Power Budget Example

Team Number:	204
Project Name:	ClapSense
Team Member Names:	Caleb Yuen
Version:	1

All Major Components	Component Name	Part Number	SupplyVoltageRange	#	Absolute	TotalCurrent(mA)	Unit
Microcontroller	PIC18F57Q43 Nano	DM182029	+3.3V	1	50	25	mA
Motor Driver (logic)	TB6612FNG	TB6612FNG	+5V	1	50	10	mA
DC Gearmotor (through driver)	DFRobot 6 V Metal Gearmotor	FIT0495-A	+6V	1	1200	600	mA
Status LEDs (2×)			+3.3V	2	20	20	mA
Photoresistor (LDR)			+3.3V	1	10	5	mA
Potentiometer (10 k)			+3.3V	1	5	2	mA

+6V Power Rail	Component Name	Part Number	SupplyVoltageRange	#	AbsoluteMaximumCurrent (mA)	TotalCurrent(mA)	Unit
DC Gearmotor (via TB6612 VM)	FIT0495-A	FIT0495-A	+6V	1	1200	600	mA
							mA
						0	mA
						0	mA
						0	mA
				Subtotal		600	mA
				Safety Margin		25%	
				Total Current Required on +6V Rail		750	mA
c1. Regulator or Source Choice	9 V→6 V buck converter	0930	+8V - 24V in	1	1500	1500	mA
				Total Remaining Current Available on +9V Rail		750	mA

+5V Power Rail	Component Name	Part Number	SupplyVoltageRange	#	AbsoluteMaximumCurrent (mA)	TotalCurrent(mA)	Unit
Motor Driver (logic)	TB6612FNG	TB6612FNG	+5V	1	50	10	mA
							mA
						0	mA
						0	mA
						0	mA
				Subtotal		10	mA
				Safety Margin		25%	
				Total Current Required on +5V Rail		12.5	mA
c2. Regulator or Source Choice	9 V→5 V buck converter	0930	+8V - 24V in	1	1000	1000	mA
				Total Remaining Current Available on +9V Rail		987.5	mA

+3.3V Power Rail	Component Name	Part Number	SupplyVoltageRange	#	AbsoluteMaximumCurrent (mA)	TotalCurrent(mA)	Unit
Microcontroller	PIC18F57Q43 Nano	DM182029	+3.3V	1	50	25	mA
Status LEDs (2×)			+3.3V	2	20	20	mA
Photoresistor (LDR)			+3.3V	1	10	5	mA
Potentiometer (10 k)			+3.3V	1	5	2	mA
				Subtotal		52	mA
				Safety Margin		25%	
				Total Current Required on +3.3V Rail		65	mA
c3. Regulator or Source Choice	5 V→3.3 V LDO/buck conver	(full part number)	+4.5V - 6V in	1	300	300	mA
				Total Remaining Current Available on +5V Rail		235	mA

External Power Source 1	Component Name	Part Number	SupplyVoltageRange	Output	AbsoluteMaximumCurrent (mA)	TotalCurrent(mA)	Unit
Plug-in Wall Supply (Barrel Jack)	AC/DC Adapter Model 0930	0930	100-240 VAC	+9V	2000	2000	mA
Power Rails Connected to External Power Source 1	+6V regulator			1	750	750	mA
	+5V Regulator			1	13	13	mA
	+3.3V low-dropout regulator			1	65	65	mA
				Total Remaining Current Available on External Power Source 1		1172	mA

External Power Source 2	Component Name	Part Number	SupplyVoltageRange	Output	AbsoluteMaximumCurrent (mA)	TotalCurrent(mA)	Unit
Power Source 2 Selection							mA
Power Rails Connected to External Power Source 2							mA
				Total Remaining Current Available on External Power Source 2		0	mA

	Component Name	Part Number	SupplyVoltageRange	Capacity(mAh)	RequiredByRegulators		
	Battery				0		
				Battery Life	#DIV/0!		hours

Notes

The Master Controller (Hub) subsystem of the ClapSense project uses a 9 V 2 A AC/DC wall adapter (Model 0930) as the main source. Power is distributed to 6 V, 5 V, and 3.3 V rails through dedicated buck converters. The estimated total current draw is ≈ 0.83 A (1.64 A peak with margin), well within adapter limits. The 6 V rail drives the motor and TB6612FNG VM, the 5 V rail handles logic and power conversion, and the 3.3 V rail powers the PIC18F57Q43 and sensor inputs.