



# Projecte EDD-Llums

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Eines de Disseny  
2024/2025

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# Diagrama de blocs



# De què tracta el projecte?

Disseny del sistema de control d'il·luminació d'un cotxe mitjançant un microcontrolador.

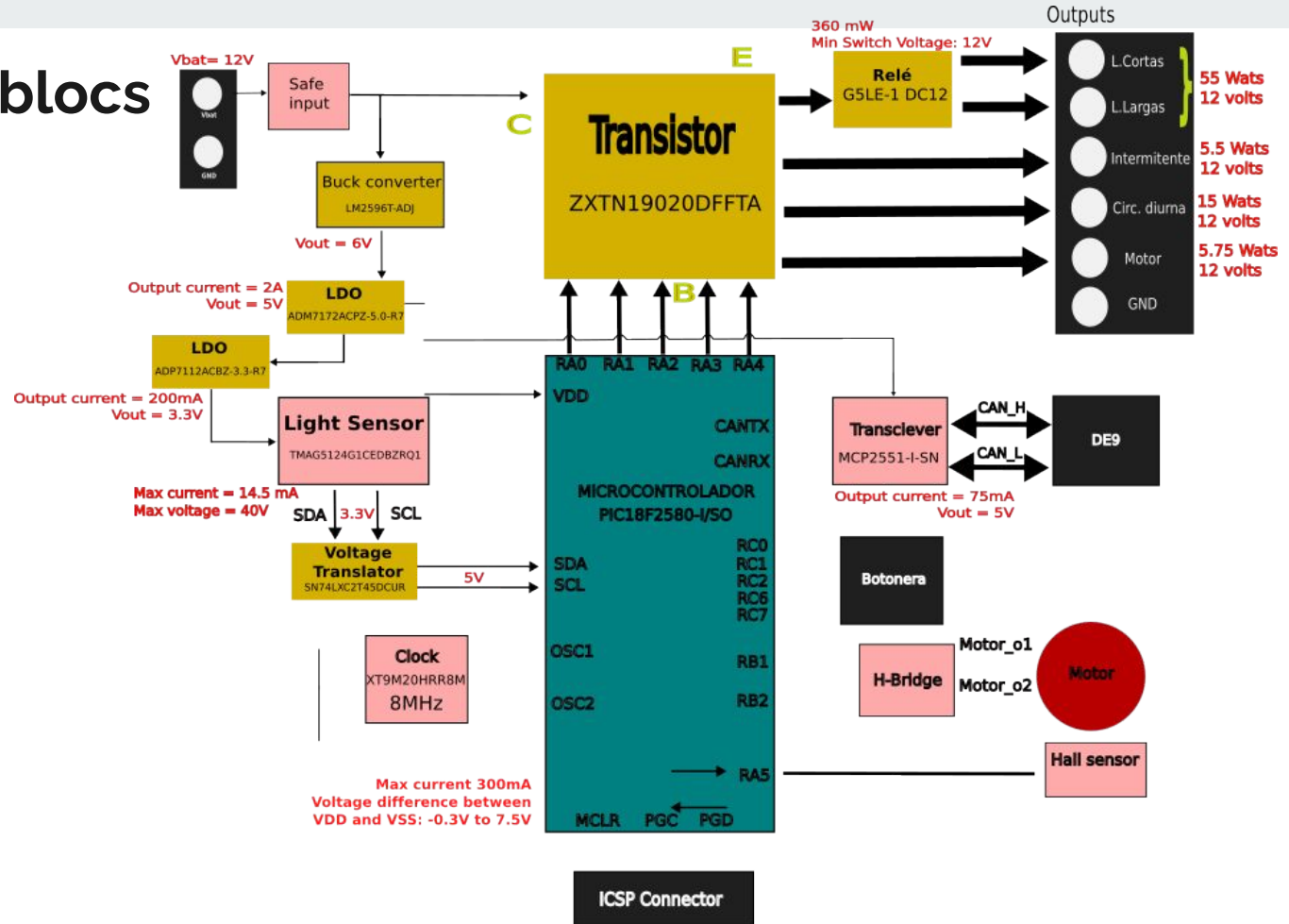


# Requisits del projecte

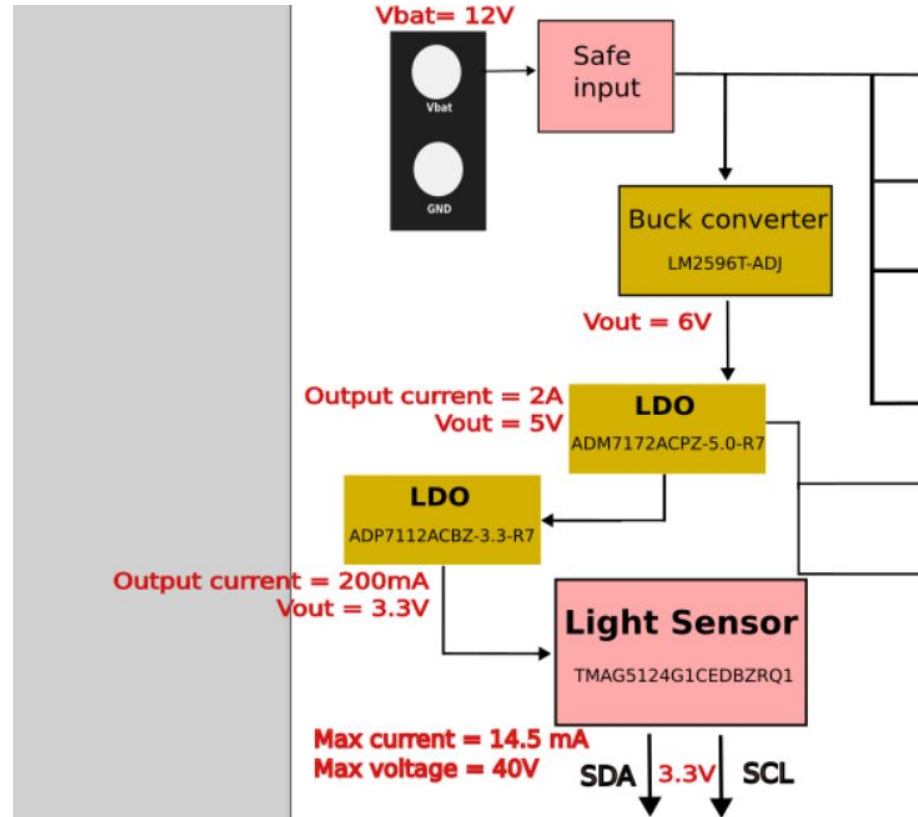
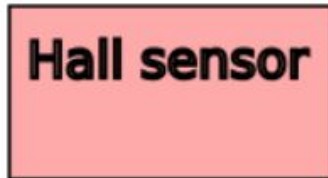
Parts clau del diagrama:

- Llums de carretera.
- Llums d'encreuament.
- Llums de circulació diürna.
- Intermitents
- Motor escombreta neteja-fars.
- Sensor digital de llum, per activar les llums.

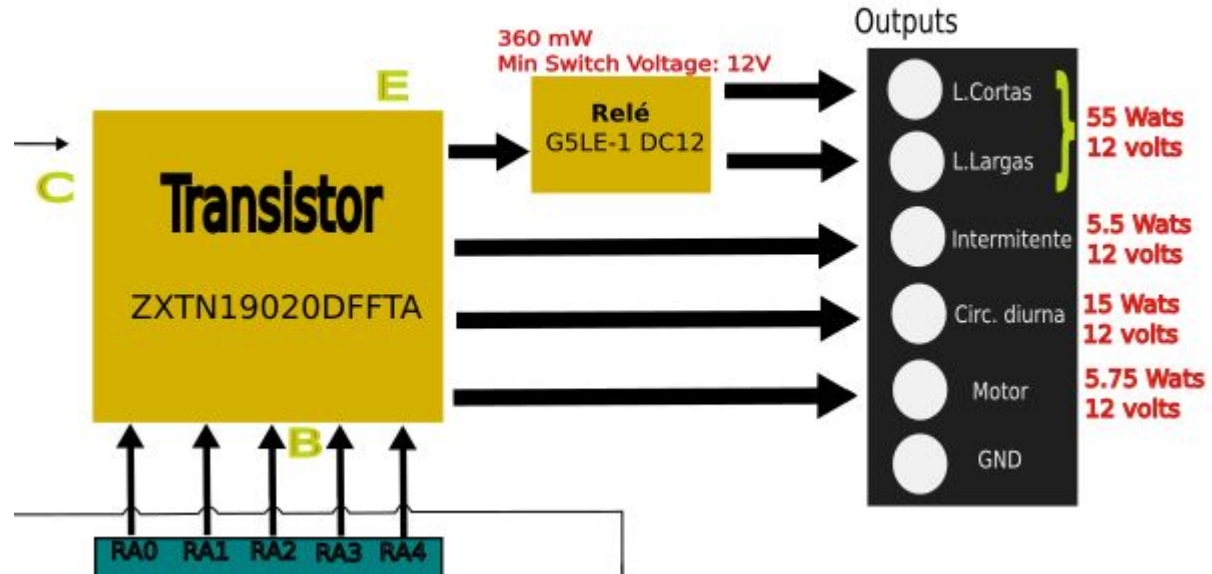
# Diagrama de blocs



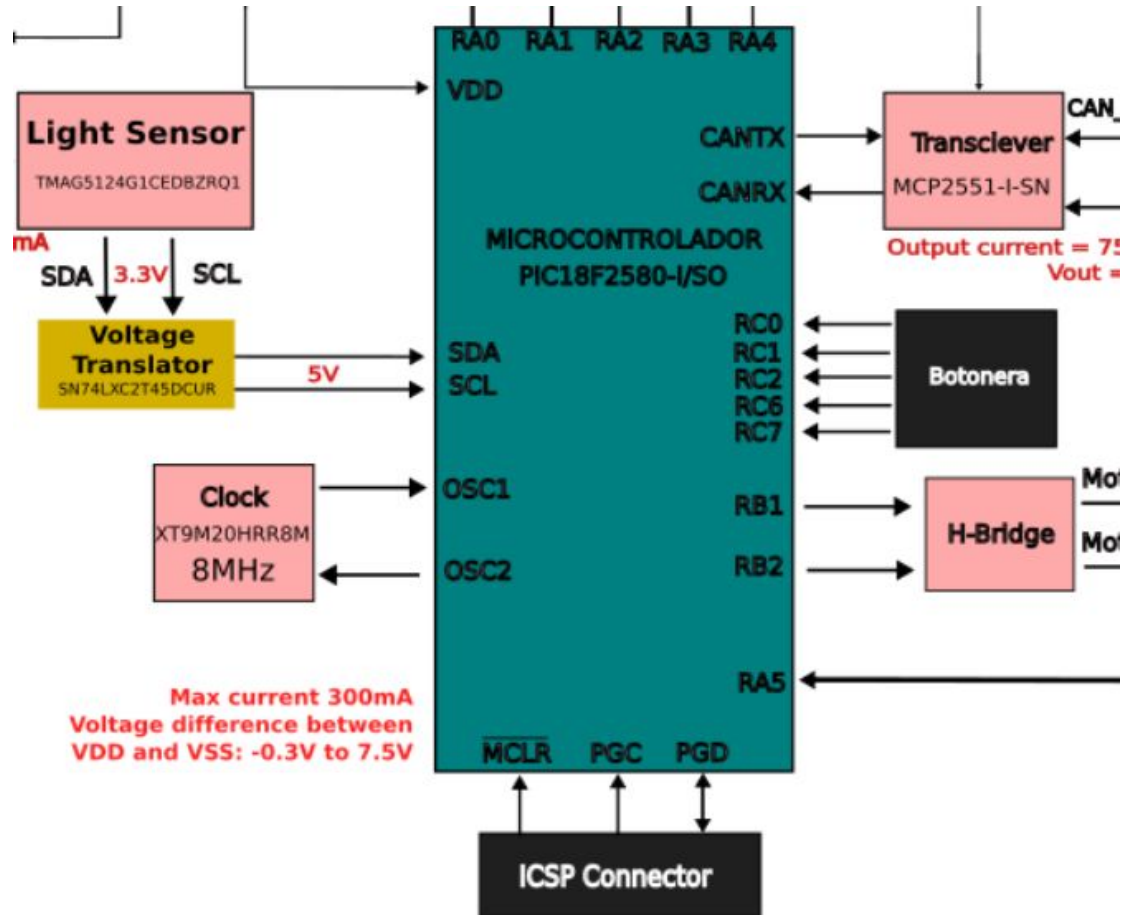
# Inputs



# Output selection stage

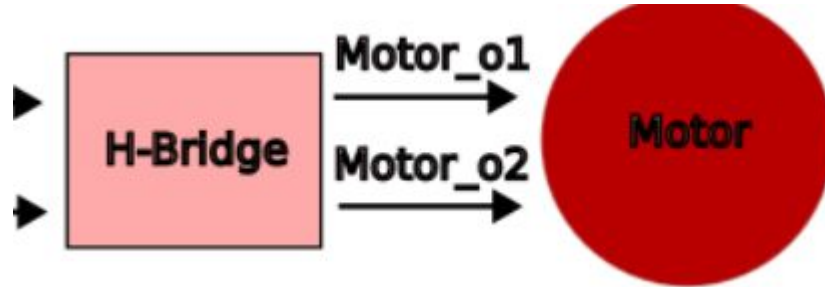


# Microcontrolador





# Outputs



## Outputs

▶	●	L.Cortas	} <b>55 Wats</b> <b>12 volts</b>
▶	●	L.Largas	
▶	●	Intermitente	<b>5.5 Wats</b> <b>12 volts</b>
▶	●	Circ. diurna	<b>15 Wats</b> <b>12 volts</b>
▶	●	Motor	<b>5.75 Wats</b> <b>12 volts</b>
	●	GND	

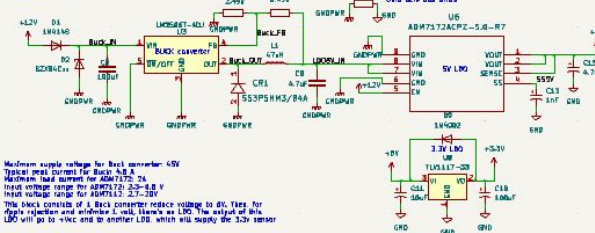
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# Esquemàtic

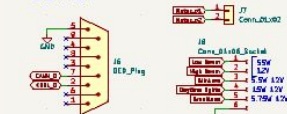
## INPUTS



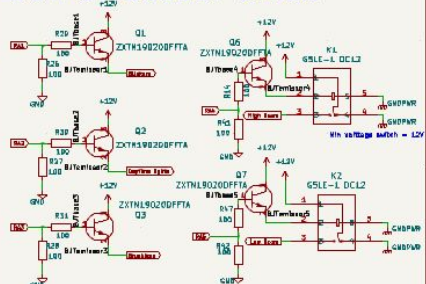
## POWER



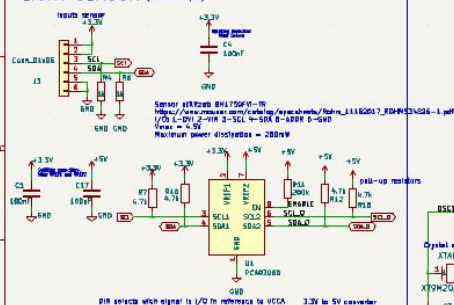
## OUTPUT



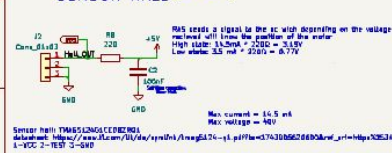
## OUTPUT SELECT STAGE



## LIGHT SENSOR (out of the pcb)



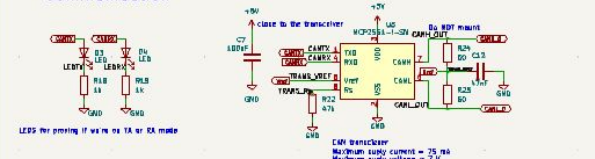
## SENSOR HALL (near the motor)



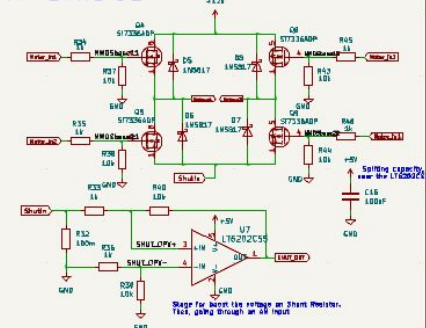
## DIGITAL



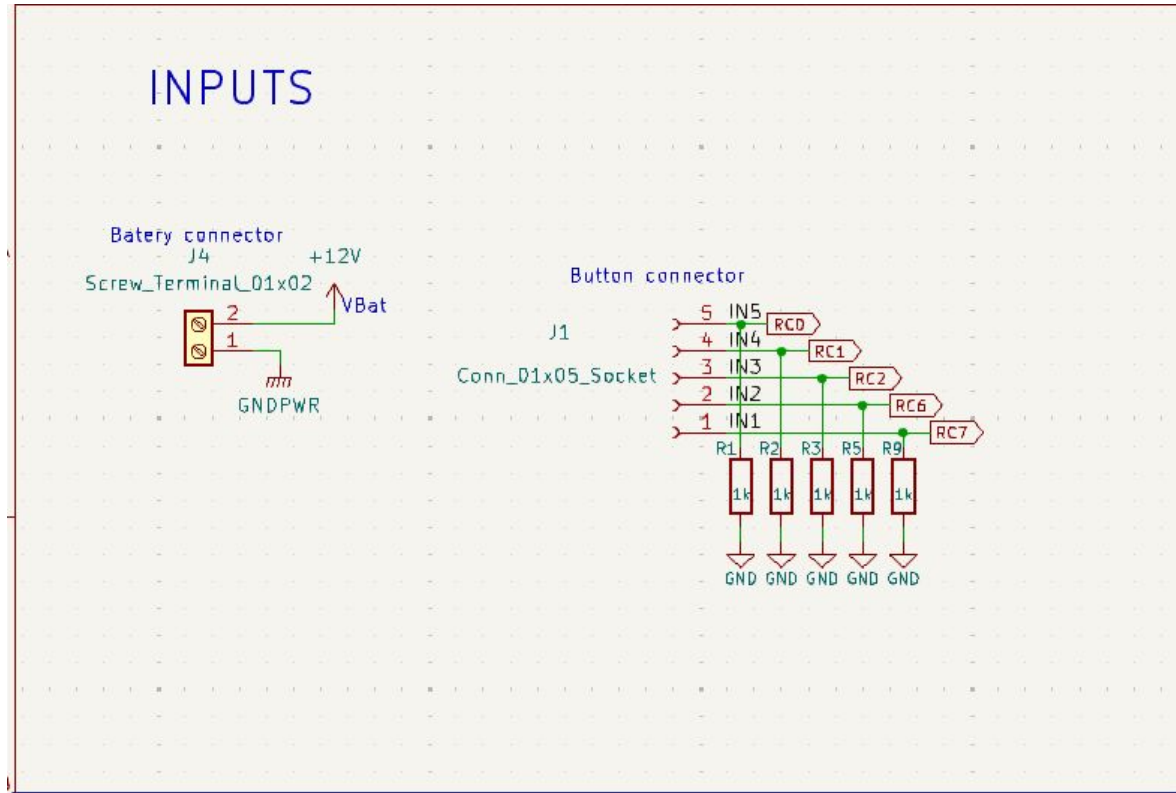
## Communication



## H-BRIDGE

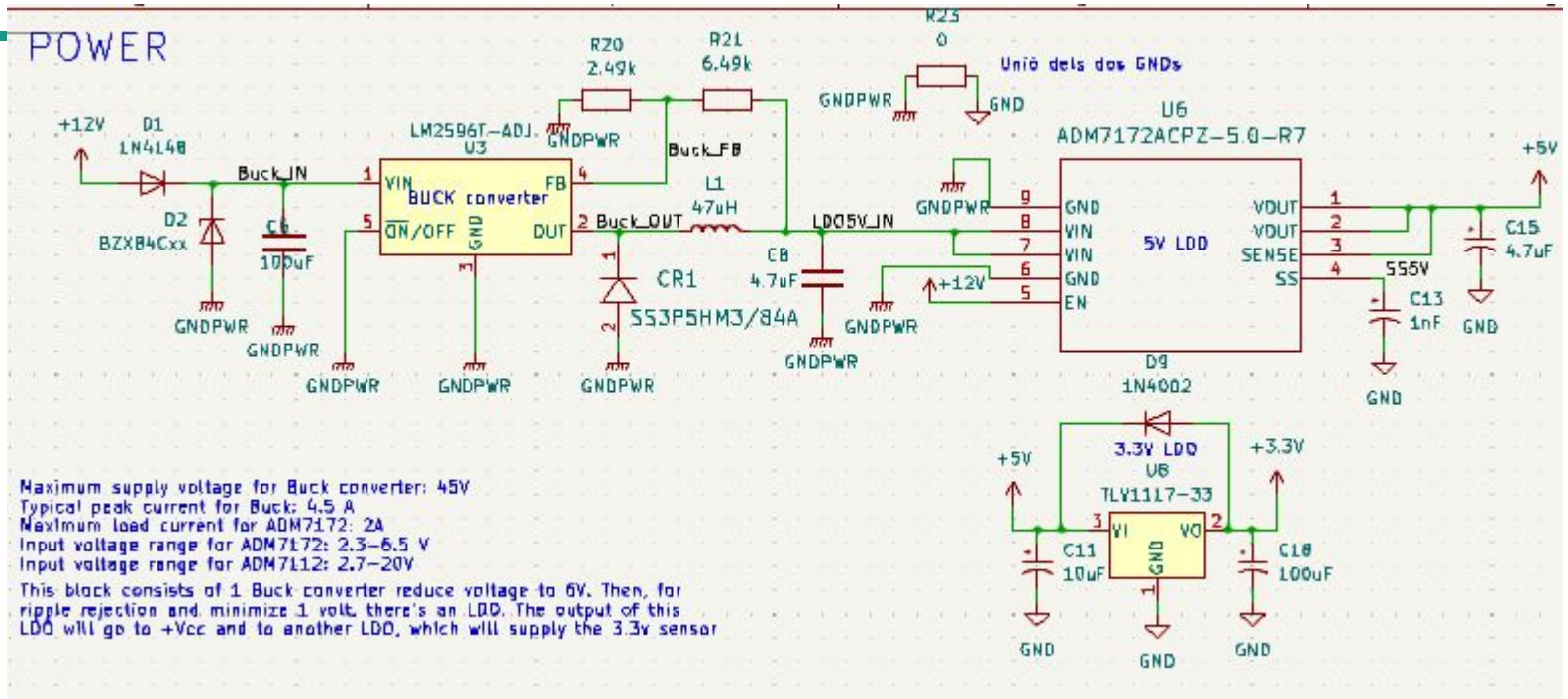


# Inputs



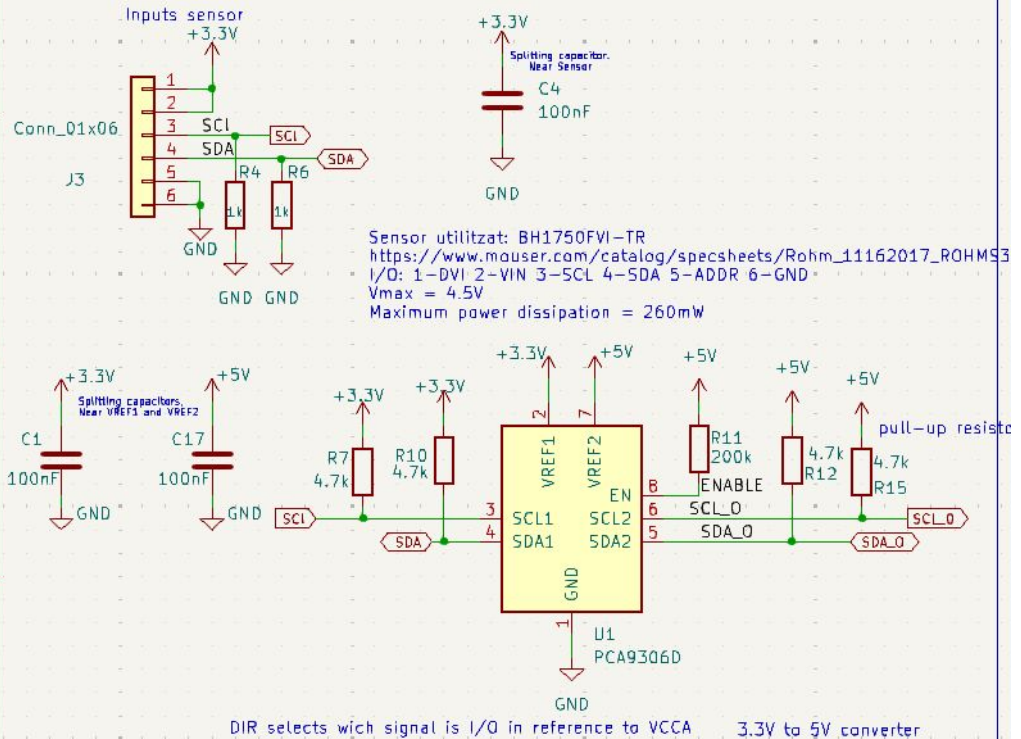
# Power

## POWER

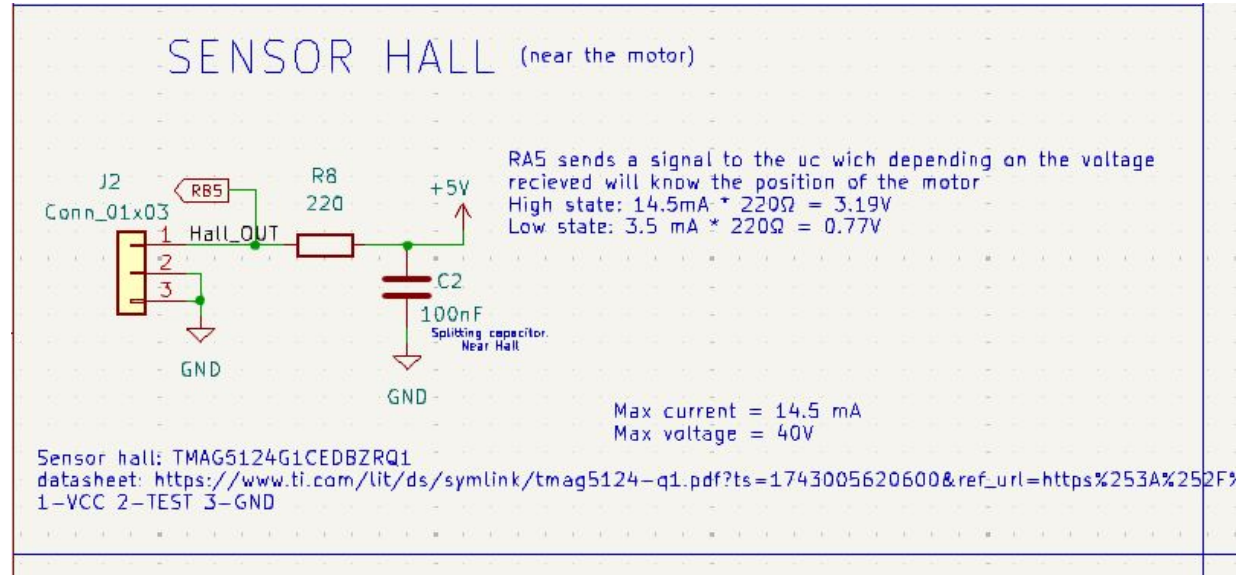


# Light Sensor

## LIGHT SENSOR (out of the pcb)



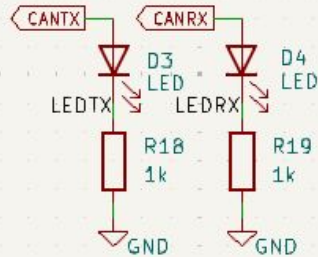
# Sensor Hall



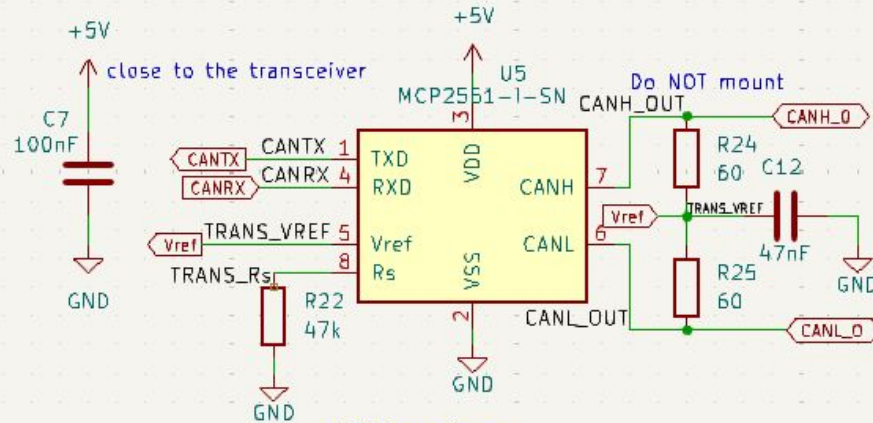


# Transceiver i leds

## Communication



LEDS for proving if we're an TX or RX mode



CAN transceiver

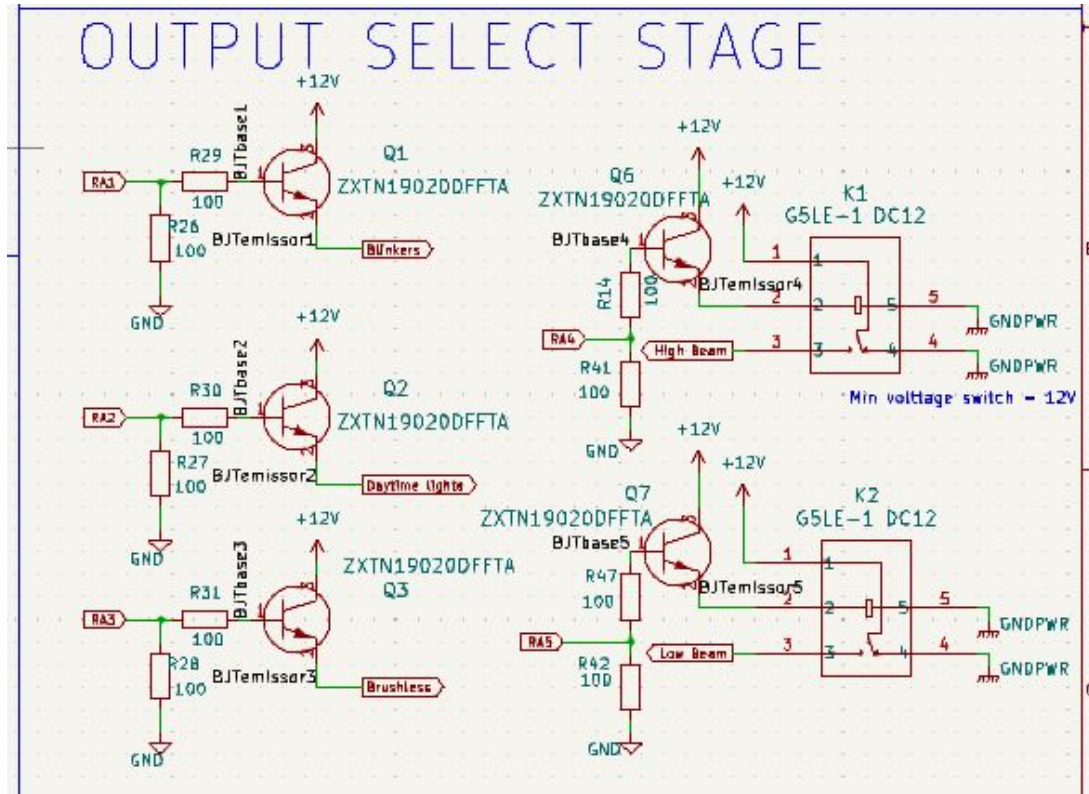
Maximum supply current = 75 mA

Maximum supply voltage = 7 V

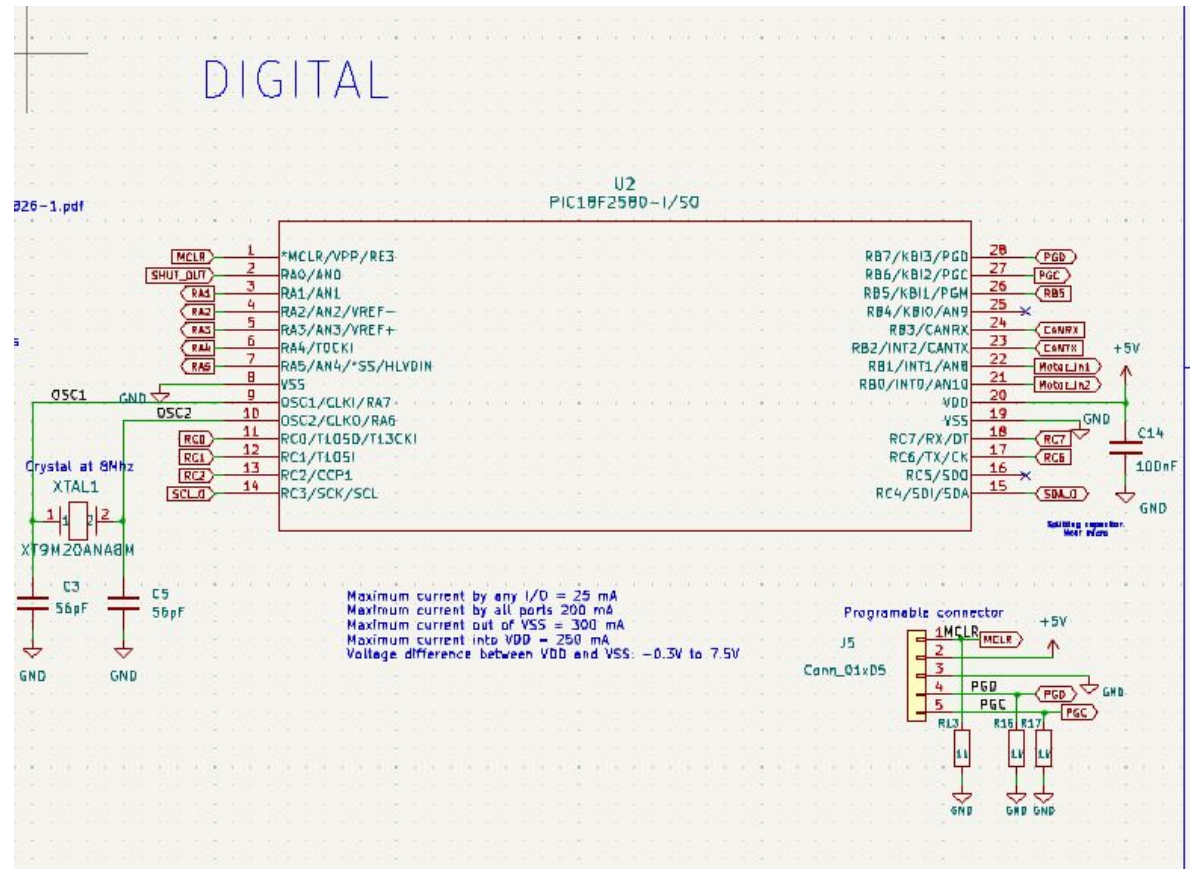




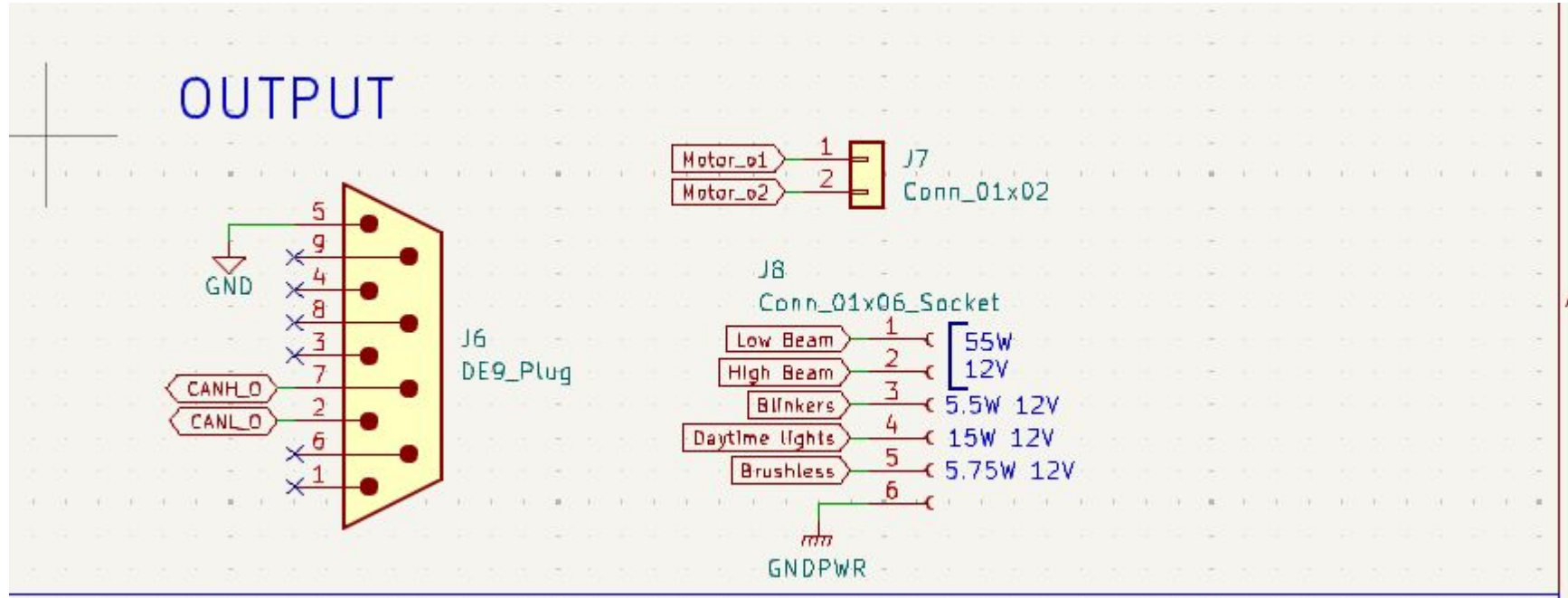
# Output select stage



# Microcontrolador



# Outputs

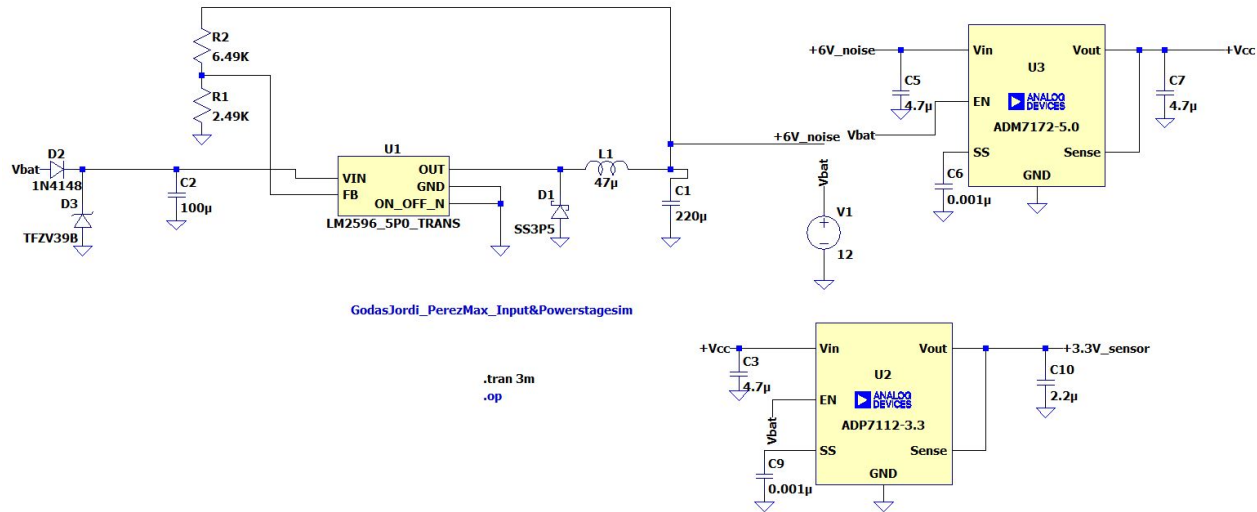


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# Simulacions

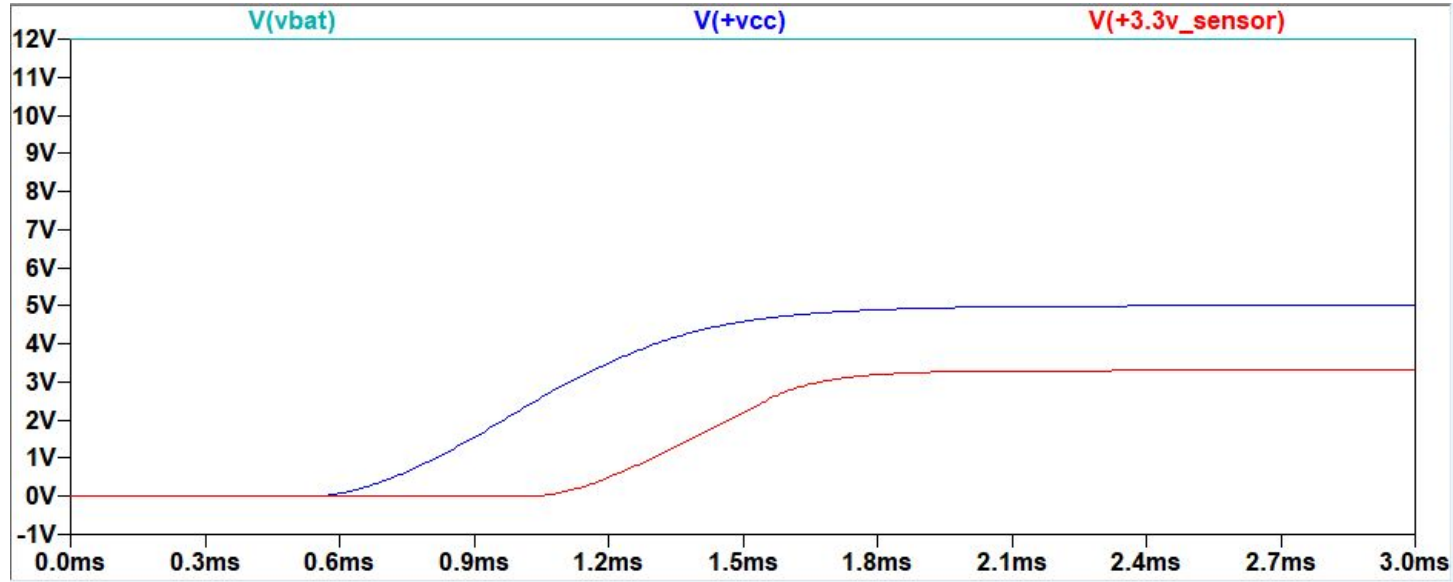
# Power stage

Ripple LM2596:



*Etapa de potència*

## Power stage

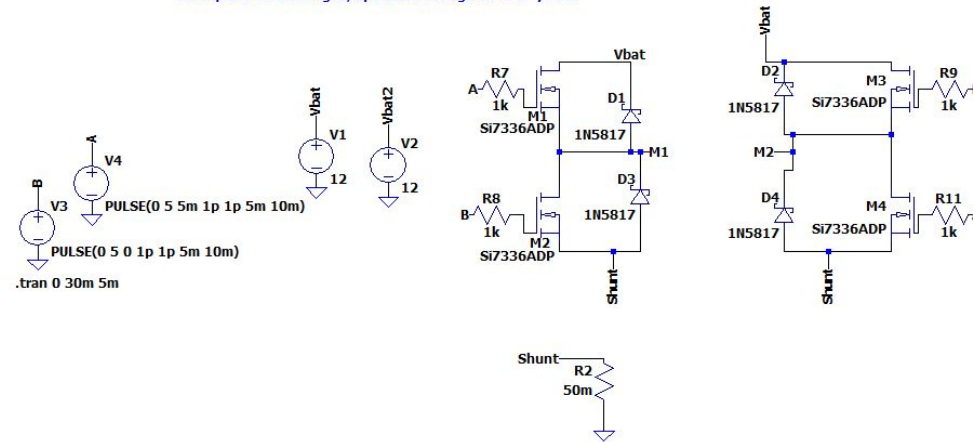


*Representació gràfica dels diferents voltatges de l'etapa de potència en funció del temps*

# H-Bridge

GodasJordi\_PerezMax\_hbridge

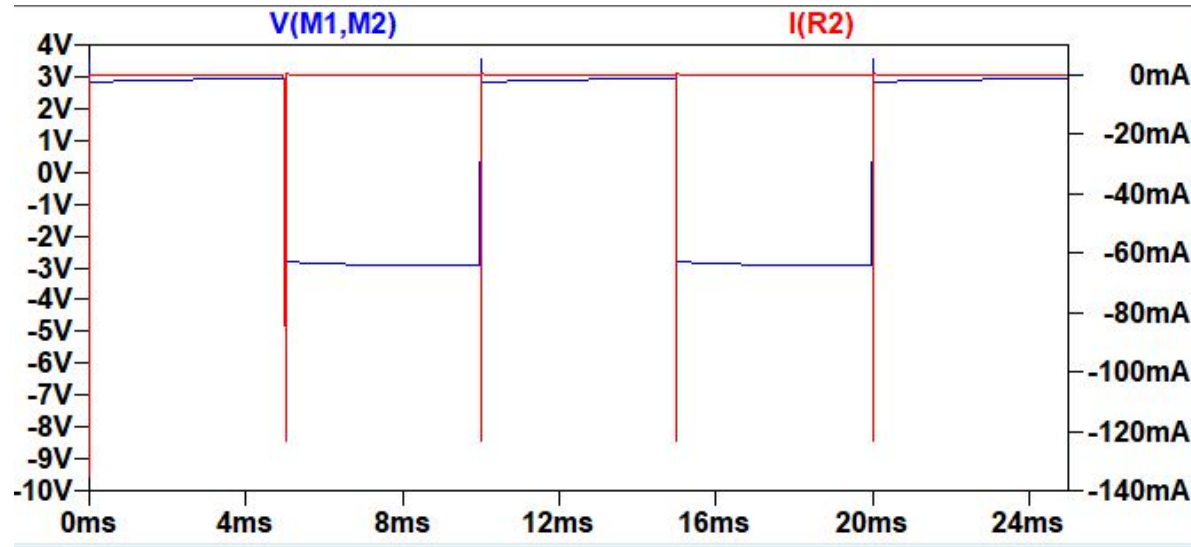
Todo esto se controlará con el micro, inclusive el fin de carrera  
Para que el motor gire en el sentido A, hay que dar corriente de base RA1+ y RA3-  
Para que el motor gire en el sentido B, hay que dar corriente de base RA0+ y RA2-  
Para que el motor no gire, aplicamos voltage en RA2- y RA3-



*Pont H per controlar el sentit de gir del motor i final de carrera*



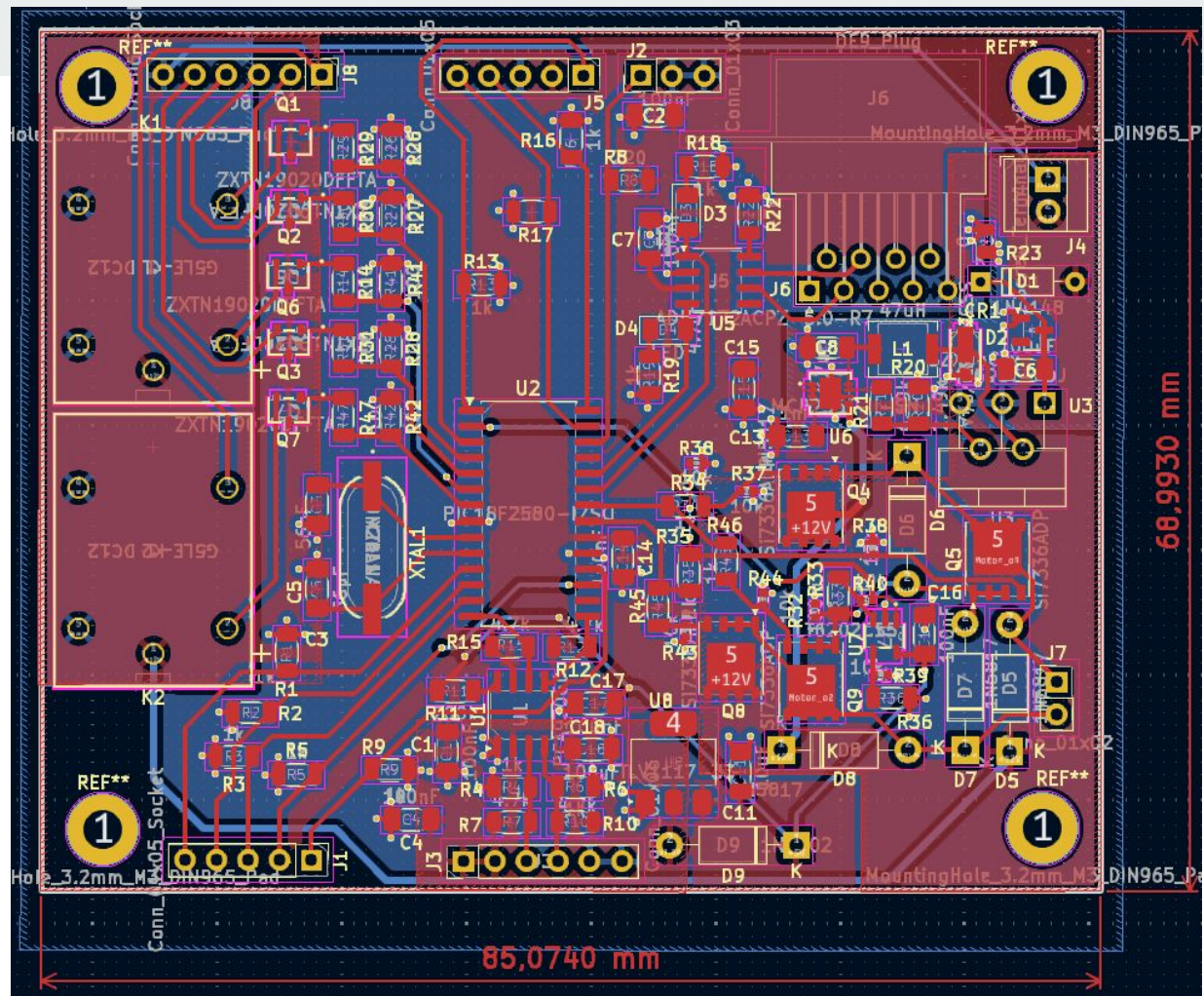
# H-Bridge



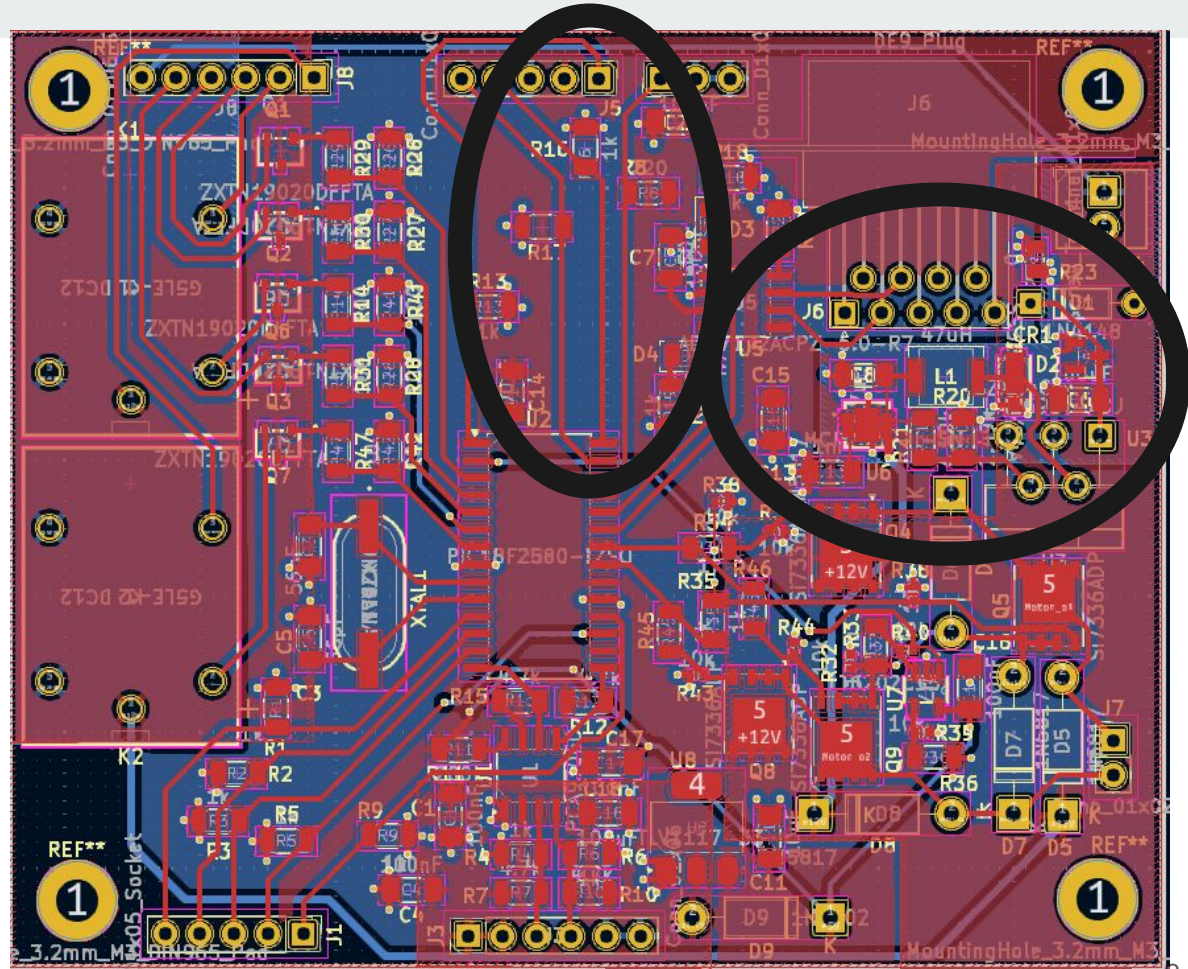
*Representació gràfica dels voltatges en el Pont H i corrent resistència Shunt*

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# Layout

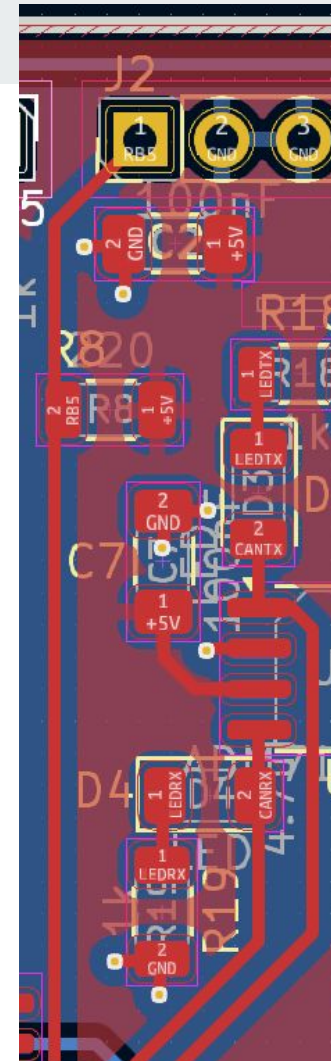
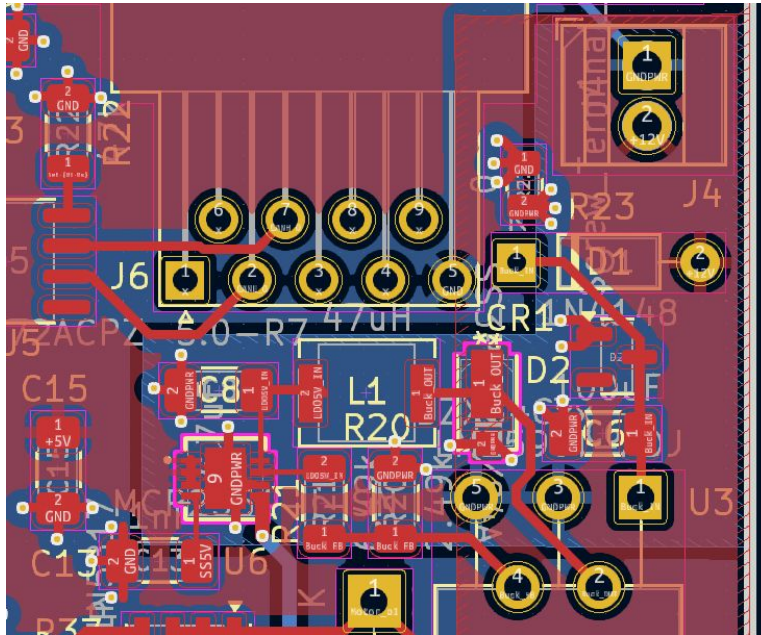


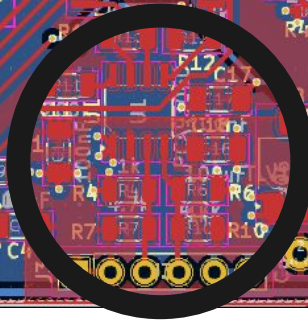
# Power i Sensor Hall



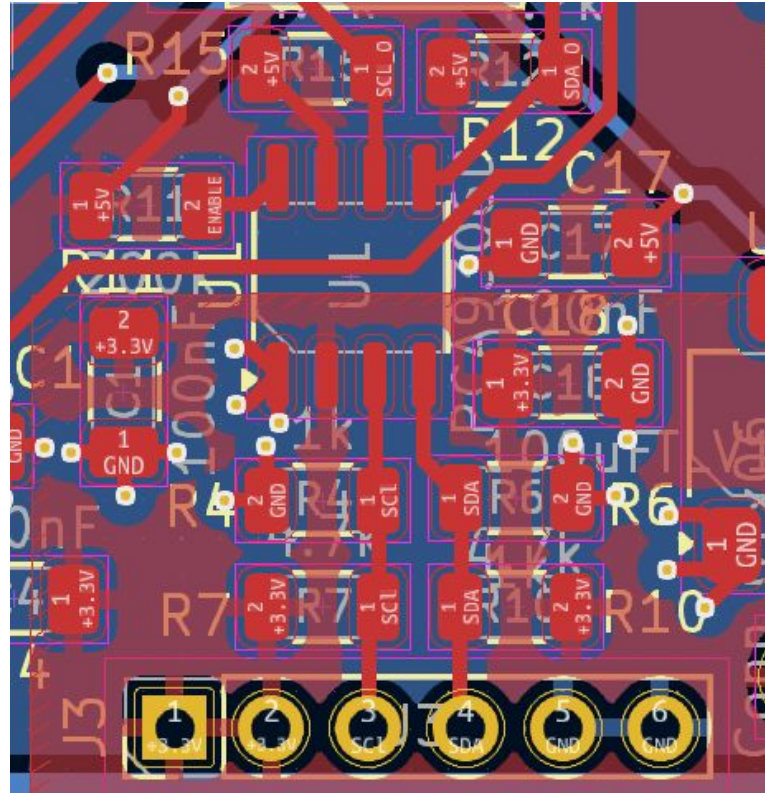


# Power i Sensor Hall

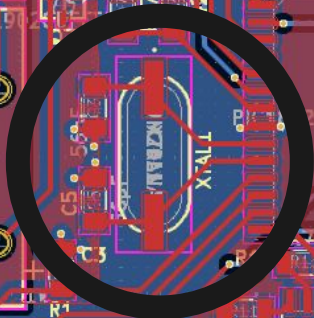




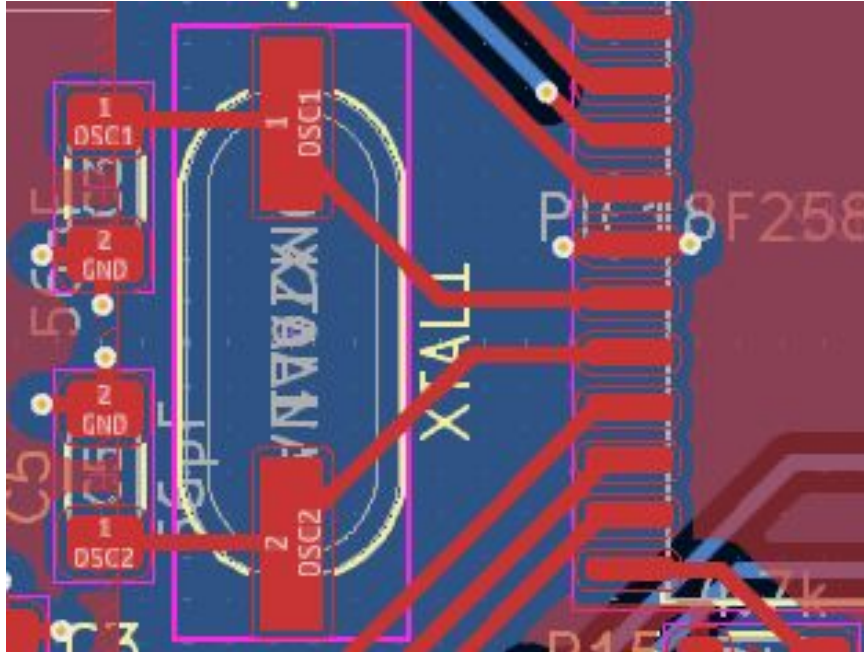
# Light Sensor



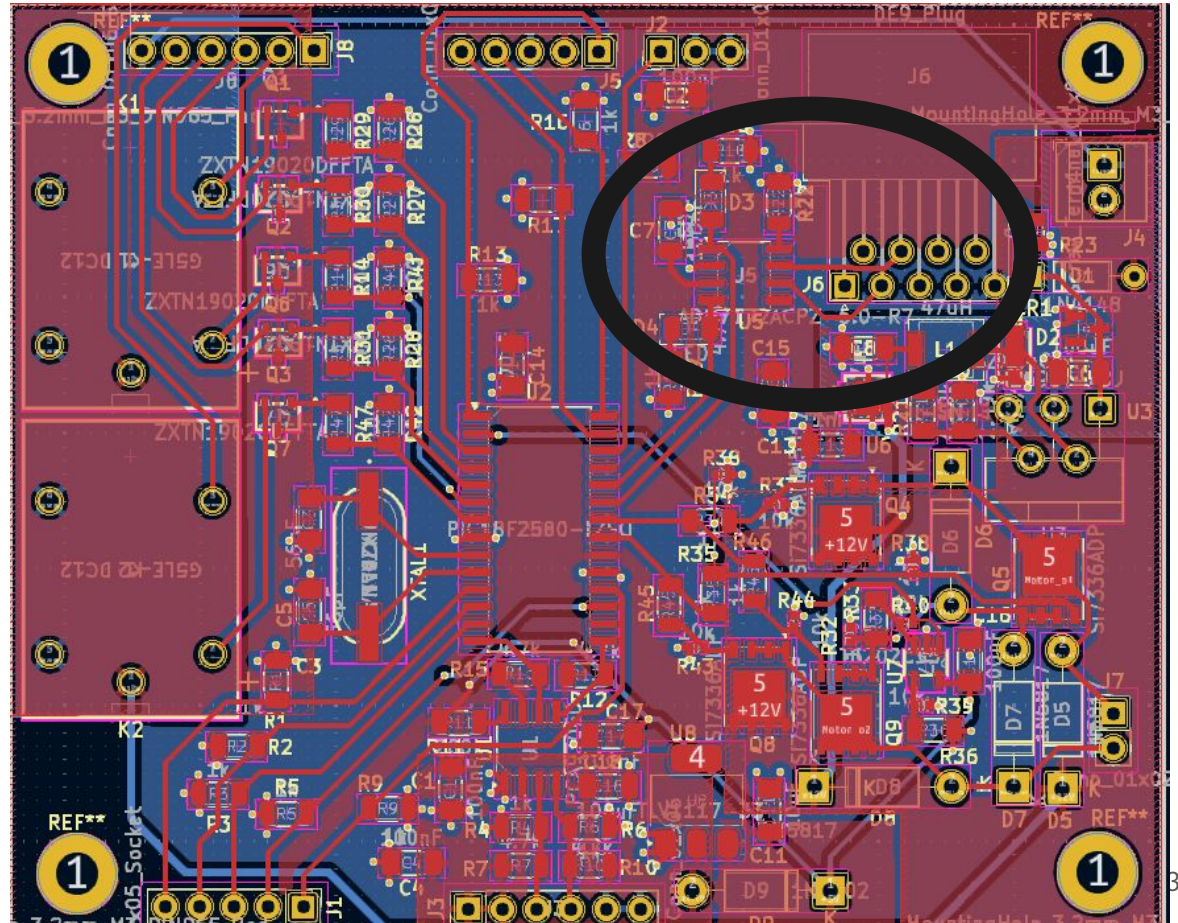




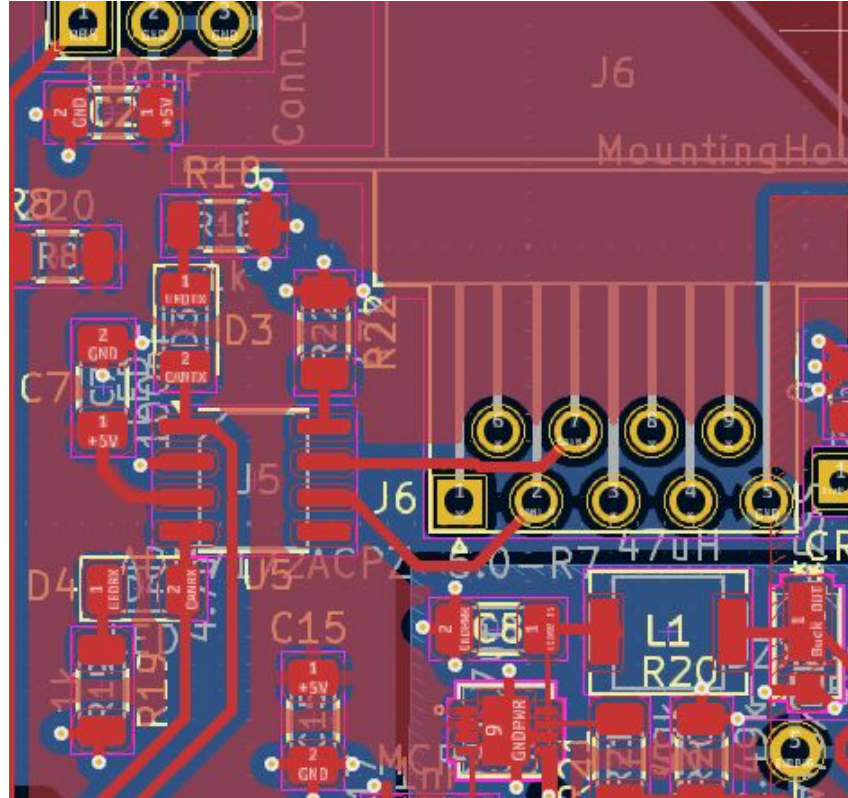




# Transceiver i leds

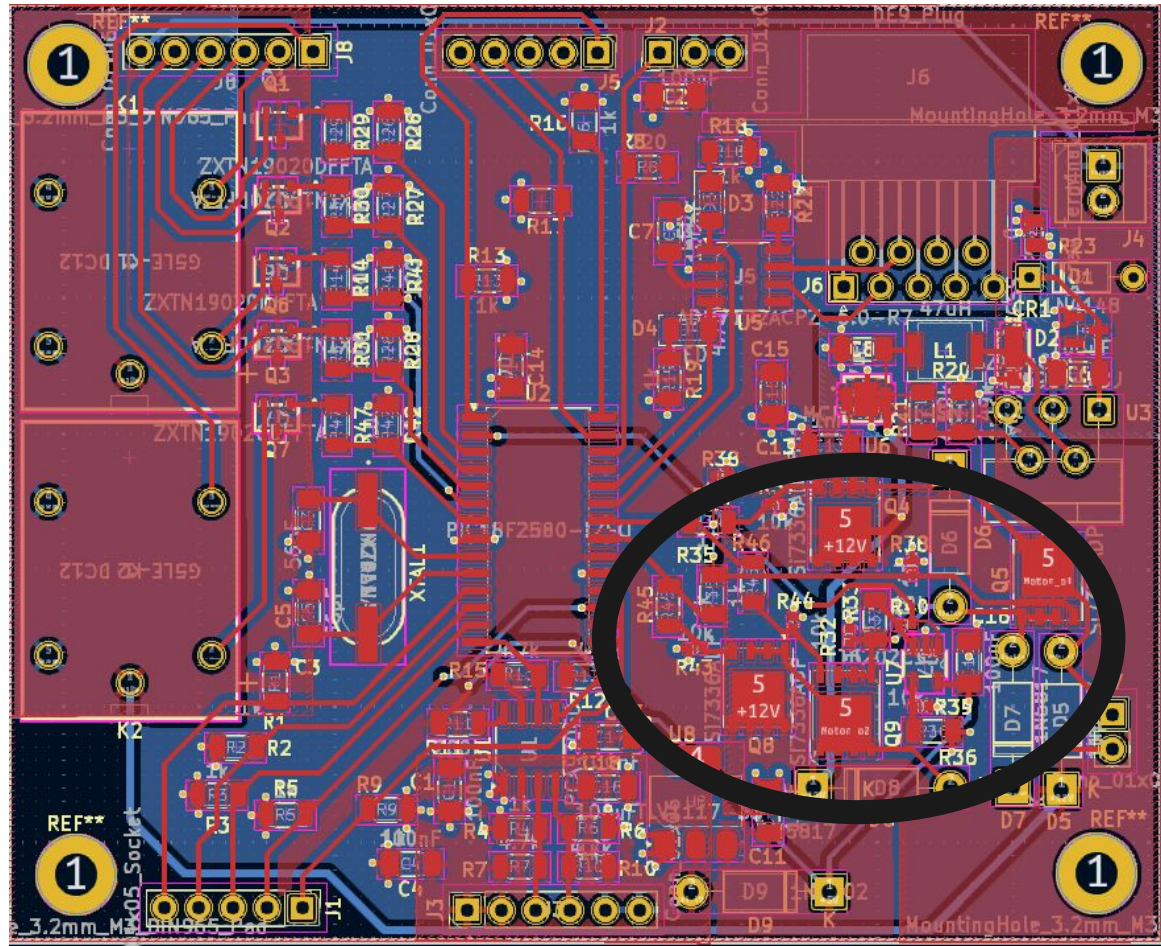


# Transceiver i leds

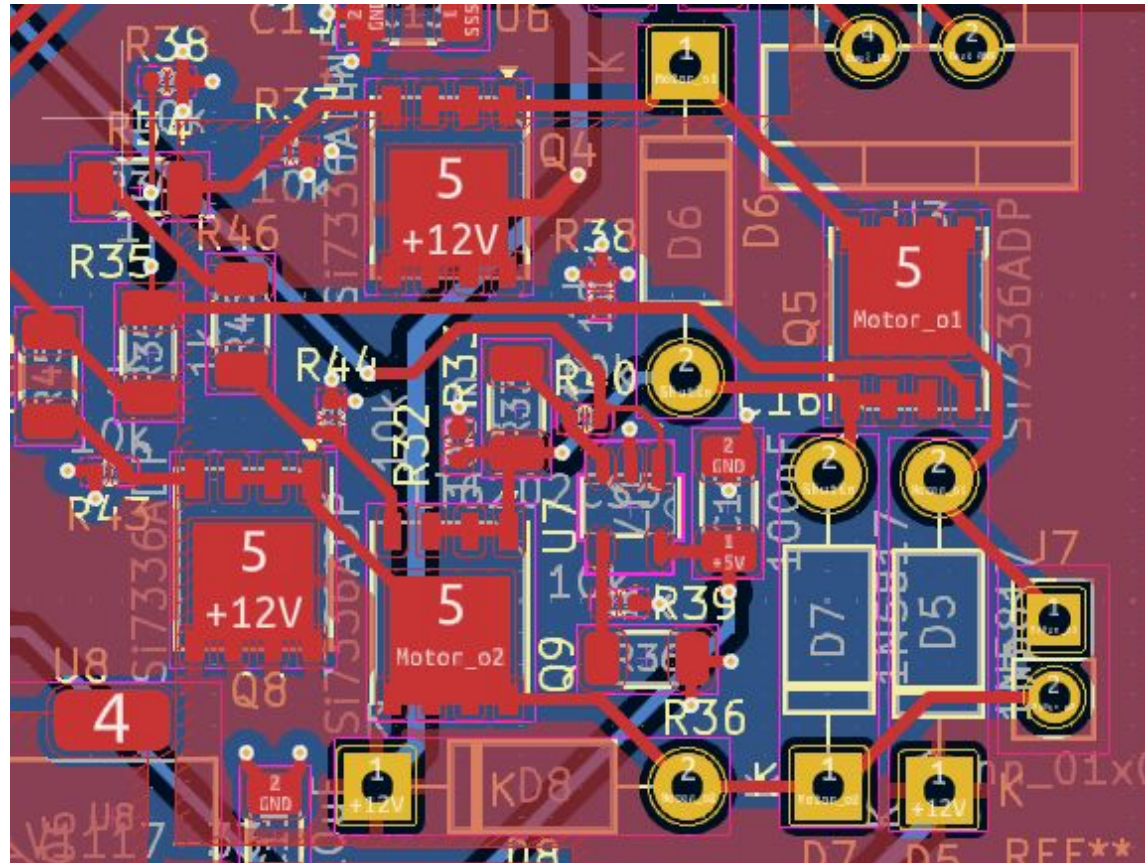




# H-bridge

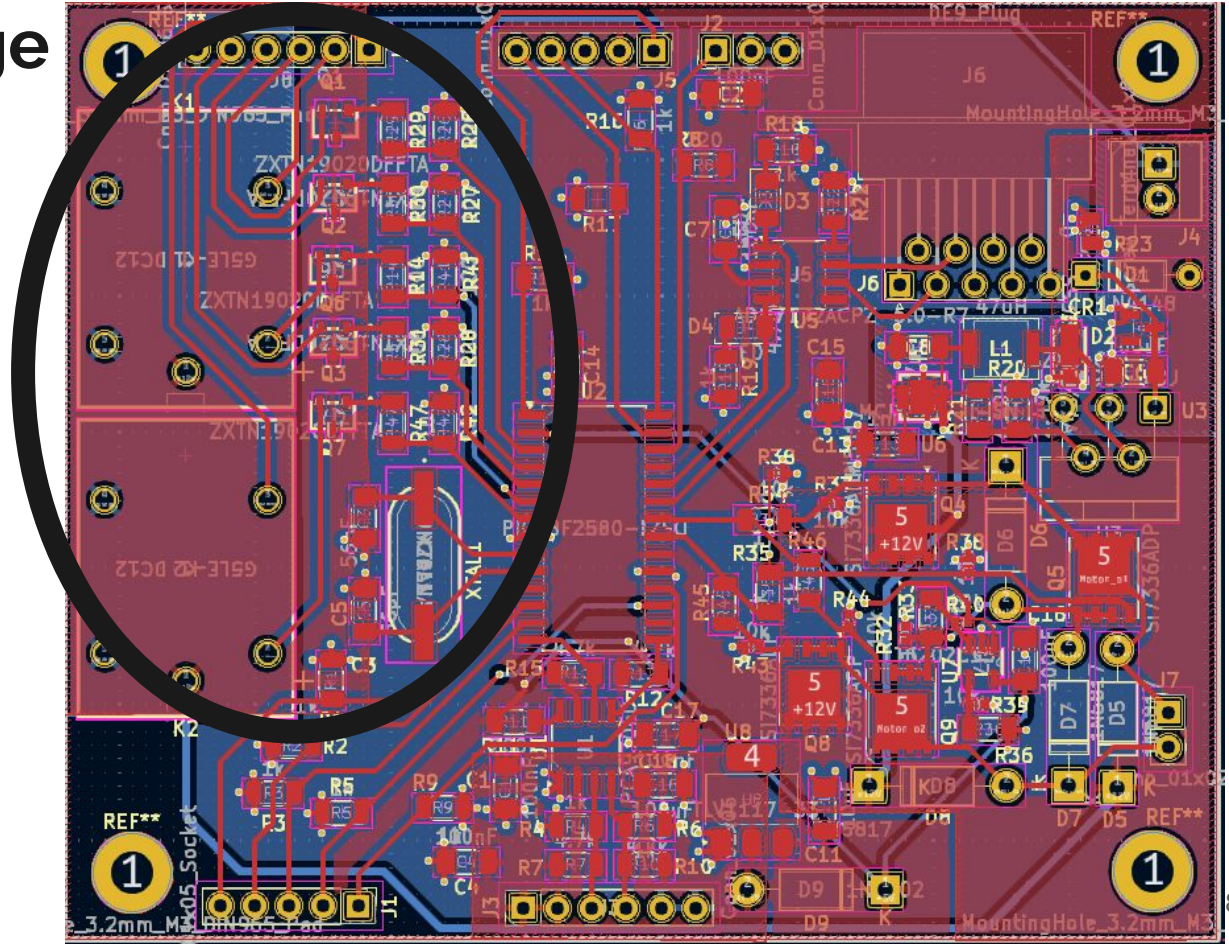


# H-bridge

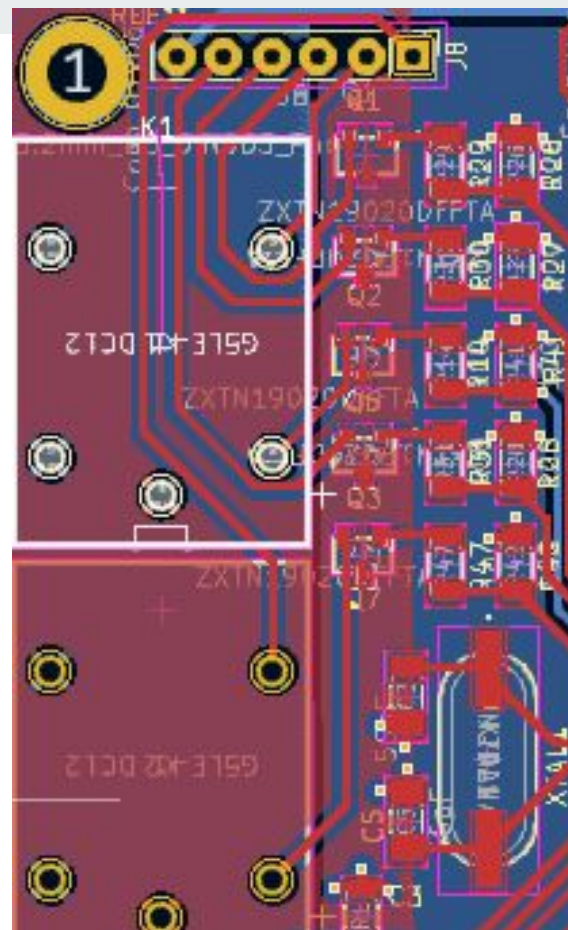




# Output select stage

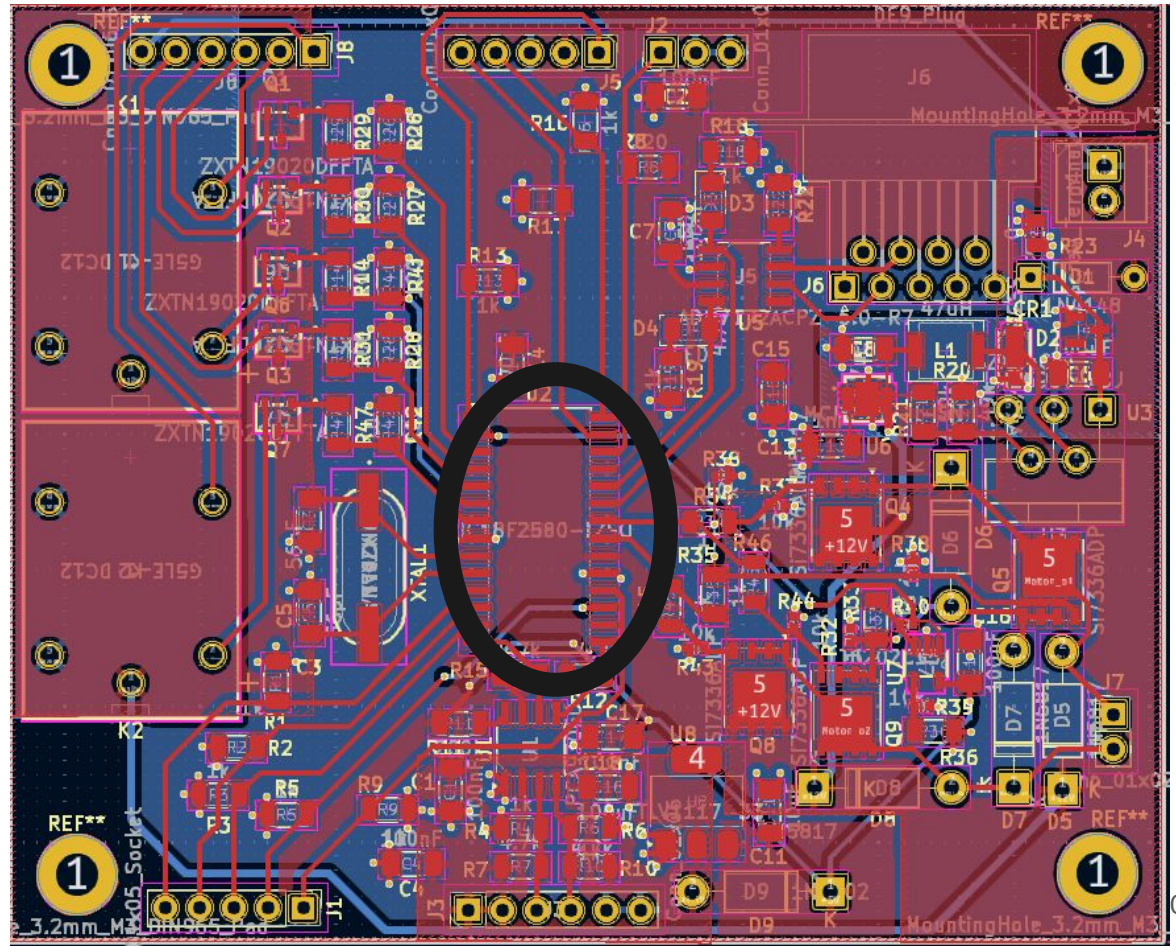


# Output select stage



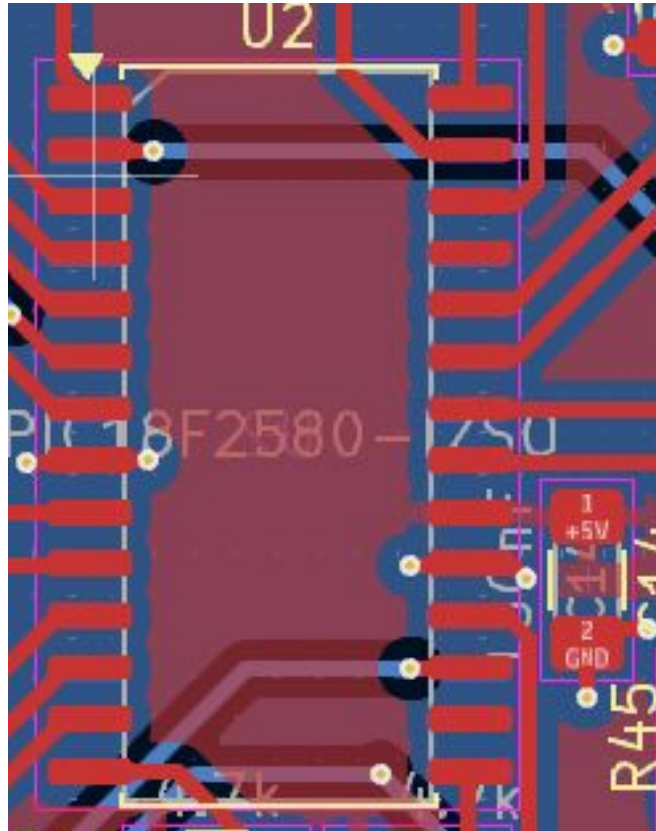


# Microcontrolador





# Microcontrolador



# Components



Nom del component	Funció	Datasheet
ADM7172ACPZ-5.0-R7	LDO 5V	<a href="#"><u>ADM7172ACPZ-5.0-R7</u></a>
ADP7112ACBZ-3.3-R7	LDO 3.3V	<a href="#"><u>ADP7112ACBZ-3.3-R7</u></a>
BH1750FVI-TR	Sensor de llum	<a href="#"><u>BH1750FVI-TR</u></a>
G5LE-1 DC12	Relé	<a href="#"><u>G5LE-1 DC12</u></a>
LM2596T-ADJ	BUCK converter	<a href="#"><u>LM2596T-ADJ</u></a>
MCP2551-I-SN	Transciever	<a href="#"><u>MCP2551-I-SN</u></a>
PIC18F2580-I/SO	Microprocesador	<a href="#"><u>PIC18F2580-I/SO</u></a>
Si7336ADP	Transistor BJT	<a href="#"><u>Si7336ADP</u></a>
SN74LXC2T45DCUR	Traductor de 5V a 3.3V	<a href="#"><u>SN74LXC2T45DCUR</u></a>
TMAG5124G1CEDBZRQ1	Sensor hall	<a href="#"><u>TMAG5124G1CEDBZRQ1</u></a>
ZXTN19020DFFTA	Transistor mosfet	<a href="#"><u>ZXTN19020DFFTA</u></a>
PCA9306D	Tracuctor de nivells	<a href="#"><u>PCA9036</u></a>
XT9M20HRR8M	Cristall	<a href="#"><u>XT9M20HRR8M</u></a>

