


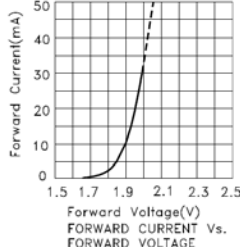
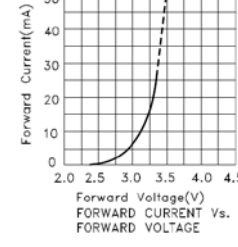
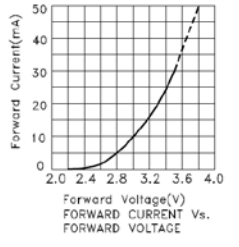
O-20 RGB LED

Required knowledge LED, RGB, Ohm's Law

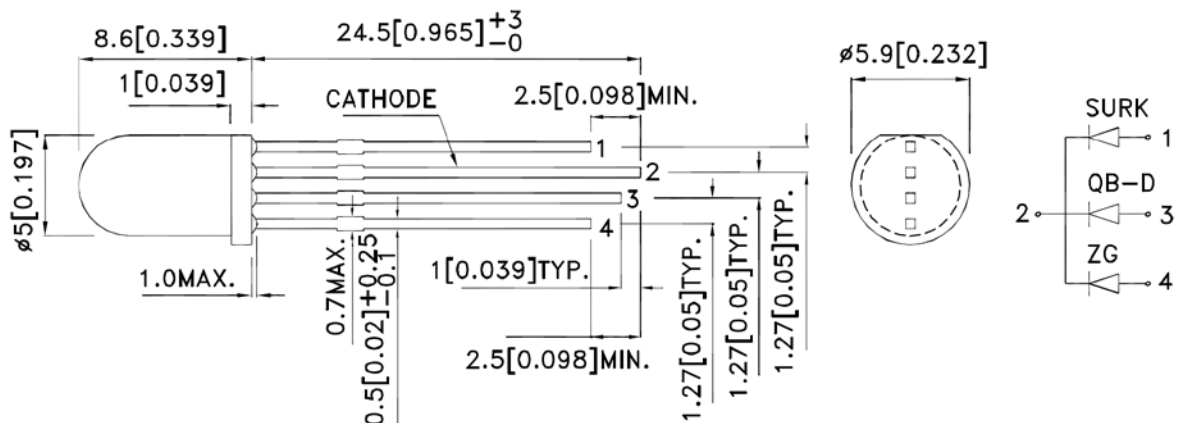
	<p>RGB led, how leds work, diode</p> <p>binary, hexadecimal, decimal, numeral system</p> <p>Ohms law, wet van Ohm, voltage, current, resistance</p>
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RGB Led	Farnell: 2290374 or own choice
3 Resistors (to be calculated)	180R, 100R, 100R

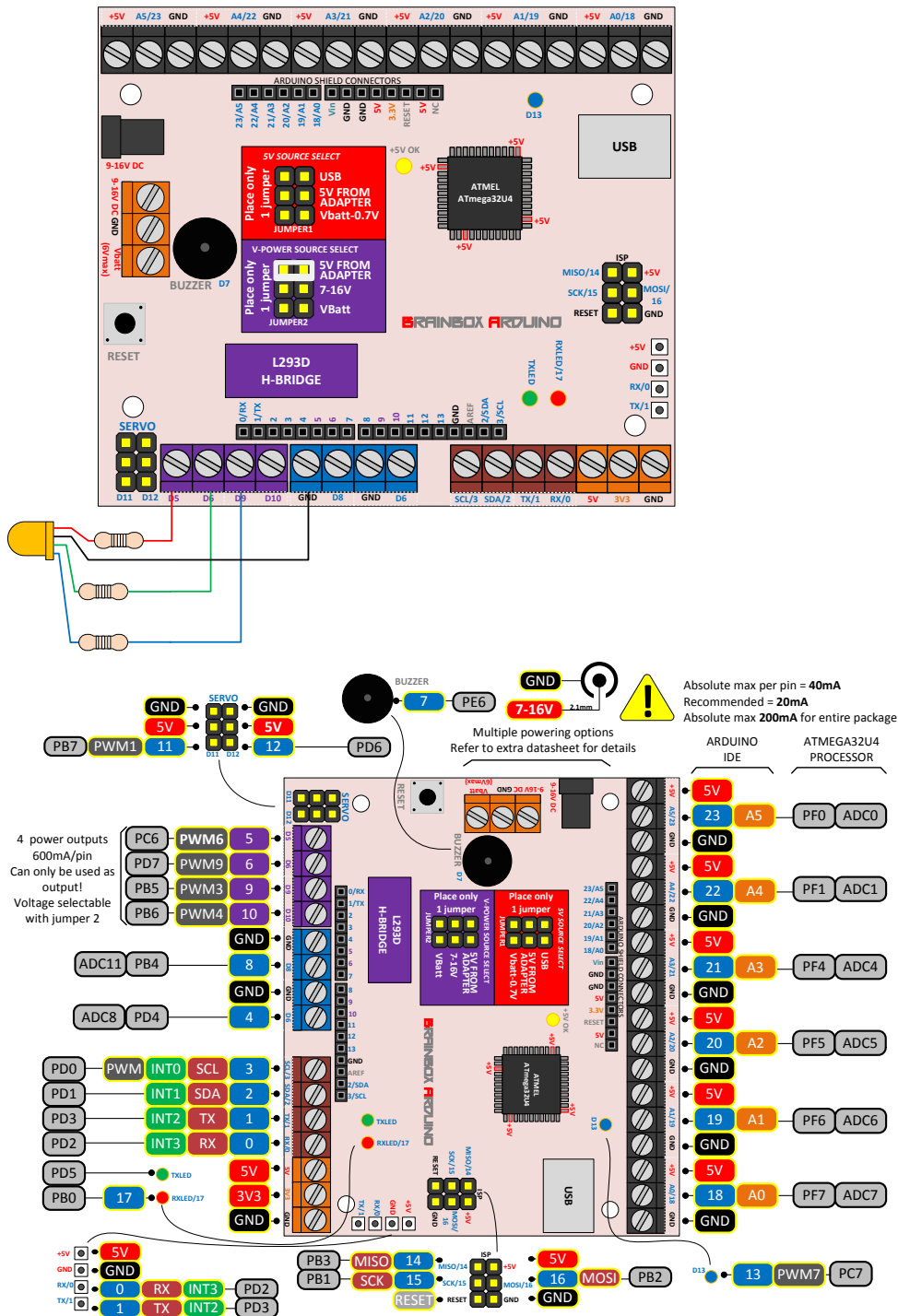
1. Refer to the datasheet and find out how much forward voltage will stand over each of the 3 led's at a 20mA current.

Color	Red	Green	Blue
Uf - If			
Uf @ 20mA	1.95V	3.3V	3.3V
Calculated Rv	$(5V - 1.95V) / 0.02A = 152 \text{ Ohm}$	$(5V - 3.3V) / 0.02A = 85 \text{ Ohm}$	$(5V - 3.3V) / 0.02A = 85 \text{ Ohm}$
Choice E12	180 Ohm	100 Ohm	100 Ohm

2. Calculate the 3 resistors – the voltage at an active IO pin of our Brainbox is 5V.
 - o Choose the next value from the E12 series : 10 12 15 18 22 27 33 39 47 56 68 82
3. Connect the resistors and RGB led's separately to 5V and check if the current never exceeds 20mA. Be aware of the correct connection of Anode and Cathode. In this case we have 1 common Cathode pin for the 3 led's.



- You could connect these 3 leds to any of the digital IO pins of the Brainbox , but because we prefer to drive RGB leds with PWM signals – so that we can dim the RGB leds seperately to generate any color that we want, we will connect our RGB leds to 3 PWM output pins. At our Brainbox Arduino, the only 3 PWM pins next to eachother are 3 power output pins (D5, D6 and D9). With Jumper 2 in the “5V from adapter” position, these outputs can be used as normal 5V dimmable PWM outputs.



CODE EXAMPLE: ON/OFF : 'O-20'

CODE EXAMPLE: PWM : 'O-PWM'