

**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	$\Omega$
Drain-to-Source Leakage Current	$I_{DSS}$	$V_{GS}=0\text{V}$ , $V_{DS}=100\text{V}$ , $T_j=25^\circ\text{C}$	-	-	250	$\mu\text{A}$
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

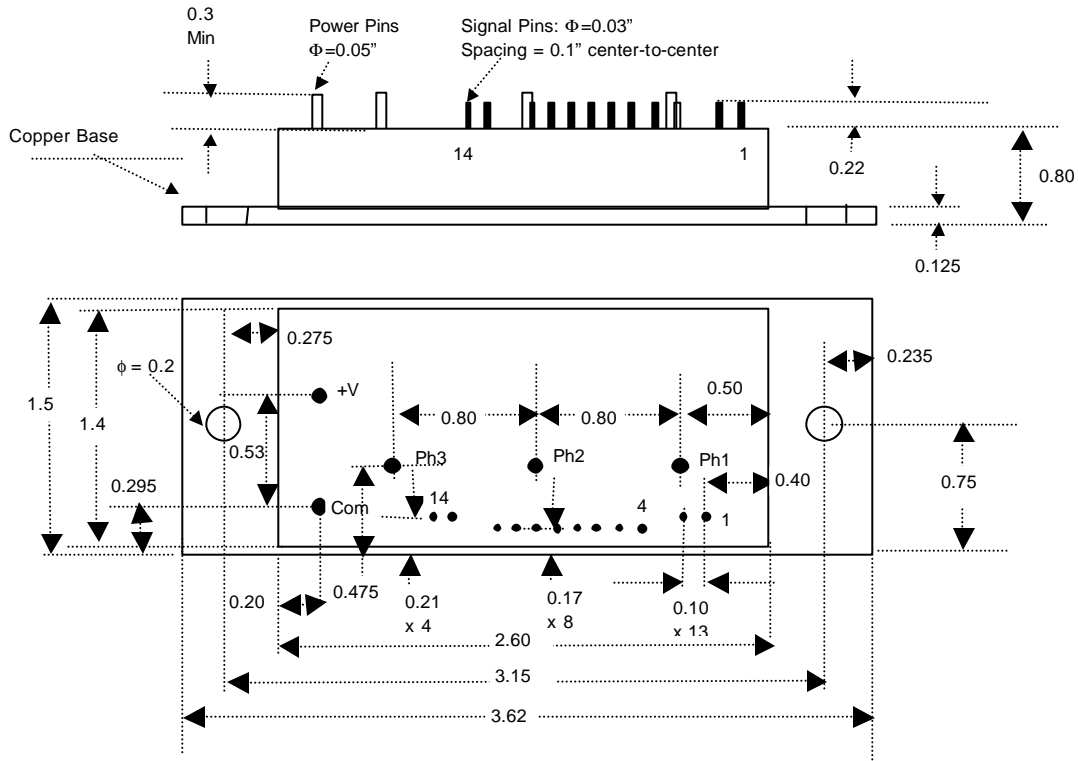
## Gate Driver

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 <sup>(1)</sup>	ITRIP <sub>th</sub>	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  $\mu$  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.