

SENSITRON

SEMICONDUCTOR

TECHNICAL DATA DATA SHEET 1161, REV. PRELIMINARY A

Three-Phase MOSFET BRIDGE, 100 VOLT, 50 AMP

ELECTRICAL CHARACTERISTICS PER MOSFET DEVICE ($T_j=25^\circ\text{C}$ UNLESS OTHERWISE SPECIFIED)

MOSFET Characteristics

| CHARACTERISTIC | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|--|---------------|--|------|-------|----------|--------------------|
| Continuous Drain Current | I_D | $V_{GS}=10\text{V}$, $T_C = 25^\circ\text{C}$ $T_C = 80^\circ\text{C}$ | - | - | 50 50 | A |
| Maximum Pulsed Drain Current | I_{DM} | $T_C = 25^\circ\text{C}$ | - | - | 150 | A |
| Drain-to-Source Breakdown Voltage | $V_{(BR)DSS}$ | $T_j=25^\circ\text{C}$, $V_{GS}=0\text{V}$, $I_D=500\mu\text{A}$ | 100 | - | - | V |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $T_j=25^\circ\text{C}$ $I_D = 500 \mu\text{A}$ | 1.0 | - | 3.0 | V |
| Static Drain-to-Source On Resistance | R_{DS} | $V_{GS} = 10 \text{ V}$, $I_D = 40 \text{ A}$ | - | 0.013 | 0.018 | Ω |
| Drain-to-Source Leakage Current | I_{DSS} | $V_{GS}=0\text{V}$, $V_{DS}=100\text{V}$, $T_j=25^\circ\text{C}$ | - | - | 250 | μA |
| Turn-on Delay | $t_{d(on)}$ | $I_D = 50 \text{ A}$, $V_{GS} = 10 \text{ V}$, $T_j=25^\circ\text{C}$, $R_G = 5\Omega$, $V_{DD} = 30\text{V}$ | - | 25 | - | ns |
| Rise Time | t_r | | 150 | | | |
| Turn-off Delay | $t_{d(off)}$ | | 60 | | | |
| Fall Time | t_f | | 120 | | | |
| Input Capacitance | C_{iss} | $V_{DS} = 25 \text{ V}$, $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$ | - | 3.8 | - | nF |
| Output Capacitance | C_{oss} | | 0.90 | | | |
| Reverse Transfer Capacitance | C_{rss} | | 0.30 | | | |
| Thermal Resistance | R_{thic} | - | - | 0.7 | 1 | $^\circ\text{C/W}$ |
| Operating and Storage Junction Temperature | T_j | - | -40 | - | 150 | $^\circ\text{C}$ |

Source Drain Diode Characteristics

| CHARACTERISTIC | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-----------------------|----------|--|------|------|------|------|
| Forward Voltage | V_{SD} | $T_j=25^\circ\text{C}$, $I_F = 30\text{A}$ | - | 0.80 | 1.1 | V |
| Reverse Recovery Time | t_{rr} | $T_j = 25^\circ\text{C}$, $I_S = 30 \text{ A}$, $di/dt = 100 \text{ A}/\mu\text{s}$ | - | 90 | 130 | ns |

SENSITRON

TECHNICAL DATA

DATA SHEET 1161, REV. PRELIMINARY A

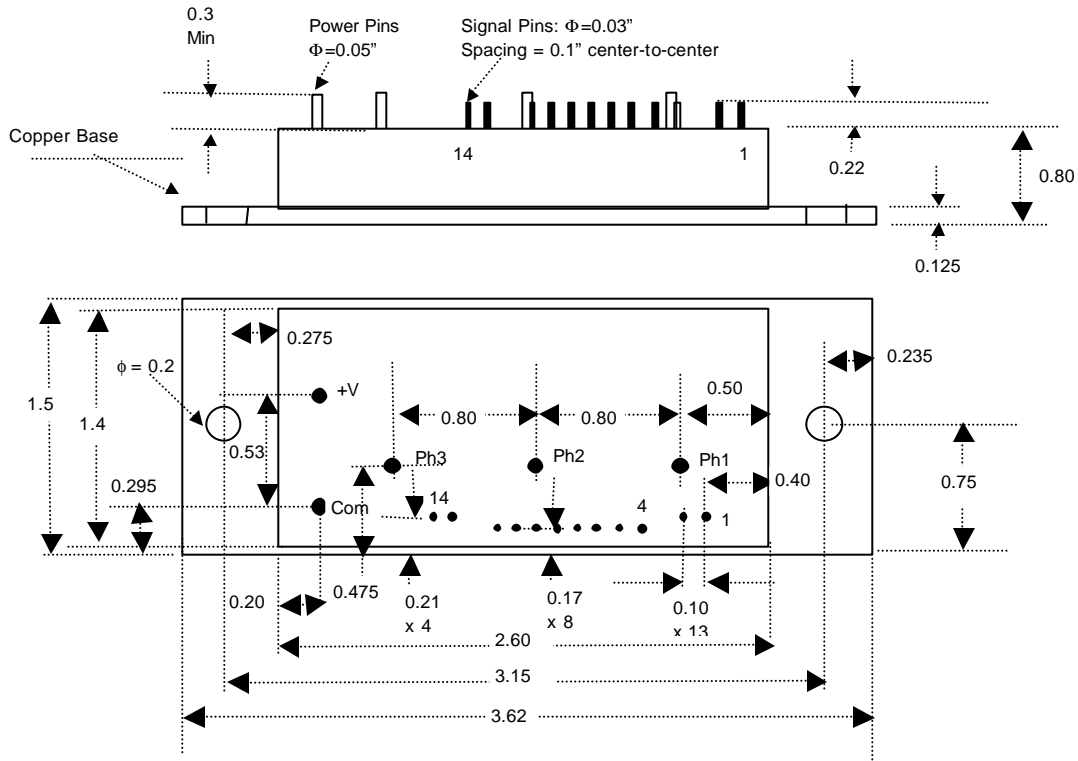
Gate Driver

| PARAMETER | SYMBOL | MIN | TYP | MAX | UNIT |
|--|---------------------|------|------|------|------|
| Supply Voltage | VCC | 10 | 15 | 20 | V |
| Input On Current | HIN, LIN | 1.6 | - | 5 | mA |
| Opto-Isolator Logic High Input Threshold | I_{th} | | 1.6 | | mA |
| Input Reverse Breakdown Voltage | BV_{in} | 5 | | | V |
| Input Forward Voltage @ $I_{in} = 5mA$ | V_F | | 1.5 | 1.7 | V |
| Under Voltage Lockout | VCCUV | 7.0 | - | 9.7 | V |
| ITRIP Threshold Voltage ⁽¹⁾ | ITRIP _{th} | 0.4 | 0.49 | 0.58 | V |
| Turn On Delay | t_{ond} | - | - | 1000 | nsec |
| Turn On Rise Time | t_r | - | - | 200 | nsec |
| Turn Off Delay | t_{offd} | - | - | 1300 | nsec |
| Turn Off Fall Time | t_f | - | - | 200 | nsec |
| Input-Output Isolation Voltage | | 1000 | | | V |

(1) Once ITRIP reaches threshold, the driver latches off. This condition can be reset by holding all three low side inputs high for more than 10 μ sec or by recycling the V_{cc} supply.

SENSITRON
TECHNICAL DATA
DATA SHEET 1161, REV. PRELIMINARY A

Package Drawing:



Package Material:

- Base: Copper**
- Frame: Nickel**
- Lid: Plastic**
- Power Terminals: Copper**

Signal Terminals & Truth Table:

| Gate Driver Truth Table | | | |
|-------------------------|----------|---------|---------|
| HIN1,2,3 | LIN1,2,3 | HO1,2,3 | LO1,2,3 |
| 0 | 0 | 0 | 0 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 0 | 1 |
| 1 | 1 | 0 | 0 |

| Signal Pins | |
|-------------|-----------|
| Pin # | Function |
| 1 | +15V |
| 2 | PWR-GRND |
| 3 | NC |
| 4 | HIN1 |
| 5 | HIN2 |
| 6 | HIN3 |
| 7 | SGN-GRND |
| 8 | LIN1 |
| 9 | LIN2 |
| 10 | LIN3 |
| 11 | SGN-GRND |
| 12 | NC |
| 13 | ITRIP |
| 14 | ITRIP-RTN |

Note: This device can be used with a non-inverting input logic, if LIN and HIN are swapped.

TECHNICAL DATA

DISCLAIMER:

- 1- The information given herein, including the specifications and dimensions, is subject to change without prior notice to improve product characteristics. Before ordering, purchasers are advised to contact the Sensitron Semiconductor sales department for the latest version of the datasheet(s).
- 2- In cases where extremely high reliability is required (such as use in nuclear power control, aerospace and aviation, traffic equipment, medical equipment, and safety equipment), safety should be ensured by using semiconductor devices that feature assured safety or by means of users' fail-safe precautions or other arrangement.
- 3- In no event shall Sensitron Semiconductor be liable for any damages that may result from an accident or any other cause during operation of the user's units according to the datasheet(s). Sensitron Semiconductor assumes no responsibility for any intellectual property claims or any other problems that may result from applications of information, products or circuits described in the datasheets.
- 4- In no event shall Sensitron Semiconductor be liable for any failure in a semiconductor device or any secondary damage resulting from use at a value exceeding the absolute maximum rating.
- 5- No license is granted by the datasheet(s) under any patents or other rights of any third party or Sensitron Semiconductor.
- 6- The datasheet(s) may not be reproduced or duplicated, in any form, in whole or part, without the expressed written permission of Sensitron Semiconductor.
- 7- The products (technologies) described in the datasheet(s) are not to be provided to any party whose purpose in their application will hinder maintenance of international peace and safety nor are they to be applied to that purpose by their direct purchasers or any third party. When exporting these products (technologies), the necessary procedures are to be taken in accordance with related laws and regulations.