
Facultad de Ciencias de la Alimentación

Universidad Nacional de Entre Ríos



UNER Facultad de Ciencias de la **Alimentación**

AUTITO MICROCONTROLADORES
Crédito de diseño y manufactura de PCB

GABRIEL ANDRÉS AGUIRRE
19 de abril de 2021

Sheet: Sujeciones

File: Sujeciones.sch

Sheet: Microcontrolador

Sheet: Sensores

SENSOR1D
SENSOR2D
SENSOR3D
SENSOR4D
SENSOR5D
SENSOR6D

File: Sensores.sch

Sheet: Alimentacion

BAT+D

File: Alimentacion.sch

SENSOR1
SENSOR2
SENSOR3
SENSOR4
SENSOR5
SENSOR6

BAT+

ESP_SOFT_RSTD

UART_RXD

UART_TXD

ESP_SOFT_RSTD

ESP_SOFT_RSTD

ESP_SOFT_RSTD

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ESP_SOFT_RSTD

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ESP_SOFT_RSTD

ESP_SOFT_RSTD

Sheet: Puente H

MOTDAD
MOTDBD
MOTIAD
MOTIBD

QUART_RXD
QUART_TXD

QUART_TXD

QUART_TXD

QUART_TXD

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File: Puente H.sch

Sheet: WiFi

Sheet: WiFi

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Crédito DyM de PCBs

Sheet: /
File: Autito Microcontroladores.sch

Title: Hoja raíz

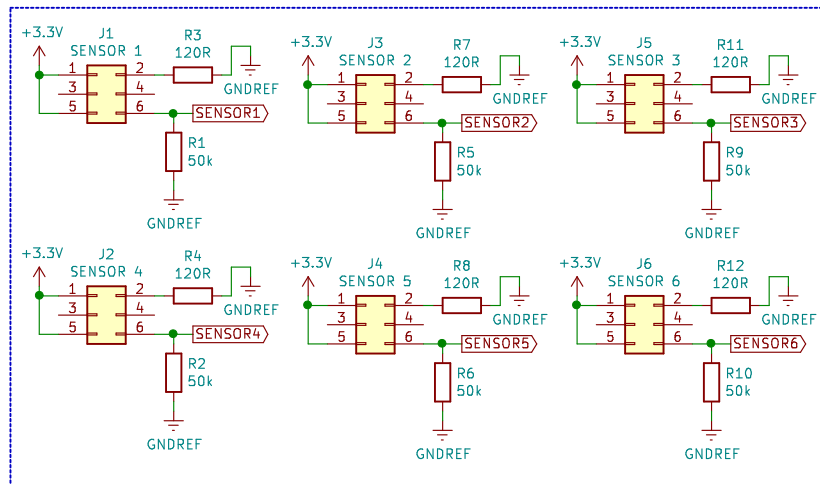
Size: A4 Date: 2021-03-30

KiCad E.D.A. kicad 5.1.9

Rev:

Id: 1/7

Sensores de proximidad



Crédito DyM de PCBs

Sheet: /Sensores/

File: Sensores.sch

Title: Sensores

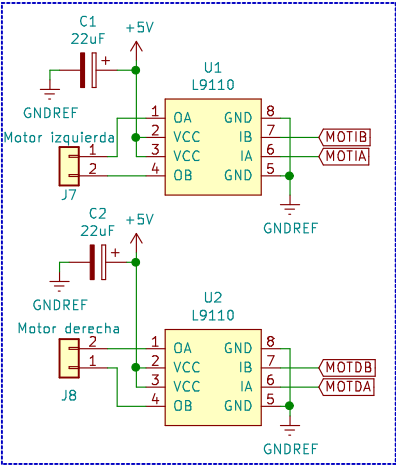
Size: A4 Date: 2021-03-30

KiCad E.D.A. kicad 5.1.9

Rev:

Id: 2/7

Dirección de Motores



Crédito DyM de PCBs

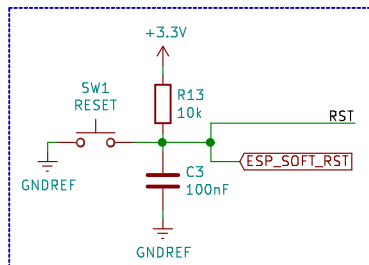
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File: Puente H.sch

Title: Puente H

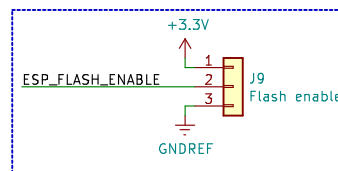
Size: A4 Date: 2021-03-30
KiCad E.D.A. kicad 5.1.9

Rev:
Id: 3/7

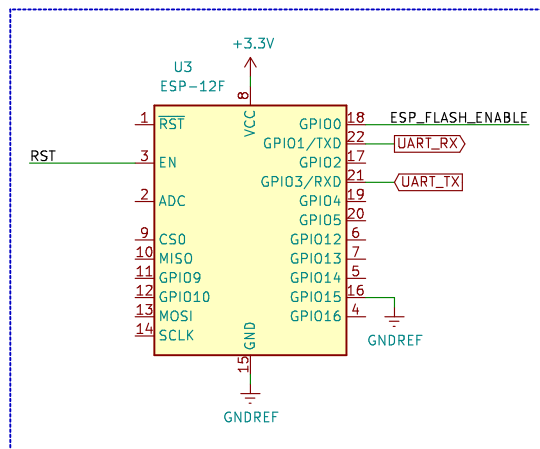
Reset



Flash enable



Modulo WiFi



Crédito DyM de PCBs

Sheet: /WiFi/
File: WiFi.sch

Title: WIFI

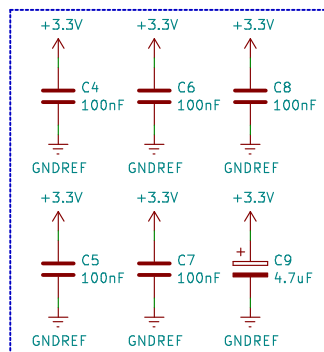
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KiCad E.D.A. kicad 5.1.9

Date: 2021-03-30

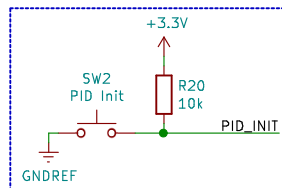
Rev:

Id: 4/7

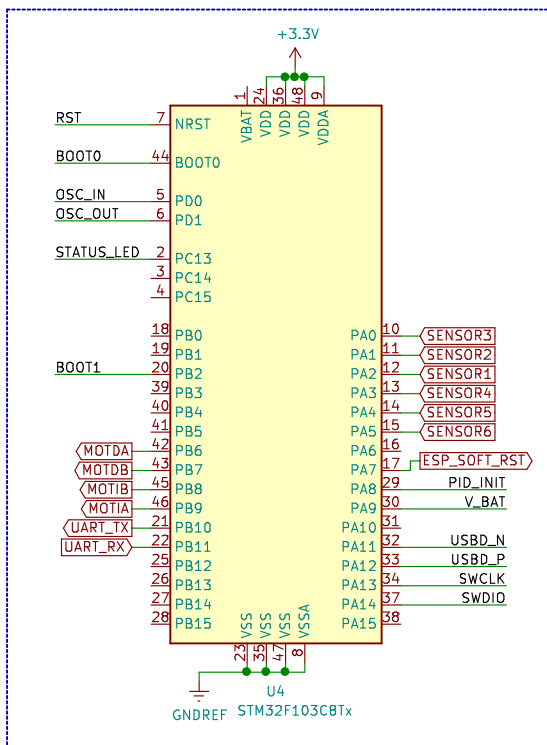
Filtrado



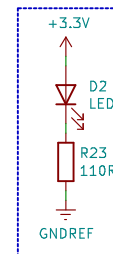
PID Init



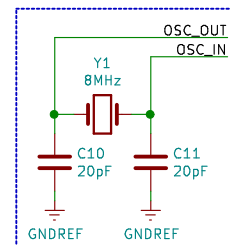
STM32F103C8T6



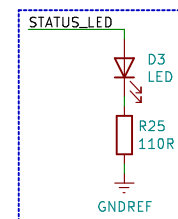
LED ON



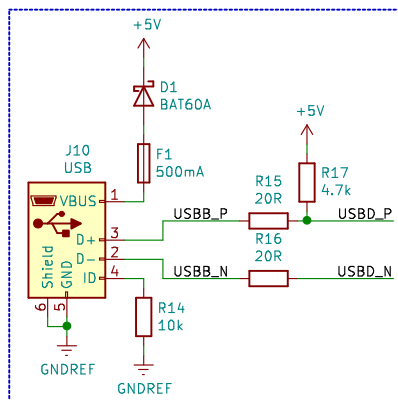
Reloj



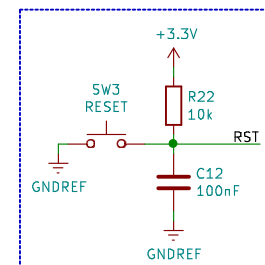
LED de estado



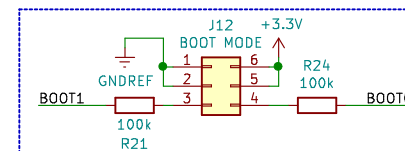
USB



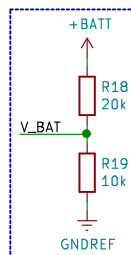
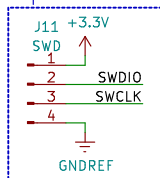
Reset



Modo de Booteo



Depuración



Crédito DyM de PCBs

Sheet: /Microcontrolador/

File: Microcontrolador.sch

Title: Microcontrolador

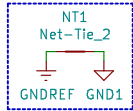
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KiCad E.D.A. kicad 5.1.9

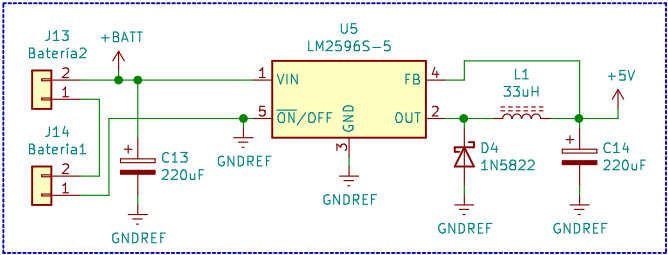
Rev:

Id: 5/7

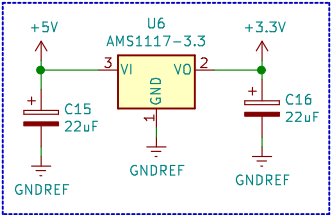
NetDie



5V Power Supply



3.3V Power Supply



Crédito DyM de PCBs

Sheet: /Alimentacion/
File: Alimentacion.sch

Title: Alimentación

Size: A4 Date: 2021-03-30
KiCad E.D.A. kicad 5.1.9

Rev:
Id: 6/7

Referencia

- FID1
Fiducial
- FID2
Fiducial
- FID3
Fiducial

Sujeción

- H1
MountingHole
- H2
MountingHole

Test points

- TP1
TestPoint
- TP2
TestPoint
- TP3
TestPoint
- TP4
TestPoint
- TP5
TestPoint
- TP6
TestPoint
- TP7
TestPoint
- TP8
TestPoint

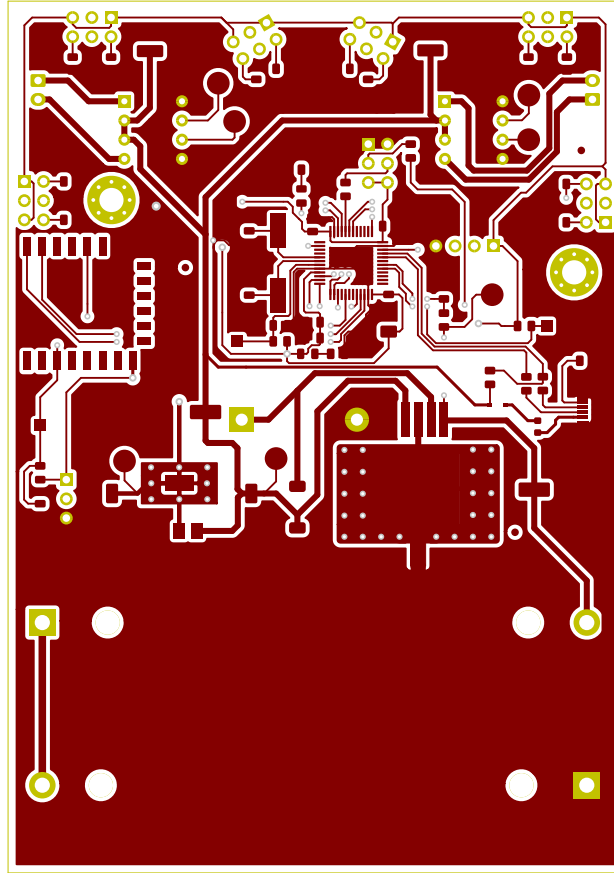
Crédito DyM de PCBs

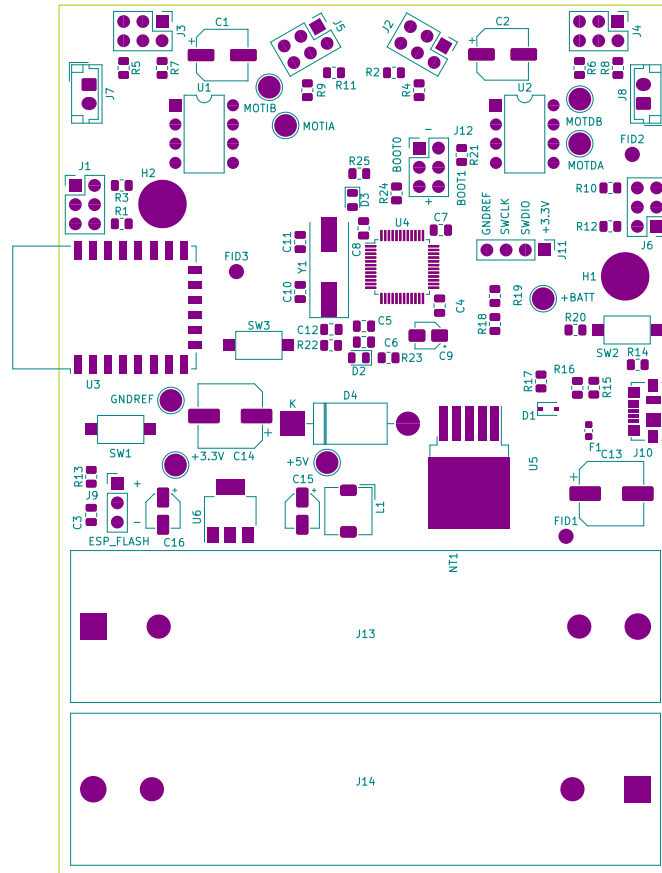
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File: Sujeciones.sch

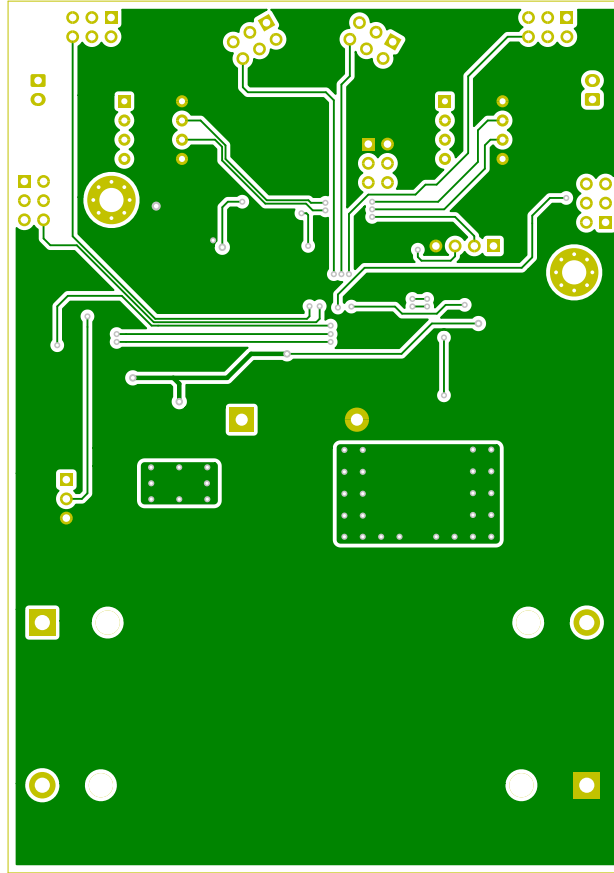
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Size: A4 Date: 2021-03-30
KiCad E.D.A. kicad 5.1.9

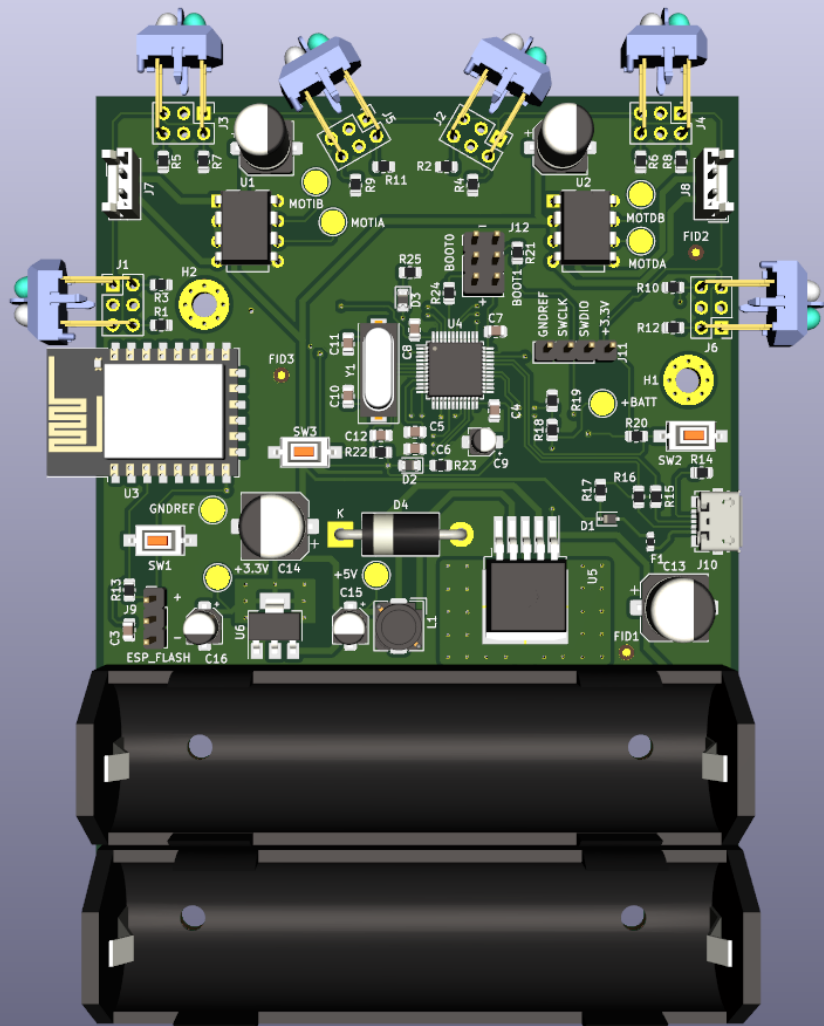
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Id: 7/7



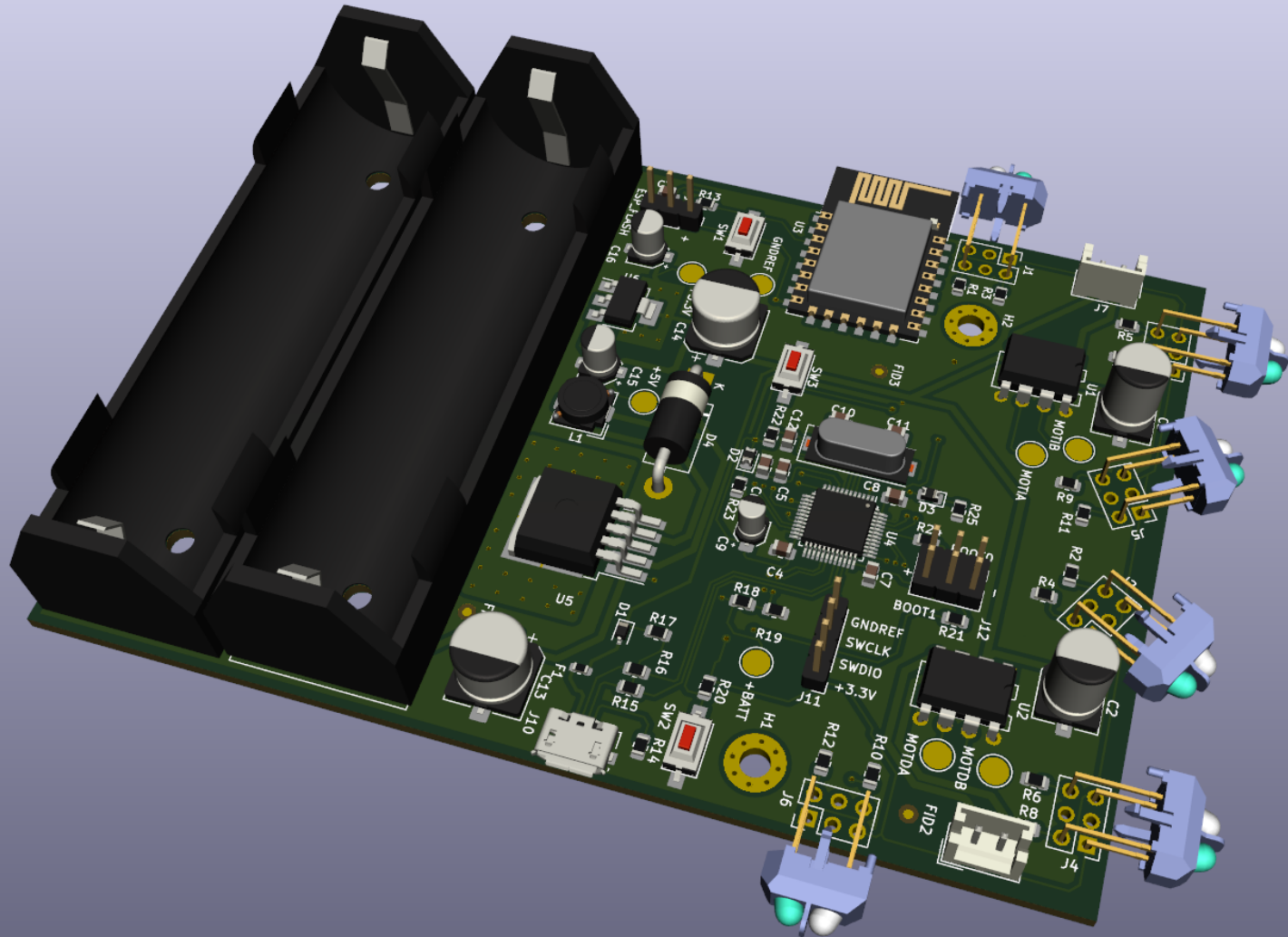


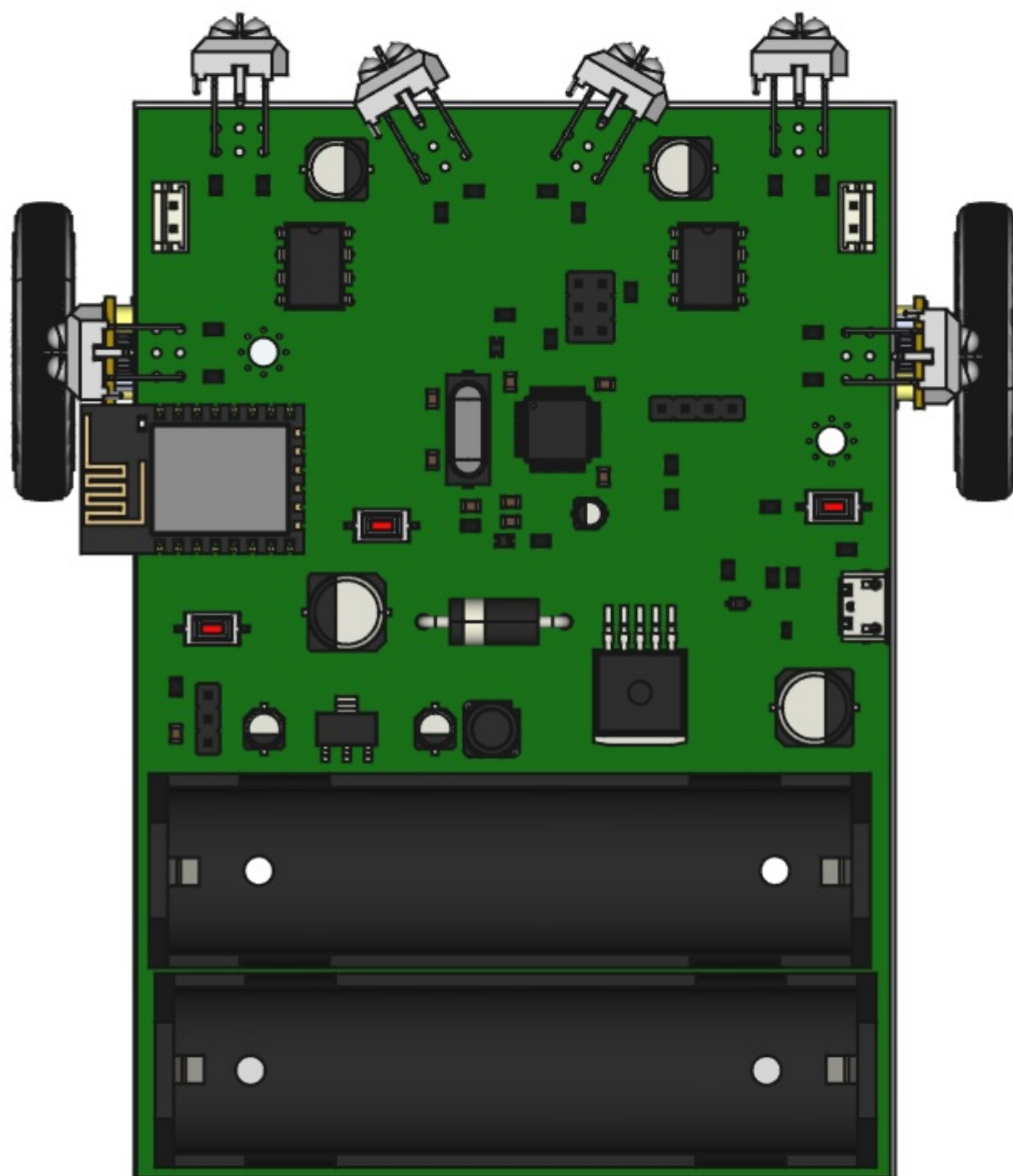


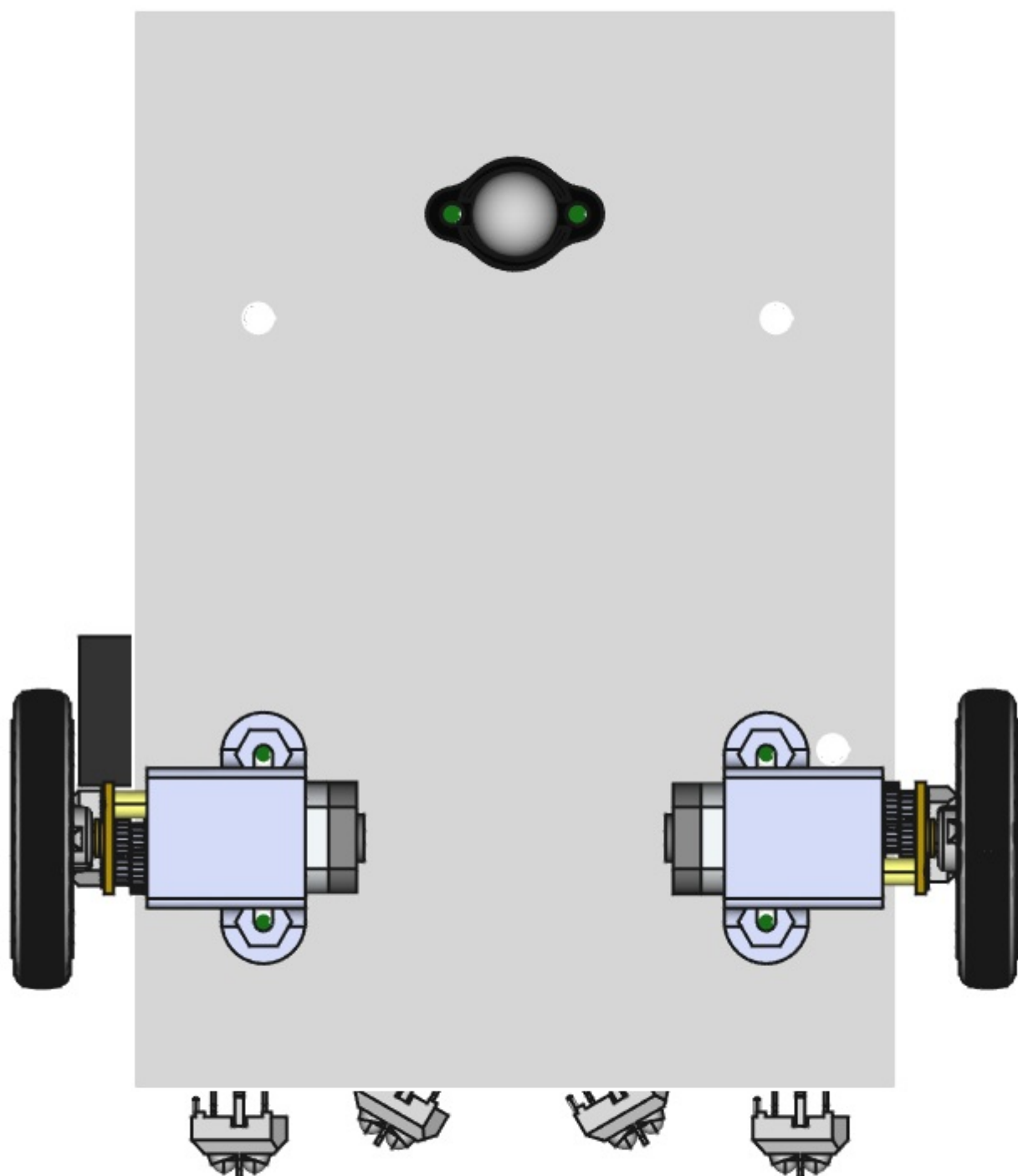


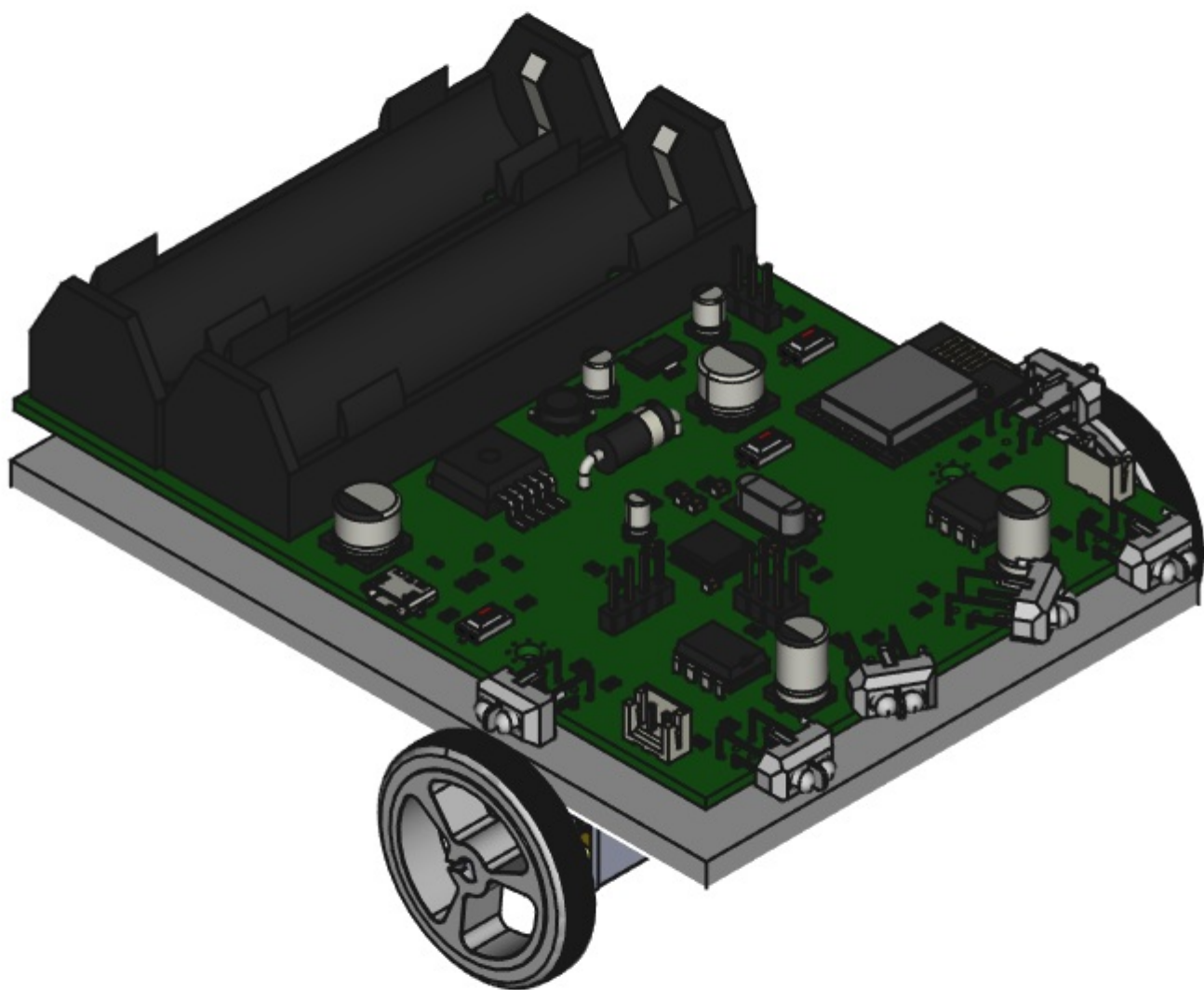














Facultad de Ciencias de la Alimentación

| Componente | Referencia | Valor | Footprint |
|----------------------------|-----------------------------|-----------------|--|
| Resistencias de 50k | R10, R6, R2, R9, R5, R1 | 50k | Resistor_SMD:R_0805_2012Metric |
| Sensores infrarojos | J6, J5, J2, J4, J1, J3 | SENSOR | Mis_componentes:TCRT5000 |
| Resistencia de 120R | R12, R8, R4, R11, R7, R3 | 120R | Resistor_SMD:R_0805_2012Metric |
| Puente H | U1, U2 | L9110 | Package_DIP:DIP-8_W7.62mm |
| Capacitor de 22uF | C1, C2, C16, C15 | 22uF | Capacitor_SMD:CP_Elec_6.3x9.9 |
| Conector para motores | J7, J8 | Motor | Connector_JST:JST_EH_B2B-EH-A_1x02_P2.50mm_Vertical |
| Modulo WiFi ESP8266 | U3 | ESP-12F | RF_Module:ESP-12E |
| Capacitor de 100nF | C3, C4, C6, C5, C8, C12, C7 | 100nF | Capacitor_SMD:C_0805_2012Metric |
| Capacitor de 20pF | C10, C11 | 20pF | Capacitor_SMD:C_0805_2012Metric |
| Boton pulsador pequeño | SW1, SW2, SW3 | Button | Button_Switch_SMD:SW_SPST_CK_RS282G05A3 |
| Resistencia de 10k | R13, R22, R14, R19, R20 | 10k | Resistor_SMD:R_0805_2012Metric |
| PinHeader 01x03 | J9 | Flash enable | Connector_PinHeader_2.54mm:PinHeader_1x03_P2.54mm_Vertical |
| Cristal de 8MHz | Y1 | 8MHz | Crystal:Crystal_SMD_HC49-SD |
| Resistencia de 100k | R24, R21 | 100k | Resistor_SMD:R_0805_2012Metric |
| PinHeader 02x03 | J12 | BOOT MODE | Connector_PinHeader_2.54mm:PinHeader_2x03_P2.54mm_Vertical |
| PinHeader 01x04 | J11 | SWD | Connector_PinHeader_2.54mm:PinHeader_1x04_P2.54mm_Vertical |
| Resistencia de 20R | R15, R16 | 20R | Resistor_SMD:R_0805_2012Metric |
| Conector micro USB hermbra | J10 | USB | Connector_USB:USB_Micro-B_Molex_47346-0001 |
| Resistencia de 4,7k | R17 | 4.7k | Resistor_SMD:R_0805_2012Metric |
| Resistencia de 20k | R18 | 20k | Resistor_SMD:R_0805_2012Metric |
| Capacitor de 4,7uF | C9 | 4.7uF | Capacitor_SMD:CP_Elec_3x5.4 |
| LED verde | D3 | LED | Diode_SMD:D_0805_2012Metric |
| LED naranja | D2 | LED | Diode_SMD:D_0805_2012Metric |
| Resistencia de 10R | R25, R23 | 110R | Resistor_SMD:R_0805_2012Metric |
| Fusible rearmable de 500mA | F1 | 500mA | Fuse:Fuse_0603_1608Metric |
| Diodo de baja caida | D1 | BAT60A | Diode_SMD:D_SOD-323 |
| STM microcontrolador | U4 | STM32F103C8Tx | Package_QFP:LQFP-48_7x7mm_P0.5mm |
| Conversor DC-DC a 5V | U5 | LM2596S-5 | Package_TO_SOT_SMD:TO-263-5_TabPin3 |
| Capacitor de 220uF | C14, C13 | 220uF | Capacitor_SMD:CP_Elec_8x6.9 |
| Inductor de 33uH | L1 | 33uH | Inductor_SMD:L_TDK_SLF6045 |
| Conversor lineal 5V a 3,3V | U6 | AMS1117-3.3 | Package_TO_SOT_SMD:SOT-223-3_TabPin2 |
| Diodo Schotky | D4 | 1N5822 | Diode_THT:D_DO-201AD_P15.24mm_Horizontal |
| Conector de bateria | J13, J14 | Batería2 | Battery:BatteryHolder_MPD_BH-18650-PC2 |
| Bateria 18650 | BAT1, BAT2 | Batería2 | 18650 |
| Motores 6V | MOT1, MOT2 | Motor izquierda | 6V |
| Llantas para motor | YANT1, YANT2 | Llantas | Para motor |
| Rueda loca | RL | Rueda loca | 3/8 inch |
| Soporte motor | MT | Soporte | Pololu |

| | |
|--------------|-------------|
| Precio total | \$76,65 |
| | \$10.731,68 |

Autito Microcontroladores

Gabriel Andrés Aguirre

| Link | Precio unidad | Precio unidad | Cantidad | Precio | Fabricante | N.º Fabricante | Mouser N.º |
|---|---------------|---------------|----------|--------|------------------------------|--------------------|----------------------|
| https://ar.n | 71,32 ARS | \$0,51 | 6 | | \$3,06 KOA Speer | RN73H2ATTD1503B25 | 660-RN73H2ATD1503B25 |
| https://ar.n | 121,54 ARS | \$0,87 | 6 | | \$5,21 Vishay Semiconductors | TCRT5000 | 782-TCRT5000 |
| https://ar.n | 70,32 ARS | \$0,50 | 6 | | \$3,01 Panasonic | ERA-6VEB1200V | 667-ERA-6VEB1200V |
| https://ar.n | 150,68 ARS | \$1,08 | 2 | | \$2,15 Adafruit | 4489 | 485-4489 |
| https://ar.n | 32,14 ARS | \$0,23 | 4 | | \$0,92 Panasonic | EEE-FN1C220R | 667-EEE-FN1C220R |
| https://ar.n | 80,36 ARS | \$0,57 | 2 | | \$1,15 JST Automotive | S06B-AIT2-1AK | 306-S06B-AIT2-1AK |
| https://ar.n | 698,13 ARS | \$4,99 | 1 | | \$4,99 Adafruit | 2491 | 485-2491 |
| https://ar.n | 52,23 ARS | \$0,37 | 7 | | \$2,61 KEMET | C0805X104M5RACTU | 80-C0805X104M5RACTU |
| https://ar.n | 49,22 ARS | \$0,35 | 2 | | \$0,70 AVX | 08055A200F4T2A | 581-08055A200F4T2A |
| https://ar.n | 10,05 ARS | \$0,07 | 3 | | \$0,22 C&K | PTS636 SL43 LFS | 611-PTS636SL43LFS |
| https://ar.n | 10,05 ARS | \$0,07 | 5 | | \$0,36 Vishay / Dale | CRCW080510K0FKEAC | 71-CRCW080510K0FKEAC |
| https://ar.n | 149,67 ARS | \$1,07 | 1 | | \$1,07 Digilent | 240-004 | 424-6-PIN-HEADER |
| https://ar.n | 156,70 ARS | \$1,12 | 1 | | \$1,12 ECS | ECS-80-20-5PVX-TR | 520-ECS-80-20-5PVX |
| https://ar.n | 10,05 ARS | \$0,07 | 2 | | \$0,14 Vishay / Dale | CRCW0805100KJNEAC | 71-CRCW0805100KJNEAC |
| https://ar.n | 210,95 ARS | \$1,51 | 1 | | \$1,51 Digilent | 240-062 | 424-2X6-PIN-HEADER |
| https://ar.n | 149,67 ARS | \$1,07 | 1 | | \$1,07 Digilent | 240-004 | 424-6-PIN-HEADER |
| https://ar.n | 25,11 ARS | \$0,18 | 2 | | \$0,36 Vishay / Dale | RCS080520R0FKEA | 71-RCS080520R0FKEA |
| https://ar.n | 45,20 ARS | \$0,32 | 1 | | \$0,32 CUI Devices | UJ2-MIBH-G-SMT-TR | 490-UJ2-MIBH-G-SMTTR |
| https://ar.n | 10,05 ARS | \$0,07 | 1 | | \$0,07 Vishay / Dale | CRCW08054K70JNEA | 71-CRCW0805J-4.7K-E3 |
| https://ar.n | 10,05 ARS | \$0,07 | 1 | | \$0,07 Vishay / Dale | CRCW080520K0FKEAC | 71-CRCW080520K0FKEAC |
| https://ar.n | 30,14 ARS | \$0,22 | 1 | | \$0,22 Wurth Elektronik | 865090468011 | 710-865090468011 |
| https://ar.n | 39,18 ARS | \$0,28 | 1 | | \$0,28 Dialight | 598-8C80-102F | 645-598-8C80-102F |
| https://ar.n | 34,15 ARS | \$0,24 | 1 | | \$0,24 Dialight | 598-8C30-102F | 645-598-8C30-102F |
| https://ar.n | 16,07 ARS | \$0,11 | 2 | | \$0,23 Vishay / Dale | CRCW0805110RFKEAC | 71-CRCW0805110RFKEAC |
| https://ar.n | 92,41 ARS | \$0,66 | 1 | | \$0,66 Littelfuse | 1812L050/60MR | 576-1812L050/60MR |
| https://ar.n | 45,20 ARS | \$0,32 | 1 | | \$0,32 Infineon Technologies | BAT 60A E6327 | 726-BAT60AE6327 |
| https://ar.n | 571,56 ARS | \$4,08 | 1 | | \$4,08 STMicroelectronics | STM32F103CBT6 | 511-STM32F103CBT6 |
| https://ar.n | 609,73 ARS | \$4,36 | 1 | | \$4,36 Texas Instruments | LM2596S-5.0/NOPB | 926-LM2596S-5.0/NOPB |
| https://ar.n | 212,95 ARS | \$1,52 | 2 | | \$3,04 Nichicon | PCH1C221MCL1GS | 647-PCH1C221MCL1GS |
| https://ar.n | 177,80 ARS | \$1,27 | 1 | | \$1,27 Taiyo Yuden | NS10145T330MNV8 | 963-NS10145T330MNV8 |
| https://ar.n | 66,00 ARS | \$0,47 | 1 | | \$0,47 Texas Instruments | LM1117MPX-3.3/NOPB | 926-LM1117MPX3.3NOPB |
| https://ar.n | 115,52 ARS | \$0,83 | 1 | | \$0,83 STMicroelectronics | 1N5822 | 511-1N5822 |
| https://ar.n | 259,16 ARS | \$1,85 | 2 | | \$3,70 Keystone Electronics | 1043 | 534-1043 |
| https://artic | 427,00 ARS | \$3,05 | 2 | | \$6,10 18650 | 18650 | 18650 |
| https://ar.n | 750,36 ARS | \$5,36 | 2 | | \$10,72 TinyCircuits | ASR00016 | 406-ASR00016 |
| https://tesl | 189,00 ARS | \$1,35 | 2 | | \$2,70 Impreso | 2343 | |
| https://robo | 172,00 ARS | \$1,23 | 1 | | \$1,23 POLOLU | P000951 | |
| https://robo | 427,00 ARS | \$3,05 | 2 | | \$6,10 POLOLU | P000989 | |



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| Componente | Referencia | Valor |
|----------------------------|-----------------------------|---------------|
| Resistencias de 50k | R10, R6, R2, R9, R5, R1 | 50k |
| Sensores infrarojos | J6, J5, J2, J4, J1, J3 | SENSOR |
| Resistencia de 120R | R12, R8, R4, R11, R7, R3 | 120R |
| Puente H | U1, U2 | L9110 |
| Capacitor de 22uF | C1, C2, C16, C15 | 22uF |
| Conector para motores | J7, J8 | Motor |
| Modulo WiFi ESP8266 | U3 | ESP-12F |
| Capacitor de 100nF | C3, C4, C6, C5, C8, C12, C7 | 100nF |
| Capacitor de 20pF | C10, C11 | 20pF |
| Boton pulsador pequeño | SW1, SW2, SW3 | Button |
| Resistencia de 10k | R13, R22, R14, R19, R20 | 10k |
| PinHeader 01x03 | J9 | Flash enable |
| Cristal de 8MHz | Y1 | 8MHz |
| Resistencia de 100k | R24, R21 | 100k |
| PinHeader 02x03 | J12 | BOOT MODE |
| PinHeader 01x04 | J11 | SWD |
| Resistencia de 20R | R15, R16 | 20R |
| Conector micro USB hermbra | J10 | USB |
| Resistencia de 4,7k | R17 | 4.7k |
| Resistencia de 20k | R18 | 20k |
| Capacitor de 4,7uF | C9 | 4.7uF |
| LED verde | D3 | LED |
| LED naranja | D2 | LED |
| Resistencia de 10R | R25, R23 | 110R |
| Fusible rearmable de 500mA | F1 | 500mA |
| Diodo de baja caida | D1 | BAT60A |
| STM microcontrolador | U4 | STM32F103C8Tx |
| Conversor DC-DC a 5V | U5 | LM2596S-5 |
| Capacitor de 220uF | C14, C13 | 220uF |
| Inductor de 33uH | L1 | 33uH |
| Conversor lineal 5V a 3,3V | U6 | AMS1117-3.3 |
| Diodo Schotky | D4 | 1N5822 |
| Conector de bateria | J13, J14 | Batería2 |

Autito Microcontroladores

Gabriel Andrés Aguirre

| Footprint |
|--|
| Resistor_SMD:R_0805_2012Metric |
| Mis_componentes:TCRT5000 |
| Resistor_SMD:R_0805_2012Metric |
| Package_DIP:DIP-8_W7.62mm |
| Capacitor_SMD:CP_Elec_6.3x9.9 |
| Connector_JST:JST_EH_B2B-EH-A_1x02_P2.50mm_Vertical |
| RF_Module:ESP-12E |
| Capacitor_SMD:C_0805_2012Metric |
| Capacitor_SMD:C_0805_2012Metric |
| Button_Switch_SMD:SW_SPST_CK_RS282G05A3 |
| Resistor_SMD:R_0805_2012Metric |
| Connector_PinHeader_2.54mm:PinHeader_1x03_P2.54mm_Vertical |
| Crystal:Crystal_SMD_HC49-SD |
| Resistor_SMD:R_0805_2012Metric |
| Connector_PinHeader_2.54mm:PinHeader_2x03_P2.54mm_Vertical |
| Connector_PinHeader_2.54mm:PinHeader_1x04_P2.54mm_Vertical |
| Resistor_SMD:R_0805_2012Metric |
| Connector_USB:USB_Micro-B_Molex_47346-0001 |
| Resistor_SMD:R_0805_2012Metric |
| Resistor_SMD:R_0805_2012Metric |
| Capacitor_SMD:CP_Elec_3x5.4 |
| Diode_SMD:D_0805_2012Metric |
| Diode_SMD:D_0805_2012Metric |
| Resistor_SMD:R_0805_2012Metric |
| Fuse:Fuse_0603_1608Metric |
| Diode_SMD:D_SOD-323 |
| Package_QFP:LQFP-48_7x7mm_P0.5mm |
| Package_TO_SOT_SMD:TO-263-5_TabPin3 |
| Capacitor_SMD:CP_Elec_8x6.9 |
| Inductor_SMD:L_TDK_SLF6045 |
| Package_TO_SOT_SMD:SOT-223-3_TabPin2 |
| Diode_THT:D_DO-201AD_P15.24mm_Horizontal |
| Battery:BatteryHolder_MPD_BH-18650-PC2 |

Buenos días Gabriel:

El costo total de las 5 unids es de \$ 11.000 + iva y el plazo de entrega de 10/12 días

Saludos cordiales,



ELEPRINT
Electrónica

GERMÁN H. RIVAROLA
Ventas

- ✉ ventas@eleprint.com.ar
- 📍 011 4635-9763 | 011 4635-0735
- 📞 José E. Rodó 5959/63, 1440, C.A.B.A

-----Mensaje original-----
De: Eleprint [mailto:wordpress@eleprint.com.ar]
Enviado el: lunes, 12 de abril de 2021 10:33 a.m.
Para: contacto@eleprint.com.ar
Asunto: UNER - Facultad de Ciencias de la Alimentación - "Cotizador Online"

Empresa: UNER - Facultad de Ciencias de la Alimentación
Contacto: Gabriel Aguirre
Teléfono: 0345154014944
Email: gabiandiagui@gmail.com

Tipo de Producto: Circuitos FR4 Doble Faz
Tipo de Material: NC
Espesor: 1.60 mm
Terminación: Estaño Selectivo
Software Utilizado: Kikad
Modelo: Autito
Cantidad: 5
Largo: 115.284mm
Ancho: 81.223mm
Comentarios:

Este mensaje fue enviado desde el formulario de Cotizacion de Eleprint.

Charge Details



| | |
|---------------------|--------|
| Engineering fee | \$4.00 |
| Remove Order Number | \$1.50 |
| Board | \$3.70 |

Build Time ?

| | |
|---|--------|
| PCB : <input checked="" type="radio"/> 3 days | \$0.00 |
|---|--------|

Calculated Price **\$9.20**

Additional charges may apply for special cases

| | |
|----------|--------|
| Weight ? | 0.15kg |
|----------|--------|

SAVE TO CART

Precio y tiempo de producción

Precio de la
PCB

☰ Matriz de comparación de precios

| | Tiempo de preparación | Cantidad | Total |
|----------------------------------|--------------------------|----------|-------|
| <input checked="" type="radio"/> | 3-4 días | 5 | \$ 34 |
| <input type="radio"/> | Express 48horas ? | 5 | \$ 58 |
| <input type="radio"/> | Express 24horas ? | 5 | \$ 82 |

💡 Precio final pendiente de nuestra comprobación.

Gastos de envío:

 ARGENTINA ▲

DHL ▼

   3-7 Days , wt : 0.164 kg **\$45**

Zona horaria CHN(GMT+8): 2021/4/12 21:37:07

Pago antes 2021/04/13 06:00 (GMT+8 solamente PCB)



Fecha de envío
2021/4/16 AM



Fecha de entrega
2021/4/21

Precio PCB: ? US \$ 34

Envío: US \$ 45

Total: US \$ 79

Email



Añadir a la cesta