

Example for #RC Airplane Series- 5

Motor Model : A2212 1400 kV BLDC Motor

Battery Parameters : 2200 mAh 11.1V (3S) 30C



Motor Amps Calculations : (Check motor datasheet for Power)

We know,

$$Power = Voltage * Current$$

$$180 \text{ W} = 11.1 \text{ V} * \text{Max. motor Current}$$

$$\text{Max. motor Current} = 16.22 \text{ A}$$

Flight Time Calculations :

We have the relation,

$$Flight \ Time \ (in \ mins) = \frac{Battery \ Amps}{Motor \ Amps} * 60$$

Now, for our model, we are choosing a battery of 2200mAh. Therefore, Battery Amps = 2.2A

$$Flight \ Time = (2.2 / 16.22) * 60$$

$$= 8.14 \text{ mins}$$

But we should not drain the battery to its full extent. Hence for safety reasons, we consider discharging the battery only to 75% of its capacity and that would be enough.

$$\text{Actual Flight Time} = 75 \% \text{ of } 8.14$$

$$= 6.1 \text{ mins approx.}$$

Battery Specifications : (from Robu.in)

Model No.	ORANGE 2200/3S-30C
Capacity (mAh)	2200
Weight (gm)	175
Output Voltage (VDC)	11.1
Charge Rate (C)	1 ~ 3
Discharge Plug	XT-60
Balance Plug	JST-XH
Length (mm):	106
Width (mm)	34
Height (mm)	23
Max. Burst Discharge (C)	60C(132.0A)
Max. Charge Rate	5 C
Max. Continuous Discharge	30C(66.0A)
Shipping Weight	0.2 kg
Shipping Dimensions	13 × 6 × 5 cm

Calculations related to Discharge Rate/ 'C' rating of battery :

(Formulae covered in Article – How to choose LiPo battery ?)

- Max. continuous discharge current = $2.2 * 30 = 66 \text{ A}$

And also, our current requirement is quite below 66 A. So all good !! For normal RC Airplanes, try not to exceed 30 C

- Max. burst discharge current = $2.2 * 60 = 132 \text{ A}$