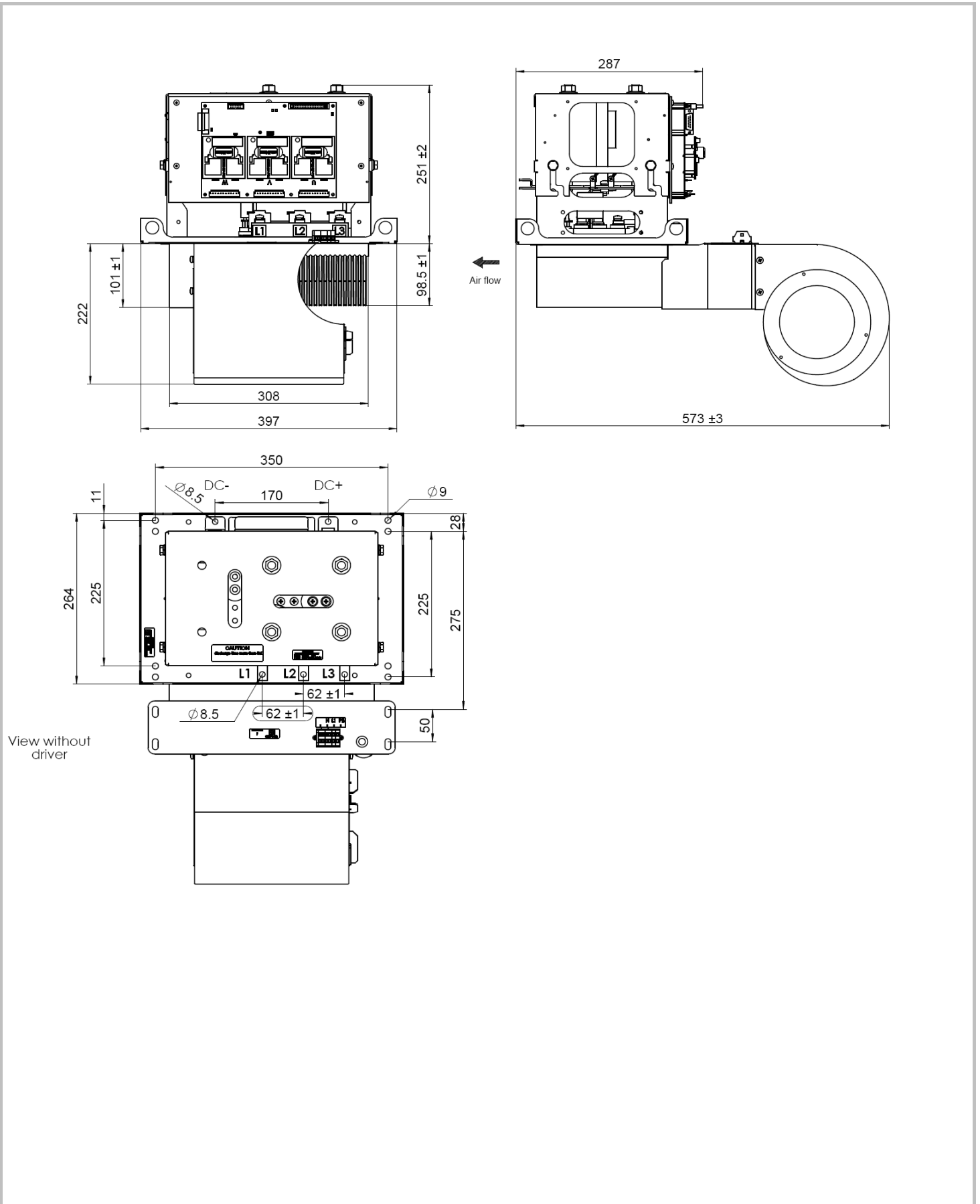
Flat cable connector X1



Suitable female connector  
 Manufacturer: HARTING  
 Part number: 09 18 534 7 813

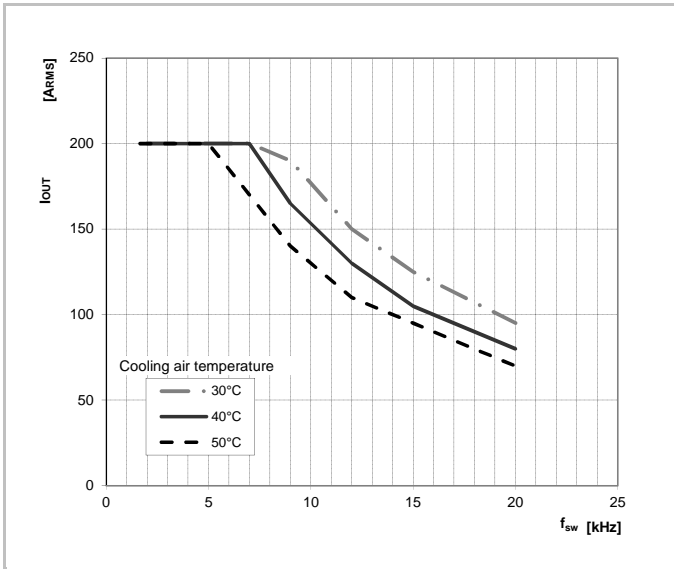
## Driver X1 connector assignment

PIN	Signal	Specification
1,3,5	Vs IN	Supply voltage
2,4,6	GND	
7	[Reserved]	[dominant/recessive]
8	GND (Signal Status)	Ground for Signal Status OUT
9	Signal Status BIDIRECTIONAL	24VDC digital logic input, push pull LOW [dominant] = "Not ready to operate" HIGH [recessive] = "Ready to operate"
10	[Reserved]	[dominant/recessive]
11	Temperature Analogue OUT	Nominal voltage range: 0...10V
12	GND (Temperature Analogue)	Ground for Temperature Analogue OUT
13	UDC Analogue OUT	Nominal voltage range: 0...10V
14	GND (UDC Analogue)	Ground for UDC Analogue OUT
15	TOP phase U Switching Signal IN	24VDC digital logic input, push pull LOW = "Switch off" HIGH = "Switch on"
16	BOT Phase U Switching Signal IN	24VDC digital logic input, push pull LOW = "Switch off" HIGH = "Switch on"
17	[Reserved]	[dominant/recessive]
18	GND (TOP phase U, BOT phase U)	Ground for TOP & BOT phase U IN
19	I phase U Analogue OUT	Nominal voltage range: 0...10V
20	GND (I Analogue phase U)	Ground for I phase U Analogue OUT
21	TOP phase V Switching Signal IN	24VDC digital logic input, push pull LOW = "Switch off" HIGH = "Switch on"
22	BOT Phase V Switching Signal IN	24VDC digital logic input, push pull LOW = "Switch off" HIGH = "Switch on"
23	[Reserved]	[dominant/recessive]
24	GND (TOP phase V, BOT phase V)	Ground for TOP & BOT phase V IN
25	I phase V Analogue OUT	Nominal voltage range: 0...10V
26	GND (I Analogue phase V)	Ground for I phase V Analogue OUT
27	TOP phase W Switching Signal IN	24VDC digital logic input, push pull LOW = "Switch off" HIGH = "Switch on"
28	BOT phase W Switching Signal IN	24VDC digital logic input, push pull LOW = "Switch off" HIGH = "Switch on"
29	[Reserved]	[dominant/recessive]
30	GND (TOP phase W, BOT phase W)	Ground for TOP & BOT phase W IN
31	I phase W Analogue OUT	Nominal voltage range: 0...10V
32	GND (I Analogue phase W)	Ground for I phase W Analogue OUT
33,34	[Reserved]	

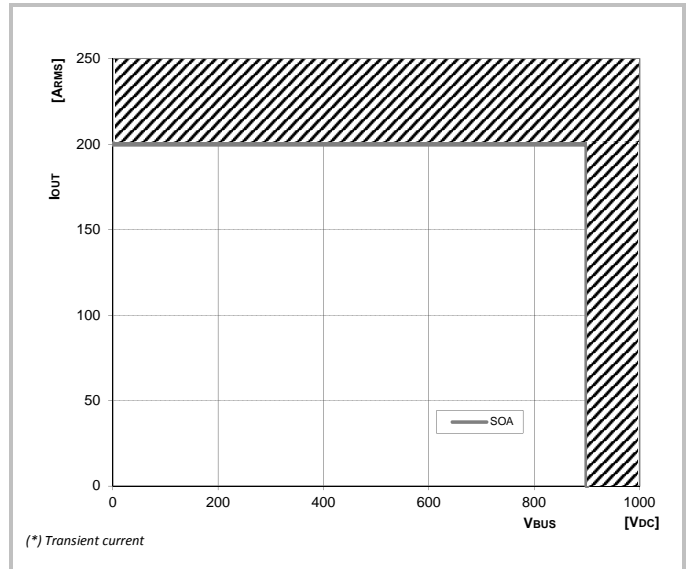


Dimensions

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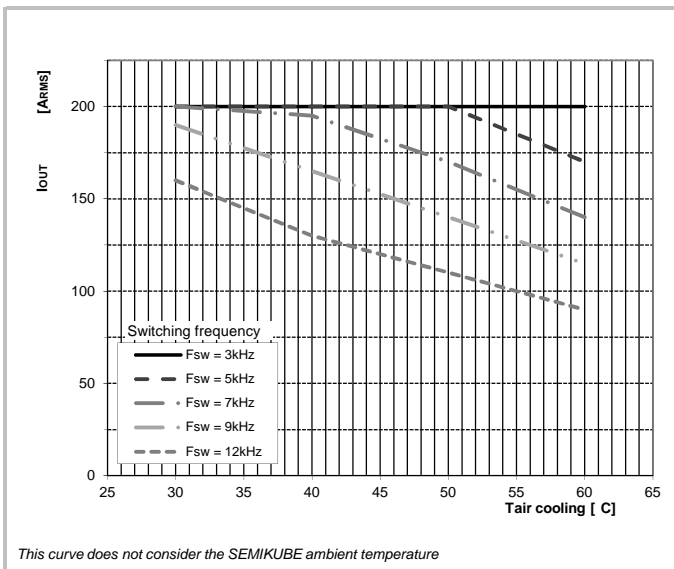


Max. Output current vs. Switching frequency



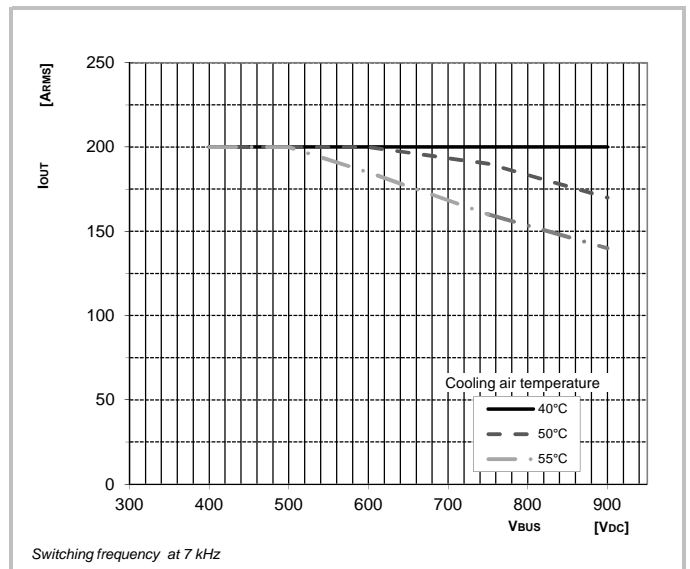
(\*) Transient current

Safe Operating Area



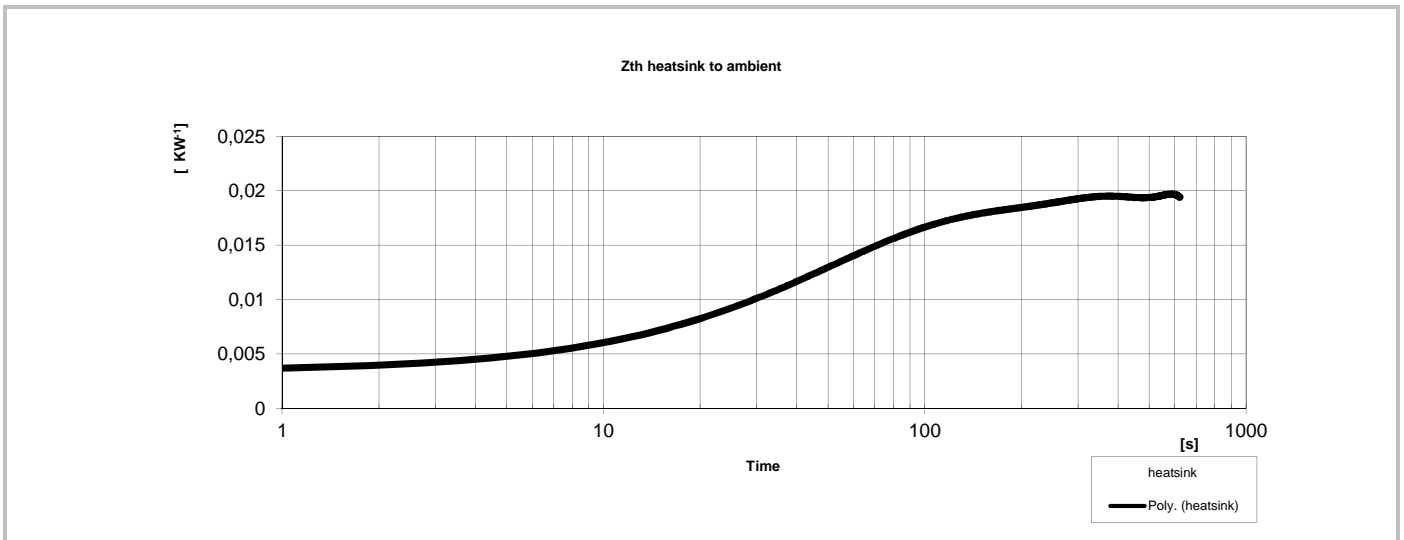
This curve does not consider the SEMIKUBE ambient temperature

Max. Output current vs. Ambient temperature



Switching frequency at 7 kHz

Max. Output current vs. DC bus voltage



Thermal characteristics