uxcell TEC1-12705

uxcell TEC1-12705 Thermoelectric Cooler Instruction Manual

Model: TEC1-12705

1. Introduction

The uxcell TEC1-12705 is a thermoelectric cooler, also known as a Peltier module, designed for various heating and cooling applications. This device utilizes the Peltier effect to create a temperature difference across its two ceramic surfaces when a direct current is applied. It is composed of semiconductor materials sandwiched between ceramic plates and operates without any moving parts, offering reliable performance for applications ranging from CPU cooling to portable refrigeration.

2. Safety Information

Important Safety Precautions:

1. **Heat Sink Requirement:** The TEC1-12705 module **must always be used in conjunction with an appropriate heat sink** on its hot side. Failure to do so will result in immediate overheating and permanent damage to the module.
2. **Thermal Grease:** Always apply a thin, even layer of high-quality thermal grease between the TEC module and both the heat sink and the object being cooled/heated to ensure efficient heat transfer.
3. **Power Supply:** Use a stable 12V DC power supply capable of providing at least 5A. Exceeding the maximum voltage or current can damage the module.
4. **Polarity:** Incorrect polarity will reverse the heating/cooling effect. Ensure correct wiring for the desired operation.
5. **Temperature Range:** Operate the module within its specified temperature range of -55°C to 83°C.

3. Package Contents

The package contains one (1) uxcell TEC1-12705 Thermoelectric Cooler module.

Image: This image displays the uxcell TEC1-12705 thermoelectric cooler module. It is a square, white ceramic component with the model number 'TEC1-12705' printed on one side. Red and black electrical wires extend from one edge of the module, indicating its power input.

4. Technical Specifications

Specification	Value
Model	TEC1-12705
Voltage	12V DC
Max Current (Imax)	5A
Resistance	2.4-2.7Ω
Max Temperature Difference (ΔTmax, Qc=0)	Up to 61°C
Operating Temperature	-55°C to 83°C

Specification	Value
Dimensions (L*W*T)	40mm x 40mm x 3.8mm (1.57" x 1.57" x 0.15")
Item Weight	0.02 Kilograms (approx. 0.78 ounces)
Manufacturer Model Number	a18112200ux0739

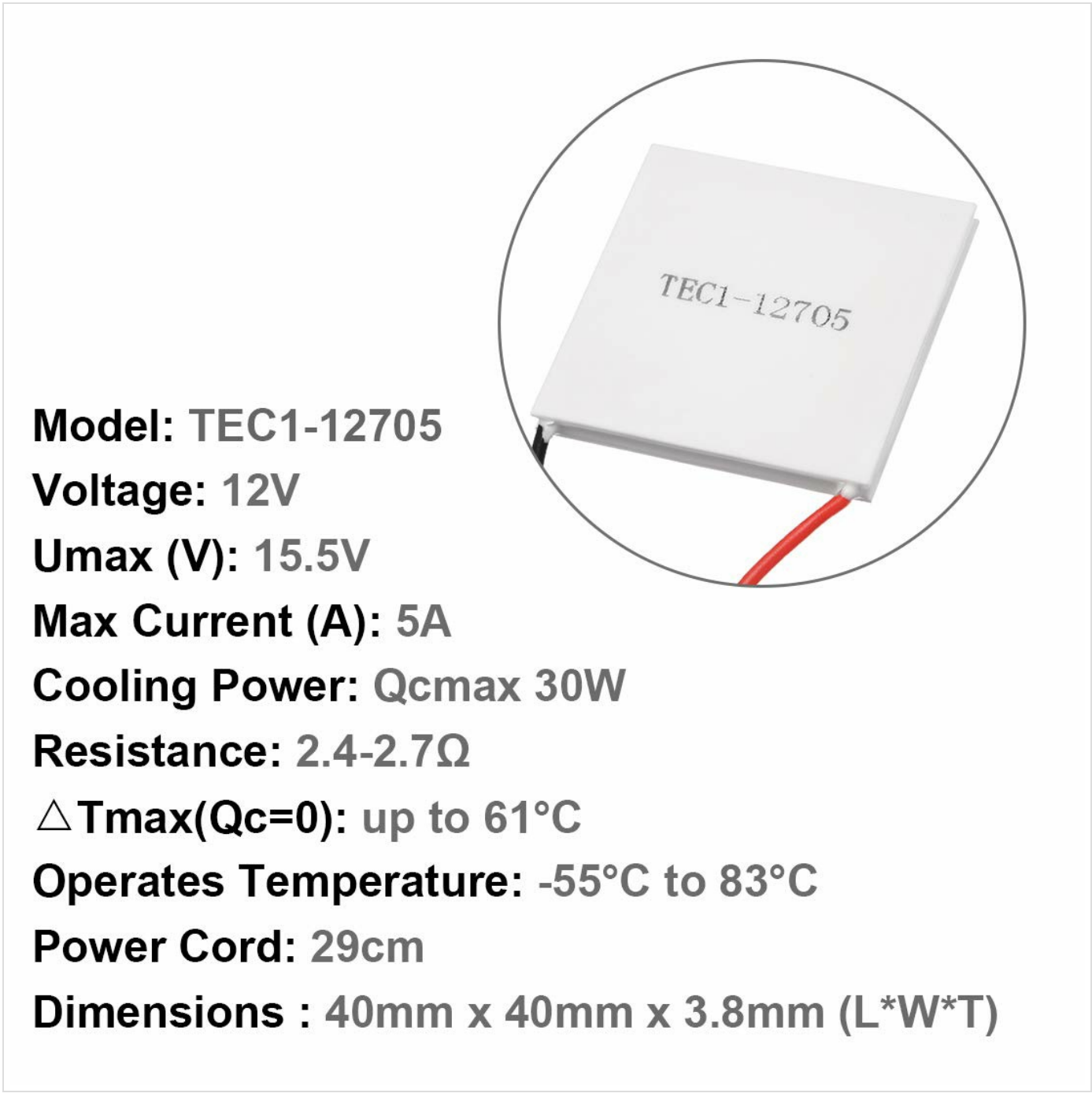


Image: This diagram provides a visual summary of the key technical specifications for the TEC1-12705 module, including its model number, voltage, current, resistance, maximum temperature difference, operating temperature range, power cord length, and physical dimensions.

5. Setup and Installation

5.1 General Installation Guidelines

1. **Surface Preparation:** Ensure that both surfaces (the TEC module and the heat sink/object to be cooled) are clean, flat, and free from dust or debris.

2. **Thermal Grease Application:** Apply a thin, even layer of thermal grease to both sides of the TEC module that will be in contact with other surfaces. This maximizes thermal conductivity.
3. **Heat Sink Attachment:** Securely attach a suitable heat sink to the designated 'hot' side of the TEC module. The hot side is the one opposite the side that cools when the red wire is positive and black is negative. Ensure firm and even pressure across the entire surface.
4. **Mounting:** The module can be mounted using appropriate fasteners or clamps, ensuring not to over-tighten and damage the ceramic plates.

5.2 Wiring and Polarity

The TEC1-12705 module has two wires: one red and one black. The polarity of the power supply determines whether the module cools or heats a specific side.

- **Cooling Mode:** To achieve cooling on the side marked with the model number (TEC1-12705), connect the **red wire to the positive (+) terminal** of your 12V DC power supply and the **black wire to the negative (-) terminal**. The opposite side will become hot and requires a heat sink.
- **Heating Mode:** To achieve heating on the side marked with the model number, reverse the polarity: connect the **red wire to the negative (-) terminal** and the **black wire to the positive (+) terminal**. The opposite side will become cold.

Image: This image shows a close-up of the red and black insulated wires extending from the thermoelectric cooler module. The red wire is typically connected to the positive terminal and the black wire to the negative terminal for standard cooling operation on the labeled side.

6. Operating Instructions

Once properly installed with a heat sink and connected to a 12V DC power supply, the TEC1-12705 module will begin to create a temperature differential.

- **Cooling:** With the red wire connected to positive and black to negative, the side of the module with the model number printed on it will become cold, while the opposite side will become hot.
- **Heating:** By reversing the polarity (red to negative, black to positive), the side with the model number will become hot, and the opposite side will become cold.

The module can achieve a maximum temperature difference (ΔTmax) of up to 61°C under ideal conditions (Qc=0, no heat load). The actual temperature difference will vary depending on the heat load and the efficiency of the heat sink used.

7. Maintenance

The TEC1-12705 module is a solid-state device with no moving parts, requiring minimal maintenance.

- **Cleanliness:** Periodically inspect the module and heat sink for dust accumulation. Dust can impede airflow and reduce heat sink efficiency. Clean gently with compressed air or a soft brush.
- **Thermal Grease Integrity:** Over time, thermal grease can dry out or degrade. If you notice a significant drop in performance, consider reapplying fresh thermal grease.
- **Connection Check:** Ensure all electrical connections remain secure and free from corrosion.

8. Troubleshooting

If the uxcell TEC1-12705 module is not performing as expected, consider the following:

- **No Cooling/Heating:**
  - Verify the 12V DC power supply is functioning and providing sufficient current (at least 5A).
  - Check wiring for correct polarity.
  - Ensure connections are secure.
- **Insufficient Cooling/Heating:**
  - Confirm that a proper heat sink is securely attached to the hot side of the module.
  - Check for proper application and integrity of thermal grease between all contact surfaces.
  - Ensure adequate airflow around the heat sink for efficient heat dissipation.
  - Verify the ambient temperature is within the operating range.
- **Module Overheating:**
  - This is almost always due to insufficient heat dissipation on the hot side. Ensure the heat sink is adequately sized for the heat load and has good thermal contact.
  - Check for proper thermal grease application.
  - Ensure the power supply is not exceeding 12V or 5A, which could lead to excessive heat generation.

9. Warranty Information

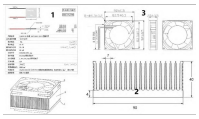
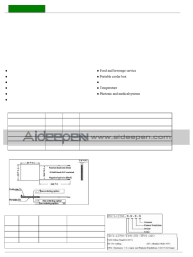
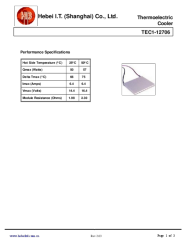
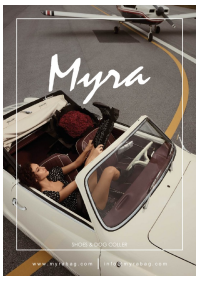
No specific warranty information is provided with this product. For details regarding warranty coverage, please refer to the purchase documentation, the retailer's policy, or contact the manufacturer directly.

10. Customer Support

For technical assistance, product inquiries, or support, please contact uxcell customer service. You can typically find contact information on the official uxcell website or through the retailer where the product was purchased.

You may also visit the uxcell Store on Amazon for more information:uxcell Store

Related Documents - TEC1-12705

	[TEC1-7103 Thermoelectric Cooler Module Manual and Installation Guide] Detailed manual for the TEC1-7103 thermoelectric cooler module, including specifications, features, and step-by-step installation guides for creating cooling solutions, such as a mobile phone cooler.
	[TEC1-12706 Thermoelectric Cooler Module Datasheet and Dimensions] Technical specifications and dimensional drawings for the TEC1-12706 Thermoelectric Cooler (TEC) module, including details on its operating parameters, ceramic specifications, and associated heatsink and fan components.
	[Aideepen TEC1-12706 Thermoelectric Module Specification Sheet] Detailed technical specifications, performance curves, and application information for the Aideepen TEC1-12706 thermoelectric cooler (Peltier module).
	[Hebei I.T. TEC1-12706 Thermoelectric Cooler Datasheet] Technical specifications, performance curves, dimensions, and operating tips for the Hebei I.T. TEC1-12706 Thermoelectric Cooler, a Peltier module manufactured by Hebei I.T. (Shanghai) Co., Ltd.
	[Specialty Calibration Weights: Cylindrical and Leaf Troy Ounce Weights] Detailed specifications for specialty calibration weights, including cylindrical and leaf troy ounce weights, with part numbers, dimensions, and accessory information from Rice Lake Weighing Systems.
	[Myra Shoes and Dog Collars Catalog] Explore the Myra collection of high-quality women's shoes and stylish dog collars. Featuring a wide range of boots, sandals, and accessories crafted with genuine leather and unique designs.