



SEMIDRIVER™

Sixpack IGBT and MOSFET Driver

SKHI 61 (R)

Features

- CMOS-compatible input buffers at $V_{DD}=5V$
- Short-circuit protection by V_{CE} -monitoring and Soft-turn-Off
- Drive interlock top/bottom
- Signal transmission by opto-couplers
- Supply undervoltage protection (13V)
- Error latch / output

Typical Applications

- Driver for IGBT and MOSFET modules in three-phase-bridge circuits, inverter drives, UPS-facilities, etc.

1) At $T_a < -25^\circ C$ the current consumption can be 1,6 times the rated maximum current for the first three operating minutes.

Absolute Maximum Ratings

| Symbol | Conditions | Values | Units |
|------------------|---|---------------|-------------|
| V_S | Supply voltage primary | 15,6 | V |
| V_{iH} | Input signal voltage | $V_S + 0,3$ | V |
| I_{out_PEAK} | Output peak current | 2 | A |
| I_{out_AVmax} | Output average current ($T_a = 85^\circ C$) | 20 | mA |
| f_{max} | Max. switching frequency ($C_{GE} < 9nF$) | 50 | kHz |
| V_{CE} | Collector emitter voltage sense across the IGBT (for 1200V-IGBTs) | 900 | V |
| dv/dt | Rate of rise and fall of voltage (secondary to primary side) | 15 | kV/ μs |
| V_{isol10} | Isolation test voltage input - output (2 sec. AC) | 2500 | V |
| V_{isol12} | Isolation test voltage output 1 - output 2 (2 sec. AC) | 1500 | V |
| R_{Gonmin} | Minimum rating of R_{Gon} | 10 | Ω |
| $R_{Goffmin}$ | Minimum rating for R_{Goff} | 10 | Ω |
| $Q_{out/pulse}$ | Max. rating for gate $T_a = 85^\circ C$ charge per pulse $T_a = 55^\circ C$ | 0,7 | μC |
| T_{op} | Operating temperature | - 40 ... + 85 | $^\circ C$ |
| T_{stg} | Storage temperature | - 40 ... + 85 | $^\circ C$ |

Characteristics

$T_a = 25^\circ C$, unless otherwise specified

| Symbol | Conditions | min. | typ. | max. | Units |
|-----------------|--|--------------|-----------|------|------------|
| V_S | Supply voltage primary | 14,4 | 15,0 | 15,6 | V |
| $I_{SO}^{1)}$ | Supply current no load | 160 | | 200 | mA |
| | primary side normal op. | | | 450 | mA |
| V_{iT+} | Input threshold voltage (High) | 4,0 | | | V |
| V_{iT-} | Input threshold voltage (LOW) | | | 1,5 | V |
| R_{in} | Input resistance | | 60 | | k Ω |
| $V_{G(on)}$ | Turn on gate voltage output | | 14,9 | | V |
| $V_{G(off)}$ | Turn off gate voltage output | | -6,5 | | V |
| R_{GE} | Internal gate-emitter resistance | | 20 | | k Ω |
| f_{ASIC} | ASIC system switching frequency | | 8 | | MHz |
| $td(on)_{IO}$ | Input-output turn-on propagation time | 0,3 | 0,45 | 0,6 | μs |
| $td(off)_{IO}$ | Input-output turn-off propagation time | 0,3 | 0,45 | 0,6 | μs |
| $t_{d(Err)}$ | Error input-output propagation time | 1,15 | 1,3 | 1,5 | μs |
| $t_{pERRRESET}$ | Error memory reset time | 7 | 15 | 27 | μs |
| t_{TD} | Interlock dead time adjustable | no interlock | | 4,1 | μs |
| V_{CEstat} | Reference voltage for V_{CE} -monitoring | | 5,8 | | V |
| t_{blank} | Blanking time | | 3,5 | | μs |
| C_{ps} | Coupling capacitance primary-secondary | | 40 | | pF |
| MTBF | Mean Time Between Failure $T_a = 40^\circ C$ | | 1 | | 10^6 h |
| w | weight | | 95 | | g |
| H x B x T | Dimensions | | 20x57x114 | | mm |

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



SEMIDRIVER™

Sevenpack IGBT and MOSFET Driver

SKHI 71 (R)

Preliminary Data

Features

- CMOS-compatible input buffers at $V_{DD}=5V$
- Short-circuit protection by V_{CE} -monitoring and Soft-turn-Off
- Drive interlock top/bottom
- Signal transmission by opto-couplers
- Supply undervoltage protection (13V)
- Error latch / output

Typical Applications

- Driver for IGBT and MOSFET modules in three-phase-bridge circuits, inverter drives, UPS-facilities, etc.

1) At $T_a < -25^\circ C$ the current consumption can be 1,6 times the rated maximum current for the first three operating minutes.

Absolute Maximum Ratings

| Symbol | Conditions | Values | Units |
|-----------------|---|---------------|-------------|
| V_S | Supply voltage primary | 15,6 | V |
| V_{iH} | Input signal voltage | $V_S + 0,3$ | V |
| $I_{outPEAK}$ | Output peak current | 2 | A |
| $I_{outAVmax}$ | Output average current ($T_a = 85^\circ C$) | 20 | mA |
| f_{max} | Max. switching frequency ($C_{GE} < 9nF$) | 50 | kHz |
| V_{CE} | Collector emitter voltage sense across the IGBT (for 1200V-IGBTs) | 900 | V |
| dv/dt | Rate of rise and fall of voltage (secondary to primary side) | 15 | kV/ μs |
| V_{isolIO} | Isolation test voltage input - output (2 sec. AC) | 2500 | V |
| V_{isol12} | Isolation test voltage output 1 - output 2 (2 sec. AC) | 1500 | V |
| R_{Gonmin} | Minimum rating of R_{Gon} | 10 | Ω |
| $R_{Goffmin}$ | Minimum rating for R_{Goff} | 10 | Ω |
| $Q_{out/pulse}$ | Max. rating for gate $T_a = 85^\circ C$ charge per pulse $T_a = 55^\circ C$ | 0,7 | μC |
| T_{op} | Operating temperature | - 40 ... + 85 | $^\circ C$ |
| T_{stg} | Storage temperature | - 40 ... + 85 | $^\circ C$ |

Characteristics

$T_a = 25^\circ C$, unless otherwise specified

| Symbol | Conditions | min. | typ. | max. | Units |
|-----------------|--|--------------|-----------|------|------------|
| V_S | Supply voltage primary | 14,4 | 15,0 | 15,6 | V |
| $I_{SO}^{1)}$ | Supply current no load | 230 | | 290 | mA |
| | primary side normal op. | | | 550 | mA |
| V_{iT+} | Input threshold voltage (High) | 4,0 | 5,0 | | V |
| V_{iT-} | Input threshold voltage (LOW) | | | 1,5 | V |
| R_{in} | Input resistance | | 60 | | k Ω |
| $V_{G(on)}$ | Turn on gate voltage output | | 14,9 | | V |
| $V_{G(off)}$ | Turn off gate voltage output | | -6,5 | | V |
| R_{GE} | Internal gate-emitter resistance | | 20 | | k Ω |
| f_{ASIC} | ASIC system switching frequency | | 8 | | MHz |
| $td(on)_{IO}$ | Input-output turn-on propagation time | 0,3 | 0,45 | 0,6 | μs |
| $td(off)_{IO}$ | Input-output turn-off propagation time | 0,3 | 0,45 | 0,6 | μs |
| $t_{d(Err)}$ | Error input-output propagation time | 1,15 | 1,3 | 1,5 | μs |
| $t_{pERRRESET}$ | Error memory reset time | 7 | 15 | 27 | μs |
| t_{TD} | Interlock dead time | no interlock | | 4,1 | μs |
| V_{CEstat} | Reference voltage for V_{CE} -monitoring | | 5,8 | | V |
| t_{blank} | Blanking time | | 3,5 | | μs |
| C_{ps} | Coupling capacitance primary-secondary | | 40 | | pF |
| MTBF | Mean Time Between Failure $T_a = 40^\circ C$ | | 1 | | 10^6 h |
| w | weight | | 99 | | g |
| H x B x T | Dimensions | | 20x57x114 | | mm |

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PIN array

Primary side PIN array

| Pin | Symbol | Function | Pin | Symbol | Function |
|-----|--------|------------------------------|-----|--------|------------------------------------|
| 01 | BS | Auxiliary earth connection | 11 | +15V | Supply voltage |
| 02 | BOT3 | Driver signal BOT HB3 | 12 | +15V | Supply voltage |
| 03 | TOP3 | Driver signal TOP HB3 | 13 | TDT1 | Deadtime bit #1 |
| 04 | BOT2 | Driver signal BOT HB2 | 14 | TDT2 | Deadtime bit #2 |
| 05 | TOP2 | Driver signal TOP HB2 | 15 | SEL | Deadtime on/off |
| 06 | BOT1 | Driver signal BOT HB1 | 16 | BSTD | Aux. earth for deadtime adjustment |
| 07 | TOP1 | Driver signal TOP HB1 | 17 | _ERRIN | _External error signal input |
| 08 | _ERR | _Error output Sixpack-driver | 18 | NC | reserved |
| 09 | BSS | System earth connection | 19 | BRK | Driver signal additional switch |
| 10 | BSS | System earth connection | 20 | _BERR | _Error output additional switch |

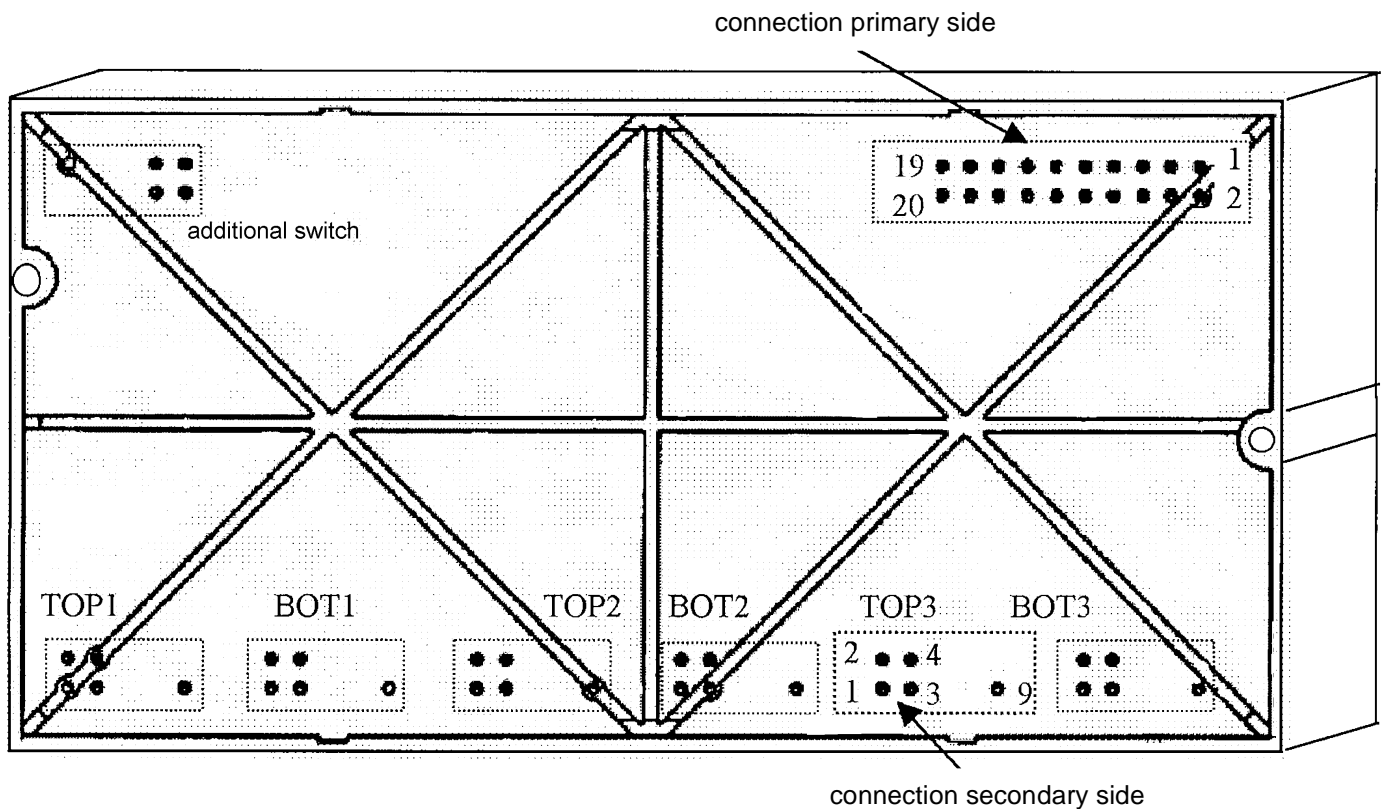


Fig. 1 Bottom view of the SKHI 61 / SKHI 71

Secondary side PIN array

| Pin | Symbol | Function | Pin | Symbol | Function |
|-----|-------------------|---------------------|-----|-------------------|------------------|
| 01 | R _{Gate} | Gate resistor input | 04 | V _{CET2} | VCE-threshold #2 |
| 02 | V _{CET1} | VCE-threshold #1 | | | |
| 03 | E | Emitter input | 09 | V _{CE} | Collector input |

