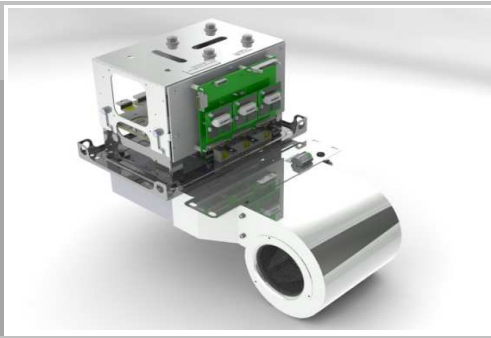


IGD-1-424-P1N4-DL-FA



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 |
| AC phase | | | | | |
| $I_{OUT RATED}$ | Rated output current | V _{BUS} =750Vdc, No overload, T _j <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 |
| DC Bus | | | | | |
| V_{BUS} | Rated DC voltage | | | 750 | Vdc |
| Efficiency | | | | | |
| $P_{LOSS INV}$ | Total power losses | | | 1 915 | W |
| η | Inverter efficiency | | | >98 | % |
| Filtering characteristics | | | | | |
| 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 |
| Stack Insulation | | | | | |
| 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

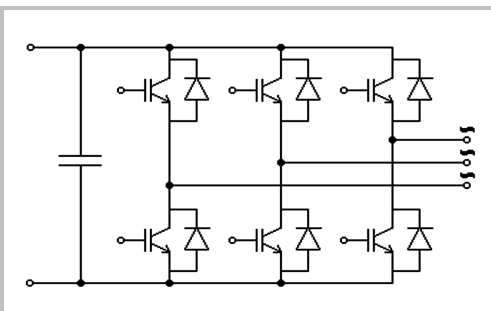
- Industrial applications
- Solar Inverters

Footnotes

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

REMARKS

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee, expressed or implied is made regarding delivery, performance or suitability.



B6CI

IGD-1-424-P1N4-DL-FA



IGBT Module stack

| Environmental conditions | | | | | |
|--------------------------|--|-----|------|-------|-----------------|
| Characteristics | Conditions | min | typ | max | Unit |
| Climatic | | | | | |
| 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 | % |
| Mechanical | | | | | |
| 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 |
| Thermal data | | | | | |
| V _{SUPPLY} | Heatsink fan AC voltage supply | | 230 | | V _{AC} |
| P _{FAN} | at 50Hz Rated power at V _{SUPPLY} | | 300 | | W |

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

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Typical Applications

- Industrial applications
- Solar Inverters

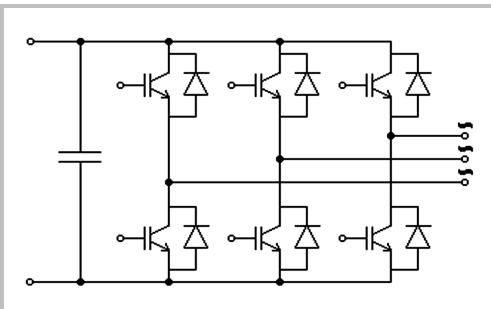
Footnotes

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

REMARKS

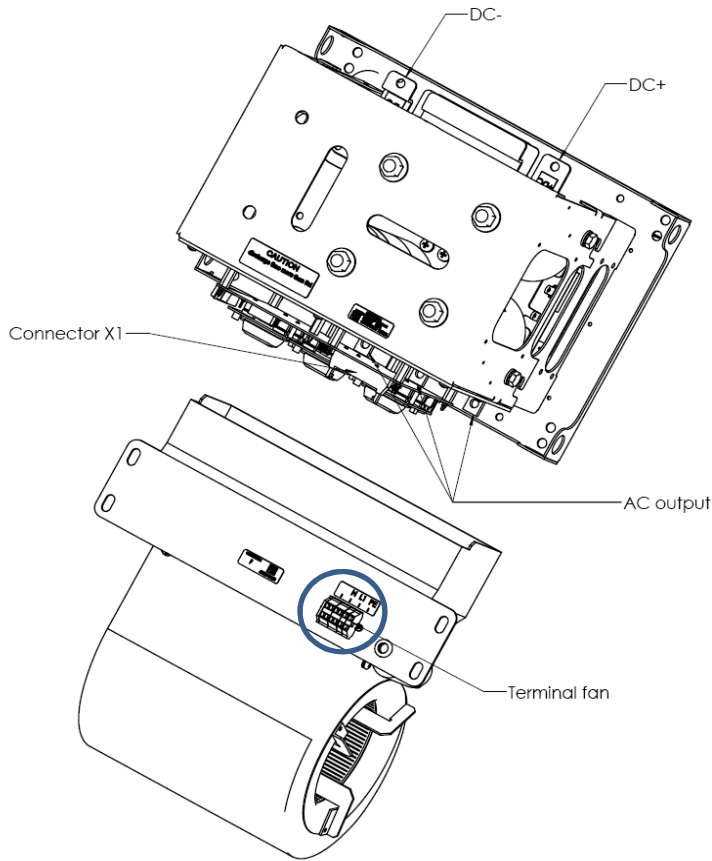
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| Gate Driver Characteristics | | | | | |
|--|--|-----------------------------|-----|----------------------|---------------------|
| <i>T_{AMBIENT} = 25°C unless otherwise specified</i> | | | | | |
| Symbol | Conditions | min | typ | max | Unit |
|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

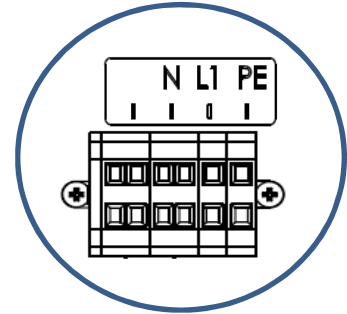


B6CI

Electrical connection

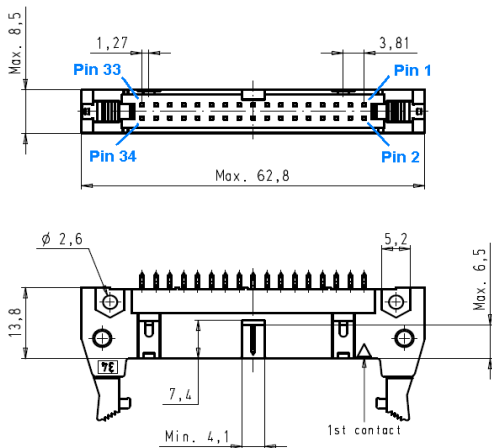


Terminal fan power supply connection



Driver connector type

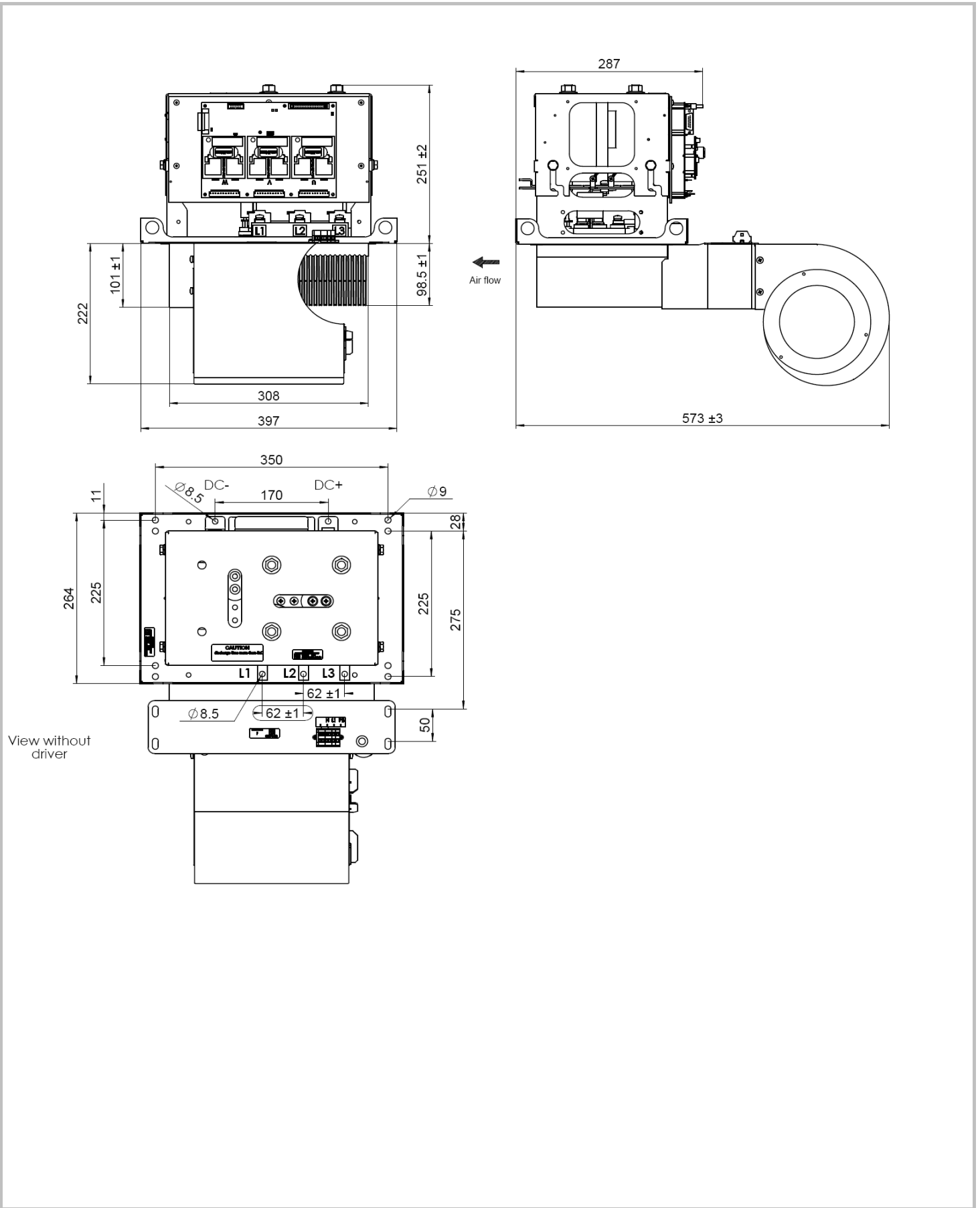
Flat cable connector X1



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

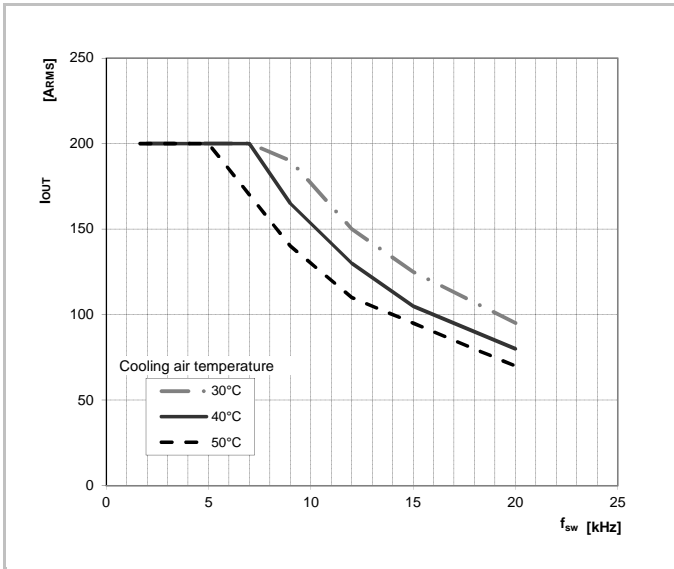
Driver X1 connector assignment

| 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] | |

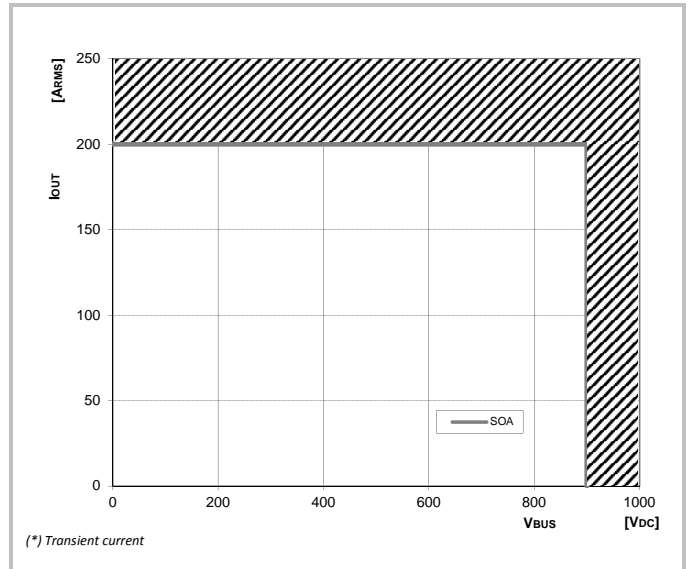


Dimensions

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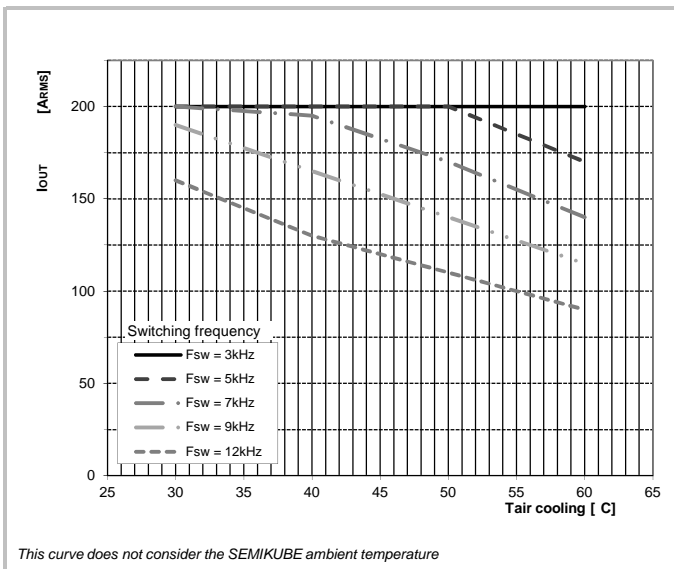


Max. Output current vs. Switching frequency



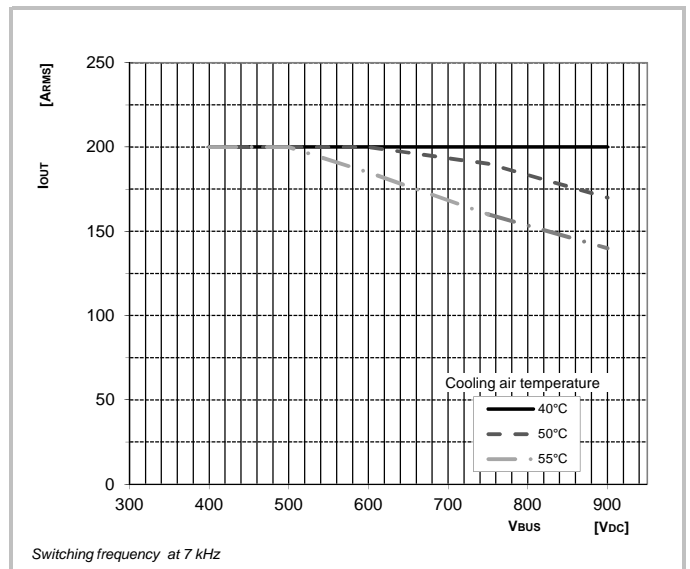
(*) Transient current

Safe Operating Area



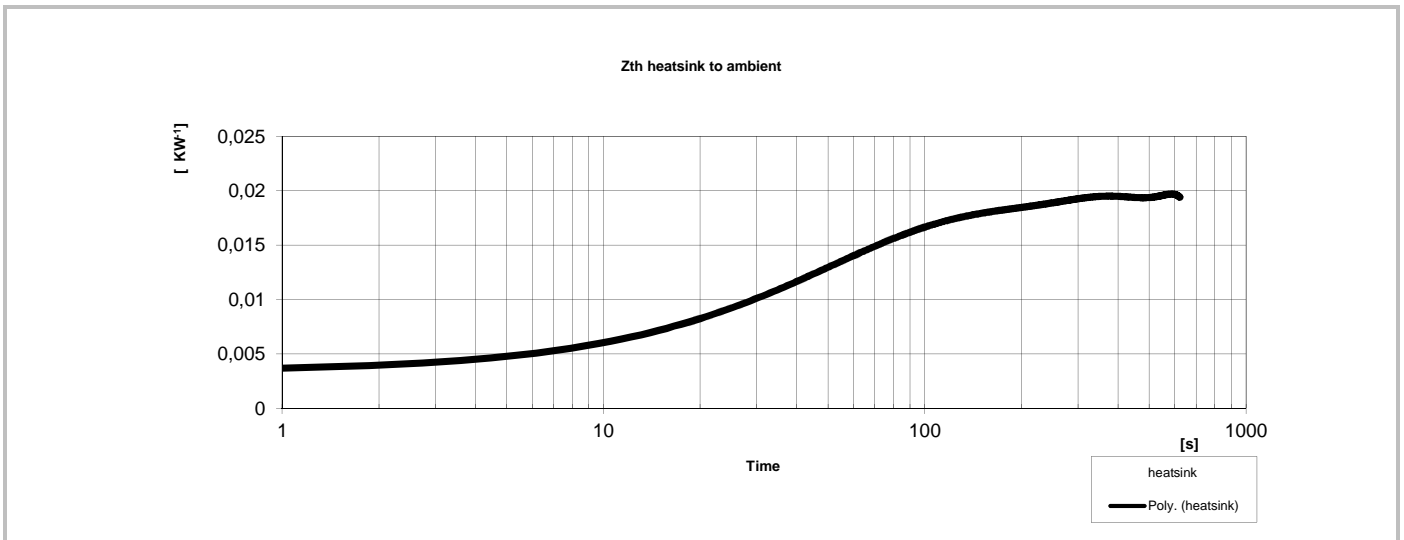
This curve does not consider the SEMIKUBE ambient temperature

Max. Output current vs. Ambient temperature



Switching frequency at 7 kHz

Max. Output current vs. DC bus voltage



Thermal characteristics