Description

Basic voltage level translator utilizes a voltage comparator to translate an input voltage range into an output voltage range. First step is to determine the input voltage range, which involves an input low voltage level \( V_{IN}(\text{low}) \) and an input high voltage level, \( V_{IN}(\text{high}) \). Next step is to figure out the proper reference voltage level, at \( V_{REF} \). In many cases \( V_{REF} \) can be simply midpoint between \( V_{IN}(\text{low}) \) and \( V_{IN}(\text{high}) \). In other cases, one may want to skew the \( V_{REF} \) voltage level towards either \( V_{IN}(\text{low}) \) or \( V_{IN}(\text{high}) \). In this example, the output voltage range is simple ground and \( V_+ \), which also represent output voltage that range from rail to rail. For logic circuit type of voltage level translator, \( V_{REF} \) could be set to 1.4V for TTL logic voltages, and \( V_+/2 \) for CMOS logic voltages. Note that this circuit utilizes an open drain voltage comparator, which requires a pull-up resistor to \( V_+ \). This pull-up resistor can be readily replaced by diode(s), zener diode, or a combination of resistors and diodes or zener diode to change the \( V_{OUT}(\text{high}) \) voltage level. Similarly, these components can also be employed to set \( V_{OUT}(\text{low}) \) voltage levels. Hence by using an open drain voltage comparator it is simpler and easier to modify both \( V_{OUT}(\text{low}) \) and \( V_{OUT}(\text{high}) \) voltage levels.

For full schematic diagram and notes, please register and login at aldinc.com