

TECHNICAL DATA
DATASHEET 4100, REV B

Three-Phase IGBT BRIDGE, With Gate Driver and Optical Isolation

DESCRIPTION: A 1200 VOLT, 140 AMP, THREE PHASE IGBT BRIDGE

ELECTRICAL CHARACTERISTICS PER IGBT DEVICE

(T_j=25°C UNLESS OTHERWISE SPECIFIED)

| PARAMETER | SYMBOL | MIN | TYP | MAX | UNIT |
|--|----------------------|------|-----|------------|----------|
| IGBT SPECIFICATIONS | | | | | |
| Collector to Emitter Breakdown Voltage I _C = 250 μA, V _{GE} = 0V | BV _{CES} | 1200 | - | - | V |
| Continuous Collector Current T _C = 25 °C T _C = 90 °C | I _C | - | - | 140 120 | A |
| Pulsed Collector Current, 1mS | I _{CM} | - | - | 350 | A |
| Gate to Emitter Voltage | V _{GE} | - | - | +/-20 | V |
| Gate-Emitter Leakage Current , V _{GE} = +/-20V | I _{GES} | - | - | +/- 100 | nA |
| Gate Threshold Voltage, I _C =2mA | V _{GE(TH)} | 3.0 | - | 6.0 | V |
| Zero Gate Voltage Collector Current V _{CE} = 600 V, V _{GE} =0V T _i =25°C V _{CE} = 480 V, V _{GE} =0V T _i =125°C | I _{CES} | - | - | 2 20 | mA mA |
| Collector to Emitter Saturation Voltage, I _C = 100A, V _{GE} = 15V, T _C = 25 °C | V _{CE(SAT)} | - | 2.5 | 2.8 | V |
| Maximum Thermal Resistance | R _{θJC} | - | - | 0.15 | °C/W |
| Brake IGBT 60A Maximum Current | | | | 0.30 | °C/W |
| Brake IGBT SPECIFICATIONS | | | | | |
| Continuous Collector Current T _C = 25 °C T _C = 90 °C | I _C | - | - | 80 60 | A |
| Pulsed Collector Current, 0.5mS | I _{CM} | - | - | 120 | A |
| Over-Temperature Shutdown | | | | | |
| Over-Temperature Shutdown | T _{sd} | 100 | 110 | 120 | °C |
| Over-Temperature Shutdown Hysteresis | | | 20 | | °C |
| Over-Temperature Output | T _{so} | | 10 | | 10mV/°C |

SENSITRON SEMICONDUCTOR

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ULTRAFast DIODES RATING AND CHARACTERISTICS

| | | | | | |
|--|-----------------|------|-----|------|---------------------------|
| Diode Peak Inverse Voltage | PIV | 1200 | - | - | V |
| Continuous Forward Current, $T_C = 90^\circ\text{C}$ | I_F | - | - | 110 | A |
| Forward Surge Current, $t_p = 10$ msec | I_{FSM} | - | - | 350 | A |
| Diode Forward Voltage, $I_F = 100\text{A}$ | V_F | - | 2.0 | 2.3 | V |
| Diode Reverse Recovery Time ($I_F = 100\text{A}$, $V_{RR} = 600\text{V}$, $di/dt = 200\text{ A}/\mu\text{s}$) | t_{rr} | - | 180 | 250 | nsec |
| Maximum Thermal Resistance | $R_{\theta JC}$ | - | - | 0.3 | $^\circ\text{C}/\text{W}$ |
| Gate Driver | | | | | |
| Supply Voltage | VCC | 10 | 15 | 20 | V |
| Input On Current | HIN, LIN | 2 | | 5.0 | mA |
| Opto-Isolator Logic High Input Threshold | I_{th} | - | 1.6 | - | mA |
| Input Reverse Breakdown Voltage | BV_{in} | 5.0 | - | - | V |
| Input Forward Voltage @ $I_{in} = 5\text{mA}$ | V_F | - | 1.5 | 1.7 | V |
| Under Voltage Lockout | VCCUV | 7.0 | - | 9.7 | V |
| ITRIP Reference Voltage ⁽¹⁾ | Itrip-ref | 1.45 | 1.5 | 1.55 | V |
| Desaturation Over-Current Protection Blanking time ⁽²⁾ | | 3 | 5 | TBD | μsec |
| Input-to-Output Turn On Delay | t_{ond} | - | | 800 | nsec |
| Output Turn On Rise Time | t_r | - | | 180 | |
| Input-to-Output Turn Off Delay | t_{offd} | - | | 1000 | |
| Output Turn Off Fall Time | t_f | | | 160 | |
| At VCC=300V, IC=50A, $T_C = 25$ | | | | | |
| Input-Output Isolation Voltage | - | 1000 | - | - | V |

| | | | | | |
|--|------------|-----|---|-----|------------------|
| Maximum operating Junction Temperature | T_{jmax} | -40 | - | 150 | $^\circ\text{C}$ |
| Maximum Storage Junction Temperature | T_{jmax} | -55 | - | 150 | $^\circ\text{C}$ |

(1) ITRIP Cycle-by cycle current limit is internally set to 70A peak. The set point can be lowered by connecting a resistor between Itrip-ref and Gnd. The set point can be increased by connecting a resistor between Itrip-ref and +5V ref

(2) Desaturation blanking maximum time is TBD and is only provided at the low-side IGBTs.

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Package Drawing:

