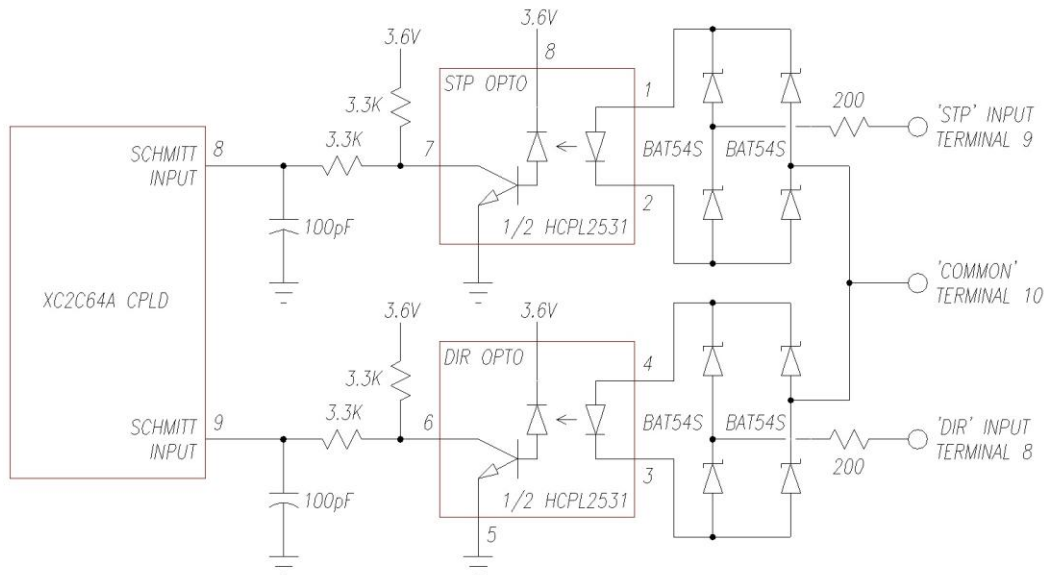


The G320X uses a universal optoisolator interface polarity circuit. The 'COMMON' terminal (term. 10) may be ground-referenced or 5VDC-referenced. The STEP and DIRECTION inputs are pull-down loads when COMMON is connected to controller GND. The STEP and DIRECTION inputs are pull-up loads when COMMON is connected to controller +5VDC.



#### Circuit Description:

Each HCPL-2531 opto LED is driven by a full Schottky diode bridge to forward bias the opto LED regardless of the STEP and DIRECTION input polarity. The HCPL-2531 opto-isolator has a 'gain' (CTR) of 20%. The collector load current is 1mA, so 5mA of LED current is required to operate the STEP and DIRECTION inputs. The opto-LED forward voltage is 1.5V and the BAT54S Schottky diodes have a forward voltage of 0.32V at 5mA. Since two Schottky diodes are conducting, the total voltage drop across all diodes is 2.14V (1.5V + 0.32V + 0.32V). The 200 Ohm resistor limits diode current to  $I = (V - 2.14V) / 200$ .

The STEP input current is 5.8 mA using 3.3V logic.  
 The STEP input current is 14.3 mA using 5V logic.

The HCPL-2531 is a dual high-speed opto-isolator which uses photo-diodes instead of photo-transistors. Even then it has a 0.5 uS 'turn-on' time and a 2 uS 'turn-off' time. The 3.3K resistor and 100pF capacitor forms a 300nS low-pass noise filter, its time delay limits the total STEP input response time to 0.8 uS 'turn-on' and 2.5 uS 'turn-off'.

#### When using COMMON connected to GND:

The minimum specified STEP logic '1' time is 1 uS.  
 The minimum specified STEP logic '0' time is 2.5 uS.  
 Use narrow logic '1' step pulses.  
 The STEP input cannot be driven with an open-collector driver.  
 3.3V and 5V logic level drivers can be used.

#### When using COMMON connected to +5VDC:

The minimum specified STEP logic '1' time is 2.5 uS.  
 The minimum specified STEP logic '0' time is 1 uS.  
 Use narrow logic '0' step pulses.  
 The STEP input can be driven with an open-collector driver.  
 The STEP input cannot be driven with 3.3V logic unless COMMON is connected to 3.3VDC.