

HIGH VOLTAGE HALF BRIDGE

Features

- Output Power IGBT's in half-bridge configuration
- 600V rated breakdown voltage
- High side gate drive designed for bootstrap operation
- Matched propagation delay for both channels
- Independent high and low side output channels (IR062HD4C10U-P2) or cross-conduction prevention logic (IR082HD4C10U-P2)
- Undervoltage lockout
- 5V Schmitt-triggered input logic
- Metal heatsink back for improved P_D

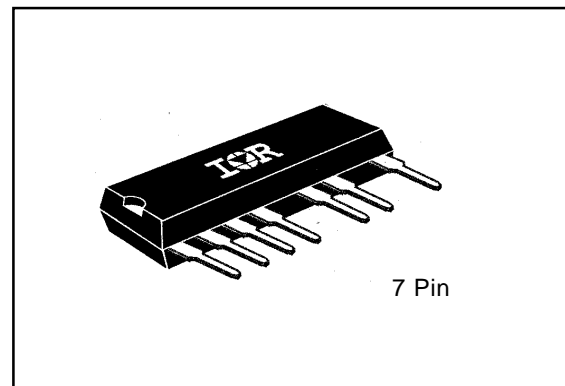
Description

The IR062HD4C10U-P2 / IR082HD4C10U-P2 are high voltage, high speed half bridges. Proprietary HVIC and latch immune CMOS technologies, along with the power IGBT technology, enable ruggedized single package construction. The logic inputs are compatible with standard CMOS or LSTTL outputs. The front-end features an independent high and low side driver in phase with the logic compatible input signals. The output features two IGBT's in a half-bridge configuration. Propagation delays for the high and low side power IGBT's are matched to simplify use. The device can operate up to 600 volts.

Product Summary

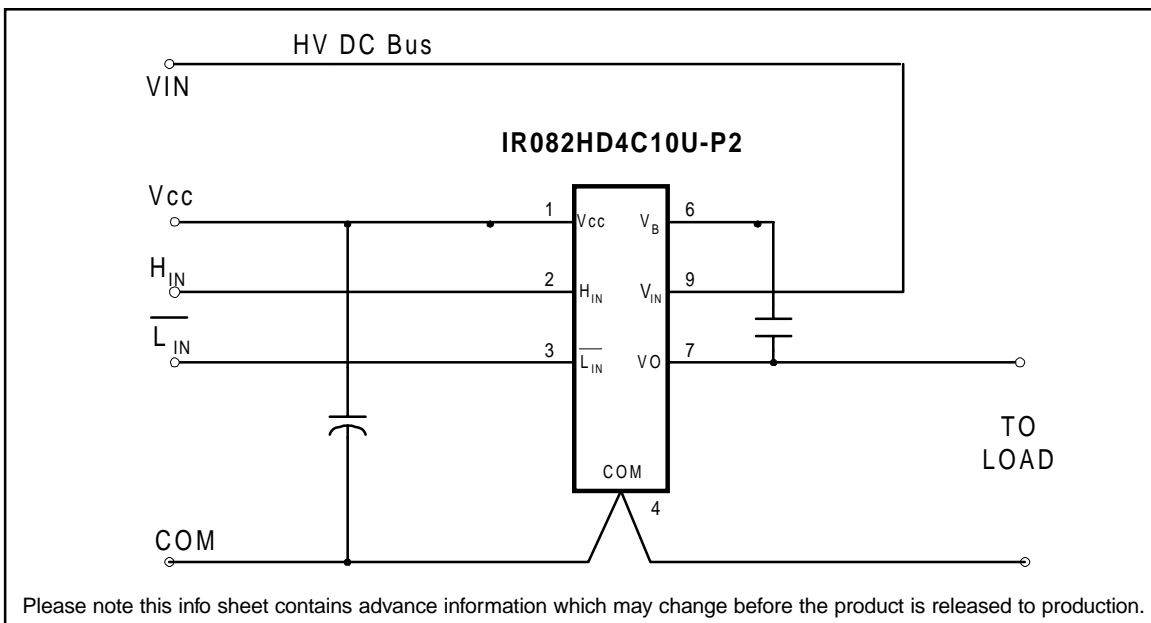
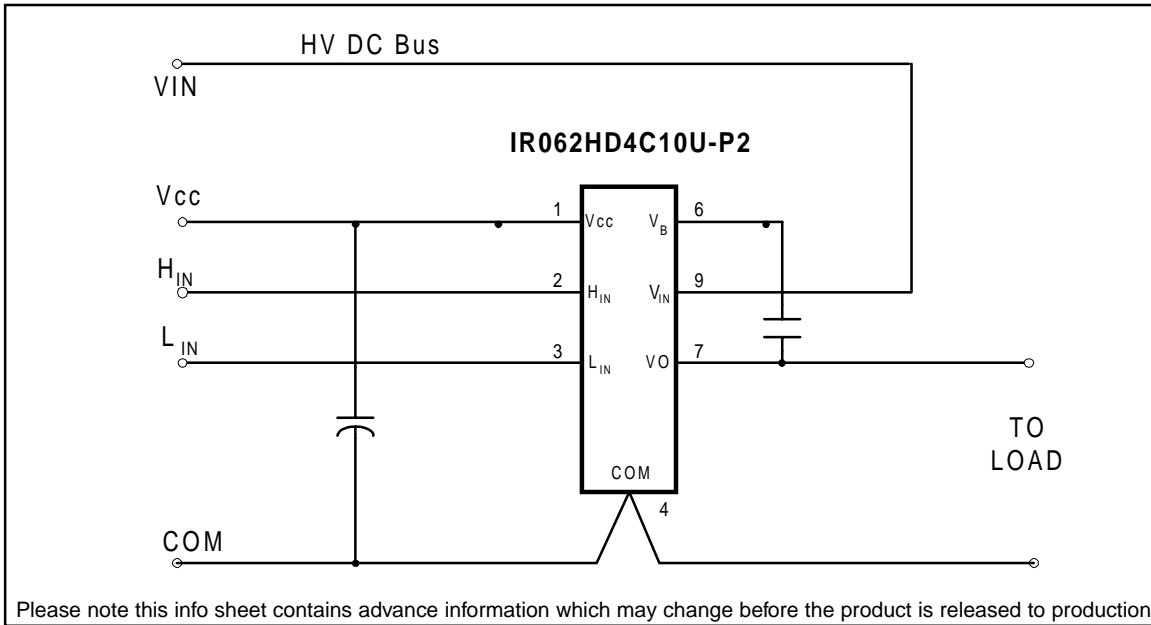
| | |
|---------------------------------------------|-------------|
| V_{IN} (max) | 600V |
| P_D (T_A = 25°C) | 3.0W |
| V_{CE(ON)} typ | 3.0V |

Package



IR062HD4C10U-P2 IR082HD4C10U-P2

Typical Connections



Absolute Maximum Ratings

Absolute Maximum Ratings indicate sustained limits beyond which damage to the device may occur. All voltage parameters are absolute voltages referenced to COM, all currents are defined positive into any lead. The Thermal Resistance and Power Dissipation ratings are measured under board mounted and still air conditions.

| Symbol | Definition | Min. | Max. | Units |
|----------------------------------|----------------------------------------------------|---------------------|-----------------------|-------|
| V _{IN} | High voltage supply | - 0.3 | 600 | V |
| V _B | High side floating supply absolute voltage | V _O -0.3 | V _O + 25 | |
| V _O | Half-bridge output voltage | -0.3 | V _{IN} + 0.3 | |
| V _{IH} /V _{IL} | Logic input voltage (HIN & LIN) | - 0.3 | V _{CC} + 0.3 | |
| V _{CC} | Low side and logic fixed supply voltage | -0.3 | 25 | |
| dV/dt | Peak diode recovery dv/dt | — | 3.50 | V/ns |
| P _D | Package power dissipation @ T _A ≤ +25°C | — | 3.00 | W |
| R _{thJA} | Thermal resistance, junction to ambient | — | 50 | °C/W |
| R _{thJC} | Thermal resistance, junction to case (metal) | — | 20 | |
| T _J | Junction temperature | -55 | 150 | °C |
| T _S | Storage temperature | -55 | 150 | |
| T _L | Lead temperature (soldering, 10 seconds) | — | 300 | |

Recommended Operating Conditions

The Input/Output logic timing diagram is shown in Figure 1. For proper operation the device should be used within the recommended conditions.

| Symbol | Definition | Min. | Max. | Units |
|----------------------------------|--------------------------------------------|---------------------|---------------------|-------|
| V _B | High side floating supply absolute voltage | V _O + 10 | V _O + 20 | V |
| V _{IN} | High voltage supply | — | 600 | |
| V _O | Half-bridge output voltage | (note 1) | V _{IN} | |
| V _{CC} | Low side and logic fixed supply voltage | 10 | 20 | |
| V _{IH} /V _{IL} | Logic input voltage (HIN & LIN) | 0 | V _{CC} | |
| T _A | Ambient temperature | -40 | 125 | A |
| I _C | Continuous collector current (TC = 25 °C) | — | 2.0 | |
| | (TC = 85 °C) | — | 1.1 | |

Note 1: Logic operational for V_O of -5 to 600V. Logic state held for V_O of -5 to -V_{BO}

IR062HD4C10U-P2

IR082HD4C10U-P2

International
 Rectifier

Dynamic Electrical Characteristics

V_{BIAS} (V_{CC} , V_{BS}) = 15V and $T_A = 25^\circ\text{C}$ unless otherwise specified. Switching time waveform definitions are shown in figure 2. Refer to IC data sheets (IR2106 and IR2108) for further characteristics.

| Symbol | Definition | $T_A = 25^\circ\text{C}$ | | | Units | Test Conditions | |
|-----------|-----------------------------------------|--------------------------|------|------|-------|--------------------|--------------|
| | | Min. | Typ. | Max. | | | |
| t_{on} | Turn-on propagation delay (see note 2) | -IR062 | — | 220 | 310 | ns | $V_o = 0V$ |
| | | -IR082 | — | 680 | 900 | | |
| t_{off} | Turn-off propagation delay (see note 2) | -IR062 | — | 257 | 380 | ns | $V_o = 600V$ |
| | | -IR082 | — | 220 | 400 | | |
| t_{rr} | Reverse recovery time (FRED Diode) | — | 28 | — | nC | $I_F = 400mA$ | |
| Q_{rr} | Reverse recovery charge (FRED Diode) | — | 40 | — | | $di/dt = 100 A/us$ | |

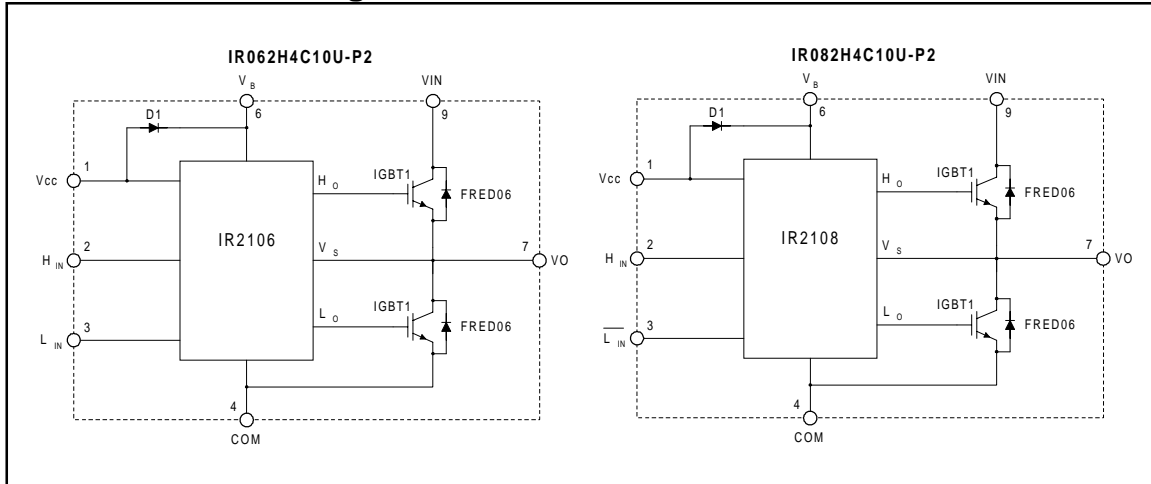
Note 2: Switching times as specified and illustrated in figure 2 are referenced to the V_O output voltage. This is shown as V_O in figure 2.

Static Electrical Characteristics

V_{BIAS} (V_{CC} , V_{BS}) = 15V and $T_A = 25^\circ\text{C}$ unless otherwise specified. The V_{IN} and I_{IN} parameters are referenced to COM.

| Symbol | Definition | $T_A = 25^\circ\text{C}$ | | | Units | Test Conditions |
|----------------------------|-------------------------------------------------------|--------------------------|------|------|--------------|--------------------------------|
| | | Min. | Typ. | Max. | | |
| V_{CCUV+} V_{BSUV+} | V_{CC} supply undervoltage positive going threshold | 8.0 | 8.9 | 9.8 | V | |
| V_{CCUV-} V_{BSUV-} | V_{CC} supply undervoltage negative going threshold | 7.4 | 8.2 | 9.0 | | |
| I_{QCC} | Quiescent V_{CC} supply current | 0.4 | 1.0 | 1.6 | mA | |
| I_{QBO} | Quiescent V_{BO} supply current | 20 | 60 | 150 | μA | |
| I_{LK} | Offset supply leakage current @25°C | — | — | 100 | | $V_B = 600V$ |
| I_{INLK} | V_{in} to V_O leakage current @25°C | — | — | 250 | | $V_{IN} = 600V,$ $V_O = 0V$ |
| | | @150°C | — | 1000 | | |
| I_{OLK} | V_O leakage current @25°C | — | — | 250 | $V_O = 600V$ | |
| | | @150°C | — | 1000 | | |
| V_{IH} | Logic "1" input voltage | 2.7 | — | — | V | $V_{CC} = 10V$ to 20V |
| V_{IL} | Logic "0" input voltage | — | — | 0.8 | | |
| I_{IN+} | Logic "1" input bias current | — | 20 | 40 | μA | $V_{IN} = 5V$ |
| I_{IN-} | Logic "0" input bias current | — | — | 1 | | |
| $V_{CE(on)}$ | Collector-to-Emitter saturation voltage | — | 3.0 | — | V | $I_C = 400mA$ |
| V_{EC} | Diode forward voltage | — | 1.2 | — | | $I_E = 400mA$ |
| V_F | Bootstrap Diode forward voltage (D1) | — | 1.5 | — | | $I_F = 400mA$ |

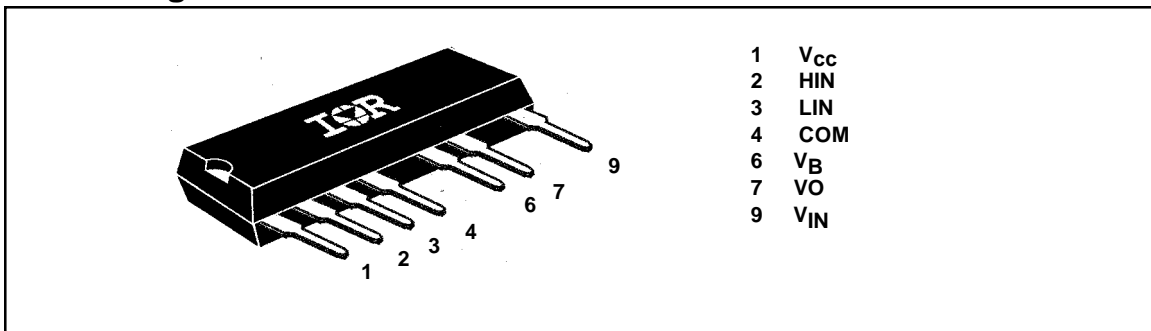
Functional Block Diagram



Lead Definitions

| Lead | |
|-----------------|---------------------------------------------------------------------------------------------|
| Symbol | Definition |
| V _{CC} | Logic and internal gate drive supply voltage. |
| H _{IN} | Logic input for high side half bridge output, in phase |
| L _{IN} | Logic input for low side half bridge output, in phase (IR062xxx) or out of phase (IR082xxx) |
| V _B | High side gate drive floating supply |
| V _{IN} | High voltage supply |
| VO | Half bridge output |
| COM | Logic return and half bridge return |

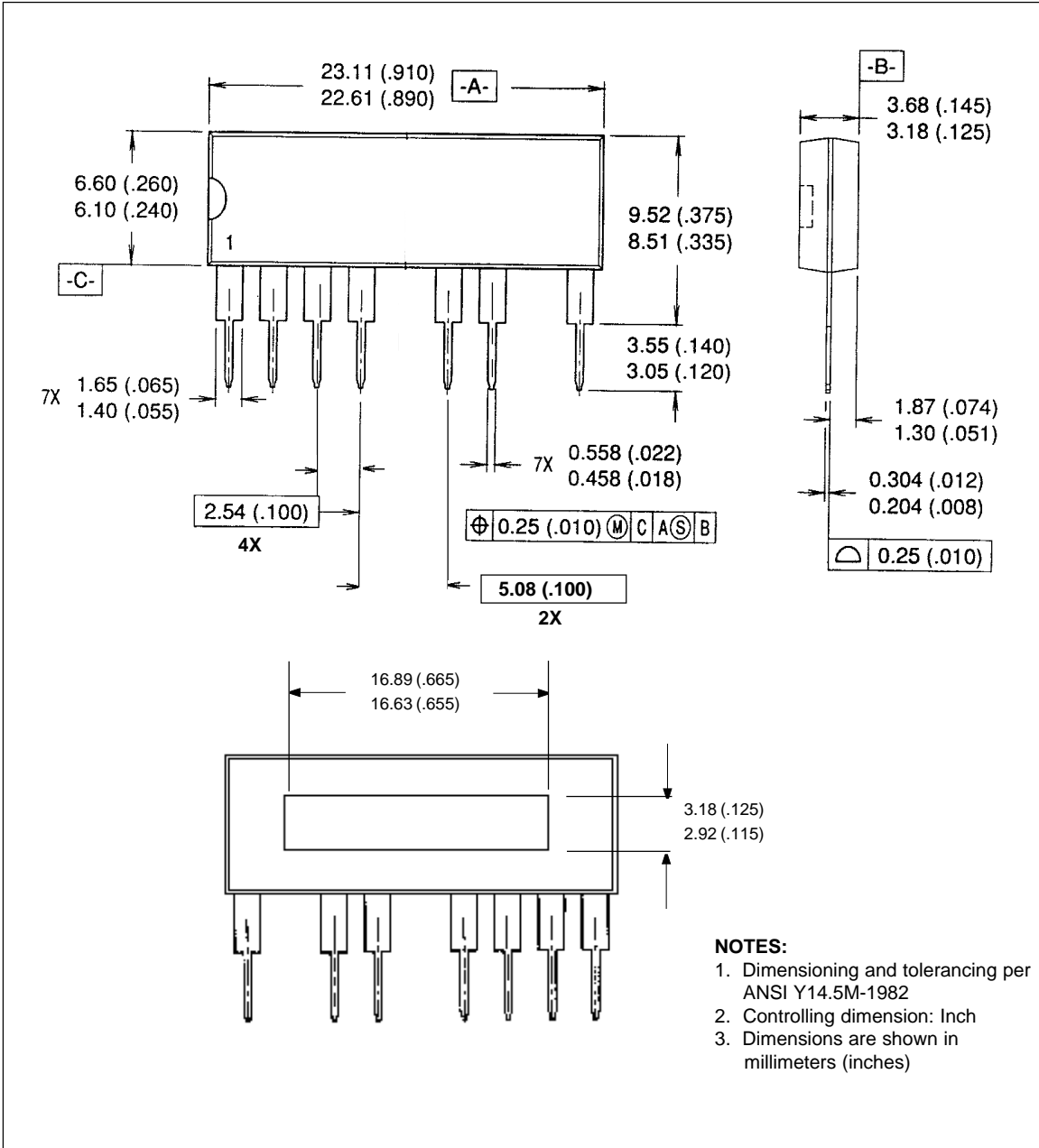
Lead Assignments



IR062HD4C10U-P2
IR082HD4C10U-P2

International
IGR Rectifier

Case Outline - 7 pin



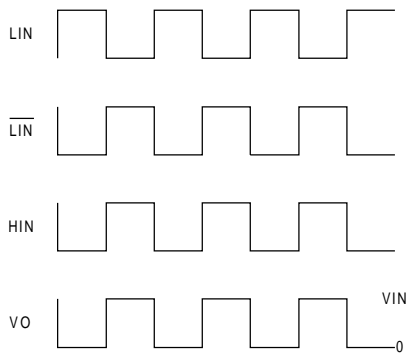


Figure 1. Input/Output Timing Diagram

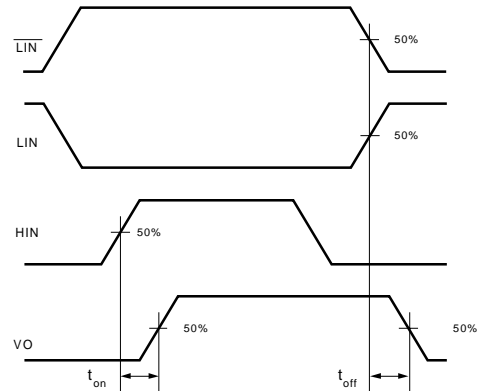


Figure 2. Switching Time Waveform Definitions