

XMAS DEV 2024



AUTOMATIZZIAMO IL PRESEPE CON RASPBERRYPI E .NET

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Silver Sponsor





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Community















DEMO



BLAZOR WEB APP - INTERACTIVITY SERVER

"Blazor is a full-stack web UI framework and is recommended for most web UI scenarios."

• https://learn.microsoft.com/en-us/aspnet/core/tutorials/choose-web-ui

"Blazor supports interactive server-side rendering (interactive SSR), where UI interactions are handled from the server over a real-time connection with the browser.Interactive SSR enables a rich user experience like one would expect from a client app but without the need to create API endpoints to access server resources."

https://learn.microsoft.com/en-us/aspnet/core/blazor/



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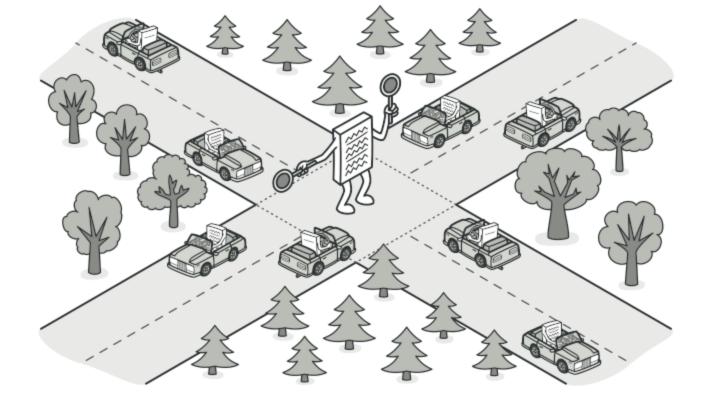
https://learn.microsoft.com/en-us/aspnet/core/blazor/



MEDIATOR PATTERN

Mediator is a behavioral design pattern that lets you reduce chaotic dependencies between objects. The pattern restricts direct communications between the objects and forces them to collaborate only via a

mediator object.





MEDIATR

"Simple, unambitious mediator implementation in .NET"

- https://github.com/jbogard/MediatR
- Simple mediator implementation in .NET
- In-process messaging with no dependencies.
- Supports request/response, commands, queries, notifications and events, synchronous and async with intelligent dispatching via C# generic variance.



COMPLEX ANIMATION MANAGEMENT - WORKFLOW-CORE

"Lightweight workflow engine for .NET Standard"

- https://github.com/danielgerlag/workflow-core
- Workflow Core is a lightweight embeddable workflow engine targeting .NET Standard.
- It supports pluggable persistence and concurrency providers to allow for multi-node clusters.
- Fluent API
- JSON / YAML Workflow Definitions



CODE



RASPBERRY PI3 B+

Specification

Processor: Broadcom BCM2837B0, Cortex-A53 64-bit SoC @ 1.4GHz

Memory: 1GB

Connectivity: • 2.4 GHz and 5 GHz IEEE 802.11b/g/n/ac wireless LAN,

Bluetooth 4.2, BLE

Gigabit Ethernet over USB 2.0 (maximum throughput

300Mbps)

4 × USB 2.0 interface

Video and sound: • 1 x full size HDMI

MIPI DSI display port
MIPI CSI camera port

4 pole stereo output and composite video port

Multimedia: H.264, MPEG-4 decode (1080p30); H.264 encode (1080p30);

OpenGL ES 1.1, 2.0 graphics

SD card support: Micro SD format for loading operating system and data

storage

Input Power: • 5V/2.5A DC via micro USB connector

5V DC via GPIO header

Power over Ethernet (PoE)-enabled (requires separate PoE

HAT)

Operating temperature: 0-50°C

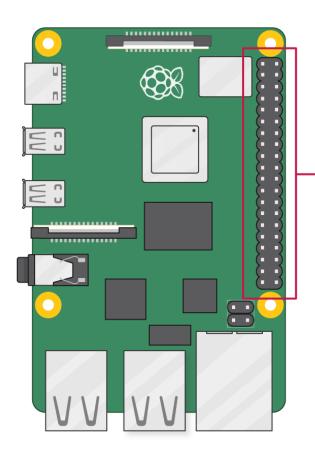
Production lifetime: Raspberry Pi 3 Model B+ will remain in production until at

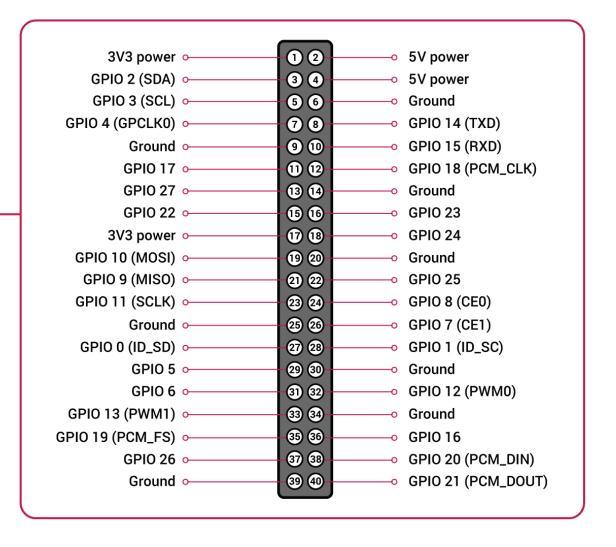
least January 2028





RASPBERRY PI3 B+



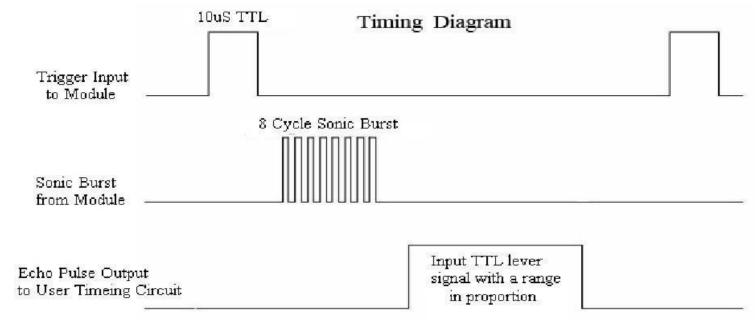




ULTRASONIC RANGING MODULE HC - SR04



The Timing diagram is shown below. You only need to supply a short 10uS pulse to the trigger input to start the ranging, and then the module will send out an 8 cycle burst of ultrasound at 40 kHz and raise its echo. The Echo is a distance object that is pulse width and the range in proportion . You can calculate the range through the time interval between sending trigger signal and receiving echo signal. Formula: uS / 58 = centimeters or uS / 148 =inch; or: the range = high level time * velocity (340M/S) / 2; we suggest to use over 60ms measurement cycle, in order to prevent trigger signal to the echo signal.





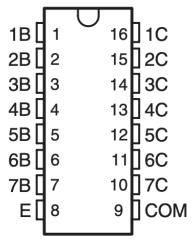
STEPPER MOTOR 5V 4-PHASE 5-WIRE & ULN2003 DRIVER BOARD

FEATURES

- 500-mA-Rated Collector Current (Single Output)
- High-Voltage Outputs: 50 V
- Output Clamp Diodes
- Inputs Compatible With Various Types of Logic
- Relay-Driver Applications



ULN2002A ... N PACKAGE
ULN2003A ... D, N, NS, OR PW PACKAGE
ULN2004A ... D, N, OR NS PACKAGE
ULQ2003A, ULQ2004A ... D OR N PACKAGE
(TOP VIEW)





POWER SUPPLY 15 W 5 V 3 A



15W Single Output Switching Power Supply

RS-15 series

User's Manual



■ Features :

- . Universal AC input / Full range
- * Protections: Short circuit / Overload / Over voltage / Over temperature
- . Cooling by free air convection
- . LED indicator for power on
- * 100% full load burn-in test
- No load power consumption<0.5W
- * All using 105°C long life electrolytic capacitors
- . Withstand 300VAC surge input for 5 second
- High operating temperature up to 70°C
- . Withstand 5G vibration test
- . High efficiency, long life and high reliability
- 3 years warranty

MW Search: https://www.meanwell.com/serviceGTIN.aspx













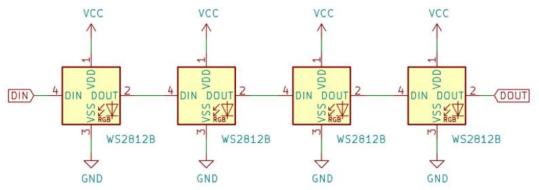
SPECIFICATION

■ GTIN CODE

SPECIFIC	ATION	IS13252 AS/NZS62368-1 UL62368-1 GB4943.1 BS EN/EN62368-1 none TPTC004 IEC62368-1											
MODEL		RS-15-3.3	RS-15-5	RS-15-12	RS-15-15	RS-15-24	RS-15-48						
оитрит	DC VOLTAGE	3.3V	5V	12V	15V	24V	48V						
	RATED CURRENT	3A	3A	1.3A	1A	0.625A	0.313A						
	CURRENT RANGE	0 ~ 3A	0~3A	0~1.3A	0~1A	0~0.625A	0~0.313A						
	RATED POWER	9.9W	15W	15.6W	15W	15W	15.024W						
	RIPPLE & NOISE (max.) Note.2	80mVp-p	80mVp-p	120mVp-p	120mVp-p	200mVp-p	200mVp-p						
	VOLTAGE ADJ. RANGE	2.9 ~ 3.6V	4.75 ~ 5.5V	10.8 ~ 13.2V	13.5 ~ 16.5V	22 ~ 27.6V	43.2 ~ 52.8V						
	VOLTAGE TOLERANCE Note.3	±3.0%	±2.0%	±1.0%	±1.0%	±1.0%	±1.0%						
	LINE REGULATION Note.4	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%						
	LOAD REGULATION Note.5	±2.0%	±1.5%	±0.5%	±0.5%	±0.5%	±0.5%						
	SETUP, RISE TIME	1000ms, 30ms/230VAC 1000ms, 30ms/115VAC at full load											
	HOLD UP TIME (Typ.)	70ms/230VAC 12ms/115VAC at full load											
INPUT	VOLTAGE RANGE	85 ~ 264VAC 120 ~ 370VDC											
	FREQUENCY RANGE	47 ~ 63Hz											
	EFFICIENCY (Typ.)	72%	77%	81%	81%	82%	82%						
	AC CURRENT (Typ.)	0.35A/115VAC 0.25A/230VAC											
	INRUSH CURRENT (Typ.)	COLD START 65A / 230VAC											
	LEAKAGE CURRENT	<2mA / 240VAC											



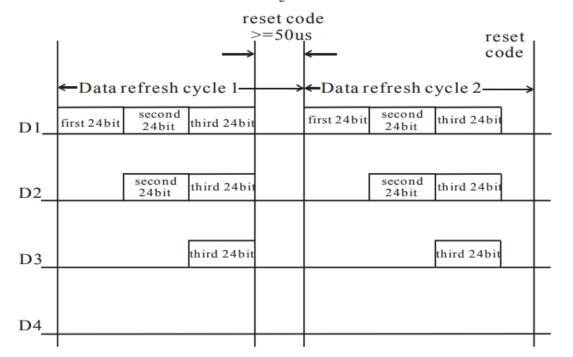
BTF-LIGHTING WS2812



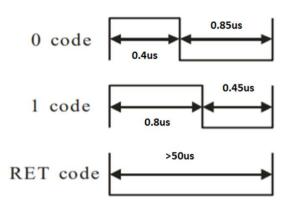
Composition of 24bit data:

	-																						
G7	G6	G5	G4	G3	G2	Gl	G0	R7	R6	R5	R4	R3	R2	R1	R0	В7	В6	В5	В4	В3	B2	Bl	В0

Note: Follow the order of GRB to sent data and the high bit sent at first.



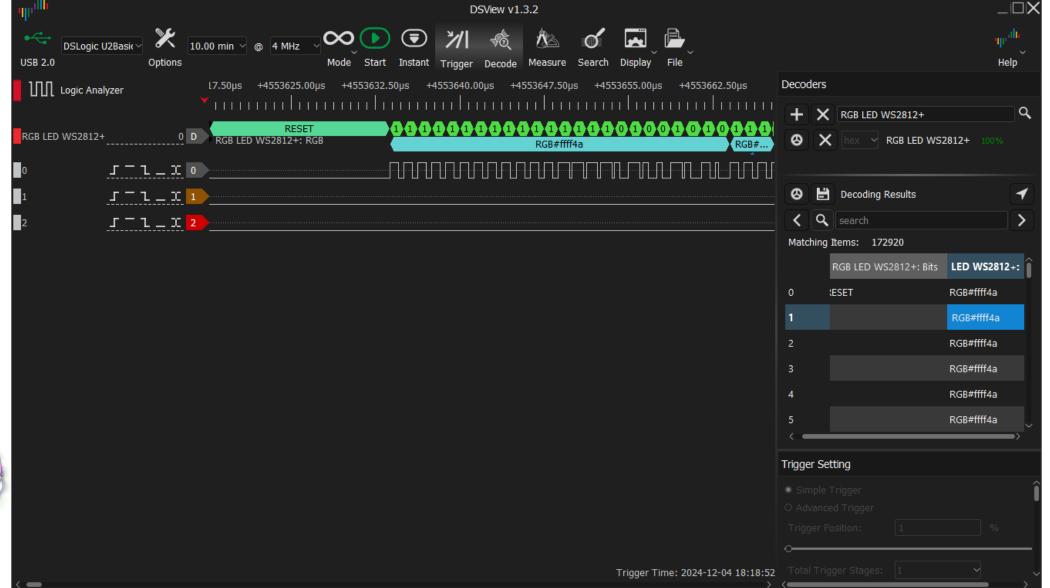
Serial Peripheral Interface WS2812B LED Protocol







BTF-LIGHTING WS2812







.NET FOR IOT

GPIO APIs: System. Device. Gpio

Device bindings: IoT.Device.Bindings

Source: dotnet/iot

System.Device.Gpio library and tests which is the main library that has the implementation for protocols such as: GPIO, SPI, I2C, PWM. This library is fully supported by the dotnet team since it has the same level of support that dotnet/corefx does.

IoT.Device.Bindings device bindings library. This is a collection of types which work as wrappers (or bindings) for devices and sensors which are able to talk to a microcontroller unit (or MCU like a Raspberry Pi for example) using the protocols supported by System.Device.Gpio.

Learn Internet of Things (IoT)

.NET IoT Libraries documentation

Deploy .NET apps on ARM single-board computers

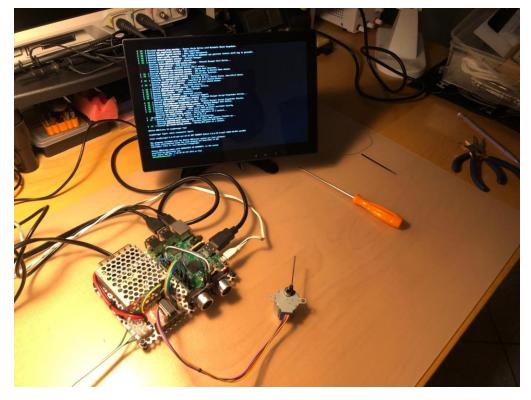
Ws28xx / SK6812 LED drivers

28BYJ-48 Stepper Motor 5V 4-Phase 5-Wire & ULN2003 Driver Board

HC-SR04 - Ultrasonic Ranging Module



WORK IN PROGRESS...







CODE







CONTACTS





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