

Umbrella Drying Machine

IS1901

Group No: 11 (ITM)



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1. Introduction

A user-friendly and sustainable solution for drying wet umbrellas in public spaces. Say goodbye to the hassle of managing wet umbrellas in a practical and hygienic way during inclement weather.



2. Problem Definition

1 Inconvenient Drying Methods

Traditional methods of umbrella drying are time-consuming and ineffective, posing safety hazards and hygiene concerns.

2 Safety and Hygiene Risks

Wet floors increase the risk of slip-and-fall incidents and present hygiene risks in high-traffic areas.

3 Lack of Comprehensive Solutions

Existing solutions are heavy, costly, and fail to address the core issues effectively.

3. Project Objectives and Aims

1

Design and Prototyping

Develop a detailed design for the Automatic Umbrella Drying Machine.

2

Automatic Activation

Automatically dry wet umbrellas using IR sensor technology.

3

Drying Mechanism

Design and implement an efficient drying mechanism.

4

User Interface and Experience

Integrate a user-friendly interface and implement safety features.

5

Energy Efficiency

Designed to use the least amount of power possible without sacrificing drying efficiency.

6

Cost-Effectiveness

uncovering strategies to save costs to offer an affordable remedy.

4. Proposed Solution

Automatic Activation

The drying mechanism is automatically activated by the Infrared (IR) sensor technology, which recognizes wet umbrellas upon insertion.

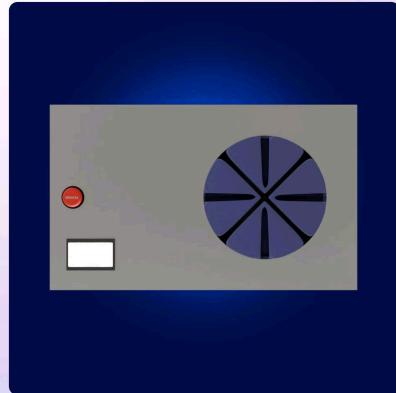
Effective Drying

The machine utilizes innovative drying technology to ensure complete drying and avoid water residue, while minimizing drying time.

User-Friendly Interface

An intuitive interface makes it simple to engage with the device, improving convenience and user experience.

Proposed Solution



Significance of the Solution



Safety

Reduces the risk of slip-and-fall incidents and creates a safer environment for users.



Hygiene

Prevents the spread of water and maintains a clean, hygienic public space.



Sustainability

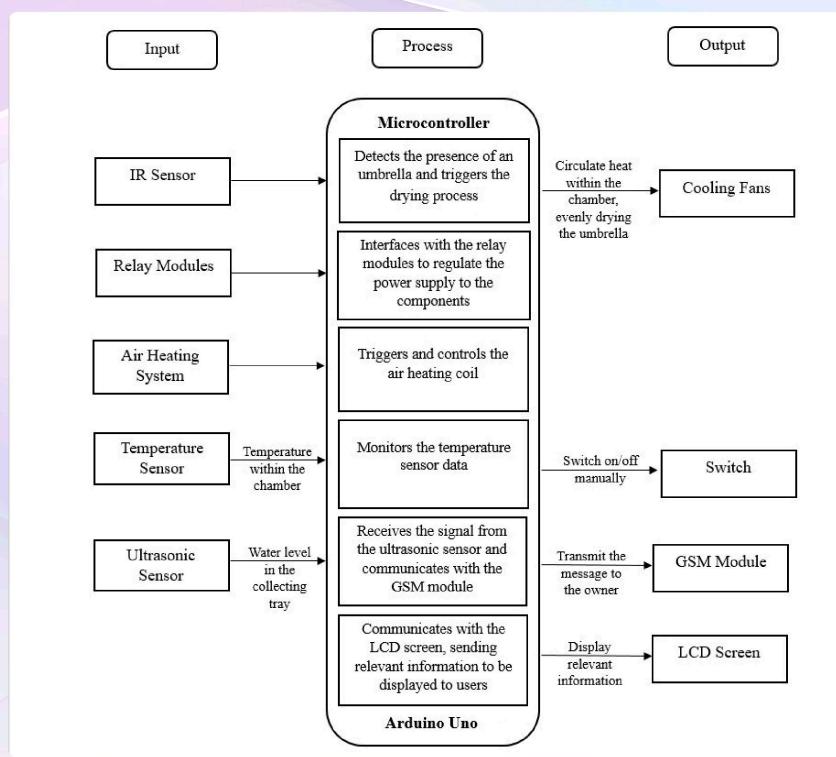
Encourages the reuse of umbrellas, reducing the consumption of disposable plastic covers.



Convenience

Offers a quick and efficient solution for drying wet umbrellas, enhancing user experience.

5. System Diagram



6.Individual Contribution & Components Used

Member : B. M. M. Amri - 225007N

I2C Module (I2C 1602 Serial LCD)

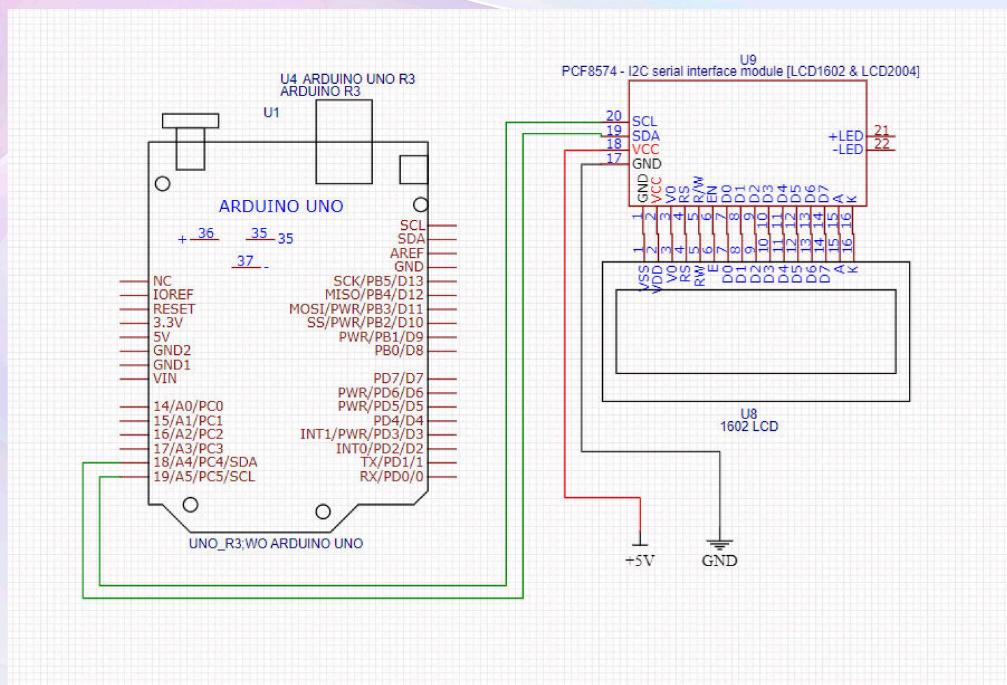


Importance of I2C module in LCD display

- Reduced pin usage
- Simplified wiring
- Compatibility
- Addressable communication
- Software efficiency

Operating Voltage: 5V

Schematic Diagram



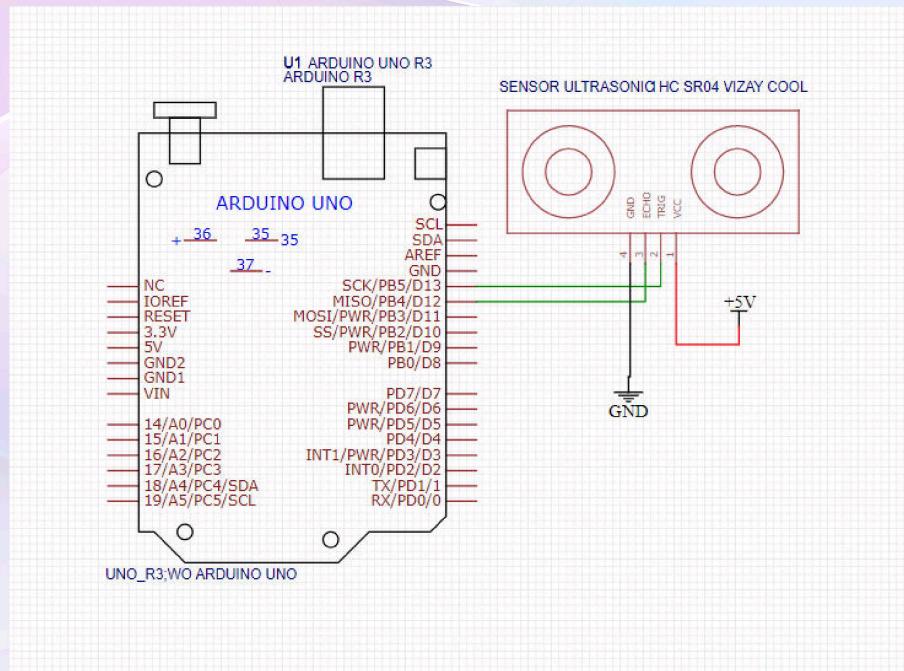
Ultrasonic Sensor (HC SR04)



Monitors the water level in the collection tray and activates when the water level reaches a certain point, signaling that the collection tray needs to be emptied.

Input Voltage: +5V

Schematic Diagram



Member : V. V. Fernandopulle - 225029H

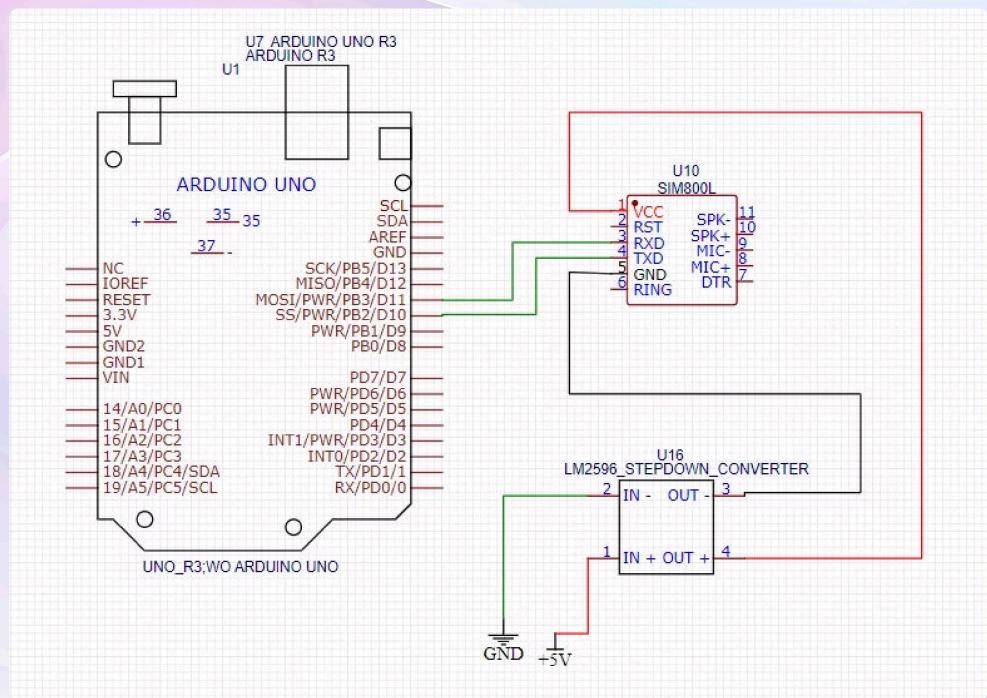
GSM Module (SIM800L)



Utilizes mobile network connectivity to transmit the message to the owner's designated phone number. The owner receives the SMS notification on their mobile device.

Input Voltage: 3.4V ~ 4.4V

Schematic Diagram



Member : D. S. Kodituwakku - 225056L

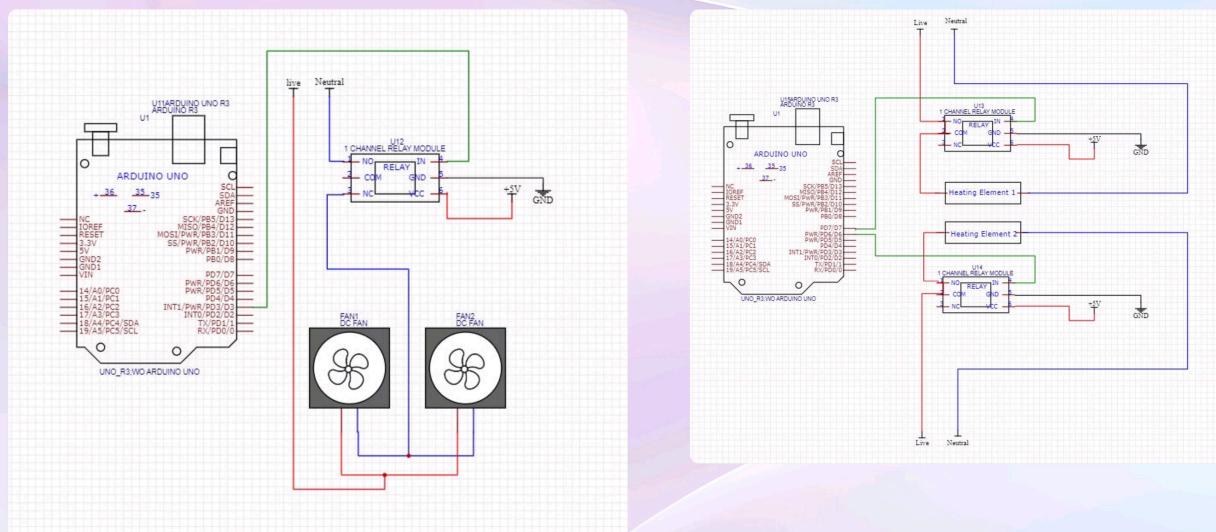
Relay Modules



Controls the activation and deactivation of the heating element and fans within the umbrella drying machine by managing the flow of electrical power.

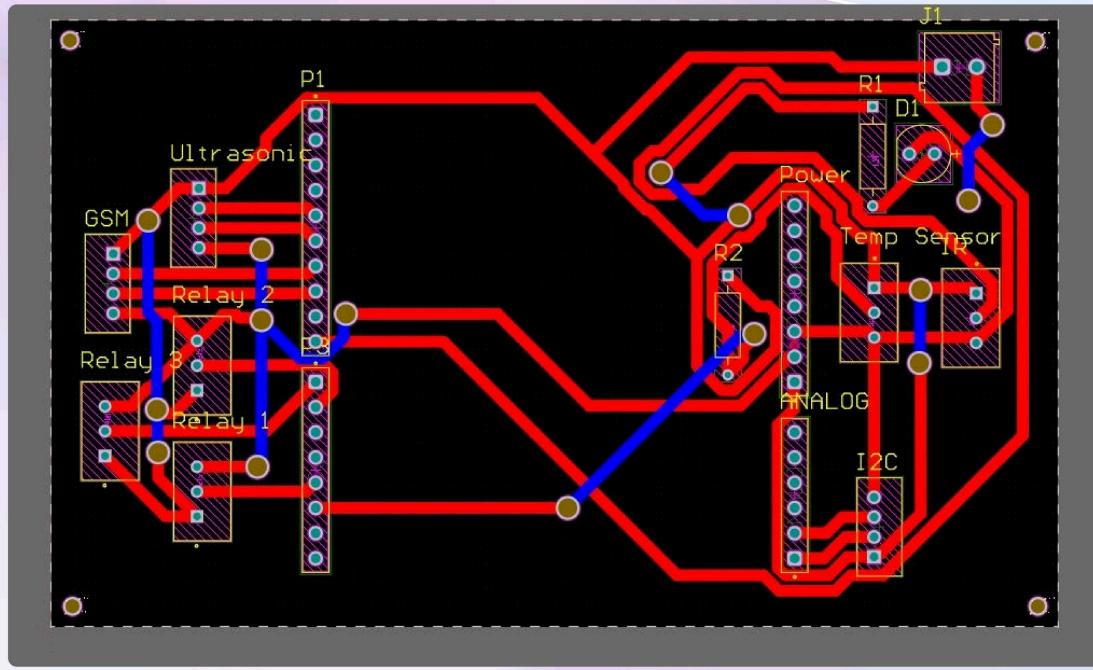
Input Voltage: 3V - 5V for each channel

Schematic Diagram



PCB Designing

PCB diagram



Made with Gamma

Member : F. H. Mushtaq - 225074N

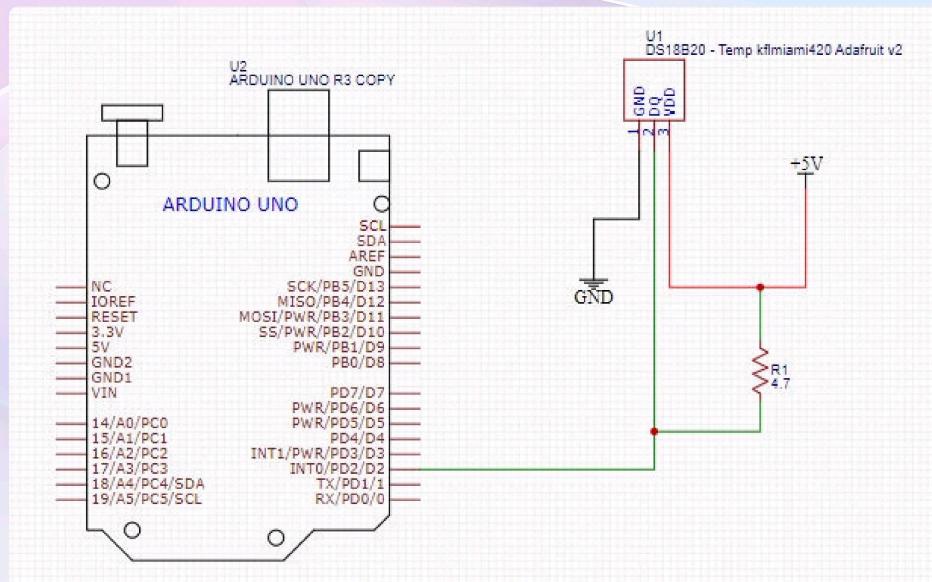
Temperature Sensor (DS18B20)



Helps regulate the air heating system to maintain an appropriate temperature for efficient drying without causing any damage to the umbrella or compromising safety.

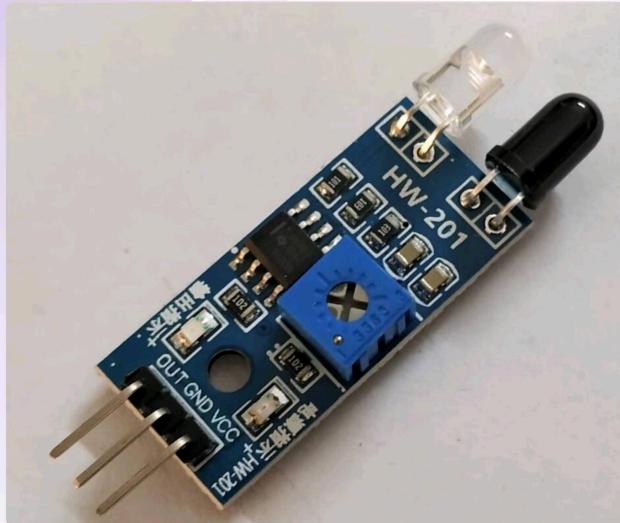
Input Voltage: 3V - 5.5V

Schematic Diagram



Member : J. A. S. Sansiluni - 225100T

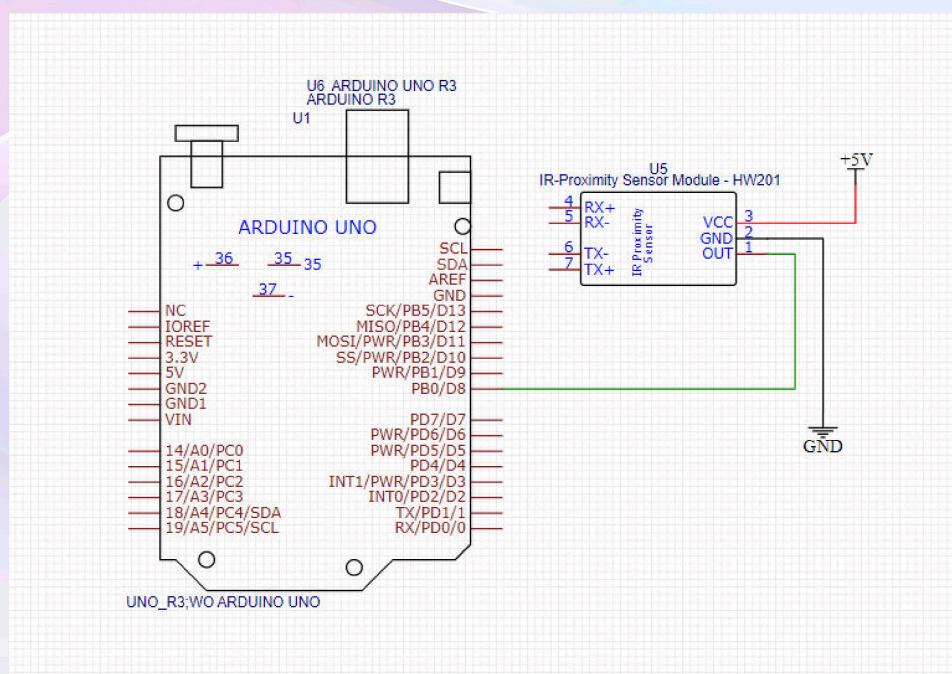
IR Sensor (HW201)



Detects the presence of the umbrella and triggers the drying process, providing a quick and efficient drying solution.

Operating Voltage: 3.3V - 5V

Schematic Diagram



Microcontroller



The Arduino Uno microcontroller serves as the central control unit.

7. Technologies and Methodologies Adopted

1. C++ Programming

- Used for low-level programming of the microcontroller and interfacing with hardware components.
- Enables efficient control and management of the umbrella drying machine's functionalities.

2. Arduino Uno Microcontroller

- Central component for controlling the operation of the umbrella drying machine.
- Provides a flexible and user-friendly platform for hardware-software interaction.

3. Altium for PCB Designing

- Altium used for designing the Printed Circuit Board (PCB) layout.
- Facilitates the integration of electronic components onto the PCB, ensuring efficient circuitry and connectivity.

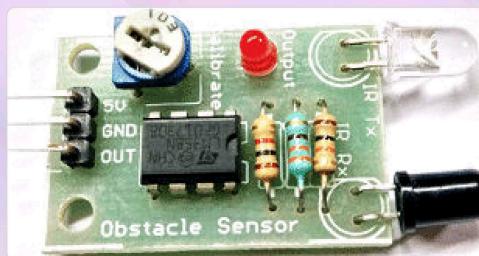
8. Work Distribution

225007N	B. M. M. Amri	I2C Module Ultra Sonic Sensor
225029H	V. V. Fernandopulle	GSM Module
225056L	D. S. Kodituwakku	PCB Designing
225074N	F. H. Mushtaq	Temperature Sensor
225100T	J. A. S. Sansiluni	IR Sensor

9. Budget

Component	Total	Relay Modules	700
Fans	9600	Dot Board	300
GSM module	2000	Frame (Aluminum & Wood work)	15000
Heating Element	500	PCB Printing	1000
Jumper Wires	300	Soldering	2000
Wires	1600	LCD screen	1000
Plug Top	400	Covering	4600
JST connectors, Resistors, Pin Headers	350	Cushion Structure	1000
Terminal Connectors	280	Other	5500
			46,130

References



Components101

IR Sensor Module

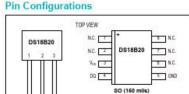
microprocessor. In addition, the DS18B20 can derive power directly from the data line ("parasite power"), eliminating the need for an external power source. Each DS18B20 has a unique 64-bit serial code, which allows multiple DS18B20s to function on the same 1-Wire bus. Thus, it is simple to use one microprocessor to control many sensors distributed over a large area. Applications that can benefit from this feature include HVAC, environmental controls, temperature monitoring systems, video building controls, or machinery, and process monitoring and control systems.

Applications

- Thermostatic Controls
- Industrial Sensors
- Consumer Products
- Thermometers
- Thermally Sensitive Systems

- ±0.5°C Accuracy from -10°C to +85°C
- Programmable Resolution from 9 Bits to 12 Bits
- No External Components Required
- Power-Poll Mode Requires Only 2 Pins for Operation (DQ and GND)
- Simplifies Distributed Temperature-Sensing Applications with Multiplex Capability
- Each Device Contains a Unique 64-Bit Serial Code Stored in On-Board ROM
- Flexible User-Defined Nonvolatile (NV) Alarm Settings with On-Chip Comparison Logic for Devices with Temperatures Outside Programmed Limits
- Available in 8-Pin SO (150 mils), 8-Pin µSO, and 3-Pin TO-92 Packages

Pin Configurations



datasheetspdf.com

18B20 Datasheet - DS18B20

Dallas Semiconductor, Stock #:642267, Datasheet, equivalent, pinout, replacement, pdf, complementary.

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THANK YOU!

