PICREF-1 SCHEMATICS

The UPS may be split into 4 main circuits: Input Power Factor Correction, Battery Boost, Free-Running Chopper, and Inverter. The UPS is an on-line device which normally will have the Power Factor Correction circuit feeding the Chopper, which then feeds the Inverter. If the input power should be lost, the Power Factor Correction circuit falls out of the power flow and the Battery Boost circuit automatically provides power to the Chopper.

The Inverter is driven by the Inverter Drive circuitry, which in turn is controlled by the Inverter Control circuitry containing the microcontroller.

UPS circuit board (PCB) power flow is shown in Figure 1.

UPS System Overview

In the Battery Boost circuit, the transistor pairs are connected in parallel for the purpose of handling high currents. The current transformer T2 is connected as shown to sense each pair's current with just one transformer, i.e., to prevent it from saturating.

The control for the 120V/240V relay (power switch) was not implemented. Wherever input power monitoring would take place, monitoring for 120 or 240V would also occur and switch the relay. These functions would be placed before the PFC circuit.

Power Factor Correction

The Power Factor Correction circuit is provisional, so the parts listed are generic parts.

FIGURE 1: PCB POWER FLOW

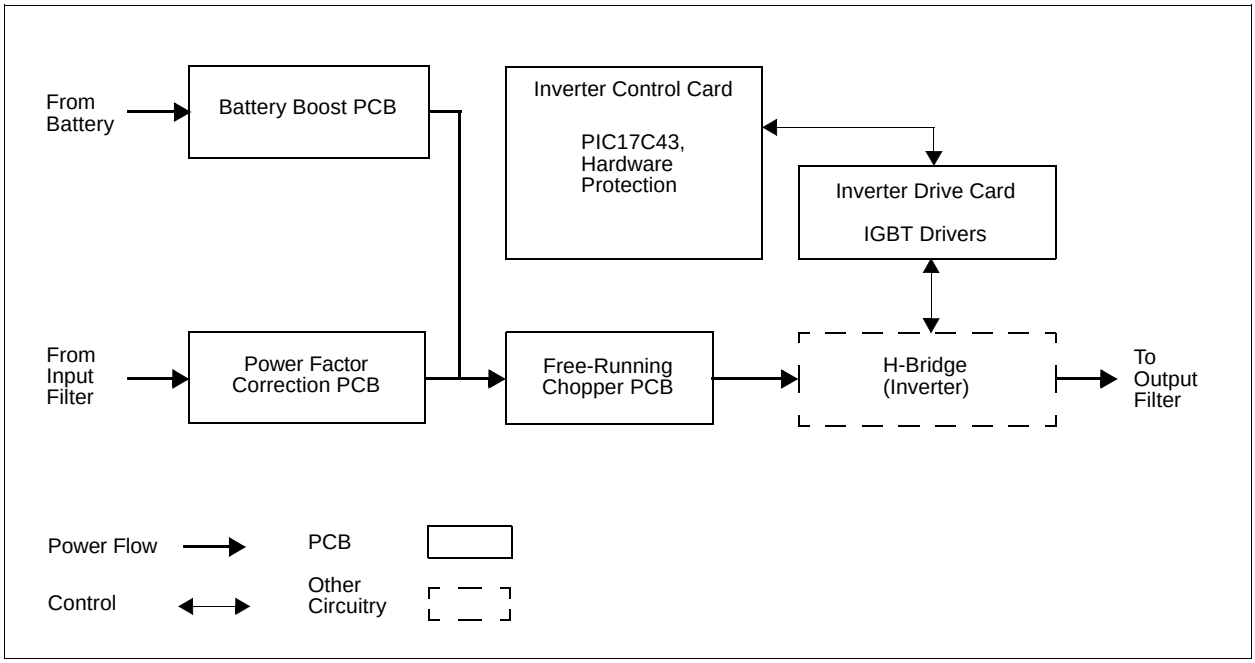


FIGURE 2: UPS SYSTEM OVERVIEW - PAGE 1 OF 3

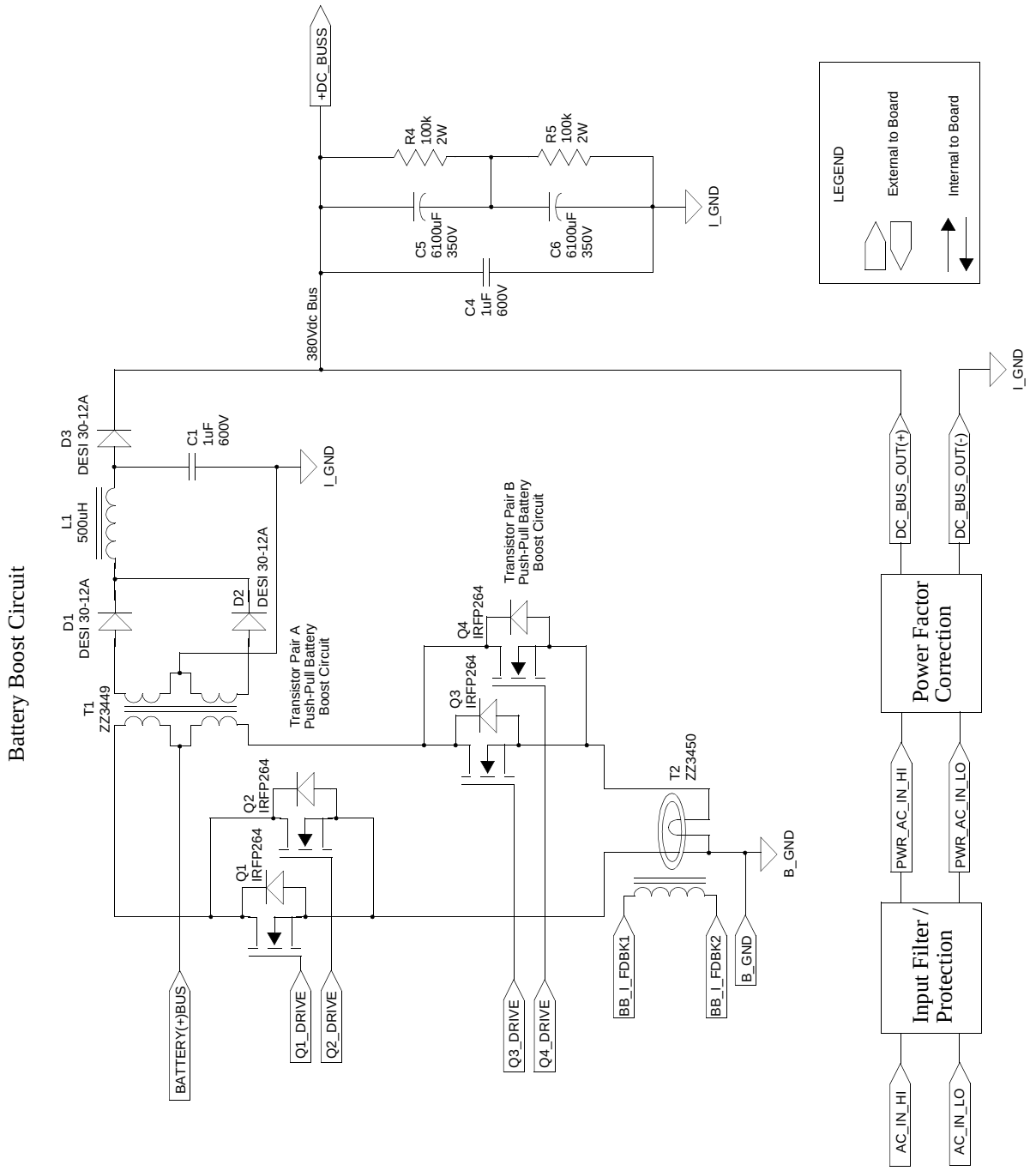


FIGURE 2: UPS SYSTEM OVERVIEW - PAGE 2 OF 3

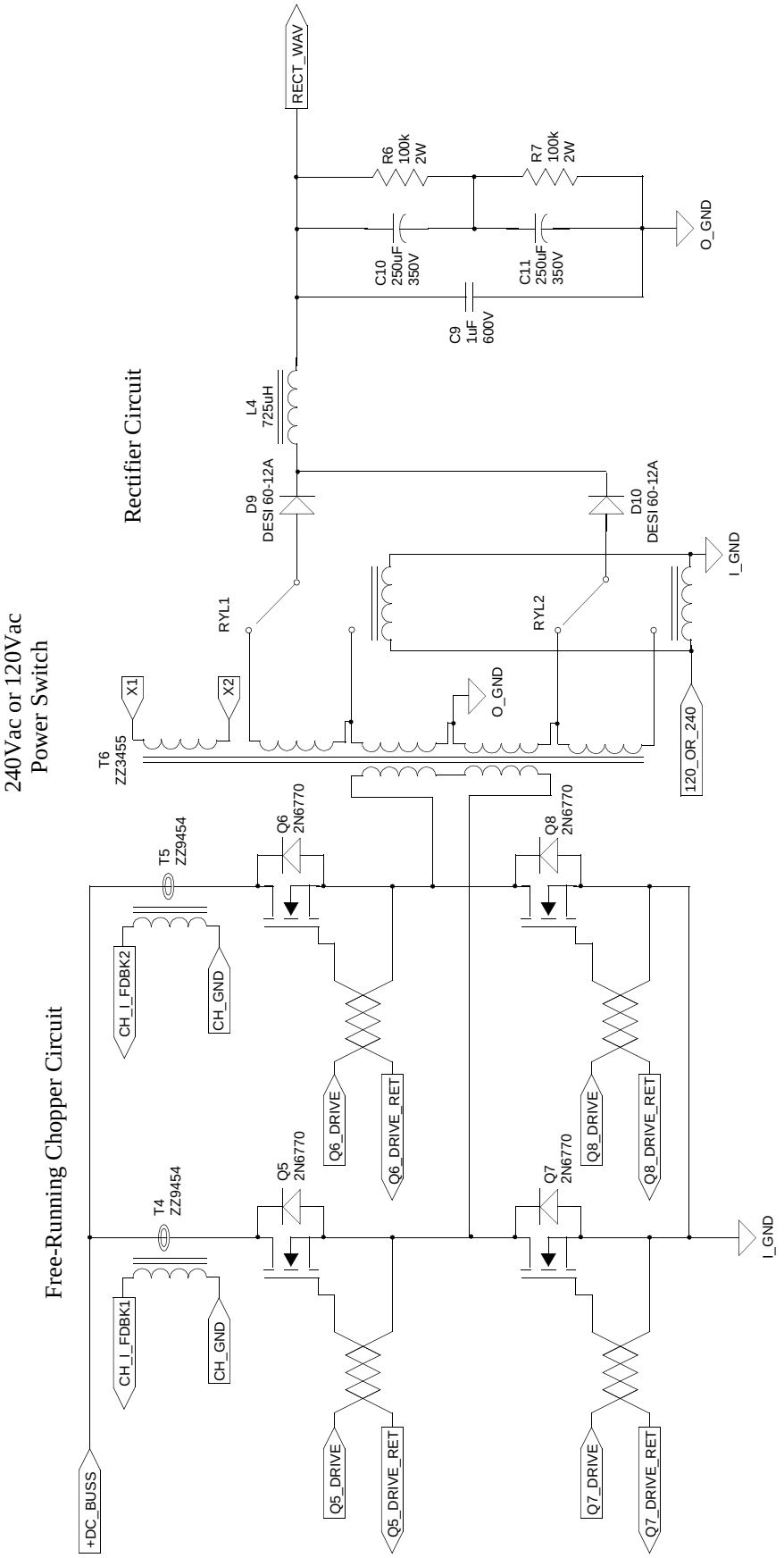


FIGURE 2: UPS SYSTEM OVERVIEW - PAGE 3 OF 3

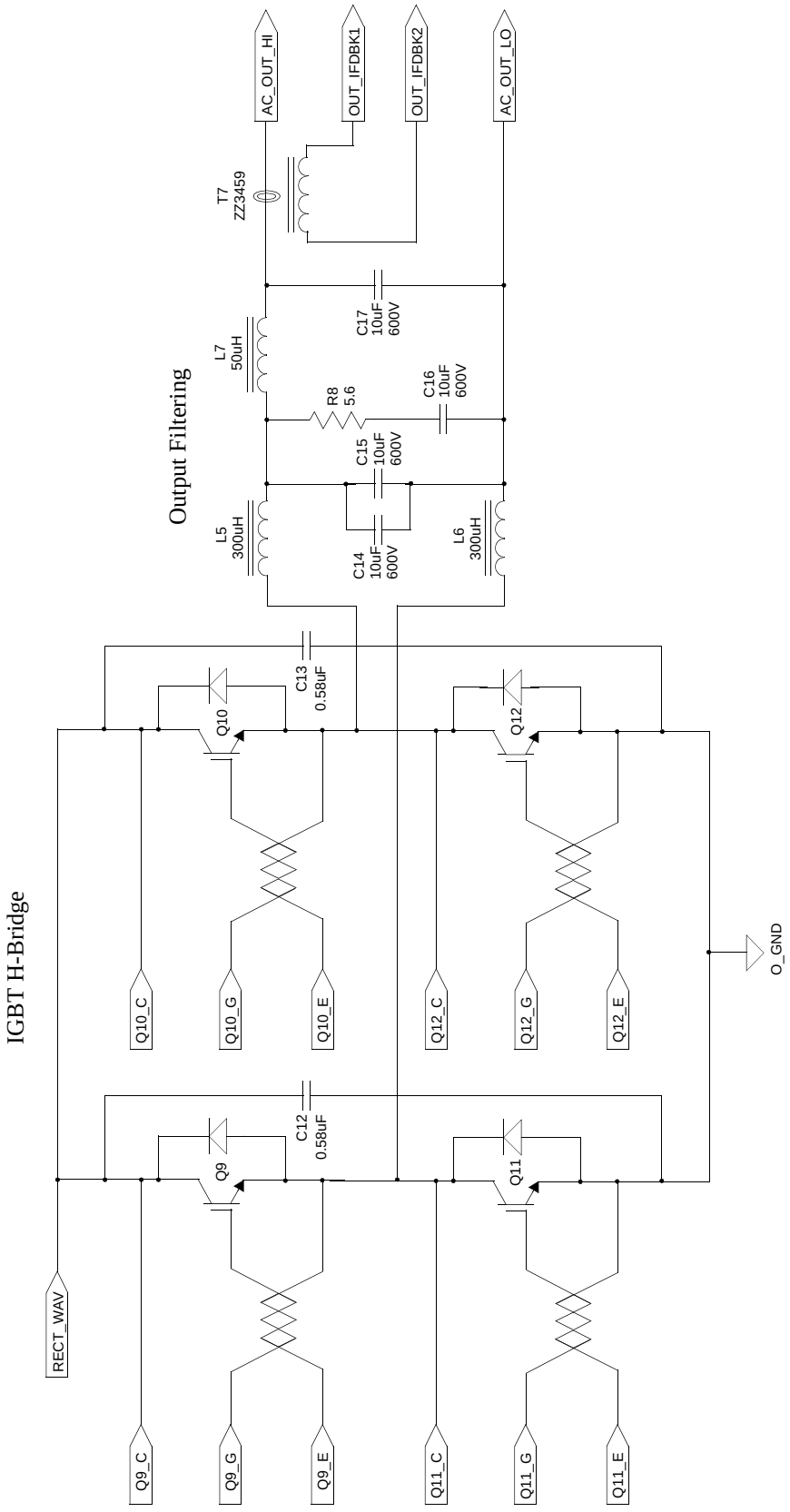


FIGURE 3: POWER FACTOR CORRECTION (PFC) – PAGE 1 OF 2

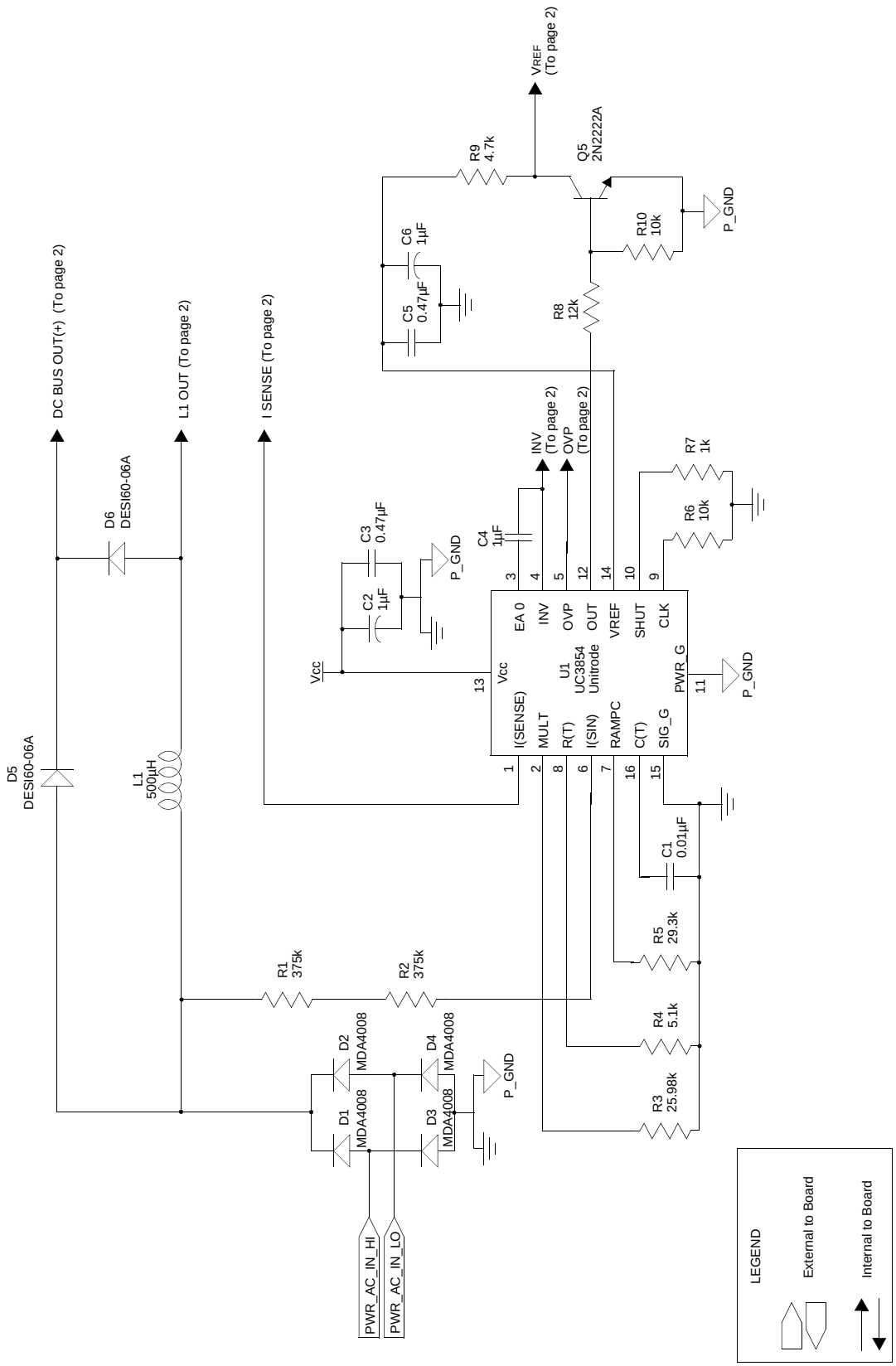


FIGURE 3: PFC – PAGE 2 OF 2

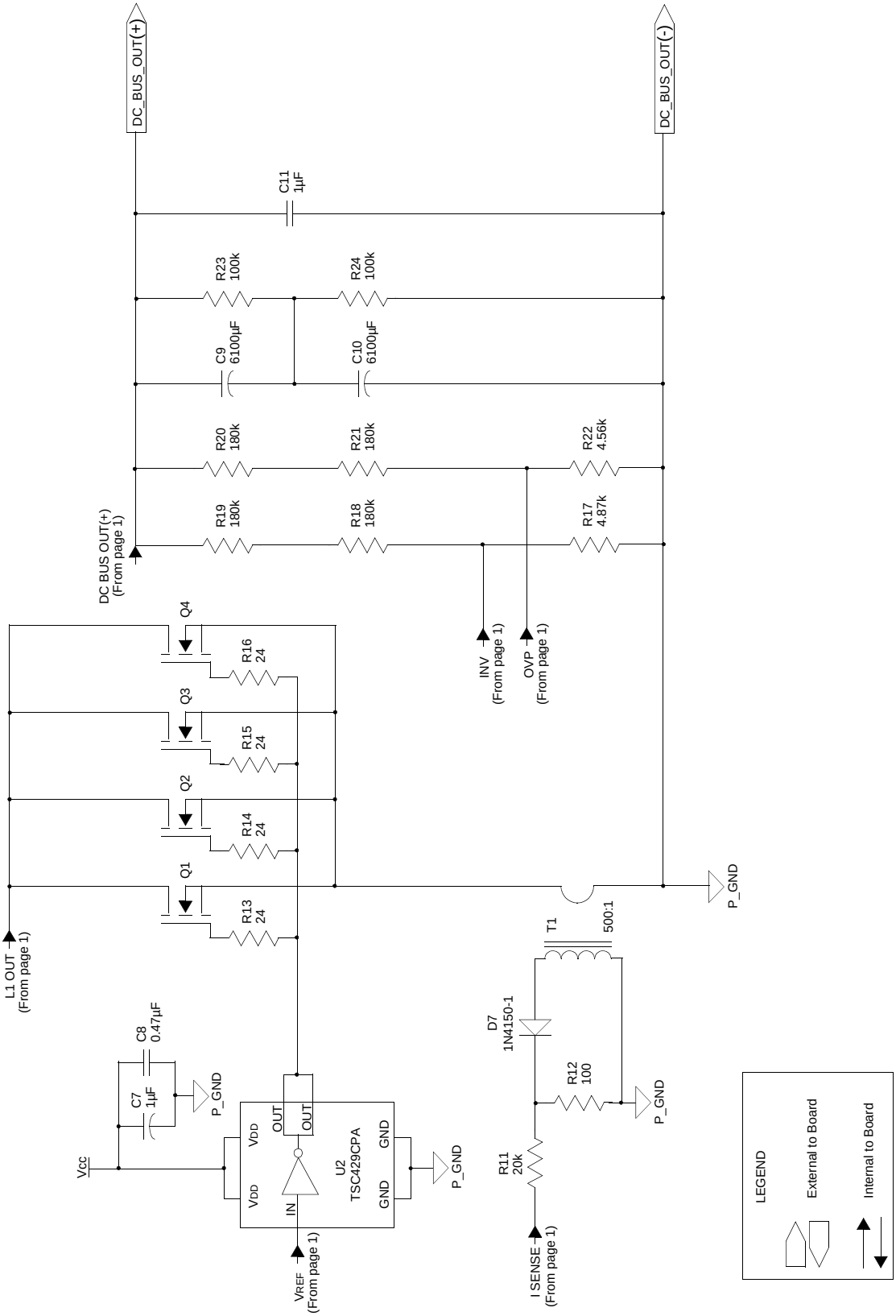


FIGURE 4: BATTERY BOOST (BB) CONTROL CARD – PAGE 1 OF 3

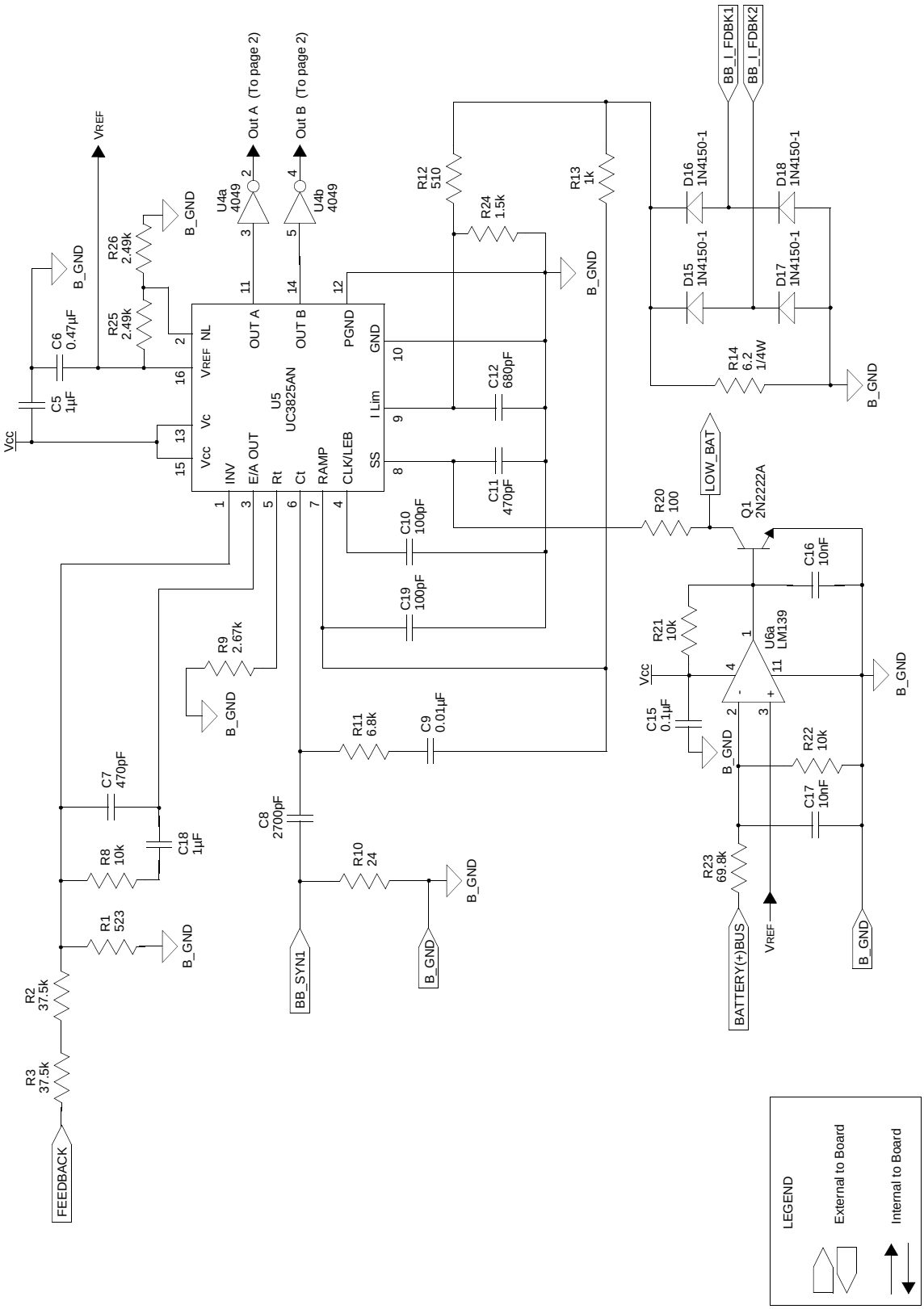


FIGURE 4: BB – PAGE 2 OF 3

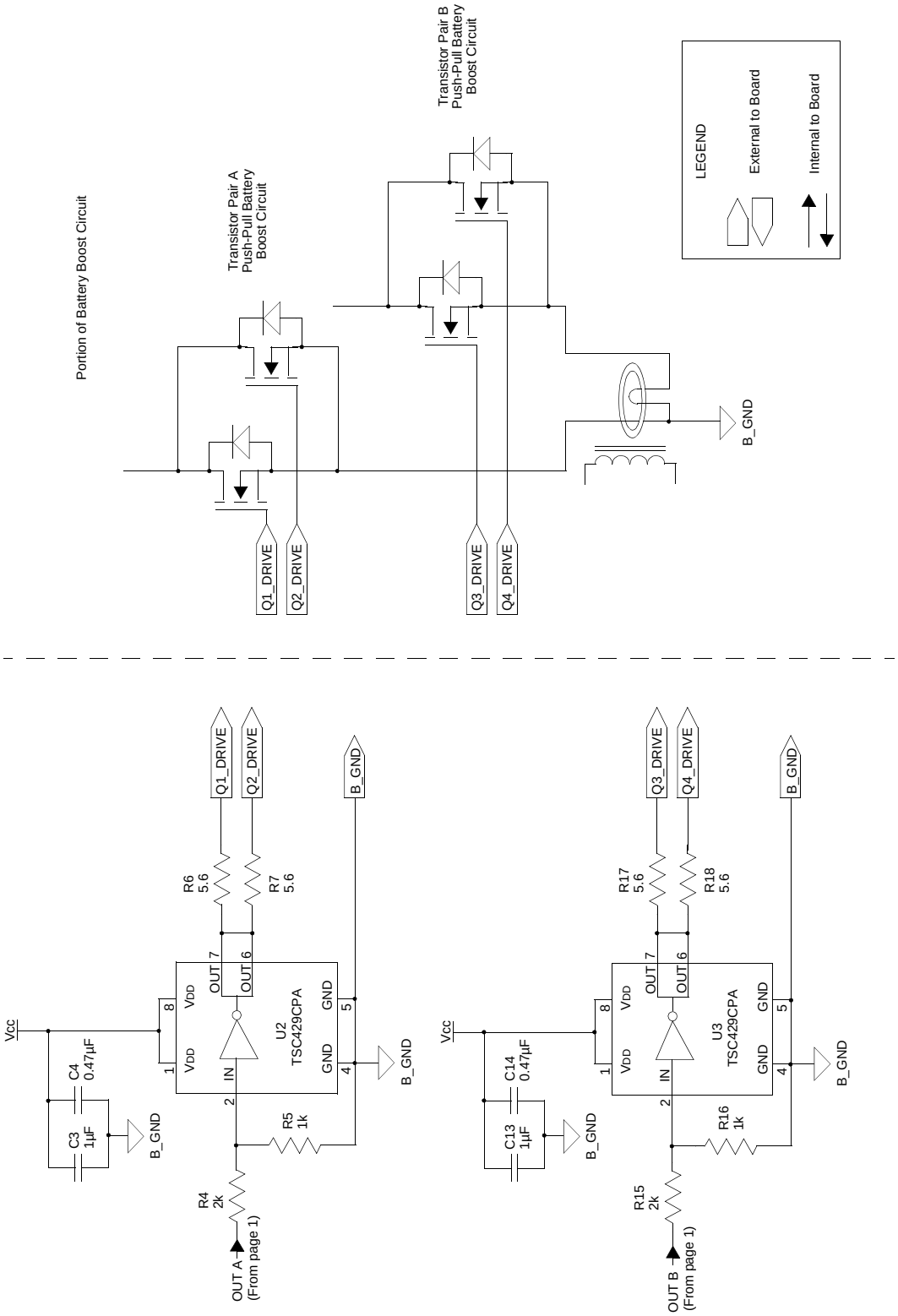


FIGURE 4: BB – PAGE 3 OF 3

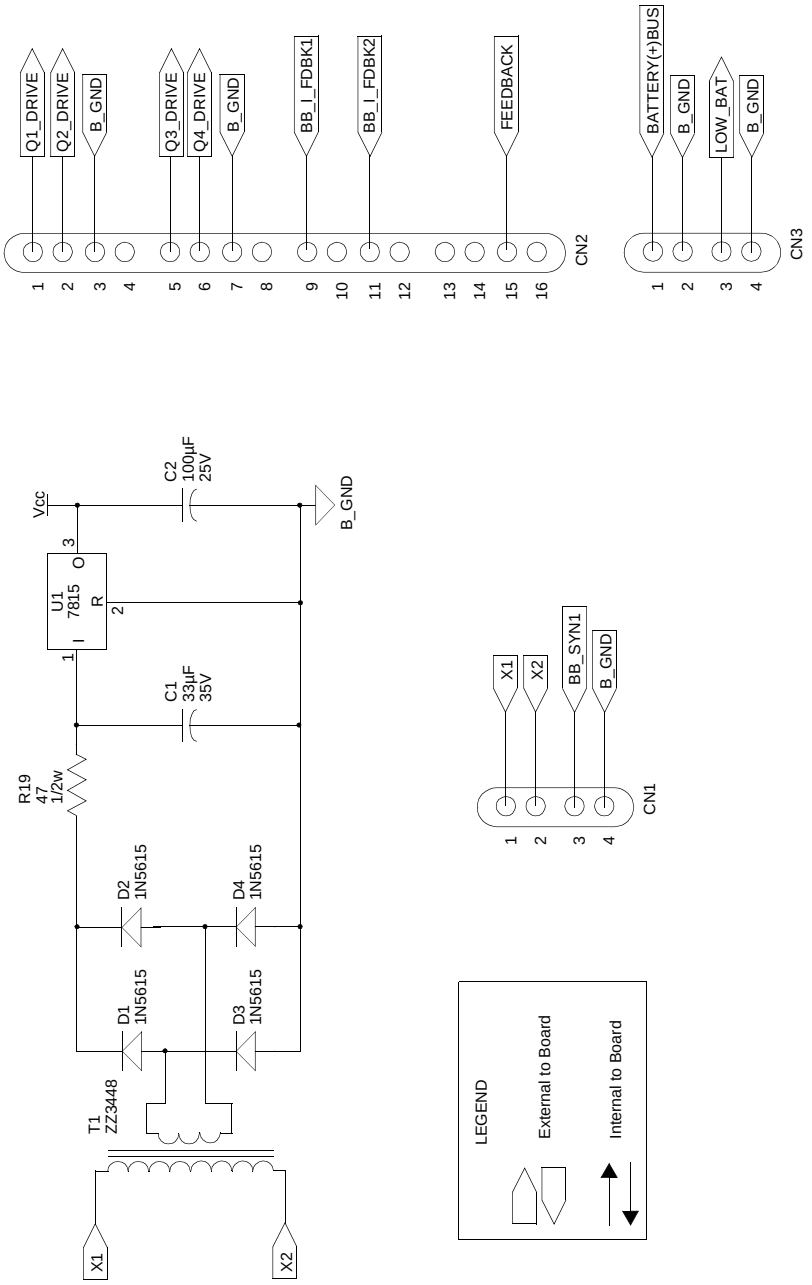


FIGURE 5: FREE-RUNNING CHOPPER (FRC) CONTROL CARD – PAGE 1 OF 3

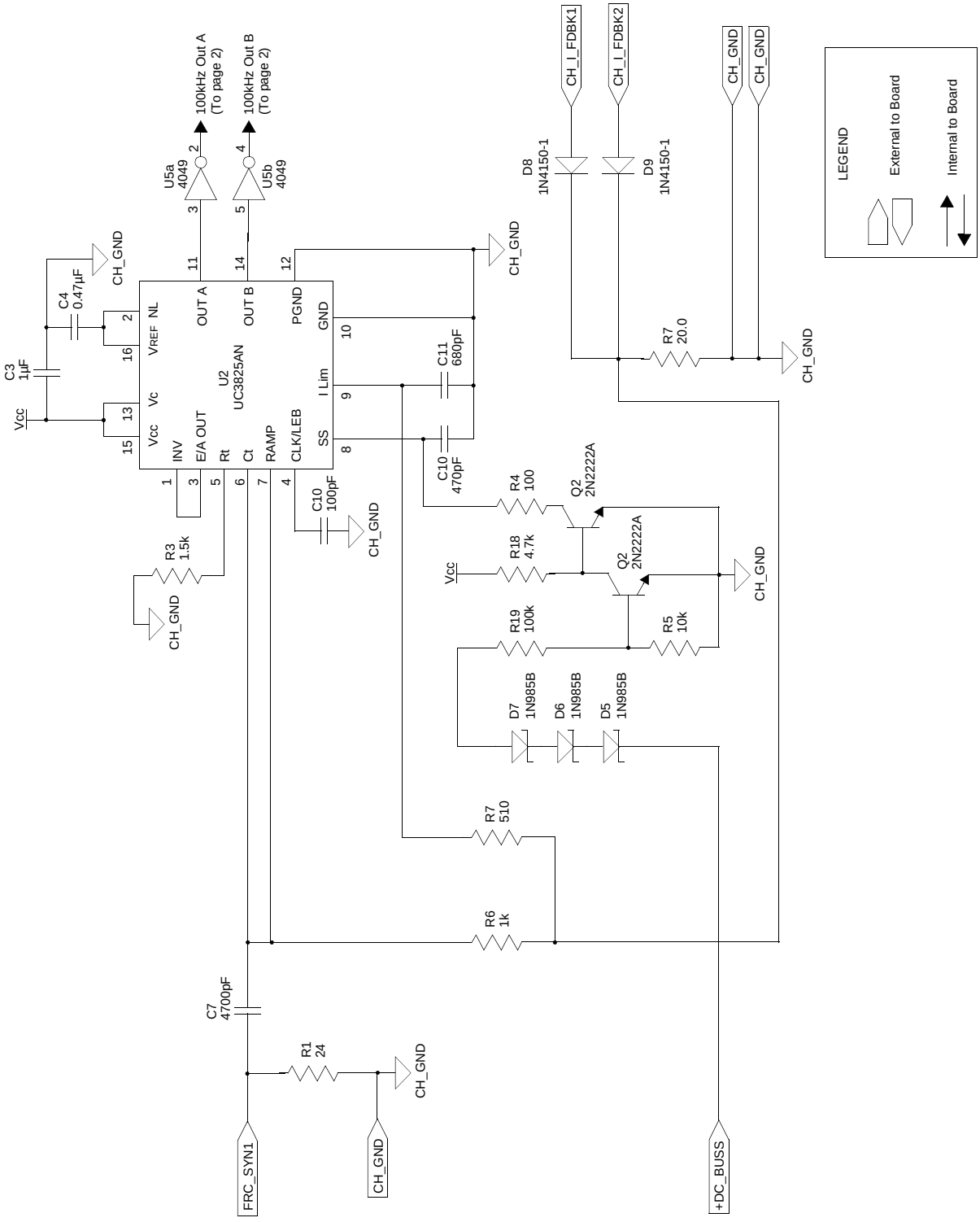


FIGURE 5: FRC – PAGE 2 OF 3

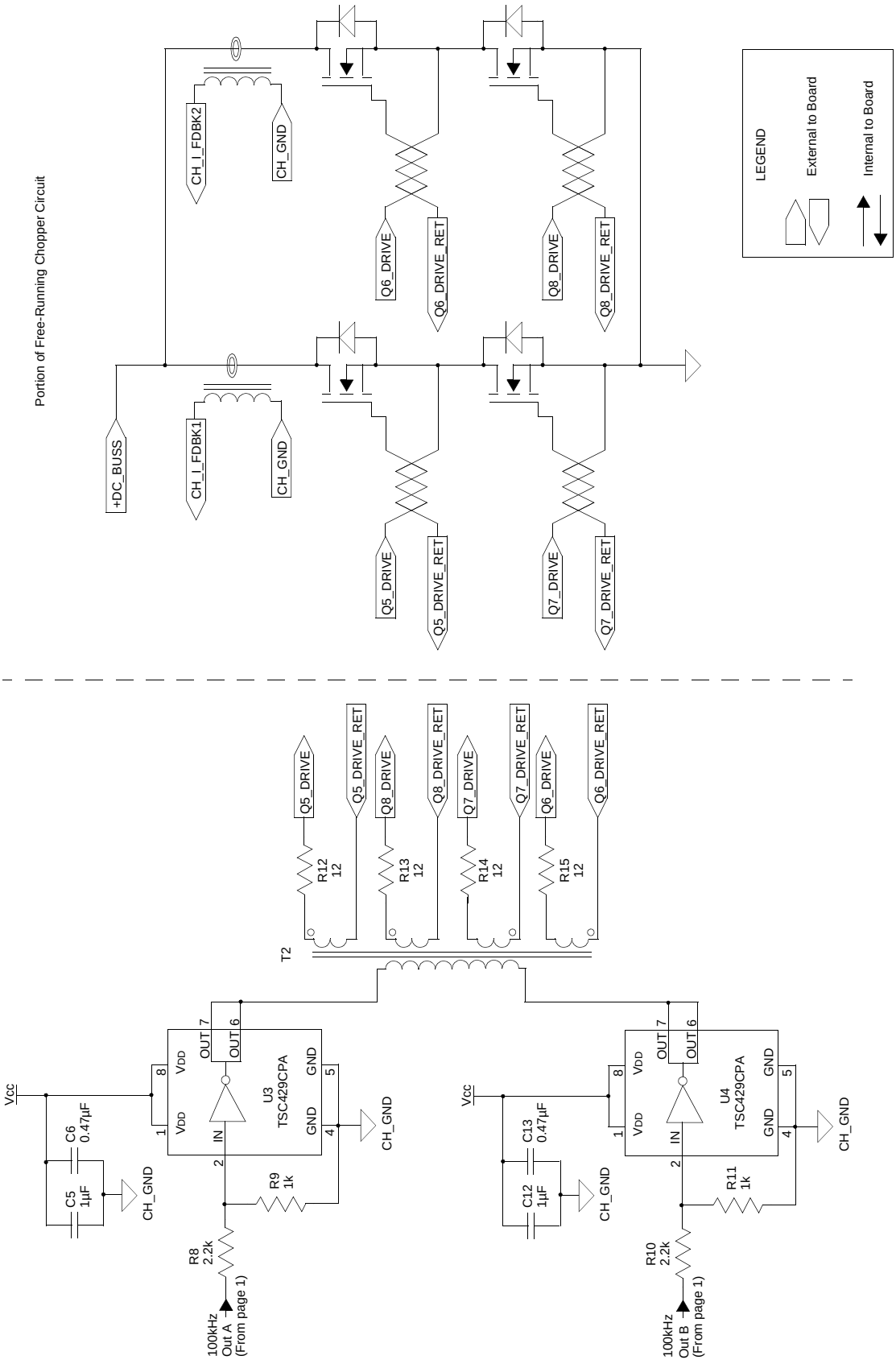


FIGURE 5: FRC – PAGE 3 OF 3

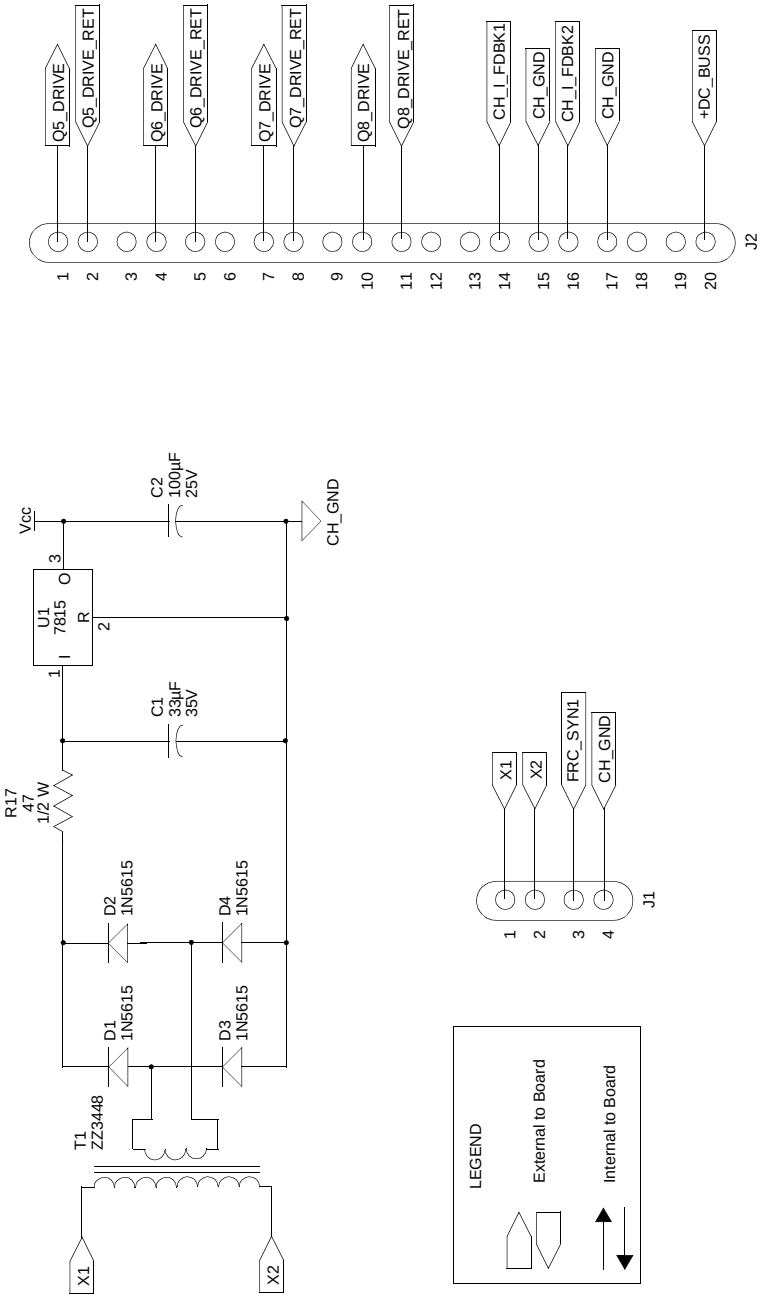


FIGURE 6: INVERTER CONTROL (INV CRTL) CARD – PAGE 1 OF 4

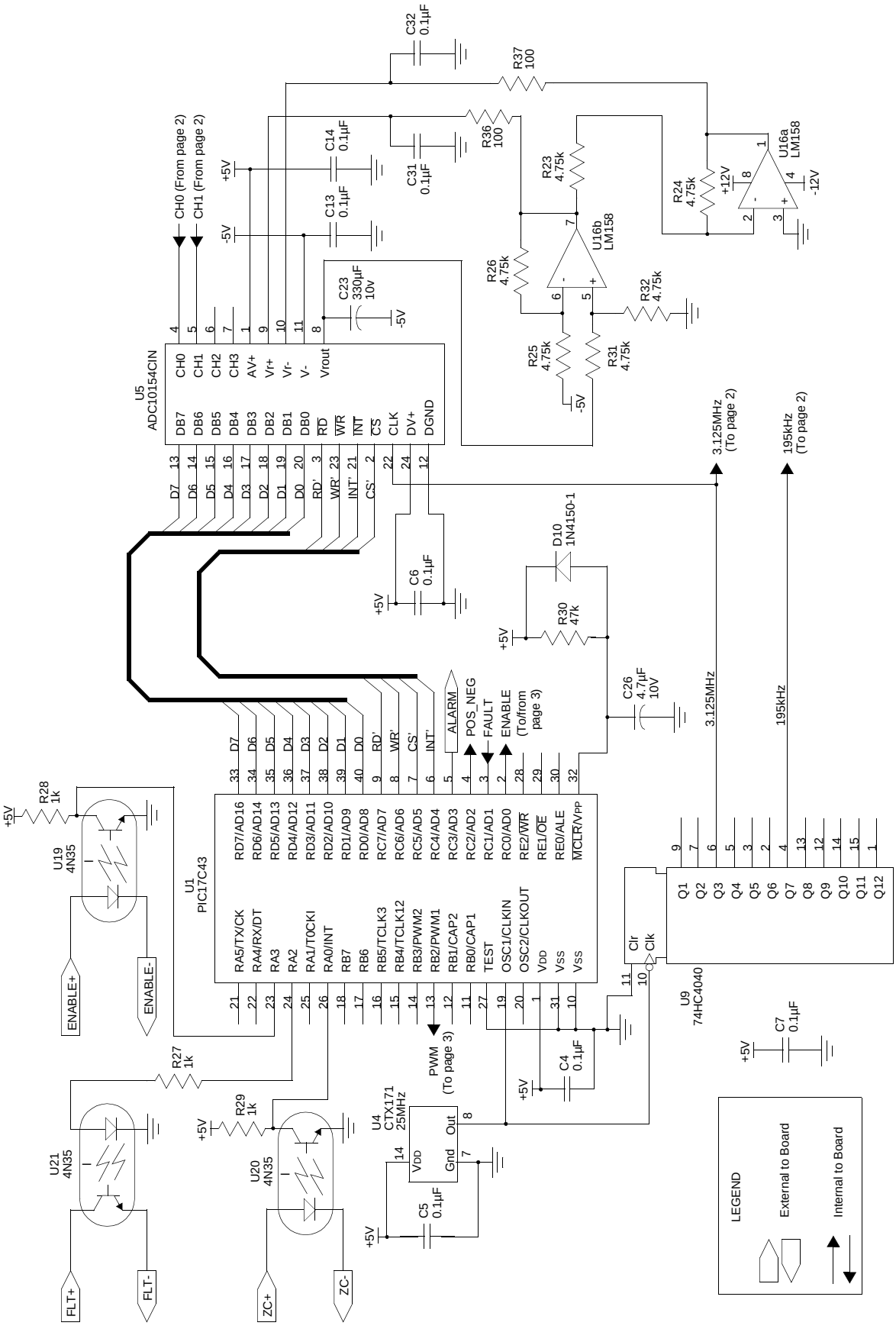


FIGURE 6: INV CRTL - PAGE 2 OF 4

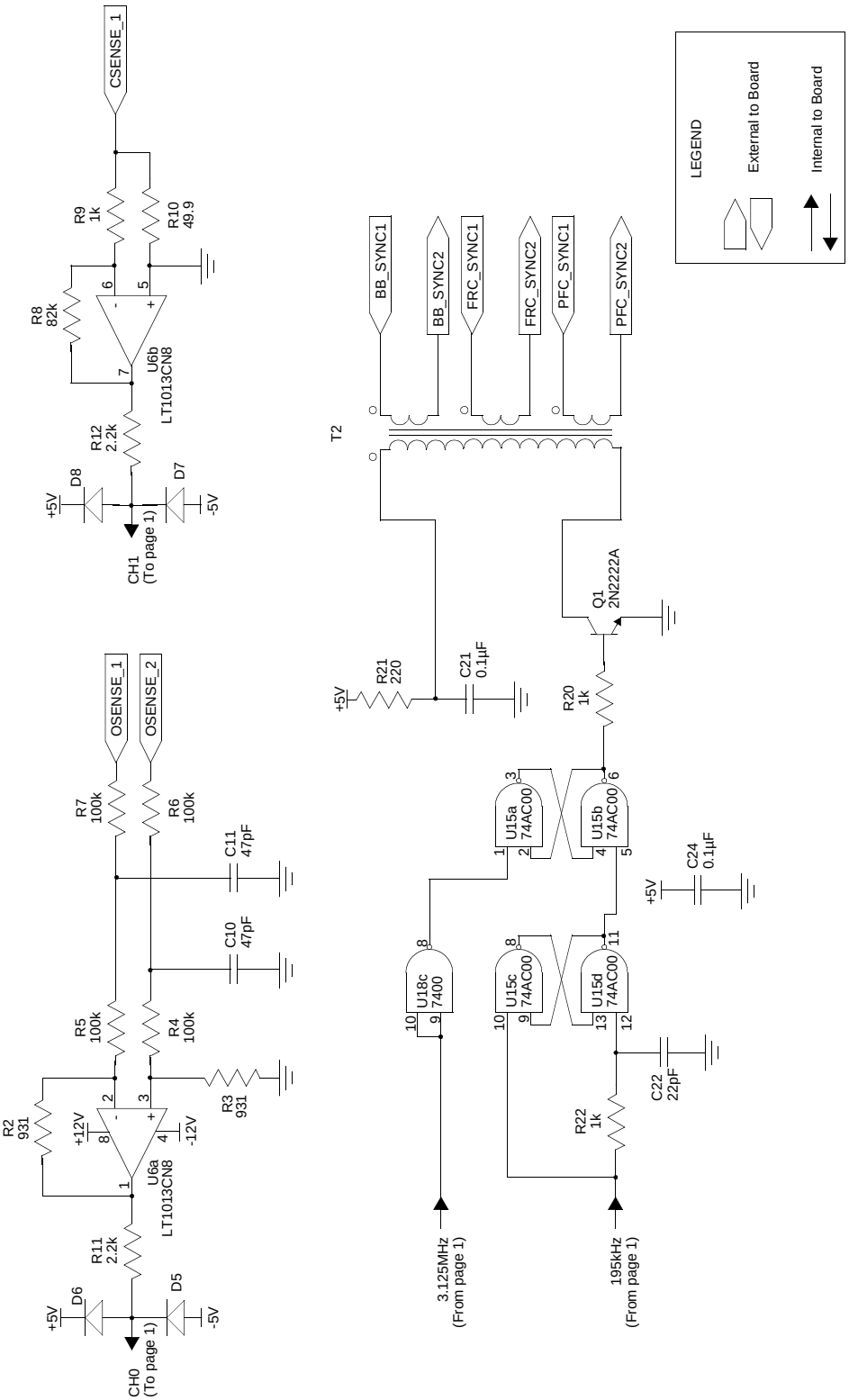


FIGURE 6: INV CRTL – PAGE 3 OF 4

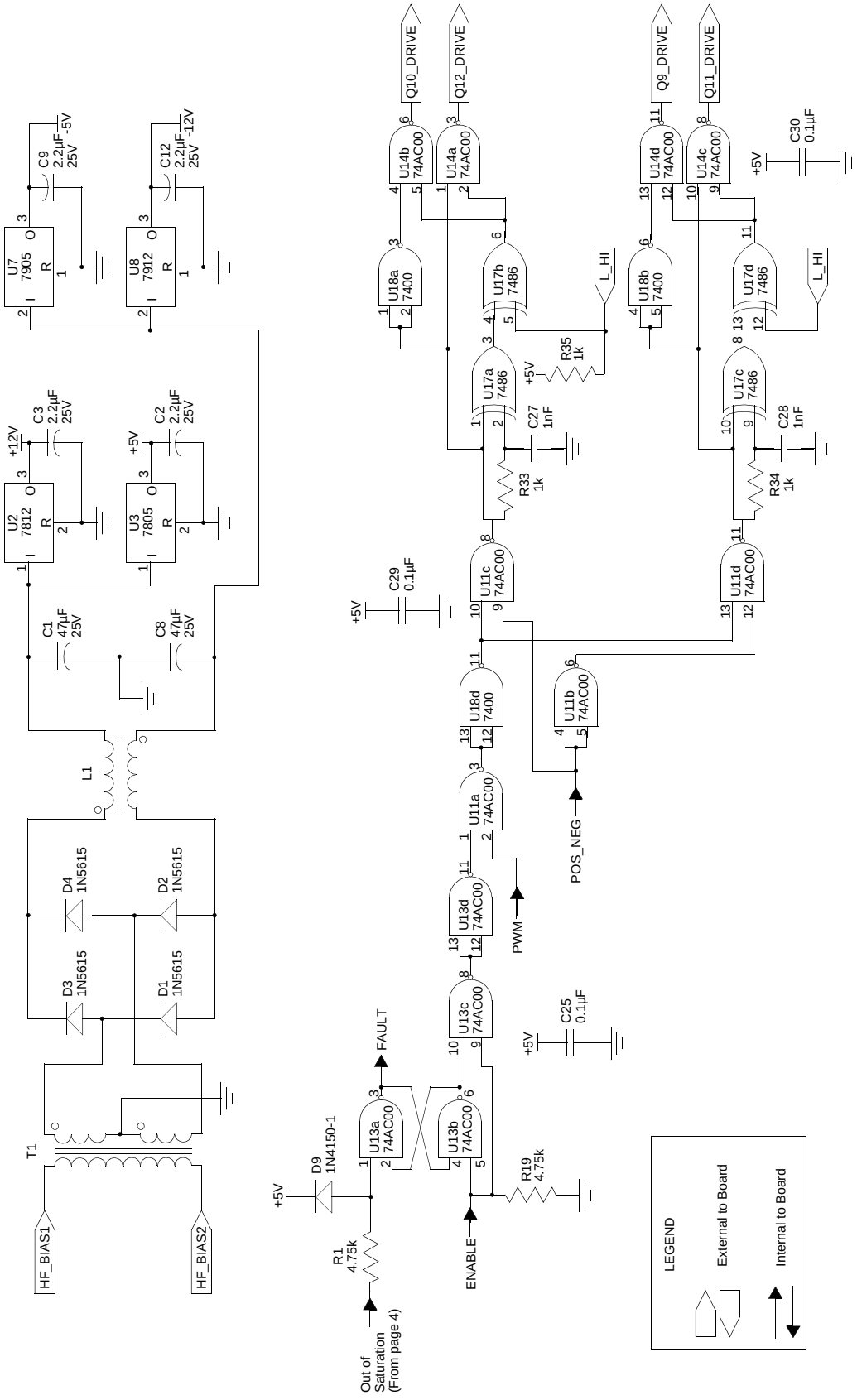


FIGURE 6: INV CRTL – PAGE 4 OF 4

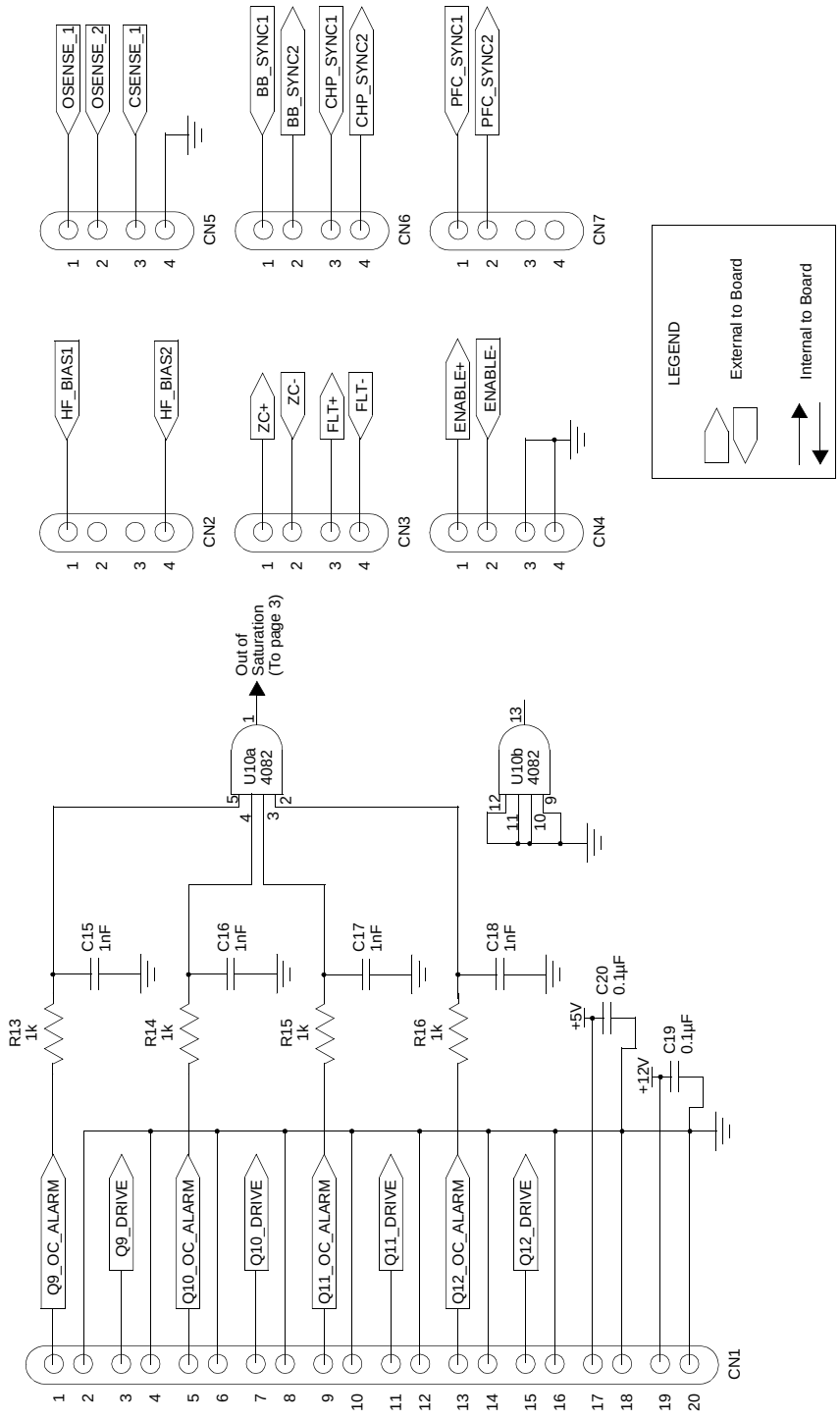
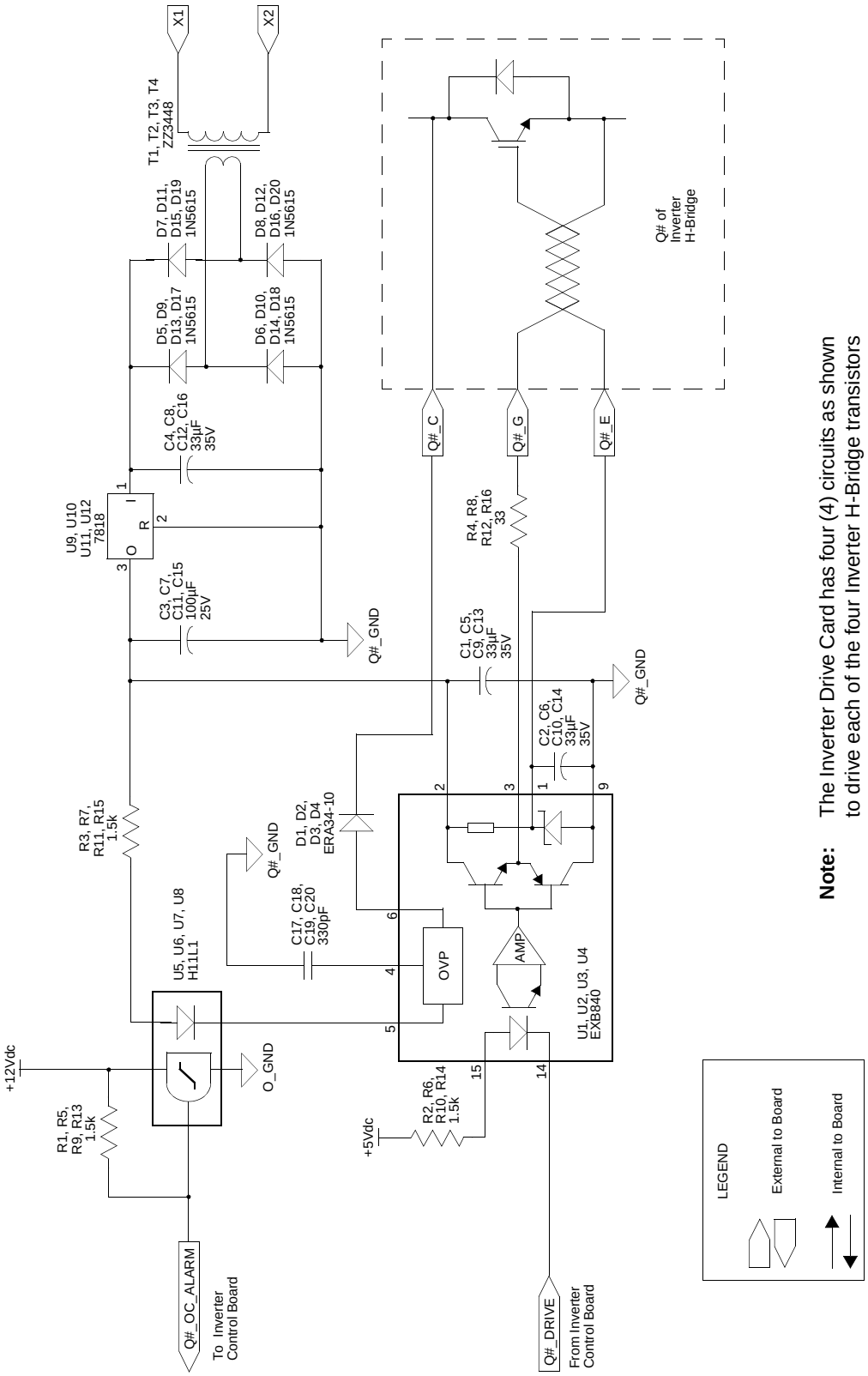


FIGURE 7: INVERTER DRIVE (INV DRV) CARD – PAGE 1 OF 2



Note: The Inverter Drive Card has four (4) circuits as shown to drive each of the four Inverter H-Bridge transistors (# = 9, 10, 11, 12).

FIGURE 7: INV DRV – PAGE 2 OF 2