



DTE Code: 4151

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TULSIRAMJI GAIKWAD-PATIL
College of Engineering & Technology

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PCB DESIGN LAB

INSTRUMENT & SPECIFICATION

Infrared IC Heaters Machine



Infrared IC Heater – Overview

- Heats objects directly using infrared radiation
- Fast response, energy efficient
- Non-contact heating method

Key Specifications

- Power: 100 W – 5 kW
- Voltage: 110 / 220 / 380 V
- Wavelength: 0.7 – 10 μm
- Heating time: Instant
- Element: Quartz / Ceramic
- Temp range: 300 – 900°C

Applications

- Plastic & thermoforming
- PCB & electronics preheating
- Paint & adhesive curing
- Textile & ink drying
- Packaging & shrink wrapping

Do's

- Use correct IR wavelength
- Maintain proper heater distance
- Use temperature controller
- Ensure proper ventilation
- Regular inspection & cleaning

Don'ts

- Do not touch hot surface
- Do not exceed rated voltage
- Do not block radiation path
- Avoid water contact
- Not for explosive areas (unless rated)

**INFRATED IC
HEATER**



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INSTRUMENT & SPECIFICATION

3018 CNC Machine - PCB Cutting Specifications

STRUCTURE



Desktop 3-axis CNC
Aluminum frame
T-slot workbed

SPINDLE



DC spindle ~300-500 W
ER11 collet
V-bits &
0.2- 1 mm end mills



MATERIALS SUPPORTED



FR-4 PCB, Acrylic, Plastic,
Wood, Wood
No steel

WORKING AREA



Approx. 300 × 180 mm
Small Z travel suitable
for PCB

DO'S



Shallow cuts
Flat clamping

DON'TS



Heavy metals
High feed rates

DRIVE SYSTEM



NEMA-17 stepper motors
Lead screw driven axes

PCB MILLING MACHINE

APPLICATIONS



PCB trace isolation
Drilling, Slot cutting
Prototyping



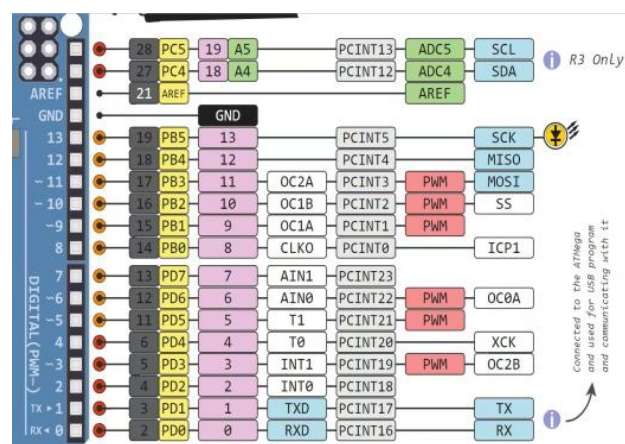
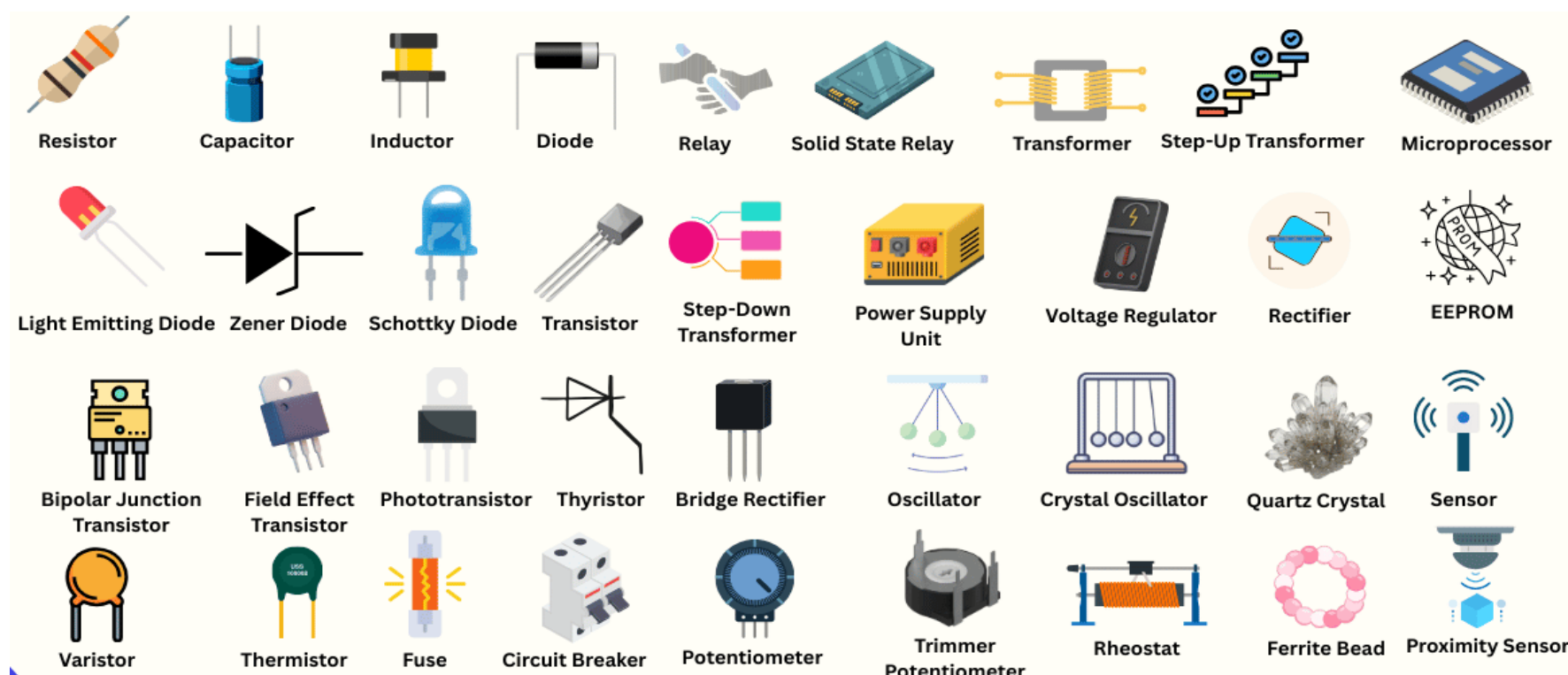
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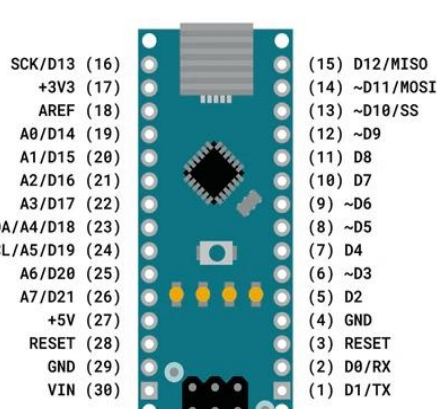
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IOT LAB

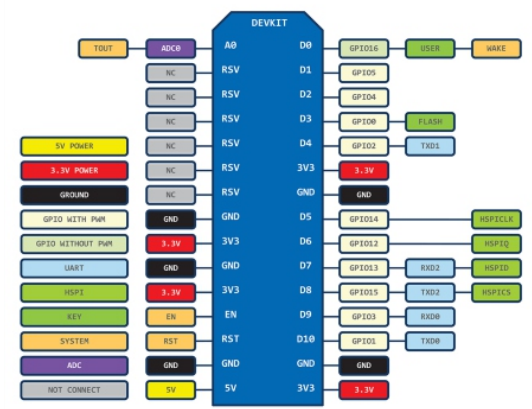
COMPONENT & INSTRUMENTS



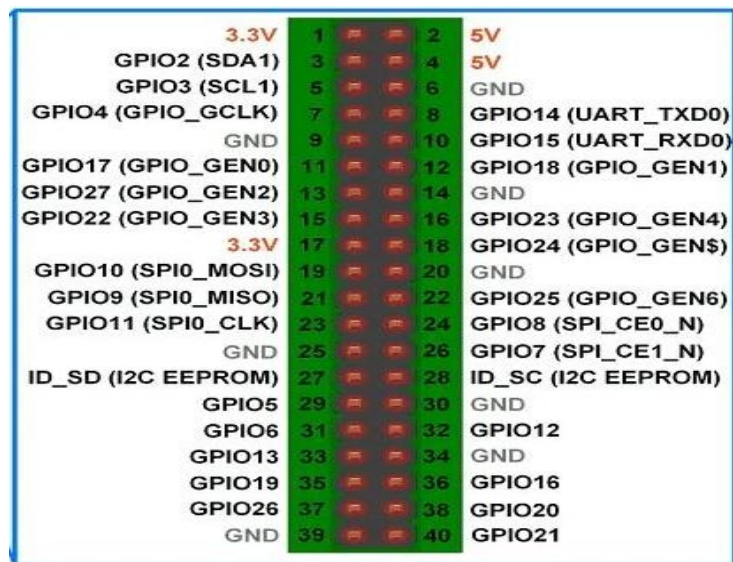
Arduino UNO Pinout



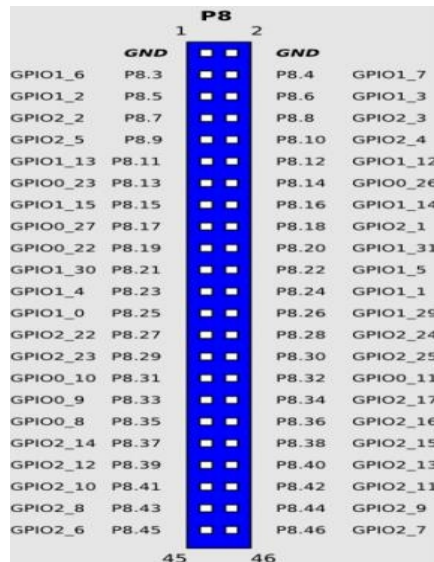
Arduino Nano Pinout



Node MCU Pinout



Raspberry Pi Pinout



Beagle Bone C++ Pinout

✓ DO's	✗ DON'Ts
Keep wiring clean, short, and labeled	Do NOT touch boards with wet hands
Verify pin connections before uploading code	Do NOT hot-plug components while powered
Disconnect power before changing hardware	Do NOT interrupt firmware upload
Use tested libraries and verified code	Do NOT place boards on metal surfaces
Handle sensors and boards carefully	Do NOT ignore overheating or burning smell



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