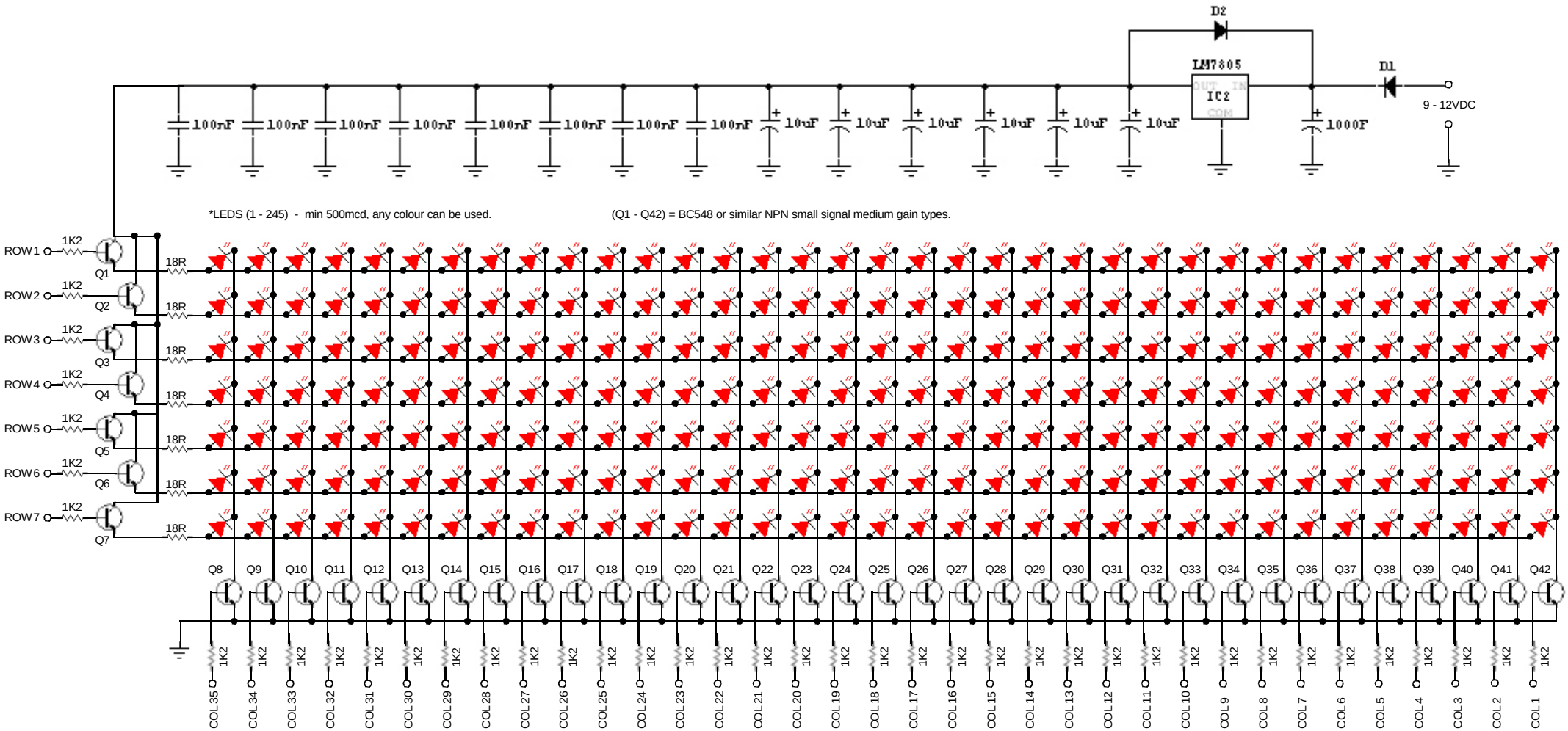

*With 35 columns & 7 rows the duty cycle is a mere 2.8% for each column. The use of high brightness LEDS is essential for adequate visibility under all of the possible lighting conditions that may occur. The prototype was constructed using 500mcd water clear LEDS. Performace is good. However, these LEDS have a very narrow viewing angle. A piece of red perspex helps to difuse the LEDS. Proper operation outdoors may not be very sustainable without the perspex. The digital control circuitry on the next page of the schematic interfaces to all 7 rows & all 35 columns. Five cascaded decade counters with gating connect to the 35 columns whilst the 7 rows are wired directly to microcontroller via transistor emitter follower buffers (Q1 - Q7). Because of the 2.8% duty cycle, power consumption is extremely low.