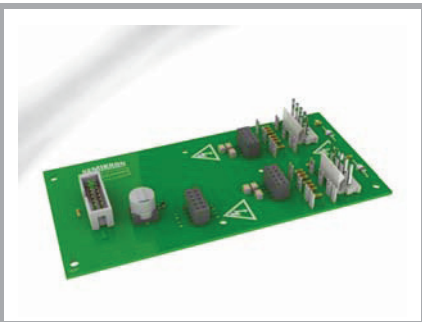


Board 1 SKYPER 32 R



SKYPER®

Adaptor board

Board 1 SKYPER 32 R

Preliminary Data

Features

- Two output channels
- Failure management

Typical Applications*

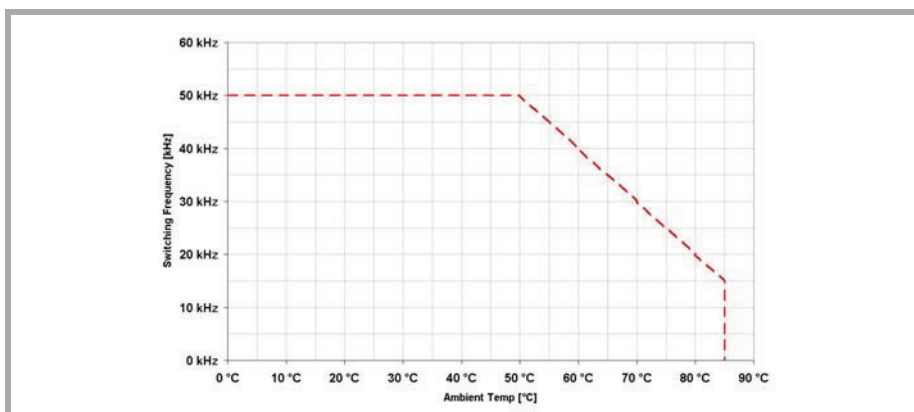
- Adaptor board for SKYPER 32 IGBT drivers in bridge circuits for industrial applications
- DC bus up to 1200V

Footnotes

All characteristics listed in the data sheet are guilty for the use with SKYPER 32. Please consider the derating of the ambient temperature. Please refer to the datasheet of SKYPER 32 for further information.

| Absolute Maximum Ratings | | | |
|--------------------------|---|------------|-------------|
| Symbol | Conditions | Values | Unit |
| V_s | Supply voltage primary | 16 | V |
| $I_{outPEAK}$ | Output peak current | 15 | A |
| $I_{outAVmax}$ | Output average current | 50 | mA |
| f_{max} | max. switching frequency | 50 | kHz |
| V_{CE} | Collector emitter voltage sense across the IGBT | 1700 | V |
| V_{isolIO} | Isolation test voltage input - output (AC, rms, 2s) | 4000 | V |
| V_{isolPD} | Partial discharge extinction voltage, rms, $Q_{PD} \leq 10pC$ | 1500 | V |
| V_{isol12} | Isolation test voltage output 1 - output 2 (AC, rms, 2s) | 1500 | V |
| $R_{Gon\ min}$ | | 1.5 | Ω |
| $R_{Goff\ min}$ | Minimum rating for external R_{Goff} | 1.5 | Ω |
| T_{op} | Operating temperature | -25 ... 85 | $^{\circ}C$ |
| T_{stg} | Storage temperature | -25 ... 85 | $^{\circ}C$ |

| Characteristics | | | | | |
|-----------------|--|------|--------|------|---------|
| Symbol | Conditions | min. | typ. | max. | Unit |
| V_s | Supply voltage primary side | 14.4 | 15 | 15.6 | V |
| V_j | input signal voltage on / off | | 15 / 0 | | V |
| V_{IT+} | Input threshold voltage HIGH | | | 12.3 | V |
| V_{IT-} | Input threshold voltage (LOW) | 4.6 | | | V |
| $V_{G(on)}$ | Turn on gate voltage output | | 15 | | V |
| $V_{G(off)}$ | Turn off gate voltage output | | -7 | | V |
| $t_{d(on)IO}$ | Input-output turn-on propagation time | | 1.1 | | μs |
| $t_{d(off)IO}$ | Input-output turn-off propagation time | | 1.1 | | μs |



Derating

This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX

* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our personal.

Adaptor board

Adaptor Board 1 SKYPER® 32 R

Technical Explanations

Revision 01

This Technical Explanation is valid for the following parts:

| part number | type | date code (YYWW) |
|-------------|----------------------|------------------|
| L6100131 | Board 1 SKYPER® 32 R | ≥ 1004 |

Related documents:

| title |
|-------------------------------------|
| Technical Explanations SKYPER® 32 R |

Prepared by: Johannes Krapp

Content

| | |
|--|---|
| Application and Handling Instructions | 2 |
| Further application support | 3 |
| General Description | 3 |
| Component Placement Layout | 4 |
| PIN Array (not SKiiP® compatible) | 4 |
| PIN Array – Secondary Side | 5 |
| Setting Dynamic Short Circuit Protection | 5 |
| Collector Series Resistance | 6 |
| Adaptation Gate Resistors | 6 |
| Boost Capacitors | 6 |
| Mounting Notes | 7 |

Please note:

All values in this technical explanation are typical values. Typical values are the average values expected in large quantities and are provided for information purposes only. These values can and do vary in different applications. All operating parameters should be validated by user's technical experts for each application.

Board 1 SKYPER® 32 R - Technical Explanations

- Please provide for static discharge protection during handling. As long as the hybrid driver is not completely assembled, the input terminals have to be short-circuited. Persons working with devices have to wear a grounded bracelet. Any synthetic floor coverings must not be statically chargeable. Even during transportation the input terminals have to be short-circuited using, for example, conductive rubber. Worktables have to be grounded. The same safety requirements apply to MOSFET- and IGBT-modules.
- Any parasitic inductances within the DC-link have to be minimised. Over-voltages may be absorbed by C- or RCD-snubber networks between main terminals for PLUS and MINUS of the power module.
- When first operating a newly developed circuit, SEMIKRON recommends to apply low collector voltage and load current in the beginning and to increase these values gradually, observing the turn-off behaviour of the free-wheeling diode and the turn-off voltage spikes generated across the IGBT. An oscillographic control will be necessary. Additionally, the case temperature of the module has to be monitored. When the circuit works correctly under rated operation conditions, short-circuit testing may be done, starting again with low collector voltage.
- It is important to feed any errors back to the control circuit and to switch off the device immediately in failure events. Repeated turn-on of the IGBT into a short circuit with a high frequency may destroy the device.
- The inputs of the hybrid driver are sensitive to over-voltage. Voltages higher than $V_S + 0,3V$ or below $-0,3V$ may destroy these inputs. Therefore, control signal over-voltages exceeding the above values have to be avoided.
- The connecting leads between hybrid driver and the power module should be as short as possible (max. 20cm), the driver leads should be twisted.

Further application support

Latest information is available at <http://www.semikron.com>. For design support please read the SEMIKRON Application Manual Power Modules available at <http://www.semikron.com>.

General Description

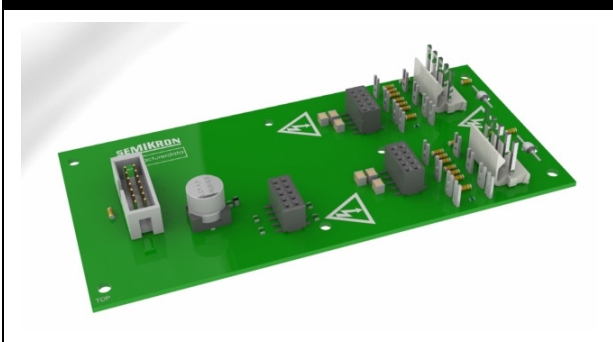
The Board 1 SKYPER® 32 is an adaptor board for the IGBT module e.g. SEMITRANS™, SEMiX® (solder pin version). The board can be customized allowing adaptation and optimization to the used IGBT module.

The switching characteristic of the IGBT can be influenced through user settings, e.g. changing turn-on and turn-off speed by variation of R_{Gon} and R_{Goff} . Furthermore, it is possible to adjust the monitoring level and blanking time for the DSCP (see Technical Explanations SKYPER® 32).

Please note:

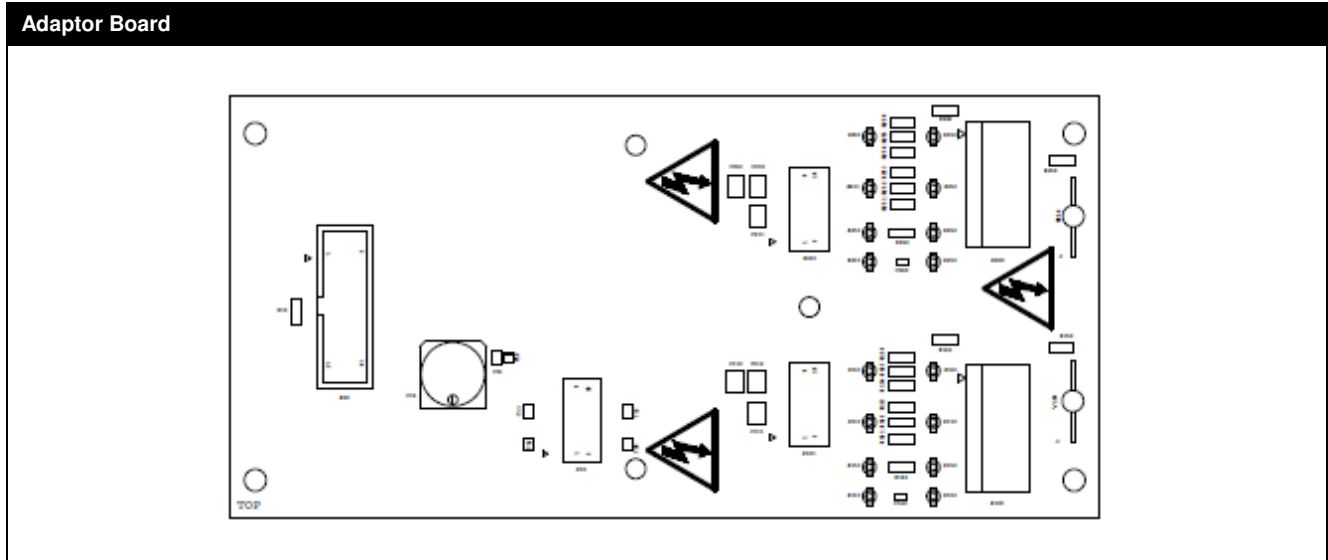
This technical explanation is based on the Technical Explanations for SKYPER® 32PRO. Please read the Technical Explanations SKYPER® 32PRO before using the Adaptor Board.

Board 1 SKYPER® 32 R



Board 1 SKYPER[®] 32 R - Technical Explanations

Component Placement Layout



PIN Array (not SKiiP[®] compatible)

Connector X20 (ODU FLAKAFIX 511.068.803.020)

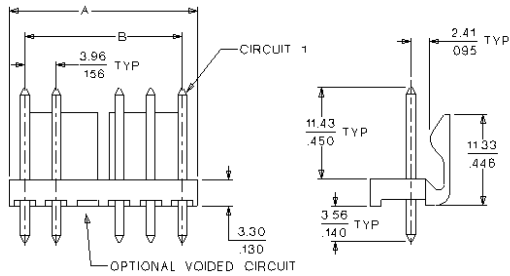
Product information of suitable female connectors and distributor contact information is available at e.g. <http://www.harting.com> (part number 09 18 520 6 813).

| PIN | Signal | Function | Specification |
|-----------|---------------|--|--|
| X20:01 | reserved | | |
| X20:02 | IF_HB_BOT | Switching signal input (BOTTOM switch) | Digital 15 V; 10 kOhm impedance; LOW = BOT switch off; HIGH = BOT switch on |
| X20:03 | IF_nERROR_OUT | ERROR output | LOW = NO ERROR; open collector output; max. 30V / 15mA (external pull up resistor necessary) |
| X20:04 | IF_HB_TOP | Switching signal input (TOP switch) | Digital 15 V; 10 kOhm impedance; LOW = TOP switch off; HIGH = TOP switch on |
| X20:05 | IF_nERROR_IN | ERROR input | 5V logic; LOW active |
| X20:06 | reserved | | |
| X20:07 | reserved | | |
| X20:08 | IF_PWR_15P | Drive power supply | Stabilised +15V ±4% |
| X20:09 | IF_PWR_15P | Drive power supply | Stabilised +15V ±4% |
| X20:10 | IF_PWR_GND | GND for power supply and GND for digital signals | |
| X20:11 | IF_PWR_GND | GND for power supply and GND for digital signals | |
| X20:12-14 | reserved | | |

Board 1 SKYPER® 32 R - Technical Explanations

PIN Array – Secondary Side

Connector X100, X200 (MOLEX Series 41791, Part Number 26-60-4050)



Product information of suitable female connectors and distributor contact information is available at e.g. <http://www.molex.com> (e.g. series 41695).

| PIN | Signal | Function | Specification |
|---------|-------------|---------------------------|---------------|
| X100:01 | EMITTER_TOP | Emitter output TOP IGBT | |
| X100:02 | reserved | | |
| X100:03 | GATE_TOP | Gate output TOP IGBT | |
| X100:05 | VCE_TOP | Collector output TOP IGBT | |
| X200:01 | EMITTER_BOT | Emitter output BOT IGBT | |
| X200:02 | reserved | | |
| X200:03 | GATE_BOT | Gate output BOT IGBT | |
| X200:05 | VCE_BOT | Collector output BOT IGBT | |

Setting Dynamic Short Circuit Protection

| R _{CE} & C _{CE} | | | |
|-----------------------------------|----------|--|-----|
| Designation | Shape | Setting | |
| R162 | MiniMELF | R _{CE} Factory setting: not equipped | TOP |
| C160 | 0603 | C _{CE} Factory setting: not equipped | TOP |
| R262 | MiniMELF | R _{CE} Factory setting: not equipped | BOT |
| C260 | 0603 | C _{CE} Factory setting: not equipped | BOT |

Board 1 SKYPER® 32 R - Technical Explanations

Collector Series Resistance

| R_{VCE} | | | |
|-------------|----------|--|-----|
| Designation | Shape | Setting | |
| R150 | MiniMELF | R_{VCE}^* Factory setting: not equipped | TOP |
| R250 | MiniMELF | R_{VCE}^* Factory setting: not equipped | BOT |

* 1200V IGBT operation: 0Ω
1700V IGBT operation: 1kΩ / 0,4W

Adaptation Gate Resistors

| R_{Gon} & R_{Goff} | | | |
|--|----------|---|-----|
| Designation | Shape | Setting | |
| R151, R152, R153 (parallel connected) | MiniMELF | R_{Gon} Factory setting: not equipped | TOP |
| R154, R155, R156 (parallel connected) | MiniMELF | R_{Goff} Factory setting: not equipped | TOP |
| R251, R252, R253 (parallel connected) | MiniMELF | R_{Gon} Factory setting: not equipped | BOT |
| R254, R255, R256 (parallel connected) | MiniMELF | R_{Goff} Factory setting: not equipped | BOT |

Boost Capacitors

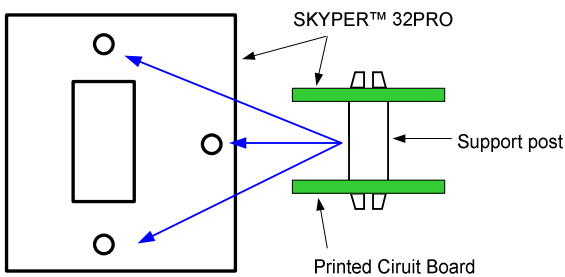
| $C_{boost15P}$ & $C_{boost8N}$ | | | |
|--------------------------------|-------|--|-----|
| Designation | Shape | Setting | |
| C112 | 1210 | $C_{boost8N}$ Factory setting: 4,7μF/25V * | TOP |
| C110 | 1210 | $C_{boost8N}$ Factory setting: 4,7μF/25V * | TOP |
| C111 | 1210 | $C_{boost15P}$ Factory setting: 2,2μF/25V * | TOP |
| C212 | 1210 | $C_{boost8N}$ Factory setting: 4,7μF/25V * | BOT |
| C210 | 1210 | $C_{boost8N}$ Factory setting: 4,7μF/25V * | BOT |
| C211 | 1210 | $C_{boost15P}$ Factory setting: 2,2μF/25V * | BOT |

* output charge pulse: 5μC

Mounting Notes

Driver Core Mounting

1. Soldering of components (e.g. R_{Gon} , R_{Goff} , etc.) on adaptor board.
2. Insert driver core into the box connector on adaptor board.
3. The connecting leads between board and power module should be as short as possible (max. 20cm), the leads should be twisted.



The connection between driver core and adaptor board should be mechanical reinforced by using support posts. The posts have to be spaced between driver core and adaptor board.

Product information of suitable support posts and distributor contact information is available at e.g. <http://www.richco-inc.com> (e.g. part number DLMSPM-8-01, LCBST-8-01).

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