Robot Component Mass Measurements

SLNo	Part No	Part Name	Qty	Mass [g]	Total Mass [g]
1	TB6612FNG	Motor Driver	1	0	0
2	514649	Battery Pack	1	318	318
3	25GA370	Geared DC Motor With Encoder	2	97	194
4	Wheel & mount		2	65	130
5	MPU-6050	6DOF IMU	1	0	0
6	EK-TM4C123GXL	TI TIva Launchpad Evaluation	1	29	29
7	MP1584	Buck Converter	1	0	0
8	SPST Switch	SPST Toggle Switch	1	0	0
9	Acryllic Sheet		1	153	153
10	Standoffs	Male to female Hex Standoff	1	82	82
11	LEDs	Indicator LEDS + resistors	1	0	0
12	Female T-conn.	Nylon Female T-connector	1	0	0
13	Perf board	7.5x5cm perfboard	1	30	30
				Total	**936**

Hylum Sheet		
Parameter	**value**	**unit**
Density	1.18	g/cm^3
length	18	cm
width	8	cm
Thickness	0.3	cm
No of sheets	3	

Robot Power Consumption Under Ideal Conditions						
SLNo	Part No	Description	Qty	Current Draw (A)		Iout (Ave/Peak)
1	TB6612FNG	Motor Driver	1	0.0011	0.0011	1.2/3.2
2	25GA370	Geared DC Motor	2	0.75	1.5	
3	Hall Effect Encoder		2	0.02	0.04	
4	MPU-6050	6DOF IMU	1	0.0039	0.045	
5	TM4C123GH6PM	@ 80MHz - 25degC	1	0.045	0.045	
				Total	**1.6311**	
				Battery capacity	**4000**	mAh
				Approx Life	**2.45**	hours

CoM & Moment of inertia from CAD model						
SLNo	Variable	Description	Value	Unit		Unit
1	I	Moment of Inertia of Robot	**6835608**	g*mm^2	**0.006835608**	kg*m^2
2	Iw	Moment of Inertia of Wheel	**50794**	g*mm^2	**0.000050794**	kg*m^2
3	L	Location of centre of Mass	**69.41**	mm	**0.06941**	m
4	mw	Mass of wheel	**96**	g	**0.096**	kg
5	m	Mass of Robot body excluding wheel	**783**	g	**0.783**	kg

Encoder Frequnecy

signals per rev @ ip shaft	11	Rated RPM	100	
gear ratio	45	RPS	1.666666667	
ppr	495	Pulse per second	825	**Hz**
phase edges per revolution	1980	Edges per Second	3300	**Hz**

Motor Velocity Calculation

RPM = (clock* (2^VELDIV) * SPEED * 60) / (LOAD * PPR * edges)

clock	25000000	LOAD	2500	
VELDIV	0	ppr	495	
SPEED	3300	edges	4	
RPM				1000000

Baudrate - IBRD & FBRD					
sys_clock	25000000		IBRD	162	A2
baudrate	9600		FBRD	49	31
BRD	162.7604167				