




# Diplomado Visión e Inteligencia Artificial

Módulo 1: Introducción al entorno Raspberry


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# Raspberry Pi4- Arquitectura.

Módulo 1: Introducción al entorno Raspberry


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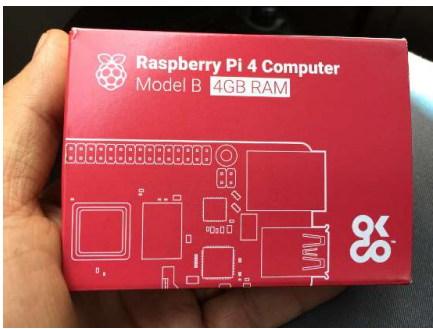
Raspberry pi3

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Tarjeta  
"Raspberry Pi 4 -Arquitectura"

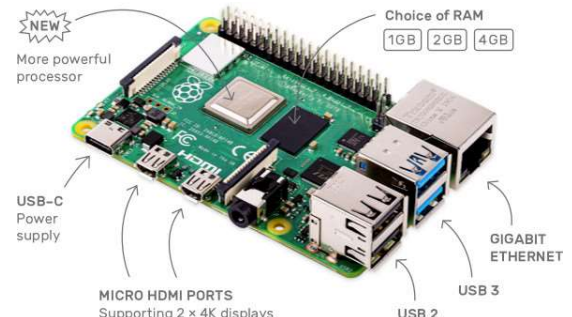


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Tarjeta



"Raspberry Pi 4", <https://www.raspberrypi.org/products/raspberry-pi-4-model-b/>, septiembre 2019

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Tarjeta

## Raspberry Pi 4B

■ Placa:



"THE OFFICIAL Raspberry Pi Beginner's Guide - 2nd Edition", <https://www.raspberrypi.org/magpi/issues/beginners-guide-2nd-ed/>, septiembre 2019

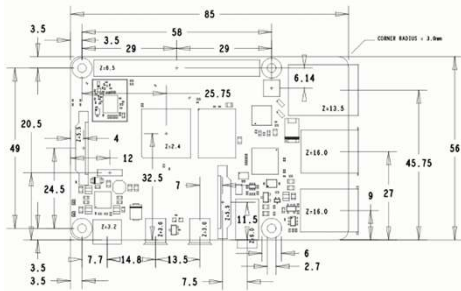
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## Tarjeta

## Raspberry Pi 4B

## ■ Dimensiones:



"Raspberry Pi 4 Model B mechanical drawing",  
[https://www.raspberrypi.org/documentation/hardware/raspberrypi/mechanical/rpi\\_MECH\\_4b\\_4p0.pdf](https://www.raspberrypi.org/documentation/hardware/raspberrypi/mechanical/rpi_MECH_4b_4p0.pdf), septiembre 2019



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## Procesador y memoria

## Raspberry Pi 4B

## ■ Procesador:

Broadcom BCM2711, Quad core Cortex-A72 (ARM v8) 64-bit SoC @ 1.5GHz



"THE OFFICIAL Raspberry Pi Beginner's Guide - 2nd Edition", <https://www.raspberrypi.org/magpi/issues/beginners-guide-2nd-ed/>, septiembre 2019



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## Procesador y memoria

## Raspberry Pi 4B

## ■ Memoria RAM:

1GB, 2GB or 4GB LPDDR4-3200 SDRAM (depending on model)



"THE OFFICIAL Raspberry Pi Beginner's Guide - 2nd Edition", <https://www.raspberrypi.org/magpi/issues/beginners-guide-2nd-ed/>, septiembre 2019



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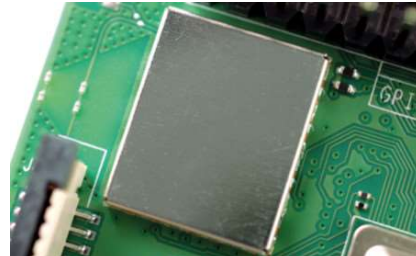
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## Conectividad

## Raspberry Pi 4B

## ■ Conectividad:

2.4 GHz and 5.0 GHz IEEE 802.11ac wireless, Bluetooth 5.0, BLE



"THE OFFICIAL Raspberry Pi Beginner's Guide - 2nd Edition", <https://www.raspberrypi.org/magpi/issues/beginners-guide-2nd-ed/>, septiembre 2019



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## Conectividad

## Raspberry Pi 4B

## ■ USB Controller:

2 USB 3.0 ports; 2 USB 2.0 ports.



"THE OFFICIAL Raspberry Pi Beginner's Guide - 2nd Edition", <https://www.raspberrypi.org/magpi/issues/beginners-guide-2nd-ed/>, septiembre 2019



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## Conectividad

## Raspberry Pi 4B

## ■ USB Ports:

2 USB 3.0 ports; 2 USB 2.0 ports.



"THE OFFICIAL Raspberry Pi Beginner's Guide - 2nd Edition", <https://www.raspberrypi.org/magpi/issues/beginners-guide-2nd-ed/>, septiembre 2019



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## Conectividad

## Raspberry Pi 4B

- Red:  
Gigabit Ethernet



"THE OFFICIAL Raspberry Pi Beginner's Guide - 2nd Edition", <https://www.raspberrypi.org/magpi/issues/beginners-guide-2nd-ed/>, septiembre 2019



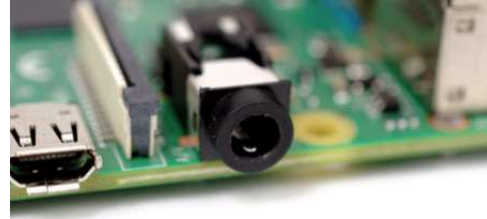
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## Video y Sonido

## Raspberry Pi 4B

- Salida de audio y video compuesto:  
4-pole stereo audio and composite video port (3.5mm AV jack)



"THE OFFICIAL Raspberry Pi Beginner's Guide - 2nd Edition", <https://www.raspberrypi.org/magpi/issues/beginners-guide-2nd-ed/>, septiembre 2019



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## Video y Sonido

## Raspberry Pi 4B

- Salida de video:  
2 x micro-HDMI ports (up to 4kp60 supported)



"THE OFFICIAL Raspberry Pi Beginner's Guide - 2nd Edition", <https://www.raspberrypi.org/magpi/issues/beginners-guide-2nd-ed/>, septiembre 2019



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## Video y Sonido

## Raspberry Pi 4B

- Salida de video:  
2 x micro-HDMI ports (up to 4kp60 supported)



"Raspberry Pi 4", <https://www.raspberrypi.org/products/raspberry-pi-4-model-b/>, septiembre 2019



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## Video y Sonido

## Raspberry Pi 4B

- Alimentación de energía:  
5V DC via USB-C connector (minimum 3A\*)



"THE OFFICIAL Raspberry Pi Beginner's Guide - 2nd Edition", <https://www.raspberrypi.org/magpi/issues/beginners-guide-2nd-ed/>, septiembre 2019



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## Acceso I/O

## Raspberry Pi 4B

- Entrada de video:  
2-lane MIPI CSI camera port



"THE OFFICIAL Raspberry Pi Beginner's Guide - 2nd Edition", <https://www.raspberrypi.org/magpi/issues/beginners-guide-2nd-ed/>, septiembre 2019



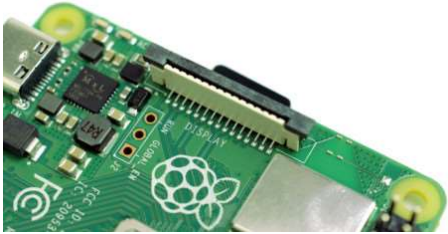
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**Acceso I/O**

## Raspberry Pi 4B

- Salida de video:  
2-lane MIPI DSI display port



"THE OFFICIAL Raspberry Pi Beginner's Guide - 2nd Edition", <https://www.raspberrypi.org/magpi/issues/beginners-guide-2nd-ed/>, septiembre 2019

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**Acceso I/O**

## Raspberry Pi 4B

- Salida de video:  
2-lane MIPI DSI display port (pantalla touchscreen)



"THE OFFICIAL Raspberry Pi Beginner's Guide - 2nd Edition", <https://www.raspberrypi.org/magpi/issues/beginners-guide-2nd-ed/>, septiembre 2019


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**Acceso I/O**

## Raspberry Pi 4B

- Pines de I/O:  
Raspberry Pi standard 40 pin GPIO header (fully backwards compatible with previous boards)



"THE OFFICIAL Raspberry Pi Beginner's Guide - 2nd Edition", <https://www.raspberrypi.org/magpi/issues/beginners-guide-2nd-ed/>, septiembre 2019


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**Acceso I/O**

## Raspberry Pi 3B+/4B

- GPIO:



"The Pi4J Project", <http://pi4j.com/pins/model-3b-plus-rev1.html>, septiembre 2018

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**Acceso I/O**

## Raspberry Pi 3B/4B

- GPIO:

GPIO	NAME	FUNCTION	GPIO
1	GPIO1	5V	15
2	GPIO2	5V	16
3	GPIO3	5V	17
4	GPIO4	5V	18
5	GPIO5	5V	19
6	GPIO6	5V	20
7	GPIO7	5V	21
8	GPIO8	5V	22
9	GPIO9	5V	23
10	GPIO10	5V	24
11	GPIO11	5V	25
12	GPIO12	5V	26
13	GPIO13	5V	27
14	GPIO14	5V	28
15	GPIO15	5V	29
16	GPIO16	5V	30
17	GPIO17	5V	31
18	GPIO18	5V	32
19	GPIO19	5V	33
20	GPIO20	5V	34
21	GPIO21	5V	35
22	GPIO22	5V	36
23	GPIO23	5V	37
24	GPIO24	5V	38
25	GPIO25	5V	39
26	GPIO26	5V	40

"The Pi4J Project", <http://pi4j.com/pins/model-3b-plus-rev1.html>, septiembre 2018

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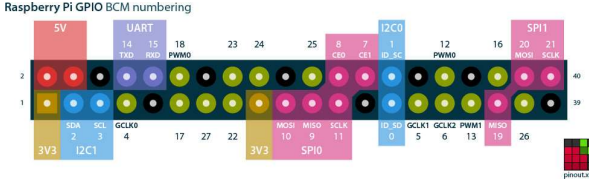
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**Acceso I/O**

## Raspberry Pi 3B/4B

- GPIO:

Raspberry Pi GPIO BCM numbering



"Pinout", <https://pinout.xyz/#>, septiembre 2018

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## Almacenamiento

## Raspberry Pi 4B

- Almacenamiento:  
Micro-SD card slot for loading operating system and data storage



"THE OFFICIAL Raspberry Pi Beginner's Guide - 2nd Edition", <https://www.raspberrypi.org/magpi/issues/beginners-guide-2nd-ed/>, septiembre 2019

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## Multimedia

## Raspberry Pi 4B

- Codecs de multimedia soportados:  
H.265 (4kp60 decode), H.264 (1080p60 decode, 1080p30 encode), OpenGL ES 3.0 graphics

"THE OFFICIAL Raspberry Pi Beginner's Guide - 2nd Edition", <https://www.raspberrypi.org/magpi/issues/beginners-guide-2nd-ed/>, septiembre 2019

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## Temperatura de Operación

## Raspberry Pi 3B+/4

- Temperatura de operación:  
0 – 50 grados centígrados.

"Raspberry Pi 3 Model B+ Technical Datasheet", [http://www.farnell.com/datasheets/2609094.pdf?\\_ga=2.67468436.405064749.1537836912-2044607258.1537836912, septiembre 2018](http://www.farnell.com/datasheets/2609094.pdf?_ga=2.67468436.405064749.1537836912-2044607258.1537836912, septiembre 2018)

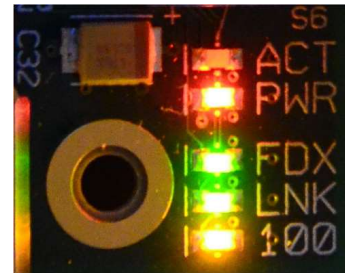
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## Monitoreo del Funcionamiento

## Raspberry Pi 3B+/4

- Status Leds:



"Raspberry Pi Hacks", <https://www.oreilly.com/library/view/raspberry-pi-hacks/9781449362737/ch01.html>, septiembre 2018

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## Monitoreo del Funcionamiento

## Raspberry Pi 3B+/4

- Status Led:
  - ACT (actividad - verde: Indica que se está accediendo a la tarjeta SD.
  - PWR (power - rojo): Indica que el sistema está energizado.
  - FDX (full duplex - verde): Indica conexión a una red LAN en modo full duplex
  - LNK (link - verde parpadeando): Indica actividad en la red LAN.
  - 100 (amarillo): Indica conexión a una red LAN a 100-Mbit/s:

"Learning Computer Architecture with Raspberry Pi", Even Upton, John Wiley & Sons, Inc. USA 2016

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## Tarjeta

## Raspberry pi3



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